

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	°C
$I_{F(RMS)}$		9.5	A
I_{FSM}	50 Hz	159	A
	60 Hz	167	
I^2t	50 Hz	134	A ² s
	60 Hz	141	
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 REVERSE VOLTAGE V	$V_{R(BR)}$, MINIMUM AVALANCHE VOLTAGE V ⁽¹⁾	I_{RRM} MAXIMUM AT $T_J = 175\text{ °C}$ 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 μs 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	Sinusoidal half wave, initial T _J = T _J maximum	159	A	
		t = 8.3 ms			167		
		t = 10 ms	100 % V _{RRM} reapplied		134		A ² s
		t = 8.3 ms			141		
Maximum I ² t for fusing	I ² t	t = 10 ms	No voltage reapplied		127		
		t = 8.3 ms			116		
		t = 10 ms	100 % V _{RRM} reapplied		90		
		t = 8.3 ms			82		
Maximum I ² √t for fusing	I ² √t	t = 0.1 ms to 10 ms, no voltage reapplied			1270	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			0.63	V	
High level value of threshold voltage	V _{F(TO)2}	(I > π × I _{F(AV)} , T _J = T _J maximum			0.86		
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			15.7	mΩ	
High level value of forward slope resistance	r _{f2}	(I > π × 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 μs 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

