Standard Recovery Diodes (Stud Version), 16 A

DO-203AA (DO-4)

FEATURES

- High surge current capability
- Stud cathode and stud anode version
- Wide current range
- Types up to 1200 V V_{RRM}
- Designed and qualified for industrial and consumer level
- Material categorization: For definitions of compliance please see www.vishay.com/doc?99912

RoHS COMPLIANT

TYPICAL APPLICATIONS

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

PRODUCT SUMMARY	
$I_{F(AV)}$	16 A
Package	DO-203AA (DO-4)
Circuit configuration	Single diode

MAJOR RATINGS AND CHARACTERISTICS			
PARAMETER	TEST CONDITIONS	VALUES	UNITS
$I_{F(AV)}$		16	A
	T_C	140	°C
$I_{F(RMS)}$		25	A
I_{FSM}	50 Hz	350	A
	60 Hz	370	
I^2t	50 Hz	612	A^2s
	60 Hz	560	
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 VOLTAGE V	$V_{R(BR)}$, MINIMUM AVALANCHE VOLTAGE V (1)	I_{RRM} MAXIMUM AT T_J = 175 °C mA
VS-16F(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			16	A
					140	°C
Maximum RMS forward current	$I_{F(RMS)}$				25	A
Maximum on-repetitive peak reverse power	P_R(1)	10 µs square pulse, $T_J = T_J$ maximum			15	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	350	A
		t = 8.3 ms			370	
		t = 10 ms	100 % V_{RRM} reapplied		295	
		t = 8.3 ms			310	
Maximum I^2t for fusing	I^2t	t = 10 ms	No voltage reapplied		612	A^2s
		t = 8.3 ms			560	
		t = 10 ms	100 % V_{RRM} reapplied		435	
		t = 8.3 ms			395	
Maximum $I^2\sqrt{t}$ for fusing	$I^2\sqrt{t}$	t = 0.1 to 10 ms, no voltage reapplied			6120	$A^2\sqrt{s}$
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			0.77	V
High level value of threshold voltage	$V_{F(TO)2}$	(I > π x $I_{F(AV)}$), $T_J = T_J$ maximum			0.90	
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			7.80	mΩ
High level value of forward slope resistance	r_{f2}	(I > π x $I_{F(AV)}$), $T_J = T_J$ maximum			5.70	
Maximum forward voltage drop	V_{FM}	I_{pk} = 50 A, T_J = 25 °C, t_p = 400 µs rectangular wave			1.23	V

Note

(1) Available only for avalanche version, all other parameters the same as 16F

THERMAL AND MECHANICAL SPECIFICATIONS				
PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum junction operating 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	1.6	K/W
Maximum thermal resistance, case to heatsink	R_{thCS}	Mounting surface, smooth, flat and greased	0.5	
Allowable mounting torque		Not lubricated threads	1.5 + 0 - 10 % (13)	N · m (lbf · in)
		Lubricated threads	1.2 + 0 - 10 % (10)	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°	0.31	0.23	$T_J = T_J$ maximum	K/W
120°	0.38	0.40		
90°	0.49	0.54		
60°	0.72	0.75		
30°	1.20	1.21		

Note

- The table above shows the increment of thermal resistance R_{thJC} when devices operate at different conduction angles than DC

