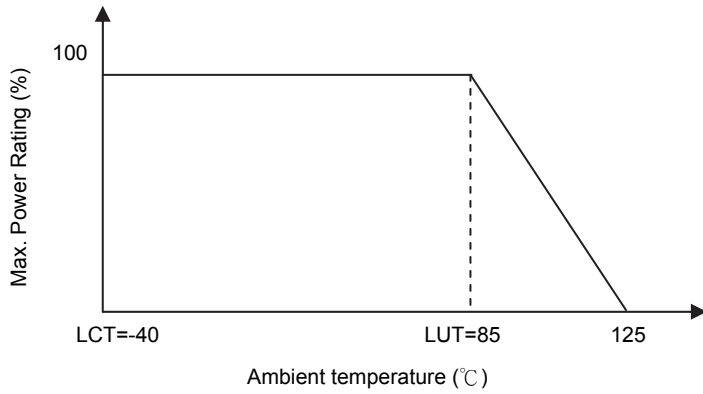
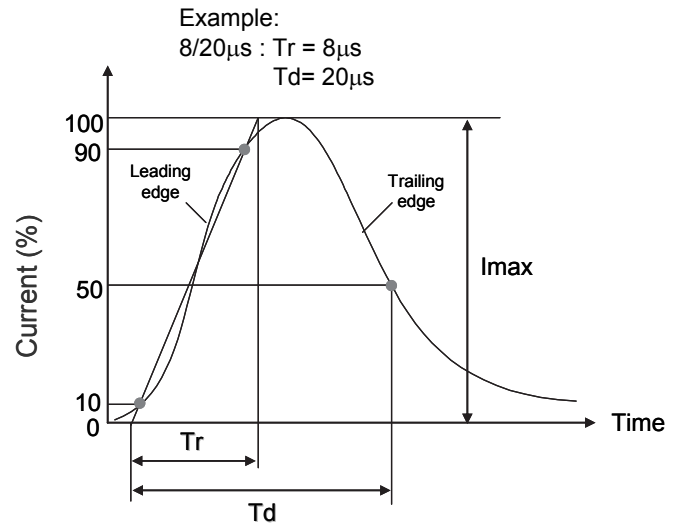


SMD Type Surge Suppressor

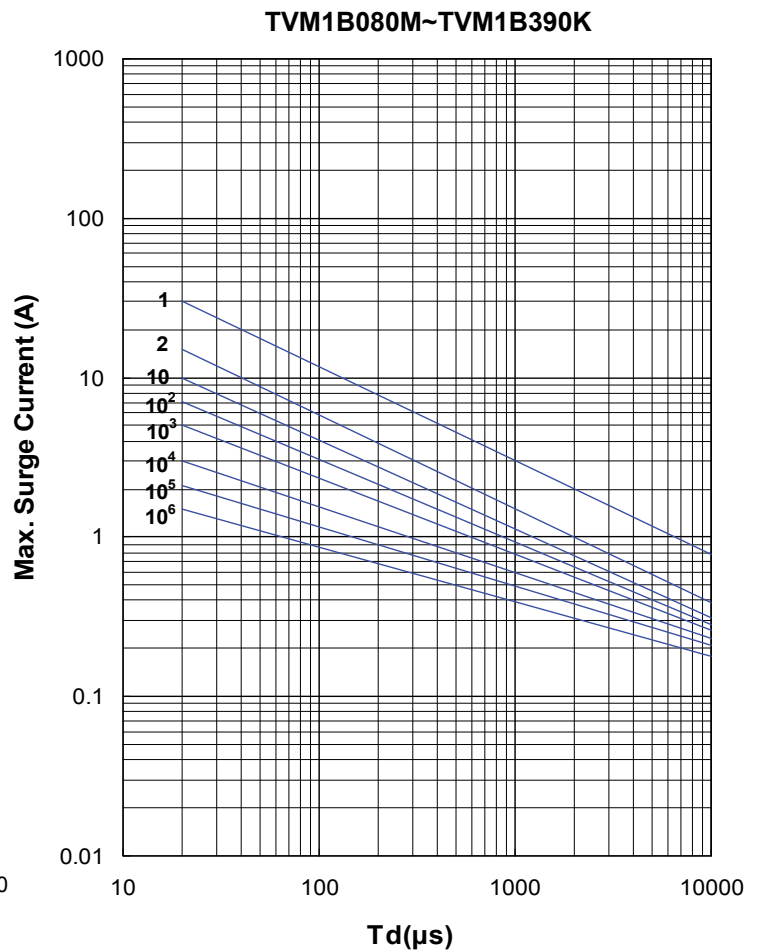
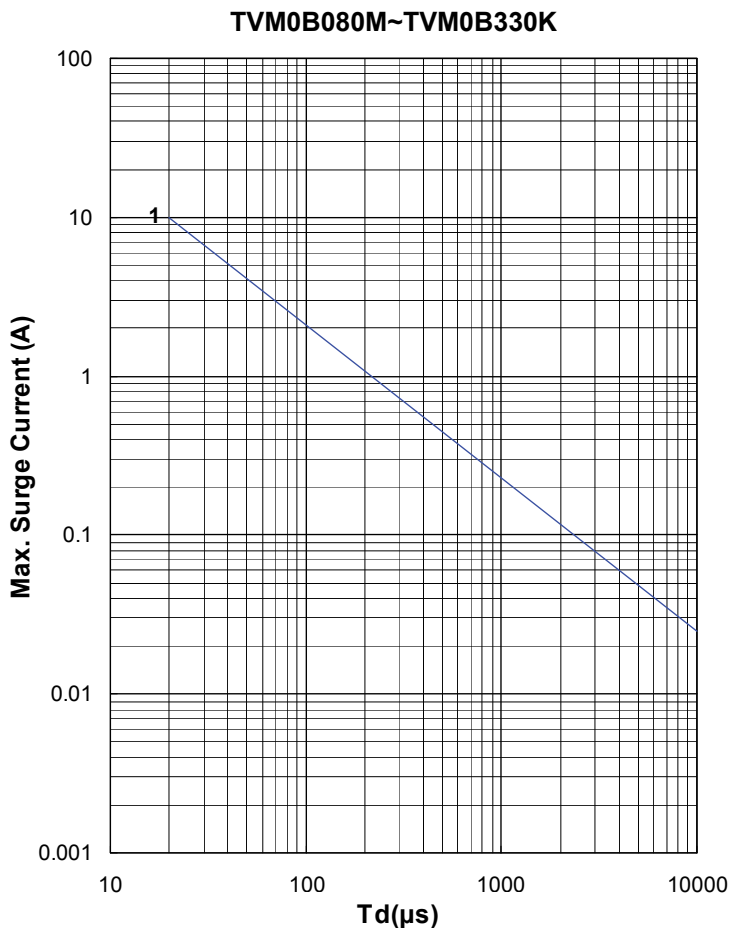
Power Derating Curve



