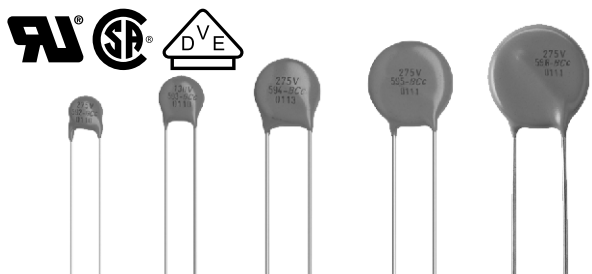


## VDR Metal Oxide Varistors Standard



### 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    |
| 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 on reel
- On tape in ammpack

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.

### FEATURES

- Zinc oxide disc, epoxy coated
- Straight leads
- Straight leads with flange (2381 592 and 593 series only)
- Kinked leads
- Compliant to RoHS directive 2002/95/EC and in accordance to WEEE 2002/96/EC
- Certified according to UL 1449 edition 3, VDE/IEC 61051-1/2 and CSA



**RoHS**  
COMPLIANT

### APPLICATION

- Overvoltage and transient voltage protection

### DESCRIPTION

The varistors consist of a disc of low- $\beta$  ceramic material with two tinned solid copper leads or tinned copper clad steel wire. They are coated with a layer of ochre coloured epoxy, which provides electrical, mechanical and climatic protection. The encapsulation is resistant to all cleaning solvents in accordance with IEC 60068-2-45.

### MOUNTING

The varistors are suitable for processing on automatic insertion and cutting and bending equipment.

Varistors with flanged leads provide better positioning on printed-circuit boards (PCB) and more accurate control over component height. This is important for hand mounting and automatic insertion techniques; see outlines of flanged leads drawing.

### 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 number (592, 593, 594, 595 or 596)
- Manufacturers logo
- Date of manufacture (YYWW)

### INFLAMMABILITY

The varistors are 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> at 1 mA | MAXIMUM VOLTAGE at STATED CURRENT |       | MAXIMUM ENERGY <sup>(4)</sup> (10 x 1000 $\mu$ s) | MAXIMUM NON-REP. TRANSIENT CURRENT <sup>(5)</sup> $I_{NRP}$ (8 x 20 $\mu$ s) | TYPICAL CAP. at 1 kHz | T (max.) | E             | UL 1449 ED3 SPD TYPE <sup>(8)</sup> | CATALOG NUMBERS <sup>(1)</sup> |                           |
|----------------------------|--------|--------------------------------|-----------------------------------|-------|---------------------------------------------------|------------------------------------------------------------------------------|-----------------------|----------|---------------|-------------------------------------|--------------------------------|---------------------------|
| RMS <sup>(2)</sup> (V)     | DC (V) | (V)                            | V (V)                             | I (A) | (J)                                               | (A)                                                                          | (pF)                  | (mm)     | (mm)          |                                     | SAP <sup>(7)</sup>             | 12NC <sup>(6)</sup> 2381- |
| 14                         | 18     | 22                             | 48                                | 1.0   | 0.5                                               | 100                                                                          | 1300                  | 4.1      | 0.7 $\pm$ 0.3 | 4                                   | VDRS05A014xyE                  | 592 x140y                 |
|                            |        |                                | 43                                | 2.5   | 1.7                                               | 250                                                                          | 2800                  | 4.1      | 0.7 $\pm$ 0.3 | 4                                   | VDRS07B014xyE                  | 593 x140y                 |
|                            |        |                                | 43                                | 5.0   | 4.3                                               | 500                                                                          | 6000                  | 4.4      | 0.9 $\pm$ 0.3 | 4                                   | VDRS10D014xyE                  | 594 x140y                 |
|                            |        |                                | 43                                | 10.0  | 5.4                                               | 1000                                                                         | 15 000                | 4.4      | 0.9 $\pm$ 0.3 | 4                                   | VDRS14G014xyE                  | 595 x140y                 |
|                            |        |                                | 43                                | 20.0  | 8.0                                               | 2000                                                                         | 30 000                | 4.6      | 1.1 $\pm$ 0.3 | 4                                   | VDRS20M014ByE                  | 596 x140y                 |

**ELECTRICAL DATA AND ORDERING INFORMATION**

| MAXIMUM CONTINUOUS VOLTAGE |           | VOLTAGE <sup>(3)</sup><br>at 1 mA | MAXIMUM VOLTAGE<br>at STATED<br>CURRENT |          | MAXIMUM<br>ENERGY <sup>(4)</sup><br>(10 x<br>1000 µs) | MAXIMUM<br>NON-REP.<br>TRANSIENT<br>CURRENT <sup>(5)</sup><br>I <sub>NRP</sub><br>(8 x 20 µs) | TYPICAL<br>CAP.<br>at 1 kHz | T<br>(max.) | E         | UL 1449<br>ED3<br>SPD<br>TYPE <sup>(8)</sup> | CATALOG<br>NUMBERS <sup>(1)</sup> |                              |
|----------------------------|-----------|-----------------------------------|-----------------------------------------|----------|-------------------------------------------------------|-----------------------------------------------------------------------------------------------|-----------------------------|-------------|-----------|----------------------------------------------|-----------------------------------|------------------------------|
| RMS <sup>(2)</sup><br>(V)  | DC<br>(V) | (V)                               | V<br>(V)                                | I<br>(A) | (J)                                                   | (A)                                                                                           | (pF)                        | (mm)        | (mm)      |                                              | SAP <sup>(7)</sup>                | 12NC <sup>(6)</sup><br>2381- |
| 17                         | 22        | 27                                | 60                                      | 1.0      | 0.7                                                   | 100                                                                                           | 1050                        | 4.1         | 0.8 ± 0.3 | 4                                            | VDRS05A017xyE                     | 592 x170y                    |
|                            |           |                                   | 53                                      | 2.5      | 2.0                                                   | 250                                                                                           | 2000                        | 4.1         | 0.8 ± 0.3 | 4                                            | VDRS07B017xyE                     | 593 x170y                    |
|                            |           |                                   | 53                                      | 5.0      | 5.3                                                   | 500                                                                                           | 4000                        | 4.4         | 1.0 ± 0.3 | 4                                            | VDRS10D017xyE                     | 594 x170y                    |
|                            |           |                                   | 53                                      | 10.0     | 6.9                                                   | 1000                                                                                          | 10 000                      | 4.4         | 1.0 ± 0.3 | 4                                            | VDRS14G017xyE                     | 595 x170y                    |
|                            |           |                                   | 53                                      | 20.0     | 10.0                                                  | 2000                                                                                          | 20 000                      | 4.6         | 1.2 ± 0.3 | 4                                            | VDRS20M017ByE                     | 596 x170y                    |
| 20                         | 26        | 33                                | 73                                      | 1.0      | 0.8                                                   | 100                                                                                           | 900                         | 4.1         | 1.0 ± 0.3 | 4                                            | VDRS05A020xyE                     | 592 x200y                    |
|                            |           |                                   | 65                                      | 2.5      | 2.5                                                   | 250                                                                                           | 1500                        | 4.1         | 1.0 ± 0.3 | 4                                            | VDRS07B020xyE                     | 593 x200y                    |
|                            |           |                                   | 65                                      | 5.0      | 6.5                                                   | 500                                                                                           | 3000                        | 4.4         | 1.2 ± 0.3 | 4                                            | VDRS10D020xyE                     | 594 x200y                    |
|                            |           |                                   | 65                                      | 10.0     | 8.8                                                   | 1000                                                                                          | 7500                        | 4.4         | 1.2 ± 0.3 | 4                                            | VDRS14G020xyE                     | 595 x200y                    |
|                            |           |                                   | 65                                      | 20.0     | 12.0                                                  | 2000                                                                                          | 15 000                      | 4.8         | 1.4 ± 0.3 | 4                                            | VDRS20M020ByE                     | 596 x200y                    |
| 25                         | 31        | 39                                | 86                                      | 1.0      | 0.9                                                   | 100                                                                                           | 500                         | 4.2         | 1.2 ± 0.3 | 4                                            | VDRS05A025xyE                     | 592 x250y                    |
|                            |           |                                   | 77                                      | 2.5      | 3.0                                                   | 250                                                                                           | 1350                        | 4.2         | 1.2 ± 0.3 | 4                                            | VDRS07B025xyE                     | 593 x250y                    |
|                            |           |                                   | 77                                      | 5.0      | 7.7                                                   | 500                                                                                           | 2600                        | 4.6         | 1.4 ± 0.3 | 4                                            | VDRS10D025xyE                     | 594 x250y                    |
|                            |           |                                   | 77                                      | 10.0     | 9.4                                                   | 1000                                                                                          | 6500                        | 4.6         | 1.4 ± 0.3 | 4                                            | VDRS14G025xyE                     | 595 x250y                    |
|                            |           |                                   | 77                                      | 20.0     | 14.0                                                  | 2000                                                                                          | 13 000                      | 5.0         | 1.6 ± 0.3 | 4                                            | VDRS20M025ByE                     | 596 x250y                    |
| 30                         | 38        | 47                                | 96                                      | 1.0      | 1.1                                                   | 100                                                                                           | 700                         | 4.4         | 1.4 ± 0.5 | 4                                            | VDRS05A030xyE                     | 592 x300y                    |
|                            |           |                                   | 93                                      | 2.5      | 3.6                                                   | 250                                                                                           | 1600                        | 4.4         | 1.4 ± 0.5 | 4                                            | VDRS07B030xyE                     | 593 x300y                    |
|                            |           |                                   | 93                                      | 5.0      | 9.2                                                   | 500                                                                                           | 2700                        | 4.8         | 1.6 ± 0.5 | 4                                            | VDRS10D030xyE                     | 594 x300y                    |
|                            |           |                                   | 90                                      | 10.0     | 12.0                                                  | 1000                                                                                          | 6000                        | 4.8         | 1.6 ± 0.5 | 4                                            | VDRS14G030xyE                     | 595 x300y                    |
|                            |           |                                   | 93                                      | 20.0     | 17.0                                                  | 2000                                                                                          | 12 000                      | 5.2         | 1.8 ± 0.5 | 4                                            | VDRS20M030ByE                     | 596 x300y                    |
| 35                         | 45        | 56                                | 123                                     | 1.0      | 1.4                                                   | 100                                                                                           | 560                         | 4.8         | 1.7 ± 0.5 | 4                                            | VDRS05A035xyE                     | 592 x350y                    |
|                            |           |                                   | 115                                     | 2.5      | 4.4                                                   | 250                                                                                           | 1300                        | 4.8         | 1.7 ± 0.5 | 4                                            | VDRS07B035xyE                     | 593 x350y                    |
|                            |           |                                   | 110                                     | 5.0      | 11.0                                                  | 500                                                                                           | 2200                        | 5.2         | 1.9 ± 0.5 | 4                                            | VDRS10D035xyE                     | 594 x350y                    |
|                            |           |                                   | 105                                     | 10.0     | 14.0                                                  | 1000                                                                                          | 4800                        | 5.2         | 1.9 ± 0.5 | 4                                            | VDRS14G035xyE                     | 595 x350y                    |
|                            |           |                                   | 110                                     | 20.0     | 20.0                                                  | 2000                                                                                          | 9600                        | 5.6         | 2.1 ± 0.5 | 4                                            | VDRS20M035ByE                     | 596 x350y                    |
| 40                         | 56        | 68                                | 145                                     | 1.0      | 1.6                                                   | 100                                                                                           | 460                         | 5.1         | 2.1 ± 0.5 | 4                                            | VDRS05A040xyE                     | 592 x400y                    |
|                            |           |                                   | 135                                     | 2.5      | 5.2                                                   | 250                                                                                           | 1000                        | 5.1         | 2.1 ± 0.5 | 4                                            | VDRS07B040xyE                     | 593 x400y                    |
|                            |           |                                   | 130                                     | 5.0      | 13.0                                                  | 500                                                                                           | 1800                        | 5.5         | 2.3 ± 0.5 | 4                                            | VDRS10D040xyE                     | 594 x400y                    |
|                            |           |                                   | 130                                     | 10.0     | 17.0                                                  | 1000                                                                                          | 3800                        | 5.5         | 2.3 ± 0.5 | 4                                            | VDRS14G040xyE                     | 595 x400y                    |
|                            |           |                                   | 135                                     | 20.0     | 24.0                                                  | 2000                                                                                          | 7600                        | 5.9         | 2.5 ± 0.5 | 4                                            | VDRS20M040ByE                     | 596 x400y                    |
| 50                         | 65        | 82                                | 145                                     | 5.0      | 2.6                                                   | 400                                                                                           | 370                         | 4.1         | 0.6 ± 0.3 | 4                                            | VDRS05C050xyE                     | 592 x500y                    |
|                            |           |                                   | 140                                     | 10.0     | 7.0                                                   | 1200                                                                                          | 900                         | 4.1         | 0.6 ± 0.3 | 4                                            | VDRS07H050xyE                     | 593 x500y                    |
|                            |           |                                   | 140                                     | 25.0     | 12.0                                                  | 2500                                                                                          | 1500                        | 4.4         | 0.8 ± 0.3 | 4                                            | VDRS10P050xyE                     | 594 x500y                    |
|                            |           |                                   | 140                                     | 50.0     | 21.0                                                  | 4500                                                                                          | 3100                        | 4.4         | 0.8 ± 0.3 | 4                                            | VDRS14T050xyE                     | 595 x500y                    |
|                            |           |                                   | 165                                     | 5.0      | 2.9                                                   | 400                                                                                           | 290                         | 4.1         | 0.7 ± 0.3 | 4                                            | VDRS05C060xyE                     | 592 x600y                    |
| 60                         | 85        | 100                               | 165                                     | 10.0     | 8.3                                                   | 1200                                                                                          | 700                         | 4.1         | 0.7 ± 0.3 | 4                                            | VDRS07H060xyE                     | 593 x600y                    |
|                            |           |                                   | 165                                     | 25.0     | 15.0                                                  | 2500                                                                                          | 1200                        | 4.4         | 0.9 ± 0.3 | 4                                            | VDRS10P060xyE                     | 594 x600y                    |
|                            |           |                                   | 165                                     | 50.0     | 24.0                                                  | 4500                                                                                          | 2300                        | 4.4         | 0.9 ± 0.3 | 3                                            | VDRS14T060xyE                     | 595 x600y                    |
|                            |           |                                   | 165                                     | 100.0    | 56.0                                                  | 6500                                                                                          | 4700                        | 4.5         | 1.1 ± 0.3 | 2                                            | VDRS20W060ByE                     | 596 x600y                    |
|                            |           |                                   | 190                                     | 5.0      | 3.4                                                   | 400                                                                                           | 240                         | 4.1         | 0.9 ± 0.3 | 4                                            | VDRS05C075xyE                     | 592 x750y                    |
| 75                         | 100       | 120                               | 200                                     | 10.0     | 10.0                                                  | 1200                                                                                          | 530                         | 4.1         | 0.9 ± 0.3 | 4                                            | VDRS07H075xyE                     | 593 x750y                    |
|                            |           |                                   | 200                                     | 25.0     | 18.0                                                  | 2500                                                                                          | 1000                        | 4.4         | 1.1 ± 0.3 | 4                                            | VDRS10P075xyE                     | 594 x750y                    |
|                            |           |                                   | 200                                     | 50.0     | 29.0                                                  | 4500                                                                                          | 1900                        | 4.4         | 1.1 ± 0.3 | 3                                            | VDRS14T075xyE                     | 595 x750y                    |
|                            |           |                                   | 200                                     | 100.0    | 64.0                                                  | 6500                                                                                          | 3900                        | 4.8         | 1.3 ± 0.3 | 2                                            | VDRS20W075ByE                     | 596 x750y                    |
|                            |           |                                   | 230                                     | 5.0      | 4.1                                                   | 400                                                                                           | 180                         | 4.2         | 1.1 ± 0.3 | 4                                            | VDRS05C095xyE                     | 592 x950y                    |
| 95                         | 125       | 150                               | 250                                     | 10.0     | 13.0                                                  | 1200                                                                                          | 450                         | 4.2         | 1.1 ± 0.3 | 4                                            | VDRS07H095xyE                     | 593 x950y                    |
|                            |           |                                   | 250                                     | 25.0     | 22.0                                                  | 2500                                                                                          | 800                         | 4.6         | 1.3 ± 0.3 | 4                                            | VDRS10P095xyE                     | 594 x950y                    |
|                            |           |                                   | 250                                     | 50.0     | 37.0                                                  | 4500                                                                                          | 1500                        | 4.6         | 1.3 ± 0.3 | 3                                            | VDRS14T095xyE                     | 595 x950y                    |
|                            |           |                                   | 250                                     | 100.0    | 88.0                                                  | 6500                                                                                          | 3000                        | 5.2         | 1.5 ± 0.3 | 2                                            | VDRS20W095ByE                     | 596 x950y                    |
|                            |           |                                   |                                         |          |                                                       |                                                                                               |                             |             |           |                                              |                                   |                              |

