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# SCD85

## Power Rectifier Diodes

### FEATURES

- High surge current capability
- Stud cathode and stud anode version
- Leaded version available
- Types up to 1600 V $V_{RRM}$
- Compliant to RoHS directive 2002/95/EC
- Designed and qualified for industrial level

### TYPICAL APPLICATIONS

- Battery chargers
- Converters
- Power supplies
- Machine tool controls
- Welding

| Parameters | | SCD85 | | Units |
|---|---|---|---|---|
| | | 10 to 120 | 140 to 160 | |
| $I_{F(AV)}$ | | 85 | 85 | A |
| | @ $T_C$ | 140 | 110 | °C |
| $I_{F(RMS)}$ | | 133 | | A |
| $I_{FSM}$ | @ 50Hz | 1700 | | A |
| | @ 60Hz | 1800 | | A |
| $I^2t$ | @ 50Hz | 14500 | | $A^2s$ |
| | @ 60Hz | 13500 | | $A^2s$ |
| $V_{RRM}$ | range | 100 to 1200 | 1400 to 1600 | V |
| $T_J$ | range | - 65 to 180 | - 65 to 150 | °C |

**MAJOR RATINGS AND CHARACTERISTICS**

| PARAMETER | TEST CONDITIONS | SCD85 | | UNITS |
|---|---|---|---|---|
| | | 10 TO 120 | 140/160 | |
| $I_{F(AV)}$ | | 85 | | A |
| | $T_C$ | 140 | 110 | °C |
| $I_{F(RMS)}$ | | 133 | | A |
| $I_{FSM}$ | 50 Hz | 1700 | | A |
| | 60 Hz | 1800 | | |
| $I^2t$ | 50 Hz | 14 500 | | $A^2s$ |
| | 60 Hz | 13 500 | | |
| $V_{RRM}$ | Range | 100 to 1200 | 1400/1600 | V |
| $T_J$ | | - 65 to 180 | - 65 to 150 | °C |

**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 $T_J = T_J$ MAXIMUM mA |
|---|---|---|---|---|
| SCD85 | 10 | 100 | 200 | 9 |
| | 20 | 200 | 300 | |
| | 40 | 400 | 500 | |
| | 60 | 600 | 700 | |
| | 80 | 800 | 900 | |
| | 100 | 1000 | 1100 | |
| | 120 | 1200 | 1300 | |
| | 140 | 1400 | 1500 | 4.5 |
| | 160 | 1600 | 1700 | |

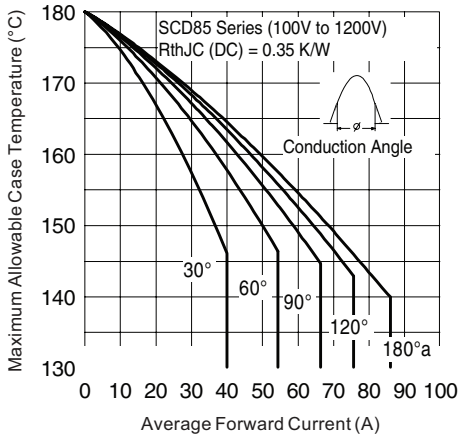
| FORWARD CONDUCTION | | | | | | | |
|---|---|---|---|---|---|---|---|
| PARAMETER | SYMBOL | TEST CONDITIONS | | | SCD85 | | UNITS |
| | | | | | 10 to 120 | 140/160 | |
| Maximum average forward current at case temperature | $I_{F(AV)}$ | 180° conduction, half sine wave | | | 85 | | A |
| | | | | | 140 | 110 | °C |
| Maximum RMS forward current | $I_{F(RMS)}$ | | | | 133 | | A |
| Maximum peak, one-cycle forward, non-repetitive surge current | $I_{FSM}$ | t = 10 ms | No voltage reapplied | Sinusoidal half wave, initial $T_J = T_J$ maximum | 1700 | | A |
| | | t = 8.3 ms | | | 1800 | | |
| | | t = 10 ms | 100 % $V_{RRM}$ reapplied | | 1450 | | |
| | | t = 8.3 ms | | | 1500 | | |
| Maximum $I^2t$ for fusing | $I^2t$ | t = 10 ms | No voltage reapplied | | 14 500 | | $A^2s$ |
| | | t = 8.3 ms | | | 13 500 | | |
| | | t = 10 ms | 100 % $V_{RRM}$ reapplied | | 10 500 | | |
| | | t = 8.3 ms | | | 9400 | | |
| Maximum $I^2\sqrt{t}$ for fusing | $I^2\sqrt{t}$ | t = 0.1 ms to 10 ms, no voltage reapplied | | | 16 000 | | $A^2\sqrt{s}$ |
| Value of threshold voltage (up to 1200 V) | $V_{F(TO)}$ | $T_J = T_J$ maximum | | | 0.68 | | V |
| Value of threshold voltage (for 1400 V, 1600 V) | | | | | 0.69 | | |
| Value of forward slope resistance (up to 1200 V) | $r_f$ | $T_J = T_J$ maximum | | | 1.62 | | mΩ |
| Value of forward slope resistance (for 1400 V, 1600 V) | | | | | 1.75 | | |
| Maximum forward voltage drop | $V_{FM}$ | $I_{pk}$ = 267 A, $T_J$ = 25 °C, $t_p$ = 400 µs rectangular wave | | | 1.2 | 1.4 | V |

