

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	I_{RRM} MAXIMUM AT $T_J = 175\text{ °C}$ mA
VS-12F(R)	10	100	150	12
	20	200	275	
	40	400	500	
	60	600	725	
	80	800	950	
	100	1000	1200	
	120	1200	1400	

**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 peak, one-cycle forward, non-repetitive surge current	I_{FSM}	t = 10 ms	No voltage reapplied	265	A
		t = 8.3 ms	No voltage reapplied	280	
		t = 10 ms	100 % V_{RRM} reapplied	225	
		t = 8.3 ms	100 % V_{RRM} reapplied	235	
Maximum I^2t for fusing	I^2t	t = 10 ms	No voltage reapplied	351	A ² s
		t = 8.3 ms	No voltage reapplied	320	
		t = 10 ms	100 % V_{RRM} reapplied	250	
		t = 8.3 ms	100 % V_{RRM} reapplied	226	
Maximum $I^2\sqrt{t}$ for fusing	$I^2\sqrt{t}$	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 % $\times \pi \times I_{F(AV)} < I < \pi \times I_{F(AV)}$), $T_J = T_J$ 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	mΩ
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, $t_p = 400$ μs rectangular wave		1.26	V

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

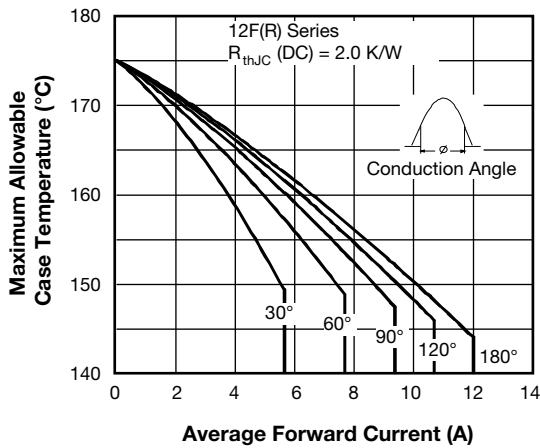