Surge Current Standard Waveform

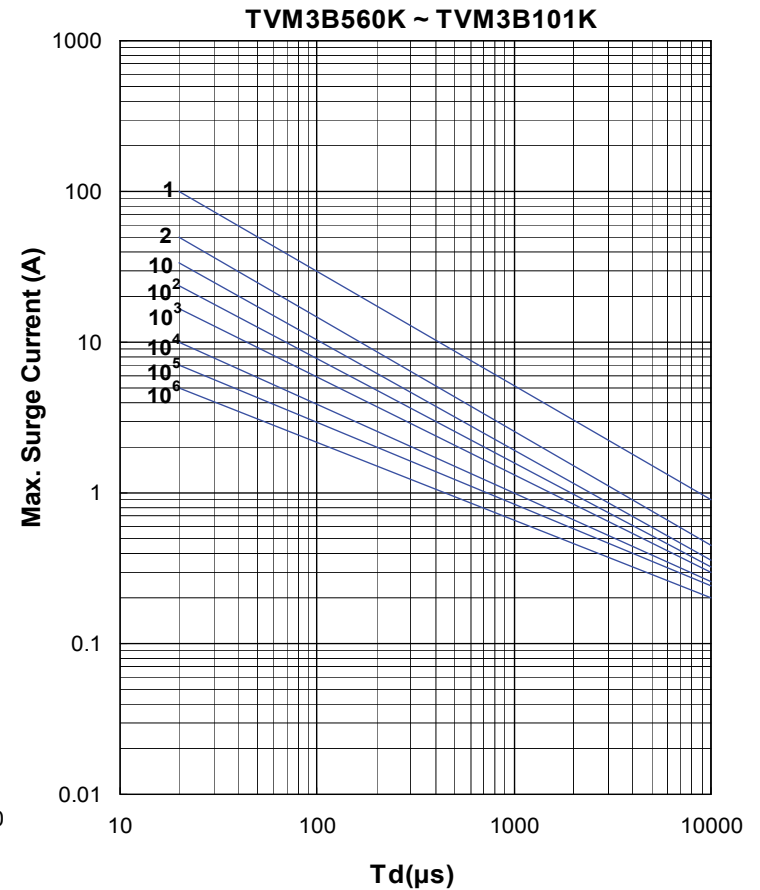
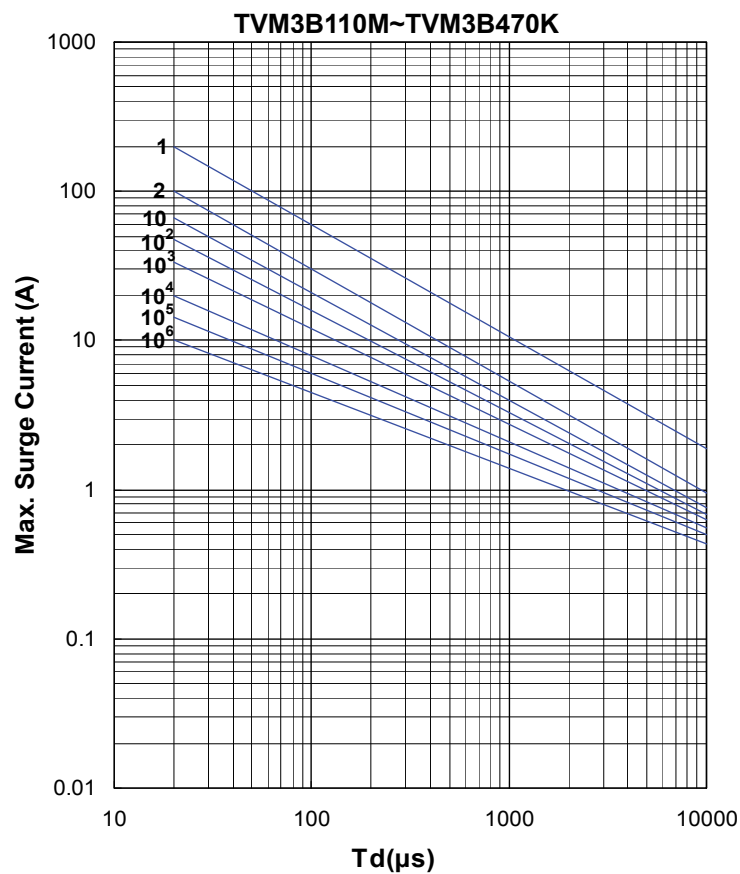
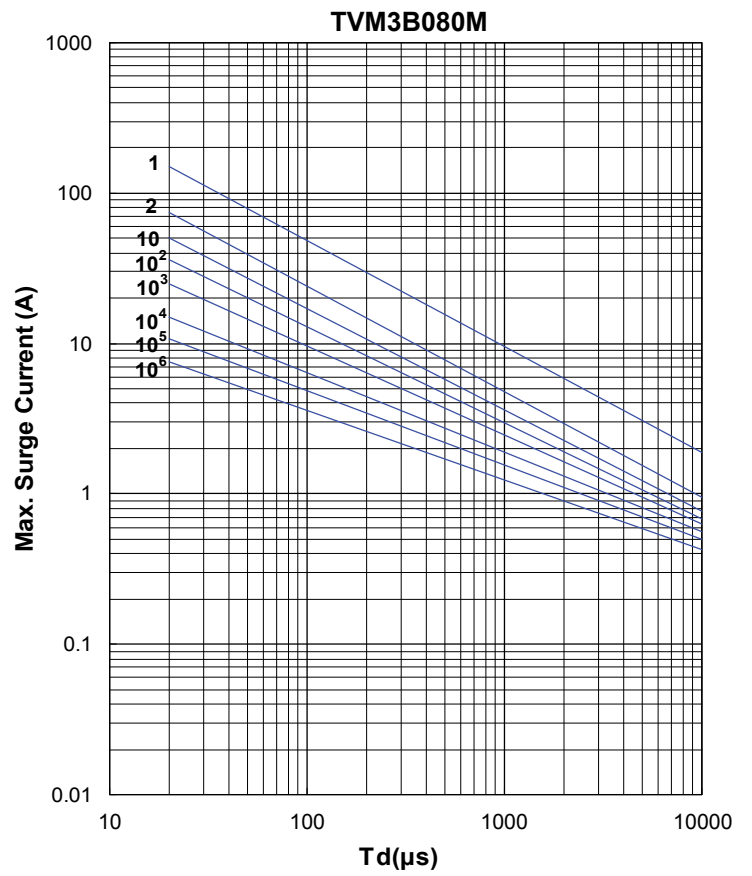
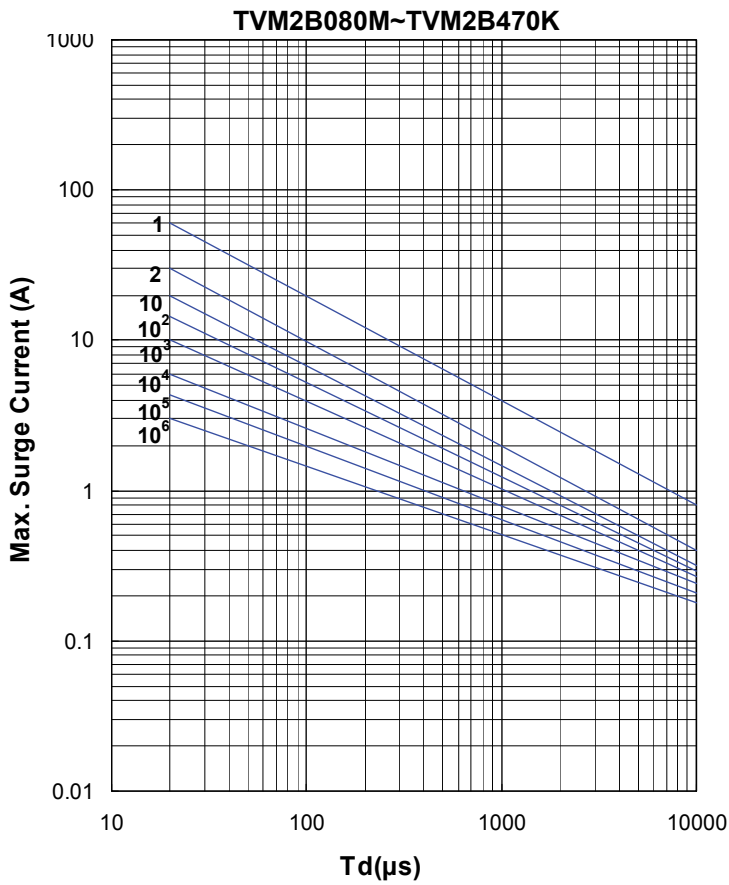


