

INTERNATIONAL RECTIFIER



# 1N1183, 1N3765, 1N1183A, 1N2128A SERIES

## 35, 40 and 60 Amp Power Silicon Rectifier Diodes

### Major Ratings and Characteristics

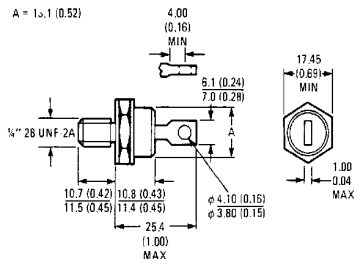
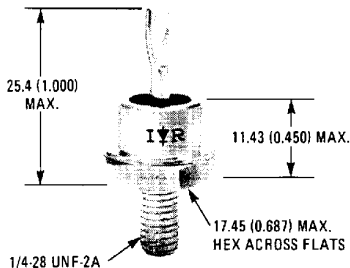
|                   | 1N1183      | 1N3765        | 1N1183A     | 1N2128A     | Units             |
|-------------------|-------------|---------------|-------------|-------------|-------------------|
| $I_F(AV)$         | 35*         | 35*           | 40*         | 60*         | A                 |
| @ Max. $T_C$      | 140*        | 140*          | 150*        | 140*        | °C                |
| $I_{FSM}$ @ 50 Hz | 480         | 380           | 765         | 860         | A                 |
| @ 60 Hz           | 500*        | 400*          | 800*        | 900*        |                   |
| $I_T$ @ 50 Hz     | 1140        | 730           | 2900        | 3700        |                   |
| @ 60 Hz           | 1040        | 670           | 2650        | 3400        | A <sup>2</sup> s  |
| $I^2/t$           | 16 100      | 10 300        | 41 000      | 52 500      | A <sup>2</sup> /s |
| $V_{RRM}$ Range   | 50* to 800* | 700* to 1000* | 50* to 600* | 50* to 600* | V                 |

\*JEDEC registered values.

### Description and Features

- Low leakage current series
- Good surge current capability up to 1000 amps
- Can be supplied to meet stringent military, aerospace and other high-reliability requirements.

### CASE STYLE AND DIMENSIONS



Conforms to JEDEC Outline DO-203AB (DO-5)  
Dimensions in Millimeters and (Inches)

## VOLTAGE RATINGS

| Part Number ① |         |         | $V_{RRM}$ - Max.<br>Repetitive Peak<br>Reverse Voltage<br>(V) | $V_R$ - Max.<br>Direct Reverse<br>Voltage<br>(V)  |
|---------------|---------|---------|---------------------------------------------------------------|---------------------------------------------------|
|               |         |         | $T_C = -65^\circ\text{C to } 200^\circ\text{C} ②$             | $T_C = -65^\circ\text{C to } 200^\circ\text{C} ②$ |
| 1N1183        | 1N1183A | 1N2128A | 50*                                                           | 50*                                               |
| 1N1184        | 1N1184A | 1N2129A | 100*                                                          | 100*                                              |
| 1N1185        | 1N1185A | 1N2130A | 150*                                                          | 150*                                              |
| 1N1186        | 1N1186A | 1N2131A | 200*                                                          | 200*                                              |
| 1N1187        | 1N1187A | 1N2133A | 300*                                                          | 300*                                              |
| 1N1188        | 1N1188A | 1N2135A | 400*                                                          | 400*                                              |
| 1N1189        | 1N1189A | 1N2137A | 500*                                                          | 500*                                              |
| 1N1190        | 1N1190A | 1N2138A | 600*                                                          | 600*                                              |
| 1N3765        |         |         | 700*                                                          | 700*                                              |
| 1N3766        |         |         | 800*                                                          | 800*                                              |
| 1N3767        |         |         | 900*                                                          | 900*                                              |
| 1N3768        |         |         | 1000*                                                         | 1000*                                             |

