

#### Features

- Non-contact surface temperature measuring
- TO housing with a silicon lens
- Using NTC thermistor for ambient temperature compensation
- Suitable for human body temperature detecting and Industrial temperature measurement
- Fast response time
- High sensitivity

#### Applications

- Non-contact infrared thermometer
- Microwave oven
- Automatic induction equipment
- Heating, Ventilation and Air Conditioning(HVAC)
- Appliance

#### Descriptions

The TSP14L5 is a thermopile temperature sensor based on MEMS (Micro-ElectroMechanical Systems) technology. This thermopile detector consists of a thermopile MEMS chip, silicon lens, a NTC thermistor for temperature compensation and a small size TO-39 package.

**Table 1 Thermopile Parameter**

Parameter	Specification			Unit	Condition
	Min.	Typ.	Max.		
Responsivity	60			V/W	Black body=500K,1HZ @temp=25°C
Detectivity	1.21E08			cm · Hz <sup>1/2</sup> /W	Black body=500K,1HZ @temp=25°C
NEP	0.59			nW · Hz <sup>1/2</sup>	Black body=500K,1HZ @temp=25°C
Voltage Response	29			V · mm <sup>2</sup> /W	Black body=500K,1HZ @temp=25°C
Thermopile Res	65	75	85	kΩ	@temp=25°C
TC of Thermopile	-0.11			%/°C	
Noise Voltage	33	35	37	nV/Hz <sup>1/2</sup>	@temp=25°C
Time Constant	16			ms	
Field of View(FOV)	5			°	Degree at 50% signal level
Operating Temp	-40~125			°C	
Storage Temp	-40~125			°C	
<b>Thermistor for Temperature Compensation</b>					

Thermistor Resistance	100	k $\Omega$	$\pm 2\%$ tolerance, @temp=25 $^{\circ}\text{C}$
TC of Thermistor(B)	3950	K	$\pm 1\%$ tolerance, Defined at 25/50 $^{\circ}\text{C}$

**Table 2 NTC Temperature VS Resistance Table**

Temp.( $^{\circ}\text{C}$ )	R <sub>min</sub> (k $\Omega$ )	R <sub>nor</sub> (k $\Omega$ )	R <sub>max</sub> (k $\Omega$ )	Temp.( $^{\circ}\text{C}$ )	R <sub>min</sub> (k $\Omega$ )	R <sub>nor</sub> (k $\Omega$ )	R <sub>max</sub> (k $\Omega$ )
-40	3127.613	3305.055	3491.167	40	51.797	53.189	54.597
-30	1663.335	1746.527	1833.147	50	34.806	35.882	36.977
-20	922.780	963.184	1004.955	60	23.909	24.740	25.590
-10	530.336	550.469	571.137	70	16.741	17.384	18.045
0	315.541	325.806	336.270	80	11.929	12.429	12.944
10	193.520	198.832	204.207	90	8.632	9.022	9.427
20	122.143	124.914	127.696	100	6.338	6.645	6.964
25	98.000	100.000	102.000	110	4.717	4.960	5.213
30	78.772	80.554	82.343	120	3.554	3.748	3.951

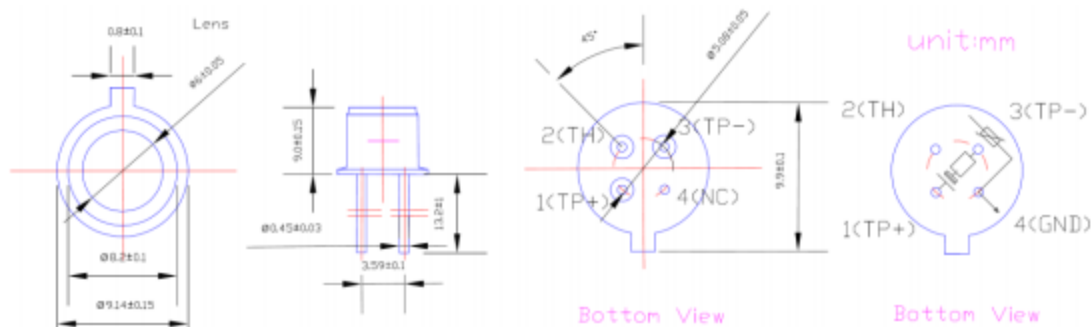
**Table 3 Pin Names and Description**

Pin	Function	Description
1	Thermopile+(TP+)	Thermopile Output DC Voltage+ pin.
2	Thermistor(TH)	Ambient Temperature Compensation Resistance+ pin.
3	Thermopile-(TP-)	Thermopile Output DC Voltage- pin.
4	GND	Ambient Temperature Compensation Resistance- pin and GND.



