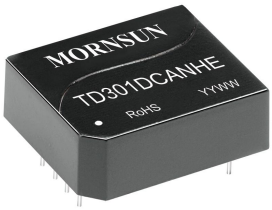
Surge protected CAN isolation transceiver module



CE RoHS

3 years Warranty

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
- EN60950 approval

The TD301DCANHEH/ TD501DCANHE series' main function is to convert TTL / CMOS level into isolated CAN bus differential level signals. The use of IC integrated technology allows for power isolation, signal isolation, CAN transceiver and bus protection all in one single CAN bus transceiver module, which withstands an isolation test voltage of 3000VDC. The internal components are highly integrated, with low electromagnetic radiation and high immunity to electromagnetic interference, which improve the capablity of surge protection and simplify the application circuits. Also, they can easily be embedded in the user's end equipment, to achieve fully functional CAN bus network connectivity.

Selection Guide

Certification	Part No.	Power input (VDC)	Baud rate (bps)	Static Current (mA)	Maximum Operating Current (mA)	Number of Nodes
CE	TD301DCANHE	3.3	20k-1M	25	90	110
	TD501DCANHE	5	20k-1M	20	75	110

Absolute Limits

Item	Operating Conditions	Min.	Typ.	Max.	Unit
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 Input Specifications

Item		Symbol	Min.	Typ.	Max.	Unit
Power Supply Input Voltage		VCC	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 Input Specifications

Item		Symbol	Min.	Typ.	Max.	Unit
Power Supply Input Voltage		VCC	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

Item		Symbol	Min.	Typ.	Max.	Unit
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 Specifications

Item		Symbol	Min.	Typ.	Max.	Unit
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		(VCC=0V, $V_{CANH/L}$=5V)	-5	--	5	uA
Load Resistance Differential		R_L	45	60	65	Ω
Input Impedance Differential		R_{diff}	19	30	52	kΩ
CAN Bus Interface		Meet ISO/DIS 11898-2 standard Twisted-pair output				

General Specifications

Item	Operating Conditions	Value
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 Standard		EN60950
Safety Certification		EN60950
Safety Class		CLASS III

Mechanical Specifications

Package	DIP8; Dimension 20.00*17.00*7.00 mm
Weight	3.8g(Typ.)
Cooling Method	Free air convection

EMC Specifications

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 AC power supply is prohibited;
4. It is strictly forbidden to disassemble the product privately in order to avoid product failure or malfunction.

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 TDX01DCANHE, which improve the capablity of surge protection and simplify the application circuits.

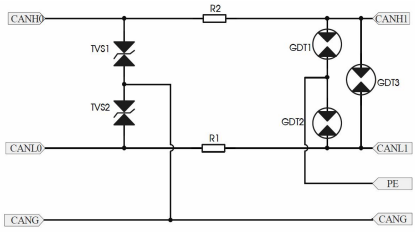


Fig.1

2.Typical application circuit

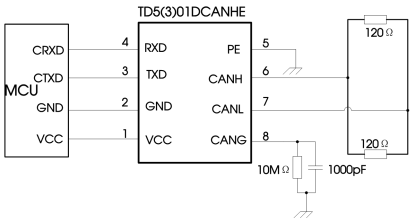


Fig.2

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 TD5(3)01DCANHE.

