

GRACE SMD PTC THERMISTOR

Feature

1. Suitable for miniaturizing circuits due to small size SMD type
2. Fast response for overheating sensing with an accuracy of $\pm 5^{\circ}\text{C}$
3. Contact noise & trouble free due to surface mounted
4. Lead is not contained in terminations

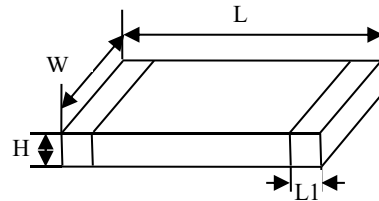


Applications

1. Overheat protection for power transistor and power-Ics
2. Inverter circuit for LCD backlight
3. AC adapter of Lap-Top Computer
4. DC/DC converte in LCD driving circuit

Production Dimension_J

Type	L (mm)	W (mm)	H(mm)	L1 (mm)
1608	1.60 ± 0.20	0.80 ± 0.20	0.80 ± 0.20	0.40 ± 0.20



Ordering Information

PTC 0603 P 470 M 101 K TWT NNN T
 ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩

- ① production series: GRACE PTC thermistor
- ② type : 0402=1005 , 0603=1608 , 0805=2012
- ③ S:For Overheat Sensing, P:For Overcurrent Protection
- ④ R_{25} : 471=470 Ω
- ⑤ R_{25} tolerance: L: $\pm 50\%$,M: $\pm 20\%$
- ⑥ 101T=100 $^{\circ}\text{C}$
- ⑦ Temperature tolerance: K: $\pm 10\%$
- ⑧ design NO.
- ⑨ customer code
- ⑩ package: T: taping B: bulk

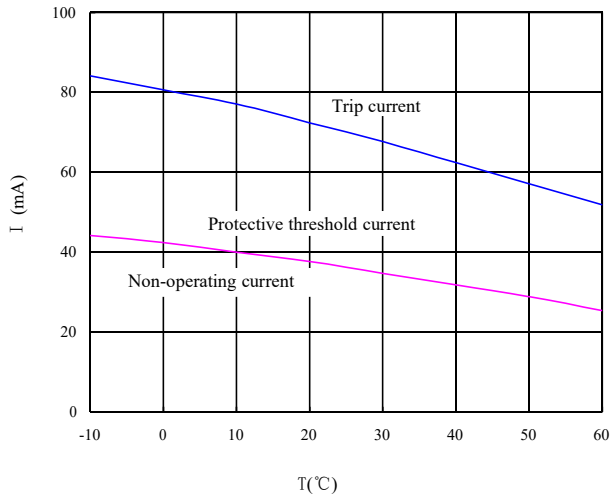
GRACE SMD PTC THERMISTOR

Electrical properties

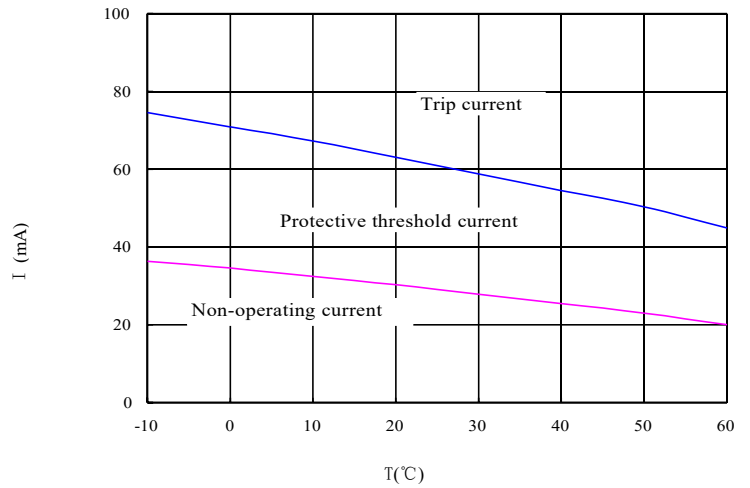
Part NO.	Size (EIA)	Switch temperature	Resistance @25°C	Hold Current		Trip Current (at -10°C)		Voltage Max	Current Max	Working temperature	
				@ +25°C	@ +60°C	@ -10°C	@ +25°C			@ Vmax	@V=0
		Tc (°C)	R25(Ω)	In(mA)	It(mA)	V _{dc} (V)	I _{max} (mA)	T _L ~T _U (°C)			
PTC0603P330M	0603	100±10	33	36	25	85	71	2 4	900	-10 ~ +60	-40 ~ +125
PTC0603P470M			47	29	20	75	61		630		
PTC0603P101M			100	21	15	55	45		300		
PTC0603P221M			220	14	10	35	29		130		
PTC0603P471M			470	10	7	25	21		60		

