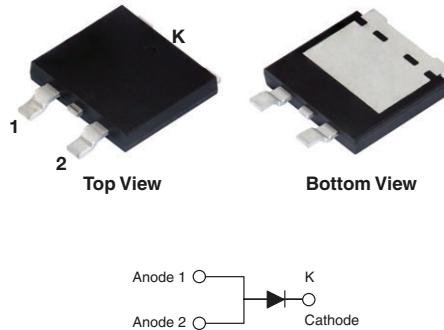


# Dual High-Voltage TMBS® (Trench MOS Barrier Schottky) Rectifier

Ultra Low  $V_F$  = 0.52 V at  $I_F$  = 5 A

## eSMP® Series SMPD (TO-263AC)



## LINKS TO ADDITIONAL RESOURCES



## 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)



**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 in commercial, industrial, and automotive application.

## 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 meets JESD 201 class 2 whisker test

**Polarity:** as marked

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	20 A
$V_{RRM}$	120 V
$I_{FSM}$	150 A
$V_F$ at $I_F$ = 20 A ( $T_A$ = 125 °C)	0.71 V
$T_J$ max.	175 °C
Package	SMPD (TO-263AC)
Circuit configuration	Single

MAXIMUM RATINGS ( $T_A$ = 25 °C unless otherwise noted)			
PARAMETER	SYMBOL	V20DM120	UNIT
Maximum repetitive peak reverse voltage	$V_{RRM}$	120	V
Maximum DC forward rectified current (fig. 1)	$I_{F(AV)}^{(1)}$	20	A
	$I_{F(AV)}^{(2)}$	5.5	
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	$I_{FSM}$	150	A
Operating junction and storage temperature range	$T_J, T_{STG}$	-40 to +175	°C

### Notes

(1) With infinite heatsink

(2) With recommended pad size, 2 oz FR4 PCB

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

PARAMETER	TEST CONDITIONS		SYMBOL	TYP.	MAX.	UNIT	
Instantaneous forward voltage per diode	$I_F = 5 \text{ A}$	$T_A = 25^\circ\text{C}$	$V_F^{(1)}$	0.62	-	V	
	$I_F = 10 \text{ A}$			0.77	-		
	$I_F = 20 \text{ A}$			1.02	1.1		
	$I_F = 5 \text{ A}$	$T_A = 125^\circ\text{C}$		0.52	-		
	$I_F = 10 \text{ A}$			0.61	-		
	$I_F = 20 \text{ A}$			0.71	0.79		
Reverse current at rated $V_R$ per diode	$V_R = 90 \text{ V}$	$T_A = 25^\circ\text{C}$	$I_R^{(2)}$	0.01	-	mA	
		$T_A = 125^\circ\text{C}$		3	-		
	$V_R = 120 \text{ V}$	$T_A = 25^\circ\text{C}$		-	0.8		
		$T_A = 125^\circ\text{C}$		5	15		

**Notes**

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

(2) Pulse test: Pulse width  $\leq 5 \text{ ms}$

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

PARAMETER	SYMBOL	V20DM120		UNIT
Typical thermal resistance	$R_{\theta\text{JC}}$	1.6		°C/W
	$R_{\theta\text{JA}}^{(1)(2)}$	48		

