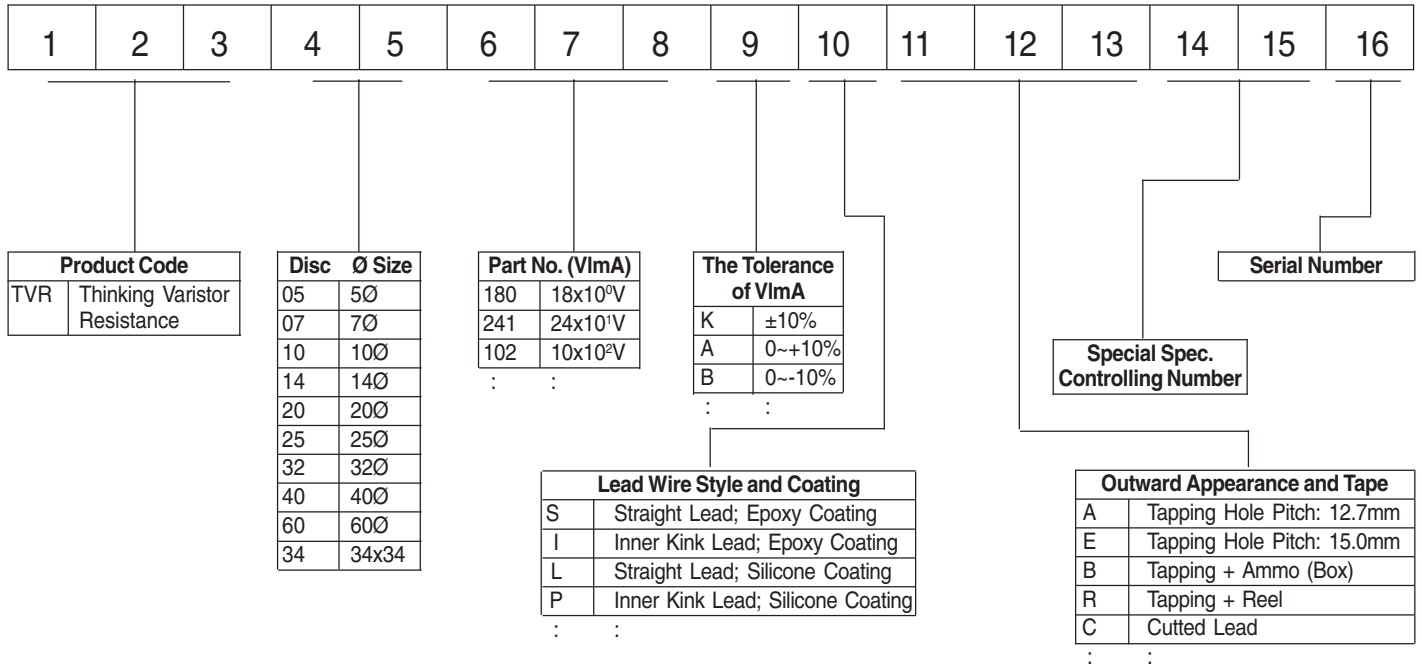




# TVR-SERIES Part Number Code

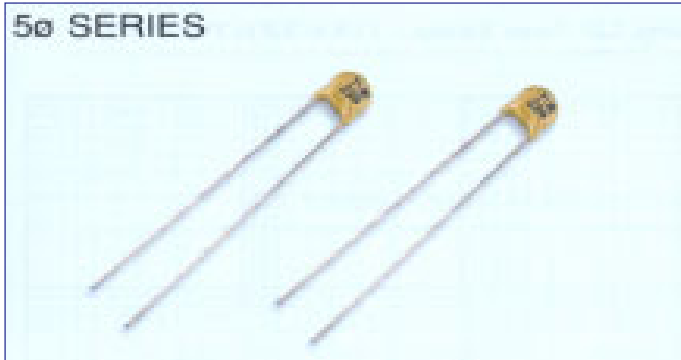


[www.DataSheet.in](http://www.DataSheet.in)

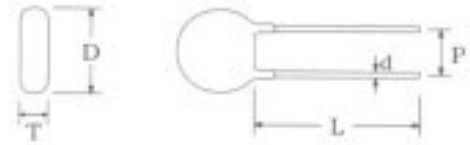


## ZINC OXIDE VARISTOR 50 SERIES

### 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<br>(8/20µs) | Max. Peak Current<br>(8/20µs) | Rated Power<br>(W) | Reference Capacitance<br>(@1KHZ<br>pf) | Dimensions<br>T(max.)<br>(mm) |
|------------|------------------|---------------|-----------|------------------------|-----------|-----------------------|--------------|-------------------------|-------------------------------|--------------------|--|-------------------------------|
|            | VImA<br>(V)      | AC rms<br>(V) | DC<br>(V) | Vp<br>(V)              | Ip<br>(A) | 10/1000<br>(J)        | 1time<br>(A) |                         |                               |                    |  |                               |
| 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                                    |                               |

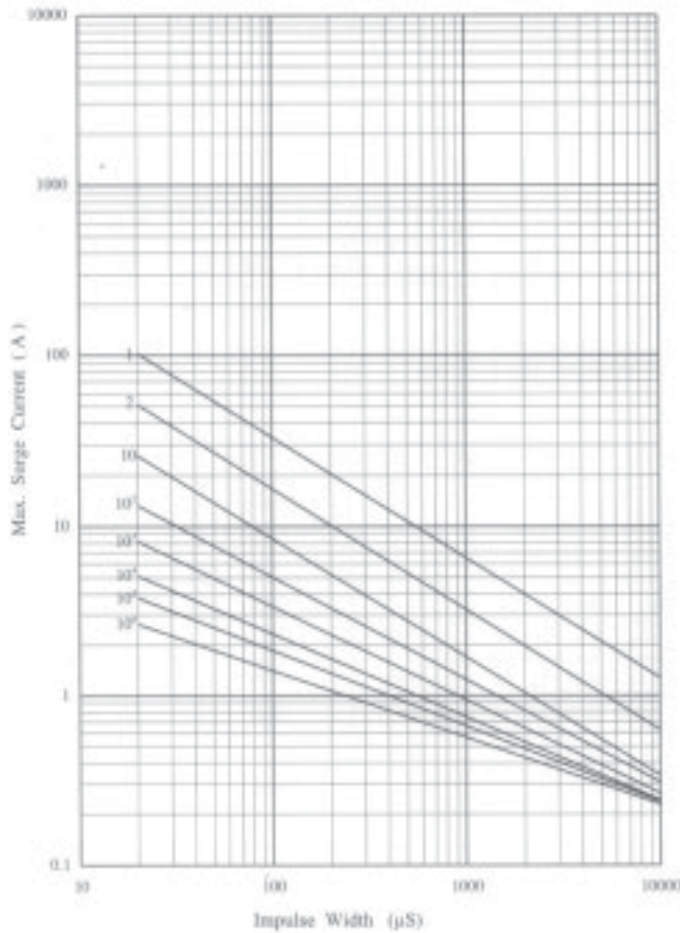
[www.DataSheet.in](http://www.DataSheet.in)



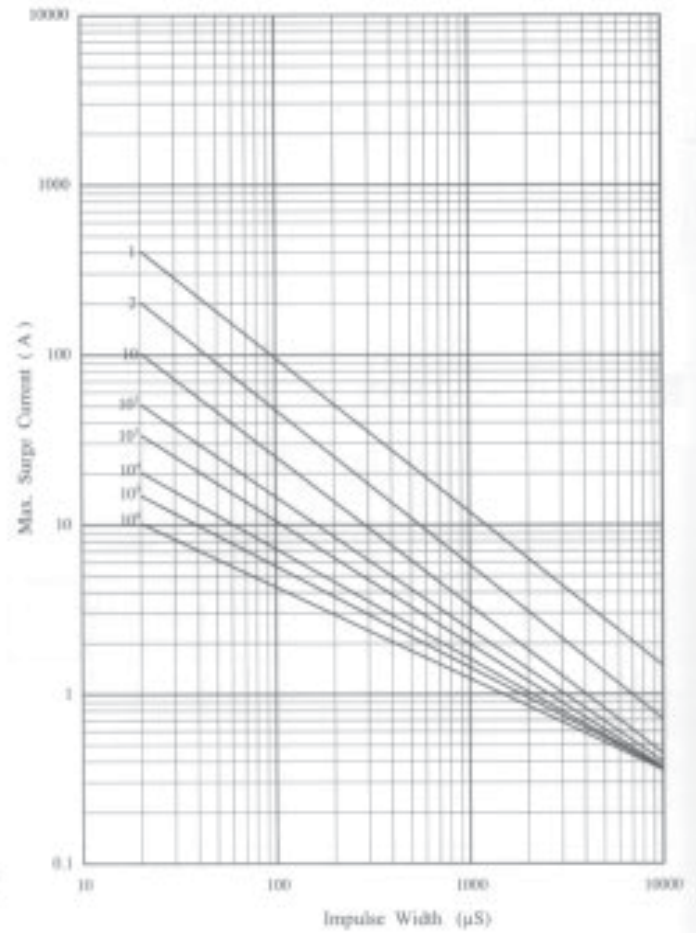


LIFE TIMES

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

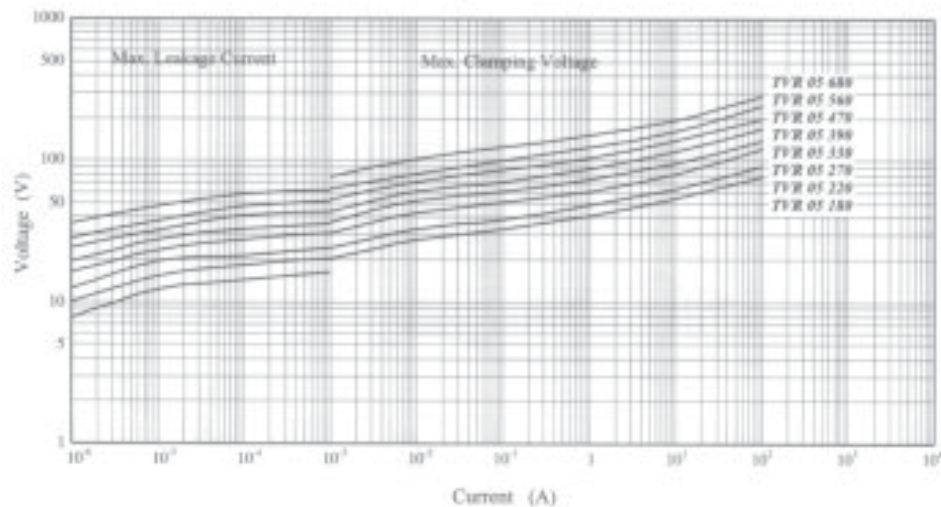


Surge Life Times Ratings ( TVR 05 820 to TVR 05 471 )

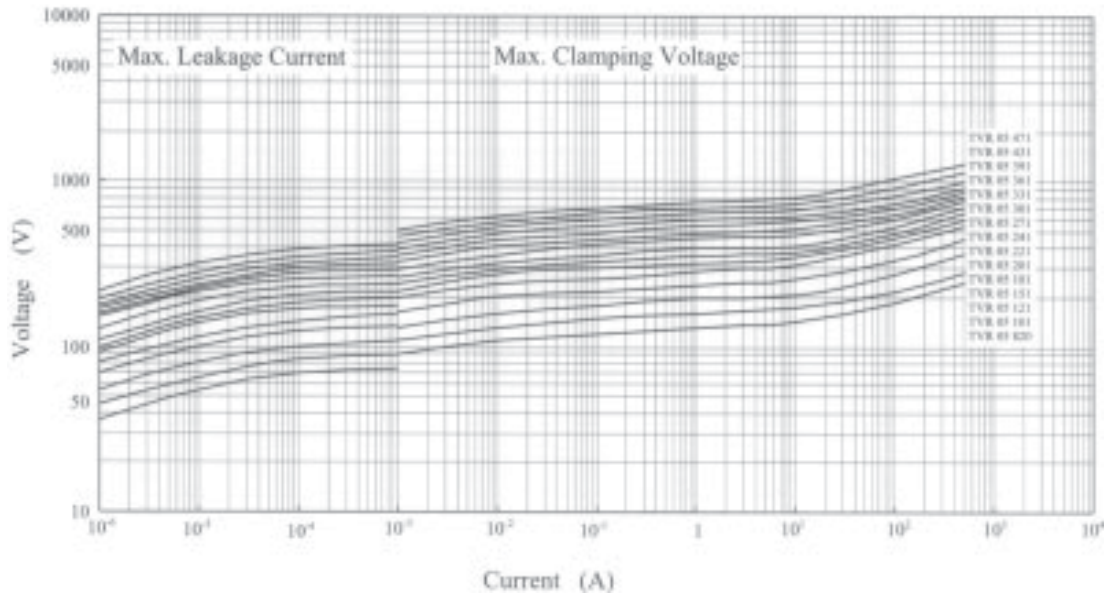


V-I CHARACTERISTIC CURVE

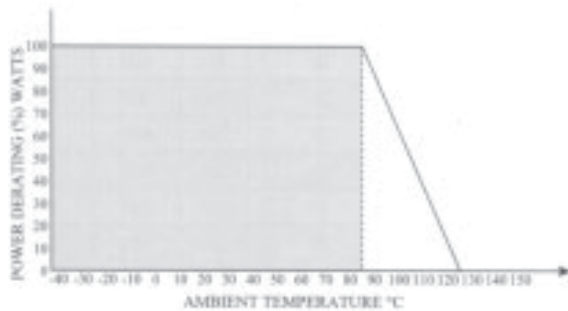
Max. Leakage Current and Max. Clamping Voltage Curves ( TVR 05 180 to TVR 05 680 )



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

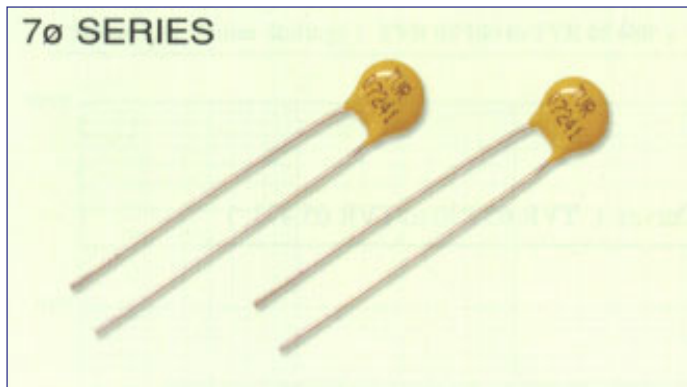


**POWER DERATING CURVE**

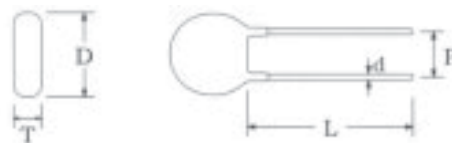




# ZINC OXIDE VARISTOR 7Ø SERIES



## 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          |             |                       |            |

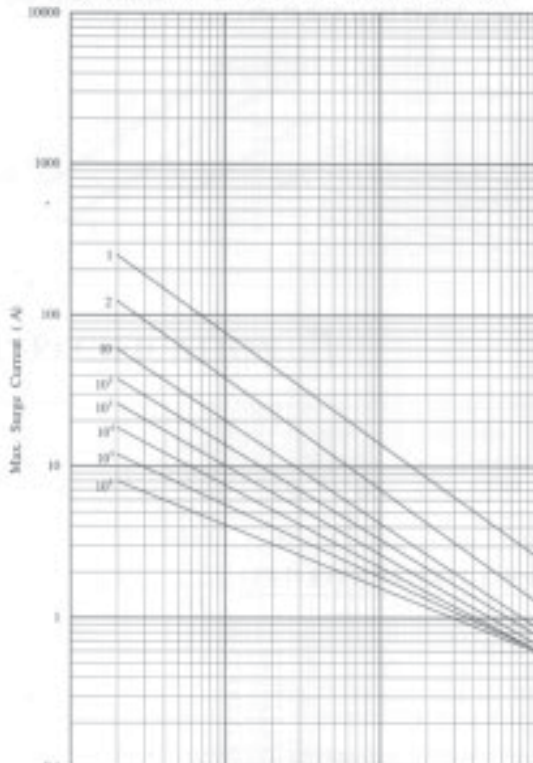




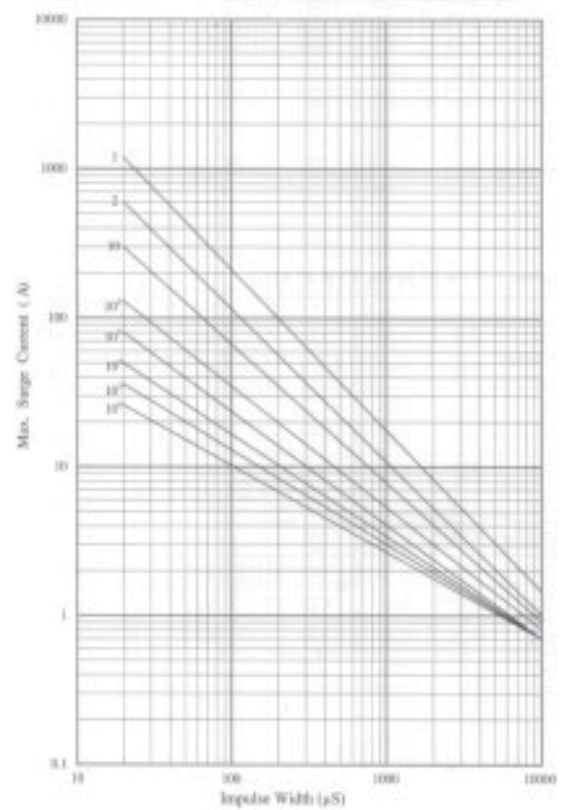


## LIFE TIMES

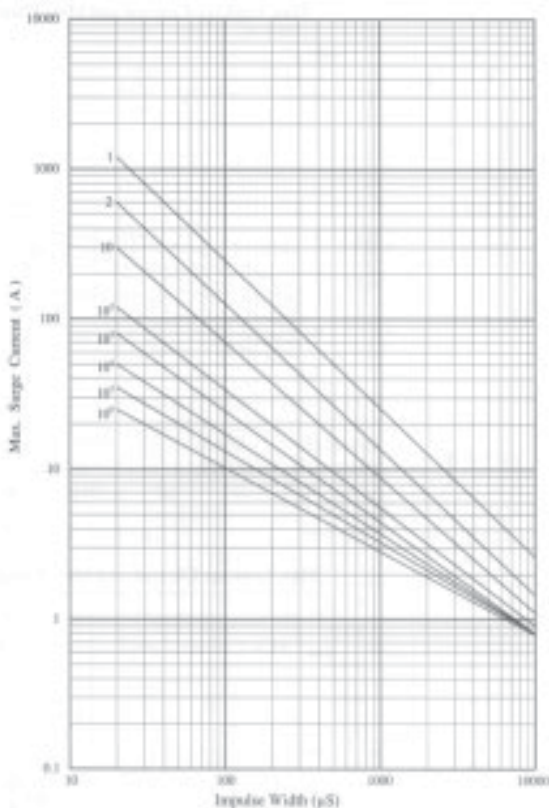
Surge Life Times Ratings ( TVR 07 180 to TVR 07 680 )



