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

50PF(R)... 50PF(R)...W





DO-203AB (DO-5) 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
- RoHS compliant
- Designed and qualified for multiple level

RoHS COMPLIANT

## TYPICAL APPLICATIONS

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

| PRODUCT SUMMARY | |
|---|---|
| $I_{F(AV)}$ | 50 A |

| MAJOR RATINGS AND CHARACTERISTICS | | | |
|---|---|---|---|
| PARAMETER | TEST CONDITIONS | VALUES | UNITS |
| $I_{F(AV)}$ | | 50 | A |
| | $T_C$ | 140 | °C |
| $I_{F(RMS)}$ | | 78 | A |
| $I_{FSM}$ | 50 Hz | 800 | A |
| | 60 Hz | 830 | |
| $I^2t$ | 50 Hz | 3200 | $A^2s$ |
| | 60 Hz | 2900 | |
| $V_{RRM}$ | Range | 400 to 1200 | V |
| $T_J$ | | - 55 to 180 | °C |

## ELECTRICAL SPECIFICATIONS

| VOLTAGE RATINGS | | | | |
|---|---|---|---|---|
| TYPE NUMBER | VOLTAGE CODE | $V_{RRM}$, MAXIMUM REPETITIVE PEAK REVERSE VOLTAGE V | $V_{RSM}$, MAXIMUM NON-REPETITIVE PEAK REVERSE VOLTAGE V | $I_{RRM}$ MAXIMUM AT $T_J$ = 150 °C mA |
| 50PF(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 | $I_{F(AV)}$ | 180° conduction, half sine wave | | | 50 | A |
| | | | | | 140 | °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 °C | 800 | A |
| | | t = 8.3 ms | | | 830 | |
| | | t = 10 ms | 100 % $V_{RRM}$ reapplied | | 670 | |
| | | t = 8.3 ms | | | 700 | |
| Maximum $I^2t$ for fusing | $I^2t$ | t = 10 ms | No voltage reapplied | | 3200 | $A^2s$ |
| | | t = 8.3 ms | | | 2900 | |
| | | t = 10 ms | 100 % $V_{RRM}$ reapplied | | 2260 | |
| | | t = 8.3 ms | | | 2050 | |
| Maximum $I^2\sqrt{t}$ for fusing | $I^2\sqrt{t}$ | t = 0.1 to 10 ms, no voltage reapplied | | | 32 000 | $A^2\sqrt{s}$ |
| Low level value of threshold voltage | $V_{F(TO)}$ | (16.7 % x $\pi$ x $I_{F(AV)}$ < I < $\pi$ x $I_{F(AV)}$), $T_J$ = $T_J$ maximum | | | 0.77 | V |
| Low level value of forward slope resistance | $r_f$ | (16.7 % x $\pi$ x $I_{F(AV)}$ < I < $\pi$ x $I_{F(AV)}$), $T_J$ = $T_J$ maximum | | | 4.30 | mΩ |
| Maximum forward voltage drop | $V_{FM}$ | $I_{pk}$ = 125 A, $T_J$ = 25 °C, $t_p$ = 400 µs rectangular wave | | | 1.40 | V |

| THERMAL AND MECHANICAL SPECIFICATIONS | | | | |
|---|---|---|---|---|
| **PARAMETER** | **SYMBOL** | **TEST CONDITIONS** | **VALUES** | **UNITS** |
| Maximum junction operating and storage temperature range | $T_J$, $T_{Stg}$ | | - 55 to 180 | °C |
| Maximum thermal resistance, junction to case | $R_{thJC}$ | DC operation | 0.51 | K/W |
| Maximum thermal resistance, case to heatsink | $R_{thCS}$ | Mounting surface, smooth, flat and greased | 0.25 | |
| Allowable mounting torque | | Tighting on nut (1) Not lubricated threads | 3.4 + 0 - 10 % (30) | N · m (lbf · in) |
| | | Tighting on Hexagon (2) Lubricated threads | 2.3 + 0 - 10 % (20) | |
| Approximate weight | | | 15.8 | g |
| | | | 0.56 | oz. |
| Case style | | See dimensions - link at the end of datasheet | DO-203AB (DO-5) | |

