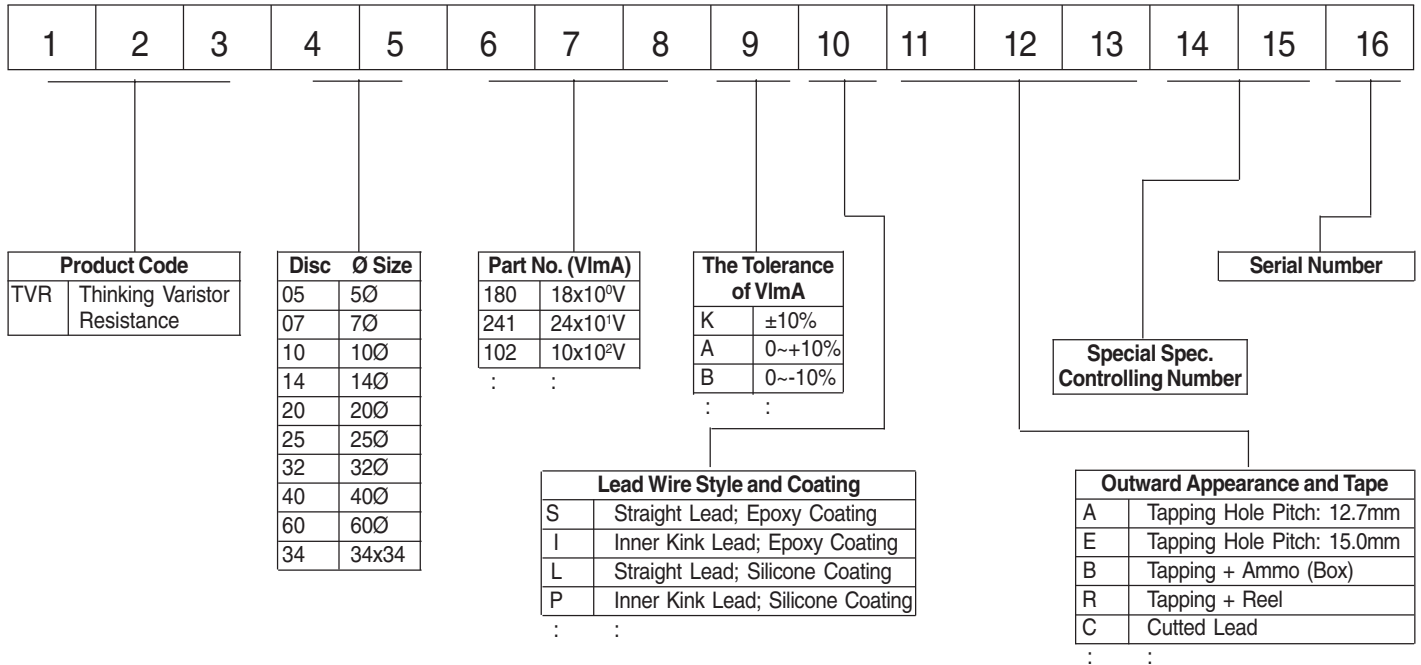




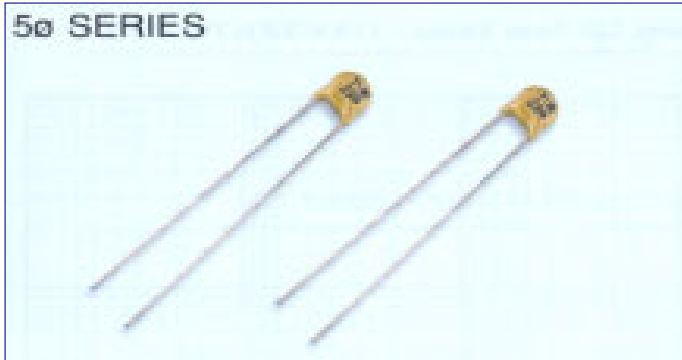
TVR-SERIES Part Number Code



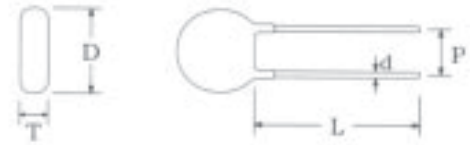


ZINC OXIDE VARISTOR 50 SERIES

50 SERIES



DIMENSION



Unit: mm

| Disc Ø | D max. | L min. | d nor. | P nor. |
|--------|--------|--------|----------|--------|
| 5 | 7.5 | 30 | 0.6±0.02 | 5±1 |

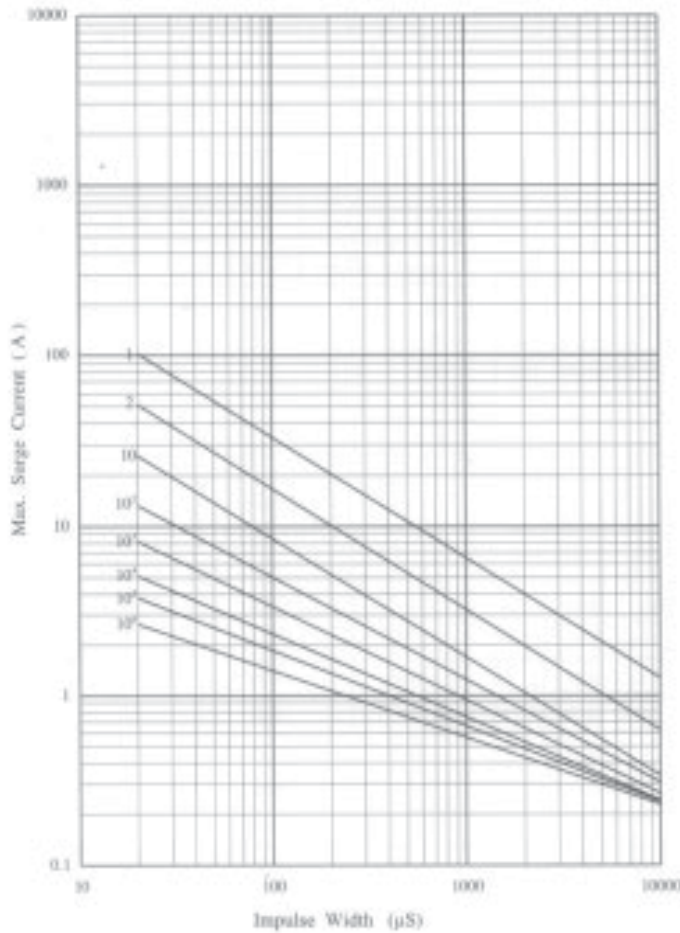
SPECIFICATION

| Part No | Varistor Voltage | | | Max. Allowable Voltage | | Max. Clamping Voltage | | Max. Energy | | Max. Peak Current (8/20µs) | | Rated Power | Reference Capacitance | Dimensions |
|------------|------------------|---------------|-----------|------------------------|-----------|-----------------------|--------------|---------------|------|-------------------------------|-----------------|-------------|-----------------------|------------|
| | VImA (V) | AC rms (V) | DC (V) | Vp (V) | Ip (A) | 10/1000 (J) | 1time (A) | 2times (A) | (W) | @1KHZ (pf) | T(max.) (mm) | | | |
| TVR 05 180 | 18 | 11 | 14 | 40 | 1 | 0.4 | 100 | 50 | 0.01 | 1600 | 3.9 | | | |
| TVR 05 220 | 22 | 14 | 18 | 48 | 1 | 0.5 | 100 | 50 | 0.01 | 1500 | 4.1 | | | |
| TVR 05 270 | 27 | 17 | 22 | 60 | 1 | 0.6 | 100 | 50 | 0.01 | 1450 | 4.3 | | | |
| TVR 05 330 | 33 | 20 | 26 | 73 | 1 | 0.8 | 100 | 50 | 0.01 | 1400 | 4.5 | | | |
| TVR 05 390 | 39 | 25 | 31 | 86 | 1 | 0.9 | 100 | 50 | 0.01 | 1100 | 4.0 | | | |
| TVR 05 470 | 47 | 30 | 38 | 104 | 1 | 1.1 | 100 | 50 | 0.01 | 850 | 4.1 | | | |
| TVR 05 560 | 56 | 35 | 45 | 123 | 1 | 1.3 | 100 | 50 | 0.01 | 600 | 4.3 | | | |
| TVR 05 680 | 68 | 40 | 56 | 150 | 1 | 1.6 | 100 | 50 | 0.01 | 580 | 4.6 | | | |
| TVR 05 820 | 82 | 50 | 65 | 145 | 5 | 2.5 | 400 | 200 | 0.1 | 460 | 4.0 | | | |
| TVR 05 101 | 100 | 60 | 85 | 175 | 5 | 3.0 | 400 | 200 | 0.1 | 400 | 4.2 | | | |
| TVR 05 121 | 120 | 75 | 100 | 210 | 5 | 4.0 | 400 | 200 | 0.1 | 350 | 4.4 | | | |
| TVR 05 151 | 150 | 95 | 125 | 260 | 5 | 4.8 | 400 | 200 | 0.1 | 300 | 4.7 | | | |
| TVR 05 181 | 180 | 115 | 150 | 315 | 5 | 5.9 | 400 | 200 | 0.1 | 150 | 4.2 | | | |
| TVR 05 201 | 200 | 130 | 170 | 355 | 5 | 6.5 | 400 | 200 | 0.1 | 140 | 4.3 | | | |
| TVR 05 221 | 220 | 140 | 180 | 380 | 5 | 7.0 | 400 | 200 | 0.1 | 130 | 4.4 | | | |
| TVR 05 241 | 240 | 150 | 200 | 415 | 5 | 8.0 | 400 | 200 | 0.1 | 120 | 4.5 | | | |
| TVR 05 271 | 270 | 175 | 225 | 475 | 5 | 8.5 | 400 | 200 | 0.1 | 110 | 4.7 | | | |
| TVR 05 301 | 300 | 195 | 250 | 525 | 5 | 8.5 | 400 | 200 | 0.1 | 100 | 4.6 | | | |
| TVR 05 331 | 330 | 215 | 275 | 585 | 5 | 9.2 | 400 | 200 | 0.1 | 105 | 4.7 | | | |
| TVR 05 361 | 360 | 230 | 300 | 620 | 5 | 10 | 400 | 200 | 0.1 | 90 | 4.8 | | | |
| TVR 05 391 | 390 | 250 | 320 | 675 | 5 | 12 | 400 | 200 | 0.1 | 85 | 5.0 | | | |
| TVR 05 431 | 430 | 275 | 350 | 745 | 5 | 13 | 400 | 200 | 0.1 | 80 | 5.2 | | | |
| TVR 05 471 | 470 | 300 | 385 | 810 | 5 | 15 | 400 | 200 | 0.1 | 75 | 5.3 | | | |

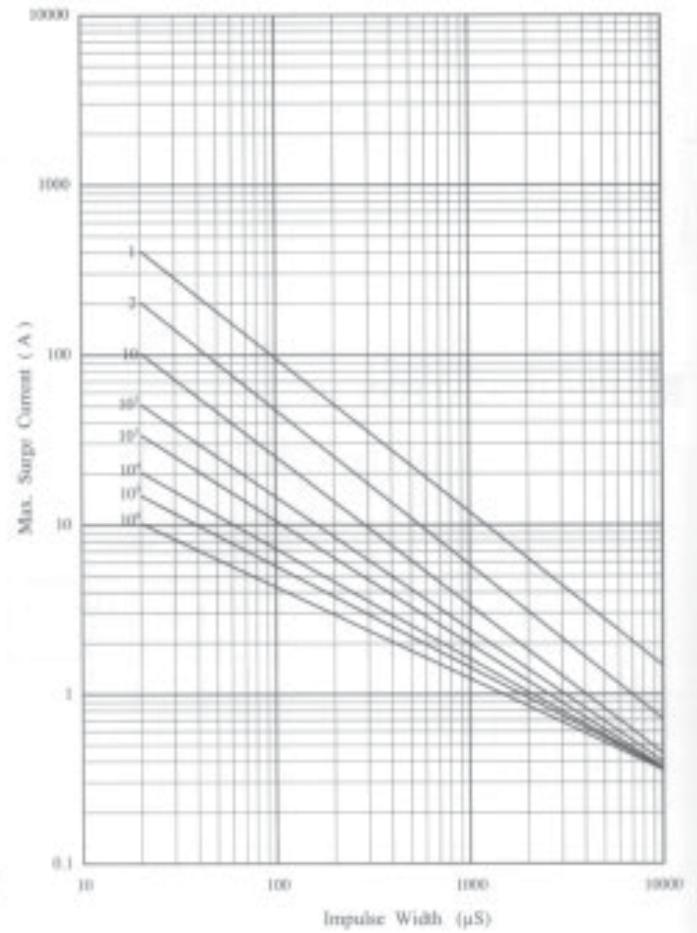


LIFE TIMES

Surge Life Times Ratings (TVR 05 180 to TVR 05 680)

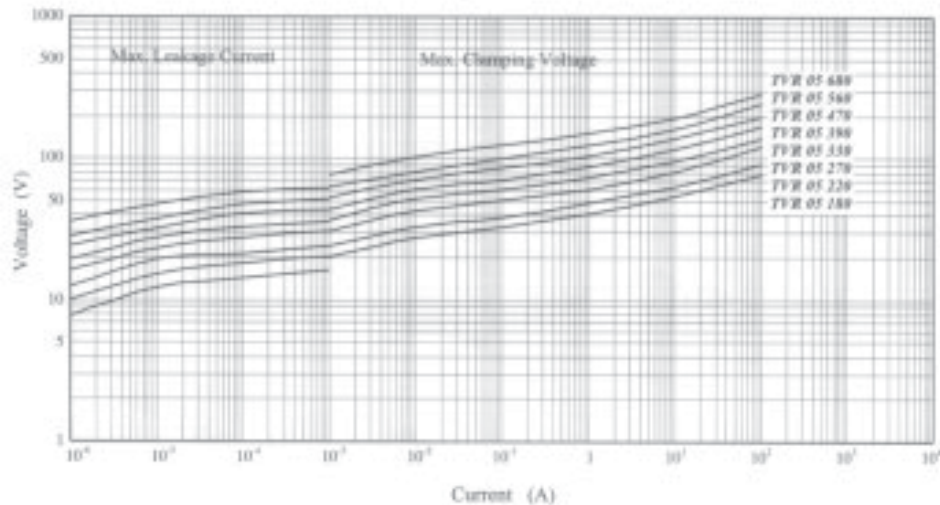


Surge Life Times Ratings (TVR 05 820 to TVR 05 471)

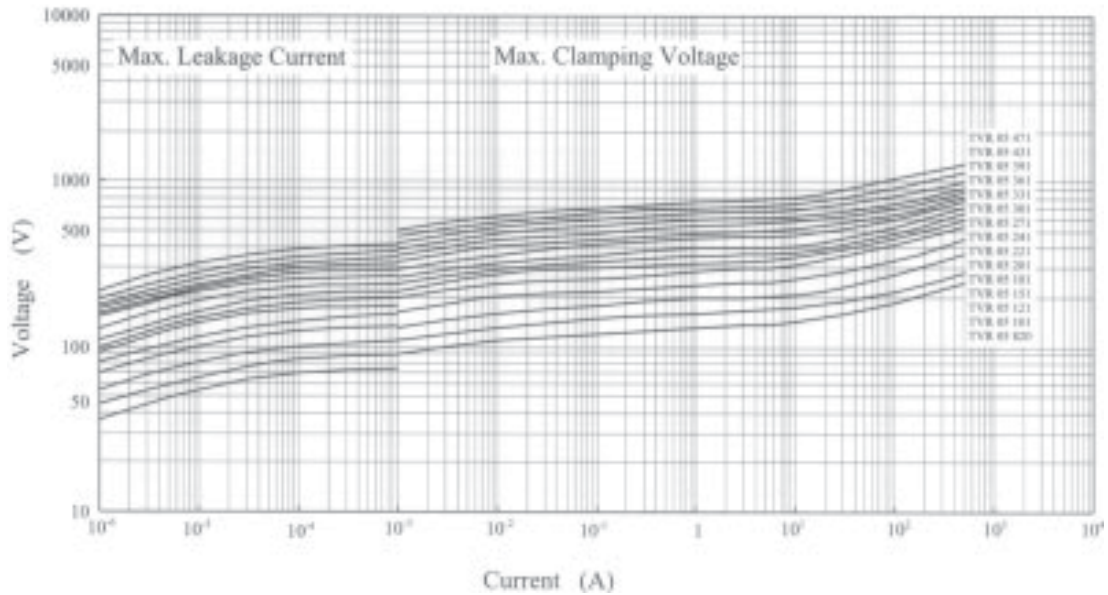


V-I CHARACTERISTIC CURVE

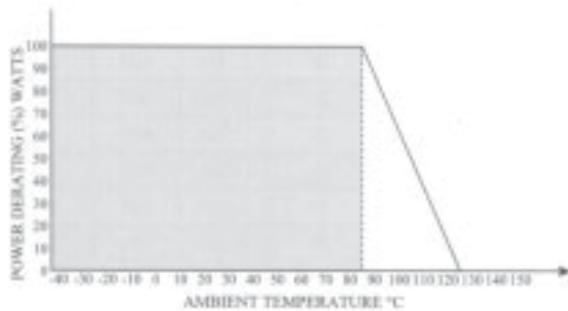
Max. Leakage Current and Max. Clamping Voltage Curves (TVR 05 180 to TVR 05 680)



Max. Leakage Current and Max. Clamping Voltage Curves (TVR 05 820 to TVR 05 471)

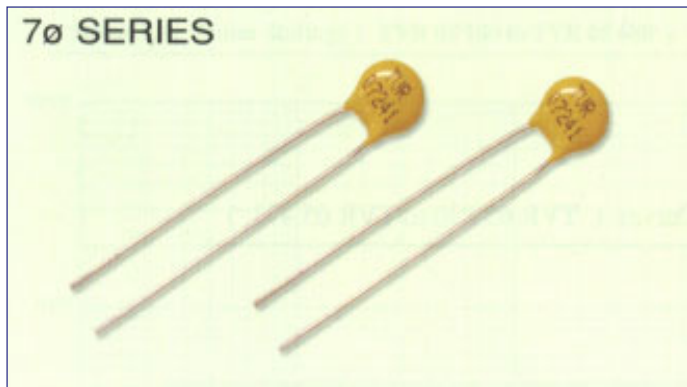


POWER DERATING CURVE

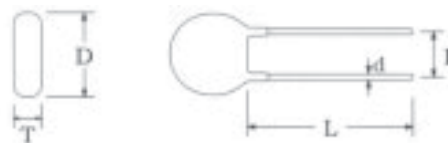




ZINC OXIDE VARISTOR 7Ø SERIES



DIMENSION



Unit: mm

| Disc Ø | D max. | L min. | d nor. | P nor. |
|--------|--------|--------|----------|--------|
| 7 | 9.5 | 30 | 0.6±0.02 | 5±1 |

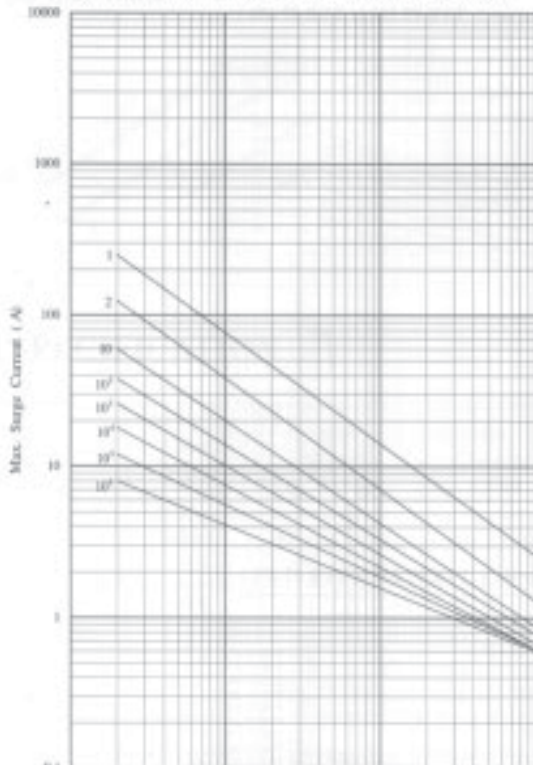
SPECIFICATION

| Part No | Varistor Voltage | | | Max. Allowable Voltage | | Max. Clamping Voltage | | Max. Energy | | Max. Peak Current (8/20µs) | | Rated Power | Reference Capacitance | Dimensions |
|------------|------------------|------------|--------|------------------------|--------|-----------------------|-----------|-------------|------|----------------------------|--------------|-------------|-----------------------|------------|
| | VImA (V) | AC rms (V) | DC (V) | Vp (V) | Ip (A) | 10/1000 (J) | 1time (A) | 2times (A) | (W) | @1KHZ (pf) | T(max.) (mm) | | | |
| TVR 07 180 | 18 | 11 | 14 | 36 | 2.5 | 0.9 | 250 | 125 | 0.02 | 3800 | 3.9 | | | |
| TVR 07 220 | 22 | 14 | 18 | 43 | 2.5 | 1.1 | 250 | 125 | 0.02 | 3600 | 4.1 | | | |
| TVR 07 270 | 27 | 17 | 22 | 53 | 2.5 | 1.4 | 250 | 125 | 0.02 | 3400 | 4.3 | | | |
| TVR 07 330 | 33 | 20 | 26 | 65 | 2.5 | 1.7 | 250 | 125 | 0.02 | 2900 | 4.5 | | | |
| TVR 07 390 | 39 | 25 | 31 | 77 | 2.5 | 2.1 | 250 | 125 | 0.02 | 1620 | 4.0 | | | |
| TVR 07 470 | 47 | 30 | 38 | 93 | 2.5 | 2.5 | 250 | 125 | 0.02 | 1550 | 4.1 | | | |
| TVR 07 560 | 56 | 35 | 45 | 110 | 2.5 | 3.1 | 250 | 125 | 0.02 | 1500 | 4.3 | | | |
| TVR 07 680 | 68 | 40 | 56 | 135 | 2.5 | 3.6 | 250 | 125 | 0.02 | 1200 | 4.6 | | | |
| TVR 07 820 | 82 | 50 | 65 | 135 | 10 | 5.5 | 1200 | 600 | 0.25 | 900 | 4.0 | | | |
| TVR 07 101 | 100 | 60 | 85 | 165 | 10 | 6.5 | 1200 | 600 | 0.25 | 750 | 4.2 | | | |
| TVR 07 121 | 120 | 75 | 100 | 200 | 10 | 7.8 | 1200 | 600 | 0.25 | 620 | 4.4 | | | |
| TVR 07 151 | 150 | 95 | 125 | 250 | 10 | 9.7 | 1200 | 600 | 0.25 | 500 | 4.7 | | | |
| TVR 07 181 | 180 | 115 | 150 | 300 | 10 | 11.7 | 1200 | 600 | 0.25 | 400 | 4.2 | | | |
| TVR 07 201 | 200 | 130 | 170 | 340 | 10 | 13 | 1200 | 600 | 0.25 | 360 | 4.3 | | | |
| TVR 07 221 | 220 | 140 | 180 | 360 | 10 | 14 | 1200 | 600 | 0.25 | 310 | 4.4 | | | |
| TVR 07 241 | 240 | 150 | 200 | 395 | 10 | 15 | 1200 | 600 | 0.25 | 290 | 4.5 | | | |
| TVR 07 271 | 270 | 175 | 225 | 455 | 10 | 18 | 1200 | 600 | 0.25 | 260 | 4.7 | | | |
| TVR 07 301 | 300 | 195 | 250 | 500 | 10 | 21 | 1200 | 600 | 0.25 | 230 | 4.6 | | | |
| TVR 07 331 | 330 | 215 | 275 | 550 | 10 | 23 | 1200 | 600 | 0.25 | 210 | 4.7 | | | |
| TVR 07 361 | 360 | 230 | 300 | 595 | 10 | 25 | 1200 | 600 | 0.25 | 190 | 4.8 | | | |
| TVR 07 391 | 390 | 250 | 320 | 650 | 10 | 25 | 1200 | 600 | 0.25 | 180 | 5.0 | | | |
| TVR 07 431 | 430 | 275 | 350 | 710 | 10 | 28 | 1200 | 600 | 0.25 | 160 | 5.2 | | | |
| TVR 07 471 | 470 | 300 | 385 | 775 | 10 | 30 | 1200 | 600 | 0.25 | 150 | 5.3 | | | |
| TVR 07 511 | 510 | 320 | 410 | 845 | 10 | 33 | 1200 | 600 | 0.25 | 140 | 5.5 | | | |
| TVR 07 561 | 560 | 350 | 450 | 930 | 10 | 33 | 1200 | 600 | 0.25 | 130 | 5.7 | | | |
| TVR 07 621 | 620 | 395 | 510 | 1020 | 10 | 35 | 1200 | 600 | 0.25 | 120 | 6.0 | | | |
| TVR 07 681 | 680 | 420 | 560 | 1120 | 10 | 35 | 1200 | 600 | 0.25 | 110 | 6.3 | | | |
| TVR 07 751 | 750 | 465 | 615 | 1235 | 10 | 38 | 1200 | 600 | 0.25 | 100 | 6.6 | | | |
| TVR 07 821 | 820 | 510 | 670 | 1355 | 10 | 42 | 1200 | 600 | 0.25 | 90 | 6.5 | | | |

