

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 μ s) | 250 to 10 000 | A |
| Detailed specification | Based on IEC 61051-1 IEC 61051-2 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- β 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 ⁽³⁾ at 1 mA | MAXIMUM VOLTAGE at STATED CURRENT | | MAXIMUM ENERGY ⁽⁴⁾ (10 x 1000 µs) | MAXIMUM NON-REP. TRANSIENT CURRENT ⁽⁵⁾ I _{NRP} (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- |
| 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 |



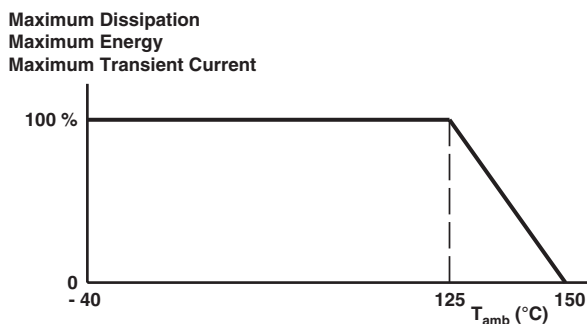
| ELECTRICAL DATA AND ORDERING INFORMATION | | | | | | | | | | | | |
|--|--------|------------------------------------|-----------------------------------|-------|--|--|-----------------------------------|---------------|-----------|-------------------------------------|--------------------------------|---------------------------|
| MAXIMUM CONTINUOUS VOLTAGE | | VOLTAGE ⁽³⁾ at 1 mA (V) | MAXIMUM VOLTAGE at STATED CURRENT | | MAXIMUM ENERGY ⁽⁴⁾ (10 x 1000 µs) (J) | MAXIMUM NON-REP. TRANSIENT CURRENT ⁽⁵⁾ I _{NRP} (8 x 20 µs) (A) | TYPICAL CAPACITANCE at 1 kHz (pF) | T (max.) (mm) | E (mm) | UL 1449 ED3 SPD TYPE ⁽⁸⁾ | CATALOG NUMBERS ⁽¹⁾ | |
| RMS ⁽²⁾ (V) | DC (V) | | V (V) | I (A) | | | | | | | SAP ⁽⁷⁾ | 12NC ⁽⁶⁾ 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 _{NRP} (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 |

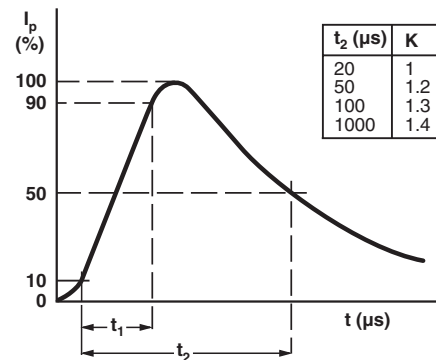
ELECTRICAL CHARACTERISTICS

| 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 μ 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



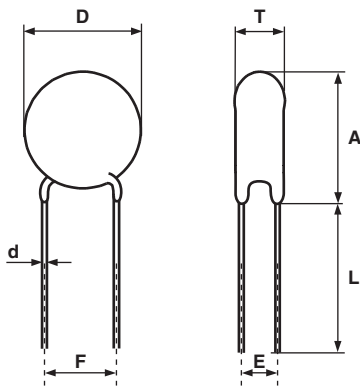
| COMPONENT DIMENSIONS (BULK TYPE) in millimeters AND CATALOG NUMBERS | | | | | | | | |
|---|--------|---------------------|--------|-----------------------|------------------|----------------|---------------|----------------------------|
| D MAX. | A MAX. | A ₀ MAX. | L MIN. | T ⁽¹⁾ MAX. | E ⁽¹⁾ | d | 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

