

■ 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.

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■ Applications

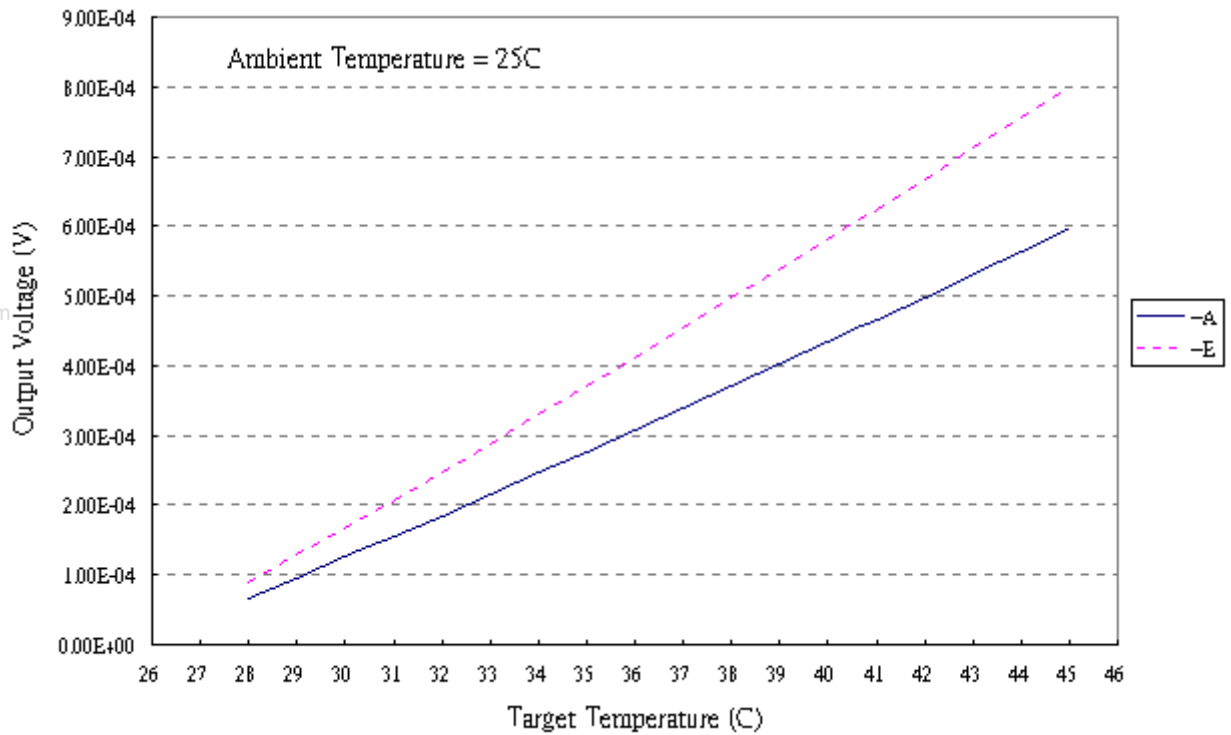
- * Ear thermometers; clinic thermometers
- * Infrared thermometers
- * Consumer applications: hair dryer, micro-wave oven, air conditioner, refrigerator
- * Continuous temperature control of manufacturing
- * Security system
- * Radiation monitor switch system
- * Absorbing measurement for gas analysis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

