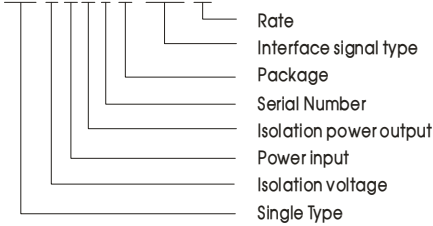


single high speed high isolation  
RS485 isolation transceiver module



**PART NUMBER SYSTEM**  
TDHx01D485H



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.

**FEATURES**

- Two-terminal isolation (input and output are mutually isolated)
- Integrated Isolated DC/DC converter
- Bus protection
- Isolation voltage :3.75KVAC
- Operating temperature range:-40℃~+105℃
- Baud rate 115200bps
- Connect up to 32 nodes on one bus

**Selection Guide**

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

**Input Specifications**

| Item         | Operating Conditions                                      | Value   |
|--------------|---|---|
| Power Input  | Static current<br>Products energized,<br>no communication | TDH301D485H ≤50mA   |
|              |   | TDH501D485H ≤40mA   |
|              | Send current<br>115200bps Square wave<br>communication    | TDH301D485H ≤100mA  |
|              |   | TDH501D485H ≤80mA   |
| Single Input | Serial interface<br>TD301D485H                            | Compatible with + 3.3 V UART interface                              |
|              | TD501D485H  | Compatible with + 5 V UART interface                                |
|              | Pin current   | I <sub>TXD</sub> ≤2mA; I <sub>RXD</sub> ≤2mA; 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                   |                      | 115200bps (max.)   |
| Transceiver Switching Delay |                      | The delay time from the receiving data switch to the send data: 30μs (min.), 100μs (max.). |
| The Number of Nodes         |                      | Connect up to 32 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       | $\geq 0.2V$  | 1      |
|             |                  | 1       | $\leq -0.2V$ | 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% | 3.75KVAC  |
| Operating Temperature                  |   | -40°C ~ +85°C   |
| Transportation and Storage Temperature |   | -55 ~ +105°C  |
| Operating Humidity                     |   | 10% ~ 90%   |
| Max. Operating Temperature for casing  | Ta=25°C   | 25°C (Typ.)   |
| 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 heat-proof plastic |
| Package         | DIP10                                    |
| Weight          | 4.0g(Typ.)                               |
| Cooling Method  | Free 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 $\pm 4KV$                         | perf. Criteria B                                   |
|                               |  | EFT             | IEC/EN61000-4-4                           | Power supply port $\pm 2KV$                        |
|                               | IEC/EN61000-4-4                                    |                 | Signal port $\pm 1KV$                     | (see 2-③ for recommended circuit) perf. Criteria B |
|                               | Surge  | IEC/EN61000-4-5 | Power supply port $\pm 1KV$               | (see 2-① for recommended circuit) perf. Criteria B |
|                               |  |                 | Signal port $\pm 0.25KV/\pm 0.5KV$        | (see 2-③ for recommended circuit) perf. Criteria B |
|                               |  |                 | Signal port $\pm 0.5KV/\pm 1KV$           | (see 2-③ for recommended circuit) perf. Criteria B |
|                               |  |                 | Signal port $\pm 1KV/\pm 2KV$             | (see 2-③ for recommended circuit) perf. Criteria B |
|                               |  |                 | Signal port $\pm 2KV/\pm 4KV$             | (see 2-③ for recommended circuit) perf. Criteria B |
| Signal port $\pm 4KV/\pm 6KV$ | (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

Please refer to Isolated Transmitter application notes.

