

Metal Oxide Varistor : TVM-B Series

SMD Type Surge Suppressor

■ Features

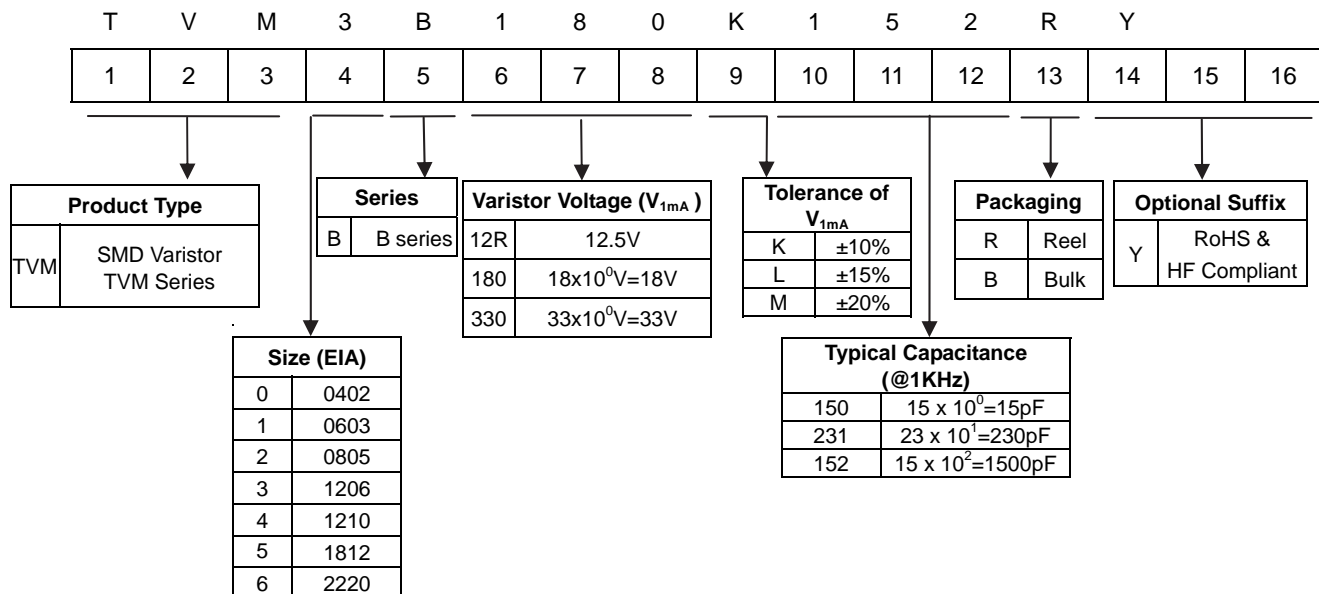
1. RoHS & Halogen Free (HF) compliant
2. EIA size: 0402 ~ 2220
3. Operating voltage: 5.5Vdc ~ 85Vdc
4. High surge suppress capability
5. Bidirectional and symmetrical V/I characteristics
6. Multilayer ceramic construction technology
7. Variable capacitance
8. Operating temperature range: -40°C ~ +85°C
Storage temperature range: -40°C ~ +125°C



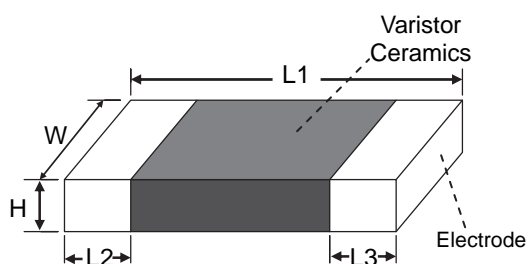
■ Recommended Applications

1. Power system
2. Motherboard/notebook computer
3. Scanner
4. Handheld devices
5. Digital video
6. Set-top box

■ Part Number Code



■ Structure and Dimensions



(Unit: mm)

| Series | Size (EIA) | L1 | W | Hmax. | L2 and L3 |
|--------|------------|-----------|-----------|-------|-----------|
| TVM0 | 0402 | 1.00±0.15 | 0.50±0.10 | 0.60 | 0.20±0.10 |
| TVM1 | 0603 | 1.60±0.15 | 0.80±0.15 | 0.95 | 0.35±0.15 |
| TVM2 | 0805 | 2.00±0.20 | 1.25±0.20 | 1.00 | 0.40±0.20 |
| TVM3 | 1206 | 3.20±0.30 | 1.60±0.20 | 1.50 | 0.50±0.20 |
| TVM4 | 1210 | 3.20±0.30 | 2.50±0.25 | 1.50 | 0.50±0.20 |
| TVM5 | 1812 | 4.50±0.40 | 3.20±0.30 | 1.50 | 0.60±0.30 |
| TVM6 | 2220 | 5.70±0.40 | 5.00±0.30 | 2.00 | 0.60±0.30 |

Metal Oxide Varistor : TVM-B Series

SMD Type Surge Suppressor

■ Electrical Characteristics

| Part No. | Varistor Voltage (@ 1mA DC) | | Max. Continuous Voltage | | Max. Clamping Voltage (8/20µs) | | Max. Surge Current (8/20µs) | Max. Energy (10/1000µs) | Rate Power | Typical Capacitance @1KHz |
|--------------|-----------------------------|-------------------|-------------------------|-----------------|--------------------------------|----------------|-----------------------------|-------------------------|------------|---------------------------|
| | V _{1mA} | ΔV _{1mA} | V _{AC(rms)} | V _{DC} | V _p | I _p | I _{max} | W _{max} | P | C _p |
| | (V) | (±%) | (V) | (V) | (V) | (A) | (A) | (J) | (W) | (pF) |
| TVM0B080M231 | 8 | 20 | 4 | 5.5 | 19 | 1 | 10 | 0.05 | 0.003 | 230 |
| TVM1B080M951 | 8 | 20 | 4 | 5.5 | 19 | 1 | 30 | 0.1 | 0.003 | 950 |
| TVM2B080M152 | 8 | 20 | 4 | 5.5 | 19 | 1 | 60 | 0.1 | 0.005 | 1500 |
| TVM3B080M482 | 8 | 20 | 4 | 5.5 | 17 | 1 | 150 | 0.3 | 0.008 | 4800 |
| TVM4B080M822 | 8 | 20 | 4 | 5.5 | 17 | 2.5 | 250 | 0.4 | 0.01 | 8200 |
| TVM5B080M183 | 8 | 20 | 4 | 5.5 | 17 | 5 | 500 | 0.8 | 0.015 | 18000 |
| TVM6B080M293 | 8 | 20 | 4 | 5.5 | 17 | 10 | 1000 | 1.4 | 0.02 | 29000 |
| TVM0B110M161 | 11 | 20 | 6 | 8 | 27 | 1 | 10 | 0.05 | 0.003 | 160 |
| TVM1B110M601 | 11 | 20 | 6 | 8 | 27 | 1 | 30 | 0.1 | 0.003 | 600 |
| TVM2B110M142 | 11 | 20 | 6 | 8 | 27 | 1 | 60 | 0.2 | 0.005 | 1400 |
| TVM3B110M392 | 11 | 20 | 6 | 8 | 25 | 1 | 200 | 0.4 | 0.008 | 3900 |
| TVM4B110M752 | 11 | 20 | 6 | 8 | 25 | 2.5 | 300 | 0.7 | 0.01 | 7500 |
| TVM5B110M153 | 11 | 20 | 6 | 8 | 25 | 5 | 500 | 1 | 0.015 | 15000 |
| TVM6B110M253 | 11 | 20 | 6 | 8 | 25 | 10 | 1200 | 3.6 | 0.02 | 25000 |
| TVM0B12RM141 | 12.5 | 20 | 7 | 9 | 30 | 1 | 10 | 0.05 | 0.003 | 140 |
| TVM1B12RM571 | 12.5 | 20 | 7 | 9 | 30 | 1 | 30 | 0.1 | 0.003 | 570 |
| TVM2B12RM112 | 12.5 | 20 | 7 | 9 | 29 | 1 | 60 | 0.2 | 0.005 | 1100 |
| TVM0B150L121 | 15 | 15 | 8 | 11 | 33 | 1 | 10 | 0.05 | 0.003 | 120 |
| TVM1B150L521 | 15 | 15 | 8 | 11 | 33 | 1 | 30 | 0.1 | 0.003 | 520 |
| TVM2B150L951 | 15 | 15 | 8 | 11 | 33 | 1 | 60 | 0.2 | 0.005 | 950 |
| TVM3B150L252 | 15 | 15 | 8 | 11 | 30 | 1 | 200 | 0.5 | 0.008 | 2500 |
| TVM4B150L482 | 15 | 15 | 8 | 11 | 30 | 2.5 | 400 | 1 | 0.01 | 4800 |
| TVM5B150L103 | 15 | 15 | 8 | 11 | 30 | 5 | 800 | 1.8 | 0.015 | 10000 |
| TVM6B150L183 | 15 | 15 | 8 | 11 | 30 | 10 | 1200 | 4.2 | 0.02 | 18000 |
| TVM0B180K800 | 18 | 10 | 11 | 14 | 35 | 1 | 10 | 0.05 | 0.003 | 80 |
| TVM1B180K421 | 18 | 10 | 11 | 14 | 35 | 1 | 30 | 0.2 | 0.003 | 420 |
| TVM2B180K671 | 18 | 10 | 11 | 14 | 35 | 1 | 60 | 0.2 | 0.005 | 670 |
| TVM3B180K152 | 18 | 10 | 11 | 14 | 33 | 1 | 200 | 0.5 | 0.008 | 1500 |
| TVM4B180K292 | 18 | 10 | 11 | 14 | 33 | 2.5 | 400 | 1.2 | 0.01 | 2900 |
| TVM5B180K552 | 18 | 10 | 11 | 14 | 33 | 5 | 800 | 1.9 | 0.015 | 5500 |
| TVM6B180K123 | 18 | 10 | 11 | 14 | 33 | 10 | 1200 | 5.4 | 0.02 | 12000 |
| TVM0B220K600 | 22 | 10 | 14 | 18 | 44 | 1 | 10 | 0.05 | 0.003 | 60 |
| TVM1B220K301 | 22 | 10 | 14 | 18 | 40 | 1 | 30 | 0.2 | 0.003 | 300 |
| TVM2B220K431 | 22 | 10 | 14 | 18 | 40 | 1 | 60 | 0.3 | 0.005 | 430 |
| TVM3B220K122 | 22 | 10 | 14 | 18 | 42 | 1 | 200 | 0.5 | 0.008 | 1200 |
| TVM4B220K242 | 22 | 10 | 14 | 18 | 38 | 2.5 | 400 | 1.5 | 0.01 | 2400 |
| TVM5B220K502 | 22 | 10 | 14 | 18 | 38 | 5 | 800 | 2.3 | 0.015 | 5000 |
| TVM6B220K103 | 22 | 10 | 14 | 18 | 38 | 10 | 1200 | 5.8 | 0.02 | 10000 |

