

Dual high speed RS232 isolated transceiver



RoHS



## FEATURES

- Products meet EIA/TIA-232-F standard
- High baud rate of up to 115200bps
- Isolation test voltage: 3000 VDC
- Integrated isolated DC/DC converter
- Operating ambient temperature range: -40°C to +85°C
- Enhanced EMC performance with recommended external circuit

The TD302D232H/TD502D232H series of isolated dual high speed 232 transceivers are all-in-one modules with isolated power supply, isolated signal and RS232 transceiver chip integrated in one RS232 interface solution. The main products function is to switch from logic level to 232 protocols level and achieving signal isolation and the product features a constant-voltage source isolated power supply which withstands a test voltage of 3000 VDC. The products also can easily be embedded in the user's end equipment, to achieve fully functional RS232 protocols network connections.

## Selection Guide

Certification	Part No.	Power Input (VDC)	Baud Rate (bps)	Static Current (mA)	Maximum Operating Current (mA)
--	TD302D232H	3.15-3.45	115200	60	90
--	TD502D232H	4.75-5.25	115200	35	80

## Absolute Limits

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 Soldering Temperature	Soldering spot 1.5mm away from case, 10s max.	--	--	300	°C

## 3.3V Input Specifications

Item	Symbol	Min.	Typ.	Max.	Unit
Power Supply Input Voltage	VCC	3.15	3.3	3.45	VDC
TXD Logic Level	High-level $V_{IH}$	0.7Vcc	--	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	0.2	0.4	
TXD Drive Current	$I_T$	2	--	--	mA
RXD Output Current	$I_R$	--	--	10	
Serial Interface	Compatible with + 3.3 V UART interface only				

## 5.0V Input Specifications

Item	Symbol	Min.	Typ.	Max.	Unit
Power Supply Input Voltage	VCC	4.75	5	5.25	VDC
TXD Logic Level	High-level $V_{IH}$	0.7Vcc	--	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	0.2	0.4	
TXD Drive Current	$I_T$	2	--	--	mA
RXD Output Current	$I_R$	--	--	10	
Serial Interface	Compatible with + 5 V UART interface only				

Transmission Specifications

Item	Symbol	Min.	Typ.	Max.	Unit
Data Delay	TXD Transmitter Delay $t_T$	--	--	2	us
	RXD Receiver Delay $t_R$	--	--	2	

Output Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Driver Output	High-level	$R_L=3k\Omega$ to GND	5	--	--	VDC
Voltage		$R_L=3k\Omega$ to GND	--	--	-5	
Receiver Input voltage			-30	--	30	
Bus Interface Protection			ESD protection			

Truth Table Specifications

Transceiver Control	Input	Output
Send Status	TXD	T_OUT
	L	H
	H	L
Receive Status <sup>①</sup>	R_IN	RXD
	$\geq 2.4V$	L
	$\leq 0.8V$	H
	$0.8V \leq RXD \leq 2.4V$	Undefined state

Note: ①The receiving threshold voltage will vary slightly with Vcc

General Specifications

Item	Operating Conditions	Value
Isolation Test	Electric strength test for 1 minute, leakage current <1mA	3000VDC
Insulation Resistance	At 500VDC	1000M $\Omega$ (Input-output)
Operating Temperature		-40°C to +85°C
Transportation and Storage Temperature		-50°C to +105°C
Operating Humidity	Non-condensing	10% - 90%
Safety Class		CLASS III

Mechanical Specifications

Case Material	WH8100-F
Dimensions	DIP8(20 x 17 x 7mm)
Weight	4.0g(Typ.)
Cooling Method	Free air convection

Electromagnetic Compatibility (EMC)

Emissions	CE	CISPR32/EN55032 CLASS A (see Fig. 2-①)	
	RE	CISPR32/EN55032 CLASS A	
Immunity	ESD	IEC/EN 61000-4-2 Contact $\pm 4kV$	Perf. Criteria B
	RS	IEC/EN 61000-4-3 10V/m	Perf. Criteria A
	EFT	IEC/EN 61000-4-4 $\pm 1kV$ (Signal port)	Perf. Criteria B
	Surge	IEC/EN 61000-4-5 $\pm 4kV$ (line to line, Signal port, see Fig. 2-②)	Perf. Criteria B
		IEC/EN 61000-4-5 $\pm 6kV$ (line to ground, Signal port, see Fig. 2-②)	Perf. Criteria B
	CS	IEC/EN 61000-4-6 3Vr.m.s	Perf. Criteria A

## Application Precautions

1. Carefully read and follow the instructions before use; contact our technical support if you have any question;
2. Do not use the product in hazardous areas;
3. Use only DC power supply source for this product, 220VAC power supply is prohibited;
4. Hot-swap is not supported;
5. If the external input of TXD is insufficient, the pull-up resistor should be added according to the situation;
6. It is strictly forbidden to disassemble the product privately in order to avoid product failure or malfunction.

## After-sales service

1. Factory inspection and quality control are strictly enforced before shipping any product; please contact your local representative or our technical support if you experience any abnormal operation or possible failure of the module;
2. The products have a 3-year warranty period, from the date of shipment. The product will be repaired or exchanged free of charge within the warranty period for any quality problem that occurs under normal use.

## Applied circuit

See *Application Notes for Isolated Transmitter* for details.

