



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



DO-200AA

### FEATURES

- Wide current range
- High voltage ratings up to 3200 V
- High surge current capabilities
- Diffused junction
- Hockey PUK version
- Case style DO-200AA
- 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
- Machine tool controls
- High power drives
- Medium traction applications

| PRODUCT SUMMARY       |              |
|-----------------------|--------------|
| $I_{F(AV)}$           | 650 A        |
| Package               | DO-200AA     |
| Circuit configuration | Single diode |

| 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 <sup>2</sup> s |
|                                   | 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<br>V | $V_{RSM}$ , MAXIMUM NON-REPETITIVE PEAK REVERSE VOLTAGE<br>V | $I_{RRM}$ MAXIMUM AT $T_J = T_J$ MAXIMUM<br>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   |  |



| FORWARD CONDUCTION  |               |   |                            |           |           |                    |
|---|---------------|---|----------------------------|-----------|-----------|--------------------|
| PARAMETER   | SYMBOL        | TEST CONDITIONS   |                            | SD300C..C |           | UNITS              |
|   |               |   |                            | 04 to 20  | 25 to 32  |                    |
| Maximum average forward current at heatsink temperature       | $I_{F(AV)}$   | 180° conduction, half sine wave<br>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 reappplied      | 6050      | 6050      |                    |
|   |               | t = 8.3 ms  |                            | 6335      | 6335      |                    |
|   |               | t = 10 ms   | 100 % $V_{RRM}$ reappplied | 5090      | 5090      |                    |
|   |               | t = 8.3 ms  |                            | 5330      | 5330      |                    |
| Maximum $I^2t$ for fusing                                     | $I^2t$        | t = 10 ms   | No voltage reappplied      | 183       | 183       | kA <sup>2</sup> s  |
|   |               | t = 8.3 ms  |                            | 167       | 167       |                    |
|   |               | t = 10 ms   | 100 % $V_{RRM}$ reappplied | 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 reappplied   |                            | 1830      | 1830      | 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) |                            | 0.95      | 0.95      | V                  |
| High level value of threshold voltage                         | $V_{F(TO)2}$  | (I > $\pi \times I_{F(AV)}$ , $T_J = T_J$ maximum)                                      |                            | 1.00      | 1.00      |                    |
| Low level values 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) |                            | 0.75      | 0.75      | mW                 |
| High level values of forward slope resistance                 | $r_{f2}$      | (I > $\pi \times I_{F(AV)}$ , $T_J = T_J$ maximum)                                      |                            | 0.72      | 0.72      |                    |
| Maximum forward voltage drop                                  | $V_{FM}$      | $I_{pk} = 1500$ A, $T_J = T_J$ maximum;<br>$t_p = 10$ ms sinusoidal wave                |                            | 2.08      | 2.08      | V                  |

| THERMAL AND MECHANICAL SPECIFICATIONS            |              |   |  |            |            |        |
|--|--------------|---|--|------------|------------|--------|
| PARAMETER  | SYMBOL       | TEST CONDITIONS                               |  | SD300C..C  |            | UNITS  |
|  |              |   |  | 04 to 20   | 25 to 32   |        |
| 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 |  | 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

