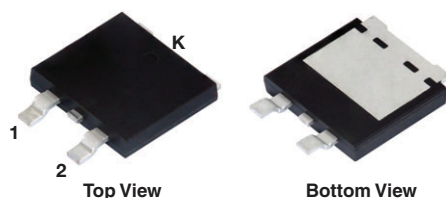


# Dual Low-Voltage TMBS® (Trench MOS Barrier Schottky) Rectifier

Ultra Low  $V_F = 0.34\text{ V}$  at  $I_F = 2.5\text{ A}$

## 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](http://www.vishay.com/doc?99912)



**RoHS**  
COMPLIANT  
HALOGEN  
**FREE**

## ADDITIONAL RESOURCES



## TYPICAL APPLICATIONS

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

## MECHANICAL DATA

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

Molding compound meets UL 94 V-0 flammability rating

Base P/N-M3 - halogen-free, RoHS-compliant, and commercial grade

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

("\_X" denotes revision code e.g. A, B,...)

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

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

**Polarity:** as marked

## PRIMARY CHARACTERISTICS

$I_{F(AV)}$	2 x 5.0 A
$V_{RRM}$	45 V
$I_{FSM}$	100 A
$V_F$ at $I_F = 5.0\text{ A}$	0.41 V
$T_J$ max.	150 °C
Package	SMPD (TO-263AC)
Circuit configuration	Common cathode

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

PARAMETER	SYMBOL	V10D45C	UNIT
Maximum repetitive peak reverse voltage	$V_{RRM}$	45	V
Maximum average forward rectified current (fig. 1)	$I_{F(AV)}$	10	A
		5	
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	$I_{FSM}$	100	A
Operating junction and storage temperature range	$T_J, T_{STG}$	-40 to +150	°C

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

PARAMETER	TEST CONDITIONS	SYMBOL	TYP.	MAX.	UNIT
Instantaneous forward voltage per diode	$I_F = 2.5\text{ A}$	$T_A = 25\text{ }^{\circ}\text{C}$	0.44	-	V
	$I_F = 5.0\text{ A}$		0.50	0.58	
	$I_F = 2.5\text{ A}$	$T_A = 125\text{ }^{\circ}\text{C}$	0.34	-	
	$I_F = 5.0\text{ A}$		0.41	0.50	
Reverse current per diode	$V_R = 45\text{ V}$	$T_A = 25\text{ }^{\circ}\text{C}$	-	500	$\mu\text{A}$
		$T_A = 125\text{ }^{\circ}\text{C}$	3	15	mA

**Notes**

(1) Pulse test: 300  $\mu\text{s}$  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	V10D45C	UNIT
Typical thermal resistance	$R_{\theta JC}$	3.5	$^{\circ}\text{C/W}$
		2.5	
	$R_{\theta JA}^{(1)(2)}$	48	

**Notes**

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

(2) Free air, without heatsink

**ORDERING INFORMATION** (Example)

PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
V10D45C-M3/I	0.55	I	2000/reel	13" diameter plastic tape and reel
V10D45CHM3_A/I (1)	0.55	I	2000/reel	13" diameter plastic tape and reel

**Note**

(1) AEC-Q101 qualified

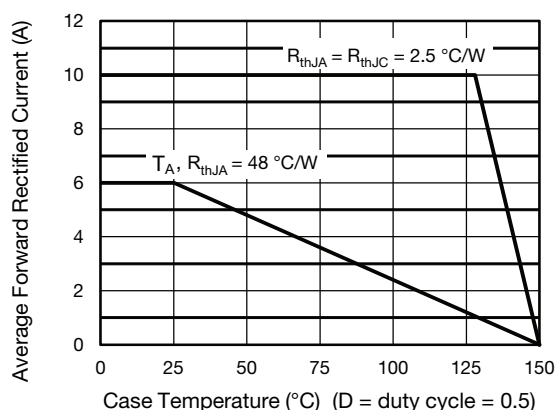
**RATINGS AND CHARACTERISTICS CURVES** ( $T_A = 25\text{ }^{\circ}\text{C}$  unless otherwise noted)


