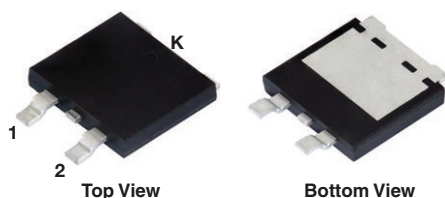


# Dual High-Voltage TMBS® (Trench MOS Barrier Schottky) Rectifier

Ultra Low  $V_F = 0.50\text{ V}$  at  $I_F = 5.0\text{ A}$

## eSMP® Series SMPD (TO-263AC)



## LINKS TO ADDITIONAL RESOURCES



## 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/doc299912](http://www.vishay.com/doc299912)



## 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 10 A
$V_{RRM}$	100 V
$I_{FSM}$	130 A
$V_F$ at $I_F = 10\text{ A}$ ( $T_J = 125\text{ °C}$ )	0.60 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	V20DM103C	UNIT
Device marking code		V20DM103C	
Maximum repetitive peak reverse voltage	$V_{RRM}$	100	V
Maximum average forward rectified current	$I_{F(AV)}$ <sup>(1)</sup>	20	A
per device (fig. 1)		10	
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	$I_{FSM}$	130	A
Operating junction temperature range	$T_J$ <sup>(2)</sup>	-40 to +175	°C
Storage temperature range	$T_{STG}$	-55 to +175	

## Notes

<sup>(1)</sup> Mounted on infinite heatsink

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

<b>ELECTRICAL CHARACTERISTICS</b> ( $T_J = 25\text{ }^{\circ}\text{C}$ unless otherwise noted)					
PARAMETER	TEST CONDITIONS	SYMBOL	TYP.	MAX.	UNIT
Instantaneous forward voltage per diode	$I_F = 5\text{ A}$	$T_J = 25\text{ }^{\circ}\text{C}$	0.57	-	V
	$I_F = 10\text{ A}$		0.69	0.76	
	$I_F = 5\text{ A}$	$T_J = 125\text{ }^{\circ}\text{C}$	0.50	-	
	$I_F = 10\text{ A}$		0.60	0.65	
Reverse current at rated $V_R$ per diode	$V_R = 70\text{ V}$	$T_J = 25\text{ }^{\circ}\text{C}$	0.002	-	mA
		$T_J = 125\text{ }^{\circ}\text{C}$	1.3	-	
	$V_R = 100\text{ V}$	$T_J = 25\text{ }^{\circ}\text{C}$	-	0.17	
		$T_J = 125\text{ }^{\circ}\text{C}$	3	9	
Typical junction capacitance	4.0 V, 1 MHz	$C_J$	1100	-	pF

**Notes**

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

<b>THERMAL CHARACTERISTICS</b> ( $T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise noted)			
PARAMETER	SYMBOL	V20DM103C	UNIT
Typical thermal resistance per device	$R_{\theta JC}^{(1)}$	1.8	$^{\circ}\text{C/W}$
	$R_{\theta JA}^{(2)(3)}$	58	

**Notes**

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

<b>ORDERING INFORMATION</b> (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
V20DM103C-M3/I	0.55	I	2000/reel	13" diameter plastic tape and reel
V20DM103CHM3/I (1)	0.55	I	2000/reel	13" diameter plastic tape and reel

**Note**

- (1) AEC-Q101 qualified

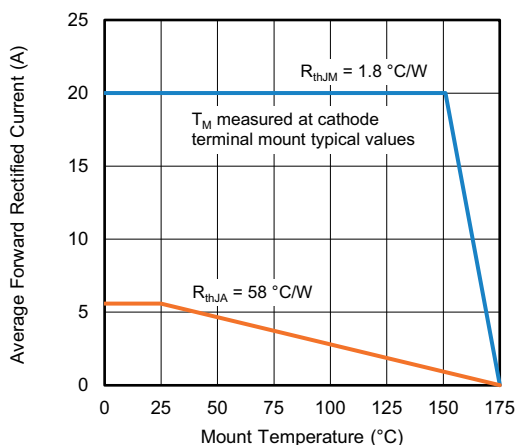
**RATINGS AND CHARACTERISTICS CURVES** ( $T_A = 25\text{ }^{\circ}\text{C}$  unless otherwise noted)


