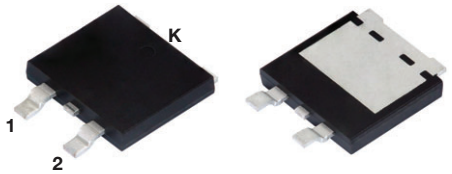
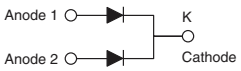
# Dual High-Voltage TMBS® (Trench MOS Barrier Schottky) Rectifier

Ultra Low $V_F$ = 0.56 V at $I_F$ = 2.5 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

AUTOMOTIVE GRADE Available

RoHS COMPLIANT

HALOGEN FREE

## DESIGN SUPPORT TOOLS AVAILABLE

3D Models

## 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 5 A |
| $V_{RRM}$ | 150 V |
| $I_{FSM}$ | 80 A |
| $V_F$ at $I_F$ = 5 A ($T_J$ = 125 °C) | 0.63 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 °C unless otherwise noted) | | | | |
|---|---|---|---|---|
| **PARAMETER** | | **SYMBOL** | **V10DM153C** | **UNIT** |
| Device marking code | | | V10DM153C | |
| Maximum repetitive peak reverse voltage | | $V_{RRM}$ | 150 | V |
| Maximum average forward rectified current (fig. 1) | per device | $I_{F(AV)}$ (1) | 10 | A |
| | per diode | | 5 | |
| Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load | | $I_{FSM}$ | 80 | 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 °C unless otherwise noted) | | | | | | |
|---|---|---|---|---|---|---|
| **PARAMETER** | **TEST CONDITIONS** | | **SYMBOL** | **TYP.** | **MAX.** | **UNIT** |
| Instantaneous forward voltage per diode | $I_F$ = 2.5 A | $T_J$ = 25 °C | $V_F$ (1) | 0.70 | - | V |
| | $I_F$ = 5 A | | | 0.84 | 0.95 | |
| | $I_F$ = 2.5 A | $T_J$ = 125 °C | | 0.56 | - | |
| | $I_F$ = 5 A | | | 0.63 | 0.68 | |
| Reverse current at rated $V_R$ per diode | $V_R$ = 100 V | $T_J$ = 25 °C | $I_R$ (2) | 0.0003 | - | mA |
| | | $T_J$ = 125 °C | | 0.5 | - | |
| | $V_R$ = 150 V | $T_J$ = 25 °C | | - | 0.05 | |
| | | $T_J$ = 125 °C | | 1.25 | 4 | |
| Typical junction capacitance | 4.0 V, 1 MHz | | $C_J$ | 280 | - | pF |

**Notes**

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 5 ms

| THERMAL CHARACTERISTICS ($T_A$ = 25 °C unless otherwise noted) | | | |
|---|---|---|---|
| **PARAMETER** | **SYMBOL** | **V10DM153C** | **UNIT** |
| Typical thermal resistance per device | $R_{\theta JC}$ (1) | 2.7 | °C/W |
| | $R_{\theta JA}$ (2)(3) | 58 | |

**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** |
| V10DM153C-M3/I | 0.55 | I | 2000/reel | 13" diameter plastic tape and reel |
| V10DM153CHM3/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)

