Standard Recovery Diodes, (Stud Version), 380 A

DO-9 (DO-205AB)

FEATURES

- Wide current range
- High voltage ratings up to 3200 V
- High surge current capabilities
- Stud cathode and stud anode version
- Standard JEDEC® types
- Compression bonded encapsulations
- Designed and qualified for industrial level
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

Pb-free

RoHS COMPLIANT

TYPICAL APPLICATIONS

- Converters
- Power supplies
- Machine tool controls
- High power drives
- Medium traction applications

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	380 A
Package	DO-9 (DO-205AB)
Circuit configuration	Single

MAJOR RATINGS AND CHARACTERISTICS				
PARAMETER	TEST CONDITIONS	VS-SD300N/R		UNITS
		16 to 20	25 to 32	
$I_{F(AV)}$		380	380	A
	T_C	100	70	°C
$I_{F(RMS)}$		595	425	A
I_{FSM}	50 Hz	6050	6050	
	60 Hz	6335	6335	
I^2t	50 Hz	183	183	kA^2s
	60 Hz	167	167	
V_{RRM}	Range	1600 to 2000	2500 to 3200	V
T_J		-40 to +180	-40 to +150	°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 $T_J = T_J$ MAXIMUM mA
VS-SD300N/R	16	1600	1700	15
	20	2000	2100	
	25	2500	2600	
	28	2800	2900	
	32	3200	3300	

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FORWARD CONDUCTION

PARAMETER	SYMBOL	TEST CONDITIONS			SD300N/R 16 to 20	SD300N/R 25 to 32	UNITS
Maximum average forward current at case temperature	$I_{F(AV)}$	180° conduction, half sine wave			380	270	A
					100	100	°C
					300	380	A
					125	70	°C
Maximum RMS forward current	$I_{F(RMS)}$	DC at T_C = 88 °C (02 to 24), T_C = 91 °C (25 to 32)			595	425	A
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	6050		A
		t = 8.3 ms			6335		
		t = 10 ms	100 % V_{RRM} reapplied		5090		
		t = 8.3 ms			5330		
Maximum I^2t for fusing	I^2t	t = 10 ms	No voltage reapplied		183		kA^2s
		t = 8.3 ms			167		
		t = 10 ms	100 % V_{RRM} reapplied		129		
		t = 8.3 ms			118		
Maximum $I^2\sqrt{t}$ for fusing	$I^2\sqrt{t}$	t = 0.1 to 10 ms, no voltage reapplied			1830		$kA^2\sqrt{s}$
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			0.95		V
High level value of threshold voltage	$V_{F(TO)2}$	(I > π x $I_{F(AV)}$), $T_J = T_J$ maximum			1.05		
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			0.75		mΩ
High level value of forward slope resistance	r_{f2}	(I > π x $I_{F(AV)}$), $T_J = T_J$ maximum			0.66		
Maximum forward voltage drop	V_{FM}	I_{pk} = 1180 A, $T_J = T_J$ maximum, t_p = 10 ms sinusoidal wave			1.83	1.83	V

THERMAL AND MECHANICAL SPECIFICATIONS

PARAMETER	SYMBOL	TEST CONDITIONS	SD300N/R 16 to 20	SD300N/R 25 to 32	UNITS
Maximum junction operating temperature range	T_J		-40 to 180	-40 to 150	°C
Maximum storage temperature range	T_{Stg}		-55 to 200		
Maximum thermal resistance, junction to case	R_{thJC}	DC operation	0.11		K/W
Maximum thermal resistance, case to heatsink	R_{thCS}	Mounting surface, smooth, flat, and greased	0.04		
Maximum allowed mounting torque ± 10 %		Not-lubricated threads	27		Nm
Approximate weight			250		g
Case style		See dimensions (link at the end of datasheet)	DO-9 (DO-205AB)		

