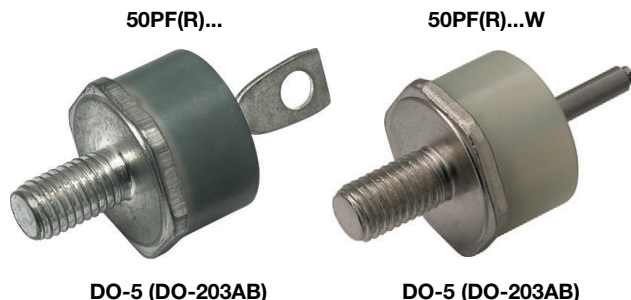


## Standard Recovery Diodes, Generation 2 DO-5 (Stud Version), 50 A



### 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)



### TYPICAL APPLICATIONS

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

### 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
	$T_C$	128	°C
$I_{F(RMS)}$		78	A
$I_{FSM}$	50 Hz	570	A
	60 Hz	595	
$I^2t$	50 Hz	1600	A <sup>2</sup> 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 <sub>F(AV)</sub>	180° conduction, half sine wave			50	A
					128	°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 reapplied	Sinusoidal half wave, initial T <sub>J</sub> = 150 °C	570	A
		t = 8.3 ms			595	
		t = 10 ms	100 % V <sub>RRM</sub> reapplied		480	
		t = 8.3 ms			500	
Maximum I <sup>2</sup> t for fusing	I <sup>2</sup> t	t = 10 ms	No voltage reapplied		1600	A <sup>2</sup> s
		t = 8.3 ms			1450	
		t = 10 ms	100 % V <sub>RRM</sub> reapplied		1150	
		t = 8.3 ms			1050	
Maximum I <sup>2</sup> √t for fusing	I <sup>2</sup> √t	t = 0.1 ms to 10 ms, no voltage reapplied			16 000	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			1.50	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 <sup>(1)</sup>	3.4 (30)	N · m (lbf · in)
		Lubricated thread, tightening on nut <sup>(1)</sup>	2.3 (20)	
		Not lubricated thread, tightening on hexagon <sup>(2)</sup>	4.2 (37)	
		Lubricated thread, tightening on hexagon <sup>(2)</sup>	3.2 (28)	
Approximate weight			15.8	g
			0.56	oz.
Case style		See dimensions - link at the end of datasheet	DO-5 (DO-203AB)	

**Notes**

- (1) Recommended for pass-through holes  
 (2) Torque must be applicable only to hexagon and not to plastic structure, recommended for holed heatsink

 **$\Delta R_{thJC}$  CONDUCTION**

CONDUCTION ANGLE	SINUSOIDAL CONDUCTION	RECTANGULAR CONDUCTION	TEST CONDITIONS	UNITS
180°	0.11	0.10	$T_J = T_J\text{ maximum}$	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

