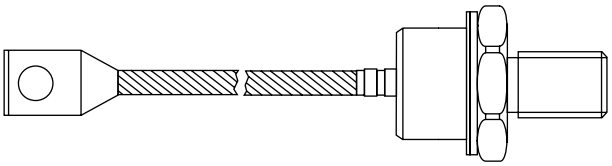
Standard Recovery Diodes (Stud Version), 400 A



DO-205AB (DO-9)

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
- Lead (Pb)-free
- Designed and qualified for industrial level

Pb-free
RoHS COMPLIANT

TYPICAL APPLICATIONS

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

PRODUCT SUMMARY	
$I_{F(AV)}$	400 A

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^2s
	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
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, No voltage reapplied	8640	
		t = 10 ms, 100 % V_{RRM} reapplied	6940	
		t = 8.3 ms, 100 % V_{RRM} reapplied	7270	
Maximum I^2t for fusing	I^2t	t = 10 ms, No voltage reapplied	340	kA^2s
		t = 8.3 ms, No voltage reapplied	311	
		t = 10 ms, 100 % V_{RRM} reapplied	241	
		t = 8.3 ms, 100 % V_{RRM} reapplied	220	
Maximum $I^2\sqrt{t}$ for fusing	$I^2\sqrt{t}$	t = 0.1 to 10 ms, no voltage reapplied	3400	$kA^2\sqrt{s}$
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	0.80	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	mΩ
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 ± 10 %		Not-lubricated threads	27	Nm
Approximate weight			250	g
Case style		See dimensions (link at the end of datasheet)	DO-205AB (DO-9)	

