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^2s
	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 °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

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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	
		t = 8.3 ms			141	
Maximum I^2t for fusing	I^2t	t = 10 ms	No voltage reapplied		127	A^2s
		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 % x π x $I_{F(AV)}$ < I < π x $I_{F(AV)}$), $T_J = T_J$ maximum			0.63	V
High level value of threshold voltage	$V_{F(TO)2}$	(I > π x $I_{F(AV)}$), $T_J = T_J$ maximum			0.86	
Low level value of forward slope resistance	r_{f1}	(16.7 % x π x $I_{F(AV)}$ < I < π x $I_{F(AV)}$), $T_J = T_J$ maximum			15.7	mΩ
High level value of forward slope resistance	r_{f2}	(I > π x $I_{F(AV)}$), $T_J = T_J$ 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

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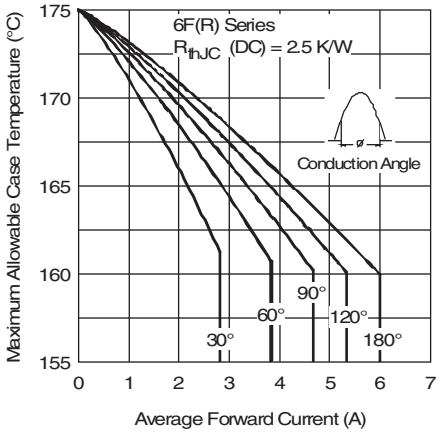