Fig. 1 - Maximum Forward Current Derating Curve

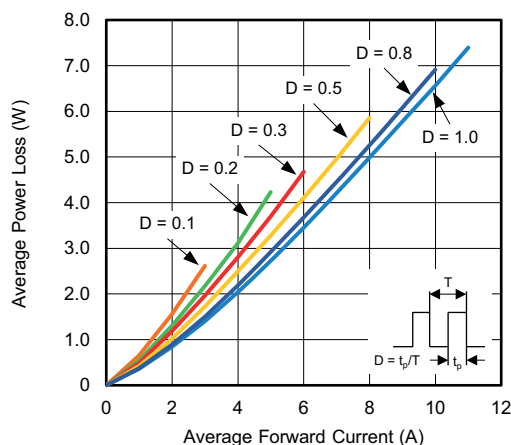


Fig. 2 - Average Power Loss Characteristics

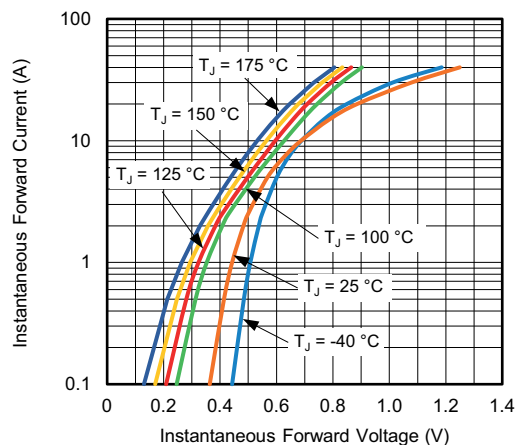


Fig. 3 - Typical Instantaneous Forward Characteristics

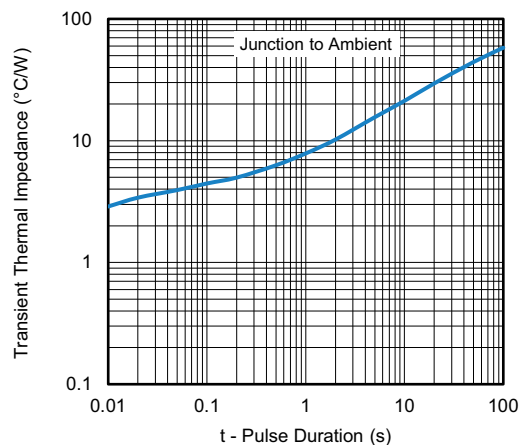


Fig. 6 - Typical Transient Thermal Impedance

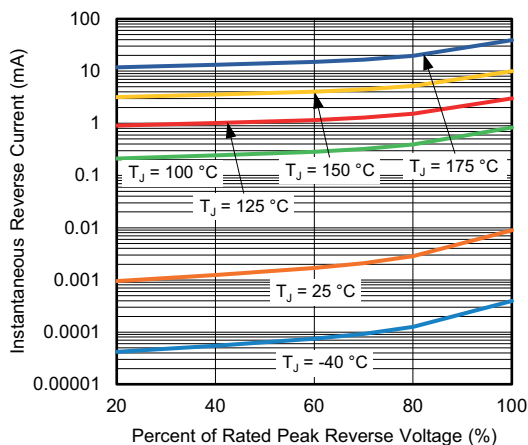


Fig. 4 - Typical Reverse Leakage Characteristics

