

SD400N/R SERIES

STANDARD RECOVERY DIODES

Stud Version

Features

- Wide current range
- High voltage ratings up to 2400V
- High surge current capabilities
- Stud cathode and stud anode version
- Standard JEDEC types

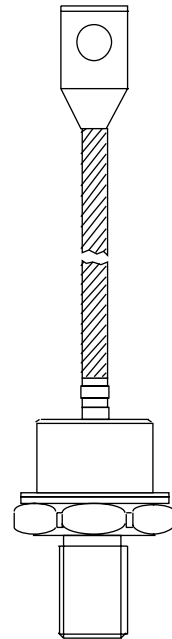
Typical Applications

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

Major Ratings and Characteristics

Parameters	SD400N/R	Units
$I_{F(AV)}$	400	A
@ T_C	120	°C
$I_{F(RMS)}$	630	A
I_{FSM} @ 50Hz	8250	A
@ 60Hz	8640	A
I^2t @ 50Hz	340	KA ² s
@ 60Hz	311	KA ² s
V_{RRM} range	400 to 2400	V
T_J	- 40 to 190	°C

400A



case style
DO-205AB (DO-9)

ELECTRICAL SPECIFICATIONS**Voltage Ratings**

Type number	Voltage Code	V_{RRM} , maximum repetitive peak reverse voltage V	V_{RSM} , maximum non-repetitive peak rev. voltage V	I_{RRM} max. @ $T_J = T_J$ max. mA
SD400N/R	04	400	500	15
	08	800	900	
	12	1200	1300	
	16	1600	1700	
	20	2000	2100	
	24	2400	2500	

Forward Conduction

Parameter		SD400N/R	Units	Conditions			
I _{F(AV)}	Max. average forward current @ Case temperature	400	A	180° conduction, half sine wave			
		120	°C				
I _{F(AV)}	Max. average forward current @ Case temperature	480	A	180° conduction, half sine wave			
		100	°C				
I _{F(RMS)}	Max. RMS forward current	630	A	DC @ 110°C case temperature			
I _{FSM}	Max. peak, one-cycle forward, non-repetitive surge current	8250	A	t = 10ms	No voltage	Sinusoidal half wave, Initial T _J = T _J max.	
		8640		t = 8.3ms	reapplied		
		6940		t = 10ms	100% V _{RRM}		
		7270		t = 8.3ms	reapplied		
I ² t	Maximum I ² t for fusing	340	KA ² s	t = 10ms	No voltage		
		311		t = 8.3ms	reapplied		
		241		t = 10ms	100% V _{RRM}		
		220		t = 8.3ms	reapplied		
I ² √t	Maximum I ² √t for fusing	3400	KA ² /s	t = 0.1 to 10ms, no voltage reapplied			
V _{F(TO)1}	Low level value of threshold voltage	0.80	V	(16.7% × π × I _{F(AV)}) < I < π × I _{F(AV)} , T _J = T _J max.			
V _{F(TO)2}	High level value of threshold voltage	0.85		(I > π × I _{F(AV)}), T _J = T _J max.			
r _{f1}	Low level value of forward slope resistance	0.55	mΩ	(16.7% × π × I _{F(AV)}) < I < π × I _{F(AV)} , T _J = T _J max.			
r _{f2}	High level value of forward slope resistance	0.51		(I > π × I _{F(AV)}), T _J = T _J max.			
V _{FM}	Max. forward voltage drop	1.62	V	I _{pk} = 1500A, T _J = T _J max, t _p = 10ms sinusoidal wave			

Thermal and Mechanical Specifications

Parameter	SD400N/R	Units	Conditions
T_J Max. junction operating temperature range	-40 to 190	°C	
T_{stg} Max. storage temperature range	-55 to 200		
R_{thJC} Max. thermal resistance, junction to case	0.11	K/W	DC operation
R_{thCS} Max. thermal resistance, case to heatsink	0.04		Mounting surface, smooth, flat and greased
T Max. allowed mounting torque $\pm 10\%$	27	Nm	Not lubricated threads
wt Approximate weight	250	g	
Case style	DO-205AB (DO-9)		See Outline Table

