

single high speed RS485 isolation transceiver module(enhanced version)

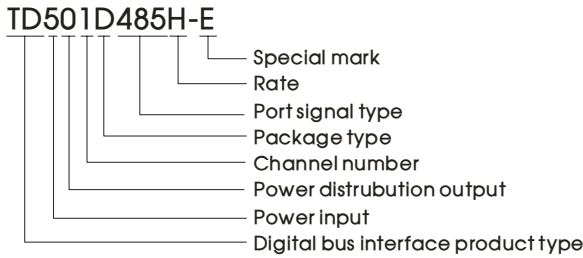


UL<sup>us</sup> CB CE RoHS

FEATURES

- Baud rate high up to 500Kbps
- Connect up to 256 nodes on one bus
- 2500VDC isolation input and output
- Integrated high efficiency isolated DC/DC converter
- Operating temperature range: -40°C~ +85°C
- ESD protection, perfect EMC recommend circuit

PART NUMBER SYSTEM



Single high rate RS485 isolation transceiver module TD301D485H-E/TD501D485H-E series are RS485 transceiver module with integrated isolated power, Signal isolated chip and the bus protection device.

Product's main function is to convert logic level to difference level of the RS485 agreement, and it implements the function of signal isolation.Products is with isolation power. It can achieve 2500 VDC electrical isolation and have the function of ESD protection. Product can be easily embedded user equipment, makes the equipment easily implement connection of RS485 protocol network .

Selection Guide

Certification	Part No.	Power Supply input (VDC)
UL/CE	TD301D485H-E	3.17~3.45
	TD501D485H-E	4.75~5.25

Input Specifications

Item	Operating Conditions		Value
Input Power Supply	Static current	Products energized, no communication	≤40mA
	Send current	200kbps Square wave communication	≤70mA
Input	Serial interface		TD301D485H-E compatible with + 3.3 V UART interface TD501D485H-E compatible with + 5 V UART interface
	Pin current		I <sub>TXD</sub> ≤2mA; I <sub>RXD</sub> ≤2 mA; I <sub>CON</sub> ≤5mA

Bus Interface

Item	Operating Conditions		Value
Output	RS485 bus interface		Standard interface RS485 ,pull-up and pull-down resistor, whose value is 5.1K,have been set to A/B line.

Transmission Specifications

Item	Operating Conditions		Value			
Data Rate			500Kbps (max.)			
Transceiver Switching Delay			The delay time from the receiving data switch to the send data : 30 μs(min.), 100 μs(max.).			
The Number of Nodes			Connect up to 256 nodes on one bus			
Transceiver control			Contrary to common RS485 transceiver control level			
Truth Table	Sending Status	Control	Input	Output		
		CON	TXD	A	B	Line state
		0	1	1	0	Normal
		0	0	0	1	Normal

Truth Table	Receiving 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)
Degree of Isolation	testing for 1 minute, leakage current <5mA, humidity <95%	2.5KVDC
Operating Temperature		-40℃~+85℃
Transportation and Storage Temperature		-50℃~+105℃
Operating Humidity		10%~90%
Max. casing Temperature	Ta=25℃	≤50℃
Application Environment		The presence of dust, fierce vibration, impulsion and corrosive gas may cause damage to the product
Safety Standard		IEC60950/EN60950/UL60950
Safety Certification		IEC60950/EN60950/UL60950
Safety Class		CLASS III

## Physical Specifications

Casing Material	Black flame-retardant heat-proof epoxy resin (UL94-V0)
Package	DIP10
Weight	About 4.0g
Cooling Method	Free air convection

