



敏思传感技术有限公司

MinSi (Henan) Sensing Technology Co., Ltd.

产品承认书

SPECIFICATION

客户名称 CUSTOMER	
产品名称 PRODUCTION	热电堆温度传感器
产品型号 MODEL	MS-TP-48CPA
版本号 VERSION NO	A2.0

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敏思传感技术有限公司



MS-TP-48CPA 热电堆温度传感器

产品简介

MS-TP-48CPA系列是一款TO46封装的非接触式模拟热电堆温度传感器，该传感器内含热电堆温度传感芯片和NTC热敏电阻。

MS-TP-48CPA系列传感器内部热电堆温度传感器芯片通过MEMS工艺在薄膜辐射接收面上制作多个串联热电偶而成。

MS-TP-48CPA系列传感器主要用于耳温、额温及其他非接触式温度测量。

特性

- TO46封装
- 热电堆电阻: $120 \pm 10\% K\Omega$
- 热敏电阻: NTC(100) $K\Omega$
- 视场角: 108°
- 工作温度范围: $-40 \sim 125^\circ C$
- 高灵敏度
- 抗电磁干扰
- 测温稳定, 测温速度快

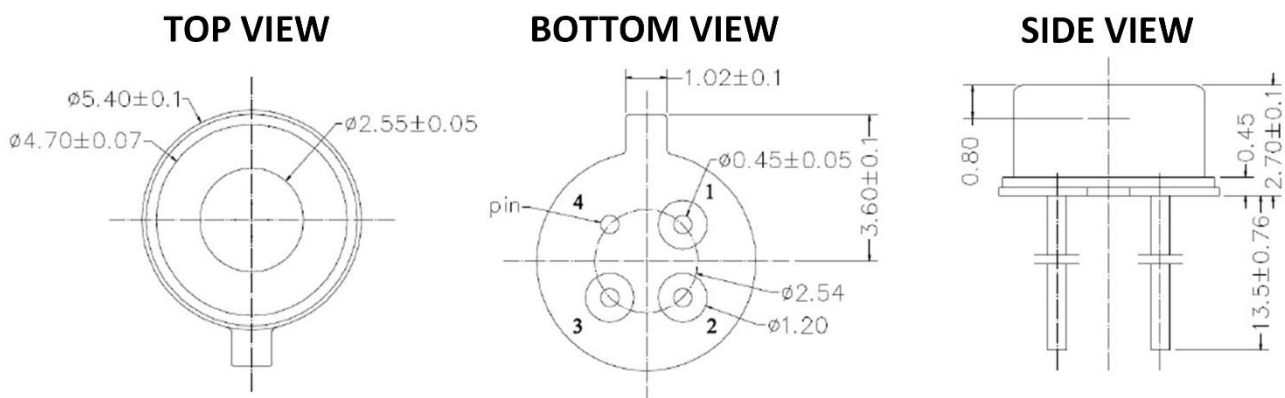
应用场景

- 非接触温度测量
- 额温枪
- 耳温枪
- 测温耳机
- 医疗电子设备
- 智能家电
- 智能家居系统控制
- 工业过程控制

1.性能参数

性能	数值	单位	备注
芯片尺寸	1.1×1.1	mm ²	/
敏感面积	0.85×0.85	mm ²	/
热电堆电阻	120±10%	kΩ	25℃
视场角	108	° (degree)	> 50%
噪声电压	36	nV/Hz ^{1/2}	25℃
噪声等效功率	0.34	nW/Hz ^{1/2}	500K, 1Hz, 25℃
响应率	106	V/W	500K, 1Hz, 25℃
电阻温度系数	≤0.06%	/℃	25~75℃
时间常数	≤15	ms	/
探测率	0.92×10 ⁸	cmHz ^{1/2} /W	25℃
NTC电阻	100±1%	KΩ	25℃
NTC (B)	3950±1%	/	B25/50℃
工作温度	-40~125	℃	/
储存温度	-40~125	℃	/

2.机械尺寸与引脚定义



Pin	Name	Type	Function
1	TP+	A	热电堆正极
2	NTC	A	环境电阻测量端
3	TP-	A	热电堆负极
4	GND	A	环境电阻接地端



