# Standard Recovery Diodes, (Hockey PUK Version), 650 A



A-PUK (DO-200AA)

## FEATURES

- Wide current range
- High voltage ratings up to 3200 V
- High surge current capabilities
- Diffused junction
- Hockey PUK version
- Case style A-PUK (DO-200AA)
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

Pb-free

RoHS COMPLIANT

## TYPICAL APPLICATIONS

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

| PRIMARY CHARACTERISTICS | |
|---|---|
| $I_{F(AV)}$ | 650 A |
| Package | A-PUK (DO-200AA) |
| Circuit configuration | Single |

| MAJOR RATINGS AND CHARACTERISTICS | | | | |
|---|---|---|---|---|
| PARAMETER | TEST CONDITIONS | SD300C..C | | UNITS |
| | | 04 to 20 | 25 to 32 | |
| $I_{F(AV)}$ | | 650 | 540 | A |
| | $T_{hs}$ | 55 | 55 | °C |
| $I_{F(RMS)}$ | | 1150 | 995 | A |
| | $T_{hs}$ | 25 | 25 | °C |
| $I_{FSM}$ | 50 Hz | 6050 | 6050 | A |
| | 60 Hz | 6335 | 6335 | |
| $I^2t$ | 50 Hz | 183 | 183 | $kA^2s$ |
| | 60 Hz | 167 | 167 | |
| $V_{RRM}$ | Range | 400 to 2000 | 2500 to 3200 | V |
| $T_J$ | | -40 to +180 | -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 REVERSE VOLTAGE V | $I_{RRM}$ MAXIMUM AT $T_J = T_J$ MAXIMUM mA |
| VS-SD300C..C | 04 | 400 | 500 | 15 |
| | 08 | 800 | 900 | |
| | 12 | 1200 | 1300 | |
| | 16 | 1600 | 1700 | |
| | 20 | 2000 | 2100 | |
| | 25 | 2500 | 2600 | |
| | 28 | 2800 | 2900 | |
| | 32 | 3200 | 3300 | |



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## FORWARD CONDUCTION

| PARAMETER | SYMBOL | TEST CONDITIONS | | | SD300C..C 04 to 20 | SD300C..C 25 to 32 | UNITS |
|---|---|---|---|---|---|---|---|
| Maximum average forward current at heatsink temperature | $I_{F(AV)}$ | 180° conduction, half sine wave Double side (single side) cooled | | | 650 (380) | 540 (250) | A |
| | | | | | 55 (85) | 55 (85) | °C |
| Maximum RMS forward current | $I_{F(RMS)}$ | 25 °C heatsink temperature double side cooled | | | 1150 | 995 | A |
| Maximum peak, one-cycle forward, non-repetitive surge current | $I_{FSM}$ | t = 10 ms | No voltage reapplied | Sinusoidal half wave, initial $T_J = T_J$ maximum | 6050 | 6050 | A |
| | | t = 8.3 ms | | | 6335 | 6335 | |
| | | t = 10 ms | 100 % $V_{RRM}$ reapplied | | 5090 | 5090 | |
| | | t = 8.3 ms | | | 5330 | 5330 | |
| Maximum $I^2t$ for fusing | $I^2t$ | t = 10 ms | No voltage reapplied | | 183 | 183 | $kA^2s$ |
| | | t = 8.3 ms | | | 167 | 167 | |
| | | t = 10 ms | 100 % $V_{RRM}$ reapplied | | 129 | 129 | |
| | | t = 8.3 ms | | | 118 | 118 | |
| Maximum $I^2\sqrt{t}$ for fusing | $I^2\sqrt{t}$ | t = 0.1 to 10 ms, no voltage reapplied | | | 1830 | 1830 | $kA^2\sqrt{s}$ |
| Low level value of threshold voltage | $V_{F(TO)1}$ | (16.7 % x π x $I_{F(AV)}$ < I < π x $I_{F(AV)}$), $T_J = T_J$ maximum | | | 0.95 | 0.95 | V |
| High level value of threshold voltage | $V_{F(TO)2}$ | (I > π x $I_{F(AV)}$), $T_J = T_J$ maximum | | | 1.00 | 1.00 | |
| Low level values of forward slope resistance | $r_{f1}$ | (16.7 % x π x $I_{F(AV)}$ < I < π x $I_{F(AV)}$), $T_J = T_J$ maximum | | | 0.75 | 0.75 | mW |
| High level values of forward slope resistance | $r_{f2}$ | (I > π x $I_{F(AV)}$), $T_J = T_J$ maximum | | | 0.72 | 0.72 | |
| Maximum forward voltage drop | $V_{FM}$ | $I_{pk}$ = 1500 A, $T_J = T_J$ maximum; $t_p$ = 10 ms sinusoidal wave | | | 2.08 | 2.08 | V |

