

### FAST RECOVERY DIODES

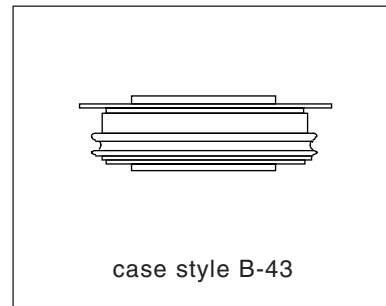
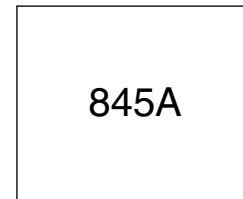
### Hockey Puk Version

#### Features

- High power FAST recovery diode series
- 1.0 to 1.5  $\mu$ s recovery time
- High voltage ratings up to 1600V
- 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 B-43
- Maximum junction temperature 125°C

#### Typical Applications

- Snubber diode for GTO
- High voltage free-wheeling diode
- Fast recovery rectifier applications



#### Major Ratings and Characteristics

| Parameters      | SD803C..C       | Units             |
|-----------------|-----------------|-------------------|
| $I_{F(AV)}$     | 845             | A                 |
| @ $T_{hs}$      | 55              | °C                |
| $I_{F(RMS)}$    | 1326            | A                 |
| @ $T_{hs}$      | 25              | °C                |
| $I_{FSM}$       | @ 50Hz<br>11295 | A                 |
|                 | @ 60Hz<br>11830 | A                 |
| $I^2t$          | @ 50Hz<br>640   | KA <sup>2</sup> s |
|                 | @ 60Hz<br>583   | KA <sup>2</sup> s |
| $V_{RRM}$ range | 400 to 1600     | V                 |
| $t_{rr}$ range  | 1.0 to 1.5      | $\mu$ s           |
| @ $T_J$         | 25              | °C                |
| $T_J$           | - 40 to 125     | °C                |

## SD803C..C Series

Bulletin I2069 rev.B 04/00

International  
**IR** Rectifier

### ELECTRICAL SPECIFICATIONS

#### Voltage Ratings

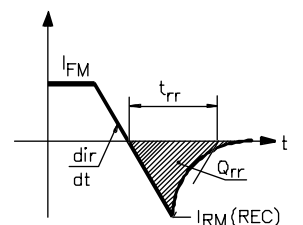
| Type number  | Voltage Code | V <sub>RRM</sub> max. repetitive peak and off-state voltage<br>V | V <sub>RSM</sub> , maximum non-repetitive peak voltage<br>V | I <sub>RRM</sub> max.<br>T <sub>J</sub> = 125°C<br>mA |
|--------------|--------------|--|---|---|
| SD803C..S10C | 04           | 400  | 500   | 45  |
|              | 08           | 800  | 900   |   |
|              | 10           | 1000   | 1100  |   |
| SD803C..S15C | 12           | 1200   | 1300  |   |
|              | 14           | 1400   | 1500  |   |
|              | 16           | 1600   | 1700  |   |