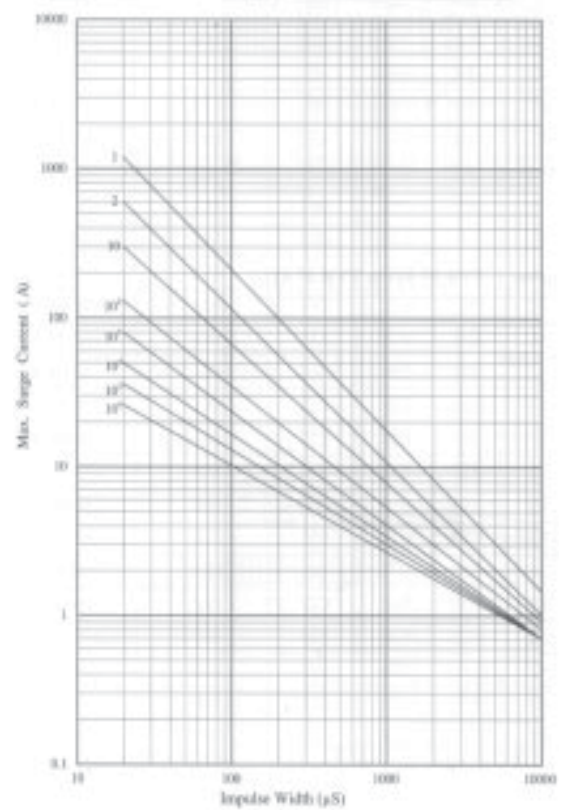


LIFE TIMES

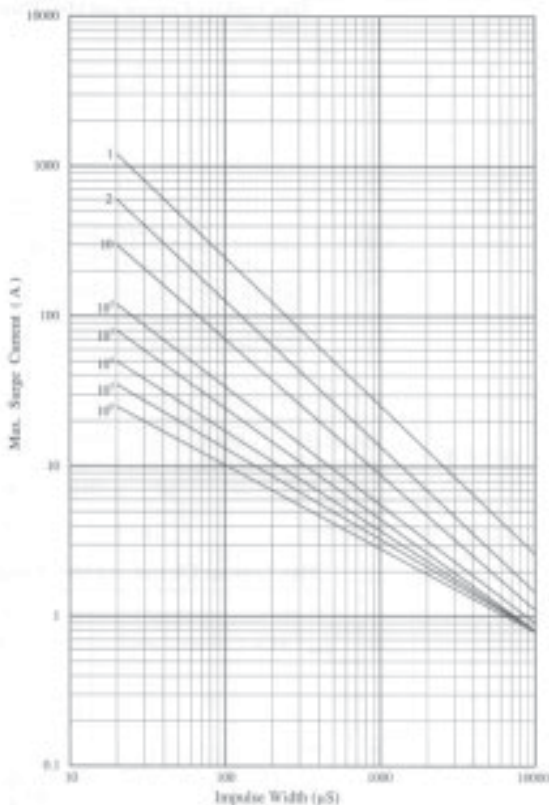
Surge Life Times Ratings (TVR 07 180 to TVR 07 680)



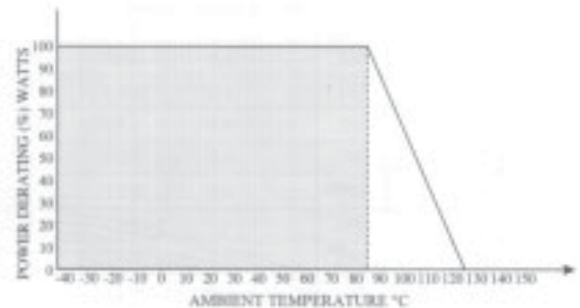
Surge Life Times Ratings (TVR 07 511 to TVR 07 821)



Surge Life Times Ratings (TVR 07 820 to TVR 07 471)



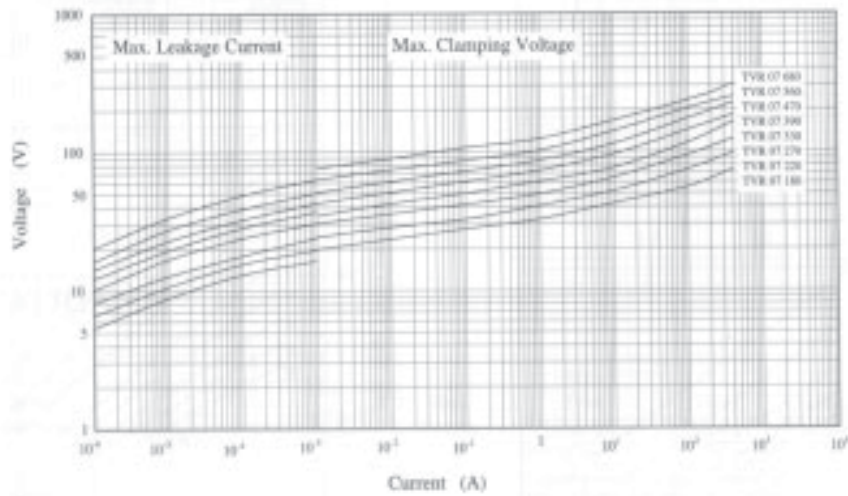
POWER DERATING CURVE



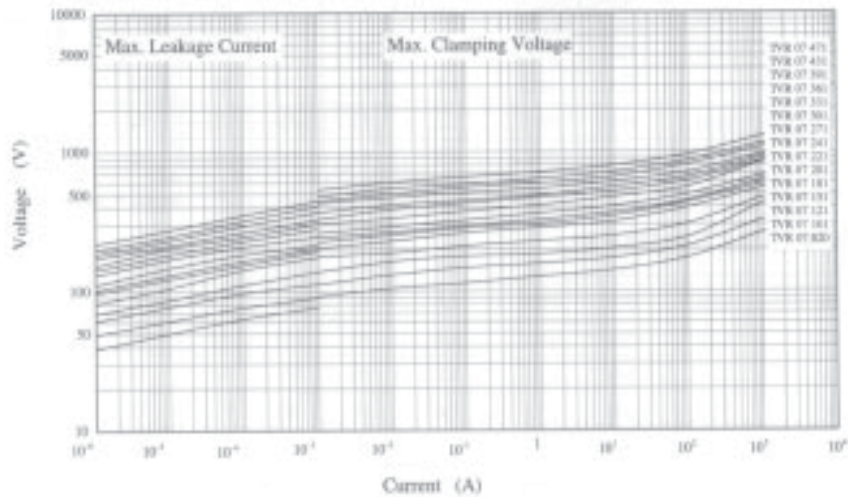


V-I CHARACTERISTIC CURVE

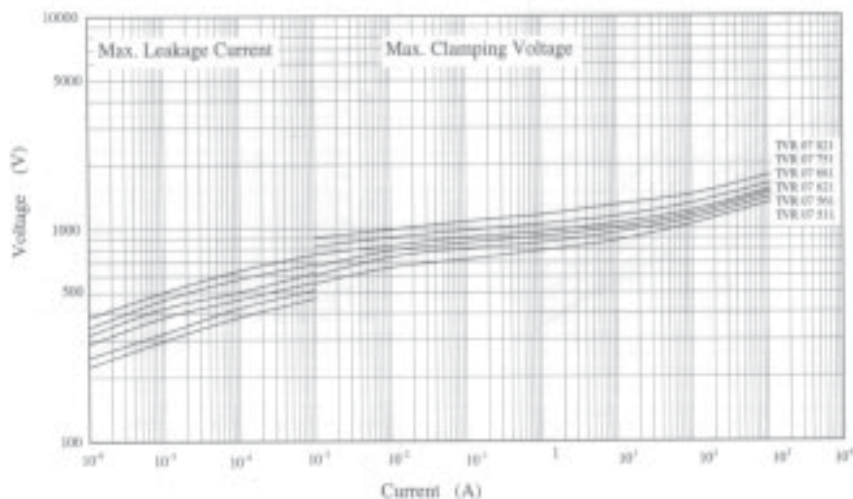
Max. Leakage Current and Max. Clamping Voltage Curves (TVR 07 180 to TVR 07 680)



Max. Leakage Current and Max. Clamping Voltage Curves (TVR 07 820 to TVR 07 471)



Max. Leakage Current and Max. Clamping Voltage Curves (TVR 07 511 to TVR 07 821)



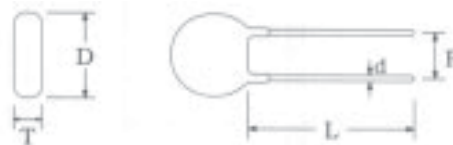


ZINC OXIDE VARISTOR 100 SERIES

100 SERIES



DIMENSION



Unit: mm

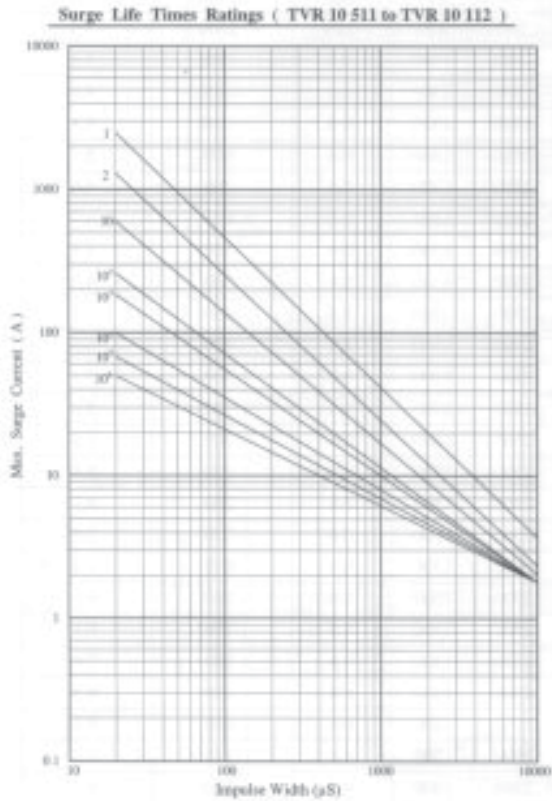
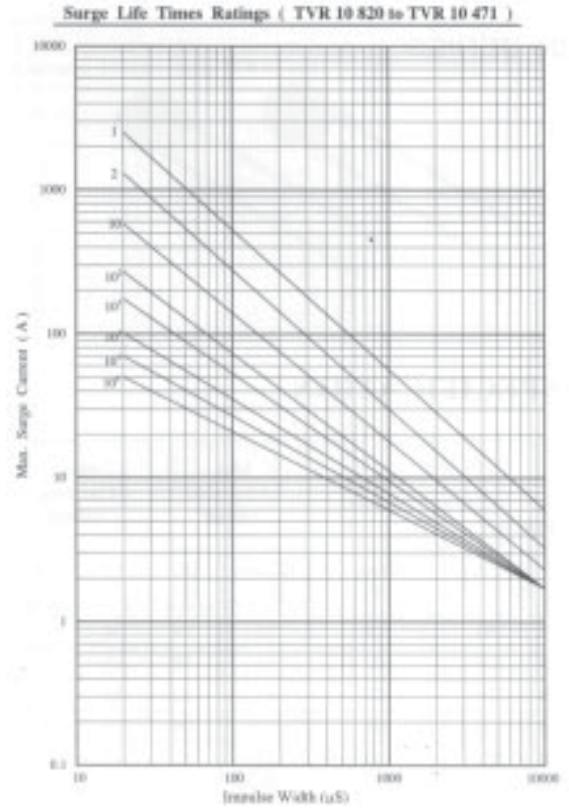
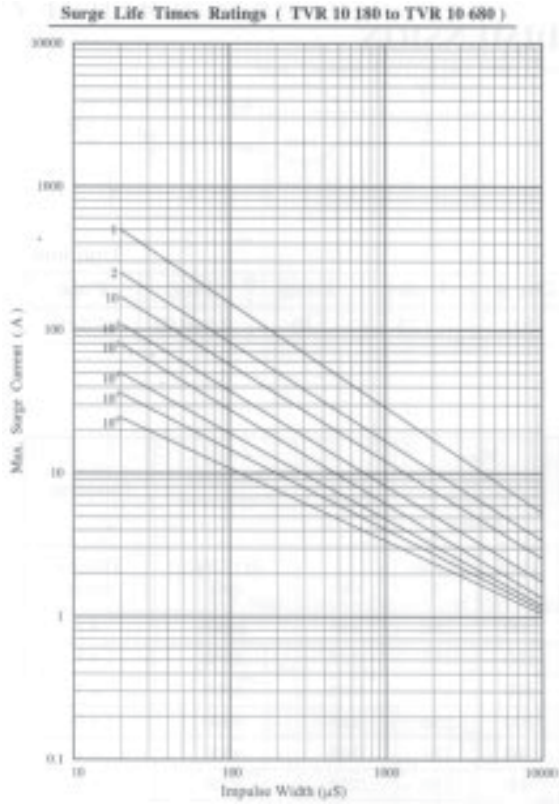
| Disc Ø | D max. | L min. | d nor. | P nor. |
|--------|--------|--------|----------|--------|
| 10 | 12.5 | 30 | 0.8±0.02 | 7.5±1 |

SPECIFICATION

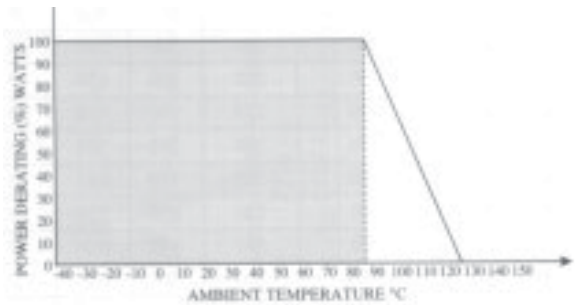
| Part No | Max. Allowable Voltage | | | Max. Clamping Voltage | | Max. Energy 10/1000 (J) | Max. Peak Current (8/20µs) | | Rated Power (W) | Reference Capacitance @1KHZ (pf) | Dimensions T(max.) (mm) |
|------------|---------------------------------|---------------|-----------|-----------------------|-----------|-------------------------------|-------------------------------|---------------|--------------------|--|-------------------------------|
| | Varistor Voltage VImA (V) | AC rms (V) | DC (V) | Vp (V) | Ip (A) | | 1time (A) | 2times (A) | | | |
| TVR 10 180 | 18 | 11 | 14 | 36 | 5 | 2.1 | 500 | 250 | 0.05 | 10000 | 4.3 |
| TVR 10 220 | 22 | 14 | 18 | 43 | 5 | 2.5 | 500 | 250 | 0.05 | 8000 | 4.5 |
| TVR 10 270 | 27 | 17 | 22 | 53 | 5 | 3.0 | 500 | 250 | 0.05 | 6500 | 4.7 |
| TVR 10 330 | 33 | 20 | 26 | 65 | 5 | 4.0 | 500 | 250 | 0.05 | 5800 | 4.9 |
| TVR 10 390 | 39 | 25 | 31 | 77 | 5 | 4.6 | 500 | 250 | 0.05 | 4500 | 4.4 |
| TVR 10 470 | 47 | 30 | 38 | 93 | 5 | 5.5 | 500 | 250 | 0.05 | 4000 | 4.5 |
| TVR 10 560 | 56 | 35 | 45 | 110 | 5 | 7.0 | 500 | 250 | 0.05 | 3500 | 4.7 |
| TVR 10 680 | 68 | 40 | 56 | 135 | 5 | 8.2 | 500 | 250 | 0.05 | 2500 | 5.0 |
| TVR 10 820 | 82 | 50 | 65 | 135 | 25 | 12 | 2500 | 1300 | 0.4 | 1700 | 4.4 |
| TVR 10 101 | 100 | 60 | 85 | 165 | 25 | 15 | 2500 | 1300 | 0.4 | 1400 | 4.6 |
| TVR 10 121 | 120 | 75 | 100 | 200 | 25 | 18 | 2500 | 1300 | 0.4 | 1100 | 4.8 |
| TVR 10 151 | 150 | 95 | 125 | 250 | 25 | 22 | 2500 | 1300 | 0.4 | 900 | 5.1 |
| TVR 10 181 | 180 | 115 | 150 | 300 | 25 | 27 | 2500 | 1300 | 0.4 | 700 | 4.6 |
| TVR 10 201 | 200 | 130 | 170 | 340 | 25 | 30 | 2500 | 1300 | 0.4 | 610 | 4.7 |
| TVR 10 221 | 220 | 140 | 180 | 360 | 25 | 32 | 2500 | 1300 | 0.4 | 550 | 4.8 |
| TVR 10 241 | 240 | 150 | 200 | 395 | 25 | 35 | 2500 | 1300 | 0.4 | 500 | 4.9 |
| TVR 10 271 | 270 | 175 | 225 | 455 | 25 | 40 | 2500 | 1300 | 0.4 | 450 | 5.1 |
| TVR 10 301 | 300 | 195 | 250 | 500 | 25 | 40 | 2500 | 1300 | 0.4 | 400 | 5.0 |
| TVR 10 331 | 330 | 215 | 275 | 550 | 25 | 43 | 2500 | 1300 | 0.4 | 360 | 5.1 |
| TVR 10 361 | 360 | 230 | 300 | 595 | 25 | 47 | 2500 | 1300 | 0.4 | 330 | 5.2 |
| TVR 10 391 | 390 | 250 | 320 | 650 | 25 | 60 | 2500 | 1300 | 0.4 | 300 | 5.4 |
| TVR 10 431 | 430 | 275 | 350 | 710 | 25 | 65 | 2500 | 1300 | 0.4 | 270 | 5.6 |
| TVR 10 471 | 470 | 300 | 385 | 775 | 25 | 70 | 2500 | 1300 | 0.4 | 250 | 5.7 |
| TVR 10 511 | 510 | 320 | 410 | 845 | 25 | 70 | 2500 | 1300 | 0.4 | 230 | 5.9 |
| TVR 10 561 | 560 | 350 | 450 | 930 | 25 | 70 | 2500 | 1300 | 0.4 | 210 | 6.1 |
| TVR 10 621 | 620 | 395 | 510 | 1020 | 25 | 70 | 2500 | 1300 | 0.4 | 190 | 6.4 |
| TVR 10 681 | 680 | 420 | 560 | 1120 | 25 | 70 | 2500 | 1300 | 0.4 | 170 | 6.7 |
| TVR 10 751 | 750 | 465 | 615 | 1235 | 25 | 75 | 2500 | 1300 | 0.4 | 160 | 7.0 |
| TVR 10 821 | 820 | 510 | 670 | 1355 | 25 | 85 | 2500 | 1300 | 0.4 | 150 | 6.9 |
| TVR 10 911 | 910 | 550 | 745 | 1500 | 25 | 93 | 2500 | 1300 | 0.4 | 140 | 7.3 |
| TVR 10 102 | 1000 | 625 | 825 | 1650 | 25 | 102 | 2500 | 1300 | 0.4 | 130 | 7.7 |
| TVR 10 112 | 1100 | 680 | 895 | 1815 | 25 | 115 | 2500 | 1300 | 0.4 | 120 | 8.1 |



LIFE TIMES



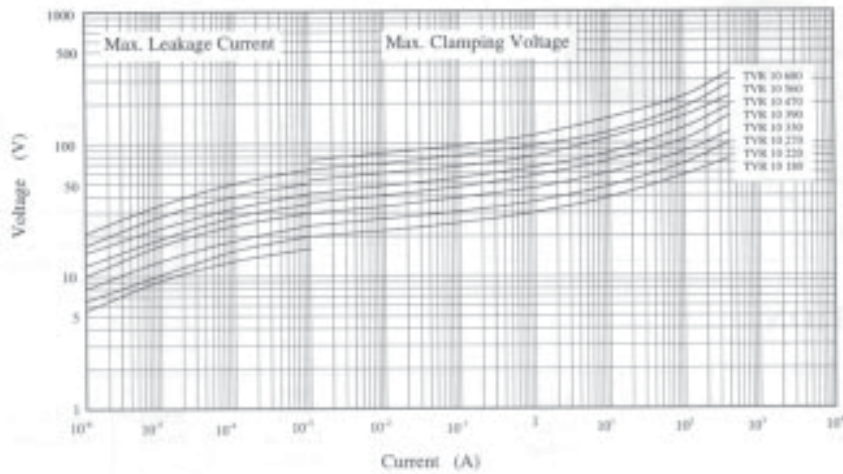
POWER DERATING CURVE



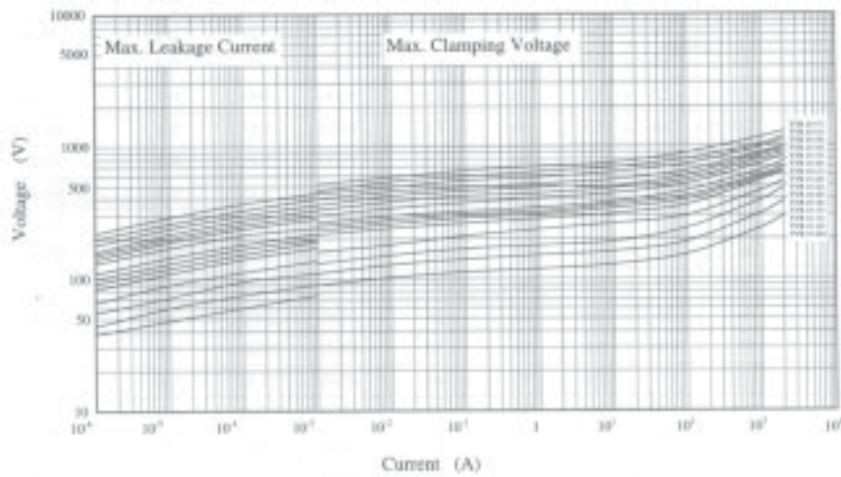


V-I CHARACTERISTIC CURVE

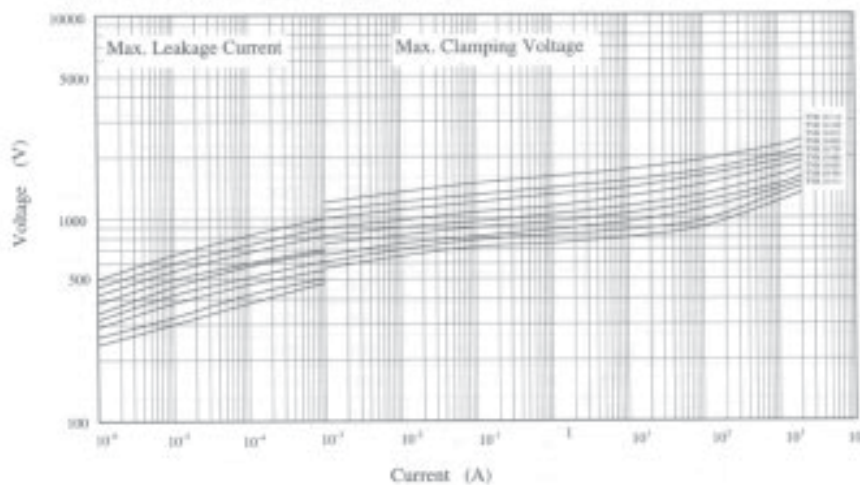
Max. Leakage Current and Max. Clamping Voltage Curves (TVR 10 150 to TVR 10 680)



Max. Leakage Current and Max. Clamping Voltage Curves (TVR 10 820 to TVR 10 471)

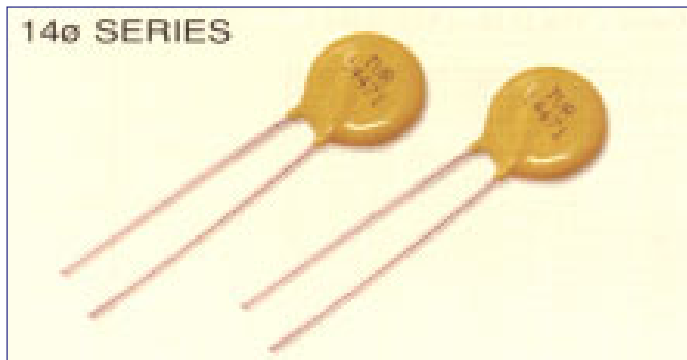


Max. Leakage Current and Max. Clamping Voltage Curves (TVR 10 511 to TVR 10 112)

