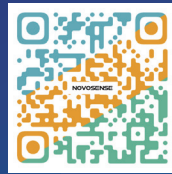


NOVOSENSE

NOVOSENSE Automotive Solution

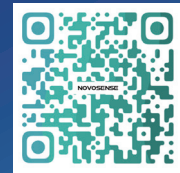
Enable the Electrification and Intellectualization of Car



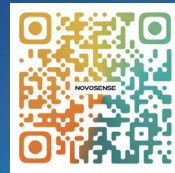
NOVOSENSE
Company Brochure



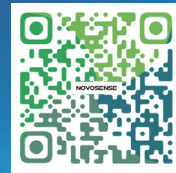
NOVOSENSE
Product Selection Guide



NOVOSENSE
Automotive Solution



NOVOSENSE
Renewable Energy & Power
Supply Application Solution



NOVOSENSE
Industrial
Control Solution



NOVOSENSE
Home Appliance
Application Solution

NOVOSENSE Microelectronics

✉ sales@novosns.com

🌐 www.novosns.com

🌐 NOVOSENSE Microelectronics

📺 NOVOSENSE Microelectronics

Release Date: April, 2025



**NOVOSENSE: Highly Robust and Reliable
Analog and Mixed Signal Chip Provider**

- Robust
- Reliable
- Keep Learning
- Persist in Long-term Value



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.

For more information and sample application, please visit: www.novosns.com

2013
Establishment

1100+
Employees

~USD 273 million
Revenue
(2024)

A provider for
all-category analog
& mixed signal chips

A leading chip
provider for automotive
applications

A leading provider
for digital isolators
and sensors

NOVOSENSE Automotive Solution Overview

Intelligent Connected/Autonomous/In-vehicle Experience

- SerDes
- Class D
- Automotive Audio Bus
- High-side & low-side switch
- SBC
- Seat air bag MEMS pressure sensor
- Temperature & humidity senso
- Magnetic switch position sensor
- High current pre-driver
- Digital relay
- Large screen rear light driver
- General power Buck/LDO
- Antenna/Camera load protection
- Voltage supervisor

Body Electronics & Lighting

- High-side & low-side switch
- eFuse
- Antenna/Camera load protection
- Multichannel half-bridge driver, pre-driver
- BDC/BLDC/Stepping motor driver
- General power Buck/LDO
- Voltage supervisor
- Magnetic switch position sensor
- Magnetic angle sensor
- Temperature sensor
- Digital relay
- Rear light & headlight driver
- Ambient lighting driver
- Interior lighting driver
- Stepping motor driver

Chassis Control & Safety

- Pressure sensor conditioning IC
- Magnetic angle sensor
- Magnetic switch position sensor
- ABS wheel speed sensor
- Antenna combiner controller
- eFuse

Fuel/Hybrid Powertrain

- Engine intake manifold MEMS pressure sensor
- Fuel vapor MEMS pressure sensor
- Crankshaft ventilator MEMS pressure sensor
- Canister desorption MEMS pressure sensor
- GPF/DPF differential pressure MEMS pressure sensor
- Pressure sensor conditioning IC

Inverter/Powertrain

- Smart ISO drive/Functional safety driver
- Digital isolator
- CAN/LIN/MiniSBC interface
- Magnetic current sensor
- Rotary transformer drive power amplifier
- Vacuum boost servo MEMS pressure sensor
- Isolated voltage/Current sensing

Battery Management System

- ISO digital relay
- Digital isolator
- ISO & non-ISO OP amps
- CAN/LIN/MiniSBC interface
- BPS battery pack thermal runaway MEMS pressure sensor
- ISO power supply
- Hall current sensor
- Temperature & humidity sensor
- ISO & non-ISO power drive
- ISO current and voltage sensing

OBC/DC-DC/PDU

- ISO & non-ISO power drive
- Digital isolator
- ISO & non-ISO OP amps
- Magnetic current sensor
- Temperature sensor
- ISO current and voltage sensing
- Current sensing amplifier
- High-side & low-side /Motor driver
- CAN/LIN/MiniSBC interface
- General power Buck/LDO
- Power device - SiC

Thermal Management System

- CAN/LIN/MiniSBC interface
- ISO & non-ISO power drive
- Digital isolator
- Electronic water valve, water pump and fan special motor drive
- Magnetic angle sensor
- Magnetic switch position sensor
- Multichannel half-bridge driver, pre-driver
- BDC/BLDC/Stepping motor driver
- Pressure sensor signal conditioning chip
- Automotive micro & special motor driver SoC
- Power device – SiC/IGBT



NOVOSENSE: Your preferred automotive supply chain partner



In 2024, NOVOSENSE's Automotive Business accounted for over **36.88%** of the company revenue, with cumulative shipments of automotive chips exceeding **668** million pcs.



As a member of the Component Technical Committee of AEC (Automotive Electronics Council), NOVOSENSE supports the development of automotive chip technology.



Certified by TÜV Rheinland, NOVOSENSE upgrades ISO 26262 ASIL D certification to "Defined-Practiced Level"

System-level understanding and holistic solutions

- Products: Sensor (Magnetic, Pressure, Temperature, Humidity), Signal Chain (Sensor Signal Conditioning, Isolator, Interface, General Signal Chain), Power Management (Gate Driver, Motor Driver, LED Driver, Power Supply, Power Protection Path, Class D, Power Device), MCU (SoC, Real-time Control MCU)

Help customer to gain competitive advantage

- Chip customization service and experience
- Flexible and timely local support

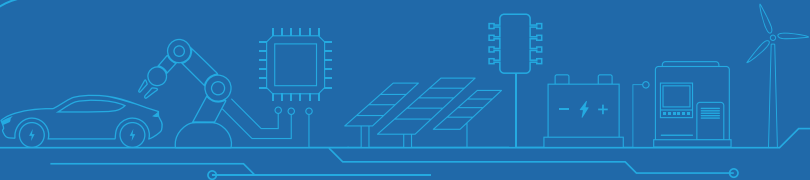
Excellent quality performance based on years of experience in automotive mass production

- Launched the first automotive chip in 2016
- Products are used in most of today's new energy vehicles
- VDE Premium Quality Award

NOVOSENSE empowers the electrification and intelligence of vehicles

Overview of NOVOSENSE Products in Automotive Applications

Automotive Application	Digital Isolator	CAN /LIN	Isolated Driver	Non-isolated Driver	Isolated Power	Motor Driver	Motor Control SoC	High&Low-side Switch	Oring & Hotswap	eFuse	Photomos	LED Driver	DC-DC Switching Converter	LDO	Tracking LDO	LDO/ Antenna LDO	Isolated Sensing	Hall Current Sensor	Current Detecting Amplifier	Operational Amplifier	Pressure Sensor	Position Sensor	Wheel Speed Sensor	Temperature Sensor	Voltage Reference	IC/Supervisor & Reset IC	Class-D Audio Amplifier	SerDes
Traction Inverter	✓	✓	✓	✓				✓					✓	✓	✓		✓	✓		✓				✓	✓	✓		
OBC	✓	✓	✓	✓	✓	✓		✓			✓	✓	✓	✓	✓		✓	✓		✓				✓	✓	✓		
DC-DC	✓	✓	✓	✓				✓	✓				✓	✓	✓		✓	✓	✓	✓				✓	✓	✓		
BMS	✓	✓			✓			✓	✓		✓		✓	✓	✓		✓	✓		✓	✓			✓	✓	✓		
BCM		✓				✓	✓	✓	✓	✓		✓	✓	✓	✓				✓	✓	✓	✓		✓	✓	✓		
Intelligent Chassis	✓	✓				✓	✓	✓		✓			✓	✓					✓	✓	✓	✓	✓					
Seat		✓				✓	✓	✓					✓	✓	✓					✓	✓	✓						
Lighting		✓				✓		✓		✓		✓	✓	✓						✓								
Door/Roof		✓				✓	✓	✓					✓	✓						✓		✓						
TMS		✓				✓	✓	✓					✓	✓	✓				✓	✓	✓			✓	✓	✓		
AC Compressor	✓	✓	✓	✓				✓					✓	✓	✓		✓	✓		✓	✓			✓	✓	✓		
PTC	✓	✓	✓	✓				✓					✓	✓			✓	✓	✓	✓	✓	✓		✓	✓	✓		
Valve/Pump /Vent Control		✓				✓	✓	✓					✓	✓						✓		✓		✓				
ADAS		✓						✓		✓			✓	✓	✓	✓				✓		✓				✓		✓
Intelligent Cockpit		✓						✓		✓		✓	✓	✓	✓	✓				✓		✓				✓	✓	
T-BOX		✓											✓	✓						✓								
Radar/Camera		✓		✓				✓					✓	✓		✓				✓								✓





NOVOSENSE Automotive Solutions

CONTENTS

3 Automotive Solution Overview

Automotive Traction Inverter, OBC/DC-DC, BMS Solution

- 12 Traction Inverter
- 13 On-board Charger (OBC)
- 14 DC-DC Charger
- 15 Battery Management System (BMS)

Body Control Module

- 17 Body Control Module(BCM)
- 18 Body Domain Controller (ZCU)
- 19 Door Control ECU
- 20 Seat Control ECU

Smart Cockpit and Intelligent Driving System

- 22 Smart Cockpit System
- 23 Intelligent Driving System

Automotive Thermal Management System

- 25 Thermal Management Controller
- 26 PTC
- 27 E-Compressor

Automotive LED Driver Solution

- 29 Rear Light System
- 30 Headlight System

Powertrain & Vehicle Safety System

- 32 Powertrain & Vehicle Safety System

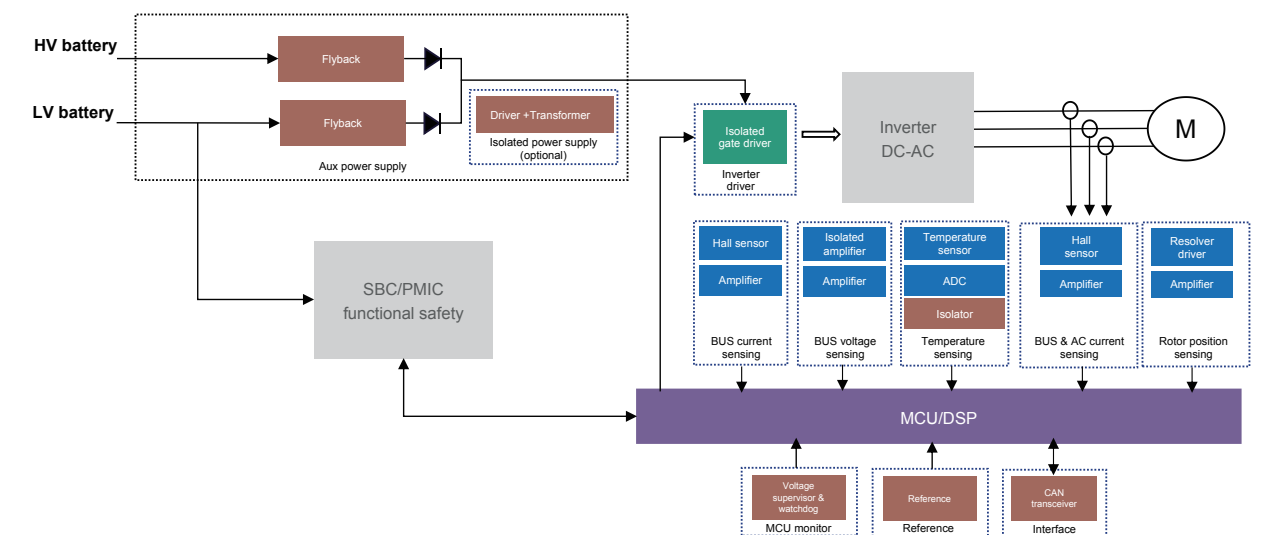
Automotive Traction Inverter, OBC/DC-DC, BMS Solution

