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Vishay Semiconductor/Diodes Division
VS-50PF120

For any questions, you can email us directly:
sales@integrated-circuit.com

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

50PF(R)... 50PF(R)...W

DO-203AB (DO-5) DO-203AB (DO-5)

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

RoHS COMPLIANT

TYPICAL APPLICATIONS

- Battery charges
- Converters
- Power supplies
- Machine tool controls
- Welding

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	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 ms	No voltage reapplied	Sinusoidal half wave, initial T_J = 150 °C	800	A
		t = 8.3 ms			830	
		t = 10 ms	100 % V_{RRM} reapplied		670	
		t = 8.3 ms			700	
Maximum I^2t for fusing	I^2t	t = 10 ms	No voltage reapplied		3200	A^2s
		t = 8.3 ms			2900	
		t = 10 ms	100 % V_{RRM} reapplied		2260	
		t = 8.3 ms			2050	
Maximum $I^2\sqrt{t}$ for fusing	$I^2\sqrt{t}$	t = 0.1 ms to 10 ms, no voltage reapplied			32 000	$A^2\sqrt{s}$
Low level value of threshold voltage	$V_{F(TO)}$	(16.7 % x π x $I_{F(AV)}$ < I < π x $I_{F(AV)}$), T_J = T_J maximum			0.77	V
Low level value of forward slope resistance	r_f	(16.7 % x π x $I_{F(AV)}$ < I < π x $I_{F(AV)}$), T_J = T_J maximum			4.30	mΩ
Maximum forward voltage drop	V_{FM}	I_{pk} = 125 A, T_J = 25 °C, t_p = 400 µs 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		Tighting on nut (1) Not lubricated threads	3.4 + 0 - 10 % (30)	N · m (lbf · in)
		Tighting 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-203AB (DO-5)	

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 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

