

Chip NTC Thermistor Datasheet

Features

- Leadless , Size 0603
- SMD type suitable for high density mounting
- B constant tolerance $\pm 3\%$
- Excellent solder ability
- Operating temperature: -40°C to $+125^{\circ}\text{C}$
- RoHS compliant & Lead-Free & Halogen Free

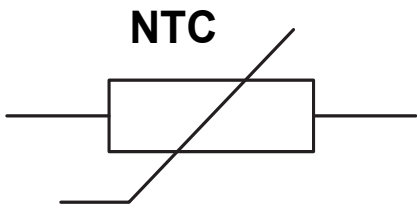
Applications

- 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

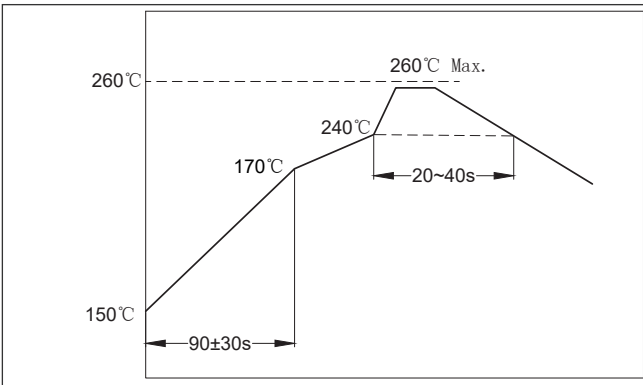
H NTC □□□□ - □□□ J □□□□ H B
① ② ③ ④ ⑤ ⑥ ⑦ ⑧

- 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°C/85°C B: 25°C/50°C



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	10±5%	KΩ
B Constant (Material Constant)	25°C /50°C	3380±3%	K
Permissible Operating Current	T _a =25°C ±0.1°C	0.31	mA
Thermal Dissipation Constant	T _a =25°C ±0.1°C	1.0	mW/°C
Thermal Time Constant	T _a =25°C ±0.1°C	< 5	sec
Rated Electric Power	T _a =25°C ±0.1°C	100	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

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

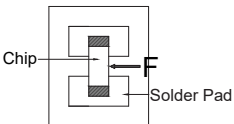
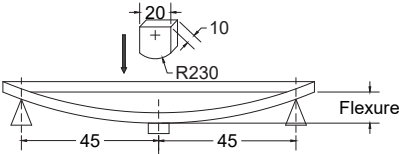
If any doubt on the results, measurements/tests should be made within the following limits:

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

● 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 . $B(25/50^{\circ}C) = \frac{\ln R_{25} - \ln R_{50}}{1/T_{25} - 1/T_{50}} \quad B(25/85^{\circ}C) = \frac{\ln R_{25} - \ln R_{85}}{1/T_{25} - 1/T_{85}}$
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.

