

UTF- SMD Series



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 equipm

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

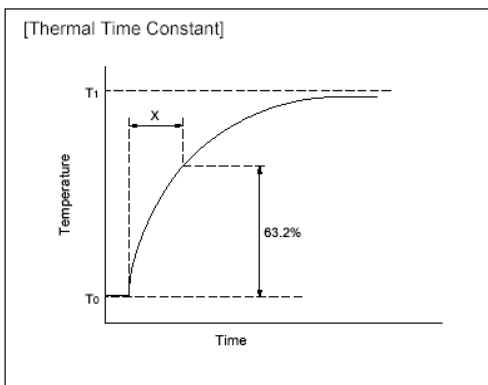
$$P = C (T_2 - T_1) \dots\dots\dots (3)$$

C : Thermal dissipation constant (mW/°C)

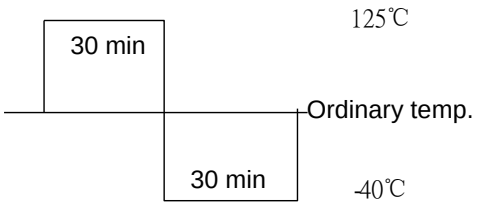
Thermal dissipation constant change by dimensions, measure, measured condition etc.

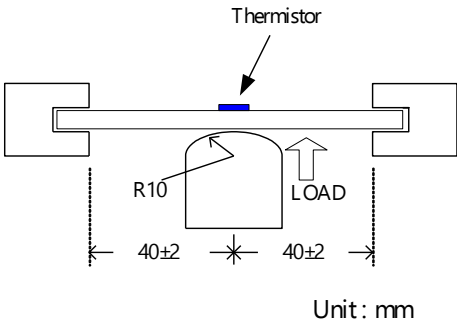
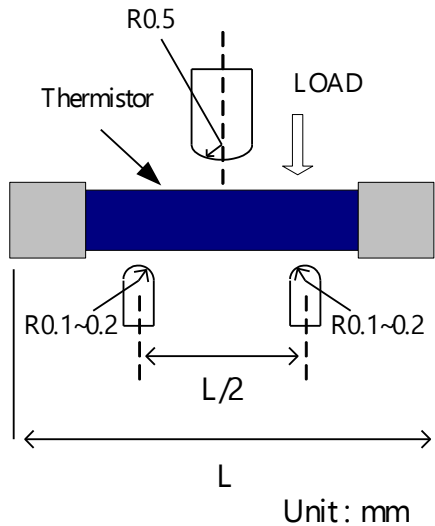
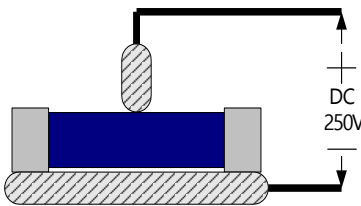
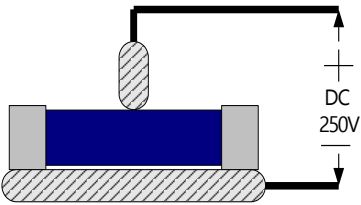
4. Thermal Time Constant

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

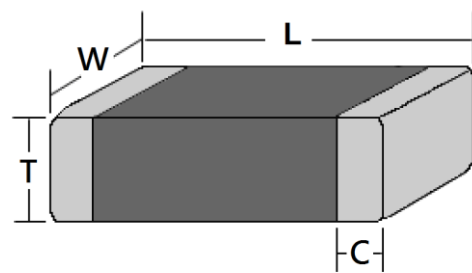


RELIABILITY TEST

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 	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. $\pm 3\%$

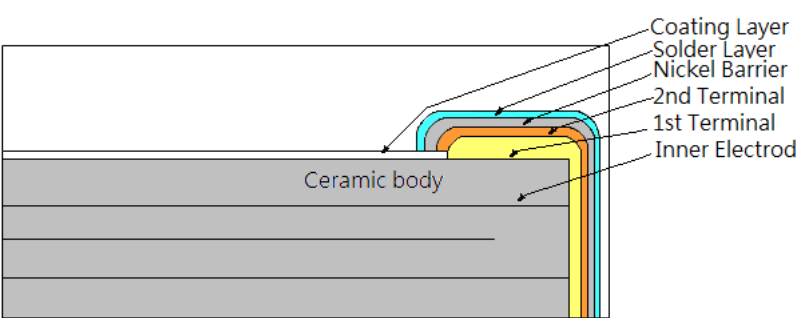
Mechanical Performance test	Bending strength	JIS C 5202 6.1.4	Pressurizing rod at a rate of 1mm/sec Maintenance time : 5 sec Bending distance : 1 mm (min.)  Unit : mm	Visual : No mechanical damage
	Resistance to flexure of substrate	JIS C 5202 6.2.1	Pressurizing force shall be 3kg  Unit : mm	MIN. 3Kg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

