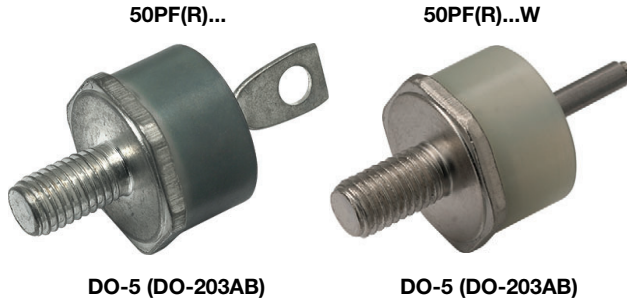


## Standard Recovery Diodes, Generation 2 DO-5 (Stud Version), 50 A



### 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](http://www.vishay.com/doc?99912)


**RoHS**  
COMPLIANT

### 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 <sup>2</sup> 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 reappplied	800	A
		t = 8.3 ms			
		t = 10 ms	100 % $V_{RRM}$ reappplied	670	
		t = 8.3 ms			
Maximum $I^2t$ for fusing	$I^2t$	t = 10 ms	No voltage reappplied	3200	A <sup>2</sup> s
		t = 8.3 ms			
		t = 10 ms	100 % $V_{RRM}$ reappplied	2260	
		t = 8.3 ms			
Maximum $I^2\sqrt{t}$ for fusing	$I^2\sqrt{t}$	t = 0.1 ms to 10 ms, no voltage reappplied		32 000	A <sup>2</sup> /s
Low level value of threshold voltage	$V_{F(TO)}$	(16.7 % $\times \pi \times I_{F(AV)} < I < \pi \times I_{F(AV)}$ ), $T_J = T_J$ maximum		0.77	V
Low level value of forward slope resistance	$r_f$	(16.7 % $\times \pi \times I_{F(AV)} < I < \pi \times I_{F(AV)}$ ), $T_J = T_J$ 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 <sup>(1)</sup> Not lubricated threads		3.4 + 0 - 10 % (30)	N · m (lbf · in)
		Tighting on hexagon <sup>(2)</sup> 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