Metal Oxide Varistor : TVM-B Series

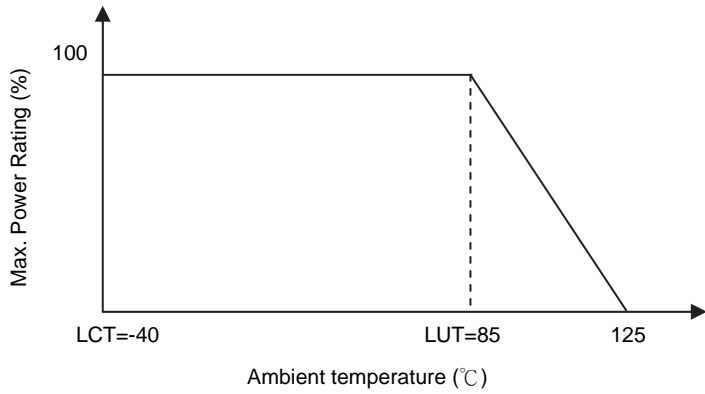
SMD Type Surge Suppressor

| Part No. | Varistor Voltage (@ 1mA DC) | | Max. Continuous Voltage | | Max. Clamping Voltage (8/20µs) | | Max. Surge Current (8/20µs) | Max. Energy (10/1000µs) | Rate Power | Typical Capacitance @1KHz |
|--------------|-----------------------------|-------------------|-------------------------|-----------------|--------------------------------|----------------|-----------------------------|-------------------------|------------|---------------------------|
| | V _{1mA} | ΔV _{1mA} | V _{AC (rms)} | V _{DC} | V _p | I _p | I _{max} | W _{max} | P | C _p |
| | (V) | (±%) | (V) | (V) | (V) | (A) | (A) | (J) | (W) | (pF) |
| TVM0B270K500 | 27 | 10 | 17 | 22 | 55 | 1 | 10 | 0.05 | 0.003 | 50 |
| TVM1B270K181 | 27 | 10 | 17 | 22 | 46 | 1 | 30 | 0.2 | 0.003 | 180 |
| TVM2B270K331 | 27 | 10 | 17 | 22 | 46 | 1 | 60 | 0.3 | 0.005 | 330 |
| TVM3B270K102 | 27 | 10 | 17 | 22 | 48 | 1 | 200 | 0.6 | 0.008 | 1000 |
| TVM4B270K202 | 27 | 10 | 17 | 22 | 44 | 2.5 | 400 | 1.7 | 0.01 | 2000 |
| TVM5B270K402 | 27 | 10 | 17 | 22 | 44 | 5 | 800 | 2.7 | 0.015 | 4000 |
| TVM6B270K772 | 27 | 10 | 17 | 22 | 44 | 10 | 1200 | 7.2 | 0.02 | 7700 |
| TVM0B330K400 | 33 | 10 | 20 | 26 | 63 | 1 | 10 | 0.05 | 0.003 | 40 |
| TVM1B330K151 | 33 | 10 | 20 | 26 | 56 | 1 | 30 | 0.3 | 0.003 | 150 |
| TVM2B330K301 | 33 | 10 | 20 | 26 | 56 | 1 | 60 | 0.3 | 0.005 | 300 |
| TVM3B330K801 | 33 | 10 | 20 | 26 | 54 | 1 | 200 | 0.7 | 0.008 | 800 |
| TVM4B330K132 | 33 | 10 | 20 | 26 | 54 | 2.5 | 400 | 1.9 | 0.01 | 1300 |
| TVM5B330K322 | 33 | 10 | 20 | 26 | 54 | 5 | 800 | 3 | 0.015 | 3200 |
| TVM6B330K582 | 33 | 10 | 20 | 26 | 54 | 10 | 1200 | 7.8 | 0.02 | 5800 |
| TVM1B390K101 | 39 | 10 | 25 | 31 | 67 | 1 | 30 | 0.3 | 0.003 | 100 |
| TVM2B390K181 | 39 | 10 | 25 | 31 | 67 | 1 | 60 | 0.3 | 0.005 | 180 |
| TVM3B390K651 | 39 | 10 | 25 | 31 | 65 | 1 | 200 | 1 | 0.008 | 650 |
| TVM4B390K102 | 39 | 10 | 25 | 31 | 65 | 2.5 | 300 | 1.7 | 0.01 | 1000 |
| TVM5B390K252 | 39 | 10 | 25 | 31 | 65 | 5 | 800 | 3.7 | 0.015 | 2500 |
| TVM6B390K412 | 39 | 10 | 25 | 31 | 65 | 10 | 1200 | 9.6 | 0.02 | 4100 |
| TVM2B470K151 | 47 | 10 | 30 | 38 | 77 | 1 | 60 | 0.3 | 0.005 | 150 |
| TVM3B470K381 | 47 | 10 | 30 | 38 | 77 | 1 | 200 | 1.1 | 0.008 | 380 |
| TVM4B470K901 | 47 | 10 | 30 | 38 | 77 | 2.5 | 300 | 2 | 0.01 | 900 |
| TVM5B470K202 | 47 | 10 | 30 | 38 | 77 | 5 | 800 | 4.2 | 0.015 | 2000 |
| TVM6B470K302 | 47 | 10 | 30 | 38 | 77 | 10 | 1200 | 12 | 0.02 | 3000 |
| TVM3B560K301 | 56 | 10 | 35 | 45 | 90 | 1 | 100 | 0.4 | 0.008 | 300 |
| TVM4B560K601 | 56 | 10 | 35 | 45 | 90 | 2.5 | 250 | 2 | 0.01 | 600 |
| TVM5B560K122 | 56 | 10 | 35 | 45 | 90 | 5 | 500 | 4 | 0.015 | 1200 |
| TVM6B560K202 | 56 | 10 | 35 | 45 | 90 | 10 | 1000 | 7.7 | 0.02 | 2000 |
| TVM3B680K251 | 68 | 10 | 40 | 56 | 110 | 1 | 100 | 0.5 | 0.008 | 250 |
| TVM4B680K451 | 68 | 10 | 40 | 56 | 110 | 2.5 | 250 | 2.3 | 0.01 | 450 |
| TVM5B680K102 | 68 | 10 | 40 | 56 | 110 | 5 | 500 | 4.8 | 0.015 | 1000 |
| TVM6B680K152 | 68 | 10 | 40 | 56 | 110 | 10 | 1000 | 9 | 0.02 | 1500 |
| TVM3B820K181 | 82 | 10 | 50 | 65 | 135 | 1 | 100 | 0.6 | 0.008 | 180 |
| TVM4B820K301 | 82 | 10 | 50 | 65 | 135 | 2.5 | 200 | 1.6 | 0.01 | 300 |
| TVM5B820K601 | 82 | 10 | 50 | 65 | 135 | 5 | 400 | 4.5 | 0.015 | 600 |
| TVM6B820K102 | 82 | 10 | 50 | 65 | 135 | 10 | 800 | 5.6 | 0.02 | 1000 |
| TVM3B101K151 | 100 | 10 | 60 | 85 | 146 | 1 | 100 | 0.7 | 0.008 | 150 |
| TVM4B101K161 | 100 | 10 | 60 | 85 | 165 | 2.5 | 200 | 2 | 0.01 | 160 |
| TVM5B101K301 | 100 | 10 | 60 | 85 | 165 | 5 | 400 | 5.8 | 0.015 | 300 |
| TVM6B101K601 | 100 | 10 | 60 | 85 | 165 | 10 | 800 | 6.8 | 0.02 | 600 |

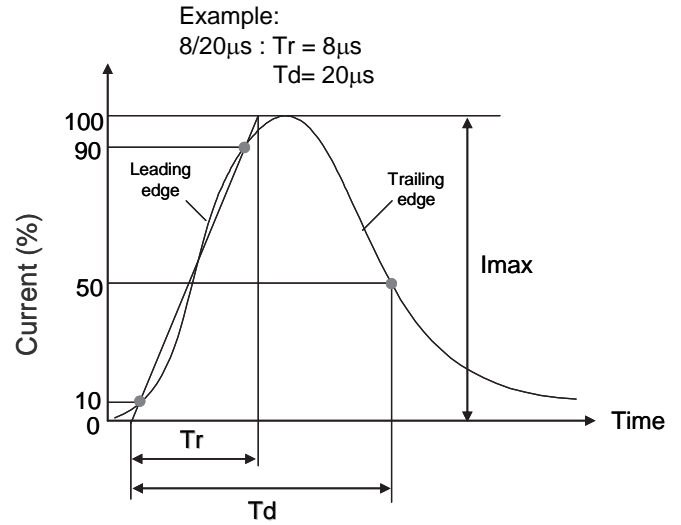
Metal Oxide Varistor : TVM-B Series

SMD Type Surge Suppressor

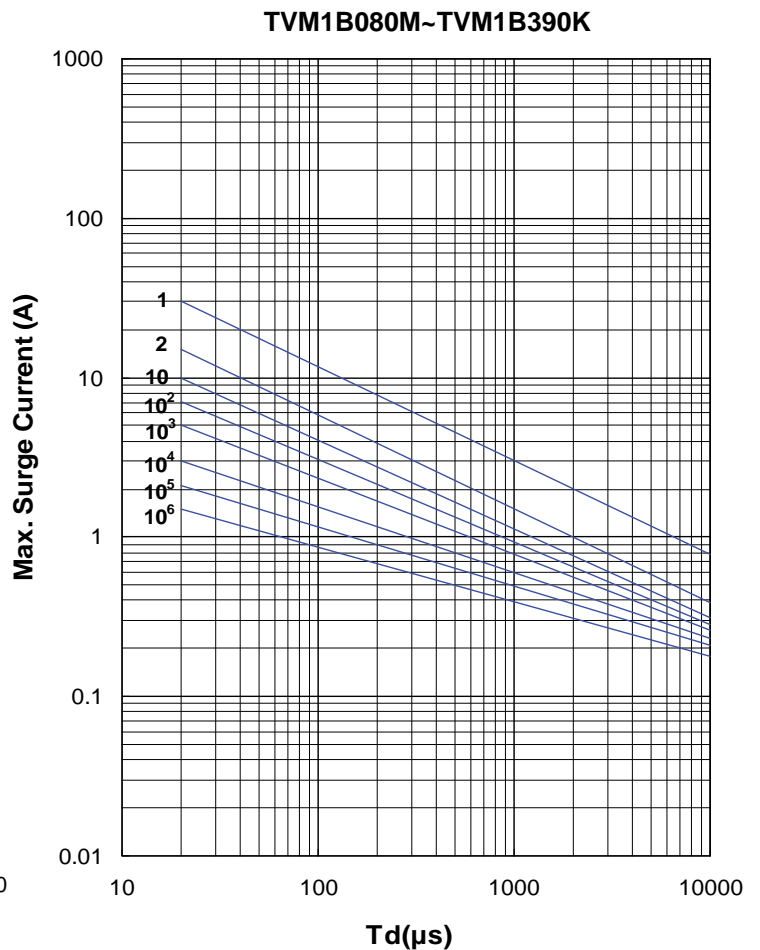
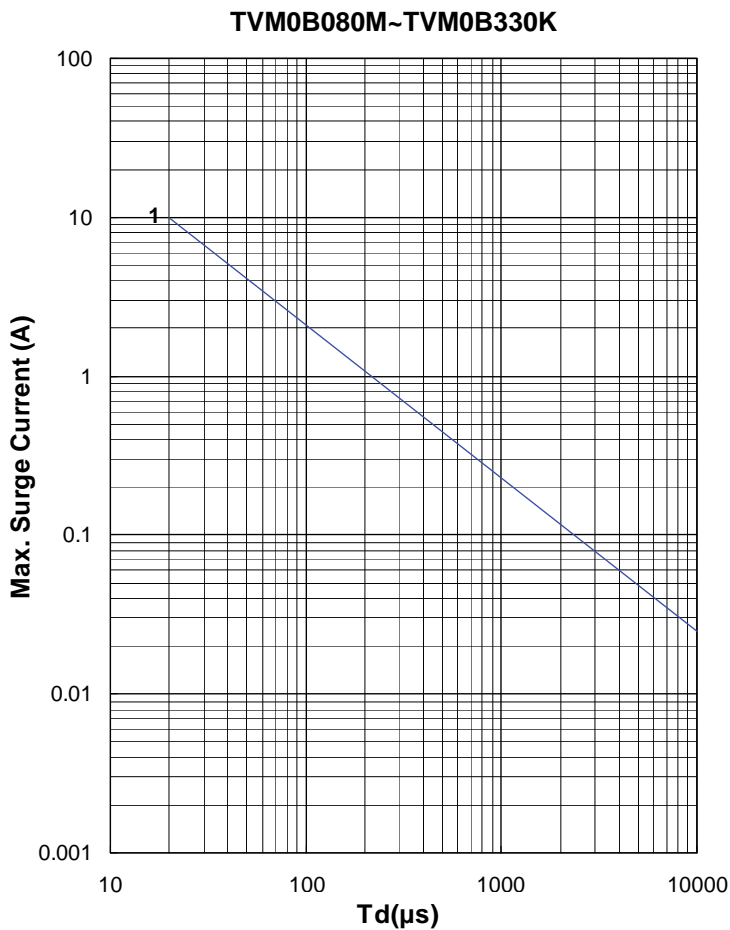
Power Derating Curve



