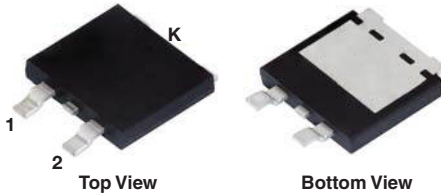




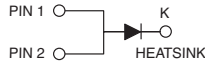
## Dual High-Voltage Trench MOS Barrier Schottky Rectifier

Ultra Low  $V_F = 0.43\text{ V}$  at  $I_F = 5\text{ A}$

TMBS® eSMP® Series  
TO-263AC (SMPD)



V35DM120



| PRIMARY CHARACTERISTICS                                |                 |
|--------------------------------------------------------|-----------------|
| $I_{F(AV)}$                                            | 35 A            |
| $V_{RRM}$                                              | 120 V           |
| $I_{FSM}$                                              | 320 A           |
| $V_F$ at $I_F = 35\text{ A}$ ( $T_A = 125\text{ °C}$ ) | 0.73 V          |
| $T_J$ max.                                             | 175 °C          |
| Package                                                | TO-263AC (SMPD) |
| Diode variations                                       | Single die      |

### FEATURES

- Trench MOS Schottky technology generation 2
- Very low profile - typical height of 1.7 mm
- Ideal for automated placement
- Low forward voltage drop, low power losses
- High efficiency operation
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- AEC-Q101 qualified available
  - Automotive ordering code: base P/NHM3
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



RoHS  
COMPLIANT  
HALOGEN  
FREE

### TYPICAL APPLICATIONS

For use in high frequency DC/DC converters, switching power supplies, freewheeling diodes, OR-ing diode, and reverse battery protection in commercial, industrial, and automotive application.

### MECHANICAL DATA

**Case:** TO-263AC (SMPD)

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

Base P/NHM3 - halogen-free, RoHS-compliant, and AEC-Q101 qualified

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

M3 and HM3 suffix meets JESD 201 class 2 whisker test

**Polarity:** As marked

| MAXIMUM RATINGS ( $T_A = 25\text{ °C}$ unless otherwise noted)                     |                   |             |      |
|------------------------------------------------------------------------------------|-------------------|-------------|------|
| PARAMETER                                                                          | SYMBOL            | V35DM120    | UNIT |
| Maximum repetitive peak reverse voltage                                            | $V_{RRM}$         | 120         | V    |
| Maximum average forward rectified current (fig. 1)                                 | $I_{F(AV)}^{(1)}$ | 35          | A    |
|                                                                                    | $I_{F(AV)}^{(2)}$ | 6.3         |      |
| Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load | $I_{FSM}$         | 320         | A    |
| Operating junction and storage temperature range                                   | $T_J, T_{STG}$    | -40 to +175 | °C   |

#### Notes

(1) With infinite heatsink

(2) With recommended pad size, 2 oz FR4 PCB



| ELECTRICAL CHARACTERISTICS (T <sub>A</sub> = 25 °C unless otherwise noted) |                         |                         |                               |      |      |      |
|----------------------------------------------------------------------------|-------------------------|-------------------------|-------------------------------|------|------|------|
| PARAMETER                                                                  | TEST CONDITIONS         |                         | SYMBOL                        | TYP. | MAX. | UNIT |
| Instantaneous forward voltage per diode                                    | I <sub>F</sub> = 5 A    | T <sub>A</sub> = 25 °C  | V <sub>F</sub> <sup>(1)</sup> | 0.53 | -    | V    |
|                                                                            | I <sub>F</sub> = 17.5 A |                         |                               | 0.73 | -    |      |
|                                                                            | I <sub>F</sub> = 35 A   |                         |                               | 0.97 | 1.05 |      |
|                                                                            | I <sub>F</sub> = 5 A    | T <sub>A</sub> = 125 °C |                               | 0.43 | -    |      |
|                                                                            | I <sub>F</sub> = 17.5 A |                         |                               | 0.61 | -    |      |
|                                                                            | I <sub>F</sub> = 35 A   |                         |                               | 0.73 | 0.81 |      |
| Reverse current at rated V <sub>R</sub> per diode                          | V <sub>R</sub> = 90 V   | T <sub>A</sub> = 25 °C  | I <sub>R</sub> <sup>(2)</sup> | 0.01 | -    | mA   |
|                                                                            |                         | T <sub>A</sub> = 125 °C |                               | 5    | -    |      |
|                                                                            | V <sub>R</sub> = 120 V  | T <sub>A</sub> = 25 °C  |                               | -    | 1.2  |      |
|                                                                            |                         | T <sub>A</sub> = 125 °C |                               | 10   | 30   |      |

