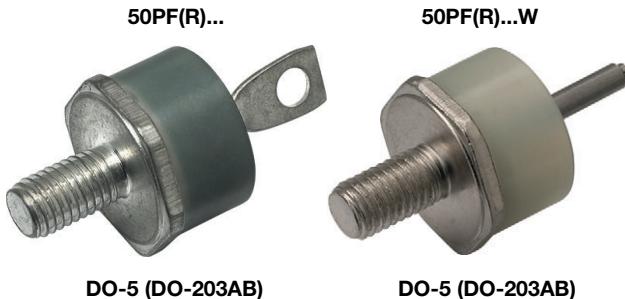


Standard Recovery Diodes, Generation 2 DO-5 (Stud Version), 50 A



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



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^2s
	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 $T_J = 150$ °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	$I_{F(AV)}$	180° conduction, half sine wave			50	A			
					140	°C			
Maximum RMS forward current	$I_{F(RMS)}$				78	A			
Maximum peak, one-cycle forward, non-repetitive surge current	I_{FSM}	$t = 10 \text{ ms}$	No voltage reapplied	Sinusoidal half wave, initial $T_J = 150 \text{ °C}$	800	A			
		$t = 8.3 \text{ ms}$	100 % V_{RRM} reapplied		830				
		$t = 10 \text{ ms}$			670				
		$t = 8.3 \text{ ms}$			700				
Maximum I^2t for fusing	I^2t	$t = 10 \text{ ms}$	No voltage reapplied	Sinusoidal half wave, initial $T_J = 150 \text{ °C}$	3200	A^2s			
		$t = 8.3 \text{ ms}$	100 % V_{RRM} reapplied		2900				
		$t = 10 \text{ ms}$			2260				
		$t = 8.3 \text{ ms}$			2050				
Maximum $I^2\sqrt{t}$ for fusing	$I^2\sqrt{t}$	$t = 0.1 \text{ ms to } 10 \text{ ms, no voltage reapplied}$			32 000	$\text{A}^2\sqrt{\text{s}}$			
Low level value of threshold voltage	$V_{F(TO)}$	$(16.7 \% \times \pi \times I_{F(AV)} < I < \pi \times I_{F(AV)}, T_J = T_J \text{ maximum})$			0.77	V			
Low level value of forward slope resistance	r_f	$(16.7 \% \times \pi \times I_{F(AV)} < I < \pi \times I_{F(AV)}, T_J = T_J \text{ maximum})$			4.30	$\text{m}\Omega$			
Maximum forward voltage drop	V_{FM}	$I_{pk} = 125 \text{ A, } T_J = 25 \text{ °C, } t_p = 400 \mu\text{s rectangular wave}$			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			0.51	K/W
Maximum thermal resistance, case to heatsink	R_{thCS}	Mounting surface, smooth, flat and greased			0.25	
Allowable mounting torque		Tightening on nut ⁽¹⁾ Not lubricated threads			$3.4 + 0 - 10 \% (30)$	$\text{N} \cdot \text{m}$ (lbf · in)
		Tightening on hexagon ⁽²⁾ 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