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

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

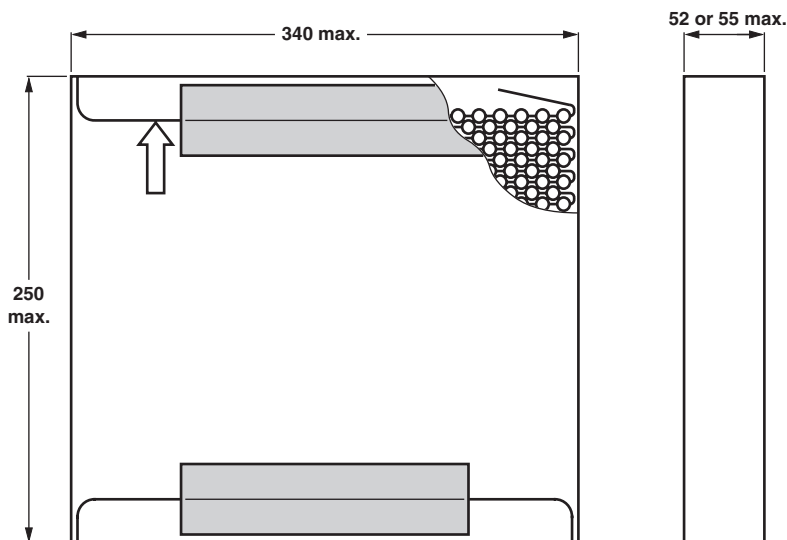
OUTLINE of Component with Straight Leads

OUTLINE of Component with Kinked Leads


| VARISTORS ON TAPE IN AMMOPACK | | | | |
|--|---|---|--|--|
| TYPE | VDRH05.... 2381 582 ... Ø 5 mm 11 V to 460 V | VDRH07.... 2381 583 ... Ø 7 mm 11 V to 510 V | VDRH10.... 2381 584 ... Ø 10 mm 11 V to 550 V | VDRH14.... 2381 585 ... Ø 14 mm 11 V to 550 V |
| Straight leads | | | | |
| H = 18 mm | - | - | ASE 0...7 | ASE 0...7 |
| H = 20 mm | ASE 0...7 | ASE 0...7 | - | - |
| See drawing: Taped version with straight leads | | | | |
| Kinked leads | | | | |
| H ₀ = 18.25 mm | AME 3...7 | AME 3...7 | AME 3...7 | AME 3...7 |
| H ₀ = 16 mm | ALE 8...7 | ALE 8...7 | ALE 8...7 | ALE 8...7 |
| See drawing: Taped version with kinked leads | | | | |
| Packaging quantities | | | | |
| 14 V to 210 V | 1500 ⁽¹⁾ | 1500 ⁽¹⁾ | 500 | 500 |
| 230 V to max. V | 1000 | 1000 | 500 | 500 |

Note

⁽¹⁾ Except for 35 V and 40 V = 1000 pieces

DIMENSIONS OF AMMOPACK in millimeters



| VARISTORS ON TAPE AND REEL | | | | |
|--|---|---|--|--|
| TYPE | VDRH05.... 2381 582 ... Ø 5 mm 11 V to 460 V | VDRH07.... 2381 583 ... Ø 7 mm 11 V to 510 V | VDRH10.... 2381 584 ... Ø 10 mm 11 V to 550 V | VDRH14.... 2381 585 ... Ø 14 mm 11 V to 550 V |
| Straight leads | | | | |
| H = 18 mm | - | - | TSE 0...6 | TSE 0...6 |
| H = 20 mm | TSE 0...6 | TSE 0...6 | - | - |
| See drawing: Taped version with straight leads | | | | |
| Kinked leads | | | | |
| H ₀ = 18.25 mm | TME 3...6 | TME 3...6 | TME 3...6 | TME 3...6 |
| H ₀ = 16 mm | TLE 8...6 | TLE 8...6 | TLE 8...6 | TLE 8...6 |
| See drawing: Taped version with kinked leads | | | | |
| Packaging quantities | | | | |
| 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)

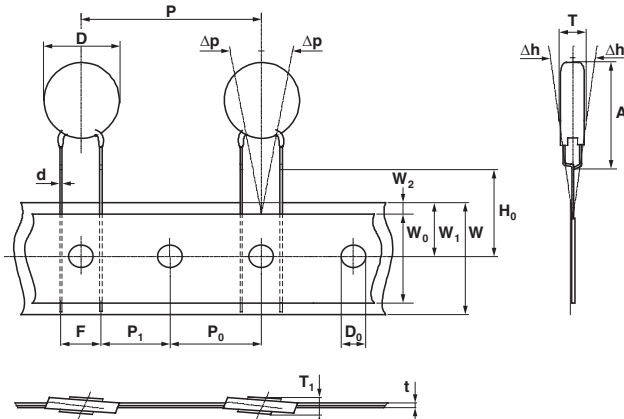
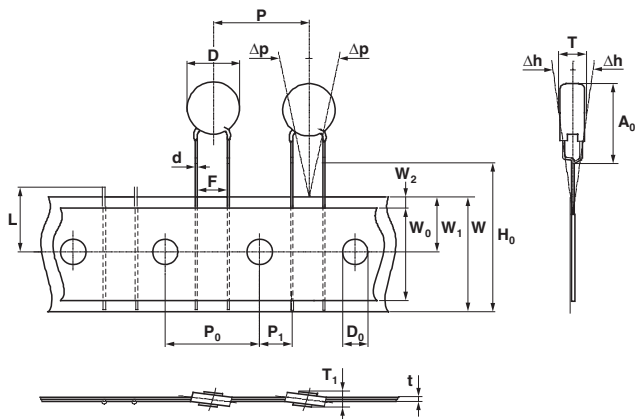
TAPED VERSION WITH STRAIGHT LEADS (only for VDRH10.....E/2381 584 and VDRH14.....E/2381 585)