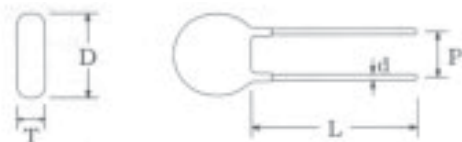




ZINC OXIDE VARISTOR 14Ø SERIES



DIMENSION



Unit: mm

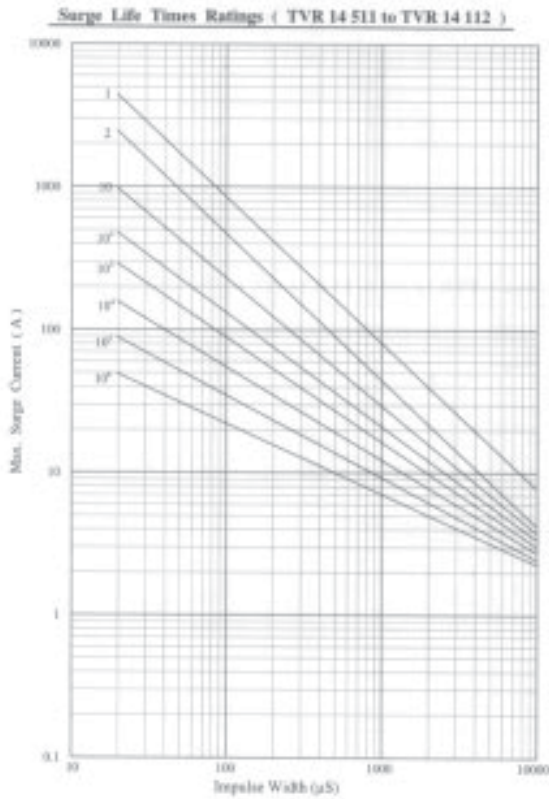
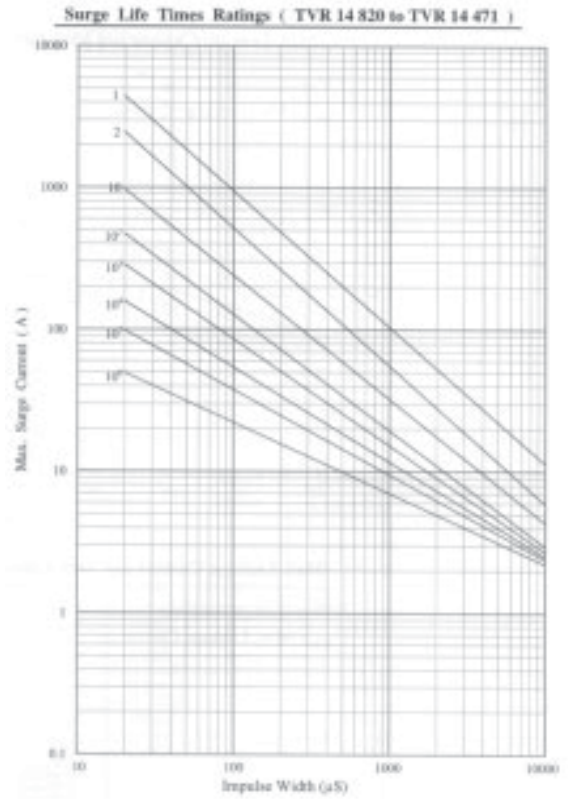
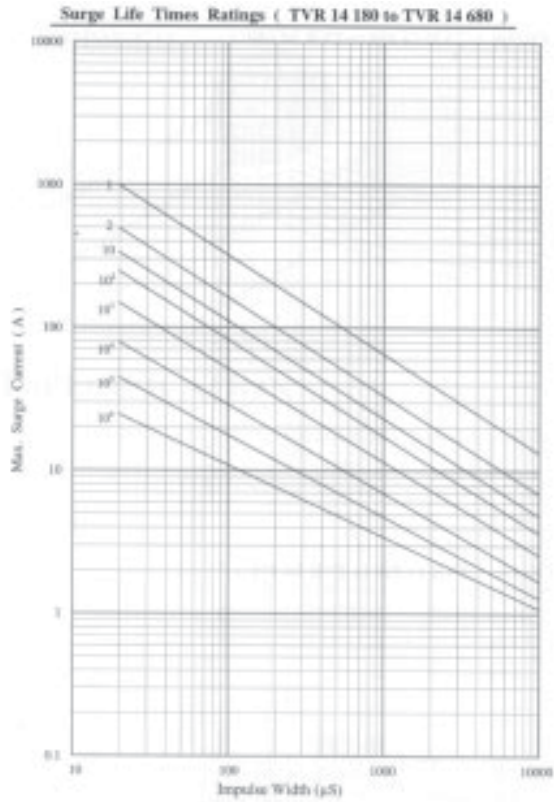
| Disc Ø | D max. | L min. | d nor. | P nor. |
|--------|--------|--------|----------|--------|
| 14 | 17 | 30 | 0.8±0.02 | 7.5±1 |

SPECIFICATION

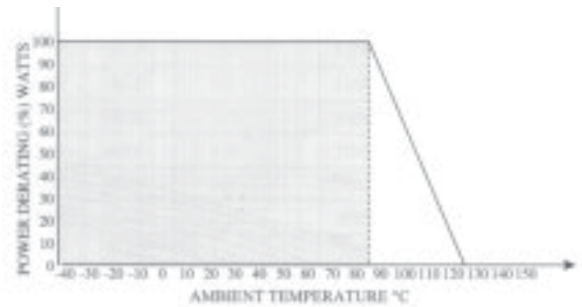
| Part No | Varistor Voltage | | | Max. Allowable Voltage | | Max. Clamping Voltage | | Max. Energy | | Max. Peak Current (8/20µs) | | Rated Power (W) | Reference Capacitance @1KHZ (pf) | Dimensions T(max.) (mm) |
|------------|------------------|---------------|-----------|------------------------|-----------|-----------------------|--------------|---------------|-----|-------------------------------|-----|--------------------|--|-------------------------------|
| | VImA (V) | AC rms (V) | DC (V) | Vp (V) | Ip (A) | 10/1000 (J) | 1time (A) | 2times (A) | | | | | | |
| TVR 14 180 | 18 | 11 | 14 | 36 | 10 | 4.0 | 1000 | 500 | 0.1 | 22000 | 4.3 | | | |
| TVR 14 220 | 22 | 14 | 18 | 43 | 10 | 5.0 | 1000 | 500 | 0.1 | 18000 | 4.5 | | | |
| TVR 14 270 | 27 | 17 | 22 | 53 | 10 | 6.0 | 1000 | 500 | 0.1 | 12000 | 4.7 | | | |
| TVR 14 330 | 33 | 20 | 26 | 65 | 10 | 7.5 | 1000 | 500 | 0.1 | 9000 | 4.9 | | | |
| TVR 14 390 | 39 | 25 | 31 | 77 | 10 | 8.6 | 1000 | 500 | 0.1 | 7800 | 4.4 | | | |
| TVR 14 470 | 47 | 30 | 38 | 93 | 10 | 10 | 1000 | 500 | 0.1 | 6600 | 4.5 | | | |
| TVR 14 560 | 56 | 35 | 45 | 110 | 10 | 11 | 1000 | 500 | 0.1 | 5400 | 4.7 | | | |
| TVR 14 680 | 68 | 40 | 56 | 135 | 10 | 14 | 1000 | 500 | 0.1 | 4500 | 5.0 | | | |
| TVR 14 820 | 82 | 50 | 65 | 135 | 50 | 22 | 4500 | 2500 | 0.6 | 2900 | 4.4 | | | |
| TVR 14 101 | 100 | 60 | 85 | 165 | 50 | 28 | 4500 | 2500 | 0.6 | 2400 | 4.6 | | | |
| TVR 14 121 | 120 | 75 | 100 | 200 | 50 | 32 | 4500 | 2500 | 0.6 | 2000 | 4.8 | | | |
| TVR 14 151 | 150 | 95 | 125 | 250 | 50 | 40 | 4500 | 2500 | 0.6 | 1600 | 5.1 | | | |
| TVR 14 181 | 180 | 115 | 150 | 300 | 50 | 52 | 4500 | 2500 | 0.6 | 1300 | 4.6 | | | |
| TVR 14 201 | 200 | 130 | 170 | 340 | 50 | 57 | 4500 | 2500 | 0.6 | 1000 | 4.7 | | | |
| TVR 14 221 | 220 | 140 | 180 | 360 | 50 | 60 | 4500 | 2500 | 0.6 | 1000 | 4.8 | | | |
| TVR 14 241 | 240 | 150 | 200 | 395 | 50 | 63 | 4500 | 2500 | 0.6 | 900 | 4.9 | | | |
| TVR 14 271 | 270 | 175 | 225 | 455 | 50 | 70 | 4500 | 2500 | 0.6 | 750 | 5.1 | | | |
| TVR 14 301 | 300 | 195 | 250 | 500 | 50 | 78 | 4500 | 2500 | 0.6 | 680 | 5.0 | | | |
| TVR 14 331 | 330 | 215 | 275 | 550 | 50 | 85 | 4500 | 2500 | 0.6 | 620 | 5.1 | | | |
| TVR 14 361 | 360 | 230 | 300 | 595 | 50 | 93 | 4500 | 2500 | 0.6 | 550 | 5.2 | | | |
| TVR 14 391 | 390 | 250 | 320 | 650 | 50 | 100 | 4500 | 2500 | 0.6 | 520 | 5.4 | | | |
| TVR 14 431 | 430 | 275 | 350 | 710 | 50 | 115 | 4500 | 2500 | 0.6 | 500 | 5.6 | | | |
| TVR 14 471 | 470 | 300 | 385 | 775 | 50 | 125 | 4500 | 2500 | 0.6 | 480 | 5.7 | | | |
| TVR 14 511 | 510 | 320 | 410 | 845 | 50 | 125 | 4500 | 2500 | 0.6 | 440 | 5.9 | | | |
| TVR 14 561 | 560 | 350 | 450 | 930 | 50 | 125 | 4500 | 2500 | 0.6 | 400 | 6.1 | | | |
| TVR 14 621 | 620 | 395 | 510 | 1020 | 50 | 125 | 4500 | 2500 | 0.6 | 330 | 6.4 | | | |
| TVR 14 681 | 680 | 420 | 560 | 1120 | 50 | 130 | 4500 | 2500 | 0.6 | 320 | 6.7 | | | |
| TVR 14 751 | 750 | 465 | 615 | 1235 | 50 | 143 | 4500 | 2500 | 0.6 | 310 | 7.0 | | | |
| TVR 14 821 | 820 | 510 | 670 | 1355 | 50 | 157 | 4500 | 2500 | 0.6 | 280 | 6.9 | | | |
| TVR 14 911 | 910 | 550 | 745 | 1500 | 50 | 175 | 4500 | 2500 | 0.6 | 250 | 7.3 | | | |
| TVR 14 102 | 1000 | 625 | 825 | 1650 | 50 | 190 | 4500 | 2500 | 0.6 | 230 | 7.6 | | | |
| TVR 14 112 | 1100 | 680 | 895 | 1815 | 50 | 213 | 4500 | 2500 | 0.6 | 210 | 8.1 | | | |



LIFE TIMES



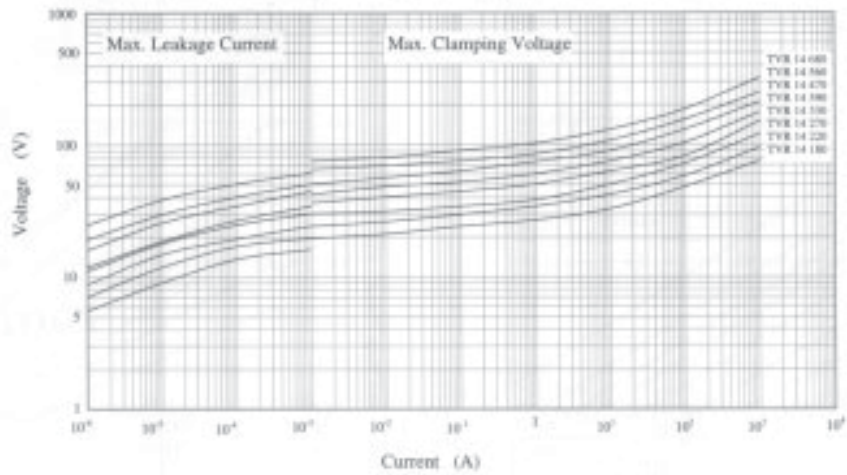
POWER DERATING CURVE



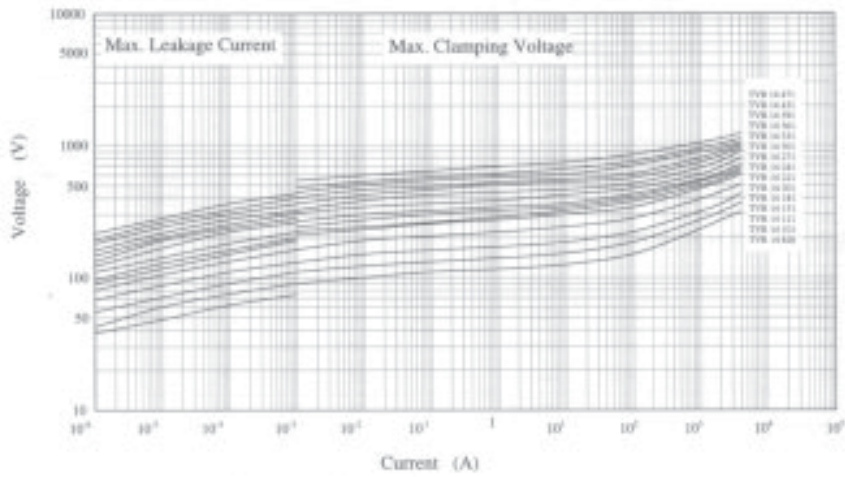


V-I CHARACTERISTIC CURVE

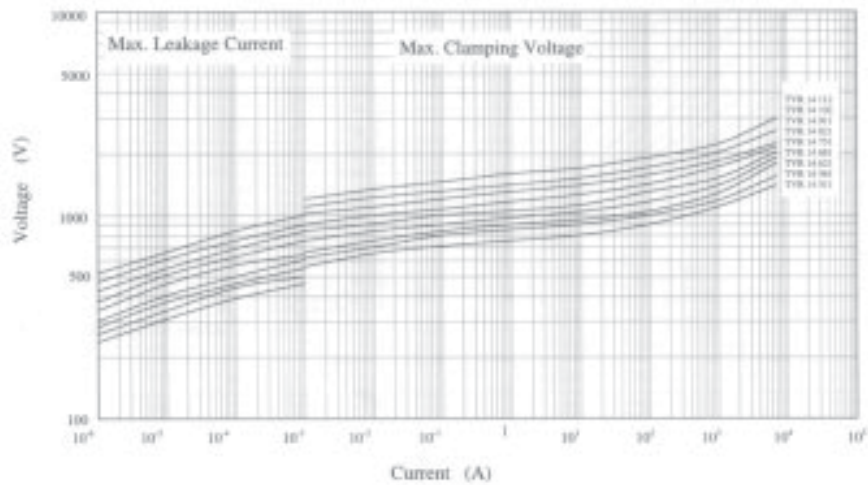
Max. Leakage Current and Max. Clamping Voltage Curves (TVR 14 180 to TVR 14 680)



Max. Leakage Current and Max. Clamping Voltage Curves (TVR 14 820 to TVR 14 471)

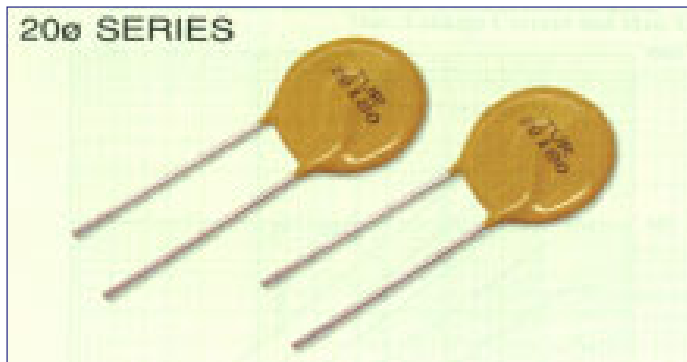


Max. Leakage Current and Max. Clamping Voltage Curves (TVR 14 511 to TVR 14 112)

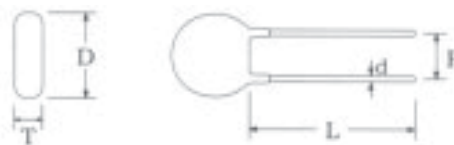




ZINC OXIDE VARISTOR 20Ø SERIES



DIMENSION



Unit: mm

| Disc Ø | D max. | L min. | d nor. | P nor. |
|--------|--------|--------|----------|--------|
| 20 | 23.5 | 26 | 1.0±0.02 | 10±1 |

SPECIFICATION

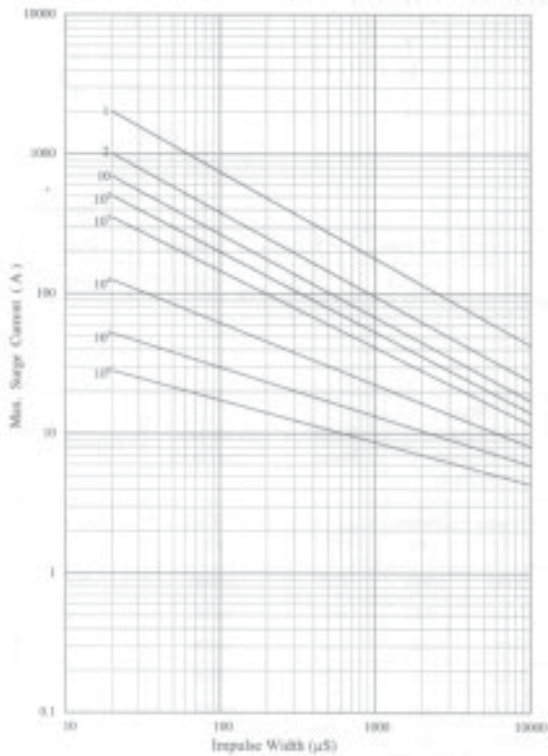
| Part No | Varistor Voltage | | | Max. Allowable Voltage | | Max. Clamping Voltage | | Max. Energy | | Max. Peak Current (8/20µs) | | Rated Power | Reference Capacitance | Dimensions |
|------------|------------------|------------|--------|------------------------|--------|-----------------------|-----------|-------------|-----|----------------------------|--------------|-------------|-----------------------|------------|
| | VImA (V) | AC rms (V) | DC (V) | Vp (V) | Ip (A) | 10/1000 (J) | 1time (A) | 2times (A) | (W) | @1KHZ (pf) | T(max.) (mm) | | | |
| TVR 20 180 | 18 | 11 | 14 | 36 | 20 | 11 | 2000 | 1000 | 0.2 | 44000 | 4.7 | | | |
| TVR 20 220 | 22 | 14 | 18 | 43 | 20 | 14 | 2000 | 1000 | 0.2 | 36000 | 4.9 | | | |
| TVR 20 270 | 27 | 17 | 22 | 53 | 20 | 18 | 2000 | 1000 | 0.2 | 26000 | 5.1 | | | |
| TVR 20 330 | 33 | 20 | 26 | 65 | 20 | 23 | 2000 | 1000 | 0.2 | 20000 | 5.3 | | | |
| TVR 20 390 | 39 | 25 | 31 | 77 | 20 | 26 | 2000 | 1000 | 0.2 | 18000 | 4.8 | | | |
| TVR 20 470 | 47 | 30 | 38 | 93 | 20 | 33 | 2000 | 1000 | 0.2 | 15500 | 4.9 | | | |
| TVR 20 560 | 56 | 35 | 45 | 110 | 20 | 41 | 2000 | 1000 | 0.2 | 13000 | 5.1 | | | |
| TVR 20 680 | 68 | 40 | 56 | 135 | 20 | 46 | 2000 | 1000 | 0.2 | 10000 | 5.4 | | | |
| TVR 20 820 | 82 | 50 | 65 | 135 | 100 | 48 | 6500 | 4000 | 1.0 | 6000 | 4.8 | | | |
| TVR 20 101 | 100 | 60 | 85 | 165 | 100 | 51 | 6500 | 4000 | 1.0 | 5000 | 5.0 | | | |
| TVR 20 121 | 120 | 75 | 100 | 200 | 100 | 55 | 6500 | 4000 | 1.0 | 4500 | 5.2 | | | |
| TVR 20 151 | 150 | 95 | 125 | 250 | 100 | 70 | 6500 | 4000 | 1.0 | 3200 | 5.5 | | | |
| TVR 20 181 | 180 | 115 | 150 | 300 | 100 | 84 | 6500 | 4000 | 1.0 | 2500 | 5.0 | | | |
| TVR 20 201 | 200 | 130 | 170 | 340 | 100 | 95 | 6500 | 4000 | 1.0 | 2000 | 5.1 | | | |
| TVR 20 221 | 220 | 140 | 180 | 360 | 100 | 100 | 6500 | 4000 | 1.0 | 2000 | 5.2 | | | |
| TVR 20 241 | 240 | 150 | 200 | 395 | 100 | 108 | 6500 | 4000 | 1.0 | 1800 | 5.3 | | | |
| TVR 20 271 | 270 | 175 | 225 | 455 | 100 | 127 | 6500 | 4000 | 1.0 | 1600 | 5.5 | | | |
| TVR 20 301 | 300 | 195 | 250 | 500 | 100 | 136 | 6500 | 4000 | 1.0 | 1500 | 5.4 | | | |
| TVR 20 331 | 330 | 215 | 275 | 550 | 100 | 150 | 6500 | 4000 | 1.0 | 1400 | 5.5 | | | |
| TVR 20 361 | 360 | 230 | 300 | 595 | 100 | 163 | 6500 | 4000 | 1.0 | 1200 | 5.6 | | | |
| TVR 20 391 | 390 | 250 | 320 | 650 | 100 | 180 | 6500 | 4000 | 1.0 | 1100 | 5.8 | | | |
| TVR 20 431 | 430 | 275 | 350 | 710 | 100 | 190 | 6500 | 4000 | 1.0 | 1050 | 6.0 | | | |
| TVR 20 471 | 470 | 300 | 385 | 775 | 100 | 220 | 6500 | 4000 | 1.0 | 950 | 6.1 | | | |
| TVR 20 511 | 510 | 320 | 410 | 845 | 100 | 220 | 6500 | 4000 | 1.0 | 900 | 6.3 | | | |
| TVR 20 561 | 560 | 350 | 450 | 930 | 100 | 220 | 6500 | 4000 | 1.0 | 800 | 6.5 | | | |
| TVR 20 621 | 620 | 395 | 510 | 1020 | 100 | 220 | 6500 | 4000 | 1.0 | 700 | 6.8 | | | |
| TVR 20 681 | 680 | 420 | 560 | 1120 | 100 | 230 | 6500 | 4000 | 1.0 | 650 | 7.1 | | | |
| TVR 20 751 | 750 | 465 | 615 | 1235 | 100 | 255 | 6500 | 4000 | 1.0 | 600 | 7.4 | | | |
| TVR 20 821 | 820 | 510 | 670 | 1355 | 100 | 282 | 6500 | 4000 | 1.0 | 530 | 7.3 | | | |
| TVR 20 911 | 910 | 550 | 745 | 1500 | 100 | 310 | 6500 | 4000 | 1.0 | 500 | 7.7 | | | |
| TVR 20 102 | 1000 | 625 | 825 | 1650 | 100 | 342 | 6500 | 4000 | 1.0 | 450 | 8.1 | | | |
| TVR 20 112 | 1100 | 680 | 895 | 1815 | 100 | 383 | 6500 | 4000 | 1.0 | 400 | 8.5 | | | |



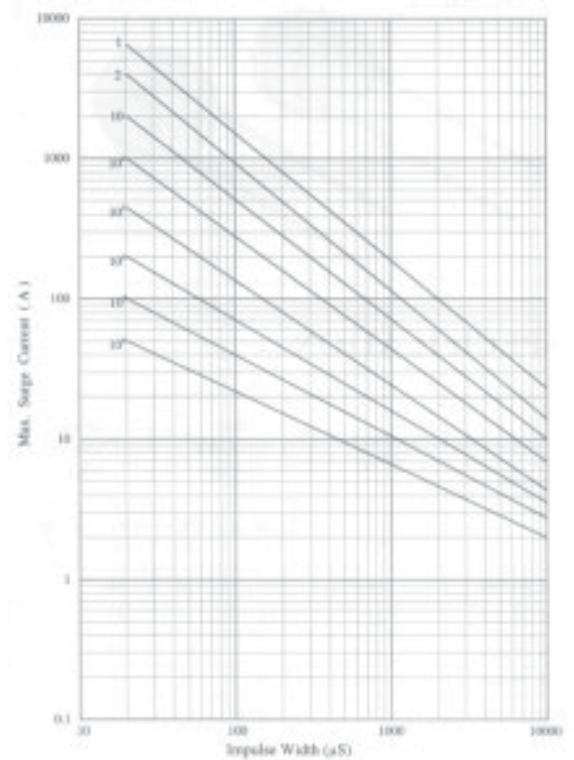


LIFE TIMES

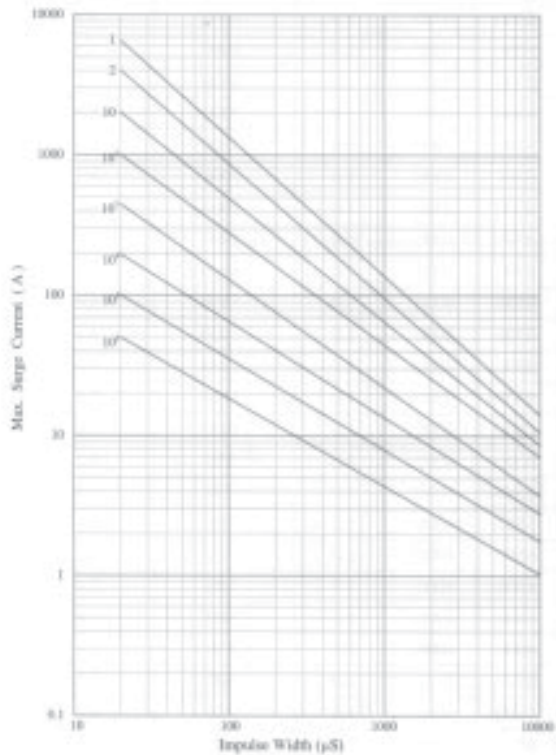
Surge Life Times Ratings (TVR 20 180 to TVR 20 680)



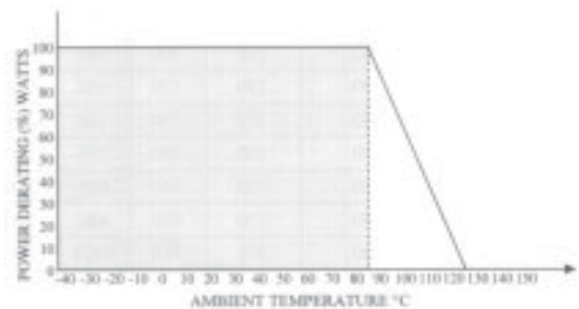
Surge Life Times Ratings (TVR 20 820 to TVR 20 471)



Surge Life Times Ratings (TVR 20 511 to TVR 20 112)