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

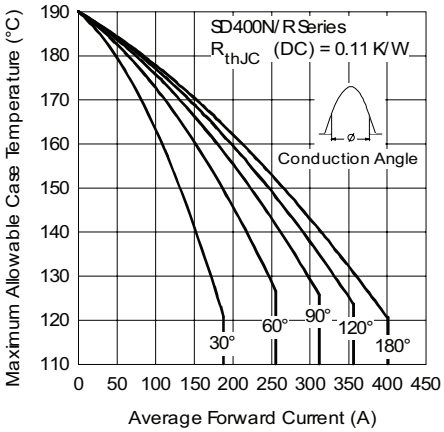


Fig. 1 - Current Ratings Characteristics

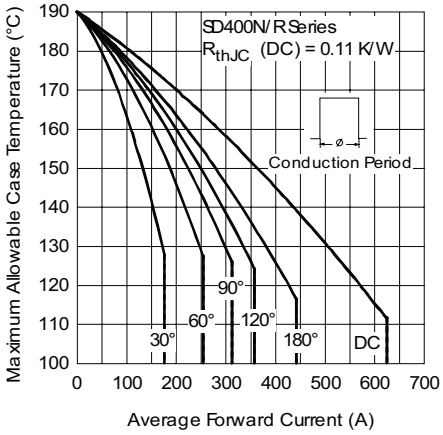


Fig. 2 - Current Ratings Characteristics

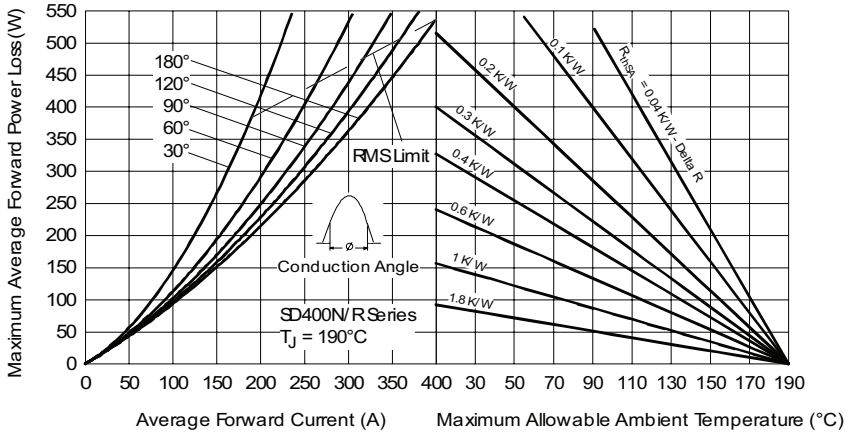


Fig. 3 - Forward Power Loss Characteristics

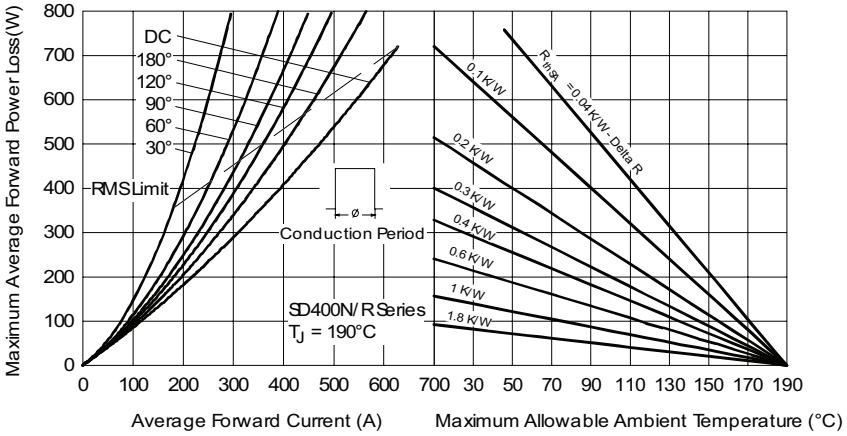


Fig. 4 - Forward Power Loss Characteristics

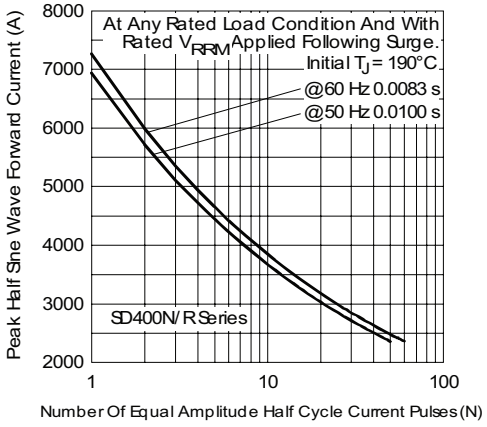


Fig. 5 - Maximum Non-Repetitive Surge Current

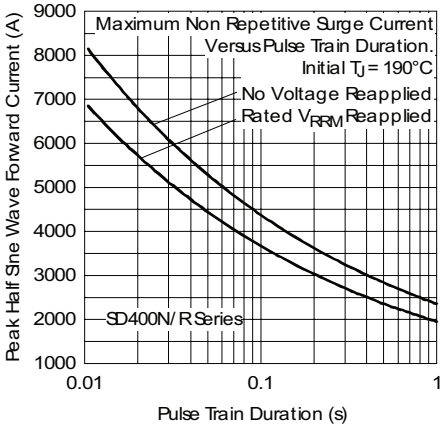


Fig. 6 - Maximum Non-Repetitive Surge Current

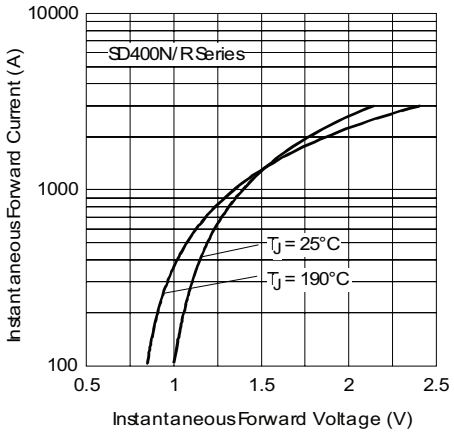


Fig. 7 - Forward Voltage Drop Characteristics

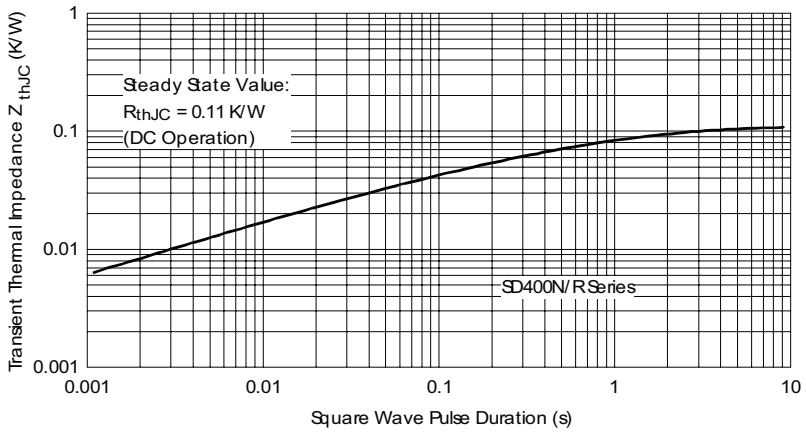


