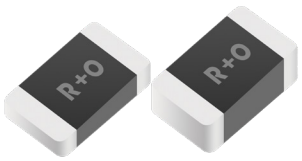
Chip NTC Thermistor Datasheet

Features

- Leadless , Size 0805
- SMD type suitable for high density mounting
- B constant tolerance ±1%
- Excellent solder ability
- Operating temperature：-40℃ to +125℃
- RoHS compliant & Lead-Free & Halogen Free

HNTC0805 Series



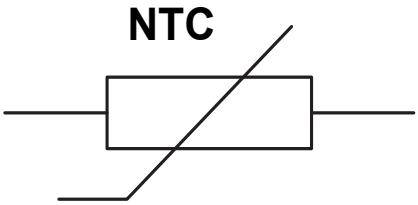
Applications

- Consumer Electronics，mobile phone，wearable device，TWS headphones，etc.
- Office automation such as printer ，facsimile,word processor，etc.
- Industrial Power Supplies
- Medical Electronics
- IoT Sensor Nodes

Part Number Code

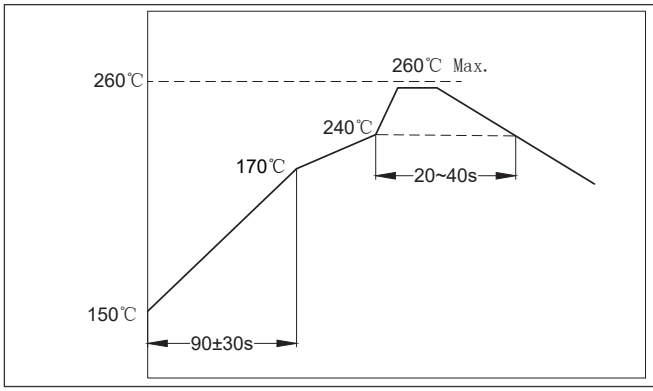
H NTC □□□□ - □□□ F □□□□ F B
① ② ③ ④ ⑤ ⑥ ⑦ ⑧

① "HJC" Brand Code
② Chip NTC Thermistor
③ Chip Size/package
④ Rated Zero-Power Resistance：103=10000Ω, 503=50000Ω, 104=100000Ω
⑤ Resistance Tolerance F: 1% G: 2% H: 3% J:5%
⑥ B Constant
⑦ B Constant Tolerance F: 1% H: 3%
⑧ B Constant calculation method A: 25℃/85℃ B: 25℃/50℃



Recommended Soldering Conditions

Reflow Soldering Recommendation



Profile Feature		Condition
Pre-heat	Temperature Min	+150°C
	Temperature Max	+170°C
	Pre-heat Time	90±30 secs.
ramp up rate		3°C /sec. Max
Time above 240°C		20~40 secs
Peak Temperature		+260°C，10 secs. Max
Ramp-down Rate		6°C /sec. Max
Time 25°C to Peak Temp (T_P)		8 min. Max
Do not exceed		+260°C

Iron Soldering Recommendation

Item	Conditions
Temperature of Soldering Iron-tip	280°C Max
Soldering Time	3 secs. Max
Times for iron soldering	1 time Max
Note: Take care not to apply the tip of the soldering iron to the terminal electrodes.	

Electrical Characteristics (Ta=25°C Unless otherwise specified)

PARAMETER	CONDITION	VALUE	UNIT
Rated Zero-Power Resistance	T_a=25°C ±0.1°C	50±1%	KΩ
B Constant (Material Constant)	25°C /50°C	3950±1%	K
Permissible Operating Current	T_a=25°C ±0.1°C	0.18	mA
Thermal Dissipation Constant	T_a=25°C ±0.1°C	2.0	mW/°C
Thermal Time Constant	T_a=25°C ±0.1°C	＜5	sec
Rated Electric Power	T_a=25°C ±0.1°C	200	mW
Operating Temperature Range	/	-40 to + 125	°C

Test and Measurement Procedures

Unless otherwise specified, the standard atmospheric conditions for measurement/test as:

Items	Condition
Ambient Temperature:	20±15°C
Relative Humidity:	65±20%
Air Pressure:	86kPa to 106kPa

If any doubt on the results, measurements/tests should be made within the following limits:

