

Duplex PT100 thermal resistance measurement module



RoHS



## FEATURES

- Duplex PT100 thermal resistance measurement
- Isolation test voltage 3.75kVrms for 60s
- High accuracy of 0.02% FS  $\pm 0.1^{\circ}\text{C}$
- High resolution of 0.01  $^{\circ}\text{C}$
- Extremely low temperature coefficient of 15PPM/ $^{\circ}\text{C} \pm 0.1^{\circ}\text{C}$
- Temperature measurement range of  $-200^{\circ}\text{C}$  to  $+850^{\circ}\text{C}$
- IIC communication interface
- Operating temperature range:  $-40^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$
- Standard DIP16 Package (25.0 x 16.9 x 7.1mm), UL94-V0
- Temperature alarm output

TRP10I7HN is an isolated temperature measurement module product used to detect PT100 thermal resistance. It can be used in industrial thermostats, temperature measuring instruments, petrochemicals, power temperature monitoring and other fields. The product can convert the on-site thermal resistance signal into IIC digital signal, and then use the standard IIC interface to output temperature data directly, so as to realize the on-site temperature signal collection and transmission. At the same time, the product with independent power supply, and the input and output are isolated from each other. In addition, this series of products have the function of two-way PT100 thermal resistance signal acquisition, and adopt a small volume design to meet the needs of on-site high-density installation.

## Selection Guide

| Certification | Part No.  | Power Supply Input (VDC) | Input Signal | Output Signal | Scale Range                                      | Sampling Rate(Hz) |
|---------------|-----------|--------------------------|--------------|---------------|--------------------------------------------------|-------------------|
| --            | TRP10I7HN | 3.3                      | Pt100        | IIC           | $-200^{\circ}\text{C}$ to $+850^{\circ}\text{C}$ | 0.5               |

## Input Specification

| Item               | Symbol                                     | Min. | Typ. | Max. | Unit |
|--------------------|--------------------------------------------|------|------|------|------|
| Power Supply Input | VDD                                        | 3.0  | 3.3  | 3.6  | VDC  |
| I/O Input level    | High-level                                 | VIH  | 1.9  | --   |      |
|                    | Low-level                                  | VIL  | 0    | --   |      |
| I/O Output level   | High-level (VDD=3.3V, I <sub>o</sub> =8mA) | VOH  | 3.1  | --   |      |
|                    | Low-level (VDD=3.3V, I <sub>o</sub> =8mA)  | VOL  | --   | --   | 0.1  |

## Transmission Specifications

| Item                    | Operating Conditions  | Min. | Typ.            | Max. | Unit                    |
|-------------------------|-----------------------|------|-----------------|------|-------------------------|
| Scale Range             | --                    | -200 | --              | +850 | $^{\circ}\text{C}$      |
| Precision               | 25 $^{\circ}\text{C}$ | --   | 0.02% $\pm 0.1$ | --   | $^{\circ}\text{C}$      |
| Resolution              | --                    | --   | 0.01            | --   | $^{\circ}\text{C}$      |
| Zero Temperature Drift  | --                    | 0.05 | 0.1             | 0.2  | $^{\circ}\text{C}$      |
| Temperature Coefficient | --                    | --   | 10              | 15   | PPM/ $^{\circ}\text{C}$ |
| Channel Number          | 2                     |      |                 |      | --                      |

## General Specifications

| Item                                   | Operating Conditions                   | Value                                           |
|----------------------------------------|----------------------------------------|-------------------------------------------------|
| Electric Isolation                     | 1Min leakage current $\leq 5\text{mA}$ | 3750Vrms                                        |
| Insulation Resistance                  | At 500VDC                              | 100G $\Omega$                                   |
| Operating Ambient Temperature          |                                        | $-40^{\circ}\text{C}$ to $+85^{\circ}\text{C}$  |
| Transportation and Storage Temperature |                                        | $-40^{\circ}\text{C}$ to $+105^{\circ}\text{C}$ |
| Operating Humidity                     | Non-condensing                         | 10% - 90%                                       |
| Safety Class                           |                                        | CLASS III                                       |