CHIP DIMENSION

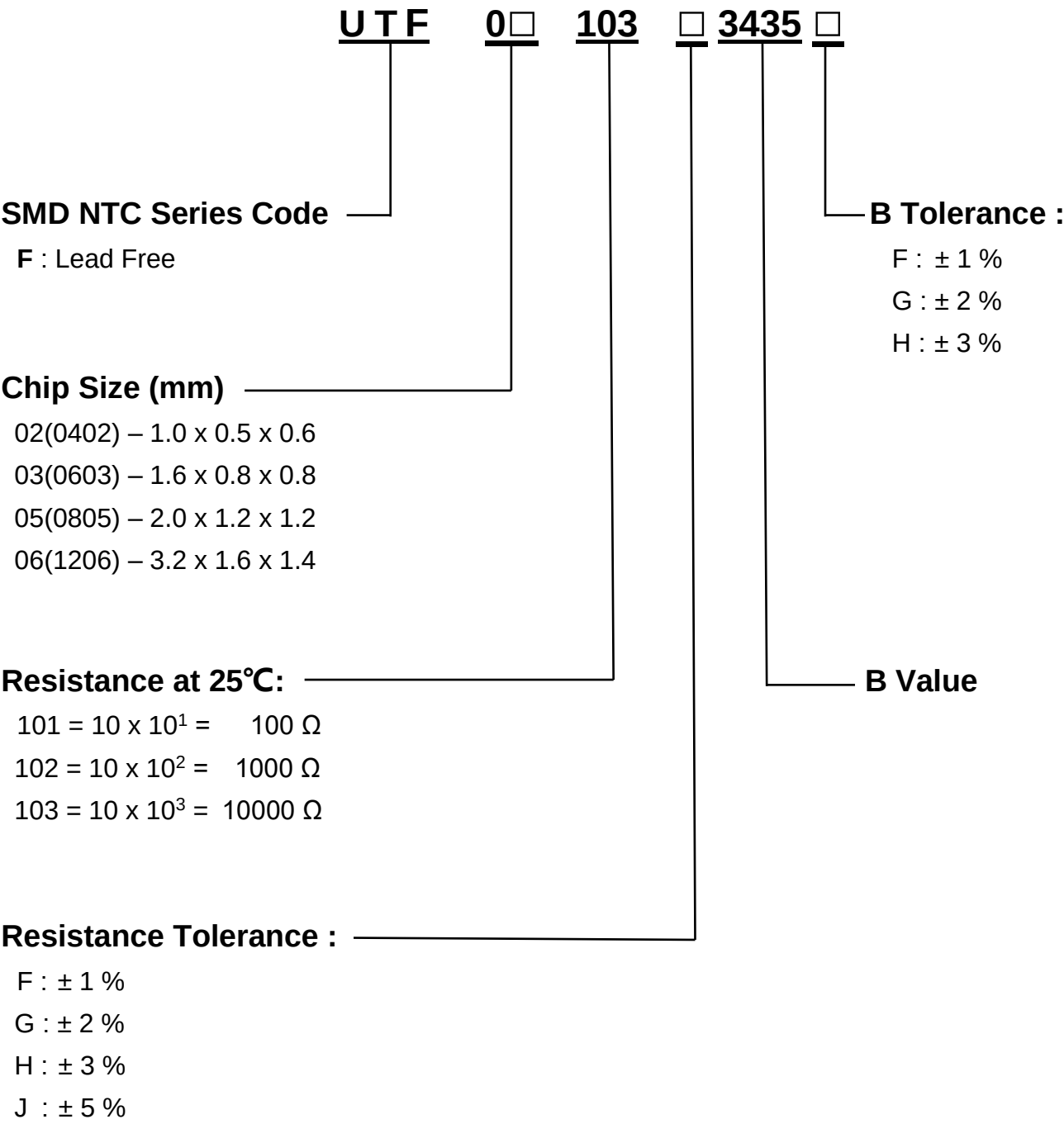


Size	L[mm]	W[mm]	T[mm]	C[mm]
1005 (0402)	1.00 ± 0.05	0.50 ± 0.05	0.50 ± 0.05	0.25 ± 0.10
1608 (0603)	1.60 ± 0.10	0.80 ± 0.10	0.80 ± 0.10	0.40 ± 0.20
2012 (0805)	2.00 ± 0.20	1.25 ± 0.20	0.80 ± 0.20	0.50 ± 0.20
3216 (1206)	3.40 ± 0.20	1.70 ± 0.20	1.40 ± 0.20	0.50 ± 0.20

