

STANDARD RECOVERY DIODES

Stud Version

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

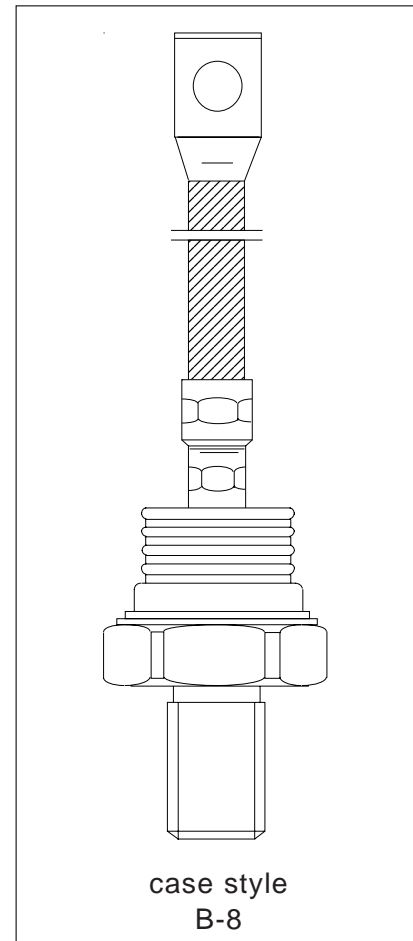
Typical Applications

- 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 ² s
@ 60Hz	257	KA ² s
V_{RRM} range	3000 to 4500	V
T_J	- 40 to 150	°C

475A



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 @ Case temperature	475	A	180° conduction, half sine wave
	55	°C	
$I_{F(AV)}$ Max. average forward current @ Case temperature	300	A	180° conduction, half sine wave
	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
	7850		t = 8.3ms reapplied
	6310		t = 10ms 50% V_{RRM}
	6600		t = 8.3ms reapplied
I^2t Maximum I^2t for fusing	281	KA ² s	t = 10ms No voltage
	257		t = 8.3ms reapplied
	199		t = 10ms 50% V_{RRM}
	182		t = 8.3ms reapplied
$I^2\sqrt{t}$ Maximum $I^2\sqrt{t}$ for fusing	2810	KA ² /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	mΩ	$(16.7\% \times \pi \times I_{F(AV)} < I < \pi \times I_{F(AV)})$, $T_J = T_J$ 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 resistance 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

