

Product Overview

The NSI1052 is an isolated CAN transceiver which fully compatible with the ISO11898-2 standard. The NSI1052 integrated two channel digital isolators and a high reliability CAN transceiver. The digital isolator is silicon oxide isolation based on Novosense capacity isolation technology. The high integrated solution can help to simplify system design and improve reliability. The NSI1052 device is safety certified by UL1577 support 5.7kV_{rms} insulation withstand voltages, while providing high electromagnetic immunity and low emissions. The data rate of the NSI1052 is up to 5Mbps. The NSI1052 provides thermal protection and transmit data dominant time out function. AEC-Q100 (Grade 1) option is provided for all devices.

Key Features

- Fully compatible with the ISO11898-2 standard
- Up to 5700Vrms Insulation voltage
- Power supply voltage
 VDD1: 2.5V to 5.5V
 VDD2: 4.5V to 5.5V
- Bus fault protection of -58V to +58V
- Transmit data (TXD) dominant time out function
- Over current and over temperature protection
- Data rate: up to 5Mbps
- Ideal Passive, High Impedance Bus and Logic Terminals When Unpowered
- High CMTI: 150kV/μs
- Low loop delay: <220ns
- High system level EMC performance:
 Enhanced system level ESD, EFT, Surge immunity
- Operation temperature: -40°C ~125°C

- AEC-Q100 Qualified for Grade1
- RoHS-compliant packages: SOP16(300mil)

Safety Regulatory Approvals

- UL recognition: 5700Vrms for 1 minute per UL1577
- CQC certification per GB4943.1
- CSA component notice 5A
- DIN EN IEC 60747-17 (VDE 0884-17)

Applications

- Automotive application
- Industrial automation system
- Isolated CAN Bus
- Telecom

Device Information

Part Number	Package	Body Size
NSI1052-Q1SWR	SOP16(300mil)	10.30mm × 7.50mm

Functional Block Diagrams

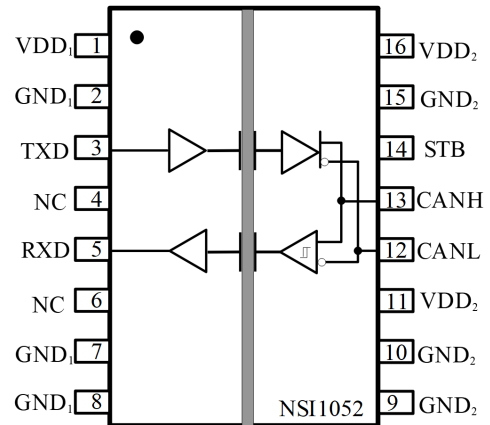


Figure 1. NSI1052 Block Diagram

INDEX

1. PIN CONFIGURATION AND FUNCTIONS 3

2. ABSOLUTE MAXIMUM RATINGS 4

3. ESD RATINGS 4

4. RECOMMENDED OPERATING CONDITIONS 4

5. THERMAL INFORMATION 5

6. SPECIFICATIONS 6

 6.1. ELECTRICAL CHARACTERISTICS 6

 6.2. SWITCHING ELECTRICAL CHARACTERISTICS 8

 6.3. PARAMETER MEASUREMENT INFORMATION 9

7. HIGH VOLTAGE FEATURE DESCRIPTION 12

 7.1. INSULATION AND SAFETY RELATED SPECIFICATIONS 12

 7.2. INSULATION CHARACTERISTICS 12

 7.3. SAFETY-LIMITING VALUES 13

 7.4. REGULATORY INFORMATION 14

8. FUNCTION DESCRIPTION 15

 8.1. DEVICE FUNCTIONAL MODES 15

 8.2. STANDBY MODE 16

 8.3. TXD DOMINANT TIME-OUT FUNCTION 16

 8.4. BUS DOMINANT TIME-OUT FUNCTION 16

 8.5. CURRENT PROTECTION 16

 8.6. OVER TEMPERATURE PROTECTION 16

9. PACKAGE INFORMATION 17

10. ORDER INFORMATION 18

11. DOCUMENTATION SUPPORT 18

12. TAPE AND REEL INFORMATION 19

13. REVISION HISTORY 21

1. Pin Configuration and Functions

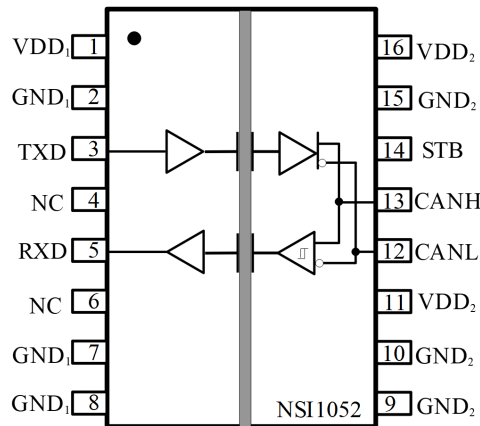


Figure 1.1 NSI1052-Q1SWR SOP16(300mil) Package

Table 1.1 NSI1052-Q1SWR SOP16(300mil) Pin Configuration and Description

NSI1052-Q1SWR PIN NO.	SYMBOL	FUNCTION
1	VDD ₁	Power Supply for Side 1
2	GND ₁	Ground 1, the ground reference for Isolator Side 1
3	TXD	CAN transmit data input (LOW for dominant and HIGH for recessive bus states)
4	NC	No Connection
5	RXD	CAN receive data output (LOW for dominant and HIGH for recessive bus states)
6	NC	No Connection
7	GND ₁	Ground 1, the ground reference for Isolator Side 1
8	GND ₁	Ground 1, the ground reference for Isolator Side 1
9	GND ₂	Ground 2, the ground reference for Isolator Bus Side
10	GND ₂	Ground 2, the ground reference for Isolator Bus Side
11	VDD ₂	Power supply for Bus Side, this pin must be connected externally to PIN16
12	CANL	Low-level CAN bus line
13	CANH	High-level CAN bus line
14	STB	Standby mode control input (active high)
15	GND ₂	Ground 2, the ground reference for Isolator Bus Side
16	VDD ₂	Power supply for Bus Side, this pin must be connected externally to PIN11

2. Absolute Maximum Ratings

Parameters	Symbol	Min	Typ	Max	Unit	Comments
Power Supply Voltage	VDD ₁ , VDD ₂	-0.5		6.5	V	
Maximum Input Voltage	V _{TXD}	-0.4		VDD ₁ +0.4	V	
Maximum BUS Pin Voltage	V _{CANH} , V _{CANL}	-58		+58	V	
Output current	I _o	-15		15	mA	
Operating Temperature	T _{opr}	-40		125	°C	
Storage Temperature	T _{stg}	-65		150	°C	