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 582 | VDRH07 583 | VDRH10 584 | VDRH14 585 |
| A | Mounting height | 9.0 max. | 11.0 max. | 15.5 max. | 19.0 max. |
| A ₀ | 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 ⁽¹⁾ | 5.0 + 0.8/- 0.2 | | 7.5 ± 0.8 | |
| H | Distance component to tape center ⁽²⁾ | 20.0 + 2.0/- 0.0 | | 18.0 + 2.0/- 0.0 | |
| H ₀ | 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

- ⁽¹⁾ Guaranteed between component and tape
- ⁽²⁾ For 2381 585 0511y and 2381 585 0551y: H = 20 mm ± 1 mm

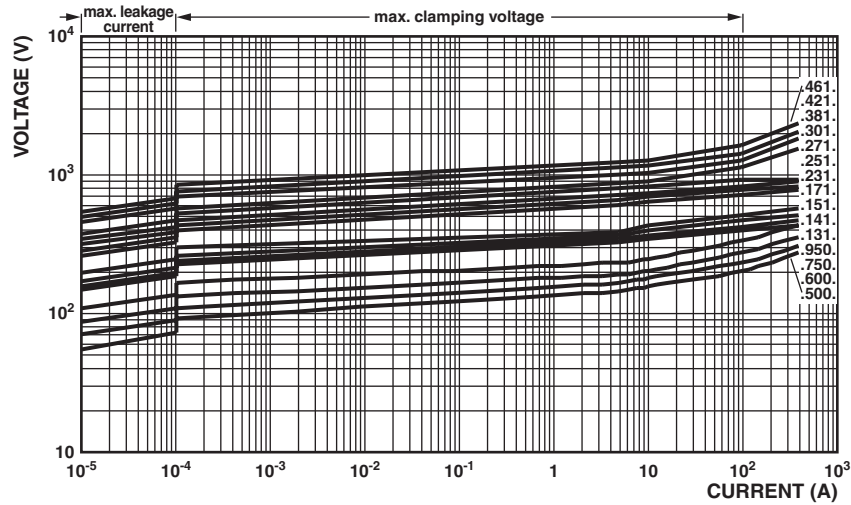


V/I CHARACTERISTICS

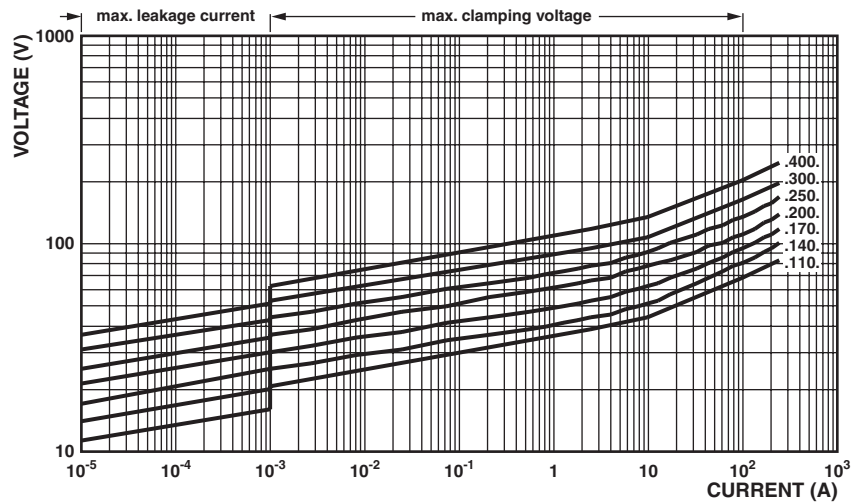
11 V_{RMS} to 40 V_{RMS}; VDRH05.....E/2381 582



