

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 03/04

International
IR 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	A	180° conduction, half sine wave		
	140	$^\circ\text{C}$			
$I_{F(RMS)}$ 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 $\pm 10\%$	2.3 \pm 3.4		Nm	Tighting on nut (1)
	20 \pm 30		lbf · in	
	3.2 \pm 4.3		Nm	Tighting on Hexagon (2)
	28 \pm 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	$T_J = T_J \text{ max.}$
120°	0.16	0.16		
90°	0.20	0.22		
60°	0.29	0.31		
30°	0.49	0.50		

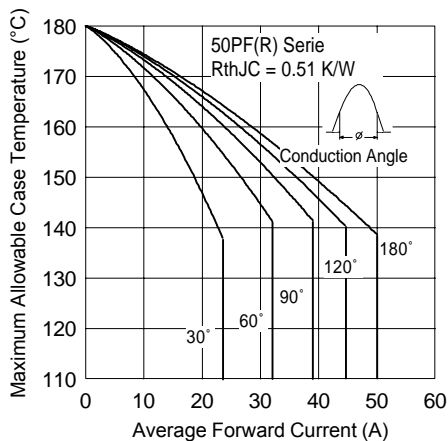


Fig. 1 - Current Ratings Characteristics

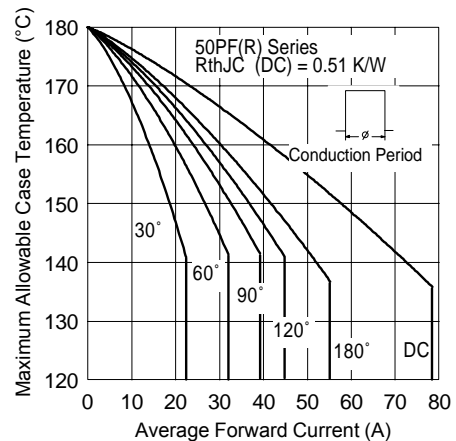


Fig. 2 - Current Ratings Characteristics

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

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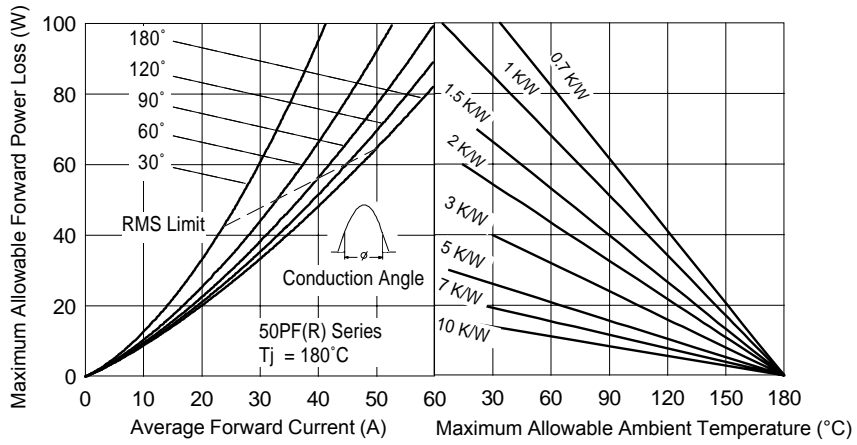


