

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-135SR

## Thermometrics Thermopile IR Sensor



This thermopile sensor is used for non-contact surface temperature measuring. The ZTP-135SR model consists of thermo-elements, flat IR filter, a thermistor for temperature compensation in a hermetically-sealed TO-46(18) package. There is also a variety of filters available to help maximize performance in specific applications.

### Applications

- Ear thermometers
- Non-contact thermometers
- Appliances
- Electronics

### Features

- Small-size sensor (TO-46 package)
- Included ambient temperature (thermistor) sensor for compensation
- High sensitivity
- Fast response time
- Low cost

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## 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  | 81  | k $\Omega$             | 25 °C         |
| Resistance T.C.     | 0.12      |     |     | %/°C                   |               |
| Responsivity        | 43        | 62  | 81  | V/W                    | 500K, 1Hz     |
| Responsivity T.C.   | -0.10     |     |     | %/°C                   |               |
| Noise Voltage       | 32        |     |     | nV rms                 | R.M.S., 25 °C |
| NEP                 | 0.51      |     |     | nW/Hz <sup>1/2</sup>   | 500K, 1Hz     |
| Detectivity         | 1.35 E08  |     |     | cmHz <sup>1/2</sup> /W | 500K, 1Hz     |
| Time Constant       | 25        |     |     | ms                     |               |

## Thermistor

| Parameter    | Limits |      |      | Units      | Condition                        |
|--------------|--------|------|------|------------|----------------------------------|
|              | Min    | Typ  | Max  |            |                                  |
| Resistance   | 97     | 100  | 103  | k $\Omega$ | Tol.:3%, @25 °C                  |
| Beta - Value | 3920   | 3960 | 4000 | K          | Tol.:1%, Defined at @25 °C/50 °C |

## Absolute Maximum Ratings

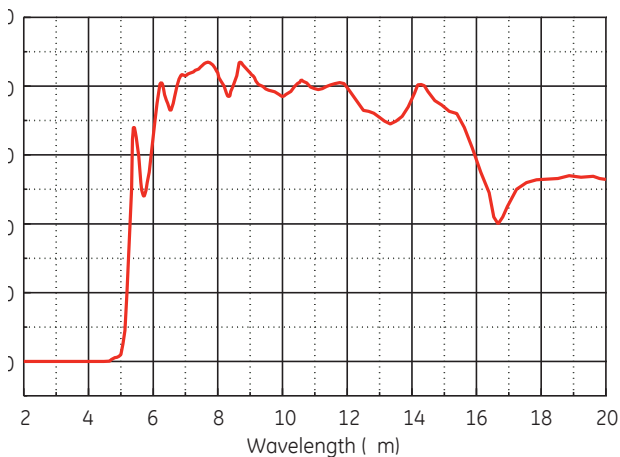
### Operating Temperature

-20°C ~ 100°C

### Storage Temperature

-40°C ~ 120°C

## Filter Transmission Data

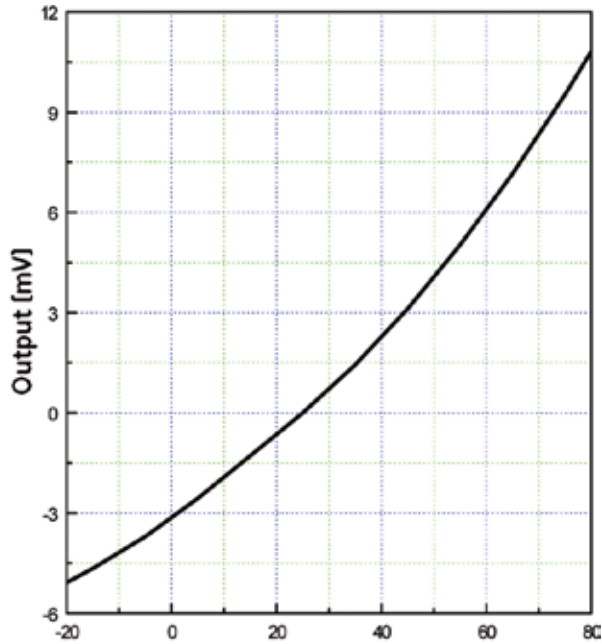


## Thermistor Resistance (R-T Table)

| Tamb (°C) | Rmin (k $\Omega$ ) | Rcent (k $\Omega$ ) | Rmax (k $\Omega$ ) |
|-----------|--------------------|---------------------|--------------------|
| -20       | 909.1              | 947.9               | 987.3              |
| -15       | 687.7              | 715.9               | 744.7              |
| -10       | 524.5              | 545.4               | 566.5              |
| -5        | 403.3              | 418.8               | 434.5              |
| 0         | 312.6              | 324.1               | 335.8              |
| 5         | 244.0              | 252.7               | 261.5              |
| 10        | 191.8              | 198.5               | 205.1              |
| 15        | 151.9              | 156.9               | 162.0              |
| 20        | 121.0              | 124.9               | 128.8              |
| 25        | 97.00              | 100.0               | 103.0              |
| 30        | 78.05              | 80.55               | 83.06              |
| 35        | 63.16              | 65.25               | 67.36              |
| 40        | 51.39              | 53.15               | 54.91              |
| 45        | 42.03              | 43.51               | 45.00              |
| 50        | 34.54              | 35.79               | 37.05              |
| 55        | 28.52              | 29.58               | 30.65              |
| 65        | 19.70              | 20.47               | 21.25              |
| 70        | 16.48              | 17.14               | 17.81              |
| 75        | 13.83              | 14.40               | 14.98              |
| 80        | 11.66              | 12.15               | 12.65              |
| 85        | 9.867              | 10.29               | 10.72              |
| 90        | 8.380              | 8.745               | 9.118              |
| 95        | 7.143              | 7.460               | 7.785              |
| 100       | 6.111              | 6.388               | 6.670              |

