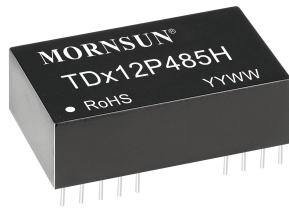


Dual high speed RS485 isolation transceiver
(Power distribution)



RoHS



FEATURES

- Integrated high efficient isolated DC-DC converter
- High baud rate of up to 200Kbps
- Two-port isolation test voltage(2.5kVDC)
- Operating ambient temperature range: -40°C to +85°C
- The bus supports maximum 32 nodes
- Set isolation and ESD bus protection in one

The main function of the TD312P485H/TD512P485H series is to convert a logic level signal into isolated RS485 differential level signals. The special integrated IC technology of the RS485 transceiver achieves isolation between the power supply and the signal lines isolation, does RS485 communication and protects the bus all in one and the same module. The product's isolated power supply withstands a test voltage of up to 2500VDC. Products can achieve function of RS485 two-port network connection. Also, they can easily be embedded in the user's end equipment, to achieve fully functional RS485 network connections.

Selection Guide

Certification	Part No.	Power input (VDC)	Baud rate (Kbps)	Static Current (mA)	Max. Operating Current (mA)	Isolated power output (typ.)(VDC)	Number of Nodes
--	TD312P485H	3.17-3.45	200	60	121	5	32
	TD512P485H	4.75-5.25	200	50	80	5	32

Input Specifications

Item	Operating Conditions	Value
Power Input	Static Current	TD312P485H≤60mA, TD512P485H≤50mA
	Send Current	TD312P485H≤121mA, TD512P485H≤80mA
Input	Serial Interface	TD512P485H Compatible with + 3.3V UART interface only
		TD312P485H Compatible with + 5V UART interface only
	Pin Current	I _{TXD} ≤2mA; I _{RXD} ≤2 mA; I _{CON} ≤5mA

Bus Interface

Item	Operating Conditions	Value
Output Port	RS485 Bus Interface	Standard RS485 interface, pull-up and pull-down resistors with 4.7kΩ each on A and B channels.
	Isolated Power Output	20mA Nominal 5V, ≤0.15W

Transmission Specifications

Item	Operating Conditions	Value																				
Data Rate		200Kbps (max.)																				
Transceiver Switching Delay		≤30us																				
Number of Nodes		Up to 32 nodes connected on one bus																				
Transceiver Control		Refer to below truth table																				
Truth Table	Sending Status	<table border="1"> <thead> <tr> <th colspan="2">Input</th> <th colspan="3">Output</th> </tr> <tr> <th>CON</th> <th>TXD</th> <th>A</th> <th>B</th> <th>Line state</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>1</td> <td>1</td> <td>0</td> <td>Normal</td> </tr> <tr> <td>0</td> <td>0</td> <td>0</td> <td>1</td> <td>Normal</td> </tr> </tbody> </table>	Input		Output			CON	TXD	A	B	Line state	0	1	1	0	Normal	0	0	0	1	Normal
		Input		Output																		
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		Input		Output																		
		CON	A-B	RXD																		
1		≥-10mV	1																			
1	≤-200mV	0																				
1	-200mV < V _A -V _B < -10mV	Undefined state																				

Note: ①Receiving threshold varies with V_{cc} will produce subtle error.

General Specifications

Item	Operating Conditions	Value
Electric Isolation		Two- port isolation (input and output are mutually isolated)
Isolation Test	Electric Strength Test for 1 min., leakage current <5mA	2.5kVDC
Operating Temperature		-40°C to +85°C
Transportation and Storage Temperature		-50°C to +105°C
Operating Humidity		10% - 90%
Casing Temperature Rise	Ta=25°C	25°C (Typ.)
Application Environment		The presence of dust, severe vibration, shock and corrosive gas may cause damage to the product

Mechanical Specifications

Case Material	Black flame-retardant heat-proof plastic (UL94-V0)
Package	DIP24
Dimensions	31.80*20.30*9.50 mm
Weight	11g(Typ.)
Cooling Method	Free air convection

Electromagnetic Compatibility (EMC)