ΔR_{thJC} CONDUCTION

CONDUCTION ANGLE	SINUSOIDAL CONDUCTION	RECTANGULAR CONDUCTION	TEST CONDITIONS	UNITS
180°	0.019	0.013	$T_J = T_J$ maximum	K/W
120°	0.023	0.023		
90°	0.028	0.030		
60°	0.042	0.044		
30°	0.073	0.074		

Note

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

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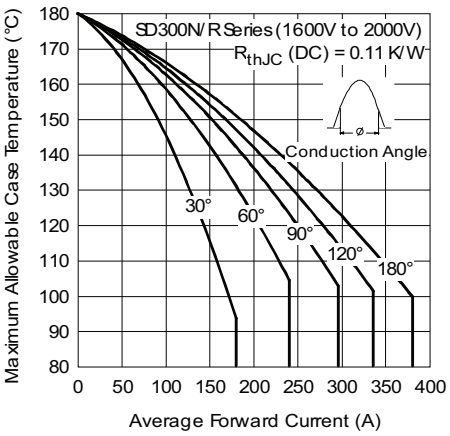

Fig. 1 - Current Ratings Characteristics

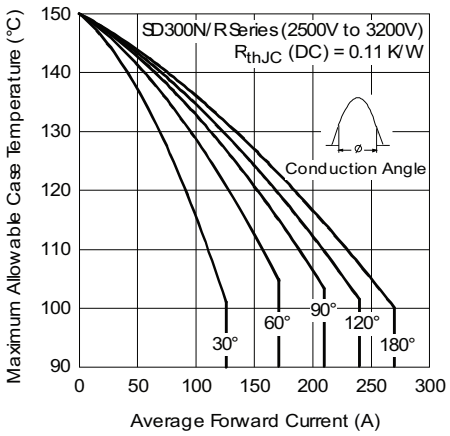

Fig. 3 - Current Ratings Characteristics

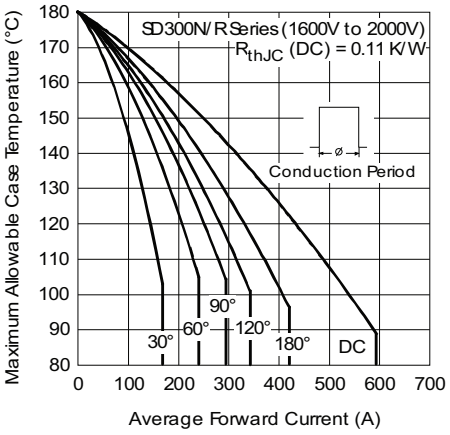

Fig. 2 - Current Ratings Characteristics

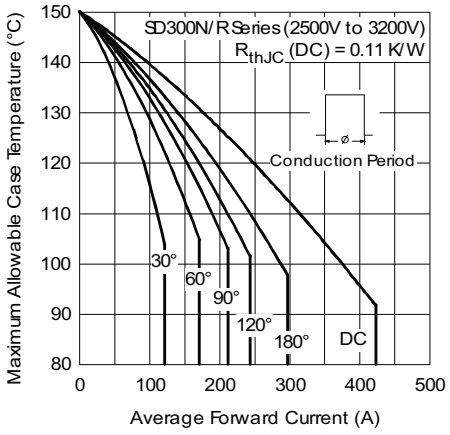

Fig. 4 - Current Ratings Characteristics

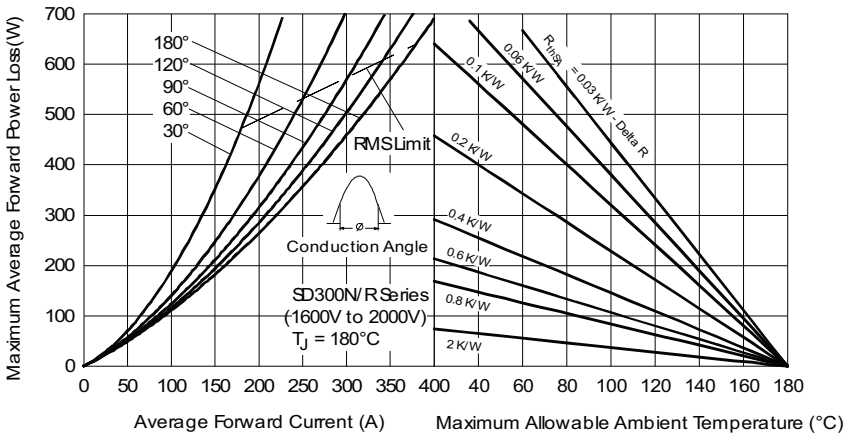

Fig. 5 - Forward Power Loss Characteristics

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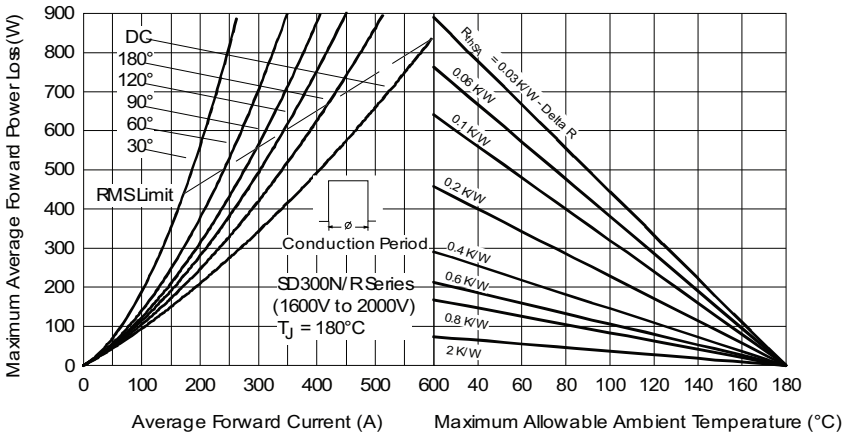

