

## VDR Metal Oxide Varistors Standard



### LINKS TO ADDITIONAL RESOURCES



3D Models



Design Tools



SPICE Models

| QUICK REFERENCE DATA                                                |                                                         |      |
|---------------------------------------------------------------------|---------------------------------------------------------|------|
| PARAMETER                                                           | VALUE                                                   | UNIT |
| Maximum continuous voltage in operating temperature range:          |                                                         |      |
| RMS                                                                 | 14 to 680                                               | V    |
| DC                                                                  | 18 to 895                                               | V    |
| Maximum non-repetitive transient current $I_{NRP}$ (8 x 20 $\mu$ s) | 100 to 6500                                             | A    |
| Maximum energy (10/1000 $\mu$ s)                                    | 0.5 to 496                                              | J    |
| Detailed specification                                              | Based on<br>IEC 61051-1<br>IEC 61051-2<br>IEC 61051-2-2 |      |
| Storage temperature                                                 | -40 to +125                                             | °C   |
| Operating temperature                                               | -40 to +85                                              | °C   |

### ORDERING INFORMATION

The varistors are available in a number of packaging options:

- Bulk
- On tape and reel
- On tape in ammpack (fanfold)

The basic ordering code for each option is given in tables titled Varistors on Tape on Reel, Varistors on Tape in Ammpack and Varistors in Bulk. To complete the catalog number and to determine the required operating parameters, see Electrical Data and Ordering Information table.

#### Note

- Special lead-configuration as inside or outside crimped leads on request

### AGENCY APPROVALS

- cUL certificate
- ULus certificate
- VDE certificate

#### Note

- Agency approval documents, please see: [www.vishay.com/ppg?29081&documents](http://www.vishay.com/ppg?29081&documents)

### FEATURES

- Low  $\beta$  high purity zinc oxide disc
- Halogen free insulating epoxy coating
- Straight leads and kinked leads
- Straight leads with flange (VDRS05 and VDRS07 only)
- Certified for operation up to 85 °C according to UL 1449 edition 4, VDE/IEC 61051-1/2
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



**RoHS**  
COMPLIANT  
HALOGEN  
**FREE**

### APPLICATION

- Overvoltage and transient voltage protection

### DESCRIPTION

The varistors consist of a disc of low- $\beta$  ZnO ceramic material with two solid copper leads (S20 types only) or copper clad steel wire. The wires have a matte tin plating. They are coated with UL 94 V-0 approved ochre colored halogen-free epoxy, which provides electrical, mechanical and climatic protection.

### MOUNTING

The varistors are suitable for hand-mounting (bulk) or automatic pick and place mounting (tape on reel or fanfold). The parts can be soldered by hand or wave soldering. Pin-in-paste reflow soldering is not recommended. Bending of the leads for different angle placement is not recommended.

#### Typical soldering

235 °C, duration: 5 s (Pb-bearing)

245 °C, duration: 5 s (lead (Pb)-free)

#### Resistance to soldering heat

260 °C, duration: 10 s max.

### MARKING

The varistors are marked with the following information:

- Maximum continuous RMS voltage
- Series numbers
  - 592 for VDRS05
  - 593 for VDRS07
  - 594 for VDRS10
  - 595 for VDRS14
  - 596 for VDRS20
- Safety marks on VDRS10-14-20 types
- Manufacturers logo
- Date of manufacture (YYWW)

### INFLAMMABILITY

The varistors are passive non-flammable.

The encapsulation is made of flammable resistant epoxy in accordance with UL 94 V-0.



## ELECTRICAL DATA AND ORDERING INFORMATION

| MAXIMUM CONTINUOUS VOLTAGE |           | VOLTAGE <sup>(3)</sup><br>AT 1 mA | MAXIMUM VOLTAGE AT STATED CURRENT |          | MAXIMUM ENERGY <sup>(4)</sup><br>(10 x 1000 µs) | MAXIMUM NON-REP. TRANSIENT CURRENT <sup>(5)</sup><br>I <sub>NRP</sub> (8 x 20 µs) | NOMINAL DISCHARGE CURRENT <sup>(7)</sup><br>I <sub>N</sub> | TYPICAL CAPACITANCE AT 1 kHz | T (max.) | E         | SAP MATERIAL AND ORDERING NUMBER <sup>(1)</sup><br>xy <sup>(6)</sup> |
|----------------------------|-----------|-----------------------------------|-----------------------------------|----------|-------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------|------------------------------|----------|-----------|----------------------------------------------------------------------|
| RMS <sup>(2)</sup><br>(V)  | DC<br>(V) |                                   | V<br>(V)                          | I<br>(A) |                                                 |                                                                                   |                                                            |                              |          |           |                                                                      |
| 14                         | 18        | 22                                | 48                                | 1.0      | 0.5                                             | 100                                                                               | 0.10                                                       | 1300                         | 4.1      | 0.7 ± 0.3 | VDRS05A014xyE                                                        |
|                            |           |                                   | 43                                | 2.5      | 1.7                                             | 250                                                                               | 0.15                                                       | 2800                         | 4.1      | 0.7 ± 0.3 | VDRS07B014xyE                                                        |
|                            |           |                                   | 43                                | 5.0      | 4.3                                             | 500                                                                               | 0.25                                                       | 6000                         | 4.4      | 0.9 ± 0.3 | VDRS10D014xyE                                                        |
|                            |           |                                   | 43                                | 10.0     | 5.4                                             | 1000                                                                              | 1.00                                                       | 15 000                       | 4.4      | 0.9 ± 0.3 | VDRS14G014xyE                                                        |
|                            |           |                                   | 43                                | 20.0     | 8.0                                             | 2000                                                                              | 2.00                                                       | 30 000                       | 4.6      | 1.1 ± 0.3 | VDRS20M014ByE                                                        |
| 17                         | 22        | 27                                | 60                                | 1.0      | 0.7                                             | 100                                                                               | 0.10                                                       | 1050                         | 4.1      | 0.8 ± 0.3 | VDRS05A017xyE                                                        |
|                            |           |                                   | 53                                | 2.5      | 2.0                                             | 250                                                                               | 0.15                                                       | 2000                         | 4.1      | 0.8 ± 0.3 | VDRS07B017xyE                                                        |
|                            |           |                                   | 53                                | 5.0      | 5.3                                             | 500                                                                               | 0.25                                                       | 4000                         | 4.4      | 1.0 ± 0.3 | VDRS10D017xyE                                                        |
|                            |           |                                   | 53                                | 10.0     | 6.9                                             | 1000                                                                              | 1.00                                                       | 10 000                       | 4.4      | 1.0 ± 0.3 | VDRS14G017xyE                                                        |
|                            |           |                                   | 53                                | 20.0     | 10.0                                            | 2000                                                                              | 2.00                                                       | 20 000                       | 4.6      | 1.2 ± 0.3 | VDRS20M017ByE                                                        |
| 20                         | 26        | 33                                | 73                                | 1.0      | 0.8                                             | 100                                                                               | 0.10                                                       | 900                          | 4.1      | 1.0 ± 0.3 | VDRS05A020xyE                                                        |
|                            |           |                                   | 65                                | 2.5      | 2.5                                             | 250                                                                               | 0.15                                                       | 1500                         | 4.1      | 1.0 ± 0.3 | VDRS07B020xyE                                                        |
|                            |           |                                   | 65                                | 5.0      | 6.5                                             | 500                                                                               | 0.25                                                       | 3000                         | 4.4      | 1.2 ± 0.3 | VDRS10D020xyE                                                        |
|                            |           |                                   | 65                                | 10.0     | 8.8                                             | 1000                                                                              | 1.00                                                       | 7500                         | 4.4      | 1.2 ± 0.3 | VDRS14G020xyE                                                        |
|                            |           |                                   | 65                                | 20.0     | 12.0                                            | 2000                                                                              | 2.00                                                       | 15 000                       | 4.8      | 1.4 ± 0.3 | VDRS20M020ByE                                                        |
| 25                         | 31        | 39                                | 86                                | 1.0      | 0.9                                             | 100                                                                               | 0.10                                                       | 500                          | 4.2      | 1.2 ± 0.3 | VDRS05A025xyE                                                        |
|                            |           |                                   | 77                                | 2.5      | 3.0                                             | 250                                                                               | 0.15                                                       | 1350                         | 4.2      | 1.2 ± 0.3 | VDRS07B025xyE                                                        |
|                            |           |                                   | 77                                | 5.0      | 7.7                                             | 500                                                                               | 0.25                                                       | 2600                         | 4.6      | 1.4 ± 0.3 | VDRS10D025xyE                                                        |
|                            |           |                                   | 77                                | 10.0     | 9.4                                             | 1000                                                                              | 1.00                                                       | 6500                         | 4.6      | 1.4 ± 0.3 | VDRS14G025xyE                                                        |
|                            |           |                                   | 77                                | 20.0     | 14.0                                            | 2000                                                                              | 2.00                                                       | 13 000                       | 5.0      | 1.6 ± 0.3 | VDRS20M025ByE                                                        |
| 30                         | 38        | 47                                | 96                                | 1.0      | 1.1                                             | 100                                                                               | 0.10                                                       | 700                          | 4.4      | 1.4 ± 0.5 | VDRS05A030xyE                                                        |