Surge Current Standard Waveform



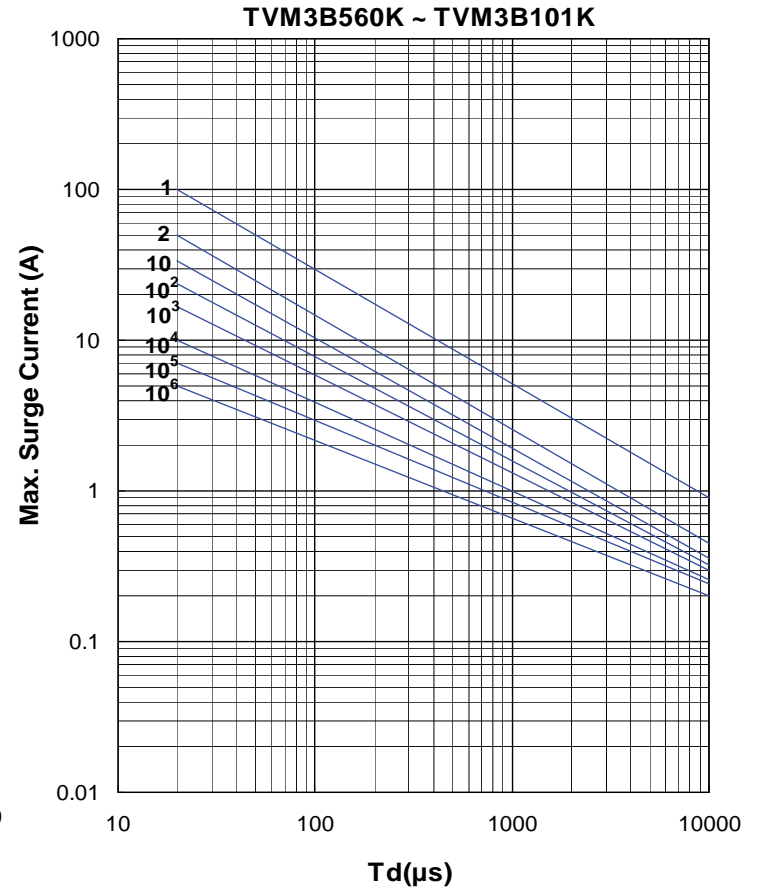
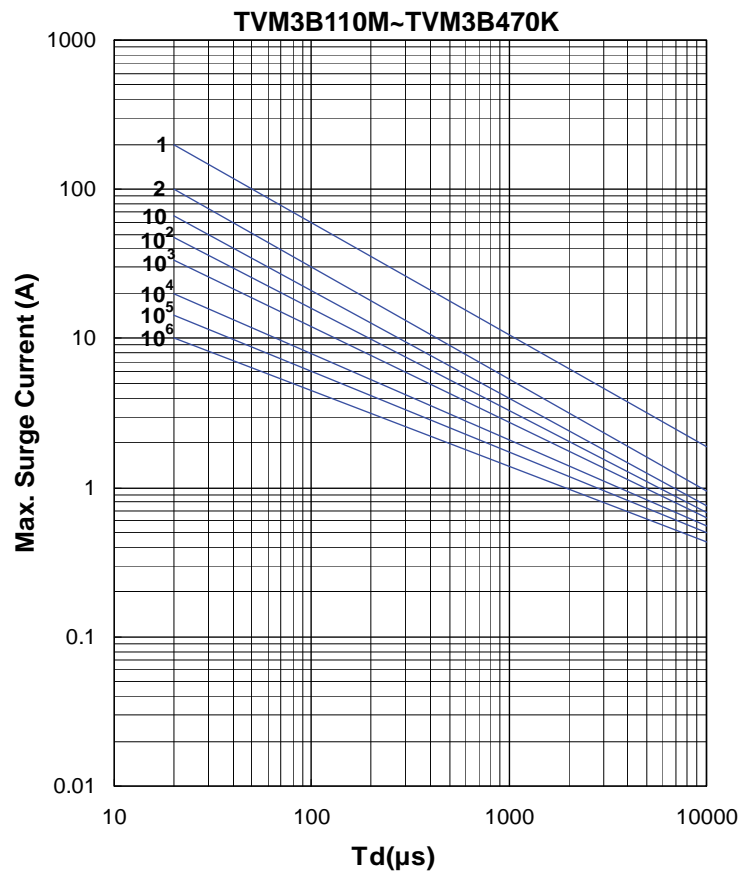
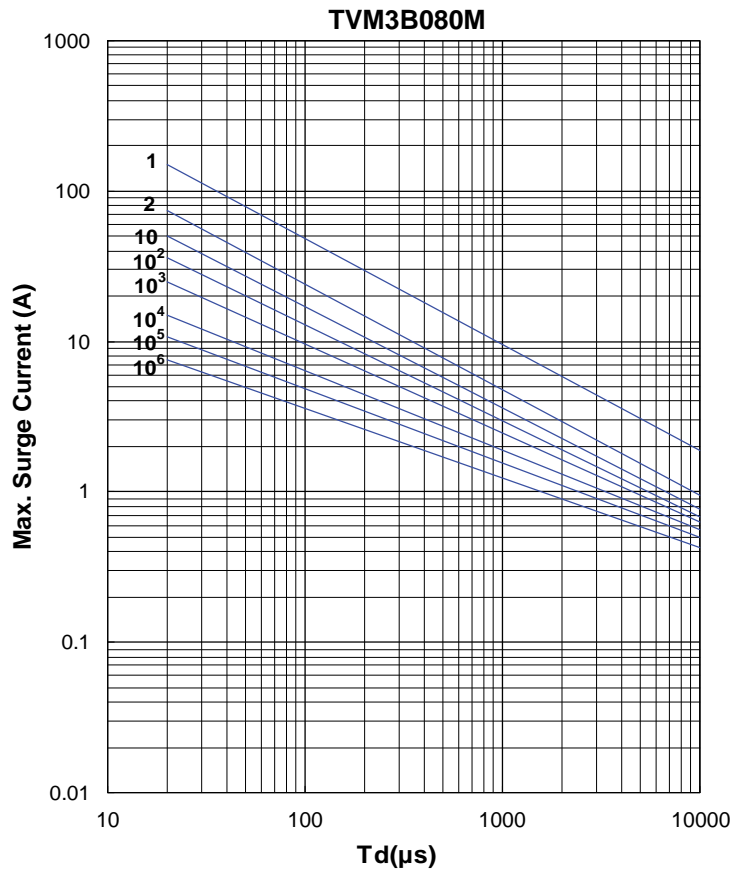
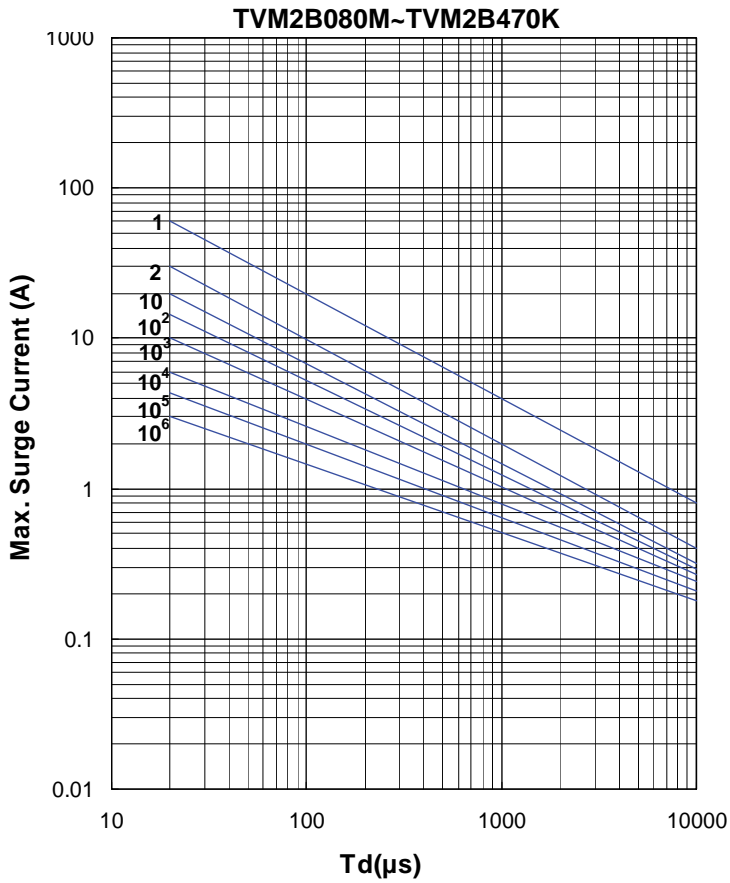
Max. Surge Current Derating Curves



