



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 ² s |
| | 60 Hz | 1040 | 670 | 2650 | 3400 | |
| $I^2\sqrt{t}$ | | 16 100 | 10 300 | 41 000 | 52 500 | A ² √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 ($T_J = -65\text{ °C TO }200\text{ °C}^{(2)}$) V | V_{RM} , MAXIMUM DIRECT REVERSE VOLTAGE ($T_J = -65\text{ °C TO }200\text{ °C}^{(2)}$) 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 $T_C = -65\text{ °C to }190\text{ °C}$

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

1N1183, 1N3765, 1N1183A, 1N2128A Series



Vishay High Power Products Power Silicon Rectifier Diodes,
35 A/40 A/60 A

| 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 $\frac{1}{2} V_{RRM}$ 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 ² s |
| | | 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 √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 | $I_{R(AV)}$ | Maximum rated $I_{F(AV)}$ and T_C | | $V_{RRM} = 700$ | 5.0 ⁽¹⁾ | - | - | mA |
| | | | | $V_{RRM} = 800$ | 4.0 ⁽¹⁾ | - | - | |
| | | | | $V_{RRM} = 900$ | 3.0 ⁽¹⁾ | - | - | |
| | | | | $V_{RRM} = 1000$ | 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 $t_x = I^2\sqrt{t} \times \sqrt{t_x}$



1N1183, 1N3765, 1N1183A, 1N2128A Series

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| 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 | | |
| 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 | | | | |
| Maximum allowable mounting torque (+ 0 %, - 10 %) | | Not lubricated thread, tightening on nut ⁽²⁾ | 3.4 (30) | | | | N · m (lbf · in) |
| | | Lubricated thread, tightening on nut ⁽²⁾ | 2.3 (20) | | | | |
| | | Not lubricated thread, tightening on hexagon ⁽³⁾ | 4.2 (37) | | | | |
| | | Lubricated thread, tightening on hexagon ⁽³⁾ | 3.2 (28) | | | | |
| 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

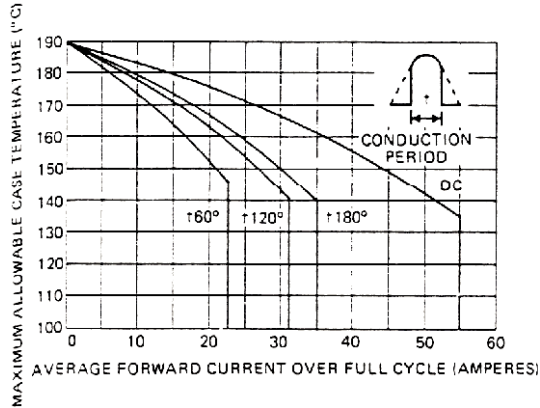


Fig. 1 - Maximum Allowable Case Temperature vs. Average Forward Current, 1N1183 and 1N3765 Series

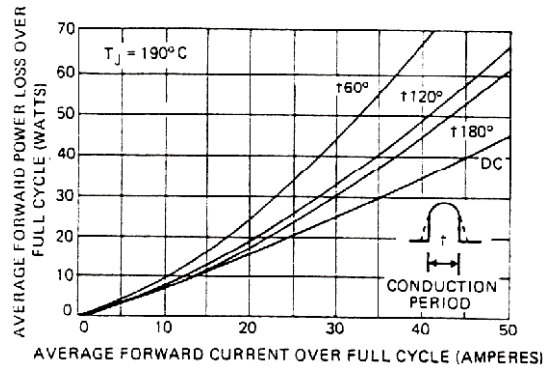


Fig. 2 - Typical Low Level Forward Power Loss vs. Average Forward Current (Sinusoidal Current Waveform), 1N1183 and 1N3765 Series

