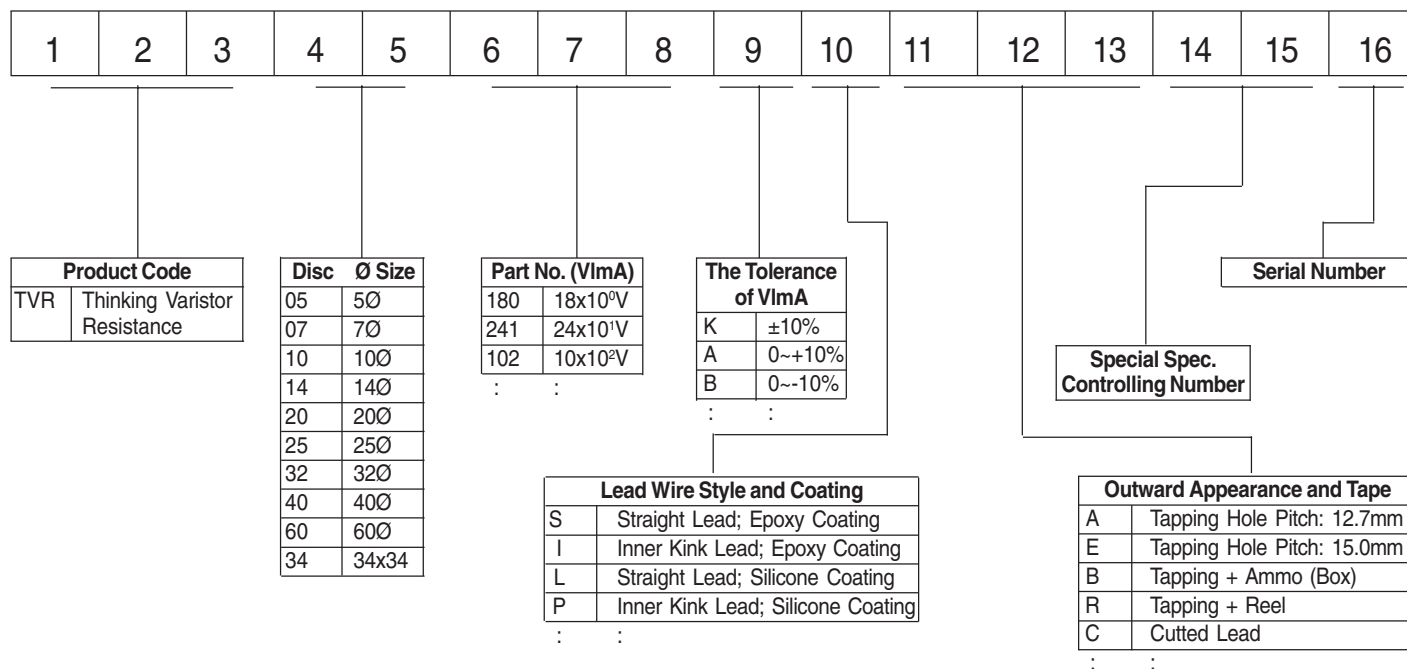
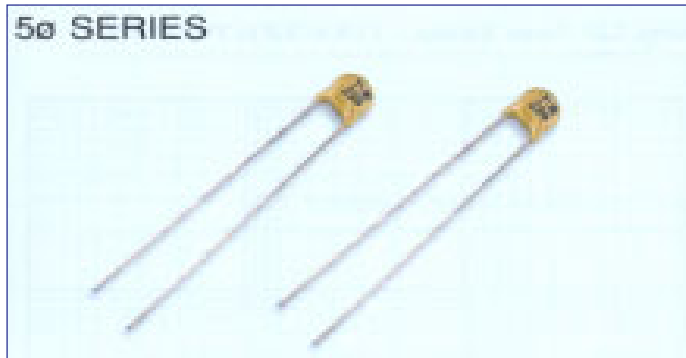


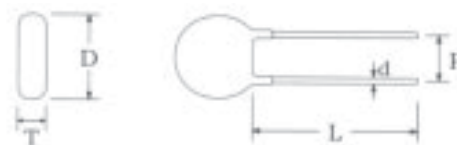


## TVR-SERIES Part Number Code





## DIMENSION



Unit: mm

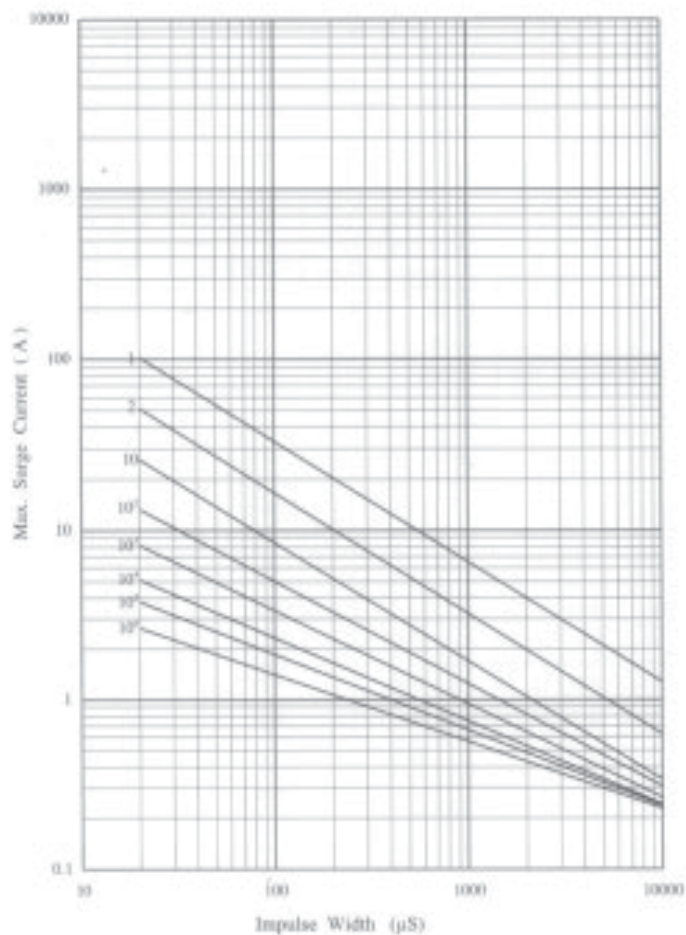
| Disc Ø | D max. | L min. | d nor.   | P nor. |
|--------|--------|--------|----------|--------|
| 5      | 7.5    | 30     | 0.6±0.02 | 5±1    |

## SPECIFICATION

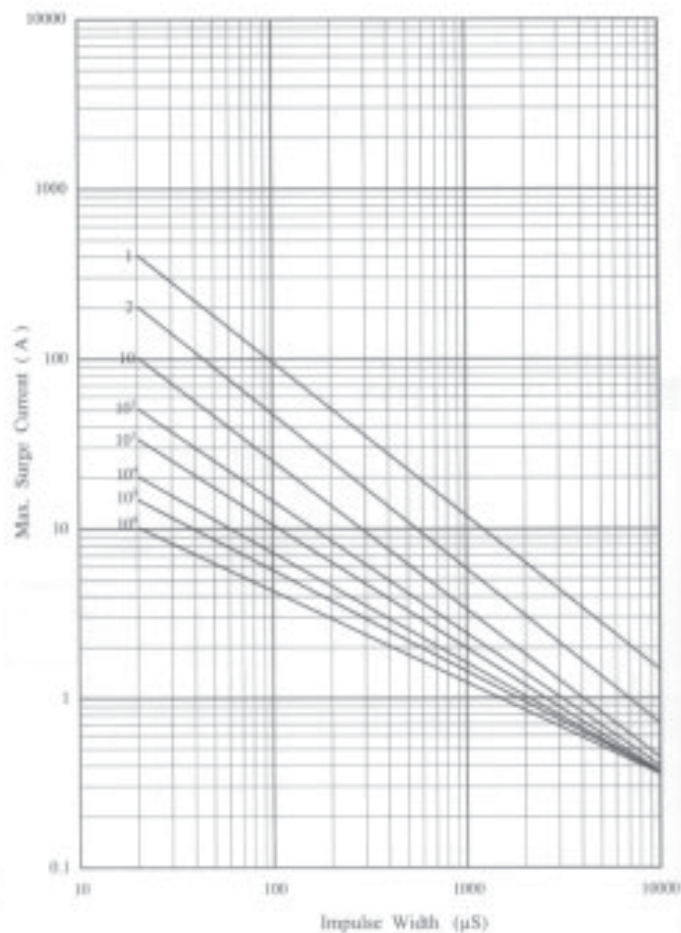
| Part No    | Varistor<br>Voltage | Max.<br>Allowable<br>Voltage |     | Max.<br>Clamping<br>Voltage |     | Max.<br>Energy | Max.<br>Peak<br>Current<br>(8/20µs) |        | Rated<br>Power | Reference<br>Capacitance | Dimensions      |
|------------|---------------------|------------------------------|-----|-----------------------------|-----|----------------|--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

## LIFE TIMES

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

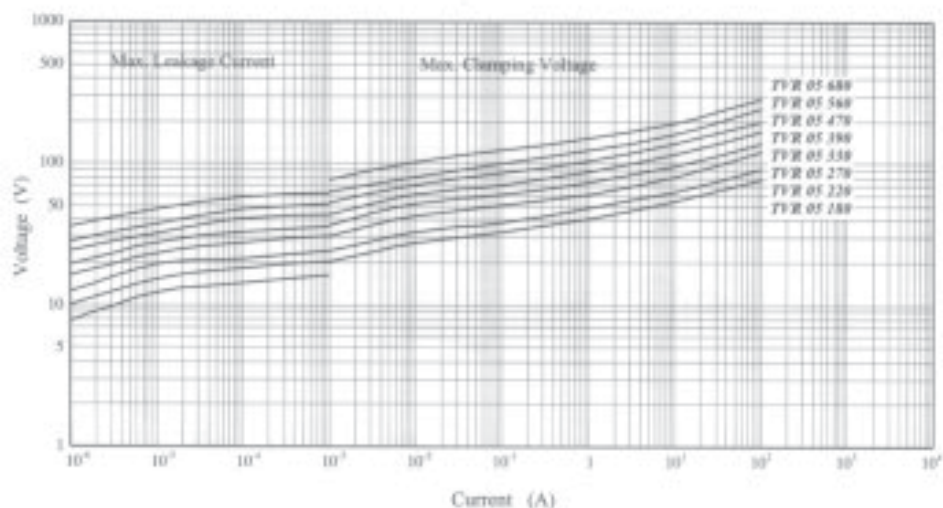


Surge Life Times Ratings ( TVR 05 820 to TVR 05 471 )

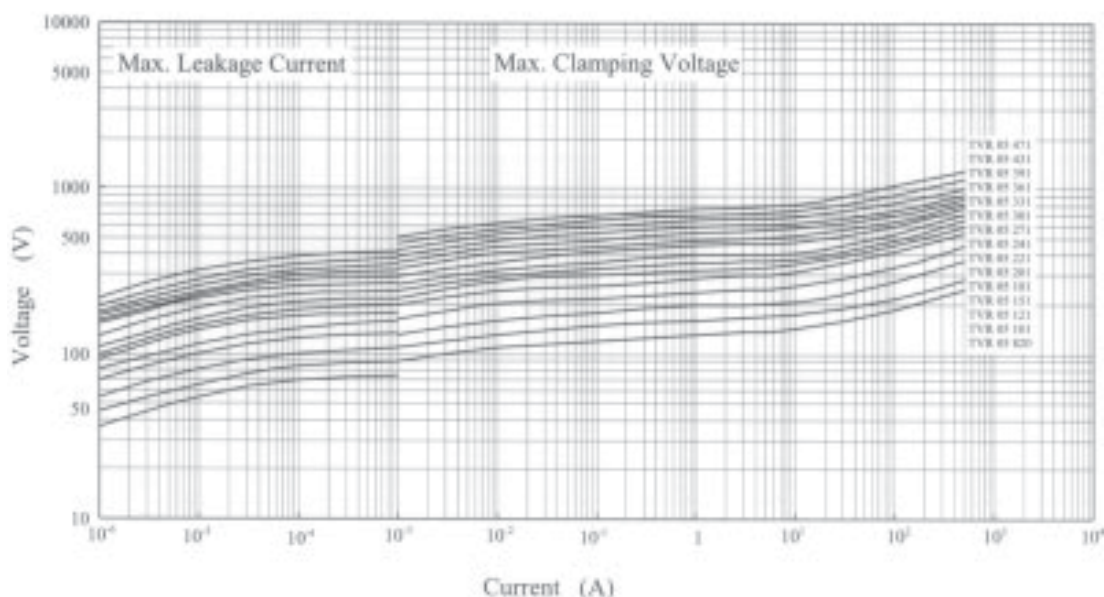


## V-I CHARACTERISTIC CURVE

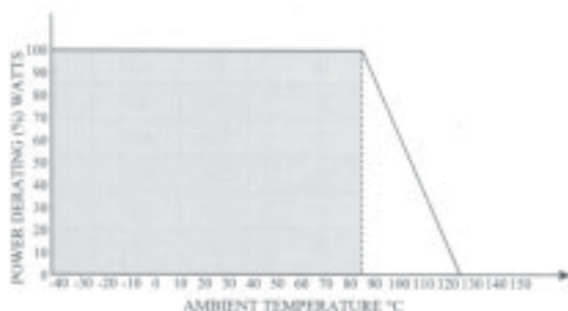
Max. Leakage Current and Max. Clamping Voltage Curves ( TVR 05 180 to TVR 05 680 )



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



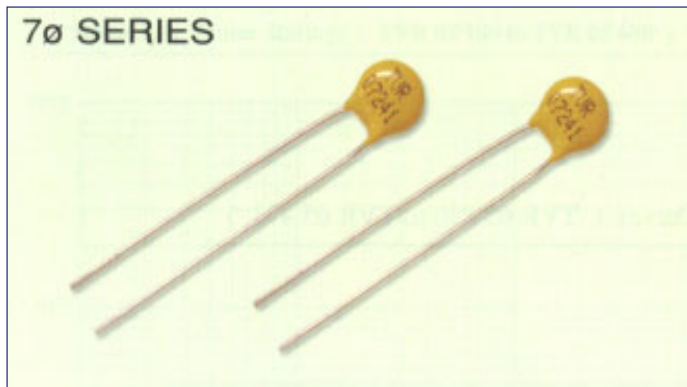
## POWER DERATING CURVE



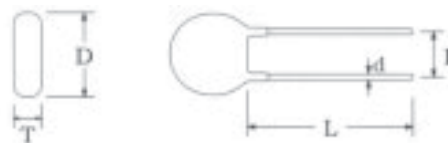


## ZINC OXIDE VARISTOR 7Ø SERIES

### 7Ø SERIES



### DIMENSION



Unit: mm

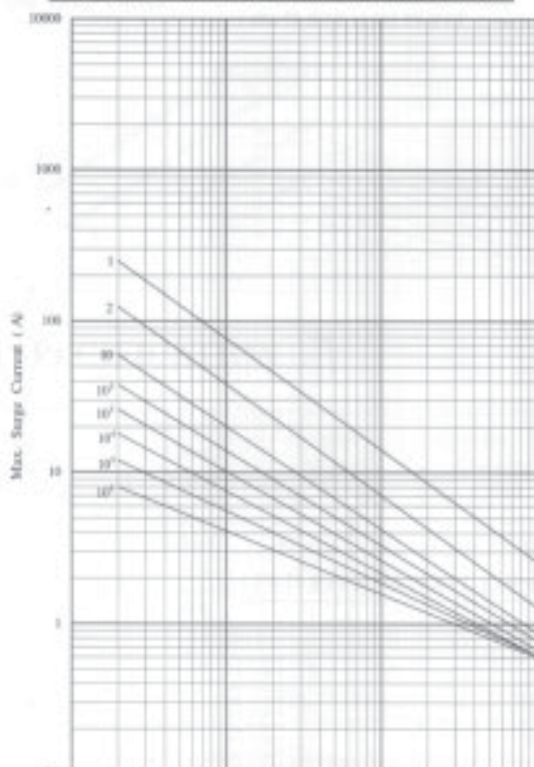
| Disc Ø | D max. | L min. | d nor.   | P nor. |
|--------|--------|--------|----------|--------|
| 7      | 9.5    | 30     | 0.6±0.02 | 5±1    |

