

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 ² s
	@ 60Hz	580	A ² s
V_{RRM}	range	100 to 1200	V
T_J	range	- 65 to 175	°C



25F(R) Series

Bulletin I2018 rev. C 01/05

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	25 120	A °C	180° conduction, half sine wave
$I_{F(RMS)}$ 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. see note (2)
I_{FSM} Max. peak, one-cycle forward, non-repetitive surge current	356	A	t = 10ms No voltage
	373		t = 8.3ms reappplied
	300		t = 10ms 100% V_{RRM}
	314		t = 8.3ms reappplied
I^2t Maximum I^2t for fusing	636	A²s	t = 10ms No voltage
	580		t = 8.3ms reappplied
	450		t = 10ms 100% V_{RRM}
	410		t = 8.3ms reappplied
I^2vt Maximum I^2vt for fusing	6360	A²√s	t = 0.1 to 10ms, no voltage reappplied
$V_{F(TO)1}$ 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	$I_{pk} = 78A$, $T_J = 25^\circ\text{C}$, $t_p = 400\mu\text{s}$ 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_J Max. junction operating temperature range	-65 to 175	°C	
T_{stg} Max. storage temperature range	-65 to 200		
R_{thJC} Max. thermal resistance, junction to case	1.5	K/W	DC operation
R_{thCS} Max. thermal resistance, case to heatsink	0.5		Mounting surface, smooth, flat and greased
T Allowable mounting torque	1.5 ^{+0-10%}	Nm	Not lubricated threads
	13	lbf.in	
	1.2 ^{+0-10%}	Nm	Lubricated threads
	10	lbf.in	
wt Approximate weight	7 (0.25)	g (oz)	
Case style	DO-203AA (DO-4)	See Outline Table	

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°	0.28	0.24	K/W	$T_J = T_J \text{ max.}$
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

A	25	F	R	120	M
1	2	3	4	5	6

- 1** - A = Avalanche diode
None = Standard diode
- 2** - Current rating: Code = $I_{F(AV)}$
- 3** - F = Standard device
- 4** - None = Stud Normal Polarity (Cathode to Stud)
R = Stud Reverse Polarity (Anode to Stud)
- 5** - Voltage code: Code x 10 = V_{RRM} (See Voltage Ratings table)
- 6** - 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)

Outlines Table

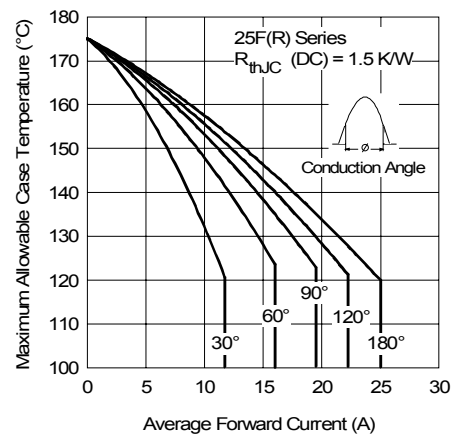
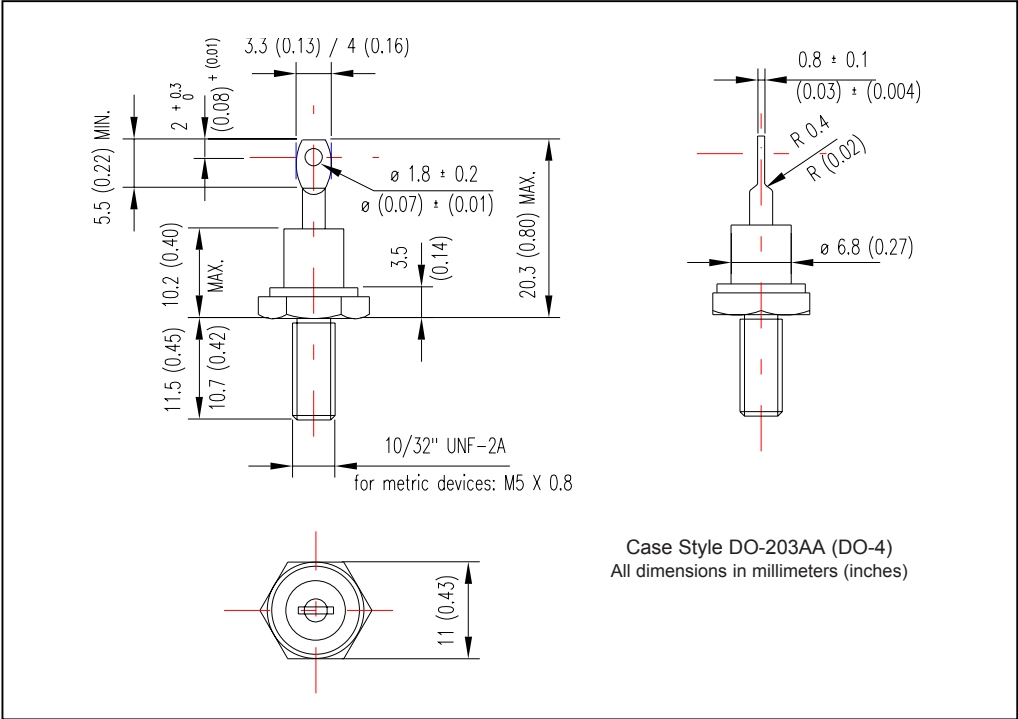