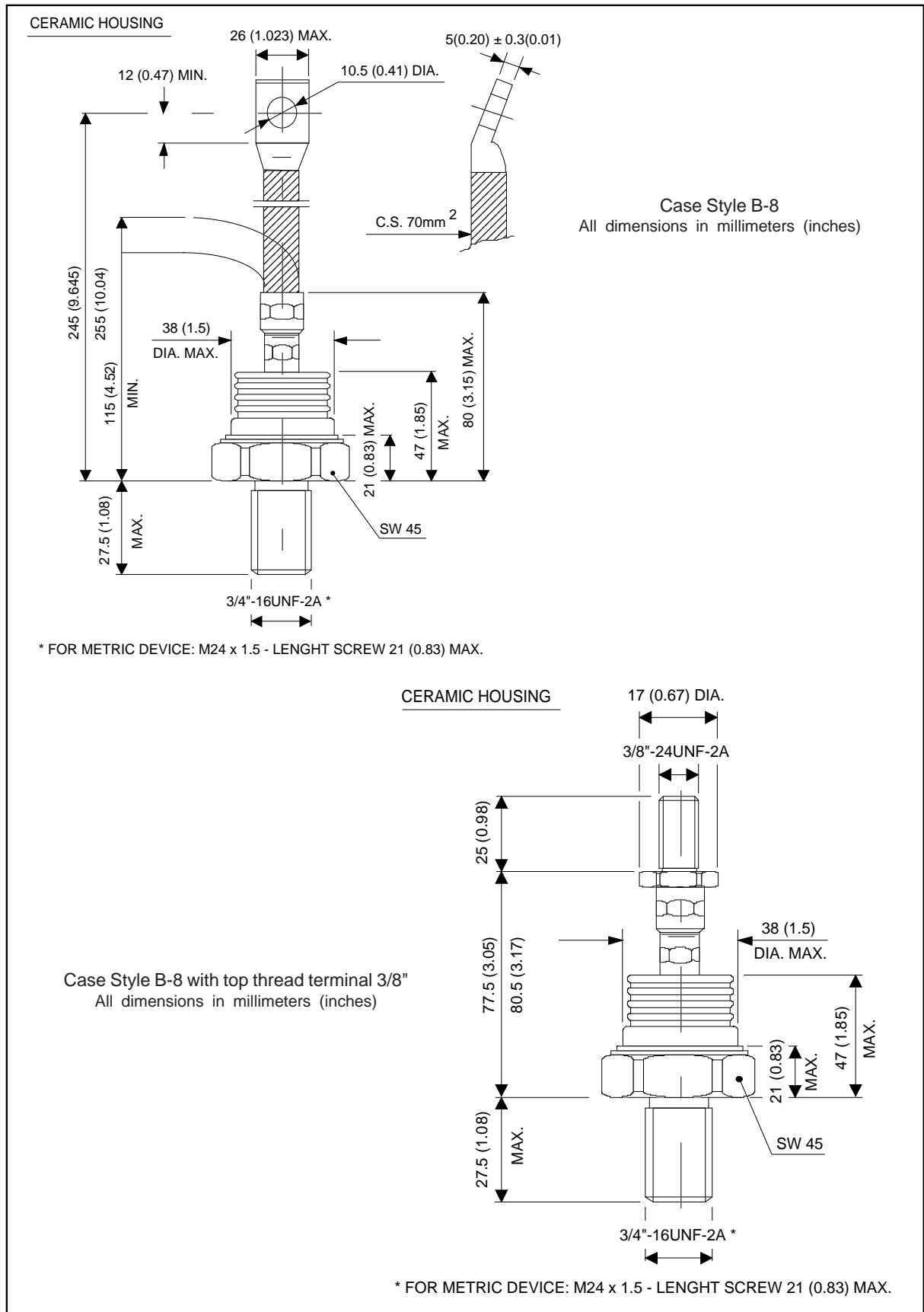
Device Code

SD	50	0	N	45	P	S	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 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



