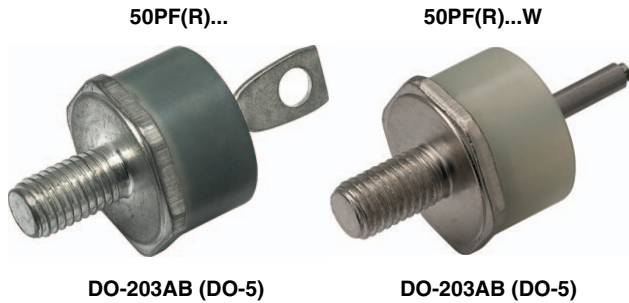


## Standard Recovery Diodes, Generation 2 DO-5 (Stud Version), 50 A



### 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

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

PRODUCT SUMMARY	
$I_{F(AV)}$	50 A
Package	DO-203AB (DO-5)
Circuit configuration	Single diode

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	Sinusoidal half wave, initial $T_J = 150\text{ °C}$	A
		t = 8.3 ms			
		t = 10 ms	100 % $V_{RRM}$ reapplied		
		t = 8.3 ms			
Maximum $I^2t$ for fusing	$I^2t$	t = 10 ms	No voltage reapplied		A <sup>2</sup> s
		t = 8.3 ms			
		t = 10 ms	100 % $V_{RRM}$ reapplied		
		t = 8.3 ms			
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-203AB (DO-5)	

**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 <sub>J</sub> = T <sub>J</sub> 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<sub>thJC</sub> when devices operate at different conduction angles than DC

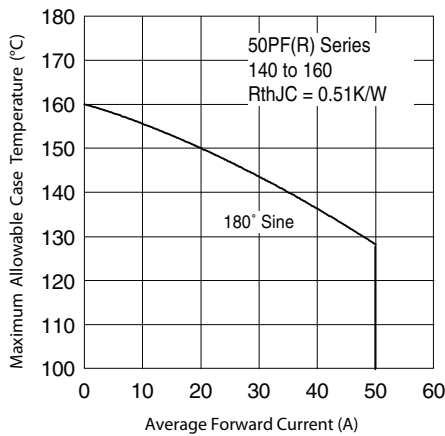


Fig. 1 - Current Ratings Characteristics

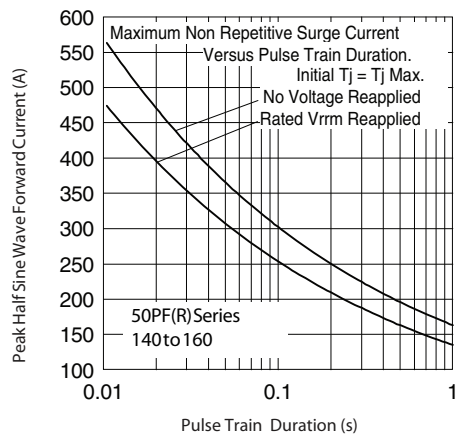


Fig. 3 - Maximum Non-Repetitive Surge Current

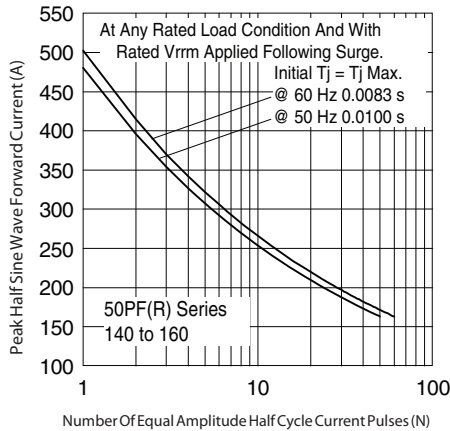


Fig. 2 - Maximum Non-Repetitive Surge Current

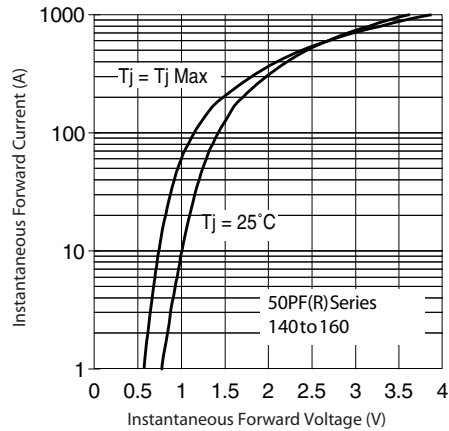


Fig. 4 - Forward Voltage Drop Characteristics

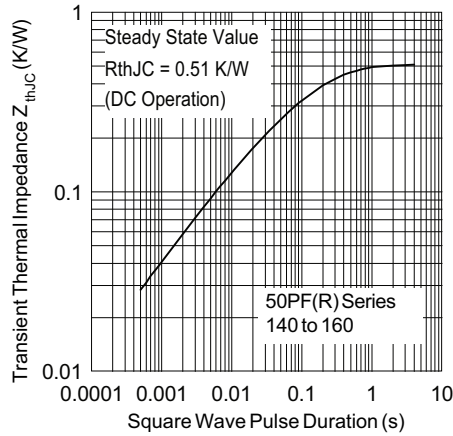


Fig. 5 - Thermal Impedance  $Z_{thJC}$  Characteristics

### ORDERING INFORMATION TABLE

Device code	<b>VS-</b>	<b>50</b>	<b>PF</b>	<b>R</b>	<b>160</b>	<b>W</b>
	①	②	③	④	⑤	⑥

