



Medical  
electric  
equipment



Power  
Factor  
Correction



World  
wide



Safety  
Approvals



EMI



Inrush  
current  
limiting



OCP



OVP



Remote  
ON/OFF

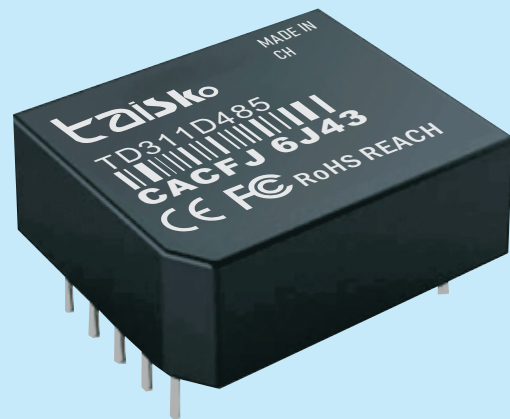
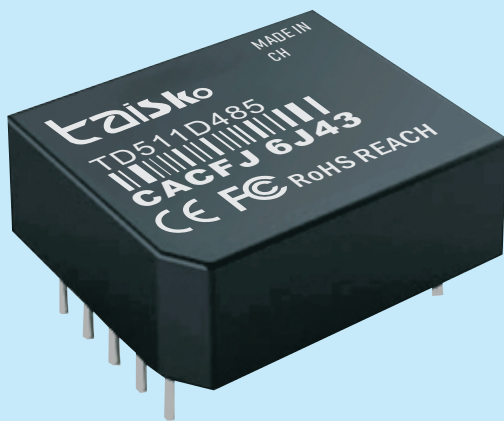


Parallel  
Operation



1U

# TD-series



## Feature

RS485 isolated transceiver  
It is an integrated transceiver chip  
Isolation chip and DC/DC  
Integrated isolated power supply  
The interface isolation transceiver module  
Can completely replace tradition  
The optocoupler isolation scheme  
In the past, we needed to send and receive chips  
Isolation chip/optocoupler  
Only by isolating the power supply can it be achieved  
The entire isolation and transmission plan  
Now we only need to collect  
Using an RS485  
Isolation transceiver module  
It can be easily achieved  
Greatly simplified the customer's design.

## Safety agency approval

ENI 55032:2015/A1:2020  
EN IEC 62368-1:2020+A11:2020  
IEC 62321-1:2013/IEC 62321-2:2021/IEC 62321-3-1:2013,

## Up to 5-year warranty (Refer to Instruction Manual)

## CE FCC marking

Low Voltage Directive  
RoHS Directive

## ROHS REACH marking

Electrical Equipment Safety Regulations  
RoHS Regulations

## EMI

- PCA300F, PCA600F  
Complies with FCC-B, CISPR32-B, EN55011-B, EN55032-B, VCCI-B
- PCA1000F, PCA1500F  
Complies with FCC-A, CISPR32-A, EN55011-A, EN55032-A, VCCI-A

## EMS Compliance : EN61204-3, EN61000-6-2

IEC60601-1-2 (2014), EN60601-1-2 (2015)

EN61000-4-2  
EN61000-4-3  
EN61000-4-4  
EN61000-4-5  
EN61000-4-6  
EN61000-4-8  
EN61000-4-11

## 1 Product Features:

- Powered by a single input power supply
- Isolated output power pin
- Up to 64 nodes can be connected
- Electromagnetic radiation (EMI) is extremely low
- Operating temperature range:  $-40^{\circ}\text{C} \sim +85^{\circ}\text{C}$
- Integrates power isolation, signal isolation, and bus ESD protection functions