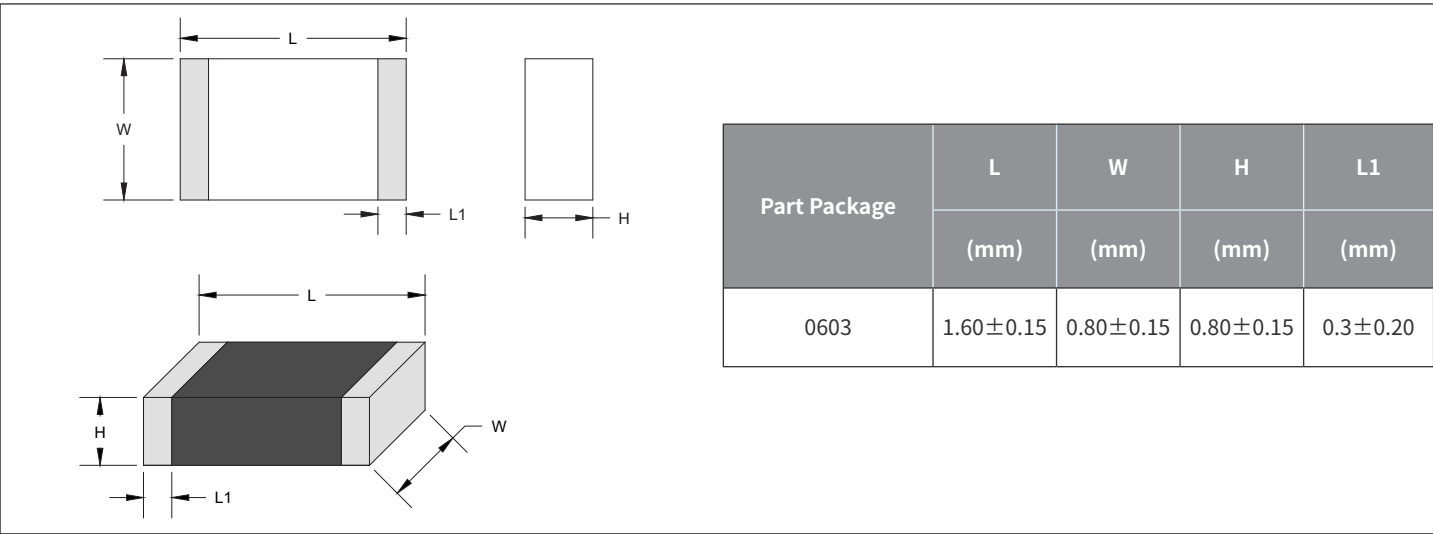
● Reliability Test

Items	Standard	Test Methods and Remarks	Requirements															
Terminal Strength	IEC 60068-2-21	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>	Size	F	Duration	0402, 0603	5N	10±1s	0805	10N	10±1s	No removal or split of the termination or other defects shall occur. 						
Size	F	Duration																
0402, 0603	5N	10±1s																
0805	10N	10±1s																
Resistance to Flexure	IEC 60068-2-21	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>	Size	Flexure	Speed	Duration	0402, 0603	1mm	< 0.5mm/s	10±1s	0805	2mm	< 0.5mm/s	10±1s	No visible damage. Δ R25/R25 ≤ 5%			
Size	Flexure	Speed	Duration															
0402, 0603	1mm	< 0.5mm/s	10±1s															
0805	2mm	< 0.5mm/s	10±1s															
Dropping	IEC 60068-2-32	Drop a chip 10 times on a concrete floor from a height of 1 meter.	No visible damage.															
Solderability	IEC 60068-2-58	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	No visible damage Wetting shall exceed 95% coverage.															
Resistance to Soldering Heat	IEC 60068-2-58	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	No visible damage. Δ R25/R25 ≤ 5% Δ B/B ≤ 2%															
Temperature cycling	IEC 60068-2-14	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.	Step	Temperature	Period	1	-40±5°C	30±3min	2	Room Temperature	5±3min	3	125±2°C	30±3min	4	Room Temperature	5±3min	No visible damage Δ R25/R25 ≤ 3% Δ B/B ≤ 2%
Step	Temperature	Period																
1	-40±5°C	30±3min																
2	Room Temperature	5±3min																
3	125±2°C	30±3min																
4	Room Temperature	5±3min																
Resistance to dry heat	IEC 60068-2-2	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	No visible damage. Δ R25/R25 ≤ 5% Δ B/B ≤ 2%															
Resistance to cold	IEC 60068-2- 1	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.	No visible damage. Δ R25/R25 ≤ 5% Δ B/B ≤ 2%															
Resistance to damp heat	IEC 60068-2-78	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.	No visible damage. Δ R25/R25 ≤ 3% Δ B/B ≤ 2%															
Resistance to high temperature load	IEC 60539-1 5.25.4	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	No visible damage. Δ R25/R25 ≤ 5% Δ B/B ≤ 2%															

