

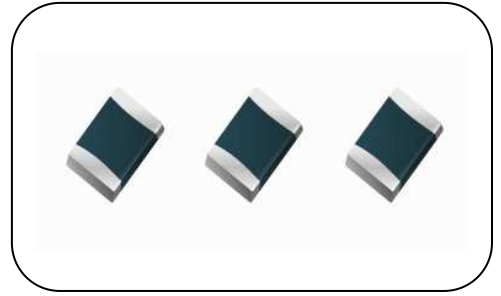
# CPTC Thermistor : TPM Type

## SMD CPTC Thermistor for Over-Current Protection



### ■ Features

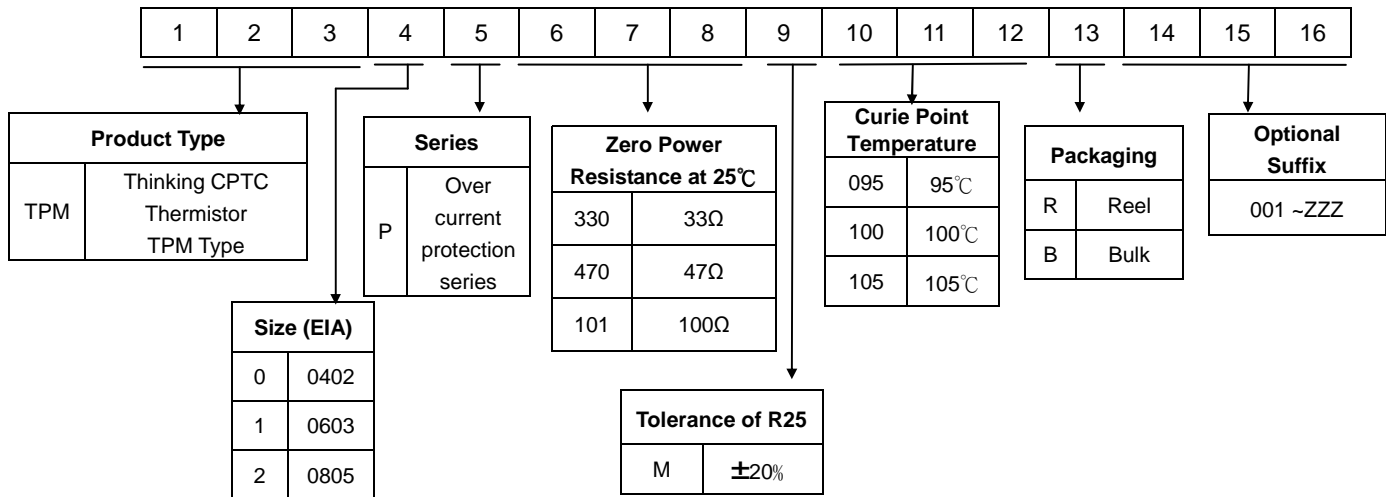
1. RoHS & Halogen-free compliant
2. EIA size 0603
3. Suitable for reflow soldering
4. Suitable for over-current or short circuit protection



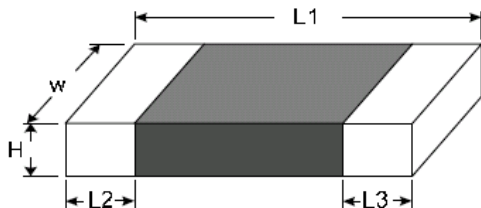
### ■ Recommended Applications

1. Notebook
2. AC adapter
3. Battery charger
4. LED
5. Over-current protection for any consumer device

### ■ Part Number Code



### ■ Structure and Dimensions



(Unit: mm)

Part No.	Size (EIA)	L1	W	H max.	L2 and L3.
TPM1P	0603	1.60±0.15	0.80±0.15	0.95	0.4±0.02

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### ■ Electrical Characteristics