CHIP STRUCTURE



SMD CHIP NTC ORDER MAP



SPECIFICATION

1005 (0402) Size

Part Number	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)
UT□02300□2600□	30	2600	250	2.5	-40 ~ 125
UT□02300□3250□	30	3250			
UT□02330□3250□	33	3250			
UT□02470□3250□	47	3250			
UT□02680□3250□	68	3250			
UT□02101□3250□	100	3250			
UT□02221□3250□	220	3250			
UT□02102□4100□	1.0K	4100			
UT□02152□4100□	1.5K	4100			
UT□02202□4100□	2.0K	4100			
UT□02202□4520□	2.0K	4520			
UT□02222□4100□	2.2K	4100			
UT□02302□4100□	3K	4100			
UT□02472□3520□	4.7K	3520			
UT□02103□3435□	10K	3435			
UT□02103□3800□	10K	3800			
UT□02103□3950□	10K	3950			
UT□02103□4050□	10K	4050			
UT□02103□4100□	10K	4100			
UT□02103□4550□	10K	4550			
UT□02153□3920□	15K	3920			
UT□02223□3800□	22K	3800			
UT□02223□4550□	22K	4550			
UT□02333□4050□	33K	4050			

Part Number	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)
UT□02473□3920□	47K	3920			
UT□02473□4050□	47K	4050			
UT□02473□4550□	47K	4550			
UT□02683□4150□	68K	4150			
UT□02104□4050□	100K	4050			
UT□02104□4600□	100K	4600			
UT□02154□4050□	150K	4050			
UT□02224□4600□	220K	4600			
UT□02474□4050□	470K	4050			
UT□02474□4650□	470K	4650			

1608 (0603) Size

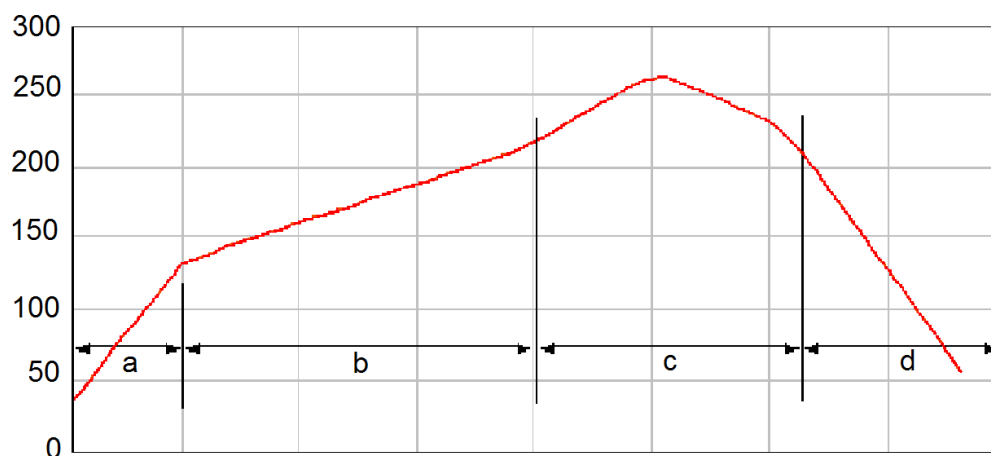
Part Number	Resistance (25°C) (Ω)	B-constant (25-85°C) (k)	Maximum Power Rating (25°C) (mW)	Thermal Dissipation Constant (mW/°C)	Operating Temp. Range (°C)
UT□03220□3050□	22	3050	350	3.5	-40 ~ 125
UT□03300□3200□	30	3200			
UT□03330□3200□	33	3200			
UT□03400□3200□	40	3200			
UT□03470□3200□	47	3200			
UT□03680□3200□	68	3200			
UT□03101□2800□	100	2800			
UT□03101□3250□	100	3250			
UT□03221□3250□	220	3250			
UT□03102□4150□	1K	4150			
UT□03152□4150□	1.5K	4150			
UT□03202□4150□	2K	4150			
UT□03202□4150□	2.2K	4150			
UT□03302□4150□	3K	4150			
UT□03472□4150□	4.7K	4150			
UT□03472□4500□	4.7K	4500			
UT□03502□3250□	5K	3250			
UT□03502□3970□	5K	3970			
UT□03682□4150□	6.8K	4150			
UT□03103□3400□	10K	3400			
UT□03103□3435□	10K	3435			
UT□03103□3550□	10K	3550			
UT□03103□3800□	10K	3800			
UT□03103□3970□	10K	3970			
UT□03303□3950□	30K	3950			
UT□03473□3950□	47K	3950			
UT□03473□4050□	47K	4050			
UT□03503□4100□	50K	4100			

