

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


RoHS
COMPLIANT

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 ² s
	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 reappplied	800	A
		t = 8.3 ms		100 % V_{RRM} reappplied	
		t = 10 ms	Sinusoidal half wave, initial $T_J = 150\text{ °C}$		
		t = 8.3 ms		700	
Maximum I^2t for fusing	I^2t	t = 10 ms	No voltage reappplied	3200	A ² s
		t = 8.3 ms		100 % V_{RRM} reappplied	
		t = 10 ms	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 reappplied		32 000	A ² /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		1.40	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-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	$T_J = T_J$ 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

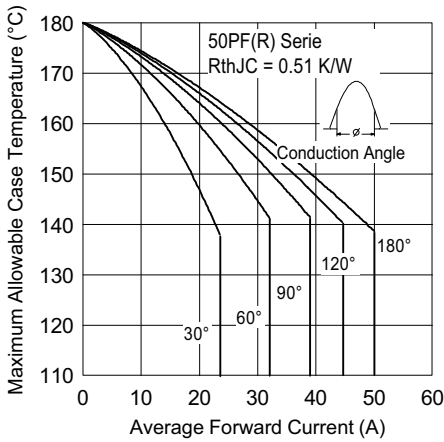


Fig. 1 - Current Ratings Characteristics

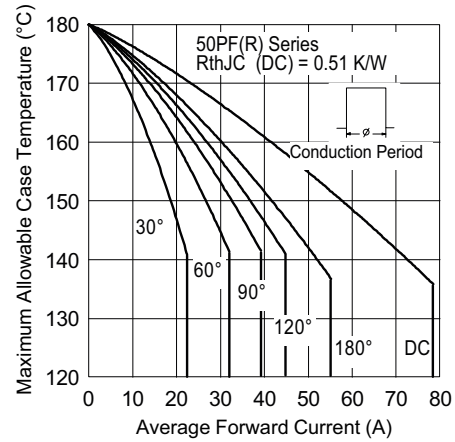


Fig. 2 - Current Ratings Characteristics

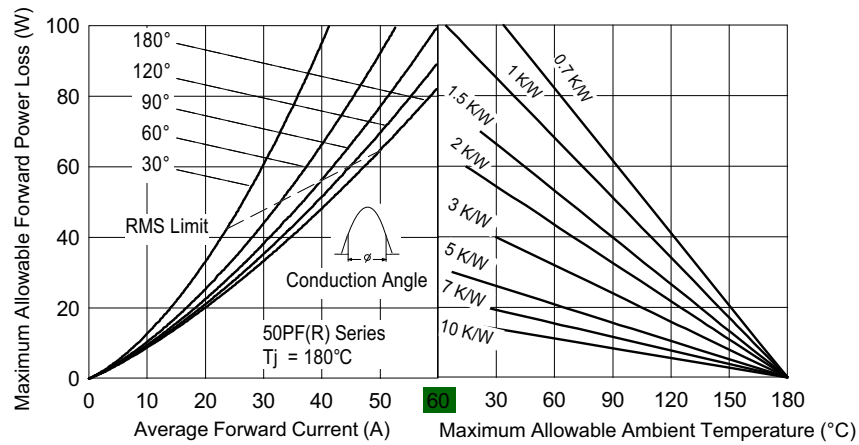


Fig. 3 - Forward Power Loss Characteristics

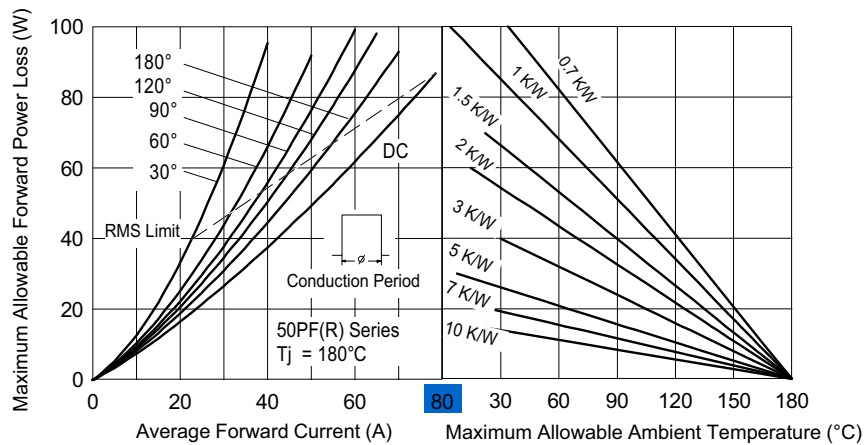


Fig. 4 - Forward Power Loss Characteristics

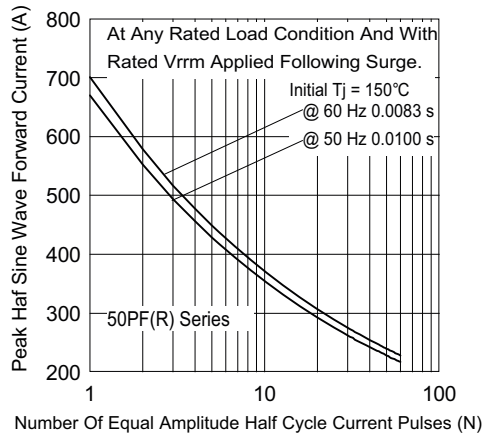


Fig. 5 - Maximum Non-Repetitive Surge Current

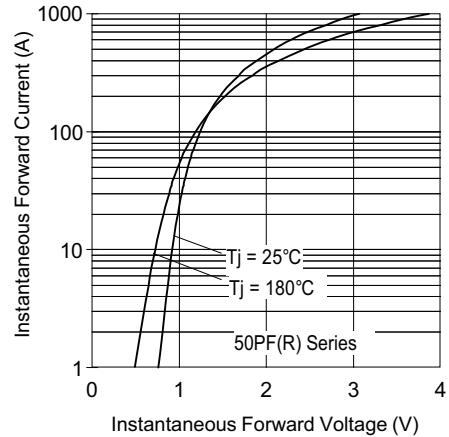


Fig. 7 - Forward Voltage Drop Characteristics

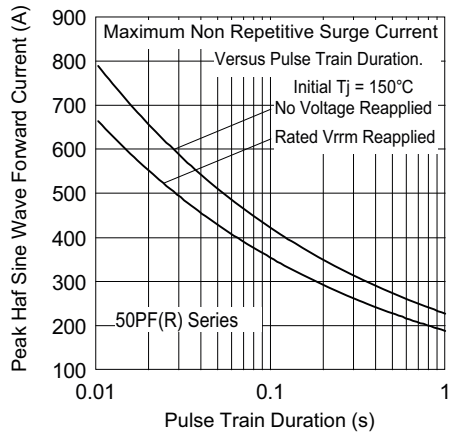


Fig. 6 - Maximum Non-Repetitive Surge Current

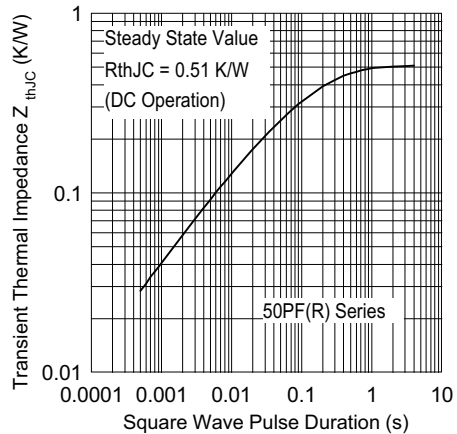
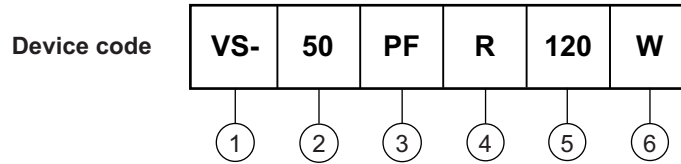