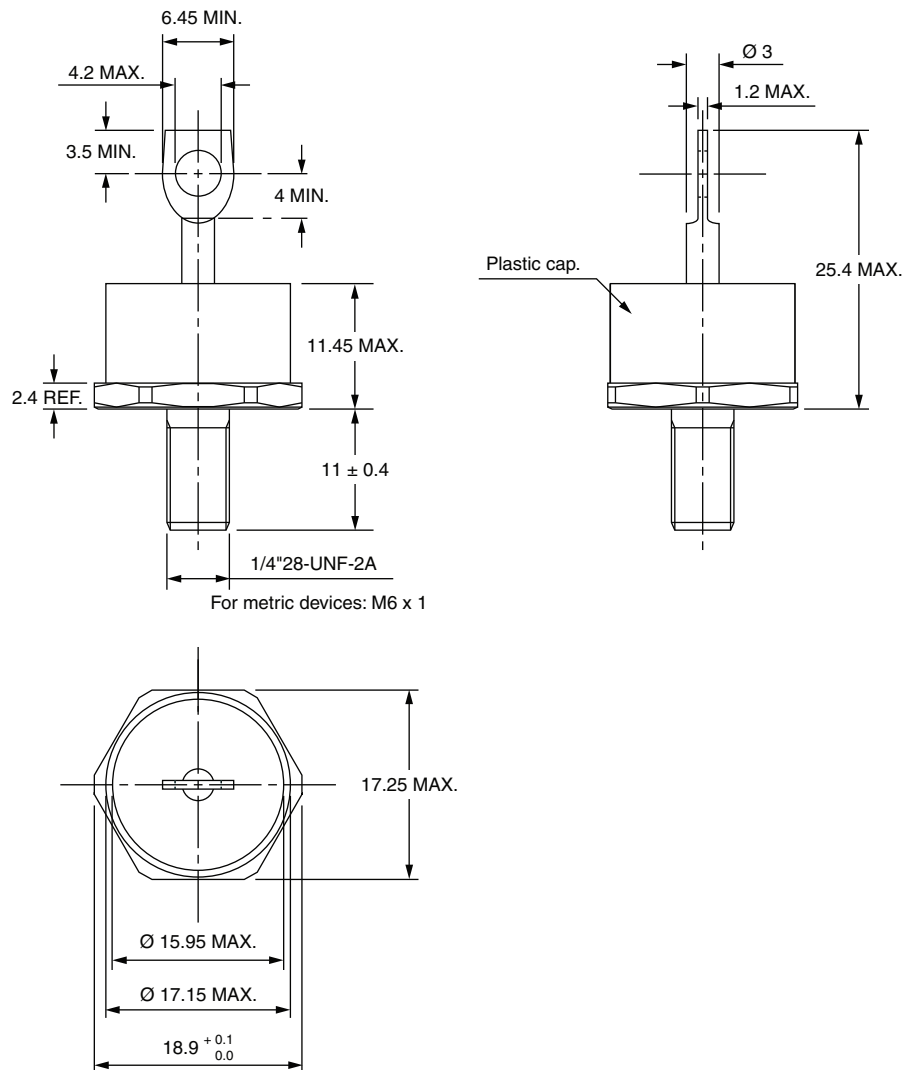
- 1** - Vishay Semiconductors product
- 2** - 50 = Standard device
- 3** - PF = Plastic package
- 4** -
  - None = Stud normal polarity (cathode to stud)
  - R = Stud reverse polarity (anode to stud)
- 5** - Voltage code x 10 =  $V_{RRM}$  (see Voltage Ratings table)
- 6** -
  - None = Standard terminal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