## EMC Specifications

EMI	Conducted Disturbance	CISPR22/EN55022	CLASS A (see 2-② for recommended circuit)		
	Radiated Emission	CISPR22/EN55022	CLASS A (see 2-② for recommended circuit)		
EMS	Electrostatic Discharge	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
			Signal port ±1KV	(see 2-③ for recommended circuit)	perf. Criteria B
	Surge Immunity	IEC/EN61000-4-5	Power supply port ±1KV	(see 2-① for recommended circuit)	perf. Criteria B
			Signal port ±0.25KV/±0.5KV	(see 2-③ for recommended circuit)	perf. Criteria B
			Signal port ±0.5KV/±1KV	(see 2-③ for recommended circuit)	perf. Criteria B
			Signal port ±1KV/±2KV	(see 2-③ for recommended circuit)	perf. Criteria B
			Signal port ±2KV/±4KV	(see 2-③ for recommended circuit)	perf. Criteria B
Signal port ±4KV/±6KV	(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

See *Application Notes for Isolated Transmitter* for details.

Design Reference

1. Typical application

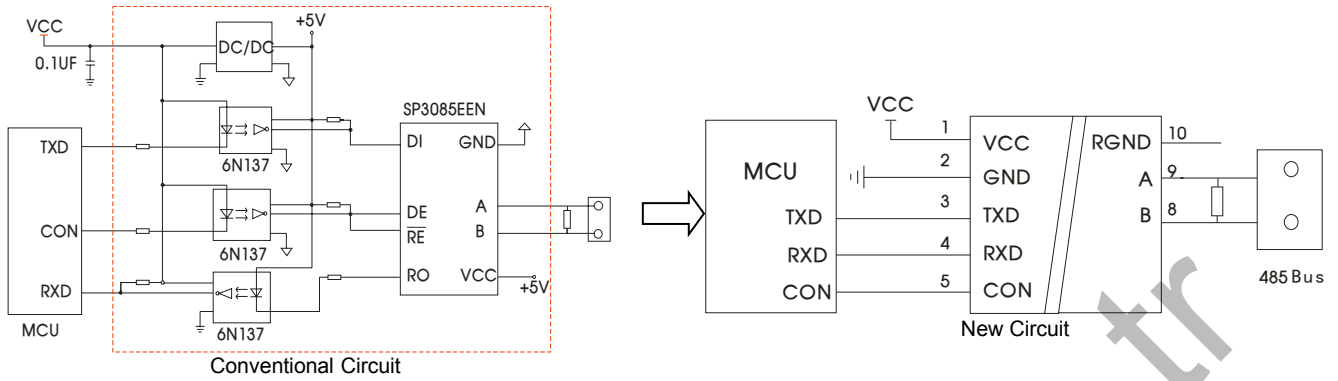


Fig. 1

2. Recommended EMC circuit

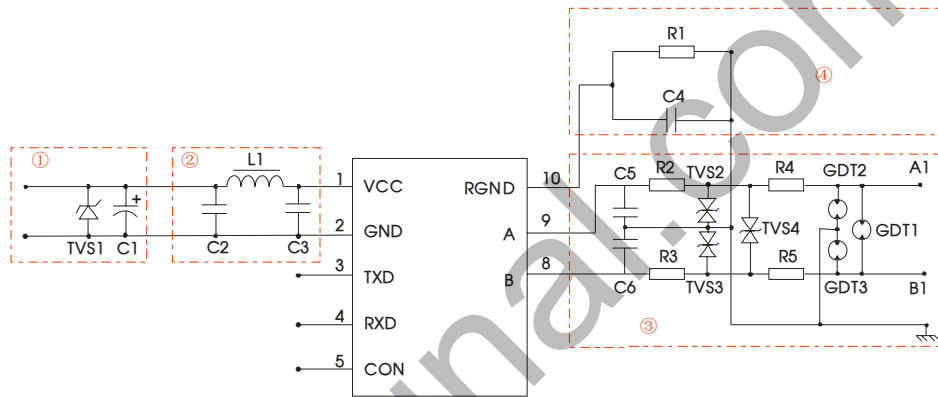


Fig. 2

Recommended external circuit parameters:

