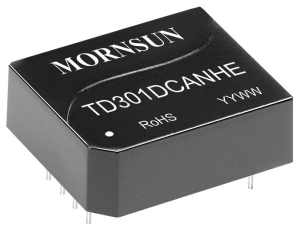


High surge protection CAN isolation transceiver module

FEATURES



RoHS



- Two-terminal isolation(2.5kVDC)
- High speed data rate: 1Mbps
- Operating temperature range:-40°C to +85°C
- Connect up to 110 nodes on one bus
- ESD: Contact  $\pm 8kV$ /Air $\pm 15kV$
- High surge protection:  $\pm 4kV$

TD301DCANHE / TD501DCANHE, the main function is to convert TTL / CMOS level to CAN bus differential level, to achieve signal isolation; is a use of IC integrated technology, set power isolation, signal isolation, CAN transceiver and bus protection in one CAN bus transceiver module, can achieve 2500VDC electrical isolation. The internal devices of TD301DCANHE / TD501DCANHE series, with low electromagnetic radiation and high resistance to electromagnetic interference, are highly integrated, It improves the protection ability of modules, and also simplifies the user of users. Products can be easily embedded in the user equipment, so that equipment can easily achieve CAN bus network connectivity.

Selection Guide

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

Limit Specifications

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 Welding Resistance Temperature	Welding spot is 1.5mm away from the casing, 10 seconds	--	--	300	°C

Input Specifications(3.3V series)

Item	Symbol	Min.	Typ.	Max.	Unit	
Power Supply Input Voltage	VCC	3.15	3.3	3.45	VDC	
TXD Logic Level	High-level	$V_{IH}$	0.7V <sub>CC</sub>	--		V <sub>CC</sub> +0.5
	Low-level	$V_{IL}$	0	--		0.8
RXD Logic Level	High-level	$V_{OH}$	V <sub>CC</sub> -0.4	V <sub>CC</sub> -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					

Input Specifications(5.0V series)

Item	Symbol	Min.	Typ.	Max.	Unit	
Power Supply Input Voltage	VCC	4.75	5	5.25	VDC	
TXD Logic Level	High-level	$V_{IH}$	0.7V <sub>CC</sub>	--		V <sub>CC</sub> +0.5
	Low-level	$V_{IL}$	0	--		0.8
RXD Logic Level	High-level	$V_{OH}$	V <sub>CC</sub> -0.4	V <sub>CC</sub> -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 Transmit Delay	tr	--	100	115	ns
	RXD Receive Delay	tr	--	100	135	
	Cycle Delay	t <sub>PRO(TXD-RXD)</sub>	--	200	250	
Dominant Timeout		--	1.5	5	mS	

### Output Specifications

Item	Symbol	Min.	Typ.	Max.	Unit	
Dominant Level (Logic 0)	CANH	V <sub>(OD)CANH</sub>	2.75	3.5	4.5	VDC
	CANL	V <sub>(OD)CANL</sub>	0.5	1.5	2	
Recessive Level (Logic 1)	CANH	V <sub>(OR)CANH</sub>	2	2.5	3	
	CANL	V <sub>(OR)CANL</sub>	2	2.5	3	
Differential Level	Dominant Level (Logic 0)	V <sub>diff(d)</sub>	1.5	2.5	3	
	Recessive Level (Logic 1)	V <sub>diff(r)</sub>	-0.05	0	0.05	
Bus Pin Maximum Withstand Voltage	V <sub>x</sub>	-7	--	+12		
Bus transient voltage	V <sub>trt</sub> , Meet ISO7637-3 standard	-150	--	+100		
Bus Pin Leakage Current	(VCC=0V, V <sub>CANH/L</sub> =5V)	-5	--	5	uA	
Differential load resistance	R <sub>L</sub>	45	60	65	Ω	
Differential Input Impedance	R <sub>diff</sub>	19	30	52	kΩ	
CAN Bus Interface	Meet ISO/DIS 11898-2 standard Twisted-pair output					

