



Medical
electric
equipment



Power
Factor
Correction



World
wide



Safety
Approvals



EMI



Inrush
current
limiting



OCP



OVP



Remote
ON/OFF

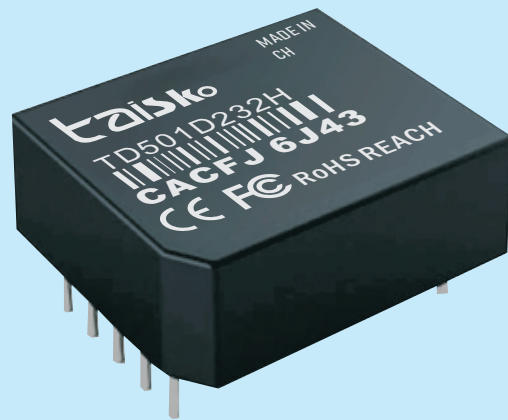
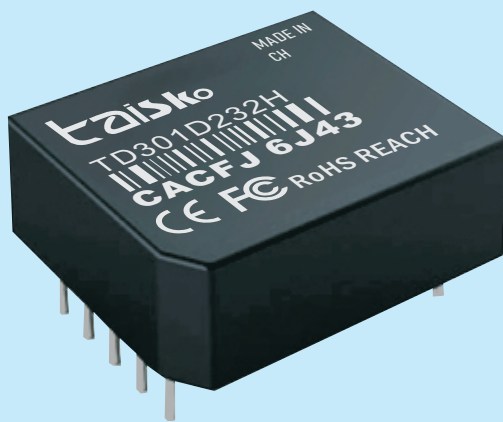


Parallel
Operation



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

TDx01D232H series

Single channel RS-232 isolated transceiver

1 Product features:

- Single input power supply
- Non isolated output power pin
- Point to Point
- Electromagnetic radiation EMI is extremely low
- Working temperature range: -40 °C~+85 °C
- The bus has ESD protection capability up to 15kV

2 Product Description:

TD301D232H/TD501D232H is a high-speed single channel isolated RS-232 transceiver suitable for bidirectional data communication, with a maximum baud rate of 115.2kbps. The transceiver integrates an isolated DC/DC converter internally, which can achieve electrical isolation between the controller and the RS-232 transceiver with only a single power supply. The maximum isolation voltage can reach 2500VDC, and there is no need to configure an isolated power supply, making it convenient for users to apply. Due to the complete isolation between the control ground and the bus ground, it can withstand higher common mode voltages. Internal Collection

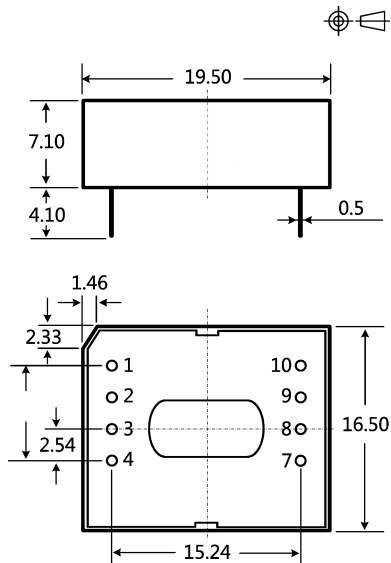
The components with anti-static function have passed the IEC61000-4-2 air discharge test, and the human body model (HBM) has an ESD protection capability exceeding $\pm 15\text{kV}$. Adopting a dual in-line DIP8 package, it has the characteristics of small size and high integration.

3 Scope of application:

Industrial communication, coal mining industry, power monitoring, petrochemical industry, building automation, communication between PLC and frequency converter ..