## Physical Specifications

|                |                                                             |
|----------------|-------------------------------------------------------------|
| Case Material  | Black plastic, flame-retardant and heat-resistant(UL94 V-0) |
| Dimensions     | 25.00 x 16.90 x 7.10mm                                      |
| Weight         | 5.3g(Typ.)                                                  |
| Cooling Method | Free air convection                                         |

## Electromagnetic Compatibility(EMC)

|          |       |                 |                                                   |                  |
|----------|-------|-----------------|---------------------------------------------------|------------------|
| Immunity | ESD   | IEC/EN61000-4-2 | Contact $\pm 3.5\text{kV}$ (PT100 measuring port) | perf. Criteria A |
|          | EFT   | IEC/EN61000-4-4 | $\pm 1\text{kV}$ (PT100 measuring port)           | perf. Criteria B |
|          | Surge | IEC/EN61000-4-5 | $\pm 1\text{kV}$ (PT100 measuring port)           | 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. 220V AC power supply is prohibited.
4. It is strictly forbidden to disassemble the product privately in order to avoid product failure or malfunction.
5. Hot-swap is not supported.

## 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 *TRP10I7HN Product User Manual* for details.

## Design Reference

### 1. Product block diagram

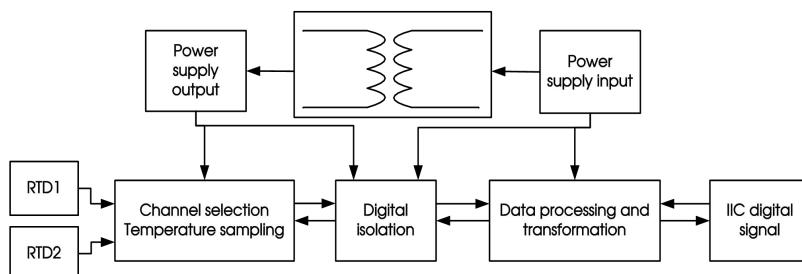
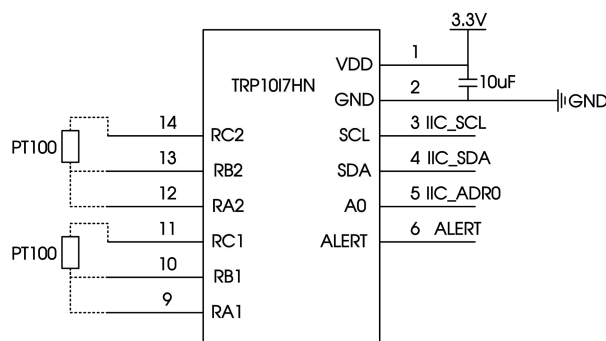


Fig. 1 Product block diagram

### 2. Typical application

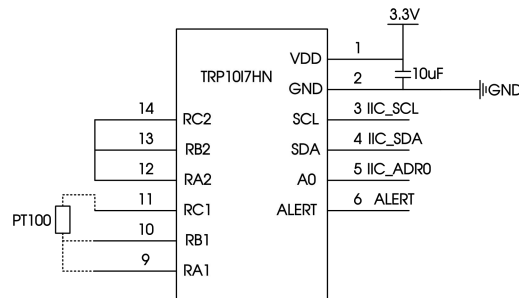
#### 1)Dual signal detection application circuit: :

The TRP10I7HN dual-channel thermal resistance acquisition module can work with 3.3V DC power supply. The signal input terminal is connected to the PT100 thermal resistance signal directly. RA1, RB1, RC1 are form a signal acquisition circuit, and RA2, RB2, and RC2 form another. The signal output terminal is connected with the standard IIC interface to realize dual-channel PT100 thermal resistance signal acquisition.