Current protection range

PTC0603P330M101KT

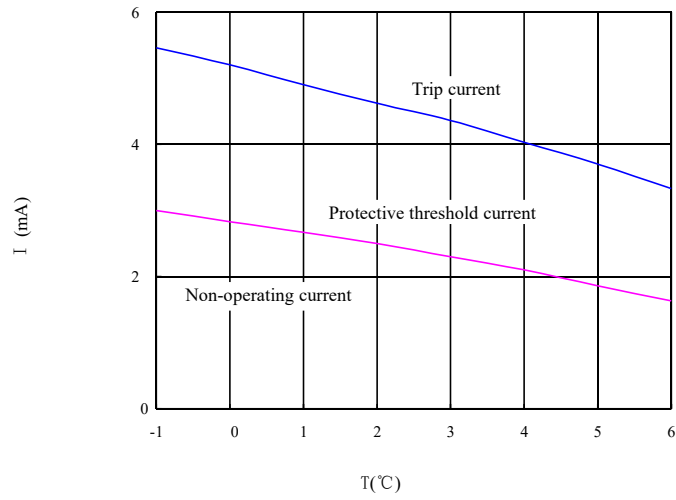


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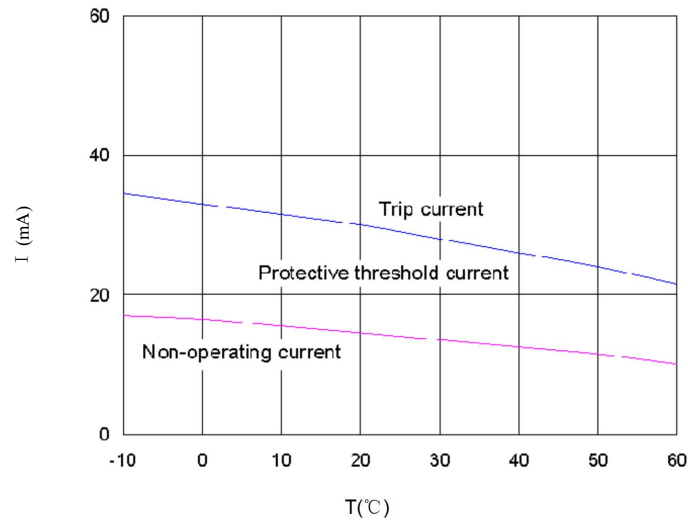


