Signal conditioning modules
TMxxxxP Series

MORNSUN®

Millivolt level signal conditioning module

RoHS

FEATURES

- Signal input, signal output, power input, and isolation power output are all isolated from each other
- High accuracy of 0.1% Full Scale
- High linearity of 0.1% Full Scale
- Extremely low temperature coefficient of 50PPM/℃
- Operating ambient temperature range -25℃ to +71℃
- High reliability with >500,000 hours MTBF

PART NUMBER SYSTEM

TM xxxx P

- Package
- Isolation power output
- Power supply
- Signal output
- Signal input
- millivolt level signal
- Isolation amplifier

The TMxxxxP series are highly integrated and efficiency active signal conditioning modules, consisting of millivolt level positive and negative signal input with a positive signal output. These modules have a built-in highly efficient and isolated micro-power source, that can provide energy for the integrated signal processing circuit as well as providing isolated power for peripheral devices and circuits. The product greatly simplifies the design of three-wire and four-wire user applications and also greatly reduces the space needed for circuitry on the PC Board. These modules have three-port isolation (input, output and power supply). These modules adopt unique electromagnetic isolation technology, allowing for higher accuracy and extremely low temperature drift in comparison with opto-coupler devices.

Selection Guide

Part No.	Power Supply input Typ. (VDC)	Input Signal	Output Signal	Isolation Power Output (VDC)
TM1130P	24	0-10 mV	4-20mA	None
TM3130P	24	0-30mV	4-20mA	None
TM4130P	24	0-50mV	4-20mA	None
TM4150P	12	0-50mV	4-20mA	None
TM5230P	24	0-75mV	0-20mA	None
TM6130P	24	0-100mV	4-20mA	None
TM2550P	12	0-20mV	0-10V	None
TM2650P	12	0-20mV	0-5V	None
TM3650P	12	0-30mV	0-5V	None
TM4530P	24	0-50mV	0-10V	None
TM4630P	24	0-50mV	0-5V	None
TM4650P	12	0-50mV	0-5V	None
TM4660P	5	0-50mV	0-5V	None
TM4S50P-2.5	12	0-50mV	0-2.5V	None
TM5530P	24	0-75mV	0-10V	None
TM5630P	24	0-75mV	0-5V	None
TM5650P	12	0-75mV	0-5V	None
TM6530P	24	0-100mV	0-10V	None
TM6630P	24	0-100mV	0-5V	None
TM6650P	12	0-100mV	0-5V	None
TM6S50P-3.3	12	0-100mV	0-3.3V	None
TM2S60P-2.5	5	0-20mV	0-2.5V	None
TM5130P	24	0-75mV	4-20mA	None
TM6660P	5	0-100mV	0-5V	None

Notes: Customization products are available if required.

Input Specifications

Item		Operating Conditions	Min.	Typ.	Max.	Unit
Power input	Input voltage		Typ.-5%	Typ.	Typ.+5%	VDC
	Input power	At full load	--	--	1	W
	Power supply protection		Input reverse polarity protection			
Signal input	Input signal		See selection guide			
	Input impedance		10			MΩ
	Overload		--	--	5	V

Output Specifications

Item		Operating Conditions	Min.	Typ.	Max.	Unit
Signal output	Output signal		See selection guide			
	Load capacity	voltage signal	2	--	--	kΩ
		current signal	--	--	500	Ω

Transmission Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Signal Precision	Ta=25℃	-0.1%FS	--	+0.1%FS	--
Temperature Coefficient	Operating temperature range from -25℃ to +71℃	--	--	50	PPM/℃

General Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Electric Isolation		signal input, signal output and power input terminals are all isolated from each other			
Isolation Test	Electric strength test for 1 minute with a leakage current <1mA, humidity <70%RH	2.5	--	--	kVDC
Insulation Resistance	At 500VDC	100	--	--	MΩ
Operating Temperature		-25	--	+71	℃
Transportation and Storage Temperature		-50	--	+105	℃
Application Environment		The presence of dust and corrosive gas may cause damage to the product			

