

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}
- Designed and qualified for industrial and consumer level
- Material categorization: For definitions of compliance please see www.vishay.com/doc?99912



RoHS
COMPLIANT

PRODUCT SUMMARY

$I_{F(AV)}$	12 A
Package	DO-203AA (DO-4)
Circuit configuration	Single diode

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 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 $T_J = 175\text{ °C}$ mA
VS-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 ² t for fusing	I ² t	t = 10 ms	No voltage reapplied			351	A ² s
		t = 8.3 ms				320	
		t = 10 ms	100 % V _{RRM} reapplied			250	
		t = 8.3 ms				226	
Maximum I ² √t for fusing	I ² √t	t = 0.1 to 10 ms, no voltage reapplied			3510	A ² √s	
Low level value of threshold voltage	V _{F(TO)1}	(16.7 % × π × I _{F(AV)} < I < π × I _{F(AV)}), T _J = T _J maximum			0.77	V	
High level value of threshold voltage	V _{F(TO)2}	(I > π × I _{F(AV)}), T _J = T _J maximum			0.97		
Low level value of forward slope resistance	r _{f1}	(16.7 % × π × I _{F(AV)} < I < π × I _{F(AV)}), T _J = T _J maximum			10.70	mΩ	
High level value of forward slope resistance	r _{f2}	(I > π × 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

