



# Model TS318-3B0814 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
- Accurate Reference Sensor
- Small TO-18 Package
- 8-14µm 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 × 0.8    | mm <sup>2</sup>      |   |
| Thermopile Resistance                            | $R_{TP}$      | 70 ± 30      | kΩ                   | $T_{Amb} = +25^{\circ}C$  |
| Temperature Coefficient of Thermopile Resistance | $TCR_{TP}$    | -0.06 ± 0.04 | %/K                  | $T_{Amb} = +25^{\circ}C$ to $+75^{\circ}C$  |
| Voltage Response                                 | $V_{TP}$      | 5.2 ± 1.3    | mV                   | $T_{Amb} = +25^{\circ}C$ , $T_{Obj} = +100^{\circ}C$ , DC, totally filled field of view |
| Temperature Coefficient of Voltage Response      | $TCV_{TP}$    | -0.45 ± 0.08 | %/K                  | $T_{Amb} = +25^{\circ}C$ to $+75^{\circ}C$  |
| Noise Equivalent Voltage                         | NEV           | 45           | nV/Hz <sup>1/2</sup> | $T_{Amb} = +25^{\circ}C$  |
| Rise Time  | $\tau_{63}$   | 12 ± 5       | ms                   |   |
| Ambient Temperature Sensor                       |               | Ni-RTD       |                      |   |
| Ambient Temperature Sensor Resistance            | $R_{Ni-RTD}$  | 1000 ± 4     | Ω                    | $T_{Amb} = 0^{\circ}C$  |
| Temperature Coefficient of Ni-RTD                | $TC_{Ni-RTD}$ | 6178 ± 150   | ppm/K                | $T_{Amb} = 0^{\circ}C$ to $+100^{\circ}C$   |

## TYPICAL PERFORMANCE CURVES

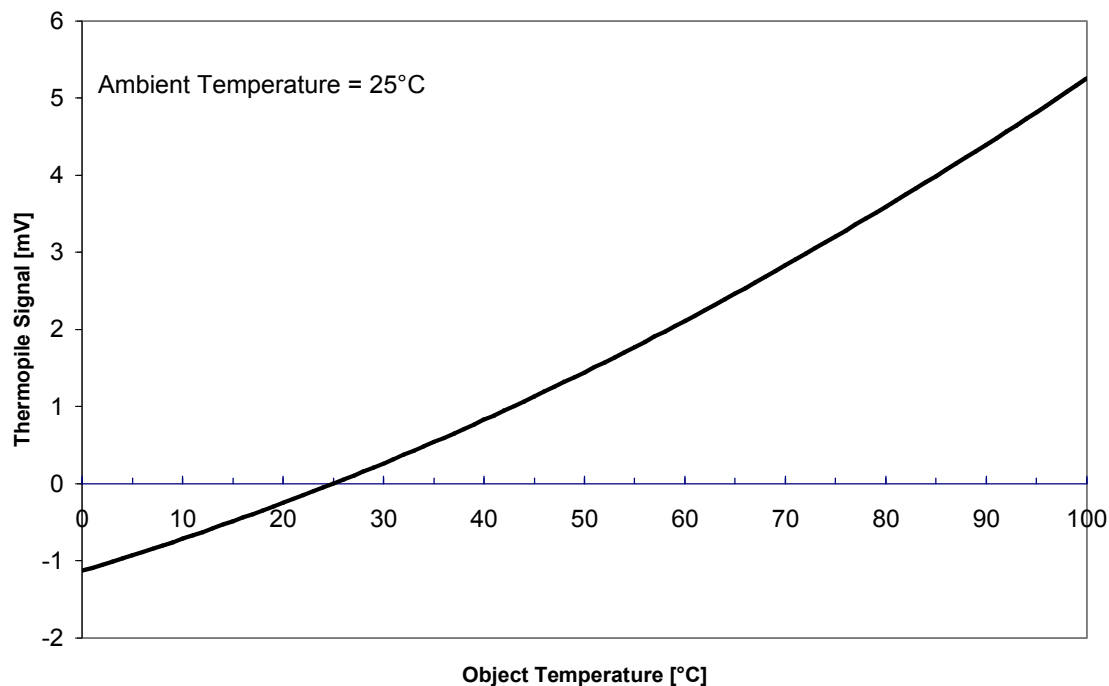


Figure 1: Thermopile signal versus object temperature at 25°C ambient temperature

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## OPTICAL CHARACTERISTICS

| Parameter     | Symbol | Value | Unit | Description              |
|---------------|--------|-------|------|--------------------------|
| Field of View | FOV    | 120   | deg  | at 50% of maximum signal |

