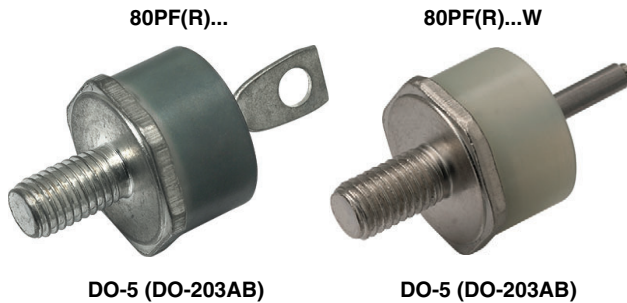




**THE DATASHEET OF  
VS-80PF40W**



## Standard Recovery Diodes, Generation 2 DO-5 (DO-203AB) (Stud Version), 80 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**

$I_{F(AV)}$	80 A
Package	DO-5 (DO-203AB)
Circuit configuration	Single

**MAJOR RATINGS AND CHARACTERISTICS**

PARAMETER	TEST CONDITIONS	VALUES	UNITS
$I_{F(AV)}$		80	A
	$T_C$	140	°C
$I_{F(RMS)}$		126	A
$I_{FSM}$	50 Hz	1500	A
	60 Hz	1570	
$I^2t$	50 Hz	11 250	A <sup>2</sup> s
	60 Hz	10 230	
$V_{RRM}$	Range	400 to 1200	V
$T_J$		-55 to +180	°C

**ELECTRICAL SPECIFICATIONS**
**VOLTAGE RATINGS**

TYPE NUMBER	VOLTAGE CODE	V <sub>RRM</sub> , MAXIMUM REPETITIVE PEAK REVERSE VOLTAGE V	V <sub>RSM</sub> , MAXIMUM NON-REPETITIVE PEAK REVERSE VOLTAGE V	I <sub>RRM</sub> MAXIMUM AT T <sub>J</sub> = 150 °C mA
VS-80PF(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		80	A	
				140	°C	
Maximum RMS forward current	$I_{F(RMS)}$			126	A	
Maximum peak, one-cycle forward, non-repetitive surge current	$I_{FSM}$	t = 10 ms	No voltage reappplied	1500	A	
		t = 8.3 ms		Sinusoidal half wave, initial $T_J = 150\text{ °C}$		1570
		t = 10 ms	100 % $V_{RRM}$ reappplied			1260
		t = 8.3 ms				1320
Maximum $I^2t$ for fusing	$I^2t$	t = 10 ms	No voltage reappplied		11 250	A <sup>2</sup> s
		t = 8.3 ms		100 % $V_{RRM}$ reappplied	10 230	
		t = 10 ms	7950			
		t = 8.3 ms	7200			
Maximum $I^2\sqrt{t}$ for fusing	$I^2\sqrt{t}$	t = 0.1 ms to 10 ms, no voltage reappplied			112 500	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		0.73	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		3.0	mΩ	
Maximum forward voltage drop	$V_{FM}$	$I_{pk} = 220\text{ A}$ , $T_J = 25\text{ °C}$ , $t_p = 400\text{ }\mu\text{s}$ 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		0.30	K/W
Maximum thermal resistance, case to heatsink	$R_{thCS}$	Mounting surface, smooth, flat and greased		0.25	
Allowable mounting torque		Not lubricated threads, tightening on nut <sup>(1)</sup>		3.4 (30)	N · m (lbf · in)
		Lubricated threads, tightening on nut <sup>(1)</sup>		2.3 (20)	
		Not lubricated threads, tightening on Hexagon <sup>(2)</sup>		4.2 (37)	
		Lubricated threads, 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°	0.14	0.10	$T_J = T_J$ maximum	K/W
120°	0.16	0.17		
90°	0.21	0.22		
60°	0.30	0.31		
30°	0.50	0.50		

**Note**

- The table above shows the increment of thermal resistance  $R_{thJC}$  when devices operate at different conduction angles than DC