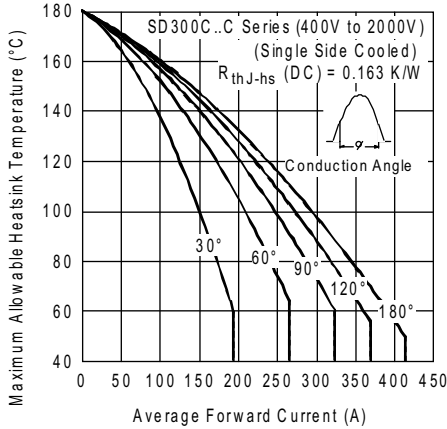


Fig. 1 - Current Ratings Characteristics

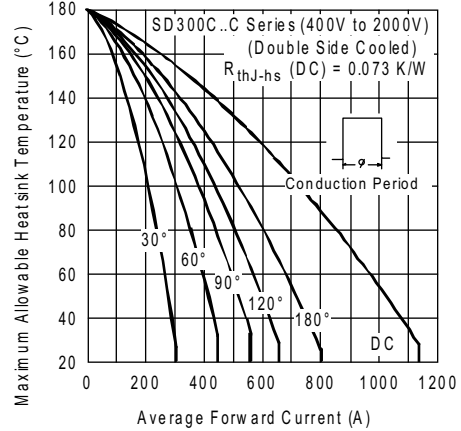


Fig. 4 - Current Ratings Characteristics

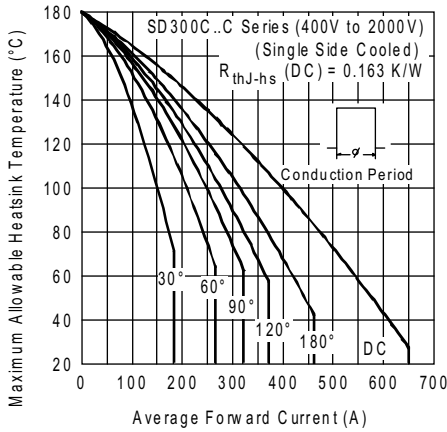


Fig. 2 - Current Ratings Characteristics



Fig. 5 - Current Ratings Characteristics

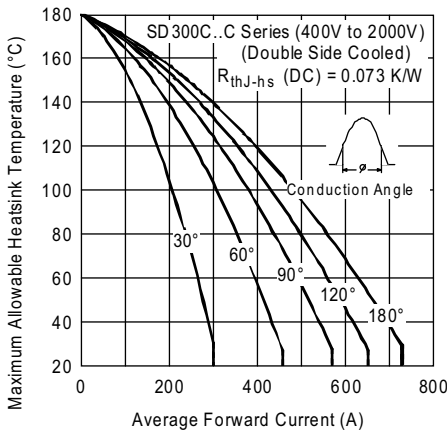


Fig. 3 - Current Ratings Characteristics



Fig. 6 - Current Ratings Characteristics

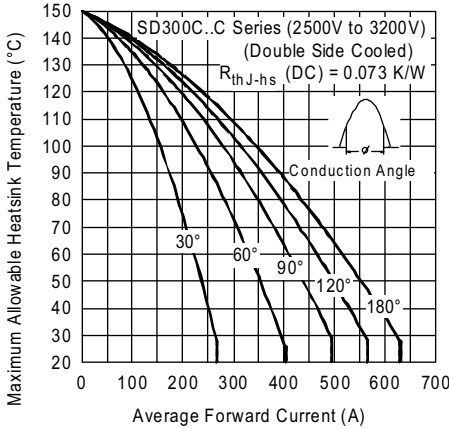


Fig. 7 - Current Ratings Characteristics

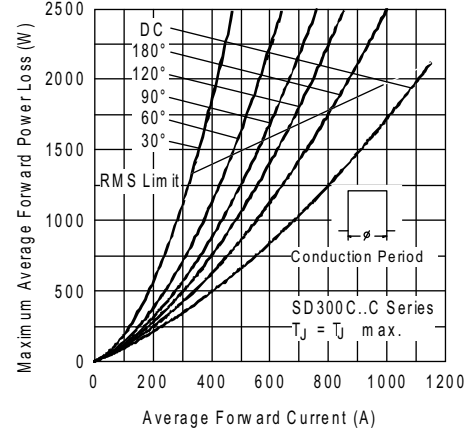


Fig. 10 - Forward Power Loss Characteristics

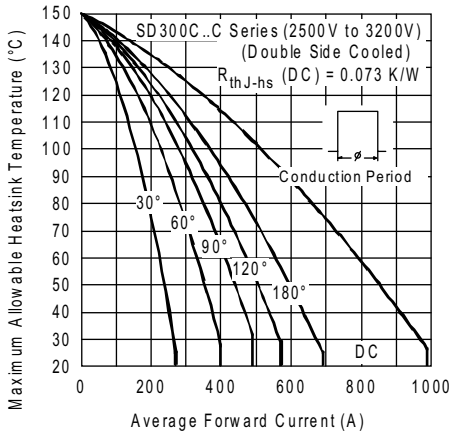


Fig. 8 - Current Ratings Characteristics

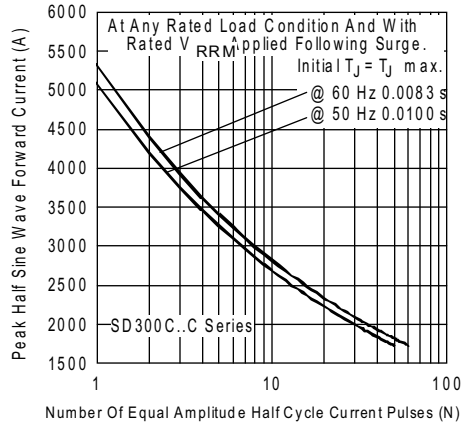


Fig. 11 - Maximum Non-Repetitive Surge Current Single and Double Side Cooled

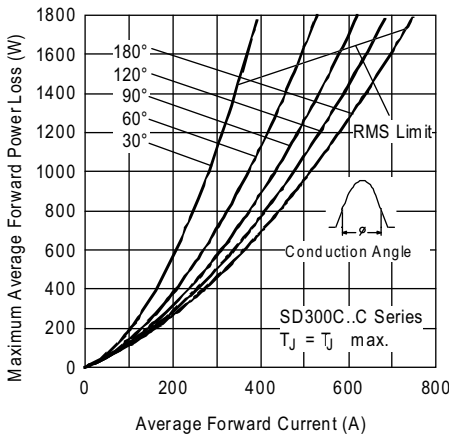


Fig. 9 - Forward Power Loss Characteristics

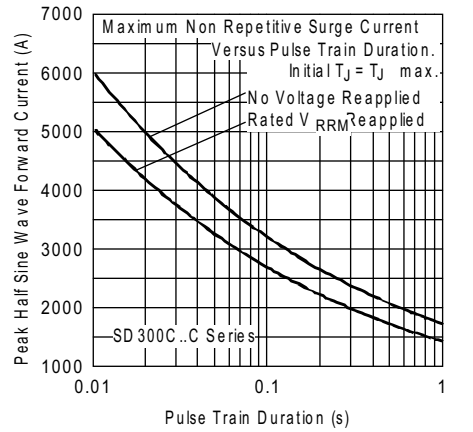


Fig. 12 - Maximum Non-Repetitive Surge Current Single and Double Side Cooled



Fig. 13 - Forward Voltage Drop Characteristics



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

**ORDERING INFORMATION TABLE**

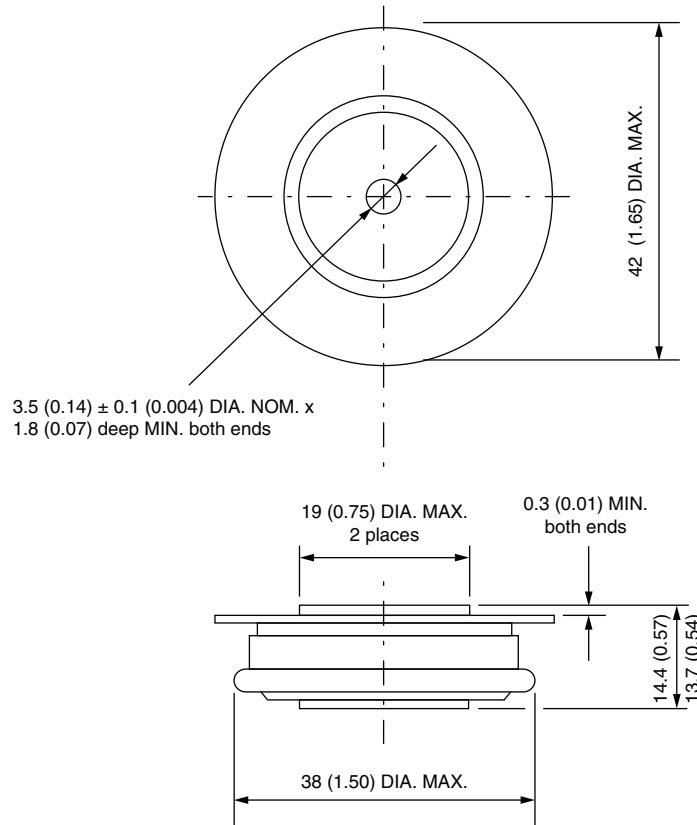
|             |            |           |  |          |          |           |          |
|-------------|------------|-----------|--|----------|----------|-----------|----------|
| Device code | <b>VS-</b> | <b>SD</b> | <b>30</b>  | <b>0</b> | <b>C</b> | <b>32</b> | <b>C</b> |
|             | ①          | ②         | ③  | ④        | ⑤        | ⑥         | ⑦        |
|             | <b>1</b>   | -         | Vishay Semiconductors product                              |          |          |           |          |
|             | <b>2</b>   | -         | Diode  |          |          |           |          |
|             | <b>3</b>   | -         | Essential part number                                      |          |          |           |          |
|             | <b>4</b>   | -         | 0 = Standard recovery                                      |          |          |           |          |
|             | <b>5</b>   | -         | C = Ceramic PUK  |          |          |           |          |
|             | <b>6</b>   | -         | Voltage code x 100 = $V_{RRM}$ (see Voltage Ratings table) |          |          |           |          |
|             | <b>7</b>   | -         | C = PUK case DO-200AA                                      |          |          |           |          |

**LINKS TO RELATED DOCUMENTS**

|            |  |
|------------|--|
| Dimensions | <a href="http://www.vishay.com/doc?95248">www.vishay.com/doc?95248</a> |
|------------|--|

## 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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