

Bulletin I2077 rev.B 11/01

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

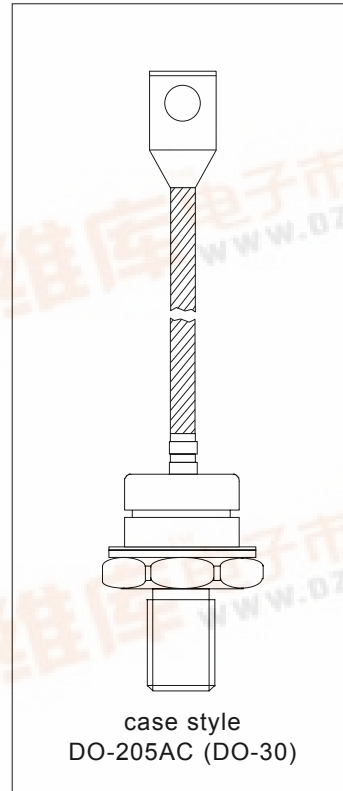


Typical Applications

- 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 ² s |
| | @ 60Hz | 59 | 101 | KA ² 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 |
| | 3770 | | t = 8.3ms reapplied |
| | 3000 | | t = 10ms 100% V_{RRM} |
| | 3170 | | t = 8.3ms reapplied |
| I^2t Maximum I^2t for fusing | 65 | KA ² s | t = 10ms No voltage |
| | 59 | | t = 8.3ms reapplied |
| | 46 | | t = 10ms 100% V_{RRM} |
| | 42 | | t = 8.3ms reapplied |
| I^2/t Maximum I^2/t for fusing | 650 | KA ² /s | t = 0.1 to 10ms, no voltage reapplied |
| | | | |
| $V_{F(TO)1}$ 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 _J Max. junction operating temperature range | -40 to 180 | 150 | °C | |
| T _{stg} Max. storage temperature range | -55 to 200 | | | |
| R _{thJC} Max. thermal resistance, junction to case | 0.23 | | K/W | DC operation |
| R _{thCS} 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_{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° | 0.041 | 0.030 | K/W | T _J = T _J max. |
| 120° | 0.049 | 0.051 | | |
| 90° | 0.063 | 0.068 | | |
| 60° | 0.093 | 0.096 | | |
| 30° | 0.156 | 0.157 | | |

Ordering Information Table

Device Code

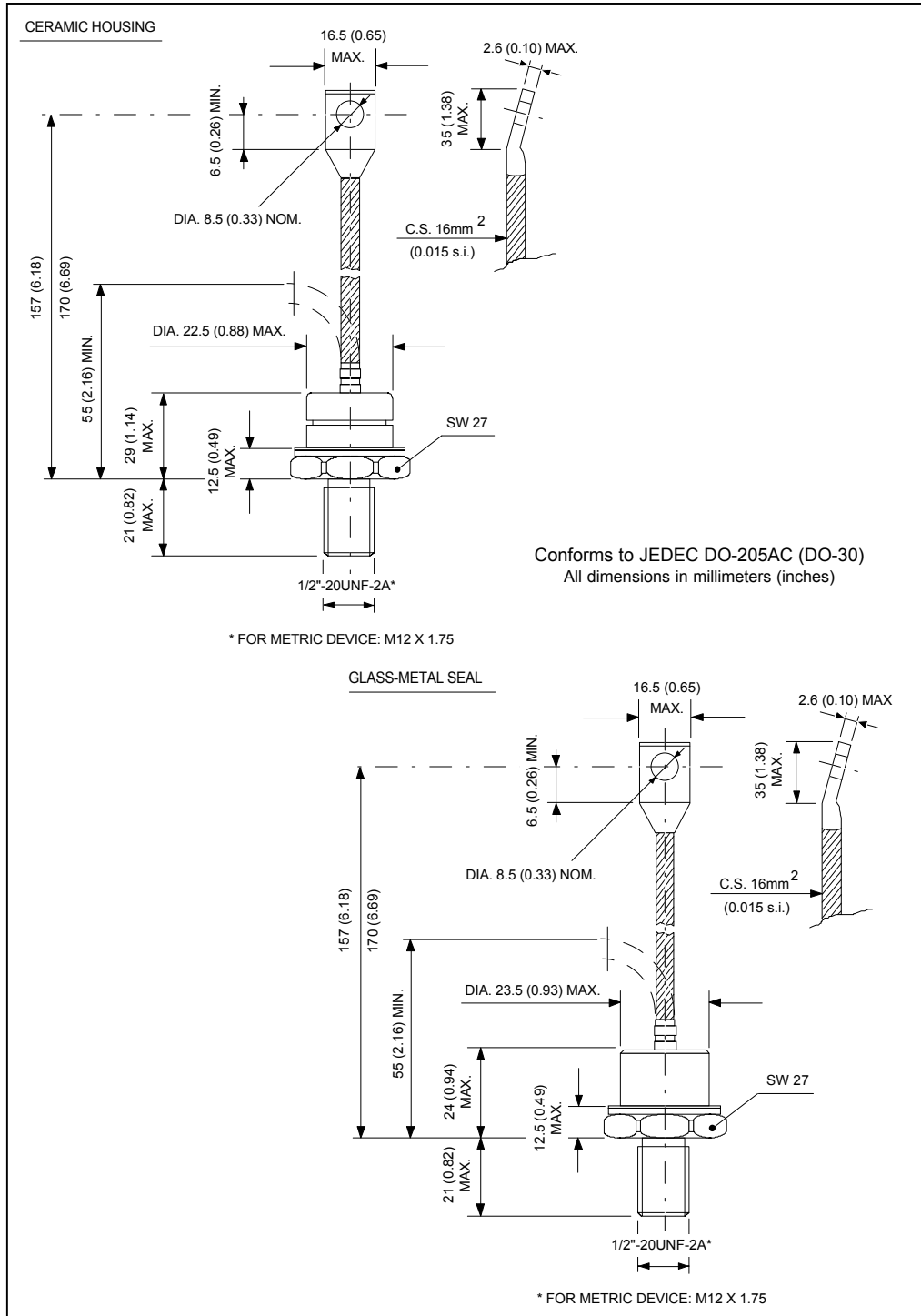
| | | | | | | | |
|----|----|---|---|----|---|---|---|
| SD | 15 | 0 | N | 25 | P | B | C |
| ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ | ⑧ |

