

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



DO-4 (DO-203AA)

### 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)


**RoHS**  
COMPLIANT

### 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	



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 peak, one cycle forward, non-repetitive surge current	$I_{FSM}$	t = 10 ms	No voltage reappplied	159	A	
		t = 8.3 ms		Sinusoidal half wave, initial $T_J = T_J$ maximum		167
		t = 10 ms	100 % $V_{RRM}$ reappplied			134
		t = 8.3 ms				141
Maximum $I^2t$ for fusing	$I^2t$	t = 10 ms	No voltage reappplied		127	A <sup>2</sup> s
		t = 8.3 ms		100 % $V_{RRM}$ reappplied	116	
		t = 10 ms	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 reappplied			1270	A <sup>2</sup> √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	mΩ	
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, $t_p = 400$ μs rectangular wave		1.10	V	

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 heat sink	$R_{thCS}$	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-4 (DO-203AA)	

$\Delta R_{thJC}$ 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

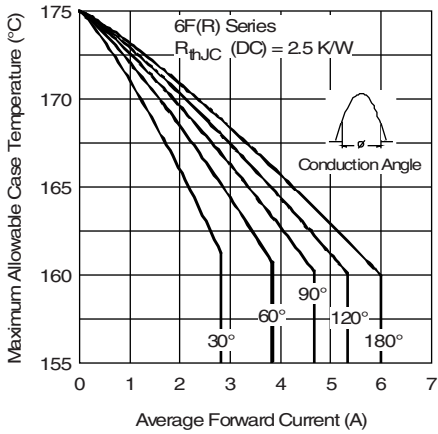


Fig. 1 - Current Ratings Characteristics

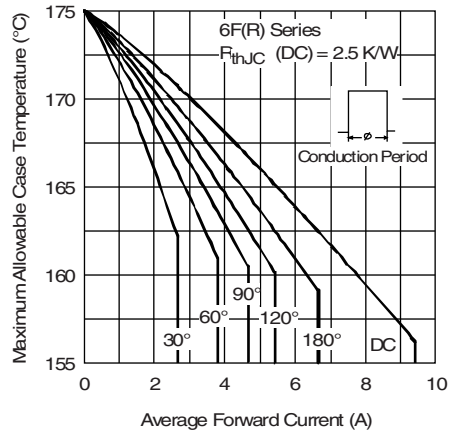


Fig. 2 - Current Ratings Characteristics

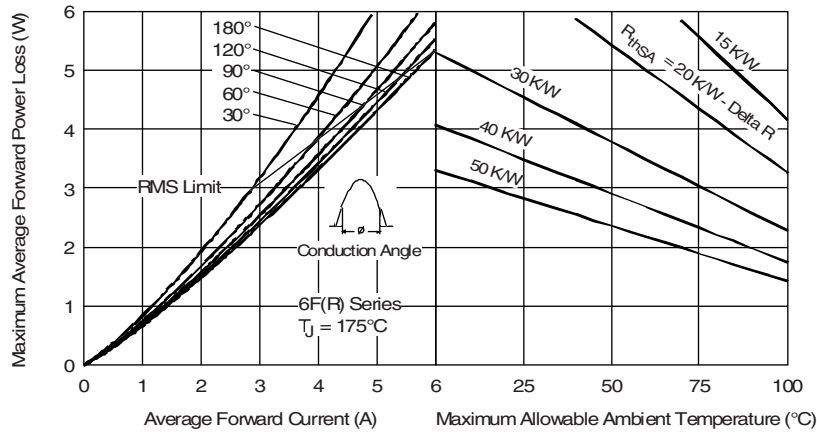


Fig. 3 - Forward Power Loss Characteristics

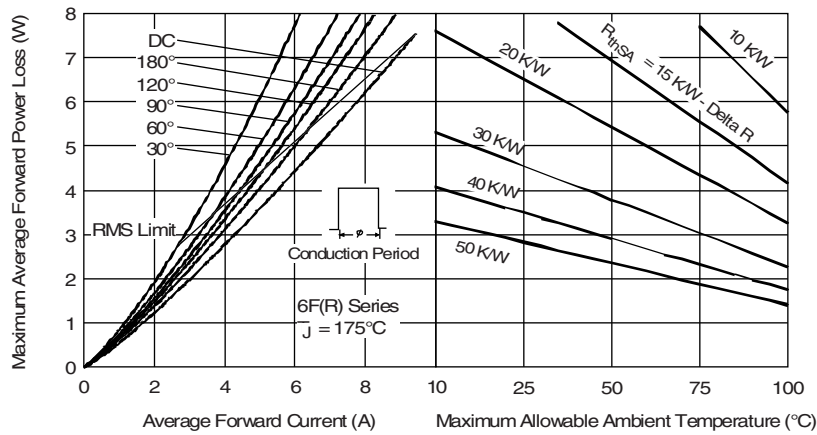


Fig. 4 - Forward Power Loss Characteristics

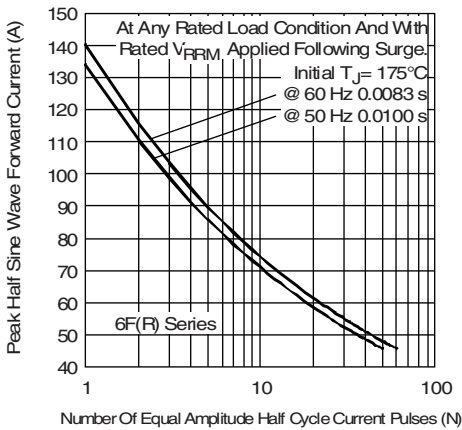


Fig. 5 - Maximum Non-Repetitive Surge Current

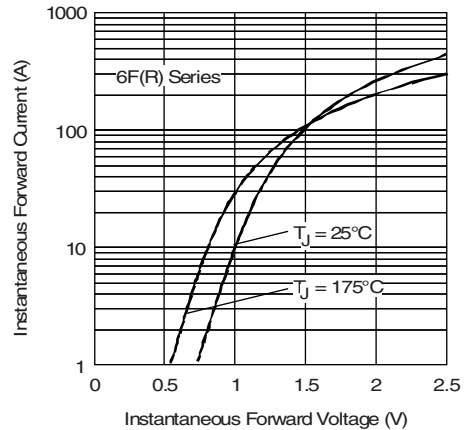


Fig. 7 - Forward Voltage Drop Characteristics

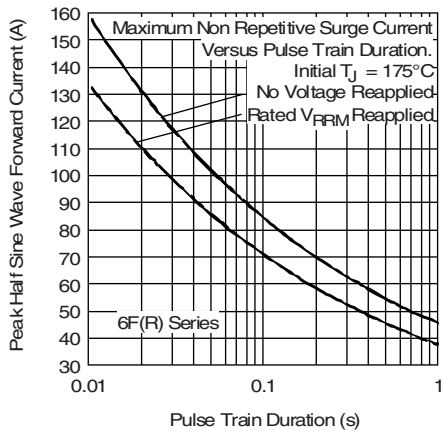


Fig. 6 - Maximum Non-Repetitive Surge Current

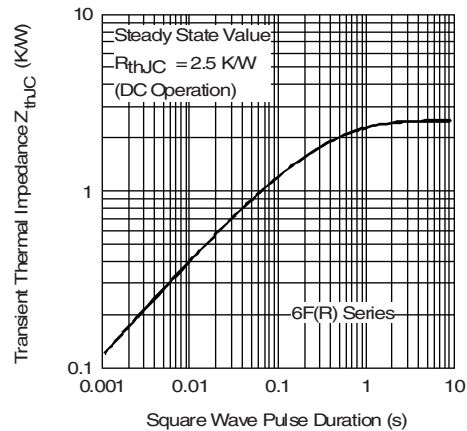


Fig. 8 - Thermal Impedance  $Z_{thJC}$  Characteristics

## ORDERING INFORMATION TABLE

Device code	<b>VS-</b>	<b>6</b>	<b>F</b>	<b>R</b>	<b>120</b>	<b>M</b>
	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>
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