

RTDs detection type isolated module



FEATURES

- three-wire Pt100 RTDs signal input
- High precision grade (0.2% F.S.)
- High linearity (0.2% F.S.)
- Low ripple & noise: $\leq 30\text{mVp-p}$ (20MHZ, 100 Ω load)
- Extremely low temperature drift (50PPM/ $^{\circ}\text{C}$, within -40 to +85 $^{\circ}\text{C}$.Typ.)
- Three-port isolation (input, output and power supply)
- Standard DIP24(31.8*20.3*9.5mm), Meets UL94V-0 flame retardant package
- Auxilliary power: 24V DC single power supply
- Industry standard signal output : 4~20mA
- Low cost, Ultra-small size, Convenient to use, High reliability
- Industrial grade (range of operating temperature: -40 to +85 $^{\circ}\text{C}$)

TRP15130P-SC Series temperature signal isolation module is a hybrid integrated circuit, it is the RTD signal by the level of isolation of temperature converted into a standard linear with temperature signal. The circuit on the same chip integrates a set of multi-channel high isolated DC / DC power supply, Several high-performance signal isolators, and RTD linearization, long-term compensation, interference suppression circuit. Especially suitable for Pt100 RTD signal isolation converted into 4~20mA standard signal isolation. Temperature signals transmission and remote without distortion, Temperature signal acquisition and isolated of DCS system or industrial site PLC. Chip integrates a high-efficiency DC-DC, it can produce two groups were separated from each other to the internal power amplifier inputs, modulation circuit supply and Outputs of the demodulator circuit, Switching circuit, and filter circuit. SMD technology structure and new isolation technologies allow the device to achieve: power, signal input and signal output 2000VAC Three-terminal isolation. The product can meet the harsh operating environment requirements. Such as industrial grade temperature, humidity and vibration environment. The main application: Signal isolation, Data acquisition, High-accuracy temperature measurement, Thermal-resistance signal isolation, Temperature control, Ground Disturbing and Restraining, Temperature sensor signal convert into standard signal, Oil temperature detection and alarm, Signal remote transmission, Power monitoring, Medical equipment temperature control, Isolating transmitters.

Selection Guide

| Part No. | Power Supply Input (VDC) | Input Signal | Output Signal | Isolation voltage | Isolation Power Output (VDC) |
|--------------|--------------------------|-----------------------------------|---------------|-------------------|------------------------------|
| TRP15130P-SC | 24 | Pt100 (0~100 $^{\circ}\text{C}$) | 4~20mA | 2KAC | None |

Input Specifications

| Item | Operating Conditions | | Value |
|--------------------|-------------------------|--|---------------------------------|
| Input Power Supply | Input voltage | | 24V $\pm 5\%$ |
| | Power supply protection | | Reverse polarity protection |
| Input | Input signal | | Pt100 |
| | Input impedance | | Pt100: 0~100 $^{\circ}\text{C}$ |

Output Specifications

| Item | Operating Conditions | | Value |
|--------|----------------------|-----------------------|----------------------|
| Output | Output signal | | 4~20mA |
| | Load capacity | Current output @ 20mA | $\leq 100\Omega$ |
| | Ripple & noise | Bandwidth 20MHz | $\leq 30\text{mVpp}$ |

Transmission Specifications

| Item | Operating Conditions | | Value |
|-------------------|--|--|--|
| Zero Offset | | | None |
| Precision | | | $\pm 0.2\% \text{F.S.}$, Typ.(0.5%F.S.Max.) |
| Temperature Drift | Operating temperature range of -40 to +85 $^{\circ}\text{C}$ | | 50PPM/ $^{\circ}\text{C}$, Typ. |

| | | |
|---------------------|-----------------------|------------------------------------|
| Regulatory function | Full-scale regulation | External regulation resistor (10K) |
| | Zero regulation | External regulation resistor (10K) |

General Specifications

| Item | Operating Conditions | Value |
|--|---|---|
| Electric Isolation | | Three-terminal isolation (signal input, signal output and input power supply are mutually isolated) |
| Degree of Isolation | testing for 1 minute, leakage current <5mA, humidity <70% | 2.0KVAC /60S |
| Insulation Resistance | | 100M Ω , 500VDC (signal input terminal, signal output terminal and power supply terminal) |
| Operating Temperature | | -40~+85 $^{\circ}$ C |
| Transportation and Storage Temperature | | -50~+105 $^{\circ}$ C |
| Temperature rising | Ta=25 $^{\circ}$ C | \leq 50 $^{\circ}$ C |
| Application Environment | | The presence of dust, fierce vibration, impulsion and corrosive gas may cause damage to the product |

Physical Specifications

| | |
|-----------------|--|
| Casing Material | Black flame-retardant heat-proof plastic (UL94-V0) |
| Package | DIP24(31.80*20.30*9.50mm) L*W*H |
| Weight | 10.3g(Typ.) |
| Cooling Method | Free air convection |