**Notes**

(1) As general recommendation we suggest to tight on Hexagon and not on nut

(2) Torque must be applicable only to Hexagon and not to plastic structure

| $\Delta R_{thJC}$ 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

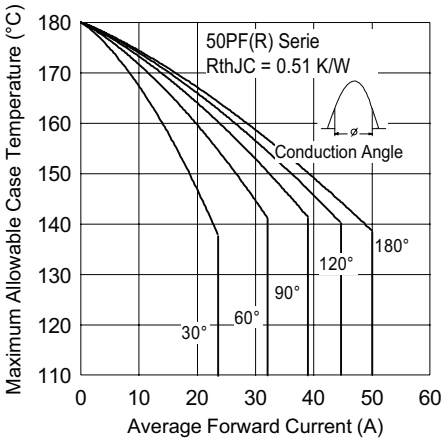



Fig. 1 - Current Ratings Characteristics

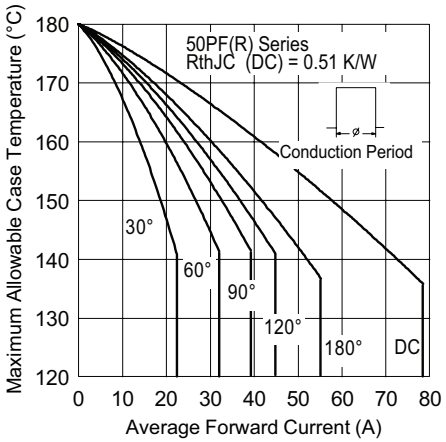



Fig. 2 - Current Ratings Characteristics

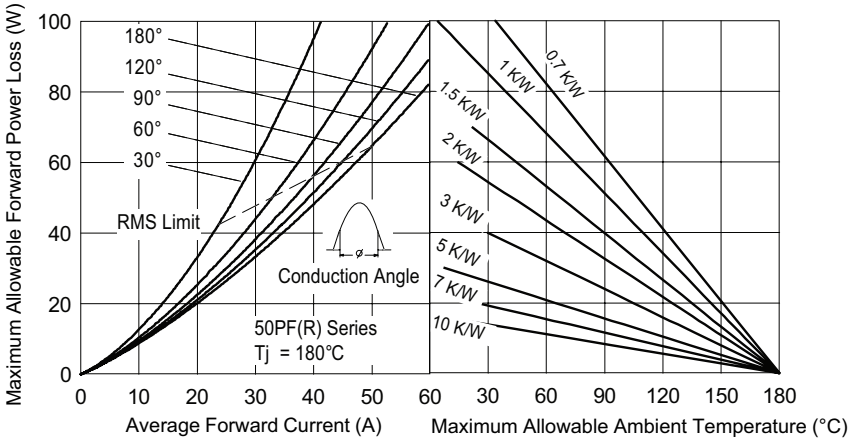



Fig. 3 - Forward Power Loss Characteristics

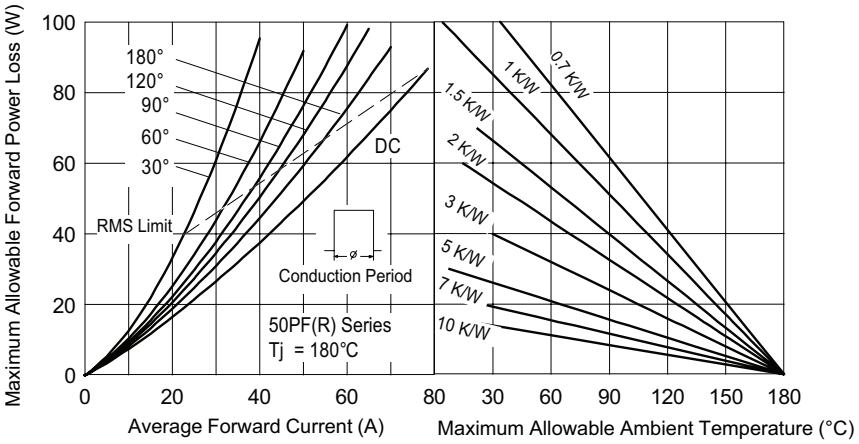



Fig. 4 - Forward Power Loss Characteristics

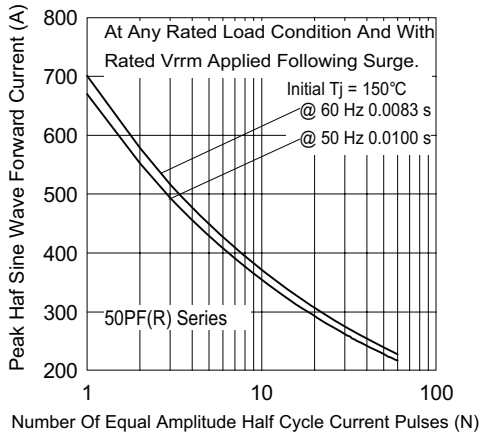



Fig. 5 - Maximum Non-Repetitive Surge Current