Electrical Characteristics

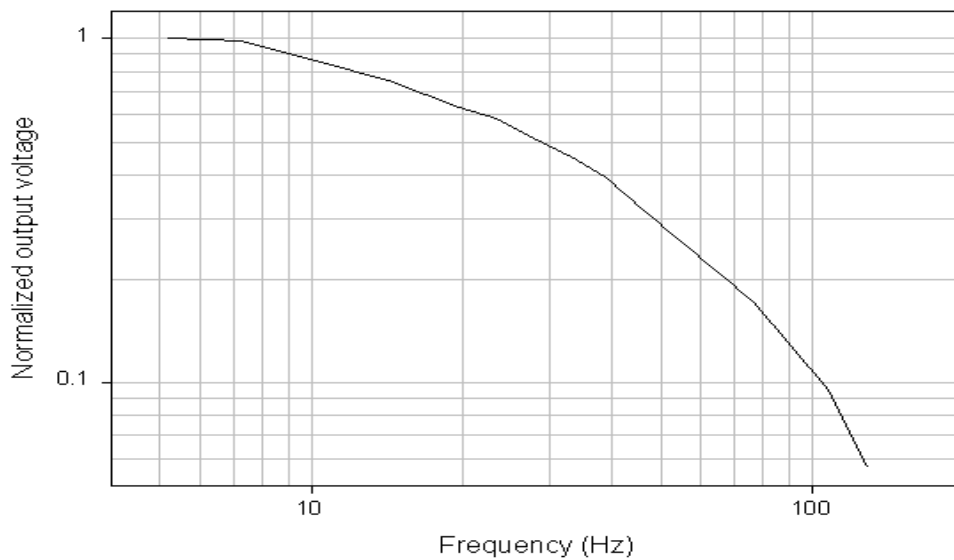
Parameter	Condition	Min.	Typ.	Max.	Unit
Thermopile					
Number of thermojunctions		---	116	---	
Chip size		---	1740*1740	---	μm^2
Active region size	Interference layer	---	Diameter 545	---	μm
Thickness of substrate	Silicon-substrate	600	625	650	μm
Resistance of thermopile	25 \square	50	65	80	K Ω
Sensitivity	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	\square