Fig. 1 - Current Ratings Characteristics

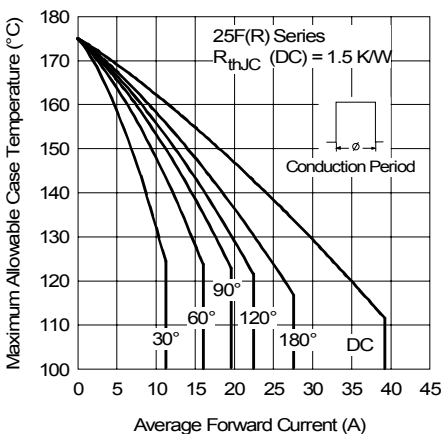


Fig. 2 - Current Ratings Characteristics

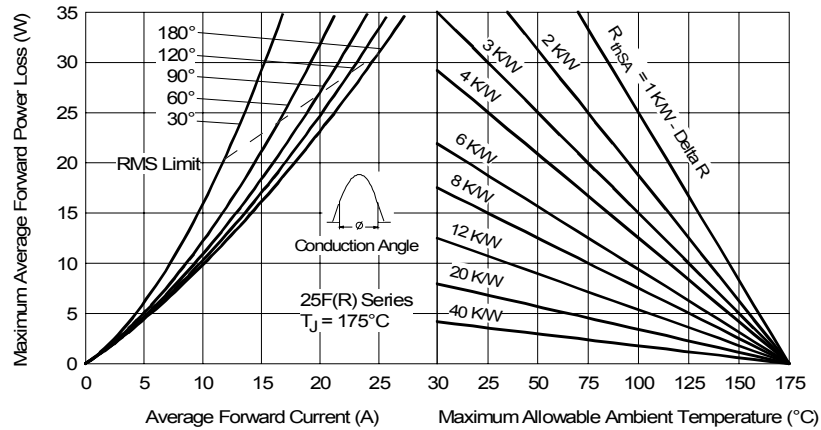


Fig. 3 - Forward Power Loss Characteristics

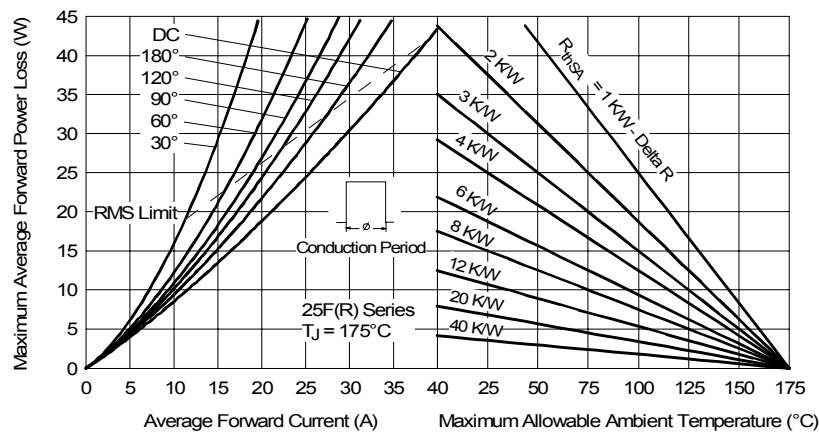


Fig. 4 - Forward Power Loss Characteristics

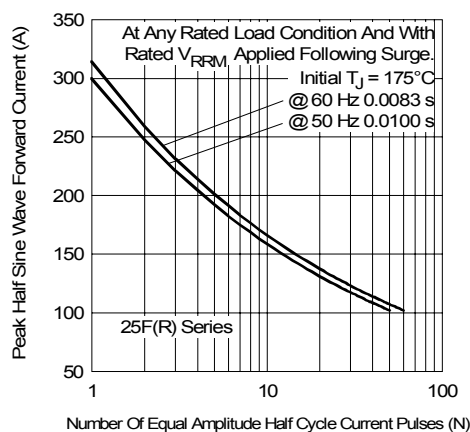


