

Specification of SMD Chips Thermistor

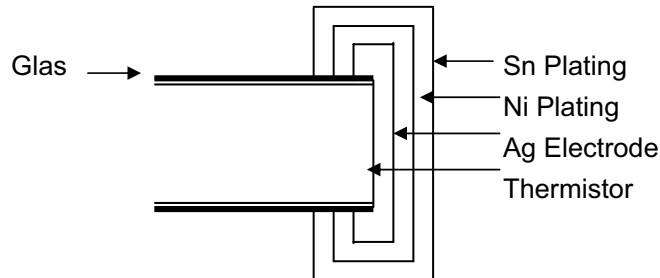
◆ PART NO. : SMD02-220 H 3150 H

◆ CHIP DIMENSIONS



Item	L(mm)	W(mm)	T(mm)	C(mm)
1005 (0402)	1.00 ±0.05	0.50 ±0.05	0.50±0.05	0.25±0.10

◆ CHIP STRUCTURE



◆ ELECTRICAL CHARACTERISTICS

Style	Symbol	Condition	Specification
Resistance at 25°C	R ₂₅	T = 25 ± 0.1°C	100K Ω ± 3 %
B Constant	B	25°C to 85°C	4000 °K ± 1 %
Thermal Time Constant	T	T = 25 ± 0.1°C	Approx. 7.5 sec
Thermal Dissipation Constant	C	T = 25 ± 0.1°C	Approx. 4 mW/°C
Maximum Power Rating*	P _w	T = 25 ± 0.1°C	400 mW
Operation Temp. Range	--	--	-40°C ~ 125°C

*Maximum Power Rating = Thermal Dissipation Constant × (125°C-25°C)

Resistance-Temperature Characteristics

Part No. : SMD02-220 H 3150H

R : 22 ohms ± 3%
B : 3150°K ± 3%

Temperature (°C)	Resistance (Ω)			Temp. Coef. (%/°C)	Resist. Tolerance (%)		Temp. Tolerance (°C)	
	MIN.	CENTER	MAX.		MIN.	MAX.	MIN.	MAX.
-40	331	371	416	-5.52	-10.88	12.11	-2.19	1.97
-39	313	351	393	-5.48	-10.73	11.93	-2.18	1.96
-38	297	332	372	-5.43	-10.59	11.74	-2.16	1.95
-37	282	315	351	-5.38	-10.44	11.56	-2.15	1.94
-36	268	299	333	-5.34	-10.30	11.38	-2.13	1.93
-35	254	283	315	-5.29	-10.16	11.20	-2.12	1.92
-34	242	269	298	-5.25	-10.01	11.03	-2.10	1.91
-33	230	255	283	-5.20	-9.87	10.85	-2.09	1.90
-32	218	242	268	-5.16	-9.73	10.68	-2.07	1.89
-31	208	230	254	-5.12	-9.59	10.51	-2.05	1.87
-30	198	218	241	-5.08	-9.45	10.34	-2.04	1.86
-29	188	208	229	-5.04	-9.32	10.18	-2.02	1.85
-28	179	198	217	-5.00	-9.18	10.01	-2.00	1.84
-27	171	188	206	-4.96	-9.05	9.85	-1.99	1.83
-26	163	179	196	-4.92	-8.91	9.68	-1.97	1.81
-25	155	170	187	-4.88	-8.78	9.52	-1.95	1.80
-24	148	162	177	-4.84	-8.64	9.36	-1.93	1.79
-23	141	155	169	-4.80	-8.51	9.20	-1.92	1.77
-22	135	147	161	-4.76	-8.38	9.05	-1.90	1.76
-21	129	141	153	-4.73	-8.25	8.89	-1.88	1.74
-20	123	134	146	-4.69	-8.12	8.74	-1.86	1.73
-19	118	128	139	-4.66	-7.99	8.59	-1.84	1.72
-18	113	122	132	-4.62	-7.86	8.44	-1.83	1.70
-17	108	117	126	-4.59	-7.74	8.29	-1.81	1.69
-16	103	111	121	-4.55	-7.61	8.14	-1.79	1.67
-15	99	107	115	-4.52	-7.48	7.99	-1.77	1.66
-14	94	102	110	-4.48	-7.36	7.85	-1.75	1.64
-13	90	97	105	-4.45	-7.23	7.70	-1.73	1.63
-12	87	93	100	-4.42	-7.11	7.56	-1.71	1.61
-11	83	89	96	-4.39	-6.99	7.42	-1.69	1.59
-10	79	85	92	-4.35	-6.87	7.27	-1.67	1.58

