

International  
**IR** Rectifier

## SD150N/R SERIES

STANDARD RECOVERY DIODES

Stud Version

### Features

- Wide current range
- High voltage ratings up to 2500V
- High surge current capabilities
- Stud cathode and stud anode version
- Standard JEDEC types

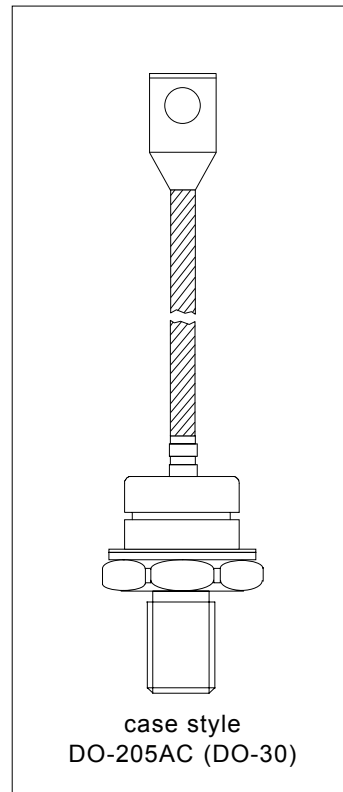
150A

### Typical Applications

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

### Major Ratings and Characteristics

Parameters	SD150N/R		Units	
	400 to 2000	2500		
$I_{F(AV)}$	150	200	A	
@ $T_C$	125	110	°C	
$I_{F(RMS)}$	235	314	A	
$I_{FSM}$	@ 50Hz	3600	4700	A
	@ 60Hz	3770	4920	A
$i^2t$	@ 50Hz	65	110	KA <sup>2</sup> s
	@ 60Hz	59	101	KA <sup>2</sup> s
$V_{RRM}$ range	400 to 2000	2500	V	
$T_J$	- 40 to 180	150	°C	



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### 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
SD150N/R	04	400	500	15
	08	800	900	
	12	1200	1300	
	16	1600	1700	
	20	2000	2100	
	25	2500	2600	

#### Forward Conduction

Parameter	SD150N/R	Units	Conditions
$I_{F(AV)}$ Max. average forward current @ Case temperature	150	A	180° conduction, half sine wave
	125	°C	
$I_{F(AV)}$ Max. average forward current @ Case temperature	200	A	180° conduction, half sine wave
	110	°C	
$I_{F(RMS)}$ Max. RMS forward current	235	A	DC @ 113°C case temperature
$I_{FSM}$ Max. peak, one-cycle forward, non-repetitive surge current	3600	A	t = 10ms No voltage reappplied
	3770		t = 8.3ms reappplied
	3000		t = 10ms 100% $V_{RRM}$ reappplied
	3170		t = 8.3ms reappplied
$I^2t$ Maximum $I^2t$ for fusing	65	KA <sup>2</sup> s	t = 10ms No voltage reappplied
	59		t = 8.3ms reappplied
	46		t = 10ms 100% $V_{RRM}$ reappplied
	42		t = 8.3ms reappplied
$I^2\sqrt{t}$ Maximum $I^2\sqrt{t}$ for fusing	650	KA <sup>2</sup> √s	t = 0.1 to 10ms, no voltage reappplied
$V_{F(TO)1}$ Low level value of threshold voltage	0.93	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	1.06		$(I > \pi \times I_{F(AV)})$ , $T_J = T_J$ max.
$r_{f1}$ Low level value of forward slope resistance	1.27	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	1.04		$(I > \pi \times I_{F(AV)})$ , $T_J = T_J$ max.
$V_{FM}$ Max. forward voltage drop	1.5	V	$I_{pk} = 470A$ , $T_J = T_J$ max, $t_p = 10ms$ sinusoidal wave

**Thermal and Mechanical Specifications**

Parameter	SD150N/R		Units	Conditions
	400to2000	2500		
T <sub>J</sub> Max. junction operating temperature range	-40 to 180	150	°C	
T <sub>stg</sub> Max. storage temperature range	-55 to 200			
R <sub>thJC</sub> Max. thermal resistance, junction to case	0.23		K/W	DC operation
R <sub>thCS</sub> Max. thermal resistance, case to heatsink	0.08			Mounting surface, smooth, flat and greased
T Max. allowed mounting torque ±10%	14		Nm	Not lubricated threads
wt Approximate weight	120		g	
Case style	DO-205AC(DO-30)		See Outline Table	