Fig. 5 - Maximum Non-Repetitive Surge Current

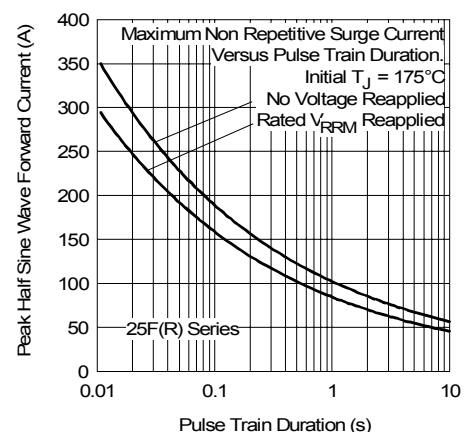


Fig. 6 - Maximum Non-Repetitive Surge Current

25F(R) Series

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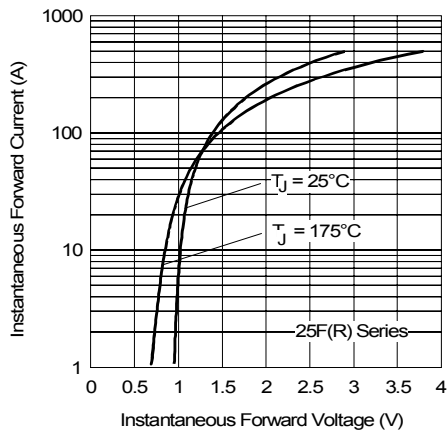


Fig. 7 - Forward Voltage Drop Characteristics

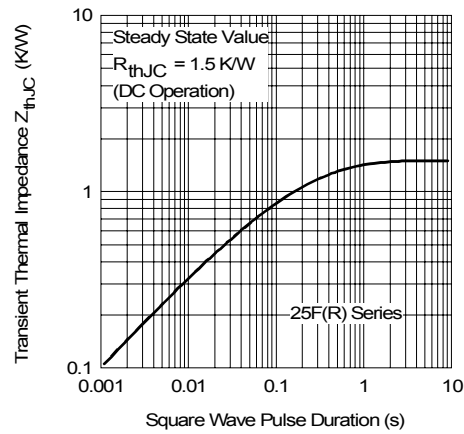


Fig. 8 - Thermal Impedance Z_{thJC} Characteristics