



DESCRIPTION

NTC thermistor is Negative Temperature Coefficient of Thermal resistor.

A thermistor is a thermally sensitive resistor whose primary function is to exhibit a change in electrical resistance with a change in body temperature.

NTC thermistor is one in which the zero-power resistance decreases with an increase in temperature.

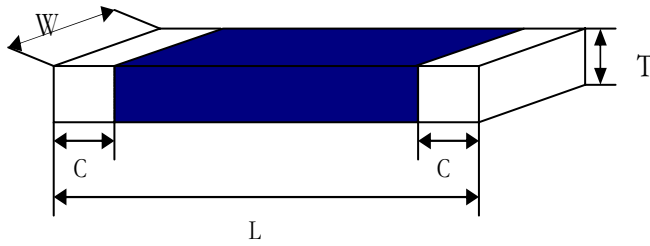
FEATURES

- Small Size, Low Capacitance at 40 MHz (below 3pF)
- Corresponding to the high B value.
- Glass coated perform for long term reliability
- Strong against electrostatic.
- Excellent in cost-performance.
- High Accuracy and High Environmental Resistance are provided due to our original Manufacturing Method.
- All Pb-free product [Pb and Cd are not contained in product]

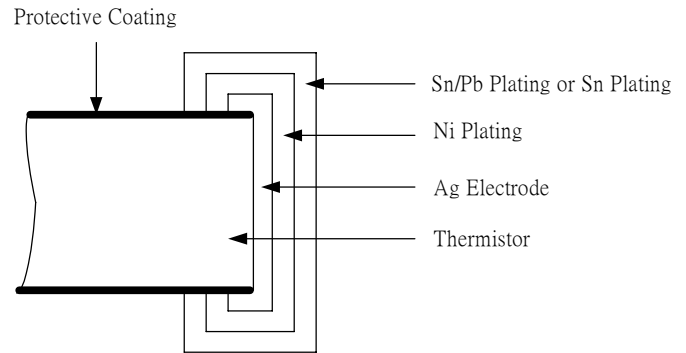
APPLICATIONS

- Mobile Communication related equipment. (TCXO, RF circuit, LCD panel, Battery pack) .
- Computer related equipment.
- Temperature detection for CPU and memory device.
- Video camcorder, car audio related equipment.
- Temperature compensation for contrast of LCD.
- Optical communication equipment.

CHIP DIMENSION

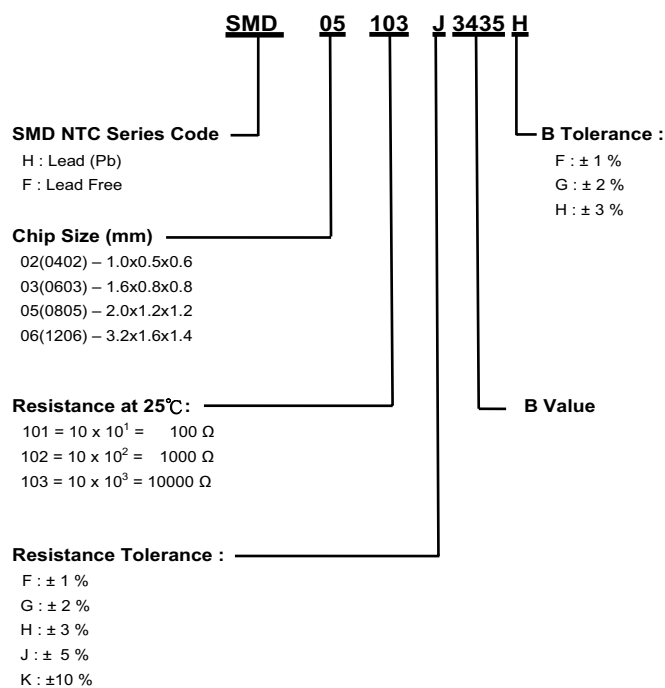


CHIP STRUCTURE



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
1608 (0603)	1.60 ±0.10	0.80 ±0.10	0.95 ±0.10	0.40±0.20
2012 (0805)	2.00 ±0.20	1.25 ±0.20	1.20±0.20	0.50±0.20
3216 (1206)	3.20 ±0.20	1.60 ±0.20	1.40 ±0.30	0.25±0.60

