

## Standard Recovery Diodes, (Hockey PUK Version), 3800 A


**K-PUK (DO-200AC)**

### FEATURES

- Wide current range
- High voltage ratings up to 1000 V
- High surge current capabilities
- Diffused junction
- Hockey PUK version
- Case style K-PUK (DO-200AC)
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)


**RoHS**  
COMPLIANT

### TYPICAL APPLICATIONS

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

#### PRIMARY CHARACTERISTICS

|                       |                  |
|-----------------------|------------------|
| $I_{F(AV)}$           | 3800 A           |
| Package               | K-PUK (DO-200AC) |
| Circuit configuration | Single           |

#### MAJOR RATINGS AND CHARACTERISTICS

| PARAMETER    | TEST CONDITIONS | VALUES      | UNITS             |
|--------------|-----------------|-------------|-------------------|
| $I_{F(AV)}$  |                 | 3800        | A                 |
|              | $T_{hs}$        | 55          | °C                |
| $I_{F(RMS)}$ |                 | 6230        | A                 |
|              | $T_{hs}$        | 25          | °C                |
| $I_{FSM}$    | 50 Hz           | 35 800      | A                 |
|              | 60 Hz           | 37 500      |                   |
| $I^2t$       | 50 Hz           | 6410        | kA <sup>2</sup> s |
|              | 60 Hz           | 5850        |                   |
| $V_{RRM}$    | Range           | 400 to 1000 | V                 |
| $T_J$        |                 | -40 to +180 | °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 $T_J = 180$ °C mA |
| VS-SD3000C..K   | 04           | 400   | 500   | 75                                     |
|                 | 08           | 800   | 900   |  |
|                 | 10           | 1000  | 1100  |  |

| FORWARD CONDUCTION  |               |  |                           |   |             |                    |  |
|---|---------------|--|---------------------------|---|-------------|--------------------|--|
| PARAMETER   | SYMBOL        | TEST CONDITIONS  |                           |   | VALUES      | UNITS              |  |
| Maximum average forward current at heatsink temperature       | $I_{F(AV)}$   | 180° conduction, half sine wave<br>Double side (single side) cooled                      |                           |   | 3800 (1925) | A                  |  |
|   |               |  |                           |   | 55 (85)     | °C                 |  |
| Maximum RMS forward current                                   | $I_{F(RMS)}$  | 25 °C heatsink temperature double side cooled  |                           |   | 6230        | A                  |  |
| Maximum peak, one-cycle forward, non-repetitive surge current | $I_{FSM}$     | $t = 10 \text{ ms}$  | No voltage reapplied      | Sinusoidal half wave, initial $T_J = T_J$ maximum | 35 800      |                    |  |
|   |               | $t = 8.3 \text{ ms}$   | 37 500                    |   |             |                    |  |
|   |               | $t = 10 \text{ ms}$  | 100 % $V_{RRM}$ reapplied |   | 30 100      |                    |  |
|   |               | $t = 8.3 \text{ ms}$   | 31 500                    |   |             |                    |  |
| Maximum $I^2t$ for fusing                                     | $I^2t$        | $t = 10 \text{ ms}$  | No voltage reapplied      | Sinusoidal half wave, initial $T_J = T_J$ maximum | 6410        | kA <sup>2</sup> s  |  |
|   |               | $t = 8.3 \text{ ms}$   | 5850                      |   |             |                    |  |
|   |               | $t = 10 \text{ ms}$  | 100 % $V_{RRM}$ reapplied |   | 4530        |                    |  |
|   |               | $t = 8.3 \text{ ms}$   | 4135                      |   |             |                    |  |
| Maximum $I^2\sqrt{t}$ for fusing                              | $I^2\sqrt{t}$ | $t = 0.1 \text{ to } 10 \text{ ms}$ , no voltage reapplied                               |                           |   | 64 100      | kA <sup>2</sup> √s |  |
| Low level value of threshold voltage                          | $V_{F(TO)1}$  | $(16.7 \% \times \pi \times I_{F(AV)} < I < \pi \times I_{F(AV)})$ , $T_J = T_J$ maximum |                           |   | 0.74        | V                  |  |
| High level value of threshold voltage                         | $V_{F(TO)2}$  | $(I > \pi \times I_{F(AV)})$ , $T_J = T_J$ maximum                                       |                           |   | 0.86        |                    |  |
| Low level value of forward slope resistance                   | $r_{f1}$      | $(16.7 \% \times \pi \times I_{F(AV)} < I < \pi \times I_{F(AV)})$ , $T_J = T_J$ maximum |                           |   | 0.08        | mW                 |  |
| High level value of forward slope resistance                  | $r_{f2}$      | $(I > \pi \times I_{F(AV)})$ , $T_J = T_J$ maximum                                       |                           |   | 0.07        |                    |  |
| Maximum forward voltage drop                                  | $V_{FM}$      | $I_{pk} = 6000 \text{ A}$ , $T_J = T_J$ maximum<br>$t_p = 10 \text{ ms}$ sinusoidal wave |                           |   | 1.22        | V                  |  |