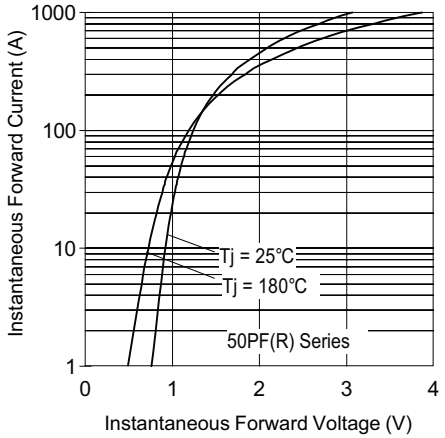



Fig. 7 - Forward Voltage Drop Characteristics

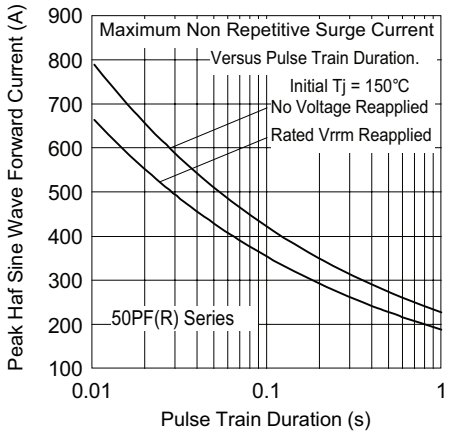



Fig. 6 - Maximum Non-Repetitive Surge Current

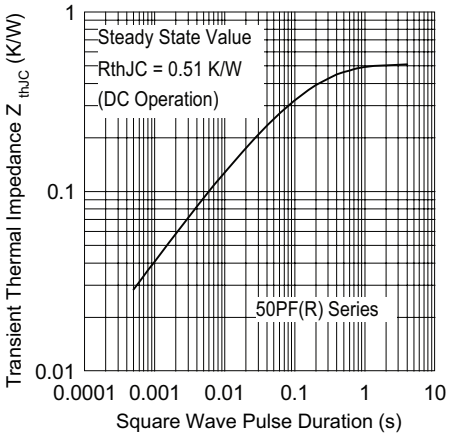
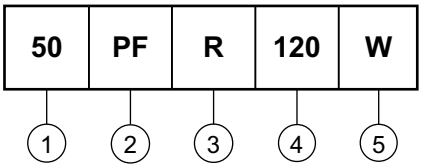



Fig. 8 - Thermal Impedance $Z_{thJC}$ Characteristics

## ORDERING INFORMATION TABLE

**Device code**




1 - • 50 = Standard device
• 52 = Isolated lead on standard terminal
with silicone sleeve available for 1200 V only
(red = Reverse polarity)
(blue = Normal polarity)

2 - PF = Plastic package

3 - • None = Stud normal polarity (cathode to stud)
• R = Stud reverse polarity (anode to stud)