3. 传感器输出特性表

Recommended V-T reference value (0-100°C)												
Vout(mV)		T amb.(°C)										
		-40	-30	-20	-10	0	10	20	23	30	40	50
T_obj. (°C)	0	1.0652	0.8793	0.6351	0.3332	0.0000	-0.4335	-0.8353	-0.9972	-1.3949	-1.9795	-2.7451
	1	1.1049	0.9174	0.6712	0.3714	0.0366	-0.3916	-0.8000	-0.9602	-1.3558	-1.9415	-2.7003
	2	1.1448	0.9557	0.7079	0.4100	0.0737	-0.3494	-0.7640	-0.9227	-1.3163	-1.9030	-2.6553
	3	1.1850	0.9944	0.7451	0.4490	0.1115	-0.3069	-0.7273	-0.8846	-1.2763	-1.8638	-2.6099
	4	1.2254	1.0334	0.7828	0.4884	0.1497	-0.2641	-0.6899	-0.8459	-1.2358	-1.8241	-2.5642
	5	1.2660	1.0727	0.8210	0.5281	0.1886	-0.2209	-0.6518	-0.8067	-1.1948	-1.7838	-2.5183
	6	1.3070	1.1124	0.8598	0.5683	0.2280	-0.1774	-0.6130	-0.7669	-1.1534	-1.7430	-2.4719
	7	1.3483	1.1524	0.8991	0.6089	0.2680	-0.1336	-0.5736	-0.7265	-1.1114	-1.7015	-2.4253
	8	1.3898	1.1929	0.9390	0.6499	0.3086	-0.0894	-0.5334	-0.6856	-1.0690	-1.6595	-2.3783
	9	1.4317	1.2337	0.9794	0.6914	0.3497	-0.0449	-0.4926	-0.6441	-1.0261	-1.6169	-2.3310
	10	1.4739	1.2749	1.0203	0.7333	0.3914	0.0000	-0.4512	-0.6020	-0.9826	-1.5737	-2.2832
	11	1.5165	1.3166	1.0618	0.7756	0.4337	0.0453	-0.4090	-0.5593	-0.9387	-1.5300	-2.2352
	12	1.5594	1.3586	1.1039	0.8184	0.4765	0.0909	-0.3662	-0.5160	-0.8942	-1.4856	-2.1867
	13	1.6027	1.4011	1.1465	0.8617	0.5200	0.1370	-0.3227	-0.4722	-0.8492	-1.4407	-2.1379
	14	1.6463	1.4441	1.1896	0.9054	0.5639	0.1834	-0.2786	-0.4277	-0.8037	-1.3951	-2.0887
	15	1.6904	1.4874	1.2333	0.9497	0.6085	0.2302	-0.2338	-0.3826	-0.7577	-1.3490	-2.0390
	16	1.7349	1.5313	1.2776	0.9944	0.6537	0.2775	-0.1883	-0.3370	-0.7111	-1.3023	-1.9890
	17	1.7797	1.5756	1.3224	1.0396	0.6994	0.3252	-0.1422	-0.2907	-0.6639	-1.2550	-1.9386
	18	1.8250	1.6204	1.3678	1.0854	0.7457	0.3733	-0.0955	-0.2438	-0.6163	-1.2071	-1.8877
	19	1.8707	1.6657	1.4138	1.1316	0.7926	0.4218	-0.0481	-0.1963	-0.5681	-1.1586	-1.8364
	20	1.9169	1.7115	1.4603	1.1784	0.8400	0.4708	0.0000	-0.1481	-0.5193	-1.1095	-1.7847
	21	1.9635	1.7578	1.5074	1.2257	0.8880	0.5202	0.0487	-0.0994	-0.4699	-1.0598	-1.7325
	22	2.0106	1.8046	1.5551	1.2735	0.9367	0.5701	0.0981	-0.0500	-0.4200	-1.0095	-1.6799
