

Specification Thermopile Sensor P2401

Specification :

- 1) MEMS Thermopile element
- 2) TO-46 Package
- 3) High sensitivity
- 4) 5.5μm LWP Filter
- 5) High accuracy NTC



Applications :

- 1) Non-contact temperature measurements
- 2) Ear thermometers 、 Forehead thermometer
- 3) Continuous temperature control of manufacturing
- 4) Consumer applications
- 5) Home appliance temperature measurement

Model:	Prepared by	Reviewed by	Approved by
P2401	Chen Qiao	Allen Li	Allen Li
Date	2019.01.21	2019.01.21	2019.01.21
Version	2.0		

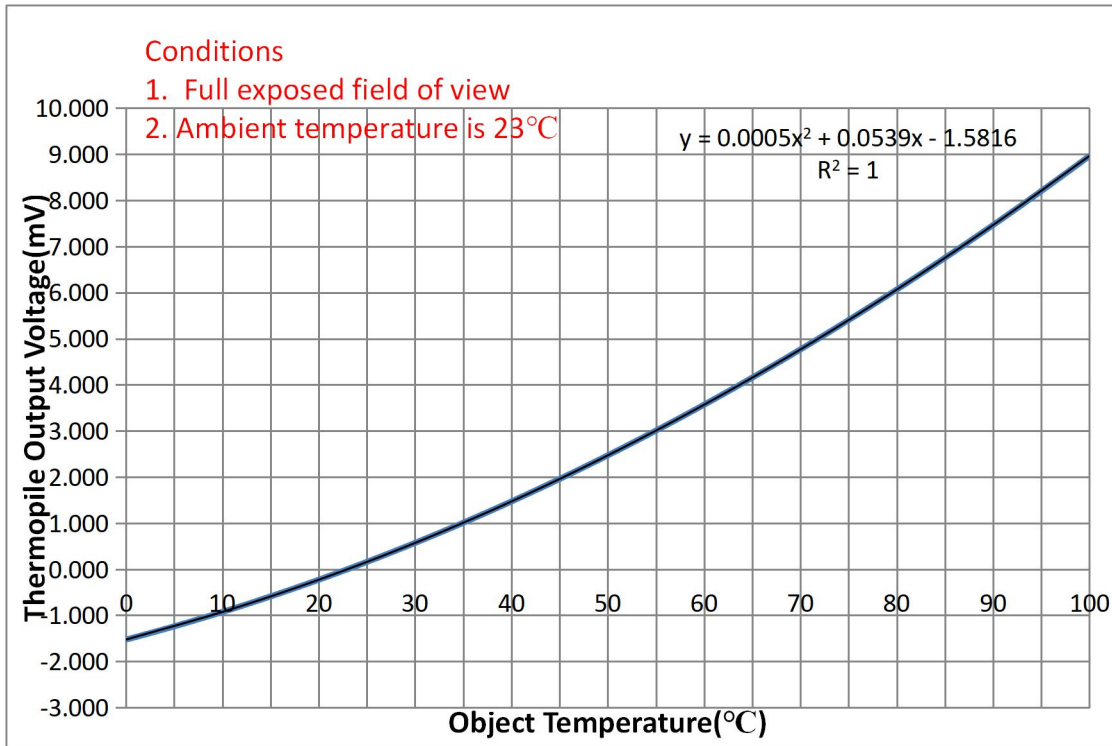
Absolute Maximum Ratings:

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

Performance specifications:

