

## VDR Metal Oxide Varistors High Surge



### FEATURES

- Zinc oxide disc, epoxy coated
- Straight or kinked leads
- Higher current surge/size ratio capability up to 10 kA for H20 types
- 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

### QUICK REFERENCE DATA

| PARAMETER   | VALUE   | UNIT |
|---|---|------|
| Maximum continuous voltage in operating temperature range:          |   |      |
| RMS   | 11 to 680   | V    |
| DC  | 14 to 895   | V    |
| Maximum non-repetitive transient current $I_{NRP}$ (8 x 20 $\mu$ s) | 250 to 10 000   | A    |
| Detailed specification  | Based on<br>IEC 61051-1<br>IEC 61051-2<br>IEC 61051-2-2 |      |
| Storage temperature   | - 40 to + 150   | °C   |
| Operating temperature   | - 40 to + 125   | °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.

### 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 colored 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.

### 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 (582, 583, 584, 585 or 586)
- Manufacture logo
- Date of manufacture (YYWW)

### INFLAMMABILITY

The varistors are non-flammable. The encapsulation is made of flammable-resistant epoxy lacquer 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 µs) |        | MAXIMUM NON-REP. TRANSIENT CURRENT <sup>(5)</sup> I <sub>NRP</sub> (8 x 20 µs) |           | TYPICAL CAPACITANCE 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- |
| 11                                       | 14     | 18                             | 40    | 1.0                               | 0.7  | 250  | 1600   | 3.4  | 0.5 ± 0.3 | 4                            | VDRH05B011xyE | 582      | x110y |                                     |                                |                           |
|  |        |                                | 36    | 2.5                               | 1.5  | 500  | 3600   | 3.4  | 0.5 ± 0.3 | 4                            | VDRH07D011xyE | 583      | x110y |                                     |                                |                           |
|  |        |                                | 36    | 5.0                               | 2.6  | 1000   | 8000   | 3.8  | 0.7 ± 0.3 | 4                            | VDRH10G011xyE | 584      | x110y |                                     |                                |                           |
|  |        |                                | 36    | 10.0                              | 5.2  | 2000   | 20 000 | 3.8  | 0.7 ± 0.3 | 4                            | VDRH14M011xyE | 585      | x110y |                                     |                                |                           |
|  |        |                                | 36    | 20.0                              | 13.0 | 3000   | 40 000 | 4.2  | 0.9 ± 0.3 | 3                            | VDRH20R011ByE | 586      | x110y |                                     |                                |                           |
| 14                                       | 18     | 22                             | 48    | 1.0                               | 0.8  | 250  | 1300   | 3.4  | 0.7 ± 0.3 | 4                            | VDRH05B014xyE | 582      | x140y |                                     |                                |                           |
|  |        |                                | 43    | 2.5                               | 1.7  | 500  | 2800   | 3.4  | 0.7 ± 0.3 | 4                            | VDRH07D014xyE | 583      | x140y |                                     |                                |                           |
|  |        |                                | 43    | 5.0                               | 3.2  | 1000   | 6000   | 3.8  | 0.9 ± 0.3 | 4                            | VDRH10G014xyE | 584      | x140y |                                     |                                |                           |
|  |        |                                | 43    | 10.0                              | 6.3  | 2000   | 15 000 | 3.8  | 0.9 ± 0.3 | 4                            | VDRH14M014xyE | 585      | x140y |                                     |                                |                           |
|  |        |                                | 43    | 20.0                              | 16.0 | 3000   | 30 000 | 4.2  | 1.1 ± 0.3 | 3                            | VDRH20R014ByE | 586      | x140y |                                     |                                |                           |
| 17                                       | 22     | 27                             | 60    | 1.0                               | 1.1  | 250  | 1050   | 3.7  | 0.8 ± 0.3 | 4                            | VDRH05B017xyE | 582      | x170y |                                     |                                |                           |
|  |        |                                | 53    | 2.5                               | 2.1  | 500  | 2000   | 3.7  | 0.8 ± 0.3 | 4                            | VDRH07D017xyE | 583      | x170y |                                     |                                |                           |
|  |        |                                | 53    | 5.0                               | 3.9  | 1000   | 4000   | 4.1  | 1.0 ± 0.3 | 4                            | VDRH10G017xyE | 584      | x170y |                                     |                                |                           |
|  |        |                                | 53    | 10.0                              | 7.8  | 2000   | 10 000 | 4.1  | 1.0 ± 0.3 | 4                            | VDRH14M017xyE | 585      | x170y |                                     |                                |                           |
|  |        |                                | 53    | 20.0                              | 19.0 | 3000   | 20 000 | 4.5  | 1.2 ± 0.3 | 3                            | VDRH20R017ByE | 586      | x170y |                                     |                                |                           |
| 20                                       | 26     | 33                             | 73    | 1.0                               | 1.3  | 250  | 900    | 3.9  | 1.0 ± 0.3 | 4                            | VDRH05B020xyE | 582      | x200y |                                     |                                |                           |
|  |        |                                | 65    | 2.5                               | 2.8  | 500  | 1500   | 3.9  | 1.0 ± 0.3 | 4                            | VDRH07D020xyE | 583      | x200y |                                     |                                |                           |
|  |        |                                | 65    | 5.0                               | 4.8  | 1000   | 3000   | 4.3  | 1.2 ± 0.3 | 4                            | VDRH10G020xyE | 584      | x200y |                                     |                                |                           |
|  |        |                                | 65    | 10.0                              | 9.5  | 2000   | 7500   | 4.3  | 1.2 ± 0.3 | 4                            | VDRH14M020xyE | 585      | x200y |                                     |                                |                           |
|  |        |                                | 65    | 20.0                              | 24.0 | 3000   | 15 000 | 4.7  | 1.4 ± 0.3 | 3                            | VDRH20R020ByE | 586      | x200y |                                     |                                |                           |
| 25                                       | 31     | 39                             | 86    | 1.0                               | 1.5  | 250  | 500    | 4.2  | 1.2 ± 0.3 | 4                            | VDRH05B025xyE | 582      | x250y |                                     |                                |                           |
|  |        |                                | 77    | 2.5                               | 3.0  | 500  | 1350   | 4.2  | 1.2 ± 0.3 | 4                            | VDRH07D025xyE | 583      | x250y |                                     |                                |                           |
|  |        |                                | 77    | 5.0                               | 5.6  | 1000   | 2600   | 4.6  | 1.4 ± 0.3 | 4                            | VDRH10G025xyE | 584      | x250y |                                     |                                |                           |
|  |        |                                | 77    | 10.0                              | 11.0 | 2000   | 6500   | 4.6  | 1.4 ± 0.3 | 4                            | VDRH14M025xyE | 585      | x250y |                                     |                                |                           |
|  |        |                                | 77    | 20.0                              | 28.0 | 3000   | 13 000 | 5.0  | 1.6 ± 0.3 | 3                            | VDRH20R025ByE | 586      | x250y |                                     |                                |                           |
| 30                                       | 38     | 47                             | 104   | 1.0                               | 1.8  | 250  | 700    | 4.4  | 1.4 ± 0.5 | 4                            | VDRH05B030xyE | 582      | x300y |                                     |                                |                           |
|  |        |                                | 93    | 2.5                               | 3.8  | 500  | 1600   | 4.4  | 1.4 ± 0.5 | 4                            | VDRH07D030xyE | 583      | x300y |                                     |                                |                           |
|  |        |                                | 93    | 5.0                               | 6.8  | 1000   | 2700   | 4.8  | 1.6 ± 0.5 | 4                            | VDRH10G030xyE | 584      | x300y |                                     |                                |                           |
|  |        |                                | 93    | 10.0                              | 14.0 | 2000   | 6000   | 4.8  | 1.6 ± 0.5 | 4                            | VDRH14M030xyE | 585      | x300y |                                     |                                |                           |
|  |        |                                | 93    | 20.0                              | 34.0 | 3000   | 12 000 | 5.2  | 1.8 ± 0.5 | 3                            | VDRH20R030ByE | 586      | x300y |                                     |                                |                           |
| 35                                       | 45     | 56                             | 123   | 1.0                               | 2.2  | 250  | 560    | 4.8  | 1.7 ± 0.5 | 4                            | VDRH05B035xyE | 582      | x350y |                                     |                                |                           |
|  |        |                                | 110   | 2.5                               | 4.4  | 500  | 1300   | 4.8  | 1.7 ± 0.5 | 4                            | VDRH07D035xyE | 583      | x350y |                                     |                                |                           |
|  |        |                                | 110   | 5.0                               | 8.1  | 1000   | 2200   | 5.2  | 1.9 ± 0.5 | 4                            | VDRH10G035xyE | 584      | x350y |                                     |                                |                           |
|  |        |                                | 110   | 10.0                              | 16.0 | 2000   | 4800   | 5.2  | 1.9 ± 0.5 | 4                            | VDRH14M035xyE | 585      | x350y |                                     |                                |                           |
|  |        |                                | 110   | 20.0                              | 41.0 | 3000   | 9600   | 5.6  | 2.1 ± 0.5 | 3                            | VDRH20R035ByE | 586      | x350y |                                     |                                |                           |
| 40                                       | 56     | 68                             | 150   | 1.0                               | 2.6  | 250  | 460    | 5.1  | 2.1 ± 0.5 | 4                            | VDRH05B040xyE | 582      | x400y |                                     |                                |                           |
|  |        |                                | 135   | 2.5                               | 5.4  | 500  | 1000   | 5.1  | 2.1 ± 0.5 | 4                            | VDRH07D040xyE | 583      | x400y |                                     |                                |                           |
|  |        |                                | 135   | 5.0                               | 9.8  | 1000   | 1800   | 5.5  | 2.3 ± 0.5 | 4                            | VDRH10G040xyE | 584      | x400y |                                     |                                |                           |
|  |        |                                | 135   | 10.0                              | 20.0 | 2000   | 3800   | 5.5  | 2.3 ± 0.5 | 4                            | VDRH14M040xyE | 585      | x400y |                                     |                                |                           |
|  |        |                                | 135   | 20.0                              | 49.0 | 3000   | 7600   | 5.9  | 2.5 ± 0.5 | 3                            | VDRH20R040ByE | 586      | x400y |                                     |                                |                           |
| 50                                       | 65     | 82                             | 145   | 5.0                               | 3.5  | 800  | 370    | 3.5  | 0.6 ± 0.3 | 4                            | VDRH05E050xyE | 582      | x500y |                                     |                                |                           |
|  |        |                                | 135   | 10.0                              | 7.0  | 1750   | 900    | 3.5  | 0.6 ± 0.3 | 4                            | VDRH07K050xyE | 583      | x500y |                                     |                                |                           |
|  |        |                                | 135   | 25.0                              | 14.0 | 3500   | 1500   | 3.9  | 0.8 ± 0.3 | 3                            | VDRH10S050xyE | 584      | x500y |                                     |                                |                           |
|  |        |                                | 135   | 50.0                              | 28.0 | 6000   | 3100   | 3.9  | 0.8 ± 0.3 | 2                            | VDRH14V050xyE | 585      | x500y |                                     |                                |                           |