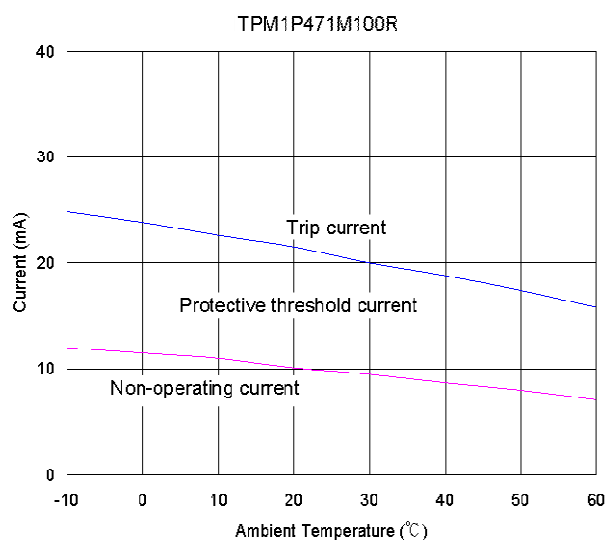
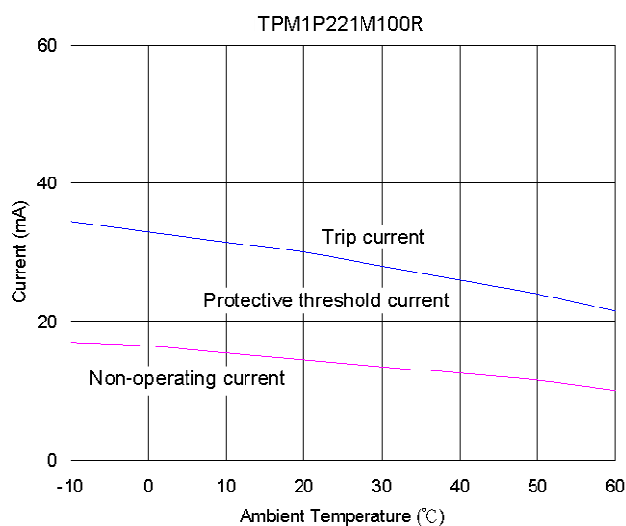
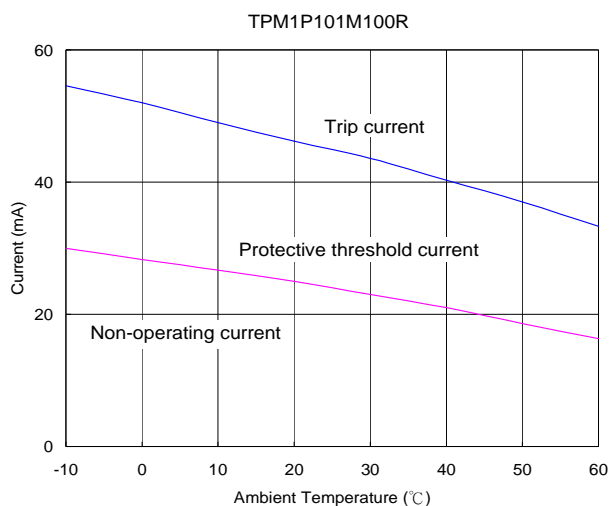
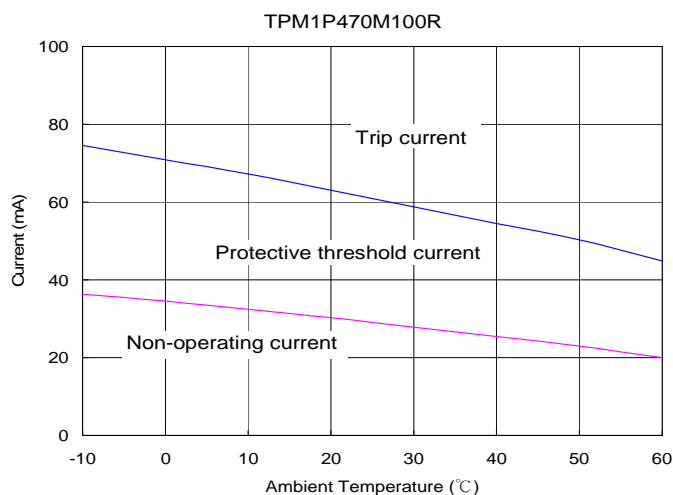
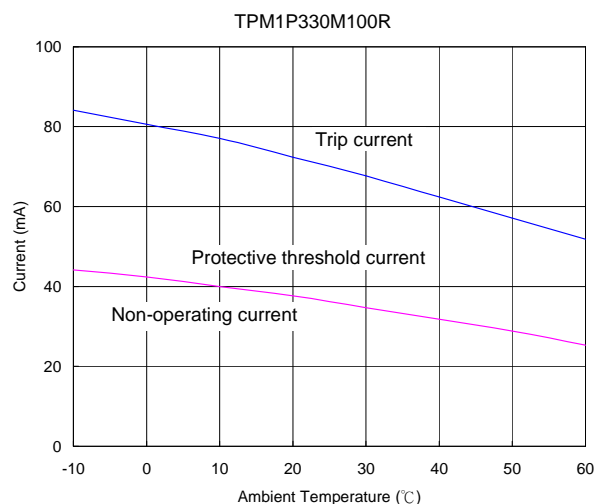
Part No.	Size (EIA)	Curie Point Temp.	Zero Power Resistance at 25°C	Non-operating Current		Trip Current (at -10°C)		Max. Voltage	Max. Current	Operating Temperature Range	
				@ +25°C	@ +60°C	@ -10°C	@ +25°C			@ Vmax	@ V=0
		Tc (°C)	R25(Ω)	In(mA)		It(mA)		V <sub>dc</sub> (V)	I <sub>max</sub> (mA)	T <sub>L</sub> ~T <sub>U</sub> (°C)	
TPM1P330M100R	0603	100±10	33	36	25	85	71	24	900	-10 ~ +60	-40~+125
TPM1P470M100R			47	29	20	75	61		630		
TPM1P101M100R			100	21	15	55	45		300		
TPM1P221M100R			220	14	10	35	29		130		
TPM1P471M100R			470	10	7	25	21		60		

