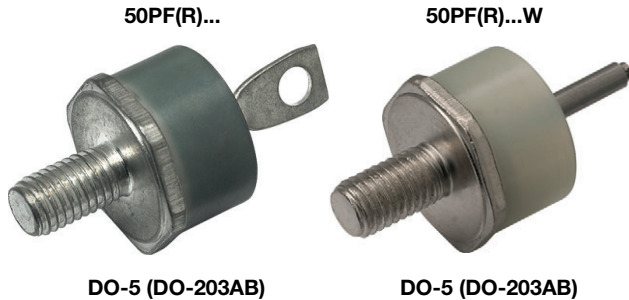


## Standard Recovery Diodes, Generation 2 DO-5 (Stud Version), 50 A



### FEATURES

- High surge current capability
- Designed for a wide range of applications
- Stud cathode and stud anode version
- Wire version available
- Low thermal resistance
- Designed and qualified for multiple level
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



### TYPICAL APPLICATIONS

- Converters
- Power supplies
- Machine tool controls
- Welding
- Any high voltage input rectification bridge

| PRIMARY CHARACTERISTICS |                 |
|-------------------------|-----------------|
| $I_{F(AV)}$             | 50 A            |
| Package                 | DO-5 (DO-203AB) |
| Circuit configuration   | Single          |

| MAJOR RATINGS AND CHARACTERISTICS |                 |              |                  |
|-----------------------------------|-----------------|--------------|------------------|
| PARAMETER                         | TEST CONDITIONS | VALUES       | UNITS            |
| $I_{F(AV)}$                       |                 | 50           | A                |
|                                   | $T_C$           | 128          | °C               |
| $I_{F(RMS)}$                      |                 | 78           | A                |
| $I_{FSM}$                         | 50 Hz           | 570          | A                |
|                                   | 60 Hz           | 595          |                  |
| $I^2t$                            | 50 Hz           | 1600         | A <sup>2</sup> s |
|                                   | 60 Hz           | 1450         |                  |
| $V_{RRM}$                         | Range           | 1400 to 1600 | V                |
| $T_J$                             |                 | -55 to +160  | °C               |

### ELECTRICAL SPECIFICATIONS

| VOLTAGE RATINGS  |              |  |  |   |
|------------------|--------------|--|--|---|
| TYPE NUMBER      | VOLTAGE CODE | $V_{RRM}$ , MAXIMUM REPETITIVE PEAK REVERSE VOLTAGE<br>V | $V_{RSM}$ , MAXIMUM NON-REPETITIVE PEAK REVERSE VOLTAGE<br>V | $I_{RRM}$ MAXIMUM AT $T_J = 150$ °C<br>mA |
| VS-50PF(R)...(W) | 140          | 1400   | 1650   | 4.5                                       |
|                  | 160          | 1600   | 1900   |   |



| FORWARD CONDUCTION  |               |  |                           |   |                   |
|---|---------------|--|---------------------------|---|-------------------|
| PARAMETER   | SYMBOL        | TEST CONDITIONS  |                           | VALUES  | UNITS             |
| Maximum average forward current at case temperature           | $I_{F(AV)}$   | 180° conduction, half sine wave  |                           | 50  | A                 |
|   |               |  |                           | 128   | °C                |
| Maximum RMS forward current                                   | $I_{F(RMS)}$  |  |                           | 78  | A                 |
| Maximum peak, one cycle forward, non-repetitive surge current | $I_{FSM}$     | t = 10 ms  | No voltage reapplied      | Sinusoidal half wave, initial $T_J = 150\text{ °C}$ | A                 |
|   |               | t = 8.3 ms   |                           |   |                   |
|   |               | t = 10 ms  | 100 % $V_{RRM}$ reapplied |   |                   |
|   |               | t = 8.3 ms   |                           |   |                   |
| Maximum $I^2t$ for fusing                                     | $I^2t$        | t = 10 ms  | No voltage reapplied      |   | A <sup>2</sup> s  |
|   |               | t = 8.3 ms   |                           |   |                   |
|   |               | t = 10 ms  | 100 % $V_{RRM}$ reapplied |   |                   |
|   |               | t = 8.3 ms   |                           |   |                   |
| Maximum $I^2\sqrt{t}$ for fusing                              | $I^2\sqrt{t}$ | t = 0.1 ms to 10 ms, no voltage reapplied  |                           | 16 000  | A <sup>2</sup> √s |
| Low level value of threshold voltage                          | $V_{F(TO)}$   | $(16.7\% \times \pi \times I_{F(AV)} < I < \pi \times I_{F(AV)})$ , $T_J = T_J$ maximum          |                           | 0.77  | V                 |
| Low level value of forward slope resistance                   | $r_f$         | $(16.7\% \times \pi \times I_{F(AV)} < I < \pi \times I_{F(AV)})$ , $T_J = T_J$ maximum          |                           | 4.30  | mΩ                |
| Maximum forward voltage drop                                  | $V_{FM}$      | $I_{pk} = 125\text{ A}$ , $T_J = 25\text{ °C}$ , $t_p = 400\text{ }\mu\text{s}$ rectangular wave |                           | 1.50  | V                 |