Notes

- (1) Pulse test: 300 μs pulse width, 1 % duty cycle
- (2) Pulse test: Pulse width ≤ 5 ms

| THERMAL CHARACTERISTICS (T <sub>A</sub> = 25 °C unless otherwise noted) |                                    |          |      |
|-------------------------------------------------------------------------|------------------------------------|----------|------|
| PARAMETER                                                               | SYMBOL                             | V35DM120 | UNIT |
| Typical thermal resistance                                              | R <sub>θJC</sub>                   | 1.1      | °C/W |
|                                                                         | R <sub>θJA</sub> <sup>(1)(2)</sup> | 48       |      |

Notes

- (1) The heat generated must be less than the thermal conductivity from junction-to-ambient: dP<sub>D</sub>/dT<sub>J</sub> < 1/R<sub>θJA</sub> - junction-to-mount
- (2) Free air, without heatsink

| ORDERING INFORMATION (Example) |                 |              |               |                                    |
|--------------------------------|-----------------|--------------|---------------|------------------------------------|
| PREFERRED P/N                  | UNIT WEIGHT (g) | PACKAGE CODE | BASE QUANTITY | DELIVERY MODE                      |
| V35DM120-M3/I                  | 0.55            | I            | 2000/reel     | 13" diameter plastic tape and reel |
| V35DM120HM3/I <sup>(1)</sup>   | 0.55            | I            | 2000/reel     | 13" diameter plastic tape and reel |