Metal Oxide Varistor : TVM-B Series

SMD Type Surge Suppressor

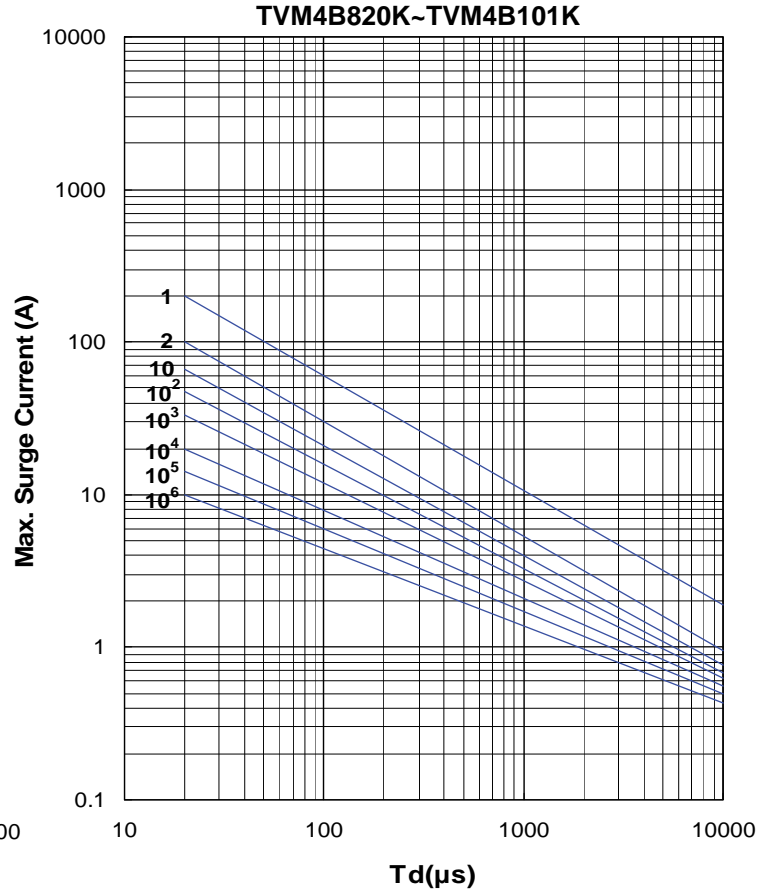
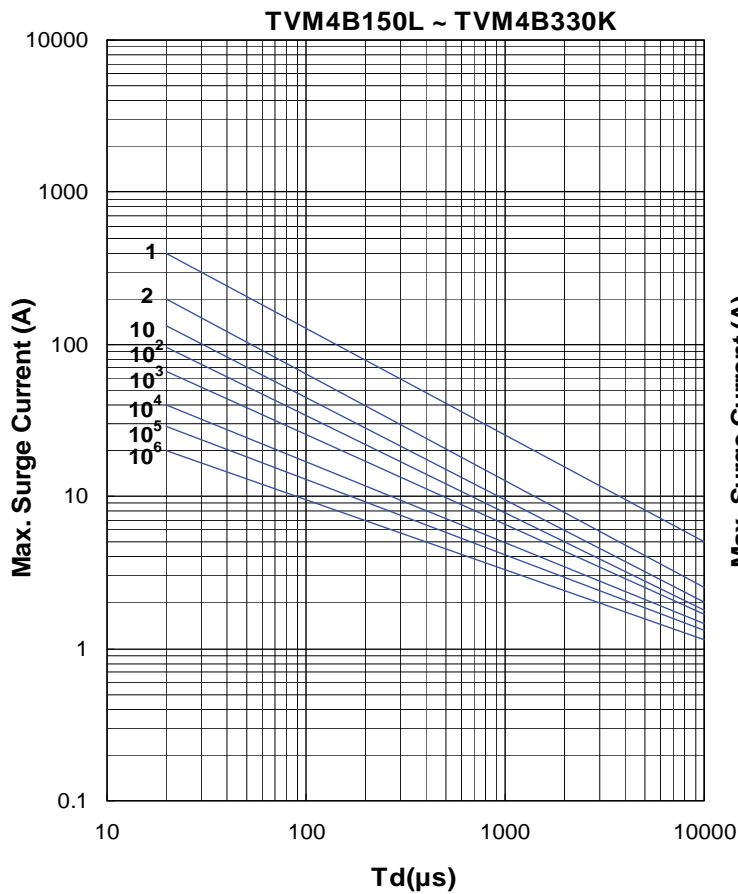
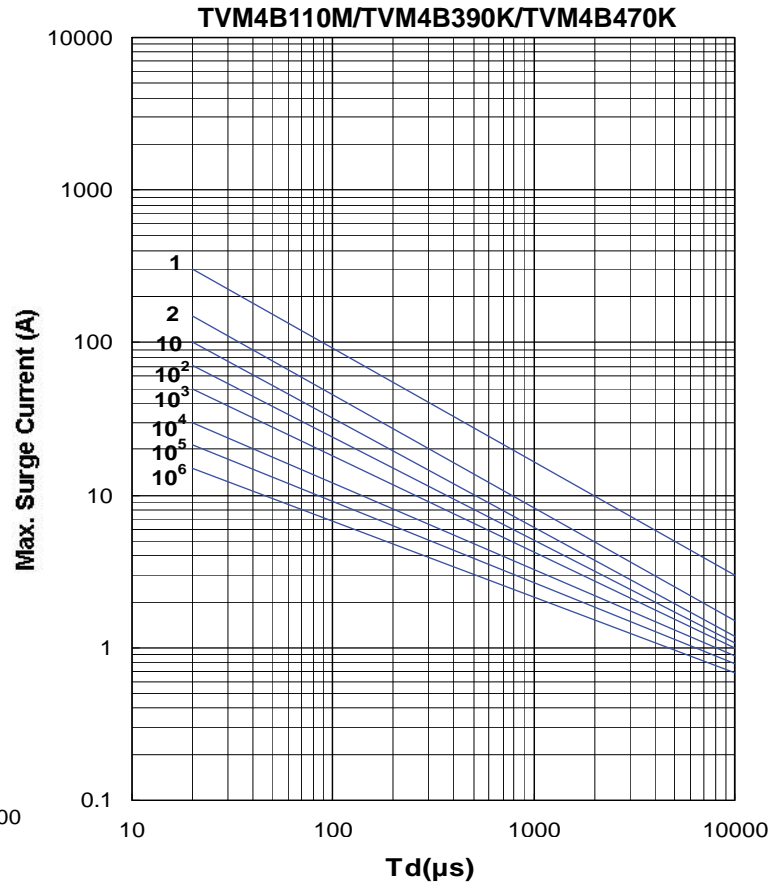
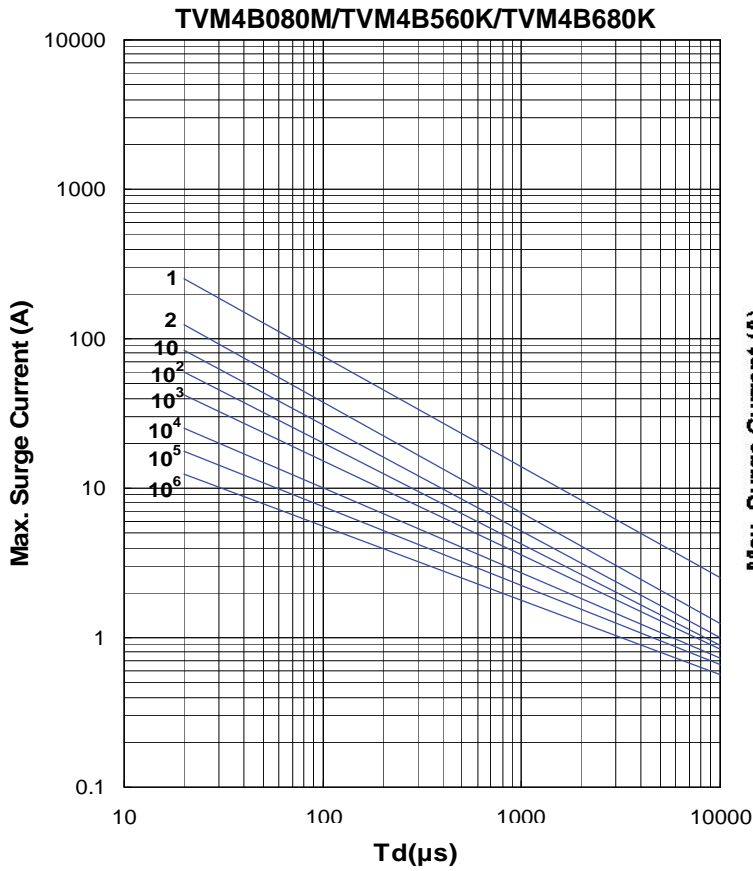
■ Max. Surge Current Derating Curves