Fig. 1 - Forward Current Derating Curve

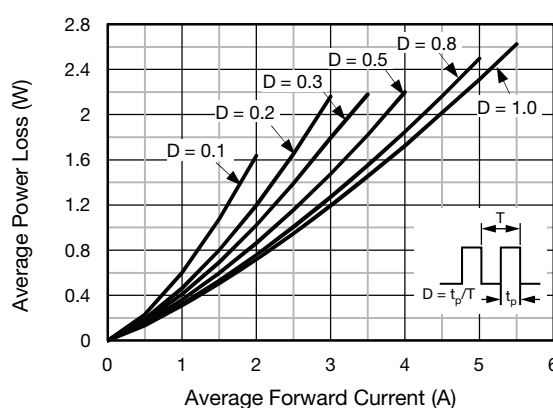


Fig. 2 - Forward Power Loss Characteristics Per Diode

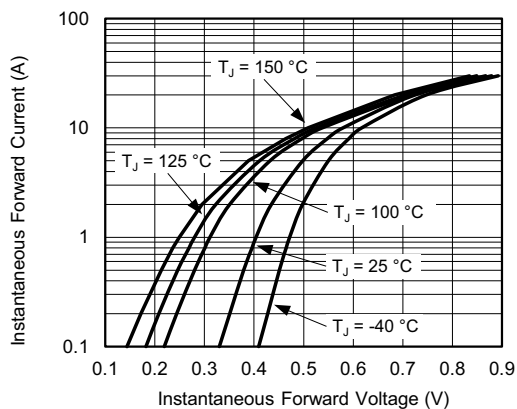


Fig. 3 - Typical Instantaneous Forward Characteristics Per Diode

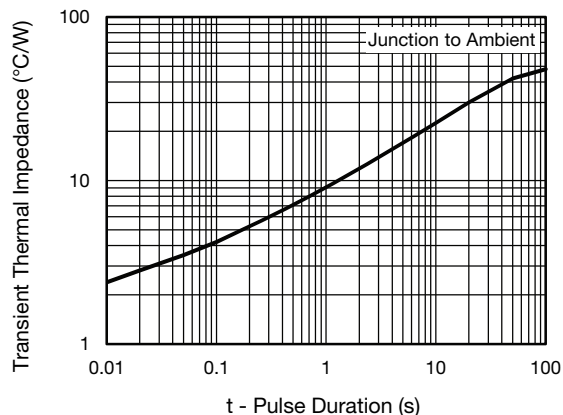


Fig. 6 - Typical Transient Thermal Impedance Per Diode

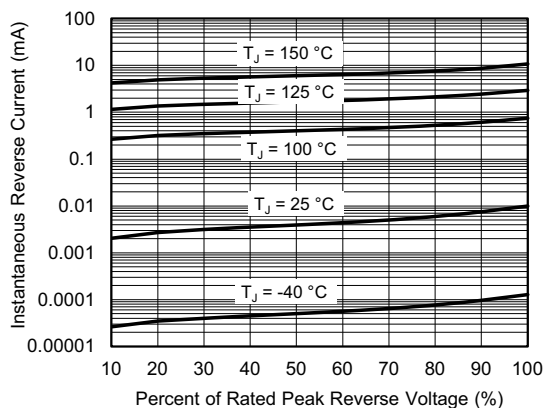