| ELECTRICAL DATA AND ORDERING INFORMATION |        |                                    |                                   |       |  |  |                                   |               |           |                                     |                                |                           |
|--|--------|------------------------------------|-----------------------------------|-------|--|--|-----------------------------------|---------------|-----------|-------------------------------------|--------------------------------|---------------------------|
| MAXIMUM CONTINUOUS VOLTAGE               |        | VOLTAGE <sup>(3)</sup> at 1 mA (V) | MAXIMUM VOLTAGE at STATED CURRENT |       | MAXIMUM ENERGY <sup>(4)</sup> (10 x 1000 µs) (J) | MAXIMUM NON-REP. TRANSIENT CURRENT <sup>(5)</sup> I <sub>NRP</sub> (8 x 20 µs) (A) | TYPICAL CAPACITANCE at 1 kHz (pF) | T (max.) (mm) | E (mm)    | UL 1449 ED3 SPD TYPE <sup>(8)</sup> | CATALOG NUMBERS <sup>(1)</sup> |                           |
| RMS <sup>(2)</sup> (V)                   | DC (V) |                                    | V (V)                             | I (A) |  |  |                                   |               |           |                                     | SAP <sup>(7)</sup>             | 12NC <sup>(6)</sup> 2381- |
| 60                                       | 85     | 100                                | 175                               | 5.0   | 4.5  | 800  | 290                               | 3.7           | 0.7 ± 0.3 | 4                                   | VDRH05E060xyE                  | 582 x600y                 |
|  |        |                                    | 165                               | 10.0  | 9.0  | 1750   | 700                               | 3.7           | 0.7 ± 0.3 | 4                                   | VDRH07K060xyE                  | 583 x600y                 |
|  |        |                                    | 165                               | 25.0  | 18.0   | 3500   | 1200                              | 4.1           | 0.9 ± 0.3 | 4                                   | VDRH10S060xyE                  | 584 x600y                 |
|  |        |                                    | 165                               | 50.0  | 36.0   | 6000   | 2300                              | 4.1           | 0.9 ± 0.3 | 2                                   | VDRH14V060xyE                  | 585 x600y                 |
|  |        |                                    | 165                               | 100.0 | 72.0   | 10 000   | 4600                              | 4.5           | 1.1 ± 0.3 | 2                                   | VDRH20X060ByE                  | 586 x600y                 |
| 75                                       | 100    | 120                                | 210                               | 5.0   | 5.5  | 800  | 240                               | 4.0           | 0.9 ± 0.3 | 4                                   | VDRH05E075xyE                  | 582 x750y                 |
|  |        |                                    | 200                               | 10.0  | 11.0   | 1750   | 530                               | 4.0           | 0.9 ± 0.3 | 4                                   | VDRH07K075xyE                  | 583 x750y                 |
|  |        |                                    | 200                               | 25.0  | 22.0   | 3500   | 1000                              | 4.4           | 1.1 ± 0.3 | 4                                   | VDRH10S075xyE                  | 584 x750y                 |
|  |        |                                    | 200                               | 50.0  | 44.0   | 6000   | 1900                              | 4.4           | 1.1 ± 0.3 | 2                                   | VDRH14V075xyE                  | 585 x750y                 |
|  |        |                                    | 200                               | 100.0 | 88.0   | 10 000   | 3800                              | 4.8           | 1.3 ± 0.3 | 2                                   | VDRH20X075ByE                  | 586 x750y                 |
| 95                                       | 125    | 150                                | 260                               | 5.0   | 6.5  | 800  | 180                               | 4.2           | 1.1 ± 0.3 | 4                                   | VDRH05E095xyE                  | 582 x950y                 |
|  |        |                                    | 250                               | 10.0  | 13.0   | 1750   | 450                               | 4.2           | 1.1 ± 0.3 | 4                                   | VDRH07K095xyE                  | 583 x950y                 |
|  |        |                                    | 250                               | 25.0  | 25.0   | 3500   | 800                               | 4.6           | 1.3 ± 0.3 | 4                                   | VDRH10S095xyE                  | 584 x950y                 |
|  |        |                                    | 250                               | 50.0  | 53.0   | 6000   | 1500                              | 4.6           | 1.3 ± 0.3 | 2                                   | VDRH14V095xyE                  | 585 x950y                 |
|  |        |                                    | 250                               | 100.0 | 106.0  | 10 000   | 3000                              | 5.0           | 1.5 ± 0.3 | 2                                   | VDRH20X095ByE                  | 586 x950y                 |
| 115                                      | 150    | 180                                | 320                               | 5.0   | 8.0  | 800  | 150                               | 3.6           | 0.9 ± 0.3 | 4                                   | VDRH05E115xyE                  | 582 x111y                 |
|  |        |                                    | 300                               | 10.0  | 16.0   | 1750   | 390                               | 3.6           | 0.9 ± 0.3 | 4                                   | VDRH07K115xyE                  | 583 x111y                 |
|  |        |                                    | 300                               | 25.0  | 32.0   | 3500   | 680                               | 4.0           | 1.1 ± 0.3 | 3                                   | VDRH10S115xyE                  | 584 x111y                 |
|  |        |                                    | 300                               | 50.0  | 65.0   | 6000   | 1320                              | 4.0           | 1.1 ± 0.3 | 2                                   | VDRH14V115xyE                  | 585 x111y                 |
|  |        |                                    | 300                               | 100.0 | 130.0  | 10 000   | 2640                              | 4.4           | 1.3 ± 0.3 | 2                                   | VDRH20X115ByE                  | 586 x111y                 |
| 130                                      | 170    | 205                                | 355                               | 5.0   | 8.5  | 800  | 130                               | 3.8           | 1.0 ± 0.3 | 4                                   | VDRH05E130xyE                  | 582 x131y                 |
|  |        |                                    | 340                               | 10.0  | 17.5   | 1750   | 320                               | 3.8           | 1.0 ± 0.3 | 4                                   | VDRH07K130xyE                  | 583 x131y                 |
|  |        |                                    | 340                               | 25.0  | 35.0   | 3500   | 580                               | 4.3           | 1.2 ± 0.3 | 3                                   | VDRH10S130xyE                  | 584 x131y                 |
|  |        |                                    | 340                               | 50.0  | 70.0   | 6000   | 1050                              | 4.3           | 1.2 ± 0.3 | 2                                   | VDRH14V130xyE                  | 585 x131y                 |
|  |        |                                    | 340                               | 100.0 | 140.0  | 10 000   | 2100                              | 4.8           | 1.4 ± 0.3 | 2                                   | VDRH20X130ByE                  | 586 x131y                 |
| 140                                      | 180    | 220                                | 380                               | 5.0   | 9.0  | 800  | 120                               | 3.9           | 1.0 ± 0.3 | 4                                   | VDRH05E140xyE                  | 582 x141y                 |
|  |        |                                    | 360                               | 10.0  | 19.0   | 1750   | 290                               | 3.9           | 1.0 ± 0.3 | 4                                   | VDRH07K140xyE                  | 583 x141y                 |
|  |        |                                    | 360                               | 25.0  | 39.0   | 3500   | 540                               | 4.3           | 1.2 ± 0.3 | 3                                   | VDRH10S140xyE                  | 584 x141y                 |
|  |        |                                    | 360                               | 50.0  | 78.0   | 6000   | 950                               | 4.3           | 1.2 ± 0.3 | 2                                   | VDRH14V140xyE                  | 585 x141y                 |
|  |        |                                    | 360                               | 100.0 | 155.0  | 10 000   | 1900                              | 4.8           | 1.5 ± 0.3 | 2                                   | VDRH20X140ByE                  | 586 x141y                 |
| 150                                      | 200    | 240                                | 415                               | 5.0   | 10.5   | 800  | 110                               | 4.1           | 1.1 ± 0.3 | 4                                   | VDRH05E150xyE                  | 582 x151y                 |
|  |        |                                    | 395                               | 10.0  | 21.0   | 1750   | 270                               | 4.1           | 1.1 ± 0.3 | 4                                   | VDRH07K150xyE                  | 583 x151y                 |
|  |        |                                    | 395                               | 25.0  | 42.0   | 3500   | 490                               | 4.3           | 1.3 ± 0.3 | 3                                   | VDRH10S150xyE                  | 584 x151y                 |
|  |        |                                    | 395                               | 50.0  | 84.0   | 6000   | 850                               | 4.3           | 1.3 ± 0.3 | 2                                   | VDRH14V150xyE                  | 585 x151y                 |
|  |        |                                    | 395                               | 100.0 | 168.0  | 10 000   | 1700                              | 4.8           | 1.5 ± 0.3 | 2                                   | VDRH20X150ByE                  | 586 x151y                 |
| 175                                      | 225    | 275                                | 475                               | 5.0   | 11.0   | 800  | 90                                | 4.1           | 1.3 ± 0.3 | 4                                   | VDRH05E175xyE                  | 582 x171y                 |
|  |        |                                    | 455                               | 10.0  | 24.0   | 1750   | 230                               | 4.1           | 1.3 ± 0.3 | 4                                   | VDRH07K175xyE                  | 583 x171y                 |
|  |        |                                    | 455                               | 25.0  | 49.0   | 3500   | 430                               | 4.5           | 1.5 ± 0.3 | 3                                   | VDRH10S175xyE                  | 584 x171y                 |
|  |        |                                    | 455                               | 50.0  | 99.0   | 6000   | 750                               | 4.5           | 1.5 ± 0.3 | 2                                   | VDRH14V175xyE                  | 585 x171y                 |
|  |        |                                    | 455                               | 100.0 | 190.0  | 10 000   | 1500                              | 4.9           | 1.7 ± 0.3 | 2                                   | VDRH20X175ByE                  | 586 x171y                 |
| 195                                      | 250    | 300                                | 525                               | 5.0   | 12.0   | 800  | 80                                | 4.3           | 1.4 ± 0.8 | 4                                   | VDRH05E195xyE                  | 582 x191y                 |
|  |        |                                    | 455                               | 10.0  | 26.0   | 1750   | 210                               | 4.3           | 1.4 ± 0.8 | 4                                   | VDRH07K195xyE                  | 583 x191y                 |
|  |        |                                    | 455                               | 25.0  | 52.0   | 3500   | 380                               | 4.8           | 1.6 ± 0.8 | 4                                   | VDRH10S195xyE                  | 584 x191y                 |
|  |        |                                    | 455                               | 50.0  | 105.0  | 6000   | 690                               | 4.8           | 1.6 ± 0.8 | 2                                   | VDRH14V195xyE                  | 585 x191y                 |
|  |        |                                    | 455                               | 100.0 | 210.0  | 10 000   | 1350                              | 5.1           | 1.9 ± 0.8 | 2                                   | VDRH20X195ByE                  | 586 x191y                 |