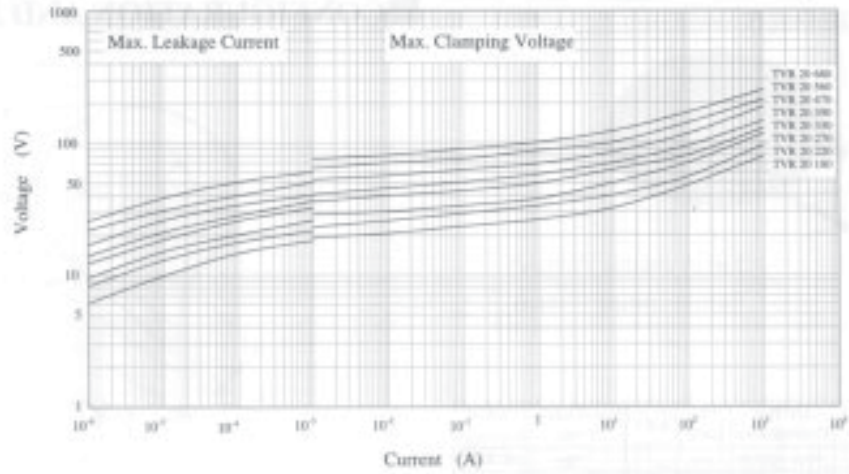
POWER DERATING CURVE



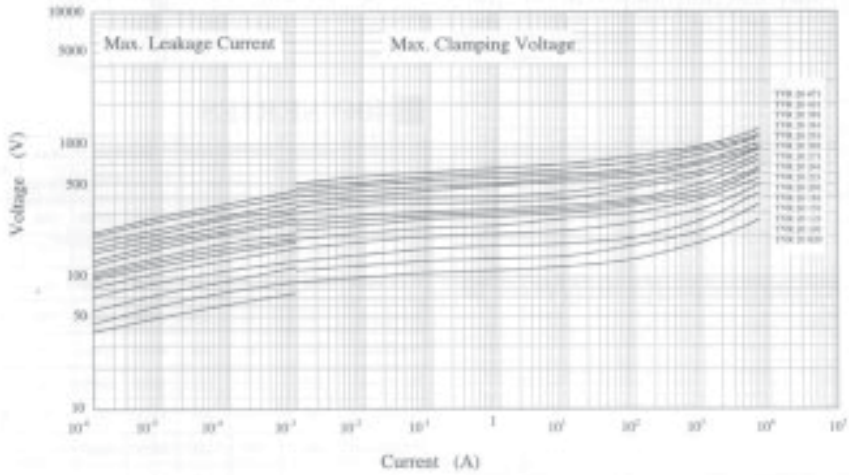


V-I CHARACTERISTIC CURVE

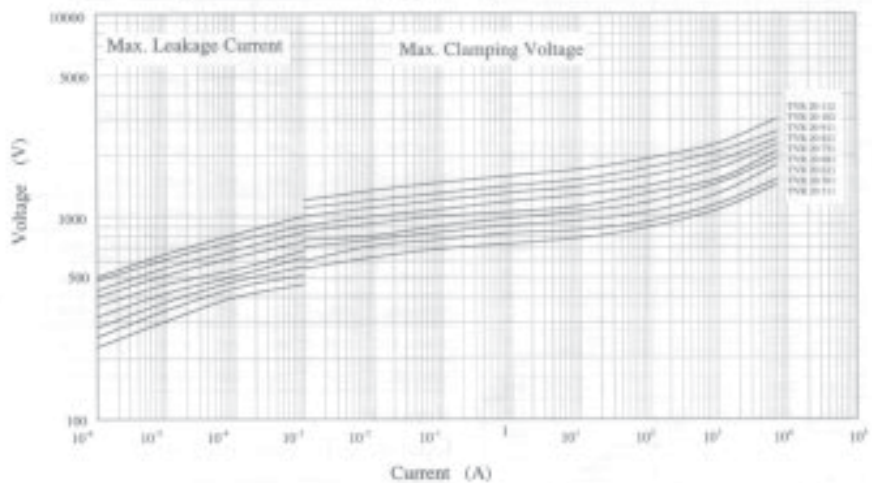
Max. Leakage Current and Max. Clamping Voltage Curves (TVR 20 180 to TVR 20 680)



Max. Leakage Current and Max. Clamping Voltage Curves (TVR 20 820 to TVR 20 471)



Max. Leakage Current and Max. Clamping Voltage Curves (TVR 20 511 to TVR 20 112)





ZINC OXIDE VARISTOR G SERIES

TVR G TYPE



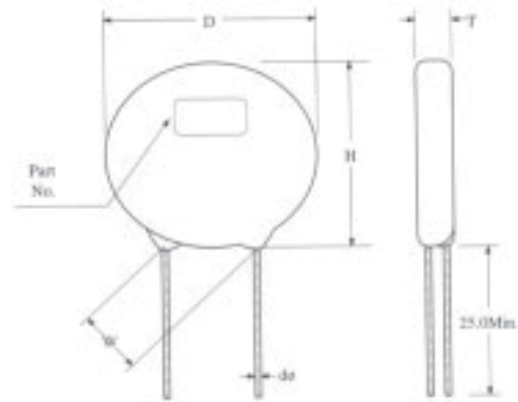
250 SERIES

| Part Number | Normal Varistor Voltage VmA(V) | Max. Allowable voltage | | Max. Peak Current(8/20µs) | | Max. Energy 2ms (J) | Max. Rated Power (W) | Max. Clamping Voltage V150A (V) | Typical Capacitance @1KHZ (PF) |
|-------------|-----------------------------------|------------------------|-----------|---------------------------|---------------|---------------------------|-------------------------|---------------------------------------|--------------------------------------|
| | | ACrms (V) | DC (V) | 1time (A) | 2times (A) | | | | |
| TVR25201KG | 200 | 130 | 170 | 15000 | 10000 | 128 | 1.0 | 340 | 2200 |
| TVR25221KG | 220 | 140 | 180 | 15000 | 10000 | 135 | 1.0 | 365 | 2000 |
| TVR25241KG | 240 | 150 | 200 | 15000 | 10000 | 146 | 1.0 | 395 | 1900 |
| TVR25271KG | 270 | 175 | 225 | 15000 | 10000 | 170 | 1.0 | 455 | 1600 |
| TVR25361KG | 360 | 230 | 300 | 15000 | 10000 | 190 | 1.0 | 595 | 1300 |
| TVR25391KG | 390 | 250 | 320 | 15000 | 10000 | 210 | 1.0 | 650 | 1100 |
| TVR25431KG | 430 | 275 | 350 | 15000 | 10000 | 220 | 1.0 | 710 | 1000 |
| TVR25471KG | 470 | 300 | 385 | 15000 | 10000 | 225 | 1.0 | 775 | 950 |
| TVR25511KG | 510 | 320 | 415 | 15000 | 10000 | 230 | 1.0 | 845 | 900 |
| TVR25561KG | 560 | 350 | 450 | 15000 | 10000 | 235 | 1.0 | 930 | 800 |
| TVR25621KG | 620 | 385 | 505 | 15000 | 10000 | 240 | 1.0 | 1025 | 700 |
| TVR25681KG | 680 | 420 | 560 | 15000 | 10000 | 250 | 1.0 | 1120 | 650 |
| TVR25751KG | 750 | 460 | 615 | 15000 | 10000 | 275 | 1.0 | 1240 | 600 |
| TVR25781KG | 780 | 485 | 640 | 15000 | 10000 | 290 | 1.0 | 1290 | 550 |
| TVR25821KG | 820 | 510 | 670 | 15000 | 10000 | 300 | 1.0 | 1355 | 520 |
| TVR25911KG | 910 | 550 | 745 | 15000 | 10000 | 340 | 1.0 | 1500 | 500 |
| TVR25951KG | 950 | 575 | 765 | 15000 | 10000 | 355 | 1.0 | 1570 | 450 |
| TVR25102KG | 1000 | 625 | 825 | 15000 | 10000 | 375 | 1.0 | 1650 | 430 |
| TVR25112KG | 1100 | 680 | 895 | 15000 | 10000 | 390 | 1.0 | 1815 | 400 |

320 SERIES

| Part Number | Normal Varistor Voltage VmA(V) | Max. Allowable voltage | | Max. Peak Current(8/20µs) | | Max. Energy 2ms (J) | Max. Rated Power (W) | Max. Clamping Voltage V200A (V) | Typical Capacitance @1KHZ (PF) |
|-------------|-----------------------------------|------------------------|-----------|---------------------------|---------------|---------------------------|-------------------------|---------------------------------------|--------------------------------------|
| | | ACrms (V) | DC (V) | 1time (A) | 2times (A) | | | | |
| TVR32201KG | 200 | 130 | 170 | 25000 | 20000 | 210 | 1.2 | 340 | 3900 |
| TVR32221KG | 220 | 140 | 180 | 25000 | 20000 | 225 | 1.2 | 365 | 3500 |
| TVR32241KG | 240 | 150 | 200 | 25000 | 20000 | 240 | 1.2 | 395 | 3300 |
| TVR32271KG | 270 | 175 | 225 | 25000 | 20000 | 250 | 1.2 | 455 | 2800 |
| TVR32361KG | 360 | 230 | 300 | 25000 | 20000 | 300 | 1.2 | 595 | 2200 |
| TVR32391KG | 390 | 250 | 320 | 25000 | 20000 | 330 | 1.2 | 650 | 2000 |
| TVR32431KG | 430 | 275 | 350 | 25000 | 20000 | 360 | 1.2 | 710 | 1800 |
| TVR32471KG | 470 | 300 | 385 | 25000 | 20000 | 405 | 1.2 | 775 | 1700 |
| TVR32511KG | 510 | 320 | 415 | 25000 | 20000 | 430 | 1.2 | 845 | 1600 |
| TVR32561KG | 560 | 350 | 450 | 25000 | 20000 | 470 | 1.2 | 930 | 1400 |
| TVR32621KG | 620 | 385 | 505 | 25000 | 20000 | 550 | 1.2 | 1025 | 1250 |
| TVR32681KG | 680 | 420 | 560 | 25000 | 20000 | 600 | 1.2 | 1120 | 1150 |
| TVR32751KG | 750 | 460 | 615 | 25000 | 20000 | 660 | 1.2 | 1240 | 1100 |
| TVR32781KG | 780 | 485 | 640 | 25000 | 20000 | 680 | 1.2 | 1290 | 1050 |
| TVR32821KG | 820 | 510 | 670 | 25000 | 20000 | 750 | 1.2 | 1355 | 950 |
| TVR32911KG | 910 | 550 | 745 | 25000 | 20000 | 820 | 1.2 | 1500 | 900 |
| TVR32951KG | 950 | 575 | 765 | 25000 | 20000 | 860 | 1.2 | 1570 | 850 |
| TVR32102KG | 1000 | 625 | 825 | 25000 | 20000 | 900 | 1.2 | 1650 | 800 |
| TVR32112KG | 1100 | 680 | 895 | 25000 | 20000 | 950 | 1.2 | 1815 | 750 |
| TVR32122KG | 1200 | 750 | 1060 | 25000 | 20000 | 1000 | 1.2 | 2000 | 650 |

CONFIGURATION AND DIMENSION



| Disc Ø | D max. | T max | W | H max | dØ±0.02 |
|--------|--------|-------|------|-------|---------|
| 25 | 29 | 10 | 10±1 | 33 | 1.0 |
| 32 | 36 | 10 | 15±1 | 40 | 1.5 |
| 40 | 44 | 12 | 20±1 | 48 | 1.5 |

Unit: mm

400 SERIES

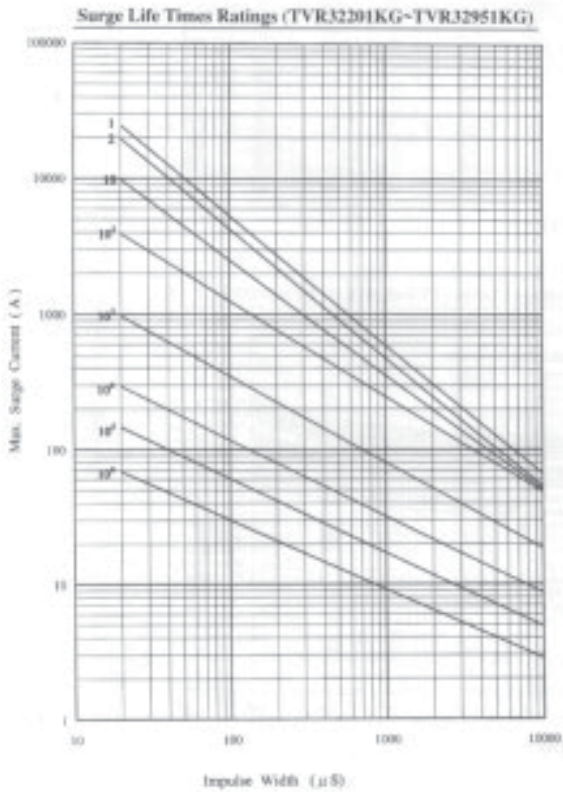
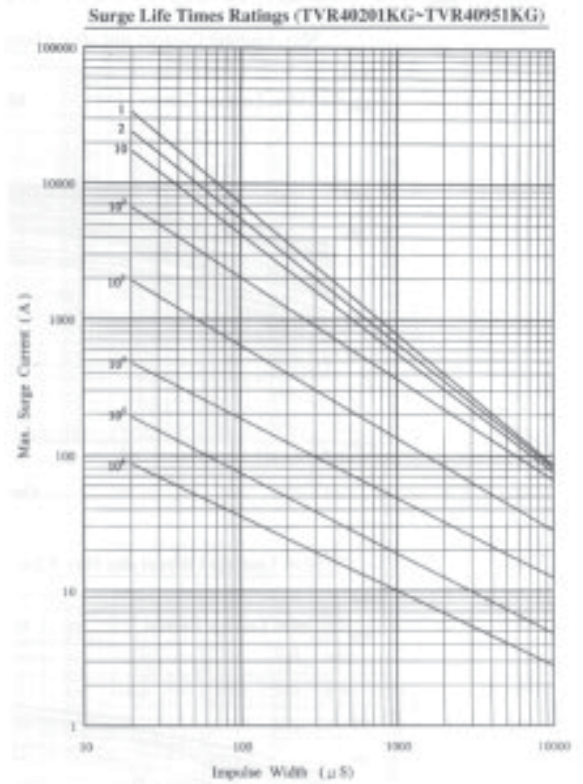
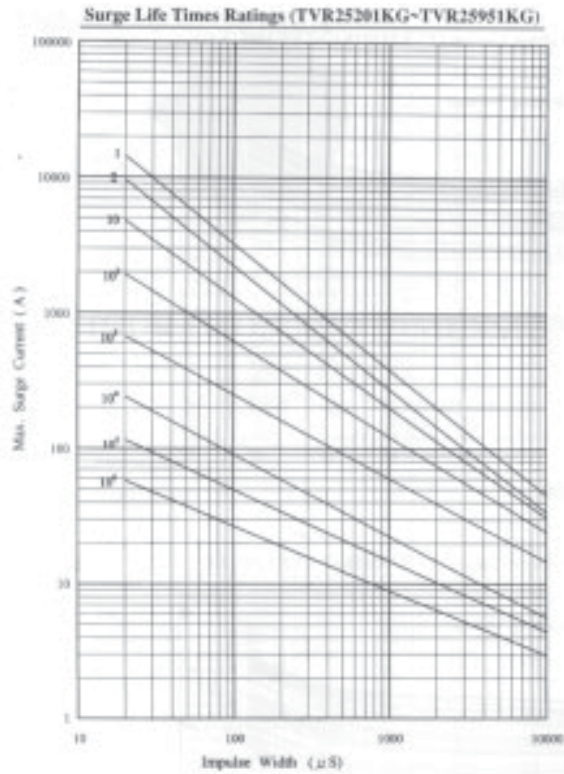
| Part Number | Normal Varistor Voltage VmA(V) | Max. Allowable voltage | | Max. Peak Current(8/20µs) | | Max. Energy 2ms (J) | Max. Rated Power (W) | Max. Clamping Voltage V300A (V) | Typical Capacitance @1KHZ (PF) |
|-------------|-----------------------------------|------------------------|-----------|---------------------------|---------------|---------------------------|-------------------------|---------------------------------------|--------------------------------------|
| | | ACrms (V) | DC (V) | 1time (A) | 2times (A) | | | | |
| TVR40201KG | 200 | 130 | 170 | 40000 | 30000 | 320 | 1.4 | 340 | 6000 |
| TVR40221KG | 220 | 140 | 180 | 40000 | 30000 | 340 | 1.4 | 365 | 5500 |
| TVR40241KG | 240 | 150 | 200 | 40000 | 30000 | 360 | 1.4 | 395 | 5000 |
| TVR40271KG | 270 | 175 | 225 | 40000 | 30000 | 400 | 1.4 | 455 | 4500 |
| TVR40361KG | 360 | 230 | 300 | 40000 | 30000 | 460 | 1.4 | 595 | 3500 |
| TVR40391KG | 390 | 250 | 320 | 40000 | 30000 | 490 | 1.4 | 650 | 3000 |
| TVR40431KG | 430 | 275 | 350 | 40000 | 30000 | 550 | 1.4 | 710 | 2800 |
| TVR40471KG | 470 | 300 | 385 | 40000 | 30000 | 595 | 1.4 | 775 | 2600 |
| TVR40511KG | 510 | 320 | 415 | 40000 | 30000 | 640 | 1.4 | 845 | 2500 |
| TVR40561KG | 560 | 350 | 450 | 40000 | 30000 | 700 | 1.4 | 930 | 2200 |
| TVR40621KG | 620 | 385 | 505 | 40000 | 30000 | 800 | 1.4 | 1025 | 2000 |
| TVR40681KG | 680 | 420 | 560 | 40000 | 30000 | 910 | 1.4 | 1120 | 1800 |
| TVR40751KG | 750 | 460 | 615 | 40000 | 30000 | 1000 | 1.4 | 1240 | 1700 |
| TVR40781KG | 780 | 485 | 640 | 40000 | 30000 | 1030 | 1.4 | 1290 | 1600 |
| TVR40821KG | 820 | 510 | 670 | 40000 | 30000 | 860 | 1.4 | 1355 | 1500 |
| TVR40911KG | 910 | 550 | 745 | 40000 | 30000 | 960 | 1.4 | 1500 | 1400 |
| TVR40951KG | 950 | 575 | 765 | 40000 | 30000 | 1000 | 1.4 | 1570 | 1300 |
| TVR40102KG | 1000 | 625 | 825 | 40000 | 30000 | 1050 | 1.4 | 1650 | 1200 |
| TVR40112KG | 1100 | 680 | 895 | 40000 | 30000 | 1150 | 1.4 | 1815 | 1100 |
| TVR40122KG | 1200 | 750 | 1060 | 40000 | 30000 | 1250 | 1.4 | 2000 | 1000 |

Remark:
Operating Temperature: -40~85°C
Storage Temperature: -40~110°C

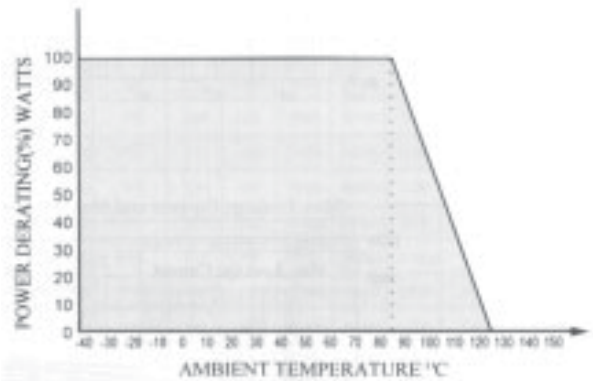




LIFE TIMES

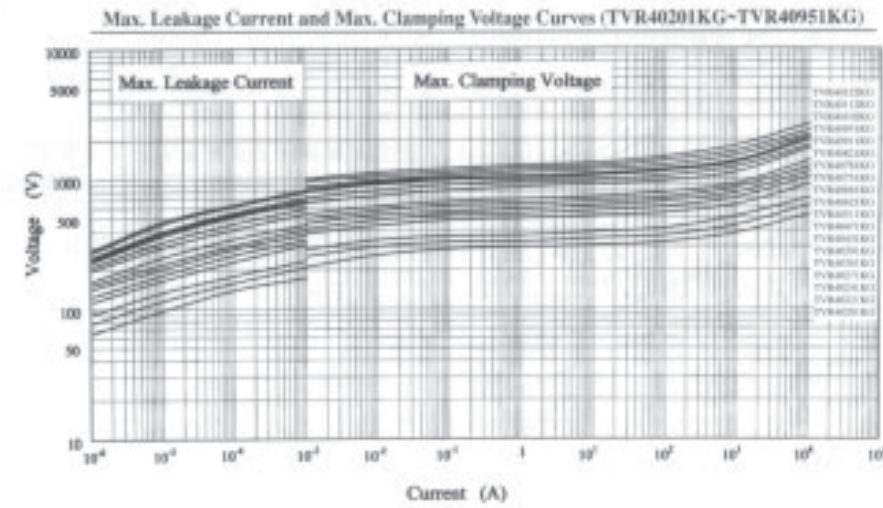
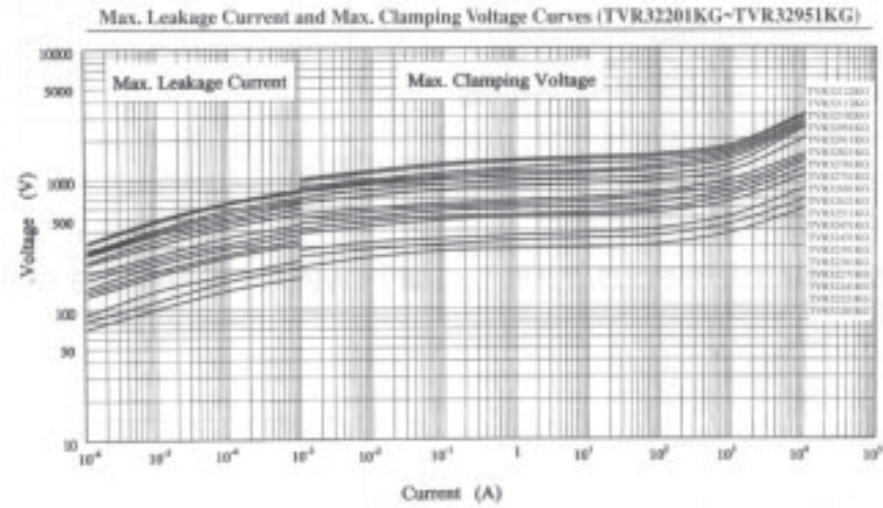
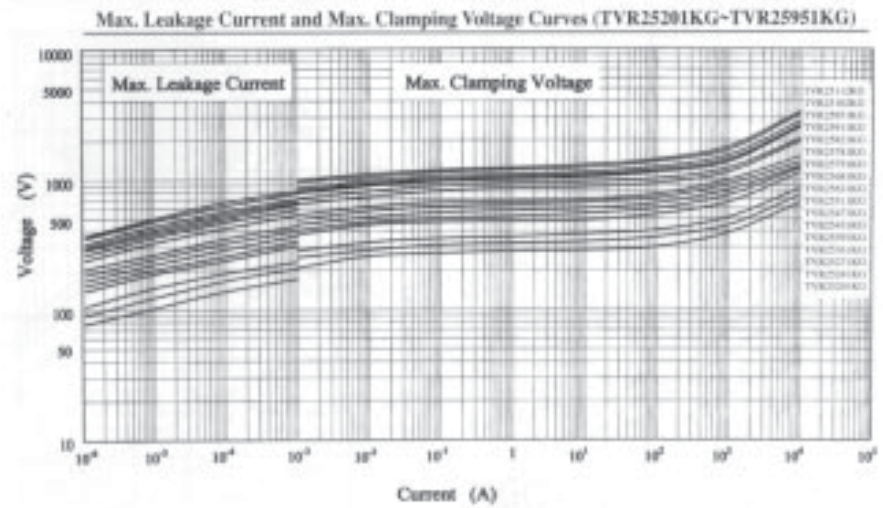


POWER DERATING CURVE





V-I CHARACTERISTIC CURVE





ZINC OXIDE VARISTOR Q SERIES

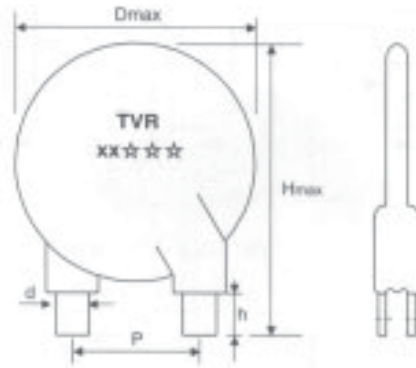
TVR Q TYPE

320/400/600 SERIES



Epoxy coating (Yellow)
Silicon coating (Green)

CONFIGURATION AND DIMENSION



the leads with screw holes are available as per photo above.