**ΔR<sub>thJC</sub> Conduction**

(The following table shows the increment of thermal resistance R<sub>thJC</sub> when devices operate at different conduction angles than DC)

Conduction angle	Sinusoidal conduction	Rectangular conduction	Units	Conditions
180°	0.041	0.030	K/W	T <sub>J</sub> = T <sub>J</sub> max.
120°	0.049	0.051		
90°	0.063	0.068		
60°	0.093	0.096		
30°	0.156	0.157		

**Ordering Information Table**

**Di e Code**

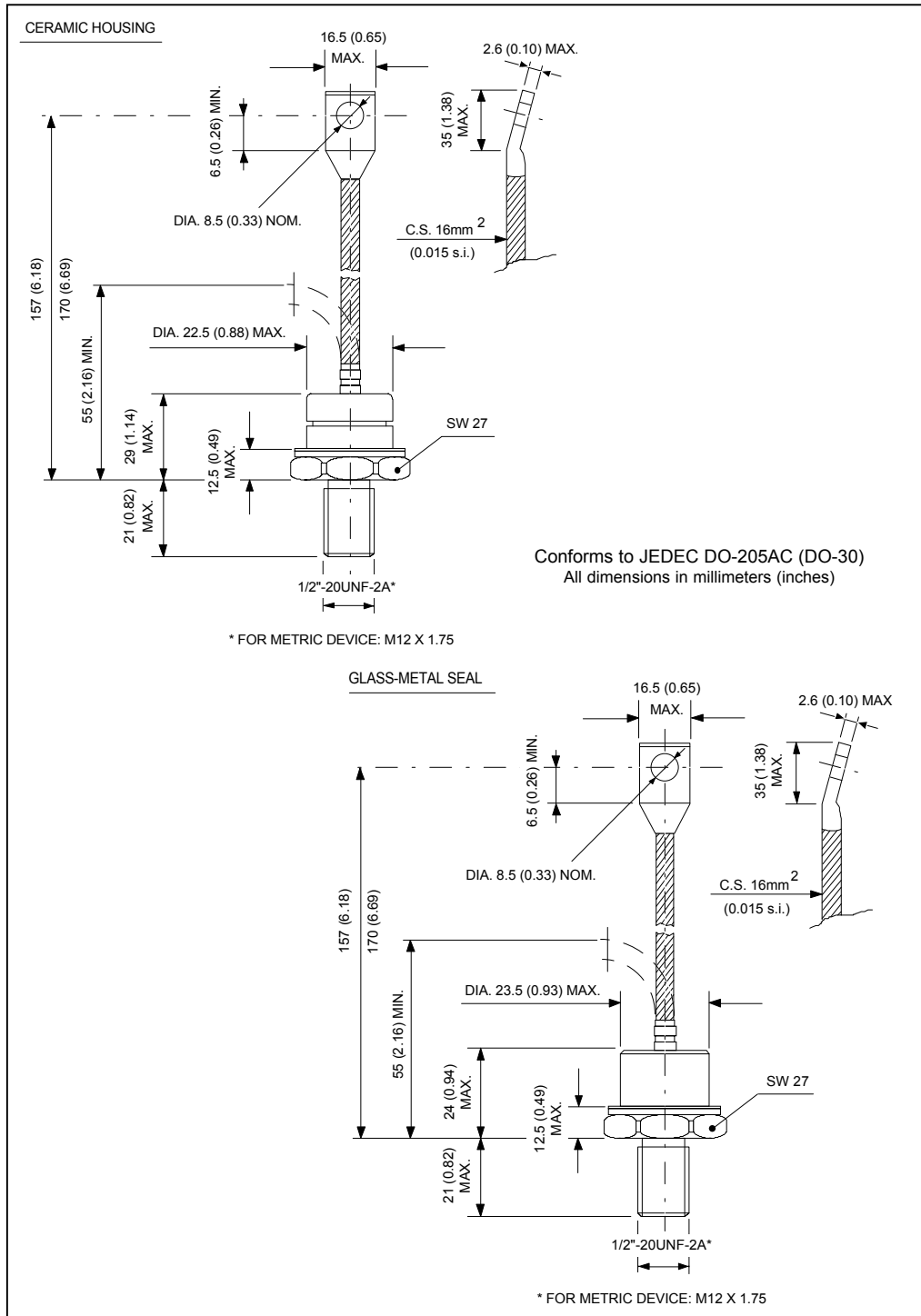
