NOVOSENSE

NOVOSENSE
Product Selection Guide

- Sensor
- Signal Chain
- Power Management

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About NOVOSENSE

NOVOSENSE Microelectronics (NOVOSENSE, SSE Stock Code 688052) is a highly robust & reliable analog and mixed signal Chip company. Since its establishment in 2013, the company has been focusing on sensor, signal chain, and power management, providing comprehensive semiconductor products and solutions, which are widely used in automotive, industrial, information communication and consumer electronics markets.

With the mission of "Sense & Drive the Future, Build a Green, Smart and Connected World with Semiconductors", the company is committed to providing chip-level solutions to link the digital world and the real world.

"Sense and Drive the Future, Build a Green, Smart and Connected World with Semiconductors”

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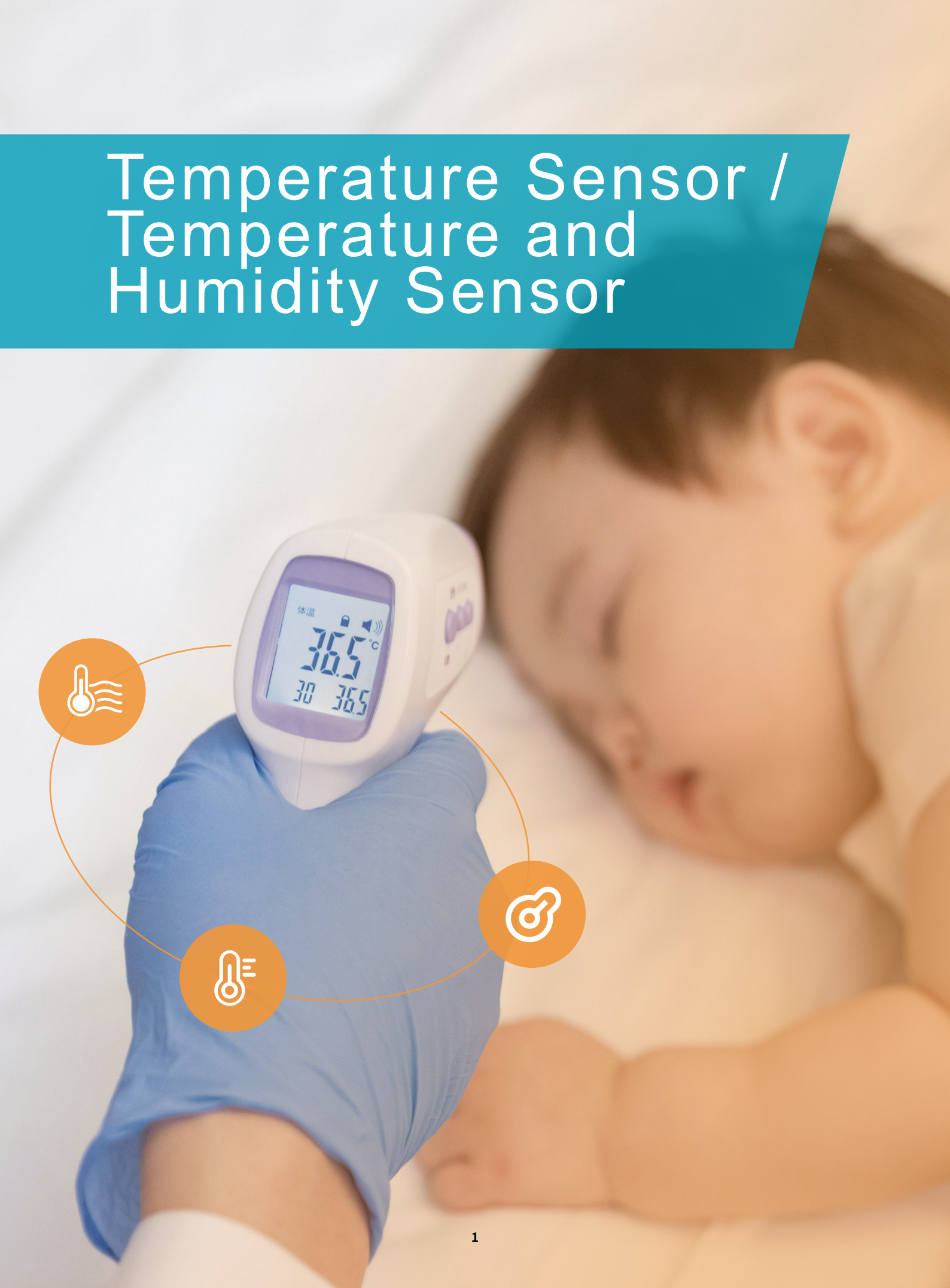
Temperature Sensor / Temperature and Humidity Sensor



Temperature Sensor

Part number	Product description	Package	Temperature range	Supply voltage	Working current	Port type	Max. resolution	Max. precision	Typical application
NST1001	High-precision dual-pin digital pulse output temperature sensor	TO-92S/ DFN-2	-50°C~150°C	1.65V~5.5V	30μA	Pulse count output	0.0625°C	±0.2°C	NTC replacement, quick response probe, 2-wire temperature probe, gas meter temperature compensation, wearable and IoT temperature measurement
NST1001HA	High-precision dual-pin digital pulse output temperature sensor with maximum accuracy of ±0.2°C	DFN-2	-50°C~150°C	1.65V~5.5V	30μA	Pulse count output	0.0625°C	±0.1°C	NTC replacement, quick response probe, 2-wire temperature probe, gas meter temperature compensation, wearable and IoT temperature measurement
NST1002	High-precision single-BUS digital temperature sensor	TO-92S/ DFN-2	-50°C~150°C	1.7V~5.5V	30μA	One wire protocol	0.0078125°C	±0.1°C	NTC replacement, quick response probe, 2-wire temperature probe, glucometer，wearable and IoT temperature measurement
NST175	Digital temperature sensor with I²C/SMBUS interface in industrial-qualified package	MSOP-8/ SOP-8	-55°C ~125°C	1.62V~5.5V	30μA	I²C/SMBUS	0.0625°C	±0.5°C	LM75/TMP75 replacement, server temperature measurement, battery temperature measurement, SSD temperature measurement, board-level temperature measurement
NST175-Q1	Digital temperature sensor with I²C/SMBUS interface in automotive-grade standard packaging	MSOP-8/ SOP-8	-40°C~150°C	1.62V~5.5V	30μA	I²C/SMBUS	0.0625°C	±0.2°C	Automotive air conditioning system, automotive infotainment system, air flow sensor, battery management system BMS, engine control unit, on-board HID lamp, airbag control unit
NST1075	Small-size high-precision digital temperature sensor	WSON8	-55°C~125°C	1.62V~5.5V	30μA	I²C/SMBUS	0.0625°C	±0.5°C	TMP75 replacement，server temperature measurement, routers, communication base stations, board-level temperature measurement
NST118	Small-size high-precision digital temperature sensor with I²C/SMBUS port	DFN-6	-40°C~125°C	1.71V~3.6V	6.5μA	I²C/SMBUS	0.0625°C	±0.1°C	x117 substitution, wearable temperature monitoring, medical thermometer, battery temperature measurement, industrial IoT, environmental monitoring, etc.
NST117	Small-size high-precision digital temperature sensor with I²C port	DFN-6	-55°C~125°C	1.62V~5.5V	30μA	I²C/SMBUS	0.0625°C	±0.2°C	x117 series substitution, wearable temperature monitoring, medical thermometer, battery temperature measurement, industrial Internet of Things, environmental monitoring, etc.
NST112 -DSTR	SOT563 is a high-accuracy and low-power digital temperature sensor with a I²C/SMBUS port	SOT563	-40°C~125°C	1.71V~3.6V	6.5μA	I²C/SMBUS	0.0625°C	±0.5°C	1X2 series substitution, board level temperature measurement, server temperature measurement, battery temperature measurement, SSD temperature measurement, IoT temperature monitoring, etc.
NST112x	WLCSP is a high-accuracy and low-power digital temperature sensor with a I²C/SMBUS port	DSBGA-4	-40°C~125°C	1.5V~3.6V	5.7μA	I²C/SMBUS	0.015625℃	±0.1°C	1X2 series substitution, wearable temperature monitoring, board level temperature measurement, server temperature measurement, battery temperature measurement, SSD temperature measurement, IoT temperature monitoring, etc.
NST103	WLCSP is a low-power digital temperature sensor with a I²C/SMBUS port	DSBGA-4	-40°C~125°C	1.5V~3.6V	3μA	I²C/SMBUS	1°C	±1°C	X103 series substitution, mobile phone, laptop, SOLID-state disk, server, telecommunication, set-top box, sensor, low power environment
NST461	High-precision and high-resolution I²C/SMBUS remote and local temperature sensors (1L+1R)	WQFN-10	-40°C~125°C	2.1V~3.6V	37μA	I²C/SMBUS	0.0625°C	±0.5°C	X461/451 substitution, X4x1 compatibility, laptop, desktop, solid-state drive, server, telecommunication, Industrial Internet of Things, etc.
NST1412	High-precision I²C/SMBUS remote and local temperature sensors (1L+1R)	MSOP-10	-40°C~125°C	3V~3.6V	37μA	I²C/SMBUS	0.125°C	±0.5°C	EMC1412 substitution, laptop, desktop, solid-state drive, server, telecommunication, Industrial Internet of Things, etc.
NST1413	High-precision I²C/SMBUS remote and local temperature sensors (1L+2R)	MSOP-10	-40°C~125°C	3V~3.6V	37μA	I²C/SMBUS	0.125°C	±0.5°C	EMC1413 substitution, laptop, desktop, solid-state drive, server, telecommunication, Industrial Internet of Things, etc.
NST7719	High-precision I²C/SMBUS remote and local temperature sensors (1L+2R)	MSOP-10	-40°C~125°C	3V~3.6V	37μA	I²C/SMBUS	0.125°C	±0.5°C	NCT7719 substitution, laptop, desktop, server, telecommunication, Industrial Internet of Things, etc.
NST20	High-precision, low-power analog output temperature sensor (negative temperature coefficient)	SC70-5	-55°C~130°C	2.4V~5.5V	20μA	Analog output	-11.77mV/°C	±0.5°C	X20 series substitution, laptop temperature monitoring, smart phone temperature measurement, temperature monitoring of portable medical devices, industrial Internet of Things and power system, power module temperature measurement, environmental monitoring &HVAC, etc.

Part number	Product description	Package	Temperature range	Supply voltage	Working current	Port type	Max. resolution	Max. precision	Typical application
NST86	High-precision, low-power analog output temperature sensor (negative temperature coefficient)	SC70-5	-50°C~150°C	2.4V~5.5V	20μA	Analog output	-10.9mV/°C	±0.5°C	X86 series substitution, laptop temperature monitoring, smart phone temperature measurement, temperature monitoring of portable medical devices, industrial Internet of Things and power system, power module temperature measurement, environmental monitoring &HVAC, etc.
NST86-Q1	Automotive-grade high precision, low power consumption analog output temperature sensor (negative temperature coefficient)	SC70-5	-40°C~150°C	2.4V~5.5V	20μA	Analog output	-10.9mV/°C	±0.5°C	Car audio host, car infotainment system, electric power steering (EPS), battery management system (BMS), gear shifting system, gasoline engine
NST235	High-precision, low-power analog output temperature sensor (positive temperature coefficient)	SC70-5 SOT23-3	-40°C~150°C	2.3V~5.5V	20μA	Analog output	10mV/°C	±0.5°C	X235 series substitution, laptop temperature monitoring, smart phone temperature measurement, temperature monitoring of portable medical devices, industrial Internet of Things and power system, power module temperature measurement, environmental monitoring &HVAC, etc.
NST235-Q1	Automotive-grade high precision, low power consumption analog output temperature sensor (positive temperature coefficient)	SOT23-3	-40°C~150°C	2.3V~5.5V	20μA	Analog output	10mV/°C	±0.5°C	Car audio host, car infotainment system, electric power steering (EPS), battery management system (BMS), gear shifting system, gasoline engine
NST60	High-precision, low-power analog output temperature sensor (positive temperature coefficient)	SOT23-3	-40°C~125°C	2.4V~5.5V	20μA	Analog output	6.25mV/°C	±0.5°C	X60 series substitution, laptop temperature monitoring, smart phone temperature measurement, temperature monitoring of portable medical devices, industrial Internet of Things and power system, power module temperature measurement, environmental monitoring &HVAC, etc.
NST60-Q1	Automotive-grade high precision, low power consumption analog output temperature sensor (positive temperature coefficient)	SOT23-3	-40°C~125°C	2.4V~5.5V	20μA	Analog output	6.25mV/°C	±0.5°C	Car audio host, car infotainment system, electric power steering (EPS), battery management system (BMS), gear shifting system, gasoline engine

Temperature and Humidity Sensor

Part number	Product description	Package	Temperature range	Relative humidity (RH) range	Supply voltage	Working current	Port type	Max. resolution	Max. precision	Typical application
NSHT30-CLAR	High-precision, Low-power I²C Digital Interface Temperature and Humidity Sensor	LGA	-40°C~125°C	0%RH~100%RH	2.0V~5.5V	3.2μA	I²C	/	±0.3°C	Humidifier/dehumidifierWhite goodsIntelligent constant temperature and humidity controllerVentilatorsSmart agricultureCold chain logisticsHygrographAutomobile intelligent fog removal system
NSHT30-QDNR	High-precision, Low-power I²C Digital Interface Temperature and Humidity Sensor	DFN	-40°C~125°C	0%RH~100%RH	2.0V~5.5V	3.2μA	I²C	/	±0.3°C	Humidifier/dehumidifierWhite goodsIntelligent constant temperature and humidity controllerVentilatorsSmart agricultureCold chain logisticsHygrographAutomobile intelligent fog removal system
NSHT30-Q1	Automotive High-precision, Low-power I²C Digital Interface Temperature and Humidity Sensor	DFN	-40°C~125°C	0%RH~100%RH	2.0V~5.5V	3.2μA	I²C	N/A	±0.3°C	Window fog removal，Automotive HVAC control module, Automotive Lidar,Battery Management System, Automotive

NST1001: D-NTC® Digital Pulse Output Temperature Sensor

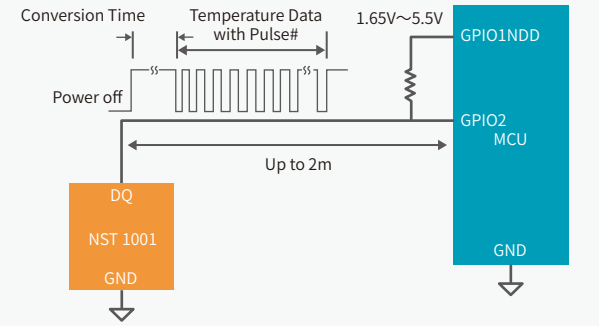
◆ Product introduction

NST1001 is a high-precision double-pin digital output temperature sensor. NST1001 features pulse counting digital output and high precision in a wide temperature range, which can be directly connected with MCU, while ensuring measurement accuracy and reducing overhead. The NST1001 device supports a maximum accuracy of ±0.75 °C over temperatures ranging from -50 °C to 150 °C, while providing extremely high resolution (0.0625 °C) without system calibration or hardware/software compensation. The pulse-counting digital port is designed for direct connection to GPIO or comparator inputs to simplify component implementation. Simple two-pin architecture is adopted. So the NST1001 device can be easily converted into a two-wire temperature probe.

◆ Product feature

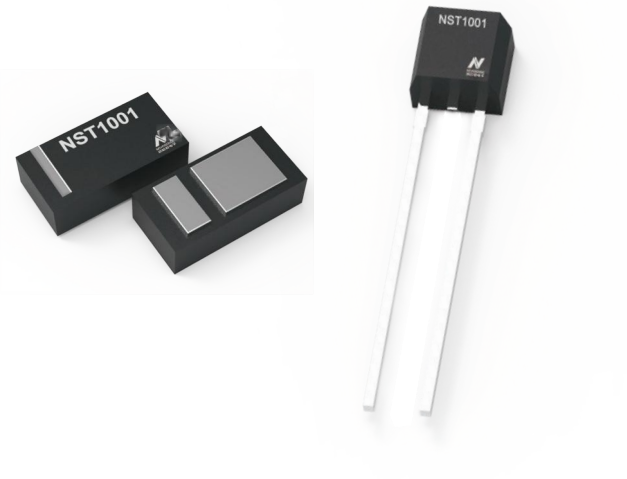
- Operating temperature range: -50°C~150°C
- High accuracy in full temperature range
  25°C~45°C: ±0.2°C (typical) @ NST1001
  25°C~45°C:±0.2°C(max.) @ NST1001HA
  Accuracy within range -20 °C~85°C: ±0.5°C (max.)
  Accuracy within range -50°C~-20°C: ±0.75°C (max.)
  Accuracy within range 85°C~150°C: ±0.75°C (max.)
- High resolution: 0.0625°C（1 LSB）
- Quick temperature response: silicone oil τ63%0.21S（DFN2L）
- Single temperature conversion time: 50mS
- Ultra-low power consumption: 30μA operating current, zero standby power consumption
- Supply voltage range: 1.65V to 5.5V
- Pulse count type digital output to reduce the AD conversion port on master side
- Support dual pin simplified temperature measurement solution
- DFN2L ultra small packaging, with same resistance size as 0603

◆ Functional block diagram



◆ Package

- TO-92S (4mm x 3mm)
- DFN2L (1.6mm x 0.8mm)



◆ Application

Power metering | Gas meter temperature measurement | Smart closestool | Digital temperature probes | Smart wearable devices, | Industrial Internet of things | Battery temperature detection

NST1002: D-NTC single bus-type digital temperature sensor

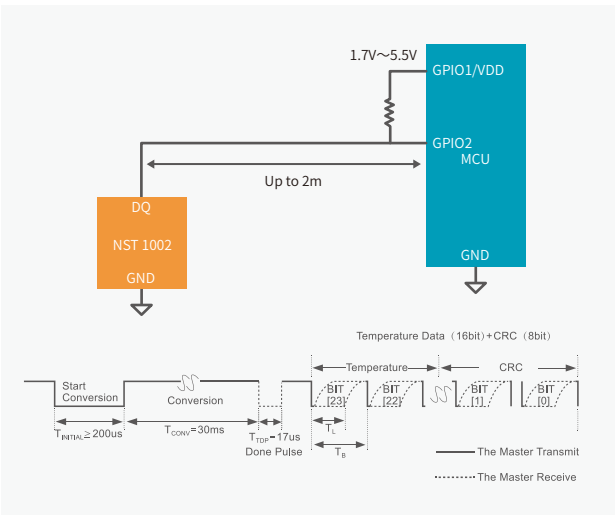
Product introduction

NST1002 is a high-precision dual-pin single bus-type temperature sensor. NST1002 has a single bus protocol output interface and high precision in a wide temperature range. It can be directly connected with MCU to ensure the measurement accuracy and reduce the overhead. The NST1002 device supports a maximum accuracy of ±0.5°C over temperatures ranging from -40°C to 125°C, while providing extremely high resolution (0.0078125°C) without system calibration or hardware/software compensation. The digital interface of the single bus protocol is designed to connect directly to GPIO, simplifying hardware design. The simple dual-pin architecture enables the NST1002 device to be easily converted into a two-wire temperature probe.

Product feature

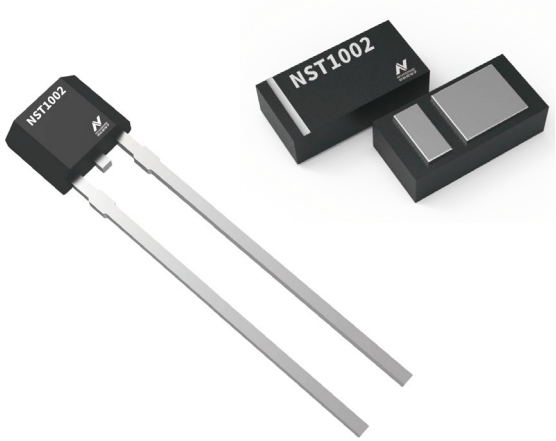
- Operating temperature range: –50°C to 150°C
- High accuracy over –50°C to 150°C
  DFN-2L
  0°C~85°C: ±0.1°C (typical) ±0.25°C(max.)
  -40°C ~125°C: ±0.5°C (max.)
  -40°C ~150°C: ±0.5°C (max.)@3.3V
  TO-92S-2L
  0°C~85°C: ±0.2°C (typical)
  -20°C ~85°C: ±0.35°C (max.)
  -40°C ~125°C: ±0.7°C (max.)
  -40°C ~125°C: ±0.7°C (max.) @3.3V
- High resolution: 0.0078125°C (1 LSB)
- Quick temperature response: 0.27S (DFN2L)
- Single temperature conversion time: 32ms
- Ultra-low power consumption: 30μA operating current, zero standby
- power consumption
- Supply voltage range: 1.7V to 5.5V
- Single bus protocol digital output, without AD conversion port
- Support dual pin simplified temperature measurement solution
- DFN2L ultra small packaging, with same size as 0603 resistance

Functional block diagram



Package

- TO-92S (4mm x 3mm)
- DFN2L (1.6mm x 0.8mm)



Application

Ammeter | Gas meter temperature measurement | Intelligent closestool | Home appliances | Glucometer | Digital temperature probe | Intelligent wearables | Industrial Internet of Things | Battery temperature detection

NST175: Digital Temperature Sensor with I²C Port in Industrial-qualified Package

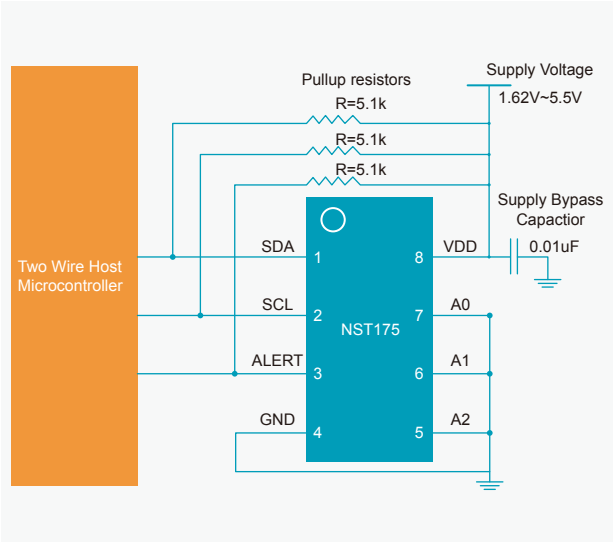
◆ Product introduction

The NST175 is a low-power, high-precision digital temperature sensor ideal as an alternative to negative temperature coefficient (NTC) and positive temperature coefficient (PTC) thermistors. The device provides typical accuracy of ±0.5 °C without calibration or signal adjustment from external components. NST175 temperature sensor is a highly linear product, which can sense the temperature without complex calculation or lookup. The on-chip 12-bit analog-to-digital converter (ADC) provides resolution as low as 0.0625 °C. The NST175 is compatible with SMBUS and I²C, allowing a maximum of 27 devices to be connected to one BUS and supporting the SMBUS alarm function. The NST175 has a rated operating range of -55 °C to 125 °C and is ideal for extended temperature measurement in a wide range of communications, computing, consumer products, Internet of Things, environmental, industrial and instrumentation applications. NST175 comes in industry-qualified MSOP8 and SOP8 packages.

◆ Product feature

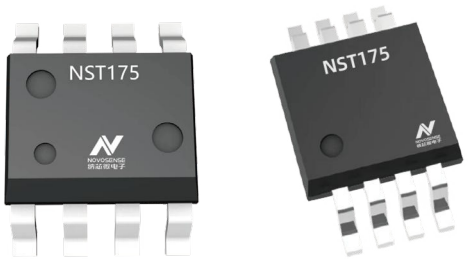
- Maintain high accuracy in –40°C至125°C wide temperature range:
  -20°C-85°C: +0.2℃ (typical) ± 0.5°C（max.）
  -40°C~125°C: ±0.5℃ (typical) ±1°C (max.)
- Resolution range: 9~12 bits, configurable by the user up to 0.0625°C
- Up to 27 device addresses supported
- Wide supply voltage range: 1.62V to 5.5V
- Working current: 27μA (typical)
- Turn-off current: 0.2μA (typical)
- Digital port: compatible with SMBus, I²C

◆ Functional block diagram



◆ Package

- MSOP8 (3.0mm x 3.0mm)
- SOP8 (4.9mm x 3.91mm)



◆ Application

- System temperature monitoring
- Computer peripherals overheating protection
- Laptop
- IoT application
- Communication device
- Power supply temperature monitoring
- Thermostat control
- Environmental monitoring, heating ventilation air conditioning (HVAC)

NST175-Q1：I²C/SMBus Interface Digital Temperature Sensor with Automotive-Grade Standard Packaging

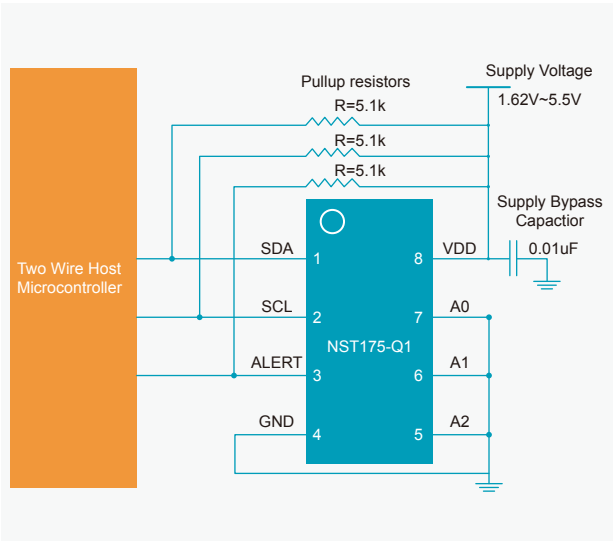
◆ Product introduction

The NST175-Q1 is a low-power, high-precision digital temperature sensor ideal as an alternative to negative temperature coefficient (NTC) and positive temperature coefficient (PTC) thermistors. The device provides max accuracy of ±0.5 °C without calibration or signal adjustment from external components. NST175-Q1 temperature sensor is a highly linear product, which can sense the temperature without complex calculation or lookup. The on-chip 12-bit analog-to-digital converter (ADC) provides resolution as low as 0.0625 ° C. The NST175 is compatible with SMBus and I²C, allowing a maximum of 27 devices to be connected to one BUS and supporting the SMBus alarm function. The NST175 has a rated operating range of -40 °C to 125 °C and is ideal for extended temperature measurement in a wide range of automotive applications. NST175-Q1 comes in industry-qualified MSOP8 and SOP8 packages.

◆ Product feature

- Maintain high accuracy in full temperature range:
  - -20°C~ 85°C: ±0.2°C (typical)
  - -40°C~125°C: ±1°C (max.)
- Maximum resolution 0.0625°C, optional
- Up to 27 device addresses supported
- Wide supply voltage range: 1.62V to 5.5V
- Working current: 30μA (typical)
- Turn-off current: 0.1μA (typical)
- Digital port: compatible with SMBus, I²C
- AEC-Q100 Grade0

◆ Functional block diagram



◆ Package

- SOP8 (4.9mm x 3.91mm)

◆ Application

- Car air conditioning system
- Automotive infotainment systems
- Air flow sensor
- Battery Management System (BMS)
- Engine control unit
- Car HID lights
- Airbag control unit

NST1075: Small-size high-precision digital temperature sensor

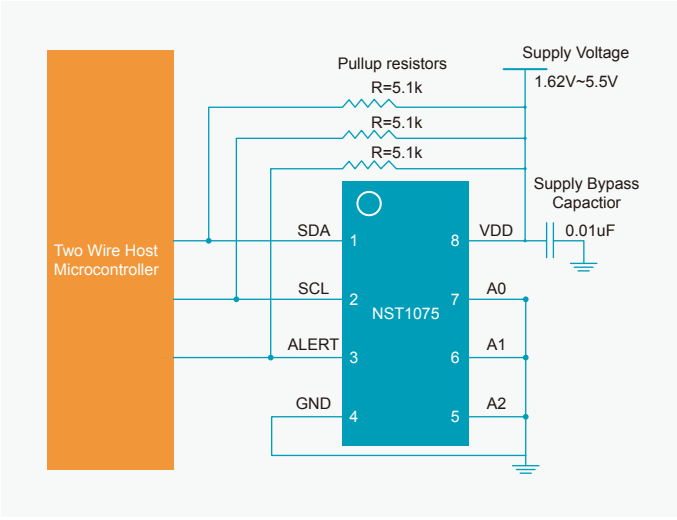
◆ Product introduction

The NST1075 is a low-power, high-precision digital temperature sensor ideal as an alternative to negative temperature coefficient (NTC) and positive temperature coefficient (PTC) thermistors. The device provides typical accuracy of ±0.5°C without calibration or signal adjustment from external components. NST1075 temperature sensor is a highly linear product, which can sense the temperature without complex calculation or lookup. The on-chip 12-bit analog-to-digital converter (ADC) provides resolution as low as 0.0625 °C. The NST1075 is compatible with SMBUS and I²C interface, allowing a maximum of 27 devices to be connected to one bus and supporting the SMBus alarm function. The NST1075 has an operating temperature range of -55 °C to 125 °C and is ideal for extended temperature measurement in a wide range of communications, computing, consumer products, Internet of Things, environmental, industrial and instrumentation applications. NST1075 is packaged with WSON8 and the size is 2.0mm×2.0mm, which can better meet the temperature measurement requirements of miniaturized devices such as routers.

◆ Product feature

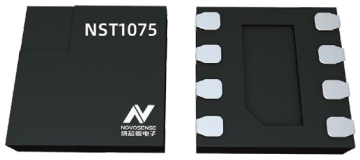
- Maintain high accuracy in wide temperature range:
  –55°C~125°C
  20°C ~ 85°C：± 0.5°C（typical）
  -20°C ~ 85°C：± 1°C（max）
  -55°C ~ 125°C：± 1.5°C（max）
- Maximum resolution: 0.0625°C, optional
- Up to 27 device addresses supported
- Wide supply voltage range: 1.62V to 5.5V
- Working current: 30μA (typical)
- Turn-off current: 0.2μA (typical)
- Digital port: Compatible with SMBUS, I²C

◆ Functional block diagram



◆ Package

- WSON8 (2.0mm×2.0mm)



◆ Application

- System temperature monitoring
- Computer peripherals overheating protection
- Server
- IoT application
- Communication device
- Power supply temperature monitoring
- Thermostat control
- Environmental monitoring, heating ventilation air conditioning (HVAC)

NST118: Small Ultra-high-precision Digital Temperature Sensor with I²C Port

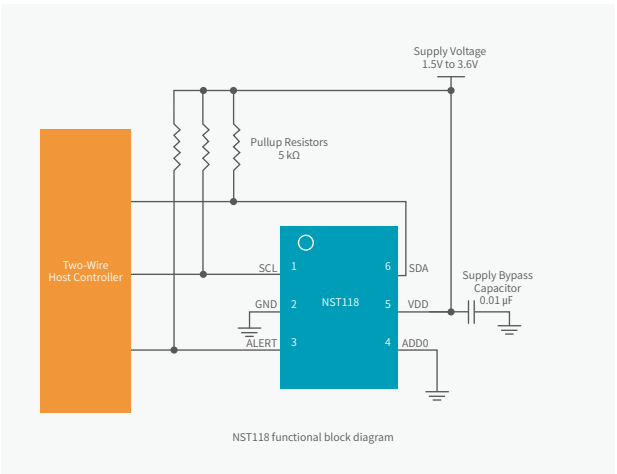
◆ Product introduction

NST118 is a low power-consumption ultra-high-precision digital temperature sensor. It is an ideal substitute for negative temperature coefficient (NTC) and positive temperature coefficient (PTC) thermistors. The NST118 has I²C and SMBUS compatible ports, supports up to four device addresses, and has programmable alarm and SMBUS reset capabilities. It achieves accuracy up to ±0.2 °C (Max) in the range of 25 °C to 45 °C without calibration. The NST118 has low power consumption, which minimizes the impact of spontaneous heat on measurement accuracy. The NST118 temperature sensor is highly linear and does not require recombination calculations or lookup to derive the temperature. The 12-bit on-chip analog-to-digital conversion provides resolution up to 0.0625°C . The NST118 temperature sensor operates from -40°C to 125°C and is suitable for consumer products, industrial equipment, Internet of Things and automotive markets. The NST118's DNF(2mm x 2mm) package is also compatible with the NST117.

◆ Product feature

- High accuracy in -40°C ~125°C wide temperature range
- Ultra precision at 25°C ~45°C ±0.2°C (maximum)
- I²C/ SMBUS compatible port
- 12-bit ADC, maximum resolution: 0.0625 °C
- User programmable over-temperature alarm threshold
- Low static current:
  Working current 2.9μA@1Hz in operating mode (typical)
  Turn-off current 0.5μA in shutdown mode (typical)
- Input voltage range: 1.71 V to 3.6 V
  Digital port: compatible with SMBUS, I²C

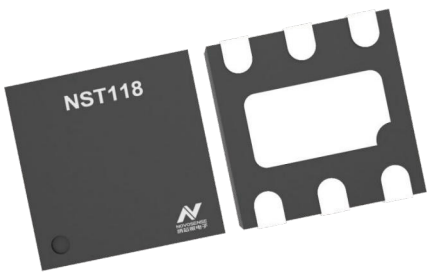
◆ Functional block diagram



NST118 functional block diagram

◆ Package

- DFN6(2mmx2mm)



◆ Application

Wearable devices (TWS, watches, bracelets, etc.)

Laptop

Industrial Internet of Things（IoT）

Communication infrastructure

Power system monitor

Environmental monitoring and HVAC

NST117: Small-size High-precision Digital Temperature Sensor with I²C Port

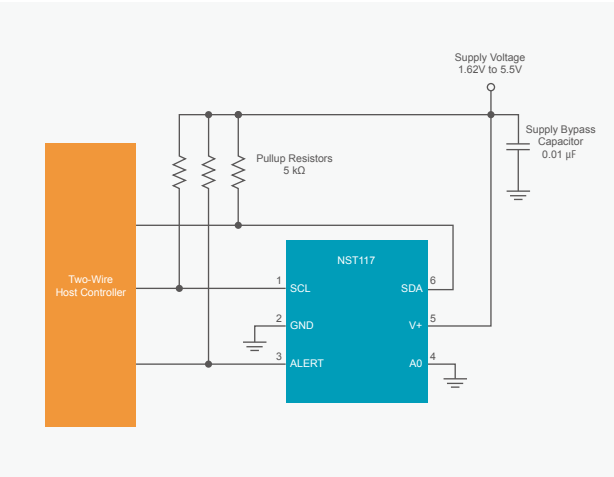
Product introduction

The NST117 is a low-power, high-precision digital temperature sensor ideal as an alternative to negative temperature coefficient (NTC) and positive temperature coefficient (PTC) thermistors. The device provides typical accuracy of ±0.2°C without calibration or signal adjustment from external components. NST117 temperature sensor is a highly linear product, which can sense the temperature without complex calculation or lookup. The on-chip 12-bit analog-to-digital converter (ADC) provides resolution as low as 0.0625 °C. The NST117 is compatible with SMBUS and I²C, allowing a maximum of 3 devices to be connected to one BUS and supporting the SMBUS alarm function. The NST117 has a rated operating range of -55 °C to 125 °C and is ideal for extended temperature measurement in a wide range of communications, computing, consumer products, Internet of Things, environmental, industrial and instrumentation applications. NST117 comes in industry-standard DFN-6 packages.

Product feature

- Maintain high accuracy in full temperature range:
  30°C~ 45°C: ±0.2°C (typical)
  -20°C~ 85°C: ±0.5°C (typical)
  -55°C~125°C:±2°C (max.)
- Maximum resolution 0.0625°C, optional
- Up to 3 device addresses supported
- Wide supply voltage range: 1.62V to 5.5V
- Working current: 30μA (typical)
- Turn-off current: 0.1μA (typical)
- Digital port: compatible with SMBUS, I²C

Functional block diagram



Package

- DFN6 (2mm*2mm)

Application

Smart wearable
Medical thermometer
Industrial automation
Power temperature measurement
Server
Communication device
Hard disk
Laptop
Electronic temperature control

NST112: High-precision Low-power I²C Port Digital Temperature Sensor with Ultra-small SOT563 and DSBGA Package

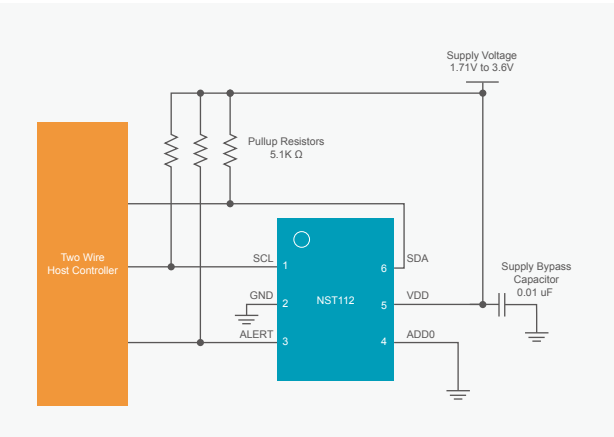
◆ Product introduction

NST112 is a low power-consumption high-precision digital temperature sensor. It is suitable for substitution of negative temperature coefficient and positive temperature coefficient thermistor. The NST112 has an port compatible with I²C and SMBUS, programmable alarm and SMBUS reset functions, and supports up to four devices on a single BUS. In addition, it achieves accuracy up to ±0.5 °C in the range of -20 °C to 85 °C without calibration. The NST112 temperature sensor is highly linear and does not require recombination calculations or lookup to derive the temperature. The NST112 features 12bit analog-to-digital conversion and provides up to 0.0625°C resolution. The NST112 temperature sensor can operate normally in the temperature range of -40 °C to 125 °C, which makes it suitable for operation in communications, computers, consumer products, environmental, industrial and instrumentation. The NST112 is an extremely low-power sensor that can be used for temperature measurement applications in the Internet of Things. The NST112 is available in both SOT563 and DSBGA(4) packages, with the DSBGA(4) achieving output accuracy up to ±0.1 °C at temperature range.

◆ Product feature

- Operating temperature range: -40°C~150°C
- High accuracy in -40°C~125°C wide temperature range:
  25 °C ~ 45 °C: ±0.1°C (typ.)@DSBGA
  -40°C~125°C: ±1°C (max.)@DSBGA
  -20°C~85°C: ±0.5°C (typ.)
  -40°C~125°C: ±1°C (max.)
- I²C/ SMBUS compatible port
- 12-bit ADC, maximum resolution: 0.0625 °C@SOT563
- 14-bit ADC, maximum resolution: 0.015625°C@DSBGA
- Over-temperature alarm value presetting
- Ultra-low static power consumption
  2.9μA@1Hz
  6.5μA@4Hz
- Supply voltage range: 1.71 V to 3.6 V with SOT563 package, 1.5V to 3.6V with DSBGA package
- Digital output

◆ Functional block diagram



◆ Package

- SOT563(6) (1.6mm x 1.2mm)
- DSBGA(4) (0.75mm x 0.75mm)

◆ Application

Portable and battery-powered applications

Power system monitor

Communication infrastructure

General system thermal management

Industrial Internet of Things

Computer peripheral thermal protection

Laptop

Storage devices such as solid state disks (SSDs)

Smart wearable devices

NST103: Digital Temperature Sensor with I²C Port in Wafer-level Package

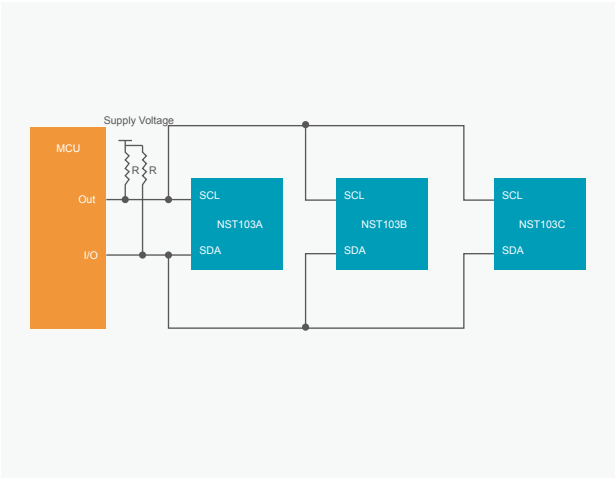
Product introduction

The NST103 is a digital output temperature sensor in a 4-pins wafer chip scale package (WCSP). The resolution of NST103 reading temperature can reach 1°C. The NST103 has a two-wire port compatible with both I²C and SMBUS ports. In addition, the port supports multiple device access (MDA) commands, allowing the master to simultaneously communicate with multiple devices on the BUS without having to send commands individually to each NST103 on the BUS. It can connect up to 8 NST103s in parallel and be easily read by the host. The NST103 is particularly ideal for space-constrained, power-sensitive applications that have multiple temperature measurement areas that must be monitored. The specified operating temperature range of NST103 is -40°C to 125°C.

Product feature

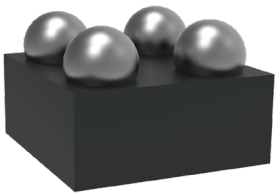
- Multiple device access (MDA)
- Global read/write operations
- I²C/ SMBUS compatible
- 8-bit ADC, resolution: 1°C
- Precision: The typical value is ±1°C(-10°C to 100°C)
  Maximum error in the whole temperature range: ±3°C
- Low static current: In operating mode, the current is 3μA@0.25Hz
  The turn-off current in shutdown mode is 1.0μA
- Input voltage range: 1.5V to 3.6V
- Digital output

Functional block diagram



Package

- WLCSP (DSBGA) (0.75mm x 0.75mm)



Application

Cellphone | Solid-state drive | Laptop | Server

NST461: Small-size High-precision I²C Interface Remote and Local Digital Temperature Sensor

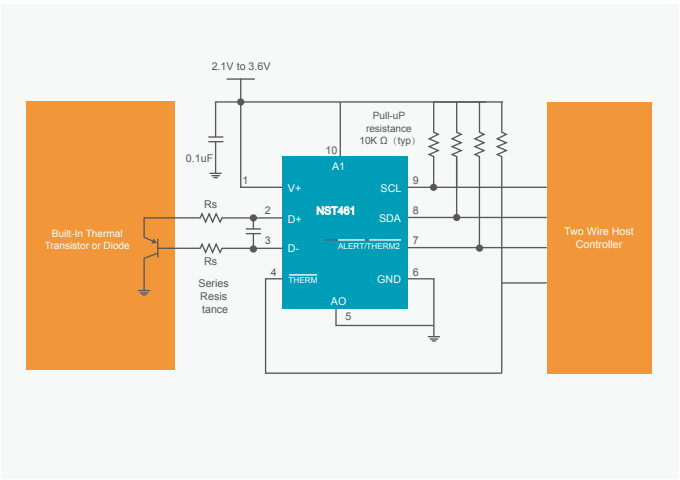
Product introduction

NST461 is a remote temperature sensor monitor with built-in local temperature sensor. The transistors connected to its remote temperature sensors are usually low-cost NPN or PNP type transistors or substrate thermal transistors and diodes, which are essential components of microcontrollers, microprocessors or FPGAs. On-chip 12-bit analog-to-digital conversion provides resolution up to 0.0625°C for local and remote temperature sensors. The NST461 is compatible with I²C and SMBu interfaces, supports programmable pin addresses for up to nine devices, and has programmable alarm and SMBUS reset capabilities. NST461 includes series resistance cancellation, programmable non-ideal factor (η factor), programmable offset, programmable temperature limit, programmable digital filter, diode fault detection and temperature alarm, improving output accuracy and noise performance, and providing a reliable solution for thermal monitoring. With an operating voltage range of 2.1V to 3.6V and a temperature range of -40 °C to 125 °C, the NST461 is ideal for multi-position, high-precision temperature measurements in a wide range of applications, including communications, computing, instrumentation and industry.

Product feature

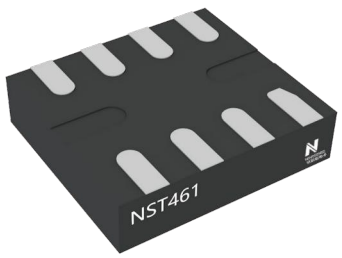
- Remote temperature detector: ±1.6°C max. accuracy error
- Local temperature monitor: ±1.5°C max. accuracy error
- 12-bit ADC, resolution: 0.0625°C
- Power supply and logic voltage range: 2.1 V to 3.6 V
- 37μA working current（1 SPS）
- 4μA shutoff current
- Series resistance error elimination
- η- factor and offset correction
- Programmable digital filter
- Diode fault detection
- SMBUS and I²C serial interface
- Compatible with programmable pin addresses

Functional block diagram



Package

- WQFN(10) (2.0mm x 2.0mm)



Application

- Processor and FPGAtemperature monitoring
- Communication device
- Servers and personal computers
- Test and measurement equipment
- LED lighting and projector thermal control
- Industrial control unit
- Storage device

NST1412/NST1413: High-precision Remote and Local Temperature Sensors with Digital Interface in Industrial-qualified Package

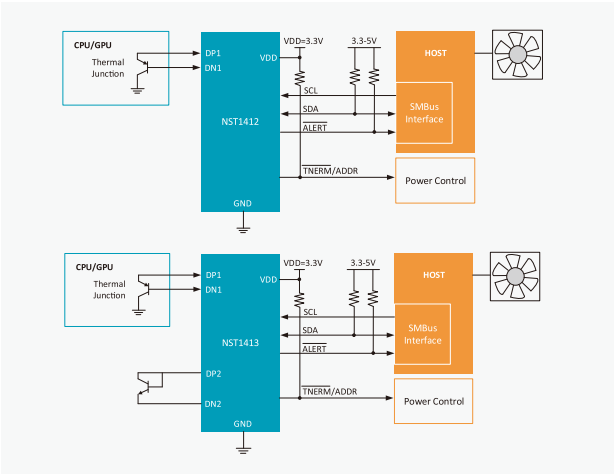
◆ Product introduction

NST1412 and NST413 are remote temperature sensor monitors with built-in local temperature sensors. The transistors connected to its remote temperature sensors are usually low-cost NPN or PNP type transistors and diodes, which are essential components of microcontrollers, microprocessors or FPGAs. For local and remote temperature sensors, 11-bit on-chip analog-to-digital conversion provides resolution up to 0.125 °C. The NST141x two-wire serial interface is compatible with I²C and SMBUS interfaces and can use up to nine different pin programmable addresses. In addition, NST141x integrates additional features such as series resistance cancellation, programmable non-ideal factor (η factor), programmable offset, programmable temperature limits, programmable digital filters, diode fault detection and temperature alarm to improve accuracy and noise resistance, achieving a reliable thermal monitoring solution. With an operating voltage range of 3V to 3.6V and a temperature range of -40 °C to 125 °C, the NST141x is ideal for multi-position, high-precision temperature measurements in a wide range of applications, including communications, computing, instrumentation and industry. The NST1412 supports single channel local and single channel remote temperature monitoring, and the NST1413 supports single channel local and dual-channels remote temperature monitoring.

◆ Product feature

- Remote temperature detector:
  ±1°C max precision（-10°C<T_{Diode}<105°C）
  11-bit ADC, resolution:0.125°C
  -Support diode filter capacitors up to 1nF
- Local temperature monitor:
  ±1°Cprecision （-10°C<T_{Diode}<105°C）
  11-bit ADC, resolution:0.125°C
- Automatic remote diode type identification and optimization setting
- Series resistance cancellation
- Programmable temperature threshold alarm
- I²C/SMBUS digital output

◆ Functional block diagram



◆ Package

- NST1412 - MSOP(8) (3.0mm x 3.0mm)
- NST1413 - MSOP(10) (3.0mm x 3.0mm)

◆ Application

Processor and FPGA temperature monitoring

Communication device

Servers and personal computers

Test and measurement equipment

LED lighting and projector thermal control

Industrial control unit

Storage device

NST7719: High-precision remote and local temperature sensors with digital interface in industry-standard package

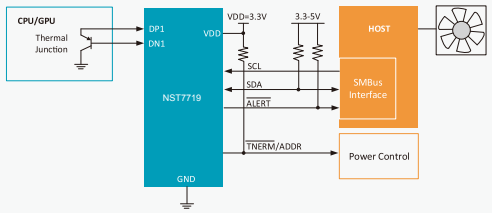
Product introduction

NST7719 is a remote temperature sensor monitor with built-in local temperature sensor. The transistors connected to its remote temperature sensors are usually low-cost NPN or PNP type transistors and diodes, which are essential components of microcontrollers, microprocessors or FPGAs. For local and remote temperature sensors, 11-bit on-chip analog-to-digital conversion provides resolution up to 0.125°C. The NST7719 two-wire serial interface is compatible with I²C and SMBUS interfaces with up to six different pin-programmable addresses. In addition, NST7719 integrates personalized features such as series resistance cancellation, programmable non-ideal factor (η factor), programmable offset, programmable temperature limits, programmable digital filters, diode fault detection and temperature alarm to improve accuracy and noise resistance, achieving a reliable thermal monitoring solution. With an operating voltage range of 3V to 3.6V and a temperature range of -40°C to 125°C, the NST7719 is ideal for multi-position, high-precision temperature measurements in a wide range of applications, including communications, computing, instrumentation and industry. It supports one-way local and two-way remote temperature monitoring.

Product feature

- Remote temperature detector:
  ±1.5°C max precision (-10°C <T_{Diode}<105°C)
  11-bit ADC, resolution:0.125°C
  Support diode filter capacitors up to 1nF
- Local temperature monitor:
  ±1.5°C max precision (-10°C <T_{Diode}<105°C)
  11-bit ADC, resolution:0.125°C
- Automatic remote diode type identification and optimization setting
- Series resistance elimination
- Programmable temperature threshold alarm
- I²C/SMBUS digital output

Functional block diagram



Package

- MSOP-10 (3.0mm×3.0mm)

Application

Processor and FPGA temperature monitoring

Communication device

Servers and personal computers

Measuring equipment

LED lighting and projector thermal control

Industrial control unit

Storage device

NST20/NST60/NST235/NST86: High-precision and Low-power Analog Output Temperature Sensor

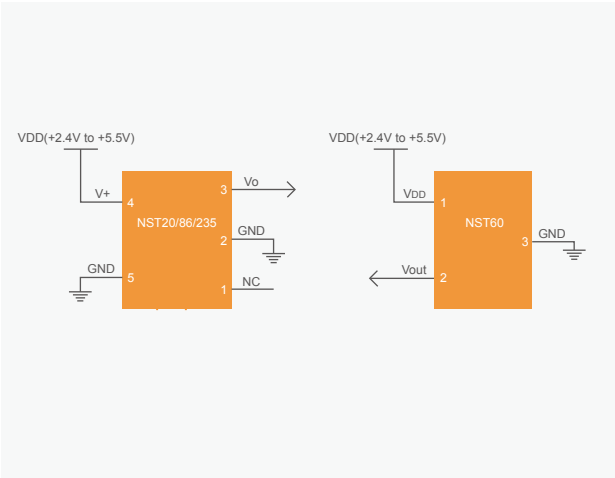
◆ Product introduction

NST20/60/235/86 is a series of precision CMOS integrated circuit linear analog output temperature sensor. Input voltages range is from 2.4V to 5.5V. The maximum temperature error in the whole temperature range is within ±2.5°C(excluded NST60). 20μA typical operating mode current and 0.1μA typical turn-off current can greatly reduce the power loss of battery-powered equipment. Class-AB output drivers provide a powerful maximum output of 500μA, which can drive capacitive loads up to 1000pF, and can be directly connected to the ADC sample-hold input end. With excellent accuracy and a powerful linear output driver, the NST20/60/235/86 analog output temperature sensor is an extremely cost-effective alternative to passive thermistors.

◆ Product feature

- Operating temperature range:
  NST20: -55°C~ 130°C
  NST60: -40°C ~125°C
  NST235: -40°C~150°C
  NST86: -50°C~ 150°C
- High accuracy: ±1.5°C (typical)
- Wide input voltage range: 2.4V~5.5V
- Output drive capacity: 500μA
- Output short circuit protection
- Analog output parameter:
  NST20: -11.77mV/°C negative slope output
  NST60: 6.25mV/°C positive slope output
  NST235: 10 mV/°C positive slope output
  NST86: -10.9mV/°C negative slope output
- Low static current:
  Operating mode current 20μA (typical)
  Turn-off current 0.1μA (typical)

◆ Functional block diagram



◆ Package

- SOT23(3) (2.9mmx1.3mm)
- SC70(5) (2.0mmx1.25mm)

◆ Application

- Smart phones, computers, fax machines, printers, etc.
- Automotive infotainment system
- Portable medical device
- Industrial automation and control
- Wireless and telecommunications infrastructure
- Electronic testing equipment
- Environmental monitoring and HVAC
- Grid infrastructure

NST60-Q1/NST86-Q1NST/235-Q1 Automotive-grade high precision, low power analog output temperature sensor

Product introduction

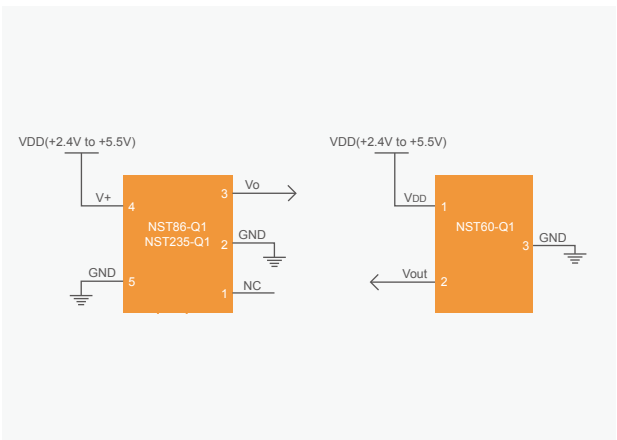
The NST60-Q1/NST86-Q1/NST235-Q1 series represent a range of automotive-grade precision CMOS integrated circuit linear analog output temperature sensors. They feature an input voltage range from 2.4V to 5.5V. Across the full temperature range, the maximum temperature error is within ±2.5°C for the NST86-Q1/235-Q1 and ±4°C for the NST60-Q1. With a typical quiescent current of 20μA and a typical shutdown current of 0.1μA, these sensors minimize power consumption in battery-powered devices.

The Class AB output driver provides a robust maximum output of 500μA, capable of driving capacitive loads up to 1000pF and connecting directly to the sample-and-hold input of analog-to-digital converters. With its exceptional accuracy and powerful linear output driver, the NST60 analog output temperature sensor offers a highly cost-effective alternative to passive thermistors.

Product feature

- Operating temperature range:
  NST60-Q1: -40°C ~ 150°C
  NST235-Q1: -40°C ~ 150°C
  NST86-Q1: -40°C ~ 150°C
- High precision:
  NST235-Q1: ±0.5°C (typical)
  NST60-Q1: ±1.5°C (typical)
  NST86-Q1: ±1.5°C (typical)
- Wide input voltage range: 2.4V~5.5V
- Output drive capability: 500μA
- Output short circuit protection
- Analog output parameters:
  NST60-Q1: 6.25mV/°C positive slope output
  NST235-Q1: 10mV/°C positive slope output
  NST86-Q1: -10.9mV/°C negative slope output
- Low quiescent current:
  Operating mode current is 20μA(typical)
  Off-mode current is 0.1μA (typical)
- AEC-Q
  NST235-Q1: AEC-Q100 Grade1
  NST60-Q1: AEC-Q100 Grade1
  NST86-Q1: AEC-Q100 Grade0

Functional block diagram



Package

- SOT23(3) (2.9mmx1.3mm)
- SC70(5) (2.0mmx1.25mm)

Application

- Car audio host
- car infotainment system
- electric power steering (EPS)
- battery management system (BMS)
- gear shifting system
- gasoline engine

NSHT30: High-precision, Low-power I²C Digital Interface Temperature and Humidity Sensor

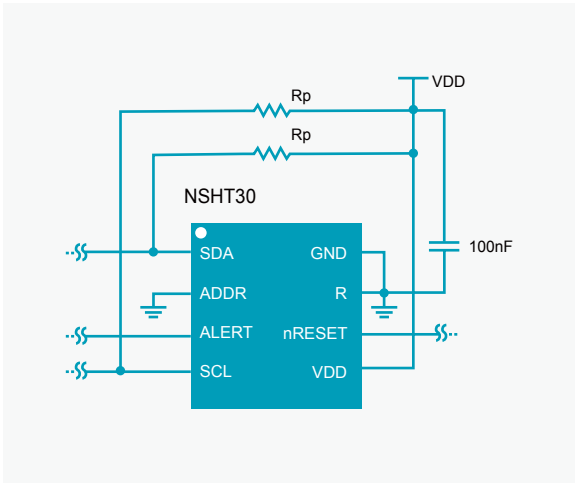
◆ Product introduction

NSHT30 is a CMOS-MEMS-based relative humidity (RH) and temperature sensor. NSHT30 integrates a complete sensor system on a single chip, including capacitive relative humidity sensor, CMOS temperature sensor and signal processor and I²C digital communication interface, in the DFN and LGA packages of 2.5mm2.5mm0.9mm. The communication mode of its I²C interface, extremely small package and low power consumption characteristics allow NSHT30 to be more widely integrated into a variety of applications. In addition, NSHT30's I²C interface features two unique, selectable I²C addresses, communication rates up to 1MHz, and a wide voltage operating range, making NSHT30 more compatible in a variety of application environments. It also has programmable interrupt thresholds that can provide alarms and system awakenings without the need for a microcontroller to continuously monitor the system.

◆ Product feature

- Relative humidity (RH) sensor:
  Working range: 0%RH~100%RH
  Accuracy: ±3%RH (typ.)
- Temperature sensor:
  Operating temperature range: -40°C~125°C
  Accuracy: ±0.3°C (typ.)
- Digital output for relative humidity and temperature compensation
- Wide supply voltage range: 2.0V~5.5V
- I²C digital interface, communication rate up to 1MHz
  2 optional addresses
  Data protection with CRC check
- Low-power: average current: 3.2μA
- 8-Pin LGA and DFN package available
- AEC-Q100 qualified (DFN package)

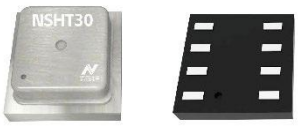
◆ Functional block diagram



◆ Package

- DFN-8 (2.5mm x 2.5mm x 0.9mm)
- LGA-8 (2.5mm x 2.5mm x 0.9mm)

DFN-8



LGA-8

◆ Application

Humidifier/ dehumidifier | White goods | Intelligent constant temperature and humidity controller | Ventilators | Smart agriculture | Cold chain logistics | Hygrograph | Automobile intelligent fog removal system

NSHT30-Q1 Automotive High-precision, Low-power I²C Digital Interface Temperature and Humidity Sensor

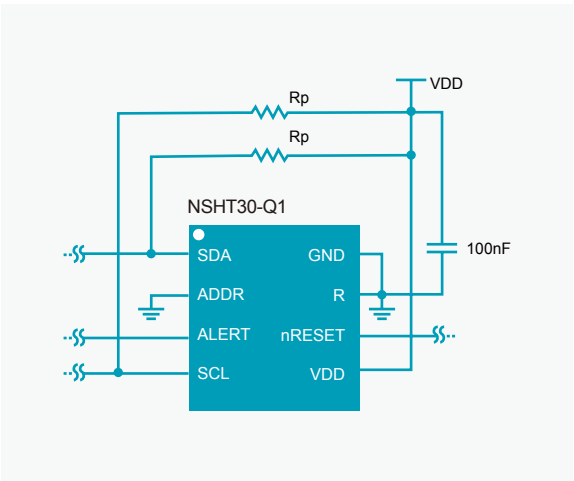
◆ Product introduction

NSHT30-Q1 is a CMOS-MEMS based automotive grade relative humidity RH and temperature sensor. NSHT30-Q1 integrates a complete sensor system on a single chip, including capacitive relative humidity sensors, CMOS temperature sensors and signal processors as well as I²C digital communication interfaces. It is packaged in a 2.5mm2.5mm0.9mm DFN package. The communication method of its I²C interface, extremely small package and low power consumption characteristics make the NSHT30 more widely integrated into various automotive applications. In addition, the NSHT30's I²C interface has two unique and selectable I²C addresses with a maximum communication rate of 1MHz and wide voltage operating range, making it more compatible in various application environments. At the same time, it has a programmable interrupt threshold that can provide alarm and system wake-up without requiring a microcontroller to continuously monitor the system.

◆ Product feature

- Relative humidity RH sensor:
  Operating range: 0%RH to 100%RH
  Accuracy: ±3%RH typical value
- Temperature sensor:
  Operating temperature range: -40°C~125°C
  Accuracy: ±0.3°C typical value
- Digital output with relative humidity and temperature compensation
- Wide power supply voltage range: 2.0V~5.5V
- I²C digital interface, communication rate up to 1MHz
  Two optional addresses
  Data protection with CRC check
- Low power consumption: average current 3.2μA
- 8-Pin DFN package
- AEC-Q100 Grade1

◆ Functional block diagram



◆ Package

- DFN-8 (2.5mm x 2.5mm x 0.9mm)
- LGA-8 (2.5mm x 2.5mm x 0.9mm)

DFN-8

◆ Application

Automotive air conditioning system

automotive infotainment system

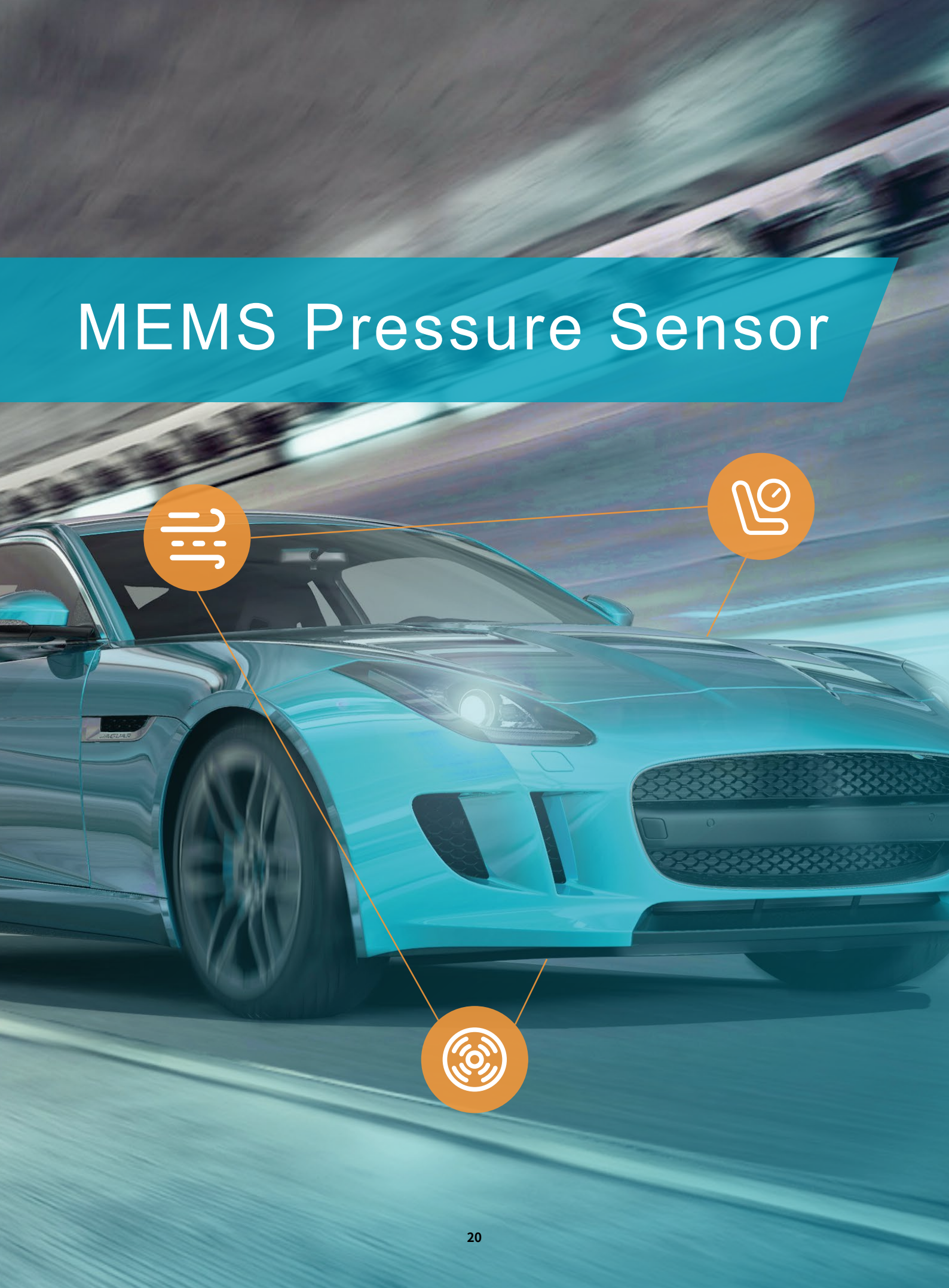
air flow sensor

battery management system BMS

Cold chain logistics

airbag control unit

MEMS Pressure Sensor



MEMS Pressure Sensor

Part number	Product description	Package	Temperature range	Supply voltage	Operation current	Pressure range	Output type	Accuracy	Typical application
NSPGL1	Automotive integrated gauge pressure sensor (range can be customized)	Ceramic module	-40°C~130°C	4.5V~5.5V	2.9mA	0~±5kPa /±100kPa	Absolute / Ratio-metric	±1.6% F.S.	FTPS fuel vapor pressure, KPS crankcase ventilation pressure detection, vacuum boosting system, industrial control
NSPAS3M	Automotive-qualified integrated absolute pressure sensor (range can be customized)	SOP-8 (7.0mmx 7.0mm)	-40°C~125°C	4.5V~5.5V	3.1mA	10kPa~ 400kPa	Absolute / Ratio-metric	±1.5% F.S.	Motorcycle intake manifold pressure sensor, ECU atmospheric monitoring, seat pressure detection, canister desorption pressure detection, gas/refrigerant leak detection, industrial vacuum degree detection
NSPAS3	Automotive integrated gauge pressure sensor module (range can be customized)	SOP-8 (7.0mmx-7.0mm)	-40°C~130°C	4.5V~5.5V	3.1mA	10kPa ~400kPa	Absolute / Ratio-metric	±0.5% F.S.	Motorcycle/automobile TMAP sensor, canister desorption pressure detection, ECU atmospheric monitoring, battery pack pressure detection, seat pressure detection, industrial vacuum degree detection
NSPAS1	Automotive integrated gauge pressure sensor module (range can be customized)	SOP-8 (7.3mmx-7.3mm)	-40°C~125°C	4.5V~5.5V	3.1mA	10kPa ~400kPa	Absolute / Ratio-metric	±0.5% F.S.	Motorcycle/automobile TMAP sensor, canister desorption pressure detection, ECU atmospheric monitoring, battery pack pressure, seat pressure detection, industrial vacuum degree detection
NSPAS5	Automotive-grade Integrated Corrosion-resistant Absolute Pressure Sensor (range can be customized)	SOP-8 （7.0mmx-7.0mm）	-40°C ~130°C	4.5V~5.5V	2.9mA	10kPa ~400kPa	Absolute / Ratio-metric	±0.5% F.S.	EGR-TMAP exhaust gas recirculation pressure detection(The corrosion- resistant version is under development)
NSPGS2	Gauge pressure sensor integrated with air nozzle in SOP-6 package (range can be customized)	Single air nozzle SOP-6 (7.0mmx-7.0mm)	-40°C~70°C	3V~5.5V	2.5mA	-100kPa ~250kPa	Analog/I²C /SPI	±1% F.S.	Coffee machine, health pot, vacuum cleaner, vacuum juicer and other small household appliances, air cushion bed, massage chair, smart sphygmomanometer and other health care applications, industrial control, and IoT pressure detection
NSPGD1(M)	Gauge pressure sensor integrated with air nozzle in DIP-8 package (range can be customized)	Single air nozzle DIP-8 (10.4mmx-10.4mm)	0°C~70°C	3V~5.5V	2.5mA	-10kPa~ 10kPa	Analog /I²C/ Frequency	±1% F.S.	Washing machine, dishwasher, water purifier and other household appliances, pressure switch, negative pressure vacuum detection, gas pressure detection ventilator, oxygen generator, anesthesia instrument, biological safety cabinet
NSPDS5/7	Differential pressure sensor with dual air nozzle in SOIC-16 package (range can be customized)	Dual air nozzle SOIC-16 (10.3mmx-7.5mm)	-20°C~70°C	3V~5.5V	2.4mA	±500Pa ~±250kPa	Analog/I²C	±1% F.S.	Fire fighting residual pressure monitoring, ventilator, oxygen generator, anesthesia instrument, HVAC/VAV, biological safety cabinet, environmental monitoring, industrial micro differential pressure detection, etc.
NSPDS9	Ultra-low range differential pressure sensor with dual air nozzle in SOIC-16 package (range can be customized)	Dual air nozzle SOIC-16 (10.3mmx-7.5mm)	-20°C~70°C	3V~5.5V	2.4mA	±125Pa~ ±500Pa	Analog/I²C	±1% F.S.	Fire fighting residual pressure monitoring, ventilator, oxygen generator, anesthesia instrument, HVAC/VAV, biological safety cabinet and other micro differential pressure detection
NSPGS5	Differential gauge pressure sensor with single air nozzle in SOIC-16 package (range can be customized)	Single air nozzle SOIC-16 (10.3mmx-7.5mm)	-20°C~70°C	3V~5.5V	2.9mA	-10kPa~ 10kPa	Analog/I²C	±1% F.S.	Ventilator, oxygen generator, anesthesia instrument, biosafety cabinet, etc.

Part number	Product description	Package	Temperature range	Supply voltage	Bridge arm resistance	Pressure range	Output type	Accuracy	Typical application
NSP1830	High-performance and high-reliability MEMS differential pressure sensor (range can be customized)	MEMS wafer (1.8x1.8x0.4 mm)	-40°C~125°C	5V	6.3kΩ	0kPa~±100k Pa/500Kpa	analog voltage output (mV)	±0.05% F.S.	White household appliances, medical electronics, automotive electronics, industrial control
NSP1831	High-performance and high-reliability MEMS micro differential pressure sensor (range can be customized)	MEMS wafer (2x2x0.4mm)	-40°C~125°C	5V	5.3kΩ	0kPa~±6kPa /±10kPa	analog voltage output (mV)	±0.2% F.S.	White household appliances, medical electronics, automotive electronics, industrial control
NSP1832	High-performance and high-reliability automotive-qualified MEMS differential pressure sensor with PT pad (range can be customized)	MEMS wafer (1.65x1.65x0. 4mm)	-40°C~150°C	5V	5.3kΩ	0kPa~±5kPa /±100kPa	analog voltage output (mV)	±0.2% F.S.	EVAP/FTPS fuel steam, GPF/DPF vehicle exhaust detection
NSP1833	High-performance and high-reliability MEMS micro differential pressure sensor (range can be customized)	MEMS wafer (2.5x2.5x0.4 mm)	-40°C~85°C	5V	5.3kΩ	0kPa~±1kPa	analog voltage output (mV)	±0.2% F.S.	White household appliances, medical electronics, industrial control
NSP1630	High-performance and high-reliability absolute pressure sensor (range can be customized)	MEMS wafer (1x1x0.4mm)	-40°C~125°C	5V	5.3kΩ	0kPa~200kPa	analog voltage output (mV)	±0.1% F.S.	TMAP intake manifold pressure detection, BPS battery pack pressure detection
NSP1631	High-performance and high-reliability large-range absolute pressure sensor (range can be customized)	MEMS wafer (1x1x0.4mm)	-40°C~125°C	5V	5.3kΩ	0kPa~500kPa	analog voltage output (mV)	±0.1% F.S.	Turbo-TMAP pressurized intake pressure detection
NSP1632	High-performance and high-reliability automotive-qualified MEMS absolute pressure sensor with Pt pad (range can be customized)	MEMS wafer (1x1x0.4mm)	-40°C~150°C	5V	5.3kΩ	0kPa~100kP a/200kPa	analog voltage output (mV)	±0.1% F.S.	TMAP intake manifold pressure detection, BPS battery pack pressure detection, and EGR-TMAP exhaust gas recirculation pressure detection

NSPGL1 series: Automotive-qualified Integrated Gauge Pressure Sensor

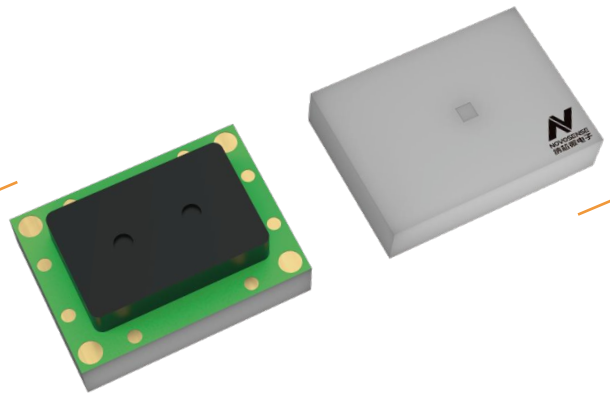
◆ Product introduction

NSPGL1 series is a calibrated differential pressure sensor launched by NOVOSENSE for automotive fuel vapor pressure detection and exhaust differential pressure detection. The product adopts automotive-qualified signal conditioning chip to calibrate and compensate the precious metal MEMS die output, which can convert pressure signals in a specific range into analog output voltage. Its unique ceramic substrate packaging process makes the product resistant to oil vapor and other media corrosion, MEMS die is independent packaging and flexible design. This product can provide standard output in the temperature range from -40°C to 130°C without customer calibration, which can accelerate the process of product development and mass production. The integrated package is convenient for usage and flexible for multi-applications. It is not only suitable for automobile fuel steam pressure detection and engine exhaust emission SCR system (National V and VI emission standards), but also suitable for industrial control and instrumentation and other fields.

◆ Product feature

- Operating temperature range: -40°C~130°C
- Pressure range ±5kPa~ ±100kPa, which can be customized
- The comprehensive accuracy in the full temperature range is better than ±1.6%F.S. (±0.18kPa)
- Support 5V power supply and direct power supply within 18V in absolute voltage output mode
- Support -24V to 28V over voltage and reverse voltage protection
- Fluorinated gel protection, compatible with oil and gas environment
- Support absolute output/proportional output, with output curve customized
- It can be calibrated many times, with the function of factory reset adjustment
- Package: ceramic module package (7.5mm x 10.2mm)

◆ Package



◆ Application

Automotive

- FTPS fuel steam pressure detection
- DPF vacuum assisted pressure detection
- VBS vacuum boosting system sensor
- Crankcase ventilation pressure sensor

Industrial

- Negative pressure vacuum detection
- Gas pressure monitoring

NSPAS3M series: Automotive-qualified Integrated Absolute Pressure Sensor

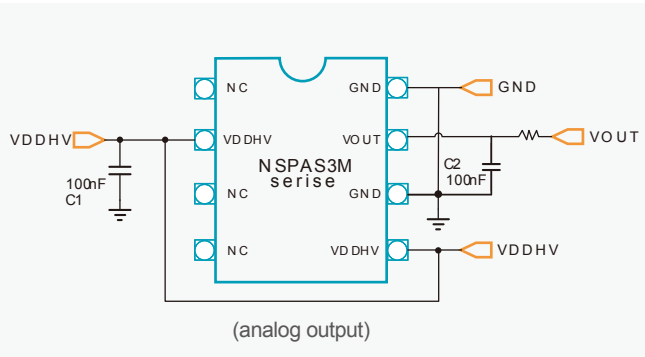
◆ Product introduction

The NSPAS3M series is a submillisecond responsive absolute pressure sensor product for the motorcycle intake manifold pressure sensor market. The product adopts automotive-qualified signal conditioning chips to calibrate and compensate the MEMS die output, which can convert pressure signals from 10kPa to 400kPa into analog output signals with a customized output range from 0 to 5V. While ensuring excellent reliability of the product, it integrates two chips into one package, greatly reducing the package size. At the same time, this products can provide standard output within the accuracy range in its operation temperature range without customer calibration, which can accelerate the process of product development and mass production; this product complies with the AEC-Q100 reliability standard.

◆ Product feature

- Width operating temperature range: -40°C~125°C
- High accuracy in full temperature range:
  - Better than ±1.5%F.S. in the range of 0°C~85°C
  - Better than ±1.5%F.S. in the range of -40°C~125°C
- Support -24V to 28V over voltage and reverse voltage protection
- Support 5V power supply and direct power supply within 18V in absolute voltage output mode
- Fluorinated gel protection, compatible with oil and gas environment
- Faster response time less than 1ms
- Support absolute output/ratio-metric output, with output curve customized
- Pressure range: 10kPa~400kPa, which can be customized
- AEC-Q100 qualified

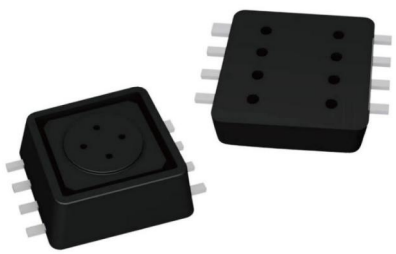
◆ Functional block diagram



(analog output)

◆ Package

SOP-8 (7.0mm x 7.0mm)



◆ Application

Automotive

- Motorcycle intake manifold pressure sensor
- ECU/VCU atmospheric pressure detection
- Canister desorption pressure detection
- Seat air bag pressure detection

Industrial

- Gas/refrigerant leak detection
- Pressure transmitter
- Industrial vacuum degree testing

NSPAS3 series: Automotive-qualified Integrated Absolute Pressure Sensor

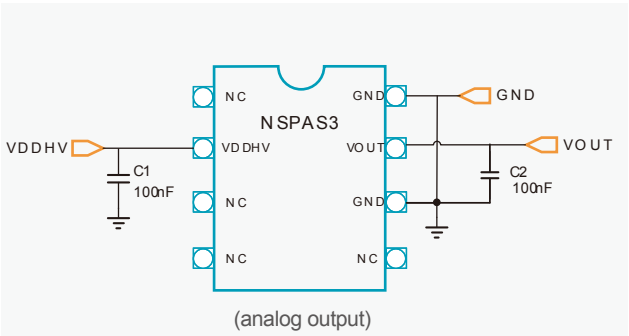
Product introduction

The NSPAS3 series is a calibrated absolute pressure sensor launched by NOVOSENSE for the automotive intake manifold pressure sensor. The product adopts automotive-qualified signal conditioning chips to calibrate and compensate the MEMS die output, which can convert pressure signals from 10kPa to 400kPa into analog output signals with a customized output range from 0 to 5V. While ensuring excellent reliability of the product, it integrates two chips into one package, greatly reducing the package size. At the same time, this products can provide standard output within the accuracy range in its operation temperature range without customer calibration, which can accelerate the process of product development and mass production; this product complies with the AEC-Q100 reliability standard.

Product feature

- Width operating temperature range: -40°C~130°C
- High accuracy in full temperature range:
  - Better than ±1%F.S. in the range of 0°C~85°C
  - Better than ±1.5%F.S. in the range of -40°C~130°C
- Support -24V to 28V over voltage and reverse voltage protection
- Fluorinated gel protection, compatible with oil and gas environment
- Faster response time less than 0.8ms
- Support absolute output/ratio-metric output, with output curve customized
- Disconnection detection, output clamping, output alarm function
- Pressure range: 10kPa~400kPa, which can be customized
- AEC-Q100 qualified
- range can be customized

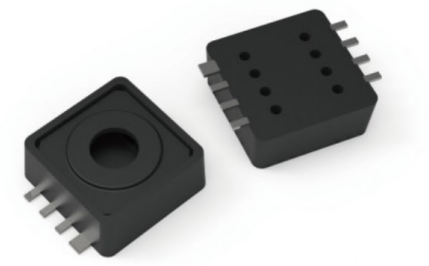
Functional block diagram



(analog output)

Package

SOP-8 (7.0mm x 7.0mm)



Application

Automotive

- Motorcycle three-in-one sensor
- Vehicle TMAP intake pressure detection
- BPS battery pack thermal runaway pressure detection
- Seat air bag pressure detection
- Canister desorption pressure detection
- ECU/VCU atmospheric pressure detection
- EGR-TMAP exhaust gas recirculation pressure detection (The corrosion- resistant version is under development)

Industrial

- Gas/refrigerant leak detection
- Pressure transmitter
- Industrial vacuum degree testing

NSPAS1 series: Automotive-qualified Integrated Absolute Pressure Sensor

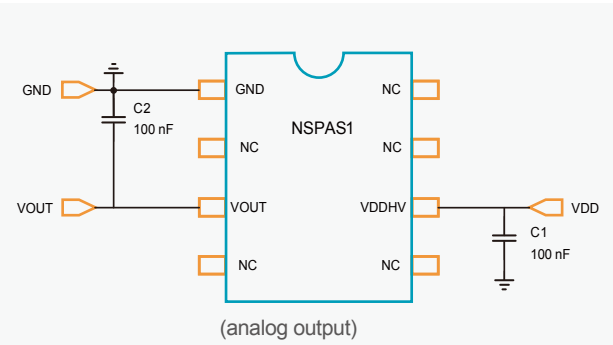
Product introduction

NSPAS1 is a calibrated absolute pressure sensor launched by NOVOSENSE for vehicle intake pressure, NEV vacuum boosting system and motorcycle electronic injection. The product adopts automotive-qualified signal conditioning chip to calibrate and compensate the output of MEMS piezoresistive die, ensuring excellent reliability of the product while integrating the two chips to greatly reduce the package size. At the same time, this product can provide standard output in its operation temperature range without customer calibration, which can accelerate the process of product development and mass production; the product complies with the AEC-Q100 reliability standard.

Product feature

- Operating temperature range: -40°C~125°C
- High accuracy in full temperature range:
  - Better than ±1%F.S. in the range of - 0°C~85°C
  - Better than ±1.5%F.S. in the range of - -40°C~125°C
- Support -24V to 28V over voltage and reverse voltage protection
- Fluorinated gel protection, compatible with oil and gas environment
- Faster response time less than 0.8ms
- Support absolute output/ratio-metric output, with output curve customized
- Disconnection detection, output clamping, output alarm function
- Pressure range 10kPa~400kPa, which can be customized
- AEC-Q100 qualified

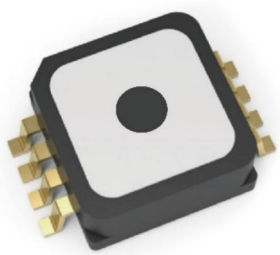
Functional block diagram



(analog output)

Package

SOP-8 (7.3mm x 7.3mm)



Application

Automotive

- Motorcycle three-in-one sensor
- Vehicle TMAP intake pressure detection
- BPS battery pack thermal runaway pressure detection
- Canister desorption pressure detection
- ECU/VCU atmospheric pressure detection
- Seat air bag pressure detection

Industrial

- Gas/refrigerant leak detection
- Pressure transmitter
- Industrial vacuum degree testing

NSPAS5 series: Automotive-grade Integrated Corrosion-resistant Absolute Pressure Sensor (range can be customized)

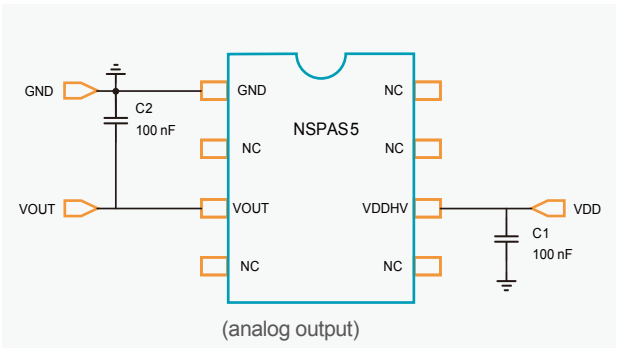
Product introduction

The NSPAS5 series is an automotive-grade integrated corrosion-resistant absolute pressure sensor launched by NOVOSENSE. This product uses automotive-grade signal conditioning chips to calibrate and compensate the output of MEMS cores, converting pressure signals ranging from 10kPa to 400kPa into analog output signals with a customizable output range of 0~5V. While ensuring the excellent reliability of the product, integrating and packaging two chips greatly reduces the package size. At the same time, the conditioned product can provide standard output within a precise range over a temperature range, eliminating the need for customers to calibrate sensors and accelerating the process of product development and mass production. The product meets AEC-Q100 reliability standards.

Product feature

- Wide operating temperature range:-40°C~130°C
- High accuracy in full temperature range:
  Better than +1%F.S. in the range of 0°C~85°C
  Better than +1.5%FS.in the range of -40°C~130°C
- Support -24V to 28V over voltage and reverse voltage protection
- Fluorinated gel protection, compatible with oil and gas environment
- Corrosion-resistant
- Faster response time less than 0.8ms
- Support absolute output/ratio-metric output, with output curve customized
- Disconnection detection, output clamping, output alarm function
- Pressure range:10kPa~400kPa, which can be customized
- AEC-Q100 qualified
- Range can be customzied

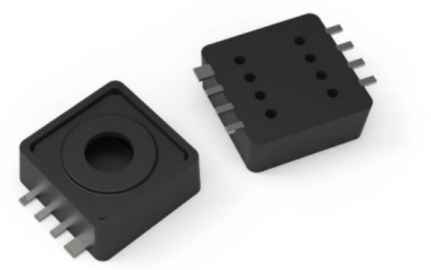
Functional block diagram



(analog output)

Package

SOP-8 (7.0mm x 7.0mm)



Application

Automotive

EGR-TMAP exhaust gas recirculation pressure detection (The corrosion- resistant version is under development)

NSPGS2 series: Integrated Gauge Pressure Sensor with Air Nozzle in SOP Package

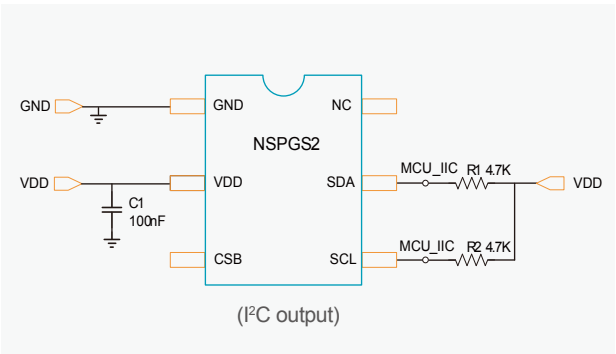
◆ Product introduction

NSPGS2 is a calibrated gauge pressure sensor launched by NOVOSENSE for the market of small household appliances and healthcare equipment. This series of products adopts high-performance signal conditioning chip to calibrate and compensate the temperature and pressure of MEMS piezoresistive die. It comes in SOP6 package form with vertical air nozzle for easy soldering and use. This series of pressure sensors can convert pressure signals from -100kPa to +250kPa into analog/digital output signals with a customized output range. They are suitable for pressure detection of non-corrosive gases compatible with the structural materials of pressure sensitive components, especially for small household appliances, healthcare, industry and the IoT.

◆ Product feature

- Customizable range: -100kPa ~+250kPa
- Wide temperature range: -40°C~70°C
- The comprehensive accuracy in the full temperature range is better than ± 2.5%
- Analog voltage output/ I²C digital output/SPI
- High stability, 100% calibration, temperature compensation
- Packaging with single air nozzle, easy to install and seal
- Front air intake for chips avoid blockage

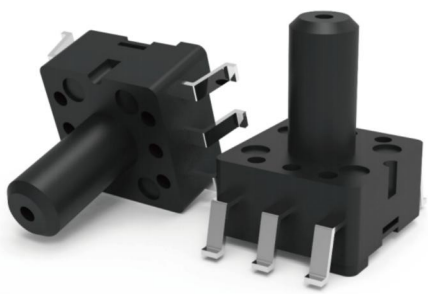
◆ Functional block diagram



(I²C output)

◆ Package

SOP-6 (6.3mm x 7.0mm)



◆ Application

Industrial
- Pressure transmitter
- Pressure switch
- Negative pressure vacuum detection

Medical
- Sphygmomanometer
- Oxygen generator
- Biosafety cabinet

Home appliances
- Coffee machine
- Health pot
- Vacuum cleaner
- Sweeper
- Vacuum juicer

Consumption
- Air mattress
- Massage chair
- Inflator

NSPGD1(M) series: Integrated Gauge Pressure Sensor with Air Nozzle in DIP8 Package

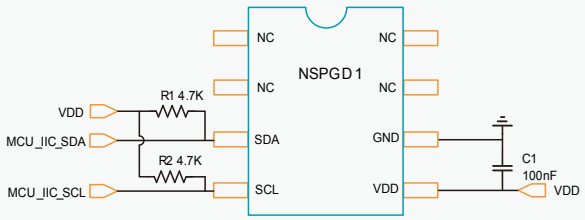
Product introduction

NSPGD1(M) is a series of calibrated gauge pressure sensors launched by NOVOSENSE for the home appliance and medical market. The series of products adopts high-performance signal conditioning chip to calibrate and compensate the temperature and pressure of MEMS piezoresistive die output. The NSPGD1 series integrated pressure sensor has an optional pressure range from -10kPa to +10kPa. It adopts DIP8 package form with air nozzle, which is convenient for soldering and use. It is suitable for gauge pressure detection of non-corrosive gases compatible with pressure sensitive components, especially for non-contact liquid level detection. It is also suitable for industrial, IoT and other fields. This series pressure sensor supports analog output /I²C digital output and unique frequency output, which is more flexible for multi-applications.

Product feature

- Customizable range: -10kPa ~ +10kPa
- Wide temperature range: 0°C~70°C
- The comprehensive accuracy in the full temperature range is better than ± 2.5%
- Analog voltage /I²C digital output/frequency output
- High stability, 100% calibration, temperature compensation
- DIP package with air nozzle, easy to install and seal
- Front air intake for chips avoid blockage
- Internal waterproof moisture-proofing treatment

Functional block diagram



(I²C output)

Package

DIP-8 (10.4mm x 10.4mm)

Application

Home appliances

- Washing machine
- Dishwasher
- Coffee machine
- Water purifier

Industrial

- Pressure switch
- Negative pressure vacuum detection
- Gas pressure detection

Medical

- Ventilator
- Oxygen generator
- Anesthesia apparatus
- Biosafety cabinet

NSPDSx series: Dual-nozzle Integrated Differential Pressure Sensor

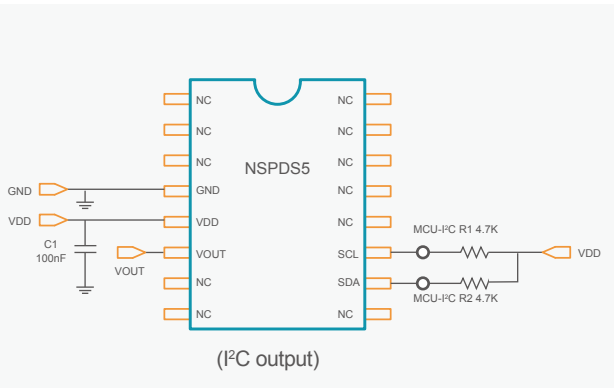
Product introduction

The NSPDSx is a calibrated pressure sensor launched by NOVOSENSE for the differential pressure monitoring market. The series of products adopts high-performance signal conditioning chips to calibrate and compensate the temperature and pressure of advanced MEMS piezoresistive die. JEDC-standard SOIC-16 package with double vertical barb air nozzle is adopted for convenient soldering and use. The NSPDSx series integrated pressure sensors have an optional pressure range from ±125Pa to ±250kPa, which are suitable for the pressure detection of non-corrosive gases compatible with the structural materials of pressure sensing elements, and also for consumer, medical, industrial and IoT fields. This pressure sensors supports analog output /I²C digital output and can be installed directly on standard printed circuit boards for multi-applications.

