

STANDARD RECOVERY DIODES

Hockey Puk Version

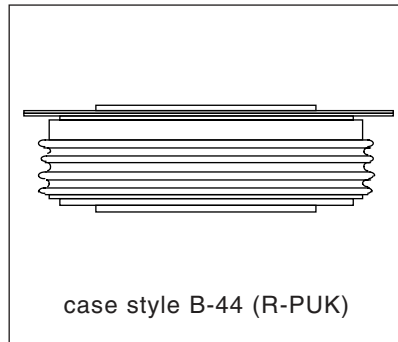
Features

- Wide current range
- High voltage ratings up to 4000V
- High surge current capabilities
- Diffused junction
- Hockey Puk version
- Case style B-44 (R-PUK)

Typical Applications

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

4450A



Major Ratings and Characteristics

| Parameters | SD4000C..R | Units | |
|-----------------|--------------|-------|-------------------|
| $I_{F(AV)}$ | 4450 | A | |
| @ T_{hs} | 55 | °C | |
| $I_{F(RMS)}$ | 7700 | A | |
| @ T_{hs} | 25 | °C | |
| I_{FSM} | @ 50Hz | 57300 | A |
| | @ 60Hz | 60000 | A |
| I^2t | @ 50Hz | 16430 | KA ² s |
| | @ 60Hz | 15000 | KA ² s |
| V_{RRM} range | 3000 to 4000 | V | |
| T_J | - 40 to 150 | °C | |

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. @ $T_J = 150^\circ\text{C}$ mA |
|-------------|--------------|--|---|---|
| SD4000C..R | 30 | 3000 | 3100 | 100 |
| | 34 | 3400 | 3500 | |
| | 38 | 3800 | 3900 | |
| | 40 | 4000 | 4100 | |

Forward Conduction

| Parameter | SD4000C..R | Units | Conditions |
|--|-------------|--------------------|--|
| $I_{F(AV)}$ Max. average forward current @ Heatsink temperature | 4450 (2200) | A | 180° conduction, half sine wave |
| | 55 (85) | °C | Double side (single side) cooled |
| $I_{F(RMS)}$ Max. RMS forward current | 7700 | A | @ 25°C heatsink temperature double side cooled |
| I_{FSM} Max. peak, one-cycle forward, non-repetitive surge current | 57300 | A | t = 10ms No voltage reappplied |
| | 60000 | | t = 8.3ms reappplied |
| | 48200 | | t = 10ms 100% V_{RRM} reappplied |
| | 50470 | | t = 8.3ms reappplied |
| I^2t Maximum I^2t for fusing | 16430 | KA ² s | t = 10ms No voltage reappplied |
| | 15000 | | t = 8.3ms reappplied |
| | 11615 | | t = 10ms 100% V_{RRM} reappplied |
| | 10605 | | t = 8.3ms reappplied |
| $I^2\sqrt{t}$ Maximum $I^2\sqrt{t}$ for fusing | 164300 | KA ² √s | t = 0.1 to 10ms, no voltage reappplied |
| $V_{F(TO)1}$ Low level value of threshold voltage | 0.830 | 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 | 1.112 | | $(I > \pi \times I_{F(AV)})$, $T_J = T_J$ max. |
| r_{f1} Low level value of forward slope resistance | 0.101 | 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 | 0.071 | | $(I > \pi \times I_{F(AV)})$, $T_J = T_J$ max. |
| V_{FM} Max. forward voltage drop | 1.44 | V | $I_{pk} = 6000A$, $T_J = T_J$ max, $t_p = 10ms$ sinusoidal wave |

Thermal and Mechanical Specifications

| Parameter | SD400C..R | Units | Conditions |
|---|-----------------|-----------|--|
| T _J Max. junction operating temperature range | -40 to 150 | °C | |
| T _{stg} Max. storage temperature range | -55 to 200 | | |
| R _{thJ-hs} Max. thermal resistance, junction to heatsink | 0.02 0.01 | K/W | DC operation single side cooled DC operation double side cooled |
| F Mounting force, ± 10% | 39200 (4000) | N (Kg) | |
| wt Approximate weight | 1590 | g | |
| Case style | B-44 (R-PUK) | | See Outline Table |

