

## Standard Recovery Diodes, Generation 2 DO-5 (Stud Version), 80 A

80PF(R)...



DO-203AB (DO-5)

80PF(R)...W



DO-203AB (DO-5)

### FEATURES

- High surge current capability
- Designed for a wide range of applications
- Stud cathode and stud anode version
- Wire version available
- Low thermal resistance
- UL approval pending
- Compliant to RoHS directive 2002/95/EC
- Designed and qualified for multiple level


**RoHS**  
COMPLIANT

### TYPICAL APPLICATIONS

- Battery chargers
- Converters
- Power supplies
- Machine tool controls
- Welding

### PRODUCT SUMMARY

|             |      |
|-------------|------|
| $I_{F(AV)}$ | 80 A |
|-------------|------|

### MAJOR RATINGS AND CHARACTERISTICS

| PARAMETER    | TEST CONDITIONS | VALUES      | UNITS            |
|--------------|-----------------|-------------|------------------|
| $I_{F(AV)}$  |                 | 80          | A                |
|              | $T_C$           | 140         | °C               |
| $I_{F(RMS)}$ |                 | 126         | A                |
| $I_{FSM}$    | 50 Hz           | 1500        | A                |
|              | 60 Hz           | 1570        |                  |
| $I^2t$       | 50 Hz           | 11 250      | A <sup>2</sup> s |
|              | 60 Hz           | 10 230      |                  |
| $V_{RRM}$    | Range           | 400 to 1200 | V                |
| $T_J$        |                 | - 55 to 180 | °C               |

### ELECTRICAL SPECIFICATIONS

#### VOLTAGE RATINGS

| TYPE NUMBER   | VOLTAGE CODE | $V_{RRM}$ , MAXIMUM REPETITIVE<br>PEAK REVERSE VOLTAGE<br>V | $V_{RSM}$ , MAXIMUM NON-REPETITIVE<br>PEAK REVERSE VOLTAGE<br>V | $I_{RRM}$ MAXIMUM<br>AT $T_J = 150\text{ °C}$<br>mA |
|---------------|--------------|-------------------------------------------------------------|-----------------------------------------------------------------|-----------------------------------------------------|
| 80PF(R)...(W) | 40           | 400                                                         | 500                                                             | 9                                                   |
|               | 80           | 800                                                         | 960                                                             |                                                     |
|               | 120          | 1200                                                        | 1440                                                            |                                                     |

| 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                                                                            |                                  |                                                       | 80      | A                 |
|                                                               |                     |                                                                                                            |                                  |                                                       | 140     | °C                |
| Maximum RMS forward current                                   | I <sub>F(RMS)</sub> |                                                                                                            |                                  |                                                       | 126     | A                 |
| Maximum peak, one-cycle forward, non-repetitive surge current | I <sub>FSM</sub>    | t = 10 ms                                                                                                  | No voltage reapplied             | Sinusoidal half wave, initial T <sub>J</sub> = 150 °C | 1500    | A                 |
|                                                               |                     | t = 8.3 ms                                                                                                 |                                  |                                                       | 1570    |                   |
|                                                               |                     | t = 10 ms                                                                                                  | 100 % V <sub>RRM</sub> reapplied |                                                       | 1260    |                   |
|                                                               |                     | t = 8.3 ms                                                                                                 |                                  |                                                       | 1320    |                   |
| Maximum I <sup>2</sup> t for fusing                           | I <sup>2</sup> t    | t = 10 ms                                                                                                  | No voltage reapplied             |                                                       | 11 250  | A <sup>2</sup> s  |
|                                                               |                     | t = 8.3 ms                                                                                                 |                                  |                                                       | 10 230  |                   |
|                                                               |                     | t = 10 ms                                                                                                  | 100 % V <sub>RRM</sub> reapplied |                                                       | 7950    |                   |
|                                                               |                     | t = 8.3 ms                                                                                                 |                                  |                                                       | 7200    |                   |
| Maximum I <sup>2</sup> √t for fusing                          | I <sup>2</sup> √t   | t = 0.1 ms to 10 ms, no voltage reapplied                                                                  |                                  |                                                       | 112 500 | A <sup>2</sup> √s |
| Low level value of threshold voltage                          | V <sub>F(TO)</sub>  | (16.7 % x π x I <sub>F(AV)</sub> ) < I < π x I <sub>F(AV)</sub> ), T <sub>J</sub> = T <sub>J</sub> maximum |                                  |                                                       | 0.73    | V                 |
| Low level value of forward slope resistance                   | r <sub>f</sub>      | (16.7 % x π x I <sub>F(AV)</sub> ) < I < π x I <sub>F(AV)</sub> ), T <sub>J</sub> = T <sub>J</sub> maximum |                                  |                                                       | 3.0     | mΩ                |
| Maximum forward voltage drop                                  | V <sub>FM</sub>     | I <sub>pk</sub> = 220 A, T <sub>J</sub> = 25 °C, t <sub>p</sub> = 400 μs rectangular wave                  |                                  |                                                       | 1.40    | V                 |

| THERMAL AND MECHANICAL SPECIFICATIONS                    |                                   |                                                             |                 |                     |
|----------------------------------------------------------|-----------------------------------|-------------------------------------------------------------|-----------------|---------------------|
| PARAMETER                                                | SYMBOL                            | TEST CONDITIONS                                             | VALUES          | UNITS               |
| Maximum junction operating and storage temperature range | T <sub>J</sub> , T <sub>Stg</sub> |                                                             | - 55 to 180     | °C                  |
| Maximum thermal resistance, junction to case             | R <sub>thJC</sub>                 | DC operation                                                | 0.30            | K/W                 |
| Maximum thermal resistance, case to heatsink             | R <sub>thCS</sub>                 | 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-203AB (DO-5) |                     |