Fig. 8 - Thermal Impedance Z_{thJC} Characteristic

ORDERING INFORMATION TABLE

Device code

SD	40	0	N	24	P	C
1	2	3	4	5	6	7

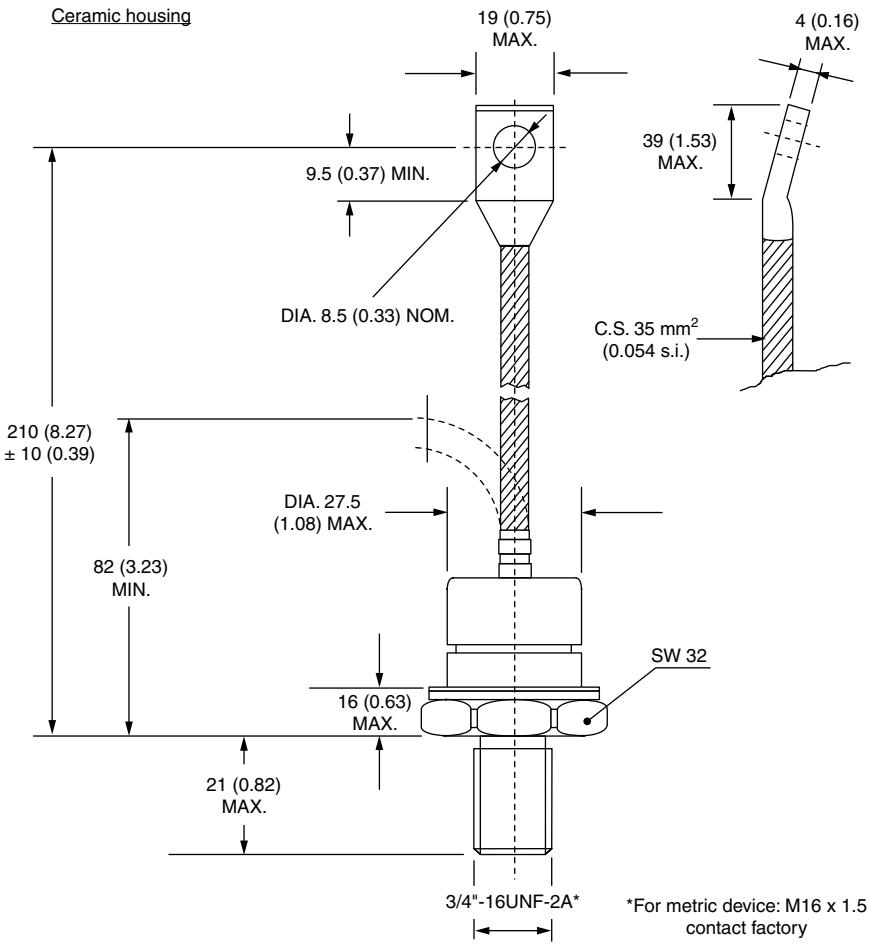
- **1** - Diode
- **2** - Essential part number
- **3** - 0 = Standard recovery
- **4** - • N = Stud normal polarity (cathode to stud)
  • R = Stud reverse polarity (anode to stud)
- **5** - Voltage code x 100 = V_{RRM} (see Voltage Ratings table)
- **6** - P = Stud base DO-205AB (DO-9) 3/4" 16UNF-2A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

For metric device M16 x 1.5 contact factory

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

DO-205AB (DO-9)

DIMENSIONS in millimeters (inches)



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