Standard Recovery Diodes (Stud Version), 12 A

DO-203AA (DO-4)

PRODUCT SUMMARY	
$I_{F(AV)}$	12 A

FEATURES

- High surge current capability
- Stud cathode and stud anode version
- Wide current range
- Types up to 1200 V V_{RRM}
- RoHS compliant
- Designed and qualified for industrial and consumer level

RoHS COMPLIANT

TYPICAL APPLICATIONS

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

MAJOR RATINGS AND CHARACTERISTICS			
PARAMETER	TEST CONDITIONS	VALUES	UNITS
$I_{F(AV)}$		12	A
	T_C	144	°C
$I_{F(RMS)}$		19	A
I_{FSM}	50 Hz	265	A
	60 Hz	280	
I^2t	50 Hz	351	A^2s
	60 Hz	320	
V_{RRM}	Range	100 to 1200	V
T_J		- 65 to 175	°C

ELECTRICAL SPECIFICATIONS

VOLTAGE RATINGS					
TYPE NUMBER	VOLTAGE CODE	V_{RRM}, MAXIMUM REPETITIVE PEAK REVERSE VOLTAGE V	V_{RSM}, MAXIMUM NON-REPETITIVE PEAK VOLTAGE V	$V_{R(BR)}$, MINIMUM AVALANCHE VOLTAGE V (1)	I_{RRM} MAXIMUM AT T_J = 175 °C mA
12F(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	

Note

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

FORWARD CONDUCTION						
PARAMETER	**SYMBOL**	**TEST CONDITIONS**			**VALUES**	**UNITS**
Maximum average forward current at case temperature	$I_{F(AV)}$	180° conduction, half sine wave			12	A
					144	°C
Maximum RMS forward current	$I_{F(RMS)}$				19	A
Maximum on-repetitive peak reverse power	P_R(1)	10 µs square pulse, $T_J = T_J$ maximum			7	K/W
Maximum peak, one-cycle forward, non-repetitive surge current	I_{FSM}	t = 10 ms	No voltage reapplied	Sinusoidal half wave, initial $T_J = T_J$ maximum	265	A
		t = 8.3 ms			280	
		t = 10 ms	100 % V_{RRM} reapplied		225	
		t = 8.3 ms			235	
Maximum I^2t for fusing	I^2t	t = 10 ms	No voltage reapplied		351	A^2s
		t = 8.3 ms			320	
		t = 10 ms	100 % V_{RRM} reapplied		250	
		t = 8.3 ms			226	
Maximum $I^2\sqrt{t}$ for fusing	$I^2\sqrt{t}$	t = 0.1 to 10 ms, no voltage reapplied			3510	$A^2\sqrt{s}$
Low level value of threshold voltage	$V_{F(TO)1}$	(16.7 % x π x $I_{F(AV)} < I < \pi$ x $I_{F(AV)}$), $T_J = T_J$ maximum			0.77	V
High level value of threshold voltage	$V_{F(TO)2}$	($I > \pi$ x $I_{F(AV)}$), $T_J = T_J$ maximum			0.97	
Low level value of forward slope resistance	r_{f1}	(16.7 % x π x $I_{F(AV)} < I < \pi$ x $I_{F(AV)}$), $T_J = T_J$ maximum			10.70	mΩ
High level value of forward slope resistance	r_{f2}	($I > \pi$ x $I_{F(AV)}$), $T_J = T_J$ maximum			6.20	
Maximum forward voltage drop	V_{FM}	I_{pk} = 38 A, T_J = 25 °C, t_p = 400 µs rectangular wave			1.26	V

Note

(1) Available only for avalanche version, all other parameters the same as 12F

THERMAL AND MECHANICAL SPECIFICATIONS				
PARAMETER	**SYMBOL**	**TEST CONDITIONS**	**VALUES**	**UNITS**
Maximum junction operating temperature range	T_J		- 65 to 175	°C
Maximum storage temperature range	T_{Stg}		- 65 to 200	
Maximum thermal resistance, junction to case	R_{thJC}	DC operation	2	K/W
Maximum thermal resistance, case to heatsink	R_{thCS}	Mounting surface, smooth, flat and greased	0.5	
Allowable mounting torque		Not lubricated threads	1.5 + 0 - 10 %	N · m
			13	lbf · in
		Lubricated threads	1.2 + 0 - 10 %	N · m
			10	lbf · in
Approximate weight			7	g
			0.25	oz.
Case style		See dimensions - link at the end of datasheet	DO-203AA (DO-4)	

ΔR_{thJC} CONDUCTION				
CONDUCTION ANGLE	SINUSOIDAL CONDUCTION	RECTANGULAR CONDUCTION	TEST CONDITIONS	UNITS
180°	0.33	0.26	$T_J = T_J$ maximum	K/W
120°	0.41	0.44		
90°	0.53	0.58		
60°	0.78	0.81		
30°	1.28	1.29		

