

# Model TS318-1B0814 Thermopile Sensor



**Thermopile IR-Sensor**  
**For Contactless Temperature Measurement**  
**Single Element**  
**Small Package for Ear Thermometer**  
**High Signal**  
**Flat Filter**  
**Accurate Reference Sensor**

## DESCRIPTION

Thermopiles are mainly used for contactless temperature measurement in many applications. Their function is to transfer the heat radiation emitted from the objects into a voltage output.

## FEATURES

- High Signal
- Ni-RTD Reference Sensor
- Small TO-18 Package
- 8-14 $\mu$ m Band Pass Filter for measurement distances >0.5m

## APPLICATIONS

- Pyrometers (general)
- Industrial Pyrometers

## ABSOLUTE MAXIMUM RATINGS

| Parameter           | Symbol         | Min | Typical | Max  | Unit | Description   |
|---------------------|----------------|-----|---------|------|------|---------------|
| Storage Temperature | T <sub>s</sub> | -20 | +20     | +85  | °C   | permanent     |
| Storage Temperature | T <sub>s</sub> | -20 | +20     | +100 | °C   | non permanent |

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## PERFORMANCE SPECS

| Parameter  | Symbol        | Value            | Unit                 | Condition   |
|--|---------------|------------------|----------------------|---|
| Operating Ambient Temperature                    | $T_{Amb}$     | -20 to +85       | °C                   | permanent   |
| Operating Ambient Temperature                    | $T_{Amb}$     | -20 to +100      | °C                   | non permanent   |
| Package  |               | TO-18            |                      |   |
| Absorber Area                                    | A             | $0.8 \times 0.8$ | mm <sup>2</sup>      |   |
| Thermopile Resistance                            | $R_{TP}$      | $70 \pm 30$      | k $\Omega$           | $T_{Amb} = +25^{\circ}\text{C}$   |
| Temperature Coefficient of Thermopile Resistance | $TCR_{TP}$    | $-0.06 \pm 0.04$ | %/K                  | $T_{Amb} = +25^{\circ}\text{C}$ to $+75^{\circ}\text{C}$  |
| Voltage Response                                 | $V_{TP}$      | $5.0 \pm 1.3$    | mV                   | $T_{Amb} = +25^{\circ}\text{C}$ , $T_{Obj} = +100^{\circ}\text{C}$ , DC, totally filled field of view |
| Temperature Coefficient of Voltage Response      | $TCV_{TP}$    | $-0.45 \pm 0.08$ | %/K                  | $T_{Amb} = +25^{\circ}\text{C}$ to $+75^{\circ}\text{C}$  |
| Noise Equivalent Voltage                         | NEV           | 34               | nV/Hz <sup>1/2</sup> | $T_{Amb} = +25^{\circ}\text{C}$   |
| Rise Time  | $\tau_{63}$   | $12 \pm 5$       | ms                   |   |
| Ambient Temperature Sensor                       |               | Ni-RTD           |                      |   |
| Ambient Temperature Sensor Resistance            | $R_{Ni-RTD}$  | $1000 \pm 4$     | $\Omega$             | $T_{Amb} = 0^{\circ}\text{C}$   |
| Temperature Coefficient of Ni-RTD                | $TC_{Ni-RTD}$ | $6178 \pm 150$   | ppm/K                | $T_{Amb} = 0^{\circ}\text{C}$ to $+100^{\circ}\text{C}$   |

