

## 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


**RoHS**  
COMPLIANT

### TYPICAL APPLICATIONS

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

### PRODUCT SUMMARY

$I_{F(AV)}$	12 A
-------------	------

### 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 <sup>2</sup> 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 <sup>(1)</sup>	$I_{RRM}$ 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

<sup>(1)</sup> 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 $\mu$ 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 <sup>2</sup> 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 <sup>2</sup> $\sqrt{s}$
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 $\Omega$	
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, $t_p = 400$ $\mu$ 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)	



$\Delta R_{thJC}$ CONDUCTION				
CONDUCTION ANGLE	SINUSOIDAL CONDUCTION	RECTANGULAR CONDUCTION	TEST CONDITIONS	UNITS
180°	0.33	0.26	T <sub>J</sub> = T <sub>J</sub> 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

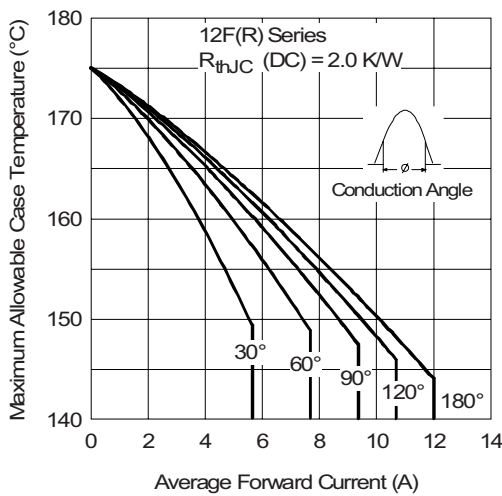


Fig. 1 - Current Ratings Characteristics

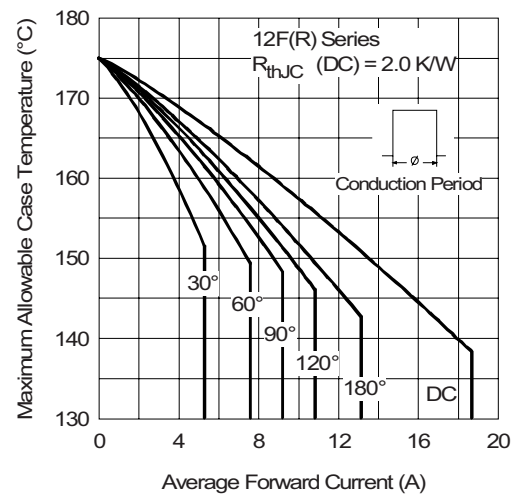


Fig. 2 - Current Ratings Characteristics

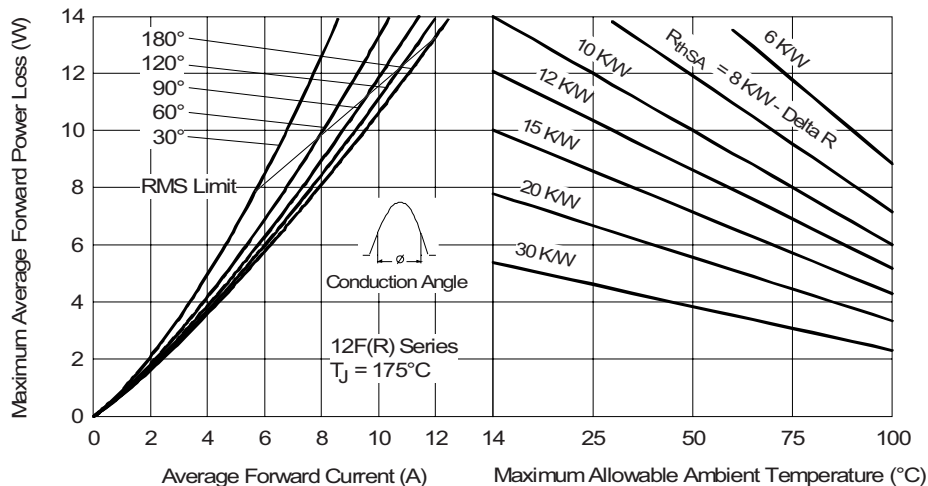


Fig. 3 - Forward Power Loss Characteristics

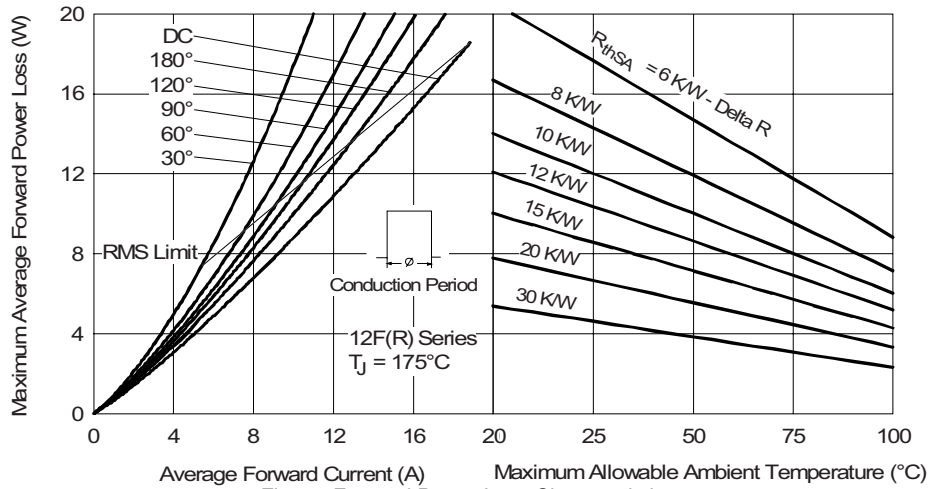


Fig. 4 - Forward Power Loss Characteristics

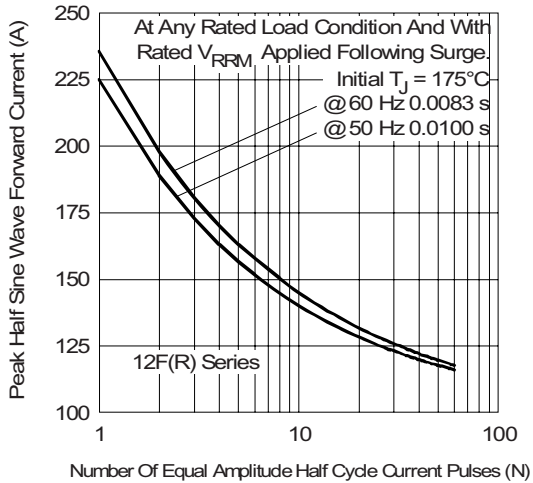


Fig. 5 - Maximum Non-Repetitive Surge Current

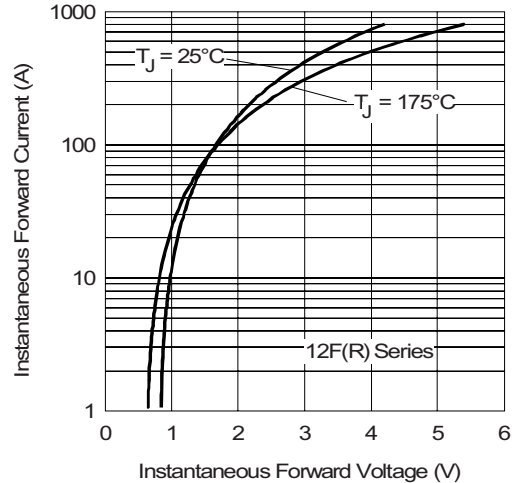