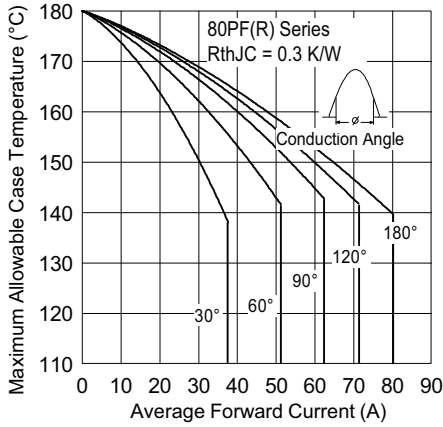


Fig. 1 - Current Ratings Characteristics

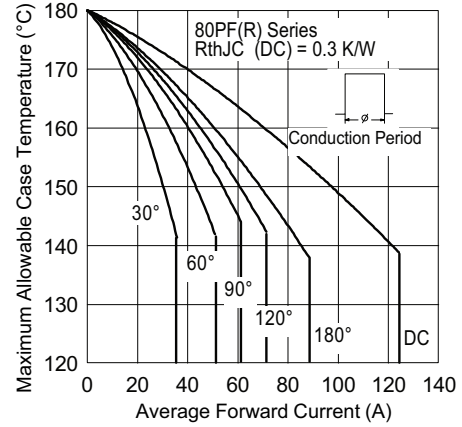


Fig. 2 - Current Ratings Characteristics

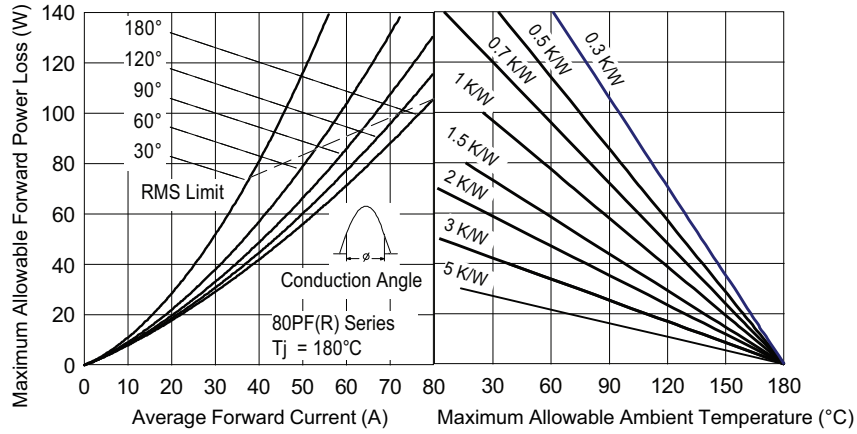


Fig. 3 - Forward Power Loss Characteristics

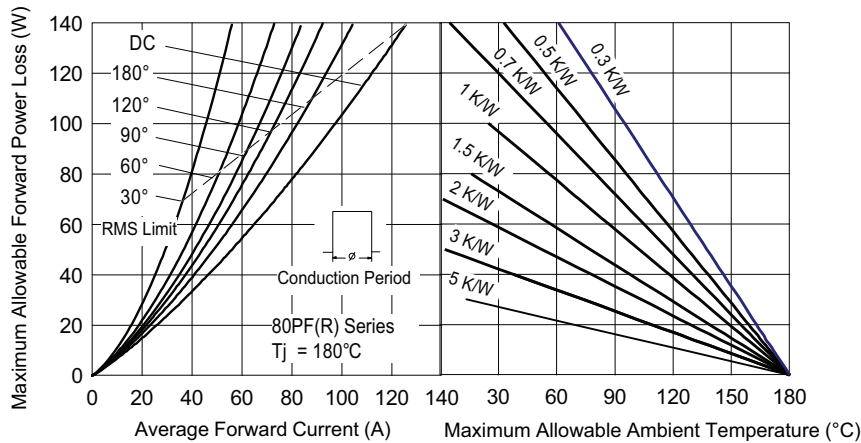


Fig. 4 - Forward Power Loss Characteristics