	23	2.0581	1.8520	1.6033	1.3219	0.9859	0.6204	0.1480	0.0000	-0.3696	-0.9586	-1.6268
	24	2.1062	1.8998	1.6521	1.3708	1.0356	0.6712	0.1987	0.0506	-0.3185	-0.9071	-1.5733
	25	2.1547	1.9482	1.7015	1.4203	1.0860	0.7225	0.2499	0.1019	-0.2669	-0.8550	-1.5193
	26	2.2037	1.9972	1.7515	1.4703	1.1369	0.7742	0.3018	0.1538	-0.2147	-0.8023	-1.4648
	27	2.2532	2.0467	1.8021	1.5209	1.1885	0.8264	0.3544	0.2063	-0.1619	-0.7490	-1.4099
	28	2.3032	2.0968	1.8532	1.5721	1.2406	0.8792	0.4076	0.2595	-0.1085	-0.6951	-1.3545
	29	2.3537	2.1474	1.9050	1.6238	1.2933	0.9324	0.4614	0.3133	-0.0546	-0.6406	-1.2985
	30	2.4048	2.1986	1.9573	1.6761	1.3466	0.9861	0.5158	0.3677	0.0000	-0.5854	-1.2421
	31	2.4564	2.2504	2.0102	1.7290	1.4005	1.0404	0.5708	0.4228	0.0552	-0.5297	-1.1852
	32	2.5085	2.3027	2.0637	1.7825	1.4549	1.0952	0.6265	0.4785	0.1109	-0.4733	-1.1277
	33	2.5612	2.3557	2.1178	1.8366	1.5100	1.1505	0.6829	0.5349	0.1673	-0.4163	-1.0698
	34	2.6144	2.4092	2.1725	1.8913	1.5656	1.2063	0.7398	0.5919	0.2243	-0.3587	-1.0113
	35	2.6682	2.4634	2.2278	1.9466	1.6219	1.2627	0.7974	0.6495	0.2819	-0.3005	-0.9523
	36	2.7226	2.5181	2.2837	2.0025	1.6787	1.3196	0.8555	0.7078	0.3401	-0.2416	-0.8927
	37	2.7775	2.5735	2.3402	2.0591	1.7362	1.3770	0.9144	0.7668	0.3989	-0.1821	-0.8327
	38	2.8330	2.6294	2.3973	2.1162	1.7942	1.4350	0.9738	0.8264	0.4584	-0.1221	-0.7720
	39	2.8891	2.6860	2.4550	2.1739	1.8528	1.4936	1.0338	0.8867	0.5185	-0.0613	-0.7109
	40	2.9457	2.7433	2.5133	2.2323	1.9120	1.5527	1.0945	0.9476	0.5792	0.0000	-0.6491
	41	3.0030	2.8011	2.5722	2.2913	1.9719	1.6124	1.1558	1.0092	0.6405	0.0620	-0.5868
	42	3.0608	2.8596	2.6317	2.3509	2.0323	1.6727	1.2177	1.0714	0.7025	0.1246	-0.5239
	43	3.1193	2.9187	2.6918	2.4112	2.0933	1.7335	1.2802	1.1342	0.7651	0.1878	-0.4605
	44	3.1783	2.9784	2.7526	2.4721	2.1550	1.7950	1.3434	1.1978	0.8283	0.2516	-0.3965
	45	3.2379	3.0388	2.8139	2.5336	2.2172	1.8570	1.4071	1.2619	0.8922	0.3161	-0.3319
	46	3.2982	3.0998	2.8758	2.5958	2.2800	1.9197	1.4715	1.3268	0.9567	0.3813	-0.2667
	47	3.3590	3.1614	2.9384	2.6586	2.3435	1.9829	1.5365	1.3923	1.0219	0.4470	-0.2009