1N1183, 1N3765, 1N1183A, 1N2128A Series



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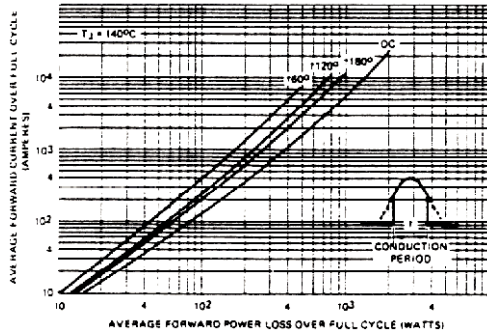


Fig. 3 - Typical High Level Forward Power Loss vs. Average Forward Current (Sinusoidal Current Waveform), 1N1183 and 1N3765 Series

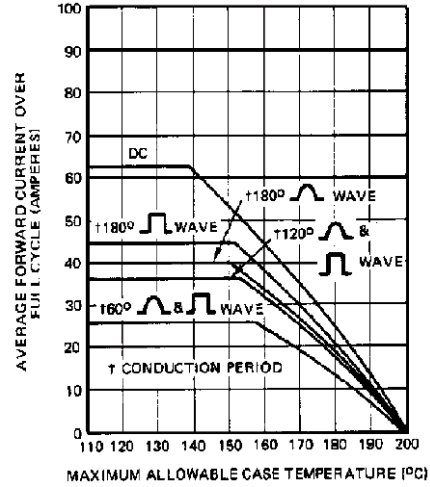


Fig. 6 - Average Forward Current vs. Maximum Allowable Case Temperature, 1N1183A Series



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

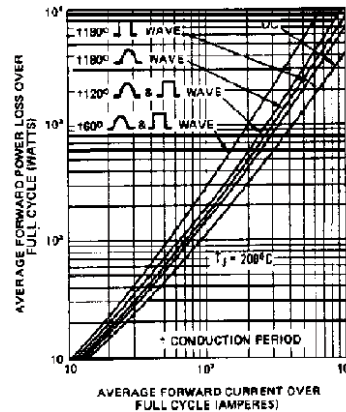


Fig. 8 - Maximum High Level Forward Power Loss vs. Average Forward Current, 1N1183A Series



1N1183, 1N3765, 1N1183A, 1N2128A Series

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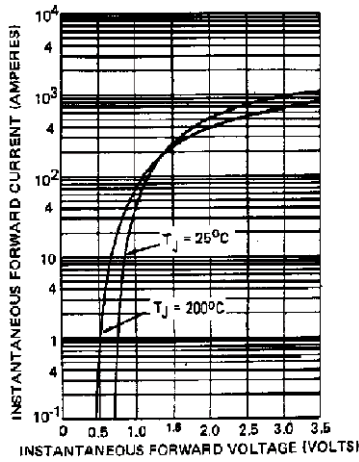


Fig. 9 - Maximum Forward Voltage vs. Forward Current, 1N1183A Series

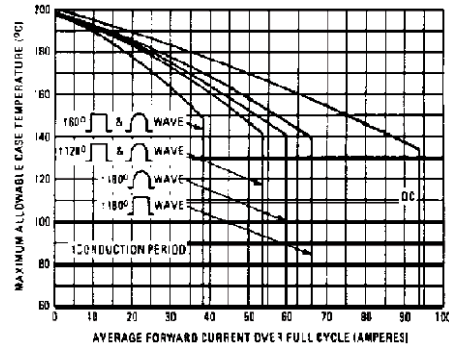


Fig. 12 - Maximum Allowable Case Temperature vs. Average Forward Current, 1N2128A Series



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

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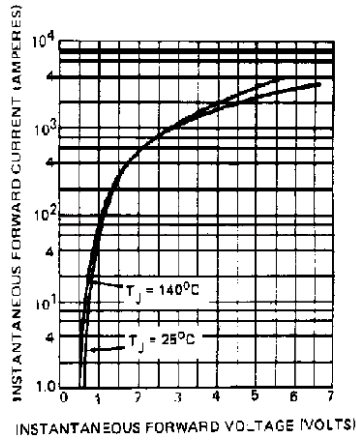


Fig. 15 - Maximum Forward Voltage vs. Forward Current, 1N2128A Series

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



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