

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
- UL approval pending
- RoHS compliant
- Designed and qualified for multiple level


**RoHS
COMPLIANT**
PRODUCT SUMMARY

$I_{F(AV)}$	50 A
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TYPICAL APPLICATIONS

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

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
50PF(R)...(W)	40	400	500	9
	80	800	960	
	120	1200	1440	

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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
				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		830	
		t = 10 ms	100 % V_{RRM} reappplied	670	
		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		2900	
		t = 10 ms	100 % V_{RRM} reappplied	2260	
		t = 8.3 ms		2050	
Maximum $I^2\sqrt{t}$ for fusing	$I^2\sqrt{t}$	t = 0.1 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}	$I_{pk} = 125$ 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



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ΔR_{thJC} CONDUCTION				
CONDUCTION ANGLE	SINUSOIDAL CONDUCTION	RECTANGULAR CONDUCTION	TEST CONDITIONS	UNITS
180°	0.11	0.10	$T_J = T_{J \text{ maximum}}$	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

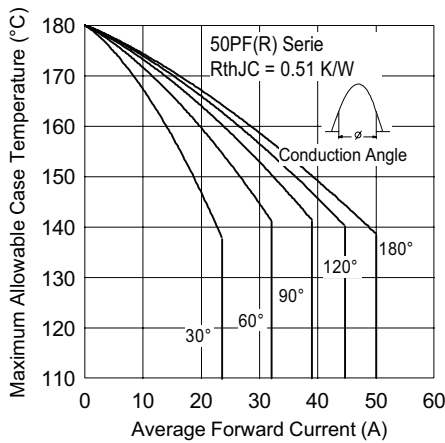


Fig. 1 - Current Ratings Characteristics

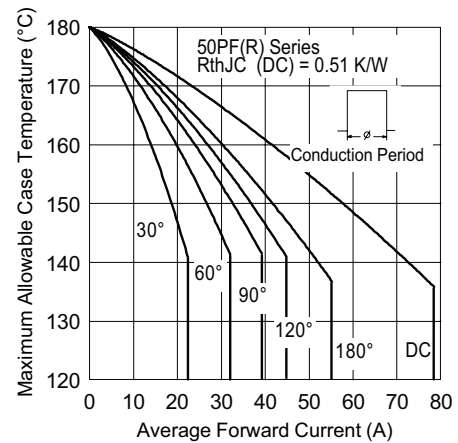


Fig. 2 - Current Ratings Characteristics

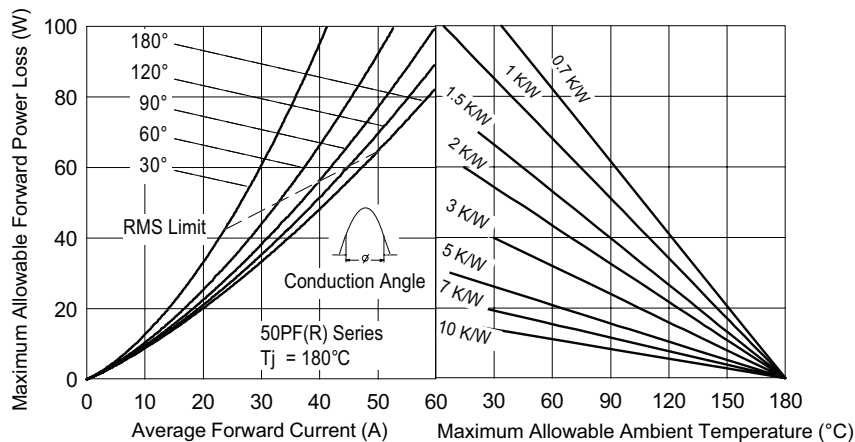


Fig. 3 - Forward Power Loss Characteristics

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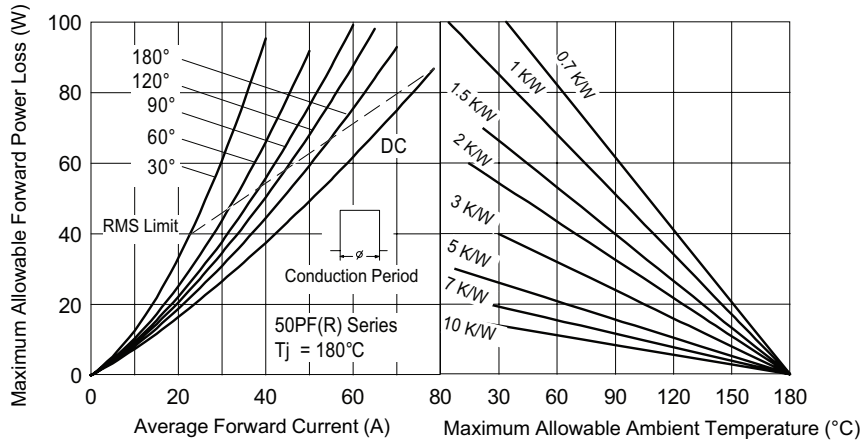


