

Standard Recovery Diodes (Stud Version), 12 A



DO-203AA (DO-4)

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



TYPICAL APPLICATIONS

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

PRODUCT SUMMARY

$I_{F(AV)}$	12 A
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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 ² s
	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

12F(R) Series



Vishay High Power Products Standard Recovery Diodes (Stud Version), 12 A

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 μ s 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 reappplied	265	A	
		t = 8.3 ms		Sinusoidal half wave, initial $T_J = T_J$ maximum		280
		t = 10 ms	100 % V_{RRM} reappplied			225
		t = 8.3 ms				235
Maximum I^2t for fusing	I^2t	t = 10 ms	No voltage reappplied		351	A ² s
		t = 8.3 ms		100 % V_{RRM} reappplied	320	
		t = 10 ms	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 reappplied			3510	A ² \sqrt{s}
Low level value of threshold voltage	$V_{F(TO)1}$	$(16.7\% \times \pi \times I_{F(AV)} < I < \pi \times I_{F(AV)})$, $T_J = T_J$ maximum		0.77	V	
High level value of threshold voltage	$V_{F(TO)2}$	$(I > \pi \times I_{F(AV)})$, $T_J = T_J$ maximum		0.97		
Low level value of forward slope resistance	r_{f1}	$(16.7\% \times \pi \times I_{F(AV)} < I < \pi \times I_{F(AV)})$, $T_J = T_J$ maximum		10.70	m Ω	
High level value of forward slope resistance	r_{f2}	$(I > \pi \times I_{F(AV)})$, $T_J = T_J$ maximum		6.20		
Maximum forward voltage drop	V_{FM}	$I_{pk} = 38$ A, $T_J = 25$ °C, $t_p = 400$ μ s 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