### General Specifications

Item	Operating Conditions	Value
Isolation Voltage	Testing for 1 minute, leakage current <1mA,	2.5kVDC
Insulation Resistance	Isolation voltage 500VDC	1000MΩ (input-output)
Operating Temperature		-40℃ to +85℃
Transportation and Storage Temperature		-50℃ to +125℃
Operating Humidity	Non-condensing	10%-90%

### Physical Specifications

Casing Material	WH8100-F
Dimensions	DIP8
Weight	3.8g(Typ.)
Cooling Method	Free air convection

### EMC Specifications

EMS	ESD	IEC/EN 61000-4-2	Contact ±8kV/Air±15kV (Bare component, Signal port)	Perf. Criteria B
	EFT	IEC/EN 61000-4-4	±2kV (Bare component, Signal port)	Perf. Criteria B
	Surge	IEC/EN 61000-4-5	±4kV (Bare component, Signal port)	Perf. Criteria B
	CS	IEC/EN 61000-4-6	3Vr.m.s (Bare component)	Perf. Criteria A

Notes: : \*These parameter is limited to the CAN communication interface:CANH, CANL or CANG; CAN interface floating ground during the test.

Application Precautions

1. Please read the instructions carefully before use; contact our technical support if you have any problem;
2. Do not use the product in hazardous areas;
3. Use DC power supply for the product and 220V AC power supply is prohibited;
4. Do not dismount and assemble the product without permission to avoid failure or malfunction of equipment;

After-sales service

1. Ex-factory inspection and quality control have been strictly conducted for the product; if there occurs abnormal operation or possibility of failure of internal module, please contact the local representative or our technical support;
2. The warranty period for the product is 3 years as calculated from the date of delivery. If any quality problem occurs under normal use within the warranty period, the product can be repaired or changed for free.

Applied circuit

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

Design Reference

1. Schematic diagram of surge circuit

In order to improve the surge protection capability of bare machine with interface of CAN transceiver, TD5(3)01DCANHE series add surge suppression circuit for CAN interface. It improves the surge protection capability of the module, and simplifies user' application

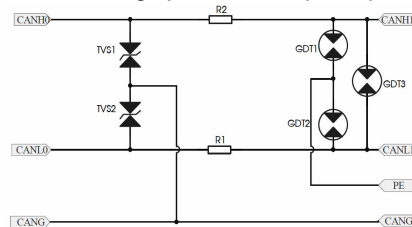


Fig. 1

2. Typical application circuit

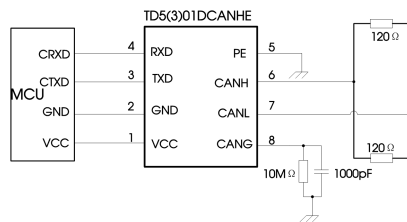


Fig. 2

In general, the module, which is properly connected to the power supply, CAN controller and CAN bus network interface, can be used directly by customers without adding peripheral circuits. Figure 1 shows a typical application circuit connection for a module.

Notes: The CAN controller logic level should be compatible with TD5(3)01DCANHE isolated CAN transceiver module.