ΔR_{thJ-hs} Conduction

(The following table shows the increment of thermal resistance R_{thJ-hs} when devices operate at different conduction angles than DC)

| Conduction angle | Sinusoidal conduction | | Rectangular conduction | | Units | Conditions |
|------------------|-----------------------|-------------|------------------------|-------------|-------|--------------------------------------|
| | Single Side | Double Side | Single Side | Double Side | | |
| 180° | 0.0009 | 0.0010 | 0.0006 | 0.0006 | K/W | T _J = T _J max. |
| 120° | 0.0010 | 0.0011 | 0.0010 | 0.0010 | | |
| 90° | 0.0013 | 0.0013 | 0.0014 | 0.0014 | | |
| 60° | 0.0019 | 0.0019 | 0.0020 | 0.0020 | | |
| 30° | 0.0033 | 0.0033 | 0.0034 | 0.0034 | | |

Ordering Information Table

Device Code

| | | | | | |
|----|-----|---|---|----|---|
| SD | 400 | 0 | C | 40 | R |
| ① | ② | ③ | ④ | ⑤ | ⑥ |

- Diode
- Essential part number
- 0 = Standard recovery
- C = Ceramic Puk
- Voltage code: code x 100 = V_{RRM} (see Voltage Ratings Table)
- R = Puk Case B-44 (R-PUK)

SD4000C..R Series

Bulletin I2033 rev.B 04/00

International
IRF Rectifier

Outline Table

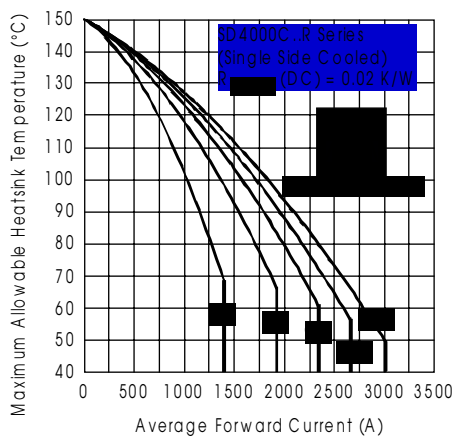
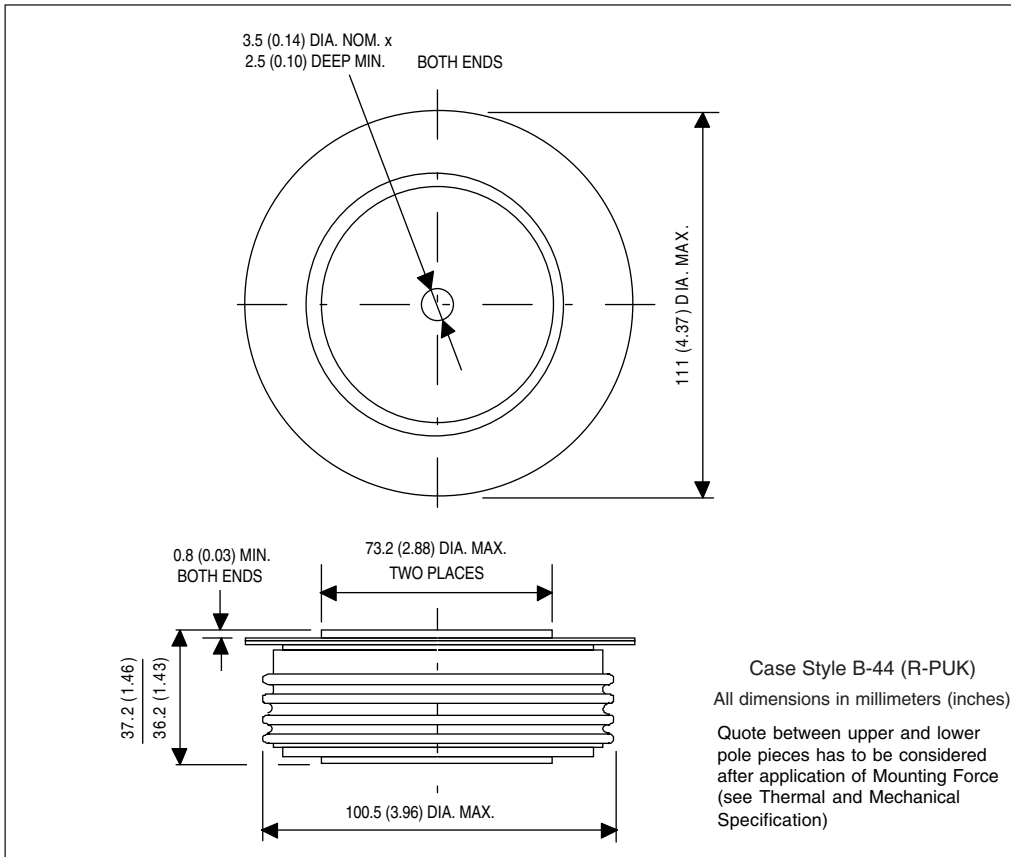