- 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_{RRM} (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)

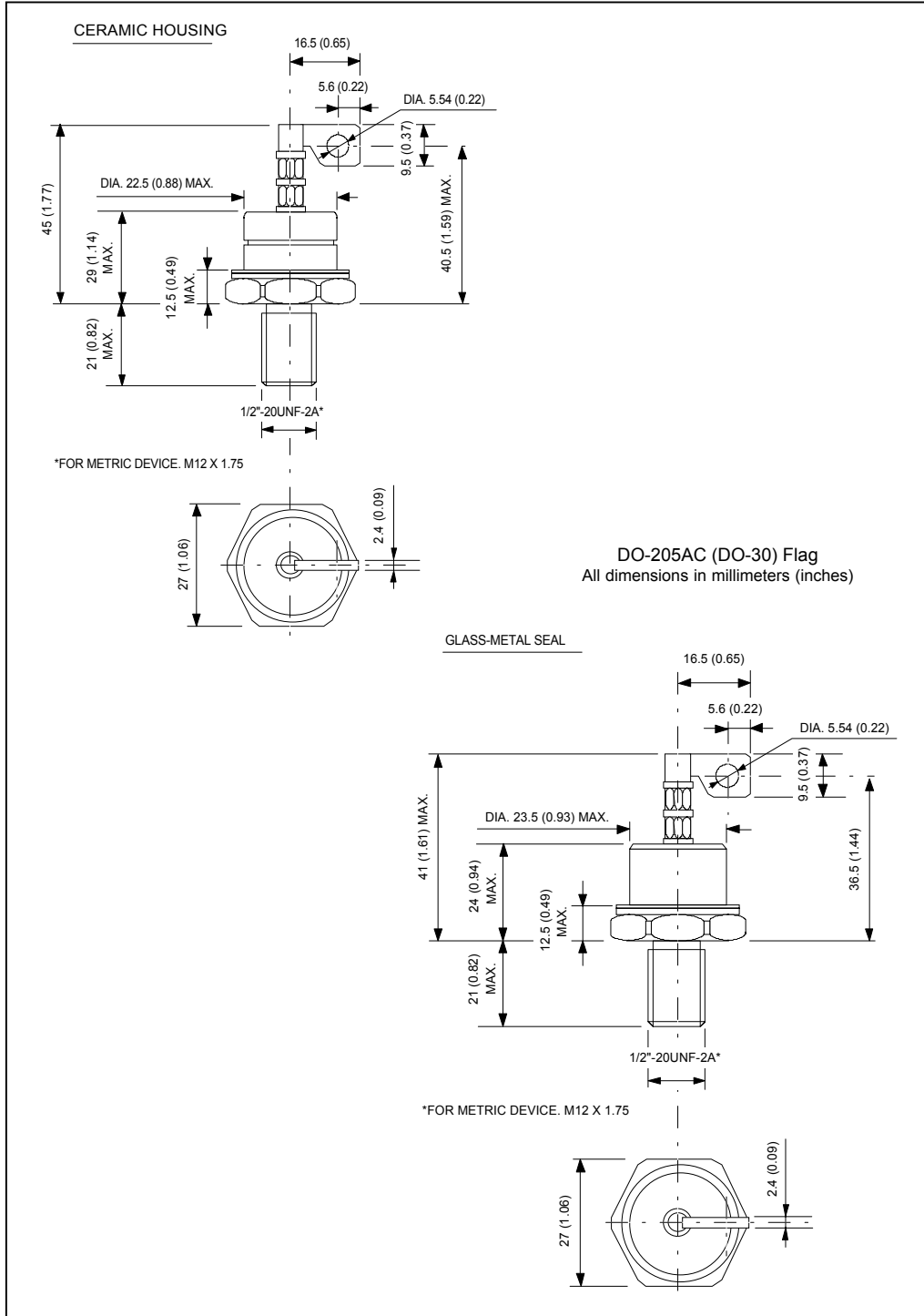
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Outline Table



