

# 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 $\Omega$	$T_{Amb} = +25\text{ }^{\circ}\text{C}$
Temperature Coefficient of Thermopile Resistance	$TCR_{TP}$	$-0.06 \pm 0.04$	%/K	$T_{Amb} = +25\text{ }^{\circ}\text{C}$ to $+75\text{ }^{\circ}\text{C}$
Voltage Response	$V_{TP}$	$5.0 \pm 1.3$	mV	$T_{Amb} = +25\text{ }^{\circ}\text{C}$ , $T_{Obj} = +100\text{ }^{\circ}\text{C}$ , DC, totally filled field of view
Temperature Coefficient of Voltage Response	$TCV_{TP}$	$-0.45 \pm 0.08$	%/K	$T_{Amb} = +25\text{ }^{\circ}\text{C}$ to $+75\text{ }^{\circ}\text{C}$
Noise Equivalent Voltage	NEV	34	nV/Hz <sup>1/2</sup>	$T_{Amb} = +25\text{ }^{\circ}\text{C}$
Rise Time	$\tau_{63}$	$12 \pm 5$	ms	
Ambient Temperature Sensor		Ni-RTD		
Ambient Temperature Sensor Resistance	$R_{Ni-RTD}$	$1000 \pm 4$	$\Omega$	$T_{Amb} = 0\text{ }^{\circ}\text{C}$
Temperature Coefficient of Ni-RTD	$TC_{Ni-RTD}$	$6178 \pm 150$	ppm/K	$T_{Amb} = 0\text{ }^{\circ}\text{C}$ to $+100\text{ }^{\circ}\text{C}$

## TYPICAL PERFORMANCE CURVES

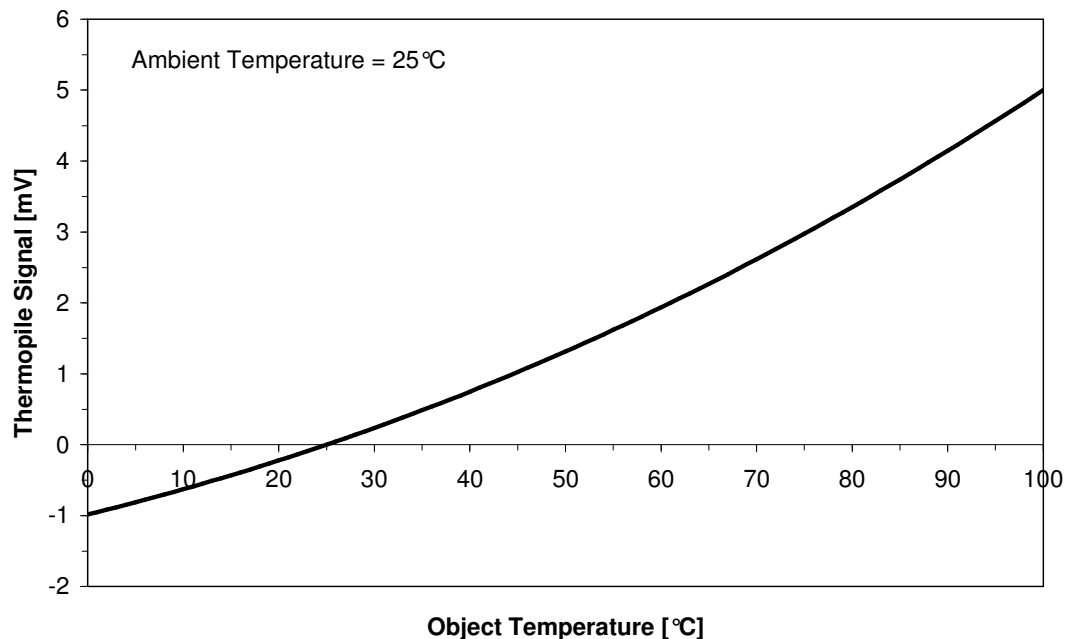


Figure 1: Thermopile signal versus object temperature at 25°C ambient temperature