3. ESD Ratings

Ratings		Value	Unit
Electrostatic discharge	Human body model (HBM), per AEC-Q100-002-RevD <ul style="list-style-type: none"> All pins 	±6000	V
	Charged device model (CDM), per AEC-Q100-011-RevB <ul style="list-style-type: none"> All pins 	±2000	V

4. Recommended Operating Conditions

Parameters	Symbol	Min	Typ	Max	Unit	Comments
Supply voltage, controller side	VCC ₁	2.5		5.5	V	
Supply voltage, bus side	VCC ₂	4.5	5	5.5	V	
Voltage at bus pins (separately or common mode)	V _I or V _{IC}	-30		30	V	
High-level input voltage	V _{IH}	2		5.5	V	TXD pin
Low-level input voltage	V _{IL}	0		0.8	V	TXD pin
High-level output current	I _{OH}	-70			mA	CANH or CANL
		-4			mA	RXD pin
Low-level output current	I _{OL}			70	mA	CANH or CANL
				4	mA	RXD pin
Ambient Temperature	T _A	-40		125	°C	
Junction temperature	T _J	-40		150	°C	

5. Thermal Information

<i>Parameters</i>	<i>Symbol</i>	<i>SOP16(300mil)</i>	<i>Unit</i>
Junction-to-ambient thermal resistance	θ_{JA}	69.9	°C/W
Junction-to-case(top) thermal resistance	$\theta_{JC (top)}$	31.8	
Junction-to-board thermal resistance	θ_{JB}	29	

6. Specifications

6.1. Electrical Characteristics

(VDD₁=2.5V~5.5V, VDD₂=4.5V~5.5V, T_A=-40°C to 125°C. Unless otherwise noted, Typical values are at VDD₁ = 3.3V, VDD₂ = 5V, T_A= 25°C)

Parameters	Symbol	Min	Typ	Max	Unit	Comments
Supply Voltage	VDD ₁	2.5		5.5	V	
	VDD ₂	4.5	5	5.5	V	
Logic side supply current	IDD ₁		1.97	3.50	mA	VDD ₁ =3.3V, V _{TXD} =0V
			0.97	2.00	mA	VDD ₁ =3.3V, V _{TXD} = VDD ₁
			2.02	3.50	mA	VDD ₁ =5V, V _{TXD} =0V
			1.02	2.00	mA	VDD ₁ =5V, V _{TXD} = VDD ₁
Bus side supply current	IDD ₂		46	70	mA	Normal mode, V _{TXD} =0V, R _{Load} =60Ω
			5.54	10	mA	Normal mode, V _{TXD} =VDD ₁ , V _{STB} =0V
			1.22		mA	Standby mode, V _{TXD} =VDD ₁ , V _{STB} =VDD ₂
Thermal-Shutdown Threshold	T _{TS}	155	165	180	°C	
Common Mode Transient Immunity	CMTI	±100	±150		kV/μs	
Logic Side						
High level input voltage	V _{IH}	2			V	TXD pin
Low level input voltage	V _{IL}			0.8	V	TXD pin
High level input current	I _{IH}			10	μA	TXD pin
Low level input current	I _{IL}	-10			μA	TXD pin
Output Voltage High	V _{OH}	VDD ₁ -0.4			V	I _{OH} = -4mA, RXD pin
Output Voltage Low	V _{OL}			0.4	V	I _{OL} = 4mA, RXD pin
Input Capacitance	C _{IN}		2		pF	TXD pin
Driver						
CANH output voltage (Dominant)	V _{OH(D)}	2.8	3.48	4.5	V	V _{TXD} =0V, R _{Load} =60Ω
CANL output voltage (Dominant)	V _{OL(D)}	0.8	1.25	2.25	V	V _{TXD} =0V, R _{Load} =60Ω
CAN bus output voltage (Recessive)	V _{O(R)}	2	0.5*VDD ₂	3	V	V _{TXD} =VDD ₁ , R _{Load} =60Ω

Parameters	Symbol	Min	Typ	Max	Unit	Comments
Differential output voltage (Dominant)	$V_{OD(D)}$	1.5		3	V	$V_{DD2}=5V$, $V_{TXD}=0V$, $R_{Load}=60\Omega$, see Figure 6.1
Differential output voltage (Recessive)	$V_{OD(R)}$	-0.05		0.05	V	$V_{DD2}=5V$, $R_{Load}=60\Omega$, see Figure 6.1
		-0.1		0.1	V	$V_{DD2}=5V$, No Load, see Figure 6.1
Dominant short-circuit output current	$I_{O(sc)dom}$	-100		-40	mA	$V_{TXD}=0V$, $t < t_{to(dom)TXD}$, $V_{CANH}=-30V$
		40		100	mA	$V_{TXD}=0V$, $t < t_{to(dom)TXD}$, $V_{CANL}=30V$
Recessive short-circuit output current	$I_{O(sc)rec}$	-5		5	mA	Normal mode; $V_{TXD} = V_{DD1}$, $V_{CANH} = V_{CANL} = -27 V$ to $+30 V$
Receiver						
Positive-going bus input threshold voltage	V_{IT+}		750	900	mV	$-12V < V_{COM} < +12V$
Negative-going bus input threshold voltage	V_{IT-}	500	650		mV	
Hysteresis voltage	V_{HYS}		100		mV	
Power-off (unpowered) bus input leakage current	$I_{IOFF(LKG)}$	-5		5	μA	$V_{CANH}/V_{CANL} = 5V$, $V_{CC} = 0V$, $V_{IO} = 0V$
Input capacitance to ground	C_i		13		pF	CANH or CANL
Differential input	C_{ID}		5		pF	
Differential input resistance	R_{ID}	19	33	52	k Ω	$-2V \leq V_{CANH} \leq 7V$, $-2V \leq V_{CANL} \leq 7V$, $R_{ID}=R_{CANH}+R_{CANL}$
Input resistance	R_{IN}	9	16	28	k Ω	$-2V \leq V_{CANH} \leq 7V$, $-2V \leq V_{CANL} \leq 7V$
Input resistance matching	$R_{I_{match}}$	-3		+3	%	CANH=CANL
Common-mode voltage range	V_{COM}	-30		+30	V	

6.2. Switching Electrical Characteristics

(VDD₁=2.5V~5.5V, VDD₂=4.5V~5.5V, T_A=-40°C to 125°C. Unless otherwise noted, Typical values are at VDD₁ = 3.3V, VDD₂ = 5V, T_A = 25°C)