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

Thermopile voltage vs. blackbody temperature

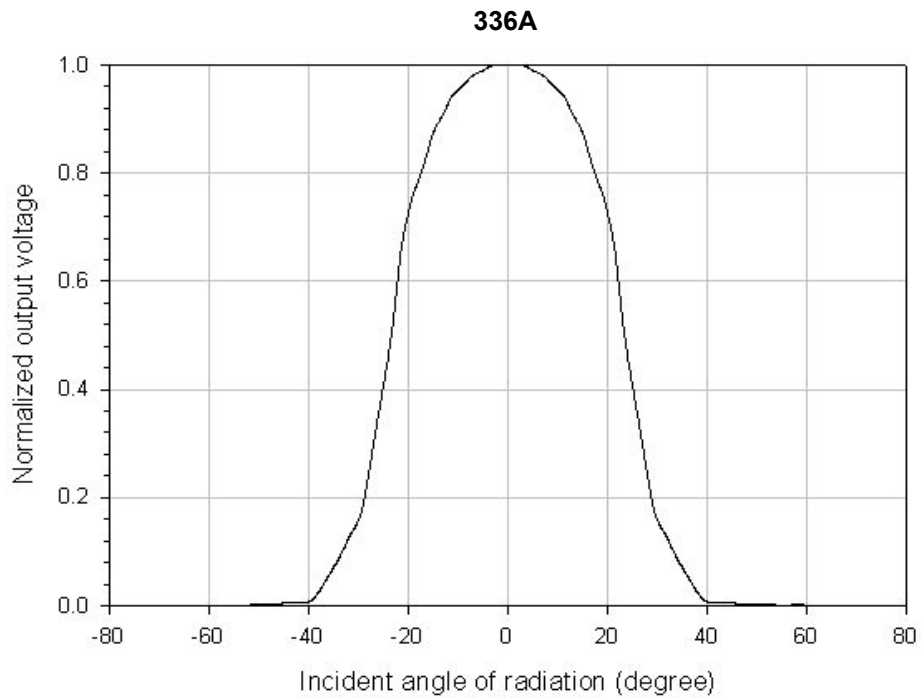


Frequency response

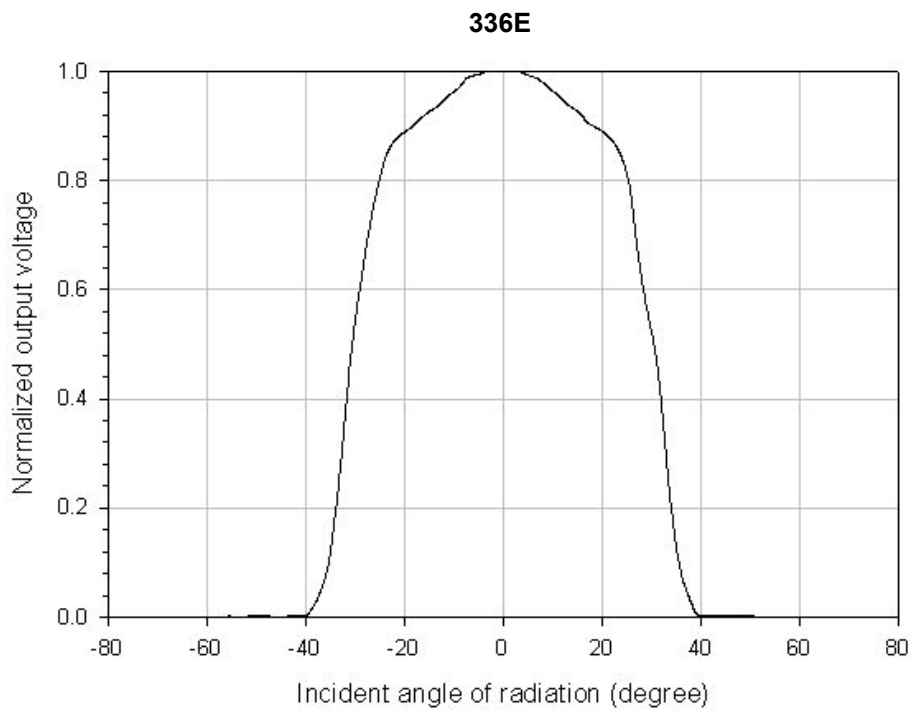


Field of view

1) window size: 2.57mm (diameter)

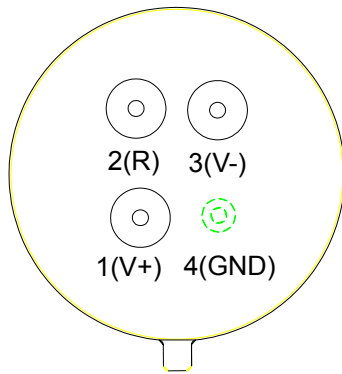


2) window size: 3.80mm (diameter)

