

Ceramic PTC Thermistor: TPM-P Series

SMD CPTC Thermistor for Over-Current Protection



■ Features

1. RoHS & Halogen-free compliant
2. EIA size 0603,0805,1210
3. Suitable for reflow soldering
4. Suitable for over-current or short circuit protection
5. Agency Recognition:
UL & cUL: File No. E138827
TUV: File No. R50193877



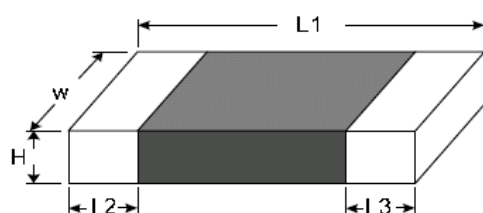
■ Recommended Applications

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

■ Part Number Code

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Product Type TPM THINKING SMD CPTC Thermistor		Series P Over Current Protection Series		Resistance (R ₂₅) 330 470 101 33Ω 47Ω 100Ω		Curie Point Temperature 100 110 100℃ 110℃		Packaging R Reel		Optional Suffix 001 ~ZZZ					
Size (EIA)		Tolerance of R ₂₅													
1	0603	L	±15%												
2	0805	M	±20%												
4	1210	H	±25%												
		S	±35%												

■ Structures 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	0.80±0.15	0.40±0.20
TPM2P	0805	2.00±0.20	1.25±0.20	1.00 max.	0.45±0.25
TPM4P	1210	3.20±0.30	2.50±0.25	1.80 max.	0.50±0.20
For TPM2P150M100R					
TPM2P	0805	2.00±0.20	1.25±0.20	1.45	0.45±0.25

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Electrical Characteristics

0603 Series

Part No.	Curie Point Temp.	Zero Power Resistance at 25°C	Non-operating Current		Trip Current		Max. Voltage	Max. Current	Operating Temperature Range		Safety Approvals	
			@ +60°C	@ +25°C	@+25°C	@ -10°C			@ Vmax	@V=0		
	T _c (°C)	R ₂₅ (Ω)	I _n (mA)		I _t (mA)		V _{max} (V _{DC})	I _{max} (mA)	T _L ~T _U (°C)		UL/cUL	TUV
TPM1P330M100R	100±10	33	25	36	71	85	24	900	-10 ~ +60	-40~ +125	✓	✓
TPM1P470M100R		47	20	29	61	75		630			✓	✓
TPM1P101M100R		100	15	21	45	55		300			✓	✓
TPM1P221M100R		220	10	14	29	35		130			✓	✓
TPM1P471M100R		470	7	10	21	25		60			✓	✓

0805 Series

Part No.	Curie Point Temp.	Zero Power Resistance at 25°C	Non-operating Current		Trip Current		Max. Voltage	Max. Current	Operating Temperature Range		Safety Approvals	
			@ +60°C	@ +25°C	@+25°C	@ -10°C			@ Vmax	@V=0		
	T _c (°C)	R ₂₅ (Ω)	I _n (mA)		I _t (mA)		V _{max} (V _{DC})	I _{max} (mA)	T _L ~T _U (°C)		UL/cUL	TUV
TPM2P150M100R	100±10	15	40	59	116	140	20	1600	-10 ~ +60	-40~ +125		