48	3.4205	3.2237	3.0016	2.7220	2.4076	2.0467	1.6021	1.4584	1.0877	0.5134	-0.1346
49	3.4826	3.2867	3.0653	2.7861	2.4722	2.1112	1.6683	1.5252	1.1542	0.5804	-0.0676
50	3.5453	3.3503	3.1297	2.8509	2.5375	2.1762	1.7352	1.5926	1.2213	0.6481	0.0000
51	3.6086	3.4145	3.1947	2.9162	2.6034	2.2419	1.8026	1.6607	1.2891	0.7164	0.0682
52	3.6726	3.4794	3.2604	2.9823	2.6699	2.3082	1.8707	1.7295	1.3575	0.7854	0.1370
53	3.7372	3.5449	3.3266	3.0489	2.7370	2.3752	1.9394	1.7989	1.4266	0.8550	0.2064
54	3.8024	3.6111	3.3934	3.1163	2.8048	2.4427	2.0087	1.8689	1.4963	0.9252	0.2765
55	3.8682	3.6780	3.4609	3.1842	2.8731	2.5109	2.0786	1.9396	1.5667	0.9961	0.3472
56	3.9347	3.7455	3.5290	3.2528	2.9421	2.5798	2.1492	2.0110	1.6378	1.0677	0.4185
57	4.0017	3.8136	3.5977	3.3221	3.0117	2.6493	2.2203	2.0830	1.7095	1.1398	0.4904
58	4.0694	3.8824	3.6670	3.3920	3.0819	2.7194	2.2921	2.1556	1.7819	1.2127	0.5630
59	4.1378	3.9519	3.7370	3.4626	3.1528	2.7902	2.3645	2.2289	1.8549	1.2862	0.6362
60	4.2068	4.0220	3.8076	3.5338	3.2243	2.8617	2.4375	2.3029	1.9286	1.3603	0.7101
61	4.2763	4.0927	3.8787	3.6057	3.2964	2.9338	2.5111	2.3774	2.0030	1.4351	0.7847
62	4.3466	4.1642	3.9505	3.6782	3.3691	3.0066	2.5854	2.4526	2.0780	1.5105	0.8599
63	4.4174	4.2362	4.0230	3.7513	3.4424	3.0801	2.6603	2.5285	2.1537	1.5867	0.9357
64	4.4889	4.3089	4.0960	3.8251	3.5164	3.1542	2.7358	2.6050	2.2301	1.6634	1.0122
65	4.5610	4.3822	4.1697	3.8996	3.5910	3.2290	2.8119	2.6821	2.3071	1.7408	1.0894
66	4.6337	4.4562	4.2440	3.9747	3.6663	3.3045	2.8886	2.7598	2.3848	1.8189	1.1672
67	4.7070	4.5308	4.3189	4.0504	3.7422	3.3806	2.9660	2.8382	2.4632	1.8977	1.2458
68	4.7810	4.6061	4.3944	4.1268	3.8187	3.4575	3.0440	2.9172	2.5422	1.9771	1.3250
69	4.8556	4.6820	4.4706	4.2038	3.8959	3.5350	3.1226	2.9969	2.6219	2.0572	1.4048
70	4.9307	4.7585	4.5473	4.2814	3.9737	3.6133	3.2019	3.0771	2.7023	2.1379	1.4854
71	5.0065	4.8357	4.6247	4.3597	4.0522	3.6922	3.2818	3.1580	2.7833	2.2193	1.5666
72	5.0829	4.9134	4.7027	4.4386	4.1313	3.7718	3.3623	3.2395	2.8650	2.3014	1.6486
73	5.1599	4.9918	4.7814	4.5181	4.2110	3.8522	3.4435	3.3216	2.9474	2.3842	1.7312
74	5.2375	5.0708	4.8606	4.5983	4.2914	3.9332	3.5253	3.4043	3.0304	2.4676	1.8145
75	5.3157	5.1504	4.9405	4.6790	4.3724	4.0150	3.6077	3.4877	3.1142	2.5517	1.8985
76	5.3945	5.2306	5.0210	4.7604	4.4541	4.0974	3.6908	3.5716	3.1985	2.6364	1.9832
77	5.4739	5.3115	5.1021	4.8424	4.5365	4.1806	3.7745	3.6561	3.2836	2.7219	2.0687
78	5.5538	5.3929	5.1838	4.9250	4.6195	4.2645	3.8588	3.7413	3.3693	2.8080	2.1548
79	5.6344	5.4749	5.2662	5.0082	4.7031	4.3491	3.9438	3.8270	3.4556	2.8948	2.2416
80	5.7155	5.5575	5.3491	5.0920	4.7875	4.4344	4.0295	3.9133	3.5427	2.9823	2.3292
81	5.7972	5.6406	5.4327	5.1765	4.8724	4.5204	4.1158	4.0002	3.6304	3.0705	2.4174
82	5.8794	5.7244	5.5169	5.2615	4.9581	4.6072	4.2027	4.0877	3.7187	3.1593	2.5064
83	5.9622	5.8087	5.6017	5.3471	5.0444	4.6947	4.2903	4.1758	3.8078	3.2488	2.5960
84	6.0455	5.8936	5.6871	5.4332	5.1314	4.7829	4.3786	4.2644	3.8974	3.3390	2.6864
85	6.1294	5.9790	5.7732	5.5200	5.2190	4.8719	4.4675	4.3537	3.9878	3.4299	2.7775
86	6.2139	6.0650	5.8598	5.6073	5.3073	4.9615	4.5570	4.4434	4.0788	3.5215	2.8694
87	6.2988	6.1515	5.9471	5.6952	5.3963	5.0520	4.6473	4.5338	4.1704	3.6138	2.9619
88	6.3843	6.2386	6.0350	5.7837	5.4860	5.1431	4.7382	4.6247	4.2627	3.7067	3.0552
89	6.4703	6.3261	6.1235	5.8727	5.5763	5.2350	4.8298	4.7162	4.3557	3.8004	3.1492
90	6.5568	6.4142	6.2125	5.9622	5.6673	5.3276	4.9220	4.8082	4.4493	3.8947	3.2440
91	6.6438	6.5028	6.3023	6.0524	5.7590	5.4210	5.0149	4.9007	4.5435	3.9898	3.3394
92	6.7313	6.5919	6.3926	6.1430	5.8514	5.5151	5.1085	4.9938	4.6384	4.0855	3.4356
93	6.8193	6.6815	6.4835	6.2342	5.9444	5.6100	5.2028	5.0874	4.7339	4.1819	3.5326
94	6.9077	6.7716	6.5750	6.3259	6.0382	5.7056	5.2977	5.1816	4.8301	4.2790	3.6302
95	6.9967	6.8622	6.6671	6.4181	6.1326	5.8019	5.3934	5.2763	4.9269	4.3769	3.7286
96	7.0860	6.9532	6.7598	6.5108	6.2277	5.8990	5.4897	5.3715	5.0244	4.4754	3.8278
97	7.1759	7.0447	6.8532	6.6041	6.3236	5.9968	5.5867	5.4672	5.1225	4.5746	3.9276
98	7.2661	7.1366	6.9471	6.6978	6.4201	6.0954	5.6845	5.5634	5.2212	4.6745	4.0282
99	7.3568	7.2289	7.0416	6.7920	6.5173	6.1947	5.7829	5.6601	5.3206	4.7752	4.1296
100	7.4479	7.3217	7.1367	6.8867	6.6152	6.2948	5.8820	5.7574	5.4205	4.8765	4.2317



