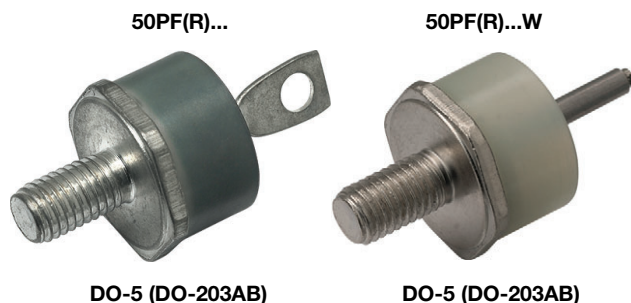


## Standard Recovery Diodes, Generation 2 DO-5 (Stud Version), 50 A



### 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 $T_J = 150\text{ °C}$ 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 <sub>F(AV)</sub>	180° conduction, half sine wave			50	A	
					140	°C	
Maximum RMS forward current	I <sub>F(RMS)</sub>				78	A	
Maximum peak, one-cycle forward, non-repetitive surge current	I <sub>FSM</sub>	t = 10 ms	No voltage reappplied	Sinusoidal half wave, initial T <sub>J</sub> = 150 °C	800	A	
		t = 8.3 ms			830		
		t = 10 ms	100 % V <sub>RRM</sub> reappplied		670		
		t = 8.3 ms			700		
Maximum I <sup>2</sup> t for fusing	I <sup>2</sup> t	t = 10 ms	No voltage reappplied		3200	A <sup>2</sup> s	
		t = 8.3 ms			2900		
		t = 10 ms	100 % V <sub>RRM</sub> reappplied		2260		
		t = 8.3 ms			2050		
Maximum I <sup>2</sup> √t for fusing	I <sup>2</sup> √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 <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			0.77	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			4.30	mΩ	
Maximum forward voltage drop	V <sub>FM</sub>	I <sub>pk</sub> = 125 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	$T_J, T_{Stg}$		-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