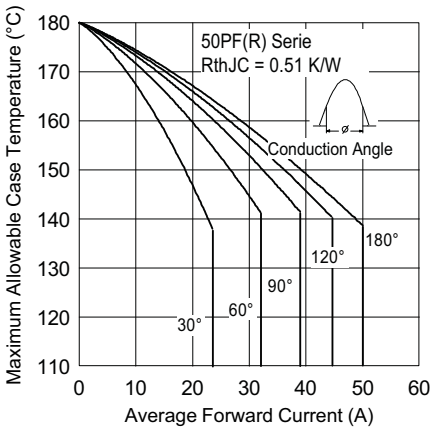


Fig. 1 - Current Ratings Characteristics

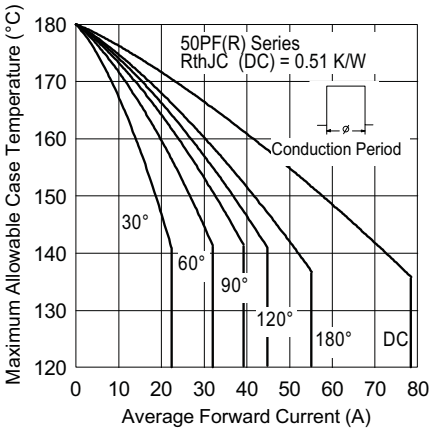


Fig. 2 - Current Ratings Characteristics

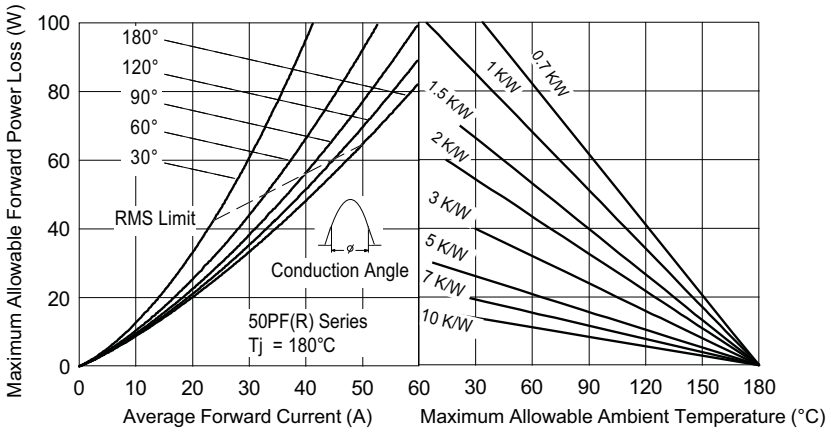


Fig. 3 - Forward Power Loss Characteristics

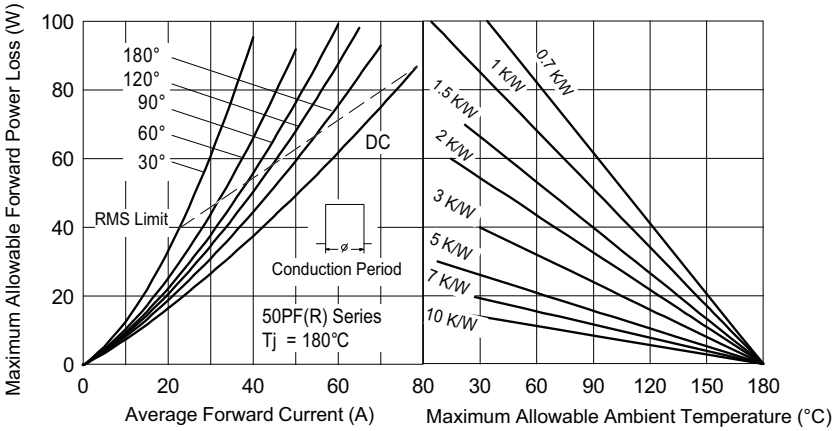


Fig. 4 - Forward Power Loss Characteristics

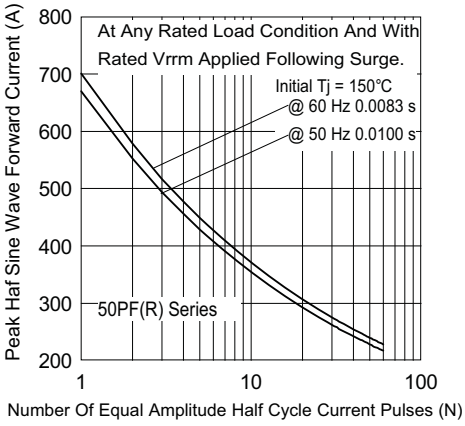


Fig. 5 - Maximum Non-Repetitive Surge Current

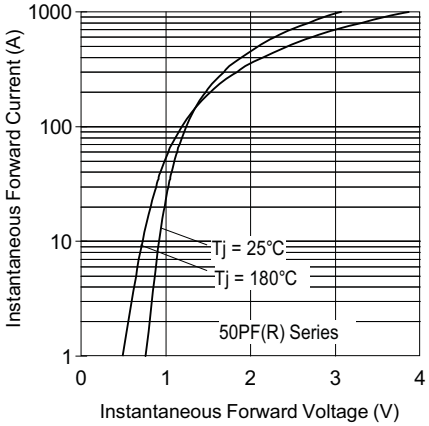


Fig. 7 - Forward Voltage Drop Characteristics

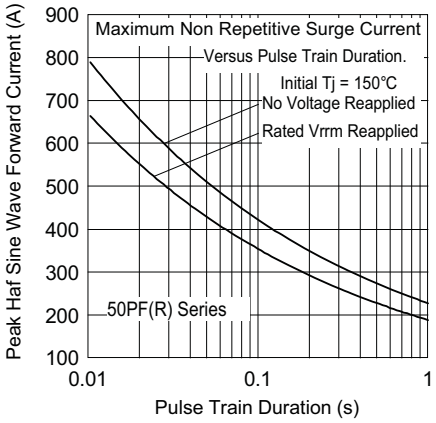


Fig. 6 - Maximum Non-Repetitive Surge Current

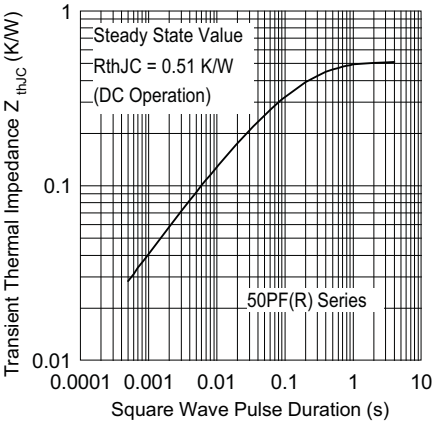


Fig. 8 - Thermal Impedance Z_{thJC} Characteristics

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)