$\Delta R_{thJC}$ 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

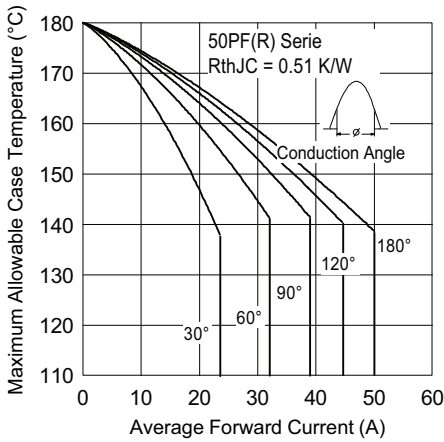


Fig. 1 - Current Ratings Characteristics

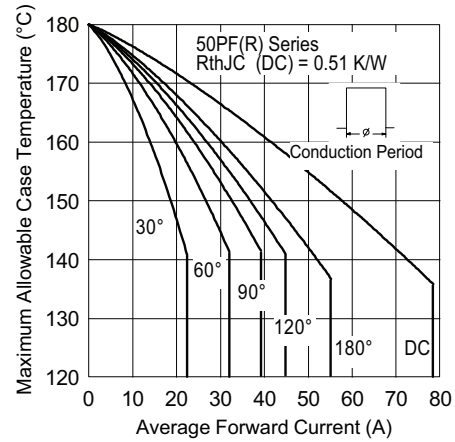


Fig. 2 - Current Ratings Characteristics

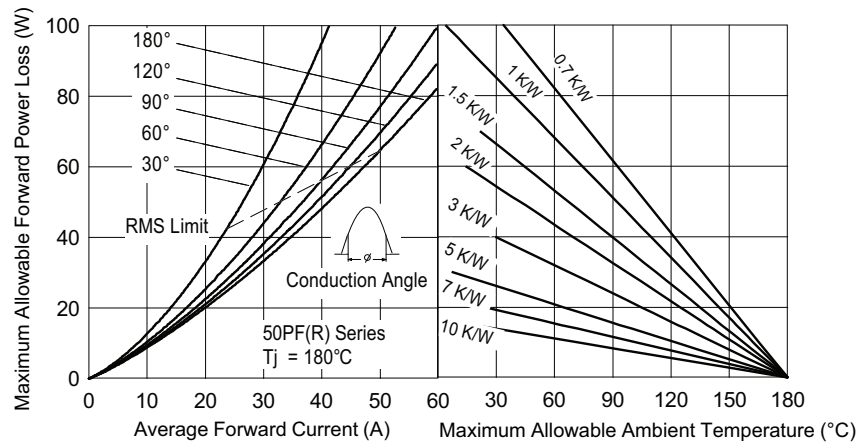


Fig. 3 - Forward Power Loss Characteristics

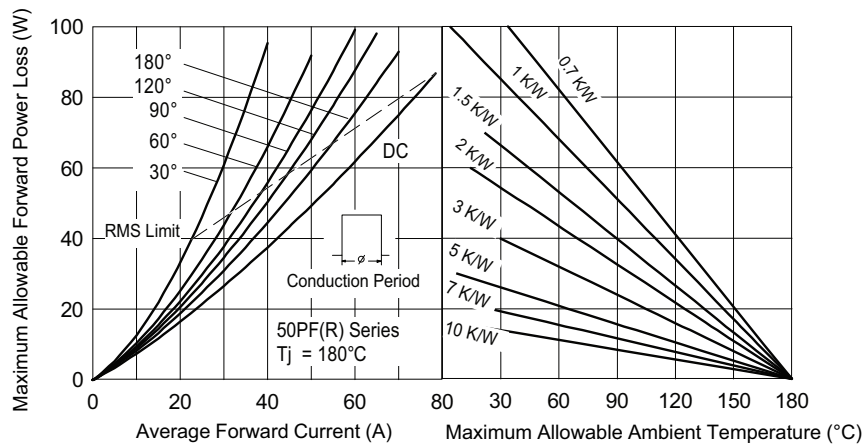


Fig. 4 - Forward Power Loss Characteristics

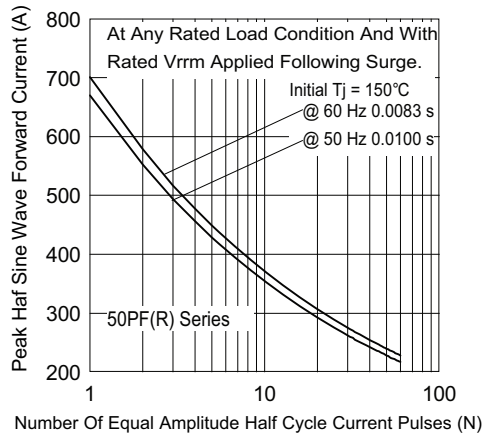


Fig. 5 - Maximum Non-Repetitive Surge Current

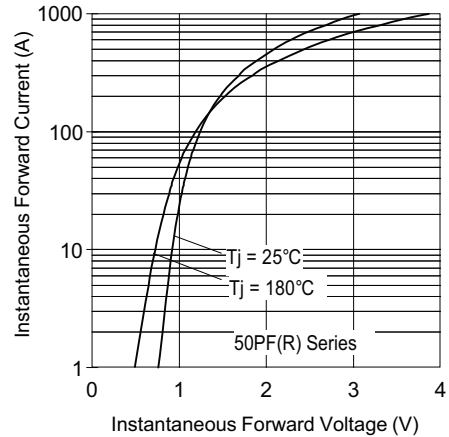


Fig. 7 - Forward Voltage Drop Characteristics

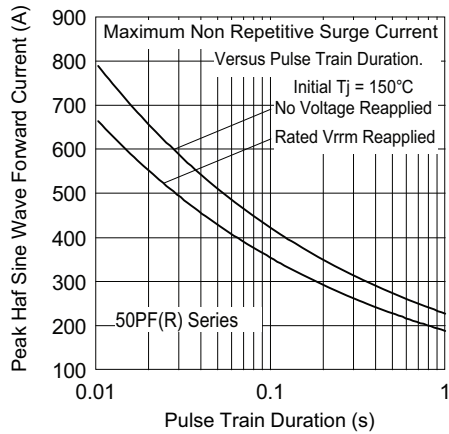


Fig. 6 - Maximum Non-Repetitive Surge Current

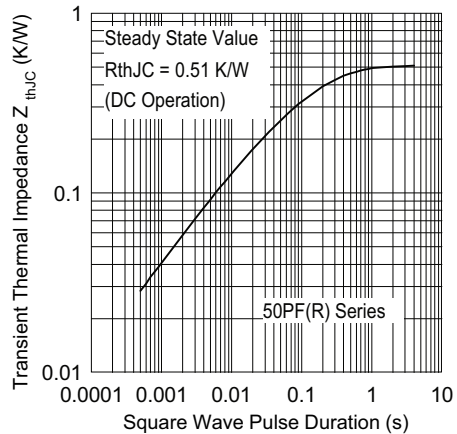
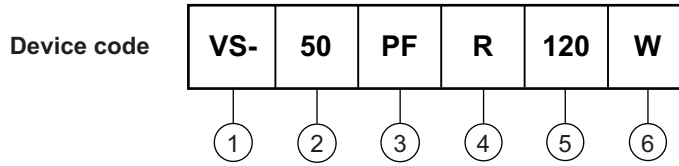