## 2 Product description:

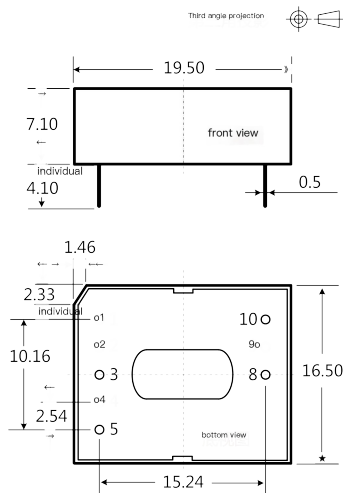
TD311D485 / TD511D485, their primary function is to convert logic levels into differential levels of the RS-485 protocol, achieving signal isolation. This is a TD-485 protocol transceiver module that utilizes IC integration technology, integrating power isolation, signal isolation, RS-485 communication, and bus protection. The product comes with a constant voltage isolated power supply, enabling 2500VDC electrical isolation. The product can be easily embedded into user devices, allowing the devices to easily achieve RS-485 protocol network connectivity.

## 3 Scope of application:

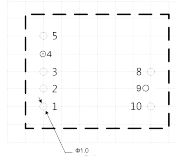
Industrial communication, coal mining industry, power monitoring, building automation ..

## 4 Appearance dimensions and pin description:

### 4.1 Appearance and Dimensions Diagram



### 4.2 Recommended print layout



Note: The grid spacing is 2.54\*2.54mm

### 4.3 Pin definition

Pin		describe
Serial Number	name	
1	VCC	Power input positive
2	GND	Power input ground
3	TXD	Data transmission pin
4	RXD	Data receiving pin
5	CON	Transmission and reception control pin
8	B	TD-485 B leg
9	A	TD-485 A leg
10	RGND	Isolated output power supply ground

## 5 Product model table

PRODUCT MODEL	Power supply voltage range (VDC)	static current (mA, Typ)	maximum operating current (mA)	Transmission baud rate (bps)	Nodes (pcs)	type
TD311D485	3.3 (3.15~3.45)	30	130	9600	64	low speed
TD511D485	5 (4.75~5.25)	35	130	9600	64	low speed

## 6 Specification parameters

### 6.1 Maximum limit parameter

Using beyond the following limit values may cause permanent damage to the module,

project	condition	minimum value	Nominal value	Maximum value	unit
Input Voltage	TD311D485	-0.7	3.3	5	V dc
	TD511D485	-0.7	5	7	
Pin soldering temperature resistance	Manual soldering @ 3~5 seconds	--	370	--	°C
	Wave soldering @ 5~10 seconds	--	265	--	
hot plugging	--	Not Supported			

Note: This series of modules does not have an input anti-reverse connection function. It is strictly prohibited to connect the positive and negative terminals reversely; otherwise, irreversible damage to the module may occur.

### 6.2 Input characteristics

project	symbol	condition	minimum value	Nominal value	Maximum value	unit	
INPUT VOLTAGE	$V_{CC}$	TD311D485	3.15	3.3	3.45	$V_{DC}$	
		TD511D485	4.75	5	5.25		
TXD logic level	high level	$V_{IH}$	$0.7V_{CC}$	--	$V_{CC}+0.5$		
	Low Level	$V_{IL}$	0	--	$0.3V_{CC}$		
RXD logic level	high level	$V_{OH}$	$I_{RXD}=4mA$	$V_{CC}-0.4$	$V_{CC}-0.2$		--
	Low Level	$V_{OL}$	$I_{RXD}=4mA$	--	0.2		0.4
CON control level	high level	$V_{CON\_H}$	TD311D485	2.3	--		$V_{CC}+0.5$
			TD511D485	3.8	--		$V_{CC}+0.5$
	Low Level	$V_{CON\_L}$	0	--	$0.3V_{CC}$		
TXD drive current	$I_{TXD}$		2				mA
CON drive current	$I_{CON}$		5				
RXD output current	$I_{RXD}$				10		
TXD pull-up resistor	$R_{TXD}$			10		kΩ	
serial interface		TD311D485	3.3V standard UART interface				
		TD511D485	5V standard UART interface				

