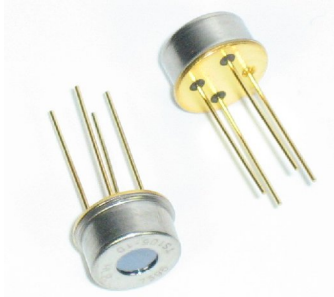


# Model TS305-10C50 Thermopile Sensor



- Thermopile IR-Sensor
- For Contactless Temperature Measurement
- Single Element
- 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 NTC Reference Sensor  
 5.0µm Long Wave Pass Filter

## APPLICATIONS

Industrial Pyrometers  
 Climate Control  
 Medical

## 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-5             |                      |   |
| Absorber Area                                    | A              | $0.8 \times 0.8$ | mm <sup>2</sup>      |   |
| Thermopile Resistance                            | $R_{TP}$       | $70 \pm 30$      | k $\Omega$           | $T_{Amb} = +25^{\circ}C$  |
| Temperature Coefficient of Thermopile Resistance | $TCR_{TP}$     | $-0.06 \pm 0.04$ | %/K                  | $T_{Amb} = +25^{\circ}C$ to $+75^{\circ}C$  |
| Voltage Response                                 | $V_{TP}$       | $6.5 \pm 1.9$    | mV                   | $T_{Amb} = +25^{\circ}C$ , $T_{Obj} = +100^{\circ}C$ , DC, totally filled field of view |
| Temperature Coefficient of Voltage Response      | $TCV_{TP}$     | $-0.45 \pm 0.08$ | %/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  | $\tau_{63}$    | $12 \pm 5$       | ms                   |   |
| Ambient Temperature Sensor                       |                | NTC              |                      |   |
| Ambient Temperature Sensor Resistance            | $R_{NTC}$      | $100 \pm 5$      | k $\Omega$           | $T_{Amb} = +25^{\circ}C$  |
| Beta Value of NTC                                | $\beta$ -Value | $3955 \pm 0.3\%$ | K                    | $T_{Amb} = 0^{\circ}C$ to $+50^{\circ}C$  |