Outline Table



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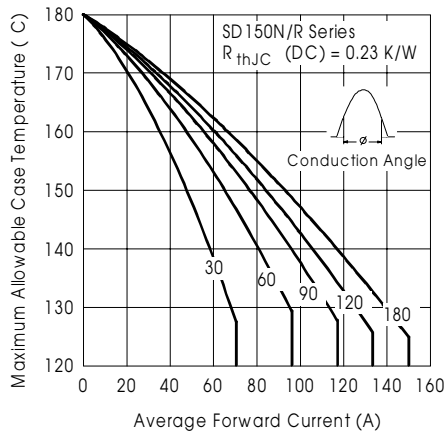


Fig. 1 - Current Ratings Characteristics

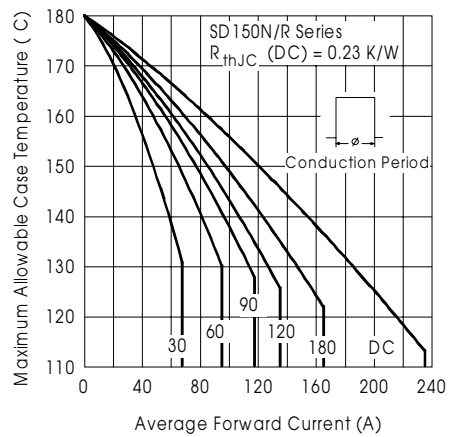


Fig. 2 - Current Ratings Characteristics

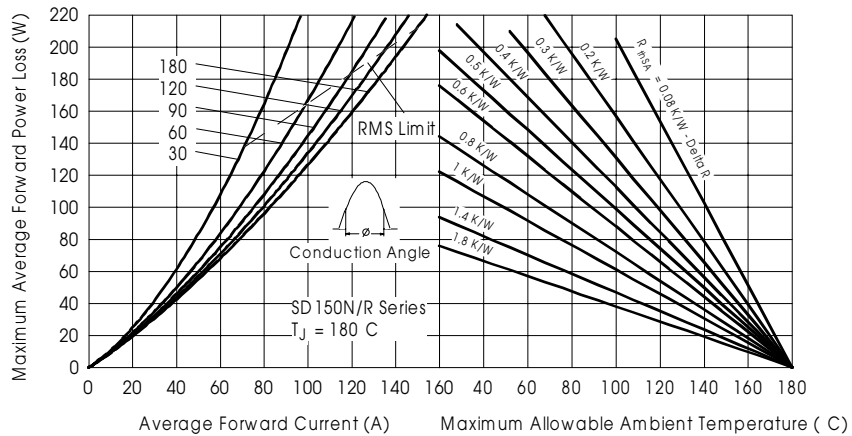


Fig. 3 - Forward Power Loss Characteristics

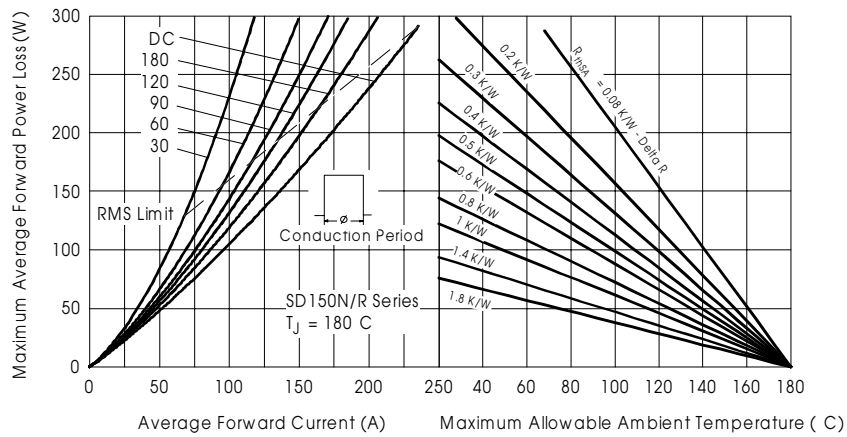


Fig. 4 - Forward Power Loss Characteristics

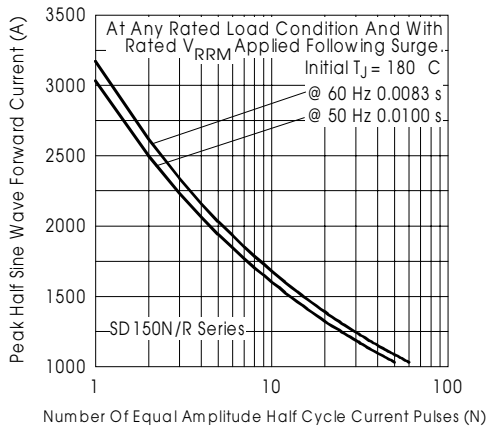