Tamb=23.7℃											
Tobj	Vout	Tobj	Vout	Tobj	Vout	Tobj	Vout	Tobj	Vout	Tobj	Vout
0	-1.0173	10	-0.6324	20	-0.1826	30	0.3327	40	0.9136	50	1.5598
0.1	-1.0137	10.1	-0.6282	20.1	-0.1778	30.1	0.3382	40.1	0.9198	50.1	1.5666
0.2	-1.0102	10.2	-0.6240	20.2	-0.1729	30.2	0.3437	40.2	0.9259	50.2	1.5734
0.3	-1.0067	10.3	-0.6198	20.3	-0.1681	30.3	0.3492	40.3	0.9321	50.3	1.5802
0.4	-1.0031	10.4	-0.6156	20.4	-0.1632	30.4	0.3547	40.4	0.9382	50.4	1.5870
0.5	-0.9995	10.5	-0.6114	20.5	-0.1584	30.5	0.3602	40.5	0.9444	50.5	1.5938
0.6	-0.9960	10.6	-0.6072	20.6	-0.1535	30.6	0.3657	40.6	0.9506	50.6	1.6006
0.7	-0.9924	10.7	-0.6030	20.7	-0.1486	30.7	0.3713	40.7	0.9568	50.7	1.6075
0.8	-0.9888	10.8	-0.5988	20.8	-0.1438	30.8	0.3768	40.8	0.9629	50.8	1.6143
0.9	-0.9853	10.9	-0.5946	20.9	-0.1389	30.9	0.3823	40.9	0.9691	50.9	1.6212
1	-0.9817	11	-0.5903	21	-0.1340	31	0.3879	41	0.9753	51	1.6280
1.1	-0.9781	11.1	-0.5861	21.1	-0.1291	31.1	0.3934	41.1	0.9815	51.1	1.6349
1.2	-0.9745	11.2	-0.5818	21.2	-0.1242	31.2	0.3990	41.2	0.9877	51.2	1.6417
1.3	-0.9709	11.3	-0.5776	21.3	-0.1193	31.3	0.4045	41.3	0.9940	51.3	1.6486
1.4	-0.9673	11.4	-0.5733	21.4	-0.1144	31.4	0.4101	41.4	1.0002	51.4	1.6554
1.5	-0.9636	11.5	-0.5691	21.5	-0.1095	31.5	0.4157	41.5	1.0064	51.5	1.6623
1.6	-0.9600	11.6	-0.5648	21.6	-0.1045	31.6	0.4213	41.6	1.0127	51.6	1.6692
1.7	-0.9564	11.7	-0.5605	21.7	-0.0996	31.7	0.4269	41.7	1.0189	51.7	1.6761
1.8	-0.9527	11.8	-0.5562	21.8	-0.0947	31.8	0.4325	41.8	1.0252	51.8	1.6830
1.9	-0.9491	11.9	-0.5519	21.9	-0.0897	31.9	0.4381	41.9	1.0314	51.9	1.6899
2	-0.9454	12	-0.5476	22	-0.0848	32	0.4437	42	1.0377	52	1.6968
2.1	-0.9418	12.1	-0.5433	22.1	-0.0798	32.1	0.4493	42.1	1.0439	52.1	1.7037
2.2	-0.9381	12.2	-0.5390	22.2	-0.0748	32.2	0.4549	42.2	1.0502	52.2	1.7107
2.3	-0.9344	12.3	-0.5347	22.3	-0.0699	32.3	0.4605	42.3	1.0565	52.3	1.7176
2.4	-0.9308	12.4	-0.5304	22.4	-0.0649	32.4	0.4662	42.4	1.0628	52.4	1.7245
2.5	-0.9271	12.5	-0.5260	22.5	-0.0599	32.5	0.4718	42.5	1.0691	52.5	1.7315
2.6	-0.9234	12.6	-0.5217	22.6	-0.0549	32.6	0.4775	42.6	1.0754	52.6	1.7384
2.7	-0.9197	12.7	-0.5174	22.7	-0.0499	32.7	0.4831	42.7	1.0817	52.7	1.7454
2.8	-0.9160	12.8	-0.5130	22.8	-0.0449	32.8	0.4888	42.8	1.0880	52.8	1.7523
2.9	-0.9123	12.9	-0.5087	22.9	-0.0399	32.9	0.4944	42.9	1.0943	52.9	1.7593
3	-0.9086	13	-0.5043	23	-0.0349	33	0.5001	43	1.1007	53	1.7663
3.1	-0.9048	13.1	-0.4999	23.1	-0.0299	33.1	0.5058	43.1	1.1070	53.1	1.7733
3.2	-0.9011	13.2	-0.4955	23.2	-0.0248	33.2	0.5115	43.2	1.1133	53.2	1.7803
3.3	-0.8974	13.3	-0.4912	23.3	-0.0198	33.3	0.5172	43.3	1.1197	53.3	1.7873
3.4	-0.8936	13.4	-0.4868	23.4	-0.0147	33.4	0.5229	43.4	1.1261	53.4	1.7943
3.5	-0.8899	13.5	-0.4824	23.5	-0.0097	33.5	0.5286	43.5	1.1324	53.5	1.8013
3.6	-0.8861	13.6	-0.4780	23.6	-0.0046	33.6	0.5343	43.6	1.1388	53.6	1.8083
3.7	-0.8824	13.7	-0.4736	23.7	0.0004	33.7	0.5400	43.7	1.1452	53.7	1.8153
3.8	-0.8786	13.8	-0.4691	23.8	0.0055	33.8	0.5458	43.8	1.1515	53.8	1.8223
3.9	-0.8748	13.9	-0.4647	23.9	0.0106	33.9	0.5515	43.9	1.1579	53.9	1.8294
4	-0.8710	14	-0.4603	24	0.0157	34	0.5572	44	1.1643	54	1.8364
4.1	-0.8673	14.1	-0.4559	24.1	0.0208	34.1	0.5630	44.1	1.1707	54.1	1.8434
4.2	-0.8635	14.2	-0.4514	24.2	0.0259	34.2	0.5687	44.2	1.1771	54.2	1.8505
4.3	-0.8597	14.3	-0.4470	24.3	0.0310	34.3	0.5745	44.3	1.1835	54.3	1.8576
4.4	-0.8559	14.4	-0.4425	24.4	0.0361	34.4	0.5803	44.4	1.1900	54.4	1.8646
4.5	-0.8520	14.5	-0.4380	24.5	0.0412	34.5	0.5860	44.5	1.1964	54.5	1.8717
4.6	-0.8482	14.6	-0.4336	24.6	0.0463	34.6	0.5918	44.6	1.2028	54.6	1.8788
4.7	-0.8444	14.7	-0.4291	24.7	0.0514	34.7	0.5976	44.7	1.2093	54.7	1.8858
4.8	-0.8406	14.8	-0.4246	24.8	0.0566	34.8	0.6034	44.8	1.2157	54.8	1.8929