ΔR_{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

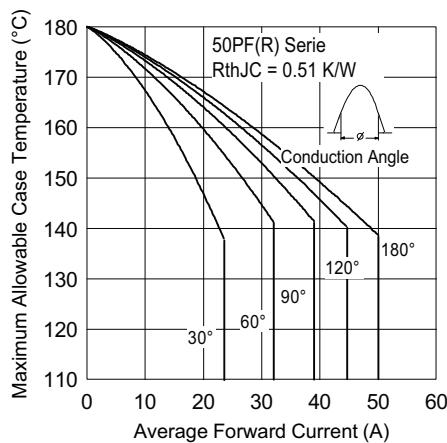


Fig. 1 - Current Ratings Characteristics

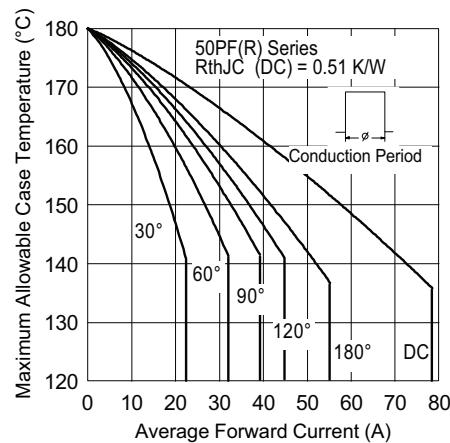


Fig. 2 - Current Ratings Characteristics

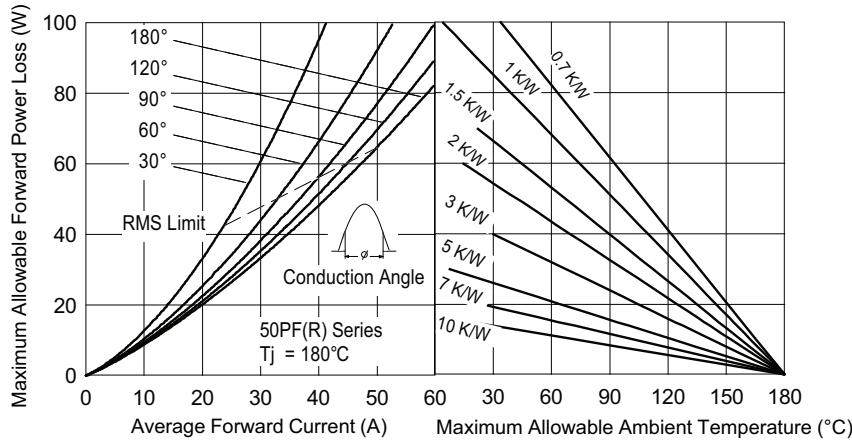


Fig. 3 - Forward Power Loss Characteristics

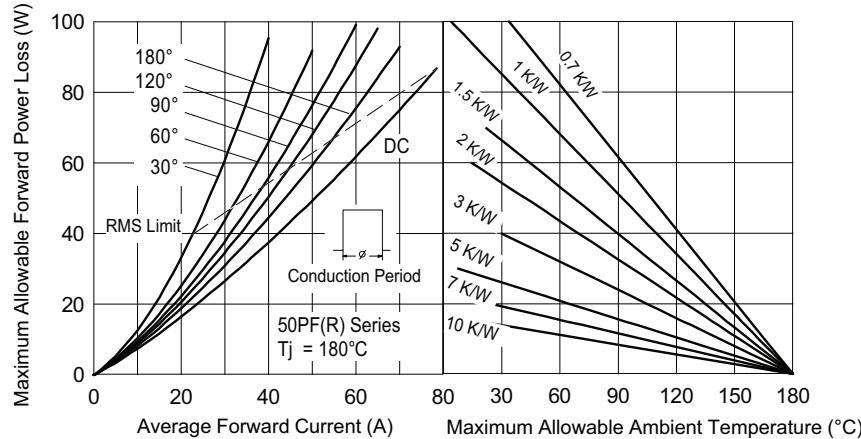


Fig. 4 - Forward Power Loss Characteristics

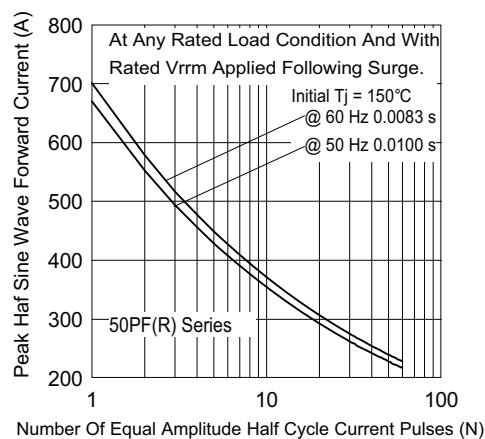


Fig. 5 - Maximum Non-Repetitive Surge Current

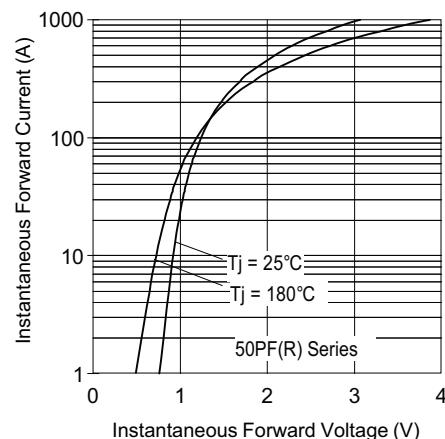


Fig. 7 - Forward Voltage Drop Characteristics

