

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}
- RoHS compliant
- Designed and qualified for industrial and consumer level



TYPICAL APPLICATIONS

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

PRODUCT SUMMARY

$I_{F(AV)}$	16 A
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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 ² s
	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
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		A ² s
		t = 8.3 ms			310		
Maximum I ² t for fusing	I ² t	t = 10 ms	No voltage reapplied		612		
		t = 8.3 ms			560		
		t = 10 ms	100 % V _{RRM} reapplied		435		
		t = 8.3 ms			395		
Maximum I ² √t for fusing	I ² √t	t = 0.1 to 10 ms, no voltage reapplied			6120	A ² √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	$T_J = T_{J \text{ maximum}}$	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

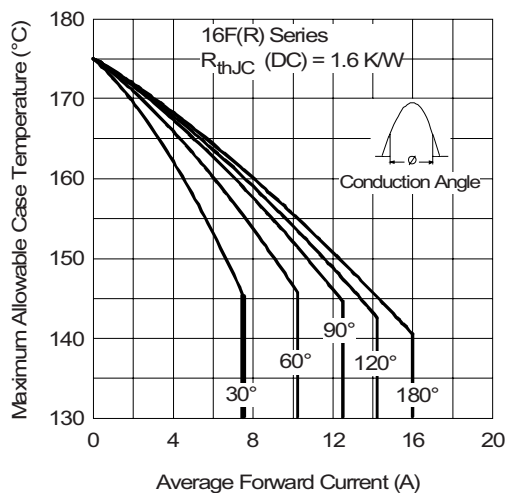


Fig. 1 - Current Ratings Characteristics

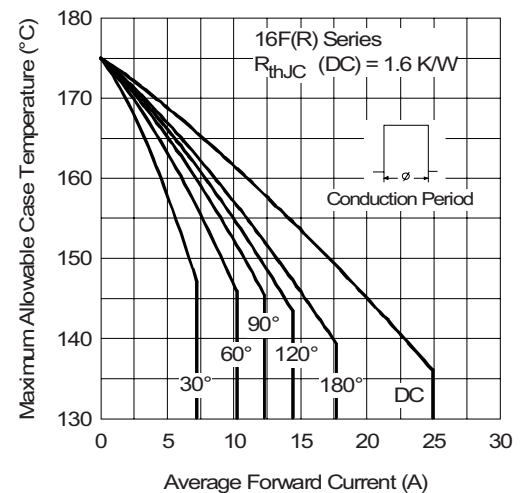


Fig. 2 - Current Ratings Characteristics

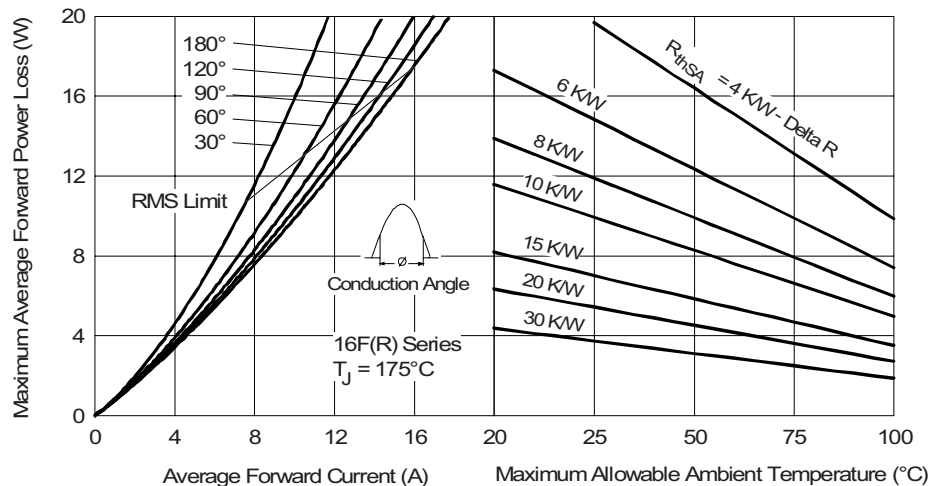


