

## General Description

The STP11DF45 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, STP11DF45 is robust for all kinds of application environment. An 3.2~4.1  $\mu\text{m}$  band pass filter in front of the sensor makes the device sensitive to infrared (IR) radiation which can transmits the glass-ceramic plate for induction cooker

The STP11DF45 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.

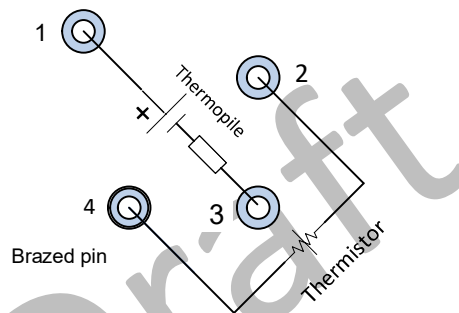
## Features and Benefits

- High responsivity, High Signal-Noise ratio
- Small size, high reliability, 4-pin metal housing TO-5
- Operating Temperature Range:  $-40^{\circ}\text{C}$  to  $+125^{\circ}\text{C}$
- Anti-electromagnetic interference

## Applications

- Consumer electronic
- Home Appliance

## Block Diagram

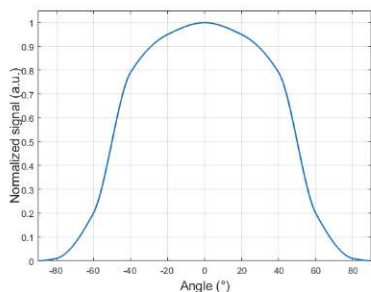


## Electrical Characteristics( $V_S = 5.0\text{V}$ , $T_A = +25^{\circ}\text{C}$ , unless otherwise noted. )

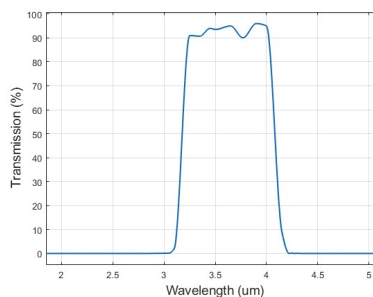
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$R_{TP}$	Thermopile resistance		120	135	150	$\text{K}\Omega$
R	Responsivity	500K, with filter cut-on 3.2 $\mu\text{m}$	328	383	438	$\text{V/W}$
$\tau$	Time constant		13	15	17	ms
$V_N$	Noise voltage	Johnson-noise	44.5	47.2	49.8	$\text{nV/Hz}^{1/2}$
$D^*$	Specific detectivity		$3.45 \times 10^8$	$4.05 \times 10^8$	$4.65 \times 10^8$	$\text{cmHz}^{1/2}/\text{W}$
FOV	Field of View	At 50% intensity points	85	90	95	$^{\circ}$
$TC_{RTP}$	TC of resistance	$-40^{\circ}\text{C} \sim 100^{\circ}\text{C}$	200	300	400	ppm/K
<b>Thermistor</b>						
$R_{th}$	Thermistor resistance	$25^{\circ}\text{C}$	95	100	105	$\text{K}\Omega$
$\beta$	B-value		3930	3950	3970	

## Optical Characteristics

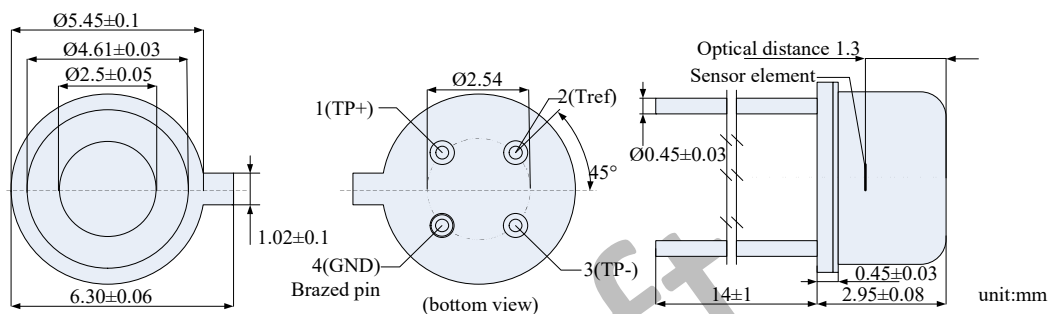
Optical characteristics



Filter parameters



## Pin Configurations & Package Outlines



## Pin Definitions and Descriptions

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	Date	Notes
V1.0	2021/7/5	Initial Release