



T H E R M O M E T R I C S  
A C O M M I T M E N T T O E X C E L L E N C E

# ZTP-135

## Thermopile IR Sensor



This thermopile sensor is used for non-contact surface temperature measuring. The ZTP-135 model consists of thermo-elements, flat IR filter, a thermistor for temperature compensation and a hermetically-sealed small-size package. There is also a variety of filters available to maximize performance in specific applications

### Applications

- Patient monitoring
- Ear & Tympanic thermometers
- Occupancy detection
- HVAC
- Appliance

### Features

- Non-contact measurement
- Wider surface area measurement
- Small-size sensor package
- Included ambient temperature - (thermistor) sensor for compensation
- High sensitivity
- Fast response time
- Low cost

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# Specifications

## Thermopile Chip

Parameter	Limits			Units	Condition
	Min	Typ	Max		
Chip Size		1.8 x 1.8		mm <sup>2</sup>	
Diaphragm Size		1.4 x 1.4		mm <sup>2</sup>	
Active Area		0.7 x 0.7		mm <sup>2</sup>	
Internal Resistance	42	60	78	kΩ	25°C
Resistance T.C			0.12	%/°C	
Responsivity	42	60	78	V/W	500K, 1 Hz
Responsivity T.C		-0.10		%/°C	
Noise Voltage		32		nV rms	R.M.S., 25°C
NEP		0.53		nW/Hz <sup>1/2</sup>	500K, 1 Hz
Detectivity		1.30 E08		cmHz <sup>1/2</sup> /W	500K, 1 Hz
Time Constant		25		ms	

## Thermistor for Temperature Compensation

Parameter	Limits			Units	Condition
	Min	Typ	Max		
Resistance	9.7	10	10.3	kΩ	Tol. :3%, @25°C
Beta - Value	3930	3970	4001	K	Tol. :1%, Defined at 25°C/85°C