EMC Specifications

| | | | | |
|-----|-------|-----------------|---|------------------|
| EMI | CE | CISPR22/EN55022 | CLASS A (see Fig. 3 for recommended circuit) | |
| | RE | CISPR22/EN55022 | CLASS A | |
| EMS | ESD | IEC/EN61000-4-2 | Contact \pm 4KV | perf. Criteria B |
| | EFT | IEC/EN61000-4-4 | Power supply port \pm 2KV (see Fig. 3 for recommended circuit) | perf. Criteria B |
| | Surge | IEC/EN61000-4-5 | Power supply port \pm 1KV (see Fig. 3 for recommended circuit) | perf. Criteria B |

Application Precautions

1. Please read the instructions carefully before use; contact our technical support if you have any problem.
2. Do not use the product in hazardous areas.
3. Use DC power supply for the product and 220V AC power supply is prohibited.
4. Do not dismount and assemble the product without permission to avoid failure or malfunction of equipment.

After-sales service

1. Ex-factory inspection and quality control have been strictly conducted for the product; if there occurs abnormal operation or possibility of failure of internal module, please contact the local representative or our technical support.
2. The warranty period for the product is 3 years as calculated from the date of delivery. If any quality problem occurs under normal use within the warranty period, the product can be repaired or changed for free.

Applied circuit

See *Application Notes for Isolated Transmitter* for details.

Design Reference

1. Product structure diagram

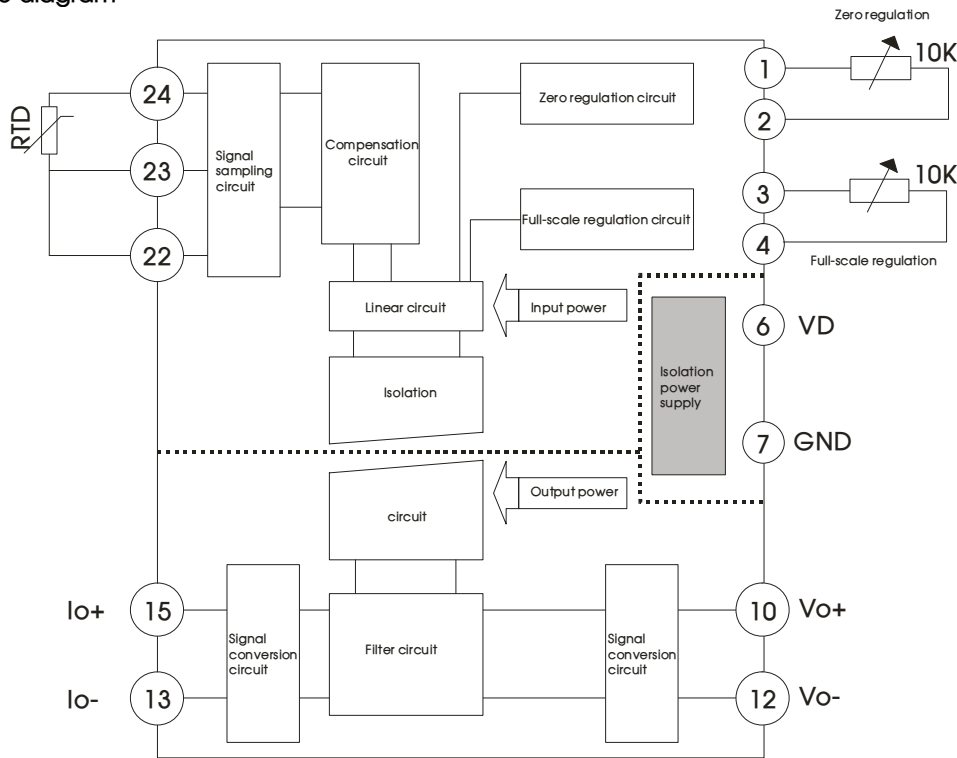


Fig. 1

2. Product calibration

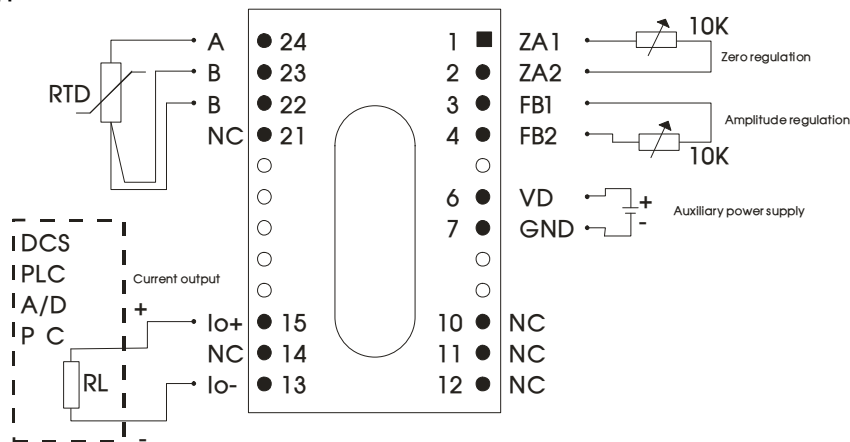


Fig. 2

Calibration Equipment: the 0.01 accuracy resistance box, The DC power, Four and a half multimeter.