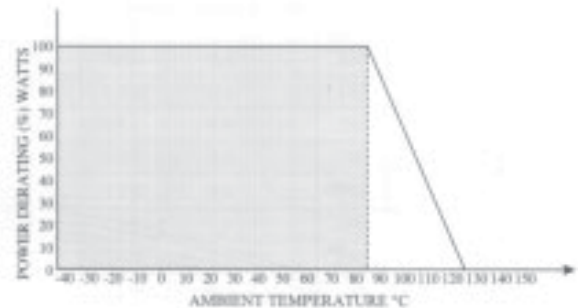
Surge Life Times Ratings ( TVR 07 511 to TVR 07 821 )



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



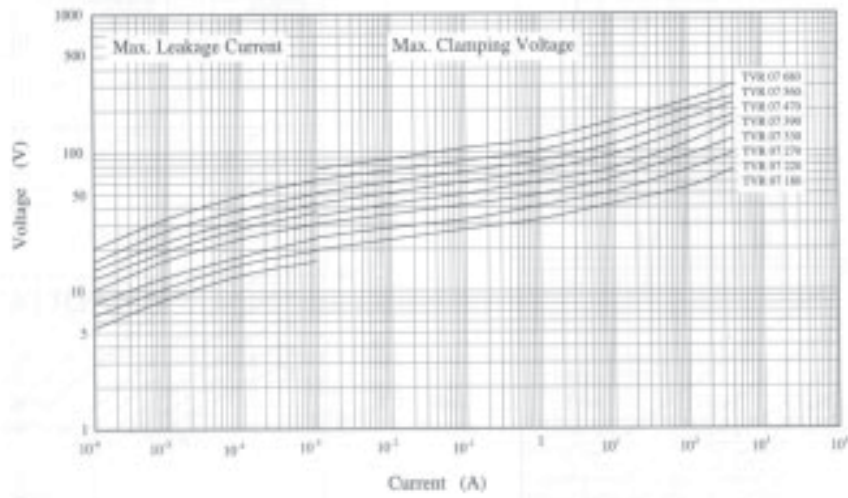
## POWER DERATING CURVE



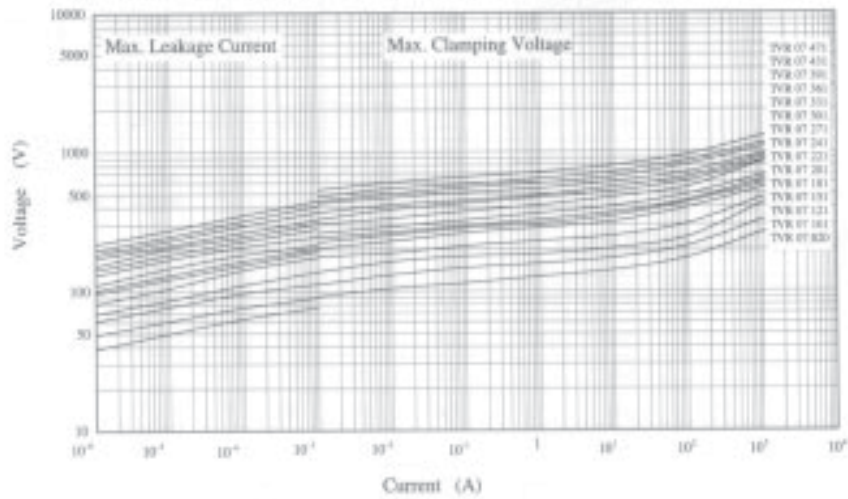


V-I CHARACTERISTIC CURVE

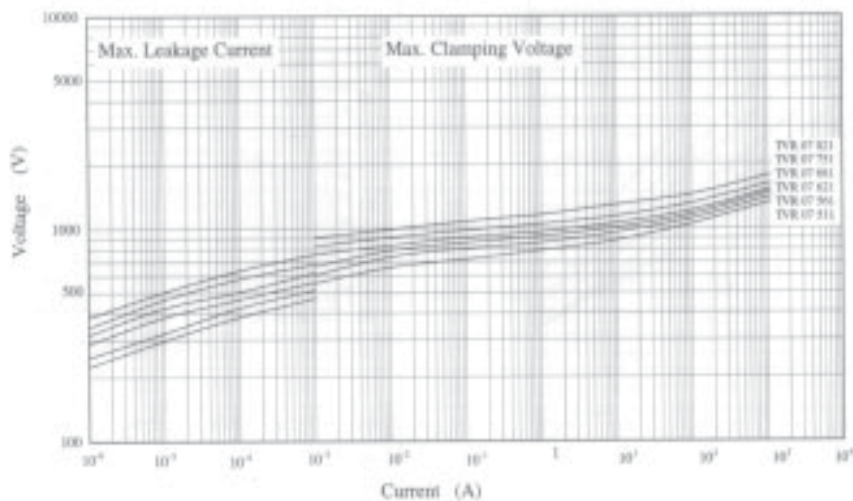
Max. Leakage Current and Max. Clamping Voltage Curves ( TVR 07 180 to TVR 07 680 )



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



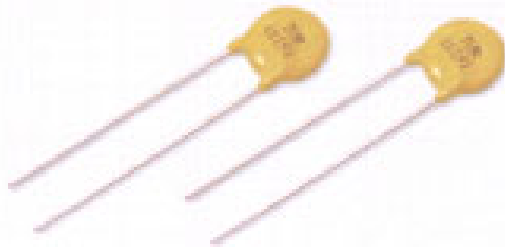
Max. Leakage Current and Max. Clamping Voltage Curves ( TVR 07 511 to TVR 07 821 )



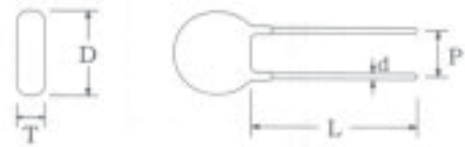


## ZINC OXIDE VARISTOR 100 SERIES

### 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  |

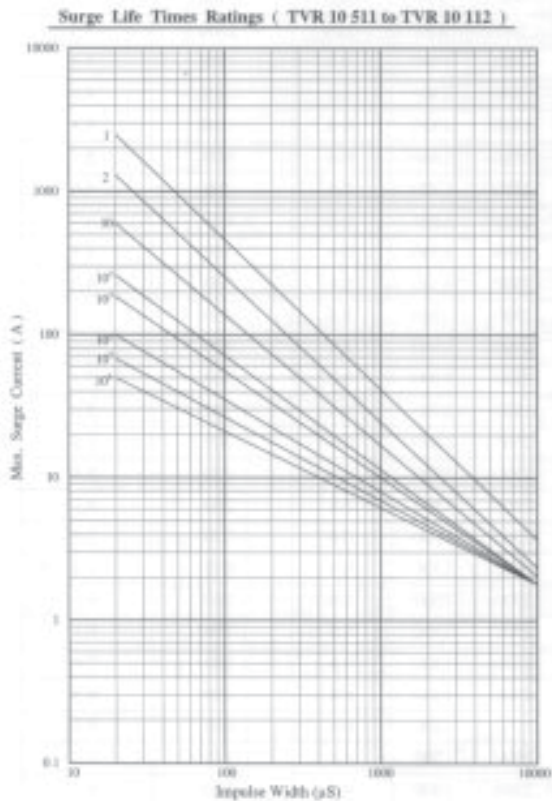
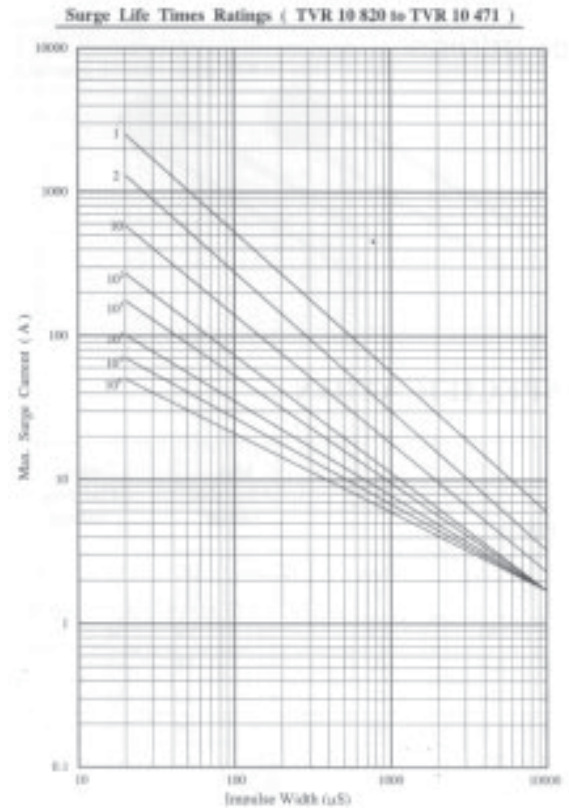
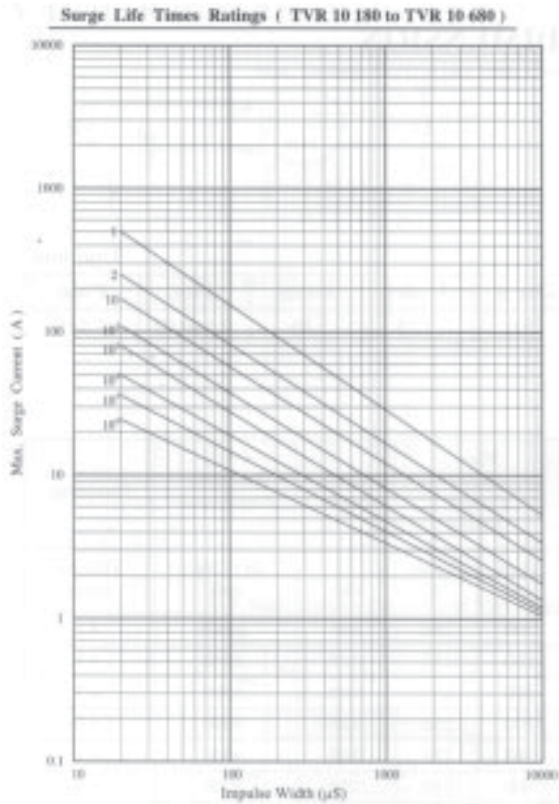
### SPECIFICATION

| Part No    | Max. Allowable Voltage          |               |           | Max. Clamping Voltage |           | Max. Energy<br>10/1000<br>(J) | Max. Peak Current<br>(8/20µs) |               | Rated Power<br>(W) | Reference Capacitance<br>@1KHZ<br>(pf) | Dimensions<br>T(max.)<br>(mm) |
|------------|---------------------------------|---------------|-----------|-----------------------|-----------|-------------------------------|-------------------------------|---------------|--------------------|--|-------------------------------|
|            | Varistor Voltage<br>VImA<br>(V) | AC rms<br>(V) | DC<br>(V) | Vp<br>(V)             | Ip<br>(A) |                               | 1time<br>(A)                  | 2times<br>(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                           |

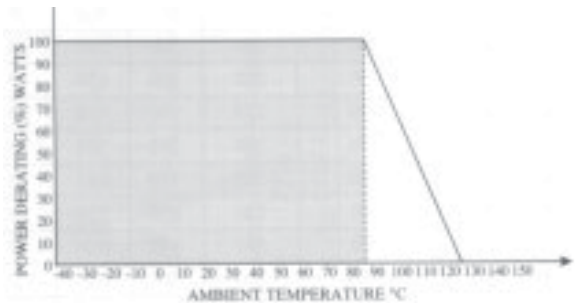




LIFE TIMES



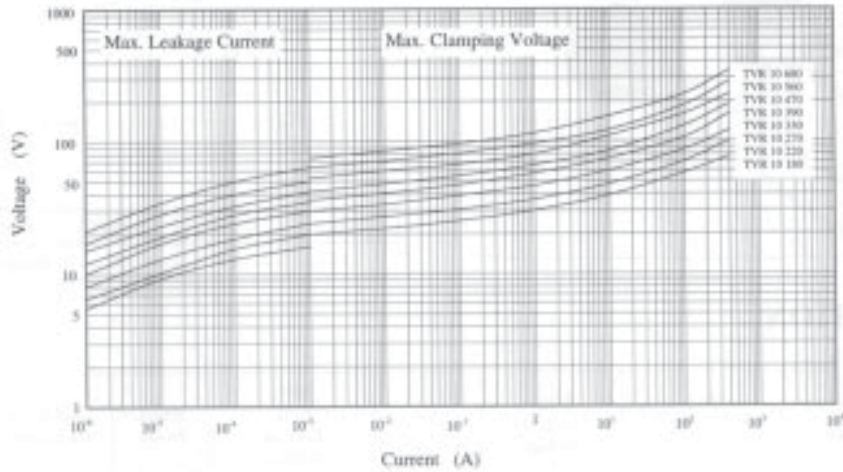
POWER DERATING CURVE



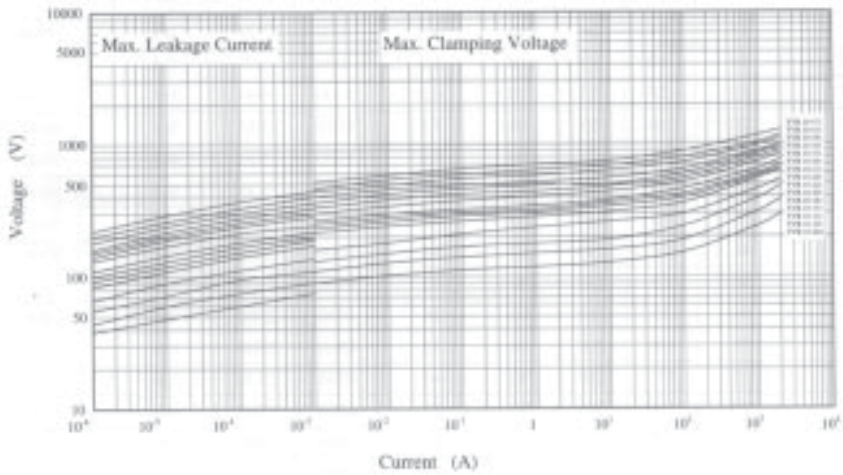


V-I CHARACTERISTIC CURVE

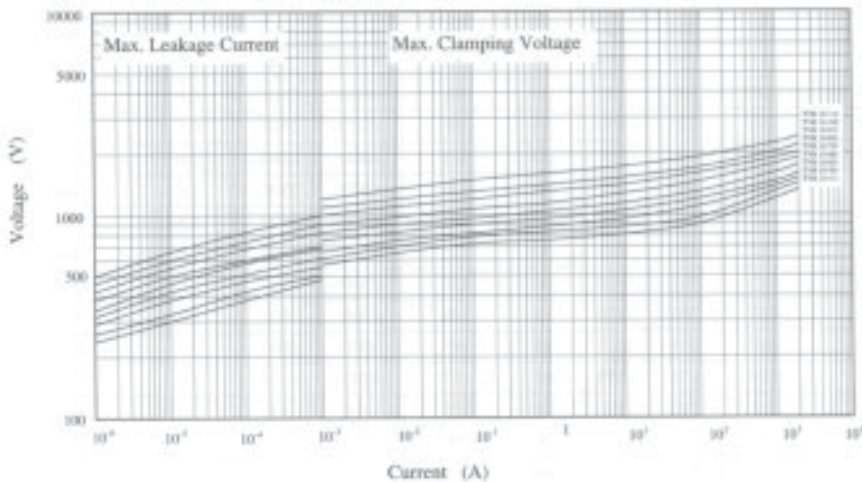
Max. Leakage Current and Max. Clamping Voltage Curves ( TVR 10 150 to TVR 10 680 )