Note

- The table above shows the increment of thermal resistance R_{thJC} when devices operate at different conduction angles than DC

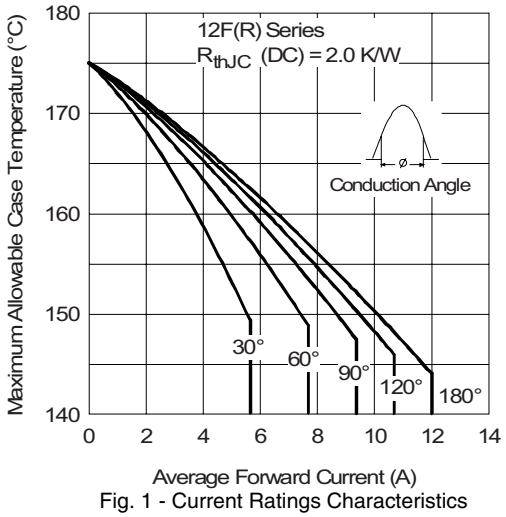

Fig. 1 - Current Ratings Characteristics

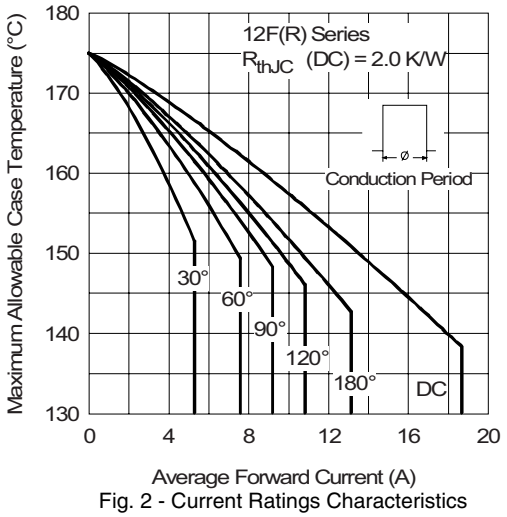

Fig. 2 - Current Ratings Characteristics

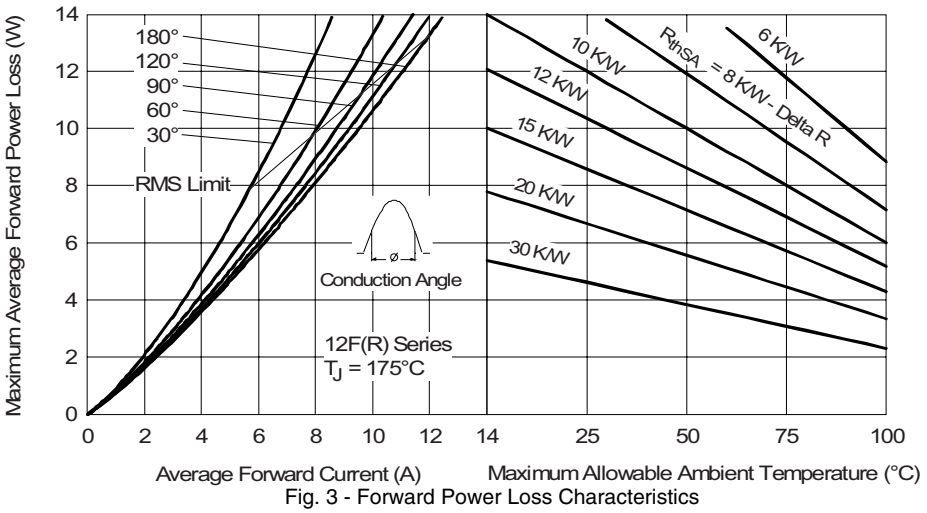

Fig. 3 - Forward Power Loss Characteristics

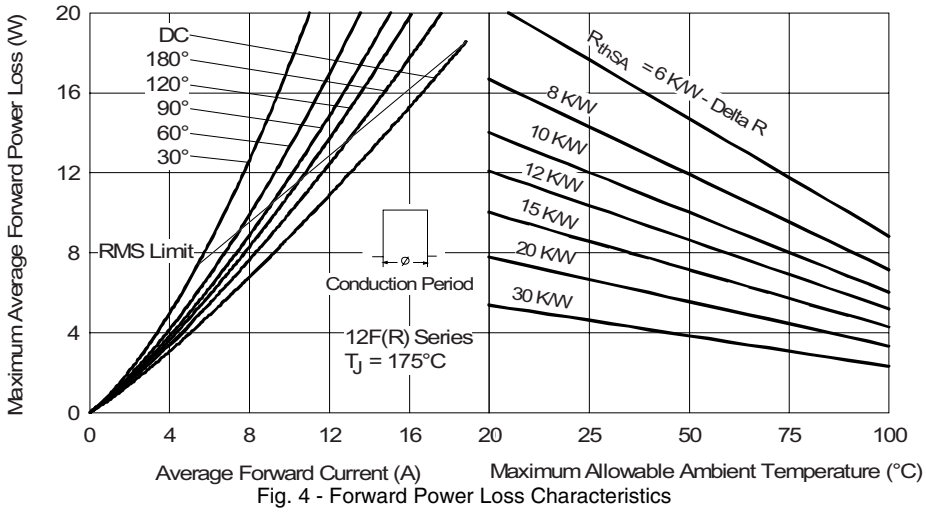

Fig. 4 - Forward Power Loss Characteristics

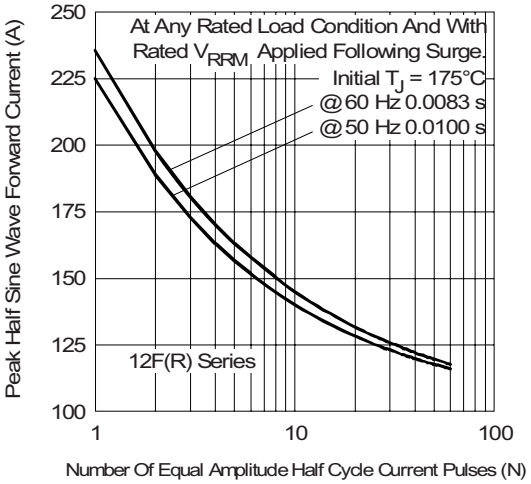

Fig. 5 - Maximum Non-Repetitive Surge Current

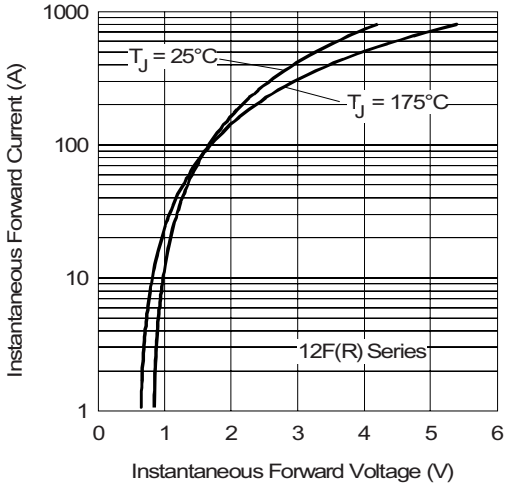

Fig. 7 - Forward Voltage Drop Characteristics

