Descriptions Industrial Bus



RoHS

CE Report EN62368-1

UKCA Report BS EN62368-1

Features

- Ultra small package: 12.70 x 10.16 x 7.70（mm）
- Integrated high efficient isolated DC-DC converter
- Automatic send and receive data function
- Two-port isolation test voltage (2.5kVDC)
- High baud rate of up to 500kbps
- Operating ambient temperature range: -40℃ to +85℃
- The bus supports maximum 64 nodes
- Set isolation and ESD bus protection in one

Applications

- Industrial control
- Power
- Communication

Selection Guide

Certification	Part No.	Power input (VDC)	Baud rate (kbps)	Static Current (mA)	Max. Operating Current (mA)	Isolated Power Output (VDC)(typ.)	Number of Nodes
EN/BS EN	T485L301DM	3.15-3.45	500	22	90	5	64
	T485L501DM	4.75-5.25	500	18	70	5	64
	T485L301DMG	3.15-3.45	500	22	90	5	64
	T485L501DMG	4.75-5.25	500	18	70	5	64

Notes: *Product images are for reference only; the actual product shall prevail.

Specifications

Product feature	Item		Operating Conditions	Min.	Typ.	Max.	Unit
Absolute Limitsts	Input Surge Voltage (1sec.max.)		3.3V series	-0.7	--	5	VDC
			5.0V series	-0.7	--	7	
	Pin Soldering Temperature		Soldering time 10s max.	--	--	300	℃
3.3V Input Specifications	Power Supply Input Voltage		VCC	3.15	3.3	3.45	VDC
	TXD Logic Level	High-level	VIH	0.7VCC	3.3	3.6	
		Low-level	VIL	0	--	0.8	
	RXD Logic Level	High-level	VOH	VCC-0.4	VCC-0.2	--	
		Low-level	VOL	0	0.2	0.4	
	TXD Drive Current		IT	2	--	-	mA
	RXD Output Current		IR	--	--	10	
	Serial Interface		Compatible with + 3.3 V UART interface only				
5.0V Input Specifications	Power Supply Input Voltage		VCC	4.75	5	5.25	VDC
	TXD Logic Level	High-level	VIH	0.7VCC	5	5.5	
		Low-level	VIL	0	--	0.8	
	RXD Logic Level	High-level	VOH	VCC-0.4	VCC-0.2	--	
		Low-level	VOL	0	0.2	0.4	
	TXD Drive Current		IT	2	--	--	mA
	RXD Output Current		IR	--	--	10	
	Serial Interface		Compatible with + 5 V UART interface only				
Transmission Specifications	Data Delay	TXD Transmitter Delay	tT	--	180	--	ns
		RXD Receiver Delay	tR	--	120	--	
Output Specifications	Difference Level		Vdiff(d), No load	3	--	--	VDC
	Difference Input Impedance		-7V≤VCM≤+12V	96	--	--	kΩ
	Built-in Pull-down Resistor			--	24	--	
	Isolation Power Output Voltage①		Nominal input voltage	4.9	5	5.5	VDC
	Bus Interface Protection		ESD protection				

Truth Table Specifications					
	Transceiver Control	Input	Output		
	Send Status	TXD	A	B	RXD
		1	1	0	1
		0	0	1	1
	Receive Status	VA-VB	RXD		
		≥-20mV	1		
		≤-220mV	0		
		-220mV < VA-VB < -20mV	Undefined state		

General Specifications			
	Isolation Test	Electric Strength Test for 1 minute, leakage current <1mA	2500VDC
	Insulation Resistance	At 500VDC	1000MΩ (input-output)
	Operating Temperature	-40℃ to +85℃	

	Transportation and Storage Temperature	-50℃ to +105℃	
	Operating Humidity	Non-condensing	10% - 90%
	Safety Class	CLASS III	
Mechanical Specifications	Dimensions	DIP8	
	Weight	2.0g(Typ.)	
	Cooling Method	Free air convection	

Note:
① Isolated output power pins are for external pull-up, pull-down resistors only (recommended maximum current <25mA) and are not meant for any other purpose.