Parameters	Symbol	Min	Typ	Max	Unit	Comments
Loop delay1	T _{loop1}		90	220	ns	Driver input to receiver output, Recessive to Dominant, see Figure 6.6
Loop delay2	T _{loop2}		100	220	ns	Driver input to receiver output, Dominant to Recessive, see Figure 6.6
transmitted recessive bit width	t _{bit(bus)}	435		530	ns	t _{bit(TXD)} = 500 ns
		155		210	ns	t _{bit(TXD)} = 200 ns
bit time on pin RXD	t _{bit(RXD)}	400		550	ns	t _{bit(TXD)} = 500 ns
		120		220	ns	t _{bit(TXD)} = 200 ns
Driver						
Propagation delay time, recessive -to- dominant output	t _{PLH}		52		ns	see Figure 6.3
Propagation delay time, dominant -to- recessive output	t _{PHL}		73		ns	see Figure 6.3
Differential output signal rise time	t _r		64		ns	see Figure 6.3
Differential output signal fall time	t _f		52		ns	see Figure 6.3
Bus dominant time-out time	t _{TXD_DTO}	800	2000	4000	μs	see Figure 6.7
Receiver						
Propagation delay time, low-to-high-level output	t _{PLH}		32		ns	see Figure 6.5
Propagation delay time, high-to-low-level output	t _{PHL}		35		ns	see Figure 6.5
RXD signal rise time	t _r		3		ns	see Figure 6.5
RXD signal fall time	t _f		3		ns	see Figure 6.5

6.3. Parameter Measurement Information

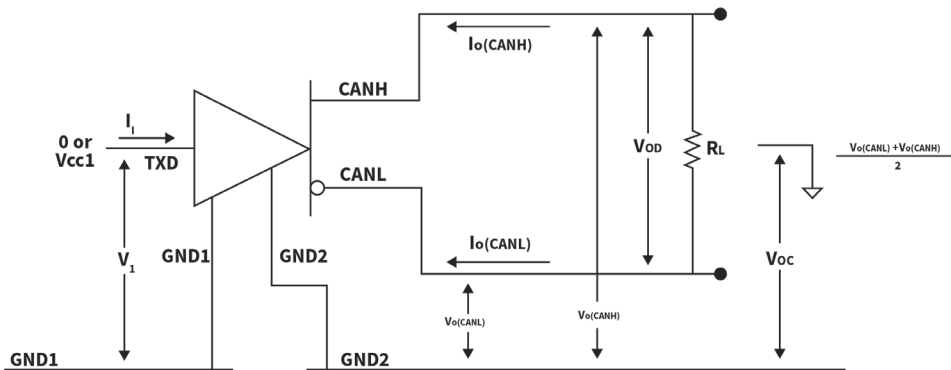


Figure 6.1. Driver Voltage, Current and Test Definitions

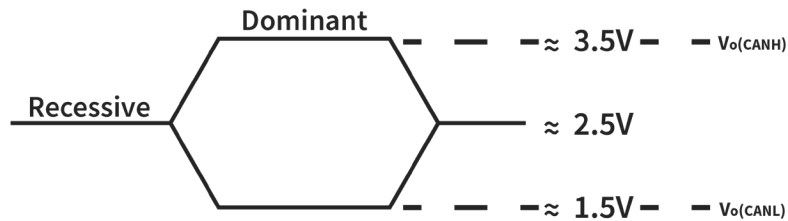
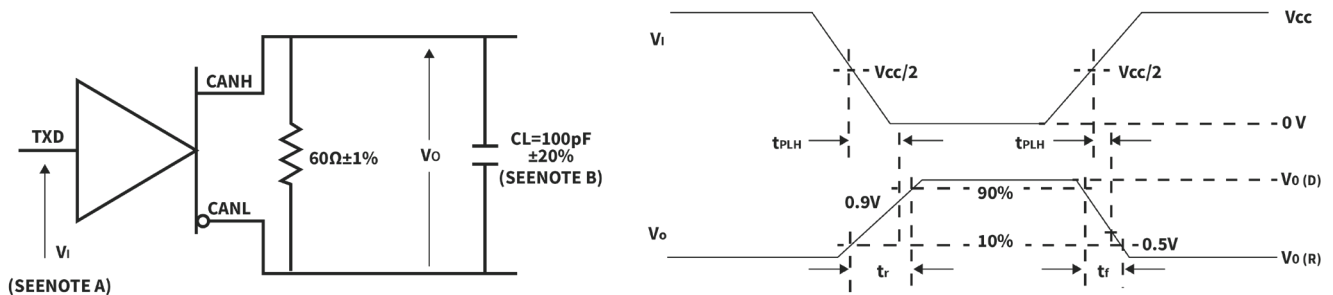


Figure 6.2. Bus Logic State Voltage Definitions



A. The input pulse is supplied by a generator having the following characteristics: PRR ≤ 125 kHz, 50% duty cycle, $t_r \leq 6$ ns, $t_f \leq 6$ ns, $Z_o = 50 \Omega$.

B. C_L includes instrumentation and fixture capacitance within ±20%.

Figure 6.3. Driver Test Circuit and Voltage Waveform

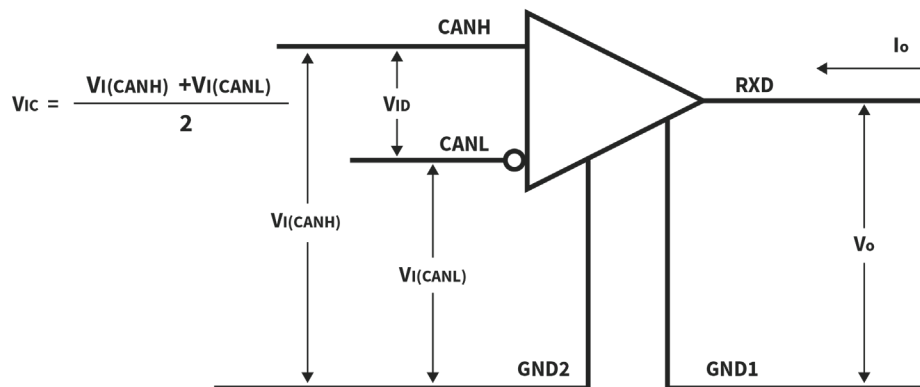
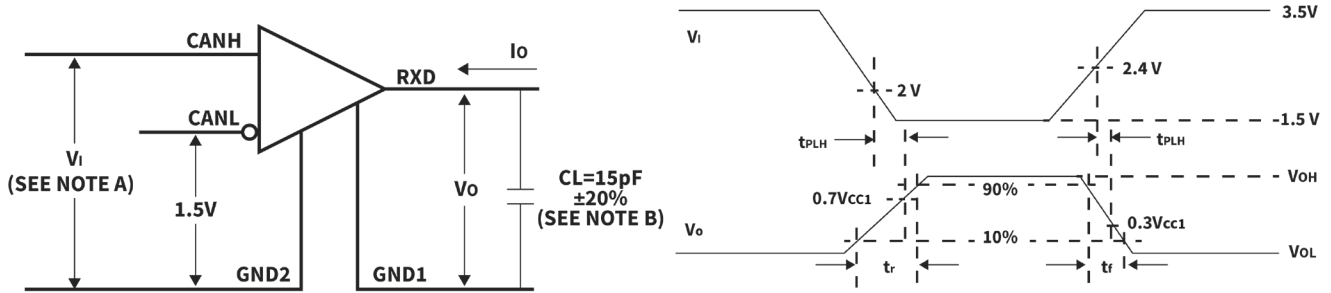


Figure 6.4. Receiver Voltage and Current Definitions



- A. The input pulse is supplied by a generator having the following characteristics: $PRR \leq 125 \text{ kHz}$, 50% duty cycle, $t_r \leq 6 \text{ ns}$, $t_f \leq 6 \text{ ns}$, $Z_o = 50 \Omega$.
- B. C_L includes instrumentation and fixture capacitance within $\pm 20\%$.

