

Standard Recovery Diodes (Stud Version), 6 A



DO-203AA (DO-4)

FEATURES

- High surge current capability
- Avalanche types available
- Stud cathode and stud anode version
- Wide current range
- Types up to 1200 V V_{RRM}
- Material categorization: For definitions of compliance please see www.vishay.com/doc?99912


RoHS
COMPLIANT

TYPICAL APPLICATIONS

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

PRODUCT SUMMARY

$I_{F(AV)}$	6 A
Package	DO-203AA (DO-4)
Circuit configuration	Single diode

MAJOR RATINGS AND CHARACTERISTICS

PARAMETER	TEST CONDITIONS	VALUES	UNITS
$I_{F(AV)}$		6	A
	T_C	160	$^{\circ}C$
$I_{F(RMS)}$		9.5	A
I_{FSM}	50 Hz	159	A
	60 Hz	167	
I^2t	50 Hz	134	A^2s
	60 Hz	141	
V_{RRM}	Range	100 to 1200	V
T_J		-65 to 175	$^{\circ}C$

ELECTRICAL SPECIFICATIONS

VOLTAGE RATINGS

TYPE NUMBER	VOLTAGE CODE	V_{RRM} , MAXIMUM REPETITIVE PEAK REVERSE VOLTAGE V	V_{RSM} , MAXIMUM NON-REPETITIVE PEAK REVERSE VOLTAGE V	$V_{R(BR)}$, MINIMUM AVALANCHE VOLTAGE V ⁽¹⁾	I_{RRM} MAXIMUM AT $T_J = 175^{\circ}C$ mA
VS-6F(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		6	A
				160	°C
Maximum RMS forward current	$I_{F(RMS)}$			9.5	A
Maximum non-repetitive peak reverse power	$P_R^{(1)}$	10 μ s square pulse, $T_J = T_J$ maximum		4	K/W
Maximum peak, one cycle forward, non-repetitive surge current	I_{FSM}	t = 10 ms	No voltage reapplied	159	A
		t = 8.3 ms		167	
		t = 10 ms	100 % V_{RRM} reapplied	134	
		t = 8.3 ms		141	
Maximum I^2t for fusing	I^2t	t = 10 ms	No voltage reapplied	127	A ² s
		t = 8.3 ms		116	
		t = 10 ms	100 % V_{RRM} reapplied	90	
		t = 8.3 ms		82	
Maximum $I^2\sqrt{t}$ for fusing	$I^2\sqrt{t}$	t = 0.1 ms to 10 ms, no voltage reapplied		1270	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		0.63	V
High level value of threshold voltage	$V_{F(TO)2}$	(I $> \pi \times I_{F(AV)}$), $T_J = T_J$ maximum		0.86	
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		15.7	m Ω
High level value of forward slope resistance	r_{f2}	(I $> \pi \times I_{F(AV)}$), $T_J = T_J$ maximum		5.6	
Maximum forward voltage drop	V_{FM}	$I_{pk} = 19$ A, $T_J = 25$ °C, $t_p = 400$ μ s rectangular wave		1.10	V

Note

(1) Available only for avalanche version, all other parameters the same as 6F

THERMAL AND MECHANICAL SPECIFICATIONS				
PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum junction 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	2.5	K/W
Maximum thermal resistance, case to heatsink	R_{thCS}	Mounting surface, smooth, flat and greased	0.5	
Mounting torque, ± 10 %		Lubricated threads (Not lubricated threads)	1.2 (1.5)	N · m (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°	0.34	0.29	$T_J = T_J$ maximum	K/W
120°	0.44	0.48		
90°	0.57	0.63		
60°	0.85	0.88		
30°	1.37	1.39		

