

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
- RoHS compliant
- 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 ² 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	

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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 ² t for fusing	I ² t	t = 10 ms	No voltage reapplied		1600	A ² s
		t = 8.3 ms			1450	
		t = 10 ms	100 % V _{RRM} reapplied		1150	
		t = 8.3 ms			1050	
Maximum I ² √t for fusing	I ² √t	t = 0.1 to 10 ms, no voltage reapplied			16 000	A ² √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	
Allowable mounting torque		Tightening on nut ⁽¹⁾ Not lubricated threads	$3.4 \pm 0 - 10 \%$ (30)	N · m (lbf · in)
		Tightening on hexagon ⁽²⁾ Lubricated threads	$2.3 \pm 0 - 10 \%$ (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	$T_J = T_J$ 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

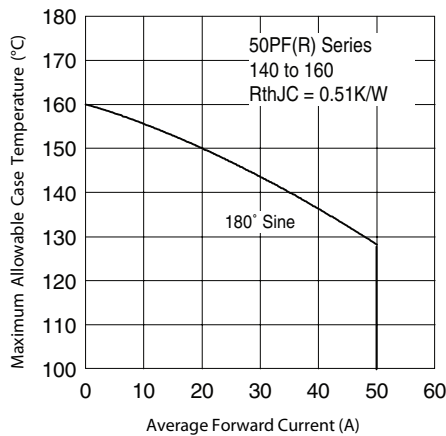


Fig. 1 - Current Ratings Characteristics

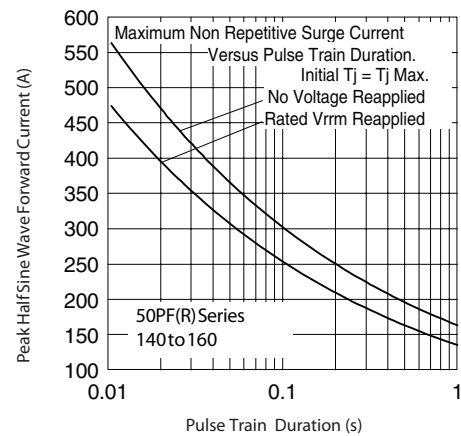


Fig. 3 - Maximum Non-Repetitive Surge Current

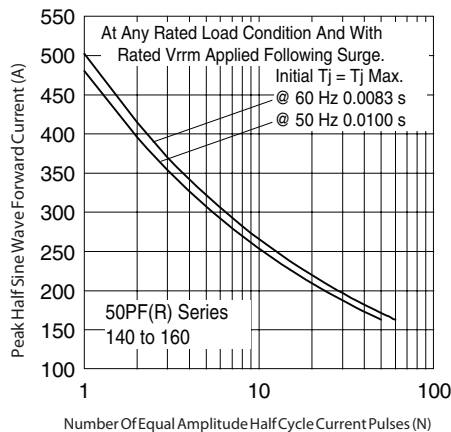


Fig. 2 - Maximum Non-Repetitive Surge Current

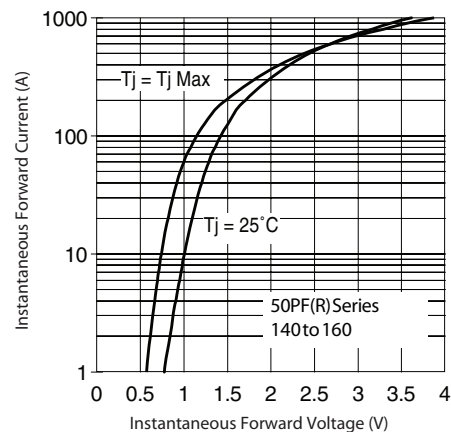


Fig. 4 - Forward Voltage Drop Characteristics

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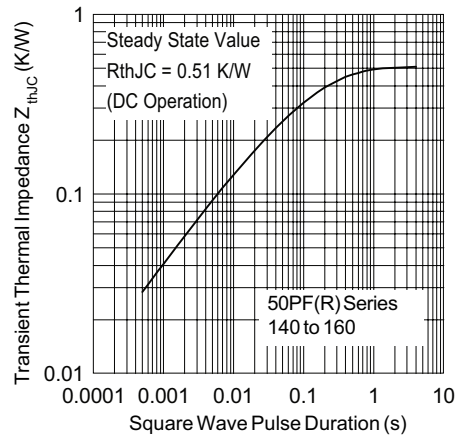


Fig. 5 - Thermal Impedance Z_{thJC} Characteristics

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 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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