1210 Series

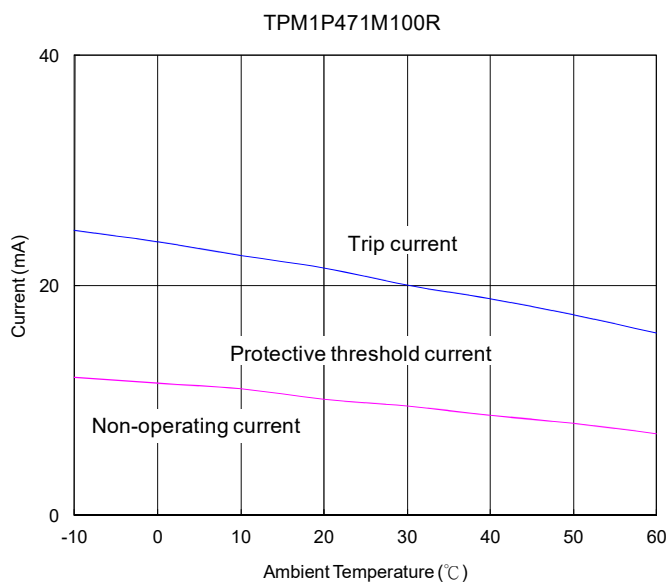
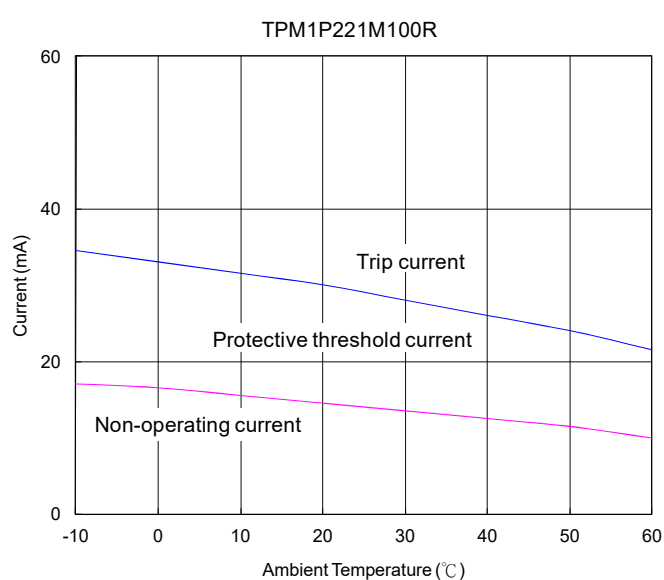
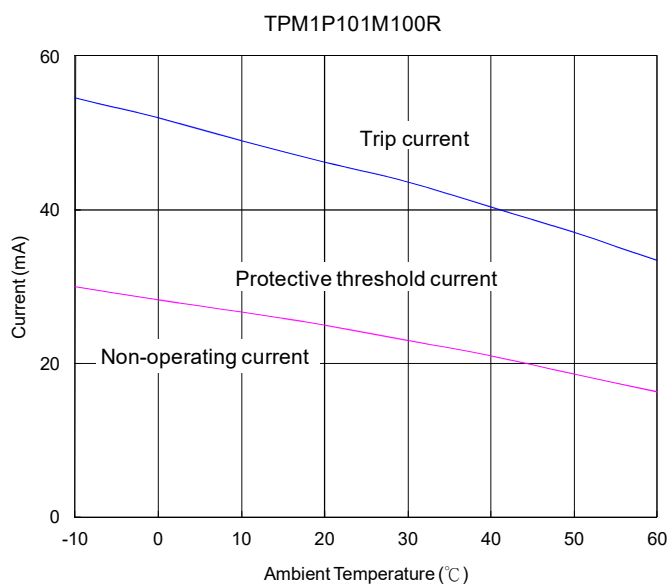
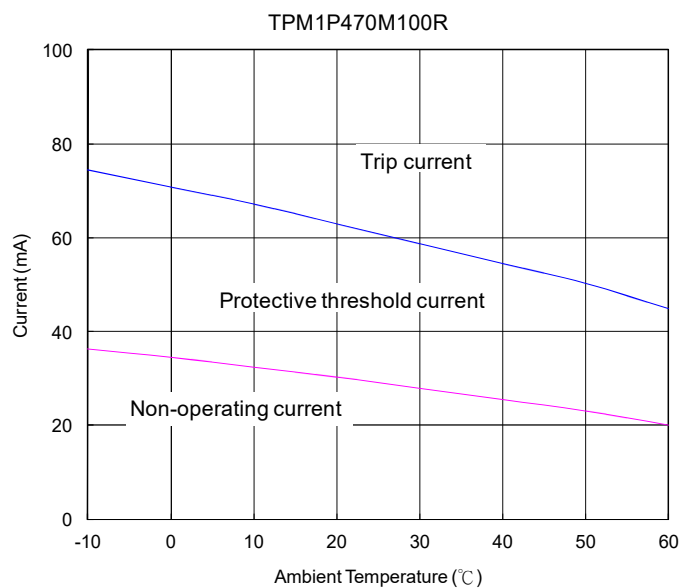
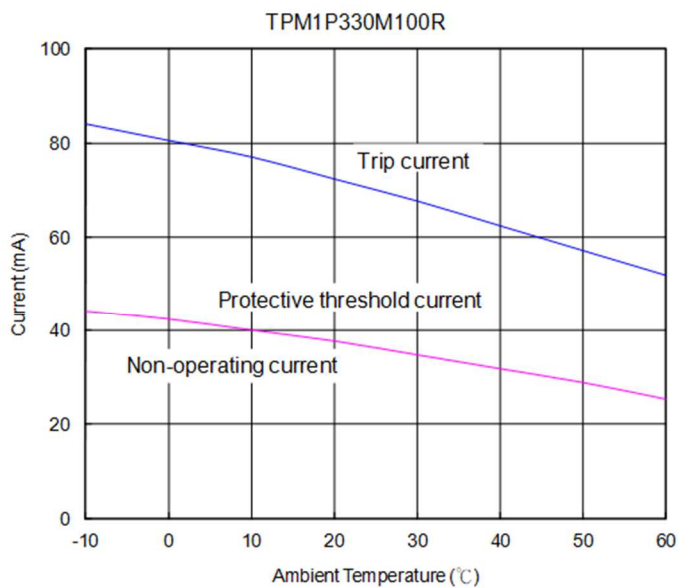
Part No.	Curie Point Temp.	Zero Power Resistance at 25°C	Non-operating Current		Trip Current		Max. Voltage	Max. Current	Operating Temperature Range		Safety Approvals	
			@ +85°C	@ +25°C	@+25°C	@ -40°C			@ Vmax	@V=0		
	T _c (°C)	R ₂₅ (Ω)	I _n (mA)		I _t (mA)		V _{max} (V _{DC})	I _{max} (mA)	T _L ~T _U (°C)		UL/cUL	TUV
TPM4P270H110R	110±10	27	40	90	180	263	30	500	-40 ~ +85	-40~ +125		
TPM4P550H120R	120±10	55	34	60	130	190	30	400				
TPM4P121H120R	120±10	120	23	40	90	132	80	300				
TPM4P401H090R	90±10	400	6	15	40	59	265	200				
TPM4P152S120R	120±10	1500	4	12	22	32	400	150				

