

single high speed high isolation RS485 isolation transceiver module



RoHS

FEATURES

- High baud rate up to 115200bps
- Integrated Isolated DC/DC converter
- Bus protection
- Two-terminal isolation: 3.75kVAC
- Operating temperature range: -40°C to +85°C
- The bus is able to support 32 nodes at maximum
- EN60950 approval

TDH301D485H/TDH501D485H series are transceiver isolation module with integrated power isolation, electrical isolation, and RS485 interface bus protector; The traditional isolation RS485 circuits uses a piece of power isolation module, three optocouplers and RS485 transceiver chip to realize the application. Now only a RS485 transceiver module can realize the functions. Simplify the customers on the isolation requirements of the design; Products can be easily embedded in the user equipment, achieve function of RS485 network connection.

Selection Guide

Certification	Part No.	Power Supply input (VDC)
CE	TDH301D485H	3.17-3.45
	TDH501D485H	4.75-5.25

Input Specifications

Item	Operating Conditions		Value
Power Input	Static Current	Products powered on, no communication	TDH301D485H ≤50mA
			TDH501D485H ≤40mA
	Send Current	115200bps Square wave communication	TDH301D485H ≤100mA
			TDH501D485H ≤80mA
Single Input	Serial Interface	TDH301D485H	Compatible with + 3.3 V UART interface only
		TDH501D485H	Compatible with + 5 V UART interface only
	Pin Current		I _{TXD} ≤ 2mA; I _{RXD} ≤ 2mA; I _{CON} ≤ 5mA

Bus Interface

Item	Operating Conditions		Value
Output	RS485 Bus Interface		Standard RS485 interface. A, B bus built-in 5.1k of the pull-down resistor

Transmission Specifications

Item	Operating Conditions		Value			
Transmission Rate			115200bps (max.)			
Handoff Delay			≤30us			
Number of Nodes			The bus is able to support 32 nodes at maximum			
Transceiver Control			Contrary to common RS485 transceiver control level			
Truth Table	Send Status	Control	Input	Output		
		CON	TXD	A	B	Line state
		0	1	1	0	Normal
		0	0	0	1	Normal
	Receive Status	Control	Input	Output		
		CON	A-B	RXD		
		1	≥0.2V	1		
		1	≤-0.2V	0		

General Specifications

Item	Operating Conditions	Value
Electric Isolation		Two-terminal isolation (input and output are mutually isolated)
Isolation Voltage	testing for 1 minute, leakage current <5mA, humidity <95%	3.75 kVAC
Operating Temperature		-40°C to +85°C
Transportation and Storage Temperature		-55 °C to +105°C
Operating Humidity		10% - 90%
Max. Operating Temperature for Casing	Ta=25°C	25°C(Typ.)
Safety Standard		EN60950
Safety Certification		EN60950
Safety Class		CLASS III
Application Environment		The presence of dust, fierce vibration, impulsion and corrosive gas may cause damage to the product

Physical Specifications

Casing Material	Black flame-retardant and heat-resistant plastic
Package	DIP10
Weight	4g(Typ.)
Cooling Method	Free air convection

EMC Specifications

EMI	CE	CISPR22/EN55022	CLASS A (see 2-② for recommended circuit)	
	RE	CISPR22/EN55022	CLASS A (see 2-② for recommended circuit)	
EMS	ESD	IEC/EN61000-4-2	Contact ±4kV	perf. Criteria B
	EFT	IEC/EN61000-4-4	Power supply port ±2kV	(see 2-① for recommended circuit) perf. Criteria B
		IEC/EN61000-4-4	Signal port ±1kV	(see 2-③ for recommended circuit) perf. Criteria B
	Surge	IEC/EN61000-4-5	Power supply port ±1kV (line to line)	(see 2-① for recommended circuit) perf. Criteria B
			Signal port ±0.25kV (line to line)/ ±0.5kV (line to ground)	(see 2-③ for recommended circuit) perf. Criteria B
			Signal port ±0.5kV (line to line)/ ±1kV (line to ground)	(see 2-③ for recommended circuit) perf. Criteria B
			Signal port ±1kV (line to line)/ ±2kV (line to ground)	(see 2-③ for recommended circuit) perf. Criteria B
			Signal port ±2kV (line to line)/ ±4kV (line to ground)	(see 2-③ for recommended circuit) perf. Criteria B
Signal port ±4kV (line to line)/ ±6kV (line to ground)	(see 2-③ for recommended circuit) perf. Criteria B			

Application Precautions

1. Please read the technical manual carefully before use; contact our technical support if you have any problem.
2. Do not use the product in hazardous areas.
3. Use DC power supply for the product and 220V AC power supply is prohibited.
4. Do not dismount and assemble the product without permission to avoid failure or malfunction of equipment.

