

# THERMOPILE

# OTP- 638D2

## Thermopile Sensor

### OTP-638D2

Revision Date: 2016/12/16 (Rev.00)



The OTP-638D2 is a thermopile sensor in classic TO-46 housing. The sensor is composed of 116 elements of thermocouple in series on a floating micro-membrane having an active area of diameter 545  $\mu\text{m}$ . The thermopile sensor provides nearly Johnson-noise-limited performance, which can be calculated by its ohmic series resistance. A thermistor with a lead connected to ground is also provided inside the TO package for ambient temperature reference.

- TO-46 metal housing
- Thermistor temperature reference included
- Low temperature coefficient of sensitivity
- Ideally suited for ear thermometers, miniature pyrometer.

Parameter	Typ	Unit	Conditions
Sensitivity	128	V/W	323K, 5-14 $\mu\text{m}$
TC of sensitivity	0.14 $\pm$ 0.05	%/K	25 $^{\circ}\text{C}$
Thermopile Voltage	2.4 $\pm$ 0.7	mV	Tb:50 $^{\circ}\text{C}$ , Ta:25 $^{\circ}\text{C}$ 5-14 $\mu\text{m}$
Active area in diameter	545	$\mu\text{m}$	
Resistance of thermopile	115 $\pm$ 35	K $\Omega$	25 $^{\circ}\text{C}$
TC of resistance	0.1 $\pm$ 0.05	%/K	25 $^{\circ}\text{C}$
Time constant	17	ms	
Noise voltage	42.9	nV/Hz <sup>1/2</sup>	r.m.s 300K
NEP	0.34	nW/Hz <sup>1/2</sup>	323K, 5-14 $\mu\text{m}$
Normalized detectivity (D*)	1.43 $\times$ 10 <sup>8</sup>	cm <sup>2</sup> Hz <sup>1/2</sup> /W	323K, 5-14 $\mu\text{m}$
Thermistor resistance	100 $\pm$ 5%	K $\Omega$	25 $^{\circ}\text{C}$
$\beta$ value	3964 $\pm$ 0.5%	K	25 $^{\circ}\text{C}/100^{\circ}\text{C}$
Field of view	90	$^{\circ}$	@50% target signal
Cut on wavelength	5 $\pm$ 0.3	$\mu\text{m}$	@25 $^{\circ}\text{C}$ , 50% transmittance

