

# Model TS318-5C50 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
- 5.0 $\mu$ m Long Wave Pass Filter

## APPLICATIONS

- Medical
- Ear Thermometer

## 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 $\Omega$	$T_{Amb} = +25^{\circ}\text{C}$
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	$V_{TP}$	$9.2 \pm 2.2$	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	45	nV/Hz <sup>1/2</sup>	$T_{Amb} = +25^{\circ}\text{C}$
Rise Time	$\tau_{63}$	$12 \pm 5$	ms	
Ambient Temperature Sensor		NTC		
Ambient Temperature Sensor Resistance	$R_{NTC}$	$100 \pm 5$	k $\Omega$	$T_{Amb} = +25^{\circ}\text{C}$
Beta Value of NTC	$\beta$ -Value	$3955 \pm 0.5\%$	K	$T_{Amb} = 0^{\circ}\text{C}$ to $+50^{\circ}\text{C}$

## TYPICAL PERFORMANCE CURVES

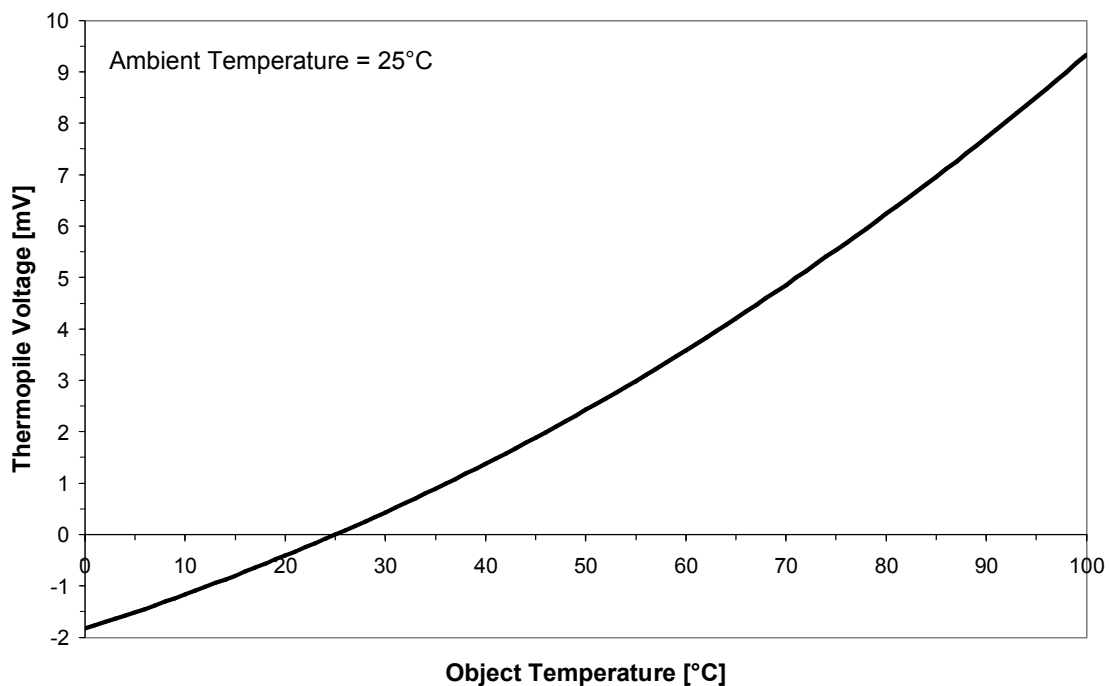


Figure 1: Thermopile signal versus object temperature at 25°C ambient temperature

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## OPTICAL CHARACTERISTICS

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

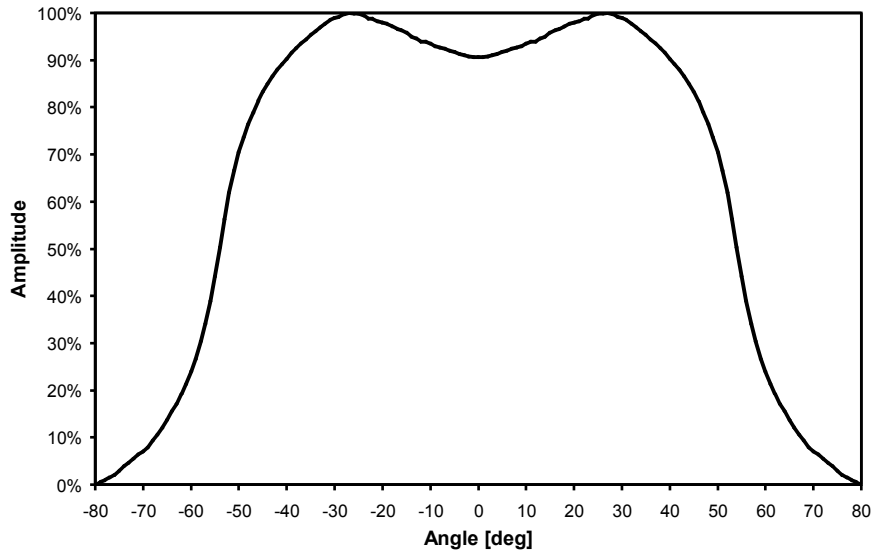


Figure 2: Field of View Curve

## FILTER CHARACTERISTICS

Parameter	Symbol	Value	Unit	Description
Transmission Range	LWP	$\geq 5.0$	$\mu\text{m}$	Long Wave Pass

