

## 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](http://www.vishay.com/doc?99912)


**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 <sup>2</sup> s
	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	



FORWARD CONDUCTION							
PARAMETER	SYMBOL	TEST CONDITIONS		SD300N/R		UNITS	
				16 to 20	25 to 32		
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 $T_C = 88\text{ °C}$ (02 to 24), $T_C = 91\text{ °C}$ (25 to 32)		595	425		
Maximum peak, one-cycle forward, non-repetitive surge current	$I_{FSM}$	Sinusoidal half wave, initial $T_J = T_J$ maximum	t = 10 ms	No voltage reapplied	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 <sup>2</sup> s
			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 <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)		0.95		V	
High level value of threshold voltage	$V_{F(TO)2}$	$(I > \pi \times I_{F(AV)})$ , $T_J = T_J$ maximum		1.05			
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)		0.75		mΩ	
High level value of forward slope resistance	$r_{f2}$	$(I > \pi \times I_{F(AV)})$ , $T_J = T_J$ maximum		0.66			
Maximum forward voltage drop	$V_{FM}$	$I_{pk} = 1180\text{ A}$ , $T_J = T_J$ maximum, $t_p = 10\text{ ms}$ sinusoidal wave		1.83	1.83	V	

THERMAL AND MECHANICAL SPECIFICATIONS						
PARAMETER	SYMBOL	TEST CONDITIONS		SD300N/R		UNITS
				16 to 20	25 to 32	
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)		

