

## 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                  |
| Maximum RMS forward current                                   | $I_{F(RMS)}$  | 25 °C heatsink temperature double side cooled                                                                                                                                                                                             | 55 (85)   | 55 (85)   | °C                 |
| Maximum peak, one-cycle forward, non-repetitive surge current | $I_{FSM}$     | <div> <div> <div>t = 10 ms</div> <div>t = 8.3 ms</div> </div> <div> <div>No voltage reapplied</div> <div>100 % <math>V_{RRM}</math> reapplied</div> </div> </div> <div>Sinusoidal half wave, initial <math>T_J = T_J</math> maximum</div> | 6050      | 6050      | A                  |
|                                                               |               |                                                                                                                                                                                                                                           | 6335      | 6335      |                    |
|                                                               |               |                                                                                                                                                                                                                                           | 5090      | 5090      |                    |
|                                                               |               |                                                                                                                                                                                                                                           | 5330      | 5330      |                    |
| Maximum $I^2t$ for fusing                                     | $I^2t$        | <div> <div> <div>t = 10 ms</div> <div>t = 8.3 ms</div> </div> <div> <div>No voltage reapplied</div> <div>100 % <math>V_{RRM}</math> reapplied</div> </div> </div> <div>Sinusoidal half wave, initial <math>T_J = T_J</math> maximum</div> | 183       | 183       | kA <sup>2</sup> s  |
|                                                               |               |                                                                                                                                                                                                                                           | 167       | 167       |                    |
|                                                               |               |                                                                                                                                                                                                                                           | 129       | 129       |                    |
|                                                               |               |                                                                                                                                                                                                                                           | 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 <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

