



# Fast Recovery Diodes (Hockey PUK Version), 700/790 A



DO-200AB (B-PUK)

### FEATURES

- High power fast recovery diode series
- 2.0  $\mu$ s to 3.0  $\mu$ s recovery time
- High voltage ratings up to 2500 V
- High current capability
- Optimized turn-on and turn-off characteristics
- Low forward recovery
- Fast and soft reverse recovery
- Press PUK encapsulation
- Case style conform to JEDEC® DO-200AB (B-PUK)
- Maximum junction temperature 150 °C
- Designed and qualified for industrial level
- Material categorization: For definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



RoHS  
COMPLIANT

| PRODUCT SUMMARY       |                  |
|-----------------------|------------------|
| $I_{F(AV)}$           | 700/790 A        |
| Package               | DO-200AB (B-PUK) |
| Circuit configuration | Single diode     |

### TYPICAL APPLICATIONS

- Snubber diode for GTO
- High voltage freewheeling diode
- Fast recovery rectifier applications

| MAJOR RATINGS AND CHARACTERISTICS |                 |              |              |         |
|-----------------------------------|-----------------|--------------|--------------|---------|
| PARAMETER                         | TEST CONDITIONS | SD703C..L    |              | UNITS   |
|                                   |                 | S20          | S30          |         |
| $I_{F(AV)}$                       |                 | 700          | 790          | A       |
|                                   | $T_{hs}$        | 55           | 55           | °C      |
| $I_{F(RMS)}$                      |                 | 1320         | 1470         | A       |
| $I_{FSM}$                         | 50 Hz           | 9300         | 9600         |         |
|                                   | 60 Hz           | 9730         | 10 050       |         |
| $V_{RRM}$                         | Range           | 1200 to 2500 | 1200 to 2500 | V       |
| $t_{rr}$                          |                 | 2.0          | 3.0          | $\mu$ s |
|                                   | $T_J$           | 25           | 25           | °C      |
| $T_J$                             |                 | -40 to 150   | -40 to 150   |         |

### 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-SD703C..L    | 12           | 1200                                                     | 1300                                                         | 50                                             |
|                 | 16           | 1600                                                     | 1700                                                         |                                                |
|                 | 20           | 2000                                                     | 2100                                                         |                                                |
|                 | 25           | 2500                                                     | 2600                                                         |                                                |



| FORWARD CONDUCTION                                            |               |                                                                                         |                           |                         |           |                    |
|---------------------------------------------------------------|---------------|-----------------------------------------------------------------------------------------|---------------------------|-------------------------|-----------|--------------------|
| PARAMETER                                                     | SYMBOL        | TEST CONDITIONS                                                                         |                           | SD703C..L               |           | UNITS              |
|                                                               |               |                                                                                         |                           | s20                     | s30       |                    |
| Maximum average forward current at heatsink temperature       | $I_{F(AV)}$   | 180° conduction, half sine wave<br>Double side (single side) cooled                     |                           | 700 (365)               | 790 (400) | A                  |
|                                                               |               |                                                                                         |                           | 55 (85)                 | 55 (85)   | °C                 |
| Maximum RMS forward current                                   | $I_{F(RMS)}$  | 25 °C heatsink temperature double side cooled                                           |                           | 1320                    | 1470      |                    |
| Maximum peak, one-cycle forward, non-repetitive surge current | $I_{FSM}$     | t = 10 ms<br>t = 8.3 ms                                                                 | No voltage reapplied      | 9300                    | 9600      | A                  |
|                                                               |               |                                                                                         | 100 % $V_{RRM}$ reapplied | 9730                    | 10 050    |                    |
|                                                               |               | Sinusoidal half wave, initial $T_J = T_J$ maximum                                       |                           | t = 10 ms<br>t = 8.3 ms | 7820      |                    |
|                                                               |               |                                                                                         | 8190                      | 8450                    |           |                    |
| Maximum $I^2t$ for fusing                                     | $I^2t$        | t = 10 ms<br>t = 8.3 ms                                                                 | No voltage reapplied      | 432                     | 460       | kA <sup>2</sup> s  |
|                                                               |               |                                                                                         | 100 % $V_{RRM}$ reapplied | 395                     | 420       |                    |
|                                                               |               | Sinusoidal half wave, initial $T_J = T_J$ maximum                                       |                           | t = 10 ms<br>t = 8.3 ms | 306       |                    |
|                                                               |               |                                                                                         | 279                       | 297                     |           |                    |
| Maximum $I^2\sqrt{t}$ for fusing                              | $I^2\sqrt{t}$ | t = 0.1 to 10 ms, no voltage reapplied                                                  |                           | 4320                    | 4600      | 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) |                           | 1.00                    | 0.95      | V                  |
| High level value of threshold voltage                         | $V_{F(TO)2}$  | (I > $\pi \times I_{F(AV)}$ , $T_J = T_J$ maximum)                                      |                           | 1.11                    | 1.05      |                    |
| Low level value of forward slope resistance                   | $r_{f1}$      | (16.7 % $\times \pi \times I_{T(AV)} < I < \pi \times I_{T(AV)}$ , $T_J = T_J$ maximum) |                           | 0.80                    | 0.60      | mW                 |
| High level value of forward slope resistance                  | $r_{f2}$      | (I > $\pi \times I_{T(AV)}$ , $T_J = T_J$ maximum)                                      |                           | 0.76                    | 0.56      |                    |
| Maximum forward voltage drop                                  | $V_{FM}$      | $I_{pk} = 1500$ A, $T_J = T_J$ maximum, $t_p = 10$ ms sinusoidal wave                   |                           | 2.20                    | 1.85      | V                  |

