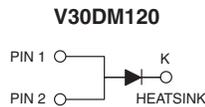
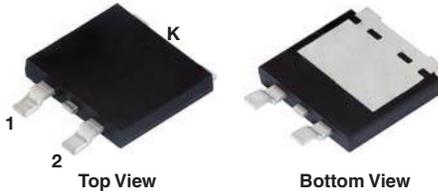




Dual High-Voltage Trench MOS Barrier Schottky Rectifier

Ultra Low $V_F = 0.46\text{ V}$ at $I_F = 5\text{ A}$

TMBS® eSMP® Series
TO-263AC (SMPD)



| PRIMARY CHARACTERISTICS | |
|--|-----------------|
| $I_{F(AV)}$ | 30 A |
| V_{RRM} | 120 V |
| I_{FSM} | 250 A |
| V_F at $I_F = 30\text{ A}$ ($T_A = 125\text{ °C}$) | 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



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 | V30DM120 | UNIT |
| Maximum repetitive peak reverse voltage | V_{RRM} | 120 | V |
| Maximum average forward rectified current (fig. 1) | $I_{F(AV)}^{(1)}$ | 30 | A |
| | $I_{F(AV)}^{(2)}$ | 6 | |
| Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load | I_{FSM} | 250 | 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 ($T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted) | | | | | | |
|--|----------------------|-----------------------------------|-------------|------|------|------|
| PARAMETER | TEST CONDITIONS | | SYMBOL | TYP. | MAX. | UNIT |
| Instantaneous forward voltage per diode | $I_F = 5\text{ A}$ | $T_A = 25\text{ }^\circ\text{C}$ | $V_F^{(1)}$ | 0.55 | - | V |
| | $I_F = 15\text{ A}$ | | | 0.73 | - | |
| | $I_F = 30\text{ A}$ | | | 0.98 | 1.06 | |
| | $I_F = 5\text{ A}$ | $T_A = 125\text{ }^\circ\text{C}$ | | 0.46 | - | |
| | $I_F = 15\text{ A}$ | | | 0.61 | - | |
| | $I_F = 30\text{ A}$ | | | 0.73 | 0.81 | |
| Reverse current at rated V_R per diode | $V_R = 90\text{ V}$ | $T_A = 25\text{ }^\circ\text{C}$ | $I_R^{(2)}$ | 0.01 | - | mA |
| | | $T_A = 125\text{ }^\circ\text{C}$ | | 4 | - | |
| | $V_R = 120\text{ V}$ | $T_A = 25\text{ }^\circ\text{C}$ | | - | 1 | |
| | | $T_A = 125\text{ }^\circ\text{C}$ | | 8 | 20 | |

Notes

- (1) Pulse test: 300 μs pulse width, 1 % duty cycle
 (2) Pulse test: Pulse width $\leq 5\text{ ms}$

| THERMAL CHARACTERISTICS ($T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted) | | | |
|---|--------------------------|----------|--------------------|
| PARAMETER | SYMBOL | V30DM120 | UNIT |
| Typical thermal resistance | $R_{\theta JC}$ | 1.2 | $^\circ\text{C/W}$ |
| | $R_{\theta JA}^{(1)(2)}$ | 48 | |

Notes

- (1) The heat generated must be less than the thermal conductivity from junction-to-ambient: $dP_D/dT_J < 1/R_{\theta JA}$ - junction-to-mount
 (2) Free air, without heatsink

| ORDERING INFORMATION (Example) | | | | |
|---------------------------------------|-----------------|--------------|---------------|------------------------------------|
| PREFERRED P/N | UNIT WEIGHT (g) | PACKAGE CODE | BASE QUANTITY | DELIVERY MODE |
| V30DM120-M3/I | 0.55 | I | 2000/reel | 13" diameter plastic tape and reel |
| V30DM120HM3/I ⁽¹⁾ | 0.55 | I | 2000/reel | 13" diameter plastic tape and reel |

Note

- (1) AEC-Q101 qualified



RATINGS AND CHARACTERISTICS CURVES (T_A = 25 °C unless otherwise noted)

