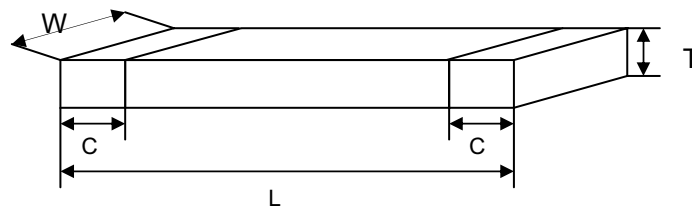


SMD NTC THERMISTOR

Specification of SMD Chips Thermistor

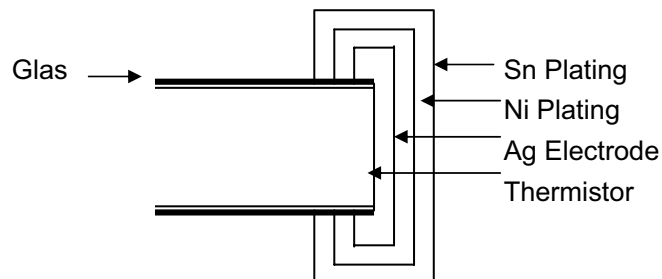
◆ PART NO. : SMD02-104 F4050F

◆ 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)

SMD NTC THERMISTOR

Resistance-Temperature Characteristics

Part No. : SMD02-104 F 4050F

R : 100,000 ohms $\pm$ **1%**
B : 4050 °K $\pm$ **1%**

Temperature (°C)	Resistance (Ω)			Temp. Coef. (%/°C)	Resist. Tolerance (%)		Temp. Tolerance (°C)	
	MIN.	CENTER	MAX.		MIN.	MAX.	MIN.	MAX.
-40	3063873	3204000	3350201	-6.79	-4.37	4.56	-0.67	0.64
-39	2865526	2994556	3129083	-6.73	-4.31	4.49	-0.67	0.64
-38	2681736	2800615	2924471	-6.66	-4.24	4.42	-0.66	0.64
-37	2511308	2620893	2734986	-6.60	-4.18	4.35	-0.66	0.63
-36	2353153	2454223	2559379	-6.54	-4.12	4.28	-0.66	0.63
-35	2206281	2299546	2396513	-6.48	-4.06	4.22	-0.65	0.63
-34	2069791	2155895	2245356	-6.42	-3.99	4.15	-0.65	0.62
-33	1942861	2022391	2104966	-6.36	-3.93	4.08	-0.64	0.62
-32	1824741	1898233	1974487	-6.31	-3.87	4.02	-0.64	0.61
-31	1714746	1782688	1853137	-6.25	-3.81	3.95	-0.63	0.61
-30	1612252	1675090	1740203	-6.20	-3.75	3.89	-0.63	0.61
-29	1516685	1574825	1635031	-6.15	-3.69	3.82	-0.62	0.60
-28	1427521	1481337	1537028	-6.09	-3.63	3.76	-0.62	0.60
-27	1344281	1394113	1445647	-6.04	-3.57	3.70	-0.61	0.59
-26	1266524	1312683	1360388	-5.99	-3.52	3.63	-0.61	0.59
-25	1193846	1236618	1280794	-5.94	-3.46	3.57	-0.60	0.58
-24	1125877	1165523	1206445	-5.90	-3.40	3.51	-0.60	0.58
-23	1062274	1099035	1136955	-5.85	-3.34	3.45	-0.59	0.57
-22	1002726	1036821	1071969	-5.80	-3.29	3.39	-0.58	0.57
-21	946941	978574	1011163	-5.76	-3.23	3.33	-0.58	0.56
-20	894656	924012	954236	-5.72	-3.18	3.27	-0.57	0.56
-19	845624	872874	900912	-5.67	-3.12	3.21	-0.57	0.55
-18	799620	824921	850938	-5.63	-3.07	3.15	-0.56	0.54
-17	756434	779932	804079	-5.59	-3.01	3.10	-0.55	0.54
-16	715875	737701	760118	-5.55	-2.96	3.04	-0.55	0.53
-15	677763	698041	718855	-5.51	-2.91	2.98	-0.54	0.53
-14	641933	660778	680107	-5.47	-2.85	2.93	-0.54	0.52
-13	608235	625749	643703	-5.43	-2.80	2.87	-0.53	0.52
-12	576525	592805	609484	-5.39	-2.75	2.81	-0.52	0.51
-11	546673	561808	577305	-5.35	-2.69	2.76	-0.52	0.50