Fig. 8 - Thermal Impedance  $Z_{thJC}$  Characteristics



## ORDERING INFORMATION TABLE



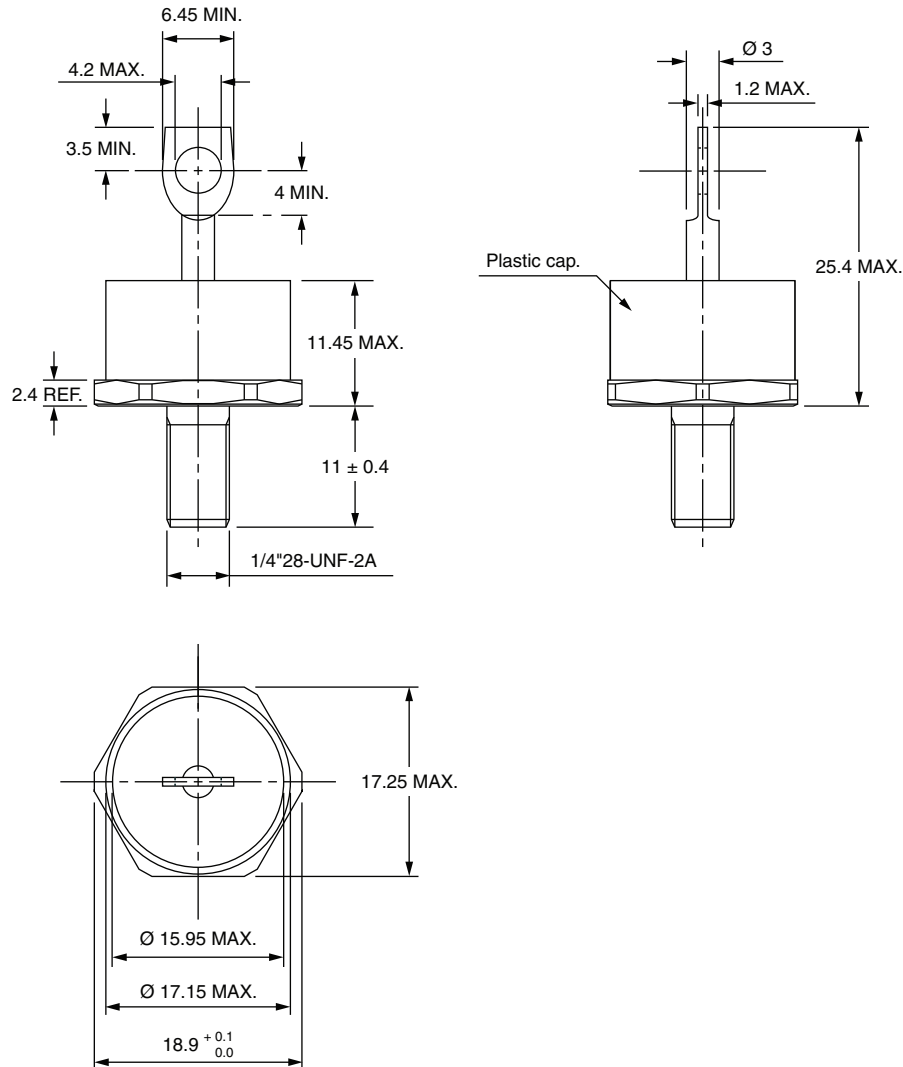
- 1 - Vishay Semiconductors product
- 2 -
  - 50 = standard device
  - 52 = isolated lead on standard terminal with silicone sleeve available for 1200 V only (red = reverse polarity) (blue = normal polarity)
- 3 - PF = plastic package
- 4 -
  - None = stud normal polarity (cathode to stud)
  - R = stud 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	<a href="http://www.vishay.com/doc?95345">www.vishay.com/doc?95345</a>