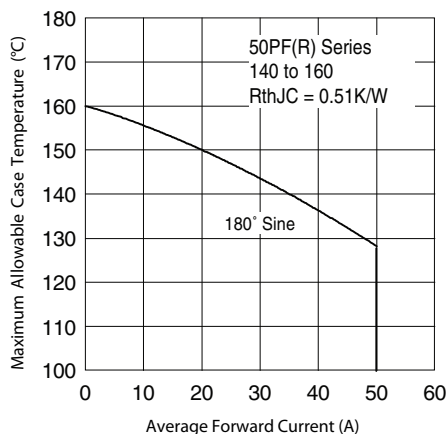


Fig. 1 - Current Ratings Characteristics

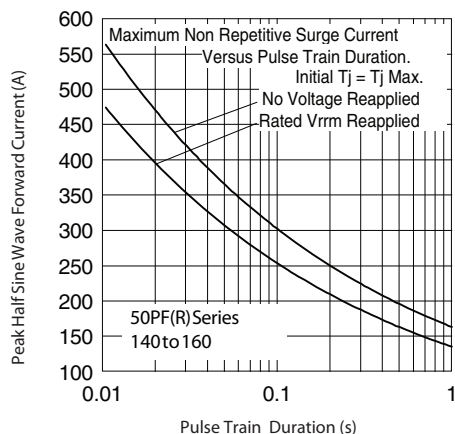


Fig. 3 - Maximum Non-Repetitive Surge Current

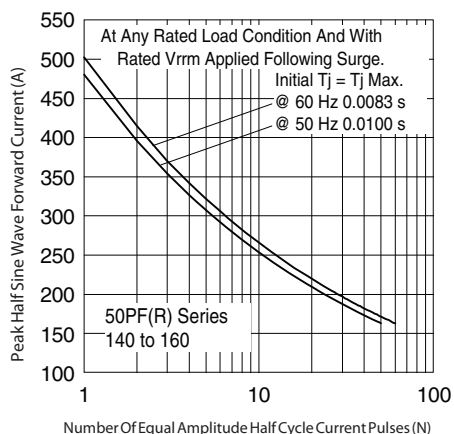


Fig. 2 - Maximum Non-Repetitive Surge Current

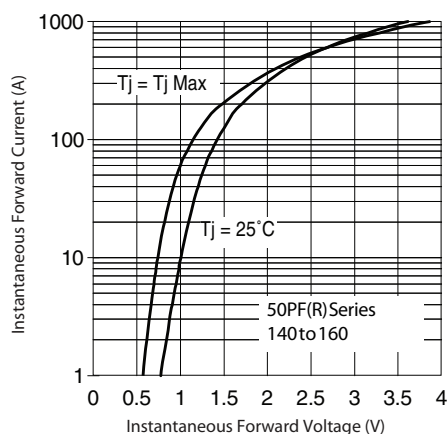


Fig. 4 - Forward Voltage Drop Characteristics

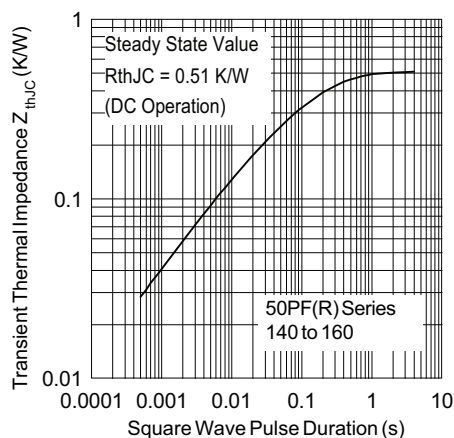


Fig. 5 - Thermal Impedance  $Z_{thJC}$  Characteristics