Max. Surge Current Derating Curves



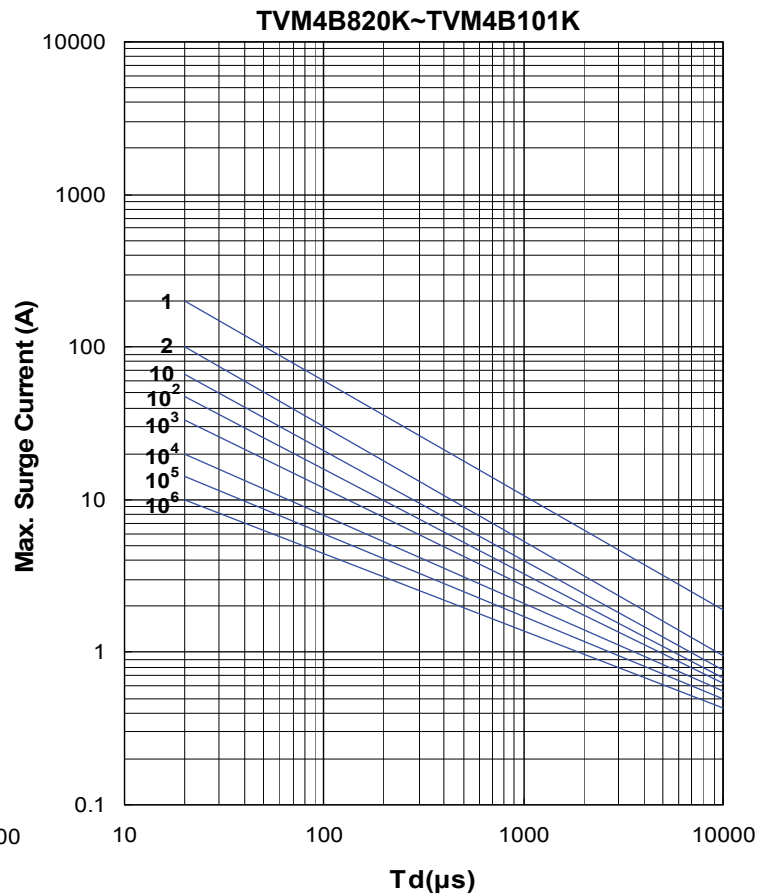
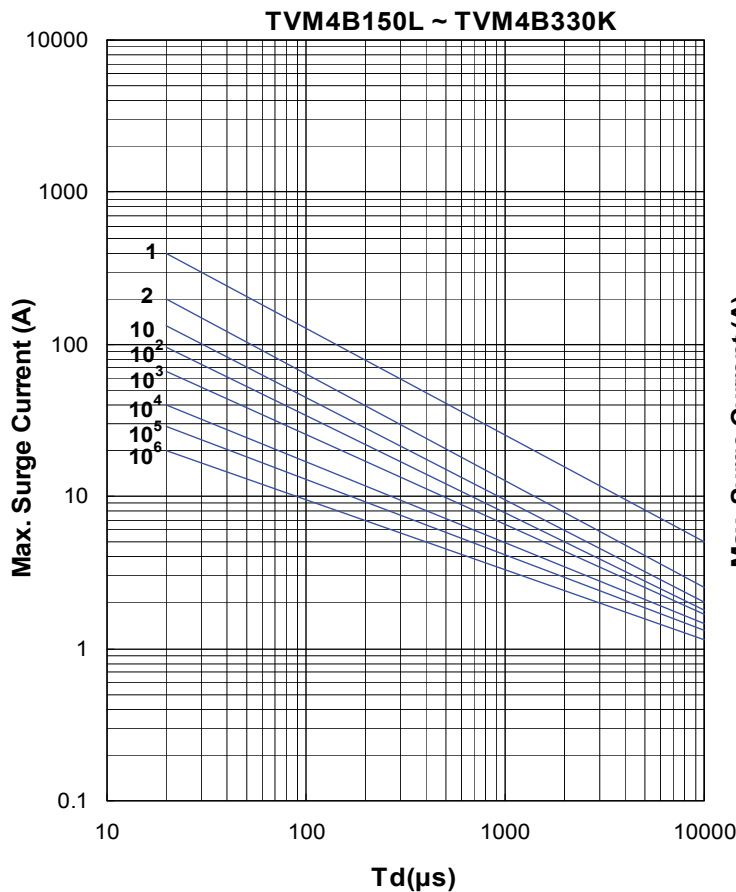
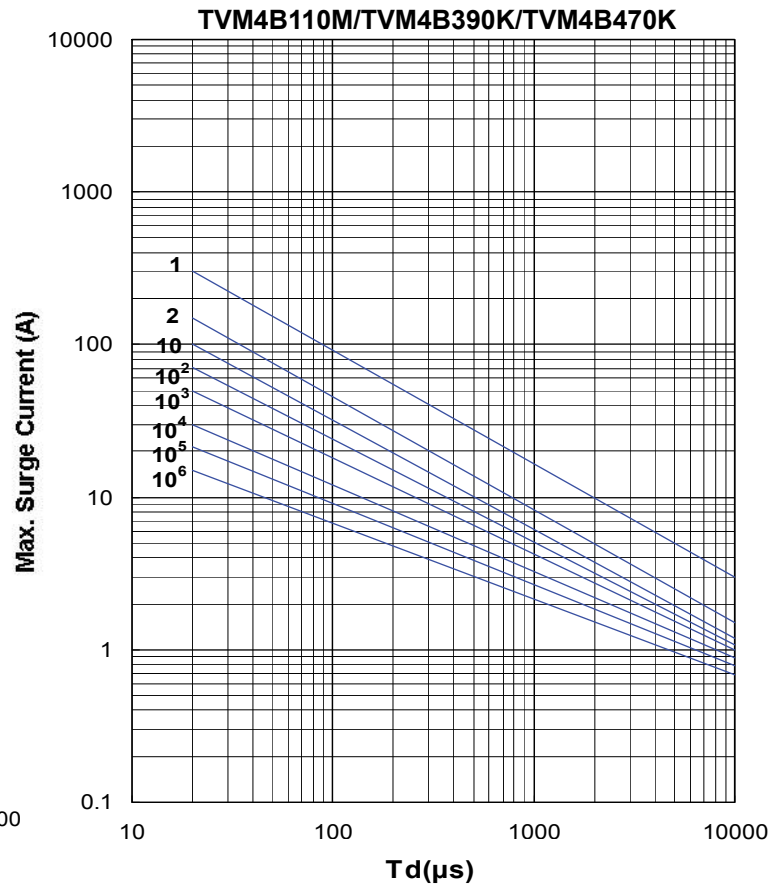
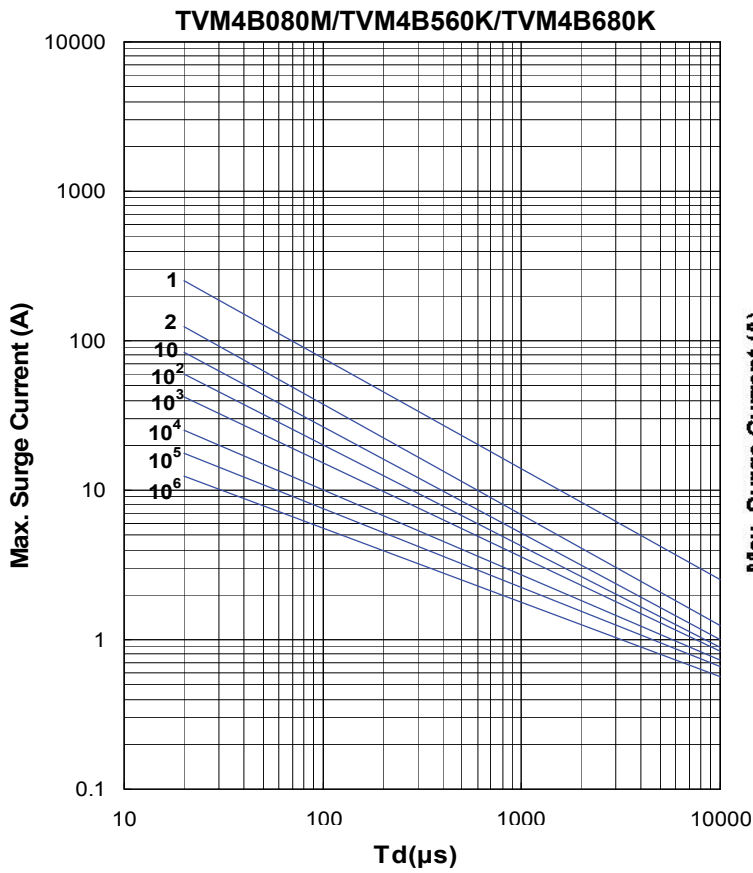
SMD Type Surge Suppressor

