Description

Surge protected CAN isolation transceiver module

RoHS

Features

- Two-terminal isolation(2.5kVDC)
- High baud rate of up to 1 Mbps
- Operating ambient temperature range: -40℃ to +85℃
- The bus supports maximum 110 nodes
- ESD: Contact ±8kV/Air±15kV
- Surge protection: ±4kV

Application

- Industrial control
- Power
- Communication

Selection Guide

Certification	Part No.	Power input (VDC)	Baud rate (bps)	Static Current (mA)	Maximum Operating Current (mA)	Number of Nodes
--	TCANL301DE	3.3	20k-1M	25	90	110
	TCANL501DE	5	20k-1M	20	75	110

Product Feature

	Item		Operating Conditions	Min.	Typ.	Max.	Unit
Absolute Limits	Input Surge Voltage (1sec.max.)		3.3V series	-0.7	--	5	VDC
			5.0V series	-0.7	--	7	
	Pin Soldering Temperature		Soldering spot 1.5mm away from case, 10s max.	--	--	300	℃
3.3V Series Input Specifications	Power Supply Input Voltage		V_{CC}	3.15	3.3	3.45	VDC
	TXD Logic Level	High-level	V_{IH}	0.7Vcc	--	Vcc+0.5	
		Low-level	V_{IL}	0	--	0.8	
	RXD Logic Level	High-level	V_{OH}	Vcc-0.4	Vcc-0.2	--	
		Low-level	V_{OL}	--	0.2	0.4	
	TXD Drive Current		I_T	2	--	--	mA
	RXD Output Current		I_R	--	--	10	
	Serial Interface		Standard CAN controller interface for +3.3V				
5.0V Series Input Specifications	Power Supply Input Voltage		V_{CC}	4.75	5	5.25	VDC
	TXD Logic Level	High-level	V_{IH}	0.7Vcc	--	Vcc+0.5	
		Low-level	V_{IL}	0	--	0.8	
	RXD Logic Level	High-level	V_{OH}	Vcc-0.4	Vcc-0.2	--	
		Low-level	V_{OL}	--	0.2	0.4	
	TXD Drive Current		I_T	2	--	--	mA
	RXD Output Current		I_R	--	--	10	
	Serial Interface		Standard CAN controller interface for +5.0V				
Transmission Specifications	Data Delay	TXD Transmitter Delay	t_T	--	100	115	ns
		RXD Receiver Delay	t_R	--	100	135	
		Cycle Delay	$t_{PRO(TXD-RXD)}$	--	200	250	
	Dominant Timeout			--	1.5	5	ms
Output Specification	Dominant Level (Logic 0)	CANH	$V_{(OD)CANH}$	2.75	3.5	4.5	VDC
		CANL	$V_{(OD)CANL}$	0.5	1.5	2	
	Recessive Level (Logic 1)	CANH	$V_{(OR)CANH}$	2	2.5	3	
		CANL	$V_{(OR)CANL}$	2	2.5	3	
	Differential Level	Dominant Level (Logic 0)	$V_{diff(d)}$	1.5	2.5	3	
		Recessive Level (Logic 1)	$V_{diff(r)}$	-0.05	0	0.05	
	Bus Pin Maximum Withstand Voltage		V_X	-7	--	+12	
	Bus Transient Toltage		V_{trt} , Meet ISO7637-3 standard	-150	--	+100	
	Bus Pin Leakage Current		(V_{CC}=0V, $V_{CANH/L}$=5V)	-5	--	5	uA
	Load Resistance Differential		R_L	50	60	65	Ω
	Input Impedance Differential		R_{diff}	30		80	kΩ
	CAN Bus Interface		Meet ISO/DIS 11898-2 standard twisted-pair output				
General Specifications	Isolation Test		Electric strength test for 1 minute, leakage current <1mA	2.5kVDC			
	Insulation Resistance		At 500VDC	1000MΩ (input-output)			
	Operating Temperature			-40℃ to +85℃			

	Transportation and Storage Temperature		-50℃ to +125℃
	Operating Humidity	Non-condensing	10% - 90%
	Safety Class		CLASS III
Mechanical Specifications	Package	DIP8; Dimension 20.00 x17.00 x 7.00 mm	
	Weight	3.8g(Typ.)	
	Cooling Method	Free air convection	

EMC

Immunity	ESD	IEC/EN 61000-4-2	Contact ±8kV/Air±15kV (without external components, Signal port)*	Perf. Criteria B
	EFT	IEC/EN 61000-4-4	±2kV (without external components, Signal port)*	Perf. Criteria B
	Surge	IEC/EN 61000-4-5	±4kV (without external components, Signal port)*	Perf. Criteria B
	CS	IEC/EN 61000-4-6	3Vr.m.s (without external components)	Perf. Criteria A
Note: *Above only valid to communication port of CANH, CANL, CANG. The pin of CANG is open during testing.				