SD	15	0	N	25	P	B	C
①	②	③	④	⑤	⑥	⑦	⑧

- 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<sub>RRM</sub> (See Voltage Ratings table)
- 6** - P = Stud base DO-205AC (DO-30) 1/2" 20UNF-2A  
M = Stud base DO-205AC (DO-30) M12 X 1.75
- 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)

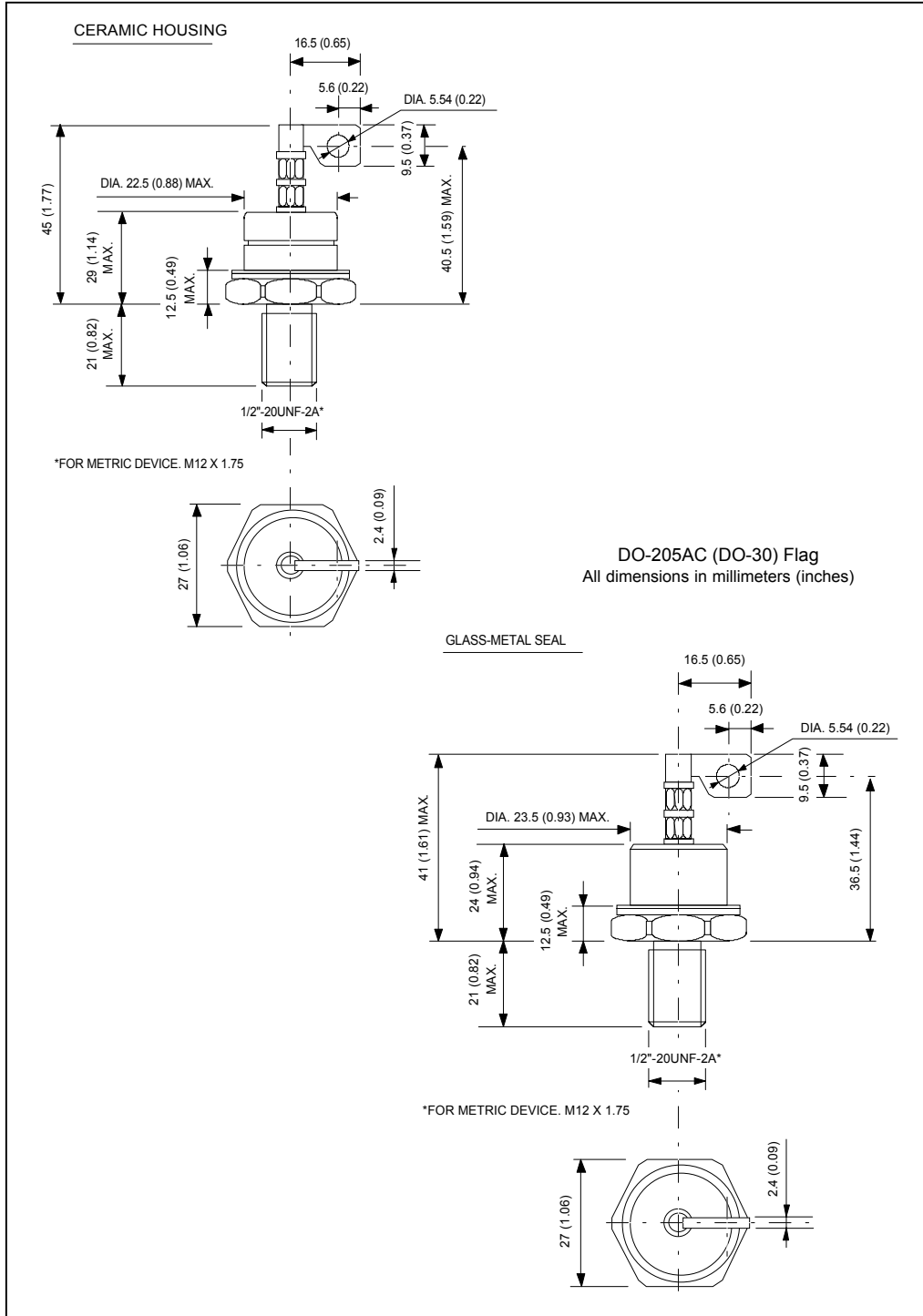
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## Outline Table