|                            |           |                                   | 93                                | 2.5      | 3.6                                             | 250                                                                               | 0.15                                                       | 1600                         | 4.4      | 1.4 ± 0.5 | VDRS07B030xyE                                                        |
|                            |           |                                   | 93                                | 5.0      | 9.2                                             | 500                                                                               | 0.25                                                       | 2700                         | 4.8      | 1.6 ± 0.5 | VDRS10D030xyE                                                        |
|                            |           |                                   | 93                                | 10.0     | 12.0                                            | 1000                                                                              | 1.00                                                       | 6000                         | 4.8      | 1.6 ± 0.5 | VDRS14G030xyE                                                        |
|                            |           |                                   | 93                                | 20.0     | 17.0                                            | 2000                                                                              | 2.00                                                       | 12 000                       | 5.2      | 1.8 ± 0.5 | VDRS20M030ByE                                                        |
| 35                         | 45        | 56                                | 123                               | 1.0      | 1.4                                             | 100                                                                               | 0.10                                                       | 560                          | 4.8      | 1.7 ± 0.5 | VDRS05A035xyE                                                        |
|                            |           |                                   | 110                               | 2.5      | 4.4                                             | 250                                                                               | 0.15                                                       | 1300                         | 4.8      | 1.7 ± 0.5 | VDRS07B035xyE                                                        |
|                            |           |                                   | 110                               | 5.0      | 11.0                                            | 500                                                                               | 0.25                                                       | 2200                         | 5.2      | 1.9 ± 0.5 | VDRS10D035xyE                                                        |
|                            |           |                                   | 110                               | 10.0     | 14.0                                            | 1000                                                                              | 1.00                                                       | 4800                         | 5.2      | 1.9 ± 0.5 | VDRS14G035xyE                                                        |
|                            |           |                                   | 110                               | 20.0     | 20.0                                            | 2000                                                                              | 2.00                                                       | 9600                         | 5.6      | 2.1 ± 0.5 | VDRS20M035ByE                                                        |
| 40                         | 56        | 68                                | 145                               | 1.0      | 1.6                                             | 100                                                                               | 0.10                                                       | 460                          | 5.1      | 2.1 ± 0.5 | VDRS05A040xyE                                                        |
|                            |           |                                   | 135                               | 2.5      | 5.2                                             | 250                                                                               | 0.15                                                       | 1000                         | 5.1      | 2.1 ± 0.5 | VDRS07B040xyE                                                        |
|                            |           |                                   | 135                               | 5.0      | 13.0                                            | 500                                                                               | 0.25                                                       | 1800                         | 5.5      | 2.3 ± 0.5 | VDRS10D040xyE                                                        |
|                            |           |                                   | 135                               | 10.0     | 17.0                                            | 1000                                                                              | 1.00                                                       | 3800                         | 5.5      | 2.3 ± 0.5 | VDRS14G040xyE                                                        |
|                            |           |                                   | 135                               | 20.0     | 24.0                                            | 2000                                                                              | 2.00                                                       | 7600                         | 5.9      | 2.5 ± 0.5 | VDRS20M040ByE                                                        |
| 50                         | 65        | 82                                | 145                               | 5.0      | 2.6                                             | 400                                                                               | 0.10                                                       | 370                          | 4.1      | 0.6 ± 0.3 | VDRS05C050xyE                                                        |
|                            |           |                                   | 140                               | 10.0     | 7.0                                             | 1200                                                                              | 0.50                                                       | 900                          | 4.1      | 0.6 ± 0.3 | VDRS07H050xyE                                                        |
|                            |           |                                   | 140                               | 25.0     | 12.0                                            | 2500                                                                              | 1.50                                                       | 1500                         | 4.4      | 0.8 ± 0.3 | VDRS10P050xyE                                                        |
|                            |           |                                   | 140                               | 50.0     | 21.0                                            | 4500                                                                              | 3.00                                                       | 3100                         | 4.4      | 0.8 ± 0.3 | VDRS14T050xyE                                                        |
| 60                         | 85        | 100                               | 170                               | 5.0      | 2.9                                             | 400                                                                               | 0.10                                                       | 290                          | 4.1      | 0.7 ± 0.3 | VDRS05C060xyE                                                        |
|                            |           |                                   | 165                               | 10.0     | 8.3                                             | 1200                                                                              | 0.50                                                       | 700                          | 4.1      | 0.7 ± 0.3 | VDRS07H060xyE                                                        |
|                            |           |                                   | 165                               | 25.0     | 15.0                                            | 2500                                                                              | 1.50                                                       | 1200                         | 4.4      | 0.9 ± 0.3 | VDRS10P060xyE                                                        |
|                            |           |                                   | 165                               | 50.0     | 24.0                                            | 4500                                                                              | 3.00                                                       | 2300                         | 4.4      | 0.9 ± 0.3 | VDRS14T060xyE                                                        |
|                            |           |                                   | 165                               | 100.0    | 56.0                                            | 6500                                                                              | 3.00                                                       | 4700                         | 4.5      | 1.1 ± 0.3 | VDRS20W060ByE                                                        |
| 75                         | 100       | 120                               | 210                               | 5.0      | 3.4                                             | 400                                                                               | 0.10                                                       | 240                          | 4.1      | 0.9 ± 0.3 | VDRS05C075xyE                                                        |
|                            |           |                                   | 200                               | 10.0     | 10.0                                            | 1200                                                                              | 0.50                                                       | 530                          | 4.1      | 0.9 ± 0.3 | VDRS07H075xyE                                                        |
|                            |           |                                   | 200                               | 25.0     | 18.0                                            | 2500                                                                              | 1.50                                                       | 1000                         | 4.4      | 1.1 ± 0.3 | VDRS10P075xyE                                                        |
|                            |           |                                   | 200                               | 50.0     | 29.0                                            | 4500                                                                              | 3.00                                                       | 1900                         | 4.4      | 1.1 ± 0.3 | VDRS14T075xyE                                                        |
|                            |           |                                   | 200                               | 100.0    | 64.0                                            | 6500                                                                              | 3.00                                                       | 3900                         | 4.8      | 1.3 ± 0.3 | VDRS20W075ByE                                                        |
| 95                         | 125       | 150                               | 250                               | 5.0      | 4.1                                             | 400                                                                               | 0.10                                                       | 180                          | 4.2      | 1.1 ± 0.3 | VDRS05C095xyE                                                        |
|                            |           |                                   | 250                               | 10.0     | 13.0                                            | 1200                                                                              | 0.50                                                       | 450                          | 4.2      | 1.1 ± 0.3 | VDRS07H095xyE                                                        |
|                            |           |                                   | 250                               | 25.0     | 22.0                                            | 2500                                                                              | 1.50                                                       | 800                          | 4.6      | 1.3 ± 0.3 | VDRS10P095xyE                                                        |
|                            |           |                                   | 250                               | 50.0     | 37.0                                            | 4500                                                                              | 3.00                                                       | 1500                         | 4.6      | 1.3 ± 0.3 | VDRS14T095xyE                                                        |
|                            |           |                                   | 250                               | 100.0    | 88.0                                            | 6500                                                                              | 3.00                                                       | 3000                         | 5.2      | 1.5 ± 0.3 | VDRS20W095ByE                                                        |