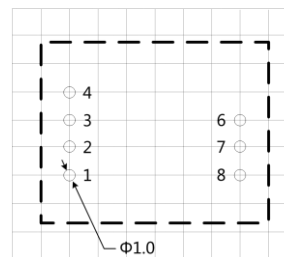
4 Appearance dimensions and pin specifications:

4.1 Appearance dimension diagram



Note:
Dimension unit: mm
Terminal diameter
tolerance: ± 0.10
Unmarked tolerance: ± 0.25

4.2 Suggested printing image



Note: The grid spacing is 2.54 * 2.54mm

4.3 Pin Definition

Pin		describe
Serial Number	name	
1	VC C	Positive power input
2	G N D	Power input ground
3	TX D	Transmitter input, TTL/CMOS logic
4	RX D	Receiver output, TTL/CMOS logic
6	RI N	Receiver input, RS232 level
7	TO UT	Transmitter output, RS232 level
8	RG N D	Isolation output power 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
TD301D232H	3.3 (3.15~3.45)	50	80	115200	2	high speed
TD501D232H	5 (4.75~5.25)	35	70	115200	2	high 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	TD301D232H	-0.7	3.3	5	V dc
	TD501D232H	-0.7	5	7	
Pin soldering temperature resistance	Manual welding @ 3-5 seconds	--	370	--	°C
	Wave soldering @ 5-10 seconds	--	265	--	
hot plugging	--	Not Supported			

Note: This series of modules does not have input anti reverse connection function. It is strictly prohibited to input positive and negative connections in reverse, otherwise it will cause irreversible damage to the module.

6.2 Input characteristics

project		symbol	condition	minimum value	Nominal value	Maximum value	unit
INPUT VOLTAGE		VCC	TD301D232H	3.15	3.3	3.45	V dc
			TD501D232H	4.75	5	5.25	
TXD logic level	high level	VIH		0.7VCC	--	VCC+0.5	
	Low Level	VIL		0	--	0.3VCC	
RXD logic level	high level	VOH	IRXD=-4mA	VCC-0.4	VCC-0.2	--	
	Low Level	VOL	IRXD=4mA	--	0.2	0.4	
TXD driving current		ITXD		2			mA
RXD output current		IRXD				10	
TXD pull-up resistor		RTXD			10		kΩ
serial interface			TD301D232H	3.3V standard UART interface			
			TD501D232H	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	Rated input voltage	--	--	--	
Output voltage of transmitter	VOD	Nominal input voltage, differential load of 3K Ω	±5	±5.4	--	V dc
Receiver input voltage	IOD		-15	--	+15	
Bus interface protection			ESD electrostatic protection			

6.4 Transmission characteristics

project	symbol	condition	minimum value	Nominal value	Maximum value	unit
Input impedance of transceiver		$-7V \leq V_{CM} \leq +12V$	3	5	7	k Ω
Data transmission delay			100	--	1000	ns

6.5 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 time 1 minute, leakage current<5mA, humidity<95%	--	2.5K	--	V dc
Working temperature range	Output as full load	-40	--	+85	°C
storage temperature	--	-55	--	+125	°C
Storage humidity	No condensation	--	--	95	%
Temperature rise of the casing during operation		--	20	--	°C
Usage environment	The presence of dust, strong vibrations, impacts, and gases that corrode product components in the surrounding environment may cause damage to the product				

6.6 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

6.7 EMC characteristics

classification	project	parameter	grade
EMS	Electrostatic Discharge	IEC/EN 61000-4-2 Contact $\pm 4\text{KV}$ /Air $\pm 8\text{KV}$ (bare metal, RS-232 port)	Perf.Criteria B
		IEC/EN 61000-4-2 Contact $\pm 8\text{KV}$ /Air $\pm 15\text{KV}$ (recommended circuit shown in Figure 2/Figure 3)	Perf.Criteria B
	Pulse group immunity	IEC/EN 61000-4-4 $\pm 2\text{KV}$	Perf.Criteria B
	Lightning surge immunity	IEC/EN 61000-4-5 common mode $\pm 2\text{KV}$ (bare metal, RS-232 port)	Perf.Criteria B
		IEC/EN 61000-4-5 differential mode $\pm 2\text{KV}$, common mode $\pm 4\text{KV}$ (recommended circuit shown in Figure 2/Figure 3)	Perf.Criteria B
	Conducted disturbance immunity	IEC/EN61000-4-6 3Vr.m.s	Perf.Criteria A

Note: (1) The input voltage cannot exceed the specified range value, otherwise it may cause permanent irreparable damage.

2 This parameter is only applicable to 232 communication ports, namely RIN, TOUT, RGND, and the module primary is not grounded during testing.

3 Unless otherwise specified, the parameters in this manual are measured at 25 °C, humidity of 40%~75%, and input nominal voltage.

