

Standard Recovery Diodes, (Stud Version), 400 A



DO-9 (DO-205AB)

FEATURES

- Wide current range
- High voltage ratings up to 2400 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


RoHS
COMPLIANT

TYPICAL APPLICATIONS

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

PRIMARY CHARACTERISTICS

$I_{F(AV)}$	400 A
Package	DO-9 (DO-205AB)
Circuit configuration	Single

MAJOR RATINGS AND CHARACTERISTICS

PARAMETER	TEST CONDITIONS	VALUES	UNITS
$I_{F(AV)}$		480	A
	T_C	120	°C
$I_{F(RMS)}$		630	A
I_{FSM}	50 Hz	8250	
	60 Hz	8640	
I^2t	50 Hz	340	kA ² s
	60 Hz	311	
V_{RRM}	Range	1600 to 2400	V
T_J		-40 to +190	°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-SD400N/R	16	1600	1700	15
	20	2000	2100	
	24	2400	2500	



FORWARD CONDUCTION						
PARAMETER	SYMBOL	TEST CONDITIONS			VALUES	UNITS
Maximum average forward current at case temperature	I _{F(AV)}	180° conduction, half sine wave			400	A
					120	°C
					480	A
					100	°C
Maximum RMS forward current	I _{F(RMS)}	DC at 110 °C case temperature			630	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	8250	
		t = 8.3 ms			8640	
		t = 10 ms	100 % V _{RRM} reapplied		6940	
		t = 8.3 ms			7270	
Maximum I ² t for fusing	I ² t	t = 10 ms	No voltage reapplied		340	kA ² s
		t = 8.3 ms			311	
		t = 10 ms	100 % V _{RRM} reapplied		241	
		t = 8.3 ms			220	
Maximum I ² √t for fusing	I ² √t	t = 0.1 to 10 ms, no voltage reapplied			3400	kA 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			0.80	V
High level value of threshold voltage	V _{F(TO)2}	(I > π x I _{F(AV)}), T _J = T _J maximum			0.85	
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			0.55	mW
High level value of forward slope resistance	r _{f2}	(I > π x I _{F(AV)}), T _J = T _J maximum			0.51	
Maximum forward voltage drop	V _{FM}	I _{pk} = 1500 A, T _J = T _J maximum, t _p = 10 ms sinusoidal wave			1.62	V

THERMAL AND MECHANICAL SPECIFICATIONS				
PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum junction operating temperature range	T_J		-40 to +190	°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 $\pm 10\%$		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°	0.020	0.013	$T_J = T_J$ maximum	K/W
120°	0.023	0.023		
90°	0.029	0.031		
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