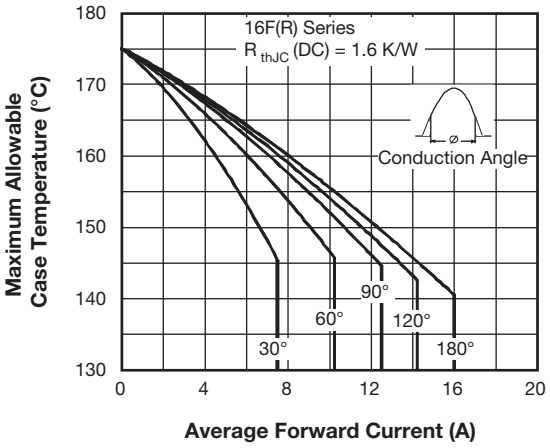


Fig. 1 - Current Ratings Characteristics

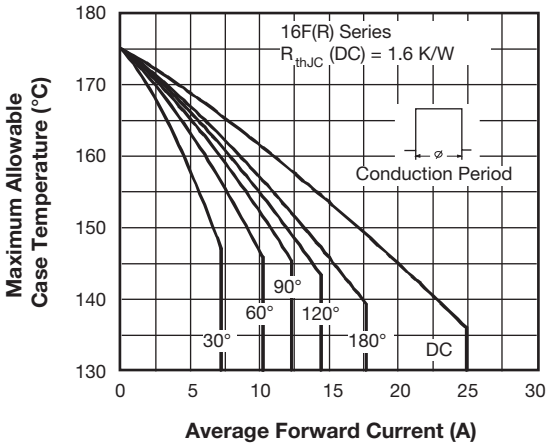


Fig. 2 - Current Ratings Characteristics

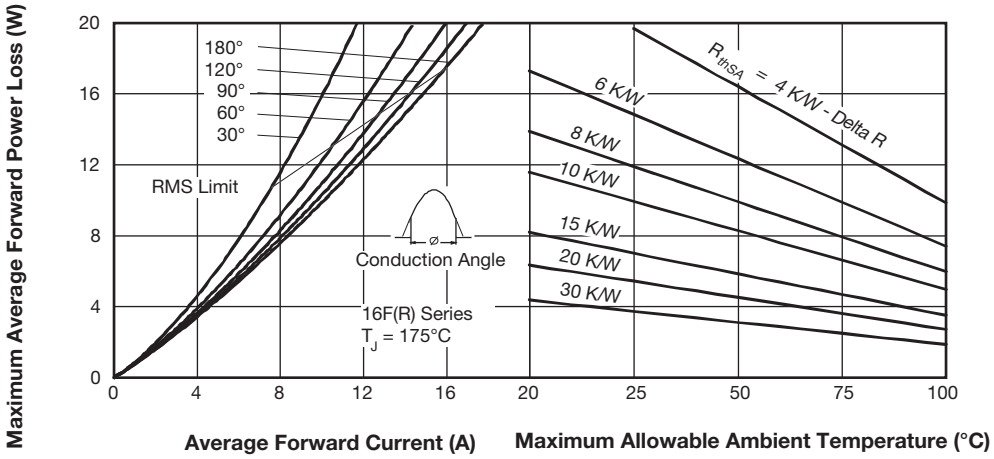


Fig. 3 - Forward Power Loss Characteristics

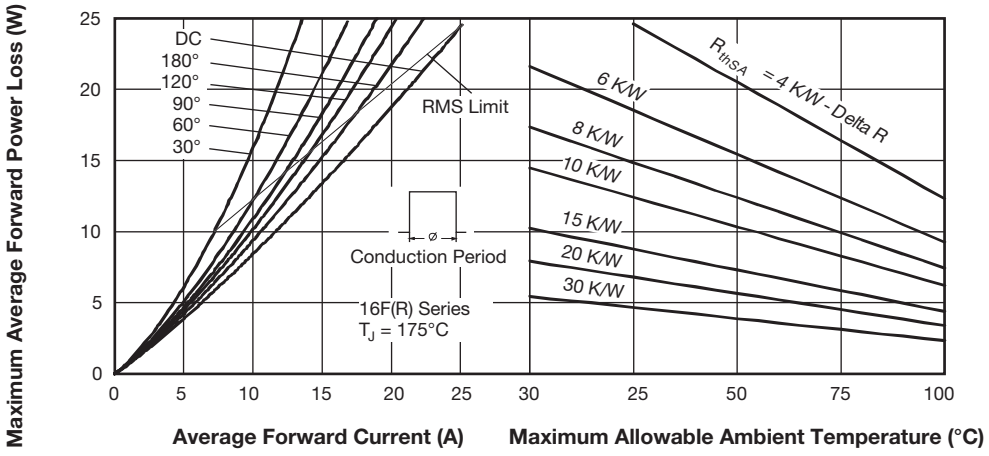


Fig. 4 - Forward Power Loss Characteristics

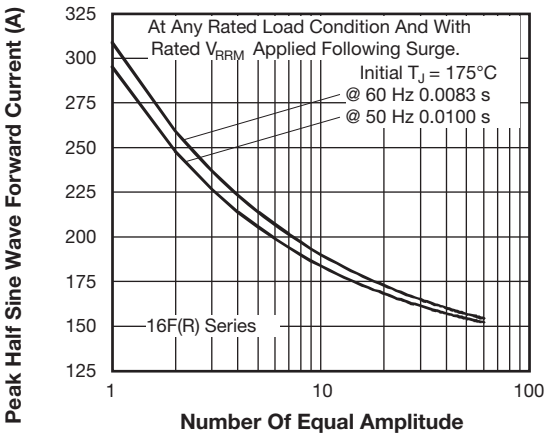