- Traction Inverter
- On-board Charger (OBC)
- DC-DC Charger
- Battery Management System (BMS)

Traction Inverter

NOVOSENSE

The main drive inverter is a key component of an electric vehicle (EV), which is responsible for converting the DC from a high-voltage battery into the three-phase AC, and further to drive the motor. Its power determines the power performance of an EV, together with its efficiency further influence the cruising range of an EV. The inverter could also realize energy recovery when braking, which convert moving energy into high-voltage DC for power battery charging.



MCU

- MCU (NS800RT5039, NS800RT5049)

Power management

- Flyback (NSR2240x, NSR226xx, NSR28C4x)
- Buck (NSR1143x, NSR1103x)
- LDO (NSR31xxx, NSR33xxx, NSR35xxx)
- H-bridge (NSIP3266)

Current & voltage & temperature sensing

- Hall sensor (NSM203x, MT9519, MT9511)
- Temperature sensor (NST235-Q1, NST86-Q1, NST175-Q1)
- Isolated amplifier (NSI1311, NSI361x)
- Amplifier (NSOPA9xxx, NSOPA8xxx)

Interface & digital isolation

- CAN transceiver (NCA1043(B), NCA1145, NCA1044/NCA1462)
- Isolator (NSI824x, NSI822x)

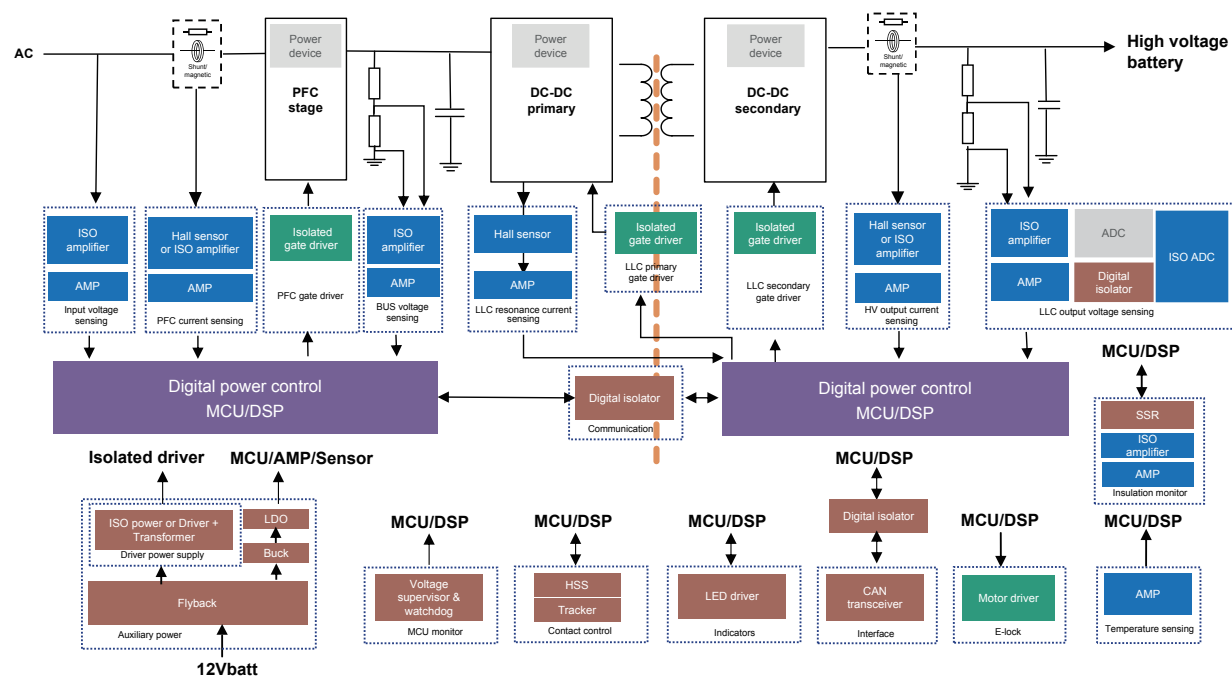
Gate driver & motor driver

- Isolated gate driver (NSI6611, NSI6651, NSI67xx, NSI6911)
- Non-isolated driver (NSD1026V)

Protection & reference & others

- MCU monitor (NSR7808)
- Reference (NSREF30xx, NSREF31xx)
- Resolver driver (NSOPA240x)

In an electric vehicle (EV), the OBC converts commercial power AC into DC to charge the power battery. It is a key component of EV power system, and its power also directly determines the charging speed of power battery. In addition, it can convert the DC from the power battery into AC to supply power to external loads, that is. V2L/V2H/V2G functions.



MCU

- MCU (NS800RT5039, NS800RT5049)

Power management

- Flyback (NSR2240x, NSR226xx, NSR28C4x)
- Buck(NSR1143x, NSR1103x)
- LDO (NSR31xxx, NSR33xxx, NSR35xxx)
- ISO power (NSIP2266-Q1)
- Tracking LDO (NSE425x)

Current & voltage & temperature sensing

- Hall sensor (NSM201x, NSM211x, MT952x)
- Isolated amplifier (NSI1300, NSI1200, NSI1311, NSI1611, NSI36xx)
- Isolated ADC (NSI1306)
- Isolated comparator (NSI22C12, NSI22C11)
- Amplifier (NSOPA9xxx, NSOPA8xxx)
- Comparator (NSCMP3021)
- Temperature sensor (NST235-Q1, NST86-Q1, NST175-Q1)

Interface & digital isolation

- CAN transceiver (NCA1042B/1051A/1043(B)/1145)
- Digital isolator (NSI824x, NSI822x)

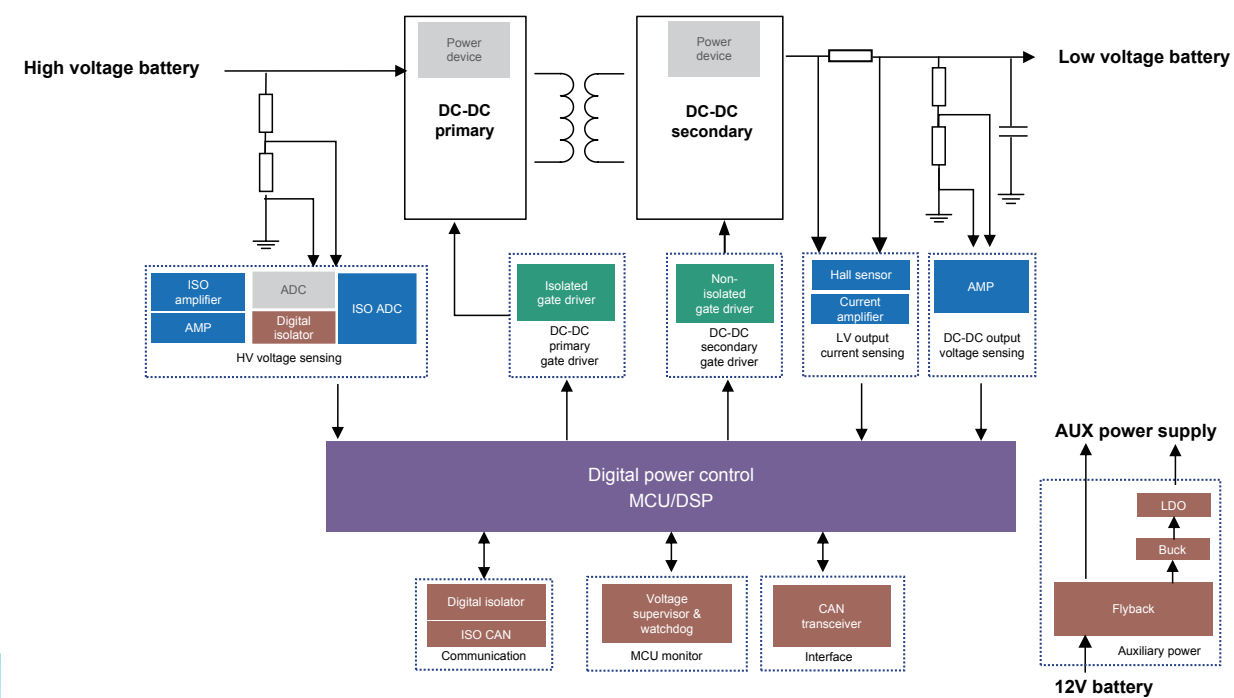
Gate driver & motor driver

- Half bridge isolated driver (NSI6602V, NSI6602M, NSI6602U)
- Single channel isolated driver (NSI6601M)
- Non-isolated driver (NSD1026V)
- Motor driver (NSD731x)

Protection & reference & others

- Voltage supervisor (NSR7808)
- High side switch (NSE34xxx, NSE35xxx)
- LED driver (NSL2161x, NSL2163x)
- Reference (NSREF30xx)
- Solid-State Relay(NSI7107, NSI7258)

In an electric vehicle (EV), the DC-DC charger, a key component of the EV power system, is responsible for converting the HV DC from the power battery into LV DC for the 12V battery.