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■ Protective Threshold Current Range (0603 Series)

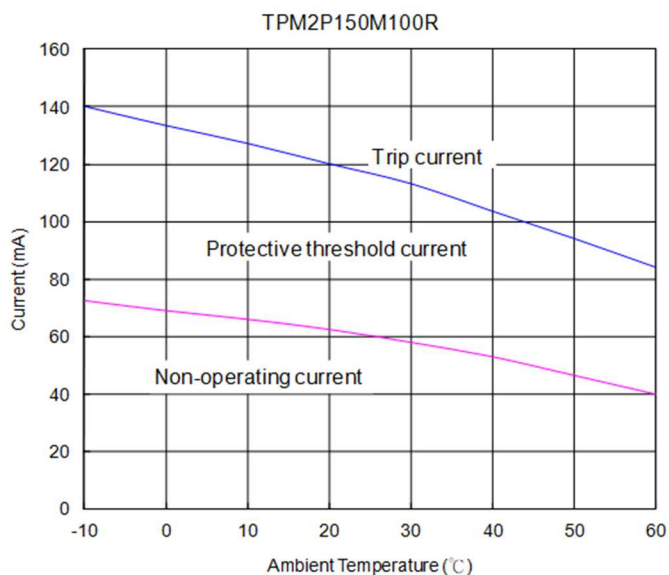


Ceramic PTC Thermistor: TPM-P Series

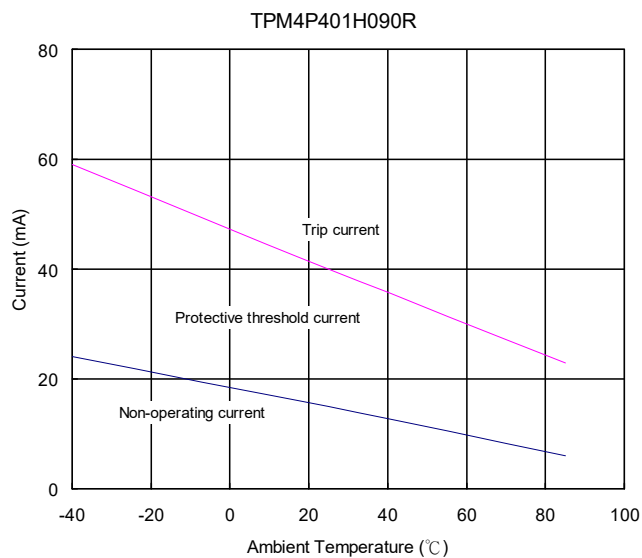
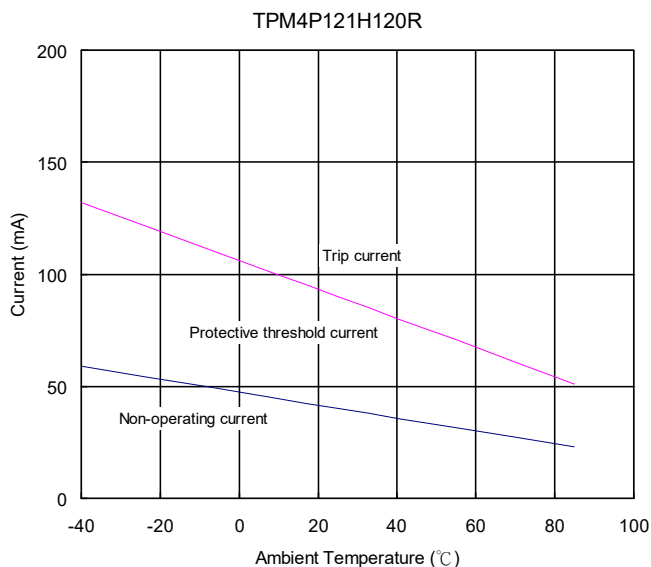
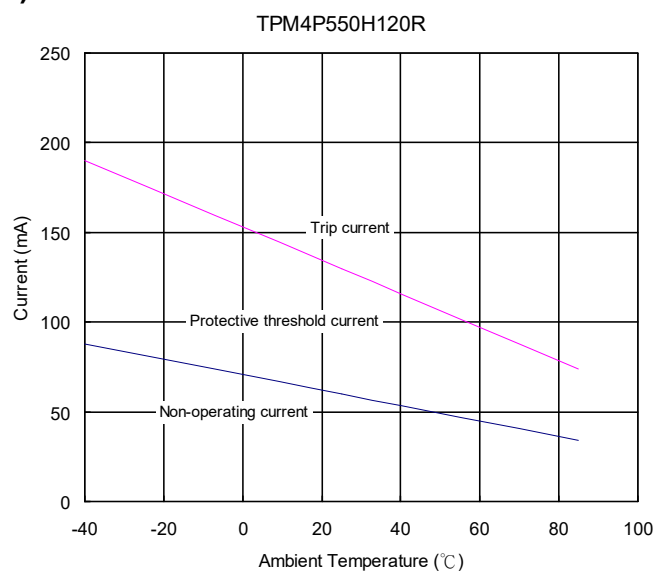
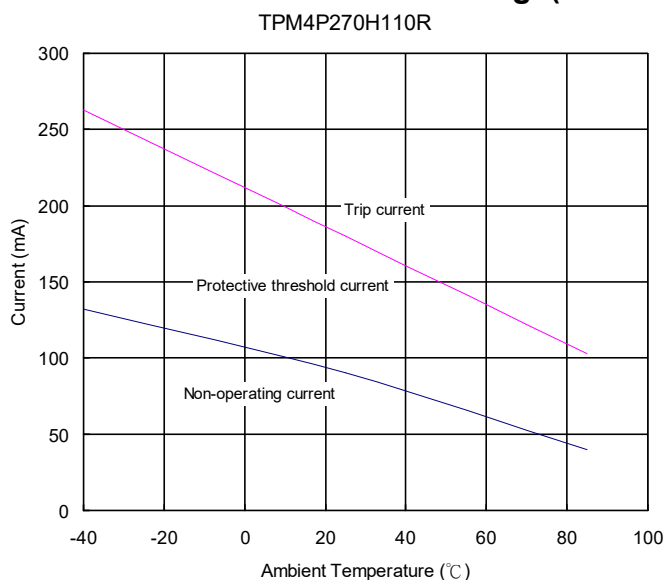
SMD CPTC Thermistor for Over-Current Protection