Figure 6.5. Receiver Test Circuit and Voltage Waveform

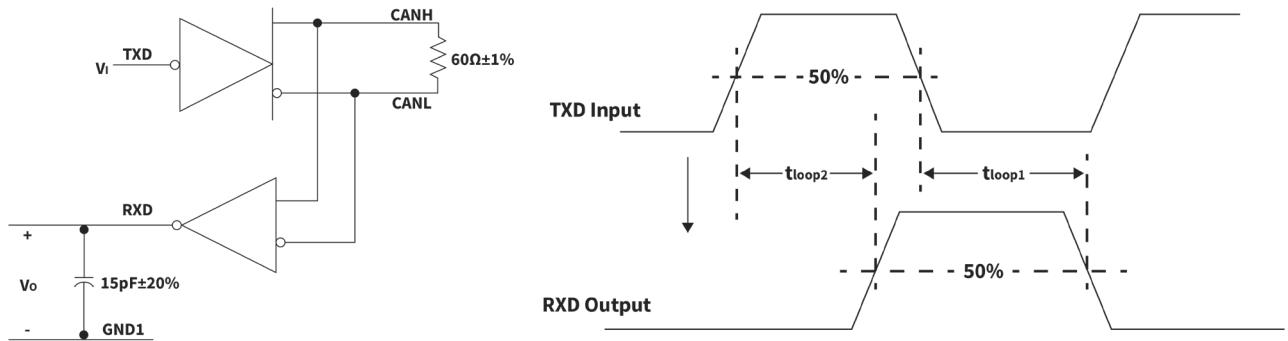
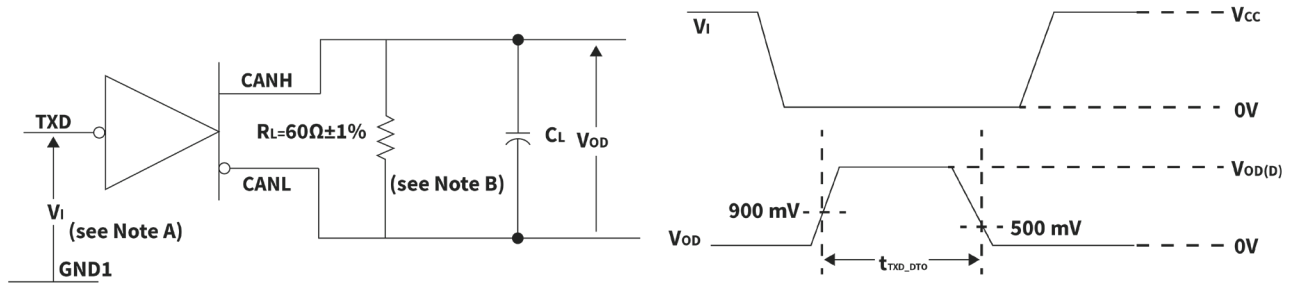


Figure 6.6. t_{LOOP} Test Circuit and Voltage Waveform



- A. The input pulse is supplied by a generator having the following characteristics: $PRR \leq 125 \text{ kHz}$, 50% duty cycle, $t_r \leq 6 \text{ ns}$, $t_f \leq 6 \text{ ns}$, $Z_o = 50 \Omega$.
- B. C_L includes instrumentation and fixture capacitance within $\pm 20\%$.

Figure 6.7. Dominant Time-out Test Circuit and Voltage Waveform

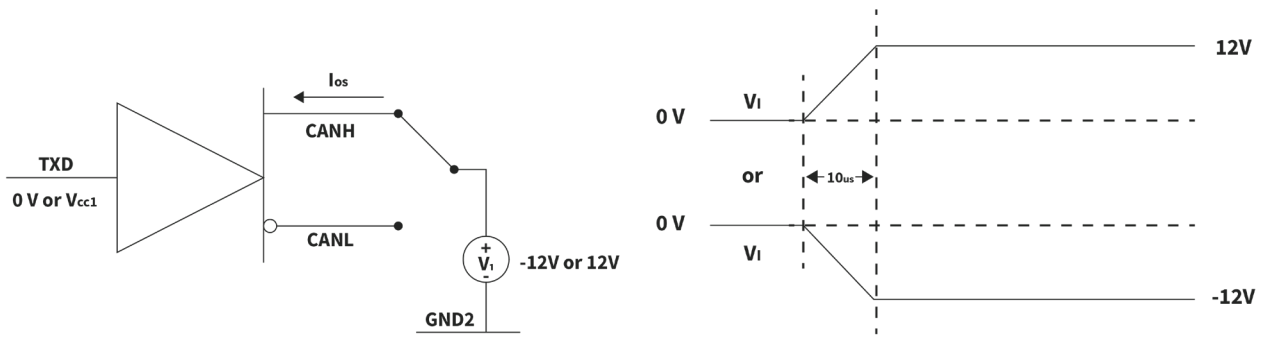


Figure 6.8. Driver Short-Circuit Current Test Circuit and Waveform

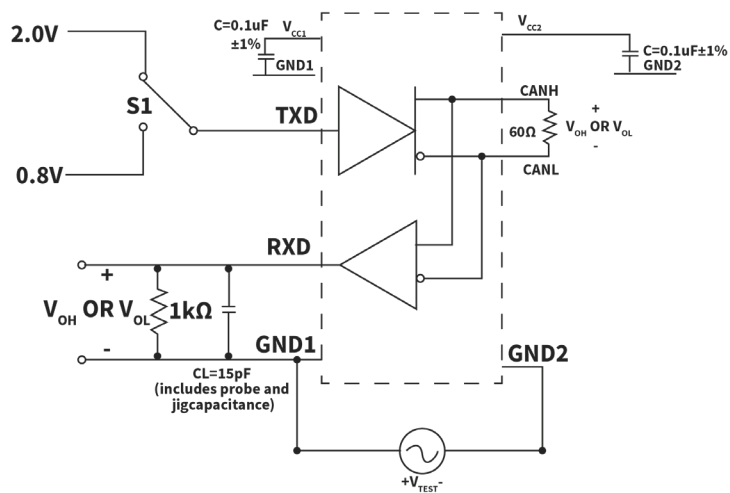


Figure 6.9. Common-Mode Transient Immunity Test Circuit

7. High Voltage Feature Description

7.1. Insulation and Safety Related Specifications

Description	Symbol	Value	Unit	Comments
		SOP16(300mil)		
Minimum External Clearance	CLR	8	mm	IEC 60664-1:2007
Minimum External Creepage	CPG	8	mm	IEC 60664-1:2007
Distance Through Insulation	DTI	28	µm	
Tracking Resistance (Comparative Tracking Index)	CTI	>600	V	DIN EN 60112 (VDE 0303-11); IEC 60112
Material Group		I		IEC 60664-1