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

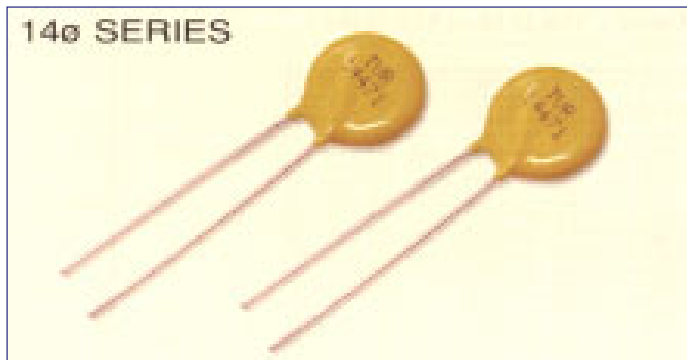


Max. Leakage Current and Max. Clamping Voltage Curves ( TVR 10 511 to TVR 10 112 )

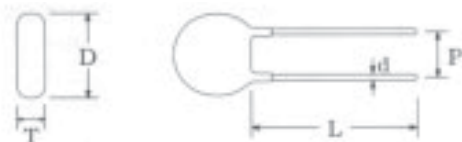




## ZINC OXIDE VARISTOR 14Ø SERIES



### DIMENSION



Unit: mm

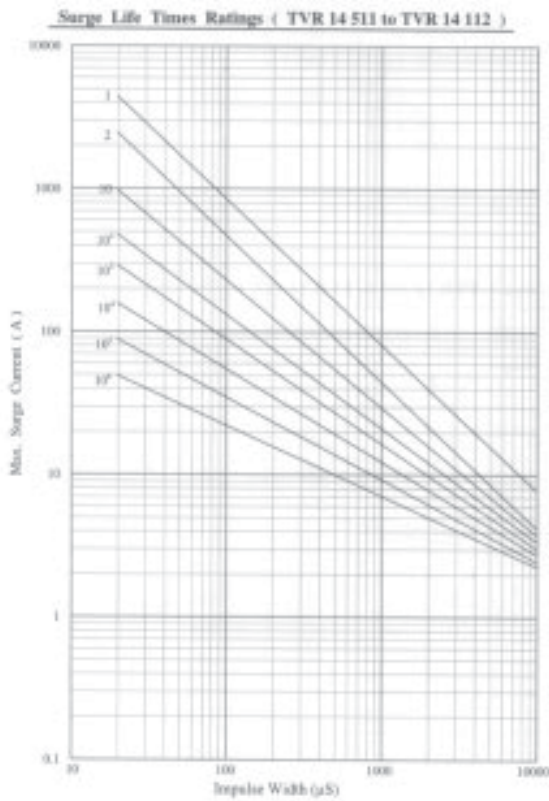
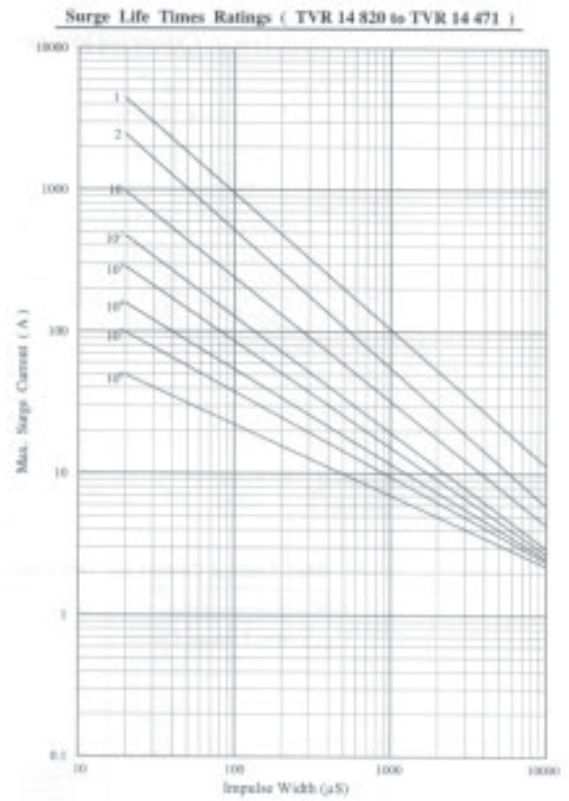
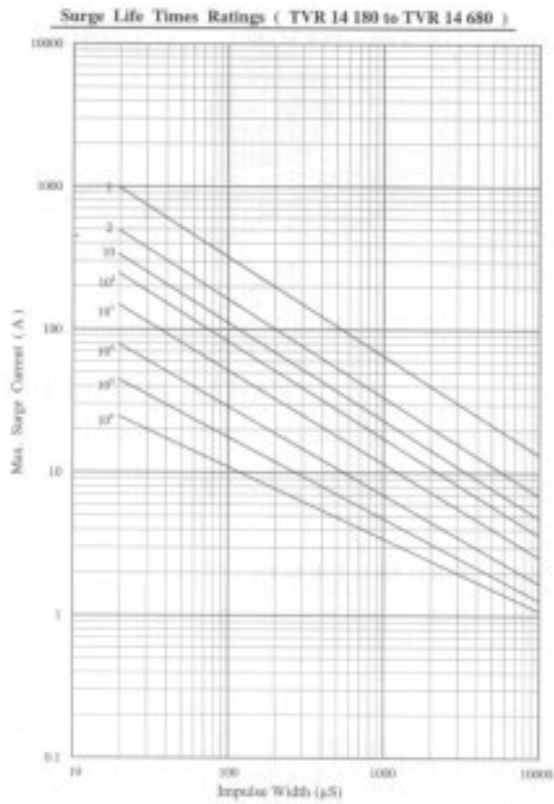
| Disc Ø | D max. | L min. | d nor.   | P nor. |
|--------|--------|--------|----------|--------|
| 14     | 17     | 30     | 0.8±0.02 | 7.5±1  |

### SPECIFICATION

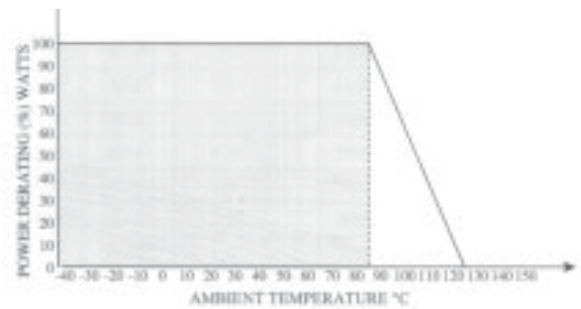
| Part No    | Varistor Voltage |            |        | Max. Allowable Voltage |        | Max. Clamping Voltage |           | Max. Energy |     | Max. Peak Current (8/20µs) |     | Rated Power (W) | Reference Capacitance @1KHZ (pf) | Dimensions T(max.) (mm) |
|------------|------------------|------------|--------|------------------------|--------|-----------------------|-----------|-------------|-----|----------------------------|-----|-----------------|----------------------------------|-------------------------|
|            | 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

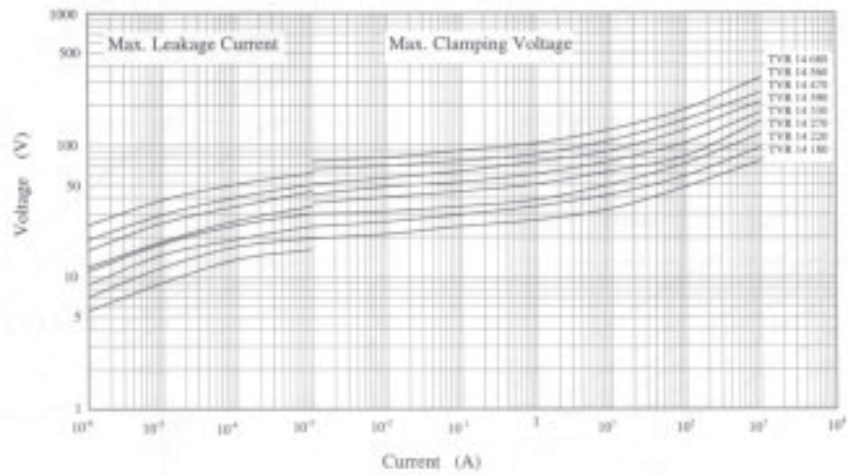




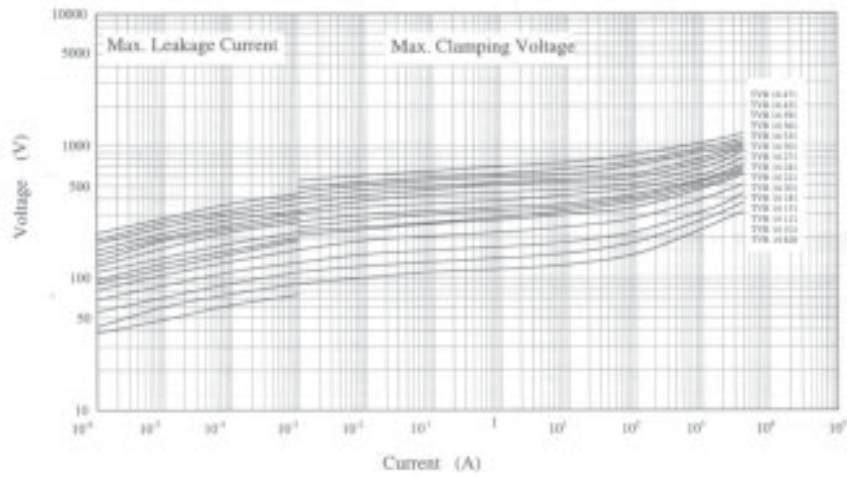


V-I CHARACTERISTIC CURVE

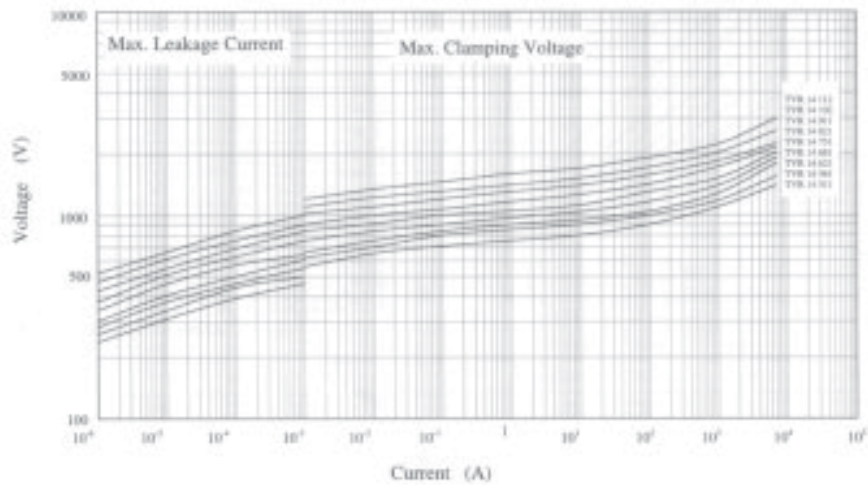
Max. Leakage Current and Max. Clamping Voltage Curves ( TVR 14 180 to TVR 14 680 )



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



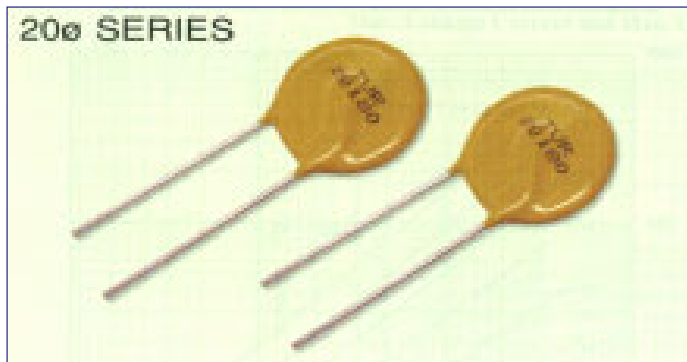
Max. Leakage Current and Max. Clamping Voltage Curves ( TVR 14 511 to TVR 14 112 )



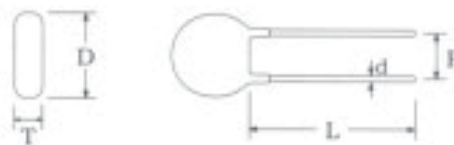




## ZINC OXIDE VARISTOR 20Ø SERIES



### DIMENSION



Unit: mm

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

### SPECIFICATION

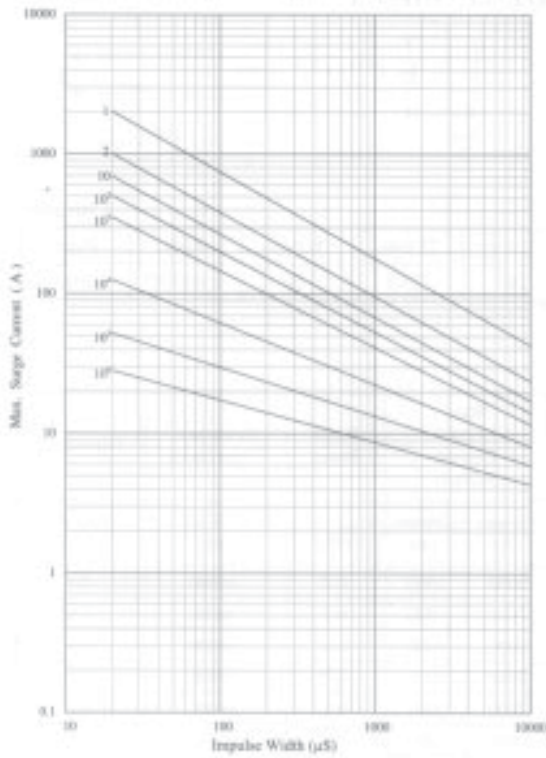
| Part No    | Varistor Voltage |            |        | Max. Allowable Voltage |        | Max. Clamping Voltage |           | Max. Energy |     | Max. Peak Current (8/20µs) |              | Rated Power | Reference Capacitance | Dimensions |
|------------|------------------|------------|--------|------------------------|--------|-----------------------|-----------|-------------|-----|----------------------------|--------------|-------------|-----------------------|------------|
|            | 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          |             |                       |            |



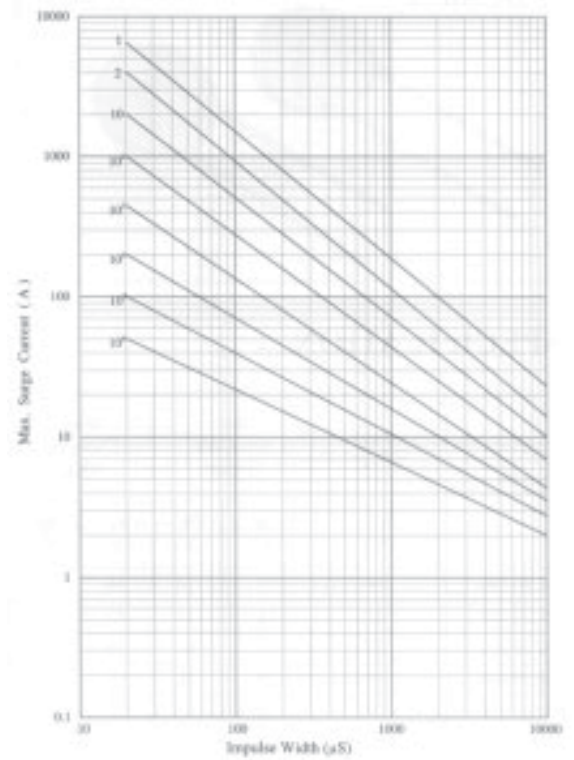


## LIFE TIMES

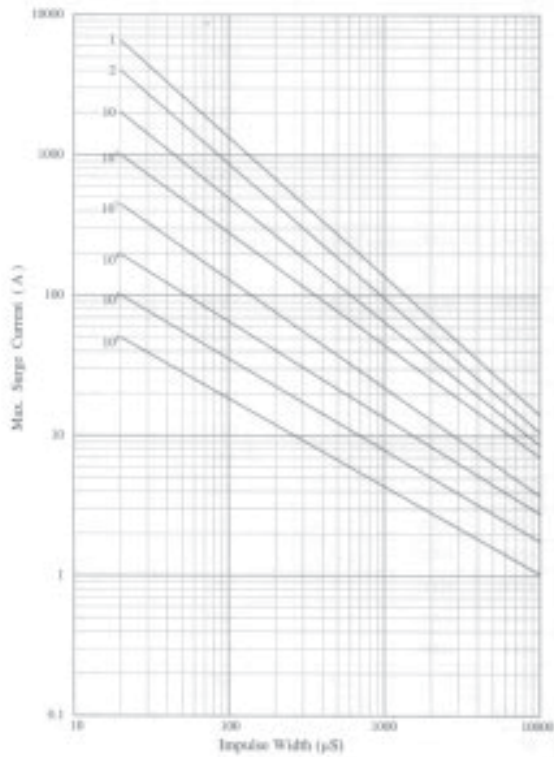
Surge Life Times Ratings ( TVR 20 180 to TVR 20 680 )