**ELECTRICAL DATA AND ORDERING INFORMATION**

| MAXIMUM CONTINUOUS VOLTAGE |           | VOLTAGE <sup>(3)</sup><br>at 1 mA | MAXIMUM VOLTAGE<br>at STATED<br>CURRENT |          | MAXIMUM<br>ENERGY <sup>(4)</sup><br>(10 x<br>1000 µs) | MAXIMUM<br>NON-REP.<br>TRANSIENT<br>CURRENT <sup>(5)</sup><br>I <sub>NRP</sub><br>(8 x 20 µs) | TYPICAL<br>CAP.<br>at 1 kHz | T<br>(max.) | E         | UL 1449<br>ED3<br>SPD<br>TYPE <sup>(8)</sup> | CATALOG<br>NUMBERS <sup>(1)</sup> |                              |
|----------------------------|-----------|-----------------------------------|-----------------------------------------|----------|-------------------------------------------------------|-----------------------------------------------------------------------------------------------|-----------------------------|-------------|-----------|----------------------------------------------|-----------------------------------|------------------------------|
| RMS <sup>(2)</sup><br>(V)  | DC<br>(V) | (V)                               | V<br>(V)                                | I<br>(A) | (J)                                                   | (A)                                                                                           | (pF)                        | (mm)        | (mm)      |                                              | SAP <sup>(7)</sup>                | 12NC <sup>(6)</sup><br>2381- |
| 130                        | 170       | 205                               | 310                                     | 5.0      | 5.5                                                   | 400                                                                                           | 130                         | 4.2         | 1.0 ± 0.3 | 4                                            | VDRS05C130xyE                     | 592 x131y                    |
|                            |           |                                   | 340                                     | 10.0     | 17.0                                                  | 1200                                                                                          | 320                         | 4.2         | 1.0 ± 0.3 | 4                                            | VDRS07H130xyE                     | 593 x131y                    |
|                            |           |                                   | 340                                     | 25.0     | 30.0                                                  | 2500                                                                                          | 580                         | 4.6         | 1.2 ± 0.3 | 4                                            | VDRS10P130xyE                     | 594 x131y                    |
|                            |           |                                   | 340                                     | 50.0     | 56.0                                                  | 4500                                                                                          | 1050                        | 4.6         | 1.2 ± 0.3 | 3                                            | VDRS14T130xyE                     | 595 x131y                    |
|                            |           |                                   | 340                                     | 100.0    | 114.0                                                 | 6500                                                                                          | 2100                        | 5.3         | 1.4 ± 0.3 | 2                                            | VDRS20W130ByE                     | 596 x131y                    |
| 140                        | 180       | 220                               | 350                                     | 5.0      | 6.3                                                   | 400                                                                                           | 120                         | 4.4         | 1.0 ± 0.3 | 4                                            | VDRS05C140xyE                     | 592 x141y                    |
|                            |           |                                   | 370                                     | 10.0     | 21.0                                                  | 1200                                                                                          | 290                         | 4.4         | 1.0 ± 0.3 | 4                                            | VDRS07H140xyE                     | 593 x141y                    |
|                            |           |                                   | 370                                     | 25.0     | 33.0                                                  | 2500                                                                                          | 540                         | 4.8         | 1.2 ± 0.3 | 4                                            | VDRS10P140xyE                     | 594 x141y                    |
|                            |           |                                   | 370                                     | 50.0     | 57.0                                                  | 4500                                                                                          | 950                         | 4.8         | 1.2 ± 0.3 | 3                                            | VDRS14T140xyE                     | 595 x141y                    |
|                            |           |                                   | 360                                     | 100.0    | 124.0                                                 | 6500                                                                                          | 1900                        | 5.4         | 1.5 ± 0.3 | 2                                            | VDRS20W140ByE                     | 596 x141y                    |
| 150                        | 200       | 240                               | 395                                     | 5.0      | 7.1                                                   | 400                                                                                           | 110                         | 4.4         | 1.1 ± 0.3 | 4                                            | VDRS05C150xyE                     | 592 x151y                    |
|                            |           |                                   | 400                                     | 10.0     | 20.0                                                  | 1200                                                                                          | 270                         | 4.4         | 1.1 ± 0.3 | 4                                            | VDRS07H150xyE                     | 593 x151y                    |
|                            |           |                                   | 400                                     | 25.0     | 36.0                                                  | 2500                                                                                          | 490                         | 4.8         | 1.3 ± 0.3 | 4                                            | VDRS10P150xyE                     | 594 x151y                    |
|                            |           |                                   | 400                                     | 50.0     | 59.0                                                  | 4500                                                                                          | 850                         | 4.8         | 1.3 ± 0.3 | 3                                            | VDRS14T150xyE                     | 595 x151y                    |
|                            |           |                                   | 395                                     | 100.0    | 134.0                                                 | 6500                                                                                          | 1700                        | 5.5         | 1.6 ± 0.3 | 2                                            | VDRS20W150ByE                     | 596 x151y                    |
| 175                        | 225       | 275                               | 410                                     | 5.0      | 7.3                                                   | 400                                                                                           | 90                          | 4.6         | 1.3 ± 0.3 | 4                                            | VDRS05C175xyE                     | 592 x171y                    |
|                            |           |                                   | 455                                     | 10.0     | 23.0                                                  | 1200                                                                                          | 230                         | 4.6         | 1.3 ± 0.3 | 4                                            | VDRS07H175xyE                     | 593 x171y                    |
|                            |           |                                   | 455                                     | 25.0     | 41.0                                                  | 2500                                                                                          | 430                         | 5.0         | 1.5 ± 0.3 | 4                                            | VDRS10P175xyE                     | 594 x171y                    |
|                            |           |                                   | 455                                     | 50.0     | 67.0                                                  | 4500                                                                                          | 750                         | 5.0         | 1.5 ± 0.3 | 3                                            | VDRS14T175xyE                     | 595 x171y                    |
|                            |           |                                   | 455                                     | 100.0    | 158.0                                                 | 6500                                                                                          | 1500                        | 5.7         | 1.7 ± 0.3 | 2                                            | VDRS20W175ByE                     | 596 x171y                    |
| 230                        | 300       | 360                               | 560                                     | 5.0      | 10.0                                                  | 400                                                                                           | 70                          | 4.9         | 1.7 ± 0.8 | 4                                            | VDRS05C230xyE                     | 592 x231y                    |
|                            |           |                                   | 600                                     | 10.0     | 30.0                                                  | 1200                                                                                          | 170                         | 4.9         | 1.7 ± 0.8 | 4                                            | VDRS07H230xyE                     | 593 x231y                    |
|                            |           |                                   | 600                                     | 25.0     | 54.0                                                  | 2500                                                                                          | 320                         | 5.4         | 1.9 ± 0.8 | 4                                            | VDRS10P230xyE                     | 594 x231y                    |
|                            |           |                                   | 600                                     | 50.0     | 88.0                                                  | 4500                                                                                          | 540                         | 5.4         | 1.9 ± 0.8 | 3                                            | VDRS14T230xyE                     | 595 x231y                    |
|                            |           |                                   | 595                                     | 100.0    | 208.0                                                 | 6500                                                                                          | 1100                        | 6.2         | 2.2 ± 0.8 | 2                                            | VDRS20W230ByE                     | 596 x231y                    |
| 250                        | 320       | 390                               | 600                                     | 5.0      | 11.0                                                  | 400                                                                                           | 60                          | 4.9         | 1.9 ± 0.8 | 4                                            | VDRS05C250xyE                     | 592 x251y                    |
|                            |           |                                   | 650                                     | 10.0     | 33.0                                                  | 1200                                                                                          | 160                         | 4.9         | 1.9 ± 0.8 | 4                                            | VDRS07H250xyE                     | 593 x251y                    |
|                            |           |                                   | 650                                     | 25.0     | 58.0                                                  | 2500                                                                                          | 300                         | 5.4         | 2.1 ± 0.8 | 4                                            | VDRS10P250xyE                     | 594 x251y                    |
|                            |           |                                   | 650                                     | 50.0     | 96.0                                                  | 4500                                                                                          | 480                         | 5.4         | 2.1 ± 0.8 | 3                                            | VDRS14T250xyE                     | 595 x251y                    |
|                            |           |                                   | 650                                     | 100.0    | 240.0                                                 | 6500                                                                                          | 960                         | 6.4         | 2.3 ± 0.8 | 2                                            | VDRS20W250ByE                     | 596 x251y                    |
| 275                        | 350       | 430                               | 695                                     | 5.0      | 12.0                                                  | 400                                                                                           | 55                          | 4.9         | 2.0 ± 0.8 | 4                                            | VDRS05C275xyE                     | 592 x271y                    |
|                            |           |                                   | 710                                     | 10.0     | 36.0                                                  | 1200                                                                                          | 140                         | 4.9         | 2.0 ± 0.8 | 4                                            | VDRS07H275xyE                     | 593 x271y                    |
|                            |           |                                   | 710                                     | 25.0     | 63.0                                                  | 2500                                                                                          | 270                         | 5.4         | 2.2 ± 0.8 | 4                                            | VDRS10P275xyE                     | 594 x271y                    |
|                            |           |                                   | 710                                     | 50.0     | 104.0                                                 | 4500                                                                                          | 440                         | 5.4         | 2.2 ± 0.8 | 3                                            | VDRS14T275xyE                     | 595 x271y                    |
|                            |           |                                   | 710                                     | 100.0    | 264.0                                                 | 6500                                                                                          | 900                         | 6.6         | 2.5 ± 0.8 | 2                                            | VDRS20W275ByE                     | 596 x271y                    |
| 300                        | 385       | 470                               | 750                                     | 5.0      | 13.0                                                  | 400                                                                                           | 50                          | 5.3         | 2.2 ± 0.8 | 4                                            | VDRS05C300xyE                     | 592 x301y                    |
|                            |           |                                   | 800                                     | 10.0     | 40.0                                                  | 1200                                                                                          | 130                         | 5.3         | 2.2 ± 0.8 | 4                                            | VDRS07H300xyE                     | 593 x301y                    |
|                            |           |                                   | 800                                     | 25.0     | 71.0                                                  | 2500                                                                                          | 240                         | 5.9         | 2.4 ± 0.8 | 4                                            | VDRS10P300xyE                     | 594 x301y                    |
|                            |           |                                   | 800                                     | 50.0     | 117.0                                                 | 4500                                                                                          | 400                         | 5.9         | 2.4 ± 0.8 | 3                                            | VDRS14T300xyE                     | 595 x301y                    |
|                            |           |                                   | 775                                     | 100.0    | 280.0                                                 | 6500                                                                                          | 810                         | 6.9         | 2.7 ± 0.8 | 2                                            | VDRS20W300ByE                     | 596 x301y                    |
| 320                        | 420       | 510                               | 800                                     | 5.0      | 15.0                                                  | 400                                                                                           | 45                          | 5.5         | 2.4 ± 0.8 | 4                                            | VDRS05C320xyE                     | 592 x321y                    |
|                            |           |                                   | 850                                     | 10.0     | 44.0                                                  | 1200                                                                                          | 120                         | 5.5         | 2.4 ± 0.8 | 4                                            | VDRS07H320xyE                     | 593 x321y                    |
|                            |           |                                   | 850                                     | 25.0     | 77.0                                                  | 2500                                                                                          | 220                         | 6.2         | 2.6 ± 0.8 | 4                                            | VDRS10P320xyE                     | 594 x321y                    |
|                            |           |                                   | 850                                     | 50.0     | 120.0                                                 | 4500                                                                                          | 370                         | 6.2         | 2.6 ± 0.8 | 3                                            | VDRS14T320xyE                     | 595 x321y                    |
|                            |           |                                   | 842                                     | 100.0    | 296.0                                                 | 6500                                                                                          | 750                         | 7.1         | 2.9 ± 0.8 | 2                                            | VDRS20W320ByE                     | 596 x321y                    |
| 350                        | 460       | 560                               | 940                                     | 5.0      | 19.5                                                  | 400                                                                                           | 42                          | 5.8         | 2.7 ± 0.8 | 4                                            | VDRS05C350xyE                     | 592 x351y                    |
|                            |           |                                   | 920                                     | 10.0     | 39.0                                                  | 1200                                                                                          | 110                         | 5.8         | 2.7 ± 0.8 | 4                                            | VDRS07H350xyE                     | 593 x351y                    |
|                            |           |                                   | 920                                     | 25.0     | 78.0                                                  | 2500                                                                                          | 200                         | 6.6         | 2.9 ± 0.8 | 4                                            | VDRS10P350xyE                     | 594 x351y                    |
|                            |           |                                   | 920                                     | 50.0     | 156.0                                                 | 4500                                                                                          | 325                         | 6.6         | 2.9 ± 0.8 | 3                                            | VDRS14T350xyE                     | 595 x351y                    |
|                            |           |                                   | 920                                     | 100.0    | 312.0                                                 | 6500                                                                                          | 660                         | 7.4         | 3.2 ± 0.8 | 2                                            | VDRS20W350ByE                     | 596 x351y                    |