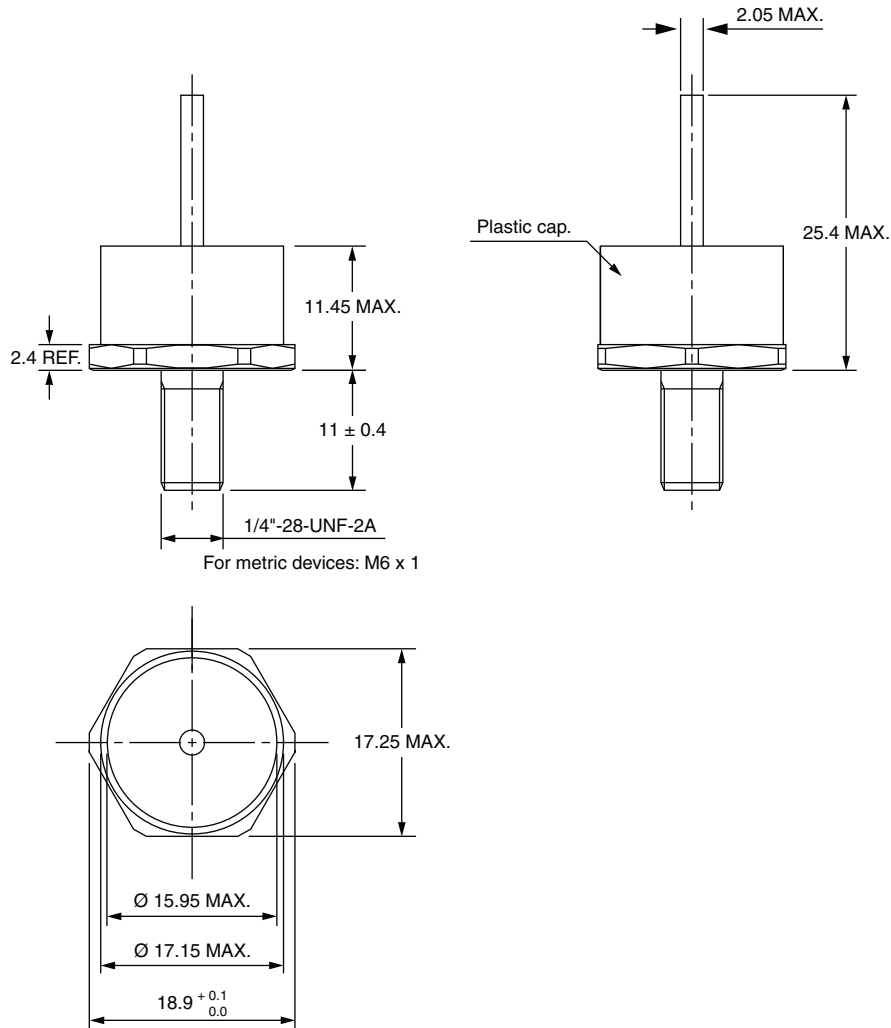


**Note**

- For metric device please contact factory



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

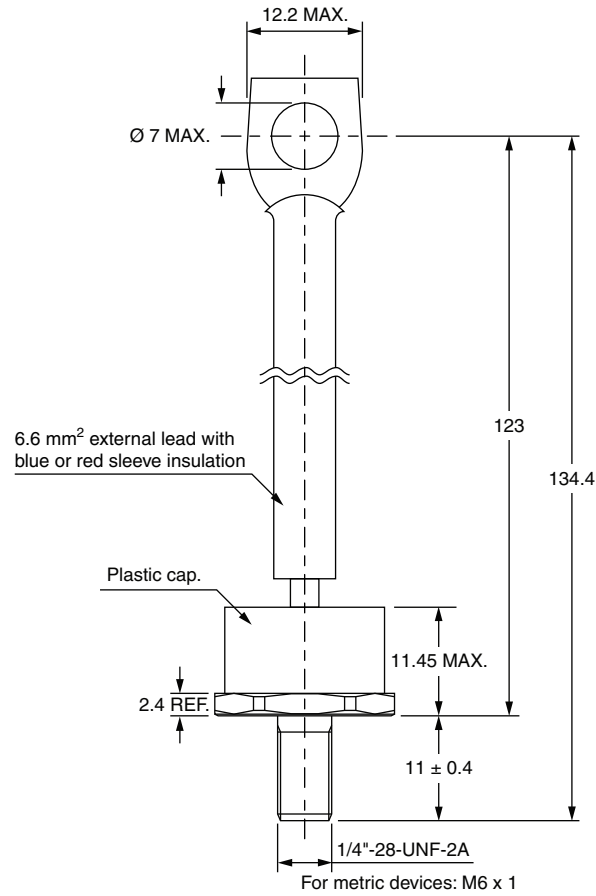


#### Note

- For metric device please contact factory



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



### Note

- For metric device please contact factory



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**Please note that some Vishay documentation may still make reference to RoHS Directive 2002/95/EC. We confirm that all the products identified as being compliant to Directive 2002/95/EC conform to Directive 2011/65/EU.**

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- Поставка более 17-ти миллионов наименований электронных компонентов;
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- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



#### Как с нами связаться

**Телефон:** 8 (812) 309 58 32 (многоканальный)

**Факс:** 8 (812) 320-02-42

**Электронная почта:** [org@eplast1.ru](mailto:org@eplast1.ru)

**Адрес:** 198099, г. Санкт-Петербург, ул. Калинина, дом 2, корпус 4, литера А.