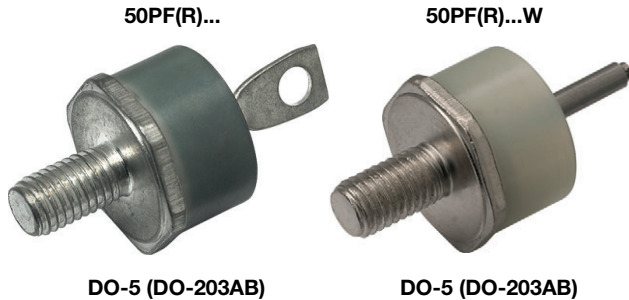


## Standard Recovery Diodes, Generation 2 DO-5 (Stud Version), 50 A



### 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	$I_{F(AV)}$	180° conduction, half sine wave		50	A	
				128	°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	570	A	
		t = 8.3 ms		Sinusoidal half wave, initial $T_J = 150\text{ °C}$		595
		t = 10 ms	100 % $V_{RRM}$ reapplied			480
		t = 8.3 ms				500
Maximum $I^2t$ for fusing	$I^2t$	t = 10 ms	No voltage reapplied		1600	A <sup>2</sup> s
		t = 8.3 ms		100 % $V_{RRM}$ reapplied	1450	
		t = 10 ms	1150			
		t = 8.3 ms	1050			
Maximum $I^2\sqrt{t}$ for fusing	$I^2\sqrt{t}$	t = 0.1 ms to 10 ms, no voltage reapplied			16 000	A <sup>2</sup> √s
Low level value of threshold voltage	$V_{F(TO)}$	$(16.7\% \times \pi \times I_{F(AV)} < I < \pi \times I_{F(AV)})$ , $T_J = T_J$ 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	$V_{FM}$	$I_{pk} = 125\text{ A}$ , $T_J = 25\text{ °C}$ , $t_p = 400\text{ }\mu\text{s}$ 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	$T_J = T_J$ 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

