

Specification Thermopile Sensor

MTP10-B7F55



Specification:

- MEMS Thermopile Element
- TO-46 Package
- High Sensitivity
- 5.5 μm LWP Filter
- High Accuracy NTC

Applications:

- Non-contact Temperature Measurements
- Ear Thermometers, Forehead Thermometers
- Continuous Temperature Control of Manufacturing
- Consumer Applications
- Home Appliance Temperature Measurements

Model No.: MTP10-B7F55	Approved by	Checked by	Drawn by
Rev. 01 / Date 2019.09			

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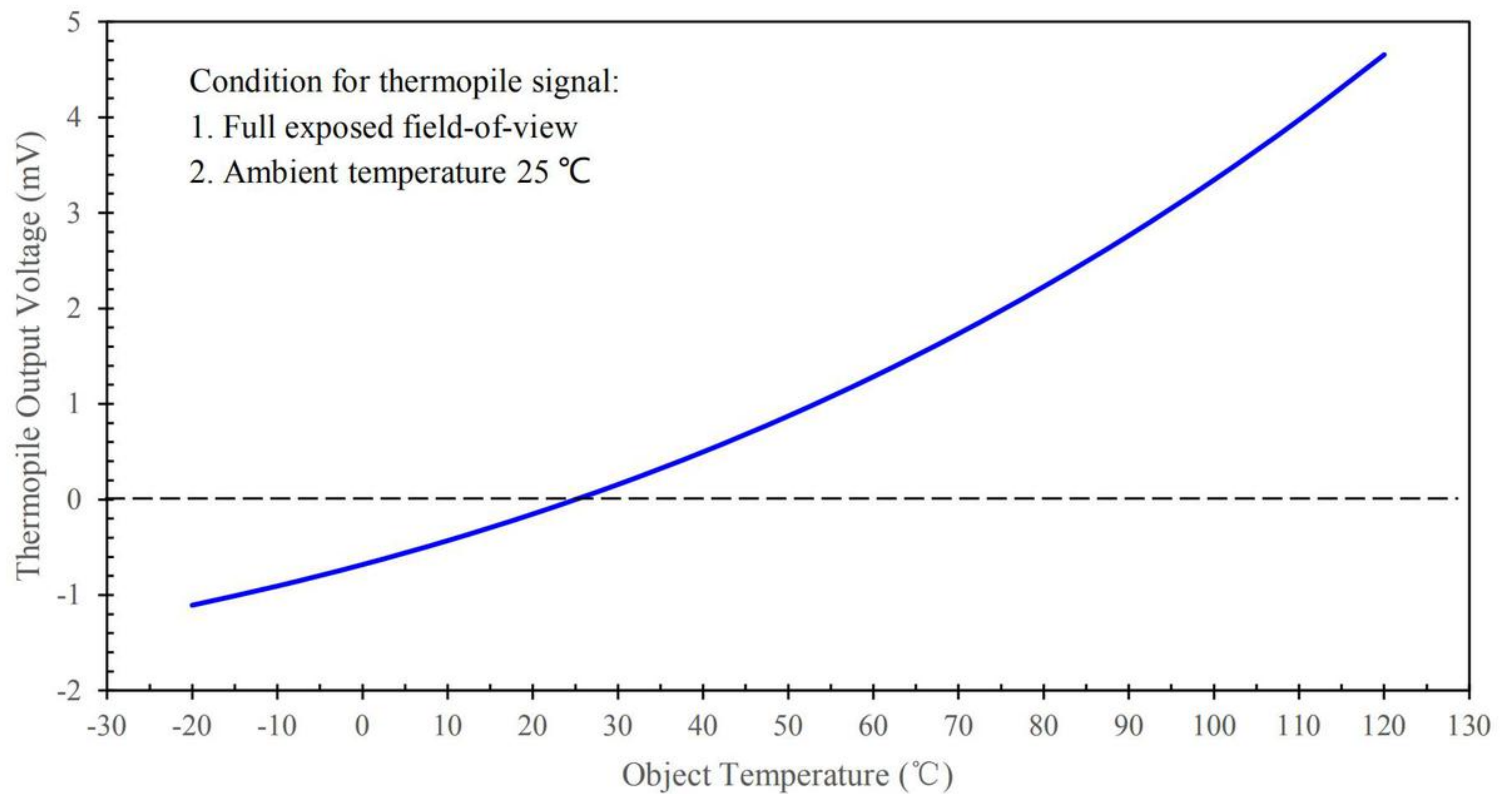
Absolute Maximum Ratings