SMD CHIP NTC ORDER MAP



1608 (0603) Size

SPECIFICATION

Part Number (SMD)	Resistance (25°C) (Ω)	B-constant (25-85°C) (k)	Maximum Power Rating (25°C) (mW)	Thermal Dissipation Constant (mW/°C)	Operating Temp. Range (°C)
03220□3150□	22	3150	350	3.5	-40 ~ 125
03300□3150□	30	3150			
03470□3150□	47	3150			
03680□3150□	68	3150			
03101□2800□	100	2800			
03101□3250□	100	3250			
03221□3250□	220	3250			
03102□2950□	1K	2950			
03102□2950□	1K	4100			
03202□3100□	2K	3100			
03202□3150□	2K	3150			
03202□4100□	2K	4100			
03222□3150□	2.2K	3150			
03302□3150□	3K	3150			
03302□3200□	3K	3200			
03332□3150□	3.3K	3150			
03472□3340□	4.7K	3340			
03472□4100□	4.7K	4100			
03502□3950□	5.0K	3950			
03103□3435□	10K	3435			
03103□3550□	10K	3550			
03103□3610□	10K	3610			
03103□3700□	10K	3700			
03103□3800□	10K	3800			
03103□3970□	10K	3970			
03103□4100□	10K	4100			
03123□3550□	12K	3550			

1608 (0603) Size

SPECIFICATION

Part Number (SMD)	Resistance (25℃) (Ω)	B-constant (25-85℃) (k)	Maximum Power Rating (25℃) (mW)	Thermal Dissipation Constant (mW/℃)	Operating Temp. Range (℃)
03303□3900□	30K	3900	350	3.5	-40 ~ 125
03333□3900□	33K	3900			
03333□3950□	33K	3950			
03403□3950□	40K	3950			
03473□3950□	47K	3950			
03473□4100□	47K	4100			
03493□3950□	49K	3950			
03503□3950□	50.0	3950			
03513□3950□	51K	3950			
03683□3950□	68K	3950			
03683□4150□	68K	4150			
03104□3950□	100K	3950			
03104□4100□	100K	4100			
03104□4400□	100K	4400			
03154□4000□	150k	4000			
03154□4600□	150k	4600			
03204□3950□	200K	3950			
03224□3950□	220K	3950			
03502□3950□	5.0K	3950			
03103□3435□	10K	3435			
03103□3550□	10K	3550			
03103□3610□	10K	3610			
03103□3700□	10K	3700			
03103□3800□	10K	3800			
03103□3970□	10K	3970			
03103□4100□	10K	4100			

1608 (0603) Size

SPECIFICATION

Part Number (SMD)	Resistance (25℃) (Ω)	B-constant (25-85℃) (k)	Maximum Power Rating (25℃) (mW)	Thermal Dissipation Constant (mW/℃)	Operating Temp. Range (℃)
03123□3550□	12K	3550	350	3.5	-40 ~ 125
03303□3900□	30K	3900			
03333□3900□	33K	3900			
03333□3950□	33K	3950			
03403□3950□	40K	3950			
03473□3950□	47K	3950			
03473□4100□	47K	4100			
03493□3950□	49K	3950			
03503□3950□	50.0	3950			
03513□3950□	51K	3950			
03683□3950□	68K	3950			
03683□4150□	68K	4150			
03104□3950□	100K	3950			
03104□4100□	100K	4100			
03104□4400□	100K	4400			
03154□4000□	150k	4000			
03154□4600□	150k	4600			
03204□3950□	200K	3950			
03224□3950□	220K	3950			
03224□3950□	220K	4650			
03304□4055□	300K	4055			
03334□4100□	330K	4100			
03374□4000□	370K	4000			
03404□4100□	400K	4100			
03474□4050□	470K	4055			
03474□4100□	470K	4100			
03474□4750□	470K	4750			
03504□4100□	500K	4100			
03564□4100□	560K	4100			

※ Please inquire to our sales for other spec



BASIC CHARACTERISTICS

1. Zero-power Resistance of Thermistor

$$R = R_0 \exp B (1/T - 1/T_0) \dots\dots\dots(1)$$

R : Resistance in ambient temperature T (K)
(K : absolute temperature)

R₀ : Resistance in ambient temperature T₀ (K)

B : B-constant of Thermistor

2. B-Constant

As (1) formula

$$B = \ln (R/R_0) / (1/T - 1/T_0) \dots\dots\dots(2)$$

3. Thermal Dissipation Constant

When spend electric power P (mW) in ambient temperature T₁, if Thermistor temperature rises T₂, there is a formula as follows