Electromagnetic Compatibility (EMC)

Emissions	CE	CISPR32/EN55032 CLASS A (see Fig. 3)	
Immunity	ESD	IEC/EN 61000-4-2 Contact ±4kV (A, B port)	Perf. Criteria B
		IEC/EN 61000-4-2 Contact ±8kV (see Fig.2, A, B port)	Perf. Criteria B
	EFT	IEC/EN 61000-4-4 ±2kV (see Fig.2, A, B port)	Perf. Criteria B
	Surge	IEC/EN 61000-4-5 ±2kV (Line to ground) (without external components, A, B port)	Perf. Criteria B
		IEC/EN 61000-4-5 ±4kV (see Fig.2, A, B port)	Perf. Criteria B
	CS	IEC/EN 61000-4-6 3Vr.m.s	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. AC power supply is prohibited;
4.It is strictly forbidden to disassemble the product privately in order to avoid product failure or malfunction;
5. If the external input of TXD is insufficient, the pull-up resistor should be added according to the situation;
6. Hot swapping is not supported.

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

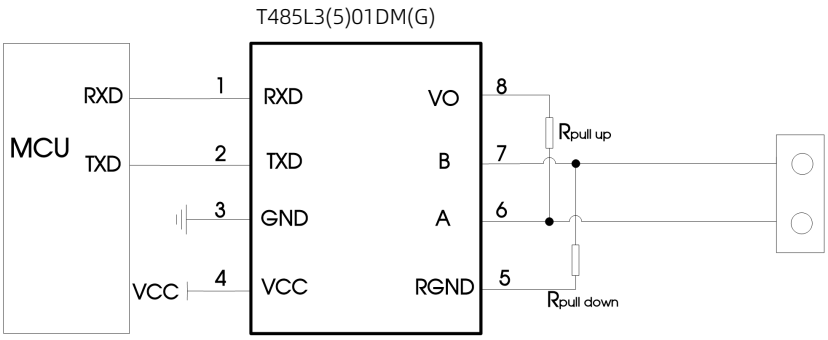


Fig. 1 Typical application

Figure 1 shows a typical connection circuit for the isolated transceiver module T485L301DM(G) and T485L501DM(G). The T485L501DM module's power supply must be 5V and match the module's TXD and RXD pin interface level of 5V (not supporting any 3.3V system levels). Accordingly, T485L301DM(G) module's power supply must be 3.3V and match the module's TXD and RXD pin interface level of 3.3V (not supporting any 5V system levels).

The module has a built-in 24kΩ pull-down resistor, which under normal circumstances meets the demand for the use of internal pull-up and pull-down resistors. Depending on the actual circuit, the use of additional external R pull-up and R pull-down resistor may be chosen.

2. Recommended EMC circuit

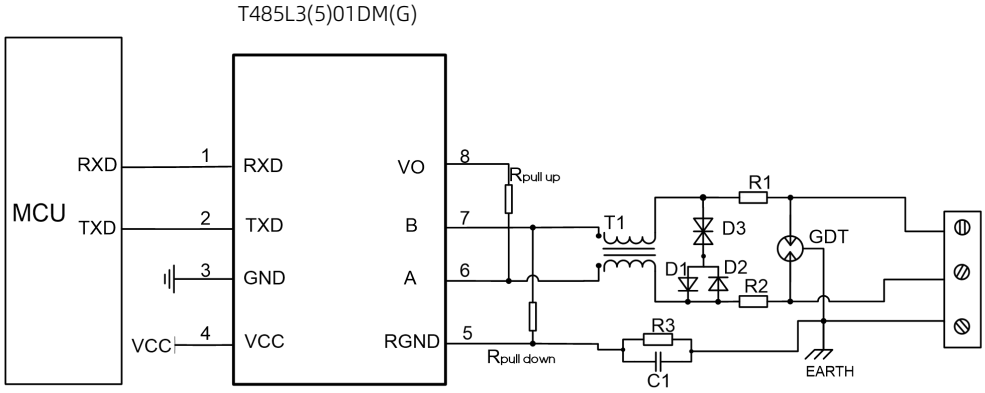


Fig. 2 Port protection circuit for harsh environments

Note: The twisted pair shield reliably connects to the earth.