| RECOVERY CHARACTERISTICS |                                 |                           |              |           |                                  |               |              |  |
|--------------------------|---------------------------------|---------------------------|--------------|-----------|----------------------------------|---------------|--------------|--|
| CODE                     | MAXIMUM VALUE AT $T_J = 25$ °C  | TEST CONDITIONS           |              |           | TYPICAL VALUES AT $T_J = 150$ °C |               |              |  |
|                          | $t_{rr}$ AT 25 % $I_{RRM}$ (μs) | $I_{pk}$ SQUARE PULSE (A) | di/dt (A/μs) | $V_r$ (V) | $t_{rr}$ AT 25 % $I_{RRM}$ (μs)  | $Q_{rr}$ (μC) | $I_{rr}$ (A) |  |
| S20                      | 2.0                             | 1000                      | 50           | - 50      | 3.5                              | 240           | 110          |  |
| S30                      | 3.0                             |                           |              |           | 5.0                              | 380           | 130          |  |

| THERMAL AND MECHANICAL SPECIFICATIONS                    |                |                                               |                  |           |  |
|----------------------------------------------------------|----------------|-----------------------------------------------|------------------|-----------|--|
| PARAMETER                                                | SYMBOL         | TEST CONDITIONS                               | VALUES           | UNITS     |  |
| Maximum junction operating and storage temperature range | $T_J, T_{Stg}$ |                                               | - 40 to 150      | °C        |  |
| Maximum thermal resistance, case junction to heatsink    | $R_{thJ-hs}$   | DC operation single side cooled               | 0.092            | K/W       |  |
|                                                          |                | DC operation double side cooled               | 0.046            |           |  |
| Mounting force, ± 10 %                                   |                |                                               | 9800<br>(1000)   | N<br>(kg) |  |
| Approximate weight                                       |                |                                               | 250              | g         |  |
| Case style                                               |                | See dimensions - link at the end of datasheet | DO-200AB (B-PUK) |           |  |

| $\Delta R_{thJ-hs}$ CONDUCTION |                       |             |                        |             |                     |       |
|--------------------------------|-----------------------|-------------|------------------------|-------------|---------------------|-------|
| CONDUCTION ANGLE               | SINUSOIDAL CONDUCTION |             | RECTANGULAR CONDUCTION |             | TEST CONDITIONS     | UNITS |
|                                | SINGLE SIDE           | DOUBLE SIDE | SINGLE SIDE            | DOUBLE SIDE |                     |       |
| 180°                           | 0.011                 | 0.011       | 0.008                  | 0.008       | $T_J = T_J$ maximum | K/W   |
| 120°                           | 0.013                 | 0.014       | 0.013                  | 0.013       |                     |       |
| 90°                            | 0.017                 | 0.017       | 0.018                  | 0.018       |                     |       |
| 60°                            | 0.024                 | 0.025       | 0.026                  | 0.026       |                     |       |
| 30°                            | 0.043                 | 0.043       | 0.043                  | 0.044       |                     |       |