Metal Oxide Varistor : TVM-B Series

SMD Type Surge Suppressor

Max. Surge Current Derating Curves

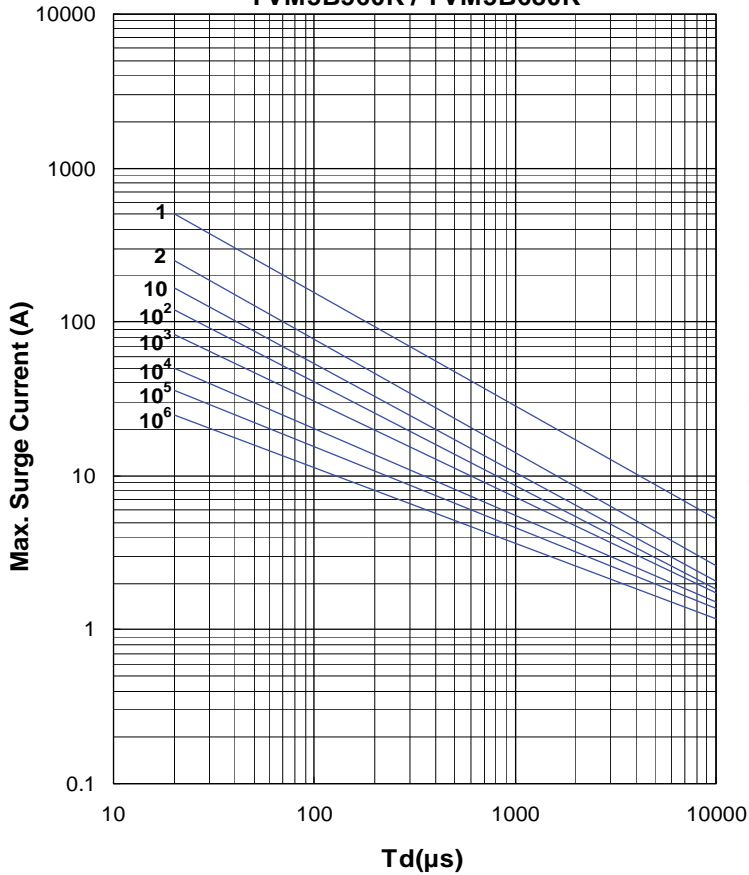


Metal Oxide Varistor : TVM-B Series

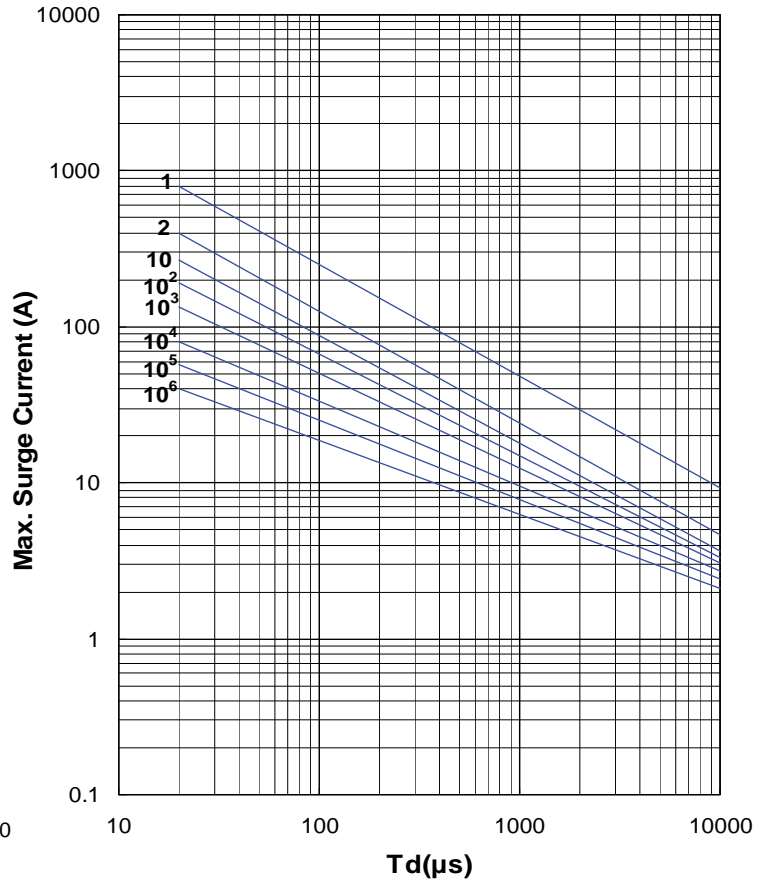
SMD Type Surge Suppressor

Max. Surge Current Derating Curves

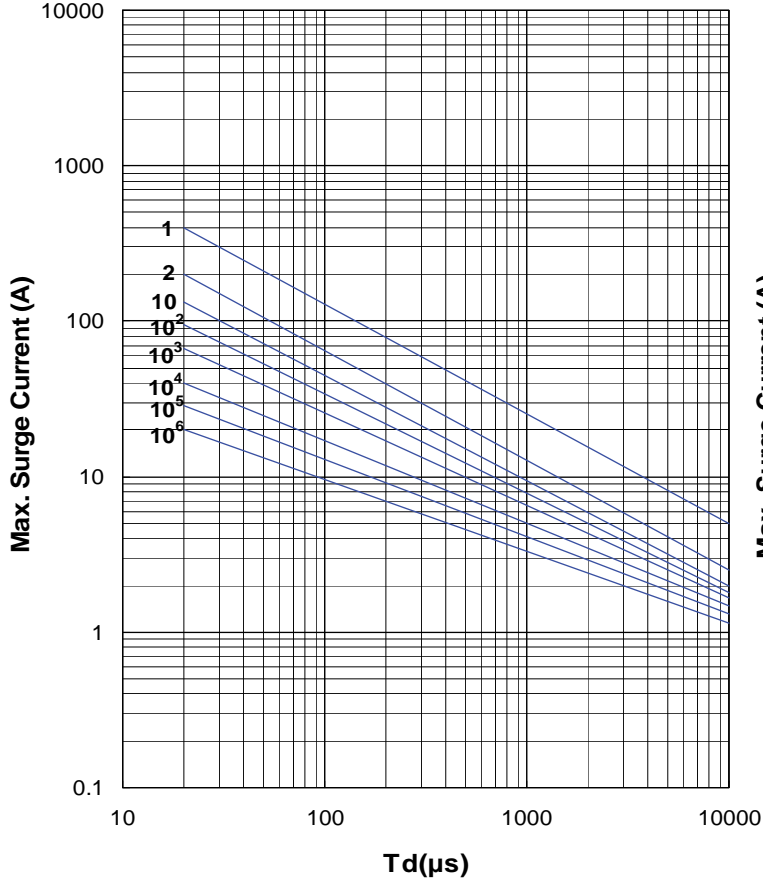
TVM5B080M / TVM5B110M/
TVM5B560K / TVM5B680K



