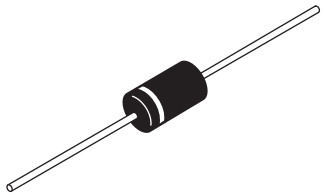
# Schottky Rectifier, 3 A



C-16


## FEATURES

- Low profile, axial leaded outline
- Very low forward voltage drop
- High frequency operation
- High purity, high temperature epoxy encapsulation for enhanced mechanical strength and moisture resistance
- Guard ring for enhanced ruggedness and long term reliability
- Compliant to RoHS Directive 2002/95/EC
- Designed and qualified for commercial level
- Halogen-free according to IEC 61249-2-21 definition (-M3 only)

RoHS COMPLIANT
HALOGEN FREE Available

## DESCRIPTION

The VS-MBR350..., VS-MBR350 axial leaded Schottky rectifier has been optimized for very low forward voltage drop, with moderate leakage. Typical applications are in switching power supplies, converters, freewheeling diodes, and reverse battery protection.

| PRODUCT SUMMARY | |
|---|---|
| Package | DO-201AD (C-16) |
| $I_{F(AV)}$ | 3 A |
| $V_R$ | 50 V, 60 V |
| $V_F$ at $I_F$ | 0.64 V |
| $I_{RM}$ max. | 15 mA at 125 °C |
| $T_J$ max. | 150 °C |
| Diode variation | Single die |
| $E_{AS}$ | 5.0 mJ |

| MAJOR RATINGS AND CHARACTERISTICS | | | |
|---|---|---|---|
| SYMBOL | CHARACTERISTICS | VALUES | UNITS |
| $I_{F(AV)}$ | Rectangular waveform | 3.0 | A |
| $V_{RRM}$ | | 50/60 | V |
| $I_{FSM}$ | $t_p$ = 5 µs sine | 460 | A |
| $V_F$ | 3 Apk, $T_J$ = 25 °C | 0.73 | V |
| $T_J$ | | - 40 to 150 | °C |

| VOLTAGE RATINGS | | | | | | |
|---|---|---|---|---|---|---|
| PARAMETER | SYMBOL | VS-MBR350 | VS-MBR350-M3 | VS-MBR360 | VS-MBR360-M3 | UNITS |
| Maximum DC reverse voltage | $V_R$ | 50 | 50 | 60 | 60 | V |
| Maximum working peak reverse voltage | $V_{RWM}$ | | | | | |

| ABSOLUTE MAXIMUM RATINGS | | | | | |
|---|---|---|---|---|---|
| PARAMETER | SYMBOL | TEST CONDITIONS | | VALUES | UNITS |
| Maximum average forward current See fig. 4 | $I_{F(AV)}$ | 50 % duty cycle at $T_L$ = 50 °C, rectangular waveform | | 3.0 | A |
| Maximum peak one cycle non-repetitive surge current See fig. 6 | $I_{FSM}$ | 5 µs sine or 3 µs rect. pulse | Following any rated load condition and with rated $V_{RRM}$ applied | 460 | |
| | | 10 ms sine or 6 ms rect. pulse | | 80 | |
| Non-repetitive avalanche energy | $E_{AS}$ | $T_J$ = 25 °C, $I_{AS}$ = 1 A, L = 10 mH | | 5.0 | mJ |
| Repetitive avalanche current | $I_{AR}$ | Current decaying linearly to zero in 1 µs Frequency limited by, $T_J$ maximum $V_A$ = 1.5 x $V_R$ typical | | 1.0 | A |

## ELECTRICAL SPECIFICATIONS

| PARAMETER | SYMBOL | TEST CONDITIONS | | VALUES | UNITS |
|---|---|---|---|---|---|
| Maximum forward voltage drop See fig. 1 | $V_{FM}$ (1) | 1.0 A | $T_J$ = 25 °C | 0.58 | V |
| | | 3.0 A | | 0.73 | |
| | | 9.4 A | | 1.06 | |
| | | 1.0 A | $T_J$ = 125 °C | 0.49 | |
| | | 3.0 A | | 0.64 | |
| | | 9.4 A | | 0.89 | |
| Maximum reverse leakage current See fig. 2 | $I_{RM}$ (1) | $T_J$ = 25 °C | $V_R$ = Rated $V_R$ | 0.6 | mA |
| | | $T_J$ = 100 °C | | 8 | |
| | | $T_J$ = 125 °C | | 15 | |
| Typical junction capacitance | $C_T$ | $V_R$ = 5 $V_{DC}$ (test signal range 100 kHz to 1 MHz) 25 °C | | 190 | pF |
| Typical series inductance | $L_S$ | Measured lead to lead 5 mm from package body | | 9.0 | nH |
| Maximum voltage rate of change | dV/dt | Rated $V_R$ | | 10 000 | V/µs |