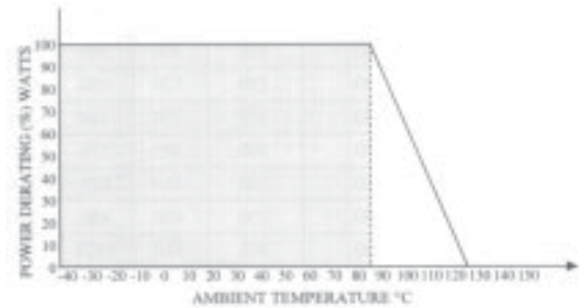
Surge Life Times Ratings ( TVR 20 820 to TVR 20 471 )



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



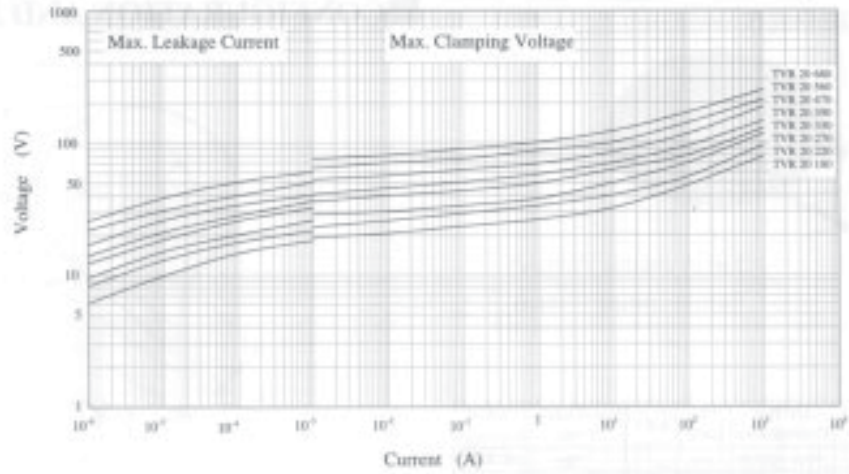
## POWER DERATING CURVE



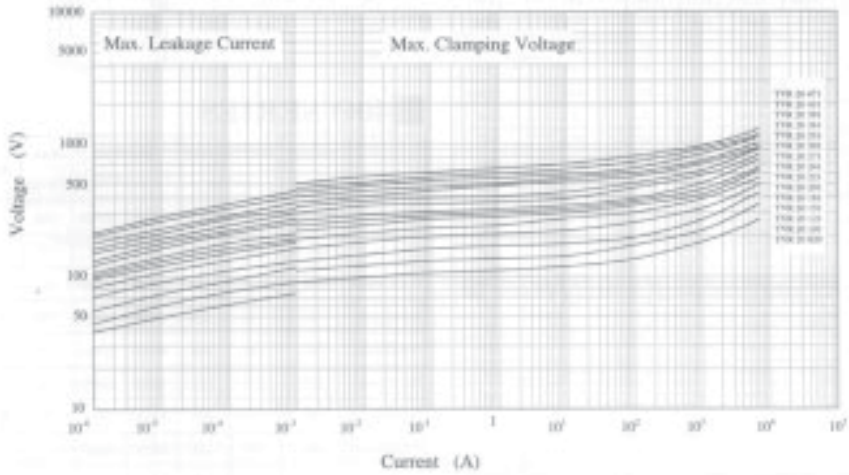


V-I CHARACTERISTIC CURVE

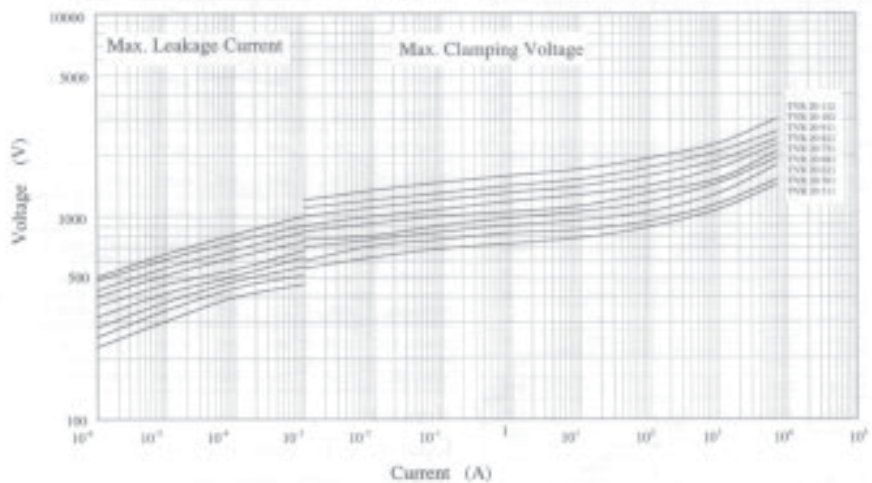
Max. Leakage Current and Max. Clamping Voltage Curves ( TVR 20 180 to TVR 20 680 )



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

### 250/320/400 SERIES



Epoxy coating (Yellow)  
Silicon coating (Green)

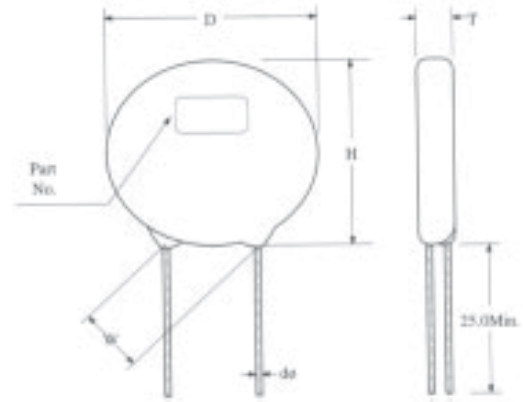
### 250 SERIES

| Part Number | Normal Varistor Voltage<br>V <sub>m</sub> (V) | Max. Allowable voltage |           | Max. Peak Current(8/20μs) |               | Max. Energy<br>2ms<br>(J) | Max. Rated Power<br>(W) | Max. Clamping Voltage<br>V <sub>150A</sub> (V) | Typical Capacitance<br>@1KHZ<br>(PF) |
|-------------|---|------------------------|-----------|---------------------------|---------------|---------------------------|-------------------------|--|--------------------------------------|
|             |   | ACrms<br>(V)           | DC<br>(V) | 1time<br>(A)              | 2times<br>(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<br>V <sub>m</sub> (V) | Max. Allowable voltage |           | Max. Peak Current(8/20μs) |               | Max. Energy<br>2ms<br>(J) | Max. Rated Power<br>(W) | Max. Clamping Voltage<br>V <sub>200A</sub> (V) | Typical Capacitance<br>@1KHZ<br>(PF) |
|-------------|---|------------------------|-----------|---------------------------|---------------|---------------------------|-------------------------|--|--------------------------------------|
|             |   | ACrms<br>(V)           | DC<br>(V) | 1time<br>(A)              | 2times<br>(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         | 550                       | 1.2                     | 1355   | 950                                  |
| TVR32911KG  | 910   | 550                    | 745       | 25000                     | 20000         | 620                       | 1.2                     | 1500   | 900                                  |
| TVR32951KG  | 950   | 575                    | 765       | 25000                     | 20000         | 660                       | 1.2                     | 1570   | 850                                  |
| TVR32102KG  | 1000  | 625                    | 825       | 25000                     | 20000         | 690                       | 1.2                     | 1650   | 800                                  |
| TVR32112KG  | 1100  | 680                    | 895       | 25000                     | 20000         | 760                       | 1.2                     | 1815   | 750                                  |
| TVR32122KG  | 1200  | 750                    | 1060      | 25000                     | 20000         | 800                       | 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<br>V <sub>m</sub> (V) | Max. Allowable voltage |           | Max. Peak Current(8/20μs) |               | Max. Energy<br>2ms<br>(J) | Max. Rated Power<br>(W) | Max. Clamping Voltage<br>V <sub>300A</sub> (V) | Typical Capacitance<br>@1KHZ<br>(PF) |
|-------------|---|------------------------|-----------|---------------------------|---------------|---------------------------|-------------------------|--|--------------------------------------|
|             |   | ACrms<br>(V)           | DC<br>(V) | 1time<br>(A)              | 2times<br>(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

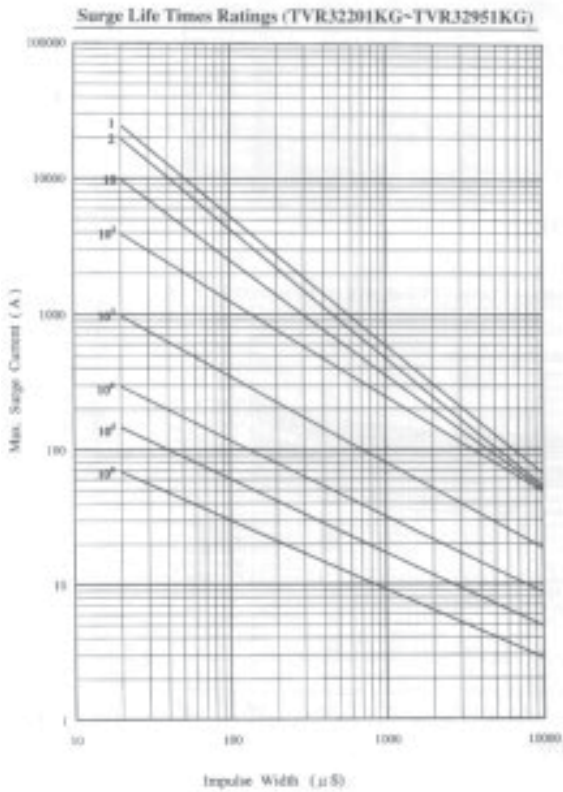
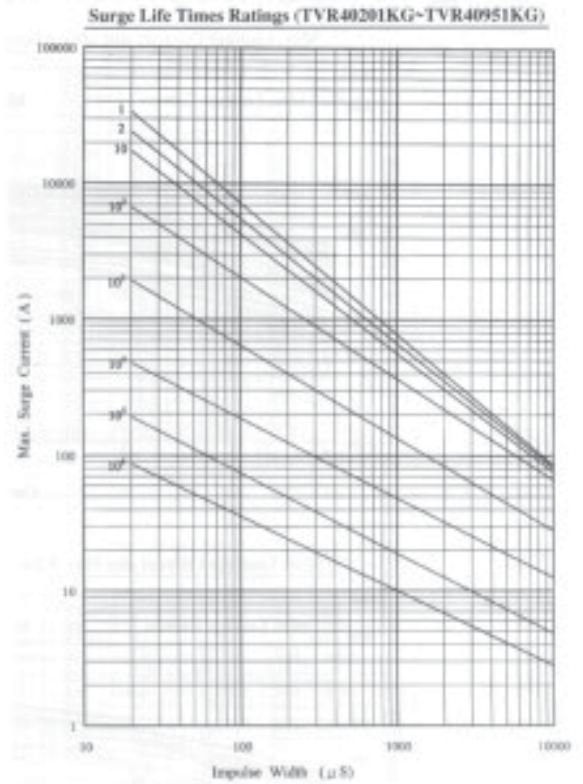
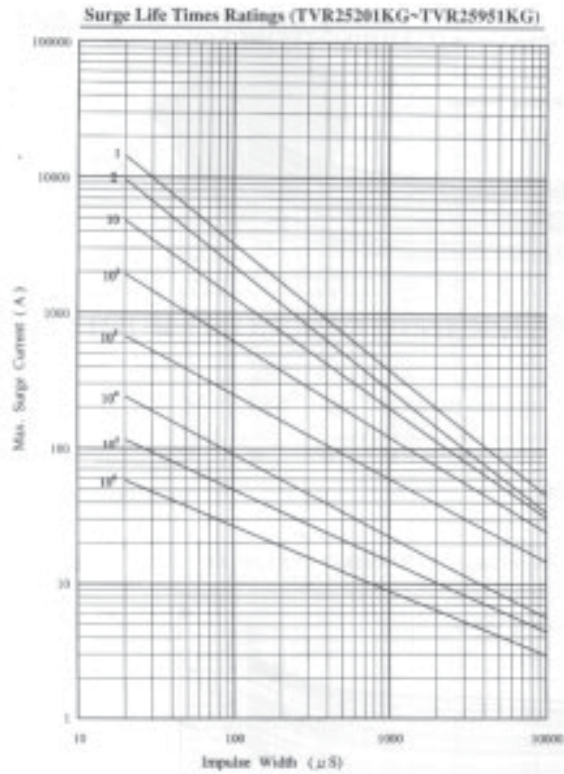
Storage Temperature: -40-110°C



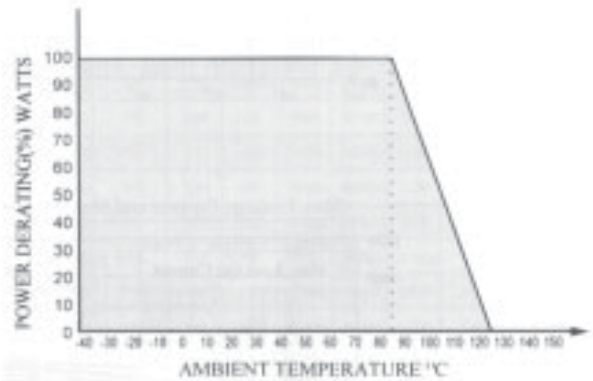




LIFE TIMES



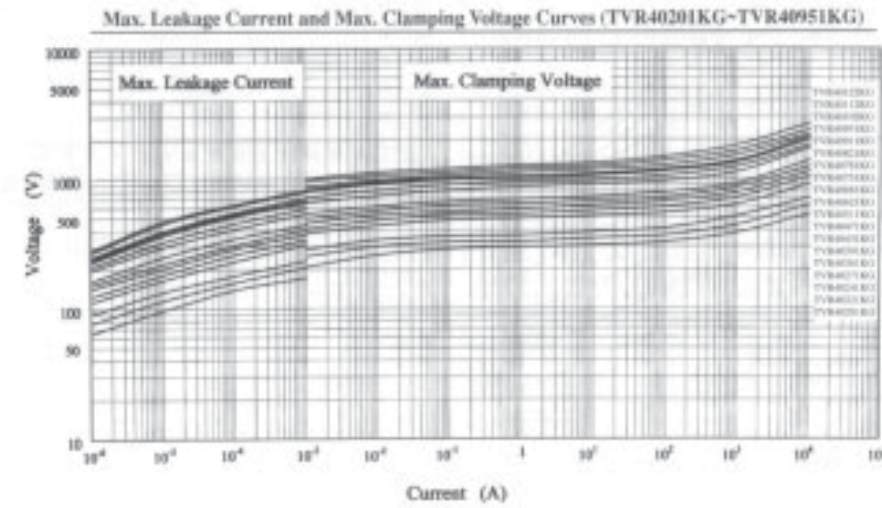
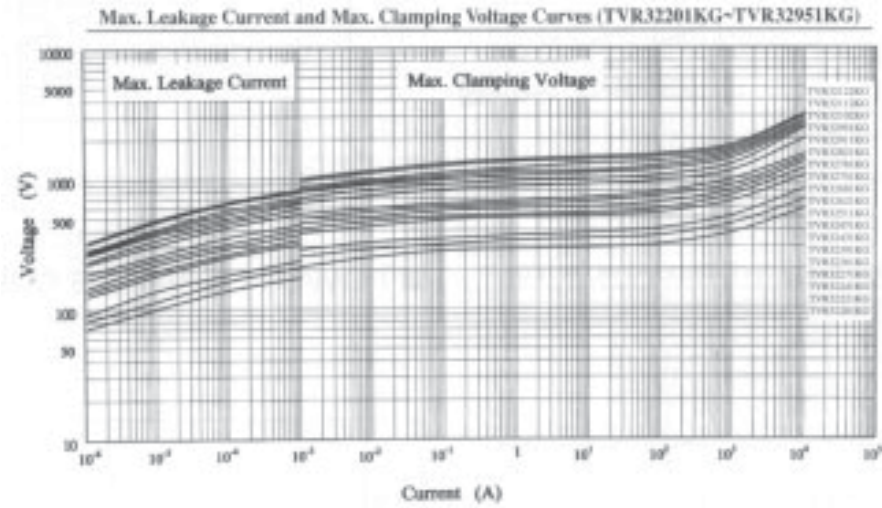
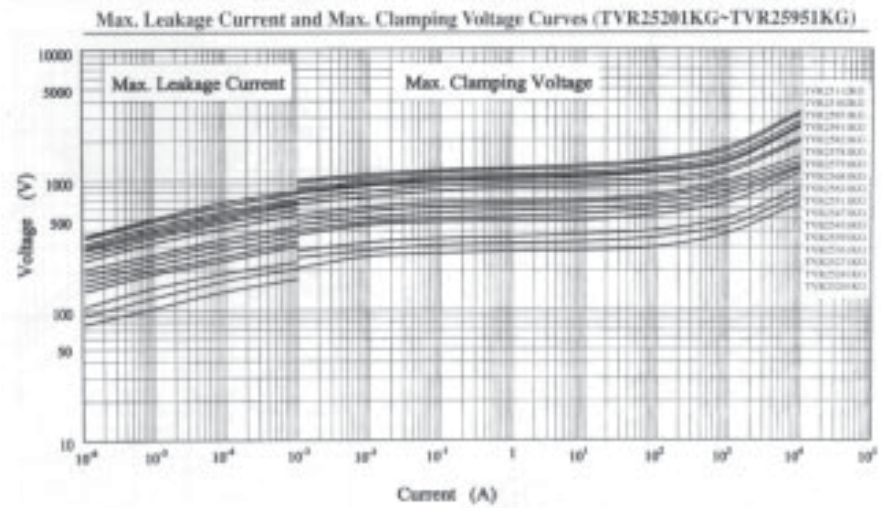
POWER DERATING CURVE