Application Precautions

1. Carefully read and follow the instructions before use; contact our technical support if you have any question;
2. Do not use the product in hazardous areas;
3. use only DC power supply source for this product. 220V power supply is prohibited;
4. It is strictly forbidden to disassemble the product privately in order to avoid product failure or malfunction;
5. Hot-swap is not supported;
6. If the external input of TXD is insufficient, the pull-up resistor should be added according to the situation.

After-sales service

1. Factory inspection and quality control are strictly enforced before shipping any product; please contact your local representative or our technical support if you experience any abnormal operation or possible failure of the module;
2. The products have a 3-year warranty period, from the date of shipment. The product will be repaired or exchanged free of charge within the warranty period for any quality problem that occurs under normal use.

Applied circuit

Refer to the CAN Industrial Bus Interface Isolating Module Application Manual.

Design Reference

1. Schematic diagram of surge circuit

Surge protection circuit is designed into TCANLX01DE, which improve the capablity of surge protection and simplify the application circuits.

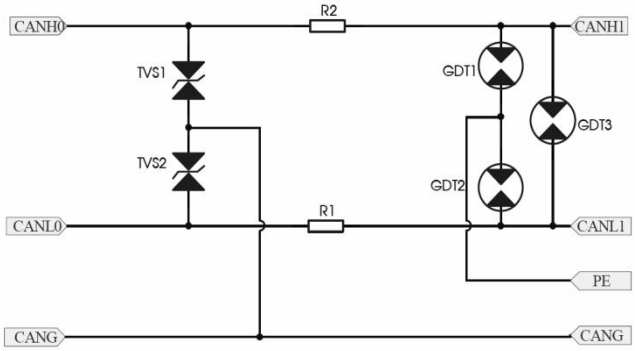


Fig.1

2. Typical application circuit

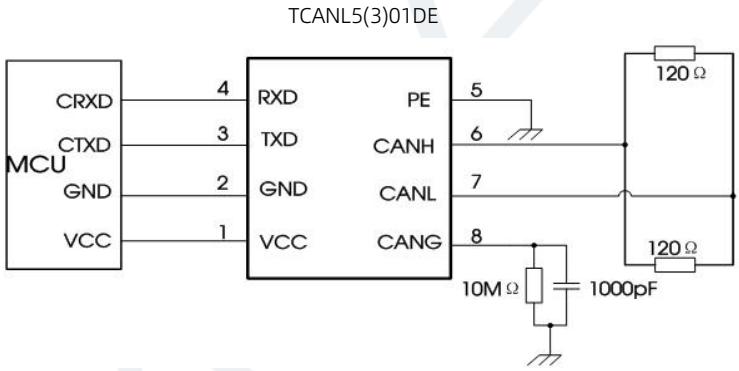


Fig.2

Figure 2 shows a typical application circuit for connecting a module. The module with its integrated power supply, CAN controller and CAN bus network interface can generally be used by customers as is, without the need of adding peripheral circuits.

Note: The logic level of the CAN controller should be compatible with the TCANL5(3)01DE.