**Δ $R_{thJC}$  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

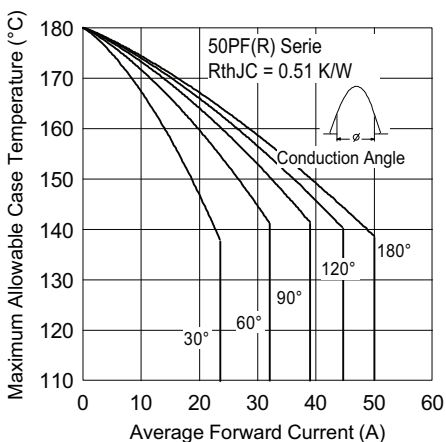


Fig. 1 - Current Ratings Characteristics

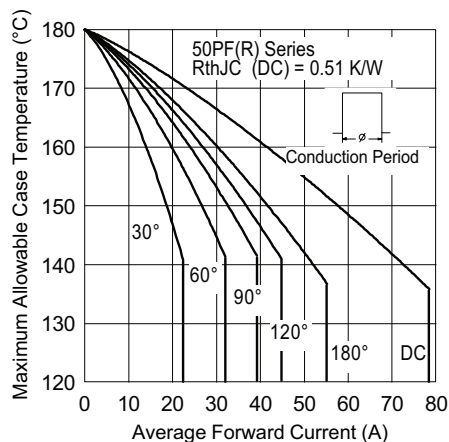


Fig. 2 - Current Ratings Characteristics

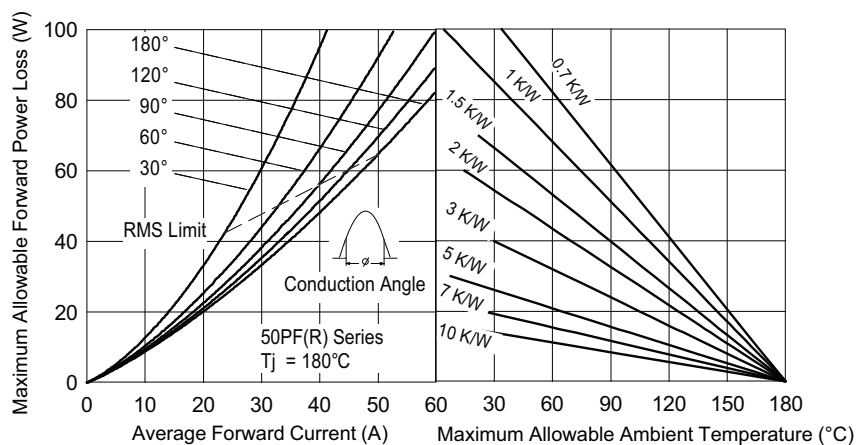


Fig. 3 - Forward Power Loss Characteristics

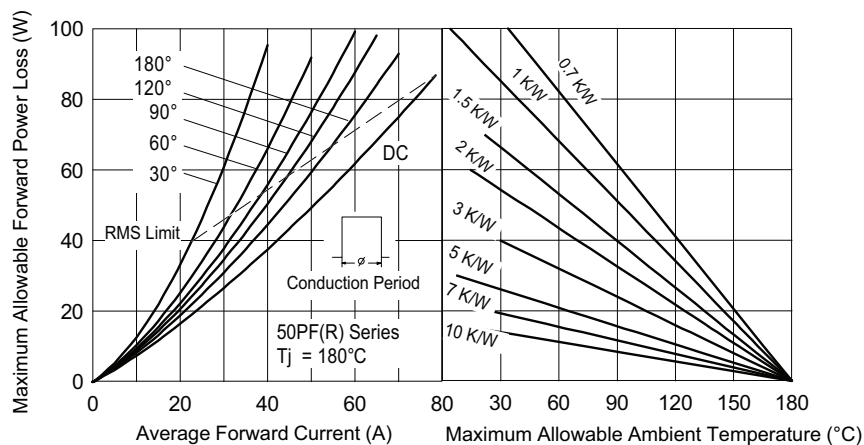


Fig. 4 - Forward Power Loss Characteristics

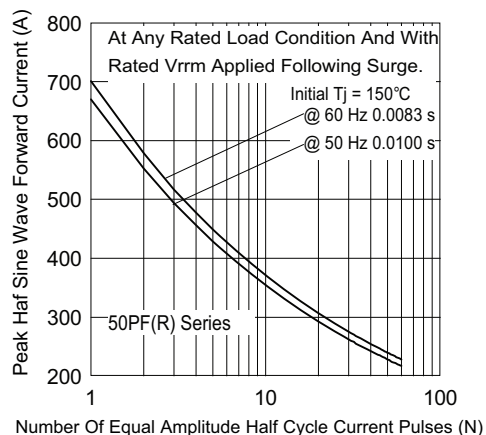


Fig. 5 - Maximum Non-Repetitive Surge Current

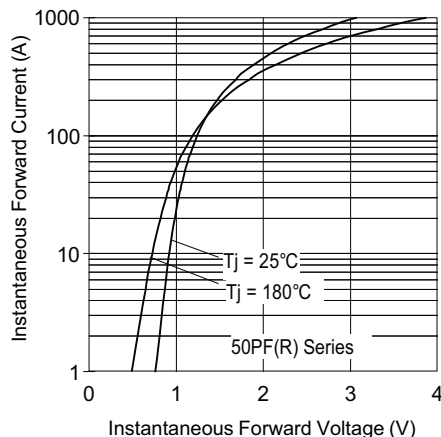


Fig. 7 - Forward Voltage Drop Characteristics

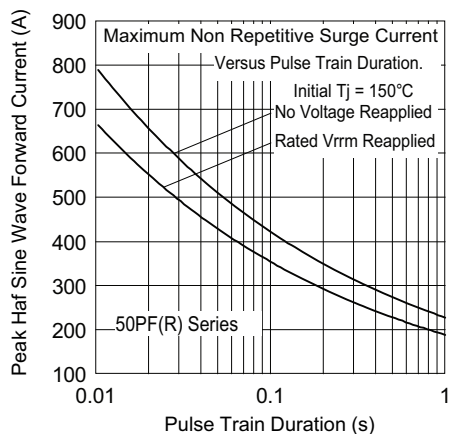
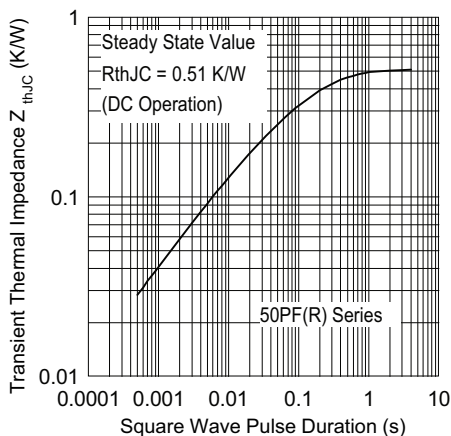


