

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


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 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	I_{RRM} MAXIMUM AT $T_J = 175^\circ\text{C}$ 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}	$t = 10\text{ ms}$ $t = 8.3\text{ ms}$ No voltage reappplied 100 % V_{RRM} reappplied	159 167 134 141	A
Maximum I^2t for fusing	I^2t	$t = 10\text{ ms}$ $t = 8.3\text{ ms}$ No voltage reappplied 100 % V_{RRM} reappplied	127 116 90 82	A^2s
Maximum $I^2\sqrt{t}$ for fusing	$I^2\sqrt{t}$	$t = 0.1\text{ ms to }10\text{ ms}$, no voltage reappplied	1270	$A^2\sqrt{s}$
Low level value of threshold voltage	$V_{F(TO)1}$	$(16.7\% \times \pi \times I_{F(AV)} < I < \pi \times I_{F(AV)})$, $T_J = T_J\text{ maximum}$	0.63	V
High level value of threshold voltage	$V_{F(TO)2}$	$(I > \pi \times I_{F(AV)})$, $T_J = T_J\text{ maximum}$	0.86	
Low level value of forward slope resistance	r_{f1}	$(16.7\% \times \pi \times I_{F(AV)} < I < \pi \times I_{F(AV)})$, $T_J = T_J\text{ maximum}$	15.7	$m\Omega$
High level value of forward slope resistance	r_{f2}	$(I > \pi \times I_{F(AV)})$, $T_J = T_J\text{ maximum}$	5.6	
Maximum forward voltage drop	V_{FM}	$I_{pk} = 19\text{ A}$, $T_J = 25\text{ °C}$, $t_p = 400\text{ }\mu s$ 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, $\pm 10\%$		Lubricated threads (Not lubricated threads)	1.2 (1.5)	N · m (lbf · in)
Approximate weight			7 0.25	g oz.
Case style		See dimensions - link at the end of datasheet	DO-4 (DO-203AA)	

 ΔR_{thJC} CONDUCTION

CONDUCTION ANGLE	SINUSOIDAL CONDUCTION	RECTANGULAR CONDUCTION	TEST CONDITIONS	UNITS
180°	0.34	0.29	$T_J = T_J\text{ maximum}$	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