Design Reference

1. Typical application

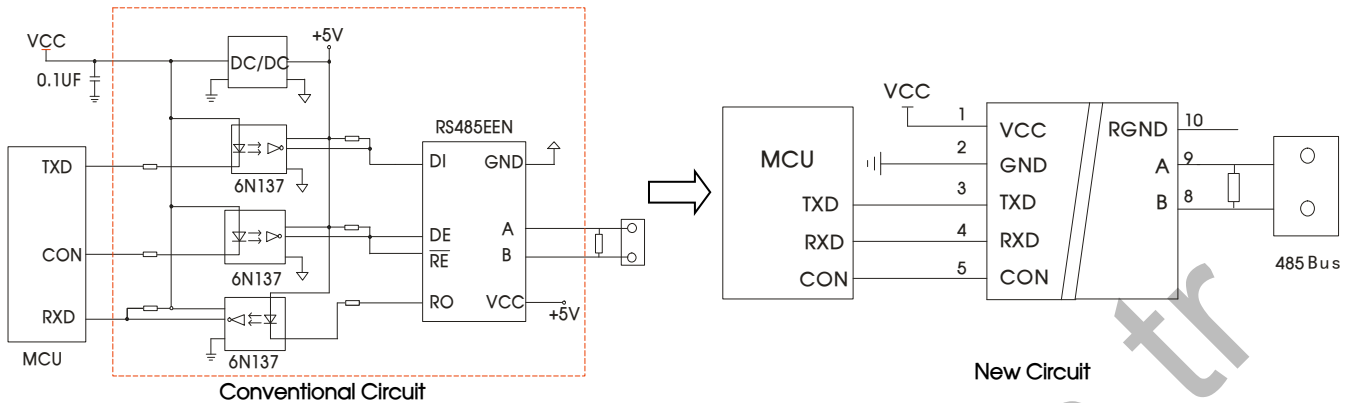


Fig. 1

2. EMC solution-recommended circuit

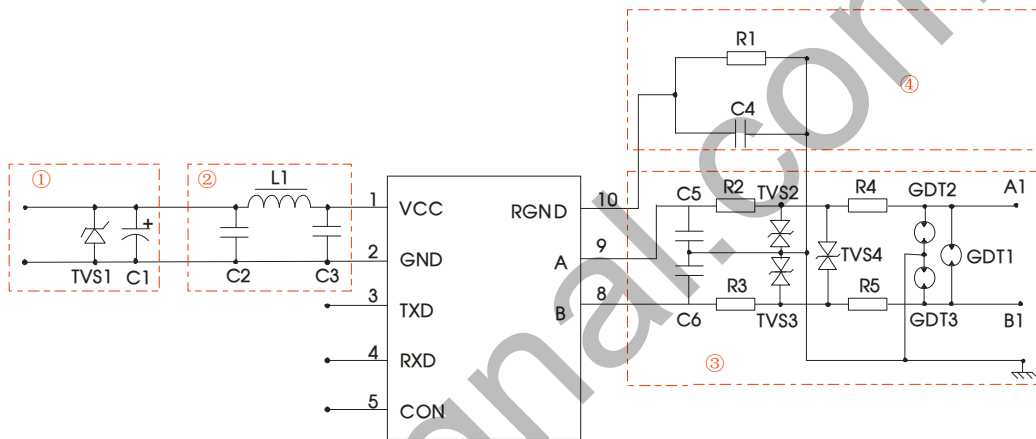


Fig. 2

Recommended external circuit parameters:

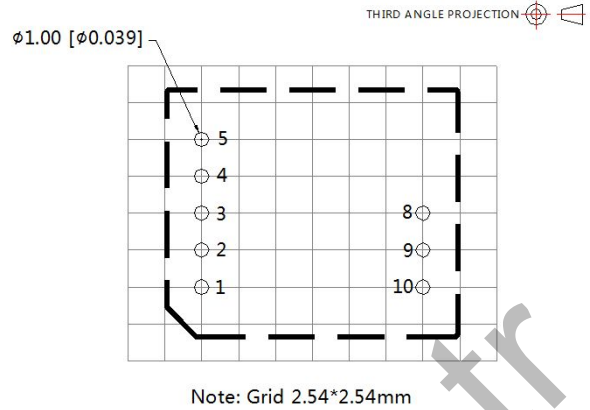
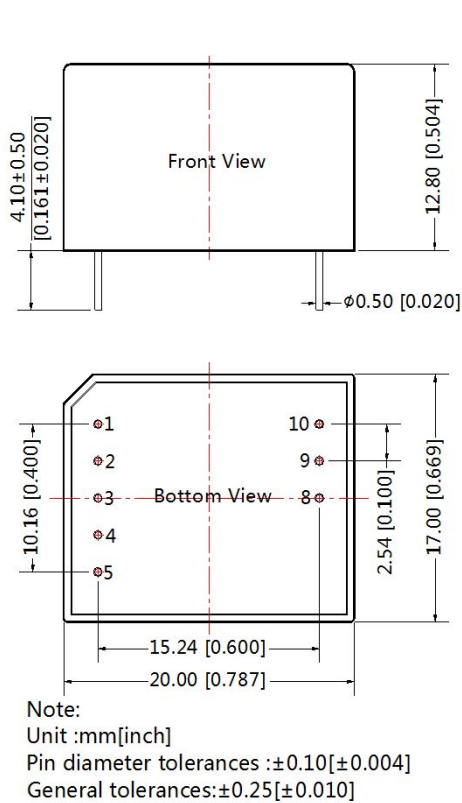
| Model          | TD301D485H/TD501D485H                        |                                      |                                      |                                      |                                      |
|----------------|--|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|
|                | $\pm 0.25KV/\pm 0.5KV$                       | $\pm 0.5KV/\pm 1KV$                  | $\pm 1KV/\pm 2KV$                    | $\pm 2KV/\pm 4KV$                    | $\pm 4KV/\pm 6KV$                    |
| C1             | 220uF/10V(Electrolytic capacitor)            |                                      | 220uF/10V(Electrolytic capacitor)    |                                      |                                      |
| TVS1           | SMCJ5.0A (TD301D485H) / SMCJ6.5A(TD501D485H) |                                      |                                      |                                      |                                      |
| 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 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 " $\pm 4KV / \pm 6KV$ " hierarchy, GDT4, GDT5 and GDT6 empathy, 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



| 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](http://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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