

STANDARD RECOVERY DIODES GEN II DO5

Stud Version

Features

- High surge current capability
- Designed for a wide range of applications
- Stud cathode and stud anode version
- Leaded version available/ wire version available
- Low thermal resistance
- UL approval pending

50 A

Typical Applications

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

Major Ratings and Characteristics

Parameters	50PF (R)...(W)		Units
	40 to 120		
$I_{F(AV)}$	50		A
@ T_C	140		°C
$I_{F(RMS)}$	78		A
I_{FSM}	@ 50Hz	800	A
	@ 60Hz	830	
I^2t	@ 50Hz	3200	A ² s
	@ 60Hz	2900	
V_{RRM}	range	400 to 1200	V
T_J	range	- 55 to 180	°C

50PF(R)...



case style DO-203AB (DO-5)

50PF(R)...W



case style DO-203AB (DO-5)

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

Bulletin I20105 rev. B 06/02

International
 Rectifier

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} max. @ $T_J = 150^\circ\text{C}$ mA
50PF (R)...(W)	40	400	500	9
	80	800	960	
	120	1200	1440	

Forward Conduction

Parameter	50PF(R)...(W)	Units	Conditions		
	40 to 120				
$I_{F(AV)}$ Max. average forward current @ Case temperature	50 140	A $^\circ\text{C}$	180° conduction, half sine wave		
$I_{F(RMS)}$ Max. RMS forward current	78	A			
I_{FSM} Max. peak, one-cycle forward, non-repetitive surge current	800	A	t = 10ms	No voltage	Sinusoidal half wave, Initial $T_J = 150^\circ\text{C}$
	830		t = 8.3 ms	reapplied	
	670		t = 10ms	100% V_{RRM}	
	700		t = 8.3 ms	reapplied	
I^2t Maximum I^2t for fusing	3200	A^2s	t = 10ms	No voltage	
	2900		t = 8.3ms	reapplied	
	2260		t = 10ms	100% V_{RRM}	
	2050		t = 8.3ms	reapplied	
$I^2\sqrt{t}$ Maximum $I^2\sqrt{t}$ for fusing	32000	$\text{A}^2\sqrt{\text{s}}$	t = 0.1 to 10ms, no voltage reapplied		
$V_{F(TO)}$ Low level value of threshold voltage	0.77	V	$(16.7\% \times \pi \times I_{F(AV)} < I < \pi \times I_{F(AV)})$, $T_J = T_J \text{ max.}$		
r_f Low level value of forward slope resistance	4.30	m Ω	$(16.7\% \times \pi \times I_{F(AV)} < I < \pi \times I_{F(AV)})$, $T_J = T_J \text{ max.}$		
V_{FM} Max. forward voltage drop	1.40	V	$I_{pk} = 125\text{A}$, $T_J = 25^\circ\text{C}$, $t_p = 400\mu\text{s}$ rectangular wave		

Thermal and Mechanical Specifications

Parameter	50PF (R)...(W)		Units	Conditions
	40 to 120			
T _J Max. junction operating temperature range	-55 to 180		°C	
T _{stg} Max. storage temperature range	-55 to 180			
R _{thJC} Max. thermal resistance, junction to case	0.51		K/W	DC operation
R _{thCS} Max. thermal resistance, case to heatsink	0.25			Mounting surface, smooth, flat and greased
T Max. allowed mounting torque ±10%	2.3 ÷ 3.4		Nm	Tighting on nut (1)
	20 ÷ 30		lbf · in	
	3.2 ÷ 4.3		Nm	Tighting on Hexagon (2)
	28 ÷ 38		lbf · in	
wt Approximate weight	15.8 (0.56)		g (oz)	
Case style	DO-203AB (DO5)			See Outline Table

- (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

ΔR_{thJC} Conduction

(The following table shows the increment of thermal resistance R_{thJC} when devices operate at different conduction angles than DC)

Conduction angle	Sinusoidal conduction	Rectangular conduction	Units	Conditions
180°	0.11	0.10	K/W	T _J = T _J max.
120°	0.16	0.16		
90°	0.20	0.22		
60°	0.29	0.31		
30°	0.49	0.50		