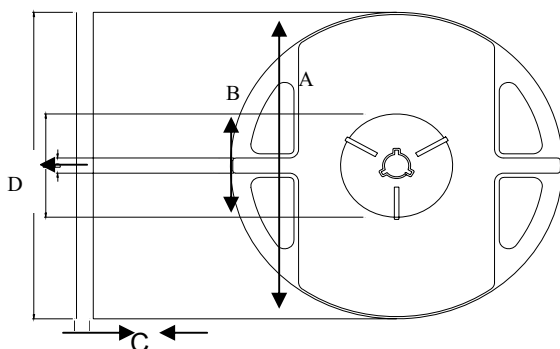
-9	76	82	88	-4.32	-6.74	7.14	-1.65	1.56
-8	73	78	84	-4.29	-6.62	7.00	-1.63	1.54
-7	70	75	80	-4.26	-6.50	6.86	-1.61	1.53
-6	67	72	77	-4.23	-6.38	6.72	-1.59	1.51
-5	65	69	73	-4.20	-6.27	6.59	-1.57	1.49
-4	62	66	70	-4.17	-6.15	6.46	-1.55	1.47
-3	60	63	67	-4.14	-6.03	6.32	-1.53	1.46
-2	57	61	65	-4.11	-5.91	6.19	-1.50	1.44
-1	55	58	62	-4.09	-5.80	6.06	-1.48	1.42
0	53	56	59	-4.06	-5.68	5.93	-1.46	1.40
1	51	54	57	-4.03	-5.57	5.80	-1.44	1.38
2	49	52	55	-4.00	-5.46	5.67	-1.42	1.36
3	47	50	52	-3.98	-5.34	5.55	-1.40	1.34
4	45	48	50	-3.95	-5.23	5.42	-1.37	1.32
5	44	46	48	-3.92	-5.12	5.30	-1.35	1.30
6	42	44	46	-3.90	-5.01	5.18	-1.33	1.28
7	40	42	45	-3.87	-4.90	5.05	-1.31	1.26
8	39	41	43	-3.85	-4.79	4.93	-1.28	1.24
9	37	39	41	-3.82	-4.68	4.81	-1.26	1.22
10	36	38	40	-3.79	-4.57	4.69	-1.24	1.20
11	35	36	38	-3.77	-4.46	4.57	-1.21	1.18
12	34	35	37	-3.75	-4.35	4.45	-1.19	1.16
13	32	34	35	-3.72	-4.24	4.34	-1.17	1.14
14	31	33	34	-3.70	-4.14	4.22	-1.14	1.12
15	30	31	33	-3.67	-4.03	4.11	-1.12	1.10
16	29	30	31	-3.65	-3.93	3.99	-1.09	1.08
17	28	29	30	-3.63	-3.82	3.88	-1.07	1.05
18	27	28	29	-3.61	-3.72	3.77	-1.04	1.03
19	26	27	28	-3.58	-3.61	3.65	-1.02	1.01
20	25	26	27	-3.56	-3.51	3.54	-1.00	0.99
21	24	25	26	-3.54	-3.41	3.43	-0.97	0.96
22	24	24	25	-3.52	-3.30	3.32	-0.95	0.94
23	23	24	24	-3.49	-3.20	3.21	-0.92	0.92
24	22	23	23	-3.47	-3.10	3.11	-0.89	0.89
25	21	22	23	-3.45	-3.00	3.00	-0.87	0.87
26	21	21	22	-3.43	-3.10	3.11	-0.91	0.90
27	20	21	21	-3.41	-3.20	3.21	-0.94	0.94
28	19	20	21	-3.39	-3.30	3.32	-0.98	0.97
29	19	19	20	-3.37	-3.40	3.42	-1.02	1.01
30	18	19	19	-3.35	-3.49	3.53	-1.05	1.04
31	17	18	19	-3.33	-3.59	3.63	-1.09	1.08