Unit: mm

| Disc Ø | D max. | H max | P±0.5 | d±0.2 | hmin |
|--------|--------|-------|-------|-------|------|
| 32 | 36 | 41 | 25 | 7.0 | 10 |
| 40 | 44 | 48 | 25 | 7.0 | 10 |
| 60 | 63 | 78 | 25 | 9.5 | -- |

| Part Number | Normal Varistor Voltage VImA(V) | Max. Allowable voltage | | Max. Peak Current(8/20µs) | | | Max. Energy (J) | Max. Clamping Voltage V200A (V) | Typical Capacitance @1KHZ (PF) |
|-------------|---------------------------------|------------------------|--------|---------------------------|------------|---------|-----------------|---------------------------------|--------------------------------|
| | | ACrms (V) | DC (V) | 1time (A) | 2times (A) | 2ms (A) | | | |
| TVR32201KQ | 200 | 130 | 170 | 25000 | 20000 | 210 | 1.2 | 340 | 3900 |
| TVR32221KQ | 220 | 140 | 180 | 25000 | 20000 | 225 | 1.2 | 365 | 3500 |
| TVR32241KQ | 240 | 150 | 200 | 25000 | 20000 | 240 | 1.2 | 395 | 3300 |
| TVR32271KQ | 270 | 175 | 225 | 25000 | 20000 | 255 | 1.2 | 455 | 2800 |
| TVR32361KQ | 360 | 230 | 300 | 25000 | 20000 | 300 | 1.2 | 595 | 2200 |
| TVR32391KQ | 390 | 250 | 320 | 25000 | 20000 | 330 | 1.2 | 650 | 2000 |
| TVR32431KQ | 430 | 275 | 350 | 25000 | 20000 | 360 | 1.2 | 710 | 1800 |
| TVR32471KQ | 470 | 300 | 385 | 25000 | 20000 | 405 | 1.2 | 775 | 1700 |
| TVR32511KQ | 510 | 320 | 415 | 25000 | 20000 | 430 | 1.2 | 845 | 1600 |
| TVR32561KQ | 560 | 340 | 450 | 25000 | 20000 | 470 | 1.2 | 930 | 1400 |
| TVR32621KQ | 620 | 385 | 505 | 25000 | 20000 | 550 | 1.2 | 1025 | 1250 |
| TVR32681KQ | 680 | 420 | 560 | 25000 | 20000 | 600 | 1.2 | 1120 | 1150 |
| TVR32751KQ | 750 | 460 | 615 | 25000 | 20000 | 660 | 1.2 | 1240 | 1100 |
| TVR32781KQ | 780 | 485 | 640 | 25000 | 20000 | 680 | 1.2 | 1290 | 1050 |
| TVR32821KQ | 820 | 510 | 670 | 25000 | 20000 | 550 | 1.2 | 1355 | 950 |
| TVR32911KQ | 910 | 550 | 745 | 25000 | 20000 | 620 | 1.2 | 1500 | 900 |
| TVR32951KQ | 950 | 575 | 765 | 25000 | 20000 | 660 | 1.2 | 1570 | 850 |
| TVR32112KQ | 1100 | 680 | 895 | 25000 | 20000 | 760 | 1.2 | 1815 | 750 |
| TVR32122KQ | 1200 | 750 | 1060 | 25000 | 20000 | 800 | 1.2 | 2000 | 650 |

| Part Number | Normal Varistor Voltage VImA(V) | Max. Allowable voltage | | Max. Peak Current(8/20µs) | | | Max. Energy (J) | Max. Clamping Voltage V300A (V) | Typical Capacitance @1KHZ (PF) |
|-------------|---------------------------------|------------------------|--------|---------------------------|------------|---------|-----------------|---------------------------------|--------------------------------|
| | | ACrms (V) | DC (V) | 1time (A) | 2times (A) | 2ms (A) | | | |
| TVR40201KQ | 200 | 130 | 170 | 40000 | 30000 | 310 | 1.4 | 340 | 6000 |
| TVR40221KQ | 220 | 140 | 180 | 40000 | 30000 | 340 | 1.4 | 365 | 5500 |
| TVR40241KQ | 240 | 150 | 200 | 40000 | 30000 | 360 | 1.4 | 395 | 5000 |
| TVR40271KQ | 270 | 175 | 225 | 40000 | 30000 | 400 | 1.4 | 455 | 4500 |
| TVR40361KQ | 360 | 230 | 300 | 40000 | 30000 | 460 | 1.4 | 595 | 3500 |
| TVR40391KQ | 390 | 250 | 320 | 40000 | 30000 | 490 | 1.4 | 650 | 3000 |
| TVR40431KQ | 430 | 275 | 350 | 40000 | 30000 | 550 | 1.4 | 710 | 2800 |
| TVR40471KQ | 470 | 300 | 385 | 40000 | 30000 | 595 | 1.4 | 775 | 2600 |
| TVR40511KQ | 510 | 320 | 415 | 40000 | 30000 | 640 | 1.4 | 845 | 2500 |
| TVR40561KQ | 560 | 350 | 450 | 40000 | 30000 | 710 | 1.4 | 930 | 2200 |
| TVR40621KQ | 620 | 385 | 505 | 40000 | 30000 | 800 | 1.4 | 1025 | 2000 |
| TVR40681KQ | 680 | 420 | 560 | 40000 | 30000 | 910 | 1.4 | 1120 | 1800 |
| TVR40751KQ | 750 | 460 | 615 | 40000 | 30000 | 1000 | 1.4 | 1240 | 1700 |
| TVR40781KQ | 780 | 485 | 640 | 40000 | 30000 | 1030 | 1.4 | 1290 | 1600 |
| TVR40821KQ | 820 | 510 | 670 | 40000 | 30000 | 860 | 1.4 | 1355 | 1500 |
| TVR40911KQ | 910 | 550 | 745 | 40000 | 30000 | 960 | 1.4 | 1500 | 1400 |
| TVR40951KQ | 950 | 575 | 765 | 40000 | 30000 | 1000 | 1.4 | 1570 | 1300 |
| TVR40112KQ | 1100 | 680 | 895 | 40000 | 30000 | 1100 | 1.4 | 1815 | 1100 |
| TVR40122KQ | 1200 | 750 | 1060 | 40000 | 30000 | 1200 | 1.4 | 2000 | 1000 |

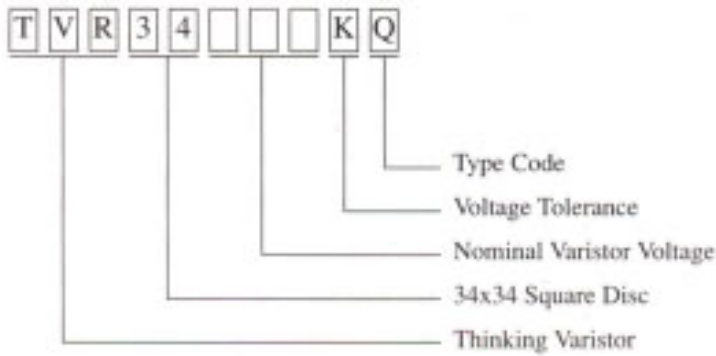
| Part Number | Normal Varistor Voltage VImA(V) | Max. Allowable voltage | | Max. Peak Current(8/20µs) | | | Max. Energy (J) | Max. Clamping Voltage V500A (V) | Typical Capacitance @1KHZ (PF) |
|-------------|---------------------------------|------------------------|--------|---------------------------|------------|---------|-----------------|---------------------------------|--------------------------------|
| | | ACrms (V) | DC (V) | 1time (A) | 2times (A) | 2ms (A) | | | |
| TVR60391KQ | 390 | 250 | 320 | 70000 | 40000 | 800 | 1.6 | 650 | 7200 |
| TVR60431KQ | 430 | 275 | 350 | 70000 | 40000 | 860 | 1.6 | 710 | 6600 |
| TVR60471KQ | 470 | 300 | 385 | 70000 | 40000 | 950 | 1.6 | 775 | 6100 |
| TVR60511KQ | 510 | 320 | 415 | 70000 | 40000 | 1000 | 1.6 | 845 | 5800 |
| TVR60561KQ | 560 | 350 | 450 | 70000 | 40000 | 1100 | 1.6 | 930 | 5100 |
| TVR60621KQ | 620 | 385 | 505 | 70000 | 40000 | 1200 | 1.6 | 1025 | 4600 |
| TVR60681KQ | 680 | 420 | 560 | 70000 | 40000 | 1500 | 1.6 | 1120 | 4300 |
| TVR60751KQ | 750 | 460 | 615 | 70000 | 40000 | 1650 | 1.6 | 1240 | 4100 |
| TVR60781KQ | 780 | 485 | 640 | 70000 | 40000 | 1700 | 1.6 | 1290 | 3800 |
| TVR60821KQ | 820 | 510 | 670 | 70000 | 40000 | 1350 | 1.6 | 1355 | 3600 |
| TVR60911KQ | 910 | 550 | 745 | 70000 | 40000 | 1500 | 1.6 | 1570 | 3300 |
| TVR60951KQ | 950 | 575 | 765 | 70000 | 40000 | 1560 | 1.6 | 1650 | 3000 |
| TVR60112KQ | 1100 | 680 | 895 | 70000 | 40000 | 1800 | 1.6 | 1815 | 2700 |
| TVR60122KQ | 1200 | 750 | 1060 | 70000 | 40000 | 2000 | 1.6 | 2000 | 2500 |
| TVR60182KQ | 1800 | 1000 | 1465 | 70000 | 40000 | 3000 | 1.6 | 2970 | 1800 |

Remark:

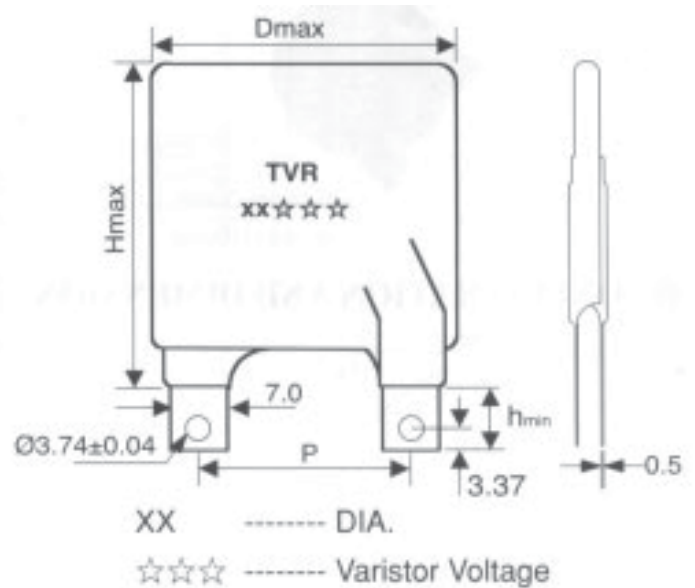
Operating Temperature: -40~85°C

Storage Temperature: -40~110°C

PART NUMBER CODE



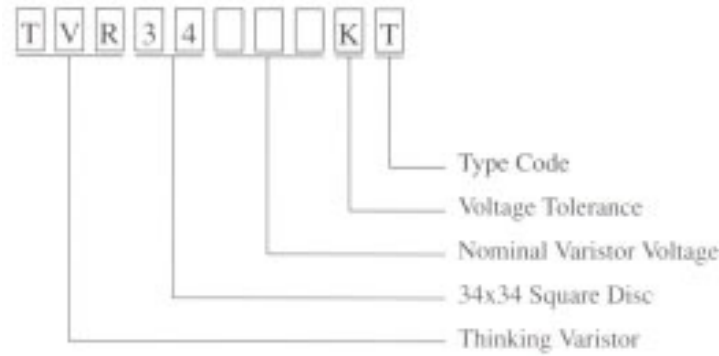
CONFIGURATION AND DIMENSION



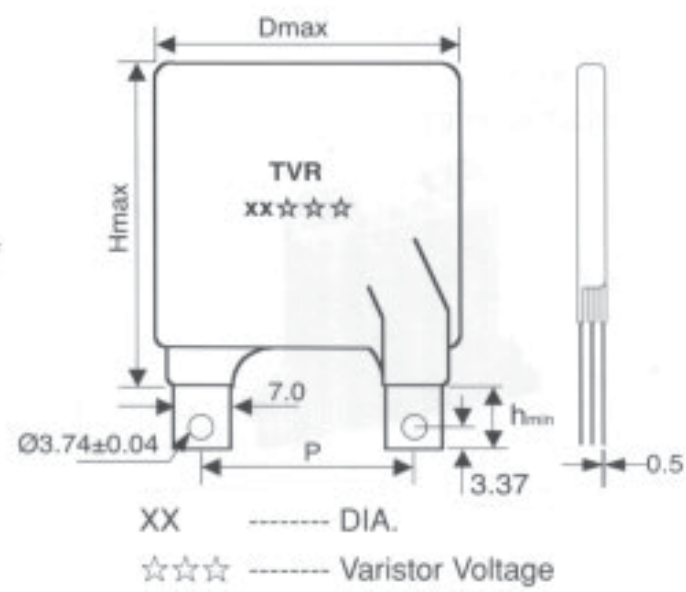
| Unit: mm | | | | |
|----------|--------|--------|--------|-------|
| Disc Ø | D max. | H max. | h min. | P±0.5 |
| 34 | 38 | 43 | 10 | 25 |

| Part Number | Normal Varistor Voltage VImA(V) | Max. Allowable voltage | | Max. Peak Current(8/20µs) | | Max. Energy 2ms (J) | Rated Power (W) | Max. Clamping Voltage V300A (V) | Typical Capacitance @1KHZ (PF) |
|-------------|------------------------------------|------------------------|-----------|---------------------------|---------------|---------------------------|--------------------|---------------------------------------|--------------------------------------|
| | | ACrms (V) | DC (V) | 1time (A) | 2times (A) | | | | |
| TVR34201KQ | 200 | 130 | 170 | 40,000 | 30,000 | 310 | 1.4 | 340 | 5600 |
| TVR34221KQ | 220 | 140 | 180 | 40,000 | 30,000 | 340 | 1.4 | 360 | 5000 |
| TVR34241KQ | 240 | 150 | 200 | 40,000 | 30,000 | 360 | 1.4 | 395 | 4800 |
| TVR34271KQ | 270 | 175 | 225 | 40,000 | 30,000 | 400 | 1.4 | 455 | 4100 |
| TVR34361KQ | 360 | 230 | 300 | 40,000 | 30,000 | 460 | 1.4 | 595 | 3200 |
| TVR34391KQ | 390 | 250 | 320 | 40,000 | 30,000 | 490 | 1.4 | 650 | 2800 |
| TVR34431KQ | 430 | 275 | 350 | 40,000 | 30,000 | 550 | 1.4 | 710 | 2600 |
| TVR34471KQ | 470 | 300 | 385 | 40,000 | 30,000 | 595 | 1.4 | 775 | 2400 |
| TVR34511KQ | 510 | 320 | 410 | 40,000 | 30,000 | 640 | 1.4 | 845 | 2300 |
| TVR34561KQ | 560 | 350 | 450 | 40,000 | 30,000 | 710 | 1.4 | 930 | 2000 |
| TVR34621KQ | 620 | 385 | 505 | 40,000 | 30,000 | 800 | 1.4 | 1025 | 1800 |
| TVR34681KQ | 680 | 420 | 560 | 40,000 | 30,000 | 910 | 1.4 | 1120 | 1700 |
| TVR34751KQ | 750 | 460 | 615 | 40,000 | 30,000 | 1000 | 1.4 | 1235 | 1600 |
| TVR34781KQ | 780 | 485 | 640 | 40,000 | 30,000 | 1030 | 1.4 | 1240 | 1500 |
| TVR34821KQ | 820 | 510 | 670 | 40,000 | 30,000 | 860 | 1.4 | 1355 | 1400 |
| TVR34911KQ | 910 | 550 | 745 | 40,000 | 30,000 | 960 | 1.4 | 1500 | 1300 |
| TVR34951KQ | 950 | 575 | 765 | 40,000 | 30,000 | 1000 | 1.4 | 1570 | 1200 |
| TVR34102KQ | 1000 | 625 | 825 | 40,000 | 30,000 | 1050 | 1.4 | 1650 | 1100 |
| TVR34112KQ | 1100 | 680 | 895 | 40,000 | 30,000 | 1200 | 1.4 | 1815 | 1050 |
| TVR34122KQ | 1200 | 750 | 1060 | 40,000 | 30,000 | 1310 | 1.4 | 2000 | 950 |

PART NUMBER CODE



CONFIGURATION AND DIMENSION



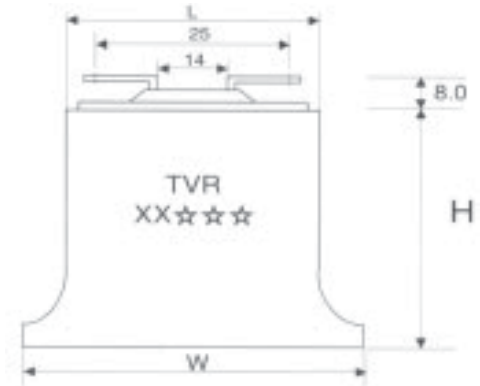
| Unit: mm | | | | |
|----------|--------|--------|--------|-------|
| Disc Ø | D max. | H max. | h min. | P±0.5 |
| 34 | 38 | 43 | 10 | 25 |

| Part Number | Normal Varistor Voltage VImA(V) | Max. Allowable voltage | | Max. Peak Current(8/20µs) | | Max. Energy 2ms (J) | Rated Power (W) | Max. Clamping Voltage V500A (V) | Typical Capacitance @1KHZ (PF) |
|-------------|------------------------------------|------------------------|------|---------------------------|--------|---------------------------|--------------------|---------------------------------------|--------------------------------------|
| | | ACrms | DC | 1time | 2times | | | | |
| | | (V) | (V) | (A) | (A) | | | | |
| TVR34201KT | 200 | 130 | 170 | 70,000 | 40,000 | 410 | 1.6 | 340 | 14040 |
| TVR34221KT | 220 | 140 | 180 | 70,000 | 40,000 | 451 | 1.6 | 360 | 12760 |
| TVR34241KT | 240 | 150 | 200 | 70,000 | 40,000 | 490 | 1.6 | 395 | 11700 |
| TVR34271KT | 270 | 175 | 225 | 70,000 | 40,000 | 550 | 1.6 | 455 | 10400 |
| TVR34361KT | 360 | 230 | 300 | 70,000 | 40,000 | 730 | 1.6 | 595 | 7800 |
| TVR34391KT | 390 | 250 | 320 | 70,000 | 40,000 | 800 | 1.6 | 650 | 7200 |
| TVR34431KT | 430 | 275 | 350 | 70,000 | 40,000 | 860 | 1.6 | 710 | 6600 |
| TVR34471KT | 470 | 300 | 385 | 70,000 | 40,000 | 950 | 1.6 | 775 | 6100 |
| TVR34511KT | 510 | 320 | 410 | 70,000 | 40,000 | 1000 | 1.6 | 845 | 5800 |
| TVR34561KT | 560 | 350 | 450 | 70,000 | 40,000 | 1100 | 1.6 | 930 | 5100 |
| TVR34621KT | 620 | 385 | 505 | 70,000 | 40,000 | 1200 | 1.6 | 1025 | 4600 |
| TVR34681KT | 680 | 420 | 560 | 70,000 | 40,000 | 1500 | 1.6 | 1120 | 4300 |
| TVR34751KT | 750 | 460 | 615 | 70,000 | 40,000 | 1650 | 1.6 | 1240 | 4100 |
| TVR34781KT | 780 | 485 | 640 | 70,000 | 40,000 | 1700 | 1.6 | 1290 | 3800 |
| TVR34821KT | 820 | 510 | 670 | 70,000 | 40,000 | 1350 | 1.6 | 1355 | 3600 |
| TVR34911KT | 910 | 550 | 745 | 70,000 | 40,000 | 1500 | 1.6 | 1500 | 3300 |
| TVR34951KT | 950 | 575 | 765 | 70,000 | 40,000 | 1560 | 1.6 | 1570 | 3000 |
| TVR34102KT | 1000 | 625 | 825 | 70,000 | 40,000 | 1650 | 1.6 | 1650 | 2900 |
| TVR34112KT | 1100 | 680 | 895 | 70,000 | 40,000 | 1800 | 1.6 | 1815 | 2700 |
| TVR34122KT | 1200 | 750 | 1060 | 70,000 | 40,000 | 2000 | 1.6 | 2000 | 2500 |

Note: The two terminals at the same side of the products must be connected together in applications.

TVR B TYPE

CONFIGURATION AND DIMENSION



Unit: mm

| Disc Ø | W ± 1 | H ± 1 | L ± 1 |
|--------|-------|-------|-------|
| 25 | 62 | 48 | 42 |
| 32 | 62 | 48 | 42 |

250 SERIES

| Part Number | Normal Varistor Voltage | Max. Allowable voltage | | Max. Peak Current(8/20µs) | | Max. Energy 2ms | Max. Rated Power | Max. Clamping Voltage V300A | Typical Capacitance @1KHZ |
|-------------|-------------------------|------------------------|-----|---------------------------|--------|-----------------|------------------|-----------------------------|---------------------------|
| | | ACrms | DC | 1time | 2times | | | | |
| TVR25201KB | 200 | 130 | 170 | 15000 | 10000 | 128 | 1.0 | 340 | 2200 |
| TVR25221KB | 220 | 140 | 180 | 15000 | 10000 | 135 | 1.0 | 365 | 2000 |
| TVR25241KB | 240 | 150 | 200 | 15000 | 10000 | 146 | 1.0 | 395 | 1900 |
| TVR25271KB | 270 | 175 | 225 | 15000 | 10000 | 170 | 1.0 | 455 | 1600 |
| TVR25361KB | 360 | 230 | 300 | 15000 | 10000 | 190 | 1.0 | 595 | 1300 |
| TVR25391KB | 390 | 250 | 320 | 15000 | 10000 | 210 | 1.0 | 650 | 1100 |
| TVR25431KB | 430 | 275 | 350 | 15000 | 10000 | 220 | 1.0 | 710 | 1000 |
| TVR25471KB | 470 | 300 | 385 | 15000 | 10000 | 225 | 1.0 | 775 | 950 |
| TVR25511KB | 510 | 320 | 415 | 15000 | 10000 | 230 | 1.0 | 845 | 900 |
| TVR25561KB | 560 | 350 | 450 | 15000 | 10000 | 235 | 1.0 | 930 | 800 |
| TVR25621KB | 620 | 385 | 505 | 15000 | 10000 | 240 | 1.0 | 1025 | 700 |
| TVR25681KB | 680 | 420 | 560 | 15000 | 10000 | 250 | 1.0 | 1120 | 650 |
| TVR25751KB | 750 | 460 | 615 | 15000 | 10000 | 275 | 1.0 | 1240 | 600 |
| TVR25781KB | 780 | 485 | 640 | 15000 | 10000 | 290 | 1.0 | 1290 | 550 |
| TVR25821KB | 820 | 510 | 670 | 15000 | 10000 | 300 | 1.0 | 1355 | 520 |
| TVR25911KB | 910 | 550 | 745 | 15000 | 10000 | 340 | 1.0 | 1500 | 500 |
| TVR25951KB | 950 | 575 | 765 | 15000 | 10000 | 355 | 1.0 | 1570 | 450 |
| TVR25102KB | 1000 | 625 | 825 | 15000 | 10000 | 375 | 1.0 | 1650 | 430 |
| TVR25112KB | 1100 | 680 | 895 | 15000 | 10000 | 390 | 1.0 | 1815 | 400 |

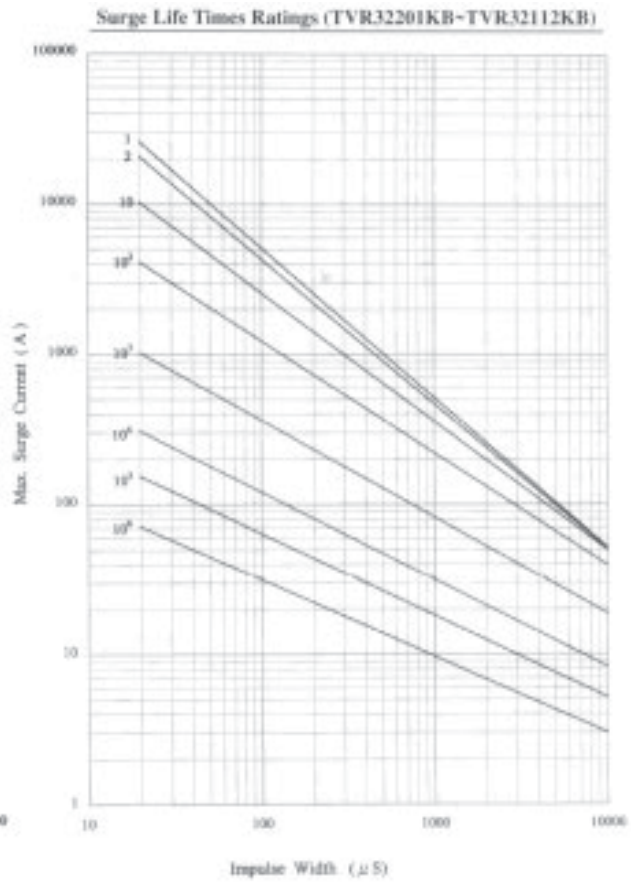
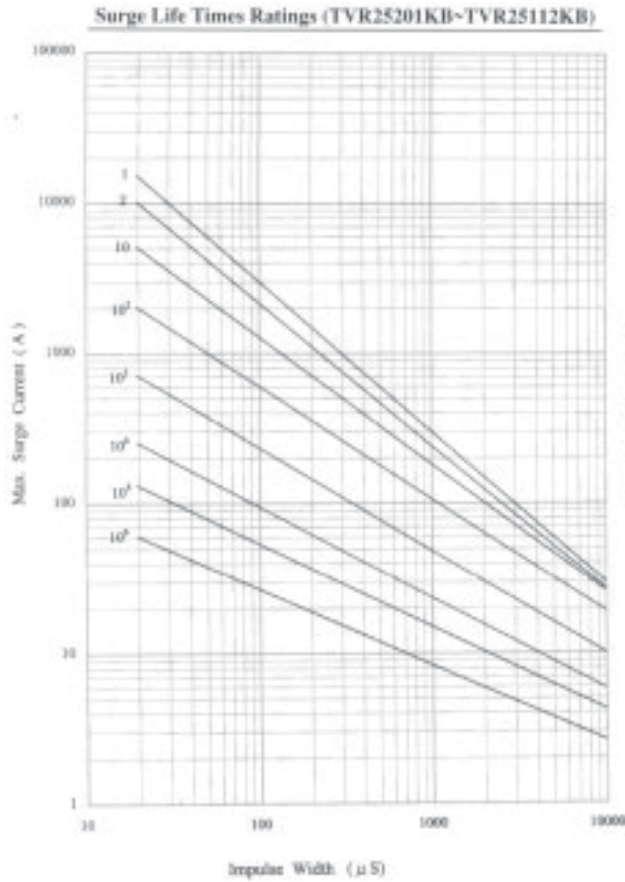
Remark:
Operating Temperature: -40~85°C
Storage Temperature: -40~110°C