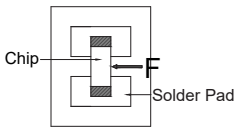
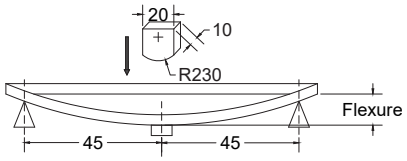
Items	Condition
Ambient Temperature:	25±2°C
Relative Humidity:	65±5%
Air Pressure:	86kPa to 106kPa

Inspection Equipment
1.Visual Examination: 20×magnifier
2.Resistance value test: Thermistor resistance tester

Electrical Test

Items	Test Methods and Remarks
Nominal Zero-Power Resistance at 25°C	Ambient temperature：25±0.05°C ; Measuring electric power：≤ 0.1mW
Nominal B Constant	Measure the resistance at the ambient temperature of 25±0.05°C , 50±0.05°C or 85±0.05°C . $B_{(25/50℃)} = \frac{\ln R_{25}-\ln R_{50}}{1/T_{25}-1/T_{50}}$ $B_{(25/85℃)} = \frac{\ln R_{25}-\ln R_{85}}{1/T_{25}-1/T_{85}}$
Thermal Time Constant	The total time for the temperature of the thermistor to change by 63.2% of the difference from ambient temperature T0 (°C) to T1 (°C) by the drastic change of the power applied to thermistor from Non-zero Power to Zero-Power state, normally expressed in second(S)
Dissipation Factor	The required power which makes the NTC thermistor body temperature raise 1 °C through self-heated, normally expressed in milliwatts per degree Celsius (mW/°C). It can be calculated by the following formula: $\delta = \frac{W}{T-T_0}$
Rated Power	The necessary electric power makes thermistor’ s temperature rise 100°C by self-heating at ambient temperature 25°C .
Permissible operating current	The current that keep body temperature of chip NTC on the PC board in still air rising 1° C by self-heating.

Reliability Test

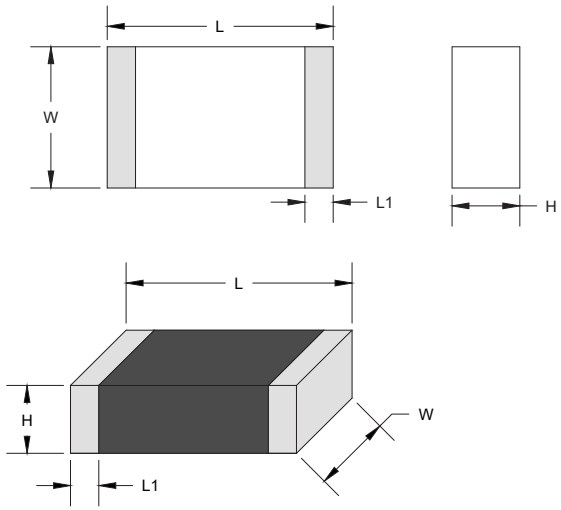
<table>
<tr><th>Items</th><th>Standard</th><th>Test Methods and Remarks</th><th>Requirements</th></tr>
<tr><td>Terminal Strength</td><td>IEC 60068-2-21</td><td>Solder the chip to the testing jig using eutectic solder. Then apply a force in the direction of the arrow.
<table>
<tr><th>Size</th><th>F</th><th>Duration</th></tr>
<tr><td>0402, 0603</td><td>5N</td><td>10±1s</td></tr>
<tr><td>0805</td><td>10N</td><td>10±1s</td></tr>
</table></td><td>No removal or split of the termination or other defects shall occur.
 
</td></tr>
<tr><td>Resistance to Flexure</td><td>IEC 60068-2-21</td><td>Solder the chip to the test jig (glass epoxy board shown in the right) using a eutectic solder. Then apply a force in the direction shown as follow;
 