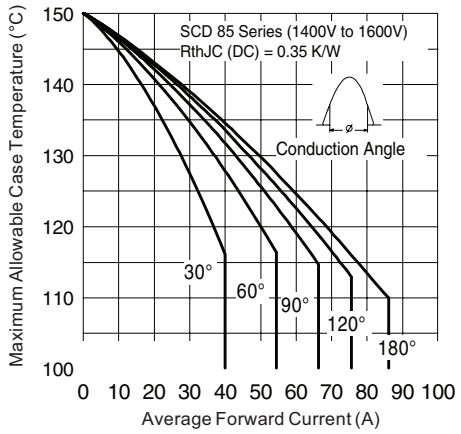
| THERMAL AND MECHANICAL SPECIFICATIONS | | | | | |
|---|---|---|---|---|---|
| PARAMETER | SYMBOL | TEST CONDITIONS | SCD85 | | UNITS |
| | | | 10 to 120 | 140/160 | |
| Maximum junction operating and storage temperature range | $T_J$, $T_{Stg}$ | | - 65 to 180 | - 65 to 150 | °C |
| Maximum thermal resistance, junction to case | $R_{thJC}$ | DC operation | 0.35 | | K/W |
| Maximum thermal resistance, case to heatsink | $R_{thCS}$ | Mounting surface, smooth, flat and greased | 0.25 | | |
| Maximum shock (1) | | | 1500 | | g |
| Maximum constant vibration (1) | | 50 Hz | 20 | | |
| Maximum constant acceleration (1) | | Stud outwards | 5000 | | |
| Maximum allowable mounting torque (+ 0 %, - 10 %) | | Not lubricated thread, tighting on nut (2) | 3.4 (30) | | N · m (lbf · in) |
| | | Lubricated thread, tighting on nut (2) | 2.3 (20) | | |
| | | Not lubricated thread, tighting on hexagon (3) | 4.2 (37) | | |
| | | Lubricated thread, tighting on hexagon (3) | 3.2 (28) | | |
| Approximate weight | | Unleaded device | 17 | | g |
| | | | 0.6 | | oz. |
| Case style | | See dimensions - link at the end of datasheet | DO-203AB (DO-5) | | |

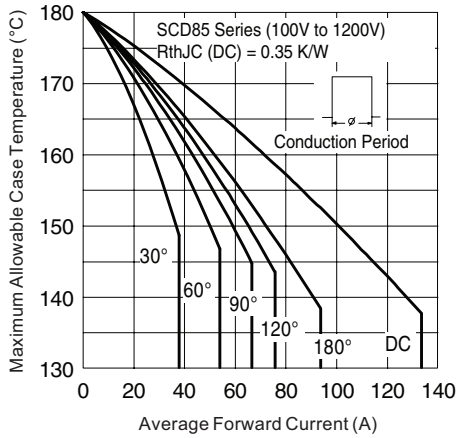
| $\Delta R_{thJC}$ CONDUCTION | | | | |
|---|---|---|---|---|
| CONDUCTION ANGLE | SINUSOIDAL CONDUCTION | RECTANGULAR CONDUCTION | TEST CONDITIONS | UNITS |
| 180° | 0.10 | 0.08 | $T_J = T_J$ maximum | K/W |
| 120° | 0.11 | 0.11 | | |
| 90° | 0.13 | 0.13 | | |
| 60° | 0.17 | 0.17 | | |
| 30° | 0.26 | 0.26 | | |