320 SERIES

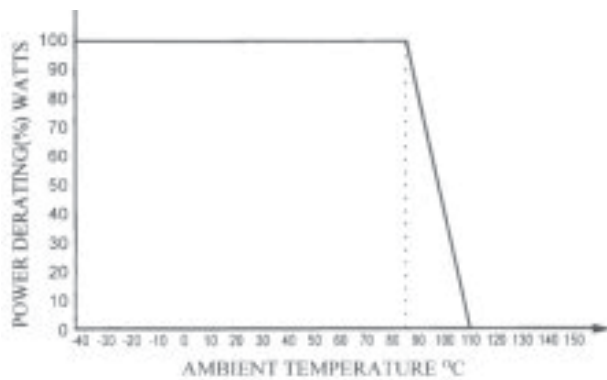
| Part Number | Normal Varistor Voltage | Max. Allowable voltage | | Max. Peak Current(8/20µs) | | Max. Energy 2ms | Max. Rated Power | Max. Clamping Voltage V300A | Typical Capacitance @1KHZ |
|-------------|-------------------------|------------------------|------|---------------------------|--------|-----------------|------------------|-----------------------------|---------------------------|
| | | ACrms | DC | 1time | 2times | | | | |
| TVR32201KB | 200 | 130 | 170 | 25000 | 20000 | 210 | 1.2 | 340 | 3900 |
| TVR32221KB | 220 | 140 | 180 | 25000 | 20000 | 225 | 1.2 | 365 | 3500 |
| TVR32241KB | 240 | 150 | 200 | 25000 | 20000 | 240 | 1.2 | 395 | 3300 |
| TVR32271KB | 270 | 175 | 225 | 25000 | 20000 | 255 | 1.2 | 455 | 2800 |
| TVR32361KB | 360 | 230 | 300 | 25000 | 20000 | 300 | 1.2 | 595 | 2200 |
| TVR32391KB | 390 | 250 | 320 | 25000 | 20000 | 330 | 1.2 | 650 | 2000 |
| TVR32431KB | 430 | 275 | 350 | 25000 | 20000 | 360 | 1.2 | 710 | 1800 |
| TVR32471KB | 470 | 300 | 385 | 25000 | 20000 | 405 | 1.2 | 775 | 1700 |
| TVR32511KB | 510 | 320 | 415 | 25000 | 20000 | 430 | 1.2 | 845 | 1600 |
| TVR32561KB | 560 | 350 | 450 | 25000 | 20000 | 470 | 1.2 | 930 | 1400 |
| TVR32621KB | 620 | 385 | 505 | 25000 | 20000 | 550 | 1.2 | 1025 | 1250 |
| TVR32681KB | 680 | 420 | 560 | 25000 | 20000 | 600 | 1.2 | 1120 | 1150 |
| TVR32751KB | 750 | 460 | 615 | 25000 | 20000 | 660 | 1.2 | 1240 | 1100 |
| TVR32781KB | 780 | 485 | 640 | 25000 | 20000 | 680 | 1.2 | 1290 | 1050 |
| TVR32821KB | 820 | 510 | 670 | 25000 | 20000 | 555 | 1.2 | 1355 | 950 |
| TVR32911KB | 910 | 550 | 745 | 25000 | 20000 | 620 | 1.2 | 1500 | 900 |
| TVR32951KB | 950 | 575 | 765 | 25000 | 20000 | 660 | 1.2 | 1570 | 850 |
| TVR32102KB | 1000 | 625 | 825 | 25000 | 20000 | 690 | 1.2 | 1650 | 800 |
| TVR32112KB | 1100 | 680 | 895 | 25000 | 20000 | 760 | 1.2 | 1815 | 750 |
| TVR32122KB | 1200 | 750 | 1060 | 25000 | 20000 | 800 | 1.2 | 2000 | 650 |



LIFE TIMES



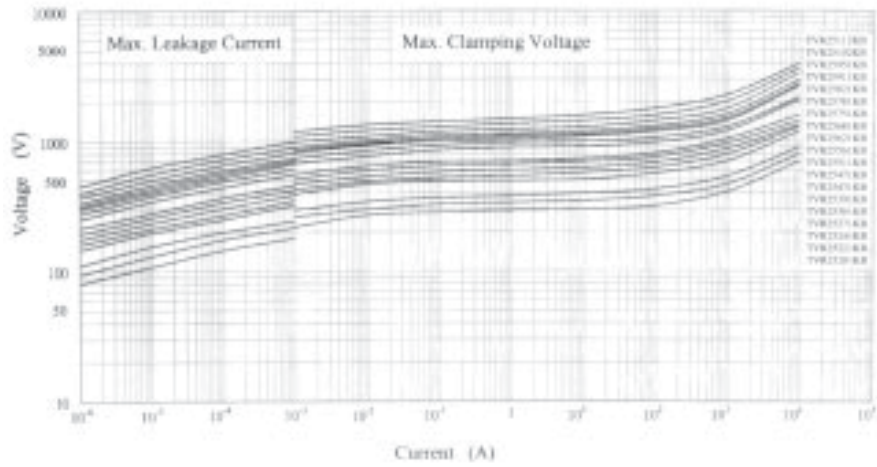
POWER DERATING CURVE



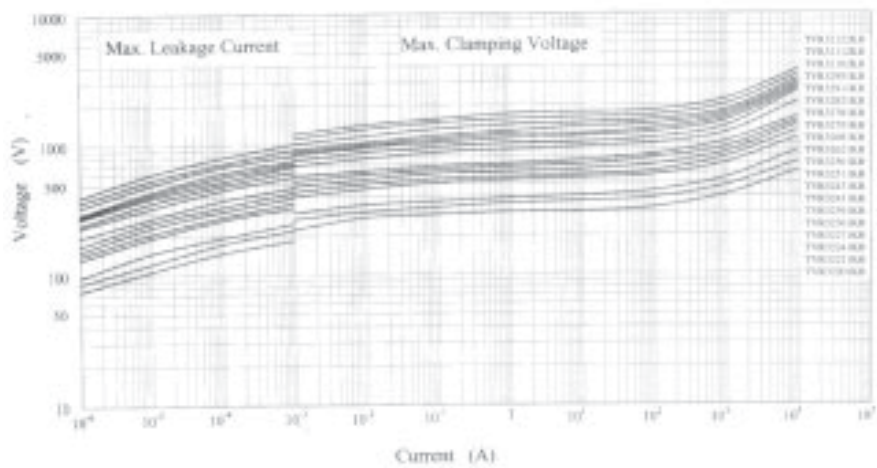


V-I CHARACTERISTIC CURVE

Max. Leakage Current and Max. Clamping Voltage Curves (TVR25201KB~TVR25112KB)

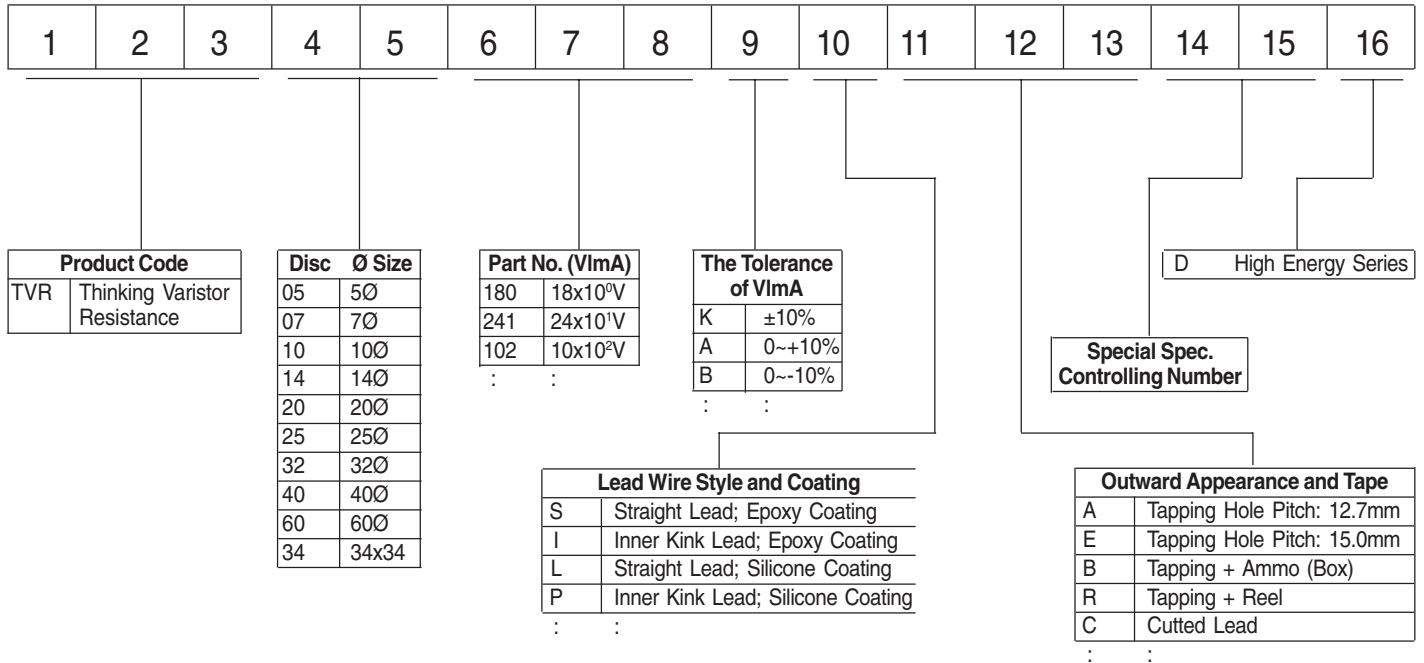


Max. Leakage Current and Max. Clamping Voltage Curves (TVR32201KB~TVR32112KB)





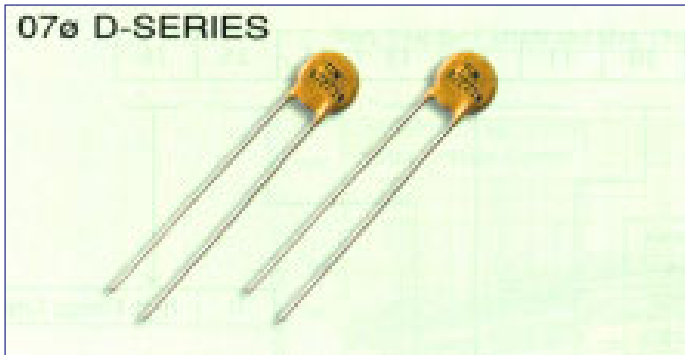
TVR-D SERIES Part Number Code



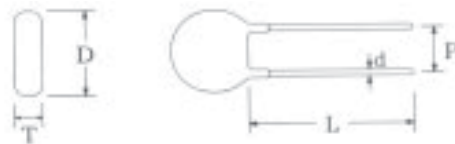


ZINC OXIDE VARISTOR 07Ø SERIES D-SERIES

07Ø D-SERIES



DIMENSION



Unit: mm

| Disc Ø | Dimensions | | | |
|--------|------------|--------|----------|-------|
| | D max. | L min. | dnor. | Pnor. |
| 07 | 9.5 | 30 | 0.6±0.02 | 5±1 |

SPECIFICATION

| Part Number | Normal Varistor Voltage @1mA _{DC} | Max. Allowable Voltage | | Max. Clamping Voltage @ 10A (8/20µs) (V) | Max. Peak Current (8/20µs) | | Rated Power (W) | Max. Energy 10/1000µs (J) | Reference Capacitance @ 1KHZ (pf) |
|-------------|--|------------------------|--------|--|----------------------------|------------|-----------------|---------------------------|-----------------------------------|
| | | AC rms (V) | DC (V) | | 1time (A) | 2times (A) | | | |
| TVR07201 | 200 | 130 | 170 | 340 | 1800 | 1200 | 0.25 | 18 | 360 |
| TVR07221 | 220 | 140 | 180 | 360 | 1800 | 1200 | 0.25 | 20 | 310 |
| TVR07241 | 240 | 150 | 200 | 395 | 1800 | 1200 | 0.25 | 21 | 290 |
| TVR07271 | 270 | 175 | 225 | 455 | 1800 | 1200 | 0.25 | 24 | 260 |
| TVR07301 | 300 | 195 | 250 | 500 | 1800 | 1200 | 0.25 | 28 | 230 |
| TVR07331 | 330 | 215 | 275 | 550 | 1800 | 1200 | 0.25 | 29 | 210 |
| TVR07361 | 360 | 230 | 300 | 595 | 1800 | 1200 | 0.25 | 32 | 190 |
| TVR07391 | 390 | 250 | 320 | 650 | 1800 | 1200 | 0.25 | 35 | 180 |
| TVR07431 | 430 | 275 | 350 | 710 | 1800 | 1200 | 0.25 | 40 | 160 |
| TVR07471 | 470 | 300 | 385 | 775 | 1800 | 1200 | 0.25 | 42 | 150 |
| TVR07511 | 510 | 320 | 410 | 845 | 1800 | 1200 | 0.25 | 46 | 140 |
| TVR07561 | 560 | 350 | 450 | 930 | 1800 | 1200 | 0.25 | 47 | 130 |
| TVR07621 | 620 | 395 | 510 | 1020 | 1800 | 1200 | 0.25 | 51 | 120 |
| TVR07681 | 680 | 420 | 560 | 1120 | 1800 | 1200 | 0.25 | 53 | 110 |
| TVR07751 | 750 | 465 | 615 | 1235 | 1800 | 1200 | 0.25 | 57 | 100 |
| TVR07821 | 820 | 510 | 670 | 1355 | 1800 | 1200 | 0.25 | 61 | 90 |

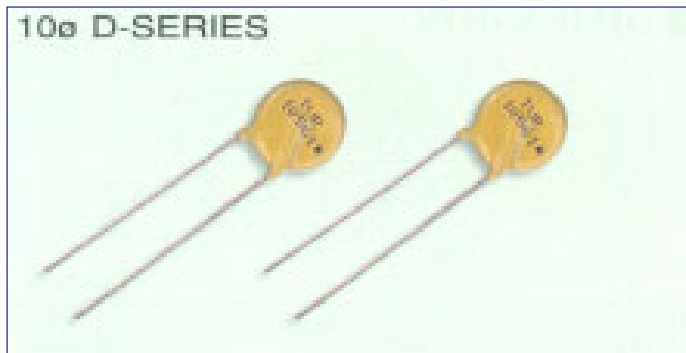
Operating Temperature: -40°C~85°C

Storage Temperature: -40°C~125°C

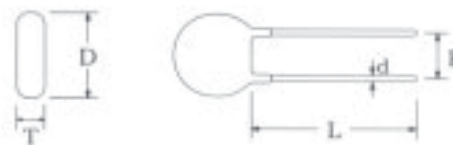


ZINC OXIDE VARISTOR 100 SERIES D-SERIES

100 D-SERIES



DIMENSION



Unit: mm

| Disc Ø | Dimensions | | | |
|--------|------------|--------|----------|-------|
| | D max. | L min. | dnor. | Pnor. |
| 10 | 14.0 | 30 | 0.8±0.02 | 7.5±1 |

SPECIFICATION

| Part Number | Normal Varistor Voltage @1mA _{DC} | Max. Allowable Voltage | | Max. Clamping Voltage @25A (8/20µs) (V) | Max. Peak Current (8/20µs) | | Rated Power (W) | Max. Energy 10/1000µs (J) | Reference Capacitance @1KHZ (pf) |
|-------------|--|------------------------|--------|---|----------------------------|------------|-----------------|---------------------------|----------------------------------|
| | | AC rms (V) | DC (V) | | 1time (A) | 2times (A) | | | |
| TVR10201 | 200 | 130 | 170 | 340 | 3500 | 2500 | 0.4 | 45 | 610 |
| TVR10221 | 220 | 140 | 180 | 360 | 3500 | 2500 | 0.4 | 50 | 550 |
| TVR10241 | 240 | 150 | 200 | 395 | 3500 | 2500 | 0.4 | 55 | 500 |
| TVR10271 | 270 | 175 | 225 | 455 | 3500 | 2500 | 0.4 | 58 | 450 |
| TVR10301 | 300 | 195 | 250 | 500 | 3500 | 2500 | 0.4 | 60 | 400 |
| TVR10331 | 330 | 215 | 275 | 550 | 3500 | 2500 | 0.4 | 62 | 360 |
| TVR10361 | 360 | 230 | 300 | 595 | 3500 | 2500 | 0.4 | 65 | 330 |
| TVR10391 | 390 | 250 | 320 | 650 | 3500 | 2500 | 0.4 | 70 | 300 |
| TVR10431 | 430 | 275 | 350 | 710 | 3500 | 2500 | 0.4 | 80 | 270 |
| TVR10471 | 470 | 300 | 385 | 775 | 3500 | 2500 | 0.4 | 85 | 250 |
| TVR10511 | 510 | 320 | 410 | 845 | 3500 | 2500 | 0.4 | 92 | 230 |
| TVR10561 | 560 | 350 | 450 | 930 | 3500 | 2500 | 0.4 | 97 | 210 |
| TVR10621 | 620 | 395 | 510 | 1020 | 3500 | 2500 | 0.4 | 107 | 190 |
| TVR10681 | 680 | 420 | 560 | 1120 | 3500 | 2500 | 0.4 | 110 | 170 |
| TVR10751 | 750 | 465 | 615 | 1235 | 3500 | 2500 | 0.4 | 115 | 160 |
| TVR10821 | 820 | 510 | 670 | 1355 | 3500 | 2500 | 0.4 | 125 | 150 |
| TVR10911 | 910 | 550 | 745 | 1500 | 3500 | 2500 | 0.4 | 130 | 140 |
| TVR10102 | 1000 | 625 | 825 | 1650 | 3500 | 2500 | 0.4 | 145 | 130 |
| TVR10112 | 1100 | 680 | 895 | 1815 | 3500 | 2500 | 0.4 | 155 | 120 |

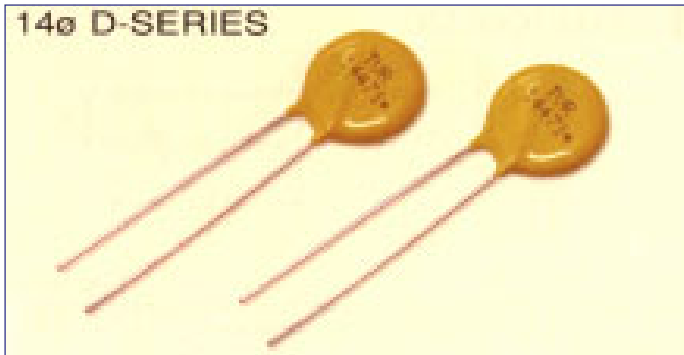
Operating Temperature: -40°C~85°C

Storage Temperature: -40°C~125°C

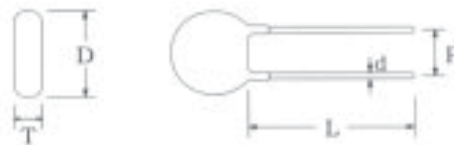


ZINC OXIDE VARISTOR 1400 SERIES D-SERIES

1400 D-SERIES



DIMENSION



Unit: mm

| Disc Ø | Dimensions | | | |
|--------|------------|--------|----------|-------|
| | D max. | L min. | dnor. | Pnor. |
| 14 | 18.0 | 30 | 0.8±0.02 | 7.5±1 |

SPECIFICATION

| Part Number | Normal Varistor Voltage @1mA _{DC} | Max. Allowable Voltage | | Max. Clamping Voltage | Max. Peak Current (8/20µs) | | Rated Power (W) | Max. Energy | Reference Capacitance |
|-------------|--|------------------------|--------|-----------------------|----------------------------|------------|-----------------|---------------|-----------------------|
| | | AC rms (V) | DC (V) | @50A (8/20µs) (V) | 1time (A) | 2times (A) | | 10/1000µs (J) | @1KHZ (pf) |
| TVR14201 | 200 | 130 | 170 | 340 | 6500 | 5000 | 0.6 | 70 | 1000 |
| TVR14221 | 220 | 140 | 180 | 360 | 6500 | 5000 | 0.6 | 78 | 1000 |
| TVR14241 | 240 | 150 | 200 | 395 | 6500 | 5000 | 0.6 | 84 | 900 |
| TVR14271 | 270 | 175 | 225 | 455 | 6500 | 5000 | 0.6 | 100 | 750 |
| TVR14301 | 300 | 195 | 250 | 500 | 6000 | 5000 | 0.6 | 110 | 680 |
| TVR14331 | 330 | 215 | 275 | 550 | 6000 | 5000 | 0.6 | 120 | 620 |
| TVR14361 | 360 | 230 | 300 | 595 | 6000 | 5000 | 0.6 | 135 | 550 |
| TVR14391 | 390 | 250 | 320 | 650 | 6000 | 5000 | 0.6 | 145 | 520 |
| TVR14431 | 430 | 275 | 350 | 710 | 6000 | 5000 | 0.6 | 160 | 500 |
| TVR14471 | 470 | 300 | 385 | 775 | 6000 | 5000 | 0.6 | 175 | 480 |
| TVR14511 | 510 | 320 | 410 | 845 | 6000 | 5000 | 0.6 | 190 | 440 |
| TVR14561 | 560 | 350 | 450 | 930 | 6000 | 5000 | 0.6 | 205 | 400 |
| TVR14621 | 620 | 395 | 510 | 1020 | 6000 | 5000 | 0.6 | 215 | 330 |
| TVR14681 | 680 | 420 | 560 | 1120 | 6000 | 5000 | 0.6 | 225 | 320 |
| TVR14751 | 750 | 465 | 615 | 1235 | 6000 | 5000 | 0.6 | 230 | 310 |
| TVR14821 | 820 | 510 | 670 | 1355 | 6000 | 5000 | 0.6 | 240 | 280 |
| TVR14911 | 910 | 550 | 745 | 1500 | 6000 | 5000 | 0.6 | 255 | 250 |
| TVR14102 | 1000 | 625 | 825 | 1650 | 6000 | 5000 | 0.6 | 290 | 230 |
| TVR14112 | 1100 | 680 | 895 | 1815 | 6000 | 5000 | 0.6 | 310 | 210 |

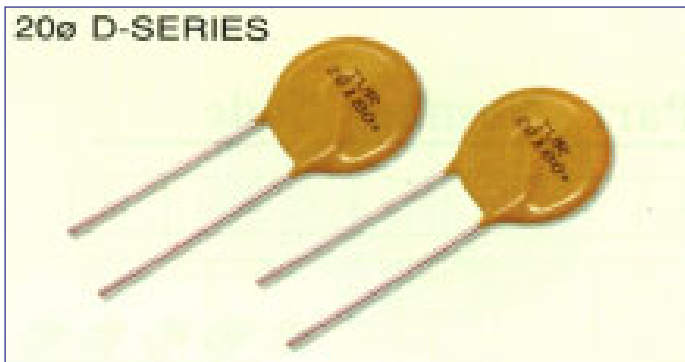
Operating Temperature: -40°C~85°C

Storage Temperature: -40°C~125°C

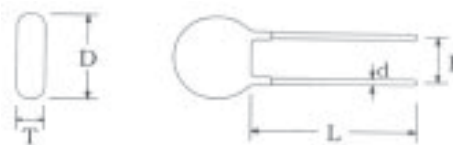


ZINC OXIDE VARISTOR 20Ø D-SERIES

20Ø D-SERIES



DIMENSION



Unit: mm

| Disc Ø | Dimensions | | | |
|--------|------------|--------|----------|-------|
| | D max. | L min. | dnor. | Pnor. |
| 20 | 23.5 | 26 | 0.8±0.02 | 7.5±1 |

SPECIFICATION

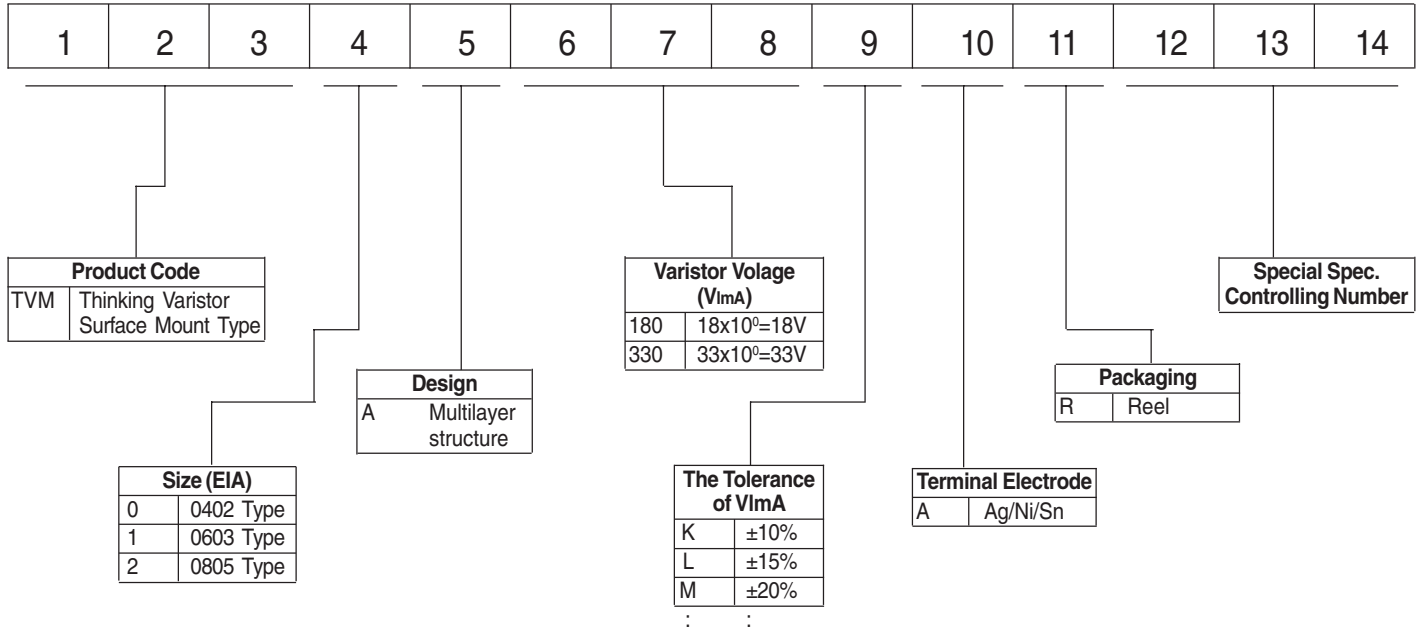
| Part Number | Normal Varistor Voltage @1mA _{DC} | Max. Allowable Voltage | | Max. Clamping Voltage | Max. Peak Current (8/20µs) | | Rated Power (W) | Max. Energy | Reference Capacitance |
|-------------|--|------------------------|--------|-----------------------|----------------------------|------------|-----------------|---------------|-----------------------|
| | | AC rms (V) | DC (V) | @100A (8/20µs) (V) | 1time (A) | 2times (A) | | 10/1000µs (J) | @1KHZ (pf) |
| TVR20201 | 200 | 130 | 170 | 340 | 12000 | 9000 | 1.0 | 150 | 2000 |
| TVR20221 | 220 | 140 | 180 | 360 | 12000 | 9000 | 1.0 | 160 | 2000 |
| TVR20241 | 240 | 150 | 200 | 395 | 12000 | 9000 | 1.0 | 170 | 1800 |
| TVR20271 | 270 | 175 | 225 | 455 | 12000 | 9000 | 1.0 | 190 | 1600 |
| TVR20301 | 300 | 195 | 250 | 500 | 10000 | 6500 | 1.0 | 210 | 1500 |
| TVR20331 | 330 | 215 | 275 | 550 | 10000 | 6500 | 1.0 | 230 | 1400 |
| TVR20361 | 360 | 230 | 300 | 595 | 10000 | 6500 | 1.0 | 270 | 1200 |
| TVR20391 | 390 | 250 | 320 | 650 | 10000 | 6500 | 1.0 | 300 | 1100 |
| TVR20431 | 430 | 275 | 350 | 710 | 10000 | 6500 | 1.0 | 325 | 1050 |
| TVR20471 | 470 | 300 | 385 | 775 | 10000 | 6500 | 1.0 | 350 | 950 |
| TVR20511 | 510 | 320 | 410 | 845 | 10000 | 6500 | 1.0 | 380 | 900 |
| TVR20561 | 560 | 350 | 450 | 930 | 10000 | 6500 | 1.0 | 410 | 800 |
| TVR20621 | 620 | 395 | 510 | 1020 | 10000 | 6500 | 1.0 | 420 | 700 |
| TVR20681 | 680 | 420 | 560 | 1120 | 10000 | 6500 | 1.0 | 430 | 650 |
| TVR20751 | 750 | 465 | 615 | 1235 | 10000 | 6500 | 1.0 | 450 | 600 |
| TVR20821 | 820 | 510 | 670 | 1355 | 10000 | 6500 | 1.0 | 470 | 530 |
| TVR20911 | 910 | 550 | 745 | 1500 | 10000 | 6500 | 1.0 | 510 | 500 |
| TVR20102 | 1000 | 625 | 825 | 1650 | 10000 | 6500 | 1.0 | 556 | 450 |
| TVR20112 | 1100 | 680 | 895 | 1815 | 10000 | 6500 | 1.0 | 620 | 400 |