$\Delta R_{thJC}$ 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

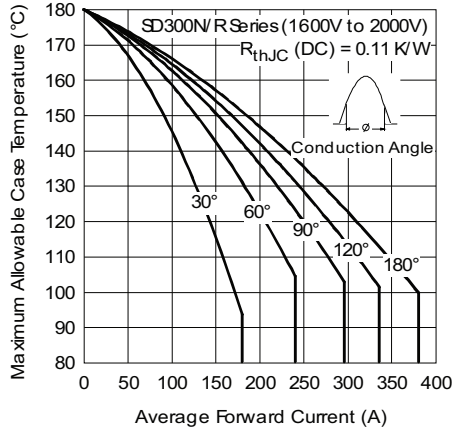


Fig. 1 - Current Ratings Characteristics

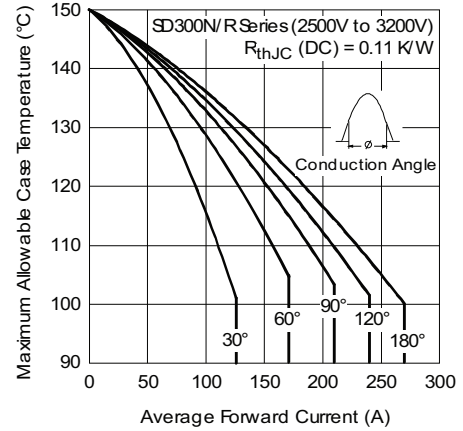


Fig. 3 - Current Ratings Characteristics

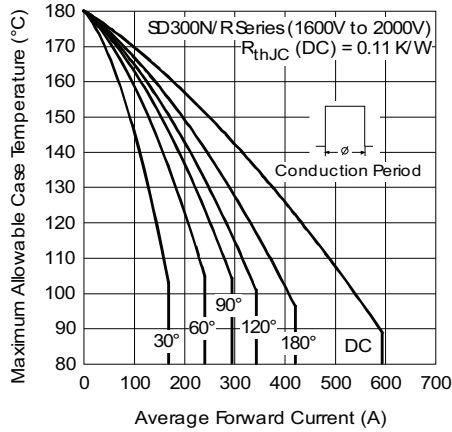


Fig. 2 - Current Ratings Characteristics

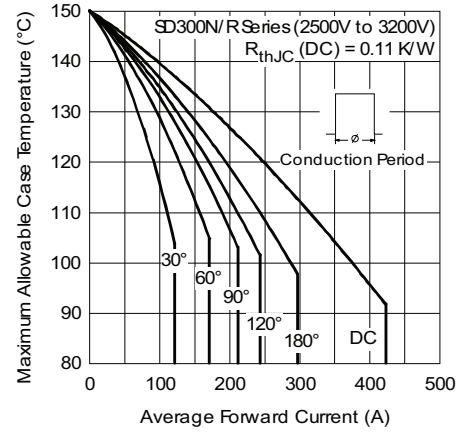


Fig. 4 - Current Ratings Characteristics

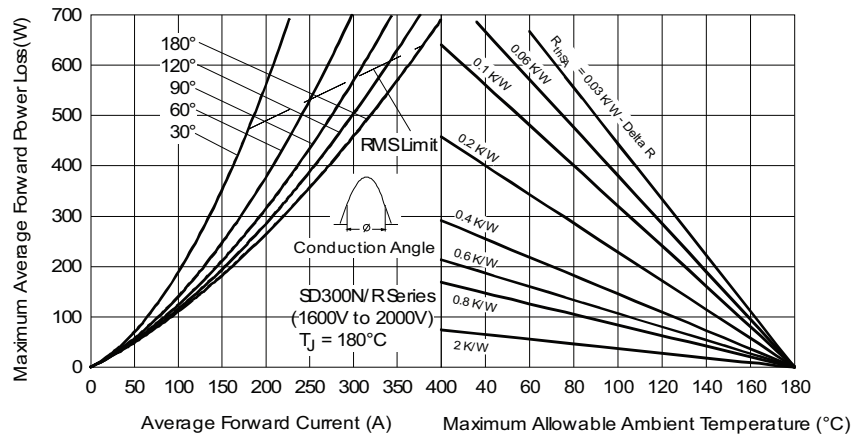


Fig. 5 - Forward Power Loss Characteristics

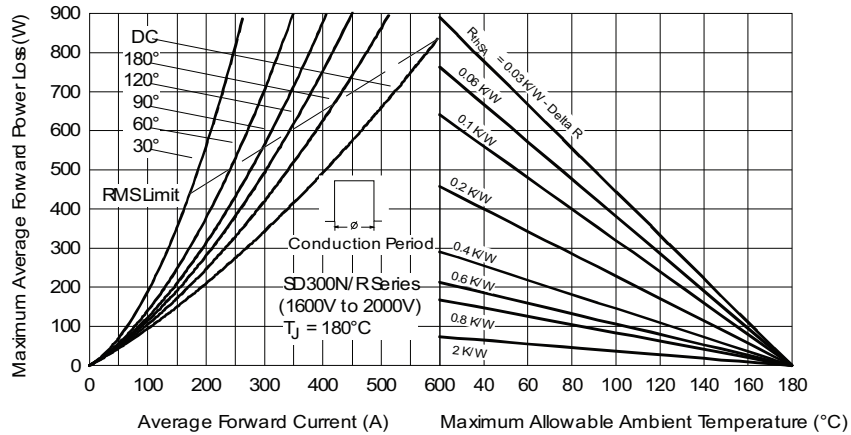


