

# ANTREX Electronics

## Electronic Components Sourcing Information

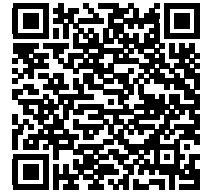
---

### Product Reference Information

|                      |                                         |
|----------------------|-----------------------------------------|
| <b>Part Number:</b>  | VDRS20W460BSE                           |
| <b>Manufacturer:</b> | Vishay Beyschlag/Draloric/BC Components |
| <b>Package:</b>      | Disc 23mm                               |
| <b>Availability:</b> | Please confirm with sales               |

#### Product Page:

<https://antrexco.com/product/details/vishay-beyschlag-draloric-bc-components/vdrs20w460bse.html>



Scan for product page

#### Request a Quote:

[Submit RFQ for this part](#)

### Contact Information

Email: [info@antrexco.com](mailto:info@antrexco.com)

WhatsApp: +86-186-8066-5326

Website: <https://antrexco.com>

### Quality & Trust

New & Original Components

Supplier verification and packaging condition review

CoC / RoHS / REACH documents available on request

Secure sourcing support for OEM / EMS projects

#### Note:

This PDF includes an ANTREX product reference cover page.

The original manufacturer datasheet follows from the next page.

---

## VDR Metal Oxide Varistors Standard



### LINKS TO ADDITIONAL RESOURCES



3D Models



Design Tools



SPICE Models

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

### ORDERING INFORMATION

The varistors are available in a number of packaging options:

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

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

#### Note

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

### AGENCY APPROVALS

- cUL certificate
- ULus certificate
- VDE certificate

#### Note

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

### FEATURES

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



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

### APPLICATION

- Overvoltage and transient voltage protection

### DESCRIPTION

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

### MOUNTING

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

#### Typical soldering

235 °C, duration: 5 s (Pb-bearing)

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

#### Resistance to soldering heat

260 °C, duration: 10 s max.

### MARKING

The varistors are marked with the following information:

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

### INFLAMMABILITY

The varistors are passive non-flammable.

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



## ELECTRICAL DATA AND ORDERING INFORMATION

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



## ELECTRICAL DATA AND ORDERING INFORMATION

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

## ELECTRICAL DATA AND ORDERING INFORMATION

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

## Notes

- (1) The products are certified according to cULus (E332800), and VDE/IEC (40002622). See Agency Approval section for certificate download
- (2) The sinusoidal voltage is assumed as the normal operating condition. If a non-sinusoidal voltage is present, type selection should be based on multiplying the peak voltage by a factor of 0.707.
- (3) The voltage measured at 1 mA meets the requirements of IEC 61051.  
The tolerance on the voltage at 1 mA is  $\pm 10\%$ .
- (4) High energy surges are generally of longer duration. The maximum energy for one pulse of  $10 \times 1000 \mu\text{s}$  is given as a reference for longer duration pulses. This pulse can be characterized by peak current ( $I_p$ ) and pulse width  $t_2$  (virtual time of half  $I_p$  value, following IEC 60060-2, section 6). If  $V_p$  is the clamping voltage corresponding to  $I_p$ , the energy absorbed in the varistor is determined by the formula:
- $$E = K \times V_p \times I_p \times t_2$$
- where K is dependent on the value of  $t_2$  when the value of  $t_1$  is between  $8 \mu\text{s}$  and  $10 \mu\text{s}$  (see Peak Current as a Function of Pulse Width drawing)
- (5) A current wave of  $8 \times 20 \mu\text{s}$  is used as a standard for pulse current and clamping voltage ratings. The maximum non-repetitive transient current is given for one pulse applied during the life of the component.
- (6) For composition of the SAP part number:
- |                |                         |                |                                                                                    |
|----------------|-------------------------|----------------|------------------------------------------------------------------------------------|
| Replace "x" by | B for bulk type         | Replace "y" by | S for straight leads                                                               |
|                | T for tape and reel     |                | F for straight leads with flange (bulk only)                                       |
|                | A for tape and ammopack |                | G for straight leads with flange and $H_0 = 16 \text{ mm}$ (tape and reel/ammo)    |
|                |                         |                | H for straight leads with flange and $H_0 = 18.25 \text{ mm}$ (tape and reel/ammo) |
|                |                         |                | K for kinked leads (bulk only)                                                     |
|                |                         |                | L for kinked leads with $H_0 = 16 \text{ mm}$ (tape and reel/ammo)                 |
|                |                         |                | M for kinked leads with $H_0 = 18.25 \text{ mm}$ (tape and reel/ammo)              |
- (7) All varistors are UL 1449 edition 4 recognized as SPD type 5 (component level) for operating temperatures up to  $85^\circ\text{C}$ . The varistors may be used in other SPD types as 2, 3, or 4 depending on the indicated  $I_N$  nominal discharge current ratings. The final acceptance of the component is dependent upon its installation and use in complete equipment submitted to underwriters laboratories Inc.

