

## Standard Recovery Diodes, (Stud Version), 6 A



DO-4 (DO-203AA)


**RoHS**  
COMPLIANT

### FEATURES

- High surge current capability
- 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](http://www.vishay.com/doc?99912)

### TYPICAL APPLICATIONS

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

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

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 <sup>2</sup> 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	$I_{RRM}$ MAXIMUM AT $T_J = 175$ °C mA
VS-6F(R)	10	100	150	12
	20	200	275	
	40	400	500	
	60	600	725	
	80	800	950	
	100	1000	1200	
	120	1200	1400	

<b>FORWARD CONDUCTION</b>							
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 peak, one cycle forward, non-repetitive surge current	$I_{FSM}$	$t = 10 \text{ ms}$	No voltage reapplied	Sinusoidal half wave, initial $T_J = T_J$ maximum	159	A	
		$t = 8.3 \text{ ms}$			167		
		$t = 10 \text{ ms}$	100 % $V_{RRM}$ reapplied		134		
		$t = 8.3 \text{ ms}$			141		
Maximum $I^2t$ for fusing	$I^2t$	$t = 10 \text{ ms}$	No voltage reapplied		127	$\text{A}^2\text{s}$	
		$t = 8.3 \text{ ms}$			116		
		$t = 10 \text{ ms}$	100 % $V_{RRM}$ reapplied		90		
		$t = 8.3 \text{ ms}$			82		
Maximum $I^2\sqrt{t}$ for fusing	$I^2\sqrt{t}$	$t = 0.1 \text{ ms to } 10 \text{ ms, no voltage reapplied}$			1270	$\text{A}^2\sqrt{\text{s}}$	
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	$\text{m}\Omega$	
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	$V_{FM}$	$I_{pk} = 19 \text{ A, } T_J = 25 \text{ °C, } t_p = 400 \mu\text{s}$ rectangular wave			1.10	V	

<b>THERMAL AND MECHANICAL SPECIFICATIONS</b>						
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 heat sink	$R_{thCS}$	Mounting surface, smooth, flat and greased			0.5	
Mounting torque, $\pm 10 \%$		Lubricated threads (Not lubricated threads)			1.2 (1.5)	$\text{N} \cdot \text{m}$ (lbf · in)
Approximate weight					7	g
					0.25	oz.
Case style		See dimensions - link at the end of datasheet			DO-4 (DO-203AA)	

<b><math>\Delta R_{thJC}</math> CONDUCTION</b>					
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

