Descriptions

Industrial Bus



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℃ to +85℃
- Enhanced EMC performance with recommended external circuit

Applications

- Industrial control
- Power
- Communication

Selection Guide

Certification	Part No.	Power Input (VDC)	Baud Rate (bps)	Static Current (mA)	Maximum Operating Current (mA)
--	T232L302D	3.15-3.45	115200	60	90
	T232L502D	4.75-5.25	115200	35	80

Specifications

Product feature	Item		Symbol	Min.	Typ.	Max.	Unit
Absolute Limits	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	℃
3.3V Input Specifications	Power Supply Input Voltage		VCC	3.15	3.3	3.45	VDC
	TXD Logic Level	High-level	VIH	0.7Vcc	--	3.6	
		Low-level	VIL	0	--	0.8	
	RXD Logic Level	High-level	VOH	VCC-0.4	3.1	--	
		Low-level	VOL	0	0.2	0.4	
	TXD Drive Current		IT	2	--	--	mA
	RXD Output Current		IR	--	--	10	
	Serial Interface		Compatible with + 3.3 V UART interface only				
5.0V Input Specifications	Power Supply Input Voltage		VCC	4.75	5	5.25	VDC
	TXD Logic Level	High-level	VIH	0.7Vcc	--	5.5	
		Low-level	VIL	0	--	0.8	
	RXD Logic Level	High-level	VOH	VCC-0.4	4.8	--	
		Low-level	VOL	0	0.2	0.4	
	TXD Drive Current		IT	2	--	--	mA
	RXD Output Current		IR	--	--	10	
	Serial Interface		Compatible with + 5 V UART interface only				
Output Specifications	Data Delay	TXD Transmitter Delay	tT	--	--	2	us
		RXD Receiver Delay	tR	--	--	2	
		High-level	RL=3kΩ to GND	5	--	--	VDC
		Low-level	RL=3kΩ to GND	--	--	-5	
	Receiver Input voltage			-15	--	15	
	Bus Interface Protection		ESD protection				
Truth Table Specifications	Send Status		TXD	T_OUT			
			L	H			
			H	L			
	Receive Status①		R_IN	RXD			
			≥2.4V	L			
			≤0.8V	H			
			0.8V≤RXD≤2.4V	Undefined state			
Note: ①The receiving threshold voltage will vary slighty with Vcc.							
General Specifications	Isolation Test		Electric strength test for 1 minute, leakage current <1mA	3000VDC			

	Insulation Resistance	At 500VDC	1000MΩ (Input-output)
	Operating Temperature		-40℃ to +85℃
	Transportation and Storage Temperature		-50℃ to +105℃
	Operating Humidity	Non-condensing	10% - 90%
	Safety Class		CLASS III
Mechanical Specifications	Case Material	WH8100-F	
	Dimensions	DIP12(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 ±4kV	Perf. Criteria B
	RS	IEC/EN 61000-4-3 10V/m	Perf. Criteria A
	EFT	IEC/EN 61000-4-4 ±1kV (Signal port)	Perf. Criteria B
	Surge	IEC/EN 61000-4-5 ±4kV (line to line, Signal port, see Fig. 2-②)	Perf. Criteria B
		IEC/EN 61000-4-5 ±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.

