

### 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  $V_{RRM}$

25 A

#### Typical Applications

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

#### Major Ratings and Characteristics

Parameters	25F(R)	Units
$I_{F(AV)}$	25	A
@ $T_C$	120	°C
$I_{F(RMS)}$	40	A
$I_{FSM}$ @ 50Hz	356	A
@ 60Hz	373	A
$I^2t$ @ 50Hz	636	A <sup>2</sup> s
@ 60Hz	580	A <sup>2</sup> s
$V_{RRM}$ range	100 to 1200	V
$T_J$ range	- 65 to 175	°C



## 25F(R) Series

Bulletin I2018 rev. B 09/98

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	$V_{R(BR)}$ , minimum avalanche voltage V (1)	$I_{RRM}$ max. @ $T_J = 175^\circ\text{C}$ mA
25F(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	25F(R)	Units	Conditions
$I_{F(AV)}$ Max. average forward current @ Case temperature	25	A	180° conduction, half sine wave
	120	°C	
$I_{F(RMS)}$ Max. RMS forward current	40	A	
$P_R$ Maximum non-repetitive peak reverse power	10	K/W	10µs square pulse, $T_J = T_J$ max. <b>see note (2)</b>
$I_{FSM}$ Max. peak, one-cycle forward, non-repetitive surge current	356	A	t = 10ms No voltage
	373		t = 8.3ms reapplied
	300		t = 10ms 100% $V_{RRM}$
	314		t = 8.3ms reapplied
$I^2t$ Maximum $I^2t$ for fusing	636	A <sup>2</sup> s	t = 10ms No voltage
	580		t = 8.3ms reapplied
	450		t = 10ms 100% $V_{RRM}$
	410		t = 8.3ms reapplied
$I^2\sqrt{t}$ Maximum $I^2\sqrt{t}$ for fusing	6360	A <sup>2</sup> √s	t = 0.1 to 10ms, no voltage reapplied
$V_{F(TO)1}$ Low level value of threshold voltage	0.80	V	$(16.7\% \times \pi \times I_{F(AV)} < I < \pi \times I_{F(AV)})$ , $T_J = T_J$ max.
$V_{F(TO)2}$ High level value of threshold voltage	0.90		$(I > \pi \times I_{F(AV)})$ , $T_J = T_J$ max.
$r_{f1}$ Low level value of forward slope resistance	6.80	mΩ	$(16.7\% \times \pi \times I_{F(AV)} < I < \pi \times I_{F(AV)})$ , $T_J = T_J$ max.
$r_{f2}$ High level value of forward slope resistance	5.70		$(I > \pi \times I_{F(AV)})$ , $T_J = T_J$ max.
$V_{FM}$ Max. forward voltage drop	1.30	V	$I_{pk} = 78\text{A}$ , $T_J = 25^\circ\text{C}$ , $t_p = 400\mu\text{s}$ rectangular wave

(2) Available only for Avalanche version, all other parameters the same as 25F.

Thermal and Mechanical Specifications

Parameter	25F(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	1.5	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°	0.28	0.24	K/W	T <sub>J</sub> = T <sub>J</sub> max.
120°	0.39	0.41		
90°	0.50	0.54		
60°	0.73	0.75		
30°	1.20	1.21		

Ordering Information Table

Device Code													
<table border="1" style="margin: auto;"> <tr> <td style="padding: 5px;">A</td> <td style="padding: 5px;">25</td> <td style="padding: 5px;">F</td> <td style="padding: 5px;">R</td> <td style="padding: 5px;">120</td> <td style="padding: 5px;">M</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> <td style="text-align: center;">⑥</td> </tr> </table>	A	25	F	R	120	M	①	②	③	④	⑤	⑥	<p><b>1</b> - A = Avalanche diode None = Standard diode</p> <p><b>2</b> - Current rating: Code = I<sub>F(AV)</sub></p> <p><b>3</b> - F = Standard device</p> <p><b>4</b> - None = Stud Normal Polarity (Cathode to Stud) R = Stud Reverse Polarity (Anode to Stud)</p> <p><b>5</b> - Voltage code: Code x 10 = V<sub>RRM</sub> (See Voltage Ratings table)</p> <p><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)</p>
A	25	F	R	120	M								
①	②	③	④	⑤	⑥								

