# Power Silicon Rectifier Diodes, 35 A/40 A/60 A

DO-203AB (DO-5)

## DESCRIPTION/FEATURES

- Low leakage current series
- Good surge current capability up to 1000 A
- Can be supplied to meet stringent military, aerospace and other high reliability requirements
- Compliant to RoHS directive 2002/95/EC

RoHS COMPLIANT

| PRODUCT SUMMARY | |
|---|---|
| $I_{F(AV)}$ | 35 A/40 A/60 A |

## MAJOR RATINGS AND CHARACTERISTICS

| PARAMETER | TEST CONDITIONS | 1N1183 | 1N3765 | 1N1183A | 1N2128A | UNITS |
|---|---|---|---|---|---|---|
| $I_{F(AV)}$ | | 35 (1) | 35 (1) | 40 (1) | 60 (1) | A |
| | $T_C$ | 140 (1) | 140 (1) | 150 (1) | 140 (1) | °C |
| $I_{FSM}$ | 50 Hz | 480 | 380 | 765 | 860 | A |
| | 60 Hz | 500 (1) | 400 (1) | 800 (1) | 900 (1) | |
| $I^2t$ | 50 Hz | 1140 | 730 | 2900 | 3700 | $A^2s$ |
| | 60 Hz | 1040 | 670 | 2650 | 3400 | |
| $I^2\sqrt{t}$ | | 16 100 | 10 300 | 41 000 | 52 500 | $A^2\sqrt{s}$ |
| $V_{RRM}$ | Range | 50 to 600 (1) | 700 to 1000 (1) | 50 to 600 (1) | 50 to 600 (1) | V |

**Note**

(1) JEDEC registered values

## ELECTRICAL SPECIFICATIONS

### VOLTAGE RATINGS

| TYPE NUMBER | | | $V_{RRM}$, MAXIMUM REPETITIVE PEAK REVERSE VOLTAGE ($T_J$ = - 65 °C TO 200 °C (2)) V | $V_{RM}$, MAXIMUM DIRECT REVERSE VOLTAGE ($T_J$ = - 65 °C TO 200 °C (2)) V |
|---|---|---|---|---|
| 1N1183 | 1N1183A | 1N2128A | 50 (1) | 50 (1) |
| 1N1184 | 1N1184A | 1N2129A | 100 (1) | 100 (1) |
| 1N1185 | 1N1185A | 1N2130A | 150 (1) | 150 (1) |
| 1N1186 | 1N1186A | 1N2131A | 200 (1) | 200 (1) |
| 1N1187 | 1N1187A | 1N2133A | 300 (1) | 300 (1) |
| 1N1188 | 1N1188A | 1N2135A | 400 (1) | 400 (1) |
| 1N1189 | 1N1189A | 1N2137A | 500 (1) | 500 (1) |
| 1N1190 | 1N1190A | 1N2138A | 600 (1) | 600 (1) |
| 1N3765 | | | 700 (1) | 700 (1) |
| 1N3766 | | | 800 (1) | 800 (1) |
| 1N3767 | | | 900 (1) | 900 (1) |
| 1N3768 | | | 1000 (1) | 1000 (1) |

**Notes**

(1) JEDEC registered values

(2) For 1N1183 Series and 1N3765 Series $T_C$ = - 65 °C to 190 °C

- Basic type number indicates cathode to case. For anode to case, add “R” to part number, e.g., 1N1188R, 1N3766R, 1N1186AR, 1N2135AR