#### Forward Conduction

| Parameter   | SD803C..C | Units              | Conditions   |
|---|-----------|--------------------|--|
| I <sub>F(AV)</sub> Max. average forward current<br>@ Heatsink temperature | 845(420)  | A                  | 180° conduction, half sine wave.   |
|   | 55(75)    | °C                 | Double side (single side) cooled   |
| I <sub>F(RMS)</sub> Max. RMS current                                      | 1326      | A                  | @ 25°C heatsink temperature double side cooled   |
| I <sub>FSM</sub> Max. peak, one-cycle non-repetitive forward current      | 11295     | A                  | t = 10ms No voltage reappplied   |
|   | 11830     |                    | t = 8.3ms 100% V <sub>RRM</sub> reappplied   |
|   | 9500      |                    | t = 10ms 100% V <sub>RRM</sub> reappplied  |
|   | 9945      |                    | t = 8.3ms 100% V <sub>RRM</sub> reappplied   |
| I <sup>2</sup> t Maximum I <sup>2</sup> t for fusing                      | 640       | KA <sup>2</sup> s  | t = 10ms No voltage reappplied   |
|   | 583       |                    | t = 8.3ms 100% V <sub>RRM</sub> reappplied   |
|   | 451       |                    | t = 10ms 100% V <sub>RRM</sub> reappplied  |
|   | 412       |                    | t = 8.3ms 100% V <sub>RRM</sub> reappplied   |
| I <sup>2</sup> /t Maximum I <sup>2</sup> /t for fusing                    | 6400      | KA <sup>2</sup> /s | t = 0.1 to 10ms, no voltage reappplied   |
| V <sub>F(TO)1</sub> Low level of threshold voltage                        | 1.02      | V                  | (16.7% × π × I <sub>F(AV)</sub> < I < π × I <sub>F(AV)</sub> ), T <sub>J</sub> = T <sub>J</sub> max. |
| V <sub>F(TO)2</sub> High level of threshold voltage                       | 1.32      |                    | (I > π × I <sub>F(AV)</sub> ), T <sub>J</sub> = T <sub>J</sub> max.                                  |
| r <sub>f1</sub> Low level of forward slope resistance                     | 0.38      | mΩ                 | (16.7% × π × I <sub>F(AV)</sub> < I < π × I <sub>F(AV)</sub> ), T <sub>J</sub> = T <sub>J</sub> max. |
| r <sub>f2</sub> High level of forward slope resistance                    | 0.28      |                    | (I > π × I <sub>F(AV)</sub> ), T <sub>J</sub> = T <sub>J</sub> max.                                  |
| V <sub>FM</sub> Max. forward voltage                                      | 1.89      | V                  | I <sub>pk</sub> = 2655A, T <sub>J</sub> = 25°C, t <sub>p</sub> = 10ms sinusoidal wave                |

#### Recovery Characteristics

| Code | T <sub>J</sub> = 25°C<br>typical t <sub>rr</sub><br>@ 25% I <sub>RRM</sub><br>(μs) | Test conditions                        |                 |                       | Max. values @ T <sub>J</sub> = 125°C              |                         |                        |
|------|--|--|-----------------|-----------------------|---|-------------------------|------------------------|
|      |  | I <sub>pk</sub><br>Square Pulse<br>(A) | di/dt<br>(A/μs) | V <sub>r</sub><br>(V) | t <sub>rr</sub><br>@ 25% I <sub>RRM</sub><br>(μs) | Q <sub>rr</sub><br>(μC) | I <sub>rr</sub><br>(A) |
| S10  | 1.0  | 1000                                   | 25              | -30                   | 2.0   | 45                      | 34                     |
| S15  | 1.5  |  |                 |                       | 3.2   | 87                      | 51                     |



**Thermal and Mechanical Specifications**

| Parameter   | SD803C..C      | Units | Conditions   |
|---|----------------|-------|--|
| T <sub>J</sub> Max. operating temperature range                   | -40 to 125     | °C    |  |
| T <sub>stg</sub> Max. storage temperature range                   | -40 to 150     |       |  |
| R <sub>thJ-hs</sub> Max. thermal resistance, junction to heatsink | 0.076<br>0.038 | K/W   | DC operationsingle side cooled<br>DC operationdouble side cooled |
| F Mounting force, ± 10%   | 9800<br>(1000) |       | N<br>(Kg)  |
| wt Approximate weight   | 83             | g     |  |
| Case style  | B-43           |       | See Outline Table  |

**ΔR<sub>thJ-hs</sub> Conduction**

(The following table shows the increment of thermal resistance R<sub>thJ-hs</sub> when devices operate at different conduction angles than DC)

| Conduction angle | Sinusoidal conduction |             | Rectangular conduction |             | Units | Conditions                           |
|------------------|-----------------------|-------------|------------------------|-------------|-------|--------------------------------------|
|                  | Single Side           | Double Side | Single Side            | Double Side |       |                                      |
| 180°             | 0.006                 | 0.007       | 0.005                  | 0.005       | K/W   | T <sub>J</sub> = T <sub>J</sub> max. |
| 120°             | 0.008                 | 0.008       | 0.008                  | 0.008       |       |                                      |
| 90°              | 0.010                 | 0.010       | 0.011                  | 0.011       |       |                                      |
| 60°              | 0.015                 | 0.015       | 0.016                  | 0.016       |       |                                      |
| 30°              | 0.026                 | 0.026       | 0.026                  | 0.026       |       |                                      |

**Ordering Information Table**

**Device Code**

|    |    |   |   |    |     |   |
|----|----|---|---|----|-----|---|
| SD | 80 | 3 | C | 16 | S15 | C |
| ①  | ②  | ③ | ④ | ⑤  | ⑥   | ⑦ |