Max. Surge Current Derating Curves



SMD Type Surge Suppressor

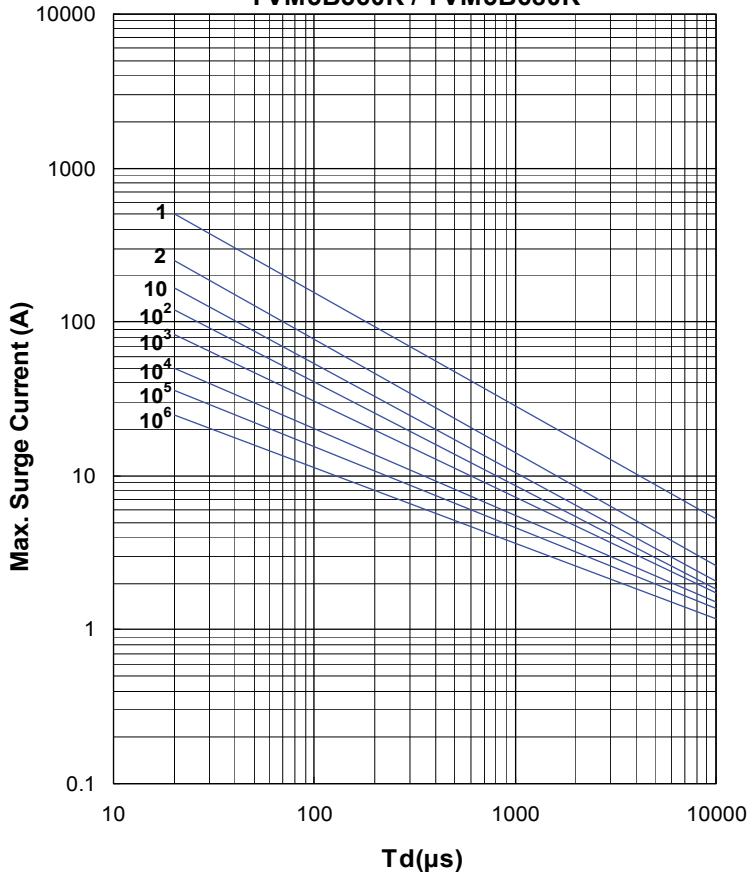
Max. Surge Current Derating Curves



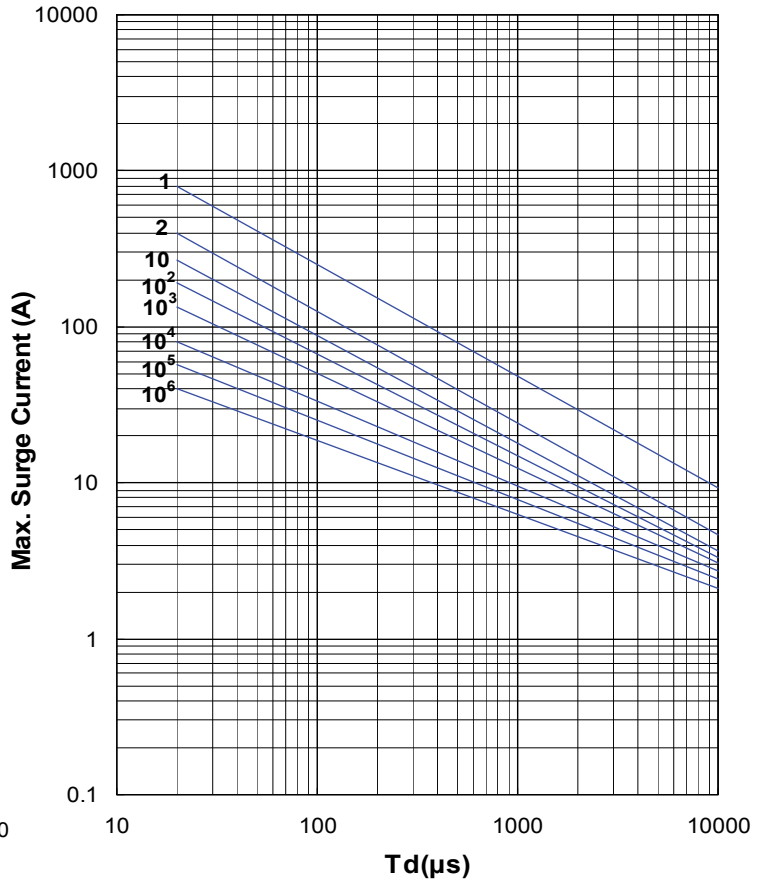
SMD Type Surge Suppressor

Max. Surge Current Derating Curves

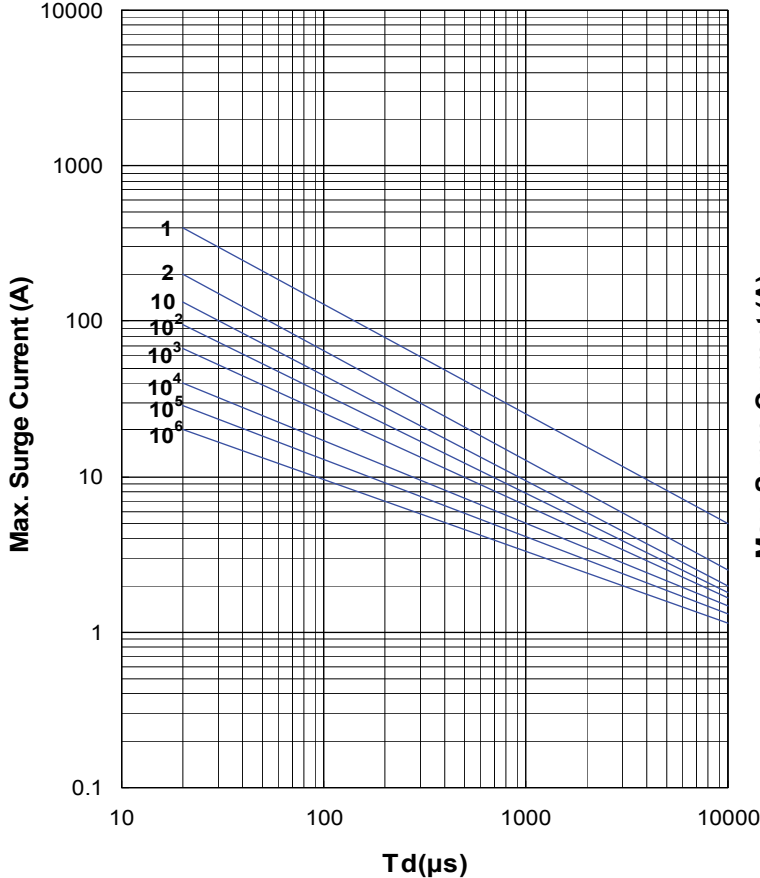
TVM5B080M / TVM5B110M/
TVM5B560K / TVM5B680K



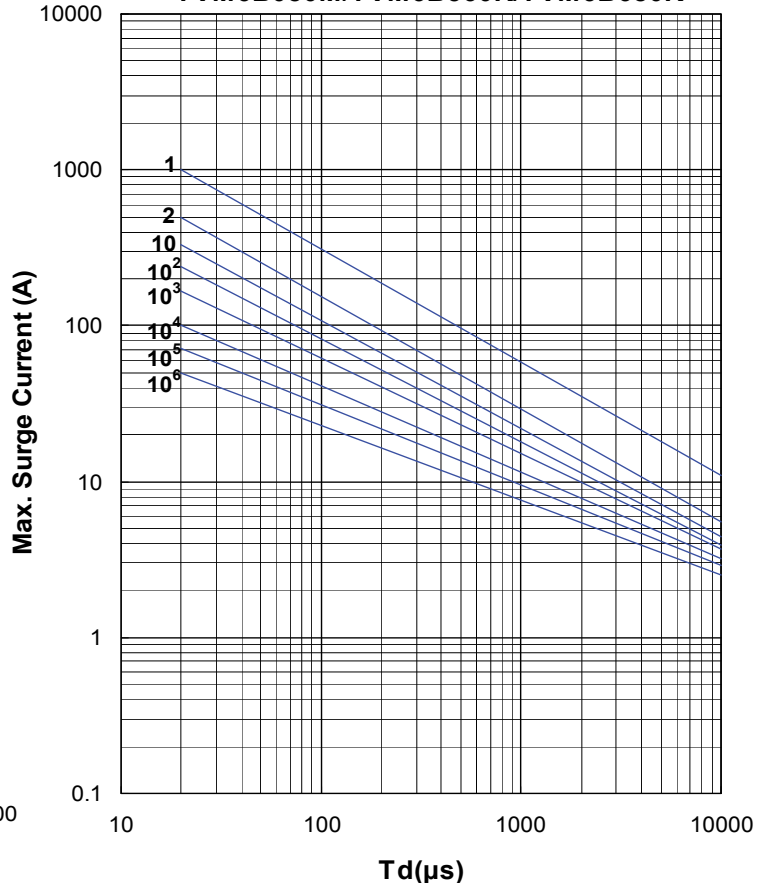
TVM5B150L~TVM5B470K



TVM5B820K ~ TVM5B101K

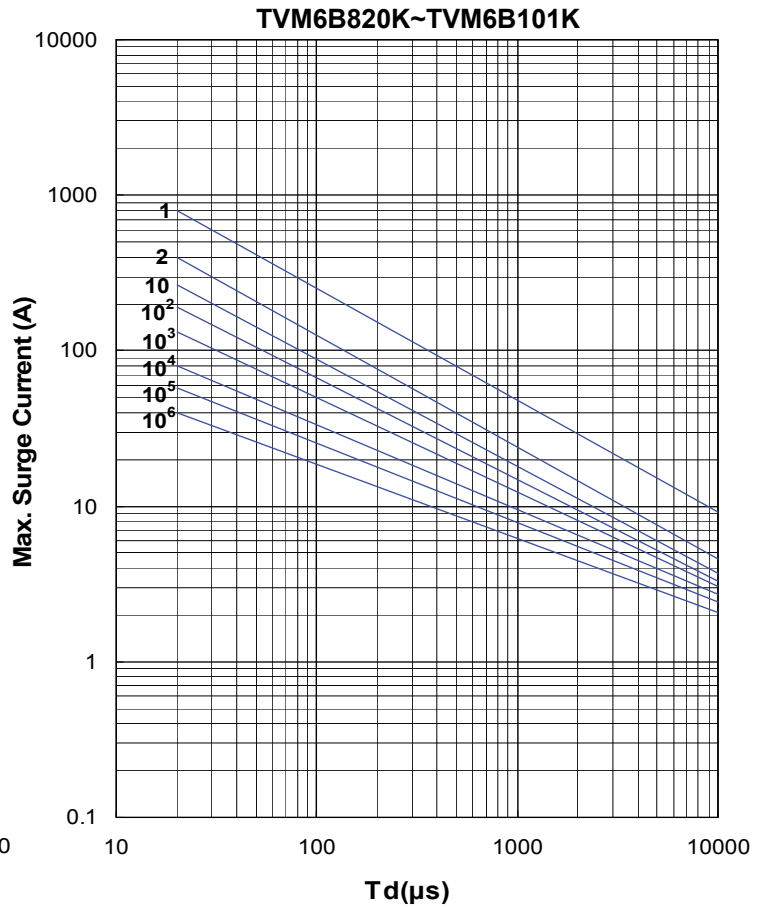
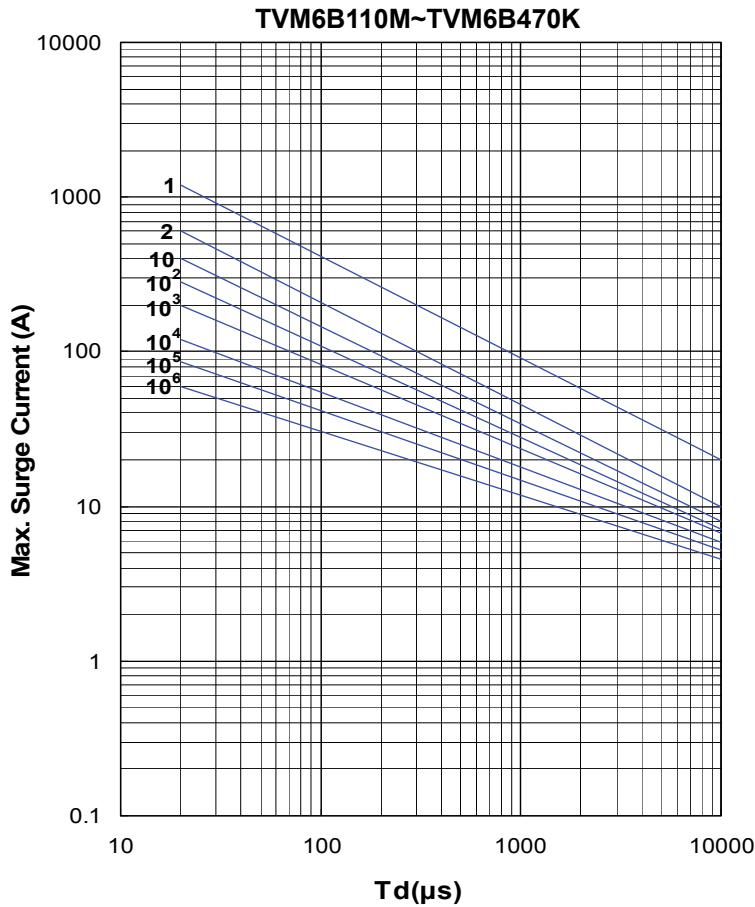


