

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 ² t	@ 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	°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°C	
		830		t = 8.3 ms	reapplied		
		670		t = 10ms	100% V _{RRM}		
		700		t = 8.3 ms	reapplied		
I ² t	Maximum I ² t for fusing	3200	A ² s	t = 10ms	No voltage		
		2900		t = 8.3ms	reapplied		
		2260		t = 10ms	100% V _{RRM}		
		2050		t = 8.3ms	reapplied		
I ² /t	Maximum I ² /t for fusing	32000	A ² /s	t = 0.1 to 10ms, no voltage reapplied			
V _{F(TO)}	Low level value of threshold voltage	0.77	V	(16.7% × π × I _{F(AV)} < I < π × I _{F(AV)}), T _J = T _J max.			
r _f	Low level value of forward slope resistance	4.30	mΩ	(16.7% × π × I _{F(AV)} < I < π × I _{F(AV)}), T _J = T _J max.			
V _{FM}	Max. forward voltage drop	1.40	V	I _{pk} = 125A, T _J = 25°C, t _p = 400μs 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 ± 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	$T_J = T_J \text{ max.}$
120°	0.16	0.16		
90°	0.20	0.22		
60°	0.29	0.31		
30°	0.49	0.50		

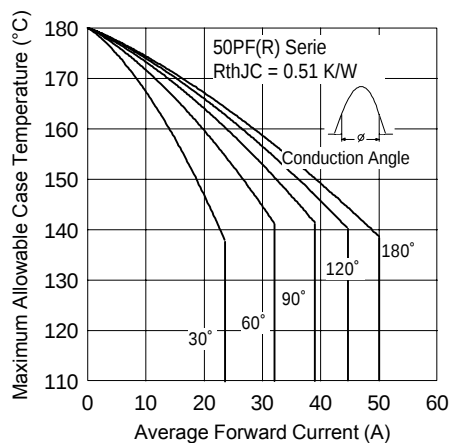


Fig. 1 - Current Ratings Characteristics

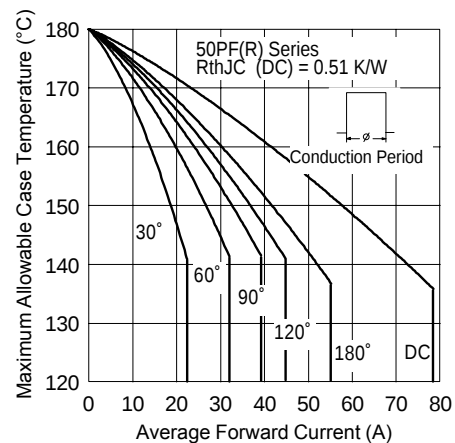


Fig. 2 - Current Ratings Characteristics

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

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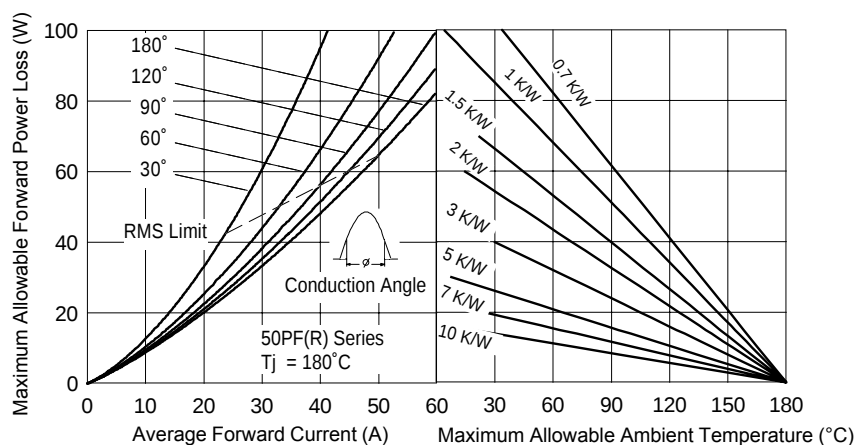