## TYPICAL PERFORMANCE CURVES

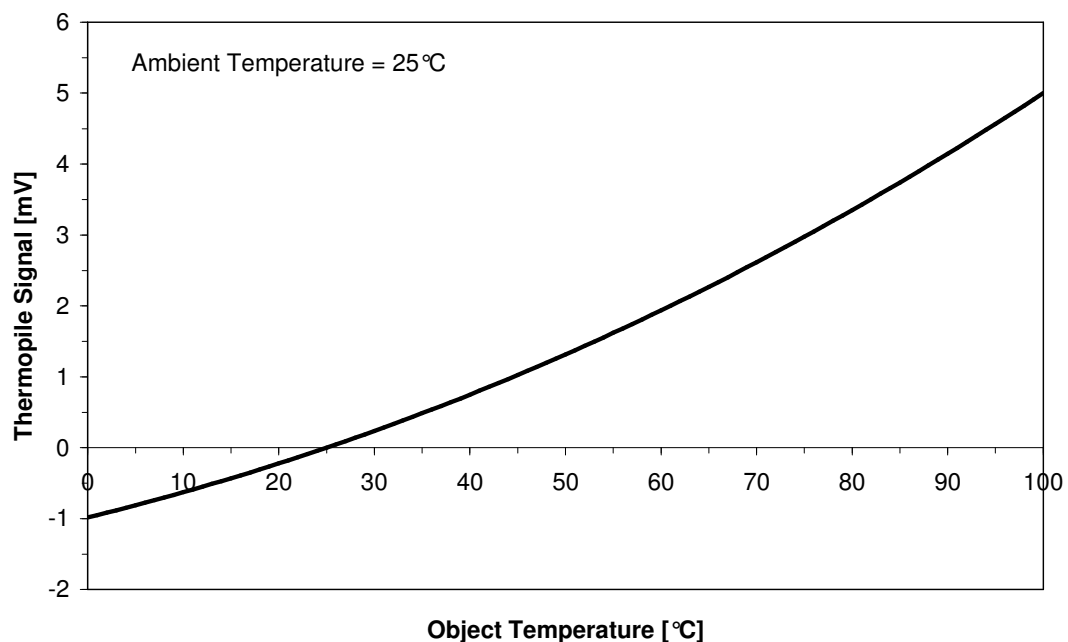


Figure 1: Thermopile signal versus object temperature at 25°C ambient temperature

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## OPTICAL CHARACTERISTICS

| Parameter     | Symbol | Value | Unit | Description              |
|---------------|--------|-------|------|--------------------------|
| Field of View | FOV    | 110   | deg  | at 50% of maximum signal |

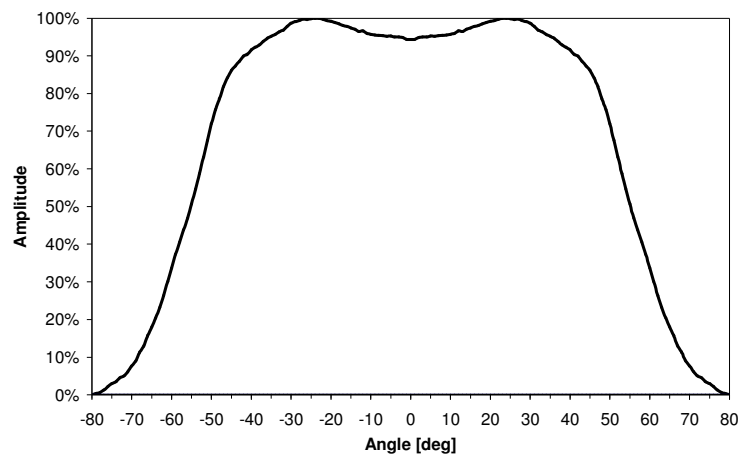


Figure 2: Field of View Curve

## FILTER CHARACTERISTICS

| Parameter          | Symbol                    | Value       | Unit          | Description               |
|--------------------|---------------------------|-------------|---------------|---------------------------|
| Transmission Range | BBP                       | 8-14        | $\mu\text{m}$ | Broad Band Pass           |
| Transmission       | $T_9 \dots 13\mu\text{m}$ | $\geq 75.0$ | %             | at 9 ... 13 $\mu\text{m}$ |