V-I CHARACTERISTIC CURVE





## ZINC OXIDE VARISTOR Q SERIES

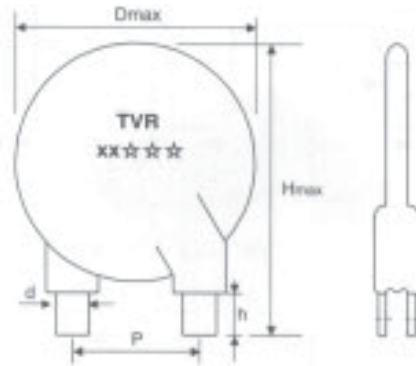
### TVR Q TYPE

#### 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                  | DC   | 1time                     | 2times | 2ms |                 |                                 |                                |
| 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                  | DC   | 1time                     | 2times | 2ms  |                 |                                 |                                |
| 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                           |

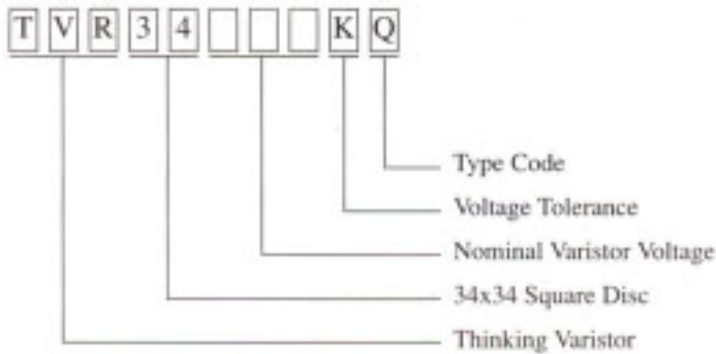
| Part Number | Normal Varistor Voltage VImA(V) | Max. Allowable voltage |      | Max. Peak Current(8/20µs) |        |      | Max. Energy (J) | Max. Clamping Voltage V500A (V) | Typical Capacitance @1KHZ (PF) |
|-------------|---------------------------------|------------------------|------|---------------------------|--------|------|-----------------|---------------------------------|--------------------------------|
|             |                                 | ACrms                  | DC   | 1time                     | 2times | 2ms  |                 |                                 |                                |
| 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:

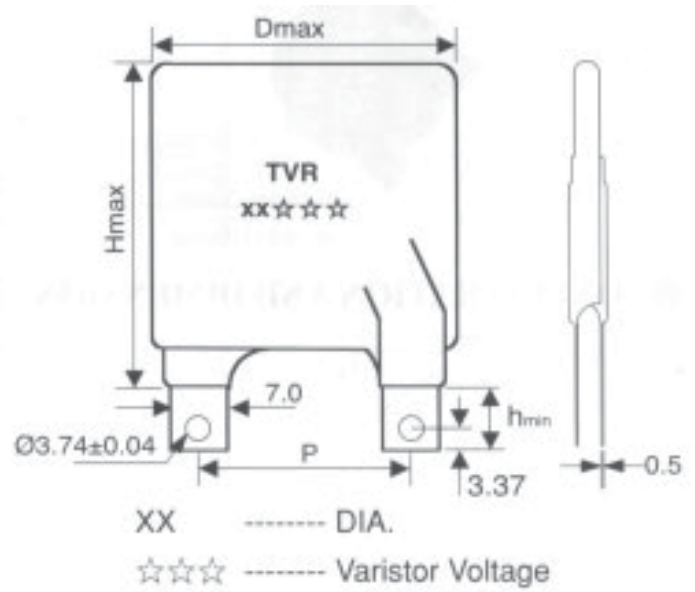
Operating Temperature: -40~85°C

Storage Temperature: -40~110°C

## PART NUMBER CODE



## CONFIGURATION AND DIMENSION

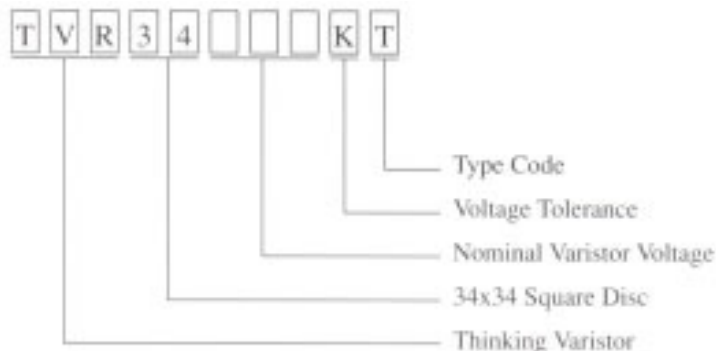


Unit: mm

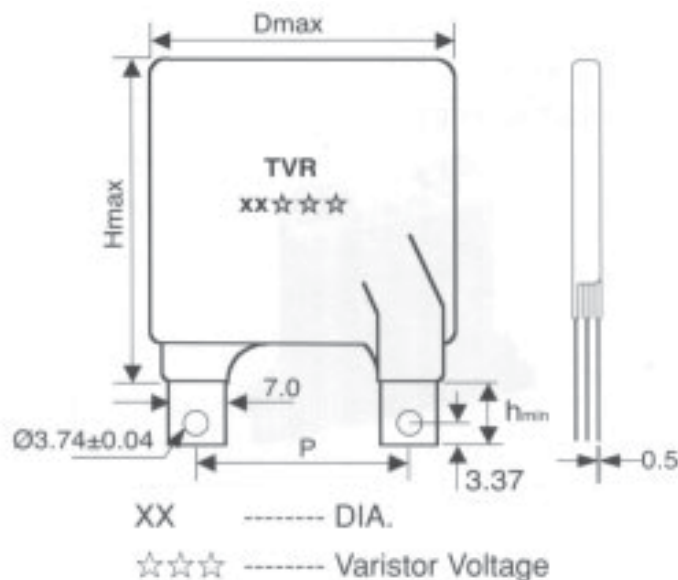
| Disc Ø | D max. | H max. | h min. | P±0.5 |
|--------|--------|--------|--------|-------|
| 34     | 38     | 43     | 10     | 25    |

| Part Number | Normal Varistor Voltage<br>VImA(V) | Max. Allowable voltage |           | Max. Peak Current(8/20µs) |               | Max. Energy<br>2ms<br>(J) | Rated Power<br>(W) | Max. Clamping Voltage<br>V300A<br>(V) | Typical Capacitance<br>@1KHZ<br>(PF) |
|-------------|------------------------------------|------------------------|-----------|---------------------------|---------------|---------------------------|--------------------|---------------------------------------|--------------------------------------|
|             |                                    | ACrms<br>(V)           | DC<br>(V) | 1time<br>(A)              | 2times<br>(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



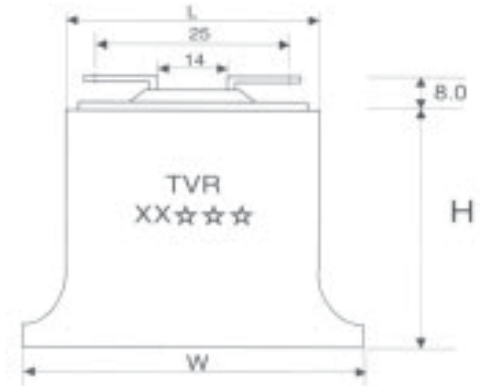
| Unit: mm |        |        |        |       |
|----------|--------|--------|--------|-------|
| Disc Ø   | D max. | H max. | h min. | P±0.5 |
| 34       | 38     | 43     | 10     | 25    |

| Part Number | Normal Varistor Voltage<br>VImA(V) | Max. Allowable voltage |           | Max. Peak Current(8/20µs) |               | Max. Energy<br>2ms<br>(J) | Rated Power<br>(W) | Max. Clamping Voltage<br>V500A<br>(V) | Typical Capacitance<br>@1KHZ<br>(PF) |
|-------------|------------------------------------|------------------------|-----------|---------------------------|---------------|---------------------------|--------------------|---------------------------------------|--------------------------------------|
|             |                                    | ACrms<br>(V)           | DC<br>(V) | 1time<br>(A)              | 2times<br>(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 |                 |                  |                             |                           |
|             |                         | VimA(V)                | (V) | (V)                       | (A)    |                 |                  |                             |                           |
| 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

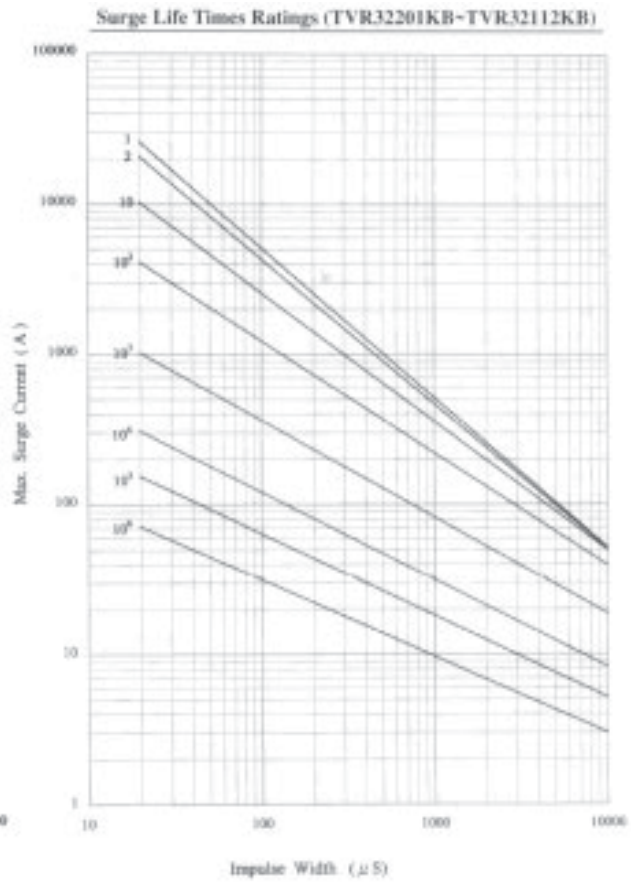
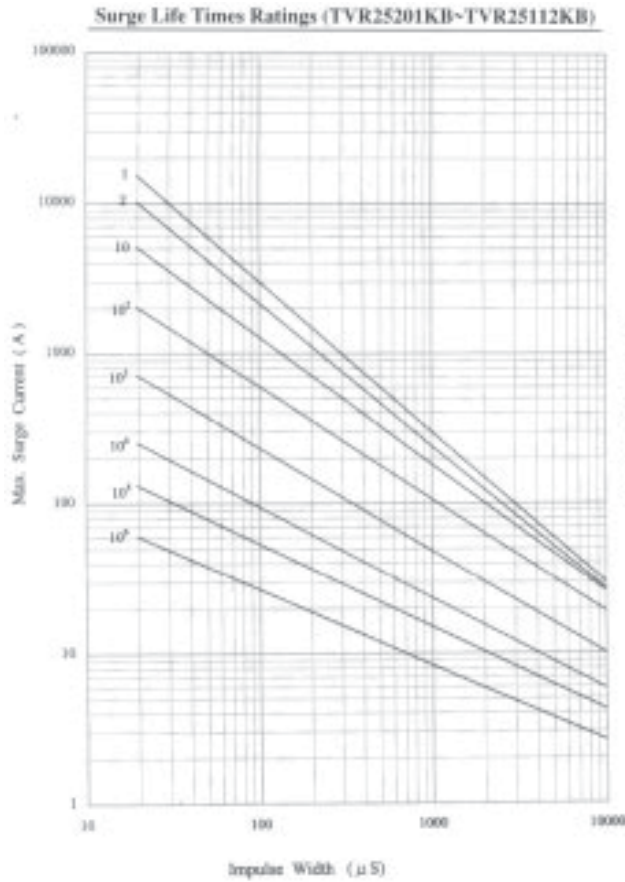
## 320 SERIES

| 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 |                 |                  |                             |                           |
|             |                         | VimA(V)                | (V)  | (V)                       | (A)    |                 |                  |                             |                           |
| 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                       |

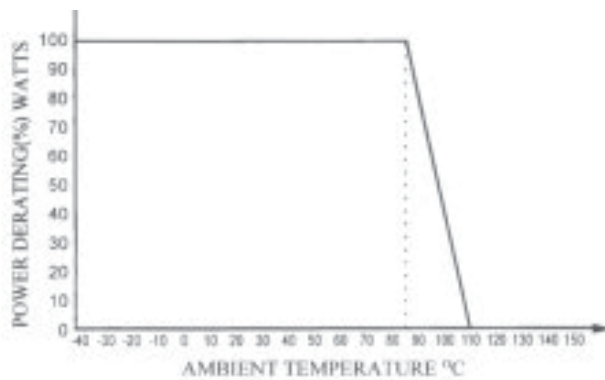




LIFE TIMES



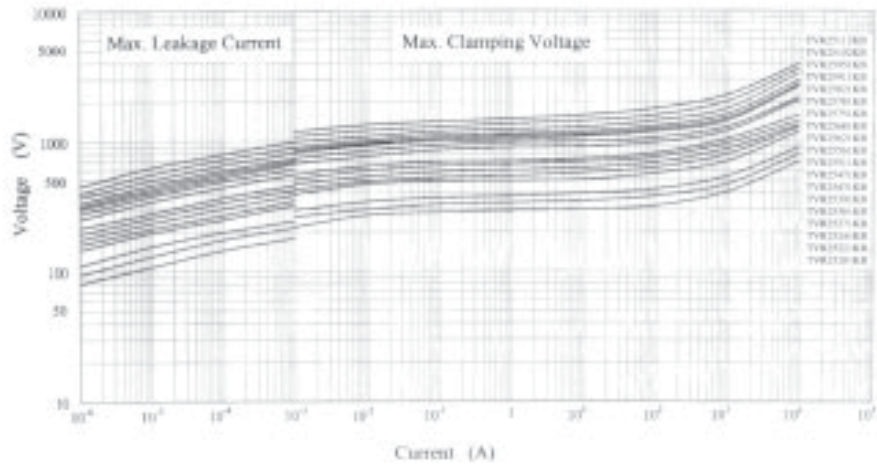
POWER DERATING CURVE



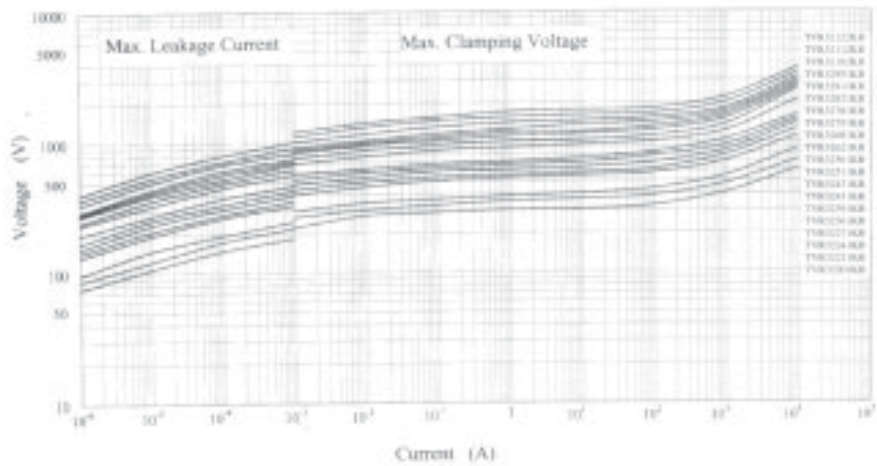


V-I CHARACTERISTIC CURVE

Max. Leakage Current and Max. Clamping Voltage Curves (TVR25201KB-TV25112KB)

