

■ Features

The thermopile sensor consists of a series of 116 thermoelements, forming a sensitive region size of $545\ \mu\text{m}$ (diameter). The sensor is hermetically sealed into a TO-5 metal housing, with an optical filter. This standard filter allows measurements to be made in the spectral range above $5\ \mu\text{m}$ wavelength. The thermosensor exhibits an almost white noise, comparable to an ohmic resistance. It has a constant signal versus frequency up to its frequency limit, and is directly proportional to incident radiation.

■ Applications

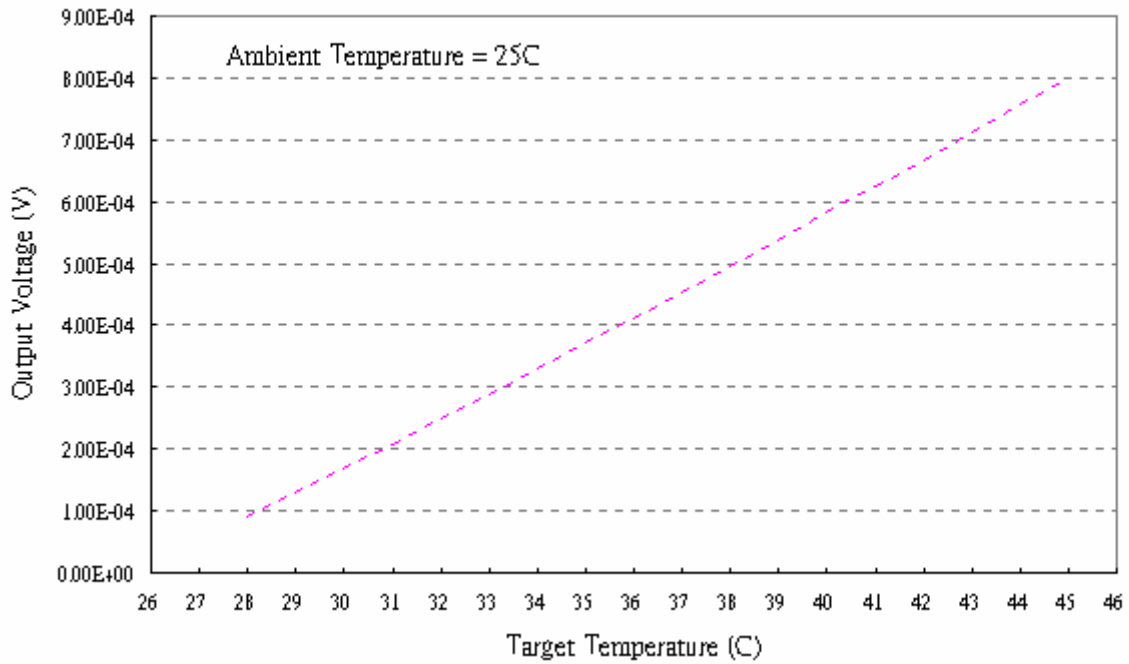
- * Ear thermometers; clinic thermometers
- * Infrared thermometers
- * Consumer applications: hair dryer, micro-wave oven, air conditioner, refrigerator
- * Continuous temperature control of manufacturing
- * Security system
- * Radiation monitor switch system
- * Absorbing measurement for gas analysis
- * Thermoelectric converter
- * Heat flux flowmeter