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	SMBJ8.5CA
GDT	B3D090L	--	--

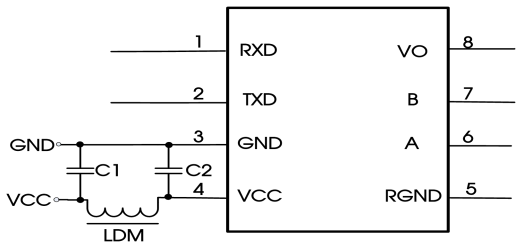


Fig. 3

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

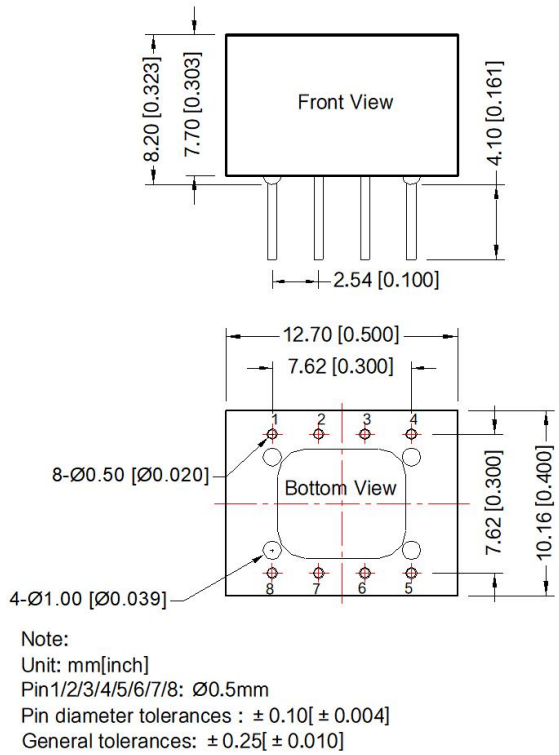
3. Precautions

1.T485L501DM(G) is for 5V TTL level only (not compatible with 3.3V TTL level); T485L301DM(G) is for 3.3V TTL level only (not compatible with 5V).

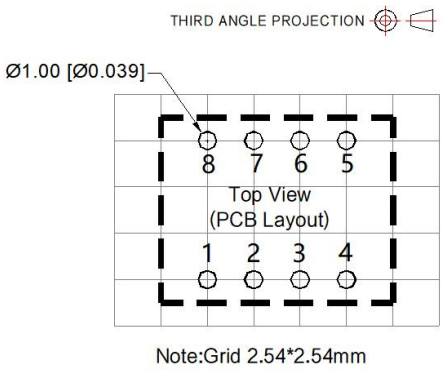
2.We recommend using a shielded twisted pair of wires for the Data transmission line and using same single point earth connection for each of the networks.

3. Reference the truth table characteristics: When the A / B line differential voltage of the series of embedded isolated RS-485 transceiver module is ≥ -20mV, the modules receiving level is high and when the A / B line differential voltage is ≤ -220mV the modules receiving level is low; the modules receiving level is undefined when the A / B line differential voltage is greater than -220mV but less than -20mV, so the design is to ensure that the module will not be receiving this state. Depending on the actual situation, it is up to the user of the RS-485 network design or application to decide whether to add a termination resistor. Avoiding data communication errors: Regardless if the RS-485 network is static or dynamic, it is essential to avoid that the differential voltage of A / B line ever comes between -220mV and -20mV.

Dimensions and Recommended Layout



Note:
Unit: mm[inch]
Pin1/2/3/4/5/6/7/8: Ø0.5mm
Pin diameter tolerances : ± 0.10[± 0.004]
General tolerances: ± 0.25[± 0.010]



Note:Grid 2.54*2.54mm

Pin-Out		
Pin	Mark	Mark
1	RXD	Receiving Pin
2	TXD	Send Pin
3	GND	GND
4	VCC	Input Power+
5	RGND	Isolation Power Output RGND
6	A	A Pin
7	B	B Pin
8	VO	Isolation Power Output

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;
6. The image certification marks are for reference only; please refer to the selection table for actual specifications. Certification is based on the physical mark or packaging label.