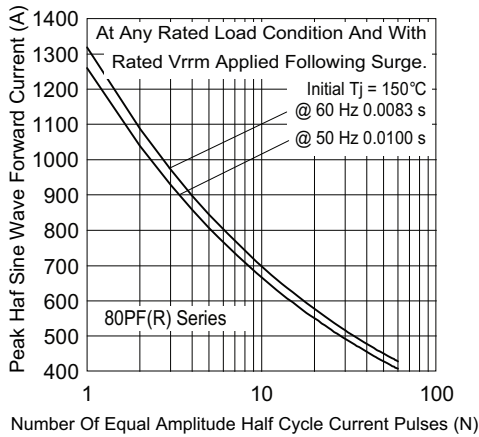


Fig. 5 - Maximum Non-Repetitive Surge Current

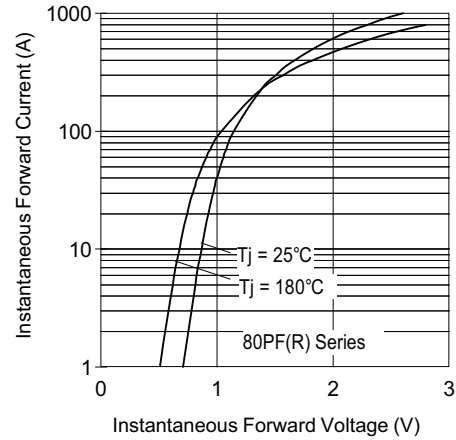


Fig. 7 - Forward Voltage Drop Characteristics

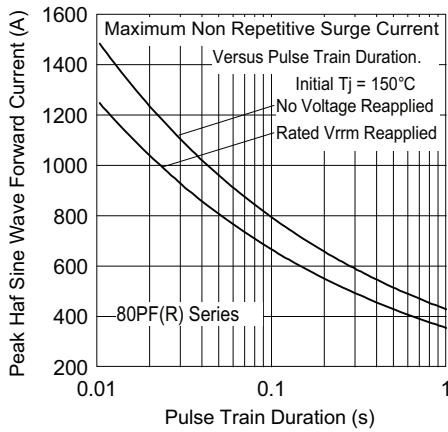


Fig. 6 - Maximum Non-Repetitive Surge Current

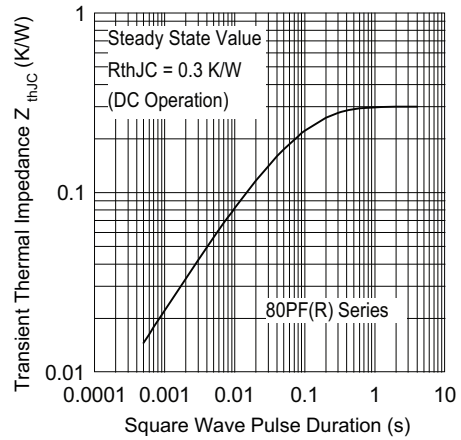
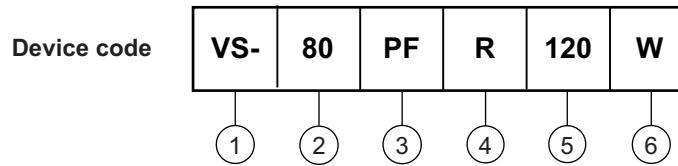