<table>
<tr><th>Size</th><th>Flexure</th><th>Speed</th><th>Duration</th></tr>
<tr><td>0402, 0603</td><td>1mm</td><td>＜0.5mm/s</td><td>10±1s</td></tr>
<tr><td>0805</td><td>2mm</td><td>＜0.5mm/s</td><td>10±1s</td></tr>
</table></td><td>No visible damage.
| Δ R25/R25 | ⩽ 5%</td></tr>
<tr><td>Dropping</td><td>IEC 60068-2-32</td><td>Drop a chip 10 times on a concrete floor from a height of 1 meter.</td><td>No visible damage.</td></tr>
<tr><td>Solderability</td><td>IEC 60068-2-58</td><td>1. Solder temperature: 245±5°C
2. Duration: 3±0.3s
3. Solder: Sn/3.0Ag/0.5Cu
4. 25% Resin and 75% ethanol in weight</td><td>No visible damage
Wetting shall exceed 95% coverage.</td></tr>
<tr><td>Resistance to Soldering Heat</td><td>IEC 60068-2-58</td><td>1. Solder temperature: 260±5°C
2. Duration: 10±1s
3. Solder: Sn/3.0Ag/0.5Cu
4. 25% Resin and 75% ethanol in weight
5. The chip shall be stabilized at normal condition for 1~2 hours before measuring</td><td>No visible damage.
| Δ R25/R25 | ⩽ 5%
| Δ B/B | ⩽ 2%</td></tr>
<tr><td>Temperature cycling</td><td>IEC 60068-2-14</td><td>1. 5 cycles of following sequence without loading.
<table>
<tr><th>Step</th><th>Temperature</th><th>Period</th></tr>
<tr><td>1</td><td>-40±5°C</td><td>30±3min</td></tr>
<tr><td>2</td><td>Room Temperature</td><td>5±3min</td></tr>
<tr><td>3</td><td>125±2°C</td><td>30±3min</td></tr>
<tr><td>4</td><td>Room Temperature</td><td>5±3min</td></tr>
</table>
2. The chip shall be stabilized at normal condition for 1~2 hours before measuring.</td><td>No visible damage
| Δ R25/R25 | ⩽ 3%
| Δ B/B | ⩽ 2%</td></tr>
<tr><td>Resistance to dry heat</td><td>IEC 60068-2-2</td><td>1. 125±5°C in air, for 1000±24 hours without loading
2. The chip shall be stabilized at normal condition for 1~2 hours before measuring</td><td>No visible damage.
| Δ R25/R25 | ⩽ 5%
| Δ B/B | ⩽ 2%</td></tr>
<tr><td>Resistance to cold</td><td>IEC 60068-2- 1</td><td>1. -40±3°C in air, for 1000±24 hours without loading.
2. The chip shall be stabilized at normal condition for 1~2 hours before measuring.</td><td>No visible damage.
| Δ R25/R25 | ⩽ 5%
| Δ B/B | ⩽ 2%</td></tr>
<tr><td>Resistance to damp heat</td><td>IEC 60068-2-78</td><td>1. 40±2°C , 90~95%RH in air, for 1000±24 hours without loading
2. The chip shall be stabilized at normal condition for 1~2 hours before measuring.</td><td>No visible damage.
| Δ R25/R25 | ⩽ 3%
| Δ B/B | ⩽ 2%</td></tr>
<tr><td>Resistance to high temperature load</td><td>IEC 60539-1 5.25.4</td><td>1. 85±2°C in air with permissive operating current for 1000±48 hours
2. The chip shall be stabilized at normal condition for 1~2 hours before measuring</td><td>No visible damage.
| Δ R25/R25 | ⩽ 5%
| Δ B/B | ⩽ 2%</td></tr>
</table>

Environmental Specification

Storage temperature:	-10°C to +40°C
Storage Conditions:	Light-proof, Hermetically Sealed, Moisture-proof; The components should be left in their original packing to avoid soldering problems due to oxidized contacts.
Relative humidity:	< 75 % RH
Storage period	The components should be employed within 6 months after delivery

