

Bulletin I20206 rev. A 09/98

# International IOR Rectifier

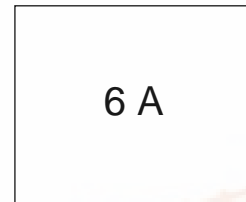
## 6F(R) SERIES

### STANDARD RECOVERY DIODES

### Stud Version

#### Features

- High surge current capability
- Avalanche types available
- Stud cathode and stud anode version
- Wide current range
- Types up to 1200V  $V_{RRM}$



#### Typical Applications

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

#### Major Ratings and Characteristics

Parameters	6F(R)	Units
$I_{F(AV)}$	6	A
@ $T_c$	160	°C
$I_{F(RMS)}$	9.5	A
$I_{FSM}$ @ 50Hz	159	A
@ 60Hz	167	A
$I^2t$ @ 50Hz	134	A <sup>2</sup> s
@ 60Hz	141	A <sup>2</sup> s
$V_{RRM}$ range	100 to 1200	V
$T_j$ range	- 65 to 175	°C



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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	$V_{R(BR)}$ : minimum avalanche voltage V (1)	$I_{RRM}$ max. @ $T_J = 175^\circ\text{C}$ mA
6F(R)	10	100	150	--	12
	20	200	275	--	
	40	400	500	500	
	60	600	725	750	
	80	800	950	950	
	100	1000	1200	1150	
	120	1200	1400	1350	

(1) Avalanche version only available from  $V_{RRM}$  400V to 1200V.

#### Forward Conduction

Parameter	6F(R)	Units	Conditions
$I_{F(AV)}$ Max. average forward current @ Case temperature	6	A	180° conduction, half sine wave
	160	°C	
$I_{F(RMS)}$ Max. RMS forward current	9.5	A	
$P_R$ Maximum non-repetitive peak reverse power	4	KW	10µs square pulse, $T_J = T_J$ max. <b>see note (2)</b>
$I_{FSM}$ Max. peak, one-cycle forward, non-repetitive surge current	159	A	t = 10ms No voltage reappplied
	167		t = 8.3ms 100% $V_{RRM}$ reappplied
	134		t = 10ms 100% $V_{RRM}$ reappplied
	141		t = 8.3ms 100% $V_{RRM}$ reappplied
$I^2t$ Maximum $I^2t$ for fusing	127	A <sup>2</sup> s	t = 10ms No voltage reappplied
	116		t = 8.3ms 100% $V_{RRM}$ reappplied
	90		t = 10ms 100% $V_{RRM}$ reappplied
	82		t = 8.3ms 100% $V_{RRM}$ reappplied
$I^2\sqrt{t}$ Maximum $I^2\sqrt{t}$ for fusing	1270	A <sup>2</sup> √s	t = 0.1 to 10ms, no voltage reappplied
$V_{F(TO)1}$ Low level value of threshold voltage	0.63	V	(16.7% x $\pi$ x $I_{F(AV)}$ ) < I < $\pi$ x $I_{F(AV)}$ , $T_J = T_J$ max.
$V_{F(TO)2}$ High level value of threshold voltage	0.86		(I > $\pi$ x $I_{F(AV)}$ ), $T_J = T_J$ max.
$r_{f1}$ Low level value of forward slope resistance	15.7	mΩ	(16.7% x $\pi$ x $I_{F(AV)}$ ) < I < $\pi$ x $I_{F(AV)}$ , $T_J = T_J$ max.
$r_{f2}$ High level value of forward slope resistance	5.6		(I > $\pi$ x $I_{F(AV)}$ ), $T_J = T_J$ max.
$V_{FM}$ Max. forward voltage drop	1.10	V	$I_{pk} = 19A$ , $T_J = 25^\circ\text{C}$ , $t_p = 400\mu\text{s}$ rectangular wave

(2) Available only for Avalanche version, all other parameters the same as 6F.

### Thermal and Mechanical Specifications

Parameter	6F(R)	Units	Conditions
T <sub>J</sub> Max. junction operating temperature range	-65 to 175	°C	
T <sub>stg</sub> Max. storage temperature range	-65 to 200		
R <sub>thJC</sub> Max. thermal resistance, junction to case	2.5	K/W	DC operation
R <sub>thCS</sub> Max. thermal resistance, case to heatsink	0.5		Mounting surface, smooth, flat and greased
T Mounting torque, ± 10%	1.2 (1.5)	Nm	Lubricated threads (Not lubricated threads)
wt Approximate weight	7 (0.25)	g (oz)	
Case style	DO-203AA (DO-4)		See Outline Table

### $\Delta R_{thJC}$ Conduction

(The following table shows the increment of thermal resistance R<sub>thJC</sub> when devices operate at different conduction angles than DC)

Conduction angle	Sinusoidal conduction	Rectangular conduction	Units	Conditions
180°	0.34	0.29	K/W	T <sub>J</sub> = T <sub>J</sub> max.
120°	0.44	0.48		
90°	0.57	0.63		
60°	0.85	0.88		
30°	1.37	1.39		