Note

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

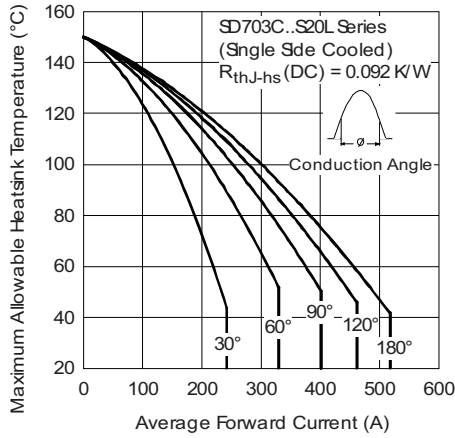


Fig. 1 - Current Ratings Characteristics

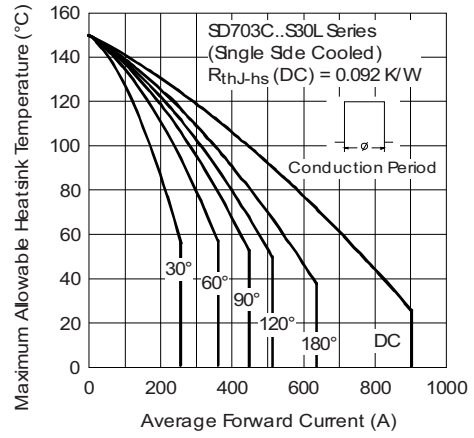


Fig. 4 - Current Ratings Characteristics

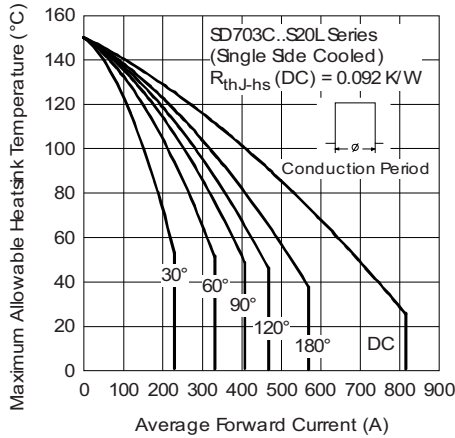


Fig. 2 - Current Ratings Characteristics

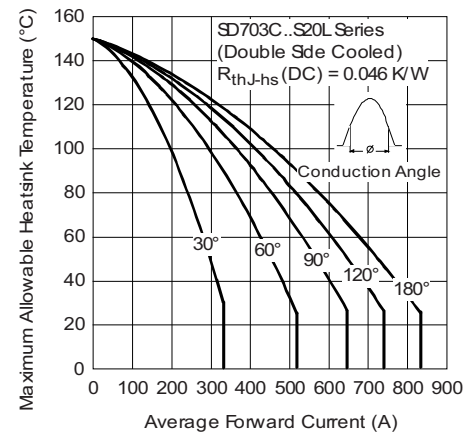


Fig. 5 - Current Ratings Characteristics

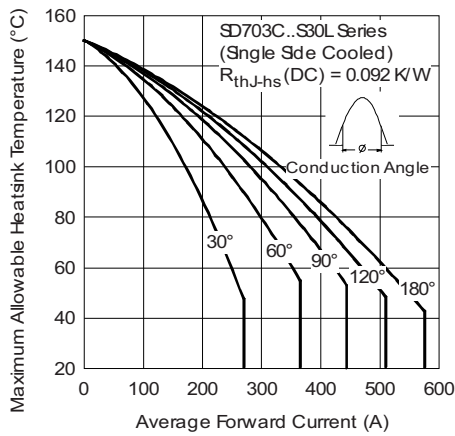


Fig. 3 - Current Ratings Characteristics

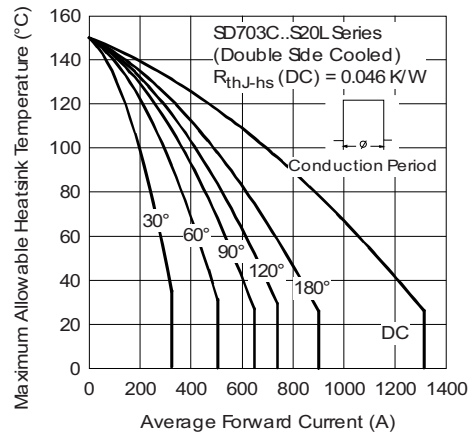


Fig. 6 - Current Ratings Characteristics

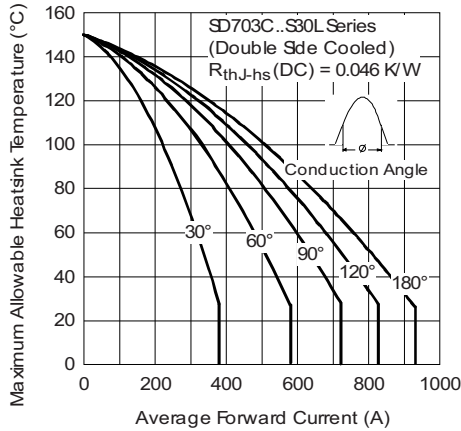


Fig. 7 - Current Ratings Characteristics

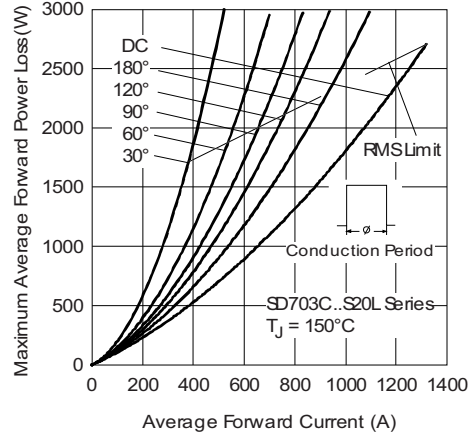


Fig. 10 - Forward Power Loss Characteristics

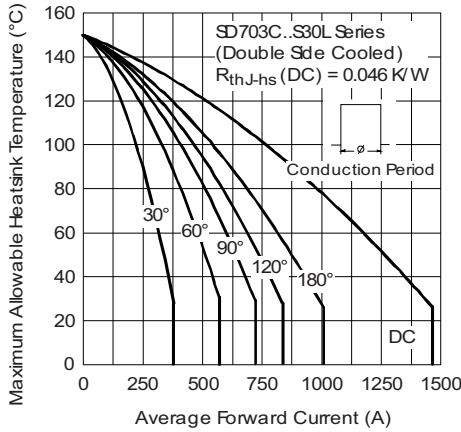


Fig. 8 - Current Ratings Characteristics

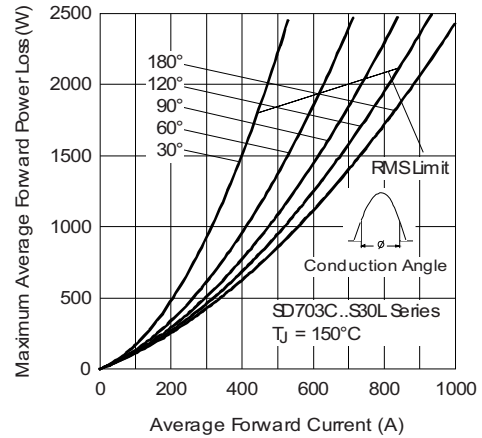


Fig. 11 - Forward Power Loss Characteristics

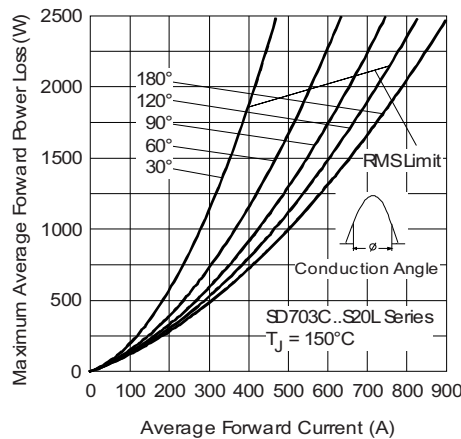


Fig. 9 - Forward Power Loss Characteristics

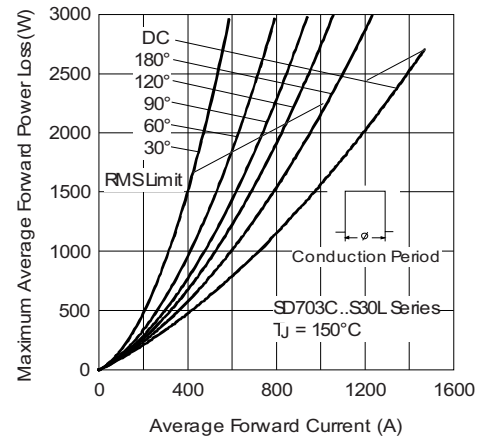


Fig. 12 - Forward Power Loss Characteristics

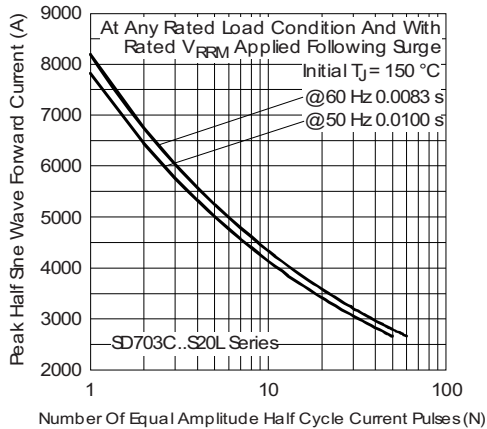


Fig. 13 - Maximum Non-Repetitive Surge Current Single and Double Side Cooled

