

# Standard Recovery Diodes, (Stud Version), 16 A



| PRIMARY CHARACTERISTICS |        |  |  |  |
|-------------------------|--------|--|--|--|
| I <sub>F(AV)</sub> 16 A |        |  |  |  |
| Package DO-4 (DO-203AA) |        |  |  |  |
| Circuit configuration   | Single |  |  |  |

#### **FEATURES**

- High surge current capability
- Stud cathode and stud anode version



- · Wide current range
- Types up to 1200 V V<sub>RRM</sub>
- · Designed and qualified for industrial and consumer level
- Material categorization: for definitions of compliance please see <a href="https://www.vishay.com/doc?99912"><u>www.vishay.com/doc?99912</u></a>

#### **TYPICAL APPLICATIONS**

- · Battery charges
- Converters
- Power supplies
- · Machine tool controls

| MAJOR RATINGS AND CHARACTERISTICS |                 |             |                  |  |
|-----------------------------------|-----------------|-------------|------------------|--|
| PARAMETER                         | TEST CONDITIONS | VALUES      | UNITS            |  |
| 1                                 |                 | 16          | А                |  |
| I <sub>F(AV)</sub>                | T <sub>C</sub>  | 140         | °C               |  |
| I <sub>F(RMS)</sub>               |                 | 25          | А                |  |
| I <sub>FSM</sub>                  | 50 Hz           | 350         | ۸                |  |
|                                   | 60 Hz           | 370         | - A              |  |
| l <sup>2</sup> t                  | 50 Hz           | 612         | A <sup>2</sup> s |  |
|                                   | 60 Hz           | 560         |                  |  |
| $V_{RRM}$                         | Range           | 100 to 1200 | V                |  |
| TJ                                |                 | -65 to +175 | °C               |  |

#### **ELECTRICAL SPECIFICATIONS SPECIFICATIONS**

| VOLTAGE RATINGS |                 |   |   |  |  |
|-----------------|-----------------|---|---|--|--|
| TYPE<br>NUMBER  | VOLTAGE<br>CODE | V <sub>RRM</sub> , MAXIMUM<br>REPETITIVE PEAK<br>REVERSE VOLTAGE<br>V | V <sub>RSM</sub> , MAXIMUM<br>NON-REPETITIVE<br>PEAK VOLTAGE<br>V | I <sub>RRM</sub> MAXIMUM<br>AT T <sub>J</sub> = 175 °C<br>mA |  |
|                 | 10              | 100   | 150   |  |  |
|                 | 20              | 200   | 275   |  |  |
|                 | 40              | 400   | 500   |  |  |
| VS-16F(R)       | 60              | 600   | 725   | 12   |  |
|                 | 80              | 800   | 950   |  |  |
|                 | 100             | 1000  | 1200  |  |  |
|                 | 120             | 1200  | 1400  |  |  |