■ Protective Threshold Current Range (0805 Series)



■ Protective Threshold Current Range(1210 Series)



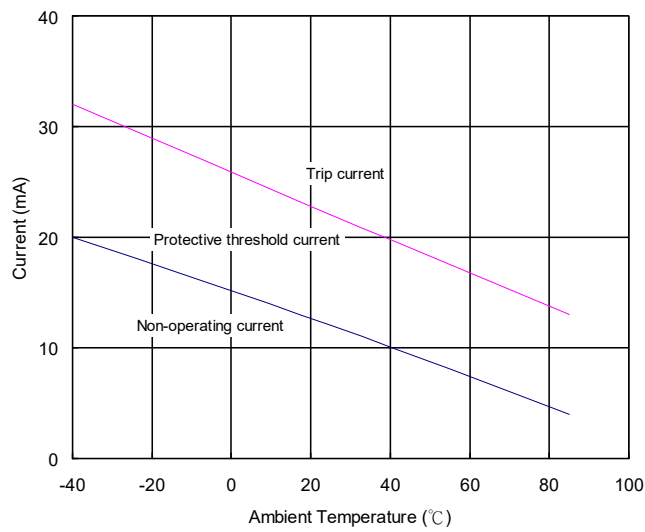
Ceramic PTC Thermistor: TPM-P Series

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■ Protective Threshold Current Range(1210 Series)

TPM4P152S120R



Ceramic PTC Thermistor: TPM-P Series

SMD CPTC Thermistor for Over-Current Protection



■ Typical Application Circuit

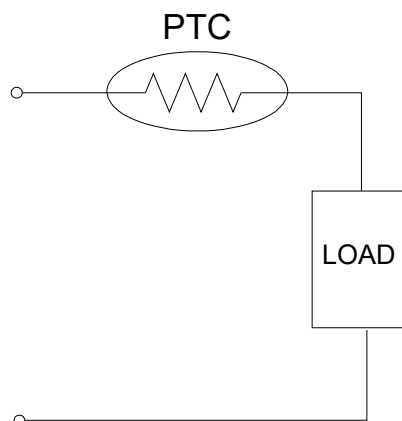


Fig 1. Over-current Protection

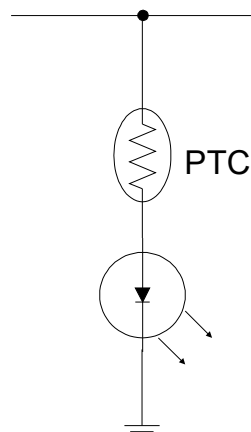
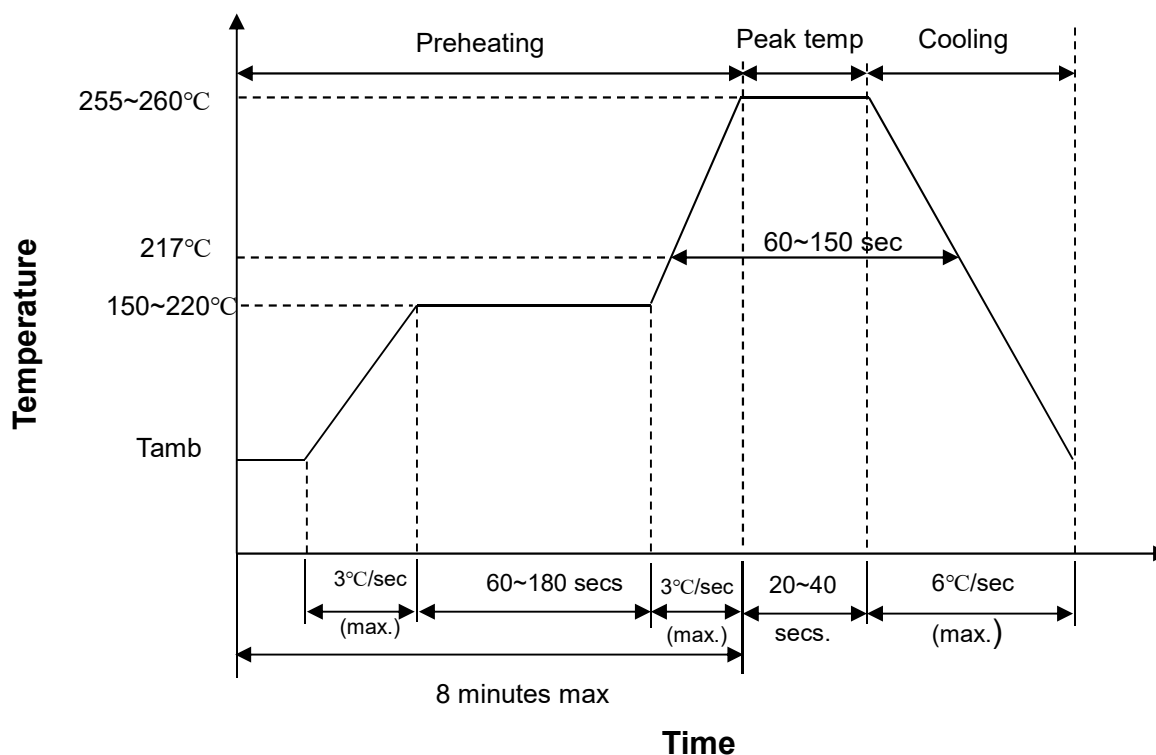


