# Model TS318-11C55 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
- NTC Reference Sensor
- Small TO-18 Package
- 5.5µm Long Wave Pass Filter

## APPLICATIONS

- Medical
- Ear Thermometer

## ABSOLUTE MAXIMUM RATINGS

| Parameter | Symbol | Min | Typical | Max | Unit | Description |
|---|---|---|---|---|---|---|
| Storage Temperature | $T_S$ | -20 | +20 | +85 | °C | permanent |
| Storage Temperature | $T_S$ | -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 | $mm^2$ | |
| Thermopile Resistance | $R_{TP}$ | 70 ± 30 | kΩ | $T_{Amb}$ = +25°C |
| Temperature Coefficient of Thermopile Resistance | $TCR_{TP}$ | -0.06 ± 0.04 | %/K | $T_{Amb}$ = +25°C to +75°C |
| Voltage Response | $V_{TP}$ | 8.4 ± 2.1 | mV | $T_{Amb}$ = +25°C, $T_{Obj}$ = +100°C, DC, totally filled field of view |
| Temperature Coefficient of Voltage Response | $TCV_{TP}$ | -0.45 ± 0.08 | %/K | $T_{Amb}$ = +25°C to +75°C |
| Noise Equivalent Voltage | NEV | 34 | $nV/Hz^{½}$ | $T_{Amb}$ = +25°C |
| Rise Time | $\tau_{63}$ | 12 ± 5 | ms | |
| Ambient Temperature Sensor | | NTC | | |
| Ambient Temperature Sensor Resistance | $R_{NTC}$ | 100 ± 5 | kΩ | $T_{Amb}$ = +25°C |
| Beta Value of NTC | β-Value | 3955 ±0.3% | K | $T_{Amb}$ = 0°C to +50°C |

## TYPICAL PERFORMANCE CURVES

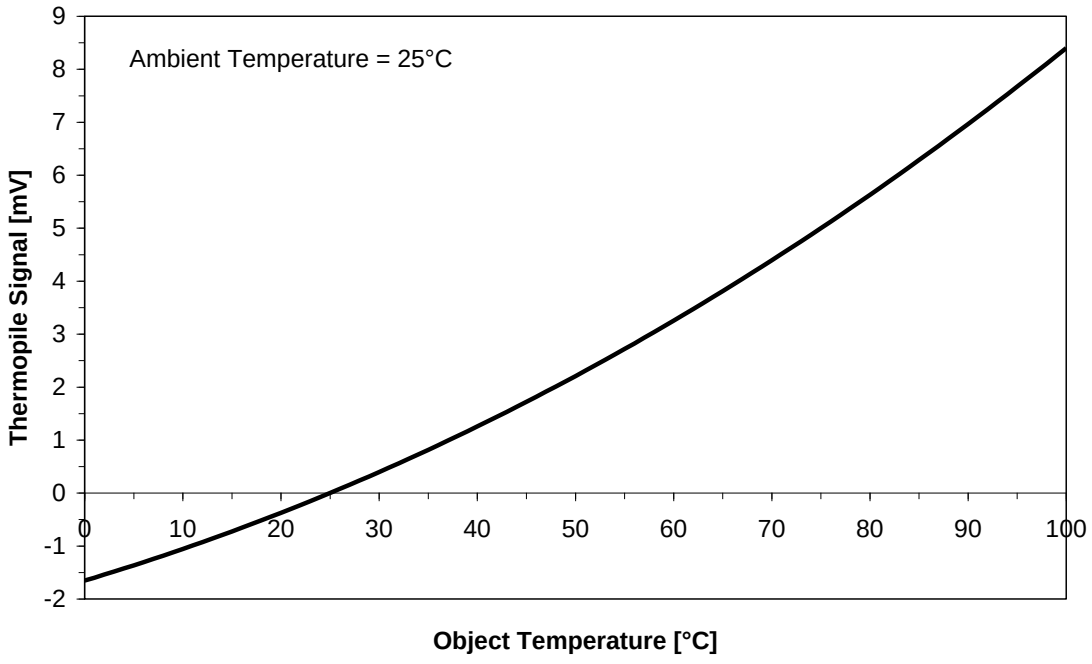


Figure 1: Thermopile signal versus object temperature at 25°C ambient temperature