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

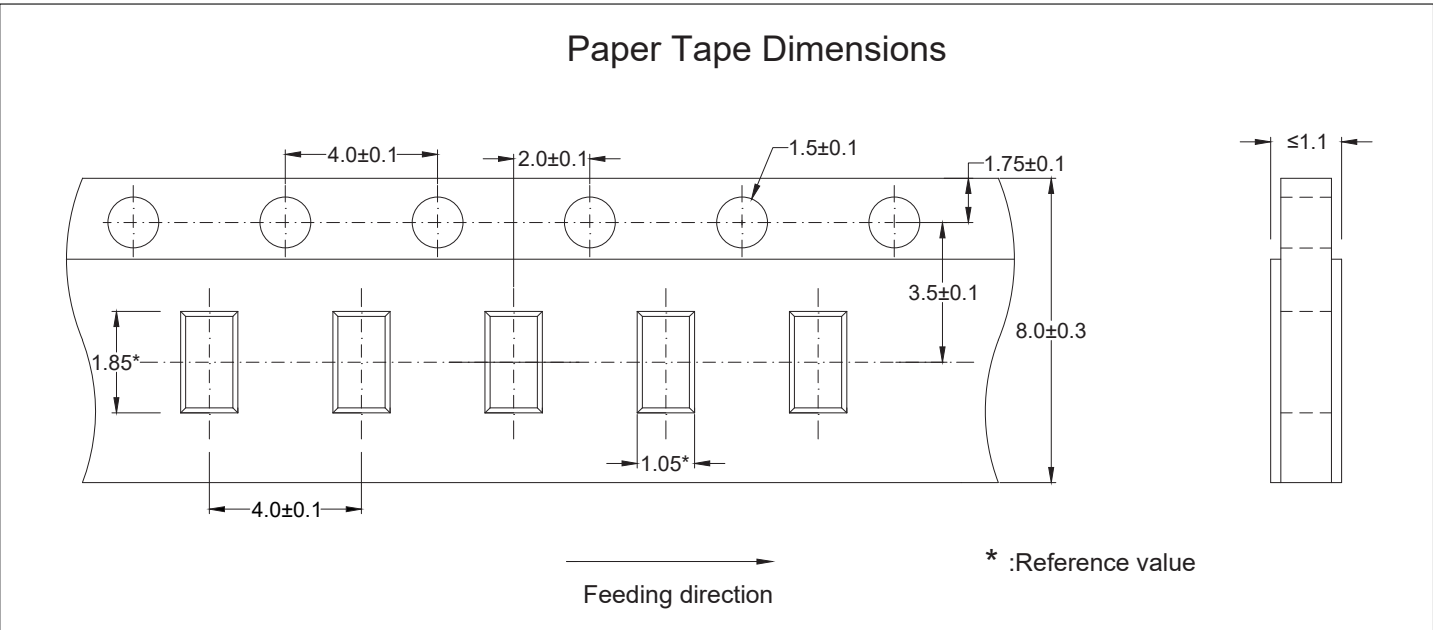
Physical Dimensions



Ordering Information

PACKAGE	Part Number	DELIVERY MODE	MPQ(PCS)
0603	HNTC0603-103J3380HB	7" REEL	4,000

Packaging Information



● R-T Chart

Temp.(°C)	R_Min(KΩ)	R_Typ(KΩ)	R_Max(KΩ)	R_Tolerance	Temp._Tolerance(°C)
-40	182.010	197.390	213.534	8.18%	1.39
-39	172.103	186.540	201.683	8.12%	1.39
-38	162.793	176.350	190.559	8.06%	1.39
-37	154.063	166.800	180.139	8.00%	1.40
-36	145.849	157.820	170.346	7.94%	1.40
-35	138.134	149.390	161.159	7.88%	1.40
-34	130.919	141.510	152.575	7.82%	1.40
-33	124.121	134.090	144.497	7.76%	1.40
-32	117.723	127.110	136.902	7.70%	1.40
-31	111.688	120.530	129.746	7.65%	1.40
-30	106.008	114.340	123.018	7.59%	1.40
-29	100.674	108.530	116.706	7.53%	1.40
-28	95.631	103.040	110.745	7.48%	1.40
-27	90.880	97.870	105.135	7.42%	1.40
-26	86.391	92.989	99.840	7.37%	1.40
-25	82.152	88.381	94.844	7.31%	1.40
-24	78.153	84.036	90.136	7.26%	1.40
-23	74.372	79.931	85.690	7.21%	1.40
-22	70.798	76.052	81.491	7.15%	1.40
-21	67.417	72.384	77.523	7.10%	1.40
-20	64.218	68.915	73.771	7.05%	1.39
-19	61.190	65.634	70.225	6.99%	1.39
-18	58.324	62.529	66.870	6.94%	1.39
-17	55.608	59.589	63.695	6.89%	1.39
-16	53.035	56.804	60.689	6.84%	1.39
-15	50.596	54.166	57.843	6.79%	1.39
-14	48.282	51.665	55.146	6.74%	1.39
-13	46.088	49.294	52.591	6.69%	1.39
-12	44.007	47.046	50.169	6.64%	1.39
-11	42.031	44.913	47.872	6.59%	1.39
-10	40.156	42.889	45.694	6.54%	1.39
-9	38.374	40.967	43.626	6.49%	1.39
-8	36.681	39.142	41.664	6.44%	1.39
-7	35.072	37.408	39.800	6.39%	1.38
-6	33.543	35.761	38.031	6.35%	1.38
-5	32.089	34.196	36.350	6.30%	1.38
-4	30.706	32.707	34.752	6.25%	1.38
-3	29.389	31.291	33.232	6.20%	1.38
-2	28.137	29.945	31.789	6.16%	1.38
-1	26.946	28.664	30.416	6.11%	1.38
0	25.811	27.445	29.110	6.07%	1.38
1	24.729	26.283	27.865	6.02%	1.37
2	23.698	25.177	26.681	5.97%	1.37
3	22.717	24.124	25.554	5.93%	1.37
4	21.782	23.121	24.481	5.88%	1.37
5	20.890	22.165	23.459	5.84%	1.37
6	20.039	21.253	22.485	5.79%	1.37