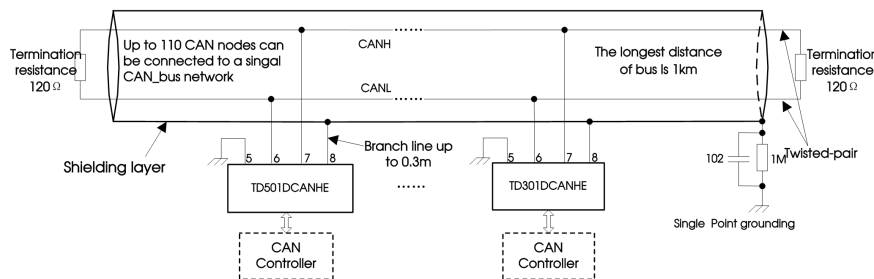


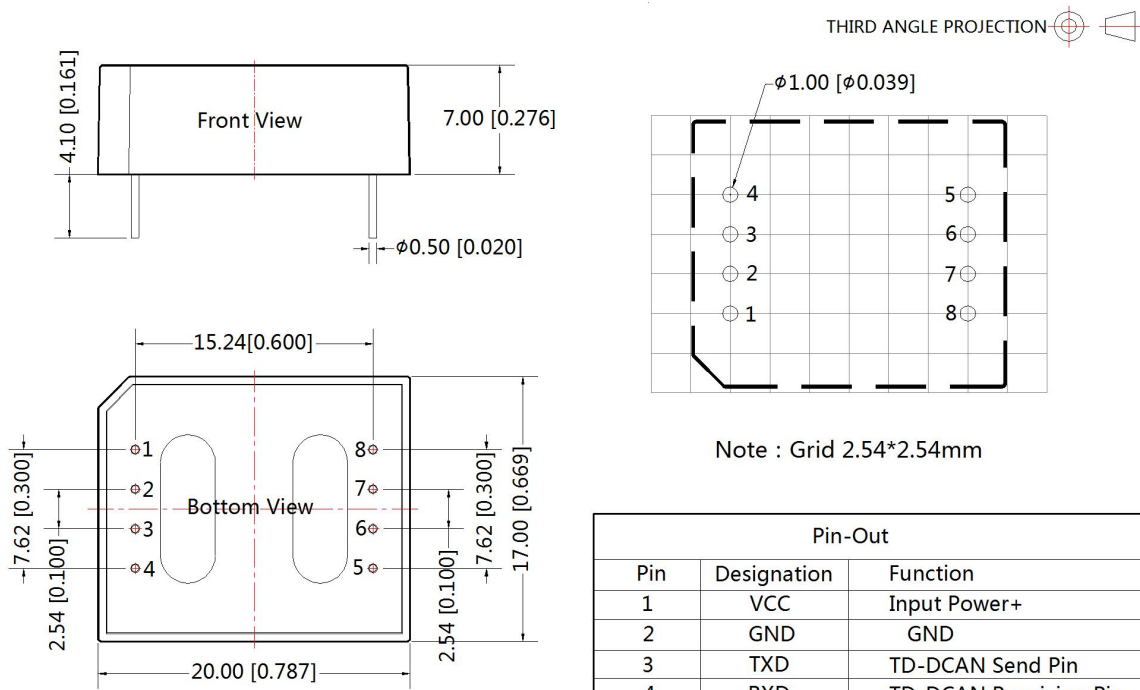
Fig. 3

As shown in Figure 2, a single CAN-bus network can connect up to 110 single-channel TD5(3)01DCANHE isolated CAN transceiver modules. The universal type module can support a max communication distance of 1km with baud rate beyond 20kbps. If looking to access more nodes or longer communication distance, it can be achieved by using CAN repeaters or other expansion equipment.

Notes: The communication distance of the bus is related to the communication speed and field application. It can be designed according to the actual application and reference standard. The communication cable is recommended to twisted pair or shielded twisted pair and should stay away from the interference source. For long-distance communication, the terminal resistance value needs to be selected according to the communication distance and the cable impedance and the number of nodes.

2. For more information, please find the application note on [www.mornsun-power.com](http://www.mornsun-power.com)

Dimensions and Recommended Layout



Note:  
Unit: mm[inch]  
Pin diameter tolerances:  $\pm 0.10[\pm 0.004]$   
General tolerances:  $\pm 0.25[\pm 0.010]$

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. Packing information please refer to Product Packing Information which can be downloaded from [www.mornsun-power.com](http://www.mornsun-power.com). Packing bag number: 58040012;
2. Unless otherwise specified, data in this datasheet should be tested under the conditions of  $T_a=25^\circ\text{C}$ , humidity<75%RH when inputting nominal voltage and outputting rated load;
3. All index testing methods in this datasheet are based on our Company's corporate standards;
4. The performance indexes of the product models listed in this datasheet are as above, but some indexes of non-standard model products will exceed the above-mentioned requirements, and please directly contact our technician for specific information;
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.

MORNSUN Guangzhou Science & Technology Co., Ltd.

Address: No. 5, Kehui St. 1, Kehui Development Center, Science Ave., Guangzhou Science City, Huangpu District, Guangzhou, P. R. China  
Tel: 86-20-38601850 Fax: 86-20-38601272 E-mail: sales@mornsun.cn