Fig. 5 - Maximum Non-Repetitive Surge Current

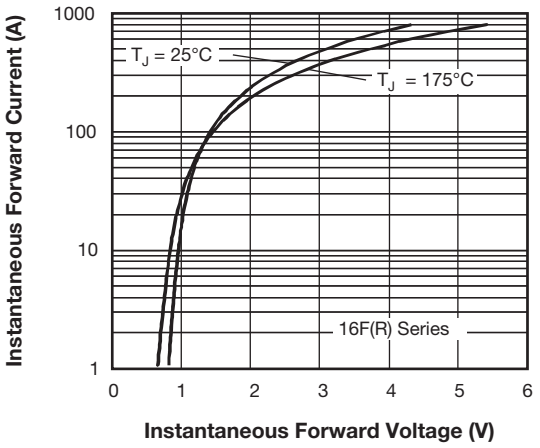


Fig. 7 - Forward Voltage Drop Characteristics

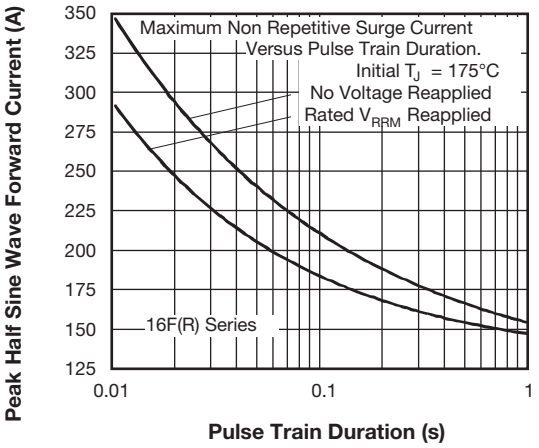


Fig. 6 - Maximum Non-Repetitive Surge Current

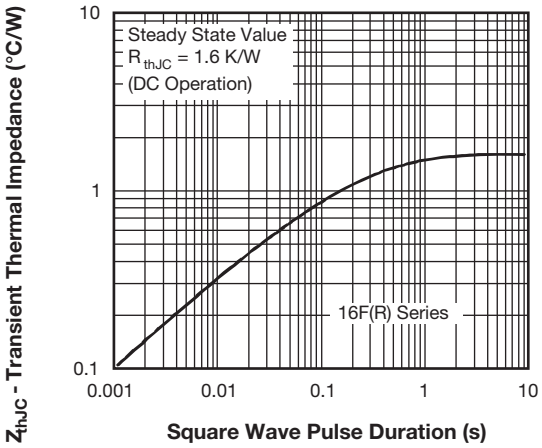


Fig. 8 - Thermal Impedance Z_{thJC} Characteristics

ORDERING INFORMATION TABLE

Device code

VS-	16	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)