Fig. 6 - Forward Power Loss Characteristics

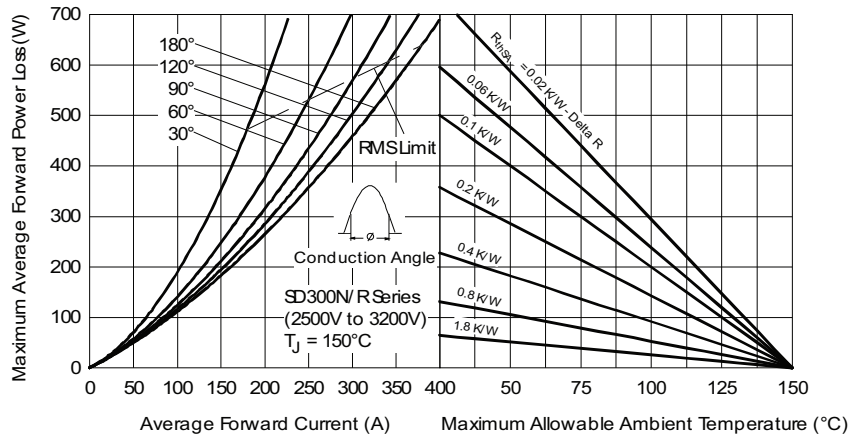


Fig. 7 - Forward Power Loss Characteristics

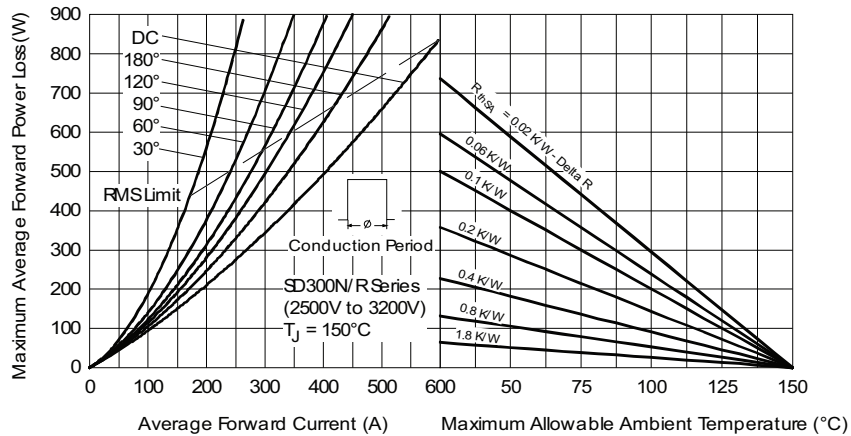


Fig. 8 - Forward Power Loss Characteristics

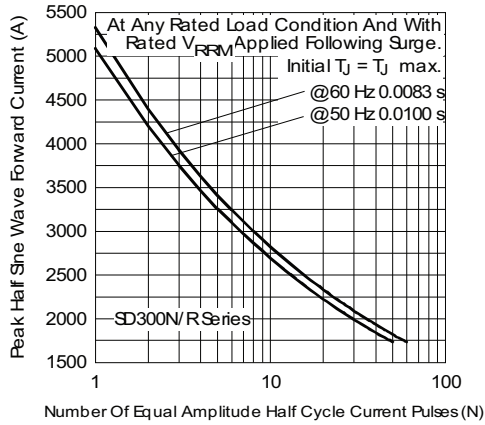


Fig. 9 - Maximum Non-Repetitive Surge Current

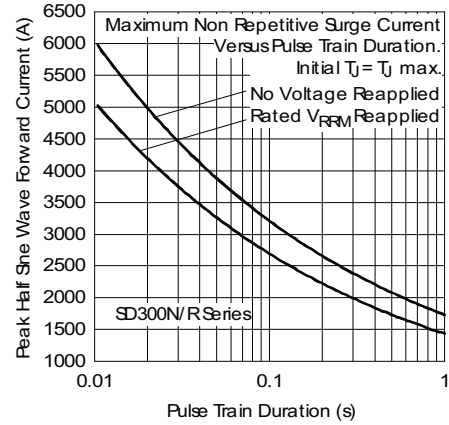


Fig. 10 - Maximum Non-Repetitive Surge Current

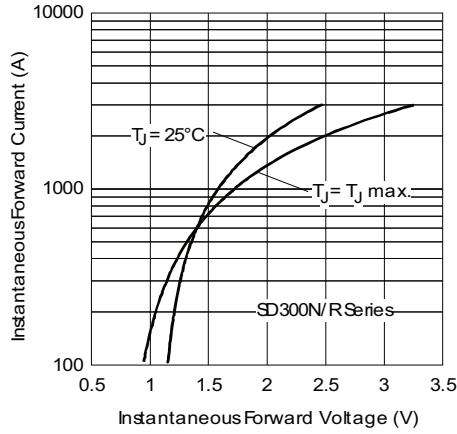


Fig. 11 - Forward Voltage Drop Characteristics

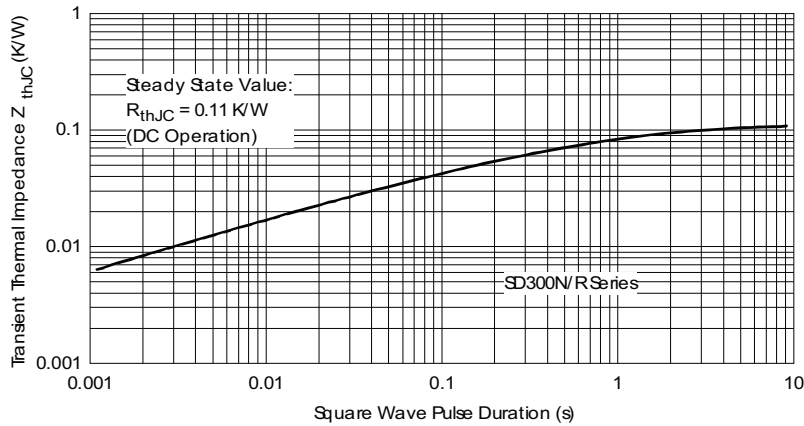
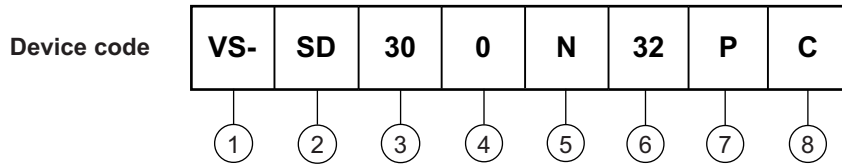