SMD NTC THERMISTOR

-10	518558	532631	547031	-5.31	-2.64	2.70	-0.51	0.50
-9	492067	505153	518536	-5.28	-2.59	2.65	-0.50	0.49
-8	467095	479265	491703	-5.24	-2.54	2.60	-0.49	0.48
-7	443546	454865	466426	-5.21	-2.49	2.54	-0.49	0.48
-6	421330	431857	442604	-5.17	-2.44	2.49	-0.48	0.47
-5	400361	410153	420143	-5.14	-2.39	2.44	-0.47	0.46
-4	380563	389671	398957	-5.11	-2.34	2.38	-0.47	0.46
-3	361862	370334	378967	-5.07	-2.29	2.33	-0.46	0.45
-2	344191	352071	360096	-5.04	-2.24	2.28	-0.45	0.44
-1	327487	334817	342276	-5.01	-2.19	2.23	-0.44	0.44
0	311691	318508	325441	-4.98	-2.14	2.18	-0.44	0.43
1	296748	303087	309531	-4.95	-2.09	2.13	-0.43	0.42
2	282606	288501	294490	-4.92	-2.04	2.08	-0.42	0.42
3	269219	274700	280265	-4.89	-2.00	2.03	-0.41	0.41
4	256541	261637	266807	-4.86	-1.95	1.98	-0.41	0.40
5	244531	249267	254070	-4.83	-1.90	1.93	-0.40	0.39
6	233149	237551	242011	-4.80	-1.85	1.88	-0.39	0.39
7	222360	226449	230591	-4.77	-1.81	1.83	-0.38	0.38
8	212128	215927	219771	-4.74	-1.76	1.78	-0.38	0.37
9	202423	205950	209517	-4.72	-1.71	1.73	-0.37	0.36
10	193213	196487	199797	-4.69	-1.67	1.68	-0.36	0.36
11	184471	187509	190579	-4.66	-1.62	1.64	-0.35	0.35
12	176170	178989	181834	-4.64	-1.57	1.59	-0.34	0.34
13	168287	170900	173536	-4.61	-1.53	1.54	-0.33	0.33
14	160796	163218	165660	-4.59	-1.48	1.50	-0.33	0.32
15	153678	155921	158182	-4.56	-1.44	1.45	-0.32	0.32
16	146911	148988	151079	-4.54	-1.39	1.40	-0.31	0.31
17	140476	142398	144331	-4.51	-1.35	1.36	-0.30	0.30
18	134356	136132	137918	-4.49	-1.30	1.31	-0.29	0.29
19	128532	130173	131822	-4.46	-1.26	1.27	-0.28	0.28
20	122990	124505	126026	-4.44	-1.22	1.22	-0.28	0.27
21	117714	119111	120512	-4.42	-1.17	1.18	-0.27	0.27
22	112689	113977	115267	-4.39	-1.13	1.13	-0.26	0.26
23	107904	109089	110276	-4.37	-1.09	1.09	-0.25	0.25
24	103345	104434	105524	-4.35	-1.04	1.04	-0.24	0.24
25	99000	100000	101000	-4.33	-1.00	1.00	-0.23	0.23
26	94777	95775	96775	-4.31	-1.04	1.04	-0.24	0.24
27	90753	91749	92746	-4.28	-1.09	1.09	-0.25	0.25
28	86919	87910	88904	-4.26	-1.13	1.13	-0.27	0.26
29	83265	84250	85239	-4.24	-1.17	1.17	-0.28	0.28
30	79781	80759	81742	-4.22	-1.21	1.22	-0.29	0.29