Outlines Table

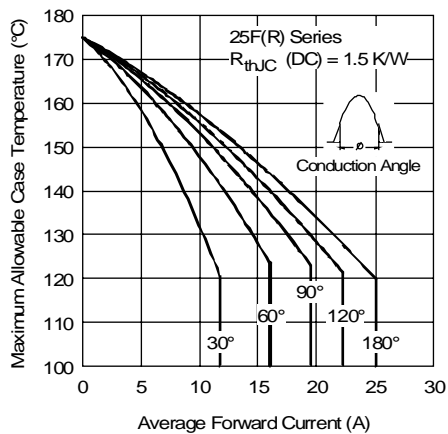
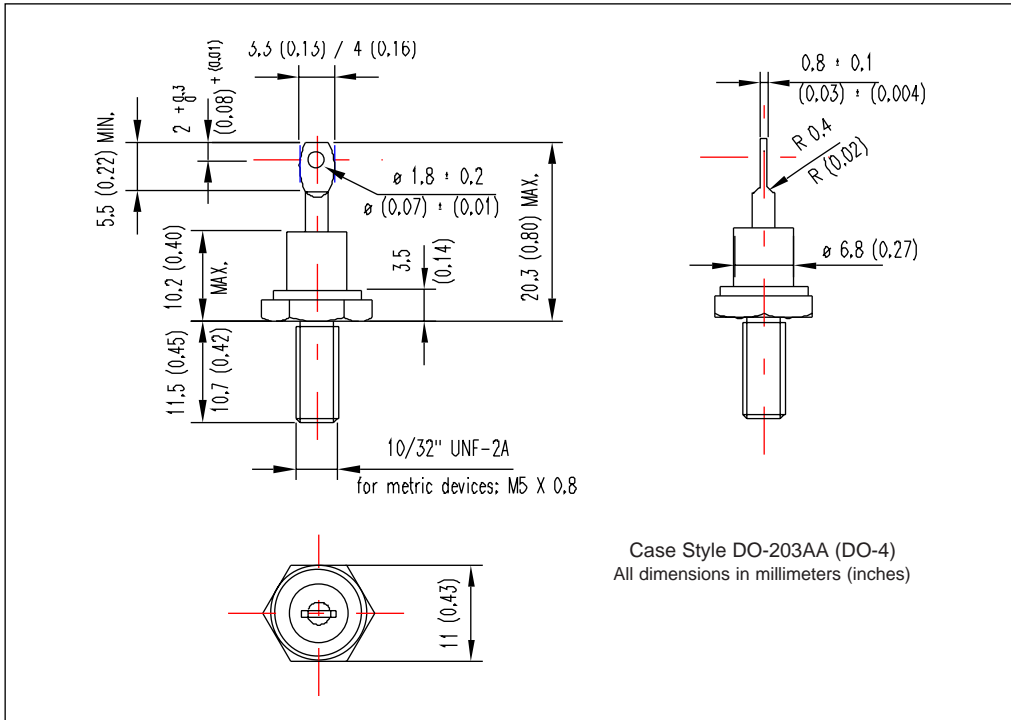