Fig 2. LED Protection

■ Soldering Recommendation

IR-Reflow Soldering Profile



Note: Suitable for reflow soldering only.

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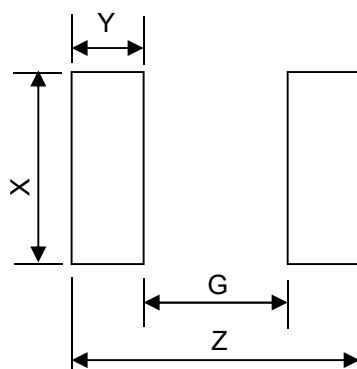


■ Reworking Conditions with Soldering Iron

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 component damage.

■ Recommended Soldering Pad Dimensions



Size (EIA)	Z (mm)	G (mm)	X (mm)	Y (mm)
0603	2.8	0.8	1.0	1.0
0805	3.4	1.0	1.4	1.2
1210	4.5	2.1	2.8	1.2

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■ Reliability

Item	Standard	Test Conditions / Methods	Specifications															
Rapid Change of Temperature	IEC 60068-2-14	The conditions shown below shall be repeated 5 cycles on PCB <table><tr><th>Step</th><th>Temperature (°C)</th><th>Period (minutes)</th></tr><tr><td>1</td><td>-40 ± 3</td><td>30 ± 3</td></tr><tr><td>2</td><td>Room temperature</td><td>≤3</td></tr><tr><td>3</td><td>125 ± 2</td><td>30 ± 3</td></tr><tr><td>4</td><td>Room temperature</td><td>≤3</td></tr></table>	Step	Temperature (°C)	Period (minutes)	1	-40 ± 3	30 ± 3	2	Room temperature	≤3	3	125 ± 2	30 ± 3	4	Room temperature	≤3	No visible damage ΔR ₂₅ /R ₂₅ ≤ 20 %
Step	Temperature (°C)	Period (minutes)																
1	-40 ± 3	30 ± 3																
2	Room temperature	≤3																
3	125 ± 2	30 ± 3																
4	Room temperature	≤3																
Damp Heat, Steady State	IEC 60068-2-78	60 ± 2°C, 90 ~ 95% RH , 1000± 24 hrs	No visible damage ΔR ₂₅ /R ₂₅ ≤ 20 %															
Bending Strength	IEC-60068-2-21	Warp 2mm Speed < 0.5mm/sec. Duration: 10 sec on PCB 	No visible damage ΔR ₂₅ /R ₂₅ ≤ 10 %															
High Temp. Storage	IEC 60068-2-2	125 ± 2°C, 1000 ± 24 hrs	No visible damage ΔR ₂₅ /R ₂₅ ≤ 20 %															
Low Temp. Storage	IEC 60068-2-1	-40 ± 3°C, 1000 ± 24 hrs	No visible damage ΔR ₂₅ /R ₂₅ ≤ 20 %															
High Temp. Endurance Load	Specification Standard	60 ± 3°C Vmax., for 1.5hrs on / 0.5hrs off, 1000 ± 24 hrs	No visible damage ΔR ₂₅ /R ₂₅ ≤ 20 %															
High Temp. Load (*1)	IEC 60738-1 7.24.3	85 ± 5°C, Vmax. , 1000 ± 24 hrs	No visible damage ΔR ₂₅ /R ₂₅ ≤ 20 %															
Climatic Sequence	IEC 60738-1 7.22	a. 125°C x 16 hrs b. 1st cycle : 40°C, 95 %RH x 24 hrs c. -40°C x 2 hrs d. 5 cycles: 40°C, 95% RH x 24 hrs / Cycle	No visible damage ΔR ₂₅ /R ₂₅ ≤ 20 %															
Solderability	IEC 60068-2-58	245 ± 5°C, 3 ± 0.3 sec	At least 95% of terminal electrode is covered by new solder															
Resistance to Soldering Heat	IEC 60068-2-58	8.1.2.2 Solder reflow method Preheating:150~180°C, 60~120 secs Peak temperature: 245~255°C, ≤ 20 secs (reflow)	No visible damage ΔR ₂₅ /R ₂₅ ≤ 20 %															

