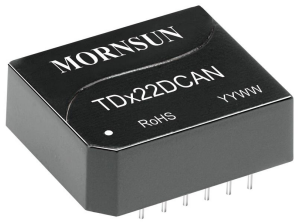
Duplex High Rate Isolation CAN Transceiver Module



RoHS CE 3 years Warranty

FEATURES

- Integrated high efficiency isolated DC/DC converter
- Two-port isolation (2.5kVDC) / Channel isolation (1.5kVDC)
- High baud rate up to 1Mbps
- Operating ambient temperature range: -40℃ ~ +105℃
- Complies with ISO 11898 standard
- An unpowered node does not disturb the bus lines
- The bus supports maximum 110 nodes
- Set isolation and ESD bus protection in one
- EN60950 approval

The TD322DCAN/ TD522DCAN 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 two-port isolation test voltage of 2500VDC and channel isolation test voltage of 1500VDC. 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)	Bus Maximum Voltage(V)	Number of Nodes
CE	TD322DCAN	3.3	40k-1M	37	70	±58	110
	TD522DCAN	5	40k-1M	42	60	±58	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 series 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}	0.7V_{CC}	--	3.6	
	Low-level	V_{IL}	0	--	0.8	
RXD Logic Level	High-level	V_{OH}	V_{CC}-0.4	3.1	--	
	Low-level	V_{OL}	0	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

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_{CC}	--	5.5	
	Low-level	V_{IL}	0	--	0.8	
RXD Logic Level	High-level	V_{OH}	V_{CC}-0.4	4.8	--	
	Low-level	V_{OL}	0	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	--	55	115	ns
	RXD Receiver Delay	t_R	--	65	135	
	Cycle Delay	$t_{PRO(TXD-RXD)}$	--	120	250	

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	2.25	
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	3	
	Recessive Level (Logic 1)	$V_{diff(r)}$	-0.05	0	0.05	
Bus Pin Maximum Withstand Voltage		V_X	-58	--	+58	
Bus Transient Voltage		V_{trf} , 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		Meets ISO/DIS 11898-2 standard Twisted-pair output				

General Specifications

Item	Operating Conditions	Value
Isolation Test	Electric Strength Test for 1 min., leakage current <1mA	Input-output: 2.5kVDC
		output-output: 1.5kVDC
Insulation Resistance	At 500VDC	1000MΩ
Operating Temperature		-40℃ ~ +105℃
Transportation and Storage Temperature		-50℃ ~ +125℃
Operating Humidity	Non-condensing	10% - 90%
Maximum temperature of the product	Ta=25℃, Free air convection	≤65℃
Safety Standard		EN60950
Safety Certification		EN60950
Safety Class		CLASS III
Application Environment		The presence of dust, severe vibration, shock and corrosive gas may cause damage to the product

Physical Specifications

Case Material	Black flame-retardant heat-proof plastic (UL94 V-0)
Dimensions	20.0 x 17.0 x 7.0 mm
Weight	4.2g(Typ.)
Cooling Method	Free air convection

Electromagnetic Compatibility (EMC)

Immunity	ESD	IEC/EN 61000-4-2	Contact ±4kV/Air ±8kV (without external components, signal port)	Perf. Criteria A
	RS	IEC/EN 61000-4-3	10V/m (without external components)	Perf. Criteria A
	EFT	IEC/EN 61000-4-4	±2kV (without external components, signal port)	Perf. Criteria B
	Surge	IEC/EN 61000-4-5	±2kV (without external components, signal port)	Perf. Criteria A
	CS	IEC/EN 61000-4-6	3Vr.m.s (without external components)	Perf. Criteria A

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. Typical application circuit

TD5(3)22DCAN

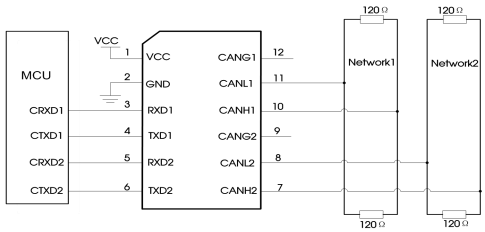


Fig.1

Figure 1 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)22DCAN.