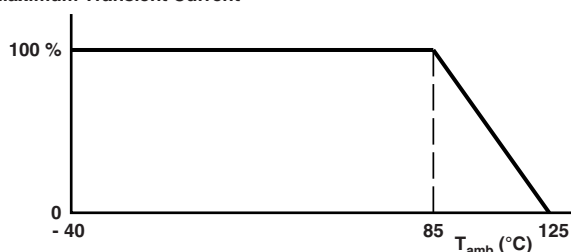


## ELECTRICAL CHARACTERISTICS

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

## DERATING CURVE

Maximum Voltage  
Maximum Dissipation  
Maximum Energy  
Maximum Transient Current



## PEAK CURRENT AS A FUNCTION OF PULSE WIDTH



## COMPONENT DIMENSIONS (BULK TYPE) in millimeters AND CATALOG NUMBERS

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

## Note

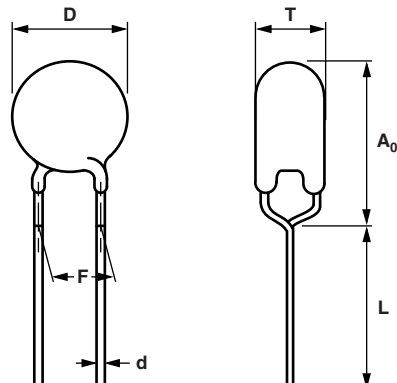
<sup>(1)</sup>  $T_{max}$  and E values per size and voltage level can be found back in the Electrical Data and Ordering Information table

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

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

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

**OUTLINE** of Component with Straight Leads

**OUTLINE** of Component with Kinked Leads

**OUTLINE** of Component with Flanged Leads


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

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

**DIMENSIONS OF AMMOPACK** in millimeters

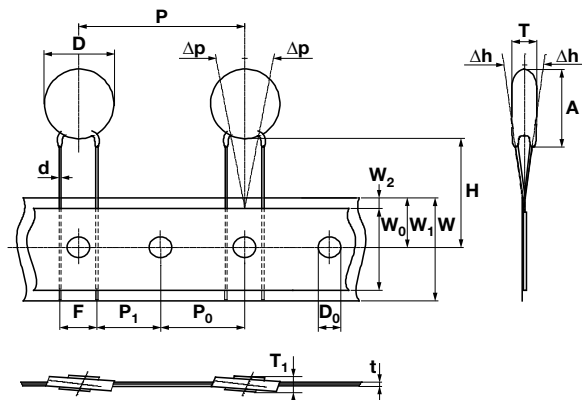

| VARISTORS ON TAPE AND REEL                                                                                                         |                                      |                                      |                                       |                                       |
|----------------------------------------------------------------------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

## PACKAGING

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



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



**TAPED VERSION WITH KINKED LEADS**

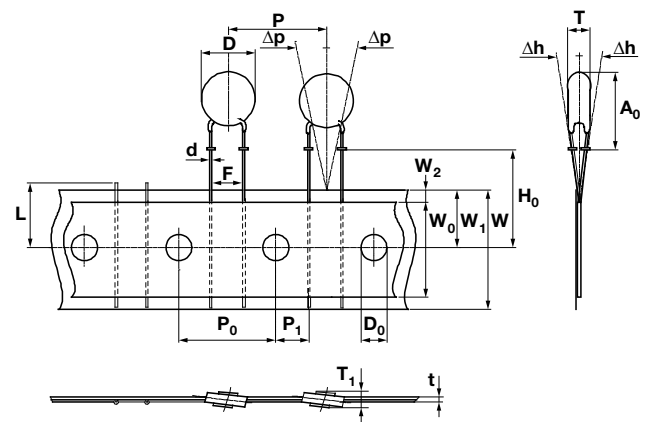
(only for VDRS05 and VDRS07)


**TAPED VERSION WITH KINKED LEADS**

(only for VDRS10 and VDRS14)


**TAPED VERSION WITH FLANGED LEADS**

(only for VDRS05 and VDRS07)