| ELECTRICAL DATA AND ORDERING INFORMATION |        |                     |                                   |       |                                   |   |                              |          |           |                          |                     |                |
|--|--------|---------------------|-----------------------------------|-------|-----------------------------------|---|------------------------------|----------|-----------|--------------------------|---------------------|----------------|
| MAXIMUM CONTINUOUS VOLTAGE               |        | VOLTAGE (3) at 1 mA | MAXIMUM VOLTAGE at STATED CURRENT |       | MAXIMUM ENERGY (4) (10 x 1000 µs) | MAXIMUM NON-REP. TRANSIENT CURRENT (5) I <sub>NRP</sub> (8 x 20 µs) | TYPICAL CAPACITANCE at 1 kHz | T (max.) | E         | UL 1449 ED3 SPD TYPE (8) | CATALOG NUMBERS (1) |                |
| RMS (2) (V)                              | DC (V) | (V)                 | V (V)                             | I (A) | (J)                               | (A)   | (pF)                         | (mm)     | (mm)      |                          | SAP (7)             | 12NC (6) 2381- |
| 210                                      | 275    | 330                 | 575                               | 5.0   | 13.0                              | 800   | 75                           | 4.4      | 1.6 ± 0.8 | 4                        | VDRH05E210xyE       | 582 x211y      |
|  |        |                     | 505                               | 10.0  | 28.0                              | 1750  | 190                          | 4.4      | 1.6 ± 0.8 | 4                        | VDRH07K210xyE       | 583 x211y      |
|  |        |                     | 505                               | 25.0  | 58.0                              | 3500  | 350                          | 4.8      | 1.8 ± 0.8 | 4                        | VDRH10S210xyE       | 584 x211y      |
|  |        |                     | 505                               | 50.0  | 115.0                             | 6000  | 610                          | 4.8      | 1.8 ± 0.8 | 2                        | VDRH14V210xyE       | 585 x211y      |
|  |        |                     | 505                               | 100.0 | 228.0                             | 10 000  | 1250                         | 5.3      | 2.0 ± 0.8 | 2                        | VDRH20X210ByE       | 586 x211y      |
| 230                                      | 300    | 360                 | 620                               | 5.0   | 16.0                              | 800   | 70                           | 4.6      | 1.7 ± 0.8 | 4                        | VDRH05E230xyE       | 582 x231y      |
|  |        |                     | 595                               | 10.0  | 32.0                              | 1750  | 170                          | 4.6      | 1.7 ± 0.8 | 4                        | VDRH07K230xyE       | 583 x231y      |
|  |        |                     | 595                               | 25.0  | 65.0                              | 3500  | 320                          | 5.1      | 1.9 ± 0.8 | 4                        | VDRH10S230xyE       | 584 x231y      |
|  |        |                     | 595                               | 50.0  | 130.0                             | 6000  | 540                          | 5.1      | 1.9 ± 0.8 | 2                        | VDRH14V230xyE       | 585 x231y      |
|  |        |                     | 595                               | 100.0 | 255.0                             | 10 000  | 1100                         | 5.4      | 2.2 ± 0.8 | 2                        | VDRH20X230ByE       | 586 x231y      |
| 250                                      | 320    | 390                 | 675                               | 5.0   | 17.0                              | 800   | 60                           | 4.8      | 1.9 ± 0.8 | 4                        | VDRH05E250xyE       | 582 x251y      |
|  |        |                     | 650                               | 10.0  | 35.0                              | 1750  | 160                          | 4.8      | 1.9 ± 0.8 | 4                        | VDRH07K250xyE       | 583 x251y      |
|  |        |                     | 650                               | 25.0  | 70.0                              | 3500  | 300                          | 5.1      | 2.1 ± 0.8 | 4                        | VDRH10S250xyE       | 584 x251y      |
|  |        |                     | 650                               | 50.0  | 140.0                             | 6000  | 480                          | 5.1      | 2.1 ± 0.8 | 2                        | VDRH14V250xyE       | 585 x251y      |
|  |        |                     | 650                               | 100.0 | 275.0                             | 10 000  | 960                          | 5.5      | 2.3 ± 0.8 | 2                        | VDRH20X250ByE       | 586 x251y      |
| 275                                      | 350    | 430                 | 745                               | 5.0   | 20.0                              | 800   | 55                           | 4.9      | 2.0 ± 0.8 | 4                        | VDRH05E275xyE       | 582 x271y      |
|  |        |                     | 710                               | 10.0  | 40.0                              | 1750  | 140                          | 4.9      | 2.0 ± 0.8 | 4                        | VDRH07K275xyE       | 583 x271y      |
|  |        |                     | 710                               | 25.0  | 80.0                              | 3500  | 270                          | 5.3      | 2.2 ± 0.8 | 4                        | VDRH10S275xyE       | 584 x271y      |
|  |        |                     | 710                               | 50.0  | 155.0                             | 6000  | 440                          | 5.3      | 2.2 ± 0.8 | 2                        | VDRH14V275xyE       | 585 x271y      |
|  |        |                     | 710                               | 100.0 | 303.0                             | 10 000  | 900                          | 5.8      | 2.5 ± 0.8 | 2                        | VDRH20X275ByE       | 586 x271y      |
| 300                                      | 385    | 470                 | 810                               | 5.0   | 21.0                              | 800   | 50                           | 5.1      | 2.2 ± 0.8 | 4                        | VDRH05E300xyE       | 582 x301y      |
|  |        |                     | 775                               | 10.0  | 42.0                              | 1750  | 130                          | 5.1      | 2.2 ± 0.8 | 4                        | VDRH07K300xyE       | 583 x301y      |
|  |        |                     | 775                               | 25.0  | 85.0                              | 3500  | 240                          | 5.5      | 2.4 ± 0.8 | 4                        | VDRH10S300xyE       | 584 x301y      |
|  |        |                     | 775                               | 50.0  | 175.0                             | 6000  | 400                          | 5.5      | 2.4 ± 0.8 | 2                        | VDRH14V300xyE       | 585 x301y      |
|  |        |                     | 775                               | 100.0 | 350.0                             | 10 000  | 810                          | 5.9      | 2.7 ± 0.8 | 2                        | VDRH20X300ByE       | 586 x301y      |
| 320                                      | 420    | 510                 | 880                               | 5.0   | 22.0                              | 800   | 45                           | 5.5      | 2.4 ± 0.8 | 4                        | VDRH05E320xyE       | 582 x321y      |
|  |        |                     | 842                               | 10.0  | 45.0                              | 1750  | 120                          | 5.5      | 2.4 ± 0.8 | 4                        | VDRH07K320xyE       | 583 x321y      |
|  |        |                     | 842                               | 25.0  | 92.0                              | 3500  | 220                          | 6.0      | 2.6 ± 0.8 | 4                        | VDRH10S320xyE       | 584 x321y      |
|  |        |                     | 842                               | 50.0  | 190.0                             | 6000  | 370                          | 6.0      | 2.6 ± 0.8 | 2                        | VDRH14V320xyE       | 585 x321y      |
|  |        |                     | 842                               | 100.0 | 382.0                             | 10 000  | 750                          | 6.3      | 2.9 ± 0.8 | 2                        | VDRH20X320ByE       | 586 x321y      |
| 350                                      | 460    | 560                 | 940                               | 5.0   | 25.0                              | 800   | 42                           | 5.8      | 2.7 ± 0.8 | 4                        | VDRH05E350xyE       | 582 x351y      |
|  |        |                     | 920                               | 10.0  | 51.0                              | 1750  | 110                          | 5.8      | 2.7 ± 0.8 | 4                        | VDRH07K350xyE       | 583 x351y      |
|  |        |                     | 920                               | 25.0  | 102.0                             | 3500  | 200                          | 6.1      | 2.9 ± 0.8 | 4                        | VDRH10S350xyE       | 584 x351y      |
|  |        |                     | 920                               | 50.0  | 205.0                             | 6000  | 320                          | 6.1      | 2.9 ± 0.8 | 2                        | VDRH14V350xyE       | 585 x351y      |
|  |        |                     | 920                               | 100.0 | 410.0                             | 10 000  | 650                          | 6.5      | 3.2 ± 0.8 | 2                        | VDRH20X350ByE       | 586 x351y      |
| 385                                      | 505    | 620                 | 1050                              | 5.0   | 27.0                              | 800   | 40                           | 6.0      | 3.0 ± 0.8 | 4                        | VDRH05E385xyE       | 582 x381y      |
|  |        |                     | 1025                              | 10.0  | 54.0                              | 1750  | 95                           | 6.0      | 3.0 ± 0.8 | 4                        | VDRH07K385xyE       | 583 x381y      |
|  |        |                     | 1025                              | 25.0  | 107.0                             | 3500  | 180                          | 6.5      | 3.2 ± 0.8 | 3                        | VDRH10S385xyE       | 584 x381y      |
|  |        |                     | 1025                              | 50.0  | 215.0                             | 6000  | 280                          | 6.5      | 3.2 ± 0.8 | 2                        | VDRH14V385xyE       | 585 x381y      |
|  |        |                     | 1025                              | 100.0 | 420.0                             | 10 000  | 570                          | 6.8      | 3.5 ± 0.8 | 2                        | VDRH20X385ByE       | 586 x381y      |
| 420                                      | 560    | 680                 | 1150                              | 5.0   | 28.0                              | 800   | 35                           | 6.3      | 3.2 ± 0.8 | 4                        | VDRH05E420xyE       | 582 x421y      |
|  |        |                     | 1120                              | 10.0  | 56.0                              | 1750  | 85                           | 6.3      | 3.2 ± 0.8 | 4                        | VDRH07K420xyE       | 583 x421y      |
|  |        |                     | 1120                              | 25.0  | 112.0                             | 3500  | 165                          | 6.7      | 3.4 ± 0.8 | 3                        | VDRH10S420xyE       | 584 x421y      |
|  |        |                     | 1120                              | 50.0  | 225.0                             | 6000  | 250                          | 6.7      | 3.4 ± 0.8 | 2                        | VDRH14V420xyE       | 585 x421y      |
|  |        |                     | 1120                              | 100.0 | 430.0                             | 10 000  | 510                          | 7.1      | 3.7 ± 0.8 | 2                        | VDRH20X420ByE       | 586 x421y      |



