

ATP-B16

Thermopile IR Sensor



Thermometrics Thermopile IR Sensor are used for non-contact surface, or infra-red, temperature measurement. The ATP-B16 Model consists of thermo-elements, flat infrared filter and thermistor for temperature compensation, all in one hermetically-sealed TO-46 sensor package. There are a variety of filters available to maximize performance in specific applications.

Features

- MEMS Thermopile element
- TO-46 Package
- High sensitivity
- High accuracy NTC

Applications

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

ATP-B16 Specification Parameter:

Thermopile Chip

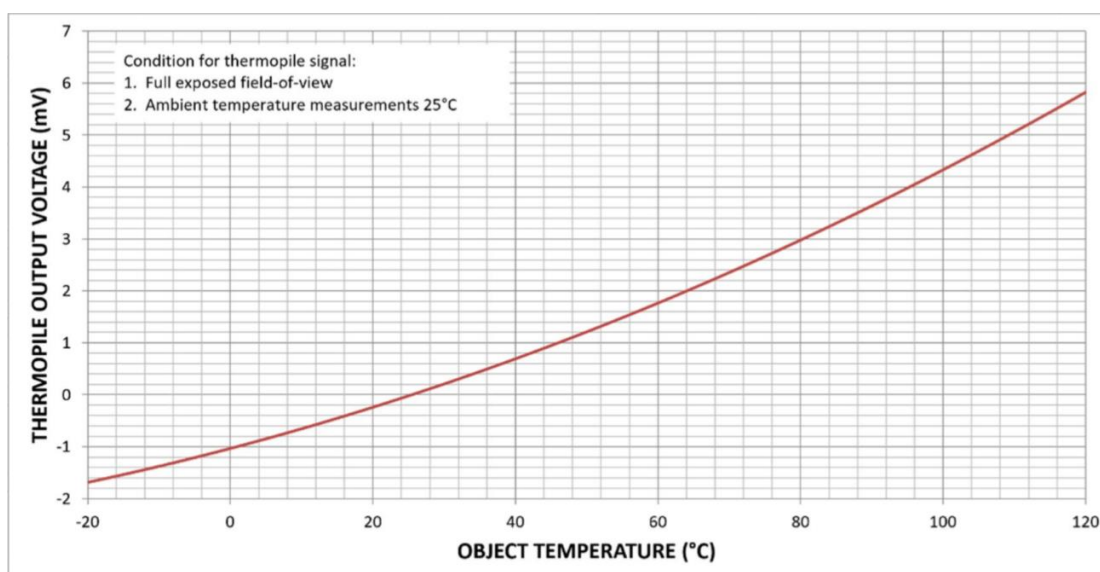
Feature	parameter	remarks
Chip size	1.6*1.6	mm
Sensitive area	1.125*1.125	mm
Responsivity	88 V/W±30%	Black body temperature:500 K, 4HZ Ambient temperature: 25°C
Thermopile resistance	120±20KΩ	25°C
Operating temperature range	-20~120°C	
Storage temperature range	-40~150°C	
Pin insulation resistance	≥500 MΩ	

NTC Thermistor For Temperature Compensation

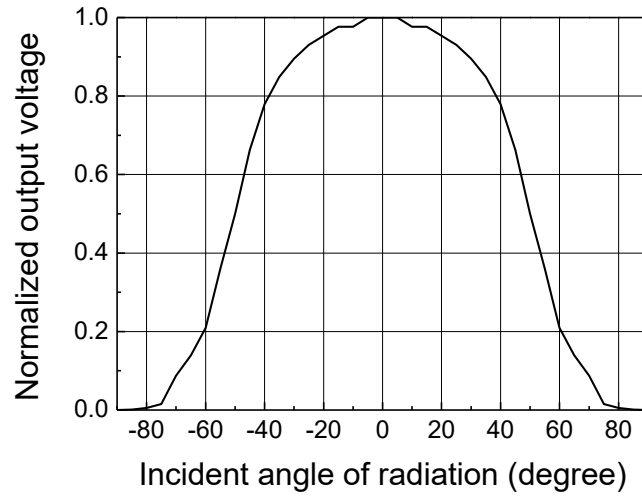
Feature	parameter	remarks
Zero-power resistance (R25)	100±2K Ω	25° C
B value(B25/50)	3950K ±1%	Calculate at zero-power resistance 25° C and 50° C

