

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

50PF(R)...



DO-203AB (DO-5)

50PF(R)...W



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
- Compliant to RoHS directive 2002/95/EC
- Designed and qualified for multiple level



**RoHS**  
COMPLIANT

### TYPICAL APPLICATIONS

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

### PRODUCT SUMMARY

$I_{F(AV)}$	50 A
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### 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 <sup>2</sup> 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 $T_J = 150\text{ °C}$ mA
50PF(R)...(W)	140	1400	1650	4.5
	160	1600	1900	

# 50PF(R)...(W) High Voltage Series



Vishay High Power Products

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FORWARD CONDUCTION						
PARAMETER	SYMBOL	TEST CONDITIONS			VALUES	UNITS
Maximum average forward current at case temperature	I <sub>F(AV)</sub>	180° conduction, half sine wave			50	A
					128	°C
Maximum RMS forward current	I <sub>F(RMS)</sub>				78	A
Maximum peak, one cycle forward, non-repetitive surge current	I <sub>FSM</sub>	t = 10 ms	No voltage reapplied	Sinusoidal half wave, initial T <sub>J</sub> = 150 °C	570	A
		t = 8.3 ms			595	
		t = 10 ms	100 % V <sub>RRM</sub> reapplied		480	
		t = 8.3 ms			500	
Maximum I <sup>2</sup> t for fusing	I <sup>2</sup> t	t = 10 ms	No voltage reapplied		1600	A <sup>2</sup> s
		t = 8.3 ms			1450	
		t = 10 ms	100 % V <sub>RRM</sub> reapplied		1150	
		t = 8.3 ms			1050	
Maximum I <sup>2</sup> √t for fusing	I <sup>2</sup> √t	t = 0.1 ms to 10 ms, no voltage reapplied			16 000	A <sup>2</sup> √s
Low level value of threshold voltage	V <sub>F(TO)</sub>	(16.7 % × π × I <sub>F(AV)</sub> < I < π × I <sub>F(AV)</sub> ), T <sub>J</sub> = T <sub>J</sub> maximum			0.77	V
Low level value of forward slope resistance	r <sub>f</sub>	(16.7 % × π × I <sub>F(AV)</sub> < I < π × I <sub>F(AV)</sub> ), T <sub>J</sub> = T <sub>J</sub> maximum			4.30	mΩ
Maximum forward voltage drop	V <sub>FM</sub>	I <sub>pk</sub> = 125 A, T <sub>J</sub> = 25 °C, t <sub>p</sub> = 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, tightening on nut <sup>(1)</sup>	3.4 (30)	N · m (lbf · in)
		Lubricated thread, tightening on nut <sup>(1)</sup>	2.3 (20)	
		Not lubricated thread, tightening on hexagon <sup>(2)</sup>	4.2 (37)	
		Lubricated thread, tightening on hexagon <sup>(2)</sup>	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

<sup>(1)</sup> Recommended for pass-through holes

<sup>(2)</sup> Torque must be applicable only to hexagon and not to plastic structure, recommended for holed heatsink



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$\Delta R_{thJC}$ 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

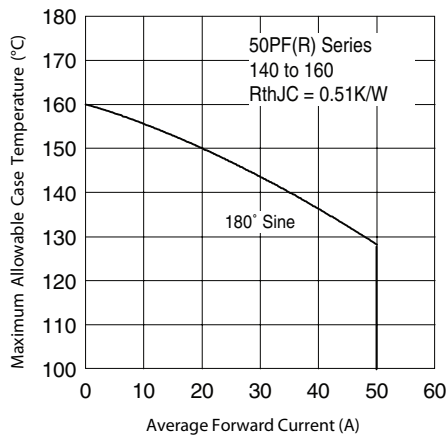


Fig. 1 - Current Ratings Characteristics

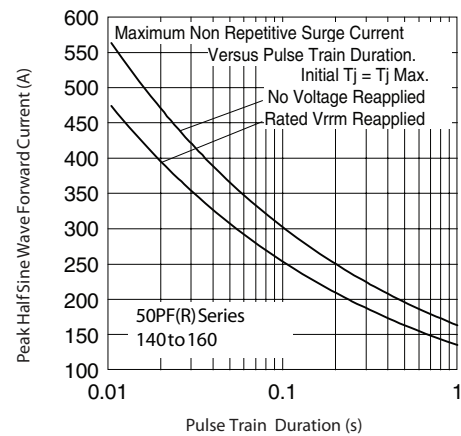


Fig. 3 - Maximum Non-Repetitive Surge Current

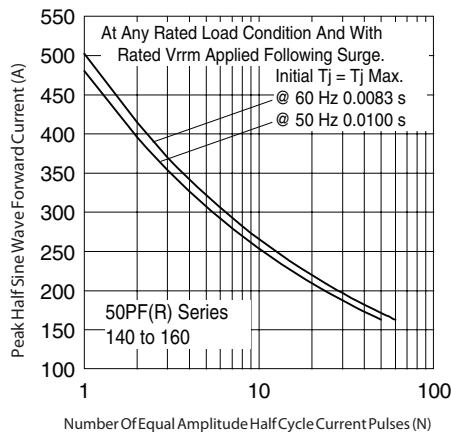


Fig. 2 - Maximum Non-Repetitive Surge Current

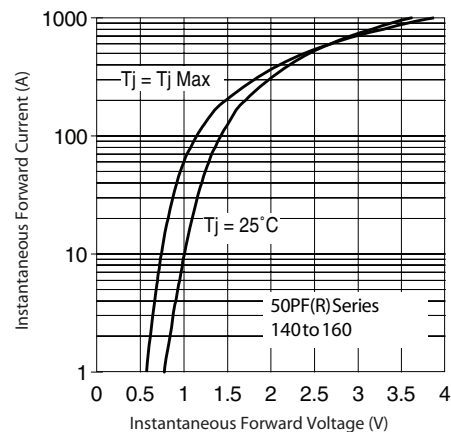


Fig. 4 - Forward Voltage Drop Characteristics

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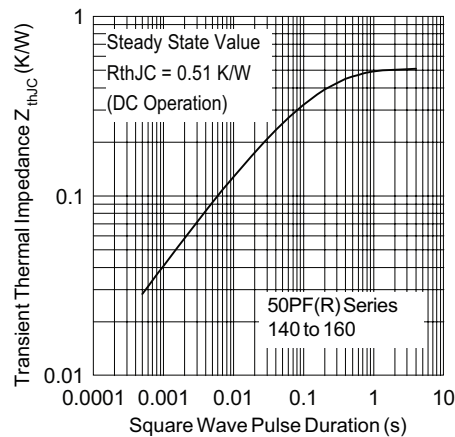


Fig. 5 - Thermal Impedance  $Z_{thJC}$  Characteristics

## ORDERING INFORMATION TABLE

Device code

50	PF	R	160	W
1	2	3	4	5

- 1 - 50 = Standard device
- 2 - PF = Plastic package
- 3 -
  - None = Stud normal polarity (cathode to stud)
  - R = Stud reverse polarity (anode to stud)
- 4 - Voltage code  $\times 10 = V_{RRM}$  (see Voltage Ratings table)
- 5 -
  - 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	<a href="http://www.vishay.com/doc?95345">www.vishay.com/doc?95345</a>



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