### SPECIFICATION

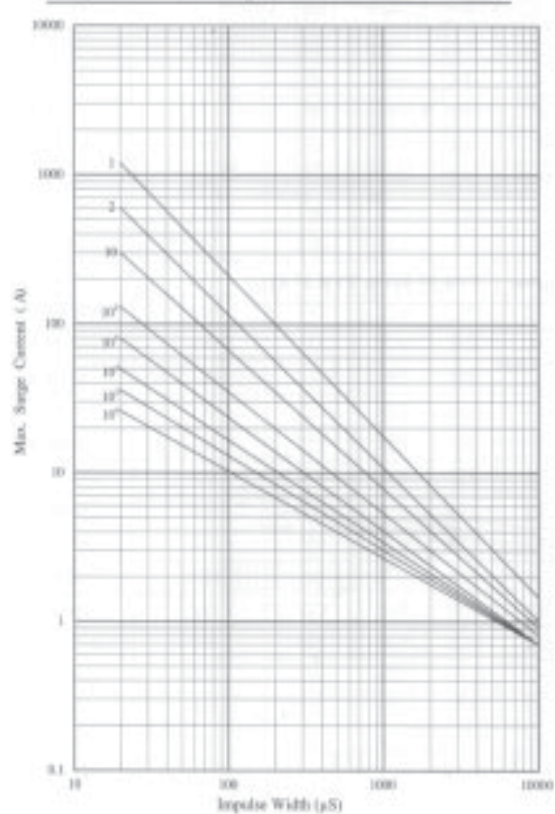
| Part No    | Varistor Voltage |               |           | Max. Allowable Voltage |           | Max. Clamping Voltage |              | Max. Energy   |  | Max. Peak Current<br>(8/20µs) |  | Rated Power | Reference Capacitance | Dimensions      |
|------------|------------------|---------------|-----------|------------------------|-----------|------------------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

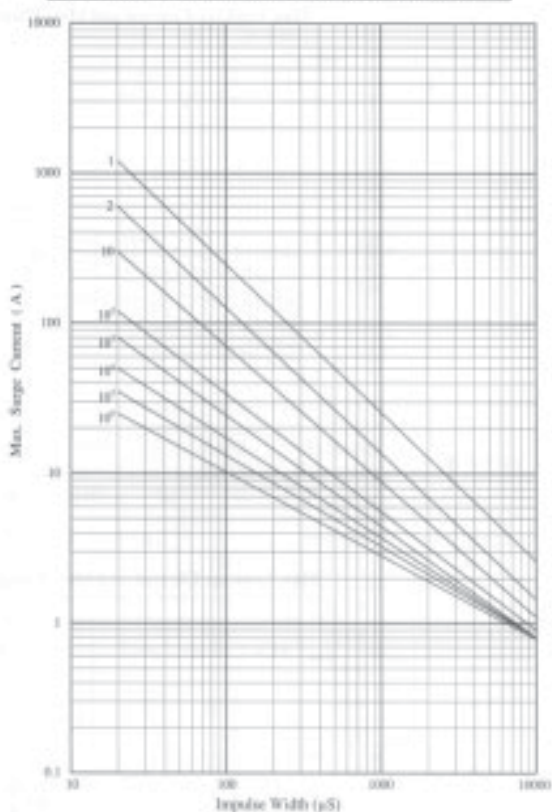
Surge Life Times Ratings ( TVR 07 180 to TVR 07 680 )



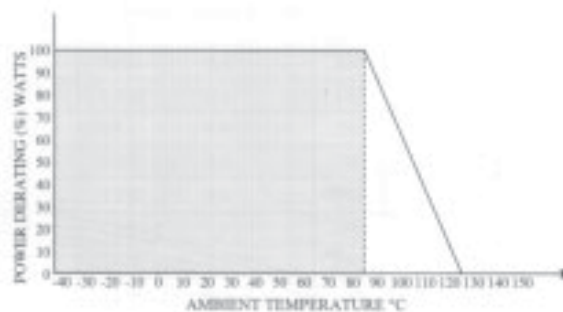
Surge Life Times Ratings ( TVR 07 511 to TVR 07 821 )



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

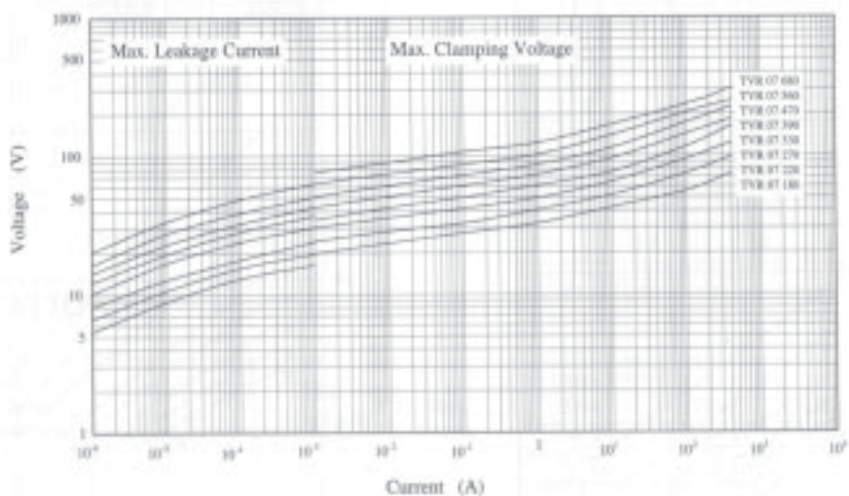


## POWER DERATING CURVE

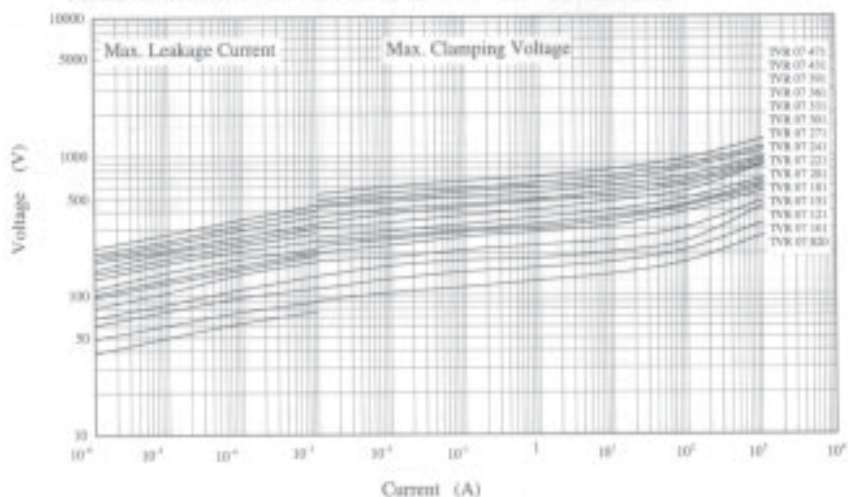


## V-I CHARACTERISTIC CURVE

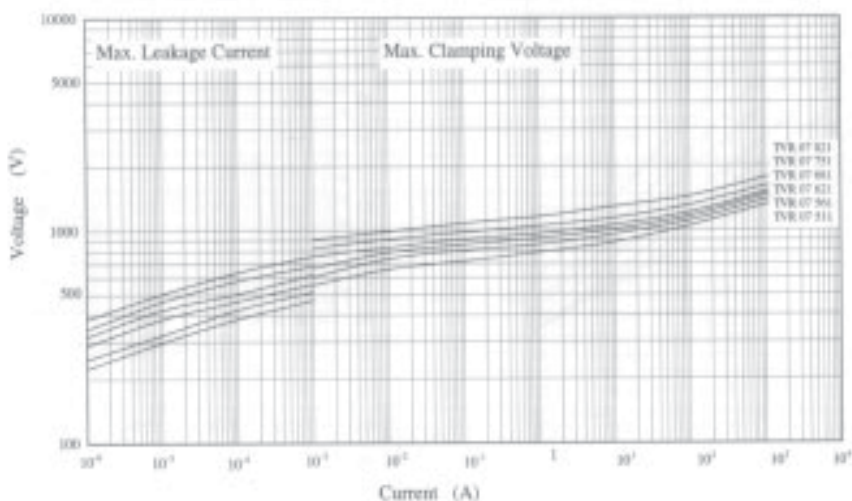
Max. Leakage Current and Max. Clamping Voltage Curves ( TVR 07 180 to TVR 07 650 )



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 )



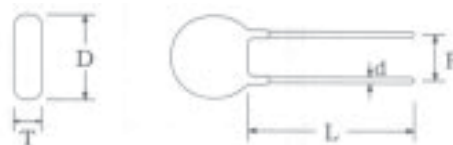


## ZINC OXIDE VARISTOR 100 SERIES

### 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  |

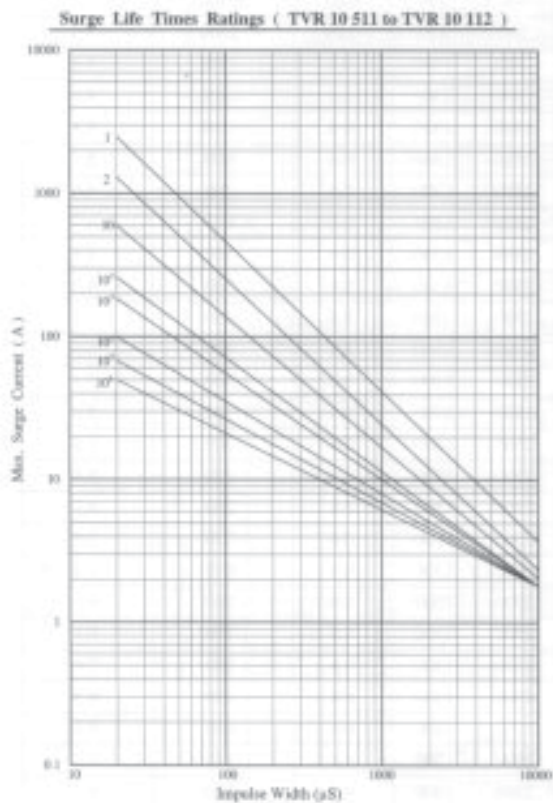
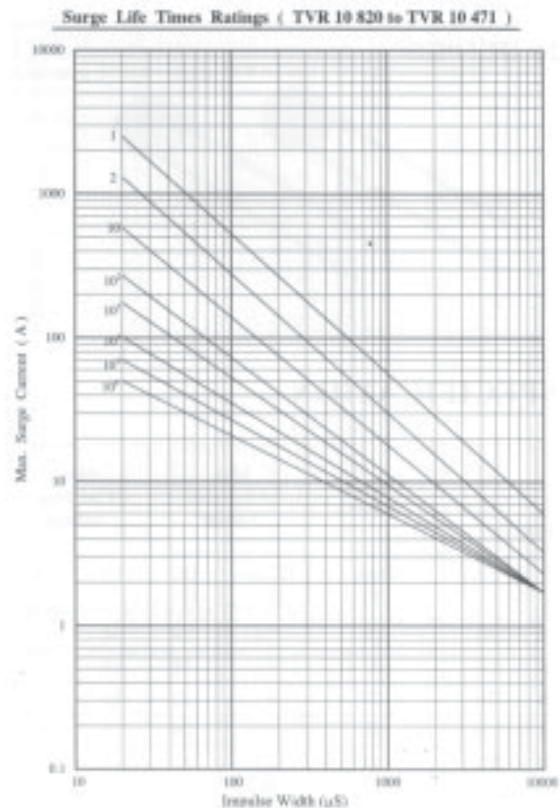
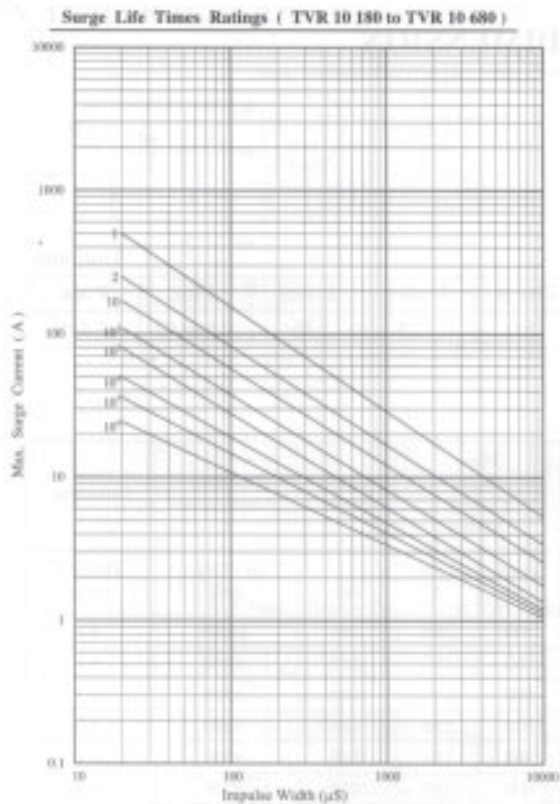
### SPECIFICATION

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

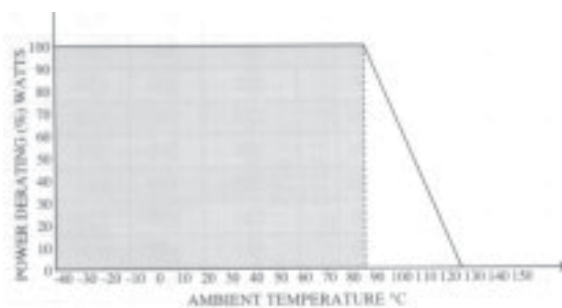


## ZINC OXIDE VARISTOR 100 SERIES

### LIFE TIMES

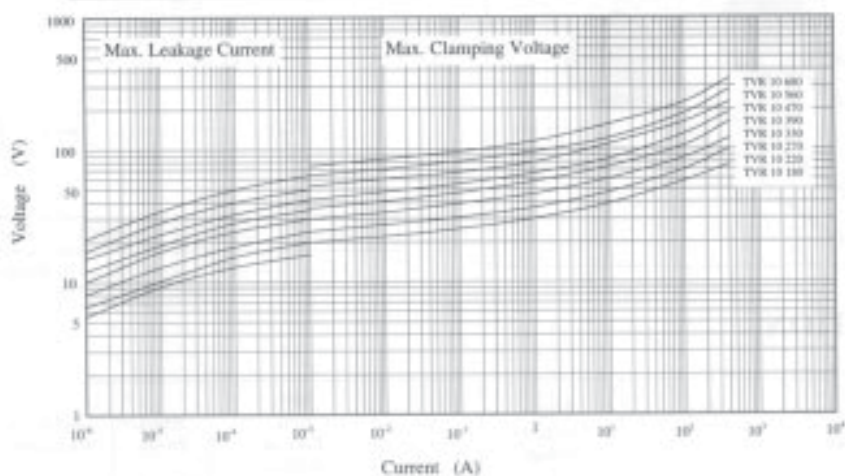


### POWER DERATING CURVE

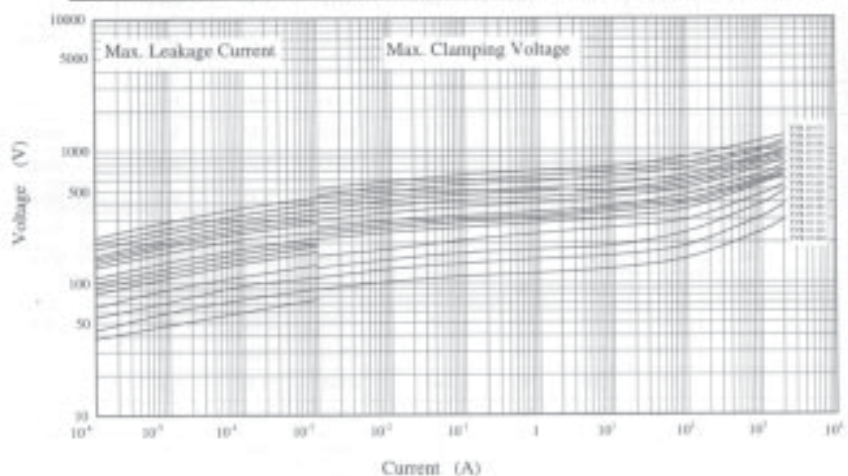


### V-I CHARACTERISTIC CURVE

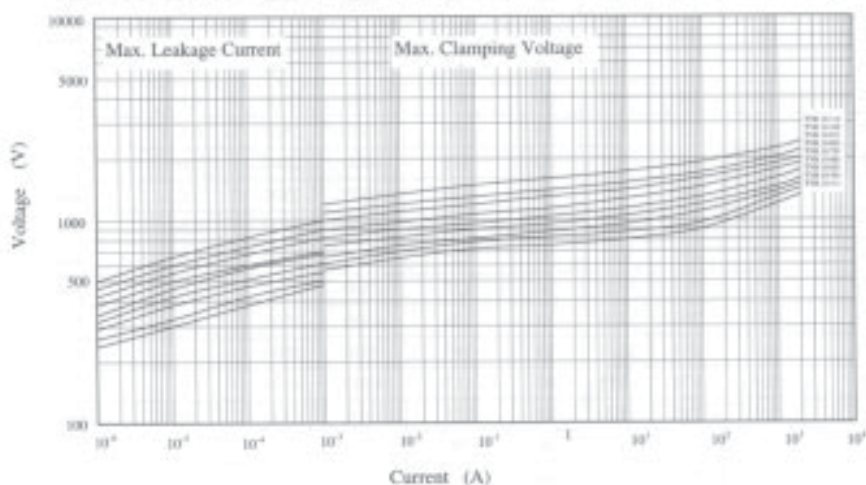
Max. Leakage Current and Max. Clamping Voltage Curves ( TVR 10 150 to TVR 10 650 )



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 )



