THE DATASHEET OF

SD500R40PSC

Bulletin I2095 rev. B 09/06

International
IOR Rectifier

SD500N/R SERIES

STANDARD RECOVERY DIODES

Stud Version

475A

Features

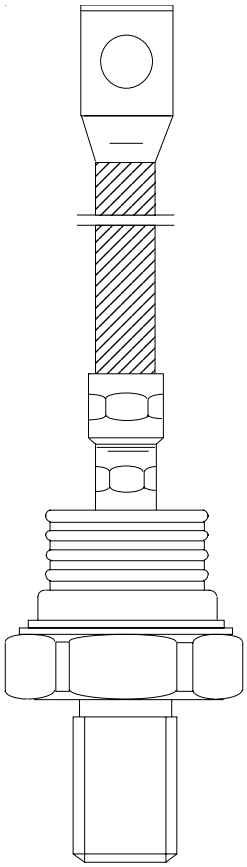
- Wide current range
- High voltage ratings up to 4500V
- High surge current capabilities
- Stud cathode and stud anode version
- Standard JEDEC types
- RoHS Compliant

Typical Applications

- Converters
- Power supplies
- High power drives
- Auxiliary system supplies for traction applications

Major Ratings and Characteristics

Parameters		SD500N/R	Units
$I_{F(AV)}$		475	A
	@ T_C	55	°C
$I_{F(RMS)}$		745	A
I_{FSM}	@ 50Hz	7500	A
	@ 60Hz	7850	A
I^2t	@ 50Hz	281	KA^2s
	@ 60Hz	257	KA^2s
V_{RRM} range		3000 to 4500	V
T_J		- 40 to 150	°C



case style
B-8

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
SD500N/R	30	3000	3100	50
	36	3600	3700	
	40	4000	4100	
	45	4500	4600	

Forward Conduction

Parameter		SD500N/R	Units	Conditions		
$I_{F(AV)}$	Max. average forward current	475	A	180° conduction, half sine wave		
	@ Case temperature	55	°C			
$I_{F(AV)}$	Max. average forward current	300	A	180° conduction, half sine wave		
	@ Case temperature	100	°C			
$I_{F(RMS)}$	Max. RMS forward current	745	A	DC @ 40°C case temperature		
I_{FSM}	Max. peak, one-cycle forward, non-repetitive surge current	7500	A	t = 10ms	No voltage reapplied	Sinusoidal half wave, Initial $T_J = T_J$ max.
		7850		t = 8.3ms		
		6310		t = 10ms	50% V_{RRM} reapplied	
		6600		t = 8.3ms		
I^2t	Maximum I^2t for fusing	281	KA^2s	t = 10ms	No voltage reapplied	
		257		t = 8.3ms		
		199		t = 10ms	50% V_{RRM} reapplied	
		182		t = 8.3ms		
$I^2\sqrt{t}$	Maximum $I^2\sqrt{t}$ for fusing	2810	$KA^2\sqrt{s}$	t = 0.1 to 10ms, no voltage reapplied		
$V_{F(TO)1}$	Low level value of threshold voltage	0.88	V	($16.7\% \times \pi \times I_{F(AV)} < I < \pi \times I_{F(AV)}$), $T_J = T_J$ max.		
$V_{F(TO)2}$	High level value of threshold voltage	0.97		($I > \pi \times I_{F(AV)}$), $T_J = T_J$ max.		
r_{f1}	Low level value of forward slope resistance	0.78	m Ω	($16.7\% \times \pi \times I_{F(AV)} < I < \pi \times I_{F(AV)}$), $T_J = T_J$ max.		
r_{f2}	High level value of forward slope resistance	0.72		($I > \pi \times I_{F(AV)}$), $T_J = T_J$ max.		
V_{FM}	Max. forward voltage drop	1.66	V	I_{pk}= 1000A, $T_J = T_J$ max, t_p = 10ms sinusoidal wave		

Thermal and Mechanical Specifications

	Parameter	SD500N/R	Units	Conditions
T_J	Max. junction operating temperature range	-40 to 150	°C	
T_{stg}	Max. storage temperature range	-55 to 200		
R_{thJC}	Max. thermal resistance, junction to case	0.1	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 ±10%	50	Nm	Not lubricated threads
wt	Approximate weight	454	g	
	Case style	B-8		See Outline Table