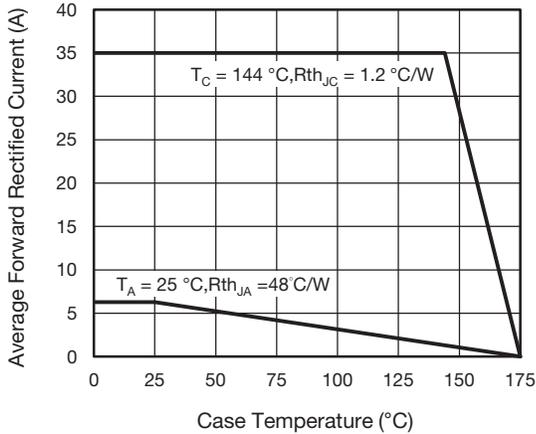


Fig. 1 - Forward Current Derating Curve

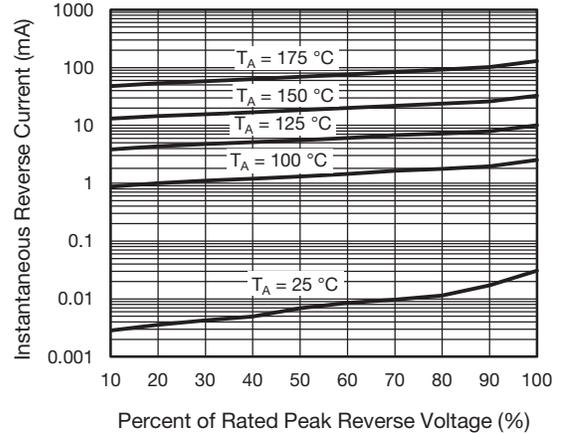


Fig. 4 - Typical Reverse Characteristics

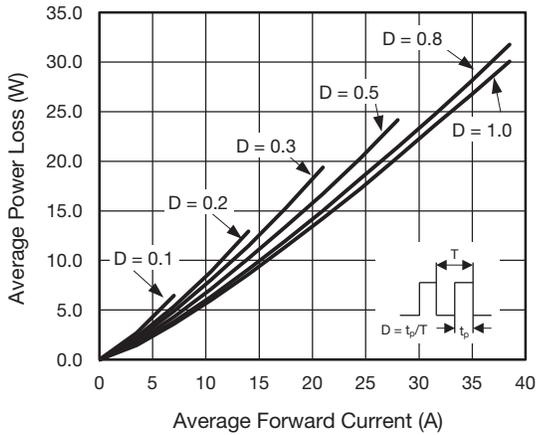


Fig. 2 - Forward Power Loss Characteristics

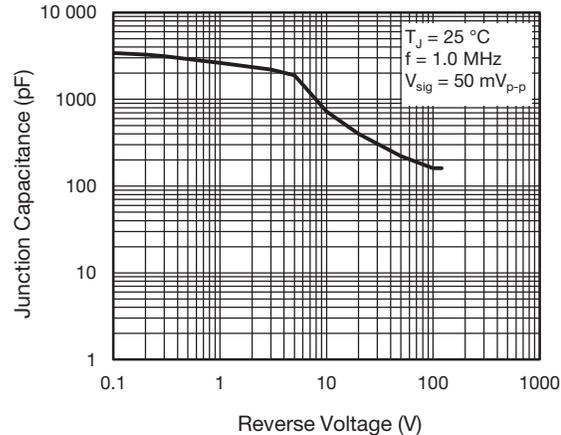


Fig. 5 - Typical Junction Capacitance

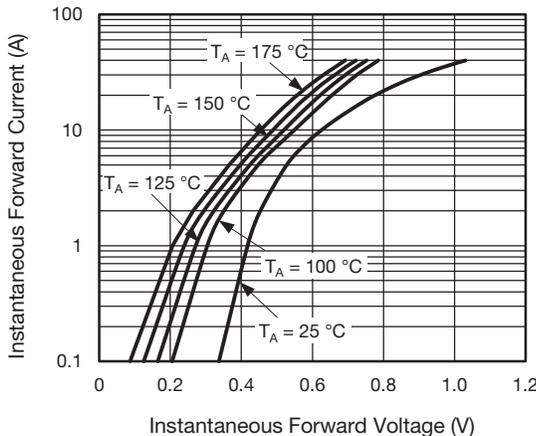


Fig. 3 - Typical Instantaneous Forward Characteristics