ATP-B16 Characteristics:

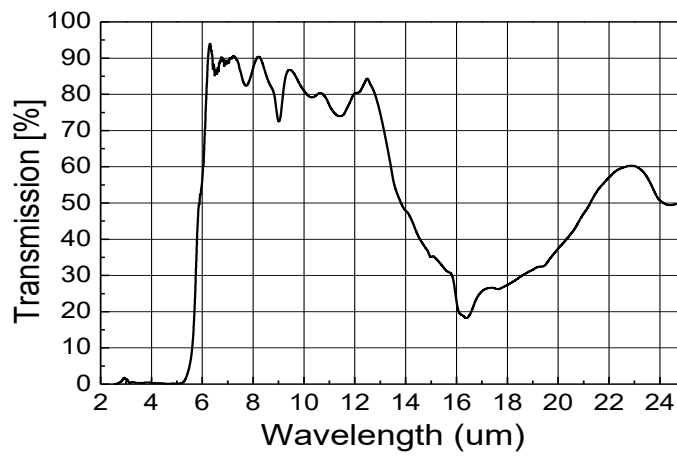
Typical performance curves:

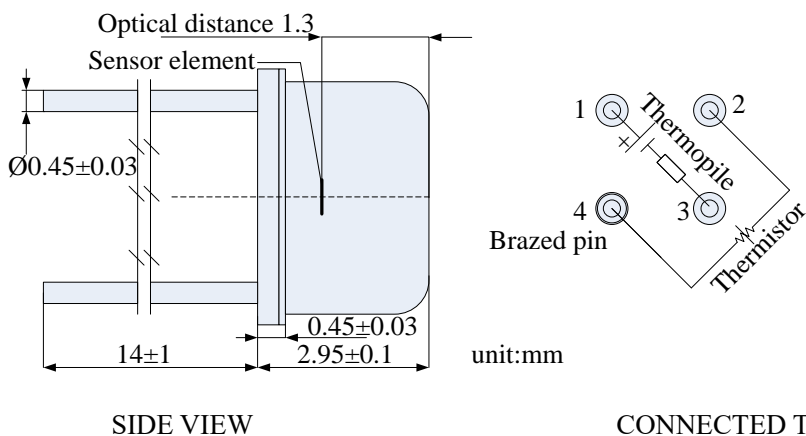
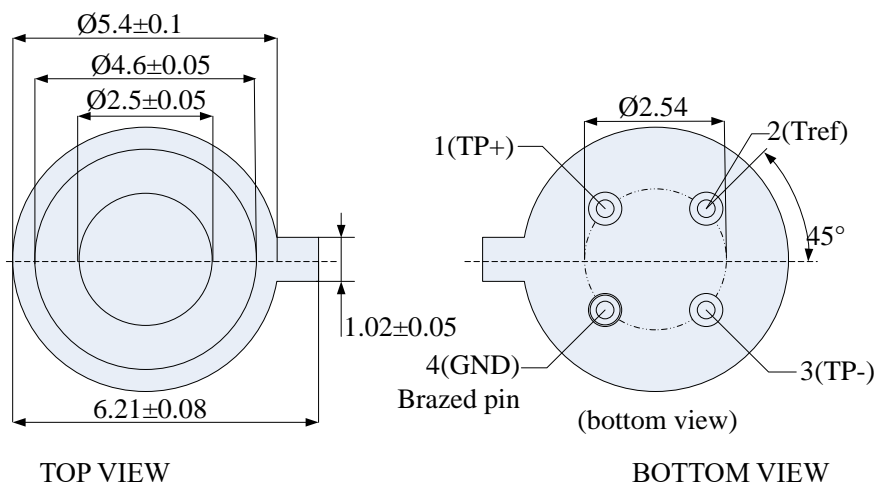


Field angle 90°



Infrared Spectral Characteristic:



Mechanical dimensions:

PIN Name and Description:

PIN	Function	Explain
1	thermopile "+"pole	Thermopile output DC anode voltage+ pin
2	thermistor "+"pole	Ambient temperature compensation
3	thermopile "-"pole	Thermopile output DC cathode voltage- pin
4	GND	Ambient temperature compensation/ Resistance-pin and grounding

Temperature vs. Resistance of Thermistor:

Temp(° C)	R_st (K Ω)	Temp(° C)	R_st (K Ω)	Temp(° C)	R_st (K Ω)
-20	975.8038	21	119.4612	62	22.9937
-19	920.5962	22	114.2223	63	22.1836
-18	868.8615	23	109.2417	64	21.4061
-17	820.3603	24	104.5053	65	20.6594
-16	774.8710	25	100.0000	66	19.9424
-15	732.1889	26	95.7132	67	19.2537
-14	692.1238	27	91.6333	68	18.5920
-13	654.4999	28	87.7492	69	17.9562
-12	619.1540	29	84.0505	70	17.3452
-11	585.9346	30	80.5274	71	16.7578
-10	554.7016	31	77.1707	72	16.1930
-9	525.3245	32	73.9717	73	15.6499
-8	497.6821	33	70.9222	74	15.1276
-7	471.6621	34	68.0144	75	14.6251
-6	447.1599	35	65.2411	76	14.1417
-5	424.0781	36	62.5954	77	13.6764
-4	402.3264	37	60.0707	78	13.2286
-3	381.8204	38	57.6610	79	12.7976
-2	362.4818	39	55.3604	80	12.3825
-1	344.2375	40	53.1635	81	11.9828
0	327.0195	41	51.0651	82	11.5978
1	310.7640	42	49.0602	83	11.2270
2	295.4121	43	47.1443	84	10.8697
3	280.9084	44	45.3130	85	10.5254
4	267.2014	45	43.5621	86	10.1935
5	254.2428	46	41.8878	87	9.8736
6	241.9877	47	40.2862	88	9.5652
7	230.3940	48	38.7539	89	9.2678
8	219.4224	49	37.2876	90	8.9809
9	209.0361	50	35.8842	91	8.7042
10	199.2007	51	34.5405	92	8.4373
11	189.8841	52	33.2538	93	8.1797
12	181.0559	53	32.0214	94	7.9312
13	172.6881	54	30.8408	95	7.6912
14	164.7540	55	29.7096	96	7.4596
15	157.2290	56	28.6253	97	7.2360
16	150.0898	57	27.5860	98	7.0201
17	143.3144	58	26.5895	99	6.8115
18	136.8825	59	25.6338	100	6.6101
19	130.7749	60	24.7171	101	6.4155



Temperature vs. Voltage of Sensor (Ambient temperature 25°C):