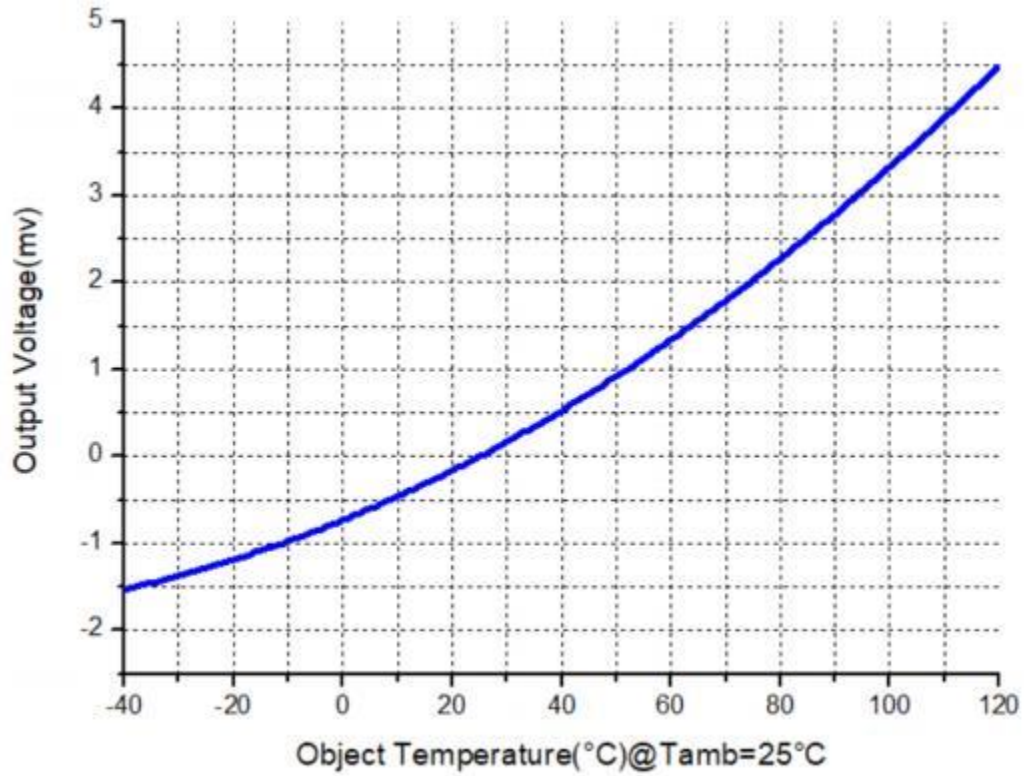
**Figure 1 Thermopile TSP14L5**

**Outline of Sensor Package**

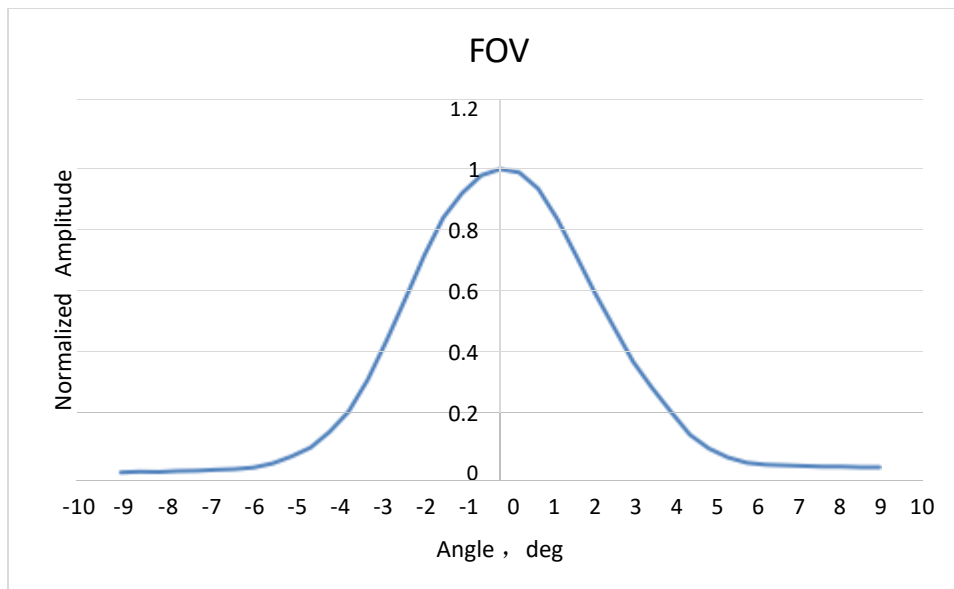


**Figure 2 Outline of Sensor Package**

**Sensitivity Output Curve**



**Figure 3 Sensitivity Output Curve**



**Figure 4 Typical FOV**