| THERMAL AND MECHANICAL SPECIFICATIONS           |                |   |                 |                     |
|---|----------------|---|-----------------|---------------------|
| PARAMETER                                       | SYMBOL         | TEST CONDITIONS   | VALUES          | UNITS               |
| Maximum junction and storage temperature range  | $T_J, T_{Stg}$ |   | -55 to 160      | °C                  |
| Maximum thermal resistance, junction to case    | $R_{thJC}$     | DC operation  | 0.51            | K/W                 |
| Thermal resistance, case to heatsink            | $R_{thCS}$     | Mounting surface, smooth, flat and greased                  | 0.25            |                     |
| Maximum allowable mounting torque (+0 %, -10 %) |                | Not lubricated thread, tightening on nut <sup>(1)</sup>     | 3.4<br>(30)     | N · m<br>(lbf · in) |
|   |                | Lubricated thread, tightening on nut <sup>(1)</sup>         | 2.3<br>(20)     |                     |
|   |                | Not lubricated thread, tightening on hexagon <sup>(2)</sup> | 4.2<br>(37)     |                     |
|   |                | Lubricated thread, tightening on hexagon <sup>(2)</sup>     | 3.2<br>(28)     |                     |
| Approximate weight                              |                |   | 15.8            | g                   |
|   |                |   | 0.56            | oz.                 |
| Case style                                      |                | See dimensions - link at the end of datasheet               | DO-5 (DO-203AB) |                     |

**Notes**

- (1) Recommended for pass-through holes
- (2) Torque must be applicable only to hexagon and not to plastic structure, recommended for holed heatsink

| $\Delta R_{thJC}$ CONDUCTION |                       |                        |                     |       |
|------------------------------|-----------------------|------------------------|---------------------|-------|
| CONDUCTION ANGLE             | SINUSOIDAL CONDUCTION | RECTANGULAR CONDUCTION | TEST CONDITIONS     | UNITS |
| 180°                         | 0.11                  | 0.10                   | $T_J = T_J$ maximum | K/W   |
| 120°                         | 0.16                  | 0.16                   |                     |       |
| 90°                          | 0.20                  | 0.22                   |                     |       |
| 60°                          | 0.29                  | 0.31                   |                     |       |
| 30°                          | 0.49                  | 0.50                   |                     |       |

**Note**

- The table above shows the increment of thermal resistance  $R_{thJC}$  when devices operate at different conduction angles than DC