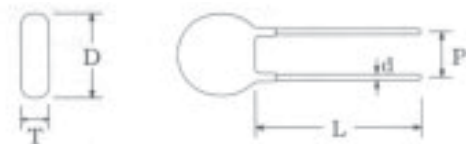


## ZINC OXIDE VARISTOR 140 SERIES

### 140 SERIES



### DIMENSION



Unit: mm

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

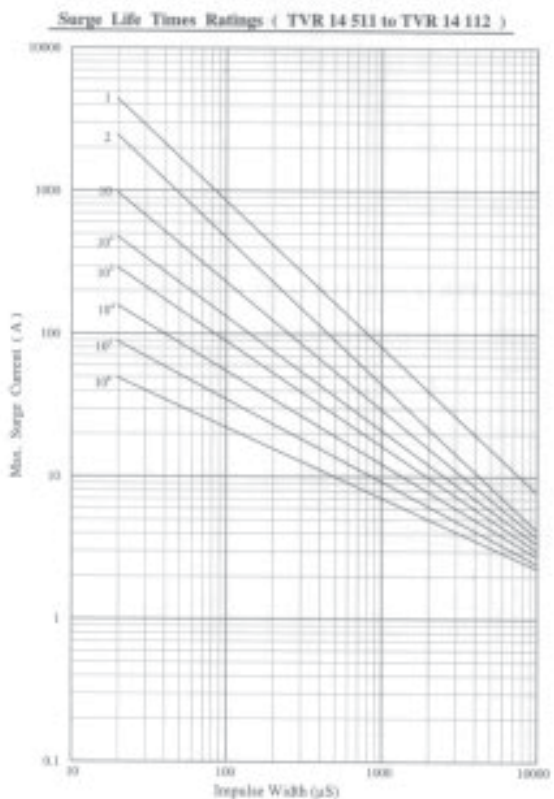
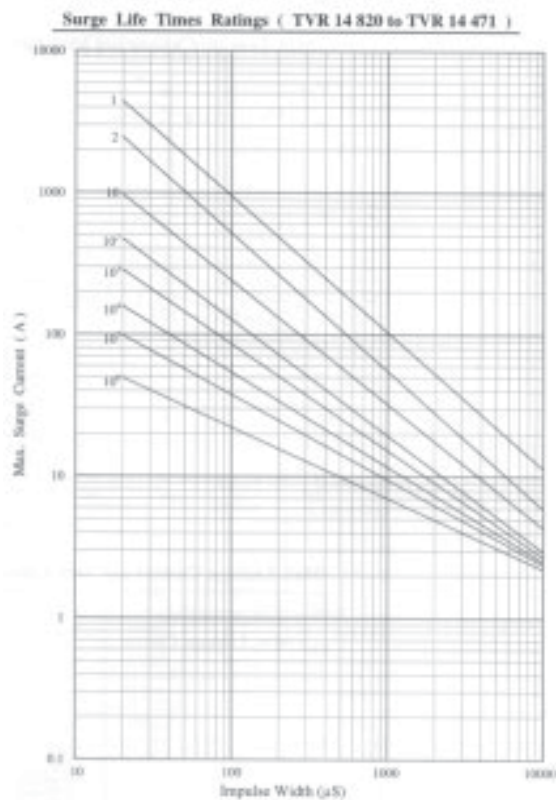
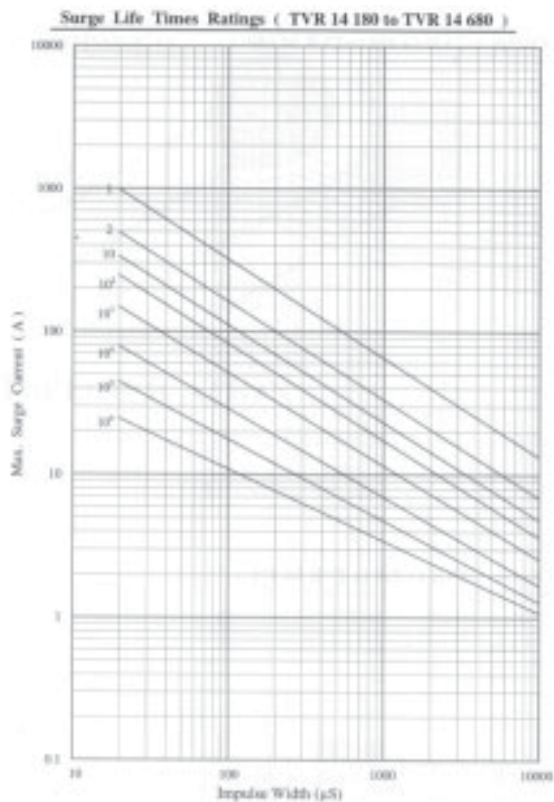
### SPECIFICATION

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

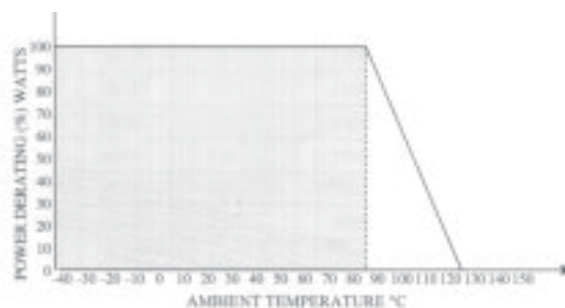


## ZINC OXIDE VARISTOR 140 SERIES

### LIFE TIMES

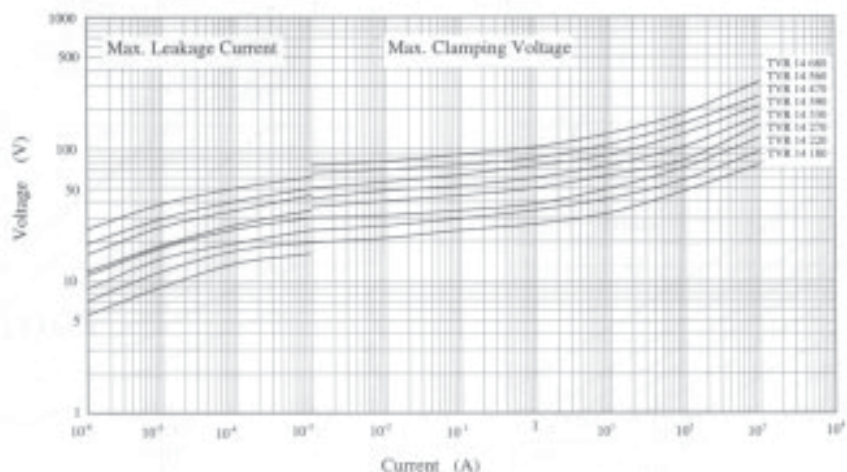


### POWER DERATING CURVE

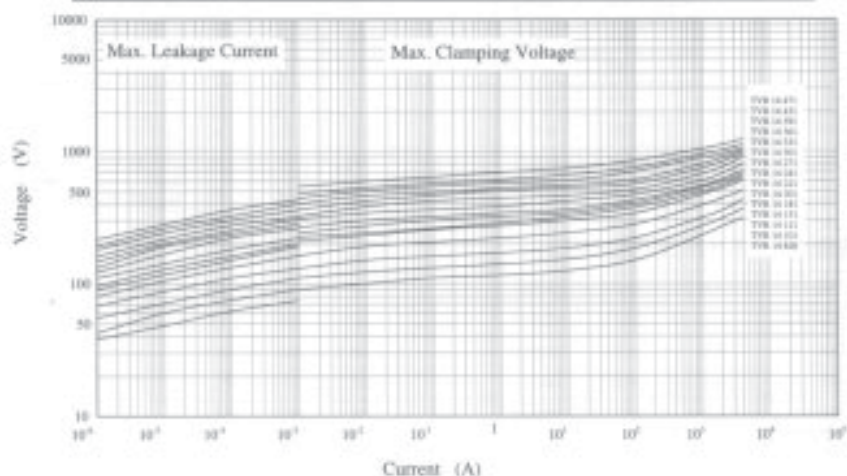


## V-I CHARACTERISTIC CURVE

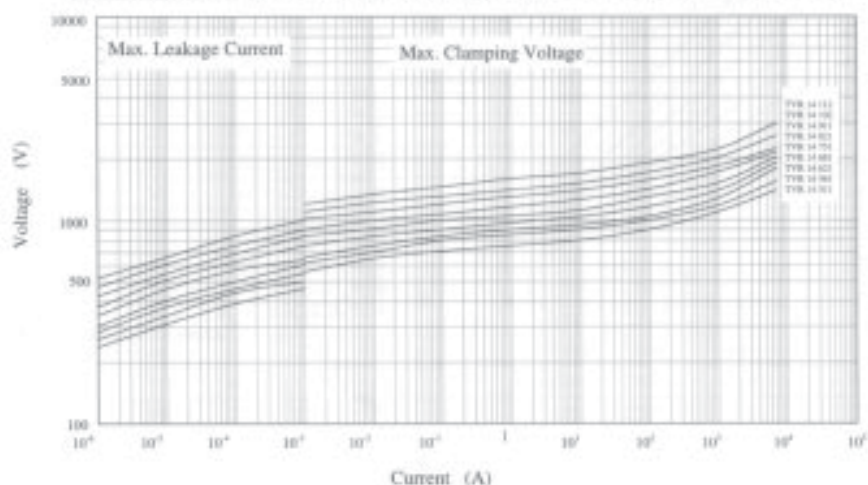
Max. Leakage Current and Max. Clamping Voltage Curves ( TVR 14 180 to TVR 14 680 )



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



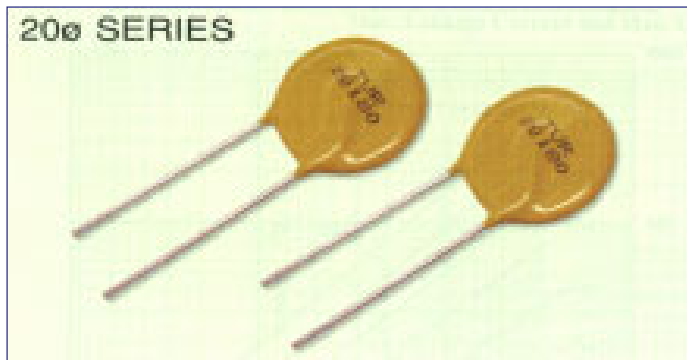
Max. Leakage Current and Max. Clamping Voltage Curves ( TVR 14 511 to TVR 14 112 )



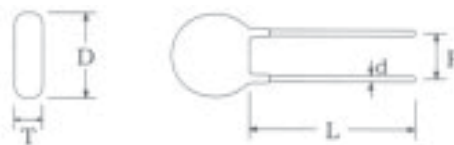


## ZINC OXIDE VARISTOR 20Ø SERIES

### 20Ø SERIES



### DIMENSION



Unit: mm

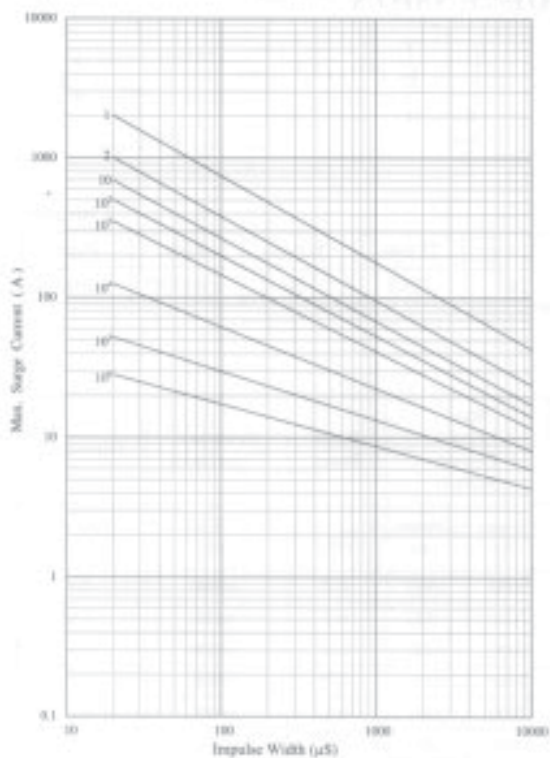
| Disc Ø | D max. | L min. | d nor.   | P nor. |
|--------|--------|--------|----------|--------|
| 20     | 23.5   | 26     | 1.0±0.02 | 10±1   |

### SPECIFICATION

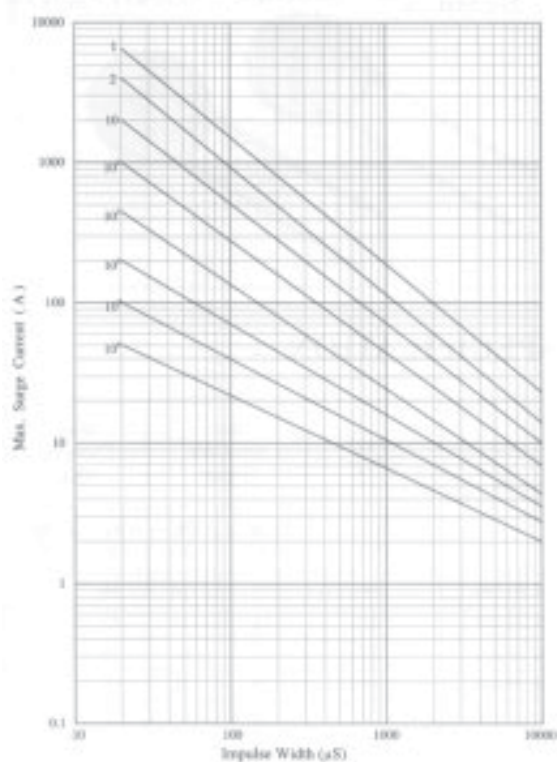
| Part No    | Varistor<br>Voltage | Max.<br>Allowable<br>Voltage | Max.<br>Clamping<br>Voltage | Max.<br>Energy | Max.<br>Peak<br>Current<br>(8/20μs) |                |              |               | Rated<br>Power | Reference<br>Capacitance | Dimensions      |
|------------|---------------------|------------------------------|-----------------------------|----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

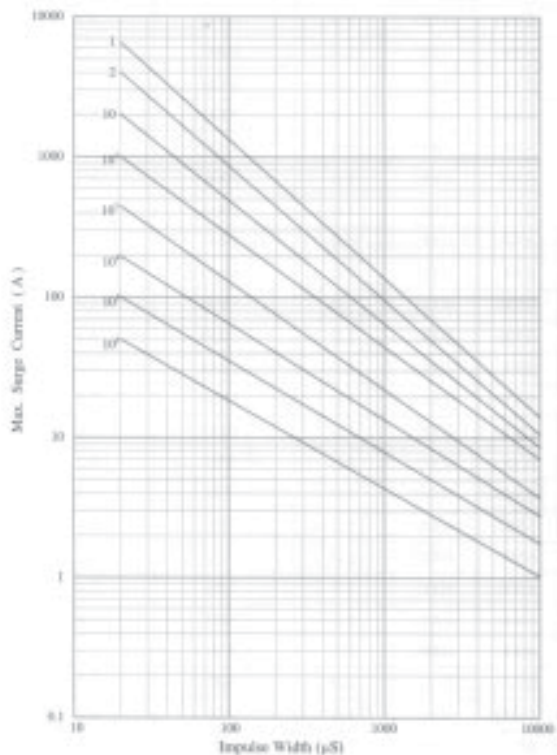
Surge Life Times Ratings ( TVR 20 180 to TVR 20 680 )



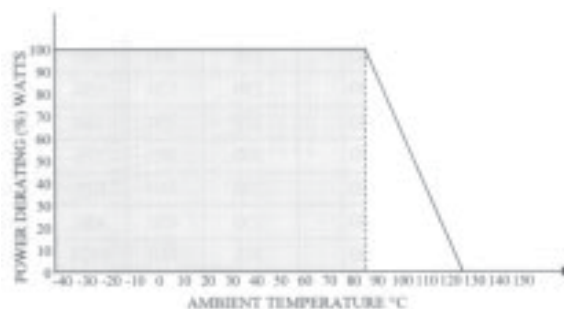
Surge Life Times Ratings ( TVR 20 820 to TVR 20 471 )