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

Performance specifications

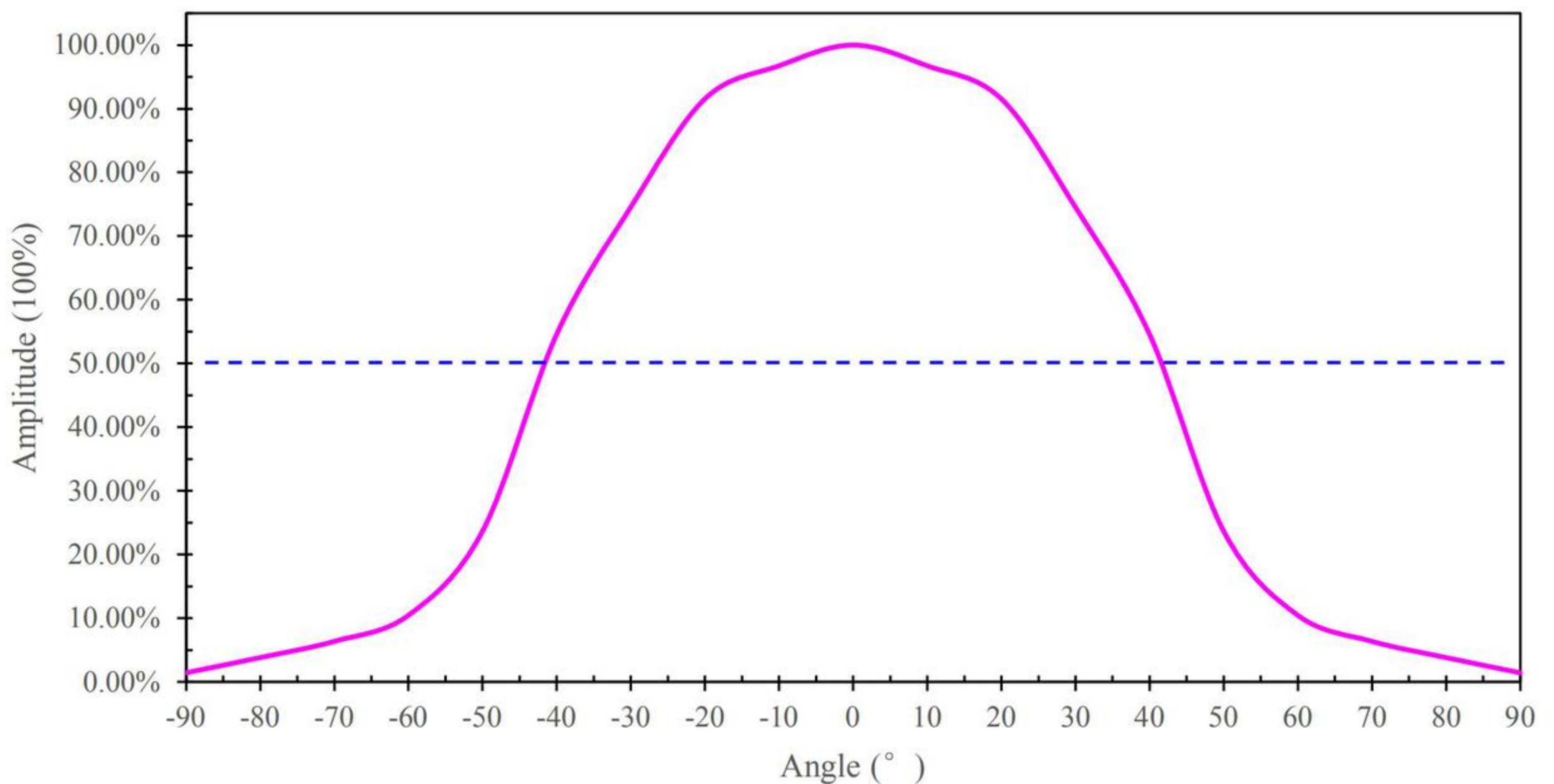
Parameter	Value	Unit	Conditions
Chip size	1.1 × 1.1	mm ²	
Membrane area	0.75 × 0.75	mm ²	
Field of view	83	°	At 50 % intensity points
Thermopile resistance	54 ± 10 %	kΩ	temp = 25 °C
Noise voltage	30 ± 2	nV/Hz ^{1/2}	temp = 25 °C
NEP	0.37	nW/Hz ^{1/2}	500 K, 1 Hz
Responsivity	81	V/W	500 K, 5.5 μm (Long pass)
Temp. coefficient of resistance	0.1	% / °C	Temp = 25~75 °C
Time constant	20	ms	
Specific detectivity	5.9e+07	cmHz ^{1/2} /W	Filter F5.5, 500 K, 1 Hz
Thermistor resistance	100 ± 1%	kΩ	25 °C
Thermistor BETA-value	3950 ± 1%	K	25 °C/50 °C