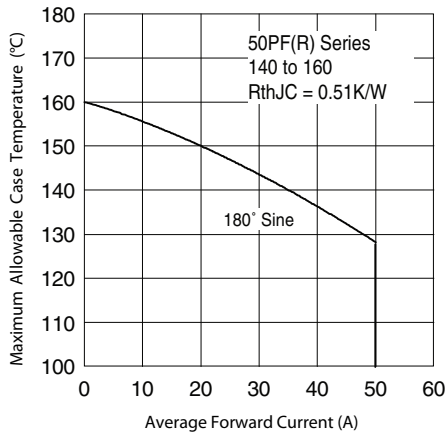


Fig. 1 - Current Ratings Characteristics

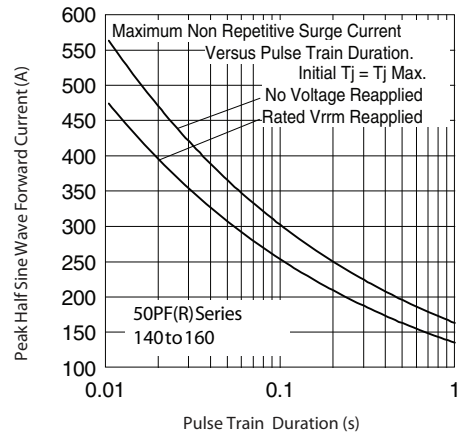


Fig. 3 - Maximum Non-Repetitive Surge Current

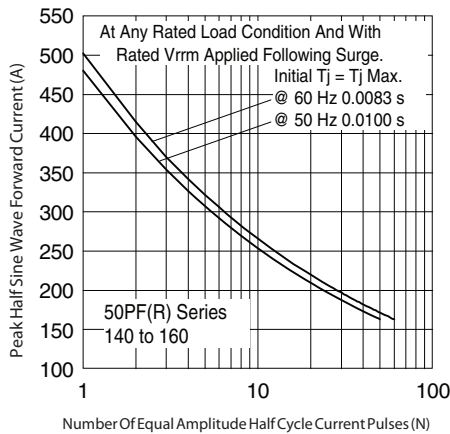


Fig. 2 - Maximum Non-Repetitive Surge Current

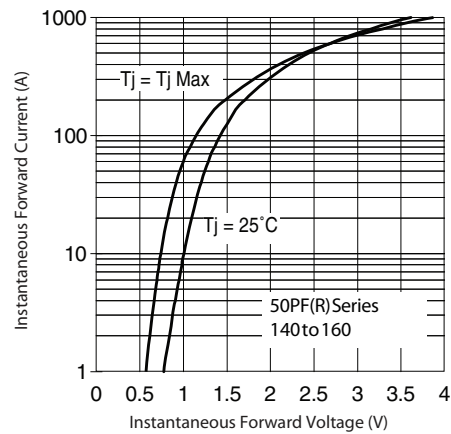


Fig. 4 - Forward Voltage Drop Characteristics

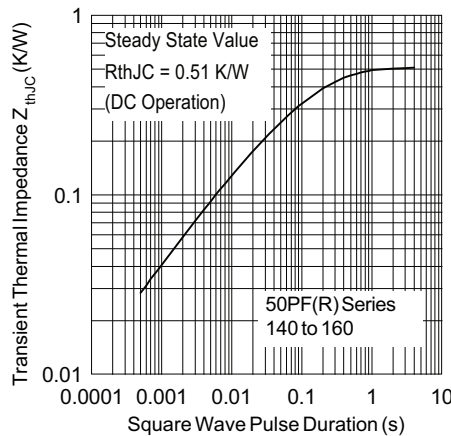
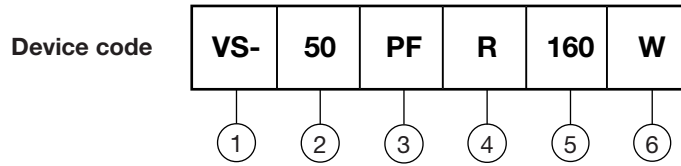


Fig. 5 - Thermal Impedance  $Z_{thJC}$  Characteristics



## ORDERING INFORMATION TABLE



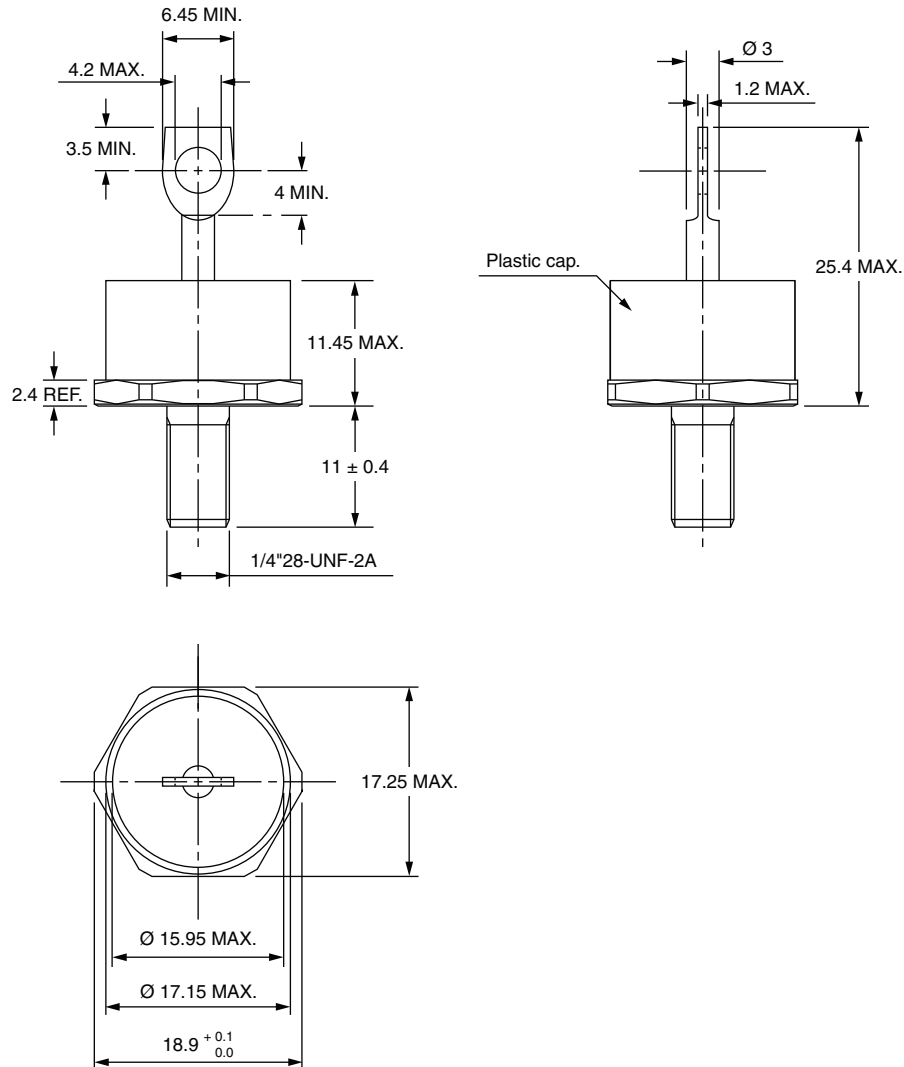
- 1** - Vishay Semiconductors product
- 2** - 50 = standard device
- 3** - PF = plastic package
- 4** -
  - None = stud normal polarity (cathode to stud)
  - R = stud reverse polarity (anode to stud)
- 5** - Voltage code x 10 =  $V_{RRM}$  (see Voltage Ratings table)
- 6** -
  - None = standard terminal  
(see dimensions for 50PF(R)... - link at the end of datasheet)
  - W = wire terminal  
(see dimensions for 50PF(R)...W - link at the end of datasheet)