MCU

- MCU (NS800RT3025, NS800RT5037)

Power management

- Flyback (NSR2240x, NSR226xx, NSR28C4x)
- Buck (NSR1143x, NSR1103x)
- LDO (NSR31xxx, NSR33xxx, NSR35xxx)
- H-bridge (NSIP3266)

Current & voltage & temperature sensing

- Hall sensor (MT9519)
- Isolated amplifier (NSI1300, NSI1200, NSI1311, NSI1611, NSI36xx)
- Isolated comparator (NSI22C12, NSI22C11)
- Isolated ADC (NSI1306)
- Current sensing (NSCSA21x, NSCSA24x)
- Amplifier (NSOPA9xxx, NSOPA8xxx)
- Temperature sensor (NST235-Q1, NST86-Q1, NST175-Q1)

Interface & digital isolation

- CAN transceiver (NCA1043(B), NCA1145)
- Isolated CAN (NSI1042)
- Digital isolator (NSI824x, NSI822x)

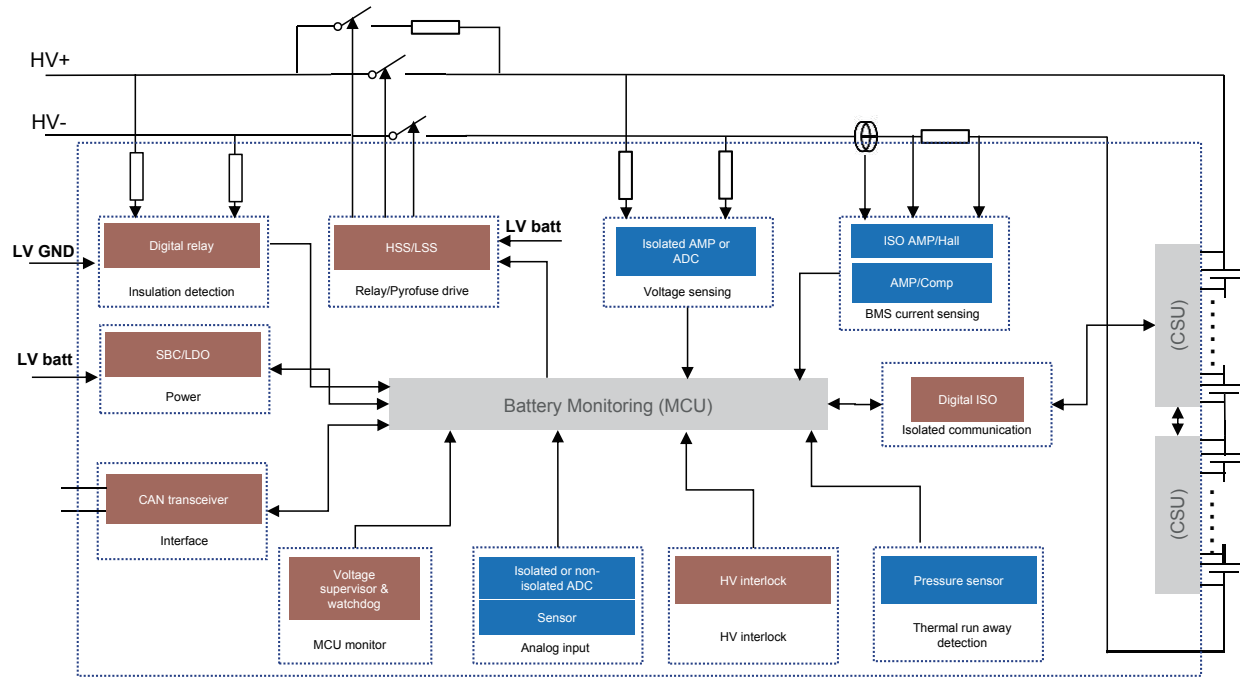
Gate driver & motor driver

- Half bridge isolated driver (NSI6602V, NSI6602M, NSI6602U)
- Single channel isolated driver (NSI6601, NSI6601M, NSI6801)
- Non-isolated driver (NSD1026V)

Protection & reference & others

- Voltage supervisor (NSR7808)
- Reference (NSREF30xx)

The battery management system (BMS) is the "center" of the entire battery pack, which is responsible for monitoring the running status of each battery cell in the pack to ensure its safe and reliable operation. It monitors and collects the running parameters of the battery in real time for SOx analysis and calculation, and realizes effective control of the battery based on specific protection control strategies, so as to ensure the safe and reliable operation of the entire battery system. At the same time, BMS interacts with other external devices through its own interface to establish linkage control of other systems and ensure the safe, reliable and efficient operation of the power supply system.



Current & voltage & pressure sensing

- Linear current sensor (NSM203x, MT951x)
- Isolated amplifier (NSI1300, NSI1311, NSI36xx)
- Isolated ADC(NSI1306)
- Amplifier (NSOPA9xxx, NSOPA8xxx)
- Pressure sensor (NSPADx, NSPASx)
- Temperature & Humidity Sensor (NSHT30-Q1)

Interface & digital isolation

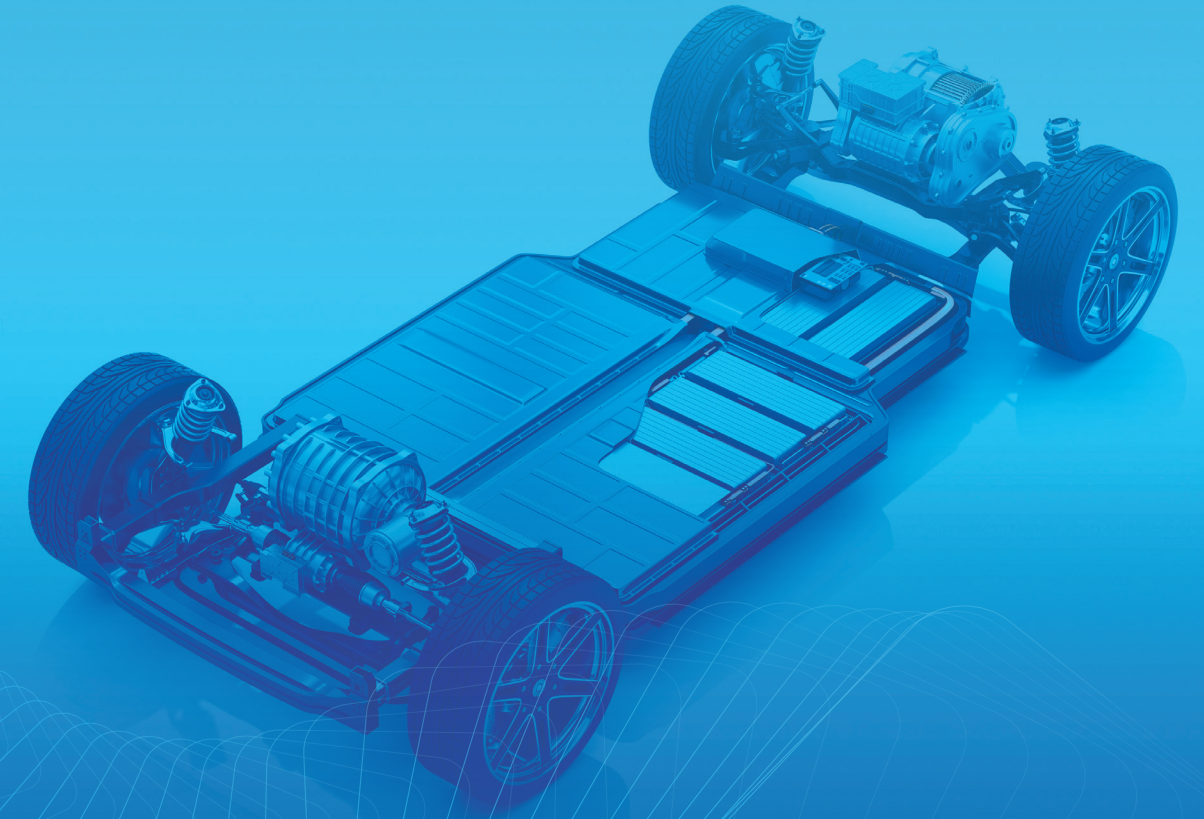
- CAN transceiver (NCA1044/57, NCA1462, NCA1043(B), NCA1145B)
- Digital isolator (NSI824x, NSI822x)

Power management

- LDO (NSR31/33/35xxx, NSR30x0x)
- Isolated transformer driver (NSIP605x)
- Digital isolator + isolated power (NSIP9x4x)

Protection & others

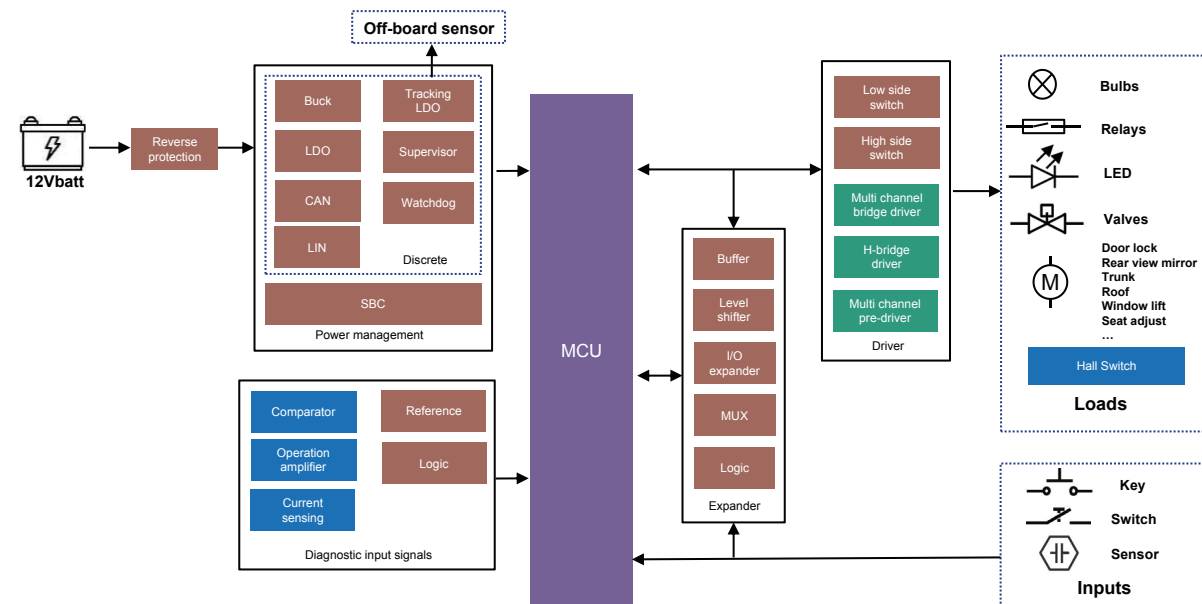
- High side switch (NSE34xxx, NSE35xxx)
- Low side switch (NSE11409, NSD12409, NSD11/2416)
- Voltage supervisor (NSR7808)
- Digital relay (NSI7258)



Body Control Module

- Body Control Module(BCM)
- Body Domain Controller (ZCU)
- Door Control ECU
- Seat Control ECU

The Body Control Module (BCM) is an electronic control unit used to control the body electrical system. Through CAN/LIN bus or hard wire, the BCM realizes vehicle body control such as internal and external lights, windows, keyless entry and start system, anti-theft alarm control, wiper washing control etc., further enhance the safety, comfort and convenience of a vehicle.