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



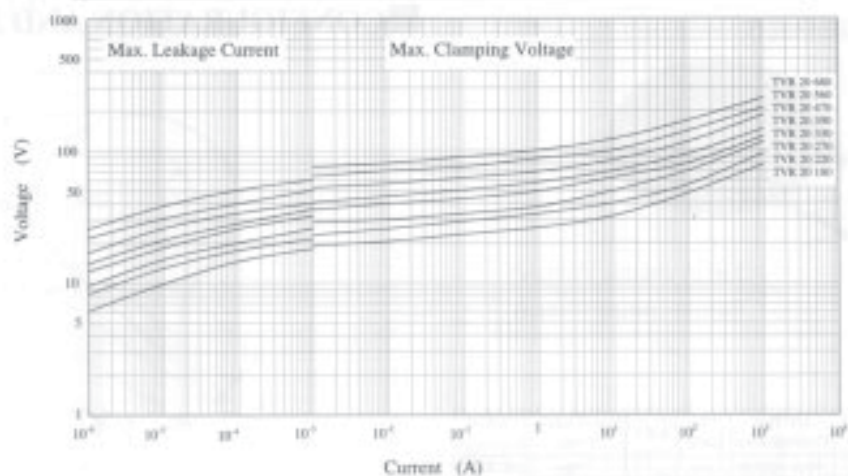
## POWER DERATING CURVE



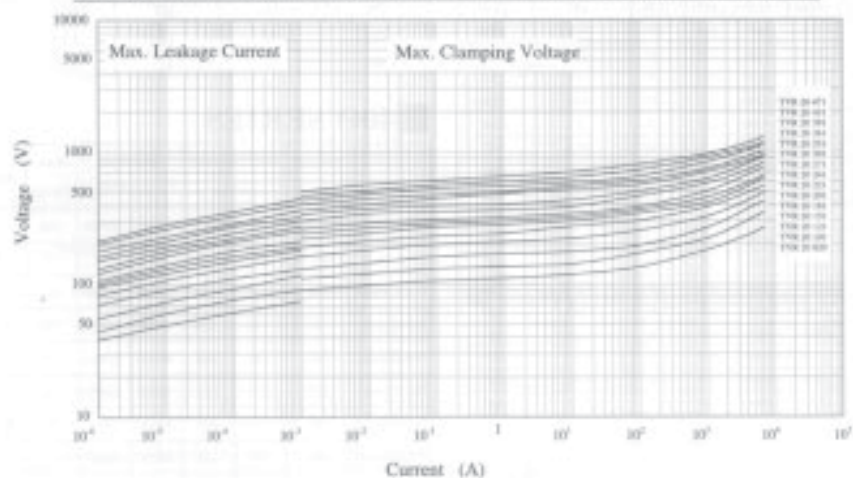


### V-I CHARACTERISTIC CURVE

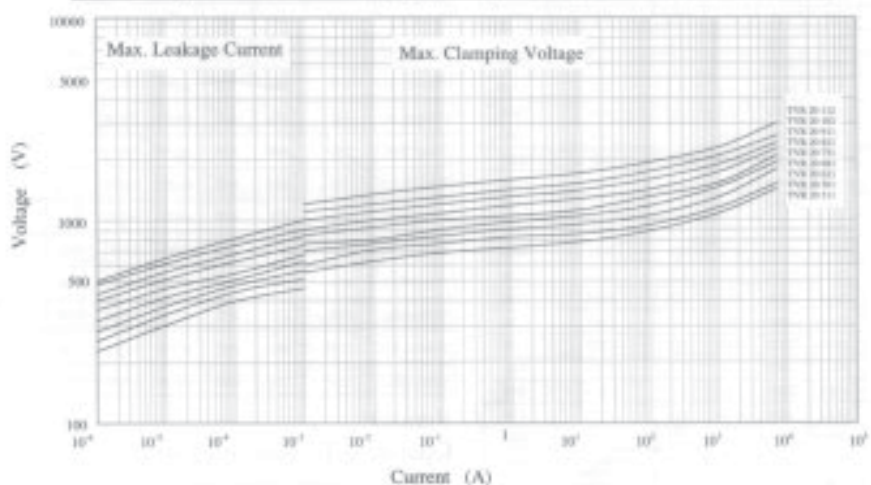
Max. Leakage Current and Max. Clamping Voltage Curves ( TVR 20 180 to TVR 20 680 )



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 )



## TVR G TYPE

### 250/320/400 SERIES



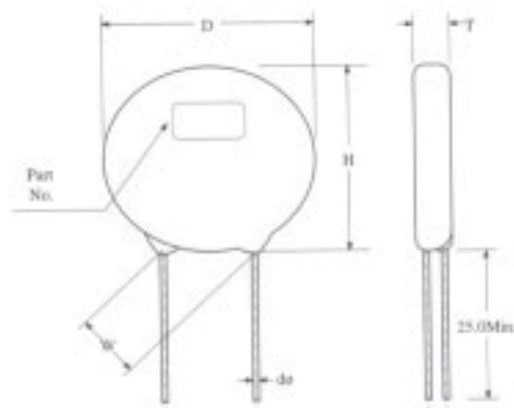
### 250 SERIES

| Part Number | Normal Varistor Voltage | Max. Allowable voltage |        | Max. Peak Current(8/20µs) |            | Max. Energy | Rated Power | Max. Clamping Voltage | Typical Capacitance |
|-------------|-------------------------|------------------------|--------|---------------------------|------------|-------------|-------------|-----------------------|---------------------|
|             | VlmA(V)                 | ACrms (V)              | DC (V) | 1time (A)                 | 2times (A) | 2ms (J)     | (W)         | V150A (V)             | @1KHZ (PF)          |
| 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 | Max. Allowable voltage |        | Max. Peak Current(8/20µs) |            | Max. Energy | Rated Power | Max. Clamping Voltage | Typical Capacitance |
|-------------|-------------------------|------------------------|--------|---------------------------|------------|-------------|-------------|-----------------------|---------------------|
|             | VlmA(V)                 | ACrms (V)              | DC (V) | 1time (A)                 | 2times (A) | 2ms (J)     | (W)         | V200A (V)             | @1KHZ (PF)          |
| 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



| Unit: mm |        |       |      |       |         |
|----------|--------|-------|------|-------|---------|
| 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     |

### 400 SERIES

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

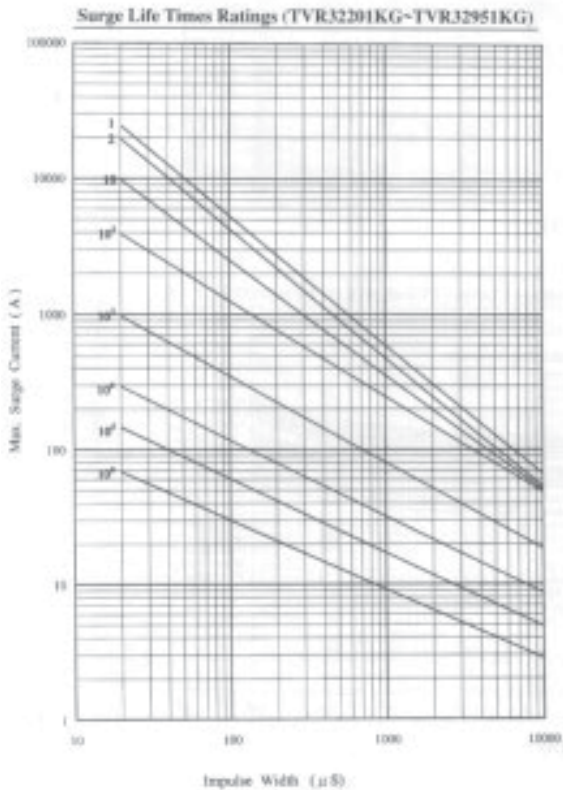
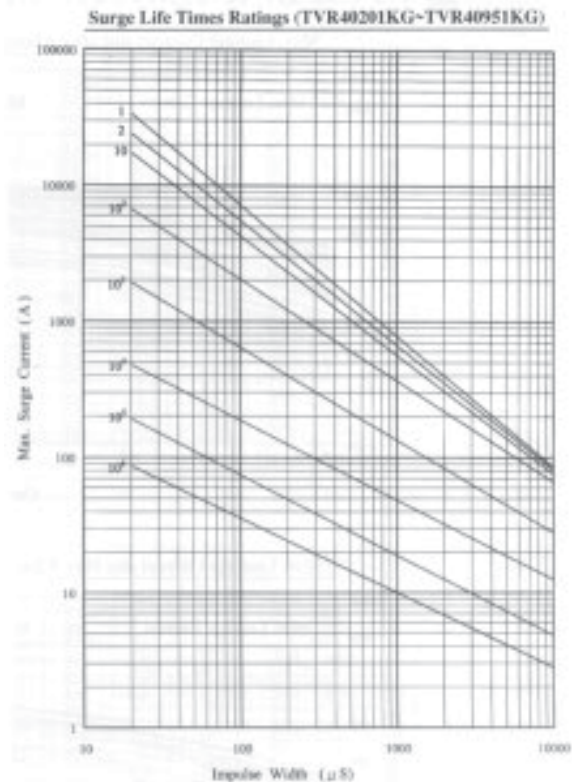
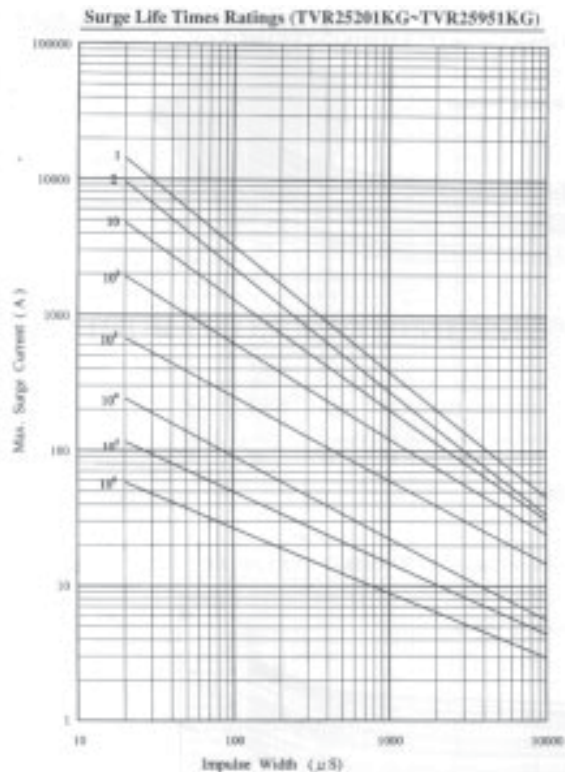
Remark:

Operating Temperature: -40~85°C

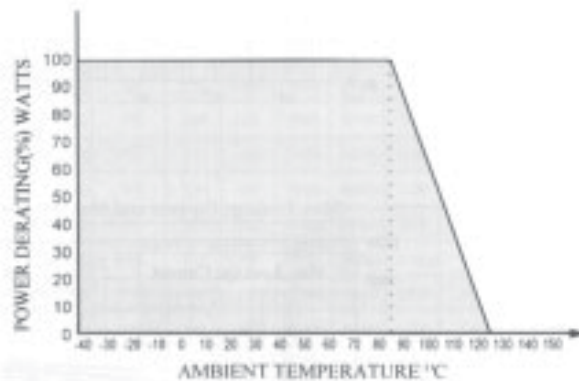
Storage Temperature: -40~110°C



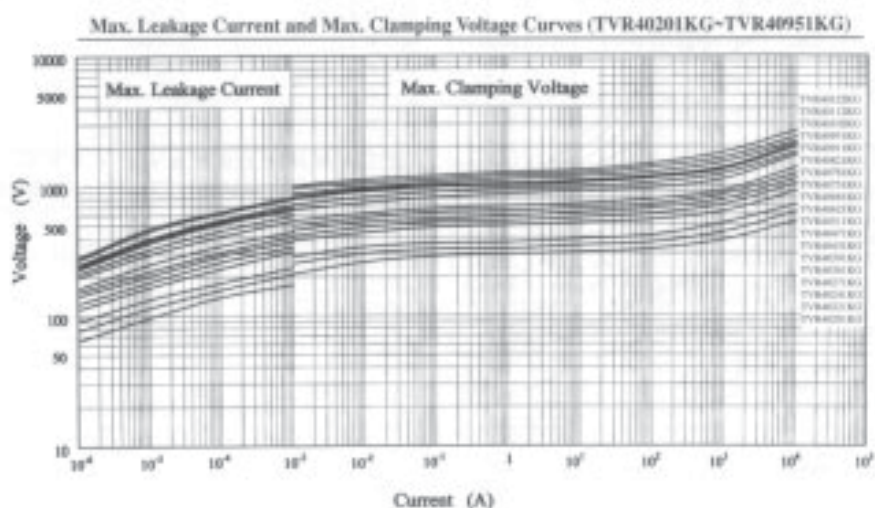
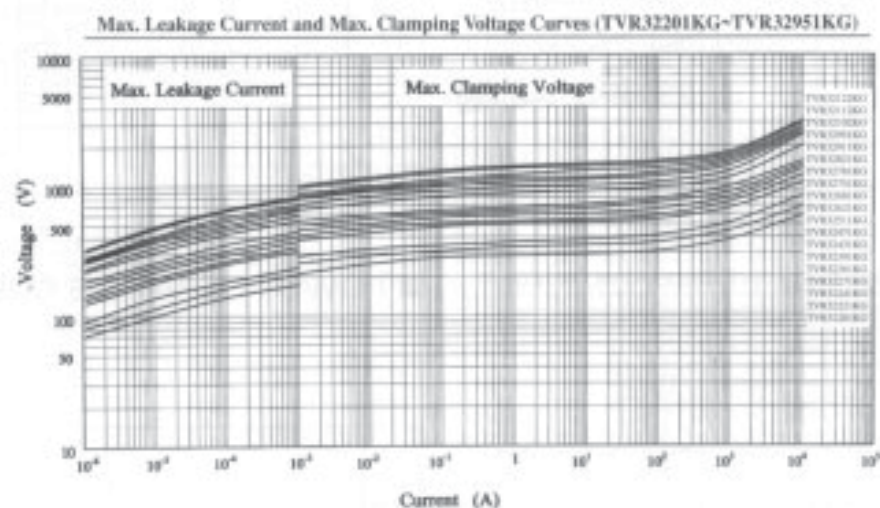
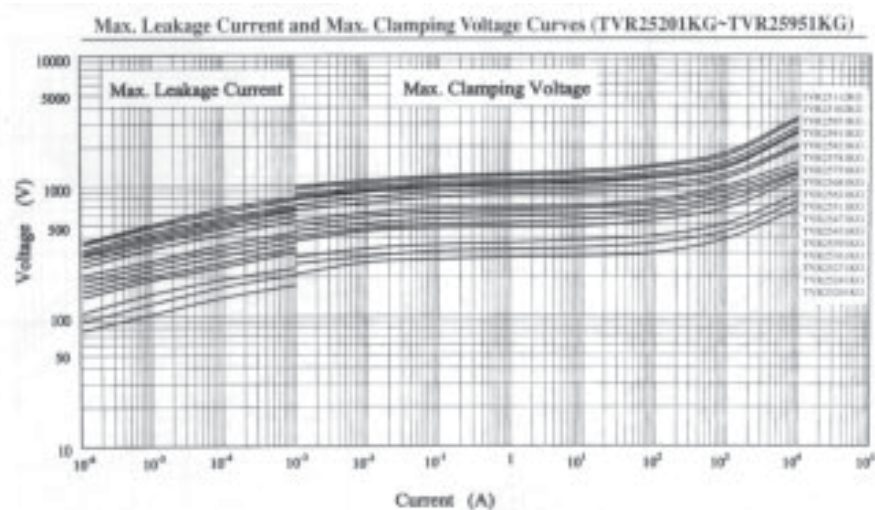
## LIFE TIMES



## POWER DERATING CURVE



## V-I CHARACTERISTIC CURVE



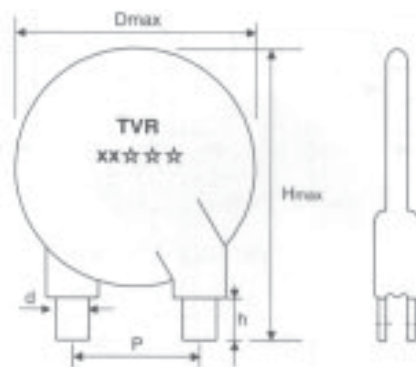
## TVR Q TYPE

### 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<br>Number | Normal<br>Varistor<br>Voltage | Max. Allowable<br>voltage |           | Max. Peak<br>Current(8/20µs) |               |            | Max. Energy<br>2ms<br>Power | Max. Clamping<br>Voltage |  | Typical<br>Capacitance<br>@1KHZ |
|----------------|-------------------------------|---------------------------|-----------|------------------------------|---------------|------------|-----------------------------|--------------------------|--|---------------------------------|
|                | VImA(V)                       | ACrms<br>(V)              | DC<br>(V) | 1time<br>(A)                 | 2times<br>(A) | 2ms<br>(J) |                             | V500A<br>(V)             |  |                                 |
|                |                               |                           |           |                              |               |            |                             |                          |  |                                 |
| 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         | 710        | 1.2                         | 1355                     |  | 950                             |
| TVR32911KQ     | 910                           | 550                       | 745       | 25000                        | 20000         | 760        | 1.2                         | 1500                     |  | 900                             |
| TVR32951KQ     | 950                           | 575                       | 765       | 25000                        | 20000         | 780        | 1.2                         | 1570                     |  | 850                             |
| TVR32112KQ     | 1100                          | 680                       | 895       | 25000                        | 20000         | 910        | 1.2                         | 1815                     |  | 750                             |
| TVR32122KQ     | 1200                          | 750                       | 1060      | 25000                        | 20000         | 1000       | 1.2                         | 2000                     |  | 650                             |

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

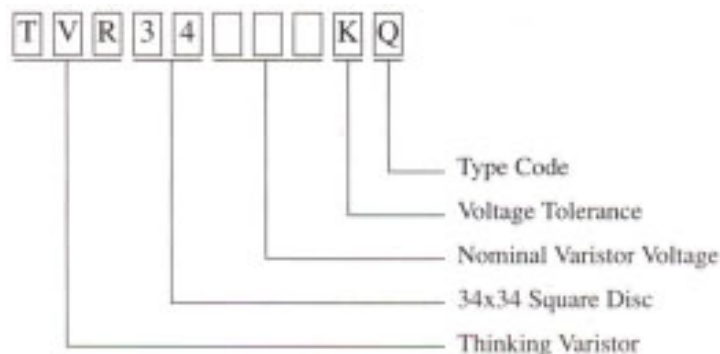
| Part<br>Number | Normal<br>Varistor<br>Voltage | Max. Allowable<br>voltage |           | Max. Peak<br>Current(8/20µs) |               |            | Max. Energy<br>2ms<br>Power | Max. Clamping<br>Voltage |  | Typical<br>Capacitance<br>@1KHZ |
|----------------|-------------------------------|---------------------------|-----------|-----------------------------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