Physical Dimensions

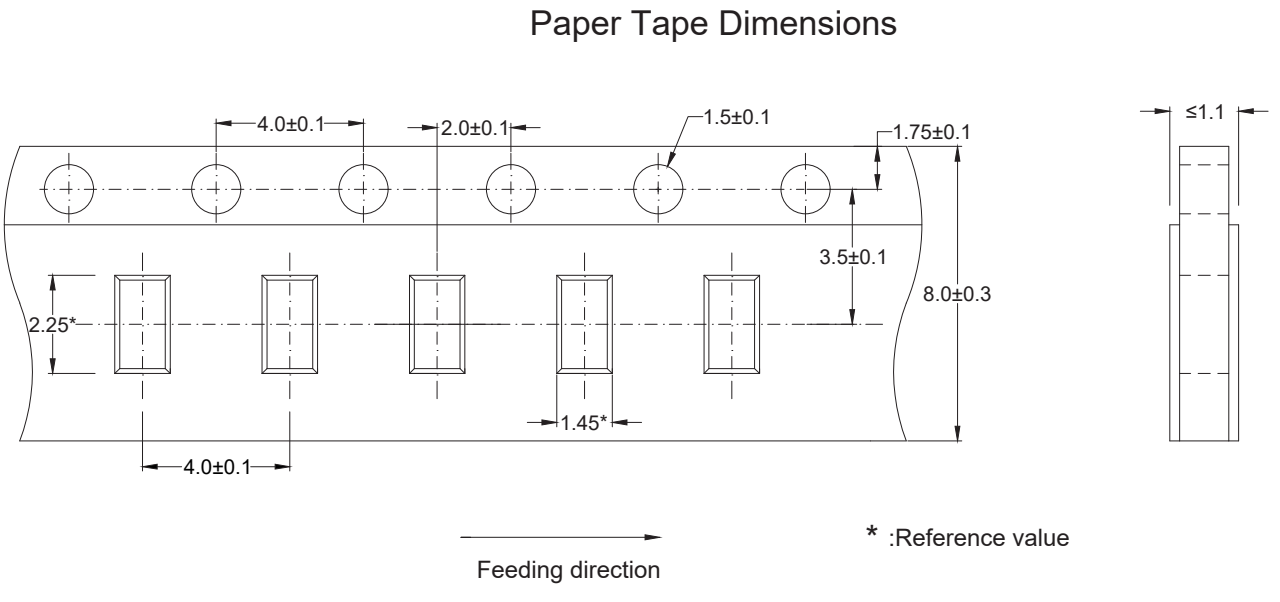


Part Package	L	W	H	L1
	(mm)	(mm)	(mm)	(mm)
0805	2.00±0.20	1.25±0.20	0.85±0.20	0.5±0.30

Ordering Information

PACKAGE	Part Number	DELIVERY MODE	MPQ(PCS)
0805	HNTC0805-503F3950FB	7''REEL	4,000

Packaging Information



R-T Chart

Temp.(℃)	R_Min(KΩ)	R_Typ(KΩ)	R_Max(KΩ)	R_Tolerance	Temp._Tolerance(℃)
-40	1542.135	1612.772	1686.477	4.57%	0.67
-39	1446.393	1511.666	1579.727	4.50%	0.66
-38	1357.159	1417.493	1480.362	4.44%	0.66
-37	1273.956	1329.741	1387.831	4.37%	0.65
-36	1196.343	1247.937	1301.626	4.30%	0.65
-35	1123.913	1171.644	1221.280	4.24%	0.64
-34	1056.293	1100.462	1146.364	4.17%	0.64
-33	993.136	1034.020	1076.480	4.11%	0.63
-32	934.124	971.977	1011.264	4.04%	0.63
-31	878.962	914.018	950.377	3.98%	0.62
-30	827.379	859.852	893.510	3.91%	0.62
-29	779.122	809.210	840.375	3.85%	0.61
-28	733.959	761.843	790.708	3.79%	0.61
-27	691.675	717.523	744.262	3.73%	0.60
-26	652.072	676.037	700.812	3.66%	0.59
-25	614.964	637.188	660.149	3.60%	0.59
-24	580.182	600.795	622.079	3.54%	0.58
-23	547.566	566.689	586.422	3.48%	0.58
-22	516.971	534.715	553.013	3.42%	0.57
-21	488.260	504.727	521.698	3.36%	0.57
-20	461.308	476.593	492.335	3.30%	0.56
-19	435.997	450.186	464.791	3.24%	0.55
-18	412.219	425.393	438.945	3.19%	0.55
-17	389.872	402.106	414.683	3.13%	0.54
-16	368.864	380.226	391.899	3.07%	0.54
-15	349.106	359.660	370.495	3.01%	0.53
-14	330.518	340.322	350.381	2.96%	0.52
-13	313.025	322.132	331.472	2.90%	0.52
-12	296.556	305.017	313.689	2.84%	0.51
-11	281.045	288.908	296.960	2.79%	0.50
-10	266.433	273.739	281.217	2.73%	0.50
-9	252.662	259.452	266.397	2.68%	0.49
-8	239.680	245.989	252.439	2.62%	0.48
-7	227.437	233.301	239.291	2.57%	0.48
-6	215.888	221.337	226.901	2.51%	0.47
-5	204.989	210.053	215.220	2.46%	0.46
-4	194.700	199.406	204.206	2.41%	0.46
-3	184.985	189.358	193.816	2.35%	0.45
-2	175.808	179.872	184.011	2.30%	0.44
-1	167.137	170.913	174.757	2.25%	0.43
0	158.941	162.449	166.019	2.20%	0.43
1	151.192	154.451	157.765	2.15%	0.42
2	143.863	146.891	149.967	2.09%	0.41
3	136.929	139.741	142.597	2.04%	0.41
4	130.368	132.979	135.629	1.99%	0.40
5	124.156	126.580	129.039	1.94%	0.39
6	118.274	120.524	122.805	1.89%	0.38