Calibration steps:

- 1) Accordance with the application diagram to wiring, or install the product into the circuit board which has been designed.
- 2) According to the value of the auxiliary power supply , connect the power, Install adjustment potentiometer; the output of product is connected with the multimeter.
- 3) According to the temperature range of input to query the indexing table corresponding resistance value range(Rlow~Rhigh).
- 4) Turn on the power 15 minutes.
- 5) The resistance box is set to equal the value of the resistance Rlow, adjust the Zero potentiometer so that the output value corresponding to zero (eg. 4mA).
- 6) The resistance box is set to equal the value of the resistance Rhigh, adjust the Amplitude potentiometer so that the output corresponding to Full-Degree (eg. 20mA).
- 7) In order to improve the output accuracy, please repeat several steps 5 and 6.
- 8) Calibration finished.

3.Recommended EMC circuit

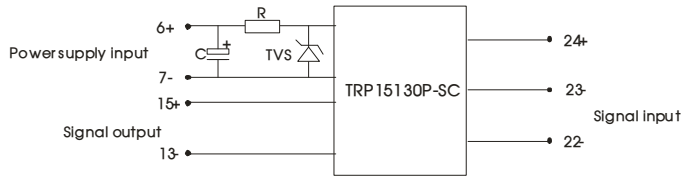
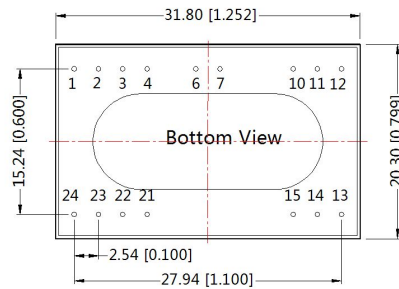
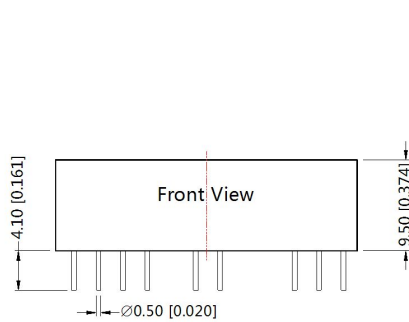


Fig. 3

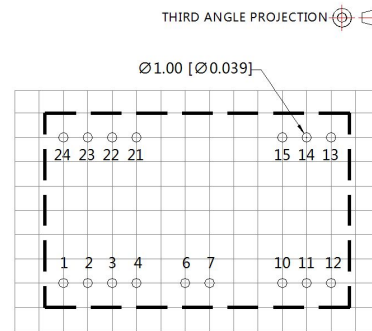
| Components | Recommended parameters |
|------------|------------------------|
| TVS | SMCJ30A |
| R | 12Ω 2W Wirewound |
| C | 220 μ F/35V |

3. 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:±0.25[±0.010]



Note : Grid 2.54*2.54mm

| Pin-Out | | |
|---------|----------|-----------------------------------|
| Pin | Function | |
| 1 | ZA1 | Zero Adjustment 1 |
| 2 | ZA2 | Zero Adjustment 2 |
| 3 | FB1 | Amplitude Adjustment 1 |
| 4 | FB2 | Amplitude Adjustment 2 |
| 6 | VD | Power Supply(+) |
| 7 | GND | Power Supply(-) |
| 10 | Vo+ | Voltage Signal Output (-) |
| 12 | Vo- | Voltage Signal Output (-) |
| 13 | Io- | Current Signal Output (-) |
| 15 | Io+ | Current Signal Output (+) |
| 22 | B | Thermal Resistance Signal Input B |
| 23 | B | Thermal Resistance Signal Input B |
| 24 | A | Thermal Resistance Signal Input A |
| 其它 | NC | No Electrical Connections |

Notes:

1. Packing Information please refer to 'Product Packing Information'. Packing bag number: 58210008;
2. Unless otherwise specified, data in this datasheet should be tested under the conditions of $T_a=25^{\circ}\text{C}$, humidity<75% when inputting nominal voltage and outputting rated load;
3. All index testing methods in this datasheet are based on our Company's corporate standards;
4. The performance indexes of the product models listed in this datasheet are as above, but some indexes of non-standard model products will exceed the above-mentioned requirements, and please directly contact our technician for specific information;
5. We can provide product customization service;
6. Specifications of this product are subject to changes without prior notice.

Mornsun Guangzhou Science & Technology Co., Ltd.

Address: No. 5, Kehui St. 1, Kehui Development Center, Science Ave., Guangzhou Science City, Luogang District, Guangzhou, P. R. China
Tel: 86-20-38601850-8801 Fax: 86-20-38601272 E-mail: info@mornsun.cn