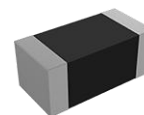


## FEATURES 特征

- Small in size, suitable for high-density surface mount technology.  
体积小, 适合高密度表面贴装
- Excellent solderability and high heat resistance.  
良好的可焊性和耐焊性
- The ceramic body surface is encapsulated with glass, featuring excellent moisture resistance and high reliability.  
瓷体表面采用玻璃包封, 耐潮湿性能好, 高可靠性
- High-precision resistance value and B-value constant.  
高精度的电阻值和B值常数
- Operating Temp : -40°C~+125°C (Including self heating).  
工作温度范围:-40°C~+125°C(包括自身温度上升)



## APPLICATIONS 用途

- Temperature sensing for rechargeable batteries in devices such as mobile phones, car phones, laptop computers, and smart wearable devices.  
手机、汽车电话、笔记本电脑、智能穿戴设备等设备充电电池的温度传感
- Temperature compensation for transistors, ICs, and crystal oscillators in mobile communication equipment.  
移动通信设备的晶体管、IC和晶体振荡器的温度补偿
- electronic thermometers, electronic perpetual calendars, temperature displays of electronic clocks, electronic gifts, etc.  
电子温度计、电子万年历、电子钟温度显示、电子礼品等

## PART NUMBERING 产品型号

ANTC
1005
-
154
J
4500
F
B

①
②
③
④
⑤
⑥
⑦

① Series Name	
ANTC	Chip NTC Thermistor

② External Dimensions [inch] (L×W) (mm)	
1005 [0402]	1.0×0.5

③ Nominal Zero-Power Resistance at 25°C	
Code (example)	Resistance [KΩ]
154	150

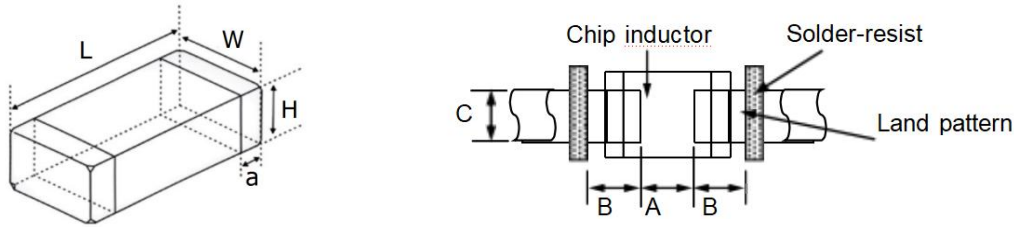
④ Tolerance of Resistance	
J	±5%

⑤ B Constant	
4500	4500K

⑦ B Constant Calculation Method	
B	25°C&50°C

⑥ Tolerance of B Constant	
F	±1%

## DIMENSIONS & RECOMMENDED LAND PATTERN 尺寸及推荐焊盘



Unit: mm [inch]

Dimensions					Recommended Land Pattern		
Series	L	W	H	a	A	B	C
ANTC1005 [0402]	1.0±0.15 [0.039±0.006]	0.5±0.15 [0.020±0.006]	0.5±0.15 [0.020±0.006]	0.25±0.1 [0.010±0.004]	0.4	0.4-0.5	0.5

## ELECTRICAL CHARACTERISTICS 特性规格表

### ● ANTC1005 Series

Part No	Resistance (25°C) (kΩ)	B Constant (25/50°C) (K)	B Constant (25/85°C) (K)	Permissible Operating Current (25°C)(mA)	Rated Electric Power(25°C) (mW)	Dissipation Factor (mW/°C)	Thermal Time Constant (s)
ANTC1005-154J4500FB	150±5%	4500±1%	4510	0.08	100	1	<3

### ● Test Conditions

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

- a. Ambient Temperature: 20±15°C
- b. Relative Humidity: 65±20%
- c. Air Pressure: 86kPa to 106kPa

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

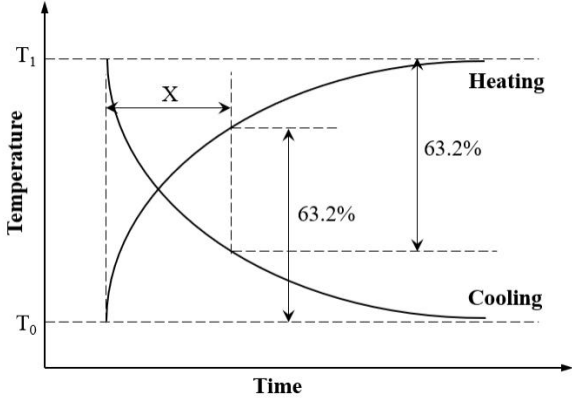
- a. Ambient Temperature: 25±2°C
- b. Relative Humidity: 65±5%
- c. Air Pressure: 86kPa to 106kPa