| THERMAL AND MECHANICAL SPECIFICATIONS            |              |   |  |  |                  |        |
|--|--------------|---|--|--|------------------|--------|
| PARAMETER  | SYMBOL       | TEST CONDITIONS                               |  |  | VALUES           | UNITS  |
| Maximum junction operating temperature range     | $T_J$        |   |  |  | -40 to +180      | °C     |
| Maximum storage temperature range                | $T_{Stg}$    |   |  |  | -55 to +200      |        |
| Maximum thermal resistance, junction to heatsink | $R_{thJ-hs}$ | DC operation single side cooled               |  |  | 0.042            | K/W    |
|  |              | DC operation double side cooled               |  |  | 0.020            |        |
| Mounting force, ± 10 %                           |              |   |  |  | 22 250 (2250)    | N (kg) |
| Approximate weight                               |              |   |  |  | 425              | g      |
| Case style                                       |              | See dimensions - link at the end of datasheet |  |  | K-PUK (DO-200AC) |        |

| $\Delta R_{thJ-hs}$ CONDUCTION |                       |             |                        |             |                     |       |
|--------------------------------|-----------------------|-------------|------------------------|-------------|---------------------|-------|
| CONDUCTION ANGLE               | SINUSOIDAL CONDUCTION |             | RECTANGULAR CONDUCTION |             | TEST CONDITIONS     | UNITS |
|                                | SINGLE SIDE           | DOUBLE SIDE | SINGLE SIDE            | DOUBLE SIDE |                     |       |
| 180°                           | 0.002                 | 0.002       | 0.001                  | 0.001       | $T_J = T_J$ maximum | K/W   |
| 120°                           | 0.002                 | 0.002       | 0.002                  | 0.002       |                     |       |
| 90°                            | 0.003                 | 0.003       | 0.003                  | 0.003       |                     |       |
| 60°                            | 0.004                 | 0.004       | 0.004                  | 0.004       |                     |       |
| 30°                            | 0.007                 | 0.007       | 0.007                  | 0.007       |                     |       |