■ Electrical Characteristics

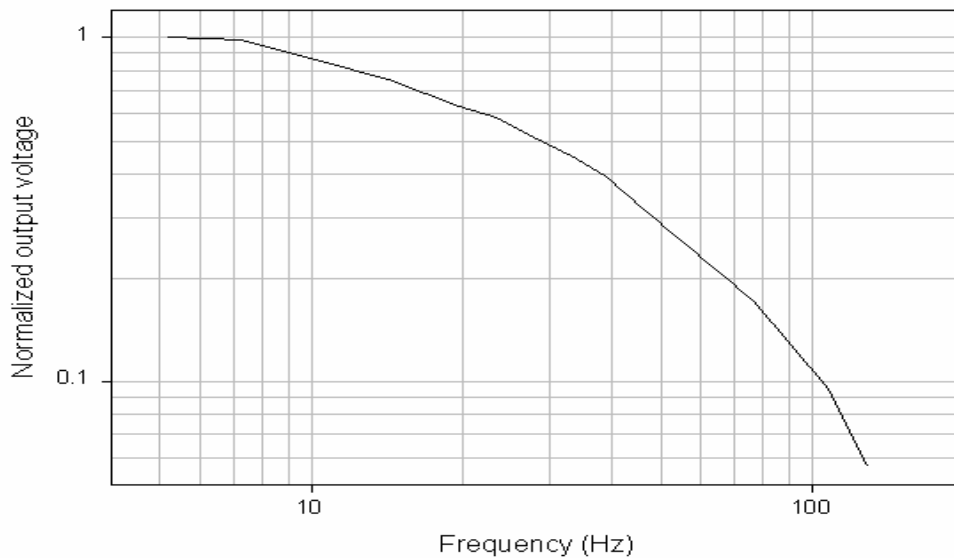
Parameter	Condition	Min.	Typ.	Max.	Unit
Thermopile					
Number of thermojunctions		—	116	—	
Chip size		—	1740*1740	—	μm^2
Active region size	Interference layer	—	Diameter 545	—	μm
Thickness of substrate	Silicon-substrate	600	625	650	μm
Resistance of thermopile	25°C	50	65	80	K Ω
Sensitivity	With 5-14 μm filter	70	85	100	V/W
Detecctivity		1.0×10^8	1.3×10^8	1.7×10^8	$\text{cm} \cdot \text{Hz}^{1/2} / \text{W}$
Time constant		—	16	—	ms
Noise voltage		28	32	36	$\text{nV}/\text{Hz}^{1/2}$
NEP		0.28	0.36	0.48	$\text{nW}/\text{Hz}^{1/2}$
Temperature range	Operation	-20	—	100	°C

Measured at 1 Hz chopper frequency, within spectral range 5-14 μm , using a blackbody radiator of 500K temperature.