**Notes**

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

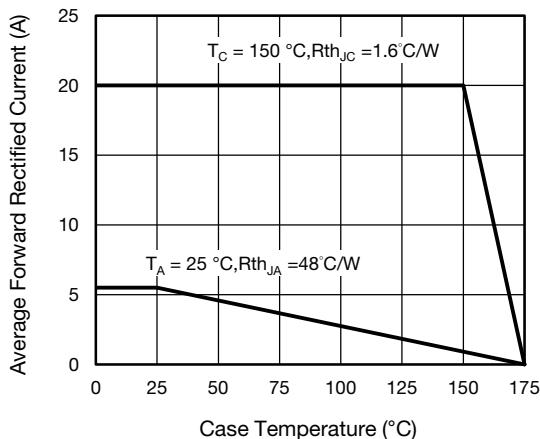
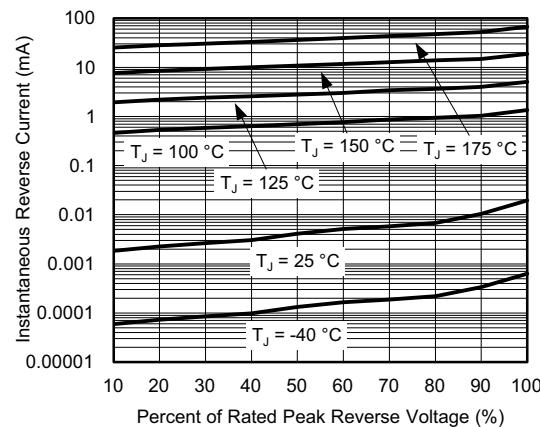
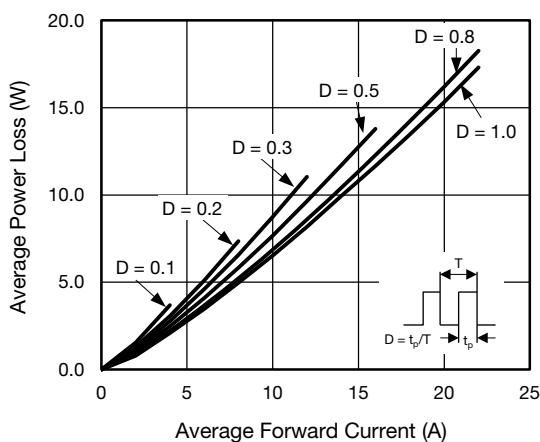
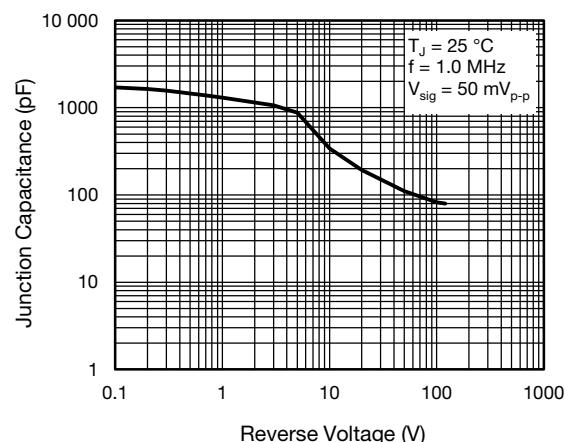
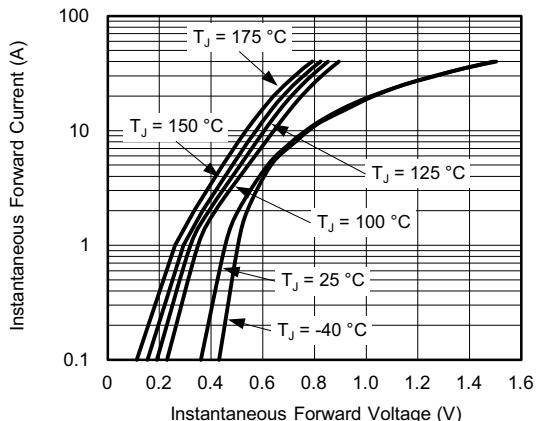
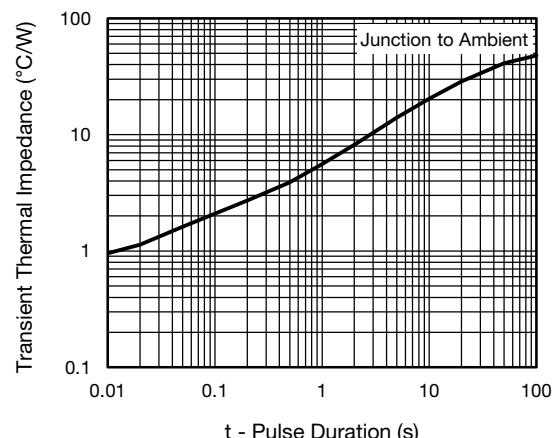
(2) Free air, without heatsink

**ORDERING INFORMATION** (Example)

PREFERRED P/N	UNIT WEIGHT (g)	PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
V20DM120-M3/I	0.55	I	2000/reel	13" diameter plastic tape and reel
V20DM120HM3/I <sup>(1)</sup>	0.55	I	2000/reel	13" diameter plastic tape and reel

