

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-115

## Thermopile IR Sensor



This thermopile sensor is used for non-contact surface temperature measuring. The ZTP-115 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
- RoHS compliant

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**Advanced Sensors**

# Specifications

## Thermopile Chip

| Parameter           | Limits |           |      | Units                  | Condition    |
|---------------------|--------|-----------|------|------------------------|--------------|
|                     | Min    | Typ       | Max  |                        |              |
| Chip Size           |        | 1.8 × 1.8 |      | mm <sup>2</sup>        |              |
| Diaphragm Size      |        | 1.0 × 1.0 |      | mm <sup>2</sup>        |              |
| Active Area         |        | 0.5 × 0.5 |      | mm <sup>2</sup>        |              |
| Internal Resistance | 35     | 50        | 65   | kΩ                     | 25°C         |
| Resistance T.C      |        |           | 0.15 | %/°C                   |              |
| Responsivity        | 42     | 60        | 78   | V/W                    | 500K, 1 Hz   |
| Responsivity T.C    |        | -0.10     |      | %/°C                   |              |
| Noise Voltage       |        | 30        |      | nV rms                 | R.M.S., 25°C |
| NEP                 |        | 0.50      |      | nW/Hz <sup>1/2</sup>   | 500K, 1 Hz   |
| Detectivity         |        | 1.00 E08  |      | cmHz <sup>1/2</sup> /W | 500K, 1 Hz   |
| Time Constant       |        | 20        |      | 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 | 4010 | K     | Tol. :1%, Defined at 25°C/85°C |

## Absolute Maximum Ratings

### Operating Temperature

-20°C ~ 100°C

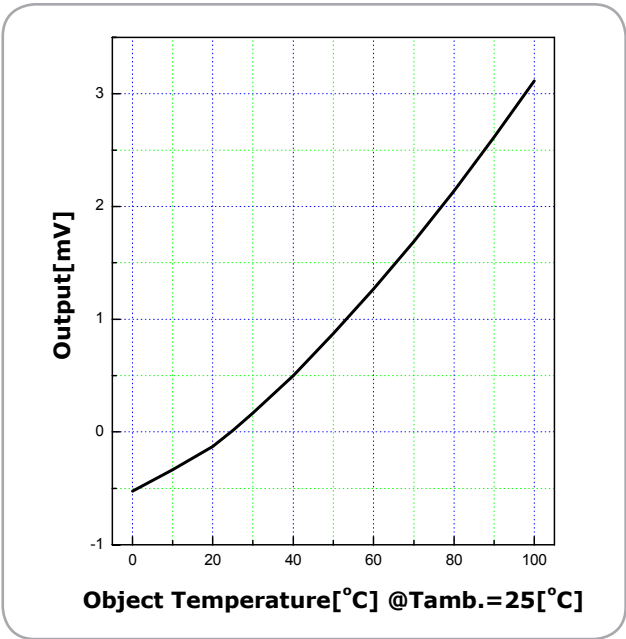
### Storage Temperature

-40°C ~ 120°C

## Thermistor Resistance (R-T Table)

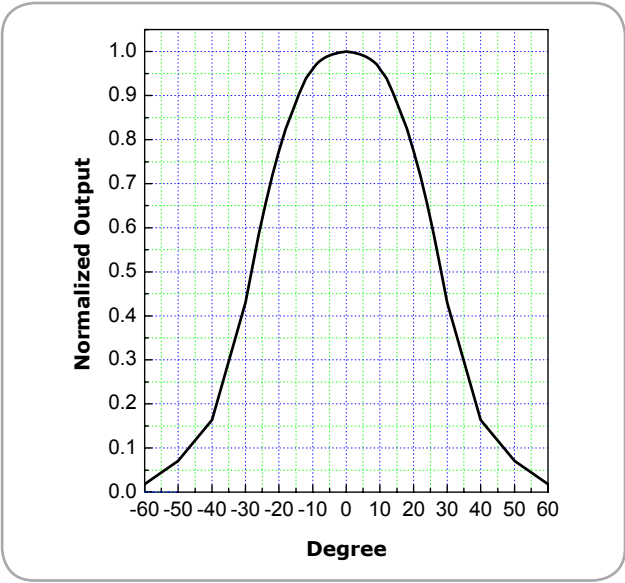
| T ambient (° C) | Rmin (kΩ) | Rcent (kΩ) | Rmax (kΩ) |
|-----------------|-----------|------------|-----------|
| -40             | 267       | 284.7      | 303.2     |
| -35             | 197.2     | 209.6      | 222.5     |
| -30             | 147.1     | 155.9      | 165       |
| -25             | 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     | 31.54      | 32.86     |
| 5               | 23.81     | 24.77      | 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