Fig. 1 - Current Ratings Characteristics

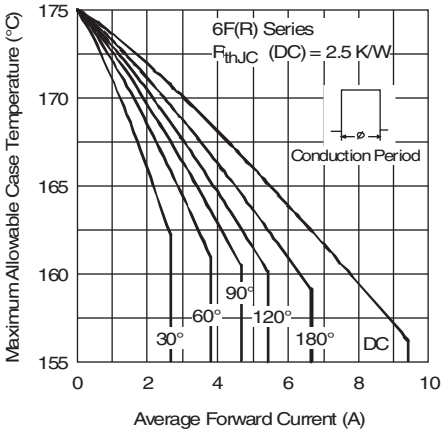

Fig. 2 - Current Ratings Characteristics

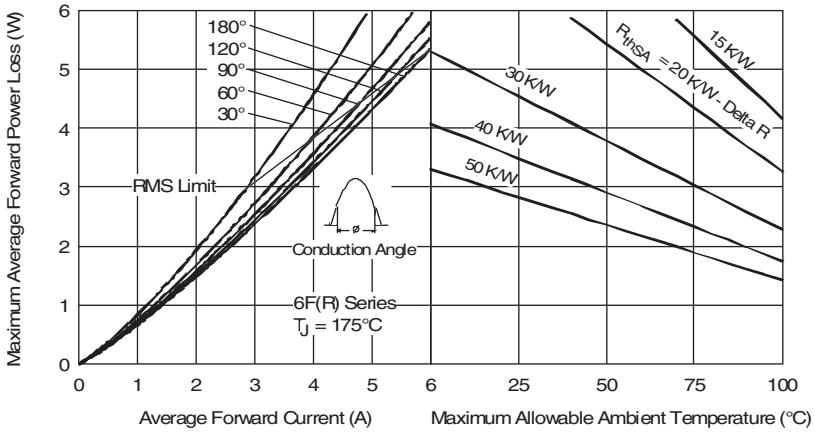

Fig. 3 - Forward Power Loss Characteristics

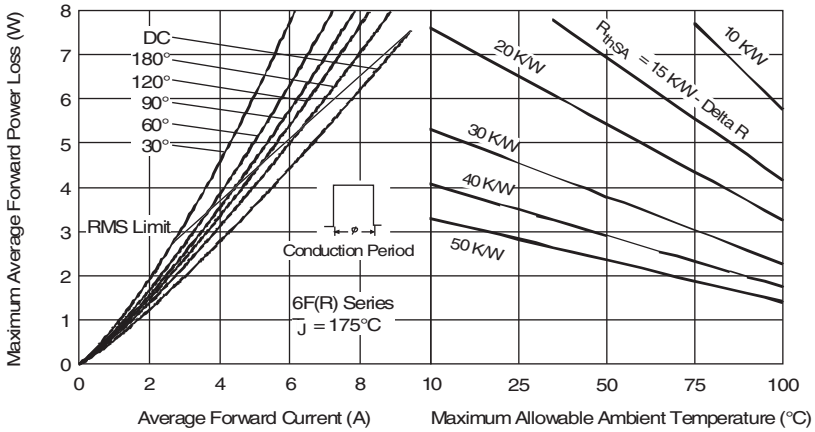

Fig. 4 - Forward Power Loss Characteristics

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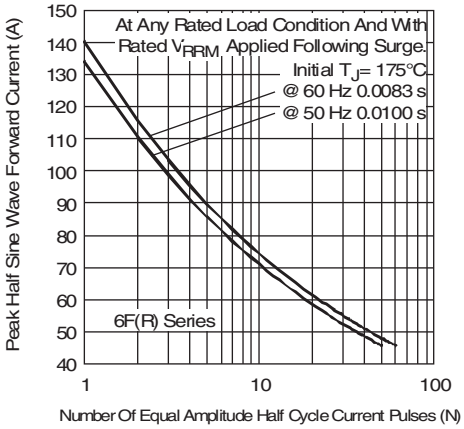