Note: *1 means the standard applies for TPM4P Series.

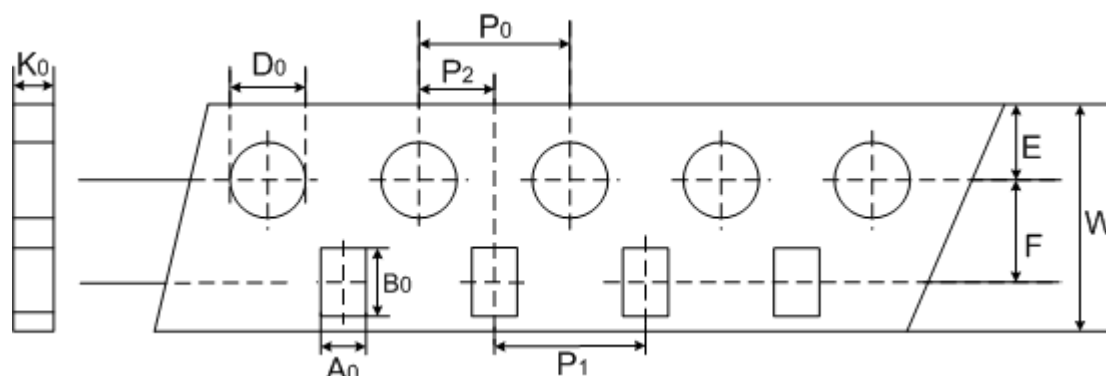
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■ Packaging

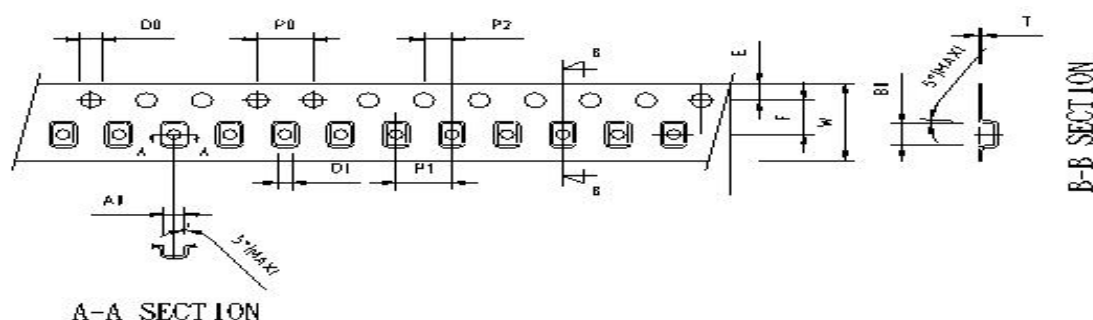
● Taping Specification (0603 & 0805 Series)



(Unit: mm)

Index Size	A ₀	B ₀	W	E	F	P ₁	P ₂	P ₀	D ₀	K ₀
0603	±0.2	±0.2	±0.2	±0.1	±0.05	±0.1	±0.05	±0.1	±0.1	±0.1
0805	1.1	1.9	8	1.75	3.5	4	2	4	1.55	0.95

