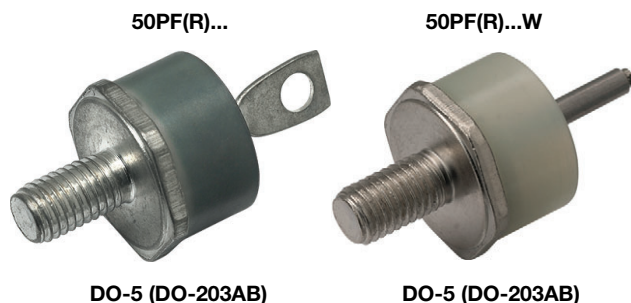


Standard Recovery Diodes, Generation 2 DO-5 (Stud Version), 50 A



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



TYPICAL APPLICATIONS

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

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	140	°C
$I_{F(RMS)}$		78	A
I_{FSM}	50 Hz	800	A
	60 Hz	830	
I^2t	50 Hz	3200	A ² s
	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
VS-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 ² t for fusing	I ² t	t = 10 ms	No voltage reapplied		3200	A ² s	
		t = 8.3 ms			2900		
		t = 10 ms	100 % V _{RRM} reapplied		2260		
		t = 8.3 ms			2050		
Maximum I ² √t for fusing	I ² √t	t = 0.1 ms to 10 ms, no voltage reapplied			32 000	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			1.40	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		Tightening on nut ⁽¹⁾ Not lubricated threads	3.4 + 0 - 10 % (30)	N · m (lbf · in)
		Tightening 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-5 (DO-203AB)	