## ELECTRICAL DATA AND ORDERING INFORMATION

| MAXIMUM CONTINUOUS VOLTAGE |           | VOLTAGE <sup>(3)</sup><br>at 1 mA | MAXIMUM VOLTAGE<br>at STATED<br>CURRENT |          | MAXIMUM ENERGY <sup>(4)</sup><br>(10 x 1000 µs) | MAXIMUM NON-REP.<br>TRANSIENT<br>CURRENT <sup>(5)</sup><br>I <sub>NRP</sub><br>(8 x 20 µs) | TYPICAL<br>CAP.<br>at 1 kHz | T<br>(max.) | E         | UL 1449<br>ED3<br>SPD<br>TYPE <sup>(8)</sup> | CATALOG<br>NUMBERS <sup>(1)</sup> |           |
|----------------------------|-----------|-----------------------------------|-----------------------------------------|----------|-------------------------------------------------|--------------------------------------------------------------------------------------------|-----------------------------|-------------|-----------|----------------------------------------------|-----------------------------------|-----------|
| RMS <sup>(2)</sup><br>(V)  | DC<br>(V) |                                   | (V)                                     | V<br>(V) |                                                 |                                                                                            |                             |             |           |                                              | I<br>(A)                          | (J)       |
| 385                        | 505       | 620                               | 1000                                    | 5.0      | 18.0                                            | 400                                                                                        | 40                          | 6.0         | 3.0 ± 0.8 | 4                                            | VDRS05C385xyE                     | 592 x381y |
|                            |           |                                   | 1025                                    | 10.0     | 51.0                                            | 1200                                                                                       | 95                          | 6.0         | 3.0 ± 0.8 | 4                                            | VDRS07H385xyE                     | 593 x381y |
|                            |           |                                   | 1025                                    | 25.0     | 67.0                                            | 2500                                                                                       | 180                         | 6.6         | 3.2 ± 0.8 | 4                                            | VDRS10P385xyE                     | 594 x381y |
|                            |           |                                   | 1025                                    | 50.0     | 110.0                                           | 4500                                                                                       | 280                         | 6.6         | 3.2 ± 0.8 | 3                                            | VDRS14T385xyE                     | 595 x381y |
|                            |           |                                   | 1025                                    | 100.0    | 328.0                                           | 6500                                                                                       | 570                         | 7.7         | 3.5 ± 0.8 | 2                                            | VDRS20W385ByE                     | 596 x381y |
| 420                        | 560       | 680                               | 1100                                    | 5.0      | 20.0                                            | 400                                                                                        | 35                          | 6.1         | 3.2 ± 0.8 | 4                                            | VDRS05C420xyE                     | 592 x421y |
|                            |           |                                   | 1120                                    | 10.0     | 56.0                                            | 1200                                                                                       | 85                          | 6.1         | 3.2 ± 0.8 | 4                                            | VDRS07H420xyE                     | 593 x421y |
|                            |           |                                   | 1120                                    | 25.0     | 73.0                                            | 2500                                                                                       | 165                         | 6.6         | 3.4 ± 0.8 | 4                                            | VDRS10P420xyE                     | 594 x421y |
|                            |           |                                   | 1120                                    | 50.0     | 120.0                                           | 4500                                                                                       | 250                         | 6.6         | 3.4 ± 0.8 | 3                                            | VDRS14T420xyE                     | 595 x421y |
|                            |           |                                   | 1120                                    | 100.0    | 344.0                                           | 6500                                                                                       | 510                         | 8.1         | 3.7 ± 0.8 | 2                                            | VDRS20W420ByE                     | 596 x421y |
| 460                        | 615       | 750                               | 1200                                    | 5.0      | 21.0                                            | 400                                                                                        | 30                          | 6.4         | 3.6 ± 0.8 | 4                                            | VDRS05C460xyE                     | 592 x461y |
|                            |           |                                   | 1240                                    | 10.0     | 63.0                                            | 1200                                                                                       | 75                          | 6.4         | 3.6 ± 0.8 | 4                                            | VDRS07H460xyE                     | 593 x461y |
|                            |           |                                   | 1240                                    | 25.0     | 82.0                                            | 2500                                                                                       | 150                         | 6.8         | 3.8 ± 0.8 | 4                                            | VDRS10P460xyE                     | 594 x461y |
|                            |           |                                   | 1240                                    | 50.0     | 135.0                                           | 4500                                                                                       | 225                         | 6.8         | 3.8 ± 0.8 | 3                                            | VDRS14T460xyE                     | 595 x461y |
|                            |           |                                   | 1240                                    | 100.0    | 360.0                                           | 6500                                                                                       | 460                         | 8.5         | 4.1 ± 0.8 | 2                                            | VDRS20W460ByE                     | 596 x461y |
| 510                        | 670       | 820                               | 1355                                    | 25.0     | 89.0                                            | 2500                                                                                       | 135                         | 7.2         | 4.1 ± 0.8 | 4                                            | VDRS10P510xyE                     | 594 x511y |
|                            |           |                                   | 1355                                    | 50.0     | 145.0                                           | 4500                                                                                       | 220                         | 7.2         | 4.1 ± 0.8 | 3                                            | VDRS14T510xyE                     | 595 x511y |
|                            |           |                                   | 1355                                    | 100.0    | 376.0                                           | 6500                                                                                       | 450                         | 8.9         | 4.4 ± 0.8 | 2                                            | VDRS20W510ByE                     | 596 x511y |
| 550                        | 745       | 910                               | 1500                                    | 25.0     | 98.0                                            | 2500                                                                                       | 120                         | 7.9         | 4.5 ± 0.8 | 4                                            | VDRS10P550xyE                     | 594 x551y |
|                            |           |                                   | 1500                                    | 50.0     | 160.0                                           | 4500                                                                                       | 180                         | 7.9         | 4.5 ± 0.8 | 3                                            | VDRS14T550xyE                     | 595 x551y |
|                            |           |                                   | 1500                                    | 100.0    | 408.0                                           | 6500                                                                                       | 370                         | 9.5         | 4.9 ± 0.8 | 2                                            | VDRS20W550ByE                     | 596 x551y |
| 625                        | 825       | 1000                              | 1650                                    | 100.0    | 448.0                                           | 6500                                                                                       | 320                         | 10.1        | 5.3 ± 0.8 | 2                                            | VDRS20W625ByE                     | 596 x621y |
| 680                        | 895       | 1100                              | 1815                                    | 100.0    | 496.0                                           | 6500                                                                                       | 270                         | 10.6        | 5.8 ± 0.8 | 2                                            | VDRS20W680ByE                     | 596 x681y |