4.9	-0.8367	14.9	-0.4201	24.9	0.0617	34.9	0.6092	44.9	1.2222	54.9	1.9000
5	-0.8329	15	-0.4156	25	0.0669	35	0.6150	45	1.2286	55	1.9071
5.1	-0.8290	15.1	-0.4111	25.1	0.0720	35.1	0.6208	45.1	1.2351	55.1	1.9143
5.2	-0.8252	15.2	-0.4066	25.2	0.0772	35.2	0.6266	45.2	1.2415	55.2	1.9214
5.3	-0.8213	15.3	-0.4021	25.3	0.0824	35.3	0.6324	45.3	1.2480	55.3	1.9285
5.4	-0.8174	15.4	-0.3976	25.4	0.0875	35.4	0.6383	45.4	1.2545	55.4	1.9356
5.5	-0.8136	15.5	-0.3931	25.5	0.0927	35.5	0.6441	45.5	1.2610	55.5	1.9428
5.6	-0.8097	15.6	-0.3885	25.6	0.0979	35.6	0.6500	45.6	1.2675	55.6	1.9499
5.7	-0.8058	15.7	-0.3840	25.7	0.1031	35.7	0.6558	45.7	1.2740	55.7	1.9570
5.8	-0.8019	15.8	-0.3795	25.8	0.1083	35.8	0.6617	45.8	1.2805	55.8	1.9642
5.9	-0.7980	15.9	-0.3749	25.9	0.1135	35.9	0.6675	45.9	1.2870	55.9	1.9714
6	-0.7941	16	-0.3703	26	0.1187	36	0.6734	46	1.2936	56	1.9785
6.1	-0.7902	16.1	-0.3658	26.1	0.1239	36.1	0.6793	46.1	1.3001	56.1	1.9857
6.2	-0.7862	16.2	-0.3612	26.2	0.1292	36.2	0.6852	46.2	1.3066	56.2	1.9929
6.3	-0.7823	16.3	-0.3566	26.3	0.1344	36.3	0.6911	46.3	1.3132	56.3	2.0001
6.4	-0.7784	16.4	-0.3520	26.4	0.1397	36.4	0.6970	46.4	1.3197	56.4	2.0073
6.5	-0.7744	16.5	-0.3474	26.5	0.1449	36.5	0.7029	46.5	1.3263	56.5	2.0145
6.6	-0.7705	16.6	-0.3428	26.6	0.1502	36.6	0.7088	46.6	1.3328	56.6	2.0217
6.7	-0.7665	16.7	-0.3382	26.7	0.1554	36.7	0.7147	46.7	1.3394	56.7	2.0289
6.8	-0.7626	16.8	-0.3336	26.8	0.1607	36.8	0.7206	46.8	1.3460	56.8	2.0361
6.9	-0.7586	16.9	-0.3290	26.9	0.1660	36.9	0.7266	46.9	1.3526	56.9	2.0433
7	-0.7546	17	-0.3244	27	0.1712	37	0.7325	47	1.3592	57	2.0506
7.1	-0.7506	17.1	-0.3197	27.1	0.1765	37.1	0.7384	47.1	1.3657	57.1	2.0578
7.2	-0.7467	17.2	-0.3151	27.2	0.1818	37.2	0.7444	47.2	1.3723	57.2	2.0650
7.3	-0.7427	17.3	-0.3105	27.3	0.1871	37.3	0.7503	47.3	1.3790	57.3	2.0723
7.4	-0.7387	17.4	-0.3058	27.4	0.1924	37.4	0.7563	47.4	1.3856	57.4	2.0795
7.5	-0.7347	17.5	-0.3012	27.5	0.1977	37.5	0.7623	47.5	1.3922	57.5	2.0868
7.6	-0.7306	17.6	-0.2965	27.6	0.2031	37.6	0.7682	47.6	1.3988	57.6	2.0941
7.7	-0.7266	17.7	-0.2918	27.7	0.2084	37.7	0.7742	47.7	1.4055	57.7	2.1013
7.8	-0.7226	17.8	-0.2871	27.8	0.2137	37.8	0.7802	47.8	1.4121	57.8	2.1086
7.9	-0.7186	17.9	-0.2825	27.9	0.2191	37.9	0.7862	47.9	1.4187	57.9	2.1159
8	-0.7145	18	-0.2778	28	0.2244	38	0.7922	48	1.4254	58	2.1232
8.1	-0.7105	18.1	-0.2731	28.1	0.2298	38.1	0.7982	48.1	1.4321	58.1	2.1305
8.2	-0.7064	18.2	-0.2684	28.2	0.2351	38.2	0.8042	48.2	1.4387	58.2	2.1378
8.3	-0.7024	18.3	-0.2637	28.3	0.2405	38.3	0.8103	48.3	1.4454	58.3	2.1451
8.4	-0.6983	18.4	-0.2589	28.4	0.2459	38.4	0.8163	48.4	1.4521	58.4	2.1525
8.5	-0.6942	18.5	-0.2542	28.5	0.2512	38.5	0.8223	48.5	1.4588	58.5	2.1598
8.6	-0.6902	18.6	-0.2495	28.6	0.2566	38.6	0.8284	48.6	1.4655	58.6	2.1671
8.7	-0.6861	18.7	-0.2447	28.7	0.2620	38.7	0.8344	48.7	1.4721	58.7	2.1745
8.8	-0.6820	18.8	-0.2400	28.8	0.2674	38.8	0.8405	48.8	1.4789	58.8	2.1818
8.9	-0.6779	18.9	-0.2353	28.9	0.2728	38.9	0.8465	48.9	1.4856	58.9	2.1891
9	-0.6738	19	-0.2305	29	0.2782	39	0.8526	49	1.4923	59	2.1965
9.1	-0.6697	19.1	-0.2257	29.1	0.2837	39.1	0.8587	49.1	1.4990	59.1	2.2039
9.2	-0.6656	19.2	-0.2210	29.2	0.2891	39.2	0.8648	49.2	1.5057	59.2	2.2112
9.3	-0.6614	19.3	-0.2162	29.3	0.2945	39.3	0.8708	49.3	1.5125	59.3	2.2186
9.4	-0.6573	19.4	-0.2114	29.4	0.3000	39.4	0.8769	49.4	1.5192	59.4	2.2260
9.5	-0.6532	19.5	-0.2066	29.5	0.3054	39.5	0.8830	49.5	1.5260	59.5	2.2334
9.6	-0.6490	19.6	-0.2018	29.6	0.3109	39.6	0.8891	49.6	1.5327	59.6	2.2408
9.7	-0.6449	19.7	-0.1970	29.7	0.3163	39.7	0.8953	49.7	1.5395	59.7	2.2482
9.8	-0.6407	19.8	-0.1922	29.8	0.3218	39.8	0.9014	49.8	1.5463	59.8	2.2556
9.9	-0.6366	19.9	-0.1874	29.9	0.3272	39.9	0.9075	49.9	1.5530	59.9	2.2630
/		/		/		/		/		60	2.2704



