



Vishay High Power Products

Power Silicon Rectifier Diodes,

35 A/40 A/60 A



DO-203AB (DO-5)

35 A/40 A/60 A

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
- · RoHS compliant

| MAJOR RATINGS AND CHARACTERISTICS | | | | | | | |
|-----------------------------------|-----------------|--------------------------|----------------------------|--------------------------|--------------------------|------------------|--|
| PARAMETER | TEST CONDITIONS | 1N1183 | 1N3765 | 1N1183A | 1N2128A | UNITS | |
| 1 | | 35 ⁽¹⁾ | 35 ⁽¹⁾ | 40 (1) | 60 ⁽¹⁾ | Α | |
| I _{F(AV)} | T _C | 140 (1) | 140 (1) | 150 ⁽¹⁾ | 140 (1) | °C | |
| I _{FSM} | 50 Hz | 480 | 380 | 765 | 860 | | |
| | 60 Hz | 500 ⁽¹⁾ | 400 (1) | 800 (1) | 900 (1) | Α | |
| I ² t | 50 Hz | 1140 | 730 | 2900 | 3700 | A ² s | |
| | 60 Hz | 1040 | 670 | 2650 | 3400 | | |
| I ² √t | | 16 100 | 10 300 | 41 000 | 52 500 | A²√s | |
| V _{RRM} | Range | 50 to 600 ⁽¹⁾ | 700 to 1000 ⁽¹⁾ | 50 to 600 ⁽¹⁾ | 50 to 600 ⁽¹⁾ | V | |

Note

PRODUCT SUMMARY

I_{F(AV)}

ELECTRICAL SPECIFICATIONS

| VOLTAGE RATINGS | | | | | | |
|-----------------|---------|---------|--|--|--|--|
| TYPE NUMBER | | | V _{RRM} , MAXIMUM REPETITIVE PEAK REVERSE VOLTAGE V | V _{RM} , MAXIMUM DIRECT REVERSE VOLTAGE V | | |
| | | | $T_J = -65$ °C TO 200 °C ⁽²⁾ | T_J = - 65 °C TO 200 °C ⁽²⁾ | | |
| 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 to 190 $^{\circ}C$
- Basic type number indicates cathode to case. For anode to case, add "R" to part number, e.g., 1N1188R, 1N3766R, 1N1186AR, 1N2135AR

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⁽¹⁾ JEDEC registered values

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 | I _{F(AV)} | 1-phase operation, 180° sinusoidal conduction | | 35 ⁽¹⁾ | 35 ⁽¹⁾ | 40 (1) | 60 ⁽¹⁾ | A |
| at case temperature | . (, | | | 140 (1) | 140 (1) | 150 ⁽¹⁾ | 140 (1) | °C |
| | 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 |
| Maximum peak one cycle | | Half cycle 60 Hz sine wave or 5 ms rectangular pulse | | 500 ⁽¹⁾ | 400 (1) | 800 (1) | 900 (1) | |
| non-repetitive surge current | | 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 ² t for fusing | - I ² t | t = 10 ms | With rated V_{RRM} applied following surge, initial $T_J = T_J$ maximum With $V_{RRM} = 0$ following surge, initial $T_J = T_J$ maximum | 1140 | 730 | 2900 | 3700 | - A ² s |
| Maximum i-t for fusing | | t = 8.3 ms | | 1040 | 670 | 2650 | 3400 | |
| Maximum I ² t for individual | | t = 10 ms | | 1610 | 1030 | 4150 | 5250 | |
| device fusing | | t = 8.3 ms | | 1470 | 940 | 3750 | 4750 | |
| Maximum I ² √t for individual device fusing | I 2√t (2) | t = 0.1 to 10 ms, V _{RRM} = 0 following surge | | 16 100 | 10 300 | 41 500 | 52 500 | A²√s |
| Maximum peak forward voltage | V | T _J = 25 °C | | 1.7 (1) | 1.8 (1) | 1.3 (1) | 1.3 (1) | V |
| at maximum forward current (I _{FM}) | V_{FM} | 1j=25 C | | 110 | 110 | 126 | 188 | Α |
| V _{RRM} = 700 | _ | Maximum rated $I_{F(AV)}$ and T_{C} | | - | 5.0 ⁽¹⁾ | = | - | |
| V _{RRM} = 800 | | | | - | 4.0 (1) | - | - | mA |
| Maximum average reverse current $V_{RRM} = 900$ | I _{R(AV)} | | | - | 3.0 (1) | - | - | |
| V _{RRM} = 1000 | 1 | | | - | 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⁾ I²t for time $t_x = I^2 \sqrt{t} \times \sqrt{t_x}$