-40°C ~ 500°C

mV		T AMB °C															
		-40	-30	-20	-10	0	10	20	25	30	40	50	60	70	80	90	100
T_OBJ °C	-40	0	-0.582	-1.24	-1.981	-2.812	-3.739	-4.769	-5.826	-5.911	-7.172	-8.559	-10.081	-11.747	-13.564	-15.543	-17.693
	-30	0.582	0	-0.658	-1.399	-2.23	-3.157	-4.187	-4.744	-5.329	-6.59	-7.977	-9.499	-11.165	-12.982	-14.961	-17.111
	-20	1.24	0.658	0	-0.741	-1.572	-2.499	-3.529	-4.086	-4.671	-5.932	-7.319	-8.841	-10.507	-12.324	-14.303	-16.453
	-10	1.981	1.399	0.741	0	-0.831	-1.758	-2.788	-3.345	-3.93	-5.191	-6.578	-8.1	-9.766	-11.583	-13.562	-15.712
	0	2.812	2.23	1.572	0.831	0	-0.927	-1.957	-2.514	-3.099	-4.36	-5.747	-7.269	-8.935	-10.752	-12.731	-14.881
	10	3.739	3.157	2.499	1.758	0.927	0	-1.03	-1.587	-2.172	-3.433	-4.82	-6.342	-8.008	-9.825	-11.804	-13.954
	20	4.769	4.187	3.529	2.788	1.957	1.03	0	-0.557	-1.142	-2.403	-3.79	-5.312	-6.978	-8.795	-10.774	-12.924
	25	5.326	4.744	4.086	3.345	2.514	1.587	0.557	0	-0.585	-1.846	-3.233	-4.755	-6.421	-8.238	-10.217	-12.367
	30	5.911	5.329	4.671	3.93	3.099	2.172	1.142	0.585	0	-1.261	-2.648	-4.17	-5.836	-7.653	-9.632	-11.782
	40	7.172	6.59	5.932	5.191	4.36	3.433	2.403	1.846	1.261	0	-1.387	-2.909	-4.575	-6.392	-8.371	-10.521
	50	8.559	7.977	7.319	6.578	5.747	4.82	3.79	3.233	2.648	1.387	0	-1.522	-3.188	-5.005	-6.984	-9.134
	60	10.081	9.499	8.841	8.1	7.269	6.342	5.312	4.755	4.17	2.909	1.522	0	-1.666	-3.483	-5.462	-7.612
	70	11.747	11.165	10.507	9.766	8.935	8.008	6.978	6.421	5.836	4.575	3.188	1.666	0	-1.817	-3.796	-5.946
	80	13.564	12.982	12.324	11.583	10.752	9.825	8.795	8.238	7.653	6.392	5.005	3.483	1.817	0	-1.979	-4.129
	90	15.543	14.961	14.303	13.562	12.731	11.804	10.774	10.217	9.632	8.371	6.984	5.462	3.796	1.979	0	-2.15
	100	17.693	17.111	16.453	15.712	14.881	13.954	12.924	12.367	11.782	10.521	9.134	7.612	5.946	4.129	2.15	0
	110	19.835	19.253	18.595	17.854	17.023	16.096	15.066	14.509	13.924	12.663	11.276	9.754	8.088	6.271	4.292	2.142
	120	22.09	21.508	20.85	20.109	19.278	18.351	17.321	16.764	16.179	14.918	13.531	12.009	10.343	8.526	6.547	4.397
	130	24.478	23.896	23.238	22.497	21.666	20.739	19.709	19.152	18.567	17.306	15.919	14.397	12.731	10.914	8.935	6.785
	140	26.998	26.416	25.758	25.017	24.186	23.259	22.229	21.672	21.087	19.826	18.439	16.917	15.251	13.434	11.455	9.305
	150	29.647	29.065	28.407	27.666	26.835	25.908	24.878	24.321	23.736	22.475	21.088	19.566	17.9	16.083	14.104	11.954
	160	32.424	31.842	31.184	30.443	29.612	28.685	27.655	27.098	26.513	25.252	23.865	22.343	20.677	18.86	16.881	14.731
	170	35.326	34.744	34.086	33.345	32.514	31.587	30.557	30	29.415	28.154	26.767	25.245	23.579	21.762	19.783	17.633
	180	38.351	37.769	37.111	36.37	35.539	34.612	33.582	33.025	32.44	31.179	29.792	28.27	26.604	24.787	22.808	20.658
	190	41.497	40.915	40.257	39.516	38.685	37.758	36.728	36.171	35.586	34.325	32.938	31.416	29.75	27.933	25.954	23.804
	200	44.762	44.18	43.522	42.781	41.95	41.023	39.993	39.436	38.851	37.59	36.203	34.681	33.015	31.198	29.219	27.069
	210	48.144	47.562	46.904	46.163	45.332	44.405	43.375	42.818	42.233	40.972	39.585	38.063	36.397	34.58	32.601	30.451
	220	51.64	51.058	50.4	49.659	48.828	47.901	46.871	46.314	45.729	44.468	43.081	41.559	39.893	38.076	36.097	33.947
	230	55.248	54.666	54.008	53.267	52.436	51.509	50.479	49.922	49.337	48.076	46.689	45.167	43.501	41.684	39.705	37.555
	240	58.967	58.385	57.727	56.986	56.155	55.228	54.198	53.641	53.056	51.795	50.408	48.886	47.22	45.403	43.424	41.274