## ELECTRICAL DATA AND ORDERING INFORMATION

| MAXIMUM CONTINUOUS VOLTAGE |           | VOLTAGE <sup>(3)</sup><br>AT 1 mA | MAXIMUM VOLTAGE AT STATED CURRENT |          | MAXIMUM ENERGY <sup>(4)</sup><br>(10 x 1000 µs) | MAXIMUM NON-REP. TRANSIENT CURRENT <sup>(5)</sup><br>I <sub>NRP</sub> (8 x 20 µs) | NOMINAL DISCHARGE CURRENT <sup>(7)</sup><br>I <sub>N</sub> | TYPICAL CAPACITANCE AT 1 kHz | T<br>(max.) | E         | SAP MATERIAL AND ORDERING NUMBER <sup>(1)</sup><br>xy <sup>(6)</sup> |
|----------------------------|-----------|-----------------------------------|-----------------------------------|----------|-------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------|------------------------------|-------------|-----------|----------------------------------------------------------------------|
| RMS <sup>(2)</sup><br>(V)  | DC<br>(V) | (V)                               | V<br>(V)                          | I<br>(A) | (J)                                             | (A)                                                                               | (kA)                                                       | (pF)                         | (mm)        | (mm)      |                                                                      |
| 130                        | 170       | 205                               | 345                               | 5.0      | 5.5                                             | 400                                                                               | 0.10                                                       | 130                          | 4.2         | 1.0 ± 0.3 | VDRS05C130xyE                                                        |
|                            |           |                                   | 340                               | 10.0     | 17.0                                            | 1200                                                                              | 0.50                                                       | 320                          | 4.2         | 1.0 ± 0.3 | VDRS07H130xyE                                                        |
|                            |           |                                   | 340                               | 25.0     | 30.0                                            | 2500                                                                              | 1.50                                                       | 580                          | 4.6         | 1.2 ± 0.3 | VDRS10P130xyE                                                        |
|                            |           |                                   | 340                               | 50.0     | 56.0                                            | 4500                                                                              | 3.00                                                       | 1050                         | 4.6         | 1.2 ± 0.3 | VDRS14T130xyE                                                        |
|                            |           |                                   | 340                               | 100.0    | 114.0                                           | 6500                                                                              | 3.00                                                       | 2100                         | 5.3         | 1.4 ± 0.3 | VDRS20W130ByE                                                        |
| 140                        | 180       | 220                               | 380                               | 5.0      | 6.3                                             | 400                                                                               | 0.10                                                       | 120                          | 4.4         | 1.0 ± 0.3 | VDRS05C140xyE                                                        |
|                            |           |                                   | 360                               | 10.0     | 21.0                                            | 1200                                                                              | 0.50                                                       | 290                          | 4.4         | 1.0 ± 0.3 | VDRS07H140xyE                                                        |
|                            |           |                                   | 360                               | 25.0     | 33.0                                            | 2500                                                                              | 1.50                                                       | 540                          | 4.8         | 1.2 ± 0.3 | VDRS10P140xyE                                                        |
|                            |           |                                   | 360                               | 50.0     | 57.0                                            | 4500                                                                              | 3.00                                                       | 950                          | 4.8         | 1.2 ± 0.3 | VDRS14T140xyE                                                        |
|                            |           |                                   | 360                               | 100.0    | 124.0                                           | 6500                                                                              | 3.00                                                       | 1900                         | 5.4         | 1.5 ± 0.3 | VDRS20W140ByE                                                        |
| 150                        | 200       | 240                               | 400                               | 5.0      | 7.1                                             | 400                                                                               | 0.10                                                       | 110                          | 4.4         | 1.1 ± 0.3 | VDRS05C150xyE                                                        |
|                            |           |                                   | 395                               | 10.0     | 20.0                                            | 1200                                                                              | 0.50                                                       | 270                          | 4.4         | 1.1 ± 0.3 | VDRS07H150xyE                                                        |
|                            |           |                                   | 395                               | 25.0     | 36.0                                            | 2500                                                                              | 1.50                                                       | 490                          | 4.8         | 1.3 ± 0.3 | VDRS10P150xyE                                                        |
|                            |           |                                   | 395                               | 50.0     | 59.0                                            | 4500                                                                              | 3.00                                                       | 850                          | 4.8         | 1.3 ± 0.3 | VDRS14T150xyE                                                        |
|                            |           |                                   | 395                               | 100.0    | 134.0                                           | 6500                                                                              | 3.00                                                       | 1700                         | 5.5         | 1.6 ± 0.3 | VDRS20W150ByE                                                        |
| 175                        | 225       | 275                               | 455                               | 5.0      | 7.3                                             | 400                                                                               | 0.10                                                       | 90                           | 4.6         | 1.3 ± 0.3 | VDRS05C175xyE                                                        |
|                            |           |                                   | 455                               | 10.0     | 23.0                                            | 1200                                                                              | 0.50                                                       | 230                          | 4.6         | 1.3 ± 0.3 | VDRS07H175xyE                                                        |
|                            |           |                                   | 455                               | 25.0     | 41.0                                            | 2500                                                                              | 1.50                                                       | 430                          | 5.0         | 1.5 ± 0.3 | VDRS10P175xyE                                                        |
|                            |           |                                   | 455                               | 50.0     | 67.0                                            | 4500                                                                              | 3.00                                                       | 750                          | 5.0         | 1.5 ± 0.3 | VDRS14T175xyE                                                        |
|                            |           |                                   | 455                               | 100.0    | 158.0                                           | 6500                                                                              | 3.00                                                       | 1500                         | 5.7         | 1.7 ± 0.3 | VDRS20W175ByE                                                        |
| 230                        | 300       | 360                               | 600                               | 5.0      | 10.0                                            | 400                                                                               | 0.10                                                       | 70                           | 4.9         | 1.7 ± 0.8 | VDRS05C230xyE                                                        |
|                            |           |                                   | 595                               | 10.0     | 30.0                                            | 1200                                                                              | 0.50                                                       | 170                          | 4.9         | 1.7 ± 0.8 | VDRS07H230xyE                                                        |
|                            |           |                                   | 595                               | 25.0     | 54.0                                            | 2500                                                                              | 1.50                                                       | 320                          | 5.4         | 1.9 ± 0.8 | VDRS10P230xyE                                                        |
|                            |           |                                   | 595                               | 50.0     | 88.0                                            | 4500                                                                              | 3.00                                                       | 540                          | 5.4         | 1.9 ± 0.8 | VDRS14T230xyE                                                        |
|                            |           |                                   | 595                               | 100.0    | 208.0                                           | 6500                                                                              | 3.00                                                       | 1100                         | 6.2         | 2.2 ± 0.8 | VDRS20W230ByE                                                        |
| 250                        | 320       | 390                               | 650                               | 5.0      | 11.0                                            | 400                                                                               | 0.10                                                       | 60                           | 4.9         | 1.9 ± 0.8 | VDRS05C250xyE                                                        |
|                            |           |                                   | 650                               | 10.0     | 33.0                                            | 1200                                                                              | 0.50                                                       | 160                          | 4.9         | 1.9 ± 0.8 | VDRS07H250xyE                                                        |
|                            |           |                                   | 650                               | 25.0     | 58.0                                            | 2500                                                                              | 1.50                                                       | 300                          | 5.4         | 2.1 ± 0.8 | VDRS10P250xyE                                                        |
|                            |           |                                   | 650                               | 50.0     | 96.0                                            | 4500                                                                              | 3.00                                                       | 480                          | 5.4         | 2.1 ± 0.8 | VDRS14T250xyE                                                        |
|                            |           |                                   | 650                               | 100.0    | 240.0                                           | 6500                                                                              | 3.00                                                       | 960                          | 6.4         | 2.3 ± 0.8 | VDRS20W250ByE                                                        |
| 275                        | 350       | 430                               | 710                               | 5.0      | 12.0                                            | 400                                                                               | 0.10                                                       | 55                           | 4.9         | 2.0 ± 0.8 | VDRS05C275xyE                                                        |
|                            |           |                                   | 710                               | 10.0     | 36.0                                            | 1200                                                                              | 0.50                                                       | 140                          | 4.9         | 2.0 ± 0.8 | VDRS07H275xyE                                                        |
|                            |           |                                   | 710                               | 25.0     | 63.0                                            | 2500                                                                              | 1.50                                                       | 270                          | 5.4         | 2.2 ± 0.8 | VDRS10P275xyE                                                        |
|                            |           |                                   | 710                               | 50.0     | 104.0                                           | 4500                                                                              | 3.00                                                       | 440                          | 5.4         | 2.2 ± 0.8 | VDRS14T275xyE                                                        |
|                            |           |                                   | 710                               | 100.0    | 264.0                                           | 6500                                                                              | 3.00                                                       | 900                          | 6.6         | 2.5 ± 0.8 | VDRS20W275ByE                                                        |
| 300                        | 385       | 470                               | 800                               | 5.0      | 13.0                                            | 400                                                                               | 0.10                                                       | 50                           | 5.3         | 2.2 ± 0.8 | VDRS05C300xyE                                                        |
|                            |           |                                   | 775                               | 10.0     | 40.0                                            | 1200                                                                              | 0.50                                                       | 130                          | 5.3         | 2.2 ± 0.8 | VDRS07H300xyE                                                        |
|                            |           |                                   | 775                               | 25.0     | 71.0                                            | 2500                                                                              | 1.50                                                       | 240                          | 5.9         | 2.4 ± 0.8 | VDRS10P300xyE                                                        |
|                            |           |                                   | 775                               | 50.0     | 117.0                                           | 4500                                                                              | 3.00                                                       | 400                          | 5.9         | 2.4 ± 0.8 | VDRS14T300xyE                                                        |
|                            |           |                                   | 775                               | 100.0    | 280.0                                           | 6500                                                                              | 3.00                                                       | 810                          | 6.9         | 2.7 ± 0.8 | VDRS20W300ByE                                                        |
| 320                        | 420       | 510                               | 850                               | 5.0      | 15.0                                            | 400                                                                               | 0.10                                                       | 45                           | 5.5         | 2.4 ± 0.8 | VDRS05C320xyE                                                        |
|                            |           |                                   | 842                               | 10.0     | 44.0                                            | 1200                                                                              | 0.50                                                       | 120                          | 5.5         | 2.4 ± 0.8 | VDRS07H320xyE                                                        |
|                            |           |                                   | 842                               | 25.0     | 77.0                                            | 2500                                                                              | 1.50                                                       | 220                          | 6.2         | 2.6 ± 0.8 | VDRS10P320xyE                                                        |
|                            |           |                                   | 842                               | 50.0     | 120.0                                           | 4500                                                                              | 3.00                                                       | 370                          | 6.2         | 2.6 ± 0.8 | VDRS14T320xyE                                                        |
|                            |           |                                   | 842                               | 100.0    | 296.0                                           | 6500                                                                              | 3.00                                                       | 750                          | 7.1         | 2.9 ± 0.8 | VDRS20W320ByE                                                        |
| 350                        | 460       | 560                               | 940                               | 5.0      | 19.5                                            | 400                                                                               | 0.10                                                       | 42                           | 5.8         | 2.7 ± 0.8 | VDRS05C350xyE                                                        |
|                            |           |                                   | 920                               | 10.0     | 39.0                                            | 1200                                                                              | 0.50                                                       | 110                          | 5.8         | 2.7 ± 0.8 | VDRS07H350xyE                                                        |
|                            |           |                                   | 920                               | 25.0     | 78.0                                            | 2500                                                                              | 1.50                                                       | 200                          | 6.6         | 2.9 ± 0.8 | VDRS10P350xyE                                                        |
|                            |           |                                   | 920                               | 50.0     | 156.0                                           | 4500                                                                              | 3.00                                                       | 325                          | 6.6         | 2.9 ± 0.8 | VDRS14T350xyE                                                        |
|                            |           |                                   | 920                               | 100.0    | 312.0                                           | 6500                                                                              | 3.00                                                       | 660                          | 7.4         | 3.2 ± 0.8 | VDRS20W350ByE                                                        |
| 385                        | 505       | 620                               | 1025                              | 5.0      | 18.0                                            | 400                                                                               | 0.10                                                       | 40                           | 6.0         | 3.0 ± 0.8 | VDRS05C385xyE                                                        |
|                            |           |                                   | 1025                              | 10.0     | 51.0                                            | 1200                                                                              | 0.50                                                       | 95                           | 6.0         | 3.0 ± 0.8 | VDRS07H385xyE                                                        |
|                            |           |                                   | 1025                              | 25.0     | 67.0                                            | 2500                                                                              | 1.50                                                       | 180                          | 6.6         | 3.2 ± 0.8 | VDRS10P385xyE                                                        |
|                            |           |                                   | 1025                              | 50.0     | 110.0                                           | 4500                                                                              | 3.00                                                       | 280                          | 6.6         | 3.2 ± 0.8 | VDRS14T385xyE                                                        |
|                            |           |                                   | 1025                              | 100.0    | 328.0                                           | 6500                                                                              | 3.00                                                       | 570                          | 7.7         | 3.5 ± 0.8 | VDRS20W385ByE                                                        |

