Descriptions

Industrial Bus

RoHS

3 Years Warranty

CE Report EN62368-1

UKCA Report BS EN62368-1

Features

- Integrated high efficiency isolated DC/DC converter
- Two-port isolation (3kVDC)
- High baud rate up to 1Mbps
- Operating ambient temperature range: -40℃ to +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

Applications

- Industrial control
- Power
- Communication

Selection Guide

Certification	Part No.	Power input (VDC)	Baud Rate (bps)	Static Current (mA)	Maximum Operating Current(mA)	Bus Maximum Voltage(VDC)	Number of Nodes
EN/BS EN	TCANL301D	3.3	5k-1M	50	90	±30	110
	TCANL501D	5	5k-1M	35	80	±30	110

Specifications

Product feature	Item		Symbol	Min.	Typ.	Max.	Unit
Absolute Limits	Input Surge Voltage (1sec.max.)		3.3V series	-0.7	--	5	VDC
			5V 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		VCC	3.15	3.3	3.45	VDC
	TXD Logic Level	High-level	VIH	0.7VCC	--	VCC+0.5	
		Low-level	VIL	0	--	0.8	
	RXD Logic Level	High-level	VOH	VCC-0.4	VCC-0.2	--	
		Low-level	VOL	--	0.2	0.4	
	TXD Drive Current		IT	2	--	--	mA
	RXD Output Current		IR	--	--	10	
	Serial Interface		Standard CAN controller interface for +3.3V				
5V Series Input Specifications	Power Supply Input Voltage		VCC	4.75	5	5.25	VDC
	TXD Logic Level	High-level	VIH	0.7VCC	--	VCC+0.5	
		Low-level	VIL	0	--	0.8	
	RXD Logic Level	High-level	VOH	VCC-0.4	VCC-0.2	--	
		Low-level	VOL	--	0.2	0.4	
	TXD Drive Current		IT	2	--	--	mA
	RXD Output Current		IR	--	--	10	
	Serial Interface		Standard CAN controller interface for +5V				
Transmission Specifications	Data Delay	TXD Transmitter Delay	tT	--	60	115	ns
		RXD Receiver Delay	tR	--	70	135	
		Cycle Delay	tPRO(TXD-RXD)	--	130	250	
Output Specifications	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)	Vdiff(d)	1.5	2	3	
		Recessive Level (Logic 1)	Vdiff(r)	-0.12	0	0.05	
	Bus Pin Maximum Withstand Voltage		VX	-30	--	+30	
	Bus Transient Voltage		Vtrt , Meet ISO7637-3 standard	-200	--	+200	
	Load Resistance Differential		RL	50	60	65	Ω
	Input Impedance Differential		Rdiff	20	--	100	kΩ
	CAN Bus Interface		Meets ISO/DIS 11898-2 standard twisted-pair output				

General Specifications	Isolation Test	Electric strength test for 1 min., leakage current <1mA	3kVDC
	Insulation Resistance	At 500VDC	1000MΩ (input-output)
	Operating Temperature	-40℃ to +105℃	
	Transportation and Storage Temperature	-50℃ to +125℃	
	Operating Humidity	Non-condensing	10% - 90%
	Safety Class	CLASS III	
Mechanical Specifications	Case Material	Black flame-retardant heat-proof plastic (UL94 V-0)	
	Dimensions	DIP8	
	Weight	4.0g (Typ.)	
	Cooling Method	Free air convection	
Note: The Recessive level (Logic 1) is the no-load specification			

Electromagnetic Compatibility (EMC)

Emission	CE	CISPR32/EN55032 CLASS A (see Fig. 3)	
Immunity	ESD	IEC/EN 61000-4-2 Contact ±4kV (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 ±2kV (line to ground) (without external components, Signal port)	Perf. Criteria B
	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;

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.

Design Reference

1. Typical application circuit

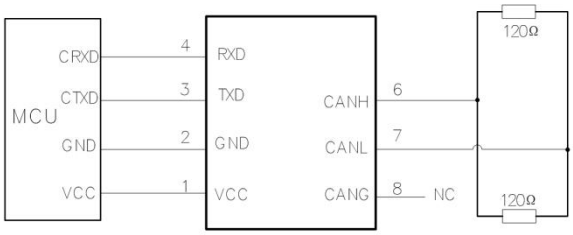


Fig. 1

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 TCANL5(3)01D.

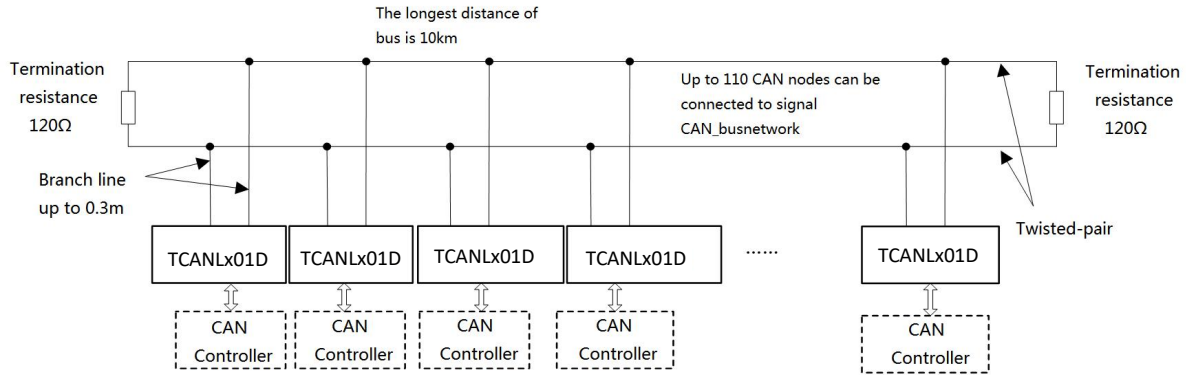


Fig.2

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.