Operating Temperature: -40°C~85°C

Storage Temperature: -40°C~125°C

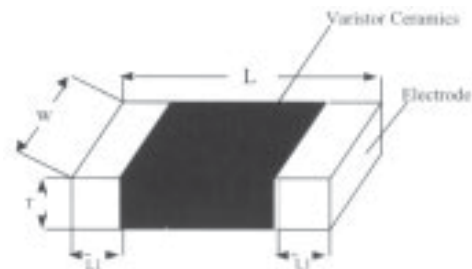


TVM-SERIES Part Number Code





ZINC OXIDE VARISTOR 0402 SERIES



DIMENSION

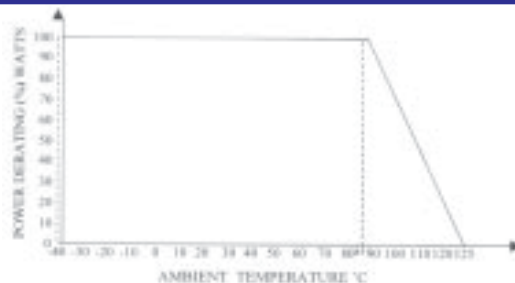
| Unit: mm | | | | | |
|----------|------|-----------|-----------|---------|----------|
| Part No. | Size | L | W | T | L1 |
| TVM0 | 0402 | 1.00±0.15 | 0.50±0.10 | 0.60max | 0.20±0.1 |

SPECIFICATION

| Part No | Varistor Voltage | | Max. Allowable Voltage | | Max. Clamping Voltage (8/20µs) | | Max. Surge Current (8/20µs) | Max. Energy (10/1000µs) | Max. Rate Power | Reference Capacitance @1KHZ |
|-----------|------------------|------|------------------------|-----------------|--------------------------------|----------------|-----------------------------|-------------------------|-----------------|-----------------------------|
| | V _{ImA} | (±%) | V _{AC} | V _{DC} | V _P | I _p | I _{max} | W _{max} | P | C |
| | (V) | | (V) | (V) | (VP) | (A) | (A) | (J) | (W) | (pF) |
| TVM0A080M | 8 | 20 | 4 | 5.5 | 19 | 1.0 | 10 | 0.05 | 0.003 | 230 |
| TVM0A110M | 11 | 20 | 6 | 8 | 27 | 1.0 | 10 | 0.05 | 0.003 | 200 |
| TVM0A12RM | 12.5 | 20 | 7 | 9 | 30 | 1.0 | 10 | 0.05 | 0.003 | 170 |
| TVM0A150L | 15 | 15 | 8 | 11 | 33 | 1.0 | 10 | 0.05 | 0.003 | 130 |
| TVM0A180K | 18 | 10 | 11 | 14 | 35 | 1.0 | 10 | 0.05 | 0.003 | 100 |
| TVM0A220K | 22 | 10 | 14 | 18 | 44 | 1.0 | 10 | 0.05 | 0.003 | 80 |
| TVM0A270K | 27 | 10 | 17 | 22 | 55 | 1.0 | 10 | 0.05 | 0.003 | 65 |
| TVM0A330K | 33 | 10 | 20 | 26 | 63 | 1.0 | 10 | 0.05 | 0.003 | 45 |

| | |
|---|----------------|
| Nonlinearity exponent (α) | ≥ 20 |
| Leakage Current (IL) at 25°C, V _{dc} | $\leq 20\mu A$ |

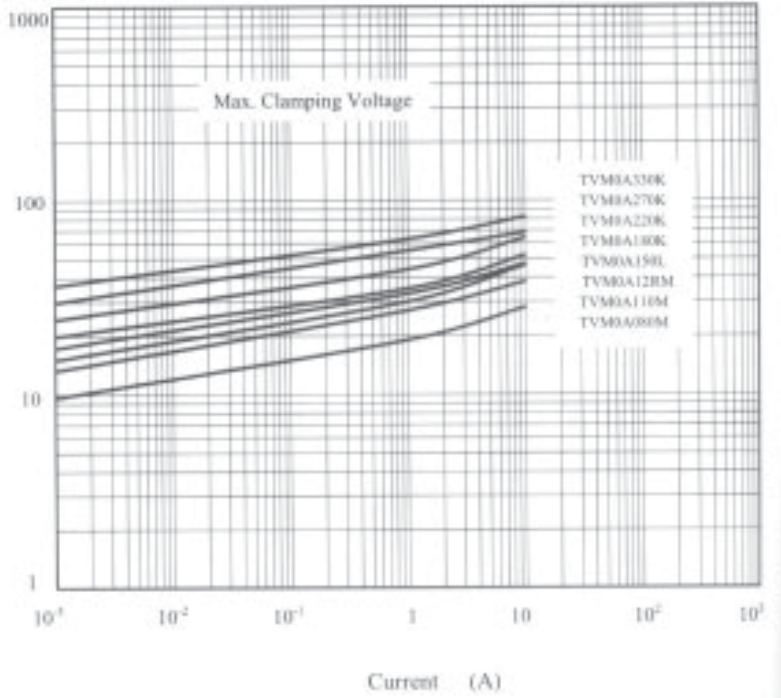
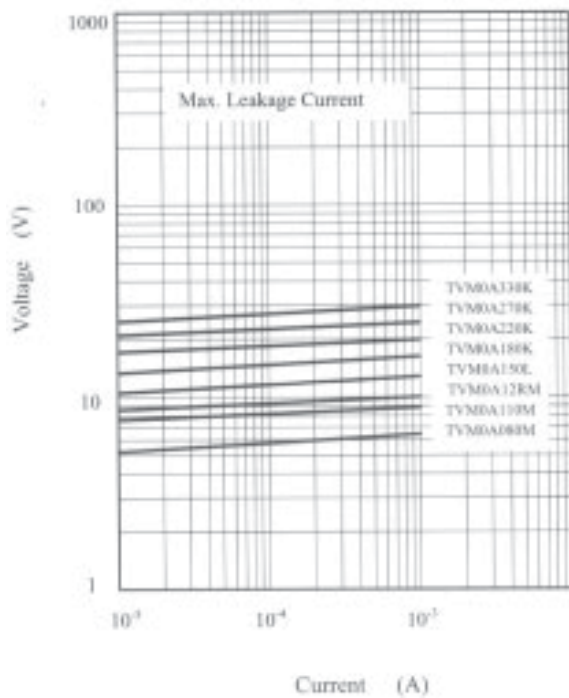
OPERATING TEMPERATURE VS POWER DERATING CURVE





MAX. LEAKAGE CURRENT AND MAX. CLAMPING VOLTAGE CURVES

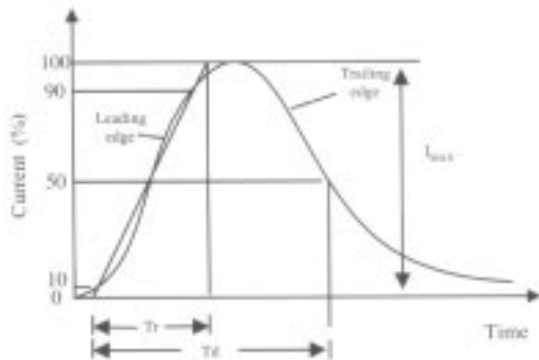
TVM0A080M~TVM0A330K



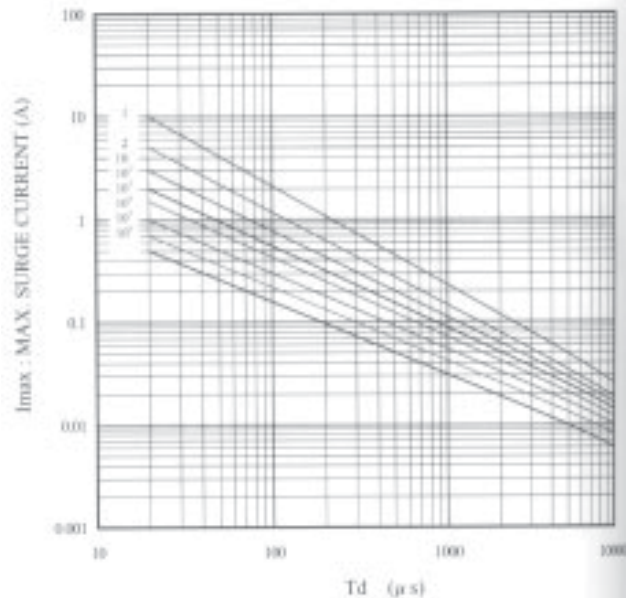
SURGE CURRENT STANDARD WAVEFORM

MAX. SURGE CURRENT DERATING CURVES

EXAMPLE: 8/20 μ S
 Tr = 8 μ S
 Td = 20 μ S

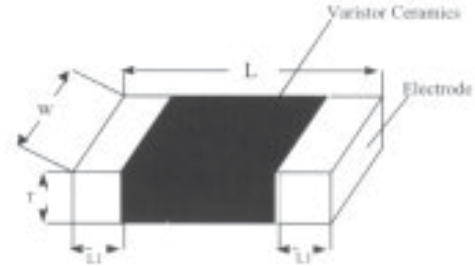


TVM0A080M~TVM0A330K





ZINC OXIDE VARISTOR 0603 SERIES



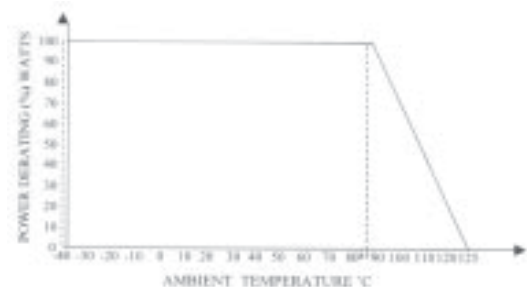
DIMENSION

| Unit: mm | | | | | |
|----------|------|-----------|-----------|---------|-----------|
| Part No. | Size | L | W | T | L1 |
| TVM1 | 0603 | 1.60±0.15 | 0.80±0.15 | 0.95max | 0.25±0.15 |

SPECIFICATION

| Part No | Varistor Voltage | | Max. Allowable Voltage | | Max. Clamping Voltage (8/20µs) | | Max. Surge Current (8/20µs) | Max. Energy (10/1000µs) | Rate Power | Reference Capacitance @1KHZ |
|-----------|---------------------|------|------------------------|---------------------|--------------------------------|--------------------|-----------------------------|-------------------------|------------|-----------------------------|
| | V _{mA} (V) | (±%) | V _{AC} (V) | V _{DC} (V) | V _P (VP) | I _p (A) | I _{max} (A) | W _{max} (J) | P (W) | C (pF) |
| TVM1A080M | 8 | 20 | 4 | 5.5 | 19 | 1.0 | 30 | 0.1 | 0.003 | 950 |
| TVM1A110M | 11 | 20 | 6 | 8 | 27 | 1.0 | 30 | 0.1 | 0.003 | 600 |
| TVM1A12RM | 12.5 | 20 | 7 | 9 | 30 | 1.0 | 30 | 0.1 | 0.003 | 570 |
| TVM1A150L | 15 | 15 | 8 | 11 | 33 | 1.0 | 30 | 0.1 | 0.003 | 520 |
| TVM1A180K | 18 | 10 | 11 | 14 | 35 | 1.0 | 30 | 0.2 | 0.003 | 350 |
| TVM1A220K | 22 | 10 | 14 | 18 | 40 | 1.0 | 30 | 0.2 | 0.003 | 300 |
| TVM1A270K | 27 | 10 | 17 | 22 | 46 | 1.0 | 30 | 0.2 | 0.003 | 180 |
| TVM1A330K | 33 | 10 | 20 | 26 | 56 | 1.0 | 30 | 0.3 | 0.003 | 150 |
| TVM1A390K | 39 | 10 | 25 | 31 | 67 | 1.0 | 30 | 0.3 | 0.003 | 100 |

OPERATING TEMPERATURE VS. POWER DERATING CURVE

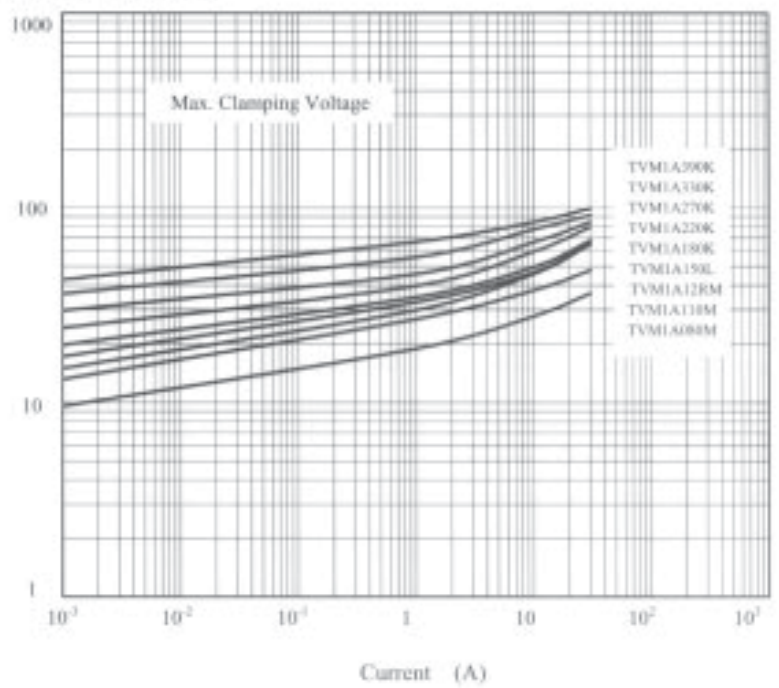
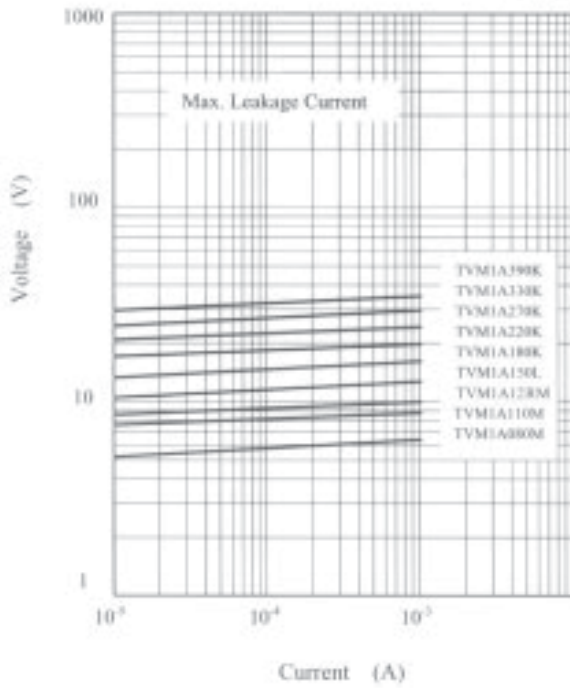


| | |
|------------------------------------|----------------|
| Nonlinearity exponent (α) | ≥ 20 |
| Leakage Current (IL) at 25°C, Vdc | $\leq 20\mu A$ |



MAX. LEAKAGE CURRENT AND MAX. CLAMPING VOLTAGE CURVES

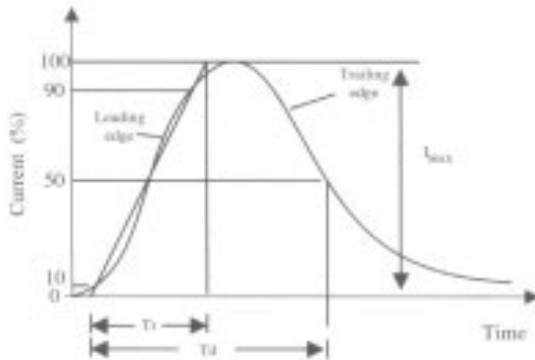
TVM1A080M-TVM1A390K



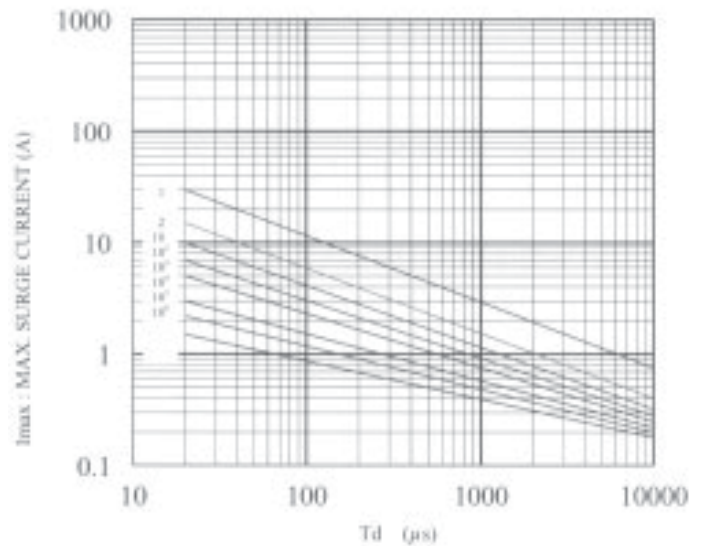
SURGE CURRENT STANDARD WAVEFORM

MAX. SURGE CURRENT DERATING CURVES

EXAMPLE: 8/20μS
Tr = 8μS
Td = 20μS

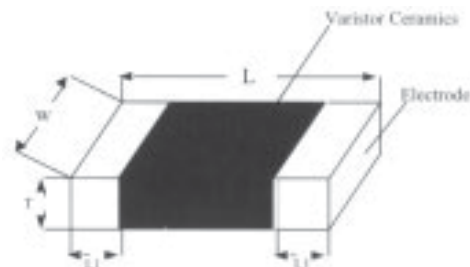


TVM1A080M-TVM1A390K





ZINC OXIDE VARISTOR 0805 SERIES



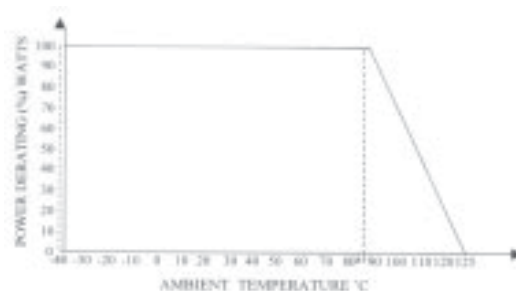
DIMENSION

| Unit: mm | | | | | |
|----------|------|----------|-----------|---------|-----------|
| Part No. | Size | L | W | T | L1 |
| TVM2 | 0805 | 2.0±0.20 | 1.25±0.20 | 1.20max | 0.40±0.20 |

SPECIFICATION

| Part No | Varistor Voltage | | Max. Allowable Voltage | | Max. Clamping Voltage (8/20µs) | | Max. Surge Current (8/20µs) | Max. Energy (10/1000µs) | Rate Power | Reference Capacitance @1KHZ |
|-----------|---------------------|------|------------------------|---------|--------------------------------|--------------------|-----------------------------|-------------------------|------------|-----------------------------|
| | V _{mA} (V) | (±%) | VAC (V) | VDC (V) | V _P (VP) | I _p (A) | I _{max} (A) | W _{max} (J) | P (W) | C (pF) |
| TVM2A080M | 8 | 20 | 4 | 5.5 | 19 | 1.0 | 60 | 0.1 | 0.005 | 1210 |
| TVM2A110M | 11 | 20 | 6 | 8 | 27 | 1.0 | 60 | 0.2 | 0.005 | 1380 |
| TVM2A12RL | 12.5 | 15 | 7 | 9 | 27 | 1.0 | 60 | 0.2 | 0.005 | 1050 |
| TVM2A150L | 15 | 15 | 8 | 11 | 33 | 1.0 | 60 | 0.2 | 0.005 | 950 |
| TVM2A180K | 18 | 10 | 11 | 14 | 35 | 1.0 | 60 | 0.2 | 0.005 | 670 |
| TVM2A220K | 22 | 10 | 14 | 18 | 40 | 1.0 | 60 | 0.3 | 0.005 | 540 |
| TVM2A270K | 27 | 10 | 17 | 22 | 46 | 1.0 | 60 | 0.3 | 0.005 | 460 |
| TVM2A330K | 33 | 10 | 20 | 26 | 56 | 1.0 | 60 | 0.3 | 0.005 | 360 |
| TVM2A390K | 39 | 10 | 25 | 31 | 67 | 1.0 | 60 | 0.3 | 0.005 | 180 |
| TVM2A470K | 47 | 10 | 30 | 38 | 77 | 1.0 | 60 | 0.3 | 0.005 | 150 |

OPERATING TEMPERATURE VS. POWER DERATING CURVE

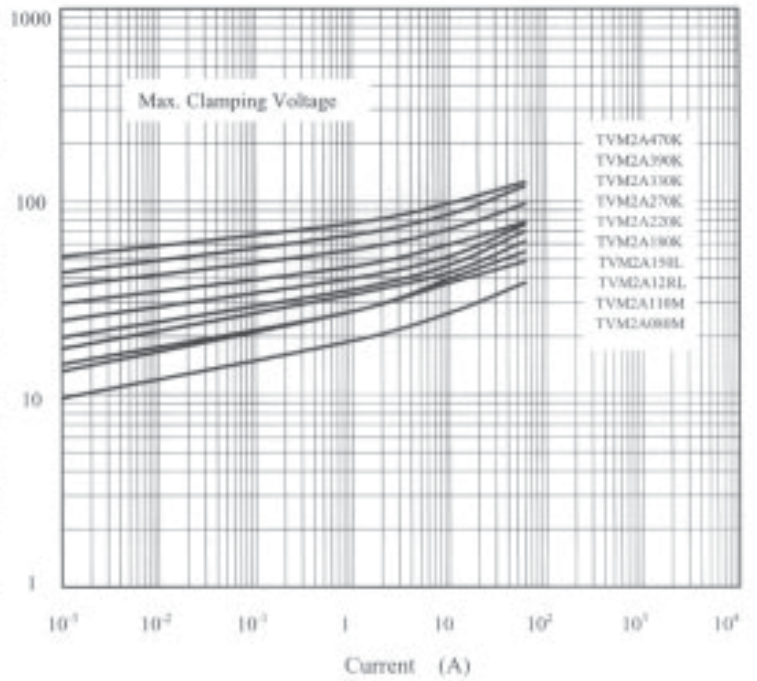
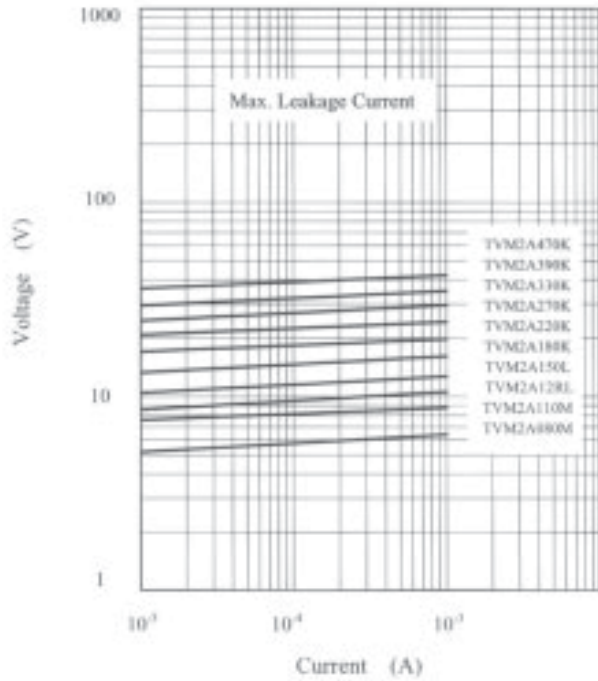


| | |
|------------------------------------|----------------|
| Nonlinearity exponent (α) | ≥ 20 |
| Leakage Current (IL) at 25°C, Vdc | $\leq 20\mu A$ |



