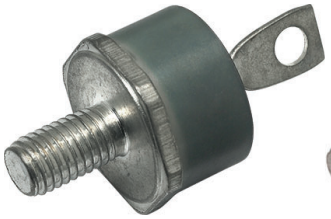
Standard Recovery Diodes, Generation 2 DO-5 (Stud Version), 50 A

50PF(R)...



DO-5 (DO-203AB)

50PF(R)...W

DO-5 (DO-203AB)

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

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

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	128	°C
$I_{F(RMS)}$		78	A
I_{FSM}	50 Hz	570	A
	60 Hz	595	
I^2t	50 Hz	1600	A^2s
	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	

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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 °C	570	A
		t = 8.3 ms			595	
		t = 10 ms	100 % V_{RRM} reapplied		480	
		t = 8.3 ms			500	
Maximum I^2t for fusing	I^2t	t = 10 ms	No voltage reapplied		1600	A^2s
		t = 8.3 ms			1450	
		t = 10 ms	100 % V_{RRM} reapplied		1150	
		t = 8.3 ms			1050	
Maximum $I^2\sqrt{t}$ for fusing	$I^2\sqrt{t}$	t = 0.1 ms to 10 ms, no voltage reapplied			16 000	$A^2\sqrt{s}$
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			1.50	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, tighting on nut (1)	3.4 (30)	N · m (lbf · in)
		Lubricated thread, tighting on nut (1)	2.3 (20)	
		Not lubricated thread, tighting on hexagon (2)	4.2 (37)	
		Lubricated thread, tighting 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-5 (DO-203AB)	

Notes

(1) Recommended for pass-through holes

(2) Torque must be appliable 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

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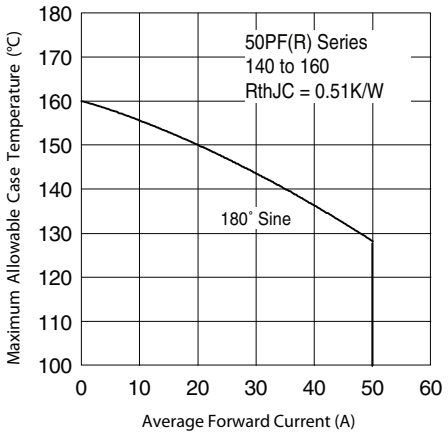