MCU

- MCU (NS300K214, NS300K116, NS300S214, NS300S116)

Protection & reference & others

- High side switch (NSE34xxx, NSE35xxx)
- Low side switch (NSE11409, NSD1x4xx, NSD56008)
- Tracking LDO (NSE425x)
- Supervisor (NSR7808)
- Watchdog (NSR7850)
- Reference (NSREF30xx, NSREF31xx)
- I/O expander (NCA9539)
- Reverse protection (NSE14700, NSE14500)

Current & position sensing

- Hall sensor (NSM201x, MT952x)
- Hall switch (MT83xx, MT89xx, MT72xx, MT73xx)
- Amplifier (NSOPA9xxx, NSOPA8xxx)
- Current sensing (NSCSA24x)
- Comparator (NSCMP302x)

Motor driver

- Half bridge driver (NSD7315, NSD7312, NSD7314)
- Multi-channel bridge driver (NSD830x, NSD831x)
- Multi-channel pre-driver (NSD360x)
- SoC (NSUC1610, NSUC1612, NSUC1602)

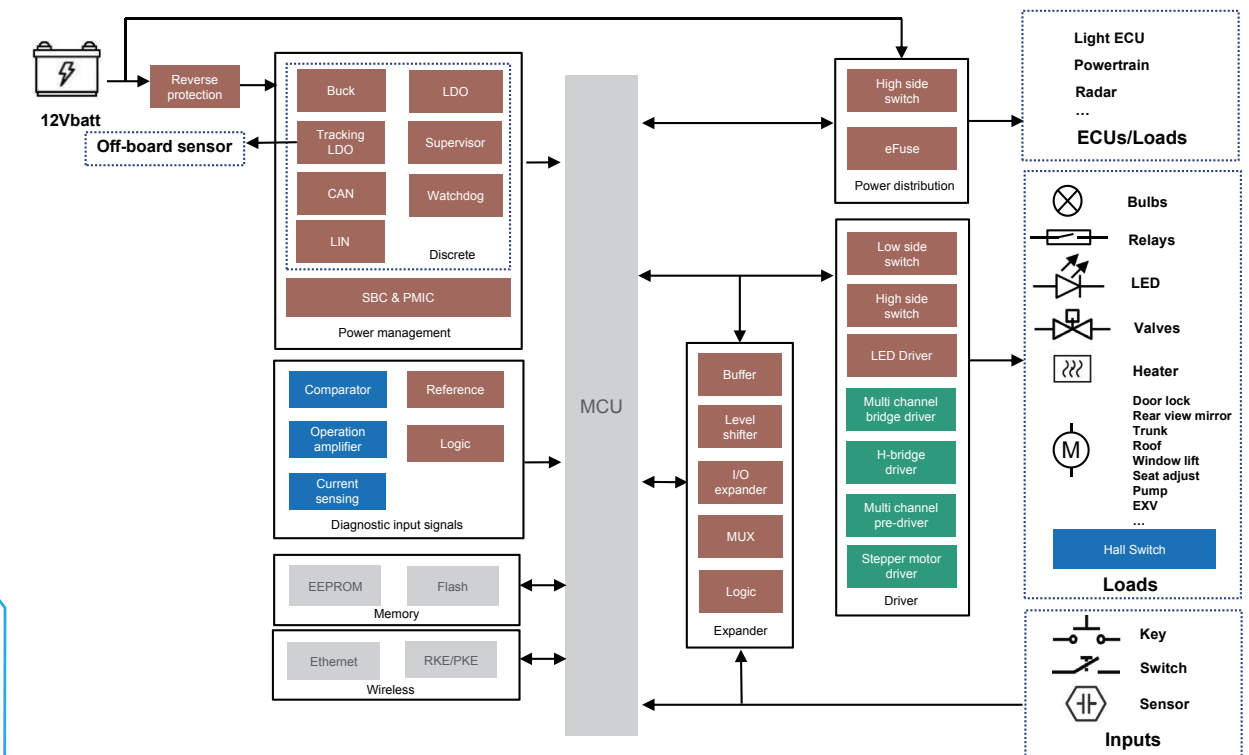
Interface & digital isolation

- CAN transceiver (NCA104x, NCA1057, NCA1462, NCA1145)
- LIN transceiver (NCA1021S)
- Buffer (NCA824x, NCA8T24x)
- Level shifter (NCAS0104, NCAB0104)

Power management

- LDO (NSR30xxx, NSR31xxx, NSR33xxx, NSR35xxx)
- Buck (NSR104xx, NSR106xx, NSR114xx, NSR110xx)
- SBC (NSR926x)

The Zone Control Unit (ZCU) is a key component in the evolution of automotive electronic architecture toward centralization and intelligence. By dividing the vehicle into zones, it integrates previously distributed body control modules—such as lighting, wipers, doors and windows, seats, and air conditioning—into a single unit. This reduces wiring complexity, enhances system efficiency, and elevates the overall intelligence of the vehicle.



Current & position sensing

- Hall sensor (NSM201x, MT952x)
- Hall switch (MT83xx, MT89xx, MT72xx, MT73xx)
- Amplifier (NSOPA9xxx, NSOPA8xxx)
- Current sensing (NSCSA24x)
- Comparator (NSCMP302x)

Motor driver

- Half bridge driver (NSD7315, NSD7312, NSD7314)
- Multi-channel bridge driver (NSD830x, NSD831x)
- Multi-channel pre-driver (NSD360x)
- Stepper motor driver (NSD838x, NSUC1610, NSUC1612)

Power management

- LDO (NSR30xxx, NSR31xxx, NSR33xxx, NSR35xxx)
- Buck (NSR104xx, NSR106xx, NSR114xx, NSR110xx)
- SBC (NSR926x)

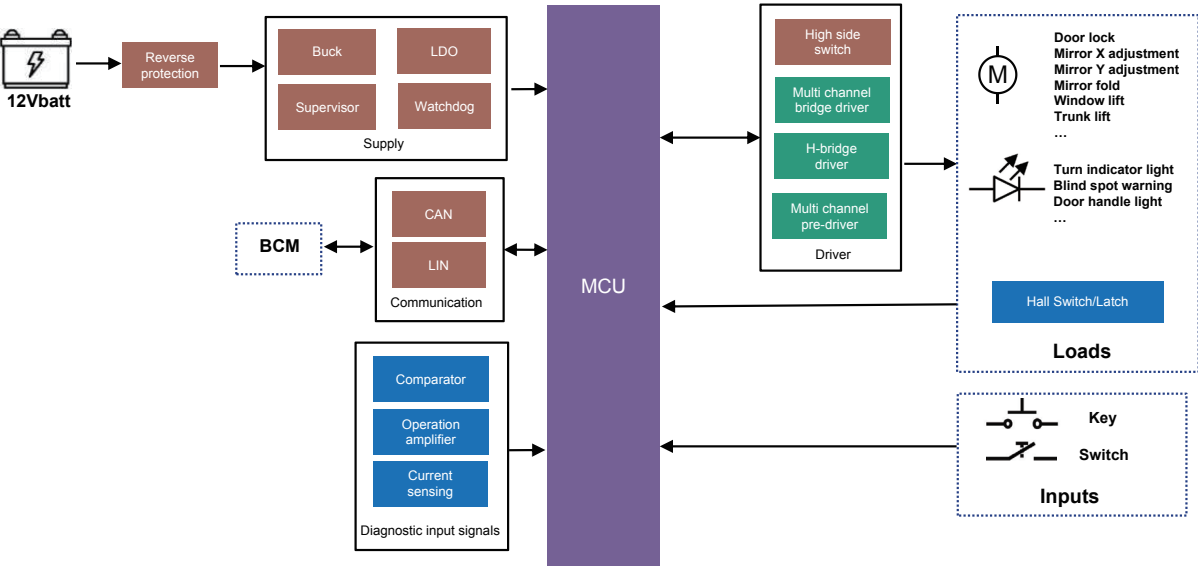
Interface & digital isolation

- CAN transceiver (NCA104x, NCA1057, NCA1462, NCA1145)
- LIN transceiver (NCA1021S)
- Buffer (NCA824x, NCA8T24x)
- Level shifter (NCAS0104, NCAB0104)

Protection & reference & others

- High side switch (NSE34xxx, NSE35xxx)
- Low side switch (NSE11409, NSD1x4xx, NSD56008)
- eFuse (NSE1048)
- LED Driver (NSL2x6xx, NSL219xx, NSL23716x, NSL239xx)
- Tracking LDO (NSE425x)
- Supervisor (NSR7808)
- Watchdog (NSR7850)
- Reference (NSREF30xx, NSREF31xx)
- I/O expander (NCA9539)
- Reverse protection (NSE14700, NSE14500)

The Door Control ECU is an electronic unit designed for vehicle door system control, managing functions such as power windows, central locking, electric tailgate, keyless entry, and door lighting to enhance convenience and safety. It optimizes wiring layout, reduces mechanical components, improves system reliability, and supports remote control and intelligent interaction.