Fig. 4 - Forward Power Loss Characteristics

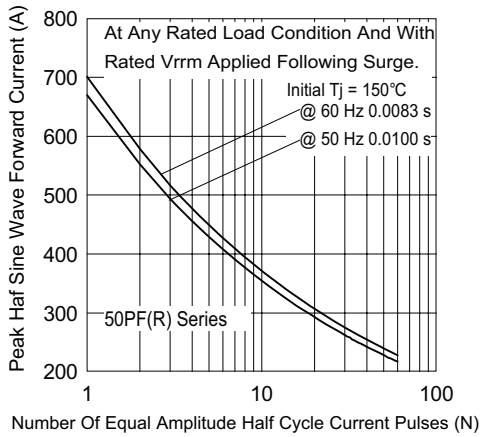


Fig. 5 - Maximum Non-Repetitive Surge Current

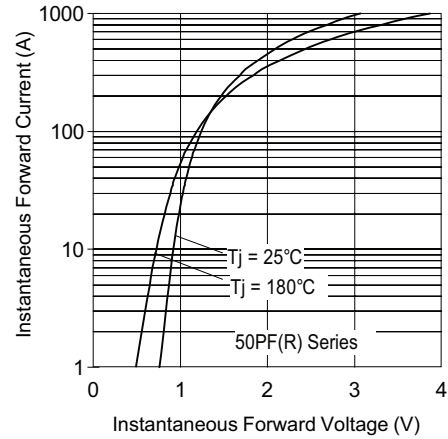


Fig. 7 - Forward Voltage Drop Characteristics

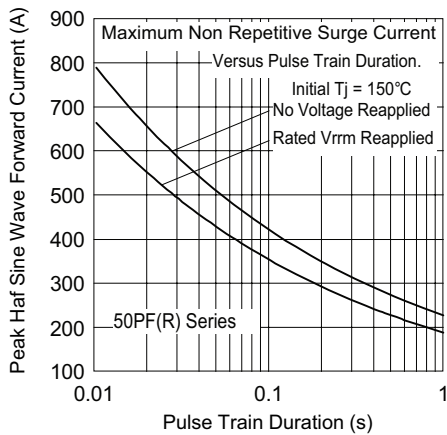


Fig. 6 - Maximum Non-Repetitive Surge Current

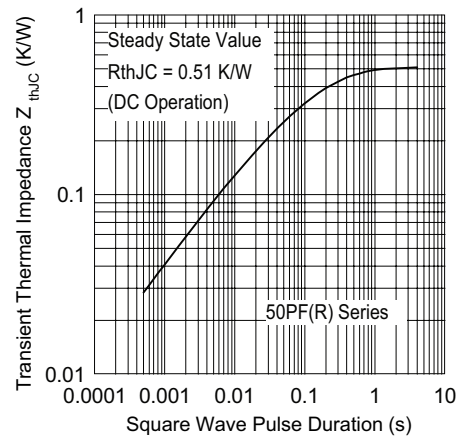
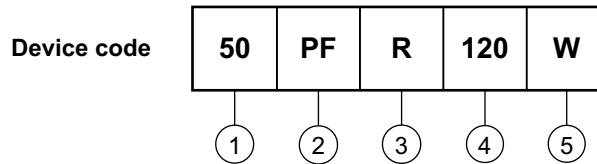


Fig. 8 - Thermal Impedance Z_{thJC} Characteristics



ORDERING INFORMATION TABLE



- 1** -
 - 50 = Standard device
 - 52 = Isolated lead on standard terminal
with silicone sleeve available for 1200 V only
(red = Reverse polarity)
(blue = Normal polarity)
- 2** - PF = Plastic package
- 3** -
 - None = Stud normal polarity (cathode to stud)
 - R = Stud reverse polarity (anode to stud)
- 4** - Voltage code x 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	http://www.vishay.com/doc?95345



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