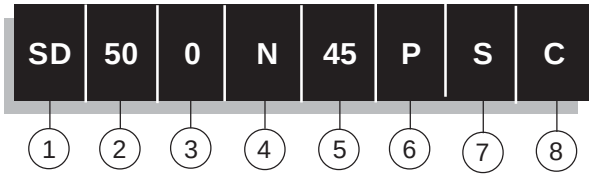
ΔR_{thJC} Conduction

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

Conduction angle	Sinusoidal conduction	Rectangular conduction	Units	Conditions
180°	0.012	0.008	K/W	$T_J = T_J$ max.
120°	0.014	0.014		
90°	0.017	0.019		
60°	0.025	0.026		
30°	0.042	0.042		

Ordering Information Table

Device Code



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 B-8 3/4" 16UNF-2A

M = Stud base B-8 M24 X 1.5

7 - S = Isolated lead with silicone sleeve

(Red = Reverse Polarity; Blue = Normal Polarity)

T = Threaded Top Terminal 3/8" 24UNF-2A

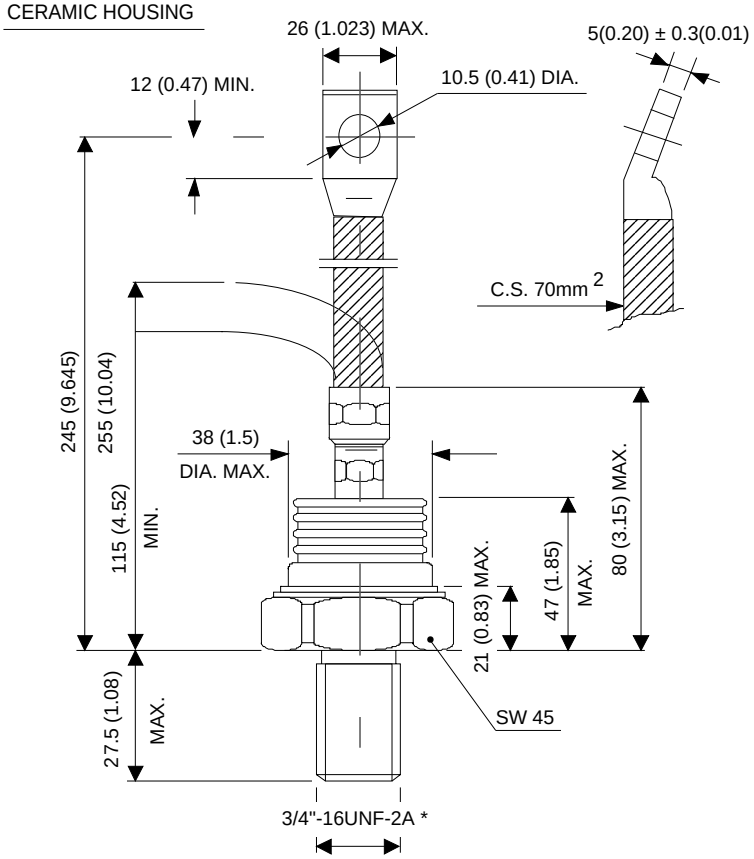
None = Non isolated lead

8 - C = Ceramic Housing

NOTE: Available for rotating applications (Contact factory)