Fig. 7 - Forward Voltage Drop Characteristics

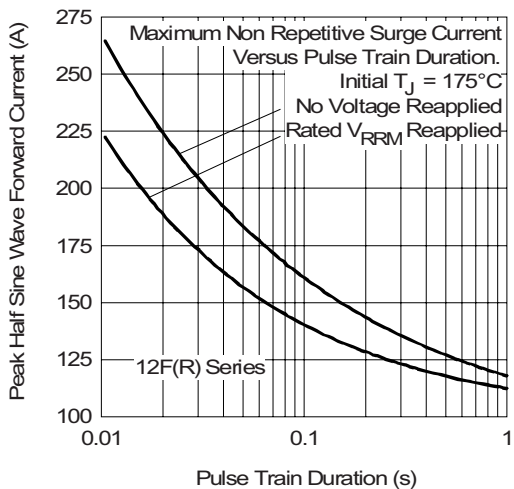


Fig. 6 - Maximum Non-Repetitive Surge Current

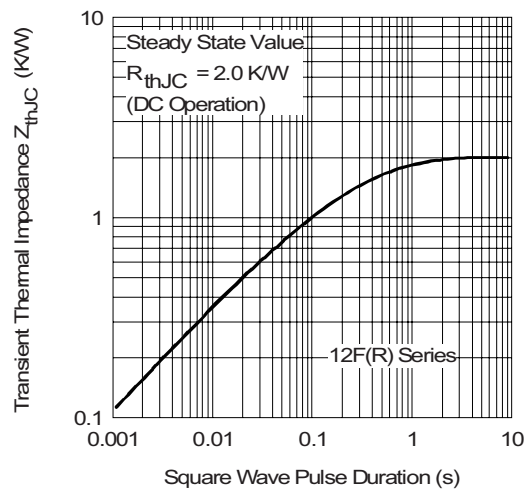


Fig. 8 - Thermal Impedance  $Z_{thJC}$  Characteristics



## ORDERING INFORMATION TABLE

Device code	<b>12</b>	<b>F</b>	<b>R</b>	<b>120</b>	<b>M</b>
	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	<a href="http://www.vishay.com/doc?95311">http://www.vishay.com/doc?95311</a>



## Disclaimer

All product specifications and data are subject to change without notice.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Vishay"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained herein or in any other disclosure relating to any product.

Vishay disclaims any and all liability arising out of the use or application of any product described herein or of any information provided herein to the maximum extent permitted by law. The product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein, which apply to these products.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay.

The products shown herein are not designed for use in medical, life-saving, or life-sustaining applications unless otherwise expressly indicated. Customers using or selling Vishay products not expressly indicated for use in such applications do so entirely at their own risk and agree to fully indemnify Vishay for any damages arising or resulting from such use or sale. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

Product names and markings noted herein may be trademarks of their respective owners.