Fig. 1 - Current Ratings Characteristics

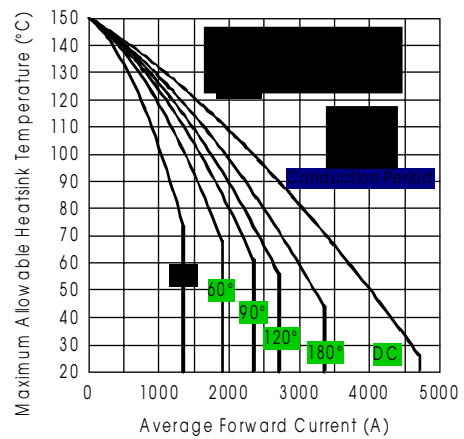


Fig. 2 - Current Ratings Characteristics

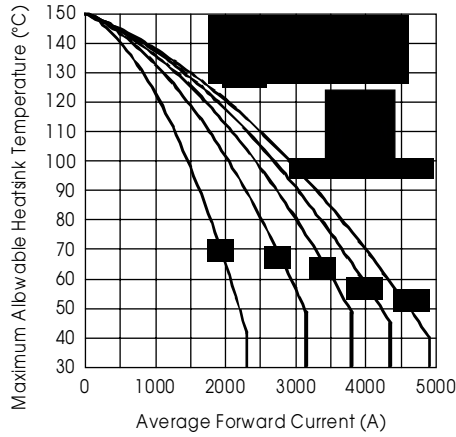


Fig. 3 - Current Ratings Characteristics

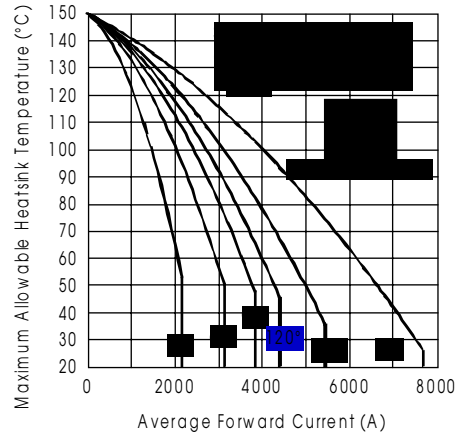


Fig. 4 - Current Ratings Characteristics

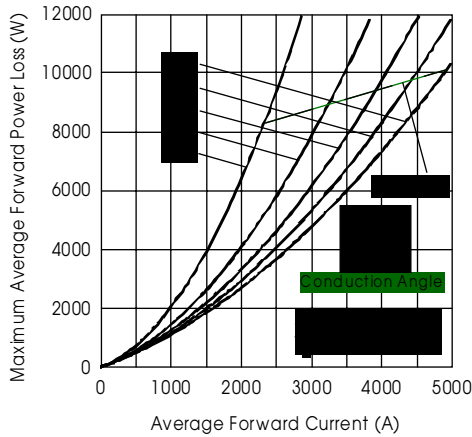


Fig. 5 - Forward Power Loss Characteristics

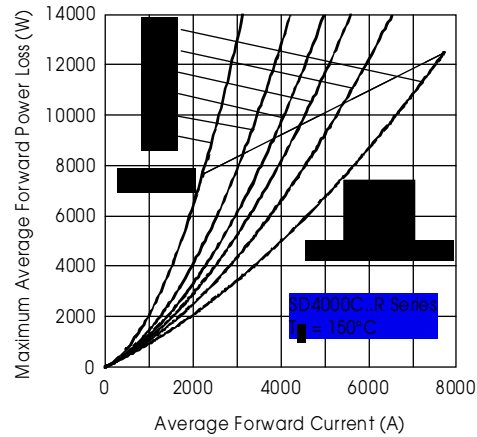