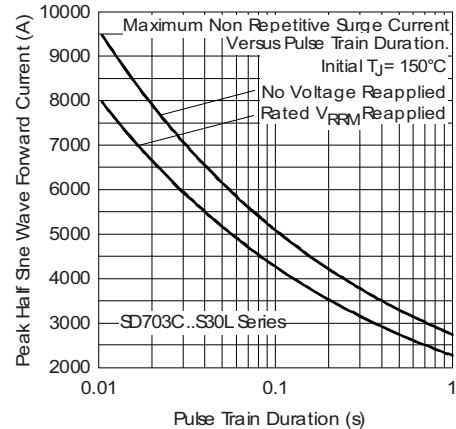


Fig. 16 - Maximum Non-Repetitive Surge Current Single and Double Side Cooled

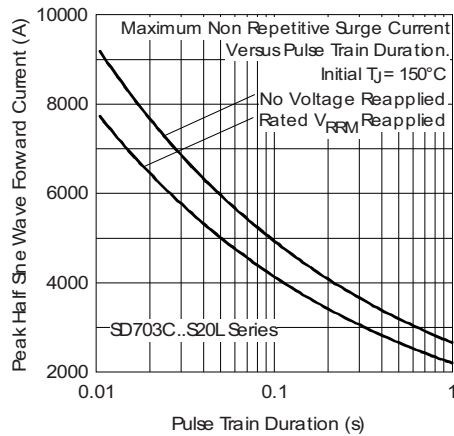


Fig. 14 - Maximum Non-Repetitive Surge Current Single and Double Side Cooled

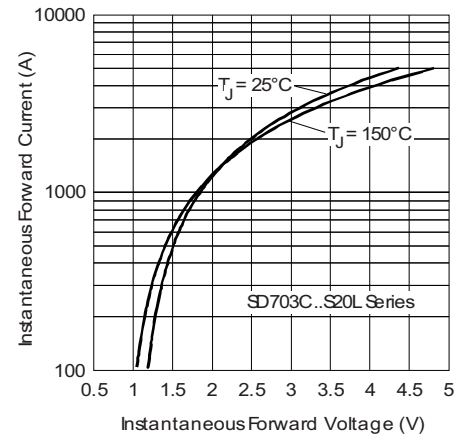


Fig. 17 - Forward Voltage Drop Characteristics

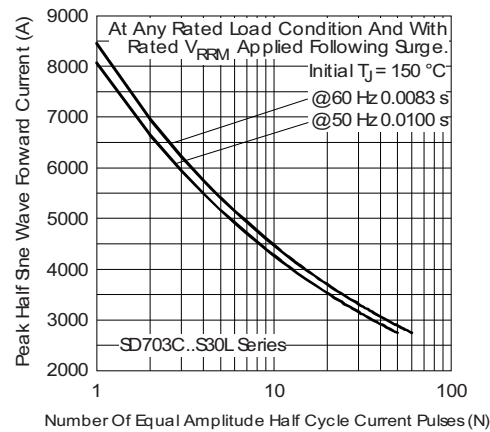


Fig. 15 - Maximum Non-Repetitive Surge Current Single and Double Side Cooled

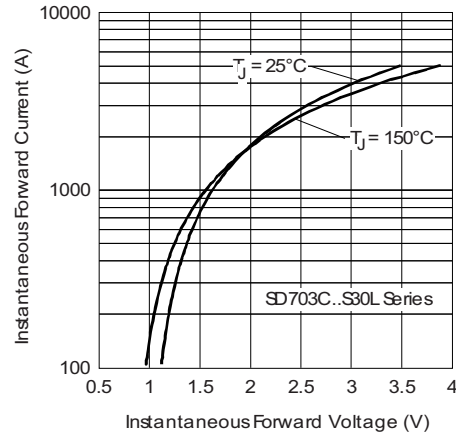


Fig. 18 - Forward Voltage Drop Characteristics

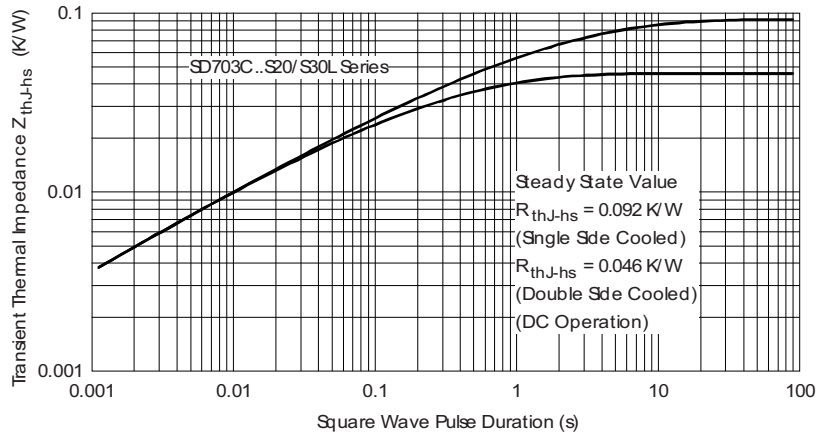


Fig. 19 - Thermal Impedance  $Z_{thJ-hs}$  Characteristic

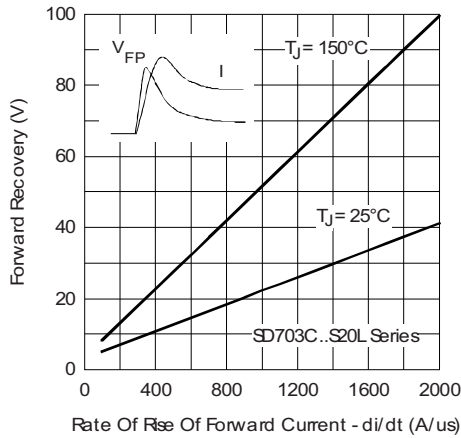


Fig. 20 - Typical Forward Recovery Characteristics

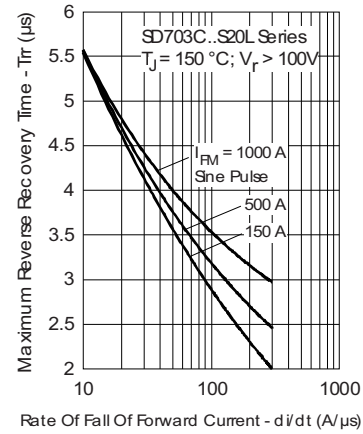


Fig. 22 - Recovery Time Characteristics

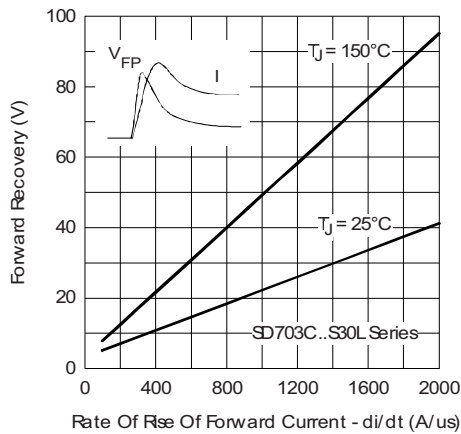


Fig. 21 - Typical Forward Recovery Characteristics

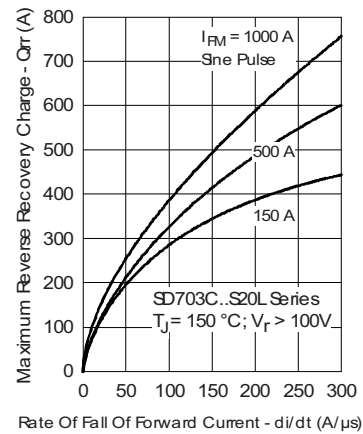


Fig. 23 - Recovery Charge Characteristics

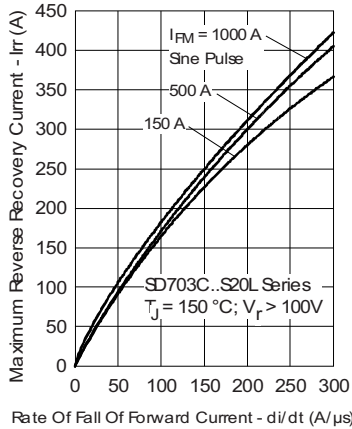


Fig. 24 - Recovery Current Characteristics

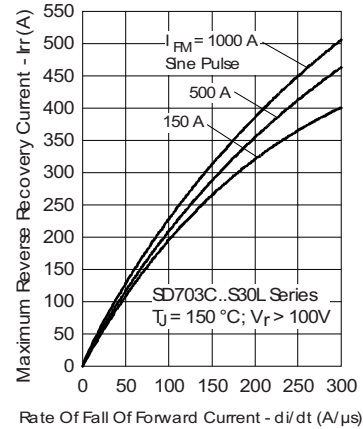


Fig. 27 - Recovery Current Characteristics

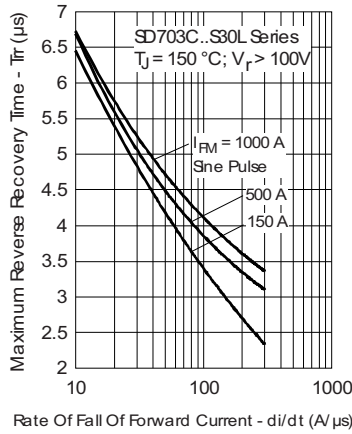