### 6.3 output characteristic

project	symbol	condition	minimum value	Nominal value	Maximum value	unit
Built-in isolated output power supply voltage	$V_O$	Nominal input voltage	--	--	--	VDC
Differential output voltage (A-B)	$V_{OD}$	Nominal input voltage, with a differential load of 54Ω	1.5	--	$V_O$	

project	symbol	condition	minimum value	Nominal value	Maximum value	unit
Differential output current (A-B)	$I_{OD}$		28	--	--	mA
Bus interface protection		ESD electrostatic protection				

#### 6.4 Transmission characteristics

project	symbol	condition	minimum value	Nominal value	Maximum value	unit
Built-in pull-up/pull-down resistor			--	22	--	k $\Omega$
Transceiver input impedance		$-7V \leq V_{CM} \leq +12V$	96	--	--	
Data transmission delay			--	--	80	$\mu$ s
Data reception delay			--	--	80	
Transmission and reception status delay	$T_{RTT}, T_{TTR}$	--	--	25	--	$\mu$ s

#### 6.5 Truth table characteristic

project	input		output	
	CON	TXD	A	B
Sending function	0	1	1	0
	0	0	0	1
	CON	$V_A - V_B$	RXD	
Receiving function	1	$\geq -10mV$	1	
	1	$\leq -200mV$	0	
	1	$-200mV < V_A - V_B < -10mV$	uncertain state	

#### 6.6 General characteristics

project	condition	minimum value	Nominal value	Maximum value	unit
Electrical isolation		Isolation at both ends (input and output are isolated from each other)			
Isolation Voltage	Test duration: 1 minute, leakage current <5mA, humidity <95%	--	2.5K	--	VDC
Operating temperature range	Output at full capacity	-40	--	+85	$^{\circ}$ C
storage temperature	--	-55	--	+105	$^{\circ}$ C
Storage humidity	No condensation	--	--	95	%
Temperature rise of the shell during operation		--	20	--	$^{\circ}$ C
Usage environment	The presence of dust, strong vibrations, impacts, and corrosive gases in the surrounding environment may cause damage to the product components				

#### 6.7 physical property

project	condition
Housing material	Black flame-retardant and heat-resistant plastic (UL94-V0)
Package Size	19.50*16.50*7.10mm
weight	4.0g (nominal)
Cooling method	Natural air cooling

#### 6.8 EMC characteristics

classification	project	parameter	grade
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classification	project	parameter	grade
EMS	Electrostatic Discharge	IEC/EN 61000-4-2 Contact ±4KV/Air ±8KV (bare machine)	Perf.Criteria B
		IEC/EN 61000-4-2 Contact ±8KV/Air ±15KV (recommended circuit shown in Figure 2/Figure 3)	Perf.Criteria B
	Pulse train immunity	IEC/EN 61000-4-4 ±2KV	Perf.Criteria B
	Lightning surge immunity	IEC/EN 61000-4-5 Common mode ±2KV (bare machine)	Perf.Criteria B
		IEC/EN 61000-4-5 Differential mode ±2KV, Common mode ±4KV (recommended circuit shown in Figure 2/Figure 3)	Perf.Criteria B
Conducted disturbance immunity	IEC/EN61000-4-6 3Vr.m.s	Perf.Criteria A	