## Notes

- (1) The products are certified according to (c)UL (E332800), VDE (40026222) and CSA (219883).
- (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  $10 \times 1000 \mu s$  is given as a reference for longer duration pulses. This pulse can be characterised by peak current ( $I_p$ ) and pulse width  $t_2$  (virtual time of half  $I_p$  value, following IEC 60060-2, section 6). If  $V_p$  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:  
a) 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  $8 \times 20 \mu s$  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 12NC part number replace “x” and “y” by figures from the sections “Varistors in Bulk”, “Varistors on Tape in Ammopack” and “Varistors on Tape on Reel”.
- (7) For composition of the SAP part number:

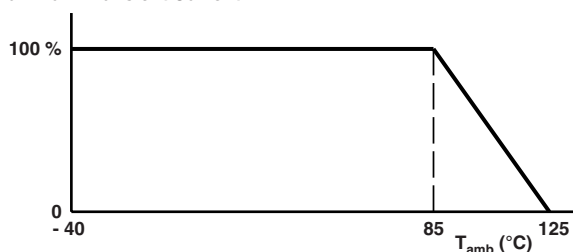
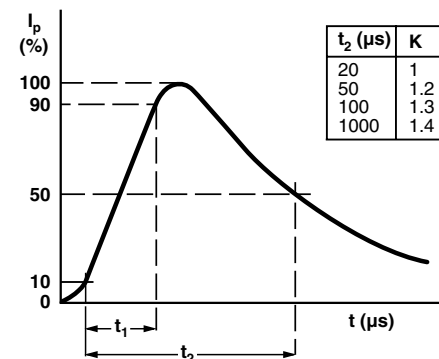
|                         |                                                                                        |
|-------------------------|----------------------------------------------------------------------------------------|
| Replace “x” by          | Replace “y” by                                                                         |
| B for bulk type         | S for straight leads                                                                   |
| T for tape and reel     | F for straight leads with flange (bulk only)                                           |
| A for tape and ammopack | G for straight leads with flange and $H_0 = 16 \text{ mm}$ (tape and reel/ammopack)    |
|                         | H for straight leads with flange and $H_0 = 18.25 \text{ mm}$ (tape and reel/ammopack) |
|                         | K for kinked leads (bulk only)                                                         |
|                         | L for kinked leads with $H_0 = 16 \text{ mm}$ (tape and reel/ammopack)                 |
|                         | M for kinked leads with $H_0 = 18.25 \text{ mm}$ (tape and reel/ammopack)              |
- (8) All varistors are recognized under VZAC2 surge protective devices, components type 4 as specified in UL 1449 edition 3. The parts with indication type 2 or 3 SPD's, are tested and certified to be used in type 2 or 3 SPD applications. The final acceptance of the component is dependent upon its installation and use in complete equipment submitted to underwriters laboratories Inc.

**ELECTRICAL CHARACTERISTICS**

| <b>ELECTRICAL DATA</b>                                                   |               |              |
|--------------------------------------------------------------------------|---------------|--------------|
| PARAMETER                                                                | VALUE         | UNIT         |
| Maximum continuous voltage:                                              |               |              |
| RMS                                                                      | 14 to 680     | V            |
| DC                                                                       | 18 to 895     | V            |
| Maximum non-repetitive transient current ( $I_{NRP}$ ) (8 x 20 $\mu$ s): |               |              |
| VDRS05.....E/2381 592 ....                                               | 100 or 400    | A            |
| VDRS07.....E/2381 593 ....                                               | 250 or 1200   | A            |
| VDRS10.....E/2381 594 ....                                               | 500 or 2500   | A            |
| VDRS14.....E/2381 595 ....                                               | 1000 or 4500  | A            |
| VDRS20.....E/2381 596 ....                                               | 2000 or 6500  | A            |
| Thermal resistance:                                                      |               |              |
| VDRS05.....E/2381 592 ....                                               | $\approx 80$  | K/W          |
| VDRS07.....E/2381 593 ....                                               | $\approx 70$  | K/W          |
| VDRS10.....E/2381 594 ....                                               | $\approx 60$  | K/W          |
| VDRS14.....E/2381 595 ....                                               | $\approx 50$  | K/W          |
| VDRS20.....E/2381 596 ....                                               | $\approx 40$  | K/W          |
| Maximum dissipation:                                                     |               |              |
| VDRS05.....E/2381 592 ....                                               | 100           | mW           |
| VDRS07.....E/2381 593 ....                                               | 250           | mW           |
| VDRS10.....E/2381 594 ....                                               | 400           | mW           |
| VDRS14.....E/2381 595 ....                                               | 600           | mW           |
| VDRS20.....E/2381 596 ....                                               | 1000          | mW           |
| Temperature coefficient of voltage at 1 mA maximum                       | $\pm 0.05$    | %/K          |
| Voltage proof between interconnected leads and case                      | 2500          | V            |
| Storage temperature                                                      | - 40 to + 125 | $^{\circ}$ C |
| Operating temperature                                                    | - 40 to + 85  | $^{\circ}$ C |

**DERATING CURVE**

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 MAX. | A MAX. | A <sub>0</sub> MAX. | L MIN. | T <sup>(1)</sup> MAX. | E <sup>(1)</sup> | d              | F             | CATALOG NUMBER             |
|--------|--------|---------------------|--------|-----------------------|------------------|----------------|---------------|----------------------------|
| 7.0    | 9.0    | 11.0                | 24.0   | 6.5                   | 0.7 to 3.6       | 0.6 $\pm$ 0.05 | 5 $\pm$ 1.0   | VDRS05.....E/2381 592 .... |
| 9.0    | 11.0   | 13.0                | 24.0   | 6.5                   | 0.7 to 3.6       | 0.6 $\pm$ 0.05 | 5 $\pm$ 1.0   | VDRS07.....E/2381 593 .... |
| 13.5   | 15.5   | 18.0                | 17.0   | 8                     | 0.9 to 4.5       | 0.8 $\pm$ 0.05 | 7.5 $\pm$ 1.0 | VDRS10.....E/2381 594 .... |
| 17.0   | 19.0   | 23.0                | 16.0   | 8                     | 0.9 to 4.5       | 0.8 $\pm$ 0.05 | 7.5 $\pm$ 1.0 | VDRS14.....E/2381 595 .... |
| 23.0   | 25.0   | 28.0                | 24.0   | 10                    | 1.1 to 5.8       | 1.0 $\pm$ 0.05 | 10 $\pm$ 1.0  | VDRS20.....E/2381 596 .... |

**Note**

<sup>(1)</sup> T<sub>max</sub> and E values per size and voltage level can be found back in the Electrical Data table

**VARISTORS IN BULK**

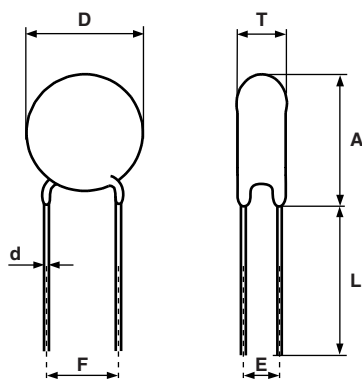
| TYPE                                                                                 | VDRS05...<br>2381 592 ...<br>Ø 5 mm<br>14 V to 460 V | VDRS07...<br>2381 593 .....<br>Ø 7 mm<br>14 V to 460 V | VDRS10...<br>2381 594 .....<br>Ø 10 mm<br>14 V to 550 V | VDRS14...<br>2381 595 .....<br>Ø 14 mm<br>14 V to 550 V | VDRS20...<br>2381 596 .....<br>Ø 20 mm<br>14 V to 680 V |
|--------------------------------------------------------------------------------------|------------------------------------------------------|--------------------------------------------------------|---------------------------------------------------------|---------------------------------------------------------|---------------------------------------------------------|
| Straight leads; see outline of components with straight leads drawing <sup>(1)</sup> | BSE<br>5...6                                         | BSE<br>5...6                                           | BSE<br>5...6                                            | BSE<br>5...6                                            | BSE<br>5...6                                            |
| Straight leads with flange; see outline of components with flanged leads drawing     | BFE<br>7...6                                         | BFE<br>7...6                                           | -                                                       | -                                                       | -                                                       |
| Kinked leads; see outline of components with kinked leads drawing                    | BKE<br>6...6                                         | BKE<br>6...6                                           | BKE<br>6...6                                            | BKE<br>6...6                                            | BKE<br>6...6                                            |
| <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**

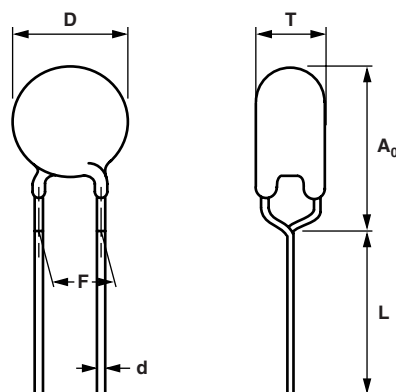
<sup>(1)</sup> Outline of the Ø 20 mm differs from the other dimensions

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

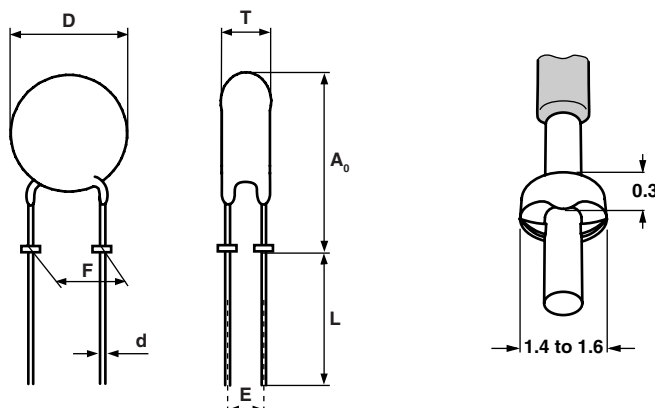
**OUTLINE** of Component with Straight Leads



