MORNSUN®

Single high speed RS485 isolation transceiver module

CE Report EN62368-1 RoHS

3 years Warranty

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 TD5(3)01D485H(G)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
EN	TD301D485H	3.15-3.45	200	20	130	32
	TD501D485H	4.75-5.25	200	20	130	32
--	TD301D485HG	3.15-3.45	200	20	130	32
--	TD501D485HG	4.75-5.25	200	20	130	32

3.3V Input Specifications

Item		Symbol	Min.	Typ.	Max.	Unit
Power Supply Input Voltage		V_{CC}	3.15	3.3	3.45	VDC
TXD Logic Level	High-level	V_{IH}	0.7V_{CC}	3.3	3.6	
	Low-level	V_{IL}	0	--	0.8	
RXD Logic Level	High-level	V_{OH}	V_{CC}-0.4	3.1	--	
	Low-level	V_{OL}	0	0.2	0.4	
Pin Current		ITXD≤2mA; IRXD≤2mA; ICON≤5mA				
Serial Interface		Compatible with + 3.3 V UART interface only				

5V Input Specifications

Item		Symbol	Min.	Typ.	Max.	Unit
Power Supply Input Voltage		V_{CC}	4.75	5	5.25	VDC
TXD Logic Level	High-level	V_{IH}	0.7V_{CC}	5	5.5	
	Low-level	V_{IL}	0	--	0.8	
RXD Logic Level	High-level	V_{OH}	V_{CC}-0.4	4.8	--	
	Low-level	V_{OL}	--	0.2	0.4	
Pin Current		ITXD≤2mA; IRXD≤2mA; ICON≤5mA				
Serial Interface		Compatible with + 5 V UART interface only				

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		Delay time of switching from receiving (sending) data to sending (receiving) data: typically 30us, maximum 100us .				
Number of Nodes		Up to 32 nodes connected on one bus				
Transceiver control		CON pin low level: sending data, CON pin high level: receiving data				
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.

OutputSpecifications

Item	Symbol	Min.	Typ.	Max.	Unit
Difference Level	Vdiff(d), RL=54Ω	1.5	2	--	VDC
Difference load resistance		54	--	--	Ω
Difference Input Impedance	-7V≤VCM≤+12V	96	--	--	kΩ
Bus Interface Protection		ESD protection			

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	2.5kVDC
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 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 Fig.2)		
	RE	CISPR32/EN55032	CLASS A (see Fig.2)		
Immunity	ESD	IEC/EN61000-4-2	Contact ±4kV		perf. Criteria B
	EFT	IEC/EN61000-4-4	±2kV (Power supply port)	(see Fig.2)	perf. Criteria B
		IEC/EN61000-4-4	±1kV (Signal port)	(see Fig.2)	perf. Criteria B
	Surge	IEC/EN61000-4-5	±1kV (Power supply port)	(see Fig.2)	perf. Criteria B
			±4kV (Line to ground) (Signal port)	(see Fig.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

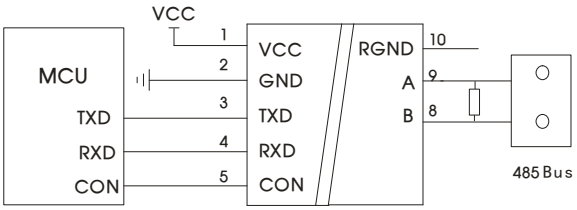


Fig. 1

2. Recommended EMC circuit

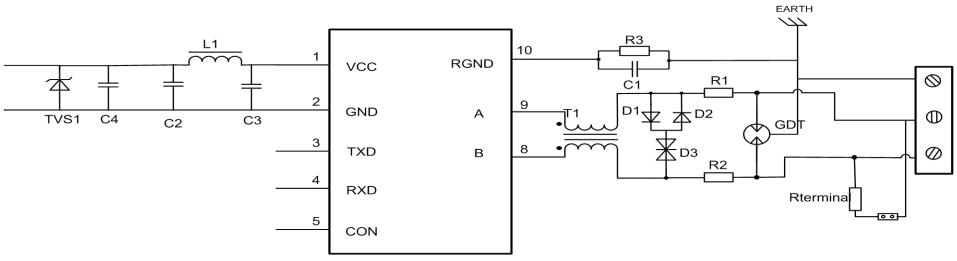


Fig. 2

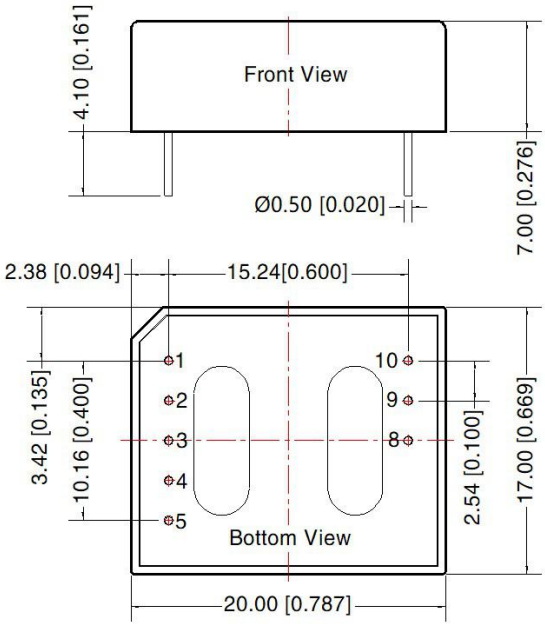
Recommended components and values:

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	$R_{terminal}$	120Ω
C2/C3	1uF/50V	L1	10uH
TVS1	SMCJ5.0A (TD301D485H(G)) / SMCJ6.5A(TD501D485H(G))		
C4	220uF/10V(Electrolytic capacitor)		

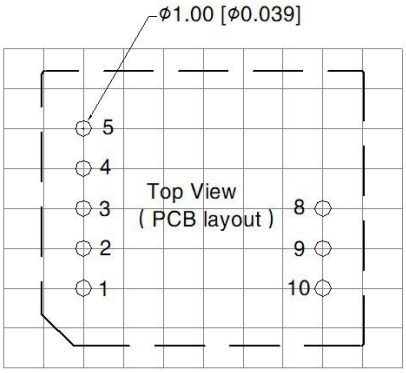
3. For additional information, please refer to our application note on www.mornsun-power.com

Design Reference

THIRD ANGLE PROJECTION



Note:
Unit: mm[inch]
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	TD_D485H Sending Pin
4	RXD	TD_D485H Receiving Pin
5	CON	Sending&Receiving Control Pin
8	B	TD_D485H B Pin
9	A	TD_D485H A Pin
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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