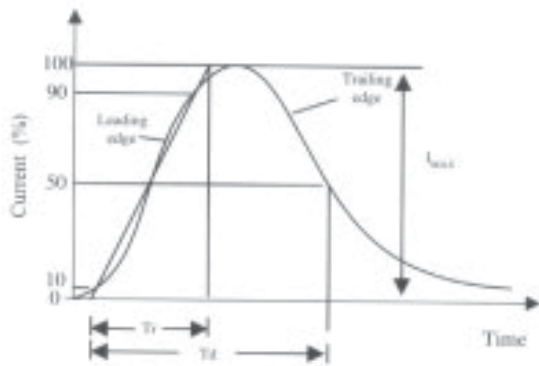
MAX. LEAKAGE CURRENT AND MAX. CLAMPING VOLTAGE CURVES

TVM2A080M-TVM2A470K



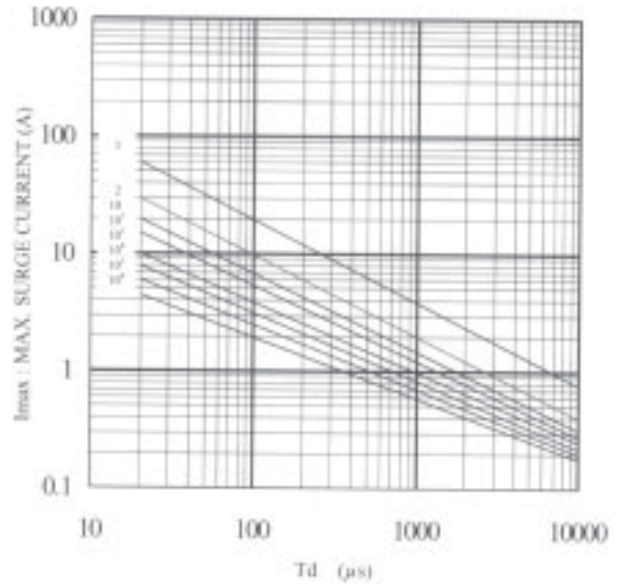
SURGE CURRENT STANDARD WAVEFORM

EXAMPLE: 8/20μS
Tr = 8μS
Td = 20μS



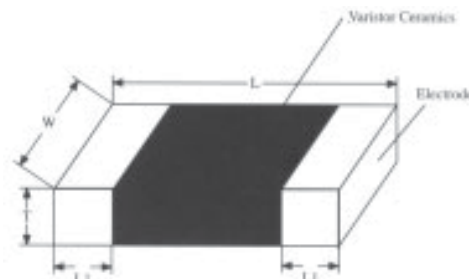
MAX. SURGE CURRENT DERATING CURVES

TVM2A080M-TVM2A470K





ZINC OXIDE VARISTOR 1206 SERIES



DIMENSION

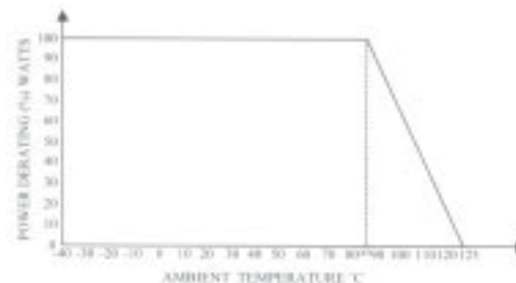
Unit: mm

| Part No. | Size | L | W | T | L1 |
|----------|------|----------|-----------|---------|-----------|
| TVM3 | 1206 | 3.2±0.30 | 1.60±0.20 | 1.50max | 0.50±0.20 |

SPECIFICATION

| Part No | Normal Varistor Voltage | Max. Allowable Voltage | | Max. Clamping Voltage (8/20µs) | | Max. Surge Current (8/20µs) | Max. Energy (10/1000µs) | Rate Power | Reference Capacitance @1KHZ |
|-----------|-------------------------|------------------------|------------------------|--------------------------------|-----------------------|-----------------------------|-------------------------|------------|-----------------------------|
| | V _{mA} (V) | V _{AC} (V) | V _{DC} (V) | V _P (V) | I _P (A) | I _{max} (A) | W _{max} (J) | P (W) | C (pF) |
| TVM3A080M | 8 | 4 | 5.5 | 17 | 1.0 | 150 | 0.3 | 0.008 | 4580 |
| TVM3A110M | 11 | 6 | 8 | 25 | 1.0 | 200 | 0.4 | 0.008 | 3900 |
| TVM3A150L | 15 | 8 | 11 | 30 | 1.0 | 200 | 0.5 | 0.008 | 2540 |
| TVM3A180K | 18 | 11 | 14 | 33 | 1.0 | 200 | 0.5 | 0.008 | 1450 |
| TVM3A220K | 22 | 14 | 18 | 38 | 1.0 | 200 | 0.5 | 0.008 | 1200 |
| TVM3A270K | 27 | 17 | 22 | 44 | 1.0 | 200 | 0.6 | 0.008 | 1050 |
| TVM3A330K | 33 | 20 | 26 | 54 | 1.0 | 200 | 0.7 | 0.008 | 800 |
| TVM3A390K | 39 | 25 | 31 | 65 | 1.0 | 200 | 1.0 | 0.008 | 650 |
| TVM3A470K | 47 | 30 | 38 | 77 | 1.0 | 200 | 1.1 | 0.008 | 385 |
| TVM3A560K | 56 | 35 | 45 | 90 | 1.0 | 100 | 0.4 | 0.008 | 300 |
| TVM3A680K | 68 | 40 | 56 | 110 | 1.0 | 100 | 0.5 | 0.008 | 250 |
| TVM3A820K | 82 | 50 | 65 | 135 | 1.0 | 100 | 0.6 | 0.008 | 180 |
| TVM3A101K | 100 | 60 | 85 | 165 | 1.0 | 100 | 0.7 | 0.008 | 110 |

OPERATING TEMPERATURE VS. POWER DERATING CURVE

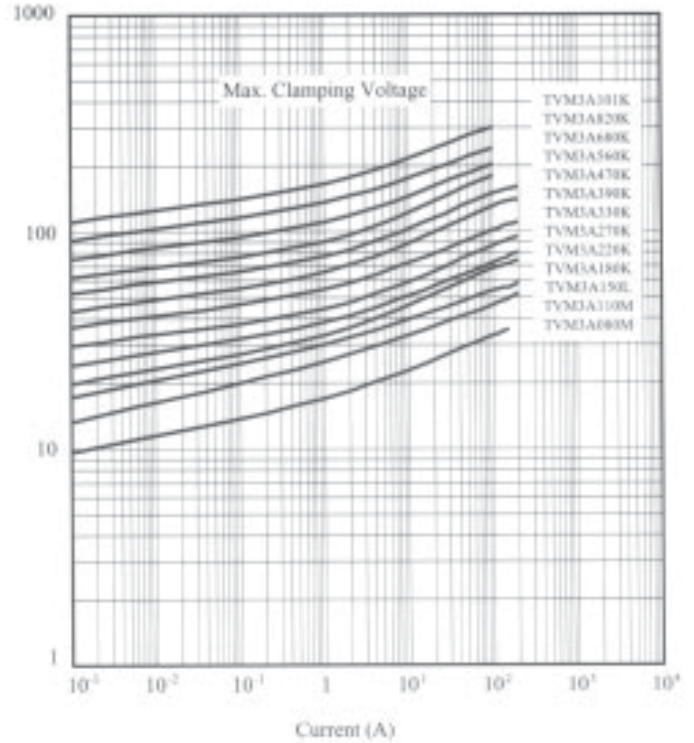
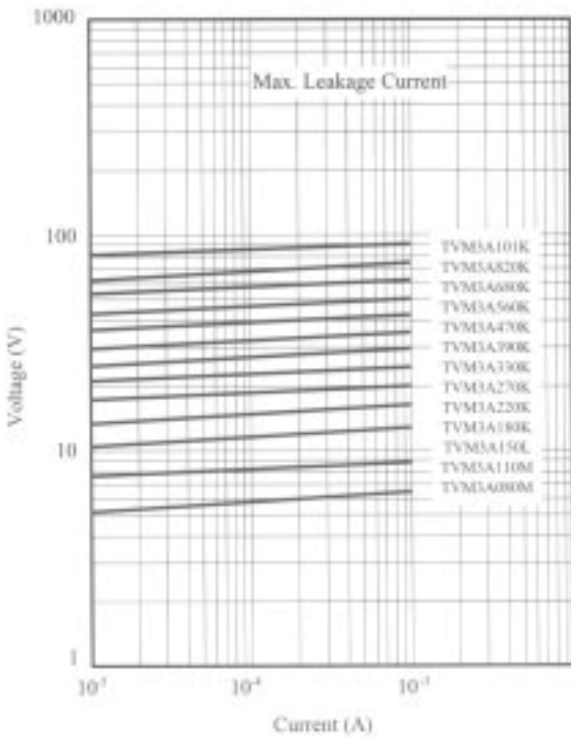


| | |
|------------------------------------|----------------------|
| Nonlinearity exponent (α) | ≥ 15 |
| Leakage Current (IL) at 25°C, Vdc | $\leq 20\mu\text{A}$ |



MAX. LEAKAGE CURRENT AND MAX. CLAMPING VOLTAGE CURVES

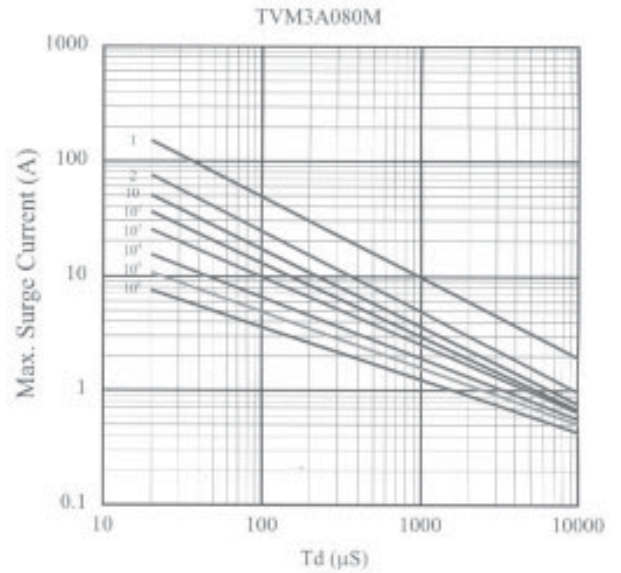
TVM3A080M ~ TVM3A101K



SURGE CURRENT STANDARD WAVEFORM

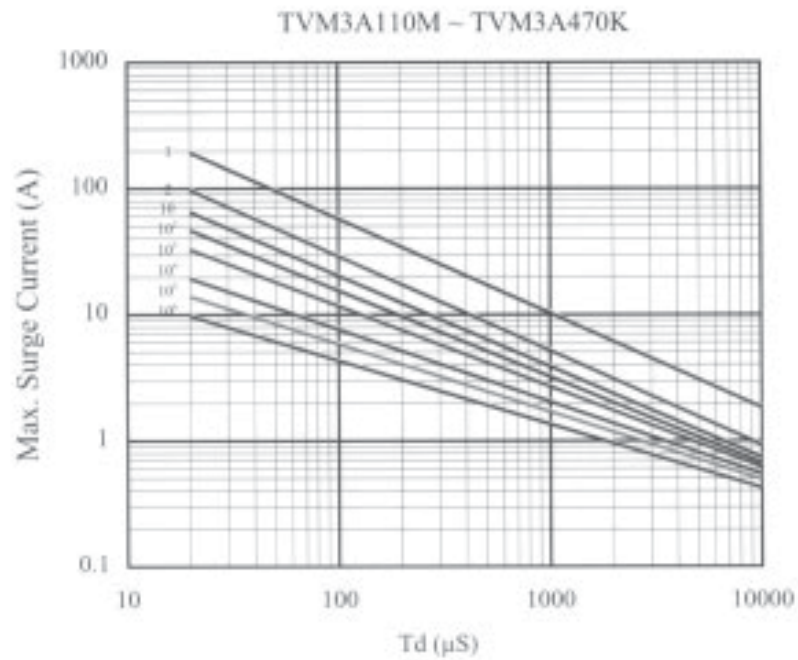
MAX. SURGE CURRENT DERATING CURVES

EXAMPLE: 8/20 μ S
Tr = 8 μ S
Td = 20 μ S

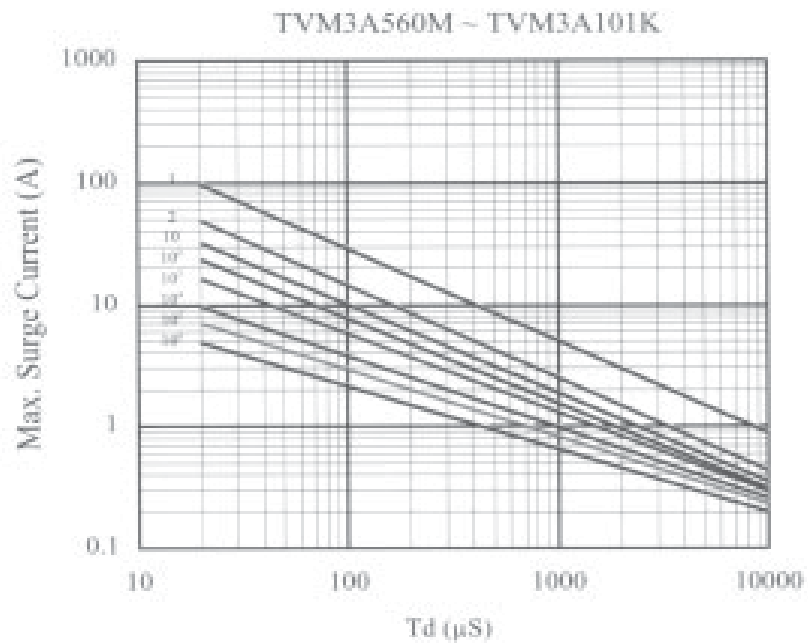




MAX. SURGE CURRENT DERATING CURVES

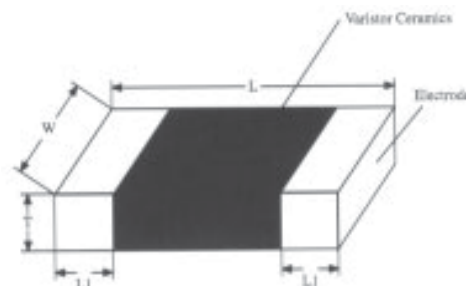


MAX. SURGE CURRENT DERATING CURVES





ZINC OXIDE VARISTOR 1210 SERIES



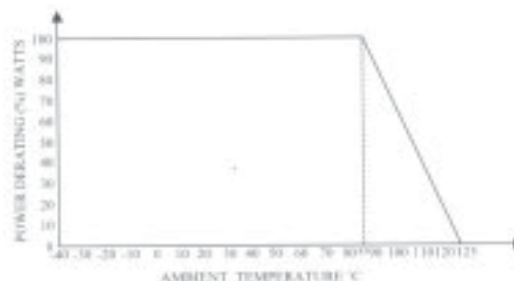
DIMENSION

| Unit: mm | | | | | |
|----------|------|----------|-----------|---------|-----------|
| Part No. | Size | L | W | T | L1 |
| TVM4 | 1210 | 3.2±0.30 | 2.50±0.25 | 1.50max | 0.50±0.20 |

SPECIFICATION

| Part No | Normal Varistor Voltage | Max. Allowable Voltage | | Max. Clamping Voltage (8/20µs) | | Max. Surge Current (8/20µs) | Max. Energy (10/1000µs) | Rate Power | Reference Capacitance @1KHZ |
|-----------|-------------------------|------------------------|---------|--------------------------------|--------|-----------------------------|-------------------------|------------|-----------------------------|
| | VImA (V) | VAC (V) | VDC (V) | VP (V) | IP (A) | I _{max} (A) | W _{max} (J) | P (W) | C (pF) |
| | TVM4A080M | 8 | 4 | 5.5 | 17 | 2.5 | 250 | 0.4 | 0.01 |
| TVM4A110M | 11 | 6 | 8 | 25 | 2.5 | 300 | 0.7 | 0.01 | 8000 |
| TVM4A150L | 15 | 8 | 11 | 30 | 2.5 | 400 | 1.0 | 0.01 | 4850 |
| TVM4A180K | 18 | 11 | 14 | 33 | 2.5 | 400 | 1.2 | 0.01 | 2870 |
| TVM4A220K | 22 | 14 | 18 | 38 | 2.5 | 400 | 1.5 | 0.01 | 2370 |
| TVM4A270K | 27 | 17 | 22 | 44 | 2.5 | 400 | 1.7 | 0.01 | 2000 |
| TVM4A330K | 33 | 20 | 26 | 54 | 2.5 | 400 | 1.9 | 0.01 | 1490 |
| TVM4A390K | 39 | 25 | 31 | 65 | 2.5 | 300 | 1.7 | 0.01 | 1185 |
| TVM4A470K | 47 | 30 | 38 | 77 | 2.5 | 300 | 2.0 | 0.01 | 960 |
| TVM4A560K | 56 | 35 | 45 | 90 | 2.5 | 250 | 2.0 | 0.01 | 600 |
| TVM4A680K | 68 | 40 | 56 | 110 | 2.5 | 250 | 2.3 | 0.01 | 450 |
| TVM4A820K | 82 | 50 | 65 | 135 | 2.5 | 200 | 1.6 | 0.01 | 350 |
| TVM4A101K | 100 | 60 | 85 | 165 | 2.5 | 200 | 2.0 | 0.01 | 230 |

OPERATING TEMPERATURE VS. POWER DERATING CURVE

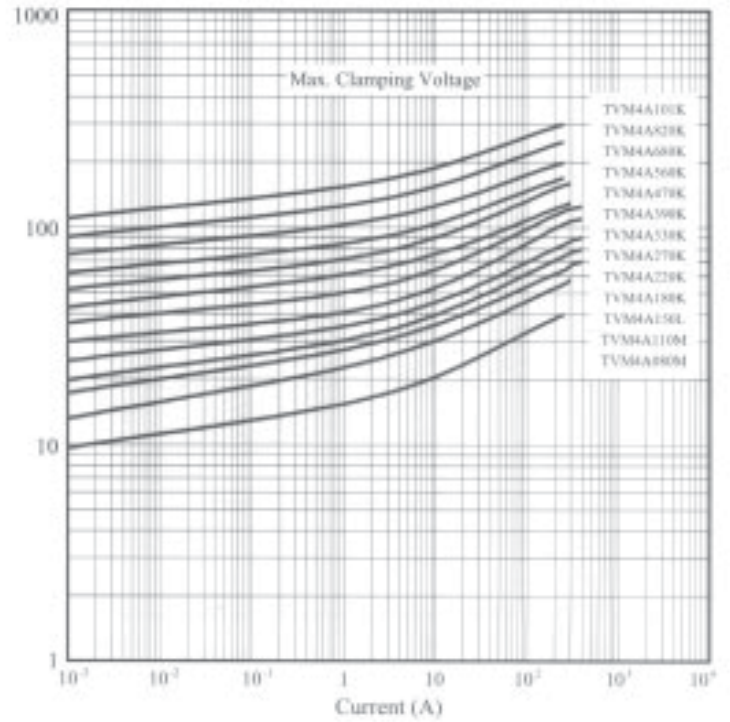
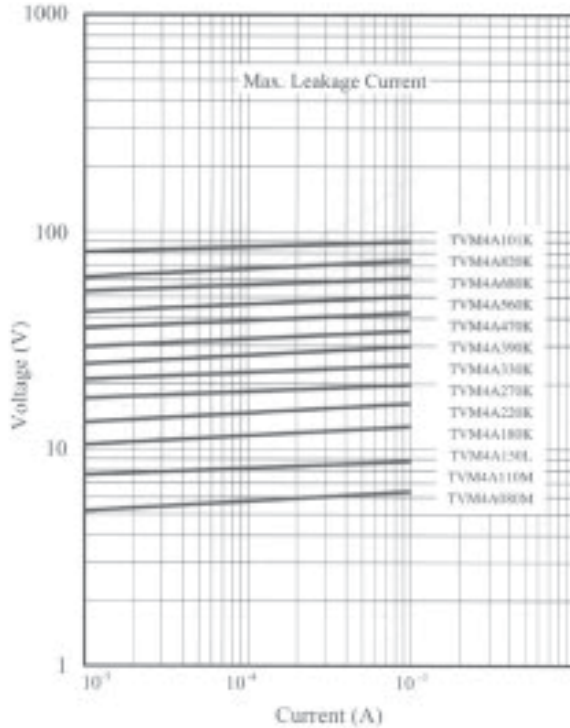


| | |
|------------------------------------|----------------|
| Nonlinearity exponent (α) | ≥ 15 |
| Leakage Current (IL) at 25°C, Vdc | $\leq 20\mu A$ |



MAX. LEAKAGE CURRENT AND MAX. CLAMPING VOLTAGE CURVES

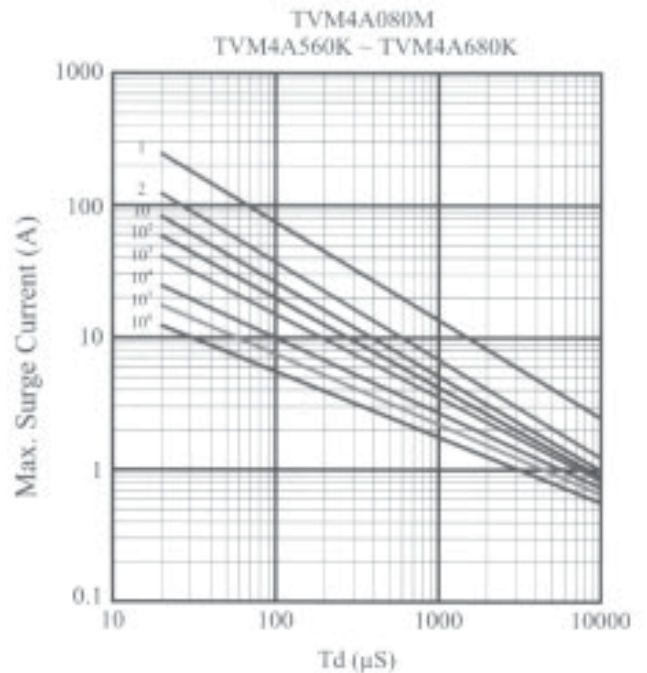
TVM4A080M – TVM4A101K



SURGE CURRENT STANDARD WAVEFORM

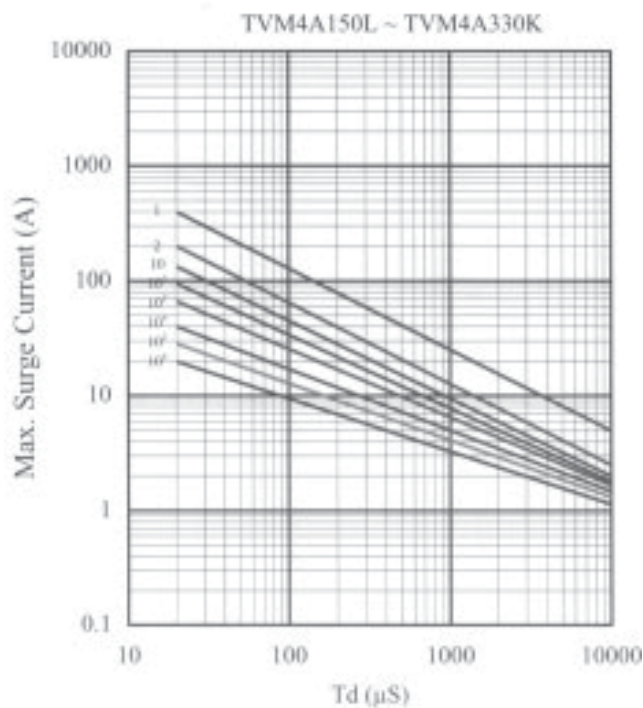
MAX. SURGE CURRENT DERATING CURVES

EXAMPLE: 8/20 μ S
 Tr = 8 μ S
 Td = 20 μ S

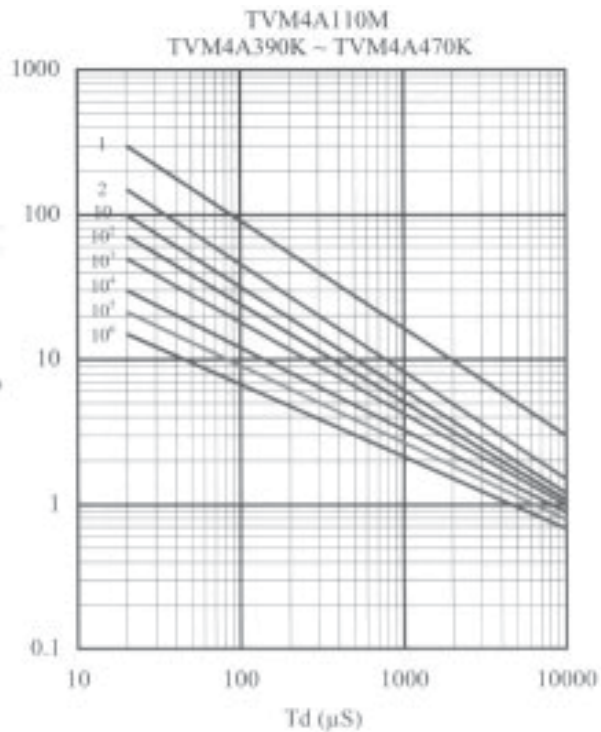




MAX SURGE CURRENT DERATING CURVES



MAX SURGE CURRENT DERATING CURVES



MAX SURGE CURRENT DERATING CURVES