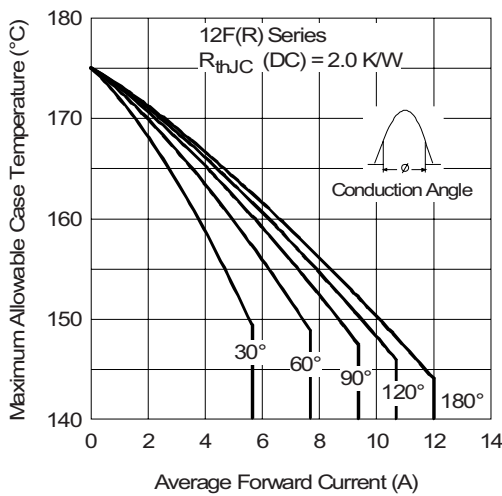


Fig. 1 - Current Ratings Characteristics

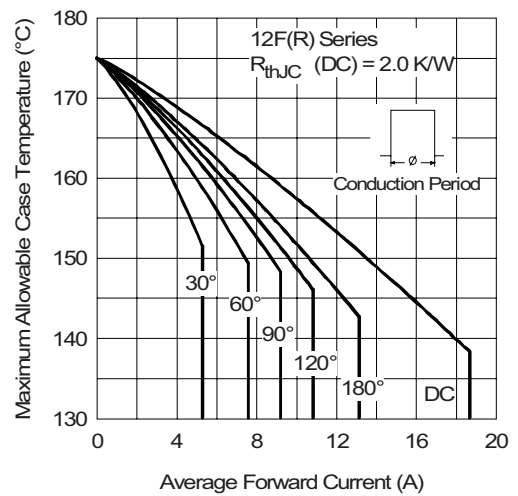


Fig. 2 - Current Ratings Characteristics

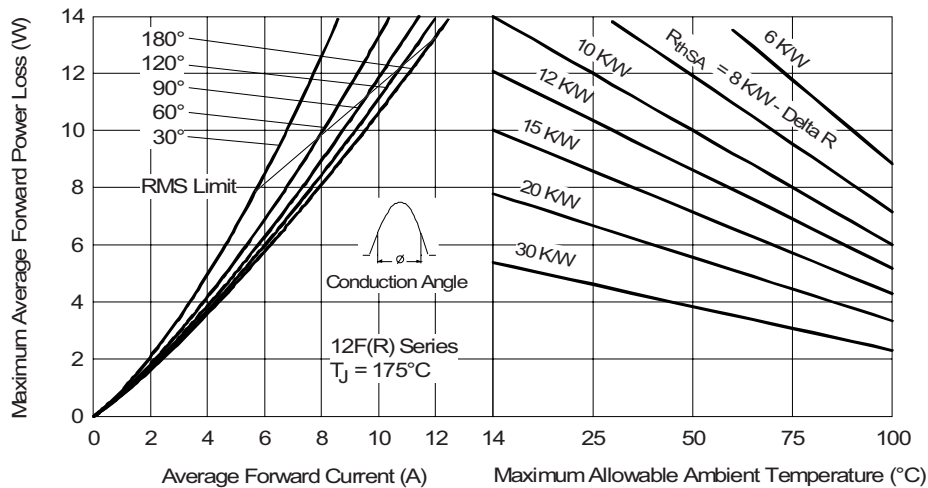


Fig. 3 - Forward Power Loss Characteristics

12F(R) Series



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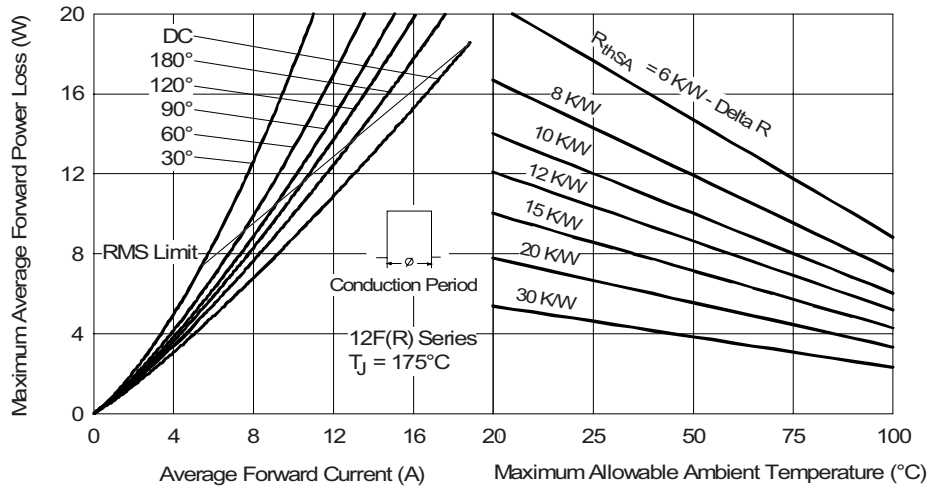