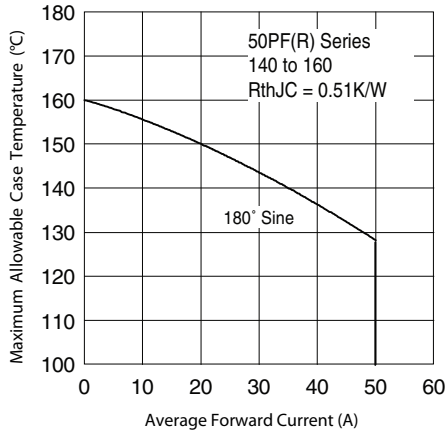


Fig. 1 - Current Ratings Characteristics

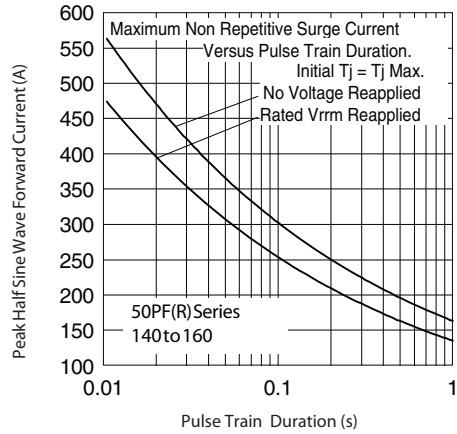


Fig. 3 - Maximum Non-Repetitive Surge Current

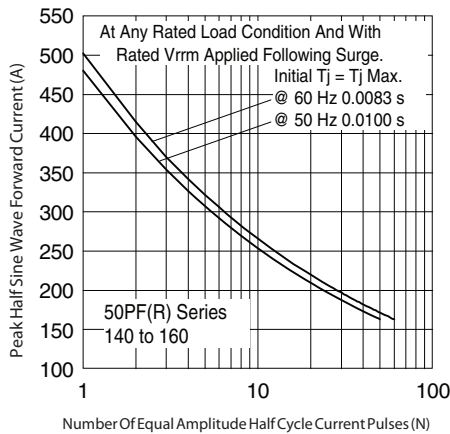


Fig. 2 - Maximum Non-Repetitive Surge Current

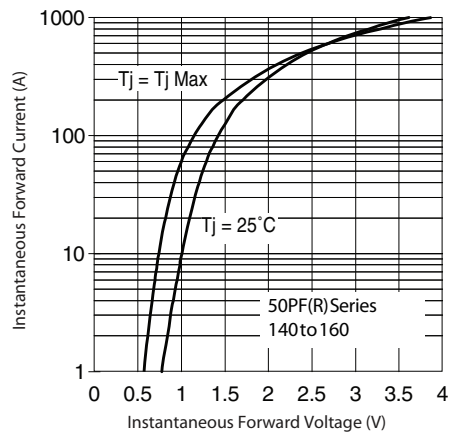


Fig. 4 - Forward Voltage Drop Characteristics

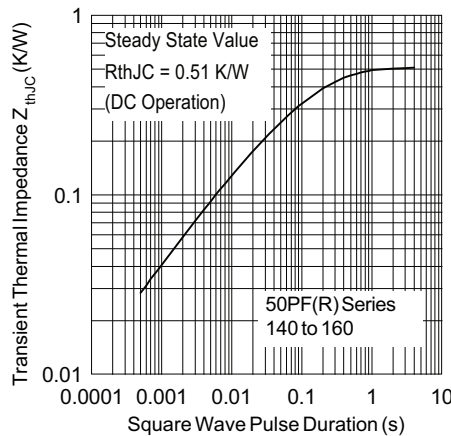
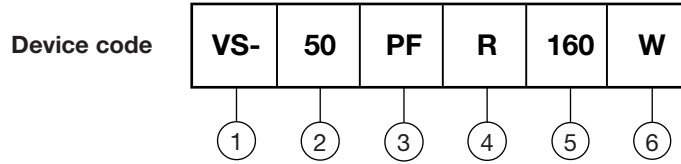


Fig. 5 - Thermal Impedance  $Z_{thJC}$  Characteristics



## ORDERING INFORMATION TABLE



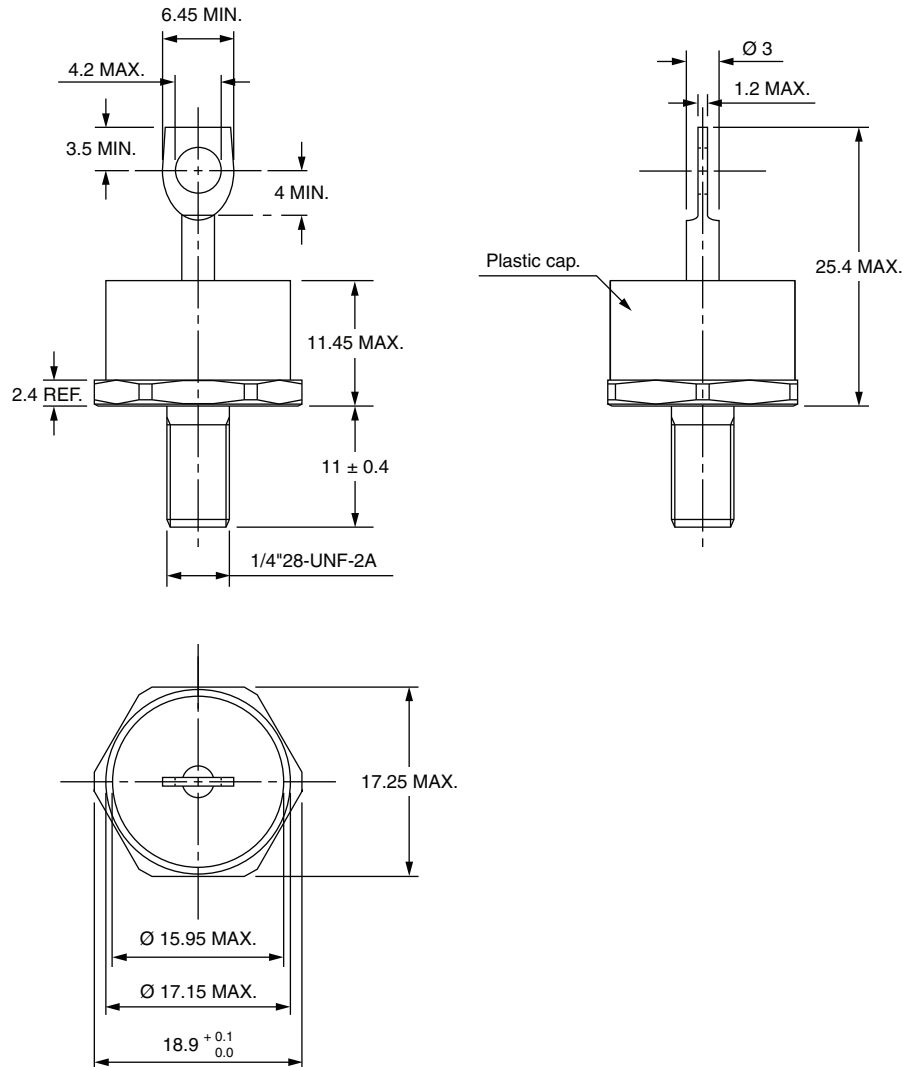
- 1** - Vishay Semiconductors product
- 2** - 50 = standard device
- 3** - PF = plastic package
- 4** -
  - None = stud normal polarity (cathode to stud)
  - R = stud reverse polarity (anode to stud)
- 5** - Voltage code x 10 =  $V_{RRM}$  (see Voltage Ratings table)
- 6** -
  - None = standard terminal  
(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>