7 design reference

7.1 Typical applications

The matching level of the TXD and RXD pin interfaces of TD501D232H is 5V, and the matching level of the TXD and RXD pin interfaces of TD301D232H is 3.3V, which can be directly embedded in the circuit board and communicate with external devices through the serial interface. If users need to connect external devices through the DB9 serial port cable, they need to consider the internal connection of the DB9 serial port cable. The DB9 serial port cable has two types: direct connection and cross connection of pins 2 and 3. Figure 1 and Figure 2 respectively show the typical connection circuit between the TDx01D232H module and the MCU serial interface, where the 232 channel communicates with external devices using direct or cross serial cables.

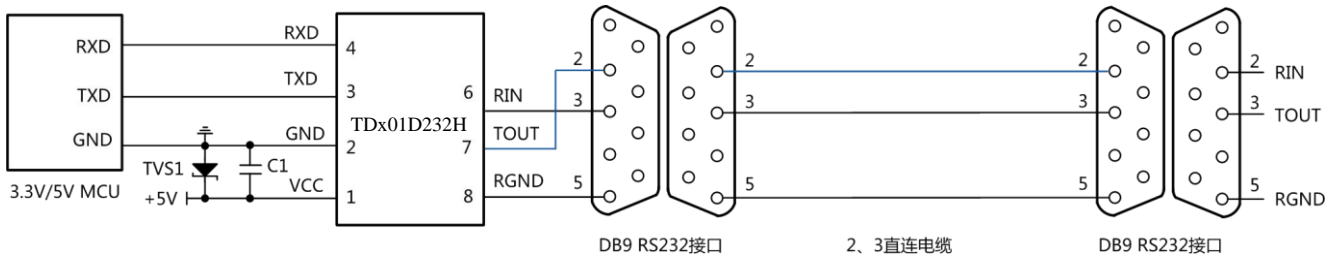


Figure 1 Use 2-3 pin direct

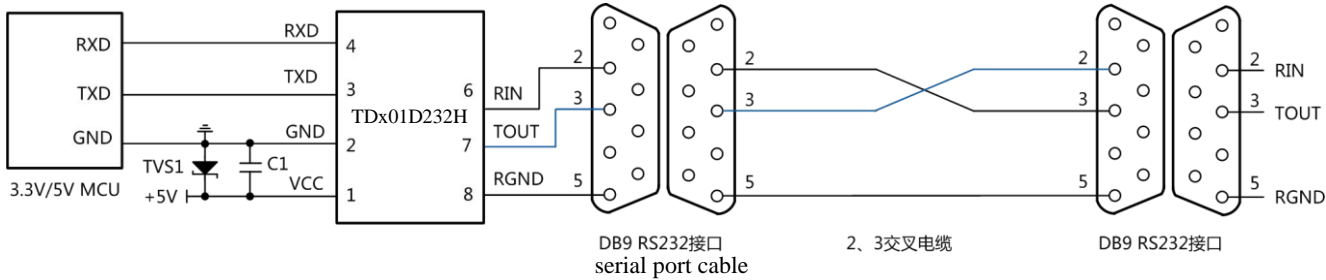


Figure 2 Use 2-3 pin crossover serial cable

7.2 EMC Typical Recommended Circuit

If the TDx01D232H module is applied in harsh environments such as high voltage power, lightning strikes, etc., to ensure reliable operation of the module, it is recommended that users add TVS tubes, lightning protection tubes, and other devices to the TOUT and RIN terminals of the module to form a port protection circuit. The specific recommended application circuit is shown in Figure 3, and the recommended parameters are shown in Table 1. The recommended circuit diagram and parameter values are for reference only. Please determine whether the components in the circuit diagram are needed based on the actual situation.

If specific surge level requirements need to be met, it is recommended to use the recommended protection circuit shown in Figure 3. Table 1 provides a set of recommended device parameters, and the recommended circuit diagram and parameter values are for reference only. Please determine the appropriate parameter values based on the actual situation.

Table 1. Recommended EMC Parameters

label	model	label	model
C1	10μF, 25V	TVS1	SMBJ5.0A
RT1, RT2	JK250-180T	TVS2	SMBJ30CA
R1	1MΩ, 1206	TVS3, TVS4	SMBJ18CA
C2	102, 2KV,1206	GDT	B3D090L
U1	TDx01D232H module		