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

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| THERMAL AND ME | HANICA | AL 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 | | o 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 | | *C/VV | | |
| minimum | | Non-lubricated threads | 2.3 (20) | | | | N ⋅ m (lbf ⋅ in) |
| Mounting torque maximum | | Non-lubricated trireads | 3.4 (30) | | | | |
| Approximate weight | | | 17 | | g | | |
| Approximate weight | | | 0.6 | | | | oz. |
| Case style | | JEDEC | | DC | D-203AB (DC | D-5) | • |

Note

(1) JEDEC registered values

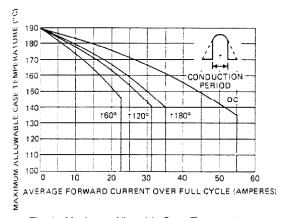


Fig. 1 - Maximum Allowable Case Temperature vs. Average Forward Current, 1N1183 and 1N3765 Series

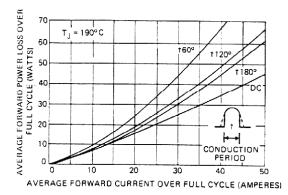


Fig. 2 - Typical Low Level Forward Power Loss vs. Average Forward Current (Sinusoidal Current Waveform), 1N1183 and 1N3765 Series

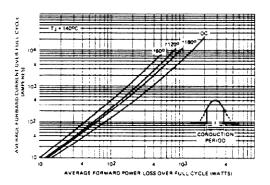


Fig. 3 - Typical High Level Forward Power Loss vs. Average Forward Current (Sinusoidal Current Waveform), 1N1183 and 1N3765 Series

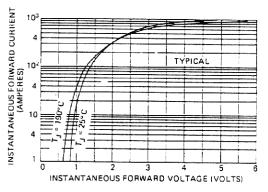


Fig. 4 - Typical Forward Voltage vs. Forward Current, 1N1183 and 1N3765 Series

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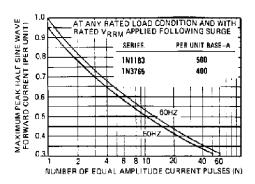


Fig. 5 - Maximum Non-Repetitive Surge Current vs. Number of Current Pulses, 1N1183 and 1N3765 Series

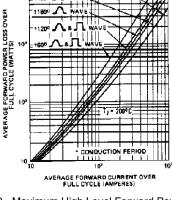


Fig. 8 - Maximum High Level Forward Power Loss vs. Average Forward Current, 1N1183A Series

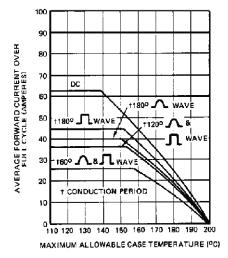


Fig. 6 - Average Forward Current vs. Maximum Allowable Case Temperature, 1N1183A Series

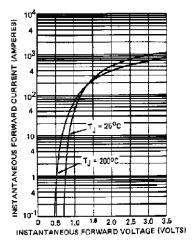


Fig. 9 - Maximum Forward Voltage vs. Forward Current, 1N1183A Series

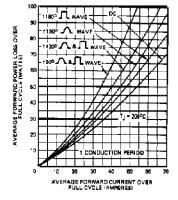


Fig. 7 - Maximum Low Level Forward Power Loss vs. Average Forward Current, 1N1183A Series

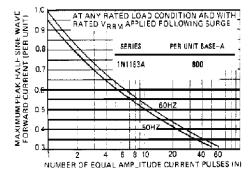


Fig. 10 - Maximum Non-Repetitive Surge Current vs. Number of Current Pulses, 1N1183A Series





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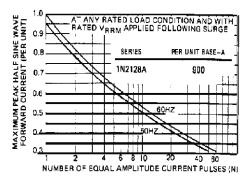


Fig. 11 - Maximum Non-Repetitive Surge Current vs. Number of Current Pulses, 1N2128A Series

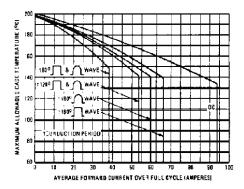


Fig. 12 - Maximum Allowable Case Temperature vs. Average Forward Current, 1N2128A Series

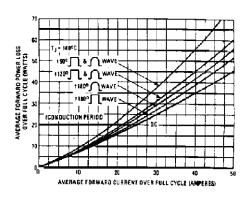


Fig. 13 - Maximum Low Level Forward Power Loss vs. Average Forward Current, 1N2128A Series

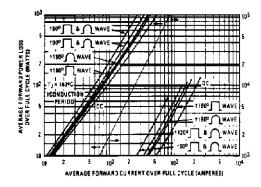


Fig. 14 - Maximum High Level Forward Power Loss vs. Average Forward Current, 1N2128A Series

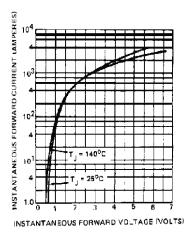


Fig. 15 - Maximum Forward Voltage vs. Forward Current, 1N2128A Series

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

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