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

 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

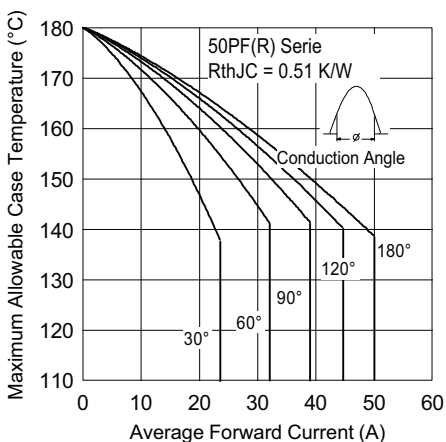


Fig. 1 - Current Ratings Characteristics

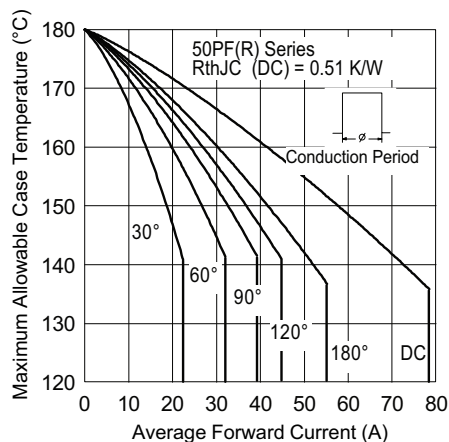


Fig. 2 - Current Ratings Characteristics

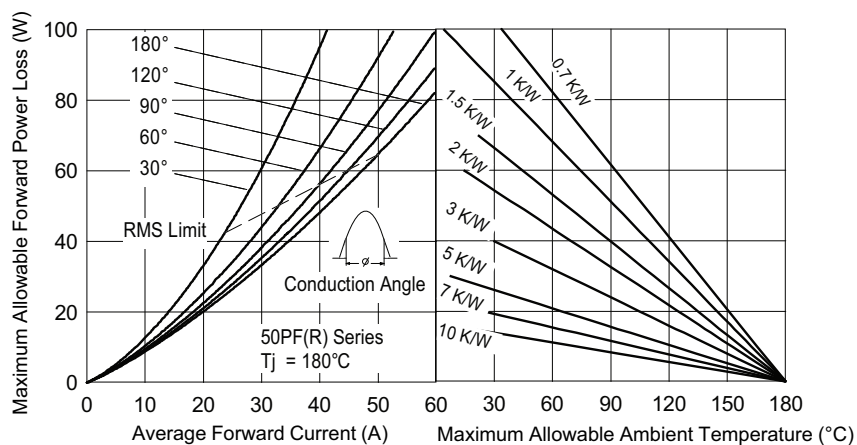


Fig. 3 - Forward Power Loss Characteristics

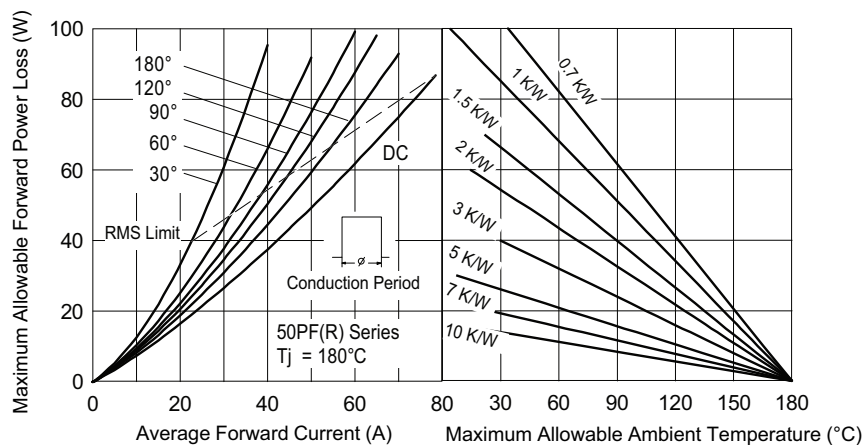


Fig. 4 - Forward Power Loss Characteristics

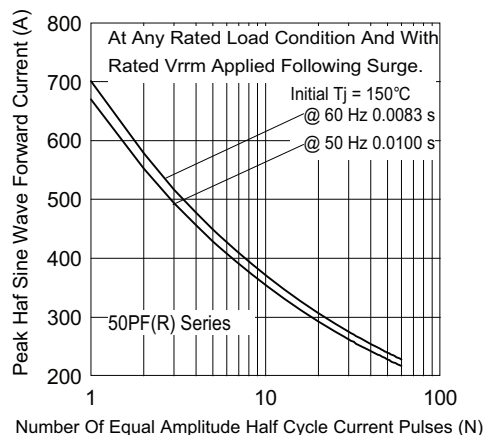


Fig. 5 - Maximum Non-Repetitive Surge Current

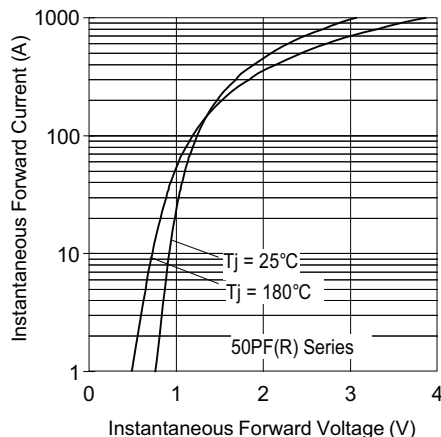


Fig. 7 - Forward Voltage Drop Characteristics

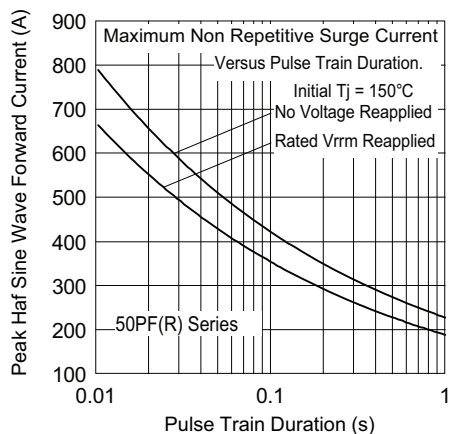
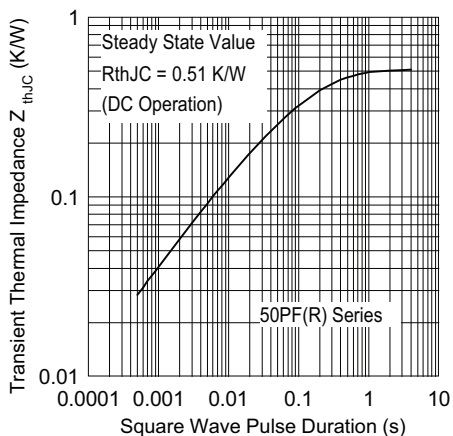