**Note**

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

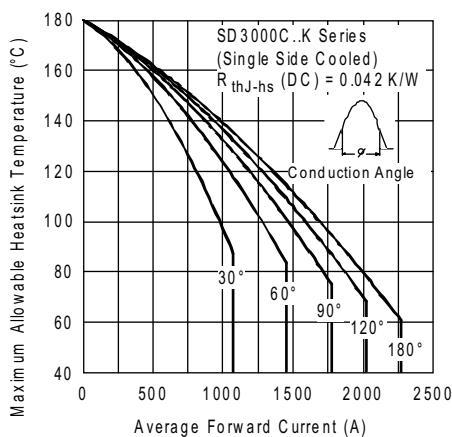


Fig. 1 - Current Ratings Characteristics

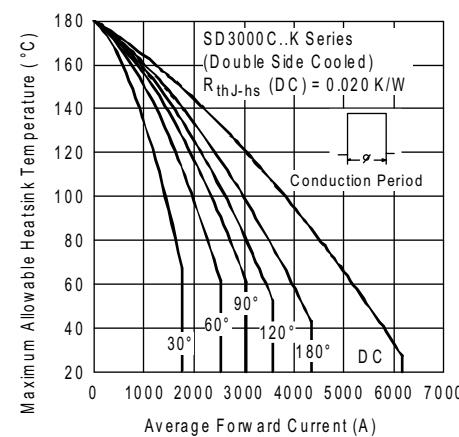


Fig. 4 - Current Ratings Characteristics

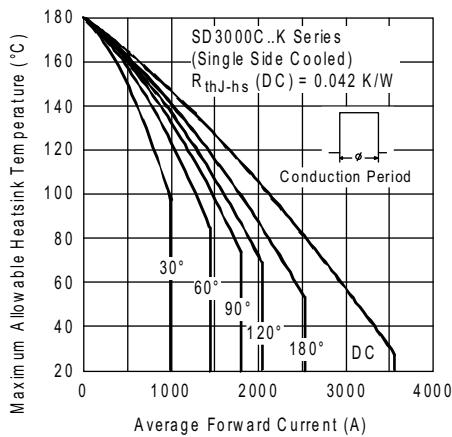


Fig. 2 - Current Ratings Characteristics

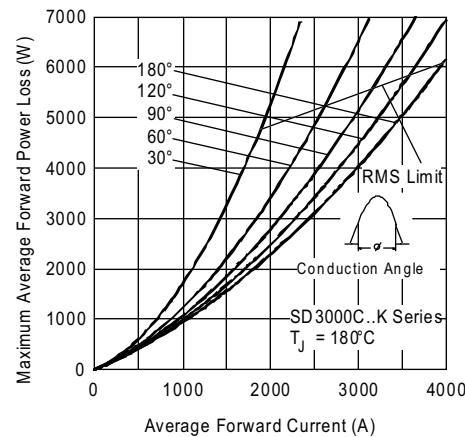


Fig. 5 - Forward Power Loss Characteristics

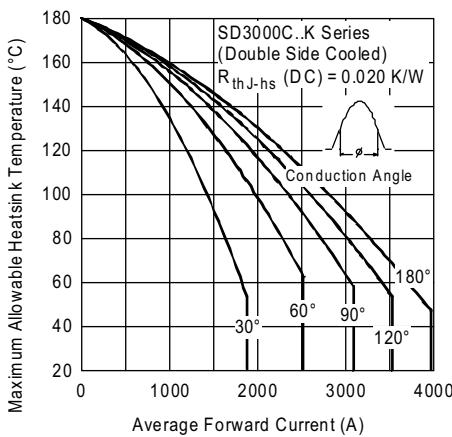


Fig. 3 - Current Ratings Characteristics

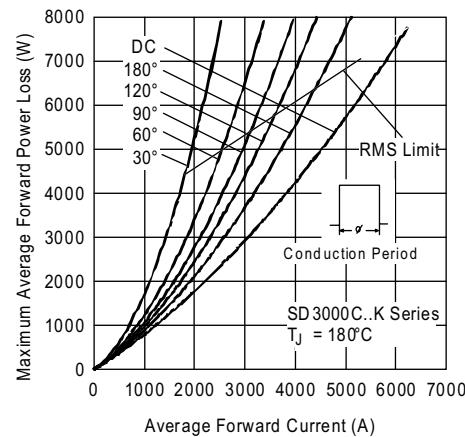


Fig. 6 - Forward Power Loss Characteristics

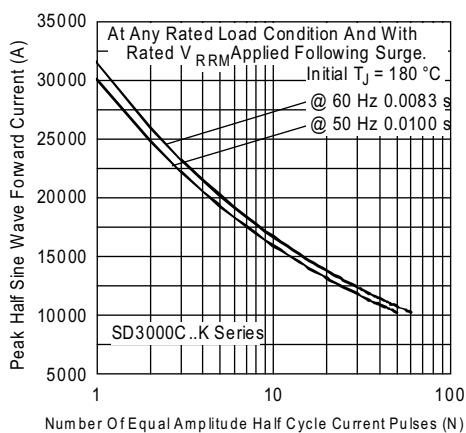


Fig. 7 - Maximum Non-Repetitive Surge Current  
Single and Double Side Cooled

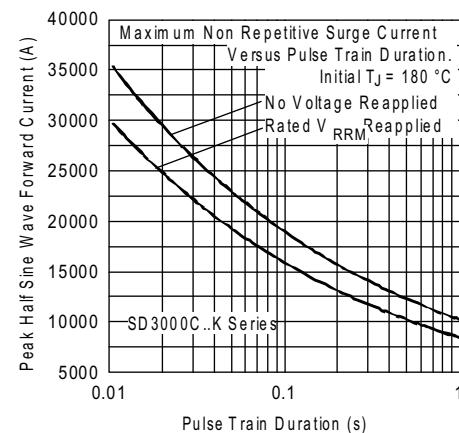


Fig. 8 - Maximum Non-Repetitive Surge Current  
Single and Double Side Cooled

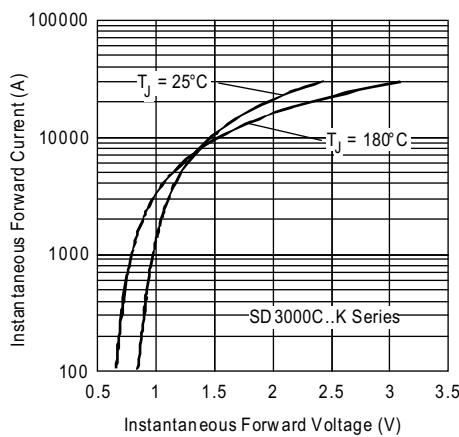


Fig. 9 - Forward Voltage Drop Characteristics

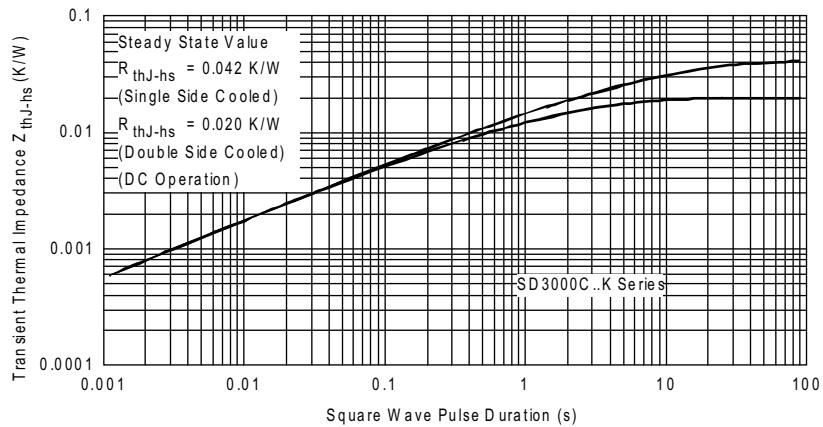