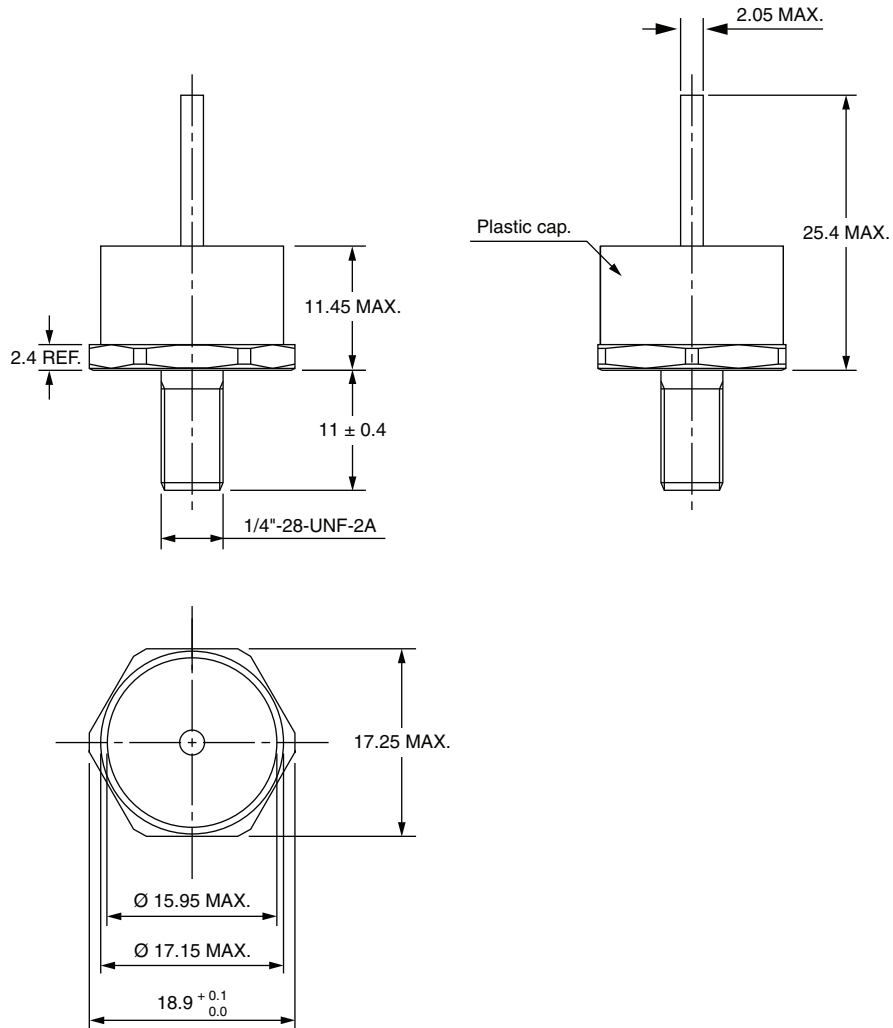
## DO-203AB (DO-5) for 50PF(R)...(W), 80PF(R)...(W), and 95PF(R)...(W) Series

**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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