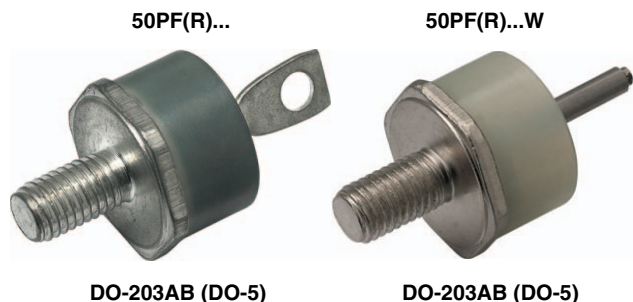


Standard Recovery Diodes, Generation 2 DO-5 (Stud Version), 50 A



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


RoHS
COMPLIANT

TYPICAL APPLICATIONS

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

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

| 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 ² 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 V | V_{RSM} , MAXIMUM NON-REPETITIVE PEAK REVERSE VOLTAGE V | I_{RRM} MAXIMUM AT $T_J = 150$ °C 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 °C | 570 | A | |
| | | t = 8.3 ms | | | 595 | | |
| | | t = 10 ms | 100 % V _{RRM} reapplied | | 480 | | |
| | | t = 8.3 ms | | | 500 | | |
| Maximum I ² t for fusing | I ² t | t = 10 ms | No voltage reapplied | | 1600 | A ² s | |
| | | t = 8.3 ms | | | 1450 | | |
| | | t = 10 ms | 100 % V _{RRM} reapplied | | 1150 | | |
| | | t = 8.3 ms | | | 1050 | | |
| Maximum I ² √t for fusing | I ² √t | t = 0.1 ms to 10 ms, no voltage reapplied | | | 16 000 | A ² √s | |
| Low level value of threshold voltage | V _{F(TO)} | (16.7 % x π x I _{F(AV)} < I < π x I _{F(AV)}), T _J = T _J maximum | | | 0.77 | V | |
| Low level value of forward slope resistance | r _f | (16.7 % x π x I _{F(AV)} < I < π 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 | | | 1.50 | 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 ⁽¹⁾ | 3.4 (30) | N · m (lbf · in) |
| | | Lubricated thread, tightening on nut ⁽¹⁾ | 2.3 (20) | |
| | | Not lubricated thread, tightening on hexagon ⁽²⁾ | 4.2 (37) | |
| | | Lubricated thread, tightening on hexagon ⁽²⁾ | 3.2 (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