### ● Inspection Equipment

Visual Examination: 20 x magnifier

Resistance value test: Thermistor resistance tester

## ELECTRICAL TEST 电性测试

No.	Items	Test Methods and Remarks
1	Nominal Zero-Power Resistance at 25°C(R25)	Ambient temperature: 25±0.05°C Measuring electric power: ≤0.1mW
2	B Constant	Respectively measure the resistance value R1 & R2 at the ambient temperature of T1 & T2, calculate B constant value by the following formula: $B(T_1/T_2) = \frac{\ln R_1 - \ln R_2}{1/T_1 - 1/T_2}$ T: Absolute temperature (K) Usually 25°C and 50°C or 85°C are used.
3	Thermal Time Constant	Under zero-power conditions, when the ambient temperature of the thermistor changes drastically, the time required for the thermistor to produce a temperature change of 63.2% of the difference between the initial temperature and the final temperature, usually expressed in seconds (S). 
4	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: $\delta = \frac{W}{T - T_0}$
5	Rated Power	The necessary electric power makes thermistor's temperature rise 100°C by self-heating at ambient temperature 25°C.
6	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.

**RESISTANCE-TEMPERATURE CHARACTERISTICS (CENTER VALUE) 电阻 - 温度特性**

温度 (°C)	R 最小值 (kΩ)	R 中心值 (kΩ)	R 最大值 (kΩ)	阻值公差 (+)	阻值公差 (-)	温度公差 (+) (°C)	温度公差 (-) (°C)
-40	8,139.942	8,925.720	9,762.882	9.38%	8.80%	1.17	1.10
-39	7,540.480	8,262.003	9,029.934	9.29%	8.73%	1.17	1.09
-38	6,988.757	7,651.612	8,356.393	9.21%	8.66%	1.16	1.09
-37	6,480.714	7,089.976	7,737.125	9.13%	8.59%	1.16	1.09
-36	6,012.655	6,572.935	7,167.461	9.05%	8.52%	1.16	1.09
-35	5,581.217	6,096.707	6,643.159	8.96%	8.46%	1.16	1.09
-34	5,183.335	5,657.848	6,160.361	8.88%	8.39%	1.16	1.09
-33	4,816.217	5,253.223	5,715.556	8.80%	8.32%	1.16	1.09
-32	4,477.316	4,879.973	5,305.545	8.72%	8.25%	1.15	1.09
-31	4,164.310	4,535.496	4,927.418	8.64%	8.18%	1.15	1.09
-30	3,875.077	4,217.415	4,578.520	8.56%	8.12%	1.15	1.09
-29	3,607.683	3,923.563	4,256.433	8.48%	8.05%	1.15	1.09
-28	3,360.358	3,651.962	3,958.949	8.41%	7.98%	1.15	1.09
-27	3,131.486	3,400.806	3,684.054	8.33%	7.92%	1.15	1.09
-26	2,919.590	3,168.442	3,429.909	8.25%	7.85%	1.14	1.09
-25	2,723.315	2,953.361	3,194.833	8.18%	7.79%	1.14	1.09
-24	2,541.426	2,754.184	2,977.291	8.10%	7.72%	1.14	1.09
-23	2,372.788	2,569.646	2,775.878	8.03%	7.66%	1.14	1.09
-22	2,216.363	2,398.590	2,589.310	7.95%	7.60%	1.14	1.09
-21	2,071.200	2,239.958	2,416.410	7.88%	7.53%	1.13	1.08
-20	1,936.425	2,092.779	2,256.103	7.80%	7.47%	1.13	1.08
-19	1,811.237	1,956.162	2,107.402	7.73%	7.41%	1.13	1.08
-18	1,694.902	1,829.292	1,969.401	7.66%	7.35%	1.13	1.08
-17	1,586.746	1,711.419	1,841.274	7.59%	7.28%	1.12	1.08
-16	1,486.147	1,601.856	1,722.257	7.52%	7.22%	1.12	1.08
-15	1,392.536	1,499.970	1,611.654	7.45%	7.16%	1.12	1.08
-14	1,305.389	1,405.183	1,508.824	7.38%	7.10%	1.12	1.08
-13	1,224.224	1,316.959	1,413.176	7.31%	7.04%	1.12	1.07
-12	1,148.598	1,234.808	1,324.170	7.24%	6.98%	1.11	1.07
-11	1,078.102	1,158.279	1,241.309	7.17%	6.92%	1.11	1.07
-10	1,012.359	1,086.956	1,164.133	7.10%	6.86%	1.11	1.07
-9	951.023	1,020.456	1,092.222	7.03%	6.80%	1.10	1.07
-8	893.774	958.427	1,025.187	6.97%	6.75%	1.10	1.07
-7	840.318	900.543	962.670	6.90%	6.69%	1.10	1.07
-6	790.382	846.504	904.344	6.83%	6.63%	1.10	1.06
-5	743.715	796.033	849.902	6.77%	6.57%	1.09	1.06
-4	700.085	748.877	799.066	6.70%	6.52%	1.09	1.06
-3	659.278	704.798	751.577	6.64%	6.46%	1.09	1.06
-2	621.095	663.579	707.196	6.57%	6.40%	1.09	1.06
-1	585.354	625.018	665.702	6.51%	6.35%	1.08	1.06
0	551.884	588.930	626.892	6.45%	6.29%	1.08	1.05
1	520.530	555.143	590.578	6.38%	6.24%	1.08	1.05
2	491.145	523.497	556.585	6.32%	6.18%	1.07	1.05