Outline Table



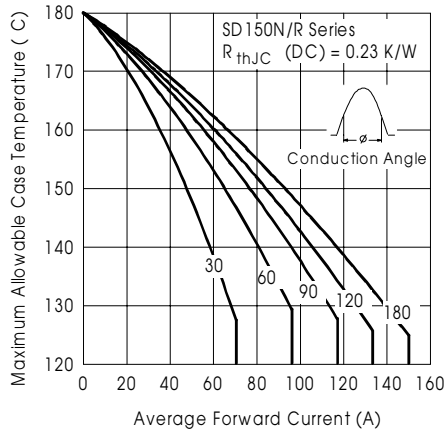


Fig. 1 - Current Ratings Characteristics

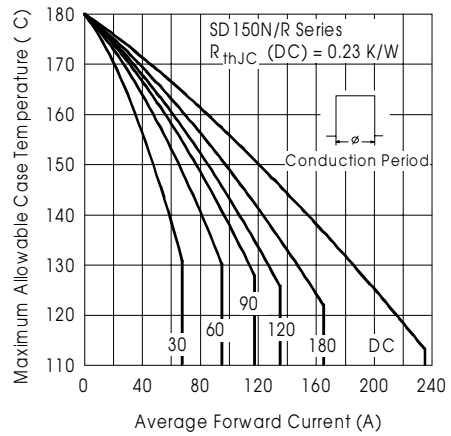


Fig. 2 - Current Ratings Characteristics

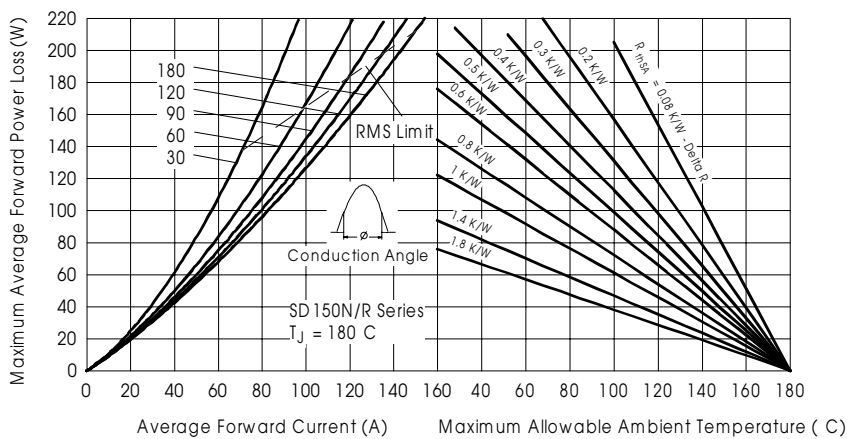


Fig. 3 - Forward Power Loss Characteristics

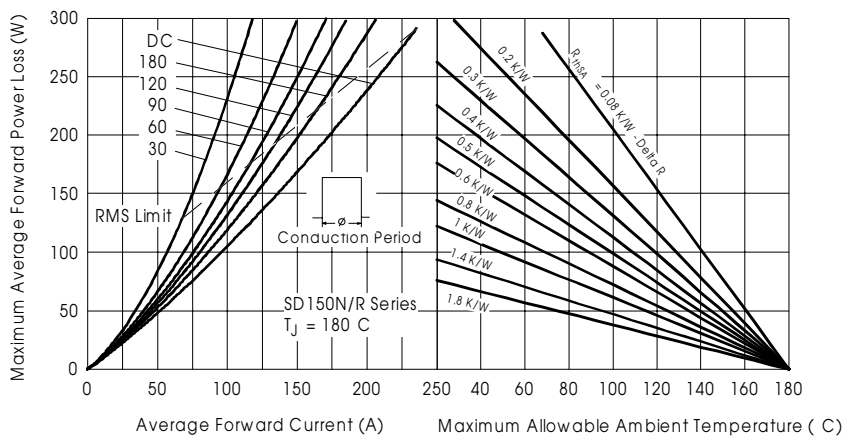


Fig. 4 - Forward Power Loss Characteristics

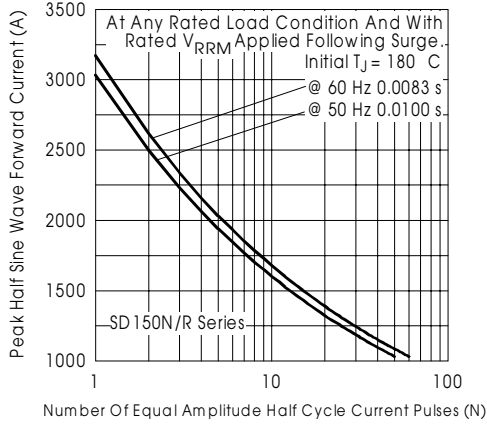


Fig. 5 - Maximum Non-Repetitive Surge Current