Description	Test Condition	Value
		SOP16(300mil)
Overvoltage Category per IEC60664-1	For Rated Mains Voltage ≤ 150Vrms	I to IV
	For Rated Mains Voltage ≤ 300Vrms	I to IV
	For Rated Mains Voltage ≤ 600Vrms	I to IV
	For Rated Mains Voltage ≤ 1000Vrms	I to III
Climatic Classification		40/125/21
Pollution Degree per DIN VDE 0110		2

7.2. Insulation Characteristics

Description	Test Condition	Symbol	Value	Unit
			SOP16(300mil)	
Maximum Repetitive Isolation Voltage		V_{IORM}	2121	V_{PEAK}
Maximum Working Isolation Voltage	AC voltage	V_{IOWM}	1500	V_{RMS}
	DC voltage		2121	V_{DC}
Apparent Charge	Method a, after Input/output safety test subgroup 2/3, $V_{ini}=V_{IOTM}$, $t_{ini} = 60$ s, $V_{pd(m)}=1.2*V_{IORM}$, $t_m=10$ s.	q_{pd}	<5	pC
	Method a, after environmental tests subgroup 1, $V_{ini}=V_{IOTM}$, $t_{ini}=60$ s, $V_{pd(m)}=1.6*V_{IORM}$, $t_m=10$ s			
	Method b, routine test			

	(100% production) and preconditioning (type test); $V_{ini}=1.2 \cdot V_{IOTM}$, $t_{ini}=1s$ $V_{pd(m)}=1.875 \cdot V_{IORM}$, $t_m=1s$ (method b1) or $V_{pd(m)}=V_{ini}$, $t_m=t_{ini}$ (method b2)			
Maximum Transient Isolation Voltage	$t = 60 \text{ sec}$	V_{IOTM}	8000	V_{PEAK}
Maximum impulse voltage	Tested in air, 1.2/50 μ s waveform per IEC62368-1	V_{IMP}	6250	V_{PEAK}
Maximum Surge Isolation Voltage	Test method per IEC62368-1, 1.2/50 μ s waveform, $V_{IOSM} \geq V_{IMP} \times 1.3$	V_{IOSM}	10000	V_{PEAK}
Isolation Resistance	$V_{IO} = 500V$, $T_A=25^\circ C$	R_{IO}	$>10^{12}$	Ω
	$V_{IO} = 500V$, $100^\circ C \leq T_A \leq 125^\circ C$		$>10^{11}$	
	$V_{IO} = 500V$, $T_A=T_s$		$>10^9$	
Isolation Capacitance	$f = 1MHz$	C_{IO}	1.2	pF
Insulation Specification per UL1577				
Insulation voltage per UL	$V_{TEST} = V_{ISO}$, $t = 60 \text{ s}$ (qualification) $V_{TEST} = 1.2 \times V_{ISO}$, $t = 1 \text{ sec}$, (100% production test)	V_{ISO}	5700	V_{rms}

7.3. Safety-Limiting Values

Reinforced isolation safety-limiting values as outlined in VDE-0884-17 of NSI1052-Q1SWR

Description	Test Condition	Value	Unit
Safety Supply Power	$R_{\theta JA} = 69.9 \text{ }^\circ C/W^1$, $T_J = 150 \text{ }^\circ C$, $T_A = 25 \text{ }^\circ C$	1788	mW
Safety Supply Current	$R_{\theta JA} = 69.9 \text{ }^\circ C/W^1$, $V_I = 5V$, $T_J = 150 \text{ }^\circ C$, $T_A = 25 \text{ }^\circ C$	357	mA
Safety Temperature ²⁾		150	$^\circ C$

- 1) Calculate with the junction-to-air thermal resistance, $R_{\theta JA}$, of SOP16(300mil) package ([Thermal Information Table](#)) which is that of a device installed on a low effective thermal conductivity test board (1s) according to JESD51-3.
- 2) The maximum safety temperature has the same value as the maximum junction temperature (T_J) specified for the device.

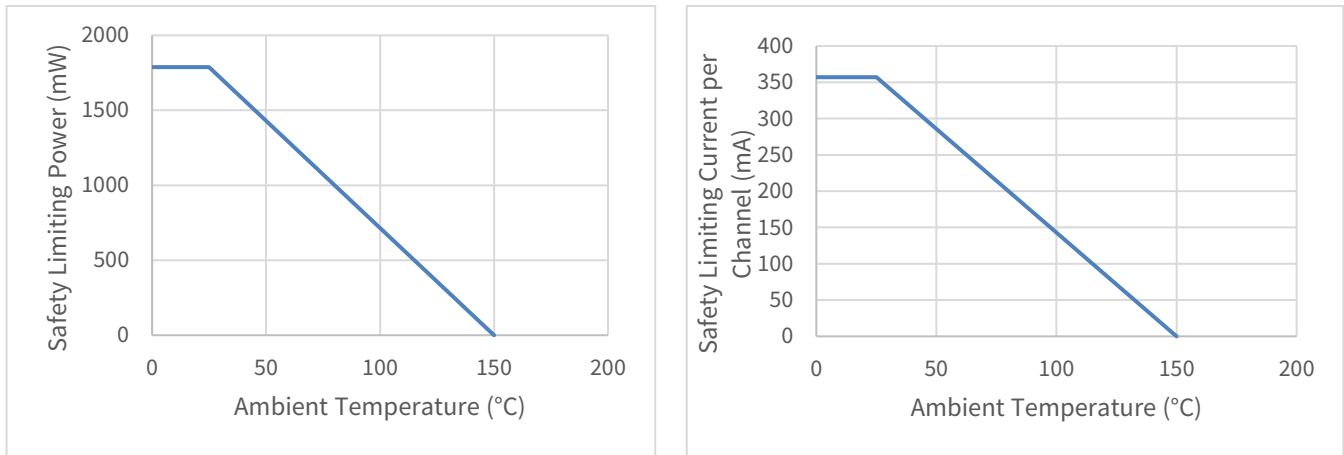


Figure 7.2 NSI1052-Q1SWR Thermal derating Curve, Dependence of Safety Limiting Values with Case Temperature per DIN EN IEC 60747-17 (VDE 0884-17)

7.4. Regulatory information

The NSI1052-Q1SWR is approved by the organizations listed in table.