Outlines Table

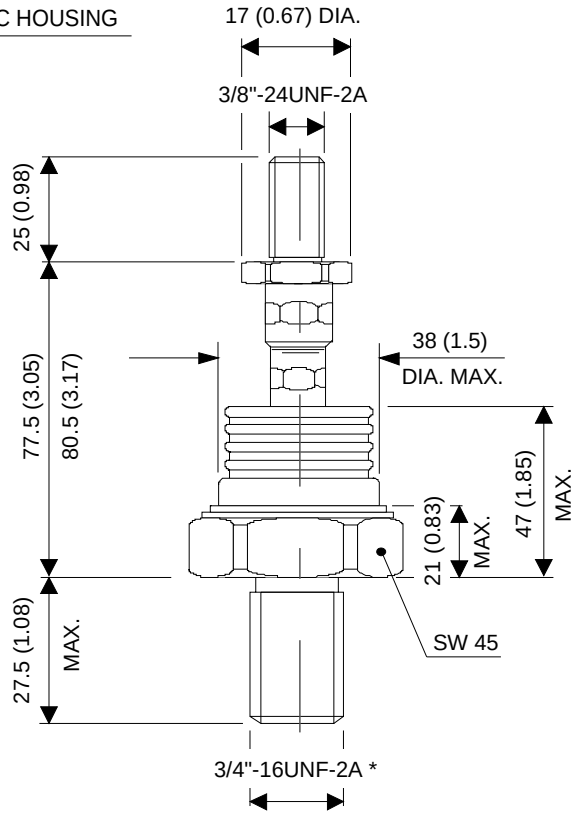
CERAMIC HOUSING



Case Style B-8
All dimensions in millimeters (inches)

* FOR METRIC DEVICE: M24 x 1.5 - LENGHT SCREW 21 (0.83) MAX.

CERAMIC HOUSING



Case Style B-8 with top thread terminal 3/8"
All dimensions in millimeters (inches)

* FOR METRIC DEVICE: M24 x 1.5 - LENGHT SCREW 21 (0.83) MAX.

