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

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

DO-5 (DO-203AB) 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	

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

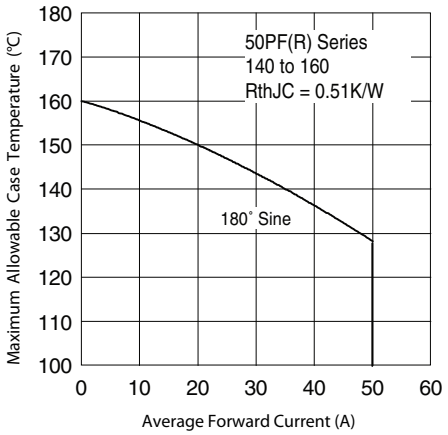


Fig. 1 - Current Ratings Characteristics

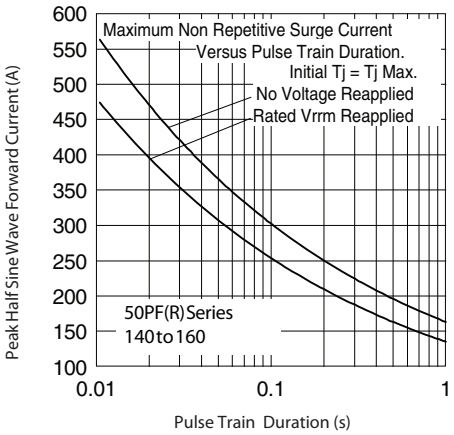


Fig. 3 - Maximum Non-Repetitive Surge Current