## ELECTRICAL SPECIFICATIONS

|                                                                 | 1N1183 | 1N3765 | 1N1183A | 1N2128A | Units             | Conditions                                                                                       |
|-----------------------------------------------------------------|--------|--------|---------|---------|-------------------|--------------------------------------------------------------------------------------------------|
| $I_{F(AV)}$ Max. average forward current<br>@ Max. $T_C$        | 35*    | 35*    | 40*     | 60*     | A                 | 1-phase operation, 180° conduction                                                               |
|                                                                 | 140*   | 140*   | 150*    | 140*    | °C                |                                                                                                  |
| $I_{FSM}$ Max. peak one-cycle non-repetitive surge current      | 480    | 380    | 765     | 880     | A                 | Half cycle 50 Hz sine wave or 5 ms rectangular pulse                                             |
|                                                                 | 500*   | 400*   | 800*    | 900*    | A                 | Half cycle 60 Hz sine wave or 5 ms rectangular pulse                                             |
|                                                                 | 570    | 455    | 910     | 1000    | A                 | Half cycle 50 Hz sine wave or 6 ms rectangular pulse                                             |
|                                                                 | 595    | 475    | 950     | 1050    | A                 | Half cycle 60 Hz sine wave or 5 ms rectangular pulse                                             |
| $I^2t$ Max. $I^2t$ for fusing                                   | 1140   | 730    | 2900    | 3700    | A <sup>2</sup> s  | $t = 10\text{ms}$ With rated $V_{RRM}$ applied following surge, initial $T_J = T_J \text{ max.}$ |
|                                                                 | 1040   | 670    | 2650    | 3400    | A <sup>2</sup> s  | $t = 8.3\text{ms}$ With $V_{RRM} = 0$ following surge, initial $T_J = T_J \text{ max.}$          |
| Max. $I^2t$ for individual device fusing                        | 1610   | 1030   | 4150    | 5250    | A <sup>2</sup> s  | $t = 10\text{ms}$ With $V_{RRM} = 0$ following surge, initial $T_J = T_J \text{ max.}$           |
|                                                                 | 1470   | 940    | 3750    | 4750    | A <sup>2</sup> s  | $t = 8.3\text{ms}$ With $V_{RRM} = 0$ following surge, initial $T_J = T_J \text{ max.}$          |
| $I^2\sqrt{t}$ Max. $I^2\sqrt{t}$ for individual device fusing ③ | 16 100 | 10 300 | 41 500  | 52 500  | A <sup>2</sup> √s | $t = 0.1$ to $10\text{ms}$ , $V_{RRM} = 0$ following surge.                                      |
| $V_{FM}$ Max. peak forward voltage<br>@ $I_{FM}$                | 1.7*   | 1.8*   | 1.3*    | 1.3*    | V                 | $T_J = 25^\circ\text{C}$                                                                         |
|                                                                 | 110    | 110    | 126     | 188     | A                 |                                                                                                  |
| $I_{R(AV)}$ Max. average reverse current                        | —      | 5.0*   | —       | —       | mA                | Max. rated $I_{F(AV)}$ and $T_C$ , $V_{RRM} = 700\text{V}$                                       |
|                                                                 | —      | 4.0*   | —       | —       | mA                | 800V                                                                                             |
|                                                                 | —      | 3.0*   | —       | —       | mA                | 900V                                                                                             |
|                                                                 | —      | 2.0*   | —       | —       | mA                | 1000V                                                                                            |
|                                                                 | 10*    | —      | 2.5*    | 10*     | mA                | Max. rated $I_{F(AV)}$ , $V_{RRM}$ and $T_C$                                                     |

① Basic part number indicates cathode-to-case. For anode-to-case, add "R" to part number, i.e., 1N1188R, 1N3766R, 1N1186RA, 1N2135RA

② For 1N1183 series and 1N3765 series  $T_C = -65$  to  $190^\circ\text{C}$ .③  $I^2t$  for  $t_{FX} = I^2\sqrt{t} \cdot \sqrt{t_{FX}}$ 

\* JEDEC registered values.

**THERMAL-MECHANICAL SPECIFICATIONS**

|                   |                                                    | 1N1183          | 1N3765   | 1N1183A    | 1N2128A | Units          | Conditions                                  |
|-------------------|----------------------------------------------------|-----------------|----------|------------|---------|----------------|---------------------------------------------|
| T <sub>C</sub>    | Max. operating case temperature range              | -65 to 190*     |          | -65 to 200 |         | °C             |                                             |
| T <sub>stg</sub>  | Max. storage temperature range                     | -65 to 175*     |          | -65 to 200 |         | °C             |                                             |
| R <sub>thJC</sub> | Max. internal thermal resistance, junction-to-case | 1.00*           |          | 1.1*       | 0.65*   | deg. C/W       | DC operation                                |
| R <sub>thCS</sub> | Thermal resistance, case-to-sink                   | 0.25            |          |            |         | deg. C/W       | Mounting surface flat, smooth, and greased. |
| T                 | Mounting torque                                    | Min.            | 2.3 (20) |            |         | Nm<br>(lbf.in) | Non-lubricated threads                      |
|                   |                                                    | Max.            | 3.4 (30) |            |         |                |                                             |
| wt                | Approximate weight                                 | 17 (0.6)        |          |            |         | g (oz)         |                                             |
| Case style        |                                                    | DO-203AB (DO-5) |          |            |         |                | JEDEC                                       |

\*JEDEC registered values.