Fig. 1 - Current Ratings Characteristics

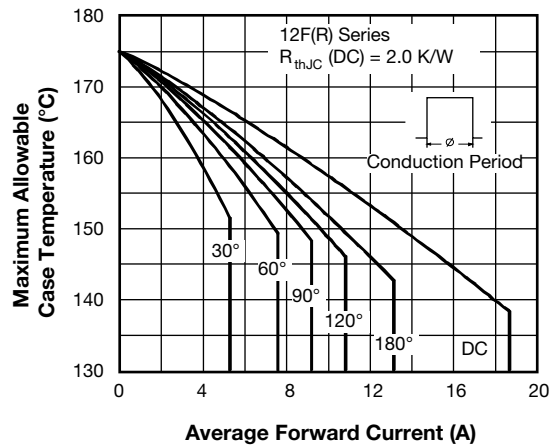


Fig. 2 - Current Ratings Characteristics

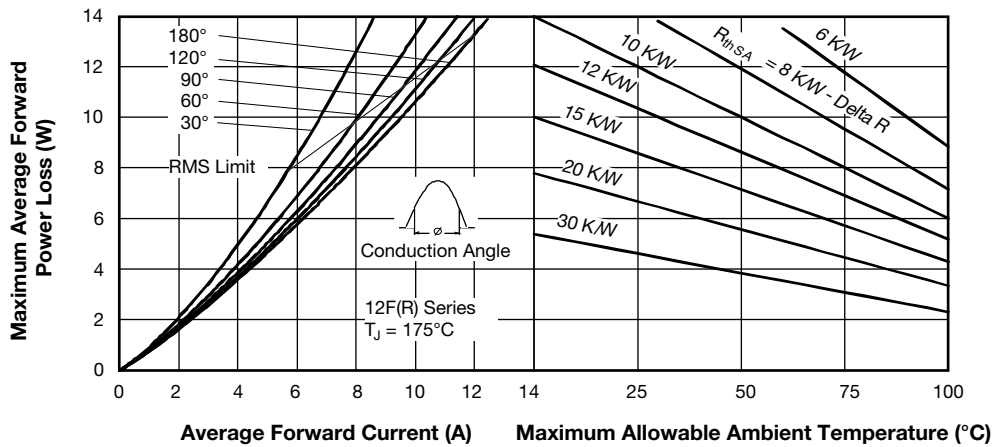


Fig. 3 - Forward Power Loss Characteristics

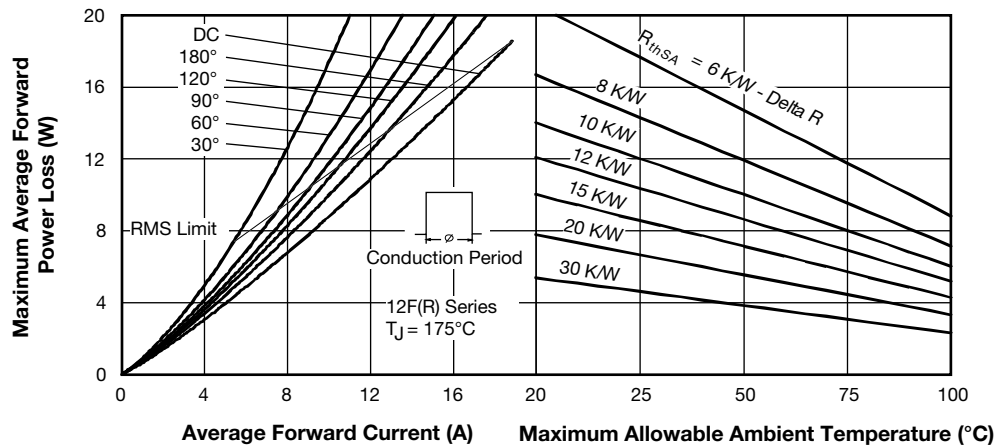


Fig. 4 - Forward Power Loss Characteristics

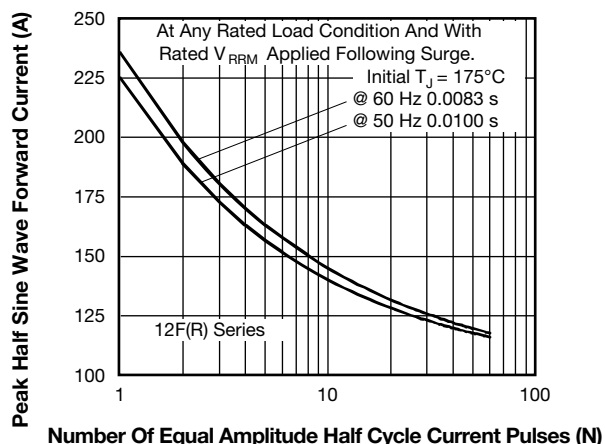


Fig. 5 - Maximum Non-Repetitive Surge Current

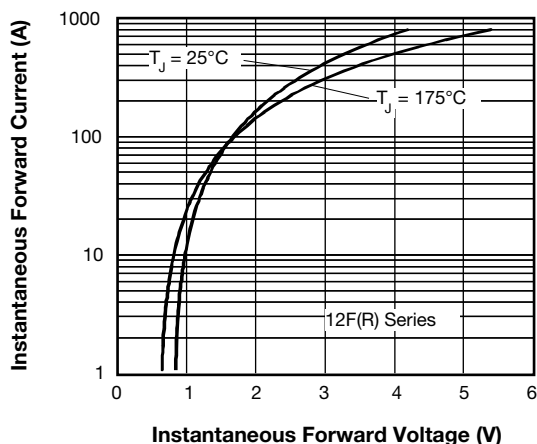


Fig. 7 - Forward Voltage Drop Characteristics

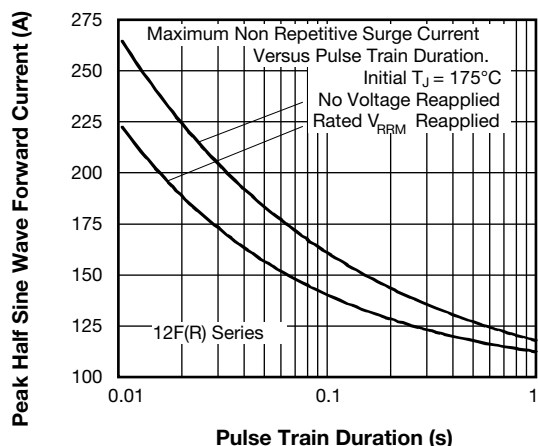


Fig. 6 - Maximum Non-Repetitive Surge Current

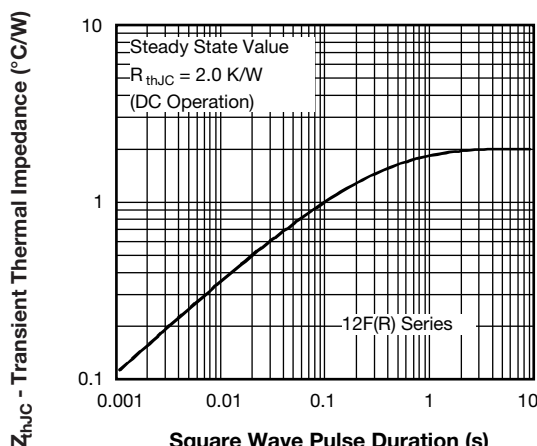


Fig. 8 - Thermal Impedance Z_{thJC} Characteristics

ORDERING INFORMATION TABLE

Device code	VS-	12	F	R	120	M
	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 $\times 10 = V_{RRM}$ (see Voltage Ratings table)
- 6** - None = stud base DO-203AA (DO-4) 10-32UNF-2A
M = stud base DO-203AA (DO-4) M5 $\times$ 0.8

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

DO-203AA (DO-4)

DIMENSIONS in millimeters (inches)





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