## TYPICAL PERFORMANCE CURVES

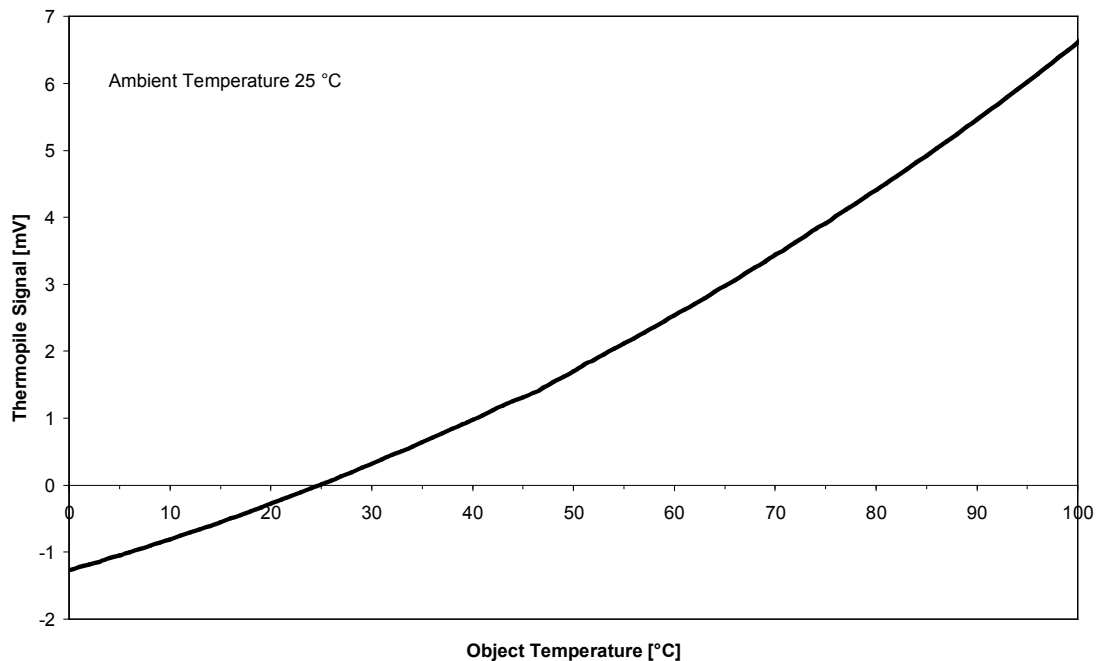


Figure 1: Thermopile signal versus object temperature at 25°C ambient temperature



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## OPTICAL CHARACTERISTICS

| Parameter     | Symbol | Value | Unit | Description              |
|---------------|--------|-------|------|--------------------------|
| Field of View | FOV    | 80    | deg  | at 50% of maximum signal |

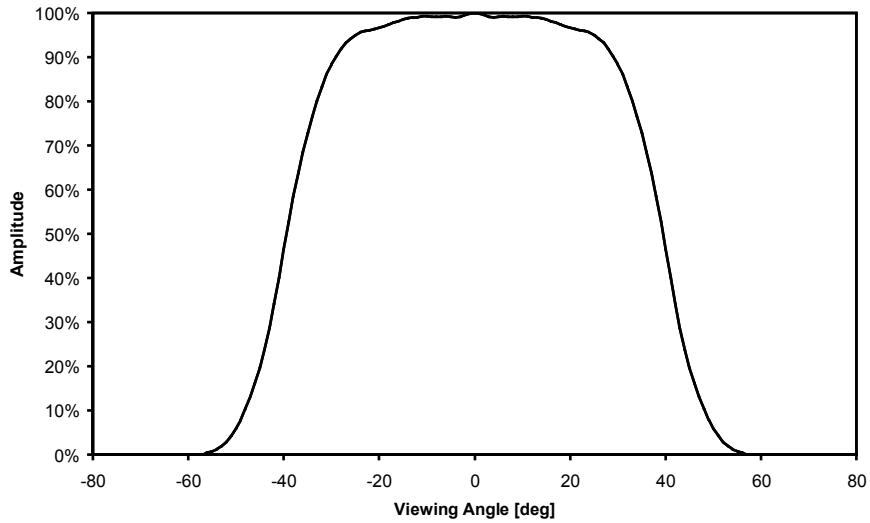


Figure 2: Field of View Curve

## FILTER CHARACTERISTICS

| Parameter          | Symbol | Value | Unit | Description    |
|--------------------|--------|-------|------|----------------|
| Transmission Range | LWP    | ≥ 5.0 | μm   | Long Wave Pass |