Fig. 8 - Thermal Impedance Z_{thJC} Characteristics



ORDERING INFORMATION TABLE



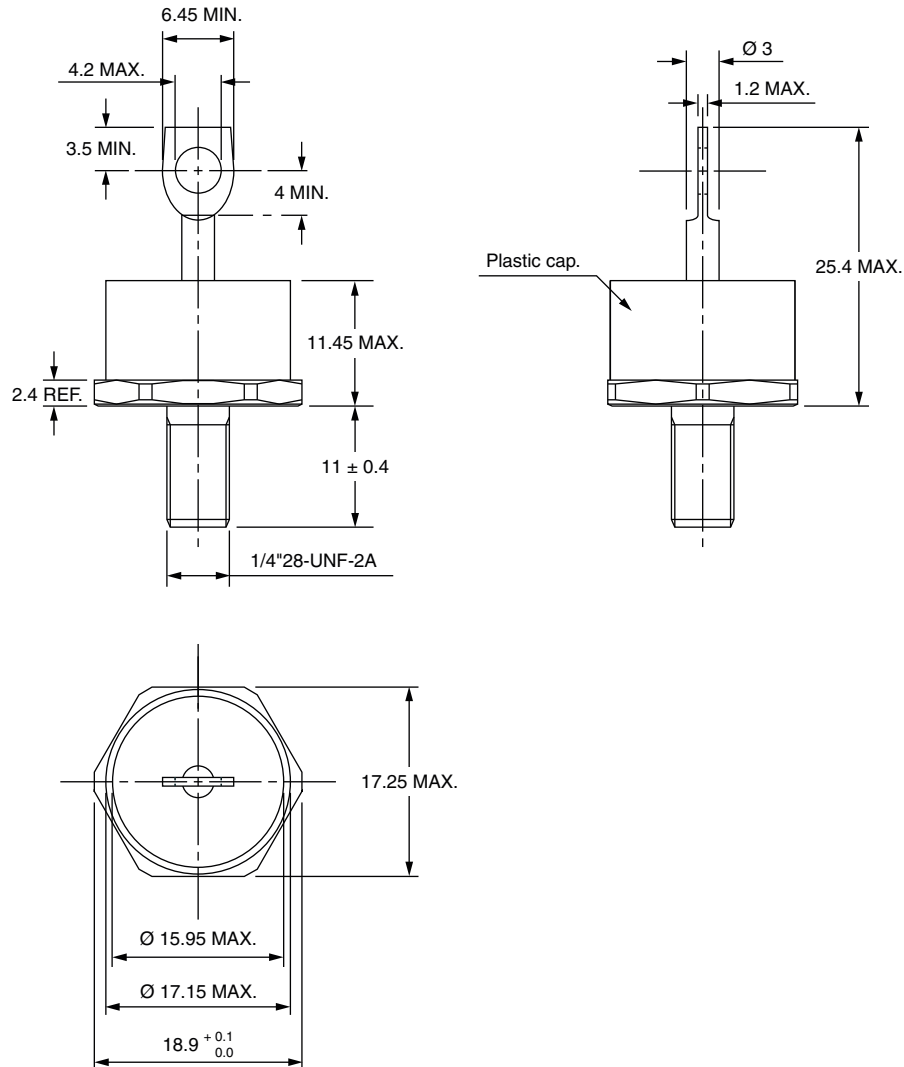
- 1** - Vishay Semiconductors product
- 2** -
 - 50 = standard device
 - 52 = isolated lead on standard terminal with silicone sleeve available for 1200 V only (red = reverse polarity) (blue = normal polarity)
- 3** - PF = plastic package
- 4** -
 - None = stud normal polarity (cathode to stud)
 - R = 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