Fig. 6 - Maximum Non-Repetitive Surge Current


Fig. 8 - Thermal Impedance Z_{thJC} Characteristics



ORDERING INFORMATION TABLE

Device code	VS-	50	PF	R	120	W
	1	2	3	4	5	6

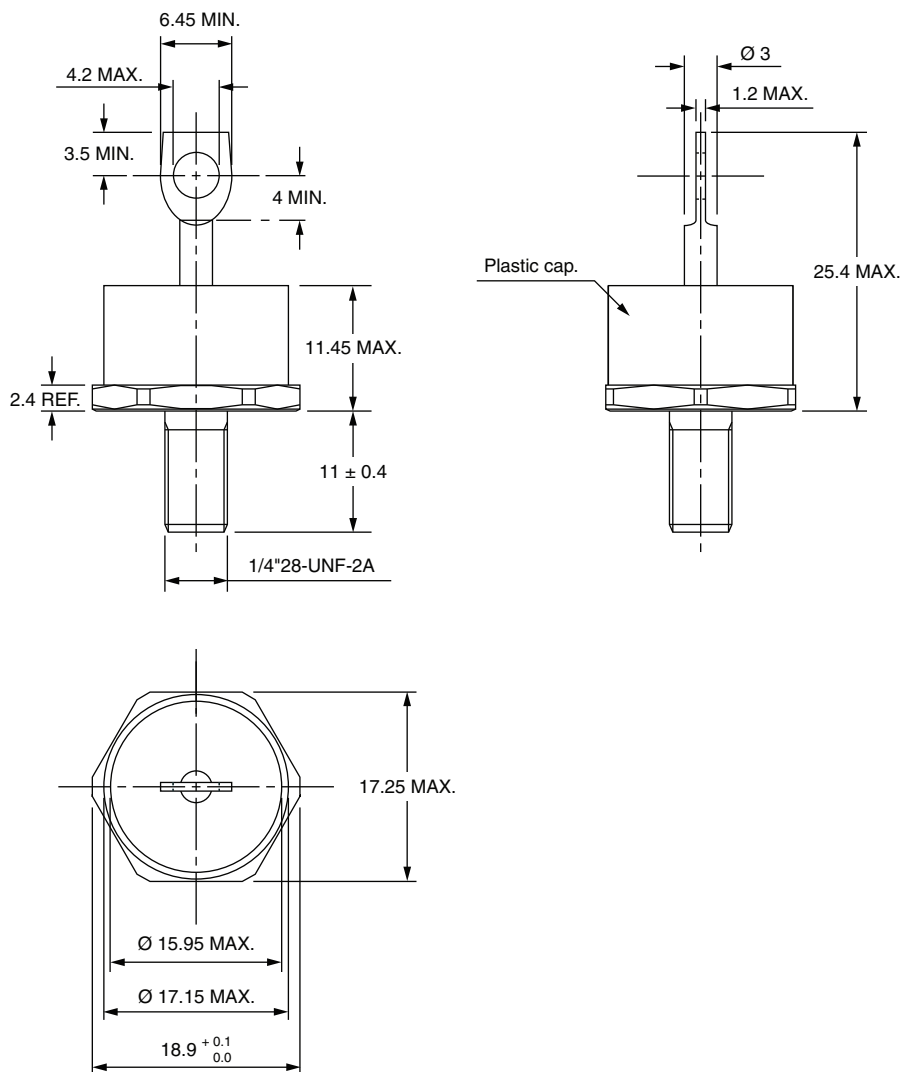
- 1** - Vishay Semiconductors product
- 2** -
 - 50 = standard device
 - 52 = isolated lead on standard terminal with silicone sleeve available for 1200 V only (red = reverse polarity) (blue = normal polarity)
- 3** - PF = plastic package
- 4** -
 - None = stud normal polarity (cathode to stud)
 - R = 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