Fig. 25 - Recovery Time Characteristics

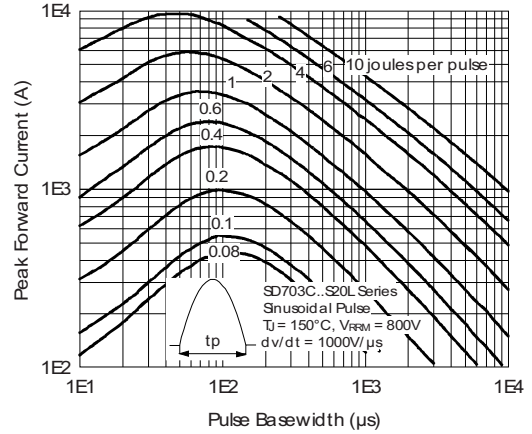


Fig. 28 - Maximum Total Energy Loss Per Pulse Characteristics

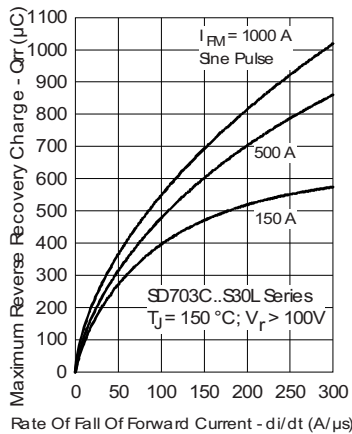


Fig. 26 - Recovery Charge Characteristics

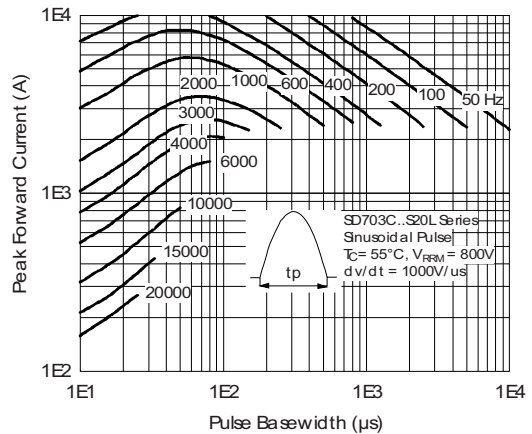


Fig. 29 - Frequency Characteristics



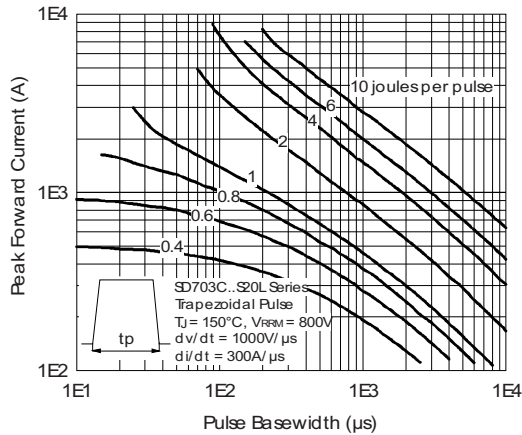


Fig. 30 - Maximum Total Energy Loss Per Pulse Characteristics

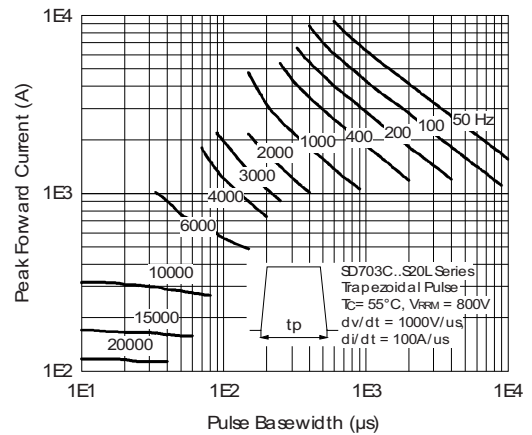


Fig. 33 - Frequency Characteristics

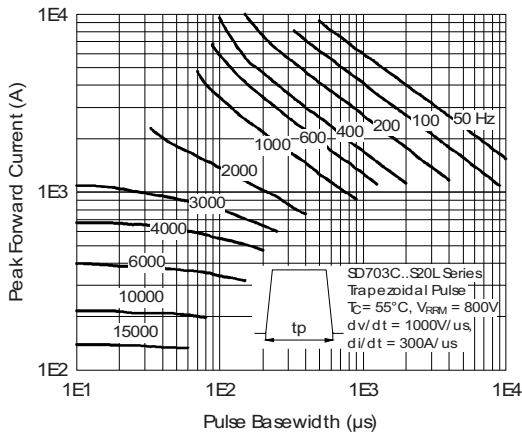


Fig. 31 - Frequency Characteristics

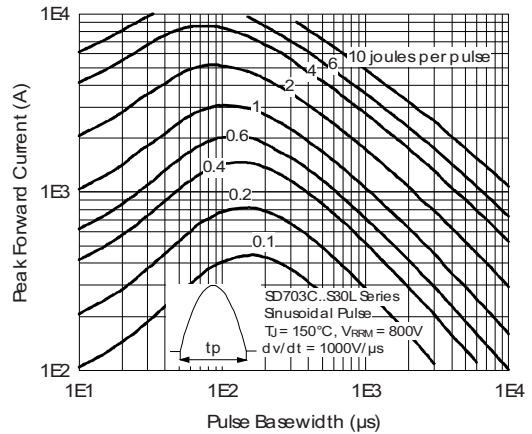


Fig. 34 - Maximum Total Energy Loss Per Pulse Characteristics

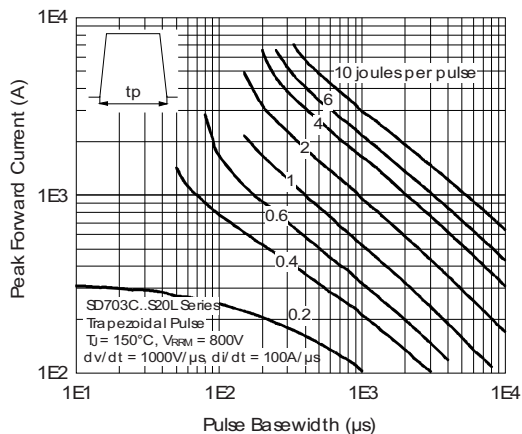


Fig. 32 - Maximum Total Energy Loss Per Pulse Characteristics

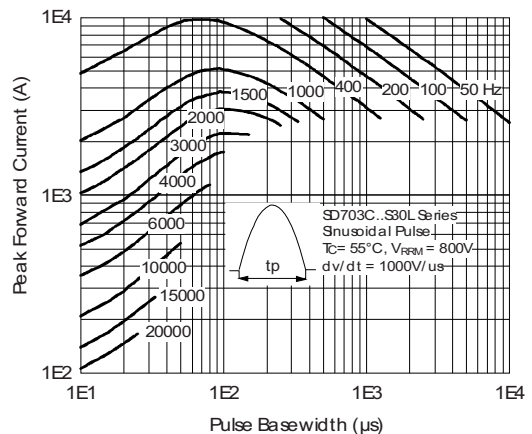


Fig. 35 - Frequency Characteristics



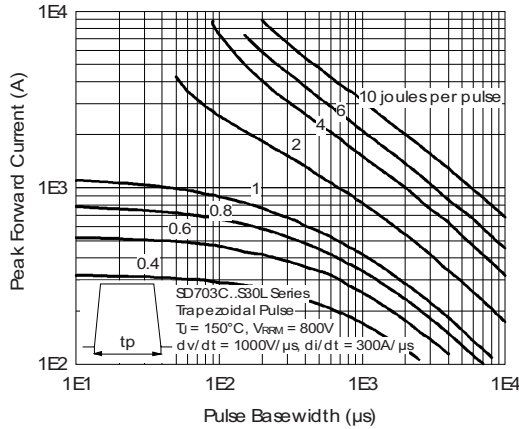


Fig. 36 - Maximum Total Energy Loss Per Pulse Characteristics

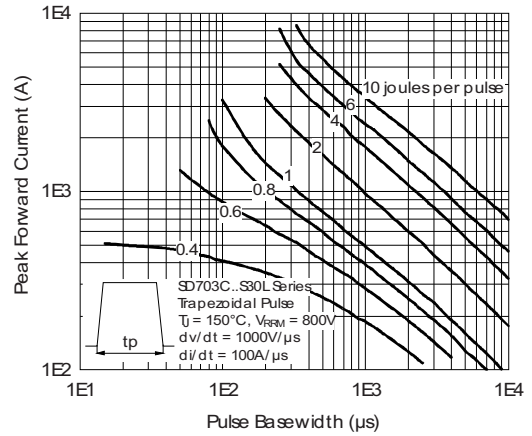


Fig. 38 - Maximum Total Energy Loss Per Pulse Characteristics

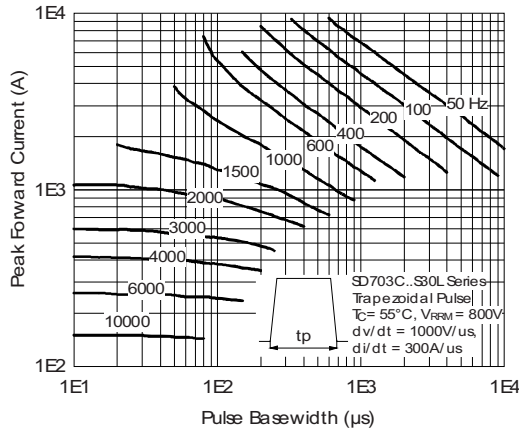


Fig. 37 - Frequency Characteristics

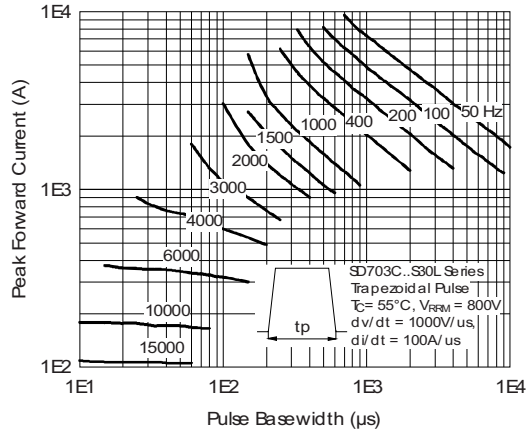


Fig. 39 - Frequency Characteristics