Fig. 6 - Forward Power Loss Characteristics

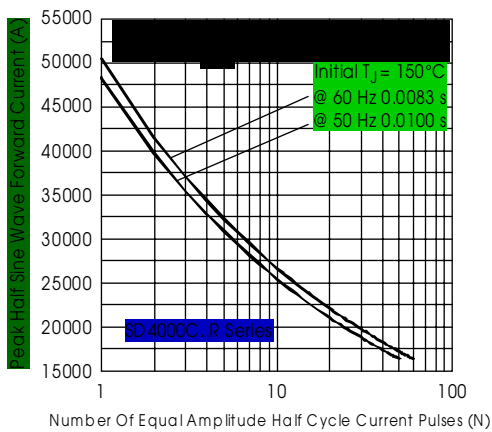


Fig. 7 - Maximum Non-Repetitive Surge Current
Single and Double Side Cooled

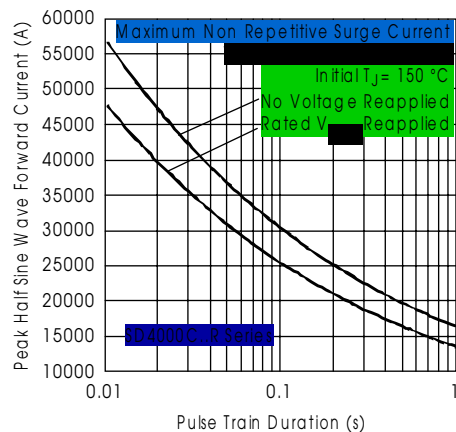


Fig. 8 - Maximum Non-Repetitive Surge Current
Single and Double Side Cooled

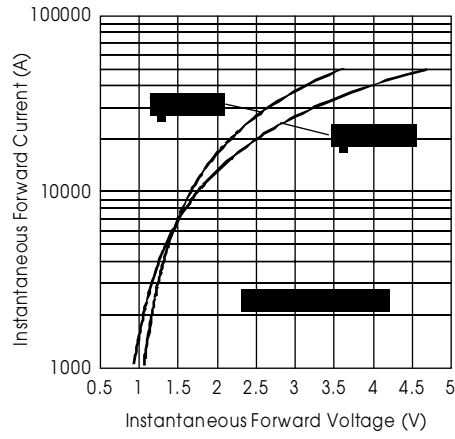


Fig. 9 - Forward Voltage Drop Characteristics

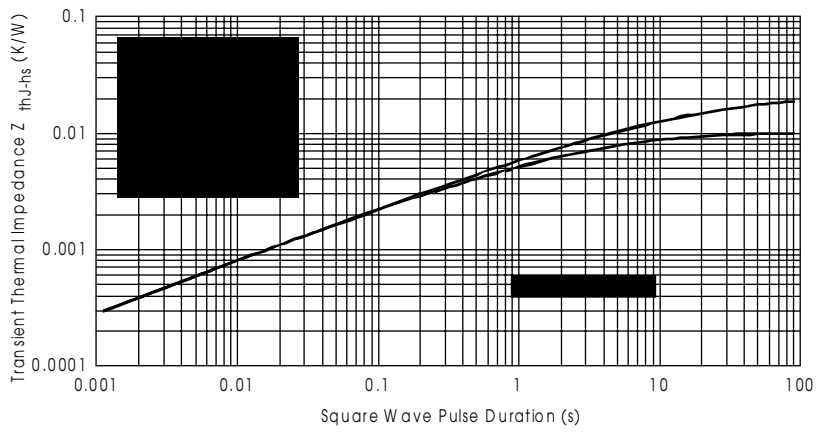


Fig. 10 - Thermal Impedance Z_{thJ-hs} Characteristics