■ Thermopile voltage vs. blackbody temperature

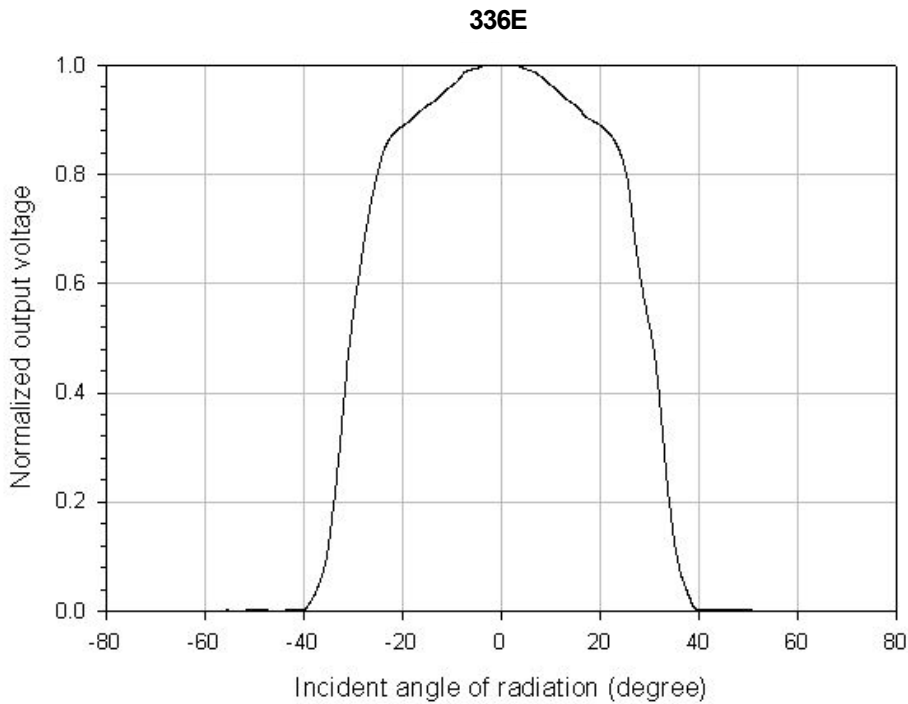


■ Frequency response



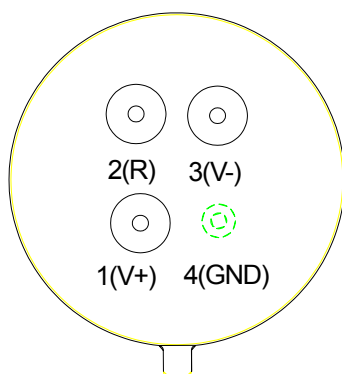
Field of view

(1) window size: 3.80mm (diameter)

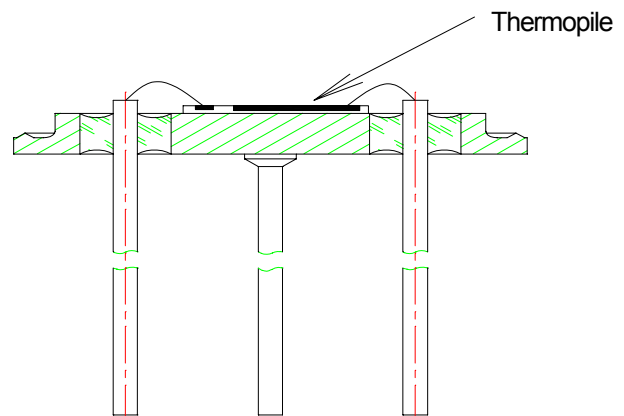


Pin assignment & description

- 1 thermopile output pin (+)
- 3 thermopile output pin (-)



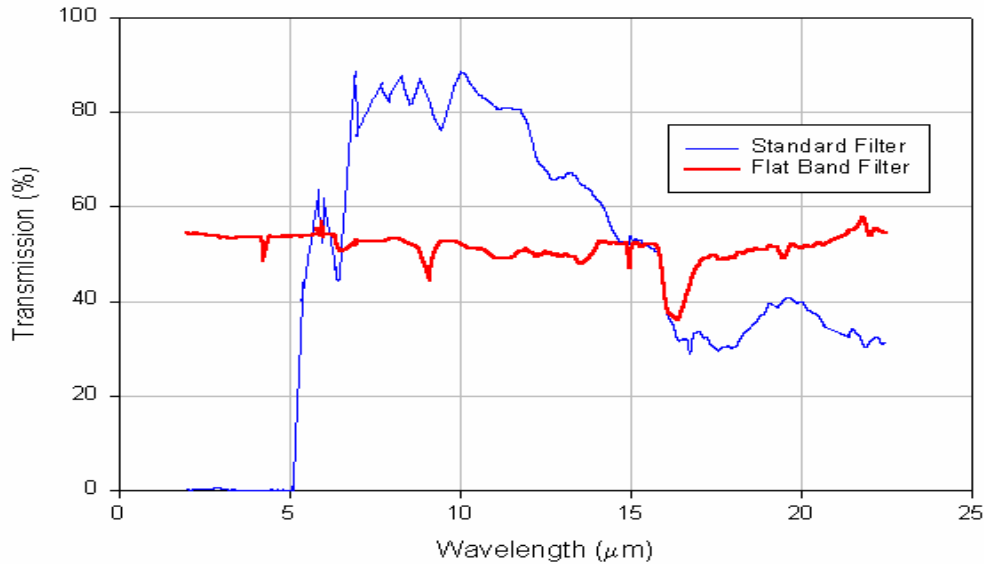
BACKSIDE VIEW



SIDE VIEW

■ **Transmission of filter**

Transmission of optical filter is measured by FTIR from 2 μm



■ **Package**

The sensor is hermetically sealed into a TO-5 metal housing, with an optical filter. This standard filter allows measurements to be made in the spectral range above 5 μm wavelength. The dimensions of header and cap are shown below.