Fig. 1 - Current Ratings Characteristics

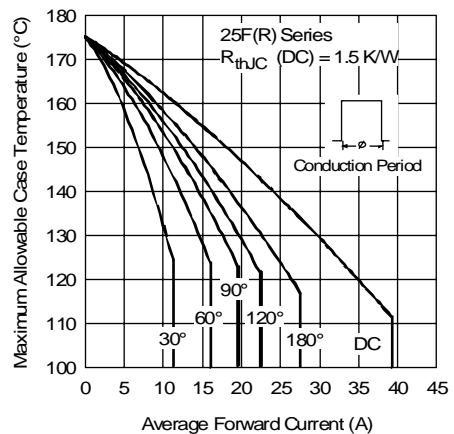


Fig. 2 - Current Ratings Characteristics

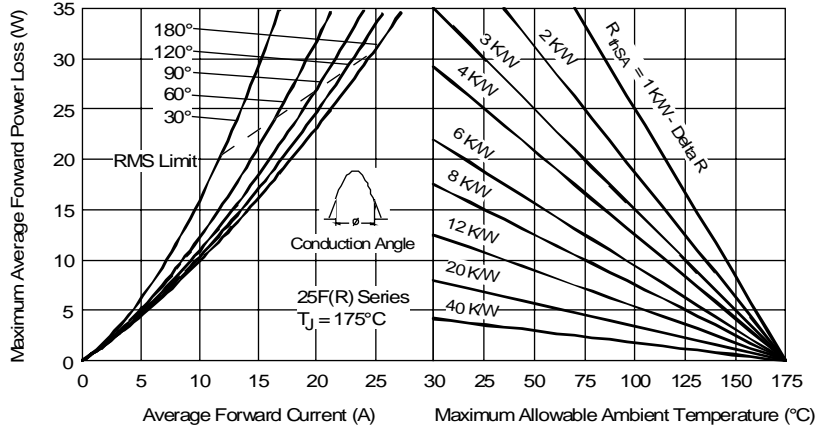


Fig. 3 - Forward Power Loss Characteristics

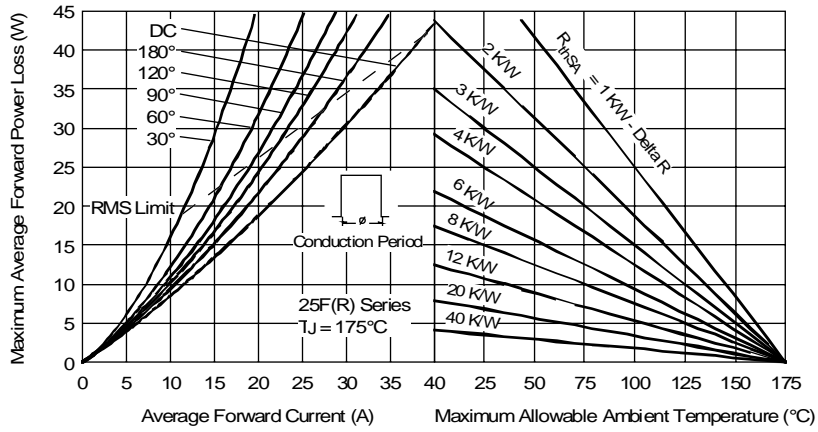


Fig. 4 - Forward Power Loss Characteristics

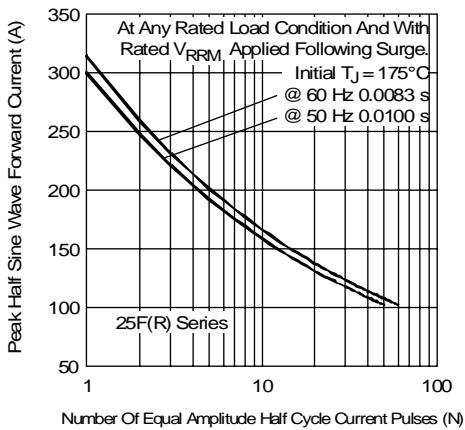


Fig. 5 - Maximum Non-Repetitive Surge Current

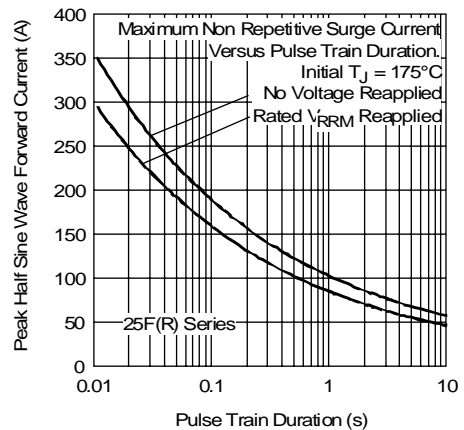


Fig. 6 - Maximum Non-Repetitive Surge Current

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International  
**IR** Rectifier

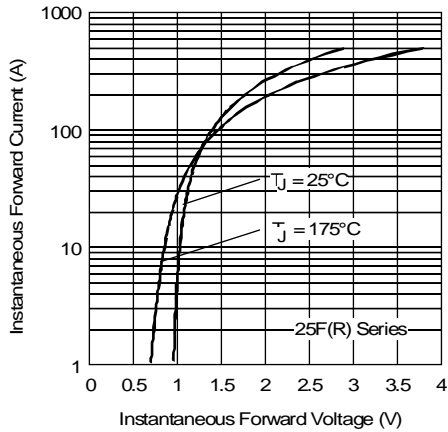


Fig. 7 - Forward Voltage Drop Characteristics

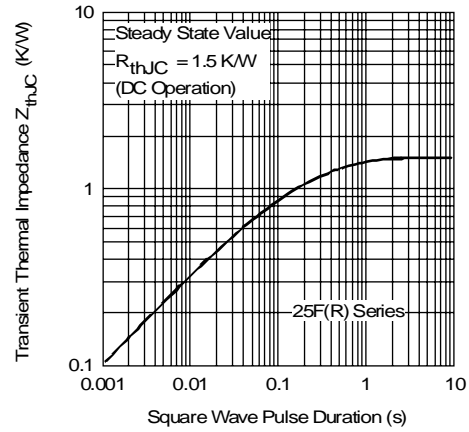


Fig. 8 - Thermal Impedance  $Z_{thJC}$  Characteristics

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**IR** Rectifier

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Data and specifications subject to change without notice.