## ELECTRICAL DATA AND ORDERING INFORMATION

| MAXIMUM CONTINUOUS VOLTAGE |           | VOLTAGE <sup>(3)</sup><br>AT 1 mA | MAXIMUM VOLTAGE<br>AT<br>STATED<br>CURRENT |          | MAXIMUM<br>ENERGY <sup>(4)</sup><br>(10 x 1000 μs) | MAXIMUM<br>NON-REP.<br>TRANSIENT<br>CURRENT <sup>(5)</sup><br>I <sub>NRP</sub> (8 x 20 μs) | NOMINAL<br>DISCHARGE<br>CURRENT <sup>(7)</sup><br>I <sub>N</sub> | TYPICAL<br>CAPACITANCE<br>AT 1 kHz | T<br>(max.) | E         | SAP MATERIAL<br>AND ORDERING<br>NUMBER <sup>(1)</sup><br>xy <sup>(6)</sup> |
|----------------------------|-----------|-----------------------------------|--------------------------------------------|----------|----------------------------------------------------|--------------------------------------------------------------------------------------------|------------------------------------------------------------------|------------------------------------|-------------|-----------|----------------------------------------------------------------------------|
| RMS <sup>(2)</sup><br>(V)  | DC<br>(V) | (V)                               | V<br>(V)                                   | I<br>(A) | (J)                                                | (A)                                                                                        | (kA)                                                             | (pF)                               | (mm)        | (mm)      |                                                                            |
| 420                        | 560       | 680                               | 1120                                       | 5.0      | 20.0                                               | 400                                                                                        | 0.10                                                             | 35                                 | 6.1         | 3.2 ± 0.8 | VDRS05C420xyE                                                              |
|                            |           |                                   | 1120                                       | 10.0     | 56.0                                               | 1200                                                                                       | 0.50                                                             | 85                                 | 6.1         | 3.2 ± 0.8 | VDRS07H420xyE                                                              |
|                            |           |                                   | 1120                                       | 25.0     | 73.0                                               | 2500                                                                                       | 1.50                                                             | 165                                | 6.6         | 3.4 ± 0.8 | VDRS10P420xyE                                                              |
|                            |           |                                   | 1120                                       | 50.0     | 120.0                                              | 4500                                                                                       | 3.00                                                             | 250                                | 6.6         | 3.4 ± 0.8 | VDRS14T420xyE                                                              |
|                            |           |                                   | 1120                                       | 100.0    | 344.0                                              | 6500                                                                                       | 3.00                                                             | 510                                | 8.1         | 3.7 ± 0.8 | VDRS20W420ByE                                                              |
| 460                        | 615       | 750                               | 1240                                       | 5.0      | 21.0                                               | 400                                                                                        | 0.10                                                             | 30                                 | 6.4         | 3.6 ± 0.8 | VDRS05C460xyE                                                              |
|                            |           |                                   | 1240                                       | 10.0     | 63.0                                               | 1200                                                                                       | 0.50                                                             | 75                                 | 6.4         | 3.6 ± 0.8 | VDRS07H460xyE                                                              |
|                            |           |                                   | 1240                                       | 25.0     | 82.0                                               | 2500                                                                                       | 1.50                                                             | 150                                | 6.8         | 3.8 ± 0.8 | VDRS10P460xyE                                                              |
|                            |           |                                   | 1240                                       | 50.0     | 135.0                                              | 4500                                                                                       | 3.00                                                             | 225                                | 6.8         | 3.8 ± 0.8 | VDRS14T460xyE                                                              |
|                            |           |                                   | 1240                                       | 100.0    | 360.0                                              | 6500                                                                                       | 3.00                                                             | 460                                | 8.5         | 4.1 ± 0.8 | VDRS20W460ByE                                                              |
| 510                        | 670       | 820                               | 1355                                       | 25.0     | 89.0                                               | 2500                                                                                       | 1.50                                                             | 135                                | 7.2         | 4.1 ± 0.8 | VDRS10P510xyE                                                              |
|                            |           |                                   | 1355                                       | 50.0     | 145.0                                              | 4500                                                                                       | 3.00                                                             | 220                                | 7.2         | 4.1 ± 0.8 | VDRS14T510xyE                                                              |
|                            |           |                                   | 1355                                       | 100.0    | 376.0                                              | 6500                                                                                       | 3.00                                                             | 450                                | 8.9         | 4.4 ± 0.8 | VDRS20W510ByE                                                              |
| 550                        | 745       | 910                               | 1500                                       | 25.0     | 98.0                                               | 2500                                                                                       | 1.50                                                             | 120                                | 7.9         | 4.5 ± 0.8 | VDRS10P550xyE                                                              |
|                            |           |                                   | 1500                                       | 50.0     | 160.0                                              | 4500                                                                                       | 3.00                                                             | 180                                | 7.9         | 4.5 ± 0.8 | VDRS14T550xyE                                                              |
|                            |           |                                   | 1500                                       | 100.0    | 408.0                                              | 6500                                                                                       | 3.00                                                             | 370                                | 9.5         | 4.9 ± 0.8 | VDRS20W550ByE                                                              |
| 625                        | 825       | 1000                              | 1650                                       | 100.0    | 448.0                                              | 6500                                                                                       | 3.00                                                             | 320                                | 10.1        | 5.3 ± 0.8 | VDRS20W625ByE                                                              |
| 680                        | 895       | 1100                              | 1815                                       | 100.0    | 496.0                                              | 6500                                                                                       | 3.00                                                             | 270                                | 10.6        | 5.8 ± 0.8 | VDRS20W680ByE                                                              |

## Notes

- (1) The products are certified according to cULus (E332800), and VDE/IEC (40002622). See Agency Approval section for certificate download
- (2) The sinusoidal voltage is assumed as the normal operating condition. If a non-sinusoidal voltage is present, type selection should be based on multiplying the peak voltage by a factor of 0.707.
- (3) The voltage measured at 1 mA meets the requirements of IEC 61051.  
The tolerance on the voltage at 1 mA is  $\pm 10\%$ .
- (4) High energy surges are generally of longer duration. The maximum energy for one pulse of  $10 \times 1000 \mu\text{s}$  is given as a reference for longer duration pulses. This pulse can be characterized by peak current ( $I_p$ ) and pulse width  $t_2$  (virtual time of half  $I_p$  value, following IEC 60060-2, section 6). If  $V_D$  is the clamping voltage corresponding to  $I_p$ , the energy absorbed in the varistor is determined by the formula:

$$E = K \times V_p \times I_p \times t_2$$

where K is dependent on the value of  $t_2$  when the value of  $t_1$  is between 8  $\mu$ s and 10  $\mu$ s (see Peak Current as a Function of Pulse Width drawing)

- (5) A current wave of  $8 \times 20 \mu\text{s}$  is used as a standard for pulse current and clamping voltage ratings. The maximum non-repetitive transient current is given for one pulse applied during the life of the component.
- (6) For composition of the SAP part number:
- |                |                        |                |                                                                                    |
|----------------|------------------------|----------------|------------------------------------------------------------------------------------|
| Replace "x" by | B for bulk type        | Replace "y" by | S for straight leads                                                               |
|                | T for tape and reel    |                | F for straight leads with flange (bulk only)                                       |
|                | A for tape and ammpack |                | G for straight leads with flange and $H_0 = 16 \text{ mm}$ (tape and reel/ammo)    |
|                |                        |                | H for straight leads with flange and $H_0 = 18.25 \text{ mm}$ (tape and reel/ammo) |
|                |                        |                | K for kinked leads (bulk only)                                                     |
|                |                        |                | L for kinked leads with $H_0 = 16 \text{ mm}$ (tape and reel/ammo)                 |
|                |                        |                | M for kinked leads with $H_0 = 18.25 \text{ mm}$ (tape and reel/ammo)              |

- (7) All varistors are UL 1449 edition 4 recognized as SPD type 5 (component level) for operating temperatures up to 85 °C. The varistors may be used in other SPD types as 2, 3, or 4 depending on the indicated  $I_N$  nominal discharge current ratings. The final acceptance of the component is dependent upon its installation and use in complete equipment submitted to underwriters laboratories Inc.



## ELECTRICAL CHARACTERISTICS

| ELECTRICAL DATA                                                                |              |                 |
|--------------------------------------------------------------------------------|--------------|-----------------|
| PARAMETER                                                                      | VALUE        | UNIT            |
| Maximum continuous voltage:                                                    |              |                 |
| RMS                                                                            | 14 to 680    | V               |
| DC                                                                             | 18 to 895    | V               |
| Maximum non-repetitive transient current ( $I_{NRP}$ ) ( $8 \times 20 \mu s$ ) |              |                 |
| VDRS05                                                                         | 100 or 400   | A               |
| VDRS07                                                                         | 250 or 1200  | A               |
| VDRS10                                                                         | 500 or 2500  | A               |
| VDRS14                                                                         | 1000 or 4500 | A               |
| VDRS20                                                                         | 2000 or 6500 | A               |
| Thermal resistance:                                                            |              |                 |
| VDRS05                                                                         | $\approx 80$ | K/W             |
| VDRS07                                                                         | $\approx 70$ | K/W             |
| VDRS10                                                                         | $\approx 60$ | K/W             |
| VDRS14                                                                         | $\approx 50$ | K/W             |
| VDRS20                                                                         | $\approx 40$ | K/W             |
| Maximum dissipation:                                                           |              |                 |
| VDRS05                                                                         | 100          | mW              |
| VDRS07                                                                         | 250          | mW              |
| VDRS10                                                                         | 400          | mW              |
| VDRS14                                                                         | 600          | mW              |
| VDRS20                                                                         | 1000         | mW              |
| Temperature coefficient of voltage at 1 mA maximum                             | $\pm 0.05$   | %/K             |
| Voltage proof between interconnected leads and case                            | 2500         | V <sub>AC</sub> |
| Storage temperature                                                            | -40 to +125  | °C              |
| Operating temperature                                                          | -40 to +85   | °C              |

## DERATING CURVE

Maximum Voltage  
Maximum Dissipation  
Maximum Energy  
Maximum Transient Current



## PEAK CURRENT AS A FUNCTION OF PULSE WIDTH



| COMPONENT DIMENSIONS (BULK TYPE) in millimeters AND CATALOG NUMBERS |           |           |           |                        |           |           |                          |                  |            |           |                   |
|---------------------------------------------------------------------|-----------|-----------|-----------|------------------------|-----------|-----------|--------------------------|------------------|------------|-----------|-------------------|
| D<br>MAX.                                                           |           | A<br>MAX. |           | A <sub>0</sub><br>MAX. |           | L<br>MIN. | T <sup>(1)</sup><br>MAX. | E <sup>(1)</sup> | d          | F         | CATALOG<br>NUMBER |
| V ≤ 320 V                                                           | V > 320 V | V ≤ 300 V | V > 300 V | V ≤ 320 V              | V > 320 V |           |                          |                  |            |           |                   |
| 7.0                                                                 |           | 9.0       |           | 11.0                   |           | 24.0      | 6.5                      | 0.7 to 3.6       | 0.6 ± 0.05 | 5 ± 1.0   | VDRS05            |
| 9.0                                                                 |           | 11.0      |           | 13.0                   |           | 24.0      | 6.5                      | 0.7 to 3.6       | 0.6 ± 0.05 | 5 ± 1.0   | VDRS07            |
| 12.0                                                                | 12.5      | 14.5      | 15.0      | 16.5                   | 17.0      | 17.0      | 8.0                      | 0.9 to 4.5       | 0.8 ± 0.05 | 7.5 ± 1.0 | VDRS10            |
| 16.0                                                                | 16.5      | 19.0      |           | 21.0                   | 21.5      | 16.0      | 8.0                      | 0.9 to 4.5       | 0.8 ± 0.05 | 7.5 ± 1.0 | VDRS14            |
| 22.5                                                                | 23.0      | 25.5      |           | 27.5                   | 28.0      | 24.0      | 10.0                     | 1.1 to 5.8       | 1.0 ± 0.05 | 10 ± 1.0  | VDRS20            |

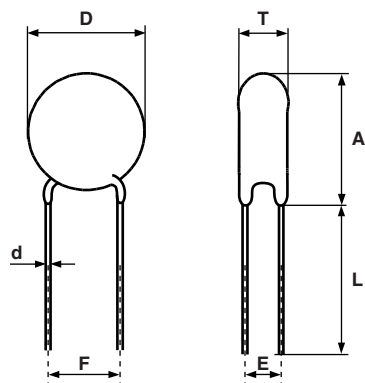
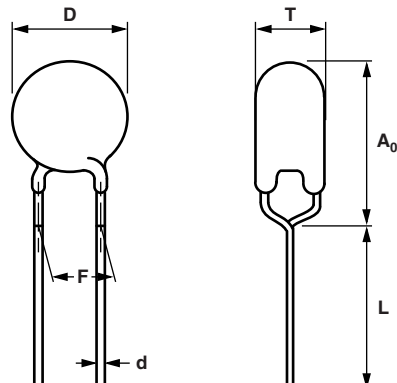
## Note