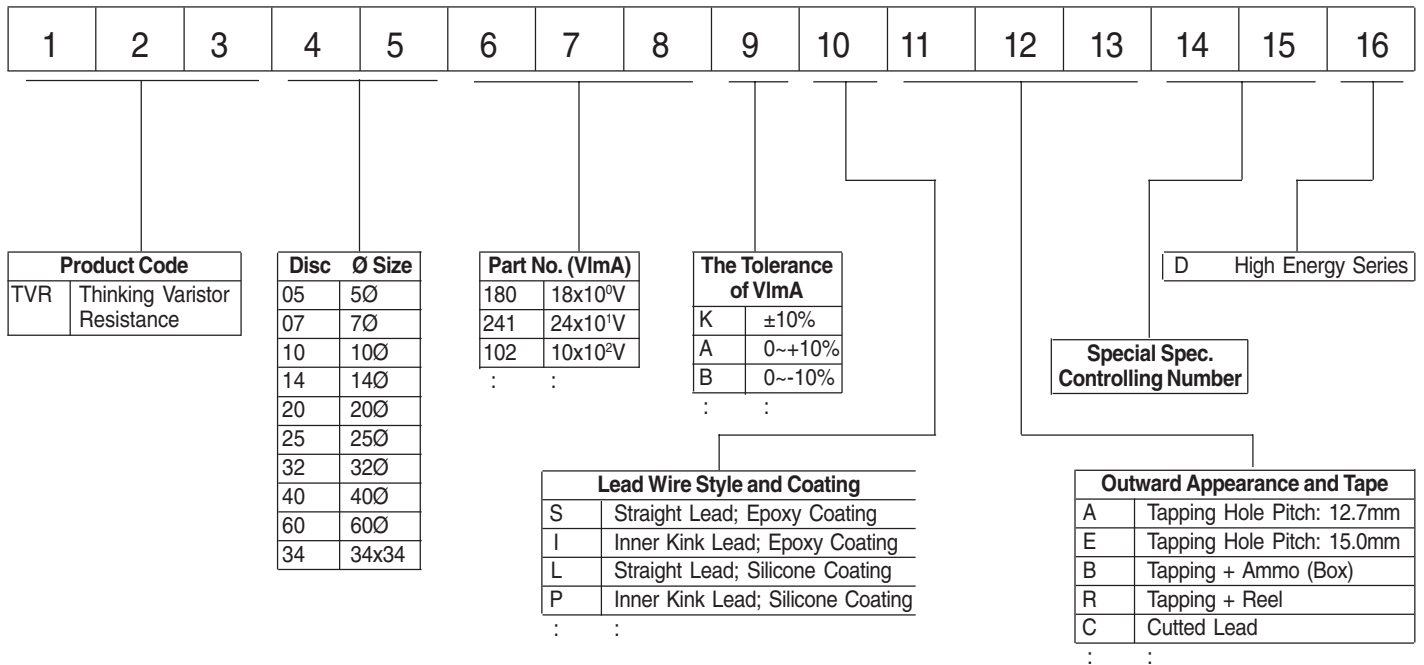


Max. Leakage Current and Max. Clamping Voltage Curves (TVR32201KB-TV32112KB)





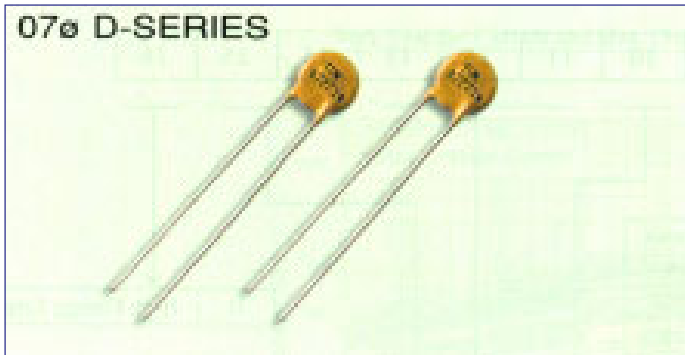
## TVR-D SERIES Part Number Code



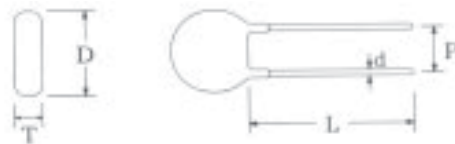


## ZINC OXIDE VARISTOR 07Ø SERIES D-SERIES

### 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 <sub>DC</sub> | 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

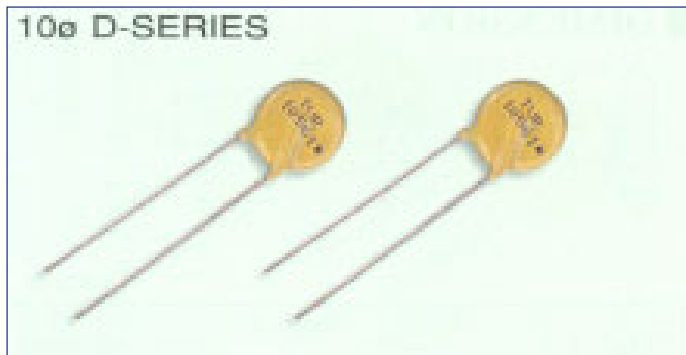
Storage Temperature: -40°C~125°C



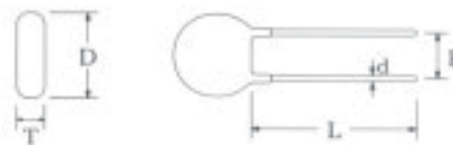


# ZINC OXIDE VARISTOR 100 SERIES D-SERIES

## 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 <sub>DC</sub> | 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

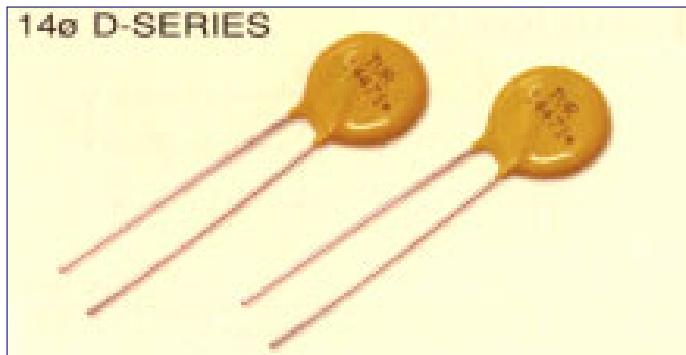
Storage Temperature: -40°C~125°C



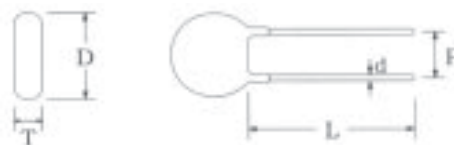


## ZINC OXIDE VARISTOR 1400 SERIES D-SERIES

### 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 @ImADC | 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                   |

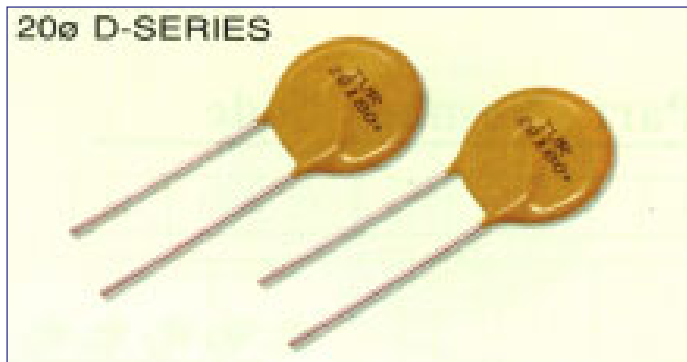
Operating Temperature: -40°C~85°C

Storage Temperature: -40°C~125°C

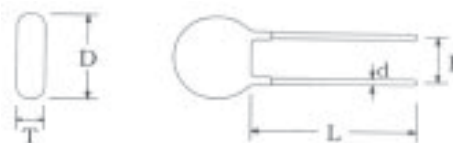


## ZINC OXIDE VARISTOR 20Ø D-SERIES

### 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

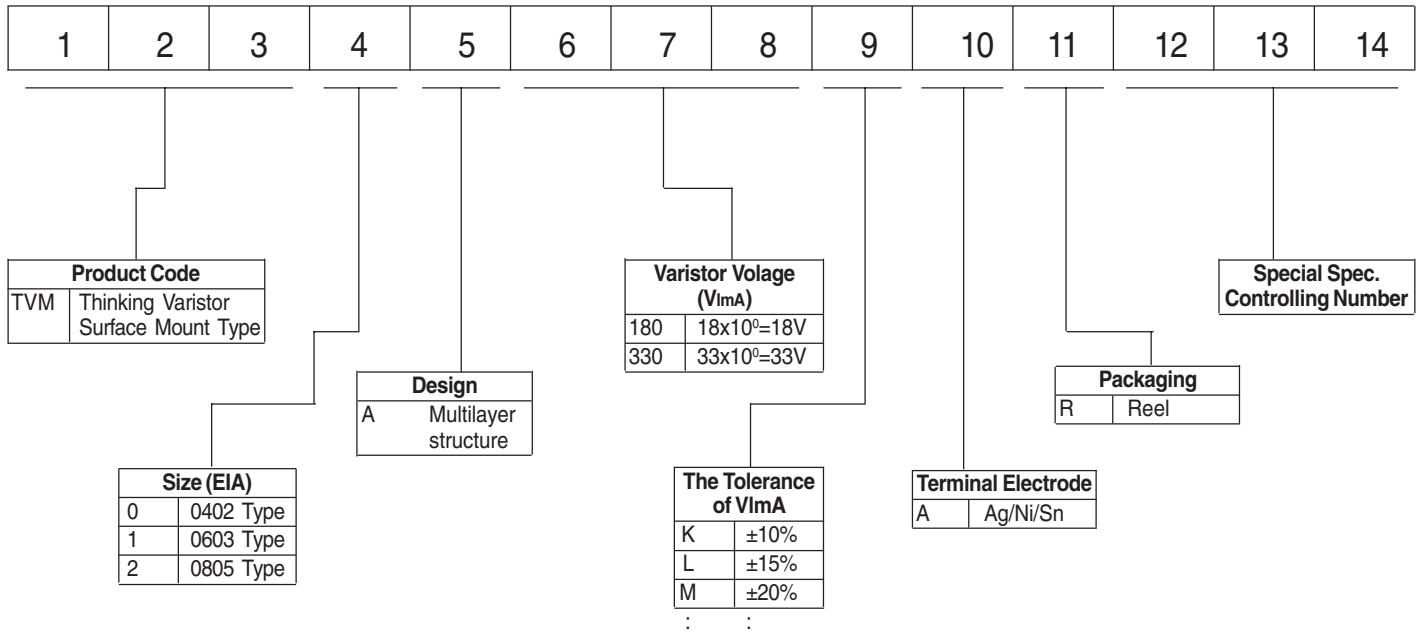
| Part Number | Normal Varistor Voltage @1mA DC | Max. Allowable Voltage |        | Max. Clamping Voltage @100A (8/20µs) (V) | Max. Peak Current (8/20µs) |            | Rated Power (W) | Max. Energy 10/1000µs (J) | Reference Capacitance @1KHZ (pf) |
|-------------|---------------------------------|------------------------|--------|--|----------------------------|------------|-----------------|---------------------------|----------------------------------|
|             |                                 | AC rms (V)             | DC (V) |  | 1time (A)                  | 2times (A) |                 |                           |                                  |
| 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



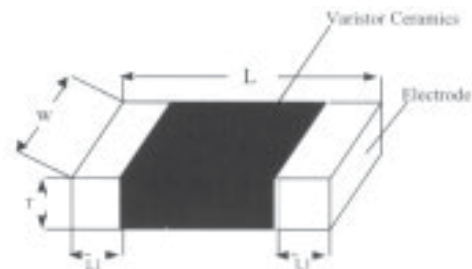
# TVM-SERIES Part Number Code







## ZINC OXIDE VARISTOR 0402 SERIES



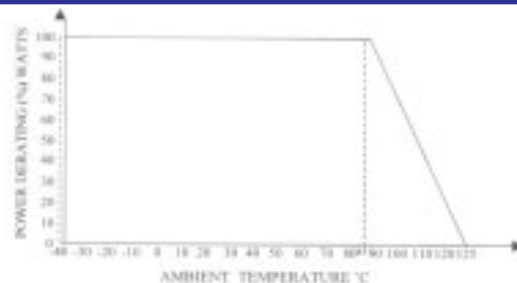
### DIMENSION

| 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 <sub>ImA</sub> | (±%) | V <sub>AC</sub>        | V <sub>DC</sub> | V <sub>P</sub>                 | I <sub>p</sub> | I <sub>max</sub>            | W <sub>max</sub>        | 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                          |

### OPERATING TEMPERATURE VS POWER DERATING CURVE

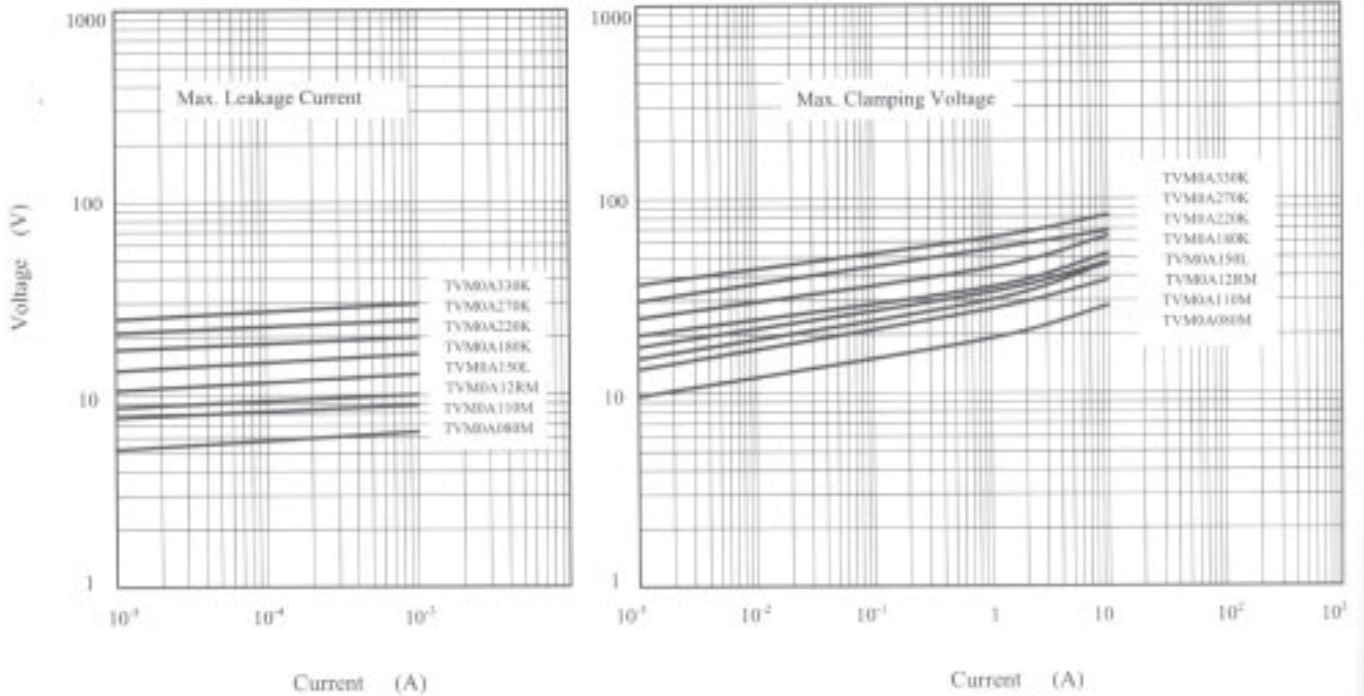


|   |                |
|---|----------------|
| Nonlinearity exponent ( $\alpha$ )            | $\geq 20$      |
| Leakage Current (IL) at 25°C, V <sub>dc</sub> | $\leq 20\mu A$ |