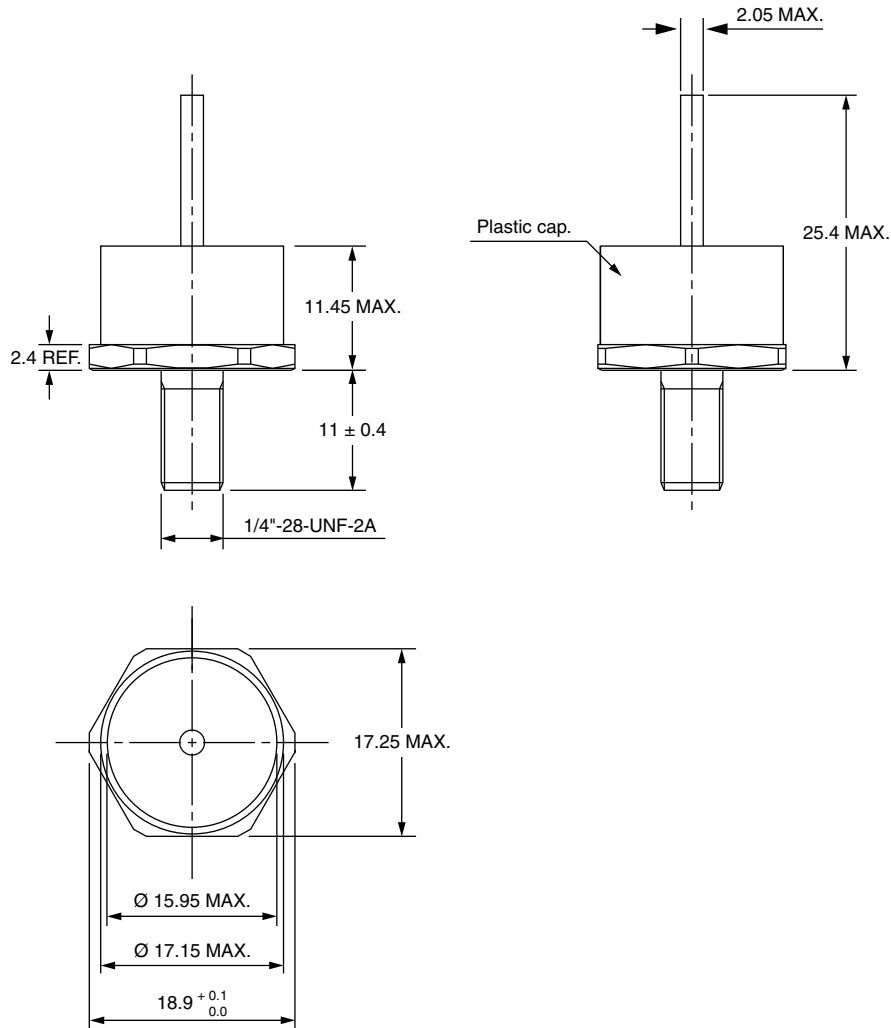
DO-203AB (DO-5) for 50PF(R)...(W), 80PF(R)...(W), and 95PF(R)...(W) Series

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



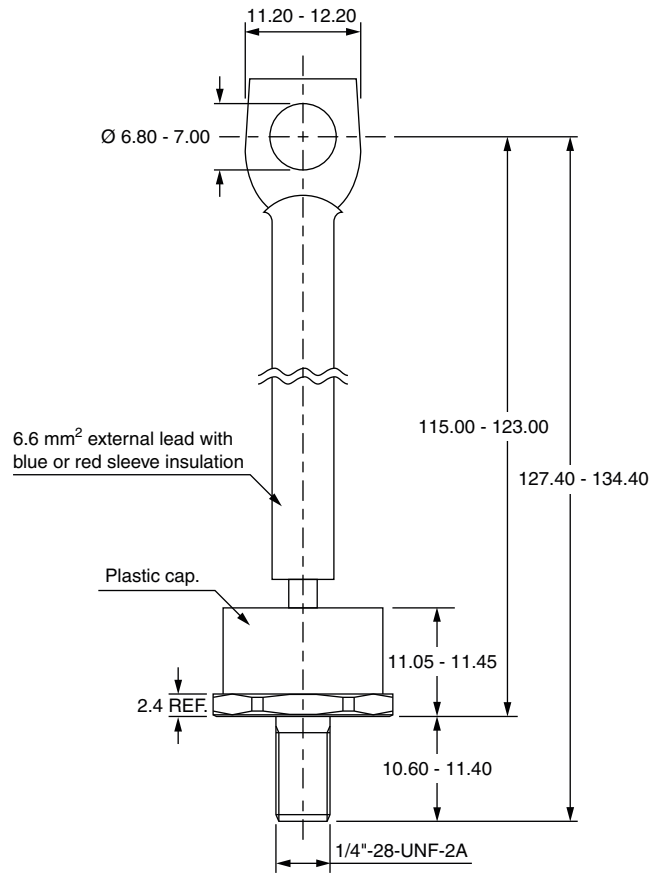


DIMENSIONS FOR 80PF(R)...(W), 50PF(R)...(W), AND 95PF(R)...(W) SERIES in millimeters





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





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