**Note**

(1) Pulse width < 300 µs, duty cycle < 2 %

## THERMAL - MECHANICAL SPECIFICATIONS

| PARAMETER | SYMBOL | TEST CONDITIONS | VALUES | UNITS |
|---|---|---|---|---|
| Maximum junction and storage temperature range | $T_J$ (1), $T_{Stg}$ | | - 40 to 150 | °C |
| Maximum thermal resistance, junction to lead | $R_{thJL}$ (2) | DC operation See fig. 4 | 30 | °C/W |
| Approximate weight | | | 1.2 | g |
| | | | 0.042 | oz. |
| Marking device | | Case style C-16 | MBR350 | |
| | | | MBR360 | |

**Notes**

(1) $\frac{dP_{tot}}{dT_J} < \frac{1}{R_{thJA}}$ thermal runaway condition for a diode on its own heatsink

(2) Mounted 1" square PCB, thermal probe connected to lead 2 mm from package

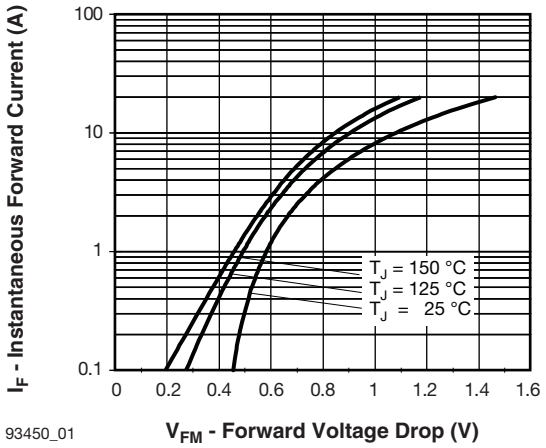



Fig. 1 - Maximum Forward Voltage Drop Characteristics

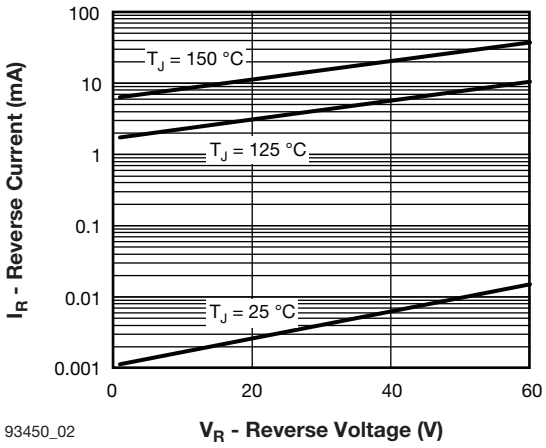



Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

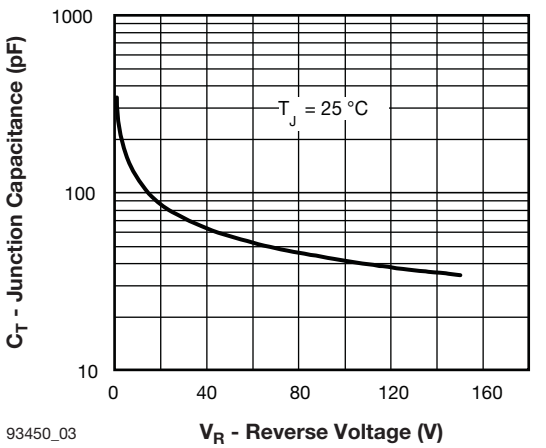



Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage

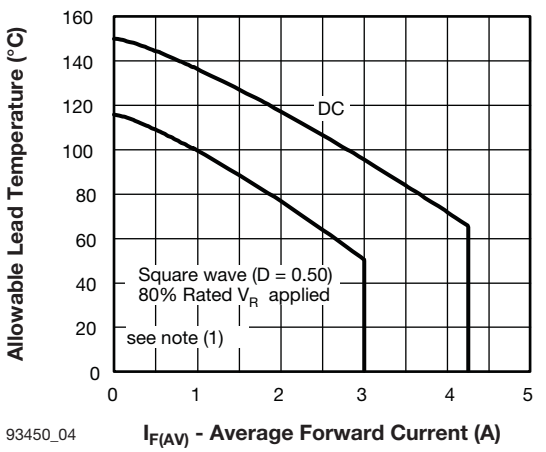



Fig. 4 - Maximum Allowable Lead Temperature vs. Average Forward Current

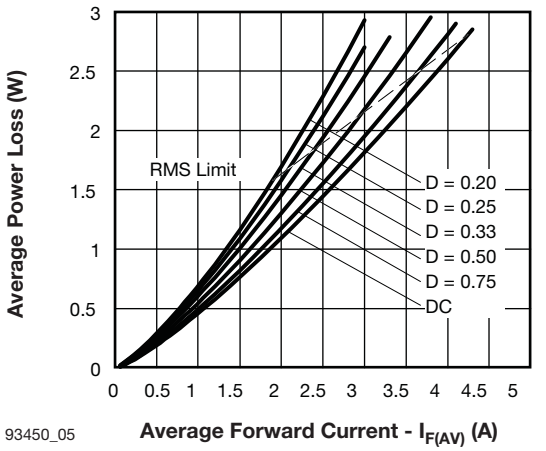



Fig. 5 - Forward Power Loss Characteristics

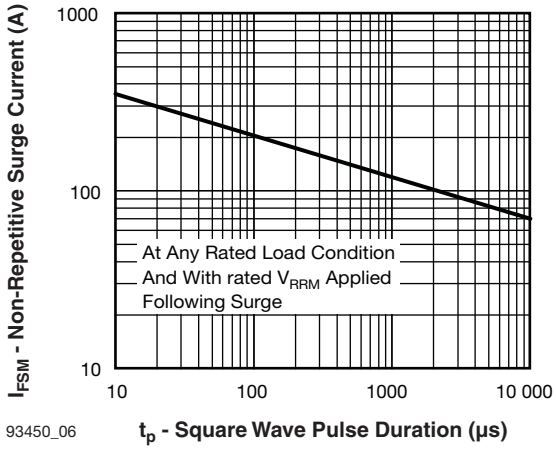


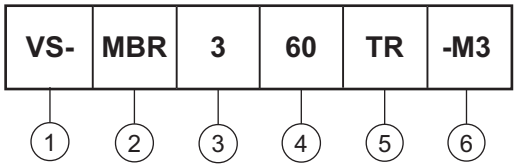

Fig. 6 - Maximum Non-Repetitive Surge Current

**Note**

(1) Formula used: $T_C = T_J - (Pd + Pd_{REV}) \times R_{thJC}$;