NTC Temperature VS Resistance Table

Rat(25°C)=100KΩ				B25/50=3950K ±1%			
Temp.(°C)	Rmin(kΩ)	Rnor(kΩ)	Rmax(kΩ)	Temp.(°C)	Rmin(kΩ)	Rnor(kΩ)	Rmax(kΩ)
-40	3588.6887	3429.7449	3277.5127	41	51.9235	51.0651	50.2158
-39	3352.6428	3206.3125	3066.0625	42	49.9049	49.0602	48.2250
-38	3133.7393	2998.9675	2869.7051	43	47.9752	47.1443	46.3232
-37	2930.6201	2806.4453	2687.2632	44	46.1298	45.3130	44.5062
-36	2742.0464	2627.5916	2517.6624	45	44.3649	43.5621	42.7696
-35	2566.8816	2461.3464	2359.9143	46	42.6764	41.8878	41.1096
-34	2404.0859	2306.7400	2213.1143	47	41.0607	40.2862	39.5224
-33	2252.7078	2162.8838	2076.4336	48	39.5143	38.7539	38.0044
-32	2111.8728	2028.9607	1949.1089	49	38.0339	37.2876	36.5524
-31	1980.7794	1904.2219	1830.4404	50	36.6163	35.8842	35.1631
-30	1858.6927	1787.9797	1719.7849	51	35.2587	34.5405	33.8335
-29	1744.9370	1679.6017	1616.5510	52	33.9582	33.2538	32.5608
-28	1638.8912	1578.5061	1520.1940	53	32.7121	32.0214	31.3423
-27	1539.9847	1484.1584	1430.2129	54	31.5178	30.8408	30.1754
-26	1447.6929	1396.0662	1346.1459	55	30.3731	29.7096	29.0576
-25	1361.5315	1313.7754	1267.5675	56	29.2755	28.6253	27.9868
-24	1281.0560	1236.8685	1194.0856	57	28.2230	27.5860	26.9607
-23	1205.8561	1164.9598	1125.3381	58	27.2135	26.5895	25.9772
-22	1135.5532	1097.6941	1060.9911	59	26.2450	25.6338	25.0343
-21	1069.7992	1034.7432	1000.7358	60	25.3156	24.7171	24.1303
-20	1008.2715	975.8038	944.2871	61	24.4237	23.8376	23.2633
-19	950.6732	920.5962	891.3817	62	23.5675	22.9937	22.4315
-18	896.7294	868.8615	841.7754	63	22.7454	22.1836	21.6336
-17	846.1864	820.3603	795.2428	64	21.9560	21.4061	20.8678
-16	798.8093	774.8710	751.5750	65	21.1977	20.6594	20.1328
-15	754.3810	732.1889	710.5786	66	20.4692	19.9424	19.4272
-14	712.7005	692.1238	672.0741	67	19.7693	19.2537	18.7497
-13	673.5814	654.4999	635.8954	68	19.0966	18.5920	18.0990
-12	636.8513	619.1540	601.8883	69	18.4499	17.9562	17.4740
-11	602.3502	585.9346	569.9095	70	17.8282	17.3452	16.8735
-10	569.9298	554.7016	539.8262	71	17.2304	16.7578	16.2965
-9	539.4526	525.3245	511.5153	72	16.6554	16.1930	15.7419
-8	510.7906	497.6821	484.8615	73	16.1023	15.6499	15.2087
-7	483.8254	471.6621	459.7586	74	15.5702	15.1276	14.6961
-6	458.4467	447.1599	436.1073	75	15.0581	14.6251	14.2032
-5	434.5519	424.0781	413.8153	76	14.5652	14.1417	13.7291
-4	412.0460	402.3264	392.7968	77	14.0907	13.6764	13.2729
-3	390.8401	381.8204	372.9716	78	13.6339	13.2286	12.8341
-2	370.8519	362.4818	354.2653	79	13.1940	12.7976	12.4118



