



# Surface Mount Trench MOS Barrier Schottky Rectifier

TMBS® eSMP® Series



DO-220AA (SMP)

## PRIMARY CHARACTERISTICS

|                        |        |
|------------------------|--------|
| $I_{F(AV)}$            | 3.0 A  |
| $V_{RRM}$              | 60 V   |
| $I_{FSM}$              | 60 A   |
| $V_F$ at $I_F = 3.0$ A | 0.48 V |
| $T_J$ max.             | 150 °C |

## TYPICAL APPLICATIONS

For use in low voltage, high frequency inverters, freewheeling, DC/DC converters, and polarity protection applications.

## FEATURES

- Low profile package
- Ideal for automated placement
- Trench MOS Schottky technology
- Low power losses, high efficiency
- Low forward voltage drop
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- AEC-Q101 qualified
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC
- Halogen-free according to IEC 61249-2-21 definition

AUTOMOTIVE  
GRADE  
Available



RoHS  
COMPLIANT  
HALOGEN  
FREE

## MECHANICAL DATA

**Case:** DO-220AA (SMP)

Molding compound meets UL 94 V-0 flammability rating  
Base P/N-M3 - halogen-free, RoHS compliant, and commercial grade

Base P/NHM3 - halogen-free, RoHS compliant, and automotive grade

**Terminals:** Matte tin plated leads, solderable per J-STD-002 and JESD 22-B102

M3 suffix meets JESD 201 class 1A whisker test, HM3 suffix meets JESD 201 class 2 whisker test

**Polarity:** Color band denotes the cathode end

## MAXIMUM RATINGS ( $T_A = 25$ °C unless otherwise noted)

| PARAMETER   | SYMBOL         | V3P6          | UNIT       |
|---|----------------|---------------|------------|
| Device marking code   |                | V36           |            |
| Maximum repetitive peak reverse voltage   | $V_{RRM}$      | 60            | V          |
| Maximum DC forward current  | $I_F^{(1)}$    | 3.0           | A          |
|   | $I_F^{(2)}$    | 2.4           |            |
| Peak forward surge current 10 ms single half sine-wave superimposed on rated load | $I_{FSM}$      | 60            | A          |
| Voltage rate of change (rated $V_R$ )   | $dV/dt$        | 10 000        | V/ $\mu$ s |
| Operating junction and storage temperature range                                  | $T_J, T_{STG}$ | - 55 to + 150 | °C         |

## Notes

(1) Mounted on 8 mm x 8 mm pad areas, 1 oz. FR4 PCB

(2) Free air, mounted on recommended copper pad area

| ELECTRICAL CHARACTERISTICS ( $T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise noted) |                      |                                     |             |      |      |               |
|---|----------------------|-------------------------------------|-------------|------|------|---------------|
| PARAMETER   | TEST CONDITIONS      |                                     | SYMBOL      | TYP. | MAX. | UNIT          |
| Instantaneous forward voltage   | $I_F = 3.0\text{ A}$ | $T_A = 25\text{ }^{\circ}\text{C}$  | $V_F^{(1)}$ | 0.53 | 0.63 | V             |
|   |                      | $T_A = 125\text{ }^{\circ}\text{C}$ |             | 0.48 | 0.59 |               |
| Reverse current   | $V_R = 60\text{ V}$  | $T_A = 25\text{ }^{\circ}\text{C}$  | $I_R^{(2)}$ | -    | 900  | $\mu\text{A}$ |
|   |                      | $T_A = 125\text{ }^{\circ}\text{C}$ |             | 4    | 15   | mA            |
| Typical junction capacitance  | 4.0 V, 1 MHz         |                                     | $C_J$       | 250  | -    | pF            |

**Notes**

- (1) Pulse test: 300  $\mu\text{s}$  pulse width, 1 % duty cycle  
(2) Pulse test: Pulse width  $\leq 40\text{ ms}$

| THERMAL CHARACTERISTICS ( $T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise specified) |                       |      |                      |
|--|-----------------------|------|----------------------|
| PARAMETER  | SYMBOL                | V3P6 | UNIT                 |
| Typical thermal resistance   | $R_{\theta JA}^{(1)}$ | 125  | $^{\circ}\text{C/W}$ |
|  | $R_{\theta JM}^{(2)}$ | 15   |                      |