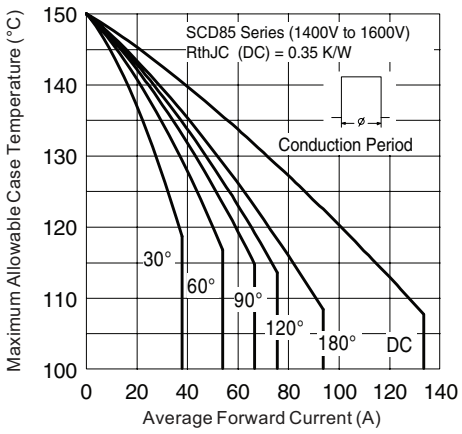
**Note**

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



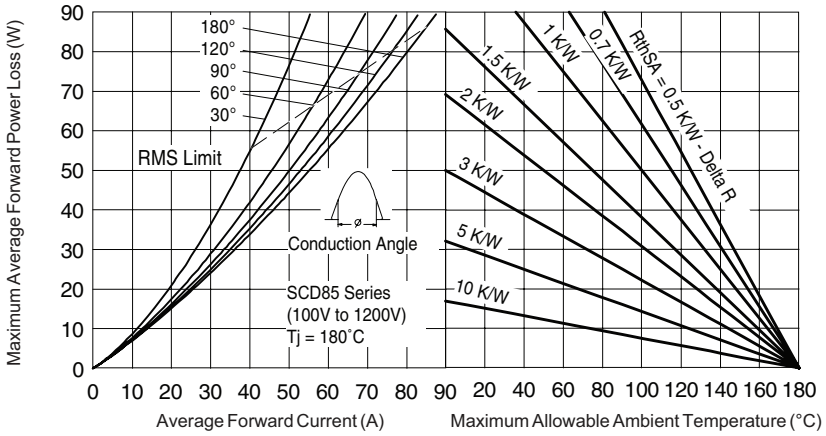



Fig. 5 - Forward Power Loss Characteristics

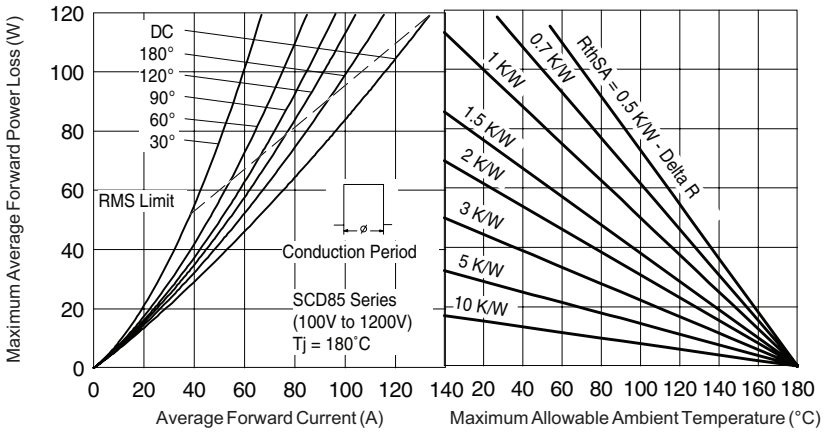



Fig. 6 - Forward Power Loss Characteristics

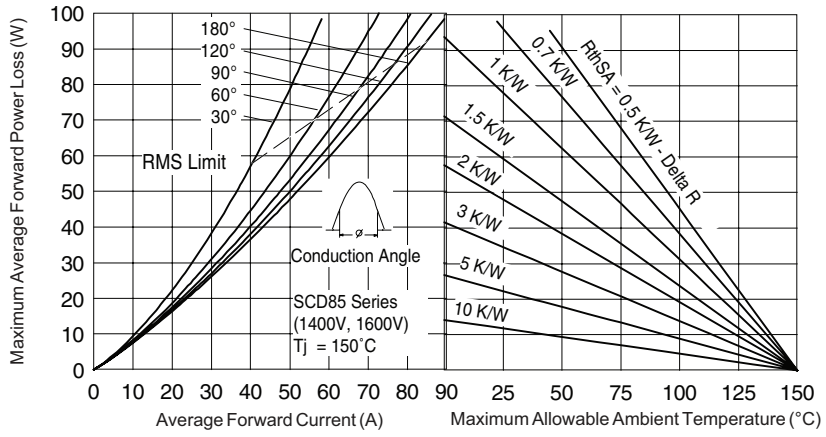



