Descriptions Industrial Bus



RoHS

Report EN62368-1

Report BS EN 62368-1

Features

- Products meet EIA/TIA-232-F standard
- Small SMD12 size measuring 17.00 x 12.14 x 9.45mm
- High baud rate up to 115200bps
- Isolation test voltage: 2500 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) (Typ.)	Max. Operating Current (mA)
EN/BS EN	T232L331M	3.15-3.45	115200	20	60
	T232L531M	4.75-5.25	115200	20	60

Notes:*Product images are for reference only; the actual product shall prevail.

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	
	Reflow Soldering Temperature		Peak temp. ≤245℃, duration ≤60s max.at 217℃. For details, please refer to IPC/JEDEC J-STD-020D.1.				
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	--	3	--	us
		RXD Receiver Delay	tR	--	3	--	
	Driver Output Voltage	High-level	RL=3kΩ to GND	3.2	3.5	--	VDC
		Low-level	RL=3kΩ to GND	--	-3.5	-3.2	
	Receiver Input Voltage			-20	--	20	
Truth Table Specifications	Send Status		TXD	T_OUT			
			L	H			
			H	L			
	Receive Status①		R_IN	RXD			
			≥2.8V	L			
			≤0.8V	H			
			0.8V < RXD < 2.8V	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	2500VDC			
	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
	Moisture Sensitivity Level (MSL)	IPC/JEDEC J-STD-020D.1	Level 1
Mechanical Specifications	Case Material	WH9100-F (UL94 V-0)	
	Dimensions	SMD12 (17.00 x 12.14 x 9.45mm)	
	Weight	2.8g(Typ.)	
	Cooling Method	Free air convection	

Electromagnetic Compatibility (EMC)

Emissions	CE	CISPR32/EN55032 CLASS A (see Fig. 2-①)	
Immunity	ESD	IEC/EN 61000-4-2 Contact ±4kV (without external components, Signal port)	Perf. Criteria B
	RS	IEC/EN 61000-4-3 10V/m	Perf. Criteria B
	EFT	IEC/EN 61000-4-4 ±1kV (without external components, 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. 220V AC 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

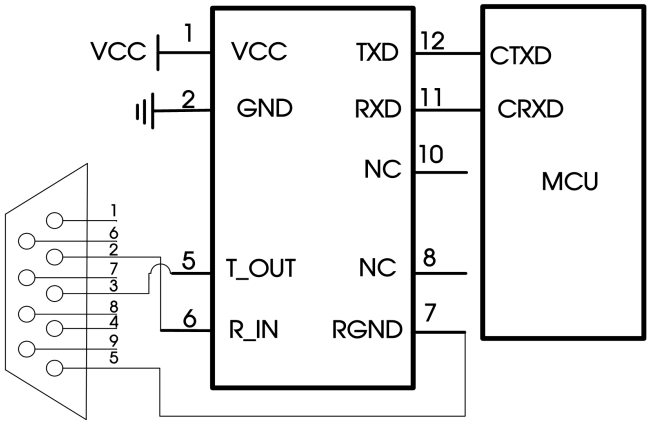


Fig. 1

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

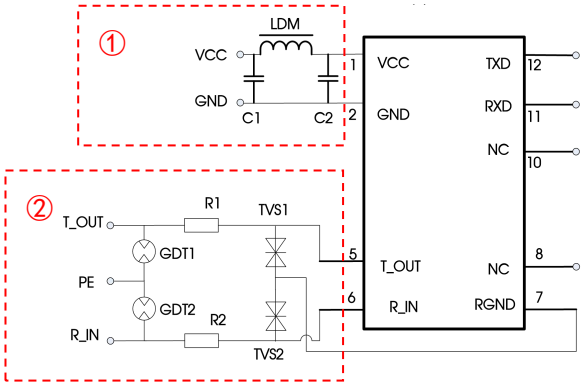


Fig. 2

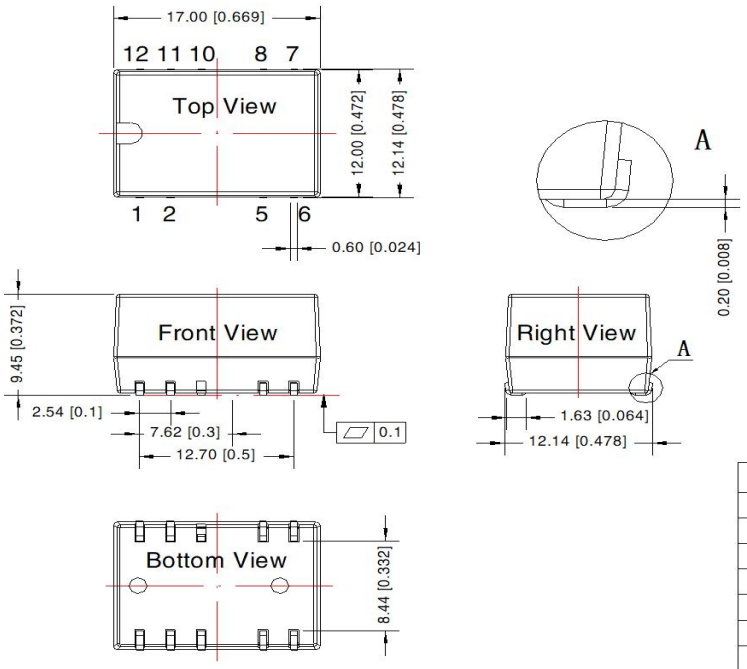
Recommended components and values:

Components	Recommended part, value
C1, C2	1uF/16V
LDM	CD43-12uH
TVS1, TVS2	SMCJ15CA
R1, R2	12Ω/2W(Wire-wound resistor)
GDT1, GDT2	S30-A90X

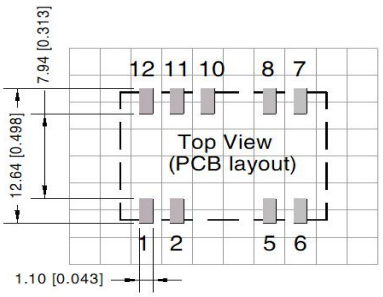
3. Precautions

T232L531M is for 5V TTL level only (not compatible with 3.3V TTL level); T232L331M is for 3.3V TTL level only (not compatible with 5V).

Dimensions and Recommended Layout



THIRD ANGLE PROJECTION



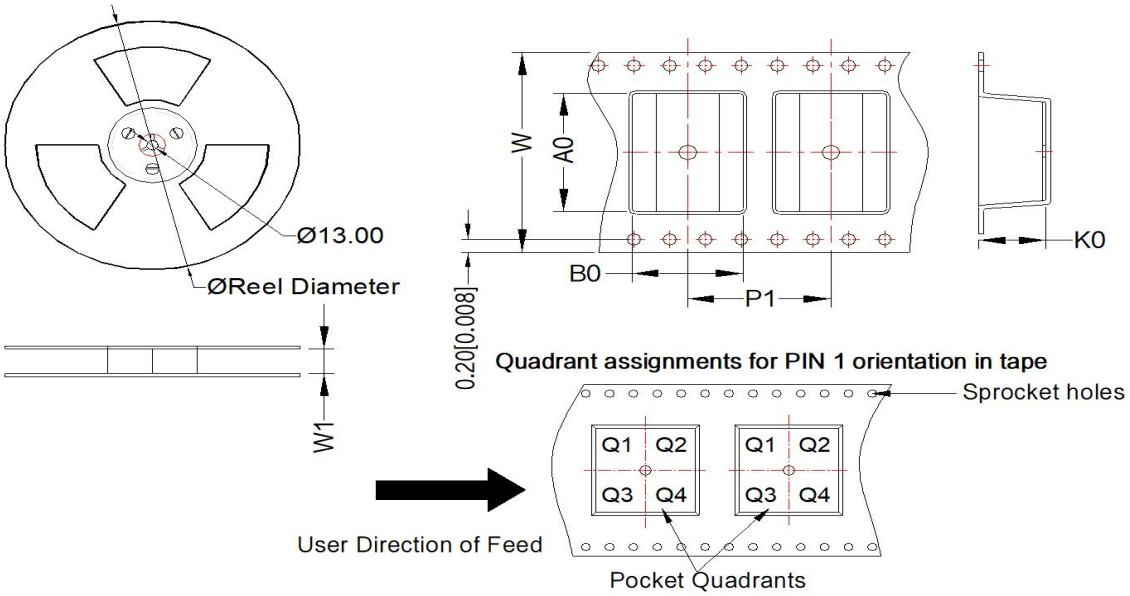
Note: Grid 2.54*2.54mm

Note:
Unit: mm[inch]
Pin section tolerances: ± 0.10[± 0.004]
General tolerances: ± 0.25[± 0.010]

Pin–Out		
Pin	Designation	Function
1	VCC	Input Power+
2	GND	Input Power Ground
5	T_OUT	RS–232 Actuator Output
6	R_IN	RS–232 Acceptor Input
7	RGND	Isolation Power Output Ground
8	NC	No Function Pin
10	NC	No Function Pin
11	RXD	TTL/CMOS Acceptor Input
12	TXD	TTL/CMOS Actuator Output

NC: Pin to be isolated from circuitry

Package diagram:



Package Type	Pin	SPQ	Reel Diameter (mm)	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P1 (mm)	W (mm)	Pin1 Quadrant
SMD	9	300	330.0	32.5	17.72	12.92	10.5	20.0	32.0	Q1

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;
6. The image certification marks are for reference only; please refer to the selection table for actual specifications. Certification is based on the physical mark or packaging label.