## THERMAL AND MECHANICAL SPECIFICATIONS

| PARAMETER | SYMBOL | TEST CONDITIONS | SD300C..C 04 to 20 | SD300C..C 25 to 32 | UNITS |
|---|---|---|---|---|---|
| Maximum operating temperature range | $T_J$ | | -40 to 180 | -40 to 150 | °C |
| Maximum storage temperature range | $T_{Stg}$ | | -55 to 200 | | |
| Maximum thermal resistance, junction to heatsink | $R_{thJ-hs}$ | DC operation single side cooled | 0.163 | | K/W |
| | | DC operation double side cooled | 0.073 | | |
| Mounting force, ± 10 % | | | 4900 (500) | | N (kg) |
| Approximate weight | | | 70 | | g |
| Case style | | See dimensions - link at the end of datasheet | A-PUK (DO-200AA) | | |

## $\Delta R_{thJ-hs}$ CONDUCTION

| CONDUCTION ANGLE | SINUSOIDAL CONDUCTION | | RECTANGULAR CONDUCTION | | TEST CONDITIONS | UNITS |
|---|---|---|---|---|---|---|
| | SINGLE SIDE | DOUBLE SIDE | SINGLE SIDE | DOUBLE SIDE | | |
| 180° | 0.017 | 0.017 | 0.011 | 0.012 | $T_J = T_J$ maximum | K/W |
| 120° | 0.020 | 0.020 | 0.020 | 0.020 | | |
| 90° | 0.025 | 0.025 | 0.027 | 0.027 | | |
| 60° | 0.036 | 0.036 | 0.038 | 0.038 | | |
| 30° | 0.064 | 0.062 | 0.065 | 0.062 | | |

**Note**

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


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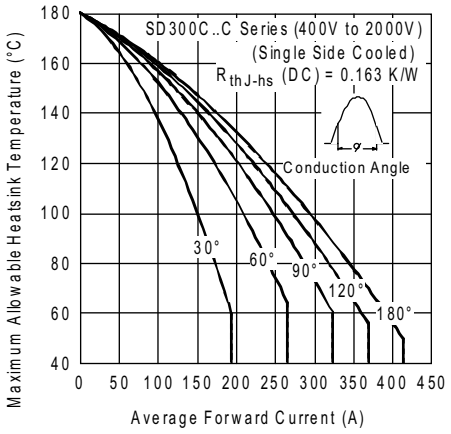



