

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

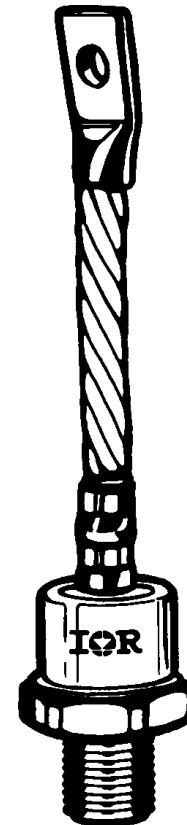
400A

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



case style
DO-205AB (DO-9)

SD400N/R Series

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
	8640		t = 8.3ms reapplied
	6940		t = 10ms 100% V_{RRM}
	7270		t = 8.3ms reapplied
I^2t Maximum I^2t 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
$I^2\sqrt{t}$ Maximum $I^2\sqrt{t}$ 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)

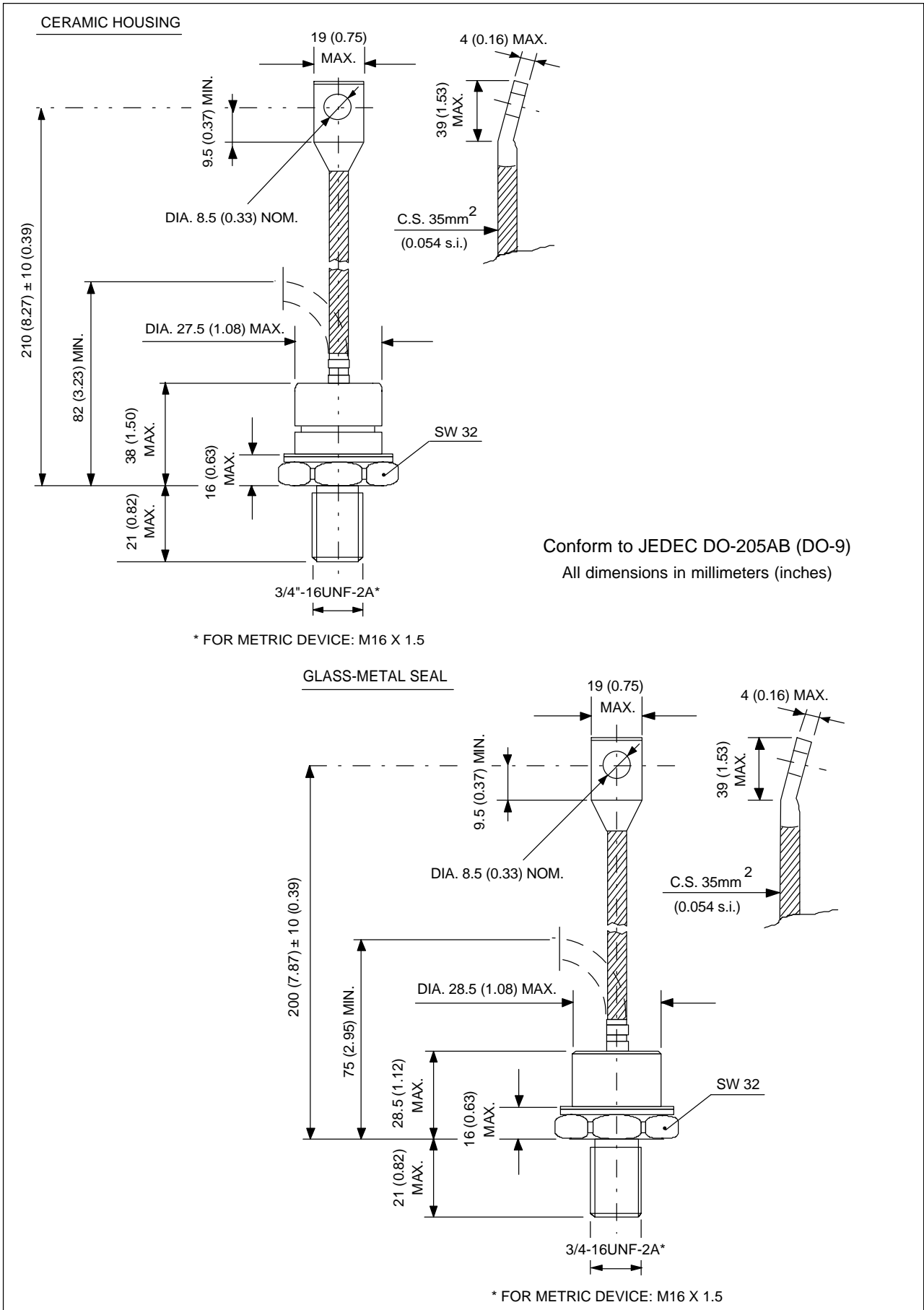
Conduction angle	Sinusoidal conduction	Rectangular conduction	Units	Conditions
180°	0.020	0.013	K/W	$T_J = T_J \text{ max.}$
120°	0.023	0.023		
90°	0.029	0.031		
60°	0.042	0.044		
30°	0.073	0.074		