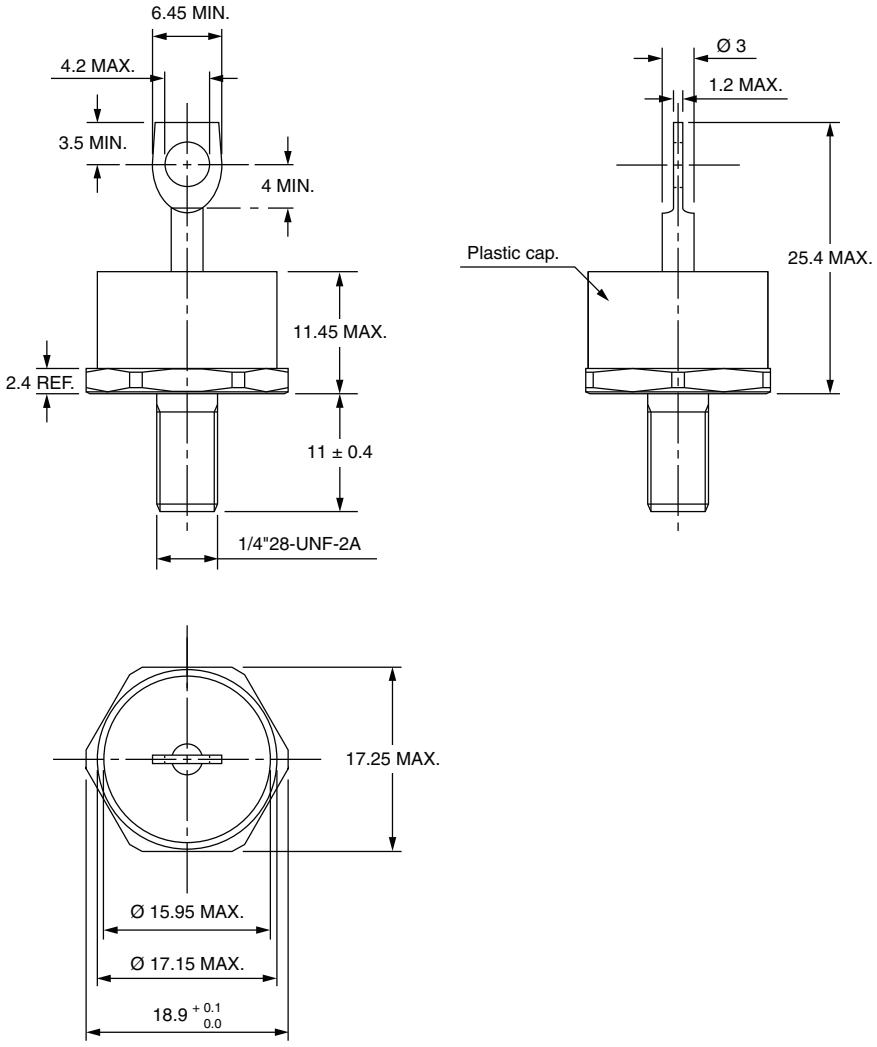
5 - Voltage code x 10 = V_{RRM} (see Voltage Ratings table)

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)