TVM6B080M/TVM6B560K/TVM6B680K

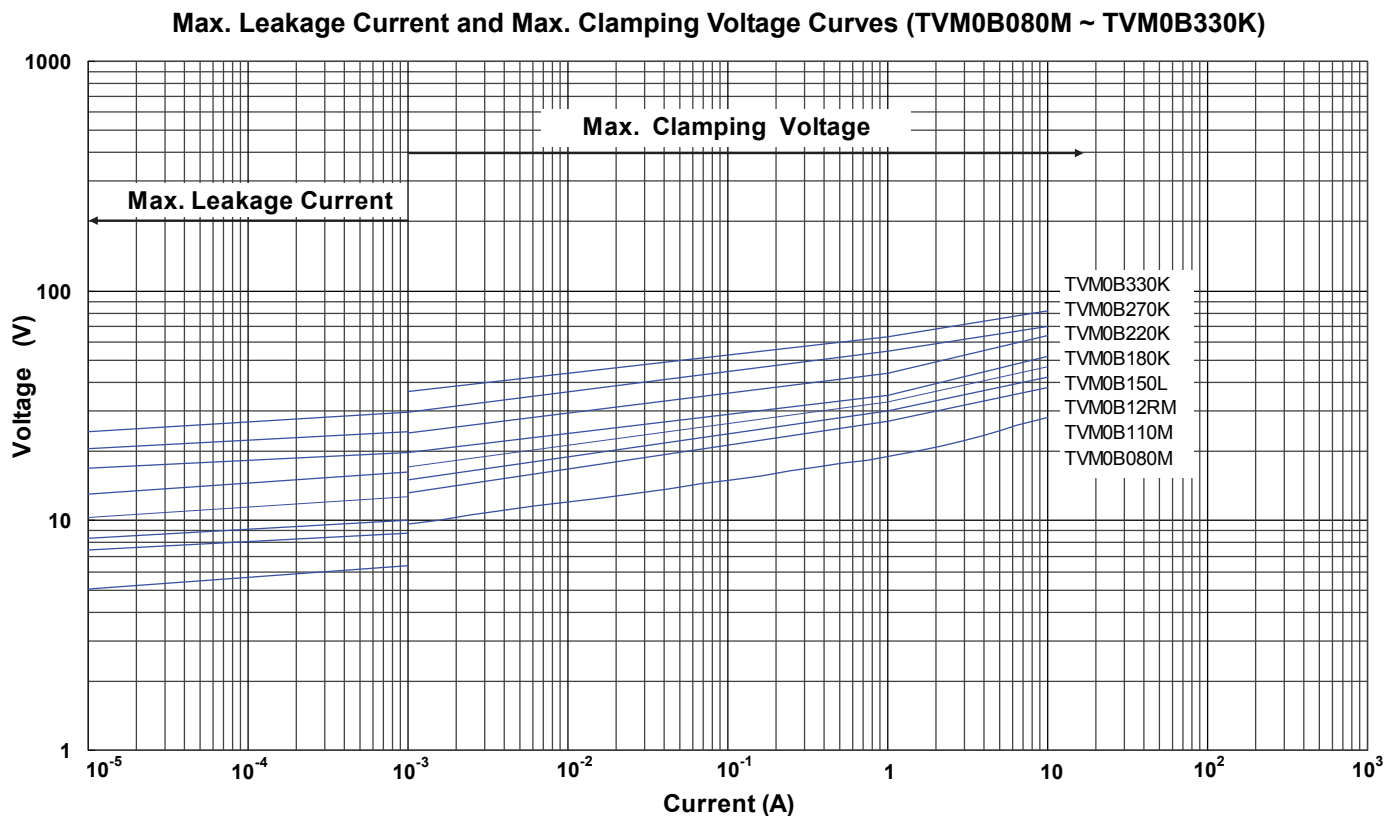


SMD Type Surge Suppressor

Max. Surge Current Derating Curves



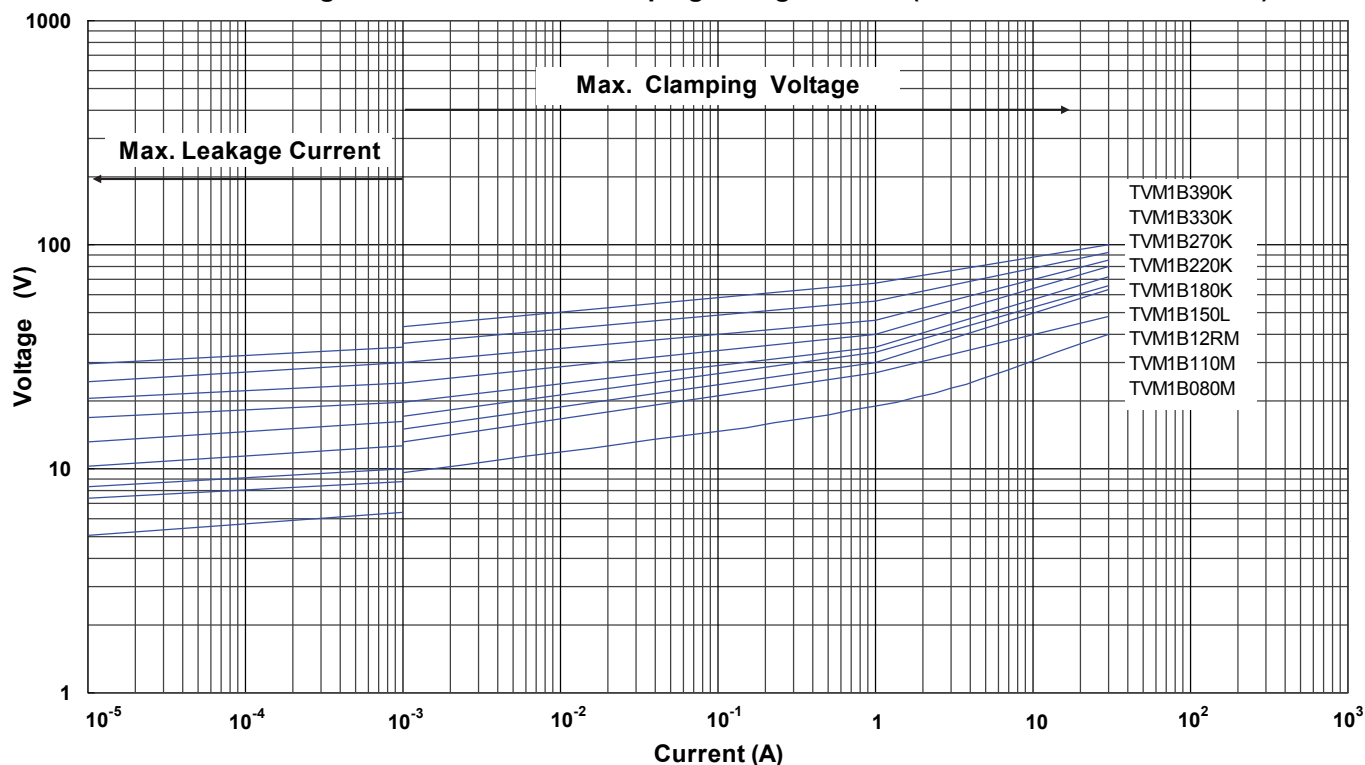
Max. Leakage Current and Max. Clamping Voltage Curves



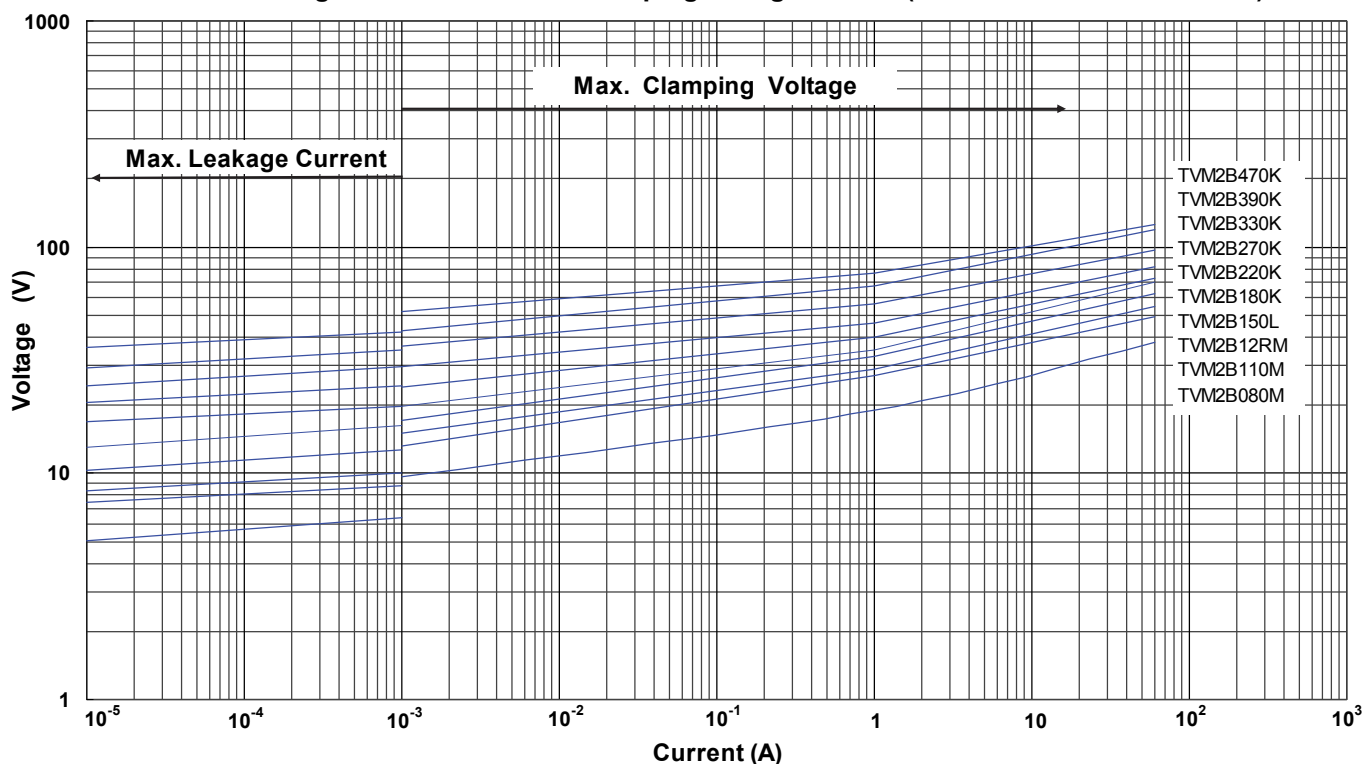
SMD Type Surge Suppressor

■ Max. Leakage Current and Max. Clamping Voltage Curves

Max. Leakage Current and Max. Clamping Voltage Curves (TVM1B080M ~ TVM1B390K)