Part Number	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)
UT□03683□4150□	68K	4150			
UT□03104□3970□	100K	3970			
UT□03104□4050□	100K	4050			
UT□03104□4400□	100K	4400			
UT□03154□3800□	150k	3800			
UT□03154□4600□	150k	4600			
UT□03224□4600□	220K	4600			
UT□03234□4600□	230K	4100			
UT□03334□4050□	330K	4050			
UT□03474□4050□	470K	4050			
UT□03684□4100□	680K	4750			

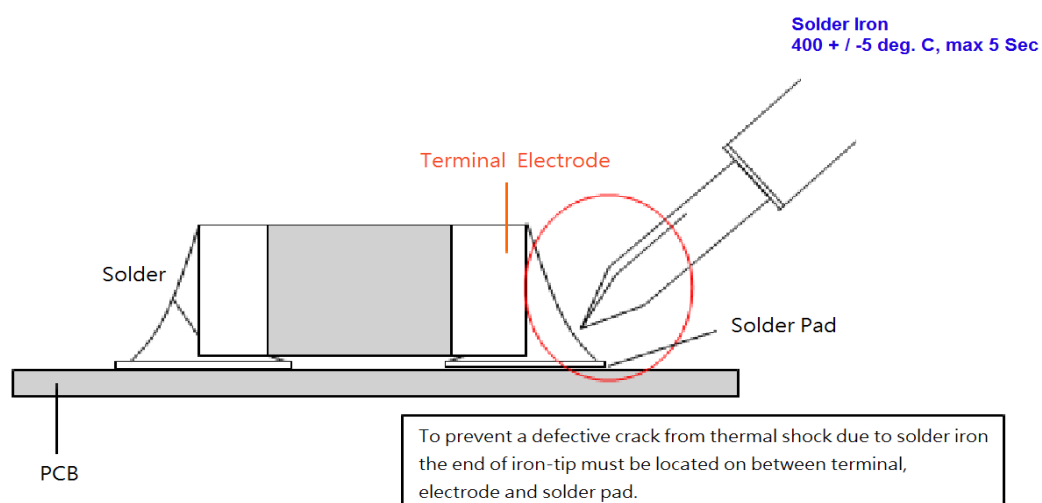
2012 (0805) Size

Part Number	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)
UT□05102□3600□	1K	3600	400	4	-40 ~ 125
UT□05202□4100□	2K	4100			
UT□05222□4100□	2.2K	4100			
UT□05682□3750□	6.8K	3750			
UT□05472□4100□	4.7K	4100			
UT□05103□3435□	10K	3435			
UT□05103□3550□	10K	3550			
UT□05103□3750□	10K	3960			
UT□05103□3970□	10K	3970			
UT□05153□4050□	15K	4000			
UT□05333□3950□	33K	3950			
UT□05473□3950□	47K	3950			
UT□05473□4050□	47K	4050			
UT□05503□41 00□	50K	4100			
UT□05683□3800□	68K	3800			
UT□05104□3977□	100K	3977			
UT□05104□4050□	100K	4050			
UT□05224□4100□	220K	4100			
UT□05234□4100□	230K	4100			
UT□05334□4100□	330K	4100			
UT□05474□4100□	470K	4100			
UT□05684□4100□	680K	4100			