MAX. LEAKAGE CURRENT AND MAX. CLAMPING VOLTAGE CURVES

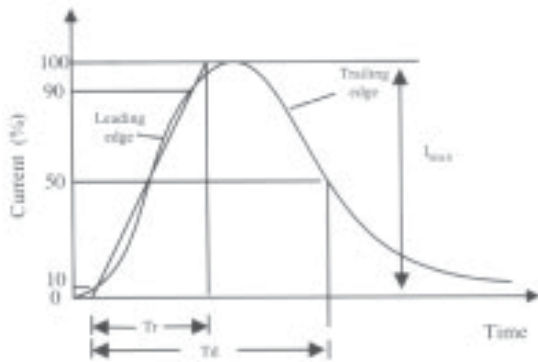
TVM0A080M~TVM0A330K



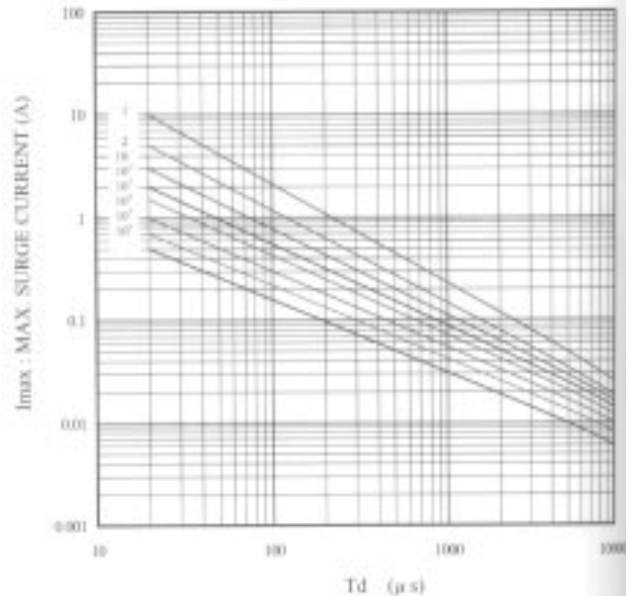
SURGE CURRENT STANDARD WAVEFORM

MAX. SURGE CURRENT DERATING CURVES

EXAMPLE:  $8/20\mu\text{s}$   
 $T_r = 8\mu\text{s}$   
 $T_d = 20\mu\text{s}$

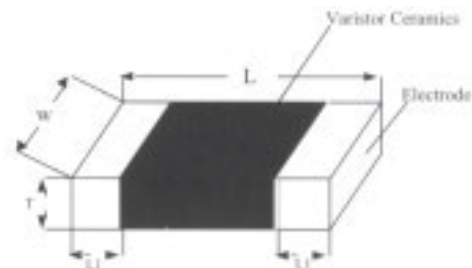


TVM0A080M~TVM0A330K





## ZINC OXIDE VARISTOR 0603 SERIES



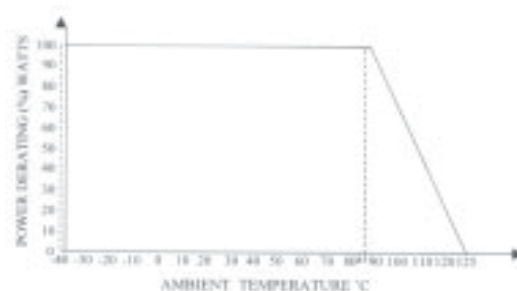
### DIMENSION

| 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 <sub>mA</sub> (V) | (±%) | V <sub>AC</sub> (V)    | V <sub>DC</sub> (V) | V <sub>P</sub> (VP)            | I <sub>p</sub> (A) | I <sub>max</sub> (A)        | W <sub>max</sub> (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

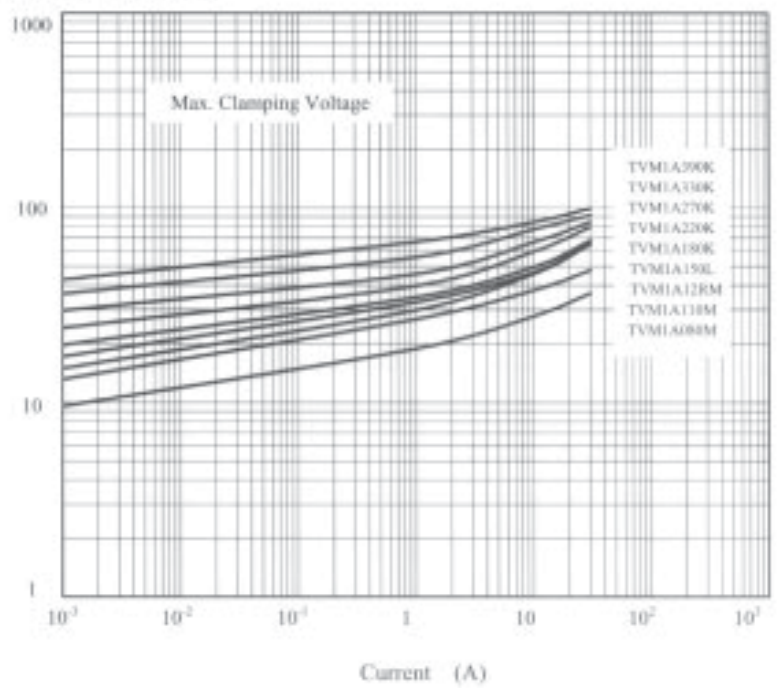
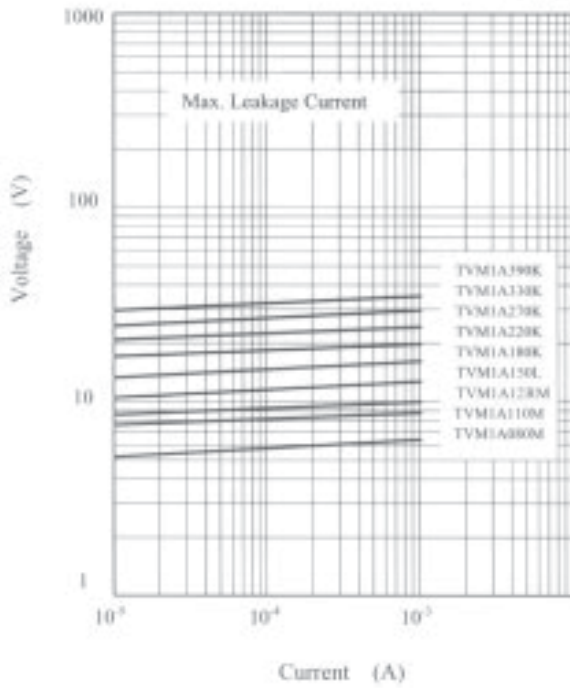


|                                    |                |
|------------------------------------|----------------|
| Nonlinearity exponent ( $\alpha$ ) | $\geq 20$      |
| Leakage Current (IL) at 25°C, Vdc  | $\leq 20\mu A$ |



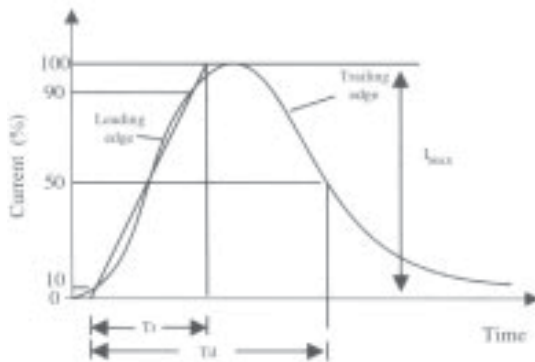
MAX. LEAKAGE CURRENT AND MAX. CLAMPING VOLTAGE CURVES

TVM1A080M-TVM1A390K



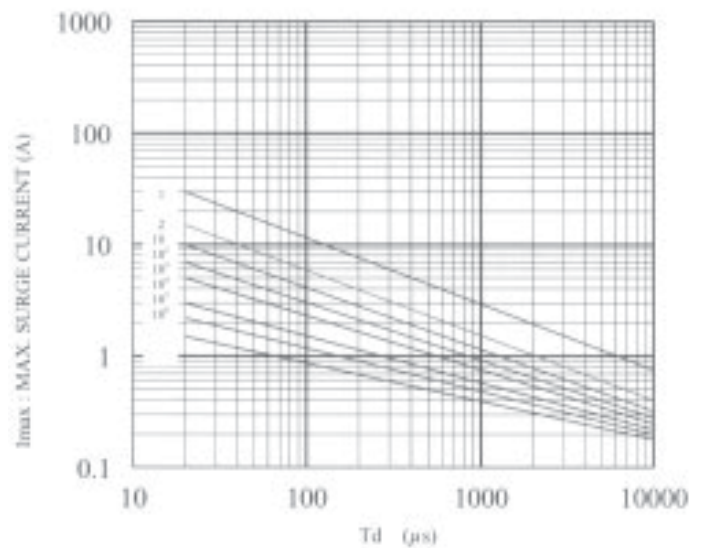
SURGE CURRENT STANDARD WAVEFORM

EXAMPLE: 8/20 $\mu$ S  
Tr = 8 $\mu$ S  
Td = 20 $\mu$ S



MAX. SURGE CURRENT DERATING CURVES

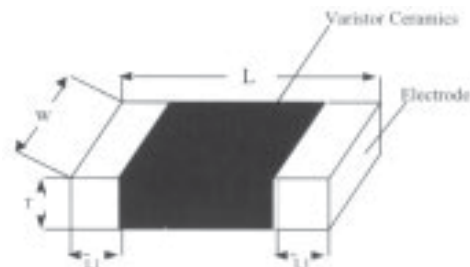
TVM1A080M-TVM1A390K







## ZINC OXIDE VARISTOR 0805 SERIES



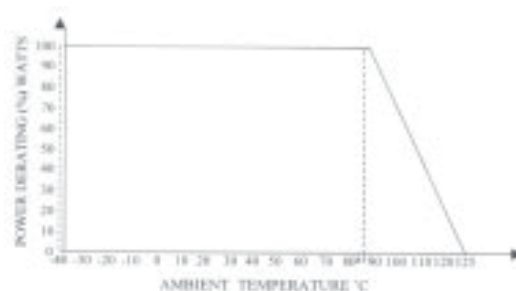
### DIMENSION

| 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 <sub>mA</sub> (V) | (±%) | VAC (V)                | VDC (V) | V <sub>P</sub> (VP)            | I <sub>p</sub> (A) | I <sub>max</sub> (A)        | W <sub>max</sub> (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

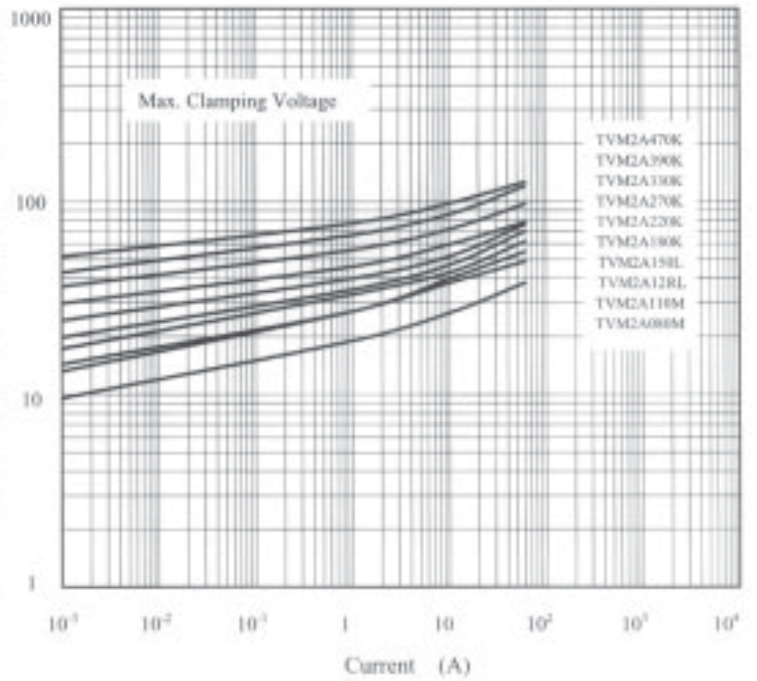
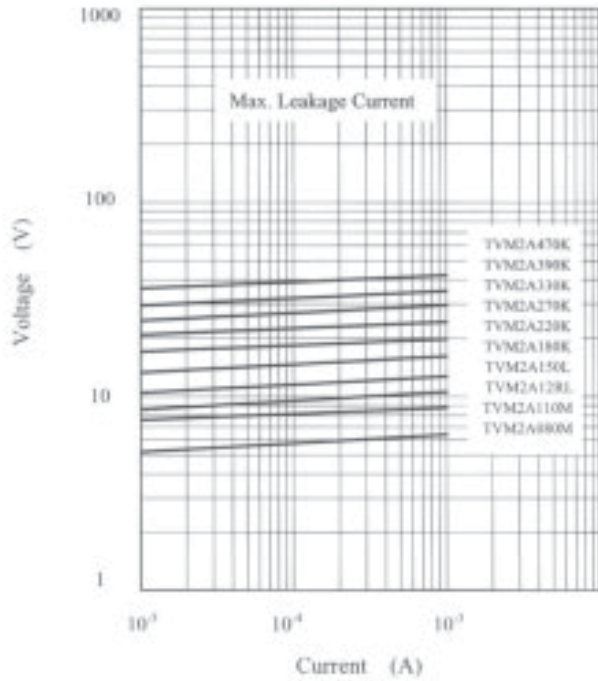


|                                    |                |
|------------------------------------|----------------|
| Nonlinearity exponent ( $\alpha$ ) | $\geq 20$      |
| Leakage Current (IL) at 25°C, Vdc  | $\leq 20\mu A$ |



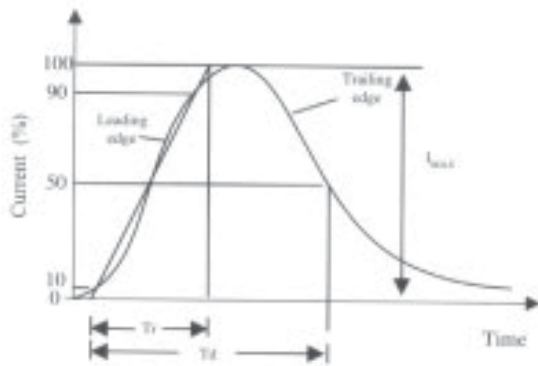
MAX. LEAKAGE CURRENT AND MAX. CLAMPING VOLTAGE CURVES

TVM2A080M-TVM2A470K



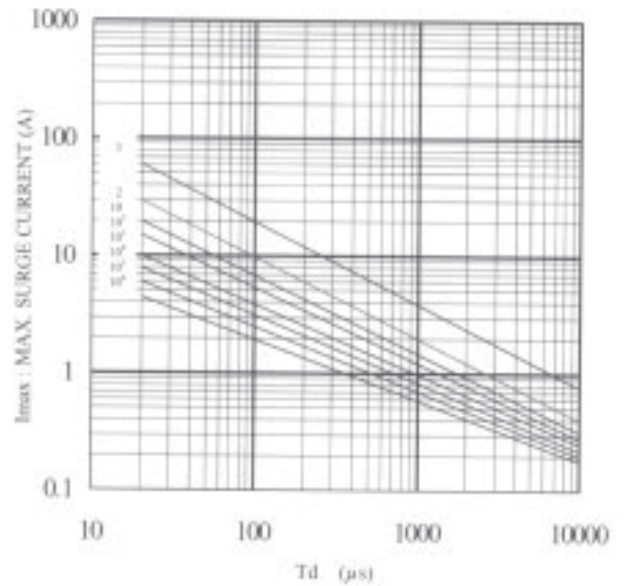
SURGE CURRENT STANDARD WAVEFORM

EXAMPLE: 8/20 $\mu$ S  
 Tr = 8 $\mu$ S  
 Td = 20 $\mu$ S



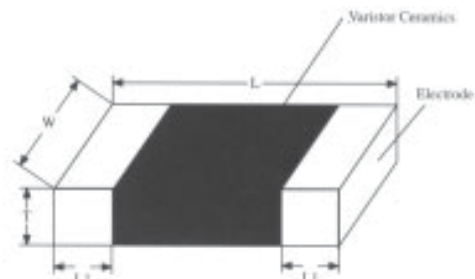
MAX. SURGE CURRENT DERATING CURVES

TVM2A080M-TVM2A470K





## ZINC OXIDE VARISTOR 1206 SERIES



### DIMENSION

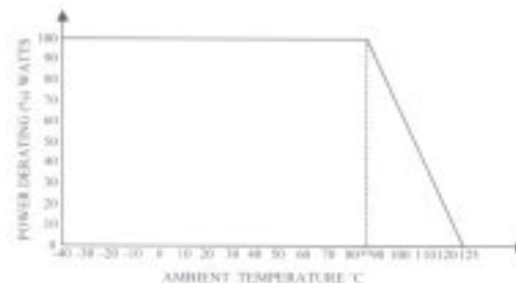
Unit: mm

| 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 <sub>mA</sub><br>(V)  | V <sub>AC</sub><br>(V) | V <sub>DC</sub><br>(V) | V <sub>P</sub><br>(V)          | I <sub>P</sub><br>(A) | I <sub>max</sub><br>(A)     | W <sub>max</sub><br>(J) | P<br>(W)   | C<br>(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