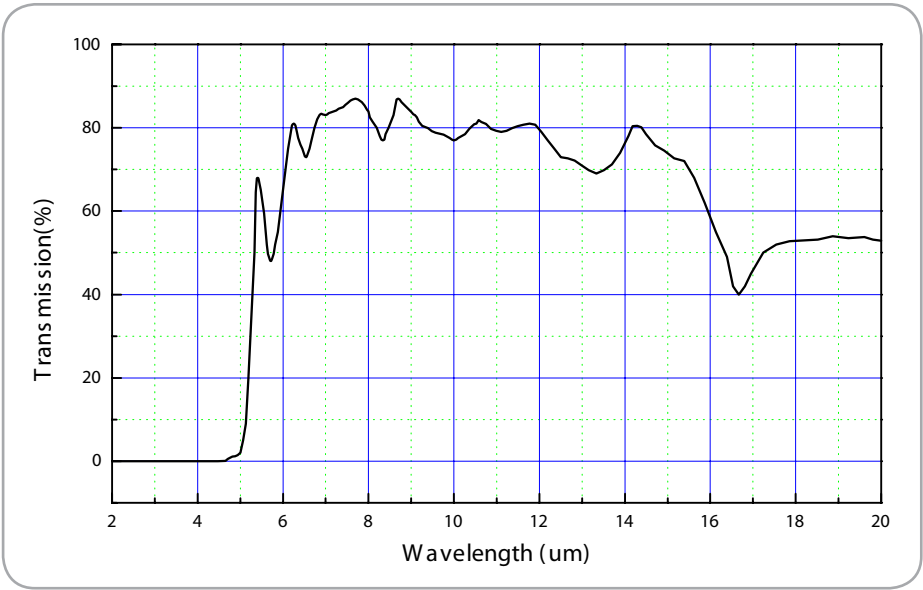


# Field of View

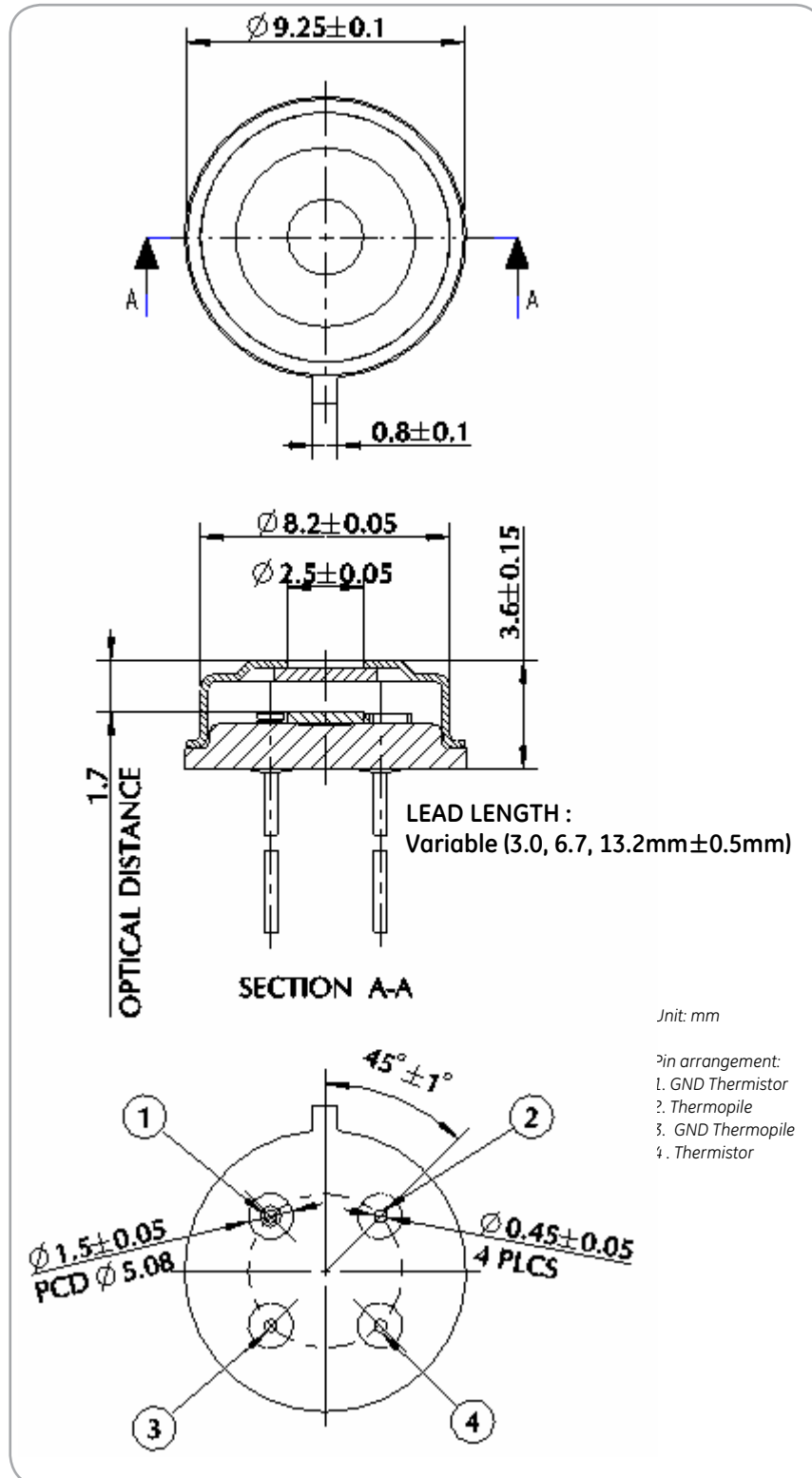
| Parameter     | Limits |     | Units  | Condition             |
|---------------|--------|-----|--------|-----------------------|
|               | Min    | Typ |        |                       |
| Field of View | 50     | 55  | Degree | 50% of Maximum Output |



# Filter Transmission Data



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



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