Mechanical Specifications

Case Material	Black plastic, flame-retardant and heat-resistant
Package	DIP24
Weight	11.5g(Typ.)
Cooling Method	Free air convection

Electromagnetic Compatibility (EMC)

Immunity	ESD	IEC/EN61000-4-2	Contact ±4kV (see Fig. 2 for recommended circuit)	perf. Criteria B
	EFT	IEC/EN61000-4-4	Power supply port ±2kV (see Fig. 2 for recommended circuit)	perf. Criteria B
		IEC/EN61000-4-4	Other ports ±1kV (see Fig. 2 for recommended circuit)	perf. Criteria B
	Surge	IEC/EN61000-4-5	Power supply ±1kV (see Fig. 2 for recommended circuit)	perf. Criteria B
		IEC/EN61000-4-5	Other ports ±1kV (line to ground) (see Fig. 2 for recommended circuit)	perf. Criteria B

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. 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

Please refer to Isolated Transmitter application notes.

Design Reference

1. Wiring diagram for product application

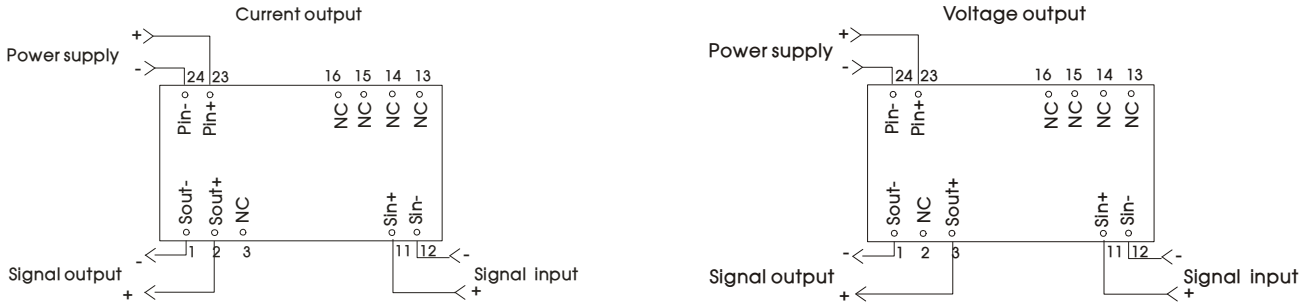


Fig.1

2. EMC compliance recommended circuit

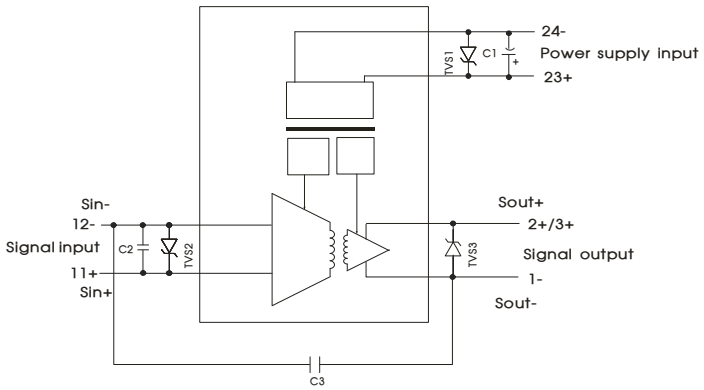


Fig.2

Component	Recommended part
TVS1	SMCJ30A
TVS2	SMBJ5A
TVS3	SMBJ15A
C1	220μF/35V
C2	1μF/50V
C3	2200pF/400VAC

3.Schematic diagram of signal input and signal output(Ideal state)