## Absolute Maximum Ratings

### Operating Temperature

-20°C ~ 100°C

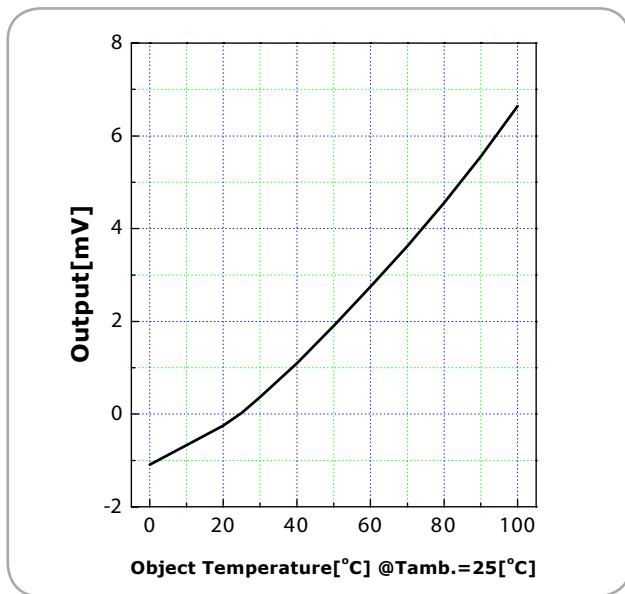
### Storage Temperature

-40°C ~ 120°C

## Thermistor Resistance (R-T Table)

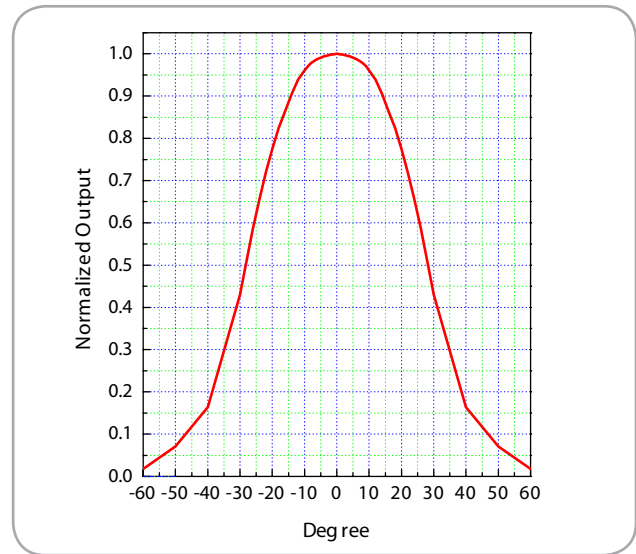
T ambient (° C)	Rmin (kΩ)	Rcent (kΩ)	Rmax (kΩ)
-40	267	284.7	303.2
-35	197.2	209.6	222.5
-30	147.1	155.9	165
-25	110.8	117.1	123.6
-20	84.16	88.68	93.35
-15	64.46	67.73	71.11
-10	49.74	52.13	54.59
-5	38.65	40.41	42.21
0	30.24	31.543	32.86
5	23.81	24.772	25.75
10	18.86	19.58	20.3
15	15.03	15.56	16.1
20	12.04	12.44	12.84
25	9.7	10	10.3
30	7.823	8.082	8.342
35	6.342	6.566	6.791
40	5.168	5.361	5.557
45	4.233	4.4	4.569
50	3.484	3.629	3.776
55	2.882	3.007	3.135
60	2.396	2.504	2.615
65	2.0009	2.095	2.192
70	1.679	1.7612	1.8458
75	1.4153	1.4871	1.5612
80	1.1984	1.261	1.3264
85	1.0193	1.0745	1.1317
90	0.8707	0.9193	0.9697
95	0.7469	0.7898	0.8344
100	0.6433	0.6812	0.7208
105	0.5562	0.5899	0.625