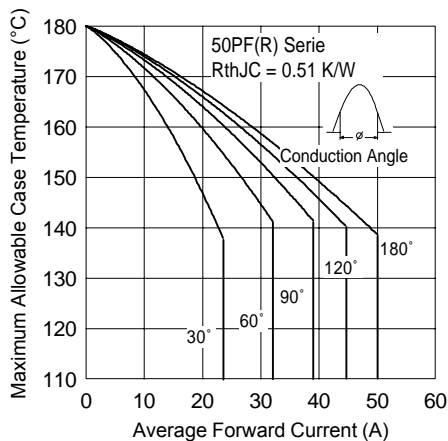


Fig. 1 - Current Ratings Characteristics

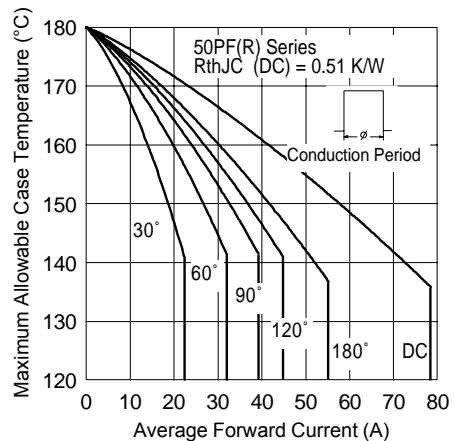


Fig. 2 - Current Ratings Characteristics

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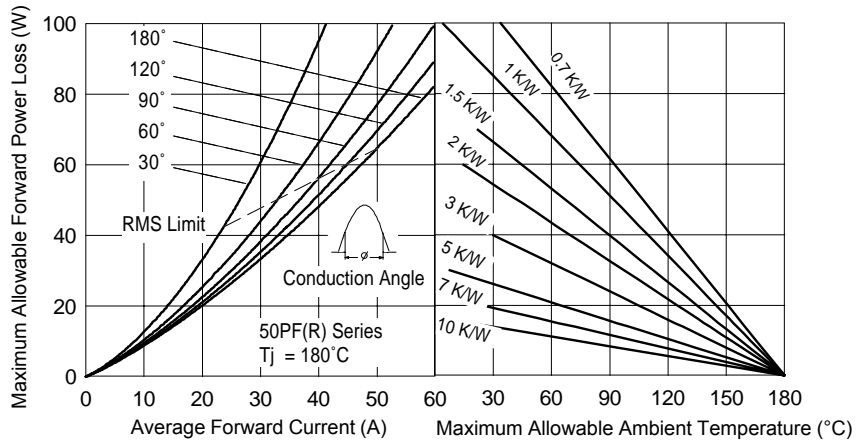