| ELECTRICAL DATA AND ORDERING INFORMATION |        |                                    |                                   |       |  |  |                                   |               |           |                                     |                                |                           |
|--|--------|------------------------------------|-----------------------------------|-------|--|--|-----------------------------------|---------------|-----------|-------------------------------------|--------------------------------|---------------------------|
| MAXIMUM CONTINUOUS VOLTAGE               |        | VOLTAGE <sup>(3)</sup> at 1 mA (V) | MAXIMUM VOLTAGE at STATED CURRENT |       | MAXIMUM ENERGY <sup>(4)</sup> (10 x 1000 µs) (J) | MAXIMUM NON-REP. TRANSIENT CURRENT <sup>(5)</sup> I <sub>NRP</sub> (8 x 20 µs) (A) | TYPICAL CAPACITANCE at 1 kHz (pF) | T (max.) (mm) | E (mm)    | UL 1449 ED3 SPD TYPE <sup>(8)</sup> | CATALOG NUMBERS <sup>(1)</sup> |                           |
| RMS <sup>(2)</sup> (V)                   | DC (V) |                                    | V (V)                             | I (A) |  |  |                                   |               |           |                                     | SAP <sup>(7)</sup>             | 12NC <sup>(6)</sup> 2381- |
| 460                                      | 615    | 750                                | 1290                              | 5.0   | 29.0   | 800  | 30                                | 6.6           | 3.6 ± 0.8 | 4                                   | VDRH05E460xyE                  | 582 x461y                 |
|  |        |                                    | 1240                              | 10.0  | 58.0   | 1750   | 75                                | 6.6           | 3.6 ± 0.8 | 4                                   | VDRH07K460xyE                  | 583 x461y                 |
|  |        |                                    | 1240                              | 25.0  | 115.0  | 3500   | 150                               | 7.0           | 3.8 ± 0.8 | 3                                   | VDRH10S460xyE                  | 584 x461y                 |
|  |        |                                    | 1240                              | 50.0  | 230.0  | 6000   | 225                               | 7.0           | 3.8 ± 0.8 | 2                                   | VDRH14V460xyE                  | 585 x461y                 |
|  |        |                                    | 1240                              | 100.0 | 440.0  | 10 000   | 450                               | 7.5           | 4.1 ± 0.8 | 2                                   | VDRH20X460ByE                  | 586 x461y                 |
| 485                                      | 640    | 780                                | 1290                              | 10.0  | 59.0   | 1750   | 65                                | 6.8           | 3.7 ± 0.8 | 4                                   | VDRH07K485xyE                  | 583 x481y                 |
|  |        |                                    | 1290                              | 25.0  | 116.0  | 3500   | 145                               | 7.3           | 3.9 ± 0.8 | 3                                   | VDRH10S485xyE                  | 584 x481y                 |
|  |        |                                    | 1290                              | 50.0  | 233.0  | 6000   | 220                               | 7.3           | 3.9 ± 0.8 | 2                                   | VDRH14V485xyE                  | 585 x481y                 |
|  |        |                                    | 1290                              | 100.0 | 450.0  | 10 000   | 400                               | 7.6           | 4.2 ± 0.8 | 2                                   | VDRH20X485ByE                  | 586 x481y                 |
| 510                                      | 670    | 820                                | 1355                              | 10.0  | 60.0   | 1750   | 62                                | 7.0           | 3.9 ± 0.8 | 4                                   | VDRH07K510xyE                  | 583 x511y                 |
|  |        |                                    | 1355                              | 25.0  | 118.0  | 3500   | 135                               | 7.5           | 4.1 ± 0.8 | 3                                   | VDRH10S510xyE                  | 584 x511y                 |
|  |        |                                    | 1355                              | 50.0  | 235.0  | 6000   | 220                               | 7.5           | 4.1 ± 0.8 | 2                                   | VDRH14V510xyE                  | 585 x511y                 |
|  |        |                                    | 1355                              | 100.0 | 460.0  | 10 000   | 400                               | 7.9           | 4.4 ± 0.8 | 2                                   | VDRH20X510ByE                  | 586 x511y                 |
| 550                                      | 745    | 910                                | 1500                              | 25.0  | 127.0  | 3500   | 120                               | 7.9           | 4.5 ± 0.8 | 3                                   | VDRH10S550xyE                  | 584 x551y                 |
|  |        |                                    | 1500                              | 50.0  | 255.0  | 6000   | 180                               | 7.9           | 4.5 ± 0.8 | 3                                   | VDRH14V550xyE                  | 585 x551y                 |
|  |        |                                    | 1500                              | 100.0 | 510.0  | 10 000   | 320                               | 8.3           | 4.9 ± 0.8 | 2                                   | VDRH20X550ByE                  | 586 x551y                 |
| 625                                      | 825    | 1000                               | 1650                              | 25.0  | 140.0  | 3500   | 105                               | 8.4           | 5.0 ± 0.8 | 3                                   | VDRH10S625ByE                  | 584 x6216                 |
|  |        |                                    | 1650                              | 50.0  | 283.0  | 6000   | 165                               | 8.4           | 5.0 ± 0.8 | 3                                   | VDRH14V625ByE                  | 585 x6216                 |
|  |        |                                    | 1650                              | 100.0 | 566.0  | 10 000   | 280                               | 8.8           | 5.3 ± 0.8 | 2                                   | VDRH20X625ByE                  | 586 x6216                 |
| 680                                      | 895    | 1100                               | 1815                              | 25.0  | 155.0  | 3500   | 80                                | 9.8           | 5.4 ± 0.8 | 3                                   | VDRH10S680ByE                  | 584 x6816                 |
|  |        |                                    | 1815                              | 50.0  | 310.0  | 6000   | 150                               | 9.8           | 5.4 ± 0.8 | 3                                   | VDRH14V680ByE                  | 585 x6816                 |
|  |        |                                    | 1815                              | 100.0 | 620.0  | 10 000   | 250                               | 10.2          | 5.8 ± 0.8 | 2                                   | VDRH20X680ByE                  | 586 x6816                 |