CUL		VDE	CQC	TUV
UL 1577 Component Recognition Program	Approved under CSA Component Acceptance Notice 5A	DIN EN IEC 60747-17 (VDE 0884-17)	Certified according to GB4943.1	Certified According to EN IEC 62368-1
Single Protection, 5700V _{rms} Isolation voltage	Single Protection, 5700V _{rms} Isolation voltage	Reinforced Insulation V _{IORM} =2121V _{peak} V _{IOTM} =8000V _{peak} V _{IOSM} =10000V _{peak}	Reinforced insulation	5000V _{rms} for 1min
E500602	E500602	Pending	CQC20001264939	Pending

8. Function Description

The NSI1052 is an isolated CAN transceiver which fully compatible with the ISO11898-2 standard. The NSI1052 integrated two channel digital isolators and a high reliability CAN transceiver. The digital isolator is silicon oxide isolation based on Novosense capacity isolation technology. The high integrated solution can help to simplify system design and improve reliability. The NSI1052 device is safety certified by UL1577 support 5.7 kV_{rms} insulation withstand voltages, while providing high electromagnetic immunity and low emissions. The data rate of the NSI1052 is up to 5Mbps. The NSI1052 provides thermal protection and transmit data dominant time out function.

8.1. Device Functional Modes

Table 8.1. Driver Function Table

<i>TXD</i>	<i>CANH</i>	<i>CANL</i>	<i>BUS STATE</i>
L	H	L	Dominant
H	Z	Z	Recessive
Open	Z	Z	Recessive

¹ H= high level; L=low level; Z= common mode(recessive) bias to VCC/2

Table 8.2. Receiver Function Table

<i>V_{ID}=CANH-CANL</i>	<i>RXD</i>	<i>BUS STATE</i>
$V_{ID} \geq 0.9V$	L	Dominant
$0.5V < V_{ID} < 0.9V$	X	Uncertain
$V_{ID} \leq 0.5V$	H	Recessive
Open	H	Recessive

¹ H= high level; L=low level; X= uncertain

8.2. Standby mode

The NSI1052 cannot transmit or receive regular CAN messages in Standby mode. Only the isolator and low-power CAN receiver are active, monitoring the bus lines for activity. The bus wake-up filter ensures that only bus dominant and bus recessive states that persist longer than $t_{\text{filtr(wake)bus}}$ are reflected on the RXD pin. To reduce current consumption, the CAN bus is terminated to GND and not biased to $VDD_2/2$ as in Normal mode. Standby mode is selected by setting pin STB HIGH. An internal pull-up ensures that Standby mode is selected by default when pin STB is not connected.

In Standby mode:

- The CAN transmitter is off
- The normal CAN receiver is off
- The low-power CAN receiver is active
- CANH and CANL are biased to GND
- The signal received at the low-power CAN receiver is reflected on pin RXD

The isolation function of the NSI1052 is not disabled in Standby mode. The NSI1052 is not designed to support CAN bus wake-up functionality with very low quiescent currents.

8.3. TXD dominant time-out function

A 'TXD dominant time-out' timer circuit prevents the bus lines from being driven to a permanent dominant state (blocking all network communication) if pin TXD is forced permanently LOW by a hardware and/or software application failure. The timer is triggered by a negative edge on pin TXD.

If the duration of the LOW level on pin TXD exceeds the internal timer value ($t_{\text{TXD_DTO}}$), the transmitter is disabled, driving the bus lines into a recessive state. The timer is reset by a positive edge on pin TXD.

8.4. Bus dominant time-out function

In Standby mode, a 'bus dominant time-out' timer is started when the CAN bus changes from recessive to dominant state. If the dominant state on the bus persists for longer than $t_{\text{to(dom)bus}}$, the RXD pin is forced HIGH. This prevents a clamped dominant bus (due to a bus short-circuit or a failure in one of the other nodes on the network) generating a permanent wake-up request. The bus dominant time-out timer is reset when the CAN bus changes from dominant to recessive state.

8.5. Current Protection

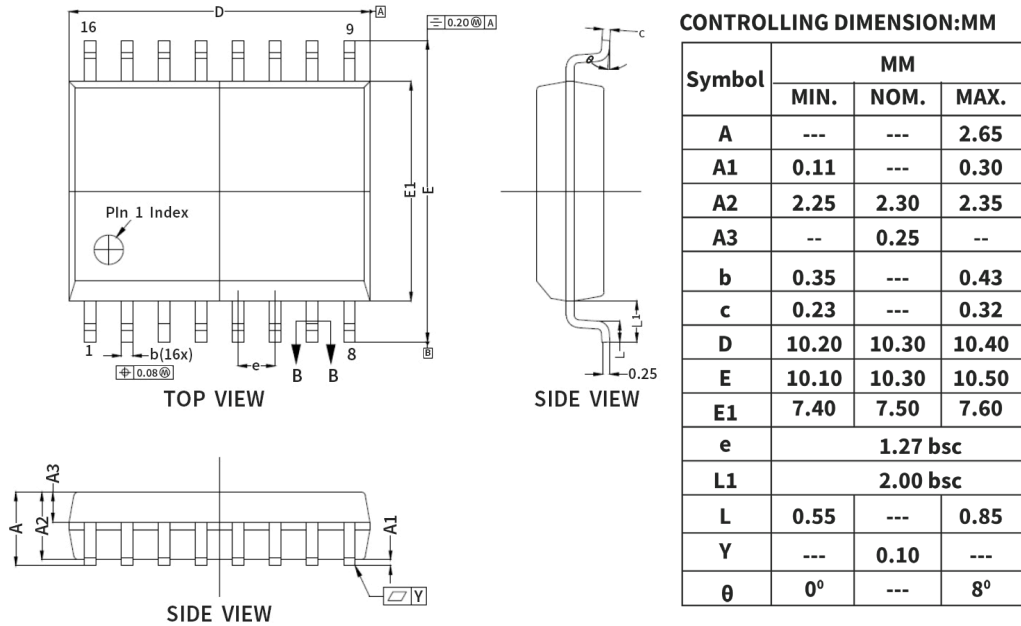
A current-limiting circuit protects the transmitter output stage from damage caused by accidental short-circuit to either positive or negative supply voltage, although power dissipation increases during this fault condition.

8.6. Over Temperature Protection

The output drivers are protected against over-temperature conditions. If the virtual junction temperature exceeds the shutdown junction temperature T_{TS} , the output drivers will be disabled until the virtual junction temperature becomes lower than T_{TS} and TXD becomes recessive again.

