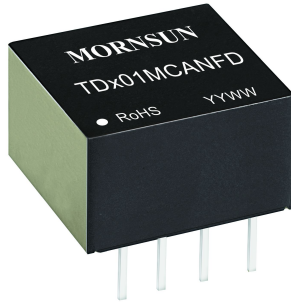


Single high speed Compact size CANFD isolation transceiver module



FEATURES

- Meet ISO 11898-5 physical layer standard requirements
- Two- port isolation : 2.5kVDC
- Bus timeout protection
- Baud rate high up to 5Mbps
- Operating temperature range: -40°C to +105°C
- Applicable 24V, 12V system
- Compact size, Standard DIP8 package
- EN60950 approval

Single-channel high-speed small-volume CANFD isolation transceiver module TD301MCANFD / TD501MCANFD, an upgraded version of CAN, which inherits the main features of isolated CAN transceiver, and further enhances its data transmission performance that achieves the success of the data transfer rate to 5Mbit/s. Ultra-small size package products can be more easily embedded in user device, the device easy to achieve CAN bus network connectivity.

Selection Guide

| Certification | Part No. | Power Supply Input (VDC) | Static Current (mA) | Maximum Operating Current (mA) | Bus Maximum Voltage (V) | Number of Nodes |
|---------------|-------------|--------------------------|---------------------|--------------------------------|-------------------------|-----------------|
| CE | TD301MCANFD | 3.3 | 30 | 60 | ±58 | 110 |
| | TD501MCANFD | 5 | 24 | 50 | ±58 | 110 |

Limit Specifications

| Item | Operating Conditions | Min. | Typ. | Max. | Unit |
|------------------------------------|--|------|------|------|------|
| Input Surge Voltage (1sec.max.) | 3.3V series | -0.7 | -- | 5 | VDC |
| | 5.0V series | -0.7 | -- | 7 | |
| Pin Welding Resistance Temperature | Welding spot is 1.5mm away from the casing, 10 seconds | -- | -- | 300 | °C |

Input Specifications (3.3V series)

| Item | Symbol | Min. | Typ. | Max. | Unit |
|----------------------------|---|-----------------|---------|------|------|
| Power Supply Input Voltage | VCC | 3.15 | 3.3 | 3.45 | VDC |
| TXD Logic Level | High-level | V _{IH} | 2 | 3.6 | |
| | Low-level | V _{IL} | 0 | 0.8 | |
| RXD Logic Level | High-level | V _{OH} | VCC-0.4 | 3.1 | |
| | Low-level | V _{OL} | -- | 0.2 | |
| TXD Drive Current | I _r | 2 | -- | -- | mA |
| RXD Output Current | I _r | -- | -- | 10 | |
| Serial Interface | Standard CANFD controller interface for +3.3V | | | | |

Input Specifications (5.0V series)

| Item | Symbol | Min. | Typ. | Max. | Unit |
|----------------------------|---|-----------------|---------|------|------|
| Power Supply Input Voltage | VCC | 4.75 | 5 | 5.25 | VDC |
| TXD Logic Level | High-level | V _{IH} | 2 | 5.5 | |
| | Low-level | V _{IL} | 0 | 0.8 | |
| RXD Logic Level | High-level | V _{OH} | VCC-0.4 | 4.8 | |
| | Low-level | V _{OL} | -- | 0.2 | |
| TXD Drive Current | I _r | 2 | -- | -- | mA |
| RXD Output Current | I _r | -- | -- | 10 | |
| Serial Interface | Standard CANFD controller interface for both +3.3V and +5.0V. | | | | |

Transmission Specifications

| Item | Symbol | Min. | Typ. | Max. | Unit | |
|------------------|--------------------|--------------------|------|------|------|----|
| Baud Rate | f_{BIT} | 40 | 1000 | 5000 | kbps | |
| Data Delay | TXD Transmit Delay | t_T | -- | 55 | 115 | ns |
| | RXD Receive Delay | t_R | -- | 65 | 135 | |
| | Cycle Delay | $t_{PRO(TXD-RXD)}$ | -- | 100 | 250 | |
| Dominant Timeout | $t_{to(dom)TXD}$ | -- | 1.25 | -- | ms | |