Ordering Information Table

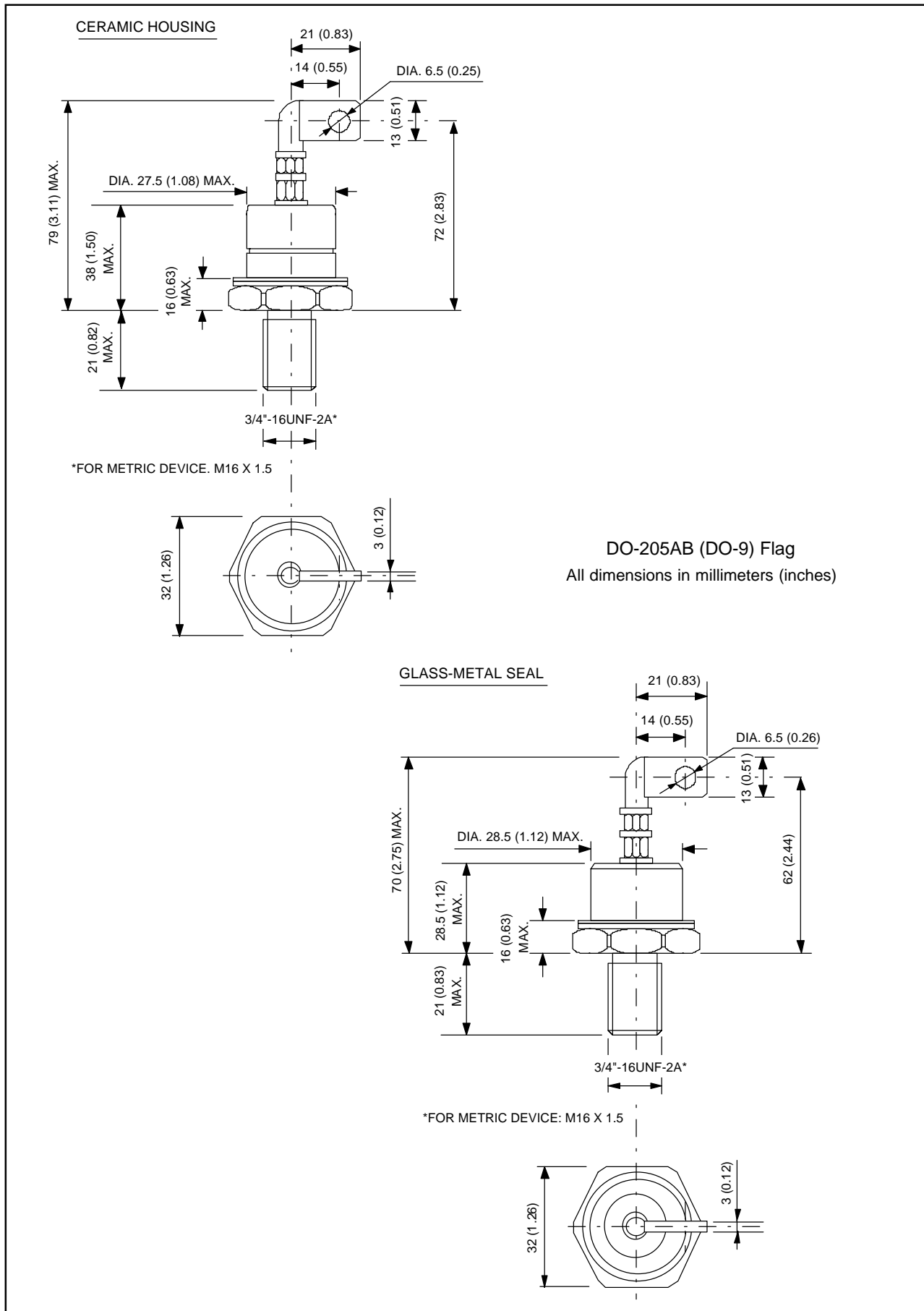
Device Code	
	<div style="display: flex; justify-content: center; gap: 5px;"> <div style="border: 1px solid black; padding: 2px 5px;">SD</div> <div style="border: 1px solid black; padding: 2px 5px;">40</div> <div style="border: 1px solid black; padding: 2px 5px;">0</div> <div style="border: 1px solid black; padding: 2px 5px;">N</div> <div style="border: 1px solid black; padding: 2px 5px;">24</div> <div style="border: 1px solid black; padding: 2px 5px;">P</div> <div style="border: 1px solid black; padding: 2px 5px;">B</div> <div style="border: 1px solid black; padding: 2px 5px;">C</div> </div>
	<div style="display: flex; justify-content: center; gap: 10px;"> ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ </div>
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)

