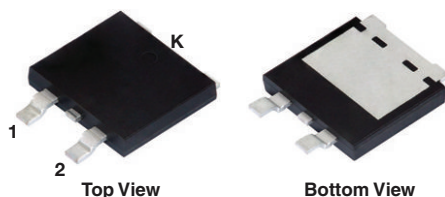


Dual Low-Voltage TMBS® (Trench MOS Barrier Schottky) Rectifier

Ultra Low $V_F = 0.40\text{ V}$ at $I_F = 5.0\text{ A}$

eSMP® Series SMPD (TO-263AC)



FEATURES

- Trench MOS Schottky technology
- 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

LINKS TO ADDITIONAL RESOURCES



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.

PRIMARY CHARACTERISTICS

| | |
|--|-----------------|
| $I_{F(AV)}$ | 2 x 20 A |
| V_{RRM} | 60 V |
| I_{FSM} | 250 A |
| V_F at $I_F = 20\text{ A}$ ($T_J = 125\text{ °C}$) | 0.57 V |
| T_J max. | 175 °C |
| Package | SMPD (TO-263AC) |
| Circuit configuration | Common cathode |

MECHANICAL DATA

Case: SMPD (TO-263AC)

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 meet JESD 201 class 2 whisker test

Polarity: as marked

MAXIMUM RATINGS ($T_A = 25\text{ °C}$ unless otherwise noted)

| PARAMETER | SYMBOL | V40DM63C | UNIT |
|--|-------------------|-------------|------|
| Device marking code | | V40DM63C | |
| Maximum repetitive peak reverse voltage | V_{RRM} | 60 | V |
| Maximum average forward rectified current per device (fig. 1) per diode | $I_{F(AV)}^{(1)}$ | 40 20 | A |
| Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load per diode | I_{FSM} | 250 | A |
| Operating junction temperature range | $T_J^{(2)}$ | -40 to +175 | °C |
| Storage temperature range | T_{STG} | -55 to +175 | |

Notes

(1) Mounted on infinite heatsink

(2) The heat generated must be less than the thermal conductivity from junction-to-ambient: $dP_D/dT_J < 1/R_{\theta JA}$

**ELECTRICAL CHARACTERISTICS** ($T_J = 25\text{ }^{\circ}\text{C}$ unless otherwise noted)

| PARAMETER | TEST CONDITIONS | | SYMBOL | TYP. | MAX. | UNIT |
|---|-----------------------|-------------------------|-------------------------------|------|------|------|
| Instantaneous forward voltage per diode | I _F = 5 A | T _J = 25 °C | V _F ⁽¹⁾ | 0.50 | - | V |
| | I _F = 10 A | | | 0.54 | - | |
| | I _F = 20 A | | | 0.61 | 0.68 | |
| | I _F = 5 A | T _J = 125 °C | | 0.40 | - | |
| | I _F = 10 A | | | 0.47 | - | |
| | I _F = 20 A | | | 0.57 | 0.62 | |
| Reverse current at rated V _R per diode | V _R = 60 V | T _J = 25 °C | I _R ⁽²⁾ | - | 0.04 | mA |
| | | T _J = 125 °C | | 2.5 | 8 | |
| Typical junction capacitance per diode | 4.0 V, 1 MHz | | C _J | 3100 | - | pF |

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 | V40DM63C | UNIT |
|---------------------------------------|--------------------------|----------|----------------------|
| Typical thermal resistance per device | $R_{\theta JC}^{(1)}$ | 1.0 | $^{\circ}\text{C/W}$ |
| | $R_{\theta JA}^{(2)(3)}$ | 50 | |

Notes

(1) Mounted on infinite heatsink

(2) The heat generated must be less than the thermal conductivity from junction-to-ambient: $dP_D/dT_J < 1/R_{\theta JA}$ - junction-to-ambient

(3) Free air, without heatsink

ORDERING INFORMATION (Example)

| PREFERRED P/N | UNIT WEIGHT (g) | PACKAGE CODE | BASE QUANTITY | DELIVERY MODE |
|------------------------------|-----------------|--------------|---------------|------------------------------------|
| V40DM63C-M3/I | 0.55 | I | 2000/reel | 13" diameter plastic tape and reel |
| V40DM63CHM3/I ⁽¹⁾ | 0.55 | I | 2000/reel | 13" diameter plastic tape and reel |