Fig. 7 - Forward Power Loss Characteristics

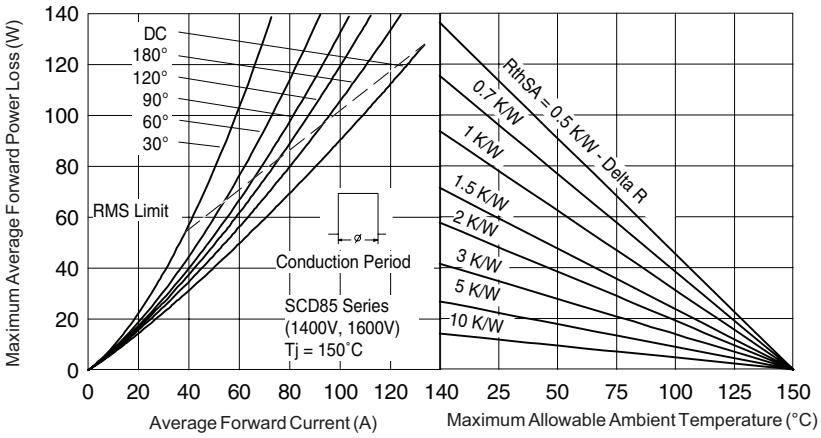



Fig. 8 - Forward Power Loss Characteristics

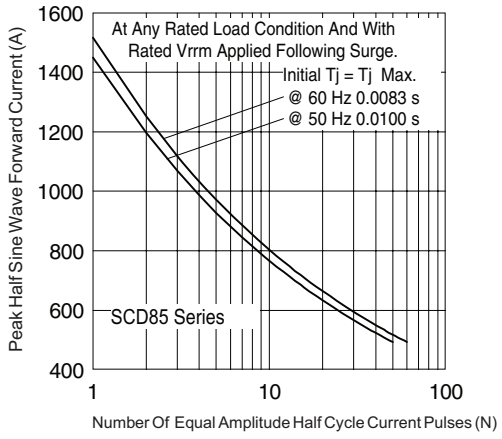



Fig. 9 - Maximum Non-Repetitive Surge Current

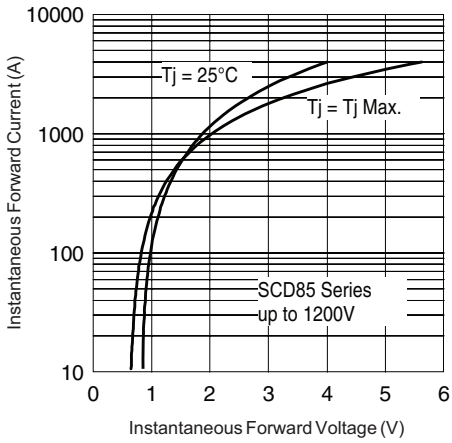



Fig. 11 - Forward Voltage Drop Characteristics (up to 1200 V)