ΔR_{thJC} Conduction

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

Conduction angle	Sinusoidal conduction	Rectangular conduction	Units	Conditions
180°	0.020	0.013	K/W	$T_J = T_{J \text{ max.}}$
120°	0.023	0.023		
90°	0.029	0.031		
60°	0.042	0.044		
30°	0.073	0.074		

Ordering Information Table

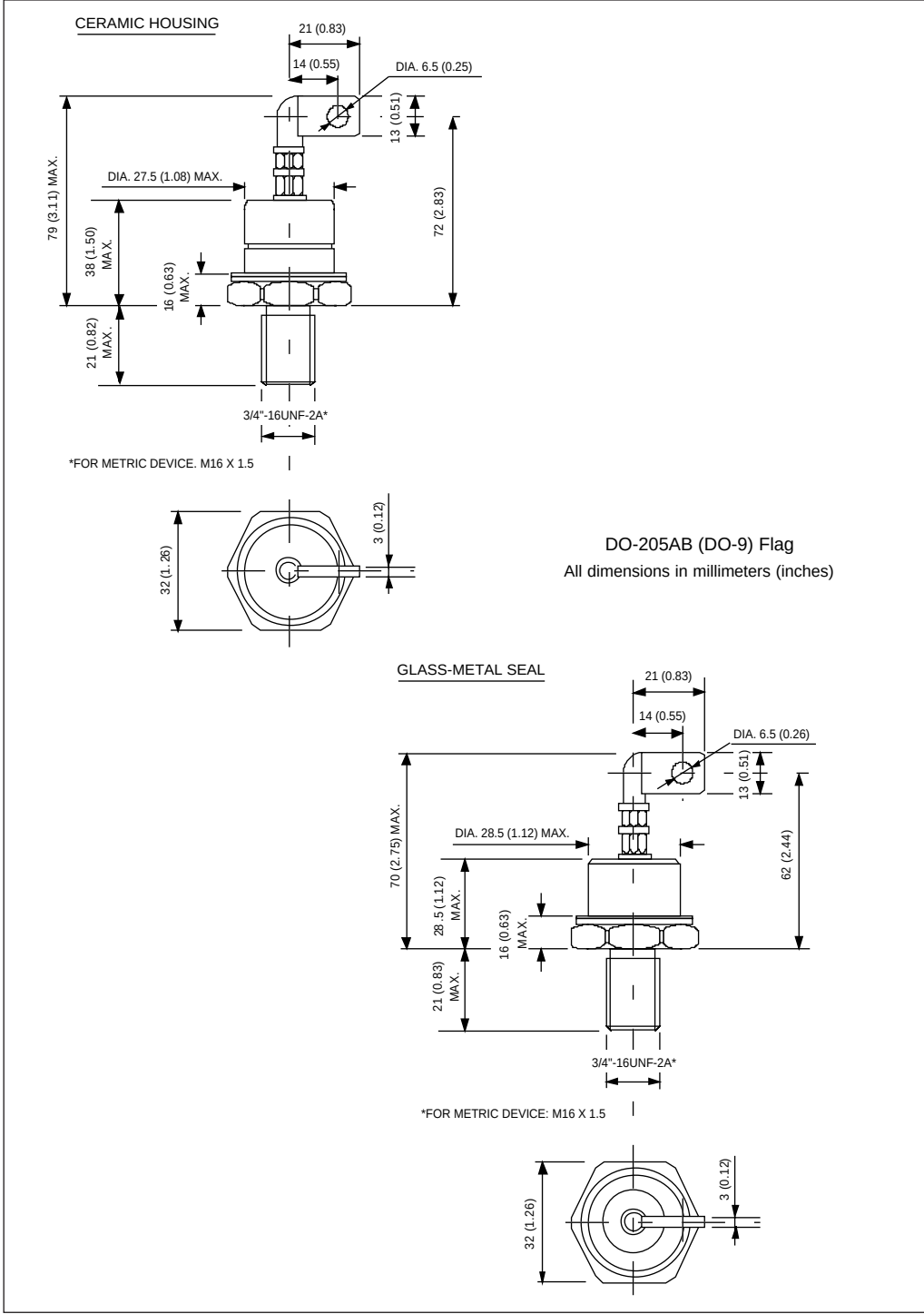
Device Code							
	SD	40	0	N	24	P	B C
	①	②	③	④	⑤	⑥	⑦ ⑧
1	- Diode						
2	- Essential part number						
3	- 0 = Standard recovery						
4	- N = Stud Normal Polarity (Cathode to Stud) R = Stud Reverse Polarity (Anode to Stud)						
5	- Voltage code: Code x 100 = V_{RRM} (See Voltage Ratings table)						
6	- P = Stud base DO-205AB (DO-9) 3/4" 16UNF-2A M = Stud base DO-205AB (DO-9) M16 X 1.5						
7	- B = Flag top terminal (for Cathode/ Anode Leads) S = Isolated lead with silicone sleeve (Red = Reverse Polarity; Blue = Normal Polarity) None = Non isolated lead						
8	- C = Ceramic Housing (over 1600V) V = Glass-metal seal (only up to 1600V)						