Fig. 1 - Current Ratings Characteristics

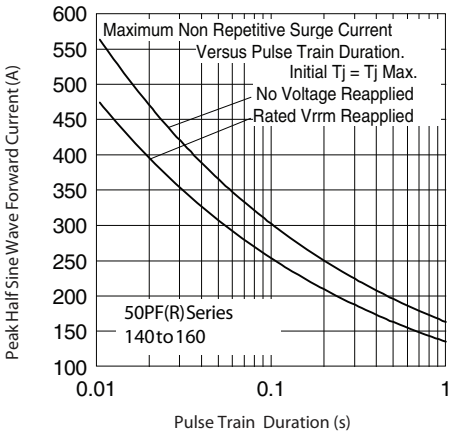

Fig. 3 - Maximum Non-Repetitive Surge Current

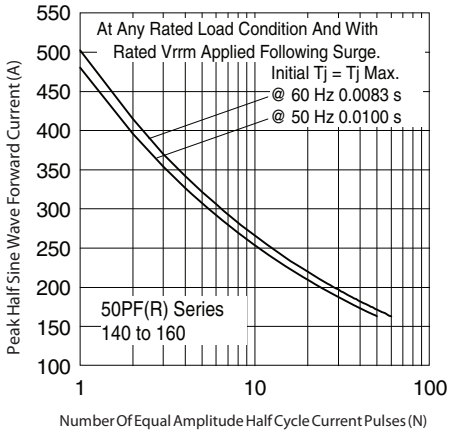

Fig. 2 - Maximum Non-Repetitive Surge Current

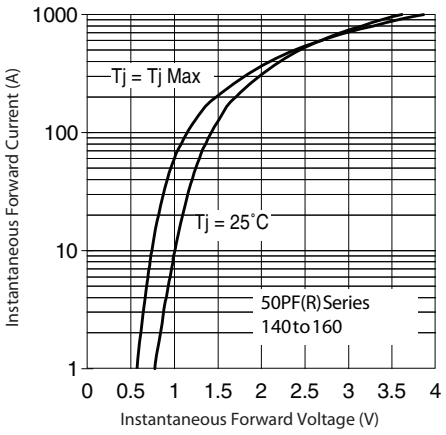

Fig. 4 - Forward Voltage Drop Characteristics

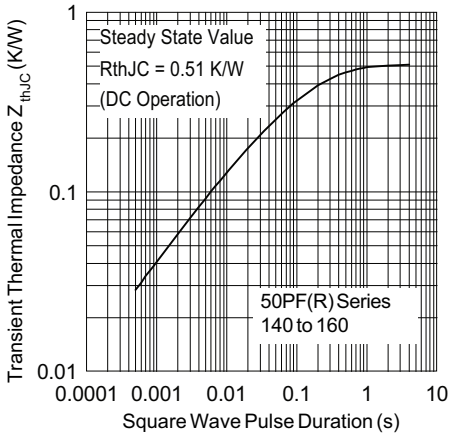

Fig. 5 - Thermal Impedance Z_{thJC} Characteristics

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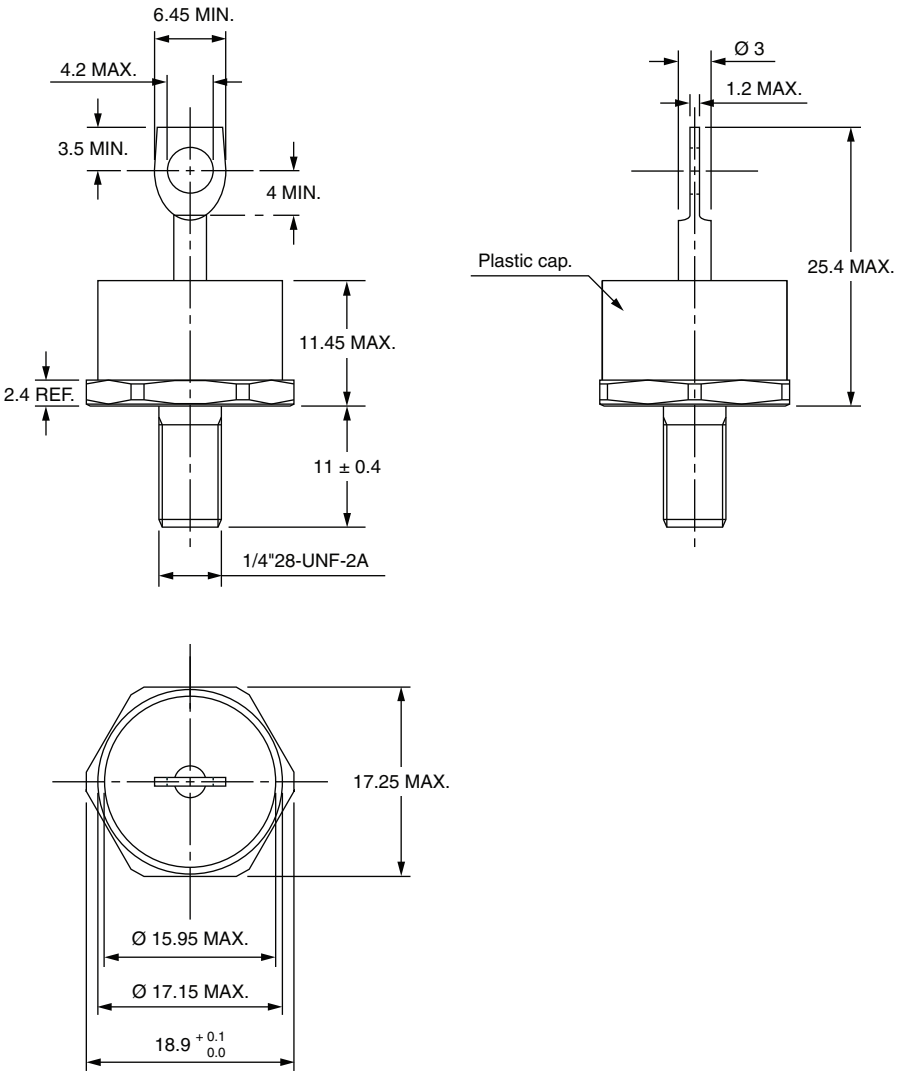
DO-203AB (DO-5) for 50PF(R)...(W), 80PF(R)...(W), and 95PF(R)...(W) Series