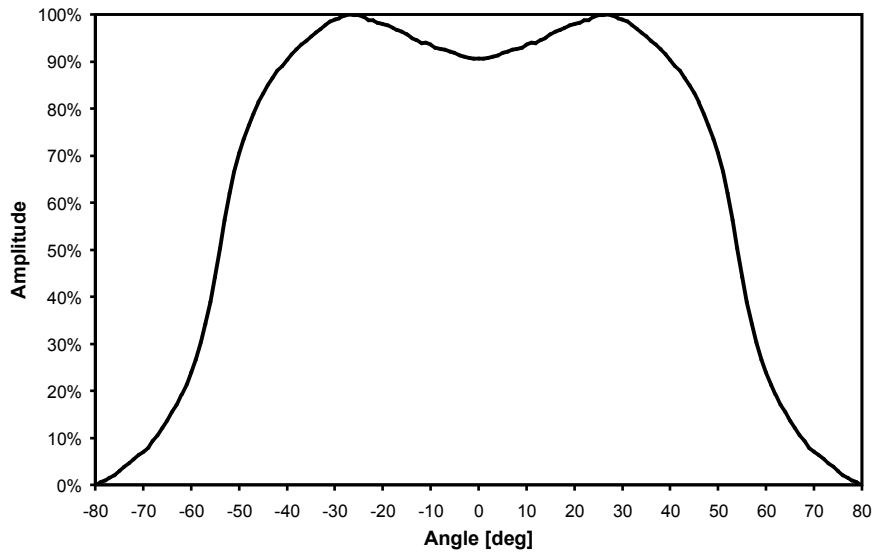


Figure 2: Field of View Curve

## FILTER CHARACTERISTICS

| Parameter          | Symbol | Value | Unit          | Description     |
|--------------------|--------|-------|---------------|-----------------|
| Transmission Range | BBP    | 8-14  | $\mu\text{m}$ | Broad Band Pass |

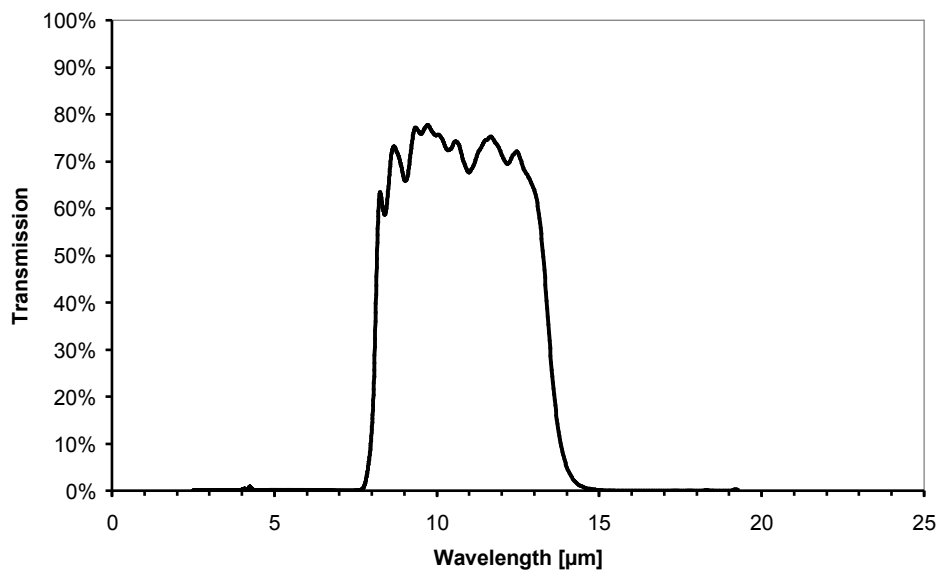


Figure 3: Filter transmission curve

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## ELECTRICAL CONNECTIONS

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

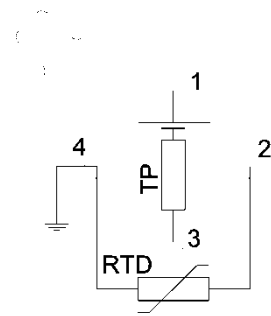


Figure 4: Electrical connections - bottom view of thermopile

## MECHANICAL DIMENSIONS

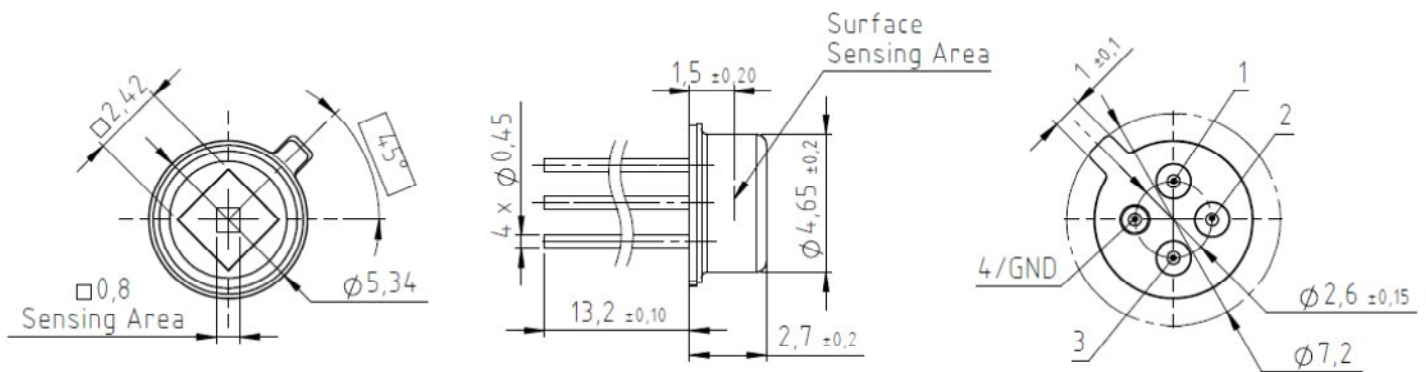


Figure 5: Mechanical dimensions of thermopile

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## ORDERING INFORMATION

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|                         |              |
|-------------------------|--------------|
| <b>Part Description</b> | TS318-3B0814 |
| <b>Part No.</b>         | G-TPCO-027   |

## TECHNICAL CONTACT INFORMATION

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