| FORWARD CONDUCTION  |                     |  |                                     |   |         |                  |
|---|---------------------|--|-------------------------------------|---|---------|------------------|
| PARAMETER   | SYMBOL              | TEST CONDITIONS  |                                     | VALUES  | UNITS   |                  |
| Maximum average forward current at case temperature           | I <sub>F(AV)</sub>  | 180° conduction, half sine wave  |                                     | 16<br>140   | A<br>°C |                  |
| Maximum RMS forward current                                   | I <sub>F(RMS)</sub> |  |                                     |   | 25      | A                |
|   | ( -/                | t = 10 ms  | No voltage                          |   | 350     |                  |
| Maximum peak, one-cycle forward, non-repetitive surge current |                     | t = 8.3 ms   | reapplied                           | Sinusoidal half wave, initial $T_J = T_J$ maximum | 370     | A                |
|   | I <sub>FSM</sub>    | t = 10 ms  | 100 % V <sub>RRM</sub><br>reapplied |   | 295     |                  |
|   |                     | t = 8.3 ms   |                                     |   | 310     |                  |
| Maximum I <sup>2</sup> t for fusing                           | l <sup>2</sup> t    | t = 10 ms  | No voltage reapplied                |   | 612     | A <sup>2</sup> s |
|   |                     | t = 8.3 ms   |                                     |   | 560     |                  |
|   |                     | t = 10 ms  | 100 % V <sub>RRM</sub><br>reapplied |   | 435     |                  |
|   |                     | t = 8.3  ms  |                                     |   | 395     |                  |
| Maximum I <sup>2</sup> √t for fusing                          | I <sup>2</sup> √t   | t = 0.1 to 10 ms, no voltage reapplied   |                                     | 6120  | A²√s    |                  |
| Low level value of threshold voltage                          | V <sub>F(TO)1</sub> | (16.7 % x $\pi$ x $I_{F(AV)}$ < I < $\pi$ x $I_{F(AV)}$ ), $T_J = T_J$ maximum                                   |                                     | 0.77  | V       |                  |
| High level value of threshold voltage                         | V <sub>F(TO)2</sub> | $(I > \pi \times I_{F(AV)}), T_J = T_J \text{ maximum}$  |                                     | 0.90  | ]       |                  |
| Low level value of forward slope resistance                   | r <sub>f1</sub>     | (16.7 % x $\pi$ x I <sub>F(AV)</sub> < I < $\pi$ x I <sub>F(AV)</sub> ), T <sub>J</sub> = T <sub>J</sub> maximum |                                     | 7.80  | mΩ      |                  |
| High level value of forward slope resistance                  | r <sub>f2</sub>     | $(I > \pi \times I_{F(AV)}), T_J = T_J \text{ maximum}$  |                                     | 5.70  | - 11122 |                  |
| Maximum forward voltage drop                                  | $V_{FM}$            | $I_{pk} = 50 \text{ A}, T_J = 25 \text{ °C}, t_p = 400 \mu \text{s rectangular wave}$                            |                                     | 1.23  | V       |                  |

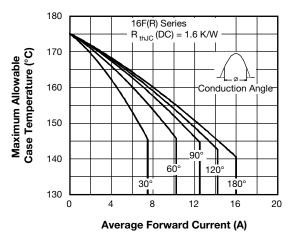
| THERMAL AND MECHANICAL SPECIFICATIONS         |                   |   |                        |                     |  |
|---|-------------------|---|------------------------|---------------------|--|
| PARAMETER                                     | SYMBOL            | TEST CONDITIONS   | VALUES                 | UNITS               |  |
| Maximum junction operating temperature range  | TJ                | T <sub>J</sub>  |                        | °C                  |  |
| Maximum storage temperature range             | T <sub>Stg</sub>  |   | -65 to +200            |                     |  |
| Maximum thermal resistance, junction to case  | R <sub>thJC</sub> | R <sub>thJC</sub> DC operation                                |                        | K/W                 |  |
| Maximum thermal resistance, case to heat sink | R <sub>thCS</sub> | Mounting surface, smooth, flat and greased                    | 0.5                    | r/vv                |  |
| Allowable mounting torque                     |                   | Not lubricated threads  | 1.5 + 0 - 10 %<br>(13) | N · m<br>(lbf · in) |  |
| Allowable mounting torque                     |                   | Lubricated threads  | 1.2 + 0 - 10 %<br>(10) | N · m<br>(lbf · in) |  |
| Approximate weight                            |                   |   | 7                      | g                   |  |
| Approximate weight                            |                   |   | 0.25                   | oz.                 |  |
| Case style                                    |                   | See dimensions - link at the end of datasheet DO-4 (DO-203AA) |                        | -203AA)             |  |

| △R <sub>thJC</sub> CONDUCTION |                       |                        |                     |       |  |
|-------------------------------|-----------------------|------------------------|---------------------|-------|--|
| CONDUCTION ANGLE              | SINUSOIDAL CONDUCTION | RECTANGULAR CONDUCTION | TEST CONDITIONS     | UNITS |  |
| 180°                          | 0.31                  | 0.23                   |                     |       |  |
| 120°                          | 0.38                  | 0.40                   |                     |       |  |
| 90°                           | 0.49                  | 0.54                   | $T_J = T_J$ maximum | K/W   |  |
| 60°                           | 0.72                  | 0.75                   |                     |       |  |
| 30°                           | 1.20                  | 1.21                   |                     |       |  |

#### Note

• The table above shows the increment of thermal resistance R<sub>thJC</sub> when devices operate at different conduction angles than DC







