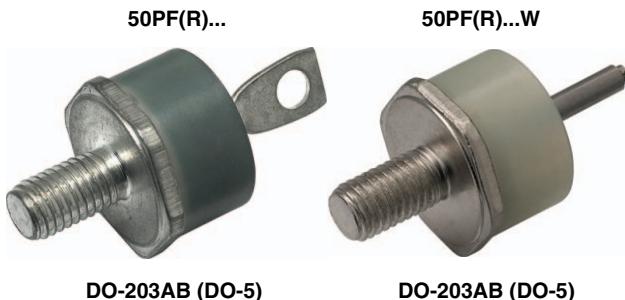


Standard Recovery Diodes, Generation 2 DO-5 (Stud Version), 50 A



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

- 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 ² 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}	$t = 10 \text{ ms}$	No voltage reapplied	Sinusoidal half wave, initial $T_J = 150 \text{ °C}$	570	A	
		$t = 8.3 \text{ ms}$	595				
		$t = 10 \text{ ms}$	100 % V_{RRM} reapplied		480		
		$t = 8.3 \text{ ms}$	500				
Maximum I^2t for fusing	I^2t	$t = 10 \text{ ms}$	No voltage reapplied		1600	A^2s	
		$t = 8.3 \text{ ms}$	1450				
		$t = 10 \text{ ms}$	100 % V_{RRM} reapplied		1150		
		$t = 8.3 \text{ ms}$	1050				
Maximum $I^2\sqrt{t}$ for fusing	$I^2\sqrt{t}$	$t = 0.1 \text{ ms to } 10 \text{ ms, no voltage reapplied}$			16 000	$\text{A}^2\sqrt{\text{s}}$	
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}	$I_{pk} = 125 \text{ A, } T_J = 25 \text{ °C, } t_p = 400 \mu\text{s rectangular wave}$			1.50	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 ⁽¹⁾	3.4 (30)	N · m (lbf · in)
		Lubricated thread, tightening on nut ⁽¹⁾	2.3 (20)	
		Not lubricated thread, tightening on hexagon ⁽²⁾	4.2 (37)	
		Lubricated thread, tightening on hexagon ⁽²⁾	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