MCU

- MCU (NS300K214, NS300K116, NS300S214, NS300S116)

Current & position sensing

- Hall Switch (MT83xx, MT89xx, MT72xx, MT73xx)
- Amplifier (NSOPA9xxx, NSOPA8xxx)
- Current sensing (NSCSA24x)
- Comparator (NSCMP302x)

Motor driver

- Half bridge driver (NSD7315, NSD7312, NSD7314)
- Multi-channel bridge driver (NSD830x, NSD831x)
- Multi-channel pre-driver (NSD360x)
- SoC (NSUC1610, NSUC1612, NSUC1602)

Protection & reference & others

- High side switch (NSE34xxx, NSE35xxx)
- Tracking LDO (NSE425x)
- Supervisor (NSR7808)
- Watchdog (NSR7850)
- Reverse protection (NSE14700, NSE14500)

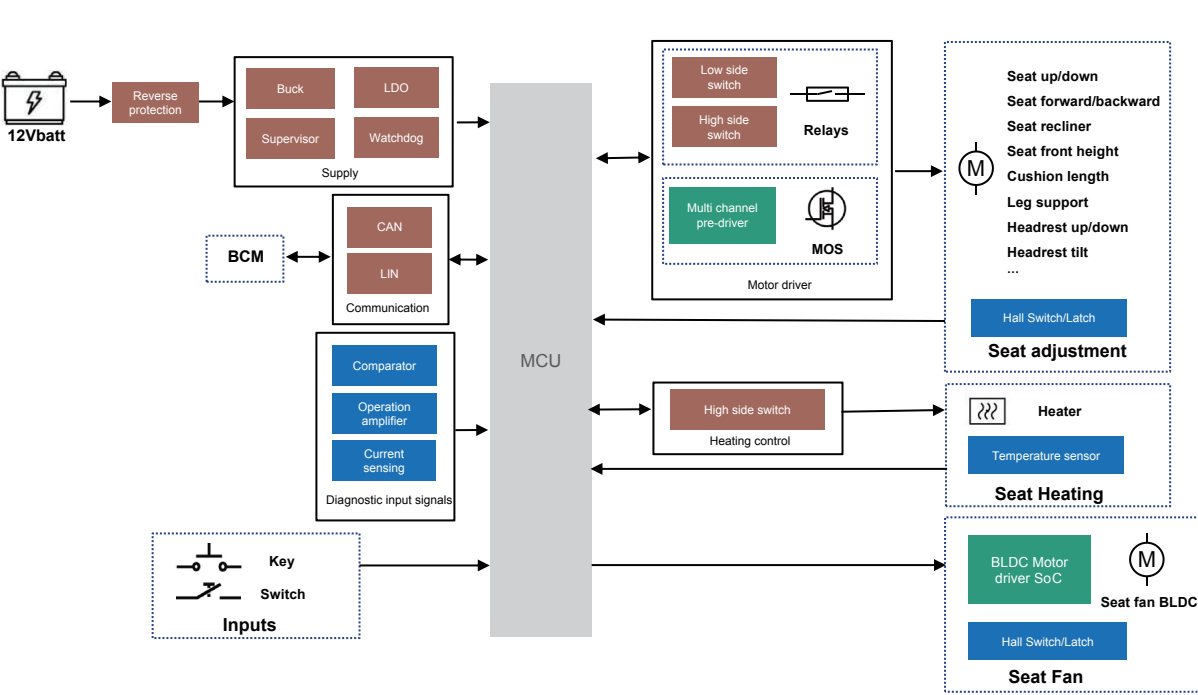
Interface & digital isolation

- CAN transceiver (NCA104x, NCA1057, NCA1462, NCA1145)
- LIN transceiver (NCA1021S)

Power management

- LDO (NSR30xxx, NSR31xxx, NSR33xxx, NSR35xxx)
- Buck (NSR104xx, NSR106xx, NSR114xx, NSR110xx)

The Seat Control ECU is the core control unit of the automotive seat system, managing electric adjustment, heating, ventilation, and memory functions to enable personalized seat settings and enhance comfort and convenience. It integrates multiple motor drivers and supports CAN/LIN communication, allowing seamless connectivity with the vehicle network for smarter interaction.



Current & position sensing

- Amplifier (NSOPA9xxx, NSOPA8xxx)
- Current sensing (NSCSA24x)
- Comparator (NSCMP302x)
- Temperature sensor (NST86, NST235, NST60, NST175)
- Pressure sensor (NSPASx, NSPAD1)
- Hall switch/latch (NSM101x, MT83xx, MT72xx, MT89xx)

Motor driver

- Multi-channel pre-driver (NSD360x)
- BLDC Motor driver SoC (NSUC1610, NSUC1602)

Protection & reference & others

- High side switch (NSE34xxx, NSE35xxx)
- Low side switch (NSE11409, NSD1x4xx, NSD56008)
- Supervisor (NSR7808)
- Watchdog (NSR7850)
- Reverse protection (NSE14700, NSE14500)

Interface & digital isolation

- CAN transceiver (NCA104x, NCA1057, NCA1462, NCA1145)
- LIN transceiver (NCA1021S)

Power management

- LDO (NSR30xxx, NSR31xxx, NSR33xxx, NSR35xxx)
- Buck (NSR104xx, NSR106xx, NSR114xx, NSR110xx)



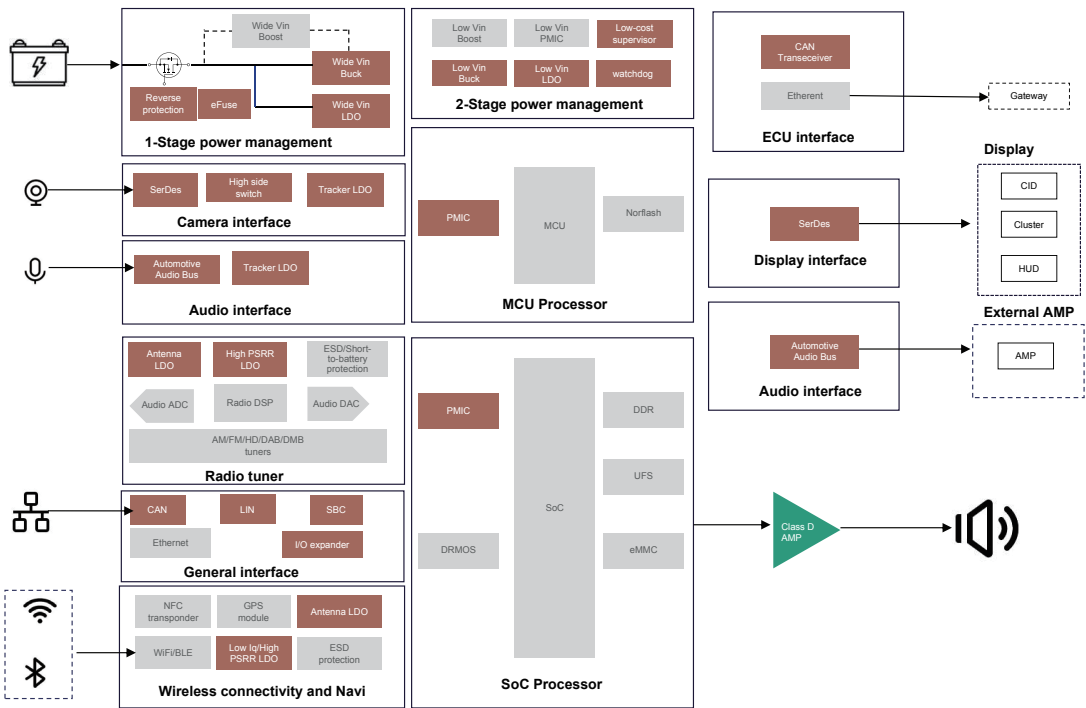
Smart Cockpit and Intelligent Driving System

- Smart Cockpit System
- Intelligent Driving System

Smart Cockpit System

NOVOSENSE

The smart cockpit system integrates in-car infotainment, driver assistance, and comfort features, providing an intelligent experience for both drivers and passengers through touchscreens, voice recognition, gesture control, and other interactive methods. The system includes a digital instrument cluster, center console screen, HUD, and streaming rearview mirror, supporting multi-screen interaction, AI assistants, and wireless connectivity. As automotive intelligence evolves, the smart cockpit is progressing towards high computing power integration, immersive experiences, and personalized customization, enhancing the convenience and safety of travel.



Class D amplifier & SoC

- Class D (NSDA6934, NSDA6954)
- SoC (NSUC1500)

Interface & digital isolation

- CAN transceiver (NCA1043(B), NCA1042B /NCA1044, NCA1145, NCA1169)
- LIN transceiver (NCA1021S)

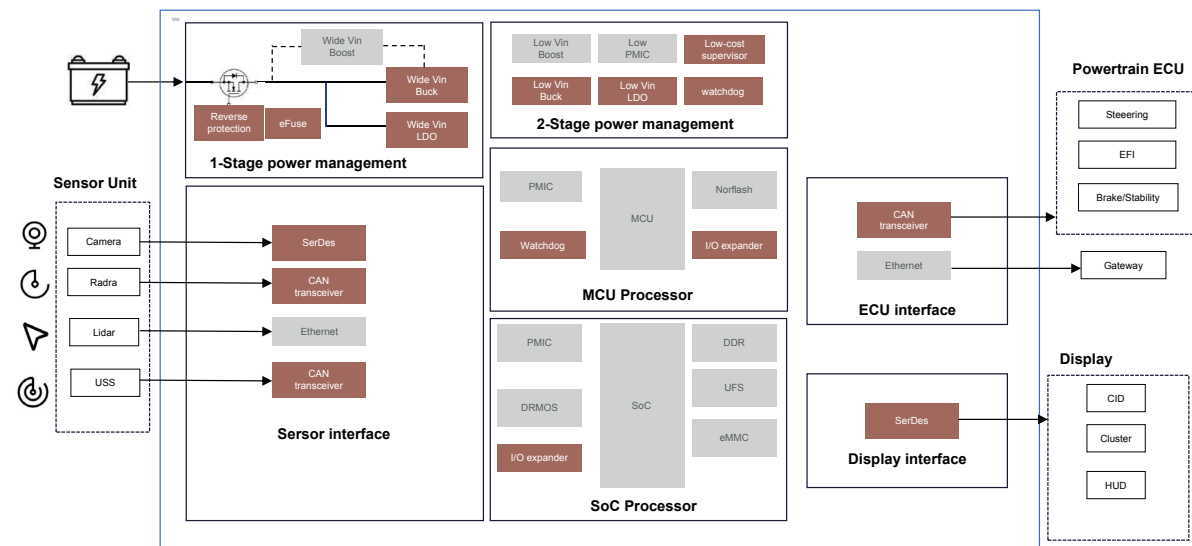
Power management

- LDO (NSR31xxx, NSR33xxx, NSR35xxx, NSR30xxx)
- Antenna LDO (NSE5701, NSE5702)
- Buck (NSR104xx, NSR106xx, NSR114xx, NSR1103x)

Protection & others

- High side switch (NSE34xxx, NSE35xxx)
- eFuse (NSE1048)
- Tracking LDO (NSE4250)
- Supervisor (NSR7808)
- Watchdog (NSR7850)
- I/O expander (NCA9539)
- Reverse protection (NSE14700, NSE14500)

The intelligent driving system integrates sensors such as cameras, millimeter-wave radar, lidar, and high-precision maps to achieve environmental perception, path planning, and vehicle control. The system supports functions like adaptive cruise control (ACC), lane-keeping assistance (LKA), and automatic parking (APA), enhancing driving safety and convenience.



