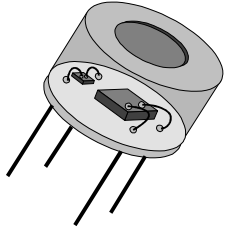


TS105-1



红外温度传感器

Thermopiles are used for non-contact surface temperature measuring. Any object emits infrared radiation. The radiation power is increasing with growing surface temperatures. Based on this relation, Thermopile measure the emitted power and determine the object's temperature precisely.

Thermopiles are based on the Seebeck effect, which is used since a long time for conventional thermocouples. The application of micromechanics and thin film technology allows the production of miniaturized and cost effective sensor elements. A multitude of thermojunctions deposited on a silicon substrate is connected in series to form a Thermopile. The hot junctions are thermally insulated from the cold junctions on the substrate by etching a self-supporting extremely thin membrane. An absorbing layer on the hot junctions transforms the incoming radiation into heat. A voltage proportional to the radiation is generated by the thermoelectric effect. The sensors are delivered in TO18-packages. Different housings and filter types can be selected to find an optimal solution for each application. Chips without housing are available as well.

Specifications

Parameter	Symbol	Unit	Value	Condition
Number of thermojunctions	n		100	
Material			BiSb, NiCr	
Active Area	A_A	mm ²	0.7×0.7	
Chip Size	A_C	mm ²	2.0×2.0	
Resistance of Thermopiles	R	k Ω	50 ± 15	25 °C
TC of resistance	TCR	% / K	-0.03 ± 0.02	+25~+75 °C
Sensitivity of sensor	S_C	V / W	typical 100	25 °C, 500 K, DC
TC of sensitivity	TCS	% / K	-0.52 ± 0.08	+25~+75 °C
Specific detectivity	D^*	cm ² ·Hz ^{1/2} / W	2.1×10^8	500 K, DC
Noise equivalent power	NEP	nW	0.38	500 K, 1 Hz
Noise voltage	U_N	nV / Hz ^{1/2}	37	500 K, 1 Hz
Time constant (preliminary)	t_{63}	ms	40 ± 10	500 K, 1 Hz
Operation temperature	T	°C	-20 ... 100	
Storage temperature	T	°C	-40 ... 100	
Field of View	FOV	°	110	
Reference Resistor(Ni-PTC)	R_{NTC}	Ω	$1000 \pm 0.4\%$	0 °C
TC of resistance	TCR	ppm / K	$6178 \pm 1\%$	0 ~ 100 °C

[工作原理](#)

[术语解释](#)

[应用手册](#)

[其他TS产品](#)

[TS105-2](#)

[TS105-3](#)

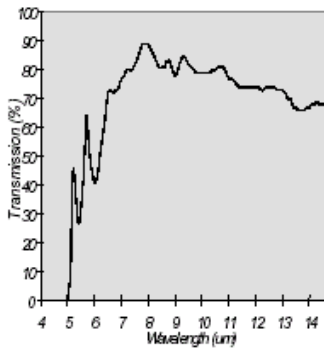
[TS105-4](#)

[TS105-61Ba](#)

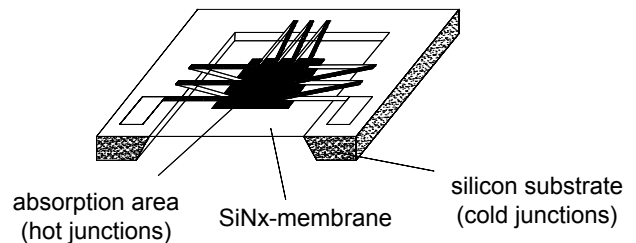
[TS118-2](#)

[TS118-3](#)

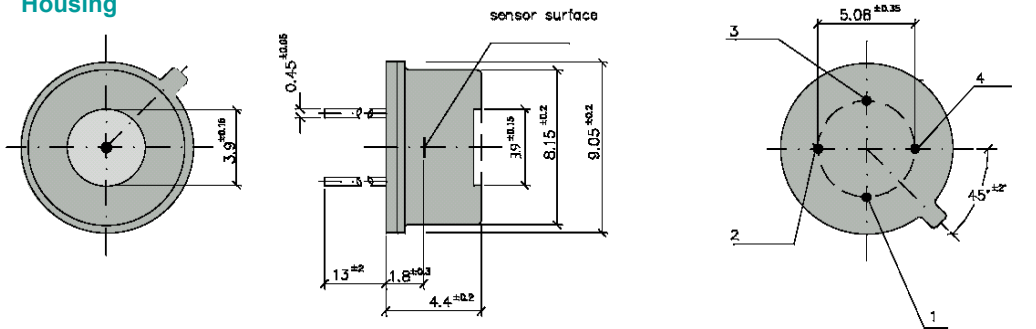
[TS118-5](#)