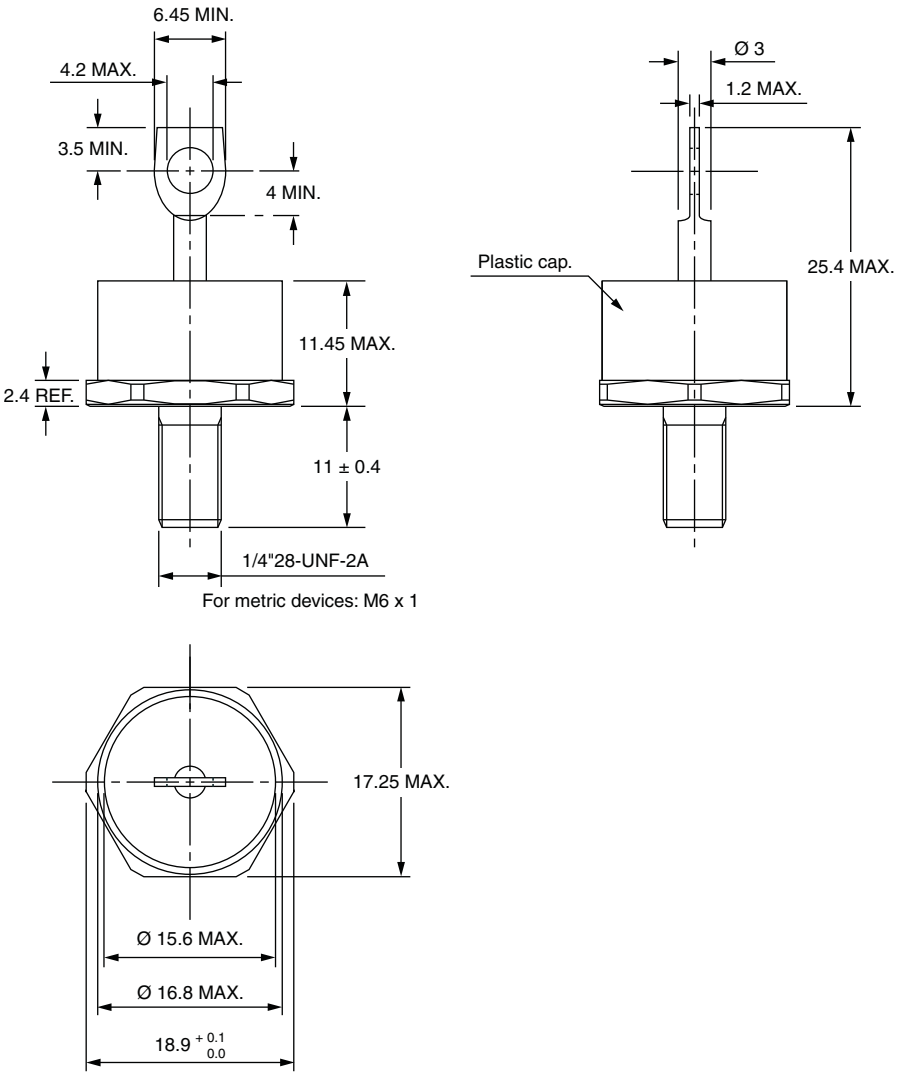
4 - Voltage code x 10 = $V_{RRM}$ (see Voltage Ratings table)

5 - • 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 | http://www.vishay.com/doc?95345 |