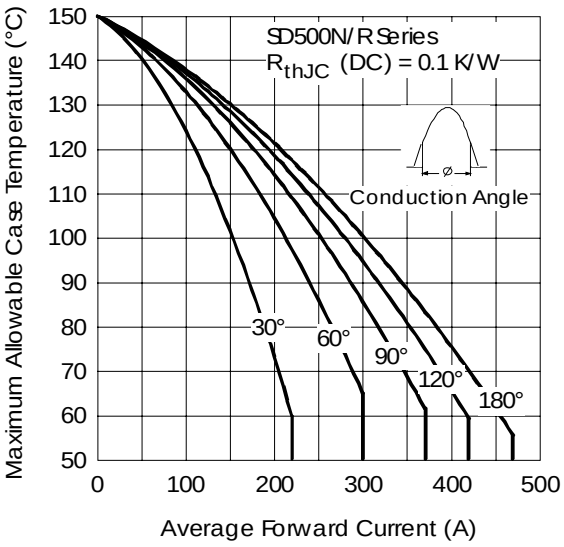


Fig. 1 - Current Ratings Characteristics

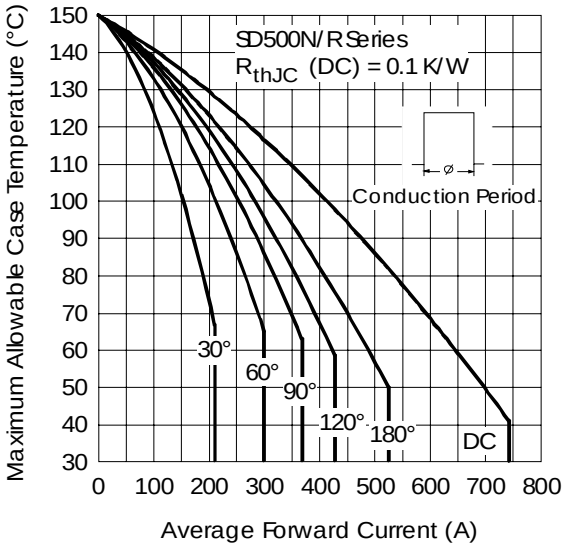


Fig. 2 - Current Ratings Characteristics

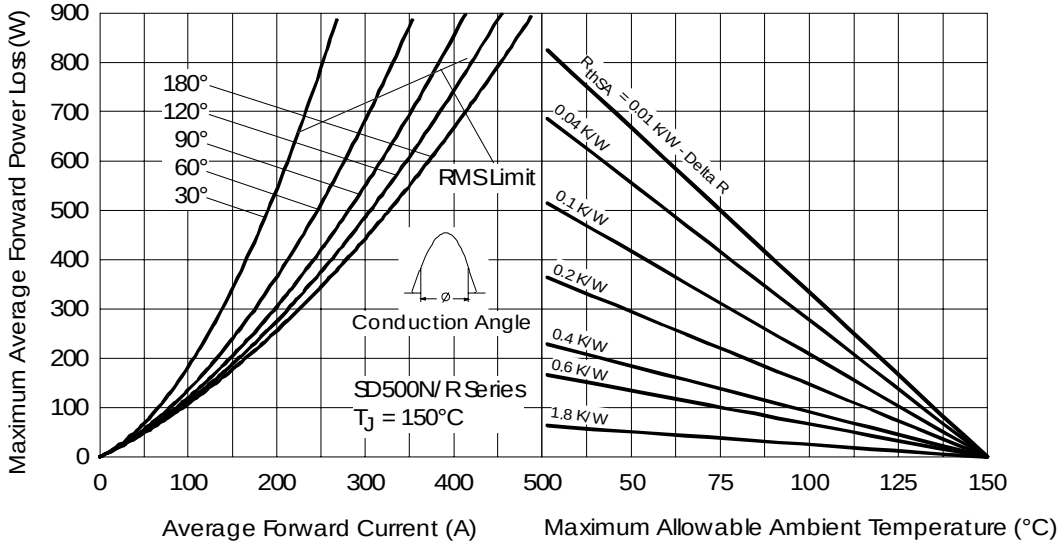


Fig. 3 - Forward Power Loss Characteristics

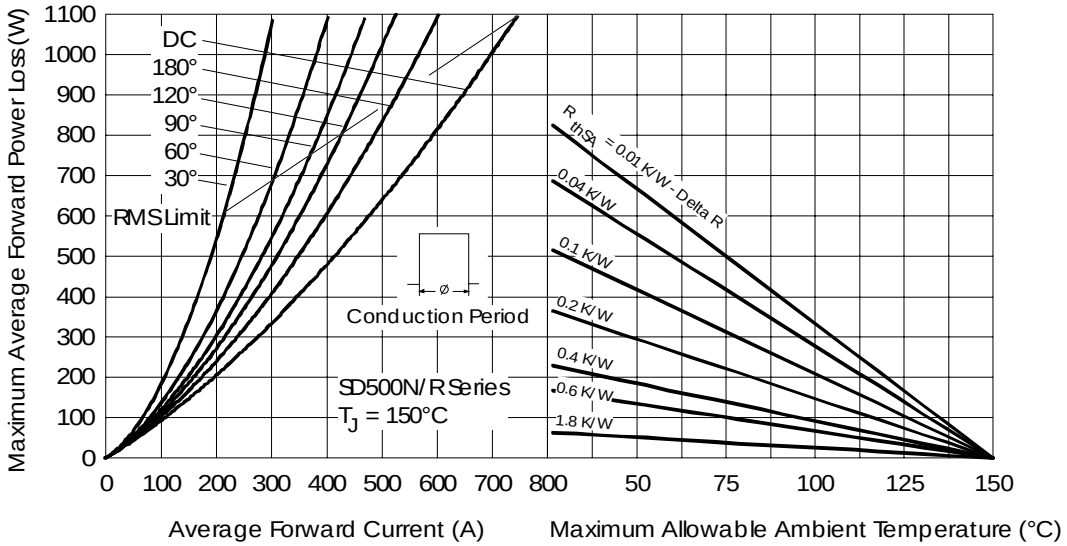


Fig. 4 - Forward Power Loss Characteristics

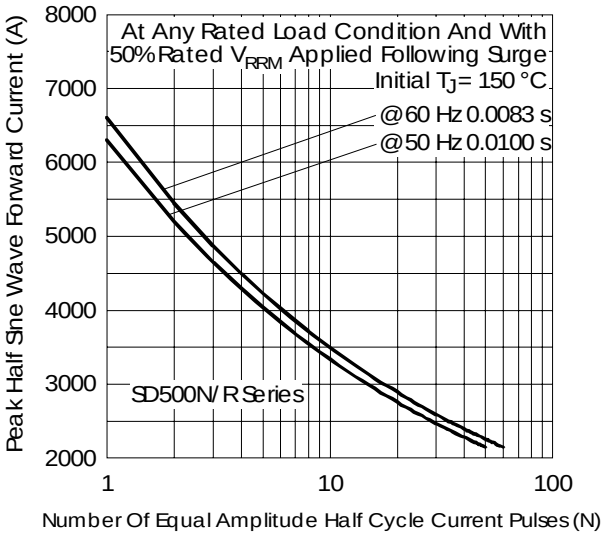


Fig. 5 - Maximum Non-Repetitive Surge Current

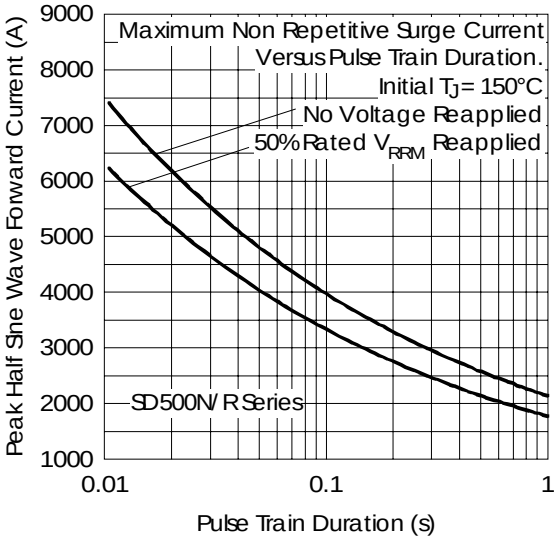