**OUTLINE** of Component with Kinked Leads

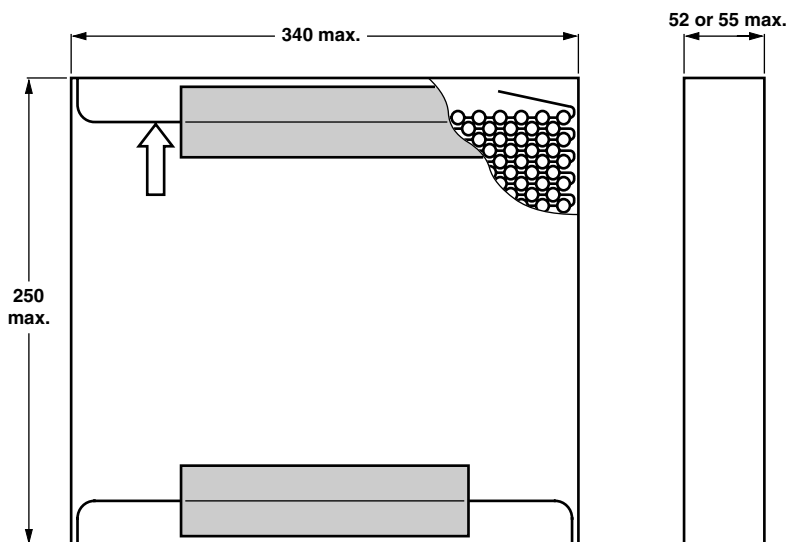


**OUTLINE** of Component with Flanged Leads



| VARISTORS ON TAPE IN AMMOPACK                  |                                                      |                                                      |                                                       |                                                       |
|------------------------------------------------|------------------------------------------------------|------------------------------------------------------|-------------------------------------------------------|-------------------------------------------------------|
| TYPE                                           | VDRS05...<br>2381 592 ...<br>Ø 5 mm<br>14 V to 460 V | VDRS07...<br>2381 593 ...<br>Ø 7 mm<br>14 V to 460 V | VDRS10...<br>2381 594 ...<br>Ø 10 mm<br>14 V to 550 V | VDRS14...<br>2381 595 ...<br>Ø 14 mm<br>14 V to 550 V |
| Straight leads                                 |                                                      |                                                      |                                                       |                                                       |
| H = 18 mm                                      | -                                                    | -                                                    | ASE<br>0...7                                          | ASE<br>0...7                                          |
| H = 20 mm                                      | ASE<br>0...7                                         | ASE<br>0...7                                         | -                                                     | -                                                     |
| See drawing: Taped version with straight leads |                                                      |                                                      |                                                       |                                                       |
| Straight leads with flange                     |                                                      |                                                      |                                                       |                                                       |
| H <sub>0</sub> = 16 mm                         | AGE<br>1...7                                         | AGE<br>1...7                                         | -                                                     | -                                                     |
| H <sub>0</sub> = 18.25 mm                      | AHE<br>2...7                                         | AHE<br>2...7                                         | -                                                     | -                                                     |
| See drawing: Taped version with flanged leads  |                                                      |                                                      |                                                       |                                                       |
| Kinked leads                                   |                                                      |                                                      |                                                       |                                                       |
| H <sub>0</sub> = 18.25 mm                      | AME<br>3...7                                         | AME<br>3...7                                         | AME<br>3...7                                          | AME<br>3...7                                          |
| H <sub>0</sub> = 16 mm                         | ALE<br>8...7                                         | ALE<br>8...7                                         | ALE<br>8...7                                          | ALE<br>8...7                                          |
| See drawing: Taped version with kinked leads   |                                                      |                                                      |                                                       |                                                       |
| Packaging quantities                           |                                                      |                                                      |                                                       |                                                       |
| 14 V to 210 V                                  | 1500 <sup>(1)</sup>                                  | 1500 <sup>(1)</sup>                                  | 500                                                   | 500                                                   |
| 230 V to max. V                                | 1000                                                 | 1000                                                 | 500                                                   | 500                                                   |

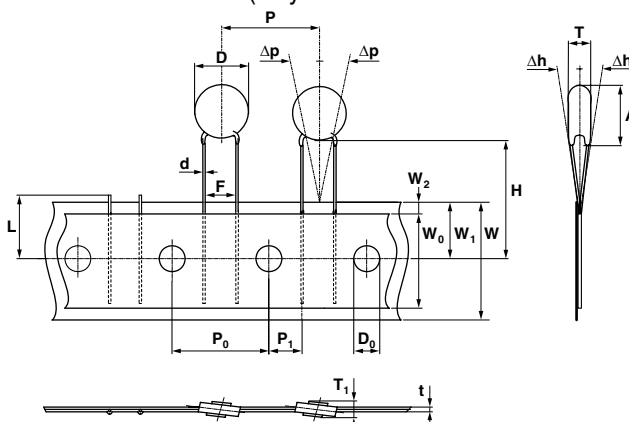
**Note**
<sup>(1)</sup> Except for 35 V and 40 V = 1000 pieces

**DIMENSIONS OF AMMOPACK** in millimeters


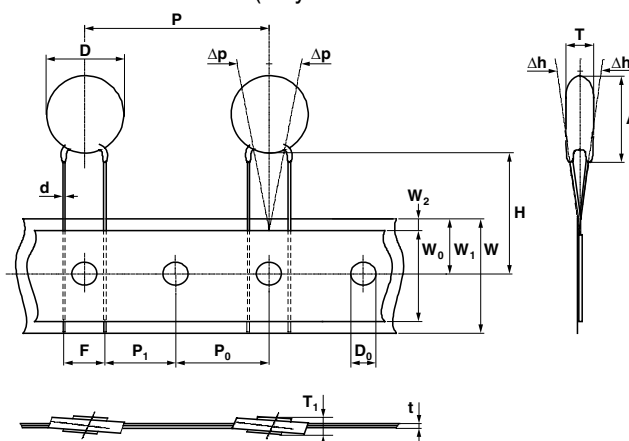
| VARISTORS ON TAPE AND REEL                     |                                                      |                                                      |                                                       |                                                       |
|------------------------------------------------|------------------------------------------------------|------------------------------------------------------|-------------------------------------------------------|-------------------------------------------------------|
| TYPE                                           | VDRS05...<br>2381 592 ...<br>Ø 5 mm<br>14 V to 460 V | VDRS07...<br>2381 593 ...<br>Ø 7 mm<br>14 V to 460 V | VDRS10...<br>2381 594 ...<br>Ø 10 mm<br>14 V to 550 V | VDRS14...<br>2381 595 ...<br>Ø 14 mm<br>14 V to 550 V |
| Straight leads                                 |                                                      |                                                      |                                                       |                                                       |
| H = 18 mm                                      | -                                                    | -                                                    | TSE<br>0...6                                          | TSE<br>0...6                                          |
| H = 20 mm                                      | TSE<br>0...6                                         | TSE<br>0...6                                         | -                                                     | -                                                     |
| See drawing: Taped version with straight leads |                                                      |                                                      |                                                       |                                                       |
| Straight leads with flange                     |                                                      |                                                      |                                                       |                                                       |
| H <sub>0</sub> = 16 mm                         | TGE<br>1...6                                         | TGE<br>1...6                                         | -                                                     | -                                                     |
| H <sub>0</sub> = 18.25 mm                      | THE<br>2...6                                         | THE<br>2...6                                         | -                                                     | -                                                     |
| See drawing: Taped version with flanged leads  |                                                      |                                                      |                                                       |                                                       |
| Kinked leads                                   |                                                      |                                                      |                                                       |                                                       |
| H <sub>0</sub> = 18.25 mm                      | TME<br>3...6                                         | TME<br>3...6                                         | TME<br>3...6                                          | TME<br>3...6                                          |
| H <sub>0</sub> = 16 mm                         | TLE<br>8...6                                         | TLE<br>8...6                                         | TLE<br>8...6                                          | TLE<br>8...6                                          |
| See drawing: Taped version with kinked leads   |                                                      |                                                      |                                                       |                                                       |
| <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.....E/2381 592 .... and VDRS07.....E/2381 593....)

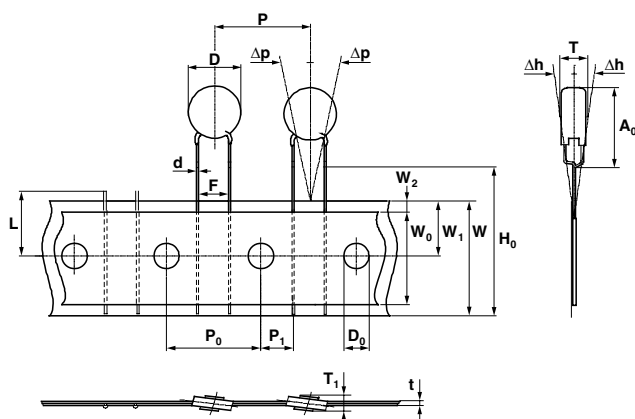


### TAPED VERSION WITH STRAIGHT LEADS (only for VDRS10.....E/2381 594 .... and VDRS14.....E/2381 595 ....)

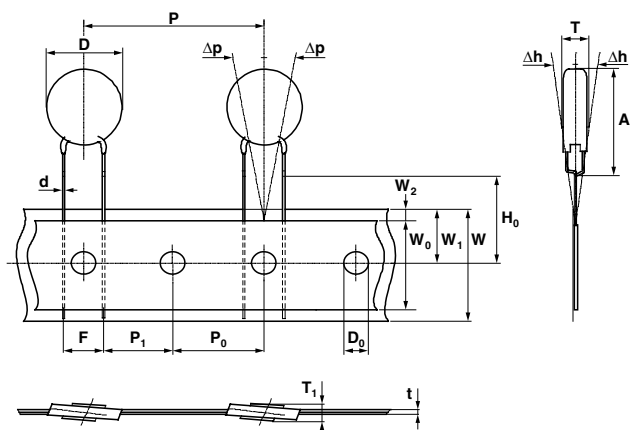


**TAPED VERSION WITH KINKED LEADS**

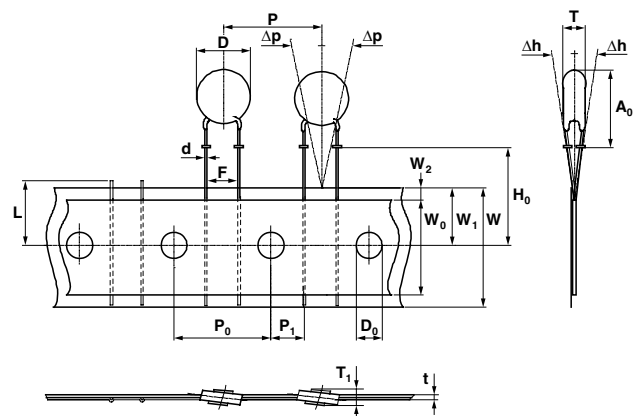
(only for VDRS05.....E/2381 592 .... and  
VDRS07.....E/2381 593 ....)

**TAPED VERSION WITH KINKED LEADS**

(only for VDRS10.....E/2381 594 .... and  
VDRS14.....E/2381 595.....)

**TAPED VERSION WITH FLANGED LEADS**

(only for VDRS05.....E/2381 592 .... and  
VDRS07.....E/2381 593 ....)

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

| SYMBOL         | PARAMETER                                        | DIMENSIONS/TOLERANCE      |               |                  |               |
|----------------|--------------------------------------------------|---------------------------|---------------|------------------|---------------|
|                |                                                  | VDRS05<br>592             | VDRS07<br>593 | VDRS10<br>594    | VDRS14<br>595 |
| A              | Mounting height                                  | 9.0<br>max.               | 11.0<br>max.  | 15.5<br>max.     | 19.0<br>max.  |
| A <sub>0</sub> | Mounting height                                  | 11.0<br>max.              | 13.0<br>max.  | 18.0<br>max.     | 23.0<br>max.  |
| D              | Body diameter                                    | 7.0<br>max.               | 9.0<br>max.   | 13.5<br>max.     | 17.0<br>max.  |
| 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**

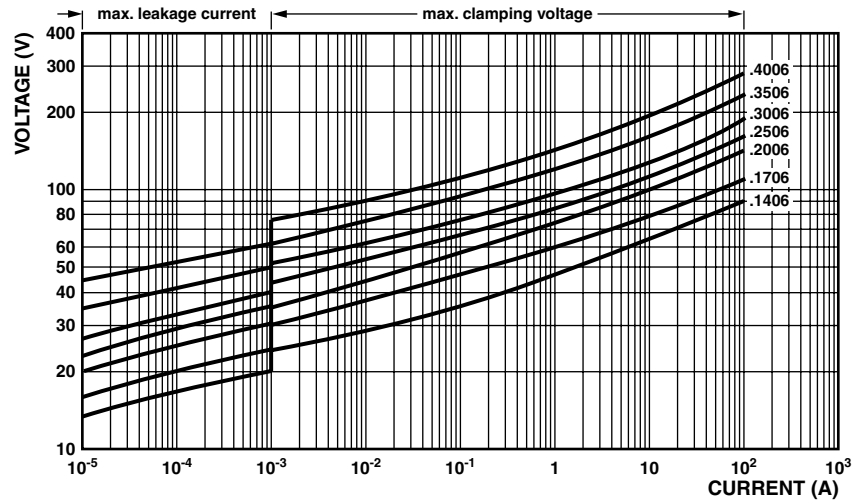
<sup>(1)</sup> Guaranteed between component and tape