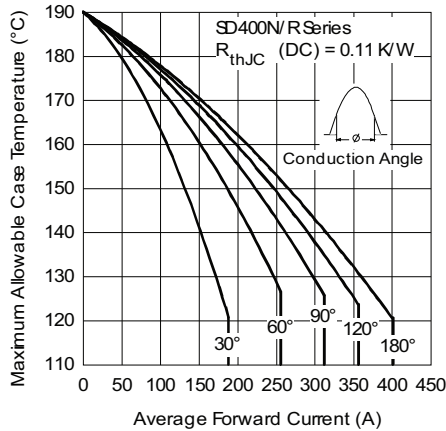


Fig. 1 - Current Ratings Characteristics

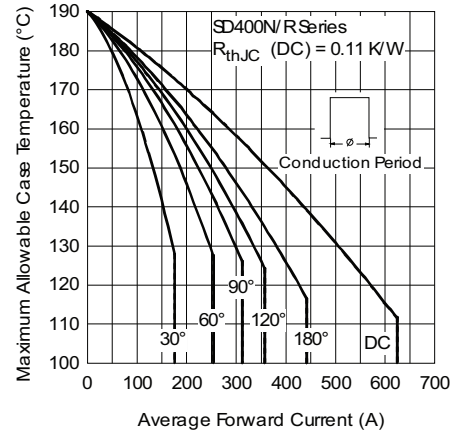


Fig. 2 - Current Ratings Characteristics

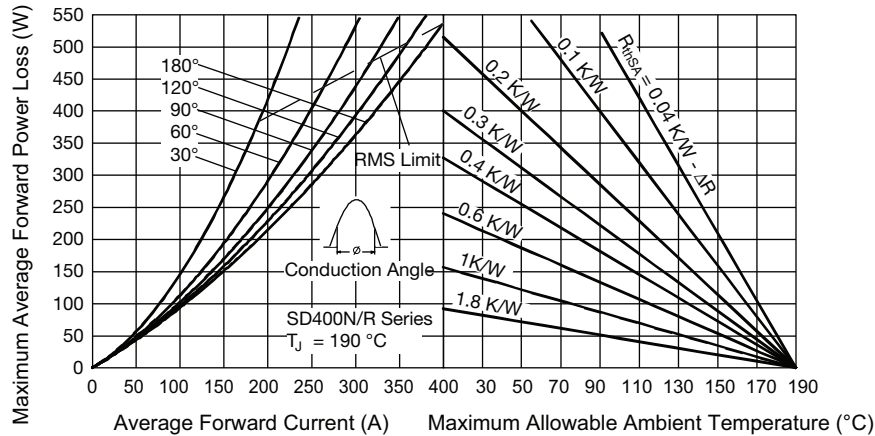


Fig. 3 - Forward Power Loss Characteristics

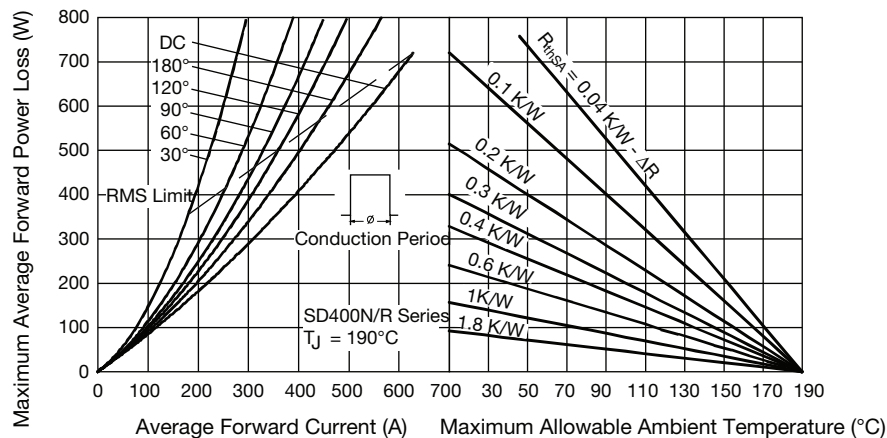


Fig. 4 - Forward Power Loss Characteristics

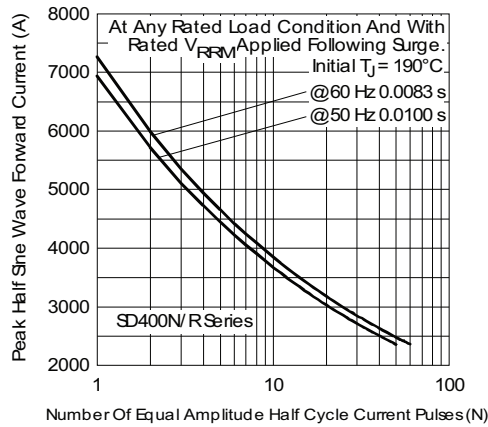


Fig. 5 - Maximum Non-Repetitive Surge Current

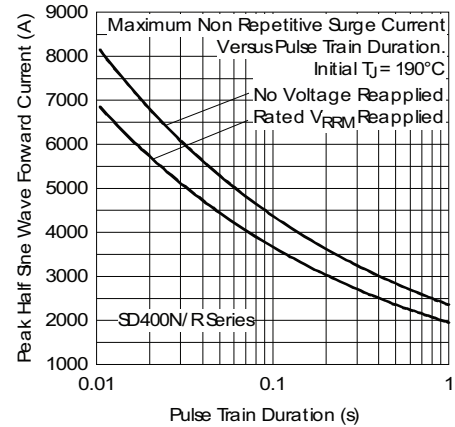