## ORDERING INFORMATION TABLE

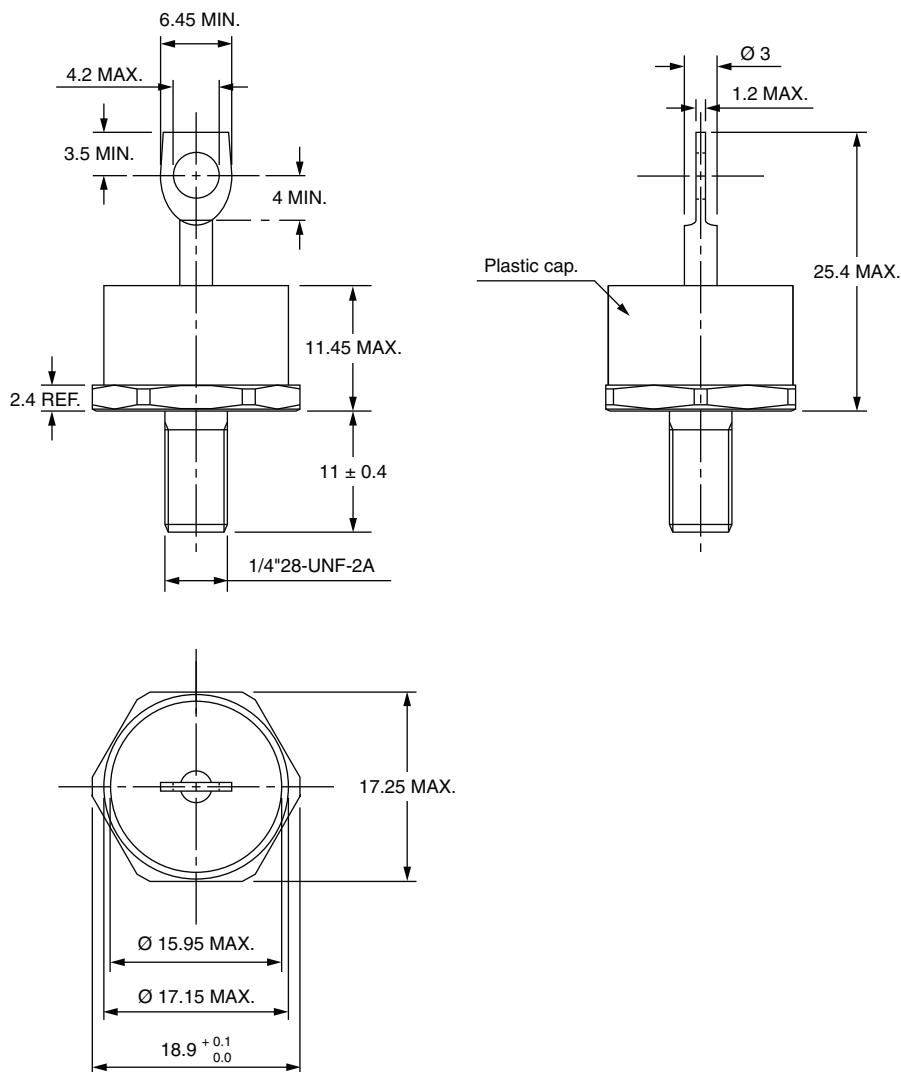
Device code	VS-	50	PF	R	160	W
	1	2	3	4	5	6
1	- Vishay Semiconductors product					
2	- 50 = standard device					
3	- PF = plastic package					
4	- <ul style="list-style-type: none"><li>None = stud normal polarity (cathode to stud)</li><li>R = stud reverse polarity (anode to stud)</li></ul>					
5	- Voltage code x 10 = $V_{RRM}$ (see Voltage Ratings table)					
6	- <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>