SD400N/R Series

Outline Table



Outline Table



SD400N/R Series

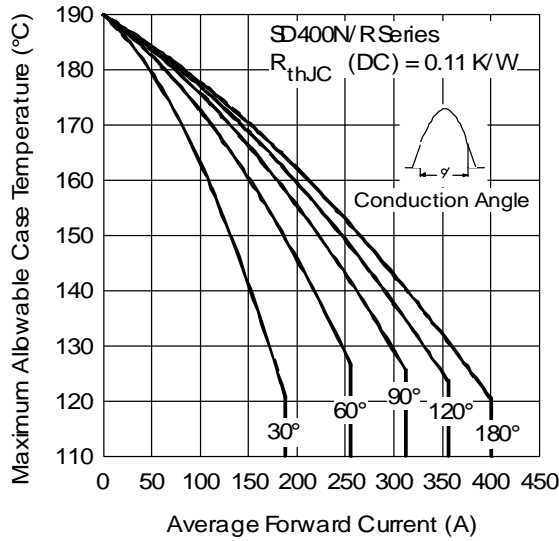


Fig. 1 - Current Ratings Characteristics

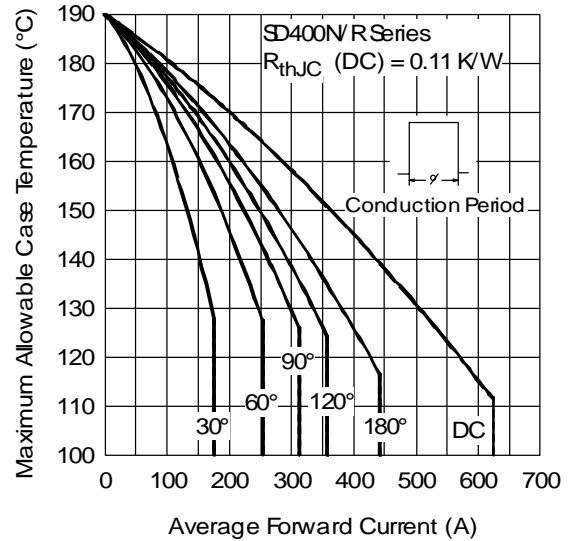


Fig. 2 - Current Ratings Characteristics