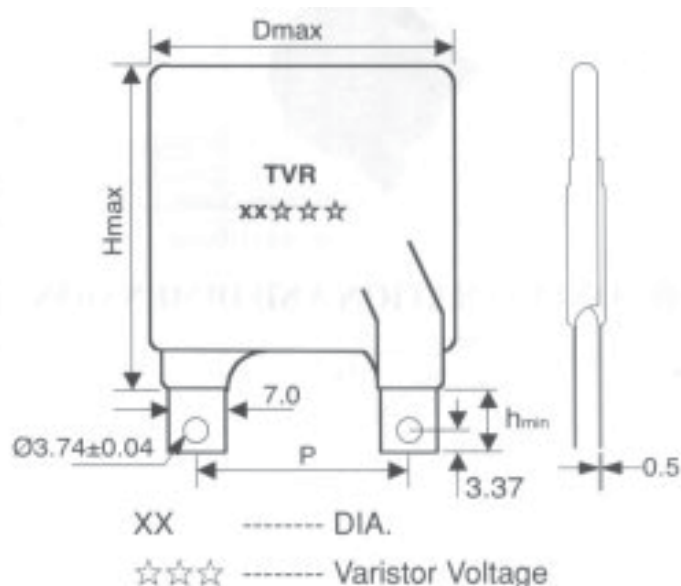
Operating Temperature: -40~85°C

Storage Temperature: -40~110°C

## PART NUMBER CODE



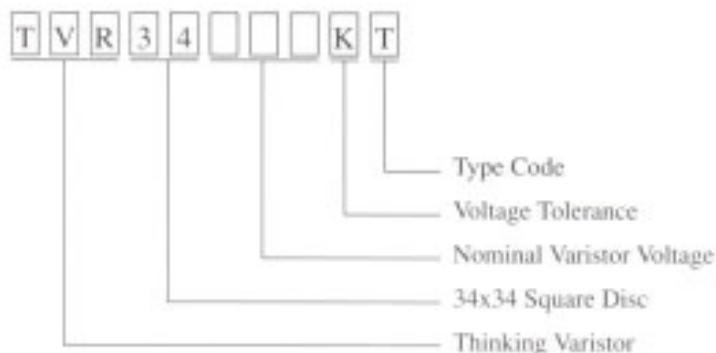
## CONFIGURATION AND DIMENSION



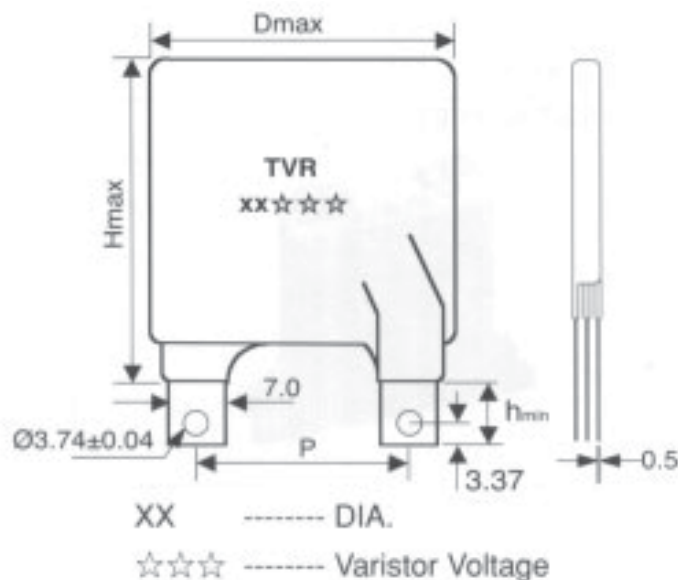
| Unit: mm |        |        |        |       |
|----------|--------|--------|--------|-------|
| Disc Ø   | D max. | H max. | h min. | P±0.5 |
| 34       | 38     | 43     | 10     | 25    |

| 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                  | DC   | 1time<br>(A)              | 2times<br>(A) |                           |                    |                                      |                                      |
|             |                                    | (V)                    | (V)  |                           |               |                           |                    |                                      |                                      |
| 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

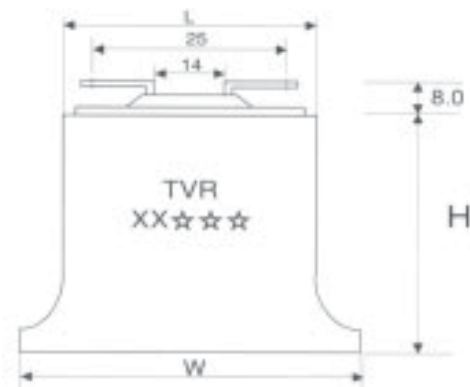
| Disc Ø | D max. | H max. | h min. | P±0.5 |
|--------|--------|--------|--------|-------|
| 34     | 38     | 43     | 10     | 25    |

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

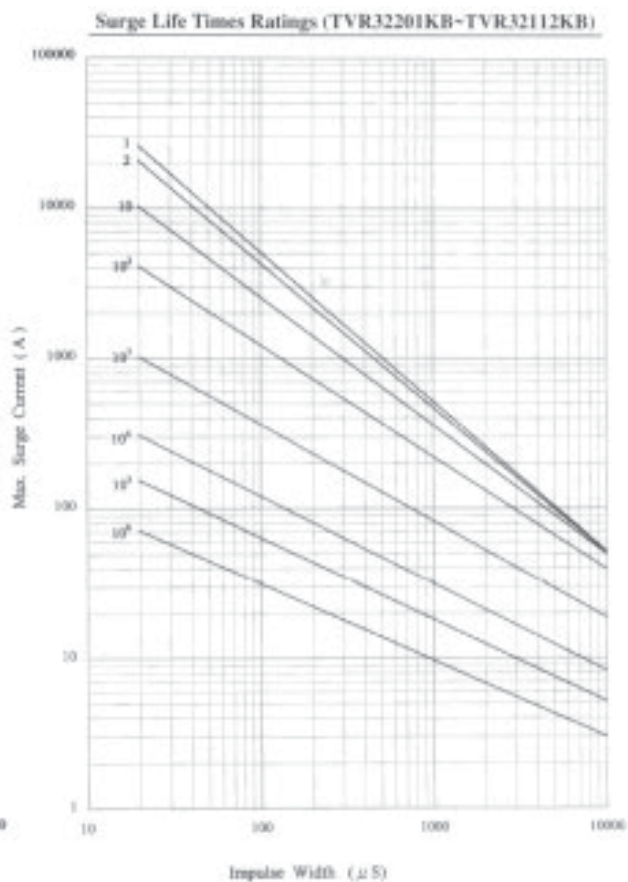
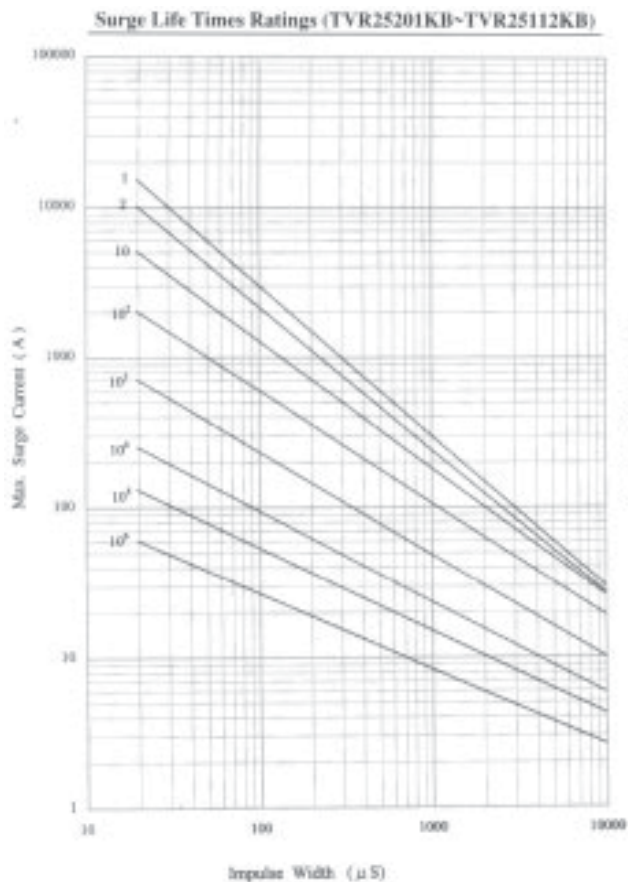
Storage Temperature: -40~110°C

## 320 SERIES

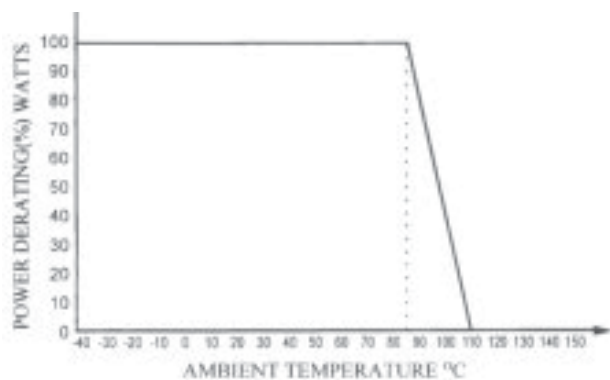
| Part<br>Number | Normal<br>Varistor<br>Voltage | Max. Allowable<br>voltage |      | Max. Peak<br>Current(8/20µs) |        | Max.<br>Energy | Rated<br>Power | Max. Clamping<br>Voltage | Typical<br>Capacitance |
|----------------|-------------------------------|---------------------------|------|------------------------------|--------|----------------|----------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



## LIFE TIMES

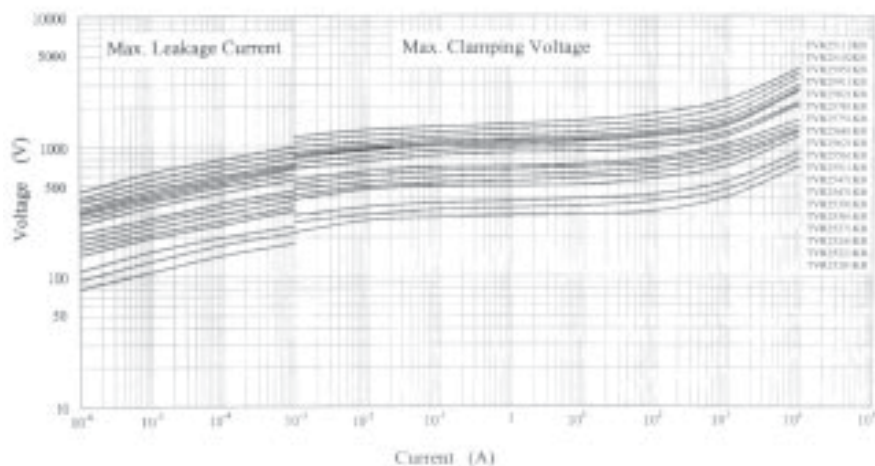


## POWER DERATING CURVE

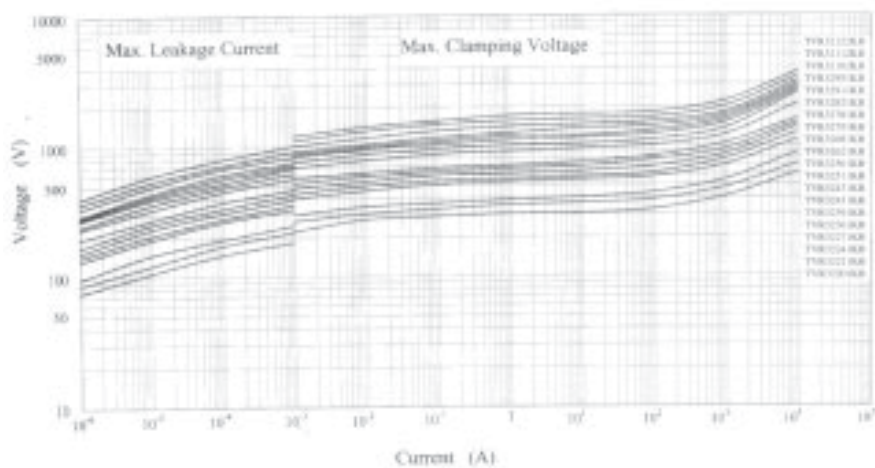


## V-I CHARACTERISTIC CURVE

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

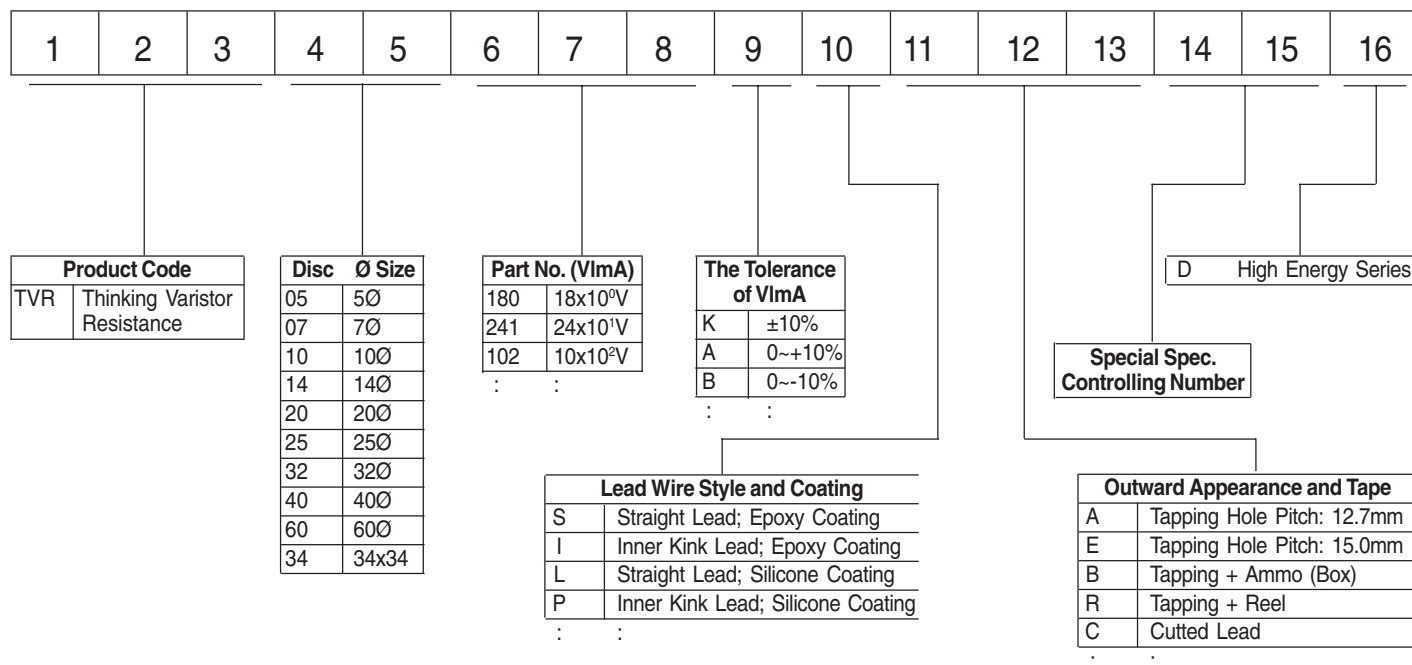


Max. Leakage Current and Max. Clamping Voltage Curves (TVR32201KB~TVR32112KB)





