



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

Vishay High Power Products

Power Silicon Rectifier Diodes, 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
- 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

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| 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 | |
| | | | | 500 ⁽¹⁾ | 400 ⁽¹⁾ | 800 ⁽¹⁾ | 900 ⁽¹⁾ | | |
| | | Half cycle 60 Hz sine wave or 5 ms rectangular pulse | Following any rated load condition and with $\frac{1}{2} V_{RRM}$ applied following surge = 0 | 570 | 455 | 910 | 1000 | | |
| | | | | 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 | $I_{R(AV)}$ | $V_{RRM} = 700$ | Maximum rated $I_{F(AV)}$ and T_C | - | 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 $t_x = I^2\sqrt{t} \times \sqrt{t_x}$



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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

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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



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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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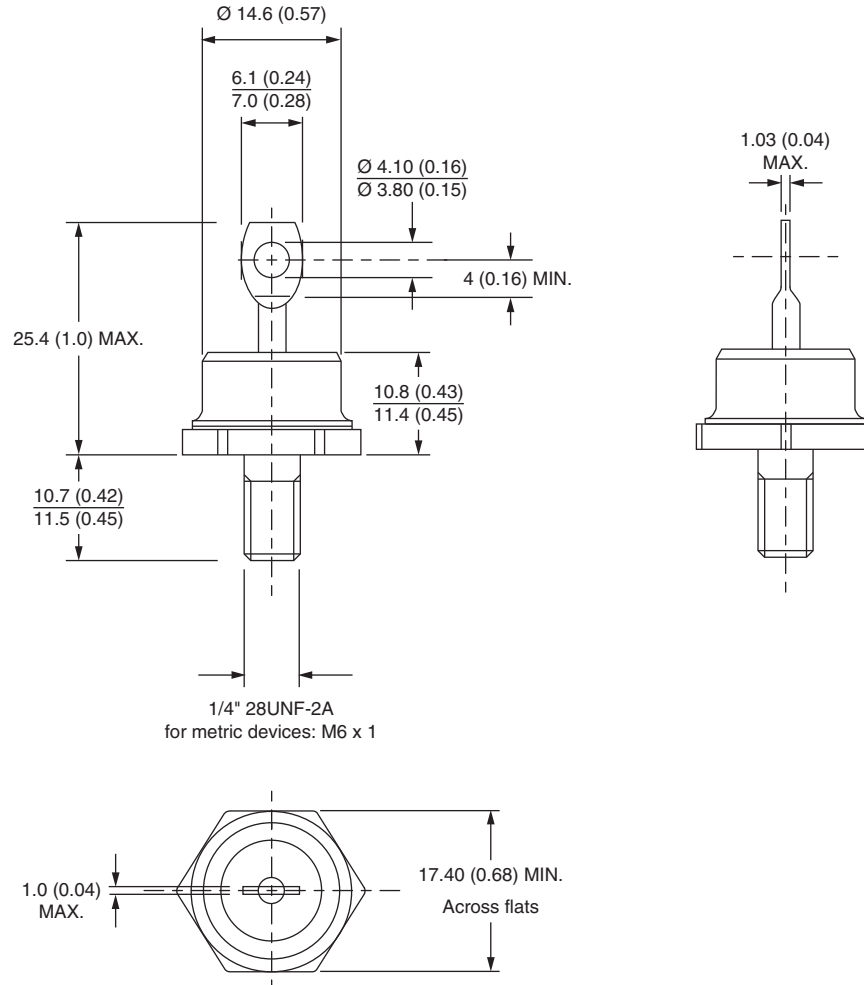


Fig. 15 - Maximum Forward Voltage vs. Forward Current,
1N2128A Series

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

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

DIMENSIONS in millimeters (inches)





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- Консультации по применению компонента;
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- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



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