Fig. 6 - Maximum Non-Repetitive Surge Current

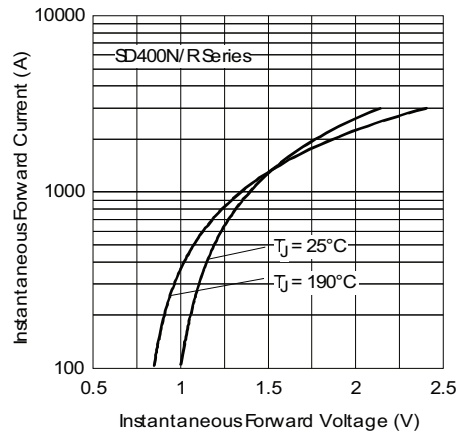
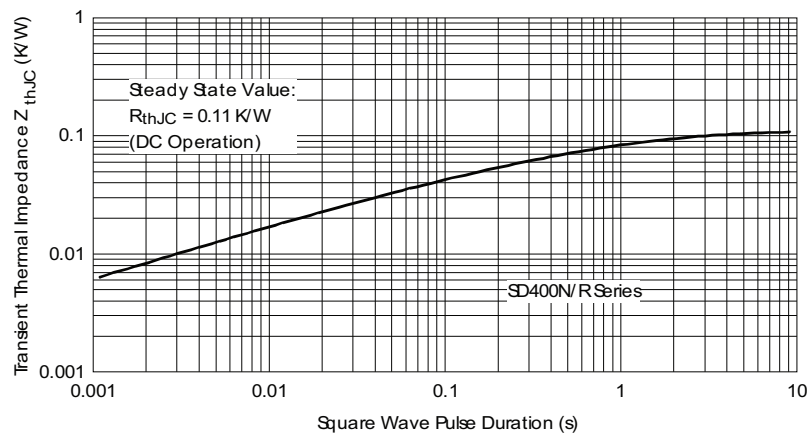


Fig. 7 - Forward Voltage Drop Characteristics


Fig. 8 - Thermal Impedance Z_{thJC} Characteristic



ORDERING INFORMATION TABLE

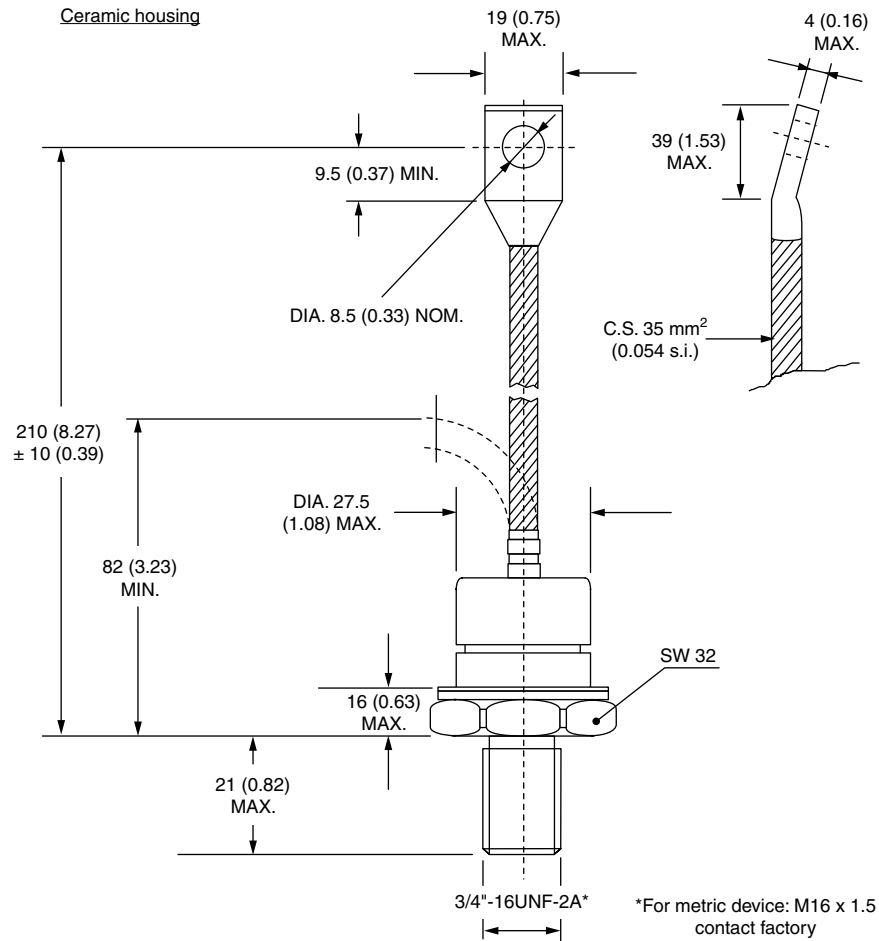
Device code	VS-	SD	40	0	N	24	P	C
	1	2	3	4	5	6	7	8

- 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

DO-205AB (DO-9)

DIMENSIONS in millimeters (inches)





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