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### ■ Protective Threshold Current Range



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### ■ Typical Application Circuit

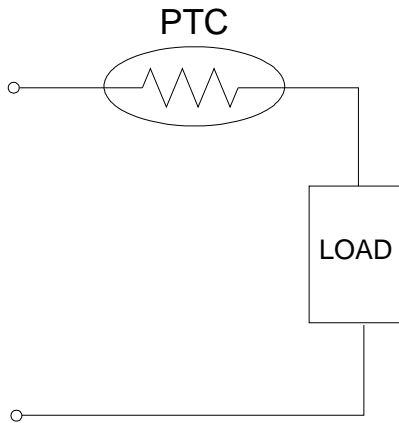


Fig 1. Over-current Protection

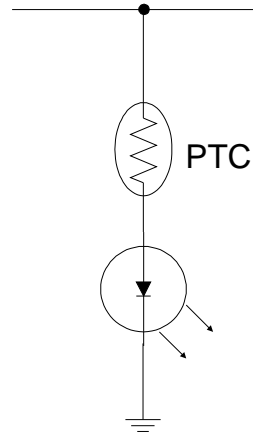
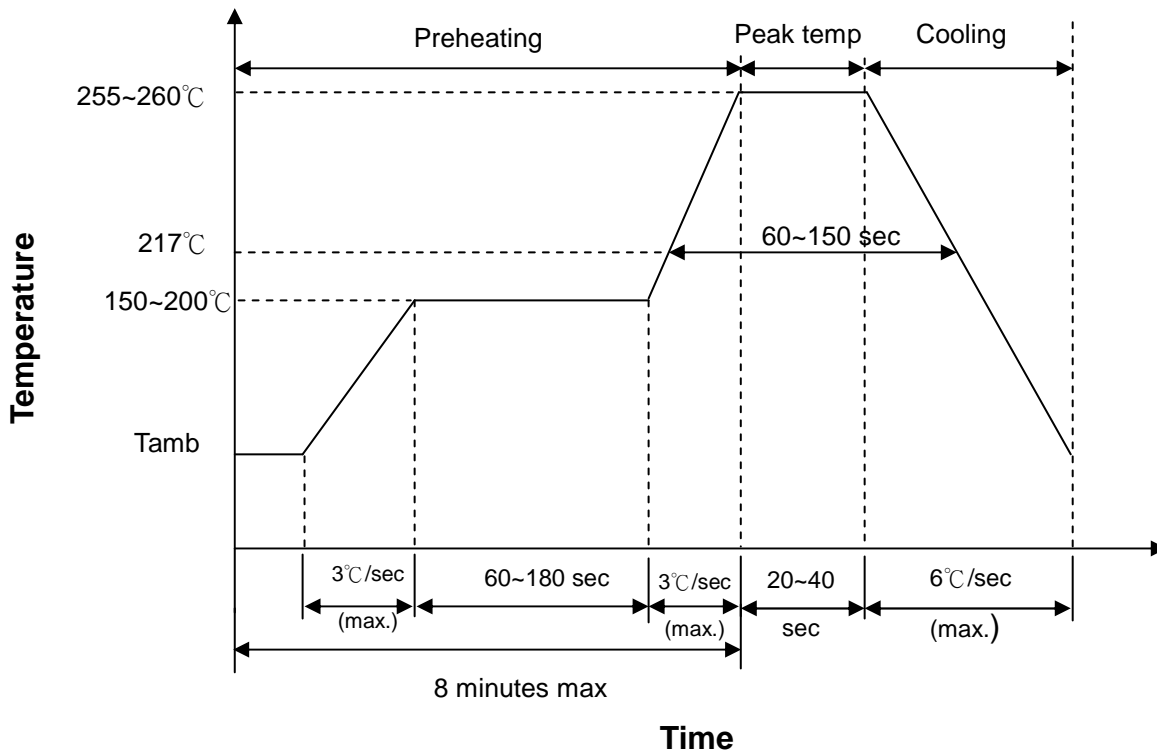