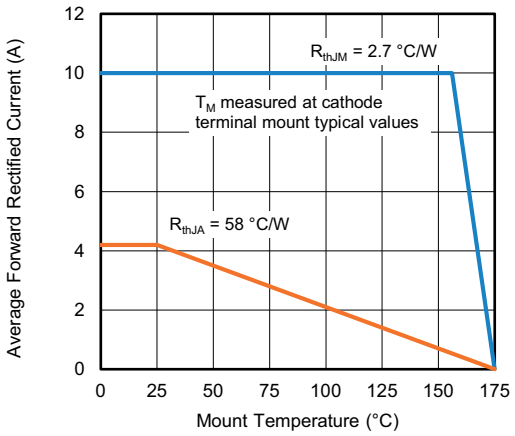



Fig. 1 - Maximum Forward Current Derating Curve

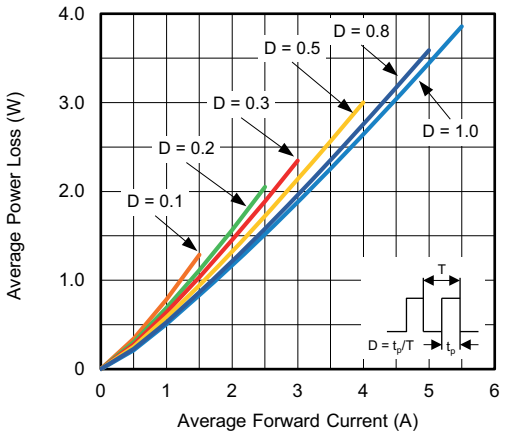



Fig. 2 - Average Power Loss Characteristics

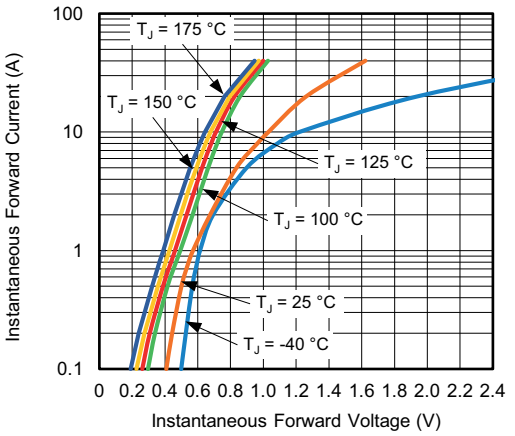



Fig. 3 - Typical Instantaneous Forward Characteristics

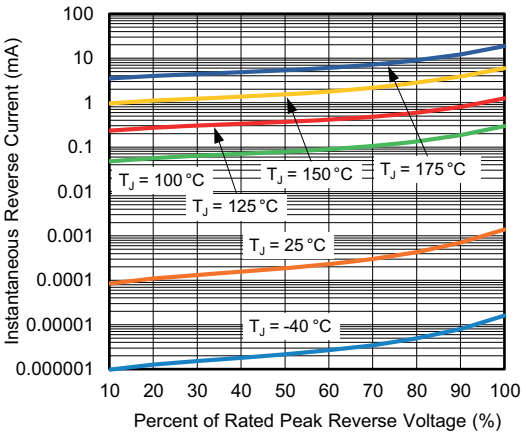



Fig. 4 - Typical Reverse Leakage Characteristics

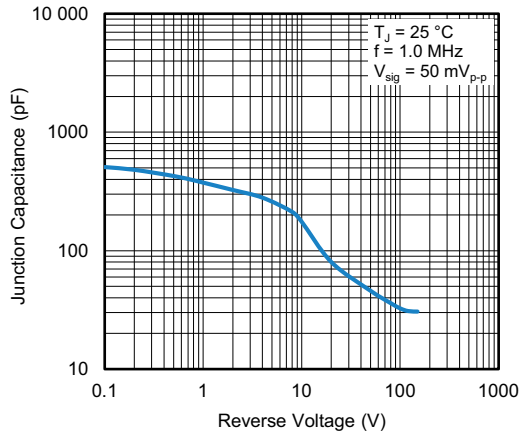