<sup>(2)</sup> For 2381 595 0511y and 2381 595 0551y: H = 20 mm ± 1 mm

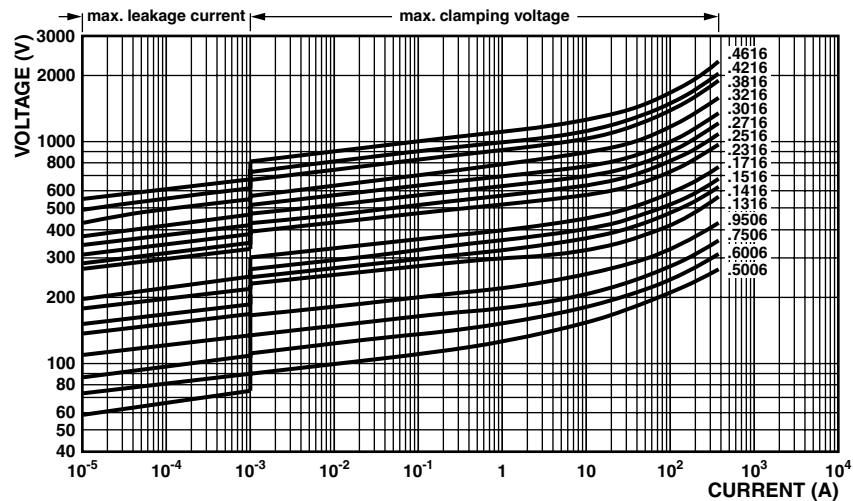


## V/I CHARACTERISTICS

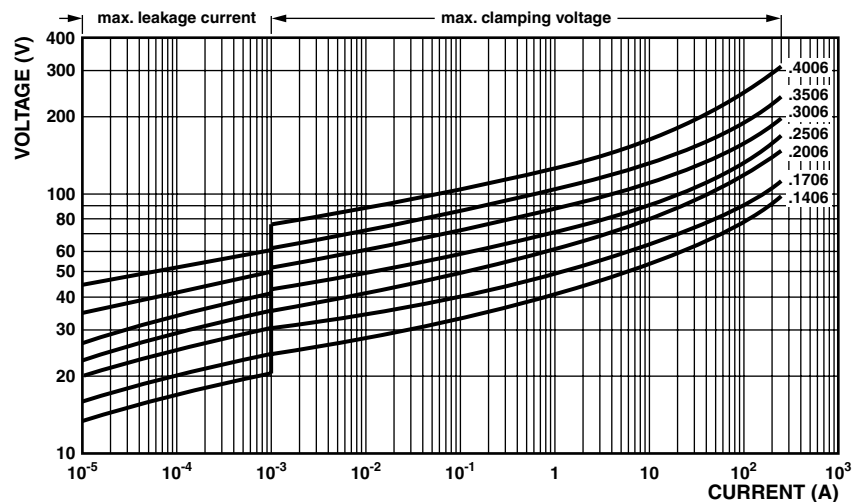
14 V<sub>RMS</sub> to 40 V<sub>RMS</sub>; VDRS05.....E/2381 592 ....



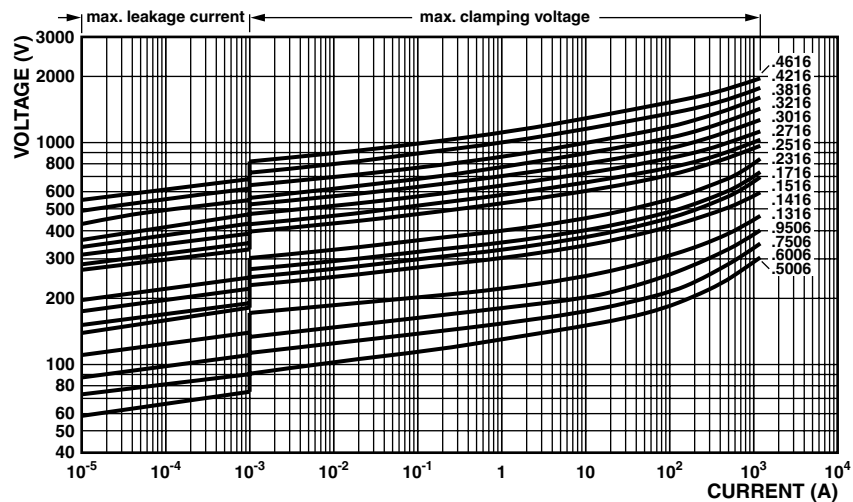
50 V<sub>RMS</sub> to 460 V<sub>RMS</sub>; VDRS05.....E/2381 592 ....



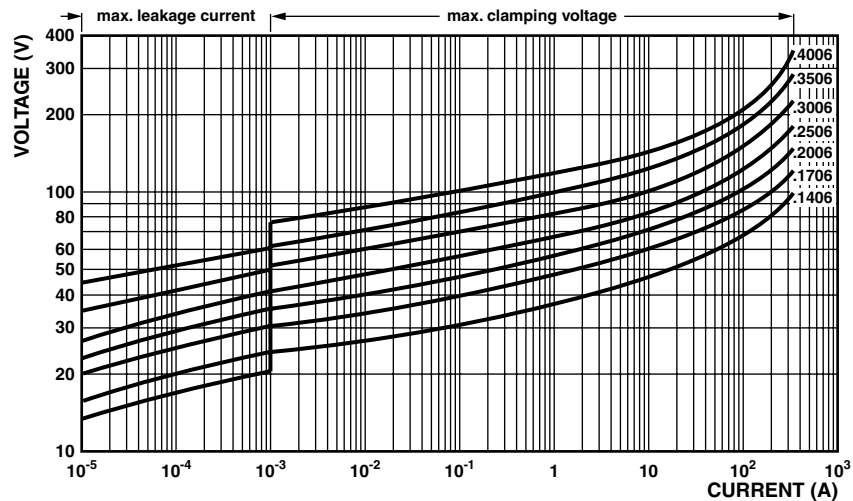
14 V<sub>RMS</sub> to 40 V<sub>RMS</sub>; VDRS07.....E/2381 593 ....



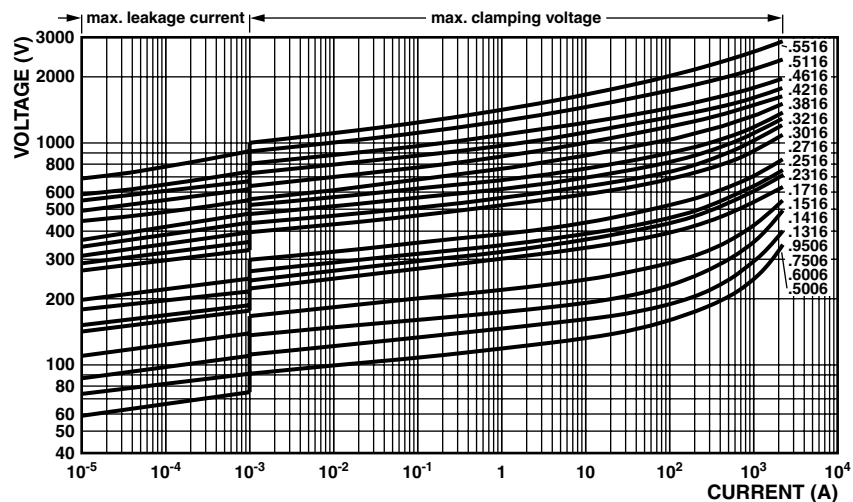
50 V<sub>RMS</sub> to 460 V<sub>RMS</sub>; VDRS07.....E/2381 593 ....



14 V<sub>RMS</sub> to 40 V<sub>RMS</sub>; VDRS10.....E/2381 594 ....

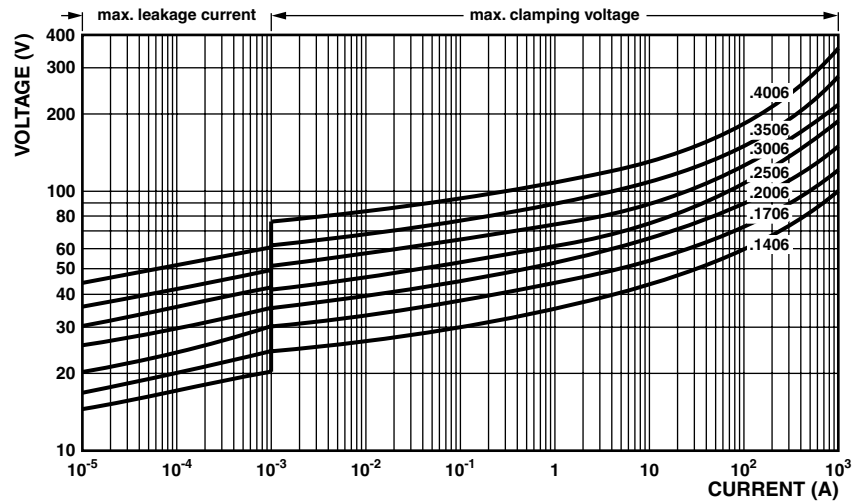


50 V<sub>RMS</sub> to 550 V<sub>RMS</sub>; VDRS10.....E/2381 594 ....

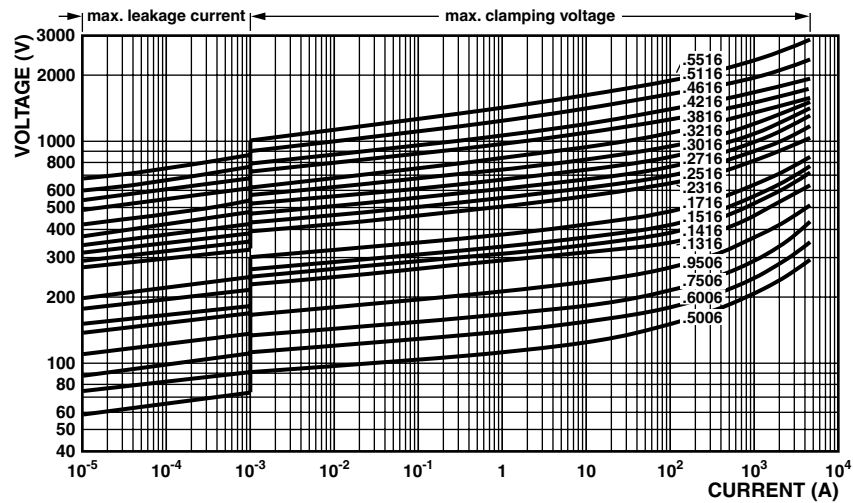




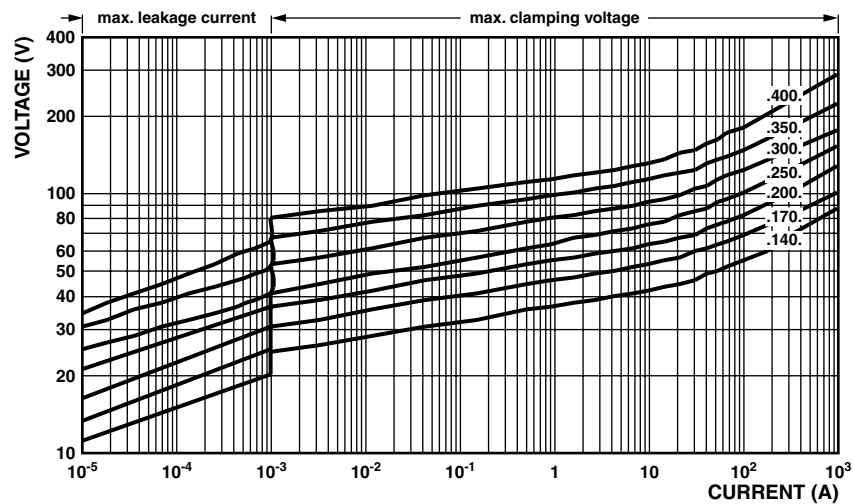
14 V<sub>RMS</sub> to 40 V<sub>RMS</sub>; VDRS14.....E/2381 595 ....



