

Dual RS485 Isolation transceiver module (Power distribution)



FEATURES

- Integrated high efficient isolated DC-DC converter
- High baud rate of up to 9600bps
- 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 TD312P485/TD512P485 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 and the 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 (bps)	Static Current (mA)	Max. Operating Current (mA)	Isolated power output (typ.)(VDC)	Number of Nodes
--	TD312P485	3.17-3.45	9600	45	120	5	32
	TD512P485	4.75-5.25	9600	35	80	5	32

Input Specifications

Item	Operating Conditions	Value
Power Input	Static Current	TD512P485≤35mA, TD312P485≤45mA
	Send Current	TD512P485≤80mA, TD312P485≤120mA
Input	Serial Interface	TD312P485 Compatible with + 3.3V UART interface only
	Pin Current	TD512P485 Compatible with + 5V UART interface only
		I _{TXD} ≤2mA; I _{RXD} ≤2 mA; I _{CON} ≤5mA

Bus Interface

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

Transmission Specifications

Item	Operating Conditions	Value				
Data Rate		9600bps (max.)				
Transceiver Switching Delay		30us -100us Delay time (typ. to max.) for transition from sending data (receiving data) to receiving data (sending data)				
Number of Nodes		Up to 32 nodes connected on one bus				
Transceiver Control		Refer to below truth table				
Truth Table	Sending status	Input		Output		
		CON	TXD	A	B	Line state
		0	1	1	0	Normal
		0	0	0	1	Normal
	Receiving status ^①	Input		Output		
		CON	A-B	RXD		
		1	≥-20mV	1		
		1	≤-220mV	0		
1	-220mV < V _A -V _B < -20mV	Undefined state				

Note: ①Receiving threshold varies with Vcc will produce subtle error.

General Specifications

Item	Operating Conditions	Value
Electric Isolation		Two-terminal isolation (input and output are mutually isolated)
Isolation Test	Electric Strength Test for 1 min., leakage current <5mA	2500VDC
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)	perf. Criteria B
		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
±4kV/±6kV (line to ground) (Signal port) (see Fig.2-③)			perf. Criteria B	

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.

Applied circuit

Refer to the *RS485 Isolated Industrial Bus Interface Module Application Manual*.

Design Reference

1. Typical application circuit

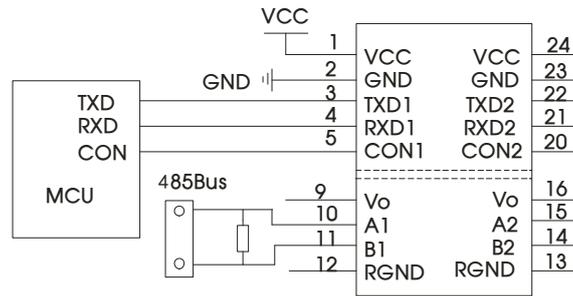


Fig. 1

Note: The connecting of 2 channel and 1 channel are the same; Input/output power of 1 channel and 2 channel are internal connected