Pd = Forward power loss = $I_{F(AV)} \times V_{FM}$ at ($I_{F(AV)}$/D) (see fig. 6); $Pd_{REV}$ = Inverse power loss = $V_{R1} \times I_R (1 - D)$; $I_R$ at $V_{R1}$ = 80 % rated $V_R$

## ORDERING INFORMATION TABLE

Device code




1 - Vishay Semiconductors product

2 - Schottky MBR series

3 - Current rating: 3 = 3 A

4 - Voltage rating — 50 = 50 V, 60 = 60 V

5 - TR = Tape and reel package
None = Bulk package

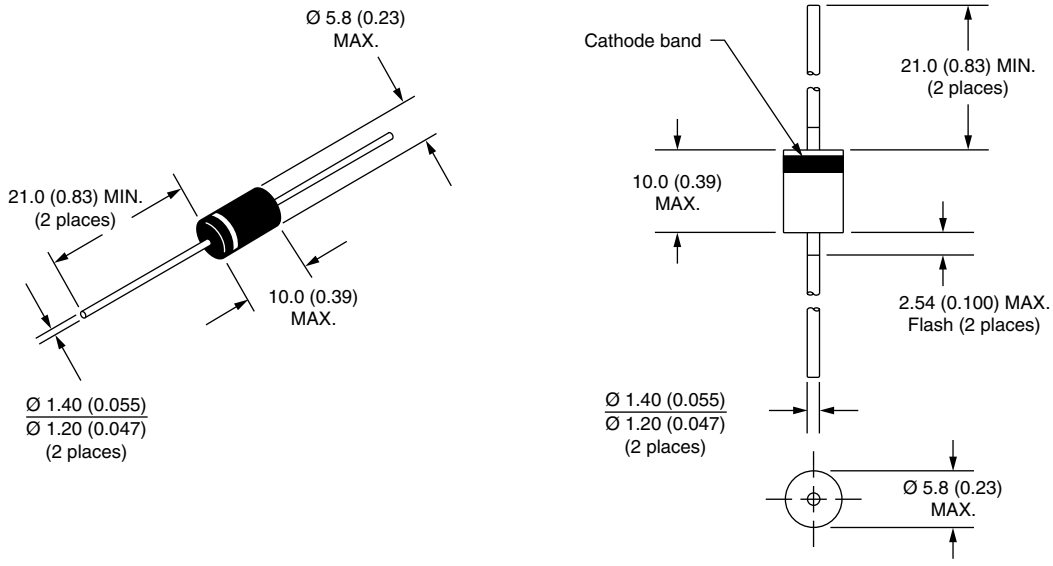
6 - Environmental digit
- None = Lead (Pb)-free and RoHS compliant
- -M3 = Halogen-free, RoHS compliant, and terminations lead (Pb)-free

| **ORDERING INFORMATION** (Example) | | | |
|---|---|---|---|
| **PREFERRED P/N** | **QUANTITY PER T/R** | **MINIMUM ORDER QUANTITY** | **PACKAGING DESCRIPTION** |
| VS-MBR350 | 500 | 500 | Bulk |
| VS-MBR350TR | 1200 | 1200 | Tape and reel |
| VS-MBR350-M3 | 500 | 500 | Bulk |
| VS-MBR350TR-M3 | 1200 | 1200 | Tape and reel |
| VS-MBR360 | 500 | 500 | Bulk |
| VS-MBR360TR | 1200 | 1200 | Tape and reel |
| VS-MBR360-M3 | 500 | 500 | Bulk |
| VS-MBR360TR-M3 | 1200 | 1200 | Tape and reel |

| **LINKS TO RELATED DOCUMENTS** | |
|---|---|
| Dimensions | www.vishay.com/doc?95242 |
| Part marking information | www.vishay.com/doc?95304 |
| Packaging information | www.vishay.com/doc?95338 |

# Axial DO-201AD (C-16)

**DIMENSIONS** in millimeters (inches)



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