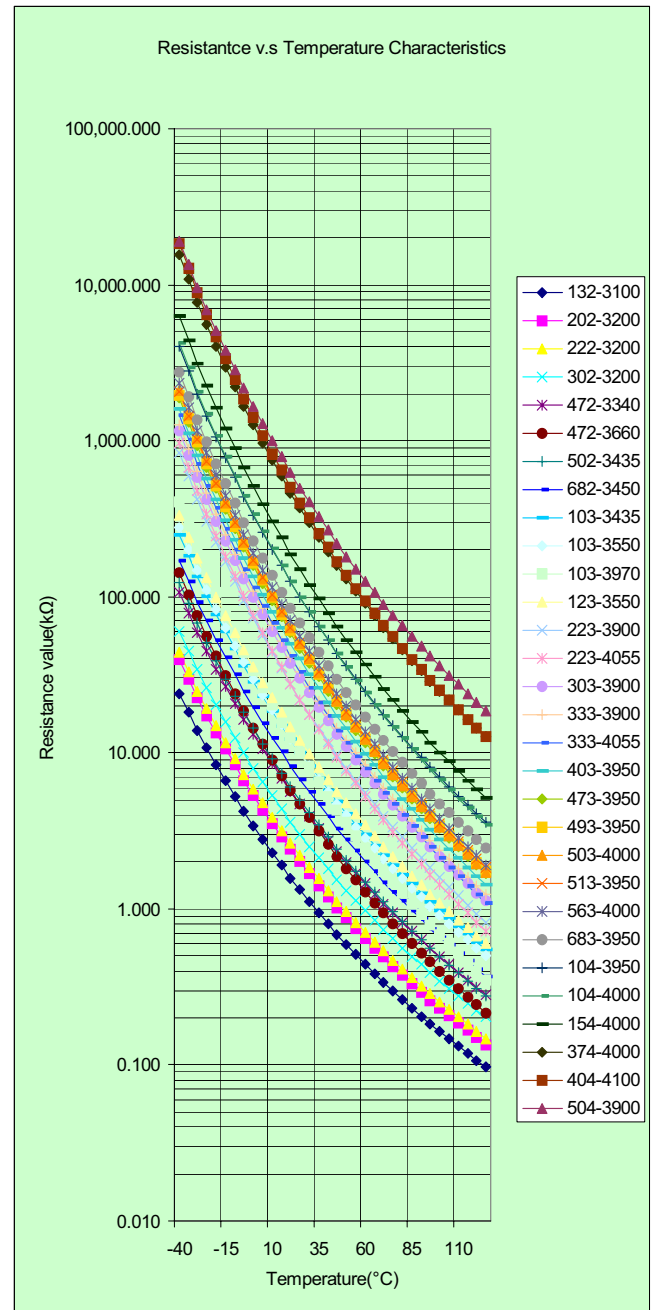
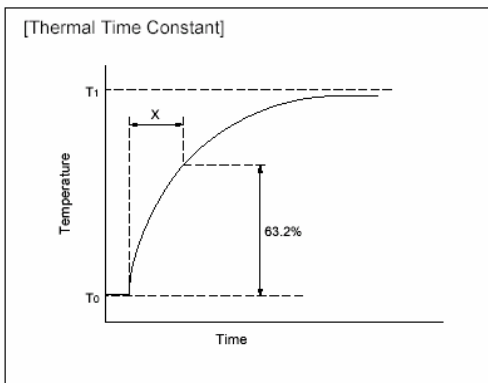
$$P = C (T_2 - T_1) \dots\dots\dots(3)$$

C : Thermal dissipation constant (mW/°C)

Thermal dissipation constant change by dimensions, measure, measured condition etc.