32	17	17	18	-3.31	-3.69	3.73	-1.13	1.11
33	16	17	17	-3.29	-3.78	3.84	-1.17	1.15
34	16	16	17	-3.27	-3.88	3.94	-1.20	1.18
35	15	16	16	-3.25	-3.97	4.04	-1.24	1.22
36	15	15	16	-3.23	-4.06	4.14	-1.28	1.26
37	14	15	15	-3.21	-4.16	4.24	-1.32	1.29
38	14	14	15	-3.20	-4.25	4.34	-1.36	1.33
39	13	14	14	-3.18	-4.34	4.44	-1.40	1.37
40	13	13	14	-3.16	-4.43	4.54	-1.44	1.40
41	12	13	14	-3.14	-4.52	4.64	-1.48	1.44
42	12	13	13	-3.12	-4.61	4.74	-1.52	1.48
43	12	12	13	-3.11	-4.70	4.84	-1.56	1.51
44	11	12	12	-3.09	-4.79	4.93	-1.60	1.55
45	11	11	12	-3.07	-4.88	5.03	-1.64	1.59
46	11	11	12	-3.05	-4.96	5.13	-1.68	1.63
47	10	11	11	-3.04	-5.05	5.22	-1.72	1.66
48	10	10	11	-3.02	-5.14	5.32	-1.76	1.70
49	10	10	11	-3.00	-5.22	5.41	-1.80	1.74
50	9	10	10	-2.99	-5.31	5.51	-1.85	1.78
51	9	10	10	-2.97	-5.39	5.60	-1.89	1.82
52	9	9	10	-2.95	-5.48	5.70	-1.93	1.85
53	9	9	10	-2.94	-5.56	5.79	-1.97	1.89
54	8	9	9	-2.92	-5.64	5.88	-2.01	1.93
55	8	9	9	-2.91	-5.72	5.98	-2.06	1.97
56	8	8	9	-2.89	-5.81	6.07	-2.10	2.01
57	8	8	9	-2.87	-5.89	6.16	-2.14	2.05
58	7	8	8	-2.86	-5.97	6.25	-2.19	2.09
59	7	8	8	-2.84	-6.05	6.34	-2.23	2.13
60	7	7	8	-2.83	-6.13	6.43	-2.27	2.17
61	7	7	8	-2.81	-6.21	6.52	-2.32	2.21
62	7	7	7	-2.80	-6.29	6.61	-2.36	2.25
63	6	7	7	-2.78	-6.37	6.70	-2.41	2.29
64	6	7	7	-2.77	-6.44	6.79	-2.45	2.33
65	6	6	7	-2.75	-6.52	6.88	-2.50	2.37
66	6	6	7	-2.74	-6.60	6.97	-2.54	2.41
67	6	6	7	-2.73	-6.67	7.06	-2.59	2.45
68	6	6	6	-2.71	-6.75	7.14	-2.63	2.49
69	5	6	6	-2.70	-6.83	7.23	-2.68	2.53
70	5	6	6	-2.68	-6.90	7.32	-2.73	2.57
71	5	5	6	-2.67	-6.98	7.40	-2.77	2.61
72	5	5	6	-2.66	-7.05	7.49	-2.82	2.65

