Bulletin I20105 rev. D 01/05

International
IOR Rectifier

50PF(R)...(W) SERIES

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

50PF(R)...

case style DO-203AB (DO-5)

50PF(R)...W

case style DO-203AB (DO-5)

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^2s
	@ 60Hz	2900	
V_{RRM}	range	400 to 1200	V
T_J	range	- 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} max. @ T_J = 150°C mA
50PF (R)...(W)	40	400	500	9
	80	800	960	
	120	1200	1440	

Forward Conduction

Parameter		50PF(R)...(W) 40 to 120	Units	Conditions		
$I_{F(AV)}$	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 reapplied	Sinusoidal half wave, Initial T_J = 150°C
		830		t = 8.3 ms		
		670		t = 10ms	100% V_{RRM} reapplied	
		700		t = 8.3 ms		
I^2t	Maximum I^2t for fusing	3200	A^2s	t = 10ms	No voltage reapplied	
		2900		t = 8.3ms		
		2260		t = 10ms	100% V_{RRM} reapplied	
		2050		t = 8.3ms		
$I^2\sqrt{t}$	Maximum $I^2\sqrt{t}$ for fusing	32000	$A^2\sqrt{s}$	t = 0.1 to 10ms, no voltage reapplied		
$V_{F(TO)}$	Low level value of threshold voltage	0.77	V	(16.7% x π x $I_{F(AV)}$ < I < π x $I_{F(AV)}$), T_J = T_J max.		
r_f	Low level value of forward slope resistance	4.30	mΩ	(16.7% x π x $I_{F(AV)}$ < I < π x $I_{F(AV)}$), 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) 40 to 120	Units	Conditions
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	Allowable mounting torque	3.4 +0-10%	Nm	Tighting on nut (1)
		30	lbf • in	Not lubricated threads
		2.3 +0-10%	Nm	Tighting on hexagon (2)
		20	lbf • in	Lubricated threads
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 appliable only to Hexagon and not to plastic structure

ΔR_{thJC} Conduction

(The following table shows the increment of thermal resistence 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		