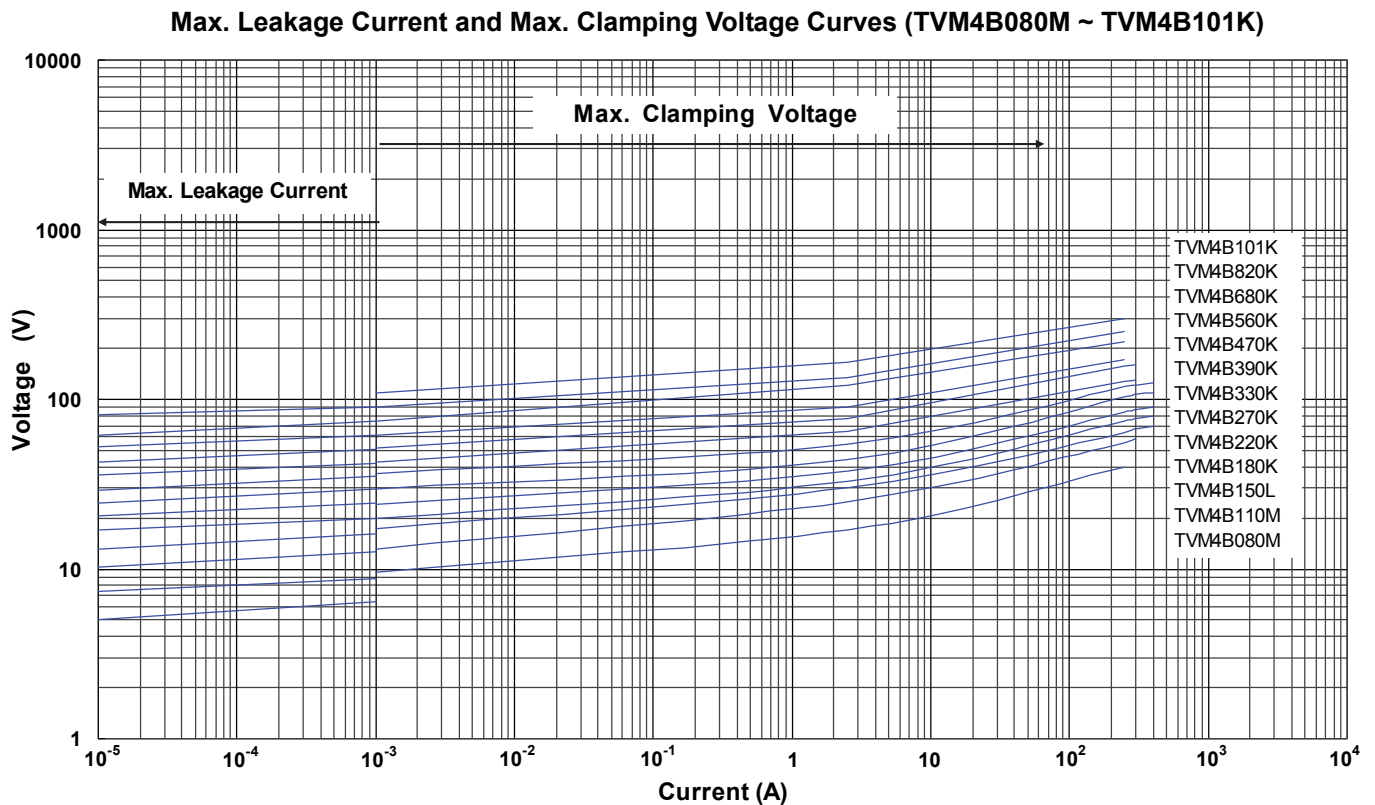
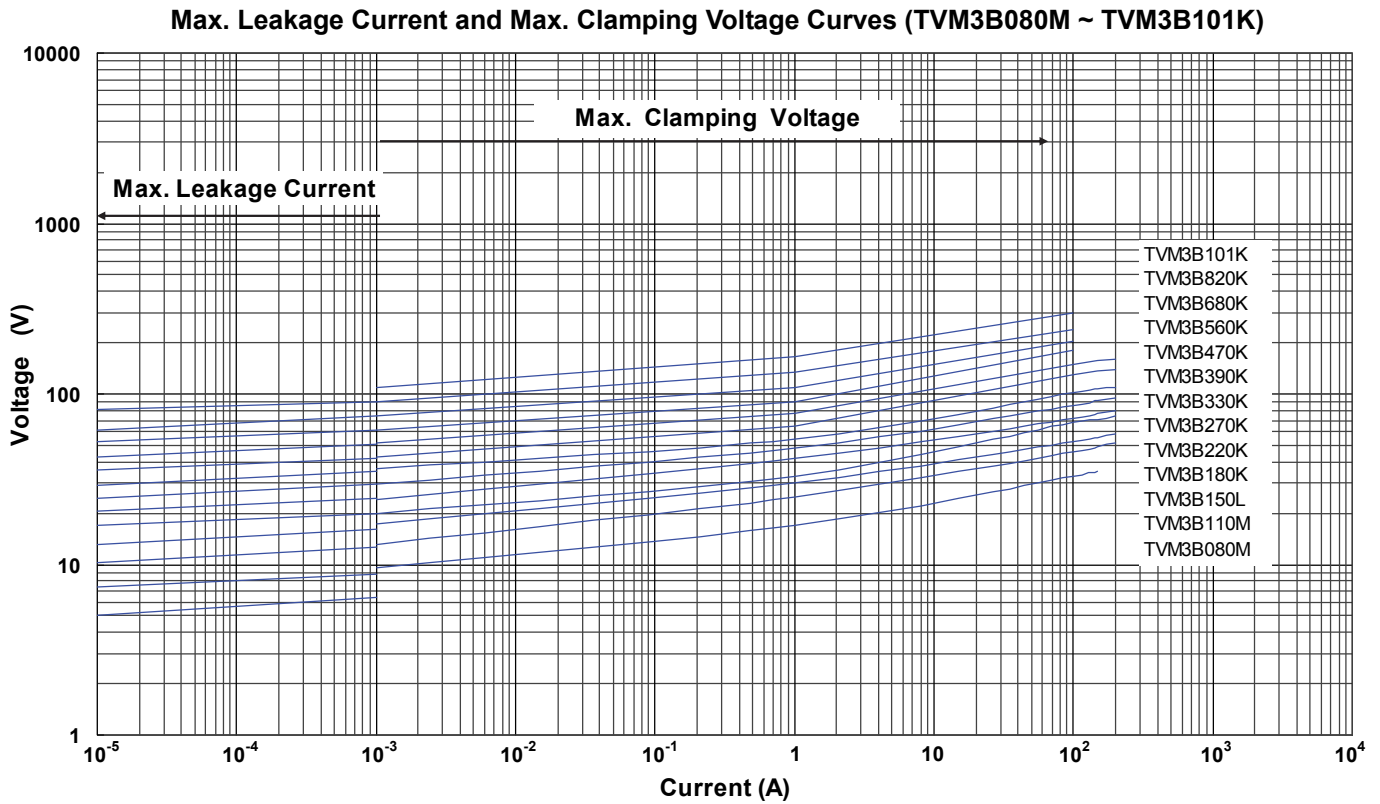


Max. Leakage Current and Max. Clamping Voltage Curves (TVM2B080M ~ TVM2B470K)



SMD Type Surge Suppressor

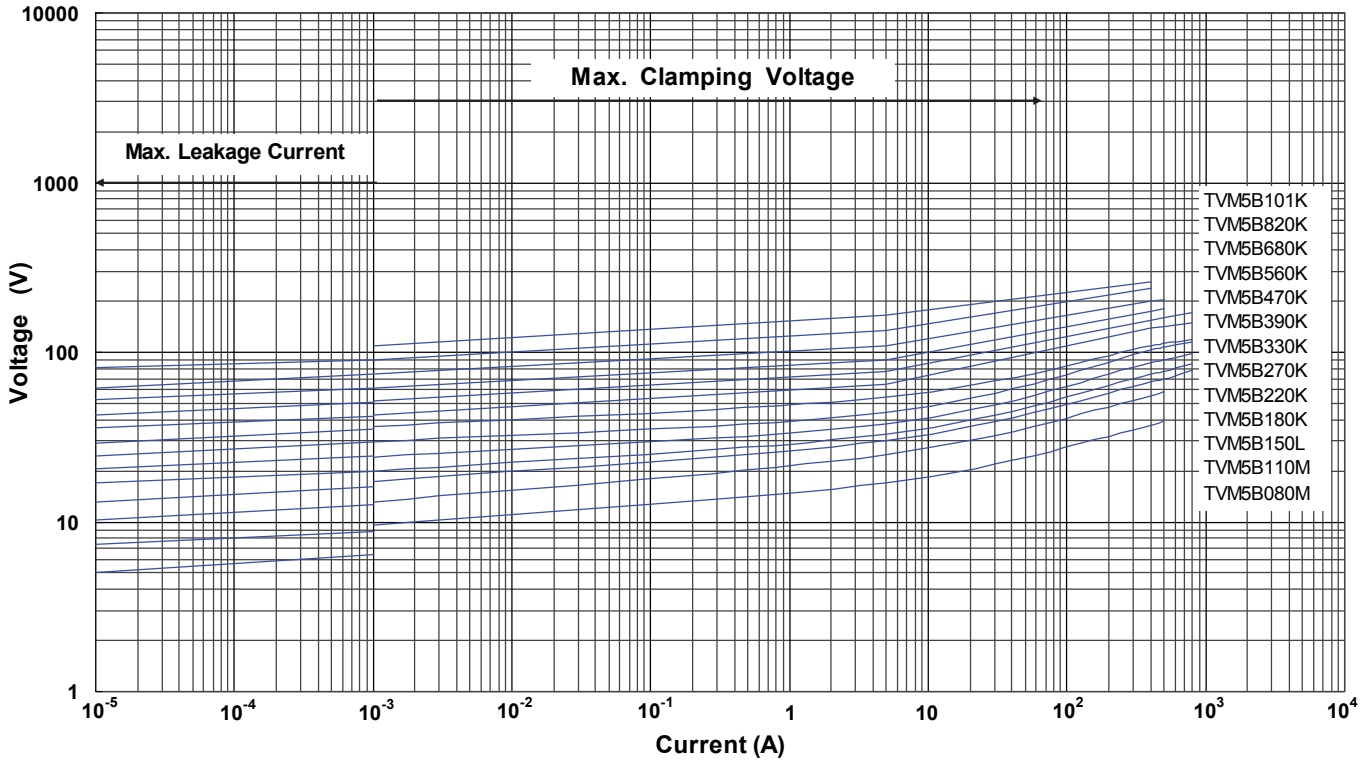
Max. Leakage Current and Max. Clamping Voltage Curves