Product feature

- Supply voltage: 3V~5.5V
- Operating temperature range: -20°C~70°C
- High accuracy in full temperature range, and customizable pressure range
  - NSPDS9: ±125Pa~±500Pa, ±1%F.S.
  - NSPDS5/7: ±500Pa~±250kPa, ±1%F.S.
- Optional output mode (analog /I²C digital output)
- High stability, 100% calibration, temperature compensation
- Dual vertical barb air nozzle package, easy to install and seal

Functional block diagram



(I²C output)

Package

SOIC-16 (7.5mm x 10.3mm)

Application

Industrial

- Fire residual pressure monitoring
- HVAC/VAV
- Pressure transmitter
- Pressure switch
- Negative pressure vacuum detection
- Gas pressure monitoring

Medical

- Ventilator
- Oxygen generator
- Anesthesia apparatus
- Biosafety cabinet
- Sphygmomanometer

NSPGS5 series: Single-nozzle Integrated Gauge Pressure Sensor

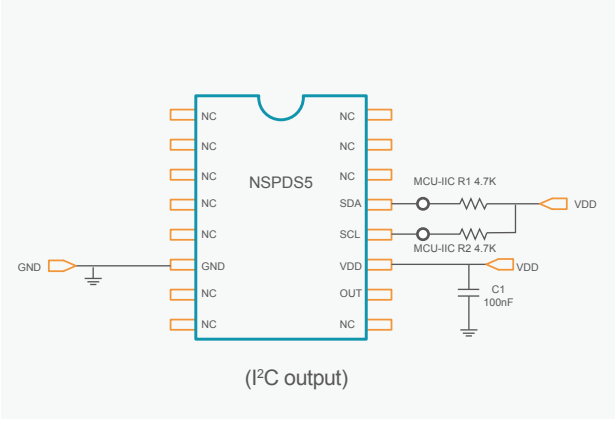
Product introduction

The NSPGS5 series is a calibrated pressure sensor launched by NOVOSENSE for the gauge pressure monitoring market. The series of products adopts high-performance signal conditioning chips to calibrate and compensate the temperature and pressure of advanced MEMS piezoresistive die. JEDC-standard SOIC-16 package with single nozzle is adopted for convenient soldering and use. The NSPGS5 series integrated pressure sensors have an optional pressure range from -10kPa to +10kPa, supporting analog output. They are suitable for the pressure detection of non-corrosive gases compatible with the structural materials of pressure sensing elements, and also for consumer, medical, industrial and IoT fields.

Product feature

- Supply voltage: 3V~5.5V
- Operating temperature range: -20°C~85°C
- Customizable range: -10kPa~+10kPa
- The comprehensive accuracy in the full temperature range is better than ±1%F.S.
- Output mode optional (analog /I²C digital output)
- High stability, 100% calibration, temperature compensation
- Single vertical nozzle package, easy to install and seal

Functional block diagram



(I²C output)

Package

SOIC-16 (7.5mm x 10.3mm)

Application

Industrial

- Gas pressure detection
- Pressure switch
- Negative pressure vacuum detection

Medical

- Ventilator
- Sphygmomanometer
- Oxygen generator
- Anesthesia apparatus
- Biosafety cabinet

NSP183x: High-performance and High-reliability MEMS Differential Pressure Sensor Wafer

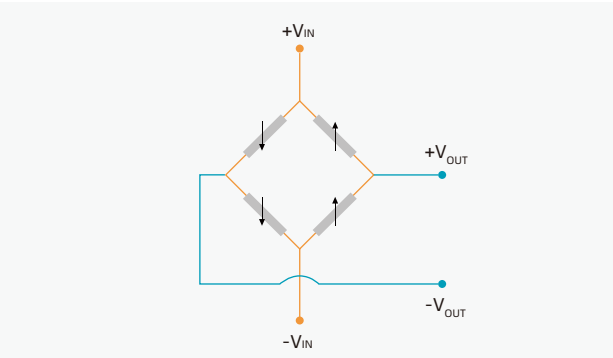
Product introduction

NOVOSENSE NSP183x series MEMS differential pressure sensor wafer is mainly made via the piezoresistive effect of silicon with NOVOSENSE independent R&D MEMS micro machining process design. The sensor wafer manufacturing platform is qualified by IATF16949, and the front/back side of every wafer pass AOI tested which compiles with AEC-Q103 standards. This series of MEMS wafers can realize differential pressure detection, which can be widely used in automotive electronics, medical electronics, white household appliances and industrial control fields. Meanwhile, NOVOSENSE also launched unique precious metal differential pressure MEMS series products, which mainly adopts precious metal double-pad structure design and stability enhanced shielding layer technology, and specially used in automotive exhaust system and other harsh environment.

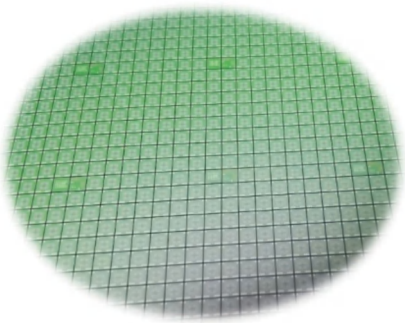
Product feature

- Operating temperature range: -40°C~85°C, -40°C~125°C and -40°C~150°C
- Pressure range: 0kPa~±1kPa, 0kPa~±6kPa/±10kPa and 0kPa~±100kPa/±500kPa
- The accuracy and stability in the life cycle are better than 1%F.S.
- Automotive-qualified IATF16949-certified process platform
- Comply with RoHS & REACH and halogen-free requirements
- Compiles with AEC-Q103 standard

Functional block diagram



Package



Application

Automotive
- FTPS fuel steampressure detection
- GPF/DPF exhaust differential pressure detection
- VBS vacuum boosting system sensor
- EGR system differential pressure detection
- Crankcase ventilation pressure sensor

Industrial
- Fire residual pressure monitoring
- HVAC/VAV
- Pressure transmitter
- Pressure switch
- Negative pressure vacuum detection
- Gas flow monitoring

Medical
- Ventilator
- Sphygmomanometer
- Oxygen generator
- Anesthesia apparatus
- Biosafety cabinet

Home appliances
- Washing machine
- Dishwasher
- Coffee machine
- Vacuum cleaner
- Water purifier
- Vacuum juicer

Consumption
- Air mattress
- Massage chair
- Air pump

NSP163x: High-performance and High-reliability MEMS Absolute Pressure Sensor Wafer

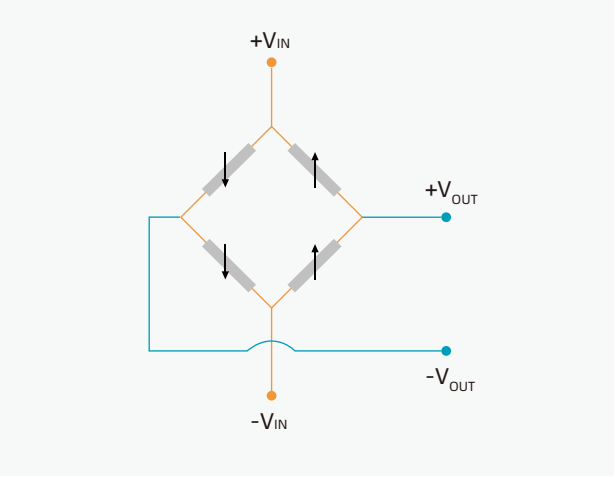
Product introduction

NOVOSENSE NSP163x series MEMS absolute pressure sensor wafer is mainly designed by using the piezoresistive effect of silicon with independently developed MEMS micromachining process. The sensor wafer manufacturing platform is qualified by IATF16949, and the front/back side of every wafer pass AOI tested which complies with AEC-Q103 standards. This series of MEMS wafers can realize absolute pressure detection, which can be widely used in automotive electronics, medical electronics, white household appliances and industrial control fields. Meanwhile, NOVOSENSE also launched a unique series of precious metal MEMS products, which are specially used in harsh environment such as automotive exhaust system.

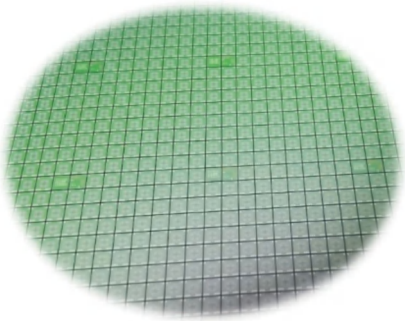
Product feature

- Operating temperature range: -40°C~125°C, -40°C~150°C
- Pressure range: 0kPa~100kPa/200kPa/500kPa
- The accuracy and stability in the life cycle are less than 1%F.S.
- Automotive-qualified IATF16949-certified process platform
- Comply with RoHS & REACH and halogen-free requirements
- Complies with AEC-Q103 standard

Functional block diagram



Package



Application

Automotive

- Motorcycle three-in-one sensor
- Vehicle TMAP intake pressure detection
- BPS battery pack thermal runaway pressure detection
- EGR-TMAP exhaust gas recirculation pressure detection
- EV/HEV vacuum boosting system sensor
- Canister desorption pressure detection
- VBS vacuum assist sensor
- ECU/VCU atmospheric pressure detection
- Seat air bag pressure detection

Industrial

- Pressure transmitter
- Industrial vacuum degree testing

Consumption

- Altimeter
- Barometer

Integrated Current Sensor

Integrated Current Sensor

Part number	Product feature	Package	Range ability	Supply voltage	Isolation voltage / operating voltage	Creepage distance / electric clearance	Temperature range	Signal bandwidth / response time	Typical application
NSM2011	Wide current range available AC/DC measurement Conduction resistance as low as 0.85mOhm Proportional output +/-2% current measurement accuracy	SOW-16	10~100A	3.3V/5V	5000Vrms@1min 1550VDC (1097VAC)	8mm/8mm	-40°C ~125°C	240kHz /2.2μs	Photovoltaic inverter Automotive OBC, DC/DC, charging gun, PTC heater Industrial inverter Power supply Service robot Unmanned aerial vehicle Two-wheeled vehicle
NSM2012	Wide current range available AC/DC measurement Support proportional output or fixed output Reference voltage output +/-2% current measurement accuracy	SOP-8	2.5~65A	3.3V/5V	3000Vrms@1min 600VDC (424VAC)	4mm/4mm	-40°C ~125°C	400kHz /1.5μs	
NSM2013	Wide current range available AC/DC measurement Conduction resistance as low as 0.85mOhm Fixed output Reference voltage output +/-2% current measurement accuracy	SOW-16	10~100A	3.3V/5V	5000Vrms@1min 1550VDC (1097VAC)	8mm/8mm	-40°C ~125°C	240kHz /2.2μs	
NSM2015	Wide current range available AC/DC measurement Conduction resistance as low as 0.85mOhm Fixed output Reference voltage output Integrated over-current protection +/-2% current measurement accuracy	SOW-16	10~100A	3.3V/5V	5000Vrms@1min 1550VDC (1097VAC)	8mm/8mm	-40°C ~125°C	320kHz /1.5μs	
NSM2016	Wide current range available AC/DC measurement Fixed output Integrated over-current protection +/-2% current measurement accuracy	SOP-8	20~50A	3.3V/5V	3000Vrms@1min 600VDC (424VAC)	4mm/4mm	-40°C ~125°C	380kHz /1.5μs	
NSM2017	Wide current range available AC/DC measurement Conduction resistance as low as 0.85mOhm Support proportional output or fixed output Integrated over-current protection	SOW-16	20~65A	3.3V/5V	5000Vrms@1min 1550VDC (1097VAC)	8mm/8mm	-40°C ~125°C	320kHz /1.5μs	
NSM2019	Wide current range available AC/DC measurement Conduction resistance as low as 0.27mOhm Support proportional output or fixed output Integrated over-current protection	SOW-10	20~200A	3.3V/5V	5000Vrms@1min 1618VDC (1144VAC)	8.2mm/8.2mm	-40°C ~150°C	320kHz /1.5μs	
NSM2110	Multiple selectable current ranges AC/DC measurement Low continuity resistance down to 1.2mΩ Fixed output Integrated overcurrent protection +/-2% current measurement accuracy	SOP-8	5~65A	3.3V/5V	3000Vrms@1min 600VDC (424VAC)	4mm/4mm	-40°C ~150°C	1MHz /400ns	PV inverter Energy storage Automobile OBC, DC/DC, charging gun, PTC heater Industrial inverter Power supply Service robot Drone Two-wheeled vehicle
NSM2111	Multiple selectable current ranges AC/DC measurement Continuity resistance as low as 0.27mΩ Fixed output Reference voltage output +/-2% current measurement accuracy	SOW-10	20~200A	3.3V/5V	5000Vrms@1min 1618VDC (1144VAC)	8.2mm/8.2mm	-40°C ~150°C	1MHz /400ns	
NSM2112	Multiple selectable current ranges AC/DC measurement Continuity resistance as low as 1.2mΩ Proportional output/Fixed output (+reference voltage output) +/-2% current measurement accuracy	SOP-8	5~65A	3.3V/5V	3000Vrms@1min 600VDC (424VAC)	4mm/4mm	-40°C ~150°C	1MHz /400ns	

Part number	Product feature	Package	Range ability	Supply voltage	Isolation voltage / operating voltage	Creepage distance / electric clearance	Temperature range	Signal bandwidth / response time	Typical application
NSM2113	Multiple selectable current ranges AC/DC measurement Continuity resistance as low as 0.27mΩ Fixed output Reference voltage output Integrated overcurrent protection +/-2% current measurement accuracy	SOW-10	20~200A	3.3V/5V	5000Vrms@1min 1618VDC (1144VAC)	8.2mm/8.2mm	-40°C ~150°C	1MHz /400ns	PV inverter Energy storage Automobile OBC, DC/DC, charging gun, PTC heater Industrial inverter Power supply Service robot Drone Two-wheeled vehicle
NSM2115	Multiple selectable current ranges AC/DC measurement Continuity resistance as low as 1mΩ Proportional output Integrated overcurrent protection +/-2% current measurement accuracy Enhanced insulation	SOW-16	10~100A	3.3V/5V	5000Vrms@1min 1550VDC (1097VAC)	8mm/8mm	-40°C ~150°C	1MHz /400ns	
NSM2117	Multiple selectable current ranges AC/DC measurement Continuity resistance as low as 0.85mΩ Fixed output Reference voltage output Integrated overcurrent protection +/-2% current measurement accuracy	SOW-16	10~100A	3.3V/5V	5000Vrms@1min 1550VDC (1097VAC)	8mm/8mm	-40°C ~150°C	1MHz /400ns	
NSM2119	Multiple selectable current ranges AC/DC measurement Continuity resistance as low as 0.85mΩ Fixed output Reference voltage output Integrated overcurrent protection +/-2% current measurement accuracy	SOW-16	10~100A	3.3V/5V	5000Vrms@1min 1550VDC (1097VAC)	8mm/8mm	-40°C ~150°C	1MHz /400ns	
NSM2311	50~200AWide current range availableAC/DC measurement Conduction resistance as low as 0.1mOhm Support Ratiometric and fix mode +/-1.5% current measure-ment accuracy	DIP-5L	50~200A	3.3V/5V	5000Vrms@1min 1358VDC (960VAC)	6.9mm/6.9mm	-40°C ~150°C	147KHz /2.3s	Photovoltaic inverter, Industrial inverter, Power supply, Service robot, Unmanned aerial vehicle, Two-wheeled vehicle

NSM2011/2012/2013/2015/2016/2017/2019: Chip-level Current Sensor with Integrated Current Path

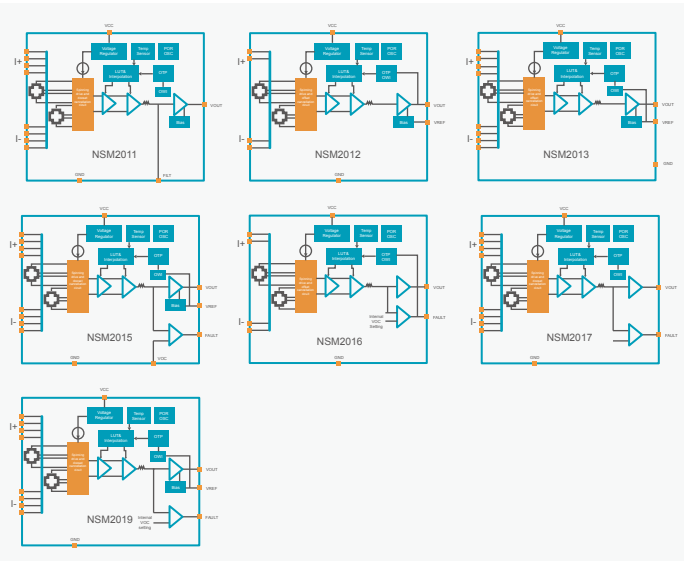
Product introduction

NSM201x series is a chip-level current sensor under 200A launched by NOVOSENSE which is mainly used for isolation measurement of current under 200A.

Product feature

- Wide current range available 2.5A~200A
- AC/DC input
- 3.3V/5V single power supply
- Input conduction impedance as low as to 0.27mOhm
- ±2% current measurement accuracy
- Withstand up to 20kA surge current (8μs /20μs surge current waveform)
- Multiple output type
  Single-end proportional output
  Pseudo difference fixed output
- Two types of package
  SOP8 package: 600VDC working isolation voltage / 3000 Vrms @ 1min withstand isolation voltage (NSM2012/NSM2016)
  SOW16 package: 1550VDC working insulation voltage / 5000 Vrms @ 1 min withstand isolation voltage (NSM2011/NSM2013/NSM2015/NSM2017)
  SOW10 package: 1618VDC working isolation voltage / 5000 Vrms @ 1min withstand isolation voltage（NSM2019）
- Overcurrent protection OCD output (NSM2015/NSM2016/NSM2017/NSM2019)
  Overcurrent protection response in micro seconds
  Overcurrent protection threshold is configurable

Functional block diagram



Safety certificate

- UL62368/EN62368 safety certification

Package

NSM2012/2016: SOP8

NSM2011/2013/2015/2017: SOW16

NSM2019:SOW10

Application

Automotive	OBC	DC/DC	PTC heater	Charging gun	PDU
Industrial	PV inverter	Industrial frequency converter	Power supply (UPS, SMPS)	PDU	
Consumer	Service robots	Drones	Two-wheeled vehicles	Vacuum cleaners	

NSM2110/2111/2112/2113/2115/2117/2119
Integrated Current Sensors

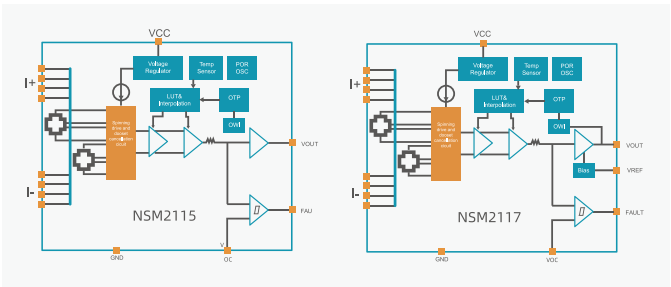
◆ Product introduction

The NSM211x series of high-bandwidth integrated current sensors from Naxinwei are primarily based on the Hall effect principle, using isolation to convert currents within ±200A into linear voltage outputs. They are suitable for various isolated current sampling applications, such as PV input side of photovoltaic string inverters, current detection for MPPT (Maximum Power Point Tracking), and AC side current detection. They are also used for busbar current and phase current sampling in industrial frequency converters, UPS and server power supplies, isolated current sampling in charging piles, current detection for automotive OBC PFC, resonant cavity current detection, and more.

◆ Product feature

- Multiple selectable current ranges: 5A to 200A
- AC/DC input
- 3.3V/5V single power supply
- Up to 1MHz bandwidth, response time <500ns
- Input continuity resistance as low as 0.27mΩ
- ±2% current measurement accuracy
- Able to withstand surge lightning currents of up to 20kA (8μs/20μs surge current waveform)
- Multiple output types:
  Single-ended proportional output
  Pseudo-differential fixed output
- Three packaging forms:
  Narrow-body SOIC 8-pin package: 600VDC working isolation voltage / 3000 Vrms @ 1min withstand isolation voltage (NSM2110/NSM2112)
  Wide-body SOIC 16-pin package: 1550VDC working insulation voltage / 5000 Vrms @ 1 min withstand isolation voltage (NSM2115/NSM2117/NSM2119)
  Wide-body SOIC 10-pin package: 1618VDC working insulation voltage / 5000 Vrms @ 1 min withstand isolation voltage (NSM2111/NSM2113)
- Overcurrent protection OCD output (NSM2110/NSM2113/NSM2115/NSM2117/NSM2119):
  Nanosecond-level overcurrent protection response speed
  Configurable overcurrent protection threshold

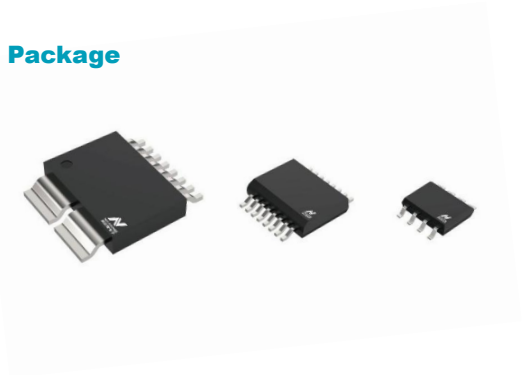
◆ Functional block diagram



◆ Safety certificate

- UL62368/EN62368 safety standard certification

◆ Package



◆ Application

Automotive	OBC	DC/DC	PTC heater	Charging gun	PDU
Industrial	PV inverter	Industrial frequency converter	Power supply (UPS, SMPS)	PDU	
Consumer	Service robots	Drones	Two-wheeled vehicles	Vacuum cleaners	

NSM2311 High Performance Module-Alternative Current Sensor with Integrated Current Path

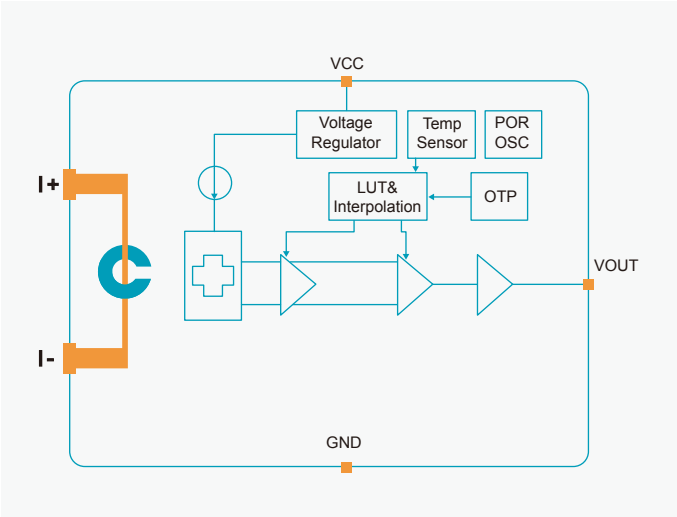
Product introduction

NSM2311 is a high performance module-alternative current sensor which is mainly used for isolation measurement of current under 200A, to achieve a compact, low-cost, and high-precision sensing solution.

Product feature

- 50~200A Wide current range available
- AC/DC input
- 3.3V/5V single power supply
- 100μOhm low Input conduction impedance
- ±2% sensitivity error over temperature
- ±5mV offset error over temperature
- 2.3s response time
- 150KHz signal bandwidth
- Ratiometric or fixed output
- ±8KV ESD(HBM)
- DIP-5L package: 1358VDC working isolation voltage / 5000 Vrms @ 1 min Withstand isolation voltage
- Withstand up to over 20kA surge current (8μs /20μs surge current waveform)
- 6.9mm Creepage distance
- 6.9mm Clearance distance
- -40~150°C operating temperature range

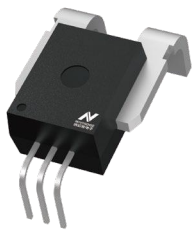
Functional block diagram



Safety Certification

- UL62368/EN62368 safety certification

Package



Application

Industrial

- industrial frequency converter
- PV inverter
- power supply (UPS, SMPS, etc.)
- PDU

Linear Hall Current Sensor

Linear Hall Current Sensor

Part number	Product feature	Package	Package thickness	Pin forms	Sensitivity range	Supply voltage	Temperature range	Signal bandwidth / response time	Typical application
NSM2031	AC/DC measurement Support proportional output or fixed output Overcurrent protection output Sensitivity drift <±2% Zero drift <±10mV Multiple pin bending forms	TO94	1.0mm	L-shaped bend (BL, BS) V-shaped bend (BV)	0.5~15mV/G	3.3V/5V	- 40°C ~150°C	240kHz /2.2μs	Electric drive system for electric vehicle Open-loop current sensor module Electric two-wheeled vehicle
NSM2032	AC/DC measurement Support proportional output or fixed output Optional reference voltage output Sensitivity drift <±1.5% Zero drift <±5mV Multiple pin bending forms Supports overvoltage, undervoltage, and open ground diagnosis	TO94	1.0mm	L-shaped bend (BL, BS) V-shaped bend (BV)	0.5~30mV/G	3.3V/5V	- 40°C ~150°C	400kHz/ 1.5μs	Electric drive system for electric vehicle Open-loop current sensor module Electric two-wheeled vehicle
NSM2033	AC/DC measurement Support proportional output or fixed output Optional reference voltage output Sensitivity drift <±1.5% Zero drift <±5mV Multiple pin bending forms Supports overvoltage, undervoltage, and open ground diagnosis	TO94	1.0mm	L-shaped bend (BL, BS) V-shaped bend (BV)	0.5~30mV/G	3.3V/5V	- 40°C ~150°C	400kHz/ 1.5μs	Electric drive system for electric vehicle Open-loop current sensor module Electric two-wheeled vehicle
NSM2034	AC/DC Measurement Fixed output Reference voltage output Sensitivity drift <±1% Zero drift <±5mV	TO94	1.6mm	N/A	0.5~30mV/G	3.3V/5V	- 40°C ~150°C	400kHz/ 1.5us	Electric drive system for electric vehicle Open-loop current sensor module Electric two-wheeled vehicle
NSM2020	Coreless solution AC/DC measurementSupport proportional output or fixed outputReference voltage output overcurrent protection output Low Sensitivity drift	TSSOP8	1.6mm	N/A	0.5~30mV/G	3.3V/5V	- 40°C ~150°C	600KHz/ 2us	Electric drive system for electric vehicle，Open-loop current sensor module，Electric two-wheeled vehicle

NSM2031: Linear Hall Current Sensor

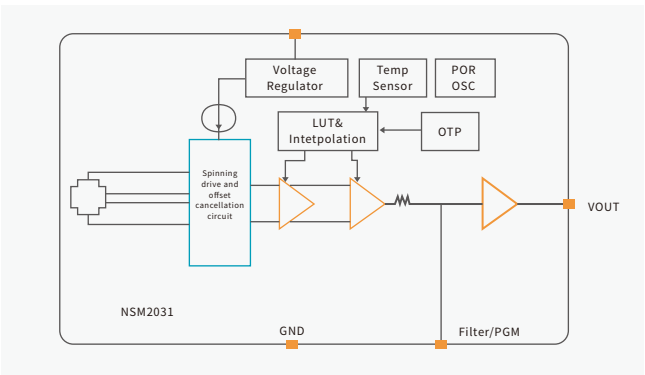
Product introduction

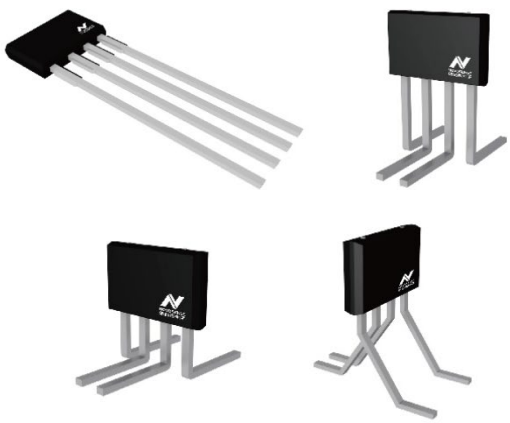
NSM2031 linear Hall effect current sensor chip can provide a high-precision solution for large range current detection based on magnetic ring. It is widely used in the phase current detection of electric vehicle electric drive system and the large current detection of current module in industrial system.

Product feature

- Automotive-qualified meet AEC - Q100 Grade0 requirements
- Working environment temperature: - 40 °C ~ 150 °C
- Wide programmable sensitivity range: 0.5 ~ 15 mV/G
- High precision, low temperature drift
  Sensitivity error <±2% over the whole temperature range
  Zero drift <±10 mV in the whole temperature range
- Industry-leading noise performance
- High bandwidth and fast response
  -3dB 240kHz bandwidth model, response time 2.2μs
- Industry leading ESD performance
  HBM: ±8kV
  CDM: ±2kV
- 1 mm,TO94 package and a variety of pin bent form
- Support proportional output or fixed output
- Overcurrent protection output, users can configure over-current protection output threshold for the current range of 50% to 200%
- Different models the optional power supply, 3.3 V or 5 V single power supply work
- Comply with RoHS standard packaging

Functional block diagram





Application

Automotive
- Traction motor inverter
- DC/DC converters
- PDU

Industrial
- Industrial motor control
- Photovoltaic inverter

NSM2032: Linear Hall Current Sensor

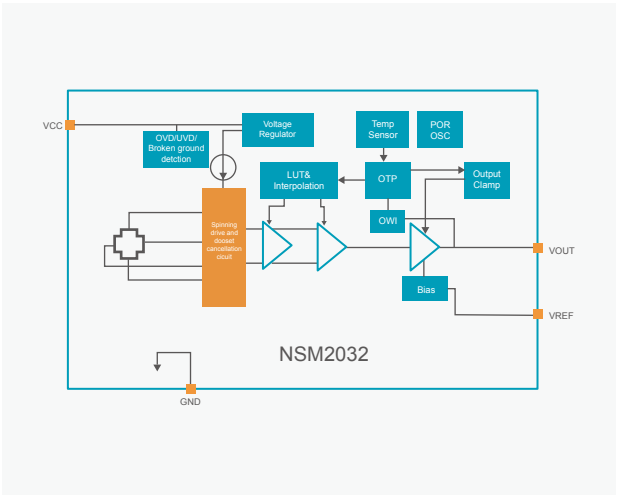
◆ Product introduction

NSM2032 linear Hall effect current sensor chip can provide a high-precision solution for large range current detection based on magnetic ring. It is widely used in the phase current detection of electric vehicle electric drive system and the large current detection of current module in industrial system.

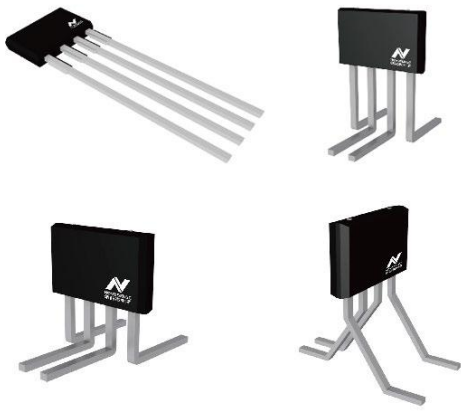
◆ Product feature

- Automotive-qualified meet AEC - Q100 Grade0 requirements
- Working environment temperature: - 40 °C ~ 150 °C
- Wide programmable sensitivity range: 0.5 ~ 30 mV/G
- High precision, low temperature drift
  -Sensitivity error <±1.5% over the whole temperature range
  -Zero drift <±5 mV in the whole temperature range
- Industry-leading noise performance
- High bandwidth and fast response
  --3dB 400kHz bandwidth model, response time 1.5μs
- Various diagnostic modes, overvoltage, undervoltage, open circuit and so on
- Industry leading ESD performance
  -HBM: ±8kV
  -CDM: ±2kV
- 1 mm TO94 package and a variety of pin bent form
- Support proportional output or fixed output
- Optional reference voltage output
- Different models the optional power supply, 3.3 V or 5 V single power supply work
- Comply with RoHS standard packaging

◆ Functional block diagram



◆ Package



◆ Application

Automotive

- Traction motor inverter
- DC/DC converters
- PDU

Industrial

- Industrial motor control
- Photovoltaic inverter

NSM2033: Linear Hall Current Sensor

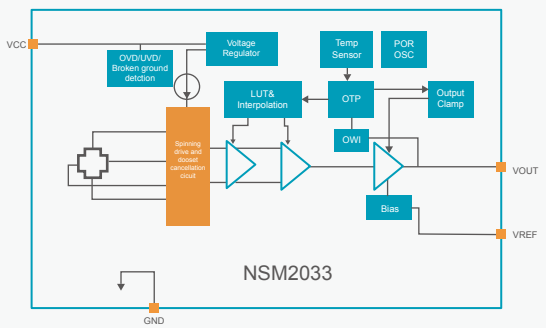
◆ Product introduction

NSM2033 linear Hall effect current sensor chip can provide a high-precision solution for large range current detection based on magnetic ring. It is widely used in the phase current detection of electric vehicle electric drive system and the large current detection of current module in industrial system.

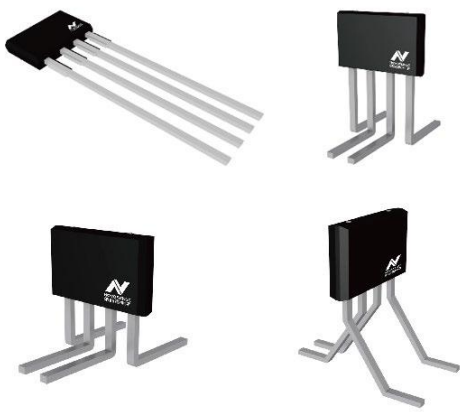
◆ Product feature

- Automotive-qualified meet AEC - Q100 Grade0 requirements
- Working environment temperature: - 40 °C ~ 150 °C
- Wide programmable sensitivity range: 0.5 ~ 30 mV/G
- High precision, low temperature drift
  -Sensitivity error <±1.5% over the whole temperature range
  -Zero drift <±5 mV in the whole temperature range
- Industry-leading noise performance
- High bandwidth and fast response
  --3dB 240kHz bandwidth model, response time 1.5μs
- Various diagnostic modes, overvoltage, undervoltage, open circuit and so on
- Industry leading ESD performance
  -HBM: ±8kV
  -CDM: ±2kV
- 1 mm TO94 package and a variety of pin bent form
- Support proportional output or fixed output
- Optional reference voltage output
- Different models the optional power supply, 3.3 V or 5 V single power supply work
  Comply with RoHS standard packaging

◆ Functional block diagram



◆ Package



◆ Application

Automotive

- Traction motor inverter
- DC/DC converters
- PDU

Industrial

- Industrial motor control
- Photovoltaic inverter

NSM2034: Linear Hall Current Sensor

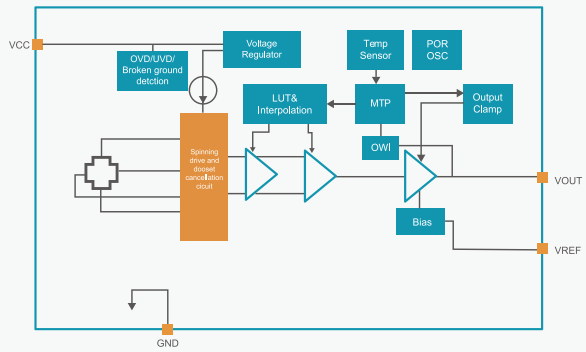
Product introduction

The NSM2034 linear Hall effect current sensor chip provides a high-precision solution for current detection based on magnetic core, widely used in current sensor modules in industrial systems.

Product feature

- Operating ambient temperature: -40°C to 150°C
- Wide programmable sensitivity range: 0.5 to 30 mV/G
- High precision, low temperature drift
  Sensitivity error <±1% over the entire temperature range
  Zero drift <±5 mV over the entire temperature range
- Industry-leading noise performance
- High bandwidth and fast response
  -3dB bandwidth for the 400kHz model, response time of 1.5μs
- Multiple diagnostic modes covering overvoltage, undervoltage, open circuit, etc.
- Industry-leading ESD performance
  HBM: ±8kV
  CDM: ±2kV
- 1.6mm TO94 package
- Fixed output
- Reference voltage output
- Different power supply options available: 3.3V or 5V single power supply operation
- Encapsulation compliant with RoHS standards

Functional block diagram



Package

Application

Industrial

- Industrial motor control
- Photovoltaic inverter

NSM2020: Coreless High bandwidth Differential Hall-Effect Current Sensor

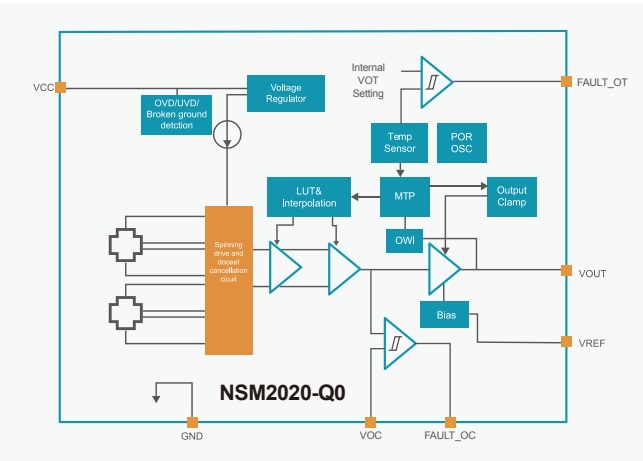
Product introduction

sensor. provides a highly accurate method of measuring 100 A to >2000 A flowing through a busbar or a PCB without needing a concentrator core or a U-Shaped Magnetic Shield. Reducing system complexity, bill of material (BOM) cost and weight

Product feature

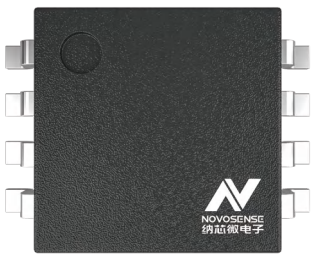
- Working environment temperature: - 40 °C ~ 150 °C
- Wide programmable sensitivity range: 0.5 ~ 30 mV/G
- High precision, low temperature drift
- Sensitivity error <±1.5% over the whole temperature range
- Zero drift <±10 mV in the whole temperature range
- 3mvRms Industry-leading noise performance
- High bandwidth and fast response
- 3dB 600kHz bandwidth model
- Response time 2μs
- Industry leading ESD performance :HBM: ±8kV，CDM: ±2kV
- Support proportional output or fixed output
- Reference output（Only in fixed mode）
- Different models the optional power supply, 3.3V or 5V single power supply work
- Broken-Ground detection，Over current detection，
- Under/Over-Voltage detection
  Comply with RoHS standard packaging
- AEC-Q100 Grade 0 qualified

Functional block diagram



Package

- TSSOP8



Application

Traction Inverter

Magnetic Position Sensor

Hall-based Angle Sensor

Part number	Product feature	Package	Range ability	Supply voltage	Interface form	Accuracy of angle measurement	Response time	Temperature range	Typical application
NSM3011	The axial angle is measured based on planar Hall Differential Hall detection can resist external stray magnetic field Provide OWI user-programmable communication port Automotive-qualified model and industrial-qualified model available	SOP-8	0~360° Support user defined samll range measurement as well	3.3V/5V	14-bit linear DAC analog output 12-bit resolution PWM output	±1° The accuracy can reach ±0.2° after four-section calibration	120μs (10μs after dynamic Angle compensation is enabled)	-40°C ~150°C	**Automotive:** Valve angle sensor (throttle, EGR, ball valve, expansion valve, etc.) Accelerator pedal angle sensor Electronic gear shifter Wiper position sensor Body height sensor **Industrial:** Industrial steering gear angle sensor Non-contact rotary button switch **Consumer:** Home printer Hand-held marking gun Moving curtain angle detection
NSM3012	The axial angle is measured based on planar Hall Differential Hall detection can resist external stray magnetic field Provide SPI and OWI user-programmable communication interfaces Automotive-qualified model and industrial-qualified model available	SOP-8	0~360° Support user defined small range measurement as well	3.3V/5V	14-bit linear DAC analog output 12-bit resolution PWM output Three-line or four-line communication	±1° The accuracy can reach ±0.2° after four-section calibration	120μs (10μs after dynamic Angle compensation is enabled)	-40°C ~150°C	
NSM3013	The axial angle is measured based on planar Hall Differential Hall detection can resist external stray magnetic field Provide OWI user-programmable communication port Automotive-qualified model and industrial-qualified model available	SOP-8	0~360° Support user defined small range measurement as well	3.3V/5V	14-bit linear DAC analog output 12-bit resolution PWM output UVW output Z-direction programmable threshold judgment switch output (SON)	±1° The accuracy can reach ±0.2° after four-section calibration	120μs (10μs after dynamic Angle compensation is enabled)	-40°C ~150°C	

Hall-effect Switches & Latches

Part number	Key features	Package	Interface	Short circuit protection	Thermal shut down	Bop/Brp (Gauss)	Supply voltage	Supply current	Supply current of low power verison	Operating temperature range	AEC-Q100	ISO 26262	Typical Application
NSM1011	Unipolar hall switch，Planar Hall effect，Overvoltage and reverse voltage protection，3 wire	SOT23 /TO92S	Open Drain	Yes	Yes	±15/±5, ±35/±25, ±75/±65, ±100/±90, ±150/±130	2.7~28V	2.5mA	63μA	-40~150°C	Grade 0	ASIL A	Solid-state switch
NSM1012	Omnipolar hall switch，Planar Hall effect，Overvoltage and reverse voltage protection，3 wire	SOT23 /TO92S	Open Drain	Yes	Yes	±15/±5, ±35/±25, ±75/±65, ±100/±90, ±150/±130	2.7~28V	2.5mA	63μA	-40~150°C	Grade 0	ASIL A	Solid-state switch
NSM1013	Hall latch，Planar Hall effect，Overvoltage and reverse voltage protection，3 wire	SOT23 /TO92S	Open Drain	Yes	Yes	±15, ±35, ±75, ±100, ±150	2.7~28V	2.5mA	63μA	-40~150°C	Grade 0	ASIL A	3-phase BLDC motor commutation
NSM1071	Unipolar Hall switch, Planar Hall effect, 3 wire, Low power consumption version available	SOT23 /TO92S	Open drain/ Push-pull	N/A	N/A	±19/±14, ±26/±21, ±36/±26, ±42/±34	1.65~5.5V	1.4mA	1.5uA	-40~125°C	NO	N/A	Solid-state switch
NSM1072	Omnipolar Hall switch, Planar Hall effect, 3 wire, Low power consumption version available	SOT23 /TO92S	Open drain/ Push-pull	N/A	N/A	±19/±14, ±26/±21, ±36/±26, ±42/±34	1.65~5.5V	1.4mA	1.5uA	-40~125°C	NO	N/A	Solid-state switch

xMR Switches & Latches

Part Number	Key Features	Package	Interface	Bop/Brp（Gauss）	Supply Voltage	Supply Current	AEC-Q100	Operating Temperature Range	Typical Application
NSM1051	Unipolar TMR switch, High sensitivity, Low power consumption, 3 wire	SOT23 /TO92	Open drain/ Push-pull	±9/±5，±14/±10，±18/±13，±35/±25，±50/±40，±75/±65	1.8~5.5V	1.5uA, 1uA, 0.5uA, 0.2uA	NO	-40~125°C	Solid-state switch
NSM1052	Omnipolar TMR switch, High sensitivity, Low power consumption, 3 wire	SOT23 /TO92	Open drain/ Push-pull	±9/±5，±14/±10，±18/±13，±35/±25，±50/±40，±75/±65	1.8~5.5V	1.5uA, 1uA, 0.5uA, 0.2uA	NO	-40~125°C	Solid-state switch
NSM1053	TMR latch, High sensitivity, Low power consumption, 3 wire	SOT23 /TO92	Open drain/ Push-pull	±9, ±14, ±18, ±35, ±50, ±75	1.8~5.5V	1.5uA, 1uA, 0.5uA, 0.2uA	NO	-40~125°C	Magnetic encoder

NSM3011/3012/3013: Hall-based Angle Sensor

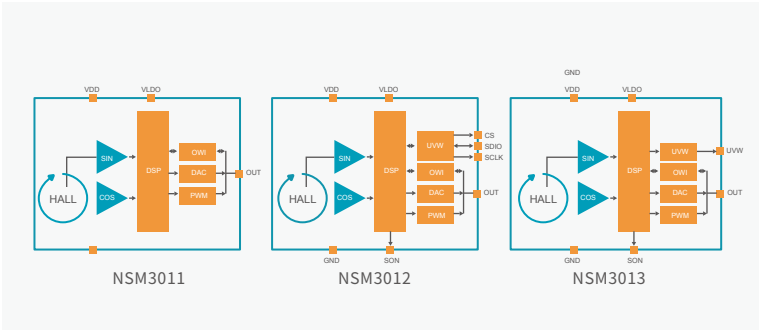
Product introduction

The NSM301x is a non-contact rotation angle sensor that supports accurate rotation angle measurement of 360° in ambient temperatures ranging from -40°C to 150°C. This series is based on planar Hall array, which converts the angle position information of bipolar magnet into analog voltage, PWM, SPI and other output forms through internal DSP. The NSM301x provides SPI and OWI interfaces for signal path configuration as well as erasable programming register blocks (MTP). It has an automatic gain (AGC) adjustment module that can adjust the gain of the signal path to accommodate different mechanical constraints and magnetic fields. This approach provides maximum flexibility in system design because it can be integrated directly into existing architectures, providing high accuracy. The chip supports 3.3V, 5V power supply voltage (different power supply versions)

Product feature

- Operating temperature: -40°C to 150°C
- Various output interface forms: 14-bit linear DAC analog output or 12-bit resolution PWM output, SPI output UVW output, Z-direction programmable threshold judgment switch output (SON)
- Provide SPI and OWI user-programmable communication interfaces
- Provide angle output with accuracy of ±1°
- Support four-section fitting one by one, with fit accuracy up to ±0.2°
- Built-in automatic gain compensation circuit to compensate the gain loss caused by the temperature characteristics of the magnet and the Z-direction installation position tolerance
- It has abnormal diagnosis function
- Differential Hall detection can resist external stray magnetic field
- NOVOSENSE's new chopper and spin current excitation technology make angular temperature drift very small
- Automotive-qualified and industrial-qualified model available, with automotive-qualified model meeting AEC - Q100 reliability standard

Functional block diagram



NSM3011 NSM3012 NSM3013

Package

SOP8

Application

Automotive

- Valve angle sensor (throttle, EGR, ball valve, expansion valve, etc.)
- Accelerator pedal angle sensor
- Electronic gear shifter
- Wiper position sensor
- Body height sensor

Industrial

- Industrial steering gear angle sensor
- Non-contact rotary button switch

Consumer

- Home printer
- Hand-held marking gun
- Moving curtain angle detection

NSM1011/1012/1013 Hall Switch&Latches

Product introduction

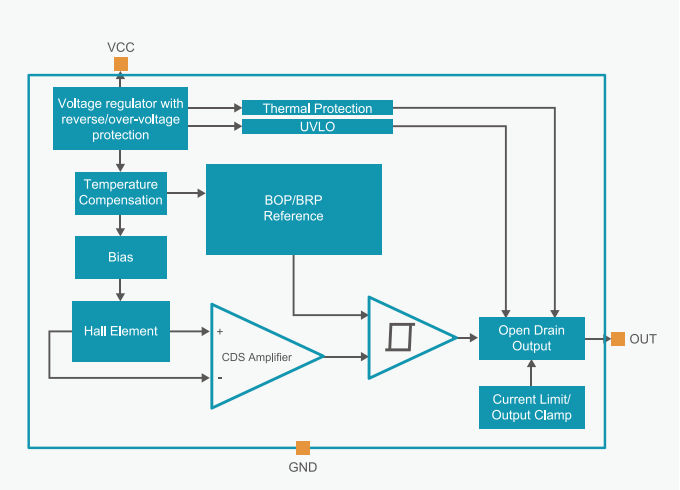
NSM101x is 3-wire fixed sensitivity Hall switch&Latches, which is automotive-grade magnetic sensors based on the planar Hall-effect to support high-precision, contactless digital position measurement within an ambient temperature range of -40°C to 150°C.It meets the requirements of AEC-Q100 and are developed according to the ISO 26262:2011 standard and its functional safety level meets up to ASIL A.

The NSM101x series consists of 3 product models, namely NSM1011 (unipolar Hall switch), NSM1012 (omnipolar Hall switch), and NSM1013 (Hall latch), which allow users to select different switching points, magnetic polarity, output polarity, normal power consumption and low power consumption modes, temperature compensation coefficients of magnet materials, package forms, etc.
Product Features

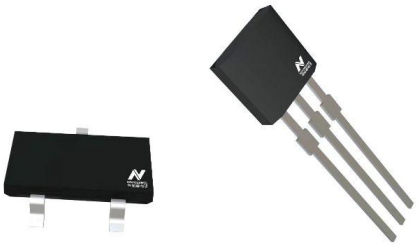
Product feature

- AEC-Q100 Grade 0 qualified
- ASIL A functional safety complianceOperating ambient temperature: -40°C~150°C
- Absolute maximum rating - supply voltage range: -20~38V
- Operating voltage range: 2.7~28V
- ESD (HBM): ±8kV
- Support low power consumption mode, with supply currents as low as 65μA
- Optional parameters:
  Different operate /release point
  Magnetic polarity : South, North
  Output polarity : High, Low
  Temperature compensation coefficient: Flat, SmCo, NdFeB, Ferrite
  Power mode: Continuous, Low power

Functional block diagram



Package



Application

BLDC Motor Commutation

Wiper home/end position sensor
Seat/windows/sunroof motors

Trunk/door/liftgate motors

Lighting actuation sensor

NSM1071/1072 Hall Switch

Product introduction

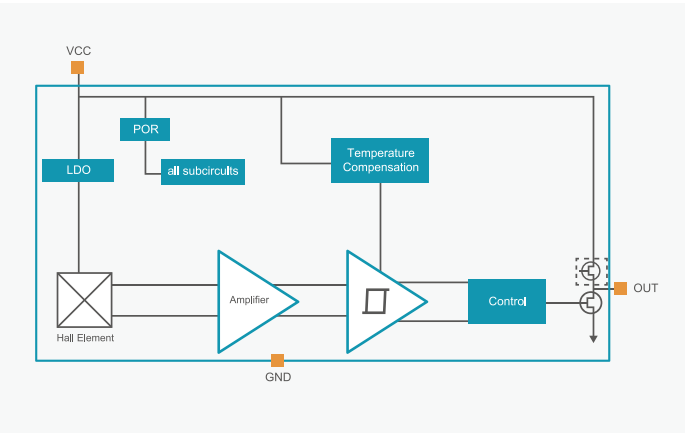
NSM107x is a 3-wire fixed sensitivity Hall switch, which are industrial-grade magnetic sensors based on the planar Hall-effect to support high-precision, contactless digital position measurement within an ambient temperature range of -40°C to 125°C. The low power version of the NSM107x with 20Hz sampling frequency has an operating current as low as 1.5μA at the common supply voltage of 3.3V, making it suitable for battery-powered applications such as IOT devices.

The NSM107x series consists of 2 product models, namely NSM1071 (unipolar Hall switch) and NSM1072 (omnipolar Hall switch), which allow users to select different switching points, power consumption modes, output interfaces, package forms, etc.

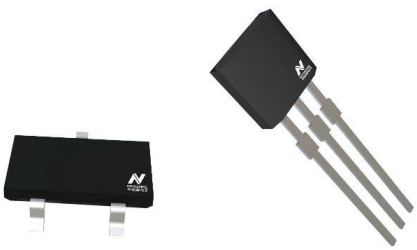
Product feature

- Operating ambient temperature: -40°C~125°C
- Operating voltage range: 1.65~5.5V
  ESD(HBM): ±4kV
- Optional parameters:
  Different operate/release points
  Power consumption modes:regular power consumption version, low power consumption version (20Hz)
  Output interface: Open-drain, Push-pull

Functional block diagram



Package



Application

Proximity switch

Wake-up switch

Speed detection

NSM1051/1052/1053 xMR Switches & Latches

◆ Product introduction

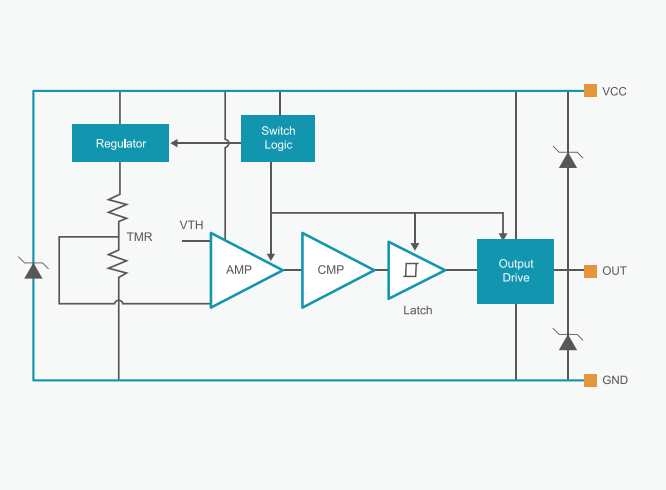
NSM105x is a 3-wire fixed sensitivity TMR switch/latches, which is industrial-grade magnetic sensors based on the tunnel magnetoresistance (TMR) effect to support high-precision, contactless digital position measurement within an ambient temperature range of -40°C to 125°C. NSM105x features extremely low power consumption, with operating currents as low as 1.5μA for the 5kHz sampling frequency version and 200nA for the 156Hz sampling frequency version.

The NSM105x series consists of 3 product models, namely NSM1051 (unipolar TMR switch), NSM1052 (omnipolar TMR switch), and NSM1053 (TMR latch), which allow users to select different switching points, magnetic polarity, output polarity, low power modes, output interfaces, and package forms.

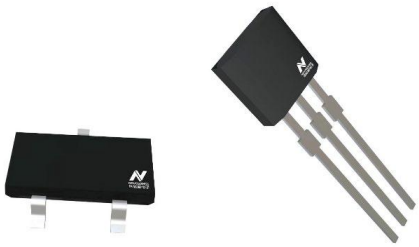
◆ Product feature

- Operating ambient temperature: -40°C~125°C
- Operating voltage range: 1.8~5.5V
- ESD (HBM): ±4kV
- Extremely low power consumption, with supply currents as low as 200nA
- Optional parameters:
  Different operate /release points
  Magnetic polarity: South, North
  Output polarity : High, Low
  Sampling frequency: 5kHz, 2.5kHz, 1.25kHz, 156Hz
  Output interface: Open-drain, Push-pull

◆ Functional block diagram



◆ Package



◆ Application

Reed switch replacement

Liquid level detection

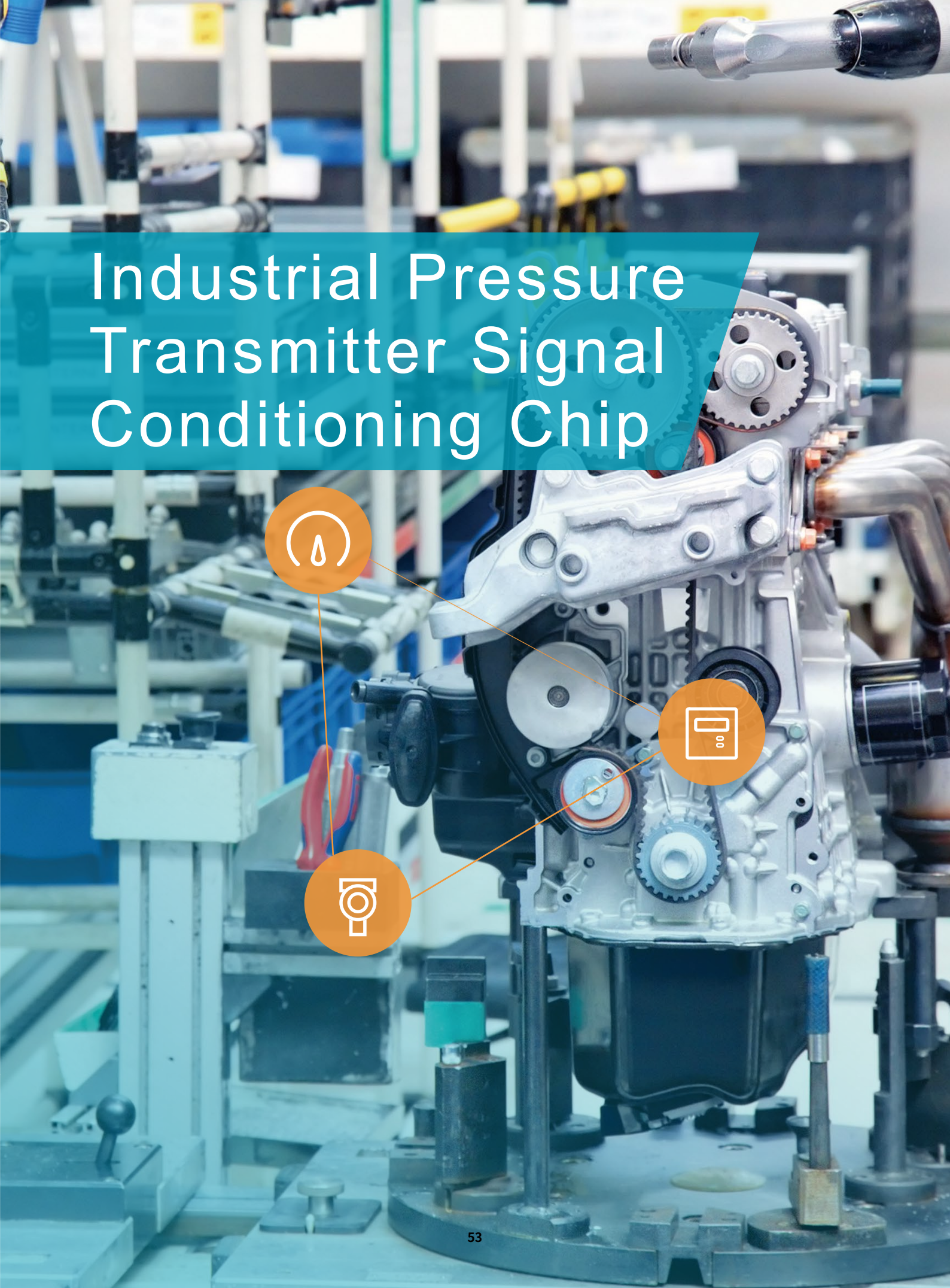
Proximity switch

Water, gas, heat meter

Speed detection

Wake-up switch

Industrial Pressure Transmitter Signal Conditioning Chip



Industrial Pressure Transmitter Signal Conditioning Chip

Part number	Product description	Sensor input type supported	Package	Temperature range	Supply voltage	Output type	Power Shunt Down function supported	Non-volatile memory	Typical application
NSA2860_SSOP16	General industrial resistance pressure transmitter signal conditioning chip	Wheatstone bridge pressure sensor Strain gage General voltage output sensor PT100/PT1000 RTD temperature sensor	SSOP16	-40~150°C	3~5.5V with external JFET can support 4~20mA loop power supply (compatible with 24V industrial power supply)	Analog voltage output Industrial transmitter standard 0~5V/0~10V/4~20mA output PWM OWI	No	EEPROM	Analog output industrial pressure transmitter Analog output industrial RTD temperature transmitter BUS-type industrial pressure transmitter BUS-type industrial RTD temperature transmitter
NSA2860_TSSOP	General industrial resistance pressure transmitter signal conditioning chip	Wheatstone bridge pressure sensor Strain gage General voltage output sensor PT100/PT1000 RTD temperature sensor	TSSOP20	-40~150°C	3~5.5V with external JFET can support 4~20mA loop power supply (compatible with 24V industrial power supply)	Analog voltage output Industrial transmitter standard 0~5V/0~10V/4~20mA output PWM I²C SPI OWI	No	EEPROM	Analog output industrial pressure transmitter Analog output industrial RTD temperature transmitter BUS-type industrial pressure transmitter BUS-type industrial RTD temperature transmitter
NSA2860X-QQNR	General EMC-enhanced industrial resistance pressure transmitter signal conditioning chip	Wheatstone bridge pressure sensor Strain gage General voltage output sensor PT100/PT1000 RTD temperature sensor	QFN20	-40~125°C	3~5.5V with external JFET can support 4~20mA loop power supply (compatible with 24V industrial power supply)	Analog voltage Industrial transmitter standard 0~5V/0~10V/4~20mA output PWM I²C SPI OWI	No	EEPROM	Analog output industrial pressure transmitter Analog output industrial RTD temperature transmitter BUS-type industrial pressure transmitter BUS-type industrial RTD temperature transmitter
NSA2862X-DQNR	General EMC-enhanced industrial resistance pressure transmitter signal conditioning chip	Wheatstone bridge pressure sensor Strain gage General voltage output sensor PT100/PT1000 RTD temperature sensor	QFN20	-40~105°C	2.7~5.5V	I²C SPI OWI	Yes	EEPROM	BUS-type industrial pressure transmitter BUS-type industrial RTD temperature transmitter IOT industrial transmitter
NSC2860X-DQNR	General industrial capacitive pressure transmitter signal conditioning chip	apacitive pressure sensor	QFN20	-40~125°C	3~5.5V with external JFET can support 4~20mA loop power supply (compatible with 24V industrial power supply)	Analog voltage output Industrial transmitter standard 0~5V/0~10V/4~20mA output PWM I²C SPI OWI	No	EEPROM	Capacitive industrial pressure transmitter

NSA2860/NSA2860X: Industrial Transmitter Signal Processing Chip Supporting 4~20mA Output

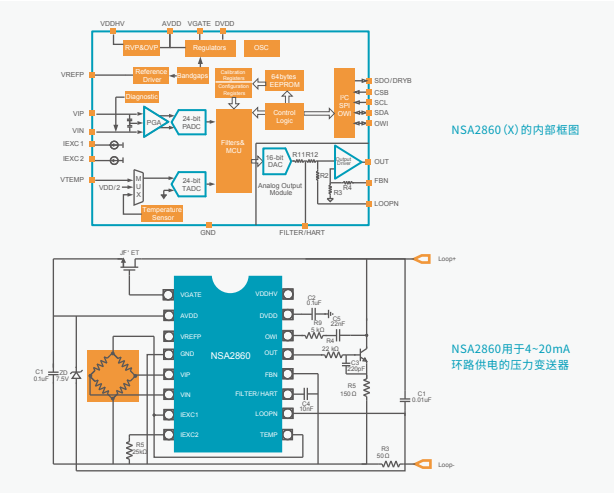
◆ Product introduction

NSA2860 (X) is a specially developed ASSP chip for 4~20mA current output or 0~5V/0~10V voltage output industrial transmitter. NSA2860 (X) has an internal integrated bridge drive, dual constant current source drive, PGA and 24-bit high-precision ADC, which can be easily used for interface bridge pressure sensors or temperature sensors such as RTD/TC. The chip integrates the customer programmable digital calibration logic, and also provides a convenient OWI interface that can communicate directly with the analog line of 4~20mA, making it convenient for the customer to calibrate the sensor after assembly and save the calibration coefficient. In addition, the NSA2860 (X) also integrates with an external JFET controller, which can be used directly under standard industrial loop power supply conditions of 24V without the need for an additional power controller. In the past few years, this chip has been widely used in industrial pressure transmitters, industrial temperature transmitters and other field instruments, and its reliability and stability has been fully verified by a large number of shipments in the industrial field.

◆ Product feature

- Integrated bridge drive, high precision PGA, 24-bit high precision ADC, supporting proportional measurement, strain gauge type or resistance bridge sensor input
- Integrated dual constant current source output, supporting three-wire or four-wire RTD temperature sensor input
- Integrated external JFET controller, supporting 24V industrial loop power supply mode for direct power supply
- Support 4 to 20mA output or 0 to 5V/0 to 10V analog output
- Support SPI BUS or I²C digital interface, which can also be used as digital transmitter analog front-end
- OWI interface, which can support customer calibration after assembly in the case of two-wire 4~20mA connection
- Digital sensor calibration mode, supporting up to the third-order sensor nonlinear calibration and second-order temperature coefficient calibration
- Low static current, with 1.5mA working current perfectly supporting 4-20mA loop power supply
- The power pin VDDHV can withstand high voltage shocks up to 28V to achieve high reliability in industrial field applications

◆ Functional block diagram

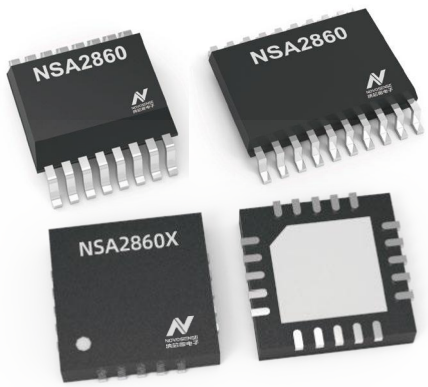


NSA2860 (X) 的内部框图

NSA2860用于4~20mA环路供电的压力变送器

◆ Package

- NSA2860_SSOP16: SSOP16
- NSA2860_TSSOP: TSSOP20
- NSA2860X-QQNR: QFN20



◆ Application

- Industrial pressure transmitter and temperature transmitter
- Industrial field instrument analog front-end
- PLC/DCS analog input/output

NSA2862X: Analog Front-end Chip for Low-power Digital Industrial Sensor

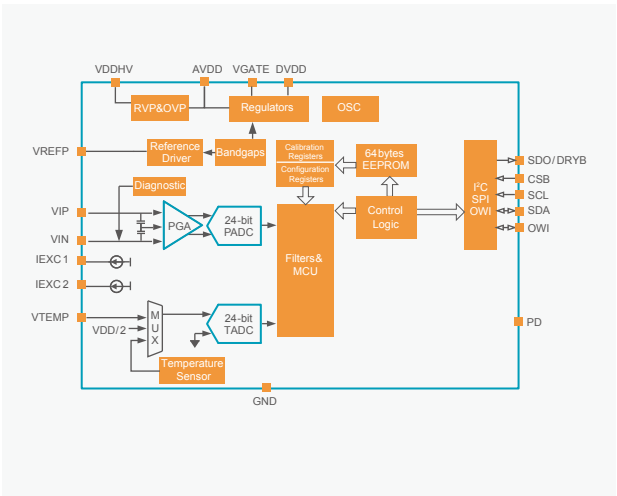
Product introduction

The NSA2862X is an analog front-end chip specially developed for digital industrial transmitters or IIoT industrial sensors requiring low sleep power consumption. NSA2862X has an internal integrated bridge drive, dual constant current source drive, PGA and 24-bit high-precision ADC, which can be easily used for interface bridge pressure sensors or temperature sensors such as RTD/TC. Its integrates customer-programmable digital calibration logic and EEPROM, so that customers can easily carry out sensor assembly calibration and calibration coefficient saving. The NSA2862X has a dedicated PD pin that can be used in industrial wireless sensor applications to set the chip to a low-power off state with 100nA static sleep current. Over the past few years, the chip has been widely used in industrial pressure IoT meters, and its reliability and stability has been fully verified in the industrial field by a large number of shipments.

Product feature

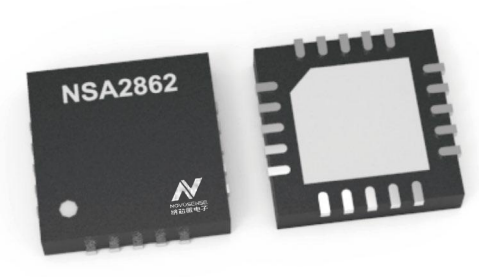
- Integrated bridge drive, high precision PGA, 24-bit high precision ADC, supporting proportional measurement, strain gauge type or resistance bridge sensor input
- Integrated dual constant current source output, supporting three-wire or four-wire RTD temperature sensor input
- Integrated external JFET controller, supporting 24V industrial loop power supply mode for direct power supply
- Support SPI BUS or I²C digital interface, which is used as digital transmitter analog front-end
- Digital sensor calibration mode, supporting up to the third-order sensor nonlinear calibration and second-order temperature coefficient calibration
- Power Down mode is supported. The static current in sleep mode is at 100nA level at room temperature

Functional block diagram



Package

- NSA2862X_DQNR: QFN20



Application

- Industrial pressure transmitter and temperature transmitter
- Industrial field instrument analog front-end
- PLC/DCS analog input and output

NSC2860X: Capacitive Industrial Transmitter Signal Processing Chip Supporting 4~20mA Output

Product introduction

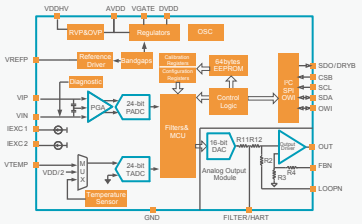
NSC2860X is an ASSP chip specially developed for 4~20mA current output or 0~5V voltage output industrial transmitter. NSC2860X has an integrated capacitive voltage conversion circuit, which specially designed for interface capacitive pressure sensors. It integrates the customer programmable digital calibration logic, and also provides a convenient OWI interface that can communicate directly with the analog line of 4~20mA, making it convenient for the customer to calibrate the sensor after assembly and save the calibration coefficient. In addition, the NSC2860X also integrates with an external JFET controller, which can be used directly under standard industrial loop power supply conditions of 24V without the need for an additional power controller. Over the past few years, the chip has been widely used in application of industrial capacitive pressure transmitter, and its reliability and stability has been fully verified in the industrial field by a large number of shipments.

Product feature

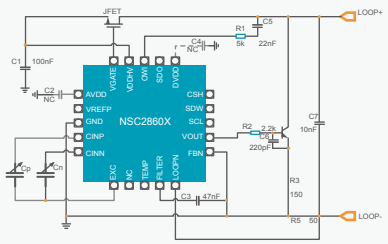
- Integrated capacitive voltage conversion circuit, supporting capacitive pressure sensor interface
- Integrated external JFET controller, supporting 24V industrial loop power supply mode for direct power supply
- Support 4 to 20mA output or 0 to 5V/0 to 10V analog output
- Support SPI BUS or I²C digital interface, which can also be used as digital transmitter analog front-end
- OWI interface, which can support customer calibration after assembly in the case of two-wire 4~20mA connection
- Digital sensor calibration mode, supporting up to the third-order sensor nonlinear calibration and second-order temperature coefficient calibration
- Low static current, with 1.5mA working current perfectly supporting 4-20mA loop power supply
- The power pin VDDHV can withstand high voltage shocks up to 28V to achieve high reliability in industrial field applications

Functional block diagram

NSC2860X internal block diagram

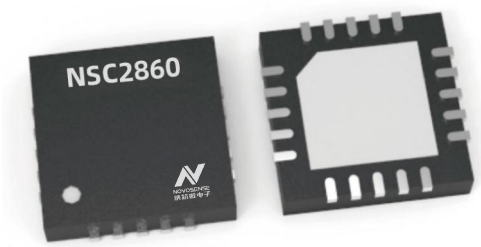


NSC2860X is used for 4~20mA loop powered pressure transmitter



Package

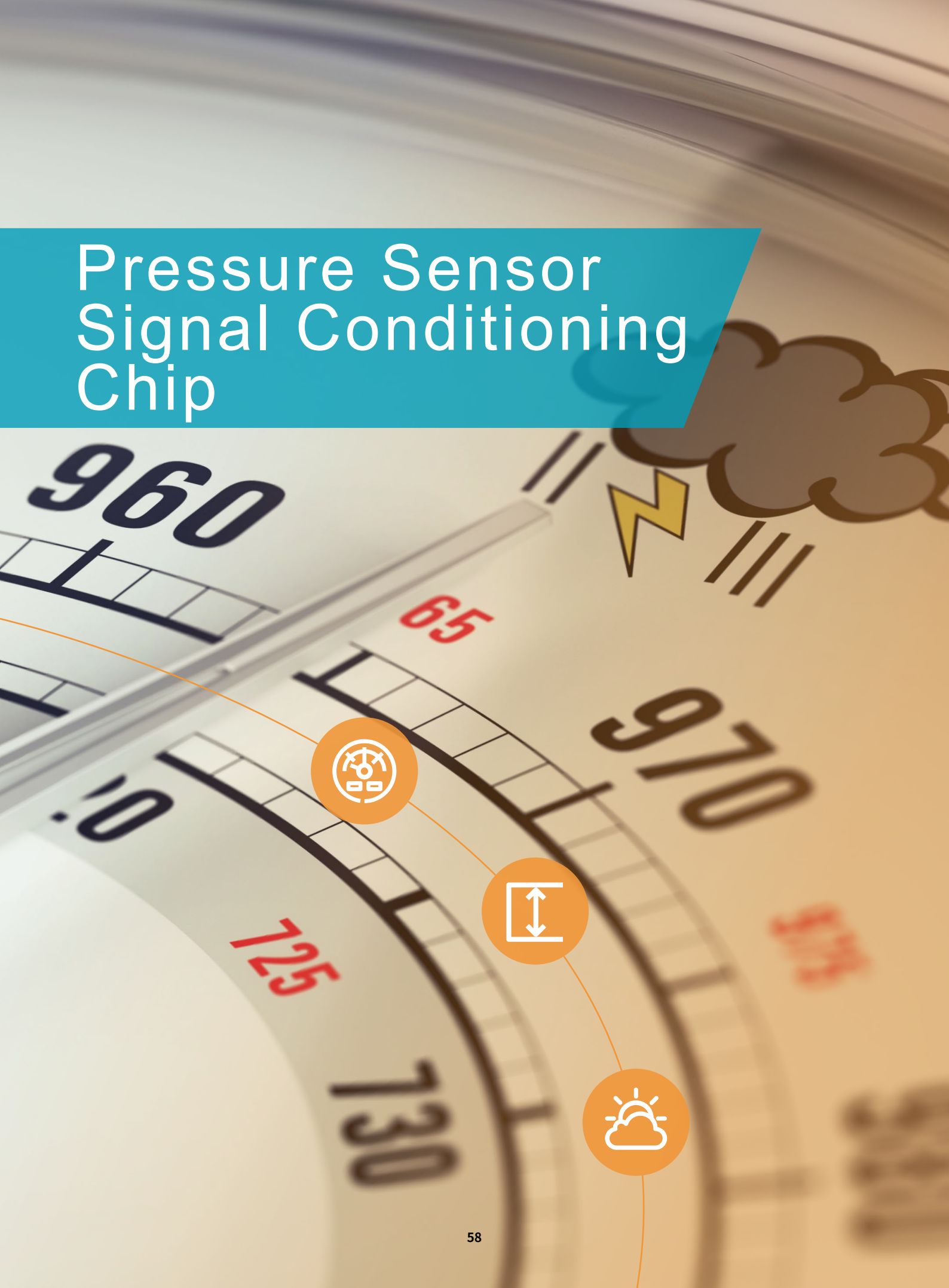
- NSC2860X-DQNR: QFN20



Application

Industrial capacitive pressure transmitter

Pressure Sensor Signal Conditioning Chip



Pressure Sensor Signal Conditioning Chip

Part number	Product description	Sensor input type supported	Package	Temperature range	Supply voltage	Output type	Non-volatile memory	Key words of selection	Typical application
NSA2200	General low-cost voltage/resistance bridge signal conditioning chip	Wheatstone bridge pressure sensor Strain gage General voltage output sensor	KGD	-40~125°C	1.8~5.5V	I²C SPI OWI	OTP	Low-cost digital output	Altimeter Consumer pressure gauge
NSA2300	General low-cost voltage/resistance bridge signal conditioning chip	Wheatstone bridge pressure sensor Strain gage General voltage output sensor	SOP8 MSOP10 KGD	-40~125°C	1.8~5.5V	Analog voltage I²C SPI OWI	OTP	Low-cost analog + digital output	Altimeter Consumer pressure gauge Additional automotive pressure sensor ear/forehead thermometer (thermopile sensor)
NSA2302	General low-cost voltage/resistance bridge signal conditioning chip	Wheatstone bridge pressure sensor Strain gage General voltage output sensor (with bias voltage)	MSOP10 KGD	-40~125°C	3~5.5V High-voltage direct power supply is supported with an external JFET	Analog voltage I²C SPI OWI	EEPROM	Low cost analog + digital output, rewritable EEPROM	Additional automotive pressure sensor ear/forehead thermometer (thermopile sensor)
NSA2860_SSOP16	General industrial resistance pressure transmitter signal conditioning chip	Wheatstone bridge pressure sensor Strain gage General voltage output sensor PT100/PT1000 RTD temperature sensor	SSOP16	-40~150°C	3~5.5V with external JFET can support 4~20mA loop power supply (compatible with 24V industrial power supply)	Analog voltage output Industrial transmitter standard 0~5V/0~10V/4~20-mA output PWM OWI	EEPROM	Industrial transmitter, cost optimized version	Analog output industrial pressure transmitter Analog output industrial RTD temperature transmitter
NSA2860_TSSOP	General industrial resistance pressure transmitter signal conditioning chip	Wheatstone bridge pressure sensor Strain gage General voltage output sensor PT100/PT1000 RTD temperature sensor	TSSOP20	-40~150°C	3~5.5V with external JFET can support 4~20mA loop power supply (compatible with 24V industrial power supply)	Analog voltage output Industrial transmitter standard 0~5V/0~10V/4~20-mA output PWM I²C SPI OWI	EEPROM	Industrial transmitter, full function	Analog output industrial pressure transmitter Analog output industrial RTD temperature transmitter BUS-type industrial pressure transmitter BUS-type industrial RTD temperature transmitter
NSA2860X-QQNR	General EMC-enhanced industrial resistance pressure transmitter signal conditioning chip	Wheatstone bridge pressure sensor Strain gage General voltage output sensor PT100/PT1000 RTD temperature sensor	QFN20	-40~125°C	3~5.5V with external JFET can support 4~20mA loop power supply (compatible with 24V industrial power supply)	Analog voltage Industrial transmitter standard 0~5V/0~10V/4~20-mA output PWM I²C SPI OWI	EEPROM	Industrial transmitter, small package	Analog output industrial pressure transmitter Analog output industrial RTD temperature transmitter BUS-type industrial pressure transmitter BUS-type industrial RTD temperature transmitter
NSA2862X-DQNR	General EMC-enhanced industrial resistance pressure transmitter signal conditioning chip	Wheatstone bridge pressure sensor Strain gage General voltage output sensor PT100/PT1000 RTD temperature sensor	QFN20	-40~125°C	3~5.5V	I²C SPI OWI	EEPROM	IoT pressure sensor	BUS-type industrial pressure transmitter BUS-type industrial RTD temperature transmitter IOT industrial transmitter
NSC2860X-DQNR	General industrial capacitive pressure transmitter signal conditioning chip	Capacitive pressure sensor	QFN20	-40~125°C	3~5.5V with external JFET can support 4~20mA loop power supply (compatible with 24V industrial power supply)	Analog voltage output Industrial transmitter standard 0~5V/0~10V/4~20-mA output PWM I²C SPI OWI	EEPROM	Capacitive input industrial pressure level transmitter	Capacitive industrial pressure transmitter
NSA9260	High-reliability automotive-qualified resistance pressure sensor conditioning chip	Wheatstone bridge resistance pressure sensor	SSOP16	-40~150°C	4.5-5.5V external JFET	Analog voltage PWM OWI	EEPROM	Automotive pressure ordinary analog output type	Automotive pressure sensor
NSA9260X	EMC-enhanced high-reliability automotive-qualified resistance pressure sensor conditioning chip	Wheatstone bridge resistance pressure sensor	SSOP16	-40~150°C	4.5-5.5V external JFET	Analog voltage PWM OWI	EEPROM	Automotive pressure EMC-enhanced analog output type	Automotive pressure sensor
NSC9260	High-reliability automotive-qualified capacitive pressure sensor conditioning chip	Capacitive pressure sensor	SSOP16	-40~150°C	4.5-5.5V external JFET	Analog voltage PWM OWI	EEPROM	Automotive capacitance pressure ordinary analog output type	Automotive pressure sensor
NSC9260X	EMC-enhanced high-reliability automotive-qualified capacitive pressure sensor conditioning chip	Capacitive pressure sensor	SSOP16	-40~150°C	4.5-5.5V external JFET	Analog voltage PWM OWI	EEPROM	Automotive capacitance pressure EMC-enhanced analog output type	Automotive pressure sensor
NSC9262	LIN-interface High-reliability automotive-qualified resistance pressure sensor conditioning chip	Capacitive pressure sensor	SSOP16	-40~150°C	7~18V	OWI LIN	EEPROM	Automotive capacitance pressure LIN output type	Automotive pressure sensor
NSC9264	SENT-interface High-reliability automotive-qualified resistance pressure sensor conditioning chip	Capacitive pressure sensor	SSOP16	-40~150°C	4.5~5.5V	OWI SENT	EEPROM	Automotive capacitance pressure SENT output type	Automotive pressure sensor

NSA2200: Digital Output Pressure Sensor Interface Chip

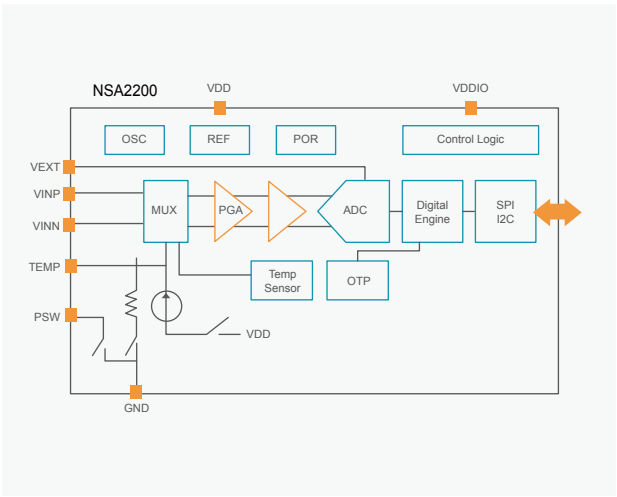
◆ Product introduction

NSA2200 is an interface chip for low-cost pressure sensors. It integrates pressure sensor bridge driver, with high precision PGA, 24-bit ADC, customer programmable digital calibration logic and customer-writable OTP. NSA2200 supports sensor nonlinear fitting calibration as well as temperature compensation for sensor sensitivity and bias errors. The supply method of this chip is wafer Know Good Die. Customers can choose to seal NSA2200 with their own pressure sensor sensitive source in one package. After calibration, it can be used as digital output pressure sensor.

◆ Product feature

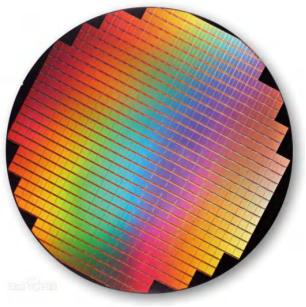
- Integrated bridge drive, high precision PGA, 24-bit high precision ADC, supporting proportional measurement, strain gauge type or resistance bridge sensor input
- Support sensor diagnosis and output clamp function
- Excellent noise performance: 600nV@OSR = 1024X, Gain = 32X (equivalent to input noise) Calibration accuracy: 0.05% FSO (support second order temperature coefficient and third order nonlinear calibration)
- High-precision internal temperature sensor, (absolute accuracy < 0.5°C, resolution < 0.01°C); support a variety of external temperature sensors (diode, two-terminal thermistor, three terminal thermistor, etc.)
- Support 1.8V to 5.5V power supply
- Support sleep working mode to greatly reduce MCU load. The static current under sleep is at 200nA level at room temperature, and supports Power Down of external bridge power supply.
- Support SPI BUS or I²C digital interface output

◆ Functional block diagram



◆ Package

- KGD



◆ Application

Consumer/industrial pressure sensor modules (washing machine level/pressure cooker/coffee machine/soybean milk machine, etc.)

Barometer

Altimeter

Weather forecaster

Electronic weight scale

NSA2300: Pressure Sensor Interface Signal Conditioning Chip Compatible with Analog and Digital Output

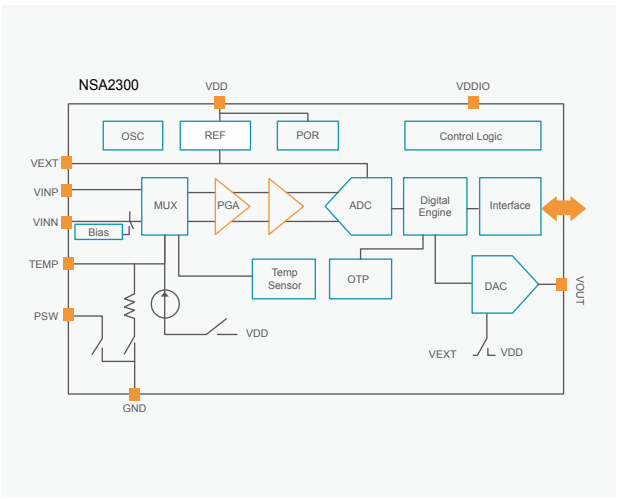
Product introduction

NSA2300 is a low-cost pressure sensor interface chip, with both analog output and digital output supported. It integrates pressure sensor bridge driver, with high precision PGA, 24-bit ADC, customer programmable digital calibration logic and customer-writable OTP. NSA2300 supports sensor nonlinear fitting calibration as well as temperature compensation for sensor sensitivity and bias errors. The packaging mode of this chip is SO8 or MSOP10, and the shipment mode of wafer Know Good Die can also be provided.

Product feature

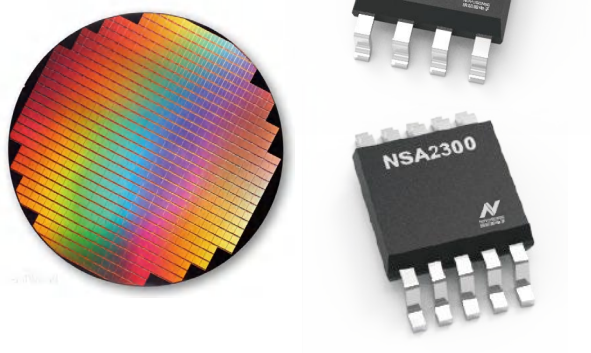
- Integrated bridge drive, high precision PGA, 24-bit high precision ADC, supporting proportional measurement, strain gauge type or resistance bridge sensor input
- Support sensor diagnosis and output clamp function
- Excellent noise performance: 600nV@OSR = 1024X, Gain = 32X (equivalent to input noise) Calibration accuracy: 0.05% FSO (support second order temperature coefficient and third order nonlinear calibration)
- High-precision internal temperature sensor, (absolute accuracy < 0.5°C, resolution < 0.01°C); support a variety of external temperature sensors (diode, two-terminal thermistor, three terminal thermistor, etc.)
- Support 1.8V to 5.5V power supply
- Support sleep working mode to greatly reduce MCU load. The static current under sleep is at 200nA level at room temperature, and supports Power Down of external bridge power supply.
- Support SPI BUS or I²C digital interface output, with analog proportional/fixed output mode.

Functional block diagram



Package

- SOP8, MSOP10, KGD



Application

Consumer/industrial pressure sensor modules (washing machine level/pressure cooker/coffee machine/soybean milk machine, etc.)

Barometer

Altimeter

Weather forecaster

Electronic weight scale

Automobile additional pressure sensor module

NSA2302: Pressure Sensor Interface Signal Conditioning Chip Compatible with Analog and Digital Output

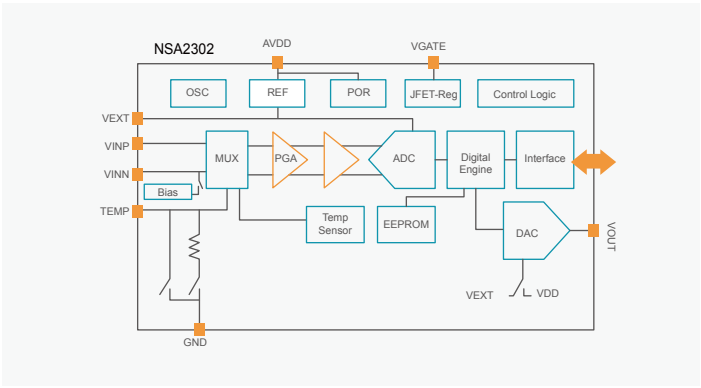
Product introduction

The NSA2302 is a highly integrated, low-cost, high-precision interface chip designed for bridge sensors to collect, amplify and calibrate sensor signals. The NSA2302 integrates a low-noise gauge amplifier (PGA), a low-power 24-bit Σ-Δ ADC, a DSP for digital calibration, and a 12-bit DAC. The NSA2302 supports second-order temperature drift calibration for sensor zero temperature, sensitivity and up to third-order nonlinear calibration, with digital calibration accuracy up to 0.1%. The calibration logic is based on the calibration parameters stored in the internal EEPROM and calculated by the built-in DSP. The NSA2302 also supports direct high-voltage supply applications with an internal JFET controller. The NSA2302 supports both I²C/SPI digital output and analog output, and supports one-wire interface (OWI) multiplexing analog pins for post-sensor calibration.

Product feature

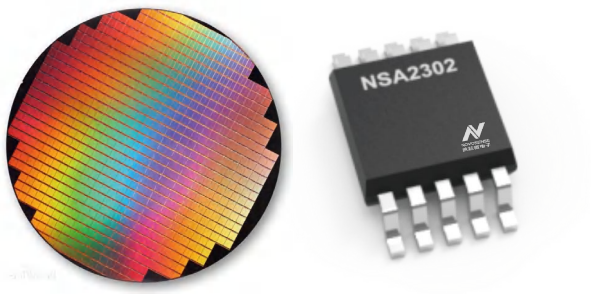
- Integrated bridge drive, high precision PGA, 24-bit high precision ADC, supporting proportional measurement, strain gauge type or resistance bridge sensor input
- Support sensor diagnosis and output clamp function
- Excellent noise performance: 600nV@OSR = 1024X, Gain = 32X (equivalent to input noise) Calibration accuracy: 0.05% FSO (support second order temperature coefficient and third order nonlinear calibration)
- High-precision internal temperature sensor, (absolute accuracy < 0.5°C, resolution < 0.01°C); support a variety of external temperature sensors (diode, two-terminal thermistor, three terminal thermistor, etc.)
- VDD supports 3V to 5.5V power supply and external high-voltage power supply through JFET controller
- Support sleep working mode to greatly reduce MCU load. The static current under sleep is at 200nA level at room temperature, and supports Power Down of external bridge power supply.
- Support SPI BUS or I²C digital interface output, with analog proportional output

Functional block diagram



Package

- MSOP10, KGD



Application

Automobile additional pressure sensor (A/C pressure sensor/TMAP sensor)

Consumer/industrial pressure sensor modules (washing machine level/pressure cooker/coffee machine/soybean milk machine, etc.)