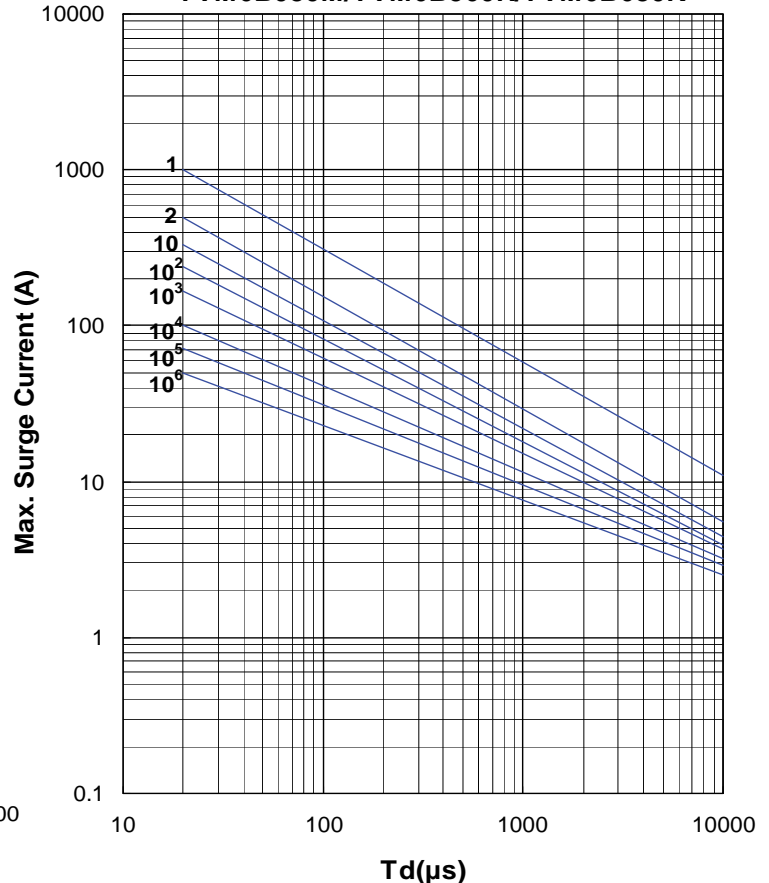
TVM5B150L~TVM5B470K



TVM5B820K ~ TVM5B101K



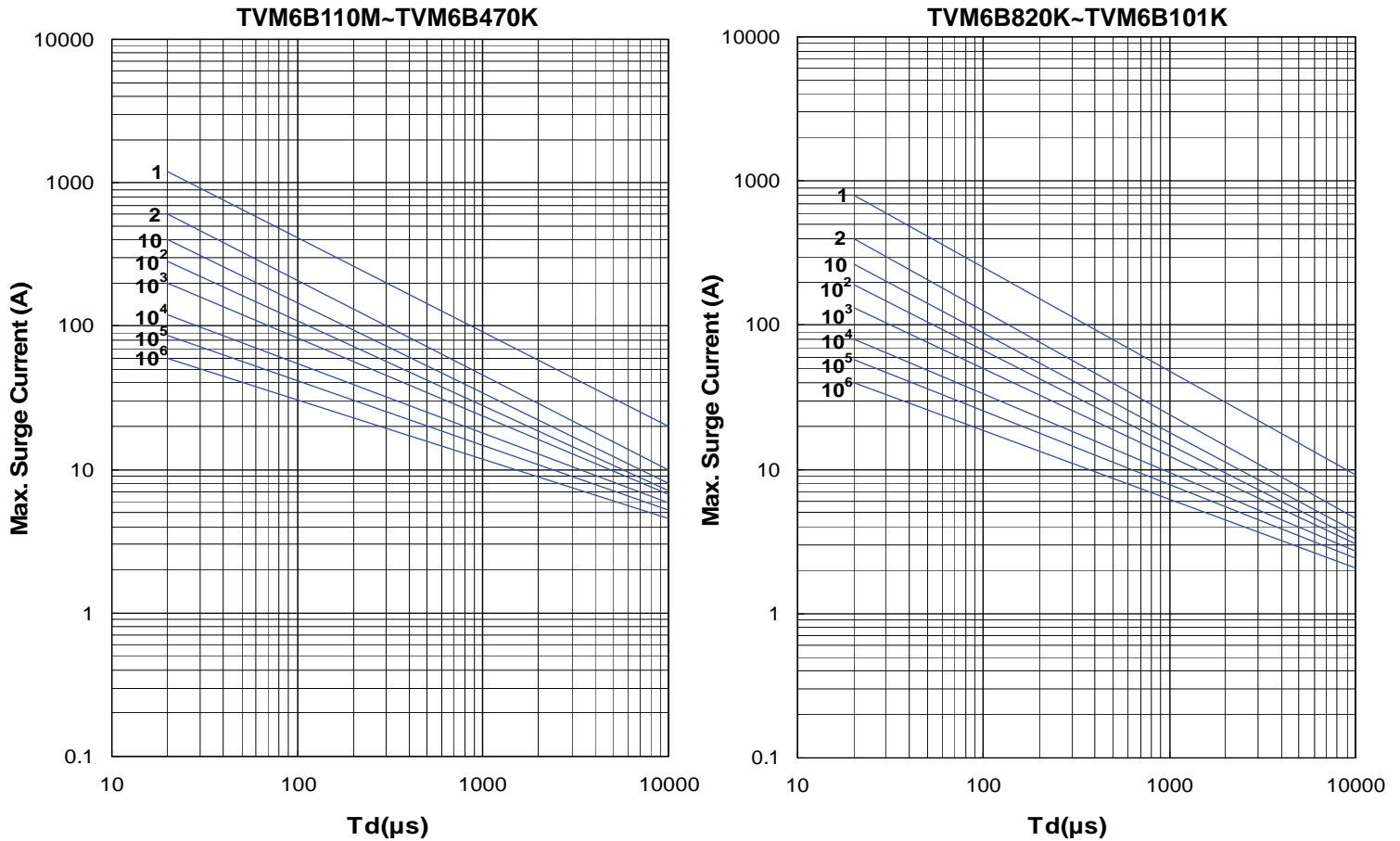
TVM6B080M/TVM6B560K/TVM6B680K



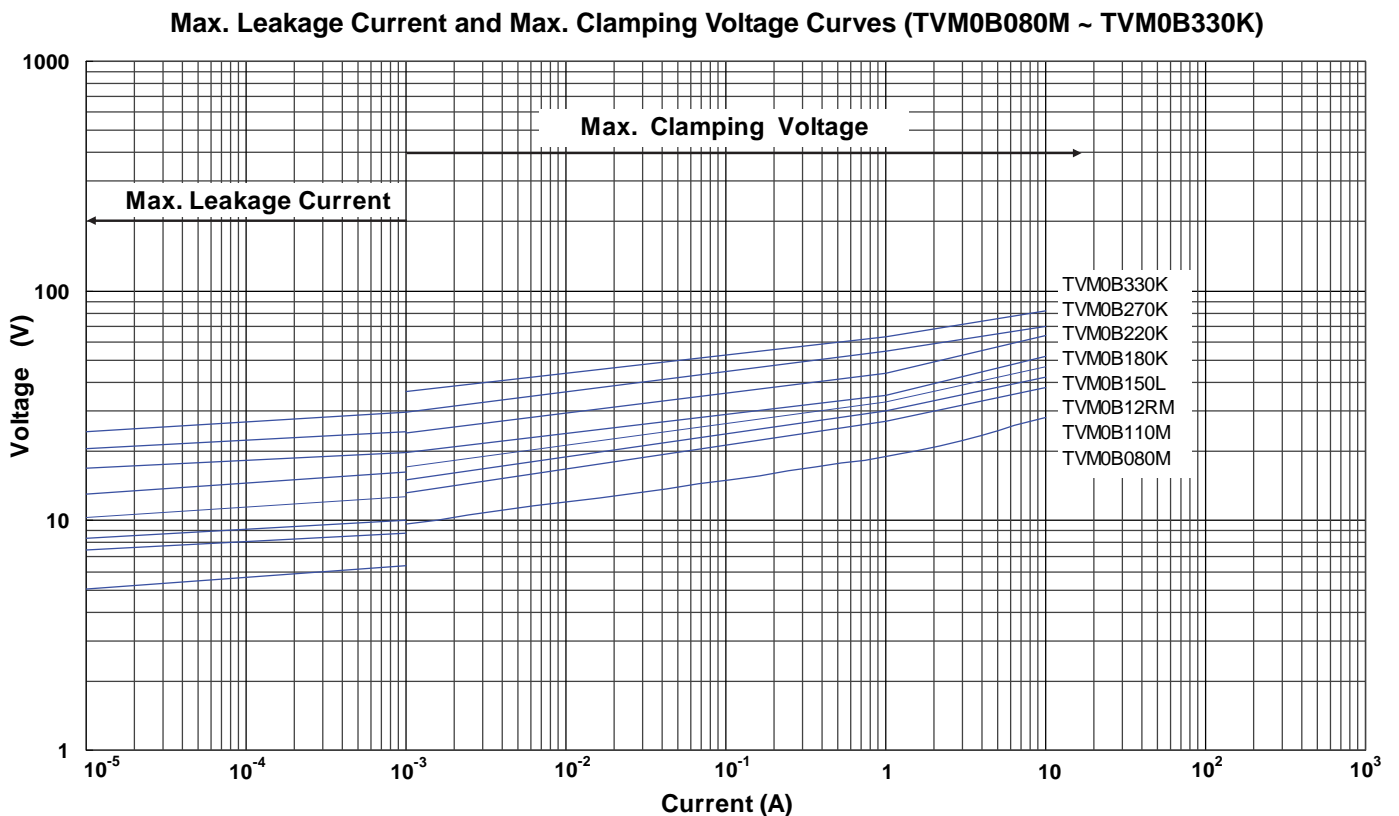
Metal Oxide Varistor : TVM-B Series

SMD Type Surge Suppressor

Max. Surge Current Derating Curves



Max. Leakage Current and Max. Clamping Voltage Curves

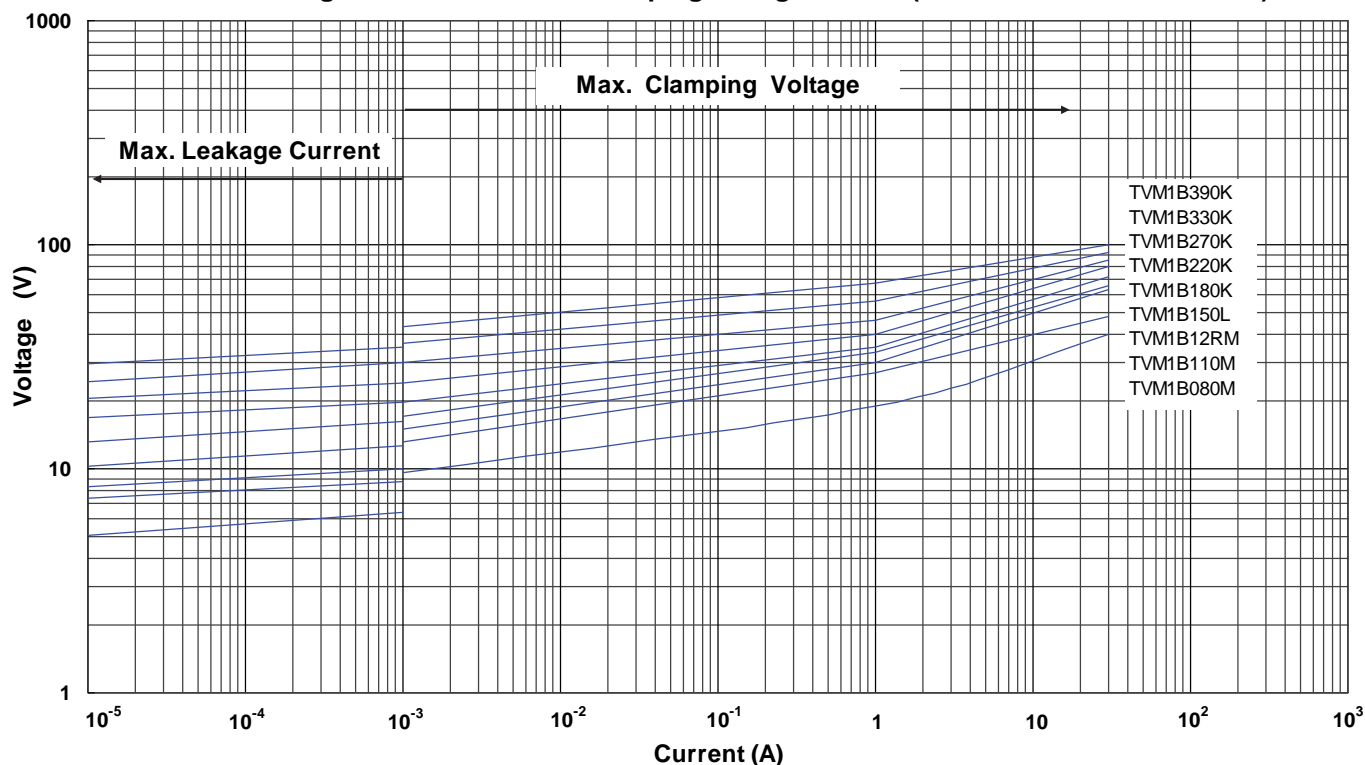


Metal Oxide Varistor : TVM-B Series

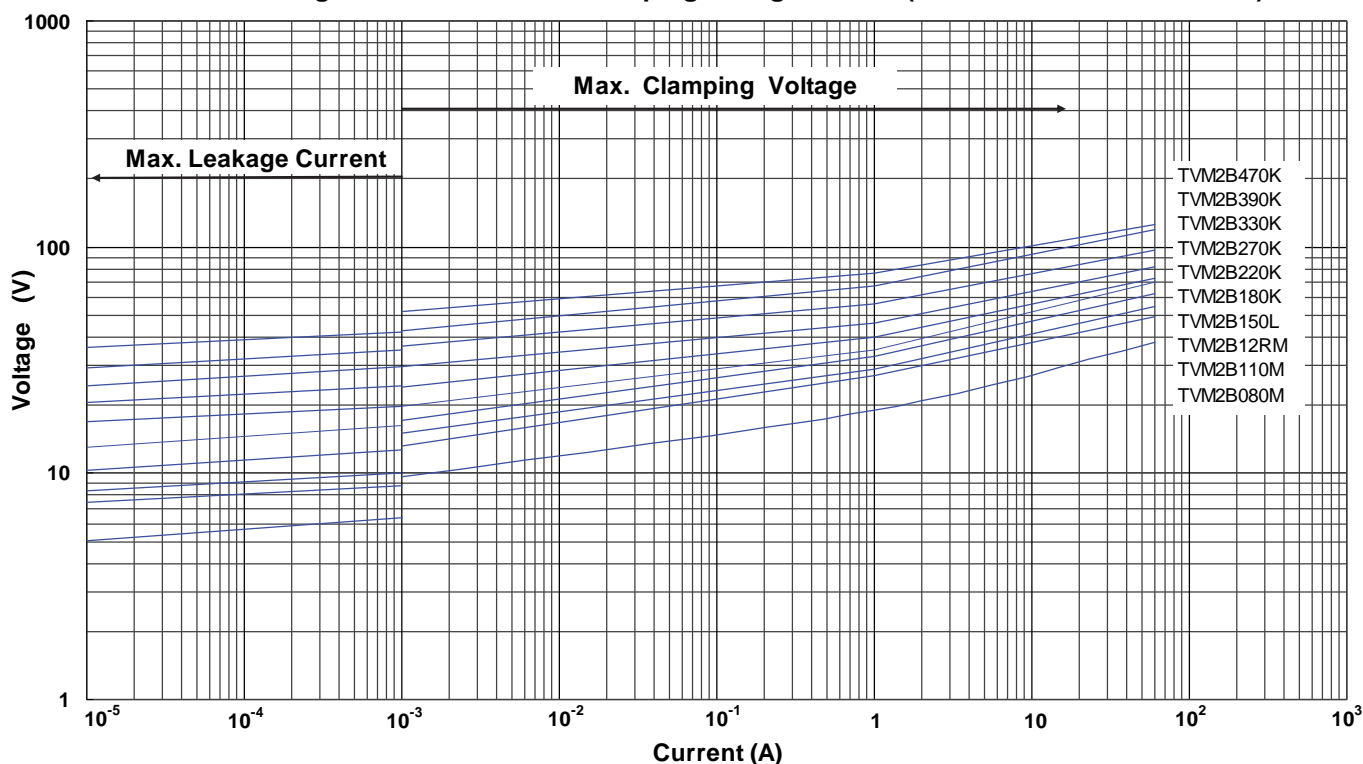
SMD Type Surge Suppressor

■ 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)