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



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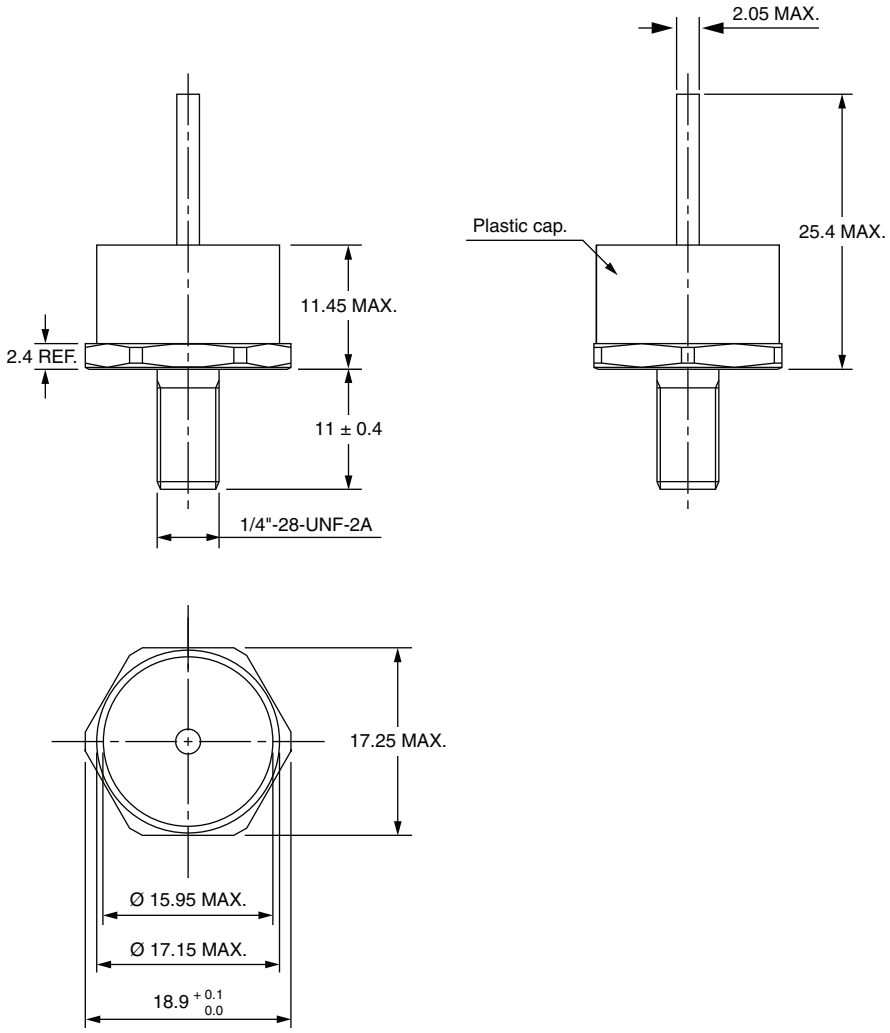
DIMENSIONS FOR 80PF(R)...(W), 50PF(R)...(W), AND 95PF(R)...(W) SERIES in millimeters



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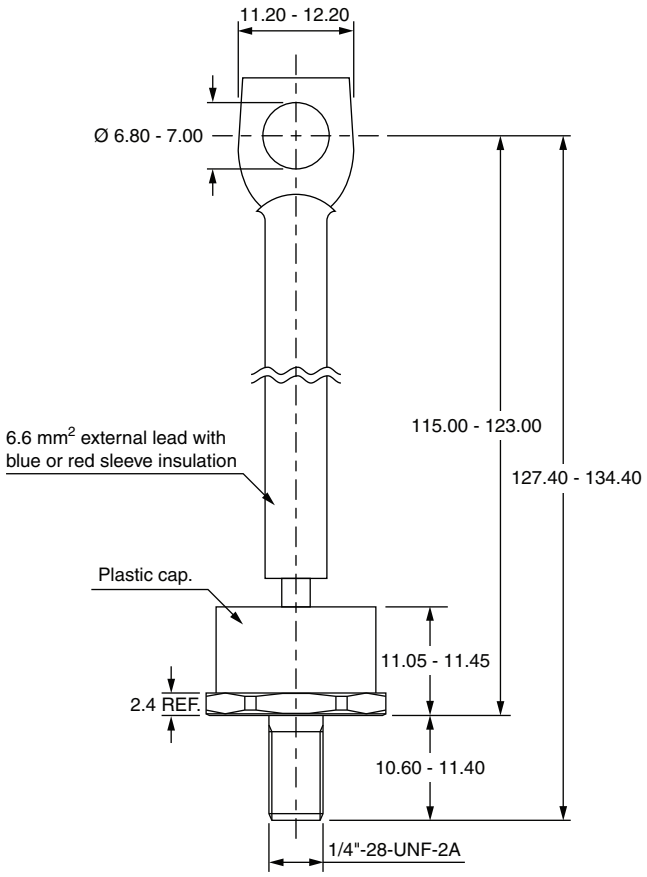
DIMENSIONS FOR 52PF(R), 82PF(R), AND 97PF(R) SERIES in millimeters



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