NSA2860/NSA2860X: Industrial Transmitter Signal Processing Chip Supporting 4~20mA Outputchip Supporting 4~20mA Output

Product introduction

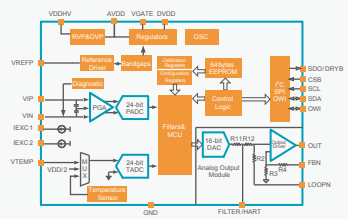
NSA2860 (X) is a specially developed ASSP chip for 4~20mA current output or 0~5V/0~10V voltage output industrial transmitter. NSA2860 (X) has an internal integrated bridge drive, dual constant current source drive, PGA and 24-bit high-precision ADC, which can be easily used for interface bridge pressure sensors or temperature sensors such as RTD/TC. The chip integrates the customer programmable digital calibration logic, and also provides a convenient OWI interface that can communicate directly with the analog line of 4~20mA, making it convenient for the customer to calibrate the sensor after assembly and save the calibration coefficient. In addition, the NSA2860 (X) also integrates with an external JFET controller, which can be used directly under standard industrial loop power supply conditions of 24V without the need for an additional power controller. In the past few years, this chip has been widely used in industrial pressure transmitters, industrial temperature transmitters and other field instruments, and its reliability and stability has been fully verified by a large number of shipments in the industrial field.

Product feature

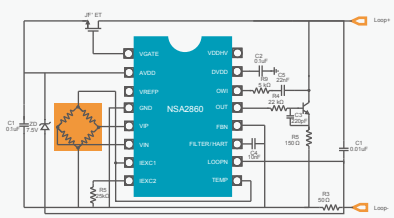
- Integrated bridge drive, high precision PGA, 24-bit high precision ADC, supporting proportional measurement, strain gauge type or resistance bridge sensor input
- Integrated dual constant current source output, supporting three-wire or four-wire RTD temperature sensor input
- Integrated external JFET controller, supporting 24V industrial loop power supply mode for direct power supply
- Support 4 to 20mA output or 0 to 5V/0 to 10V analog output
- Support 4 to 20mA output or 0 to 5V/0 to 10V analog output
- Support SPI BUS or I²C digital interface, which can also be used as digital transmitter analog front-end
- OWI interface, which can support customer calibration after assembly in the case of two-wire 4~20mA connection
- Digital sensor calibration mode, supporting up to the third-order sensor nonlinear calibration and second-order temperature coefficient calibration
- Low static current, with 1.5mA working current perfectly supporting 4-20mA loop power supply
- The power pin VDDHV can withstand high voltage shocks up to 28V to achieve high reliability in industrial field applications

Functional block diagram

NSA2860 (X) internal block diagram

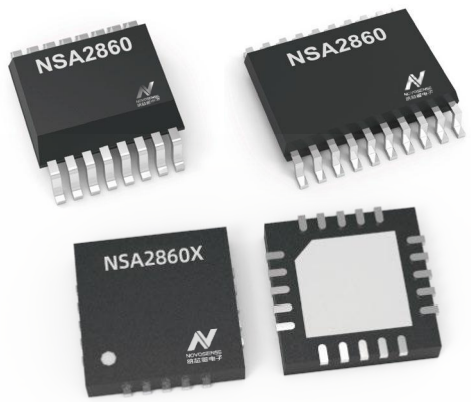


NSA2860 is used for 4~20mA loop powered pressure transmitter



Package

- NSA2860_SSOP16: SSOP16
- NSA2860_TSSOP: TSSOP20
- NSA2860X-QQNR: QFN20



Application

Industrial pressure transmitter and temperature transmitter

Industrial field instrument analog front-end

PLC/DCS analog input/output

NSA2862X: Analog Front-end Chip for Low-power Digital Industrial Sensor

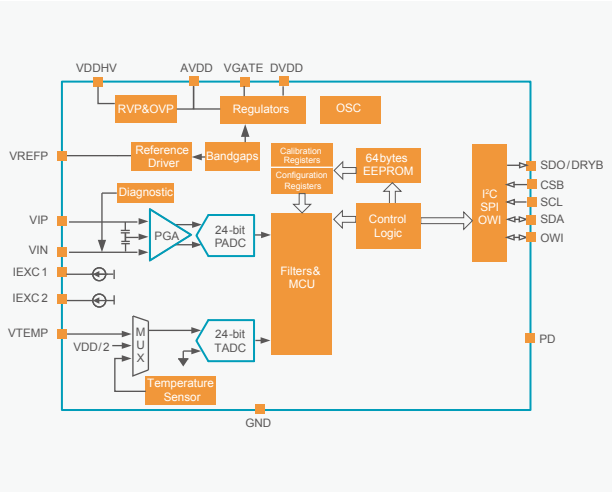
Product introduction

The NSA2862X is an analog front-end chip specially developed for digital industrial transmitters or IIoT industrial sensors requiring low sleep power consumption. NSA2862X has an internal integrated bridge drive, dual constant current source drive, PGA and 24-bit high-precision ADC, which can be easily used for interface bridge pressure sensors or temperature sensors such as RTD/TC. Its integrates customer-programmable digital calibration logic and EEPROM, so that customers can easily carry out sensor assembly calibration and calibration coefficient saving. The NSA2862X has a dedicated PD pin that can be used in industrial wireless sensor applications to set the chip to a low-power off state with 100nA static sleep current. Over the past few years, the chip has been widely used in industrial pressure IoT meters, and its reliability and stability has been fully verified in the industrial field by a large number of shipments.

Product feature

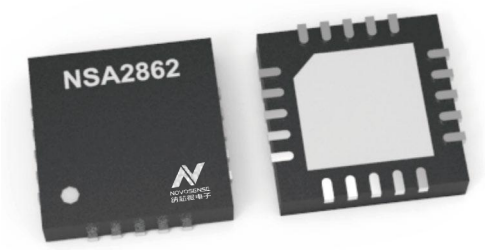
- Integrated bridge drive, high precision PGA, 24-bit high precision ADC, supporting proportional measurement, strain gauge type or resistance bridge sensor input
- Integrated dual constant current source output, supporting three-wire or four-wire RTD temperature sensor input
- Support SPI BUS or I²C digital interface, which is used as digital transmitter analog front-end
- Digital sensor calibration mode, supporting up to the third-order sensor nonlinear calibration and second-order temperature coefficient calibration
- Power Down mode is supported. The static current in sleep mode is at 100nA level at room temperature

Functional block diagram



Package

- QFN20



Application

Industrial pressure transmitter and temperature transmitter

Industrial field instrument analog front-end

PLC/DCS analog quantity input and output

NSC2860X: Capacitive Industrial Transmitter Signal Processing Chip Supporting 4~20mA Output

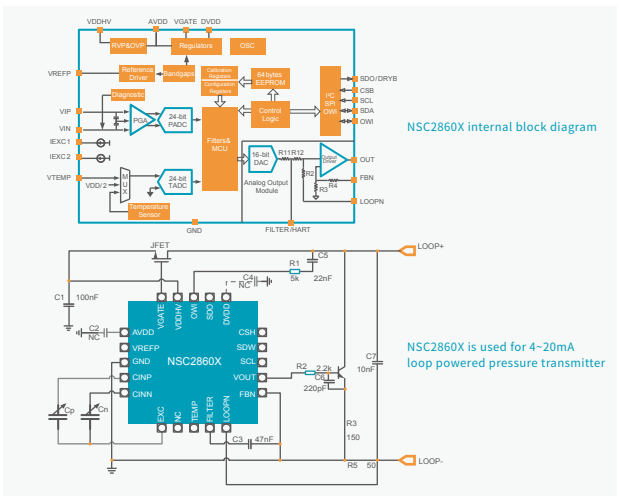
Product introduction

NSC2860X is an ASSP chip specially developed for 4~20mA current output or 0~5V voltage output industrial transmitter. NSC2860X has an integrated capacitive voltage conversion circuit, which specially designed for interface capacitive pressure sensors. It integrates the customer programmable digital calibration logic, and also provides a convenient OWI interface that can communicate directly with the analog line of 4~20mA, making it convenient for the customer to calibrate the sensor after assembly and save the calibration coefficient. In addition, the NSC2860X also integrates with an external JFET controller, which can be used directly under standard industrial loop power supply conditions of 24V without the need for an additional power controller. Over the past few years, the chip has been widely used in application of industrial capacitive pressure transmitter, and its reliability and stability has been fully verified in the industrial field by a large number of shipments.

Product feature

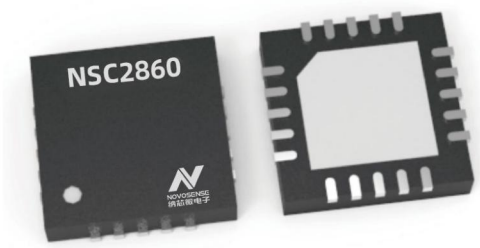
- Integrated capacitive voltage conversion circuit, supporting capacitive pressure sensor interface
- Integrated external JFET controller, supporting 24V industrial loop power supply mode for direct power supply
- Support 4 to 20mA output or 0 to 5V/0 to 10V analog output
- Support SPI BUS or I²C digital interface, which can also be used as digital transmitter analog front-end
- OWI interface, which can support customer calibration after assembly in the case of two-wire 4~20mA connection
- Digital sensor calibration mode, supporting up to the third-order sensor nonlinear calibration and second-order temperature coefficient calibration
- Low static current, with 1.5mA working current perfectly supporting 4-20mA loop power supply
- The power pin VDDHV can withstand high voltage shocks up to 28V to achieve high reliability in industrial field applications

Functional block diagram



Package

- NSC2860X-DQNR: QFN20



Application

P

Industrial capacitive pressure transmitter

NSA9260(X): Signal Conditioning Chip for Resistive Bridge Automobile Pressure Sensor

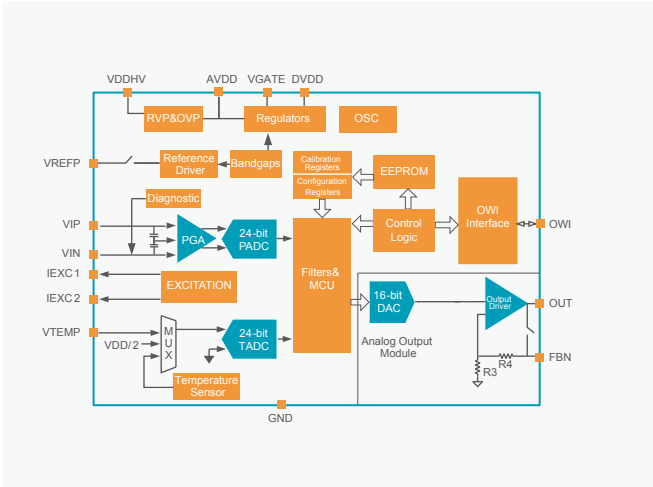
Product introduction

NSA9260 (X) is an EMC enhanced AECQ100 compliant high integration chip for signal conditioning of resistance bridge automotive pressure sensors. The NSA9260 (X) adopts a high-precision variable gain instrument amplifier and a 24-bit ADC to form the main signal measurement channel, and a 24-bit ADC to form the auxiliary temperature measurement channel. With built-in digital processing engine, the NSA9260X supports second-order temperature drift calibration and the highest third-order nonlinear calibration for sensor zero temperature and sensitivity of the sensor. The calibration accuracy can be up to 0.1%, and its calibration coefficients are stored in a set of programmable EEPROMs. NSA9260X supports over-voltage and reverse-voltage protection, analog voltage output and PWM output, as well as sensor diagnosis.

Product feature

- Support -24V to 28V over voltage and reverse voltage protection for automotive sensor applications
- Integrated bridge drive, high precision PGA, 24-bit high precision ADC, supporting proportional measurement, strain gauge type or resistance bridge sensor input
- Support sensor diagnosis and output clamp function
- High-precision 1X ~ 256X variable gain instrument amplifier, up to 8x digital gain
- Built-in digital processor-based sensor calibration logic, supporting post-customer calibration, up to third-order nonlinear calibration and second-order temperature sensitivity and offset calibration
- Calibration data can be stored in EEPROM, p multiple times programmable
- Ratio-metric or absolute voltage output, supporting PWM output as well
- Enhanced EMC performance
- Proprietary OWI communication mode, supporting calibration after sensor assembly
- Operating temperature range: -40°C ~ 150°C, compatible with AECQ100 standard

Functional block diagram



Package

- SSOP16

Application

Auto pressure sensor module
(TMAP, automotive air conditioning pressure, oil pressure sensor, brake pressure sensor, etc.)

Industrial transmitter

NSC9260(X): Signal Conditioning Chip for Capacitive Automobile Pressure Sensor

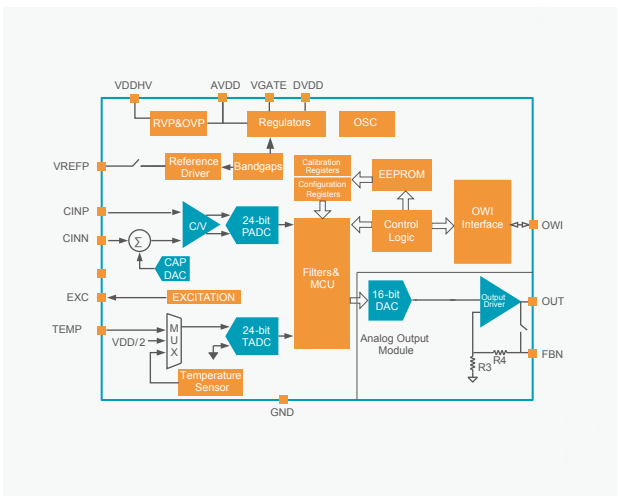
Product introduction

NSC9260 (X) is an EMC enhanced AECQ100 compliant high integration chip for signal conditioning of capacitive automotive pressure sensors. The NSC9260 (X) adopts a capacitance voltage conversion circuit and a 24-bit ADC to form the main signal measurement channel, and a 24-bit ADC to form the auxiliary temperature measurement channel. With built-in digital processing engine, the NSC9260X supports second-order temperature drift calibration and the highest third-order nonlinear calibration for sensor zero temperature and sensitivity of the sensor. The calibration accuracy can be up to 0.1%, and its calibration coefficients are stored in a set of programmable EEPROMs. NSC9260 (X) supports over-voltage and reverse-voltage protection, analog voltage output and PWM output, which is mainly used in automotive capacitive pressure sensors for measuring pressure values above 1MPa.

Product feature

- Support -24V to 28V over voltage and reverse voltage protection for automotive sensor applications
- It integrates C/V capacitive voltage conversion circuit and 24-bit high-precision ADC, which can easily measure capacitance of capacitive pressure sensor, calculate and convert it to pressure.
- Built-in digital processor-based sensor calibration logic, supporting post-customer calibration, up to third-order nonlinear calibration and second-order temperature sensitivity and offset calibration
- Calibration data can be stored in EEPROM, multiple times programmable
- Ratio-metric or absolute voltage output, supporting PWM output
- Enhanced EMC performance
- Proprietary OWI communication mode, supporting calibration after sensor assembly
- Operating temperature range: -40°C ~ 150°C, compatible with AECQ100 standard

Functional block diagram



Package

- SSOP16

Application

Auto capacitive pressure sensor module (automotive air conditioning pressure, brake pressure, etc.)

NSC9262: Capacitive Automobile Pressure Sensor Signal Conditioning Chip Supporting LIN BUS

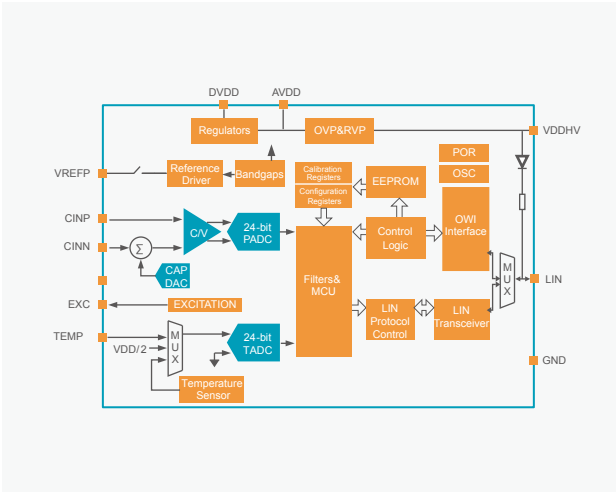
◆ Product introduction

NSC9262 is an EMC enhanced AECQ100 compliant high integration chip for signal conditioning of capacitive automotive pressure sensors, with LIN BUS interface provided. NSC9262 adopts a capacitance voltage conversion circuit and a 24-bit ADC to form the main signal measurement channel, and a 24-bit ADC to form the auxiliary temperature measurement channel. With built-in digital processing engine, the NSC9262 supports second-order temperature drift calibration and the highest third-order nonlinear calibration for sensor zero temperature and sensitivity of the sensor. The calibration accuracy can be up to 0.1%, and its calibration coefficients are stored in a set of programmable EEPROMs. NSC9262 supports over voltage and reverse voltage protection, supports LIN BUS interface and meets LIN BUS specifications. It is mainly used in the application of capacitive pressure sensors for measuring pressure values above 1MPa in automobiles.

◆ Product feature

- Support -40V to 40V over voltage and reverse voltage protection for automotive sensor applications
- It integrates C/V capacitive voltage conversion circuit and 24-bit high-precision ADC, which can easily measure capacitance of capacitive pressure sensor, calculate and convert it to pressure.
- Built-in digital processor-based sensor calibration logic, supporting customer calibration, up to third-order nonlinear calibration and second-order temperature sensitivity and offset calibration
- Calibration data can be stored in EEPROM, programmable multiple times
- Meet the LIN BUS specification 1.3/2.0/2.1
- Proprietary OWI communication mode, supporting calibration after sensor assembly
- Operating temperature range: -40°C ~ 150°C, compatible with AEC-Q100 standard

◆ Functional block diagram



◆ LIN BUS certification

- LIN BUS certification LIN1.3/2.0/2.1

◆ Package

- SSOP16

◆ Application

Automotive capacitive air conditioning pressure sensor module

NSC9264: Capacitive Automobile Pressure Sensor Signal Conditioning Chip Supporting SENT BUS

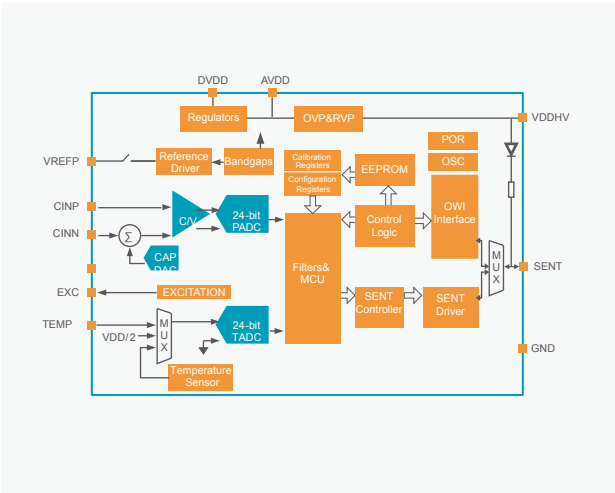
Product introduction

The NSC9264 is an EMC-enhanced AECQ100 high-integration chip for signal conditioning of capacitive automotive pressure sensors with a SENT BUS interface. NSC9264 adopts a capacitance voltage conversion circuit and a 24-bit ADC to form the main signal measurement channel, and a 24-bit ADC to form the auxiliary temperature measurement channel. With built-in digital processing engine, the NSC9264 supports second-order temperature drift calibration and the highest third-order nonlinear calibration for sensor zero temperature and sensitivity of the sensor. The calibration accuracy can be up to 0.1%, and its calibration coefficients are stored in a set of programmable EEPROMs. NSC9264 supports over voltage and reverse voltage protection, supports SENT BUS interface and meets SAE J2716 BUS specifications. It is mainly used in the application of capacitive pressure sensors for measuring pressure values above 1MPa in automobiles.

Product feature

- Support -24V to 24V over voltage and reverse voltage protection for automotive sensor applications
- It integrates C/V capacitive voltage conversion circuit and 24-bit high-precision ADC, which can easily measure capacitance of capacitive pressure sensor, calculate and convert it to pressure.
- Built-in digital processor-based sensor calibration logic, supporting customer calibration, up to third-order nonlinear calibration and second-order temperature sensitivity and offset calibration
- Calibration data can be stored in EEPROM, programmable multiple times
- Meet SAE J2716 protocol specification, meet fast and slow channel output and provide diagnostic function
- Proprietary OWI communication mode, supporting calibration after sensor assembly
- Operating temperature range: -40°C ~ 150°C, compatible with AECQ100 standard

Functional block diagram



Package

- SSOP16

Application

Automotive capacitive pressure sensor module

MEMS Microphone Signal Conditioning Chip

MEMS Microphone Signal Conditioning Chip

Part number	Product description	Product feature	Supply voltage/current	AOP	Bias range / step size	Gain range/ step size	Noise	Output mode	Typical application
NSC6272	Analog output MEMS microphone signal conditioning chip	Low cost analog output MEMS microphone signal conditioning Bias adjustment step length 0.3V Gain adjustment step 0.5dB	1.6V~3.6V /125μA	128dBV	7.5V~16V/0.3V	-4dB~11dB/ 0.5dB	4μVrms	Analog	TWS headset Smart television Smart household appliances Smart speaker
NSC6273	Analog output MEMS microphone signal conditioning chip	Low cost analog output MEMS microphone signal conditioning Bias adjustment step length 0.3V Gain adjustment step 0.5dB	2.3V~3.6V /125μA	130dBV	7.5V~16V/0.3V	-4dB~11dB/ 0.5dB	4μVrms	Analog	TWS headset Smart television Smart household appliances Smart speaker
NSC6280	Analog output MEMS microphone signal conditioning chip	Enhanced analog output MEMS microphone signal conditioning Bias adjustment step length 0.3V Gain adjustment step 0.5dB Increase EMI anti-interference of high frequency signal, make it more suitable for use in mobile phone and other applications	1.6V~3.6V /120μA	132dBV	6V~15.5V/0.3V	-1.5dB~11dB /0.5dB	4μVrms	Analog	Mobile/PAD
NSC6360	Digital output MEMS microphone signal conditioning chip	Enhanced digital output MEMS microphone signal conditioning Enhanced power supply PSRR	1.62V~3.6V /330μA@ 768kHz,750μA @2.4MHz	117dBF.S.	7.6V~15.9V /1.18V	9dB~17dB/ 0.6dB	4.5μVrms	Digital	Laptop Smart speaker
NSC6362	Digital output MEMS microphone signal conditioning chip	Enhanced digital output MEMS microphone signal conditioning Enhanced power supply PSRR	1.62V~3.6V /330μA@ 768kHz,780μA @2.4MHz	120dBF.S.	7.5V~14.4V/0.3V; 15V~19.2V/0.6V	0dB~23dB/ 0.5dB	3μVrms	Digital	Laptop Smart speaker
NSC6364	Digital output MEMS microphone signal conditioning chip with I2S interface	I2S interface Multiple modes including performance, low power and standby mode Low power consumption Suitable for mini size package	1.65V~3.6V /540μA@ 3.072MHz, 285μA@768kHz	120dBSPL	4.7V~12.7V/0.5	AGain: 4.9dB~15.7 dB/1.8dB-DGain: -1.9dB~3.8 dB/0.5dB	4μVrms	Digital	Wearable devices Remote control Internet of Things Smart home appliances Game consoles

NSC6272/NSC6273: Analog Output MEMS Microphone Signal Conditioning Chip

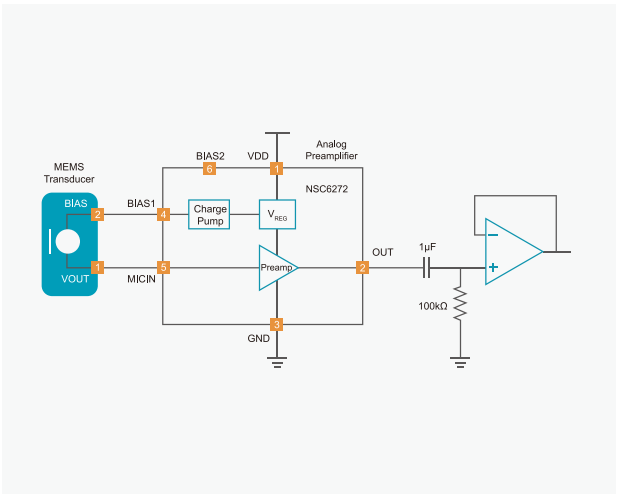
◆ Product introduction

NSC6272/NSC6273 is a MEMS microphone preamplifier. The NSC6272/NSC6273 features an integrated low-noise offset MEMS microphone circuit, as well as a high-performance analog preamplifier that provides true sound quality and supports flexible microphone systems. The bias voltage and analog preamplifier gain can be adjusted via an internal fuse bank (OTP), so the NSC6272/NSC6273 can support MEMS sensors with different parameters. It can also increase yields and provide better sensitivity consistency. The NSC6272/NSC6273 has two output pads for bias voltage at different positions, one of which can be selected as required at the top plate of the MEMS microphone. The AOP performance of NSC6273 is 130dBV, which is improved compared to 128dBV of NSC6272.

◆ Product feature

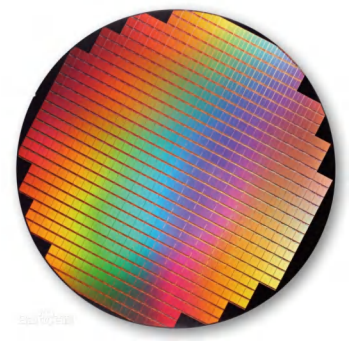
- Working voltage: 1.6V～3.6V for NSC6272, 2.3V~3.6V for NSC6273
- Current drain: 125μA typ.
- Equivalent input noise: 4μVrms（-108dBV）
- Gain adjustment (OTP): -4dB～11dB with 0.5dB/Step
- Frequency response: 20Hz～20kHz
- Bias voltage: 7.5V～16V with 0.3V/Step
- Working temperature: -40°C～85°C

◆ Functional block diagram



◆ Package

- KGD



◆ Application

TWS headset | Smart television | Smart household appliances | Smart speaker

NSC6280: Analog Output MEMS Microphone Signal Conditioning Chip

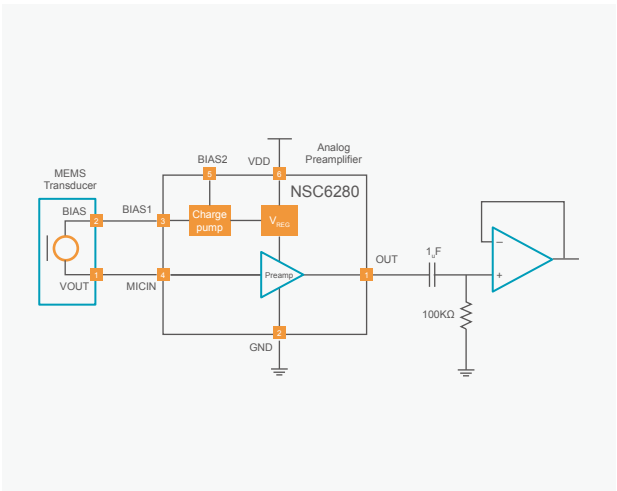
◆ Product introduction

NSC6280 is a MEMS microphone preamplifier. The NSC6280 features an integrated low-noise offset MEMS microphone circuit, as well as a high-performance analog preamplifier that provides true sound quality and supports flexible microphone systems. The bias voltage and analog preamplifier gain can be adjusted via an internal fuse bank (OTP), so the NSC6280 can support MEMS sensors with different parameters. It can also increase yields and provide better sensitivity consistency. The NSC6280 has two output pads for bias voltage at different positions, one of which can be selected as required at the top plate of the MEMS microphone. In addition, the NSC6280 is used for relatively high-end mobile phone applications. This chip has been subjected optimization in respect of high-frequency EMI interference and yield in mass production.

◆ Product feature

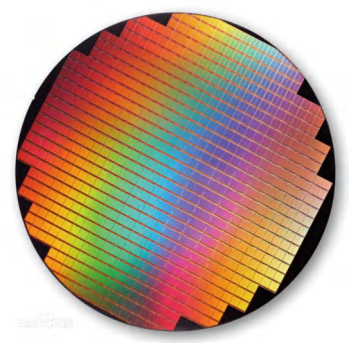
- Working voltage: 1.6V～3.6V
- Current drain: 120μA typ.
- Equivalent input noise: 4μVrms（-108dBV）
- Gain adjustment (OTP): -4dB～11dB with 0.5dB/Step
- Frequency response: 20Hz～20kHz
- Bias voltage: 6V～15.5V with 0.3V/Step
- Working temperature: -40°C～85°C

◆ Functional block diagram



◆ Package

- KGD



◆ Application

Cellphone

PAD products

NSC6360: Digital PDM Output MEMS Microphone Signal Conditioning Chip

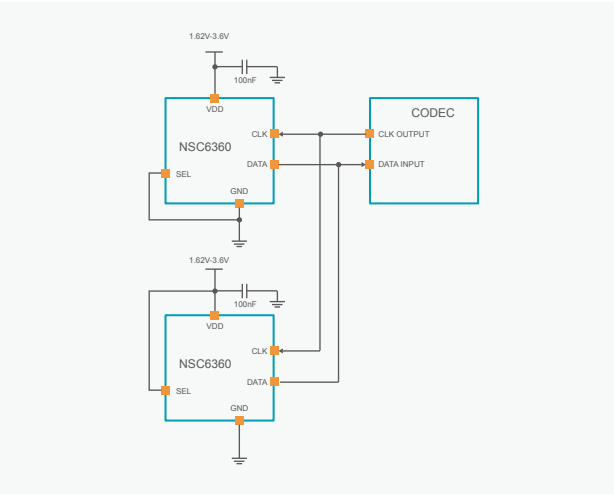
◆ Product introduction

The NSC6360 is a PDM output preamplifier for MEMS digital microphones. The chip integrates a low noise bias circuit for MEMS microphones and a high performance analog pre-amplifier circuit to provide high quality audio signal output and high flexibility for MEMS microphones. The built-in OTP is adjustable for bias and gain, so the NSC6360 supports MEMS microphone sensors with different parameters for better sensitivity consistency. Customers can integrate the chip into the MEMS digital microphone chip for audio signal conditioning. The NSC6360 chip has an extremely low startup and wake time of 20ms, programmable gain bias voltage, and left and right channel polarity. The NSC6360 supports dynamic current adjustment based on the input clock frequency, so it can be used in different power modes. The operating voltage of the chip ranges from 1.6V to 3.6V, and its operating modes include sleep mode, low voltage mode and normal mode.

◆ Product feature

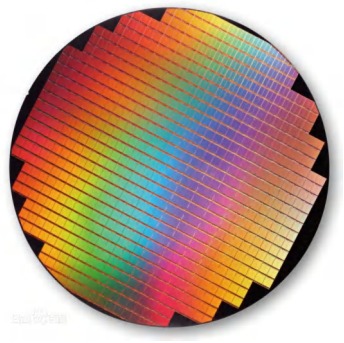
- Working voltage: 1.6V~3.6V
- Working mode: sleep mode, low voltage mode, and normal mode
- Current drain: 300μA @768kHz, 750uA@2.4MHz
- Equivalent input noise: 4.5μVrms（-107dBV）
- Gain adjustment (OTP): 9dB～17dBFS with 0.6dB/Step
- Bias voltage: 7.6V～15.9V with 1.18V/Step
- Working temperature: -40°C～85°C

◆ Functional block diagram



◆ Package

- KGD



◆ Application

Laptop　　Cellphone　　Smart speaker

NSC6362: Digital PDM Output MEMS Microphone Signal Conditioning Chip

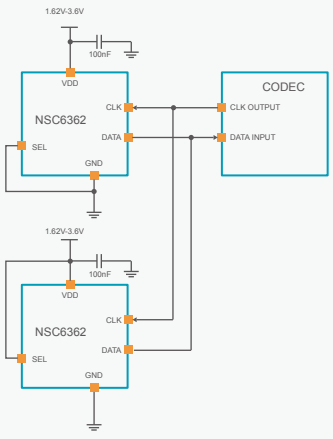
◆ Product introduction

The NSC6362 is a PDM output preamplifier for MEMS digital microphones. The chip integrates a low noise bias circuit for MEMS microphones and a high-performance analog pre-amplifier circuit to provide high quality audio signal output and high flexibility for MEMS microphones. The built-in OTP is adjustable for bias voltage and gain, so the NSC6362 supports MEMS microphone sensors with different parameters for better sensitivity consistency. Customers can integrate the chip into the MEMS digital microphone chip for audio signal conditioning. The NSC6362 chip has an extremely low startup and wake time of 20ms, programmable gain, bias voltage and left and right channel polarity. The NSC6362 supports dynamic current adjustment based on the input clock frequency, so it can be used in different power modes. The operating voltage of the chip ranges from 1.62V to 3.6V, and its operating modes include sleep mode, low voltage mode and normal mode.

◆ Product feature

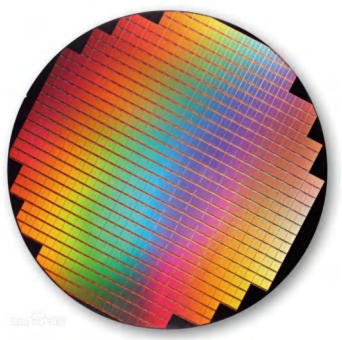
- Working voltage: 1.62V～3.6V
- Working mode: sleep mode, low voltage mode, and normal mode
- Current drain: 330μA @768kHz, 780uA@2.4MHz
- Equivalent input noise: 3μVrms（-110dBV）
- Gain adjustment (OTP): 0dB～23dBFS with 0.5dB/Step
- Bias voltage: 7.5V～19.2V with 1.3V/Step
- Working temperature: -40°C～85°C

◆ Functional block diagram



◆ Package

- KGD



◆ Application

Laptop　　Cellphone　　Smart speaker

NSC6364: I2S Interface Digital MEMS Microphone Signal Conditioning Chip

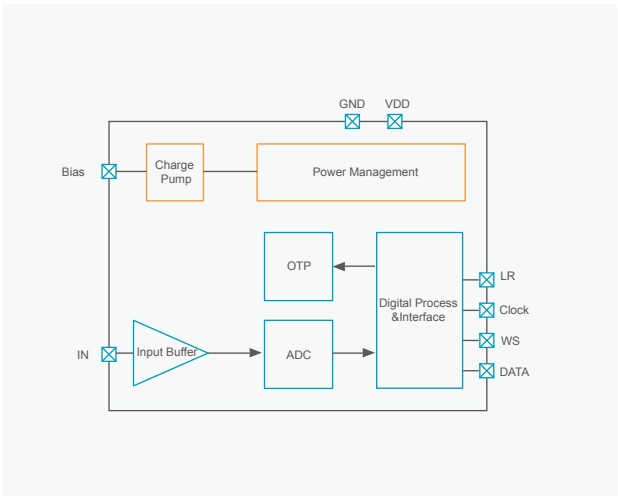
Product introduction

NSC6364 is an I2S interface silicon microphone conditioning chip for wearable devices, smart home appliances and the Internet of Things. Depending on specific MEMS microphones, the SNR can reach more than 63dB, and it has sleep, low power consumption and performance modes to meet the needs of Always Listening to the system in real time. Compared with the traditional PDM interface silicon microphone +ADC solution, this product can significantly reduce the system cost and power consumption of acoustic acquisition channel.

Product feature

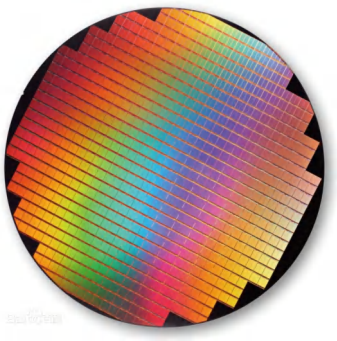
- I2S output, SNR up to 67dB
- Operating voltage range: 1.65V~3.6V
- Ultra-low power consumption
- BIAS adjustable, 4.7V~12.7V
- Analog gain adjustable, 4.9dB~+15.7dB
- Digital gain adjustable, -1.9dB~+3.8dB
- Grain size, 600um x 900um
- HBM ESD, ±4kV
- Operating temperature, -40°C~85°C
- Three working modes: Sleep, low power consumption and performance
- Good RF resistance

Functional block diagram



Package

- KGD

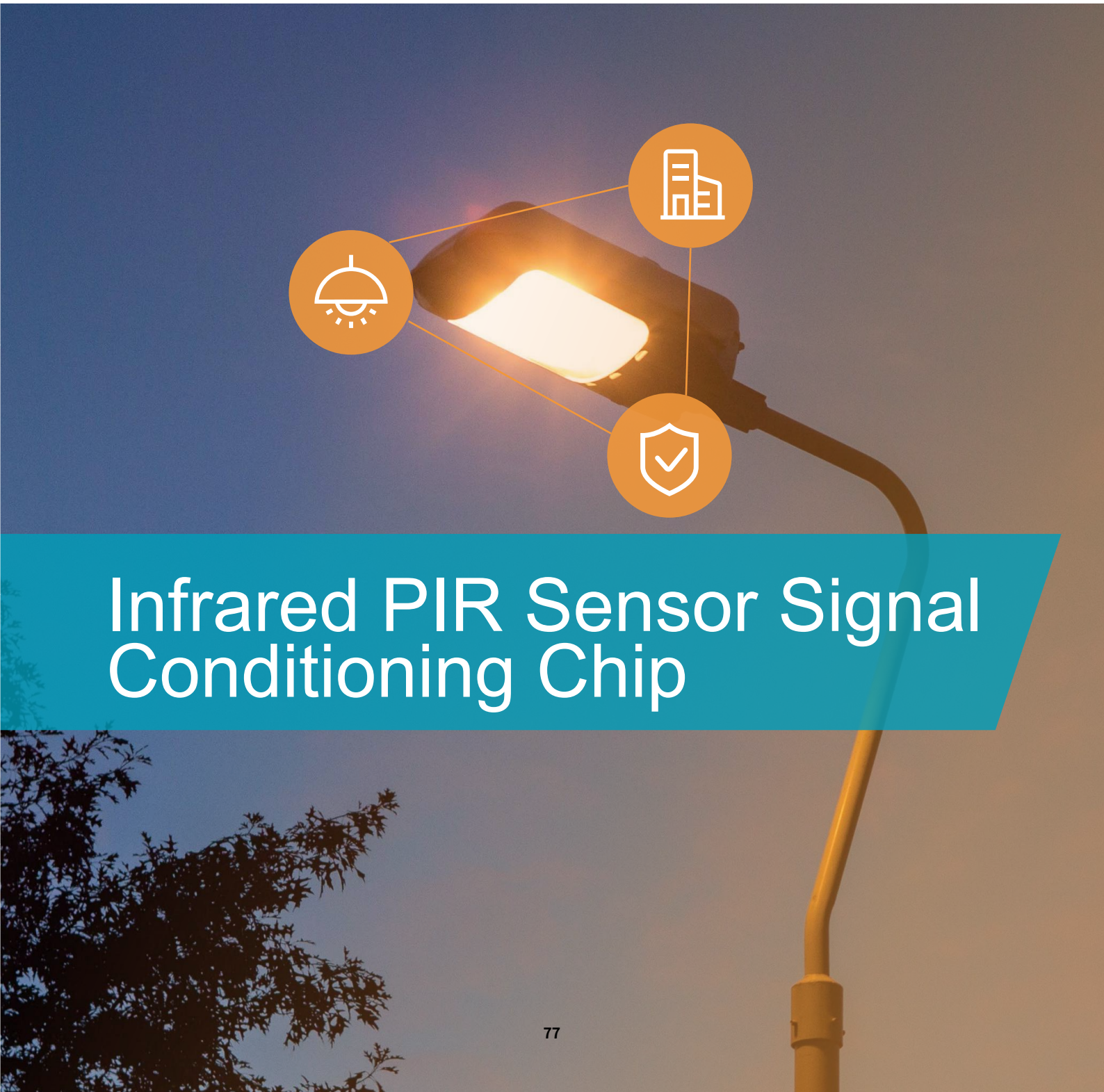


Application

Wearables | Remote control | IoT | Intelligence appliance | Game machine

Infrared PIR Sensor Signal Conditioning Chip

Part number	Probe fitting mode	Output mode	Product feature	Package	Temperature range	Supply voltage/ current	Start (minimum) trigger threshold	Product sub-material No. / Order No.	Output mode	Typical application
NSA3166	External type	Digital out-put/switching output	Register configuration for judging the threshold and opening time	DFN8	-40~85°C	1.6V~4.5V /6μA	50μV	NSA3166_C DNR	Digital and Binary	Smart lighting/Smart doorbell Smart security (camera)



Infrared PIR Sensor Signal Conditioning Chip

NSA3166: Digital Output PIR Sensor Signal Conditioning Chip

Product introduction

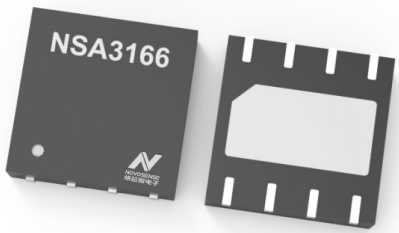
The NSA3166 is a highly integrated signal processing chip for pyroelectric infrared sensors (PIR) for smart security applications. A single NSA3166 integrates all the necessary components for pyroelectric passive infrared mobile detection, and the analog front end can be directly connected to the analog PIR detector via AC coupling. Built-in high-precision analog-to-digital converter can convert the detector signal into digital signal. The digital engine can detect the movement of human body, reduce the interference from external and support binary output and digital output. The sensor sensitivity threshold and alarm maintenance time can be dynamically adjusted by writing registers through the digital communication interface. In addition, users can also configure and adjust the logic judgment mode of human body recognition inside the chip.

Product feature

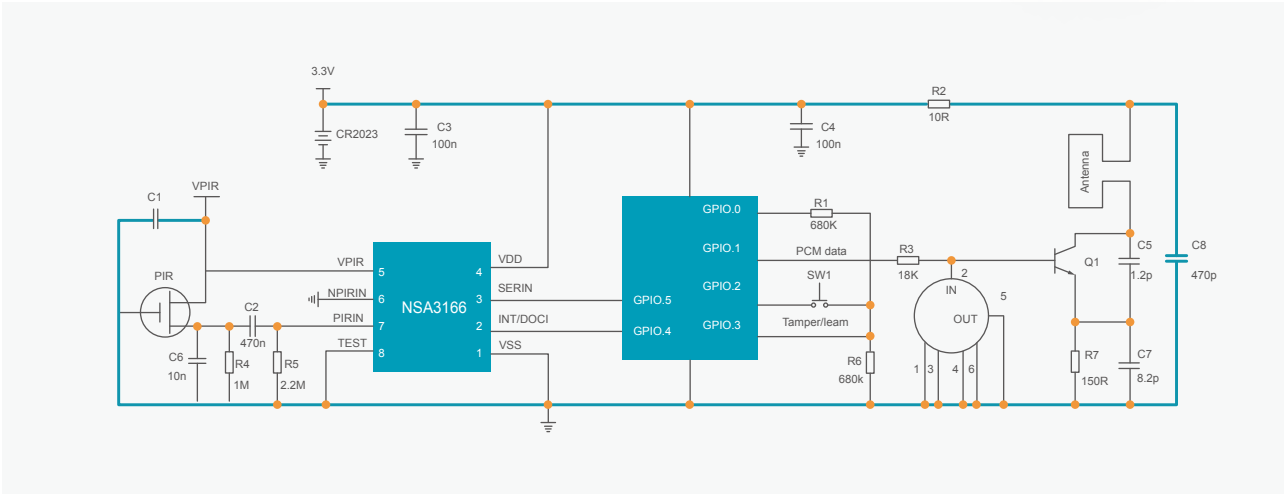
- Suitable for PIR external signal conditioning applications, with DFN8 package
- Sensitivity and response time are adjustable through digital interface
- Power supply ranges from 1.6V to 4.5V
- Support digital output and binary output
- Low-power consumption, low static current of 6μA
- Built-in temperature sensor to facilitate customers to adjust sensitivity according to temperature

Package

- DFN8



Functional block diagram



Application

Smart lighting

Smart security

Smart camera

Building automation and smart doorbell

Thermopile Sensor Signal Conditioning Chip

NSA3300: Thermopile Sensor Signal Conditioning Chip

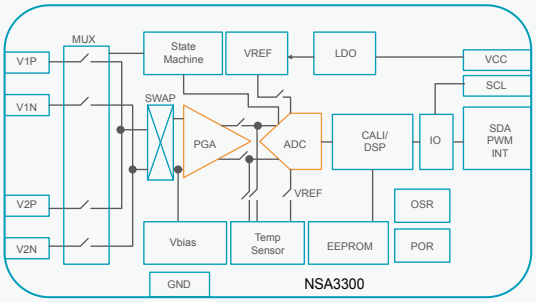
◆ Product introduction

NSA3300 is a signal conditioning chip for thermopile sensor, which is mainly used to interface thermopile sensor and convert the sensor output into digital. The internal digital engine can automatically calculate the voltage output of the thermopile sensor into temperature value. Based on the data of the LUT which is programed by the user, the end customer can directly read the temperature value through the I²C interface from the IC. The chip has low-noise instrument amplifier PGA, 24bit Σ-Δ ADC and DSP calibration algorithm. It can measure the target temperature within the range of -70 °C to 380°C and meet the accuracy error of 1% in the whole temperature range, accuracy of ±0.2°C in the range of 35°C to 42°C for human body temperature measurement, and the highest resolution of 0.01°C/LSB. The chip also can support ADC raw data to be readout without any DSP processing. The internal ambient temperature sensor on the chip can offer a high precision temperature measurement within ±0.2°C error in the range between 0~40°C. The NSA3300 supports two differential signal inputs and has four working modes: continuous single-channel sensor and ambient temperature combined output, continuous dual-channel sensor and ambient temperature combined output, continuous dual-channel sensor output, and sleep mode. In the dual-channel application scenario, the application is mainly NDIR.

◆ Product feature

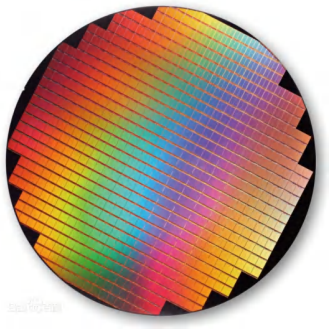
- High-precision signal amplification PGA, adjustable gain from 8x to 128x, and equivalent input noise less than 3μVrms
- Integrated high-precision temperature sensor, with accuracy up to +/-0.2°C in room temperature range from 0°C to 40°C
- Built-in EEPROM for 32-point LUT input, with digital linear interpolation between two points
- Support client sensor post-calibration, with sensitivity, offset and non-linearity compensation
- Support direct I²C reading of the target temperature, which can be configured as the temperature binary output mode
- Low power consumption, with sleep current of 5μA
- Wafer-level supply, with small die size: 1mm x 1.5mm

◆ Functional block diagram



◆ Package

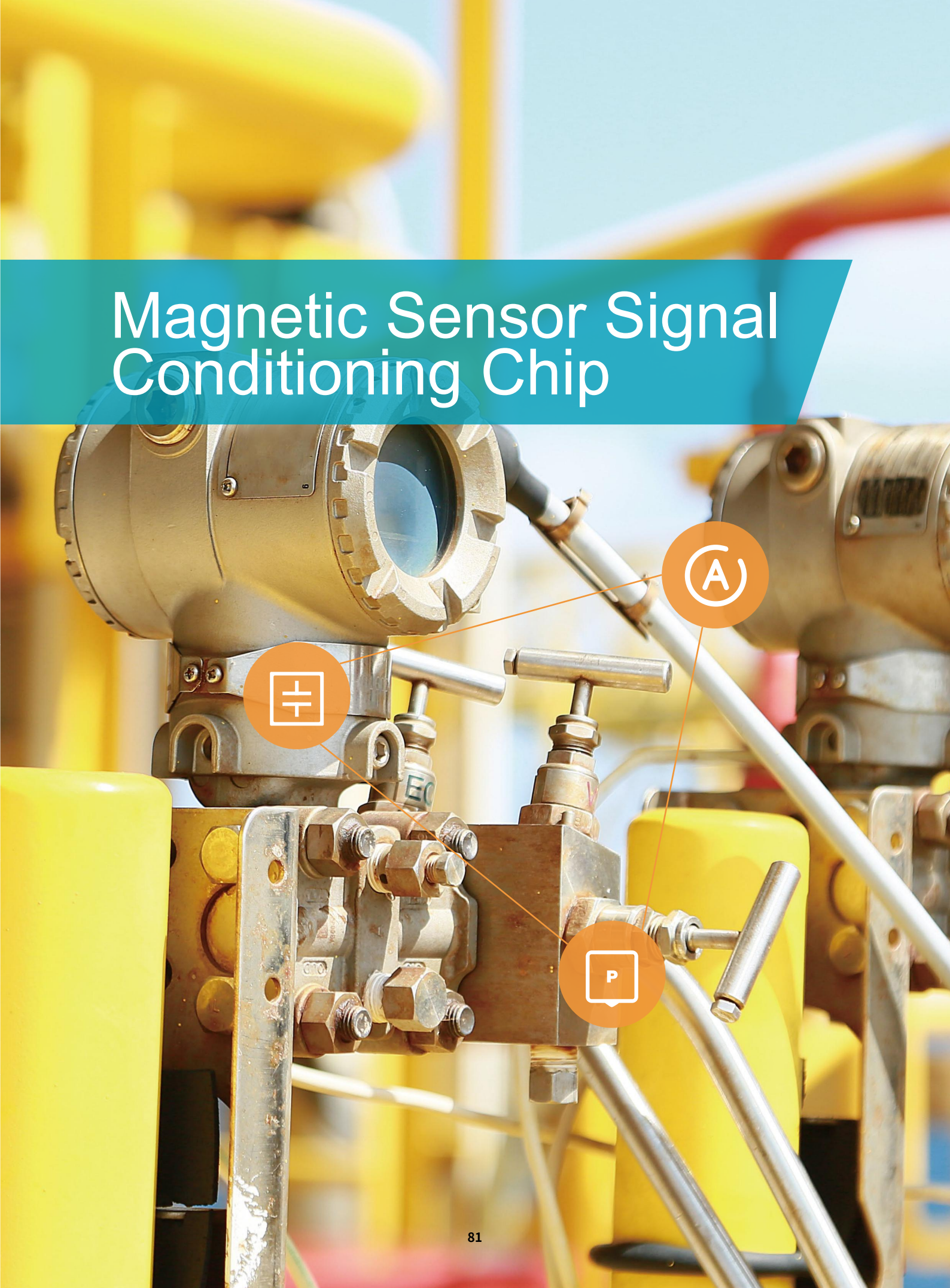
- KGD



◆ Application

- Forehead thermometer/ear thermometer
- Industrial temperature measurement
- White household appliances
- Kitchen household appliances
- Security
- NDIR gas sensor

Magnetic Sensor Signal Conditioning Chip



NSA5312: Magnetic Sensor Signal Conditioning Chip/Programmable Instrumentation Amplifier

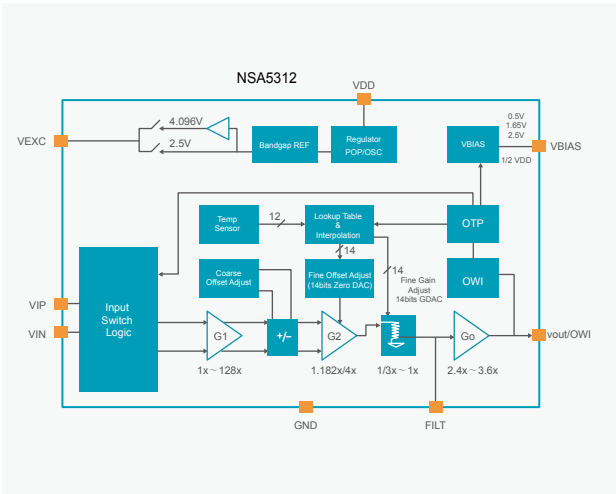
◆ Product introduction

The NSA5312 is a user programmable instrumentation amplifier. It is mainly used to provide voltage type drive signal for Wheatstone bridge sensors (such as TMR sensors),and amplify, calibrate and compensate the output signal to ensure that the sensor can get high linear output accuracy in a wide temperature range.

◆ Product feature

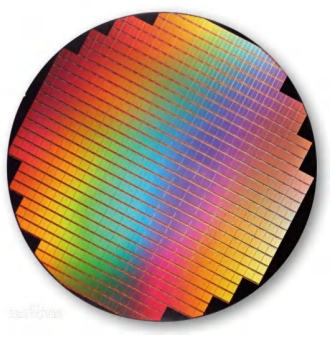
- Provide 2.5V / 4.096V voltage excitation
- Provide 0.9456~1843x programmable gain setting
- Provide 14-bit sensor sensitivity and offset calibration
- Provide sensor temperature calibration based on lookup table
- Programmable output signal bandwidth, with maximum signal bandwidth is about 600kHz
- Fast response time <1μs
- Proportional output and fixed output are available. The output reference voltage is available in 0.5V/1.65V/2.5V.
- Provide user programmable interface OWI, and support customer module level post-calibration

◆ Functional block diagram



◆ Package

- KGD



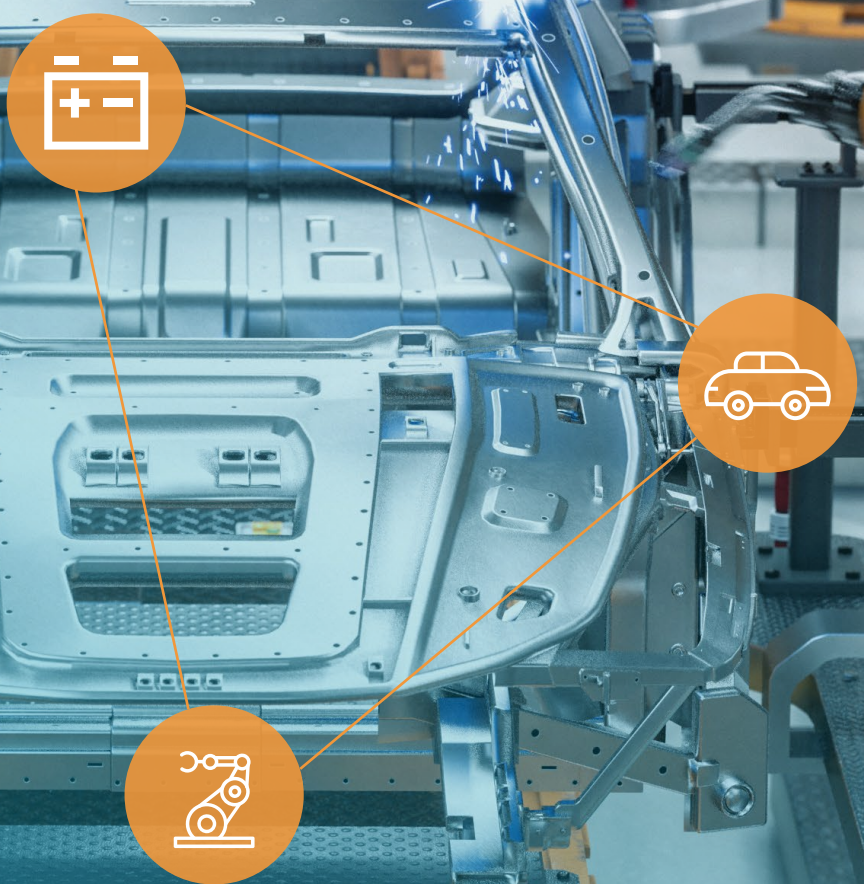
◆ Application

Current sensor module

Pressure sensor module

Industrial transmitter

Industrial and Automotive SoC



NSUC1610:Embedded Motor Driver SoC for Automotive Electronic Actuators

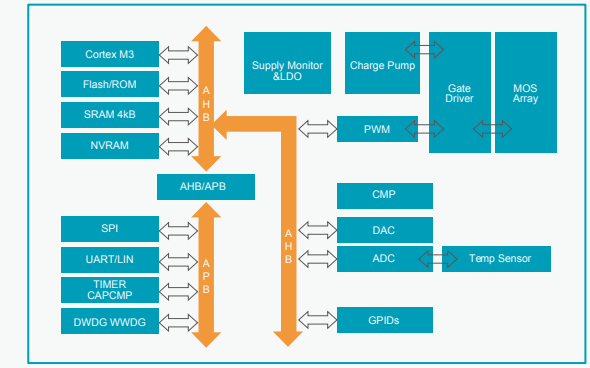
Product introduction

NSUC1610 is an integrated drive and 4-way half-bridge microcontroller, mainly used to control low-power DC motor, can support the drive of DC brush motor, DC brushless motor, stepper motor, etc., widely used in new energy vehicles. The chip adopts advanced high temperature and hign voltage process, the maximum temperature can be supported to 175°C, the maximum voltage withstand to 40V, and has overvoltage protection function, LIN port can support -40V~40V , BVDD pin can support -0.3~40V . The chip uses the ARM Cortex-M3 core, which uses separate data buses and address buses to improve the efficiency of fetching instructions and data.

Product feature

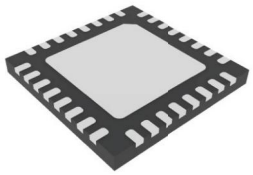
- Cortex M3 processor, the compiler environment uses Keil standard compiler and development tools, common programmer resources, easy development and debugging
- Car battery 12V direct power supply, chip power supply can withstand 40V short-term overvoltage
- Integrated power level MOSFETs (4 half-bridges), drive current up to 1A (500mOhm Rdson), integrated the corresponding gate drive and high-end MOSFET drive required charge pump power supply
- Integrated configurable DAC to configure comparator thresholds for overcurrent protection and microstep control of stepper motors
- and the LIN interface meets the requirements of ±40V over-voltage . In addition, there is a GPIO that can support high voltage (12V), which is convenient for customers to use high voltage PWMIO directly to do motor control
- Dual temperature sensor: one on the power side for overtemperature shutdown, and the other on the low-voltage side for chip temperature detection
- Wafer junction temperature up to 175°C meets the vehicle Grade 0 application target

Functional block diagram



Package

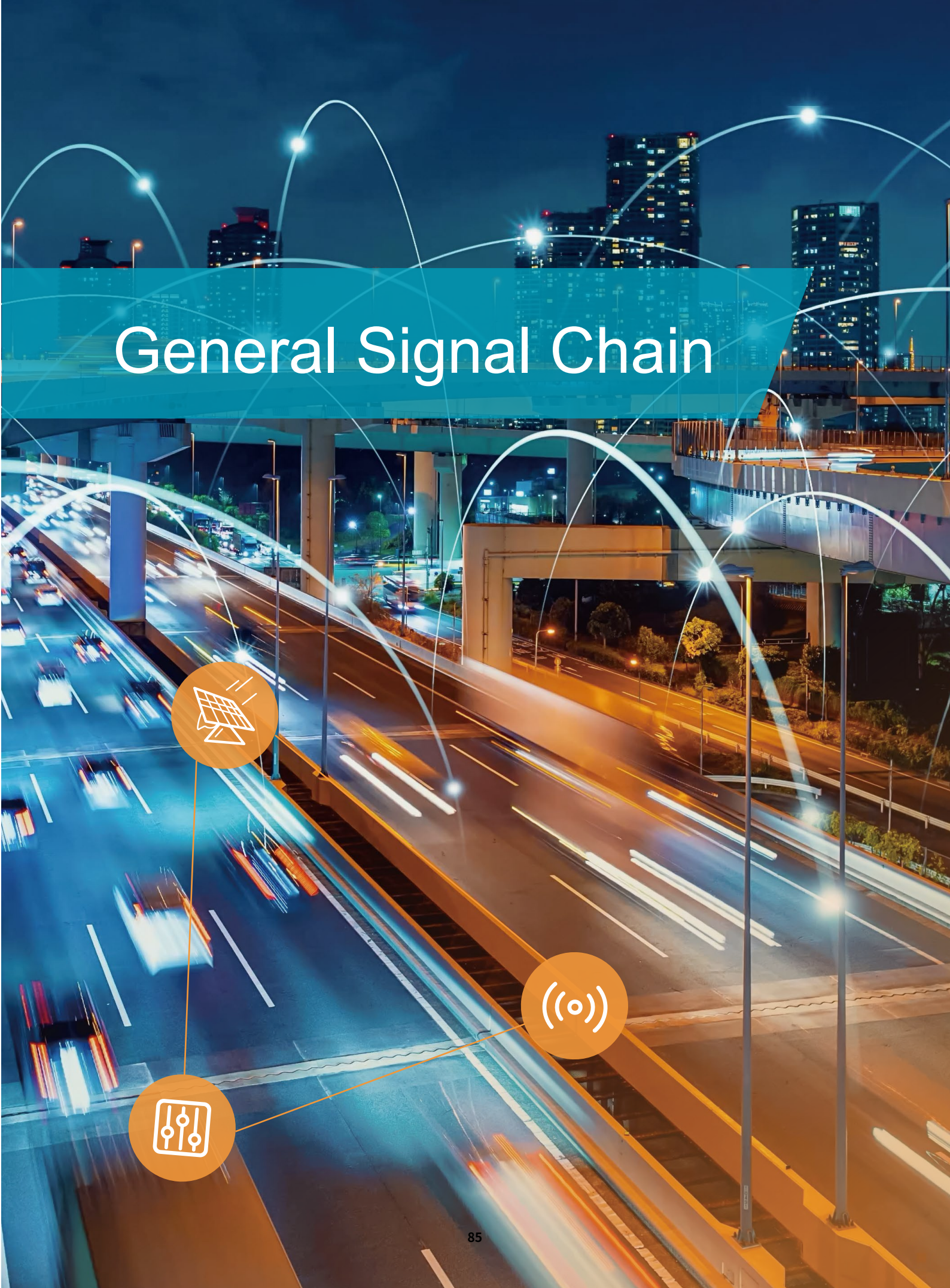
- QFN32 5mm×5mm



Application

Automotive electronic actuators
Air Conditioning Ventilation Actuators
Electronic water valve
Active Grille Shutter Actuators
Electronic charging door control
Electronic Expansion Valve
Seat Ventilation

General Signal Chain



Series Voltage References

Part number	Package	Qualification	Operating Voltage	Operating Temperature	Output Voltage	Initial Accuracy	Drift (Max.)	Noise (uVpp)	Noise (uVpp)	Status
NSREF3140	SOT23-3L	Industrial	1.8V~5.5V	-40℃~125℃	4.0V	0.20%	15	33	NSREF3140-DSTR	Active and preferred
NSREF3133	SOT23-3L	Industrial	1.8V~5.5V	-40℃~125℃	3.3V	0.20%	15	33	NSREF3133-DSTR	Active and preferred
NSREF3130	SOT23-3L	Industrial	1.8V~5.5V	-40℃~125℃	3.0V	0.20%	15	28	NSREF3130-DSTR	Active and preferred
NSREF3125	SOT23-3L	Industrial	1.8V~5.5V	-40℃~125℃	2.5V	0.20%	15	22	NSREF3125-DSTR	Active and preferred
NSREF3120	SOT23-3L	Industrial	1.8V~5.5V	-40℃~125℃	2.0V	0.20%	15	19	NSREF3120-DSTR	Active and preferred
NSREF3112	SOT23-3L	Industrial	1.8V~5.5V	-40℃~125℃	1.2V	0.20%	15	9	NSREF3112-DSTR	Active and preferred
NSREF3040	SOT23-3L	Industrial	1.8V~5.5V	-40℃~125℃	4.0V	0.20%	35	33	NSREF3040-DSTR	Active and preferred
NSREF3033	SOT23-3L	Industrial	1.8V~5.5V	-40℃~125℃	3.3V	0.20%	35	30	NSREF3033-DSTR	Active and preferred
NSREF3030	SOT23-3L	Industrial	1.8V~5.5V	-40℃~125℃	3.0V	0.20%	35	28	NSREF3030-DSTR	Active and preferred
NSREF3025	SOT23-3L	Industrial	1.8V~5.5V	-40℃~125℃	2.5V	0.20%	35	22	NSREF3025-DSTR	Active and preferred
NSREF3020	SOT23-3L	Industrial	1.8V~5.5V	-40℃~125℃	2.0V	0.20%	35	19	NSREF3020-DSTR	Active and preferred
NSREF3012	SOT23-3L	Industrial	1.8V~5.5V	-40℃~125℃	1.2V	0.20%	35	9	NSREF3012-DSTR	Active and preferred

NSREF30/31xx: High-precision, Low-tempco, Low-noise, Low-power Voltage Reference

◆ Product introduction

The NSREF30/31XX is a family of precision, low power, low dropout, series voltage references available in the tiny 3-pin SOT-23 package. The NSREF30XX offers 0.2% initial accuracy, 35 ppm/°C maxim tempco. The NSREF31XX offers 0.2% initial accuracy, 15 ppm/°C maxim tempco.

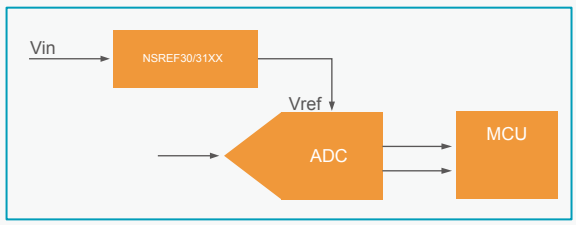
The NSREF30/31XX does not require a load capacitor,yet is stable with capacitive loads and load and can sink or source up to ±10 mA of output current, can operate on supplies down to 1 mV above the output voltage. and output only 20uVpp noise(2.5V version), and consume only 130uA, All models are specified for the wide temperature range of -40°C to +125°C, and could offer both industry and auto grade versions.

The NSREF30/31XX family is widely used in solar, digital power, industry sensor and control system, portable battery power system.

◆ Product feature

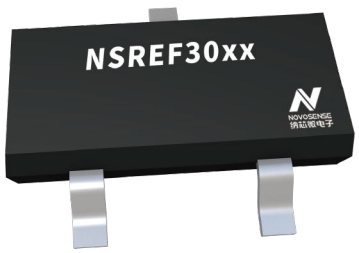
- Auto and industry grade
- Supply voltage: 1.8V~5.5V
- Low dropout voltage: 1mV
- Initial accuracy: 0.2%
- temp drift: NSREF31xx---5ppm/°C Type, 15ppm/°C Max, NSREF30xx---10ppm/°C Type, 35ppm/°C Max
- Output Noise@2.5V: 20μVpp
- Quiescent Current @2.5V : 140 μA
- Line regulation @2.5V :20ppm/V
- Load regulation:3ppm/mA(source) ; 9ppm/mA(sink)
- -40°C to 125° C

◆ Functional block diagram



◆ Package

- SOT23-3



◆ Application

Industry automation | Field instruments | Solar/UPS/BMS | Smart grid | Portable Instruments | Medical

General Purpose Operational Amplifiers

Part number	Package	Number of channal	Operating Voltage	Operating Temperature	Iq (typ at 25℃) (uA)	Input common mode Voltage range	Output voltage range
NSOPA8011	SOT23-5, SC70-5	1	1.8~5.5	-40℃~125℃	77	Rail to Rail	Rail to Rail
NSOPA8012	SOP8,MSOP8	2	1.8~5.5	-40℃~125℃	77	Rail to Rail	Rail to Rail
NSOPA8014	SOP14, TSSOP14	4	1.8~5.5	-40℃~125℃	77	Rail to Rail	Rail to Rail
NSOPA8011Q	SOT23-5, SC70-5	1	1.8~5.5	-40℃~125℃	77	Rail to Rail	Rail to Rail
NSOPA8012Q	SOP8,MSOP8	2	1.8~5.5	-40℃~125℃	77	Rail to Rail	Rail to Rail
NSOPA8014Q	SOP14, TSSOP14	4	1.8~5.5	-40℃~125℃	77	Rail to Rail	Rail to Rail
NSOPA8051	SOT23-5, SC70-5	1	1.8~5.5	-40℃~125℃	380	Rail to Rail	Rail to Rail
NSOPA8052	SOP8,MSOP8	1	1.8~5.5	-40℃~125℃	380	Rail to Rail	Rail to Rail
NSOPA8054	SOP14, TSSOP14	1	1.8~5.5	-40℃~125℃	380	Rail to Rail	Rail to Rail
NSOPA8051Q	SOT23-5, SC70-5	1	1.8~5.5	-40℃~125℃	380	Rail to Rail	Rail to Rail
NSOPA8052Q	SOP8,MSOP8	1	1.8~5.5	-40℃~125℃	380	Rail to Rail	Rail to Rail
NSOPA8054Q	SOP14, TSSOP14	1	1.8~5.5	-40℃~125℃	380	Rail to Rail	Rail to Rail
NSOPA8101	SOT23-5, SC70-5	1	1.8~5.5	-40℃~125℃	680	Rail to Rail	Rail to Rail
NSOPA8102	SOP8,MSOP8	2	1.8~5.5	-40℃~125℃	680	Rail to Rail	Rail to Rail
NSOPA8104	SOP14, TSSOP14	4	1.8~5.5	-40℃~125℃	680	Rail to Rail	Rail to Rail
NSOPA8101Q	SOT23-5, SC70-5	1	1.8~5.5	-40℃~125℃	680	Rail to Rail	Rail to Rail
NSOPA8102Q	SOP8,MSOP8	2	1.8~5.5	-40℃~125℃	680	Rail to Rail	Rail to Rail
NSOPA8104Q	SOP14, TSSOP14	4	1.8~5.5	-40℃~125℃	680	Rail to Rail	Rail to Rail
NSOPA9011	SOT23-5, SC70-5	1	2.7~40	-40℃~125℃	140	Rail to Rail	Rail to Rail
NSOPA9012	SOP8,MSOP8	2	2.7~40	-40℃~125℃	140	Rail to Rail	Rail to Rail
NSOPA9014	SOP14, TSSOP14	4	2.7~40	-40℃~125℃	140	Rail to Rail	Rail to Rail
NSOPA9011Q	SOT23-5, SC70-5	1	2.7~40	-40℃~125℃	140	Rail to Rail	Rail to Rail
NSOPA9012Q	SOP8,MSOP8	2	2.7~40	-40℃~125℃	140	Rail to Rail	Rail to Rail
NSOPA9014Q	SOP14, TSSOP14	4	2.7~40	-40℃~125℃	140	Rail to Rail	Rail to Rail
NSOPA9051	SOT23-5, SC70-5	1	2.7~40	-40℃~125℃	540	Rail to Rail	Rail to Rail
NSOPA9052	SOP8,MSOP8	2	2.7~40	-40℃~125℃	540	Rail to Rail	Rail to Rail
NSOPA9054	SOP14, TSSOP14	4	2.7~40	-40℃~125℃	540	Rail to Rail	Rail to Rail
NSOPA9051Q	SOT23-5, SC70-5	1	2.7~40	-40℃~125℃	540	Rail to Rail	Rail to Rail
NSOPA9052Q	SOP8,MSOP8	2	2.7~40	-40℃~125℃	540	Rail to Rail	Rail to Rail
NSOPA9054Q	SOP14, TSSOP14	4	2.7~40	-40℃~125℃	540	Rail to Rail	Rail to Rail
NSOPA9101	SOT23-5, SC70-5	1	2.7~40	-40℃~125℃	2500	Rail to Rail	Rail to Rail
NSOPA9102	SOP8,MSOP8	2	2.7~40	-40℃~125℃	2500	Rail to Rail	Rail to Rail
NSOPA9104	SOP14, TSSOP14	4	2.7~40	-40℃~125℃	2500	Rail to Rail	Rail to Rail
NSOPA9101Q	SOT23-5, SC70-5	1	2.7~40	-40℃~125℃	2500	Rail to Rail	Rail to Rail
NSOPA9102Q	SOP8,MSOP8	2	2.7~40	-40℃~125℃	2500	Rail to Rail	Rail to Rail
NSOPA9104Q	SOP14, TSSOP14	4	2.7~40	-40℃~125℃	2500	Rail to Rail	Rail to Rail

Vos (max at 25°C)(mV)	dVos/dT (typ)(uV/C)	IB (typ at 25°C) (pA)	PSRR (typ at 25℃) (dB)	CMRR (typ at 25℃)(dB)	f=10kHz,en (nV/srHz)	GBP (MHz)	Slew rate (V/us)	Isc(mA)(source) at 25℃ typ
0.55	0.7	5	104	89	22	1.5	2	63
0.55	0.7	5	104	89	22	1.5	2	63
0.55	0.7	5	104	89	22	1.5	2	63
0.55	0.7	5	104	89	22	1.5	2	63
0.55	0.7	5	104	89	22	1.5	2	63
0.55	0.7	5	104	89	22	1.5	2	63
0.55	0.7	5	104	89	15	5	10	43
0.55	0.7	5	104	89	15	5	10	43
0.55	0.7	5	104	89	15	5	10	43
0.55	0.7	5	104	89	15	5	10	43
0.55	0.7	5	104	89	15	5	10	43
0.55	0.7	5	104	89	15	5	10	43
0.55	0.7	5	104	89	10	10	15	43
0.55	0.7	5	104	89	10	10	15	43
0.55	0.7	5	104	89	10	10	15	43
0.55	0.7	5	104	89	10	10	15	43
0.55	0.7	5	104	89	10	10	15	43
0.55	0.7	5	104	89	10	10	15	43
2.3	3	15	120	90	22	1	2	55
2.3	3	15	120	90	22	1	2	55
2.3	3	15	120	90	22	1	2	55
2.3	3	15	120	90	22	1	2	55
2.3	3	15	120	90	22	1	2	55
2.3	3	15	120	90	22	1	2	55
1.2	0.5	15	120	90	10	6	11	85
1.2	0.5	15	120	90	10	6	11	85
1.2	0.5	15	120	90	10	6	11	85
1.2	0.5	15	120	90	10	6	11	85
1.2	0.5	15	120	90	10	6	11	85
1.2	0.5	15	120	90	10	6	11	85
1.2	0.5	15	120	90	10	10	30	85
1.2	0.5	15	120	90	10	10	30	85
1.2	0.5	15	120	90	10	10	30	85
1.2	0.5	15	120	90	10	10	30	85
1.2	0.5	15	120	90	10	10	30	85
1.2	0.5	15	120	90	10	10	30	85

NSOPA901x/NSOPA901xQ: High Voltage General Purpose Operational Amplifiers

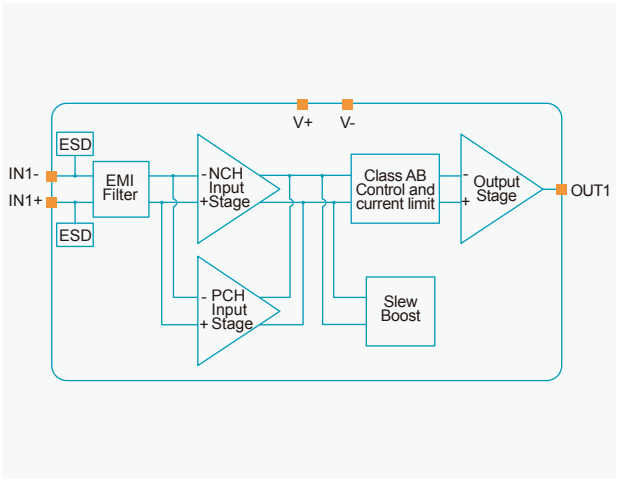
Product introduction

The NSOPA901x/NSOPA901xQ series is a family of high voltage (40 V) general purpose operational amplifiers. These devices offer exceptional DC precision and AC performance, including rail-to-rail input/output, low offset (±200 μV, typical), low offset drift (±3 μV/°C, typical), low noise (10.5 nV/√Hz and 6 μVPP), and 6MHz bandwidth.
The NSOPA901x family of op amps is available in standard packages (SOT-23, MSOP, SOP, and TSSOP), and is specified from -40°C to 125°C.

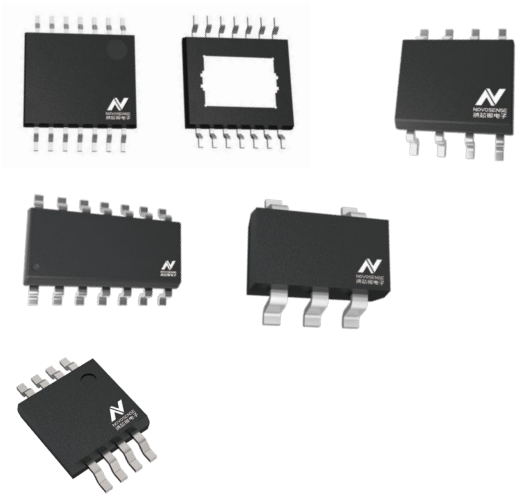
Product feature

- Wide supply: ±1.35 V to ±20 V, 2.7 V to 40 V
- Low offset voltage: 400μV typ.
- Low offset voltage drift: ±3 μV/°C typ.
- Low quiescent current: 140 μA per amplifier
- Unity-gain stable
- AEC-Q100 qualified for automotive applications
- Gain-bandwidth product: 1 MHz
- Slew rate: 2 V/μs typ.
- Robust EMIRR performance: EMI/RFI filters on input and supply pins
- Differential and common-mode input voltage range to supply rail pulse-friendly/comparator inputs 1 Amplifier operates with differential inputs up to supply rail 2 Amplifier can be used in open-loop or as comparator
- Extended temperature range: –40°C to 125°C

Functional block diagram



Package



Application

- Multiplexed data-acquisition systems
- Test and measurement equipment
- ADC driver amplifiers
- SAR ADC reference buffers
- Programmable logic controllers
- High-side and low-side current sensing

NSOPA905x/NSOPA905xQ: High Voltage General Purpose Operational Amplifiers

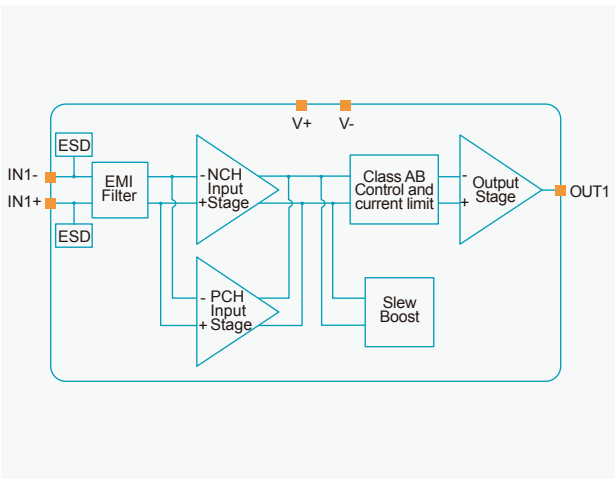
Product introduction

The NSOPA905x/NSOPA905xQ series is a family of high voltage (40 V) general purpose operational amplifiers. These devices offer exceptional DC precision and AC performance, including rail-to-rail input/output, low offset (±200 μV, typical), low offset drift (±0.5 μV/°C, typical), low noise (10.5 nV/√Hz and 6 μVPP), and 6MHz bandwidth.
The NSOPA905x family of op amps is available in standard packages (SOT-23, MSOP, SOP, and TSSOP), and is specified from -40°C to 125°C.

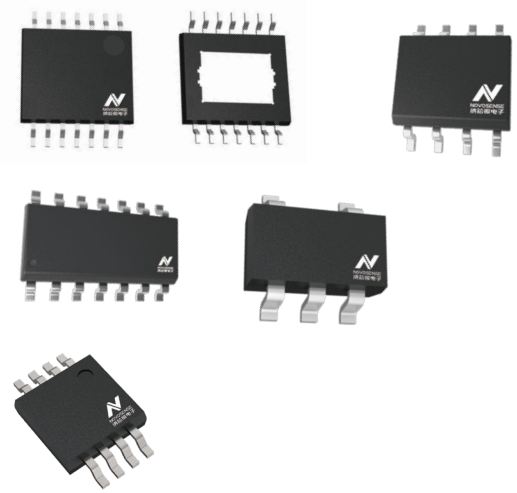
Product feature

- Wide supply: ±1.35 V to ±20 V, 2.7 V to 40 V
- Low offset voltage: 200μV typ
- Low offset voltage drift: ±0.5 μV/°C typ
- Low quiescent current: 600 μA per amplifier
- Unity-gain stable
- AEC-Q100 qualified for automotive applications
- Gain-bandwidth product: 5 MHz
- High slew rate: 12 V/μs typ
- Robust EMIRR performance: EMI/RFI filters on input and supply pins
- Differential and common-mode input voltage range to supply rail pulse-friendly/comparator inputs 1 Amplifier operates with differential inputs up to supply rail 2 Amplifier can be used in open-loop or as comparator
- Extended temperature range: –40°C to 125°C

Functional block diagram



Package



Application

- Multiplexed data-acquisition systems
- Test and measurement equipment
- ADC driver amplifiers
- SAR ADC reference buffers
- Programmable logic controllers
- High-side and low-side current sensing

NSOPA910x/NSOPA910xQ: High Voltage General Purpose Operational Amplifiers

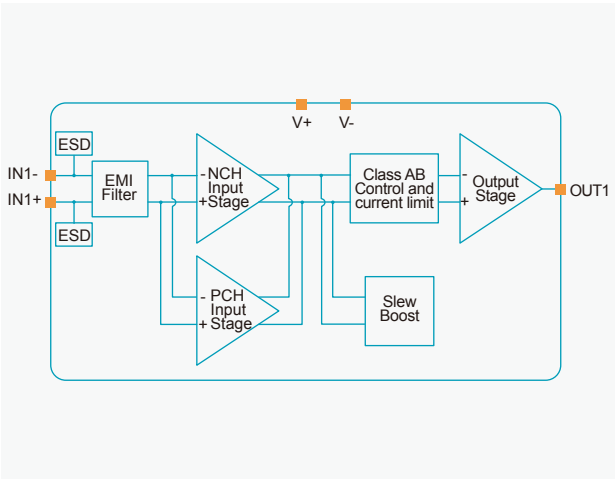
◆ Product introduction

The NSOPA910x/NSOPA910xQ series is a family of high voltage (40 V) general purpose operational amplifiers. These devices offer exceptional DC precision and AC performance, including rail-to-rail input/output, low offset (±200 μV, typical), low offset drift (±0.5 μV/°C, typical), low noise (10.5 nV/√Hz and 6 μVPP), and 6MHz bandwidth.
The NSOPA910x of op amps is available in standard packages (SOT-23, MSOP, SOP, and TSSOP), and is specified from -40°C to 125°C.

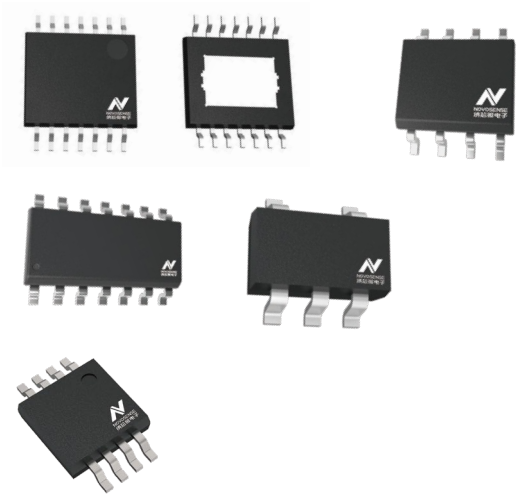
◆ Product feature

- Wide supply: ±1.35 V to ±20 V, 2.7 V to 40 V
- Low offset voltage: 200μV typ
- Low offset voltage drift: ±0.5 μV/°C typ
- Quiescent current: 2.5 mA per amplifier
- Unity-gain stable
- AEC-Q100 qualified for automotive applications
- Gain-bandwidth product: 10 MHz
- High slew rate: 30 V/μs typ
- Robust EMIRR performance: EMI/RFI filters on input and supply pins
- Differential and common-mode input voltage range to supply rail Pulse-friendly/comparator inputs 1 Amplifier operates with differential inputs up to supply rail 2 Amplifier can be used in open-loop or as comparator
- Extended temperature range: –40°C to 125°C

◆ Functional block diagram



◆ Package



◆ Application

- Multiplexed data-acquisition systems
- Test and measurement equipment
- ADC driver amplifiers
- SAR ADC reference buffers
- Programmable logic controllers
- High-side and low-side current sensing

NSOPA801x/NSOPA801xQ: Low Voltage, General Purpose, Low-power Operational Amplifiers

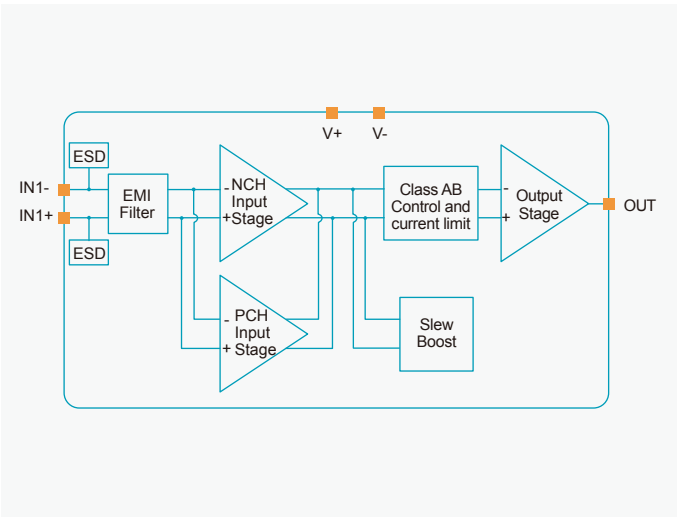
Product introduction

The NSOPA801x/NSOPA801xQ series is a low voltage (1.8 V to 5.5 V), general purpose, low-power operational amplifiers (op amps) with rail-to-rail input and output swing capabilities. These op amps provide a cost-effective solution for low-voltage operation and high capacitive-load drive are required. The capacitive-load drive of the NSOPA801x/NSOPA801xQ series is 1nF, and the resistive open-loop output impedance makes stabilization easier with much higher capacitive loads. The robust design of the NSOPA801x/NSOPA801xQ series simplifies circuit design. The op amps feature unity-gain stability, an integrated RFI and EMI rejection filter, and no-phase reversal in overdrive conditions. Micro-size packages, such as SC70-5, along with industry-standard packages such as SOT23-5L, SOP, MSOP, and TSSOP packages.

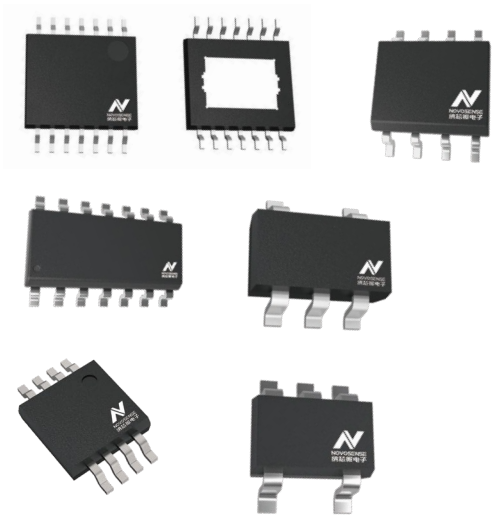
Product feature

- Supply voltage range: 1.8V to 5.5V
- Rail-to-rail input and output
- Low input offset voltage: ±0.55 mV (typical)
- Gain-bandwidth product: 1.5 MHz
- Unity-gain stable
- Low broadband noise: 22 nV/√Hz (typical)
- Low input bias current: 5 pA (typical)
- Low quiescent current: 78 μA/Ch (typical)
- Internal RFI and EMI filter
- Extended temperature range: –40°C to 125°C

Functional block diagram



Package



Application

- Sensor signal conditioning
- Power Delivery: UPS/ Power module/Solar
- Inverter/Servo/ PLC/Motor driver
- Low-side current sensing
- ASIC Input or Output Amplifiers

NSOPA805x/NSOPA805xQ: Low Voltage, General Purpose, Low-power Operational Amplifiers

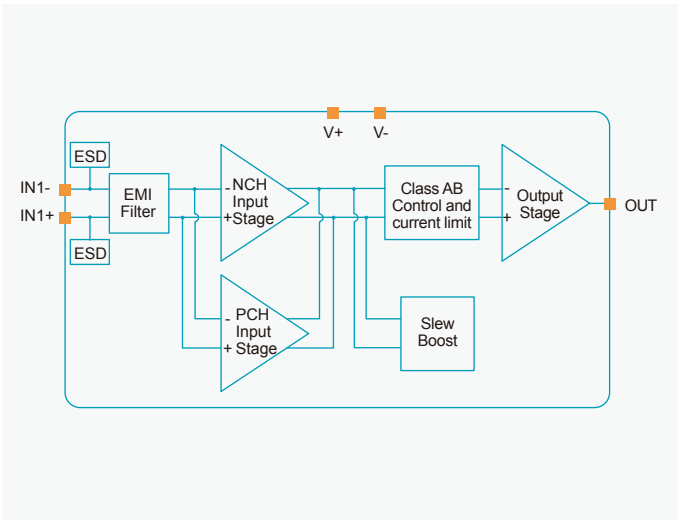
Product introduction

The NSOPA805x/NSOPA805xQ series is a low voltage (1.8 V to 5.5 V), general purpose, low-power operational amplifiers (op amps) with rail-to-rail input and output swing capabilities. These op amps provide a cost-effective solution for low-voltage operation and high capacitive-load drive are required. The capacitive-load drive of the NSOPA805x/NSOPA805xQ series is 1nF, and the resistive open-loop output impedance makes stabilization easier with much higher capacitive loads. The robust design of the NSOPA805x/NSOPA805xQ series simplifies circuit design. The op amps feature unity-gain stability, an integrated RFI and EMI rejection filter, and no-phase reversal in overdrive conditions. Micro-size packages, such as SC70-5, along with industry-standard packages such as SOT23-5L, SOP, MSOP, and TSSOP packages.