By including the TXD condition, the occurrence of output driver oscillation due to temperature drifts is avoided.

9. Package Information



NOTE: This dimension does not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or gate burrs shall not exceed 0.15 mm, per side.

Figure 9.1 SOP16(300mil) Package Shape and Dimension in millimeters

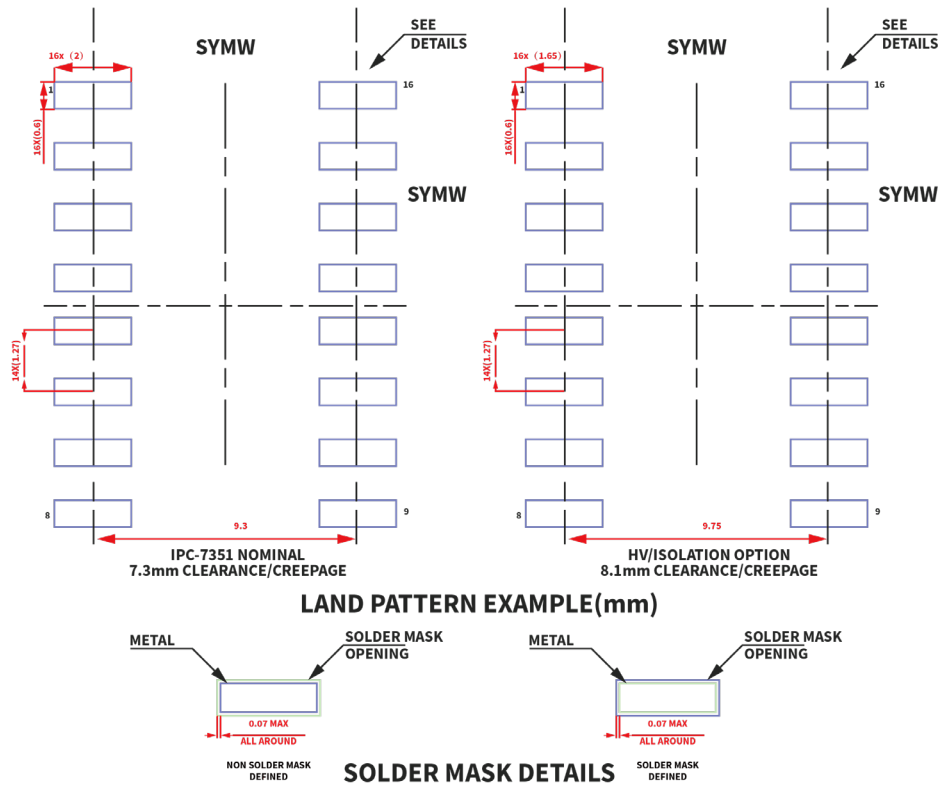


Figure 9.2 SOP16(300mil) Package Board Layout Example

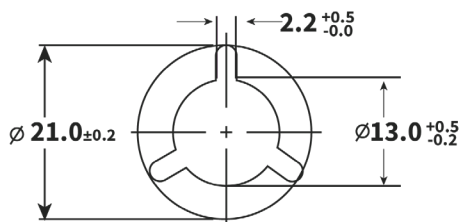
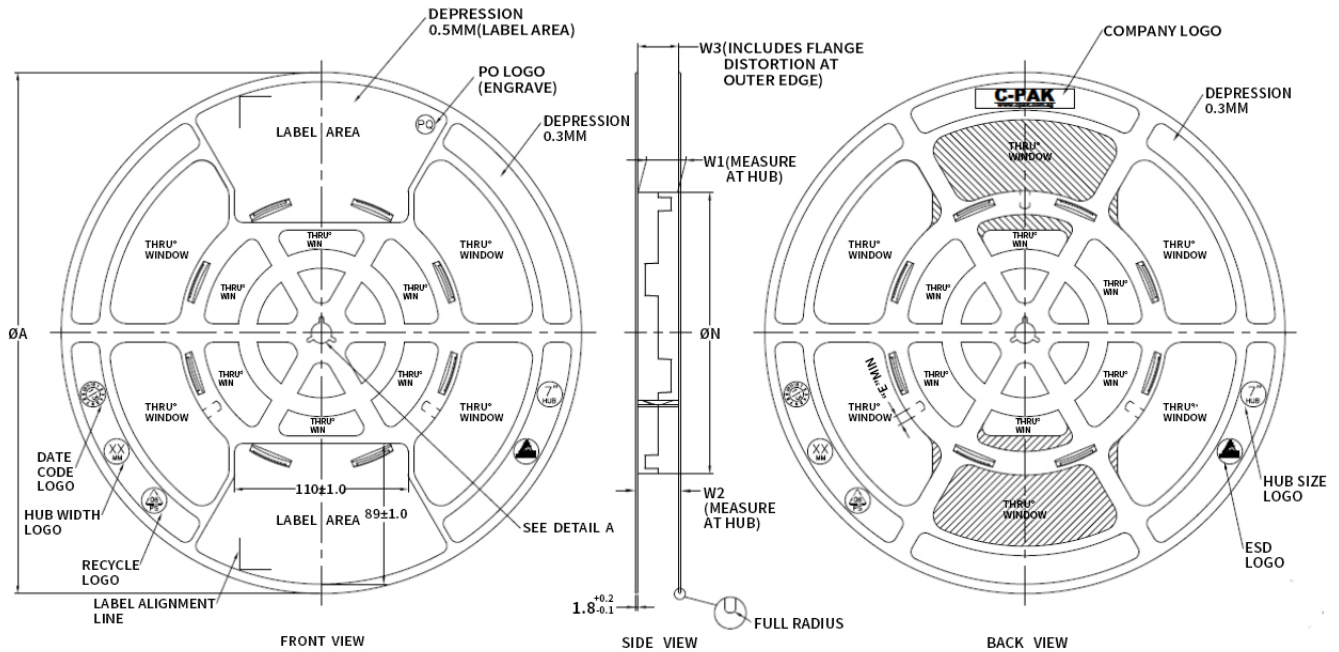
10. Order Information

<i>Part Number</i>	<i>Isolation Rating (kV)</i>	<i>Max Data Rate (Mbps)</i>	<i>Temperature</i>	<i>MSL</i>	<i>Package Type</i>	<i>Package Drawing</i>	<i>SPQ</i>
NSI1052-Q1SWR	5.7	5 (CAN FD)	-40 to 125°C	3	SOP16 (300mil)	SOW16	1000
NOTE: All packages are RoHS-compliant with peak reflow temperatures of 260 °C according to the JEDEC industry standard classifications and peak solder temperatures. All devices are AEC-Q100 qualified.							