Fig. 4 - Typical Reverse Characteristics Per Diode

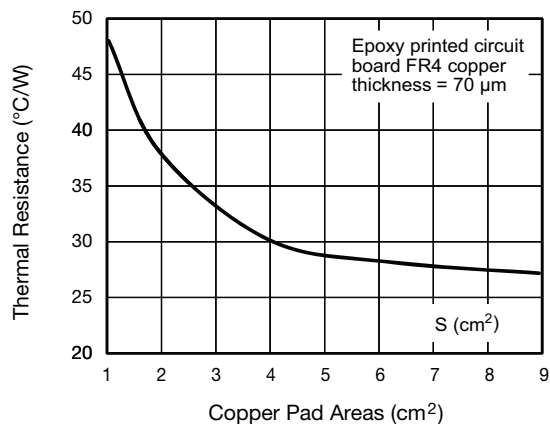


Fig. 7 - Thermal Resistance Junction-to-Ambient vs. Copper Pad Areas

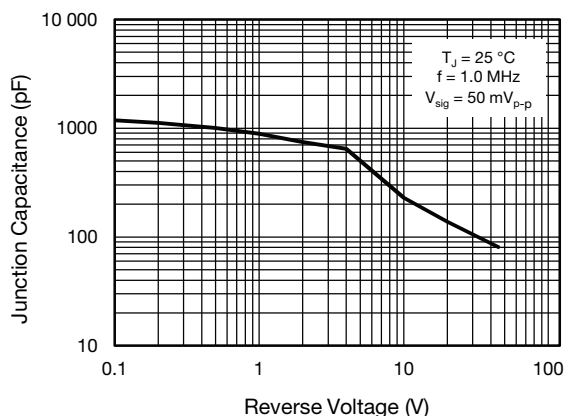
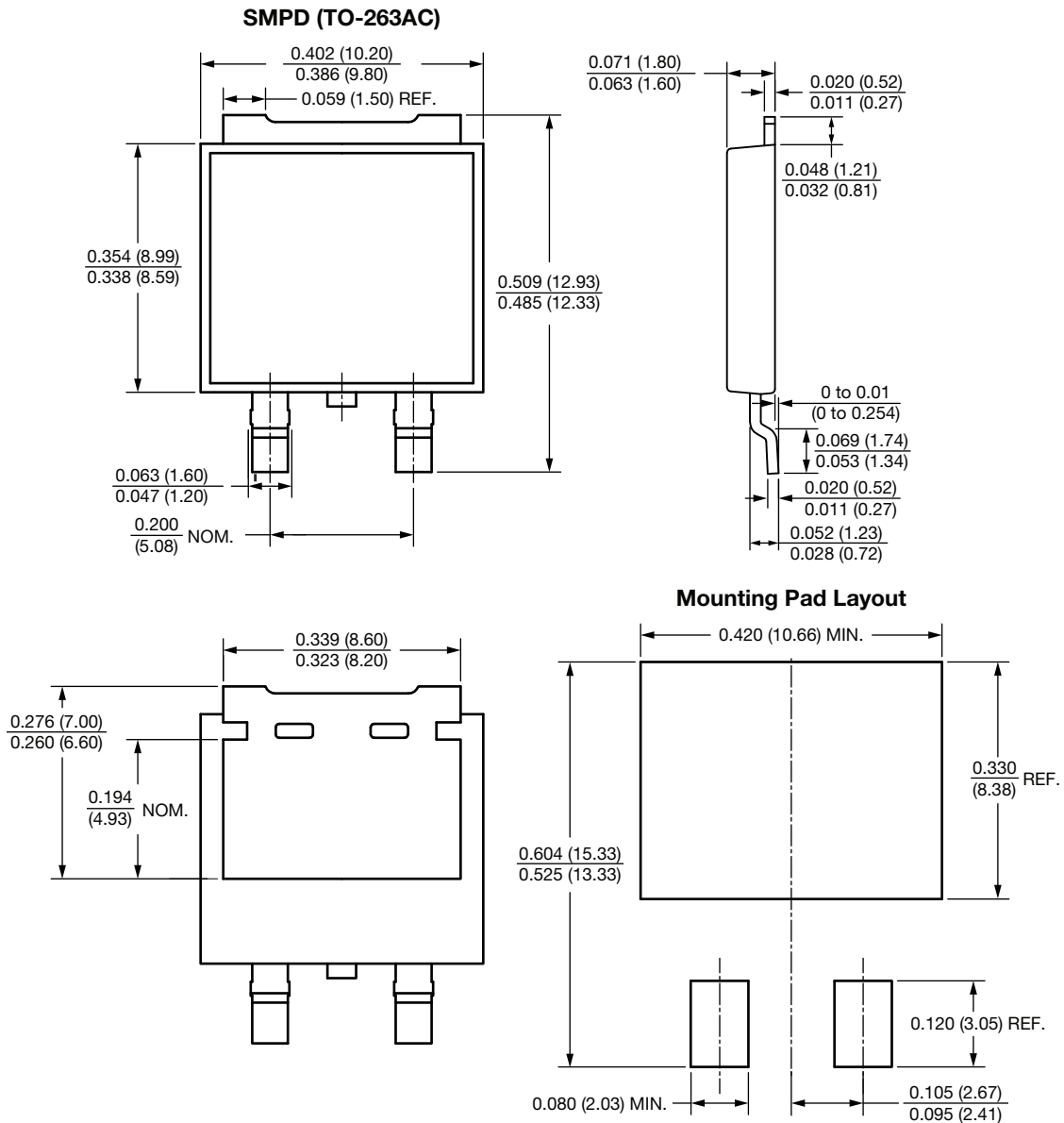


Fig. 5 - Typical Junction Capacitance Per Diode

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




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