SPECIFICATION THERMOPILE SENSOR

SP10-F5.5

Specification:

- MEMS Thermopile element
- TO-46 Package
- High sensitivity
- 5.5μm LWP Filter
- High accuracy NTC

Applications:

- Non-contact temperature measurements
- Ear thermometers、Forehead thermometer
- Continuous temperature control of manufacturing
- Consumer applications
- Home appliance temperature measurement

Model No.: SP10-F5.5	Approved by	Checked by	Drawn by
Rev. 04 / Date 2020.02			

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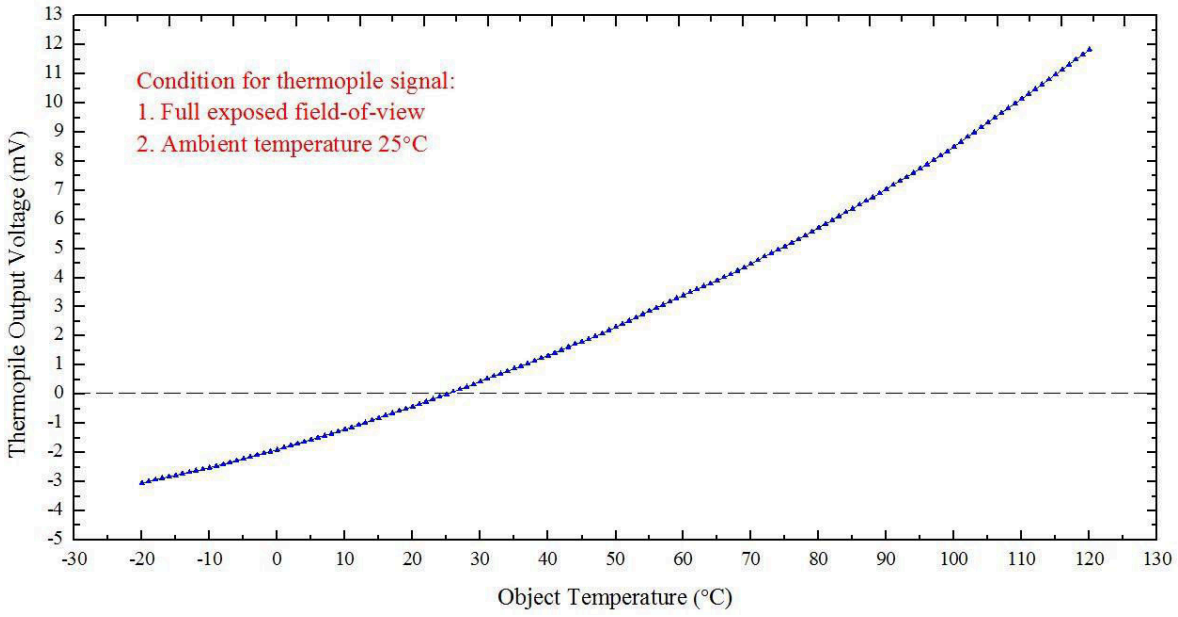
Absolute Maximum Ratings

Parameter	Value	Unit
Operating temperature	-30 to +100	°C
Storage Temperature	-40 to +125	°C

Performance specifications

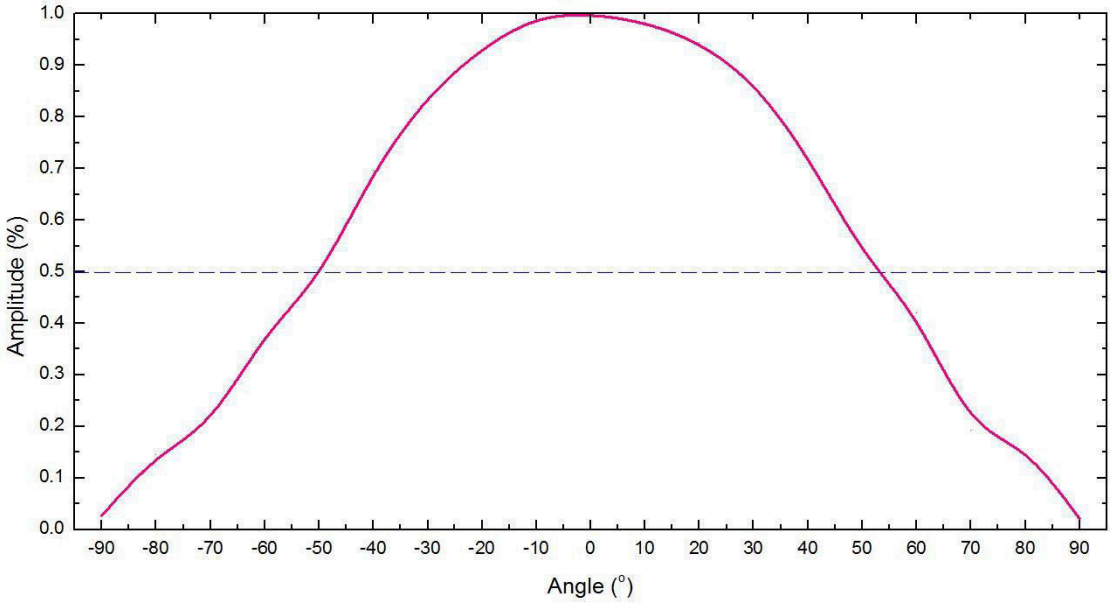
Parameter	Value	Unit	Conditions
Chip size	1.1 X 1.1	mm^2	
Sensitive area	0.35 X 0.35	mm^2	
Field of view	108	°	At 50 % intensity points
Thermopile resistance	130 ± 10	kΩ	temp=25℃
Noise voltage	46 ± 2	$nV/Hz^{1/2}$	temp=25℃
NEP	0.709	$nW/Hz^{1/2}$	500K, 1Hz
Responsivity	85	V/W	500K, 5.5μm（Long pass）
Temp. coefficient of resistance	0.06	%/℃	temp=25℃-75℃
Time constant	13	ms	
Specific detectivity	0.5 E08	$cmHz^{1/2}/W$	500K, 1Hz
Thermistor resistance	100 ± 3%	KΩ	25℃
Thermistor BETA-value	3950 ± 1%	K	25℃/50℃