Fig 2. LED Protection

### Soldering Recommendation

### ■ IR-Reflow Soldering Profile



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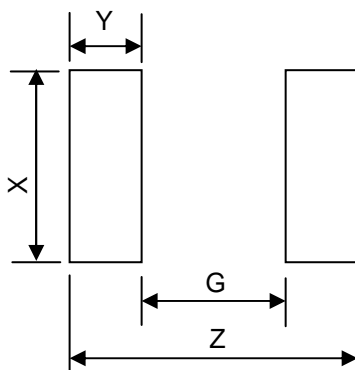


### ■ Reworking Conditions With Soldering Iron

Item	Conditions
Temperature of Soldering Iron-tip	360°C (max.)
Soldering Time	3 sec (max.)
Diameter of Soldering Iron-tip	Φ3mm (max.)

Caution: Do not touch the component surface with soldering iron directly to prevent it from damage.

### ■ Recommended Pad Dimensions




Size	Z (mm)	G (mm)	X (mm)	Y (mm)
0603	3.0	1.0	1.0	1.0

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### ■ Reliability

Item	Standard	Test Conditions / Methods	Specifications															
Bending Strength	IEC-60068-2-21	Warp 3mm Speed < 0.5mm/sec. Duration: 10 sec on PCB. 	No visible damage   $\Delta R_{25}/R_{25}$   $\leq 10\%$															
Damp Heat, Steady State	IEC 60068-2-3	60 $\pm$ 2 $^{\circ}\text{C}$ , 90 ~ 95% RH , 1000 $\pm$ 24 HRS	No visible damage   $\Delta R_{25}/R_{25}$   $\leq 20\%$															
High Temp. Storage	IEC 60738-1 IEC 60068-2-2	125 $\pm$ 3 $^{\circ}\text{C}$ , 1000 $\pm$ 24 HRS	No visible damage   $\Delta R_{25}/R_{25}$   $\leq 20\%$															
Low Temp. Storage	Specification Standard	-40 $\pm$ 3 $^{\circ}\text{C}$ , 1000 $\pm$ 24 hrs	No visible damage   $\Delta R_{25}/R_{25}$   $\leq 20\%$															
Rapid Change of Temperature	IEC 60068-2-14	The conditions shown below shall be repeated 5 cycles on PCB <table border="1" data-bbox="574 958 1114 1249"> <thead> <tr> <th>Step</th> <th>Temperature (<math>^{\circ}\text{C}</math>)</th> <th>Period (minutes)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>-40 <math>\pm</math> 5</td> <td>30 <math>\pm</math> 3</td> </tr> <tr> <td>2</td> <td>Room temperature</td> <td>5 <math>\pm</math> 3</td> </tr> <tr> <td>3</td> <td>125 <math>\pm</math> 5</td> <td>30 <math>\pm</math> 3</td> </tr> <tr> <td>4</td> <td>Room temperature</td> <td>5 <math>\pm</math> 3</td> </tr> </tbody> </table>	Step	Temperature ( $^{\circ}\text{C}$ )	Period (minutes)	1	-40 $\pm$ 5	30 $\pm$ 3	2	Room temperature	5 $\pm$ 3	3	125 $\pm$ 5	30 $\pm$ 3	4	Room temperature	5 $\pm$ 3	No visible damage   $\Delta R_{25}/R_{25}$   $\leq 20\%$
Step	Temperature ( $^{\circ}\text{C}$ )	Period (minutes)																
1	-40 $\pm$ 5	30 $\pm$ 3																
2	Room temperature	5 $\pm$ 3																
3	125 $\pm$ 5	30 $\pm$ 3																
4	Room temperature	5 $\pm$ 3																
High Temp. Endurance Load	IEC 60738-1	60 $\pm$ 3 $^{\circ}\text{C}$ Vmax. , for 1.5hrs on / 0.5hrs off , 1000 $\pm$ 24 HRS	No visible damage   $\Delta R_{25}/R_{25}$   $\leq 20\%$															
Climatic Sequence	IEC 60738-1	a. 125 $^{\circ}\text{C}$ x 16 HRS b. 1st cycle : 40 $^{\circ}\text{C}$ 95 %RH x 24 HRS c. -40 $^{\circ}\text{C}$ x 2 HRS d. 5 cycles : 40 $^{\circ}\text{C}$ 95% RH x 24 HRS / Cycle	No visible damage   $\Delta R_{25}/R_{25}$   $\leq 20\%$															
Solderability	IEC 60068-2-58	245 $\pm$ 5 $^{\circ}\text{C}$ , 3 $\pm$ 0.3 sec	At least 95% of terminal electrode is covered by new solder															
Resistance to Soldering Heat	IEC 60068-2-58	260 $\pm$ 5 $^{\circ}\text{C}$ , 10 $\pm$ 1 sec	No visible damage   $\Delta R_{25}/R_{25}$   $\leq 20\%$															

