Data Sheet

STP11DF59L5

Infrared Thermopile Sensor for Temperature Measurement

General Description

The STP11DF59L5 infrared thermopile sensor for non-contact temperature measurement is a thermopile sensor having an output signal voltage directly proportional to the incident infrared (IR) radiation power. Thanks to the anti-electromagnetic interference design, STP11DF59L5 is robust for all kinds of application environment. The sensor window integrated optical lens improves the sensor's DS ratio through optical optimization design . The STP11DF59L5 comprising a new type CMOS compatible thermopile sensor chip features good sensitivity, small temperature coefficient of sensitivity as well as high reproducibility and reliability. A high-precision thermistor reference chip is also integrated for ambient temperature compensation.

Features and Benefits

- High responsivity, High Signal-Noise ratio
- Small size, high reliability, 4-pin metal housing TO-5
- Operating Temperature Range: −40℃ to +125℃
- Anti-electromagnetic interference

Applications

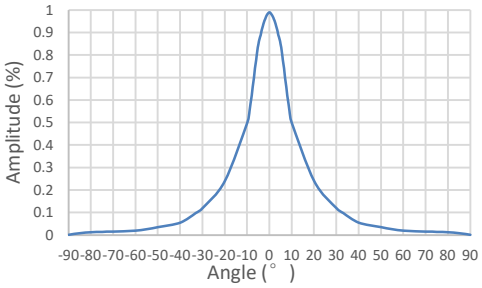
- Non-contact temperature measurement
- Pyrometer, Thermometer

Electrical Characteristics(TA = +25℃, unless otherwise noted.)

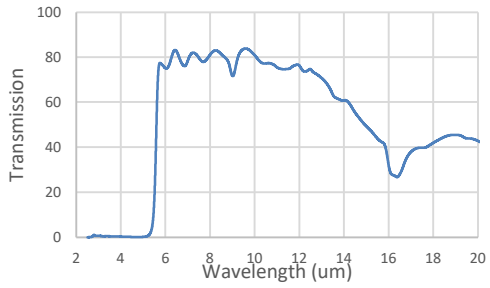
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
R_{TP}	Thermopile resistance		120	135	150	KΩ
R	Responsivity	500K, with filter cut-on 5.5 um	328	383	438	V/W
τ	Time constant		13	15	17	ms
V_N	Noise voltage	Johnson-noise	44.5	47.2	49.8	$nV/Hz^{1/2}$
D*	Specific detectivity		$3.45*10^8$	$4.05*10^8$	$4.65*10^8$	$cmHz^{1/2}/W$
FOV	Field of View	At 50% intensity points		20		°
TC_{RTP}	TC of resistance	-40℃ ~100℃	200	300	400	ppm/K
Thermistor						
R_{th}	Thermistor resistance	25° C	95	100	105	KΩ
β	B-value		3930	3950	3970	

Optical Characteristics

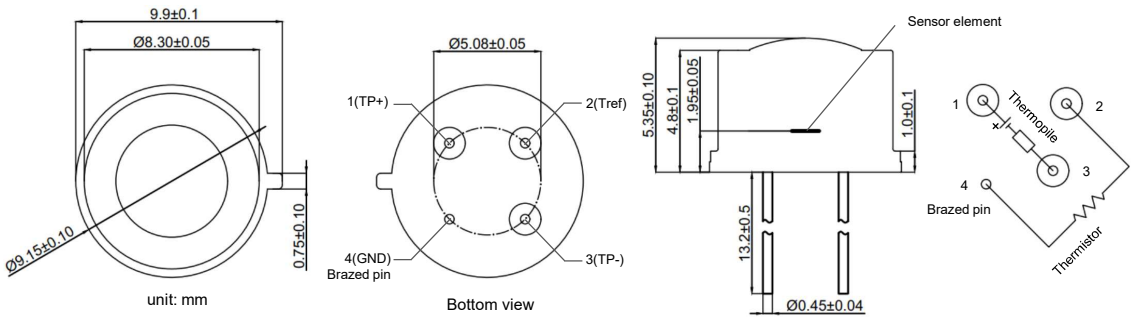
Optical characteristics



Filter parameters



Mechanical Drawings



Pin Configurations & Package Outlines

Symbol	Pin	Pin Type	Conditions
TP+	1	O	Thermopile positive
Tref	2	I	Thermistor positive
TP-	3	O	Thermopile negative
GND	4	O	Thermistor negative

Revision History

Revision Number	Release Date	Description
Rev1	2021/4/14	Initial Release
Rev2	2021/11/30	Correct the cap size.