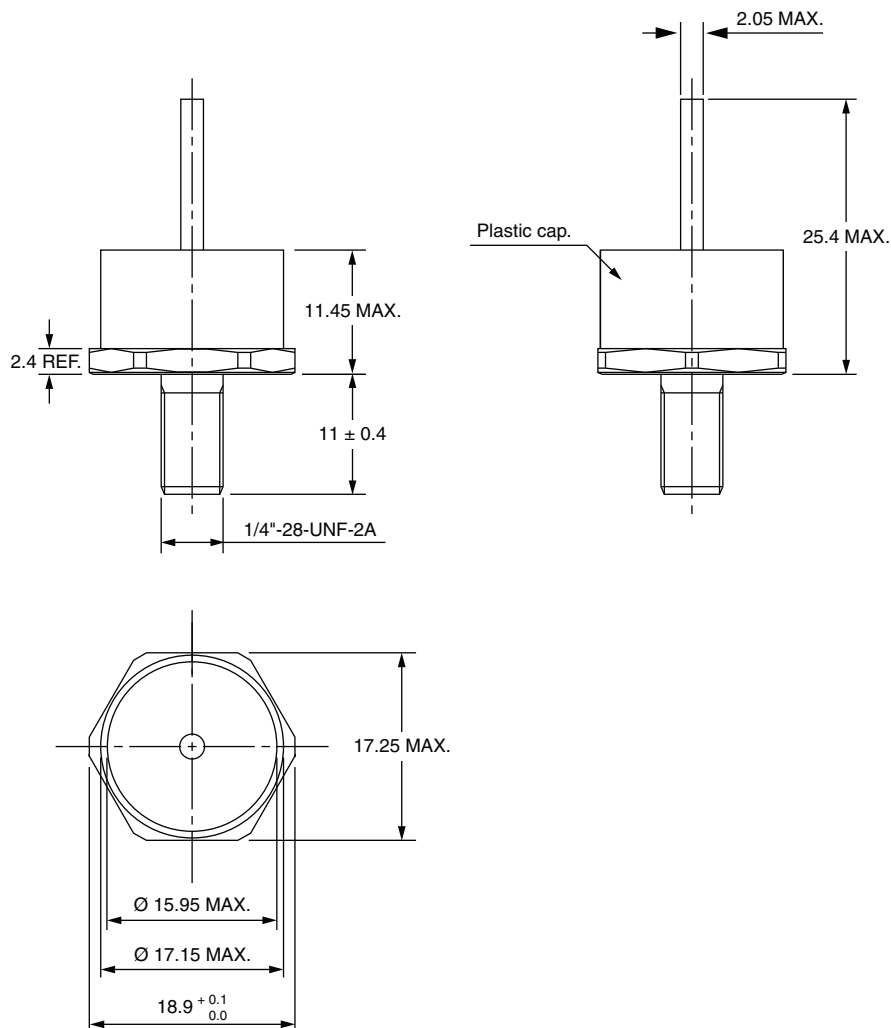
## DO-203AB (DO-5) for 50PF(R)...(W), 80PF(R)...(W), and 95PF(R)...(W) Series

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



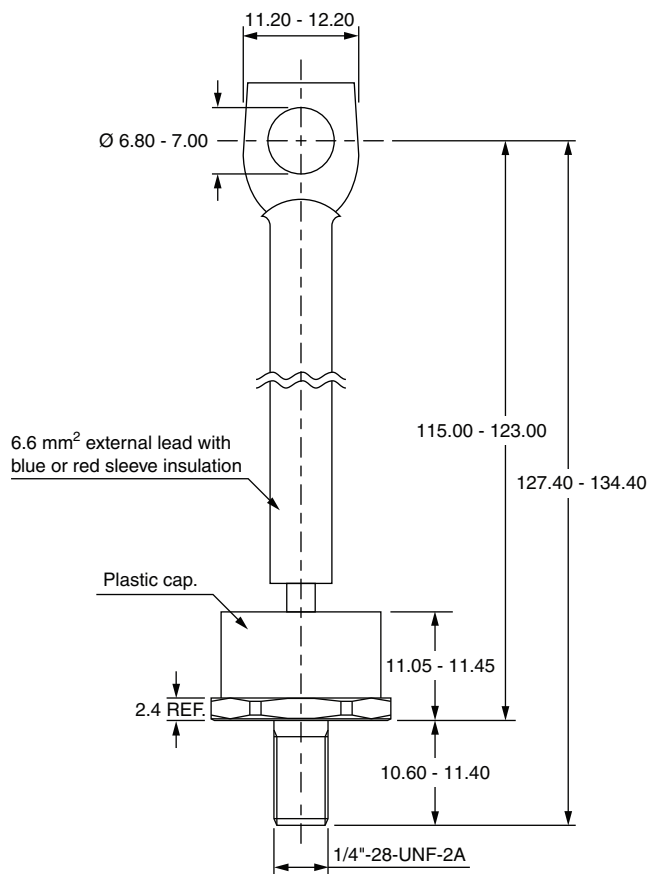


## DIMENSIONS FOR 80PF(R)...(W), 50PF(R)...(W), AND 95PF(R)...(W) SERIES in millimeters





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





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