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

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

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

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

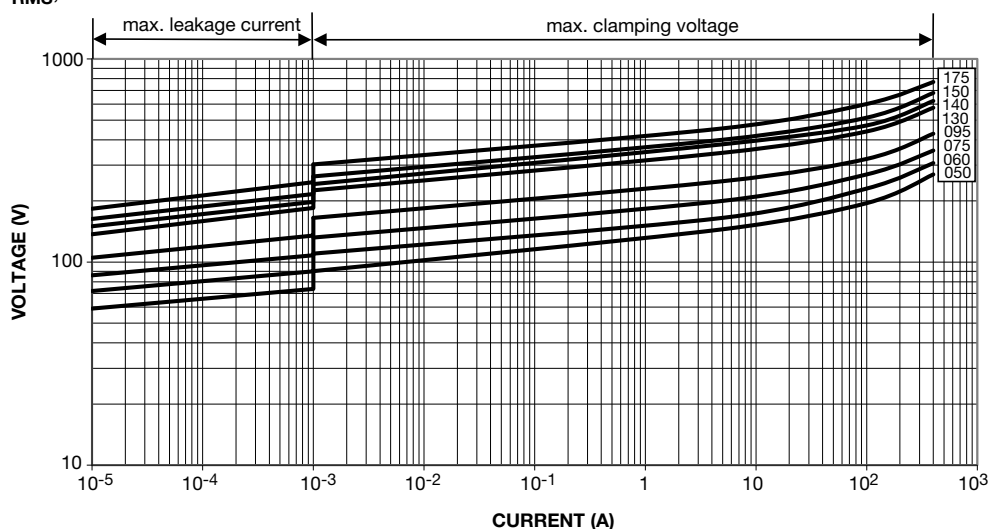


## V/I CHARACTERISTICS

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



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



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

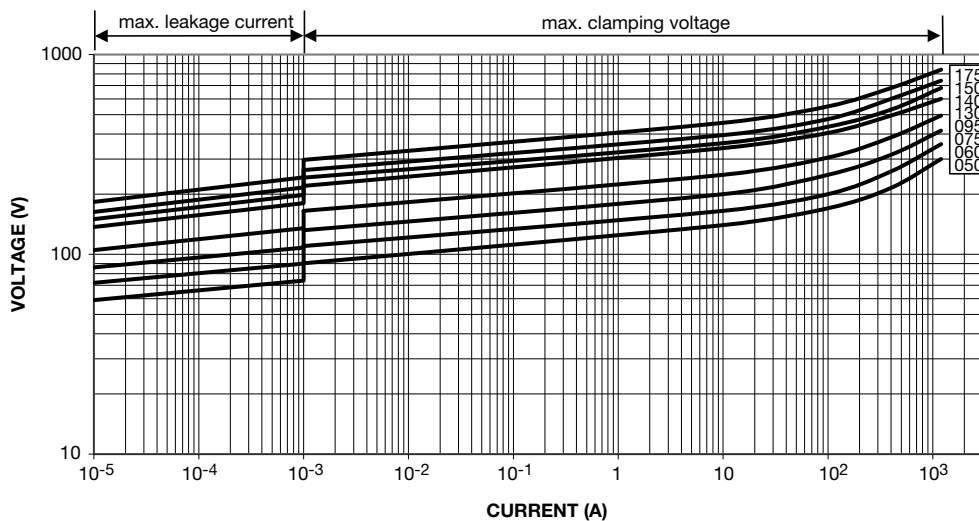




### 14 V<sub>RMS</sub> to 40 V<sub>RMS</sub>; VDRS07



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



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





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



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