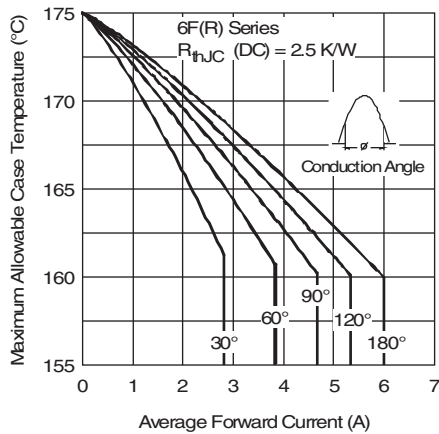


Fig. 1 - Current Ratings Characteristics

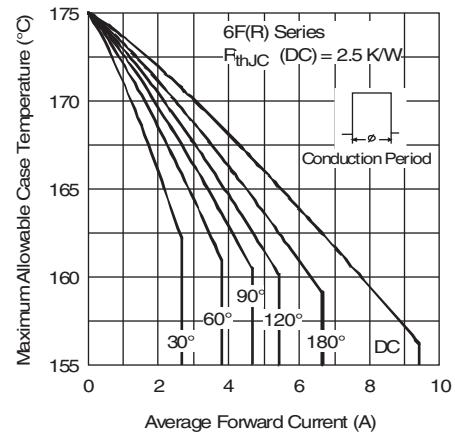


Fig. 2 - Current Ratings Characteristics

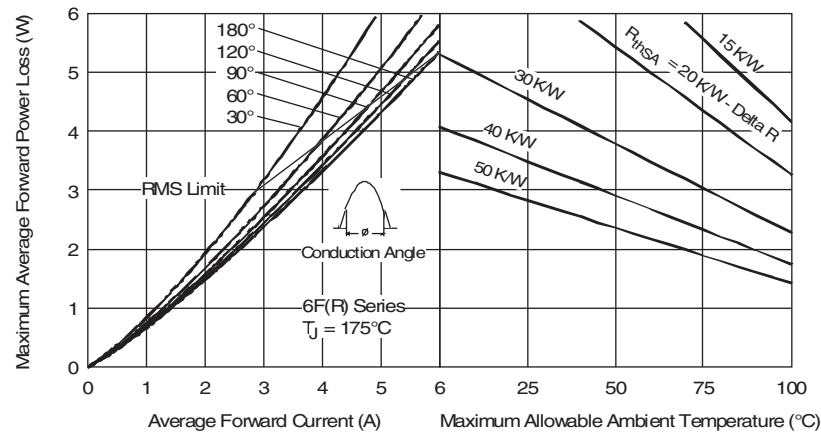


Fig. 3 - Forward Power Loss Characteristics

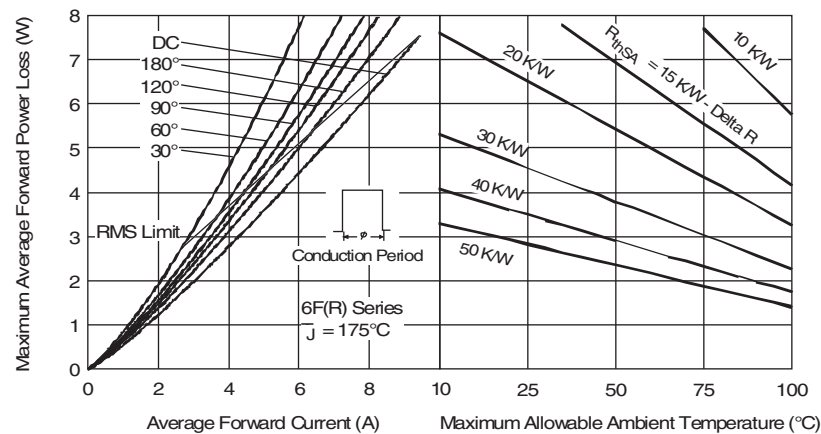


Fig. 4 - Forward Power Loss Characteristics

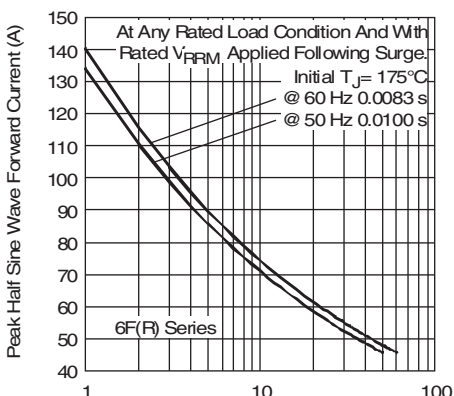


Fig. 5 - Maximum Non-Repetitive Surge Current

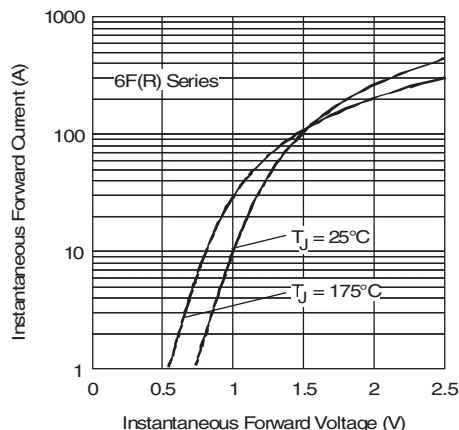


Fig. 7 - Forward Voltage Drop Characteristics

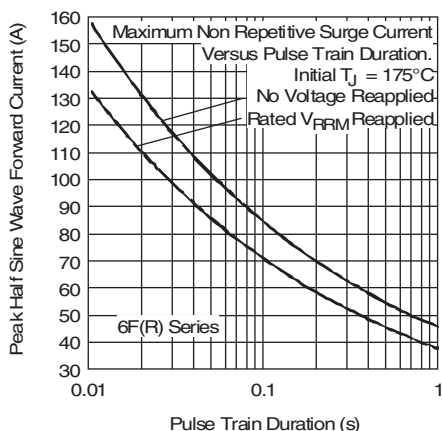


Fig. 6 - Maximum Non-Repetitive Surge Current

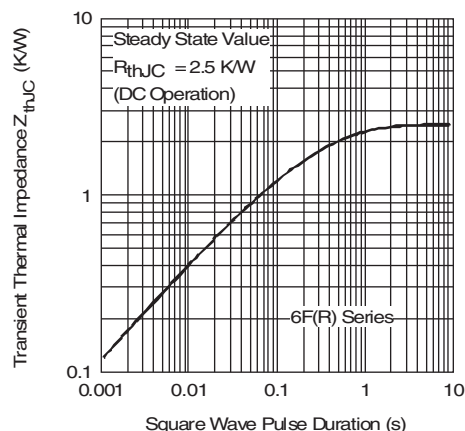


Fig. 8 - Thermal Impedance Z_{thJC} Characteristics

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

DIMENSIONS in millimeters (inches)





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