Fig. 3 - Forward Power Loss Characteristics

16F(R) Series

Vishay High Power Products Standard Recovery Diodes
(Stud Version), 16 A

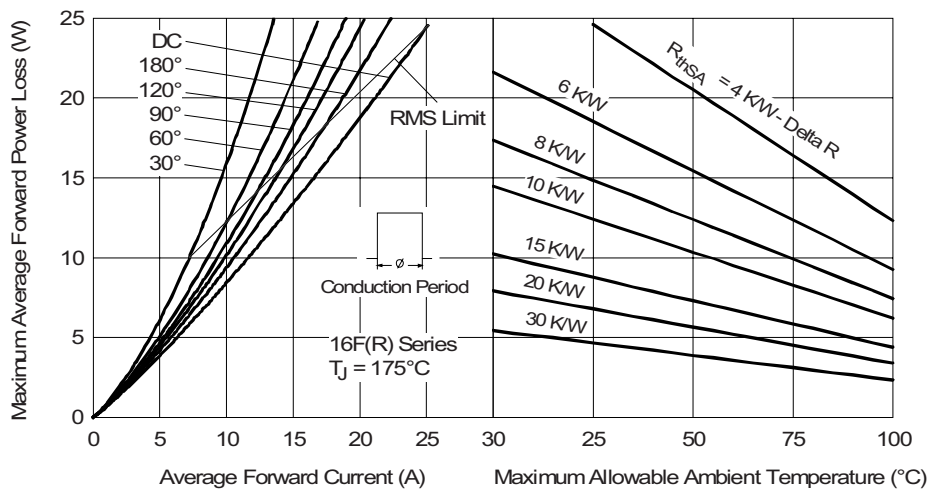


Fig. 4 - Forward Power Loss Characteristics

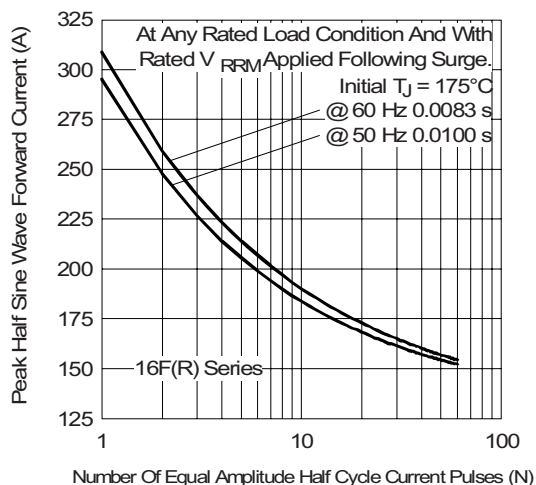


Fig. 5 - Maximum Non-Repetitive Surge Current

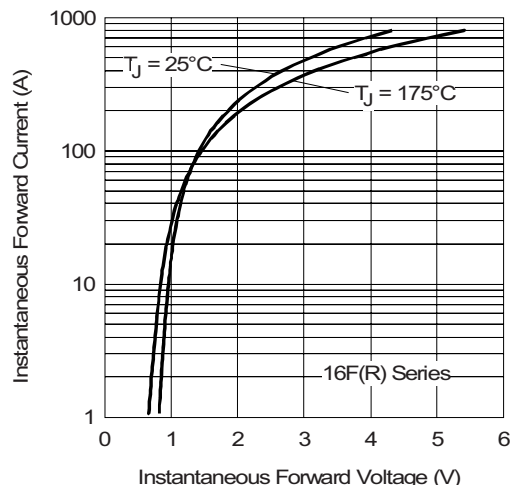


Fig. 7 - Forward Voltage Drop Characteristics

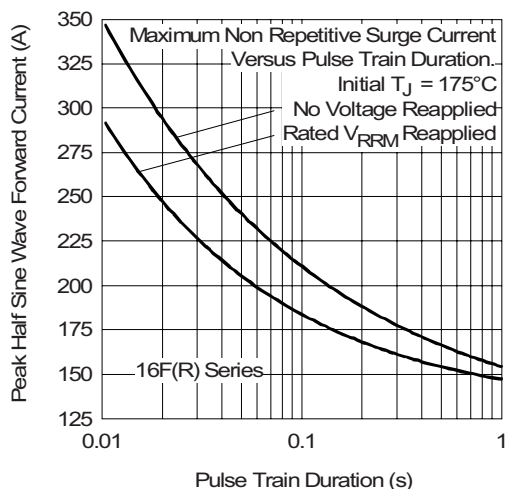


Fig. 6 - Maximum Non-Repetitive Surge Current

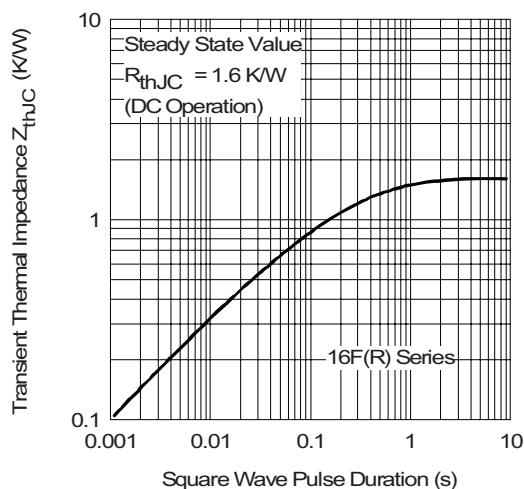


Fig. 8 - Thermal Impedance Z_{thJC} Characteristics



ORDERING INFORMATION TABLE

Device code	16	F	R	120	M
	1	2	3	4	5
	1 2 3 4 5				
	1 - Current rating: Code = $I_{F(AV)}$				
	2 - F = Standard device				
	3 - None = Stud normal polarity (cathode to stud) R = Stud reverse polarity (anode to stud)				
	4 - Voltage code x 10 = V_{RRM} (see Voltage Ratings table)				
	5 - 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	http://www.vishay.com/doc?95311



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