| ΔR_{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

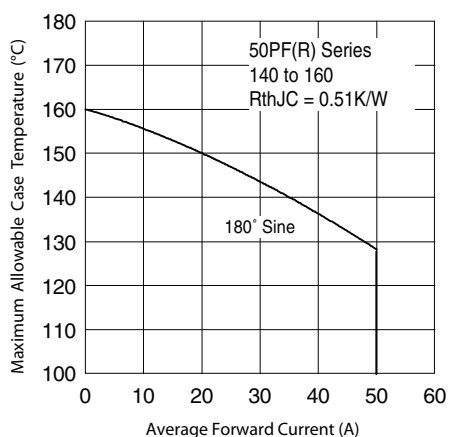


Fig. 1 - Current Ratings Characteristics

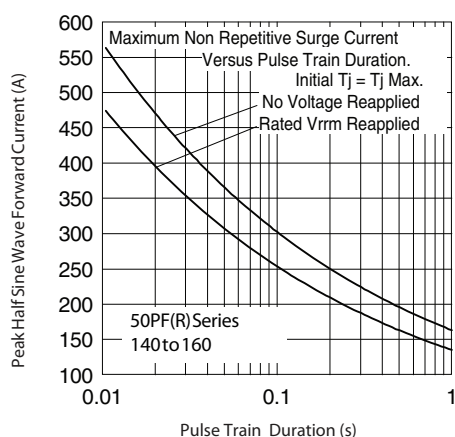


Fig. 3 - Maximum Non-Repetitive Surge Current

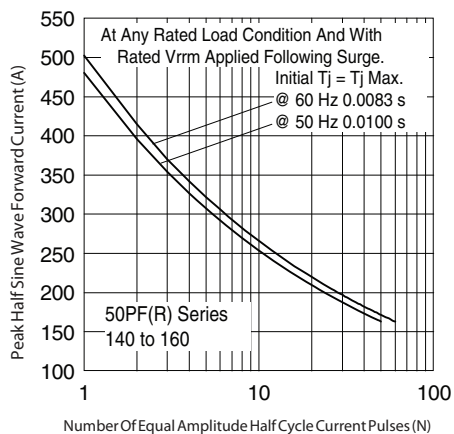


Fig. 2 - Maximum Non-Repetitive Surge Current

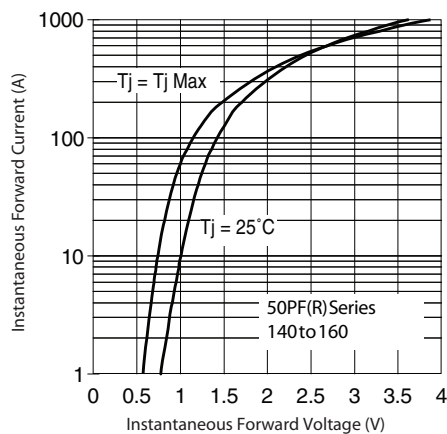


Fig. 4 - Forward Voltage Drop Characteristics

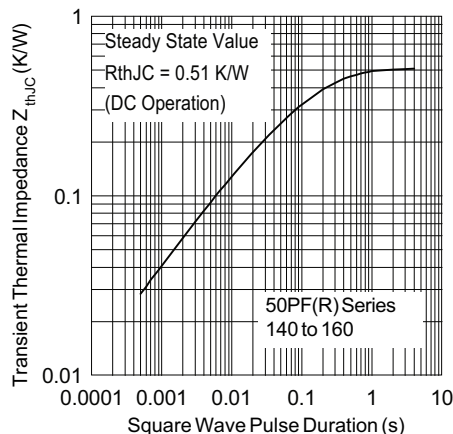


Fig. 5 - Thermal Impedance Z_{thJC} Characteristics

ORDERING INFORMATION TABLE

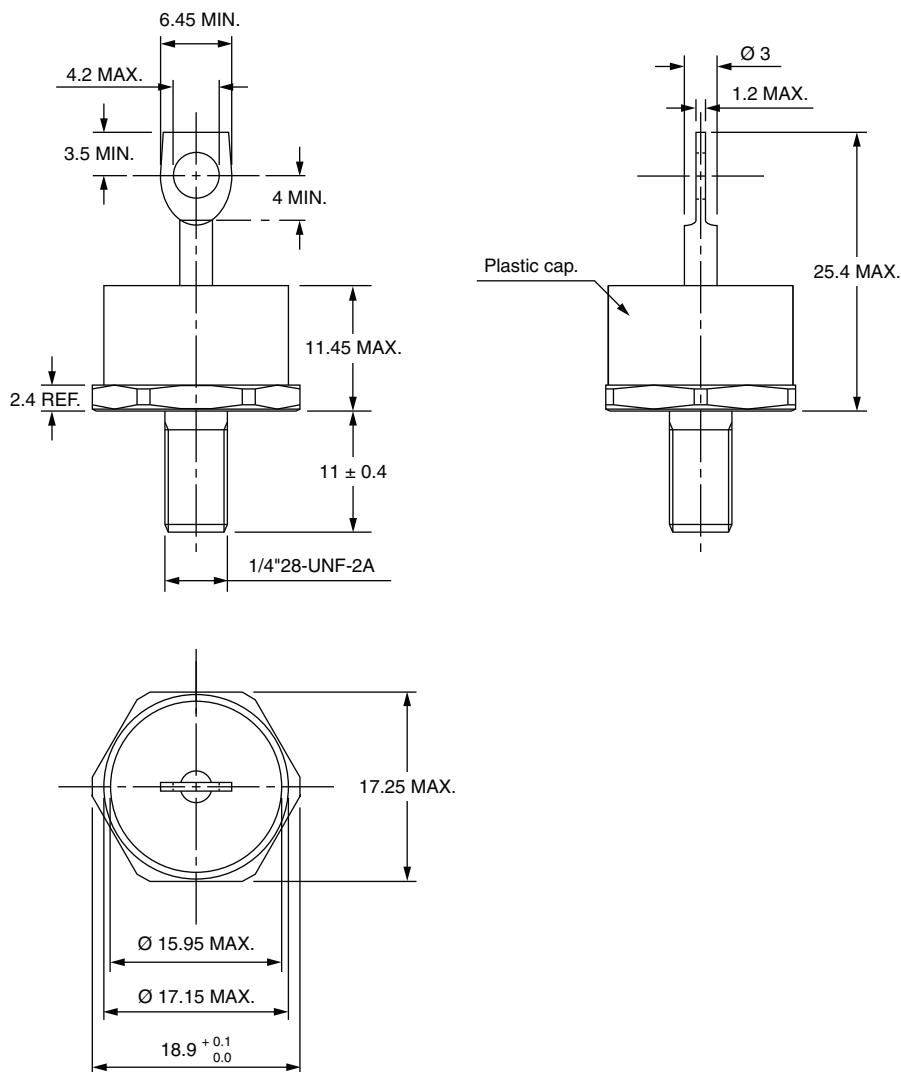
| Device code | VS- | 50 | PF | R | 160 | W |
|-------------|--|----|----|---|-----|---|
| | ① | ② | ③ | ④ | ⑤ | ⑥ |
| ① | - Vishay Semiconductors product | | | | | |
| ② | - 50 = Standard device | | | | | |
| ③ | - PF = Plastic package | | | | | |
| ④ | - • None = Stud normal polarity (cathode to stud) • 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 | www.vishay.com/doc?95345 |