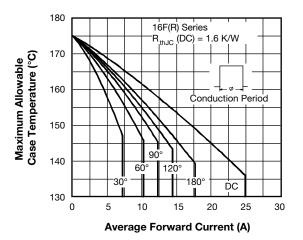


Fig. 2 - Current Ratings Characteristics

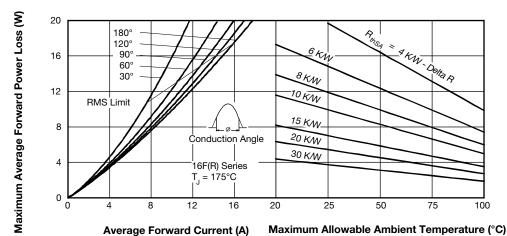


Fig. 3 - Forward Power Loss Characteristics

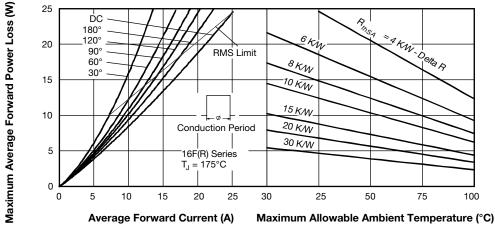


Fig. 4 - Forward Power Loss Characteristics

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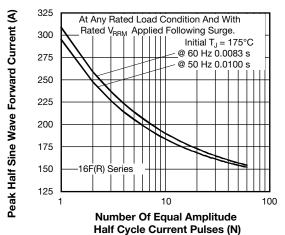


Fig. 5 - Maximum Non-Repetitive Surge Current

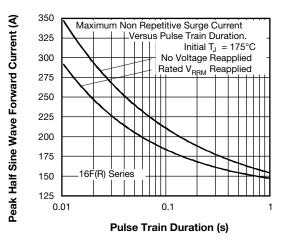


Fig. 6 - Maximum Non-Repetitive Surge Current

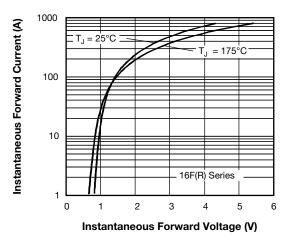


Fig. 7 - Forward Voltage Drop Characteristics

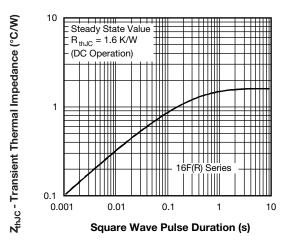
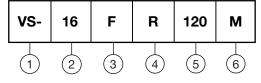


Fig. 8 - Thermal Impedance  $Z_{thJC}$  Characteristics

#### **ORDERING INFORMATION TABLE**

#### Device code



- 1 Vishay Semiconductors product
- 2 Current rating: code = I<sub>F(AV)</sub>
- 3 F = standard device
- A None = stud normal polarity (cathode to stud)

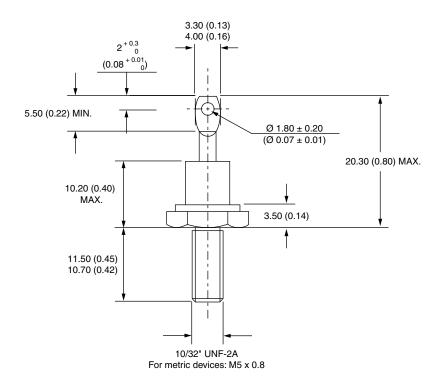
  R = stud reverse polarity (anode to stud)
- 5 Voltage code x 10 = V<sub>RRM</sub> (see Voltage Ratings table)
- 6 None = stud base DO-4 (DO-203AA) 10-32UNF-2A M = stud base DO-4 (DO-203AA) M5 x 0.8

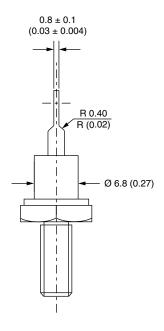
| LINKS TO RELATED DOCUMENTS |                          |  |  |  |
|----------------------------|--------------------------|--|--|--|
| Dimensions                 | www.vishay.com/doc?95311 |  |  |  |



# DO-203AA (DO-4)

### **DIMENSIONS** in millimeters (inches)







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