R-T Chart

Temp.(℃)	R_Min(KΩ)	R_Typ(KΩ)	R_Max(KΩ)	R_Tolerance	Temp._Tolerance(℃)
7	112.702	114.791	116.906	1.84%	0.38
8	107.424	109.361	111.323	1.79%	0.37
9	102.420	104.218	106.036	1.74%	0.36
10	97.677	99.343	101.028	1.70%	0.35
11	93.179	94.723	96.284	1.65%	0.34
12	88.912	90.343	91.788	1.60%	0.34
13	84.863	86.189	87.526	1.55%	0.33
14	81.021	82.247	83.484	1.50%	0.32
15	77.372	78.507	79.651	1.46%	0.31
16	73.908	74.957	76.014	1.41%	0.30
17	70.617	71.586	72.562	1.36%	0.30
18	67.490	68.385	69.286	1.32%	0.29
19	64.517	65.344	66.174	1.27%	0.28
20	61.692	62.454	63.219	1.22%	0.27
21	59.005	59.707	60.411	1.18%	0.26
22	56.449	57.095	57.742	1.13%	0.25
23	54.017	54.611	55.206	1.09%	0.25
24	51.703	52.248	52.794	1.04%	0.24
25	49.500	50.000	50.500	1.00%	0.23
26	47.361	47.860	48.360	1.04%	0.24
27	45.325	45.823	46.322	1.09%	0.25
28	43.388	43.883	44.380	1.13%	0.26
29	41.543	42.035	42.529	1.18%	0.27
30	39.786	40.275	40.766	1.22%	0.29
31	38.113	38.597	39.084	1.26%	0.30
32	36.518	36.998	37.481	1.30%	0.31
33	34.999	35.474	35.952	1.35%	0.32
34	33.550	34.020	34.492	1.39%	0.33
35	32.169	32.633	33.100	1.43%	0.35
36	30.851	31.309	31.771	1.47%	0.36
37	29.595	30.046	30.502	1.52%	0.37
38	28.395	28.841	29.290	1.56%	0.38
39	27.251	27.689	28.132	1.60%	0.40
40	26.158	26.590	27.026	1.64%	0.41
41	25.115	25.540	25.969	1.68%	0.42
42	24.119	24.536	24.959	1.72%	0.43
43	23.167	23.577	23.993	1.76%	0.45
44	22.257	22.661	23.069	1.80%	0.46
45	21.388	21.784	22.186	1.84%	0.47
46	20.557	20.946	21.340	1.88%	0.49
47	19.762	20.144	20.532	1.92%	0.50
48	19.002	19.377	19.757	1.96%	0.51
49	18.276	18.643	19.016	2.00%	0.53
50	17.580	17.941	18.307	2.04%	0.54
51	16.914	17.268	17.627	2.08%	0.55
52	16.277	16.624	16.976	2.12%	0.57
53	15.667	16.007	16.352	2.16%	0.58