**RESISTANCE-TEMPERATURE CHARACTERISTICS (CENTER VALUE) 电阻 - 温度特性**

温度 (°C)	R 最小值 (kΩ)	R 中心值 (kΩ)	R 最大值 (kΩ)	阻值公差 (+)	阻值公差 (-)	温度公差 (+) (°C)	温度公差 (-) (°C)
3	463.595	493.845	524.753	6.26%	6.13%	1.07	1.05
4	437.756	466.050	494.931	6.20%	6.07%	1.07	1.05
5	413.512	439.985	466.983	6.14%	6.02%	1.06	1.04
6	390.756	415.535	440.780	6.08%	5.96%	1.06	1.04
7	369.388	392.589	416.203	6.02%	5.91%	1.06	1.04
8	349.316	371.047	393.144	5.96%	5.86%	1.05	1.04
9	330.455	350.816	371.499	5.90%	5.80%	1.05	1.03
10	312.725	331.808	351.175	5.84%	5.75%	1.05	1.03
11	296.051	313.943	332.084	5.78%	5.70%	1.04	1.03
12	280.366	297.146	314.144	5.72%	5.65%	1.04	1.03
13	265.605	281.348	297.279	5.66%	5.60%	1.04	1.02
14	251.709	266.483	281.420	5.61%	5.54%	1.03	1.02
15	238.622	252.492	266.501	5.55%	5.49%	1.03	1.02
16	226.293	239.318	252.461	5.49%	5.44%	1.03	1.02
17	214.674	226.910	239.243	5.44%	5.39%	1.02	1.01
18	203.720	215.218	226.796	5.38%	5.34%	1.02	1.01
19	193.390	204.197	215.069	5.32%	5.29%	1.01	1.01
20	183.644	193.806	204.018	5.27%	5.24%	1.01	1.01
21	174.447	184.004	193.599	5.21%	5.19%	1.01	1.00
22	165.765	174.756	183.774	5.16%	5.15%	1.00	1.00
23	157.565	166.027	174.505	5.11%	5.10%	1.00	1.00
24	149.820	157.785	165.758	5.05%	5.05%	1.00	0.99
25	142.500	150.000	157.500	5.00%	5.00%	0.99	0.99
26	135.445	142.645	149.852	5.05%	5.05%	1.01	1.01
27	128.780	135.693	142.621	5.11%	5.10%	1.03	1.02
28	122.481	129.121	135.781	5.16%	5.14%	1.04	1.04
29	116.528	122.905	129.308	5.21%	5.19%	1.06	1.06
30	110.898	117.025	123.182	5.26%	5.24%	1.08	1.07
31	105.573	111.460	117.381	5.31%	5.28%	1.09	1.09
32	100.535	106.192	111.887	5.36%	5.33%	1.11	1.11
33	95.766	101.203	106.683	5.41%	5.37%	1.13	1.12
34	91.250	96.478	101.750	5.46%	5.42%	1.15	1.14
35	86.974	92.000	97.074	5.51%	5.46%	1.17	1.16
36	82.923	87.756	92.640	5.56%	5.51%	1.18	1.17
37	79.084	83.733	88.433	5.61%	5.55%	1.20	1.19
38	75.444	79.917	84.442	5.66%	5.60%	1.22	1.21
39	71.993	76.296	80.654	5.71%	5.64%	1.24	1.22
40	68.719	72.861	77.058	5.76%	5.68%	1.26	1.24
41	65.613	69.599	73.642	5.81%	5.73%	1.28	1.26
42	62.666	66.503	70.398	5.86%	5.77%	1.29	1.27
43	59.867	63.561	67.315	5.91%	5.81%	1.31	1.29
44	57.209	60.767	64.384	5.95%	5.85%	1.33	1.31
45	54.684	58.111	61.598	6.00%	5.90%	1.35	1.33