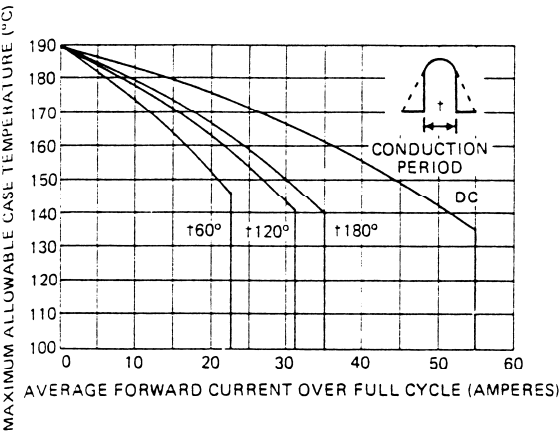


Fig. 1 - Maximum Allowable Case Temperature Vs. Average Forward Current, 1N1183 and 1N3765 Series

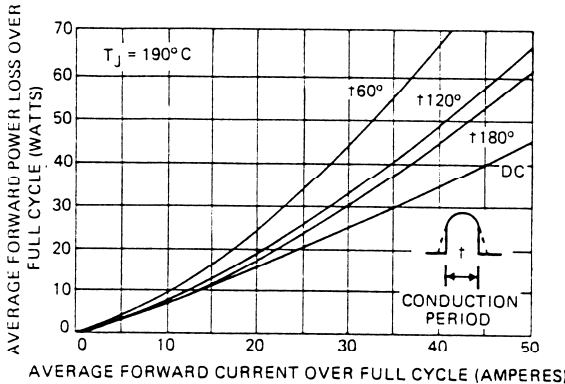


Fig. 2 - Typical Low Level Forward Power Loss Vs. Average Forward Current (Sinusoidal Current Waveform), 1N1183 and 1N3765 Series

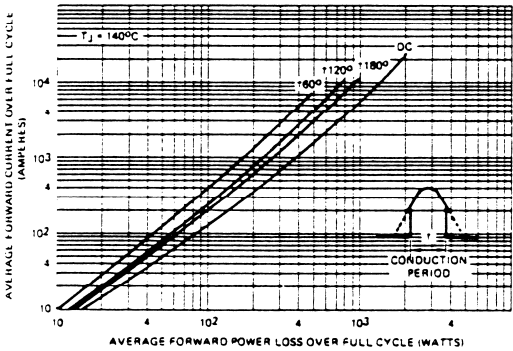


Fig. 3 - Typical High Level Forward Power Loss Vs. Average Forward Current (Sinusoidal Current Waveform), 1N1183 and 1N3765 Series

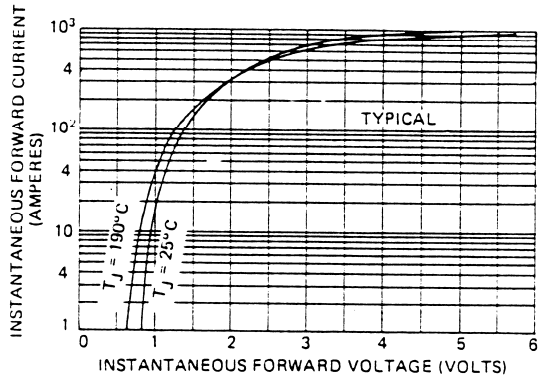


Fig. 4 - Typical Forward Voltage Vs. Forward Current, 1N1183 and 1N3765 Series

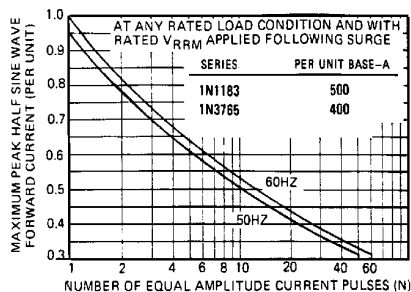


Fig. 5 - Maximum Non-Repetitive Surge Current Vs. Number of Current Pulses, 1N1183 and 1N3765 Series

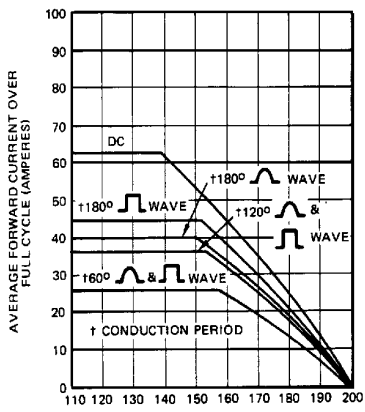


Fig. 6 - Average Forward Current Vs. Maximum Allowable Case Temperature, 1N1183A Series

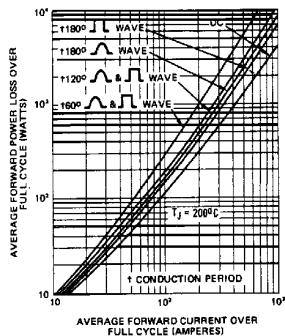


Fig. 8 - Maximum High Level Forward Power Loss Vs. Average Forward Current, 1N1183A Series.