**ORDERING INFORMATION TABLE**

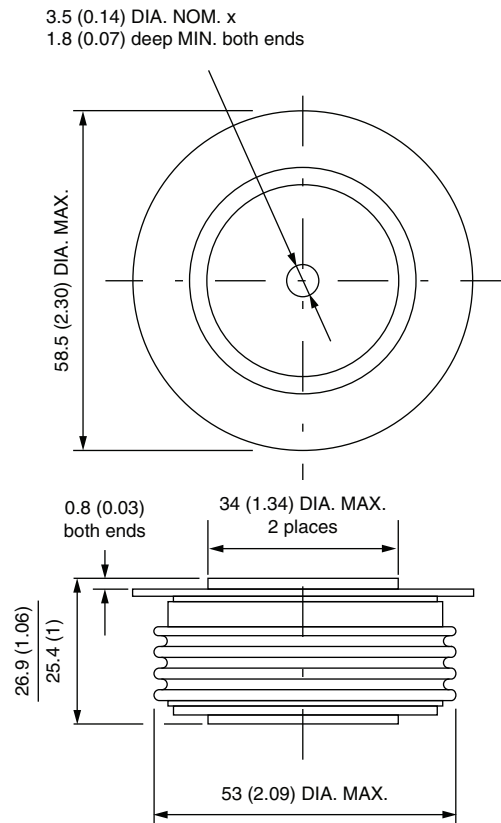
|             |            |           |           |          |          |           |            |          |
|-------------|------------|-----------|-----------|----------|----------|-----------|------------|----------|
| Device code | <b>VS-</b> | <b>SD</b> | <b>70</b> | <b>3</b> | <b>C</b> | <b>25</b> | <b>S20</b> | <b>L</b> |
|             | ①          | ②         | ③         | ④        | ⑤        | ⑥         | ⑦          | ⑧        |

- 1** - Vishay Semiconductors product
- 2** - Diode
- 3** - Essential part number
- 4** - 3 = Fast recovery
- 5** - C = Ceramic PUK
- 6** - Voltage code x 100 =  $V_{RRM}$  (see Voltage Ratings table)
- 7** -  $t_{rr}$  code
- 8** - L = PUK case DO-200AB (B-PUK)

| LINKS TO RELATED DOCUMENTS |                                                                        |
|----------------------------|------------------------------------------------------------------------|
| Dimensions                 | <a href="http://www.vishay.com/doc?95246">www.vishay.com/doc?95246</a> |