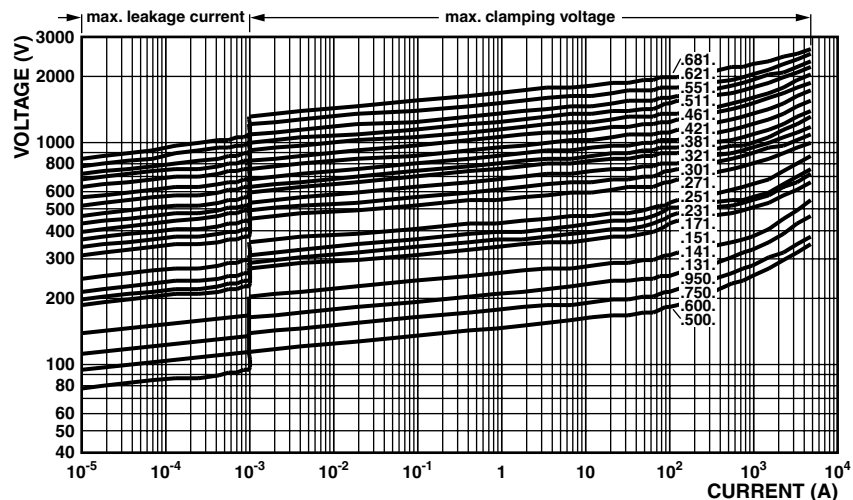
50 V<sub>RMS</sub> to 550 V<sub>RMS</sub>; VDRS14.....E/2381 595 ....



14 V<sub>RMS</sub> to 40 V<sub>RMS</sub>; VDRS20.....E/2381 596 ....

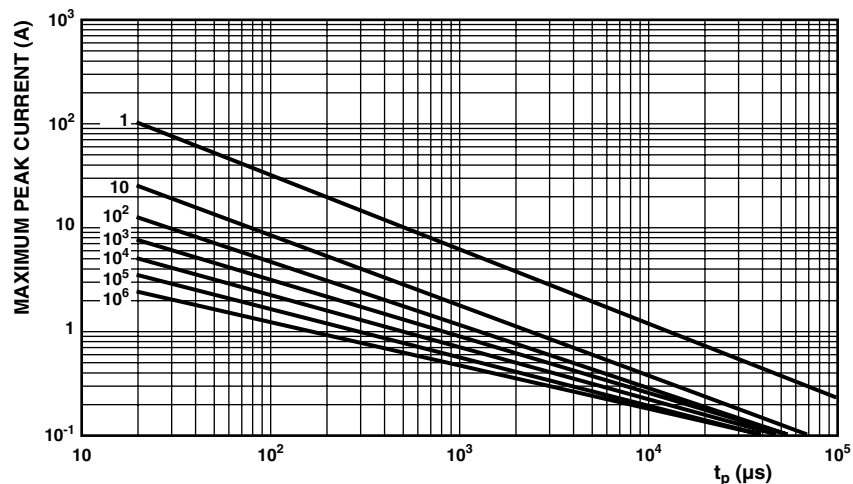


50 V<sub>RMS</sub> to 680 V<sub>RMS</sub>; VDRS20.....E/2381 596 ....

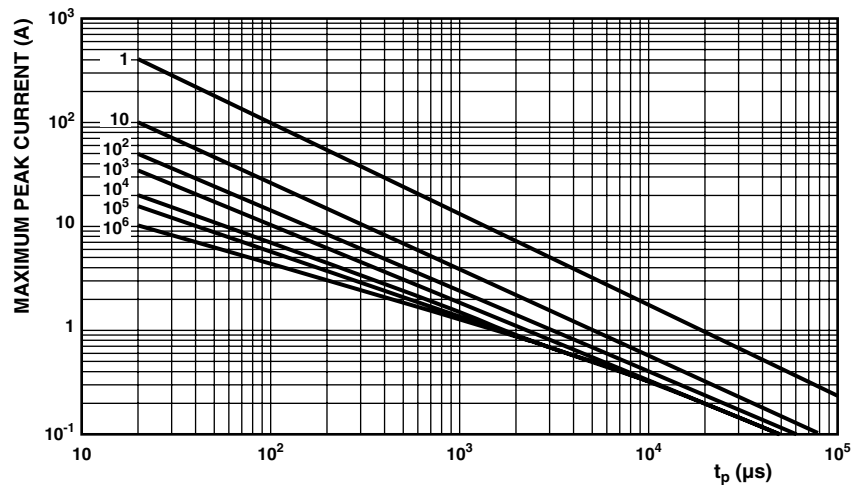


### MAXIMUM APPLICABLE TRANSIENT CURRENT AS A FUNCTION OF PULSE DURATION

14 V<sub>RMS</sub> to 40 V<sub>RMS</sub>; VDRS05.....E/2381 592 ....

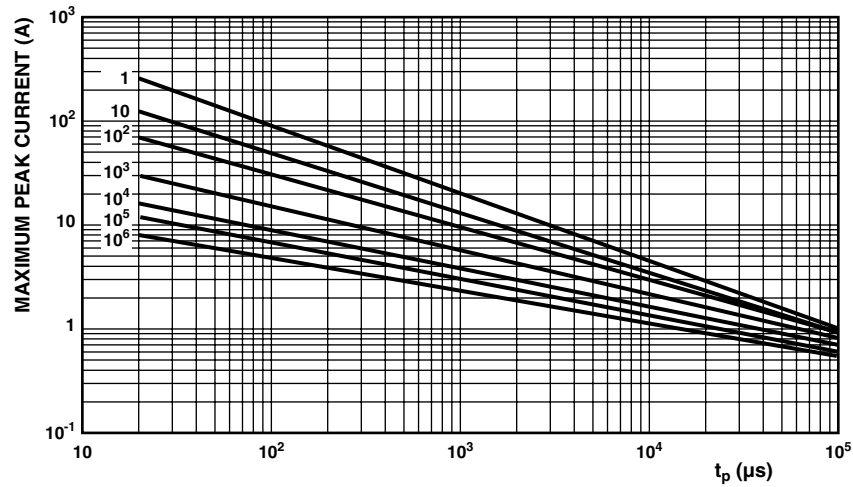


50 V<sub>RMS</sub> to 460 V<sub>RMS</sub>; VDRS05.....E/2381 592 ....

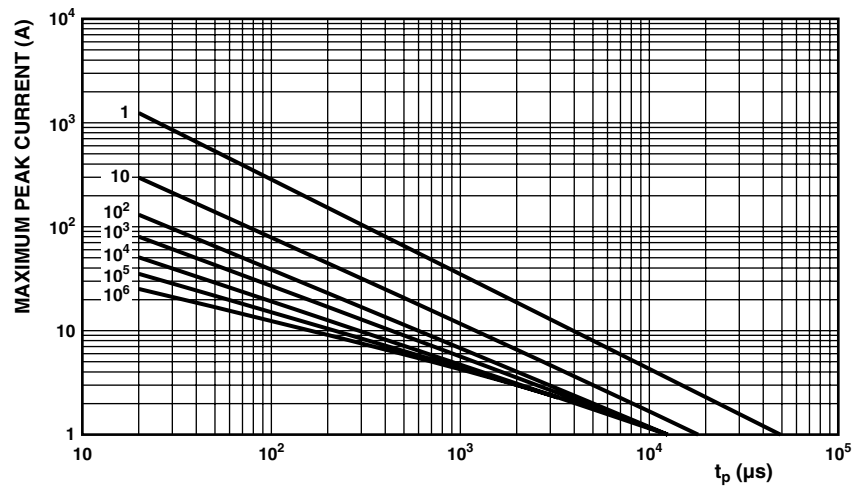




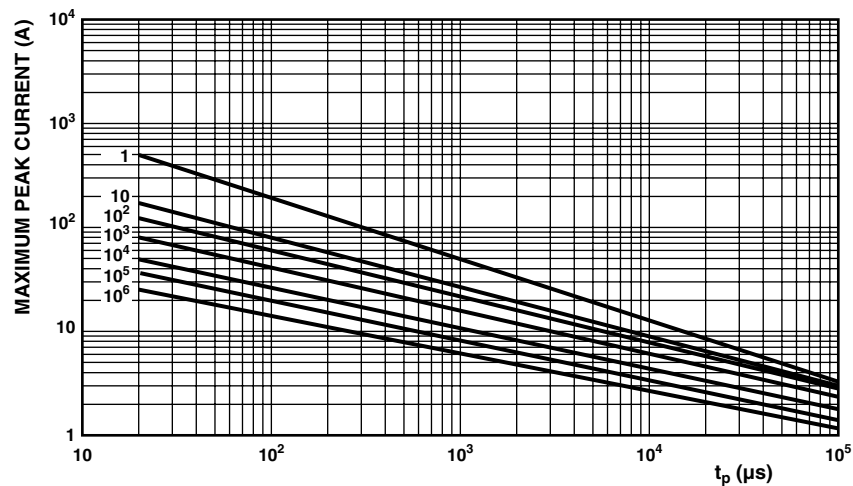
14 V<sub>RMS</sub> to 40 V<sub>RMS</sub>; VDRS07.....E/2381 593 ....



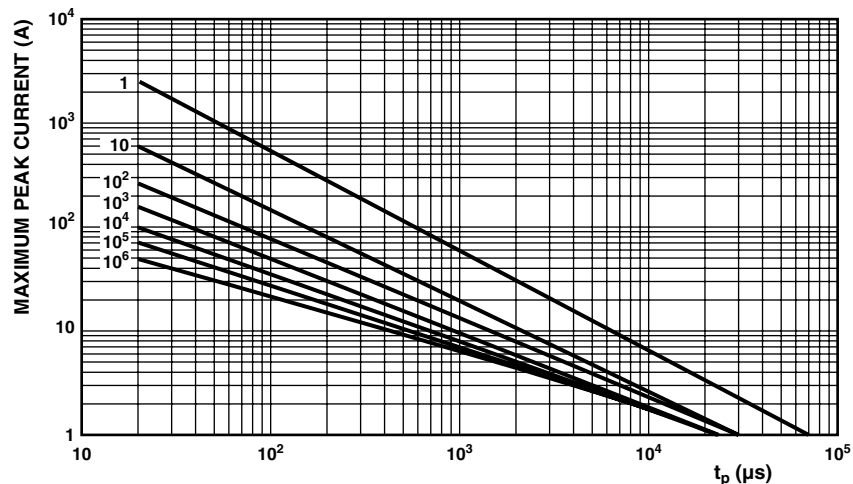
50 V<sub>RMS</sub> to 460 V<sub>RMS</sub>; VDRS07.....E/2381 593 ....



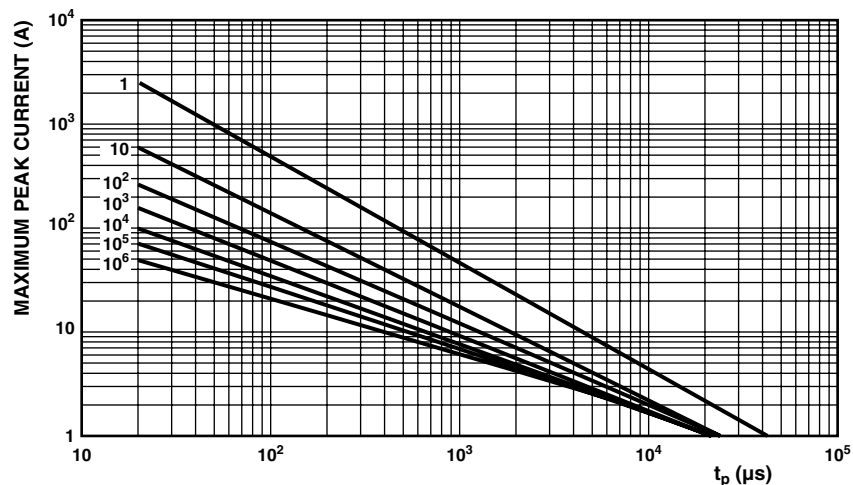
14 V<sub>RMS</sub> to 40 V<sub>RMS</sub>; VDRS10.....E/2381 594 ....