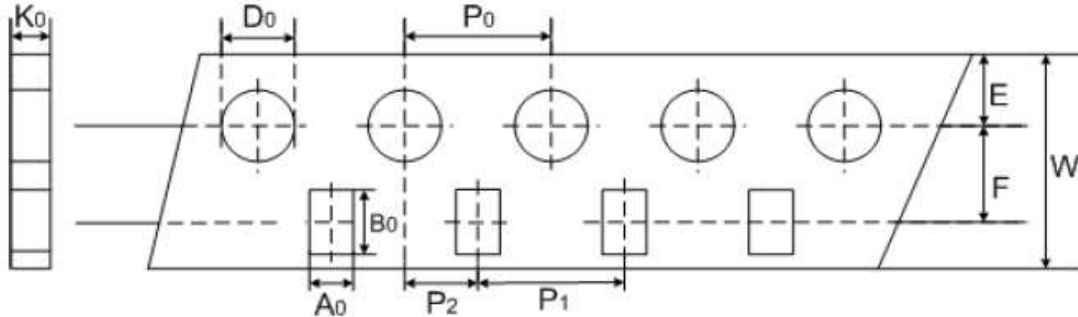
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### Package

#### Taping Specification

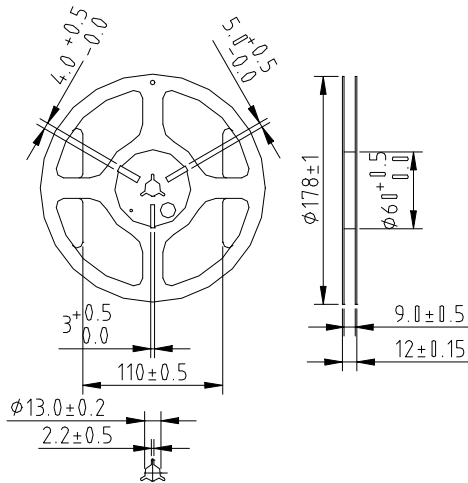


(Unit: mm)

Index	A <sub>0</sub>	B <sub>0</sub>	W	E	F	P <sub>1</sub>	P <sub>2</sub>	P <sub>0</sub>	D <sub>0</sub>	K <sub>0</sub>
Type	±0.2	±0.2	±0.2	±0.1	±0.05	±0.1	±0.05	±0.1	±0.1	±0.1
0603	1.1	1.9	8	1.75	3.5	4	2	4	1.55	0.95

#### Quantity

(Unit: mm)



Type	Quantity(pcs/reel)
0603	4000

### Storage Condition of Products

#### Storage Conditions :

1. Storage Temperature: -10°C ~ +40°C
2. Relative Humidity: ≤ 75%RH
3. Keep away from corrosive atmosphere and sunlight.

#### Period of Storage : 1 year