Fig. 3 - Forward Power Loss Characteristics

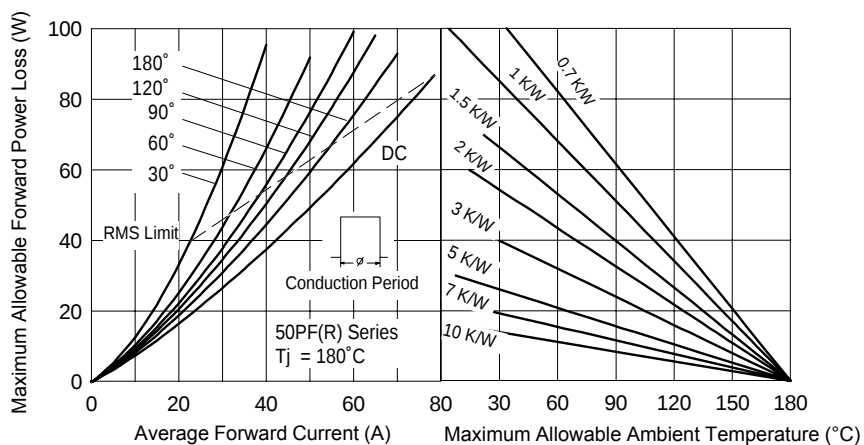


Fig. 4 - Forward Power Loss Characteristics

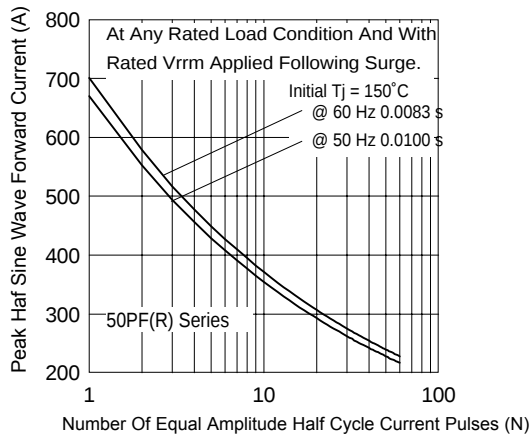


Fig. 5 - Maximum Non -Repetitive Surge Current

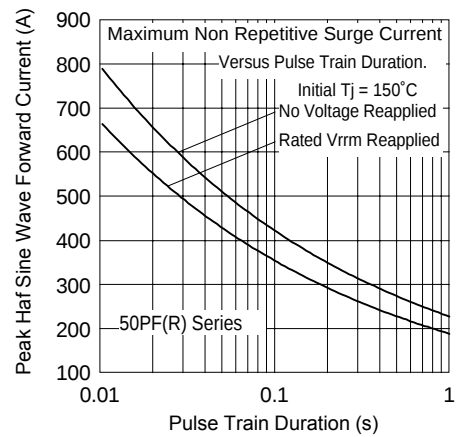


Fig. 6 - Maximum Non -Repetitive Surge Current

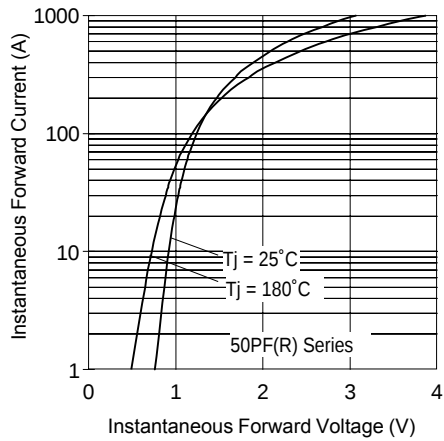


Fig. 7 - Forward Voltage Drop Characteristics

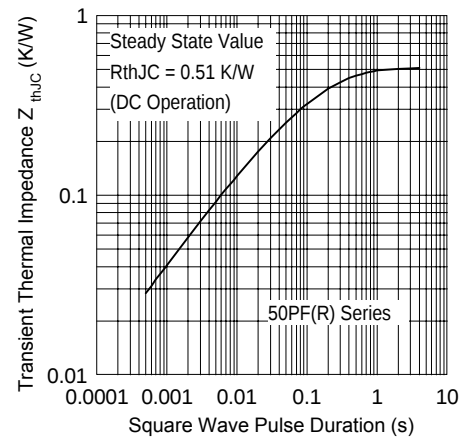
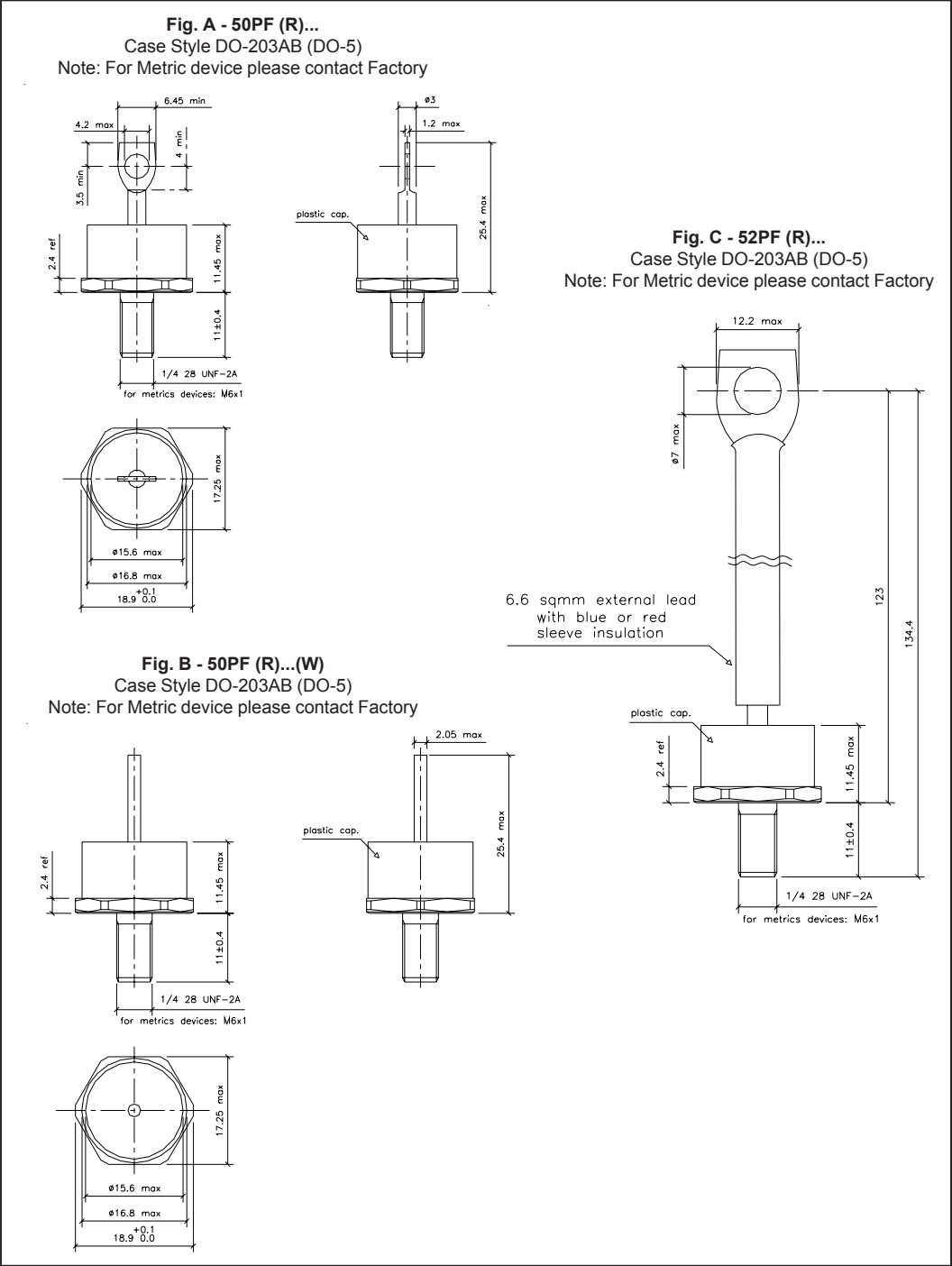


Fig. 8 - Thermal Impedance Z_{thJC} Characteristics

Outline Table



Ordering Information Table

Device Code				
	50	PF	R	120 W
	1	2	3	4 5
1	- 50	= Standard device		
	52	= Isolated lead on standard terminal with silicone sleeve available for 1200V 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: Code x 10 = V_{RRM}	(See Voltage Ratings table)		
5	- 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.

International
IR Rectifier

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