Fig. 5 - Maximum Non-Replicative Surge Current

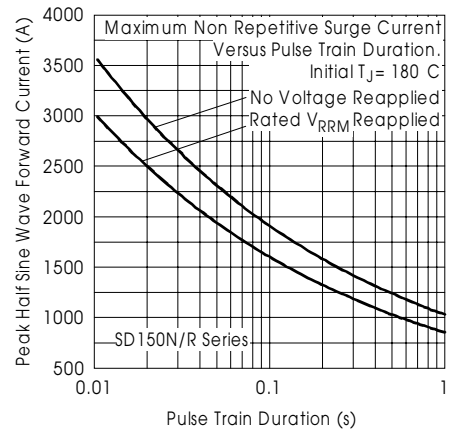


Fig. 6 - Maximum Non-Replicative Surge Current

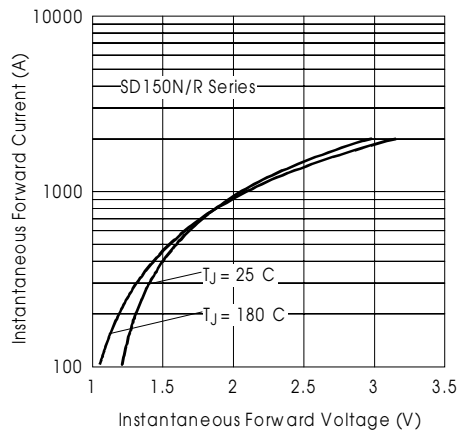


Fig. 7 - Forward Voltage Drop Characteristics

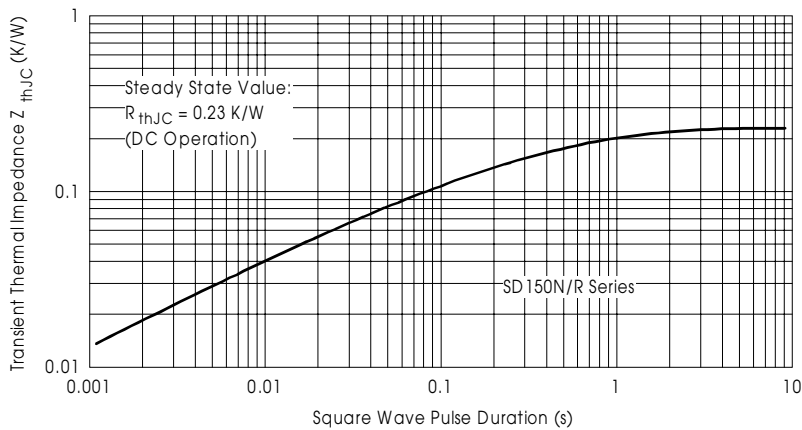


Fig. 8 - Thermal Impedance Z_{thJC} Characteristic

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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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