73	5	5	6	-2.64	-7.12	7.57	-2.87	2.70
74	5	5	5	-2.63	-7.20	7.66	-2.91	2.74
75	5	5	5	-2.62	-7.27	7.74	-2.96	2.78
76	4	5	5	-2.60	-7.34	7.83	-3.01	2.82
77	4	5	5	-2.59	-7.42	7.91	-3.05	2.86
78	4	5	5	-2.58	-7.49	8.00	-3.10	2.91
79	4	4	5	-2.56	-7.56	8.08	-3.15	2.95
80	4	4	5	-2.55	-7.63	8.16	-3.20	2.99
81	4	4	5	-2.54	-7.70	8.25	-3.25	3.03
82	4	4	4	-2.53	-7.77	8.33	-3.30	3.08
83	4	4	4	-2.51	-7.84	8.41	-3.34	3.12
84	4	4	4	-2.50	-7.91	8.49	-3.39	3.16
85	3	4	4	-2.49	-7.98	8.57	-3.44	3.20
86	3	4	4	-2.48	-8.05	8.65	-3.49	3.25
87	3	4	4	-2.47	-8.12	8.73	-3.54	3.29
88	3	4	4	-2.45	-8.18	8.81	-3.59	3.34
89	3	3	4	-2.44	-8.25	8.89	-3.64	3.38
90	3	3	4	-2.43	-8.32	8.97	-3.69	3.42
91	3	3	4	-2.42	-8.38	9.05	-3.74	3.47
92	3	3	3	-2.41	-8.45	9.13	-3.79	3.51
93	3	3	3	-2.39	-8.52	9.21	-3.85	3.56
94	3	3	3	-2.38	-8.58	9.29	-3.90	3.60
95	3	3	3	-2.37	-8.65	9.37	-3.95	3.65
96	3	3	3	-2.36	-8.71	9.44	-4.00	3.69
97	3	3	3	-2.35	-8.78	9.52	-4.05	3.73
98	3	3	3	-2.34	-8.84	9.60	-4.10	3.78
99	2	3	3	-2.33	-8.90	9.68	-4.16	3.83
100	2	3	3	-2.32	-8.97	9.75	-4.21	3.87
101	2	3	3	-2.31	-9.03	9.83	-4.26	3.92
102	2	3	3	-2.30	-9.09	9.90	-4.31	3.96
103	2	2	3	-2.28	-9.16	9.98	-4.37	4.01
104	2	2	3	-2.27	-9.22	10.05	-4.42	4.05
105	2	2	3	-2.26	-9.28	10.13	-4.48	4.10
106	2	2	3	-2.25	-9.34	10.20	-4.53	4.15
107	2	2	2	-2.24	-9.40	10.28	-4.58	4.19
108	2	2	2	-2.23	-9.46	10.35	-4.64	4.24
109	2	2	2	-2.22	-9.52	10.43	-4.69	4.29
110	2	2	2	-2.21	-9.58	10.50	-4.75	4.33
111	2	2	2	-2.20	-9.64	10.57	-4.80	4.38
112	2	2	2	-2.19	-9.70	10.65	-4.86	4.43
113	2	2	2	-2.18	-9.76	10.72	-4.91	4.47

114	2	2	2	-2.17	-9.82	10.79	-4.97	4.52
115	2	2	2	-2.16	-9.88	10.86	-5.02	4.57
116	2	2	2	-2.15	-9.94	10.94	-5.08	4.62
117	2	2	2	-2.14	-10.00	11.01	-5.14	4.66
118	2	2	2	-2.13	-10.05	11.08	-5.19	4.71
119	2	2	2	-2.12	-10.11	11.15	-5.25	4.76
120	2	2	2	-2.11	-10.17	11.22	-5.30	4.81
121	1	2	2	-2.11	-10.23	11.29	-5.36	4.86
122	1	2	2	-2.10	-10.28	11.36	-5.42	4.90
123	1	2	2	-2.09	-10.34	11.43	-5.48	4.95
124	1	2	2	-2.08	-10.39	11.50	-5.53	5.00
125	1	2	2	-2.07	-10.45	11.57	-5.59	5.05