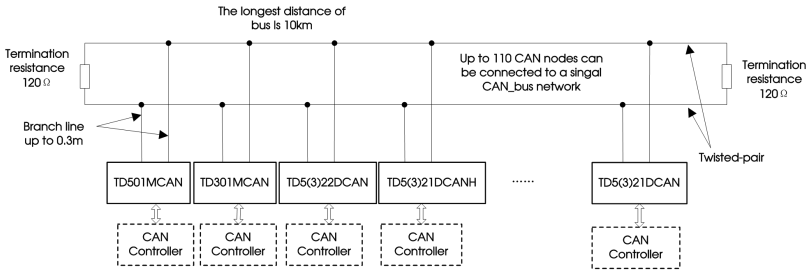


Fig.2

As shown in Figure 2, 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 40kbps. 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. If the dual-channel CAN Transceiver Module TD522DCAN or TD3322DCAN is be used, any channel's CAN-bus typical network can refer to Figure 2.

2. Recommended port protection circuit

TD5(3)22DCAN

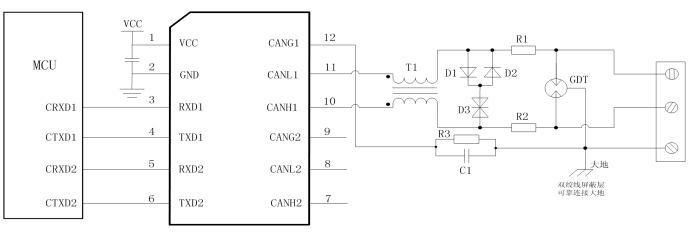


Fig.3

Note: Ground shield of twisted wire pair reliably.

Recommended components and values:

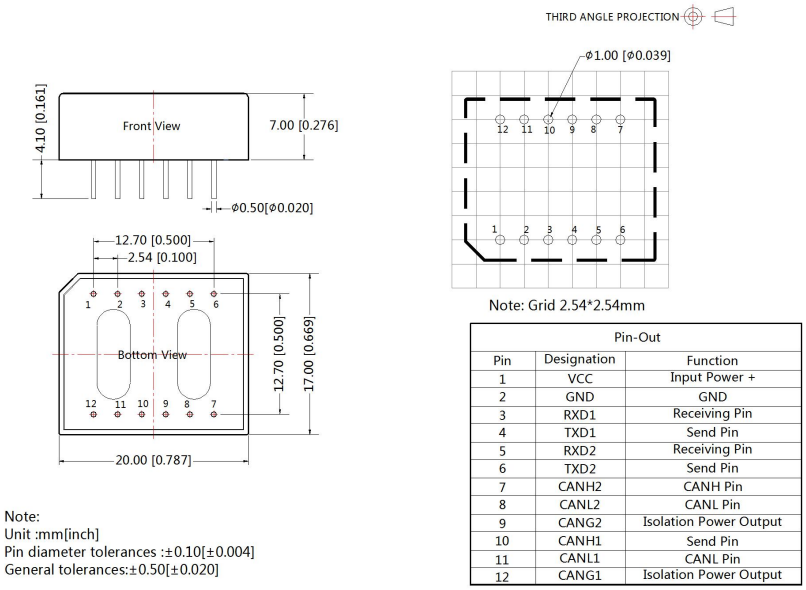
Component	Recommended part, value	Component	Recommended part, value
R3	1MΩ	R1, R2	2.7Ω/2W
C1	1nF, 2kV	D1, D2	1N4007
T1	ACM2520-301-2P	D3	SMBJ15CA
GDT	B3D090L		

When the module is used in applications with harsh environment, it can be susceptible to large energy like lightning strike, etc. in which case, it is essential to add an adequate protection circuit to the CAN signal ports to protect the system from failure and maintain a reliable bus communication. Figure 4 provides a recommended protection circuit design for high-energy lightning surges, with a degree of protection related to the selected protection device. Parameter description lists a set of recommended circuit parameters, which can be adjusted according to the actual application situation. Also, when using the shielded cable, the reliable single-point grounding of the shield must be achieved.

Note: The recommended components and values is a general guideline only and must be verified for the actual user's application. We recommended using PTC's for R1 and R2 and to use fast recovery diodes for D1 and D2.

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	RXD1	Receiving Pin
4	TXD1	Send Pin
5	RXD2	Receiving Pin
6	TXD2	Send Pin
7	CANH2	CANH Pin
8	CANL2	CANL Pin
9	CANG2	Isolation Power Output
10	CANH1	Send Pin
11	CANL1	CANL Pin
12	CANG1	Isolation Power Output

Notes:

1. For additional information on Product Packaging please refer to www.mornsun-power.com. The Packaging bag number: 58040014;
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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