| FORWARD CONDUCTION | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **PARAMETER** | **SYMBOL** | **TEST CONDITIONS** | | **1N1183** | **1N3765** | **1N1183A** | **1N2128A** | **UNITS** |
| Maximum average forward current at case temperature | $I_{F(AV)}$ | 1-phase operation, 180° sinusoidal conduction | | 35 (1) | 35 (1) | 40 (1) | 60 (1) | A |
| | | | | 140 (1) | 140 (1) | 150 (1) | 140 (1) | °C |
| Maximum peak one cycle non-repetitive surge current | $I_{FSM}$ | Half cycle 50 Hz sine wave or 6 ms rectangular pulse | Following any rated load condition and with rated $V_{RRM}$ applied | 480 | 380 | 765 | 860 | A |
| | | Half cycle 60 Hz sine wave or 5 ms rectangular pulse | | 500 (1) | 400 (1) | 800 (1) | 900 (1) | |
| | | Half cycle 50 Hz sine wave or 6 ms rectangular pulse | Following any rated load condition and with ½ $V_{RRM}$ applied following surge = 0 | 570 | 455 | 910 | 1000 | |
| | | Half cycle 60 Hz sine wave or 5 ms rectangular pulse | | 595 | 475 | 950 | 1050 | |
| Maximum $I^2t$ for fusing | $I^2t$ | t = 10 ms | With rated $V_{RRM}$ applied following surge, initial $T_J = T_J$ maximum | 1140 | 730 | 2900 | 3700 | $A^2s$ |
| | | t = 8.3 ms | | 1040 | 670 | 2650 | 3400 | |
| Maximum $I^2t$ for individual device fusing | | t = 10 ms | With $V_{RRM}$ = 0 following surge, initial $T_J$ = $T_J$ maximum | 1610 | 1030 | 4150 | 5250 | |
| | | t = 8.3 ms | | 1470 | 940 | 3750 | 4750 | |
| Maximum $I^2\sqrt{t}$ for individual device fusing | $I^2\sqrt{t}$ (2) | t = 0.1 to 10 ms, $V_{RRM}$ = 0 following surge | | 16 100 | 10 300 | 41 500 | 52 500 | $A^2\sqrt{s}$ |
| Maximum peak forward voltage at maximum forward current ($I_{FM}$) | $V_{FM}$ | $T_J$ = 25 °C | | 1.7 (1) | 1.8 (1) | 1.3 (1) | 1.3 (1) | V |
| | | | | 110 | 110 | 126 | 188 | A |
| Maximum average reverse current — $V_{RRM}$ = 700 | $I_{R(AV)}$ | Maximum rated $I_{F(AV)}$ and $T_C$ | | - | 5.0 (1) | - | - | mA |
| Maximum average reverse current — $V_{RRM}$ = 800 | | | | - | 4.0 (1) | - | - | |
| Maximum average reverse current — $V_{RRM}$ = 900 | | | | - | 3.0 (1) | - | - | |
| Maximum average reverse current — $V_{RRM}$ = 1000 | | | | - | 2.0 (1) | - | - | |
| | | Maximum rated $I_{F(AV)}$, $V_{RRM}$ and $T_C$ | | 10 (1) | - | 2.5 (1) | 10 (1) | |

**Notes**

(1) JEDEC registered values

(2) $I^2t$ for time $t_x = I^2\sqrt{t} \times \sqrt{t_x}$

## THERMAL AND MECHANICAL SPECIFICATIONS

| PARAMETER | SYMBOL | TEST CONDITIONS | 1N1183 | 1N3765 | 1N1183A | 1N2128A | UNITS |
|---|---|---|---|---|---|---|---|
| Maximum operating case temperature range | $T_C$ | | - 65 to 190 (1) | | - 65 to 200 | | °C |
| Maximum storage temperature range | $T_{Stg}$ | | - 65 to 175 (1) | | - 65 to 200 | | °C |
| Maximum internal thermal resistance, junction to case | $R_{thJC}$ | DC operation | 1.00 (1) | | 1.1 (1) | 0.65 (1) | °C/W |
| Thermal resistance, case to sink | $R_{thCS}$ | Mounting surface, smooth, flat and greased | 0.25 | | | | °C/W |
| 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) | | | | N · m (lbf · in) |
| | | Not lubricated thread, tighting on hexagon (3) | 4.2 (37) | | | | N · m (lbf · in) |
| | | Lubricated thread, tighting on hexagon (3) | 3.2 (28) | | | | N · m (lbf · in) |
| Approximate weight | | | 17 | | | | g |
| | | | 0.6 | | | | oz. |
| Case style | | JEDEC | DO-203AB (DO-5) | | | | |

**Notes**

(1) JEDEC registered values

(2) Recommended for pass-through holes

(3) Recommended for holed threaded heatsinks

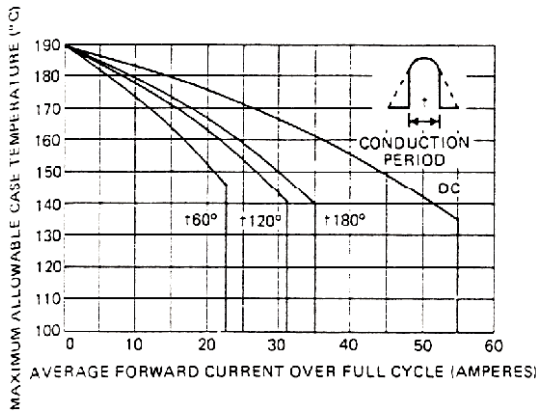



Fig. 1 - Maximum Allowable Case Temperature vs. Average Forward Current, 1N1183 and 1N3765 Series