	250	62.793	62.211	61.553	60.812	59.981	59.054	58.024	57.467	56.882	55.621	54.234	52.712	51.046	49.229	47.25	45.1
	260	66.724	66.142	65.484	64.743	63.912	62.985	61.955	61.398	60.813	59.552	58.165	56.643	54.977	53.16	51.181	49.031
	270	70.759	70.177	69.519	68.778	67.947	67.02	65.99	65.433	64.848	63.587	62.2	60.678	59.012	57.195	55.216	53.066
	280	74.894	74.312	73.654	72.913	72.082	71.155	70.125	69.568	68.983	67.722	66.335	64.813	63.147	61.33	59.351	57.201
	290	79.128	78.546	77.888	77.147	76.316	75.389	74.359	73.802	73.217	71.956	70.569	69.047	67.381	65.564	63.585	61.435
	300	83.457	82.875	82.217	81.476	80.645	79.718	78.688	78.131	77.546	76.285	74.898	73.376	71.71	69.893	67.914	65.764
	310	87.88	87.298	86.64	85.899	85.068	84.141	83.111	82.554	81.969	80.708	79.321	77.799	76.133	74.316	72.337	70.187
	320	92.394	91.812	91.154	90.413	89.582	88.655	87.625	87.068	86.483	85.222	83.835	82.313	80.647	78.83	76.851	74.701
	330	96.997	96.415	95.757	95.016	94.185	93.258	92.228	91.671	91.086	89.825	88.438	86.916	85.25	83.433	81.454	79.304
	340	101.685	101.103	100.445	99.704	98.873	97.946	96.916	96.359	95.774	94.513	93.126	91.604	89.938	88.121	86.142	83.992
	350	106.457	105.875	105.217	104.476	103.645	102.718	101.688	101.131	100.546	99.285	97.898	96.376	94.71	92.893	90.914	88.764
	360	111.31	110.728	110.07	109.329	108.498	107.571	106.541	105.984	105.399	104.138	102.751	101.229	99.563	97.746	95.767	93.617
	370	116.242	115.66	115.002	114.261	113.43	112.503	111.473	110.916	110.331	109.07	107.683	106.161	104.495	102.678	100.699	98.549
	380	121.249	120.667	120.009	119.268	118.437	117.51	116.48	115.923	115.338	114.077	112.69	111.168	109.502	107.685	105.706	103.556
	390	126.329	125.747	125.089	124.348	123.517	122.59	121.56	121.003	120.418	119.157	117.77	116.248	114.582	112.765	110.786	108.636
	400	131.48	130.898	130.24	129.499	128.668	127.741	126.711	126.154	125.569	124.308	122.921	121.399	119.733	117.916	115.937	113.787
	410	136.699	136.117	135.459	134.718	133.887	132.96	131.93	131.373	130.788	129.527	128.14	126.618	124.952	123.135	121.156	119.006
	420	141.983	141.401	140.743	140.002	139.171	138.244	137.214	136.657	136.072	134.811	133.424	131.902	130.236	128.419	126.44	124.29
	430	147.329	146.747	146.089	145.348	144.517	143.59	142.56	142.003	141.418	140.157	138.77	137.248	135.582	133.765	131.786	129.636
	440	152.734	152.152	151.494	150.753	149.922	148.995	147.965	147.408	146.823	145.562	144.175	142.653	140.987	139.17	137.191	135.041
450	158.197	157.615	156.957	156.216	155.385	154.458	153.428	152.871	152.286	151.025	149.638	148.116	146.45	144.633	142.654	140.504	
460	163.714	163.132	162.474	161.733	160.902	159.975	158.945	158.388	157.803	156.542	155.155	153.633	151.967	150.15	148.171	146.021	
470	169.282	168.7	168.042	167.301	166.47	165.543	164.513	163.956	163.371	162.11	160.723	159.201	157.535	155.718	153.739	151.589	
480	174.898	174.316	173.658	172.917	172.086	171.159	170.129	169.572	168.987	167.726	166.339	164.817	163.151	161.334	159.355	157.205	
490	180.559	179.977	179.319	178.578	177.747	176.82	175.79	175.233	174.648	173.387	172	170.478	168.812	166.995	165.016	162.866	
500	186.264	185.682	185.024	184.283	183.452	182.525	181.495	180.938	180.353	179.092	177.705	176.183	174.517	172.7	170.721	168.571	

0°C ~ 100°C

Attachment V-T SPREADSHEET-ATP-B16



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