● Taping Specification (0805 Series, for TPM2P150M100R)



(Unit: mm)

Index Size	A ₀	B ₀	W	E	F	P ₁	P ₂	P ₀	D ₀	D ₁	T
0805	±0.2	±0.2	±0.2	±0.1	±0.05	±0.1	±0.05	±0.1	±0.1	±0.1	±0.1
0805	1.5	2.3	8	1.75	3.5	4	2	4	1.55	1	0.22

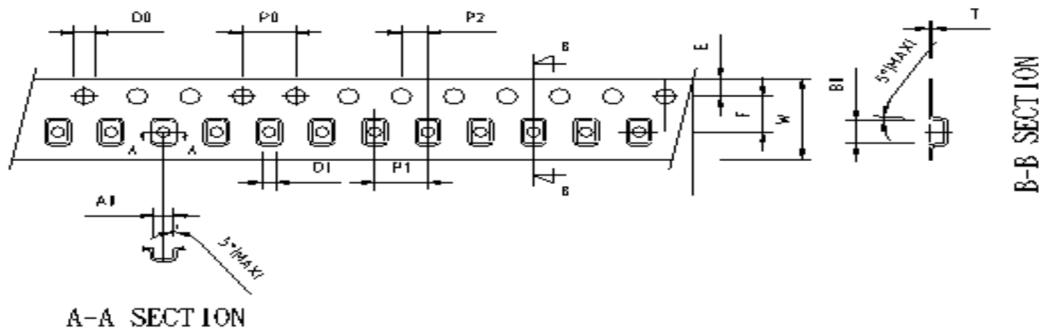
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■ Packaging

● Taping Specification (1210 Series)



(Unit: mm)

Index Size	A ₀ ±0.2	B ₀ ±0.2	W ±0.2	E ±0.1	F ±0.05	P ₁ ±0.1	P ₂ ±0.05	P ₀ ±0.1	D ₀ ±0.1	D ₁ ±0.1	T ±0.1
1210	2.75	3.55	8	1.75	3.5	4	2	4	1.55	1	0.25

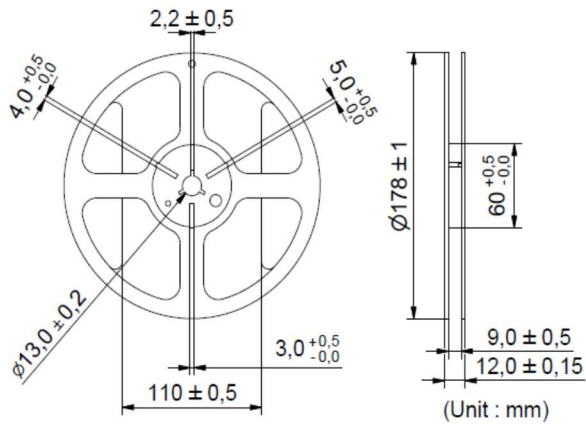
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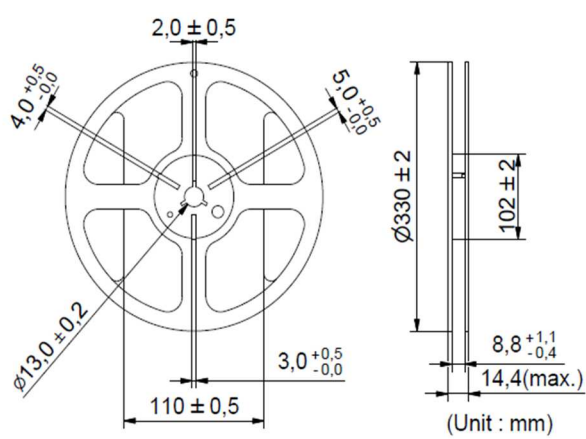
■ Quantity

- 7" Reel



Size(EIA)	Quantity (pcs / reel)
0603	4,000
0805	3,500
	3,000 (For TPM2P150M100R)
1210	2,500

- 13" Reel



Size(EIA)	Quantity (pcs / reel)
0603	16,000
0805	14,000
1210	11,000

Note: 1210 uses plastic reel, and 0603 and 0805 are paper reel.

■ Warehouse 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