Fig. 4 - Forward Power Loss Characteristics

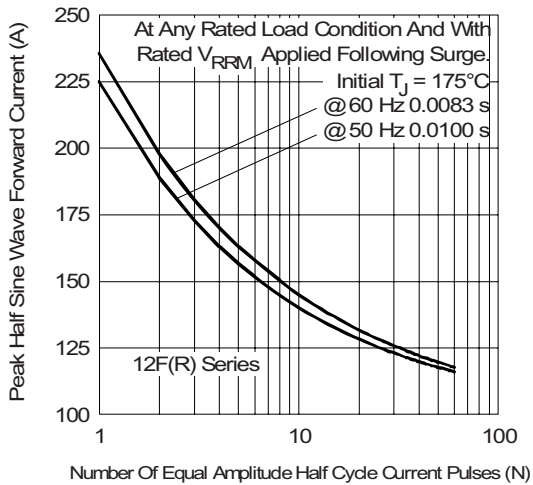


Fig. 5 - Maximum Non-Repetitive Surge Current

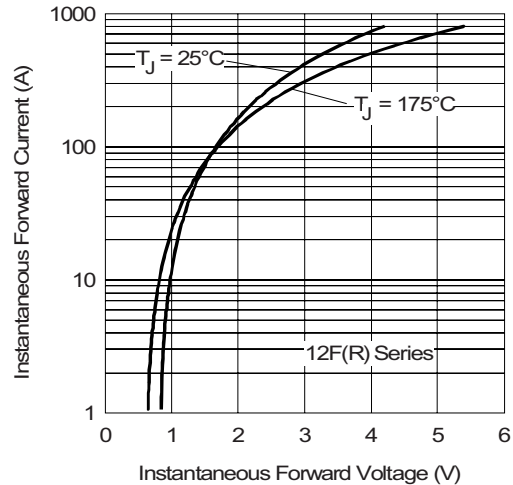


Fig. 7 - Forward Voltage Drop Characteristics

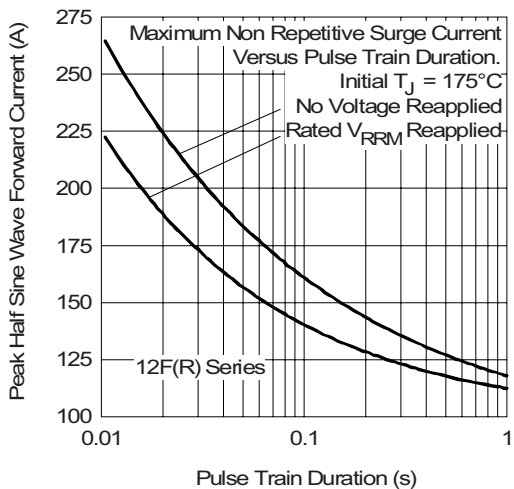


Fig. 6 - Maximum Non-Repetitive Surge Current

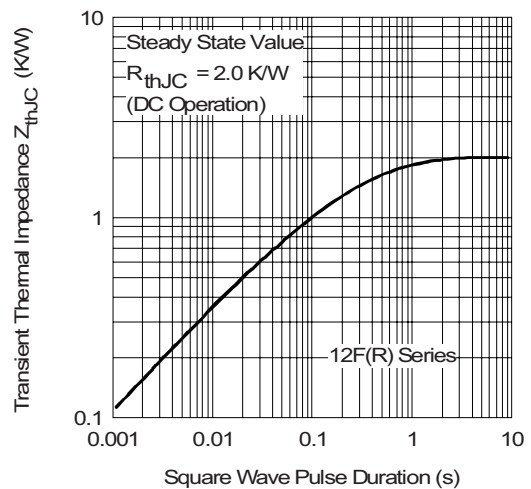


Fig. 8 - Thermal Impedance Z_{thJC} Characteristics



ORDERING INFORMATION TABLE

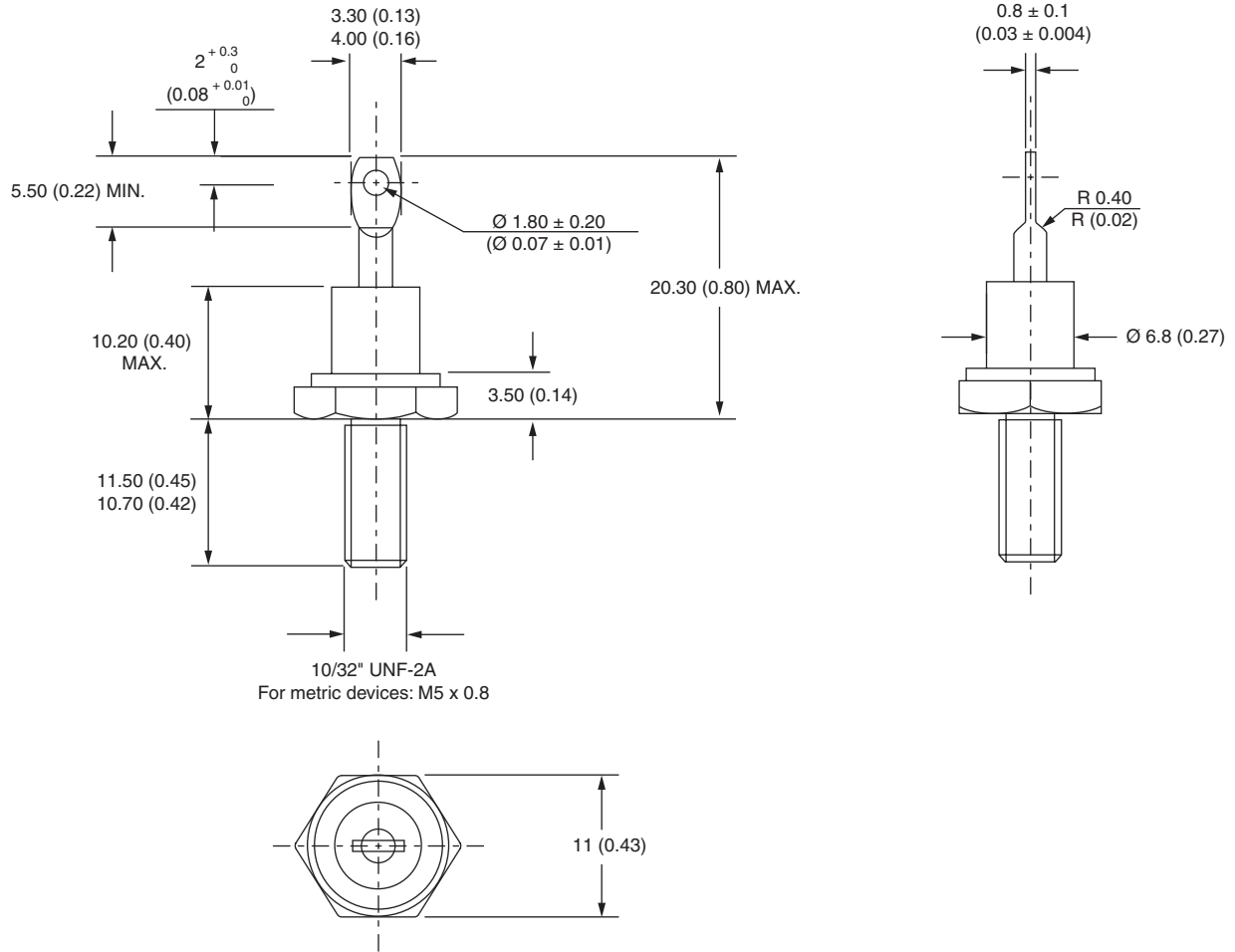
Device code	12	F	R	120	M
	①	②	③	④	⑤

- 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)



DO-203AA (DO-4)

DIMENSIONS in millimeters (inches)





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