Model	TD301D485H-E / TD501D485H-E				
	$\pm 0.25\text{KV}/\pm 0.5\text{KV}$	$\pm 0.5\text{KV}/\pm 1\text{KV}$	$\pm 1\text{KV}/\pm 2\text{KV}$	$\pm 2\text{KV}/\pm 4\text{KV}$	$\pm 4\text{KV}/\pm 6\text{KV}$
C1	220uF/10V(Electrolytic capacitor)		220uF/10V(Electrolytic capacitor)		
TVS1	SMCJ5.0A (TD301D485H-E) / SMCJ6.5A(TD501D485H-E)				
C2/C3	1uF/50V		1uF/50V		
L1	10uH		10uH		
C5/C6	100pF/100V		100pF/100V		
C4	1nF/2KV		1nF/2KV		
R1	1M $\Omega$		1M $\Omega$		
TVS2/TVS3/TVS4	SMBJ15CA		SMBJ15CA		
R4/R5	--	--	10 $\Omega$ /2W(Wire-wound resistor)	10 $\Omega$ /2W(Wire-wound resistor)	10 $\Omega$ /2W(Wire-wound resistor)
R2/R3	10 $\Omega$ /1W(Wire-wound resistor)	10 $\Omega$ /2W(Wire-wound resistor)	--	--	--
GDT1/GDT2/GDT3	--	--	G30-A90X	S30-A90X	S50-A90X

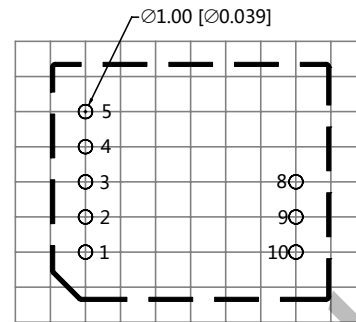
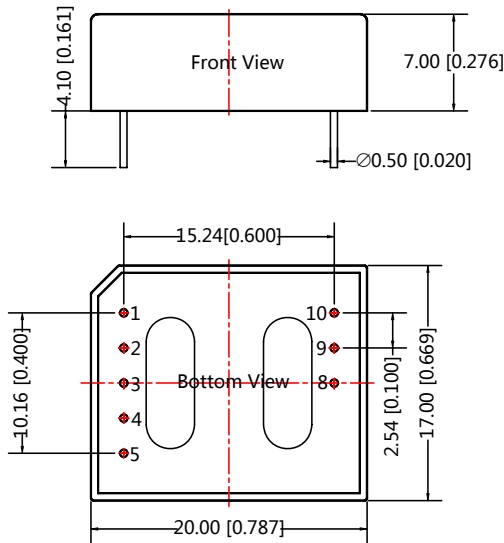
Notes:

- GDT1, GDT2 and GDT3 be used instead of a three terminal gas discharge tubey. 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, as B3D090L-C.
- 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](http://www.mornsun-power.com)

Dimensions and Recommended Layout

THIRD ANGLE PROJECTION



Note: Grid 2.54\*2.54mm

Note:  
Unit :mm[inch]  
Pin diameter tolerances :±0.10[±0.004]  
General tolerances:±0.25[±0.010]

Pin-Out		
Pin	Designation	Function
1	VCC	Input Power
2	GND	GND
3	TXD	TD_D485H Send Pin
4	RXD	TD_D485H Receiving Pin
5	CON	Send&Receiving Control Pin
8	B	TD_D485H BPin
9	A	TD_D485H APin
10	RGND	Isolation Power Output RGND

Notes:

1. Packing Information please refer to 'Product Packing Information'. Packing bag number: 58040012;
2. Unless otherwise specified, data in this datasheet should be tested under the conditions of  $T_a=25^{\circ}\text{C}$ , humidity<75% when inputting nominal voltage and outputting rated load;
3. All index testing methods in this datasheet are based on our Company's corporate standards;
4. 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;
5. We can provide product customization service;
6. Specifications of this product are subject to changes without prior notice.

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