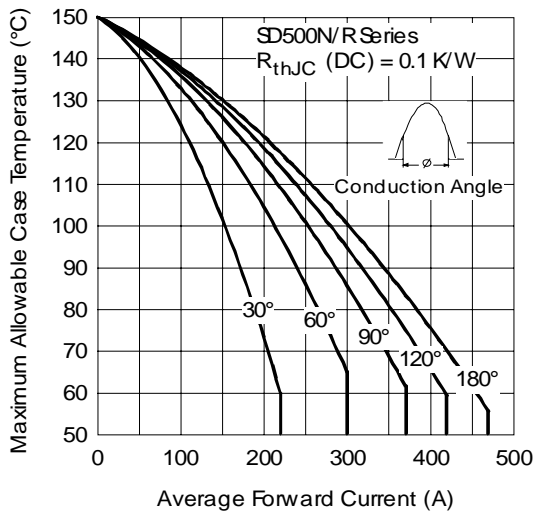


Fig. 1 - Current Ratings Characteristics

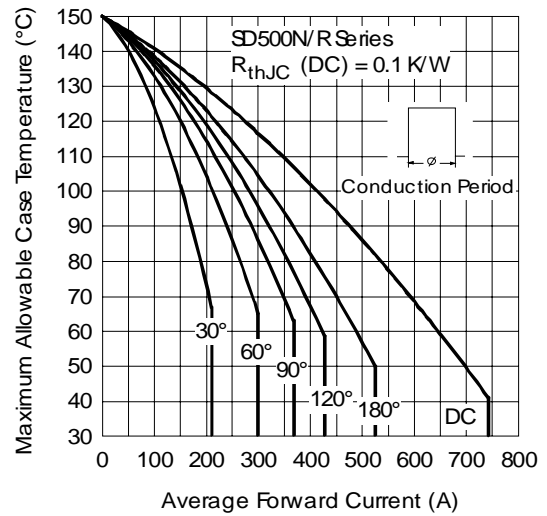


Fig. 2 - Current Ratings Characteristics

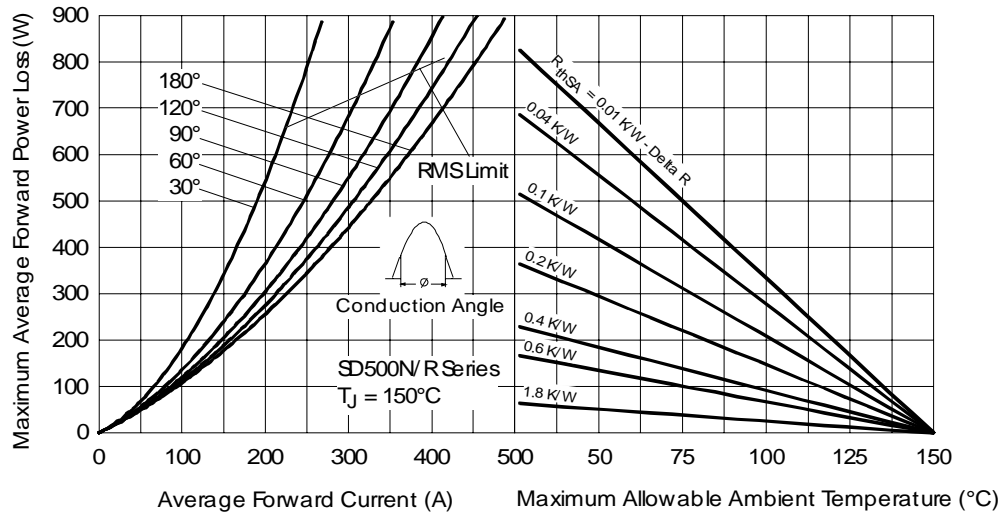


Fig. 3 - Forward Power Loss Characteristics

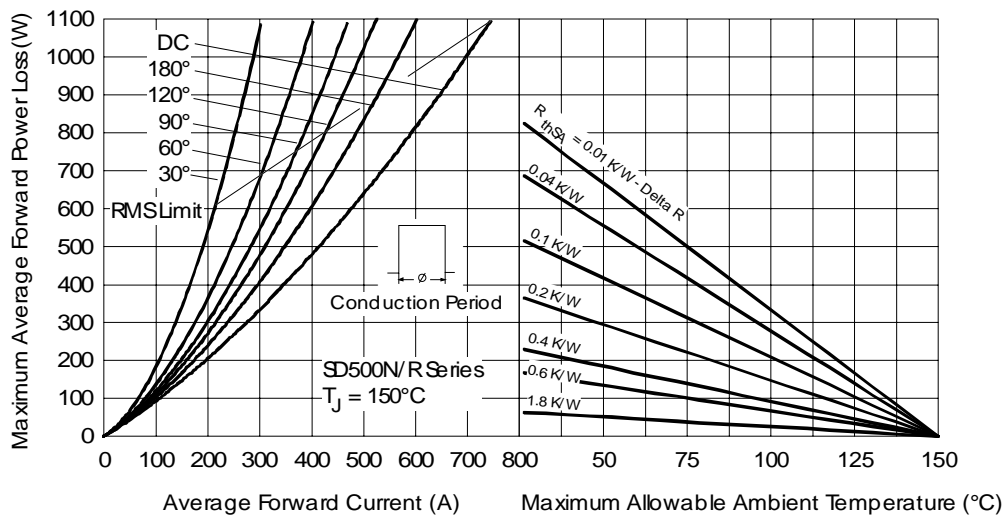


Fig. 4 - Forward Power Loss Characteristics

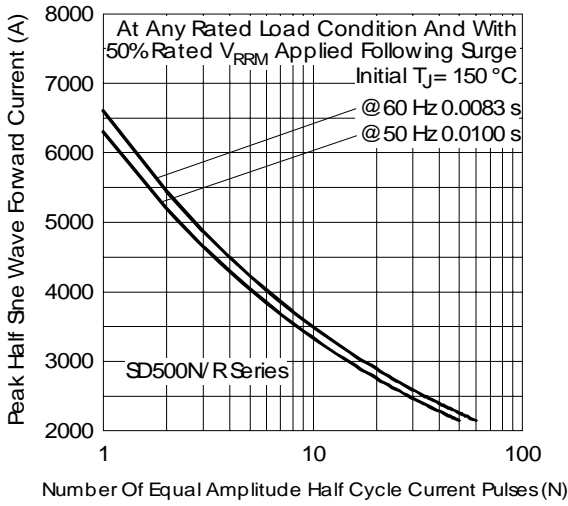


Fig. 5 - Maximum Non-Repetitive Surge Current

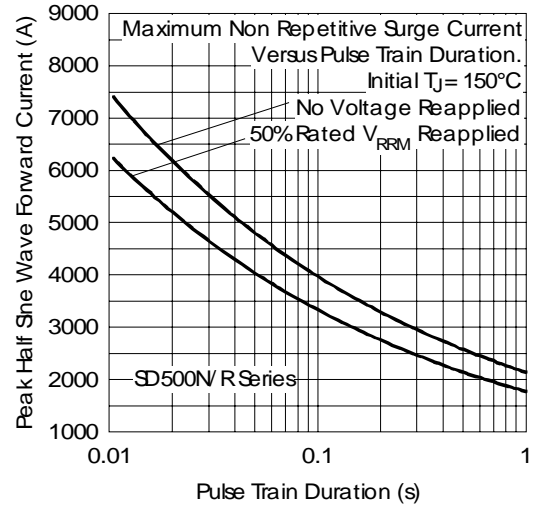