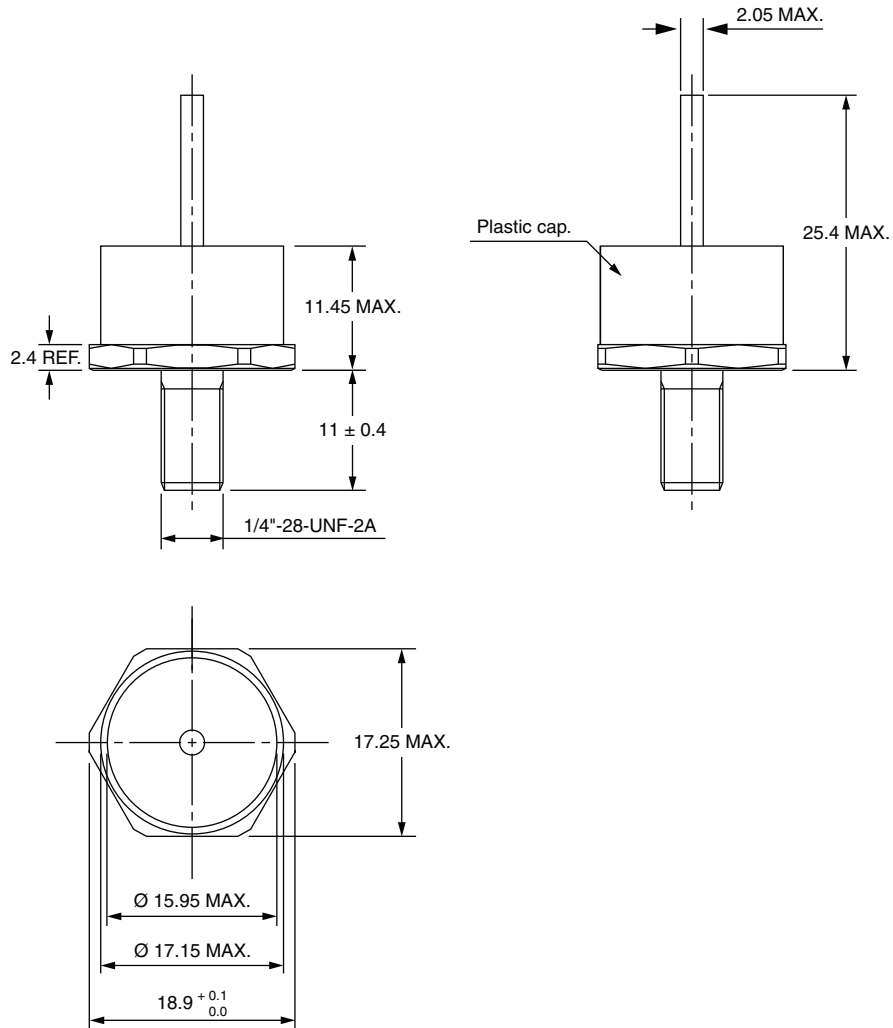
## DO-203AB (DO-5) for 50PF(R)...(W), 80PF(R)...(W), and 95PF(R)...(W) Series

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



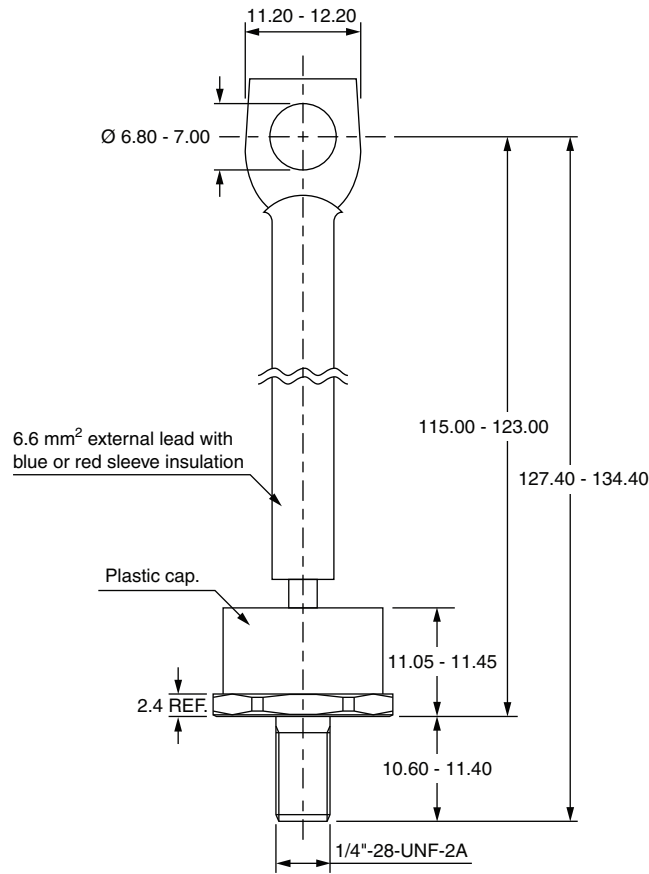


### DIMENSIONS FOR 80PF(R)...(W), 50PF(R)...(W), AND 95PF(R)...(W) SERIES in millimeters





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







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