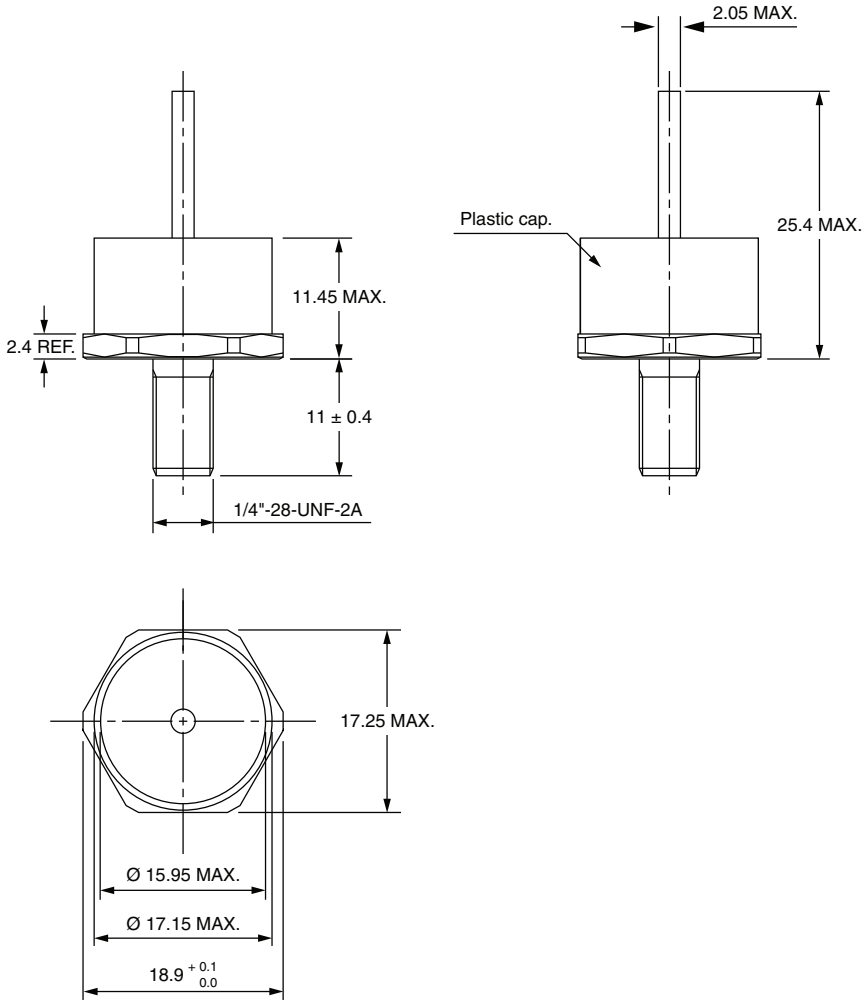
LINKS TO RELATED DOCUMENTS	
Dimensions	www.vishay.com/doc?95345

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

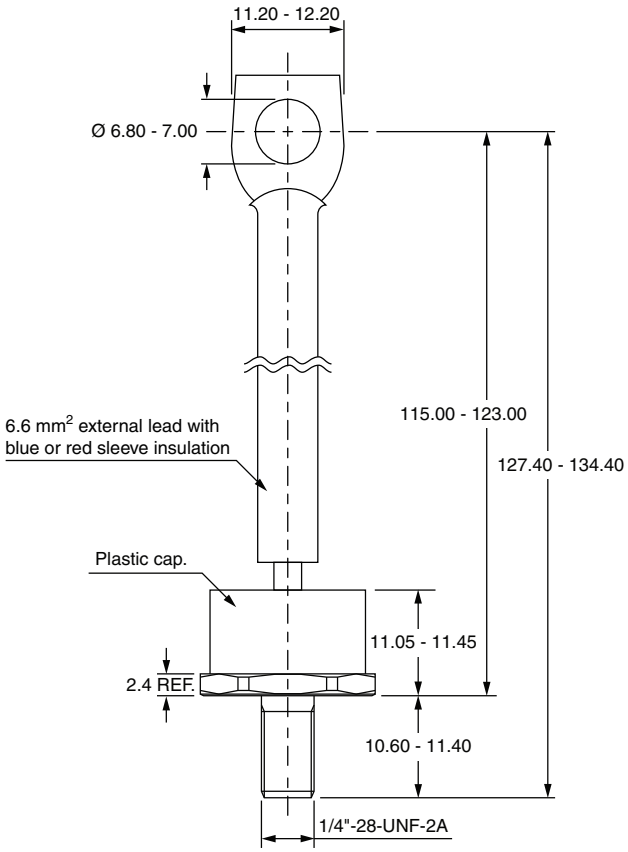


DIMENSIONS FOR 80PF(R)...(W), 50PF(R)...(W), AND 95PF(R)...(W) SERIES in millimeters



Outline Dimensions

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



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