● R-T Chart

Temp.(°C)	R_Min(KΩ)	R_Typ(KΩ)	R_Max(KΩ)	R_Tolerance	Temp._Tolerance(°C)
7	19.227	20.384	21.556	5.75%	1.37
8	18.453	19.555	20.671	5.71%	1.36
9	17.714	18.764	19.827	5.66%	1.36
10	17.009	18.010	19.022	5.62%	1.36
11	16.336	17.290	18.254	5.58%	1.36
12	15.692	16.602	17.521	5.53%	1.36
13	15.078	15.946	16.822	5.49%	1.36
14	14.491	15.319	16.154	5.45%	1.35
15	13.930	14.720	15.516	5.41%	1.35
16	13.394	14.148	14.907	5.36%	1.35
17	12.881	13.601	14.325	5.32%	1.35
18	12.391	13.078	13.769	5.28%	1.35
19	11.922	12.578	13.237	5.24%	1.34
20	11.472	12.099	12.728	5.20%	1.34
21	11.043	11.642	12.243	5.16%	1.34
22	10.632	11.204	11.778	5.12%	1.34
23	10.238	10.785	11.333	5.08%	1.34
24	9.861	10.384	10.907	5.04%	1.33
25	9.500	10.000	10.500	5.00%	1.33
26	9.147	9.632	10.118	5.04%	1.35
27	8.809	9.280	9.751	5.08%	1.37
28	8.486	8.943	9.400	5.12%	1.39
29	8.176	8.619	9.063	5.16%	1.41
30	7.879	8.309	8.741	5.19%	1.43
31	7.594	8.012	8.431	5.23%	1.44
32	7.321	7.727	8.134	5.27%	1.46
33	7.060	7.453	7.849	5.31%	1.48
34	6.809	7.191	7.575	5.35%	1.50
35	6.568	6.939	7.313	5.38%	1.52
36	6.337	6.698	7.061	5.42%	1.54
37	6.116	6.466	6.819	5.46%	1.56
38	5.903	6.243	6.586	5.50%	1.58
39	5.699	6.029	6.363	5.53%	1.60
40	5.503	5.824	6.148	5.57%	1.62
41	5.315	5.627	5.942	5.61%	1.64
42	5.134	5.437	5.744	5.64%	1.66
43	4.960	5.255	5.553	5.68%	1.68
44	4.793	5.080	5.370	5.71%	1.70
45	4.632	4.911	5.193	5.75%	1.73
46	4.478	4.749	5.024	5.78%	1.75
47	4.330	4.593	4.861	5.82%	1.77
48	4.187	4.443	4.703	5.86%	1.79
49	4.050	4.299	4.552	5.89%	1.81
50	3.918	4.160	4.407	5.92%	1.83
51	3.791	4.027	4.266	5.96%	1.85
52	3.668	3.898	4.131	5.99%	1.87
53	3.550	3.774	4.001	6.03%	1.89