Fig. 3 - Forward Power Loss Characteristics

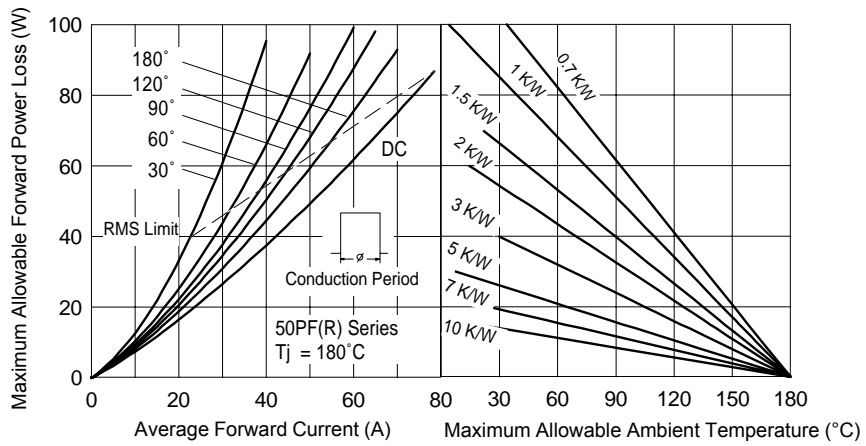


Fig. 4 - Forward Power Loss Characteristics

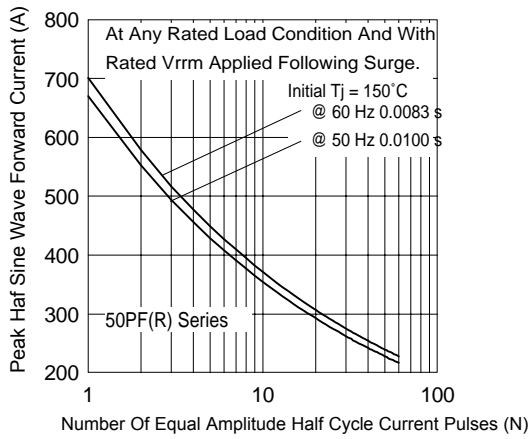


Fig. 5 - Maximum Non -Repetitive Surge Current

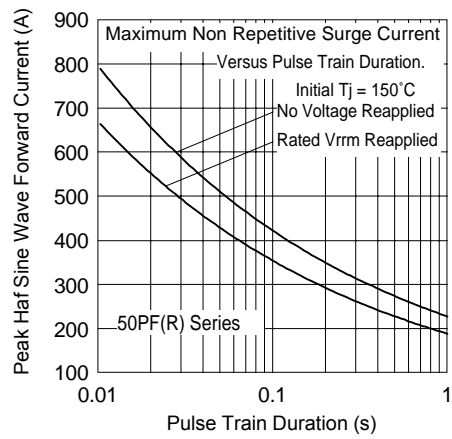


Fig. 6 - Maximum Non -Repetitive Surge Current

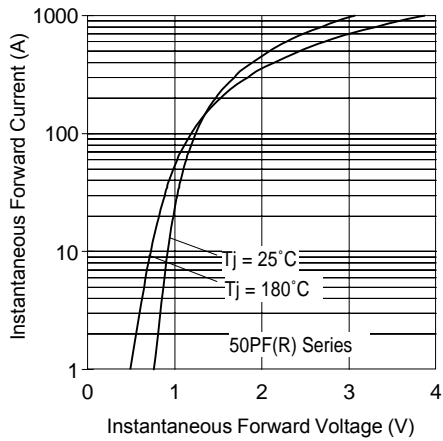


Fig. 7 - Forward Voltage Drop Characteristics

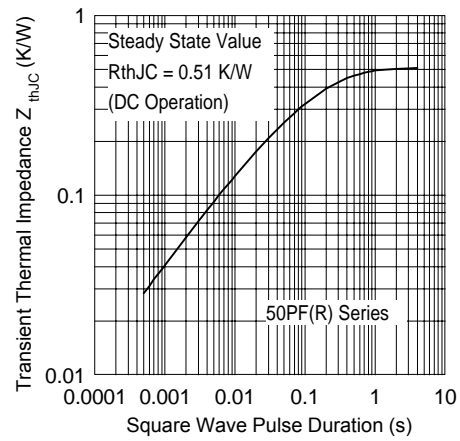
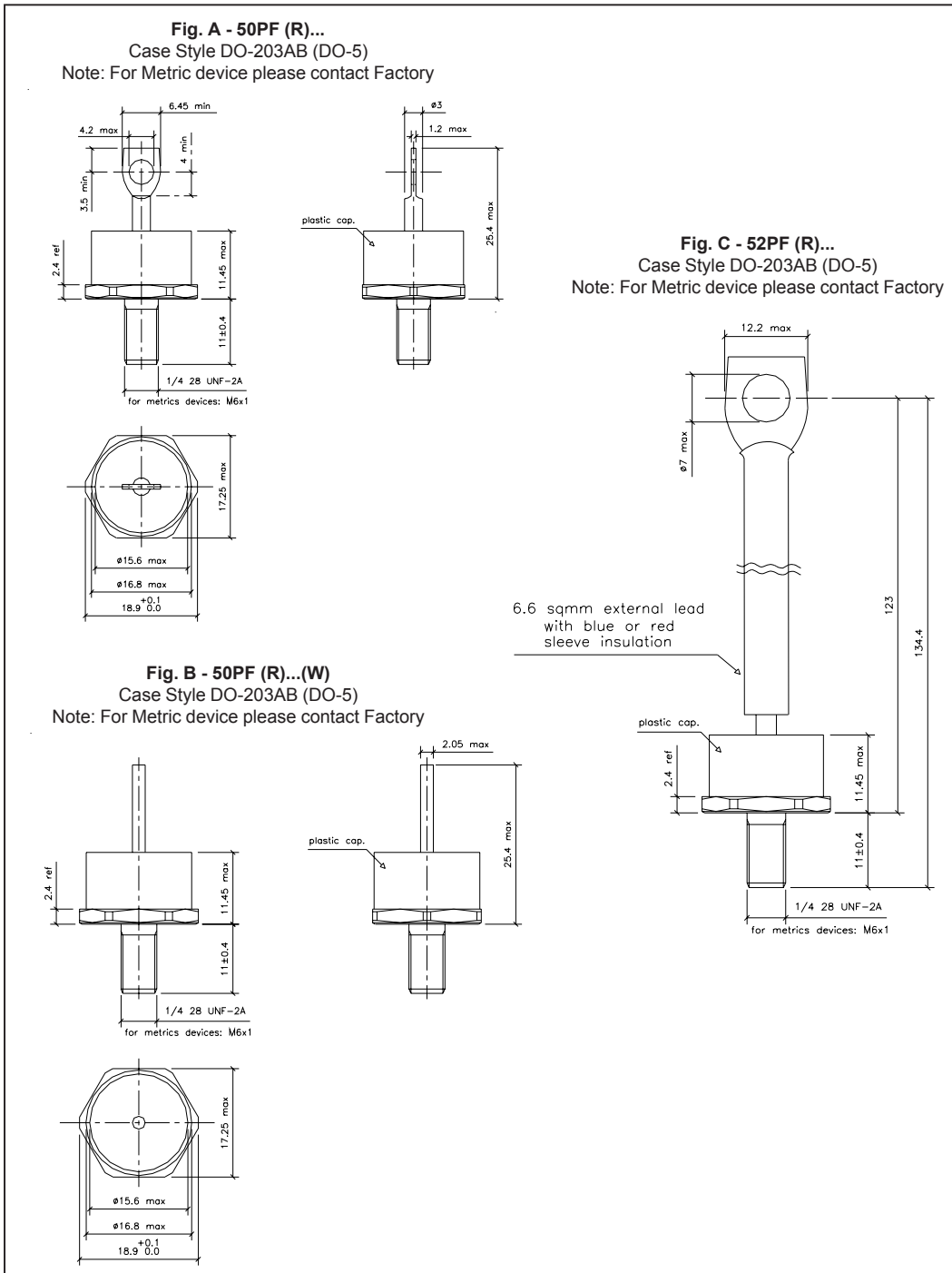


Fig. 8 - Thermal Impedance Z_{thJC} Characteristics

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</p>	<ul style="list-style-type: none"> - 50 = Standard device 52 = Isolated lead on standard terminal with silicone sleeve available for 1200V only (Red = Reverse Polarity) (Blue = Normal Polarity) 										
<p>2</p>	<ul style="list-style-type: none"> - PF = Plastic Package 										
<p>3</p>	<ul style="list-style-type: none"> - None = Stud Normal Polarity (Cathode to Stud) R = Stud Reverse Polarity (Anode to Stud) 										
<p>4</p>	<ul style="list-style-type: none"> - Voltage code: Code x 10 = V_{RRM} (See Voltage Ratings table) 										
<p>5</p>	<ul style="list-style-type: none"> - None = Standard terminal (see Fig. A) - W = Wire terminal (see Fig. B) 										

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.