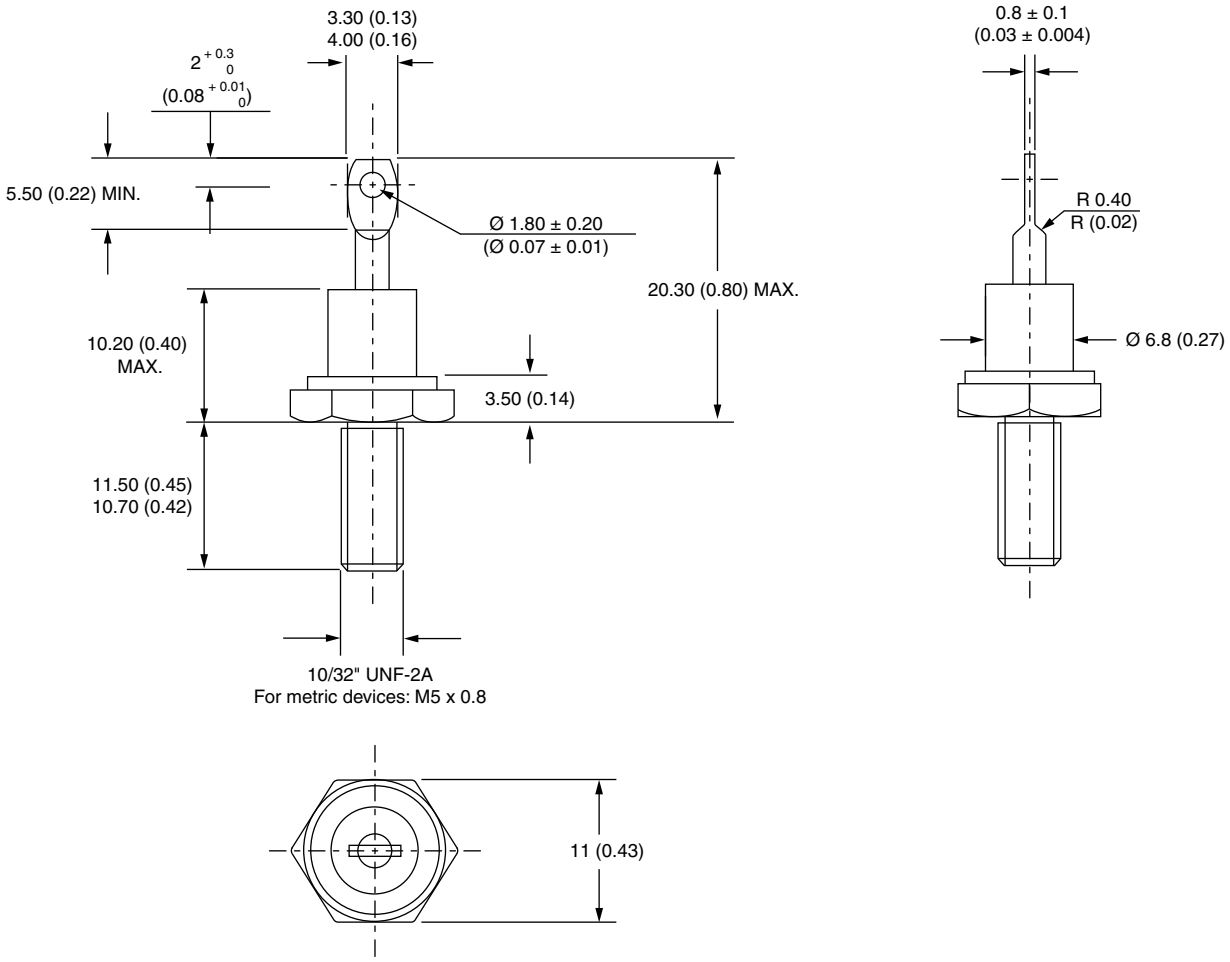
5 - Voltage code x 10 = V_{RRM} (see Voltage Ratings table)

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 diodes)

LINKS TO RELATED DOCUMENTS	
Dimensions	www.vishay.com/doc?95311

DO-203AA (DO-4)

DIMENSIONS in millimeters (inches)



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