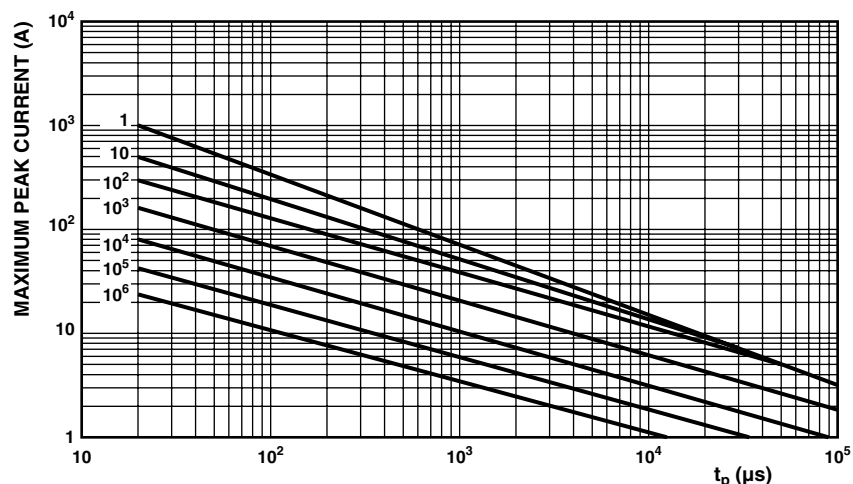
50  $V_{RMS}$  to 320  $V_{RMS}$ ; VDRS10.....E/2381 594 ....



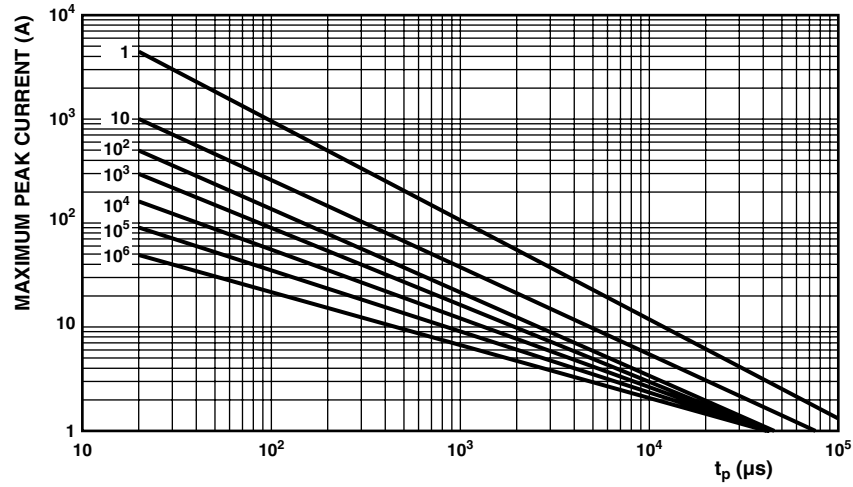
385  $V_{RMS}$  to 550  $V_{RMS}$ ; VDRS10.....E/2381 594 ....



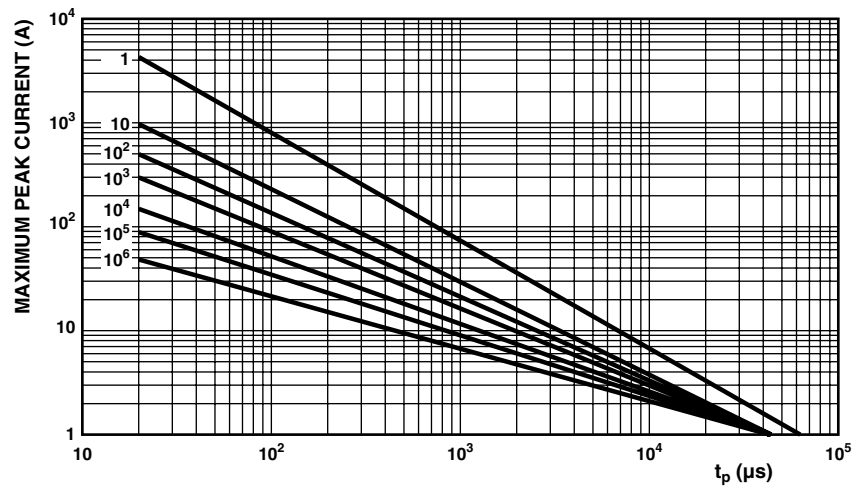
14  $V_{RMS}$  to 40  $V_{RMS}$ ; VDRS14.....E/2381 595 ....



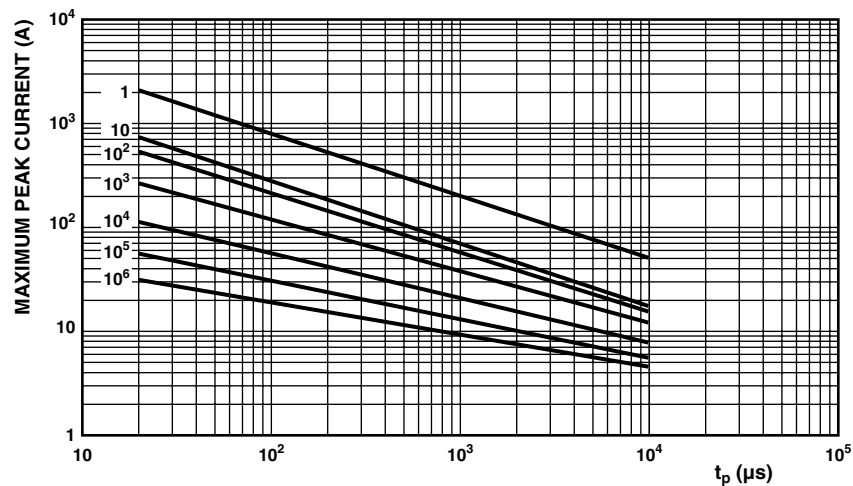
50 V<sub>RMS</sub> to 320 V<sub>RMS</sub>; VDRS14.....E/2381 595 ....



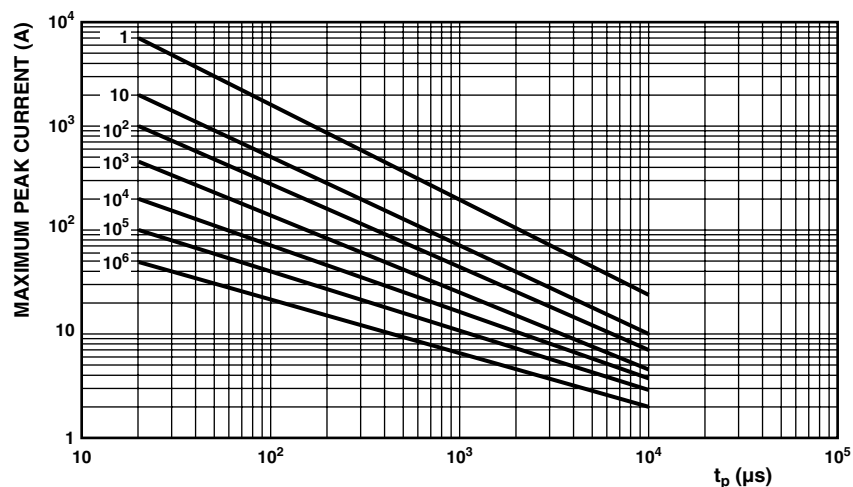
385 V<sub>RMS</sub> to 550 V<sub>RMS</sub>; VDRS14.....E/2381 595 ....



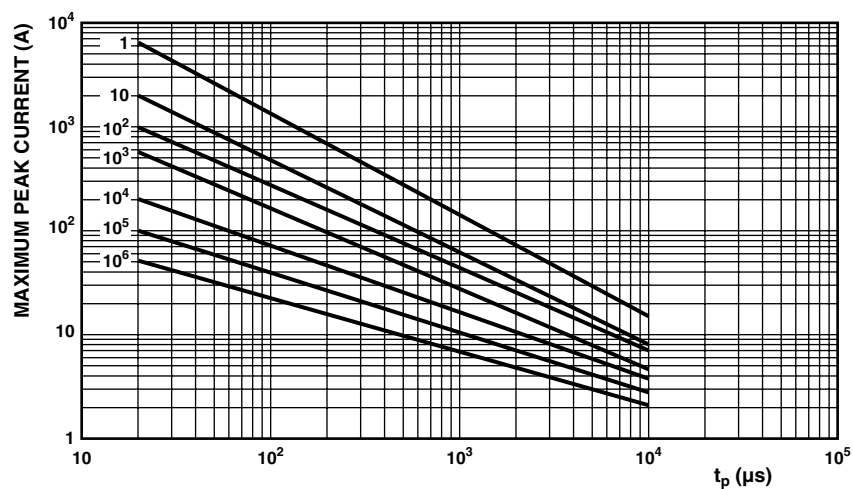
14 V<sub>RMS</sub> to 40 V<sub>RMS</sub>; VDRS20.....E/2381 596 ....



60 V<sub>RMS</sub> to 300 V<sub>RMS</sub>; VDRS20.....E/2381 596 ....



320 V<sub>RMS</sub> to 680 V<sub>RMS</sub>; VDRS20.....E/2381 596 ....





## Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Vishay"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained in any datasheet or in any other disclosure relating to any product.

Vishay makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Vishay disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Vishay's knowledge of typical requirements that are often placed on Vishay products in generic applications. Such statements are not binding statements about the suitability of products for a particular application. It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and/or specifications may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated for each customer application by the customer's technical experts. Product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein.

Except as expressly indicated in writing, Vishay products are not designed for use in medical, life-saving, or life-sustaining applications or for any other application in which the failure of the Vishay product could result in personal injury or death. Customers using or selling Vishay products not expressly indicated for use in such applications do so at their own risk. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay. Product names and markings noted herein may be trademarks of their respective owners.

## Material Category Policy

**Vishay Intertechnology, Inc. hereby certifies that all its products that are identified as RoHS-Compliant fulfill the definitions and restrictions defined under Directive 2011/65/EU of The European Parliament and of the Council of June 8, 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment (EEE) - recast, unless otherwise specified as non-compliant.**

**Please note that some Vishay documentation may still make reference to RoHS Directive 2002/95/EC. We confirm that all the products identified as being compliant to Directive 2002/95/EC conform to Directive 2011/65/EU.**

**Vishay Intertechnology, Inc. hereby certifies that all its products that are identified as Halogen-Free follow Halogen-Free requirements as per JEDEC JS709A standards. Please note that some Vishay documentation may still make reference to the IEC 61249-2-21 definition. We confirm that all the products identified as being compliant to IEC 61249-2-21 conform to JEDEC JS709A standards.**

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

Наши преимущества:

- Поставка оригинальных импортных электронных компонентов напрямую с производств Америки, Европы и Азии, а так же с крупнейших складов мира;
- Широкая линейка поставок активных и пассивных импортных электронных компонентов (более 30 млн. наименований);
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Помощь Конструкторского Отдела и консультации квалифицированных инженеров;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Поставка электронных компонентов под контролем ВП;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- При необходимости вся продукция военного и аэрокосмического назначения проходит испытания и сертификацию в лаборатории (по согласованию с заказчиком);
- Поставка специализированных компонентов военного и аэрокосмического уровня качества (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Actel, Aeroflex, Peregrine, VPT, Syfer, Eurofarad, Texas Instruments, MS Kennedy, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Компания «Океан Электроники» является официальным дистрибьютором и эксклюзивным представителем в России одного из крупнейших производителей разъемов военного и аэрокосмического назначения «JONHON», а так же официальным дистрибьютором и эксклюзивным представителем в России производителя высокотехнологичных и надежных решений для передачи СВЧ сигналов «FORSTAR».



## JONHON

«JONHON» (основан в 1970 г.)

Разъемы специального, военного и аэрокосмического назначения:

(Применяются в военной, авиационной, аэрокосмической, морской, железнодорожной, горно- и нефтедобывающей отраслях промышленности)

«FORSTAR» (основан в 1998 г.)

ВЧ соединители, коаксиальные кабели,  
кабельные сборки и микроволновые компоненты:

(Применяются в телекоммуникациях гражданского и специального назначения, в средствах связи, РЛС, а так же военной, авиационной и аэрокосмической отраслях промышленности).



Телефон: 8 (812) 309-75-97 (многоканальный)

Факс: 8 (812) 320-03-32

Электронная почта: [ocean@oceanchips.ru](mailto:ocean@oceanchips.ru)

Web: <http://oceanchips.ru/>

Адрес: 198099, г. Санкт-Петербург, ул. Калинина, д. 2, корп. 4, лит. А