Note

(1) AEC-Q101 qualified

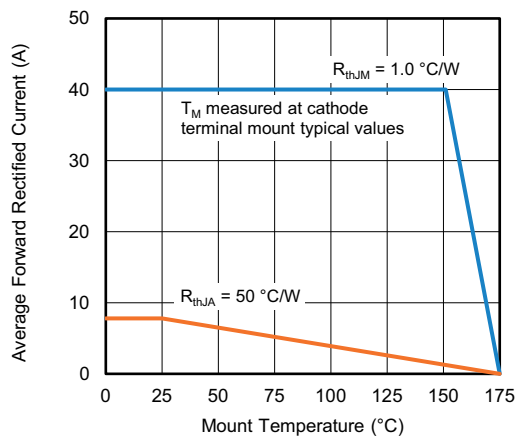
RATINGS AND CHARACTERISTICS CURVES ($T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise noted)


Fig. 1 - Maximum Forward Current Derating Curve

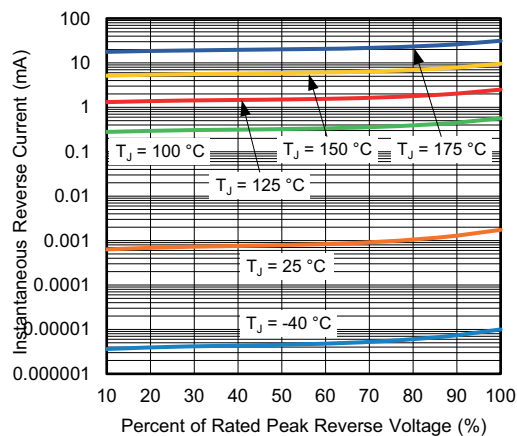


Fig. 4 - Typical Reverse Leakage Characteristics Per Diode

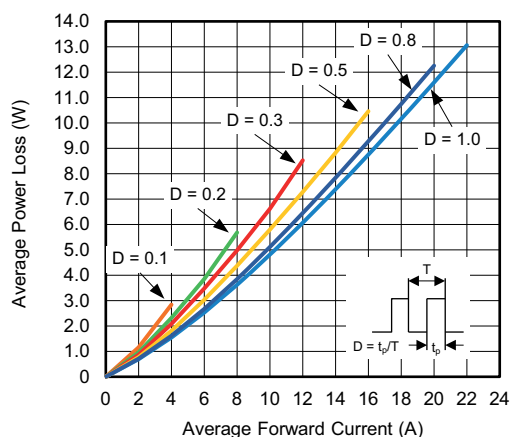


Fig. 2 - Average Power Loss Characteristics Per Diode

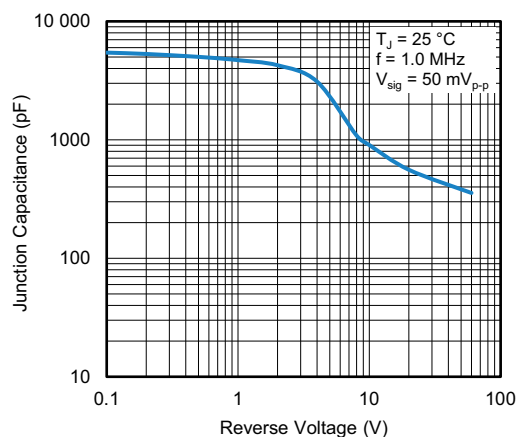