Fig. 1 - Current Ratings Characteristics

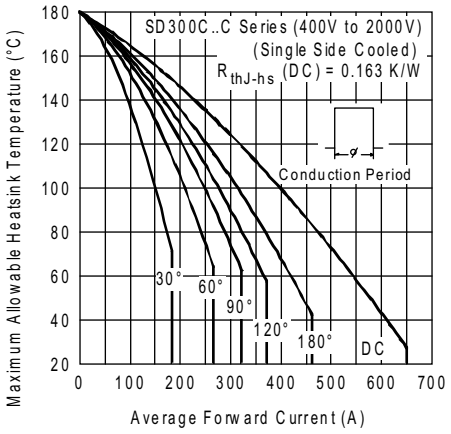



Fig. 2 - Current Ratings Characteristics

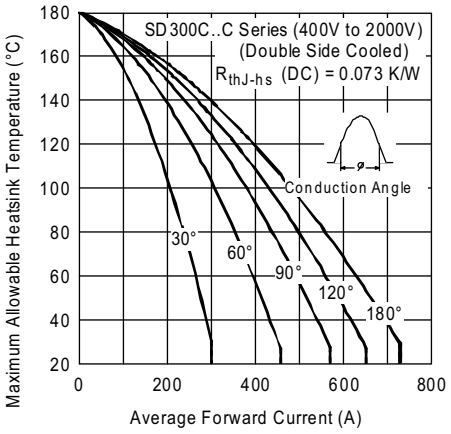



Fig. 3 - Current Ratings Characteristics

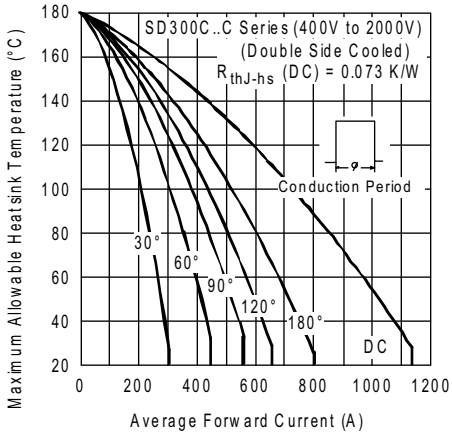



Fig. 4 - Current Ratings Characteristics

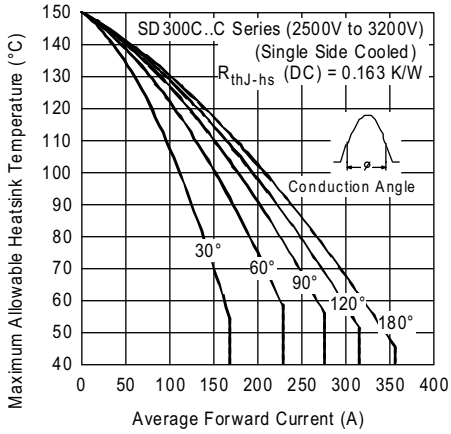



Fig. 5 - Current Ratings Characteristics

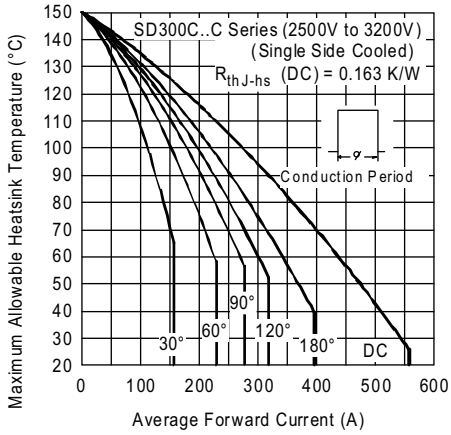



Fig. 6 - Current Ratings Characteristics


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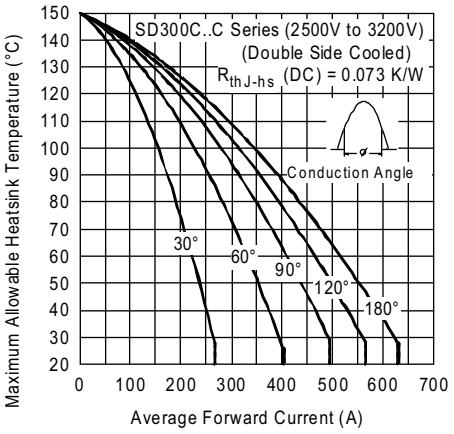