Typical performance curves



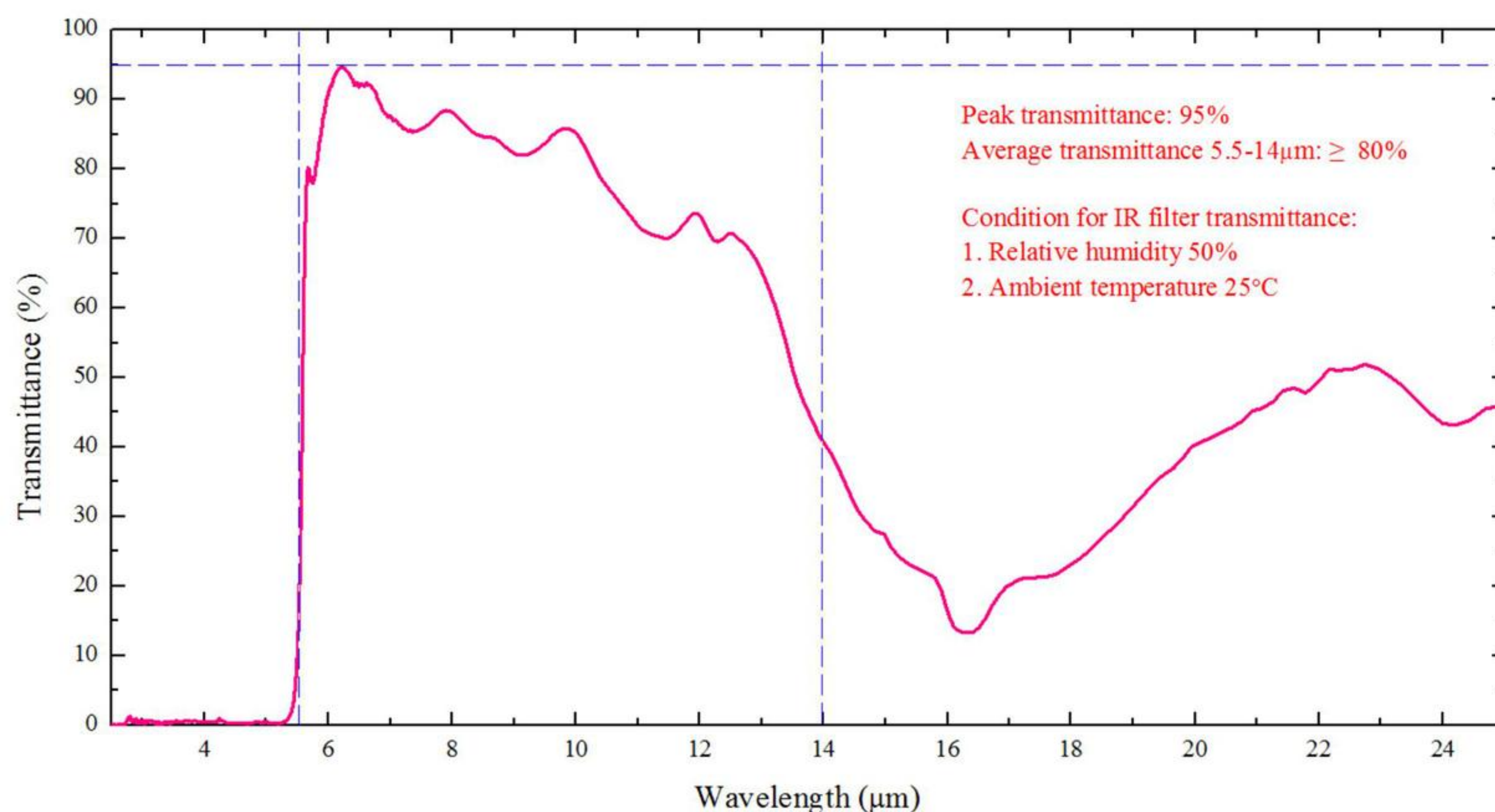
Optical characteristics

Parameter	Value	Unit	Description
Field of view	83	°	50% Maximum signal



Filter specifications

Parameter	Value	Unit	Description
Transmission Range	5.5	μm	Long wavelength pass
Transmission	≥ 75	%	Average 5.5~14 μm
Transmission blocking average	1	%	$< 5 \mu\text{m}$