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





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



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



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

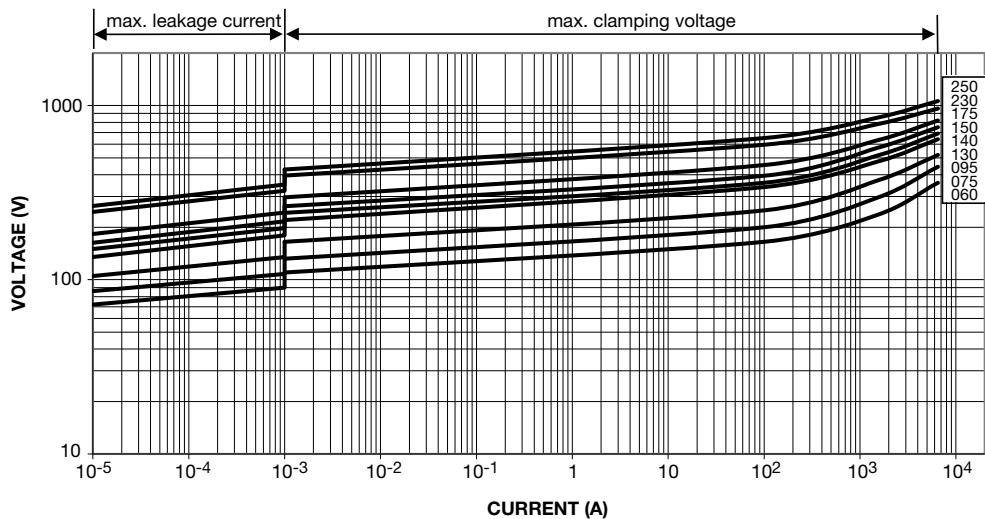




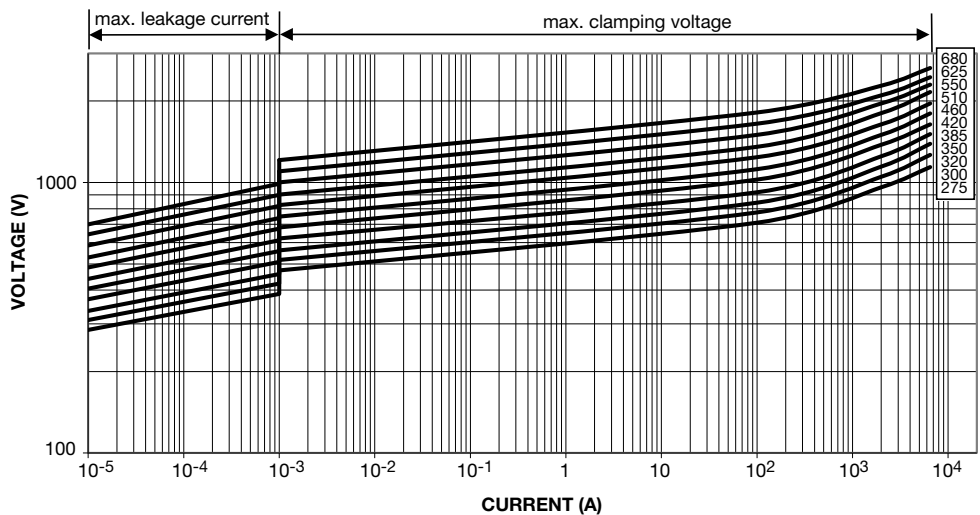
14 V<sub>RMS</sub> to 40 V<sub>RMS</sub>; VDRS20



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



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



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

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

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

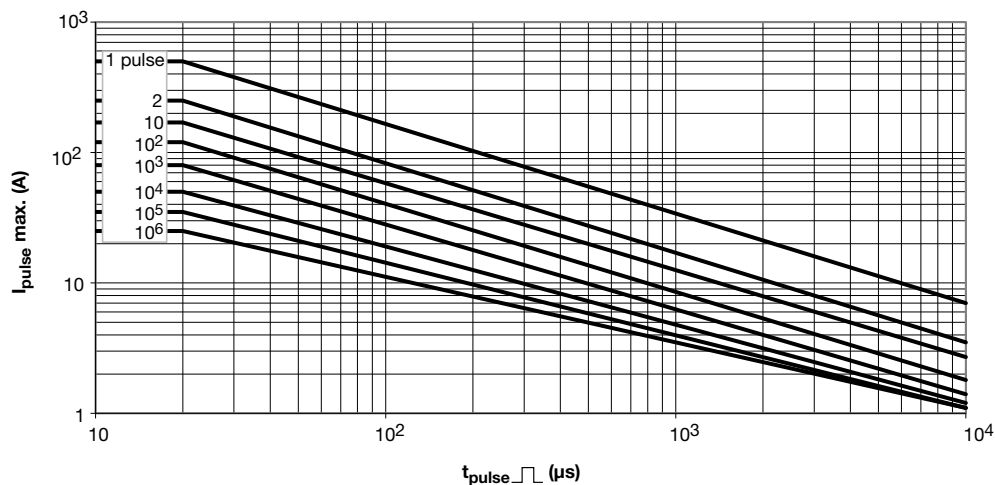
14 V<sub>RMS</sub> to 40 V<sub>RMS</sub>; VDRS07