Fig. 8 - Thermal Impedance  $Z_{thJC}$  Characteristics



## ORDERING INFORMATION TABLE



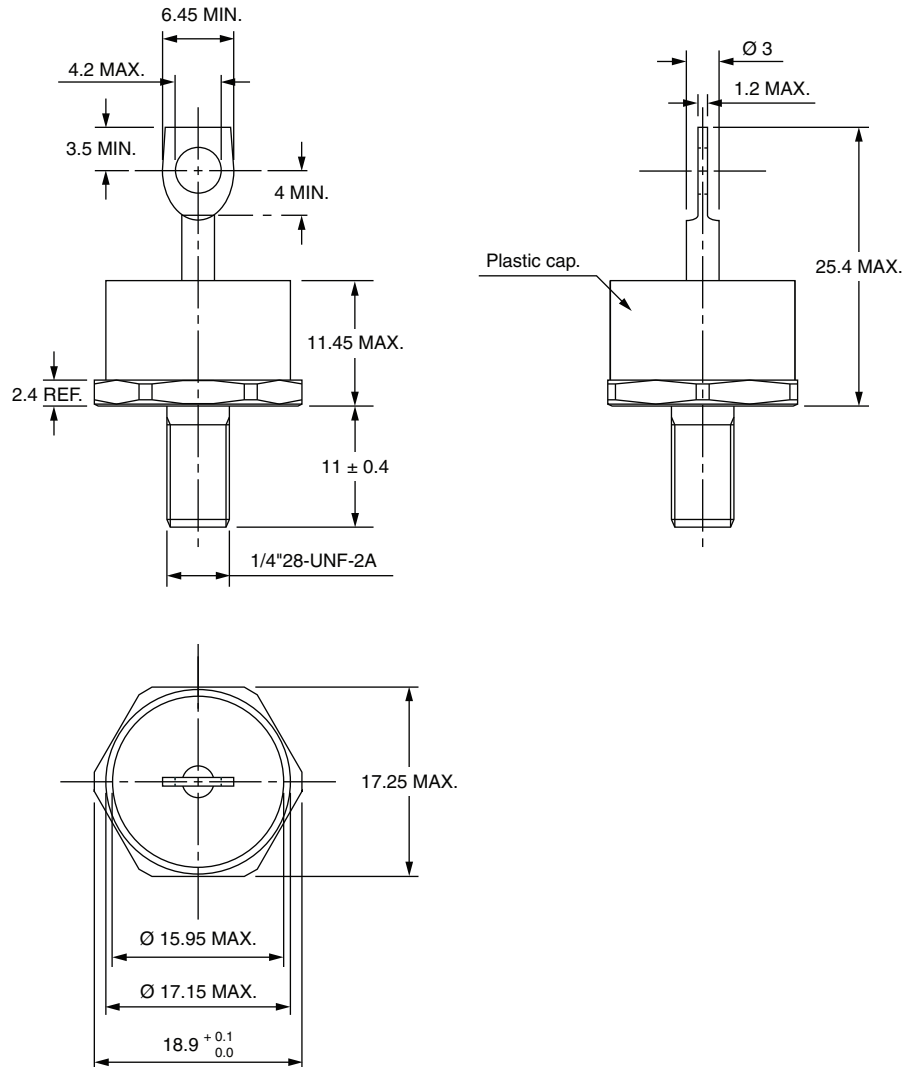
- 1** - Vishay Semiconductors product
- 2** -
  - 80 = standard device
  - 82 = isolated lead on standard terminal  
with silicone sleeve available for 1200 V only  
(red = reverse polarity)  
(blue = normal polarity)
- 3** - PF = plastic package
- 4** -
  - None = stud normal polarity (cathode to stud)
  - 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 80PF(R)... - link at the end of datasheet)
  - W = wire terminal  
(see dimensions for 80PF(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>