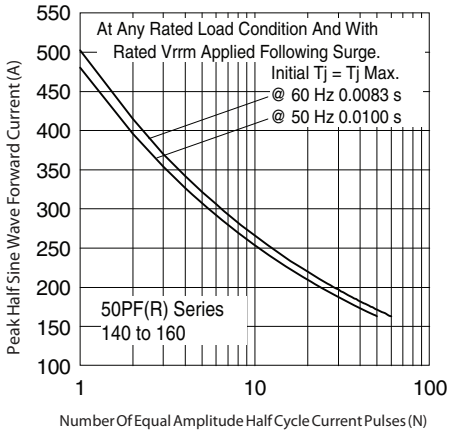


Fig. 2 - Maximum Non-Repetitive Surge Current

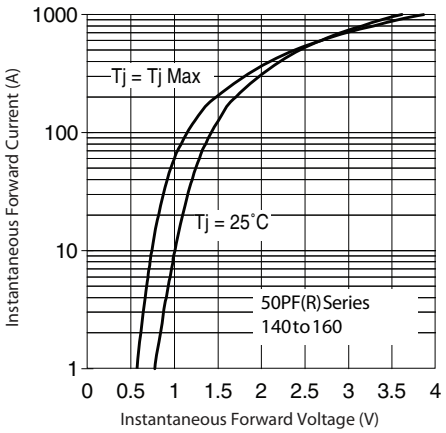


Fig. 4 - Forward Voltage Drop Characteristics

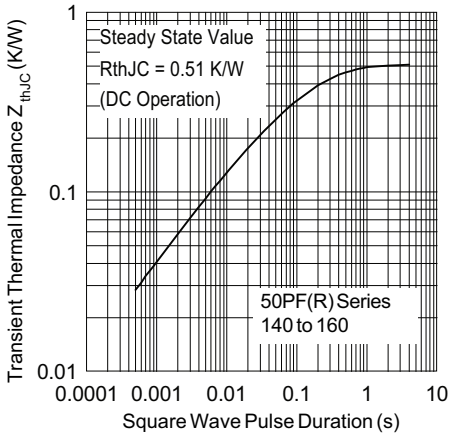


Fig. 5 - Thermal Impedance Z_{thJC} Characteristics

ORDERING INFORMATION TABLE

Device code

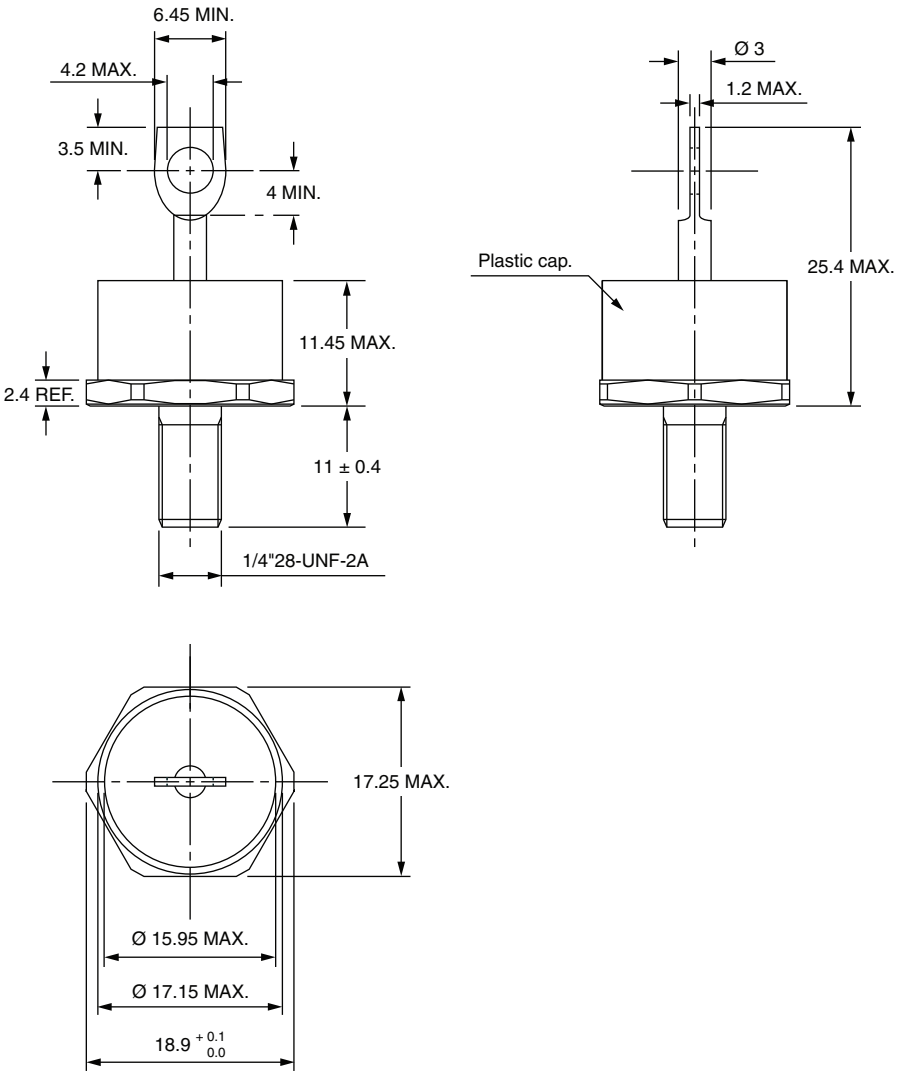
VS-	50	PF	R	160	W
1	2	3	4	5	6

- 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)