R-T Chart

Temp.(℃)	R_Min(KΩ)	R_Typ(KΩ)	R_Max(KΩ)	R_Tolerance	Temp._Tolerance(℃)
54	15.083	15.416	15.754	2.20%	0.59
55	14.524	14.850	15.181	2.23%	0.61
56	13.988	14.307	14.632	2.27%	0.62
57	13.474	13.787	14.105	2.31%	0.64
58	12.982	13.288	13.600	2.35%	0.65
59	12.510	12.809	13.115	2.38%	0.66
60	12.057	12.351	12.650	2.42%	0.68
61	11.623	11.911	12.203	2.46%	0.69
62	11.207	11.488	11.775	2.50%	0.71
63	10.808	11.083	11.364	2.53%	0.72
64	10.425	10.694	10.969	2.57%	0.73
65	10.057	10.320	10.589	2.61%	0.75
66	9.704	9.962	10.225	2.64%	0.76
67	9.365	9.617	9.875	2.68%	0.78
68	9.040	9.286	9.538	2.71%	0.79
69	8.727	8.968	9.215	2.75%	0.81
70	8.427	8.663	8.904	2.79%	0.82
71	8.138	8.369	8.605	2.82%	0.84
72	7.861	8.086	8.317	2.86%	0.85
73	7.594	7.815	8.041	2.89%	0.87
74	7.338	7.554	7.775	2.93%	0.88
75	7.092	7.303	7.519	2.96%	0.90
76	6.855	7.061	7.273	3.00%	0.91
77	6.627	6.828	7.035	3.03%	0.93
78	6.408	6.605	6.807	3.07%	0.95
79	6.197	6.389	6.587	3.10%	0.96
80	5.994	6.182	6.376	3.13%	0.98
81	5.798	5.982	6.172	3.17%	0.99
82	5.610	5.790	5.975	3.20%	1.01
83	5.429	5.605	5.786	3.23%	1.02
84	5.254	5.426	5.604	3.27%	1.04
85	5.086	5.254	5.428	3.30%	1.06
86	4.924	5.089	5.258	3.33%	1.07
87	4.768	4.929	5.095	3.37%	1.09
88	4.618	4.775	4.937	3.40%	1.10
89	4.473	4.627	4.785	3.43%	1.12
90	4.333	4.483	4.639	3.47%	1.14
91	4.198	4.345	4.497	3.50%	1.15
92	4.068	4.212	4.361	3.53%	1.17
93	3.943	4.084	4.229	3.56%	1.19
94	3.822	3.960	4.102	3.59%	1.20
95	3.705	3.840	3.979	3.63%	1.22
96	3.593	3.724	3.861	3.66%	1.24
97	3.484	3.613	3.746	3.69%	1.25
98	3.379	3.505	3.636	3.72%	1.27
99	3.278	3.401	3.529	3.75%	1.29
100	3.180	3.301	3.426	3.78%	1.31

R-T Chart

Temp.(℃)	R_Min(KΩ)	R_Typ(KΩ)	R_Max(KΩ)	R_Tolerance	Temp._Tolerance(℃)
101	3.086	3.204	3.326	3.81%	1.32
102	2.994	3.110	3.229	3.84%	1.34
103	2.906	3.019	3.136	3.88%	1.36
104	2.821	2.932	3.046	3.91%	1.38
105	2.739	2.847	2.959	3.94%	1.39
106	2.660	2.765	2.875	3.97%	1.41
107	2.583	2.686	2.794	4.00%	1.43
108	2.509	2.610	2.715	4.03%	1.45
109	2.437	2.536	2.639	4.06%	1.46
110	2.367	2.464	2.565	4.09%	1.48
111	2.300	2.395	2.494	4.12%	1.50
112	2.235	2.328	2.425	4.15%	1.52
113	2.172	2.263	2.358	4.18%	1.54
114	2.112	2.201	2.293	4.20%	1.56
115	2.053	2.140	2.230	4.23%	1.57
116	1.996	2.081	2.170	4.26%	1.59
117	1.941	2.024	2.111	4.29%	1.61
118	1.887	1.969	2.054	4.32%	1.63
119	1.836	1.916	1.999	4.35%	1.65
120	1.786	1.864	1.946	4.38%	1.67
121	1.737	1.814	1.894	4.41%	1.69
122	1.690	1.765	1.844	4.43%	1.70
123	1.645	1.718	1.795	4.46%	1.72
124	1.601	1.673	1.748	4.49%	1.74
125	1.558	1.629	1.702	4.52%	1.76