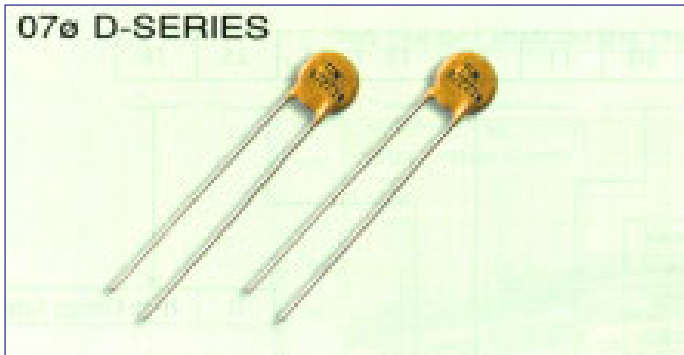
## TVR-D SERIES Part Number Code



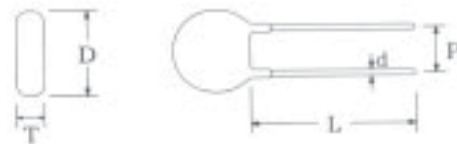


## ZINC OXIDE VARISTOR 07Ø SERIES D-SERIES

### 07Ø D-SERIES



### DIMENSION



Unit: mm

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

### SPECIFICATION

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

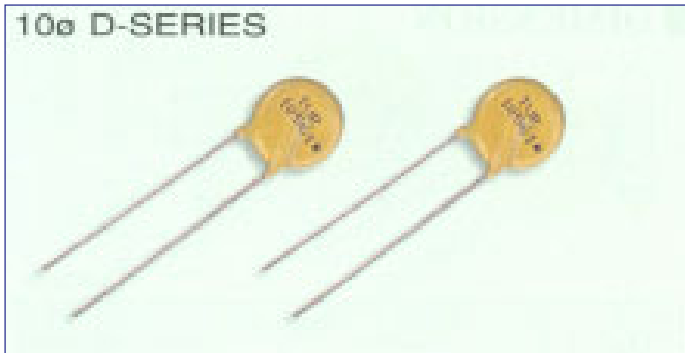
Operating Temperature: -40°C~85°C

Storage Temperature: -40°C~125°C

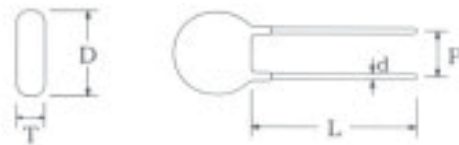


## ZINC OXIDE VARISTOR 100 SERIES D-SERIES

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

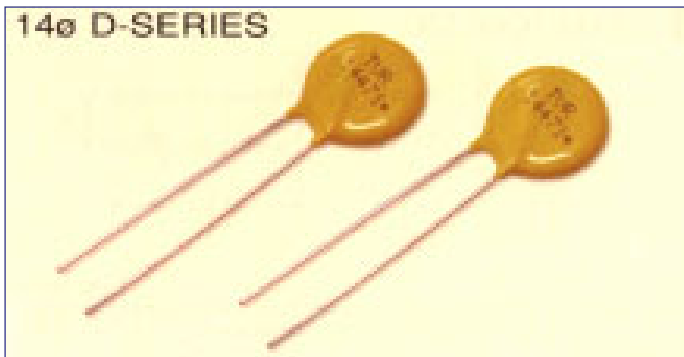
Operating Temperature: -40°C~85°C

Storage Temperature: -40°C~125°C

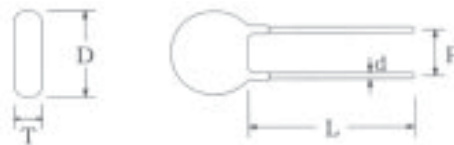


## ZINC OXIDE VARISTOR 1400 SERIES D-SERIES

### 1400 D-SERIES



### DIMENSION



Unit: mm

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

### SPECIFICATION

| Part Number | Normal Varistor Voltage @1mA DC | Max. Allowable Voltage |        | Max. Clamping Voltage @50A (8/20µs) (V) | Max. Peak Current (8/20µs) |            | Rated Power (W) | Max. Energy   |  | Reference Capacitance @1KHZ (pf) |
|-------------|---------------------------------|------------------------|--------|-----------------------------------------|----------------------------|------------|-----------------|---------------|--|----------------------------------|
|             |                                 | AC rms (V)             | DC (V) |                                         | 1time (A)                  | 2times (A) |                 | 10/1000µs (J) |  |                                  |
| 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                              |

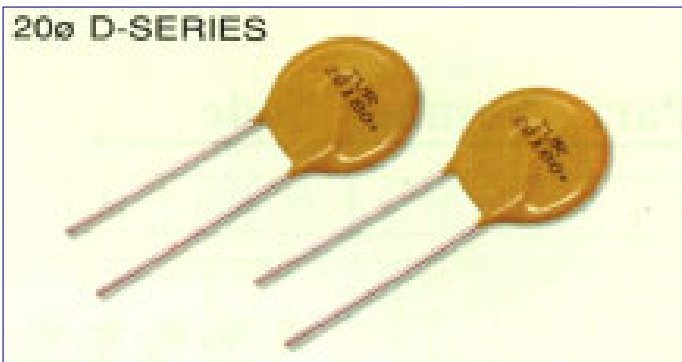
Operating Temperature: -40°C~85°C

Storage Temperature: -40°C~125°C

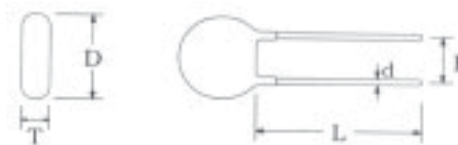


## ZINC OXIDE VARISTOR 200 D-SERIES

### 200 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

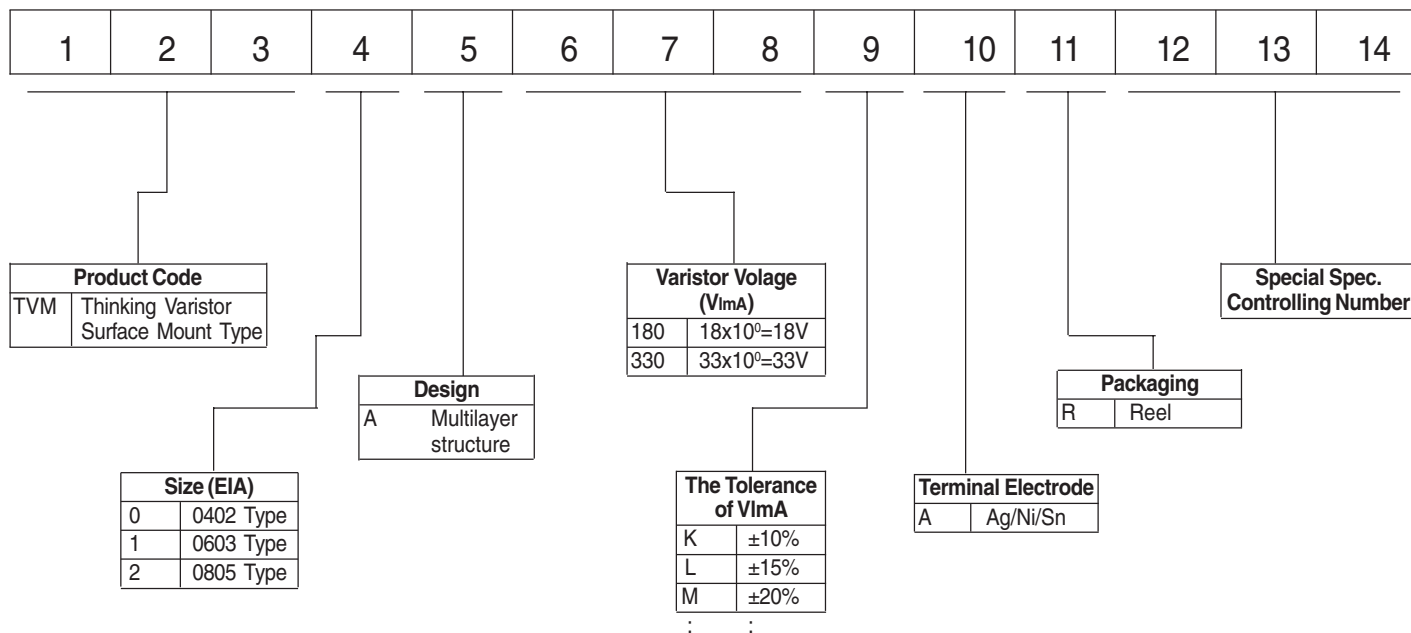
| Part Number | Normal Varistor Voltage @1mA DC | Max. Allowable Voltage |        | Max. Clamping Voltage @100A (8/20µs) (V) | Max. Peak Current (8/20µs) |            | Rated Power (W) | Max. Energy   |  | Reference Capacitance @1KHZ (pf) |
|-------------|---------------------------------|------------------------|--------|----------------------------------------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

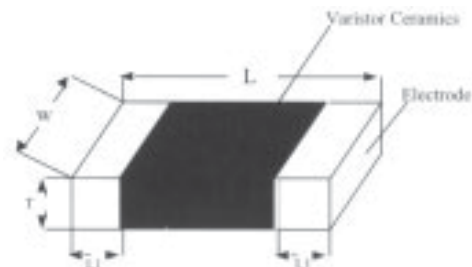


## TVM-SERIES Part Number Code





## ZINC OXIDE VARISTOR 0402 SERIES



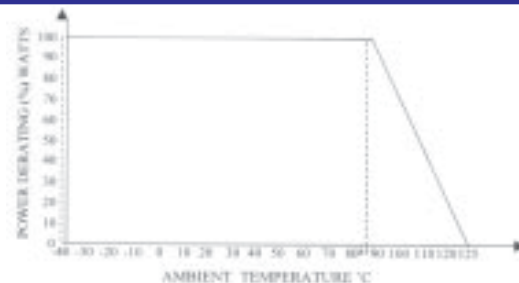
### DIMENSION

| 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

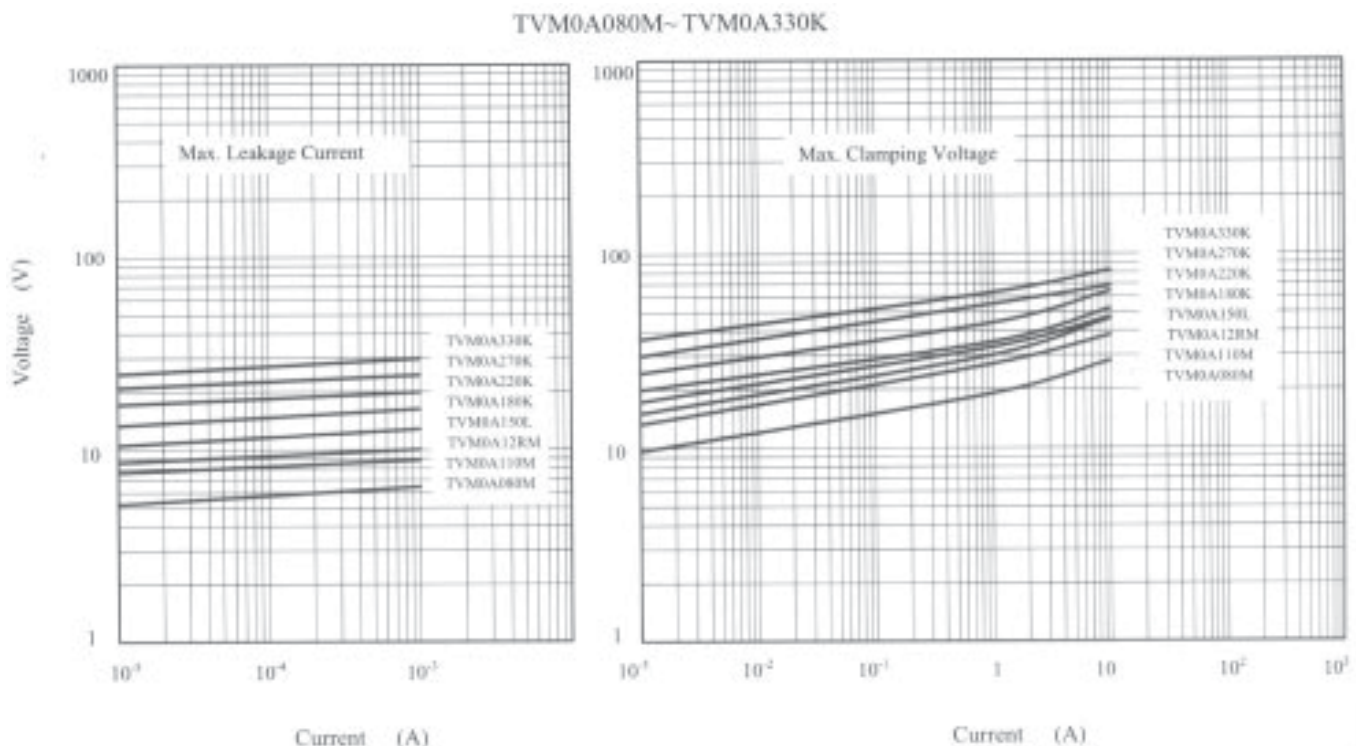
| Part No   | Varistor Voltage |      | Max. Allowable Voltage |                 | Max. Clamping Voltage (8/20µs) |                | Max. Surge Current (8/20µs) | Max. Energy (10/1000µs) | Rate Power | Reference Capacitance @1KHZ |
|-----------|------------------|------|------------------------|-----------------|--------------------------------|----------------|-----------------------------|-------------------------|------------|-----------------------------|
|           | 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



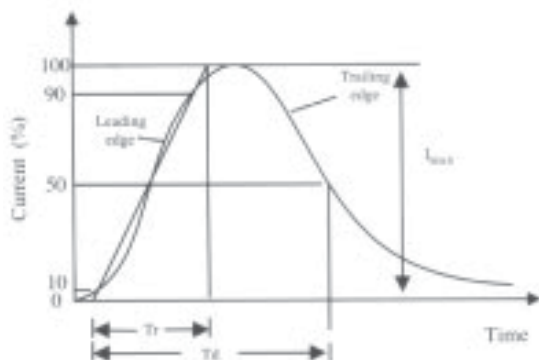
|                                               |                |
|-----------------------------------------------|----------------|
| Nonlinearity exponent ( $\alpha$ )            | $\geq 20$      |
| Leakage Current (IL) at 25°C, V <sub>dc</sub> | $\leq 20\mu A$ |

## MAX. LEAKAGE CURRENT AND MAX. CLAMPING VOLTAGE CURVES

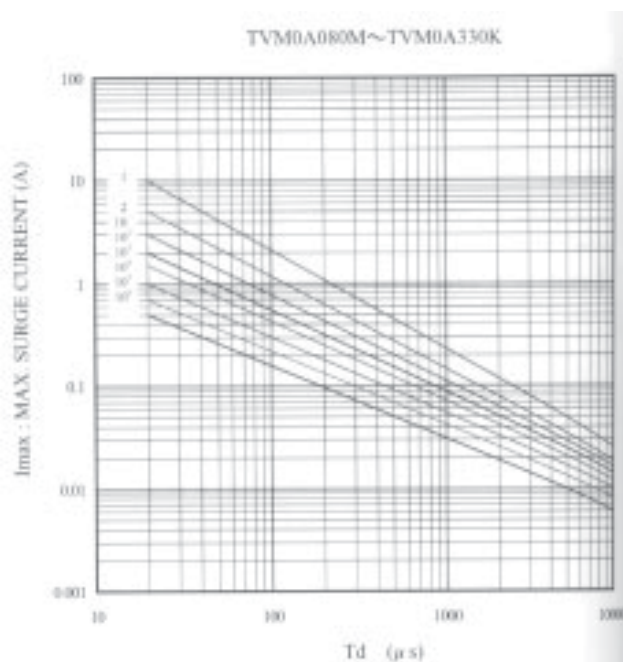


## SURGE CURRENT STANDARD WAVEFORM

EXAMPLE: 8/20 $\mu$ S  
 $T_r = 8\mu$ S  
 $T_d = 20\mu$ S



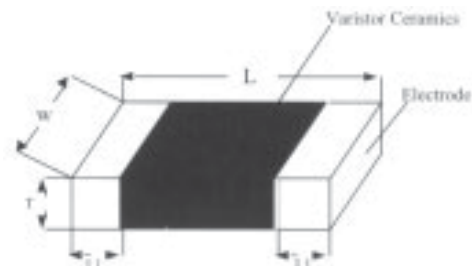
## MAX. SURGE CURRENT DERATING CURVES





## ZINC OXIDE VARISTOR 0603 SERIES

### TVM SERIES



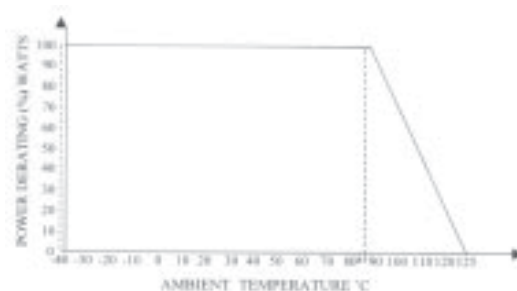
### DIMENSION

| 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

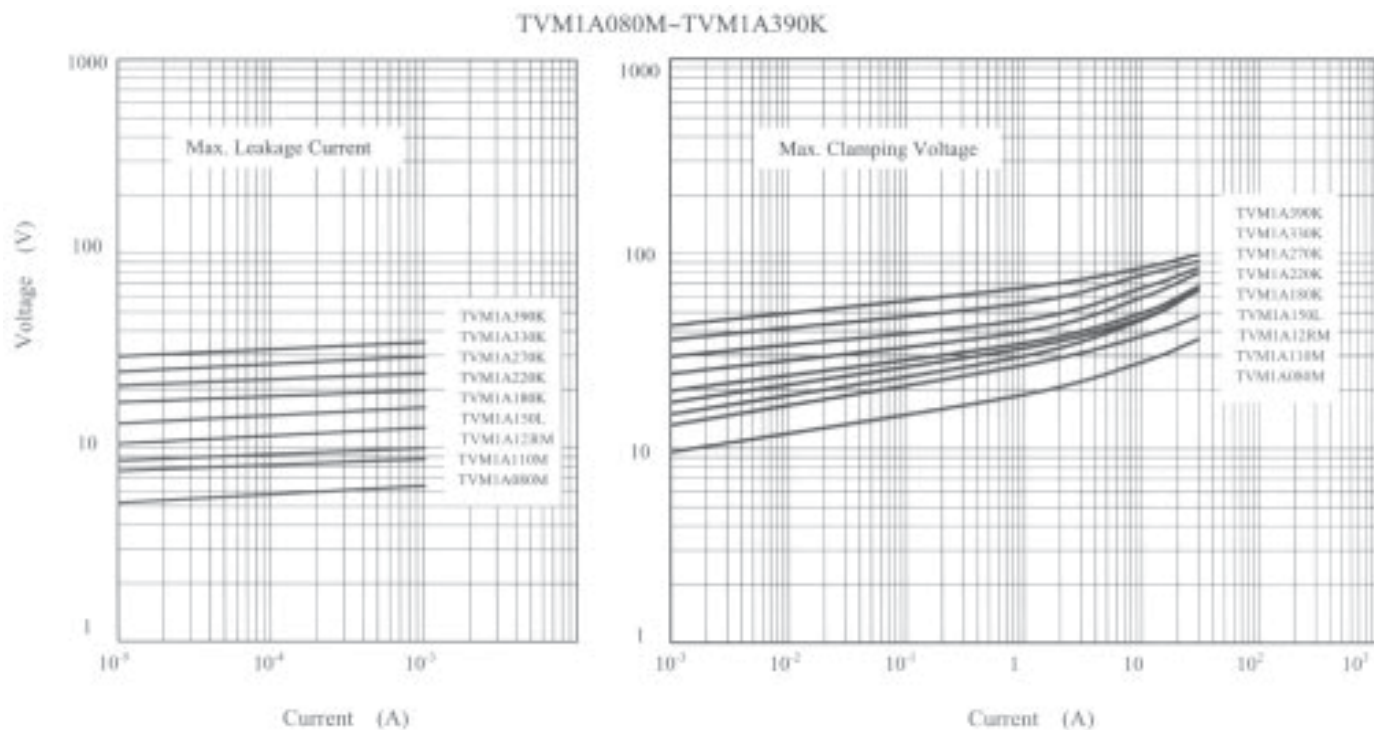
| Part No   | Varistor Voltage |      | Max. Allowable Voltage |                 | Max. Clamping Voltage (8/20µs) |                | Max. Surge Current (8/20µs) | Max. Energy (10/1000µs) | Rate Power | Reference Capacitance @1KHZ |
|-----------|------------------|------|------------------------|-----------------|--------------------------------|----------------|-----------------------------|-------------------------|------------|-----------------------------|
|           | V <sub>mA</sub>  | (±%) | V <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)                        |
| 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