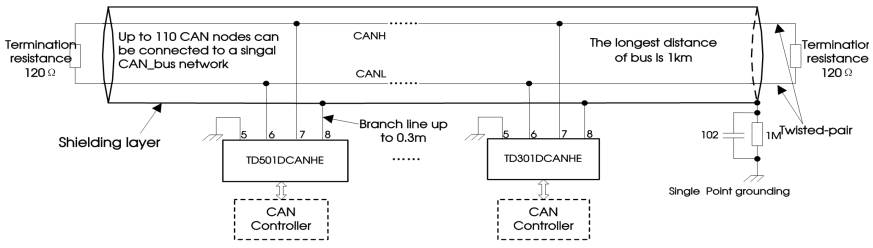


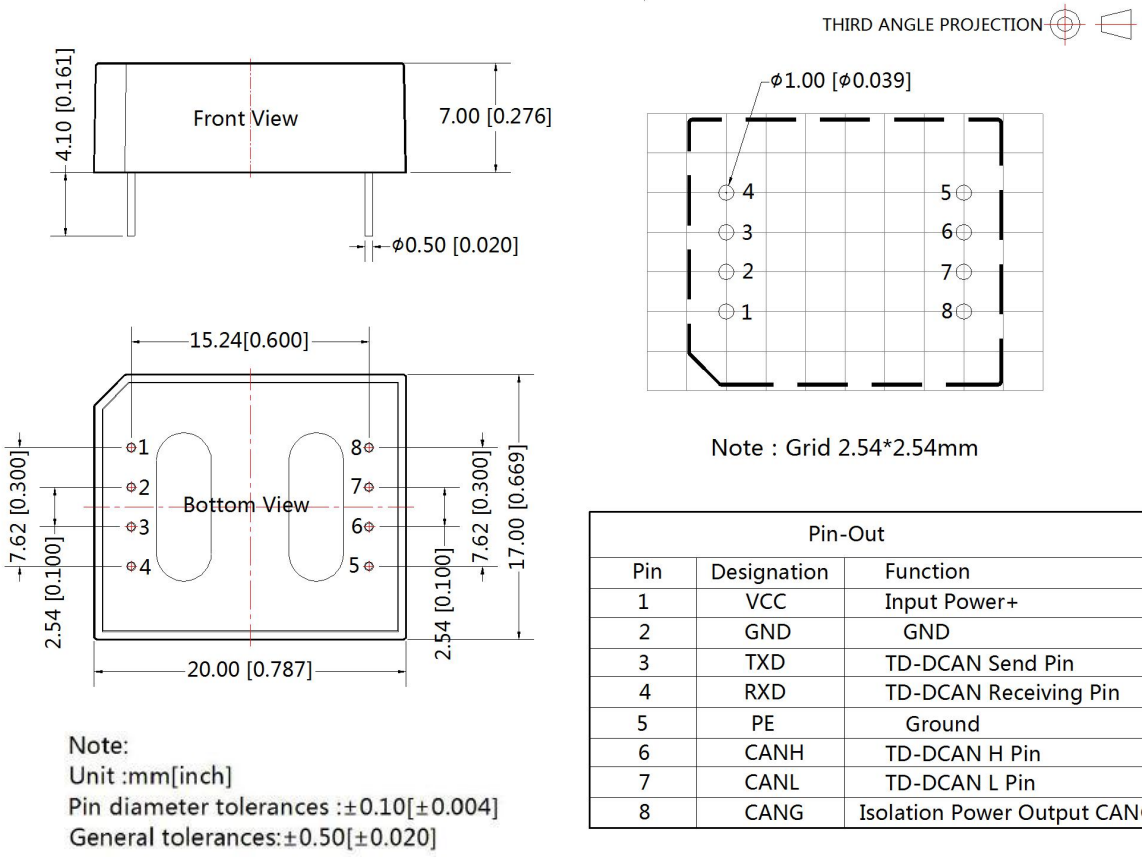
Fig.3

As shown in Figure 3, a single CAN-bus network allows connecting as many as 110 isolated single-channel TD_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.

3. For additional information, please refer to our application note on www.mornsun-power.com

Dimensions and Recommended Layout



Note:
Unit :mm[inch]
Pin diameter tolerances :±0.10[±0.004]
General tolerances:±0.50[±0.020]

Pin-Out		
Pin	Designation	Function
1	VCC	Input Power+
2	GND	GND
3	TXD	TD-DCAN Send Pin
4	RXD	TD-DCAN Receiving Pin
5	PE	Ground
6	CANH	TD-DCAN H Pin
7	CANL	TD-DCAN L Pin
8	CANG	Isolation Power Output CANG

Notes:

1. For additional information on Product Packaging please refer to www.mornsun-power.com. The Packaging bag number: 58040012;
2. 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;
3. All index testing methods in this datasheet are based on company corporate standards;
4. 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. For details, please contact our technical staff;
5. We can provide product customization service;
6. Products are related to laws and regulations: see "Features" and "EMC";
7. Our products shall be classified according to ISO14001 and related environmental laws and regulations, and shall be handled by qualified units.

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