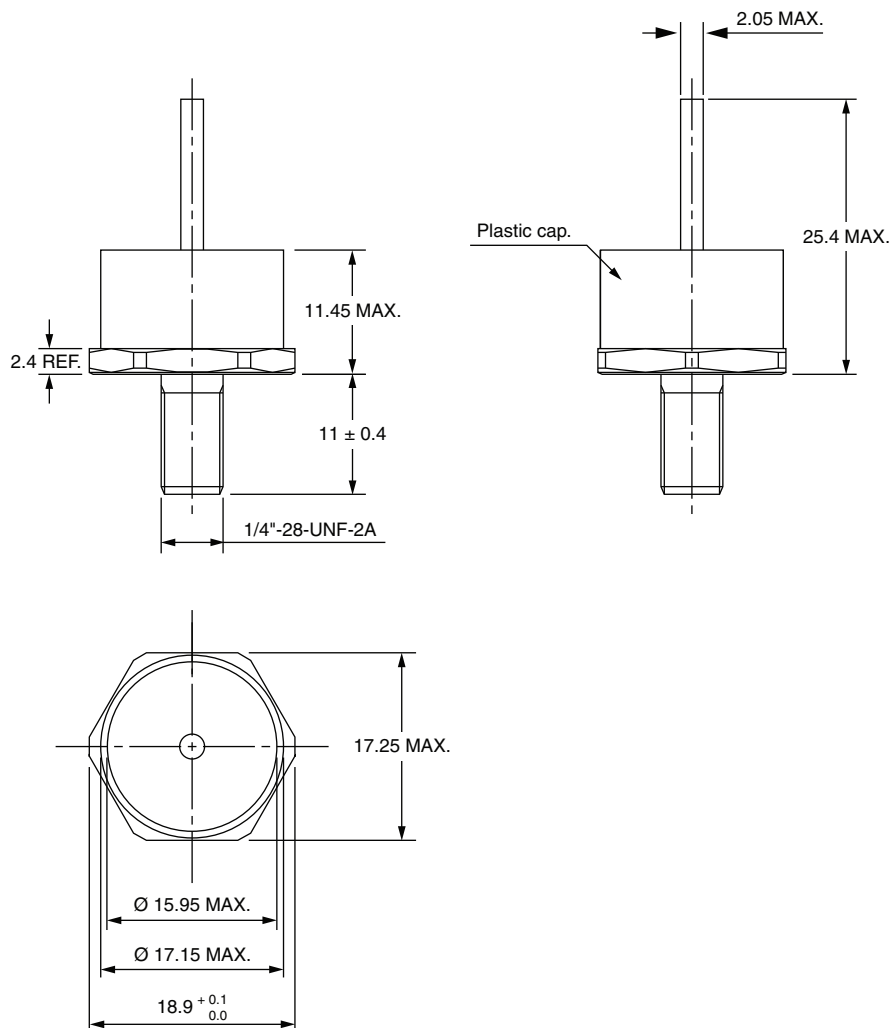
DO-203AB (DO-5) for 50PF(R)...(W), 80PF(R)...(W), and 95PF(R)...(W) Series

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



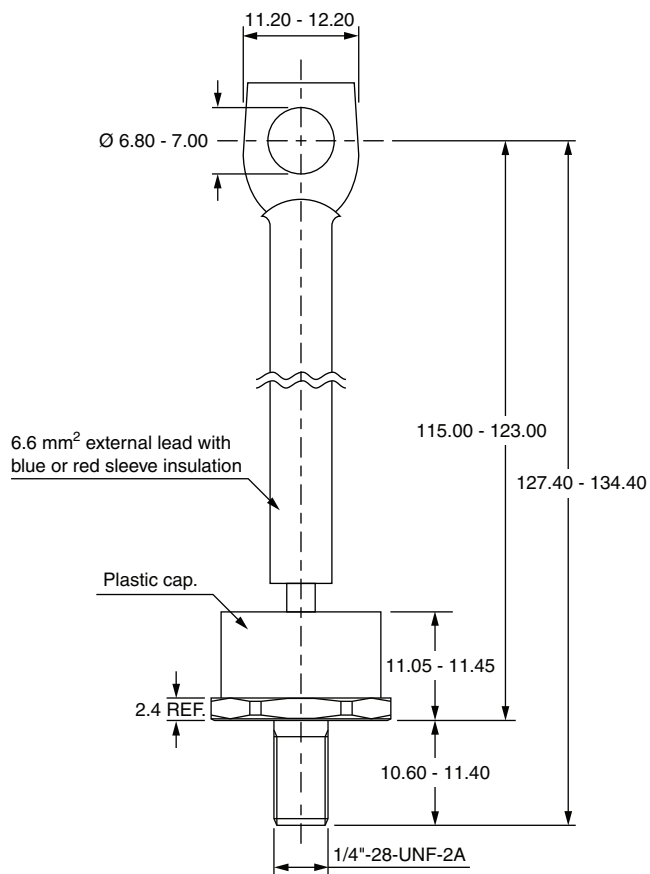


DIMENSIONS FOR 80PF(R)...(W), 50PF(R)...(W), AND 95PF(R)...(W) SERIES in millimeters





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.

Hyperlinks included in this datasheet may direct users to third-party websites. These links are provided as a convenience and for informational purposes only. Inclusion of these hyperlinks does not constitute an endorsement or an approval by Vishay of any of the products, services or opinions of the corporation, organization or individual associated with the third-party website. Vishay disclaims any and all liability and bears no responsibility for the accuracy, legality or content of the third-party website or for that of subsequent links.

Vishay products are not designed for use in life-saving or life-sustaining applications or any application in which the failure of the Vishay product could result in personal injury or death unless specifically qualified in writing by Vishay. 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.