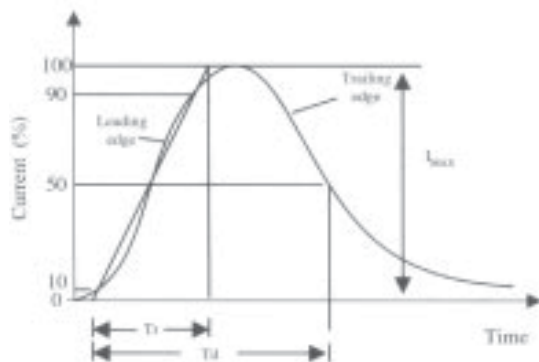
|                                               |                |
|-----------------------------------------------|----------------|
| Nonlinearity exponent ( $\alpha$ )            | $\geq 20$      |
| Leakage Current (IL) at 25°C, V <sub>DC</sub> | $\leq 20\mu A$ |

## MAX. LEAKAGE CURRENT AND MAX. CLAMPING VOLTAGE CURVES

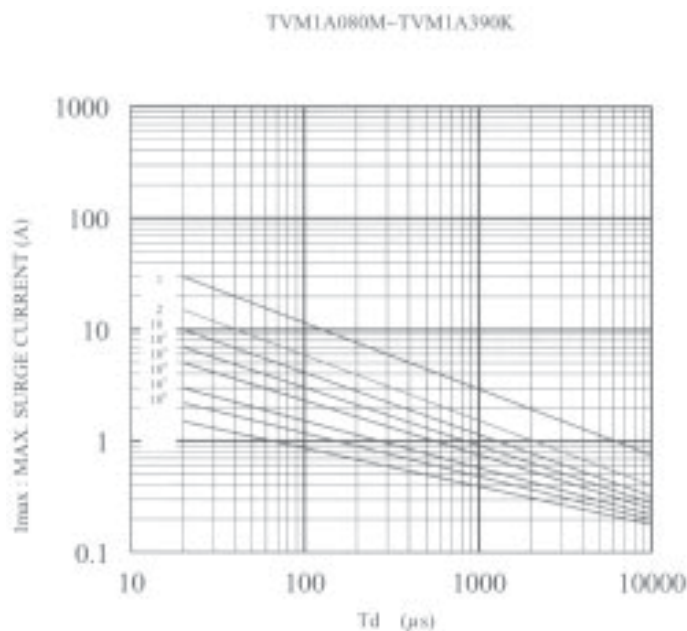


## SURGE CURRENT STANDARD WAVEFORM

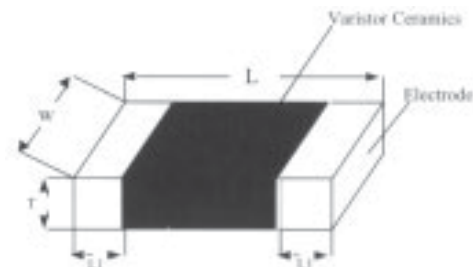
EXAMPLE: 8/20 $\mu$ S  
 $T_r = 8\mu$ S  
 $T_d = 20\mu$ S



## MAX. SURGE CURRENT DERATING CURVES



## TVM SERIES



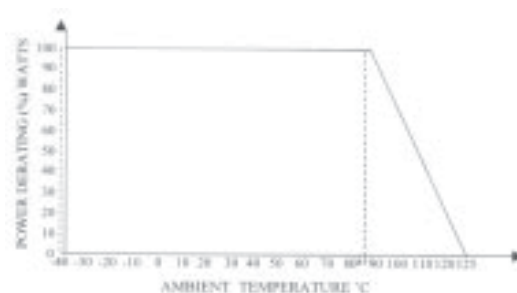
### DIMENSION

| 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

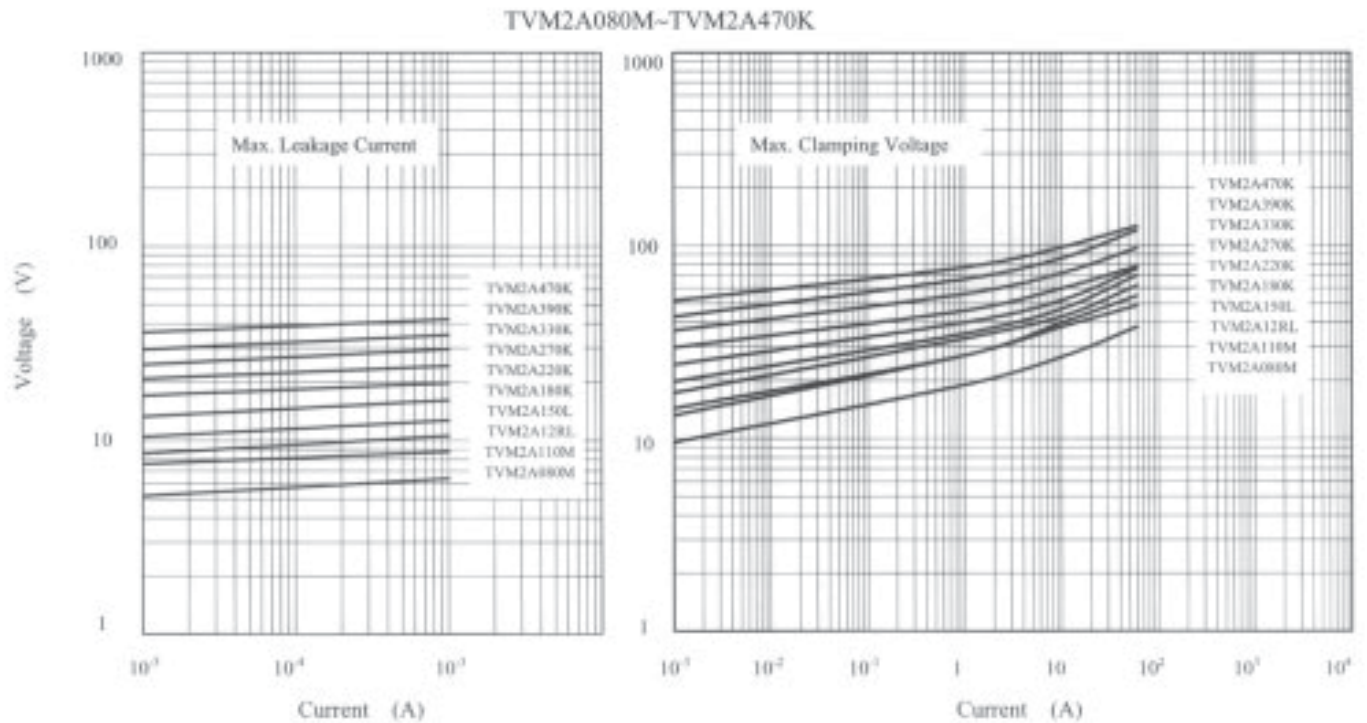
| Part No   | Varistor Voltage |      | Max. Allowable Voltage |                 | Max. Clamping Voltage (8/20μs) |                | Max. Surge Current (8/20μs) | Max. Energy (10/1000μs) | Rate Power | Reference Capacitance @1KHZ |
|-----------|------------------|------|------------------------|-----------------|--------------------------------|----------------|-----------------------------|-------------------------|------------|-----------------------------|
|           | V <sub>1mA</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)                        |
| 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



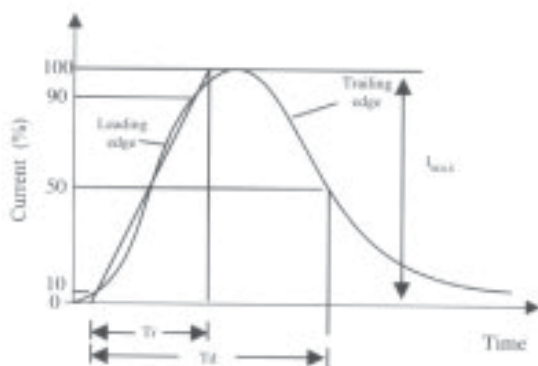
|                                               |                |
|-----------------------------------------------|----------------|
| Nonlinearity exponent ( $\alpha$ )            | $\geq 20$      |
| Leakage Current (IL) at 25°C, V <sub>DC</sub> | $\leq 20\mu A$ |

## MAX. LEAKAGE CURRENT AND MAX. CLAMPING VOLTAGE CURVES

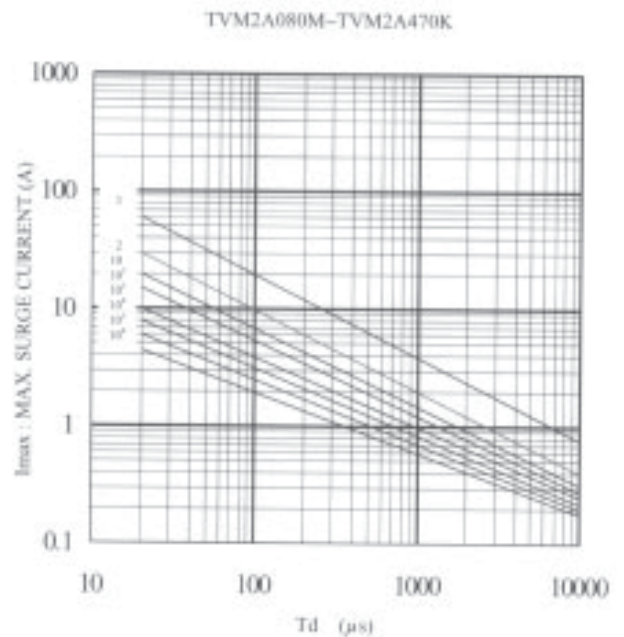


## SURGE CURRENT STANDARD WAVEFORM

EXAMPLE: 8/20 $\mu$ S  
 $T_r = 8\mu$ S  
 $T_d = 20\mu$ S



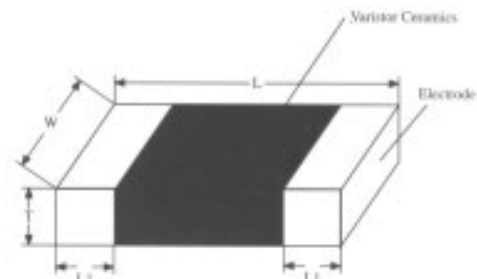
## MAX. SURGE CURRENT DERATING CURVES





## ZINC OXIDE VARISTOR 1206 SERIES

### TVM SERIES



### DIMENSION

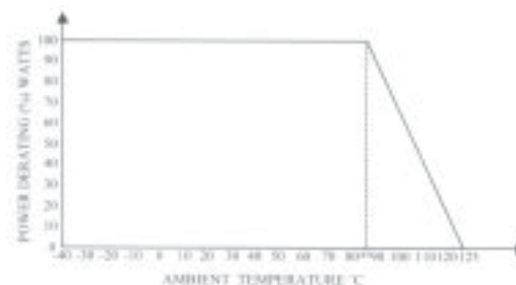
Unit: mm

| 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<br>Varistor<br>Voltage | Max.<br>Allowable<br>Voltage |                        | Max.<br>Clamping Voltage<br>(8/20µs) |                       | Max.<br>Surge Current<br>(8/20µs) | Max.<br>Energy<br>(10/1000µs) | Rate Power | Reference<br>Capacitance<br>@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                               |

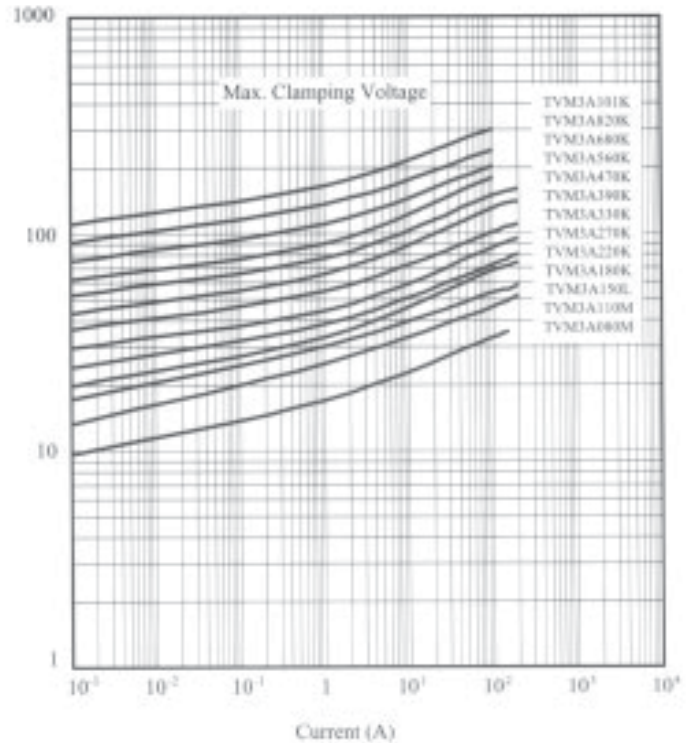
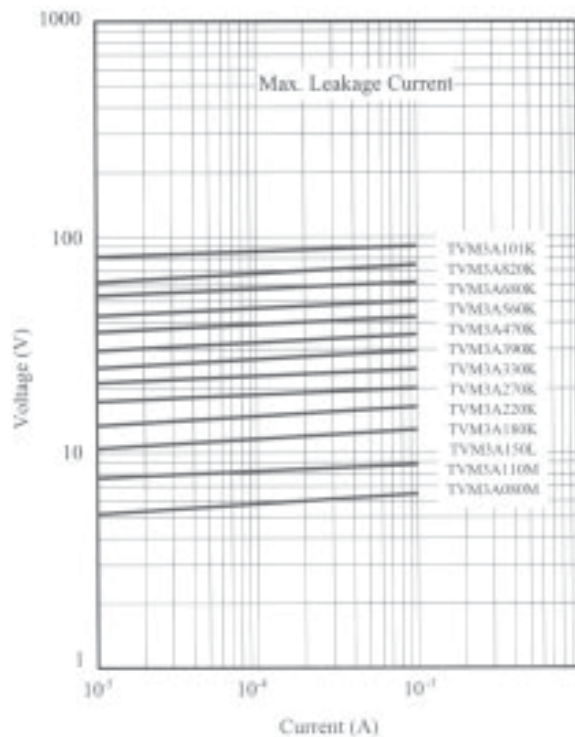
### OPERATING TEMPERATURE VS. POWER DERATING CURVE



|                                               |                |
|-----------------------------------------------|----------------|
| Nonlinearity exponent ( $\alpha$ )            | $\geq 15$      |
| Leakage Current (IL) at 25°C, V <sub>DC</sub> | $\leq 20\mu A$ |