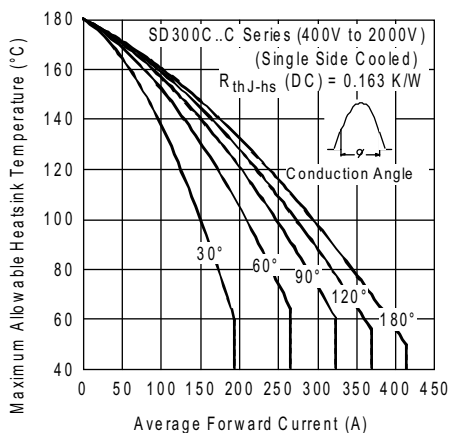


Fig. 1 - Current Ratings Characteristics

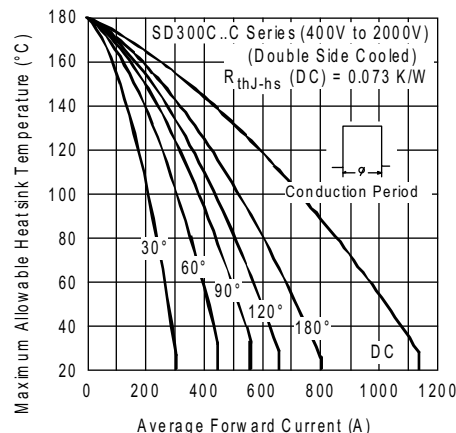


Fig. 4 - Current Ratings Characteristics

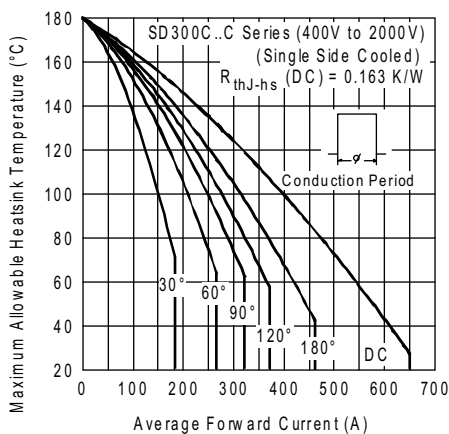


Fig. 2 - Current Ratings Characteristics

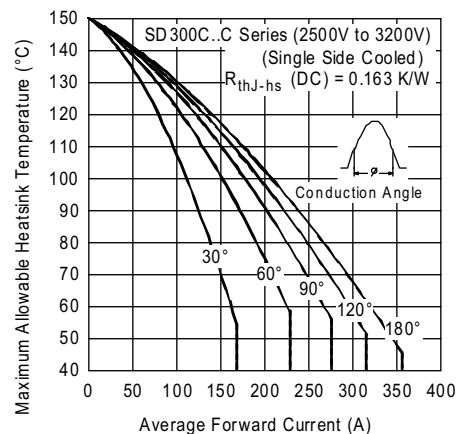


Fig. 5 - Current Ratings Characteristics

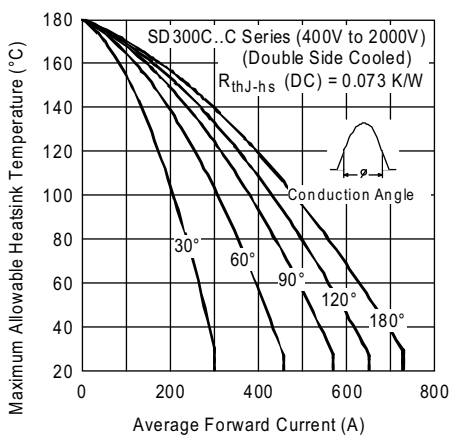


Fig. 3 - Current Ratings Characteristics

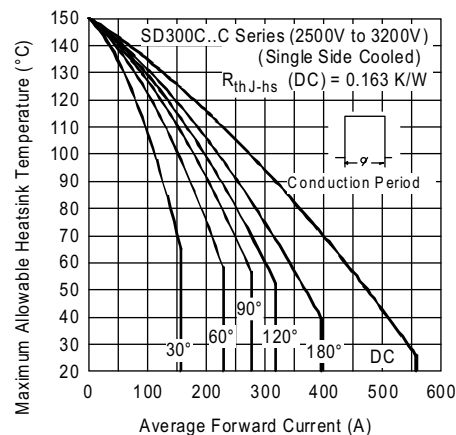


Fig. 6 - Current Ratings Characteristics

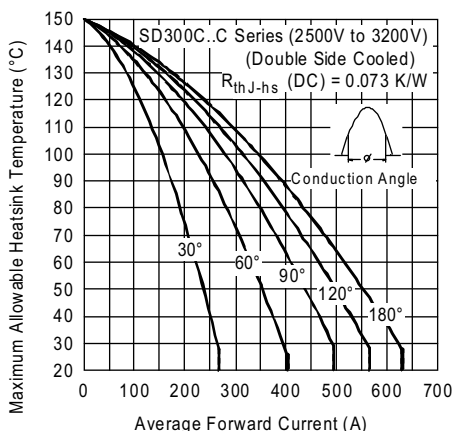


Fig. 7 - Current Ratings Characteristics

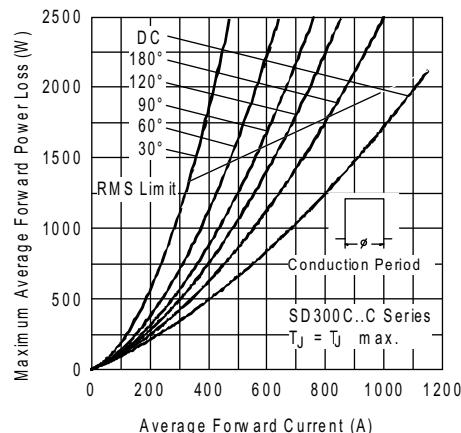


Fig. 10 - Forward Power Loss Characteristics

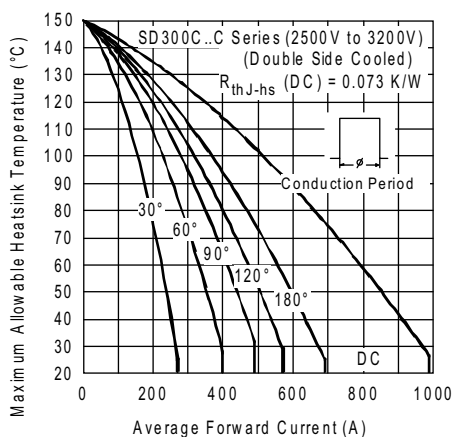


Fig. 8 - Current Ratings Characteristics

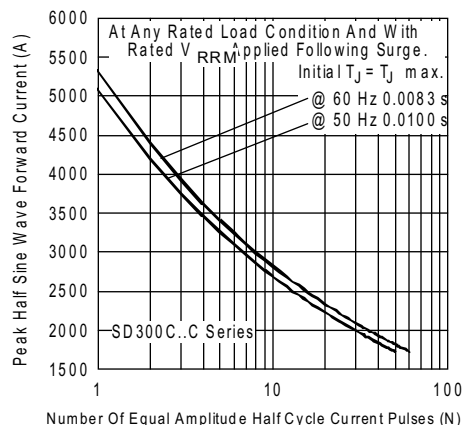


Fig. 11 - Maximum Non-Repetitive Surge Current Single and Double Side Cooled