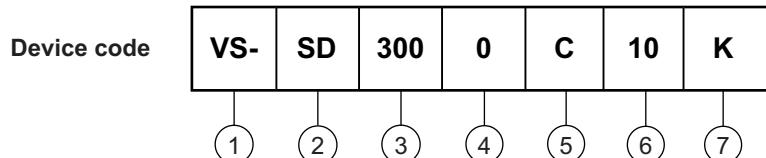


Fig. 10 - Thermal Impedance  $Z_{thJ-hs}$  Characteristics

**ORDERING INFORMATION TABLE**

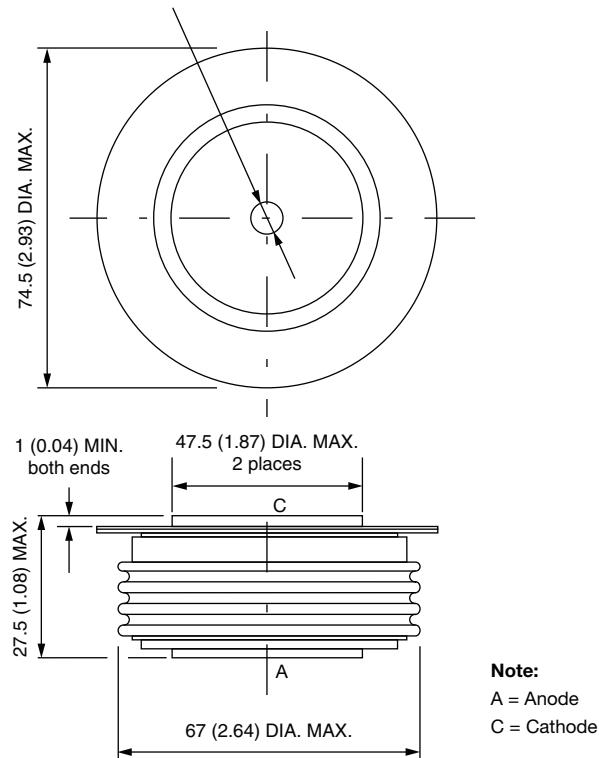
|   |  |
|---|--|
| 1 | - Vishay Semiconductors product                              |
| 2 | - Diode  |
| 3 | - Essential part number                                      |
| 4 | - 0 = standard recovery                                      |
| 5 | - C = ceramic PUK  |
| 6 | - Voltage code x 100 = $V_{RRM}$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

| LINKS TO RELATED DOCUMENTS |  |
|----------------------------|--|
| Dimensions                 | <a href="http://www.vishay.com/doc?95247">www.vishay.com/doc?95247</a> |

## K-PUK (DO-200AC)

**DIMENSIONS** in millimeters (inches)

3.5 (0.14) DIA. NOM. x  
1.8 (0.07) deep MIN. both ends



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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