◆ REEL DIMENSIONS



Unit: mm

Item	A	B	C	D
Dimension	178.0 ±1.0	60.0 ±1.0	9.0 ±0.1	13.0 ±0.1

◆ ORDERING INFORMATION

SMD 02 220 H 3150 H
 ① ② ③ ④ ⑤ ⑥

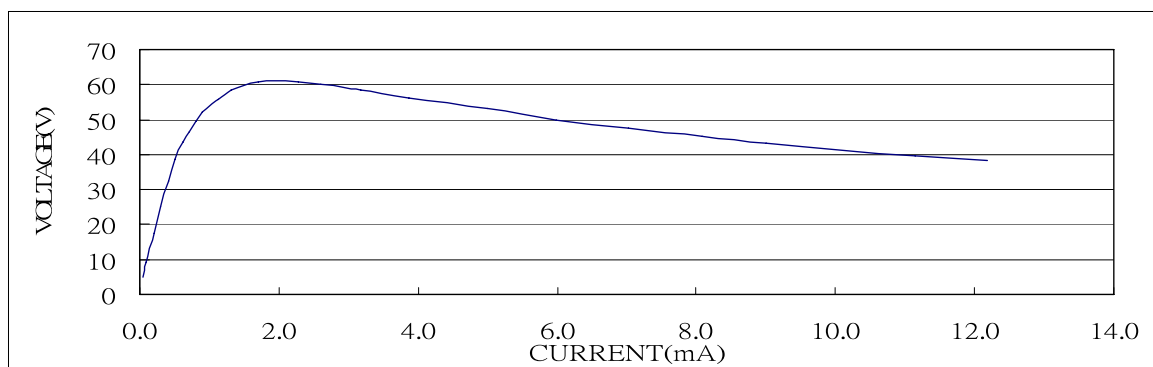
1. Series : SMD Thermistor. (TH - Lead (Pb) ; TF – Lead Free)
2. Dimension : 06 (1206) , 05 (0805) , 03 (0603) , 02 (0402)
3. Resistance : 104 = $10 \times 10^4 = 100,000$ ohm
4. R Tolerance : F:±1% ; G:±2% ; H:±3% ; J:±5% ; K:±10%
5. B value : 3215, 3435, 3700, 7970, 4000, 4100,.....etc.
6. B Tolerance : F:±1% ; G:±2% ; H:±3%

● ACCESSORY : RESISTANCE-TEMPERATURE CHARACTERISTICS

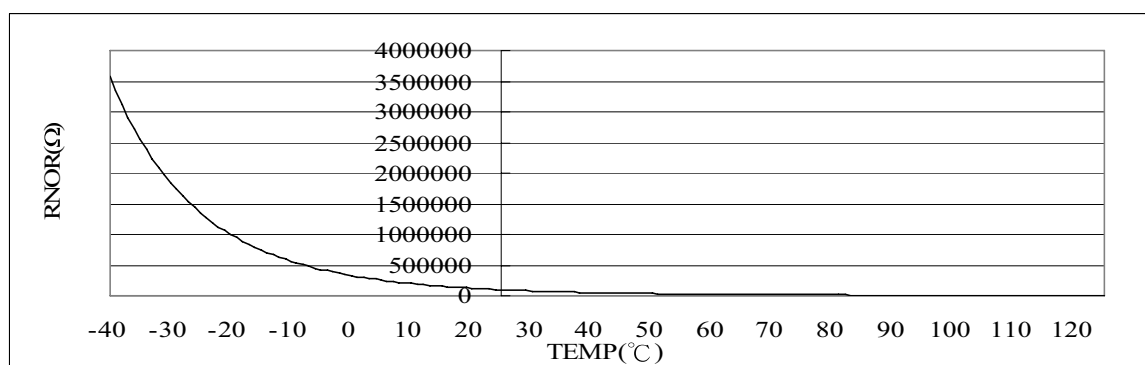
◆ RELIABILITY TEST

PERFORMANCE	TEST METHOD	APPRAISE
Life	MIL – STD – 202F , Method 108A 1000 hours at 125°C NTC WV intermittent	Within ±3 %
Humidity	MIL – STD – 202F , Method 103B 1000 hours at Temperature: 40°C Humidity: 95%	Within ±3 %
Thermal Shock	MIL – STD – 202F , Method 107 10 cycles, -40°C to +125°C	Within ±3 %
Solderability	MIL – STD – 202F , Method 208 235°C for 2 seconds	95% min. coverage
Resistance to Soldering Heat	MIL – R – 55342D , Para 4.7.7 Soldered to test board at 260°C for 10 seconds	Within ±3 %
Bending Strength	JIS C 5202 6.1.4 Pressurizing rod at a rate at 1mm/sec for 1mm	Within ±3 %
Resistance to flexure of Substrate	JIS C 5202 6.2.1 Pressurizing force shall be 3kg (min.)	Over 3 kg
Insulation Resistance	MIL – STD – 202F , Method 302 DC 250V For 10 seconds	Over 1000MΩ
Dielectric Withstand Voltage	MIL – STD – 202F , Method 301 DC 250V For 10 seconds	Not Short