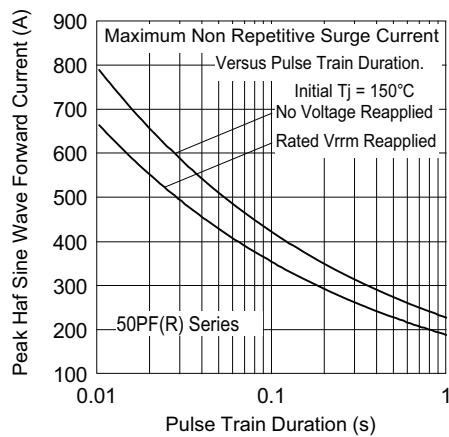


Fig. 6 - Maximum Non-Repetitive Surge Current

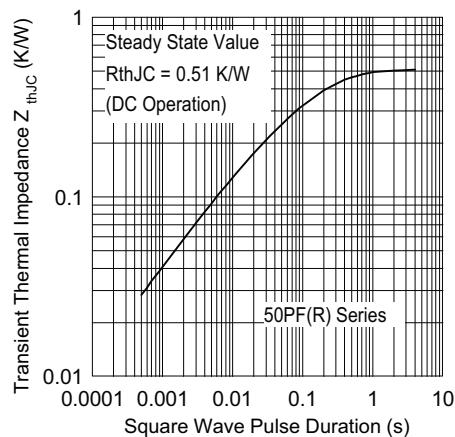


Fig. 8 - Thermal Impedance Z_{thJC} Characteristics

ORDERING INFORMATION TABLE

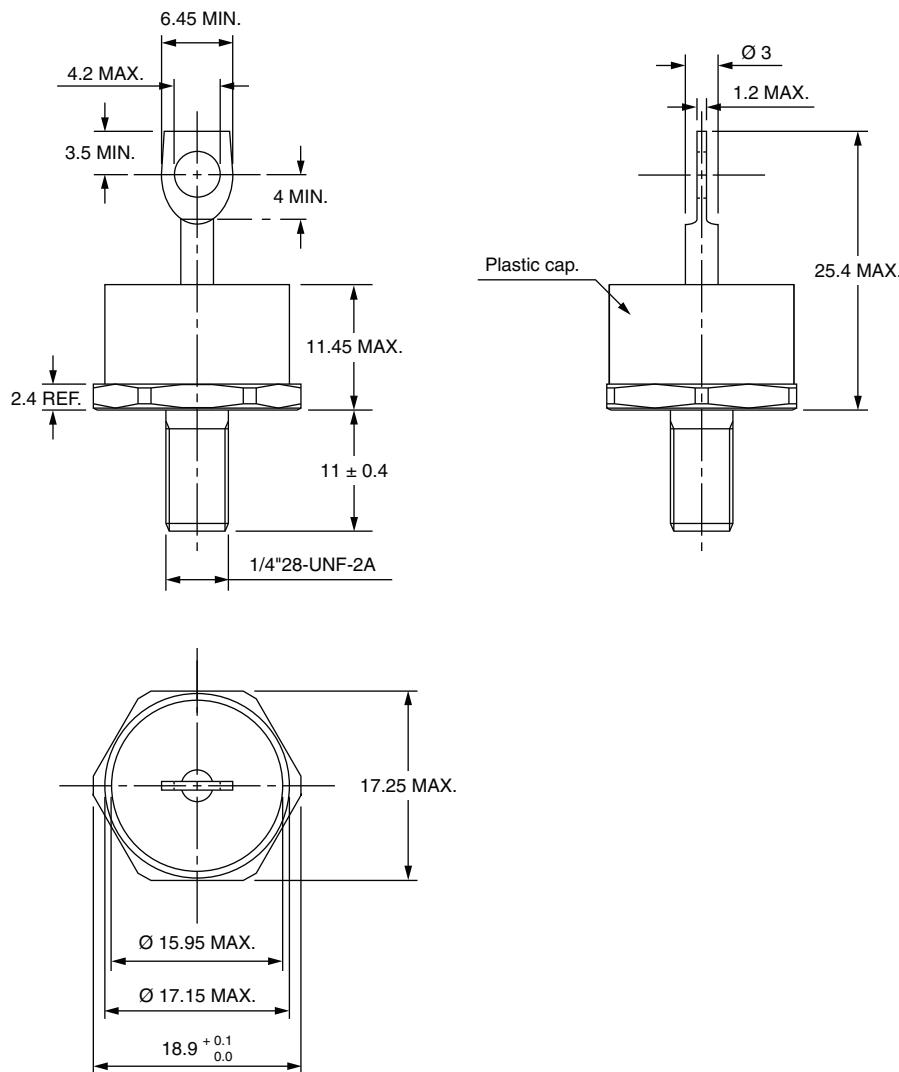
Device code	VS-	50	PF	R	120	W
	(1)	(2)	(3)	(4)	(5)	(6)

- [1]** - Vishay Semiconductors product
- [2]**
 - 50 = standard device
 - 52 = 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 50PF(R)... - link at the end of datasheet)
 - W = wire terminal
(see dimensions for 50PF(R)...W - link at the end of datasheet)