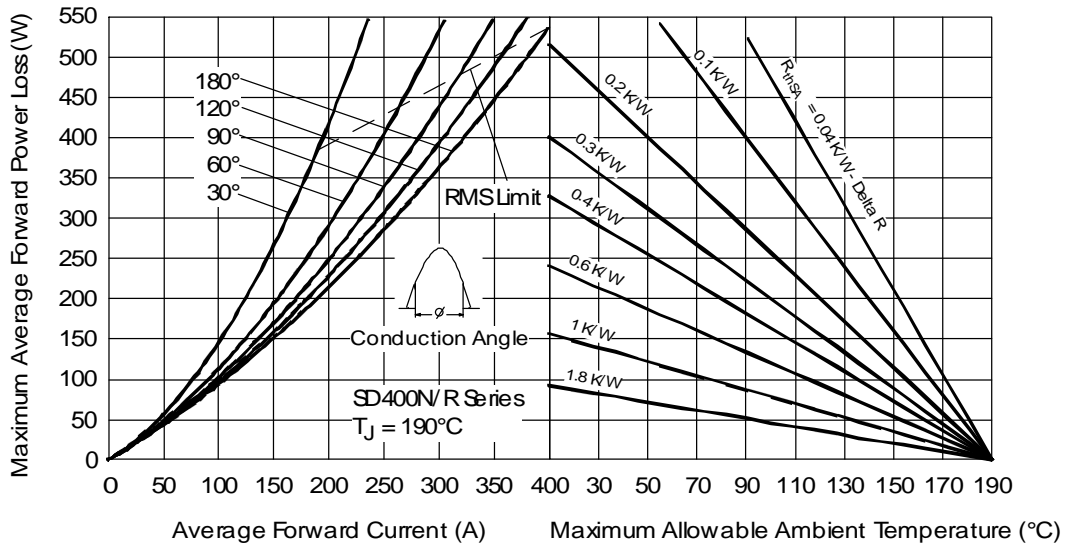


Fig. 3 - Forward Power Loss Characteristics

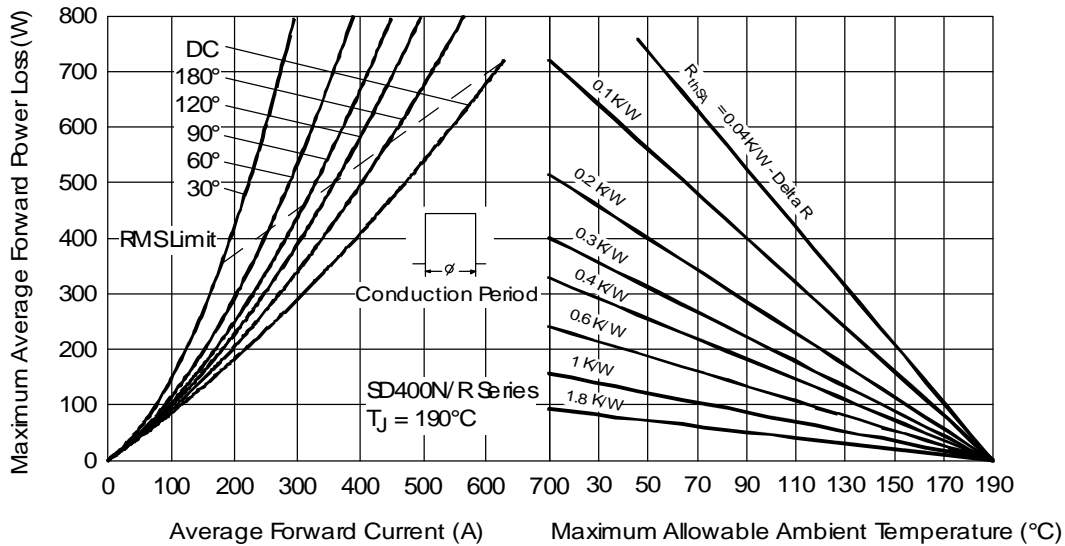


Fig. 4 - Forward Power Loss Characteristics

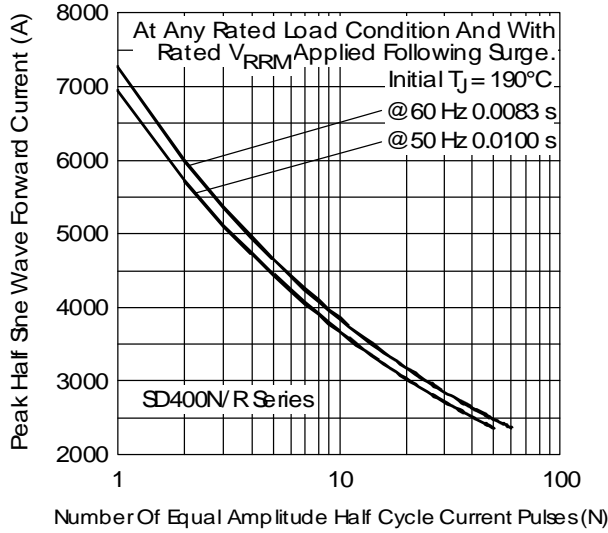


Fig. 5 - Maximum Non-Repetitive Surge Current