Fig. 6 - Maximum Non-Repetitive Surge Current


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



## ORDERING INFORMATION TABLE

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

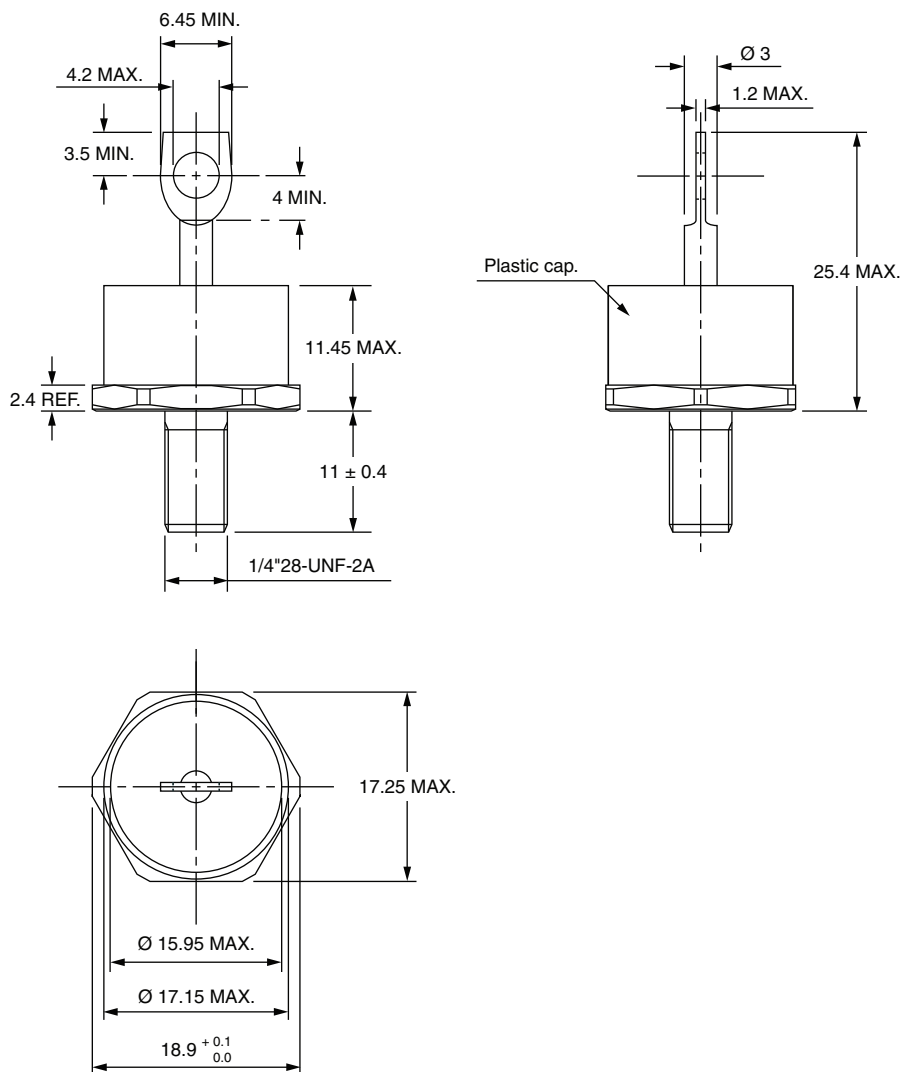
- |          |   |   |
|----------|---|---|
| <b>1</b> | - | Vishay Semiconductors product   |
| <b>2</b> | - | <ul style="list-style-type: none"><li>• 50 = standard device</li><li>• 52 = isolated lead on standard terminal with silicone sleeve available for 1200 V only (red = reverse polarity) (blue = normal polarity)</li></ul>             |
| <b>3</b> | - | PF = plastic package  |
| <b>4</b> | - | <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>   |
| <b>5</b> | - | Voltage code x 10 = $V_{RRM}$ (see Voltage Ratings table)   |
| <b>6</b> | - | <ul style="list-style-type: none"><li>• None = standard terminal (see dimensions for 50PF(R)... - link at the end of datasheet)</li><li>• W = wire terminal (see dimensions for 50PF(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>