Fig. 6 - Forward Power Loss Characteristics

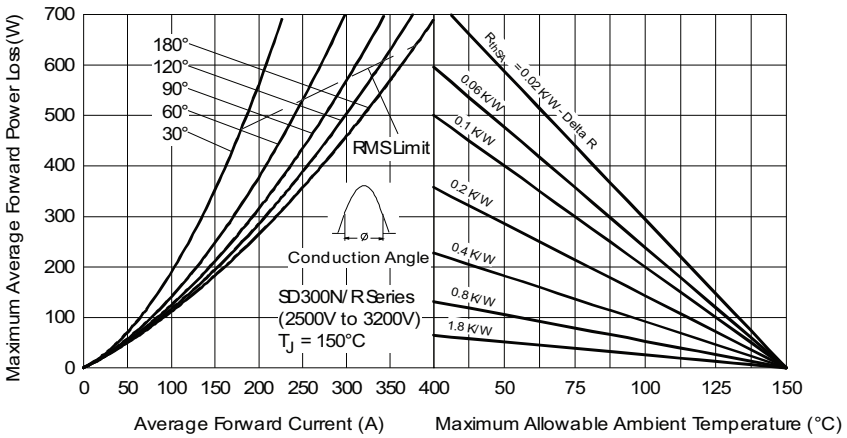

Fig. 7 - Forward Power Loss Characteristics

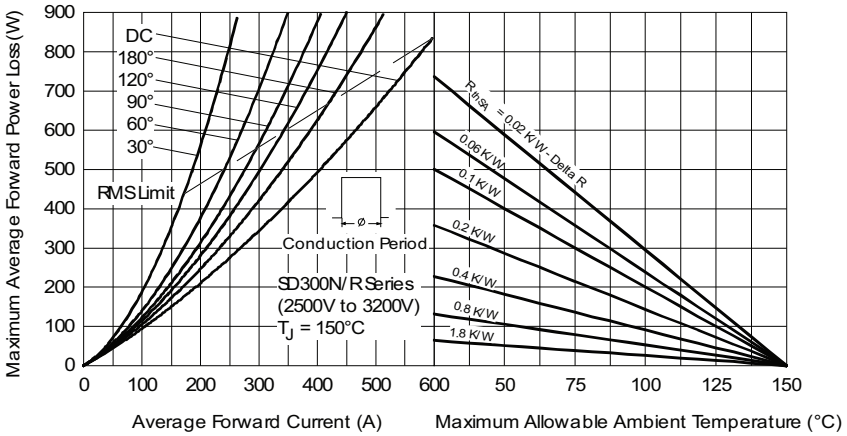

Fig. 8 - Forward Power Loss Characteristics

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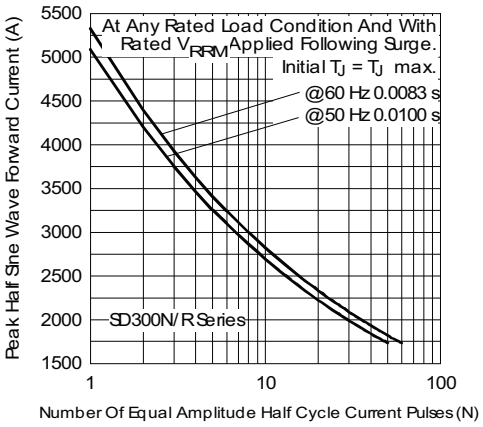