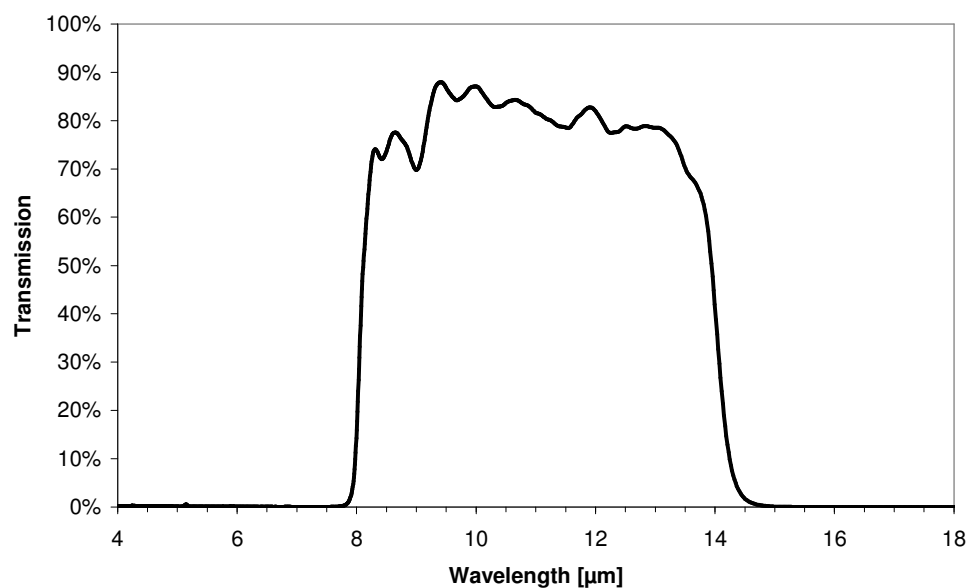


Figure 3: Filter transmission curve

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## ELECTRICAL CONNECTIONS

| Pin | Symbol |
|-----|--------|
| 1   | TP +   |
| 2   | Ni-RTD |
| 3   | TP -   |
| 4   | GND    |

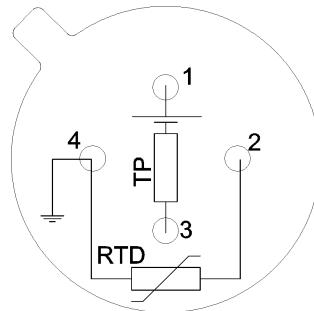
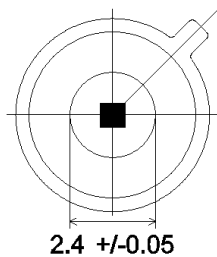


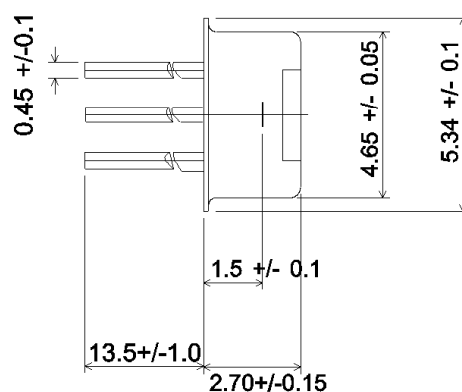
Figure 4: Electrical connections - bottom view of thermopile

## MECHANICAL DIMENSIONS

### TOP VIEW



### SIDE VIEW



### BOTTOM VIEW

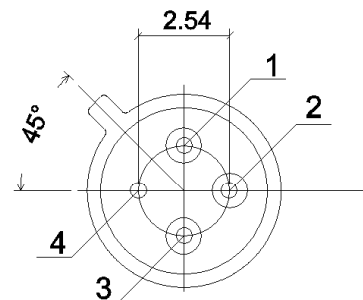


Figure 5: Mechanical dimensions of thermopile

# Model TS318-1B0814 Thermopile Sensor

## ORDERING INFORMATION

**Part Description** TS318-1B0814

**Part No.** G-TPCO-031

## TECHNICAL CONTACT INFORMATION

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