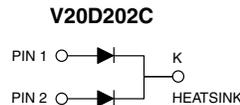
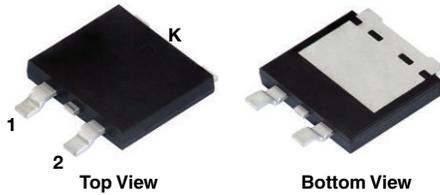


# Dual High-Voltage TMBS® (Trench MOS Barrier Schottky) Rectifier

## eSMP® Series SMPD (TO-263AC)



### LINKS TO ADDITIONAL RESOURCES



PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2 x 10 A
$V_{RRM}$	200 V
$I_{FSM}$	150 A
$V_F$ at $I_F = 10.0$ A ( $T_A = 125$ °C)	0.68 V
$T_J$ max.	175 °C
Package	SMPD (TO-263AC)
Circuit configuration	Common cathode

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

 AUTOMOTIVE  
GRADE  
Available

**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.

### 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\_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 and HM3 suffix meets JESD 201 class 2 whisker test

**Polarity:** As marked

MAXIMUM RATINGS ( $T_A = 25$ °C unless otherwise noted)			
PARAMETER	SYMBOL	V20D202C	UNIT
Maximum repetitive peak reverse voltage	$V_{RRM}$	200	V
Maximum average forward rectified current (fig. 1)	$I_{F(AV)}$	per device	20
		per diode	10
Maximum DC reverse voltage	$V_{DC}$	160	V
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	$I_{FSM}$	150	A
Voltage rate of change (rated $V_R$ )	dV/dt	10 000	V/ $\mu$ s
Operating junction and storage temperature range	$T_J, T_{STG}$	-40 to +175	°C

<b>ELECTRICAL CHARACTERISTICS</b> ( $T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted)						
PARAMETER	TEST CONDITIONS		SYMBOL	TYP.	MAX.	UNIT
Instantaneous forward voltage per diode	$I_F = 5\text{ A}$	$T_A = 25\text{ }^\circ\text{C}$	$V_F^{(1)}$	0.75	-	V
	$I_F = 10\text{ A}$			0.83	0.9	
	$I_F = 5\text{ A}$	$T_A = 125\text{ }^\circ\text{C}$		0.6	-	
	$I_F = 10\text{ A}$			0.68	0.76	
Reverse current at rated $V_R$ per diode	$V_R = 160\text{ V}$	$T_A = 25\text{ }^\circ\text{C}$	$I_R^{(2)}$	0.8	-	$\mu\text{A}$
		$T_A = 125\text{ }^\circ\text{C}$		1	-	mA
	$V_R = 200\text{ V}$	$T_A = 25\text{ }^\circ\text{C}$		-	150	$\mu\text{A}$
		$T_A = 125\text{ }^\circ\text{C}$		2.5	10	mA

**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	V20D202C	UNIT
Typical thermal resistance	per diode	$R_{\theta JC}$	2.8	$^\circ\text{C/W}$
	per device		1.5	
	per device	$R_{\theta JA}^{(1)(2)}$	58	

**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-ambient  
 (2) Free air, without heatsink

<b>ORDERING INFORMATION</b> (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
V20D202C-M3/I	0.55	I	2000/reel	13" diameter plastic tape and reel
V20D202CHM3_B/I <sup>(1)</sup>	0.55	I	2000/reel	13" diameter plastic tape and reel

**Note**

- (1) AEC-Q101 qualified

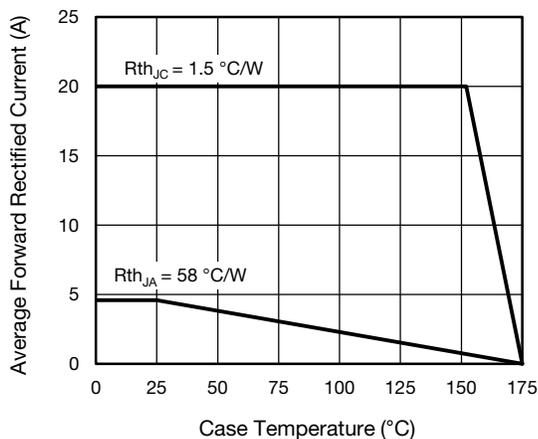
**RATINGS AND CHARACTERISTICS CURVES** ( $T_A = 25\text{ }^\circ\text{C}$  unless otherwise noted)