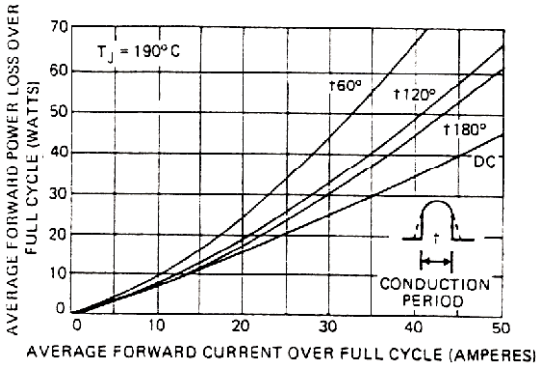



Fig. 2 - Typical Low Level Forward Power Loss vs. Average Forward Current (Sinusoidal Current Waveform), 1N1183 and 1N3765 Series

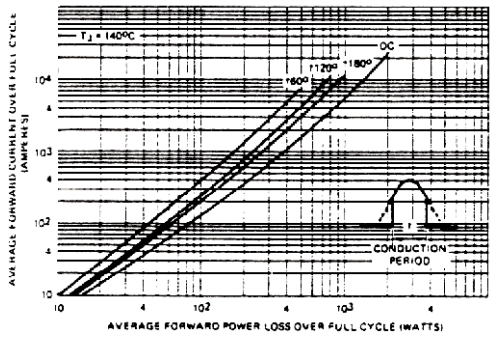



Fig. 3 - Typical High Level Forward Power Loss vs. Average Forward Current (Sinusoidal Current Waveform), 1N1183 and 1N3765 Series

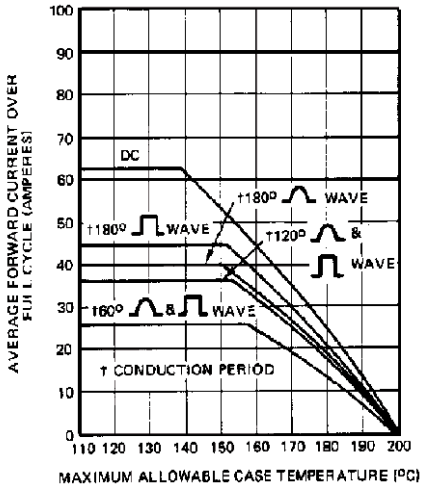



Fig. 6 - Average Forward Current vs. Maximum Allowable Case Temperature, 1N1183A Series

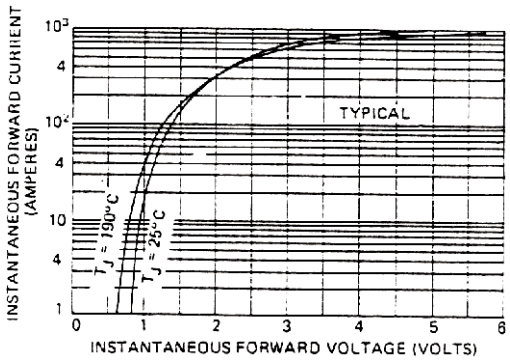



Fig. 4 - Typical Forward Voltage vs. Forward Current, 1N1183 and 1N3765 Series

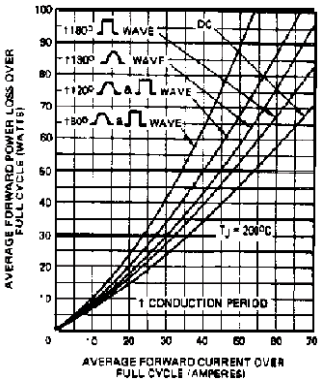



Fig. 7 - Maximum Low Level Forward Power Loss vs. Average Forward Current, 1N1183A Series