- 1** - Diode
- 2** - Essential part number
- 3** - 3 = Fast recovery
- 4** - C = Ceramic Puk
- 5** - Voltage code: Code x 100 = V<sub>RRM</sub> (see Voltage Ratings table)
- 6** - t<sub>rr</sub> code (see Recovery Characteristics table)
- 7** - C = Puk Case B-43

# SD803C..C Series

Bulletin I2069 rev. B 04/00



## Outline Table

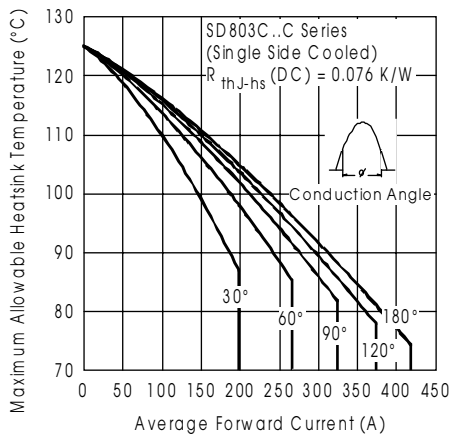
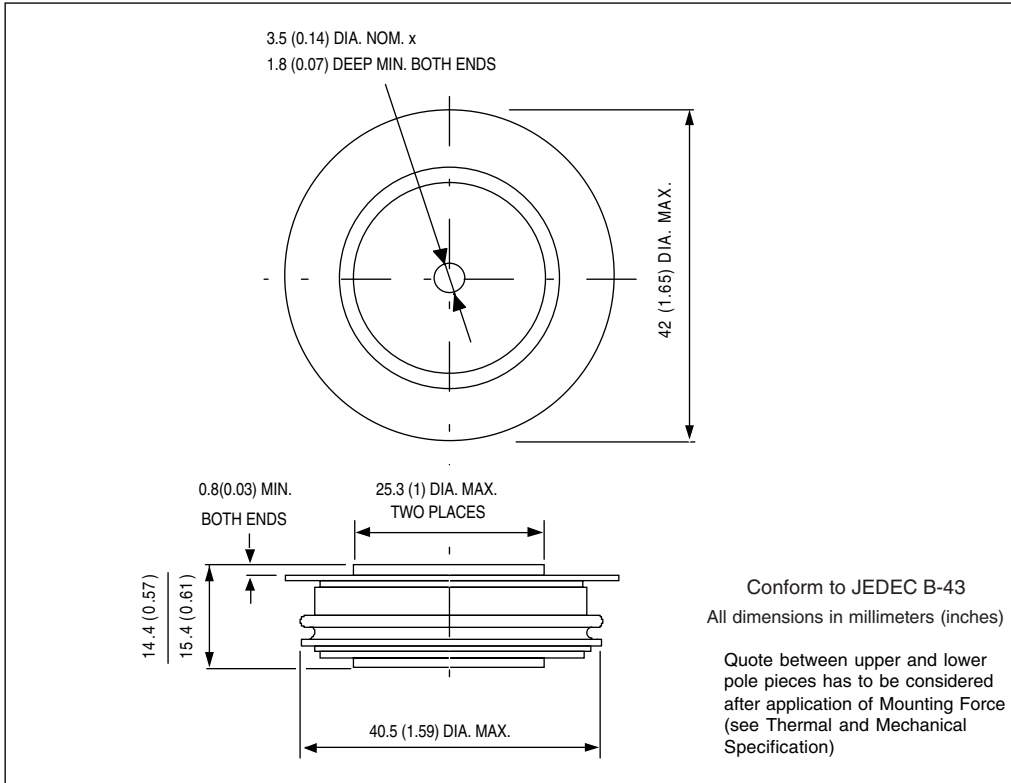