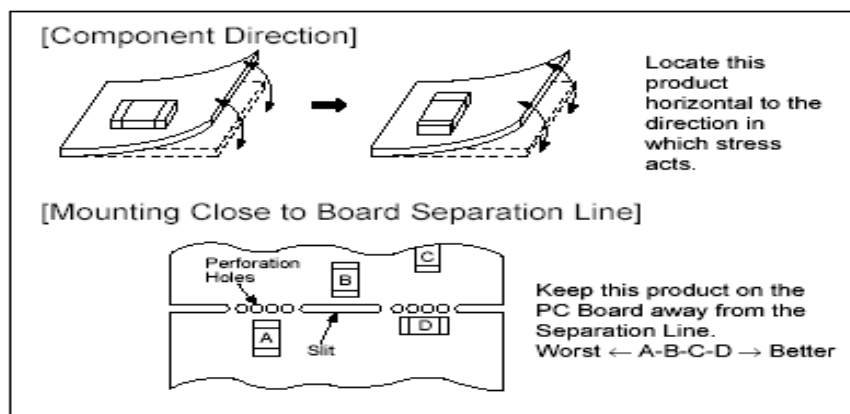
REFLOW SOLDERING PROFILE



Zone		Temp. range [deg. C]	time [sec]	Remark
a	Curing	RT ~	60	* Solder : Sn-Ag-Cu * 260deg. C, over 10sec
b	Preheat	max	90 ~ 150	
c	Soldering	220 ~ 260 [max 270]	90 ~ 150	
d	Cooling	220 ~	min 60	

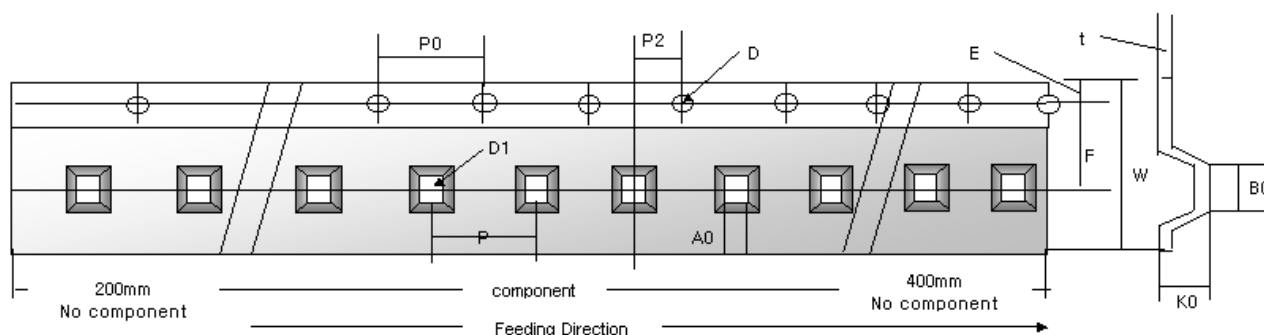


MOUNTING POSITION



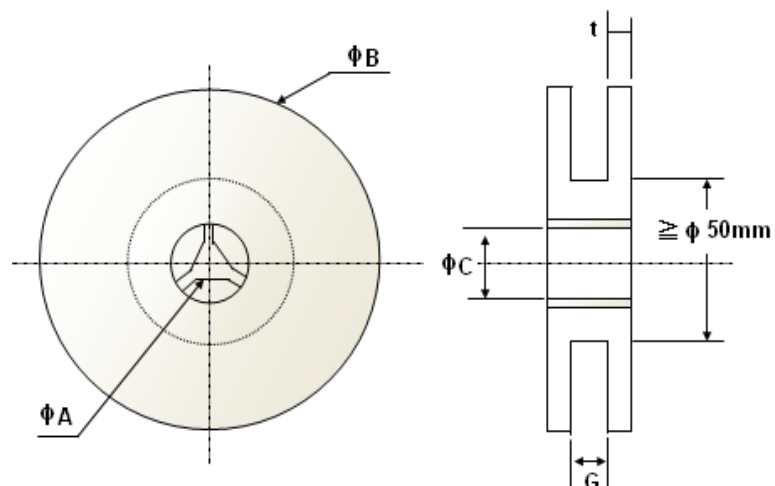
Choose a mounting position that minimize the stress imposed on the chip during flexing or bending of the board

TAPE DIMENSION



Size	A0	B0	W	D1	E	F	P	P0	P2	t
1005	0.65±0.10	1.15±0.10	8.00±0.20	1.50±0.25	1.75±0.10	3.50±0.50	4.0±0.10	4.0±0.10	2.0±0.10	0.23±0.10
1608	1.10±0.10	1.90±0.10								
2012	1.50±0.10	2.35±0.10								
3216	1.80±0.10	3.50±0.10								

REEL DIMESIONS



Chip size	ΦA	ΦB	ΦC	G	t
≤ 2012	178 ± 2.0	13.0 ± 0.5	22.0 ± 2.0	10.0 ± 1.5	2.5 ± 0.5

PACKING SPECIFICATION

Dimension	1005 (0402)	1608 (0603)	2012 (0805)	3216 (1206)	Carrier Tape
pcs/reel	10,000	4,000	4,000	3,000	Paper