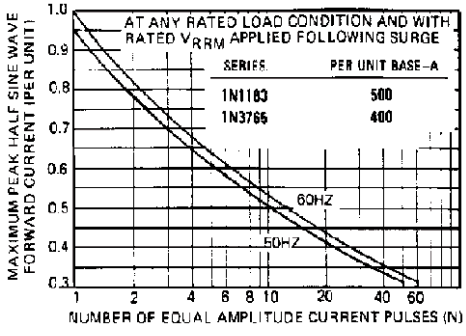



Fig. 5 - Maximum Non-Repetitive Surge Current vs. Number of Current Pulses, 1N1183 and 1N3765 Series

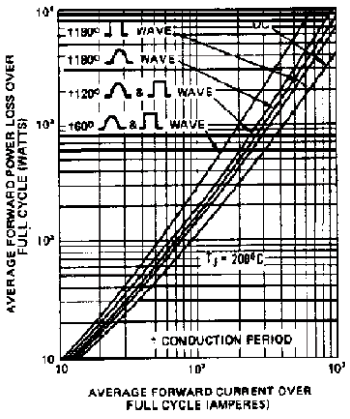



Fig. 8 - Maximum High Level Forward Power Loss vs. Average Forward Current, 1N1183A Series

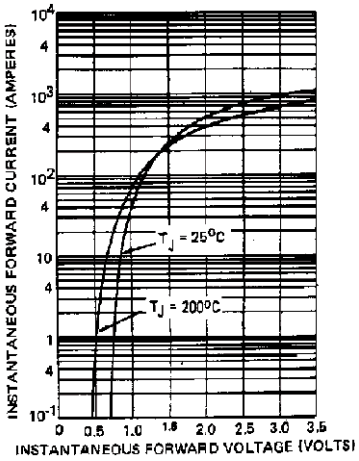



Fig. 9 - Maximum Forward Voltage vs. Forward Current, 1N1183A Series

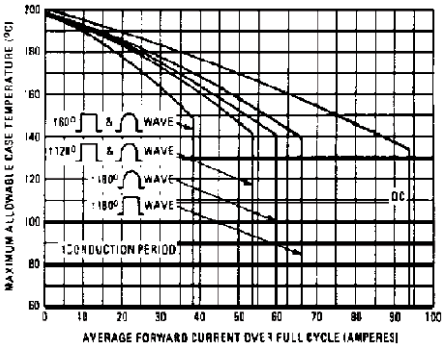



Fig. 12 - Maximum Allowable Case Temperature vs. Average Forward Current, 1N2128A Series

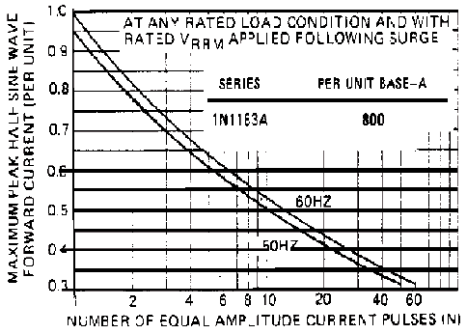



Fig. 10 - Maximum Non-Repetitive Surge Current vs. Number of Current Pulses, 1N1183A Series

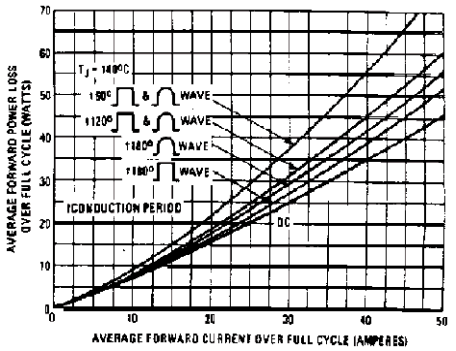



Fig. 13 - Maximum Low Level Forward Power Loss vs. Average Forward Current, 1N2128A Series

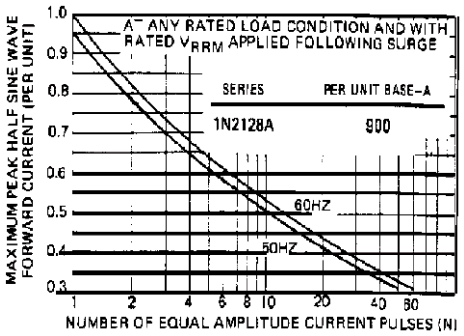



Fig. 11 - Maximum Non-Repetitive Surge Current vs. Number of Current Pulses, 1N2128A Series