Power management

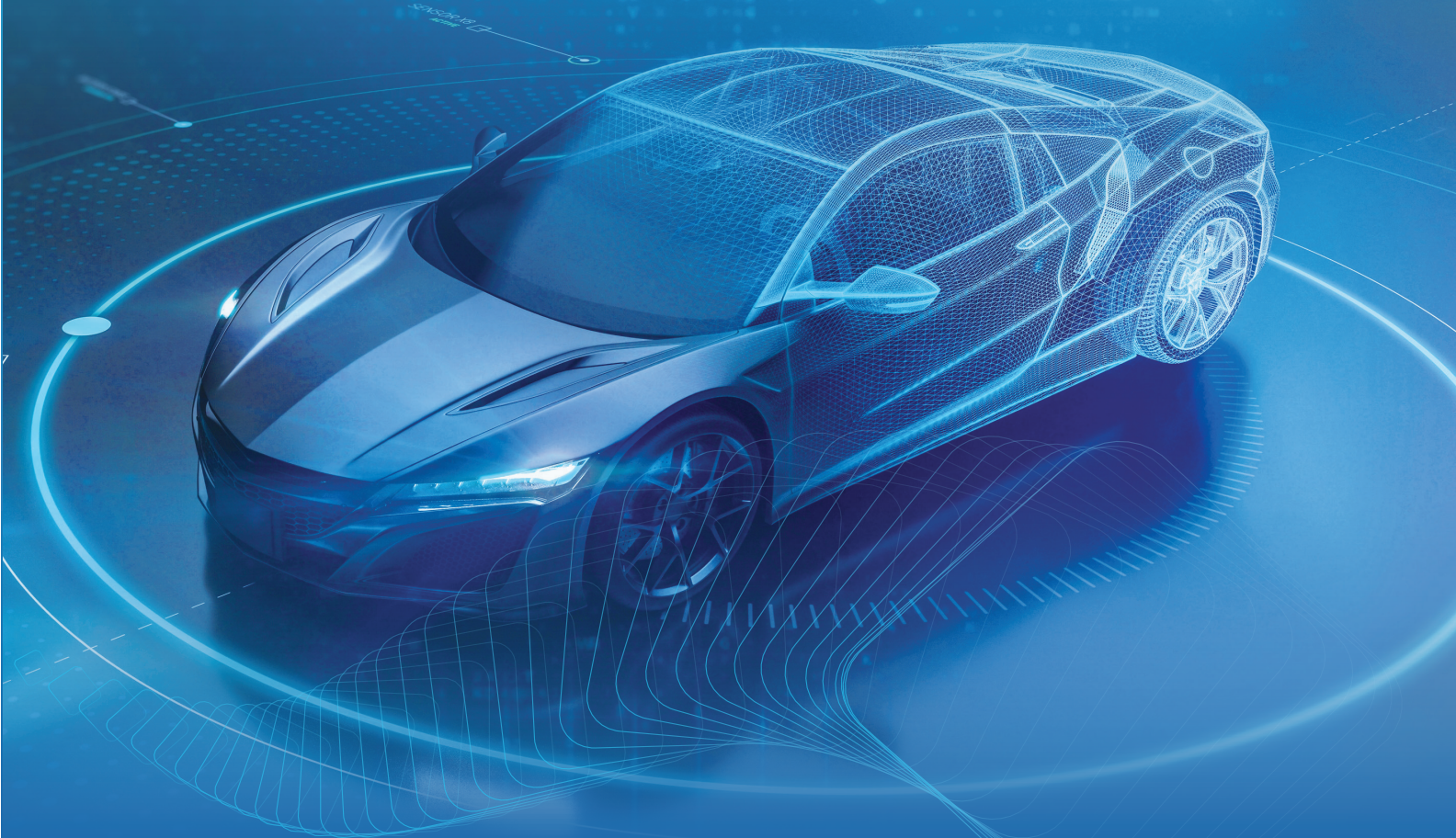
- LDO (NSR31xxx, NSR33xxx, NSR35xxx)
- Antenna LDO (NSE5701, NSE5702)
- LV LDO (NSR30xxx)
- Buck (NSR104xx, NSR106xx, NSR114xx, NSR1103x)

Interface & digital isolation

- CAN transceiver (NCA1043(B), NCA1042B /NCA1044, NCA1145, NCA1169)

Interface & digital isolation

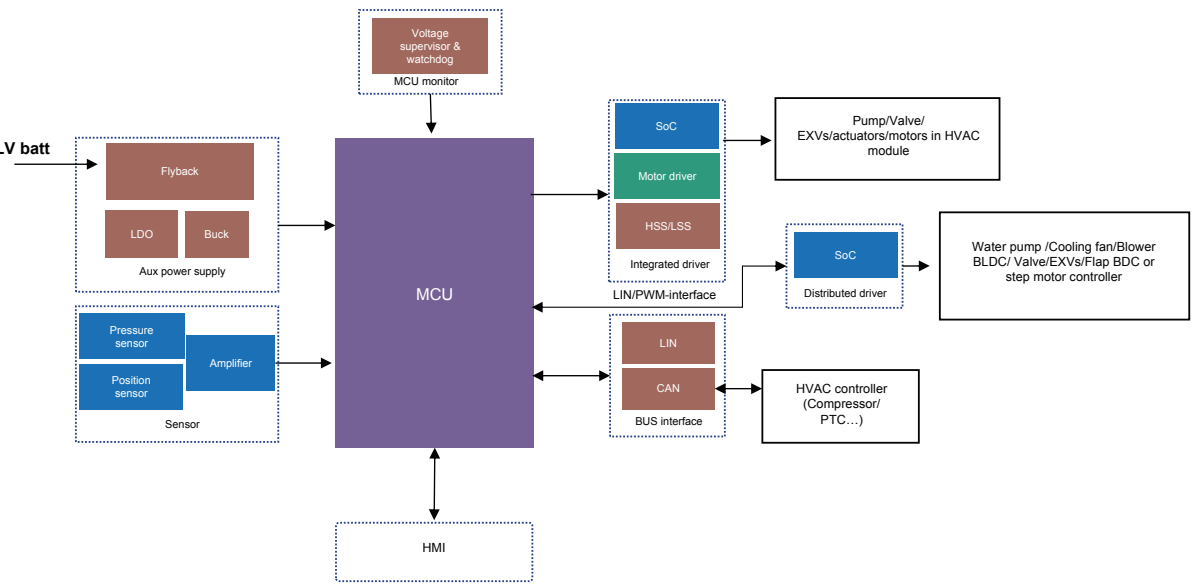
- High side switch (NSE34xxx, NSE35xxx)
- eFuse (NSE1048)
- Tracking LDO (NSE4250)
- Voltage supervisor (NSR7808)
- Watchdog (NSR7850)
- I/O expander (NCA9539)
- Reverse protection (NSE14700, NSE14500)



Automotive Thermal Management System

- Thermal Management Controller
- PTC
- E-Compressor

The thermal management controller (TMC) regulates thermal management devices (electric pumps, coolant valves, expansion devices, etc.) by controlling several motors (BDC, BLDC, bipolar stepper motors), and is connected to zone controller via CAN-FD to realize thermal management of the battery, electric drive, and passenger compartment of the electric vehicle.



MCU

- MCU (NSUC1700, NS800RT3025)

Pressure & position sensing

- Amplifier (NSOPA9xxx, NSOPA8xxx)
- Pressure sensor (NSC9262, NSC9260X, NSC9264)
- Position sensor (NSM1013, NSM301x, MT83xx, MT6511, MT652x)

SoC

- SoC (NSUC1602, NSUC1610, NSUC1612)

Power management

- Flyback (NSR2240x, NSR226xx, NSR28C4x)
- Buck (NSR1143x, NSR1103x)
- LDO (NSR31xxx, NSR33xxx, NSR35xxx)

Motor driver

- DC motor drivers (NSD731X)
- Pre-driver (NSD3602, NSD3604, NSD3608)
- Stepper (NSD8381)
- Multi-channel 1/2 half-bridge driver (NSD8308, NSD8306, NSD8312)
- Relay & Solenoid (NSD56008)

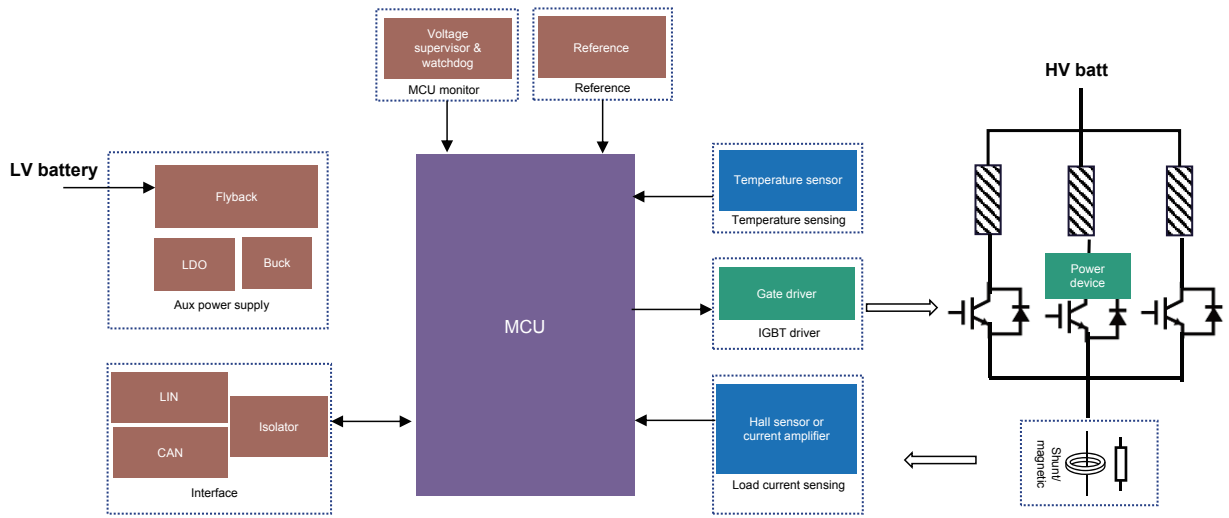
Interface

- CAN transceiver (NCA1043B, NCA1044/57, NCA1462, NCA1145B)
- LIN transceiver (NCA1021S)

Protection & reference & others

- High side switch (NSE34xxx, NSE35xxx)
- Low side switch (NSE11409, NSD12409, NSD11/2416)
- Voltage supervisor (NSR7808)

PTC stands for Positive Temperature Coefficient. In an electric vehicle (EV), a PTC heater automatically adjusts the vehicle's required heat by energizing positive temperature coefficient thermal materials, such as resistance wire or ceramic, to ensure energy efficiency and safety.