After-sales service

1. Ex-factory inspection and quality control have been strictly conducted for the product; if there occurs abnormal operation or possibility of failure of internal module, please contact the local representative or our technical support.
2. The warranty period for the product is 3 years as calculated from the date of delivery. If any quality problem occurs under normal use within the warranty period, the product can be repaired or changed for free.

Applied circuit

Refer to the RS485 Industrial Bus Interface Isolating Module Application Manual.

Design Reference

1. Typical application circuit

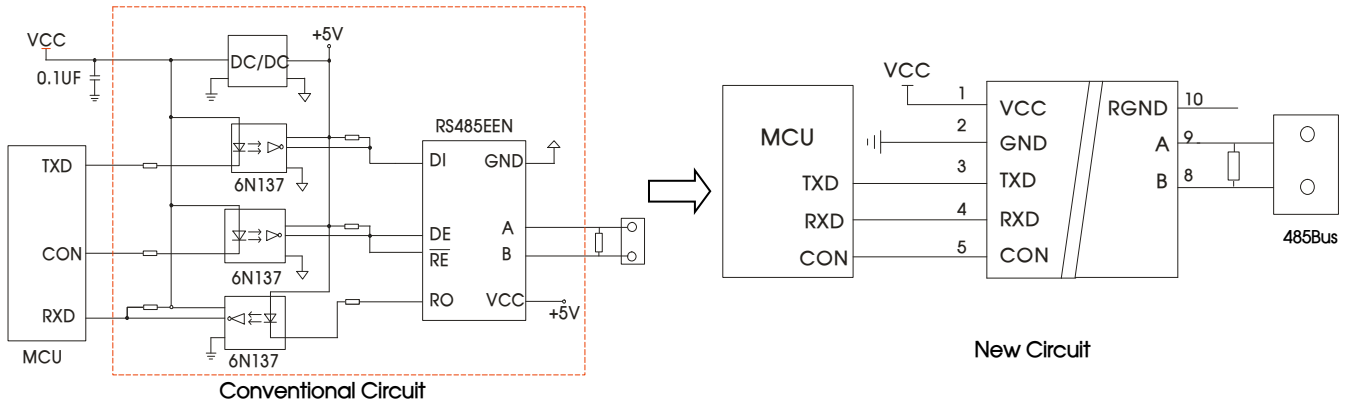


Fig. 1

2. EMC solution-recommended circuit

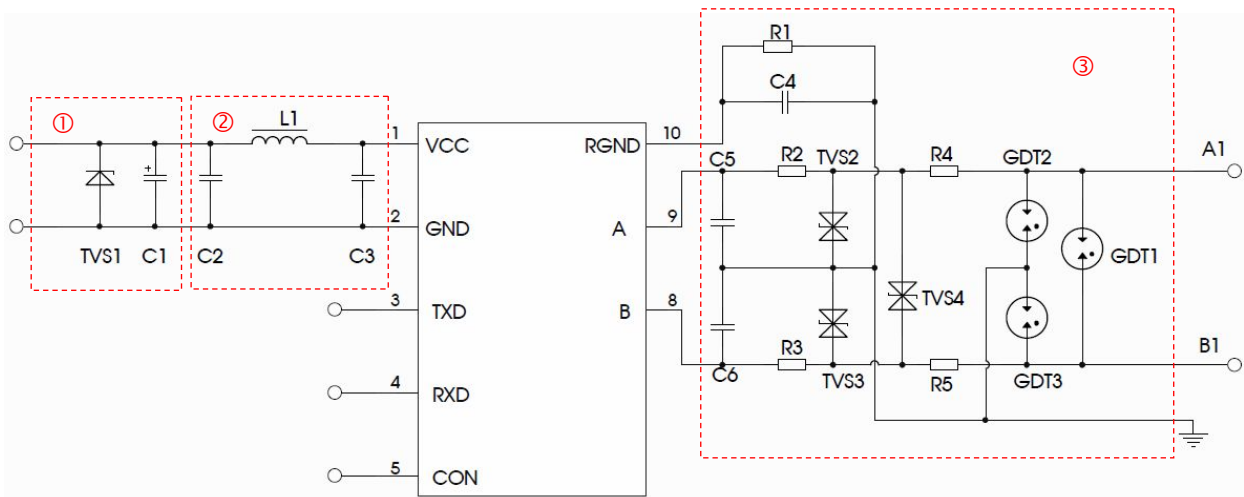


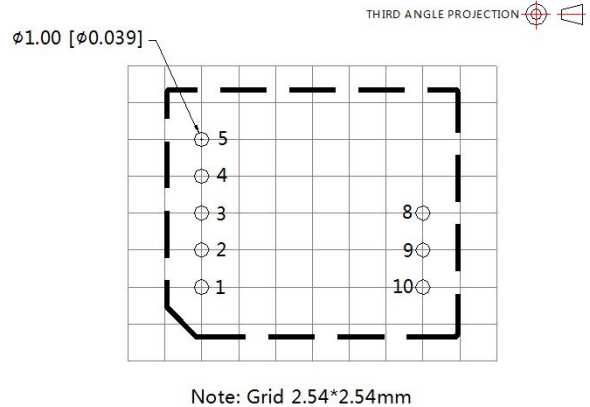
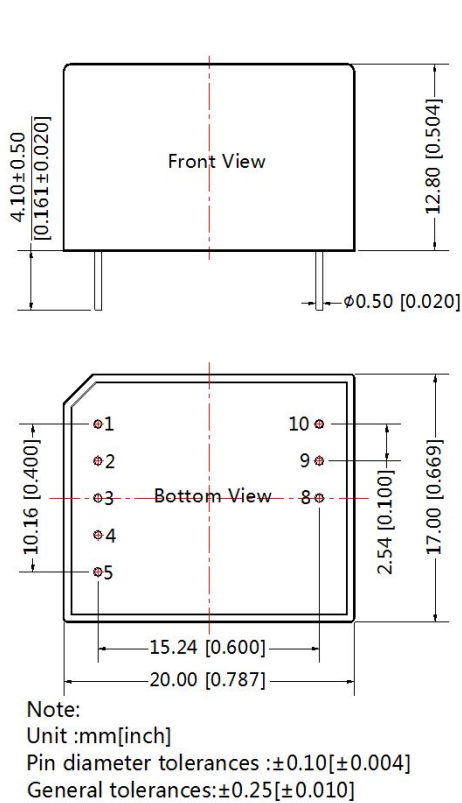
Fig. 2

Recommended external circuit parameters:

Model	TDH301D485H/TDH501D485H				
	$\pm 0.25\text{kV}/\pm 0.5\text{kV}$	$\pm 0.5\text{kV}/\pm 1\text{kV}$	$\pm 1\text{kV}/\pm 2\text{kV}$	$\pm 2\text{kV}/\pm 4\text{kV}$	$\pm 4\text{kV}/\pm 6\text{kV}$
C1	220uF/10V(Electrolytic capacitor)		220uF/10V(Electrolytic capacitor)		
TVS1	SMCJ5.0A (TDH301D485H) / SMCJ6.5A(TDH501D485H)				
C2/C3	1uF/50V		1uF/50V		
L1	10 μ H		10 μ H		
C5/C6	100pF/100V		100pF/100V		
C4	1nF/2kV		1nF/2kV		
R1	1M Ω		1M Ω		
TVS2/TVS3/TVS4	SMBJ15CA		SMBJ15CA		
R4/R5	--	--	10 Ω /2W(Wire-wound resistor)	10 Ω /2W(Wire-wound resistor)	10 Ω /2W(Wire-wound resistor)
R2/R3	10 Ω /1W(Wire-wound resistor)	10 Ω /2W(Wire-wound resistor)	--	--	--
GDT1/GDT2/GDT3	--	--	G30-A90X	S30-A90X	S50-A90X