Fig. 7 - Current Ratings Characteristics

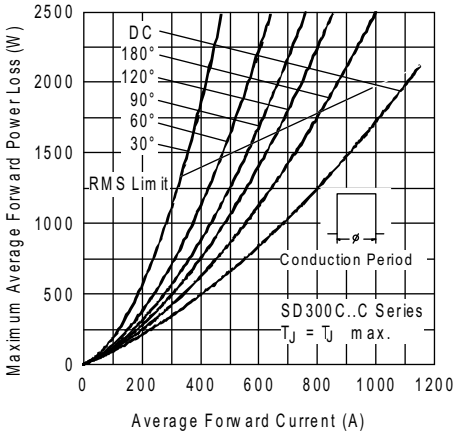



Fig. 10 - Forward Power Loss Characteristics

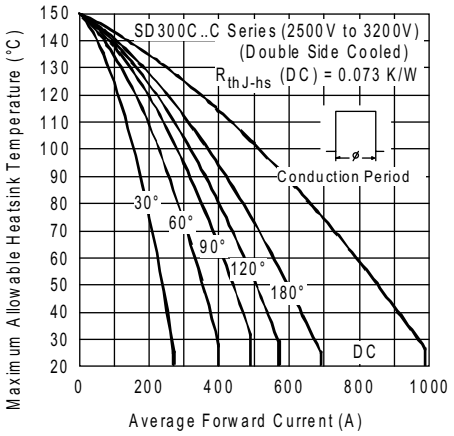



Fig. 8 - Current Ratings Characteristics

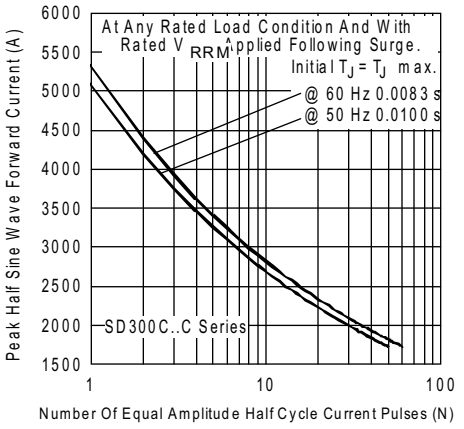



Fig. 11 - Maximum Non-Repetitive Surge Current
Single and Double Side Cooled

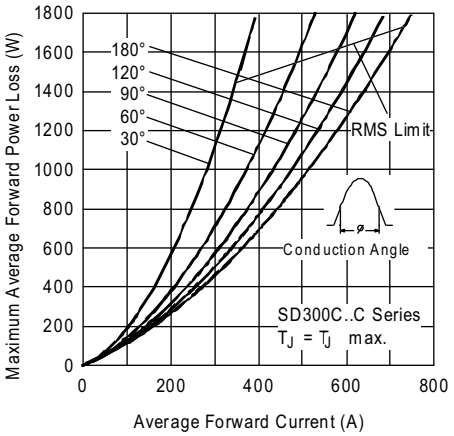



Fig. 9 - Forward Power Loss Characteristics

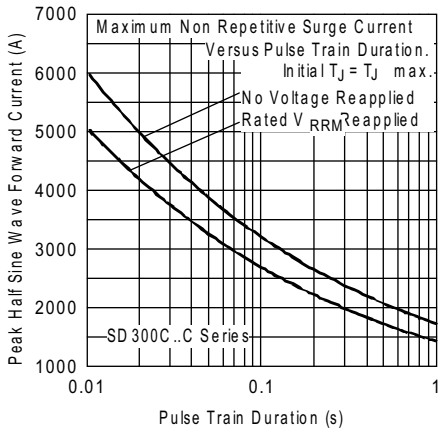



Fig. 12 - Maximum Non-Repetitive Surge Current
Single and Double Side Cooled


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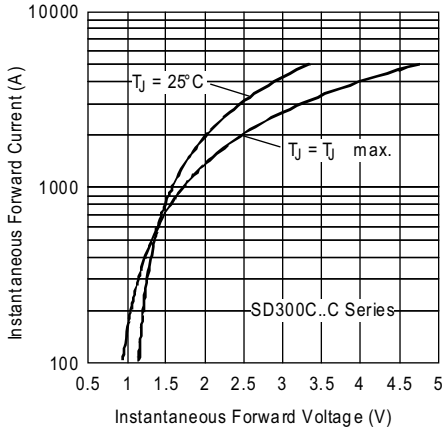