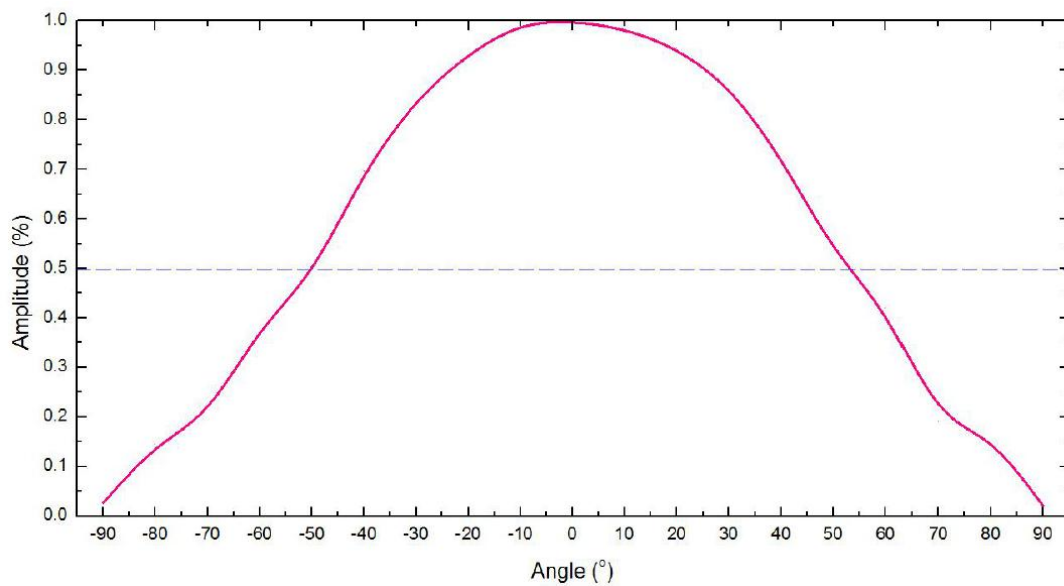
Parameter	Value	Unit	Conditions
Chip size	1.1 X1.1	mm	
Sensitive area	0.85 X 0.85	mm	
Field of view	112	o	At 50 % intensity points
Thermopile resistance	350±20%	kΩ	temp=25°C
Noise voltage	60±2	nV/Hz ^{1/2}	temp=25°C
NEP	0.44	nW/Hz ^{1/2}	500K, 1Hz
Responsivity	125	V/W	500K, 5.5μm, long pass)
Temp. coefficient of resistance	0.06	%/°C	temp=25°C-75°C
Time constant	15	ms	
Specific detectivity	0.63 E08	cmHz ^{1/2} /W	500K, 1Hz
Thermistor resistance	100 ± 3%	KΩ	25°C
Thermistor BETA-value	3950 ± 1%	K	25°C/50°C

Typical performance curves:



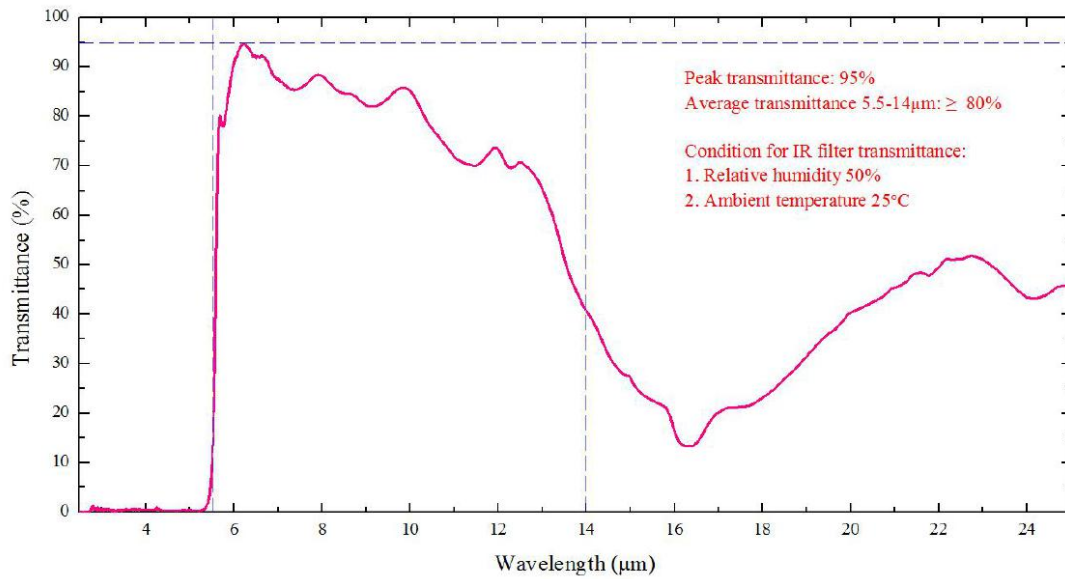
Optical characteristics:

Parameter	Value	Unit	Description
Field of view	112	o	50% Maximum signal



Filter specifications:

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



Electrical connections:

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

Temperature vs. Resistance of NTC:

Temperature (°C)	R (K Ω)	Temperature (°C)	R (K Ω)	Temperature (°C)	R (K Ω)	Temperature (°C)	R (K Ω)
-40	3305.055	2	294.436	44	45.329	86	10.237
-39	3094.400	3	280.035	45	43.575	87	9.917
-38	2898.555	4	266.422	46	41.898	88	9.608
-37	2716.384	5	253.549	47	40.293	89	9.310
-36	2546.847	6	241.372	48	38.758	90	9.022
-35	2388.988	7	229.849	49	37.289	91	8.745
-34	2241.930	8	218.942	50	35.882	92	8.478
-33	2104.867	9	208.614	51	34.541	93	8.219
-32	1977.057	10	198.832	52	33.257	94	7.970
-31	1857.820	11	189.563	53	32.027	95	7.730
-30	1746.527	12	180.778	54	30.849	96	7.497
-29	1642.601	13	172.449	55	29.721	97	7.273
-28	1545.510	14	164.550	56	28.639	98	7.057

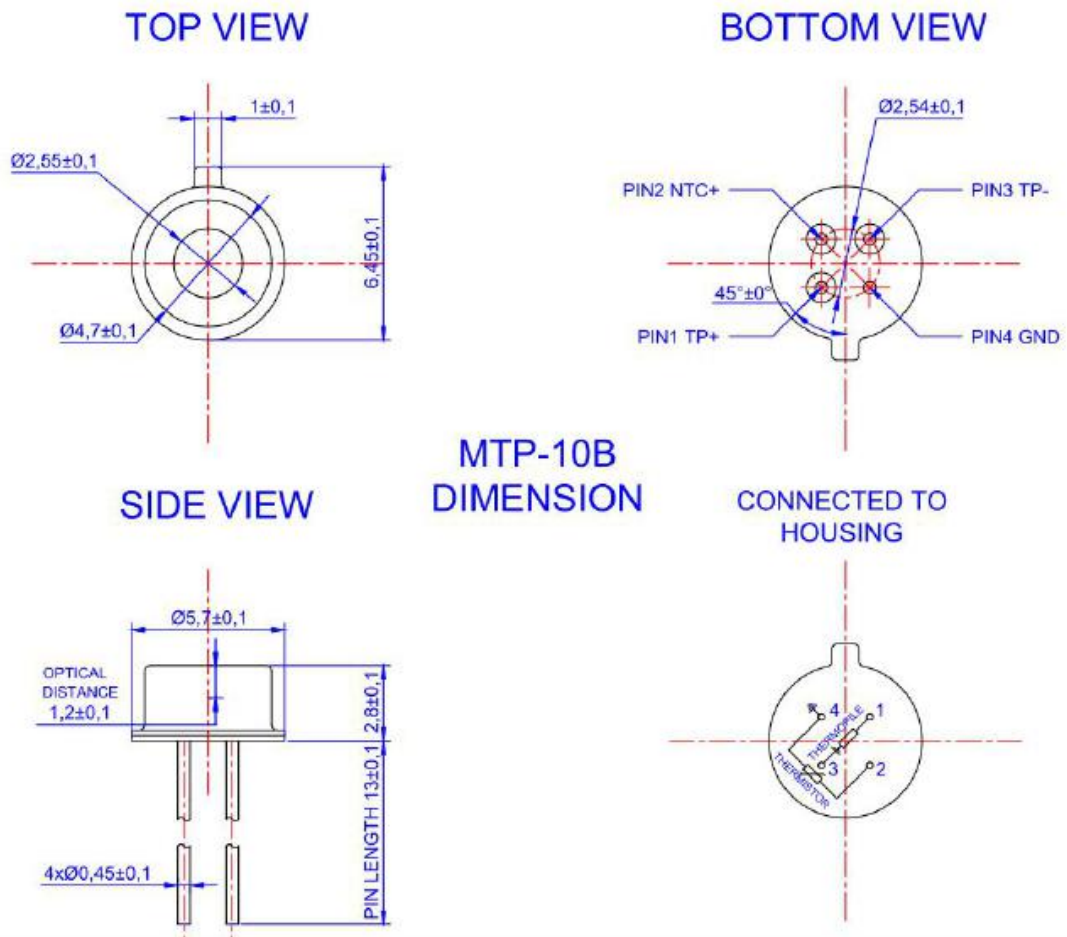
-27	1454.762	15	157.056	57	27.602	99	6.847
-26	1369.905	16	149.945	58	26.608	100	6.645
-25	1290.522	17	143.195	59	25.654	101	6.450
-24	1216.226	18	136.785	60	24.740	102	6.261
-23	1146.661	19	130.698	61	23.862	103	6.079
-22	1081.498	20	124.914	62	23.020	104	5.902
-21	1020.433	21	119.417	63	22.212	105	5.732
-20	963.184	22	114.191	64	21.436	106	5.567
-19	909.235	23	109.223	65	20.691	107	5.408
-18	858.642	24	104.497	66	19.976	108	5.253
-17	811.174	25	100.000	67	19.289	109	5.104
-16	766.621	26	95.721	68	18.628	110	4.960
-15	724.787	27	91.647	69	17.994	111	4.820
-14	685.489	28	87.768	70	17.384	112	4.685
-13	648.559	29	84.073	71	16.798	113	4.554
-12	613.841	30	80.554	72	16.234	114	4.428
-11	581.189	31	77.199	73	15.692	115	4.305
-10	550.469	32	74.002	74	15.170	116	4.187
-9	521.554	33	70.954	75	14.668	117	4.072
-8	494.330	34	68.046	76	14.186	118	3.960
-7	468.686	35	65.273	77	13.721	119	3.852
-6	444.523	36	62.627	78	13.274	120	3.748
-5	421.747	37	60.101	79	12.843	121	3.647
-4	400.269	38	57.690	80	12.429	122	3.549
-3	380.010	39	55.388	81	12.029	123	3.454
-2	360.893	40	53.189	82	11.643	124	3.362
-1	342.847	41	51.089	83	11.272	125	3.272
0	325.806	42	49.082	84	10.914		
1	309.674	43	47.163	85	10.570		