## DO-200AB (B-PUK)

**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)



## Disclaimer

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**Vishay Intertechnology, Inc. hereby certifies that all its products that are identified as RoHS-Compliant fulfill the definitions and restrictions defined under Directive 2011/65/EU of The European Parliament and of the Council of June 8, 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment (EEE) - recast, unless otherwise specified as non-compliant.**

**Please note that some Vishay documentation may still make reference to RoHS Directive 2002/95/EC. We confirm that all the products identified as being compliant to Directive 2002/95/EC conform to Directive 2011/65/EU.**

**Vishay Intertechnology, Inc. hereby certifies that all its products that are identified as Halogen-Free follow Halogen-Free requirements as per JEDEC JS709A standards. Please note that some Vishay documentation may still make reference to the IEC 61249-2-21 definition. We confirm that all the products identified as being compliant to IEC 61249-2-21 conform to JEDEC JS709A standards.**

## Данный компонент на территории Российской Федерации

### Вы можете приобрести в компании MosChip.

Для оперативного оформления запроса Вам необходимо перейти по данной ссылке:

<http://moschip.ru/get-element>

Вы можете разместить у нас заказ для любого Вашего проекта, будь то серийное производство или разработка единичного прибора.

В нашем ассортименте представлены ведущие мировые производители активных и пассивных электронных компонентов.

Нашей специализацией является поставка электронной компонентной базы двойного назначения, продукции таких производителей как XILINX, Intel (ex.ALTERA), Vicor, Microchip, Texas Instruments, Analog Devices, Mini-Circuits, Amphenol, Glenair.

Сотрудничество с глобальными дистрибьюторами электронных компонентов, предоставляет возможность заказывать и получать с международных складов практически любой перечень компонентов в оптимальные для Вас сроки.

На всех этапах разработки и производства наши партнеры могут получить квалифицированную поддержку опытных инженеров.

Система менеджмента качества компании отвечает требованиям в соответствии с ГОСТ Р ИСО 9001, ГОСТ РВ 0015-002 и ЭС РД 009

### Офис по работе с юридическими лицами:

105318, г.Москва, ул.Щербаковская д.3, офис 1107, 1118, ДЦ «Щербаковский»

Телефон: +7 495 668-12-70 (многоканальный)

Факс: +7 495 668-12-70 (доб.304)

E-mail: [info@moschip.ru](mailto:info@moschip.ru)

Skype отдела продаж:

moschip.ru

moschip.ru\_4

moschip.ru\_6

moschip.ru\_9