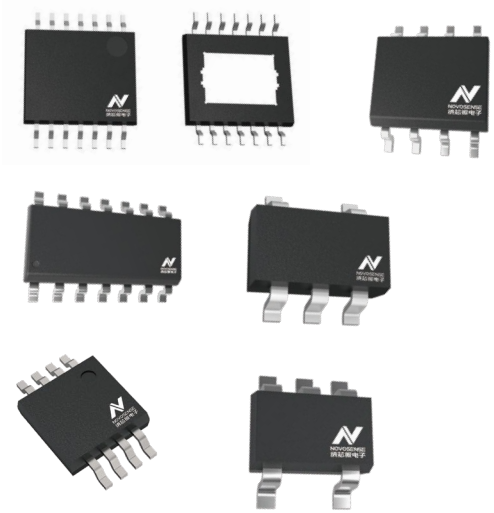
Product feature

- Supply voltage range: 1.8V to 5.5V
- Rail-to-rail input and output
- Low input offset voltage: ±0.5 mV (typical)
- Gain-bandwidth product: 5 MHz
- Unity-gain stable
- Low broadband noise: 15 nV/√Hz (typical)
- Low input bias current: 5 pA (typical)
- Low quiescent current: 380 μA/Ch (typical)
- Internal RFI and EMI filter
- Extended temperature range: –40°C to 125°C

Functional block diagram



Package



Application

- Sensor signal conditioning
- Power Delivery: UPS/ Power module/Solar
- Inverter/Servo/ PLC/Motor driver
- Low-side current sensing
- ASIC Input or Output Amplifiers

NSOPA810x/NSOPA810Q: Low Voltage, General Purpose, Low-power Operational Amplifiers

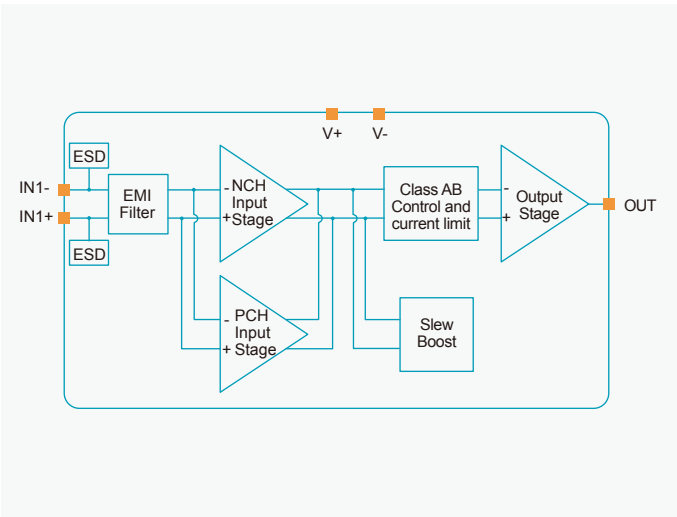
◆ Product introduction

The NSOPA810x/NSOPA810Q series is a low voltage (1.8 V to 5.5 V), general purpose, low-power operational amplifiers (op amps) with rail-to-rail input and output swing capabilities. These op amps provide a cost-effective solution for low-voltage operation and high capacitive-load drive are required. The capacitive-load drive of the NSOPA810x/NSOPA810Q series is 1nF, and the resistive open-loop output impedance makes stabilization easier with much higher capacitive loads. The robust design of the NSOPA810x/NSOPA810Q series simplifies circuit design. The op amps feature unity-gain stability, an integrated RFI and EMI rejection filter, and no-phase reversal in overdrive conditions. Micro-size packages, such as SC70-5, along with industry-standard packages such as SOT23-5L, SOP, MSOP, and TSSOP packages.

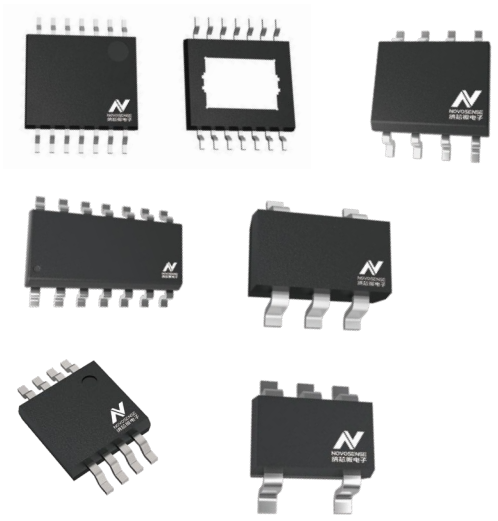
◆ Product feature

- Supply voltage range: 1.8V to 5.5V
- Rail-to-rail input and output
- Low input offset voltage: ±0.3 mV (typical)
- Gain-bandwidth product: 10 MHz
- Unity-gain stable
- Low broadband noise: 10 nV/√Hz (typical)
- Low input bias current: 5 pA (typical)
- Low quiescent current: 680 µA/Ch (typical)
- Internal RFI and EMI filter
- Extended temperature range: –40°C to 125°C

◆ Functional block diagram



◆ Package



◆ Application

- Sensor signal conditioning
- Power Delivery: UPS/ Power module/Solar
- Inverter/Servo/ PLC/Motor driver
- Low-side current sensing
- ASIC Input or Output Amplifiers

NSOPA240x Automotive Operational Amplifier with High Current Output for Resolver Drive

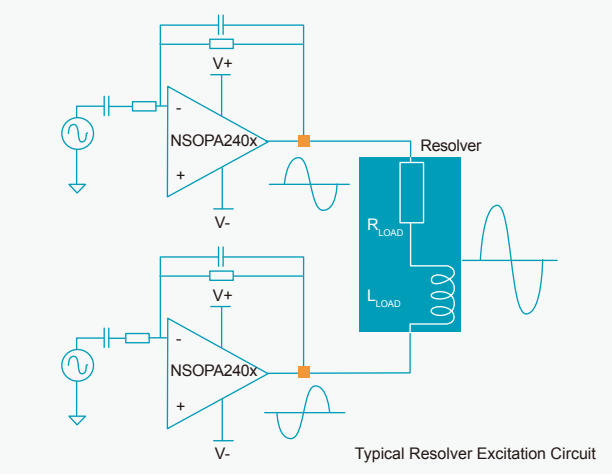
Product introduction

The NSOPA2401/NSOPA2402 are single/dual CMOS operational amplifiers combined full swing input and output. Current limiting and over temperature detection enhance overall system robustness when driving analog signals over wires that are susceptible to faults. It outputs typically up to 400mA of peak-to-peak current to drive low resistance load including inductance load such as angle resolver, lineout cable and piezo actuator. In addition, it has enhanced RF noise immunity.

Product feature

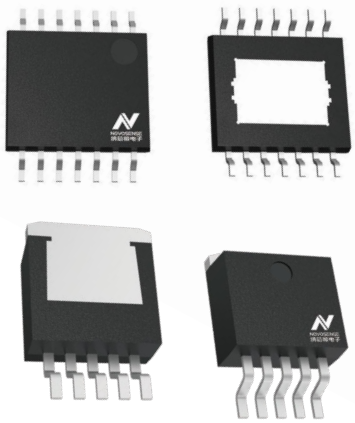
- AEC Q-100 Qualified for Grade 1: TA from –40 °C to 125 °C
- Low offset voltage: 0.6 mV (typical)
- High output current drive: 400mA, continuous
- Wide power supply voltage range: 4.5V to 36V
- Over temperature shutdown
- Output current limit
- Over current alarm (NSOPA2402 only)
- Shutdown pin for low Iq application
- 9.5MHz gain bandwidth with 7.5V/μs slew rate
- Internal RF/EMI filter
- Package: 14-pin HTSSOP, 5-pin TO252

Functional block diagram



Typical Resolver Excitation Circuit

Package



Application

- Resolver-based automotive applications
- Inverter and motor control
- Motor driver
- Liner power booster
- Servo drive power stage module

NSOPA084 36V General-purpose Operational Amplifiers

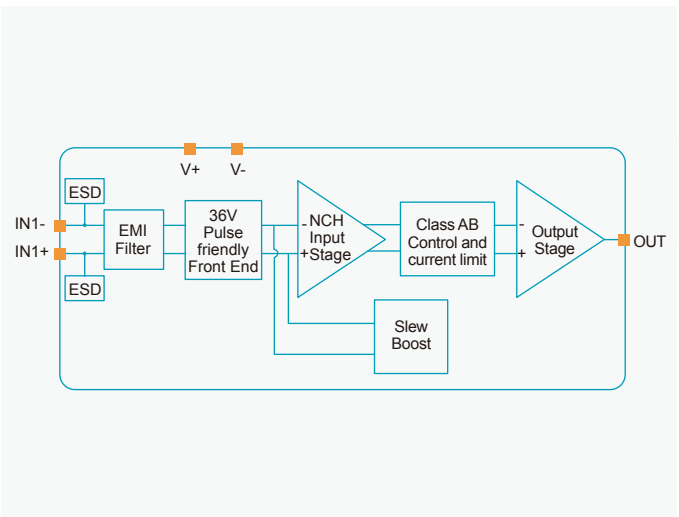
Product introduction

The NSOPA084 provide industry-leading performance over TL084 devices.
These devices provide outstanding value for cost-sensitive applications, with features including low offset (0.5mV, typical), high slew rate (30V/μs), and common-mode input to the positive supply. High ESD (2kV, HBM), integrated EMI and RF filters, and operation across the full –40°C to 125°C enable the NSOPA084 devices to be used in the most rugged and demanding applications.

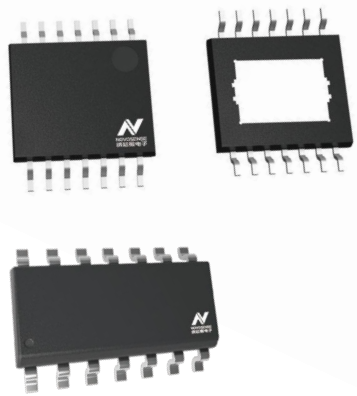
Product feature

- High slew rate: 30 V/μs typ
- Unity-gain bandwidth: 6 MHz
- Low offset voltage: 0.5 mV typ
- Low offset voltage drift: 1 μv/°c typ
- Low power consumption: 650 μA/ch typ
- High common-mode rejection (CMRR): 109 dB
- Wide common-mode and differential voltage ranges
- Common-mode input voltage range includes V+
- Low input bias and offset currents
- Low noise: e_n = 15 nV/$\sqrt{Hz}$ (typ) at 10 kHz
- Output short-circuit protection
- Low total harmonic distortion: -105 dB typ
- Pulse friendly/comparator input
- Amplifier can be used in open-loop or as comparator
- Wide supply voltage: ±2.25 V to ±18 V, 4.5 V to 36 V
- RoHS and REACH Compliance

Functional block diagram



Package



Application

- General-purpose amplification
- Power control and monitoring
- Active filters
- Industrial/ process control
- Data acquisition

Current Sense Amplifier

Part number	Input Common Mode Voltage Min (V)	Input Common Mode Voltage Max (V)	VCC (V)	Vos (max at 25°C) (mV)	dVos/dT (typ)(uV/C)	Gain (V/V)	Gain Error (max at 25°C) (%)	Gain drift (Typ) (ppm/°C%)	CMRR (Typ) (dB)	GBP (kHz)	Slew Rate (V/μs)	Package	Features
NSCSA240Ax	-4	80	2.7~5.5	25	0.06	20,50,100,200	0.1	2	135	600 @ G=20 550 @ G=50 500 @ G=100 450 @ G=200	4	SOP8 TSSOP8	PWM rejection
NSCSA240Ax-Q	-4	80	2.7~5.5	25	0.06	20,50,100,200	0.1	2	135	600 @ G=20 550 @ G=50 500 @ G=100 450 @ G=200	4	SOP8 TSSOP8	PWM rejection
NSCSA285Ax	3	76	3~5.5	12	0.15	12.5,20,50,100	0.2	20	140	90	0.6	MSOP8	Dual channel

NSCSA240 Current Sense Amplifier

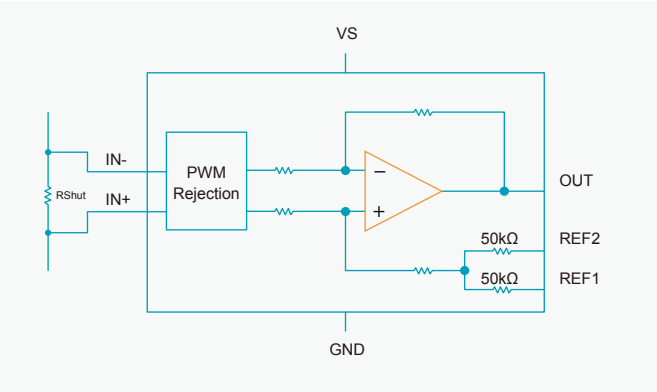
◆ Product introduction

The NSCSA240 is a high-precise, bidirectional current sense amplifier than can measure voltage drops across shunt resistors over a wide common mode range from –4 V to 80 V, independent of the supply voltage. The high-precision current measurement is achieved through a combination of low offset voltage (±5 µV typical), small gain error (0.05%, typical) and a high DC CMRR (135 dB, typical). The NSCSA240 is designed for high voltage, bidirectional measurements in switching systems that see large common-mode voltage transients at the device's inputs. The enhanced PWM rejection circuitry inside the NSCSA240 ensures minimal signal disturbance at the output due to the common mode voltage transitions at the input.

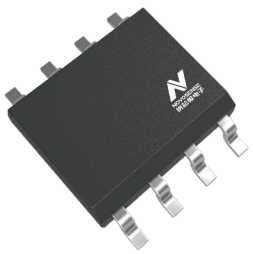
◆ Product feature

- Operating Temperature Range: –40°C to +125°C
- Enhanced PWM Rejection
- Wide Common-Mode Range: –4 V to 80 V
- GBW: 450~600kHz
- Excellent CMRR:
  135-dB DC CMRR (Typical)
  90-dB AC CMRR at 50 kHz
- Accuracy:
  Gain Error: 0.05% (Typical)
  Offset Voltage: ±5µV (Typical)
- Gain Options:
  NSCSA240A1: 20 V/V
  NSCSA240A2: 50 V/V
  NSCSA240A3: 100 V/V
  NSCSA240A4: 200 V/V
- AEC-Q100 qualified for automotive applications

◆ Functional block diagram



◆ Package



◆ Application

Power supply unit | Motor controls | Solar inverter | Telecom Equipment | Domain Controller

NSCSA285 Current Sense Amplifier

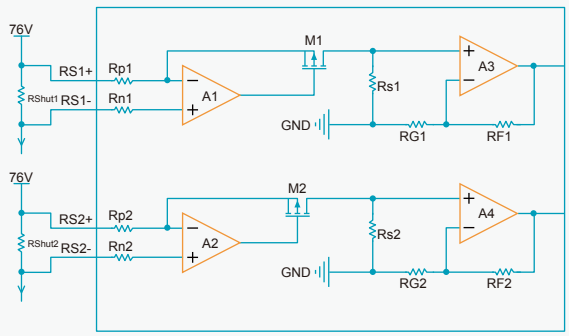
Product introduction

he NSCSA285 is a high-precise, dual channel high-side current sense amplifier than can measure voltage drops across shunt resistors over a wide common mode range from 3 V to 76 V, independent of the supply voltage. The high□precision current measurement is achieved through a combination of low offset voltage (±12 μV max), small gain error (0.05%, typical) and a high DC CMRR (140 dB, typical).The NSCSA285 features a small signal bandwidth of up to 90kHz and excellent AC CMRR performance up to 91dB at 10kHz.

Product feature

- Supply Voltage: 3V to 5.5V
- Wide Common-Mode Range: 3V to 76V
- Excellent CMRR:
  140-dB DC CMRR
  91-dB AC CMRR at 10 kHz
- Accuracy:
  Gain Error: 0.05% (Typical)
- Offset Voltage: ±12 μV (Max)
- Gain Options:
  NSCSA285A1: 12.5 V/V
  NSCSA285A2: 20 V/V
  NSCSA285A3: 50 V/V
  NSCSA285A4: 100 V/V
- Bandwidth: 90kHz
- Low Power Consumption: 600μA (Typical)
- Operation Temperature: -40°C to +125°

Functional block diagram



Package

Application

- Base stations and communication equipment
- Server backplanes
- Energy management
- Industrial control and automation

Analog-to-digital Converters (ADC)

Part number	Features	Input Channels	REF Channels	Input Voltage Range (V)	AVDD (V)	Internal reference accuracy（%）	Internal reference temperature drift（ppm/℃）	INL (ppmFS)	Gain Error (% of FSR)	Gain Drift (ppm/℃)	Programmable Gain	Package
NSAD1249	High precision, 24-Bit, ADC with Internal Reference and IDAC	12	3	AVSS ~ AVDD	3 ~ 5	0.02	3	5 @ gain = 1~16 10 @ Gain = 32~128	0.01 @ gain = 1~16 0.1 @ Gain = 64~128	2	1~128	TSSOP28
NSAD1248	High precision, 24-Bit, ADC with Internal Reference and IDAC	8	3	AVSS ~ AVDD	3 ~ 5	0.02	3	5 @ gain = 1~16 10 @ Gain = 32~128	0.01 @ gain = 1~16 0.1 @ Gain = 64~128	2	1~128	TSSOP28
NSAD1247	High precision, 24-Bit, ADC with Internal Reference and IDAC	4	2	AVSS ~ AVDD	3 ~ 5	0.02	3	5 @ gain = 1~16 10 @ Gain = 32~128	0.01 @ gain = 1~16 0.1 @ Gain = 64~128	2	1~128	TSSOP20
NSAD1246	High precision, 24-Bit, ADC with Internal Reference	2	1	AVSS ~ AVDD	3 ~ 5	0.02	3	5 @ gain = 1~16 10 @ Gain = 32~128	0.01 @ gain = 1~16 0.1 @ Gain = 64~128	2	1~128	TSSOP16
NSAD1148	High precision, 24-Bit, ADC with Internal Reference and IDAC	8	3	AVSS ~ AVDD	3 ~ 5	0.1	3	5 @ gain = 1~16 10 @ Gain = 32~128	0.01 @ gain = 1~16 0.1 @ Gain = 64~128	2	1~128	TSSOP28
NSAD1147	High precision, 24-Bit, ADC with Internal Reference and IDAC	8	3	AVSS ~ AVDD	3 ~ 5	0.1	3	5 @ gain = 1~16 10 @ Gain = 32~128	0.01 @ gain = 1~16 0.1 @ Gain = 64~128	2	1~128	TSSOP20
NSAD1146	High precision, 16-Bit, ADC with Internal Reference	8	3	AVSS ~ AVDD	3 ~ 5	0.1	3	5 @ gain = 1~16 10 @ Gain = 32~128	0.01 @ gain = 1~16 0.1 @ Gain = 64~128	2	1~128	TSSOP16

NSAD1148/NSAD1147/NSAD1146: 16-bit, Delta-Sigma(Δ-Σ), Analog-to-Digital Converters (ADCs)

◆ Product introduction

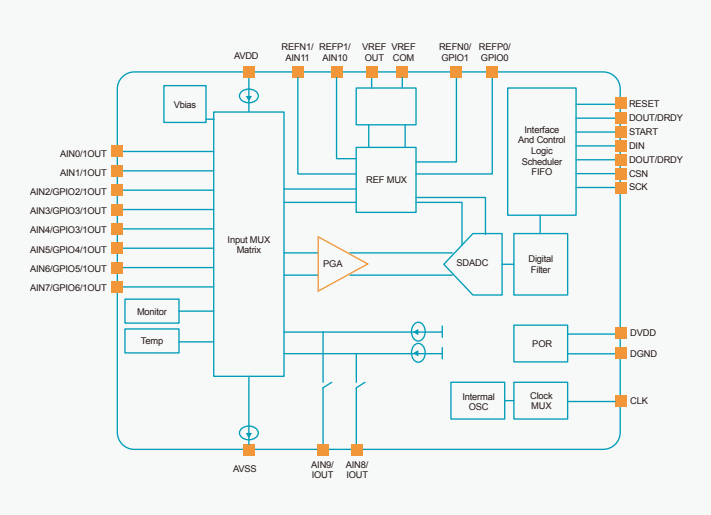
The NSAD1148/NSAD1147/NSAD1146 are low power, low noise, 16-bit, delta-sigma(Δ-Σ), analog-to-digital converters (ADCs). The device contains a cpacitive programmable gain amplifier (cpacitive PGA), with gains of 1, 2, 4, 8, 16, 32, 64 and 128, which allows to achieve rail-to-rail common-mode input range for all gains. These ADCs feature configurable digital filters with low□latency conversion and can achieve 50 Hz and 60 Hz simultaneous rejections.

The NSAD114x family have high level of integration. The device integrates a high accuracy, low-drift, 2.048-V bandgap reference, two independent programmable excitation current sources (IDACs) which allow for RTD excitation. supports up to 12 inputs that can be connected to PGA in any combination for design flexibility. In addition, these devices include features such as sensor burn-out detection, biasing voltage for thermocouple, internal temperature sensor and up to 8 general-purpose I/Os.

◆ Product feature

- Integrated capacitive PGA with programmable gain (1 to 128), achieves rail-to-rail input range for all gains
- Low-latency (single cycle settling) filter options
- Simultaneous 50Hz and 60Hz rejection at data rate 2.5Hz, 5Hz, 10Hz, 20Hz in low-latency filter option
- Two independent internal excitation current source with range 50uA to 1500uA
- Internal 2.048V bandgap reference with ±0.02% initial accuracy and 3 ppm/°C temperature drift
- Internal 4.096MHz oscillator with ±1% Accuracy • Internal Temperature Sensor with ±1% accuracy • System monitors
- Self offfset and system calibration
- Up to 8 general-purpose I/Os
- Analog Supply: Unipolar (3~5 V) or Bipolar (±1.5~±2.5 V)
- Digital Supply: 3 V to 3.6 V

◆ Functional block diagram



◆ Package

◆ Application

Temperature measurement (RTD, Thermocouples)

Pressure measurement

Factory Automation and Industrial process control

Instrumentation

NSAD1249/NSAD1248/NSAD1247/NSAD1246 24-bit, Delta-Sigma(Δ-Σ), Analog-to-Digital Converters (ADCs)

Product introduction

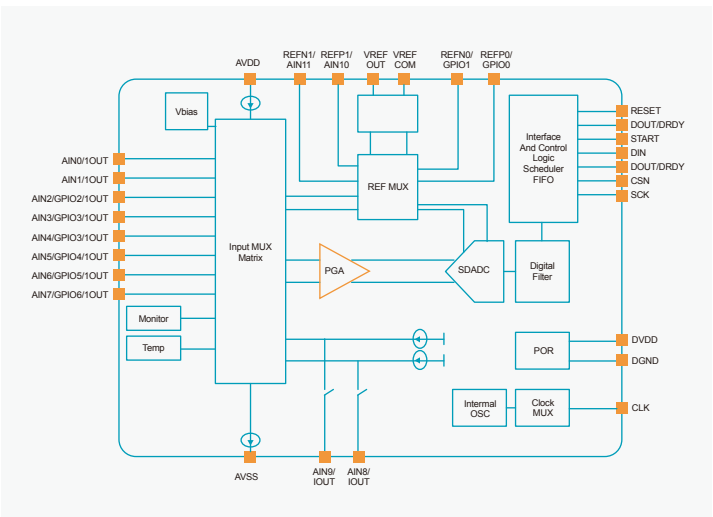
The NSAD1249/NSAD1248/NSAD1247/NSAD1246 are low power, low noise, 24-bit, delta-sigma(Δ-Σ), analog-to-digital converters (ADCs). The device contains a cpacitive programmable gain amplifier (cpacitive PGA), with gains of 1, 2, 4, 8, 16, 32, 64 and 128, which allows to achieve rail-to-rail common-mode input range for all gains. These ADCs feature configurable digital filters with low-latency conversion and can achieve 50 Hz and 60 Hz simultaneous rejections.

The NSAD124x family have high level of integration. The device integrates a high accuracy, low-drift, 2.048-V bandgap reference, two independent programmable excitation current sources (IDACs) which allow for RTD excitation. supports up to 12 inputs that can be connected to PGA in any combination for design flexibility. In addition, these devices include features such as sensor burn-out detection, biasing voltage for thermocouple, reference monitor, PGA rail detection circuits, internal temperature sensor and up to 8 general-purpose I/Os.

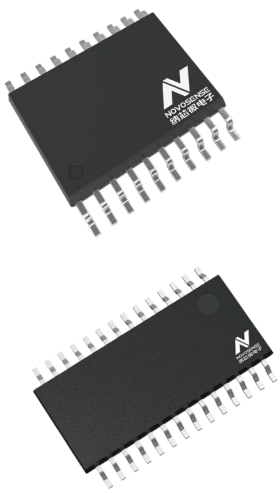
Product feature

- Integrated capacitive PGA with programmable gain (1 to 128), achieves rail-to-rail input range for all gains
- SINC3 and low-latency (single cycle settling) filter options
- Simultaneous 50Hz and 60Hz rejection at data rate 2.5Hz, 5Hz, 10Hz, 20Hz in low-latency filter option
- Two independent internal excitation current source with range 10uA to 2000uA
- Internal 2.048V bandgap reference with ±0.02% initial accuracy and 3 ppm/°C temperature drift
- Internal 4.096MHz oscillator with ±1% Accuracy
- Internal Temperature Sensor with ±1% accuracy
- System monitors and fault detection circuits
- Self offfset and system calibration
- Up to 8 general-purpose I/Os
- SPI interface with optional CRC
- Analog Supply: Unipolar (3~5 V) or Bipolar (±1.5~±2.5 V)
- Digital Supply: 3 V to 3.6 V

Functional block diagram



Package



Application

- Temperature measurement (RTD, Thermocouples)
- Pressure measurement
- Factory Automation and Industrial process control
- Instrumentation

Isolated RS-485 Transceiver

NSI8038x Series Isolated RS-485 Transceiver									
	Part No.	Duplex	ISO Rating (kVrms)	ESD	Max DataRate (Mbps)	No. of Nodes	Isolation Grade	Operating Temperature Range (°C)	Package Type
RS-485	NSI83085E	Half	5	16	0.5	256	Reinforced	-40~105	SOW-16
	NSI83086E	Full	5	16	16	256	Reinforced	-40~105	SOW-16
	NIRS485	Half	3	8	1	256	Basic	-40~105	SSOP-16

NSI8308xE: Isolated Half-Duplex/Full-Duplex 485 Transceiver with High Reliability

Product introduction

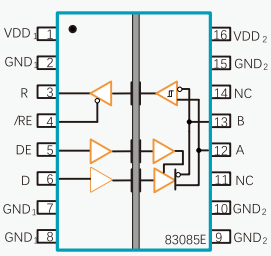
NSI8308xE is a family of isolated RS-485 transceivers based on NOVOSENSE digital isolated transceiver technology, where the NSI83085E is a half-duplex RS-485 transceiver and the NSI83086E is a full-duplex RS-485 transceiver. Both devices are safety certified by UL1577 support 5kVrms insulation withstand voltages, and feature low emission, low power consumption and high immunity to electromagnetic interference. The BUS pins on the BUS side of the NSI83086E is designed with ±10kV ESD protection to ground at system level. This product is designed with a fail-safe circuit that ensures the receiver output is logic high when the receiver input is disconnected or shorted. It features a receiver input impedance of 1/8 unit load, allowing up to 256 transceivers to be connected to the BUS.

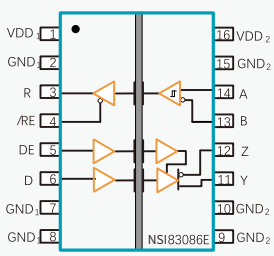
The data rate of NSI83085E is 12Mbps, and the data rate of NSI83086E is 16Mbps, and the products reduce EMI and reflection by optimizing the slew rate.

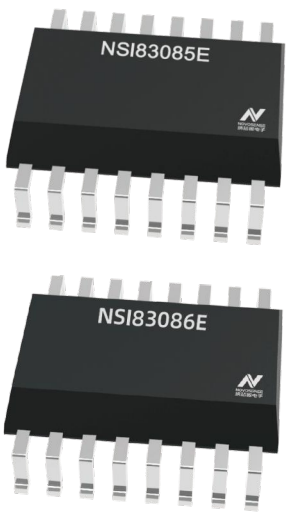
Product feature

- Dielectric strength 5000Vrms
- Up to 5000Vrms Insulation voltage
- VDD1 supply voltage: 2.5V to 5.5V
- High CMTI: ±150kV/μs
- High system level EMC performance:
  BUS pins conforming to IEC61000-4-2±10kV ESD
- Fail-safe receiver
- Supporting 256 transceivers
- Isolation Barrier Life: >60 years
- Operating temperature: -40°C to 105°C
- RoHS compliant package: SOW-16

Pinout & Package







Application

Industrial automation system

Isolated 485 communication system

Smart ammeters and water meters

Security and surveillance systems

NIRS485: Cost-optimized Isolated 485 Transceiver

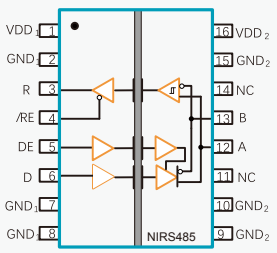
Product introduction

NIRS485 is an isolated half-duplex RS-485 based on NOVOSENSE digital isolated transceiver technology. It is safety certified by UL1577 support 3kVrms insulation withstand voltages, and features low emission, low power consumption and high immunity to electromagnetic interference. The BUS pins on the BUS side of the NIRS485 is designed with ±8kV ESD protection to ground at system level. This device is designed with a fail-safe circuit that ensures the receiver output is logic high when the receiver input is disconnected or shorted. It features a receiver input impedance of 1/8 unit load, allowing up to 256 transceivers to be connected to the BUS.
The data rate of NIRS485 is 1Mbps. The NIRS485 reduces EMI and reflections by optimizing the slew rate.

Product feature

- Up to 3000Vrms Insulation voltage
- BUS side supply voltage: 3.0V to 5.5V
- VDD1 supply voltage: 2.5V to 5.5V
- High CMTI: ±100kV/μs
- High system level EMC performance:
  BUS pins conforming to IEC61000-4-2±8kV ESD
- Fail-safe receiver
- Supporting 256 transceivers
- Isolation Barrier Life: >60 years
- Operating temperature: -40°C to 105°C
- RoHS compliant package: SSOP-16

Pinout & Package



Application

Battery management system

Isolated 485 communication system

Smart ammeters and water meters

Isolated CAN Transceiver

NSI1050 isolated CAN transceiver									
	Part No.	Part No.	ISO Rating (kVrms)	ESD(kV)	Max DataRate (Mbps)	No.of Nodes	Fail Safe	Operating Temperature Range (°C)	Package Type
CAN	NSI1050	NSI1050-DDBR	3	8	1	110	Idle, Open, Short	-40~125	DUB-8
	NSI1050	NSI1050-DSWR	5	8	1	110	Idle, Open, Short	-40~125	SOW-16
	NSI1042	NSI1042-DSWVR	5	8	5	110	Idle, Open, Short	-40~125	SOW-8
	NSI1042	NSI1042-DSWR	5	8	5	110	Idle, Open, Short	-40~125	SOW-16
	NSI1052	NSI1052-DSWR	5	8	5	110	Idle, Open, Short	-40~125	SOW-16

NSI1050: High-Performance Isolated CAN Transceiver

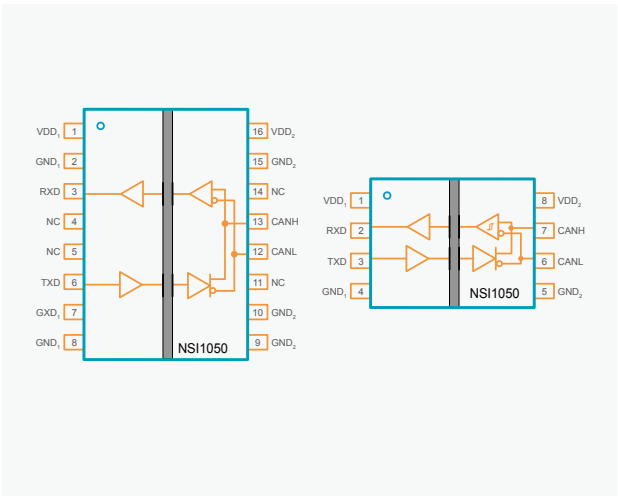
Product introduction

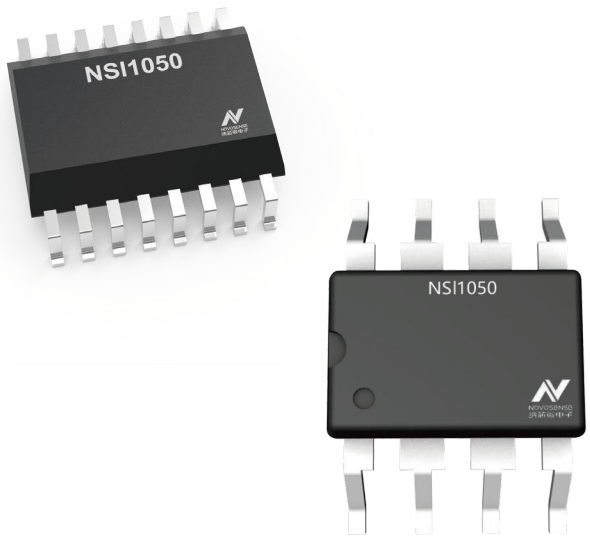
NSI1050 is an isolated CAN transceiver that is fully compatible with ISO11898-2. NSI1050 integrates a two-channel digital isolator and a high-performance CAN transceiver. The digital isolator uses silicon oxide isolation based on NOVOSENSE capacitance isolation technology. Highly integrated solutions simplify system design and improve reliability. NSI1050 device is safety certified by UL1577 support 5kVrms insulation withstand voltages, and feature high electromagnetic immunity and low emission. NSI1050 supports data transmission rates of up to 1Mbps and can support at least 110 CAN nodes. NSI1050 is designed with thermal protection and transmission data dominant timeout protection.

Product feature

- Fully compatible with ISO11898-2
- Up to 5000Vrms Insulation voltage
- Power supply voltage
  VDD1: 2.5V to 5.5V
  VDD2: 4.5V to 5.5V
- BUS protection voltage -40V to +40V
- Transmission data (TXD) dominant timeout protection
- Overcurrent and thermal protection
- Data transmission rates up to 1Mbps
- High CMTI: 100kV/μs
- Low loop delay: <220ns
- Enhanced system level ESD, EFT, surge immunity
- Operating temperature: -40°C to 125°C
- RoHS compliant package: SOW-16, DUB-8

Pinout & Package





Application

- Industrial automation system
- Isolated CAN BUS
- Communication

NSI1042/1052: High-Performance Isolated CAN Transceiver

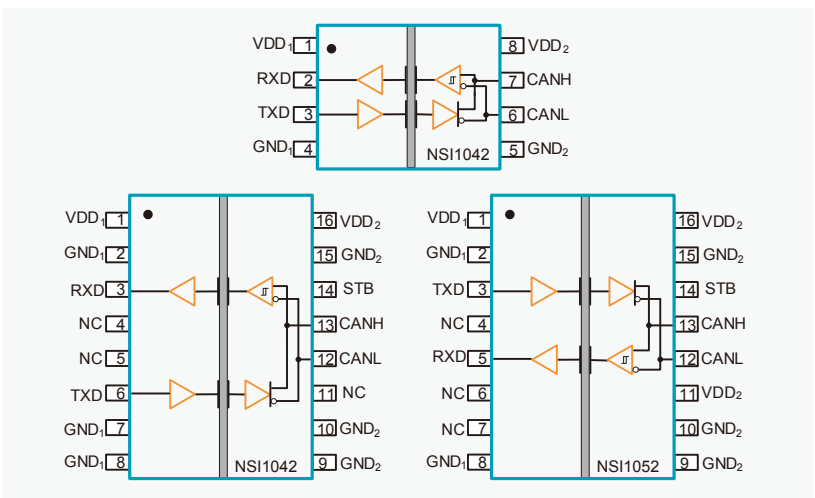
Product introduction

NSI1042 is an isolated CAN transceiver that is fully compatible with ISO11898-2. NSI1042 integrates a two-channel digital isolator and a high-performance CAN transceiver. The digital isolator uses silicon oxide isolation based on NOVOSENSE capacitance isolation technology. Highly integrated solutions simplify system design and improve reliability. NSI1042 device is safety certified by UL1577 support 5kVrms insulation withstand voltages, and feature high electromagnetic immunity and low emission. NSI1042 supports CAN FD with data rate up to 5Mbps and can support at least 110 CAN nodes. NSI1042 is designed with thermal protection and transmission data dominant timeout protection.

Product feature

- Fully compatible with ISO11898-2
- Up to 5000Vrms Insulation voltage
- Power supply voltage
- VDD1: 2.5V to 5.5V
- VDD2: 4.5V~5.5V
- BUS protection voltage -70V to +70V
- Overcurrent and thermal protection
- Communication rate up to 5Mbps
- High CMTI: 150kV / μs
- Low loop delay: <220ns
- Enhanced system level ESD, EFT, surge immunity
- Standby mode: NSI1052
- Operating temperature: -40°C to 125°C
- RoHS compliant package: SOW-8, SOW-16

Pinout & Package



Application

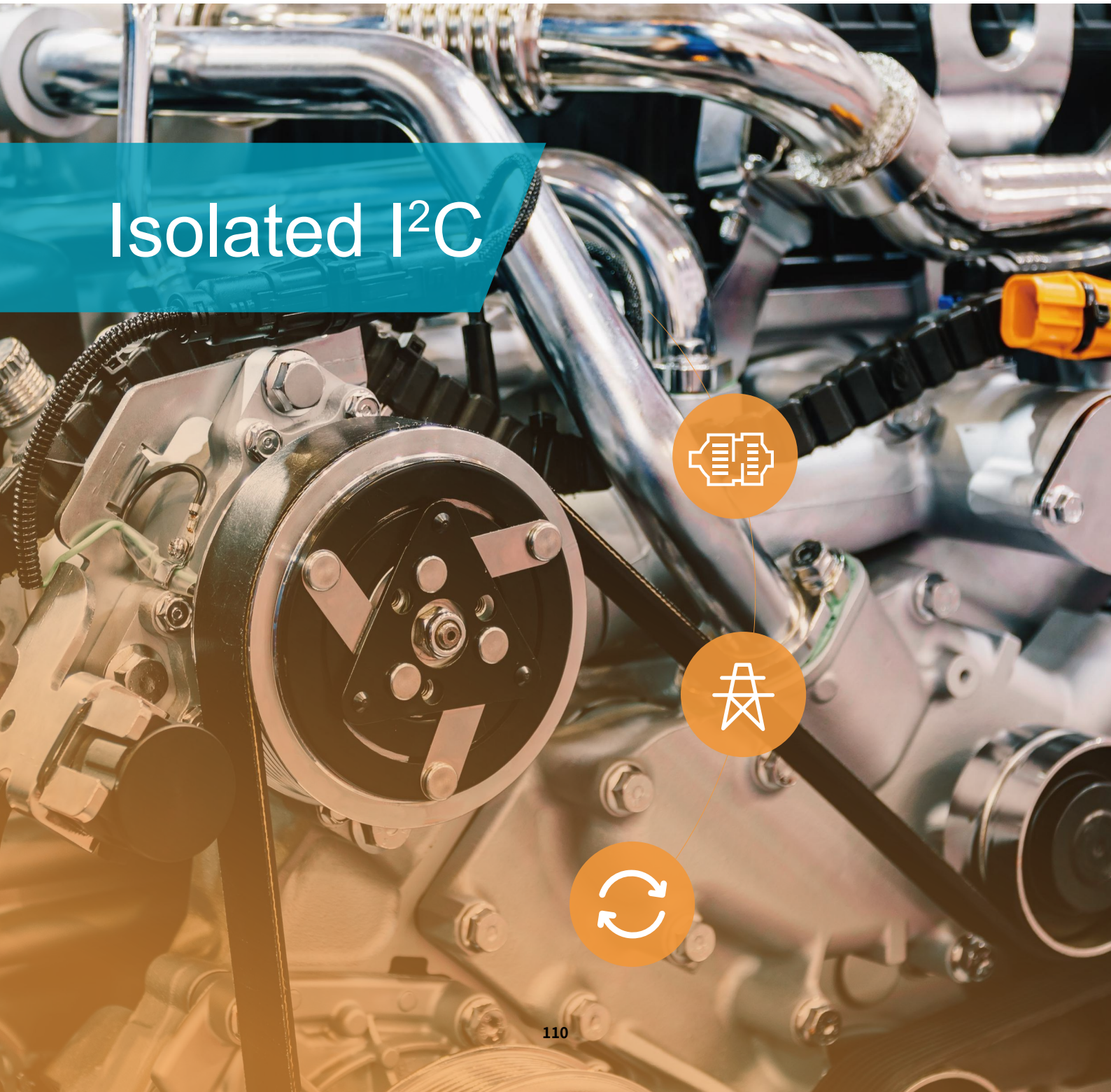
Industrial automation system

Isolated CAN BUS

Communication

Isolated I²C

NSI810x Isolated I²C								
	Part No.	ISO Rating (kVrms)	ESD(kV)	Bidirectional Channels	Max DataRate (Mbps)	AEC-Q100	Operating Temperature Range (°C)	Package Type
I²C	NSI8100N	3.75	6	2	2		-40~125	SOP-8
	NSI8100W	5	6	2	2		-40~125	SOW-16
	NSI8100NC	3.75	6	2	2		-40~125	SOP-8



NSI8100NC/NSI8100: High Reliability Bidirectional I²C Isolators

Product introduction

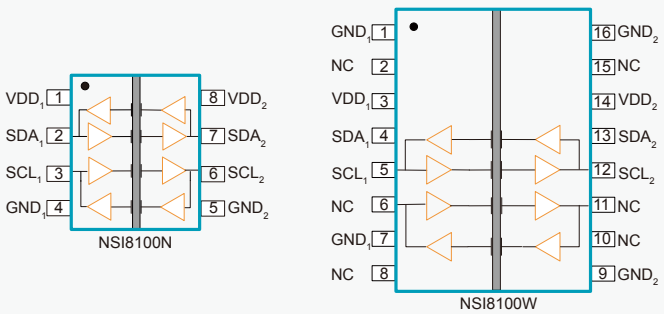
The NSI810x series are high reliability bidirectional 1²C digital isolators. The NSI810x devices are safety certified by UL1577 support several insulation withstand voltages (3.75kVrms, 5kVrms), and features high electromagnetic immunity and low emission characteristics. They Support I²C clock at a frequency up to 2MHZ, the common mode transient immunity (CMTI) is up to 150kV/μs. The wide power supply range allows them to be directly connected to digital interfaces such as most of the MCUs, and can easily provide bidirectional level conversion. Its excellent system-level electromagnetic compatibility (EMC) performance enhances its reliability and stability. NSI8100 provides dual-channel bidirectional isolation.

NSI8100NC is a bidirectional 1²C digital isolator that provides dual-channel bidirectional isolation with high reliability. It is safety certified by UL1577 support 5kVrms insulation withstand voltages, and features high electromagnetic immunity and low emission. They Support I²C clock at a frequency up to 2MHZ, the common mode transient immunity (CMTI) is up to 100kV/μs. The wide power supply range allows them to be directly connected to digital interfaces such as most of the MCUs, and can easily provide bidirectional level conversion. Its excellent system-level electromagnetic compatibility (EMC) performance enhances its reliability and stability.

Product feature

- Up to 3750/5000Vrms Insulation voltage
- I²C clock rate: up to 2MHz
- Wide power supply range: 2.5V to 5.5V
- High common mode transient immunity (CMTI): ±150kV/μs
- High system level EMC performance: system level electrostatic discharge (ESD), burst immunity (EFT), surge protection
- Chip-level ESD performance: HBM: ±6kV
- Isolation Barrier Life: >60 years
- Wide operating temperature range: -40°C to 125°C
- RoHS compliant package: SOP-8, SOW-16

Pinout & Package



Application

I²C level converter

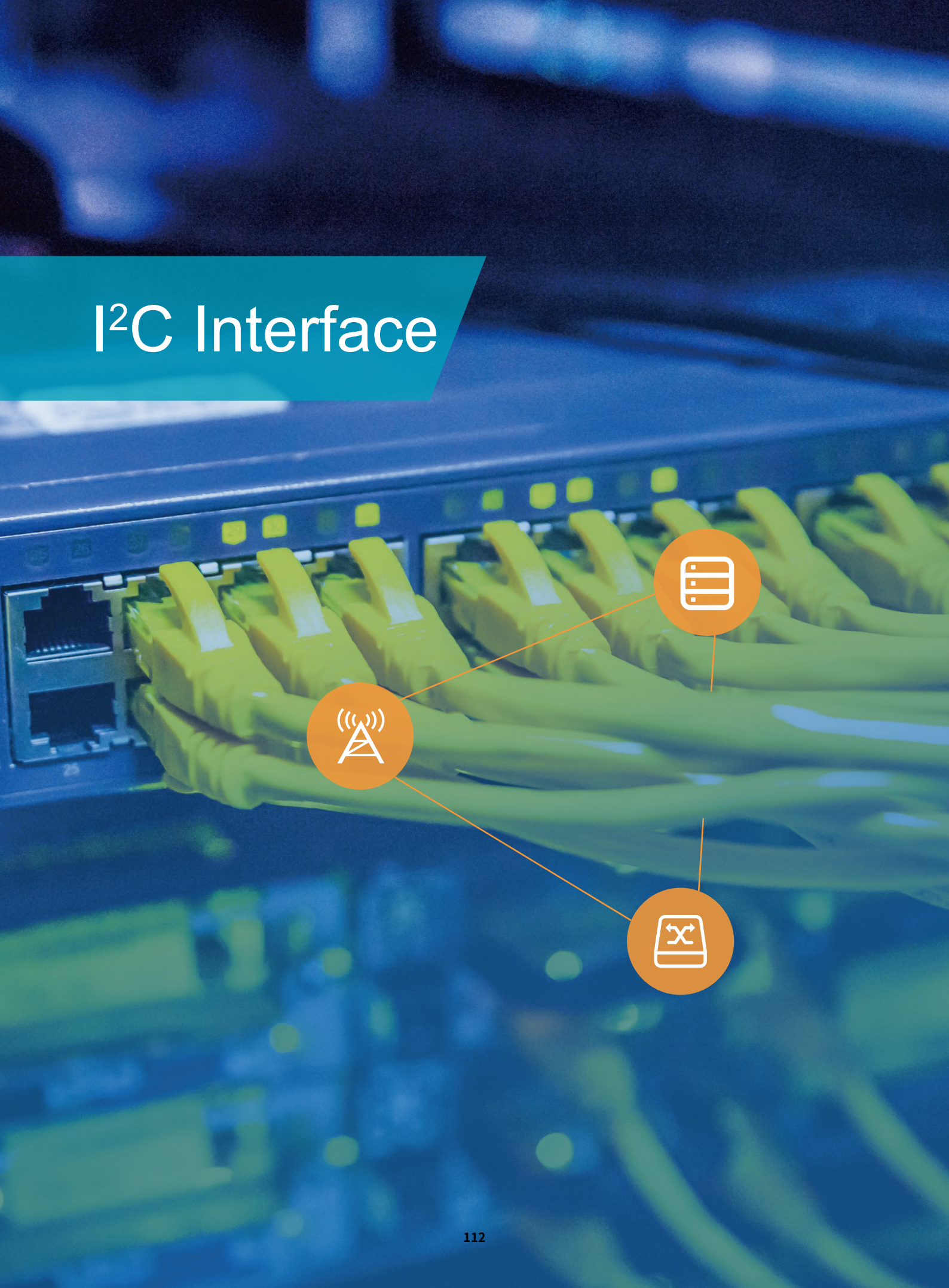
Isolated I²C, PMBUS, SMBUS interface applications

Power over Ethernet (POE)

Motor control

Power Supply System

I²C Interface



I²C Interface

I²C Hot-swappable NCA9511 Series								
	Part No.	VCC1(min)(V)	VCC1(max)(V)	VCC2(min)(V)	VCC2(max)(V)	Frequency (Max) (kHz)	Operating Temperature Range (°C)	Package Type
Hot Swappable Buffer	NCA9511	2.7	5.5	2.7	5.5	400	-40~105	MSOP-8
								SOP-8

I²C Level Converter NCA9306 Series								
	Part No.	VCC1(min)(V)	VCC1(max)(V)	VCC2(min)(V)	VCC2(max)(V)	Frequency (Max) (kHz)	Operating Temperature Range (°C)	Package Type
voltage-level shifter	NCA9306	1.2	3.3	1.8	5.5	400	-40~85	VSSOP-8
								TSSOP-8

I²C Buffer NCA9617A Series								
	Part No.	VCC1(min)(V)	VCC1(max)(V)	VCC2(min)(V)	VCC2(max)(V)	Frequency (Max) (kHz)	Operating Temperature Range (°C)	Package Type
Level-Translating Repeater	NCA9617A	0.8	5.5	2.2	5.5	1000	-40~85	MSOP8

I²C switch NCA954x series									
	Part No.	Channel	VCC(min)(V)	VCC(max)(V)	Frequency (Max) (kHz)	Addresses	Features	Operating Temperature Range (°C)	Package Type
I²C-BUS switch	NCA9545	4	2.3	5.5	400	4	Interrupt Pin Reset Pin	-40~85	TSSOP-20
	NCA9546	4	2.3	5.5	400	8	Reset Pin	-40~85	TSSOP-16
	NCA9548	8	2.3	5.5	400	8	Reset Pin	-40~85	TSSOP-24

I²C GPIO expansion for NCA95xx series										
	Part No.	Channel	VCC(min)(V)	VCC(max)(V)	Frequency (Max) (kHz)	Addresses	Features	Operating Temperature Range (°C)	AEC-Q100	Package Type
I²C GPIO Expender	NCA9555	16	2.3	5.5	400	8	Interrupt Pin LED Driver	-40~85		TSSOP-24
	NCA9534B	8	2.3	5.5	400	8	Interrupt Pin LED Driver	-40~85		TSSOP-16
										SOW-16
	NCA9539-Q1	16	1.65	5.5	400	4	Interrupt Pin LED Drive	-40~85	✓	TSSOP-24

NCA9511: I²C Hot-swappable BUS and SMBUS Buffer

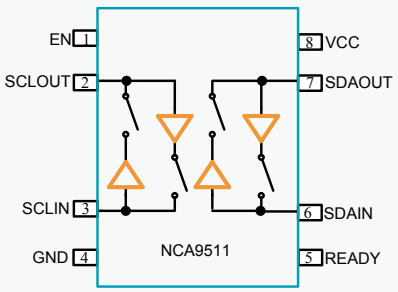
Product introduction

NCA9511 is a hot-swappable I²C BUS buffer that supports insertion of I/O cards into a powered backplane without damaging the data or the clock BUS. The control circuit prevents the backplane side I²C line (input) from connecting to the card side I²C line (output) until a stop command or BUS idle condition occurs on the backplane and there is no BUS contention on the card. After the connection is established, the device will provide bidirectional buffering, thus keeping the capacitance of the backplane and that of the card separate. During insertion, the SDA and SCL lines are pre-charged to 1V to minimize the current required to charge the parasitic capacitance of the device. When the I²C BUS is idle, the NCA9511 can be put into shutdown mode by setting the EN pin low, thereby reducing power consumption. When EN is pulled high, NCA9511 resumes normal operation. It also includes an open-drain READY output pin that indicates that the backplane is connected to the card side. When READY is high, SDAIN and SCLIN are connected to SDAOUT and SCLOUT. When both sides are disconnected, READY is low.

Product feature

- Supporting bidirectional data transmission signal of I²C BUS
- The operating supply voltage range is from 2.7V to 5.5V
  The TA ambient temperature range is from -40°C to 105°C
- 1-V pre-charge on all SDA and SCL lines prevents corruption during live insertion
- Compatible with standard mode and fast mode I²C devices
- Supporting clock stretching, arbitration and synchronization
- I²C BUS high-impedance state when VCC is powered down
- Operating temperature: -40°C to 105°C
- RoHS compliant package: MSOP-8, SOP-8

Pinout & Package



Application

Telecom switching equipment

Server

Enterprise switch

Base station

Industrial automation equipment

NCA9306: I²C and SMBUS Voltage Level Converter

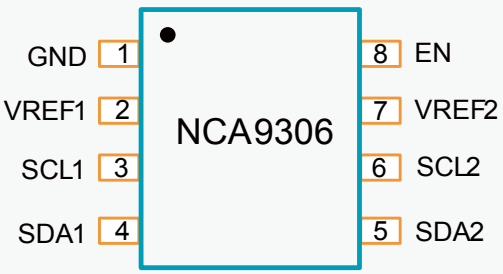
Product introduction

The NCA9306 device is a dual-channel bidirectional I²C and SMBUS voltage level converter with an enable (EN) input that enables bidirectional voltage conversion from 1.2V to 5V without the need of a direction pin. The switch is designed with a low on-state resistance (RON), allowing connections to be made with minimal propagation delay. When EN is high, the translator switch is ON, and the SCL1 and SDA1 I/O are connected to the SCL2 and SDA2 I/O, respectively, allowing bidirectional data flow between ports. When EN is low, the translator switch is off, and a high-impedance state exists between ports. the NCA9306 device can be used to isolate a 400kHz BUS from a 100kHz BUS by controlling the EN pin to disconnect the slower BUS during fast-mode communication.

Product feature

- 2-bit bidirectional converter for SDA and SCL lines in I²C applications
- Compatible with I²C and System Management BUS (SMBUS)
- Allowing level conversion between the following voltages
  1.2V VREF1 and 1.8V, 2.5V, 3.3V or 5V VREF2
  1.8V VREF1 and 2.5V, 3.3V or 5V VREF2
  2.5V VREF1 and 3.3V or 5V VREF2
  3.3V VREF1 and 5V VREF2
- Allowing bidirectional voltage conversion without direction pin
- Open drain I²C I/O ports (SCL1, SDA1, SCL2 and SDA2)
- Latch-up performance exceeds 100 mA per JESD 78, Class II
- ESD protection exceeds JESD 22
- 2000V Human Body Model (A114-A)
  1000V charging device model (C101)
- Operating temperature: -40°C to 105°C
- RoHS compliant package: VSSOP-8, TSSOP-8

Pinout & Package



Application

I²C, SMBUS, PMBUS, MDIO, UART, low-speed SDIO, GPIO and other bidirectional signal interfaces

Server

Router (telecom switching equipment)

Personal computer

Industrial automation

NCA9617A: I²C and SMBUS Dual Bidirectional Buffer

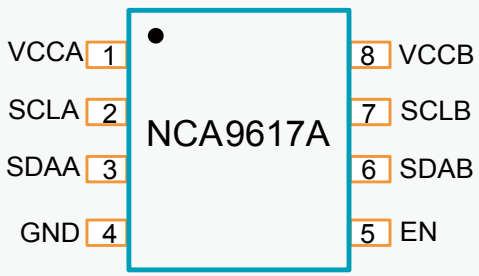
Product introduction

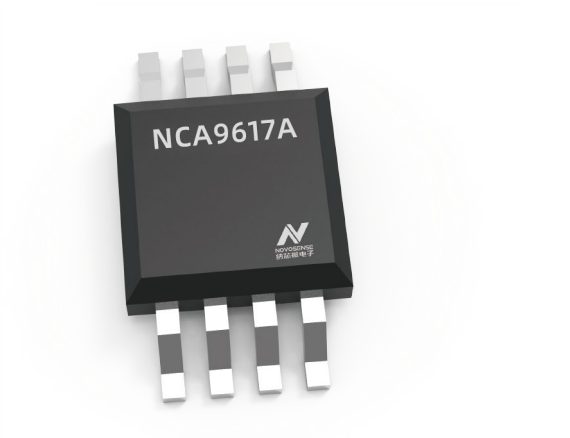
NCA9617A is a BiCMOS dual bidirectional buffer designed for I²C BUS and SMBUS systems. The device allows bidirectional voltage level conversion (up-conversion and down-conversion modes) between low voltages (as low as 0.8V) and higher voltages (2.2V to 5.5V) in hybrid applications. During level conversion, this device extends I²C and similar BUS systems without impairing system performance.

Product feature

- Dual-channel Bidirectional I²C Buffer
- Standard mode, fast mode (400kHz) and fast mode+ (1MHz) optional
- I²C operates voltage level conversion from 0.8V to 5.5V and from 2.5V to 5.5V
- Open-drain I²C I/O
- Clock stretching and multi-master arbitration supported on device
- Latch-up performance exceeds 100 mA per JESD 78, Class II
- ESD protection exceeds JESD 22
  5500V Human Body Model (A114-A)
  1500V charging device model (C101)
- Operating temperature: -40°C to 105°C
- RoHS compliant package: MSOP-8

Pinout & Package





Application

Server

Router
(telecom switching equipment)

Industrial equipment

Integrated with
a number of I²C
slave devices or products with long PCB wiring

NCA9545: 4-channel I²C-BUS Switch with Interrupt Logic and Reset

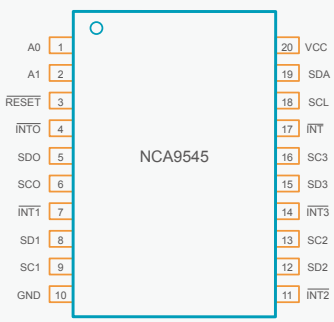
Product introduction

The NCA9545 is a quad bidirectional translating switch controlled via the I²C BUS. The SCL/SDA upstream pair fans out to four downstream pairs, or channels. Any individual SCN/SDN channel or combination of channels can be selected, depending on the contents of the program-mable control registers. Four interrupt inputs (INT3 to INT0) are provided, one for each of the downstream pairs. One interrupt (INT) output can be used as an AND operation of four interrupt inputs. A low-level on reset (RESET) input enables the NCA9545 to recover from a prolonged low state of any down-link I²C BUS. Pulling RESET low resets the I²C state machine and deselects all channels, as does the internal power-on reset function. With a on gate built into the switch, the VCC terminal can be used to limit the maximum voltage delivered by NCA9545. This allows each channel to use a different BUS voltage so that parts with voltage of 1.8V, 2.5V or 3.3V can communicate with parts with voltage of 5V without any additional protection. External pull-up resistors pull the BUS up to the desired voltage level for each channel. All I/O terminals can withstand 5.5 V.

Product feature

- 1-of-4 bidirectional translating switches
- Compatible with I²C BUS and SMBUS
- Active-low reset inputs
- 2 address pins, supporting 4 different addresses
- The operating supply voltage range is from 1.65V to 5.5V
- Low standby current
- Supports hot insertion
- Latch-up performance exceeds 100 mA per JESD 78
- ESD protection exceeds JESD 22
  2000V Human Body Model (A114-A)
  1000V charging device model (C101)
- Operating temperature: -40°C to 105°C
- RoHS compliant package: TSSOP-20

Pinout & Package



Application

Server

Router
(telecom switching equipment)

Factory
automation

Products with I²C
slave address conflicts
(e.g. multiple, identical temp sensors)

NCA9546: 4-channel I²C Switch with Reset

Product introduction

NCA9546 is a quad-channel bidirectional switch controlled by I²C BUS. The SCL/SDA upstream pair fans out to four downstream pairs, or channels. Any single SCN/SDN channel or combination of channels can be selected, depending on the contents of the programmable control registers.

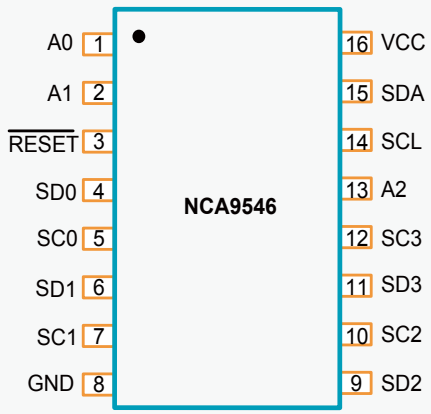
A low-level on reset (RESET) input enables the NCA9546 to recover from a prolonged low state of any down-link I²C BUS. Pulling RESET low resets the I²C state machine and deselects all channels, as does the internal power-on reset function.

The pass gates of the switches are constructed such that the VCC terminal can be used to limit the maximum high voltage, which will be passed by the NCA9546. This allows each channel to use a different BUS voltage so that parts with voltage of 1.8V, 2.5V or 3.3V can communicate with parts with voltage of 5V without any additional protection. External pull-up resistors pull the BUS up to the desired voltage level for each channel. All I/O terminals can withstand 5.5 V.

Product feature

- 1-of-4 bidirectional translating switches
- Compatible with I²C BUS and SMBUS
- Active-low reset input
- 3 address terminals, allowing up to 8 devices to be connected to the I²C BUS
- Channel selection via I²C BUS, any combination is OK
- Allowing voltage level conversion between 1.8V, 2.5V, 3.3V and 5V buses
- Operating supply voltage range is 1.7 V to 5.5 V
- Withstand voltage input of 5.5 V
- Clock frequency of 0 to 400kHz
- Latch-up performance exceeds 100 mA per JESD 78
  ESD protection exceeds JESD 22
  2000V Human Body Model (A114-A)
  1000V charging device model (C101)
- Operating temperature: -40°C to 105°C
- RoHS compliant package: TSSOP-16

Pinout & Package



Application

Server

Router
(telecom switching equipment)

Factory
automation

Products with I²C
slave address conflicts
(e.g. multiple, identical temp sensors)

NCA9548: 8-channel I²C Switch with Reset

Product introduction

NCA9548 is an eight-channel bidirectional switch controlled by I²C BUS. The SCL/SDA upstream pair fans out to eight downstream pairs, or channels. Any single SCN/SDN channel or combination of channels can be selected, depending on the contents of the programmable control registers.

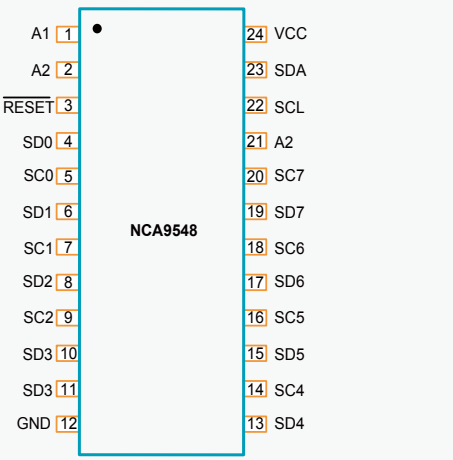
A low-level on reset (RESET) input enables the NCA9548 to recover from a prolonged low state of any down-link I²C BUS. Pulling RESET low resets the I²C state machine and deselects all channels, as does the internal power-on reset function.

The pass gates of the switches are constructed such that the VCC terminal can be used to limit the maximum high voltage, which will be passed by the NCA9548. This allows each channel to use a different BUS voltage so that parts with voltage of 1.8V, 2.5V or 3.3V can communicate with parts with voltage of 5V without any additional protection. External pull-up resistors pull the BUS up to the desired voltage level for each channel. All I/O terminals can withstand 5.5 V.

Product feature

- 1-of-8 bidirectional translating switches
- Compatible with I²C BUS and SMBUS
- Active-low reset input
- 3 address terminals, allowing up to 8 devices to be connected to the I²C BUS
- Channel selection via I²C BUS, any combination is OK
- Allowing voltage level conversion between 1.8V, 2.5V, 3.3V and 5V buses
- Operating supply voltage range is 1.65 V to 5.5 V
- Withstand voltage input of 5.5 V
- Clock frequency of 0 to 400kHz
- Latch-up performance exceeds 100mA per JESD 78
  ESD protection exceeds JESD 22
  2000V Human Body Model (A114-A)
  1000V charging device model (C101)
- Operating temperature: -40°C to 105°C
- RoHS compliant package: TSSOP-24

Pinout & Package



Application

Server

Router
(telecom switching equipment)

Factory
automation

Products with I²C
slave address conflicts

NCA9555: I²C 16-bit GPIO Expansion

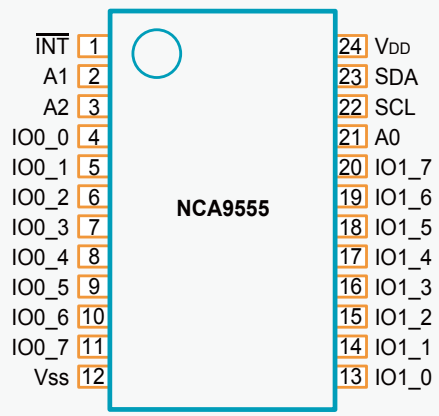
Product introduction

NCA9555 is a 24-pin CMOS device that provides 16-bit general purpose parallel I²C BUS number input/output GPIO expansion. It provides a simple solution to the additional I/O requirements of applications such as ACPI power switches, sensors, buttons, LEDs and fans. NCA9555 consists of two 8-bit configurations (input or output selection). Input, output and polarity inversion (high-level on or low-level on) registers. By writing to the I/O's configuration bits, the system host can enable I/O as input or output. The data of each input or output is stored in the corresponding input or output register. The polarity of the read register can be inverted with the Polarity inversion register. All registers can be read by the system host. NCA9555 open-drain interrupt output is activated when any input state differs from its corresponding input port register state and is used to indicate to the main equipment of the system that the output state has changed. A power-on reset sets the registers to their default values and initializes the state machine of the device. Three hardware pins (A0, A1, A2) change the fixed I²C BUS address and allow up to eight devices to share the same I²C BUS.

Product feature

- The operating supply voltage range is from 2.3V to 5.5V
- I²C to parallel port expander
- Polarity inversion register
- Active low interrupt output
- Compatible with most MCUs
- 16 I/O pins, 16 inputs by default
- Low standby current
- ESD protection exceeds JESD 22
  2000V Human Body Model (A114-A)
  1000V charging device model (C101)
- 3 address pins, supporting 8 different addresses
- Clock frequency of 0 to 400kHz
- Latch-up performance exceeds 100mA
- Operating temperature: -40°C to 85°C
- RoHS compliant package: TSSOP-24

Pinout & Package



Application

Server

Router
(telecom switching equipment)

Personal
computer

Personal
electronics

Factory
automation

Products with
GPIO-constrained
processors

NCA9534B: I²C 8-bit GPIO Expansion

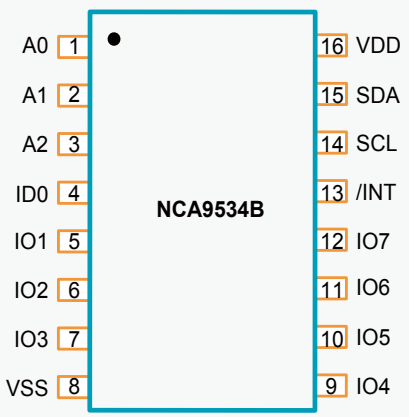
Product introduction

NCA9534B is a 16-pin CMOS device that provides 8-bit general purpose parallel I²C BUS number input/output GPIO expansion. It provides a simple solution to the additional I/O requirements of applications such as ACPI power switches, sensors, buttons, LEDs and fans. NCA9534B consists of one 8-bit configurations (input or output selection). Input, output and polarity inversion (high-level on or low-level on) registers. By writing to the I/O's configuration bits, the system host can enable I/O as input or output. The data of each input or output is stored in the corresponding input or output register. The polarity of the read register can be inverted with the Polarity Inversion register. All registers can be read by the system host. NCA9534B open-drain interrupt output is activated when any input state differs from its corresponding input port register state and is used to indicate to the main equipment of the system that the output state has changed. A power-on reset sets the registers to their default values and initializes the state machine of the device. Three hardware pins (A0, A1, A2) change the fixed I²C BUS address and allow up to eight devices to share the same I²C BUS.

Product feature

- he operating supply voltage range is from 2.3V to 5.5V
- I²C to parallel port expander
- Polarity inversion register
- Active low interrupt output
- Compatible with most MCUs
- 8 I/O pins, 8 inputs by default
- Low standby current
- ESD protection exceeds JESD 22
  2000V Human Body Model (A114-A)
  1000V charging device model (C101)
- 3 address pins, supporting 8 different addresses
- Clock frequency of 0 to 400kHz
- Latch-up performance exceeds 100mA
- Operating temperature: -40°C to 85°C
- RoHS compliant package: SOW-16, TSSOP-16

Pinout & Package



Application

Server

Router
(telecom switching equipment)

Personal
computer

Personal
electronics

Factory
automation

Products with
GPIO-constrained
processors

NCA9539-Q1: Automotive I²C 16-bit GPIO Expansion

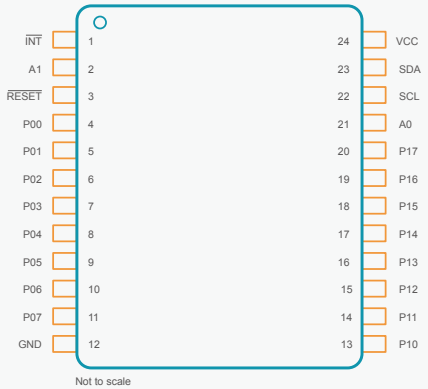
Product introduction

NCA9539-Q1 is a 16-pin CMOS device that provides 8-bit general purpose parallel I²C BUS number input/output GPIO expansion. It provides a simple solution to the additional I/O requirements of applications such as ACPI power switches, sensors, buttons, LEDs and fans. NCA9539-Q1 consists of two 8-bit configurations (input or output selection). Input, output and polarity inversion (high-level on or low-level on) registers. By writing to the I/O's configuration bits, the system host can enable I/O as input or output. The data of each input or output is stored in the corresponding input or output register. The polarity of the read register can be inverted with the Polarity Inversion register. All registers can be read by the system host. NCA9539-Q1 open-drain interrupt output is activated when any input state differs from its corresponding input port register state and is used to indicate to the main equipment of the system that the output state has changed. A power-on reset sets the registers to their default values and initializes the state machine of the device. Two hardware pins (A0, A1) change the fixed I²C BUS address and allow up to four devices to share the same I²C BUS.

Product feature

- The operating supply voltage range is from 1.65V to 5.5V
- I²C to parallel port expander
- Polarity inversion register
- Active low interrupt output
- Compatible with most MCUs
- 16 I/O pins, 16 inputs by default
- Low standby current
- ESD protection exceeds JESD 22
  2000V Human Body Model (A114-A)
  1000V charging device model (C101)
- 2 address pins, supporting 4 different addresses
- Clock frequency of 0 to 400kHz
- Latch-up performance exceeds 100mA per JESD 78
- Operating temperature: -40°C to 125°C
- RoHS compliant package: TSSOP-24

Pinout & Package



Application

In-vehicle infotainment system,advanced driver assistance system (ADAS)

Automotive body electronics, hybrid electric vehicle (HEV), electric vehicle (EV) and powertrain

Industrial automation, factory automation, building automation, test & measurement, electronic point of sale (EPOS)

I²C GPIO expansion

RS-485 Transceiver

NCA34xx Series RS-485 Transceiver									
	Part No.	Duplex	Supply Voltage (V)	ESD	Max DataRate (Mbps)	No. of Nodes	Bus Common Voltage(V)	Operating Temperature Range (°C)	Package Type
RS-485	NCA3485	Half	3~5.5	10	0.5	256	-7~12	-40~105°C	SOP-8
	NCA3491	Full	3~5.5	10	16	256	-7~12	-40~105°C	SOP-14
	NCA3176	Half	3~5.5	20	20	256	-7~12	-40~125°C	SOP-8 TSSOP-8

RS-485 Transceiver

NCA34xx: high robust RS485 half/full duplex transceiver

Product introduction

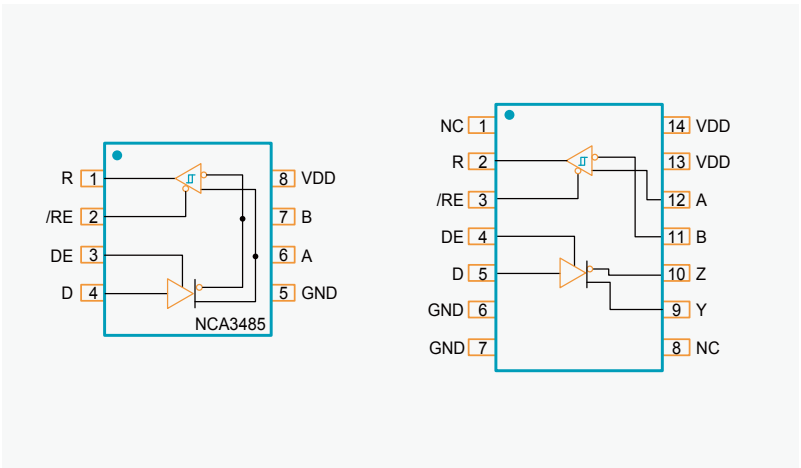
NCA34xx is high robust RS485 transceiver. NCA3485 is a half-duplex RS-485 transceiver. NCA3491 is a full-duplex RS-485 transceiver. The devices have a 1/8-unit-load receiver input impedance that allows up to 256 transceivers on the bus. The data rate of the device is up to 12Mbps.

The Bus pins are protected from ±10kV system level ESD to GND. These devices feature fail-safe circuitry, which guarantees a logic-high receiver output when the receiver inputs are open or shorted.

Product feature

- Power supply voltage: 3.0V to 5.5V
- High system level EMC performance:
  Bus Pins meet IEC61000-4-2 ±10kV ESD
- Fail-safe protection receiver
- Up to 256 transceivers on the bus
- Operation temperature: -40℃~105℃
- RoHS-compliant packages:
  SOP8
  SOP14

Pinout & Package



Application

Industrial automation system

RS-485 communication

NCA3176:High Robust Half-Duplex 485 Transceiver

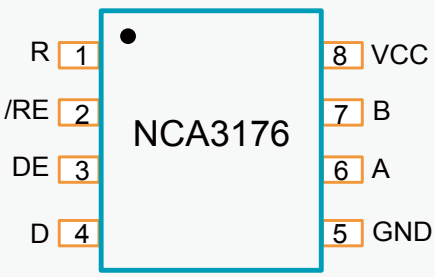
Product introduction

NCA3176 is a half-duplex RS-485 transceiver with high robust. NCA3491 allows up to 256 transceivers on the bus. The data rate of the device is up to 20Mbps. The Bus pins are protected from ±20kV system level ESD to GND, and integrated IEC EFT (Noise Immunity) . These devices feature fail-safe circuitry, which guarantees a logic-high receiver output when the receiver inputs are open or short, and avoid the line faults.

Product feature

- Power supply voltage: 3.0V to 5.5V
- High system level EMC performance:
  Bus Pins meet IEC61000-4-2 ±20kV ESD
- Fail-safe protection receiver
- Up to 256 transceivers on the bus
- Operation temperature: -40℃~125℃
- RoHS-compliant packages:
  SOP-8
  TSSOP-8

Pinout & Package



Pinout & Package

- SOP-8:4.9mm*3.9mm;
- TSSOP-8: 3mm*3mm

Application

Industrial automation system

RS-485 communication

CAN Transceiver

CAN Transceiver

CAN transceiver										
	Part No.	Part No.	Power Supply Voltage	ESD(kV)	Max DataRate (Mbps)	No. of Nodes	Low Power Mode	Operating Temperature Range (℃)	AEC-Q100	Package Type
CAN	NCA1042	NCA1042-DSPR	VIO: 3~5.5V VCC: 4.5~5.5V	8	5	110	Standby	-40~125		SOP-8
	NCA1042B/ A-Q1	NCA1042B-Q1SPR	VIO: 3~5.5V VCC: 4.5~5.5V	8	5	110	Standby	-40~125	✓	SOP-8
		NCA1042A-Q1SPR								
		NCA1042B-Q1DNR								DFN-8
		NCA1042A-Q1DNHR								
	NCA1042BN-Q1	NCA1042BN-Q1SPR	VIO: 3~5.5V VCC: 4.5~5.5V	8	5	110	Standby	-40~125	✓	SOP-8
		NCA1042BN-Q1DNR								DFN-8
	NCA1051	NCA1051-DSPR	VIO: 3~5.5V VCC: 4.5~5.5V	5	5	110	Silent	-40~125		SOP-8
	NCA1051N	NCA1051N-DSPR	VCC: 4.5~5.5V	5	5	110	Silent	-40~125		SOP-8
	NCA1051A-Q1	NCA1051A-Q1SPR	VIO: 3~5.5V VCC: 4.5~5.5V	8	5	110	Silent	-40~125	✓	SOP-8
	NCA1051N-Q1	NCA1051N-Q1SPR	VIO: 3~5.5V VCC: 4.5~5.5V	8	5	110	Silent	-40~125	✓	SOP-8
	NCA1043B-Q1	NCA1043B-Q1SPKR	VBAT: 4.5~40V VIO: 2.8~5.5V VCC: 4.5~5.5V	8	5	110	Standby Sleep	-40~125	✓	SOP-14
		NCA1043B-Q1DNKR								DFN-14
	NCA1145-Q1	NCA1145-Q1SPKR	VBAT: 4.5~28V VIO: 2.85~5.5V VCC: 4.5~5.5V	8	5	110	Standby Sleep	-40~125	✓	SOP-14
		NCA1145-Q1DNKR								DFN-14
	NCA1462-Q1	NCA1462-Q1SPR	VIO: 1.7~5.5V VCC: 4.5~5.5V	8	8	110	Standby	-40~125	✓	SOP8
	NCA1462-Q1	NCA1462-Q1DNR	VIO: 1.7~5.5V VCC: 4.5~5.5V	8	8	110	Standby	-40~125	✓	DFN8
	NCA1044-Q1	NCA1044-Q1SPR	VIO: 1.8~5.5V VCC: 4.5~5.5V	8	5	110	Standby	-40~125	✓	SOP8
	NCA1044-Q1	NCA1044-Q1DNR	VIO: 1.8~5.5V VCC: 4.5~5.5V	8	5	110	Standby	-40~125	✓	DFN8
	NCA1044-Q1	NCA1044N-Q1SPR	VCC: 4.5~5.5V	8	5	110	Standby	-40~125	✓	SOP8
	NCA1044-Q1	NCA1044N-Q1DNR	VCC: 4.5~5.5V	8	5	110	Standby	-40~125	✓	DFN8
	NCA1057-Q1	NCA1057-Q1SPR	VIO: 1.8~5.5V VCC: 4.5~5.5V	8	5	110	NA	-40~125	✓	SOP8
	NCA1057-Q1	NCA1057-Q1DNR	VIO: 1.8~5.5V VCC: 4.5~5.5V	8	5	110	NA	-40~125	✓	DFN8
	NCA1057-Q1	NCA1057N-Q1SPR	VCC: 4.5~5.5V	8	5	110	NA	-40~125	✓	SOP8
	NCA1057-Q1	NCA1057N-Q1DNR	VCC: 4.5~5.5V	8	5	110	NA	-40~125	✓	DFN8
	NCA1042C-Q1	NCA1042C-Q1SPR	VIO: 1.8~5.5V VCC: 4.5~5.5V	8	5	110	Standby	-40~125	✓	SOP8
	NCA1042C-Q1	NCA1042C-Q1DNR	VIO: 1.8~5.5V VCC: 4.5~5.5V	8	5	110	Standby	-40~125	✓	DFN8
	NCA1042C-Q1	NCA1042CN-Q1SPR	VCC: 4.5~5.5V	8	5	110	Standby	-40~125	✓	SOP8
	NCA1042C-Q1	NCA1042CN-Q1DNR	VCC: 4.5~5.5V	8	5	110	Standby	-40~125	✓	DFN8

CAN transceiver										
	Part No.	Part No.	Power Supply Voltage	ESD(kV)	Max DataRate (Mbps)	No. of Nodes	Low Power Mode	Operating Temperature Range (°C)	AEC-Q100	Package Type
CAN	NCA1042C	NCA1042C-DSPR	VIO: 1.8~5.5V VCC: 4.5~5.5V	8	5	110	Standby	-40~125		SOP8
	NCA1042C	NCA1042CN-DSPR	VCC: 4.5~5.5V	8	5	110	Standby	-40~125		SOP8
	NCA1051C	NCA1051C-DSPR	VIO: 1.8~5.5V VCC: 4.5~5.5V	8	5	110	NA	-40~125		SOP8
	NCA1051C	NCA1051CN-DSPR	VCC: 4.5~5.5V	8	5	110	NA	-40~125		SOP8
	NCA1043B-Q1	NCA1043B-Q1SPKR	VBAT:4.5~40V VCC:4.5~5.5V VIO:2.8~5.5V	8	5	110	Standby /Sleep	-40~125	✓	SOP14
	NCA1043B-Q1	NCA1043B-Q1DNKR	VBAT:4.5~40V VCC:4.5~5.5V VIO:2.8~5.5V	8	5	110	Standby /Sleep	-40~125	✓	DFN14

NCA1042: Fail-Safe CAN Transceiver Supporting CAN FD and BUS Wakeup

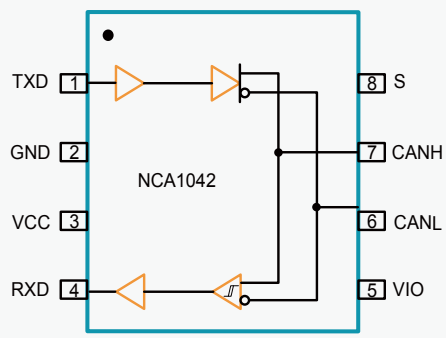
Product introduction

NCA1042 is a high-speed CAN transceiver that provides an interface between a controller area network (CAN) protocol controller and a physical two-wire CAN BUS, it can support at least 110 CAN nodes. NCA1042 implements the CAN physical layer as defined in ISO 11898-2:2016 and SAE J2284-1 to SAE J2284-5. Reliable communication is achieved in CAN FD fast phase networks with data rates up to 5 Mbps. NCA1042 is designed with thermal protection and transmission data explicit timeout protection.

Product feature

- Fully compatible with ISO11898-2
- I/O voltage range supports 3.3V and 5V MCU
- Power supply voltage
  VIO: 3V to 5.5V
  VDD: 4.5V~5.5V
- -70V to +70V BUS fault protection
- Transmission data (TXD) dominant timeout protection
- BUS dominant time out function in standby mode
- Ultra-low current standby mode with wake-up function
- Overcurrent and thermal protection
- Data rate: up to 5Mbps
- Low loop delay: <200ns
- Operating temperature: -40°C to 125°C
- RoHS compliant package: SOP-8

Pinout & Package



Application

Industrial automation, controls, sensors and drive systems

Building, security and climate control automations

Electric bicycle/ electric motorcycle system

Standards for CAN BUS, such as CANopen, DeviceNet, NMEA2000, ARNIC825, ISO11783 and CANaerospace

NCA1042B-Q1: Automotive CAN BUS Transceiver Supporting CAN FD and BUS Wakeup

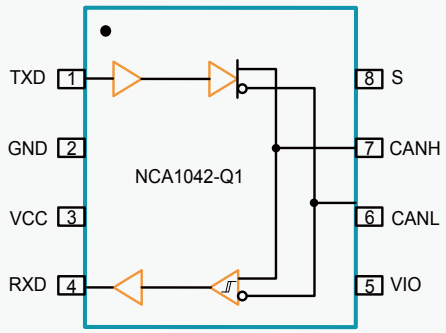
Product introduction

NCA1042B-Q1 is a high-speed CAN transceiver that provides an interface between a controller area network (CAN) protocol controller and a physical two-wire CAN BUS, it can support at least 110 CAN nodes. NCA1042B-Q1 implements the CAN physical layer as defined in ISO 11898-2:2016 and SAE J2284-1 to SAE J2284-5. Reliable communication is achieved in CAN FD fast phase networks with data rates up to 5 Mbps. NCA1042B-Q1 is designed with thermal protection and transmission data explicit timeout protection.

Product feature

- Fully compatible with ISO11898-2
- I/O voltage range supports 3.3V and 5V MCU
- Power supply voltage
  VIO: 3V to 5.5V
  VCC: 4.5V to 5.5V
- -58V to 58V BUS fault protection
- Transmission data (TXD) dominant timeout protection
- BUS dominant time out function in standby mode
- Ultra-low current standby mode with wake-up function
- Overcurrent and thermal protection
- Data rate: up to 5Mbps
- Low loop delay: <200ns
- Operating temperature: -40°C to 125°C
- AEC-Q100 certified
- RoHS compliant package: SOP-8, DFN-8

Pinout & Package



Application

Automotive
and Transportation

NCA1051/N: Fail-Safe CAN Transceiver Supporting CAN FD and BUS Wakeup

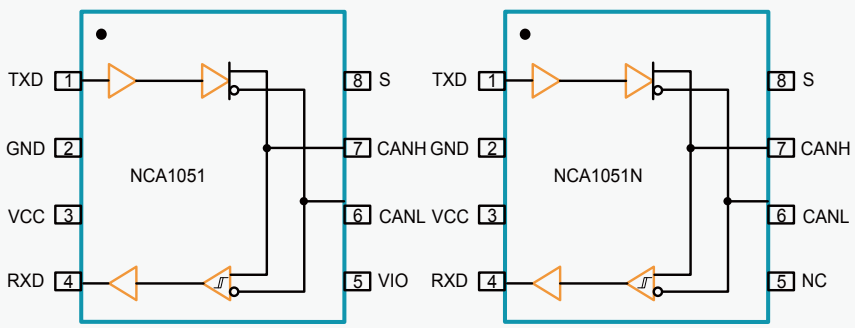
Product introduction

NCA1051/N is a high-speed CAN transceiver that provides an interface between a controller area network (CAN) protocol controller and a physical two-wire CAN BUS, it can support at least 110 CAN nodes. NCA1051 implements the CAN physical layer as defined in ISO 11898-2:2016 and SAE J2284-1 to SAE J2284-5. Reliable communication is achieved in CAN FD fast phase networks with data rates up to 5 Mbps. The NCA1051 provides thermal protection and transmit data dominant time out function. These features make the NCA1051 an excellent choice for all types of HS-CAN networks, in nodes that do not require a silent mode with wake-up capability via the BUS.

Product feature

- Fully compatible with ISO11898-2
- Ideal passive behavior to the CAN BUS when the supply voltage is off
- I/O voltage range supports 3.3V and 5V MCU
- Power supply voltage
- VIO (NCA1051): 3V to 5.5V
  VCC: 4.5V to 5.5V
- -45V to 45V BUS fault protection
- Transmission data (TXD) dominant timeout protection
- Overcurrent and thermal protection
- Data rate: up to 5Mbps
- Low loop delay: <200ns
- Operating temperature: -40°C to 125°C
- RoHS compliant package: SOP-8

Pinout & Package



Application

5Mbps operation in highly loaded CAN networks down to 10 kbps networks using TXD DTO

Industrial automation, controls, sensors and drive systems

Building, security and climate control automations

Standards for CAN BUS, such as CANopen, DeviceNet, NMEA2000, ARNIC825, ISO11783 and CANaerospace

NCA1043B-Q1: Automotive CAN BUS Transceiver Supporting CAN FD and Battery Back-up

Product introduction

NCA1043B-Q1 is a high-speed CAN transceiver that provides an interface between a controller area network (CAN) protocol controller and a physical two-wire CAN BUS, it can support at least 110 CAN nodes. NCA1043B-Q1 is designed to meet the requirements of high-speed CAN applications in the automotive industry, providing differential transmit and receive capability to (a microcontroller with) a CAN protocol controller. The NCA1043B-Q1 offers excellent Electro Magnetic Compatibility (EMC) and ElectroStatic Discharge (ESD) performance, ultra-low power consumption and passive performance when the power supply voltage is off. Further features include:

○ Low-power management controls the power supply throughout the node while supporting local and remote wake-up with wake-up source recognition

○ Various protection and diagnostic functions, including BUS short circuit detection and battery connection detection

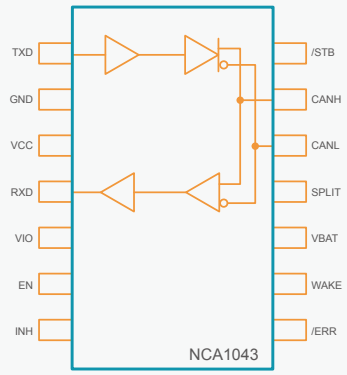
○ Supporting MCU of 3V to 5V

NCA1043B-Q1 implements the CAN physical layer as defined in ISO 11898-2:2016 and SAE J2284-1 to SAE J2284-5. Reliable communication is achieved in CAN FD fast phase networks with data rates up to 5 Mbps. The NCA1043B-Q1 provides thermal protection and transmit data dominant time out function. These features make the NCA1043B-Q1 the ideal choice for high speed CAN networks containing nodes that need to be available all times, even when the internal VIO and VCC supplies are switched off.

Product feature

- ○ Fully compatible with ISO11898-2/-5
- ○ Standby and sleep modes
- ○ Even if the whole node loses power, the local and remote wake-up functions are still supported
- ○ Suitable for 12 V and 24 V systems
- ○ Data rate up to 5 Mbps
- ○ Power supply voltage
  VBAT: 4.5V to 40V
  VCC: 4.5V to 5.5V
  VIO: 2.8V~5.5V
- ○ -58V to 58V BUS fault protection
- ○ Common mode voltage range: ± 30V
- ○ Low loop delay: <250ns
- ○ BUS pins support 8kV HBM ESD, 4kV IEC
- ○ Low power consumption standby mode: 10μA
- ○ Undervoltage and overtemperature protection
- ○ Operating temperature: -40°C to 125°C
- ○ AEC-Q100 certified
- ○ RoHS compliant package: SOP-14, DFN-14

Pinout & Package



Application

Applicable to 12V/24V system

Vehicle and transportation

Advanced driver assistance system(ADAS)

Infotainment system

Instrument cluster

Body Electronics and Lighting

NCA1145-Q1: Automotive CAN BUS Transceiver Supporting CAN FD and Local Interconnect

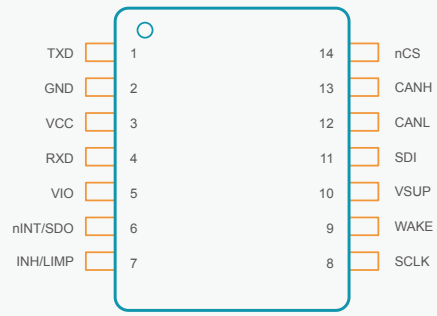
Product introduction

NCA1145-Q1 is a high-speed CAN transceiver that provides an interface between a controller area network (CAN) protocol controller and a physical two-wire CAN BUS. NCA1145-Q1 is designed to meet the requirements of high-speed CAN applications in the automotive industry, and can provide the function of sending and receiving differential signals for the CAN protocol controller (in the micro-controller). NCA1145-Q1 supports selective wake-up, which allows the system to realize local networking and run with fewer nodes in the active state, while the remaining nodes are in low-power sleep mode. NCA1145-Q1 is designed with VIO pins and support MCU of 3.3V/5V. The above mentioned features make NCA1145-Q1 a good choice for high-speed CAN networks. The nodes of these networks are always connected to the battery power lines, but in order to reduce power consumption as much as possible, they will only become active when required by the applications.