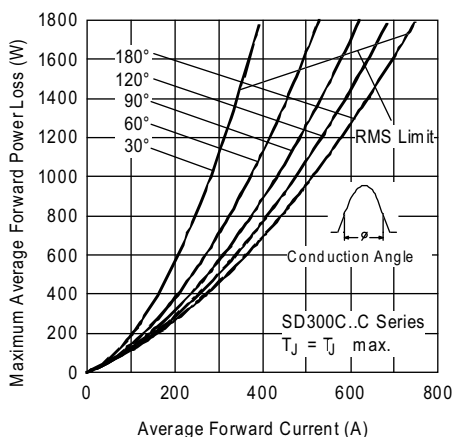


Fig. 9 - Forward Power Loss Characteristics

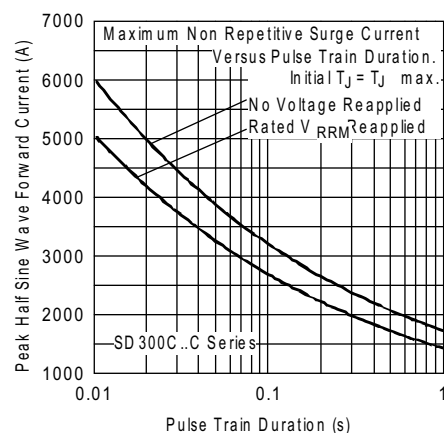


Fig. 12 - Maximum Non-Repetitive Surge Current Single and Double Side Cooled

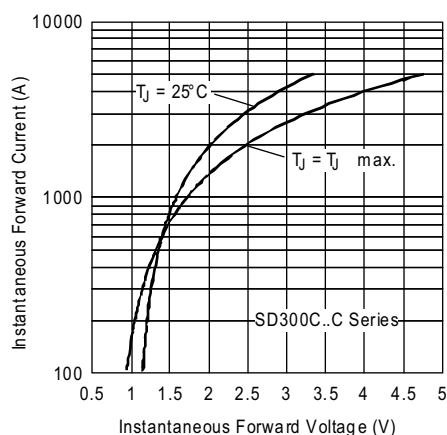
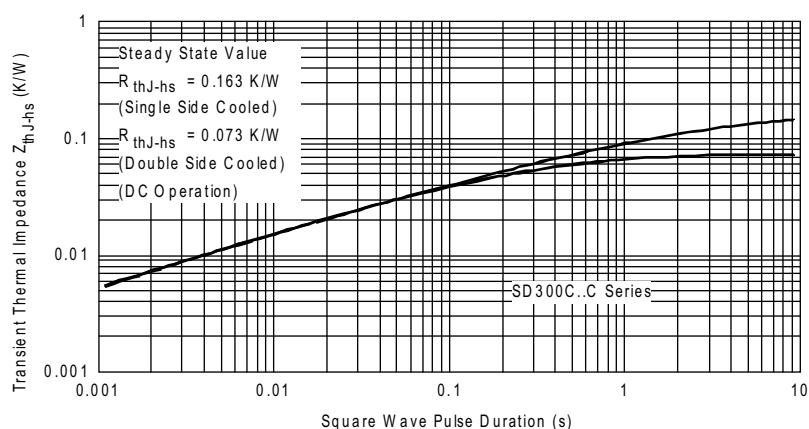


Fig. 13 - Forward Voltage Drop Characteristics


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

## ORDERING INFORMATION TABLE

| Device code | 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 DO-200AA                                      |    |   |   |    |   |

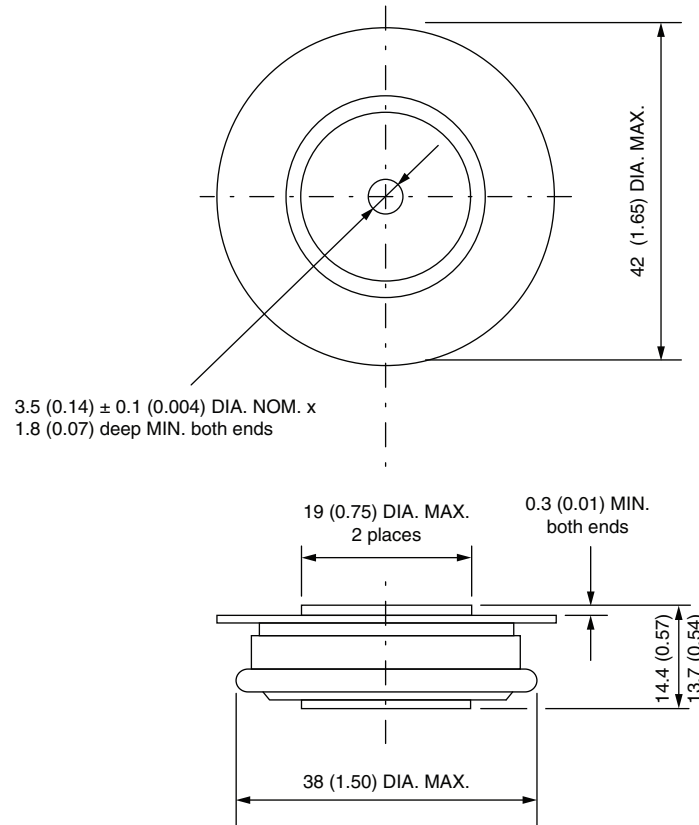
## LINKS TO RELATED DOCUMENTS

Dimensions

[www.vishay.com/doc?95248](http://www.vishay.com/doc?95248)

## 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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