MCU

- MCU (NS300K214, NS300K116)

Current & voltage & temperature sensing

- Hall sensor (NSM201x, NSM211x, MT952x)
- Isolated amplifier (NSI1300, NSI1311)
- Temperature sensor (NST20, NST175)
- Amplifier (NSOPA9xxx, NSOPA8xxx)
- Current amplifier (NSCSA21x, NSCSA240Ax)

Gate driver & motor driver

- Single channel isolated driver (NSI6601, NSI6601M)
- Dual-channel isolated driver (NSI6602V)
- Non-isolated driver (NSD1026V, NSD10151, NSD1015MT)

Power device

- 1200V family of IGBT (NPI040N120A, 1200V, 40A)

Power management

- Flyback (NSR2240x, NSR226xx, NSR28C4x)
- Buck (NSR1143x, NSR1103x)
- LDO (NSR31xxx, NSR33xxx, NSR35xxx)

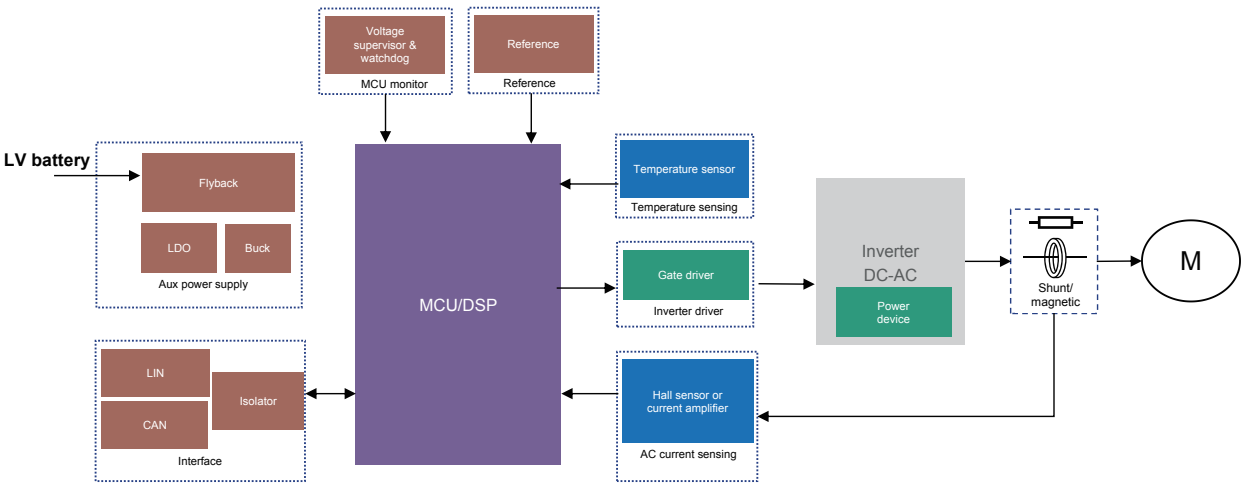
Interface & digital isolation

- CAN transceiver (NCA1043B, NCA1145B, NCA1044/57, NCA1462)
- LIN transceiver (NCA1021S)
- Digital isolator (NSI822x)

Protection & reference & others

- Voltage supervisor (NSR7808)
- Reference (NSREF30xx, NSREF31xx)

In an electric vehicle (EV), the electric compressor is an integral part of the HVAC system. Its primary function is to adjust temperature per needed, contains cabin and drivetrain cooling, and cabin as well as battery heating in cold weather.



MCU

- MCU (NSUC1700, NS800RT3025)

Power management

- Flyback (NSR2240x, NSR226xx, NSR28C4x)
- Buck (NSR1143x, NSR1103x)
- LDO (NSR31xxx, NSR33xxx, NSR35xxx)

Current & voltage & temperature sensing

- Hall sensor (NSM201x, NSM211x, MT952x)
- Isolated amplifier (NSI1300, NSI1311)
- Temperature sensor (NST20, NST175)
- Amplifier (NSOPA9xxx, NSOPA8xxx)
- Current amplifier (NSCSA240Ax)

Interface & digital isolation

- CAN transceiver (NCA1043B, NCA1145B, NCA1044/57, NCA1462)
- LIN transceiver (NCA1021S)
- Digital isolator (NSI822x)

Gate driver & motor driver

- Single channel isolated driver (NSI6601M)
- Half bridge isolated driver (NSI6602V)
- Non-isolated half bridge driver (NSD1624)
- Non-isolated driver (NSD1015MT)

Protection & reference & others

- Voltage supervisor (NSR7808)
- Reference (NSREF30xx, NSREF31xx)

Power device

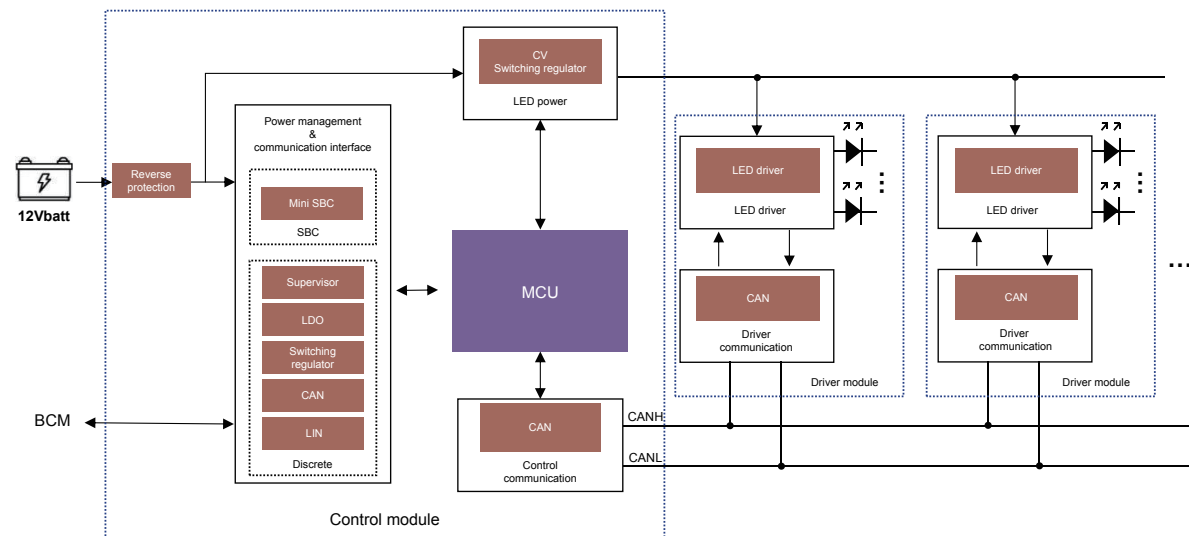
- 1200V family of SiC MOSFET (NPC0X0N120A, 1200V, 40/60/80mohm)
- 650V family of IGBT (NPI0X0N065A, 650V, 30A/50A)
- 1200V family of IGBT (NPI0X0N120A, 1200V, 40A)



Automotive LED Driver Solution

- Rear Light System
- Headlight System

The rear light is an important part of the vehicle's lighting system, which is composed of brake lights, reverse lights, turn signals and fog lights. The main function of the rear lights is to alert following vehicles and convey the front vehicle's driving status. At present, the mainstream rear light system basically uses LED lighting, generally composed of MCU + LED driver chip.



MCU

- MCU (NS300K116)

Power management

- Buck (NSR114xx)
- LDO (NSR31xxx, NSR33xxx, NSR35xxx)
- Supervisor (NSR7808)
- SBC (NSR926x)

Interface & digital isolation

- CAN transceiver (NCA1043(B), NCA1042B/NCA1044, NCA1145, NCA1169)
- LIN (NCA1021S)
- Mini SBC (NCA1169)

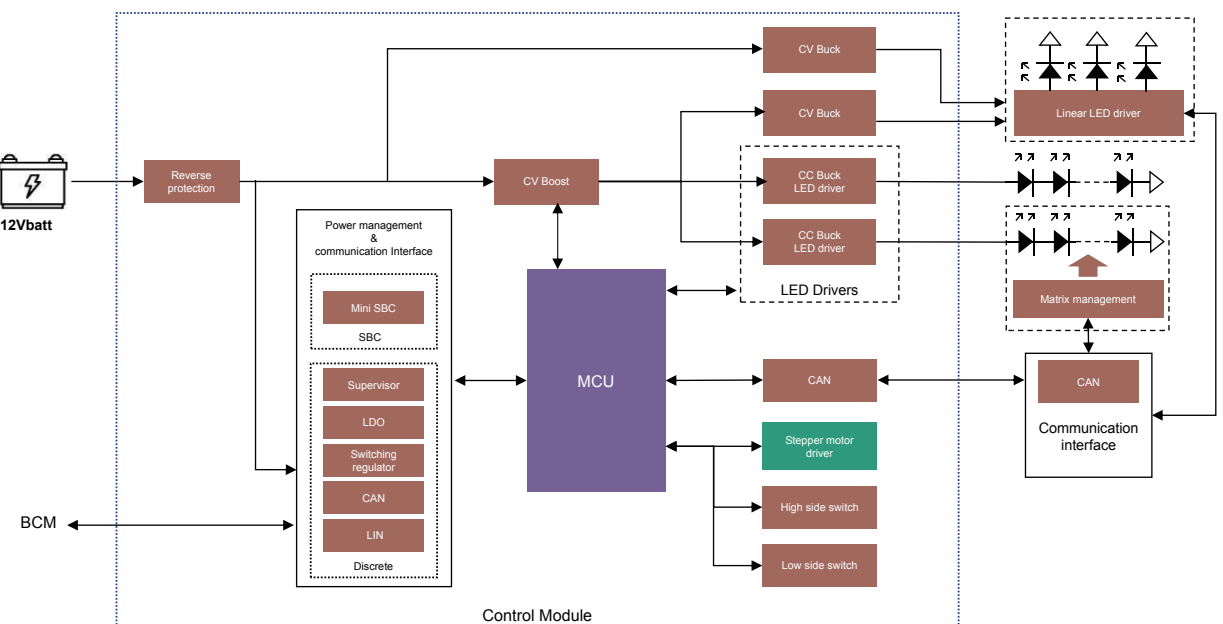
LED driver

- LED driver (NSL2161x, NSL2163x, NSL21912, NSL23916, NSL23924, NSL23716x)

Protection

- Reverse protection (NSE14700, NSE14500)

The automotive headlight system is one of the most crucial parts of the automotive lighting system, capable of illuminating the road ahead during night-time or low visibility conditions, ensuring driving safety. The new intelligent headlight system includes Adaptive Front-lighting System (AFS), Adaptive Driving Beam (ADB), etc., which can flexibly control the brightness and angle of the headlights according to the actual scene to improve driving safety. Mainstream headlight systems currently utilize LED lighting and typically consist of an MCU, LED driver, power management ICs, and a stepper motor driver.