GRACE SMD PTC THERMISTOR

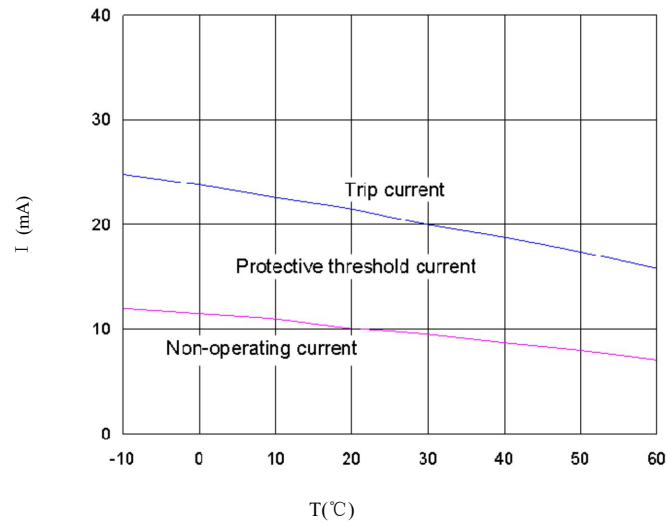
PTC0603P101M101KT



PTC0603P221M101KT

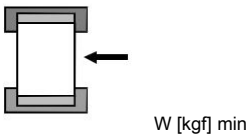


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■ Performance Specification

No	ITEM	Requirements	Test condition												
1	Operating Temp. Range	-20°C ~ Ts(+15)°C													
2	Resistance	Within Tolerance of Resistance	Measured at 25°C±0.2°C in Silicon Oil Bath												
3	Ts	marked value ± 5°C	Ts = Temperature @ [R25°C×10]												
4	Solderability	More than 95% of the terminal electrode shall be covered with new solder.	1. Type of solder : H63A 2. Soldering Temp & Time : 245 -5,+0°C, 3±0.5sec												
5	Resistance to Solder Heat	1. No Serious mechanical damage 2. More than 50% of the terminal electrode shall be covered with new solder 3. ΔR ≤ ± 20% (Ref. To initial value)	1. Type of solder : H63A 2. Soldering Temp & Time : * Solder Heat Test : 260 -0,+5°C, 10±1sec 3. Preheat the Part at 120~150°C, 1min. Let sit at R.T, for 24Hrs then Measure												
6	Humidity Test	1. No Serious mechanical damage 2. ΔR ≤ ± 20% (Ref. To initial value)	1. Test Temp. & Relative Humidity & Time : 85±5°C, 85±5% RH, 500Hrs 2. Let sit at R.T, for 24Hrs then Measure												
7	Thermal Shock	1. No Serious mechanical damage 2. ΔR ≤ ± 20% (Ref. To initial value)	1. Temp. : -40±5°C, +85±5°C 2. Soak Time : 30min ± 3min The cycles is repeated 100 times												
8	High Temp. Resistance	1. No Serious mechanical damage 2. ΔR ≤ ± 20% (Ref. To initial value)	1. Temp. : +85±5°C 2. Time : 1000Hrs ± 12Hrs Let sit at R.T, for 24Hrs then Measure												
9	Low Temp. Resistance	1. No Serious mechanical damage 2. ΔR ≤ ± 20% (Ref. To initial value)	1. Temp. : -40±5°C 2. Time : 1000Hrs ± 12Hrs Let sit at R.T, for 24Hrs then Measure												
10	Adhesive Strength of Termination	1. No Serious mechanical damage													
		<table border="1" style="width: 100%; text-align: center;"> <tr> <th>Size</th> <td>1005</td> <td>1608</td> <td>2012</td> </tr> <tr> <th>W[kgf]</th> <td>0.5</td> <td>1.0</td> <td>1.2↑</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> </tr> </table>		Size	1005	1608	2012	W[kgf]	0.5	1.0	1.2↑				
		Size		1005	1608	2012									
W[kgf]	0.5	1.0	1.2↑												

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■ Features

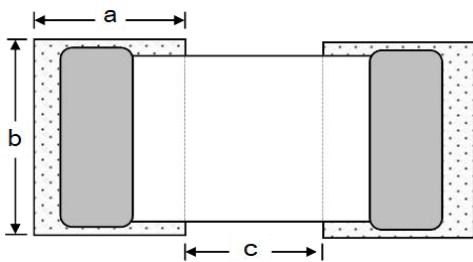
- Rapid operation to protect the circuit in an overcurrent condition abnormality such as a short circuit
- Excellent environmental reliability resulted from our original coating process on chip body [patent pending]