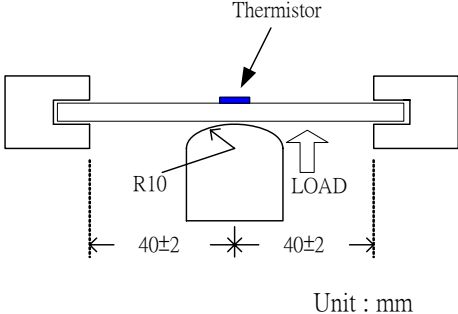
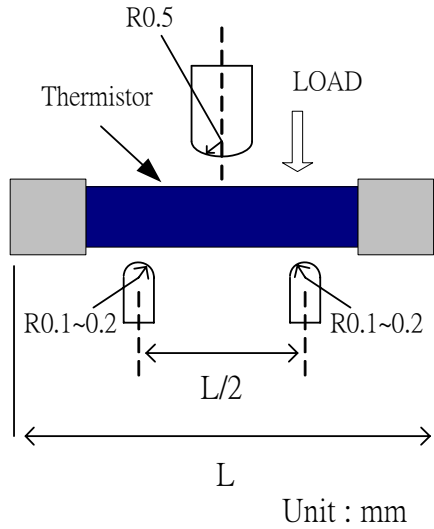
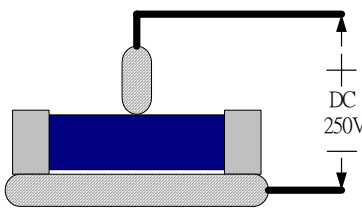
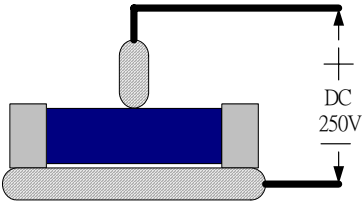
4. Thermal Time Constant

Period in which Thermistor temperature will change 63.2% of its temperature difference from ambient temperature T₀ (°C) to T₁ (°C).

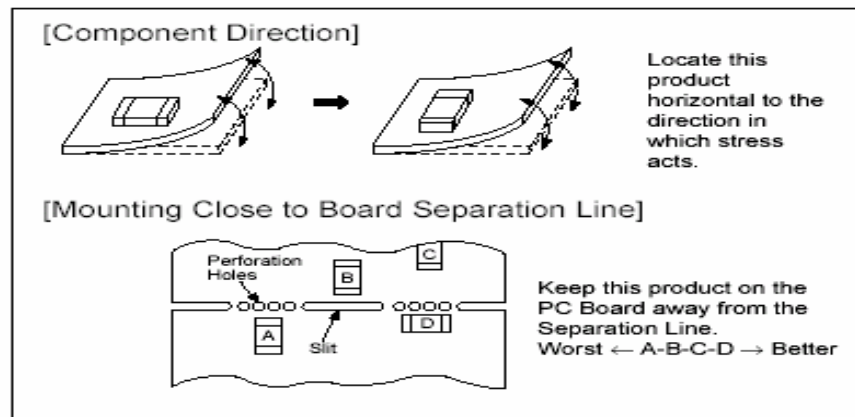


RELIABILITY TEST

Test Item		Standard	Test Method	$\Delta R_{25} / R_{25}$
Environmental test	Life	MIL-STD-202F Method 108A	Test temperature : 70°C Test duration : 1000 hrs Load power : 1206 – 6.5 mW , 0805 – 5.0 mW , 0603 – 4.5 mW , 0402 – 3.5 mW °	MAX. $\pm 3\%$
	Humidity	MIL-STD-202F Method 103B	Test temperature : 40°C Test humidity : 95% Test duration : 1000 hrs Load power : 1206 – 6.5 mW , 0805 – 5.0 mW , 0603 – 4.5 mW , 0402 – 3.5 mW °	MAX. $\pm 3\%$
	Thermal shock	MIL-STD-202F Method 107G	Test cycle : 10 times Test temperature : - 40°C & 125°C 30 min 125°C Ordinary temp. 30 min -40°C	MAX. $\pm 3\%$
	Storage in dry heat	IEC 68-2-2	Test temperature : 125°C Test duration : 1000 hrs	MAX. $\pm 3\%$
Mechanical Performance test	Solderability	MIL-STD-202F Method 208 H	Soldering temperature : 235°C Duration of immersion : 2 seconds	95 % min. coverage
	Resistance to soldering heat	MIL-R-55342D PARA 4.7.7	Soldering temperature : 260°C Duration of immersion : 10 seconds	MAX. $\pm 3\%$

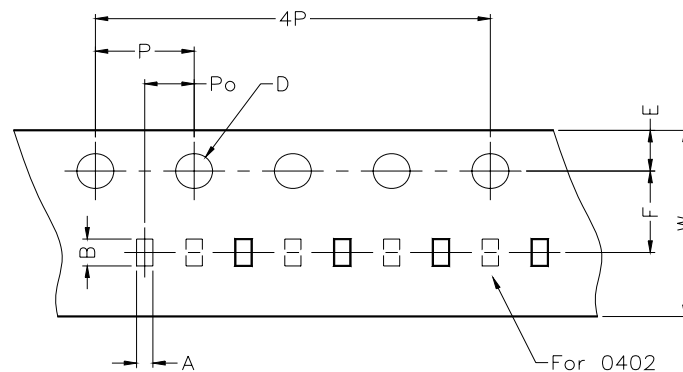
Mechanical Performance test	Bending strength	JIS C 5202 6.1.4	Pressurizing rod at a rate of 1mm/sec Maintenance time : 5 sec Bending distance : 1 mm (min.)  Unit : mm	Visual : No mechanical damage
	Resistance to flexure of substrate	JIS C 5202 6.2.1	Pressurizing force shall be 3kg  Unit : mm	MIN. 3Kg
Electrical Performance test	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