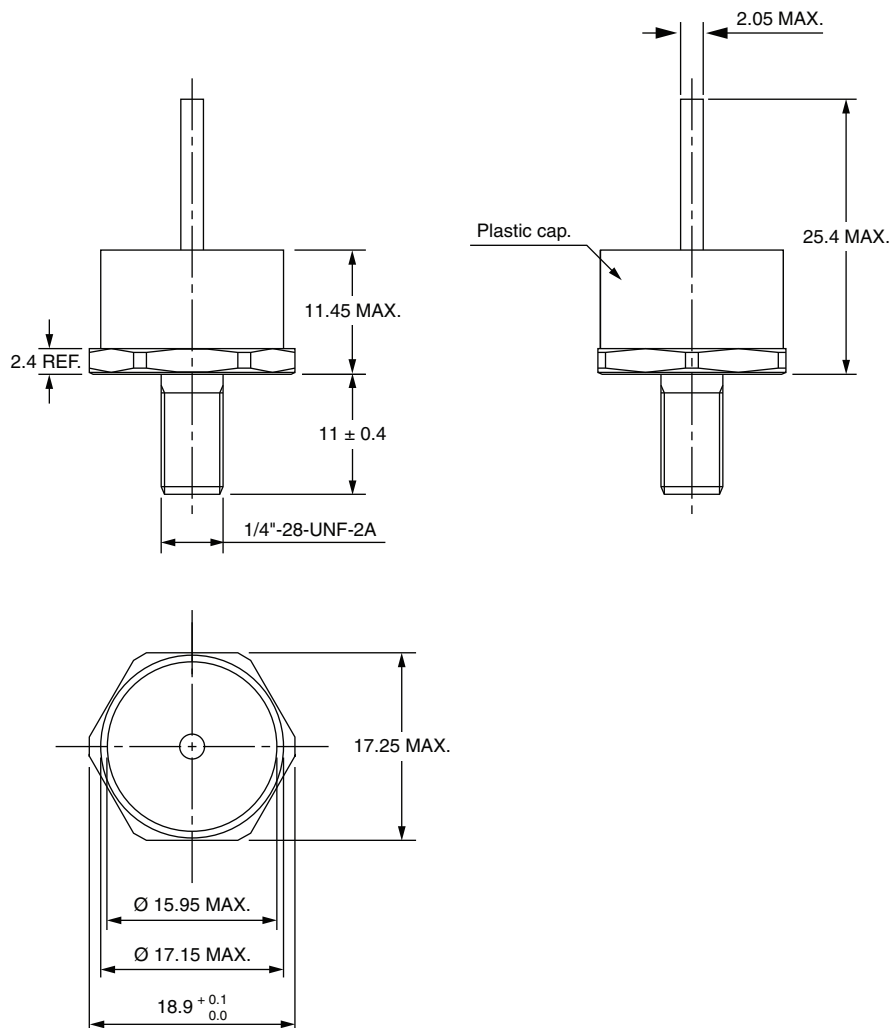
## DO-203AB (DO-5) for 50PF(R)...(W), 80PF(R)...(W), and 95PF(R)...(W) Series

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



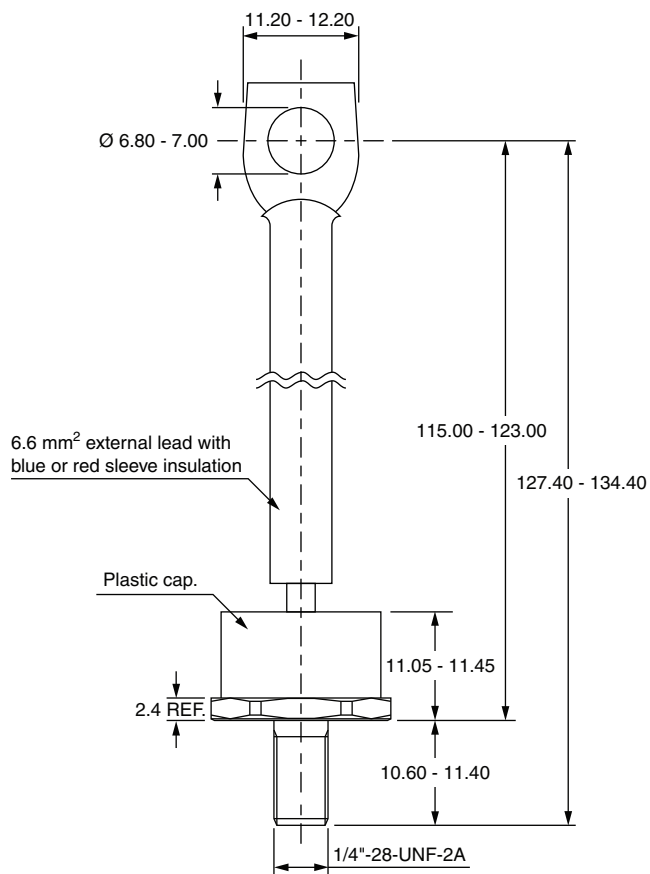


## DIMENSIONS FOR 80PF(R)...(W), 50PF(R)...(W), AND 95PF(R)...(W) SERIES in millimeters





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







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