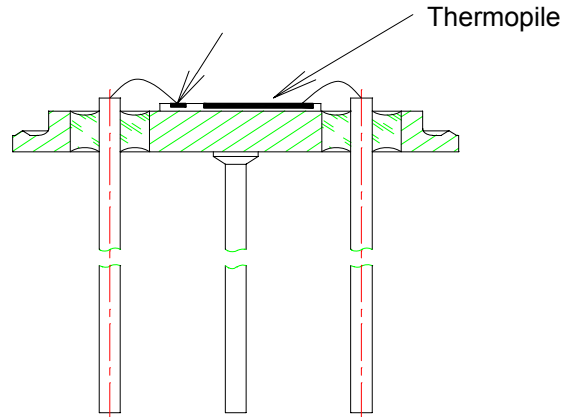


Pin assignment & description

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



BACKSIDE VIEW



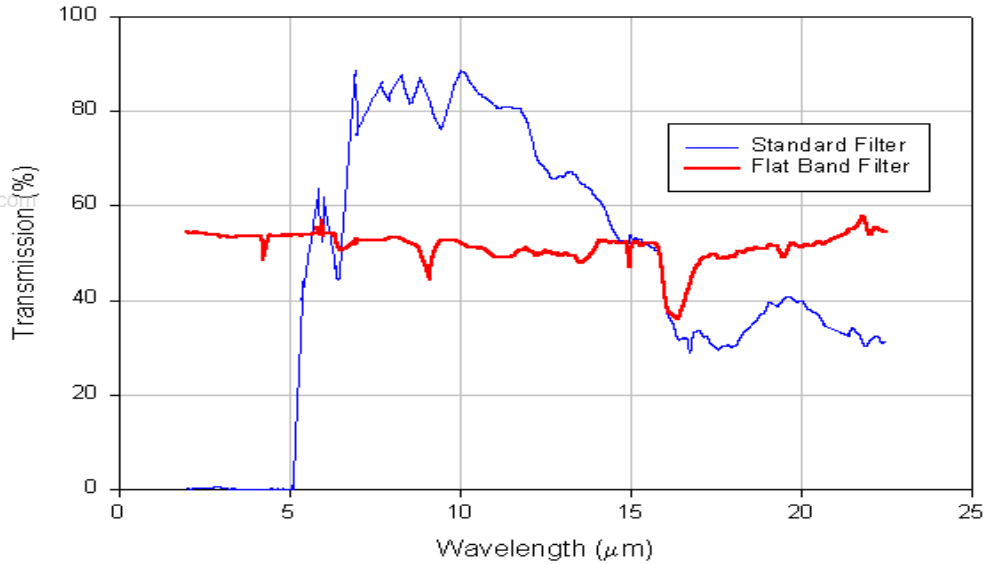
SIDE VIEW

Order information : TP336□

- : A : Standard filter (5-14 μ m), window size=2.57mm (diameter).
- B : Silicon filter with flat band transmission, window size=2.57mm (diameter).
- E : Standard filter (5-14 μ m), window size=3.80mm (diameter).
- F : Silicon filter with flat band transmission, window size=3.80mm (diameter).

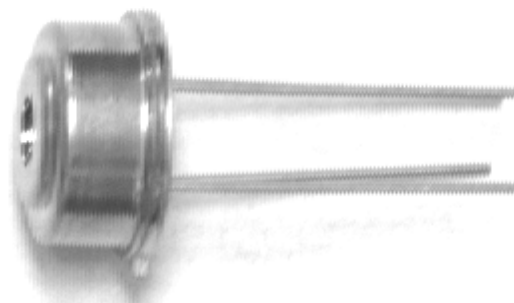
Transmission of filter

Transmission of optical filter is measured by FTIR from 2 μm

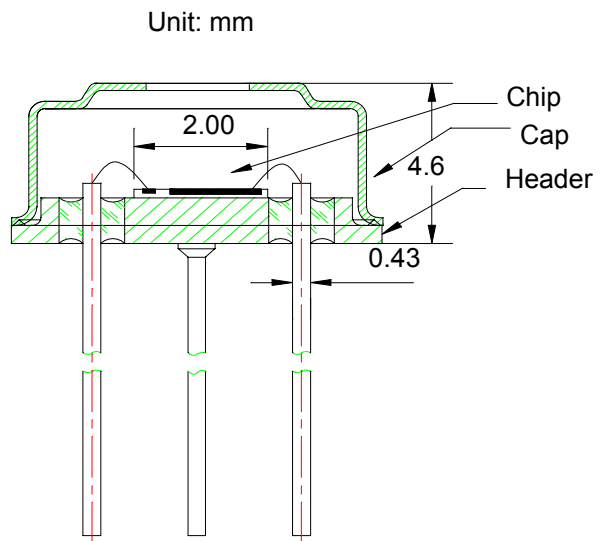
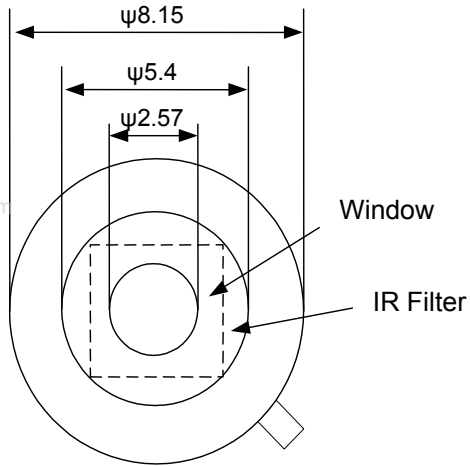