Fig. 9 - Maximum Non-Repetitive Surge Current

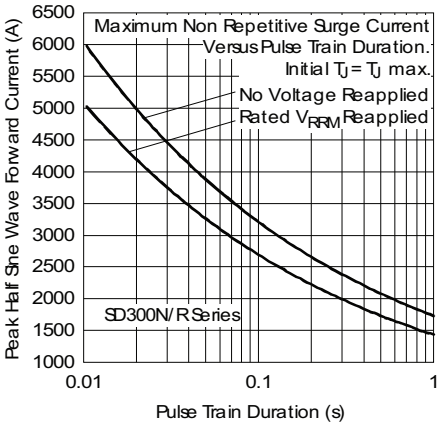

Fig. 10 - Maximum Non-Repetitive Surge Current

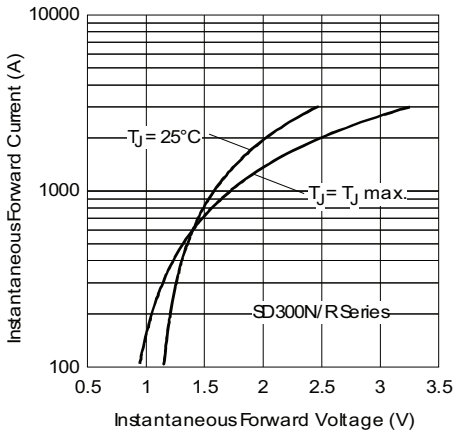

Fig. 11 - Forward Voltage Drop Characteristics

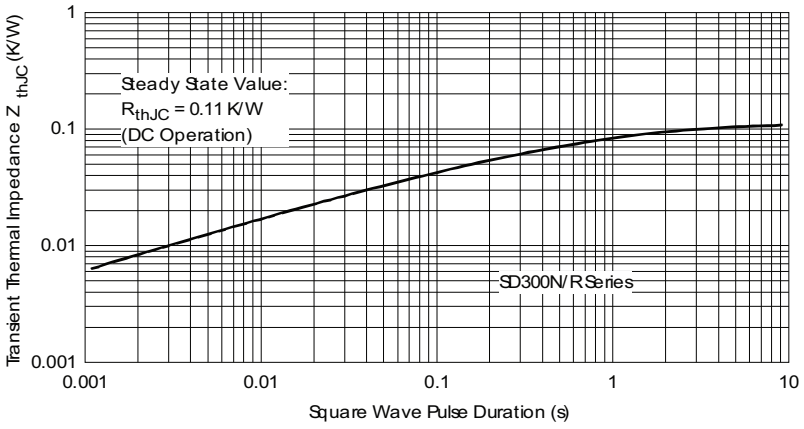

Fig. 12 - Thermal Impedance Z_{thJC} Characteristics

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ORDERING INFORMATION TABLE

Device code

VS-	SD	30	0	N	32	P	C
1	2	3	4	5	6	7	8

1 - Vishay semiconductors product

2 - Diode

3 - Essential part number