Note

- (1) AEC-Q101 qualified



### RATINGS AND CHARACTERISTICS CURVES ( $T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted)

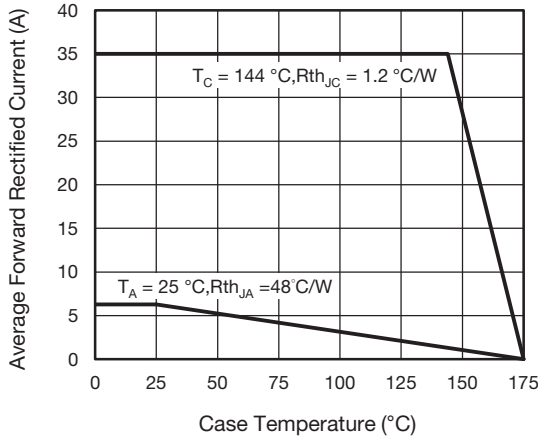


Fig. 1 - Forward Current Derating Curve

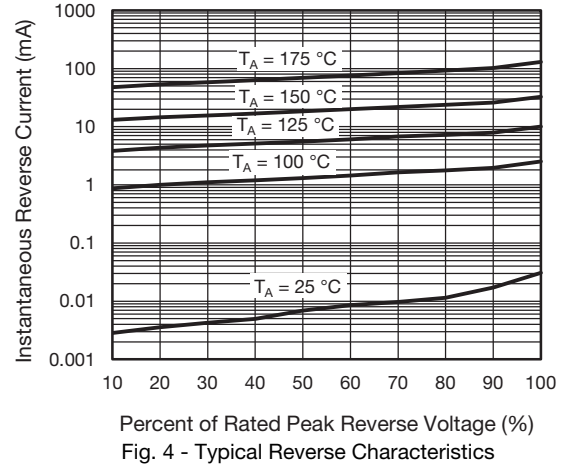


Fig. 4 - Typical Reverse Characteristics

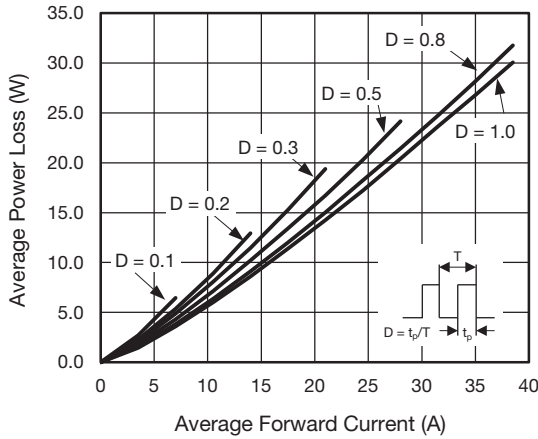


Fig. 2 - Forward Power Loss Characteristics

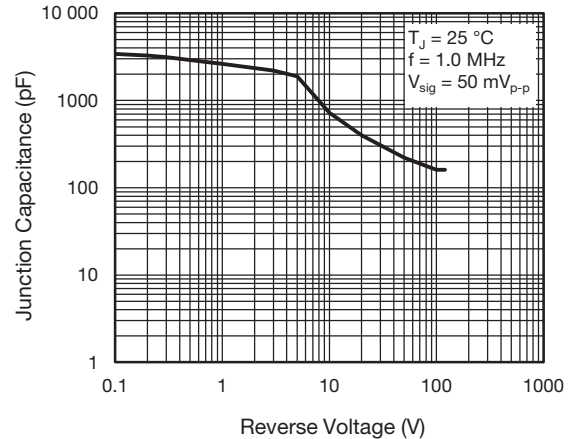


Fig. 5 - Typical Junction Capacitance

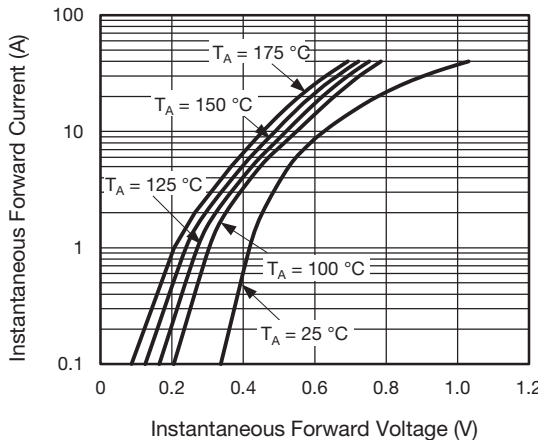