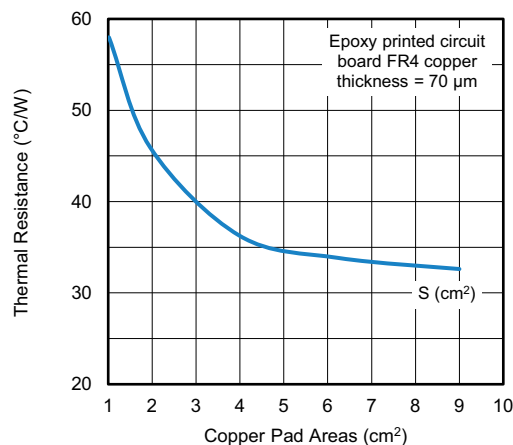


Fig. 7 - Thermal Resistance Junction-to-Ambient vs. Copper Pad Areas

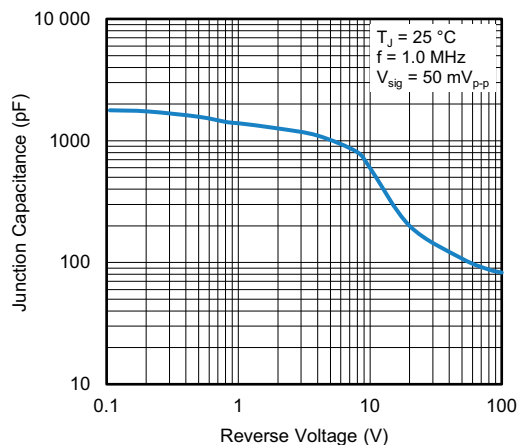
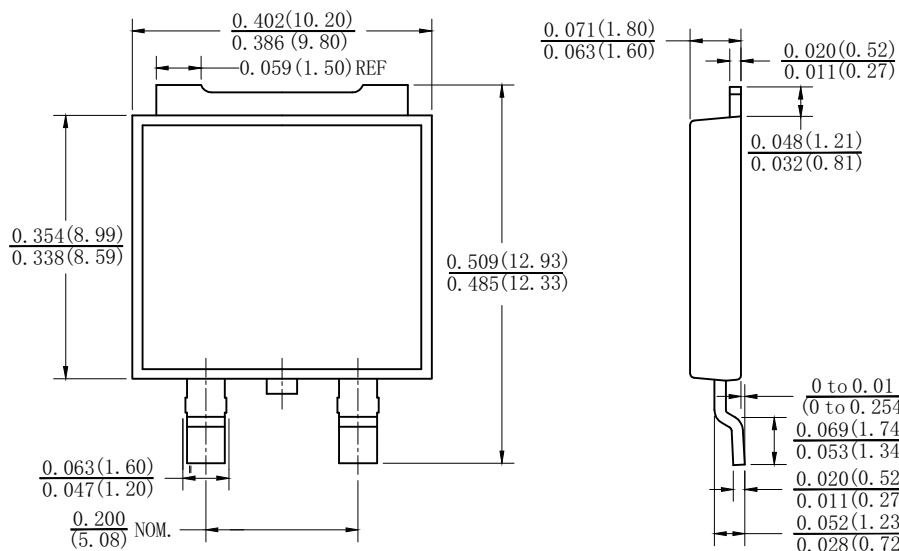


Fig. 5 - Typical Junction Capacitance

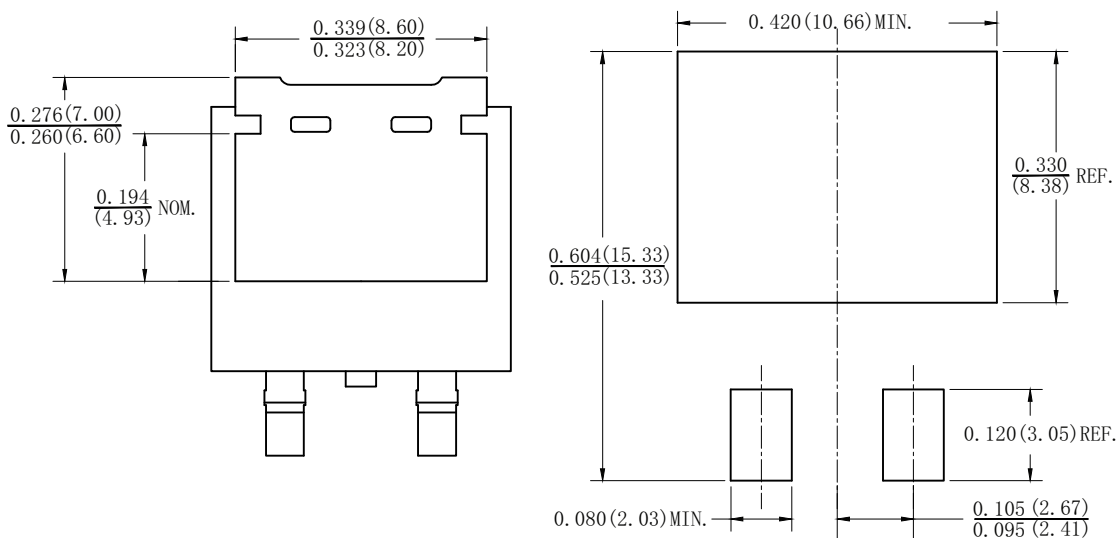


PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

SMPD (TO-263AC)



Mounting Pad Layout





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