SMD NTC THERMISTOR

31	76459	77429	78404	-4.20	-1.25	1.26	-0.30	0.30
32	73291	74252	75218	-4.18	-1.29	1.30	-0.31	0.31
33	70267	71219	72175	-4.16	-1.34	1.34	-0.32	0.32
34	67383	68323	69270	-4.14	-1.38	1.39	-0.33	0.33
35	64629	65558	66494	-4.12	-1.42	1.43	-0.35	0.34
36	62000	62918	63842	-4.10	-1.46	1.47	-0.36	0.36
37	59490	60395	61307	-4.08	-1.50	1.51	-0.37	0.37
38	57092	57984	58884	-4.06	-1.54	1.55	-0.38	0.38
39	54802	55680	56568	-4.04	-1.58	1.59	-0.39	0.39
40	52613	53478	54352	-4.03	-1.62	1.63	-0.41	0.40
41	50521	51372	52233	-4.01	-1.66	1.67	-0.42	0.41
42	48521	49359	50205	-3.99	-1.70	1.72	-0.43	0.43
43	46609	47432	48265	-3.97	-1.74	1.76	-0.44	0.44
44	44780	45589	46408	-3.95	-1.77	1.80	-0.45	0.45
45	43031	43826	44630	-3.94	-1.81	1.84	-0.47	0.46
46	41357	42137	42928	-3.92	-1.85	1.88	-0.48	0.47
47	39756	40521	41298	-3.90	-1.89	1.92	-0.49	0.48
48	38223	38974	39737	-3.88	-1.93	1.96	-0.50	0.50
49	36755	37492	38240	-3.87	-1.97	2.00	-0.52	0.51
50	35350	36073	36807	-3.85	-2.00	2.04	-0.53	0.52
51	34004	34713	35433	-3.83	-2.04	2.07	-0.54	0.53
52	32715	33410	34116	-3.82	-2.08	2.11	-0.55	0.54
53	31480	32161	32853	-3.80	-2.12	2.15	-0.57	0.56
54	30296	30963	31642	-3.79	-2.15	2.19	-0.58	0.57
55	29162	29815	30480	-3.77	-2.19	2.23	-0.59	0.58
56	28075	28714	29366	-3.75	-2.23	2.27	-0.60	0.59
57	27032	27659	28296	-3.74	-2.26	2.31	-0.62	0.61
58	26033	26646	27270	-3.72	-2.30	2.34	-0.63	0.62
59	25074	25674	26286	-3.71	-2.34	2.38	-0.64	0.63
60	24154	24741	25340	-3.69	-2.37	2.42	-0.66	0.64
61	23272	23846	24432	-3.68	-2.41	2.46	-0.67	0.66
62	22425	22987	23561	-3.66	-2.44	2.50	-0.68	0.67
63	21612	22162	22723	-3.65	-2.48	2.53	-0.69	0.68
64	20832	21370	21919	-3.63	-2.52	2.57	-0.71	0.69
65	20083	20609	21146	-3.62	-2.55	2.61	-0.72	0.71
66	19364	19878	20403	-3.60	-2.59	2.64	-0.73	0.72
67	18673	19175	19690	-3.59	-2.62	2.68	-0.75	0.73
68	18009	18501	19004	-3.58	-2.66	2.72	-0.76	0.74
69	17372	17852	18344	-3.56	-2.69	2.76	-0.77	0.76
70	16759	17229	17710	-3.55	-2.73	2.79	-0.79	0.77
71	16170	16629	17100	-3.53	-2.76	2.83	-0.80	0.78

