Single high speed RS485 isolation transceiver module

UL 60950-1 EN62368-1

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℃ to +85℃
- The bus supports maximum 32 nodes
- Set isolation and ESD bus protection in one

The main function of the TD301D485H / TD501D485H 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. 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)	Number of Nodes
UL/EN	TD301D485H	3.15-3.45	200	20	130	32
	TD501D485H	4.75-5.25	200	20	130	32

Input Specifications

Item		Operating Conditions	Value
Power Input	Static Current	Power on, no communication	≤20mA
	Send Current	200kbps Square wave communication	≤130mA
Input	Serial Interface	TD301D485H	Compatible with + 3.3 V UART interface only
		TD501D485H	Compatible with + 5V UART interface only
	Pin Current		Input characteristics I_{TXD}≤2mA; I_{RXD}≤2mA; I_{CON}≤5mA

Bus Interface

Item		Operating Conditions	Value
Output	RS485 Bus Interface		Standard RS485 interface, pull-up and pull-down resistors with 5.1kΩ each on A and B channels.

Transmission Specifications

Item	Operating Conditions	Value				
Data Rate		200kbps (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 status①	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℃ to +85℃
Transportation and Storage Temperature		-50℃ to +105℃
Operating Humidity	Non-condensing	10%RH - 90%RH
Temperature Rising	Ta=25℃	≤50℃
Application Environment		The presence of dust, severe vibration, shock and corrosive gas may cause damage to the product
Safety Standard		UL60950-1 Approval & EN62368-1 (Report)
Safety Class		CLASS III

Mechanical Specifications

Case Material	Black flame-retardant heat-proof plastic (UL94-V0)
Dimensions	DIP10
Weight	4.0g(Typ.)
Cooling Method	Free air convection

Electromagnetic Compatibility (EMC)

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

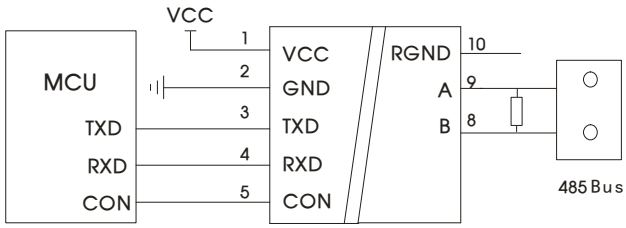


Fig. 1

2.Recommended EMC circuit

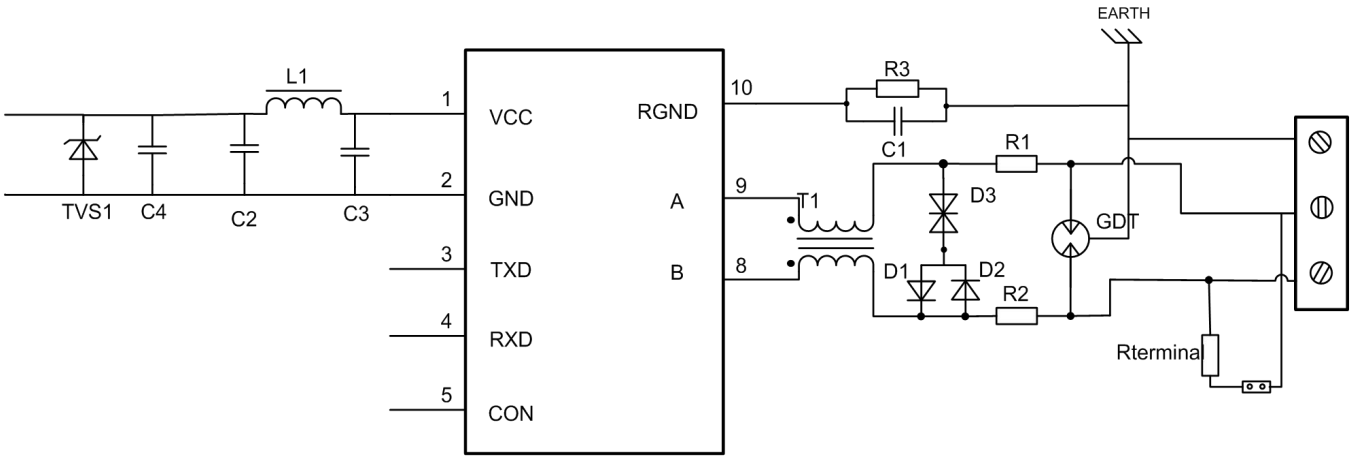


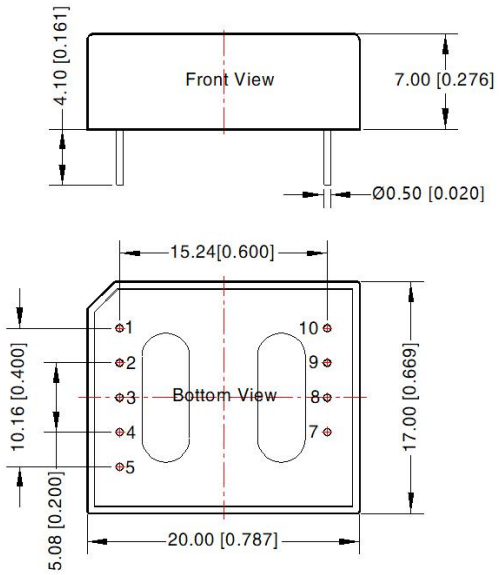
Fig. 2

Recommended components and values:

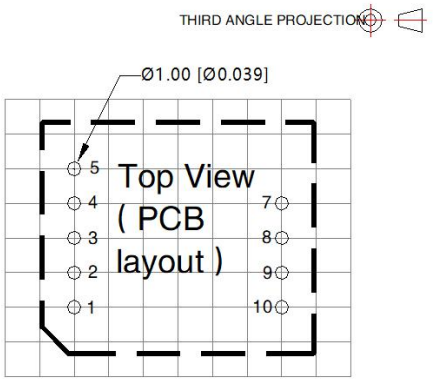
Component	Recommended part, value	Component	Recommended part, value
R3	1MΩ	R1, R2	2.7Ω/2W
C1	1nF, 2kV	D1, D2	1N4007
T1	ACM2520-301-2P	D3	SMBJ8.5CA
GDT	B3D090L	Rterminal	120Ω
C2/C3	1uF/50V	L1	10uH
TVS1	SMCJ5.0A (TD301D485H) / SMCJ6.5A(TD501D485H)		
C4	220uF/10V(Electrolytic capacitor)		

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]



Note: Grid 2.54*2.54mm

Pin-Out		
Pin	Mark	Function
1	VCC	Input Power
2	GND	GND
3	TXD	TD_D485H Sending Pin
4	RXD	TD_D485H Receiving Pin
5	CON	Sending&Receiving Control Pin
7	Vo	Isolation Power Output +5V
8	B	TD_D485H BPin
9	A	TD_D485H APin
10	RGND	Isolation Power Output RGND

Notes:

1. For additional information on Product Packaging please refer to www.mornsun-power.com. The Packaging bag number: 58040012;
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, please contact our technicians directly for specific information;
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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