TS105-1 Filter

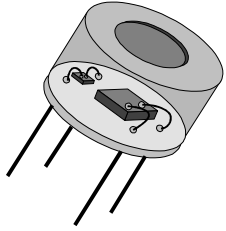


Housing



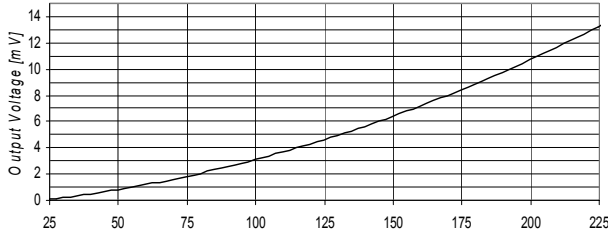
TS105-1

红外温度传感器

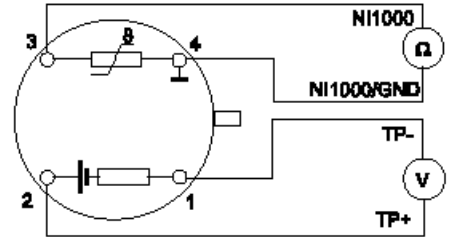


Output Voltage versus Object Temperature

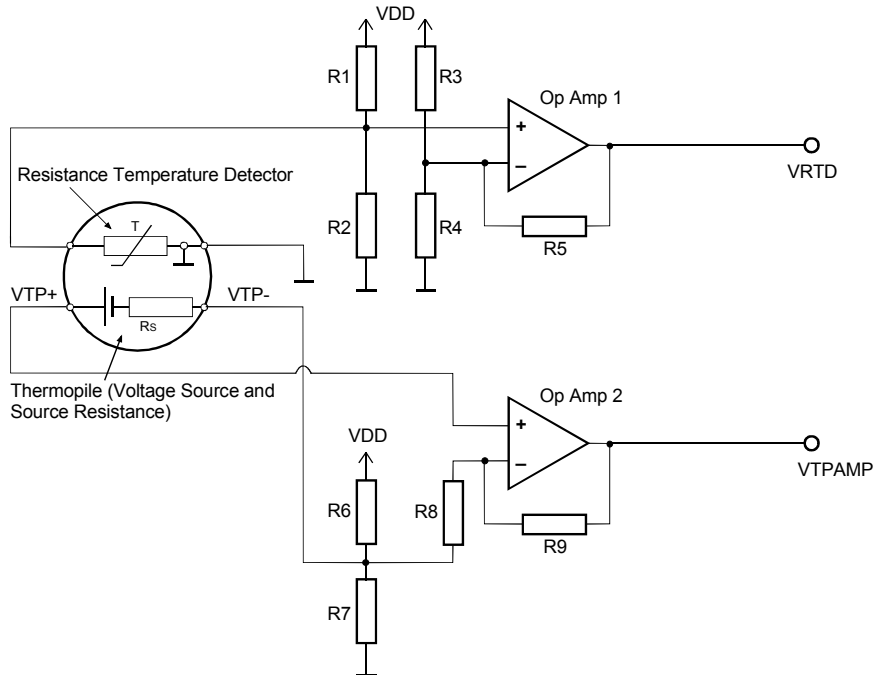
Conditions: Distance Thermopile/Black Body 5 cm, emissivity= 1, surrounding temperature 25° C
Tables with emissivity of different materials and surfaces are available.



Connecting Diagramm(bottom view)



TS105-1 application circuit

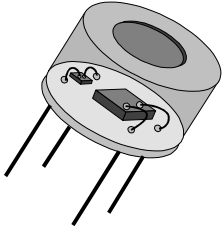


Reference resistor (PTC) table

T(°C)	0	1	2	3	4	5	6	7	8	9
-60	695,2	699,9	704,6	709,3	714,0	718,7	723,4	728,2	733,0	737,8
-50	742,6	747,4	752,2	757,0	761,9	766,8	771,6	776,5	781,4	786,4
-40	791,3	796,3	801,2	806,2	811,2	816,2	821,2	826,3	831,3	836,4
-30	841,5	846,5	851,7	856,8	861,9	867,0	872,2	877,4	882,6	887,8
-20	893,0	898,2	903,4	908,7	913,9	919,2	924,5	929,8	935,1	940,5
-10	945,8	951,2	956,5	961,9	967,3	972,7	978,2	983,6	989,1	994,5
0	1000,0	1005,5	1011,0	1016,5	1022,0	1027,6	1033,1	1038,7	1044,3	1049,9
10	1055,5	1061,1	1066,8	1072,4	1078,1	1083,8	1089,5	1095,2	1100,9	1106,6
20	1112,4	1118,1	1123,9	1129,7	1135,5	1141,3	1147,1	1153,0	1158,8	1164,7
30	1170,6	1176,5	1182,4	1188,3	1194,2	1200,2	1206,1	1212,1	1218,1	1224,1
40	1230,1	1236,1	1242,2	1248,2	1254,3	1260,4	1266,5	1272,6	1278,8	1284,9
50	1291,1	1297,2	1303,4	1309,6	1315,8	1322,0	1328,3	1334,5	1340,8	1347,1
60	1353,4	1359,7	1366,0	1372,4	1378,7	1385,1	1391,5	1397,9	1404,3	1410,8
70	1417,2	1423,7	1430,1	1436,6	1443,1	1449,7	1456,2	1462,8	1469,3	1475,9
80	1482,5	1489,1	1495,7	1502,4	1509,1	1515,7	1522,4	1529,1	1535,9	1542,6
90	1549,3	1556,1	1562,9	1569,7	1576,5	1583,4	1590,2	1597,1	1604,0	1610,9
100	1617,8	1624,7	1631,7	1638,6	1645,6	1652,6	1659,6	1666,7	1673,7	1680,8

TS105-1

红外温度传感器



TS105-1 output voltage vs temperature(calculated)

T _{amb} / °C	UTP _{obj} / μV														
	0	10	20	30	40	50	60	70	80	90	100	110	120	130	140
10	-385	0	428	926	1491	2157	2902	3597	4406	5308	6408	7375	8549	9788	11177
20	-779	-410	1	478	1021	1660	2375	3042	3818	4684	5739	6667	7794	8983	10317
30	-1205	-851	-458	0	520	1132	1817	2456	3200	4030	5040	5929	7009	8148	9425
40	-1649	-1311	-935	-497	0	585	1240	1851	2562	3356	4322	5172	6204	7293	8515
50	-2132	-1810	-1451	-1033	-559	0	625	1207	1886	2643	3565	4376	5361	6400	7566