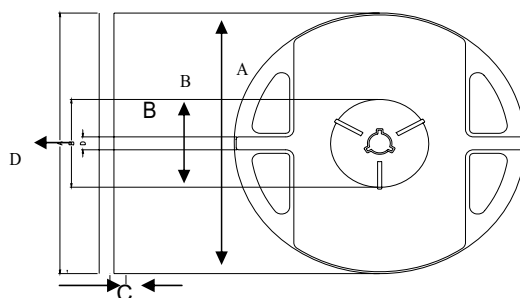
SMD NTC THERMISTOR

72	15605	16053	16513	-3.52	-2.79	2.86	-0.81	0.79
73	15061	15499	15949	-3.51	-2.83	2.90	-0.83	0.81
74	14538	14966	15406	-3.49	-2.86	2.94	-0.84	0.82
75	14035	14453	14883	-3.48	-2.90	2.97	-0.85	0.83
76	13551	13960	14380	-3.47	-2.93	3.01	-0.87	0.85
77	13086	13485	13896	-3.45	-2.96	3.04	-0.88	0.86
78	12638	13029	13430	-3.44	-3.00	3.08	-0.90	0.87
79	12207	12589	12981	-3.43	-3.03	3.11	-0.91	0.88
80	11793	12166	12549	-3.41	-3.06	3.15	-0.92	0.90
81	11394	11758	12133	-3.40	-3.10	3.19	-0.94	0.91
82	11010	11366	11732	-3.39	-3.13	3.22	-0.95	0.92
83	10640	10988	11345	-3.38	-3.16	3.26	-0.96	0.94
84	10284	10624	10973	-3.36	-3.19	3.29	-0.98	0.95
85	9941	10273	10615	-3.35	-3.23	3.32	-0.99	0.96
86	9611	9935	10269	-3.34	-3.26	3.36	-1.01	0.98
87	9293	9609	9936	-3.33	-3.29	3.39	-1.02	0.99
88	8987	9296	9614	-3.31	-3.32	3.43	-1.03	1.00
89	8691	8993	9305	-3.30	-3.36	3.46	-1.05	1.02
90	8407	8702	9006	-3.29	-3.39	3.50	-1.06	1.03
91	8133	8421	8718	-3.28	-3.42	3.53	-1.08	1.04
92	7868	8149	8440	-3.27	-3.45	3.56	-1.09	1.06
93	7613	7888	8172	-3.25	-3.48	3.60	-1.11	1.07
94	7368	7636	7913	-3.24	-3.51	3.63	-1.12	1.08
95	7131	7393	7664	-3.23	-3.55	3.67	-1.13	1.10
96	6902	7158	7423	-3.22	-3.58	3.70	-1.15	1.11
97	6682	6932	7190	-3.21	-3.61	3.73	-1.16	1.12
98	6469	6713	6966	-3.20	-3.64	3.77	-1.18	1.14
99	6264	6502	6749	-3.19	-3.67	3.80	-1.19	1.15
100	6066	6299	6540	-3.17	-3.70	3.83	-1.21	1.17
101	5875	6102	6338	-3.16	-3.73	3.86	-1.22	1.18
102	5690	5913	6143	-3.15	-3.76	3.90	-1.24	1.19
103	5512	5729	5955	-3.14	-3.79	3.93	-1.25	1.21
104	5340	5553	5773	-3.13	-3.82	3.96	-1.27	1.22
105	5174	5382	5597	-3.12	-3.85	3.99	-1.28	1.23
106	5014	5217	5427	-3.11	-3.88	4.03	-1.30	1.25
107	4859	5057	5263	-3.10	-3.91	4.06	-1.31	1.26
108	4710	4903	5104	-3.09	-3.94	4.09	-1.33	1.28
109	4566	4754	4950	-3.08	-3.97	4.12	-1.34	1.29
110	4426	4611	4802	-3.07	-4.00	4.16	-1.36	1.30
111	4291	4472	4659	-3.06	-4.03	4.19	-1.37	1.32
112	4161	4337	4520	-3.05	-4.06	4.22	-1.39	1.33

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113	4035	4207	4386	-3.04	-4.09	4.25	-1.40	1.35
114	3914	4082	4257	-3.03	-4.12	4.28	-1.42	1.36
115	3796	3960	4131	-3.02	-4.15	4.31	-1.43	1.37
116	3682	3843	4010	-3.01	-4.17	4.35	-1.45	1.39
117	3573	3729	3893	-3.00	-4.20	4.38	-1.46	1.40
118	3466	3619	3779	-2.99	-4.23	4.41	-1.48	1.42
119	3363	3513	3669	-2.98	-4.26	4.44	-1.49	1.43
120	3264	3410	3563	-2.97	-4.29	4.47	-1.51	1.45
121	3168	3311	3460	-2.96	-4.32	4.50	-1.52	1.46
122	3075	3215	3360	-2.95	-4.35	4.53	-1.54	1.48
123	2985	3121	3264	-2.94	-4.37	4.56	-1.55	1.49
124	2898	3031	3171	-2.93	-4.40	4.59	-1.57	1.50
125	2814	2944	3080	-2.92	-4.43	4.62	-1.59	1.52

◆ 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 02 104 F 4050 F
 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%

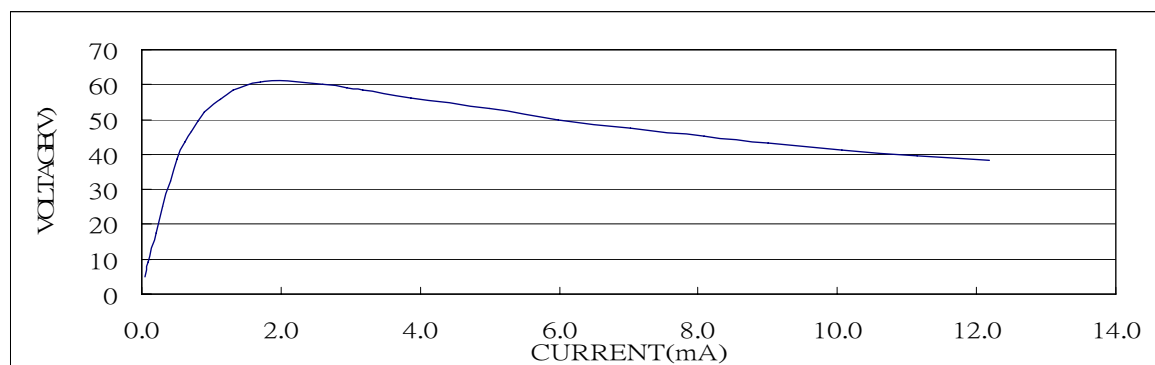
● ACCESSORY : RESISTANCE-TEMPERATURE CHARACTERISTICS