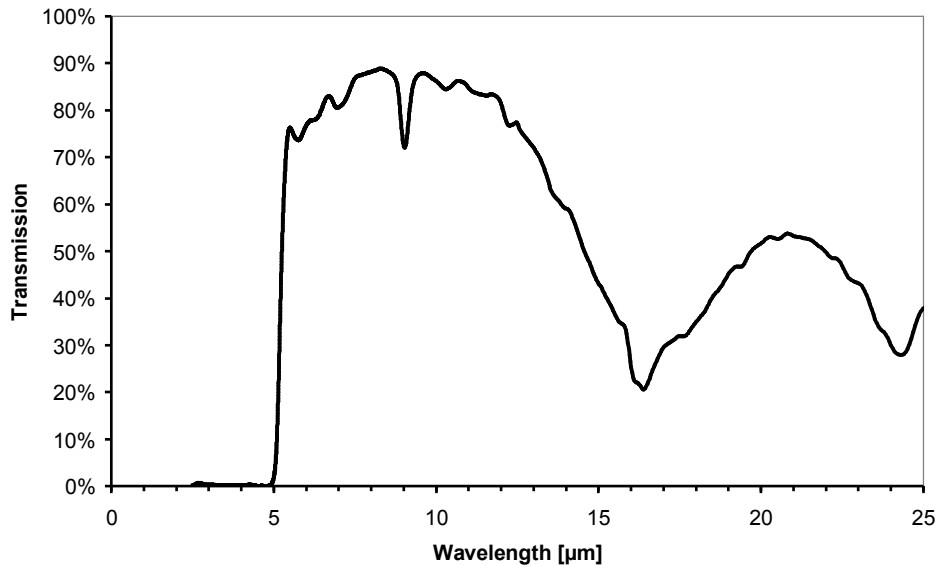


Figure 3: Filter transmission curve



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## ELECTRICAL CONNECTIONS

| Pin | Symbol |
|-----|--------|
| 1   | TP +   |
| 2   | NTC    |
| 3   | TP -   |
| 4   | GND    |

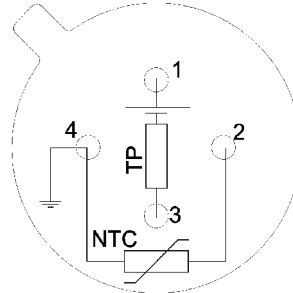


Figure 4: Electrical connections - bottom view of thermopile

## MECHANICAL DIMENSIONS

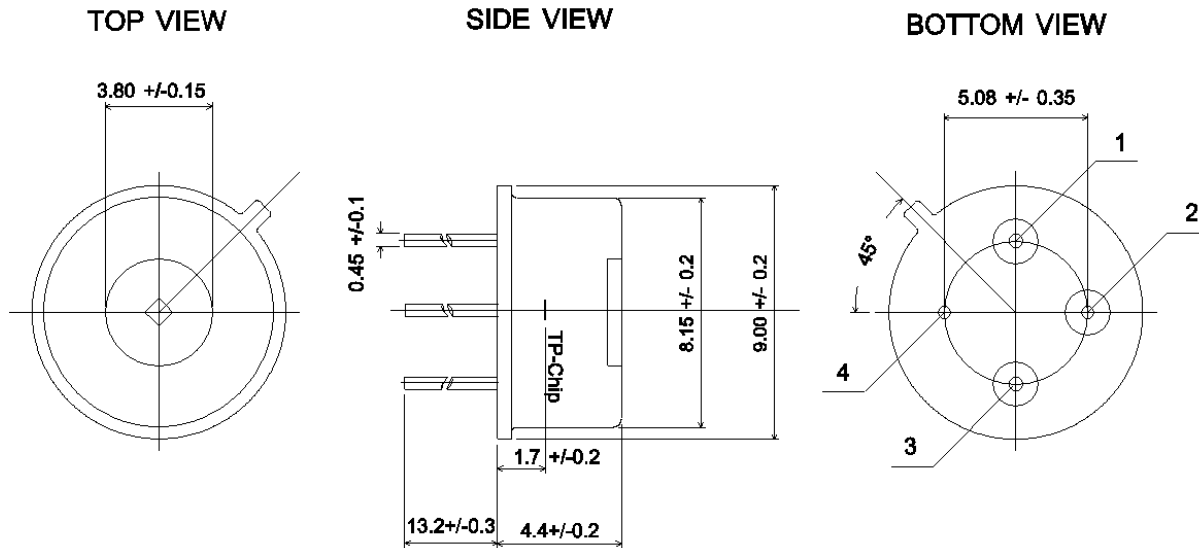


Figure 5: Mechanical dimensions of thermopile



# Model TS305-10C50 Thermopile Sensor

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## ORDERING INFORMATION

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|                         |             |
|-------------------------|-------------|
| <b>Part Description</b> | TS305-10C50 |
| <b>Part No.</b>         | G-TPCO-023  |

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## TECHNICAL CONTACT INFORMATION

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