### Ordering Information Table

Device Code	A	6	F	R	120	M
	①	②	③	④	⑤	⑥
<b>1</b>	- A = Avalanche diode None = Standard diode					
<b>2</b>	- Current rating: Code = I <sub>F(AV)</sub>					
<b>3</b>	- F = Standard device					
<b>4</b>	- None = Stud Normal Polarity (Cathode to Stud) R = Stud Reverse Polarity (Anode to Stud)					
<b>5</b>	- Voltage code: Code x 10 = V <sub>RRM</sub> (See Voltage Ratings table)					
<b>6</b>	- None = Stud base DO-203AA (DO-4) 10-32UNF-2A M = Stud base DO-203AA (DO-4) M5 X 0.8 - (Not available for Avalanche diodes)					

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## Outlines Table

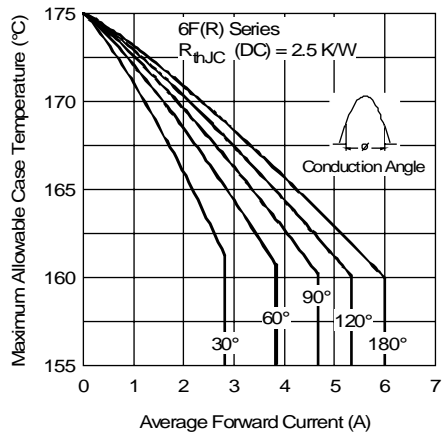
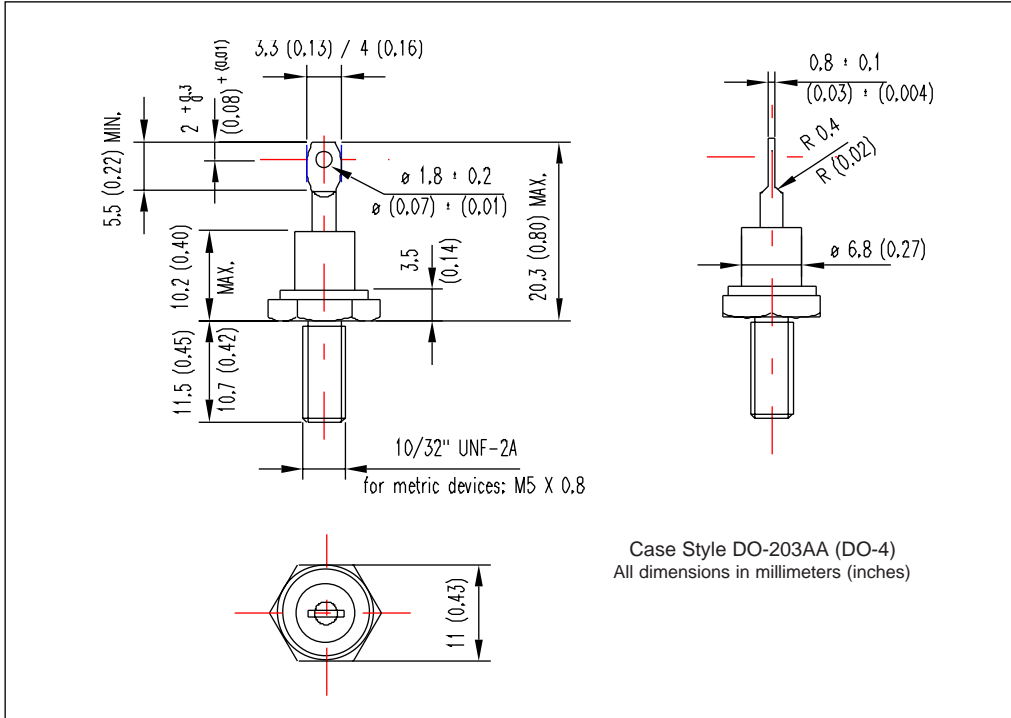