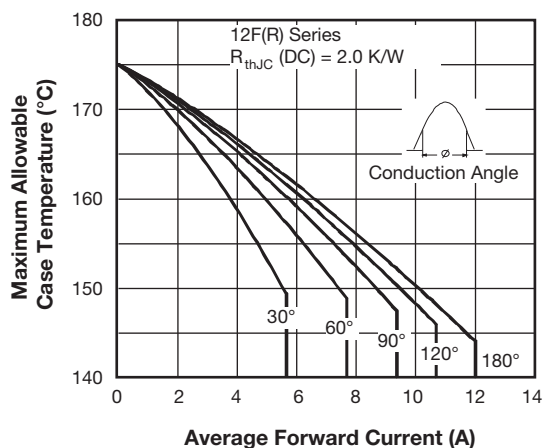


Fig. 1 - Current Ratings Characteristics

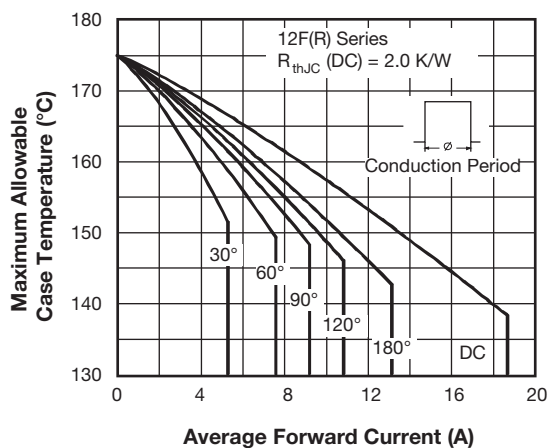


Fig. 2 - Current Ratings Characteristics

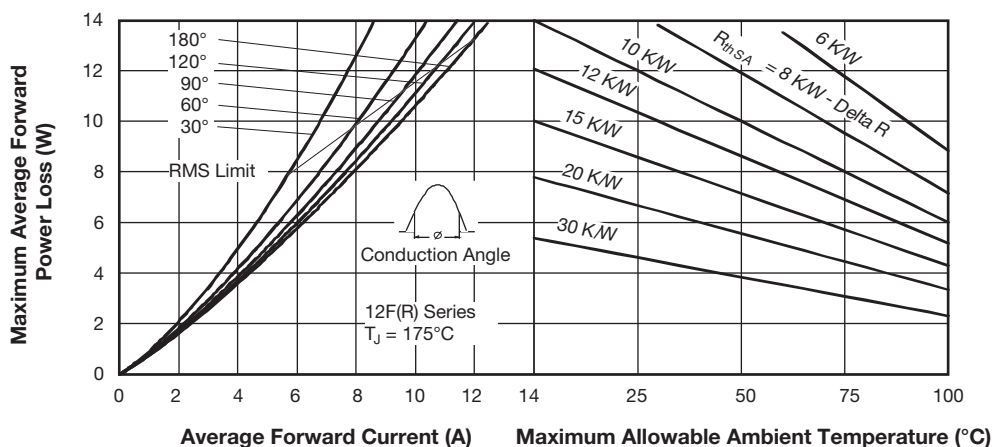


Fig. 3 - Forward Power Loss Characteristics

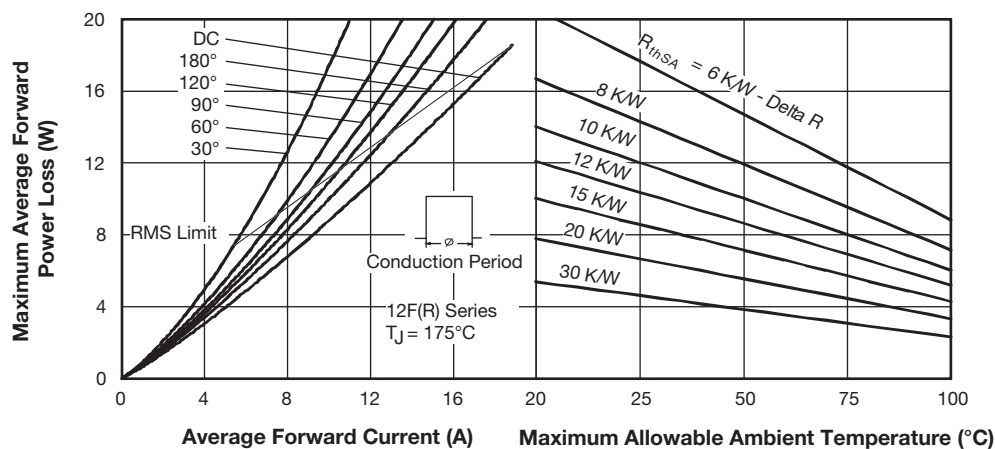


Fig. 4 - Forward Power Loss Characteristics

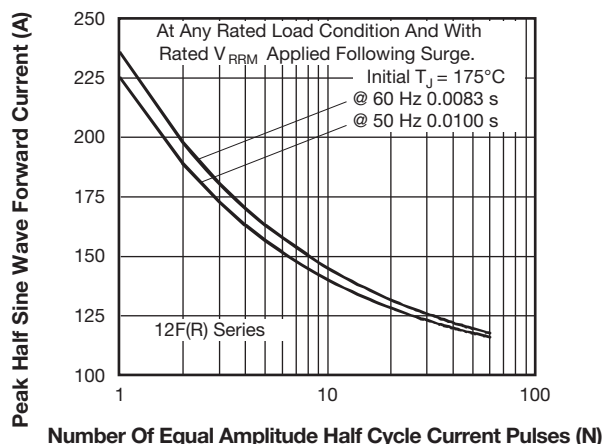


Fig. 5 - Maximum Non-Repetitive Surge Current

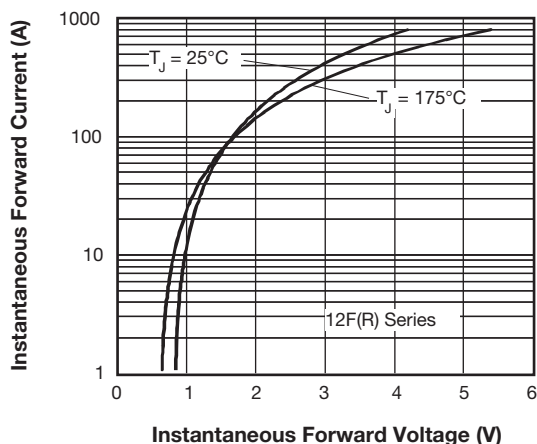


Fig. 7 - Forward Voltage Drop Characteristics

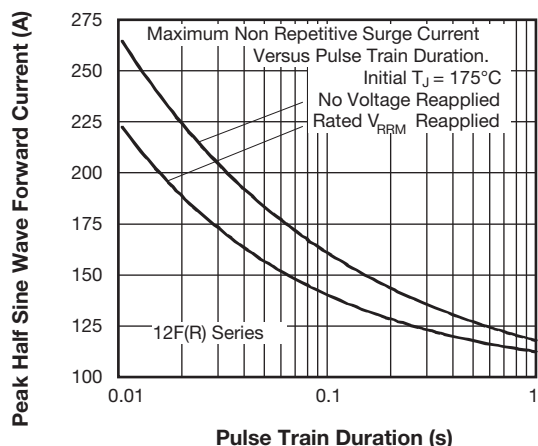


Fig. 6 - Maximum Non-Repetitive Surge Current

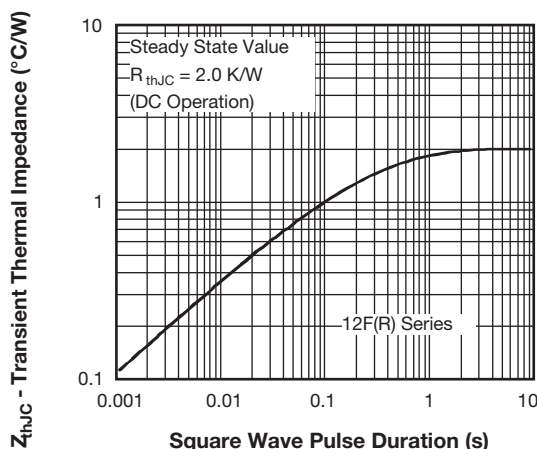


Fig. 8 - Thermal Impedance Z_{thJC} Characteristics

ORDERING INFORMATION TABLE

Device code	VS-	12	F	R	120	M
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① ② ③ ④ ⑤ ⑥

- ① - Vishay Semiconductors product
- 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 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)

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

DIMENSIONS in millimeters (inches)





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Офис по работе с юридическими лицами:

105318, г.Москва, ул.Щербаковская д.3, офис 1107, 1118, ДЦ «Щербаковский»

Телефон: +7 495 668-12-70 (многоканальный)

Факс: +7 495 668-12-70 (доб.304)

E-mail: info@moschip.ru

Skype отдела продаж:

moschip.ru

moschip.ru_4

moschip.ru_6

moschip.ru_9