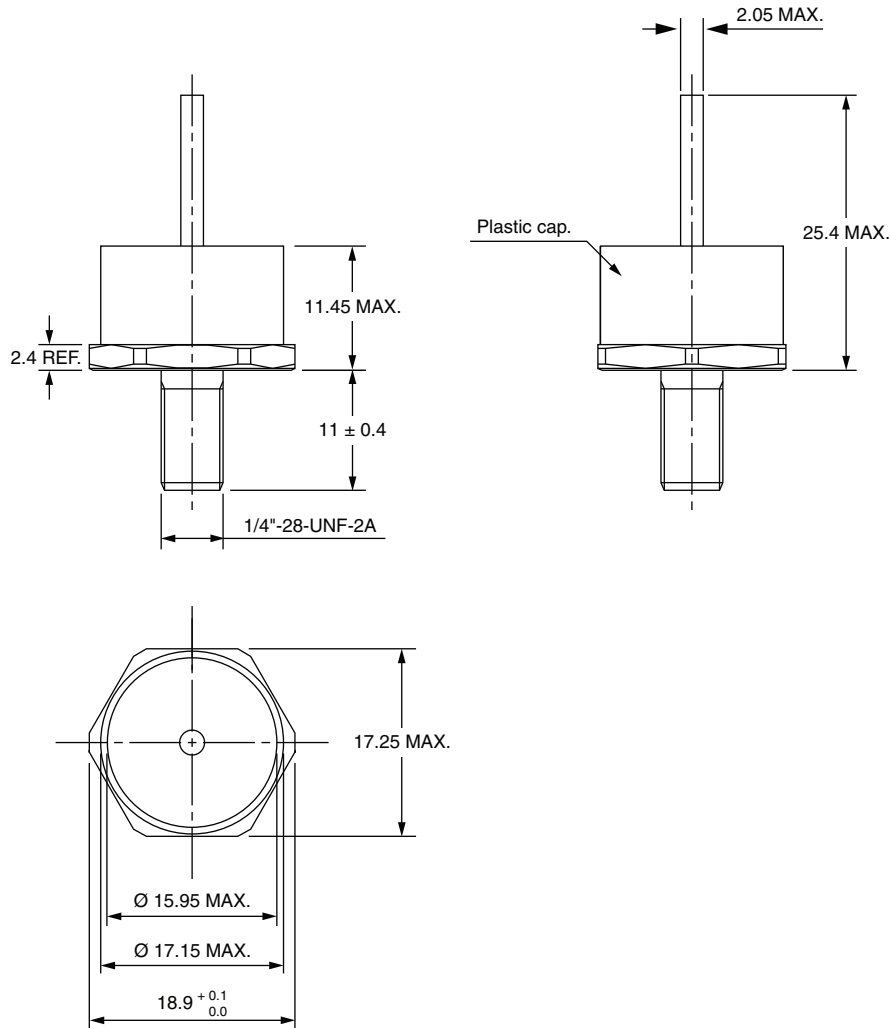
## DO-203AB (DO-5) for 50PF(R)...(W), 80PF(R)...(W), and 95PF(R)...(W) Series

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



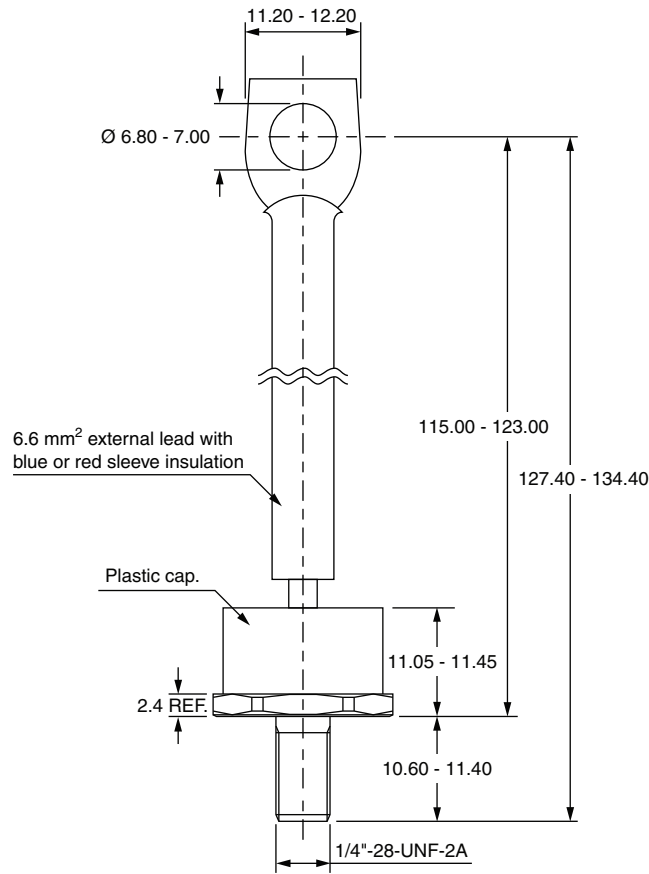


### DIMENSIONS FOR 80PF(R)...(W), 50PF(R)...(W), AND 95PF(R)...(W) SERIES in millimeters





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





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