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## OPTICAL CHARACTERISTICS

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

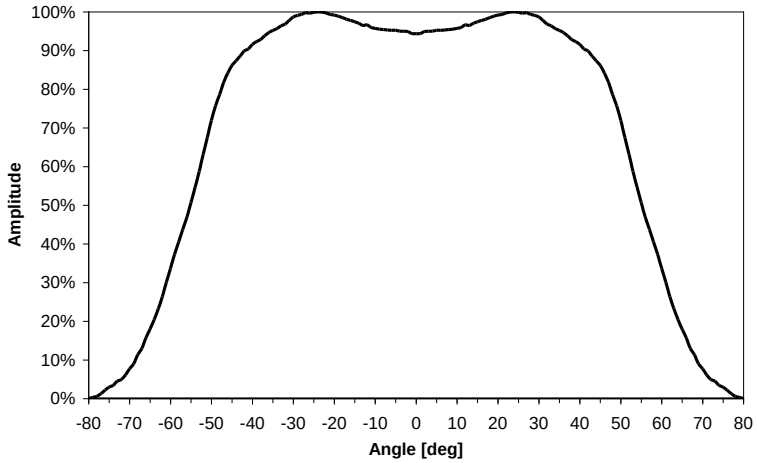


Figure 2: Field of View Curve

## FILTER CHARACTERISTICS

| Parameter | Symbol | Value | Unit | Description |
|---|---|---|---|---|
| Transmission Range | LWP | ≥ 5.5 | µm | Long Wave Pass |
| Transmission | $T_{7.5 \ldots 13.5\mu m}$ | ≥ 77.0 | % | at 7.5 ... 13.5µm |
| Transmission Blocking Average | $T_{AVG \leq 4.0\mu m}$ | <0.1 | % | Average ≤4.0µm |
| | $T_{AVG\ 4.0 \ldots 5.0\ \mu m}$ | <0.5 | % | Average 4.0 ... 5.0 µm |
| Transmission Blocking Absolute | $T_{ABS \leq 4.0\mu m}$ | <1.0 | % | Absolute ≤4.0µm |

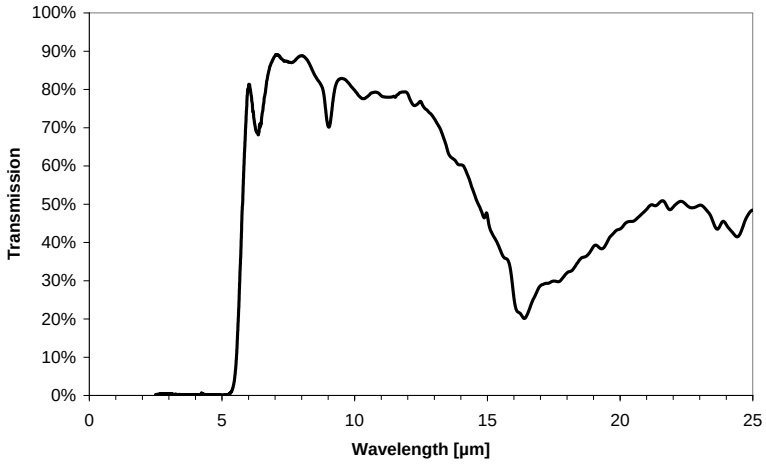


Figure 3: Filter transmission curve

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## ELECTRICAL CONNECTIONS

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

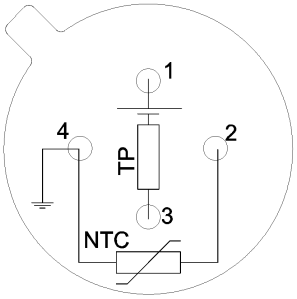


Figure 4: Electrical connections - bottom view of thermopile

## MECHANICAL DIMENSIONS

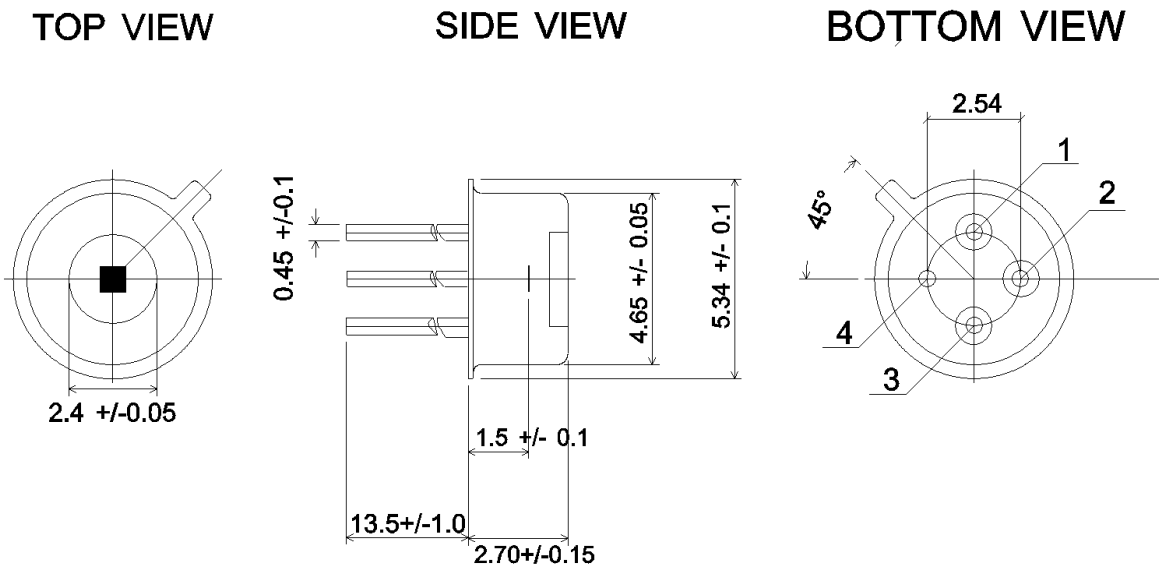


Figure 5: Mechanical dimensions of thermopile

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## ORDERING INFORMATION

| | |
|---|---|
| **Part Descripton** | TS318-11C55 |
| **Part No.** | G-TPCO-032 |

## TECHNICAL CONTACT INFORMATION

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