-1	352.0045	344.2375	336.6083	80	12.7703	12.3825	12.0053
0	334.2264	327.0195	319.9360	81	12.3622	11.9828	11.6139
1	317.4508	310.7640	304.1877	82	11.9689	11.5978	11.2372
2	301.6157	295.4121	289.3072	83	11.5900	11.2270	10.8743
3	286.6631	280.9084	275.2418	84	11.2247	10.8697	10.5248
4	272.5389	267.2014	261.9423	85	10.8727	10.5254	10.1881
5	259.1926	254.2428	249.3626	86	10.5332	10.1935	9.8637
6	246.5770	241.9877	237.4601	87	10.2059	9.8736	9.5511
7	234.6482	230.3940	226.1943	88	9.8902	9.5652	9.2499
8	223.3650	219.4224	215.5278	89	9.5858	9.2678	8.9594
9	212.6890	209.0361	205.4255	90	9.2920	8.9809	8.6794
10	202.5840	199.2007	195.8544	91	9.0085	8.7042	8.4094
11	193.0167	189.8841	186.7836	92	8.7350	8.4373	8.1489
12	183.9552	181.0559	178.1844	93	8.4710	8.1797	7.8977
13	175.3704	172.6881	170.0298	94	8.2161	7.9312	7.6554
14	167.2345	164.7540	162.2942	95	7.9700	7.6912	7.4215
15	159.5216	157.2290	154.9539	96	7.7324	7.4596	7.1958
16	152.2075	150.0898	147.9867	97	7.5029	7.2360	6.9780
17	145.2694	143.3144	141.3716	98	7.2812	7.0201	6.7677
18	138.6861	136.8825	135.0889	99	7.0670	6.8115	6.5647
19	132.4375	130.7749	129.1202	100	6.8601	6.6101	6.3686
20	126.5049	124.9734	123.4482	101	6.6601	6.4155	6.1793
21	120.8705	119.4612	118.0564	102	6.4668	6.2274	5.9964
22	115.5180	114.2223	112.9298	103	6.2799	6.0457	5.8197
23	110.4316	109.2417	108.0537	104	6.0993	5.8701	5.6489
24	105.5969	104.5053	103.4147	105	5.9246	5.7003	5.4839
25	101.0000	100.0000	99.0000	106	5.7557	5.5362	5.3245
26	96.7127	95.7132	94.7146	107	5.5923	5.3775	5.1703
27	92.6306	91.6333	90.6378	108	5.4343	5.2240	5.0213
28	88.7426	87.7492	86.7583	109	5.2814	5.0755	4.8772
29	85.0386	84.0505	83.0655	110	5.1334	4.9319	4.7379
30	81.5090	80.5274	79.5497	111	4.9903	4.7930	4.6031
31	78.1446	77.1707	76.2012	112	4.8517	4.6586	4.4727
32	74.9370	73.9717	73.0115	113	4.7175	4.5285	4.3466
33	71.8779	70.9222	69.9721	114	4.5877	4.4026	4.2245
34	68.9598	68.0144	67.0752	115	4.4619	4.2807	4.1064
35	66.1755	65.2411	64.3134	116	4.3401	4.1627	3.9921
36	63.5182	62.5954	61.6798	117	4.2222	4.0484	3.8815
37	60.9814	60.0707	59.1677	118	4.1079	3.9378	3.7743
38	58.5591	57.6610	56.7710	119	3.9972	3.8306	3.6706
39	56.2456	55.3604	54.4837	120	3.8900	3.7268	3.5702
40	54.0355	53.1635	52.3004	/			



4.订货信息

料号	温度范围	封装类型	其他参数		
MS-TP-48CPA	-K（-40℃~125℃）	-SG（TO46封装）	-HCA		
			H-非校准	C-常规热电堆芯片	A-视场角108°
Example: MS-TP-48CPA-K-SG-HCA					