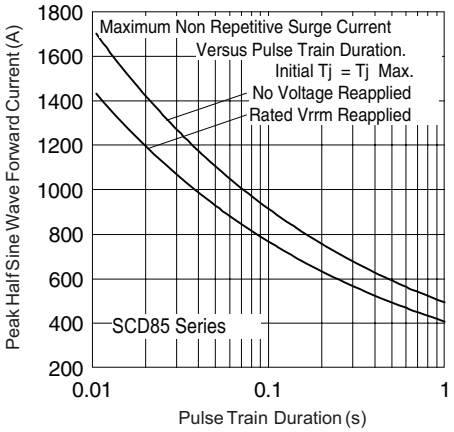



Fig. 10 - Maximum Non-Repetitive Surge Current

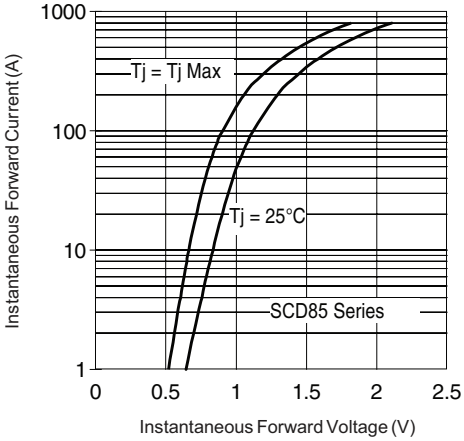
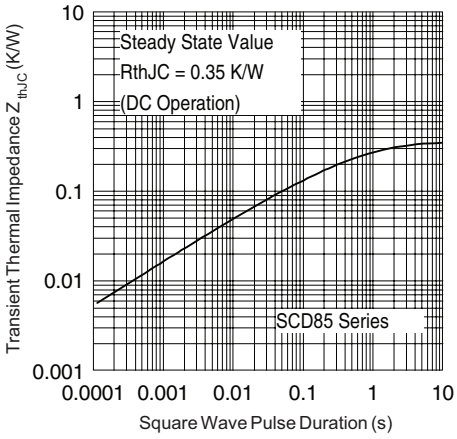
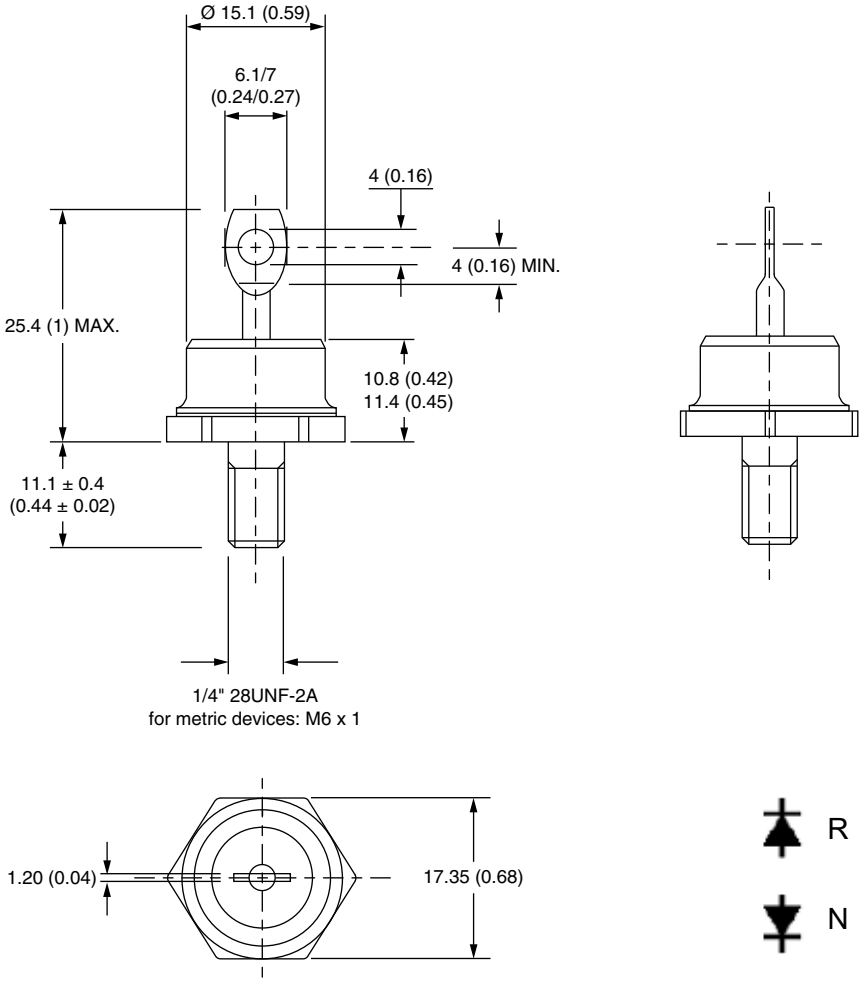



Fig. 12 - Forward Voltage Drop Characteristics (for 1400 V, 1600 V)





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