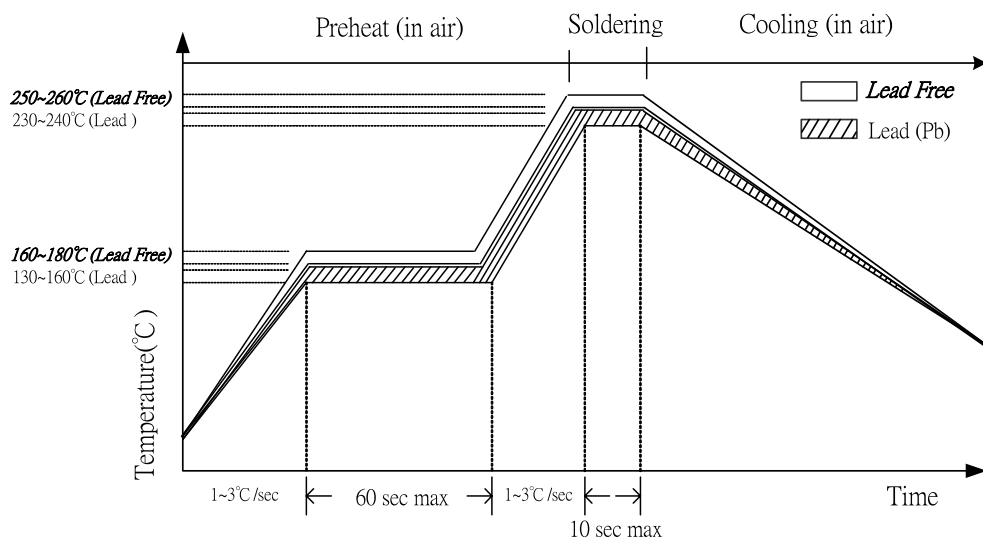
◆ VOLTAGE – CURRENT CURVE



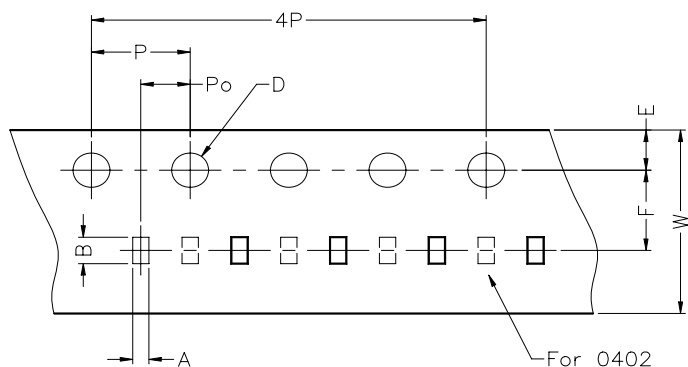
◆ RESISTANCE – TEMP CURVE



◆ REFLOW SOLDERING PROFILE



◆ TAPING DIMENSIONS



Unit: mm

Dimension	1206	0805	0603	0402
A	2.00 ± 0.05	1.50 ± 0.05	1.08 ± 0.05	0.66 ± 0.03
B	3.57 ± 0.05	2.30 ± 0.05	1.85 ± 0.05	1.15 ± 0.03
W	8.00 ± 0.02	8.00 ± 0.05	8.00 ± 0.05	8.00 ± 0.05
D	1.55 ± 0.05	1.50 ± 0.10	1.50 ± 0.10	1.50 ± 0.10
E	1.75 ± 0.10	1.75 ± 0.05	1.75 ± 0.05	1.75 ± 0.05
F	3.50 ± 0.05	3.50 ± 0.05	3.50 ± 0.05	3.50 ± 0.05
P	4.00 ± 0.10	4.00 ± 0.05	4.00 ± 0.05	4.00 ± 0.05
Po	2.00 ± 0.05	2.00 ± 0.05	2.00 ± 0.05	2.00 ± 0.05
4P	16.00 ± 0.05	16.00 ± 0.05	16.00 ± 0.05	16.00 ± 0.05