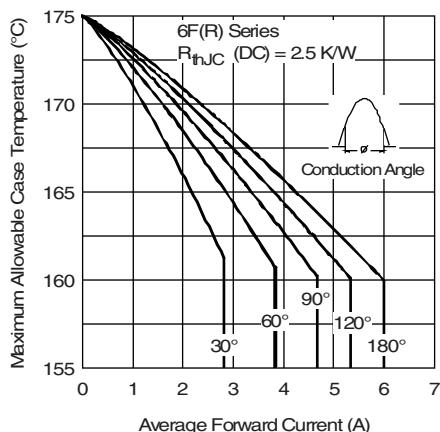


Fig. 1 - Current Ratings Characteristics

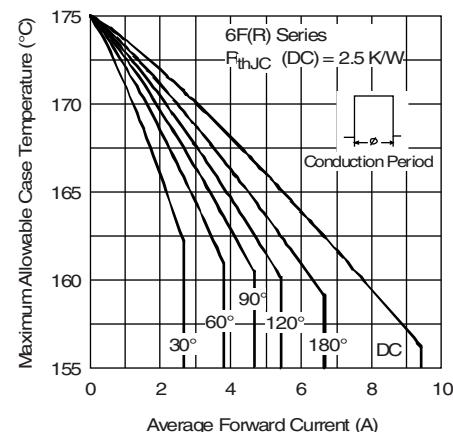


Fig. 2 - Current Ratings Characteristics

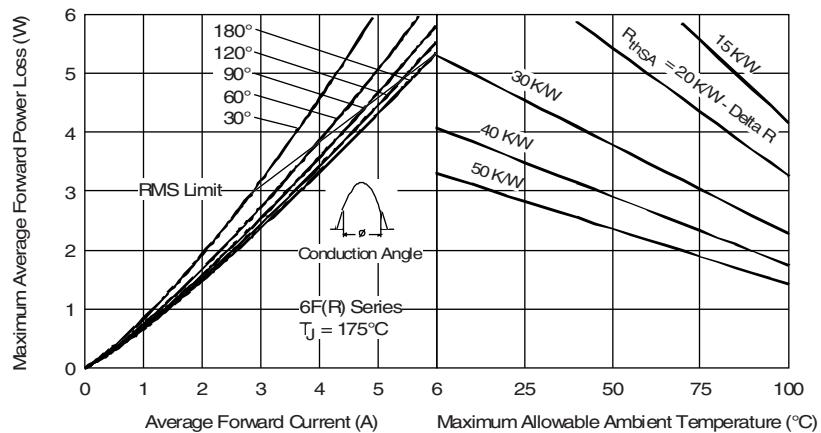


Fig. 3 - Forward Power Loss Characteristics

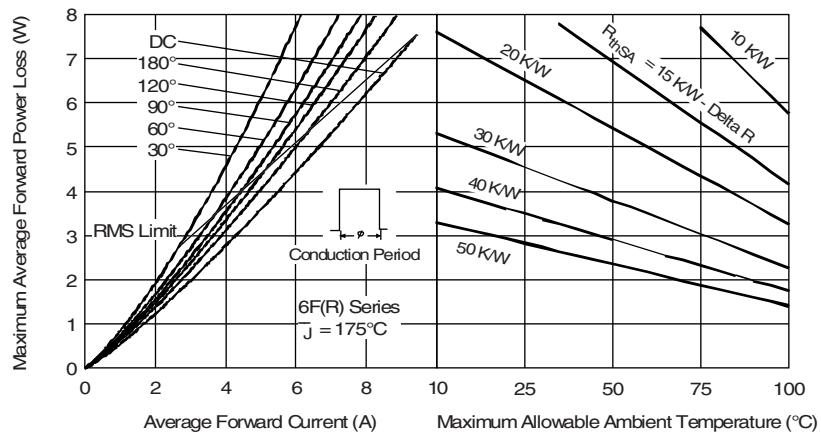


Fig. 4 - Forward Power Loss Characteristics

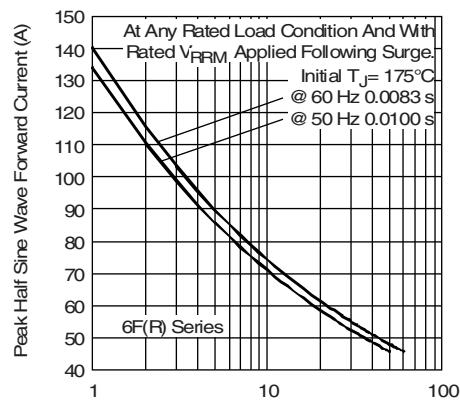


Fig. 5 - Maximum Non-Repetitive Surge Current

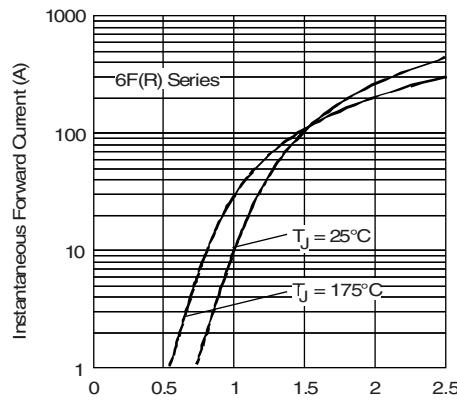


Fig. 7 - Forward Voltage Drop Characteristics

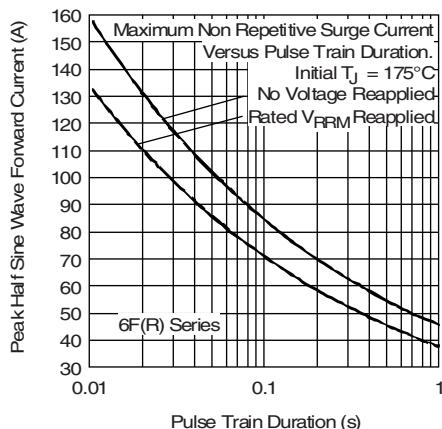
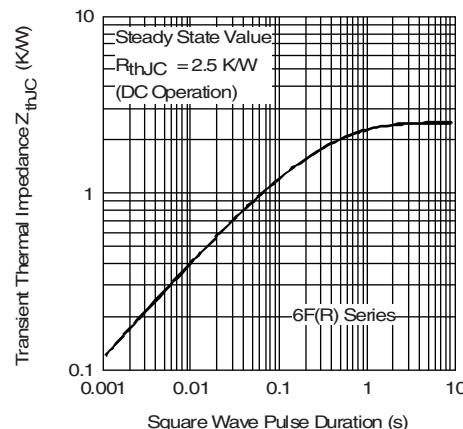