Fig. 12 - Thermal Impedance  $Z_{thJC}$  Characteristics



## ORDERING INFORMATION TABLE

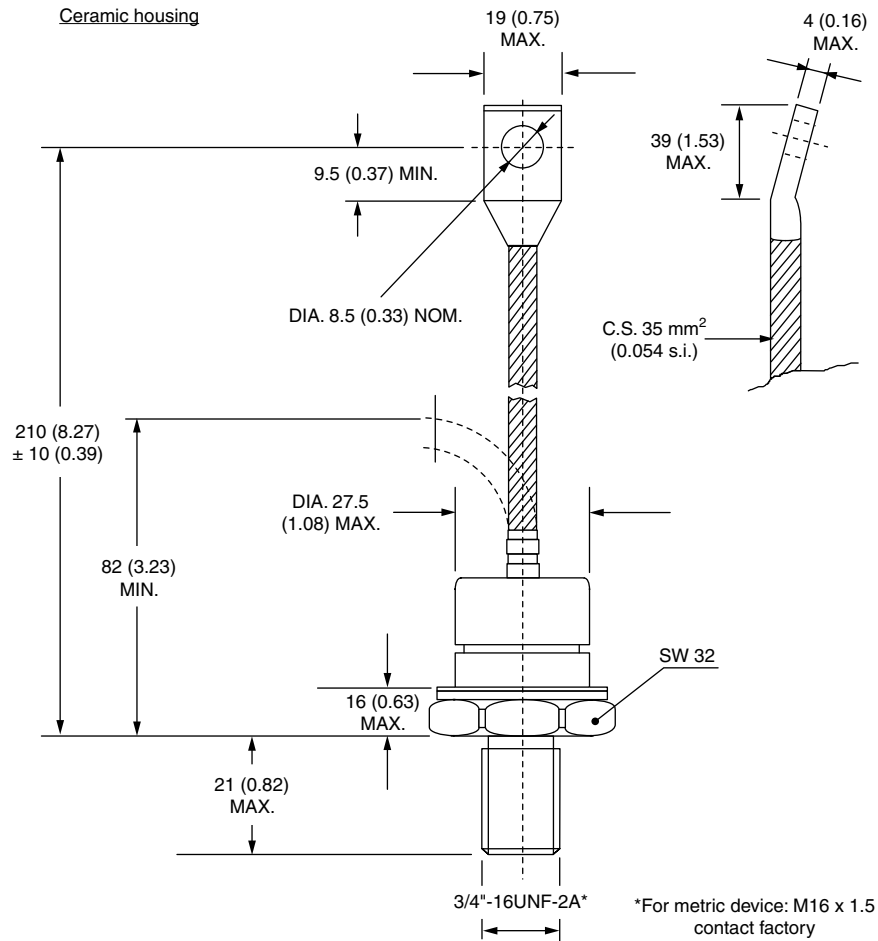


- 1** - Vishay semiconductors product
- 2** - Diode
- 3** - Essential part number
- 4** - 0 = standard recovery
- 5** -
  - N = stud normal polarity (cathode to stud)
  - R = stud reverse polarity (anode to stud)
- 6** - Voltage code x 100 =  $V_{RRM}$  (see Voltage Ratings table)
- 7** - P = stud base DO-9 (DO-205AB) 3/4" 16UNF-2A
- 8** - C = ceramic housing

LINKS TO RELATED DOCUMENTS	
Dimensions	<a href="http://www.vishay.com/doc?95301">www.vishay.com/doc?95301</a>

## DO-205AB (DO-9)

**DIMENSIONS** in millimeters (inches)





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