Typical performance curves



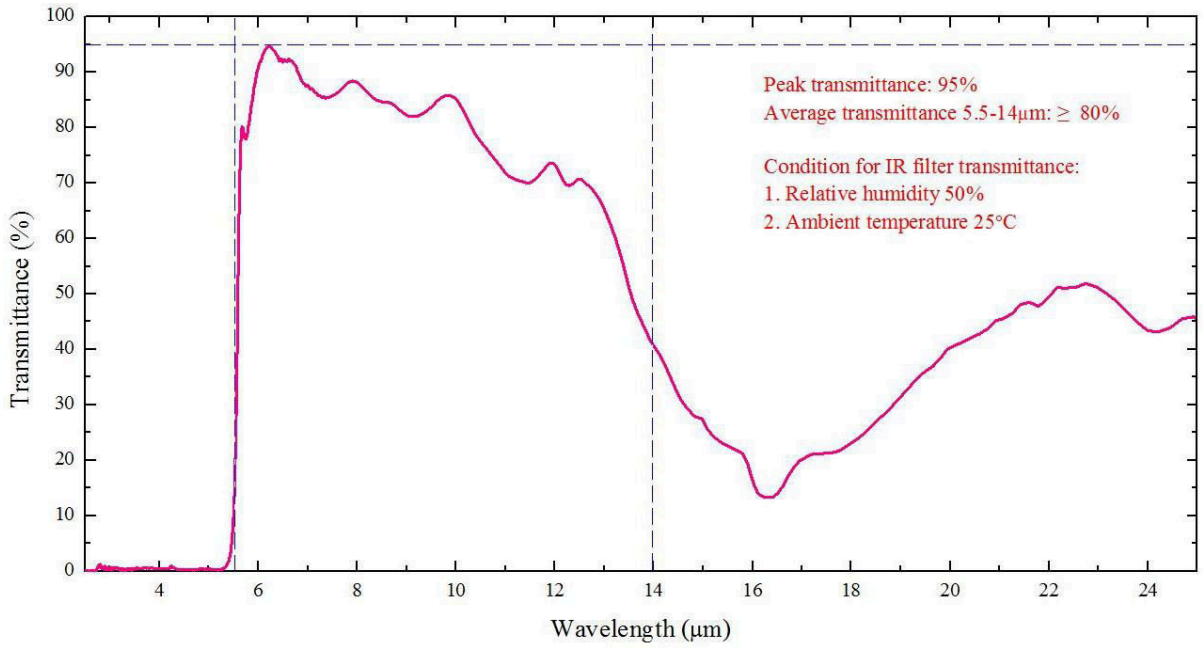
Optical characteristics

Parameter	Value	Unit	Description
Field of view	108	°	50% Maximum signal



Filter specifications

Parameter	Value	Unit	Description
Transmission Range	5.5	μ m	Long wave pass
Transmission	≥75	%	Average 5.5-14 μ m
Transmission blocking average	1	%	＜5 μ m



Electrical connections

Pin	1	2	3	4
Define	Thermopile +	NTC	Thermopile -	GND

Temperature vs. Resistance of NTC

T (℃)	R (kΩ)	T (℃)	R (kΩ)	T (℃)	R (kΩ)
-20	930.50	20	125.86	60	24.831
-19	880.14	21	120.24	61	23.959
-18	832.84	22	114.86	62	23.122
-17	788.37	23	109.70	63	22.317
-16	746.54	24	104.75	64	21.545
-15	707.18	25	100.00	65	20.803
-14	670.11	26	95.642	66	20.089
-13	635.18	27	91.506	67	19.404
-12	602.26	28	87.577	68	18.744
-11	571.20	29	83.845	69	18.110
-10	541.90	30	80.299	70	17.501
-9	514.23	31	76.926	71	16.914
-8	488.10	32	73.718	72	16.350
-7	463.41	33	70.665	73	15.806
-6	440.07	34	67.759	74	15.283
-5	417.99	35	64.991	75	14.780
-4	397.10	36	62.355	76	14.295
-3	377.34	37	59.842	77	13.828
-2	358.62	38	57.446	78	13.378
-1	340.89	39	55.161	79	12.945
0	324.10	40	52.980	80	12.527
1	307.68	41	50.900	81	12.124
2	292.34	42	48.913	82	11.736
3	277.99	43	47.016	83	11.362
4	264.53	44	45.203	84	11.001
5	251.89	45	43.471	85	10.653
6	240.00	46	41.815	86	10.317
7	228.78	47	40.231	87	9.9932
8	218.20	48	38.717	88	9.6806
9	208.19	49	37.267	89	9.3789
10	198.71	50	35.880	90	9.0876
11	189.72	51	34.552	91	8.8064
12	181.19	52	33.280	92	8.5349
13	173.07	53	32.061	93	8.2727
14	165.35	54	30.894	94	8.0195
15	157.98	55	29.775	95	7.7749
16	150.96	56	28.702	96	7.5385
17	144.26	57	27.673	97	7.3102
18	137.85	58	26.687	98	7.0895
19	131.72	59	25.740	99	6.8762
				100	6.6700

Mechanical dimensions