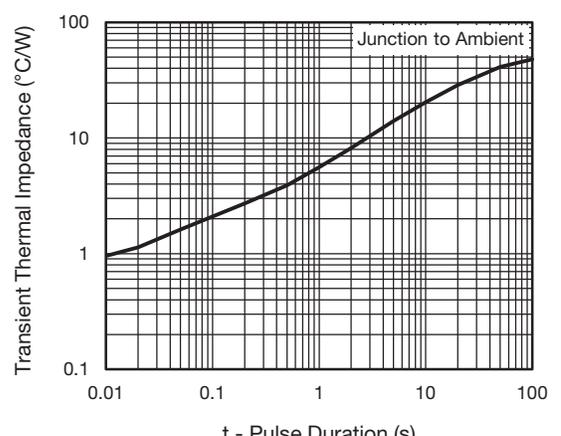


Fig. 6 - Typical Transient Thermal Impedance

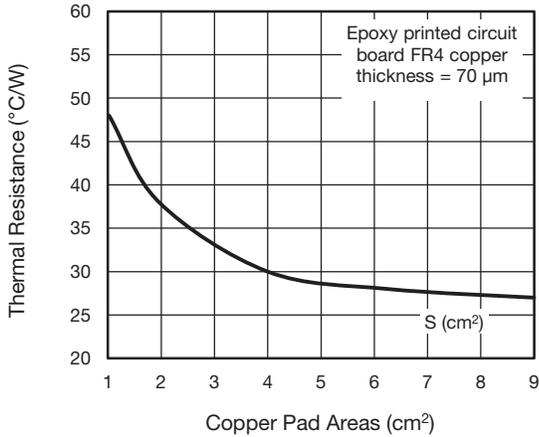
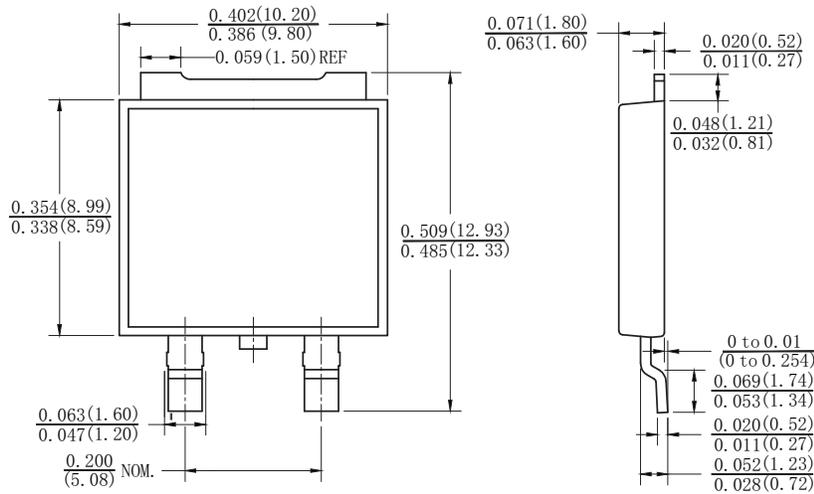


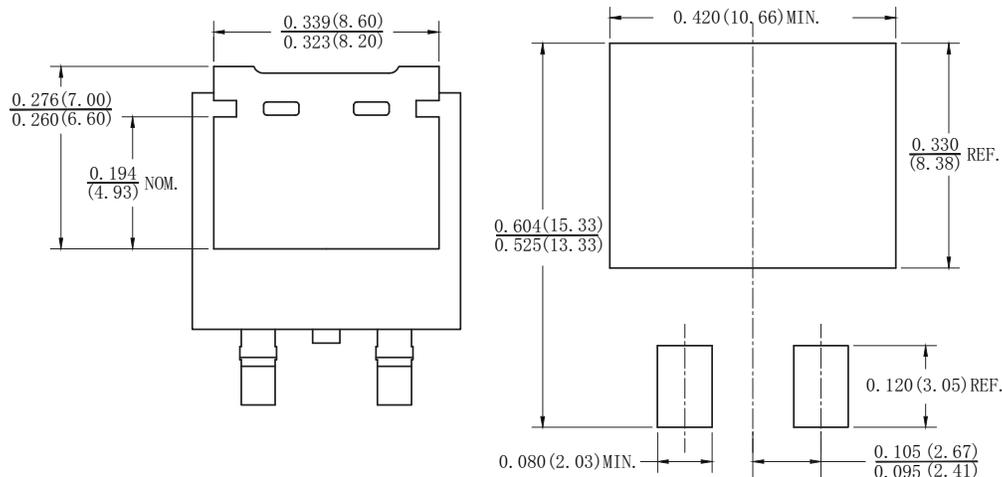
Fig. 7 - Thermal Resistance Junction-to-Ambient vs. Copper Pad Areas

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

TO-263AC (SMPD)



Mounting Pad Layout





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