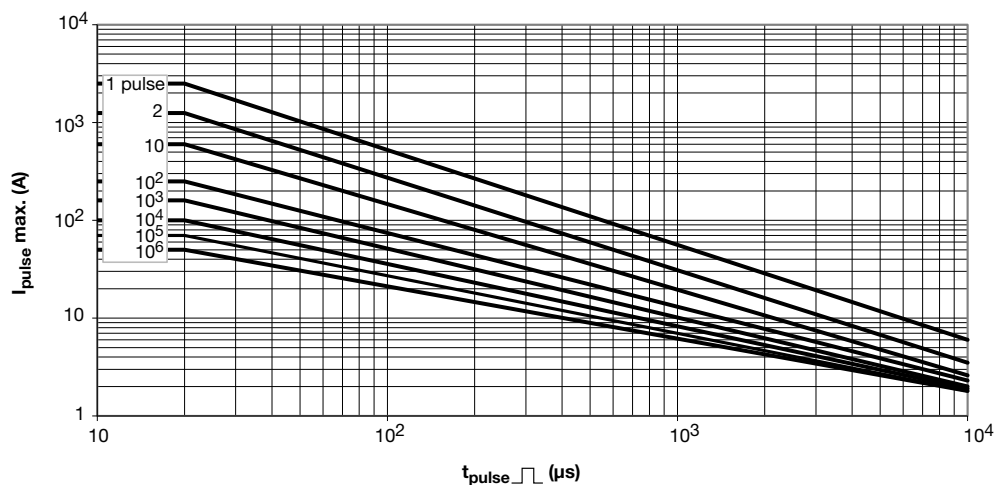

50 V<sub>RMS</sub> to 510 V<sub>RMS</sub>; VDRS07



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



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





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

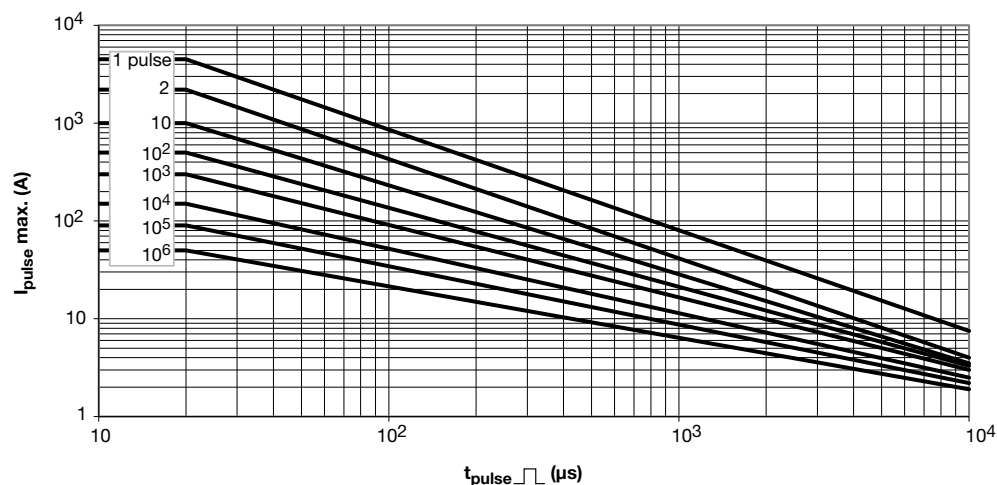
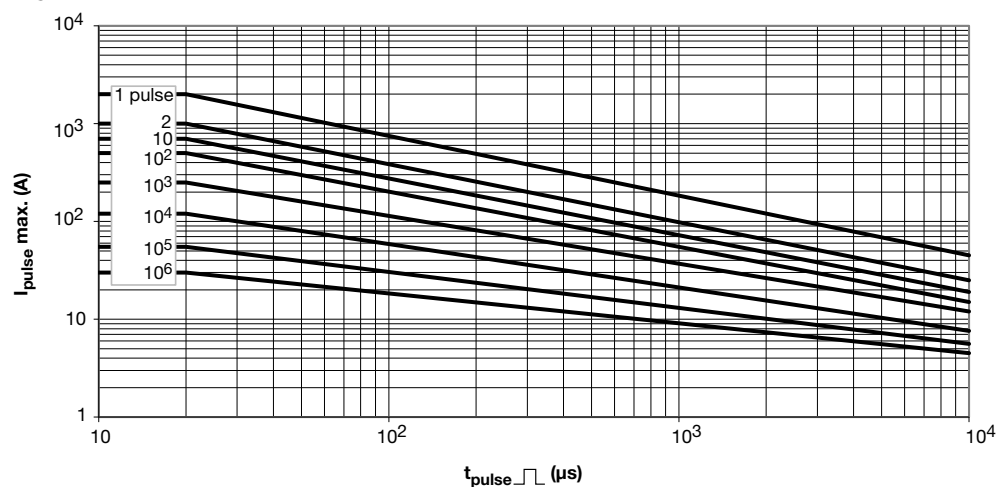
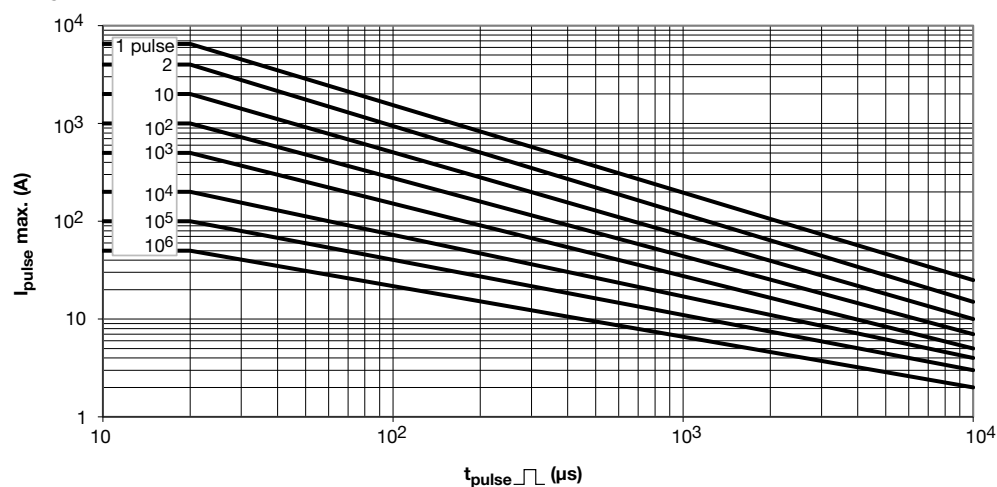