| LINKS TO RELATED DOCUMENTS |  |
|----------------------------|--|
| Dimensions                 | <a href="http://www.vishay.com/doc?95345">www.vishay.com/doc?95345</a> |



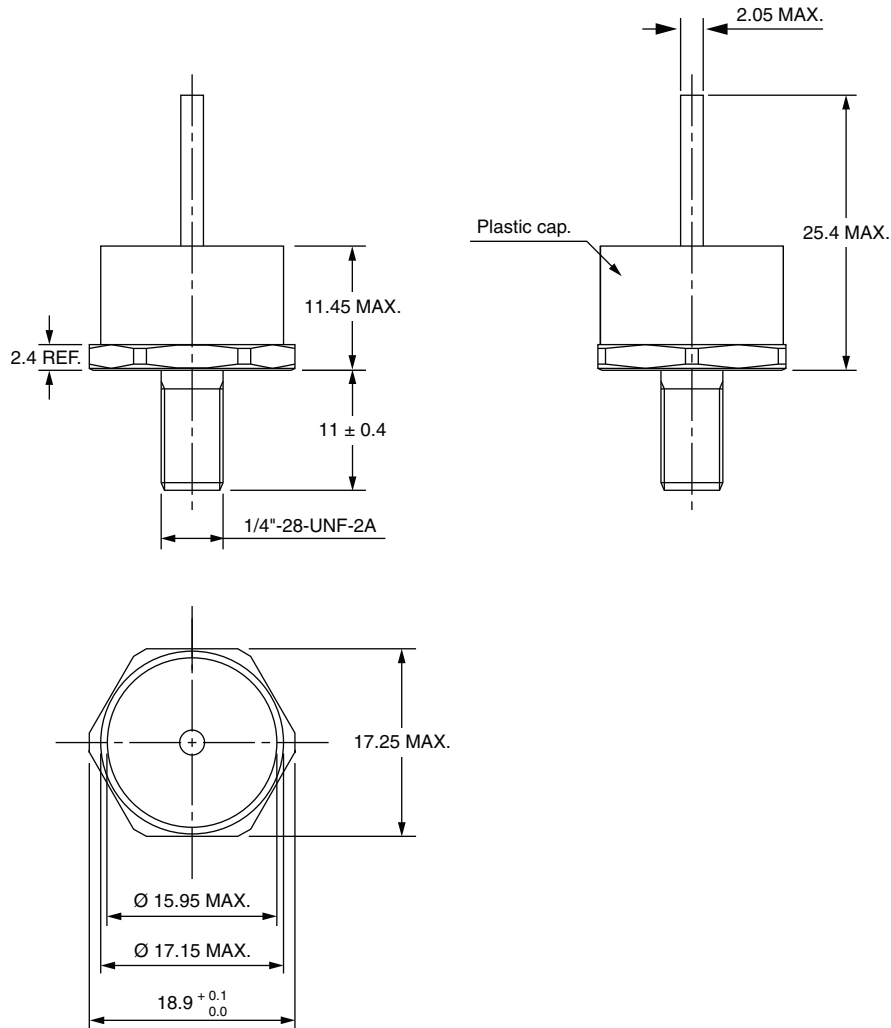
## DO-203AB (DO-5) for 50PF(R)...(W), 80PF(R)...(W), and 95PF(R)...(W) Series

**DIMENSIONS FOR 80PF(R), 50PF(R), AND 95PF(R) SERIES** in millimeters





### DIMENSIONS FOR 80PF(R)...(W), 50PF(R)...(W), AND 95PF(R)...(W) SERIES in millimeters





## DIMENSIONS FOR 52PF(R), 82PF(R), AND 97PF(R) SERIES in millimeters





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