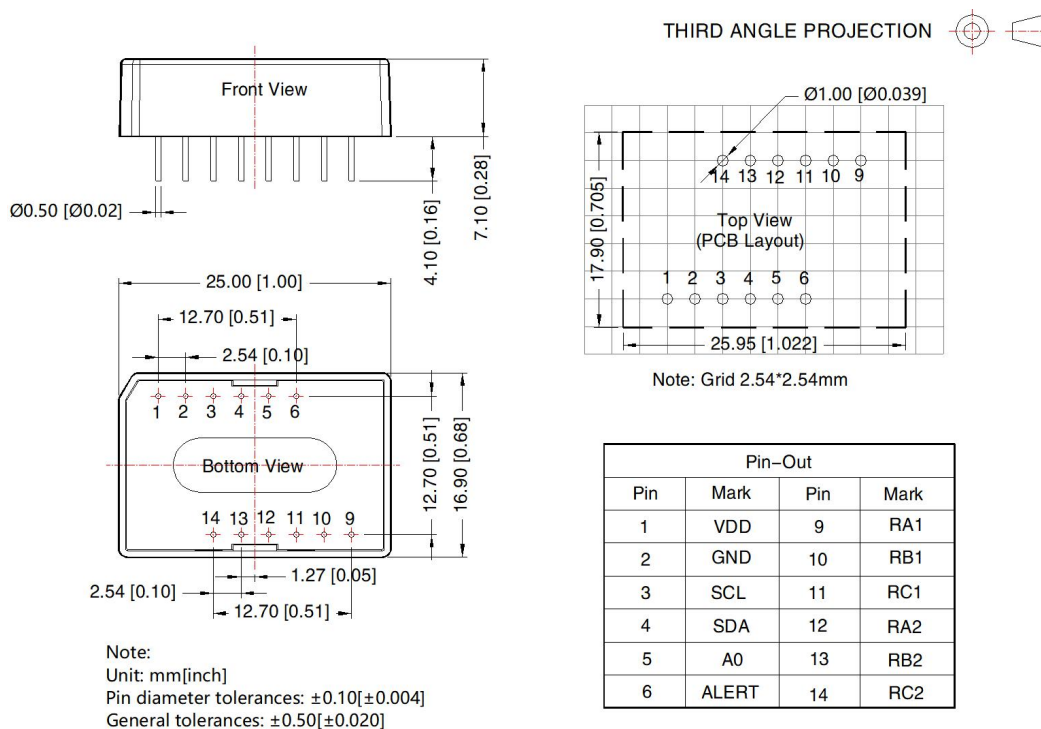
### 2) Single signal detection application circuit:

The TRP10I7HN dual-channel thermal resistance acquisition module is compatible with single-channel signal acquisition. When using single-channel signal acquisition, it is necessary to short-circuit the signal input of the other channel. The following figure shows the wiring diagram of the first signal acquisition application circuit.



3. For additional information please refer to application notes on [www.mornsun-power.com](http://www.mornsun-power.com)

## Dimensions and Recommended Layout



### Notes:

- For additional information on Product Packaging please refer to [www.mornsun-power.com](http://www.mornsun-power.com). The Packaging bag number: 58240020;
- 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;
- All index testing methods in this datasheet are based on company corporate standards;
- 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.
- We can provide product customization service;
- Products are related to laws and regulations: see "Features" and "EMC";
- Our products shall be classified according to ISO14001 and related environmental laws and regulations, and shall be handled by qualified units.

## MORNSUN Guangzhou Science & Technology Co., Ltd.

Address: No. 8 Nanyun 4th Road, Huangpu District, Guangzhou, China

Tel: 86-20-38601850

Fax: 86-20-38601272

E-mail: [info@mornsun.cn](mailto:info@mornsun.cn)

[www.mornsun-power.com](http://www.mornsun-power.com)