● R-T Chart

Temp.(°C)	R_Min(KΩ)	R_Typ(KΩ)	R_Max(KΩ)	R_Tolerance	Temp._Tolerance(°C)
54	3.437	3.654	3.876	6.06%	1.92
55	3.328	3.539	3.755	6.10%	1.94
56	3.222	3.429	3.639	6.13%	1.96
57	3.121	3.322	3.526	6.16%	1.98
58	3.023	3.219	3.418	6.20%	2.00
59	2.929	3.119	3.314	6.23%	2.03
60	2.838	3.024	3.213	6.26%	2.05
61	2.751	2.931	3.116	6.30%	2.07
62	2.666	2.842	3.022	6.33%	2.09
63	2.585	2.756	2.932	6.36%	2.12
64	2.506	2.673	2.844	6.39%	2.14
65	2.431	2.593	2.760	6.43%	2.16
66	2.357	2.516	2.679	6.46%	2.18
67	2.287	2.441	2.600	6.49%	2.21
68	2.219	2.369	2.524	6.52%	2.23
69	2.153	2.300	2.451	6.55%	2.25
70	2.089	2.233	2.380	6.59%	2.27
71	2.028	2.168	2.311	6.62%	2.30
72	1.969	2.105	2.245	6.65%	2.32
73	1.911	2.044	2.181	6.68%	2.34
74	1.856	1.986	2.119	6.71%	2.37
75	1.803	1.929	2.059	6.74%	2.39
76	1.751	1.874	2.001	6.77%	2.42
77	1.701	1.821	1.945	6.80%	2.44
78	1.653	1.770	1.891	6.83%	2.46
79	1.606	1.720	1.838	6.86%	2.49
80	1.561	1.673	1.788	6.89%	2.51
81	1.517	1.626	1.739	6.92%	2.54
82	1.475	1.581	1.691	6.95%	2.56
83	1.434	1.538	1.645	6.98%	2.58
84	1.394	1.496	1.601	7.01%	2.61
85	1.356	1.455	1.557	7.04%	2.63
86	1.319	1.416	1.516	7.07%	2.66
87	1.283	1.377	1.475	7.10%	2.68
88	1.248	1.340	1.436	7.13%	2.71
89	1.214	1.304	1.398	7.16%	2.73
90	1.182	1.270	1.361	7.19%	2.76
91	1.150	1.236	1.325	7.22%	2.78
92	1.119	1.204	1.291	7.25%	2.81
93	1.090	1.172	1.257	7.28%	2.83
94	1.061	1.141	1.225	7.30%	2.86
95	1.033	1.112	1.193	7.33%	2.88
96	1.006	1.083	1.162	7.36%	2.91
97	0.980	1.055	1.133	7.39%	2.94
98	0.954	1.028	1.104	7.42%	2.96
99	0.930	1.002	1.076	7.44%	2.99
100	0.906	0.976	1.049	7.47%	3.01

● R-T Chart

Temp.(°C)	R_Min(KΩ)	R_Typ(KΩ)	R_Max(KΩ)	R_Tolerance	Temp._Tolerance(°C)
101	0.883	0.951	1.023	7.50%	3.04
102	0.860	0.927	0.997	7.53%	3.07
103	0.838	0.904	0.972	7.55%	3.09
104	0.817	0.882	0.948	7.58%	3.12
105	0.797	0.860	0.925	7.61%	3.15
106	0.777	0.838	0.902	7.64%	3.17
107	0.758	0.818	0.880	7.66%	3.20
108	0.739	0.798	0.859	7.69%	3.23
109	0.721	0.778	0.838	7.72%	3.25
110	0.703	0.759	0.818	7.74%	3.28
111	0.686	0.741	0.799	7.77%	3.31
112	0.669	0.723	0.779	7.79%	3.33
113	0.653	0.706	0.761	7.82%	3.36
114	0.637	0.689	0.743	7.85%	3.39
115	0.622	0.673	0.726	7.87%	3.42
116	0.607	0.657	0.709	7.90%	3.45
117	0.593	0.641	0.692	7.92%	3.47
118	0.579	0.626	0.676	7.95%	3.50
119	0.565	0.612	0.661	7.97%	3.53
120	0.552	0.598	0.645	8.00%	3.56
121	0.539	0.584	0.631	8.03%	3.59
122	0.527	0.570	0.616	8.05%	3.61
123	0.514	0.557	0.602	8.08%	3.64
124	0.503	0.545	0.589	8.10%	3.67
125	0.491	0.532	0.576	8.13%	3.70