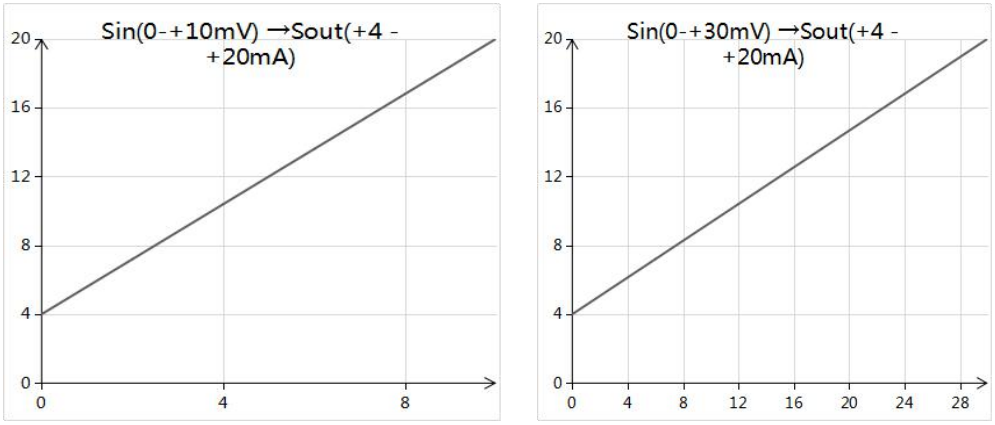
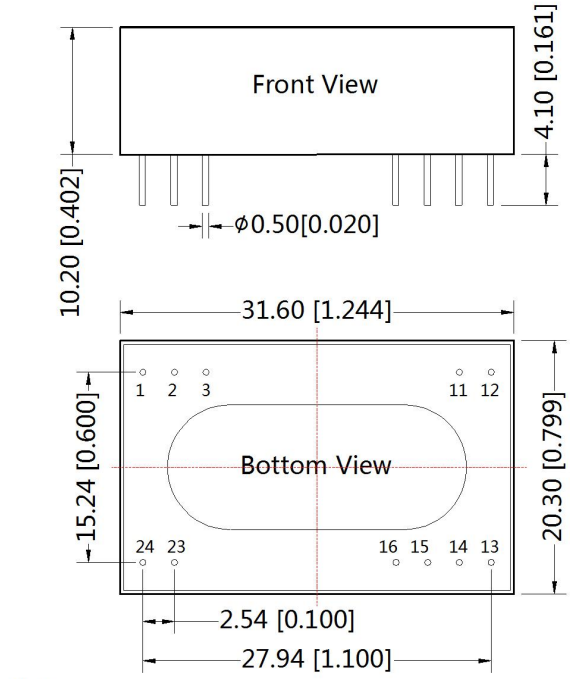


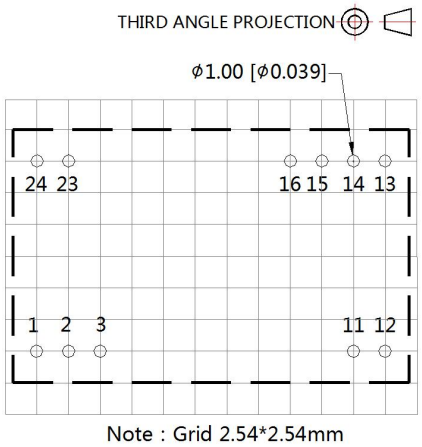
Fig. 3

4.For more information please find the application notes on www.mornsun-power.com

Dimensions and Recommended Layout



Note:
Unit :mm[inch]
Pin diameter tolerances :±0.10[±0.004]
General tolerances:±0.50[±0.020]



Note : Grid 2.54*2.54mm

Pin-Out			
Pin	Vo	Io	Function
1	Sout-	Sout-	Signal output(-)
2	NC	Sout+	Signal output(+)
3	Sout+	NC	Signal output(+)
11	Sin+	Sin+	Signal input(+)
12	Sin-	Sin-	Signal input(-)
13,14	NC	NC	No function pin
15,16	NC	NC	No function pin
23	Pin+	Pin+	Power supply(+)
24	Pin-	Pin-	Power supply(-)

NC:Not available for electrical connection

Notes:

1. For additional information on Product Packaging please refer to www.mornsun-power.com. The Packaging bag number: 58210008;
2. 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;
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 technicians directly for specific information;
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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