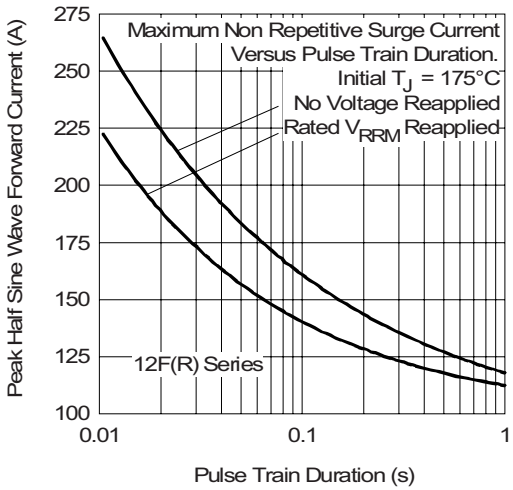

Fig. 6 - Maximum Non-Repetitive Surge Current

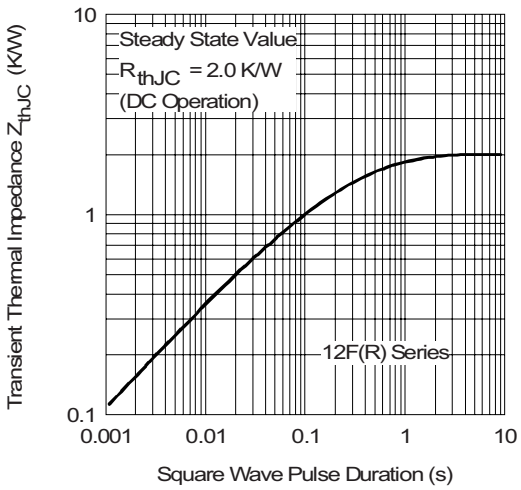

Fig. 8 - Thermal Impedance Z_{thJC} Characteristics

ORDERING INFORMATION TABLE

Device code	12	F	R	120	M
	1	2	3	4	5

1 - Current rating: Code = $I_{F(AV)}$

2 - F = Standard device

3 - None = Stud normal polarity (cathode to stud)

R = Stud reverse polarity (anode to stud)

4 - Voltage code x 10 = V_{RRM} (see Voltage Ratings table)

5 - 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)

LINKS TO RELATED DOCUMENTS	
Dimensions	http://www.vishay.com/doc?95311

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