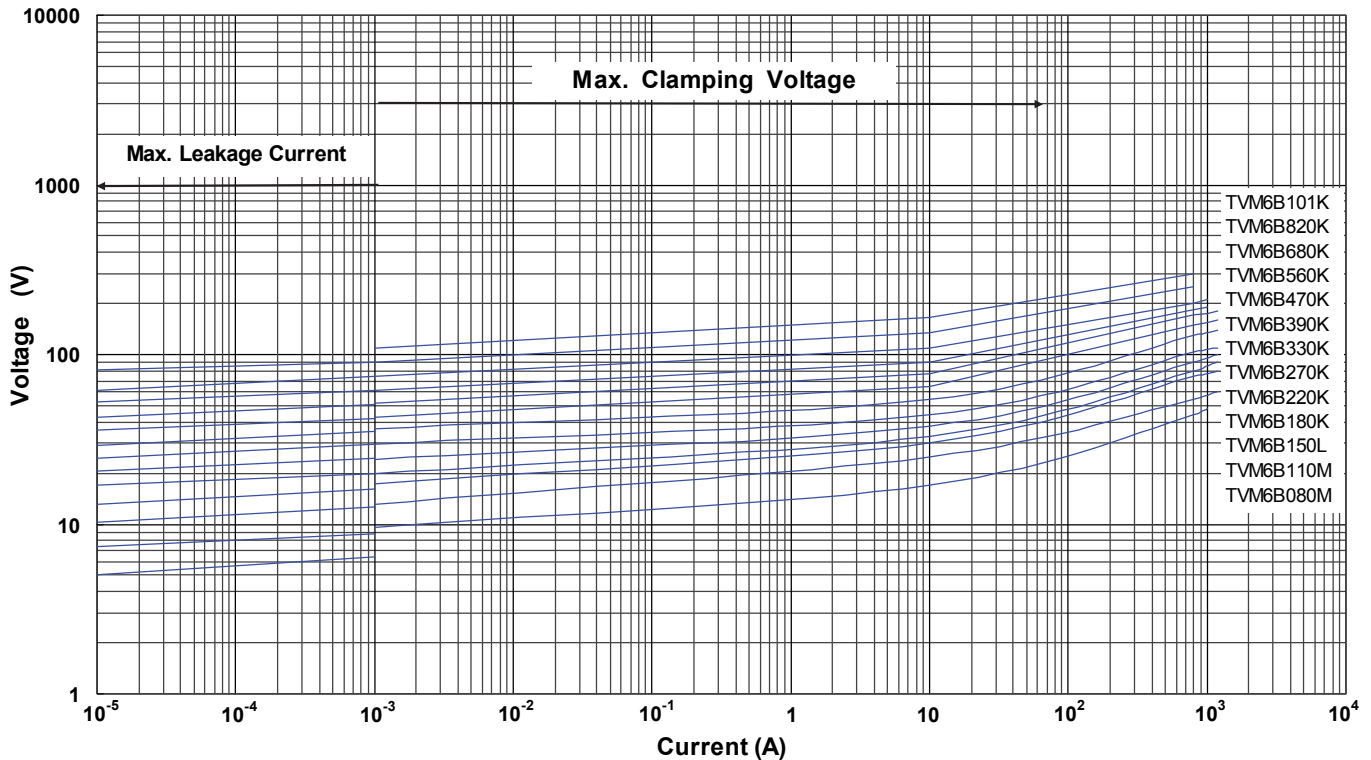
SMD Type Surge Suppressor

Max. Leakage Current and Max. Clamping Voltage Curves

Max. Leakage Current and Max. Clamping Voltage Curves (TVM5B080M ~ TVM5B101K)



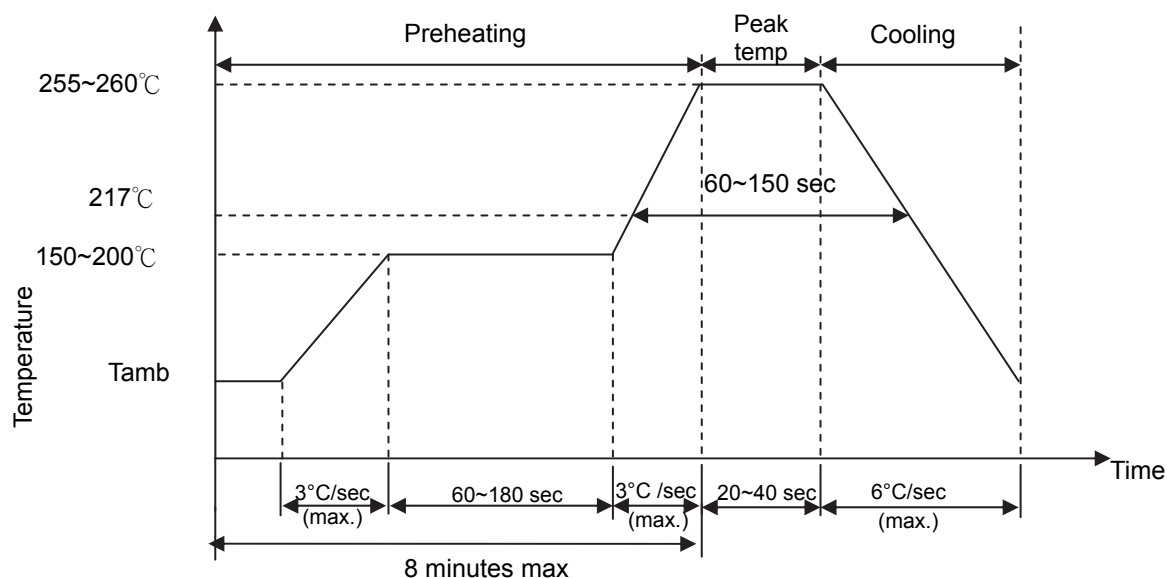
Max. Leakage Current and Max. Clamping Voltage Curves (TVM6B080M ~ TVM6B101K)



SMD Type Surge Suppressor

■ Soldering Recommendation

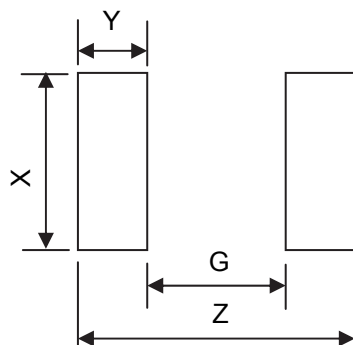
● IR-reflow Soldering Profile



● 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	Φ 3mm (max.)
Caution: Please do not touch the component surface with soldering iron directly to avoid its damage.	


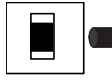
■ Recommended Soldering Pad Dimensions



Size	Z (mm)	G (mm)	X (mm)	Y (mm)
0402	1.7	0.5	0.6	0.6
0603	3.0	1.0	1.0	1.0
0805	3.4	1.0	1.4	1.2
1206	4.5	2.1	1.8	1.2
1210	4.5	2.1	2.8	1.2
1812	6.0	3.0	3.6	1.5
2220	7.2	4.2	5.5	1.5