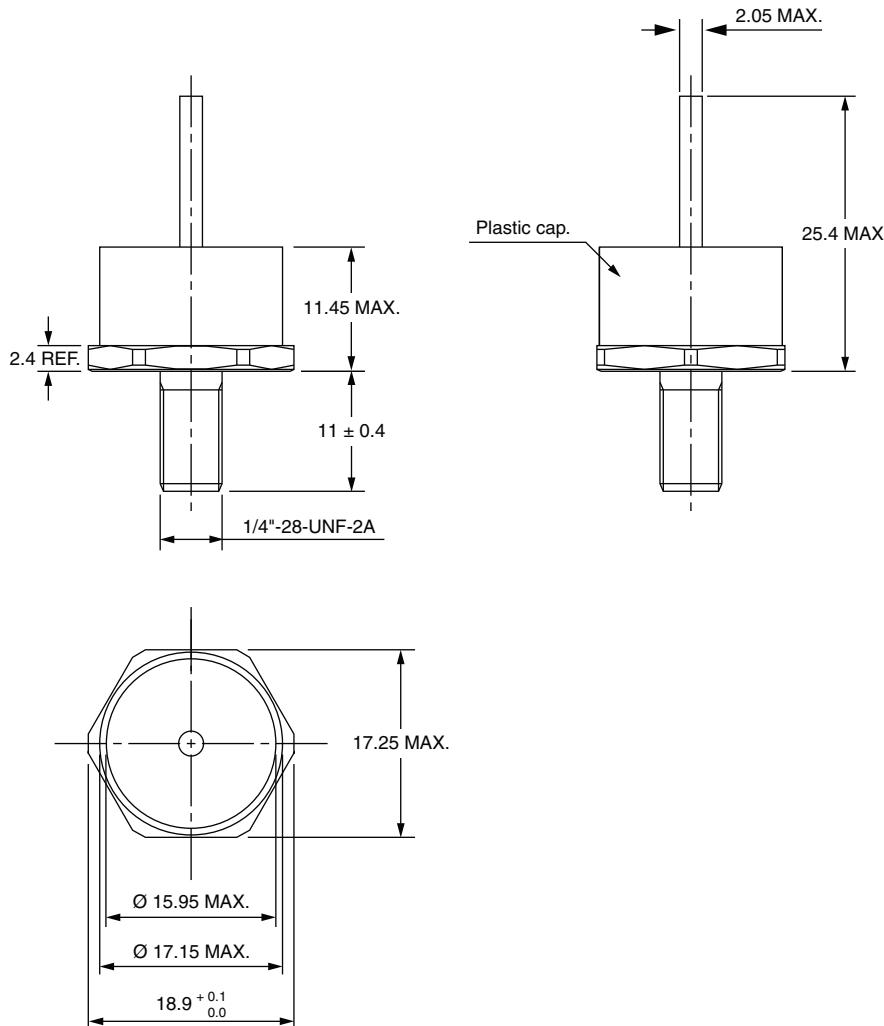
LINKS TO RELATED DOCUMENTS	
Dimensions	www.vishay.com/doc?95345

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

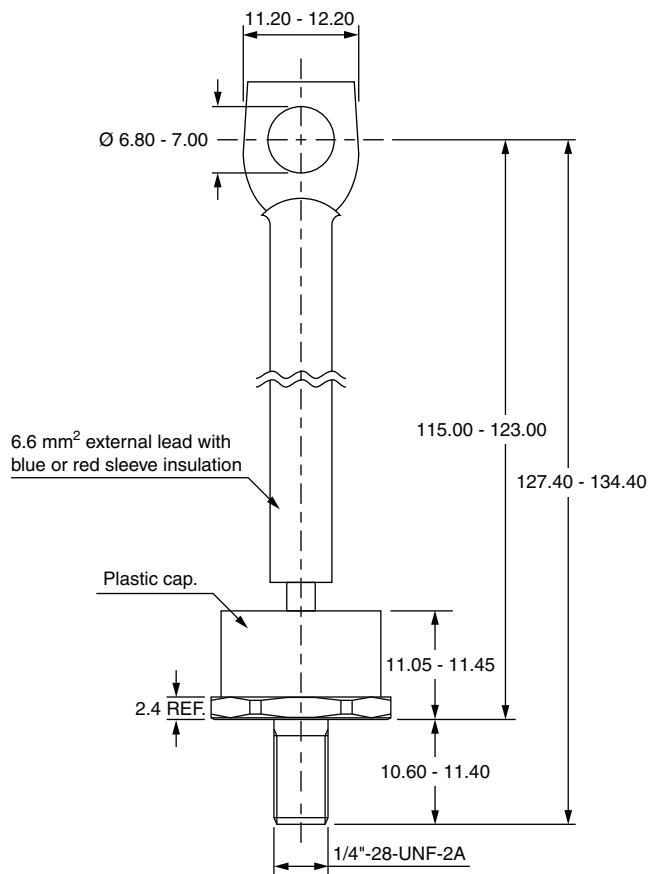
DIMENSIONS FOR 80PF(R), 50PF(R), AND 95PF(R) SERIES in millimeters



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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