Fig. 1 - Current Ratings Characteristics

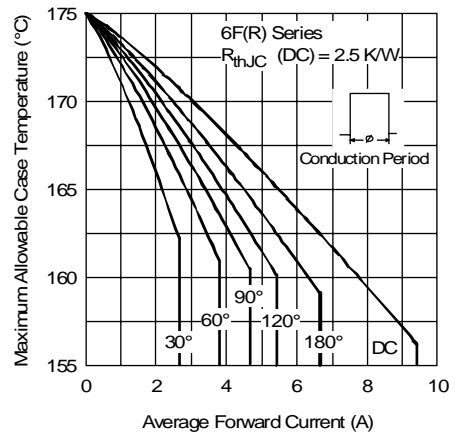


Fig. 2 - Current Ratings Characteristics

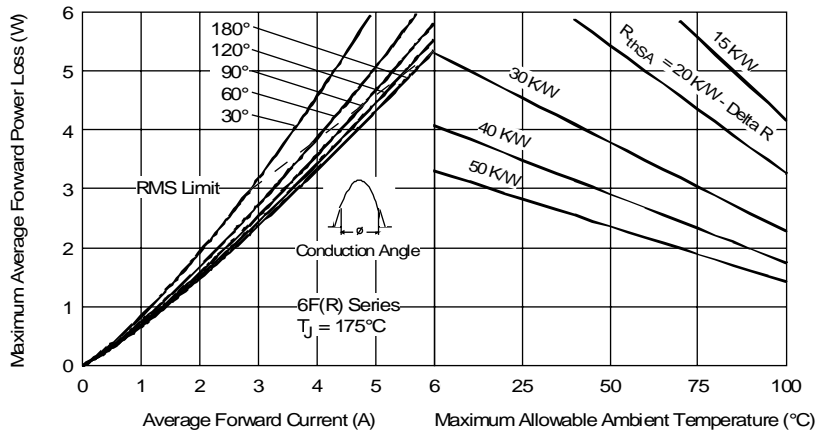


Fig. 3 - Forward Power Loss Characteristics

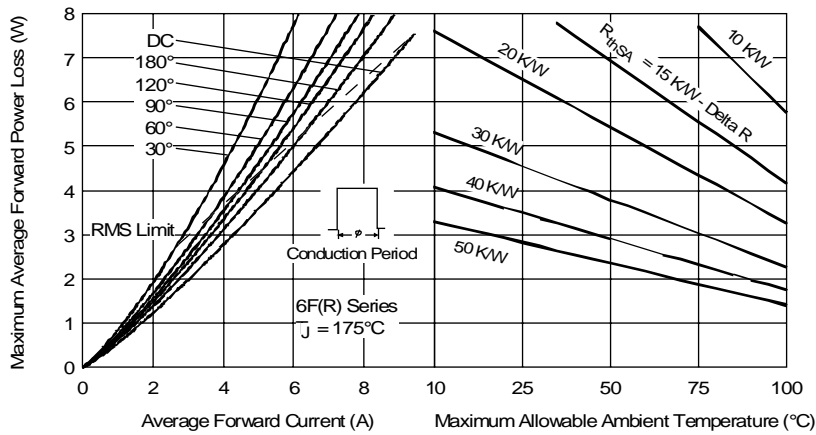


Fig. 4 - Forward Power Loss Characteristics

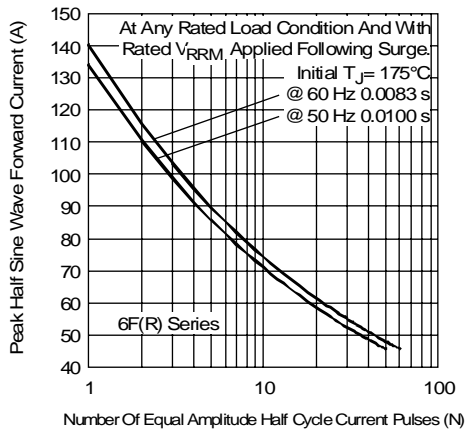


Fig. 5 - Maximum Non-Repetitive Surge Current

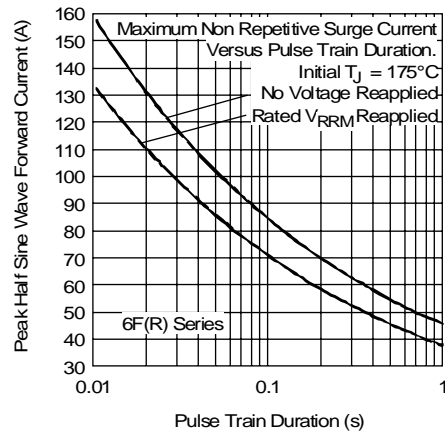


Fig. 6 - Maximum Non-Repetitive Surge Current

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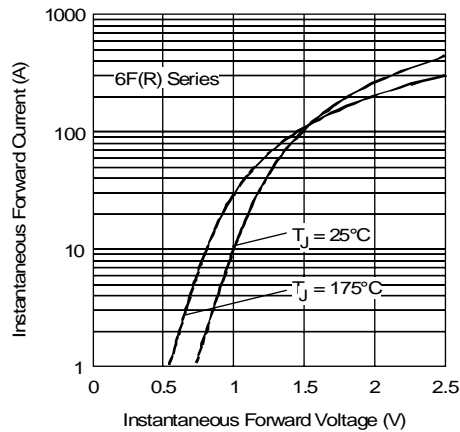


Fig. 7 - Forward Voltage Drop Characteristics

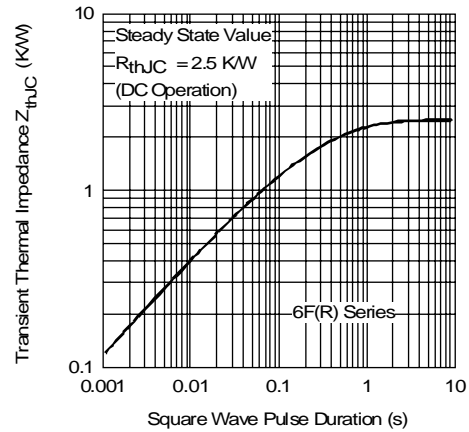


Fig. 8 - Thermal Impedance  $Z_{thJC}$  Characteristics

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Data and specifications subject to change without notice.