Note

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

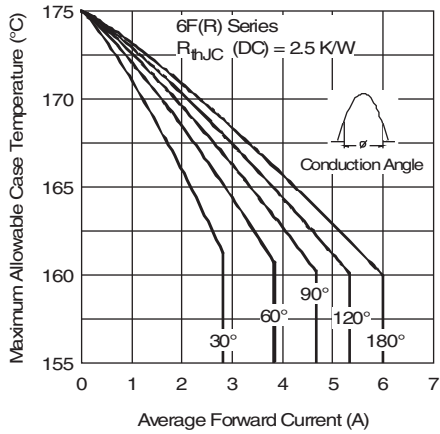


Fig. 1 - Current Ratings Characteristics

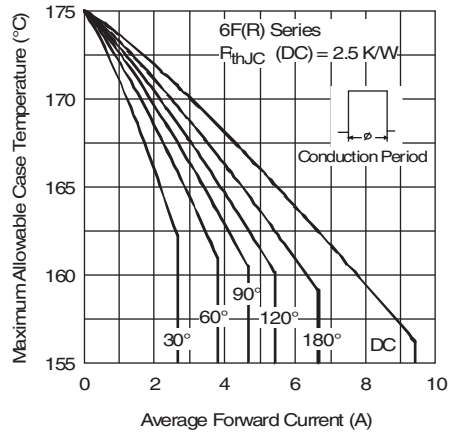


Fig. 2 - Current Ratings Characteristics

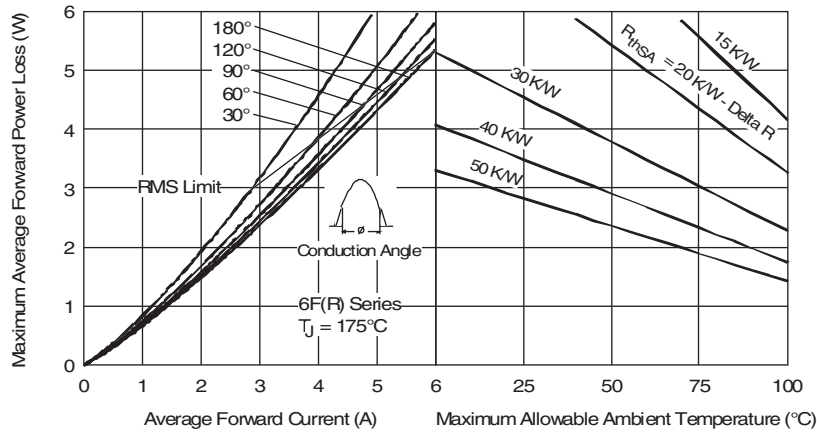


Fig. 3 - Forward Power Loss Characteristics

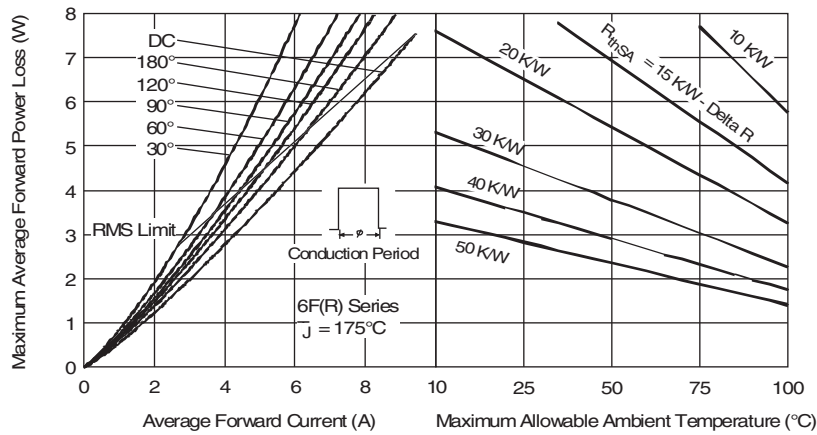


Fig. 4 - Forward Power Loss Characteristics

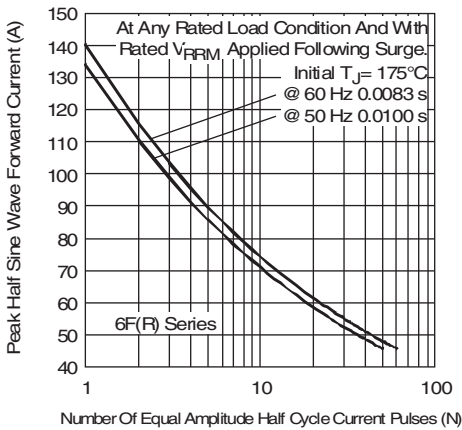


Fig. 5 - Maximum Non-Repetitive Surge Current

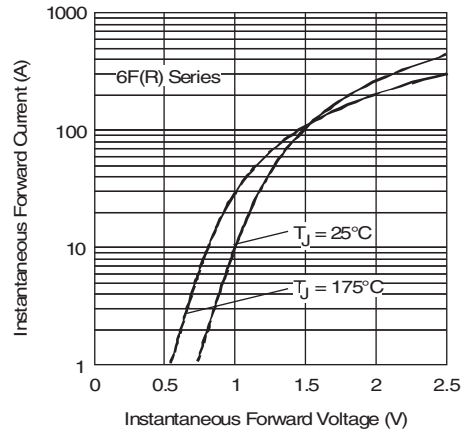


Fig. 7 - Forward Voltage Drop Characteristics

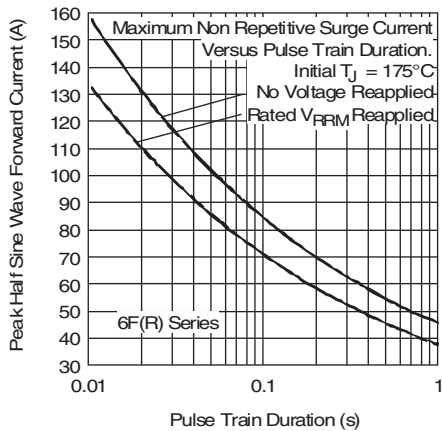


Fig. 6 - Maximum Non-Repetitive Surge Current

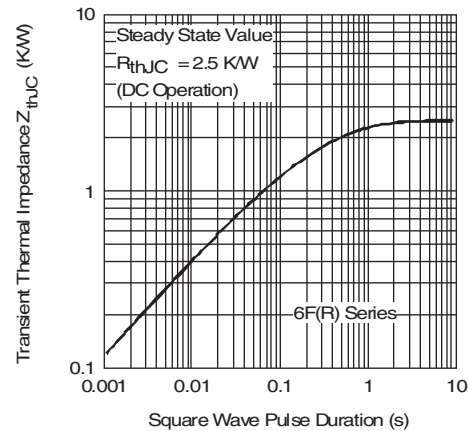


Fig. 8 - Thermal Impedance Z_{thJC} Characteristics

ORDERING INFORMATION TABLE

Device code	VS-	6	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 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 diode)			

LINKS TO RELATED DOCUMENTS

Dimensions	www.vishay.com/doc?95311
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DO-203AA (DO-4)

DIMENSIONS in millimeters (inches)





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