Bulletin I2082 rev. A 08/94

Outline Table



Outline Table



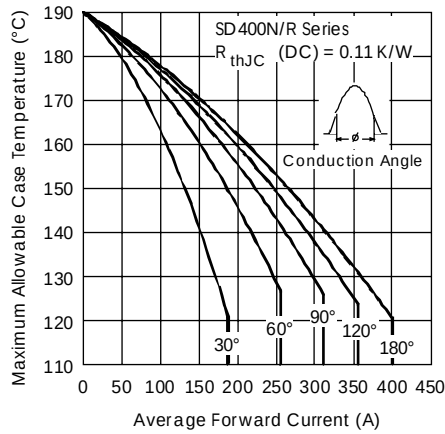


Fig. 1 - Current Ratings Characteristics

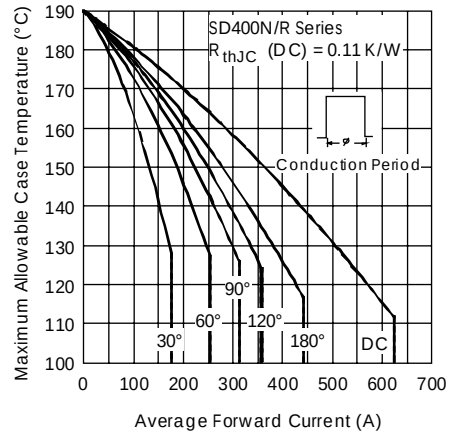


Fig. 2 - Current Ratings Characteristics

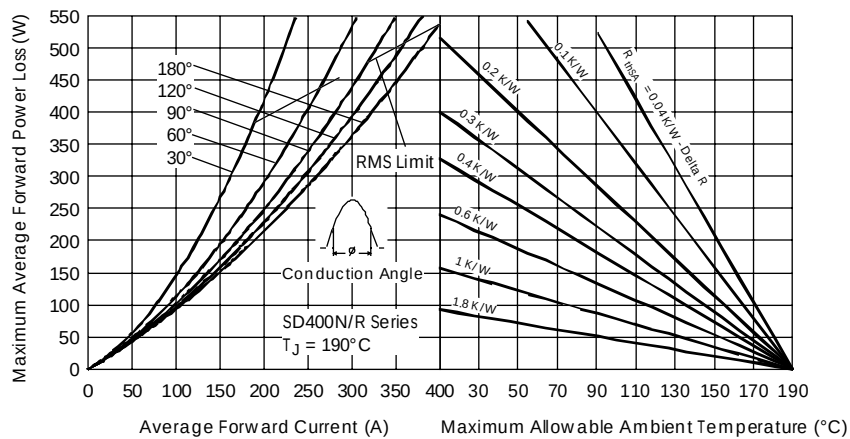


Fig. 3 - Forward Power Loss Characteristics

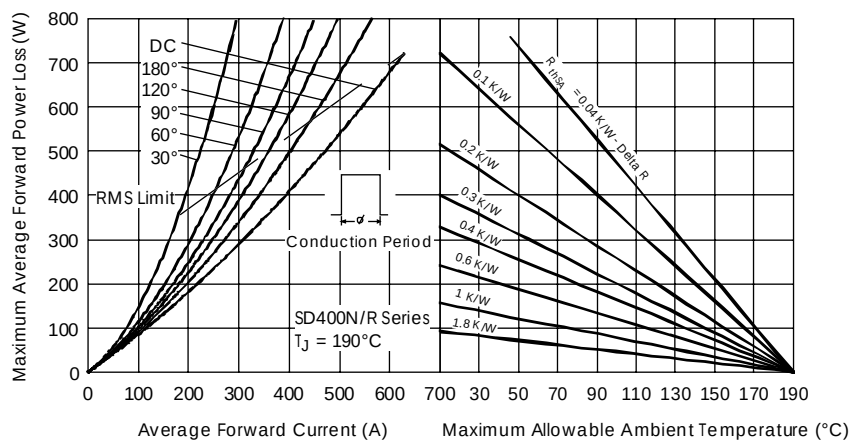