**Notes**

- (1) Free air, mounted on recommended PCB, 1 oz. pad area; thermal resistance  $R_{\theta JA}$  - junction to ambient  
(2) Units mounted on PCB with specific copper pad areas;  $R_{\theta JM}$  - junction to mount

| ORDERING INFORMATION (Example) |                 |                        |               |                                    |
|--------------------------------|-----------------|------------------------|---------------|------------------------------------|
| PREFERRED P/N                  | UNIT WEIGHT (g) | PREFERRED PACKAGE CODE | BASE QUANTITY | DELIVERY MODE                      |
| V3P6-M3/84A                    | 0.024           | 84A                    | 3000          | 7" diameter plastic tape and reel  |
| V3P6-M3/85A                    | 0.024           | 85A                    | 10 000        | 13" diameter plastic tape and reel |
| V3P6HM3/84A <sup>(1)</sup>     | 0.024           | 84A                    | 3000          | 7" diameter plastic tape and reel  |
| V3P6HM3/85A <sup>(1)</sup>     | 0.024           | 85A                    | 10 000        | 13" diameter plastic tape and reel |

**Note**

- (1) Automotive grade

**RATINGS AND CHARACTERISTICS CURVES**

( $T_A = 25\text{ }^{\circ}\text{C}$  unless otherwise noted)