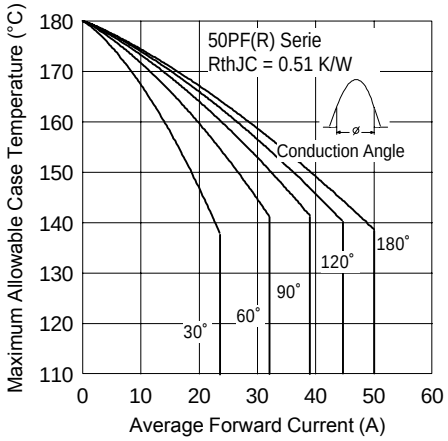


Fig. 1 - Current Ratings Characteristics

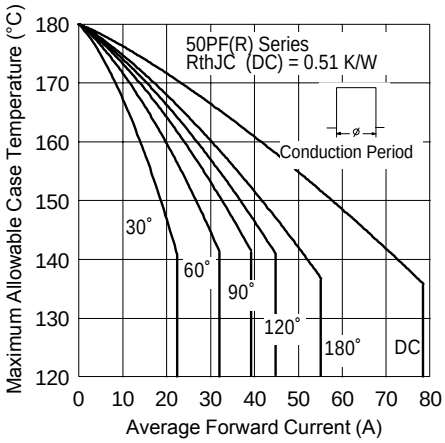


Fig. 2 - Current Ratings Characteristics

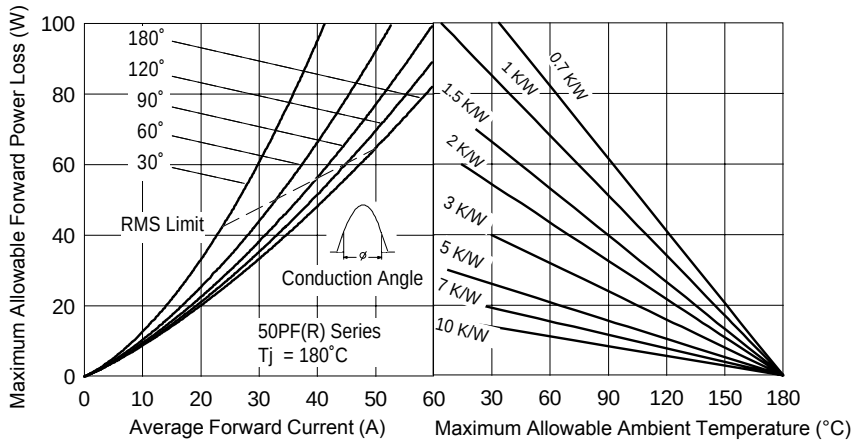


Fig. 3 - Forward Power Loss Characteristics

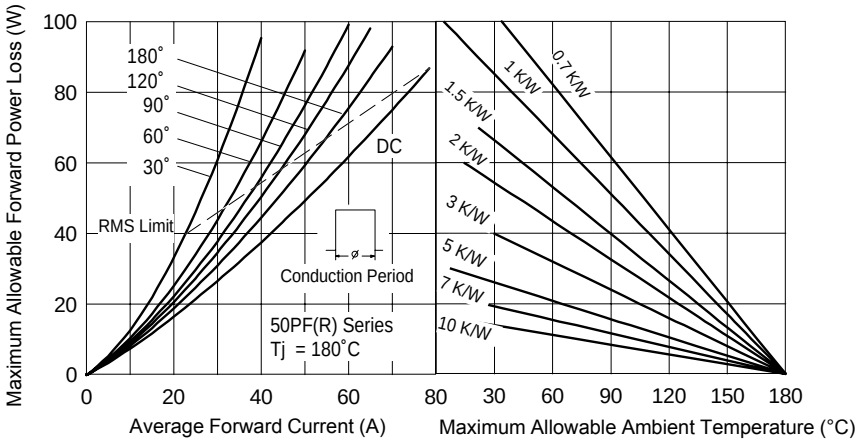


Fig. 4 - Forward Power Loss Characteristics

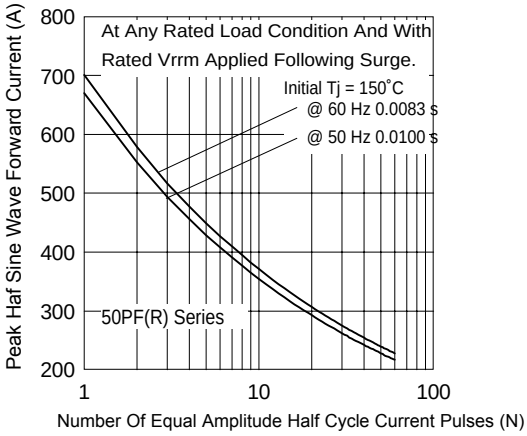


Fig. 5 - Maximum Non -Repetitive Surge Current

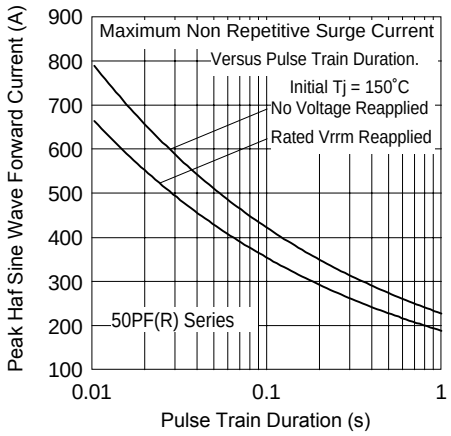


Fig. 6 - Maximum Non -Repetitive Surge Current

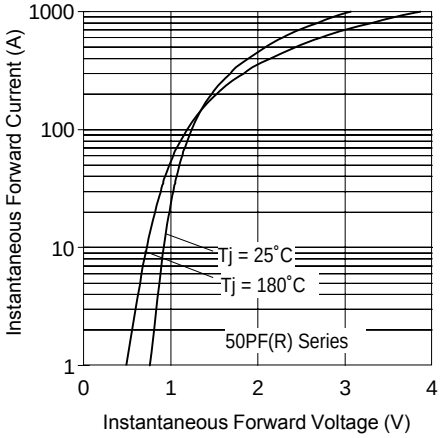


Fig. 7 - Forward Voltage Drop Characteristics

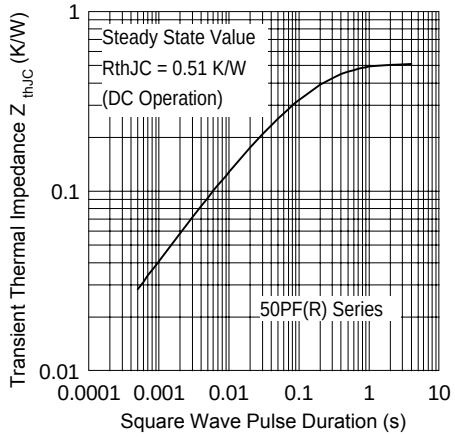


Fig. 8 - Thermal Impedance Z_{thJC} Characteristics

Outline Table

Fig. A - 50PF (R)...
Case Style DO-203AB (DO-5)
Note: For Metric device please contact Factory