Fig. 5 - Maximum Non-Repetitive Surge Current

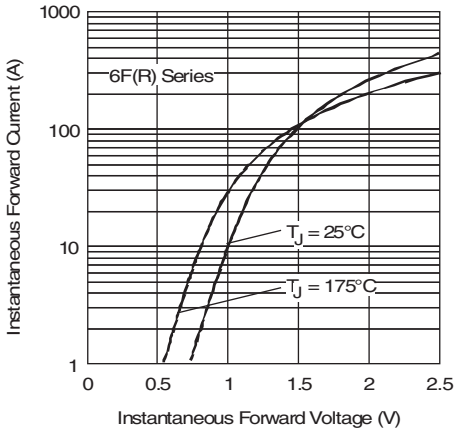

Fig. 7 - Forward Voltage Drop Characteristics

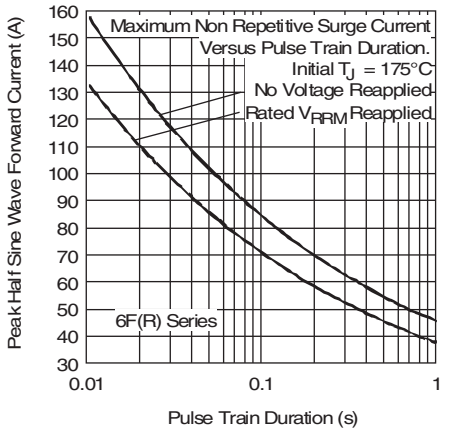

Fig. 6 - Maximum Non-Repetitive Surge Current

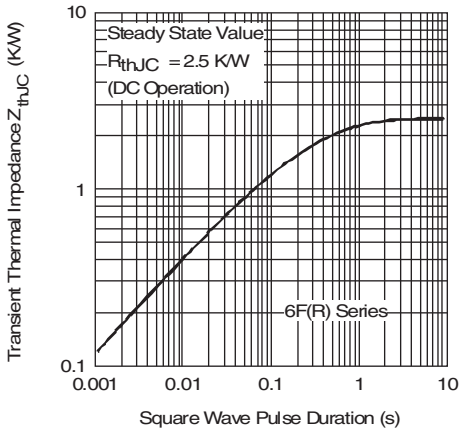

Fig. 8 - Thermal Impedance Z_{thJC} Characteristics

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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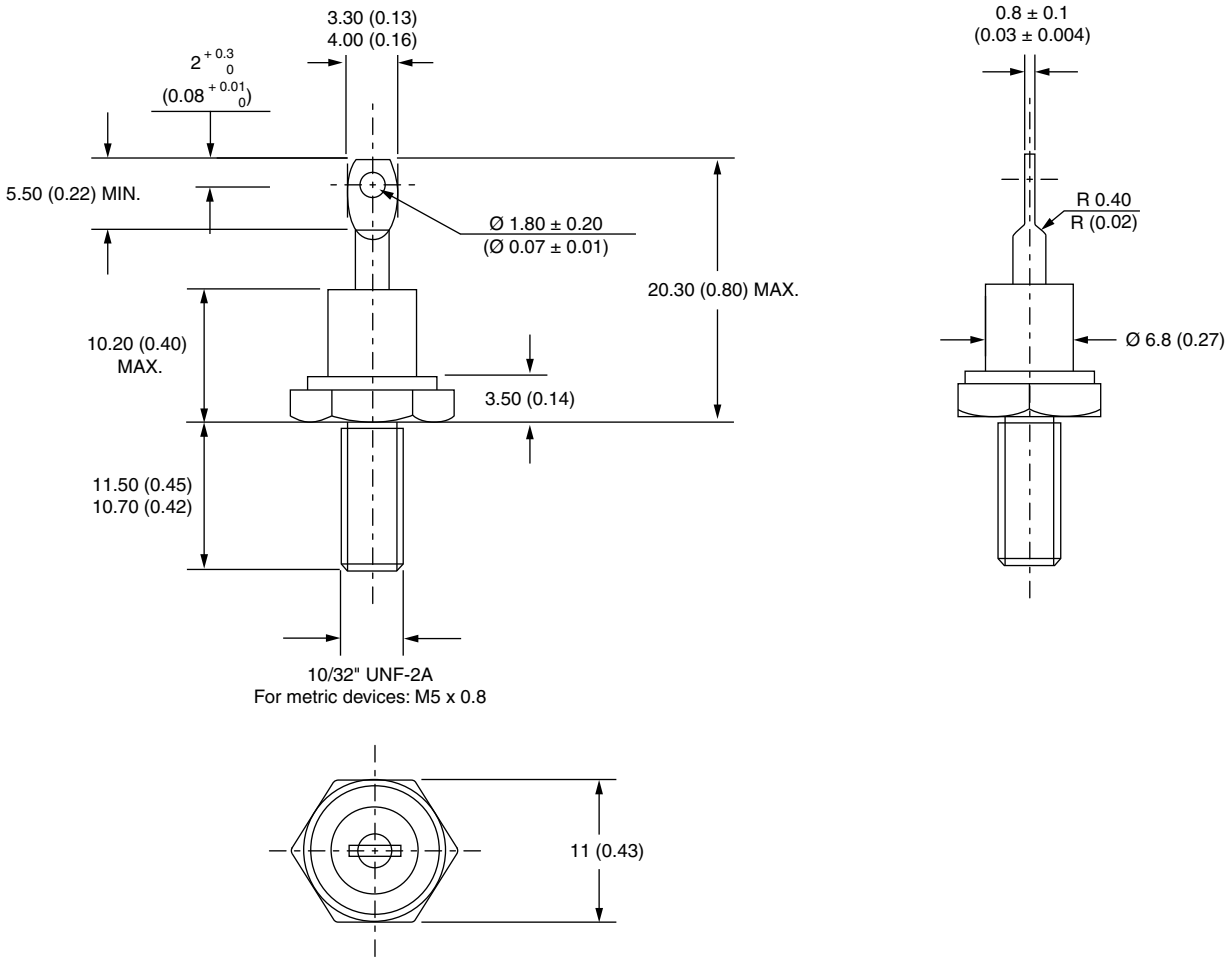
DO-203AA (DO-4)

DIMENSIONS in millimeters (inches)



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