Fig. 3 - Forward Power Loss Characteristics

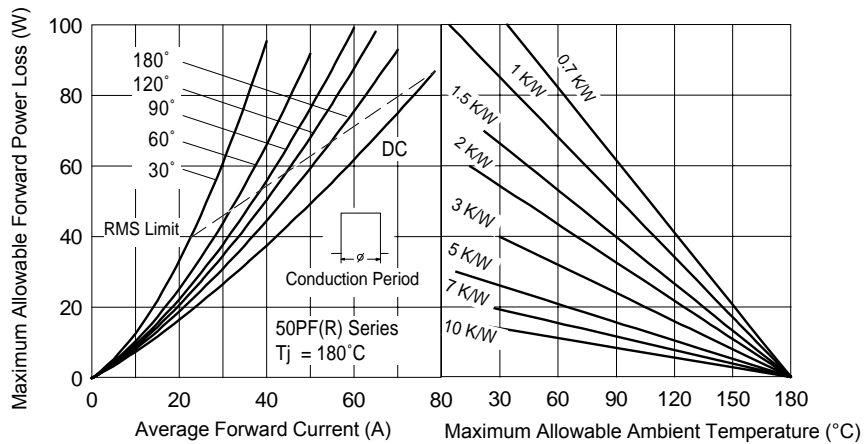


Fig. 4 - Forward Power Loss Characteristics

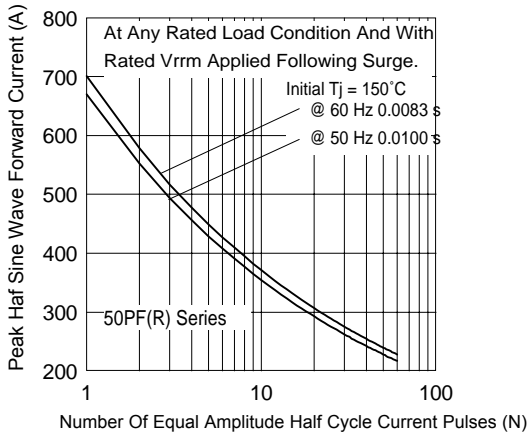


Fig. 5 - Maximum Non -Repetitive Surge Current

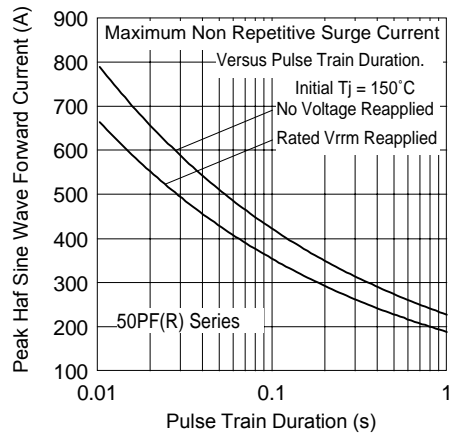


Fig. 6 - Maximum Non -Repetitive Surge Current

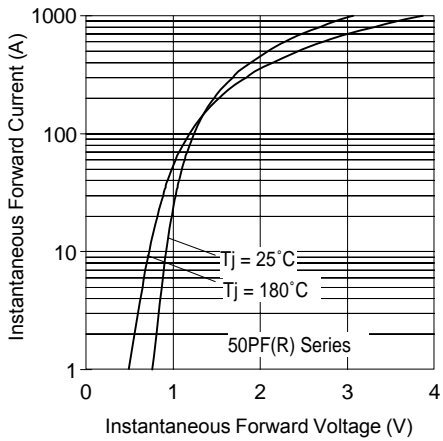


Fig. 7 - Forward Voltage Drop Characteristics

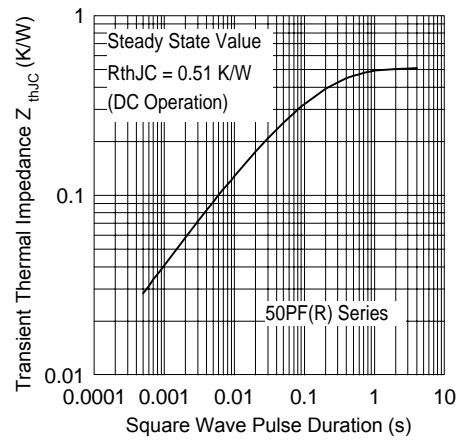
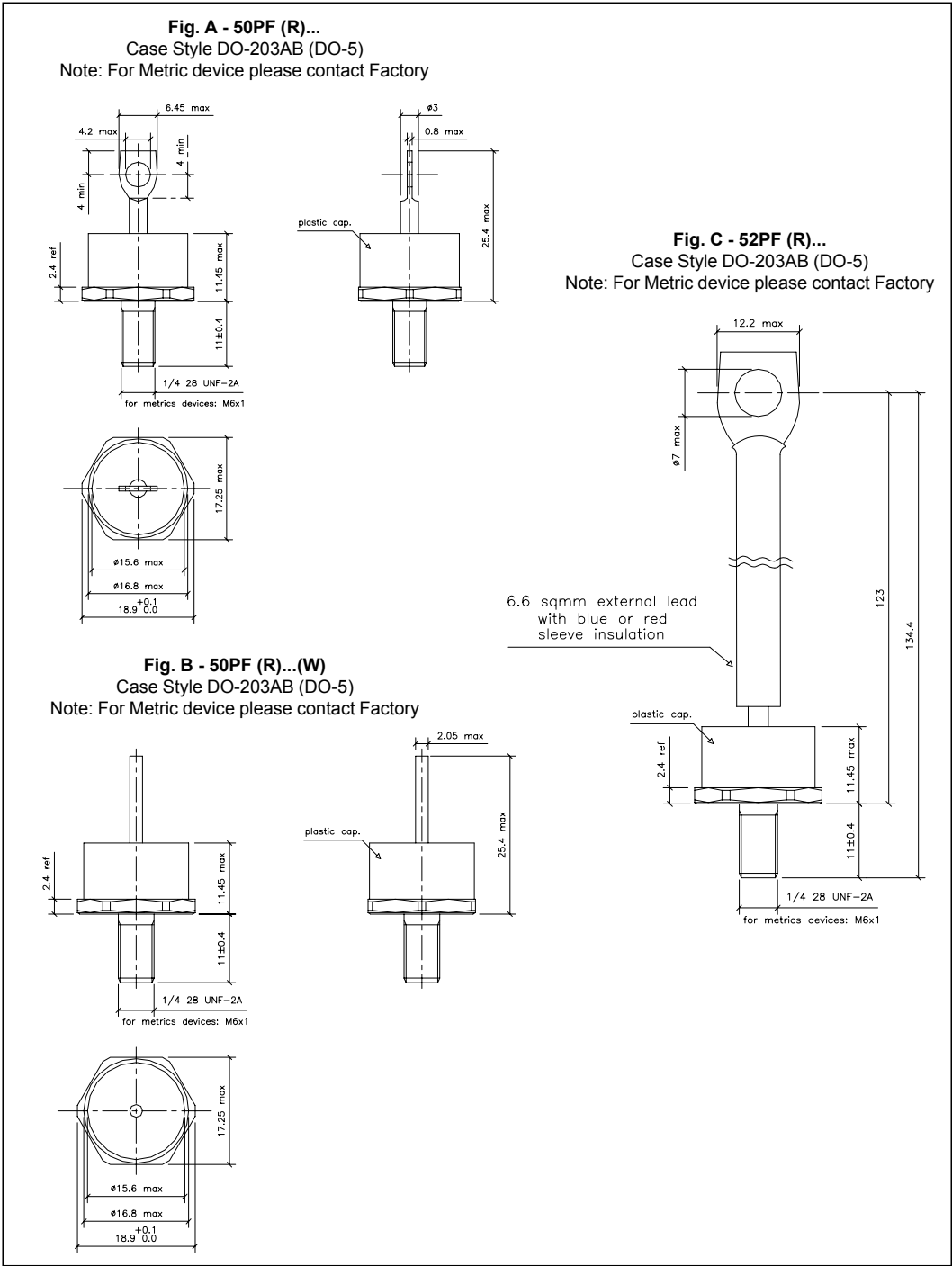


Fig. 8 - Thermal Impedance Z_{thJC} Characteristics

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

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Outline Table



Ordering Information Table

Device Code											
	<table border="1" style="margin: auto;"> <tr> <td style="padding: 5px;">50</td> <td style="padding: 5px;">PF</td> <td style="padding: 5px;">R</td> <td style="padding: 5px;">120</td> <td style="padding: 5px;">W</td> </tr> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">2</td> <td style="text-align: center;">3</td> <td style="text-align: center;">4</td> <td style="text-align: center;">5</td> </tr> </table>	50	PF	R	120	W	1	2	3	4	5
50	PF	R	120	W							
1	2	3	4	5							
<p>1 - 50 = Standard device 52 = Isolated lead on standard terminal with silicone sleeve available for 1200V only (Red = Reverse Polarity) (Blue = Normal Polarity)</p> <p>2 - PF = Plastic Package</p> <p>3 - None = Stud Normal Polarity (Cathode to Stud) R = Stud Reverse Polarity (Anode to Stud)</p> <p>4 - Voltage code: Code x 10 = V_{RRM} (See Voltage Ratings table)</p> <p>5 - None = Standard terminal (see Fig. A) - W = Wire terminal (see Fig. B)</p>											

Data and specifications subject to change without notice.
 This product has been designed and qualified for Multiple Level.
 Qualification Standards can be found on IR's Web site.