Output Specifications

| Item | Symbol | Min. | Typ. | Max. | Unit | |
|-----------------------------------|---|------------------|-------|------|------------|-----|
| Dominant Level (Logic 0) | CANH | $V_{(OD)CANFDH}$ | 2.75 | 3.5 | 4.5 | VDC |
| | CANL | $V_{(OD)CANFDL}$ | 0.5 | 1.5 | 2.25 | |
| Recessive Level (Logic 1) | CANH | $V_{(OR)CANFDH}$ | 2 | 2.5 | 3 | |
| | CANL | $V_{(OR)CANFDL}$ | 2 | 2.5 | 3 | |
| Difference Level | Dominant Level (Logic 0) | $V_{diff(d)}$ | 1.5 | 2 | 3 | |
| | Recessive Level (Logic 1) | $V_{diff(r)}$ | -0.05 | 0 | 0.05 | |
| Bus Pin Maximum Withstand Voltage | V_X | -58 | -- | +58 | | |
| Bus Transient Voltage | V_{trt} , Meet ISO7637-3 standard | -150 | -- | +100 | | |
| Bus Pin Leakage Current | ($V_{CC}=0V$, $V_{CANFDH/L}=5V$) | -5 | -- | 5 | uA | |
| Difference Load Resistance | R_L | -- | 60 | -- | Ω | |
| Difference Input Impedance | R_{diff} | 10 | -- | 100 | k Ω | |
| CAN Bus Interface | Meet ISO/DIS 11898 standard Twisted-pair output | | | | | |

General Specifications

| Item | Operating Conditions | Value |
|--|---|---|
| Isolation Voltage | testing for 1 minute, leakage current <1mA, | 2.5kVDC |
| Insulation Resistance | Isolation voltage 500VDC | 100M Ω |
| Operating Temperature | | -40 $^{\circ}$ C to +105 $^{\circ}$ C |
| Transportation and Storage Temperature | | -50 $^{\circ}$ C to +125 $^{\circ}$ C |
| Operating Humidity | Non-condensing | 10%-90% |
| Casing Temperature Rise | $T_a=25^{\circ}$ C, Free air convection | 25 $^{\circ}$ C |
| 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 (UL94 V-0) |
| Dimensions | 12.70*10.16*7.70 mm |
| Weight | 2g(Typ.) |
| Cooling Method | Free air convection |

EMC Specifications

| | | | | |
|-----|-------|------------------|---|------------------|
| EMS | ESD | IEC/EN 61000-4-2 | Contact \pm 4kV/Air \pm 8kV (Bare component, Signal port) | Perf. Criteria A |
| | RS | IEC/EN 61000-4-3 | 10V/m (Bare component) | Perf. Criteria A |
| | EFT | IEC/EN 61000-4-4 | \pm 2kV (Bare component, Signal port) | Perf. Criteria B |
| | Surge | IEC/EN 61000-4-5 | \pm 2kV (line to ground)(Bare component, Signal port) | Perf. Criteria A |
| | CS | IEC/EN 61000-4-6 | 3Vr.m.s (Bare component) | Perf. Criteria A |

Application Precautions

1. Please read the instructions 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 CAN Industrial Bus Interface Isolating Module Application Manual.