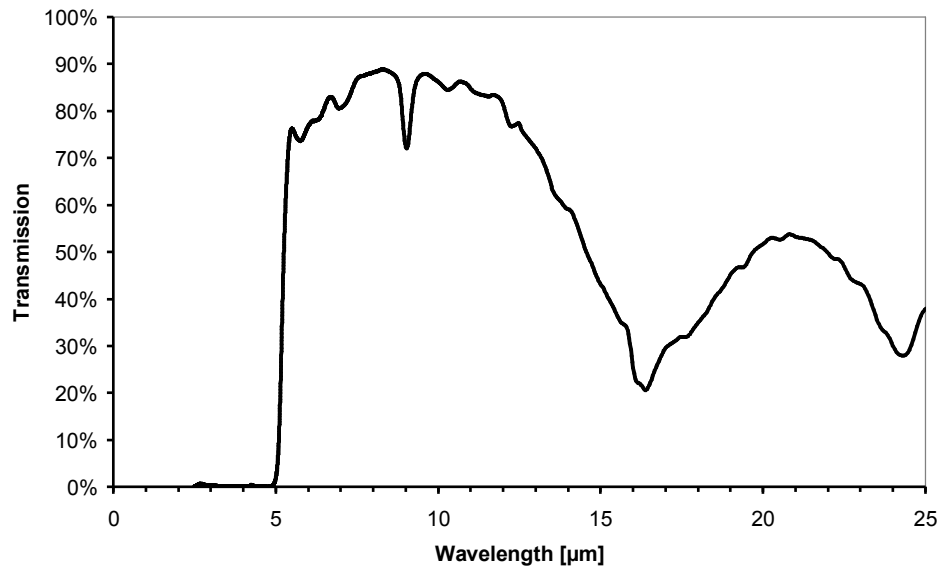


Figure 3: Filter transmission curve

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## ELECTRICAL CONNECTIONS

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

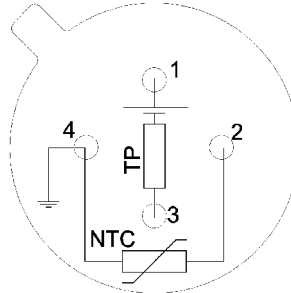


Figure 4: Electrical connections - bottom view of thermopile

## MECHANICAL DIMENSIONS

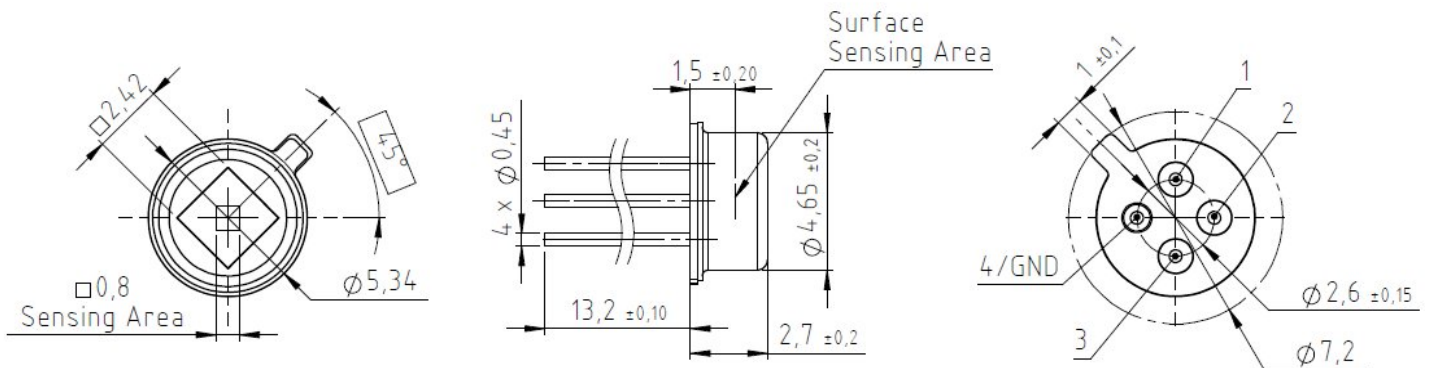


Figure 5: Mechanical dimensions of thermopile

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## ORDERING INFORMATION

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**Part Description**      TS318-5C50

**Part No.**                G-TPCO-030

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