Fig. 1 - Forward Current Derating Curve

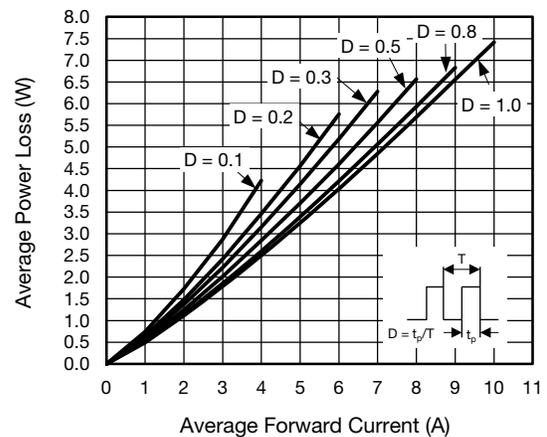


Fig. 2 - Forward Power Loss Characteristics

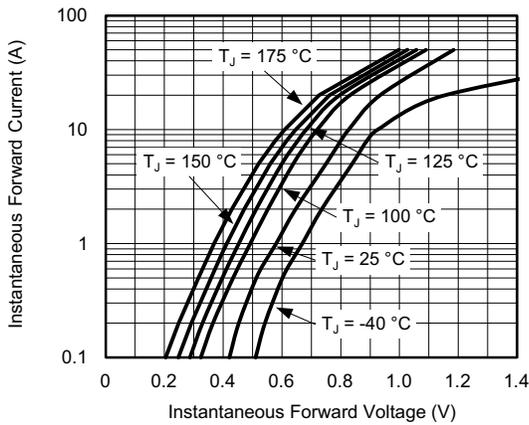


Fig. 3 - Typical Instantaneous Forward Characteristics

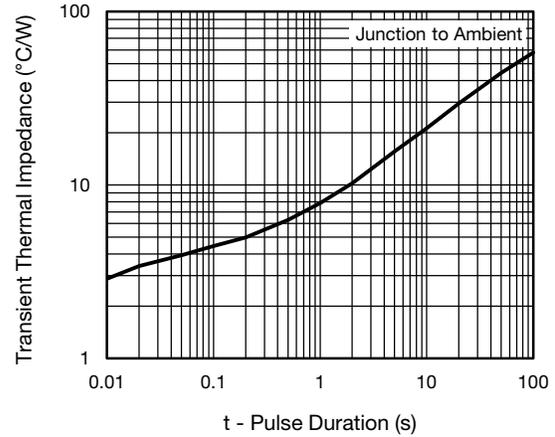


Fig. 6 - Typical Transient Thermal Impedance

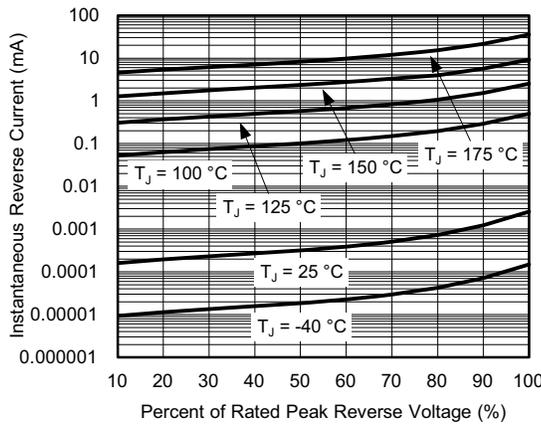


Fig. 4 - Typical Reverse Characteristics