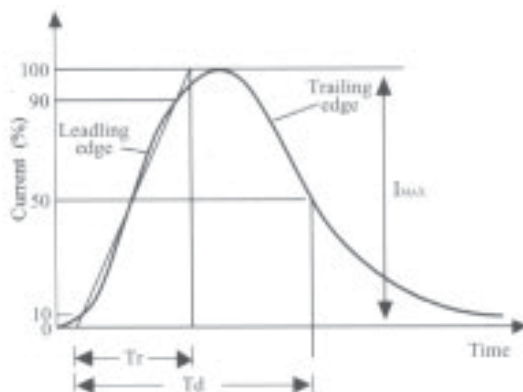
## MAX. LEAKAGE CURRENT AND MAX. CLAMPING VOLTAGE CURVES

TVM3A080M ~ TVM3A101K

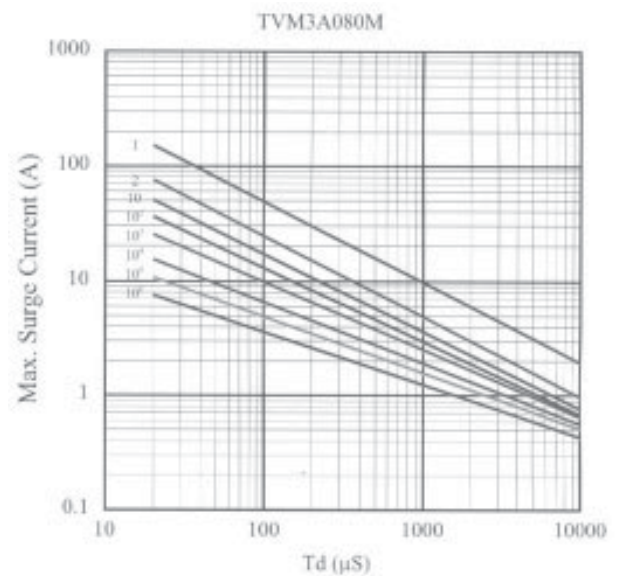


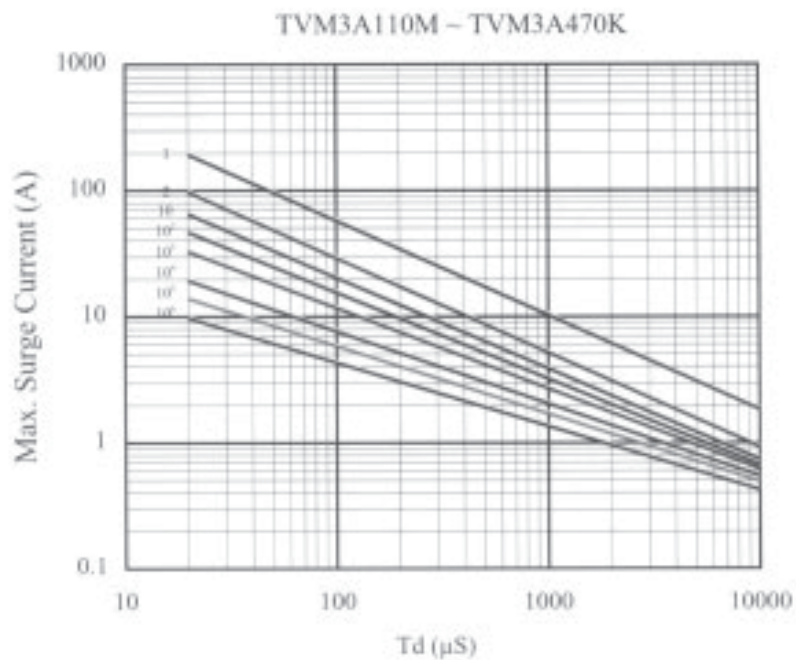
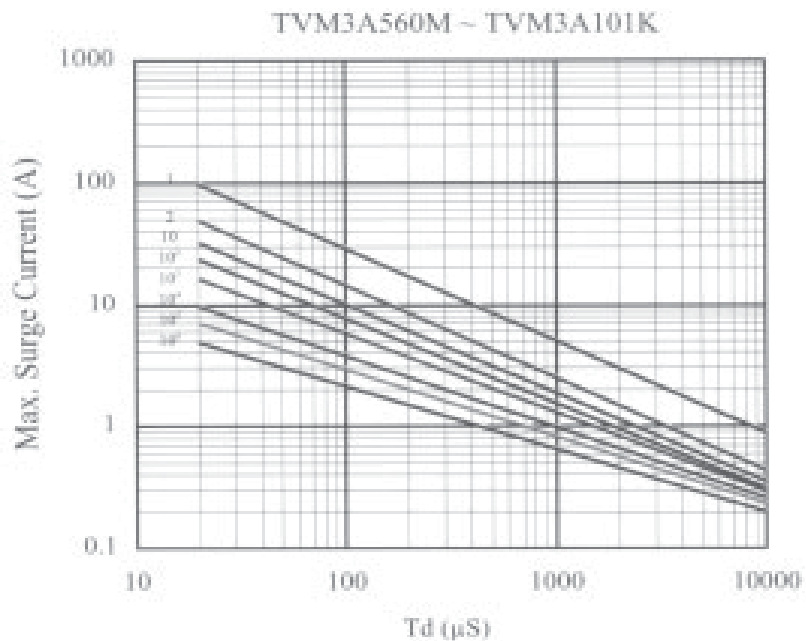
## SURGE CURRENT STANDARD WAVEFORM

EXAMPLE: 8/20 $\mu$ S  
 $T_r = 8\mu$ S  
 $T_d = 20\mu$ S



## MAX. SURGE CURRENT DERATING CURVES

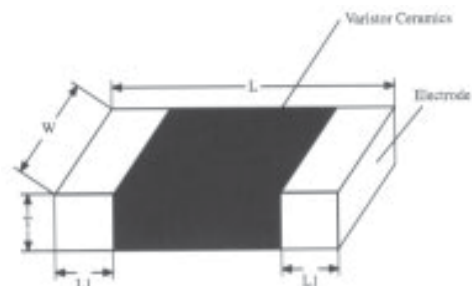


**MAX. SURGE CURRENT DERATING CURVES**

**MAX. SURGE CURRENT DERATING CURVES**




## ZINC OXIDE VARISTOR 1210 SERIES

### TVM SERIES



### DIMENSION

Unit: mm

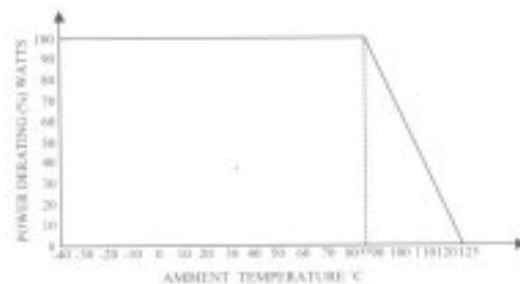
| Part No. | Size | L        | W         | T       | L1        |
|----------|------|----------|-----------|---------|-----------|
| TVM4     | 1210 | 3.2±0.30 | 2.50±0.25 | 1.50max | 0.50±0.20 |

### 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       | 9200                        |
| 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                         |

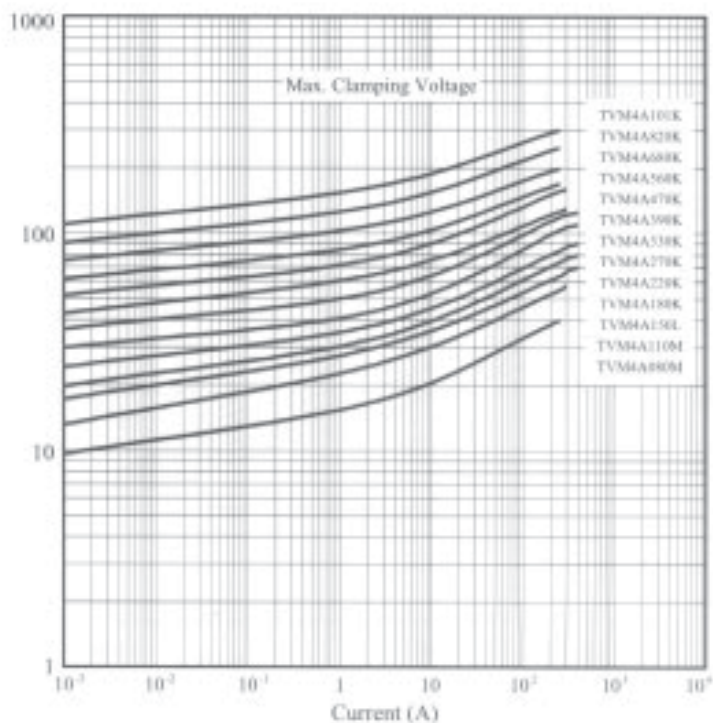
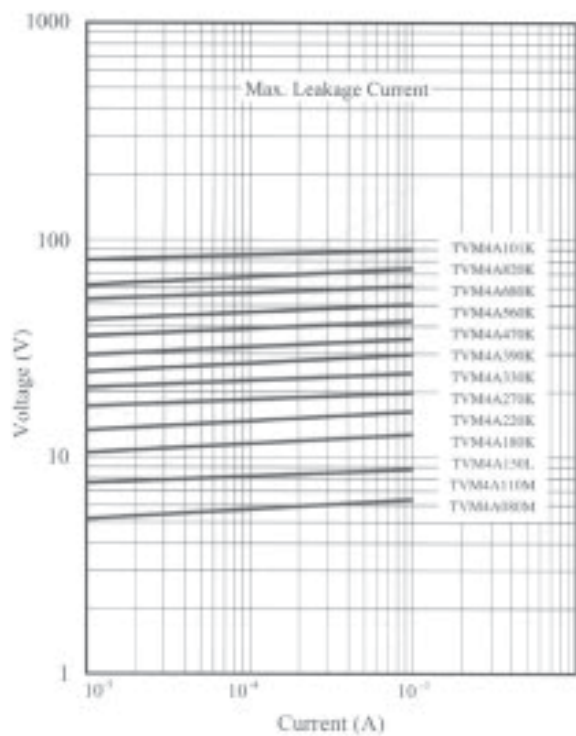
### OPERATING TEMPERATURE VS. POWER DERATING CURVE

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



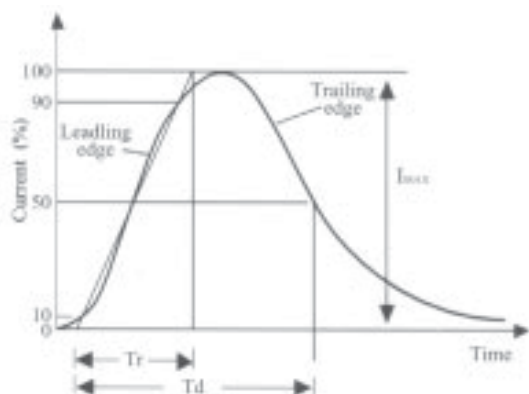
## MAX. LEAKAGE CURRENT AND MAX. CLAMPING VOLTAGE CURVES

TVM4A080M – TVM4A101K

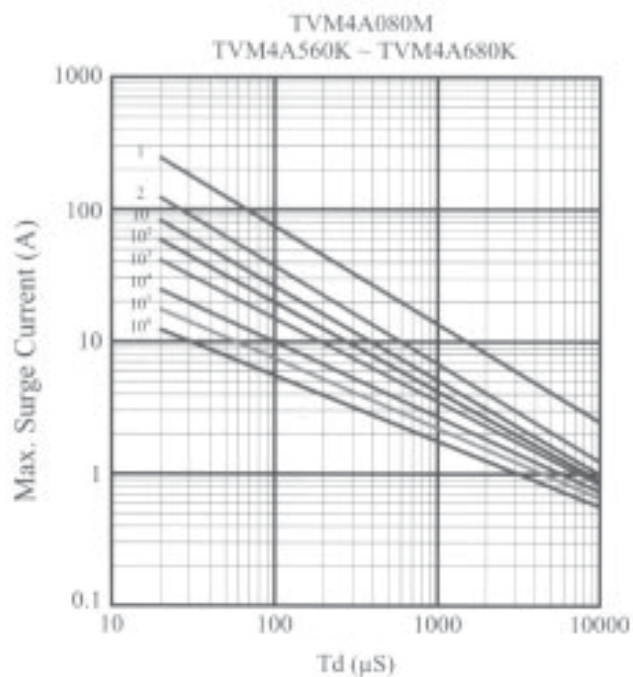


## SURGE CURRENT STANDARD WAVEFORM

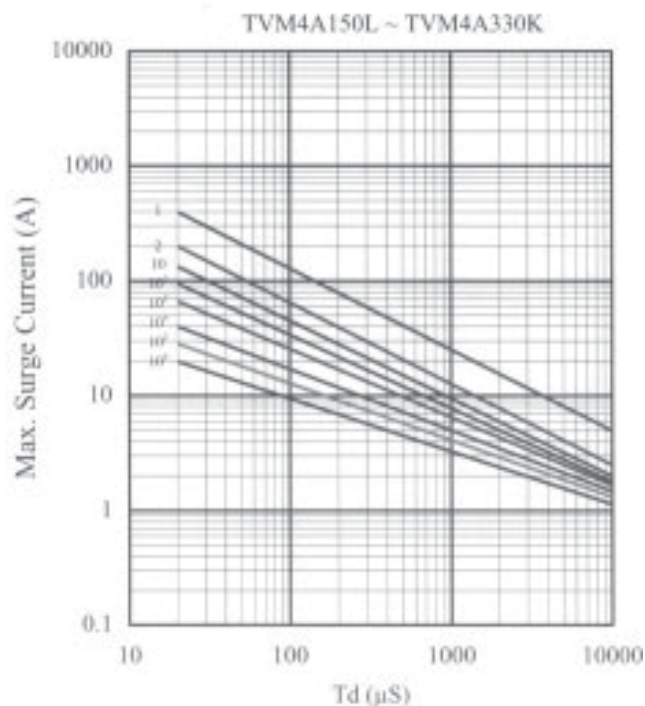
EXAMPLE: 8/20 $\mu$ S  
 $T_r = 8\mu$ S  
 $T_d = 20\mu$ S



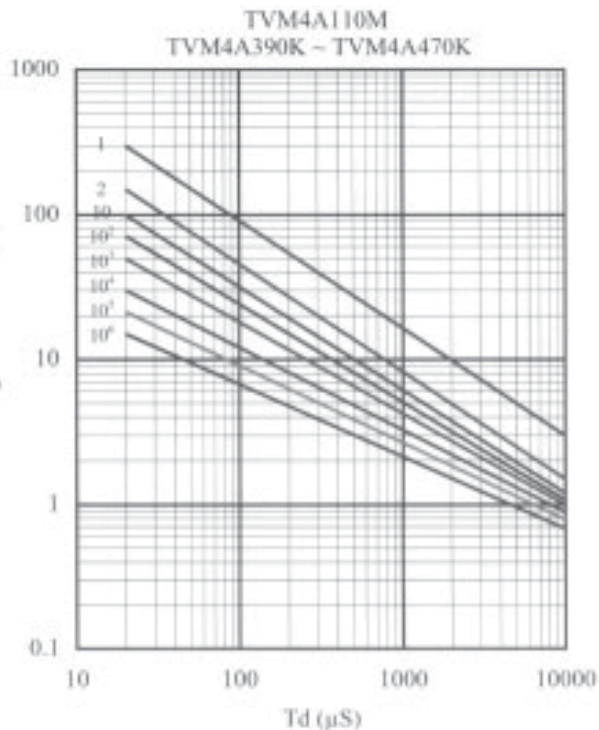
## MAX. SURGE CURRENT DERATING CURVES



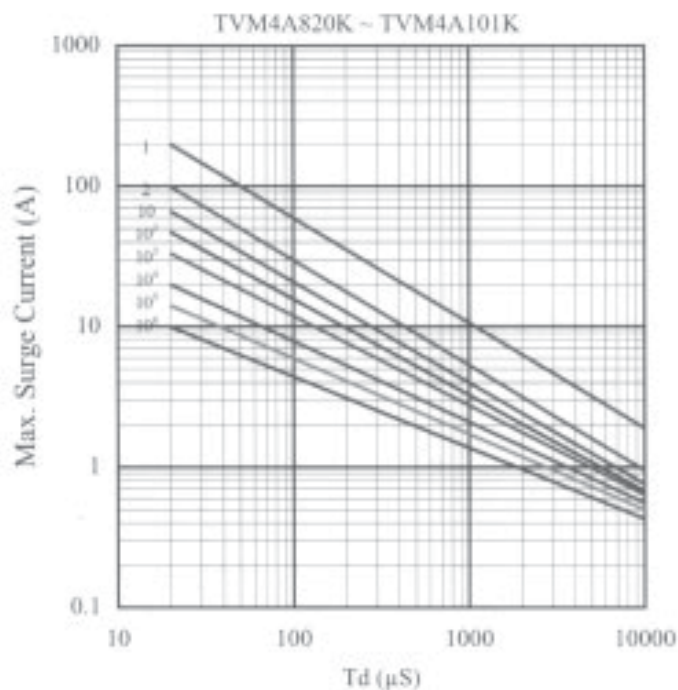
## MAX SURGE CURRENT DERATING CURVES



## MAX SURGE CURRENT DERATING CURVES



## MAX SURGE CURRENT DERATING CURVES





Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



#### Как с нами связаться

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**Адрес:** 198099, г. Санкт-Петербург, ул. Калинина, дом 2, корпус 4, литера А.