4 - 0 = standard recovery

5 - • N = stud normal polarity (cathode to stud)
• R = stud reverse polarity (anode to stud)

6 - Voltage code x 100 = V_{RRM} (see Voltage Ratings table)

7 - P = stud base DO-9 (DO-205AB) 3/4" 16UNF-2A

8 - C = ceramic housing

LINKS TO RELATED DOCUMENTS	
Dimensions	www.vishay.com/doc?95301

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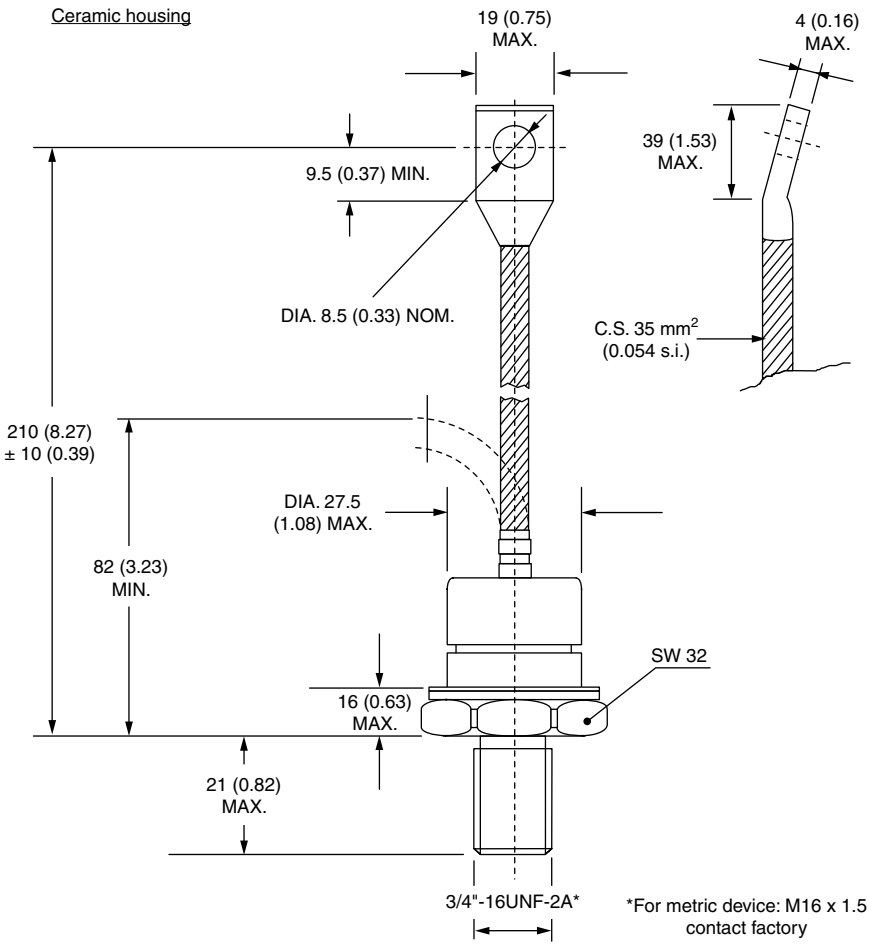
DO-205AB (DO-9)

DIMENSIONS in millimeters (inches)



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