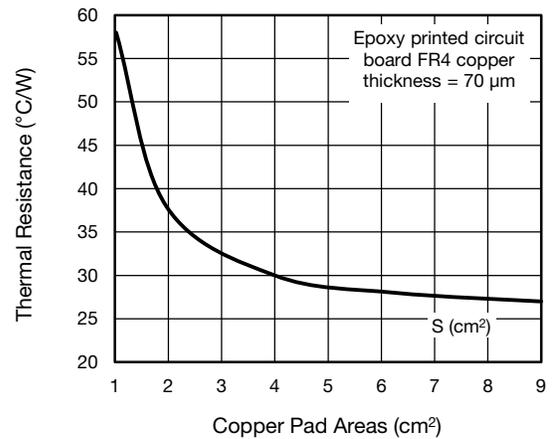


Fig. 7 - Thermal Resistance Junction-to-Ambient vs. Copper Pad Areas

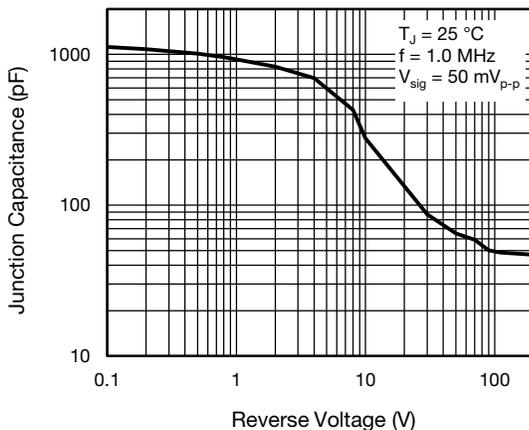
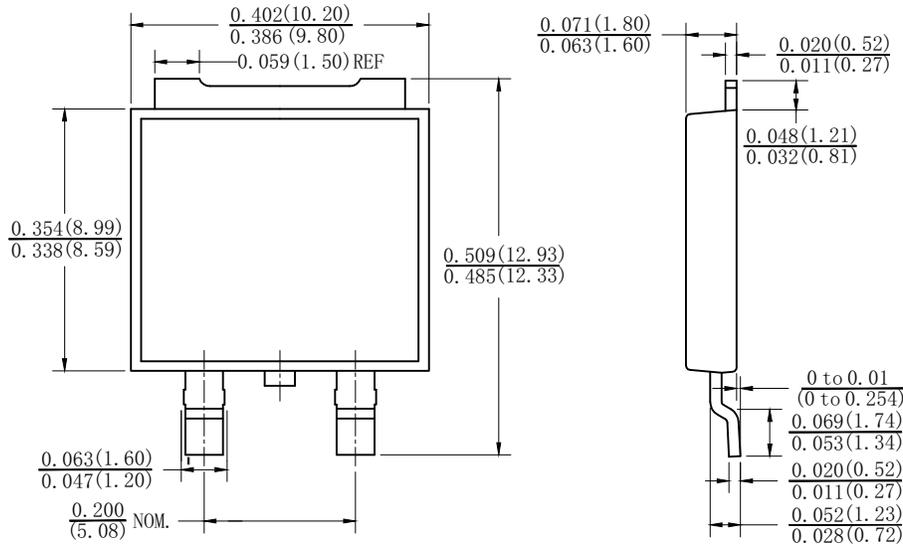


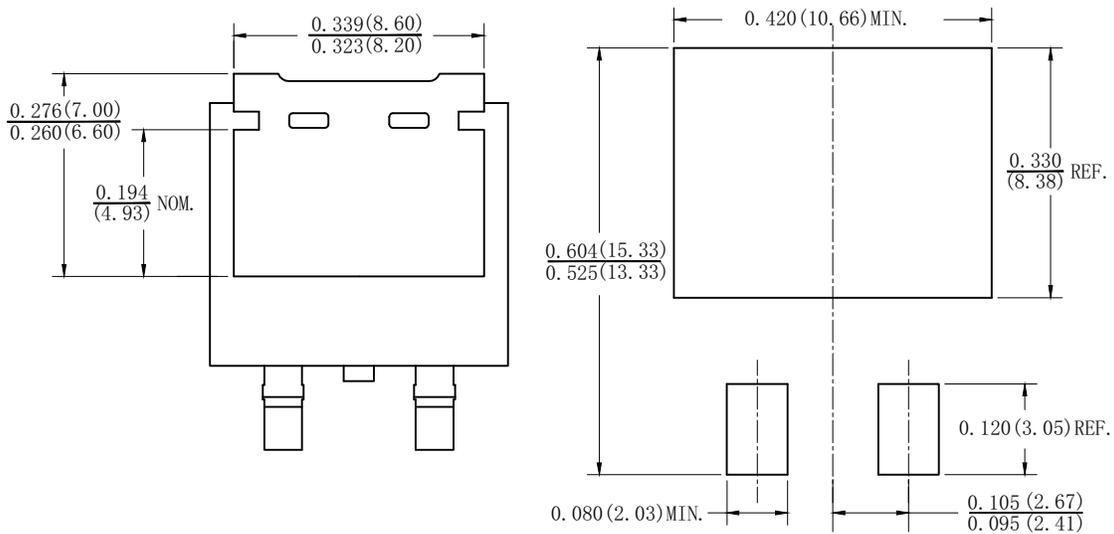
Fig. 5 - Typical Junction Capacitance

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

**SMPD (TO-263AC)**



**Mounting Pad Layout**





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