MCU

- MCU (NS800RT5039)

Motor driver

- Stepper motor driver (NSD8381)

Power management

- LDO (NSR31xxx, NSR33xxx, NSR35xxx)
- SBC (NSR926x)

Protection

- High side switch (NSE34xxx, NSE35xxx)
- Low side switch (NSE11409, NSD12409, NSD11/2416)
- Reverse protection (NSE14700, NSE14500)

Interface & digital isolation

- CAN transceiver (NCA1043(B), NCA1042B/NCA1044, NCA1145, NCA1169)
- LIN (NCA1021S)
- Mini SBC (NCA1169)

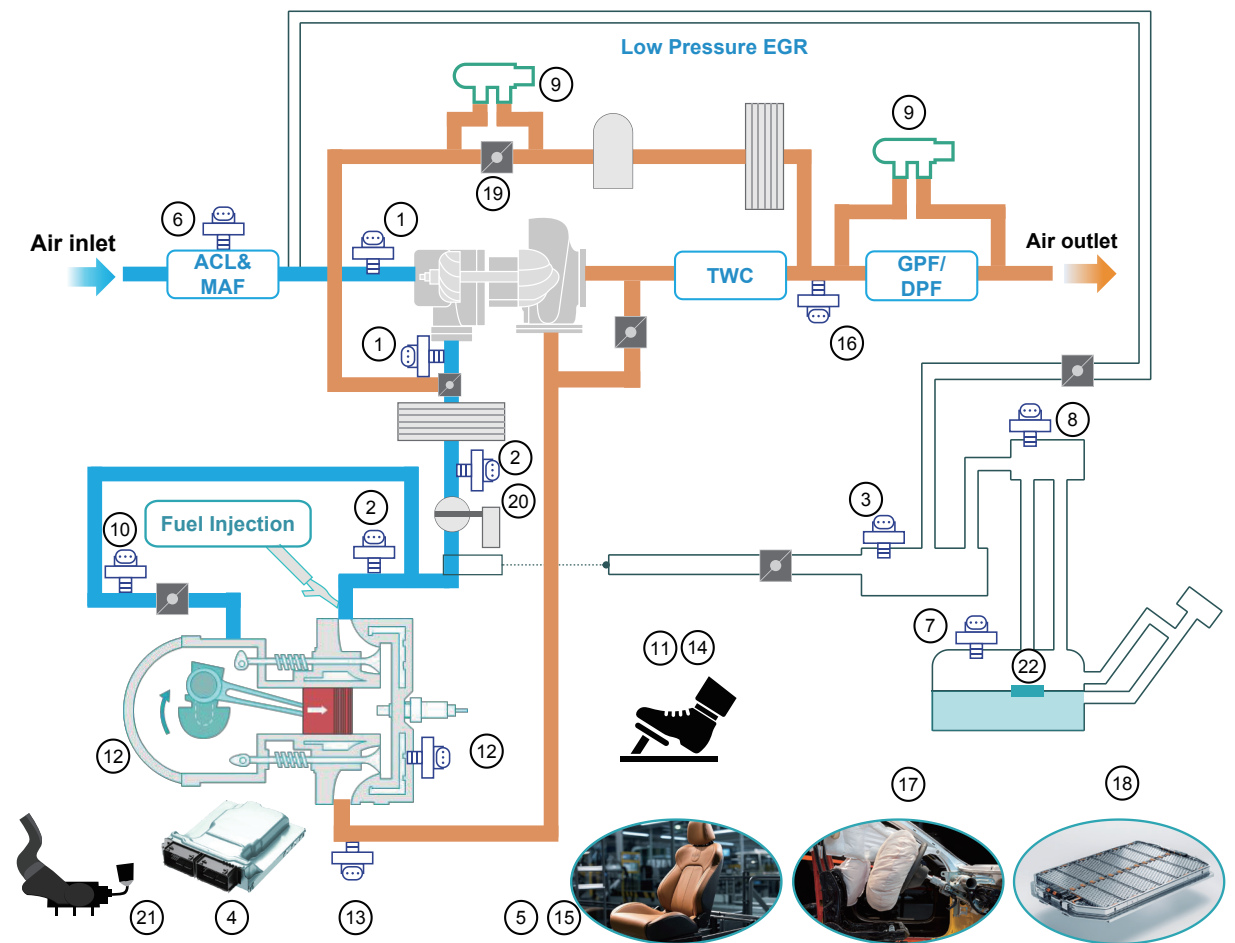
LED driver

- LED driver CC Buck (NSL31520)
- CV Boost (NSL31682)
- LED driver (NSL2161x, NSL2163x, NSL21912, NSL23916, NSL23924, NSL23716x)

Powertrain & Vehicle Safety System

Powertrain & Vehicle Safety System

NOVOSENSE



1. Intake Manifold Pressure and Temperature Sensor
2. Super TMAP/EGR Pressure and Temperature Sensor
3. Canister Purge Pressure Sensor
4. Barometric Pressure Sensor
5. Seat Massage Bladder Pressure Sensor
6. Mass Airflow Sensor (MAF)
 - Pressure Sensor ICs: NSPAS1, NSPAS3N/3M, NSPAS5, NSPAD1N
 - Pressure Sensor MEMS: NSP1630/1, NSP1632(Pt)
 - Signal Conditioning ASICs: NSA9260X (Analog), NSA9268 (Analog)

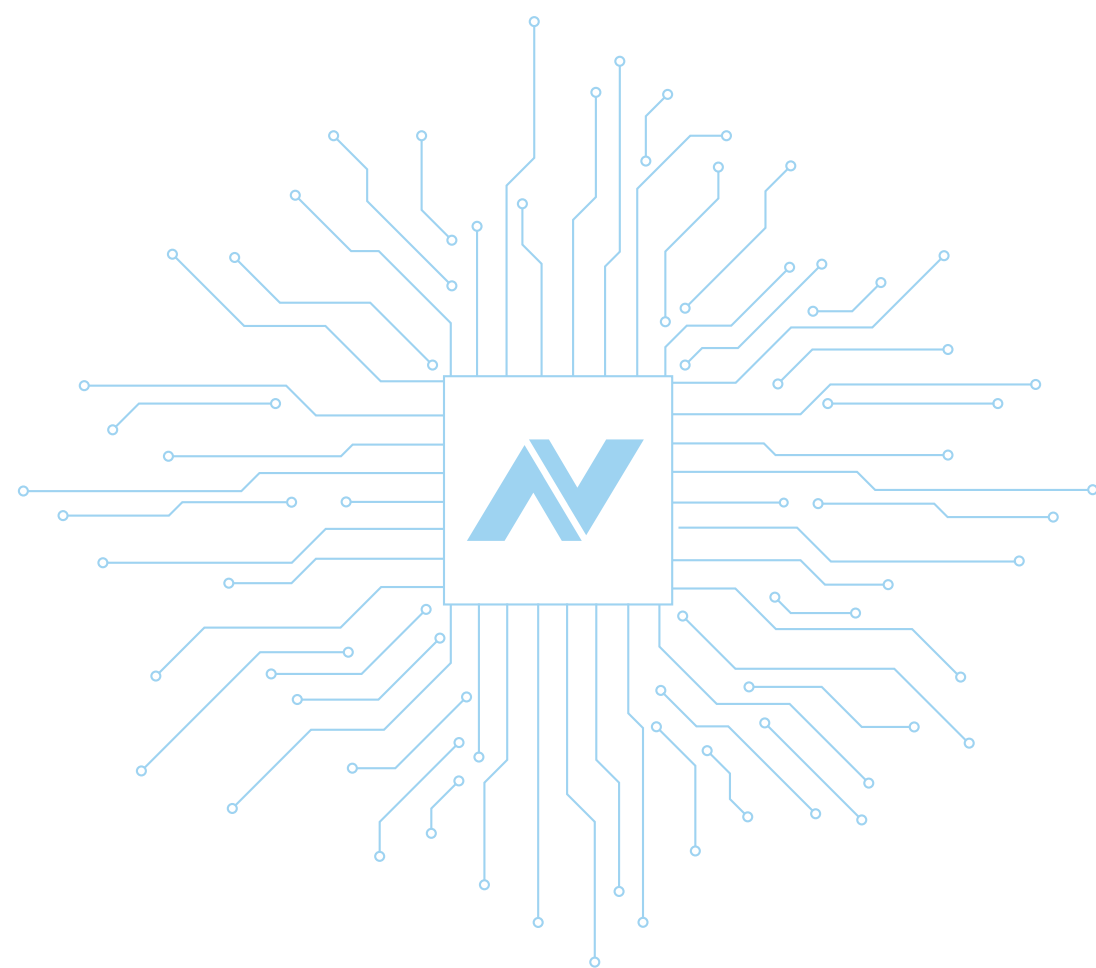
7. EVAP Fuel Vapor Pressure Sensor
8. Fuel Pump Output Pressure Sensor
9. GPF/DPF/EGR Differential Pressure Sensor
10. Crankcase Ventilation Pressure Sensor (PCV)
11. Vacuum Booster Pressure Sensor
 - Pressure Sensor ICs: NSPGL1, NSPGL2
 - Pressure Sensor MEMS: NSP1830/1, NSP1832(Pt), NSP2881/4
 - Signal Conditioning ASICs: NSA9260X (Analog), NSA9268 (Analog)

12. Oil and Fuel Injection Pressure Sensor
13. Exhaust Back Pressure Sensor (EBP)
14. ABS & ESP Brake Pressure Sensor
15. Thermal Management System Pressure & Temperature Sensor
16. Urea Injection Pressure Sensor
 - Signal Conditioning ASICs: NSA/C9260X (Analog), NSC9262 (LIN), NSA9268 (Analog), NSA9266 (SENT)
 - Temperature & Humidity Sensors: NSHT30, NST60/86/235, NST175H

17. Side Impact Airbag Pressure Sensor
 - Pressure Sensor IC: NSPAD9

18. Battery Pack Thermal Runaway Pressure Sensor (BPS)
 - Pressure Sensor IC: NSPAD9

19. EGR Valve Position Sensor
20. Throttle Position Sensor
21. Accelerator Pedal Position Sensor
22. Fuel Tank Level Sensor
 - Magnetic Angle Sensor ICs: NSM3011/12, MT6501, MT6511, MT652x



Robust

Reliable

Keep Learning

Persist in Long-term Value