7 Product characteristic curve

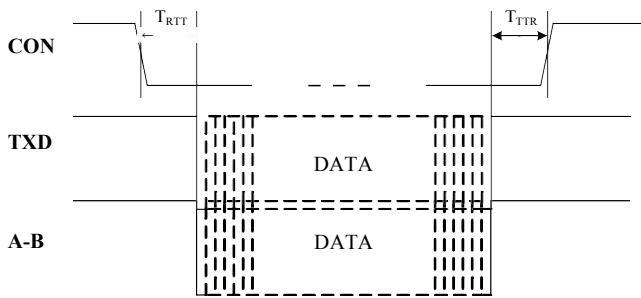


Figure 1. TDM(3)485CT module data transmission timing diagram

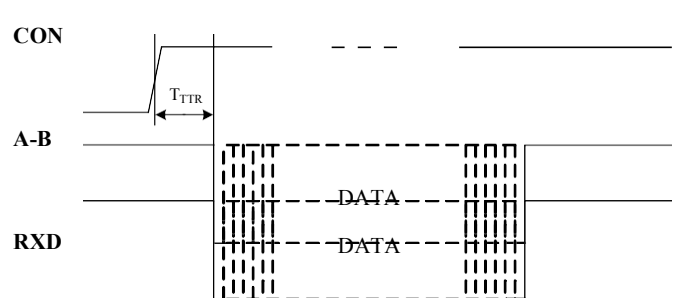


Figure 2. TDM(3)485CT module data reception timing diagram

8 design reference

8.1 Typical applications

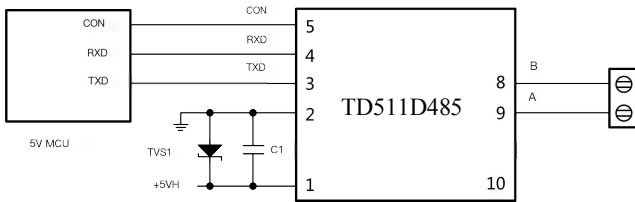


Figure 3. Circuit diagram for MCU 5V power supply application

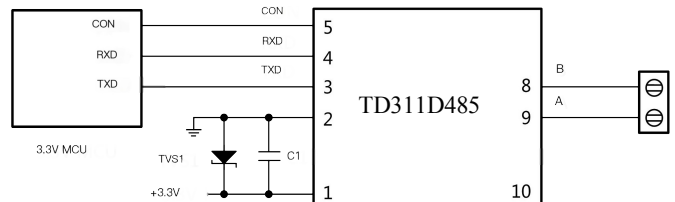


Figure 4. Circuit diagram for MCU 3.3V power supply application

Figure 3 shows the connection diagram between the UART interface of a 5V MCU system and the TD511D485 isolated transceiver module. The module must be powered by a 5V power supply, and the matching voltage levels for the TXD, RXD, and CON pin interfaces of the module are 5V, which does not support 3.3V system voltage levels. Figure 4 shows the connection diagram between the UART interface of a 3.3V MCU system and the TD311D485 isolated transceiver module. The module must be powered by a 3.3V power supply, and the matching voltage levels for the TXD, RXD, and CON pin interfaces of the module are 3.3V, which does not support 5V system voltage levels.

8.2 EMC typical recommended circuit

Since the internal A/B lines of the module come with built-in pull-up/down resistors and ESD protection devices, it is generally not necessary to add additional ESD protection devices when used in well-conditioned environments, as shown in the typical connection circuit diagram in 8.1 Typical Applications. However, if the application environment is harsh (such as high-voltage power, lightning strikes, etc.), it is recommended that users add protective measures such as TVS diodes, common mode inductors, lightning protection diodes, shielded twisted-pair cables, or single-point grounding within the same network to the A/B line terminals of the module.



When pins 6 and 7 of the module are not connected and pin 10 is not used, please leave this pin unconnected.

### **9.5 Use of shielded wire**

For data transmission lines, please choose shielded twisted-pair cables. The shielding layer of the same network should be grounded at a single point. If better anti-interference capability is required for the RS-485 network, double-shielded twisted-pair cables can be used, with the RGND of each node connected to the inner shielding layer, and the outer shielding layer grounded at a single point.

### **9.6 More information**

Please refer to the application notes for the interface module product at [www.taisko.com](http://www.taisko.com)

## **10 Important Statement**

The company reserves all rights, and product data manuals are subject to updates without prior notice.