Fig. 1 - Current Ratings Characteristics

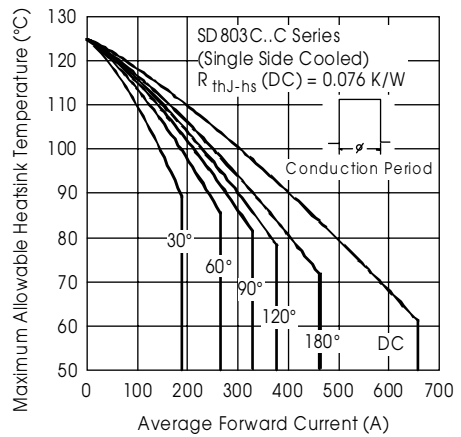


Fig. 2 - Current Ratings Characteristics

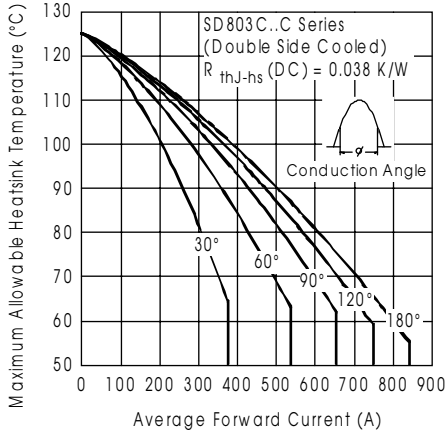


Fig. 3 - Current Ratings Characteristics

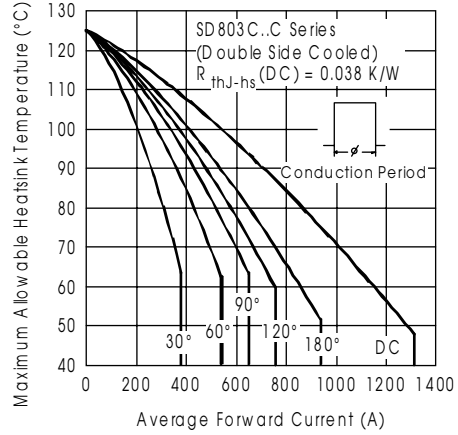


Fig. 4 - Current Ratings Characteristics

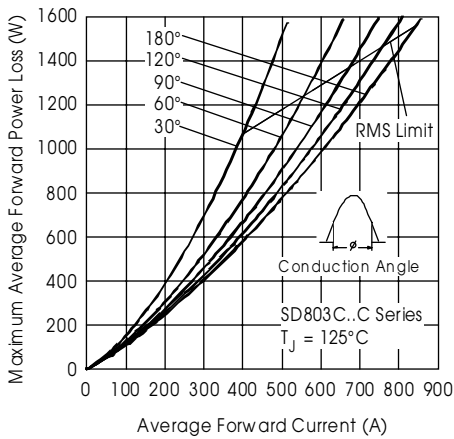


Fig. 5 - Forward Power Loss Characteristics

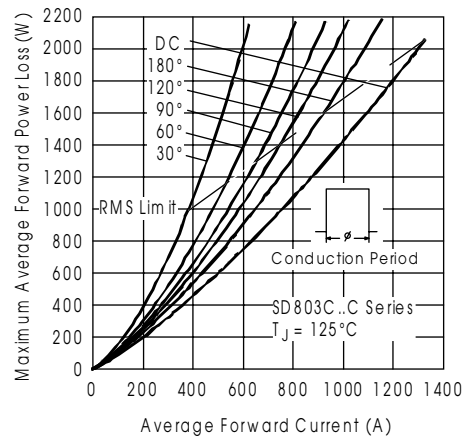


Fig. 6 - Forward Power Loss Characteristics

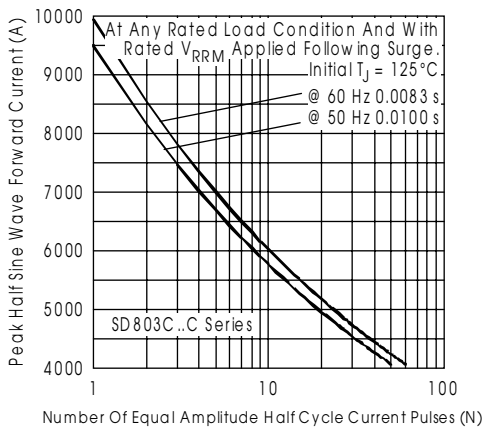


Fig. 7 - Maximum Non-repetitive Surge Current Single and Double Side Cooled

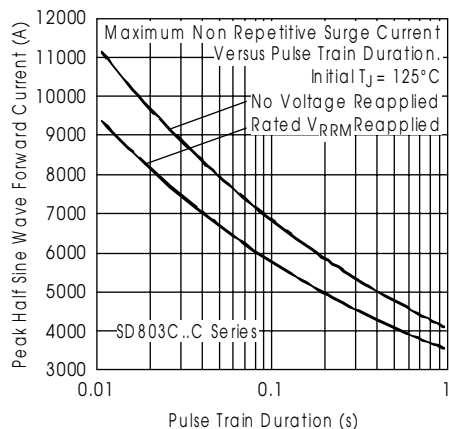


Fig. 8 - Maximum Non-repetitive Surge Current Single and Double Side Cooled

# SD803C..C Series

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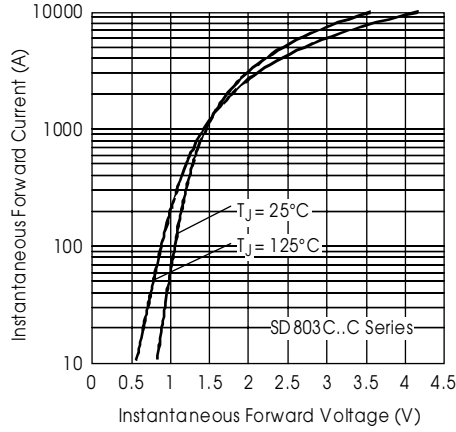