14 V<sub>RMS</sub> to 40 V<sub>RMS</sub>; VDRS14



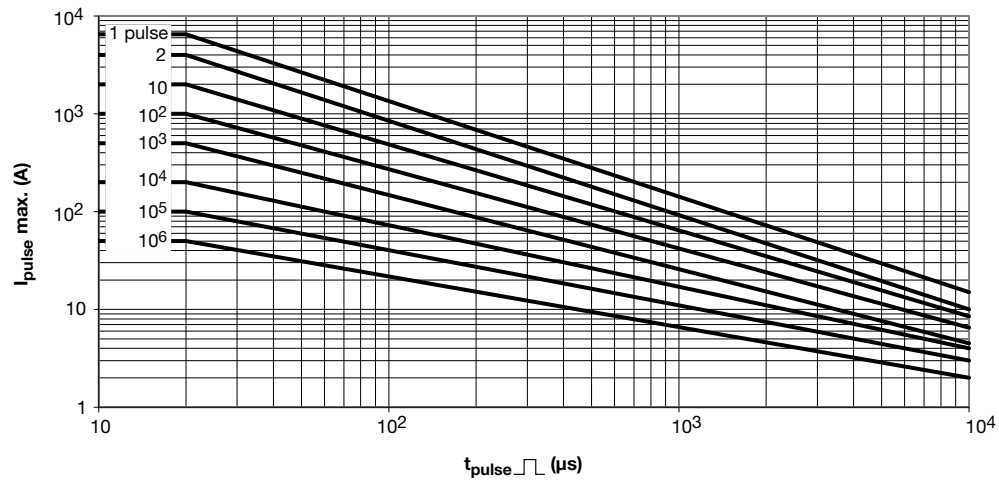
50 V<sub>RMS</sub> to 300 V<sub>RMS</sub>; VDRS14



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

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

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




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





## Disclaimer

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

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

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

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

Hyperlinks included in this datasheet may direct users to third-party websites. These links are provided as a convenience and for informational purposes only. Inclusion of these hyperlinks does not constitute an endorsement or an approval by Vishay of any of the products, services or opinions of the corporation, organization or individual associated with the third-party website. Vishay disclaims any and all liability and bears no responsibility for the accuracy, legality or content of the third-party website or for that of subsequent links.

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

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