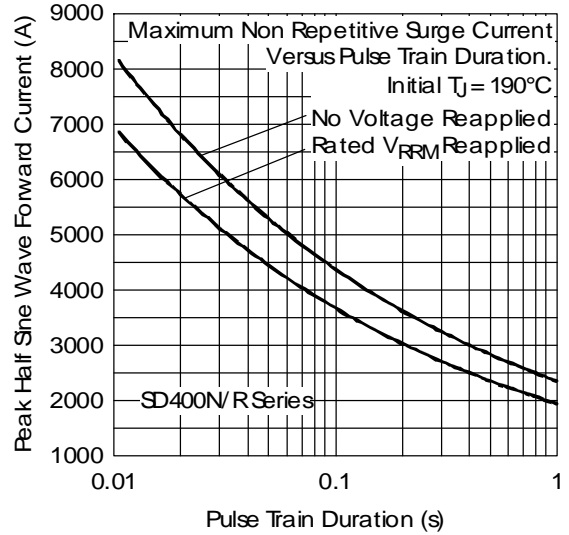


Fig. 6 - Maximum Non-Repetitive Surge Current

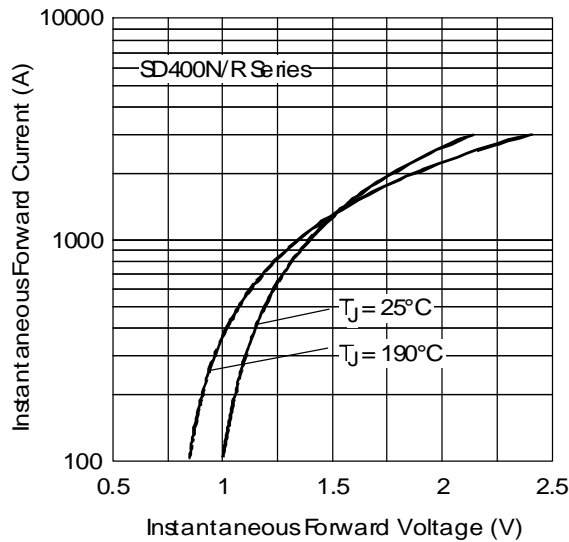


Fig. 7 - Forward Voltage Drop Characteristics

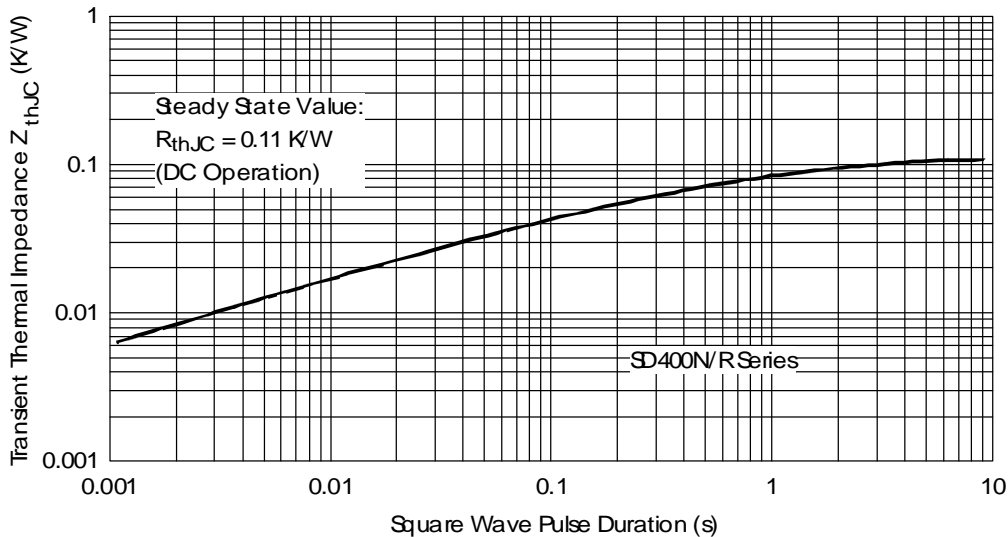


Fig. 8 - Thermal Impedance Z_{thJC} Characteristic