Fig. 9 - Forward Voltage Drop Characteristics

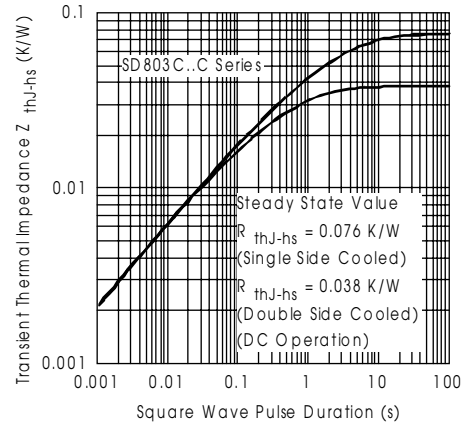


Fig. 10 - Thermal Impedance  $Z_{thj-hs}$  Characteristic

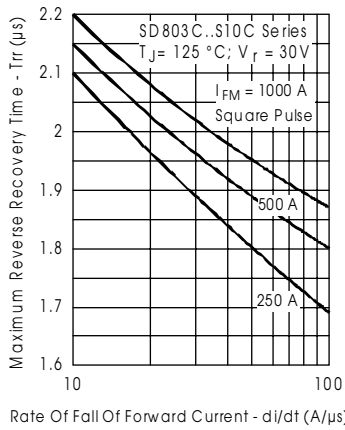


Fig. 11 - Recovery Time Characteristics

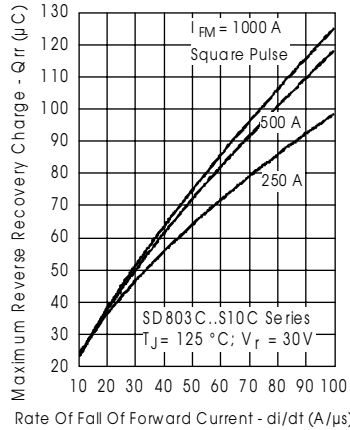


Fig. 12 - Recovery Charge Characteristics

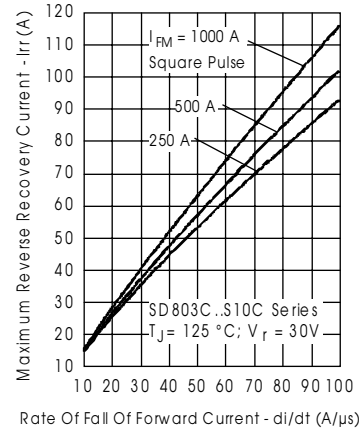


Fig. 13 - Recovery Current Characteristics

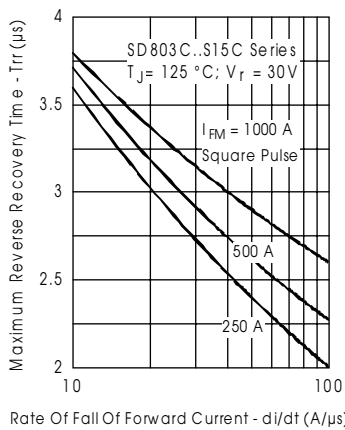