<sup>(1)</sup>  $T_{max}$  and E values per size and voltage level can be found back in the Electrical Data and Ordering Information table

| VARISTORS IN BULK                                                                    |                                      |                                      |                                       |                                       |                                       |
|--------------------------------------------------------------------------------------|--------------------------------------|--------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|
| TYPE                                                                                 | VDRS05...<br>Ø 5 mm<br>14 V to 460 V | VDRS07...<br>Ø 7 mm<br>14 V to 460 V | VDRS10...<br>Ø 10 mm<br>14 V to 550 V | VDRS14...<br>Ø 14 mm<br>14 V to 550 V | VDRS20...<br>Ø 20 mm<br>14 V to 680 V |
| Straight leads; see outline of components with straight leads drawing <sup>(1)</sup> | BSE                                  | BSE                                  | BSE                                   | BSE                                   | BSE                                   |
| Straight leads with flange; see outline of components with flanged leads drawing     | BFE                                  | BFE                                  | -                                     | -                                     | -                                     |
| Kinked leads; see outline of components with kinked leads drawing                    | BKE                                  | BKE                                  | BKE                                   | BKE                                   | BKE                                   |
| <b>Packaging quantities</b>                                                          |                                      |                                      |                                       |                                       |                                       |
| 14 V to 95 V                                                                         | 250                                  | 250                                  | 250                                   | 100                                   | 50                                    |
| 130 V to 385 V                                                                       | 250                                  | 250                                  | 250                                   | 100                                   | 50                                    |
| 420 V to 460 V                                                                       | 250                                  | 250                                  | 200                                   | 100                                   | 50                                    |
| 485 V to max. V                                                                      | -                                    | 250                                  | 150                                   | 100                                   | 50                                    |

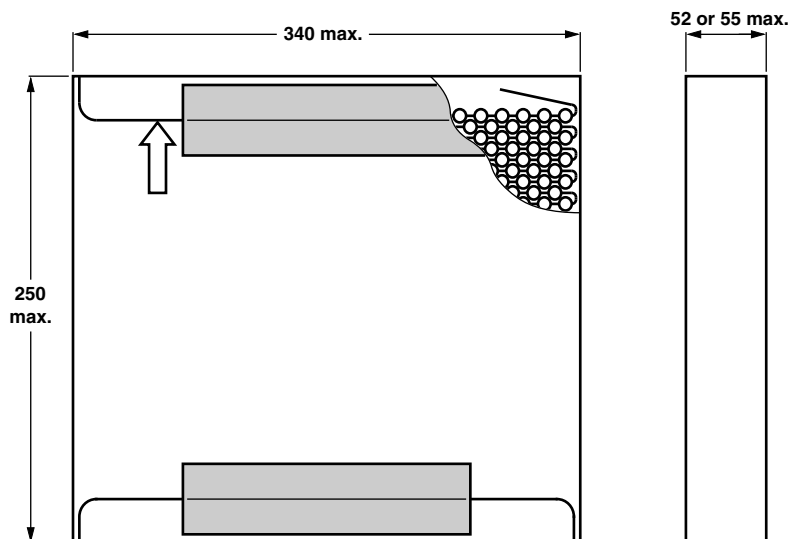
**Note**
<sup>(1)</sup> Outline of the Ø 20 mm differs from the other dimensions

**DIMENSIONS** in millimeters: see Component Dimensions and Electrical Data table

**OUTLINE** of Component with Straight Leads

**OUTLINE** of Component with Kinked Leads

**OUTLINE** of Component with Flanged Leads


| <b>VARISTORS ON TAPE IN AMMOPACK</b>                                                                                               |                                      |                                      |                                       |                                       |
|------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|--------------------------------------|---------------------------------------|---------------------------------------|
| TYPE                                                                                                                               | VDRS05...<br>Ø 5 mm<br>14 V to 460 V | VDRS07...<br>Ø 7 mm<br>14 V to 460 V | VDRS10...<br>Ø 10 mm<br>14 V to 550 V | VDRS14...<br>Ø 14 mm<br>14 V to 550 V |
| Straight leads<br>H = 18 mm<br>H = 20 mm<br>See drawing: taped version with straight leads                                         | -<br>ASE                             | -<br>ASE                             | ASE<br>-                              | ASE<br>-                              |
| Straight leads with flange<br>H <sub>0</sub> = 16 mm<br>H <sub>0</sub> = 18.25 mm<br>See drawing: taped version with flanged leads | AGE<br>AHE                           | AGE<br>AHE                           | -<br>-                                | -<br>-                                |
| Kinked leads<br>H <sub>0</sub> = 18.25 mm<br>H <sub>0</sub> = 16 mm<br>See drawing: taped version with kinked leads                | AME<br>ALE                           | AME<br>ALE                           | AME<br>ALE                            | AME<br>ALE                            |
| <b>Packaging quantities</b>                                                                                                        |                                      |                                      |                                       |                                       |
| 14 V to 210 V                                                                                                                      | 1500 <sup>(1)</sup>                  | 1500 <sup>(1)</sup>                  | 500                                   | 500                                   |
| 230 V to 510 V                                                                                                                     | 1000                                 | 1000                                 | 500                                   | 500                                   |
| 550 V                                                                                                                              | -                                    | -                                    | 400                                   | 400                                   |

**Note**
<sup>(1)</sup> Except for 35 V and 40 V = 1000 pieces

**DIMENSIONS OF AMMOPACK** in millimeters


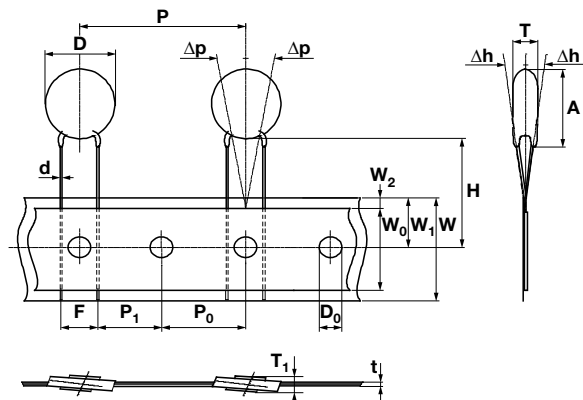
| VARISTORS ON TAPE AND REEL                                                                                                         |                                      |                                      |                                       |                                       |
|------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|--------------------------------------|---------------------------------------|---------------------------------------|
| TYPE                                                                                                                               | VDRS05...<br>Ø 5 mm<br>14 V to 460 V | VDRS07...<br>Ø 7 mm<br>14 V to 460 V | VDRS10...<br>Ø 10 mm<br>14 V to 550 V | VDRS14...<br>Ø 14 mm<br>14 V to 550 V |
| Straight leads<br>H = 18 mm<br>H = 20 mm<br>See drawing: taped version with straight leads                                         | -<br>TSE                             | -<br>TSE                             | TSE<br>-                              | TSE<br>-                              |
| Straight leads with flange<br>H <sub>0</sub> = 16 mm<br>H <sub>0</sub> = 18.25 mm<br>See drawing: taped version with flanged leads | TGE<br>THE                           | TGE<br>THE                           | -<br>-                                | -<br>-                                |
| Kinked leads<br>H <sub>0</sub> = 18.25 mm<br>H <sub>0</sub> = 16 mm<br>See drawing: taped version with kinked leads                | TME<br>TLE                           | TME<br>TLE                           | TME<br>TLE                            | TME<br>TLE                            |
| <b>Packaging quantities</b>                                                                                                        |                                      |                                      |                                       |                                       |
| 14 V to 250 V                                                                                                                      | 1500                                 | 1500                                 | 1000                                  | 750                                   |
| 275 V to 300 V                                                                                                                     | 1500                                 | 1500                                 | 750                                   | 750                                   |
| 320 V to 350 V                                                                                                                     | 1000                                 | 1000                                 | 500                                   | 500                                   |
| 385 V to max. V                                                                                                                    | 1000                                 | 1000                                 | 500                                   | 500                                   |

## PACKAGING

### TAPED VERSION WITH STRAIGHT LEADS (only for VDRS05 and VDRS07)

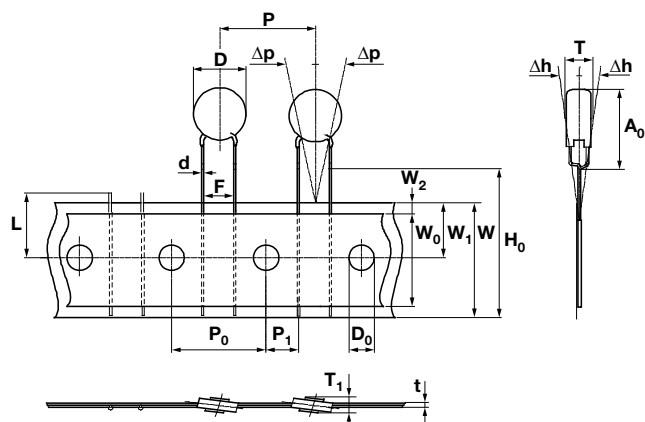


### TAPED VERSION WITH STRAIGHT LEADS (only for VDRS10 and VDRS14)

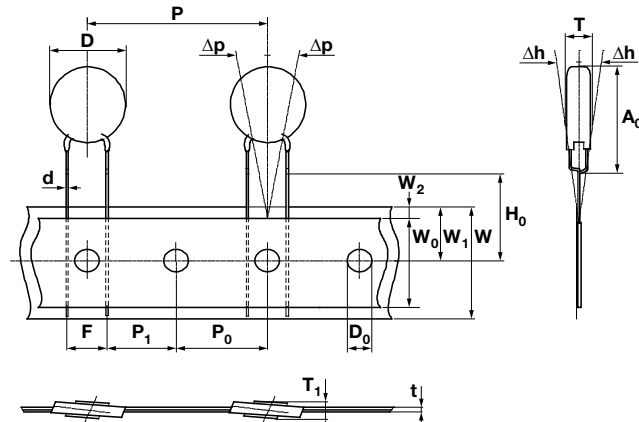


**TAPED VERSION WITH KINKED LEADS**

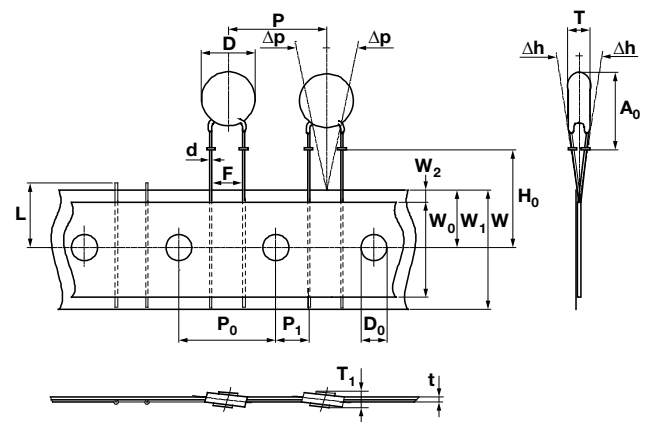
(only for VDRS05 and VDRS07)