SMD Type Surge Suppressor

■ Reliability

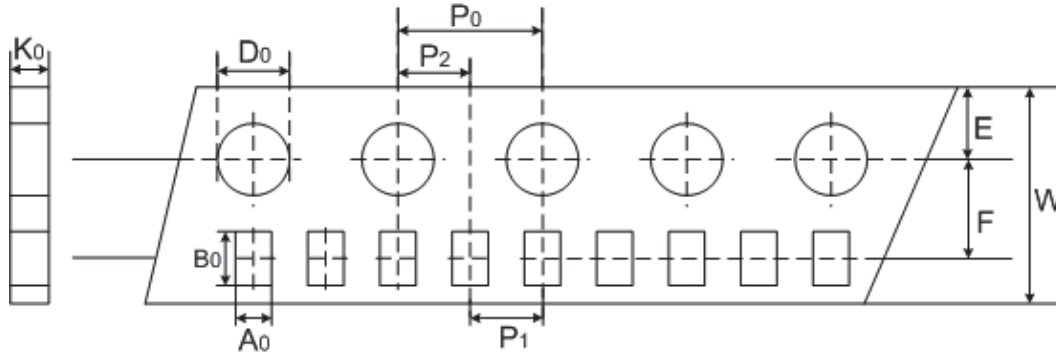
Item	Standard	Test conditions / Methods	Specifications															
Bending Strength	IEC 60068-2-21	Warp: 2mm ; Speed<0.5mm/sec Duration: 10 sec on PCB 	$ \Delta V_{1mA} / V_{1mA} \leq 5\%$ No visible damage															
Adhesion	Specification Standard	Speed < 0.5mm/sec on PCB 	$\geq 0.5\text{Kgf}$ the terminal electrode shall be break off not the chip element															
Damp Heat Load, Steady State	IEC 60068-2-78	$40\pm 2^\circ\text{C}$ 90~95% RH 500 \pm 24 hrs at V_{DC}	$ \Delta V_{1mA} / V_{1mA} \leq 10\%$ No visible damage															
High Temp. Storage	IEC 61051-1	$125\pm 5^\circ\text{C}$ x 1000 \pm 24 hrs	$ \Delta V_{1mA} / V_{1mA} \leq 5\%$ No visible damage															
Rapid Change of Temperature	IEC 61051-1	The conditions shown below shall be repeated 5 cycles on PCB. <table border="1" data-bbox="507 869 1189 1034"> <thead> <tr> <th>Step</th> <th>Temperature ($^\circ\text{C}$)</th> <th>Period (minutes)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>-40 ± 3</td> <td>30\pm3</td> </tr> <tr> <td>2</td> <td>Room temperature</td> <td>5\pm3</td> </tr> <tr> <td>3</td> <td>125 ± 2</td> <td>30\pm3</td> </tr> <tr> <td>4</td> <td>Room temperature</td> <td>5\pm3</td> </tr> </tbody> </table>	Step	Temperature ($^\circ\text{C}$)	Period (minutes)	1	-40 ± 3	30 \pm 3	2	Room temperature	5 \pm 3	3	125 ± 2	30 \pm 3	4	Room temperature	5 \pm 3	$ \Delta V_{1mA} / V_{1mA} \leq 5\%$ No visible damage
Step	Temperature ($^\circ\text{C}$)	Period (minutes)																
1	-40 ± 3	30 \pm 3																
2	Room temperature	5 \pm 3																
3	125 ± 2	30 \pm 3																
4	Room temperature	5 \pm 3																
High Temp. Load	IEC 61051-1	$85\pm 2^\circ\text{C}$ 1000 \pm 24 hrs at V_{DC}	$ \Delta V_{1mA} / V_{1mA} \leq 5\%$ No visible damage															
Low Temp. Load	Specification Standard	$-40\pm 5^\circ\text{C}$ 1000 \pm 24 hrs at V_{DC}	$ \Delta V_{1mA} / V_{1mA} \leq 5\%$ No visible damage															
Max. Energy	Specification Standard	10/1000 μs Waveform, W_{max} , 1 surge current	$ \Delta V_{1mA} / V_{1mA} \leq 10\%$ No visible damage															
Vibration	IEC 61051-1	Frequency range: 10~55Hz Amplitude: 0.75mm or 98m/s ² Direction: 3 mutually perpendicular directions, 2 hrs each	$ \Delta V_{1mA} / V_{1mA} \leq 5\%$ No visible damage															
Varistor Voltage Temp. Coefficient	Specification Standard	Measure V_{1mA} at -40°C , 25°C , 125°C	$ T_c \leq 0.05 (\%/^\circ\text{C})$															
Climatic Sequence	IEC 61051-1	a. 125°C x 16 hrs b. 1st cycle : 55°C 93%RH x 24 hrs c. -40°C x 2 hrs d. 5 cycles : 55°C 93%RH x 24 hrs/cycle	$ \Delta V_{1mA} / V_{1mA} \leq 10\%$ No visible damage															
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 60068-2-20	$260\pm 5^\circ\text{C}$ 10 \pm 1 sec.	$ \Delta V_{1mA} / V_{1mA} \leq 5\%$ No visible damage															

SMD Type Surge Suppressor

■ Packaging

● Taping Specification

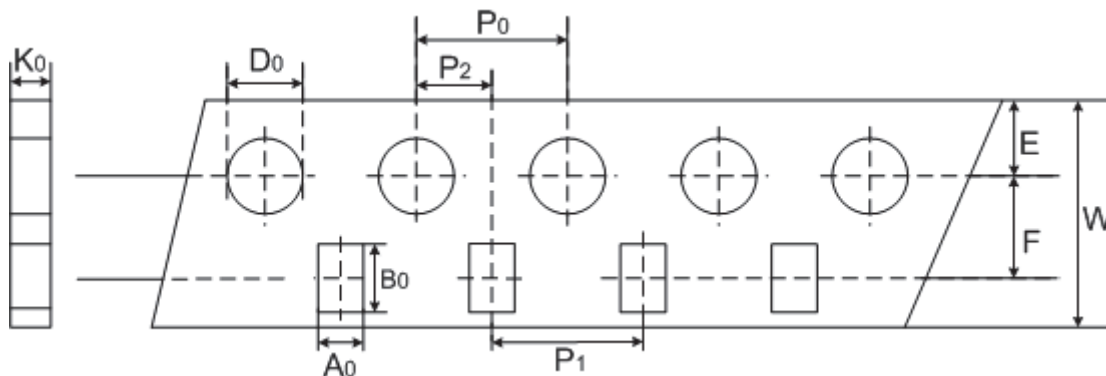
For 0402 Series



(Unit: mm)

Index Size	A ₀ ±0.05	B ₀ ±0.12	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	K ₀ ±0.1
0402	0.62	1.12	8	1.75	3.5	2	2	4	1.55	0.60

For 0603~0805 Series

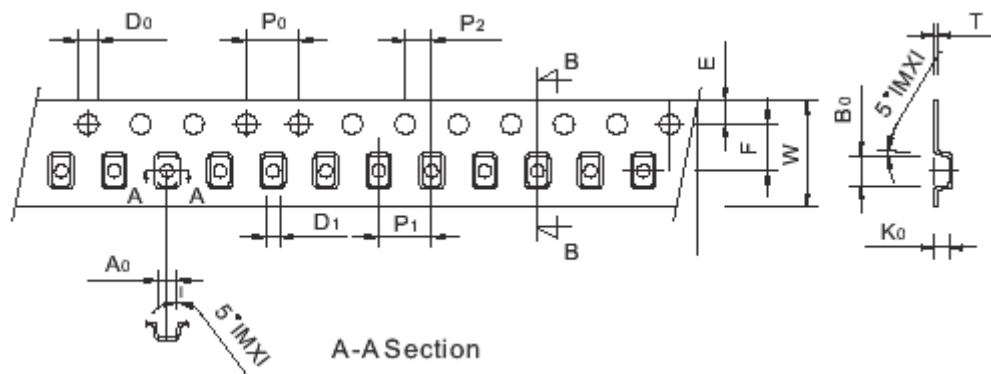


(Unit: mm)

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	K ₀ ±0.1
0603	1.1	1.9	8	1.75	3.5	4	2	4	1.55	0.95
0805	1.5	2.3	8	1.75	3.5	4	2	4	1.55	1.00

SMD Type Surge Suppressor

For 1206~ 2220 Series

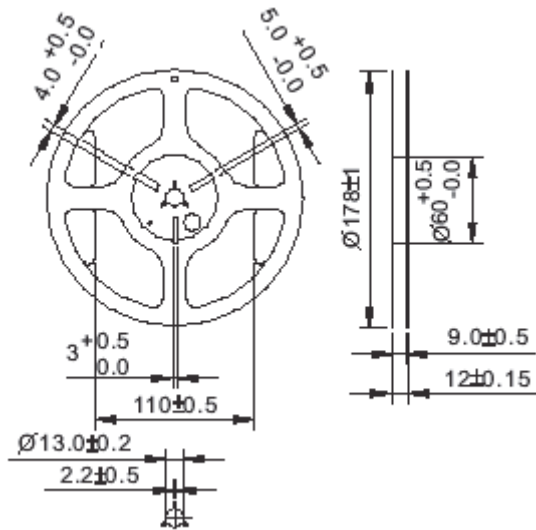


(Unit: mm)

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
1812	3.65	4.96	12	1.75	5.5	8	2	4	1.55	1.5	0.25
2220	5.50	6.25	12	1.75	5.5	8	2	4	1.55	1.5	0.25

SMD Type Surge Suppressor

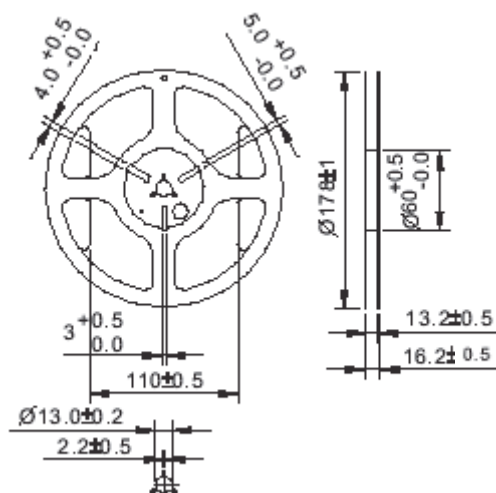
- **Quantity**
For 0402~1210 Series



(Unit: mm)

Size	Quantity (pcs/reel)
0402	10,000
0603	4,000
0805	3,500
1206	2,500
1210	2,500

For 1812~2220 Series



(Unit: mm)

Size	Quantity (pcs/reel)
1812	1,000
2220	1,000

■ Warehouse Storage Conditions of Products

- Storage Conditions:
 1. Storage Temperature: $-10^{\circ}\text{C} \sim +40^{\circ}\text{C}$
 2. Relative Humidity: $\leq 75\% \text{RH}$
 3. Keep away from corrosive atmosphere and sunlight.
- Period of Storage: 1 year