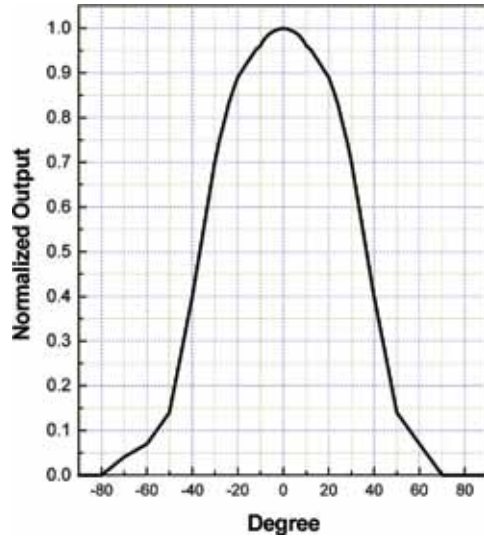
# Typical Characteristic Data

## Sensitivity

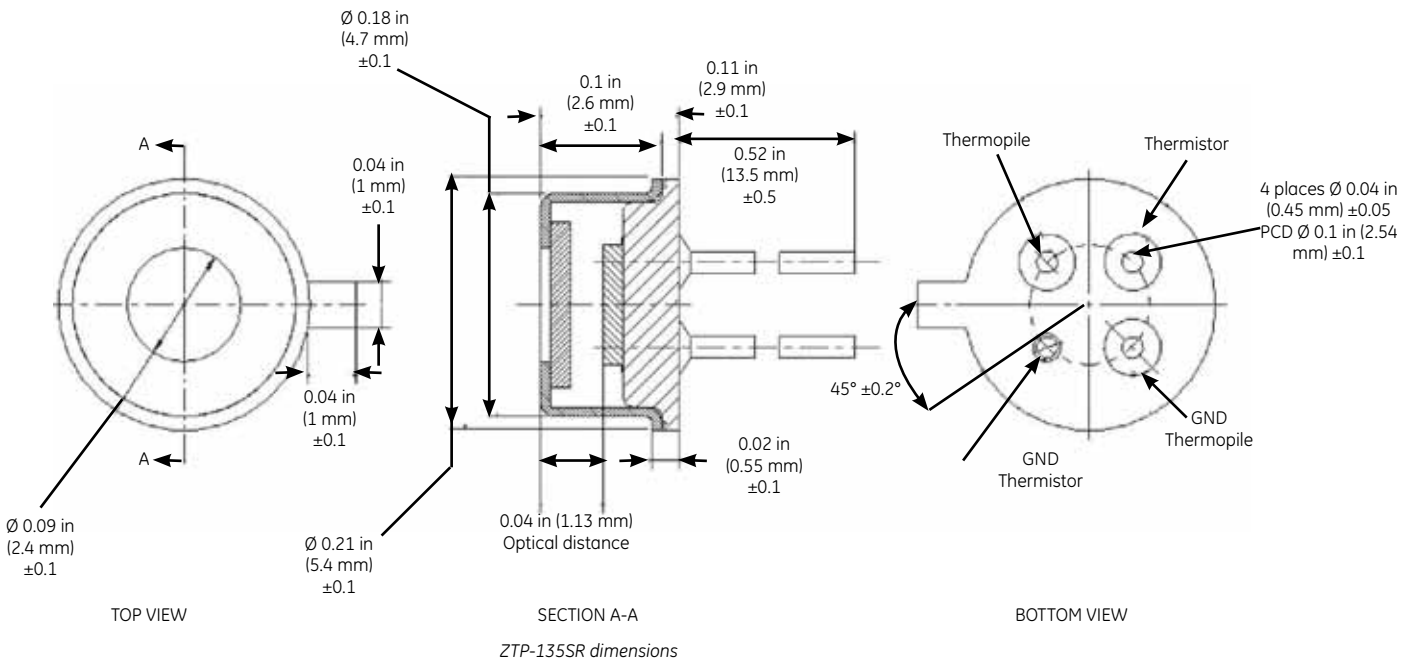


## Field of View

| Parameter     | Limits |     |     | Units  | Condition             |
|---------------|--------|-----|-----|--------|-----------------------|
|               | Min    | Typ | Max |        |                       |
| Field of View | 80     | 85  | 90  | Degree | 50% of Maximum Output |



## Outline of Sensor Package and Pin Arrangement



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