50 V_{RMS} to 460 V_{RMS}; VDRH05.....E/2381 582



11 V_{RMS} to 40 V_{RMS}; VDRH07.....E/2381 583

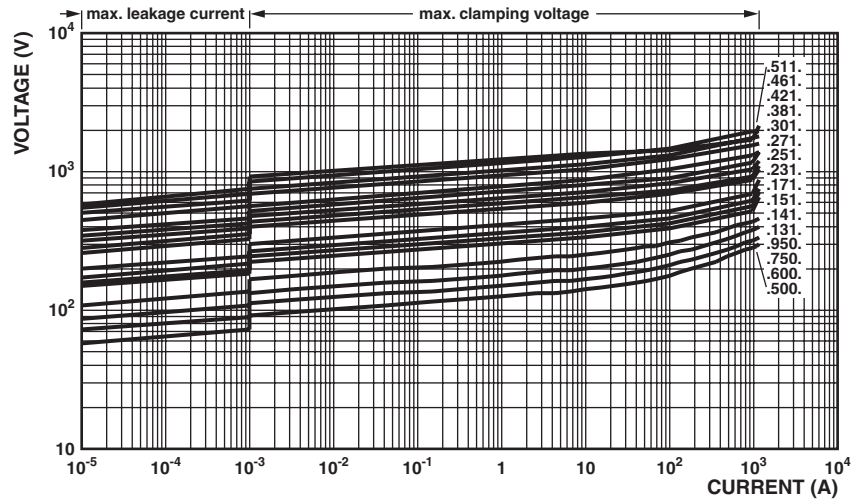


VDRH.....E/2381 58.