## Sensitivity

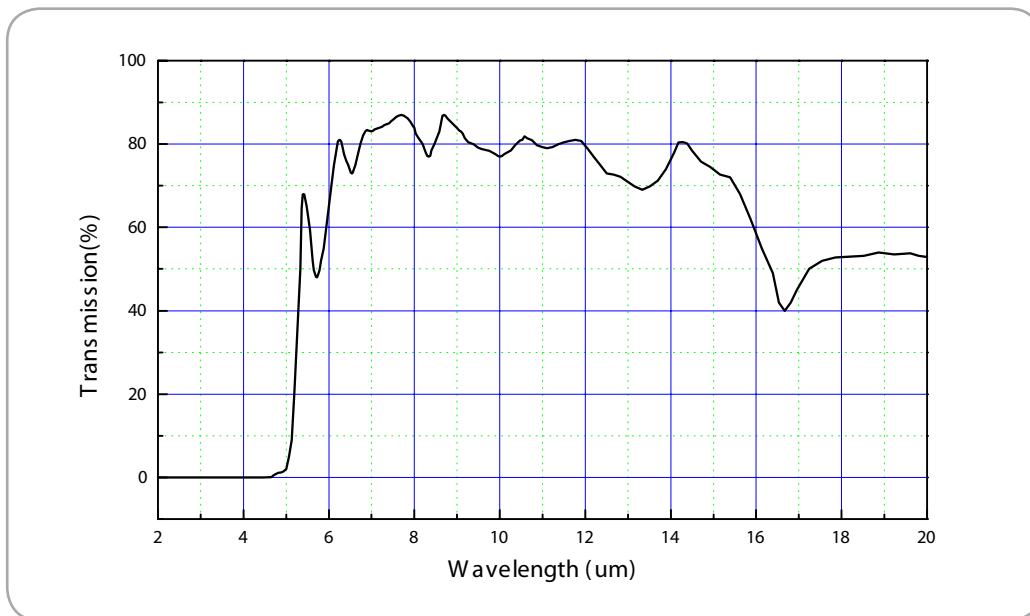


## Field of View

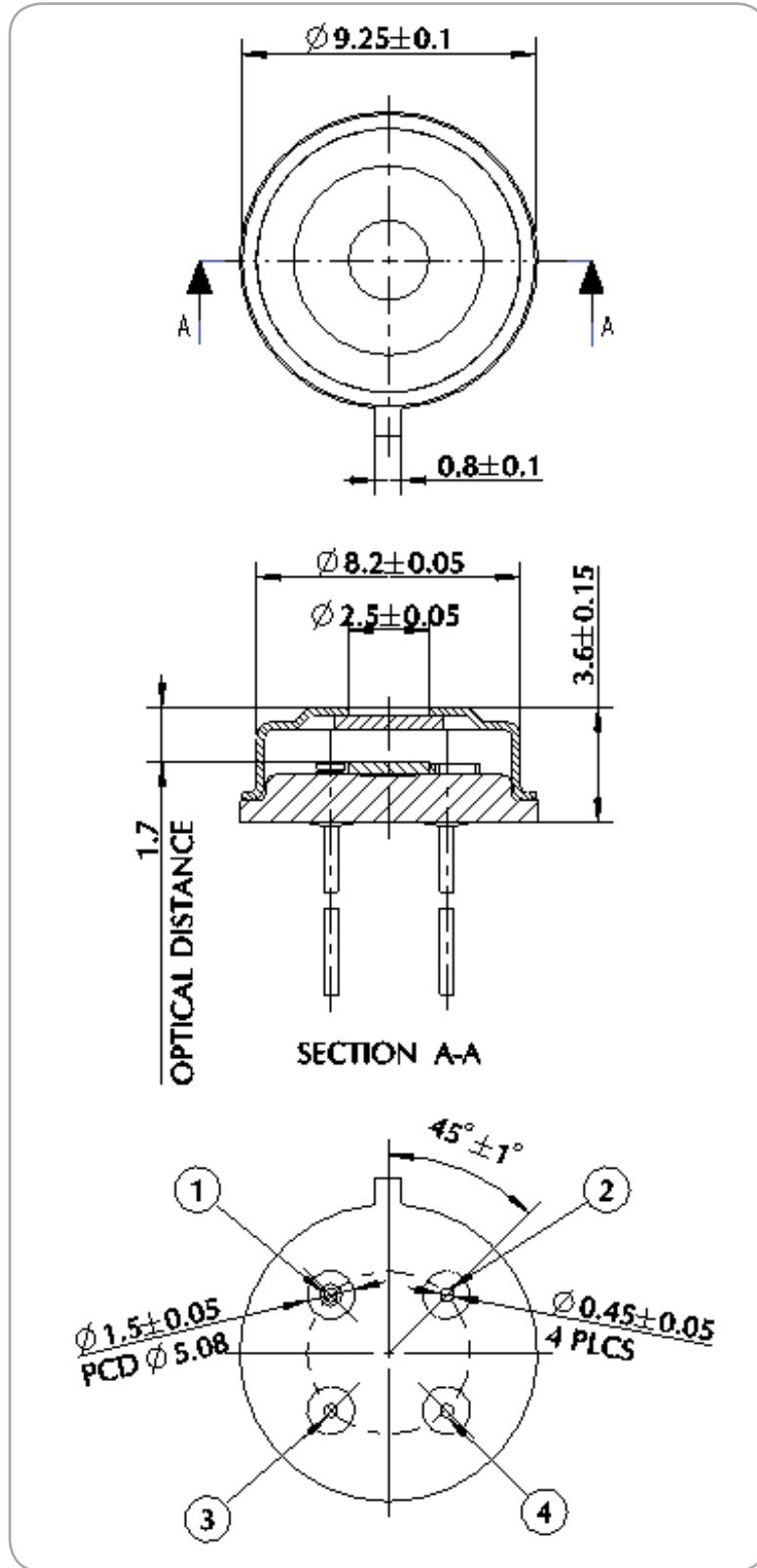
Parameter	Limits			Units	Condition
	Min	Typ	Max		
Field of View	51	56	61	Degree	50% of Maximum Output



## Filter Transmission Data



# Outline of Sensor Packaging and Pin Arrangement (unit: mm)



Unit: mm

Pin arrangement:  
1. GND Thermistor  
2. Thermopile  
3. GND Thermopile  
4. Thermistor

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