# 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



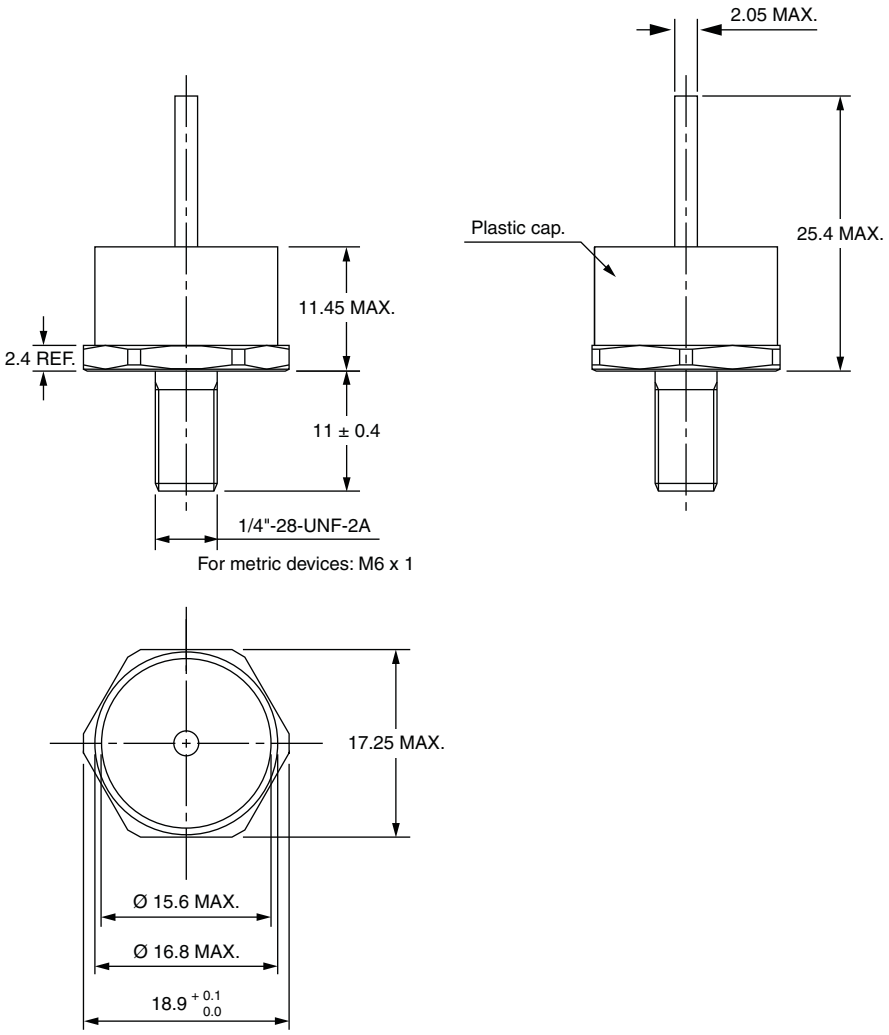

**Note**

- For metric device please contact factory

# Outline Dimensions

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

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

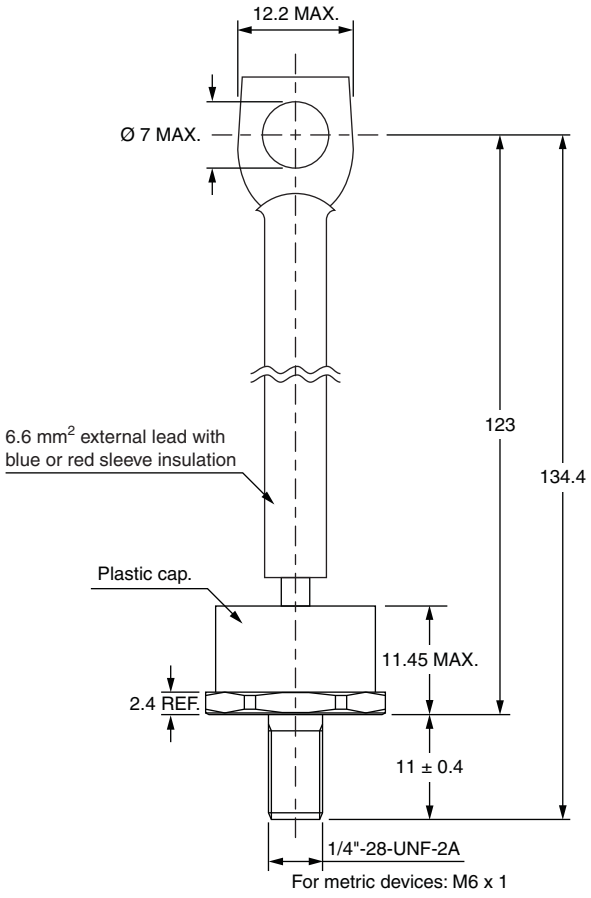



**Note**

- For metric device please contact factory

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

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




**Note**

- For metric device please contact factory

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