Notes:	1. GDT1, GDT2 and GDT3 be used instead of a three terminal gas discharge tube, GDT4, GDT5 and GDT6 empathy. Such as GDT1, GDT2 and GDT3 three two-terminal device available gas discharge tube instead of a three-terminal at $\pm 4\text{kV} / \pm 6\text{kV}$ hierarchy, GDT4, GDT5 and GDT6 empathy, as B3D090L-C. 2. It is not needed the component when parameter with the symbol of "--".				

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

Dimensions and Recommended Layout



Pin-Out		
Pin	Designation	Function
1	VCC	Input Power
2	GND	GND
3	TXD	TDH_D485H Send Pin
4	RXD	TDH_D485H Receiving Pin
5	CON	Send&Receiving Control Pin
8	B	TDH_D485H B Pin
9	A	TDH_D485H A Pin
10	RGND	Isolation Power Output RGND

Notes:

1. Packing information please refer to Product Packing Information which can be downloaded from www.mornsun-power.com. Packing bag number: 58220015;
2. If the customers using the product for wave soldering, recommended don't open hole on the bottom of the product coverage of PCB board, to avoid the product base thermal deformation;
3. Unless otherwise specified, parameters in this datasheet were measured under the conditions of $T_a=25^{\circ}\text{C}$, humidity<75% with nominal input voltage and rated output load;
4. All index testing methods in this datasheet are based on our Company's corporate standards;
5. The performance indexes of the product models listed in this datasheet are as above, but some indexes of non-standard model products will exceed the above-mentioned requirements, and please directly contact our technician for specific information;
6. We can provide product customization service;
7. Specifications of this product are subject to changes without prior notice.

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