Fig. 5 - Typical Junction Capacitance

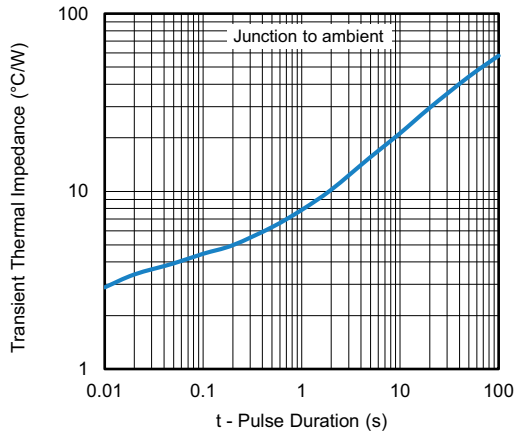



Fig. 6 - Typical Transient Thermal Impedance

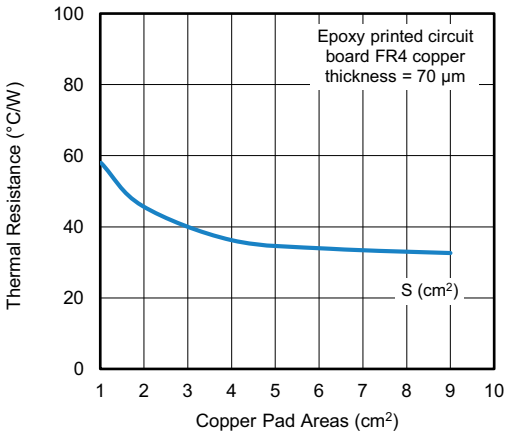
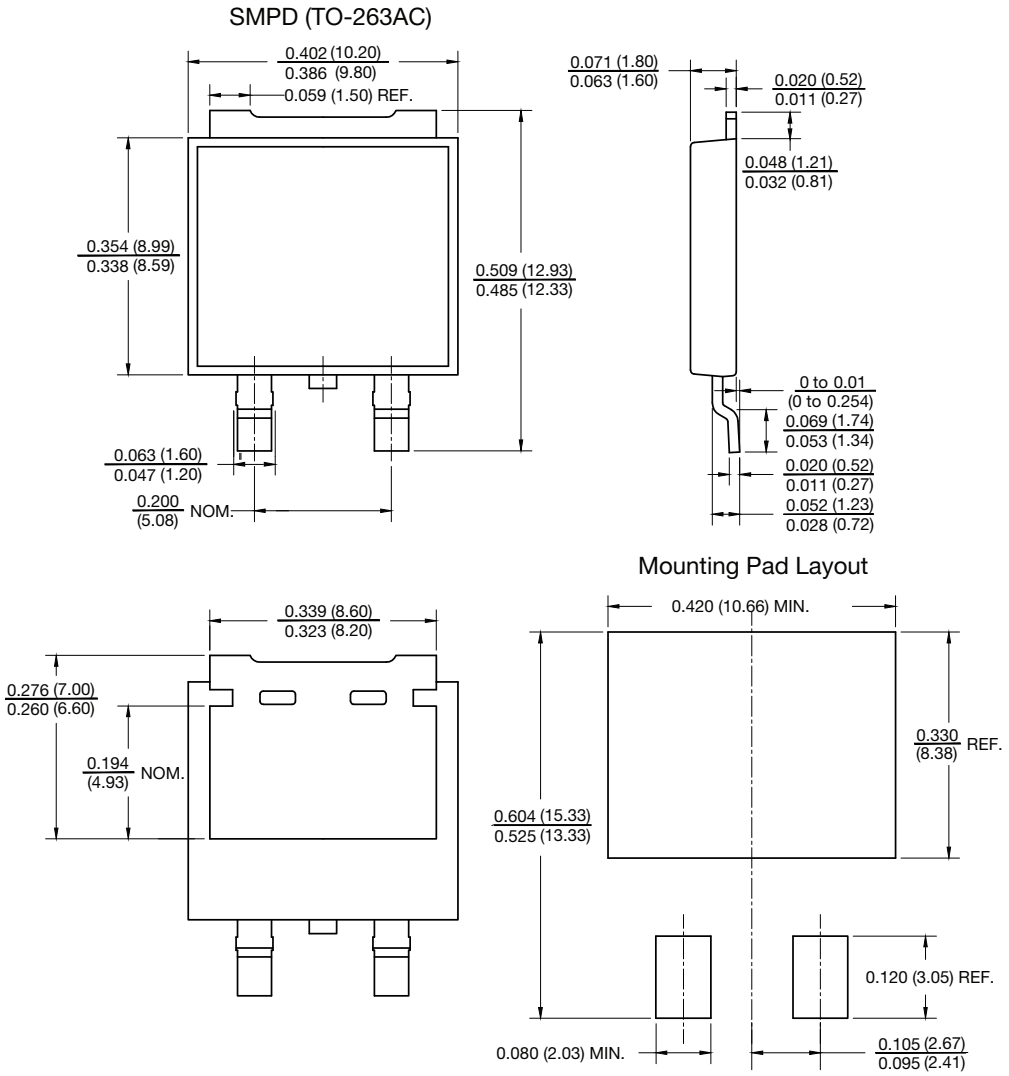



Fig. 7 - Thermal Resistance Junction-to-Ambient vs. Copper Pad Areas

## **PACKAGE OUTLINE DIMENSIONS** in inches (millimeters)



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