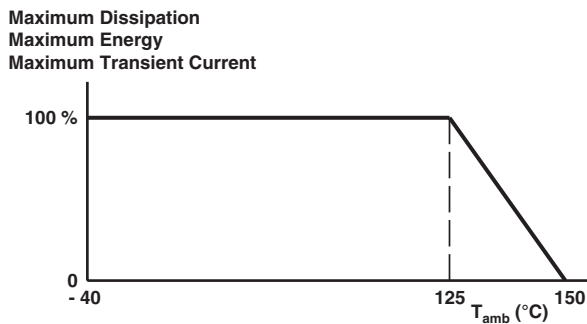
Notes

- (1) The products are certified according to (c)UL (E332800), VDE (40013495) 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 ± 10 %.
- (4) High energy surges are generally of longer duration. The maximum energy for one pulse of 10 x 1000 µs is given as a reference for longer duration pulses. This pulse can be characterised by peak current (I<sub>p</sub>) and pulse width t<sub>2</sub> (virtual time of half I<sub>p</sub> value, following "IEC 60060-2, section 6"). If V<sub>p</sub> is the clamping voltage corresponding to I<sub>p</sub>, the energy absorbed in the varistor is determined by the formula:  
E = K x V<sub>p</sub> x I<sub>p</sub> x t<sub>2</sub>  
where:  
a) K is dependant on the value of t2 when the value of t1 is between 8 µs and 10 µs; see Peak Current as a Function of Pulse Width drawing.
- (5) A current wave of 8 x 20 µs 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 B for bulk type  
T for tape and reel  
A for tape and ammopack  
Replace "y" by S for straight leads  
K for kinked leads (bulk only)  
L for kinked leads with H<sub>0</sub> = 16 mm (tape and reel/ammo)  
M for kinked leads with H<sub>0</sub> = 18.25 mm (tape and reel/ammo)
- (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.