Design Reference

1.Typical application circuit

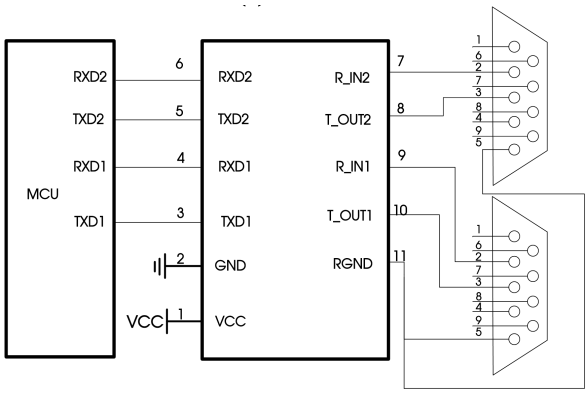


Fig. 1

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

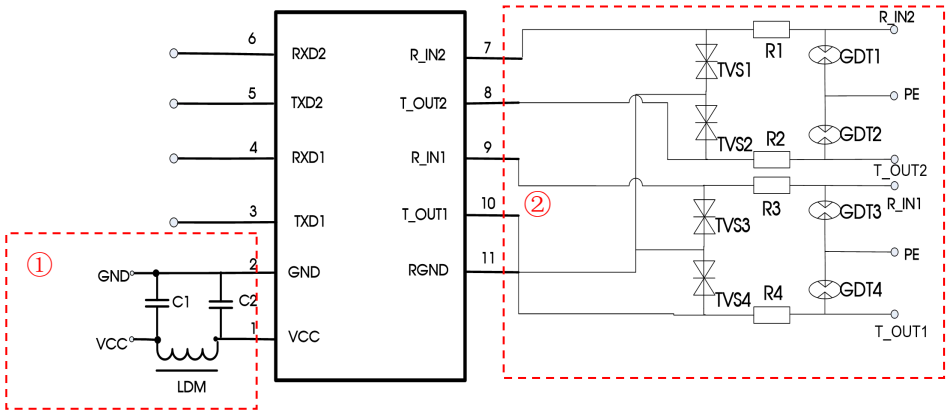


Fig. 2

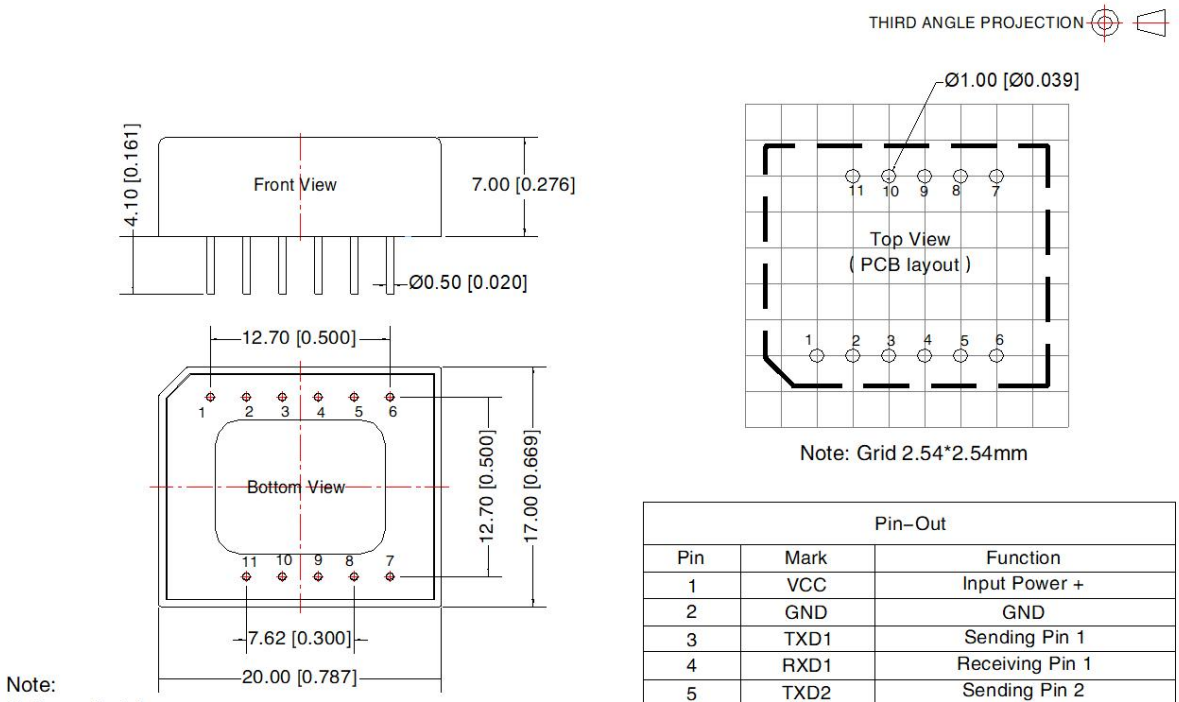
Recommended components and values:

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

3. Precautions

T232L502D is for 5V TTL level only (not compatible with 3.3V TTL level); T232L302D is for 3.3V TTL level only (not compatible with 5V).

Dimensions and Recommended Layout



Note: Grid 2.54*2.54mm

Note:
Unit :mm[inch]
Pin1/2/3/4/5/6/7/8/9/10/11: Ø 0.5mm
Pin diameter tolerances : ± 0.10[± 0.004]
General tolerances: ± 0.50[± 0.020]
The layout of the device is for reference only，please refer to the actual product

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 2
8	T2OUT	RS-232 Output 2
9	R1IN	RS-232 Input 1
10	T1OUT	RS-232 Output 1
11	RGND	Isolation Power Output RGND

Notes:

1.Unless otherwise specified, parameters in this datasheet were measured under the conditions of Ta=25℃, humidity<75%RH with nominal input voltage and rated output load;

2.All index testing methods in this datasheet are based on company corporate standards;

3.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;

4.Products are related to laws and regulations: see "Features" and "EMC";

5.Our products shall be classified according to ISO14001 and related environmental laws and regulations, and shall be handled by qualified units.