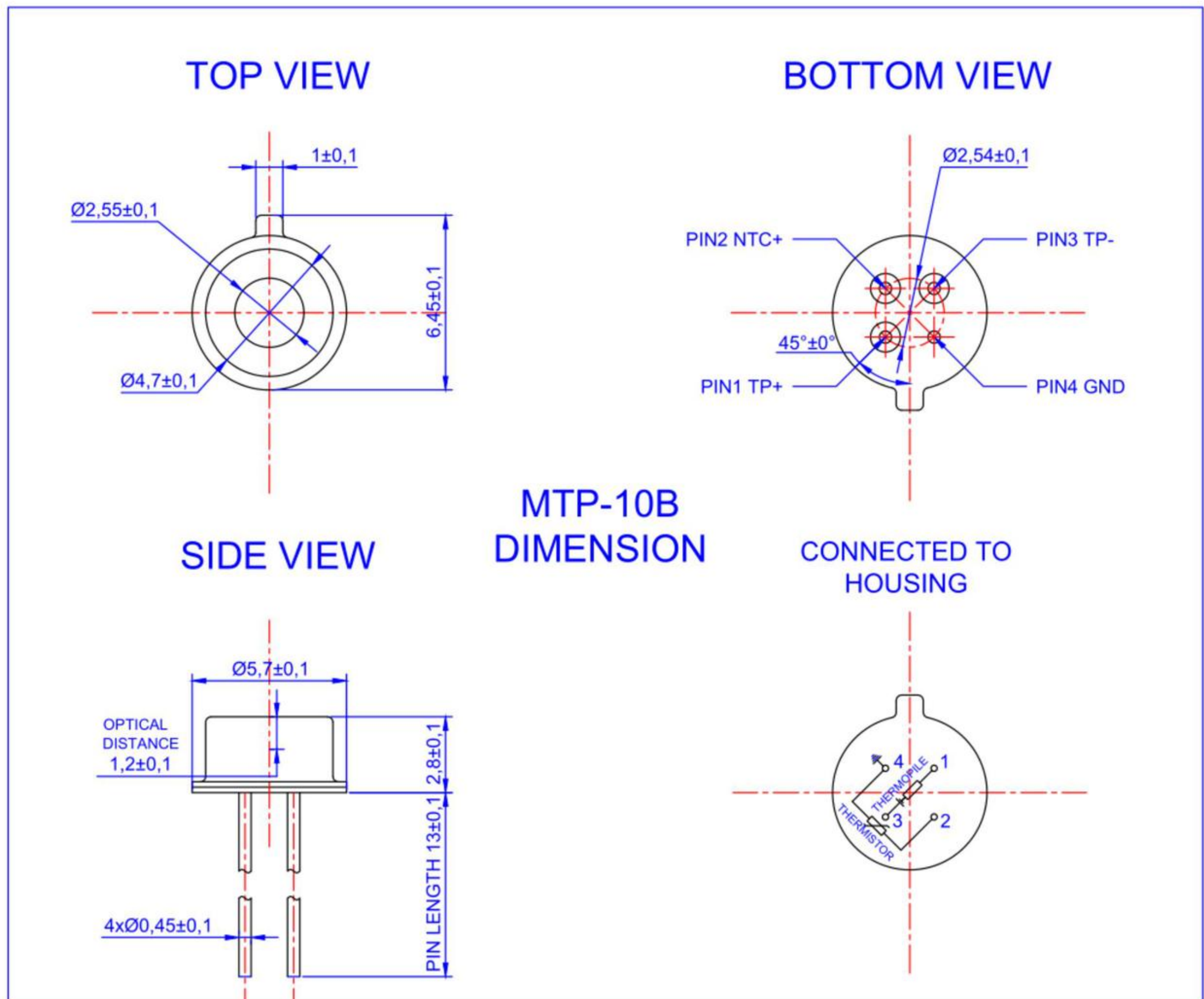
Electrical connections

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

Temperature vs. Resistance of NTC

T (°C)	R (kΩ)	T (°C)	R (kΩ)	T (°C)	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



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