**RESISTANCE-TEMPERATURE CHARACTERISTICS (CENTER VALUE) 电阻 - 温度特性**

温度 (°C)	R 最小值 (kΩ)	R 中心值 (kΩ)	R 最大值 (kΩ)	阻值公差 (+)	阻值公差 (-)	温度公差 (+) (°C)	温度公差 (-) (°C)
46	52.285	55.586	58.948	6.05%	5.94%	1.37	1.34
47	50.005	53.186	56.427	6.09%	5.98%	1.39	1.36
48	47.837	50.902	54.028	6.14%	6.02%	1.41	1.38
49	45.776	48.730	51.745	6.19%	6.06%	1.43	1.40
50	43.815	46.662	49.571	6.23%	6.10%	1.45	1.42
51	41.948	44.694	47.501	6.28%	6.14%	1.47	1.43
52	40.172	42.820	45.528	6.32%	6.18%	1.49	1.45
53	38.481	41.035	43.649	6.37%	6.22%	1.51	1.47
54	36.871	39.334	41.858	6.41%	6.26%	1.53	1.49
55	35.337	37.714	40.150	6.46%	6.30%	1.54	1.51
56	33.875	36.169	38.522	6.50%	6.34%	1.56	1.53
57	32.482	34.696	36.968	6.55%	6.38%	1.58	1.54
58	31.154	33.291	35.486	6.59%	6.42%	1.61	1.56
59	29.888	31.951	34.072	6.64%	6.46%	1.63	1.58
60	28.680	30.672	32.721	6.68%	6.50%	1.65	1.60
61	27.528	29.452	31.432	6.72%	6.53%	1.67	1.62
62	26.428	28.287	30.201	6.77%	6.57%	1.69	1.64
63	25.378	27.174	29.025	6.81%	6.61%	1.71	1.66
64	24.376	26.111	27.901	6.85%	6.65%	1.73	1.68
65	23.419	25.096	26.826	6.89%	6.68%	1.75	1.70
66	22.504	24.126	25.799	6.94%	6.72%	1.77	1.72
67	21.631	23.198	24.817	6.98%	6.76%	1.79	1.73
68	20.796	22.311	23.878	7.02%	6.79%	1.81	1.75
69	19.998	21.463	22.979	7.06%	6.83%	1.83	1.77
70	19.234	20.652	22.119	7.10%	6.87%	1.86	1.79
71	18.505	19.876	21.296	7.14%	6.90%	1.88	1.81
72	17.806	19.133	20.508	7.18%	6.94%	1.90	1.83
73	17.138	18.422	19.754	7.23%	6.97%	1.92	1.85
74	16.499	17.742	19.031	7.27%	7.01%	1.94	1.87
75	15.887	17.090	18.338	7.31%	7.04%	1.96	1.89
76	15.300	16.466	17.675	7.35%	7.08%	1.99	1.91
77	14.739	15.867	17.039	7.39%	7.11%	2.01	1.93
78	14.201	15.294	16.430	7.42%	7.14%	2.03	1.95
79	13.686	14.744	15.845	7.46%	7.18%	2.05	1.97
80	13.192	14.218	15.284	7.50%	7.21%	2.07	1.99
81	12.719	13.712	14.747	7.54%	7.25%	2.10	2.01
82	12.265	13.228	14.231	7.58%	7.28%	2.12	2.04
83	11.830	12.763	13.736	7.62%	7.31%	2.14	2.06
84	11.412	12.317	13.260	7.66%	7.35%	2.17	2.08
85	11.012	11.889	12.804	7.70%	7.38%	2.19	2.10
86	10.627	11.478	12.366	7.73%	7.41%	2.21	2.12
87	10.259	11.083	11.945	7.77%	7.44%	2.23	2.14
88	9.904	10.705	11.540	7.81%	7.48%	2.26	2.16

**RESISTANCE-TEMPERATURE CHARACTERISTICS (CENTER VALUE) 电阻 - 温度特性**

温度 (°C)	R 最小值 (kΩ)	R 中心值 (kΩ)	R 最大值 (kΩ)	阻值公差 (+)	阻值公差 (-)	温度公差 (+) (°C)	温度公差 (-) (°C)
89	9.564	10.341	11.152	7.85%	7.51%	2.28	2.18
90	9.238	9.991	10.779	7.88%	7.54%	2.30	2.20
91	8.924	9.655	10.420	7.92%	7.57%	2.33	2.22
92	8.623	9.332	10.074	7.96%	7.60%	2.35	2.25
93	8.333	9.021	9.743	7.99%	7.63%	2.37	2.27
94	8.054	8.723	9.423	8.03%	7.66%	2.40	2.29
95	7.787	8.436	9.116	8.07%	7.70%	2.42	2.31
96	7.529	8.160	8.821	8.10%	7.73%	2.45	2.33
97	7.282	7.894	8.536	8.14%	7.76%	2.47	2.35
98	7.044	7.638	8.263	8.17%	7.79%	2.49	2.38
99	6.814	7.392	7.999	8.21%	7.82%	2.52	2.40
100	6.594	7.155	7.745	8.24%	7.85%	2.54	2.42
101	6.382	6.927	7.501	8.28%	7.88%	2.57	2.44
102	6.177	6.708	7.265	8.31%	7.91%	2.59	2.47
103	5.981	6.496	7.039	8.35%	7.94%	2.62	2.49
104	5.791	6.293	6.820	8.38%	7.97%	2.64	2.51
105	5.609	6.096	6.609	8.42%	7.99%	2.67	2.53
106	5.433	5.907	6.406	8.45%	8.02%	2.69	2.56
107	5.264	5.725	6.210	8.49%	8.05%	2.72	2.58
108	5.100	5.549	6.022	8.52%	8.08%	2.74	2.60
109	4.943	5.379	5.839	8.55%	8.11%	2.77	2.62
110	4.791	5.216	5.664	8.59%	8.14%	2.79	2.65
111	4.645	5.058	5.494	8.62%	8.17%	2.82	2.67
112	4.504	4.906	5.331	8.65%	8.19%	2.84	2.69
113	4.368	4.759	5.173	8.69%	8.22%	2.87	2.72
114	4.237	4.618	5.020	8.72%	8.25%	2.89	2.74
115	4.110	4.481	4.873	8.75%	8.28%	2.92	2.76
116	3.988	4.349	4.731	8.78%	8.30%	2.95	2.79
117	3.870	4.221	4.594	8.82%	8.33%	2.97	2.81
118	3.756	4.098	4.461	8.85%	8.36%	3.00	2.83
119	3.646	3.979	4.333	8.88%	8.39%	3.03	2.86
120	3.539	3.865	4.209	8.91%	8.41%	3.05	2.88
121	3.437	3.754	4.089	8.94%	8.44%	3.08	2.90
122	3.338	3.646	3.974	8.98%	8.47%	3.10	2.93
123	3.242	3.543	3.862	9.01%	8.49%	3.13	2.95
124	3.149	3.443	3.754	9.04%	8.52%	3.16	2.98
125	3.060	3.346	3.649	9.07%	8.54%	3.18	3.00