**TAPED VERSION WITH KINKED LEADS**

(only for VDRS10 and VDRS14)


**TAPED VERSION WITH FLANGED LEADS**

(only for VDRS05 and VDRS07)


**TAPING DATA** (based on IEC 60286-2)

| SYMBOL              | PARAMETER                                        |           | DIMENSIONS/TOLERANCE      |        |                  |        |
|---------------------|--------------------------------------------------|-----------|---------------------------|--------|------------------|--------|
|                     |                                                  |           | VDRS05                    | VDRS07 | VDRS10           | VDRS14 |
| A max.              | Max. mounting height                             | V ≤ 300 V | 9.0                       | 11.0   | 14.5             | 19.0   |
|                     |                                                  | V > 300 V |                           |        | 15.0             |        |
| A <sub>0</sub> max. | Max. mounting height                             | V ≤ 320 V | 11.0                      | 13.0   | 16.5             | 21.0   |
|                     |                                                  | V > 320 V |                           |        | 17.0             | 21.5   |
| D max.              | Max. body diameter                               | V ≤ 320 V | 7.0                       | 9.0    | 12.0             | 16.0   |
|                     |                                                  | V > 320 V |                           |        | 12.5             | 16.5   |
| d                   | Lead wire diameter                               |           | 0.6 ± 0.05                |        | 0.8 ± 0.05       |        |
| F                   | Lead to lead distance <sup>(1)</sup>             |           | 5.0 + 0.8/- 0.2           |        | 7.5 ± 0.8        |        |
| H                   | Distance component to tape center <sup>(2)</sup> |           | 20.0 + 2.0/- 0.0          |        | 18.0 + 2.0/- 0.0 |        |
| H <sub>0</sub>      | Lead wire clinch height                          |           | 16.0 or 18.25 ± 0.5       |        |                  |        |
| P                   | Pitch of components on tape                      |           | 12.7 ± 1.0                |        | 25.4 ± 1.0       |        |
| T                   | Total thickness                                  |           | See Electrical Data table |        |                  |        |

**Notes**
<sup>(1)</sup> Guaranteed between component and tape

<sup>(2)</sup> For VDRS14T510xSE and VDRS14T550xSE: H = 20 mm ± 1 mm



## V/I CHARACTERISTICS

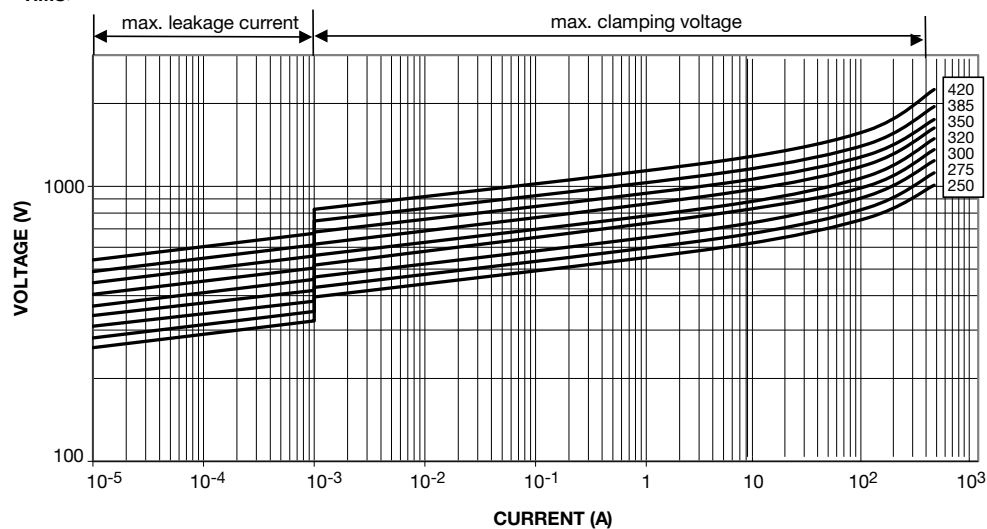
14 V<sub>RMS</sub> to 40 V<sub>RMS</sub>; VDRS05



50 V<sub>RMS</sub> to 175 V<sub>RMS</sub>; VDRS05

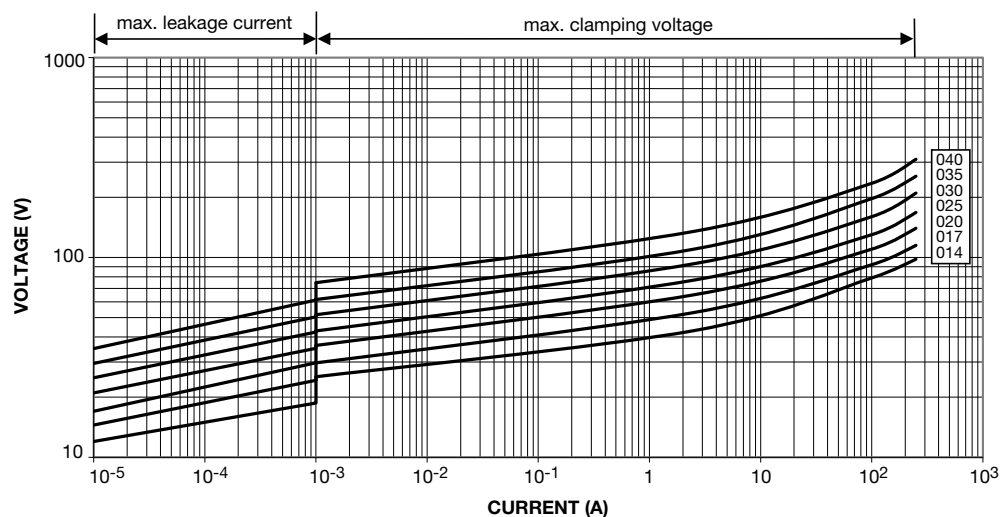


230 V<sub>RMS</sub> to 460 V<sub>RMS</sub>; VDRS05

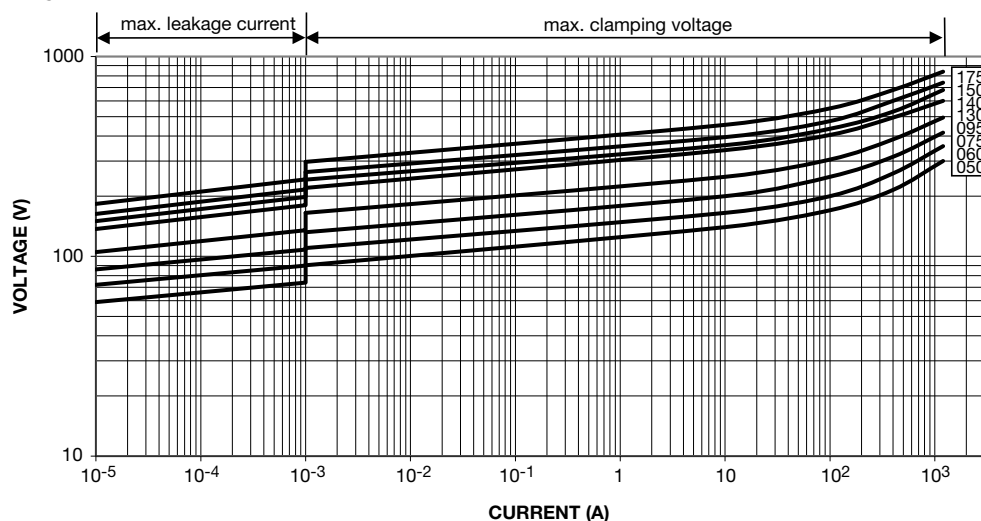




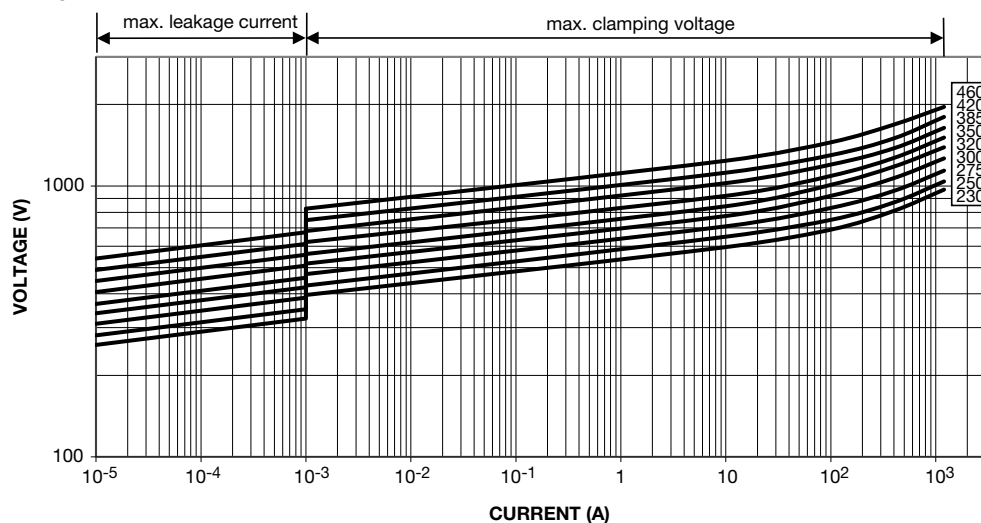
14 V<sub>RMS</sub> to 40 V<sub>RMS</sub>; VDRS07