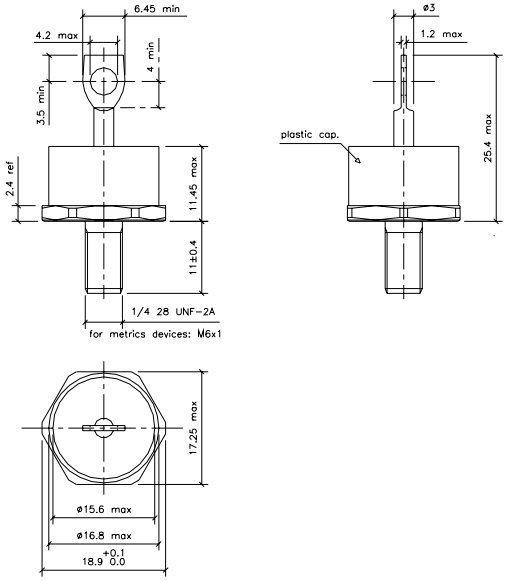


Fig. B - 50PF (R)...(W)
Case Style DO-203AB (DO-5)
Note: For Metric device please contact Factory

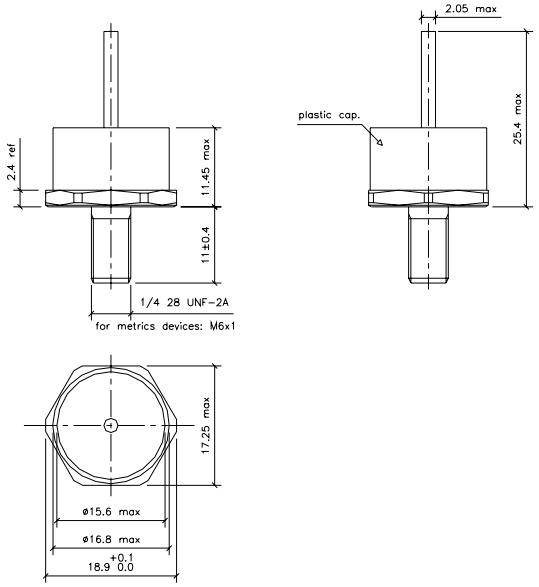
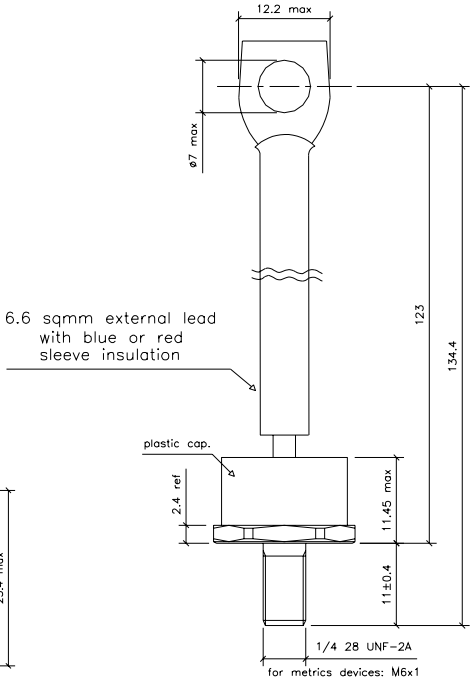
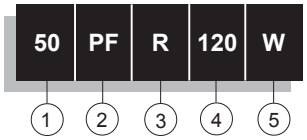


Fig. C - 52PF (R)...
Case Style DO-203AB (DO-5)
Note: For Metric device please contact Factory



Ordering Information Table

Device Code



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)

International
IOR Rectifier

IR WORLD HEADQUARTERS: 233 Kansas St., El Segundo, California 90245, USA Tel: (310) 252-7105
TAC Fax: (310) 252-7309
Visit us at www.irf.com for sales contact information. 01/05