## RELIABILITY TEST 可靠性测试

Items	Test Methods and Remarks	Requirements								
Resistance to Flexure	<p>Solder the chip on the test PCB board, then apply a force in the direction as shown below:</p> <table border="1"> <thead> <tr> <th>Inch Size</th> <th>Flexure</th> <th>Pressurizing Speed</th> <th>Duration</th> </tr> </thead> <tbody> <tr> <td>0402</td> <td>2mm</td> <td>&lt;0.5mm/s</td> <td>10±1s</td> </tr> </tbody> </table>	Inch Size	Flexure	Pressurizing Speed	Duration	0402	2mm	<0.5mm/s	10±1s	<ul style="list-style-type: none"> <li>① No visible damage.</li> <li>② R25 variation: within ±2%</li> <li>③ B constant variation: within ±1%</li> </ul>
Inch Size	Flexure	Pressurizing Speed	Duration							
0402	2mm	<0.5mm/s	10±1s							
Robustness of electrode	<p>Solder the chip on the test PCB board, then apply 5N force in the direction of the arrow for 10s as shown below.</p> <table border="1"> <thead> <tr> <th>Inch Size (EIA)</th> <th>F</th> </tr> </thead> <tbody> <tr> <td>0402</td> <td>5N</td> </tr> </tbody> </table>	Inch Size (EIA)	F	0402	5N	<p>No peeling of the electrodes or other defects shall occur.</p>				
Inch Size (EIA)	F									
0402	5N									
Vibration	<ul style="list-style-type: none"> <li>① Solder the chip on the test PCB board as shown below;</li> <li>② NTC chip shall be subjected to a simple harmonic motion having total amplitude of 1.5mm, the frequency being varied uniformly between the approximate limits of 10 and 55 Hz;</li> <li>③ The frequency ranges from 10 to 55 Hz and return to 10 Hz shall be traversed in approximately 1 minute. This motion shall be applied for a period of 2 hours in each 3 mutually perpendicular directions (total of 6 hours).</li> </ul>	<ul style="list-style-type: none"> <li>① No visible damage.</li> <li>② R25 variation: within ±2%</li> <li>③ B constant variation: within ±1%</li> </ul>								

## RELIABILITY TEST 可靠性测试

Items	Test Methods and Remarks	Requirements
Dropping	Drop a chip 10 times on a concrete floor from a height of 1 meter.	No visible damage.
Solderability	① Soldering temperature: $240\pm 5^{\circ}\text{C}$ . ② Duration: $3\pm 0.3\text{s}$ . ③ Solder: $96.5\text{wt}\%\text{Sn}/3.0\text{wt}\%\text{Ag}/0.5\text{wt}\%\text{Cu}$ ④ Flux: 25% Rosin and 75% ethanol in weight.	① No visible damage. ② Wetting shall exceed 95% coverage.
Resistance to Soldering Heat	① Soldering temperature: $260\pm 5^{\circ}\text{C}$ . ② Duration: $10\pm 1\text{s}$ . ③ Solder: $96.5\text{wt}\%\text{Sn}/3.0\text{wt}\%\text{Ag}/0.5\text{wt}\%\text{Cu}$ . ④ Flux: 25% Rosin and 75% ethanol in weight. ⑤ The chip shall be stabilized at normal condition for 1~2 hours before measuring.	① No visible damage. ② R25 variation: within $\pm 2\%$ ③ B constant variation: within $\pm 1\%$