11. Documentation Support

<i>Part Number</i>	<i>Product Folder</i>	<i>Datasheet</i>	<i>Technical Documents</i>	<i>Isolator selection guide</i>
NSI1052	Click here	Click here	Click here	Click here

12. Tape and Reel Information

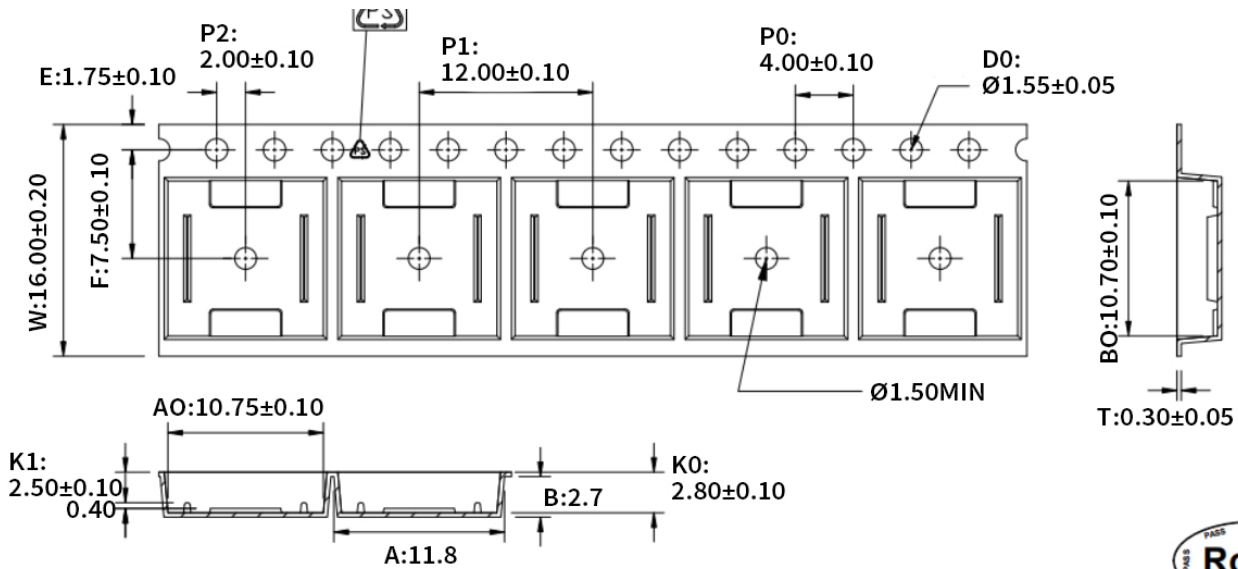


**ARBOR HOLE
DETAIL A
SCALE: 3:1**

PRODUCT SPECIFICATION						
TAPE WIDTH	Ø A ±2.0	Ø N ±2.0	W1	W2 (Max)	W3	E (MIN)
08MM	330	178	8.4 ^{+1.5} _{-0.0}	14.4	SHALL ACCOMMODATE TAPE WIDTH WITHOUT INTERFERENCE	5.5
12MM	330	178	12.4 ^{+2.0} _{-0.0}	18.4		5.5
16MM	330	178	16.4 ^{+2.0} _{-0.0}	22.4		5.5
24MM	330	178	24.4 ^{+2.0} _{-0.0}	30.4		5.5
32MM	330	178	32.4 ^{+2.0} _{-0.0}	38.4		5.5

SURFACE RESISTIVITY			
LEGEND	SR RANGE	TYPE	COLOUR
A	BELOW 10 ¹²	ANTISTATIC	ALL TYPES
B	10 ⁵ TO 10 ¹¹	STATIC DISSIPATIVE	BLACK ONLY
C	10 ⁵ & BELOW 10 ⁵	CONDUCTIVE(GENERIC)	BLACK ONLY
E	10 ⁹ TO 10 ¹¹	ANTISTATIC(COATED)	ALL TYPES

Figure 12.1 Reel Information



- 1.10 sprocket hole pitch cumulative tolerance ± 0.20 .
2. Carrier camber is within 1 mm in 250 mm.
3. Material : Black Conductive Polystyrene Alloy.
4. All dimensions meet EIA-481 requirements.
5. Thickness: 0.30 ± 0.05 mm.
6. Packing length per 22" reel: 378 Meters.(復卷 N=122)
7. Component load per 13" reel: 1000 pcs.
8. Surface resistivity: $10^5 \sim 10^{10} \Omega/\square$

W	16.00±0.20
A0	10.75±0.10
B0	10.70±0.10
K0	2.80±0.10
K1	2.50±0.10

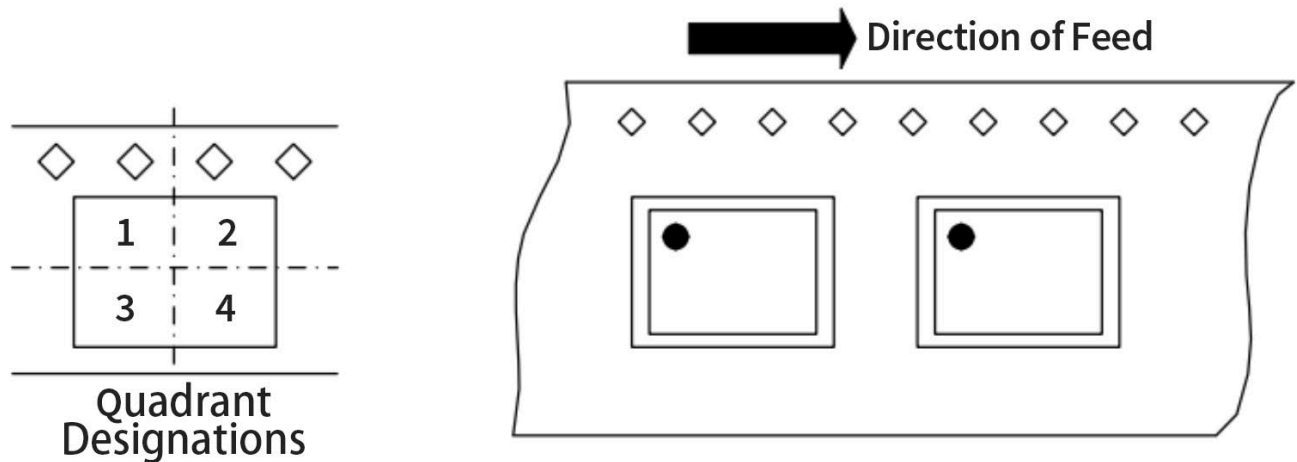


Figure 12.2 Tape and Reel Information of SOW16

13. Revision History

<i>Revision</i>	<i>Description</i>	<i>Date</i>
1.0	Initial version	2023/12/15
1.1	Update the MSL level from 2 to 3. The static current parameter of IDD2 in standby mode is added. Update Safety certification info throughout the document. Update comment in Specifications	2024/8/13

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