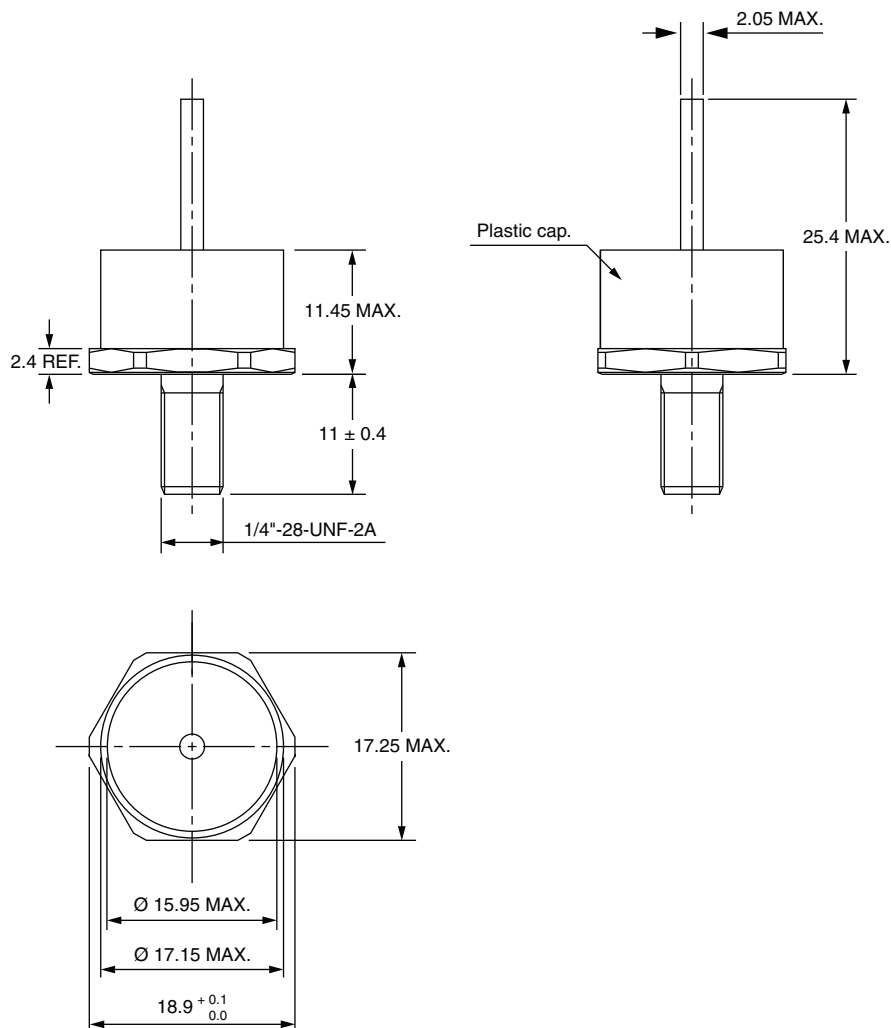
DO-203AB (DO-5) for 50PF(R)...(W), 80PF(R)...(W), and 95PF(R)...(W) Series

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



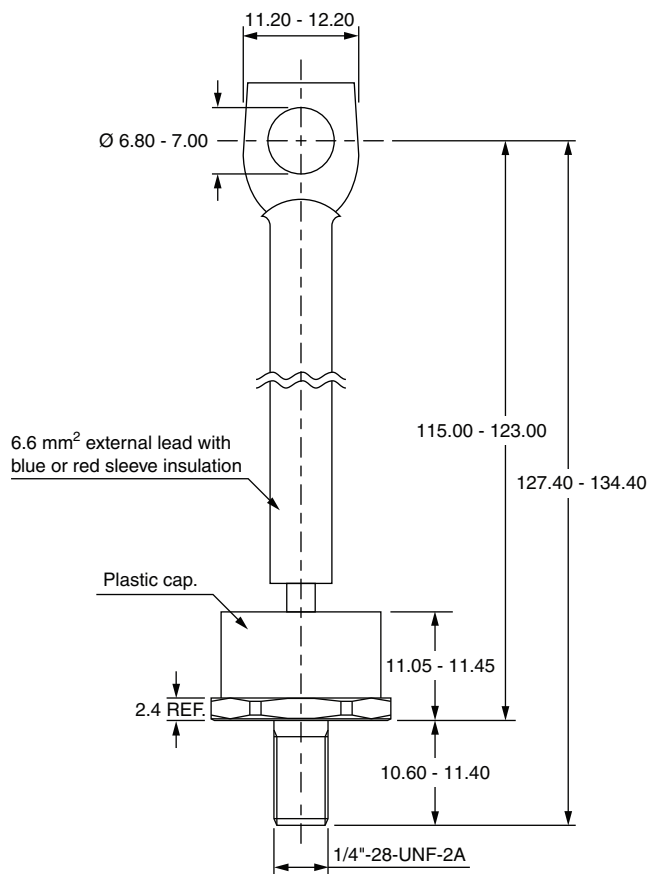


DIMENSIONS FOR 80PF(R)...(W), 50PF(R)...(W), AND 95PF(R)...(W) SERIES in millimeters





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





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.

Except as expressly indicated in writing, Vishay products are not designed for use in medical, life-saving, or life-sustaining applications or for any other application in which the failure of the Vishay product could result in personal injury or death. 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.