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## OPTICAL CHARACTERISTICS

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

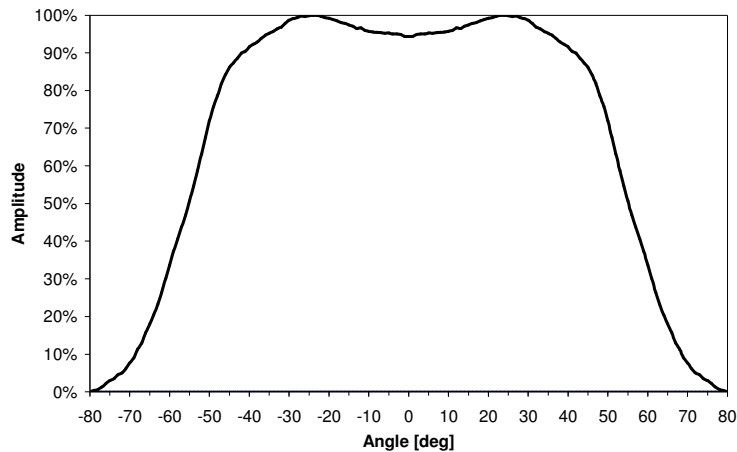


Figure 2: Field of View Curve

## 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 $\mu\text{m}$

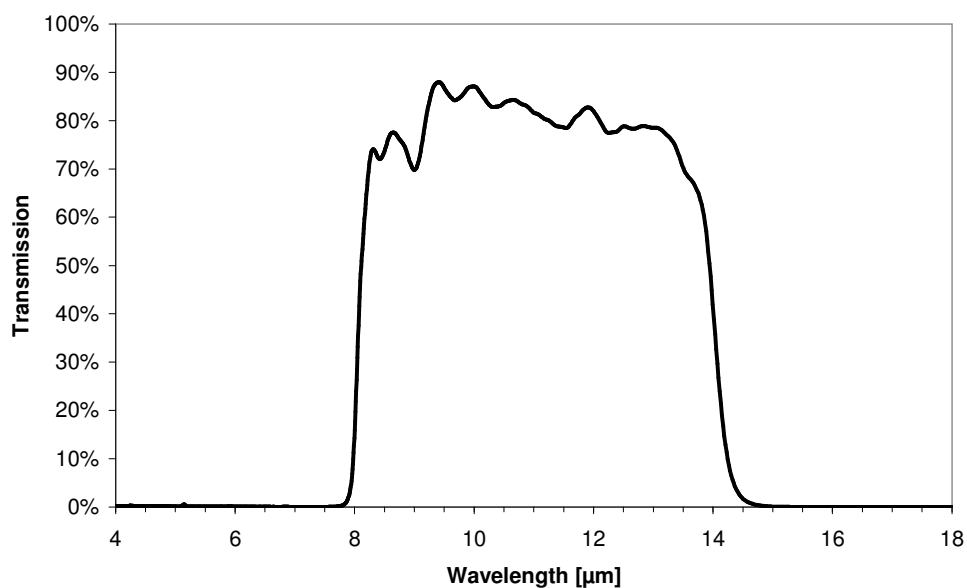


Figure 3: Filter transmission curve

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## ELECTRICAL CONNECTIONS

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

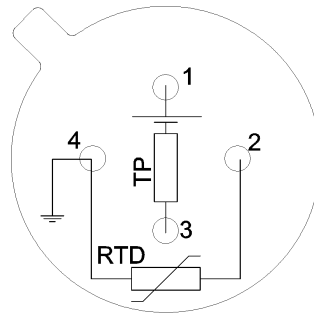
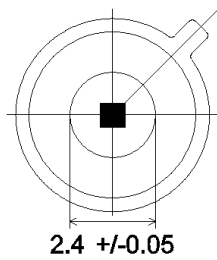


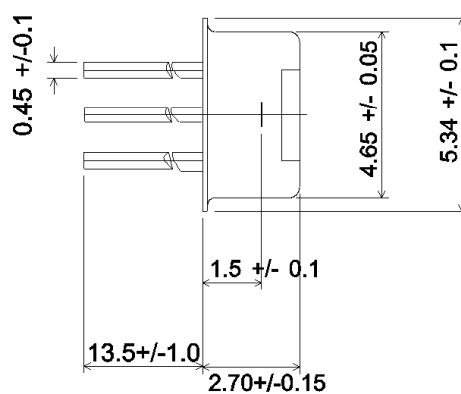
Figure 4: Electrical connections - bottom view of thermopile

## MECHANICAL DIMENSIONS

### TOP VIEW



### SIDE VIEW



### BOTTOM VIEW

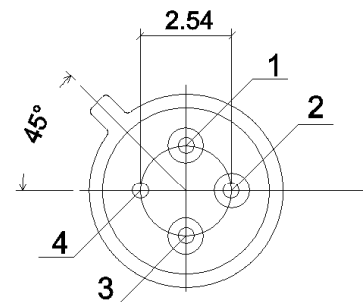


Figure 5: Mechanical dimensions of thermopile

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## ORDERING INFORMATION

**Part Description**      TS318-1B0814

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

## TECHNICAL CONTACT INFORMATION

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