**Notes**

(1) Recommended for pass-through holes

(2) Torque must be applicable only to hexagon and not to plastic structure, recommended for holed heatsink



# 80PF(R)...(W) Series

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Vishay High Power Products

| $\Delta R_{thJC}$ CONDUCTION |                       |                        |                               |       |
|------------------------------|-----------------------|------------------------|-------------------------------|-------|
| CONDUCTION ANGLE             | SINUSOIDAL CONDUCTION | RECTANGULAR CONDUCTION | TEST CONDITIONS               | UNITS |
| 180°                         | 0.14                  | 0.10                   | $T_J = T_{J \text{ maximum}}$ | K/W   |
| 120°                         | 0.16                  | 0.17                   |                               |       |
| 90°                          | 0.21                  | 0.22                   |                               |       |
| 60°                          | 0.30                  | 0.31                   |                               |       |
| 30°                          | 0.50                  | 0.50                   |                               |       |

## Note

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

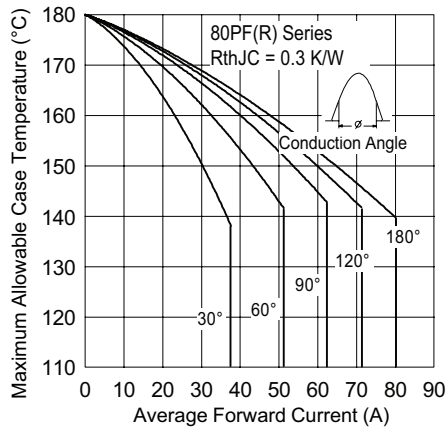


Fig. 1 - Current Ratings Characteristics

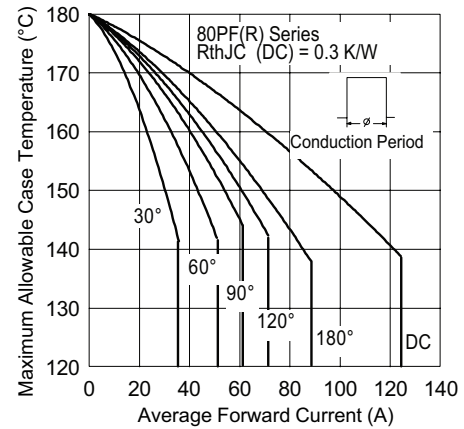


Fig. 2 - Current Ratings Characteristics

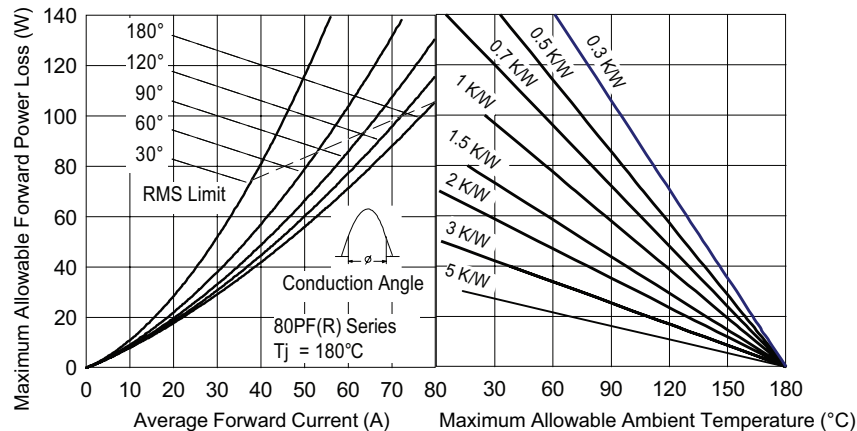


Fig. 3 - Forward Power Loss Characteristics

# 80PF(R)...(W) Series

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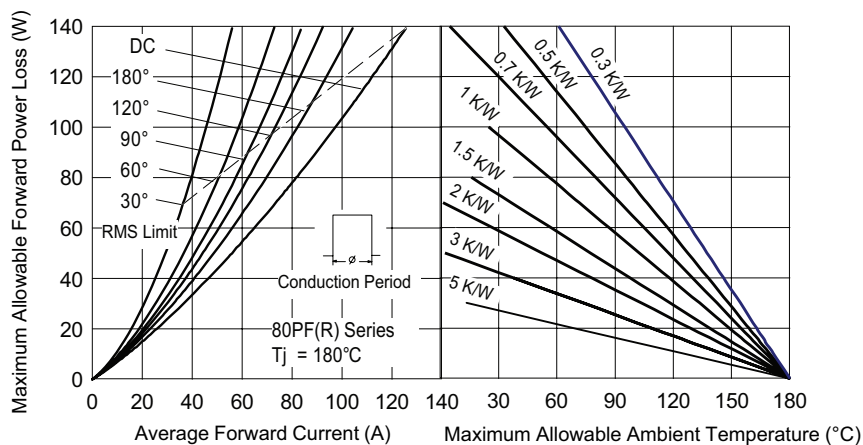