■ Applications

- Overheat protection for power transistor & power-ICs
- Inverter circuit for LCD backlight
- Air conditioner
- Car audio
- DC/DC converter in LCD driving circuit

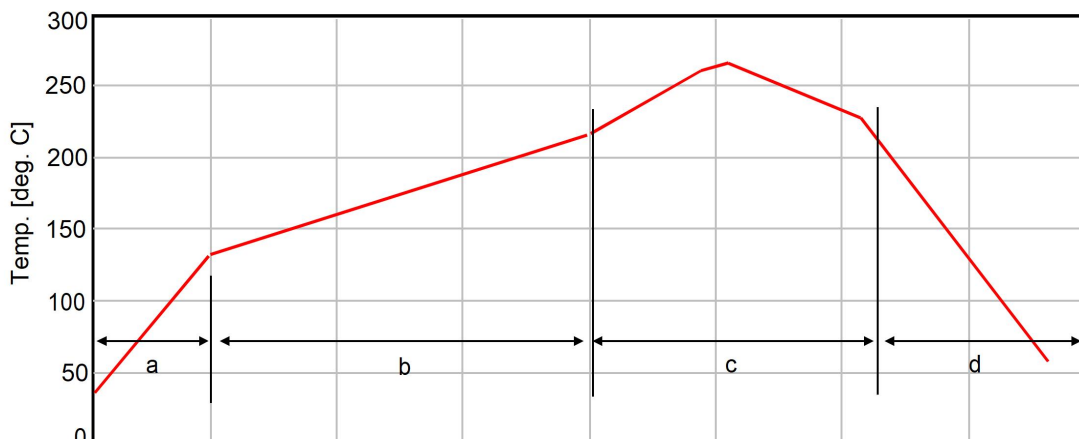
■ Recommended Soldering condition

1) Land Pattern Design



Code	Land Dimension with Chip Size [mm]			
	1005	1608	2012	3225
a	0.30~0.50	0.60~0.70	0.60~0.70	1.10~1.20
b	0.40~0.60	0.60~0.80	0.80~1.10	2.30~2.40
c	0.30~0.50	0.60~0.80	1.00~1.20	2.20~2.30

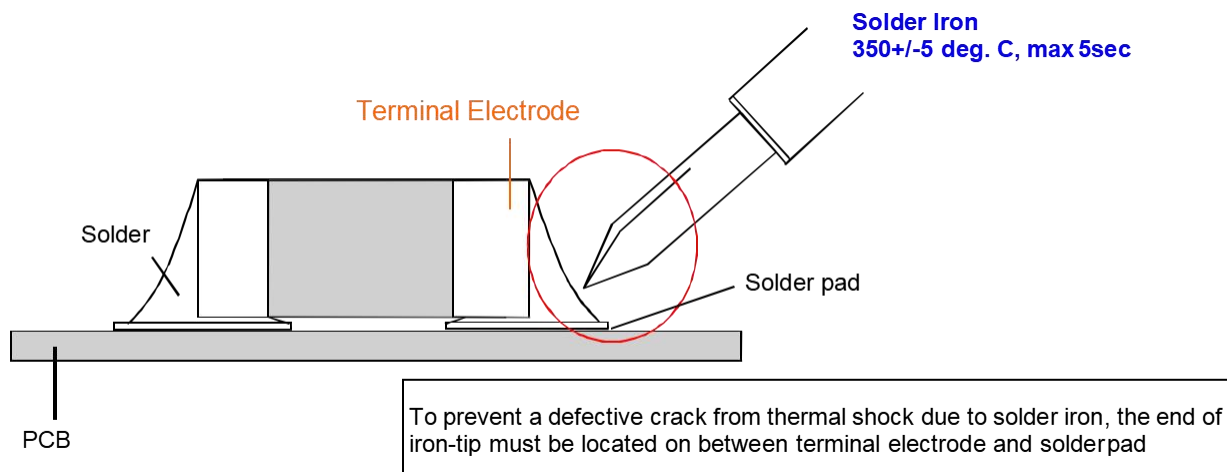
2) Reflow Soldering



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Zone		temp. range [deg. C]	time [sec]	Remark
a	Curing	RT ~ 130	60	* Solder : Sn-Ag-Cu * 260deg. C, over 10sec
b	Preheat	max 220	90 ~ 150	
c	Soldering	220 ~ 260 [max 270]	90 ~ 150	
d	Cooling	220 ~ RT	min 60	