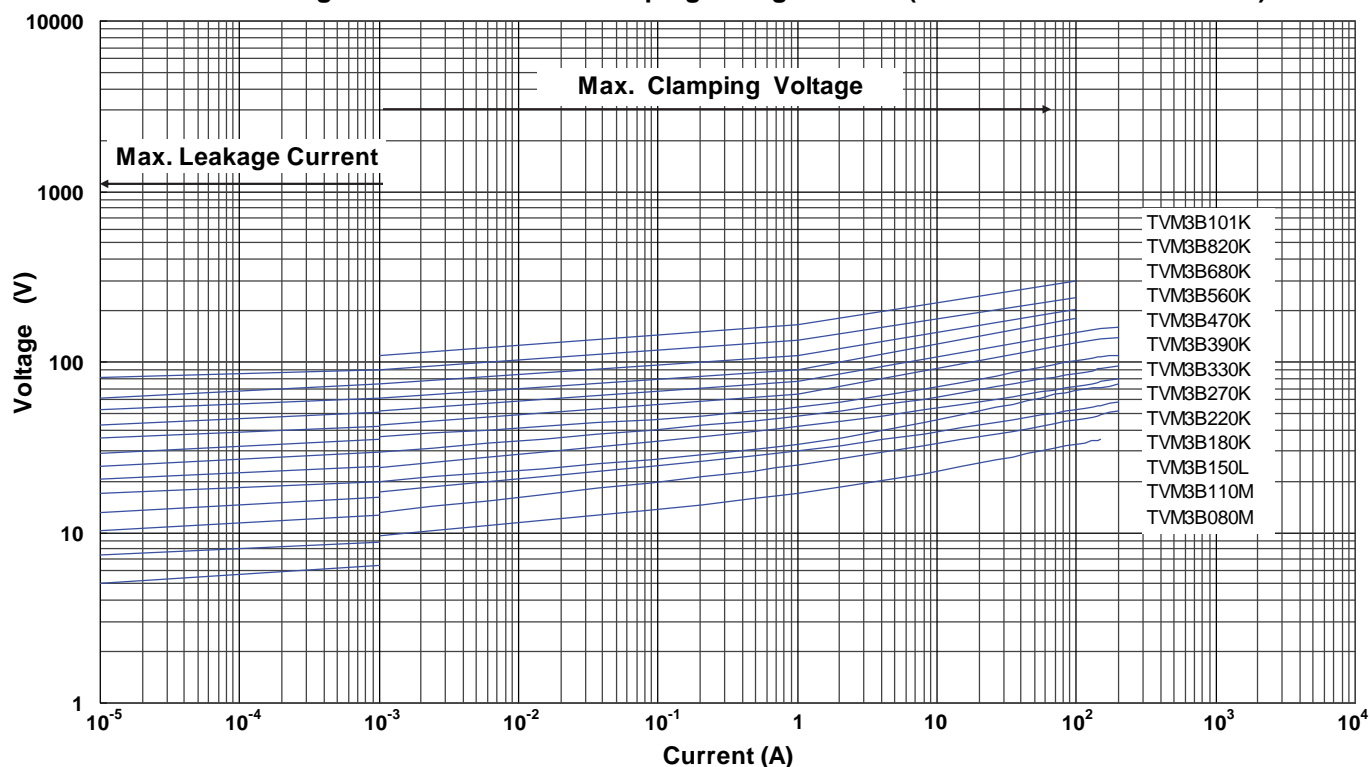


Metal Oxide Varistor : TVM-B Series

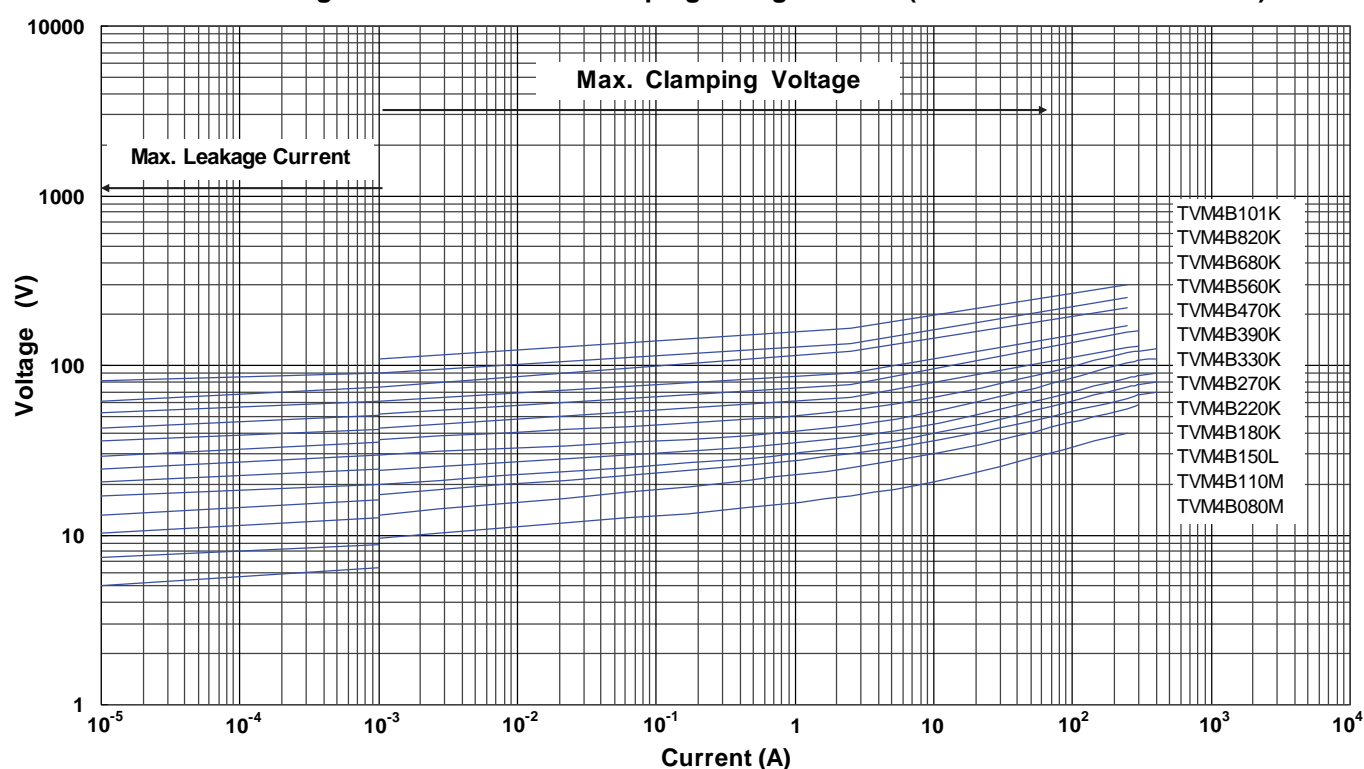
SMD Type Surge Suppressor

■ Max. Leakage Current and Max. Clamping Voltage Curves

Max. Leakage Current and Max. Clamping Voltage Curves (TVM3B080M ~ TVM3B101K)



Max. Leakage Current and Max. Clamping Voltage Curves (TVM4B080M ~ TVM4B101K)