Fig. 3 - Typical Instantaneous Forward Characteristics

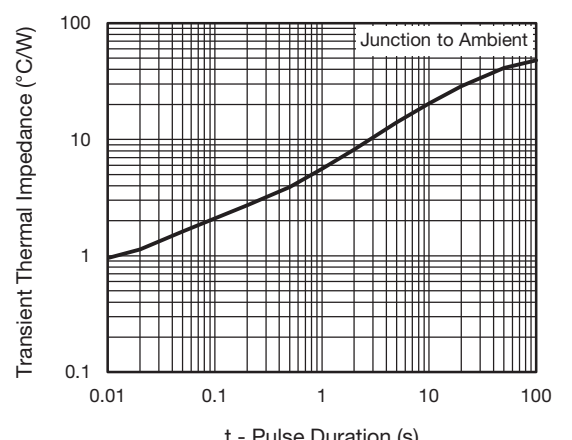


Fig. 6 - Typical Transient Thermal Impedance

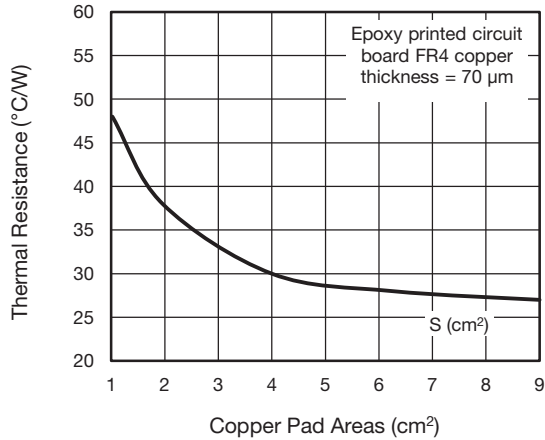
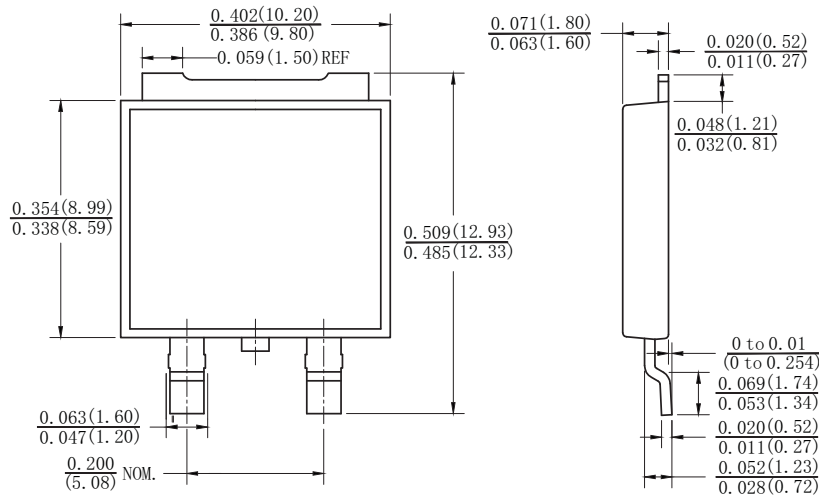


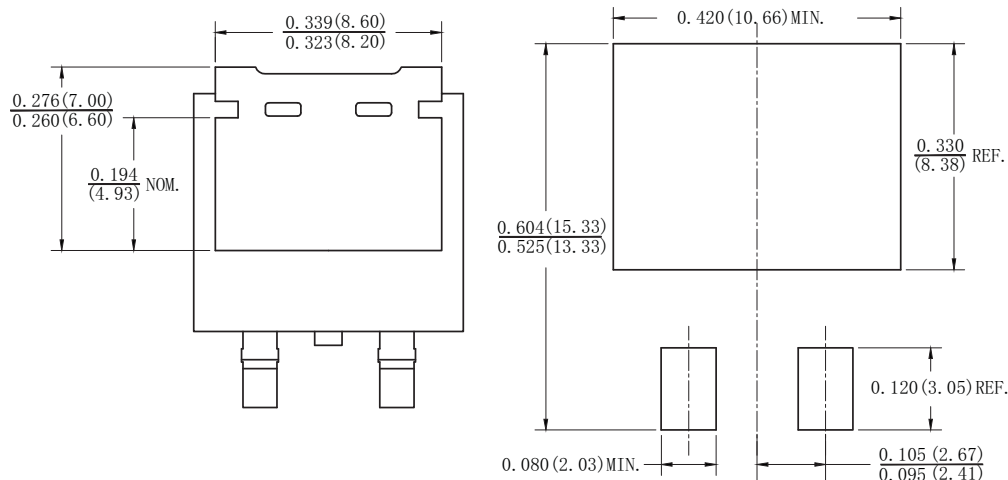
Fig. 7 - Thermal Resistance Junction-to-Ambient vs. Copper Pad Areas

## PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

### TO-263AC (SMPD)



### Mounting Pad Layout





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