### ● Climatic performance

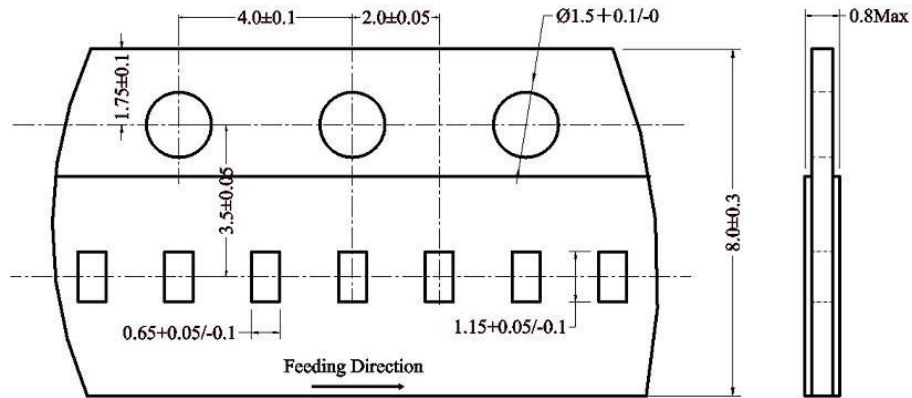
Item	Test Methods and Remarks	Requirements															
Temperature cycling	① 5 cycles of following sequence without load.	① No visible damage. ② R25 variation: within $\pm 2\%$ ③ B constant variation: within $\pm 1\%$															
	<table border="1"> <thead> <tr> <th>Step</th> <th>Temperature</th> <th>Time</th> </tr> </thead> <tbody> <tr> <td>1</td> <td><math>-40\pm 5^{\circ}\text{C}</math></td> <td><math>30\pm 3\text{min}</math></td> </tr> <tr> <td>2</td> <td><math>25\pm 2^{\circ}\text{C}</math></td> <td><math>5\pm 3\text{min}</math></td> </tr> <tr> <td>3</td> <td><math>125\pm 2^{\circ}\text{C}</math></td> <td><math>30\pm 3\text{min}</math></td> </tr> <tr> <td>4</td> <td><math>25\pm 2^{\circ}\text{C}</math></td> <td><math>5\pm 3\text{min}</math></td> </tr> </tbody> </table>		Step	Temperature	Time	1	$-40\pm 5^{\circ}\text{C}$	$30\pm 3\text{min}$	2	$25\pm 2^{\circ}\text{C}$	$5\pm 3\text{min}$	3	$125\pm 2^{\circ}\text{C}$	$30\pm 3\text{min}$	4	$25\pm 2^{\circ}\text{C}$	$5\pm 3\text{min}$
	Step		Temperature	Time													
	1		$-40\pm 5^{\circ}\text{C}$	$30\pm 3\text{min}$													
	2		$25\pm 2^{\circ}\text{C}$	$5\pm 3\text{min}$													
3	$125\pm 2^{\circ}\text{C}$	$30\pm 3\text{min}$															
4	$25\pm 2^{\circ}\text{C}$	$5\pm 3\text{min}$															
② The chip shall be stabilized at normal condition for 1~2 hours before measuring.																	
Thermal Shock	$40^{\circ}\text{C}/30\pm 5\text{min} \rightarrow +125^{\circ}\text{C}/30\pm 5\text{min}$ , transforming interval: 20s, 100 cycles																
Dry heat	① $125\pm 5^{\circ}\text{C}$ in air, for $1000\pm 24$ hours without load. ② The chip shall be stabilized at normal condition for 1~2 hours before measuring.																
Cold	① $-40\pm 3^{\circ}\text{C}$ in air, for $1000\pm 24$ hours without load. ② The chip shall be stabilized at normal condition for 1~2 hours before measuring.																
Damp heat	① $60\pm 2^{\circ}\text{C}$ , 90~95%RH in air, for $1000\pm 24$ hours without load. ② The chip shall be stabilized at normal condition for 1~2 hours before measuring.																
High temperature load	① $85\pm 2^{\circ}\text{C}$ in air with permissive operating current for $1000\pm 48$ hours. ② The chip shall be stabilized at normal condition for 1~2 hours before measuring.																

- The above variation is applicable to products with resistance value  $\geq 10\text{k}\Omega$
- The variation before and after the test of products with a resistance value less than  $10\text{k}\Omega$ : R25 within  $\pm 5\%$ ; B constant: within  $\pm 2\%$ .

**TAPING 包装**

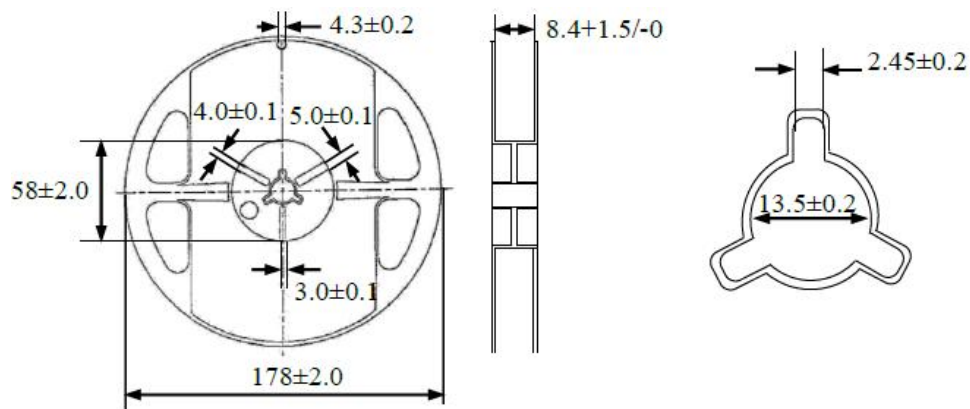
**Paper Taping**

Applicable to EIA 1005 products (Unit:mm)