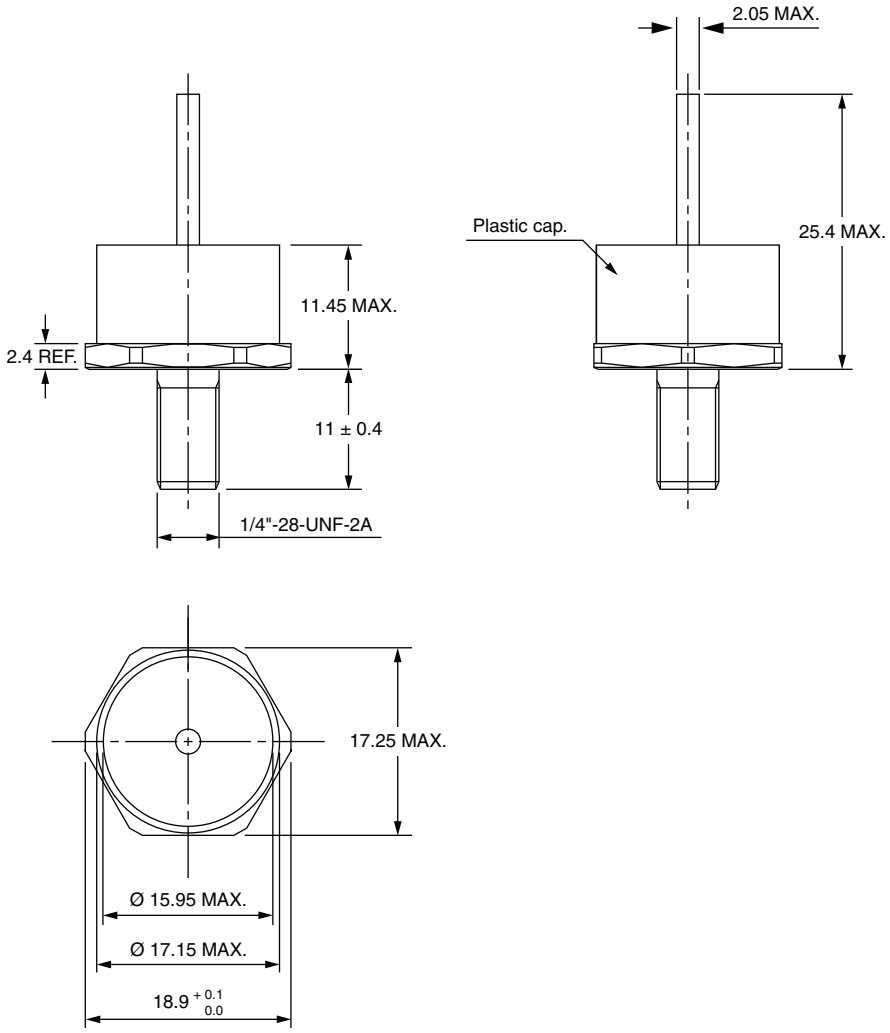
LINKS TO RELATED DOCUMENTS	
Dimensions	www.vishay.com/doc?95345

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

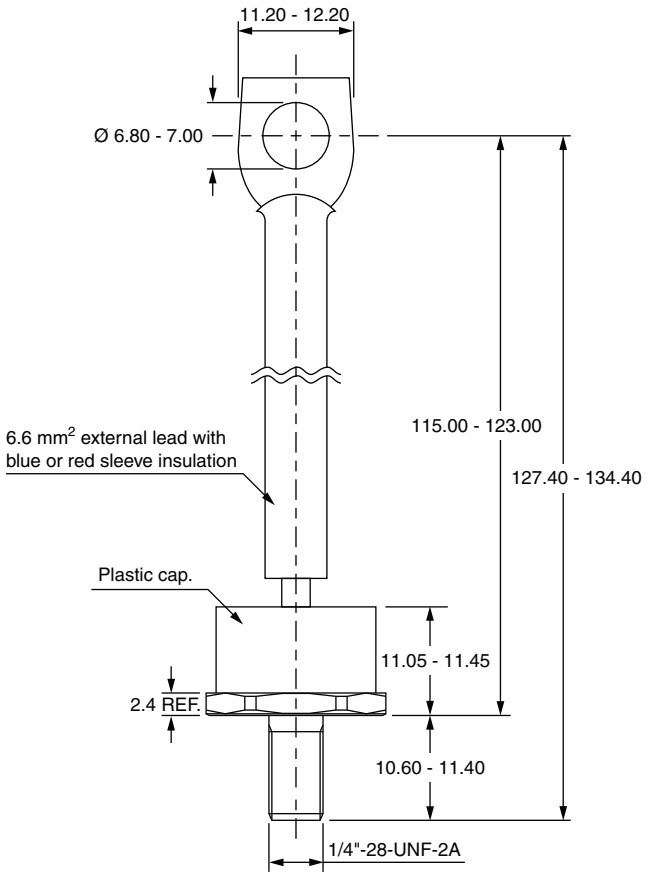
DIMENSIONS FOR 80PF(R), 50PF(R), AND 95PF(R) SERIES in millimeters



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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