Emissions	CE	CISPR32/EN55032	CLASS A (see Fig.2-②)		
	RE	CISPR32/EN55032	CLASS A (see Fig.2-②)		
Immunity	ESD	IEC/EN61000-4-2	Contact ±4kV		perf. Criteria B
			EFT	IEC/EN61000-4-4	±2kV (Power supply port) (see Fig.2-①)
	IEC/EN61000-4-4	±1kV (Signal port) (see Fig.2-③)			perf. Criteria B
	Surge	IEC/EN61000-4-5	±1kV (Power supply port) (see Fig.2-①)	perf. Criteria B	
			±0.25kV/±0.5kV (Signal port) (see Fig.2-③)	perf. Criteria B	
			±0.5kV/±1kV (Signal port) (see Fig.2-③)	perf. Criteria B	
			±1kV/±2kV (Signal port) (see Fig.2-③)	perf. Criteria B	
			±2kV/±4kV (Signal port) (see Fig.2-③)	perf. Criteria B	
±4kV/±6kV (Signal port) (see Fig.2-③)	perf. Criteria B				

Application Precautions

- Carefully read and follow the instructions before use; contact our technical support if you have any question;
- Do not use the product in hazardous areas;
- Use only DC power supply source for this product. 220V AC power supply is prohibited;
- It is strictly forbidden to disassemble the product privately in order to avoid product failure or malfunction.

After-sales service

- 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;
- 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 *RS485 Isolated Industrial Bus Interface Module Application Manual*.

Design Reference

1. Typical application circuit

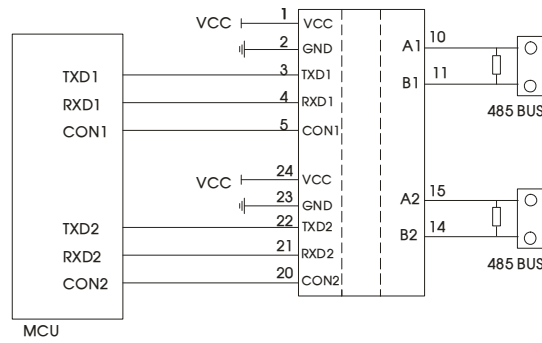


Fig. 1

Note: 1 pin and 24 pin are internal connected, 23 pin and 2 pin are internal connected.