Product feature

- Fully compatible with ISO11898-2/-5
- Standby and sleep modes
- Remote wake-up can be realized through standard CAN wake-up mode or selective wake-up frame detection.
- Local wake-up can be realized through WAKE pin
- Data rate up to 5 Mbps
- Power supply voltage
  VBAT: 4.5V to 28V
  VCC: 4.5V to 5.5V
  VIO: 2.8V~5.5V
- -58V to 58V BUS fault protection
- Common mode voltage range: ± 30V
- Low loop delay: <250ns
- BUS pins support 8kV HBM ESD, 4kV IEC
- Low power consumption standby mode: 10μA
- Operating temperature: -40°C to 125°C
- AEC-Q100 certified
- RoHS compliant package: SOP-14, DFN-14

Pinout & Package



Application

Body Electronics and Lighting

Automotive Infotainment System and Instrument Cluster

Hybrid, electric and powertrain systems

Industrial transportation

NCA1462-Q1: Automotive CAN SIC with Ringing Suppression Function

Product introduction

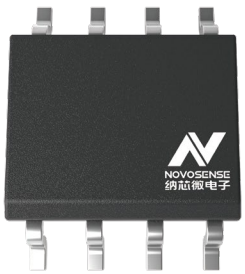
NCA1462-Q1 is a high-speed CAN transceiver with Normal and Standby modes and a VIO supply pin. It meets the physical layer requirements of the ISO 11898-2:2016 high speed CAN specification and the CiA 601-4 Signal Improvement Capability (SIC) specification, and are fully interoperable with high-speed Classical CAN and CAN FD transceivers.

The CAN signal improvements significantly reduce signal ringing on the network, enabling reliable CAN FD communication at 5 Mbps in larger topologies. In addition, the NCA1462-Q1 has a much tighter bit timing symmetry, enabling CAN FD communication up to 8 Mbps.

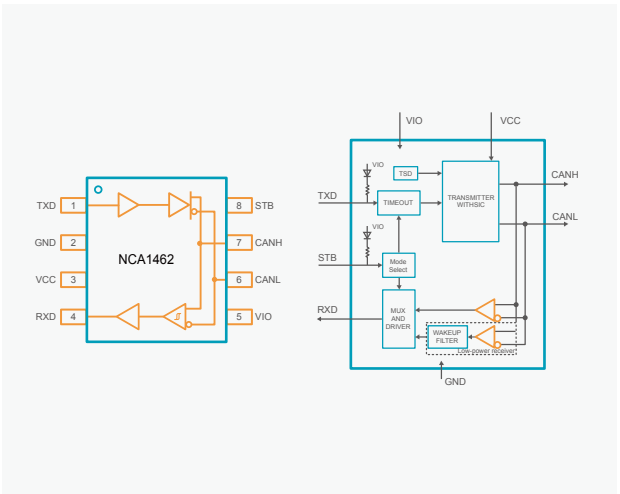
The NCA1462-Q1 is intended as a simple replacement for high-speed Classical CAN and CAN FD transceivers, such as the NCA1042.

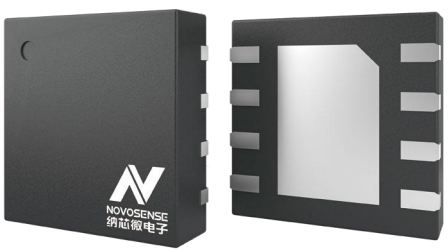
Product feature

- ISO 11898-2 and CiA601-4 and CAN SIC
- AEC-Q100 qualified, Grade 1
- Compatible with Data Rate up to 8Mbps
- DC Bus-Fault Protection: ±58V
- Common Mode Range: ±30V
- VIO support: down to 1.7V, up to 5.5V
- Package: SOP8, DFN8



Pinout & Package





Application

- Automotive gateway
- Body control modules
- Advanced Driver Assistance Systems (ADAS)
- Infotainment
- Cluster

NCA1044-Q1: Automotive High-speed CAN Transceiver with Standby Mode

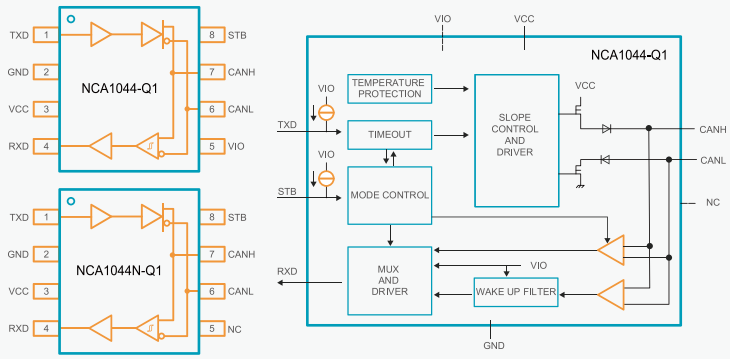
Product introduction

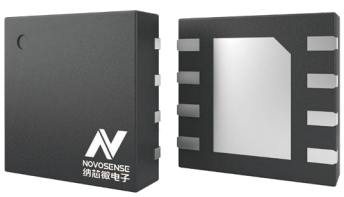
The NCA1044-Q1 is a high-speed CAN transceiver that provides an interface between a Controller Area Network (CAN) protocol controller and the physical two-wire CAN bus. The NCA1044-Q1 implements the CAN physical layer as defined in ISO 11898-2:2016 and SAE J2284-1 to SAE J2284-5. This implementation enables reliable communication in the CAN FD fast phase at data rates up to 5 Mbit/s. The NCA1044-Q1 provides thermal protection and transmit data dominant time out function.

Product feature

- ISO 11898-2 conformed
- AEC-Q100 qualified, Grade 1
- Compatible with Data Rate up to 5Mbps
- DC Bus-Fault Protection: ±58V
- Common Mode Range: ±30V
- VIO support: down to 1.8V, up to 5.5V
- Package: SOP8, DFN8

Pinout & Package





Application

- Highly loaded CAN networks down to 10 kbps networks
- Automotive gateway
- Body control modules
- Advanced Driver Assistance Systems (ADAS)
- Infotainment system

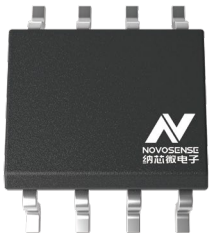
NCA1057-Q1: Automotive High-speed CAN Transceiver

Product introduction

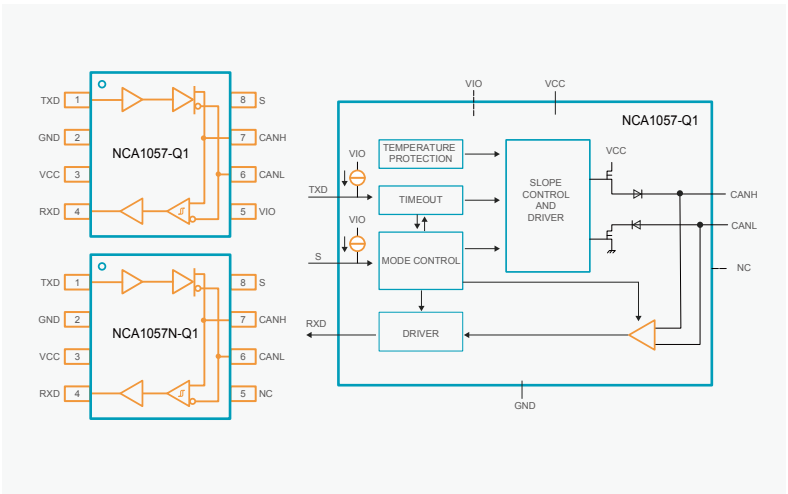
The NCA1057-Q1 is a high-speed CAN transceiver that provides an interface between a Controller Area Network (CAN) protocol controller and the physical two-wire CAN bus. The NCA1057-Q1 implements the CAN physical layer as defined in ISO 11898-2:2016 and SAE J2284-1 to SAE J2284-5. This implementation enables reliable communication in the CAN FD fast phase at data rates up to 5 Mbit/s. The NCA1057-Q1 provides thermal protection and transmit data dominant time out function.

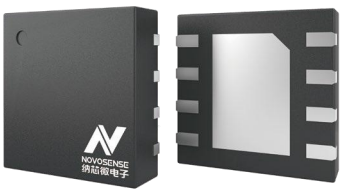
Product feature

- ISO 11898-2 conformed
- AEC-Q100 qualified, Grade 1
- Compatible with Data Rate up to 5Mbps
- DC Bus-Fault Protection: ±58V
- Common Mode Range: ±30V
- VIO support: down to 1.8V, up to 5.5V
- Package: SOP8, DFN8



Pinout & Package





Application

- Highly loaded CAN networks down to 10 kbps networks
- Automotive gateway
- Body control modules
- Advanced Driver Assistance Systems (ADAS)
- Infotainment system

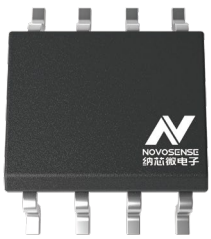
NCA1042C-Q1: Automotive High-speed CAN Transceiver with Standby Mode

Product introduction

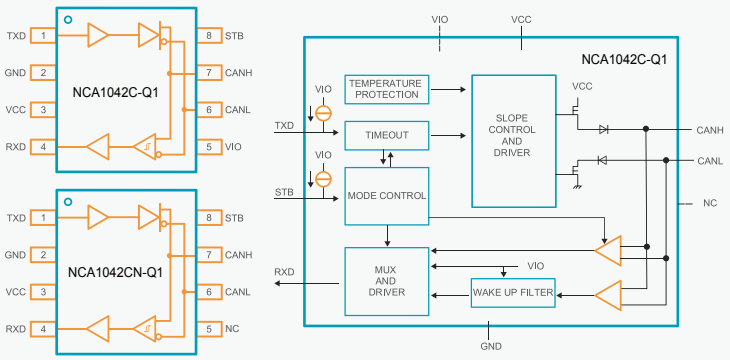
The NCA1042C-Q1 is a high-speed CAN transceiver that provides an interface between a Controller Area Network (CAN) protocol controller and the physical two-wire CAN bus. The NCA1042C-Q1 implements the CAN physical layer as defined in ISO 11898-2:2016 and SAE J2284-1 to SAE J2284-5. This implementation enables reliable communication in the CAN FD fast phase at data rates up to 5 Mbit/s. The NCA1042C-Q1 provides thermal protection and transmit data dominant time out function.

Product feature

- ISO 11898-2 conformed
- AEC-Q100 qualified, Grade 1
- Compatible with Data Rate up to 5Mbps
- DC Bus-Fault Protection: ±58V
- Common Mode Range: ±30V
- VIO support: down to 1.8V, up to 5.5V
- Package: SOP8, DFN8



Pinout & Package



Application

- Highly loaded CAN networks down to 10 kbps networks
- Automotive gateway
- Body control modules
- Advanced Driver Assistance Systems (ADAS)
- Infotainment system

NCA1042C: High-speed CAN Transceiver with Standby Mode

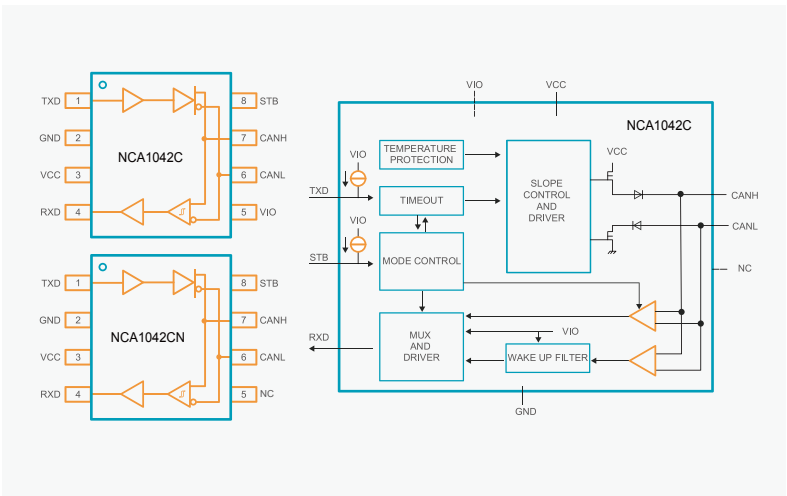
Product introduction

The NCA1042C is a high-speed CAN transceiver that provides an interface between a Controller Area Network (CAN) protocol controller and the physical two-wire CAN bus. The NCA1042C implements the CAN physical layer as defined in ISO 11898-2:2016 and SAE J2284-1 to SAE J2284-5. This implementation enables reliable communication in the CAN FD fast phase at data rates up to 5 Mbit/s. The NCA1042C provides thermal protection and transmit data dominant time out function.

Product feature

- ISO 11898-2 conformed
- Improve the bus signal by reducing ringing
- Compatible with Data Rate up to 5Mbps
- DC Bus-Fault Protection: ±70V
- Common Mode Range: ±30V
- VIO support: down to 1.8V, up to 5.5V
- Package: SOP8

Pinout & Package



Application

Highly loaded CAN networks down to 10 kbps networks

Industrial automation, control, sensors, and drive systems

Building, security, and climate control automation

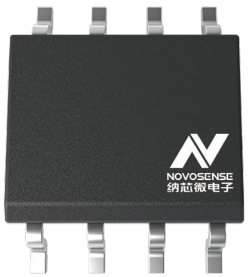
NCA1051C: High-speed CAN Transceiver

Product introduction

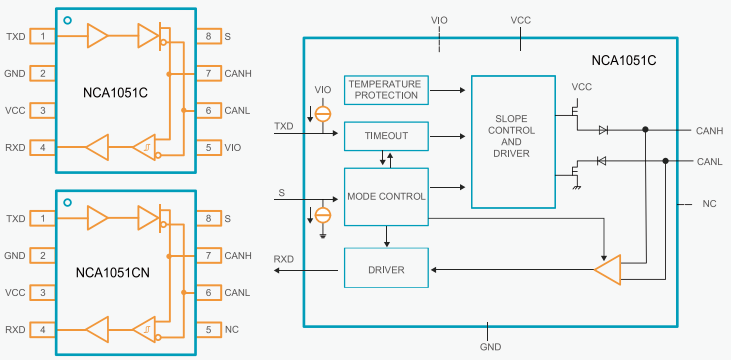
The NCA1051C is a high-speed CAN transceiver that provides an interface between a Controller Area Network (CAN) protocol controller and the physical two-wire CAN bus. The NCA1051C implements the CAN physical layer as defined in ISO 11898-2:2016 and SAE J2284-1 to SAE J2284-5. This implementation enables reliable communication in the CAN FD fast phase at data rates up to 5 Mbit/s. The NCA1051C provides thermal protection and transmit data dominant time out function.

Product feature

- ISO 11898-2 conformed
- Compatible with Data Rate up to 5Mbps
- DC Bus-Fault Protection: ±70V
- Common Mode Range: ±30V
- VIO support: down to 1.8V, up to 5.5V
- Package: SOP8



Pinout & Package



Application

Highly loaded CAN networks down to 10 kbps networks

Industrial automation, control, sensors, and drive systems

Building, security, and climate control automation

NCA1043B-Q1: Automotive High Speed CAN with Standby and Sleep Mode

Product introduction

The NCA1043B high-speed CAN transceiver provides an interface between a Controller Area Network (CAN) protocol controller and the physical two-wire CAN bus. The transceiver is designed for high-speed CAN applications in the automotive industry, providing differential transmit and receive capability to (a microcontroller with) a CAN protocol controller.

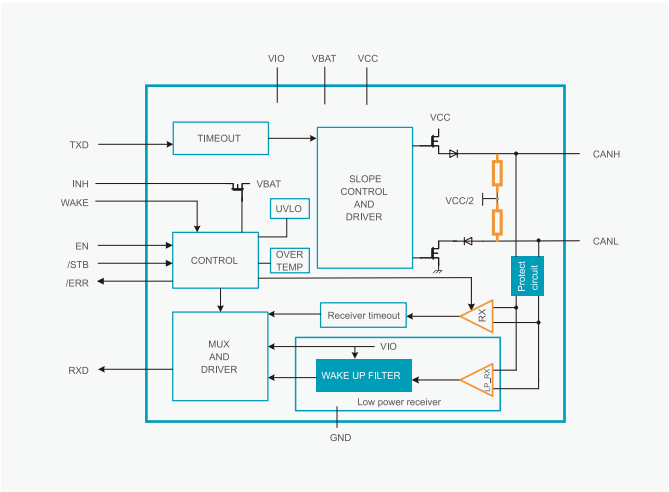
The NCA1043B offers excellent Electro Magnetic Compatibility (EMC) and ElectroStatic Discharge (ESD) performance, very low power consumption, and passive behavior when the supply voltage is turned off.

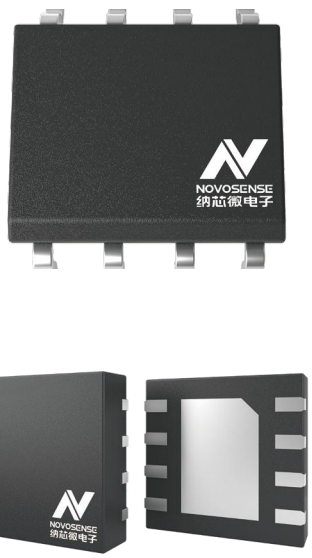
These features make the NCA1043B the ideal choice for high-speed CAN networks containing nodes that need to be available all times, even when the internal VIO and VCC supplies are switched off.

Product feature

- ISO11898-2 standard and SAE J2284-1 to SAE J2284-5
- AEC-Q100 Qualified
- I/O voltage range supports 3V and 5V MCU
- DC Bus-Fault Protection: ±58V
- Transmit data (TXD) dominant time out function
- Bus dominant time out function
- Low-power management controls the power supply throughout the node while supporting local and remote wake-up with wake-up source recognition
- Package: SOP14, DFN14

Pinout & Package





Application

- 12-V or 24-V System applications
- Advanced Driver Assistance Systems (ADAS)
- Infotainment
- Cluster
- Body electronics & lighting

LIN Transceiver

LIN Transceiver

LIN transceiver										
	Part No.	Part No.	Power Supply Voltage	ESD(kV)	Max DataRate (kbps)	BUS Voltage Protection	Wake-up	Operating Temperature Range (℃)	AEC-Q100	Package Type
LIN	NCA1021 S-Q1	NCA1021 S-Q1SPR	VBAT: 5.5~27V	8	20	-40~+40	Local/Remote	-40~150	✓	SOP14
		NCA1021 S-Q1DNR	VBAT: 5.5~27V	8	20	-40~+40	Local/Remote	-40~150	✓	DFN14

NCA1021S-Q1: Automotive LIN BUS Transceiver

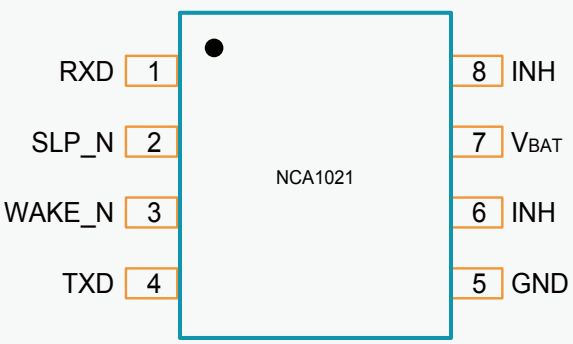
Product introduction

NCA1021S-Q1 is a LIN transceiver that supports low power consumption and multiple wake-up functions, supporting up to 20kbps for sending and receiving communication. NCA1021S-Q1 is designed with a low power consumption sleep mode and supports remote and local wake-up functions via LIN BUS or other pins. The device can also use the INH output pin as a flag to control the working status of other devices in the local system to achieve low-power operation of the system. NCA1021S-Q1 controls the status of the LIN BUS through the TXD pin and reports the status of the BUS through its open drain RXD output pin. The device converts the signal received by TXD into a LIN BUS signal through waveform shaping and slew rate adjustment to reduce Electro Magnetic Emission (EME).

Product feature

- Fully compatible with ISO17987-4
- Ultra-low electromagnetic emission (EME)
- Supporting 12V systems
- Input level compatible with 3.3V and 5 V devices
- -40V to 40V BUS fault protection
- Wake-up source identification (local or remote)
- Integrated with LIN pull-up resistor
- Transmit data (TXD) dominant time out function
- Date rate: up to 20Kbps
- AEC-Q100 certified
- Operating temperature: -40°C to 150°C
- RoHS compliant package: SOP-8

Pinout & Package



Application

Body Electronics and Lighting

Automotive Infotainment System and Instrument Cluster

Hybrid, electric and powertrain systems

Digital Isolator

Digital Isolator

NSI82xx Series High Performance Multi-Channel Digital Isolator Chip

Speed 150Mbps; Propagation delay 10ns; Output and input voltage range 2.5 to 5.5V; Operating temperature range -40 to 125 °C, and it has passed UL1577 certification

	Part No.	Part No.	ISO Rating (kVrms)	Forward/Reverse Channels	Max DataRate (Mbps)	Default Output		AEC-Q100	Package Type
						LOW	HIGH		
Single Channe	NSI8210	NSI8210Nx	3.75	1/0	150	✓	✓	✓	SOP-8
		NSI8210Dx	2	1/0	150	✓	✓		DFN-8
Dual Channel	NSI8220	NSI8220Nx	3.75	2/0	150	✓	✓	✓	SOP-8
		NSI8220Wx	5	2/0	150	✓	✓	✓	SOP-8
			5.7						SOW-16
									SOWW-16
	NSI8221	NSI8221Nx	3.75	1/1	150	✓	✓	✓	SOP-8
		NSI8221Wx	5	1/1	150	✓	✓	✓	SOW-8
			5.7						SOW-16
									SOWW-16
	NSI8222	NSI8222Nx	3.75	0/2	150	✓	✓	✓	SOP-8
		NSI8222Wx	5	0/2	150	✓	✓	✓	SOW-8
			5.7						SOW-16
									SOWW-16
Triple Channel	NSI8230	NSI8230Wx	5	3/0	150	✓	✓	✓	SOW-16
			5.7						SOWW-16
	NSI8231	NSI8240Wx	5	3/1	150	✓	✓	✓	SOW-16
			5.7						SOWW-16
Quad Channel	NSI8240	NSI8240Wx	5	4/0	150	✓	✓	✓	SOW-16
			5.7						SOWW-16
		NSI8240Sx	3	4/0	150	✓	✓		SSOP-16
		NSI8240Nx	3.75	4/0	150	✓	✓	✓	SOP-16
	NSI8241	NSI8241Wx	5	3/1	150	✓	✓	✓	SOW-16
			5.7						SOWW-16
		NSI8241Sx	3	3/1	150	✓	✓	✓	SSOP-16
		NSI8241Nx	3.75	3/1	150	✓	✓		SOP-16
	NSI8242	NSI8242Wx	5	2/2	150	✓	✓	✓	SOW-16
			5.7						SOWW-16
		NSI8242Sx	3	2/2	150	✓	✓	✓	SSOP-16
		NSI8242Nx	3.75	2/2	150	✓	✓		SOP-16
Six Channel	NSI8260	NSI8260Wx	5	6/0	150	✓	✓	✓	SOW-16
		NSI8260Sx	3	6/0	150	✓	✓	✓	SSOP-16
	NSI8261	NSI8261Wx	5	5/1	150	✓	✓	✓	SOW-16
		NSI8261Sx	3	5/1	150	✓	✓	✓	SSOP-16
	NSI8262	NSI8262Wx	5	4/2	150	✓	✓	✓	SOW-16
		NSI8262Sx	3	4/2	150	✓	✓	✓	SSOP-16
	NSI8263	NSI8263Wx	5	3/3	150	✓	✓	✓	SOW-16
		NSI8263Sx	3	3/3	150	✓	✓	✓	SSOP-16
	NSI8266	NSI8266Wx	5	0/6	150	✓	✓		SOW-16
		NSI8266Sx	3	0/6	150	✓	✓	✓	SSOP-16

NSI82xxC Series Cost-effective Multi-Channel Digital Isolator Chip

Speed 150Mbps; Propagation delay 10ns; Output and input voltage range 2.5 to 5.5V; Operating temperature range -40 to 125 °C, and it has passed UL1577 certification

	Part No.	Part No.	ISO Rating (kVrms)	Forward /Reverse Channels	Max DataRate (Mbps)	Default Output		Package Type
						LOW	HIGH	
Single Channe	NSI8210	NSI8210Cx-DSPR	3.75	1/0	100	✓	✓	SOP-8
		NSI8210Cx-DSWVR	5	1/0	100	✓	✓	SOW-8
Dual Channel	NSI8220	NSI8220Cx-DSPR	3.75	2/0	100	✓	✓	SOP-8
		NSI8220Cx-DSWVR	5	2/0	100	✓	✓	SOW-8
		NSI8220Cx-DSWR	5	2/0	100	✓	✓	SOW-16
	NSI8221	NSI8221Cx-DSPR	3.75	1/1	100	✓	✓	SOP-8
		NSI8221Cx-DSWVR	5	1/1	100	✓	✓	SOW-8
		NSI8221Cx-DSWR	5	1/1	100	✓	✓	SOW-16
	NSI8222	NSI8222Cx-DSPR	3.75	0/2	100	✓	✓	SOP-8
		NSI8222Cx-DSWVR	5	0/2	100	✓	✓	SOW-8
		NSI8222Cx-DSWR	5	0/2	100	✓	✓	SOW-16
Triple Channel	NSI8230	NSI8230Cx-DSWR	5	3/0	100	✓	✓	SOW-16
	NSI8231	NSI8231Cx-DSWR	5	2/1	100	✓	✓	SOW-16
Quad Channel	NSI8240	NSI8240Cx-DSPR	3.75	4/0	100	✓	✓	SOIC-16N
		NSI8240Cx-DSWR	5	4/0	100	✓	✓	SOW-16
	NSI8241	NSI8241Cx-DSWR	5	3/1	100	✓	✓	SOW-16
	NSI8242	NSI8242Cx-DSWR	5	2/2	100	✓	✓	SOW-16
Six Channel	NSI8260	NSI8260Cx-DSWR	5	6/0	100	✓	✓	SOW-16
	NSI8261	NSI8261Cx-DSWR	5	5/1	100	✓	✓	SOW-16
	NSI8262	NSI8262Cx-DSWR	5	4/2	100	✓	✓	SOW-16
	NSI8263	NSI8263Cx-DSWR	5	3/3	100	✓	✓	SOW-16
	NSI8266	NSI8266Cx-DSWR	5	0/6	100	✓	✓	SOW-16

NIRSxx Series Low Cost Multi-Channel Digital Isolator Chip with Basic Insulation But High Reliability

Output and input voltage range 2.5 to 5.5V; Operating temperature range -40 to 125 °C, and it has passed UL1577 certification

	Part No.	ISO Rating (kVrms)	Forward/Reverse Channels	Max DataRate (Mbps)	CMTI(kV/us)	Default Output		Package Type
						LOW	HIGH	
Dual Channel	NIRS20N1-DSPR	3	2/0	1	100		✓	SOP-8
	NIRS21N1-DSPR	3	1/1	1	100		✓	SOP-8
	NIRS22N1-DSPR	3	0/2	1	100		✓	SOP-8
Triple Channel	NIRS31-DSSR	3	2/1	1	100		✓	SSOP-16

NSI822X/ NSI823X/NSI824X/NSI826X: Enhanced Dual/Triple/Quad/ Six-Channel Digital Isolators with High Reliability

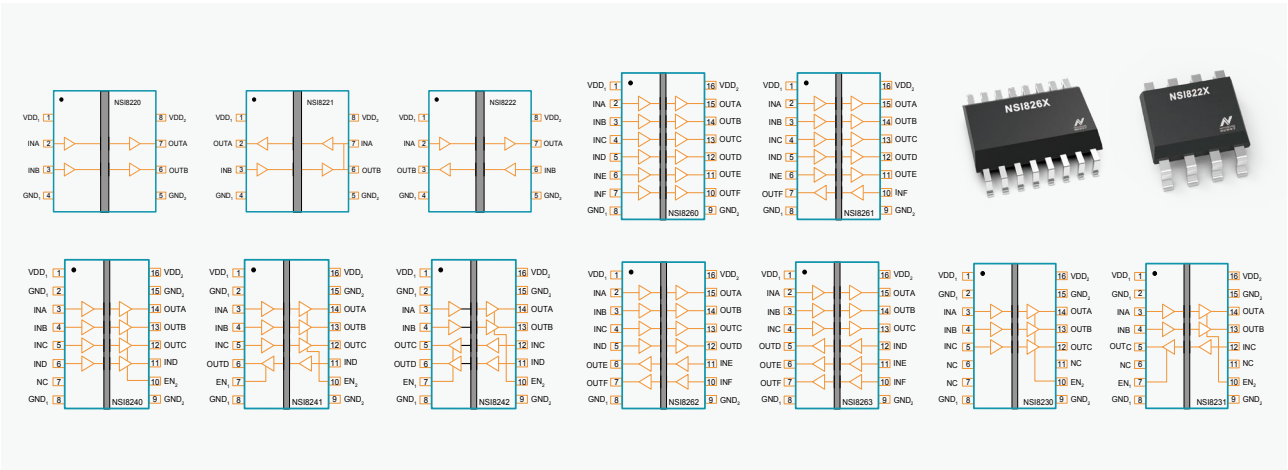
Product introduction

NSI822X/NSI823X/NSI824X/NSI826X are cost-effective dual/triple/quad/six-channel digital isolators with high reliability This series of products have passed UL1577 safety certification, support several insulation withstand voltage (3kVrms, 3.75kVrms, 5kVrms, 5.7kVrms), while providing high electromagnetic immunity and low emissions at low power consumption. The data rate of the product is up to 150Mbps, and the common mode transient immunity (CMTI) is up to 200kV/us. It provides digital channel direction configuration and the default output level configuration when the input power is lost. The wide power supply voltage range of this series of devices supports direct connection with most digital interfaces, making it easy for level conversion. Excellent system-level EMC performance improves operation reliability and stability. AEC-Q100 (level 1) options are available for all devices.

Product feature

- Isolation withstand voltage 3000Vrms, 3750Vrms, 5000Vrms, 5700Vrms
- VDE Reinforced Isolation Certification
- Date rate: DC to 150Mbps
- High CMTI: ±200kV/μs
- AEC Q100 (Grade 1) is applicable to all devices
- Chip-level ESD: HBM: ±8kV
- Enhanced ESD, EFT, surge protection at system level
- Lifetime of isolated gate: > 60 years
- Low propagation delay typical <15ns
- Low power consumption: 1.5mA/ch (1 Mbps)
- Operating temperature: -55 to 125°C
- RoHS-compliant packages: SOP-8, SOP-16, SSOP-16, SOW-8, SOW-16, and SOWW-16

Pinout & Package



Application

- Industrial automation system
- Isolation interface, such as SPI.RS232 RS485 CAN
- General-purpose multichannel isolation
- Motor control
- Power transmission
- Communication

NSI822XC/ NSI823XC/NSI824XC/NSI826XC: Cost-effective Enhanced Dual/Triple/Quad/Six-Channel Digital Isolators with High Reliability

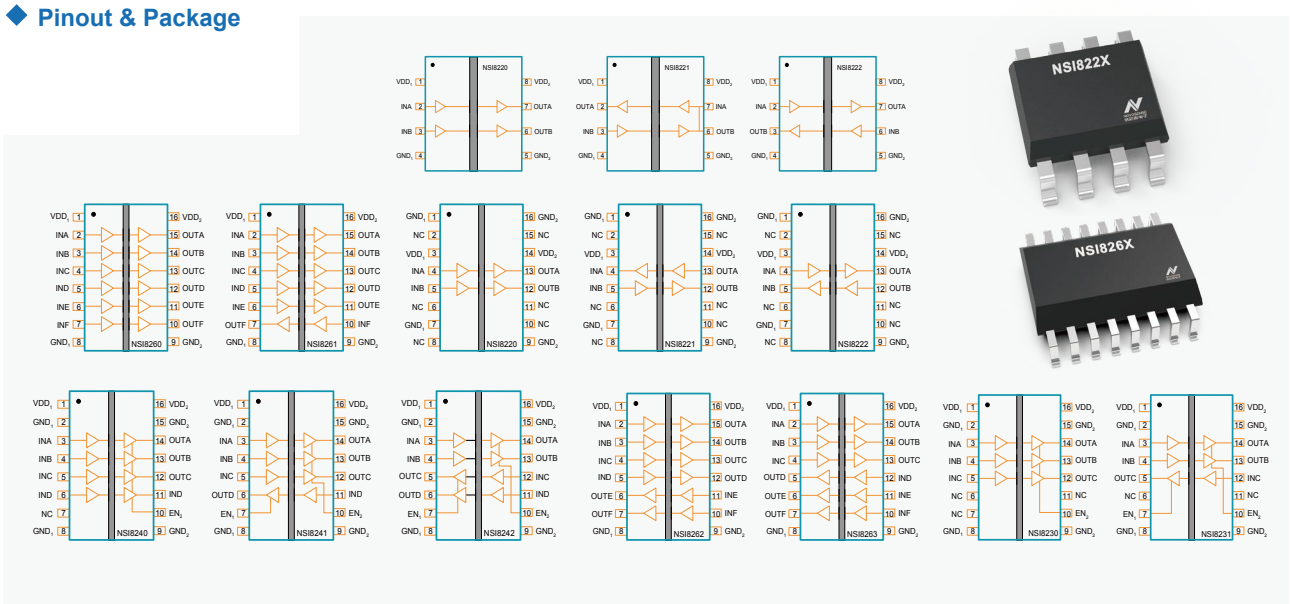
Product introduction

NSI822XC/NSI823XC/NSI824XC/NSI826XC are cost-effective dual/triple/quad/six-channel digital isolators with high reliability. This series of products have passed UL1577 safety certification, several insulation withstand voltage (3.75kVrms, 5kVrms), while providing high electromagnetic immunity and low emissions at low power consumption. The data rate of the product is up to 100Mbps, and the common mode transient immunity (CMTI) is up to 200kV/us. It provides digital channel direction configuration and the default output level configuration when the input power is lost. The wide power supply voltage range of this series of devices supports direct connection with most digital interfaces, making it easy for level conversion. Excellent system-level EMC performance improves operation reliability and stability. The MSL rating of the device is MSL 3.

Product feature

- Isolation withstand voltage 3750Vrms, 5000VRMs
- VDE Reinforced Isolation Certification
- Date rate: DC to 100Mbps
- High CMTI: ±150kV/μs
- Chip-level ESD: HBM: ±8kV
- Enhanced ESD, EFT, surge protection at system level
- Lifetime of isolated gate: > 60 years
- Low propagation delay typical <15ns
- Low power consumption: 1.5mA/ch(1 Mbps)
- Operating temperature: -40 to 125°C
- RoHS compliant package: SOP-8, SOW-8, SOW-16

Pinout & Package



Application

Industrial automation system

Isolation interface, such as SPI.RS232 RS485 CAN

General-purpose multichannel isolation

Motor control

Power transmission

Communication

NIRS2x: Cost-optimized Dual-channel Digital Isolator with High Reliability

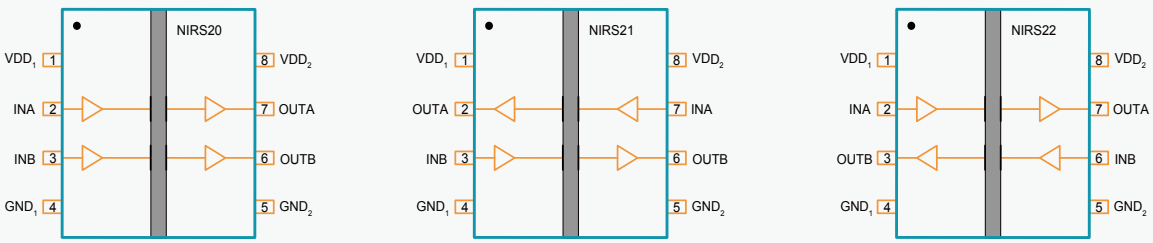
Product introduction

NIRS2x is a cost-optimized dual-channel digital isolator with high reliability. The NIRS2x device is safety certified by UL1577 support 3kVrms insulation withstand voltages, while providing high electromagnetic immunity and low emissions at low power consumption. The data rate of NIRS2x is up to 500kbps, and the common mode transient immunity (CMTI) is up to 100kV/us. NIRS2x allows digital channel direction configuration and provide a default output high level when input power is lost. The wide power supply voltage range of NIRS2x supports direct connection with most digital interfaces, making it easy for level conversion. Its high system-level EMC performance enhances its reliability and stability.

Product feature

- Up to 3000Vrms insulation voltage
- Date rate: DC to 500kbps
- Power supply voltage: 2.5V to 5.5V
- High CMTI: ±100kV/μs
- Chip-level EMC performance: HBM: ±6kV
- High system level EMC performance: Enhanced system level ESD, EFT, and surge immunity
- Maximum Surge Isolation Voltage VIOSM=6153Vpk
- Low power consumption: 1mA/ch (500kbps)
- Low transmission delay:<500ns
- Lifetime of isolated gate: > 60 years
- Operating temperature: -40°C to 125°C
- RoHS compliant package: SOP-8

Pinout & Package



Application

- Industrial automation system
- Communication via isolated SPI, RS-232, RS-485
- General-purpose multichannel isolation
- Motor control

NIRS31: Cost-optimized Triple-channel Digital Isolator with High Reliability

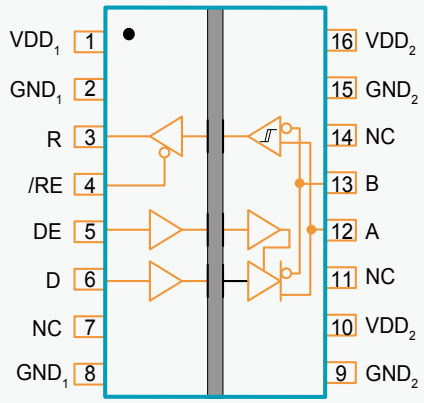
Product introduction

NIRS31 is a cost-optimized triple-channel digital isolator. The NIRS31 device is safety certified by UL1577 support several insulation withstand voltages (3.00kVrms), while providing high electromagnetic immunity and low emissions at low power consumption. The data rate of NIRS31 is up to 1Mbps, and the common mode transient immunity (CMTI) is up to 100kV/us. NIRS31 allows digital channel direction configuration and provide a default output high level when input power is lost. The wide power supply voltage range of NIRS31 supports direct connection with most digital interfaces, making it easy for level conversion. Its high system-level EMC performance enhances its reliability and stability.

Product feature

- Up to 3000Vrms insulation voltage
- Date rate: DC to 1Mbps
- Power supply voltage: 2.5V to 5.5V
- High CMTI: ±100kV/μs
- Chip-level ESD: HBM: ±6kV
- Isolation surge withstand voltage:>5kV
- Low power consumption: 1.5mA/ch (1Mbps)
- Low transmission delay:<500ns
- Lifetime of isolated gate: > 60 years
- Operating temperature: -40°C to 125°C
- RoHS compliant package: SSOP-16

Pinout & Package



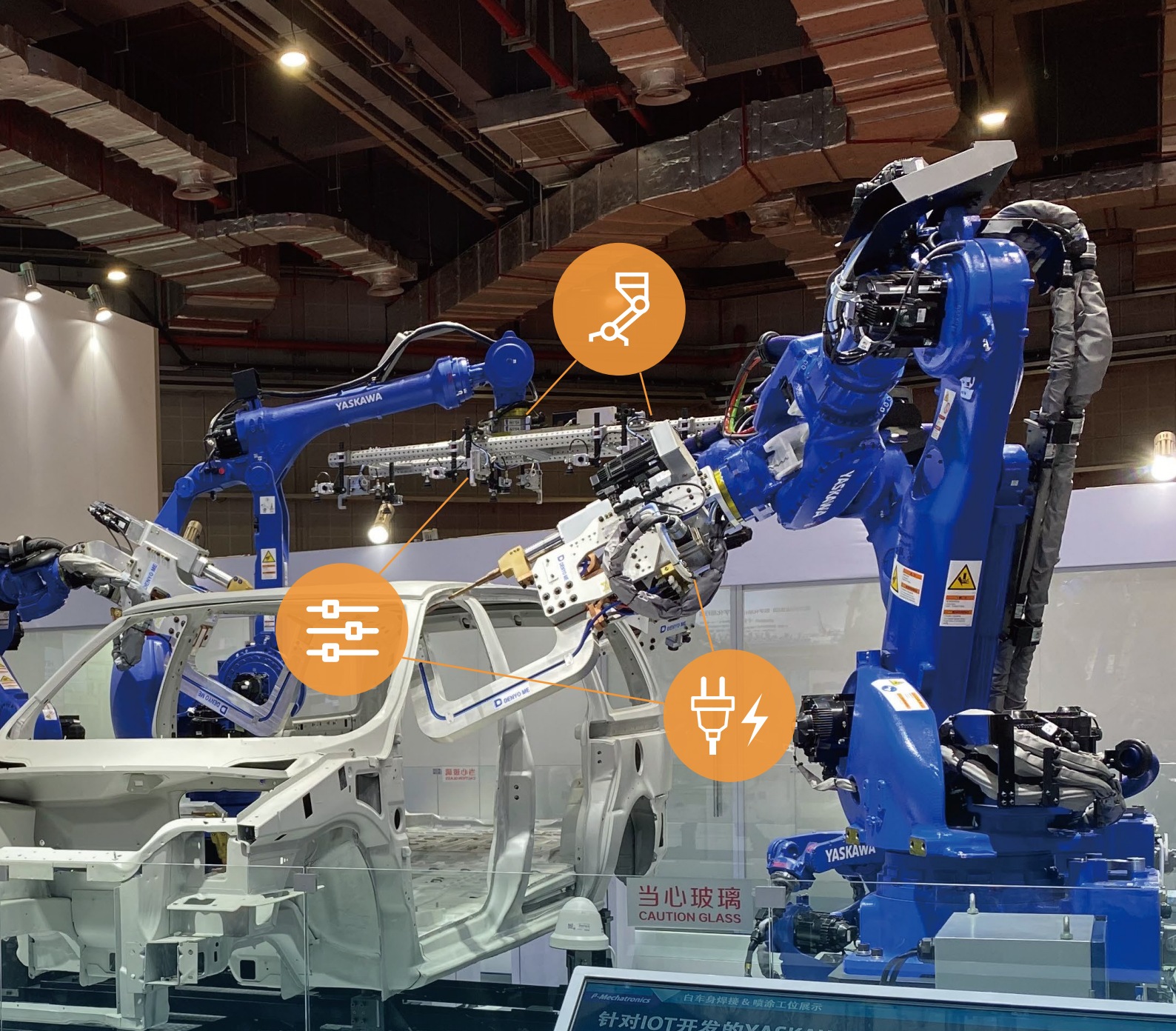
NIRS31

Application

Battery management system

Isolated 485/232 communication system

Smart ammeters and water meters



Digital Isolator with Integrated Isolated Power Supply

Digital Isolator with Integrated Isolated Power Supply

NSIP88xx/NSIP89xx Series Multi-Channel Digital Isolator Chip with Integrated Isolated Power Supply Speed 150Mbps; Propagation delay 10ns; Output and input voltage range 3.3 to 5.5V; Operating temperature range -40 to 125°C, and it has passed UL1577 certification										
	Part No.	Part No.	ISO Rating (kVrms)	Forward/ Reverse Channels	Max DataRate (Mbps)	Default Output		CMTI (kV/us)	Features	Pacakage
						LOW (W0)	HIGH (W1)			
Dual Channel	NSIP8821	NSIP8821W1-DSWR	5	1/1	150		✓	150	Split Logic VDD	SOW-16
Quad Channel	NSIP8841	NSIP8841W1-DSWR	5	3/1	150		✓	150	Split Logic VDD	SOW-16
	NSIP8842	NSIP8842W0-DSWR	5	2/2	150	✓		150	Split Logic VDD	SOW-16
	NSIP8842	NSIP8842W1-DSWR	5	2/2	150		✓	150	Split Logic VDD	SOW-16
	NSIP8844	NSIP8844W1-DSWR	5	0/4	150		✓	150	Split Logic VDD	SOW-16
Dual Channel	NSIP8921	NSIP8921W0-DSWR	5	1/1	150	✓		150	Power Disable	SOW-16
	NSIP8921	NSIP8921W1-DSWR	5	1/1	150		✓	150	Power Disable	SOW-16
Quad Channel	NSIP8940	NSIP8940W0-DSWR	5	4/0	150	✓		150	Power Disable	SOW-16
	NSIP8941	NSIP8941W0-DSWR	5	3/1	150	✓		150	Power Disable	SOW-16
	NSIP8941	NSIP8941W1-DSWR	5	3/1	150		✓	150	Power Disable	SOW-16
	NSIP8942	NSIP8942W1-DSWR	5	2/2	150		✓	150	Power Disable	SOW-16
	NSIP8944	NSIP8944W0-DSWR	5	0/4	150	✓		150	Power Disable	SOW-16
	NSIP8944	NSIP8944W1-DSWR	5	0/4	150		✓	150	Power Disable	SOW-16

NIRSP31 Low Cost Triple-Channel Digital Isolator Chip with Integrated Isolated Power Supply										
	Product	Part No.	Power Supply Voltage	Iso Rating (kVrms)	Forward/Reverse Channels	Max DataRate (Mbps)	CMTI(kV/us)	Default Output	Operating Temperature	Package Type
Isolated Power	NIRSP31	NIRSP31	4.5V to 5.5V	3	2/1	20	50	High	-40~125°C	LGA-18
		NIRSP31V	3.0V to 3.6V 4.5V to 5.5V	3	2/1	20	50	High	-40~125°C	LGA-18

NSIP882x/NSIP892x/NSIP884x/NSIP894x: Dual/Quad-Channel Digital Isolator with Integrated Isolated DC-DC Power Supply

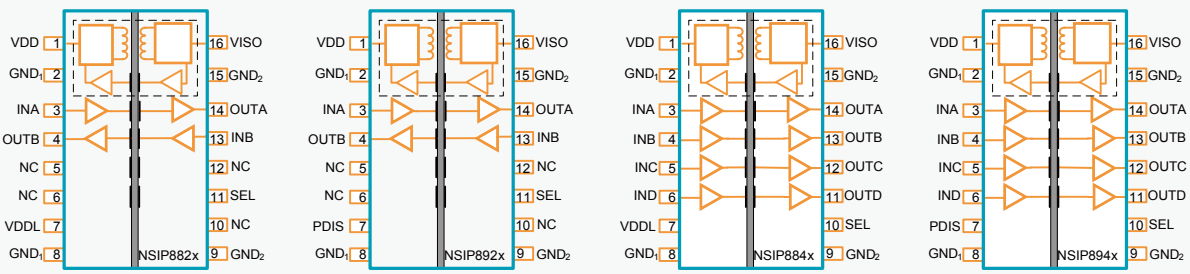
Product introduction

NSIP882x/NSIP892x/NSIP884x/NSIP894x is a dual/quad-channel digital isolator with integrated isolated DC-DC power supply. The isolation DC-DC power supply can provide up to 500mW of output power on the on-chip transformer. The feedback PWM signal is sent to the primary side by a digital isolator based on NOVOSENSE capacitance isolation technology. Highly integrated solutions simplify system design and improve reliability. The products are safety certified by UL1577 support 5kVrms withstand voltages, while providing high electromagnetic immunity and low emissions. The data rate of this series of products is up to 150Mbps, and the common mode transient immunity (CMTI) is up to 150kV/us. The NSIP882x devices provide 5V to 5V, 5V to 3.3V, 3.3V to 3.3V conversion mode, the output voltage can be set by SEL pin.The logical level of digital isolators on left side can be set by VDDL pin which can support the application when the supply voltage and I/O voltage level are different.

Product feature

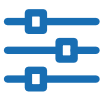
- Up to 5000Vrms insulation voltage
- Supply voltage: 3.3V to 5.5V
- 5V to 5V,5V to 3.3V, 100mA load current
- 3.3V to 3.3V, 60mA load current
- Overcurrent and thermal protection
- Date rate: DC to 150Mbps
- High CMTI:150kV/us
- Propagation delay:<15ns
- High system level EMC performance: Enhanced system level ESD, EFT, and surge immunity
- Operating temperature: -40°C to 125°C
- RoHS compliant package: SOW16

Pinout & Package

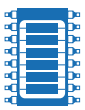


Application

Industrial automation system



Isolated SPI, RS232, RS485



Universal Multi-Channel Isolator

NIRSP31/V: Low Cost Triple-Channel Digital Isolator with Integrated Isolated DC-DC Power Supply

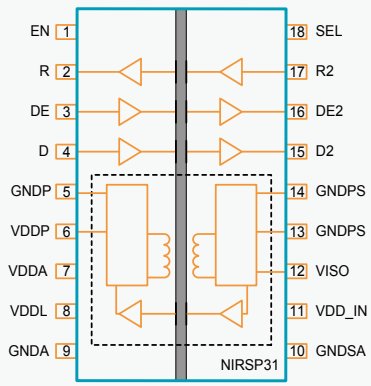
Product introduction

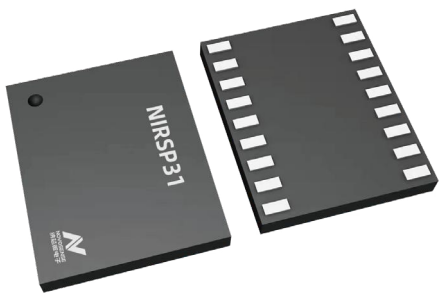
NIRSP31/V is a low cost triple-channel digital isolator with integrated isolated DC-DC power supply. The isolated DC-DC converter provides stable output voltage and up to 400mW output power by closed-loop control and transformer on chip. The feedback PWM signal is transmitted to the primary side by a digital isolator based on NOVOSENSE capacitance isolation technology. Highly integrated solutions simplify system design and improve reliability. The NIRSP31 device supports 3kVrms insulations withstand voltages, and features improved electromagnetic immunity and low emission. The data rate of the NIRSP31/V is up to 20Mbps, and the common-mode transient immunity (CMTI) is up to 50kV/us. For NIRSP31 device, 5V to 5V/ 3.3V conversion modes are allowed, for NIRSP31V device, 5V to 5V/ 3.3V conversion modes, 3.3V to 3.3V conversion modes are allowed,both output voltage can be set through SEL pin.

Product feature

- Insulation voltage up to 3000Vrms
- Supply voltage:
  NIRSP31V: 3V to 3.6V, 4.5V to 5.5V
  NIRSP31: 4.5V to 5.5V
- Load Current:
  80mA @5V->5V/3.3V
  45mA @3.3V->3.3V
- Overcurrent and thermal protection
- Data transmission rate: DC to 20Mbps
- High CMTI:50kV/us
- Propagation delay: <75ns
- Operating temperature: -40℃ to 125℃
- RoHS compliant package: LGA18

Pinout & Package





Application

Industrial BMS System

Industrial automation system

Isolated SPI, RS232, RS485

General-purpose multichannel isolation

Isolated 485 with Integrated Isolated Power Supply

Isolated 485 with Integrated Isolated Power Supply

NSIP83086: Isolated RS485 Transceiver with Integrated Isolated Power Supply									
	Part No.	Power Supply Voltage	ISO Rating (kVrms)	ESD(kV)	Max DataRate (Mbps)	CMTI (kV/us)	VISO Output(V)	Operating Temperature	Package Type
Isolated Power	NSIP83086	VDD: 4.5~5.5V VDDL: 1.8~5.5V	5	8	16	150	5	-40~105℃	SOW-16 SOW-20
	NSIP83086V	VDD: 3~5.5V VDDL: 1.8~5.5V	5	8	16	150	3.3	-40~105℃	SOW-16 SOW-20
	NSIP83086C	VDD: 3~5.5V VDDL: 1.8~5.5V	5	8	16	150	3.3 SEL=5V/Floating, VISO=5V SEL=GND2, VISO=3.3V	-40~105℃	SOW-20

NSIP83086/V/C: Isolated RS-485 Transceiver With Integrated Isolated DC-DC Power Supply

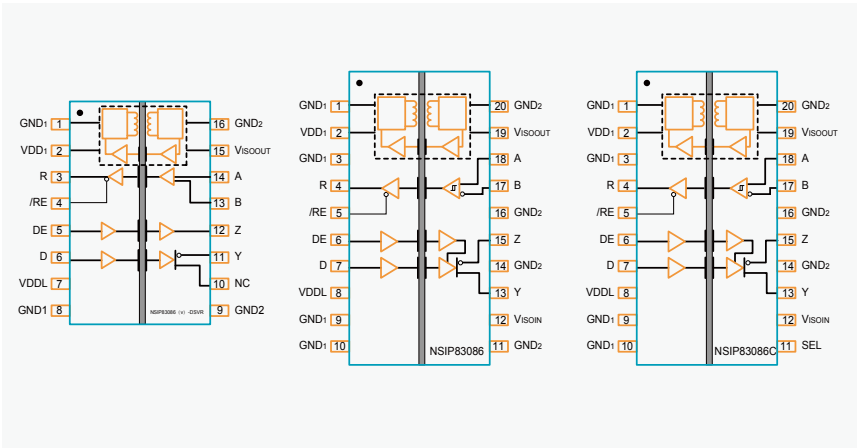
Product introduction

NSIP83086/V/C is a full duplex isolated RS-485 transceiver with integrated isolated DC-DC power supply with high reliability. Isolated DC-DC power supply can be based on on-chip transformer, the feedback PWM signal is transmitted to the primary side by a digital isolator based on NOVOSENSE capacitance isolation technology. Highly integrated solutions simplify system design and improve reliability. NSIP83086/V/C support 5kVrms insulation withstand voltages, while the high integrated solution can help to simplify system design and improve reliability. The bus pins on the bus side of the NSIP83086/V/C is designed with ±8kV ESD protection to GND2 at system level. This device is designed with a fail-safe circuit that ensures the receiver output is logic high when the receiver input is disconnected or shorted. It features a receiver input impedance of 1/8 unit load, allowing up to 256 transceivers to be connected to the bus.

Product feature

- Insulation voltage up to 5000Vrms
- It is with integrated isolated DC-DC power supply
- I/O voltage range supports 1.8V to 5V MCU
- Power supply voltage:
  VDD: 4.5V to 5.5V(NSIP83086)
  VDD: 3V to 5.5V(NSIP83086V/C)
  VDDL: 1.8V to 5.5V
- Overcurrent and thermal protection
- High CMTI:150kV/us
- Data transmission rate: 16Mbps
- Supporting 256 transceivers
- High system level EMC performance:
  BUS Pins w.r.t to GND2 meet IEC61000-4-2 ±8kV
  Other Pins w.r.t to GND2 meet IEC61000-4-2 ±7kV
- Operating temperature: -40°C to 105°C
- RoHS compliant package: SOW16, SOW20

Pinout & Package



Application

Industrial automation system

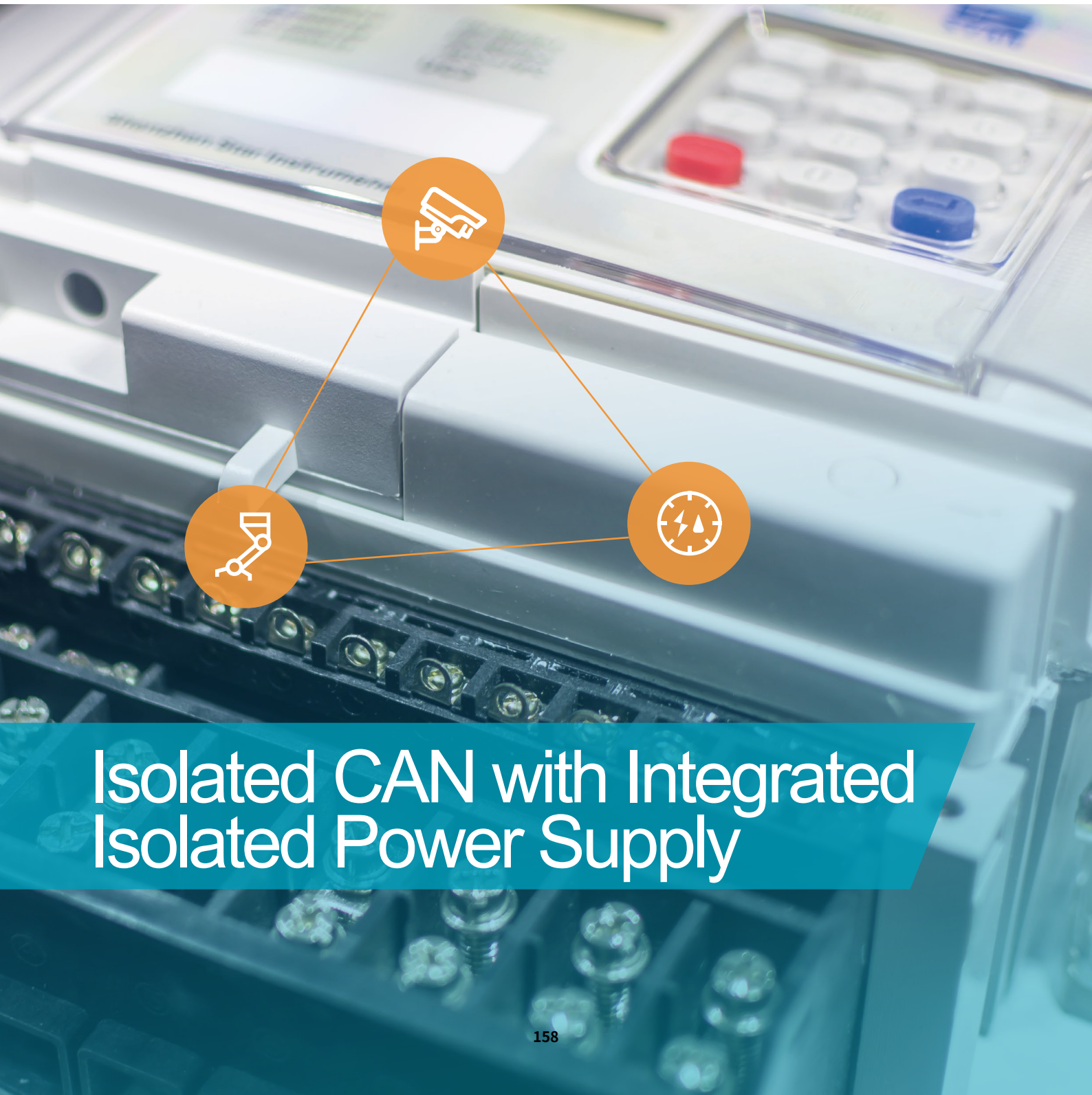
Isolated RS-485 communication system

Smart ammeters and water meters

Security and surveillance systems

Isolated CAN with Integrated Isolated Power Supply

NSIP1042: CAN Transceiver Chip with Integrated Isolated Power Supply									
	Part No.	Power Supply Voltage	ISO Rating (kVrms)	ESD(kV)	Max DataRate (Mbps)	CMTI (kV/us)	Logic Level Voltage	Operating Temperature	Package Type
Isolated Power	NSIP1042	4.5V to 5.5V	5	5	5	150	1.8V to 5.5V	-40~105°C	SOW-20



Isolated CAN with Integrated Isolated Power Supply

NSIP1042: Isolated CAN Transceiver With Integrated Isolated DC-DC Power Supply

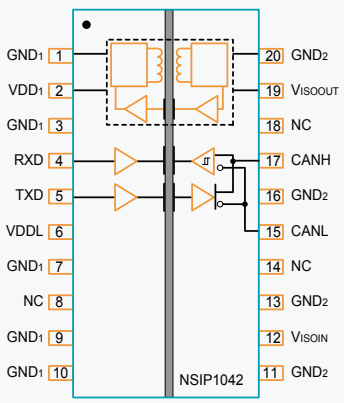
Product introduction

NSIP1042 is a CAN transceiver with integrated isolated DC-DC power supply with high reliability. The feedback PWM signal is transmitted to the primary side by a digital isolator based on NOVOSENSE capacitance isolation technology. Highly integrated solutions simplify system design and improve reliability. NSIP1042 is safety certified by UL1577 support 5kVrms insulation withstand voltages, while the high integrated solution can help to simplify system design and improve reliability. The BUS pins on the BUS side of the NSIP1042 is designed with ±5kV ESD protection to GND2 at system level. NSIP1042 can support data transmission rates of up to 5Mbps, while providing thermal protection and explicit timeout protection for transmission data.

Product feature

- Insulation voltage up to 5000Vrms
- ISO-Power integrated isolated dc-to-dc converter
- Supply voltage: 4.5V to 5.5V
- Overcurrent and thermal protection High
- CMTI:150kV/us
- Data transmission rate: 5Mbps
- High system level EMC performance: BUS pins conforming to IEC61000-4-2±5kV ESD
- Operating temperature: -40°C to 125°C
- RoHS compliant package: SOW20

Pinout & Package



Application

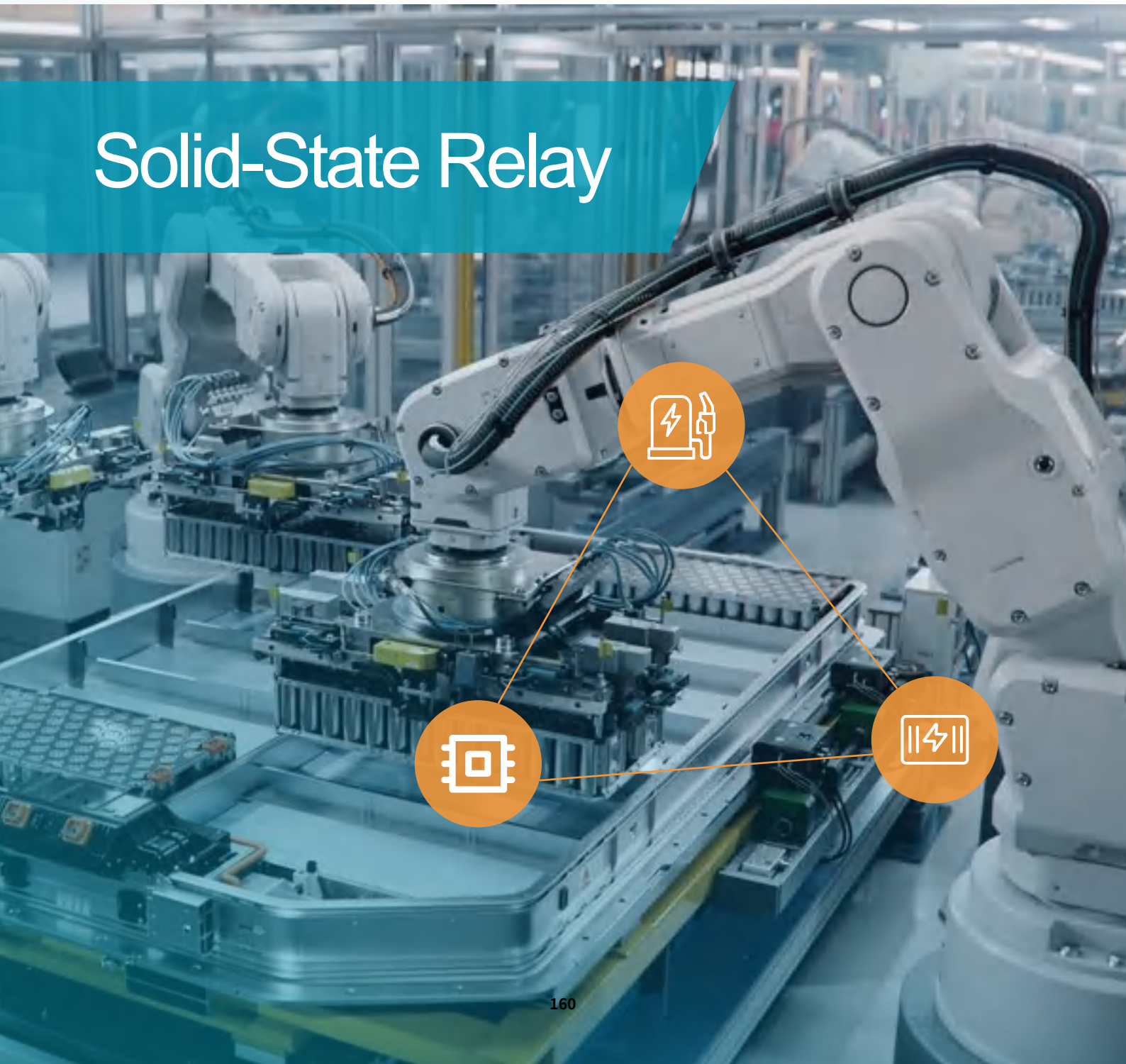
Industrial automation system

Smart ammeters and water meters

Security and surveillance systems

Solid-State Relay

Solid-State Relay											
Part numbe	Withstand isolation voltage (VISO) (Vrms)	FET	Number of channels	Supply voltage (V)	Input forward current（mA)	Break down voltage（V）	Imax (A)	Gate drive voltage (V)	Operating temperature range (°C)	Package type	Rating
NSI7258	5000	Internal	1	N/A	7-20	1700	0.05	N/A	-40~125	SOW12	Industrial



NSI7258: 1700V 50mA Solid-State Relay

Product introduction

The NSI7258 is a single-channel solid-state relay (SSR), which is pin-compatible for popular photo MOSFET. The SSR turns ON with a minimum input current of 5.5mA. It can conduct 30mA current at ON state, with resistance less than 250Ω. The SSR turns off with an input voltage of 0.5V or less. It can withstand 1000V voltage at OFF state, with less than 1μA leakage current. The NSI7258 uses NOVOSENSE's high reliability isolation technology. While the input circuit imitates the characters of LEDs, it has performance advantages compared to standard photo MOSFET, including better reliability and aging performance, higher working temperature, shorter turn-on and turn-off delay. As a result, the NSI7258 is suitable to replace photo MOSFET in high reliability system.

Product feature

- Normally open (1-Form-A) solid state relay
- Up to 5000Vrms Insulation voltage
- Breakdown voltage: 1700V
- OFF state leakage current: <1μA at 1000V
- ON state resistance: <250Ω at 10mA load current
- Input forward threshold current: <5.5mA
- Turn on time: <0.3ms
- Turn off time: <0.05ms
- Integrated MOSFETs with 0.6 mA avalanche rating
- RoHS-compliant Packages: SOW12
- Creepage and clearance ≥ 8mm (input-output)
- Creepage and clearance ≥ 5.91mm (between drain pins of MOSFETs)
- Meets CISPR32 Class B and CISPR 25 Class 5 EMI limits without ferrite beads on a 2-layer PCB

Pinout & Package

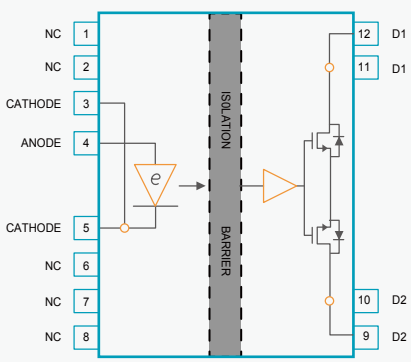
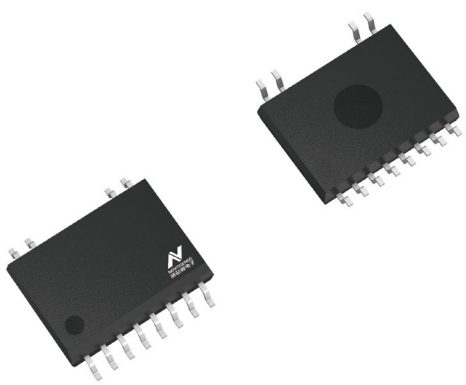


Figure 1.NSI7258 Block Diagram



Application

Solid-state Relay

EV Charging Station

Energy Storage System

Solar Energy System

Transformer Driver for Isolated Power Supplies

Transformer Driver for Isolated Power Supplies							
Part number	Iout (typ) (A)	Vin (min) (V)	Vin (max) (V)	Soft start	Operating temperature range (°C)	Package type	Rating
NSIP6051	350mA（max）	2.25	5.5	N	-40~125	SOT-23（5）	Industrial
NSIP6051-Q1	350mA（max）	2.25	5.5	N	-40~125	SOT-23（5）	Automotive
NSIP6055x	1.36A（max）	2.25	5.5	Y	-40~125	SOT-23（6）	Industrial
NSIP6055x-Q1	1.36A（max）	2.25	5.5	Y	-40~125	SOT-23（6）	Automotive

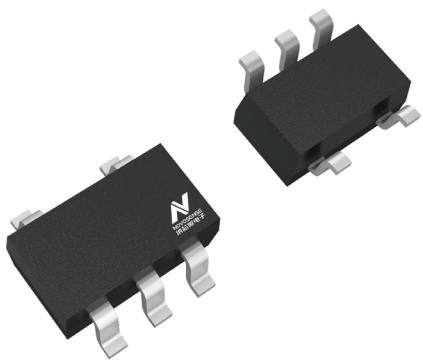
NSIP6051: Transformer Driver for Isolated Power Supplies

Product introduction

The NSIP6051 is a push-pull transformer driver specially designed for small size, low-power isolation power supply with low standby power consumption. Its periphery only needs to match simple input and output filter capacitors, isolation transformer and rectifier circuits. Its internal integrated oscillator provides a pair of high precision complementary signals to drive two N-channel MOSFETs. The internal design of the chip follows a symmetrical structure, which can effectively ensure the high symmetry of the two power MOSFETs and avoid magnetic bias during the working process of the circuit. Ultra-low noise and EMI are achieved by slew rate control of the output switch voltage and through Spread Spectrum Clocking (SSC). The internal protection features include over current protection, under-voltage lockout, thermal shutdown and break-before-make circuitry. The NSIP6051 is available in a small SOT-23 (5) package, and is specified for operation at temperatures from –40°C to 125°C.

Product feature

- Push-pull driver for transformers
- Single 3.3-V or 5-V supply
  5-V Supply: 350 mA (Max)
  3.3-V Supply: 150 mA (Max)
- Thermal shutdown and over-current protection (OCP)
- Spread Spectrum Clocking
- Small 5-Pin SOT-23 Package



Pinout & Package

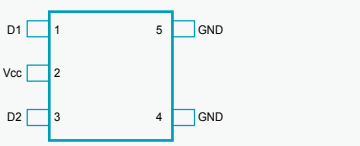


Figure 1.NSIP6051

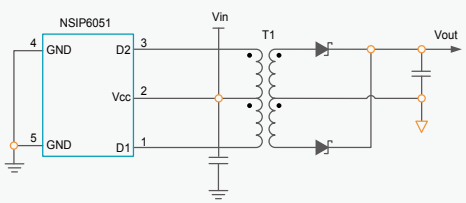


Figure 2.Simplified Schematic

Application

- Isolated interface power supply for CAN, RS-485, RS-422, RS-232, SPI, I2C, Low-Power LAN
- Industrial automation
- Process control
- Medical equipment

NSIP6051-Q1: Automotive Grade Transformer Driver for Isolated Power Supplies

Product introduction

The NSIP6051-Q1 is an automotive grade push-pull transformer driver specially designed for small size, low-power isolation power supply with low standby power consumption. The periphery of the circuit only requires simple input and output filter capacitors, isolation transformer, and rectifier circuits. Its internal integrated oscillator provides a pair of high precision complementary signals to drive two N-channel MOSFETs. The internal design of the chip follows a symmetrical structure, which can effectively ensure the high symmetry of the two power MOSFETs and avoid magnetic bias during the working process of the circuit. Ultra-low noise and EMI are achieved by slew rate control of the output switch voltage and through Spread Spectrum Clocking (SSC). The internal protection features include over current protection, under-voltage lockout, thermal shutdown and break-before-make circuitry. The NSIP6051 is available in a small SOT-23 (5) package, and is specified for operation at temperatures from –40°C to 125°C.

Product feature

- Push-pull driver for transformers
- Support 2.25V to 5.5V supply
- Ultra-low EMI
- Over-current protection (OCP)
- Over temperature protection
- Spread spectrum clocking
- Slew-rate control
- Small 5-pin SOT-23 package
- AEC-Q100 Grade 1 Qualified
- RoHS & REACH Compliance

Pinout & Package

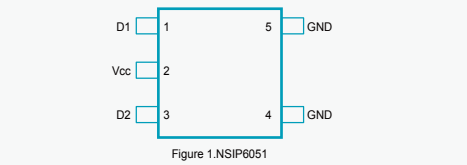


Figure 1.NSIP6051

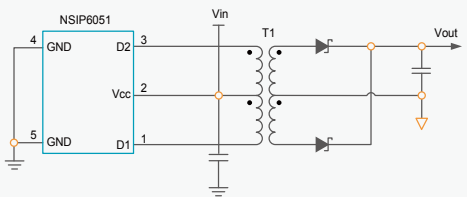
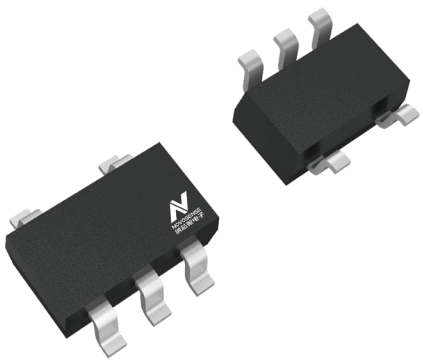


Figure 2.Simplified Schematic



Application

Isolated interface power supply for I2C, CAN, RS-485, RS-422, RS-232, SPI, Low-Power LAN

IGBT gate drive power supply

NSIP6055x: Transformer Driver for Isolated Power Supplies

Product introduction

The NSIP6055x is a push-pull transformer driver specially designed for small size, low-power isolation power supply with low standby power consumption. The periphery of the circuit only requires simple input and output filter capacitors, isolation transformer, and rectifier circuits. Its internal integrated oscillator provides a pair of high precision complementary signals to drive two N-channel MOSFETs. The internal design of the chip follows a symmetrical structure, which can effectively ensure the high symmetry of the two power MOSFETs and avoid magnetic bias during the working process of the circuit. Ultra-low noise and EMI are achieved by slew rate control of the output switch voltage and through Spread Spectrum Clocking (SSC). The internal protection features include over current protection, under-voltage lockout, thermal shutdown and break-before-make circuitry. NSIP6055A has a 160 kHz internal oscillator for applications that need to minimize emissions. NSIP6055B has a 420 kHz internal oscillators for application that require higher efficiency and smaller transformer size. The NSIP6055x is available in a small SOT-23 (6) package, and is specified for operation at temperatures from –40°C to 125°C.

Product feature

- Push-pull driver for transformers
- Support 2.25V to 5.5V supply
- High output drive: 1A at 5V supply
- Precision internal oscillator options: 160 kHz (NSIP6055A) and 420 kHz (NSIP6055B)
- Ultra-low EMI
- Over-current protection (OCP)
- Over temperature protection
- Soft-start to reduce In-rush current
- Spread Spectrum Clocking
- Slew-rate control
- Small 6-Pin SOT-23 Package
- RoHS & REACH Compliance

Pinout & Package

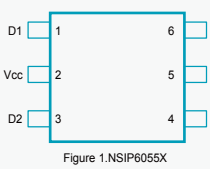


Figure 1.NSIP6055X

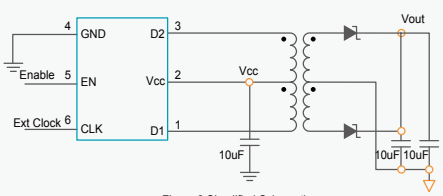
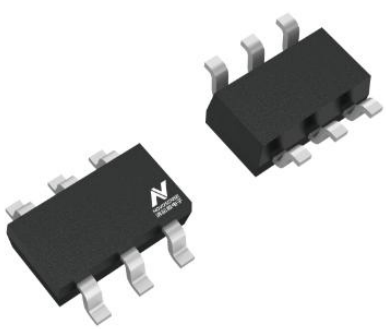


Figure 2.Simplified Schematic



Application

- Isolated interface power supply for CAN, RS-485, RS-422, RS-232, SPI, I2C, Low-Power LAN
- Industrial automation
- Process control
- Medical equipment
- IGBT gate drive power supply

NSIP6055x-Q1: Automotive Grade Transformer Driver for Isolated Power Supplies

Product introduction

The NSIP6055x-Q1 is an automotive grade push-pull transformer driver specially designed for small size, low-power isolation power supply with low standby power consumption. The periphery of the circuit only requires simple input and output filter capacitors, isolation transformer, and rectifier circuits. Its internal integrated oscillator provides a pair of high precision complementary signals to drive two N-channel MOSFETs. The internal design of the chip follows a symmetrical structure, which can effectively ensure the high symmetry of the two power MOSFETs and avoid magnetic bias during the working process of the circuit. Ultra-low noise and EMI are achieved by slew rate control of the output switch voltage and through Spread Spectrum Clocking (SSC). The internal protection features include over current protection, under-voltage lockout, thermal shutdown and break-before-make circuitry. NSIP6055A has a 160 kHz internal oscillator for applications that need to minimize emissions. NSIP6055B has a 420 kHz internal oscillators for application that require higher efficiency and smaller transformer size. The NSIP6055x is available in a small SOT-23 (6) package, and is specified for operation at temperatures from –40°C to 125°C.

Product feature

- Push-pull driver for transformers
- Support 2.25V to 5.5V supply
- High output drive: 1A at 5V supply
- Precision internal oscillator options: 160 kHz (NSIP6055A) and 420 kHz (NSIP6055B)
- Ultra-low EMI
- Over-current protection (OCP)
- Over temperature protection
- Soft-start to reduce In-rush current
- Spread Spectrum Clocking
- Slew-rate control
- Small 6-Pin SOT-23 Package
- AEC-Q100 Grade 1 Qualified
- RoHS & REACH Compliance

Pinout & Package

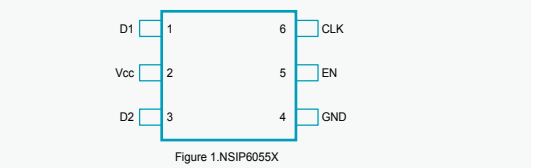


Figure 1.NSIP6055X

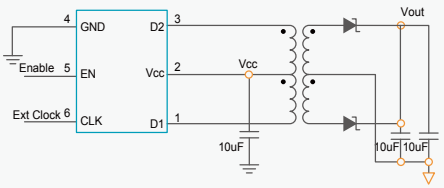
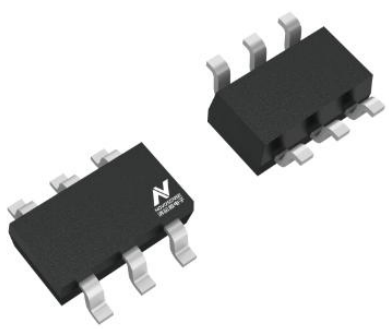


Figure 2.Simplified Schematic

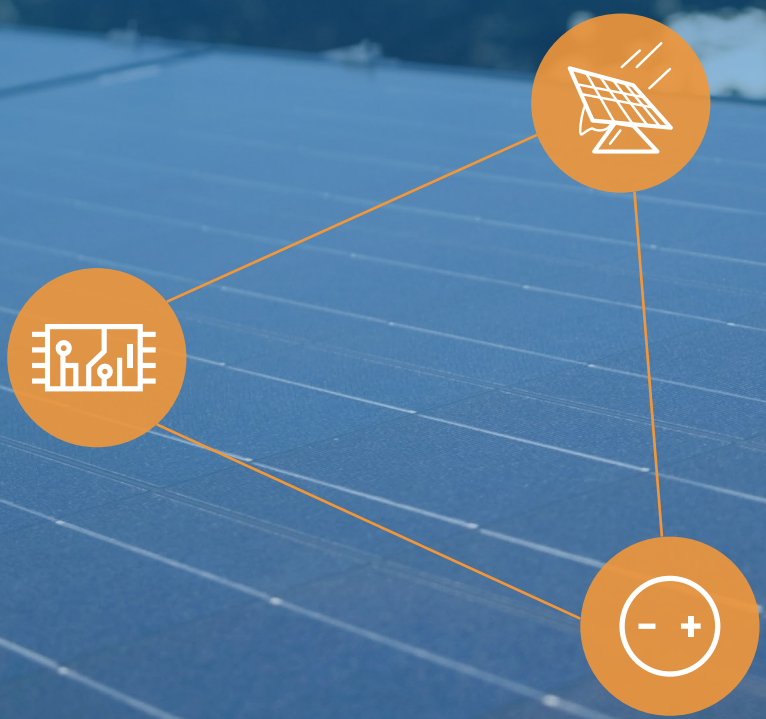


Application

Isolated interface power supply for I2C, CAN, RS-485, RS-422, RS-232, SPI, Low-Power LAN

IGBT gate drive power supply

Isolated ADC



Isolated ADC

NSI1305/6 Isolated ADC Series									
	Part No.	Part No.	ISO Rating (kVrms)	Linear Input Range(mV)	Input Type	Output Type	CMTI (kV/μs)	Operating Temperature Range (°C)	Package Type
Isolated Modulator	NSI1306	NSI1306M25	5	-250~250	Differential	Digital (clock rising edge effective)	150	-40~125	SOW-8
									SOW-16
		NSI1306M05	5	-250~250	Differential		150	-40~125	SOW-8
									SOW-16
	NSI1305	NSI1305M25	5	-250~250	Differential	Digital (clock falling edge effective)	150	-40~125	SOW-8
									SOW-16

NSI1303x Isolated ADC Series									
	Product	Part No.	ISO Rating (kVrms)	Linear Input Range(mV)	Input Type	Output Type	CMTI (kV/μs)	Differential Input Resistance (kohm)	Operating Temperature Range (°C)	Package
Isolated Modulator	NSI1303	NSI1303E0x	5	-50~50	Differential	Manchester	150	4.9	-40~125	SOW-8
		NSI1303E2x	5	-250~250	Differential	Manchester	150	22	-40~125	
		NSI1303M0x	5	-50~50	Differential	Uncoded (clock rising edge effective)	150	4.9	-40~125	SOW-8 SOW-16
		NSI1303M2x	5	-250~250	Differential		150	22	-40~125	
		NSI1303D0x	5	-50~50	Differential	Uncoded (clock falling edge effective)	150	4.9	-40~125	
		NSI1303D2x	5	-250~250	Differential		150	22	-40~125	

NSI1306: Isolated Current Sampling ADC with High Reliability

Product introduction

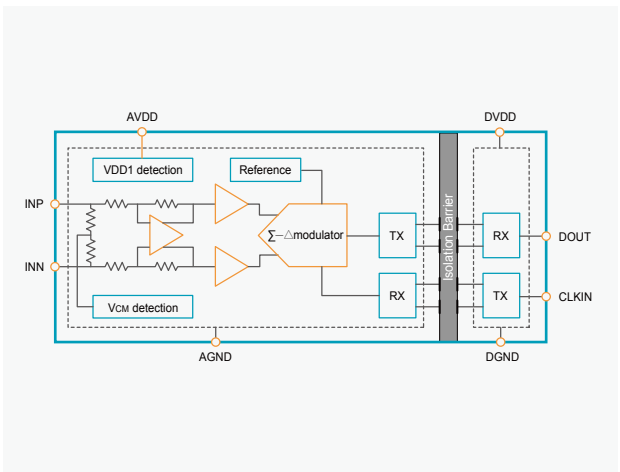
NSI1306 is a high-performance Σ-Δ modulator with output separated from input based on the NOVOSENSE capacitive isolation technology. The linear differential input signal range of the device is ± 50mV (full scale ± 64mV) or ± 250mV (full scale ± 320mV). Differential inputs are ideal for shunt resistance-based current detection in high voltage applications that require isolation.

The analog input is amplified and continuously sampled by a second-order Σ-Δ modulator and then converted to a high-speed, single-bit data stream. The output data is synchronized with the external clock, the rising edge of the clock is valid, and the frequency range is 5MHz to 21MHz. By using an appropriate digital filter (such as a sinc3 filter) to extract the bit stream, the device can achieve 16-bit resolution and 86dB/82.5dB signal-to-noise ratio (SNR) with a 20MHz master clock under the condition of 78.125KPS. The fail-safe function includes input common mode overvoltage detection and VDD1 missing detection, simplifying system design and diagnosis.

Product feature

- Insulation voltage up to 5000Vrms
- Clock frequency: 5MHz to 21MHz
- Linear input range of ± 50mV or ± 250mV
- Excellent DC performance:
  - Offset error: ± 50 μV or ± 100 μV(Max)
  - Offset drift: -0.5 to 1.5 μV/°C(Max)
  - Gain error: 0.2%(Max)
  - Gain drift: ± 40ppm/°C(Max)
- SNR: 82.5dB or 86dB(Typ)
- High CMTI： 150kV/us(Typ)
- System-level diagnostic capabilities:
  - AVDD monitoring
  - Input common mode overvoltage detection
- Operating temperature: -40°C to 125°C

Pinout & Package



Application

- Shunt current monitoring
- AC motor control
- Power and solar inverters
- UPS
- Onboard charger

NSI1305: Isolated Current Sampling ADC with High Reliability

Product introduction

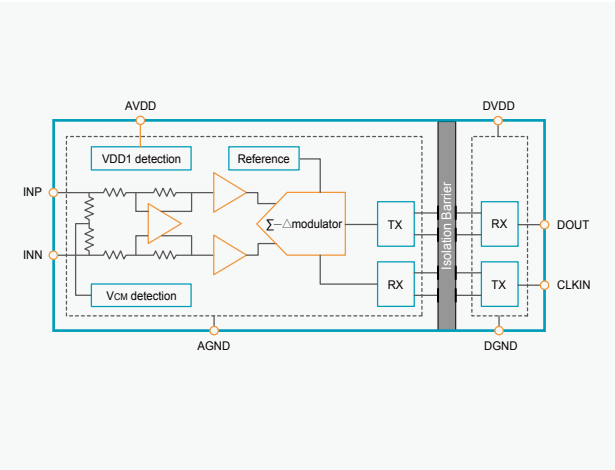
NSI1305 is a high-performance Σ-Δ modulator with output separated from input based on the NOVOSENSE capacitive isolation technology.The linear differential input signal range of the device is ± 50mV (full scale ± 64mV) or ± 250mV (full scale ± 320mV). Differential inputs are ideal for shunt resistance-based current detection in high voltage applications that require isolation.

The analog input is amplified and continuously sampled by a second-order Σ-Δ modulator and then converted to a high-speed, single-bit data stream. The output data is synchronized with the external clock, the falling edge of the clock is valid, and the frequency range is 5MHz to 21MHz. By using an appropriate digital filter (such as a sinc3 filter) to extract the bit stream, the device can achieve 16-bit resolution and 86dB/82.5dB signal-to-noise ratio (SNR) with a 20MHz master clock under the condition of 78.125KPS. The fail-safe function includes input common mode overvoltage detection and VDD1 missing detection, simplifying system design and diagnosis.

Product feature

- Insulation voltage up to 5000Vrms
- Clock frequency: 5MHz to 21MHz
- Linear input range of ± 50mV or ± 250mV
- Excellent DC performance:
  Offset error: ± 50 μV or ± 100 μV(Max)
  Offset drift: -0.5 to 1.5 μV/°C(Max)
  Gain error: 0.2%(Max)
  Gain drift: ± 40ppm/°C(Max)
- SNR: 82.5dB or 86dB(Typ)
- High CMTI： 150kV/us(Typ)
- System-level diagnostic capabilities:
  AVDD monitoring
  Input common mode overvoltage detection
- Operating temperature: -40°C to 125°C

Pinout & Package



Application

Shunt current monitoring

AC motor control

Power and solar inverters

UPS

Onboard charger

NSI1303: Isolated ADC with Integrated Internal Clock with High Reliability

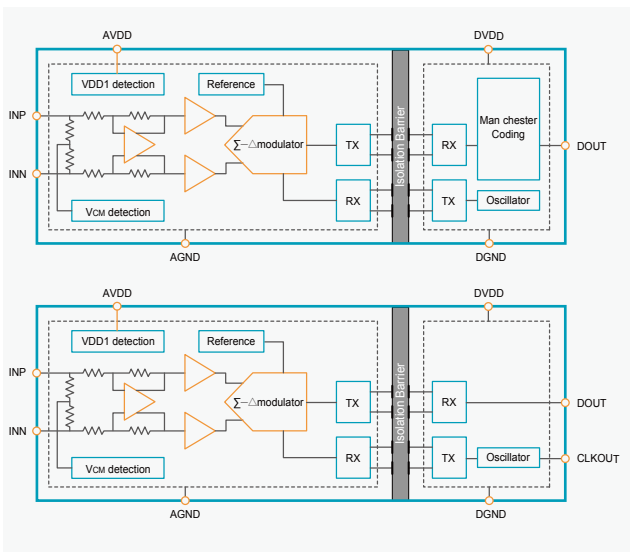
Product introduction

NSI1303 is a high-performance Σ-Δ modulator with output separated from input based on the NOVOSENSE capacitive isolation technology. The linear differential input signal range of the device is ± 50mV (full scale ± 64mV) or ± 250mV (full scale ± 320mV). The analog input is continuously sampled by a second-order Σ-Δ modulator and then converted to a high-speed, single-bit data stream. The output bit data stream of NSI1303 is synchronized with its internal clock, in this process, Manchester encoding (NSI1303Ex) is used or the data is leaving as unencoded (NSI1303M/Dx). By using an appropriate digital filter (such as a sinc3 filter) to extract the bit stream, the device can achieve 16-bit resolution and 86dB/82.5dB signal-to-noise ratio (SNR) under the condition of 78.125KPS. The output of Manchester coded NSI1303Ex supports single-wire data and clock transmission, regardless of the setting and holding time requirements of the receiving device.