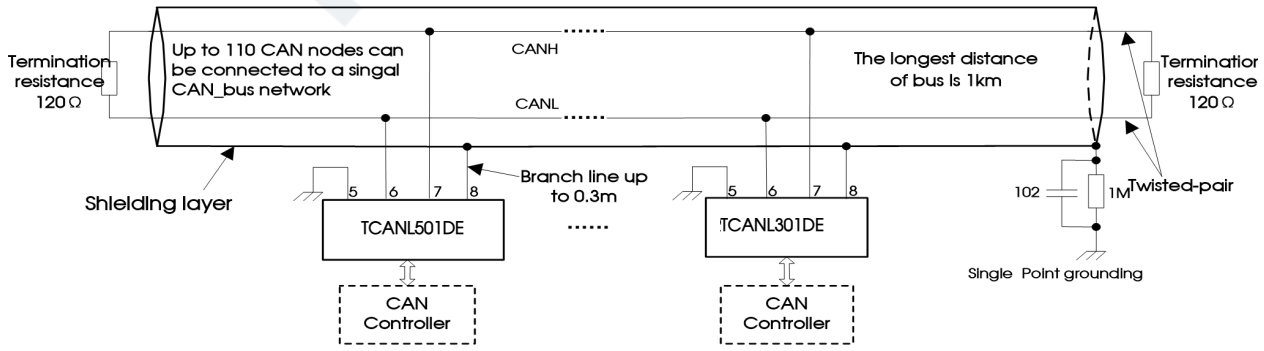


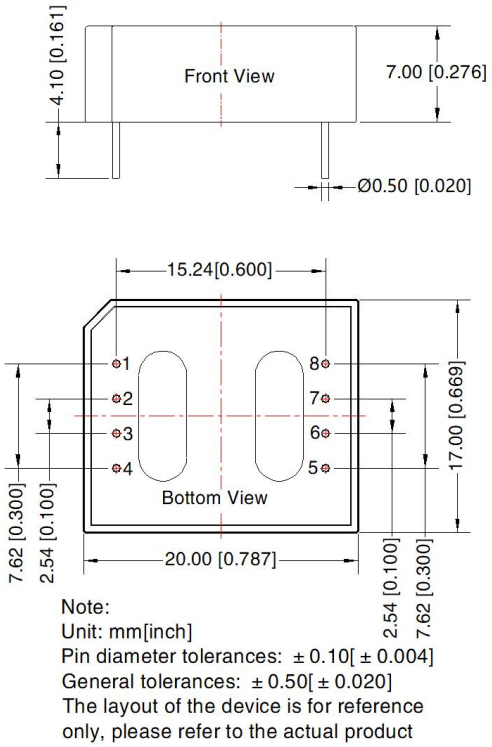
Fig.3

As shown in Figure 3, a single CAN-bus network allows connecting as many as 110 isolated single-channel R_CAN transceiver modules. This universal type module supports a maximum communication distance of 10km while the high-speed type module can

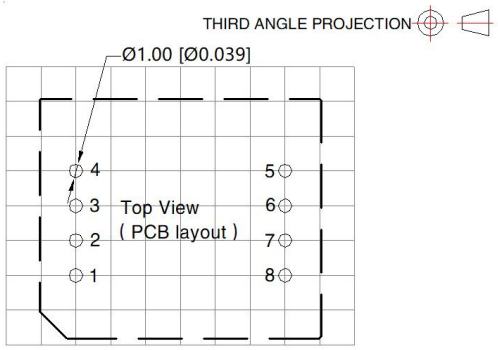
support a maximum communication distance of 1km with a baud rate beyond 20kbps. For accessing more nodes or achieving longer communication distances, CAN repeaters or other expansion equipment can easily be used.

Note: The communication distance of the bus is related to the communication speed and its field application. It can be designed according to the actual application and reference standard. We recommended the use of a twisted pair or shielded twisted pair as the communication cable and it should be kept away from any sources of interference. For long-distance communication, the terminal resistance value needs to be selected in accordance with the communication distance, the cable impedance and the number of nodes.

Dimensions and Recommended Layout



Note:
Unit: mm[inch]
Pin diameter tolerances: ± 0.10[± 0.004]
General tolerances: ± 0.50[± 0.020]
The layout of the device is for reference only, please refer to the actual product



Note: Grid 2.54*2.54mm

Pin–Out		
Pin	Mark	Function
1	VCC	Input Power+
2	GND	GND
3	TXD	Sending Pin
4	RXD	Receiving Pin
5	PE	Ground
6	CANH	H Pin
7	CANL	L Pin
8	CANG	Isolation Power Output CANG

Notes:

1.Unless otherwise specified, parameters in this datasheet were measured under the conditions of Ta=25℃, humidity<75%RH with nominal input voltage and rated output load;

2.All index testing methods in this datasheet are based on company corporate standards;

3.The above are the performance indicators of the product models listed in this datasheet. Some indicators of non-standard models will exceed the above requirements;

4.Products are related to laws and regulations: see "Features" and "EMC";

5.Our products shall be classified according to ISO14001 and related environmental laws and regulations, and shall be handled by qualified units.