**Reel Dimensions**

Universal for paper tape and plastic carrier tape



Inch Size (EIA)	Quantity/Reel
0402 (ANTC1005)	10000pcs

**CAUTION/NOTICE 注意事项****● Caution(Storage and Operating Conditions).**

- ☆ This product is designed for application in an ordinary environment (normal room temperature, humidity and atmospheric pressure).
- ☆ Do not use under the following conditions because all of these factors can deteriorate the product characteristics or cause failures and burn-out.
  - 1. Corrosive gas or deoxidizing gas (Chlorine gas, Hydrogen sulfide gas, Ammonia gas, Sulfuric acid gas, Nitric oxide gas, etc.)
  - 2. Volatile or flammable gas
  - 3. Dusty conditions
  - 4. Under vacuum, or under high or low pressure
  - 5. Wet or humid locations
  - 6. Places with salt water, oils, chemical liquids or organic solvents
  - 7. Strong vibrations
  - 8. Other places where similar hazardous conditions exist
- ☆ The ceramic of this product is fragile, and care must be taken not to load an excessive pressure or to cause a shock at handling. Such forces may cause cracking or chipping.
- ☆ Do not apply the power exceeding the 'Rated Electric power.
- ☆ Use this product within the specified temperature range. Higher temperature may cause deterioration of the characteristics or the material quality of this product.
- ☆ Be sure to provide an appropriate fail-safe function on your product to prevent secondary damage that may be caused by the abnormal function or the failure of our product.

**● Notice(Storage).**

- ☆ To keep the solderability of the product from degrading, the following storage conditions are recommended.
- ☆ Storage condition:
  - 1. Storage Temperature:  $-10^{\circ}\text{C} \sim +40^{\circ}\text{C}$
  - 2. Relative Humidity:  $\leq 75\% \text{RH}$  (not dewing condition)
  - 3. Keep away from dust, corrosive atmosphere and sunlight.
- ☆ Storage term:  
Use this product within 6 months after delivery by first-in and first-out stocking system.

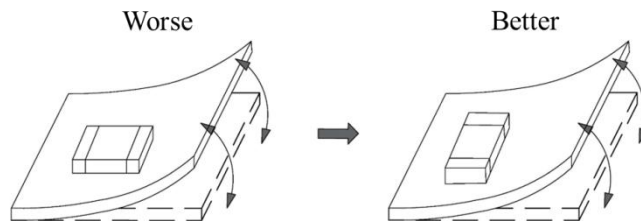
CAUTION/NOTICE 注意事项

● **Notice (Soldering and Mounting)**

☆ Mounting Position

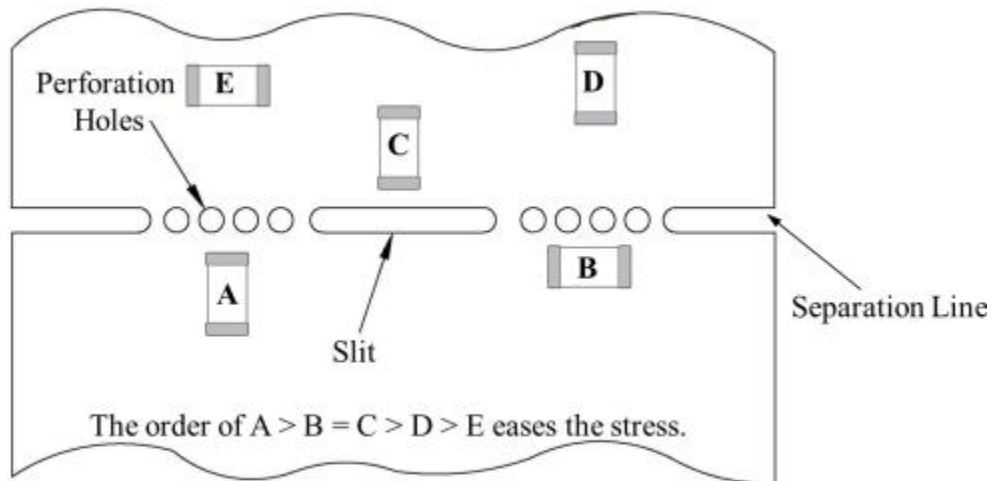
- 1. Choose a mounting position that minimizes the stress imposed on the chip during flexing or bending of the board. The recommendations are shown in the following figure:

**Component Direction**



Locate this product horizontal to the direction in which stress acts.

**When Mounting Close to Board Separation Line**



Put this product on the PC Board near the Slit, not near the Perforation Holes.

Keep this product on the PC Board away from the Separation Line.