Fig. 4 - Forward Power Loss Characteristics

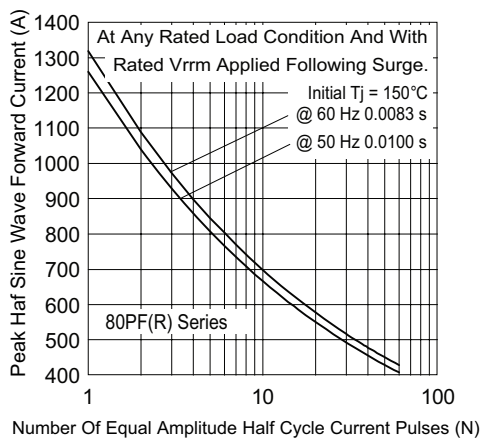


Fig. 5 - Maximum Non-Repetitive Surge Current

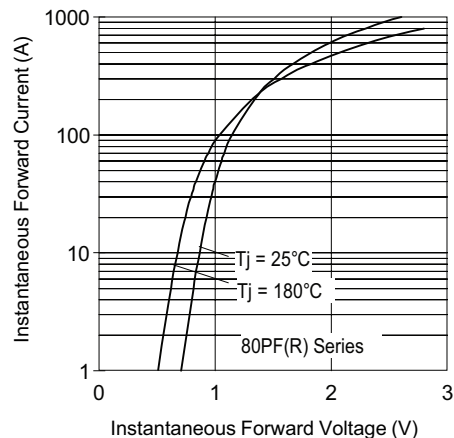


Fig. 7 - Forward Voltage Drop Characteristics

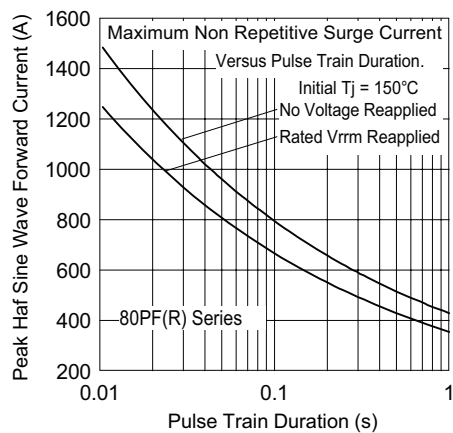


Fig. 6 - Maximum Non-Repetitive Surge Current

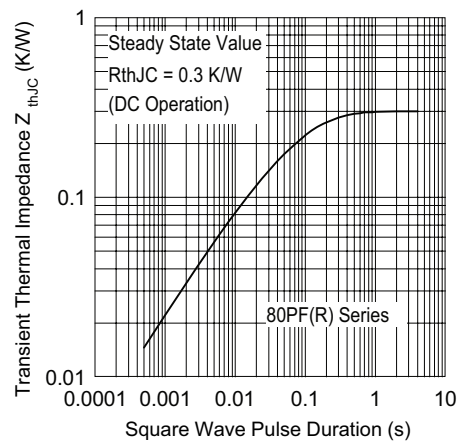


Fig. 8 - Thermal Impedance  $Z_{thJC}$  Characteristics



## ORDERING INFORMATION TABLE

|             |    |    |   |     |   |
|-------------|----|----|---|-----|---|
| Device code | 80 | PF | R | 120 | W |
|             | 1  | 2  | 3 | 4   | 5 |

- |              |   |                                                                                                                                                                                                                                               |
|--------------|---|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <div>1</div> | - | <ul style="list-style-type: none"><li>• 80 = Standard device</li><li>• 82 = Isolated lead on standard terminal<br/>with silicone sleeve available for 1200 V only<br/>(red = Reverse polarity)<br/>(blue = Normal polarity)</li></ul>         |
| <div>2</div> | - | PF = Plastic package                                                                                                                                                                                                                          |
| <div>3</div> | - | <ul style="list-style-type: none"><li>• None = Stud normal polarity (cathode to stud)</li><li>• R = Stud reverse polarity (anode to stud)</li></ul>                                                                                           |
| <div>4</div> | - | Voltage code x 10 = $V_{RRM}$ (see Voltage Ratings table)                                                                                                                                                                                     |
| <div>5</div> | - | <ul style="list-style-type: none"><li>• None = Standard terminal<br/>(see dimensions for 80PF(R)... - link at the end of datasheet)</li><li>• W = Wire terminal<br/>(see dimensions for 80PF(R)...W - link at the end of datasheet)</li></ul> |

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



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