Fig. 13 - Forward Voltage Drop Characteristics

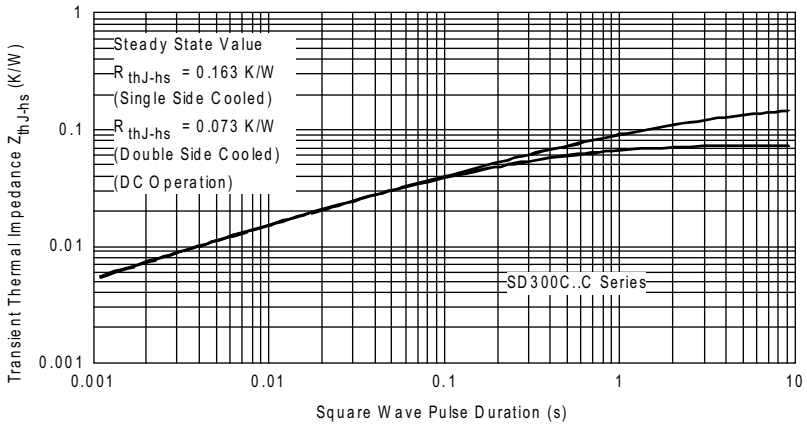



Fig. 14 - Thermal Impedance $Z_{thJC}$ Characteristics

## ORDERING INFORMATION TABLE

**Device code**

| VS- | SD | 30 | 0 | C | 32 | C |
|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |

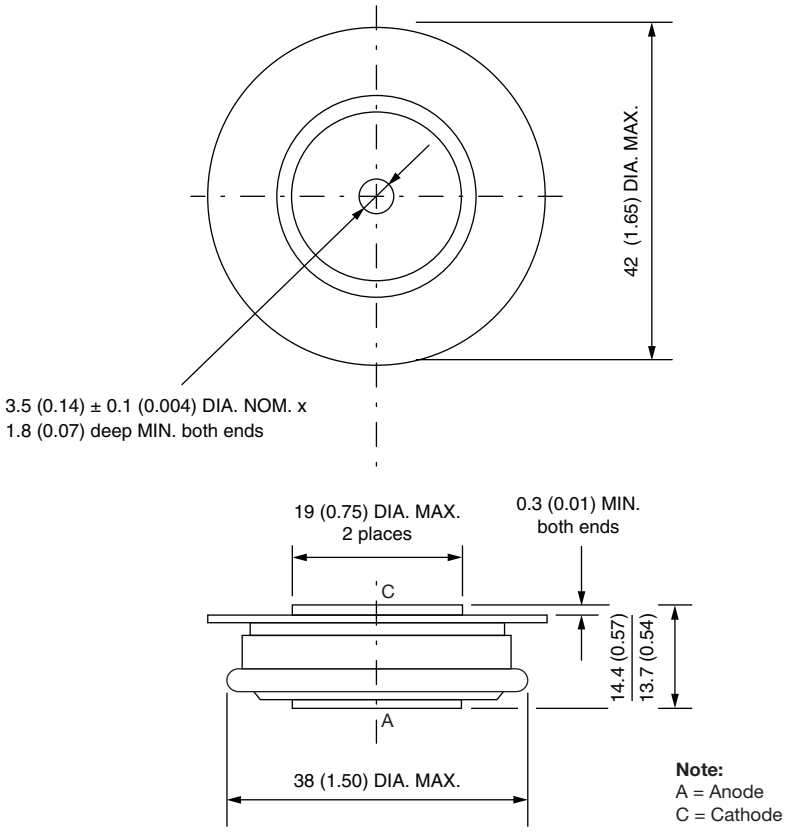
- **1** - Vishay Semiconductors product
- **2** - Diode
- **3** - Essential part number
- **4** - 0 = standard recovery
- **5** - C = ceramic PUK
- **6** - Voltage code x 100 = $V_{RRM}$ (see Voltage Ratings table)
- **7** - C = PUK case A-PUK (DO-200AA)

| LINKS TO RELATED DOCUMENTS | |
|---|---|
| Dimensions | www.vishay.com/doc?95248 |


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# DO-200AA

**DIMENSIONS** in millimeters (inches)




Quote between upper and lower pole pieces has to be considered after application of mounting force (see Thermal and Mechanical Specifications)



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