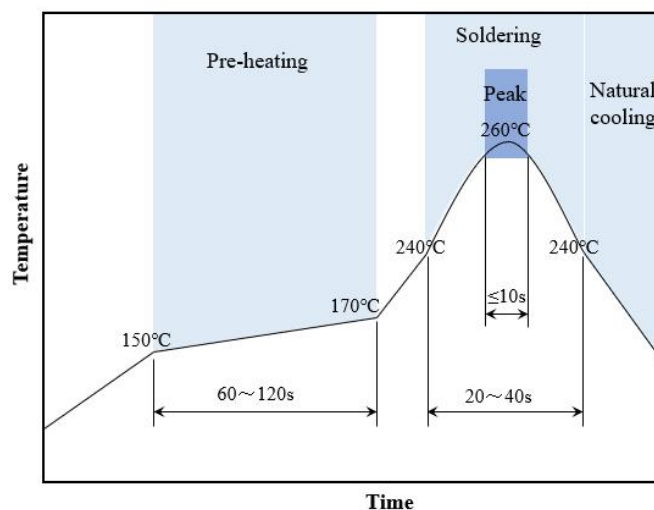
## CAUTION/NOTICE 注意事项

### ● Application to board.

- ☆ Mounting head pressure
- ☆ Under suction nozzle if dead point too, during implementation, excessive force joins of NTC thermistor low, as cause causes of crack, please use with reference to something about following.
  - 1. Being set to top surface of substrate so that under suction nozzle as for dead center, substrate does not bend back, and adjust, please.
  - 2. Nozzle pressure at implementation is 1-3N in static load, please.
  - 3. Substrate fixes up back surface of substrate with support pin in impact of suction nozzle to wely deflection to the utmost, and substrate hold deflection, please
- ☆ Mechanical shock that, if positioning your nail to wear, ragged edge of positionings, participates in NTC thermistor are locally, and NTC thermistor, as there is possibility of crack generated, cut the closed positioning, and maintenance and inspection, and, exchange of manage dimensions and position nail periodically, please.

### ● Soldering.

- ☆ Reflow Soldering
  - 1~2°C/sec. Ramp
  - Pre-heating: 150~170°C/90±30 sec.
- ☆ Insufficient preheating may cause a crack on the ceramic body. The difference between Preheating temperature and the highest temperature in the profile shall be 100°C .
  - Time above 240°C: 20~40 sec.
  - Peak temperature: 260°CMax/10 sec.
  - Solder paste: 96.5wt%Sn/3.0wt%Ag/0.5wt%Cu
  - Flux: Use rosin type flux in the soldering process.
- ☆ If strong acidic flux(with halide content exceeding 0.1wt%) or water-soluble flux(non-rosin type flux including wash-type flux and non-wash-type flux) is used, some problems might be caused in the product characteristics and reliability.



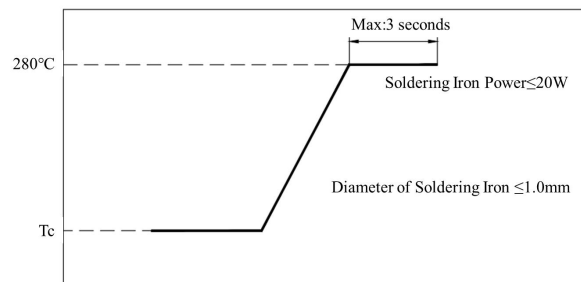
### ● Max.2 times for re-flowing.

- ☆ In case of repeated soldering, the total accumulated soldering time at peak temperature is within 30sec (Including the first time and second time).
- ☆ Cooling: Gradually cooling in air. Rapid cooling by dipping in solvent or by other means is not recommended.
- ☆ Excessive soldering conditions may cause dissolution of metallization or deterioration of solder-wetting on the external electrode.

CAUTION/NOTICE 注意事项

● **Iron Soldering.**

- ☆ Iron soldering power: Max.20W.
- ☆ Pre-heating: 150°C/60sec.
- ☆ Soldering Tip temperature: 280°C Max.
- ☆ Soldering time: 3 sec Max.
- ☆ Solder paste: 96.5wt%Sn/3.0wt%Ag/0.5wt%Cu.
- ☆ Max.1 times for iron soldering [Note: Take care not to apply the tip of the soldering iron to the terminal electrodes.]



● **Printing Conditions of Solder Paste.**

- ☆ The amount of solder is critical . Standard height of fillet is shown in the table below.

	Inch Size	Solder Paste	H
	(EIA)	Thickness	
	0402	150µm	$1/3T \leq H \leq T$

- ☆ Too much solder may cause mechanical stress, resulting in cracking, mechanical and/or electronic damage.

● **Cleaning.**

- ☆ For removing the flux after soldering, observe the following points in order to avoid deterioration of the characteristics or any change of the external electrodes quality.
  - 1.Please keep mounted parts and a substrate from an occurrence of resonance in ultrasonic cleaning.
  - 2.Please do not clean the products in the case of using a non-wash-type flux.

Inch Size (EIA)	0402
Solvent	Isopropyl Alcohol
Dipping Cleaning	Less than 5 min.at room temp. or Less than 2 min. at 40°C max.
Ultrasonic Cleaning	Less than 1 min, 20W/L Frequency of several 28kHz to several 40kHz.

● **Drying.**

- ☆ After cleaning, promptly dry this product.