Package

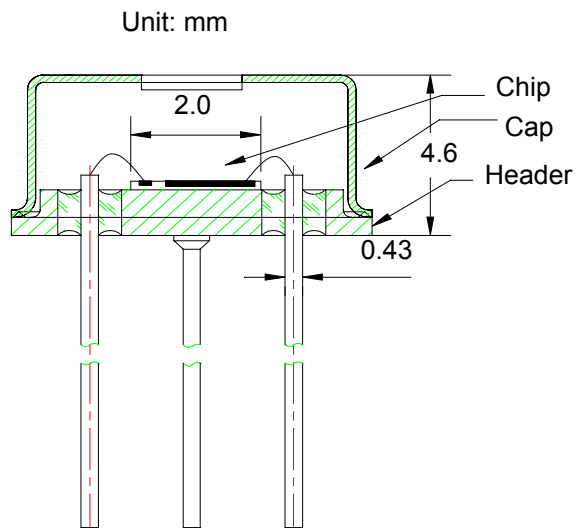
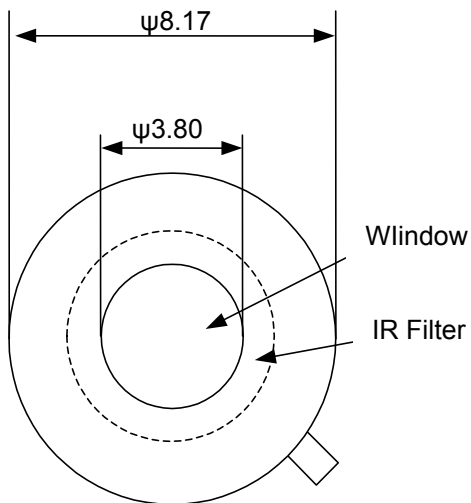
The sensor is hermetically sealed into a TO-5 metal housing, with an optical filter. This standard filter allows measurements to be made in the spectral range above 5 μm wavelength. The dimensions of header and cap are shown below.



TP336A

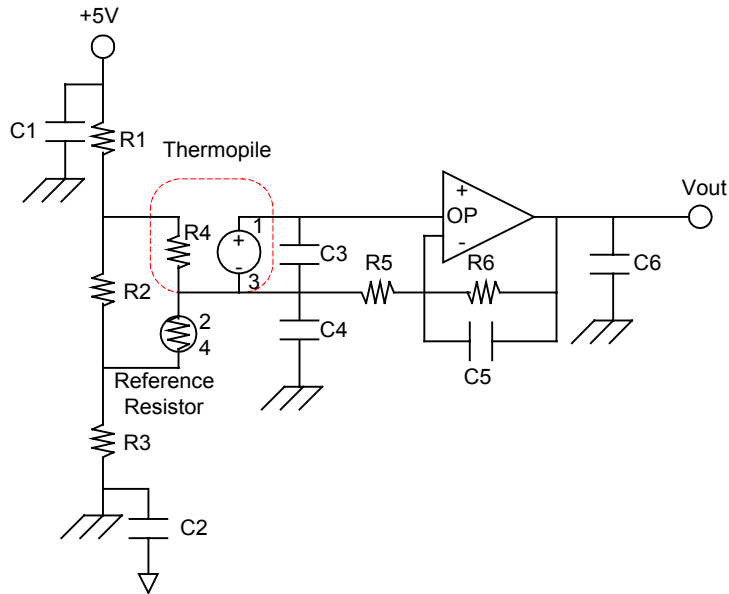


TP336E



Application circuit

Circuit 1 :



Circuit 2 :