Product feature

- Insulation voltage up to 5000Vrms
- Options of 10MHz and 20MHz internal clocks
- Linear input range of ± 50mV or ± 250mV
- Excellent DC performance:
  Offset error and drift: ±50μV or ±100μV (Max) , ±1μV/℃(Max)
  Gain error and drift: ±0.2%(Max), ±40ppm/°C(Max)
- High CMTI: 150kV/us(Typ)
- System-level diagnostic capabilities:
  AVDD monitoring
  Input common mode overvoltage detection
- Operating temperature: -40°C to 125°C
- RoHS compliant package: SOW-8(300mil), SOW-16(300mil)

Pinout & Package

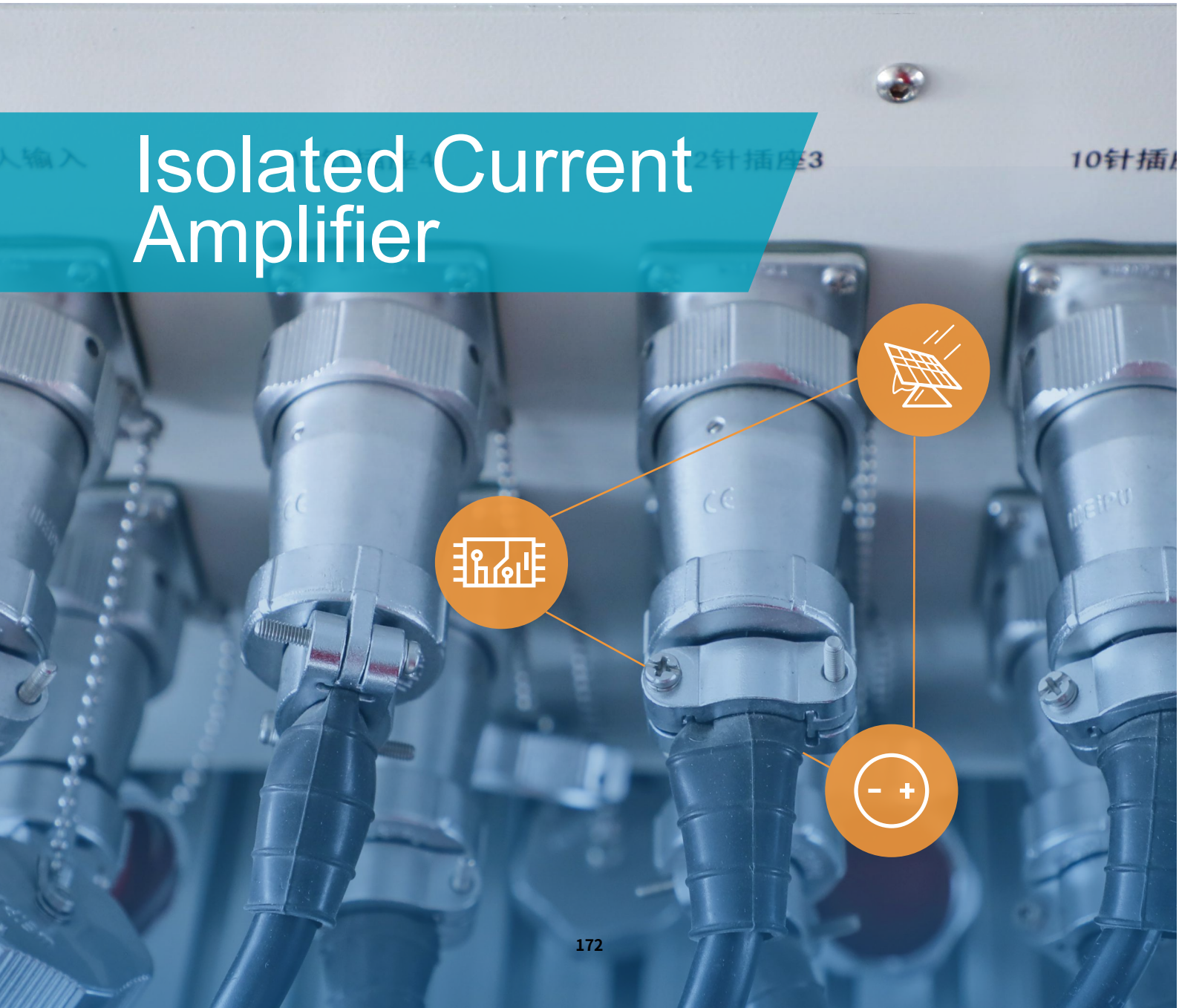


Application

- Shunt current monitoring
- AC motor control
- UPS
- Onboard charger

Isolated Current Amplifier

Isolated Current Amplifier Series											
	Product	Part No.	ISO Rating (kVrms)	Linear Input Range(mV)	Gain	Input Type	Output Type	CMTI (kV/μs)	AEC-Q100	Operating Temperature Range (°C)	Package
Isolated Current Amplifier	NSI1300	NSI1300D05	5	-50~50	8.2	Differential	Differential	150	✓	-40~125	SOW-8
		NSI1300D25		-250~250							
	NSI1200	NSI1200	5	-250~250	8	Differential	Differential	150	✓	-40~125	SOW-8
											DUB-8
	NSI1400/ NSI1200C	NSI1400	5	-250~250	8.2	Differential	Differential/ Single-ended	150		-40~125	SOW-8
			3		8.2						SOP-8
		NSI1200C	5		8						DUB-8



NSI1200/NSI1300: Isolated Current Sampling Amplifier with High Reliability

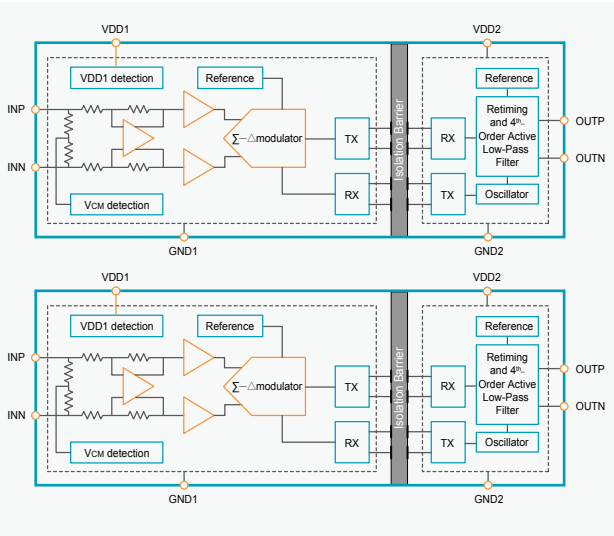
Product introduction

NSI1200/NSI1300 is a high-performance isolated amplifier with output separated from input based on the NOVOSENSE capacitive isolation technology. This series of products are designed with linear differential input signal of ± 50mV (NSI1300D05, full scale ± 64mV) or ± 250mV (NSI1200/NSI1300D25, full scale ± 320mV). The fail-safe function includes input common mode overvoltage detection and VDD1 missing detection, simplifying system design and diagnosis. The fixed gain of the NSI1200/NSI1300 is 8/8.2 and provides a differential analog output. Low offset and gain drift ensure accuracy over the entire temperature range. High common-mode transient immunity ensures that the device is able to provide accurate and reliable measurements even in the presence of high-power switching such as in motor control applications.

Product feature

- Linear input range of ± 50mV or ± 250mV
- Fixed gain: 8 for NSI1200, and 8.2 for NSI1300
- Ultralow offset error and drift:
- NSI1200: ±0.5mV(Max), ±4μV/℃(Max)
- NSI1300D05: ±0.1mV(Max), -0.8~1μV/℃(Max)
- NSI1300D25: ±0.2mV(Max), -2~4μV/℃(Max)
- Ultralow gain error and drift:
  ±0.3%(Max), ±50ppm/°C(Max)
- SNR: 86dB(Typ)
- Wide bandwidth:
  100kHz for NSI1200
  310kHz for NSI1300
- High CMTI: 150kV/us
- Operating temperature: -40°C to 125°C
- Package compliant with RoHS:
  SOW-8(300mil)(NSI1200 & NSI1300), DUB8(NSI1200 only)

Functional Block Diagram



Application

- Shunt current monitoring
- AC motor control
- Power and solar inverters
- UPS
- Onboard charger

NSI1400/NSI1200C: Cost-Effective Isolated Current Sampling Amplifier with High Reliability

Product introduction

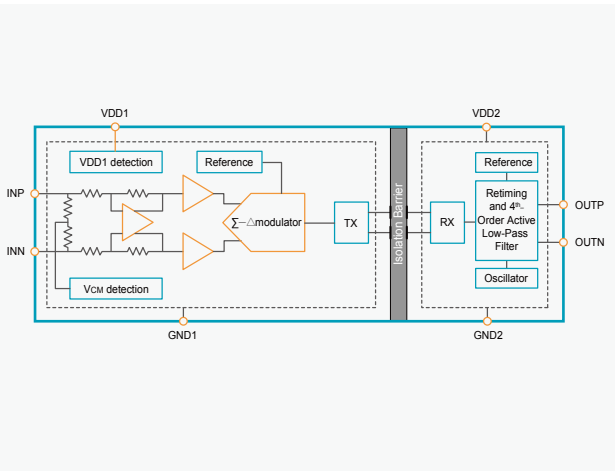
NSI1400/NSI1200C is an cost-effective isolated amplifier with output separated from input based on the NOVOSENSE capacitive isolation technology. This product is designed with linear differential input signal of ± 250mV (full scale ± 320mV). Differential inputs are ideal for shunt resistance-based current detection in high voltage applications that require isolation.

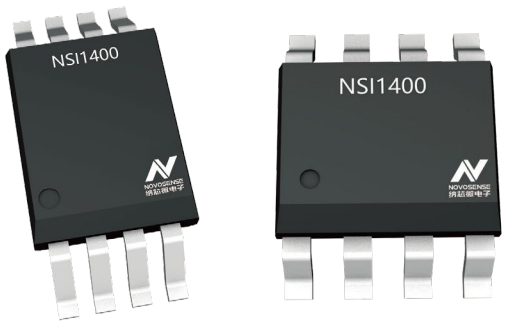
The fixed gain of the NSI1400 is 8.2, the fixed gain of the NSI1400 is 8, and differential analog input is made available as well. Low offset and gain drift ensure accuracy over the entire temperature range. High common-mode transient immunity ensures that the device is able to provide accurate and reliable measurements even in the presence of high-power switching such as in motor control applications. The fail-safe function includes input common mode overvoltage detection and VDD1 missing detection, simplifying system design and diagnosis.

Product feature

- Insulation voltage up to 5000Vrms
- Linear input range of ± 250mV
- Low offset error and drift:
  ±0.5mV (Max), ±5μV/℃ (Max) for NSI1200C,
  ±4μV/℃ (Max) for NSI1400
- Low gain error and drift: ±0.3%(Max), ±30ppm/°C(Max)
- Low non-linearity and drift: ±0.05%(Max), ±1ppm/°C(Typ)
- SNR: 72dB(Typ, BW=100kHz)
- Bandwidth: 220kHz(Typ)
- High CMTI: 125kV/us(Typ)
- System-level diagnostic capabilities: VDD1 monitoring
- Input common mode overvoltage detection
- Operating temperature: -40°C to 125°C
- Package compliant with RoHS: SOP-8(150mil), SOW-8(300mil), DUB-8(NSI1200 Only)

Functional block diagram



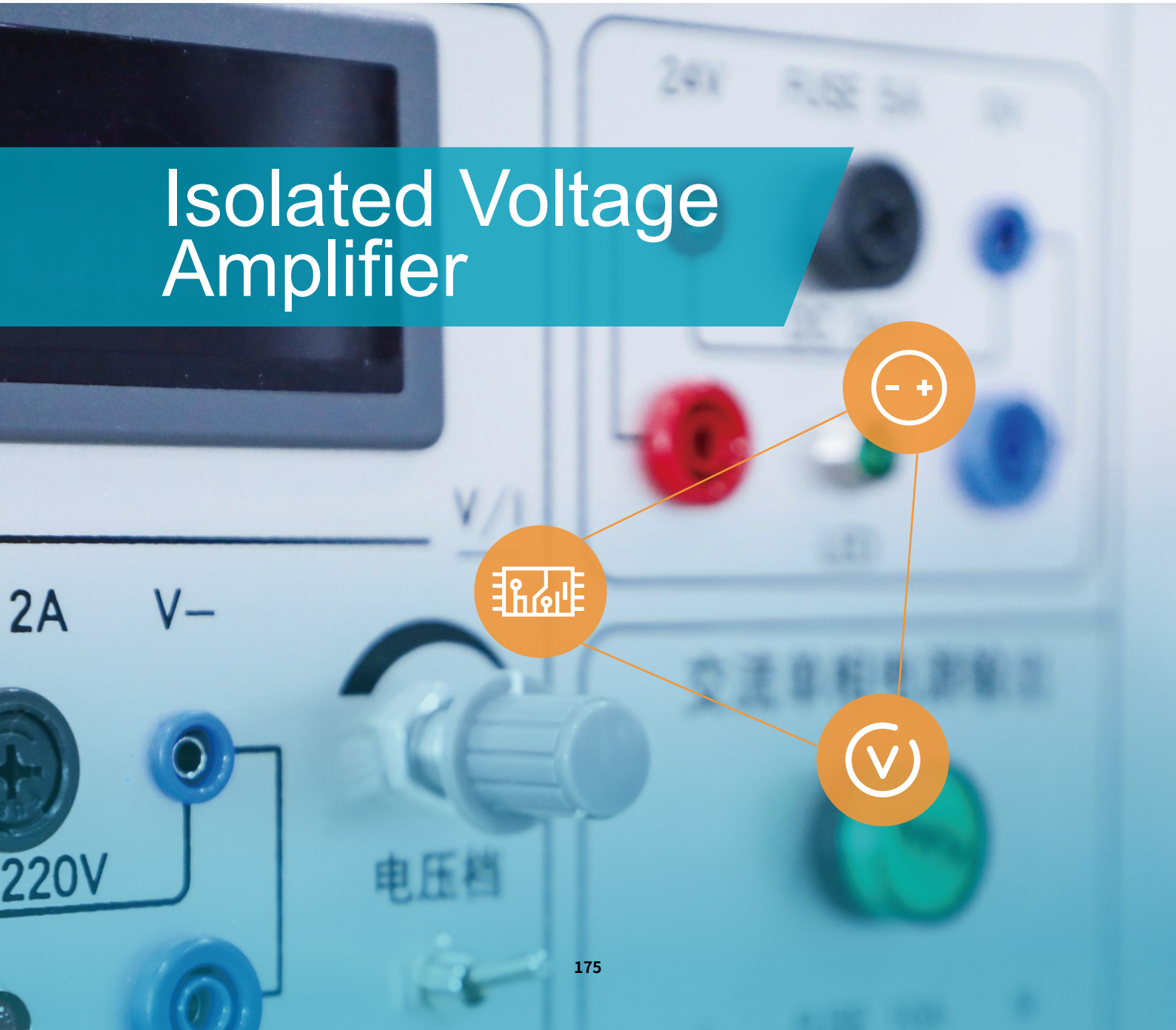


Application

- Shunt current monitoring
- AC motor control
- Power and solar inverters
- UPS
- Onboard charger

Isolated Voltage Amplifier

Isolation Voltage Amplifier Series										
	Part No.	Part No.	ISO Rating (kVrms)	Linear Input Range(mV)	Input Type	Output Type	CMTI (kV/μs)	AEC-Q100	Operating Temperature Range (°C)	Package Type
Isolated Amplifier	NSI1311	NSI1311	5	20~2000	Single-ended	Differential	150	✓	-40~125	SOW-8
	NSI1312	NSI1312D	5	-1200~1200	Differential	Differential	150		-40~125	SOW-8
										SOP-8
		NSI1312S	5	-1200~1200	Differential	Single-ended	150		-40~125	SOW-8
										SOP-8



NSI1311: Isolated Voltage Sampling Amplifier with High Reliability

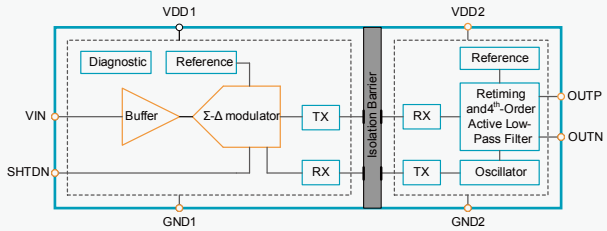
Product introduction

NSI1311 is a high-performance isolated amplifier with output separated from input based on the NOVOSENSE capacitive isolation technology. The device is designed with a single-ended input signal range of 0.1V to 2V. The high input impedance of the NSI1311 makes it ideal for connection to high voltage resistive dividers or other voltage signal sources with high output impedance. The fixed gain of the device is 1, and differential analog input is made available as well. Low offset and gain drift ensure accuracy over the entire temperature range. High common-mode transient immunity ensures that the device is able to provide accurate and reliable measurements even in the presence of high-power switching such as in motor control applications.The fail-safe function (high-side supply voltage loss detection) simplifies the design and diagnostics of the system.

Product feature

- Insulation voltage up to 5000Vrms
- Linear input range of 0.02 to 2V
- Fixed gain: 1
- Ultralow offset error and drift：±1.5mV(Max), -5 to 30μV/°C(Max)
- Ultralow gain error and drift：±0.3%(Max), ±45ppm/°C(Max)
- Ultralow non-linearity and drift：
- ±0.05%(Max) for 0.02V~0.1V VIN, ±0.04%(Max) for 0.1V~2V VIN, ±1ppm/°C(Max)
- SNR: 82dB(Typ, BW=10kHz) or 70dB(Typ, BW=100kHz)
- Wide bandwidth: 400kHz(Typ)
- High CMTI：150kV/us(Typ)
- System-level diagnostic capabilities: VDD1 monitoring
- Operating temperature: -40°C to 125°C
- RoHS compliant package: SOW-8(300mil)

Functional block diagram



Application

BUS voltage monitoring

AC motor control

Power and solar inverters

UPS

Onboard charger

NSI1312: Isolated Voltage Sampling Amplifier with High Reliability

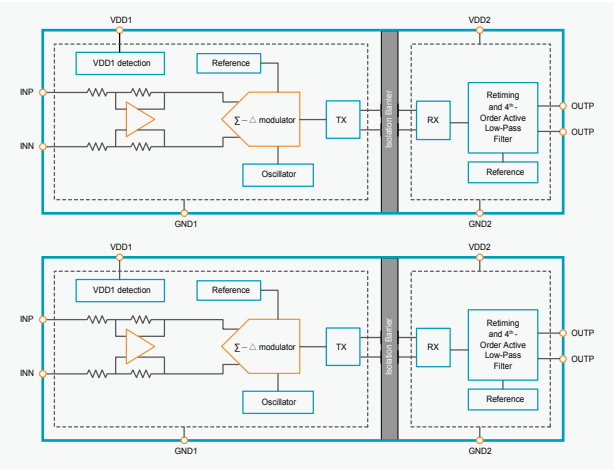
Product introduction

NSI1312 is a cost-effective isolated amplifier with output separated from input based on the NOVOSENSE capacitive isolation technology. The linear differential input signal range of the device is 1.2V (full scale ± 1.5V). The high input impedance of the NSI1311 makes it ideal for connection to high voltage resistive dividers or other voltage signal sources with high output impedance. The fixed gain of the device is 1, and two versions are available: one is with differential analog output (NSI1312D), and the other is with single-ended analog output (NSI1312S). Low offset and gain drift ensure accuracy over the entire temperature range. High common-mode transient immunity ensures that the device is able to provide accurate and reliable measurements even in the presence of high-power switching such as in motor control applications. The fail-safe function (high-side supply voltage loss detection) simplifies the design and diagnostics of the system.

Product feature

- Insulation voltage up to 5000Vrms
- Linear input range of ± 1.2V
- Fixed gain: 1
- Excellent DC performance:
  Offset error and drift: ±2.5mV(Max) , ±20μV/°C (Max)
  Gain error and drift: ±0.3%(Max), ±40ppm/°C (Max)
  Non-linearity and drift: ±0.05% (Max), ±1ppm/°C (Typ)
- SNR: 72dB(Typ)
- High CMTI: 150kV/us(Typ)
- System-level diagnostic capabilities:
  VDD1 monitoring
- Operating temperature: -40°C to 125°C
- RoHS compliant package: SOW-8 (300mil), SOP-8 (150mil)

Functional block diagram



Application

BUS voltage monitoring

AC motor control

Power and solar inverters

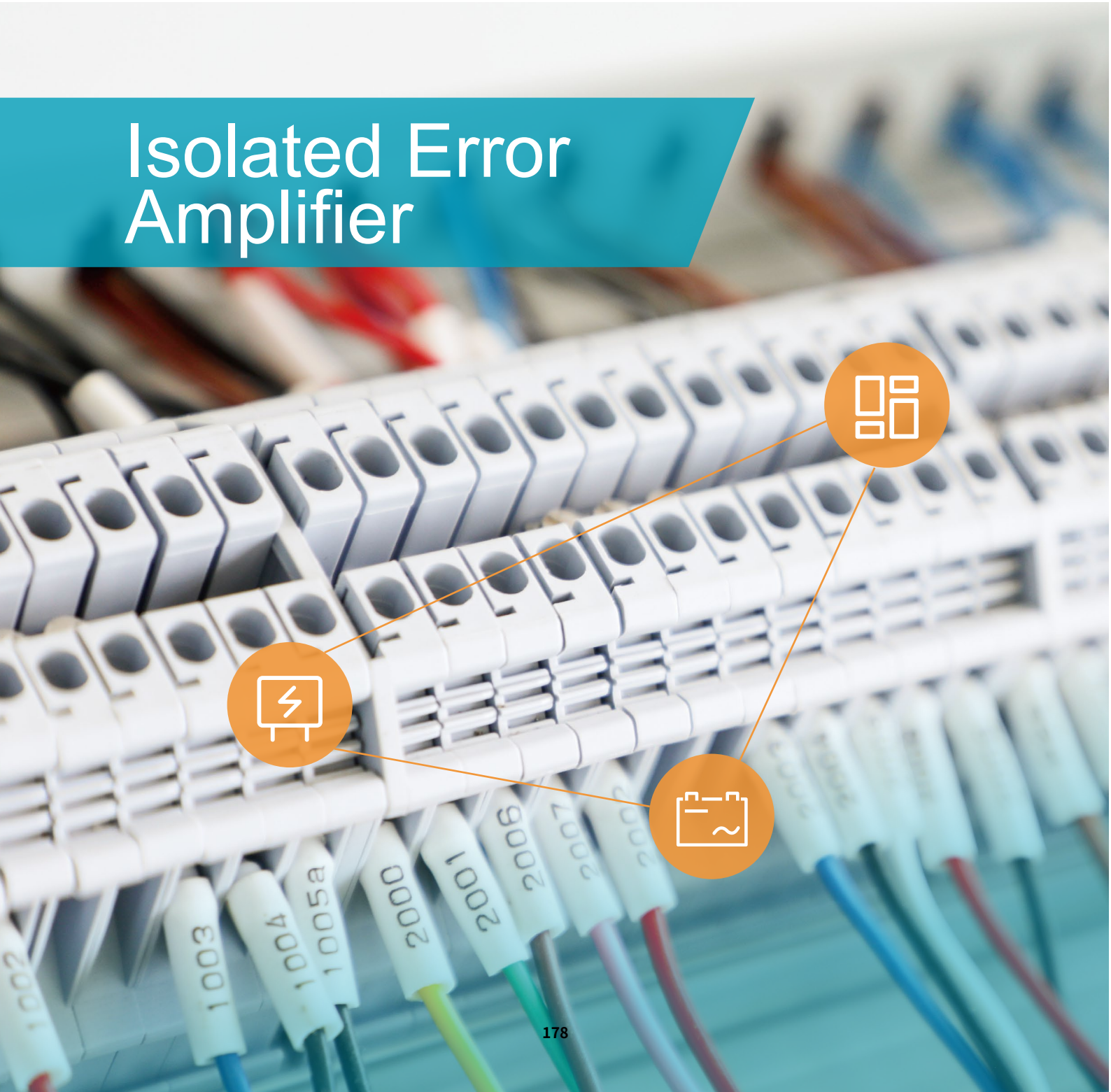
UPS

Onboard charger

Isolated Error Amplifier

NSI319x Isolated Error Amplifier								
	Part No.	ISO Rating (kVrms)	Bandwidth (kHz)	Initial Accuracy (%)	Reference Voltage (V)	CMTI (kV/μs)	Operating Temperature Range (°C)	Package Type
Isolated Error Amplifier	NSI3190	3	400	0.5	1.225	100	-40~125	SSOP16

Isolated Error Amplifier



NSI3190: Isolated Error Amplifier with High Reliability

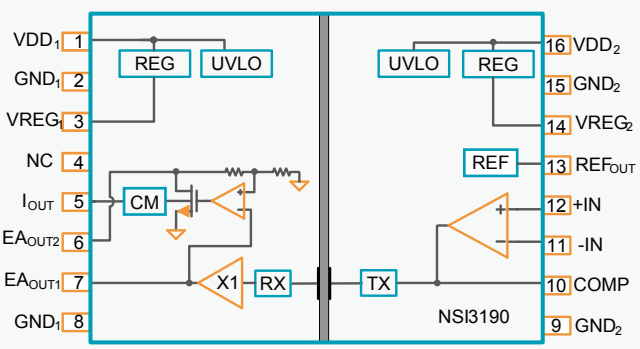
Product introduction

The NSI3190 is a high reliability isolated error amplifier based on NOVOSENSE capacitive isolation technology. NSI3190 is ideal for linear feedback power supplies. The primary side controller of the NSI3190 improves transient response, power density and stability compared to schemes using optocouplers and shunt regulators. The output of NSI3190 can support voltage output and current output, which is compatible with optocouplers. The current transmission coefficient can be set by an external resistor between EAOUT2 and VDD1 or VREG1.

Product feature

- 0.5% initial accuracy
- Insulation voltage up to 3000Vrms
- Wide bandwidth: 400kHz
- Power supply voltage:
  VDD1: 4V to 20V
  VDD2: 4V to 20V
- Reference voltage: 1.225V
- Compatible with voltage type output and current type output
- Ultra low power consumption
- Operating temperature: -40°C to 125°C

Functional block diagram



Application

DOSA compliant modules

Inverter

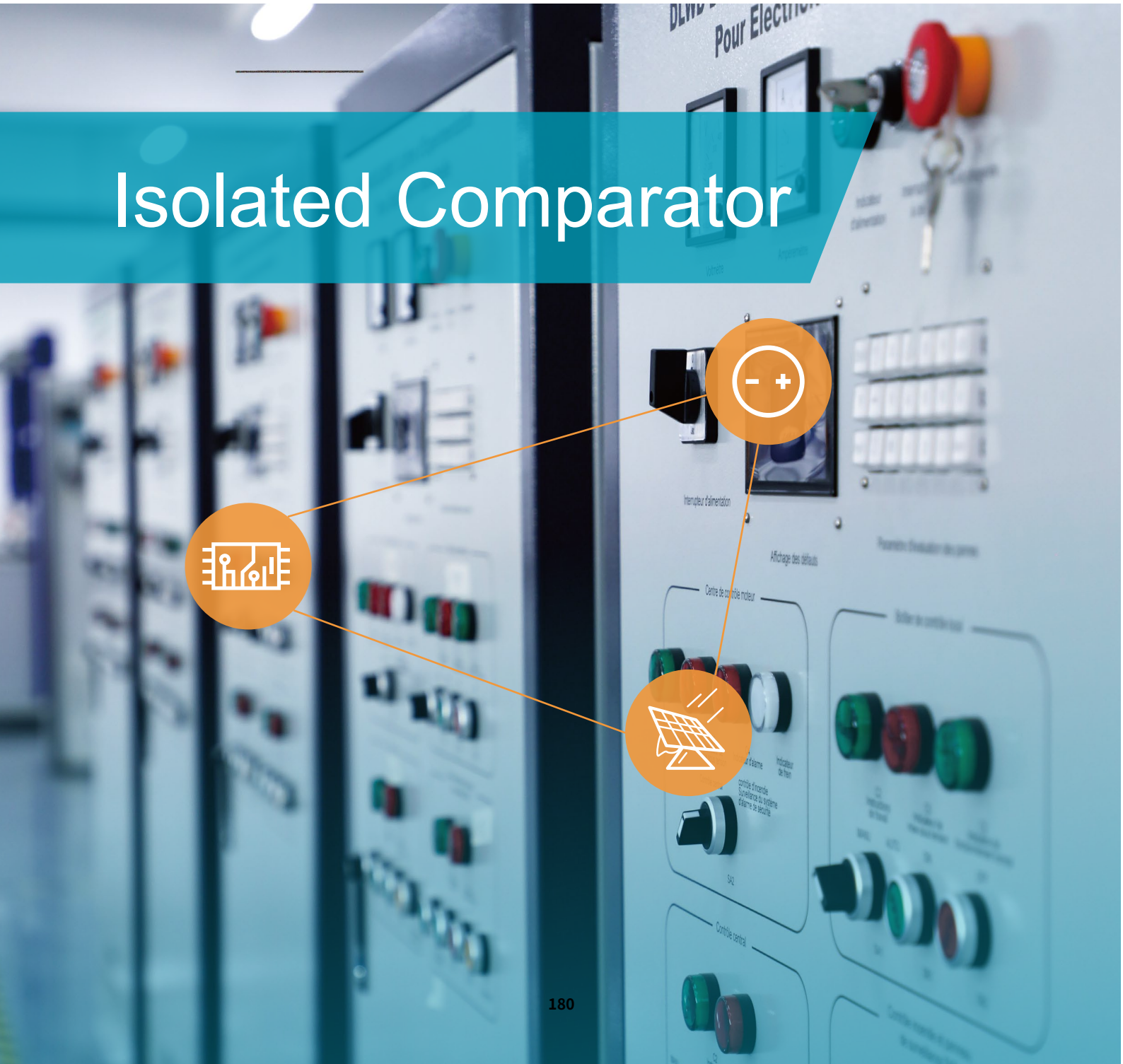
UPS

Voltage monitor

Power supply system

Isolated Comparator

NSI22C1x Isolated Comparator Series										
	Product	Part No.	ISO Rating (kVrms)	Input Power (V)	Reference Threshold (mV)	Output Type	CMTI (kV/μs)	Latching	Operating Temperature Range (°C)	Package
Isolated Comparator	NSI22C1x	NSI22C11	5	3.1-27	500~2000	Push-pull Open-drain	150		-40~125	SOW-8
										SOP-8
		NSI22C12	5	3.1-27	0~320	Open-drain	150	✓	-40~125	SOW-8
										SOP-8



NSI22C1x: High-speed isolated comparators

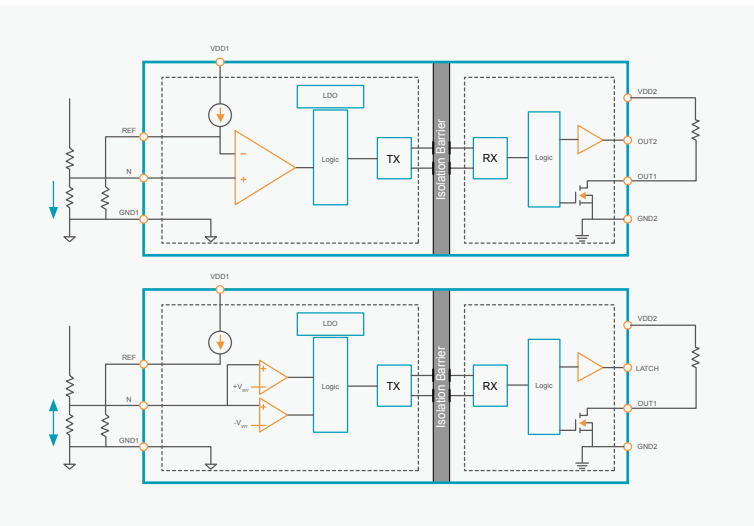
Product introduction

NSI22C1x is a high speed isolated comparator with output separated from input based on the NOVOSENSE capacitive isolation technology. NSI22C11 is an isolated comparator with open-drain and push-pull outputs, and the NSI22C12 is a window comparator with open-drain output and latch function. The fast response characteristics of the NSI22C1x make it ideal for overvoltage and overcurrent protection applications. The protection threshold of the NSI22C1x can be adjusted by external resistors. NSI22C11 is designed with an adjustable threshold from 0.5V to 2V, and NSI22C12 is designed with a window threshold adjustment range from ±20mV to ±320mV. Two packages are available for NSI22C1x, one is SOP-8 narrow-body package with basic isolation and the other is SOW-8 wide-body package with reinforced isolation.

Product feature

- Insulation voltage up to 5000Vrms
- Power supply at input side: 3.1V-27V
- Adjustable input reference range:
  NSI22C11: 0.5V to 2V
  NSI22C12: ±20 to ±320mV
- High-precision input threshold: ±1% error (Max)
- Comparator threshold error:
  NSI22C11: ±0.25% (Max)
  NSI22C12: ±1% (Max)
- CMTI: ±150kV/us(Typ)
- System-level diagnostic capabilities
  VDD1 monitoring
- Operating temperature: -40~125℃
- RoHS compliant package: SOP-8(150mil), SOW-8(300mil)

Functional block diagram



Application

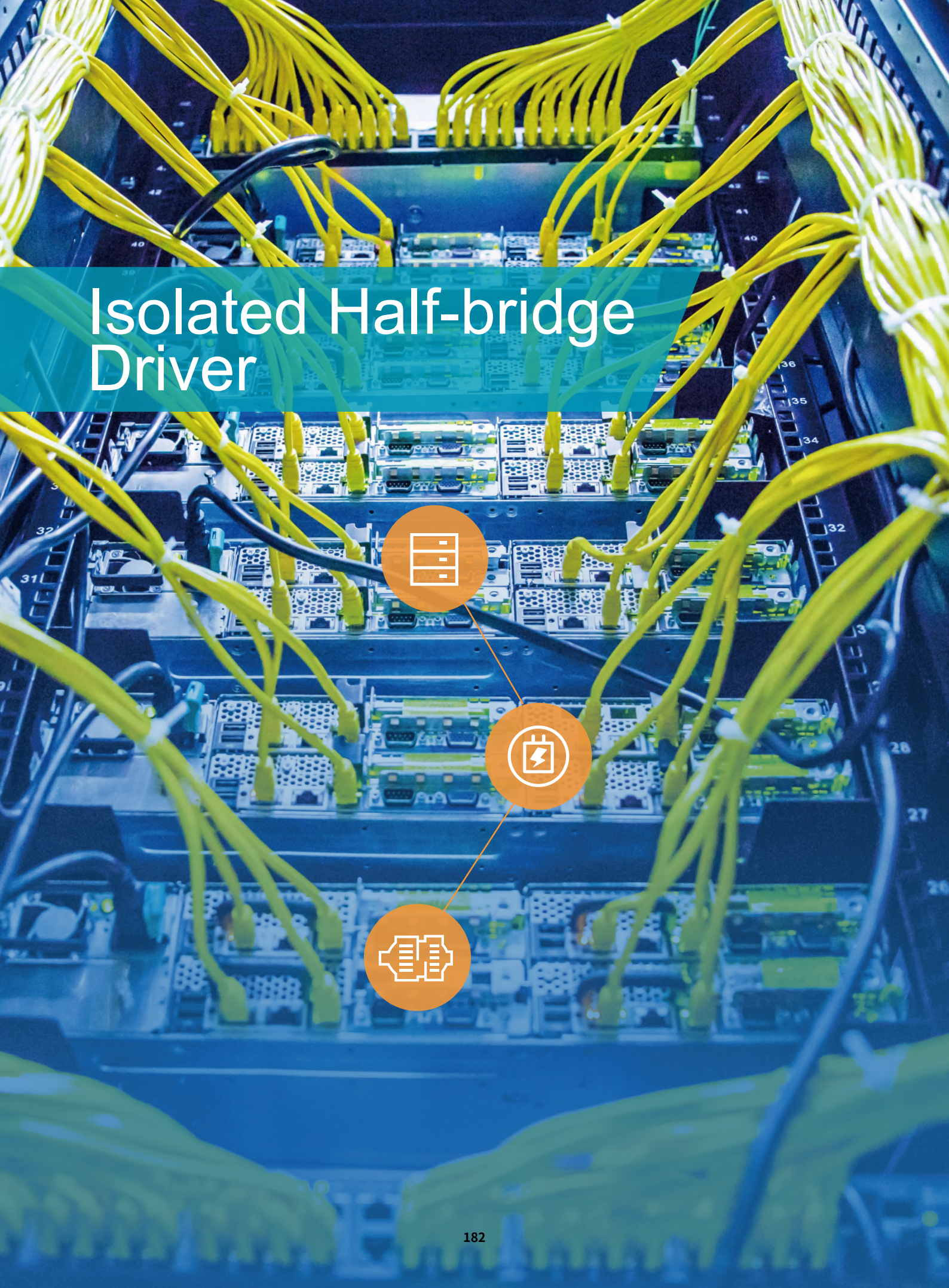
AC motor control

Power and solar inverters

UPS

Onboard charger

Isolated Half-bridge Driver



Isolated Half-bridge Driver

Part number	Peak output current (a)	VCC UVLO threshold (v)	Input side VCC voltage (Max)(V)	Output side VCC voltage (Max)(V)	CMTI (kV/μs)	Feature	Isolation withstand voltage (kVrms)	Insulation grade	Operating temperature (°C)	Qualification	Package
NSI6602A-DLAR	4/-6	6	6	30	150	Programmable dead time, Disable	2.5	Basic insulation	-40~125	Industrial	LGA13
NSI6602B-DLAR	4/-6	8	6	30	150	Programmable dead time, Disable	2.5	Basic insulation	-40~125	Industrial	LGA13
NSI6602C-DLAR	4/-6	13	6	30	150	Programmable dead time, Disable	2.5	Basic insulation	-40~125	Industrial	LGA13
NSI6602A-DSPNR	4/-6	6	6	30	150	Programmable dead time, Disable	3	Basic insulation	-40~125	Industrial	SOP16
NSI6602B-DSPNR	4/-6	8	6	30	150	Programmable dead time, Disable	3	Basic insulation	-40~125	Industrial	SOP16
NSI6602C-DSPNR	4/-6	13	6	30	150	Programmable dead time, Disable	3	Basic insulation	-40~125	Industrial	SOP16
NSI6602A-DSWR	4/-6	6	6	30	150	Programmable dead time, Disable	5.7	Reinforced insulation	-40~125	Industrial	SOW16
NSI6602B-DSWR	4/-6	8	6	30	150	Programmable dead time, Disable	5.7	Reinforced insulation	-40~125	Industrial	SOW16
NSI6602C-DSWR	4/-6	13	6	30	150	Programmable dead time, Disable	5.7	Reinforced insulation	-40~125	Industrial	SOW16
NSI6602A-DSWKR	4/-6	6	6	30	150	Programmable dead time, Disable	5.7	Reinforced insulation	-40~125	Industrial	SOW14
NSI6602B-DSWKR	4/-6	8	6	30	150	Programmable dead time, Disable	5.7	Reinforced insulation	-40~125	Industrial	SOW14
NSI6602C-DSWKR	4/-6	13	6	30	150	Programmable dead time, Disable	5.7	Reinforced insulation	-40~125	Industrial	SOW14
NSI6602A-Q1SWR	4/-6	6	6	30	150	Programmable dead time, Disable	5.7	Reinforced insulation	-40~125	Automotive	SOW16
NSI6602B-Q1SWR	4/-6	8	6	30	150	Programmable dead time, Disable	5.7	Reinforced insulation	-40~125	Automotive	SOW16
NSI6602C-Q1SWR	4/-6	13	6	30	150	Programmable dead time, Disable	5.7	Reinforced insulation	-40~125	Automotive	SOW16
NSI6602A-Q1SWKR	4/-6	6	6	30	150	Programmable dead time, Disable	5.7	Reinforced insulation	-40~125	Automotive	SOW14
NSI6602B-Q1SWKR	4/-6	8	6	30	150	Programmable dead time, Disable	5.7	Reinforced insulation	-40~125	Automotive	SOW14
NSI6602C-Q1SWKR	4/-6	13	6	30	150	Programmable dead time, Disable	5.7	Reinforced insulation	-40~125	Automotive	SOW14
NSI6602A-Q1SPNR	4/-6	6	6	30	150	Programmable dead time, Disable	3	Basic insulation	-40~125	Automotive	SOP16
NSI6602B-Q1SPNR	4/-6	8	6	30	150	Programmable dead time, Disable	3	Basic insulation	-40~125	Automotive	SOP16
NSI6602C-Q1SPNR	4/-6	13	6	30	150	Programmable dead time, Disable	3	Basic insulation	-40~125	Automotive	SOP16
NSI6622A-DLAR	4/-6	6	6	30	150	Disable	2.5	Basic insulation	-40~125	Industrial	LGA13
NSI6622B-DLAR	4/-6	8	6	30	150	Disable	2.5	Basic insulation	-40~125	Industrial	LGA13
NSI6622C-DLAR	4/-6	13	6	30	150	Disable	2.5	Basic insulation	-40~125	Industrial	LGA13
NSI6622A-DSPNR	4/-6	6	6	30	150	Disable	3	Basic insulation	-40~125	Industrial	SOP16
NSI6622B-DSPNR	4/-6	8	6	30	150	Disable	3	Basic insulation	-40~125	Industrial	SOP16
NSI6622C-DSPNR	4/-6	13	6	30	150	Disable	3	Basic insulation	-40~125	Industrial	SOP16
NSI6622A-DSWR	4/-6	6	6	30	150	Disable	5.7	Reinforced insulation	-40~125	Industrial	SOW16
NSI6622B-DSWR	4/-6	8	6	30	150	Disable	5.7	Reinforced insulation	-40~125	Industrial	SOW16
NSI6622C-DSWR	4/-6	13	6	30	150	Disable	5.7	Reinforced insulation	-40~125	Industrial	SOW16
NSI6622A-DSWKR	4/-6	6	6	30	150	Disable	5.7	Reinforced insulation	-40~125	Industrial	SOW14
NSI6622B-DSWKR	4/-6	8	6	30	150	Disable	5.7	Reinforced insulation	-40~125	Industrial	SOW14
NSI6622C-DSWKR	4/-6	13	6	30	150	Disable	5.7	Reinforced insulation	-40~125	Industrial	SOW14
NSI6622A-Q1SWR	4/-6	6	6	30	150	Disable	5.7	Reinforced insulation	-40~125	Automotive	SOW16
NSI6622B-Q1SWR	4/-6	8	6	30	150	Disable	5.7	Reinforced insulation	-40~125	Automotive	SOW16
NSI6622C-Q1SWR	4/-6	13	6	30	150	Disable	5.7	Reinforced insulation	-40~125	Automotive	SOW16
NSI6622A-Q1SWKR	4/-6	6	6	30	150	Disable	5.7	Reinforced insulation	-40~125	Automotive	SOW14
NSI6622B-Q1SWKR	4/-6	8	6	30	150	Disable	5.7	Reinforced insulation	-40~125	Automotive	SOW14
NSI6622C-Q1SWKR	4/-6	13	6	30	150	Disable	5.7	Reinforced insulation	-40~125	Automotive	SOW14
NSI6622A-Q1SPNR	4/-6	6	6	30	150	Disable	3	Basic insulation	-40~125	Automotive	SOP16
NSI6622B-Q1SPNR	4/-6	8	6	30	150	Disable	3	Basic insulation	-40~125	Automotive	SOP16
NSI6622C-Q1SPNR	4/-6	13	6	30	150	Disable	3	Basic insulation	-40~125	Automotive	SOP16
NSI6602VA-DLAR	6/-8	6	24	30	150	Programmable dead time, Disable	2.5	Basic insulation	-40~125	Industrial	LGA13

Isolated Half-bridge Driver

Part number	Peak output current (a)	VCC UVLO threshold (v)	Input side VCC voltage (Max)(V)	Output side VCC voltage (Max)(V)	CMTI (kV/μs)	Feature	Isolation withstand voltage (kVrms)	Insulation grade	Operating temperature (°C)	Qualification	Package
NSI6602VB-DLAR	6/-8	8	24	30	150	Programmable dead time, Disable	2.5	Basic insulation	-40~125	Industrial	LGA13
NSI6602VC-DLAR	6/-8	12	24	30	150	Programmable dead time, Disable	2.5	Basic insulation	-40~125	Industrial	LGA13
NSI6602VD-DLAR	6/-8	4	24	30	150	Programmable dead time, Disable	2.5	Basic insulation	-40~125	Industrial	LGA13
NSI6602VA-DLAMR	6/-8	6	24	30	150	Programmable dead time, Disable	1.6	Basic insulation	-40~125	Industrial	LGA13
NSI6602VB-DLAMR	6/-8	8	24	30	150	Programmable dead time, Disable	1.6	Basic insulation	-40~125	Industrial	LGA13
NSI6602VC-DLAMR	6/-8	12	24	30	150	Programmable dead time, Disable	1.6	Basic insulation	-40~125	Industrial	LGA13
NSI6602VD-DLAMR	6/-8	4	24	30	150	Programmable dead time, Disable	1.6	Basic insulation	-40~125	Industrial	LGA13
NSI6602VA-DSWR	6/-8	6	24	30	150	Programmable dead time, Disable	5.7	Reinforced insulation	-40~125	Industrial	SOW16
NSI6602VB-DSWR	6/-8	8	24	30	150	Programmable dead time, Disable	5.7	Reinforced insulation	-40~125	Industrial	SOW16
NSI6602VC-DSWR	6/-8	12	24	30	150	Programmable dead time, Disable	5.7	Reinforced insulation	-40~125	Industrial	SOW16
NSI6602VD-DSWR	6/-8	4	24	30	150	Programmable dead time, Disable	5.7	Reinforced insulation	-40~125	Industrial	SOW16
NSI6602VA-DSWKR	6/-8	6	24	30	150	Programmable dead time, Disable	5.7	Reinforced insulation	-40~125	Industrial	SOW14
NSI6602VB-DSWKR	6/-8	8	24	30	150	Programmable dead time, Disable	5.7	Reinforced insulation	-40~125	Industrial	SOW14
NSI6602VC-DSWKR	6/-8	12	24	30	150	Programmable dead time, Disable	5.7	Reinforced insulation	-40~125	Industrial	SOW14
NSI6602VD-DSWKR	6/-8	4	24	30	150	Programmable dead time, Disable	5.7	Reinforced insulation	-40~125	Industrial	SOW14
NSI6602VA-DSPNR	6/-8	6	24	30	150	Programmable dead time, Disable	3	Basic insulation	-40~125	Industrial	SOP16
NSI6602VB-DSPNR	6/-8	8	24	30	150	Programmable dead time, Disable	3	Basic insulation	-40~125	Industrial	SOP16
NSI6602VC-DSPNR	6/-8	12	24	30	150	Programmable dead time, Disable	3	Basic insulation	-40~125	Industrial	SOP16
NSI6602VD-DSPNR	6/-8	4	24	30	150	Programmable dead time, Disable	3	Basic insulation	-40~125	Industrial	SOP16
NSI6602VA-Q1SWR	6/-8	6	24	30	150	Programmable dead time, Disable	5.7	Reinforced insulation	-40~125	Automotive	SOW16
NSI6602VB-Q1SWR	6/-8	8	24	30	150	Programmable dead time, Disable	5.7	Reinforced insulation	-40~125	Automotive	SOW16
NSI6602VC-Q1SWR	6/-8	12	24	30	150	Programmable dead time, Disable	5.7	Reinforced insulation	-40~125	Automotive	SOW16
NSI6602VD-Q1SWR	6/-8	4	24	30	150	Programmable dead time, Disable	5.7	Reinforced insulation	-40~125	Automotive	SOW16
NSI6602VA-Q1SWKR	6/-8	6	24	30	150	Programmable dead time, Disable	5.7	Reinforced insulation	-40~125	Automotive	SOW14
NSI6602VB-Q1SWKR	6/-8	8	24	30	150	Programmable dead time, Disable	5.7	Reinforced insulation	-40~125	Automotive	SOW14
NSI6602VC-Q1SWKR	6/-8	12	24	30	150	Programmable dead time, Disable	5.7	Reinforced insulation	-40~125	Automotive	SOW14
NSI6602VD-Q1SWKR	6/-8	4	24	30	150	Programmable dead time, Disable	5.7	Reinforced insulation	-40~125	Automotive	SOW14
NSI6602VA-Q1SPNR	6/-8	6	24	30	150	Programmable dead time, Disable	3	Basic insulation	-40~125	Automotive	SOP16
NSI6602VB-Q1SPNR	6/-8	8	24	30	150	Programmable dead time, Disable	3	Basic insulation	-40~125	Automotive	SOP16
NSI6602VC-Q1SPNR	6/-8	12	24	30	150	Programmable dead time, Disable	3	Basic insulation	-40~125	Automotive	SOP16
NSI6602VD-Q1SPNR	6/-8	4	24	30	150	Programmable dead time, Disable	3	Basic insulation	-40~125	Automotive	SOP16
NSI6602MC-DSWTR	5/-5	9	6	35	150	Miller clamp, Programmable dead time, Disable	5.7	Reinforced insulation	-40~125	Industrial	SOW18
NSI6602MC-DSWTR	5/-5	12	6	35	150	Miller clamp, Programmable dead time, Disable	5.7	Reinforced insulation	-40~125	Industrial	SOW18
NSI6602MF-DSWTR	5/-5	15	6	35	150	Miller clamp, Programmable dead time, Disable	5.7	Reinforced insulation	-40~125	Industrial	SOW18
NSI6602MNB-DSWTR	5/-5	9	6	35	150	Miller clamp, Programmable dead time, Disable	5.7	Reinforced insulation	-40~125	Industrial	SOW18
NSI6602MNC-DSWTR	5/-5	12	6	35	150	Miller clamp, Programmable dead time, Disable	5.7	Reinforced insulation	-40~125	Industrial	SOW18
NSI6602MNF-DSWTR	5/-5	15	6	35	150	Miller clamp, Programmable dead time, Disable	5.7	Reinforced insulation	-40~125	Industrial	SOW18
NSI6602NA-DLAR	6/-8	6	24	30	150	Programmable dead time, Enable	2.5	Basic insulation	-40~125	Industrial	LGA13
NSI6602NB-DLAR	6/-8	8	24	30	150	Programmable dead time, Enable	2.5	Basic insulation	-40~125	Industrial	LGA13
NSI6602NC-DLAR	6/-8	12	24	30	150	Programmable dead time, Enable	2.5	Basic insulation	-40~125	Industrial	LGA13
NSI6602ND-DLAR	6/-8	4	24	30	150	Programmable dead time, Enable	2.5	Basic insulation	-40~125	Industrial	LGA13

Part number	Peak output current (a)	VCC UVLO threshold (v)	Input side VCC voltage (Max)(V)	Output side VCC voltage (Max)(V)	CMTI (kV/μs)	Feature	Isolation withstand voltage (kVrms)	Insulation grade	Operating temperature (°C)	Qualification	Package
NSI6602NA-DLAMR	6/-8	6	24	30	150	Programmable dead time, Enable	1.6	Basic insulation	-40~125	Industrial	LGA13
NSI6602NB-DLAMR	6/-8	8	24	30	150	Programmable dead time, Enable	1.6	Basic insulation	-40~125	Industrial	LGA13
NSI6602NC-DLAMR	6/-8	12	24	30	150	Programmable dead time, Enable	1.6	Basic insulation	-40~125	Industrial	LGA13
NSI6602ND-DLAMR	6/-8	4	24	30	150	Programmable dead time, Enable	1.6	Basic insulation	-40~125	Industrial	LGA13
NSI6602NA-DSWR	6/-8	6	24	30	150	Programmable dead time, Enable	5.7	Reinforced insulation	-40~125	Industrial	SOW16
NSI6602NB-DSWR	6/-8	8	24	30	150	Programmable dead time, Enable	5.7	Reinforced insulation	-40~125	Industrial	SOW16
NSI6602NC-DSWR	6/-8	12	24	30	150	Programmable dead time, Enable	5.7	Reinforced insulation	-40~125	Industrial	SOW16
NSI6602ND-DSWR	6/-8	4	24	30	150	Programmable dead time, Enable	5.7	Reinforced insulation	-40~125	Industrial	SOW16
NSI6602NA-DSWKR	6/-8	6	24	30	150	Programmable dead time, Enable	5.7	Reinforced insulation	-40~125	Industrial	SOW14
NSI6602NB-DSWKR	6/-8	8	24	30	150	Programmable dead time, Enable	5.7	Reinforced insulation	-40~125	Industrial	SOW14
NSI6602NC-DSWKR	6/-8	12	24	30	150	Programmable dead time, Enable	5.7	Reinforced insulation	-40~125	Industrial	SOW14
NSI6602ND-DSWKR	6/-8	4	24	30	150	Programmable dead time, Enable	5.7	Reinforced insulation	-40~125	Industrial	SOW14
NSI6602NA-DSPNR	6/-8	6	24	30	150	Programmable dead time, Enable	3	Basic insulation	-40~125	Industrial	SOP16
NSI6602NB-DSPNR	6/-8	8	24	30	150	Programmable dead time, Enable	3	Basic insulation	-40~125	Industrial	SOP16
NSI6602NC-DSPNR	6/-8	12	24	30	150	Programmable dead time, Enable	3	Basic insulation	-40~125	Industrial	SOP16
NSI6602ND-DSPNR	6/-8	4	24	30	150	Programmable dead time, Enable	3	Basic insulation	-40~125	Industrial	SOP16
NSI6642A-DLAR	6/-8	6	24	30	150	Programmable dead time, Enable	2.5	Basic insulation	-40~125	Industrial	LGA13
NSI6642B-DLAR	6/-8	8	24	30	150	Programmable dead time, Enable	2.5	Basic insulation	-40~125	Industrial	LGA13
NSI6642C-DLAR	6/-8	12	24	30	150	Programmable dead time, Enable	2.5	Basic insulation	-40~125	Industrial	LGA13
NSI6642D-DLAR	6/-8	4	24	30	150	Programmable dead time, Enable	2.5	Basic insulation	-40~125	Industrial	LGA13
NSI6642A-DLAMR	6/-8	6	24	30	150	Programmable dead time, Enable	1.6	Basic insulation	-40~125	Industrial	LGA13
NSI6642B-DLAMR	6/-8	8	24	30	150	Programmable dead time, Enable	1.6	Basic insulation	-40~125	Industrial	LGA13
NSI6642C-DLAMR	6/-8	12	24	30	150	Programmable dead time, Enable	1.6	Basic insulation	-40~125	Industrial	LGA13
NSI6642D-DLAMR	6/-8	4	24	30	150	Programmable dead time, Enable	1.6	Basic insulation	-40~125	Industrial	LGA13
NSI6642A-DSWR	6/-8	6	24	30	150	Programmable dead time, Enable	5.7	Reinforced insulation	-40~125	Industrial	SOW16
NSI6642B-DSWR	6/-8	8	24	30	150	Programmable dead time, Enable	5.7	Reinforced insulation	-40~125	Industrial	SOW16
NSI6642C-DSWR	6/-8	12	24	30	150	Programmable dead time, Enable	5.7	Reinforced insulation	-40~125	Industrial	SOW16
NSI6642D-DSWR	6/-8	4	24	30	150	Programmable dead time, Enable	5.7	Reinforced insulation	-40~125	Industrial	SOW16
NSI6642A-DSWKR	6/-8	6	24	30	150	Programmable dead time, Enable	5.7	Reinforced insulation	-40~125	Industrial	SOW14
NSI6642B-DSWKR	6/-8	8	24	30	150	Programmable dead time, Enable	5.7	Reinforced insulation	-40~125	Industrial	SOW14
NSI6642C-DSWKR	6/-8	12	24	30	150	Programmable dead time, Enable	5.7	Reinforced insulation	-40~125	Industrial	SOW14
NSI6642D-DSWKR	6/-8	4	24	30	150	Programmable dead time, Enable	5.7	Reinforced insulation	-40~125	Industrial	SOW14
NSI6642A-DSPNR	6/-8	6	24	30	150	Programmable dead time, Enable	3	Basic insulation	-40~125	Industrial	SOP16
NSI6642B-DSPNR	6/-8	8	24	30	150	Programmable dead time, Enable	3	Basic insulation	-40~125	Industrial	SOP16
NSI6642C-DSPNR	6/-8	12	24	30	150	Programmable dead time, Enable	3	Basic insulation	-40~125	Industrial	SOP16
NSI6642D-DSPNR	6/-8	4	24	30	150	Programmable dead time, Enable	3	Basic insulation	-40~125	Industrial	SOP16
NSI6622NA-DLAR	6/-8	6	24	30	150	Enable	2.5	Basic insulation	-40~125	Industrial	LGA13
NSI6622NB-DLAR	6/-8	8	24	30	150	Enable	2.5	Basic insulation	-40~125	Industrial	LGA13
NSI6622NC-DLAR	6/-8	12	24	30	150	Enable	2.5	Basic insulation	-40~125	Industrial	LGA13
NSI6622ND-DLAR	6/-8	4	24	30	150	Enable	2.5	Basic insulation	-40~125	Industrial	LGA13
NSI6622NA-DLAMR	6/-8	6	24	30	150	Enable	1.6	Basic insulation	-40~125	Industrial	LGA13
NSI6622NB-DLAMR	6/-8	8	24	30	150	Enable	1.6	Basic insulation	-40~125	Industrial	LGA13

Isolated Half-bridge Driver

Part number	Peak output current (a)	VCC UVLO threshold (v)	Input side VCC voltage (Max)(V)	Output side VCC voltage (Max)(V)	CMTI (kV/μs)	Feature	Isolation withstand voltage (kVrms)	Insulation grade	Operating temperature (°C)	Qualification	Package
NSI6622NC-DLAMR	6/-8	12	24	30	150	Enable	1.6	Basic insulation	-40~125	Industrial	LGA13
NSI6622ND-DLAMR	6/-8	4	24	30	150	Enable	1.6	Basic insulation	-40~125	Industrial	LGA13
NSI6622NA-DSWR	6/-8	6	24	30	150	Enable	5.7	Reinforced insulation	-40~125	Industrial	SOW16
NSI6622NB-DSWR	6/-8	8	24	30	150	Enable	5.7	Reinforced insulation	-40~125	Industrial	SOW16
NSI6622NC-DSWR	6/-8	12	24	30	150	Enable	5.7	Reinforced insulation	-40~125	Industrial	SOW16
NSI6622ND-DSWR	6/-8	4	24	30	150	Enable	5.7	Reinforced insulation	-40~125	Industrial	SOW16
NSI6622NA-DSWKR	6/-8	6	24	30	150	Enable	5.7	Reinforced insulation	-40~125	Industrial	SOW14
NSI6622NB-DSWKR	6/-8	8	24	30	150	Enable	5.7	Reinforced insulation	-40~125	Industrial	SOW14
NSI6622NC-DSWKR	6/-8	12	24	30	150	Enable	5.7	Reinforced insulation	-40~125	Industrial	SOW14
NSI6622ND-DSWKR	6/-8	4	24	30	150	Enable	5.7	Reinforced insulation	-40~125	Industrial	SOW14
NSI6622NA-DSPNR	6/-8	6	24	30	150	Enable	3	Basic insulation	-40~125	Industrial	SOP16
NSI6622NB-DSPNR	6/-8	8	24	30	150	Enable	3	Basic insulation	-40~125	Industrial	SOP16
NSI6622NC-DSPNR	6/-8	12	24	30	150	Enable	3	Basic insulation	-40~125	Industrial	SOP16
NSI6622ND-DSPNR	6/-8	4	24	30	150	Enable	3	Basic insulation	-40~125	Industrial	SOP16
NSI6602NA-Q1SWR	6/-8	6	24	30	150	Programmable dead time, Enable	5.7	Reinforced insulation	-40~125	Automotive	SOW16
NSI6602NB-Q1SWR	6/-8	8	24	30	150	Programmable dead time, Enable	5.7	Reinforced insulation	-40~125	Automotive	SOW16
NSI6602NC-Q1SWR	6/-8	12	24	30	150	Programmable dead time, Enable	5.7	Reinforced insulation	-40~125	Automotive	SOW16
NSI6602NA-Q1SWKR	6/-8	6	24	30	150	Programmable dead time, Enable	5.7	Reinforced insulation	-40~125	Automotive	SOW14
NSI6602NB-Q1SWKR	6/-8	8	24	30	150	Programmable dead time, Enable	5.7	Reinforced insulation	-40~125	Automotive	SOW14
NSI6602NC-Q1SWKR	6/-8	12	24	30	150	Programmable dead time, Enable	5.7	Reinforced insulation	-40~125	Automotive	SOW14
NSI6602NA-Q1SPNR	6/-8	6	24	30	150	Programmable dead time, Enable	3	Basic insulation	-40~125	Automotive	SOP16
NSI6602NB-Q1SPNR	6/-8	8	24	30	150	Programmable dead time, Enable	3	Basic insulation	-40~125	Automotive	SOP16
NSI6602NC-Q1SPNR	6/-8	12	24	30	150	Programmable dead time, Enable	3	Basic insulation	-40~125	Automotive	SOP16
NSI6602NA-Q1SPOR	6/-8	6	24	30	150	Programmable dead time, Enable	3	Basic insulation	-40~125	Automotive	SOP14
NSI6602NB-Q1SPOR	6/-8	8	24	30	150	Programmable dead time, Enable	3	Basic insulation	-40~125	Automotive	SOP14
NSI6602NC-Q1SPOR	6/-8	12	24	30	150	Programmable dead time, Enable	3	Basic insulation	-40~125	Automotive	SOP14
NSI6622NA-Q1SWR	6/-8	6	24	30	150	Enable	5.7	Reinforced insulation	-40~125	Automotive	SOW16
NSI6622NB-Q1SWR	6/-8	8	24	30	150	Enable	5.7	Reinforced insulation	-40~125	Automotive	SOW16
NSI6622NC-Q1SWR	6/-8	12	24	30	150	Enable	5.7	Reinforced insulation	-40~125	Automotive	SOW16
NSI6622NA-Q1SWKR	6/-8	6	24	30	150	Enable	5.7	Reinforced insulation	-40~125	Automotive	SOW14
NSI6622NB-Q1SWKR	6/-8	8	24	30	150	Enable	5.7	Reinforced insulation	-40~125	Automotive	SOW14
NSI6622NC-Q1SWKR	6/-8	12	24	30	150	Enable	5.7	Reinforced insulation	-40~125	Automotive	SOW14
NSI6622NA-Q1SPNR	6/-8	6	24	30	150	Enable	3	Basic insulation	-40~125	Automotive	SOP16
NSI6622NB-Q1SPNR	6/-8	8	24	30	150	Enable	3	Basic insulation	-40~125	Automotive	SOP16
NSI6622NC-Q1SPNR	6/-8	12	24	30	150	Enable	3	Basic insulation	-40~125	Automotive	SOP16
NSI6622NA-Q1SPOR	6/-8	6	24	30	150	Enable	3	Basic insulation	-40~125	Automotive	SOP14
NSI6622NB-Q1SPOR	6/-8	8	24	30	150	Enable	3	Basic insulation	-40~125	Automotive	SOP14
NSI6622NC-Q1SPOR	6/-8	12	24	30	150	Enable	3	Basic insulation	-40~125	Automotive	SOP14
NSI6622VA-Q1SWR	6/-8	6	24	30	150	Disable	5.7	Reinforced insulation	-40~125	Automotive	SOW16
NSI6622VB-Q1SWR	6/-8	8	24	30	150	Disable	5.7	Reinforced insulation	-40~125	Automotive	SOW16
NSI6622VC-Q1SWR	6/-8	12	24	30	150	Disable	5.7	Reinforced insulation	-40~125	Automotive	SOW16

Part number	Peak output current (a)	VCC UVLO threshold (v)	Input side VCC voltage (Max)(V)	Output side VCC voltage (Max)(V)	CMTI (kV/μs)	Feature	Isolation withstand voltage (kVrms)	Insulation grade	Operating temperature (°C)	Qualification	Package
NSI6622VA-Q1SWKR	6/-8	6	24	30	150	Disable	5.7	Reinforced insulation	-40~125	Automotive	SOW14
NSI6622VB-Q1SWKR	6/-8	8	24	30	150	Disable	5.7	Reinforced insulation	-40~125	Automotive	SOW14
NSI6622VC-Q1SWKR	6/-8	12	24	30	150	Disable	5.7	Reinforced insulation	-40~125	Automotive	SOW14
NSI6622VA-Q1SPNR	6/-8	6	24	30	150	Disable	3	Basic insulation	-40~125	Automotive	SOP16
NSI6622VB-Q1SPNR	6/-8	8	24	30	150	Disable	3	Basic insulation	-40~125	Automotive	SOP16
NSI6622VC-Q1SPNR	6/-8	12	24	30	150	Disable	3	Basic insulation	-40~125	Automotive	SOP16
NSI6622VA-Q1SPOR	6/-8	6	24	30	150	Disable	3	Basic insulation	-40~125	Automotive	SOP14
NSI6622VB-Q1SPOR	6/-8	8	24	30	150	Disable	3	Basic insulation	-40~125	Automotive	SOP14
NSI6622VC-Q1SPOR	6/-8	12	24	30	150	Disable	3	Basic insulation	-40~125	Automotive	SOP14

NSI66x2: Isolated Dual-channel Gate Driver

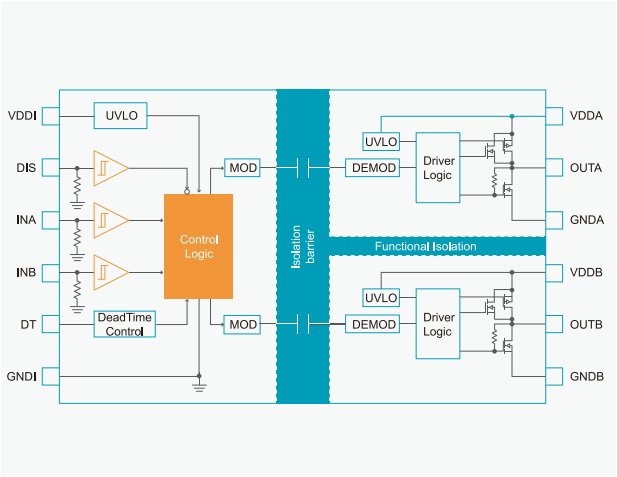
Product introduction

NSI66x2 is a series of highly reliable isolated dual channel gate driver ICs, which can be designed to drive power transistors with switching frequency up to 2MHz. Each output can source and sink up to 4A/6A with fast propagation delay of 25ns and the maximum delay matching of 5ns. NSI66x2 provides 2500Vrms isolation in 5*5mm LGA13 package according to UL1577, 3000Vrms isolation in SOP16 package, and 5700Vrms isolation in SOW16 and SOW14 packages. The common mode transient immunity (CMTI) of typical 150kV/μs improves system robustness. The absolute max rating of the driver side is 30V, and the input side accepts supply voltages from 3V to 5.5V. All supply voltage pins support undervoltage lockout (UVLO). With all these outstanding features, NSI66x2 is suitable for switching power supply systems which require high reliability, high power density and high efficiency.

Product feature

- Isolated dual channel driver
- Input side power supply voltage: 3V~5.5V
- Driver side power supply voltage: Absolute max rating 30V, with UVLO
- Peak source and sink current 4A/6A
- High CMTI: typical 150kV/μs
- Typical propagation delay: 25ns
- Maximum delay matching: 5ns
- Maximum pulse width distortion: 6ns
- Programmable dead time (NSI6602)
- No dead time (NSI6622)
- Minimum receivable input pulse width: 15ns
- Operating temperature: -40°C~125°C
- AEC-Q100 qualified

Functional block diagram



Safety certification

- UL1577 certification:
  LGA13: 2.5kVrms
  SOW14: 5.7kVrms for 1 minute
  SOW16: 5.7kVrms for 1 minute
  SOP16: 3kVrms for 1 minute
- CQC certification: GB4943.1-2011
- CSA certification: 5A
- VDE certification: DIN V VDE V 0884-11:2017-1

Package

- LGA13(4*4mm), LGA13(5*5mm),SOW14, SOW16, SOP16

Application

Isolated DC-DC and AC-DC power supplies in servers, telecommunications and Industrial

DC-AC solar inverter

Motor drive and EV charging

UPS and battery charger

NSI6602V/NSI6602N: Second - generation High-performance Isolated Dual-channel Gate Driver

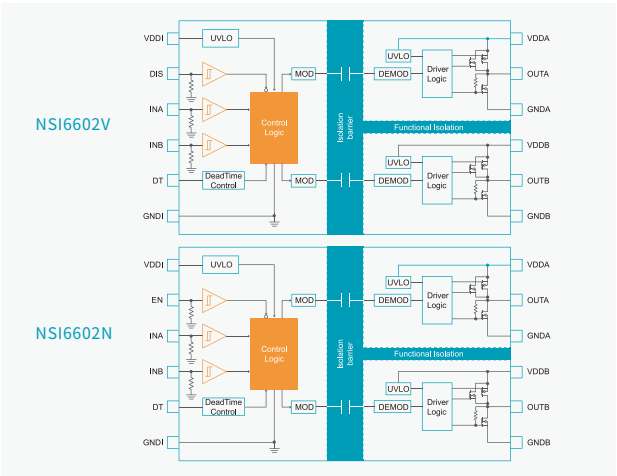
Product introduction

NSI6602V/NSI6602N is the second-generation high-reliability isolated dual-channel gate driver IC, which enhances anti-interference capability and drive capability, reduces power consumption, and improves the withstand voltage of the input side. It can drive power transistors with switching frequencies up to 2MHz. Each channel output can provide a maximum source/sink current capability of 6A/8A with a fast 25ns propagation delay and a maximum delay match of 5ns. Common-mode transient immunity (CMTI) of 150kV/us improves system robustness. The absolute max rating of the driver side is 30V, and the input side accepts supply voltages from 3V to 18V. All supply voltage pins support undervoltage lockout (UVLO). In addition, multiple undervoltage points are available. The minimum undervoltage point supports 4V and can be used to drive GaN power devices. Multiple packages are available. The minimum package is the 4*4mm LGA package, which can be used in applications with high power density requirements. According to UL1577, the NSI6602V provides 2500Vrms isolation with the 5*5mm LGA13 package, 3000Vrms isolation with the SOP16 package, and 5700Vrms isolation with SOW16 and SOW14 packages. With all these outstanding features, NSI6602V is suitable for switching power supply systems which require high reliability, high power density and high efficiency.

Product feature

- Isolated dual-channel driver
- Input side supply voltage: 3V-18V
- Driver side supply voltage: Absolute max rating 30V, with UVLO
- Peak 6A/8A source/sink current capacity
- High CMTI: typical 150kV/μs
- 25ns typical propagation delay
- 5ns maximum delay matching
- 6ns maximum pulse width distortion
- Programmable dead time
- Enabling pins: NSI6602N Disable (high level off), NSI6602N Enable (high level on)
- Acceptable minimum input pulse width 15ns
- Operating temperature: -40°C~125°C
- AEC-Q100 qualified

Functional block diagram

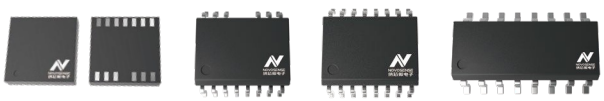


Safety certification

- LGA13(4*4mm): 1.6kVrms
  LGA13(5*5mm): 2.5kVrms
  SOW14: 5.7kVrms for 1 minute
  SOW16: 5.7kVrms for 1 minute
  SOP16: 3kVrms for 1 minute
- CQC certification: GB4943.1 -2011
- CSA certification: components 5A qualified
- VDE certification: DIN V VDE V 0884-11: 2017-1

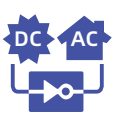
Package

- LGA13(4*4mm), LGA13(5*5mm), SOW14, SOW16, SOP16



Application

Isolated DC-DC and AC-DC power supplies in servers, telecommunications and Industrial



DC-AC solar inverter

Motor drive and EV charging

UPS and battery charger

NSI6642: Second-generation High-performance Isolated Dual-channel Gate Driver Supporting PWM Input

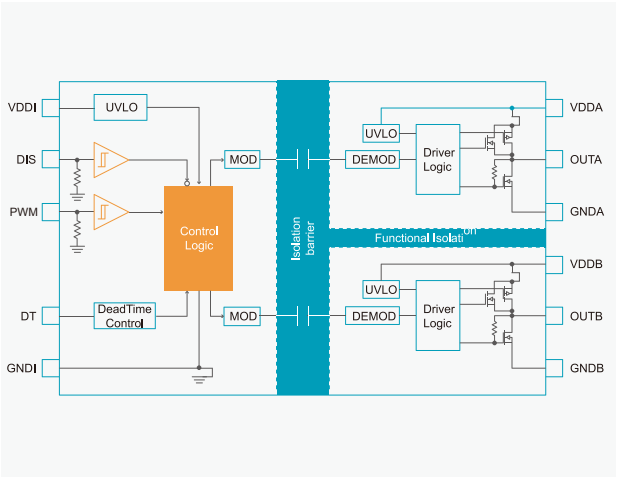
Product introduction

NSI6642 is the second-generation, highly reliable, isolated dual-channel gate driver IC which provides enhanced anti-interference and drive capabilities with lower power consumption and improved withstand voltage of the input side. It uses a single PWM input mode to achieve complementary dual output and is capable of driving power transistors with switching frequencies up to 2MHz. Each channel output can provide a peak source/sink current capability of 6A/8A with a fast 25ns propagation delay and a maximum 5ns channel to channel delay match. It has a common-mode transient immunity (CMTI) of typical 150kV/μs, improving system robustness. The absolute max rating of the driver side is 30V, and the input side accepts supply voltages from 3V to 18V. All supply voltage pins support undervoltage lockout (UVLO). In addition, multiple UVLO options are available. The minimum UVLO supports 4V and can be used to drive GaN power devices. Multiple packages are also available. The minimum package is the 4*4mm LGA package, which can be used in applications with high power density requirements. According to UL1577, the NSI6642 provides 2500Vrms isolation with the 5*5mm LGA13 package, 3000Vrms isolation in the SOP16 package, and 5000Vrms isolation in the SOW16 and SOW14 packages. With all these outstanding features, the NSI6642 is suitable for switching power supply systems which require high reliability, high power density and high efficiency.

Product feature

- Isolated dual-channel driver
- Single PWM input with complementary output OUTA and OUTB
- Input side supply voltage: 3V-18V
- Driver side supply voltage: Absolute max rating 30V, with UVLO
- Peak 6A/8A source/sink current capacity
- High CMTI: typical 150kV/μs
- 25ns typical transmission delay
- 5ns maximum channel to channel delay matching
- 6ns maximum pulse width distortion
- Programmable dead zone time
- Enable pins: NSI6642 Disable (high level off), NSI6642N Enable (high level on)
- Acceptable minimum input pulse width 15ns
- Operating temperature: -40℃~125℃
- AEC-Q100 qualified

Functional block diagram

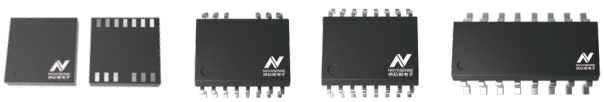


Safety certification

- UL1577 certification:
  LGA13: 2.5kVrms for 1 minute
  SOW14: 5kVrms for 1 minute
  SOW16: 5kVrms for 1 minute
  SOP16: 3kVrms for 1 minute
- CQC certification: Conforms to GB4943.1 -2011
- CSA certification: Components conform to 5A
- VDE certification: DIN V VDE V 0884-11: 2017-1

Package

- LGA13(4*4mm), LGA13(5*5mm),SOW14, SOW16, SOP16



Application

Isolated DC-DC and AC-DC power supplies for servers, telecommunications and Industrial

DC-AC solar inverter

Motor drive and EV charging

UPS and battery charger

NSI6602M: Isolated Dual-channel Gate Driver with Integrated Miller Clamp

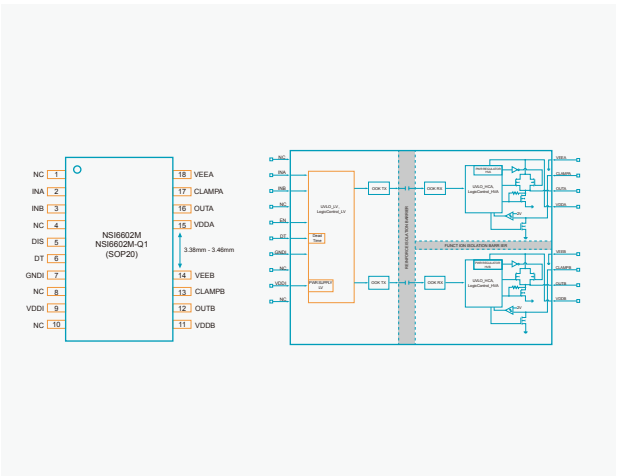
Product introduction

NSI6602M is an isolated dual-channel gate driver IC integrated with Miller clamp. It is suitable for driving IGBT, power MOSFET and SiC MOSFET in many applications. It can provide peak source/sink current of 5A/5A, and is integrated with Miller clamp with current of up to 5A. The typical 150kV/μs common mode transient immunity (CMTI) ensures the robustness of the system. The absolute max rating of the driver side is 30V, and the input side is supplied with a power supply voltage of 3V to 5.5V. All power pins support undervoltage lockout (UVLO) protection. NSI6602M is designed with high drive current, dual-channel integrated Miller clamp function, excellent reliability, wide power supply voltage range and fast signal propagation, and is suitable for switching power supply systems which require high reliability, high power density and high efficiency.

Product feature

- Isolated dual-channel driver
- Input side supply voltage: 3V - 5.5V
- Driver side supply voltage:
  Absolute max rating 35V, with UVLO
- Peak 5A/5A source/sink current capacity
- Support Miller Clamp, with current of up to 5A
- High CMTI: typical 150kV/μs
- 80ns typical propagation delay
- 5ns maximum delay matching
- 25ns maximum pulse width distortion
- Programmable dead zone time
- Acceptable minimum input pulse width 30ns
- Operating temperature: -40°C~125°C

Functional block diagram

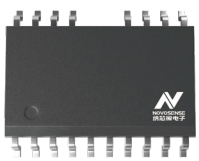


Safety certification

- UL1577 certification:
  SOW18: 5kVrms for 1 minute
- CQC certification: GB4943.1 -2011
- CSA certification: components 5A qualified
- VDE certification: DIN V VDE V 0884-11: 2017-1

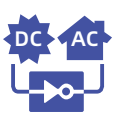
Package

- SOW18



Application

Isolated DC-DC and AC-DC power supplies in servers, telecommunications and Industrial



DC-AC solar inverter

Motor drive and EV charging

UPS and battery charger

Isolated Single-channel Gate Driver

Isolated Single-channel Gate Driver

Part Number	Peak drive current (A)	VCC UVLO threshold (v)	Input side VCC voltage (Max)(V)	Output side VCC voltage (Max)(V)	CMTI (Min) (kV/us)	Feature	Isolation Withstand Voltage (kVrms)	Insulation grade	Operating temperature (°C)	Qualification	Package
NSI6801B-DSPR	5/-5	9	N/A	35	150	Opto-compatible input	3	Basic insulation	-40~125	Industrial	SOP8
NSI6801C-DSPR	5/-5	13	N/A	35	150	Opto-compatible input	3	Basic insulation	-40~125	Industrial	SOP8
NSI6801B-DSWFR	5/-5	9	N/A	35	150	Opto-compatible input	5.7	Reinforced insulation	-40~125	Industrial	SOW8
NSI6801C-DSWFR	5/-5	13	N/A	35	150	Opto-compatible input	5.7	Reinforced insulation	-40~125	Industrial	SOW8
NSI6801TB-DDBR	5/-5	9	N/A	35	150	Opto-compatible input	5	Basic insulation	-40~125	Industrial	DUB8
NSI6801TC-DDBR	5/-5	13	N/A	35	150	Opto-compatible input	5	Basic insulation	-40~125	Industrial	DUB8
NSI6801LC-DDBR	5/-5	13	N/A	35	150	Opto-compatible input	5	Basic insulation	-40~125	Industrial	DUB8
NSI68010B-DSWAR	0.7/-0.8	9	N/A	35	150	Opto-compatible input	5.7	Reinforced insulation	-40~125	Industrial	SOW6
NSI68011C-DSWAR	1.5/-2	13	N/A	35	150	Opto-compatible input	5.7	Reinforced insulation	-40~125	Industrial	SOW6
NSI6601B-DSPR	5/-5	9	18	35	150	Split output	3	Basic insulation	-40~125	Industrial	SOP8
NSI6601C-DSPR	5/-5	13	18	35	150	Split output	3	Basic insulation	-40~125	Industrial	SOP8
NSI6601B-DSWVR	5/-5	9	18	35	150	Split output	5.7	Reinforced insulation	-40~125	Industrial	SOW8
NSI6601C-DSWVR	5/-5	13	18	35	150	Split output	5.7	Reinforced insulation	-40~125	Industrial	SOW8
NSI6601MB-DSPR	5/-5	9	18	35	150	Miller clamp	3	Basic insulation	-40~125	Industrial	SOP8
NSI6601MC-DSPR	5/-5	13	18	35	150	Miller clamp	3	Basic insulation	-40~125	Industrial	SOP8
NSI6601MB-DSWVR	5/-5	9	18	35	150	Miller clamp	5.7	Reinforced insulation	-40~125	Industrial	SOW8
NSI6601MC-DSWVR	5/-5	13	18	35	150	Miller clamp	5.7	Reinforced insulation	-40~125	Industrial	SOW8
NSI6601WC-DSWVR	5/-5	13	18	35	150	Miller clamp	5.7	Reinforced insulation	-40~125	Industrial	SOW8
NSI6601MC-Q1SPR	5/-5	13	18	35	150	Miller clamp	3	Basic insulation	-40~125	Automotive	SOP8
NSI6601MC-Q1SWVR	5/-5	13	18	35	150	Miller clamp	5.7	Reinforced insulation	-40~125	Automotive	SOW8
NSI6601MB-Q1SPR	5/-5	9	18	35	150	Miller clamp	3	Basic insulation	-40~125	Automotive	SOP8
NSI6601MB-Q1SWVR	5/-5	9	18	35	150	Miller clamp	5.7	Reinforced insulation	-40~125	Automotive	SOW8
NSI6601WC-Q1SWVR	5/-5	13	18	35	150	Miller clamp	5.7	Reinforced insulation	-40~125	Automotive	SOW8
NSI68010B-Q1SWAR	0.7/-0.8	9	N/A	35	150	Opto-compatible input	5.7	Reinforced insulation	-40~125	Automotive	SOW6
NSI68011C-Q1SWAR	1.5/-2	13	N/A	35	150	Opto-compatible input	5.7	Reinforced insulation	-40~125	Automotive	SOW6
NSI6801MB-DSWVR	5/-5	9	N/A	35	150	Opto-compatible input, Miller clamp	5.7	Reinforced insulation	-40~125	Industrial	SOW8
NSI6801MC-DSWVR	5/-5	13	N/A	35	150	Opto-compatible input, Miller clamp	5.7	Reinforced insulation	-40~125	Industrial	SOW8
NSI6801EB-DSWFR	5/-5	8	N/A	38	150	Opto-compatible input	5.7	Reinforced insulation	-40~125	Industrial	SOW6
NSI6801EC-DSWFR	5/-5	12	N/A	38	150	Opto-compatible input	5.7	Reinforced insulation	-40~125	Industrial	SOW6
NSI6801ETB-DDBR	5/-5	8	N/A	38	150	Opto-compatible input	5	Basic insulation	-40~125	Industrial	DUB8
NSI6801ETC-DDBR	5/-5	12	N/A	38	150	Opto-compatible input	5	Basic insulation	-40~125	Industrial	DUB8
NSI6801EB-DSWER	5/-5	8	N/A	38	150	Opto-compatible input	5.7	Reinforced insulation	-40~125	Industrial	SOL6
NSI6801EC-DSWER	5/-5	12	N/A	38	150	Opto-compatible input	5.7	Reinforced insulation	-40~125	Industrial	SOL6

NSI6801: Opto-compatible Isolated Single-channel Gate Driver

Product introduction

NSI6801 is a single-channel isolated gate driver, which is pin-compatible with popular optically coupled gate drivers. It can provide a peak source/sink current of 5A. It supports the minimum common mode transient immunity (CMTI) of 150kV/μs, which ensures the robustness of the system. The absolute max rating of the driver side is 35V. When the input circuit is used in optocoupler compatible systems, it has performance advantages over optocoupler gate drivers, including better reliability and aging performance, higher operating temperature, shorter propagation delay and less pulse width distortion. Therefore, NSI6801 is more suitable than photoelectric isolation drivers for switching power supply systems which require high reliability, high power density and high efficiency.

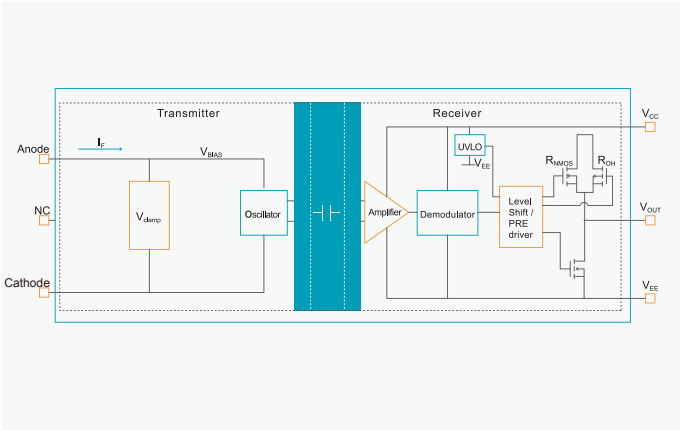
Product feature

- P2P compatible with optocoupler drivers, but upgraded performance
- Driver side power supply voltage: Absolute max rating NSI6801 35V, NSI6801E 38V
- UVLO: With UVLO protection, NSI6801 9V/13V, NSI6801E 8V/12V
- Peak source/sink current of 5A/5A
- High CMTI: 150kV/μs
- Typical propagation delay: 75ns
- Maximum pulse width distortion: 30ns

Safety certification

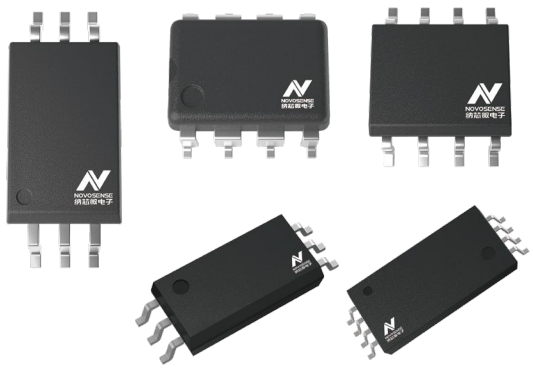
- UL certification:
  SOW6: 5700Vrms for 1 minute
  SOL6: 5700Vrms for 1 minute
  DUB8: 5000Vrms for 1 minute
  SOP8: 3000Vrms for 1 minute
  SOWW8: 5700Vrms for 1 minute
- VDE certification: DIN VDE V 0884-11:2017-01
- CSA certification: CSA components has passed 5A approval
- CQC certification: GB4943.1-2011

Functional block diagram



Package

- SOW6, SOL6, DUB8, SOP8, SOWW8



Application

Photovoltaic inverter

Motor driver

UPS power supply and battery charger

Isolation DC-DC and AC-DC power supplies

NSI68010/11: Cost-effective Opto-compatible Isolated Single-channel Gate Driver

Product introduction

The second-generation product series NSI68010/11 is based on the NSI6801 and includes NSI68010B and NSI68011C. NSI68010/11 is more cost-effective compared with the first generation in order to assist customers to reduce system costs and increase efficiency. NSI68010/11 single-channel isolated gate driver can be pin compatible with optically coupled gate drivers. It can provide up to 2A drive current. The minimum common mode transient immunity (CMTI) of 150kV/μs ensures system robustness. The absolute max rating of the driver side is 35V. When the input circuit is applied in an opto-compatible system, it offers better performance compared with optocoupler gate drivers, including better reliability, longer working life, higher operating temperature, shorter propagation delay and less pulse width distortion. Therefore, NSI6801x is suitable for replacing opto-isolated drivers in switching power supply systems which require high reliability, power density and efficiency.

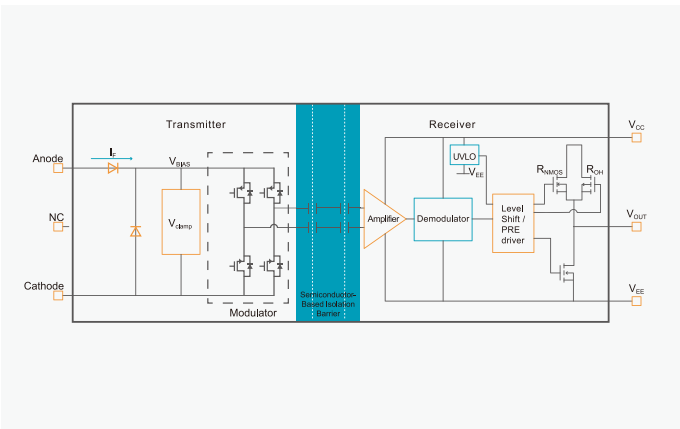
Product feature

- P2P compatible with optocoupler drivers, but upgraded performance
- Driver side power supply voltage: Absolute max rating 35V, with UVLO
- High CMTI:150kV/μs
- NSI68010 drive current: +0.7A/-0.8A
- NSI68011 drive current: +1.5A/-2A
- Typical propagation delay: 63ns
- Maximum pulse width distortion: 30ns
- Operation ambient temperature: -40℃~125℃
- AEC-Q100 qualified

Safety certification

- UL certification: 5700Vrms for 1 minute (SOW6)
- VDE certification: DIN VDE V 0884-11:2017-01
- CSA certification: CSA components has passed 5A approval
- CQC certification: GB4943.1-2011

Functional block diagram



Package

- SOW6

Application

Photovoltaic inverter

Motor driver

UPS power supply and battery charger

Isolation DC-DC and AC-DC power supplies

NSI6601/NSI6601M: Isolated Single-channel Gate Driver

Product introduction

NSI6601/6601M is a single-channel isolated gate driver suitable for driving IGBT, power MOSFET and SiC MOSFET in many applications. Separate outputs are provided to control the rising and falling duration respectively. It can provide peak source/sink current of 5A/5A. The 150kV/μs minimum common mode transient immunity (CMTI) ensures the robustness of the system. The absolute max rating of the driver side is 35V, and the input side is supplied with a power supply voltage of 3.1V to 17V. All power pins support undervoltage lockout (UVLO) protection. NSI6601 is designed with high drive current, excellent durability, wide power supply voltage range and fast signal propagation, and is suitable for switching power supply systems which require high reliability, high power density and high efficiency.