50 V<sub>RMS</sub> to 175 V<sub>RMS</sub>; VDRS07



230 V<sub>RMS</sub> to 460 V<sub>RMS</sub>; VDRS07





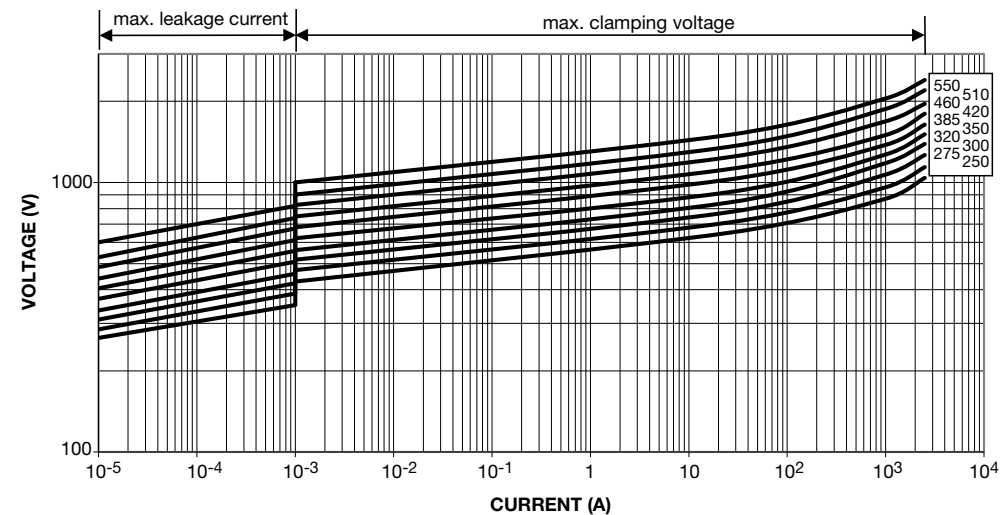
14 V<sub>RMS</sub> to 40 V<sub>RMS</sub>; VDRS10



50 V<sub>RMS</sub> to 230 V<sub>RMS</sub>; VDRS10

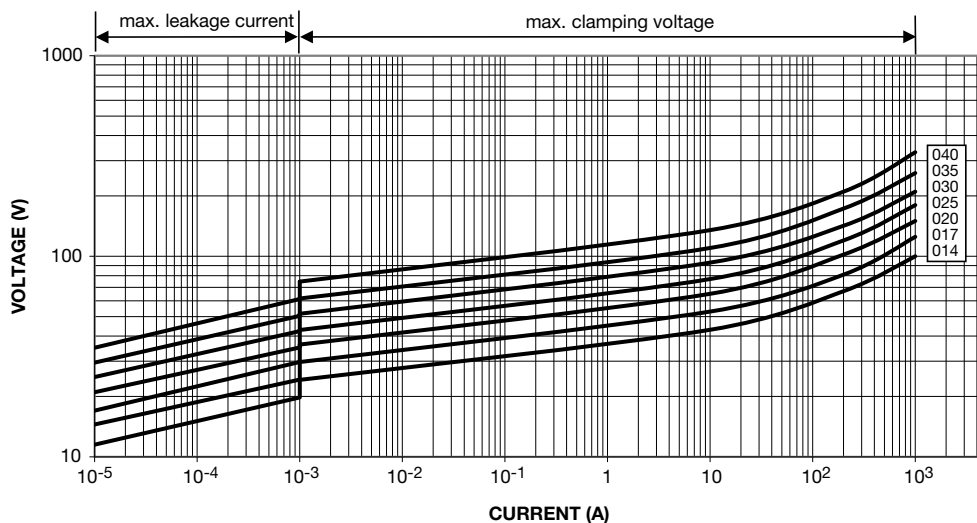


250 V<sub>RMS</sub> to 550 V<sub>RMS</sub>; VDRS10

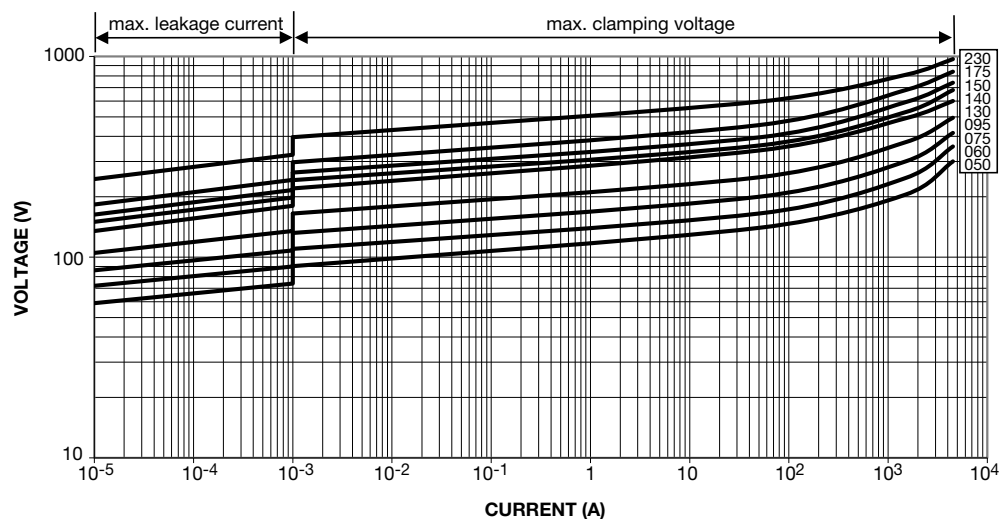




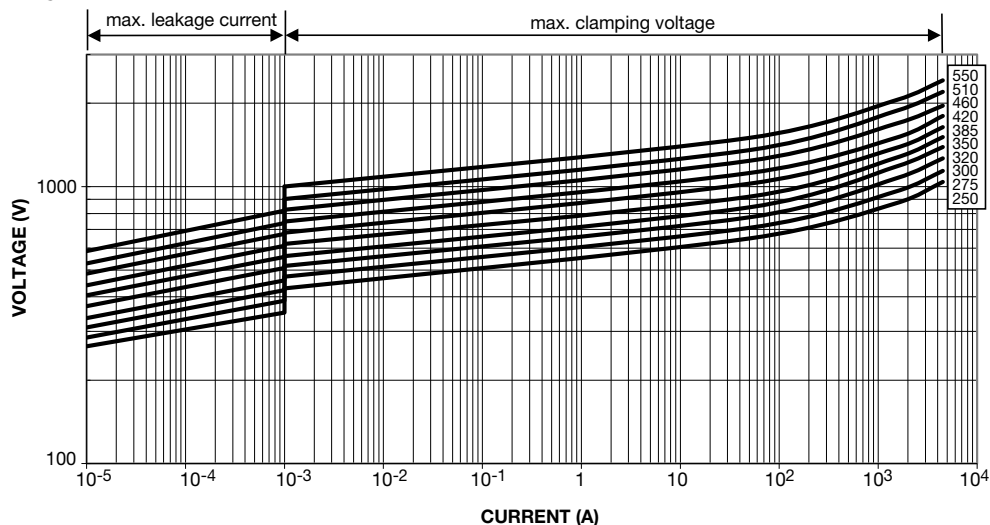
14 V<sub>RMS</sub> to 40 V<sub>RMS</sub>; VDRS14

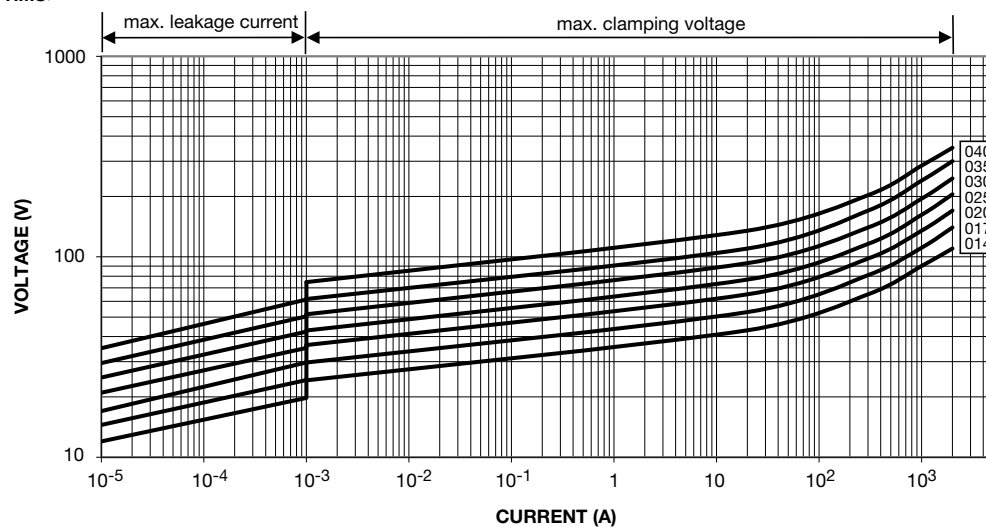
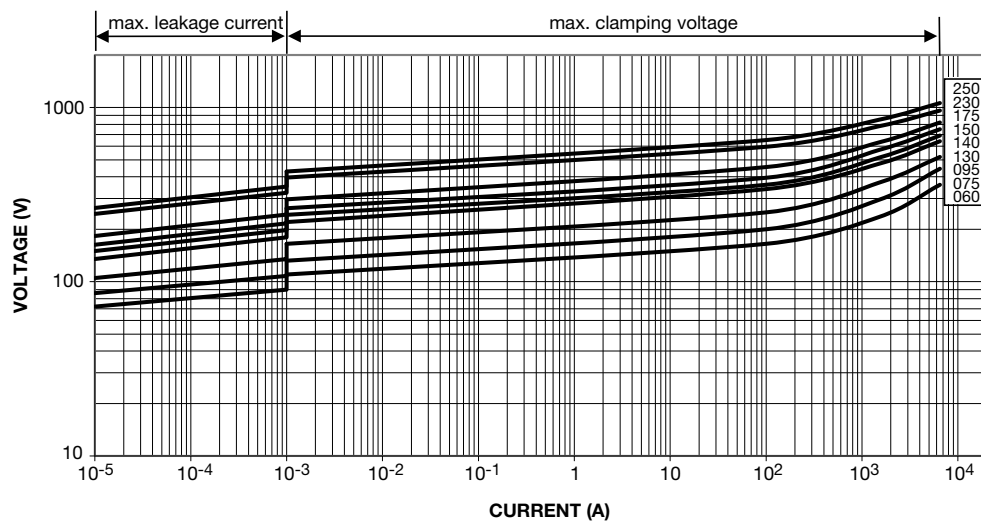
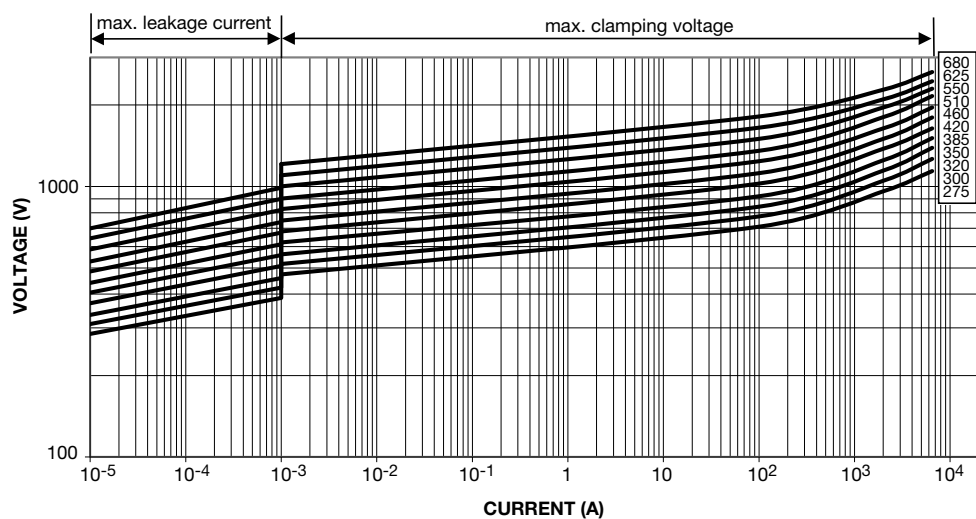