## Design Reference

### 1. Typical application circuit

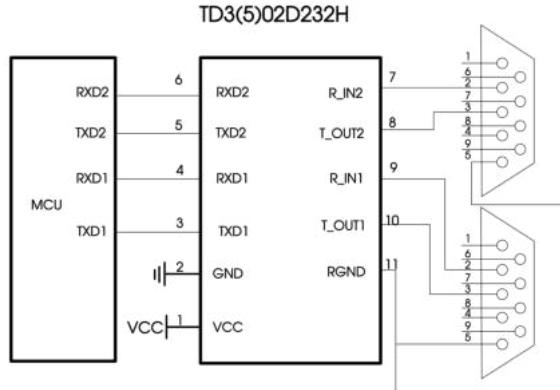


Fig.1

Note: There are two connection modes of DB9 interface connection: direct line and cross line, which are selected according to the actual application.

### 2. Recommended port protection circuit

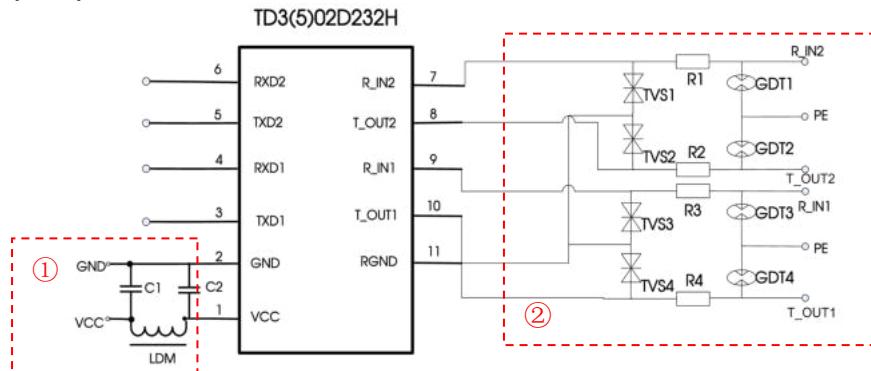


Fig.2

Recommended components and values:

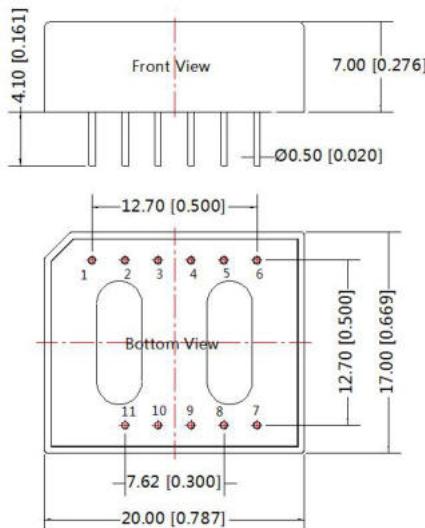
Components	Recommended part, value
C1, C2	1uF/16V
LDM	CD43-12uH
TVS1, TVS2, TVS3, TVS4	SMCJ10CA
R1, R2, R3, R4	12 Ω /2W(Wire-wound resistor)
GDT1, GDT2, GDT3, GDT4	S30-A90X

### 3. Precautions

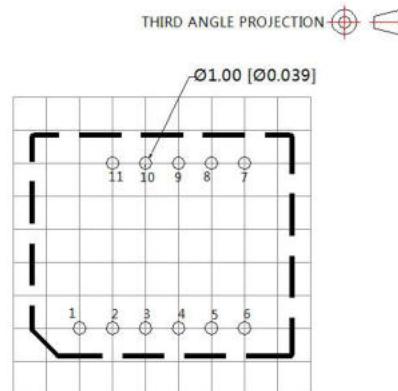
1) TD502D232H is for 5V TTL level only (not compatible with 3.3V TTL level); TD302D232H is for 3.3V TTL level only (not compatible with 5V).

4. For additional information, please refer to our application note on [www.mornsun-power.com](http://www.mornsun-power.com)

### Dimensions and Recommended Layout



Note:  
Unit :mm[inch]  
Pin diameter tolerances : $\pm 0.10$ [ $\pm 0.004$ ]  
General tolerances: $\pm 0.50$ [ $\pm 0.020$ ]



Note: Grid 2.54\*2.54mm

Pin-Out		
Pin	Mark	Function
1	VCC	Input Power +
2	GND	GND
3	TXD1	Sending Pin 1
4	RXD1	Receiving Pin 1
5	TXD2	Sending Pin 2
6	RXD2	Receiving Pin 2
7	R2IN	RS-232 Input
8	T2OUT	RS-232 Output
9	R1IN	RS-232 Input
10	T1OUT	RS-232 Output
11	RGND	Isolation Power Output RGND

### Notes:

1. For additional information on Product Packaging please refer to [www.mornsun-power.com](http://www.mornsun-power.com). The Packaging bag number: 58040014;
2. Unless otherwise specified, parameters in this datasheet were measured under the conditions of  $T_a=25^\circ\text{C}$ , humidity<75%RH with nominal input voltage and rated output load;
3. All index testing methods in this datasheet are based on company corporate standards;
4. The above are the performance indicators of the product models listed in this datasheet. Some indicators of non-standard models will exceed the above requirements. For details, please contact our technical staff;
5. We can provide product customization service, please contact our technical staff;
6. Products are related to laws and regulations: see "Features" and "EMC";
7. Our products shall be classified according to ISO14001 and related environmental laws and regulations, and shall be handled by qualified units.

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