Fig. 5 - Typical Junction Capacitance Per Diode

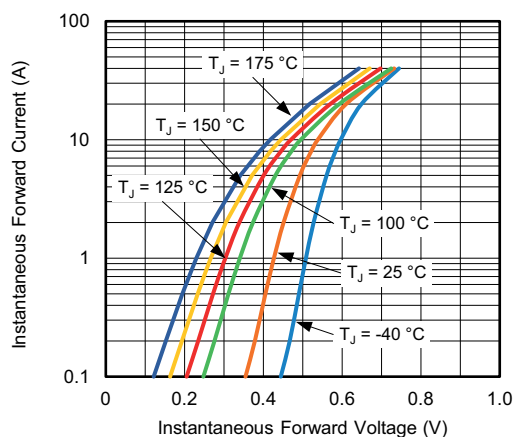


Fig. 3 - Typical Instantaneous Forward Characteristics Per Diode

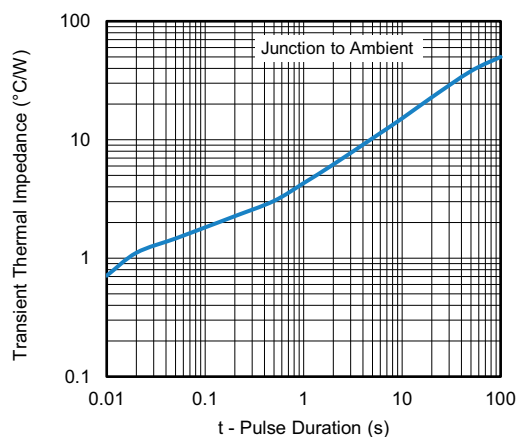


Fig. 6 - Typical Transient Thermal Impedance

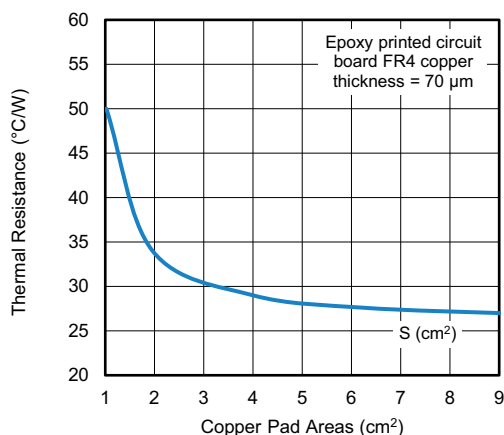
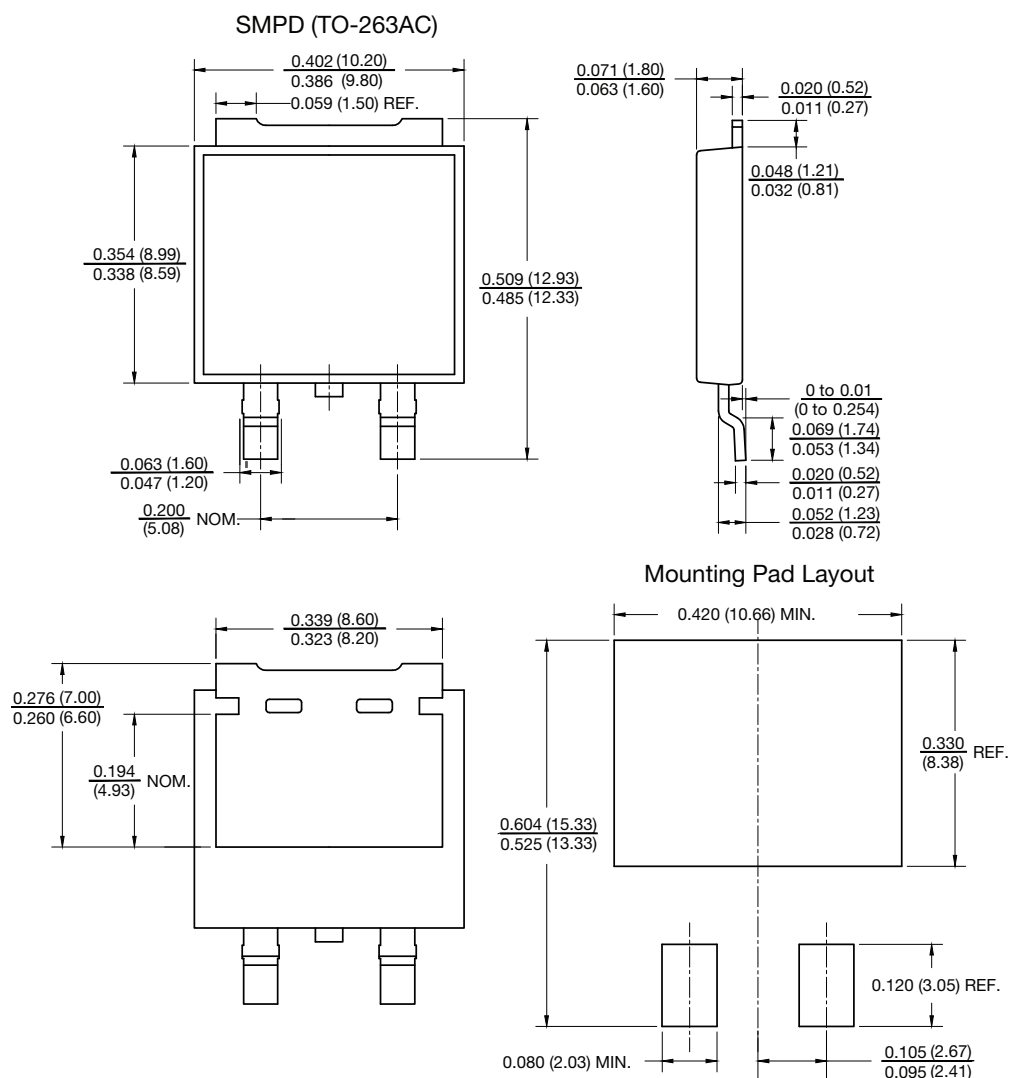


Fig. 7 - Thermal Resistance Junction-to-Ambient vs. Copper Pad Areas

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)




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