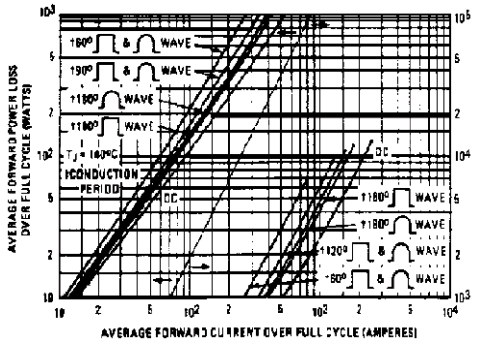



Fig. 14 - Maximum High Level Forward Power Loss vs. Average Forward Current, 1N2128A Series

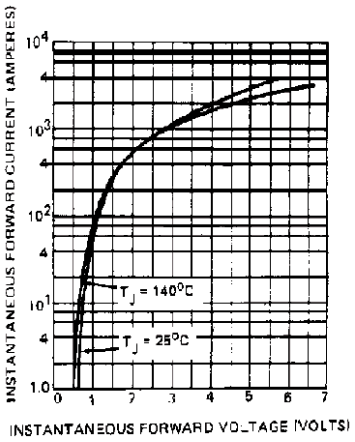
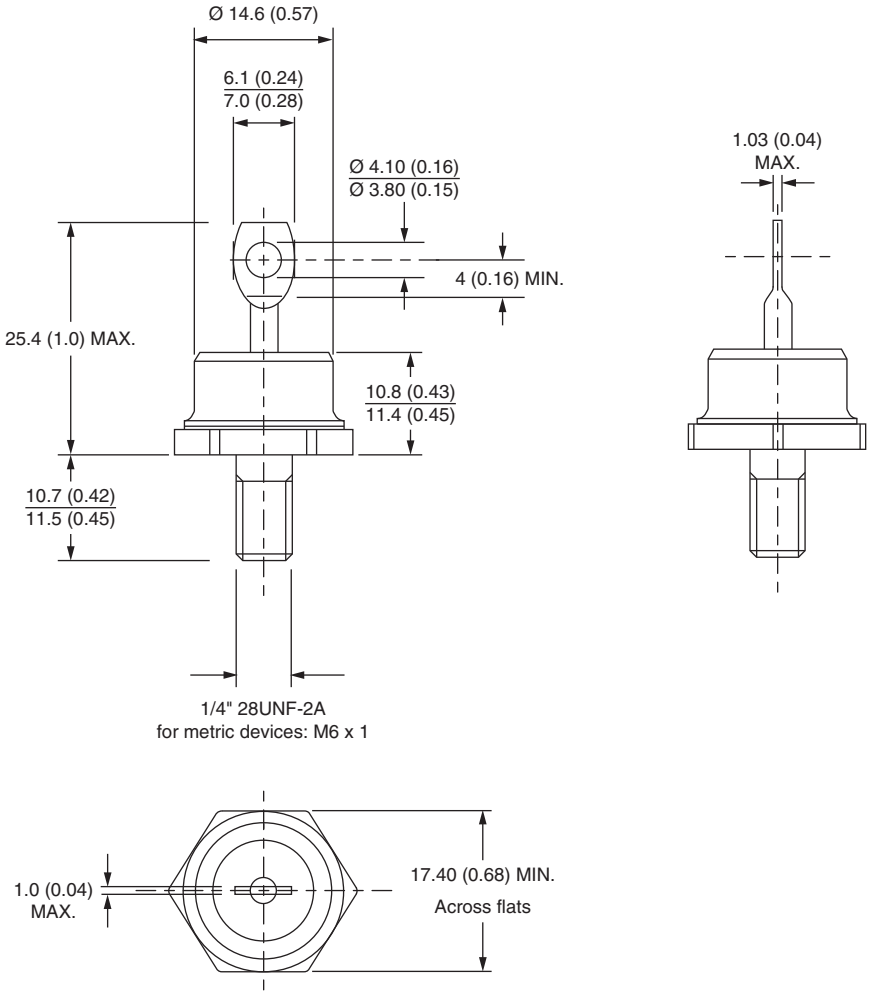



Fig. 15 - Maximum Forward Voltage vs. Forward Current,
1N2128A Series

| LINKS TO RELATED DOCUMENTS | |
|---|---|
| Dimensions | www.vishay.com/doc?95360 |

# DO-203AB (DO-5) for 1N1183, 1N3765, 1N1183A, 1N2128A, 1N3208 Series

**DIMENSIONS** in millimeters (inches)



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