3)Soldering Iron

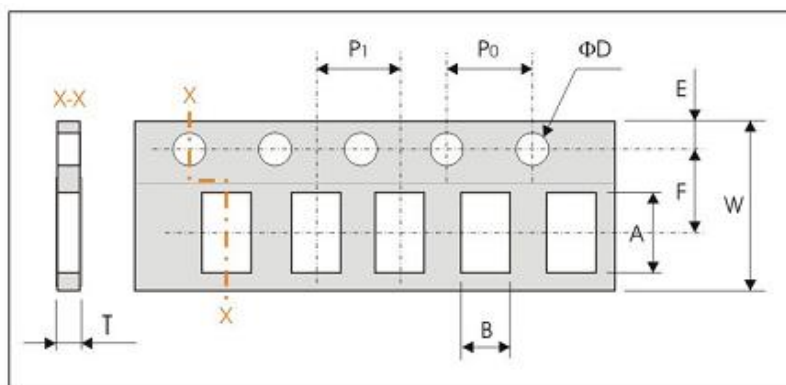


Packaging Specification

Carrier tape transparent cover tape should be heat-sealed to carry the products, and the reel should be used to reel the carrier tape.

The adhesion of the heat-sealed cover tape shall be $40 + 20 / - 15$ grams.

Both the head and the end portion of taping shall be empty for reel package and SMT auto-pickup machine. And a normal paper tape shall be connected in the head of taping for the operator handle.



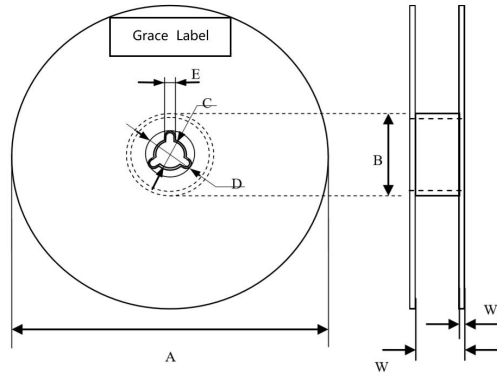
Taping Dimensions

Unit:mm

type	A	B	W	F	E	P	P ₀	T	D
1005	1.15±0.1	0.65±0.1	8±0.2	3.5±0.05	1.75±0.1	4±0.05	2±0.05	0.6±0.1	1.5 ^{+0.10-0.00}
1608	1.9±0.1	1.1±0.1	8±0.2	3.5±0.05	1.75±0.1	4±0.1	4±0.1	0.9±0.1	1.5±0.1
2012	2.3±0.1	1.5±0.1	8±0.2	3.5±0.05	1.75±0.1	4±0.1	4±0.1	0.9±0.1	1.5±0.1

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Reel Dimension



Unit:mm

type	A	B	C	D	E	W	W ₁
1005	178.0±1.0	60.0±0.5	13.0±0.2	21.0±0.2	2.0±0.5	9.0±0.50	1.5±0.15
1608	178.0±1.0	60.0±0.5	13.0±0.2	21.0±0.2	2.0±0.5	9.0±0.50	1.5±0.15
2012	178.0±1.0	60.0±0.5	13.0±0.2	21.0±0.2	2.0±0.5	9.0±0.50	1.5±0.15

Packaging Quantity

Unit:pcs

type	1005	1608	2012
quantity	10000	4000	4000
Minimum ordering	10000	4000	4000