Fig. 14 - Recovery Time Characteristics

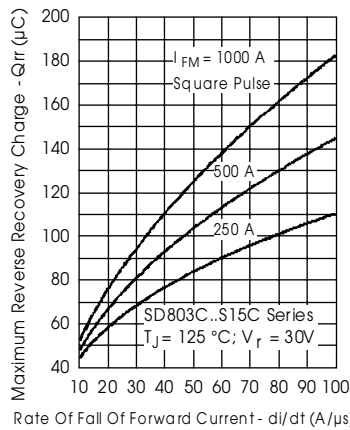


Fig. 15 - Recovery Charge Characteristics

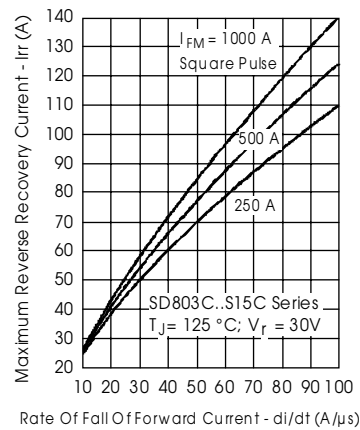


Fig. 16 - Recovery Current Characteristics

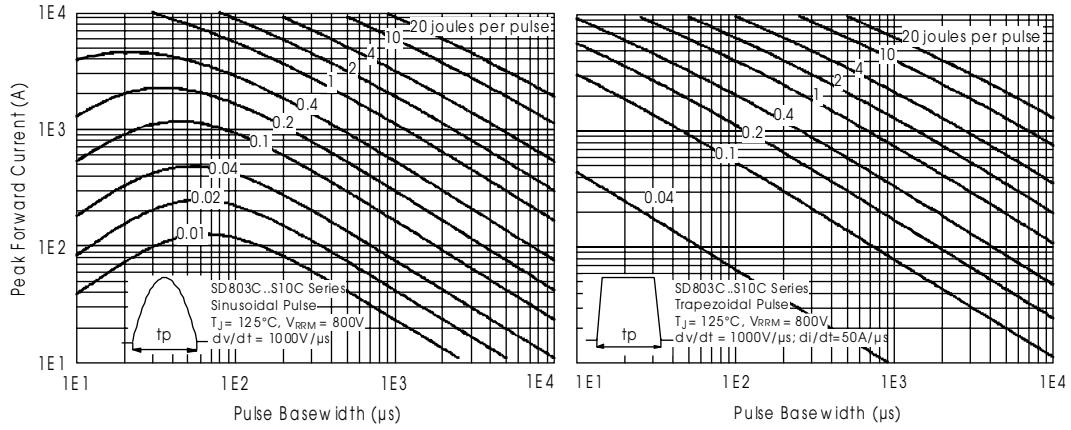


Fig. 17 - Maximum Total Energy Loss Per Pulse Characteristics

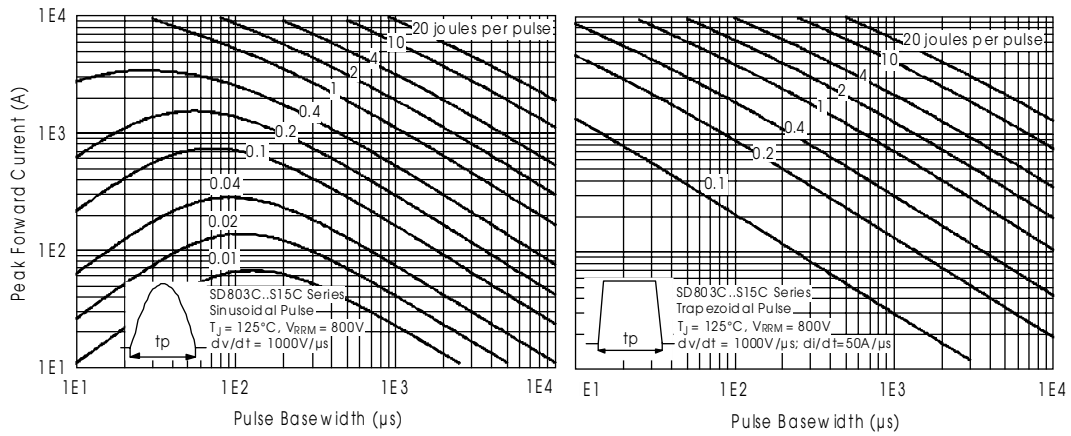


Fig. 18 - Maximum Total Energy Loss Per Pulse Characteristics