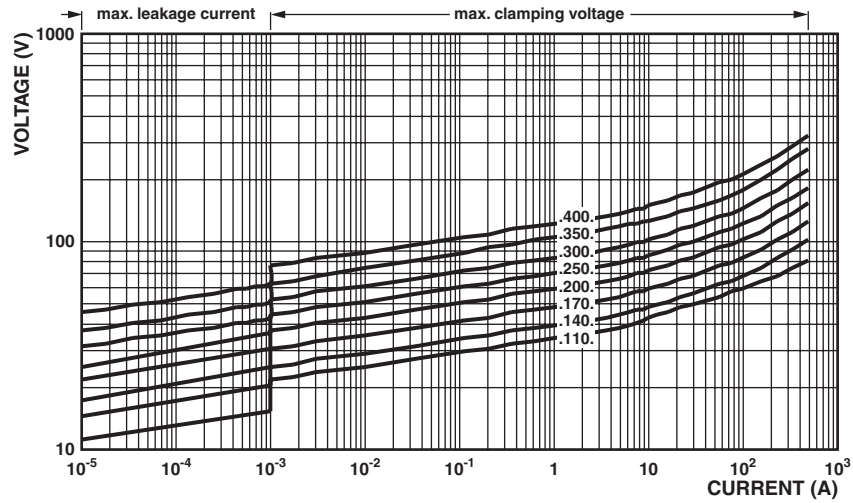


Vishay BCcomponents VDR Metal Oxide Varistors High Surge

50 V_{RMS} to 510 V_{RMS}; VDRH07.....E/2381 583



11 V_{RMS} to 40 V_{RMS}; VDRH10.....E/2381 584

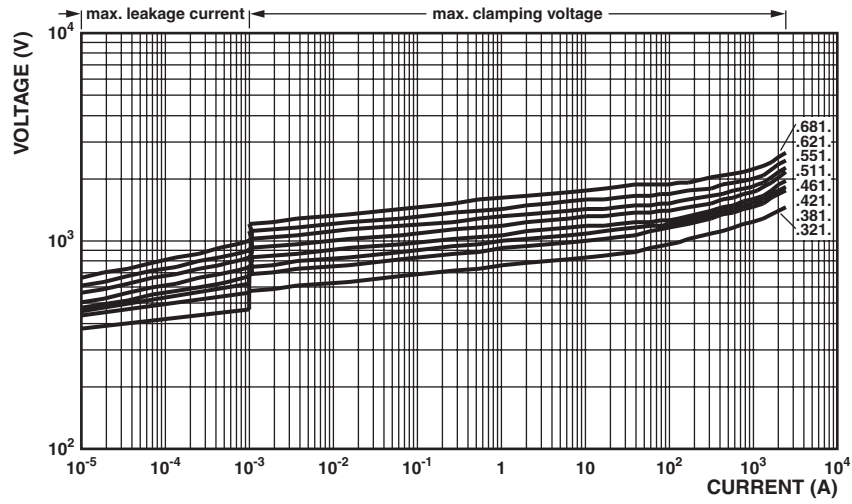


50 V_{RMS} to 300 V_{RMS}; VDRH10.....E/2381 584

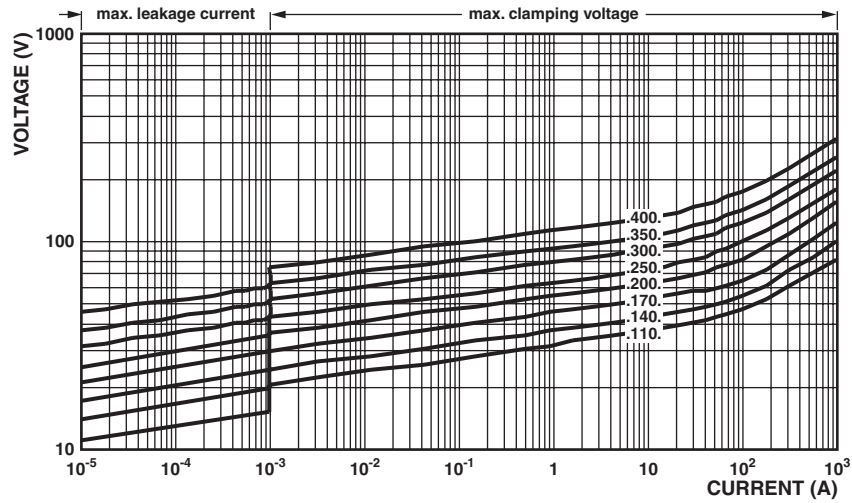




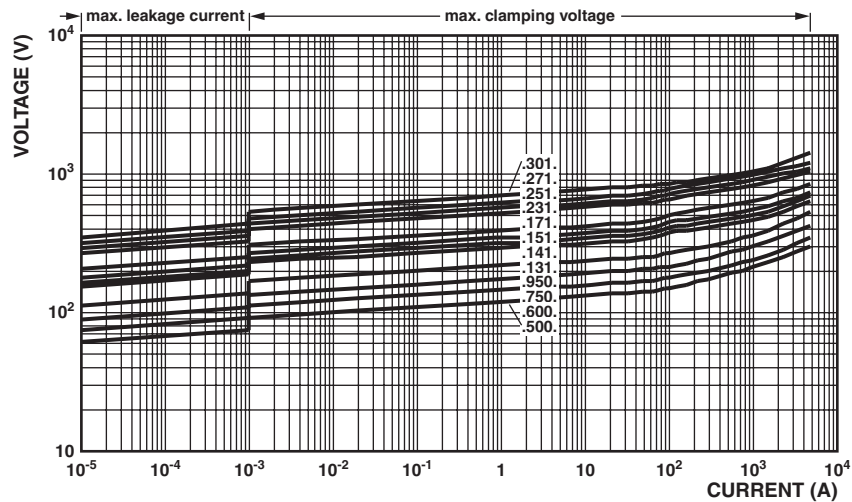
320 V_{RMS} to 680 V_{RMS}; VDRH10.....E/2381 584



11 V_{RMS} to 40 V_{RMS}; VDRH14.....E/2381 585



50 V_{RMS} to 300 V_{RMS}; VDRH14.....E/2381 585



VDRH.....E/2381 58.