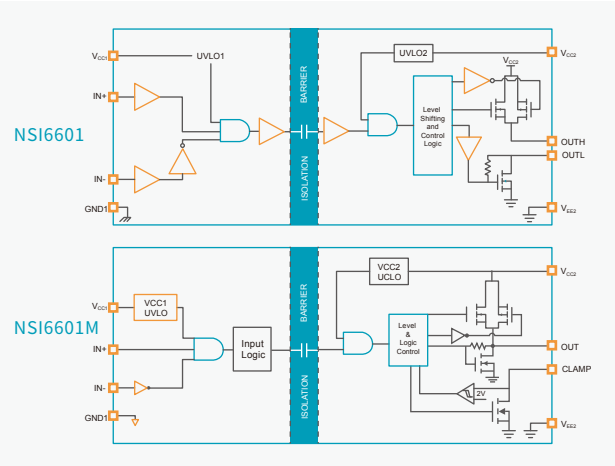
Product feature

- Single-channel isolated driver
- Input side supply voltage: 3.1V to 17V
- Driver side supply voltage: Absolute max rating 35V, with UVLO
- Version M supports Miller Clamp function (NSI6601M) with current up to 5A
- Peak source/sink current of 5A/5A
- High CMTI:150kV/μs
- Typical propagation delay: 78ns
- Operation ambient temperature: -40°C to 125°C
- AEC-Q100

Safety certification

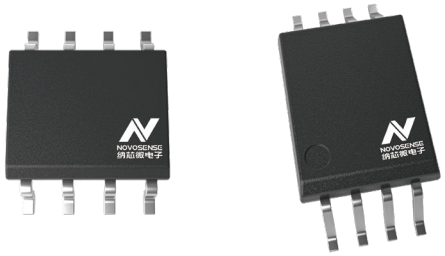
- UL certification:
  SOP8: 3000Vrms for 1 minute
  SOW8: 5700Vrms for 1 minute
- VDE certification: DIN VDE V 0884-11:2017-01
- CSA certification: CSA components has passed 5A approval
- CQC certification: GB4943.1-2011

Functional block diagram



Package

- SOP8, SOW8



Application

Photovoltaic inverter

Motor driver

UPS power supply and battery charger

Isolation DC-DC and AC-DC power supplies

NSI6801M: Opto-compatible Isolated Single-channel Gate Driver with Miller Clamp

Product introduction

NSI6801M is a single-channel isolation gate driver suitable for driving IGBT, power MOSFET and SiC MOSFET in many applications. It can provide peak source/sink current of 5A/5A, and is integrated with Miller clamp with current of up to 5A. The 150kV/μs minimum common mode transient immunity (CMTI) ensures the robustness of the system. The absolute max rating of the driver side is 35V, and the input side is supplied with a power supply voltage of 3.1V to 17V. All power pins support undervoltage lockout (UVLO) protection. NSI6801M is designed with high drive current, excellent reliability, wide power supply voltage range and fast signal propagation, and is suitable for switching power supply systems which require high

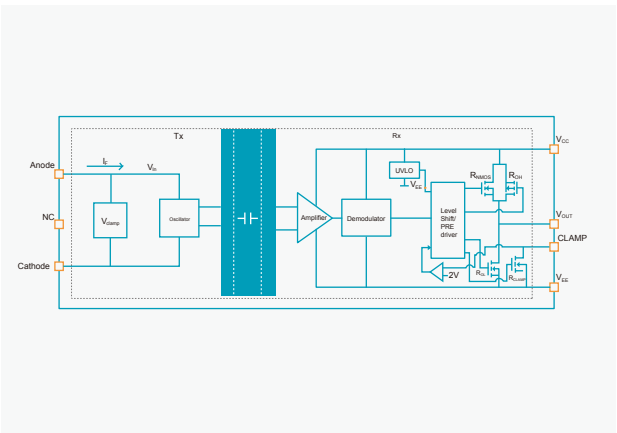
Product feature

- Isolated single-channel driver
- Input side supply voltage: 3.1V - 17V
- Driver side supply voltage: Absolute max rating 35V, with UVLO
- Support Miller Clamp function, with current of up to 5A
- Peak 5A/5A source/sink current
- •High CMTI: 150kV/μs
- 75ns typical propagation delay
- Operating ambient temperature: -40°C~125°C
- AEC-Q100

Safety certification

- UL certification:
  SOP8: 3000Vrms for 1 minute
  SOW8: 5700Vrms for 1 minute
- VDE certification: DIN VDE V 0884-11:2017-01
- CSA certification: components 5A qualified
- CQC certification: GB4943.1 -2011

Functional block diagram



Package

- SOW8

Application

Solar inverter

Motor driver

UPS and battery charger

Isolated DC-DC and AC-DC power supplies

Smart Isolated Gate Driver Integrated with DESAT Protection

Smart Isolated Gate Driver Integrated with DESAT Protection

Part Number	Peak drive current (A)	VCC UVLO threshold (V)	Input side VCC voltage (Max)(V)	Output side VCC voltage (Max)(V)	CMTI(Min) (kV/us)	Feature	Isolation Withstand Voltage (kVrms)	Insulation grade	Operating temperature (°C)	Qualification	Package
NSI6611ASC-DSWR	10/-10	12	6	35	150	DESAT short circuit protection, soft shutdown, Miller clamp, ASC function, Split output, and Fault alarm	5.7	Reinforced insulation	-40~125	Industrial	SOW16
NSI6651ASC-DSWR	10/-10	12	6	35	150	DESAT short circuit protection, soft shutdown, Miller clamp, Split output, and Fault alarm	5.7	Reinforced insulation	-40~125	Industrial	SOW16
NSI6651ALC-DSWR	10/-10	12	6	35	150	DESAT short circuit protection, soft shutdown, Miller clamp, and Fault alarm	5.7	Reinforced insulation	-40~125	Industrial	SOW16
NSI6631ASC-DSWR	10/-10	12	6	35	150	OCP short circuit protection, soft shutdown, Miller clamp, ASC function, Split output, and Fault alarm	5.7	Reinforced insulation	-40~125	Industrial	SOW16
NSI6611ASC-Q1SWR	10/-10	12	6	35	150	DESAT short circuit protection, soft shutdown, Miller clamp, ASC function, separate output, and Fault alarm	5.7	Reinforced insulation	-40~125	Automotive	SOW16
NSI6651ASC-Q1SWR	10/-10	12	6	35	150	DESAT short circuit protection, soft shutdown, Miller clamp, Split output, and Fault alarm	5.7	Reinforced insulation	-40~125	Automotive	SOW16
NSI6651ALC-Q1SWR	10/-10	12	6	35	150	DESAT short circuit protection, soft shutdown, Miller clamp, and Fault alarm	5.7	Reinforced insulation	-40~125	Automotive	SOW16
NSI6631ASC-Q1SWR	10/-10	12	6	35	150	OCP short circuit protection, soft shutdown, Miller clamp, ASC function, Split output, and Fault alarm	5.7	Reinforced insulation	-40~125	Automotive	SOW16
NSI68515LC-DSWR	5/-5	12	6	35	150	DESAT short circuit protection, soft shutdown, Miller clamp, and Fault alarm	5.7	Reinforced insulation	-40~125	Industrial	SOW16
NSI68515UC-DSWR	5/-5	12	6	35	150	DESAT short circuit protection, soft shutdown, Miller clamp, and Fault alarm, UVLO alarm	5.7	Reinforced insulation	-40~125	Industrial	SOW16
NSI68515AC-DSWR	5/-5	12	6	35	150	DESAT short circuit protection, Auto Reset, soft shutdown, Miller clamp, and Fault alarm	5.7	Reinforced insulation	-40~125	Industrial	SOW16
NSI68515RC-DSWR	5/-5	12	6	35	150	Non-Rail-to-Rail output, DESAT short circuit protection, Auto Reset, soft shutdown, Miller clamp, and Fault alarm	5.7	Reinforced insulation	-40~125	Industrial	SOW16
NSI6770ASC-Q1SWR	10/-10	12	6	38	150	Isolated Analog Sensing, DESAT short circuit protection, soft shutdown, Miller clamp, ASC function, Split output, and Fault alarm	5.7	Reinforced insulation	-40~125	Automotive	SOW16
NSI6730ASC-Q1SWR	10/-10	12	6	38	150	Isolated Analog Sensing, DESAT short circuit protection, soft shutdown, Miller clamp, ASC function, Split output, and Fault alarm	5.7	Reinforced insulation	-40~125	Automotive	SOW16
NSI6730ASB-Q1SWR	10/-10	12	6	38	150	Isolated Analog Sensing, DESAT short circuit protection, soft shutdown, Miller clamp, ASC function, Split output, and Fault alarm	5.7	Reinforced insulation	-40~125	Automotive	SOW16
NSI6730ASA-Q1SWR	10/-10	12	6	38	150	Isolated Analog Sensing, DESAT short circuit protection, soft shutdown, Miller clamp, ASC function, Split output, and Fault alarm	5.7	Reinforced insulation	-40~125	Automotive	SOW16

NSI6611/NSI6651: Smart Isolated Gate Driver Integrated with DESAT Protection

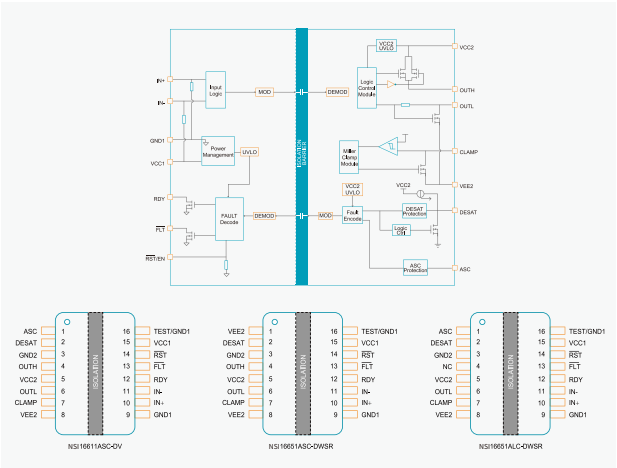
Product introduction

NSI6611/NSI6651 is a single-channel smart isolated gate driver designed to drive IGBT, power MOSFET and SiC MOSFET and other power transistors in many applications and provide protection for their safe operation. It can provide separate output to control the rising and falling duration respectively, it supports rail-to-rail output, and can provide a maximum 10A/10A source and sink current capability. NSI6611/NSI6651 can provide protection functions, such as UVLO, Miller clamp, DESAT protection, soft turnoff, and when short circuit fault or undervoltage occurs, the fault can be indicated through a separate pin. NSI6611 supports ASC function and can be used to force the output to be high in emergency situations. It supports minimum common mode transient immunity (CMTI) of 150kV/μs to improve system robustness. The absolute max rating of the driver side is 35V,and the input side accepts supply voltages from 3V to 5.5V. NSI6611/NSI6651 features large drive current, wide power supply voltage range, and high CMTI, and is designed with excellent protection. It is suitable for switching power supply systems and inverters which require high reliability, high power density and high efficiency.

Product feature

- Smart Single-channel isolated Driver
- Input side power supply voltage: 3V~5.5V
- Driver side power supply voltage:
  Absolute max rating 35V, with UVLO
- Peak source and sink current 10A/10A
- High CMTI: 150kV/μs
- Typical propagation delay: 80ns
- Maximum pulse width distortion: 30ns
- Minimum receivable input pulse width: 40ns
- Rail-to-rail output, with separate output as an option
- Protection mode:
  Miller Clamp 4.0A
  DESAT protection with a threshold of 9V
  Support soft turnoff at a current of 400mA
  Support fault reporting, reset or enable
- Operating temperature: -40°C~125°C

Functional block diagram

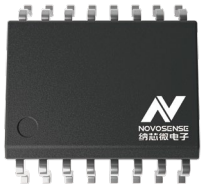


Safety certification

- UL1577 certification: 5.7KVrms
- CQC certification: GB4943.1-2011
- CSA certification: components conform to 5A
- VDE certification: DIN V VDE V 0884-11:2017-1

Package

- SOW16



Application

EV electric drive system

Air conditioning compressor

DC-AC solar inverter

Motor driver

UPS and battery charger

NSI67x0: Smart Isolated Gate Driver Integrated with Isolated Analog Sensing

◆ Product introduction

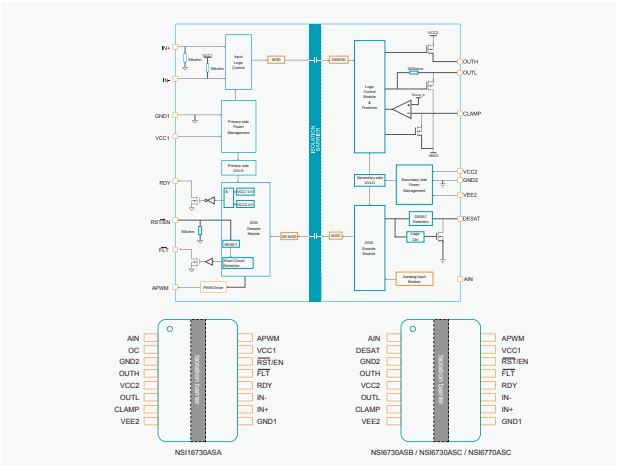
NSI67x0 is a single-channel smart isolated gate driver designed to drive IGBT, power MOSFET and SiC MOSFET and other power devices in many applications and provide protection for their safe operation. It offers separate output to control the rising and falling duration respectively, it supports rail-to-rail output, and can provide a maximum 10A/10A source and sink current capability. NSI67x0 can provide protection functions, such as UVLO, Miller Clamp, DESAT protection, soft turnoff and when short circuit fault or undervoltage occurs, the fault can be indicated through a separate pin.

NSI67x0 integrates Isolated Analog Sensing, which can be utilized for easier temperature or voltage sensing, further increasing the drivers' versatility and simplifying the system design effort, size and cost. It supports minimum common mode transient immunity (CMTI) of 150kV/μs to improve system robustness. The absolute max rating of the driver side is 35V, and the input side accepts supply voltages from 3V to 5.5V. NSI67x0 features large drive current, wide power supply voltage range, and high CMTI, and is designed with excellent protection. It is suitable for switching power supply systems and inverters which require high reliability, high power density and high efficiency.

◆ Product feature

- Smart Isolated Gate Driver Integrated with Isolated Analog Sensing
- Input side power supply voltage: 3V~5.5V
- Driver side power supply voltage: Absolute max rating 38V, with UVLO
- Peak source and sink current 10A/10A
- High CMTI: 150kV/μs
- Typical propagation delay: 90ns
- Maximum pulse width distortion: 30ns
- Minimum receivable input pulse width: 40ns
- Rail-to-rail output, with separate output as an option
- Isolated analog sensor with PWM output for
  Temperature sensing with NTC, PTC or thermal diode
  High voltage DC-Link or phase voltage
- Protection mode:
  Miller Clamp 4.0A
  DESAT protection with a threshold of 9V or 6.5V
  OC protection with a threshold of 0.7V
  Support soft turnoff at a current of 400mA
  Support fault reporting, reset or enable
- Operating temperature: -40°C~125°C

◆ Functional block diagram



◆ Safety certification

- UL1577 certification: 5.7KVrms
- CQC certification: GB4943.1-2011
- CSA certification: components conform to 5A
- VDE certification: DIN V VDE V 0884-11:2017-1

◆ Package

- SOW16

◆ Application

EV electric drive system

A/C compressor

DC-AC solar inverter

Motor driver

UPS and battery charger

NSI68515: Opto-compatible Smart Isolated Gate Driver Integrated with DESAT Protection

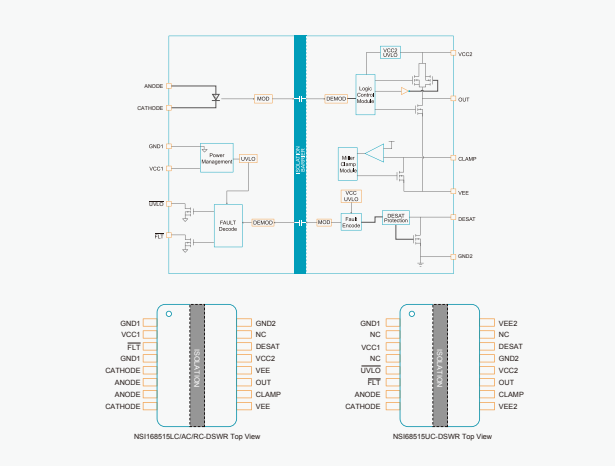
Product introduction

NSI68515 is an opt-compatible single-channel smart isolated gate driver integrated with DESAT protection designed to drive and provide protection for safe operation of IGBTs, power MOSFETs and SiC MOSFETs in many applications. NSI68515 can provide up to +5A/-5A source/sink current capability. The absolute max rating of the driver side is 35V, and the input side accepts supply voltages from 3V to 5.5V. It can provide excellent protection function, such as UVLO, Miller clamp, DESAT protection, and soft turnoff, etc., and send alarm by a separate pin when detecting a short circuit fault or undervoltage. It is available in automatic alarm reset version, rail to rail output version and non-rail to rail output version. It supports a minimum common-mode transient immunity (CMTI) of 150kV/μs to improve system robustness. NSI68515 features high driver current, wide range of power supply voltage, high CMTI, and has excellent protection function, which is suitable for motor drive, inverter, switching power system and other systems with high reliability, high power density and high efficiency.

Product feature

- Smart isolated single-channel driver integrated with DESAT protection
- Input side supply voltage: 3V - 5.5V
- Driver side supply voltage: Absolute max rating 35V, with UVLO
- Peak 5A/5A source/sink current capacity
- High CMTI: 150kV/μs
- 100ns typical propagation delay
- 100ns maximum pulse width distortion
- Acceptable minimum input pulse width 40ns
- NSI68515LC/UC/AC rail to rail output, NSI68515AC non- rail to rail output
- NSI68515AC/RC supports automatic resetting
- Protection mode
- Miller clamp 4.0A
- DESAT protection, with threshold of 6.5V
- Support soft shutdown function, with soft shutdown current of 140mA
- Support alarm feedback
- Operating temperature: -40°C~125°C

Functional block diagram

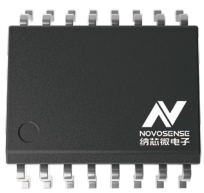


Safety certification

- UL1577 certification: 5.7KVrms
- CQC certification: GB4943.1 -2011
- CSA certification: Components 5A qualified
- VDE certification: DIN V VDE V 0884-11:2017-1 (under qualification)

Package

- SOW16



Application

EV motor driving system

A/C compressor

DC-AC solar inverter

Motor driver

UPS and battery charger

Non-isolated Low-side Gate Driver

Non-isolated Low-side Gate Driver

Part Number	Drive object	Peak drive current (A)	Output channel	VCC (V)	Propagation delay (Max) ton/off(ns)	Delay matching (ns)	Feature	Operating temperature (°C)	Qualification	Package
NSD1026V-DSPR	GaNFET/MOSFET/IGBT	5/-5	2	30	27/27	4	Enable, Negative Voltage Handling on Input(-10V)	-40~125	Industrial	SOP8
NSD1026V-DHMSR	GaNFET/MOSFET/IGBT	5/-5	2	30	27/27	4	Enable, Negative Voltage Handling on Input(-10V)	-40~125	Industrial	EP-MSOP8
NSD1026V-DDAER	GaNFET/MOSFET/IGBT	5/-5	2	30	27/27	4	Enable, Negative Voltage Handling on Input(-10V)	-40~125	Industrial	DFN8
NSD1026V-Q1SPR	GaNFET/MOSFET/IGBT	5/-5	2	30	27/27	4	Enable, Negative Voltage Handling on Input(-10V)	-40~125	Automotive	SOP8
NSD1026V-Q1HSPR	GaNFET/MOSFET/IGBT	5/-5	2	30	27/27	4	Enable, Negative Voltage Handling on Input(-10V)	-40~125	Automotive	EP-SOP8
NSD1026V-Q1HMSR	GaNFET/MOSFET/IGBT	5/-5	2	30	27/27	4	Enable, Negative Voltage Handling on Input(-10V)	-40~125	Automotive	EP-MSOP8
NSD1015T-DSPR	MOSFET/IGBT/SiC	5/-5	1	36	75/75	NA	DESAT protection, FAULT output, 5V supply output, bipolar voltage	-40~125	Industrial	SOP8
NSD1015MT-DSPR	MOSFET/IGBT/SiC	5/-5	1	36	75/75	NA	DESAT protection, FAULT output, 5V supply output, bipolar voltage	-40~125	Industrial	SOP8

NSD1026V: Dual-channel Low-side Gate Driver

Product introduction

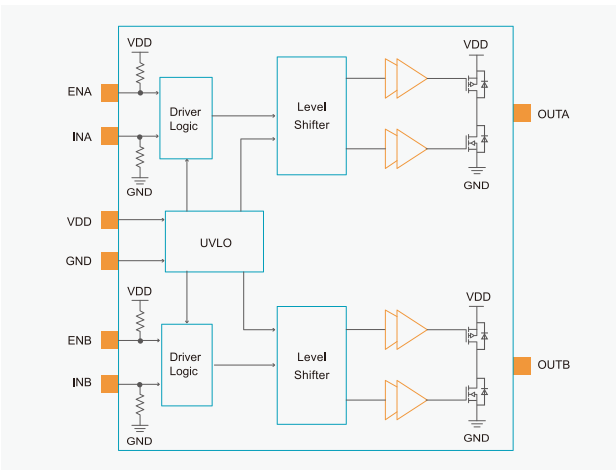
NSD1026V is an in-phase dual-channel high-speed gate driver suitable for driving MOSFET, IGBT, GaN and SiC power devices. It can provide 5A source current and sink current to drive capacitive loads, as well as rail-to-rail voltage swing in Miller platform area, which helps to reduce the Miller effect during MOSFET switching. In addition, the short rising and falling duration and the matching propagation delay of the two output channels make the NSD1026V series suitable for high frequency and dual-gate drive power applications, such as synchronous rectifiers.

Both the input pin and the enable pin support -10V input, thus increasing robustness, while the enable pin can help users realize control functions in different applications. Moreover, the internal circuit allows under-voltage lockout (UVLO), which keeps the output low until the power supply voltage returns to the operating range. The hysteresis function between high and low thresholds provides excellent immunity.

Product feature

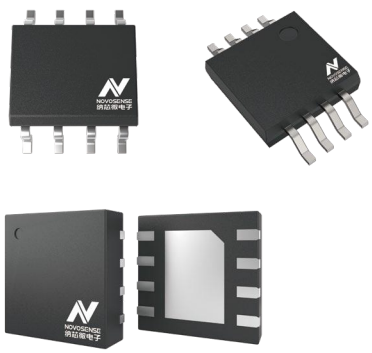
- Supply voltage range: 4.5V to 26V (Absolute max rating 30V)
- Source/sink drive current: 5A (peak)
- Each channel output is designed with two independent enable pins
- Supporting inputs as low as -10V
- CMOS/TTL compatible logic input
- The 5A reverse current function eliminates the need for output protection
- Operating temperature range: -40°C~125°C
- Propagation delay: 21 ns (typical)
- AEC-Q100 qualified

Functional block diagram



Package

- SOP8, HSOP8, HMSOP8, DFN8

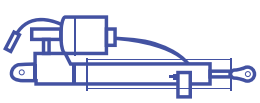


Application

PFC, LLC, SR power supply topology

Power system (OBC/DCDC, industrial power, photovoltaic, communication, server)

Motor controller



Linear driver

NSD1015T/MT: Smart Single-channel Low-side Gate Driver Integrated with DESAT Protection

Product introduction

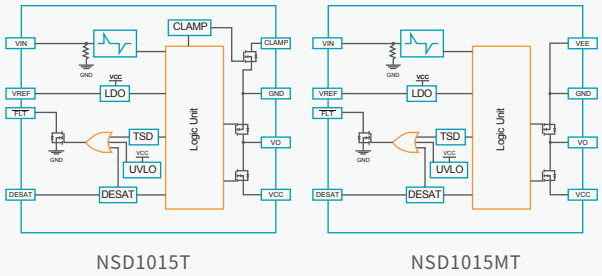
NSD1015T/MT is a smart single-channel non-isolated gate driver suitable for driving MOSFET, IGBT, and SiC power devices. It provides 5A source/sink current to drive capacitive loads.

In addition, fast rise and fall times and short propagation delays make the NSD1015T/MT series suitable for high-frequency switching applications. NSD1015T/MT's protection features include undervoltage protection (UVLO), desaturation protection (DESAT), and open-drain output fault reporting (FAULT). NSD1015T can also provide accurate 5V power output for external chips such as digital isolators. NSD1015T supports bipolar power supply, and NSD1015MT supports Miller clamp to ensure reliable shutdown.

Product feature

- Supply voltage range: VCC-GND: 13V to 32V
- Source/sink drive current: 5A (peak)
- Rise time 16ns (typical), drop time 15ns (typical)
- Input to output propagation delay 75ns (maximum)
- UVLO undervoltage protection
- Desaturation (DESAT) protection
- FAULT reporting function
- NSD1015T supports bipolar power supply and NSD1015MT supports Miller clamp
- Operating temperature range: -40°C~125°C

Functional block diagram



NSD1015T NSD1015MT

Package

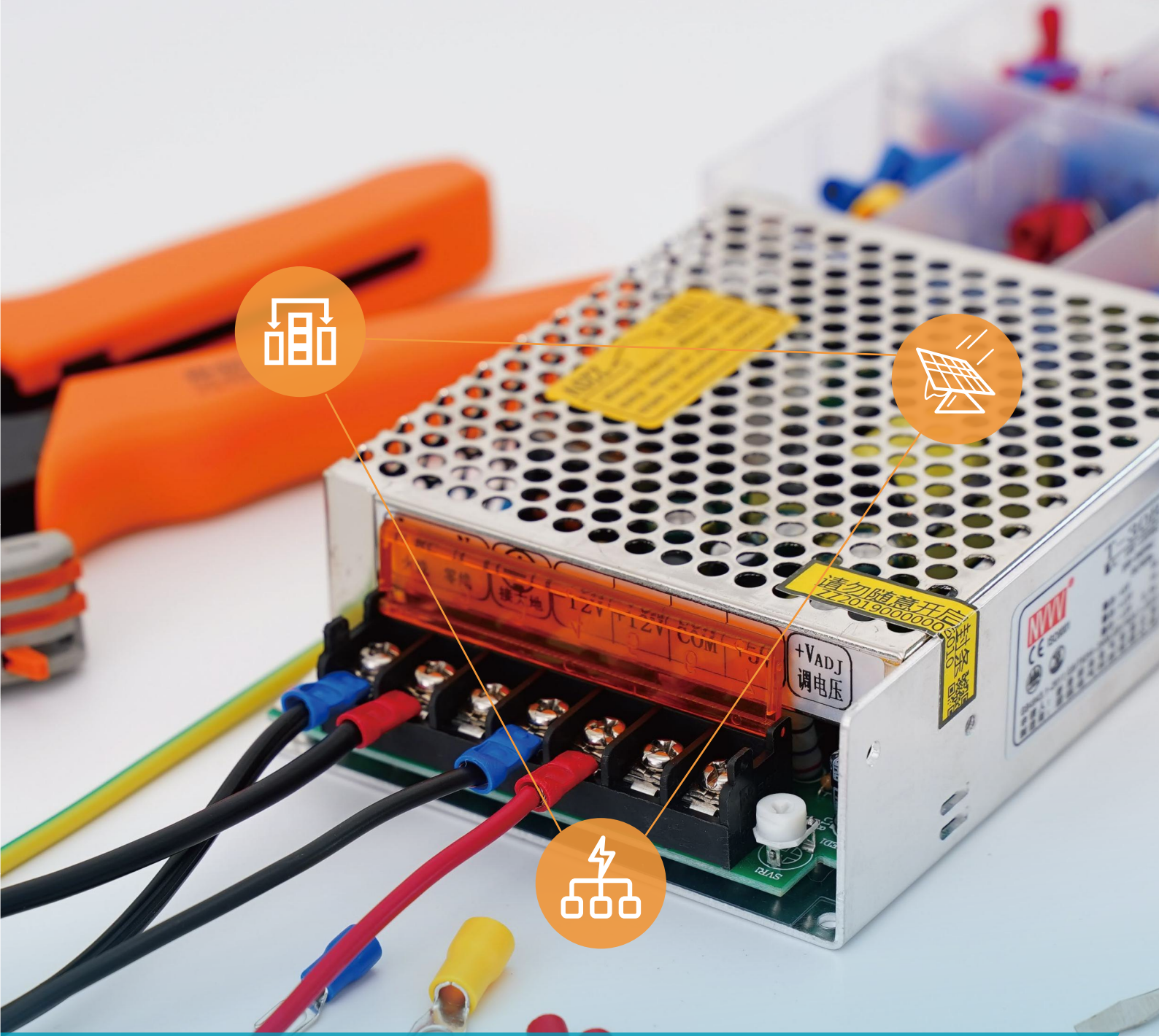
- SOP8

Application

Industrial servo driver, inverter

HEV/EV compressor controller

HEV/EV PTC



Non-isolated Half-bridge Gate Driver

Non-isolated Half-bridge Gate Driver

Part Number	Drive object	Peak drive current (A)	Output channel	BUS voltage (v)	VCC MAX(V)	Propagation delay (Max) ton/off(ns)	Delay matching (ns)	Feature	Operating temperature (°C)	Qualification	Package
NSD1624-DLAJR	MOSFET/IGBT	4/-6	2	700	24	35/35	7	UVLO, Interlock	-40~125	Industrial	LGA10
NSD1624-DSPR	MOSFET/IGBT	4/-6	2	700	24	35/35	7	UVLO, Interlock	-40~125	Industrial	SOP8
NSD1624-DSPKR	MOSFET/IGBT	4/-6	2	1200	24	35/35	7	UVLO, Interlock	-40~125	Industrial	SOP14
NSD16241-DSPR	MOSFET/IGBT	4/-6	2	700	24	35/35	7	UVLO, Interlock	-40~125	Industrial	SOP8
NSD16241-DSPKR	MOSFET/IGBT	4/-6	2	1200	24	35/35	7	UVLO, Interlock	-40~125	Industrial	SOP14
NSD16242-DSPR	MOSFET/IGBT	4/-6	2	700	24	35/35	7	UVLO, Interlock	-40~125	Industrial	SOP8
NSD1624-Q1SPR	MOSFET/IGBT	4/-6	2	700	24	55/55	7	UVLO, Interlock	-40~125	Automotive	SOP8
NSD1624-Q1SPKR	MOSFET/IGBT	4/-6	2	1200	24	55/55	7	UVLO, Interlock	-40~125	Automotive	SOP14
NSD16241-Q1SPR	MOSFET/IGBT	4/-6	2	700	24	55/55	7	UVLO, Interlock	-40~125	Automotive	SOP8
NSD16241-Q1SPKR	MOSFET/IGBT	4/-6	2	1200	24	55/55	7	UVLO, Interlock	-40~125	Automotive	SOP14
NSD16242-Q1SPR	MOSFET/IGBT	4/-6	2	700	24	55/55	7	UVLO, Interlock	-40~125	Automotive	SOP8
NSD1224LA-DAFR	MOSFET/GaNFET	3/-4	2	115	20	35/35	5	UVLO, Interlock, Enable	-40~125	Industrial	DFN10
NSD1224LA-DSPR	MOSFET/GaNFET	3/-4	2	115	20	35/35	5	UVLO, Interlock	-40~125	Industrial	SOP8

NSD1624x: High Voltage Half-bridge Gate Driver

Product introduction

NSD1624/NSD16241/NSD16242 is a series of high-voltage half-bridge driver ICs. It is designed with 4/-6A drive current and can be used to drive various power devices such as MOSFET/IGBT.

The isolation technology scheme is applied to high-voltage half-bridge driver by NOVOSENSE innovatively, so that the high-voltage output side can withstand up to 1200V DC voltage, while SW can meet the requirements of high dv/dt and can withstand negative spike. It can be applied to high-voltage half-bridges, full-bridges and LLC power supply topologies.

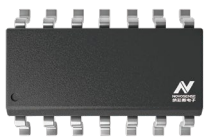
NSD1624x input is compatible with TTL/CMOS. Both the high-voltage side and the low-voltage side are designed with independent power supply undervoltage protections (UVLO), which operate in the voltage range of 10~20V.

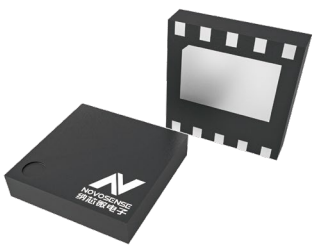
Product feature

- Voltage range on high voltage side: +/-1200V(SOP14 package); +/-700V(SOP8 & LGA package)
- Less than 35ns propagation delay, less than 7ns delay matching
- 4/-6A drive current capability
- High/low side independent UVLO protection
- Independent Logic Ground Pin (SOP14 package)
- Anti-interference of dV/dt on high voltage side up to 150kV/us
- Operating temperature range: -40°C~125°C
- AEC-Q100 qualified

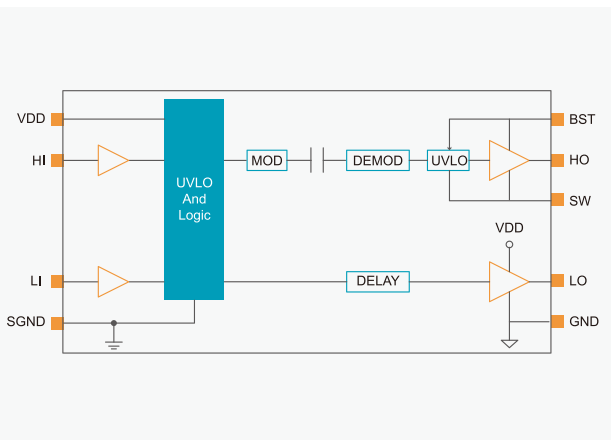
Package

- SOP14，SOP8，LGA 4*4mm





Functional block diagram



Application

Half-bridge, full-bridge, and LLC power supply topology

Power supply for industrial, communication and server applications which requires high efficiency and high density

Solar energy, motor drivers and new energy fields

NSD1224x: 120V Half-bridge Gate Driver

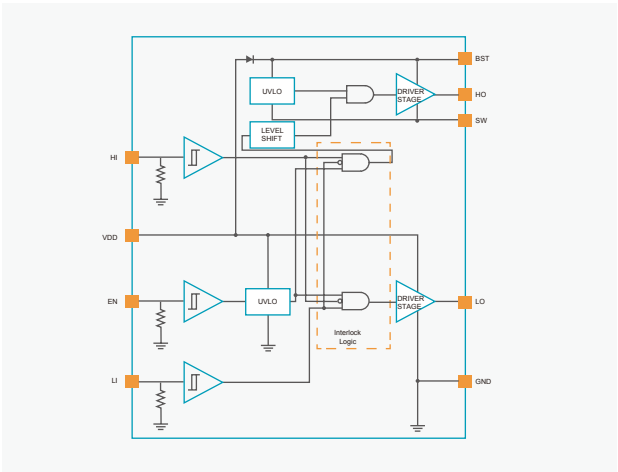
Product introduction

NSD1224x is a powerful 120V half-bridge gate driver. With peak source/sink current of 3A/-4A and low Rdson of inside ON/OFF MOSFET, it can drive high-power MOSFETs with very low switching losses. The NSD1224x input pin and SW pin can withstand large negative voltage to improve system reliability. The input interlock function prevents the short-through from high-side and low-side MOSFETs in bridge topologies The undervoltage locking (UVLO) is available in both the high-side and low-side drivers. The small communication delay and channel to channel delay matching provide more dead time design margin, further improve efficiency. NSD1224x integrates a built-in bootstrap diode, requiring no external separate diode to save layout space and reduce system costs.

Product feature

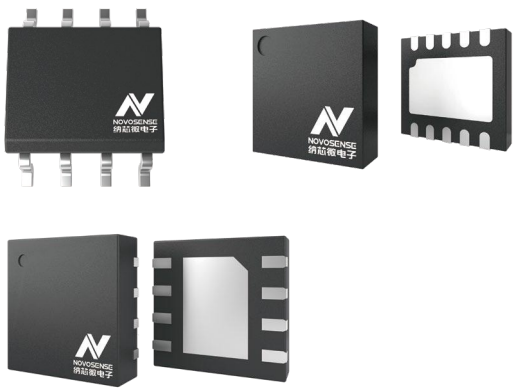
- Withstand voltage of VDD power of 20V
- Withstand voltage at SW bridge arm midpoint of -10V to 115V
- Negative withstand voltage of input pin of -10V
- The HS voltage ramp up rate of 50V/ns
- Peak source/sink current 3A/-4A
- Compatible with CMOS/TTL level input
- Input interlock
- Independent UVLO protection for high-side and low-side output
- Integrated high-voltage bootstrap diode
- Typical input/output delay of 16ns
- Typical transmission delay matching between high and low sides of 1ns
- DFN10 package has enable pin, and the static power consumption is 7μA in standby mode
- Junction temperature range of -40°C to 150°C

Functional block diagram



Package

- SOP8, HSOP8, DFN10, DFN8



Application

Micro inverter and power optimizer

Power module

New energy vehicles

GaN Integrated Power Stage & Gate Driver

GaN Integrated Power Stage

Part Number	Produtc type	Bus voltage (v)	Rds(on)(mΩ)	Ids(A)	Feature	Operating temperature (°C)	Qualification	Package
NSG65N15K-DQAFR	Half bridge	700	150	20	UVLO、Dead-time programmable,Integrated bootstrap diode	-40~125	Industrial	QFN32

GaN Half-bridge Driver

Part Number	Drive Object	Peak Drive Current (A)	Output Channel	Bus Voltage (v)	VCC(Max)(V)	Propagation Delay (Max) ton/off(ns)	Delay matching (ns)	Features	Operating Temperature (°C)	Qualification	Package
NSD2621A-DQAGR	GaNFET	2/-4	2	700	24	700	700	UVLO, Programmable dead time, Enable, Integrated LDO	-40~125	Industrial	QFN15
NSD2621C-DQAGR	GaNFET	2/-4	2	700	24	700	700	UVLO, Programmable dead time, Enable, Integrated LDO	-40~125	Industrial	QFN15

NSG65N15K: GaN Integrated Power Stage IC

Product introduction

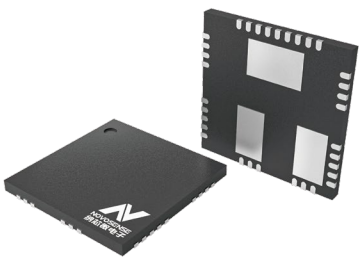
NSG65N15K is the GaN power stage device launched by NOVOSENSE. It is integrated with half-bridge driver NSD2621 and two pcs 650V GaN HEMT with 150mΩ conduction resistance, and the working current can reach 20A. Besides, NSG65N15K is integrated with the bootstrap diode, and built-in adjustable dead time, undervoltage protection, overtemperature protection, which make GaN applications more safe and reliable, and give full play to its advantages of high frequency and high speed.

Product feature

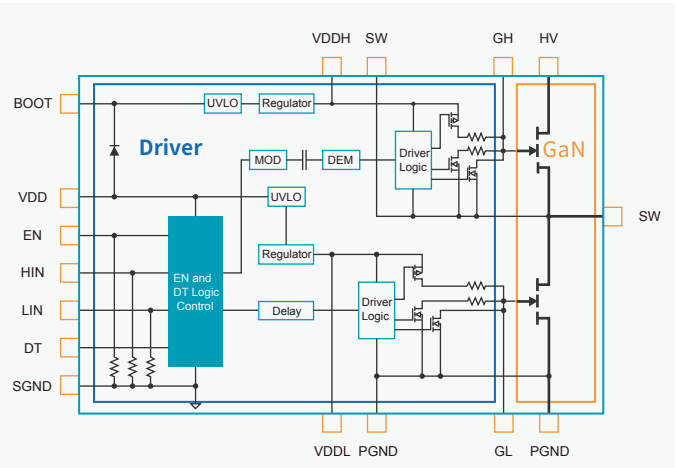
- Integrated 650V GaN HEMT and half-bridge driver
- GaN conduction resistance 150mΩ
- Non-reverse recovery loss
- Built-in LDO makes the driver voltage more stable and reliable
- High/low side independent UVLO protection
- Internal adjustable dead time
- Built-in bootstrap diode
- Operation ambient temperature: -40°C ~125°C

Package

- QFN (9*9mm)



Functional block diagram



Application

Half-bridge or full-bridge topologies such as totem poles PFC, ACF and LLC

Adapter high density power supply

PV, motor driver and ESS

NSD2621x: High Voltage Half-bridge GaN Driver IC

Product introduction

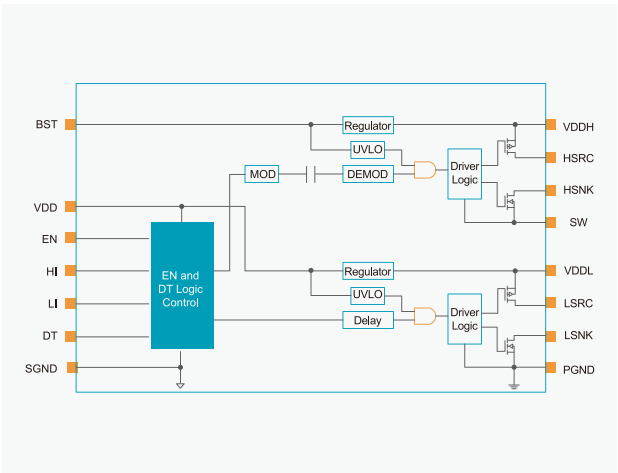
NSD2621 is a high-voltage half-bridge driver IC launched by NOVOSENSE, which is specially designed for GaN. The IC adopts the mature capacitance isolation technology of NOVOSENSE. The high-side driver can support common-mode voltage of -700V to 700V, SW voltage change slope of 150V/ns, and is designed with the Feature of low transmission delay and low delay between channels. Both channels can provide 2A/-4A driving capability.

Both high-side drive stage and low-side drive stage are equipped with special voltage regulators to ensure that the driving voltage is in a stable range acceptable to GaN gate, so that GaN can work properly under any conditions. At the same time, it is designed with UVLO protection to protect the operation safety of the power supply system.

Product feature

- Voltage range on high voltage side: +/-700V
- Independent UVLO protection for high and low sides
- 2/-4A drive current capability
- Built-in LDO makes the driving voltage more stable and reliable
- Less than 60ns propagation delay, less than 10ns delay matching between high and low side
- +5/-5V logic ground bias;
- Anti-interference of dV/dt on high voltage side: 150V/ns
- Operation ambient temperature:-40℃ ~125℃
- Package: LGA (4*4mm)
- Driver voltage NSD2621A: 6V; NSD2621B: 5.5V; NSD2621C: 5V

Functional block diagram



Package

- LGA (4*4mm)

Application

Half-bridge, full-bridge, and LLC power supply topology

Adapter high density power supply

Solar energy, motor drivers and new energy fields


Brushed DC Motor
Integrated Driver
快速控制
外部车灯
车灯
关
自动
导航
安全&保障
关闭
100%
自动

Brushed DC Motor Integrated Driver

Part Number	Load type	Rds (on) (HS+LS) mΩ	Peak current (A)	Number of half-bridge channels	VPower (Max)(V)	Integrated current detector	Interface	Load diagnosis	Feature	Operating temperature (°C)	Qualification	Package
NSD7310 -DHSPR	Brushed DC motor	520	3.6	2	5-40	No	Parallel	No	Over-current protection, over-temperature protection, under-voltage protection	-40~150	Industrial	HSOP8
NSD7310A -DHSPR	Brushed DC motor	520	3.6	2	5-40	Yes	Parallel	No	Over-current protection, over-temperature protection, under-voltage protection	-40~150	Industrial	HSOP8
NSD7312 -DHSPR	Brushed DC motor	520	3.6	2	5-40	No	Parallel	No	Over-current protection, over-temperature protection, under-voltage protection, fault report	-40~150	Industrial	HSOP8
NSD7312A -DHSPR	Brushed DC motor	520	3.6	2	5-40	Yes	Parallel	No	Over-current protection, over-temperature protection, under-voltage protection, fault report	-40~150	Industrial	HSOP8
NSD7310 -Q1DHSPR	Brushed DC motor	520	3.6	2	5-40	No	Parallel	No	Over-current protection, over-temperature protection, under-voltage protection	-40~150	Automotive	HSOP8
NSD7312 -Q1HSPR	Brushed DC motor	520	3.6	2	5-40	No	Parallel	No	Over-current protection, over-temperature protection, under-voltage protection, fault report	-40~150	Automotive	HSOP8
NSD7312A -Q1HSPR	Brushed DC motor	520	3.6	2	5-40	Yes	Parallel	No	Over-current protection, over-temperature protection, under-voltage protection, fault report	-40~150	Automotive	HSOP8
NSD7314-DHTSPR	Brushed DC motor	220	6	2	4.5-40	Yes	Parallel	No	Over-current protection, over-temperature protection, under-voltage protection	-40~150	Industrial	HSSSOP16
NSD7314-Q1HTSPR	Brushed DC motor	220	6	2	4.5-40	Yes	Parallel	No	Over-current protection, over-temperature protection, under-voltage protection	-40~150	Automotive	HSSSOP16
NSD8308 -Q1HTSXR	Brushed DC motor/Stepping /LED	1700	1.3	8	4.5-40	-	SPI	Yes	Over-current protection, over-temperature protection, under-voltage protection, fault report	-40~150	Automotive	HTSSOP24
NSD8306 -Q1HTSXR	Brushed DC motor/Stepping /LED	1700	1.3	6	4.5-40	-	SPI	Yes	Over-current protection, over-temperature protection, under-voltage protection, fault report	-40~150	Automotive	HTSSOP24
NSD8306A -Q1HTSXR	Brushed DC motor/Stepping /LED	1700	1.3	6	4.5-40	-	SPI	Yes	Over-current protection, over-temperature protection, under-voltage protection, fault report	-40~150	Automotive	HTSOP24
NSD8310 -Q1HTSXR	Brushed DC motor/Stepping /LED	1700	1.3	10	4.5-40	-	SPI	Yes	Over-current protection, over-temperature protection, under-voltage protection, fault report	-40~150	Automotive	HTSSOP24
NSD8312 -Q1HTSXR	Brushed DC motor/Stepping /LED	1700	1.3	12	4.5-40	-	SPI	Yes	Over-current protection, over-temperature protection, under-voltage protection, fault report	-40~150	Automotive	HTSSOP24

NSD731x/NSD731x-Q1 40V Peak Current 3.6A Brushed DC Motor Driver IC

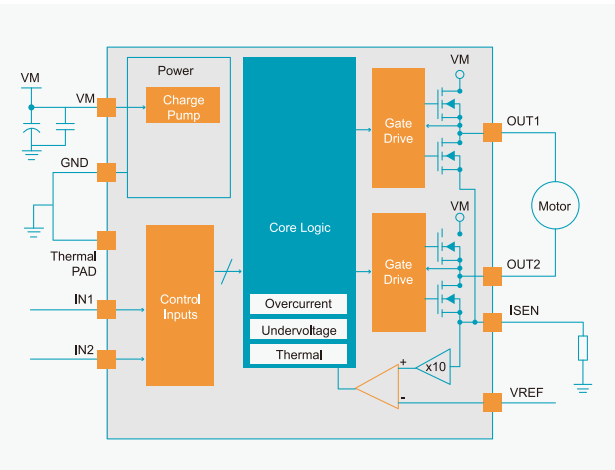
Product introduction

NSD7310/NSD7312/NSD7310A/NSD7312A/NSD7312-Q1 is a brushed DC motor driver IC. The IC has built-in N-MOSFET and provides full protection for the power level, including power supply undervoltage protection, overcurrent protection and overtemperature protection. This product can provide 3.6A peak current and supports PWM current regulation. In version A product, the internal power path current mirror function is added, and the external ADC/MCU can directly obtain the current value from the pin of the product, saving power sampling resistor and optimizing the layout. The Automotive version has passed the AEC-Q100 qualification to meet the requirements in terms of quality and reliability of vehicles.

Product feature

- Wide operating voltage range: 5V-36V (Absolute max rating 40V)
- On-resistance (HS + LS) 520mΩ
- Peak current 3.6A
- AEC-Q100 qualified
- Supporting current modulation
- Undervoltage protection
- Overcurrent protection
- Over-temperature protection
- Operating temperature: Tj=-40°C~150°C

Functional block diagram



Package

- HSOP8

Application

Home appliances

New energy vehicles

Brushed DC motor module

Automotive thermal management system

NSD7314/NSD7314-Q1: 40V Peak Current 6A Brushed DC Motor Driver IC

Product introduction

NSD7314/NSD7314-Q1 is a brushed DC motor driver IC. The IC has built-in N-MOSFET and provides full protection for the power level, including power supply undervoltage protection, overcurrent protection and overtemperature protection. This product can provide 6A peak current and supports PWM current regulation. The internal power path current mirror function is added, and the external ADC/MCU can directly obtain the current value from the pin of the product, saving power sampling resistor and optimizing the layout. The Automotive version has passed the AEC-Q100 qualification to meet the requirements in terms of quality and reliability of vehicles.

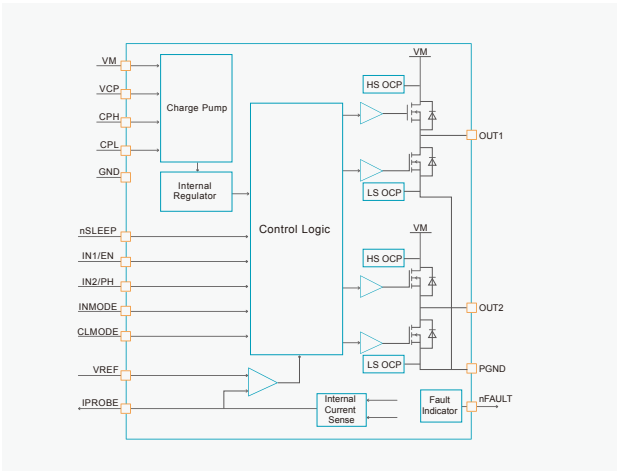
Product feature

- Wide operating voltage range: 4.5V-36V (Absolute max rating 40V)
- On-resistance (HS + LS) 220mΩ
- Peak current 6A
- AEC-Q100 qualified
- Supporting current modulation
- Undervoltage protection
- Overcurrent protection
- Over-temperature protection
- Operating temperature: Tj=-40°C~150°C

Package

- HTSSOP16

Functional Block Diagram



Application

Home appliances

New energy vehicles

Brushed DC motor module

Automotive thermal management system

NSD8312/NSD8310/NSD8308/NSD8306/-Q1: 40V 12/10/8/6-channel Half-bridge Driver IC

Product introduction

NSD8312/NSD8310/NSD8308/NSD8306 - Q1 is a multi-channel half-bridge driver chip ,which integrates 12/10/8/6 channels of half-bridges. Through flexible configuration, It can support various types of loads, including DC brushed motors, stepper motors, relays, and LEDs, etc... The chip features an internal PWM generator which could control the loads by configuring PWM frequency and duty cycle via SPI, applicable for soft start of DC brushed motors and LED dimming. Additionally, it offers smart diagnostic functions to assist vehicle systems in detecting the load status. In the event of wire breakage or short-circuits, the external MCU could get error information from internal registers for individual channels.

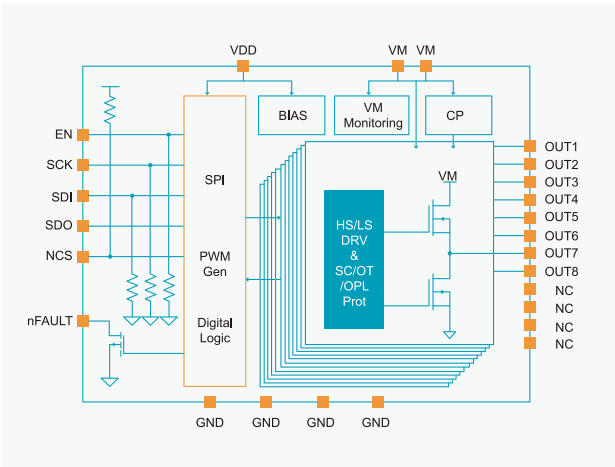
Product feature

- Wide operating voltage range 4.5V –36V (Absolute max rating 40V)
- On-resistance (HS + LS) 1.7 Ω
- Peak current 1A
- The PWM generator supports configurable frequency and duty cycle
- Open load diagnostics
- Undervoltage protection and overvoltage protection
- Operating temperature: Tj=-40°C~150°C
- AEC-Q100 qualified

Package

- HTSSOP24

Functional Block Diagram



Application

Automotive body controller

Automotive area controller

Automotive HVAC controller

Automotive thermal management system

Brushed DC Motor Pre-Driver

Part Number	Load type	Number of low-side channels	VPower(Max)(V)	Interface	Operating temperature (°C)	Qualification	Package
NSD3604-Q1QAIR	Brushed DC motor/solenoid	4	40	SPI & 4xInput	-40~150	Automotive	VQFN40
NSD3604-Q1QAJR	Brushed DC motor/solenoid	4	40	SPI & 4xInput	-40~150	Automotive	VQFN56
NSD3608-Q1QAJR	Brushed DC motor/solenoid	8	40	SPI & 4xInput	-40~150	Automotive	VQFN56
NSD3602S-Q1QDAR	Brushed DC motor/solenoid	2	40	SPI & 2xInput	-40~150	Automotive	VQFN32
NSD3602H-Q1QDAR	Brushed DC motor/solenoid	2	40	SPI & 2xInput	-40~150	Automotive	VQFN32

NSD3604/NSD3608-Q1: 40V Multi-channel Half-bridge Pre-driver

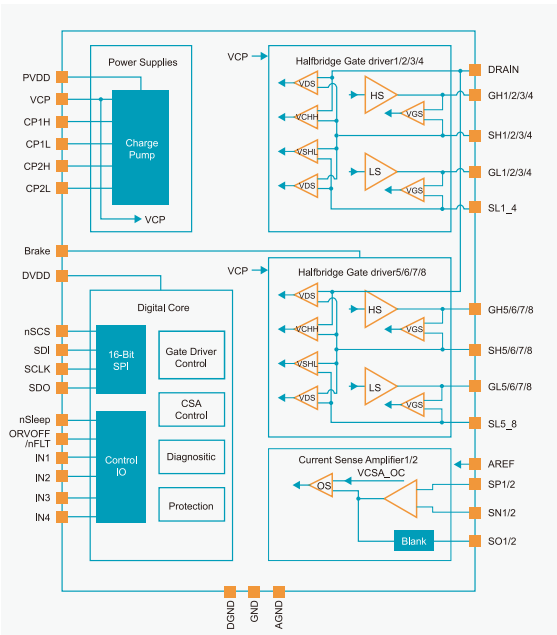
Product introduction

NSD3604/8-Q1 is a series of multi-channel half-bridge gate driver IC tailored for 12V automotive battery systems and can withstand a load dump voltage up to 40V. Featuring either 4- or 8-channel half-bridge gate drivers, it empowers independent control up to 16 external MOSFETs, and enables precise charging or discharging current management to achieve the best trade-off between EMI and efficiency for brushed DC motor control. This series can also be used as a multi-channel high-side or low side switch driver, offering flexibility for various applications including door modules, seat controllers, electric tailgates, zonal controllers, and other automotive systems requiring multi-motor or multi-load functionalities.

Product feature

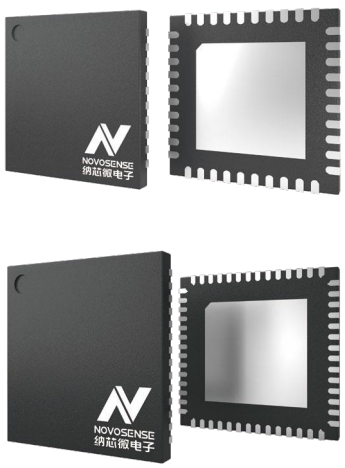
- AEC-Q100 qualified
- Wide operating voltage: 4.9V - 37V (Max. 40V)
- 4/8-channel half-bridge gate driver
- Configurable Charge/Discharge Current Profile Driver (CCPD) for optimized EMC performance
- Integrated 2-stage charge pump for 100% PWM duty cycle
- Integrated 2-channel programmable current sensing amplifier supporting high common mode input voltage
- 16-bit 10MHZ SPI communication
- Load diagnostic and protection functions
- Operating temperature: Tj=-40°C - 150°C

Functional block diagram



Package

- VQFN40/VQFN56



Application

- Automotive body domain controller
- Automotive zonal controller
- Seat controller/tailgate controller/electric pedal
- Solenoid valves

NSD3602-Q1 40V 2 Channel Half-Bridge Pre-driver for BDC Motor

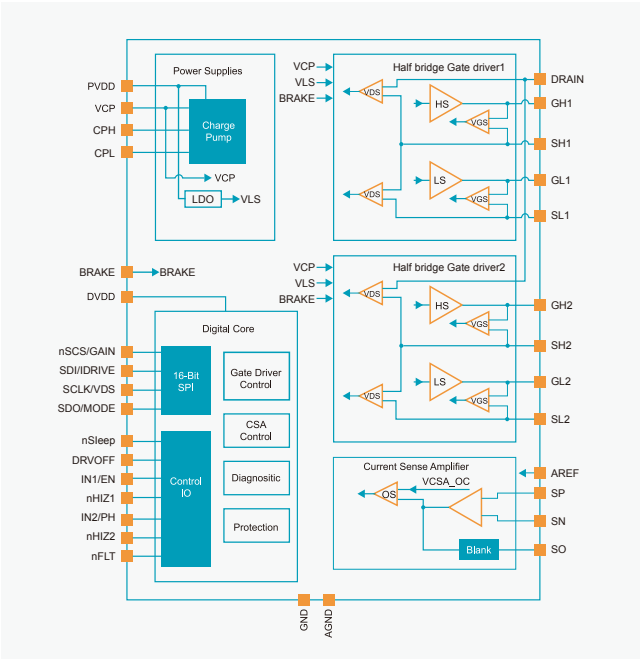
Product introduction

NSD3602 -Q1 is 2 channel half-bridge gate driver IC for 12V automotive battery systems and can withstand a load dump voltage up to 40V. Featuring 2 channel half-bridge gate drivers, it empowers independent control up to 4 external MOSFETs, and enables precise charging or discharging current management to achieve the best trade-off between EMI and efficiency for brushed DC motor control. NSD3602- Q1 offers flexibility for various applications including door modules, seat controllers, electric tailgates, zonal controllers, and other automotive systems requiring multi-motor or multi-load functionalities.

Product feature

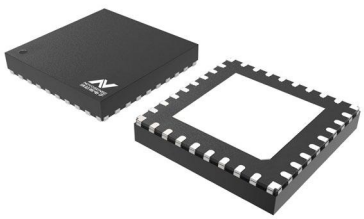
- AEC-Q100 qualified
- Wide operating voltage: 4.9V - 37V (Max. 40V)
- 2 channel half-bridge gate driver
- Configurable Charge/Discharge Current Profile Driver (CCPD) for optimized EMC performance
- Integrated 1-channel programmable current sensing amplifier supporting high common mode input voltage
- 16-bit 10MHZ SPI communication
- Load diagnostic and protection functions
- Operating temperature: Tj=-40°C - 150°C

Functional block diagram



Package

- VQFN32



Application

Automotive body domain controller

Automotive zonal controller

Seat controller/tailgate controller/electric pedal

Solenoid valves

Micro-stepping Stepper Motor

Part Number	Load type	Rds (on) (LS) mΩ	MAX current (A)	Micro-Stepping	VPower (Max)(V)	Interface	Feature	Operating temperature (°C)	Qualification	Package
NSD8381-Q1QAIR	stepper motor	1.4	1.35	32	4.5-36	SPI	Over-current protection, over-temperature protection, under-voltage protection	-40~125	Automotive	VQFN40
NSD8381-Q1QANR	stepper motor	1.2	1.35	32	4.5-36	SPI	Over-current protection, over-temperature protection, under-voltage protection	-40~125	Automotive	VQFN32
NSD8389A-Q1QBBR	stepper motor	0.9	1.5	256	4.5-36	SPI	Over-current protection, over-temperature protection, under-voltage protection	-40~125	Automotive	QFN24
NSD8389A-Q1HTSXR	stepper motor	0.9	1.5	256	4.5-36	SPI	Over-current protection, over-temperature protection, under-voltage protection	-40~125	Automotive	HTSSOP24
NSD8389-Q1QBBR	stepper motor	0.9	1.5	256	4.5-36	SPI	Over-current protection, over-temperature protection, under-voltage protection	-40~125	Automotive	QFN24
NSD8389-Q1HTSXR	stepper motor	0.9	1.5	256	4.5-36	SPI	Over-current protection, over-temperature protection, under-voltage protection	-40~125	Automotive	HTSSOP24

NSD8381-Q1: 40V 32 Micro-step Stepper Motor Driver

◆ Product introduction

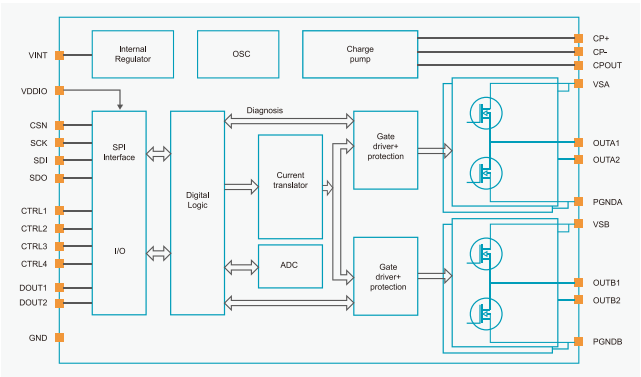
NSD8381-Q1 is an automotive grade integrated driver for stepper motors capable of current controlled micro-stepping with programmable amplitude. It features SPI ,PWM frequency spread spectrum, sensorless stall detection ,and temperature alarm and shutdown to support for flexible and reliable stepper motor control.

NSD8381 is specially designed for stepper motor drivers of headlight step control, HUD position adjustment motors, HVAC EXV(Electronic Expansion Valve) and flap motors , with excellent performance and stability.

◆ Product feature

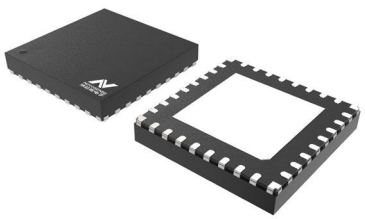
- Wide operating voltage: 4.5V-36V (Absolute max rating 40V)
- Current up to 1.35A, Rdson (HS+LS): 1.2Ω
- Programmable micro-stepping, up to 1/32 micro-stepping mode.
- Four programmable decay modes:Slow Decay,Mixed Decay,Auto Decay 1,Auto Decay 2;
- IO direct control of clock/direction/hold, or direct half-bridge control;
- Integrated current sensor and controller. Support 16-level (4-bit) current configuration for motor running and holding;
- Support PWM frequency spread spectrum for EMC performance optimization
- Support slew rate and dead time configuration
- 24-bit, 4Mhz SPI communication
- Ultra-low power sleep mode
- Integrated BEMF detection for sensorless stall detection
- Support VBat undervoltage lockout (VSUV), overcurrent protection (OCP), temperature warn(OTW/UTW) and overtemperature protection (OTSD)
- Support open-circuit diagnosis and protection of load
- Operating temperature: Tj=-40°C~150°C
- AEC-Q100 qualified

◆ Functional block diagram



◆ Package

- VQFN40, VQFN32



◆ Application

Headlight step control (ADB/AFS)

HUD position adjustment motor

HVAC Climate Flap motor

Electronic expansion valves and multi-port valves

NSD8389-Q1: 40V 256 Micro-step Stepper Motor Driver

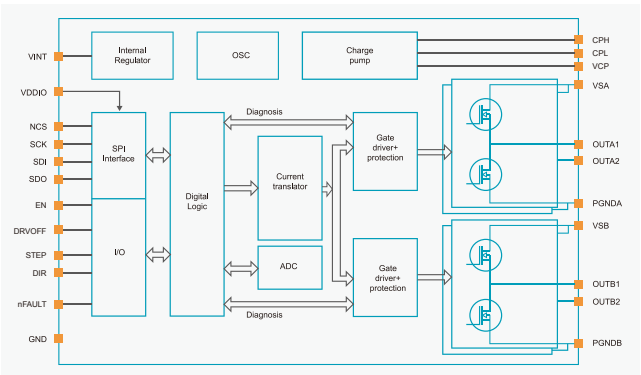
◆ Product introduction

NSD8389-Q1 is an automotive-grade high-integration bipolar stepper motor driver. It features 1/256 programmable microstepping mode, 8 programmable decay mode, integrated PWM frequency spread spectrum, slew rate, dead time, sensorless stall detection, SPI, temperature alarm and shutdown to support for flexible and reliable stepper motor control.
NSD8389 is specially designed for stepper motor drivers of headlight step control, HUD position adjustment motors, HVAC EXV (Electronic Expansion Valve) and flap motors, with excellent performance and stability.

◆ Product feature

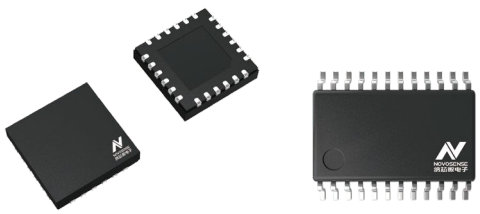
- Supply: 4.5V ~ 36V; AMR 40V
- R_{dson} & Current: 900mΩ; 1.5-A full-scale;
- Programmable micro-stepping up to 1/256 usteps
- 8 Decay Modes: smart tune, slow, and mixed decay options
- STEP/DIR input & SPI controllable Hold Mode
- Phase Counter for high precision position control
- Configurable OPL_FILT&TBLANK, default DRV_DIS for A version
- Sensorless Stall detection (bemf, zero crossing)
- Slew rate & dead time & spread spectrum configurable
- 16-bit SPI Interface with daisy chain mode
- Sleep mode with ultra low consumption
- Operating temperature: Tj=-40°C - 150°C
- AEC-Q100 Grade1

◆ Functional block diagram



◆ Package

- VQFN24, HTSSOP24



◆ Application

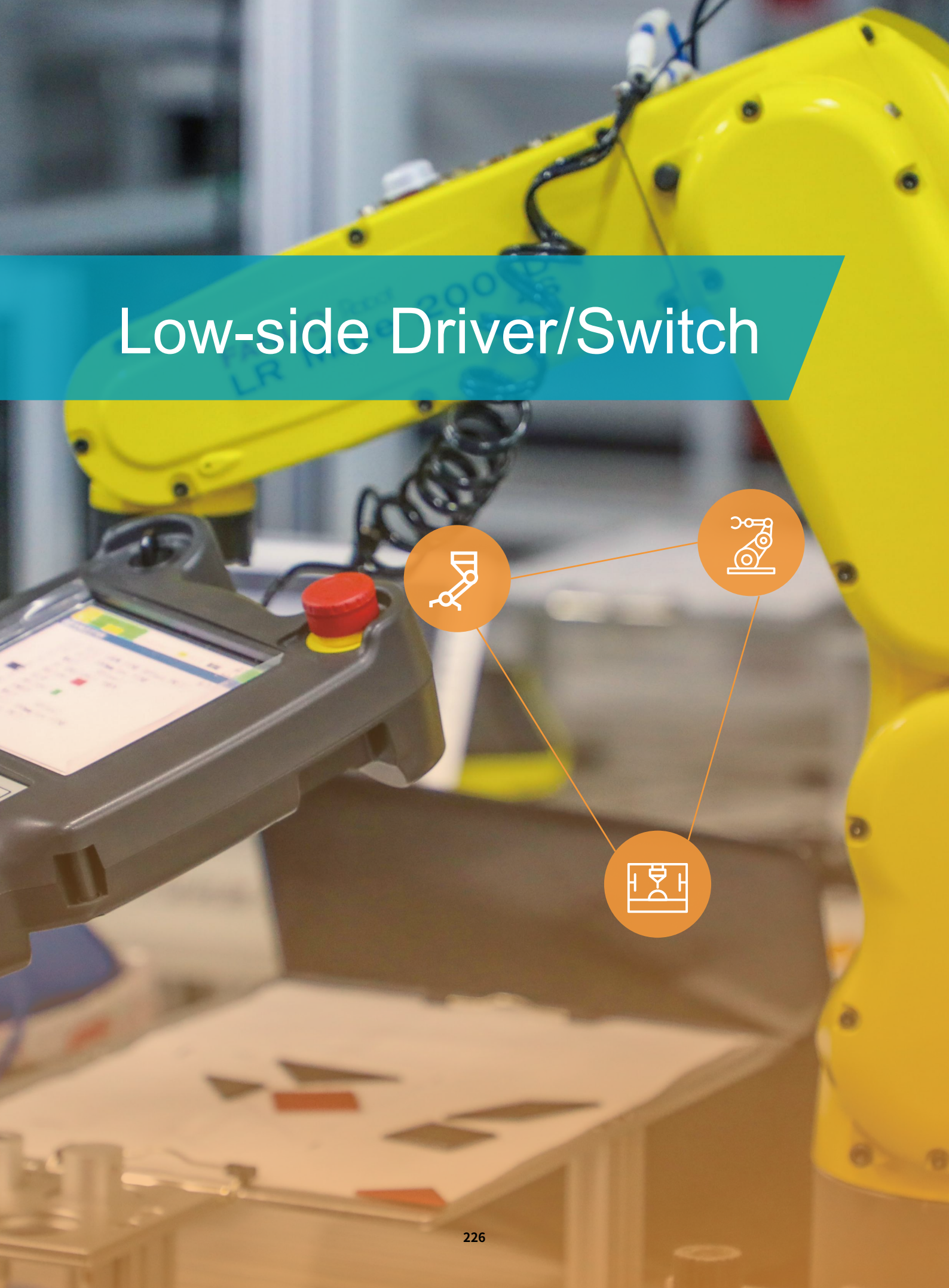
Headlight step control (ADB/AFS)

HUD position adjustment motor

HVAC Climate Flap motor

Electronic expansion valves and multi-port valves

Low-side Driver/Switch



Low-side Driver/Switch

Part Number	Load type	Rds (on) (LS) mΩ	Peak current (A)	Number of low side channels	VPower (Max)(V)	Interface	LDO	Feature	Operating temperature (°C)	Qualification	Package
NSD5604E-DHTSTR	Relay/solenoid	260	3	4	8-55	Parallel	Yes	Over-current protection, over-temperature protection, under-voltage protection, clamp and configurable current limiting point	-40~150	Industrial	HTSSOP20
NSD5604-DHTSPR	Relay/solenoid	260	3	4	8-55	Parallel	Yes	Over-current protection, over-temperature protection, under-voltage protection and clamp	-40~150	Industrial	HTSSOP16
NSD5604NE-DHTSTR	Relay/solenoid	260	3	4	8-55	Parallel	No	Over-current protection, over-temperature protection, under-voltage protection, clamp and configurable current limiting point	-40~150	Industrial	HTSSOP20
NSD5604N-DHTSPR	Relay/solenoid	260	3	4	8-55	Parallel	No	Over-current protection, over-temperature protection, under-voltage protection and clamp	-40~150	Industrial	HTSSOP16
NSD5604N-Q1HTSPR	Relay/solenoid	260	3	4	8-55	Parallel	No	Over-current protection, over-temperature protection, under-voltage protection and clamp	-40~150	Automotive	HTSSOP16
NSD12416-Q1SPR	Relay/solenoid	160	2.5	2	40	Parallel	No	Over-current protection, over-temperature protection, under-voltage protection and clamp	-40~150	Automotive	SOP8
NSD12416A-Q1SPR	Relay/solenoid	160	2.5	2	40	Parallel	No	Over-current protection, over-temperature protection, under-voltage protection and clamp	-40~150	Automotive	SOP8
NSE11409-QSPR	Relay/solenoid	90	8.5	1	40	Parallel	No	Over-current protection, over-temperature protection, under-voltage protection and clamp	-40~125	Automotive	SOP8
NSE11409-QSTBR	Relay/solenoid	90	8.5	1	40	Parallel	No	Over-current protection, over-temperature protection, under-voltage protection and clamp	-40~125	Automotive	SOT223
NSD12409-Q1SPR	Relay/solenoid	90	8	2	40	Parallel	No	Over-current protection, over-temperature protection, under-voltage protection and clamp	-40~150	Automotive	SOP8
NSD11416-Q1STBR	Relay/solenoid	160	2.5	1	40	Parallel	No	Over-current protection, over-temperature protection, under-voltage protection and clamp	-40~150	Automotive	SOT223
NSD11416-Q1SPR	Relay/solenoid	160	2.5	1	40	Parallel	No	Over-current protection, over-temperature protection, under-voltage protection and clamp, open load diagnosis	-40~150	Automotive	SOP8
NSD56008-Q1HTSPR	Relay/solenoid	1000	1	8	40	SPI & 2xInput	No	Over-current protection, over-temperature protection, under-voltage protection and clamp, open load diagnosis	-40~150	Automotive	HTSOP24
NSD12430-Q1SPR	Relay/solenoid	300	4.2	2	40	Parallel	No	Over-current protection, over-temperature protection, under-voltage protection and clamp	-40~150	Automotive	SOP8
NSD12430A-Q1SPR	Relay/solenoid	300	4.2	2	40	Parallel	No	Over-current protection, over-temperature protection, under-voltage protection and clamp	-40~150	Automotive	SOP8
NSD11430-Q1STBR	Relay/solenoid	300	4.2	1	40	Parallel	No	Over-current protection, over-temperature protection, under-voltage protection and clamp	-40~150	Automotive	SOT223
NSD11430-Q1SPR	Relay/solenoid	300	4.2	1	40	Parallel	No	Over-current protection, over-temperature protection, under-voltage protection and clamp	-40~150	Automotive	SOP8

NSD5604E/NSD5604/NSD5604NE/NSD5604N
55V Four-channel Low-side Relay and Solenoid Driver IC

◆ Product introduction

NSD5604E/NSD5604 is a 4-channel low-side driver IC. The product integrates 4-channel low-side NMOSFET to drive resistive, capacitive or inductive loads. The 4 channels can be turned on at the same time and each channel can support a load current of greater than 500mA. Each channel of the product supports independent overcurrent protection and the overcurrent points can be configured through external resistors. The IC also integrates active clamp and freewheeling diodes, by working with external TVS, different current attenuation modes including slow attenuation and fast shutdown can be realized for inductive load.

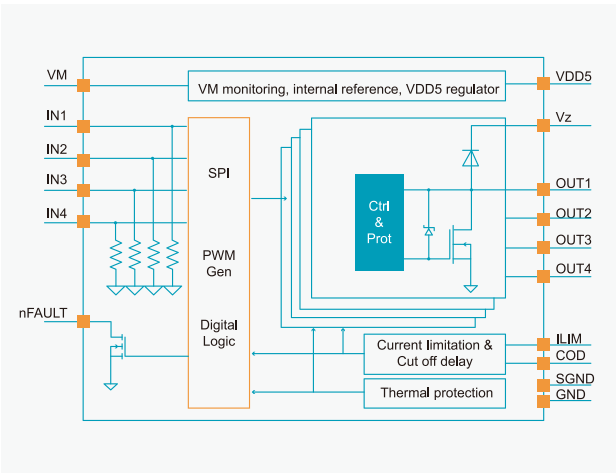
◆ Product feature

- Wide operating voltage range: 8V – 50V (Absolute max rating 55V)
- On-resistance of 260m Ω
- Peak current 3.0A
- LDO supports transmission voltage of 5V-20mA
- Integrated active clamp and freewheeling diode
- Configurable current limit point and overcurrent protection
- Undervoltage protection
- Operating temperature: Tj=-40°C~150°C

◆ Package:

- HTSSOP16
- HTSSOP20

◆ Functional Block Diagram



◆ Application

Industrial automation

Industrial machinery

Digital machine tools

General resistive /capacitive/inductive loads

NSD56008-Q1: 8-channel Low-side Relay and Solenoid Driver

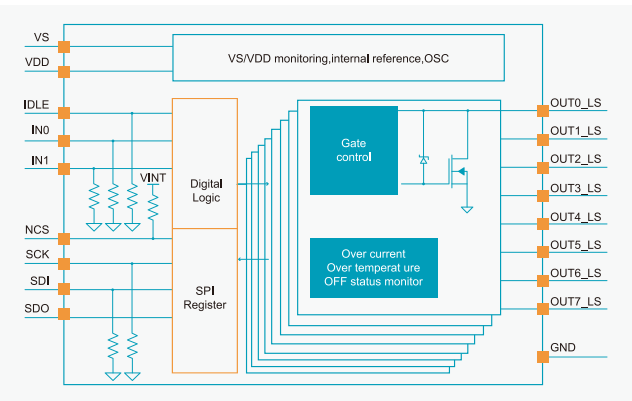
Product introduction

NSD56008-Q1 is an automotive 8-channel low-side driver IC integrated with 8-channel 1Ω NMOSFET. It supports 2-channel IO control inputs, allowing flexible mapping to any output pin. NSD56008-Q1 also supports parallel mode, limp-home mode, and provides full load protection including output status monitor, overload & overtemperature protection.

Product feature

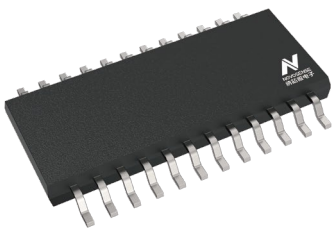
- AEC-Q100 qualified
- Operating voltage: 4.5V - 28V
- 8-channel 1Ω low-side drivers/typical load current of 330mA per channel
- 16-bit SPI communication, supporting parallel and daisy chain modes and compatible with 8-bit SPI communication
- 2 CMOS-compatible input pins IN0 and IN1 that can be mapped to output pins
- Supporting limp-home mode
- Supporting output parallel mode
- Supporting load diagnostics and protection: Overload/overtemperature protection/under-voltage protection/open-circuit diagnostics
- Operating temperature: Tj=-40°C - 150°C

Functional Block Diagram



Package:

- HTSOP24



Application

- Automotive Body Domain Controller
- Automotive Zonal controller
- Automotive Control Unit
- General resistive/ capacitive/inductive loads

Automotive 40V Single Channel 90mΩ Intelligent Low Side Switch NSE11409 series

Product introduction

NSE11409 is a single-channel smart low-side switch developed for automotive and industrial applications, featuring a withstand voltage of > 40V, and an internal resistance of about 90mΩ, it allows various diagnostic functions and different protections, and has passed AEC Q100 certification.

The IC is designed with a built-in VDD clamp of> 45V, which is especially suitable for driving inductive loads such as relays and valves to help them realize rapid demagnetization/deenergization.

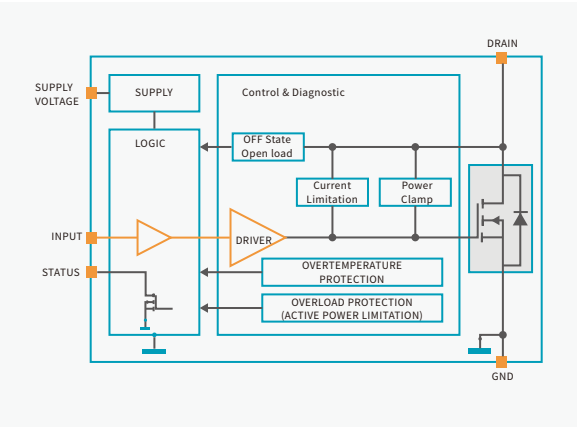
The IC is designed with an internal output current limiting function for overload protection and short circuit protection. Built-in absolute over-temperature protection and relative over-temperature protection to prevent the IC from overheating in multiple ways, slow down power accumulation, and improve IC reliability. At the same time, the IC supports open circuit detection, over-temperature detection and other diagnostic outputs.

The IC can operate at ambient temperatures from -40°C to 125°C. SOT223 and SOP8 packages are made available to meet different design requirements.

Product feature

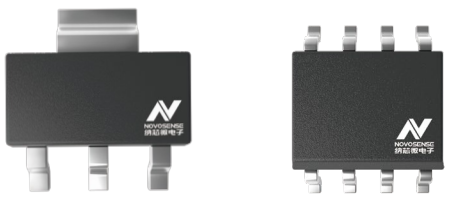
- AEC-Q100 automotive qualified
- Operation ambient temperature: -40°C to 125°C
- The operating voltage is up to 40V,
- VDD clamp to support the connection to inductive load
- Overcurrent protection: current limit value> 8A
- Over-temperature protection: absolute over-temperature protection, relative over-temperature protection
- Error status diagnostic output (SOP8 Package): open circuit detection, over temperature detection
- Ultra-low static power consumption Iq < 5μA

Functional Block Diagram



Package:

- SOT223，SOP8



Application

BMS

Body electronic controller

Vehicle controller

Air conditioning panel controller

NSD12409 – Q1 Automotive 40V Dual-channel 90mΩ Intelligent Low-Side Switch

Product introduction

NSD12409 is a dual-channel intelligent low-side switch developed for automotive and industrial applications, featuring a withstand voltage of > 40V, and an internal resistance of about 90mΩ, it allows various diagnostic functions and different protections, and has passed AEC Q100 qualification. The IC is designed with an integrated overvoltage clamp of > 45V, which is especially suitable for driving inductive loads such as relays and valves to help them realize rapid demagnetization. The chip has internal output current limiting function to realize overload and short circuit protection. Built-in absolute overtemperature protection and relative overtemperature protection prevent chip overheating in multiple ways, so that to improve chip reliability. In addition, the chip supports open circuit detection, overtemperature detection and other diagnostic output. The chip can be operated at ambient temperature from -40°C to 125°C, with SOP8 package to meet different design requirements.

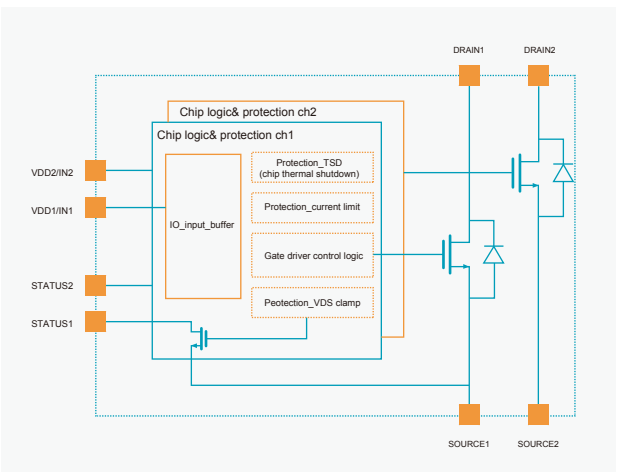
Product feature

- Operating voltage range of up to 40V
- On-resistance: 90mΩ
- Overvoltage clamp to support inductive load
- Overcurrent protection: Current limit >8A
- Overcurrent protection; Absolute overtemperature protection, relative overtemperature protection
- Operating temperature: Tj=-40°C~150°C
- AEC-Q100 qualified

Package:

- SOP8

Functional Block Diagram



Application

Automotive BMS system

Automotive body controller

Automotive controller

HVAC control panel

PLC

NSD11416/12416/12416A – Q1 Automotive 40V Single/ Dual-channel 160mΩ Intelligent Low-side Switch

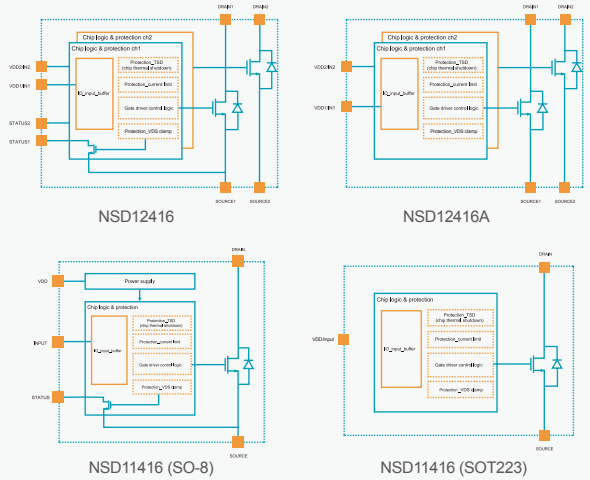
Product introduction

NSD11416/12416/12416A-Q1 is a single-channel intelligent low-side switch developed for automotive and industrial applications, featuring a withstand voltage of > 40V, and an internal resistance of about 160mΩ, it allows various diagnostic functions and different protections, and has passed AEC Q100 qualification. The IC is designed with an integrated overvoltage clamp of > 45V, which is especially suitable for driving inductive loads such as relays and valves to help them realize rapid demagnetization. The chip has internal output current limiting function to realize overload and short circuit protection. Built-in absolute overtemperature protection and relative overtemperature protection prevent chip overheating in multiple ways, so that to improve chip reliability. In addition, the chip supports open circuit detection, overtemperature detection and other diagnostic output. The chip can be operated at ambient temperature from -40°C to 125°C, and support SOT223, with SOP8 package to meet different design requirements.

Product feature

- Operating voltage range of up to 40V
- On-resistance: 160mΩ
- Overvoltage clamp to support inductive load
- Overcurrent protection: Current limit >2.5A
- Overcurrent protection; Absolute overtemperature protection, relative overtemperature protection
- Operating temperature: Tj=-40°C~150°C
- AEC-Q100 qualified

Functional Block Diagram



NSD12416

NSD12416A

NSD11416 (SO-8)

NSD11416 (SOT223)

Package:

- SOP8
- SOT223

Application

Automotive BMS system

Automotive body controller

Automotive controller

HVAC control panel

PLC

NSD11430/12430/12430A-Q1: Automotive 40V Single/ Dual-channel 300mΩ Intelligent Low-side Switch

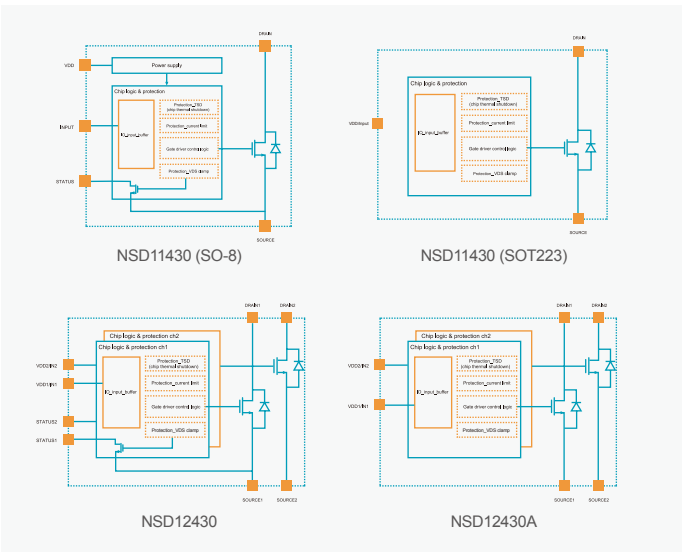
Product introduction

NSD11430/12430/12430A is a single-channel intelligent low-side switch developed for automotive and industrial applications, featuring a withstand voltage of > 40V, and an internal resistance of about 300mΩ, it allows various diagnostic functions and different protections, and has passed AEC Q100 qualification. The IC is designed with an integrated overvoltage clamp of > 45V, which is especially suitable for driving inductive loads such as relays and valves to help them realize rapid demagnetization. The chip has internal output current limiting function to realize overload and short circuit protection. Built-in absolute overtemperature protection and relative overtemperature protection prevent chip overheating in multiple ways, so that improves chip reliability. The chip can be operated at ambient temperature from -40°C to 125°C, and support SOT223, with SOP8 package to meet different design requirements.

Product feature

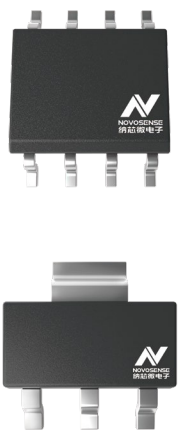
- Operating voltage range of up to 40V
- On-resistance: 300mΩ
- Overvoltage clamp to support inductive load
- Overcurrent protection: Current limit >2.5A
- Overcurrent protection; Absolute overtemperature
- protection, relative overtemperature protection
- Operating temperature: Tj=-40°C~150°C
- AEC-Q100 qualified

Functional Block Diagram



Package:

- SOP8
- SOT223



Application

Vehicle body controller

Vehicle controller

HVAC control panel

SiC Diode

SiC Diode

Part Number	Power Supply VRRM	Current IF(TC=150°C)	Operating temperature (°C)	Qualification	Package
NPD010N120A-DTOGT	1200V	10A	-55~175	Industrial	TO247-2
NPD020N120A-DTOGT	1200V	20A	-55~175	Industrial	TO247-2
NPD030N120A-DTOGT	1200V	30A	-55~175	Industrial	TO247-2
NPD040N120A-DTOGT	1200V	40A	-55~175	Industrial	TO247-2

NPD0x0N120A: 1200V SiC Diode Series

Product introduction

NPD0x0N120A is a 1200V series SiC Schottky diode product, with four current specifications, namely, 10A, 20A, 30A and 40A, which is designed for PV, energy storage, charging and other industrial applications. It offers excellent efficiency characteristics in single- or three-phase PFC, and isolation or non-isolation DC-DC circuits to meet the needs of medium- and high-voltage systems.
Compared with conventional silicon-based diodes, SiC diodes deliver significant benefits:
- The reverse recovery current of SiC diodes is almost zero, and the size of reverse recovery current is not affected by the forward on-state current, turn-off speed (di/dt), and junction temperature;
- Excellent reverse recovery characteristics can be used with high-frequency switching devices to increase the switching frequency, and reduce the overall footprint and cost of the system;
- Compared with 1200V silicon-based diodes, SiC diodes have a Schottky structure with a lower forward on-state voltage;
- Smaller reverse recovery current leads to a better EMI result;
- SiC material has a better thermal conductivity, helping reduce the junction temperature.

Product feature

- Ultra low reverse leakage current, ~5uA@175°C（typ.）
- Lower losses with Low V_F
- Great surge capability (>10 times)
- Outstanding figure of merit Q_c x V_F
- No reverse recovery charge
- Up to 50A rated diode

Package

- TO247-2

Functional Block Diagram

Application

xEV battery charging infrastructure

Photovoltaic and energy storage converters

SiC MOSFET

Part Number	Power Supply VRRM	Current IF(TC=25°C)	Operating temperature (°C)	Qualification	Package
NPC060N120A-DTOIT	1200V	49A	-55~175	Industrial	TO247-4
NPC060N120A-QTOIT	1200V	49A	-55~175	Automotive	TO247-4
NPC060N120A-QTOOT	1200V	49A	-55~175	Automotive	TO263-7
NPC040N120A-DTOIT	1200V	86A	-55~175	Industrial	TO247-4

NPC0x0N120A: 1200V SiC MOSFET Series

Product introduction

Silicon Carbide MOSFETs from NOVOSENSE provide excellent R_{DSon} temperature stability, high efficiency and optimal reliability. Our products cover 650 V, 1200 V and 1700 V voltage classes. And also provide devices with a variety of RDSon values, from below 4mΩ to above 1Ω. Our products include TO247-4L, TO263-7L, and other packages, commonly used in industrial and automotive applications. It's noted that the NOVOSENSE SiC MOSFETs in through-hole package and surface mount package are designed with Kelvin source pins for optimized switching performance.

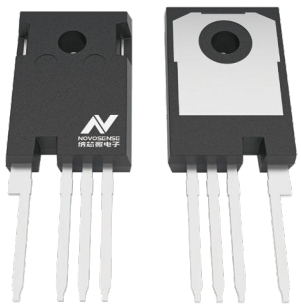
NPC0x0N120A is a 1200V SiC MOSFET product series, covering specifications such as 80mΩ, 60mΩ, 40mΩ, 22mΩ, etc. This series of products address the requirement of high-voltage, high-performance, and high-reliability SiC MOSFET in automotive and industrial applications, such as OBC/DC-DC, EV chargers, and photovoltaic and energy storage inverters.