**Note**

(1) AEC-Q101 qualified

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

**Fig. 1 - Forward Current Derating Curve**

**Fig. 4 - Typical Reverse Characteristics**

**Fig. 2 - Average Power Loss Characteristics**

**Fig. 5 - Typical Junction Capacitance**

**Fig. 3 - Typical Instantaneous Forward Characteristics**

**Fig. 6 - Typical Transient Thermal Impedance**

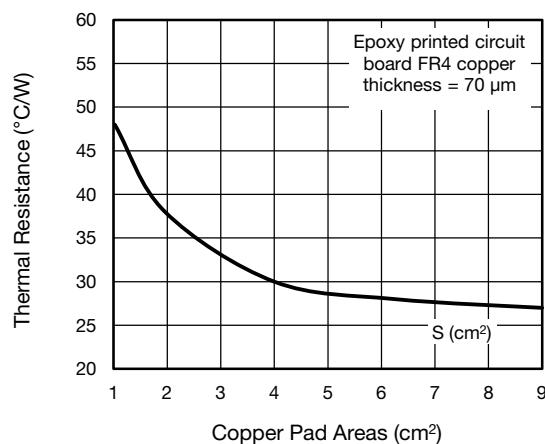
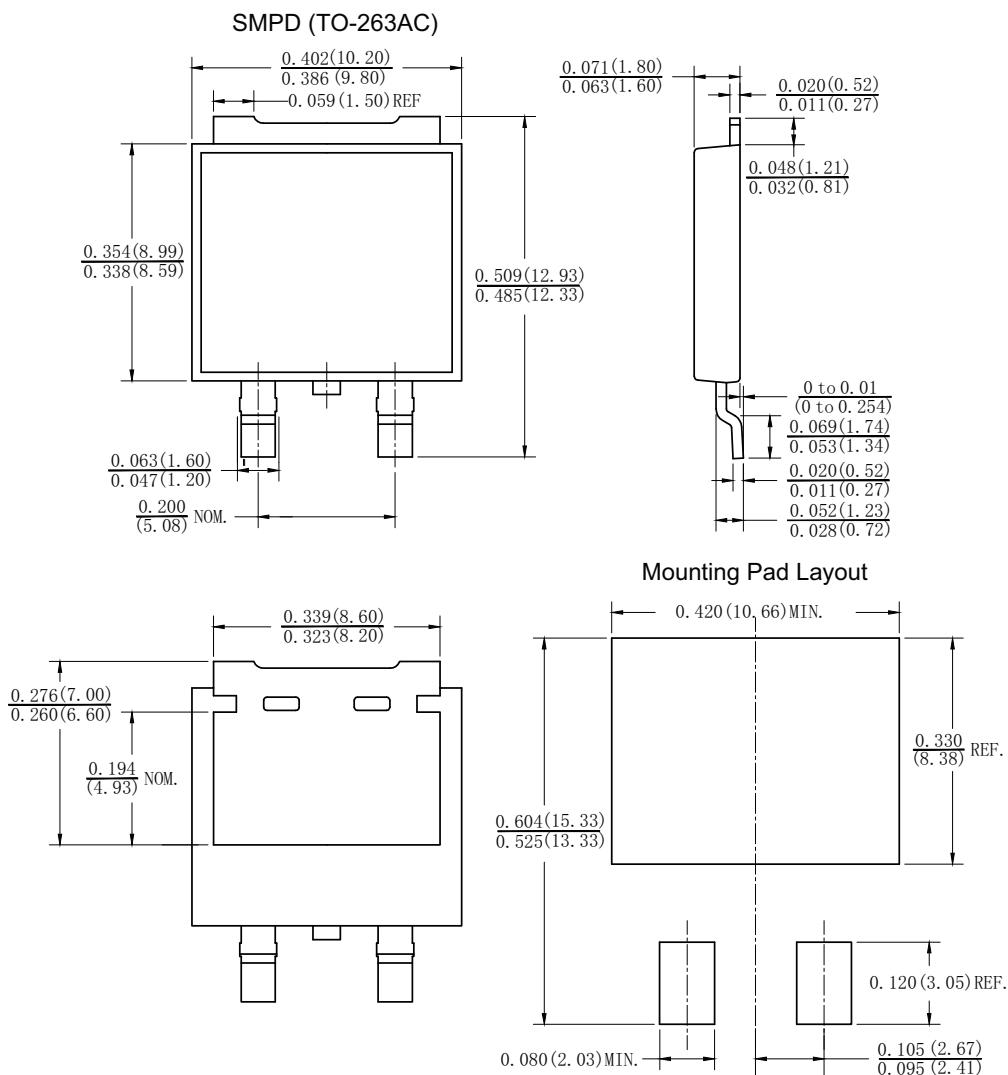


Fig. 7 - Thermal Resistance Junction-to-Ambient vs. Copper Pad Areas

### PACKAGE OUTLINE DIMENSIONS in inches (millimeters)



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