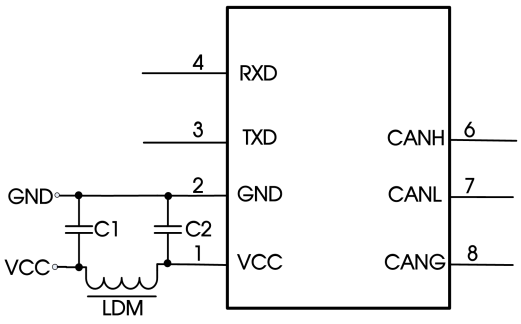


Fig. 3

Component	Recommended part, value
C1, C2	1uF/16V
LDM	CD43-12uH

2. Recommended port protection circuit

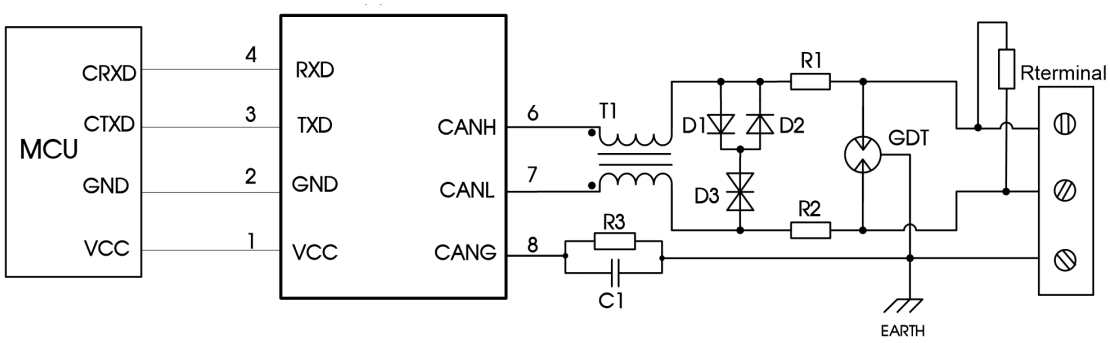


Fig.4

Note: Ground shield of twisted wire pair reliably.

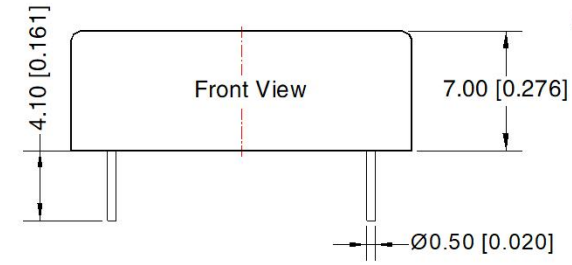
Recommended components and values:

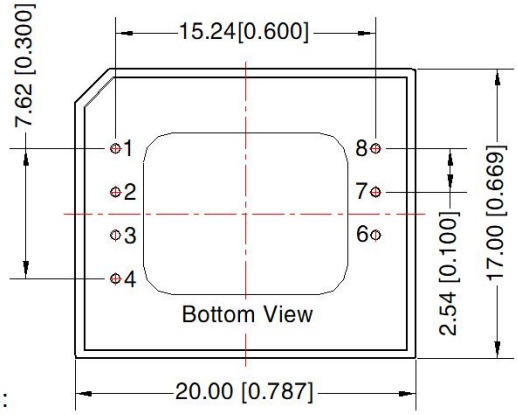
Component	Recommended part, value	Component	Recommended part, value
R3	1MΩ	R1, R2	2.7Ω/2W
C1	1nF, 2kV	D1, D2	1N4007
T1	ACM2520-301-2P	D3	SMBJ30CA
GDT	B3D090L	$R_{terminal}$	120Ω

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.

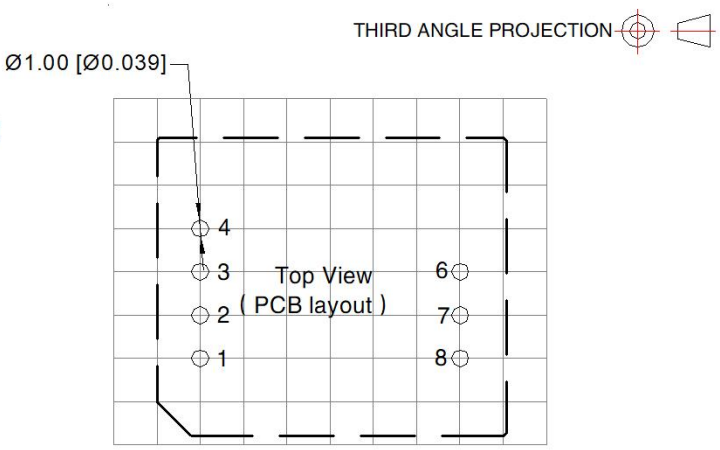
Note: The recommended components that will change the Specifications of Bus Pin Maximum Withstand Voltage by D3 and its values is a general guideline only. It must be verified for the actual user's application. We recommended using PTC's for R1 and R2 and to use fast recovery diodes for D1 and D2.

Dimensions and Recommended Layout





Note:
Unit: mm[inch]
Pin1/2/3/4/5/6/7/8 : Ø 0.5mm
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
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.