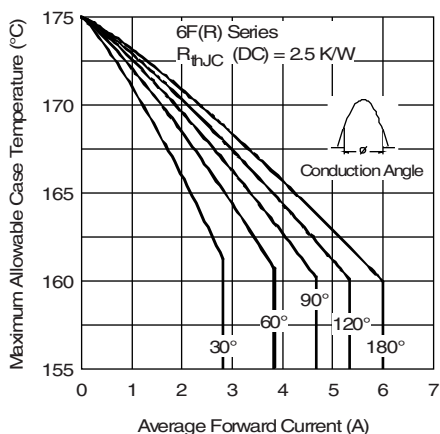


Fig. 1 - Current Ratings Characteristics

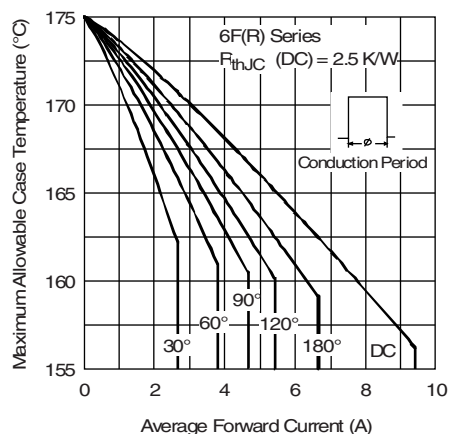


Fig. 2 - Current Ratings Characteristics

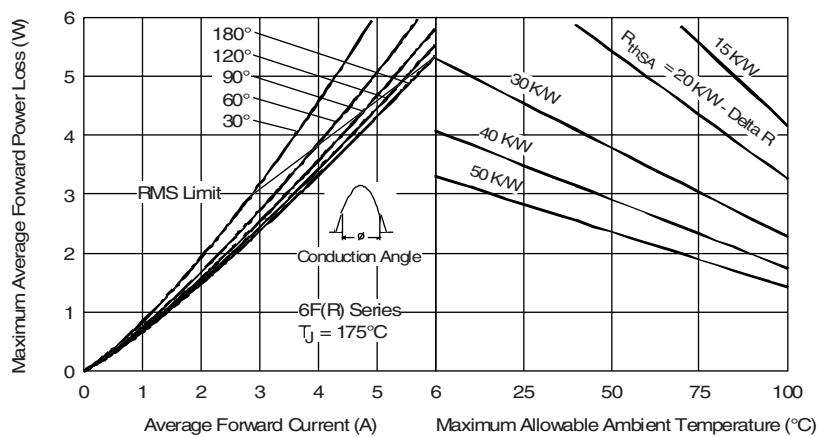


Fig. 3 - Forward Power Loss Characteristics

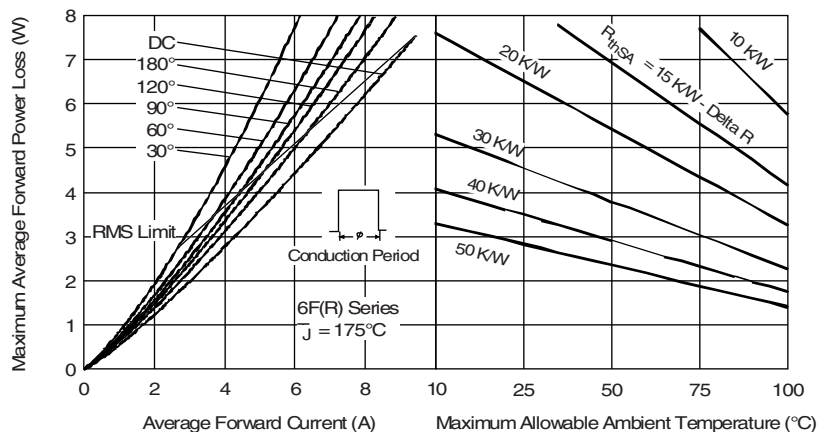


Fig. 4 - Forward Power Loss Characteristics

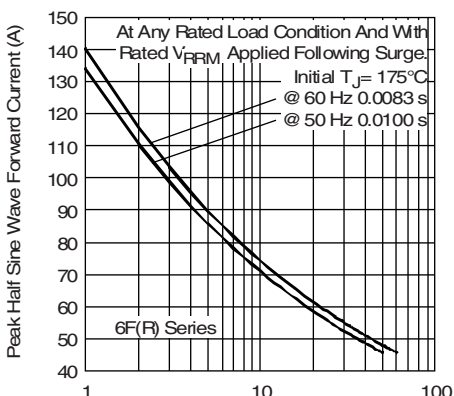


Fig. 5 - Maximum Non-Repetitive Surge Current

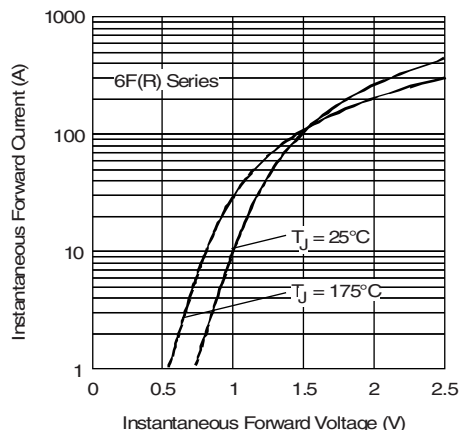


Fig. 7 - Forward Voltage Drop Characteristics

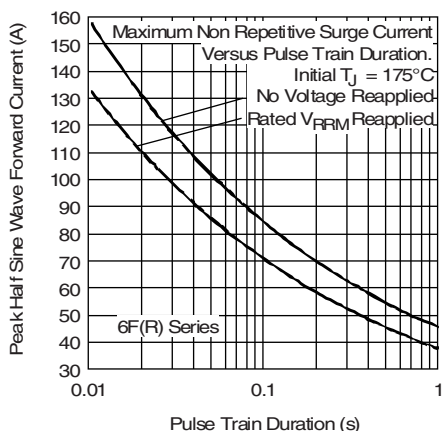


Fig. 6 - Maximum Non-Repetitive Surge Current

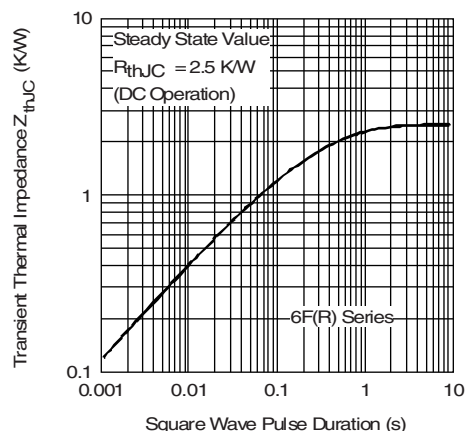


Fig. 8 - Thermal Impedance Z_{thJC} Characteristics

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

LINKS TO RELATED DOCUMENTS

Dimensions

www.vishay.com/doc?95311

DIMENSIONS in millimeters (inches)





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