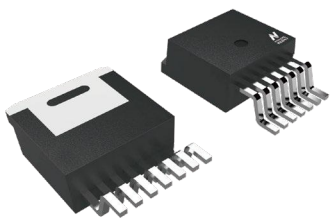
Product feature

- Excellent R_{DSon} temperature stability
- Wider gate drive voltage range (-8 - 22V)
  Supporting +15V/+18V mode (compatible with IGBT +15 V)
  20% lower R_{DSon} under +18V mode
- Outstanding threshold voltage consistency
- Very low forward voltage drop of the body diode and high robustness

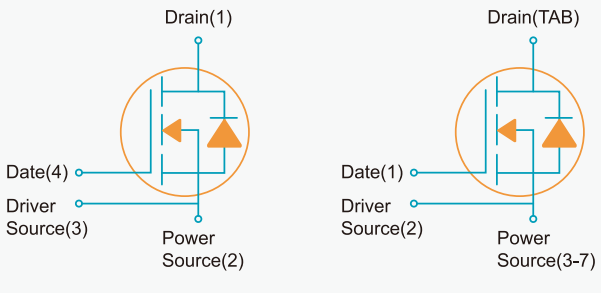
Package:

- TO247-4
- TO263-7





Functional Block Diagram



Application

Photovoltaic and energy storage converters

xEV battery charging infrastructure

OBC/DCDC converter for xEVs

LDO Linear Regulator

LDO Linear Regulator

Part Number	Ambient temperature	Number of Channels	Minimum input voltage	Maximum input voltage	Output Current	Output voltage	Static Power Consumption	Feature	Application	Package
NSR31xxx	-40°C~125°C	1CH	3V	40V	150mA	Fixed output: 2.5V, 3.3V and 5V	5μA	Current limiting protection Over-temperature protection	In-vehicle entertainment and autopilot, Body electronics and lighting, Inverter and motor control, OBC/DCDC and BMS	SOT-223 SOT-23-5L DFN-8
NSR33xxx	-40°C~125°C	1CH	3V	40V	300mA	Fixed output: 2.5V, 3.3V and 5V Adjustable output: 0.65V~18V	5μA	Enable Power normal state indication PG Current limiting protection Over-temperature protection	In-vehicle entertainment and autopilot, Body electronics and lighting, Inverter and motor control, OBC/DCDC and BMS	HMSOP8 HSOP8
NSR35xxx	-40°C~125°C	1CH	3V	40V	500mA	Fixed output: 2.5V, 3.3V and 5V Adjustable output: 0.65V~18V	5μA	Enable Current limiting protection Over-temperature protection	In-vehicle entertainment and autopilot Body electronics and lighting Inverter and motor control OBC/DCDC and BMS	TO252-4 TO263-5 TO252-2 HSOP8
NSE5701	-40°C~125°C	1CH	4.5V	28V	300mA/CH	Adjustable output 1.5V~20V	1.6mA	High Accuracy Current-Sense Adjustable Current-Limit With External Resistor Reverse Current protection Reverse polarity protection Output Inductive Load Clamp Short to Battery Protection operation：Latch mode	In-vehicle entertainment and autopilot,Antenna, GPS load supply, ADAS camera load supply	HTSSOP-16
NSE5701R	-40°C~125°C	1CH	4.5V	28V	300mA/CH	Adjustable output 1.5V~20V	1.6mA	High Accuracy Current-Sense Adjustable Current-Limit With External Resistor Reverse Current protection Reverse polarity protection Output Inductive Load Clamp Short to Battery Protection operation：Auto-Retry mode	In-vehicle entertainment and autopilot,Antenna, GPS load supply, ADAS camera load supply	HTSSOP-16
NSE5702	-40°C~125°C	2CH	4.5V	28V	300mA/CH	Adjustable output 1.5V~20V	2.3mA	High Accuracy Current-Sense Adjustable Current-Limit With External Resistor Reverse Current protection Reverse polarity protection Output Inductive Load Clamp Short to Battery Protection operation：Auto-Retry mode	In-vehicle entertainment and autopilot,Antenna, GPS load supply, ADAS camera load supply	HTSSOP-16
NSE5702R	-40°C~125°C	2CH	4.5V	28V	300mA/CH	Adjustable output 1.5V~20V	2.3mA	High Accuracy Current-Sense Adjustable Current-Limit With External Resistor Reverse Current protection Reverse polarity protection Output Inductive Load Clamp Short to Battery Protection operation：Auto-Retry mode	In-vehicle entertainment and autopilot,Antenna, GPS load supply, ADAS camera load supply	HTSSOP-16
NSE4250	-40°C~125°C	1CH	4V	40V	50mA	Adjustable output 2V~36V	100μA	High precision voltage following(+/-10mV) Short circuit protection Reverse battery polarity protection Reverse current protection Overheat protection	Various automotive ECUs: Power supply and load protection for off-board sensors	NSOT23-5 SOT23-5

Part Number	Ambient temperature	Number of Channels	Minimum input voltage	Maximum input voltage	Output Current	Output voltage	Static Power Consumption	Feature	Application	Package
NSE4251	-40°C~125°C	1CH	4V	40V	400mA	Adjustable output 2V~36V	330μA	High precision voltage following(+/-10mV) Short circuit protection Reverse battery polarity protection Reverse current protection Overheat protection	Various automotive ECUs: Power supply and load protection for off-board sensors	TO252-4 TO263-5
NSE4253	-40°C~125°C	1CH	4V	40V	300mA	Adjustable output 2V~36V	330μA	High precision voltage following(+/-10mV) Short circuit protection Reverse battery polarity protection Reverse current protection Overheat protection	Various automotive ECUs: Power supply and load protection for off-board sensors	SOP-8 HSOP-8
NSE4254	-40°C~125°C	1CH	4V	40V	100mA	Adjustable output 2V~36V	116μA	High precision voltage following(+/-10mV) Short circuit protection Reverse battery polarity protection Reverse current protection Overheat protection	Various automotive ECUs: Power supply and load protection for off-board sensors	SOP-8 HSOP-8
NSR30001	-40℃~125℃	1CH	2.5V	5.5V	1A	Adjustable output	110μA	Short circuit protection Overheat protection Current Limit Foldback Soft start	Advanced Driving Assistance System Automotive Infotainment Telematics control units High-Speed I/F Automotive Cluster Display	DFN-8
NSR30101	-40℃~125℃	1CH	2.5V	5.5V	1A	Adjustable output	110μA	Short circuit protection Overheat protection Current Limit Foldback With PG Soft start	Advanced Driving Assistance System Automotive Infotainment Telematics control units High-Speed I/F Automotive Cluster Display	DFN-6
NSR30102	-40℃~125℃	1CH	2.5V	5.5V	0.5A	Adjustable output	110μA	Short circuit protection Overheat protection Current Limit Foldback With PG Soft start	Advanced Driving Assistance System Automotive Infotainment Telematics control units High-Speed I/F Automotive Cluster Display	DFN-6
NSR30201	-40℃~125℃	1CH	2.5V	5.5V	1A	Adjustable output	110μA	Short circuit protection Overheat protection Current Limit Foldback With PG Soft start	Advanced Driving Assistance System Automotive Infotainment Telematics control units High-Speed I/F Automotive Cluster Display	DFN-6
NSR30202	-40℃~125℃	1CH	2.5V	5.5V	0.5A	Adjustable output	110μA	Short circuit protection Overheat protection Current Limit Foldback With PG Soft start	Advanced Driving Assistance System Automotive Infotainment Telematics control units High-Speed I/F Automotive Cluster Display	DFN-6
NSR30301	-40℃~125℃	1CH	2.5V	5.5V	1A	Adjustable output	110μA	Short circuit protection Overheat protection Current Limit Foldback With PG Soft start	Advanced Driving Assistance System Automotive Infotainment Telematics control units High-Speed I/F Automotive Cluster Display	DFN-8
NSR30302	-40℃~125℃	1CH	2.5V	5.5V	0.5A	Adjustable output	110μA	Short circuit protection Overheat protection Current Limit Foldback With PG Soft start	Advanced Driving Assistance System Automotive Infotainment Telematics control units High-Speed I/F Automotive Cluster Display	DFN-8
NSR30401	-40℃~125℃	1CH	2.5V	5.5V	1A	Adjustable output	110μA	Short circuit protection Overheat protection Current Limit Foldback With PG Soft start	Advanced Driving Assistance System Automotive Infotainment Telematics control units High-Speed I/F Automotive Cluster Display	DFN-8

Part Number	Ambient temperature	Number of Channels	Minimum input voltage	Maximum input voltage	Output Current	Output voltage	Static Power Consumption	Feature	Application	Package
NSR30501	-40℃~125℃	1CH	2.5V	5.5V	1A	Adjustable output	110μA	Short circuit protection Overheat protection Noise Reduction Current Limit Foldback	Advanced Driving Assistance System Automotive Infotainment Telematics control units High-Speed I/F Automotive Cluster Display	DFN-8
NSR30601	-40℃~125℃	1CH	2.5V	5.5V	1A	Adjustable output	110μA	Short circuit protection Overheat protection Noise Reduction Current Limit Foldback	Advanced Driving Assistance System Automotive Infotainment Telematics control units High-Speed I/F Automotive Cluster Display	DFN-8
NSR37033	-40℃~125℃	1CH	4V	40V	300mA	Fixed output: 3.3V	19μA	Enable Power normal state indication PG Current limiting protection Over-temperature protection Integrated watchdog	Automotive MCU Power Supply Body Control Modules (BCM) Electronic Gear Shifter Transmission Control Unit (TCU)	HTSSOP16
NSR37050	-40℃~125℃	1CH	4V	40V	300mA	Fixed output: 5V	19μA	Enable Power normal state indication PG Current limiting protection Over-temperature protection Integrated watchdog	Automotive MCU Power Supply Body Control Modules (BCM) Electronic Gear Shifter Transmission Control Unit (TCU)	HTSSOP16
NSR37133	-40℃~125℃	1CH	4V	40V	500mA	Fixed output: 3.3V	19μA	Enable Power normal state indication PG Current limiting protection Over-temperature protection Integrated watchdog	Automotive MCU Power Supply Body Control Modules (BCM) Electronic Gear Shifter Transmission Control Unit (TCU)	HTSSOP28
NSR37150	-40℃~125℃	1CH	4V	40V	500mA	Fixed output: 5V	19μA	Enable Power normal state indication PG Current limiting protection Over-temperature protection Integrated watchdog	Automotive MCU Power Supply Body Control Modules (BCM) Electronic Gear Shifter Transmission Control Unit (TCU)	HTSSOP28

Automotive 40V 150/300/500mA LDO NSR31/33/35 Series with Ultra Low Quiescent Current

Product introduction

The NSR31/33/35 series LDO chips launched by NOVOSENSE are designed for the applications where the automobile battery supplies power to the system. With a wide input voltage of 3V to 40V, it supports transient voltage up to 42V, which can meet the normal operating requirements of automobile under cold crank and start-stop conditions. Its ultra-low quiescent current of 5μA and low dropout voltage is very suitable for automotive applications with low standby power consumption required. It supplies power to MCU and CAN/LIN transceivers in standby systems to save power and extend battery life.

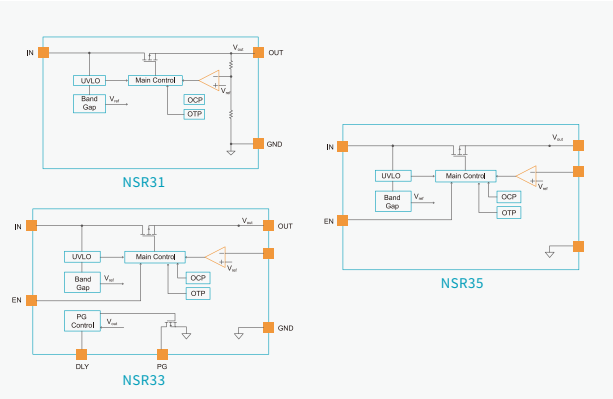
The NSR31/33/35 series provides sμFficient solutions for hardware designers, with various fixed voltage versions: 2.5V, 3.3V and 5.0V, and also provides adjustable output options (0.65V to 18V). In addition, different series are designed with output currents of 150mA, 300mA and 500mA respectively. This low-power linear regulator also integrates short-circuit protection and over-temperature protection.

These devices can operate at ambient temperatures from -40℃ to 125℃. SOT223, SOT23, DFN-8, HMSOP8, HSOP8, TO252, TO263 and other packages are made available to meet different design requirements.

Product feature

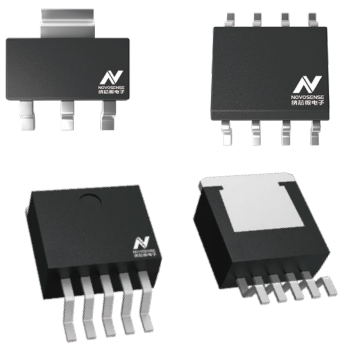
- Operating voltage range: 3V-40V, supporting transient voltage up to 42V
- Output current range:
  NSR31 series: 150mA; NSR33 series: 300mA; NSR35 series: 500mA
- Output voltage range:
  Fixed output: 2.5V,3.3V, and 5V, Adjustable output: 0.65V to 18V
- Ultra lowquiescent current Iq
  Iq: 200nA in shutdown mode
  Typical value under light load is: 5μA
- Maximum voltage drop:
  NSR31 Series: 620mV@150mA, 5Vout
  NSR33 Series: 320mV@300mA, 5Vout
  NSR35 Series: 560mV@500mA, 5Vout
- Excellent output transient response
  NSR31 Series: supporting 1mΩ ~3Ω，2.2μF~100μF capacitor
  NSR33 Series: supporting 1mΩ ~3Ω，1μF~100μF capacitor
  NSR35 Series: supporting 1mΩ ~3Ω，1μF~200μF capacitor
- Enable signal, PG signal, PG delay function: NSR331 series
- Integrated output short circuit protection, over-temperature protection

Functional Block Diagram



Package:

- NSR31 series: SOT-223, SOT-23-5L, DFN-8
- NSR33 series: HMSOP8, HSOP8
- NSR35 series: TO252-4, TO252-2, TO263-5, HSOP8



Application

- In-vehicle entertainment and autopilot
- Body electronics and lighting
- Inverter and motor control
- OBC/DCDC and BMS

Automotive 5.5V 500mA/1A LDO NSR30x0x-Q1 Series with Low Noise and High PSRR

Product introduction

NSR30x0x-Q1 series is a low-voltage linear regulator that delivers up to 1A or 500mA current. Supply voltage ranges from 2.5V to 5.5V. It is available to set the output voltage from Vref to 5V. With 60nA shutdown current, NSR30x0x-Q1 series offers low noise, optional noise reduction, and excellent PSRR performance.

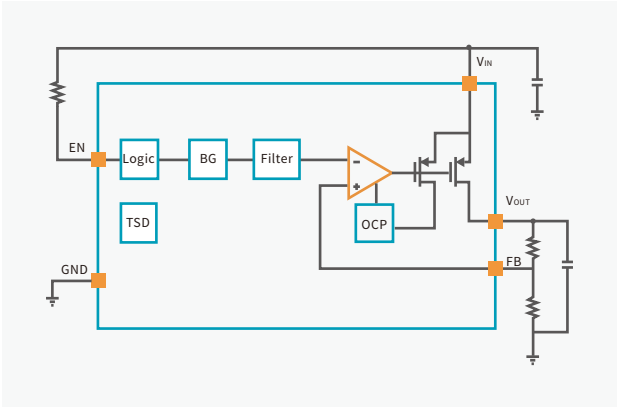
NSR30x01-Q1 series dropout voltage is only 180 mV at full load and NSR30x02-Q1 series dropout voltage is only 85 mV at full load, with superior transient response and line regulation. The device features integrated short-circuit-to-GND and thermal shutdown protections.

This device operates in ambient temperatures from –40°C to 125°C, and is available in multiple packages such as DFN-8 and DFN-6, meeting different design.

Product feature

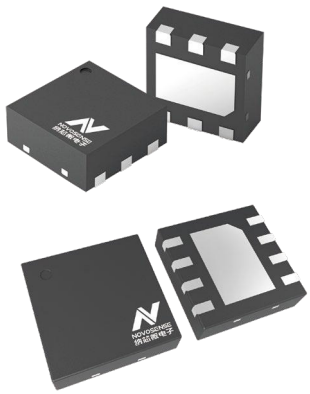
- AEC-Q100 qualified
- Operating temperature range: -40°C - 125°C
- Operating voltage range: 2.5V to 5.5V
- Output voltage range: Vref to 5V
- Output Current Range:
  NSR30x01-Q1 up to 1 A
  NSR30x02-Q1 up to 0.5 A
- Low Quiescent Current: 80 nA (Typ.) Shutdown Current when EN low
- High PSRR: Less than -30 dB@1 MHz
- Dropout Voltage:
  NSR30xx1-Q1: 180mV at 1 A Load
  NSR30xx2-Q1: 85 mV at 0.5 A Load
- Low noise: 7.6μVRMS Typ. (10Hz to 100kHz，CNR=470nF)
- Optional Noise Reduction
- Current Limit Foldback
- Integrated Fault Protection:
  Short-Circuit-to-GND protection
  Thermal Shutdown

Functional Block Diagram



Package:

- DNF-6, DFN-8



Application

Advanced Driving Assistance System

Automotive Infotainment

Telematics control units

High-Speed I/F

Automotive Cluster Display

Automotive 300mA Single-channel and Dual-channel Antenna Load Protection LDO NSE5701/2 Series

Product introduction

NSE5701/2 series devices are designed to provide single-channel and dual-channel path protection for automotive loads with a low current of less than 300mA. With a wide input voltage range from 4.5V to 28V, the NSE5701/2 series can provide adjustable output voltage ranging from 1.5V to 20V per channel.

NSE5701/2 series provides high-precision current sensing capabilities, and can differentiate and diagnose various error states through different analog level outputs. The highly precise current sensing function allows the detection of open-circuit, normal, and short-circuit conditions without further calibration.

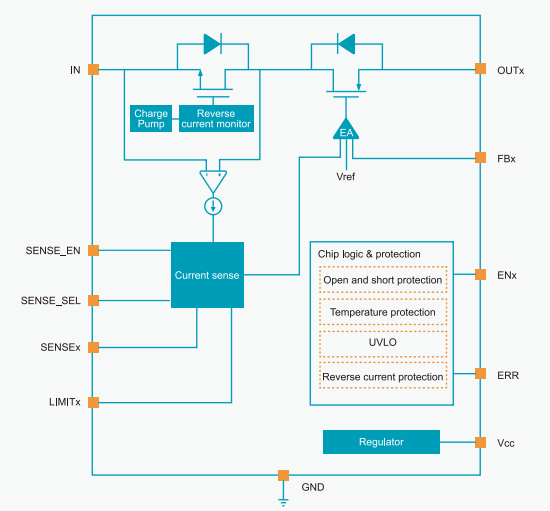
With an external resistor in place, each channel of NSE5701/2 can provide adjustable current limiting capability. This product series also features overheat protection, output battery short-circuit protection, battery reverse polarity protection, reverse current protection and internal inductive clamping protection.

NSE5701/2 series can operate at a temperature ranging from -40°C to +125°C, and is available in the HTSSOP-16 package.

Product feature

- AEC-Q100 qualified
- Operating temperature range: -40°C - 125°C
- Operating voltage range:
  4.5V-28V, with transient voltage up to 45V
- Output current range: 300mA/CH
- Output voltage range: Adjustable output from 1.5V to 20V
- Accurate current sensing
- Adjustable overcurrent output
- Integrated protection and diagnostic functions:
  Short circuit protection
  Reverse battery polarity protection
  Reverse current protection
  Overheat protection
  Output battery short circuit protection
  Output inductive load clamping
  Ability to distinguish all faults through the current sensing functionality

Functional Block Diagram



Package:

- HTSSOP-16

Application

Automotive infotainment systems: Load protection for antenna/GPS/camera, etc.

Automotive 50mA/100mA/300mA/400mA Tracking LDO NSE4250/4/3/1 Series

Product introduction

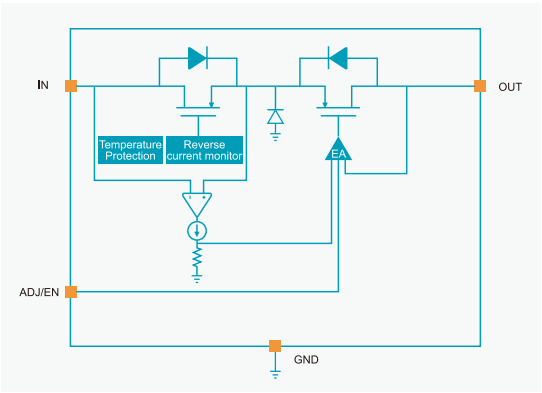
NSE425x is a tracking LDO with low dropout and high tracking accuracy, primarily designed to power off-board automotive sensors. NSE425x integrates protections against overload, overheat, reverse polarity, and short circuit between battery and ground output. By adjusting the reference voltage applied to the input pin ADJ, it can regulate power supply voltage up to VIN = 45V, with load current up to a level ranging from 50mA to 400mA.

By setting the ADJ/EN input pin at a low level, the NSE425x device can switch to standby mode, thereby minimizing the static current. NSE425x can operate at a temperature ranging from -40°C to +125°C, and is available in multiple packages such as NSOT-23-5, SOT23-5, SOP-8, HSOP-8, TO252-4, TO263-5, meeting different design requirements.

Product feature

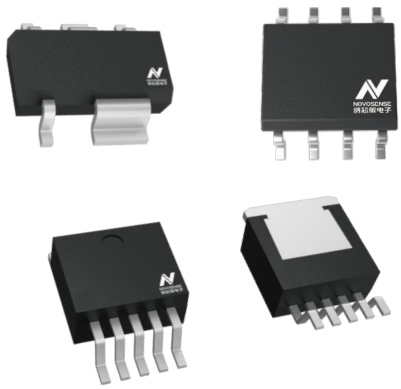
- AEC-Q100 qualified
- Operating temperature range: -40°C - 125°C
- Operating voltage range: 4V - 40V, with transient voltage up to 45V
- Output current range: 50mA/100mA/300mA/400mA
- High precision voltage following: +/-10mV
- Integrated protection and diagnostic functions:
  - Short circuit protection
  - Reverse battery polarity protection
  - Reverse current protection
  - Overheat protection

Functional Block Diagram



Package:

- NSOT23-5, SOT23-5, SOP-8, HSOP-8, TO252-4, TO263-5



Application

Various automotive ECUs: Power supply and load protection for off-board sensors

Automotive 40V 500mA/300mA LDO NSR37xxx Series Integrated with Selectable Watchdog

Product introduction

In automotive microcontroller applications, watchdogs are used to monitor the working status of microcontrollers, to avoid software runaway. NSR37xxx-Q1 is a watchdog LDO series, designed for working voltages up to 40V, with a typical quiescent current of only 19 μA under light load. And it has a low dropout voltage, only 400 mV at 200 mA output. This series has two package sizes, corresponding to two output current versions: 300mA and 500mA.

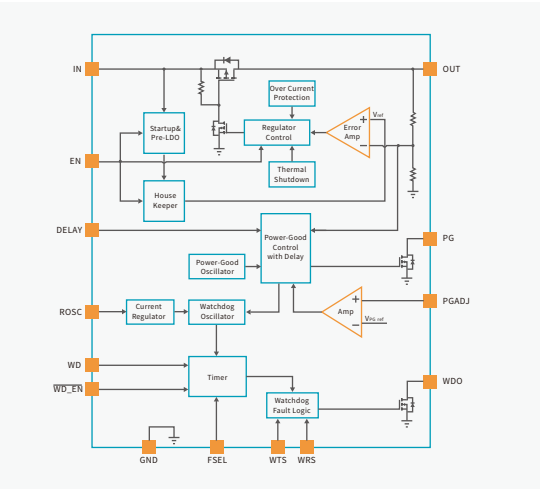
The device integrates a programmable function, which can be used to select window or standard watchdog, and the watchdog time can be set between 10ms and 500ms by external resistors. NSR37xxx-Q1 also has a PG pin, which is used to indicate when the output voltage is stable. The PG delay time and trigger threshold can be adjusted by external components. The device also has integrated short circuit and overcurrent protection functions.

NSR37xxx-Q1 can operate at a temperature ranging from -40°C to +125°C, and is available in multiple packages such as HTSSOP16 HTSSOP28, meeting different design requirements.

Product feature

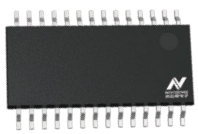
- AEC-Q100 qualified
- Operating temperature range: -40°C - 125°C
- Operating voltage range: 4V-40V, with transient voltage up to 45V
- Output current range:
  300mA for NSR370xx
  500mA for NSR371xx
- Low Quiescent Current (Iq):
  < 4 μA When EN = Low (Shutdown Mode)
  19 μA (Typ) at Light Loads (Watchdog Disabled)
- Dropout Voltage: 400 mV at 200 mA
- Integrated, Adjustable Window Watchdog Timer with Independent Flag
- Selectable Window or Standard Watchdog, with Adjustable Period: 10 ms to 500 ms
- Programmable Threshold & Reset Pulse Delay
- Integrated Fault Protection
  Thermal Shutdown
  Short-Circuit Protection

Functional Block Diagram



Package:

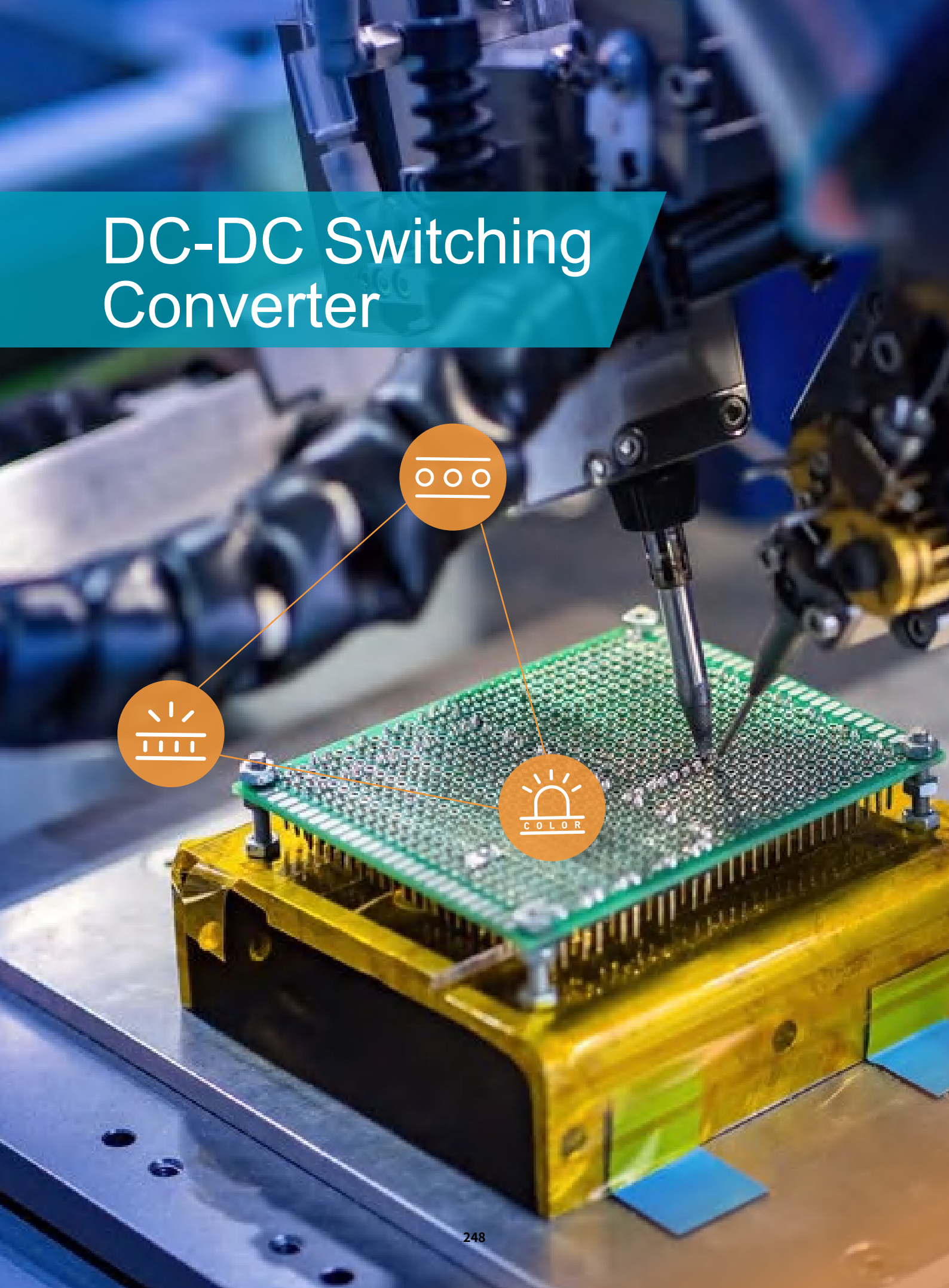
- HTSSOP16, HTSSOP28



Application

- Automotive MCU Power Supply
- Body Control Modules (BCM)
- Electronic Gear Shifter
- Transmission Control Unit (TCU)

DC-DC Switching Converter



DC-DC Switching Converter

Part Number	Ambient Temperature	Minimum Input Voltage	Maximum Input Voltage	Output current	Output Voltage	Static Power Consumption	Control Mode	Feature	Application	Package
NSR10A01	-40°C~125°C	9V	100V	500mA	Adjustable output	120μA	COT	No Control Loop Compensation Required Integrated 500 mΩ High-Side Power MOSFETs Cycle-by-Cycle Current Limit Over-Voltage Protection Over-Temperature Protection	Ebike GPS trackers/dashboards Photovoltaic energy storage systems Stepper motors Electric tools Drones	MSOP8
NSR10A11	-40°C~125°C	9V	100V	1A	Adjustable output	120μA	COT	Integrated 500 mΩ High-Side Power MOSFET Soft start Cycle-by-Cycle Current Limit Short circuit protection Over Voltage Protection Over Temperature Protection	Ebike GPS trackers/dashboards Photovoltaic energy storage systems Stepper motors Electric tools Drones	HSOP8
NSR10A21	-40°C~125°C	9V	100V	2A	Adjustable output	120μA	COT	Integrated 500 mΩ High-Side Power MOSFET Soft start Cycle-by-Cycle Current Limit Short circuit protection Over Voltage Protection Over Temperature Protection	Ebike GPS trackers/dashboards Photovoltaic energy storage systems Stepper motors Electric tools Drones	HSOP8
NSR10A12	-40°C~125°C	9V	100V	1A	Adjustable output	120μA	COT	Integrated 500 mΩ High-Side Power MOSFET Integrated 100mA LDO output Soft start Cycle-by-Cycle Current Limit Short circuit protection Over Voltage Protection Over Temperature Protection	Ebike GPS trackers/dashboards Photovoltaic energy storage systems Stepper motors Electric tools Drones	HSOP8
NSR10A22	-40°C~125°C	9V	100V	2A	Adjustable output	120μA	COT	Integrated 500 mΩ High-Side Power MOSFET Integrated 100mA LDO output Soft start Cycle-by-Cycle Current Limit Short circuit protection Over Voltage Protection Over Temperature Protection	Ebike GPS trackers/dashboards Photovoltaic energy storage systems Stepper motors Electric tools Drones	HSOP8
NSR10430	-40°C~125°C	4V	40V	3.5A	Adjustable output	65μA	PCM	Integrated 150 mΩ High-Side Power MOSFET Peak Current Mode Control ±2% Feedback Reference Voltage Full-feature Protection Internal Loop Compensation	Industrial power supplies Automotive power supplies Communication power system Moto Drives, Inverters	HSOP8
NSR10431	-40°C~125°C	4V	40V	3.5A	Adjustable output	100μA	PCM	Integrated 150 mΩ High-Side Power MOSFET Peak Current Mode Control ±2% Feedback Reference Voltage Full-feature Protection External Optional Loop Compensation	Industrial power supplies Automotive power supplies Communication power system Moto Drives, Inverters	HSOP8
NSR10421	-40°C~125°C	4V	40V	2.5A	Adjustable output	100μA	PCM	Integrated 150 mΩ High-Side Power MOSFET Peak Current Mode Control ±2% Feedback Reference Voltage Full-feature Protection External Optional Loop Compensation	Industrial power supplies Automotive power supplies Communication power system Moto Drives, Inverters	HMSOP10

Part Number	Ambient Temperature	Minimum Input Voltage	Maximum Input Voltage	Output current	Output Voltage	Static Power Consumption	Control Mode	Feature	Application	Package
NSR10430-Q1	-40°C~125°C	4V	40V	3.5A	Adjustable output	65μA	PCM	Integrated 150 mΩ High-Side Power MOSFET Peak Current Mode Control ±2% Feedback Reference Voltage Full-feature Protection Internal Loop Compensation	Industrial power supplies Automotive power supplies Communication power system Moto Drives, Inverters	HSOP8 DFN10
NSR10420-Q1	-40°C~125°C	4V	40V	2A	Adjustable output	65μA	PCM	Integrated 150 mΩ High-Side Power MOSFET Peak Current Mode Control ±2% Feedback Reference Voltage Full-feature Protection Internal Loop Compensation	Industrial power supplies Automotive power supplies Communication power system Moto Drives, Inverters	DFN10
NSR10431-Q1	-40°C~125°C	4V	40V	3.5A	Adjustable output	100μA	PCM	Integrated 150 mΩ High-Side Power MOSFET Peak Current Mode Control ±2% Feedback Reference Voltage Full-feature Protection External Optional Loop Compensation	Industrial power supplies Automotive power supplies Communication power system Moto Drives, Inverters	HSOP8
NSR10421-Q1	-40°C~125°C	4V	40V	2.5A	Adjustable output	100μA	PCM	Integrated 150 mΩ High-Side Power MOSFET Peak Current Mode Control ±2% Feedback Reference Voltage Full-feature Protection External Optional Loop Compensation	Industrial power supplies Automotive power supplies Communication power system Moto Drives, Inverters	HMSOP10
NSR10630	-40°C~125°C	4V	60V	3.5A	Adjustable output	65μA	PCM	Integrated 150 mΩ High-Side Power MOSFET Peak Current Mode Control ±2% Feedback Reference Voltage Full-feature Protection Internal Loop Compensation	Industrial power supplies Automotive power supplies Communication power system Moto Drives, Inverters	HSOP8
NSR10632	-40°C~125°C	4V	60V	3.5A	Adjustable output	65μA	PCM	Integrated 150 mΩ High-Side Power MOSFET Peak Current Mode Control ±2% Feedback Reference Voltage Full-feature Protection Internal Loop Compensation	Industrial power supplies Automotive power supplies Communication power system Moto Drives, Inverters	HSOP8
NSR10631	-40°C~125°C	4V	60V	3.5A	Adjustable output	100μA	PCM	Integrated 150 mΩ High-Side Power MOSFET Peak Current Mode Control ±2% Feedback Reference Voltage Full-feature Protection	Industrial power supplies Automotive power supplies Communication power system Moto Drives, Inverters	HSOP8
NSR10621	-40°C~125°C	4V	60V	2.5A	Adjustable output	100μA	PCM	Integrated 150 mΩ High-Side Power MOSFET Peak Current Mode Control ±12% Feedback Reference Voltage Full-feature Protection External Optional Loop Compensation	Industrial power supplies Automotive power supplies Communication power system Moto Drives, Inverters	HMSOP10
NSR10631-Q1	-40°C~125°C	4V	60V	3.5A	Adjustable output	100μA	PCM	Integrated 150 mΩ High-Side Power MOSFET Peak Current Mode Control ±2% Feedback Reference Voltage Full-feature Protection External Optional Loop Compensation	Industrial power supplies Automotive power supplies Communication power system Moto Drives, Inverters	HSOP8

Part Number	Ambient Temperature	Minimum Input Voltage	Maximum Input Voltage	Output current	Output Voltage	Static Power Consumption	Control Mode	Feature	Application	Package
NSR10630-Q1	-40°C~125°C	4V	60V	3.5A	Adjustable output	65μA	PCM	Integrated 150 mΩ High-Side Power MOSFET Peak Current Mode Control ±2% Feedback Reference Voltage Full-feature Protection Internal Loop Compensation	Industrial power supplies Automotive power supplies Communication power system Moto Drives, Inverters	HSOP8
NSR10632-Q1	-40°C~125°C	4V	60V	3.5A	Adjustable output	65μA	PCM	Integrated 150 mΩ High-Side Power MOSFET Peak Current Mode Control ±2% Feedback Reference Voltage Full-feature Protection Internal Loop Compensation	Industrial power supplies Automotive power supplies Communication power system Moto Drives, Inverters	HSOP8
NSR10621-Q1	-40°C~125°C	4V	60V	2.5A	Adjustable output	100μA	PCM	Integrated 150 mΩ High-Side Power MOSFET Peak Current Mode Control ±2% Feedback Reference Voltage Full-feature Protection External Optional Loop Compensation	Industrial power supplies Automotive power supplies Communication power system Moto Drives, Inverters	HMSOP10
NSR10430S-Q1	-40°C~125°C	4V	40V	3.5A	Adjustable output	65μA	PCM	Integrated 150 mΩ High-Side Power MOSFET Peak Current Mode Control ±2% Feedback Reference Voltage Full-feature Protection with Spread Spectrum Internal Loop Compensation	Industrial power supplies Automotive power supplies Communication power system Moto Drives, Inverters	HSOP8 DFN10
NSR10420S-Q1	-40°C~125°C	4V	40V	2A	Adjustable output	65μA	PCM	Integrated 150 mΩ High-Side Power MOSFET Peak Current Mode Control ±2% Feedback Reference Voltage Full-feature Protection with Spread Spectrum Internal Loop Compensation	Industrial power supplies Automotive power supplies Communication power system Moto Drives, Inverters	DFN10
NSR10431S-Q1	-40°C~125°C	4V	40V	3.5A	Adjustable output	100μA	PCM	Integrated 150 mΩ High-Side Power MOSFET Peak Current Mode Control ±2% Feedback Reference Voltage Full-feature Protection Spread Spectrum for Reduced EMI External Optional Loop Compensation	Industrial power supplies Automotive power supplies Communication power system Moto Drives, Inverters	HSOP8
NSR10421S-Q1	-40°C~125°C	4V	40V	2.5A	Adjustable output	100μA	PCM	Integrated 150 mΩ High-Side Power MOSFET Peak Current Mode Control ±2% Feedback Reference Voltage Full-feature Protection with Spread Spectrum External Optional Loop Compensation	Industrial power supplies Automotive power supplies Communication power system Moto Drives, Inverters	HMSOP10
NSR10631S-Q1	-40°C~125°C	4V	60V	3.5A	Adjustable output	100μA	PCM	Integrated 150 mΩ High-Side Power MOSFET Peak Current Mode Control ±2% Feedback Reference Voltage Full-feature Protection with Spread Spectrum External Optional Loop Compensation	Industrial power supplies Automotive power supplies Communication power system Moto Drives, Inverters	HSOP8
NSR10621S-Q1	-40°C~125°C	4V	60V	2.5A	Adjustable output	100μA	PCM	Integrated 150 mΩ High-Side Power MOSFET Peak Current Mode Control ±2% Feedback Reference Voltage Full-feature Protection with Spread Spectrum External Optional Loop Compensation	Industrial power supplies Automotive power supplies Communication power system Moto Drives, Inverters	HMSOP10

Industrial 100V High-voltage High-efficiency Asynchronous Buck Converter NSR10Axx Series

Product introduction

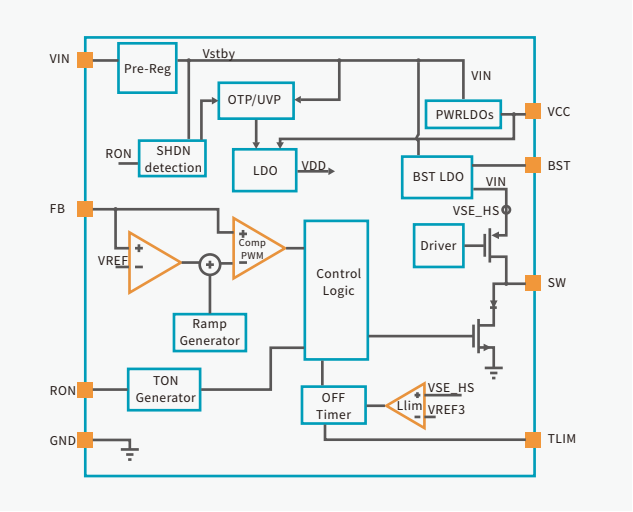
NSR10Axx series asynchronous buck converters have an input voltage range from 9V to 100V, and are suitable for 48V battery systems, such as Ebike GPS trackers/dashboards, photovoltaic energy storage systems, and stepper motors/electric tools, especially Ebike system applications.

In addition, the NSR10A12 and NSR10A22 variants integrate an additional LDO that has a voltage rating of 30V, an output voltage of 3.3V and an output current capacity of 100mA. This effectively eliminates the LDO requirement of customer's MCU/CAN for power supply, thereby reducing PCB footprint.

Product feature

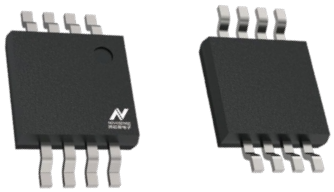
- Wide 9V to 100V Input Range
- NSR10A01: 500mA output current, 725mA peak current
  NSR10A1x: 1A output current, 2A peak current
  NSR10A2x: 2A output current, 4A peak current
- Integrated 500mΩ High-Side Power MOSFETs
- Adaptive Constant-on-time Control
- 2.5V Feedback Reference Voltage
- Adjustable Current Limit Off-time
- No Control Loop Compensation Required
- VCC Bias Function for High Light-load Efficiency
- Cycle-by-Cycle Current Limit
- Over-Voltage Protection
- Over-Temperature Protection

Functional Block Diagram



Package

- MSOP8



Application

Ebike GPS trackers/dashboards

Photovoltaic energy storage systems

Stepper motors

Electric tools

Drones

Automotive and Industrial 40V 2A/2.5A/3.5A High-efficiency Asynchronous Buck Converter NSR104xx Series

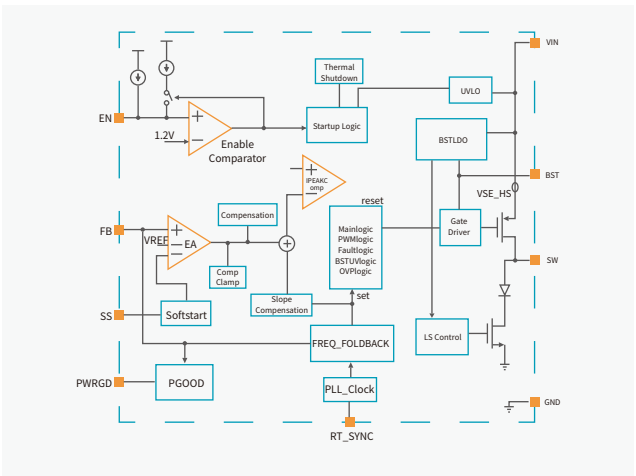
Product introduction

The NSR104xx is an asynchronous buck converter with a wide input voltage range of 4V to 40V and continuous output currents of 2A/2.5A/3.5A, designed for various buck applications. The series of high-voltage converters integrates a 150mΩ high-side power MOSFET. The NSR104xx adopts peak current mode (PCM) control. For the NSR1042/30, the converter features built-in compensation, eliminating the need for additional compensation configurations. For the NSR104x1, the converter offers externally selectable loop compensation. To reduce EMI, the NSR104xxS converters integrate spread spectrum functionality, which allows for smaller external component sizes. The non-S versions do not have spread spectrum functionality.
The NSR104xx operates in ambient temperatures ranging from –40°C to 125°C and is available in HSOP8, HMSOP10, and DFN10 packages to meet different design requirements.

Product feature

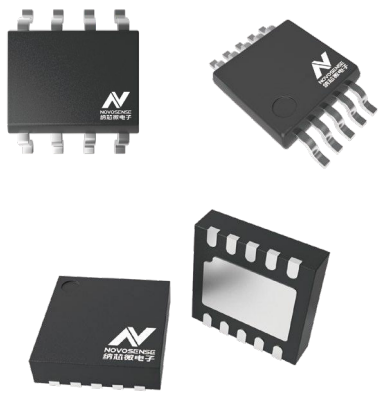
- Qualification Levels (Optional Based on Version):
  AEC-Q100 Automotive Grade Qualified
  Industrial Grade Qualified
- Operating temperature range: -40°C - 125°C
- Operating voltage range: 4V-40V
- Output current range:
  NSR10420: 2A Continuous Output Current
  NSR10421: 2.5A Continuous Output Current
  NSR10430/1: 3.5A Continuous Output Current
- Integrated 150 mΩ High-Side Power MOSFET
- Peak Current Mode Control
- ±2% Feedback Reference Voltage
- 1μA Shutdown supply current
- Loop Compensation
  NSR104x1: External Optional Loop Compensation
  NSR104xx: Internal Loop Compensation
- Full-feature Protection
- Spread Spectrum function:
  With Spread Spectrum: NSR104xxS
  Without Spread Spectrum: NSR104xx

Functional Block Diagram



Package

- HSOP8, HMSOP10, DFN10



Application

- Industrial power supplies
- Automotive power supplies
- Communication power system
- Moto Drives, Inverters

Automotive and Industrial 60V 2.5A/3.5A High-voltage High-efficiency Asynchronous Buck Converter NSR106xx Series

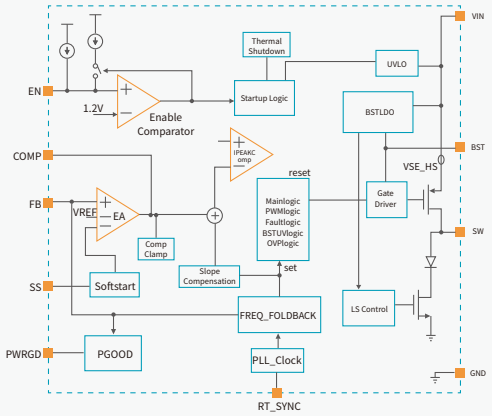
Product introduction

The NSR106xx series is an asynchronous buck converter with a wide input voltage range of 4V to 60V and continuous output currents of 2.5A/3.5A, designed for various buck applications. These high-voltage converters integrate a 150mΩ high-side power MOSFET.
The NSR106xx adopts peak current mode (PCM) control with a wide switching frequency range. The NSR106x converter features built-in compensation, eliminating the need for additional compensation configurations, while the NSR106x1 converter offers externally optional loop compensation. To reduce EMI, the NSR106xxS converters integrate a spread spectrum function, allowing for smaller external component sizes. The non-S versions do not have the spread spectrum function.
The NSR106XX series operates in ambient temperatures ranging from –40°C to 125°C and is available in various packages, including HSOP8 and HMSOP10, to meet different design requirements.

Product feature

- Qualification Levels (Optional Based on Version):
  AEC-Q100 Automotive Grade Qualified
  Industrial Grade Qualified
- Operating temperature range: -40°C - 125°C
- Operating voltage range: 4V-60V
- Output current range:
  NSR1062x: 2.5A Continuous Output Current
  NSR1063x: 3.5A Continuous Output Current
- Integrated 150 mΩ High-Side Power MOSFETs
- Peak Current Mode Control
- ±2% Feedback Reference Voltage
- Quiescent Current
  NSR106x1: 100 μA Non-switching Quiescent Current
  NSR106xx: 65 μA Non-switching Quiescent Current
- Loop Compensation
  NSR106x1: External Optional Loop Compensation
  NSR1063x: Internal Loop Compensation
- Full-feature Protection
- Spread Spectrum function:
  With Spread Spectrum: NSR106xxS
  Without Spread Spectrum: NSR106xx

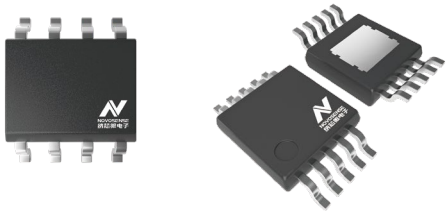
Functional Block Diagram



NSR106x1

Package

- HSOP8, HMSOP10



Application

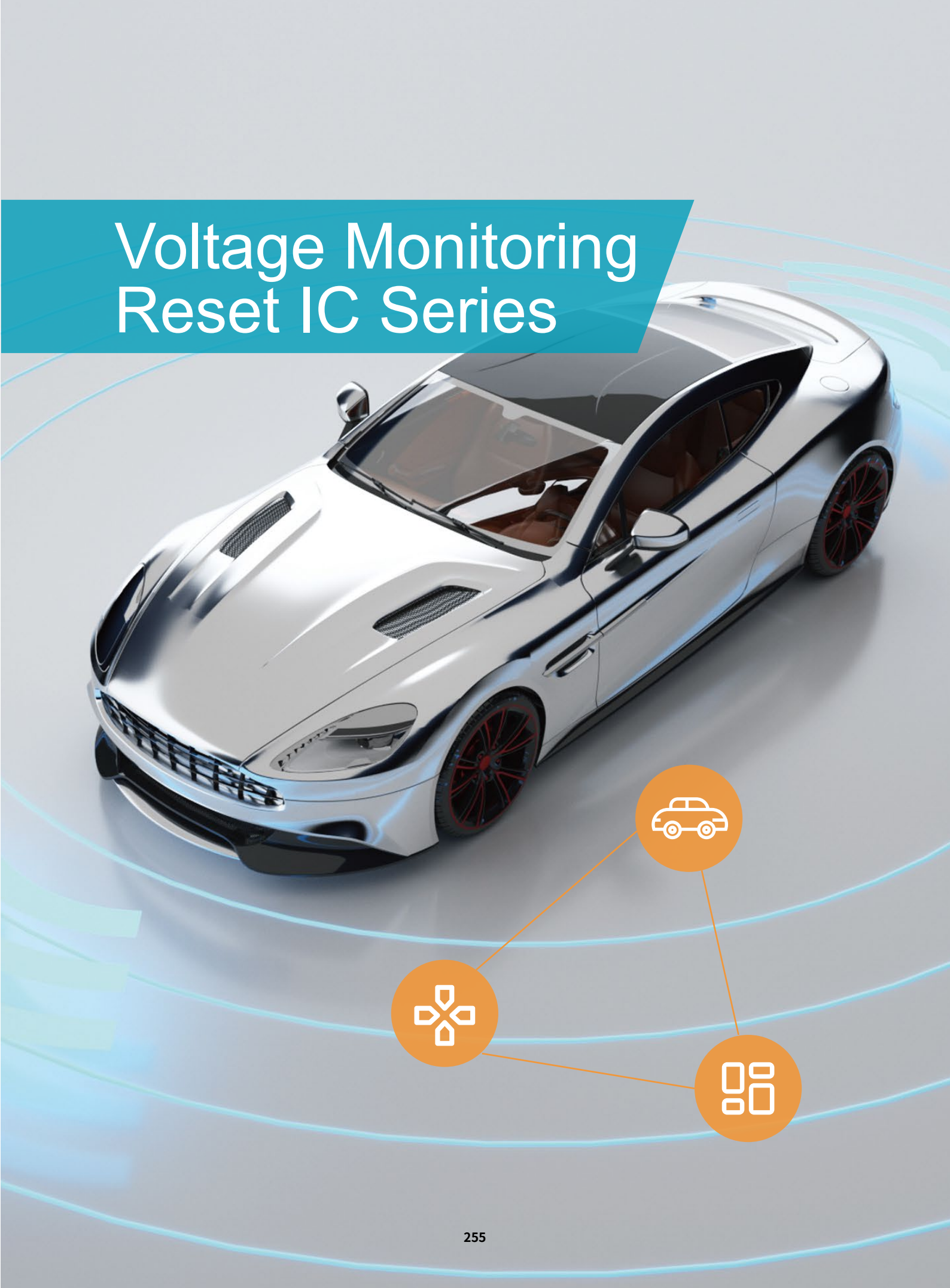
Industrial power supplies

Automotive power supplies

Communication power system

Moto Drives, Inverters

Voltage Monitoring Reset IC Series



Voltage Monitoring Reset IC Series

Part Number	Threshold Voltage	Negative-going input threshold accuracy(VIT)	Supply Voltage (V)	Iq-Quiescent Current	Other Features	Reset Delay Time	Output Type	Package	Application
NSR7808G01	Adjustable	2.0%	1.8V-6V	4.1μA	With Manual Reset function	Programmable	Low active Open Drain	SOT23-6L	ASIC/FPGA/Microcontroller Applications Battery Charge Control Unit Telematics Control Unit
NSR7808G09	0.84V	2.0%	1.8V-6V	4.1μA	With Manual Reset function	Programmable	Low active Open Drain	SOT23-6L	ASIC/FPGA/Microcontroller Applications Battery Charge Control Unit Telematics Control Unit
NSR7808G12	1.12V	2.0%	1.8V-6V	4.1μA	With Manual Reset function	Programmable	Low active Open Drain	SOT23-6L	ASIC/FPGA/Microcontroller Applications Battery Charge Control Unit Telematics Control Unit
NSR7808G125	1.16V	2.0%	1.8V-6V	4.1μA	With Manual Reset function	Programmable	Low active Open Drain	SOT23-6L	ASIC/FPGA/Microcontroller Applications Battery Charge Control Unit Telematics Control Unit
NSR7808G15	1.4 V	2.0%	1.8V-6V	4.1μA	With Manual Reset function	Programmable	Low active Open Drain	SOT23-6L	ASIC/FPGA/Microcontroller Applications Battery Charge Control Unit Telematics Control Unit
NSR7808G18	1.67V	2.0%	1.8V-6V	4.1μA	With Manual Reset function	Programmable	Low active Open Drain	SOT23-6L	ASIC/FPGA/Microcontroller Applications Battery Charge Control Unit Telematics Control Unit
NSR7808G19	1.77V	2.0%	1.8V-6V	4.1μA	With Manual Reset function	Programmable	Low active Open Drain	SOT23-6L	ASIC/FPGA/Microcontroller Applications Battery Charge Control Unit Telematics Control Unit
NSR7808G25	2.33V	2.0%	1.8V-6V	4.1μA	With Manual Reset function	Programmable	Low active Open Drain	SOT23-6L	ASIC/FPGA/Microcontroller Applications Battery Charge Control Unit Telematics Control Unit
NSR7808G30	2.79V	2.0%	1.8V-6V	4.1μA	With Manual Reset function	Programmable	Low active Open Drain	SOT23-6L	ASIC/FPGA/Microcontroller Applications Battery Charge Control Unit Telematics Control Unit
NSR7808G33	3.07V	2.0%	1.8V-6V	4.1μA	With Manual Reset function	Programmable	Low active Open Drain	SOT23-6L	ASIC/FPGA/Microcontroller Applications Battery Charge Control Unit Telematics Control Unit
NSR7808G50	4.65V	2.0%	1.8V-6V	4.1μA	With Manual Reset function	Programmable	Low active Open Drain	SOT23-6L	ASIC/FPGA/Microcontroller Applications Battery Charge Control Unit Telematics Control Unit
NSR7808G01	Adjustable	2.0%	1.8V-6V	4.1μA	With Manual Reset function	Programmable	Low active Open Drain	DFN-6	ASIC/FPGA/Microcontroller Applications Battery Charge Control Unit Telematics Control Unit
NSR7808G09	0.84V	2.0%	1.8V-6V	4.1μA	With Manual Reset function	Programmable	Low active Open Drain	DFN-6	ASIC/FPGA/Microcontroller Applications Battery Charge Control Unit Telematics Control Unit
NSR7808G12	1.12V	2.0%	1.8V-6V	4.1μA	With Manual Reset function	Programmable	Low active Open Drain	DFN-6	ASIC/FPGA/Microcontroller Applications Battery Charge Control Unit Telematics Control Unit
NSR7808G125	1.16V	2.0%	1.8V-6V	4.1μA	With Manual Reset function	Programmable	Low active Open Drain	DFN-6	ASIC/FPGA/Microcontroller Applications Battery Charge Control Unit Telematics Control Unit
NSR7808G15	1.4V	2.0%	1.8V-6V	4.1μA	With Manual Reset function	Programmable	Low active Open Drain	DFN-6	ASIC/FPGA/Microcontroller Applications Battery Charge Control Unit Telematics Control Unit
NSR7808G18	1.67V	2.0%	1.8V-6V	4.1μA	With Manual Reset function	Programmable	Low active Open Drain	DFN-6	ASIC/FPGA/Microcontroller Applications Battery Charge Control Unit Telematics Control Unit
NSR7808G19	1.77V	2.0%	1.8V-6V	4.1μA	With Manual Reset function	Programmable	Low active Open Drain	DFN-6	ASIC/FPGA/Microcontroller Applications Battery Charge Control Unit Telematics Control Unit
NSR7808G25	2.33V	2.0%	1.8V-6V	4.1μA	With Manual Reset function	Programmable	Low active Open Drain	DFN-6	ASIC/FPGA/Microcontroller Applications Battery Charge Control Unit Telematics Control Unit

Part Number	Threshold Voltage	Negative-going input threshold accuracy(VIT)	Supply Voltage (V)	Iq-Quiescent Current	Other Features	Reset Delay Time	Output Type	Package	Application
NSR7808G30	2.79V	2.0%	1.8V-6V	4.1μA	With Manual Reset function	Programmable	Low active Open Drain	DFN-6	ASIC/FPGA/Microcontroller Applications Battery Charge Control Unit Telematics Control Unit
NSR7808G33	3.07V	2.0%	1.8V-6V	4.1μA	With Manual Reset function	Programmable	Low active Open Drain	DFN-6	ASIC/FPGA/Microcontroller Applications Battery Charge Control Unit Telematics Control Unit
NSR7808G50	4.65V	2.0%	1.8V-6V	4.1μA	With Manual Reset function	Programmable	Low active Open Drain	DFN-6	ASIC/FPGA/Microcontroller Applications Battery Charge Control Unit Telematics Control Unit

Industrial Grade low-Iq Programmable-delay Voltage Monitoring Reset IC Series NSR7808

Product introduction

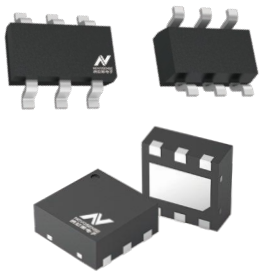
The NSR7808 series voltage monitoring reset chips are designed for industrial applications that monitor microprocessor circuits. They can monitor system voltages as low as 0.4V and provide a reset function with programmable reset delay. When the SENSE voltage drops to the threshold VIT or the manual reset MR voltage is triggered to a low level, the RESET signal is activated. The RESET output remains low until the user-set delay time elapses, at which point it is released and pulled up to a logic high level. The reset voltage can be set to typical voltage rails from 0.4V to 5V, and the reset voltage of the NSR7808G01 version can be adjusted and configured through an external resistor divider. The NSR7808 series features an ultra-low quiescent current of 4.1μA (typical value), which is ideal for industrial battery-powered applications. It provides a precise reference voltage, achieving ±2% detection accuracy (at room temperature). The reset delay time can be configured by connecting a capacitor between the CD and GND pins, allowing for a selection of any value between 1.25ms and 1s. If the CD pin is left floating, the default delay time is 20ms, and if the CD pin is connected to VDD, the delay time is 300ms.
The NSR7808 series offers hardware designers a comprehensive solution with various fixed voltage versions, as well as adjustable voltage options. It is available in SOT23-6 and DFN-6 packages, meeting different design

Product feature

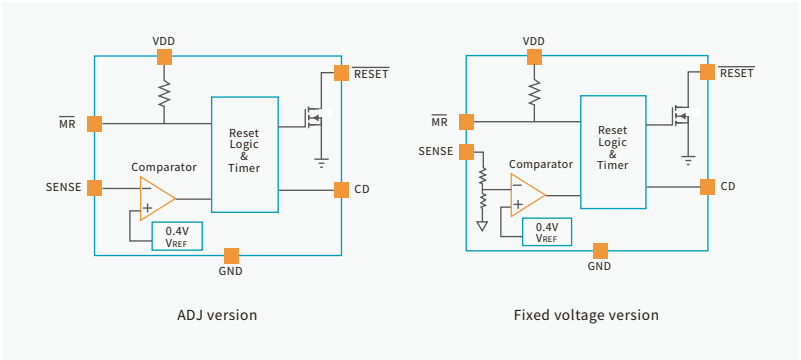
- Wide temperature range: -40°C to 125°C
- Supply voltage range: 1.8V-6V
- Monitoring threshold voltage:
  Fixed version: 0.84V, 1.12V, 1.16V, 1.4V, 1.67V, 1.77V, 2.33V, 2.79V, 3.07V, 4.65V
  Adjustable version: Adjustable
- Ultra-low static power consumption Iq: Typical 4.1μA
- Threshold voltage accuracy: 0.5%
- With Manual Reset function
- Output: Open-Drain
- Package: SOT23-6, DFN-6

Package:

- SOT23-6L，DFN-6



Functional Block Diagram



Application

ASIC/FPGA/Microcontroller Applications

Battery Charge Control Unit

Telematics Control Unit

Smart High Side Switch

Smart High Side Switch

Part Number	Ambient Temperature	Type	Number of Channels	MOS Impedance	Overcurrent value	Protection	Feature	Package	Application
NSE34025Q	-40°C~125°C	High side switch	4CH	25mΩ	30A	Overcurrent protection Short-circuit protection Overvoltage protection Over-temperature protection Lost ground protection Lost power protection Reverse polarity protection	Open circuit diagnosis Support inductive loads	HSSOP-16	BCM ZCU
NSE34050Q	-40°C~125°C	High side switch	4CH	50mΩ	27A	Overcurrent protection Short-circuit protection Overvoltage protection Over-temperature protection Lost ground protection Lost power protection Reverse polarity protection	Open circuit diagnosis Support inductive loads	HSSOP-16	BCM ZCU
NSE34140Q	-40°C~125°C	High side switch	4CH	140mΩ	11A	Overcurrent protection Short-circuit protection Overvoltage protection Over-temperature protection Lost ground protection Lost power protection Reverse polarity protection	Open circuit diagnosis Support inductive loads	HSSOP-16	BCM ZCU
NSE34050D	-40°C~125°C	High side switch	2CH	50mΩ	32A	Overcurrent protection Short-circuit protection Overvoltage protection Over-temperature protection Lost ground protection Lost power protection Reverse polarity protection	Open circuit diagnosis Support inductive loads	HSSOP-16	BCM ZCU
NSE34050S	-40°C~125°C	High side switch	1CH	50mΩ	32A	Overcurrent protection Short-circuit protection Overvoltage protection Over-temperature protection Lost ground protection Lost power protection Reverse polarity protection	Open circuit diagnosis Support inductive loads	HSSOP-16	BCM ZCU
NSE34140D	-40°C~125°C	High side switch	2CH	140mΩ	11A	Overcurrent protection Short-circuit protection Overvoltage protection Over-temperature protection Lost ground protection Lost power protection Reverse polarity protection	Open circuit diagnosis Support inductive loads	HSSOP-16	BCM ZCU
NSE34140S	-40°C~125°C	High side switch	1CH	140mΩ	11A	Overcurrent protection Short-circuit protection Overvoltage protection Over-temperature protection Lost ground protection Lost power protection Reverse polarity protection	Open circuit diagnosis Support inductive loads	HSSOP-16	BCM ZCU
NSE34025D	-40°C~125°C	High side switch	2CH	25mΩ	43A	Overcurrent protection Short-circuit protection Overvoltage protection Over-temperature protection Lost ground protection Lost power protection Reverse polarity protection	Open circuit diagnosis Support inductive loads	HSSOP-16	BCM ZCU
NSE34025S	-40°C~125°C	High side switch	1CH	25mΩ	43A	Overcurrent protection Short-circuit protection Overvoltage protection Over-temperature protection Lost ground protection Lost power protection Reverse polarity protection	Open circuit diagnosis Support inductive loads	HSSOP-16	BCM ZCU
NSE34012D	-40°C~125°C	High side switch	2CH	12mΩ	58A	Overcurrent protection Short-circuit protection Overvoltage protection Over-temperature protection Lost ground protection Lost power protection Reverse polarity protection	Open circuit diagnosis Support inductive loads	HSSOP-16	BCM ZCU
NSE34012S	-40°C~125°C	High side switch	1CH	12mΩ	58A	Overcurrent protection Short-circuit protection Overvoltage protection Over-temperature protection Lost ground protection Lost power protection Reverse polarity protection	Open circuit diagnosis Support inductive loads	HSSOP-16	BCM ZCU

Part Number	Ambient Temperature	Type	Number of Channels	MOS Impedance	Overcurrent value	Protection	Feature	Package	Application
NSE34008D	-40°C~125°C	High side switch	2CH	8mΩ	67A	Overcurrent protection Short-circuit protection Overvoltage protection Over-temperature protection Lost ground protection Lost power protection Reverse polarity protection	Open circuit diagnosis Support inductive loads	HSSOP-16	BCM ZCU
NSE34008S	-40°C~125°C	High side switch	1CH	8mΩ	67A	Overcurrent protection Short-circuit protection Overvoltage protection Over-temperature protection Lost ground protection Lost power protection Reverse polarity protection	Open circuit diagnosis Support inductive loads	HSSOP-16	BCM ZCU
NSE35120DA	-40°C~125°C	High side switch	2CH	60mΩ	18A	Overcurrent protection Short-circuit protection Overvoltage protection Over-temperature protection Lost ground protection Lost power protection Reverse polarity protection	Open circuit diagnosis Support inductive loads	HSSOP-14	BCM ZCU
NSE35200DA	-40°C~125°C	High side switch	2CH	60mΩ	11A	Overcurrent protection Short-circuit protection Overvoltage protection Over-temperature protection Lost ground protection Lost power protection Reverse polarity protection	Open circuit diagnosis Support inductive loads	HSSOP-14	BCM ZCU
NSE35040DA	-40°C~125°C	High side switch	2CH	20mΩ	48A	Overcurrent protection Short-circuit protection Overvoltage protection Over-temperature protection Lost ground protection Lost power protection Reverse polarity protection	Open circuit diagnosis Support inductive loads	HSSOP-14	BCM ZCU
NSE35040SA	-40°C~125°C	High side switch	1CH	20mΩ	48A	Overcurrent protection Short-circuit protection Overvoltage protection Over-temperature protection Lost ground protection Lost power protection Reverse polarity protection	Open circuit diagnosis Support inductive loads	HSSOP-14	BCM ZCU
NSE35080DA	-40°C~125°C	High side switch	2CH	20mΩ	40A	Overcurrent protection Short-circuit protection Overvoltage protection Over-temperature protection Lost ground protection Lost power protection Reverse polarity protection	Open circuit diagnosis Support inductive loads	HSSOP-14	BCM ZCU
NSE35012DA	-40°C~125°C	High side switch	2CH	12mΩ	65A	Overcurrent protection Short-circuit protection Overvoltage protection Over-temperature protection Lost ground protection Lost power protection Reverse polarity protection	Open circuit diagnosis Support inductive loads	HSSOP-14	BCM ZCU
NSE35012SA	-40°C~125°C	High side switch	1CH	12mΩ	65A	Overcurrent protection Short-circuit protection Overvoltage protection Over-temperature protection Lost ground protection Lost power protection Reverse polarity protection	Open circuit diagnosis Support inductive loads	HSSOP-14	BCM ZCU
NSE35020DA	-40°C~125°C	High side switch	2CH	12mΩ	65A	Overcurrent protection Short-circuit protection Overvoltage protection Over-temperature protection Lost ground protection Lost power protection Reverse polarity protection	Open circuit diagnosis Support inductive loads	HSSOP-14	BCM ZCU
NSE35030DA	-40°C~125°C	High side switch	2CH	12mΩ	65A	Overcurrent protection Short-circuit protection Overvoltage protection Over-temperature protection Lost ground protection Lost power protection Reverse polarity protection	Open circuit diagnosis Support inductive loads	HSSOP-14	BCM ZCU

Part Number	Ambient Temperature	Type	Number of Channels	MOS Impedance	Overcurrent value	Protection	Feature	Package	Application
NSE35010DA	-40℃~125℃	High side switch	2CH	10mΩ	75A	Overcurrent protection Short-circuit protection Overvoltage protection Over-temperature protection Lost ground protection Lost power protection Reverse polarity protection	Open circuit diagnosis Support inductive loads	HSSOP-14	BCM ZCU
NSE35010SA	-40℃~125℃	High side switch	1CH	10mΩ	75A	Overcurrent protection Short-circuit protection Overvoltage protection Over-temperature protection Lost ground protection Lost power protection Reverse polarity protection	Open circuit diagnosis Support inductive loads	HSSOP-14	BCM ZCU
NSE35008DA	-40℃~125℃	High side switch	2CH	8mΩ	75A	Overcurrent protection Short-circuit protection Overvoltage protection Over-temperature protection Lost ground protection Lost power protection Reverse polarity protection	Open circuit diagnosis Support inductive loads	HSSOP-14	BCM ZCU
NSE35008SA	-40℃~125℃	High side switch	1CH	8mΩ	75A	Overcurrent protection Short-circuit protection Overvoltage protection Over-temperature protection Lost ground protection Lost power protection Reverse polarity protection	Open circuit diagnosis Support inductive loads	HSSOP-14	BCM ZCU
NSE35008SP	-40℃~125℃	High side switch	1CH	8mΩ	75A	Overcurrent protection Short-circuit protection Overvoltage protection Over-temperature protection Lost ground protection Lost power protection Reverse polarity protection	Open circuit diagnosis Support inductive loads	HSSOP-14	BCM ZCU

Automotive 40V Single/Dual/Quad Channel Intelligent High-side Switch NSE34xxx/NSE35xxx Series

Product introduction

The NSE34xxx/NSE35xxx series high-side switches are designed for driving various traditional resistive, inductive, and halogen lamp loads in systems like automotive BCMs, while also being well-suited for handling large capacitive loads commonly found in first and second-level distribution in Zonal Control Units (ZCUs). These series offer options for 1, 2, or 4 channels and are available in HSSOP-16/HSSOP-14 packages, with an Rds(on) range from 8mΩ to 140mΩ. The chips feature precise current sensing, ideal for fault diagnosis, protection, and real-time monitoring of load currents. Additionally, the NSE34xxx/NSE35xxx series incorporate comprehensive protection mechanisms, including overcurrent/short-circuit protection, overtemperature protection, overvoltage protection, ground and power loss protection, reverse polarity protection, and open-load detection.

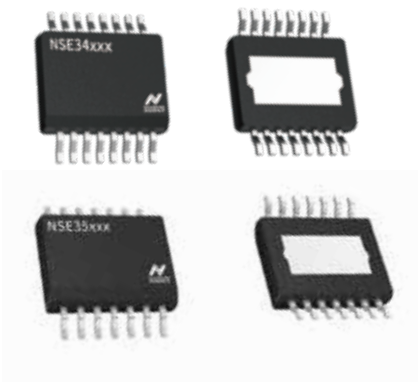
The NSE34xxx and NSE35xxx series products are AEC-Q100 qualified and certified to AEC-Q100-012 level A, ensuring over a million cycles of short-circuit and overcurrent protection.

Product feature

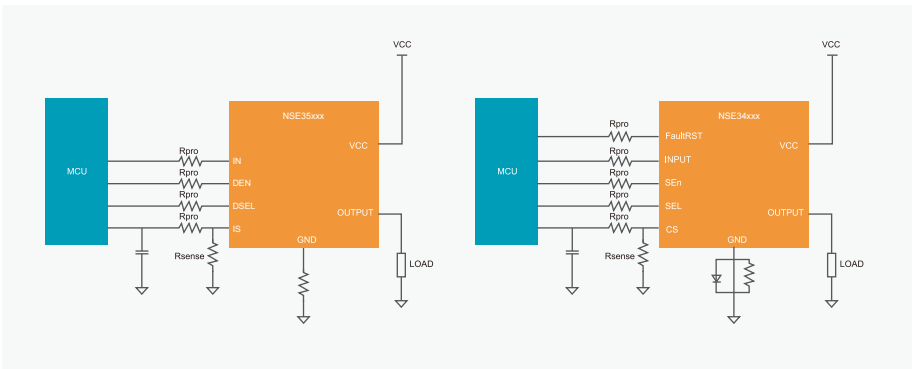
- AEC-Q100 qualified
- Operating temperature range: -40°C - 125°C
- The operating voltage range is up to 40V
- 1/2/4 channel options
- Rds(on) Range： 8mΩ ~ 140mΩ
- Accurate current sensing: +/-25% at 200mA load
- Overvoltage clamping, and supporting inductive loads
- Overcurrent protection
- Overtemperature protection: Absolute overtemperature protection, relative overtemperature protection
- Diagnostic output: Open circuit detection, short circuit detection, and overtemperature detection
- AEC-Q100-012 Level A certification

Package:

- HSSOP-16, HSSOP-14



Functional Block Diagram

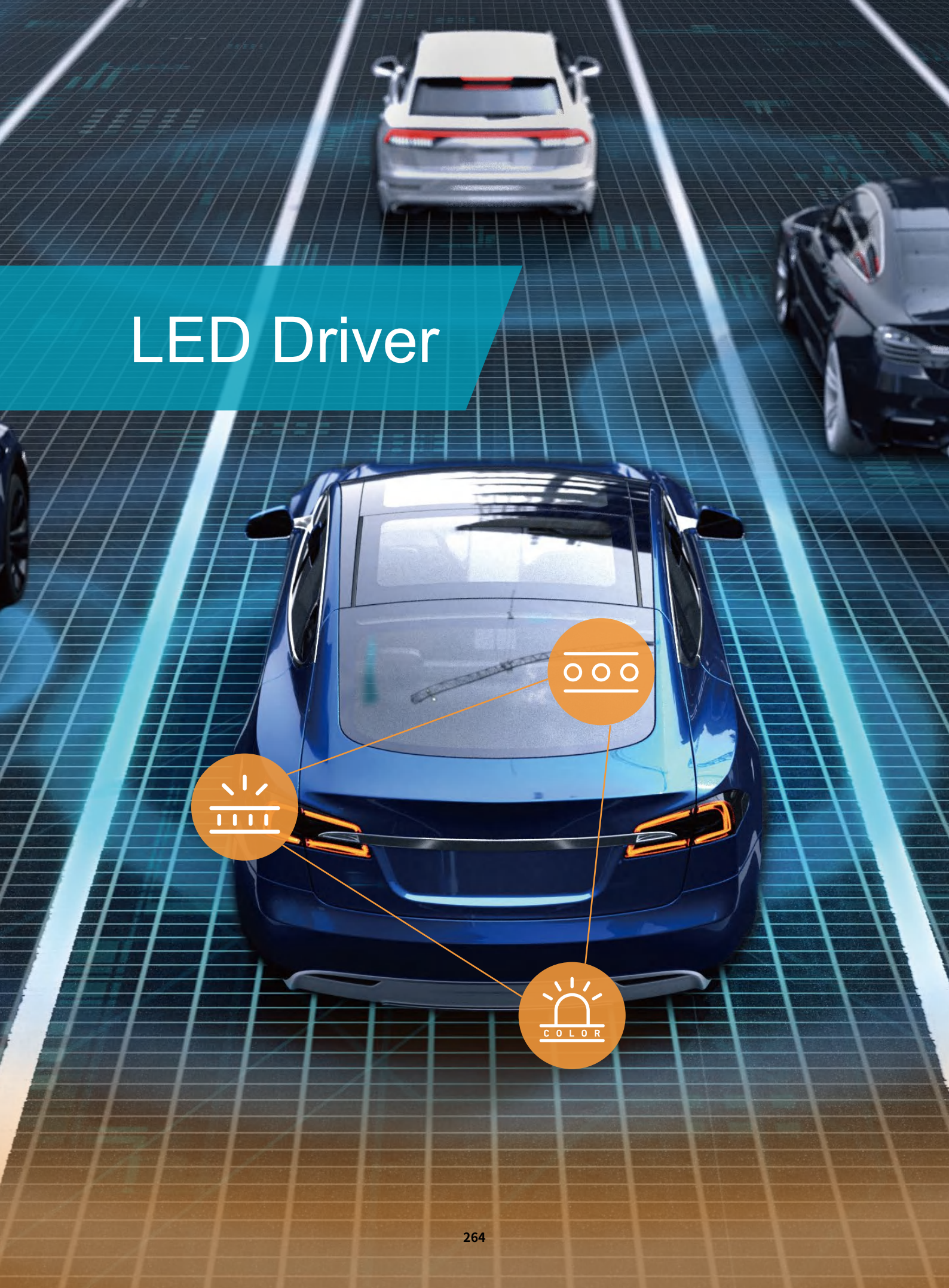


Application

Body Control Modules(BCM)

ZCU

LED Driver



LED Driver

Part Number	Ambient temperature	Number of channels	Input voltage	Output current	Diagnosis and protection	Heat dissipation enhancement	Feature	Application	Package
NSL21610	-40°C~125°C	1CH	5-40V	450mA	Open circuit diagnosis Short circuit diagnosis Over-temperature protection	Automatic current sharing via shunt resitor	PWM dimming Multiple diagnostic cascades Independent EN pin	Rear lighting Interior lightiing Other body lighting	HMSOP-8
NSL21611	-40°C~125°C	1CH	5-40V	300mA	Open circuit diagnosis Short circuit diagnosis Over-temperature protection	/	PWM dimming Multiple diagnostic cascades Independent EN pin	Rear lighting Interior lightiing Other body lighting	HMSOP-8
NSL21630	-40°C~125°C	3CH	5-40V	200mA	Open circuit diagnosis Short circuit diagnosis Over-temperature protection	Automatic current sharing via shunt resitor	PWM dimming Multiple diagnostic cascades	Rear lighting Interior lightiing Other body lighting	HTSSOP-16
NSL21631	-40°C~125°C	3CH	5-40V	200mA	Open circuit diagnosis Short circuit diagnosis Over-temperature protection	Automatic current sharing via shunt resitor	PWM dimming Multiple diagnostic cascades Independent EN pin	Rear lighting Interior lightiing Other body lighting	HTSSOP-16
NSL21912	-40℃~125℃	12CH	3.8 – 20V	100mA	Programmable fail-safe state LED Open circuit diagnosis LED Short circuit diagnosis Configurable LED open& short detect threshold Single-LED short-circuit diagnostic 8-Bit ADC for pin voltage measurement Over-temperature protection	Automatic current sharing via shunt resitor	UART Interface PWM dimming Analog current dimming	Automotive rear lighting Automotive exterior lighting General automotive body lighting applications	HTSSOP-24
NSL23716x	-40℃~125℃	16CH	3.6 – 20V	100mA	Programmable fail-safe state LED Open circuit diagnosis LED Short circuit diagnosis Configurable LED open& short detect threshold Single-LED short-circuit diagnostic 8-Bit ADC for pin voltage measurement Over-temperature protection	Configurable thermal derating	CAN differential Interface PWM/Analog dimming	Automotive rear lighting Automotive exterior lighting General automotive body lighting applications	QFN32-5x6 QFN32-4x4
NSL21916	-40℃~125℃	16CH	3-22V	100mA	Programmable fail-safe state LED Open circuit diagnosis LED Short circuit diagnosis Configurable LED open& short detect threshold Single-LED short-circuit diagnostic 8-Bit ADC for pin voltage measurement Over-temperature protection	Automatic current sharing via shunt resitor	UART Interface PWM dimming Analog current dimming	Automotive rear lighting Automotive exterior lighting General automotive body lighting applications	HTSSOP-38
NSL21924	-40℃~125℃	24CH	3-22V	100mA	Programmable fail-safe state LED Open circuit diagnosis LED Short circuit diagnosis Configurable LED open& short detect threshold Single-LED short-circuit diagnostic 8-Bit ADC for pin voltage measurement Over-temperature protection	Automatic current sharing via shunt resitor	UART Interface PWM dimming Analog current dimming	Automotive rear lighting Automotive exterior lighting General automotive body lighting applications	HTSSOP-38

Automotive 40V/450mA Single-channel Linear LED Driver NSL2161x

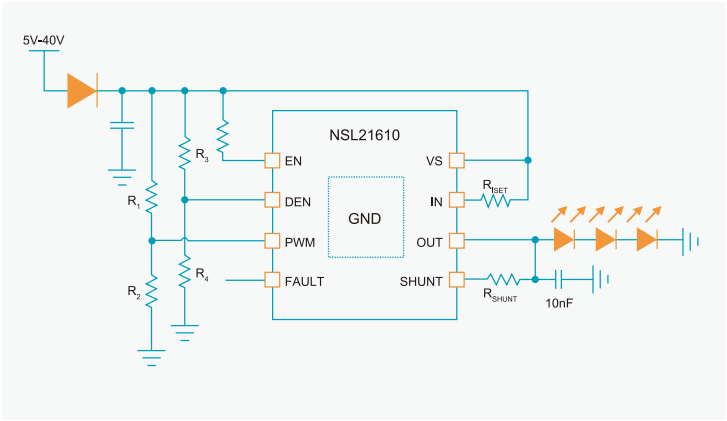
Product introduction

NSL2161x is an automotive-qualified single-channel linear constant-current LED driver, and the device has 450mA output current capability. NSL2161x adopts the latest linear constant-current architecture, featuring high constant-current accuracy and strong heat dissipation ability. In addition, the device supports complete diagnostic protection functions, including LED open circuit, LED short circuit and single LED short circuit, overtemperature protection, etc. NSL2161x supports multiple-chip FAULT pins in parallel to support diagnostic function requirements in different applications.

Product feature

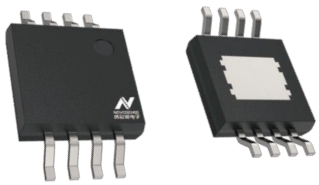
- Qualified for Automotive Grade1: Tj from-40℃-150℃
- 5V to 40V wide supply voltage range
- Single-channel high accuracy constant current with PWM dimming
- 300mA/450mA output current capability for NSL21611/NSL23610
- Automatic thermal balancing between device and external shunt resistor (NSL21610 only)
- Low dropout voltage : Max 350 mV at 100 mA
- EN control pin to enable/disable device for low power operation
- Full protections and diagnostics

Functional Block Diagram



Package:

- HMSOP-8



Application

Automotive rear lighting

Automotive interior lighting

Automotive exterior lighting

General automotive body lighting applications

Automotive 40V Three-channel Linear LED Driver with Thermal Sharing Function NSL2163x

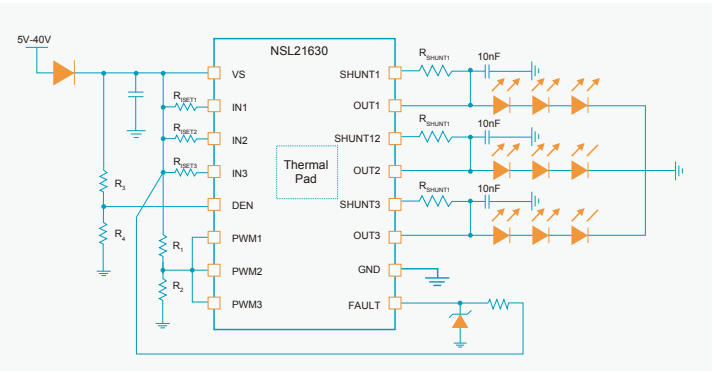
Product introduction

The NSL2163x is an automotive-qualified three-channel linear LED driver with a wide input voltage range of 5V~40V. Each channel can be configured with an output current capacity of up to 200mA. External shunt resistors can be used to share the output current, reducing device temperature rise. The device has a full range of diagnostic functions, including LED open circuit protection, LED GND short circuit protection, and device overheat protection for “all off if one fails” or “others remain on if one fails” protection with the flexible configuration of the FAULT bus. The device offers an EN pin version for low power consumption.

Product feature

- Qualified for Automotive Grade 1: Tj from-40℃-150℃
- Wide input voltage range of 5V~40V
- Three high accuracy constant current channels
- Output current capacity of 200mA per channel
- Individual current setting and PWM dimming control per channel
- Automatic thermal balancing between device and external shunt resistors
- Low dropout voltage: 450mV maximum at 100mA
- Full protections and diagnostics
- EN pin version available for low power consumption (NSL21631)

Functional Block Diagram



Package:

- HTSSOP-16

Application

Automotive rear lighting

Automotive exterior lighting

General automotive body lighting applications

Automotive 20V 12-channel Linear LED Driver NSL21912

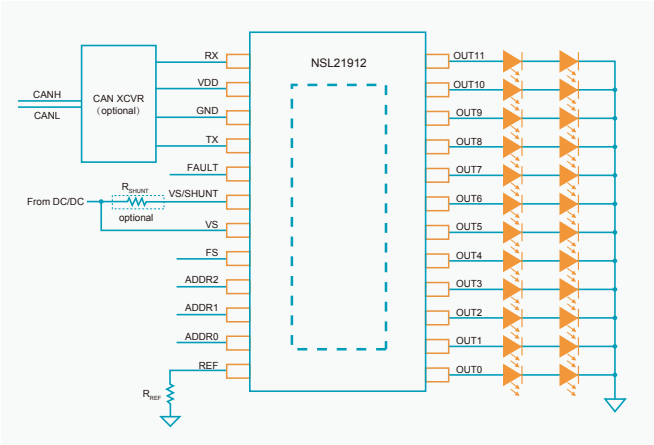
Product introduction

NSL21912 is an automotive high-side LED driver with a supply voltage range of 3.8V to 20V and a current output capability of 100mA per channel. The device supports 2-bit global and 6-bit individual current settings, and flexible 12-bit PWM dimming.
NSL21912 features a low dropout voltage requirement (700mV Max.@50mA) and supports automatic thermal sharing via VS shunt resistors, providing excellent thermal performance. NSL21912 supports multiple regulations along with LED open-circuit, short-to-ground, and single LED short-circuit diagnostics. It integrates a configurable watchdog and programmable EEPROM, allowing NSL21912 to flexibly configure fail-safe mode for different applications when the MCU connection is lost.
NSL21912 supports the UART-based digital interface for a wide range of control and diagnostic features, with a maximum of 16 NSL21912 devices on a single bus.

Product feature

- Qualified for Automotive Grade 1: Tj from -40℃ to 150℃
- 3.8V~20V supply voltage range
- 12-channel high side current sources
- 100mA output current capacity per channel
- 12-bit independent PWM dimming
- Low dropout voltage 700mV max. at 50mA
- Automatic thermal sharing via VS shunt resistor (NOVOSENSE patent)
- UART-based communcation interface(up to 2Mbps)
- Configurable LED open and LED short detect threshold
- Full protections and diagnostics

Functional Block Diagram



Package:

- HTSSOP24

Application

Automotive rear lighting

Automotive exterior lighting

General automotive body lighting applications

Automotive 16-channel Linear LED Driver NSL23716x

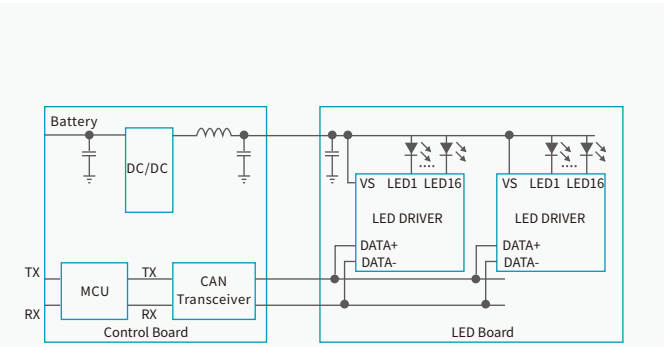
Product introduction

The NSL23716 is a 16-channel low-side LED driver that provides a maximum output current of 100mA per channel and is available in both CAN differential and UART versions, where the CAN differential interface can maximize the simplification of the BOM and provide customers with a lower system cost solution.

Product feature

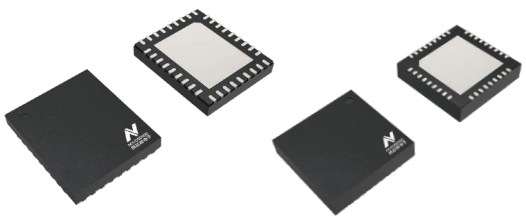
- Qualified for Automotive Grade 1: Tj from -40℃ to 150℃
- 3.6 V to 20 V wide supply voltage range
- 16-channel low side current sink
- Cascade up to 16 ICs to support up to 256 channels
- 100mA output current capacity per channel
- 12-bit independent PWM dimming per channel
- Low dropout voltage 1000mV max. at 100mA
- UART interface (NSL23716D)
- CAN compatible differential interface (NSL23716A/C)
- Up to 2 Mbps data rate
- 3.3V VCC(NSL23716A) and 5.0V VCC(NSL23716C/D)
- Internal OTP and supports programmable Fail Safe mode.
- Full protections and diagnostics

Functional Block Diagram



Package:

- QFN32-5x6，OFN32-4x4



Application

Automotive rear lighting

Automotive exterior lighting

General automotive body lighting applications

Automotive 16/24-channel Linear LED Driver NSL21916/24

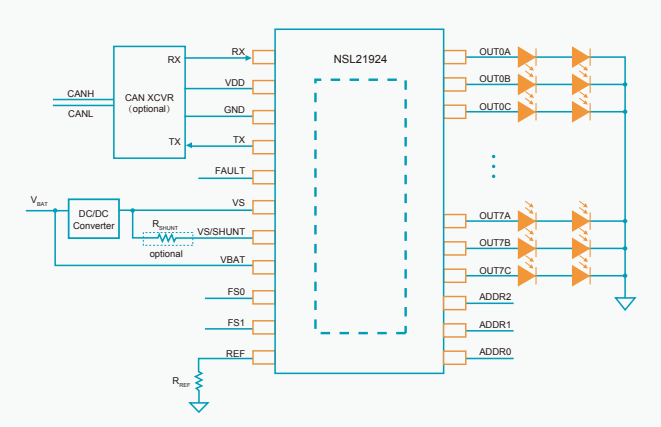
Product introduction

NSL21916/24 is a 16/24-channel high-side LED driver that controls the output channels individually with up to 100 mA current capability for each channel. 2-bit global, 6-bit individual current setting and 12-bit PWM dimming can be used to adjust the LED brightness flexibly. NSL21916/24 supports multiple regulation with LED open-circuit, short-to-ground, and single LED short-circuit diagnostics. The device also integrates a configurable watchdog which automatically sets failsafe states when the MCU connection is lost. With programmable EEPROM, NSL21916/24 can flexibly be set for different applications.
NSL21916/24 features a UART protocol-based communication interface, supporting up to 2 Mbps data rate.

Product feature

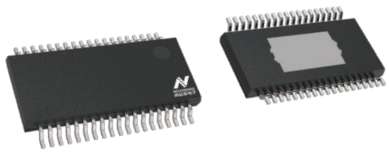
- Qualified for Automotive Grade 1: Tj from -40℃ to 150℃
- 16/24-channel high side current sources
- 100mA output current capacity per channel
- 12-bit independent PWM dimming
- Phase shift PWM dimming
- Low dropout voltage 600mV max. at 50mA
- Innovative thermal sharing characteristic based on a single shunt resistor
- UART protocol-based communication interface, supporting up to 2 Mbps data rate
- Configurable LED open and LED short detect threshold
- Full protections and diagnostics

Functional Block Diagram



Package:

- HTSSOP38



Application

Automotive rear lighting

Automotive exterior lighting

Automotive ISD/ISC application

General automotive body lighting applications

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