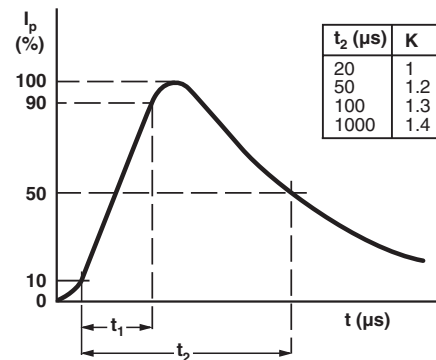
**ELECTRICAL CHARACTERISTICS**

| ELECTRICAL DATA  |                |              |
|--|----------------|--------------|
| PARAMETER  | VALUE          | UNIT         |
| Maximum continuous voltage:  |                |              |
| RMS  | 11 to 680      | V            |
| DC   | 14 to 895      | V            |
| Maximum non-repetitive transient current ( $I_{NRP}$ ) (8 x 20 $\mu$ s): |                |              |
| VDRH05.....E/2381 582 ....   | 250 or 800     | A            |
| VDRH07.....E/2381 583 ....   | 500 or 1750    | A            |
| VDRH10.....E/2381 584 ....   | 1000 or 3500   | A            |
| VDRH14.....E/2381 585 ....   | 2000 or 6000   | A            |
| VDRH20.....E/2381 586 ....   | 3000 or 10 000 | A            |
| Thermal resistance:  |                |              |
| VDRH05.....E/2381 582 ....   | $\approx$ 80   | K/W          |
| VDRH07.....E/2381 583 ....   | $\approx$ 70   | K/W          |
| VDRH10.....E/2381 584 ....   | $\approx$ 60   | K/W          |
| VDRH14.....E/2381 585 ....   | $\approx$ 50   | K/W          |
| VDRH20.....E/2381 586 ....   | $\approx$ 40   | K/W          |
| Maximum dissipation:   |                |              |
| VDRH05.....E/2381 582 ....   | 100            | mW           |
| VDRH07.....E/2381 583 ....   | 250            | mW           |
| VDRH10.....E/2381 584 ....   | 400            | mW           |
| VDRH14.....E/2381 585 ....   | 600            | mW           |
| VDRH20.....E/2381 586 ....   | 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 + 150  | $^{\circ}$ C |
| Operating temperature  | - 40 to + 125  | $^{\circ}$ C |

**DERATING CURVE**



**PEAK CURRENT AS A FUNCTION OF PULSE WIDTH**



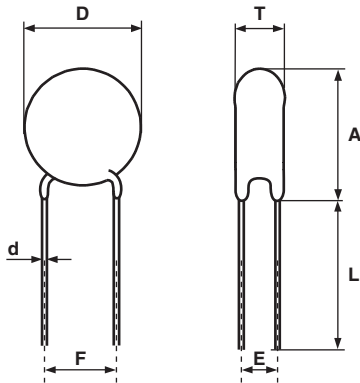
| COMPONENT DIMENSIONS (BULK TYPE) in millimeters AND CATALOG NUMBERS |        |                     |        |                       |                  |                |               |                            |
|---|--------|---------------------|--------|-----------------------|------------------|----------------|---------------|----------------------------|
| 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   | VDRH05.....E/2381 582 .... |
| 9.0   | 11.0   | 13.0                | 24.0   | 6.5                   | 0.7 to 3.6       | 0.6 $\pm$ 0.05 | 5 $\pm$ 1.0   | VDRH07.....E/2381 583 .... |
| 13.5  | 15.5   | 18.0                | 17.0   | 8                     | 0.9 to 4.5       | 0.8 $\pm$ 0.05 | 7.5 $\pm$ 1.0 | VDRH10.....E/2381 584 .... |
| 17.0  | 19.0   | 23.0                | 16.0   | 8                     | 0.9 to 4.5       | 0.8 $\pm$ 0.05 | 7.5 $\pm$ 1.0 | VDRH14.....E/2381 585 .... |
| 23.0  | 25.0   | 28.0                | 24.0   | 10                    | 1.1 to 5.8       | 1.0 $\pm$ 0.05 | 10 $\pm$ 1.0  | VDRH20.....E/2381 586 .... |

**Note**

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

| <b>VARISTORS IN BULK</b>  |   |   |  |  |  |
|---|---|---|--|--|--|
| <b>TYPE</b>   | <b>VDRH05....<br/>2381 582 ...<br/>Ø 5 mm<br/>11 V to 460 V</b> | <b>VDRH07....<br/>2381 583 ...<br/>Ø 7 mm<br/>11 V to 510 V</b> | <b>VDRH10....<br/>2381 584 ...<br/>Ø 10 mm<br/>11 V to 680 V</b> | <b>VDRH14....<br/>2381 585 ...<br/>Ø 14 mm<br/>11 V to 680 V</b> | <b>VDRH20....<br/>2381 586 ...<br/>Ø 20 mm<br/>11 V to 680 V</b> |
| Straight leads; see outline of components with straight leads drawing | BSE<br>5...6  | BSE<br>5...6  | BSE<br>5...6   | BSE<br>5...6   | BSE<br>5...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   |

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

**OUTLINE** of Component with Straight Leads

**OUTLINE** of Component with Kinked Leads


| <b>VARISTORS ON TAPE IN AMMOPACK</b>           |   |   |  |  |
|--|---|---|--|--|
| TYPE   | VDRH05....<br>2381 582 ...<br>Ø 5 mm<br>11 V to 460 V | VDRH07....<br>2381 583 ...<br>Ø 7 mm<br>11 V to 510 V | VDRH10....<br>2381 584 ...<br>Ø 10 mm<br>11 V to 550 V | VDRH14....<br>2381 585 ...<br>Ø 14 mm<br>11 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 |   |   |  |  |
| 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   |   |   |  |  |
| <b>Packaging quantities</b>                    |   |   |  |  |
| 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





| <b>VARISTORS ON TAPE AND REEL</b>              |   |   |  |  |
|--|---|---|--|--|
| <b>TYPE</b>                                    | <b>VDRH05....<br/>2381 582 ...<br/>Ø 5 mm<br/>11 V to 460 V</b> | <b>VDRH07....<br/>2381 583 ...<br/>Ø 7 mm<br/>11 V to 510 V</b> | <b>VDRH10....<br/>2381 584 ...<br/>Ø 10 mm<br/>11 V to 550 V</b> | <b>VDRH14....<br/>2381 585 ...<br/>Ø 14 mm<br/>11 V to 550 V</b> |
| 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 |   |   |  |  |
| 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 VDRH05.....E/2381 582 .... and VDRH07.....E/2381 583 ....)

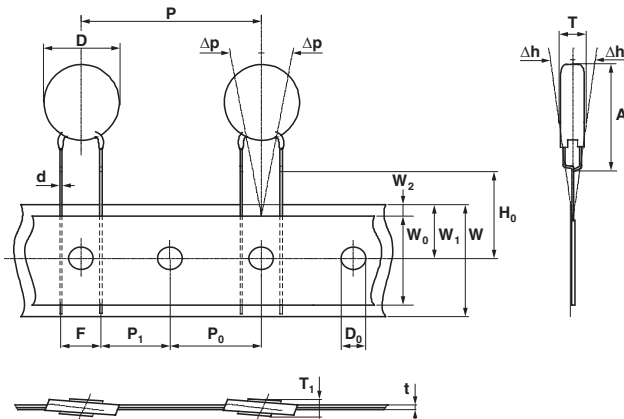
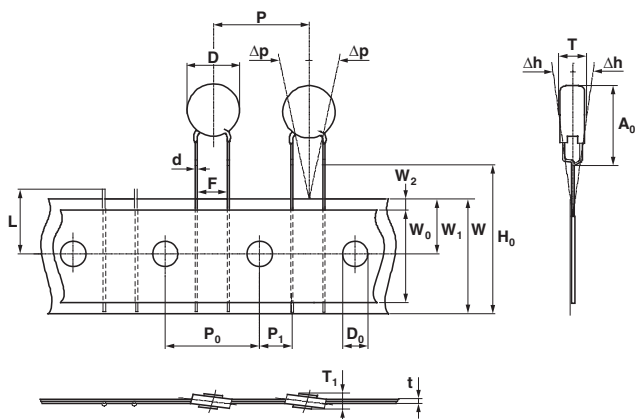
**TAPED VERSION WITH STRAIGHT LEADS** (only for VDRH10.....E/2381 584 .... and VDRH14.....E/2381 585 ....)


**TAPED VERSION WITH KINKED LEADS**

(only for VDRH05.....E/2381 582 .... and VDRH07.....E/2381 583 ....)