MOUNTING POSITION



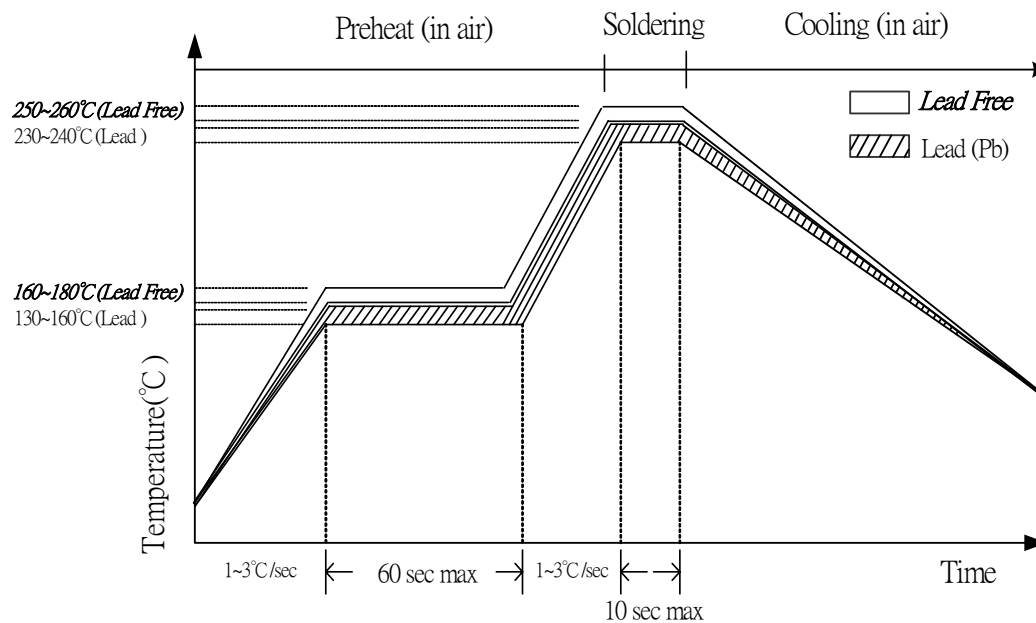
Choose a mounting position that minimize the stress imposed on the chip during flexing or bending of the board

TAPE DIMENSIONS



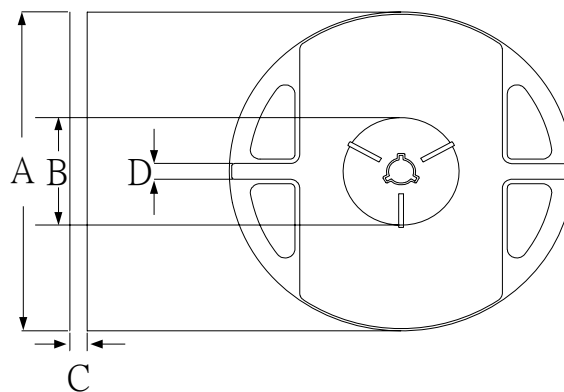
Dimension	1206	0805	0603	0402
A	2.00 ± 0.05	1.50 ± 0.05	1.08 ± 0.05	0.66 ± 0.03
B	3.57 ± 0.05	2.30 ± 0.05	1.85 ± 0.05	1.15 ± 0.03
W	8.00 ± 0.02	8.00 ± 0.05	8.00 ± 0.05	8.00 ± 0.05
D	1.55 ± 0.05	1.50 ± 0.10	1.50 ± 0.10	1.50 ± 0.10
E	1.75 ± 0.10	1.75 ± 0.05	1.75 ± 0.05	1.75 ± 0.05
F	3.50 ± 0.05	3.50 ± 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
P ₀	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

REFLOW SOLDERING PROFILE



REEL DIMENSIONS

Unit : mm



Unit : mm

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