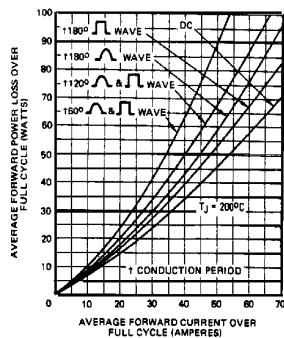


Fig. 7 - Maximum Low Level Forward Power Loss Vs. Average Forward Current, 1N1183A Series

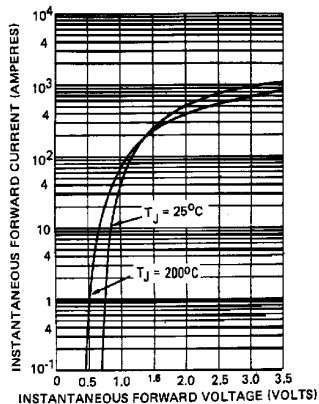


Fig. 9 - Maximum Forward Voltage Vs. Forward Current, 1N1183A Series

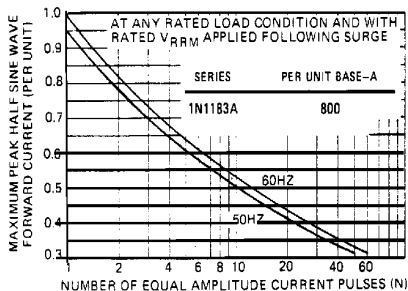


Fig. 10 - Maximum Non-Repetitive Surge Current Vs. Number of Current Pulses, 1N1183A Series

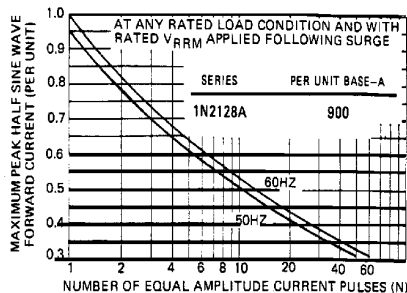


Fig. 11 - Maximum Non-Repetitive Surge Current Vs. Number of Current Pulses, 1N2128A Series

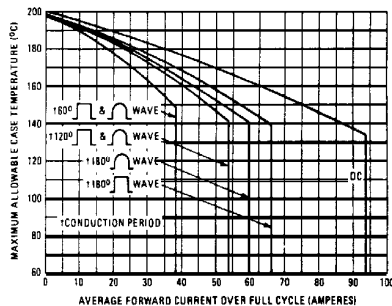


Fig. 12 - Maximum Allowable Case Temperature Vs. Average Forward Current, 1N2128A Series

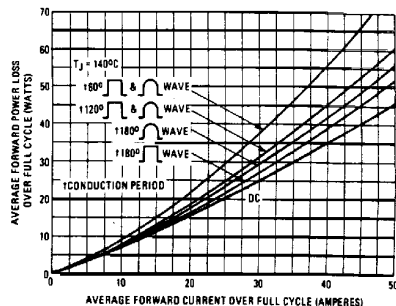


Fig. 13 - Maximum Low Level Forward Power Loss Vs. Average Forward Current, 1N2128A Series

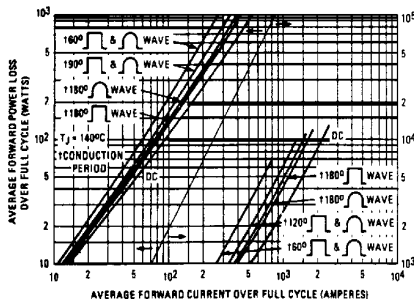


Fig. 14 - Maximum High Level Forward Power Loss Vs. Average Forward Current, 1N2128A Series

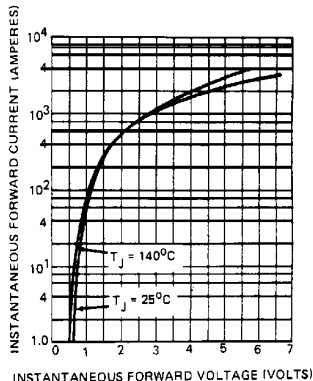


Fig. 15 - Maximum Forward Voltage Vs. Forward Current, 1N2128A Series