V-T Form (35° C-41° C)

T_AMB=22.3°C

T_OBJ	Vout	T_OBJ	Vout	T_OBJ	Vout	T_OBJ	Vout	T_OBJ	Vout	T_OBJ	Vout
35	1.082	36.1	1.184	37.1	1.277	38.1	1.370	39.1	1.463	40.1	1.555
35.1	1.091	36.2	1.193	37.2	1.286	38.2	1.379	39.2	1.472	40.2	1.565
35.2	1.100	36.3	1.202	37.3	1.295	38.3	1.388	39.3	1.481	40.3	1.574
35.3	1.110	36.4	1.212	37.4	1.305	38.4	1.398	39.4	1.490	40.4	1.583
35.4	1.119	36.5	1.221	37.5	1.314	38.5	1.407	39.5	1.500	40.5	1.593
35.5	1.128	36.6	1.230	37.6	1.323	38.6	1.416	39.6	1.509	40.6	1.602
35.6	1.137	36.7	1.240	37.7	1.333	38.7	1.425	39.7	1.518	40.7	1.611
35.7	1.147	36.8	1.249	37.8	1.342	38.8	1.435	39.8	1.528	40.8	1.621
35.8	1.156	36.9	1.258	37.9	1.351	38.9	1.444	39.9	1.537	40.9	1.630
35.9	1.165	37	1.268	38	1.360	39	1.453	40	1.546	41	1.639

Mechanical dimensions:



Disclaimers:

Information furnished in this document is believed to be accurate and reliable.

However,

Shenzhen Core Control Source Semiconductor Co., Ltd. assumes no responsibility for the consequences of

use without consideration for such information nor use beyond it.

Information mentioned in this document is subject to change without notice, apart from that


when an agreement is signed, Shenzhen core control source complies with the agreement.

Products and information provided in this document have no infringement of patents.

Shenzhen Core Control Source Semiconductor Co., Ltd. assumes no responsibility for any infringement of other rights of third parties which may result from the use of such products and information.

This document is the first version which is made in 12-Apr-18. This document supersedes and

replaces all information previously supplied.

 is a registered trademark of Shenzhen Core Control Source Semiconductor Co., Ltd.

Copyright ©2019 Shenzhen Core Control Source Semiconductor Co., Ltd. Printed All rights reserved.