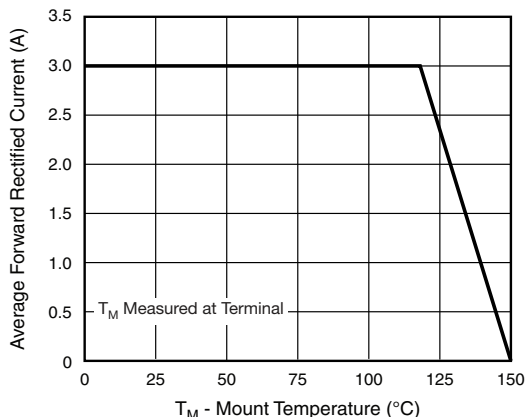


Fig. 1 - Maximum Forward Current Derating Curve

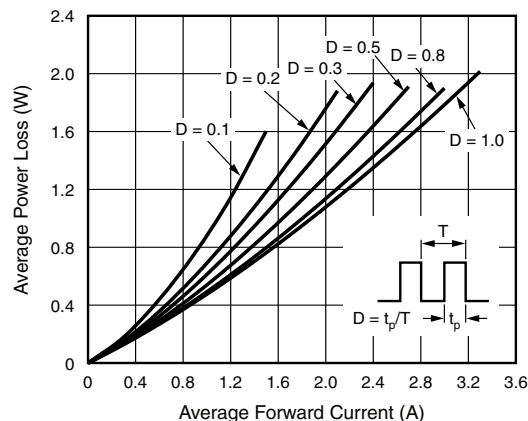


Fig. 2 - Forward Power Loss Characteristics

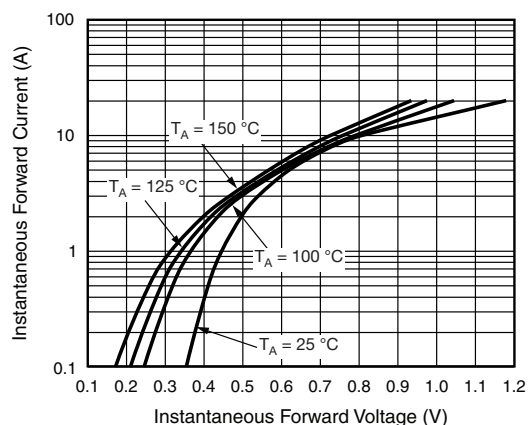


Fig. 3 - Typical Instantaneous Forward Characteristics

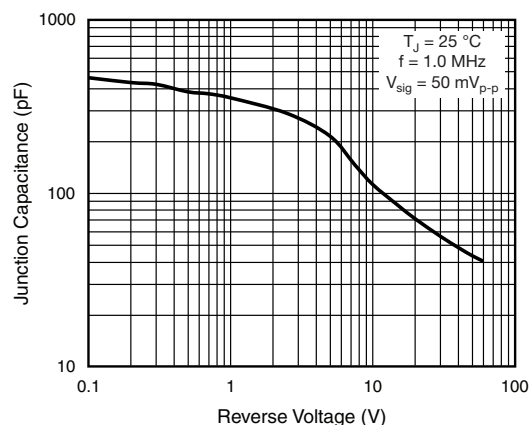


Fig. 5 - Typical Junction Capacitance

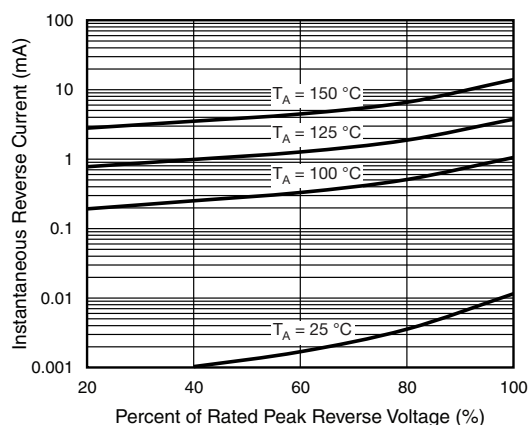


Fig. 4 - Typical Reverse Characteristics

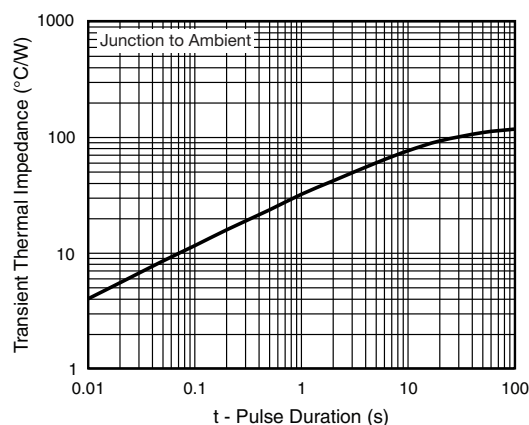
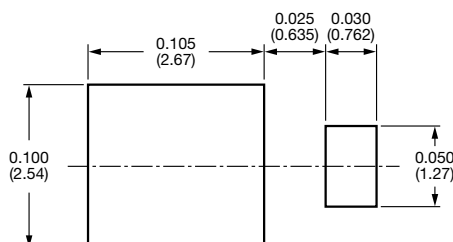
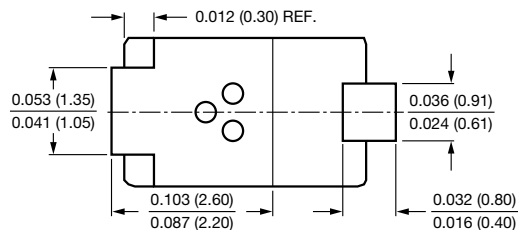
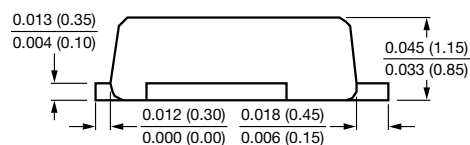
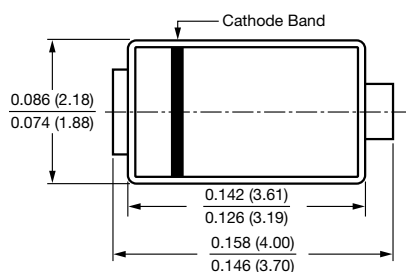


Fig. 6 - Typical Transient Thermal Impedance

**PACKAGE OUTLINE DIMENSIONS** in inches (millimeters)**DO-220AA (SMP)**



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