50 V<sub>RMS</sub> to 230 V<sub>RMS</sub>; VDRS14



250 V<sub>RMS</sub> to 550 V<sub>RMS</sub>; VDRS14



**14 V<sub>RMS</sub> to 40 V<sub>RMS</sub>; VDRS20**

**60 V<sub>RMS</sub> to 250 V<sub>RMS</sub>; VDRS20**

**275 V<sub>RMS</sub> to 680 V<sub>RMS</sub>; VDRS20**




## MAXIMUM APPLICABLE TRANSIENT CURRENT AS A FUNCTION OF PULSE DURATION

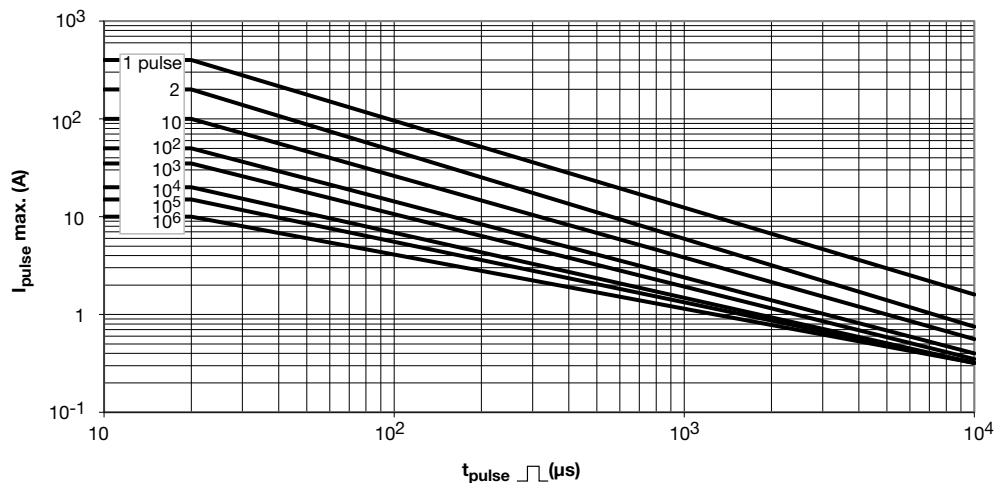
14 V<sub>RMS</sub> to 40 V<sub>RMS</sub>; VDRS05



50 V<sub>RMS</sub> to 460 V<sub>RMS</sub>; VDRS05

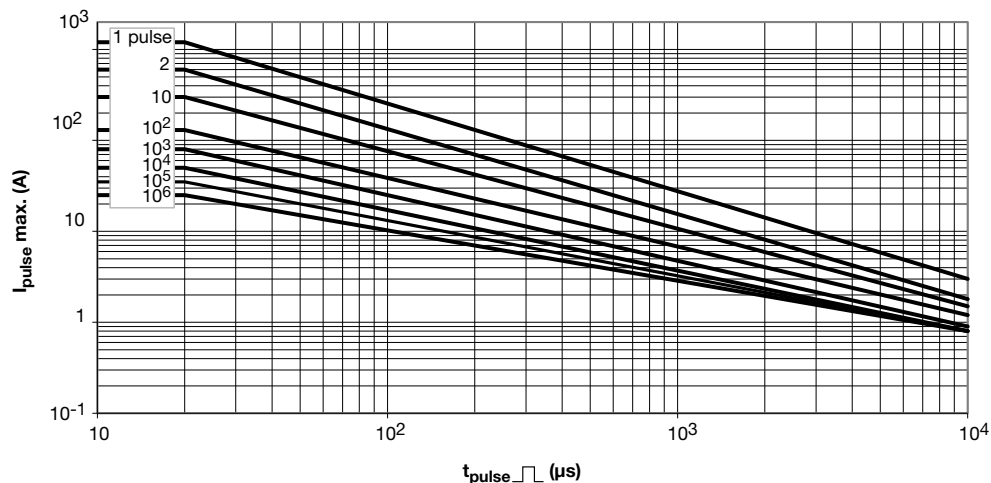


14 V<sub>RMS</sub> to 40 V<sub>RMS</sub>; VDRS07

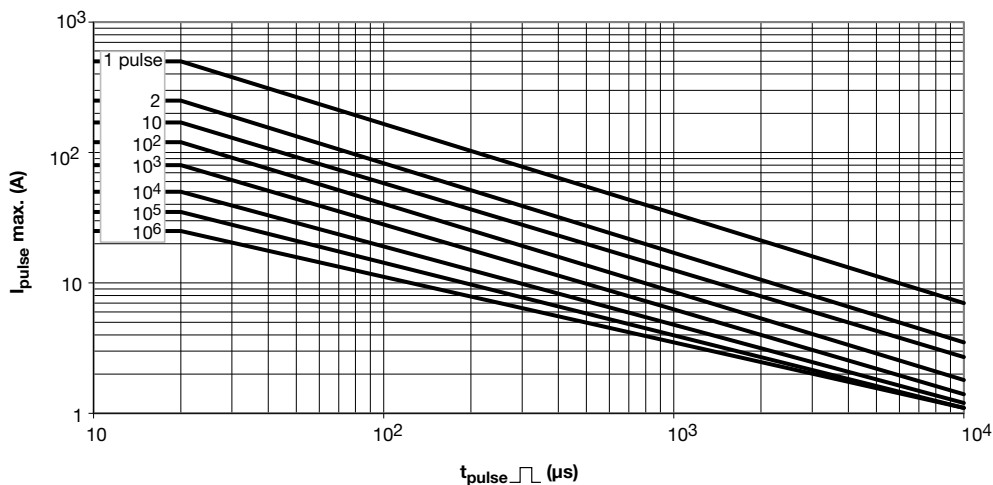




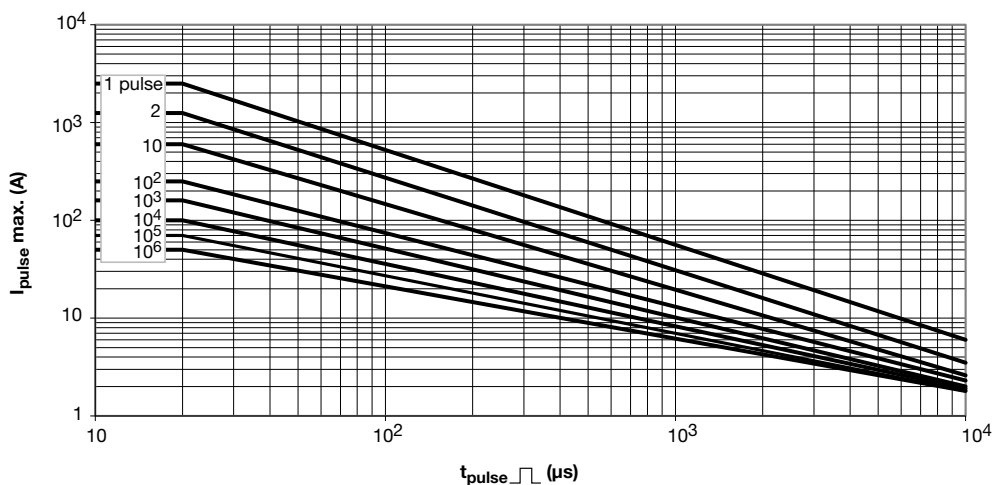
50 V<sub>RMS</sub> to 510 V<sub>RMS</sub>; VDRS07



14 V<sub>RMS</sub> to 40 V<sub>RMS</sub>; VDRS10

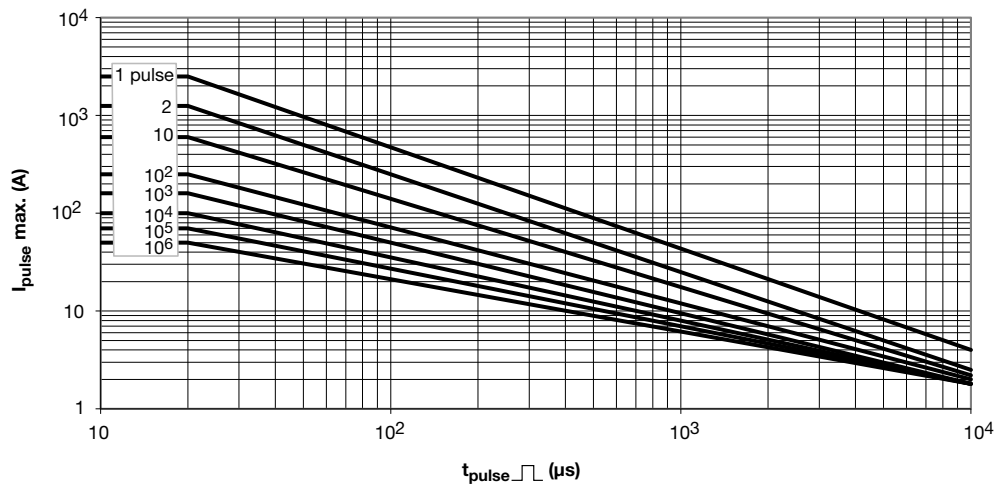


50 V<sub>RMS</sub> to 300 V<sub>RMS</sub>; VDRS10





320 V<sub>RMS</sub> to 680 V<sub>RMS</sub>; VDRS10



14 V<sub>RMS</sub> to 40 V<sub>RMS</sub>; VDRS14



50 V<sub>RMS</sub> to 300 V<sub>RMS</sub>; VDRS14





## 320 V<sub>RMS</sub> to 680 V<sub>RMS</sub>; VDRS14



## 14 V<sub>RMS</sub> to 40 V<sub>RMS</sub>; VDRS20



## 60 V<sub>RMS</sub> to 300 V<sub>RMS</sub>; VDRS20





320 V<sub>RMS</sub> to 680 V<sub>RMS</sub>; VDRS20





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