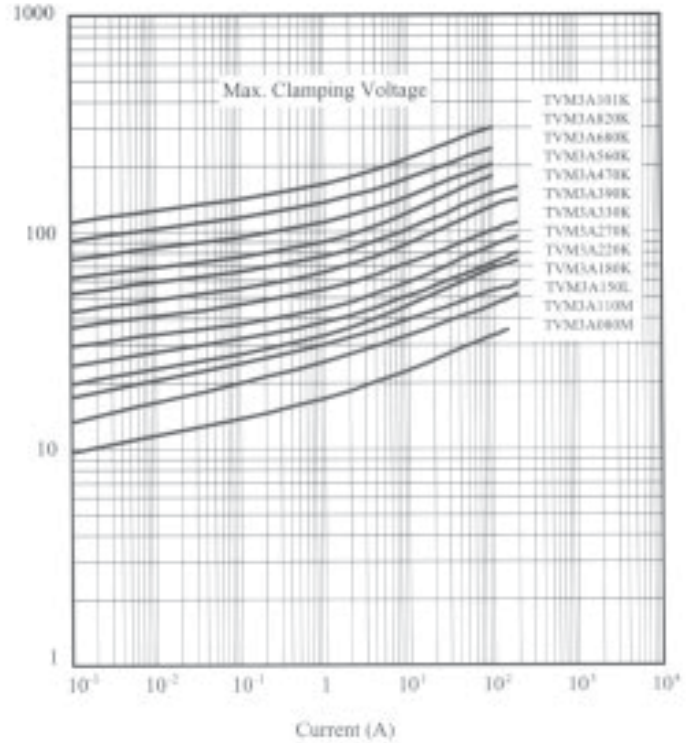
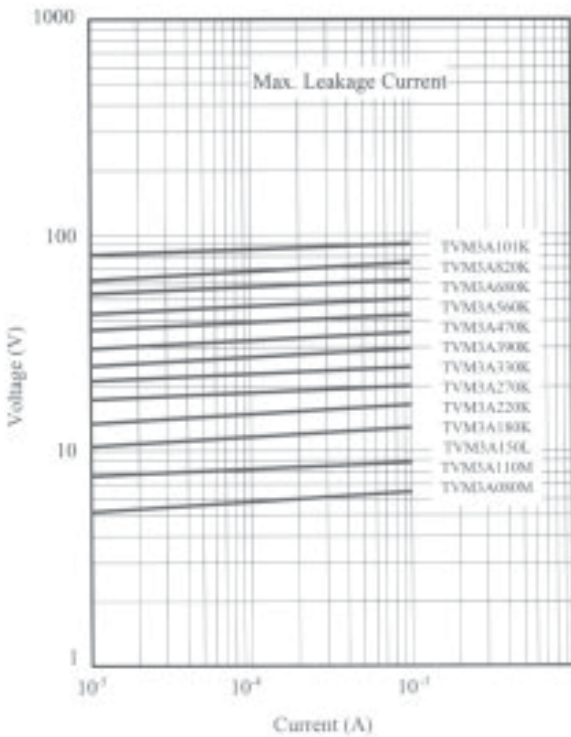


|                                    |                      |
|------------------------------------|----------------------|
| Nonlinearity exponent ( $\alpha$ ) | $\geq 15$            |
| Leakage Current (IL) at 25°C, Vdc  | $\leq 20\mu\text{A}$ |



MAX. LEAKAGE CURRENT AND MAX. CLAMPING VOLTAGE CURVES

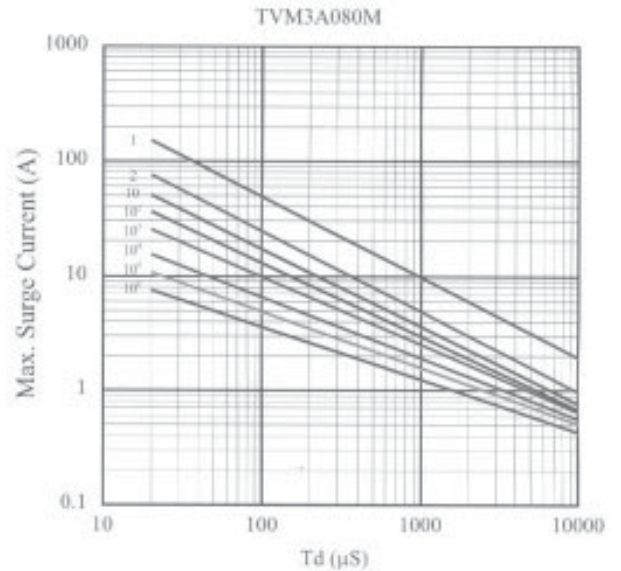
TVM3A080M ~ TVM3A101K



SURGE CURRENT STANDARD WAVEFORM

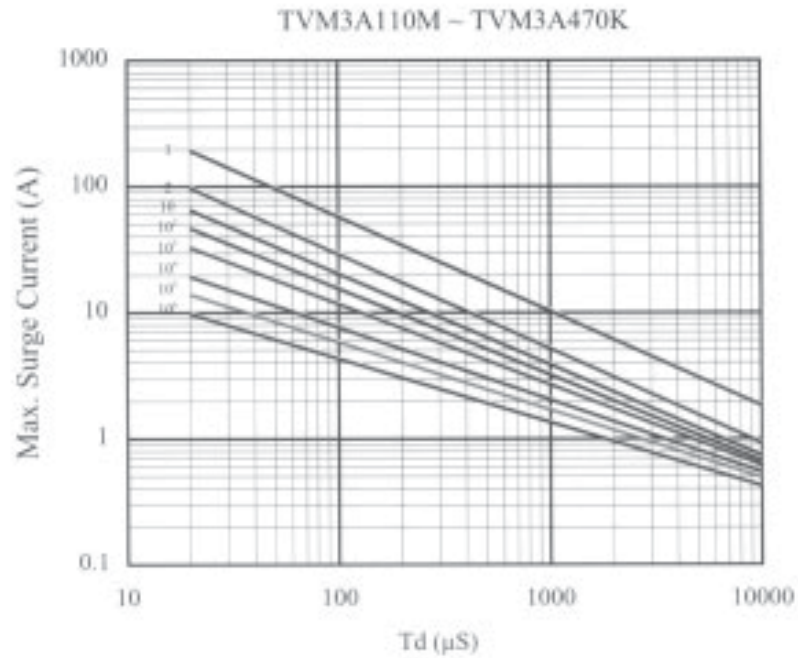
MAX. SURGE CURRENT DERATING CURVES

EXAMPLE: 8/20 $\mu$ S  
 Tr = 8 $\mu$ S  
 Td = 20 $\mu$ S

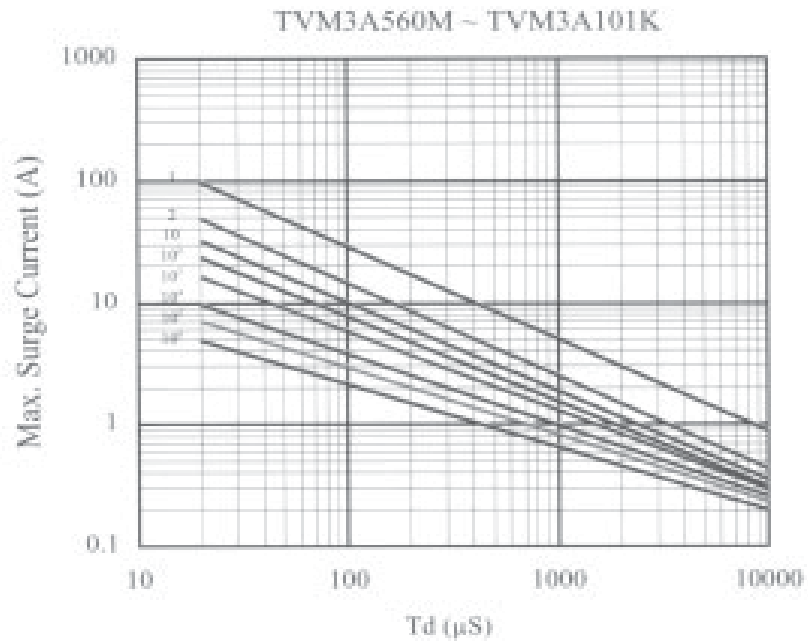




MAX. SURGE CURRENT DERATING CURVES



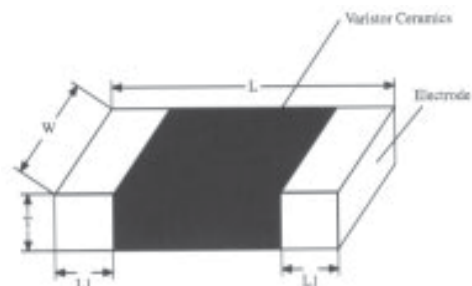
MAX. SURGE CURRENT DERATING CURVES







## ZINC OXIDE VARISTOR 1210 SERIES



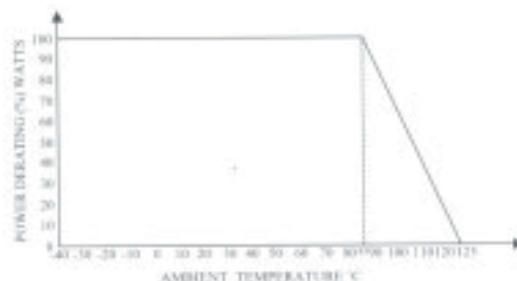
### DIMENSION

| 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 <sub>max</sub> (A)        | W <sub>max</sub> (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

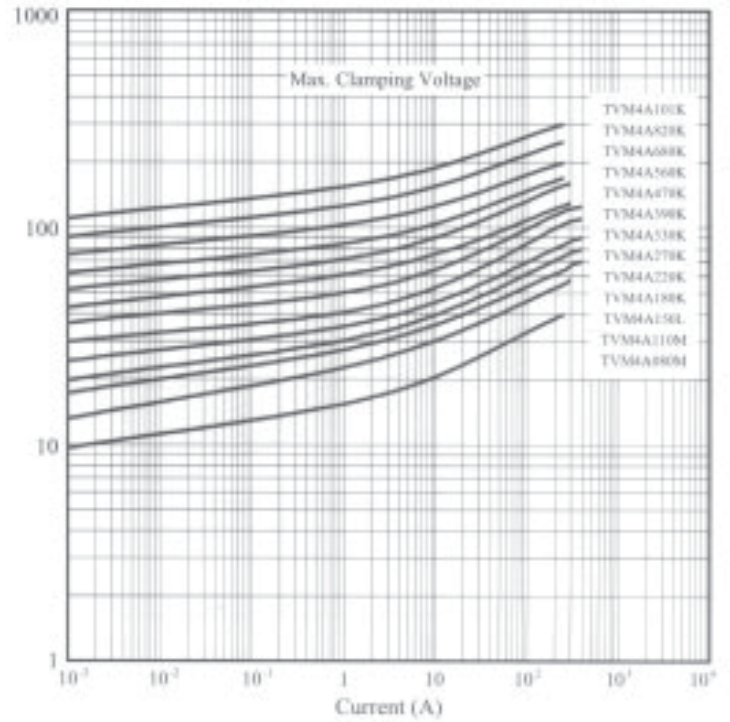
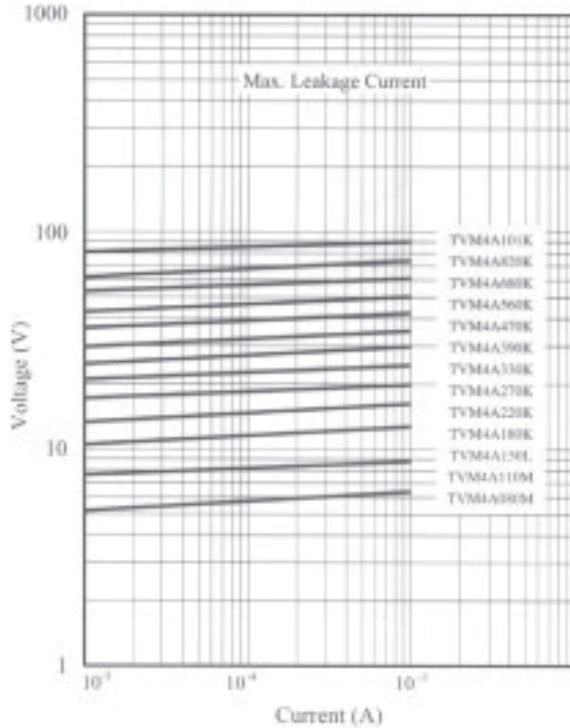


|                                    |                      |
|------------------------------------|----------------------|
| Nonlinearity exponent ( $\alpha$ ) | $\geq 15$            |
| Leakage Current (IL) at 25°C, Vdc  | $\leq 20\mu\text{A}$ |



MAX. LEAKAGE CURRENT AND MAX. CLAMPING VOLTAGE CURVES

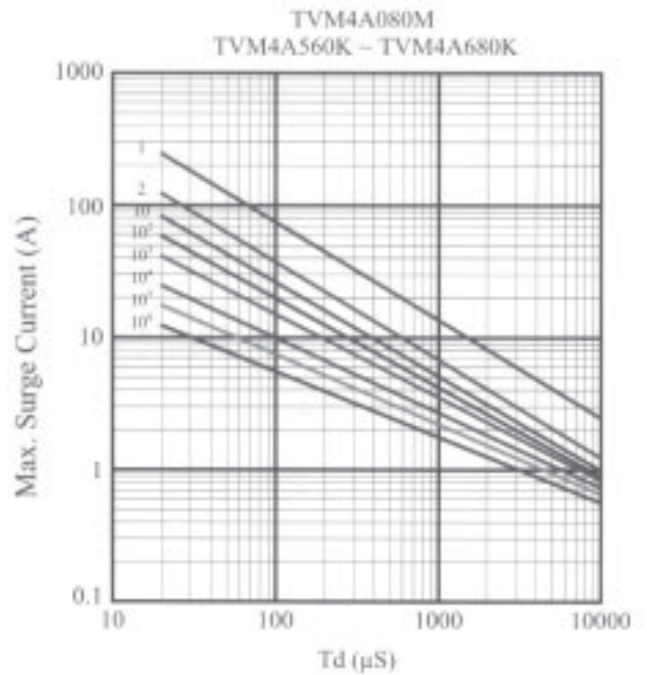
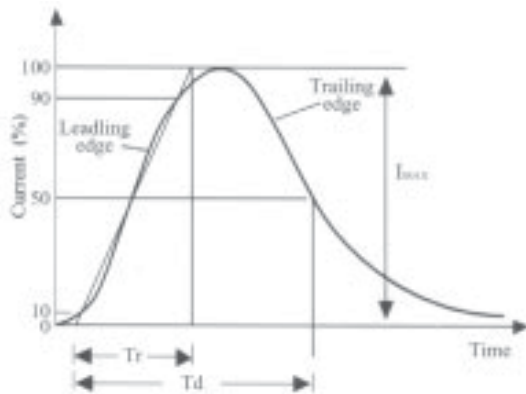
TVM4A080M – TVM4A101K



SURGE CURRENT STANDARD WAVEFORM

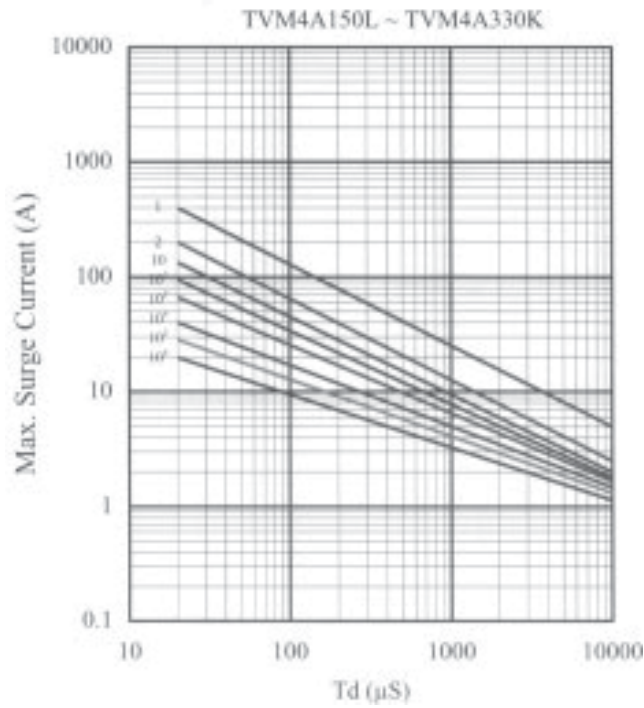
MAX. SURGE CURRENT DERATING CURVES

EXAMPLE: 8/20 $\mu$ S  
 Tr = 8 $\mu$ S  
 Td = 20 $\mu$ S

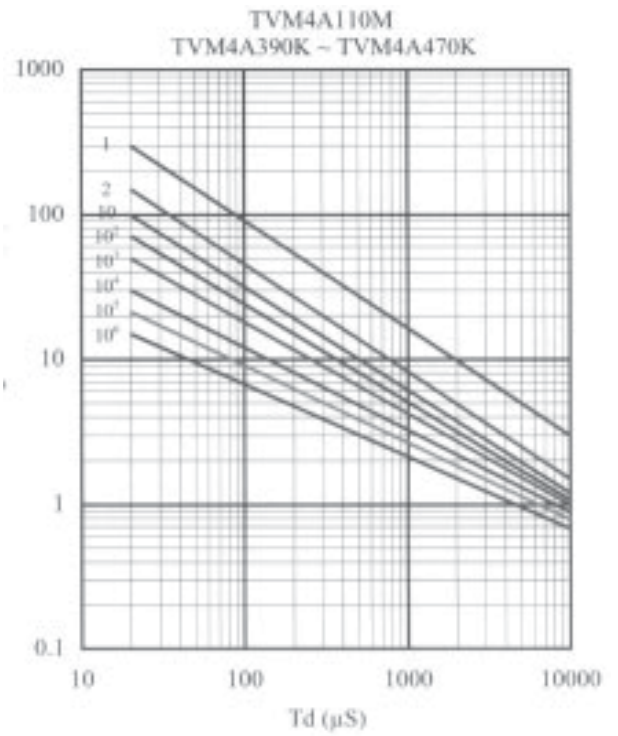




MAX SURGE CURRENT DERATING CURVES



MAX SURGE CURRENT DERATING CURVES



MAX SURGE CURRENT DERATING CURVES