Design Reference

1. Typical application circuit

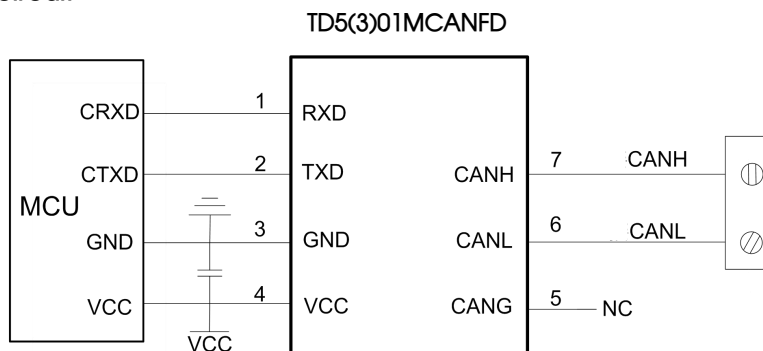


Fig.1

2. Recommended port protection circuit

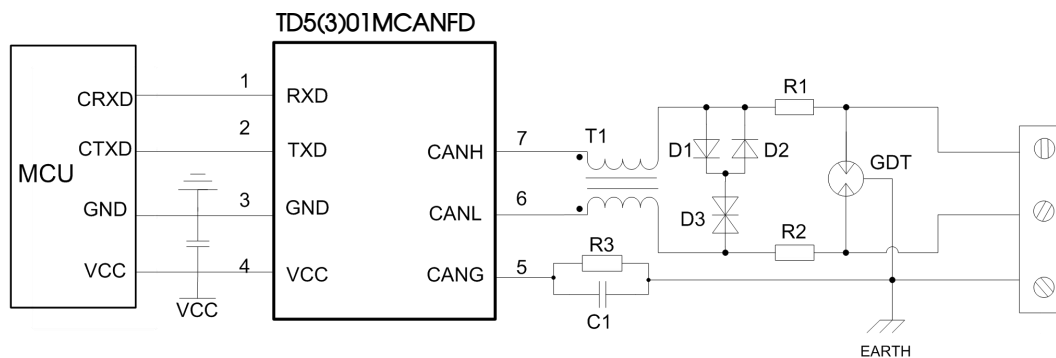


Fig.2

Notes: Twisted pair shield reliabl connected to the earth

Parameter declaration:

| Components | Recommended parameters | Components | Recommended parameters |
|------------|------------------------|------------|------------------------|
| R3 | 1MΩ, 1206 | R1、R2 | 2.7Ω /2W |
| C1 | 102,2kV | D1、D2 | 1N4007 |
| T1 | ACM2520-301-2P | D3 | SMBJ15CA |
| GDT | B3D090L | | |

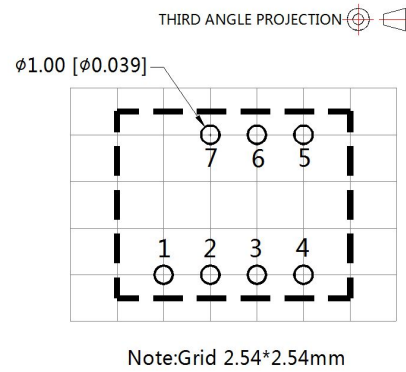
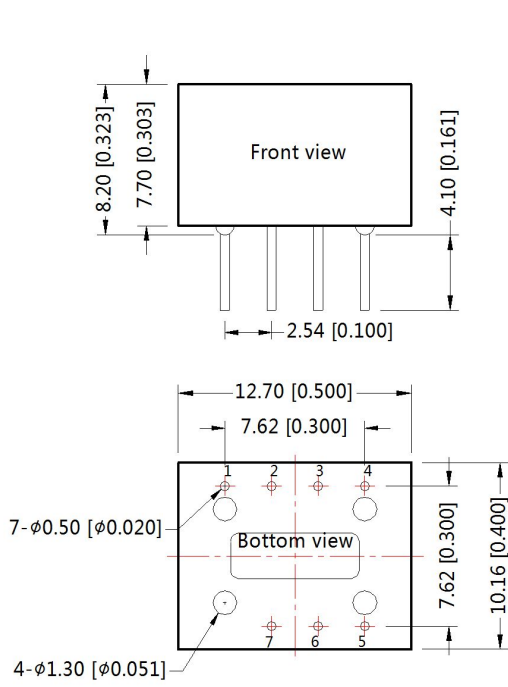
When the module is used in harsh field environment, it is susceptible to large energy of lightning strike. In this case, it is necessary to add protection circuit to the CANFD signal port to protect the module from damage and the reliability of bus communication. Figure 2 provides a recommended protection circuit design for high-energy lightning surges, with a degree of protection related to the selected protection device. Parameter description lists a set of recommended circuit parameters, which can be adjusted according to the actual application situation. Also, when using the shielded cable, the reliable single-point grounding of the shield must be achieved.

Notes: This recommended parameter is only the recommended value, which is subject to the actual application.

Recommended R1, R2 use PTC, D1, D2 use fast recovery diodes.

3. For more information Please find the application note on www.mornsun-power.com

Dimensions and Recommended Layout



| Pin-Out | | |
|---------|-------------|-----------------------------|
| Pin | Designation | Function |
| 1 | RXD | Receiving Pin |
| 2 | TXD | Send Pin |
| 3 | GND | GND |
| 4 | VCC | Input Power+ |
| 5 | CANG | Isolation Power Output CANG |
| 6 | CANL | CANL Pin |
| 7 | CANH | CANH Pin |

Note:
 Unit: mm[inch]
 Pin section tolerances: $\pm 0.10[\pm 0.004]$
 General tolerances: $\pm 0.25[\pm 0.010]$

Notes:

1. Packing information please refer to Product Packing Information which can be downloaded from www.mornsun-power.com. Packing bag number: 58200011;
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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