**TAPED VERSION WITH KINKED LEADS**

(only for VDRH10.....E/2381 584 .... and VDRH14.....E/2381 585 ....)



| TAPING DATA (based on IEC 60286-2) |  |                           |               |                  |               |
|------------------------------------|--|---------------------------|---------------|------------------|---------------|
| SYMBOL                             | PARAMETER  | DIMENSIONS/TOLERANCE      |               |                  |               |
|                                    |  | VDRH05<br>582             | VDRH07<br>583 | VDRH10<br>584    | VDRH14<br>585 |
| A                                  | Mounting height                                  | 9.0 max.                  | 11.0 max.     | 15.5 max.        | 19.0 max.     |
| A <sub>0</sub>                     | Mounting height                                  | 11.0 max.                 | 13.0 max.     | 18.0 max.        | 23.0 max.     |
| D                                  | Body diameter                                    | 7.0 max.                  | 9.0 max.      | 13.5 max.        | 17.0 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 585 0511y and 2381 585 0551y: H = 20 mm ± 1 mm



**V/I CHARACTERISTICS**

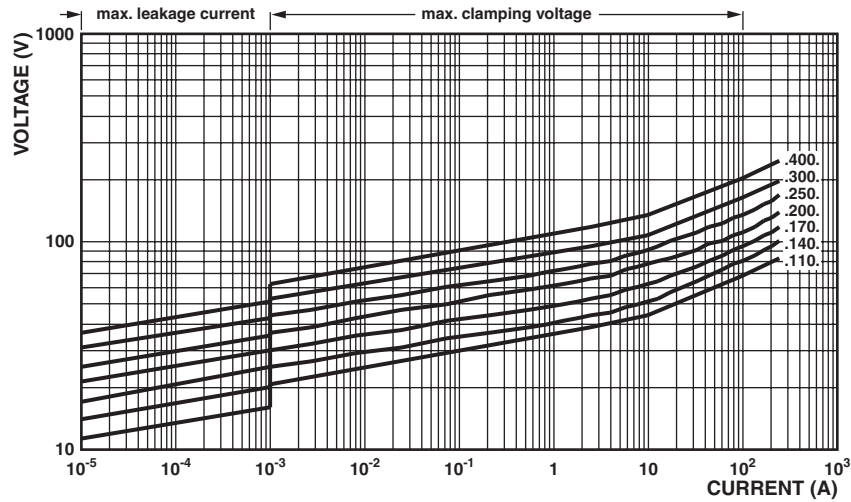
11 V<sub>RMS</sub> to 40 V<sub>RMS</sub>; VDRH05.....E/2381 582 ....