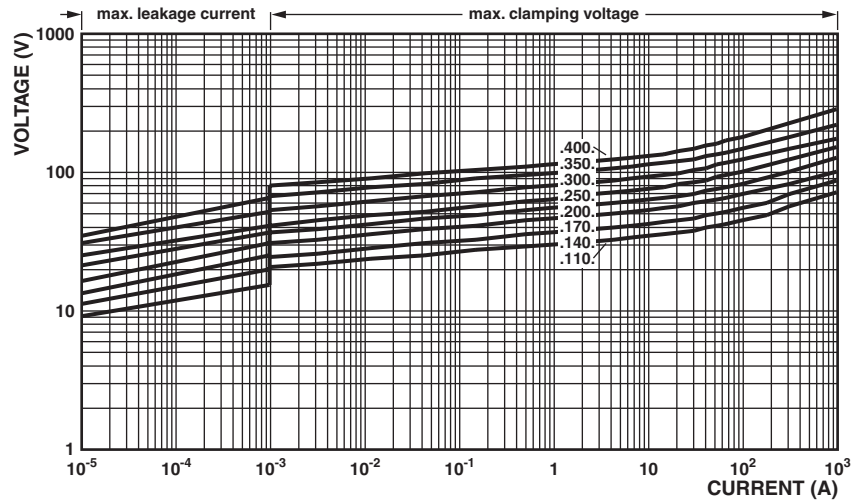


Vishay BCcomponents VDR Metal Oxide Varistors High Surge

320 V_{RMS} to 680 V_{RMS}; VDRH14.....E/2381 585



11 V_{RMS} to 40 V_{RMS}; VDRH20.....E/2381 586

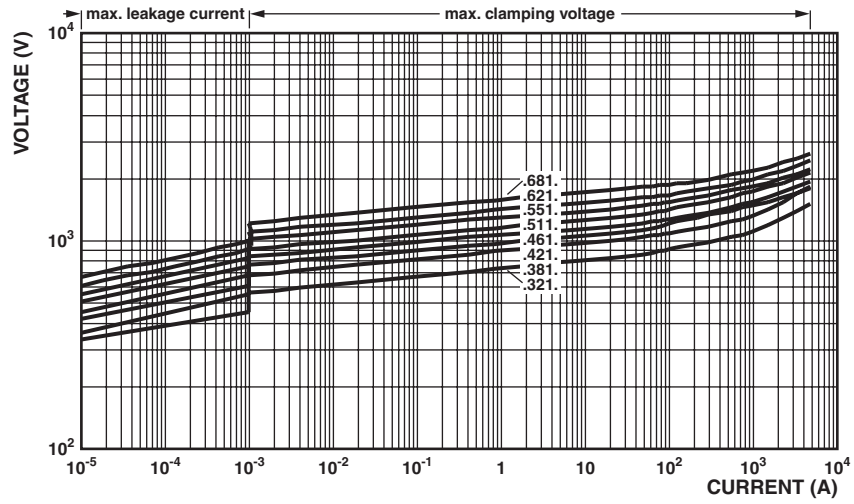


50 V_{RMS} to 300 V_{RMS}; VDRH20.....E/2381 586





320 V_{RMS} to 680 V_{RMS}; VDRH20.....E/2381 586



MAXIMUM APPLICABLE TRANSIENT CURRENT AS A FUNCTION OF PULSE DURATION

11 V_{RMS} to 40 V_{RMS}; VDRH05.....E/2381 582



50 V_{RMS} to 300 V_{RMS}; VDRH05.....E/2381 582



11 V_{RMS} to 40 V_{RMS}; VDRH07.....E/2381 583



50 V_{RMS} to 300 V_{RMS}; VDRH07.....E/2381 583



11 V_{RMS} to 40 V_{RMS}; VDRH10.....E/2381 584





50 V_{RMS} to 300 V_{RMS}; VDRH10.....E/2381 584



320 V_{RMS} to 680 V_{RMS}; VDRH10.....E/2381 584



11 V_{RMS} to 40 V_{RMS}; VDRH14.....E/2381 585



50 V_{RMS} to 300 V_{RMS}; VDRH14.....E/2381 585



320 V_{RMS} to 680 V_{RMS}; VDRH14.....E/2381 585



11 V_{RMS} to 40 V_{RMS}; VDRH20.....E/2381 586





50 V_{RMS} to 300 V_{RMS}; VDRH20.....E/2381 586



320 V_{RMS} to 680 V_{RMS}; VDRH20.....E/2381 586





Disclaimer

All product specifications and data are subject to change without notice.

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 herein or in any other disclosure relating to any product.

Vishay disclaims any and all liability arising out of the use or application of any product described herein or of any information provided herein to the maximum extent permitted by law. The product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein, which apply to these products.

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.

The products shown herein are not designed for use in medical, life-saving, or life-sustaining applications unless otherwise expressly indicated. Customers using or selling Vishay products not expressly indicated for use in such applications do so entirely at their own risk and agree to fully indemnify Vishay for any damages arising or resulting from such use or sale. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

Product names and markings noted herein may be trademarks of their respective owners.