Fig. 6 - Maximum Non-Repetitive Surge Current


Fig. 8 - Thermal Impedance  $Z_{thJC}$  Characteristics

## ORDERING INFORMATION TABLE

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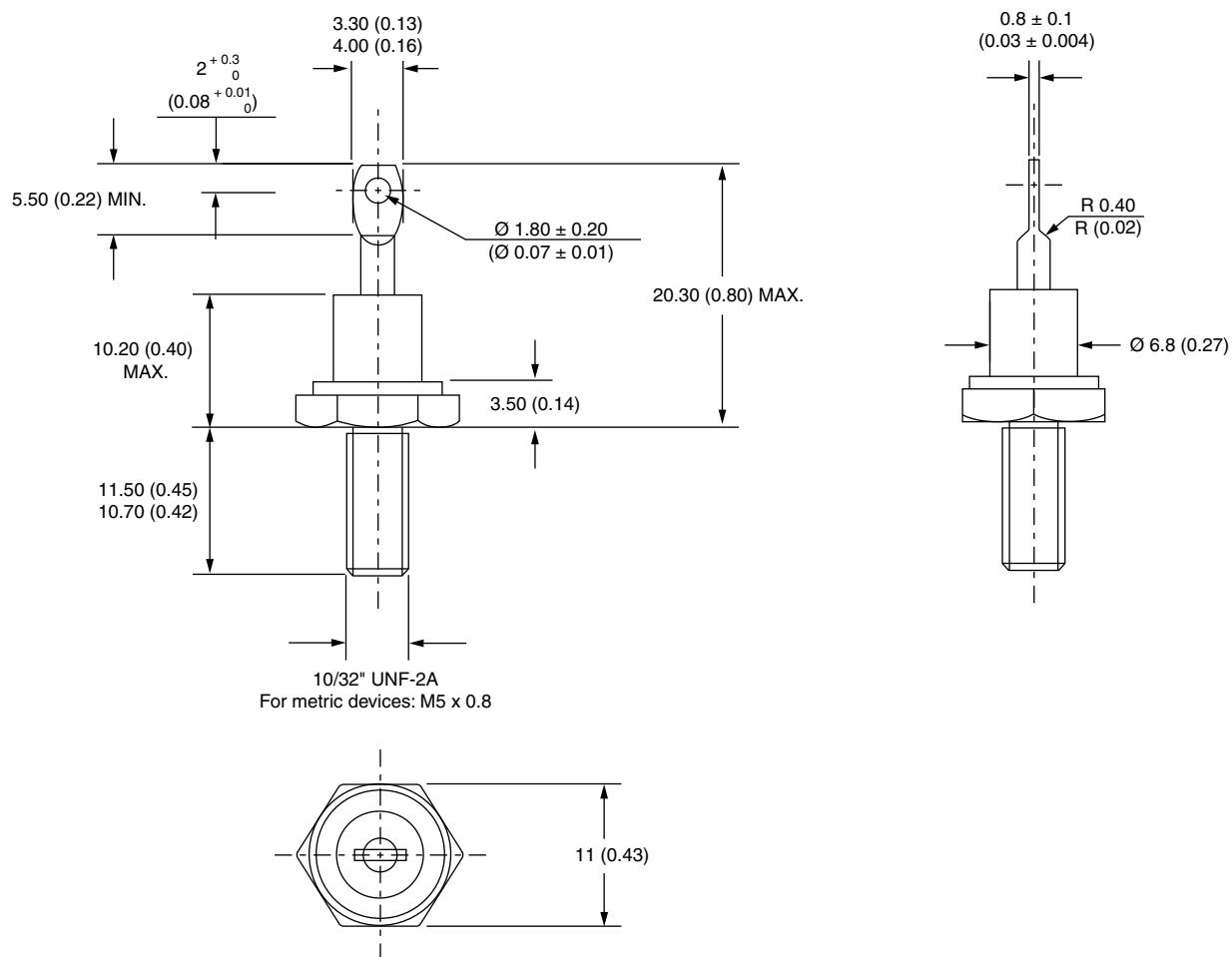
(1) (2) (3) (4) (5) (6)

- [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-4 (DO-203AA) 10-32UNF-2A  
• M = stud base DO-4 (DO-203AA) M5 x 0.8

LINKS TO RELATED DOCUMENTS	
Dimensions	<a href="http://www.vishay.com/doc?95311">www.vishay.com/doc?95311</a>

### DO-203AA (DO-4)

#### DIMENSIONS in millimeters (inches)



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