50 V<sub>RMS</sub> to 460 V<sub>RMS</sub>; VDRH05.....E/2381 582 ....



11 V<sub>RMS</sub> to 40 V<sub>RMS</sub>; VDRH07.....E/2381 583 ....

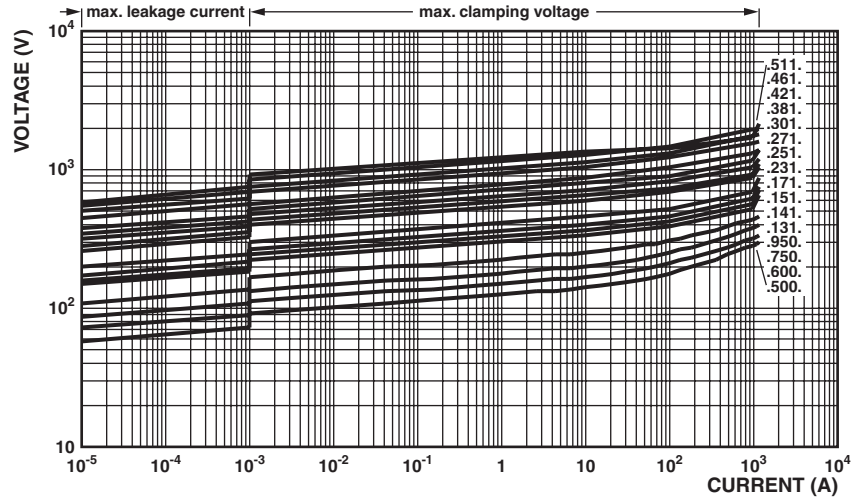


# VDRH.....E/2381 58. ....

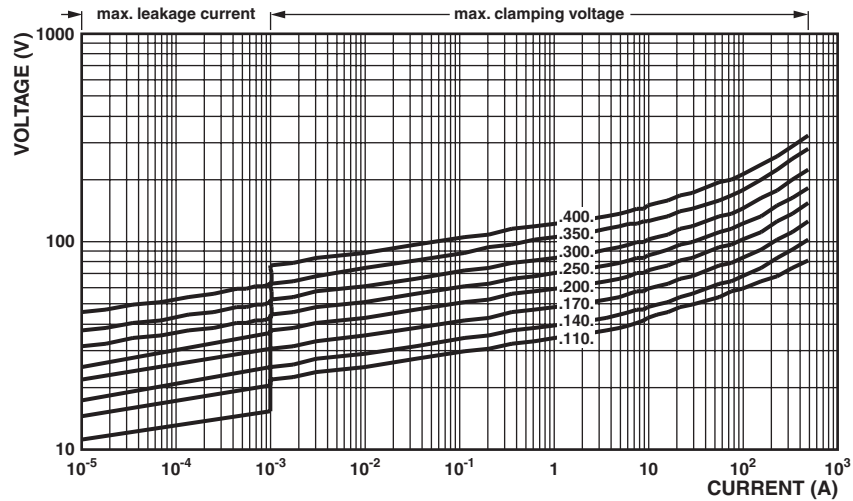


Vishay BCcomponents VDR Metal Oxide Varistors High Surge

50 V<sub>RMS</sub> to 510 V<sub>RMS</sub>; VDRH07.....E/2381 583 ....



11 V<sub>RMS</sub> to 40 V<sub>RMS</sub>; VDRH10.....E/2381 584 ....

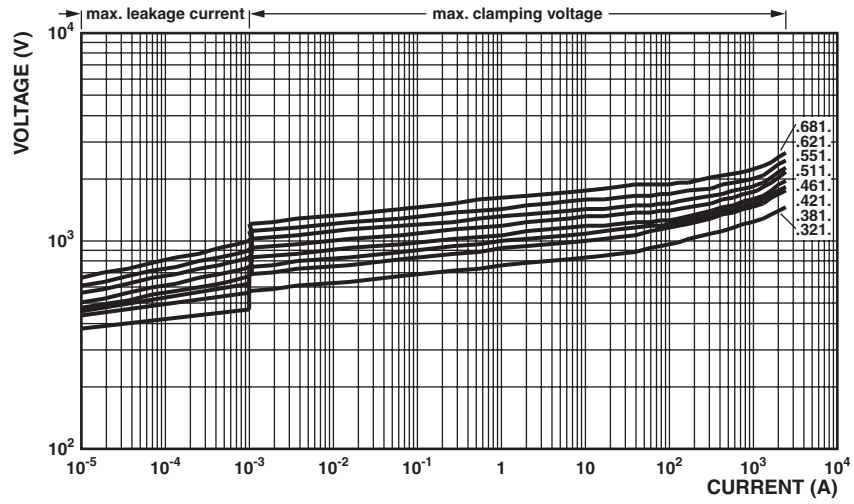


50 V<sub>RMS</sub> to 300 V<sub>RMS</sub>; VDRH10.....E/2381 584 ....

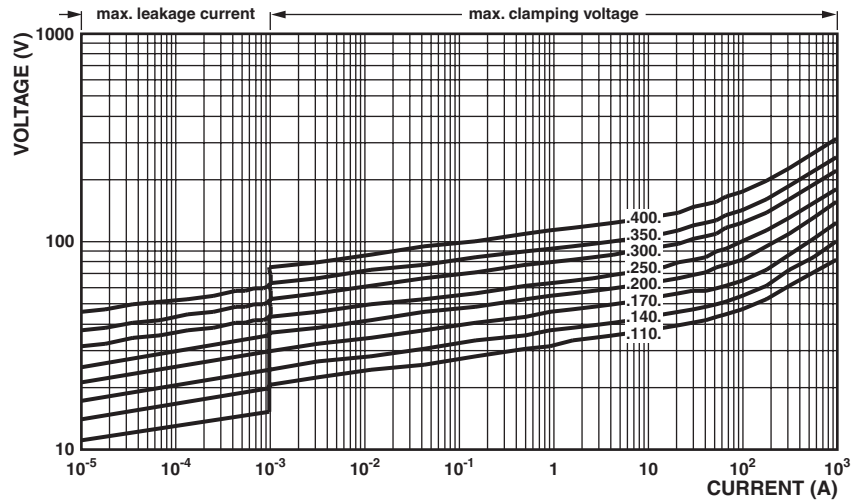




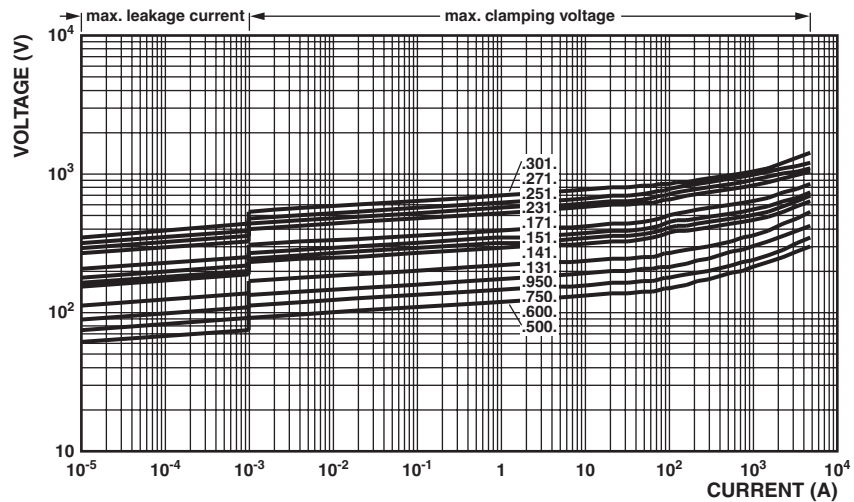
320 V<sub>RMS</sub> to 680 V<sub>RMS</sub>; VDRH10.....E/2381 584 ....



11 V<sub>RMS</sub> to 40 V<sub>RMS</sub>; VDRH14.....E/2381 585 ....



50 V<sub>RMS</sub> to 300 V<sub>RMS</sub>; VDRH14.....E/2381 585 ....



# VDRH.....E/2381 58. ....



Vishay BCcomponents VDR Metal Oxide Varistors High Surge

320 V<sub>RMS</sub> to 680 V<sub>RMS</sub>; VDRH14.....E/2381 585 ....



11 V<sub>RMS</sub> to 40 V<sub>RMS</sub>; VDRH20.....E/2381 586 ....

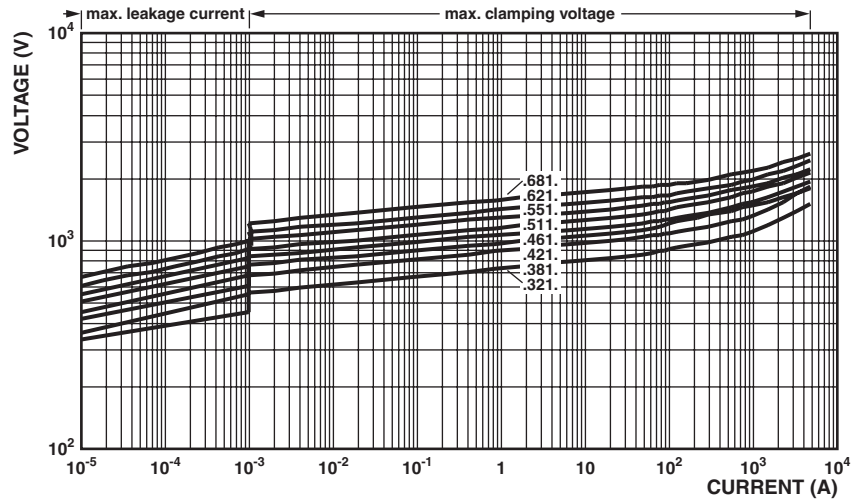


50 V<sub>RMS</sub> to 300 V<sub>RMS</sub>; VDRH20.....E/2381 586 ....





320 V<sub>RMS</sub> to 680 V<sub>RMS</sub>; VDRH20.....E/2381 586 ....



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

11 V<sub>RMS</sub> to 40 V<sub>RMS</sub>; VDRH05.....E/2381 582 ....



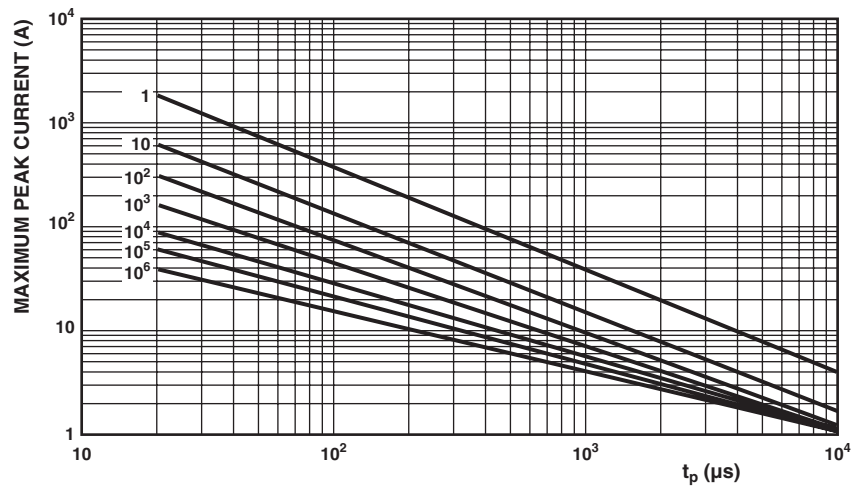
50 V<sub>RMS</sub> to 300 V<sub>RMS</sub>; VDRH05.....E/2381 582 ....



11 V<sub>RMS</sub> to 40 V<sub>RMS</sub>; VDRH07.....E/2381 583 ....



50 V<sub>RMS</sub> to 300 V<sub>RMS</sub>; VDRH07.....E/2381 583 ....



11 V<sub>RMS</sub> to 40 V<sub>RMS</sub>; VDRH10.....E/2381 584 ....







50 V<sub>RMS</sub> to 300 V<sub>RMS</sub>; VDRH10.....E/2381 584 ....



320 V<sub>RMS</sub> to 680 V<sub>RMS</sub>; VDRH10.....E/2381 584 ....



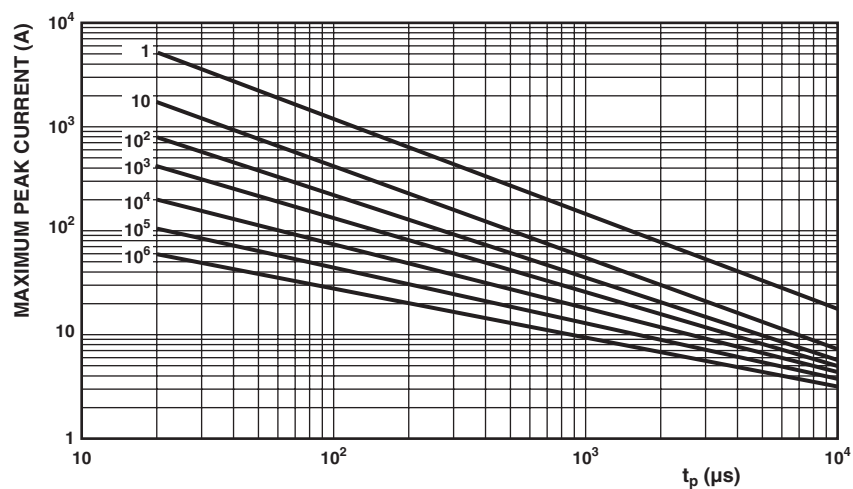
11 V<sub>RMS</sub> to 40 V<sub>RMS</sub>; VDRH14.....E/2381 585 ....



50 V<sub>RMS</sub> to 300 V<sub>RMS</sub>; VDRH14.....E/2381 585 ....



320 V<sub>RMS</sub> to 680 V<sub>RMS</sub>; VDRH14.....E/2381 585 ....



11 V<sub>RMS</sub> to 40 V<sub>RMS</sub>; VDRH20.....E/2381 586 ....





50 V<sub>RMS</sub> to 300 V<sub>RMS</sub>; VDRH20.....E/2381 586 ....



320 V<sub>RMS</sub> to 680 V<sub>RMS</sub>; VDRH20.....E/2381 586 ....





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