2. Recommended port protection circuit

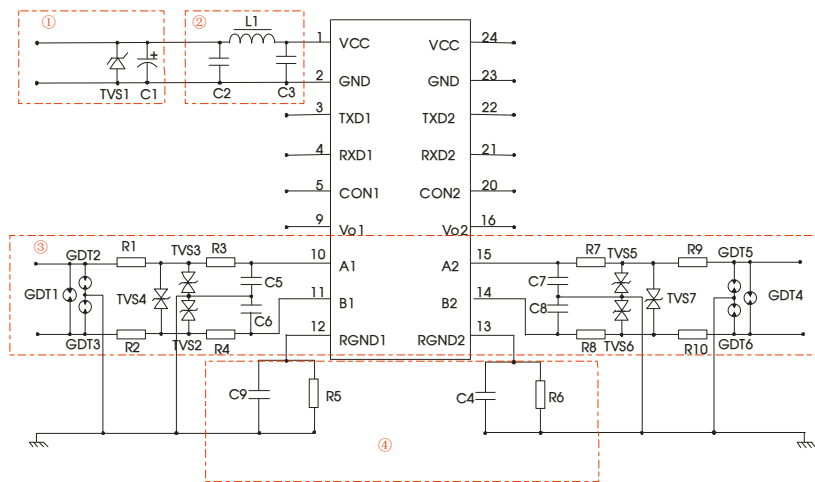


Fig. 2

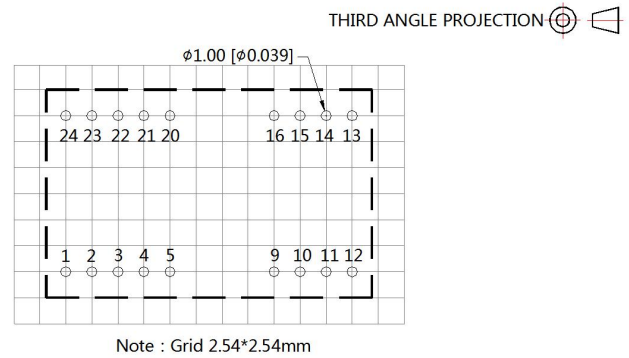
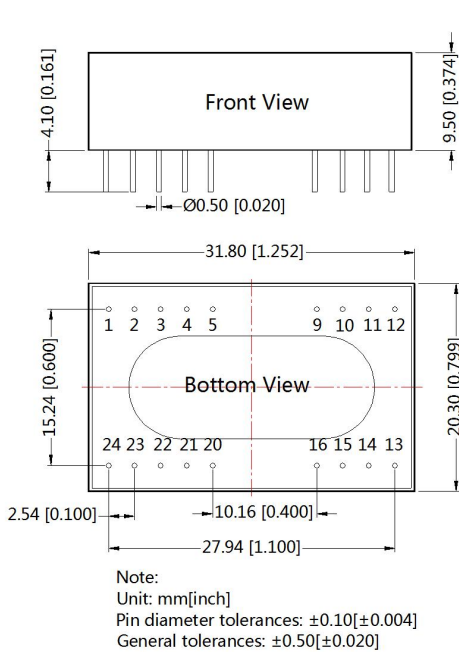
Recommended components and values:

Model	TD312P485H / TD512P485H				
	$\pm 0.25\text{kV}/\pm 0.5\text{kV}$	$\pm 0.5\text{kV}/\pm 1\text{kV}$	$\pm 1\text{kV}/\pm 2\text{kV}$	$\pm 2\text{kV}/\pm 4\text{kV}$	$\pm 4\text{kV}/\pm 6\text{kV}$
C1	220uF/10V(Electrolytic capacitor)		220uF/10V(Electrolytic capacitor)		
TVS1	SMCJ5.0A (TD312P485H) / SMCJ6.5A(TD512P485H)				
C2/C3	1uF/50V		1uF/50V		
L1	10uH		10uH		
C5/C6/C7/C8	100pF/100V		100pF/100V		
C4/C9	1nF/2kV		1nF/2kV		
R5/R6	1M Ω		1M Ω		
TVS2/TVS3/TVS4	SMBJ15CA		SMBJ15CA		
TVS5/TVS6/TVS7	SMBJ15CA		SMBJ15CA		
R1/R2/R9/R10	--	--	10 Ω /2W(Wire-wound resistor)	10 Ω /2W(Wire-wound resistor)	10 Ω /2W(Wire-wound resistor)
R3/R4/R7/R8	10 Ω /1W(Wire-wound resistor)	10 Ω /2W(Wire-wound resistor)	--	--	--
GDT1/GDT2/GDT3	--	--	G30-A90X	S30-A90X	S50-A90X
GDT4/GDT5/GDT6	--	--	G30-A90X	S30-A90X	S50-A90X

Notes: GDT1/GDT2/GDT3 can be replaced by a three terminal gas discharge tube, the same as GDT4/GDT5/GDT6. For example, GDT1/GDT2/GDT3 and GDT4/GDT5/GDT6 can be replaced by B3D090L-C.

3. For more information please find the application notes on www.mornsun-power.com

Dimensions and Recommended Layout



Pin-Out					
Pin	Designation	Function	Pin	Designation	Function
1,24	VCC	Input Power +	11	B1	Channel1 B Pin
2,23	GND	GND	12,13	RGND	Isolation Power Output RGND
3	TXD1	Channel1 TD_P485 Send Pin	14	B2	Channel 2 B Pin
4	RXD1	Channel1 TD_P485 Receiving Pin	15	A2	Channel 2 A Pin
5	CON1	Channel1 Send&Receiving Control Pin	20	CON2	Channel2 Send&Receiving Control Pin
9,16	Vo	Isolation Power Output +5V	21	RXD2	Channel2 TD_P485 Receiving Pin
10	A1	Channel 1 A Pin	22	TXD2	Channel2 TD_P485 Send Pin

Notes:

1. For additional information on Product Packaging please refer to www.mornsun-power.com. The Packaging bag number: 58210008;
2. Unless otherwise specified, parameters in this datasheet were measured under the conditions of $T_a=25^{\circ}\text{C}$, 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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