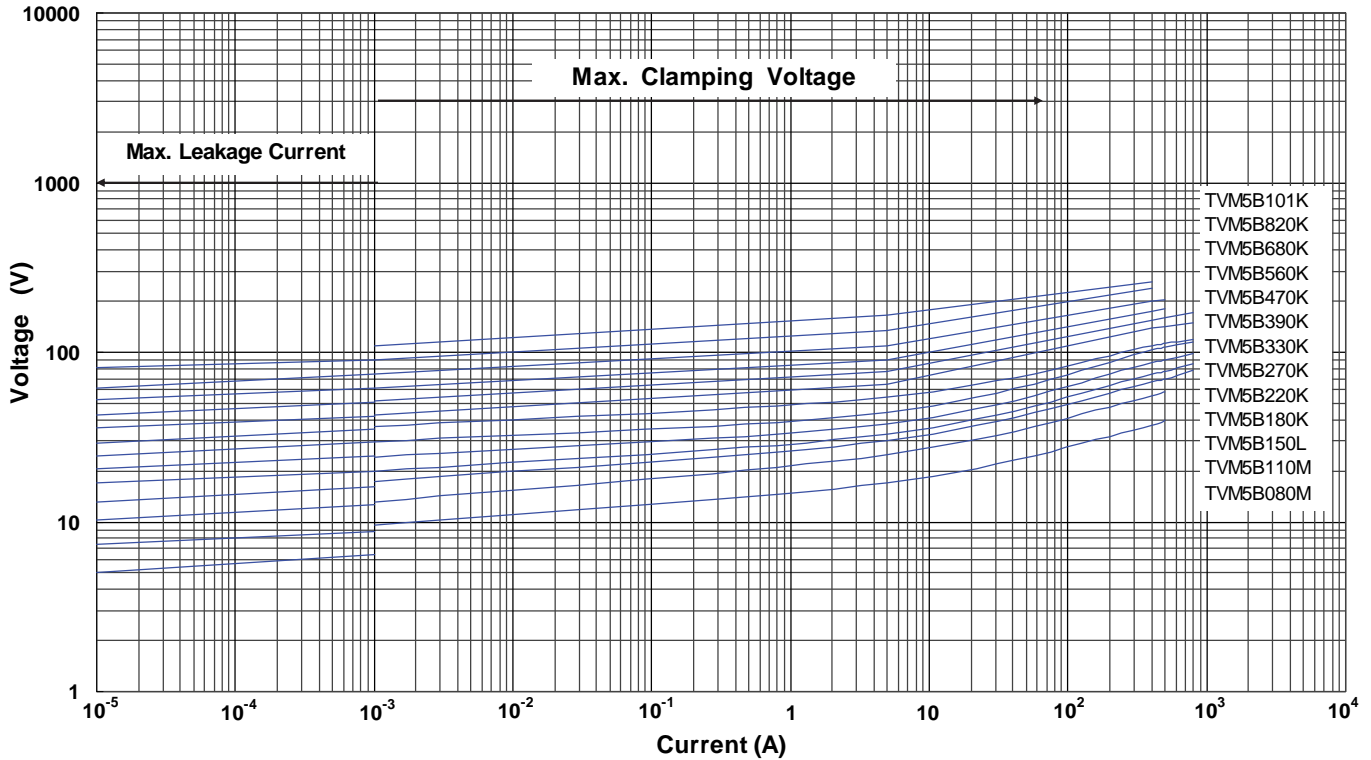


Metal Oxide Varistor : TVM-B Series

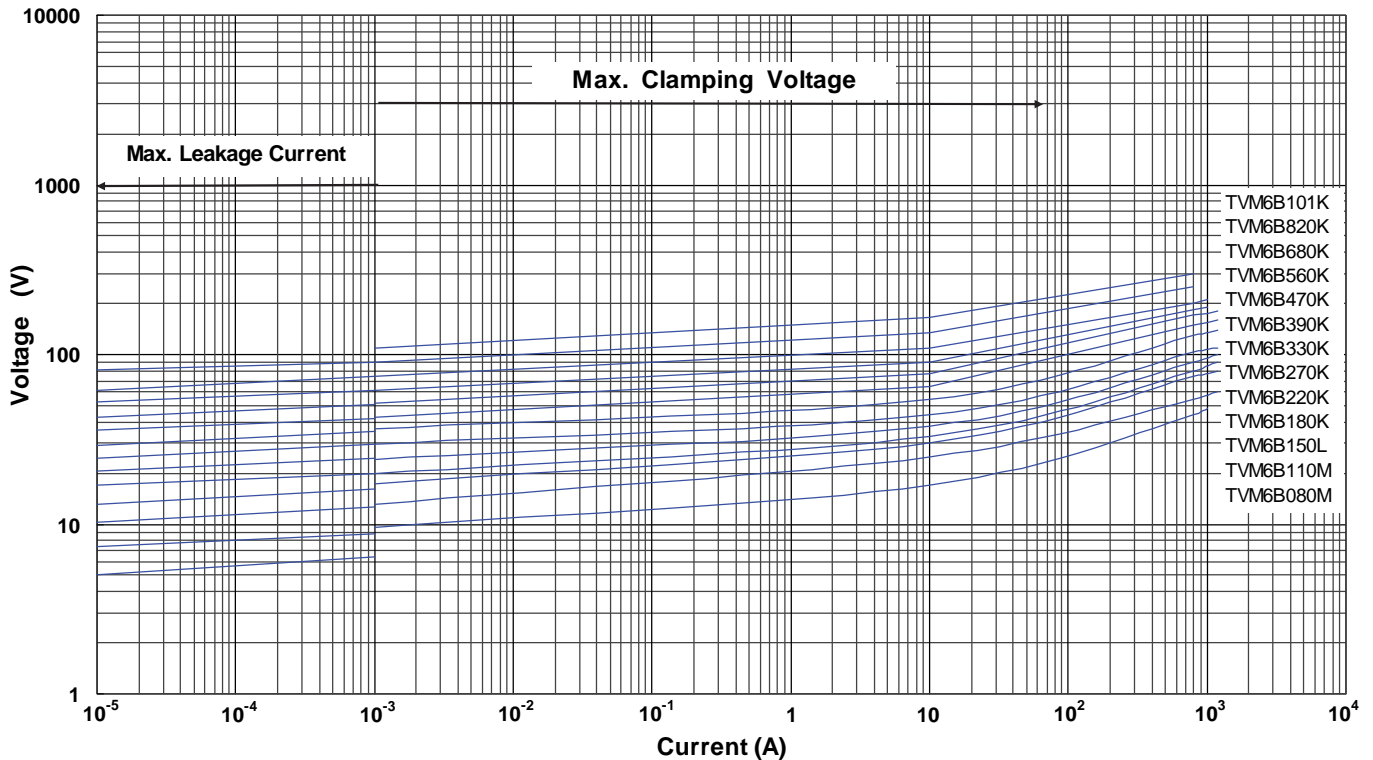
SMD Type Surge Suppressor

Max. Leakage Current and Max. Clamping Voltage Curves

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



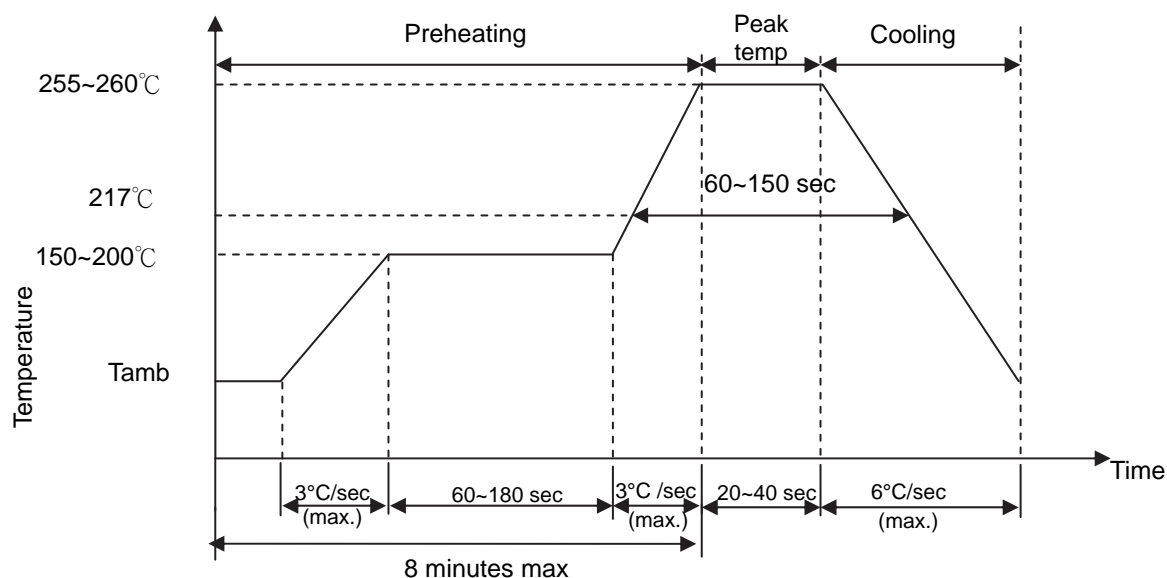
Max. Leakage Current and Max. Clamping Voltage Curves (TVM6B080M ~ TVM6B101K)



SMD Type Surge Suppressor

■ Soldering Recommendation

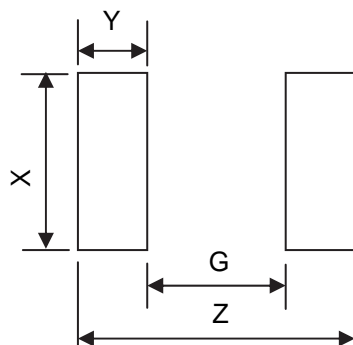
● IR-reflow Soldering Profile



● 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


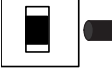


| Size | Z (mm) | G (mm) | X (mm) | Y (mm) |
|------|--------|--------|--------|--------|
| 0402 | 1.7 | 0.5 | 0.6 | 0.6 |
| 0603 | 3.0 | 1.0 | 1.0 | 1.0 |
| 0805 | 3.4 | 1.0 | 1.4 | 1.2 |
| 1206 | 4.5 | 2.1 | 1.8 | 1.2 |
| 1210 | 4.5 | 2.1 | 2.8 | 1.2 |
| 1812 | 6.0 | 3.0 | 3.6 | 1.5 |
| 2220 | 7.2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

Metal Oxide Varistor : TVM-B Series

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 | | | | | | | | | | | | | | | |

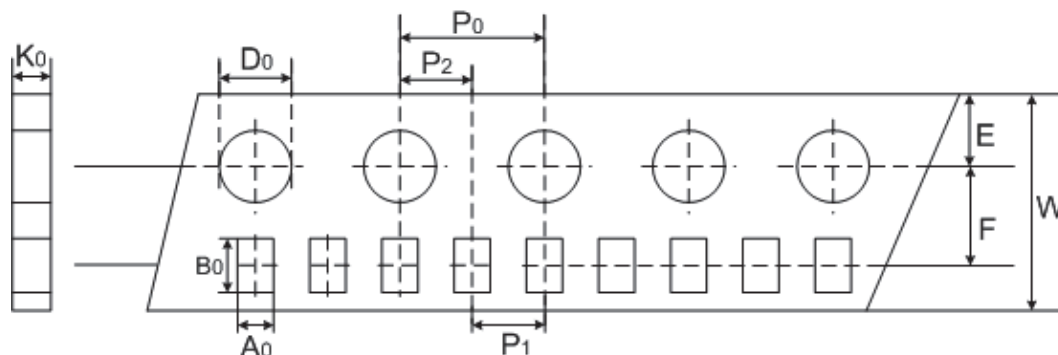
Metal Oxide Varistor : TVM-B Series

SMD Type Surge Suppressor

■ Packaging

● Taping Specification

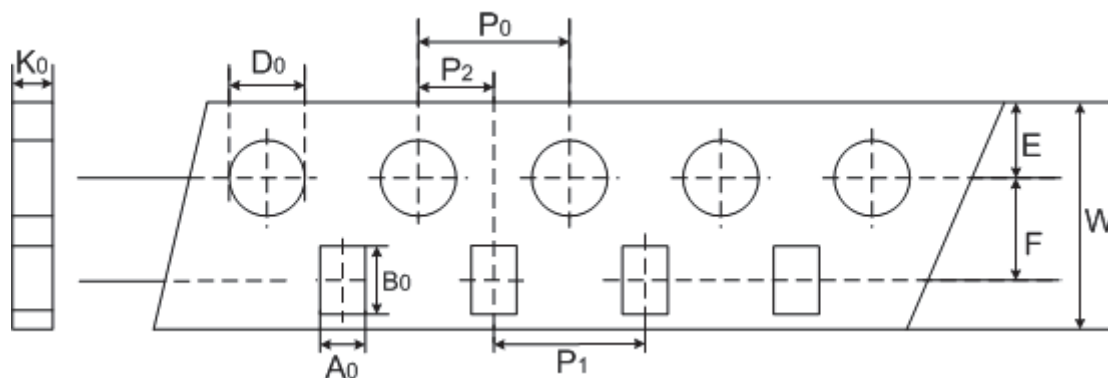
For 0402 Series



(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



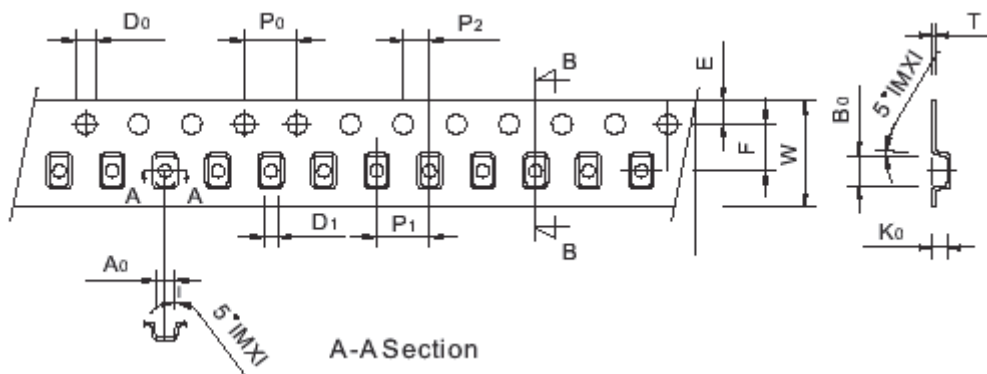
(Unit: mm)

| 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 |

Metal Oxide Varistor : TVM-B Series

SMD Type Surge Suppressor

For 1206~ 2220 Series

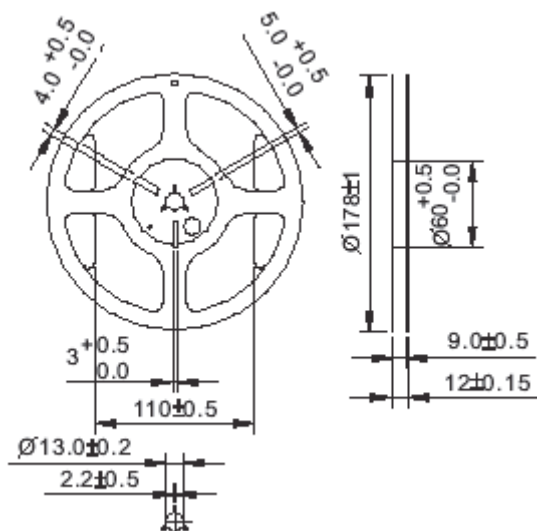


(Unit: mm)

| 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

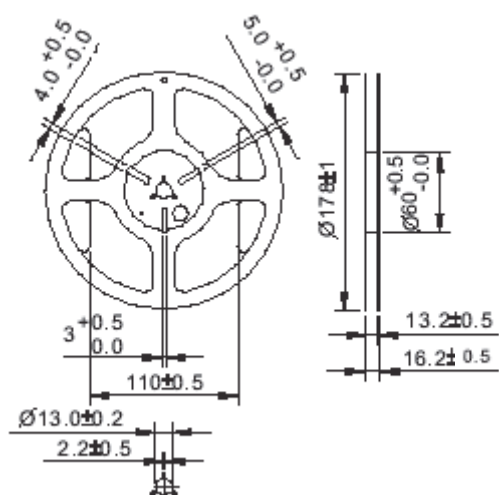
- **Quantity**
For 0402~1210 Series



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