Fig. 6 - Maximum Non-Repetitive Surge Current

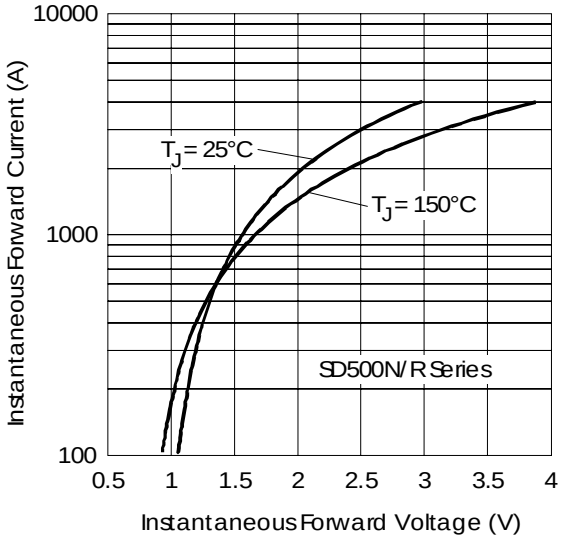


Fig. 7 - Forward Voltage Drop Characteristics

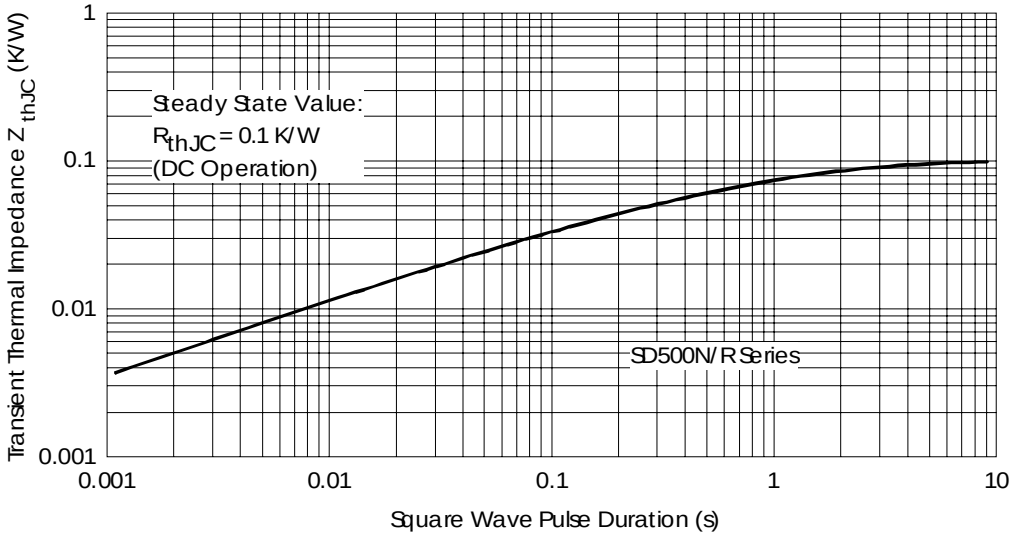


Fig. 8 - Thermal Impedance Z_{thJC} Characteristics

Data and specifications subject to change without notice.
This product has been designed and qualified for Industrial Level.
Qualification Standards can be found on IR's Web site.

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