Fig. 6 - Maximum Non-Repetitive Surge Current

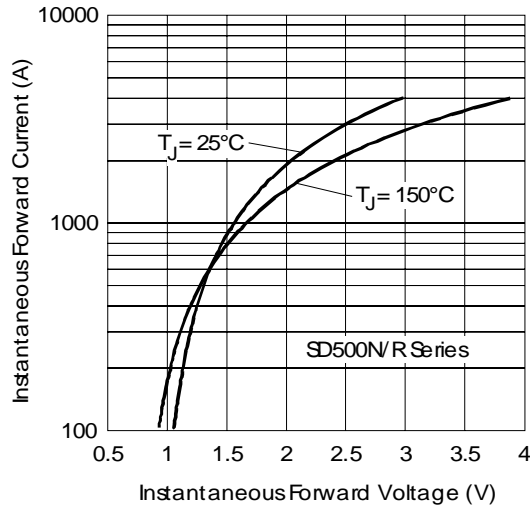


Fig. 7 - Forward Voltage Drop Characteristics

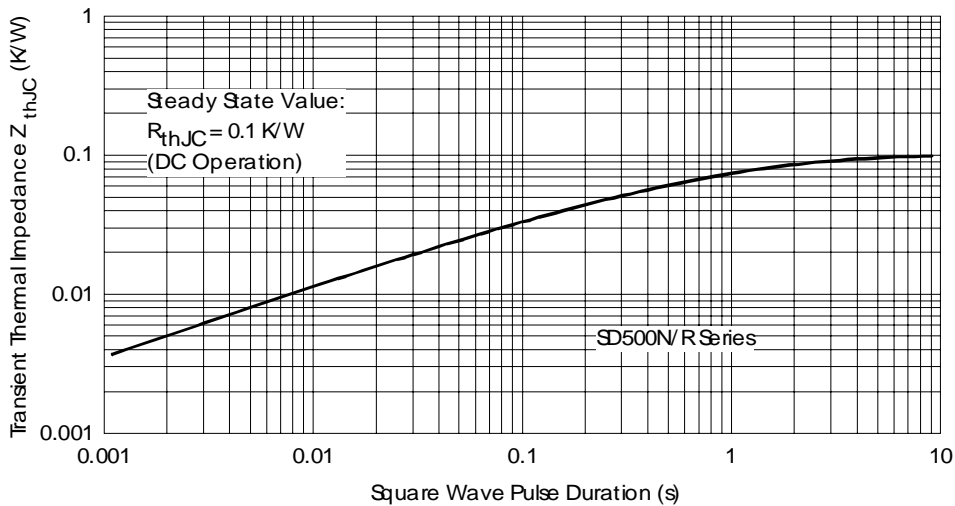


Fig. 8 - Thermal Impedance Z_{thJC} Characteristics

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.

International
IOR Rectifier

IR WORLD HEADQUARTERS: 233 Kansas St., El Segundo, California 90245, USA Tel: (310) 252-7105
TAC Fax: (310) 252-7309

Visit us at www.irf.com for sales contact information. 09/06