ΔR_{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

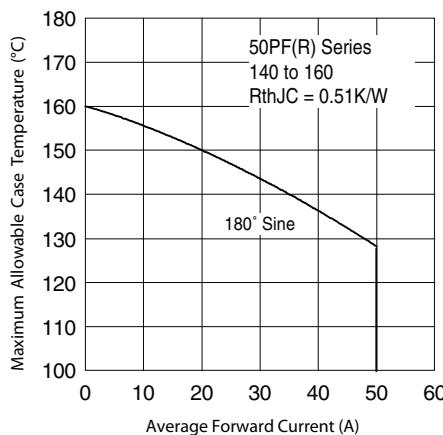


Fig. 1 - Current Ratings Characteristics

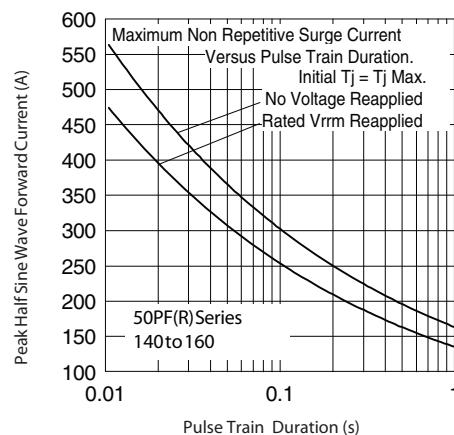


Fig. 3 - Maximum Non-Repetitive Surge Current

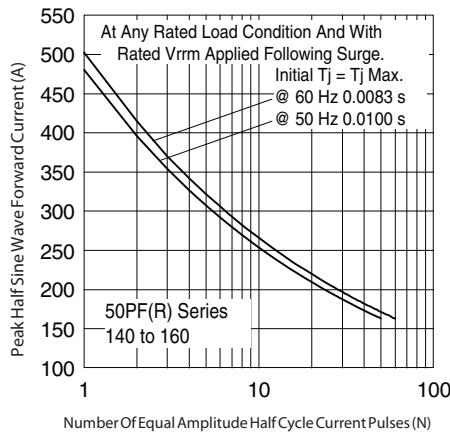


Fig. 2 - Maximum Non-Repetitive Surge Current

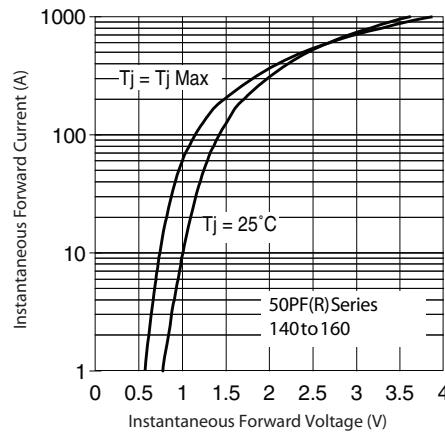


Fig. 4 - Forward Voltage Drop Characteristics

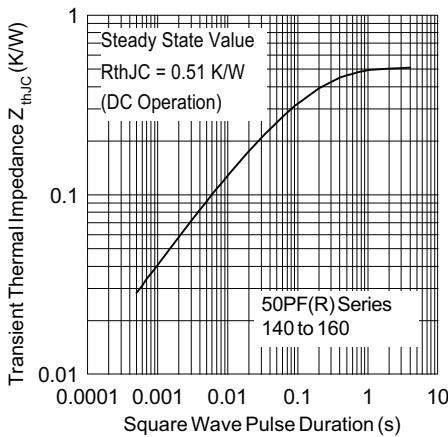


Fig. 5 - Thermal Impedance Z_{thJC} Characteristics

ORDERING INFORMATION TABLE

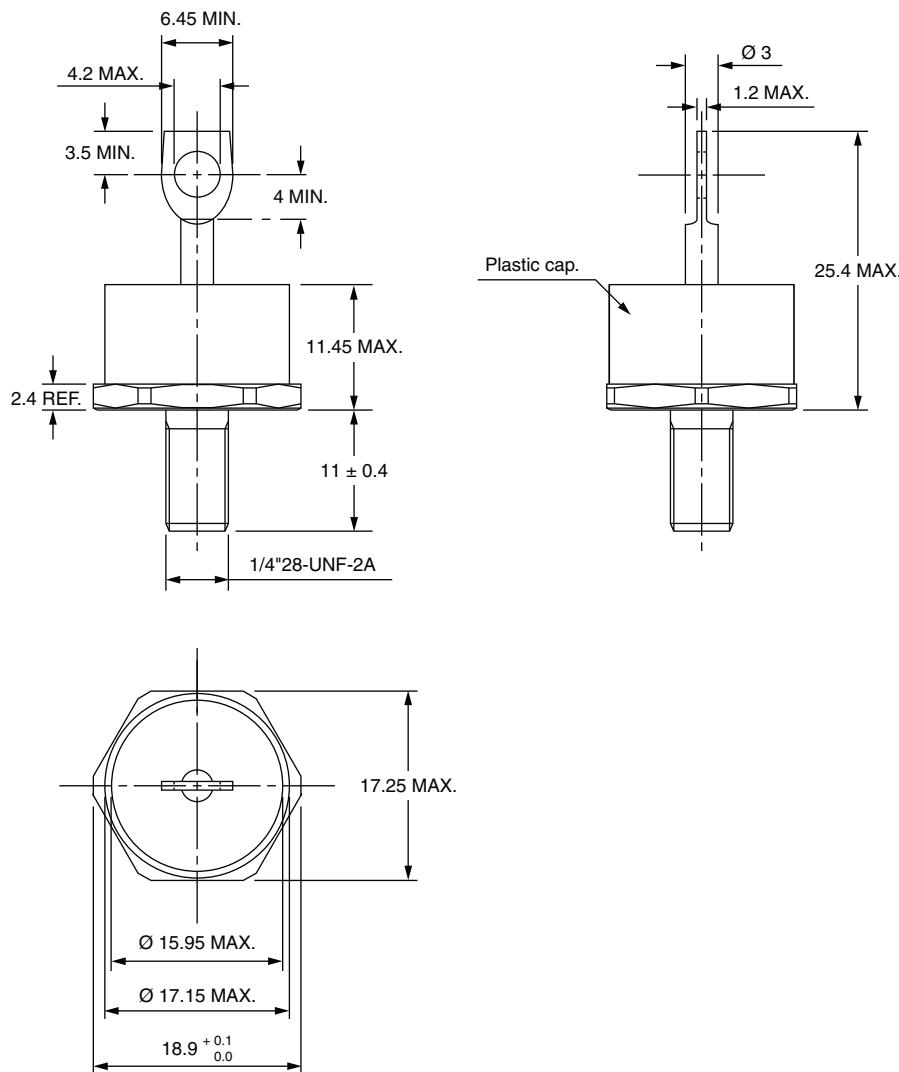
Device code	VS-	50	PF	R	160	W
	(1)	(2)	(3)	(4)	(5)	(6)
1	- Vishay Semiconductors product					
2	- 50 = Standard device					
3	- PF = Plastic package					
4	- • None = Stud normal polarity (cathode to stud) • R = Stud reverse polarity (anode to stud)					
5	- Voltage code x 10 = V_{RRM} (see Voltage Ratings 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