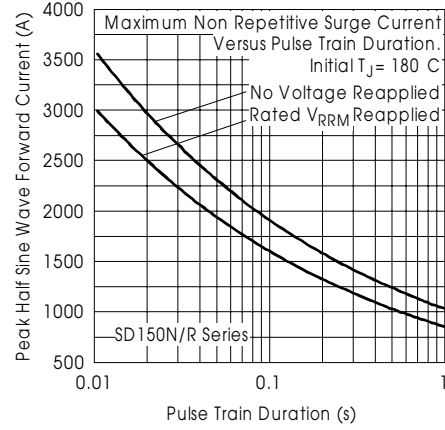


Fig. 6 - Maximum Non-Repetitive Surge Current

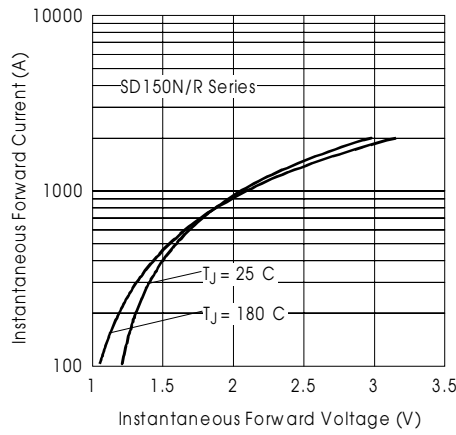


Fig. 7 - Forward Voltage Drop Characteristics

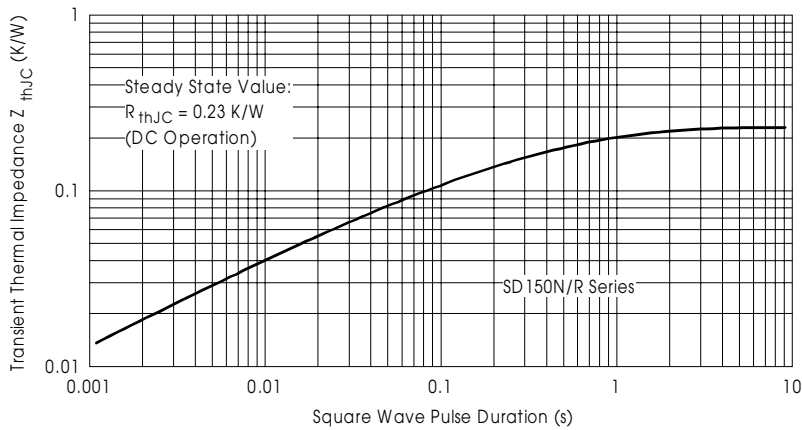


Fig. 8 - Thermal Impedance  $Z_{thJC}$  Characteristic

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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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