SMD NTC THERMISTOR

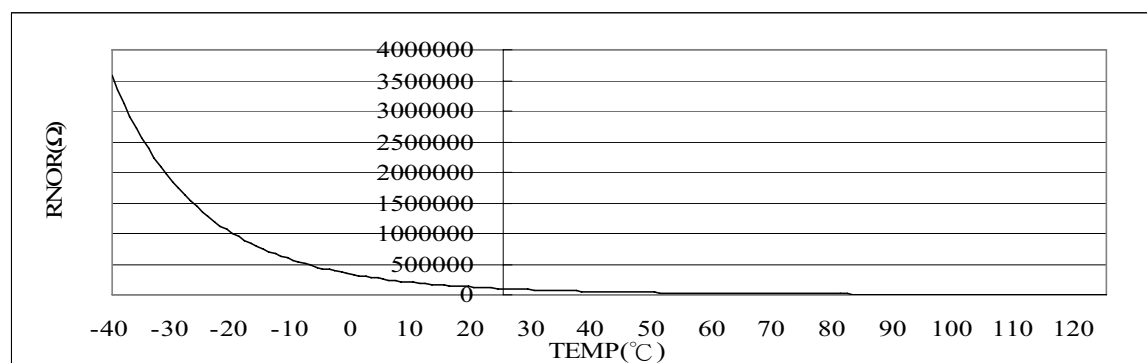
◆ RELIABILITY TEST

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 1000M Ω
Dielectric Withstand Voltage	MIL – STD – 202F , Method 301 DC 250V For 10 seconds	Not Short

◆ VOLTAGE – CURRENT CURVE

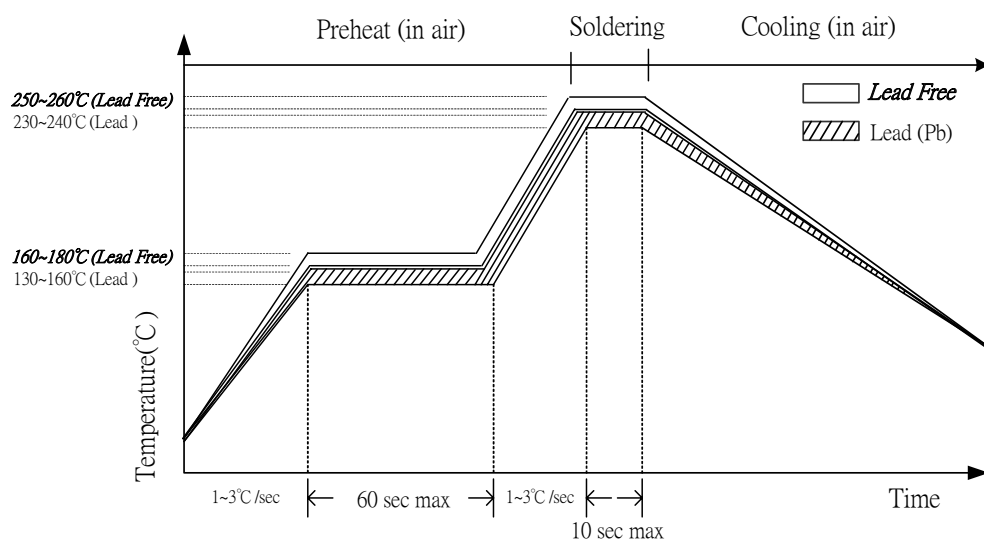


◆ RESISTANCE – TEMP CURVE

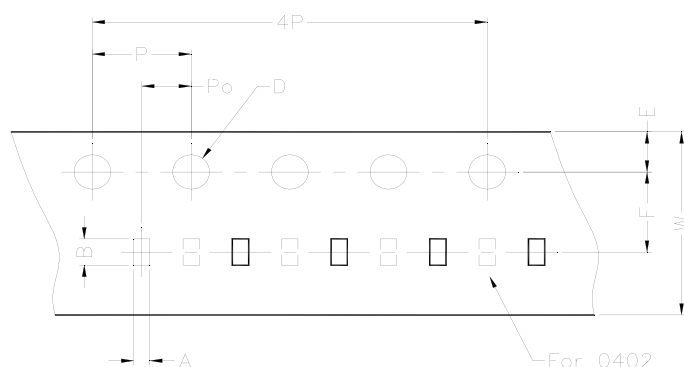


SMD NTC THERMISTOR

◆ 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