2. Recommended port protection circuit

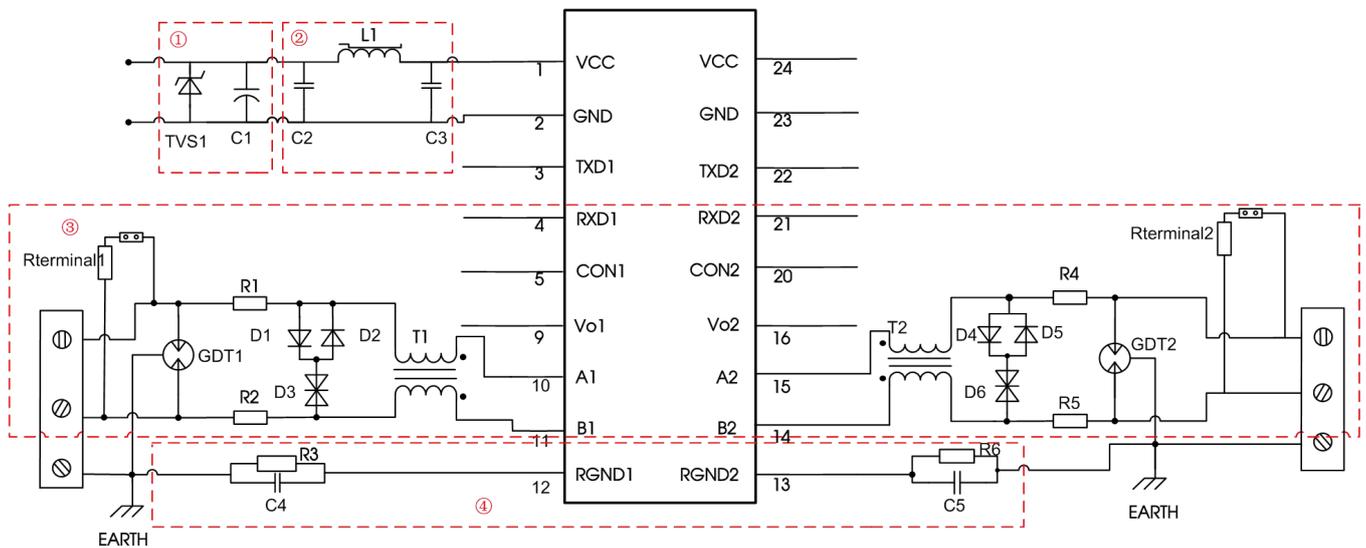


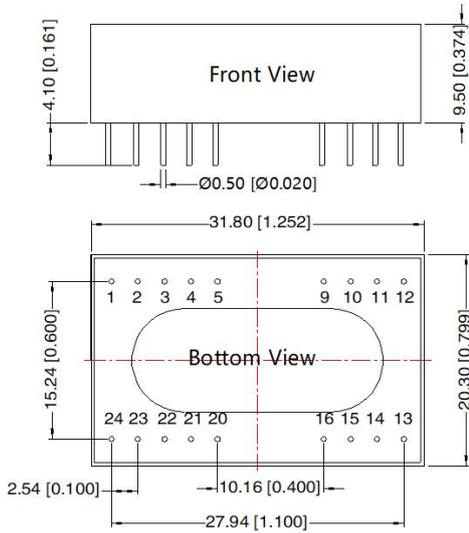
Fig. 2

Recommended components and values:

Component	Recommended part, value	Component	Recommended part, value
C1	220uF/10V(Electrolytic capacitor)	TVS1	SMCJ5.0A (TD312P485H) / SMCJ6.5A(TD512P485H)
C2, C3	1uF/50V	L1	10uH
R3, R6	1M Ω	R1, R2, R4, R5	2.7 Ω /2W
C4, C5	1nF, 2kV	D1, D2, D4, D5	1N4007
T1, T2	ACM2520-301-2P	D3, D6	SMBJ8.5CA
GDT1, GDT2	B3D090L	Rterminal1 Rterminal2	120 Ω

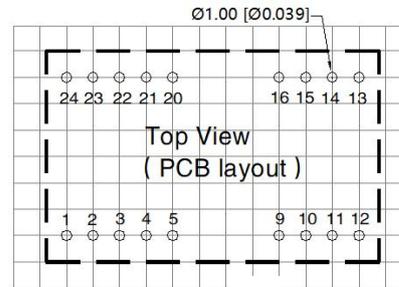
3. For additional information, please refer to our application note on www.mornsun-power.com

Dimensions and Recommended Layout



Note:
Unit: mm[inch]
Pin diameter tolerances: $\pm 0.10 [\pm 0.004]$
General tolerances: $\pm 0.50 [\pm 0.020]$

THIRD ANGLE PROJECTION



Note: Grid 2.54*2.54mm

Pin-Out					
Pin	Mark	Function	Pin	Mark	Function
1,24	VCC	Input Power +	12	RGND1	Channel 1 Isolation Power Output RGND
2,23	GND	GND	13	RGND2	Channel 2 Isolation Power Output RGND
3	TXD1	Channel 1 TD_P485H Sending Pin	14	B2	Channel 2 B Pin
4	RXD1	Channel 1 TD_P485H Receiving Pin	15	A2	Channel 2 A Pin
5	CON1	Channel 1 Sending&Receiving Control Pin	16	Vo2	Channel2 Isolation Power Output +5V
9	Vo1	Channel 1 Isolation Power Output +5V	20	CON2	Channel2 Sending&Receiving Control Pin
10	A1	Channel 1 A Pin	21	RXD2	Channel2 TD_P485H Receiving Pin
11	B1	Channel 1 B Pin	22	TXD2	Channel1 TD_P485H Sending Pin

Notes:

- For additional information on Product Packaging please refer to www.mornsun-power.com. The Packaging bag number: 58210008;
- 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;
- All index testing methods in this datasheet are based on company corporate standards;
- 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;
- We can provide product customization service;
- Products are related to laws and regulations: see "Features" and "EMC";
- 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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