Fig. 4 - Forward Power Loss Characteristics

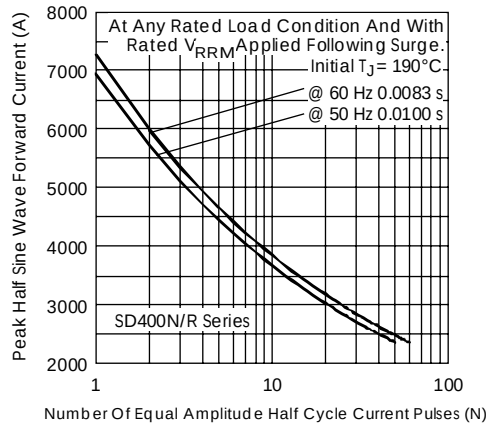


Fig. 5 - Maximum Non-Repetitive Surge Current

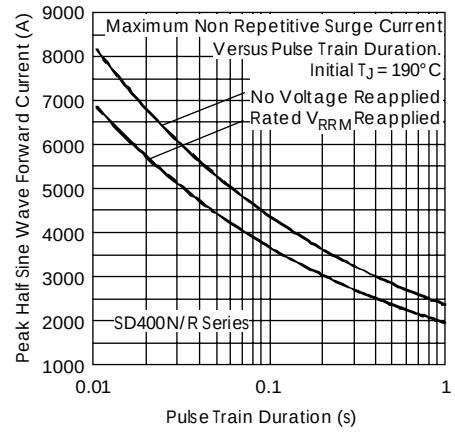


Fig. 6 - Maximum Non-Repetitive Surge Current

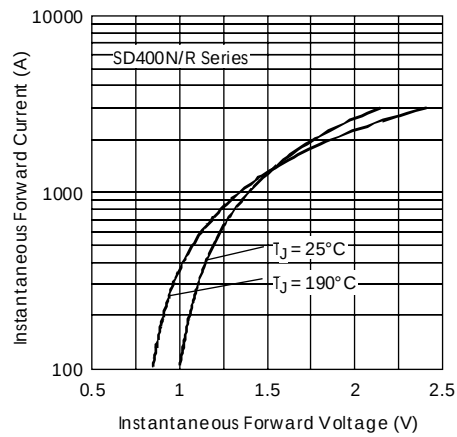


Fig. 7 - Forward Voltage Drop Characteristics

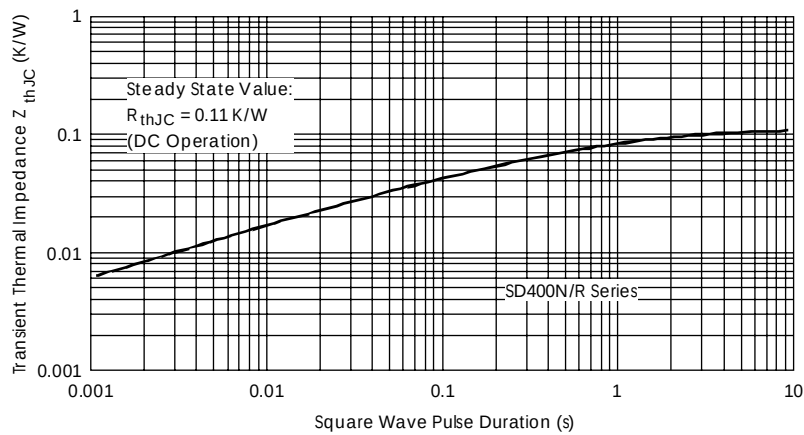


Fig. 8 - Thermal Impedance Z_{thJC} Characteristic