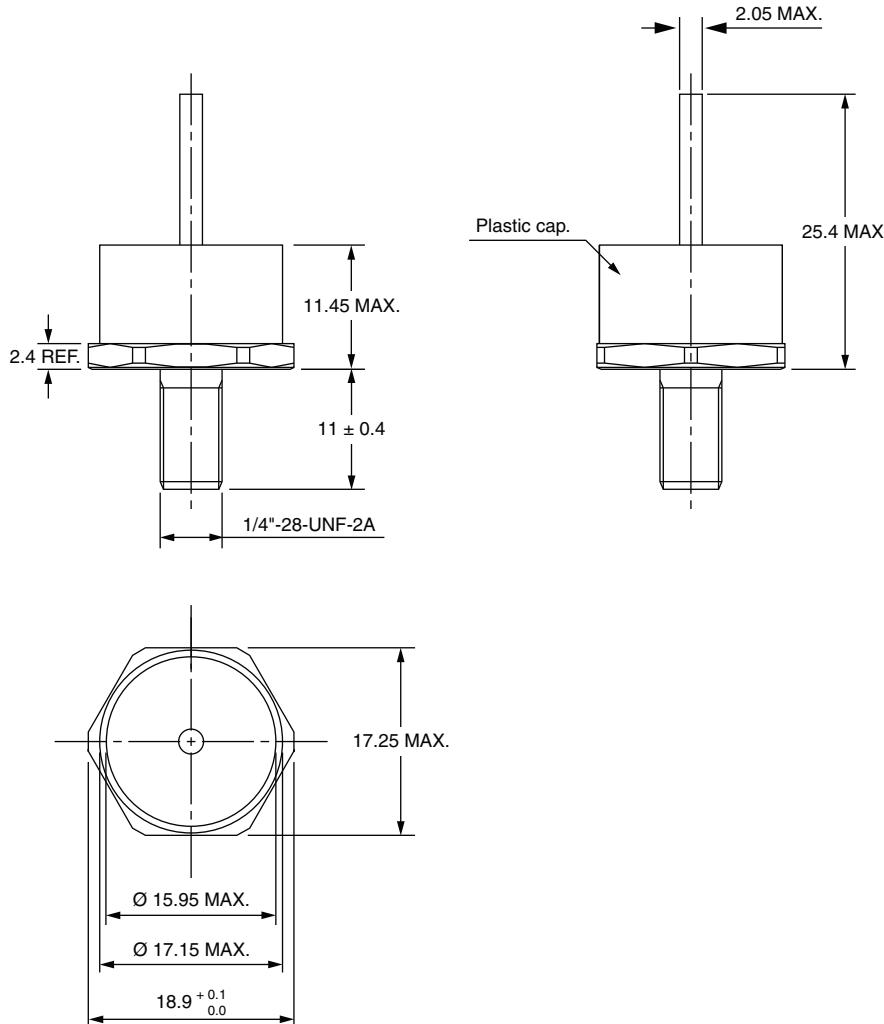
Dimensions	www.vishay.com/doc?95345
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DO-203AB (DO-5) for 50PF(R)...(W), 80PF(R)...(W), and 95PF(R)...(W) Series

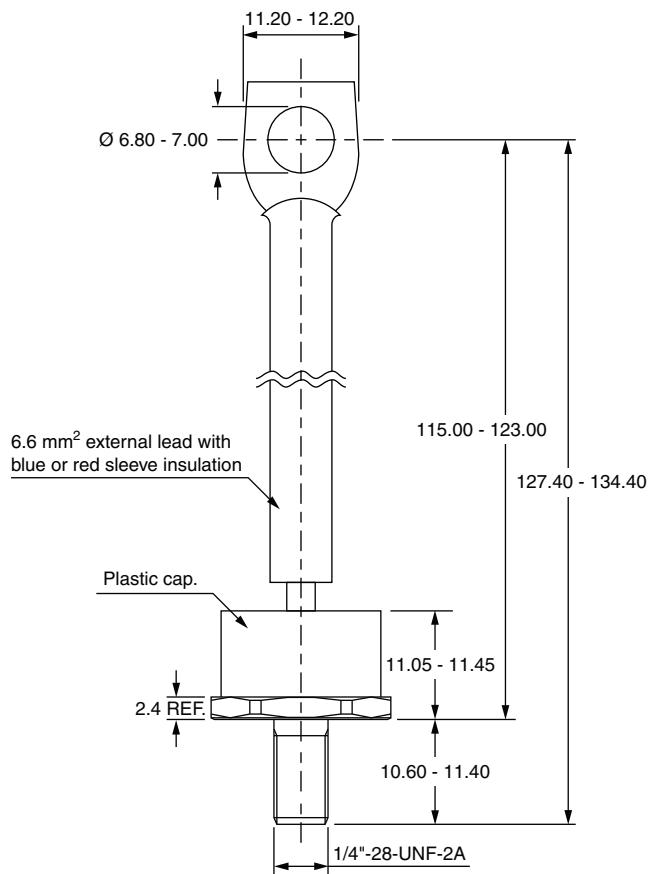
DIMENSIONS FOR 80PF(R), 50PF(R), AND 95PF(R) SERIES in millimeters



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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