COMPLIANT

HALOGEN FREE

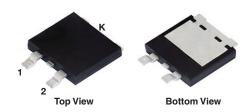


Vishay General Semiconductor

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

Ultra Low $V_F = 0.60 \text{ V}$ at $I_F = 5.0 \text{ A}$

eSMP[®] Series SMPD (TO-263AC)





DESIGN SUPPORT TOOLS AVAILABLE



PRIMARY CHARACTERISTICS				
I _{F(AV)}	2 x 10 A			
V _{RRM}	150 V			
I _{FSM}	120 A			
V _F at I _F = 10 A (T _A = 125 °C)	0.69 V			
T _J max.	175 °C			
Package	SMPD (TO-263AC)			
Circuit configuration	Common cathode			

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 <u>www.vishav.com/doc?99912</u>

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 meet JESD 201 class 2 whisker test

Polarity: as marked

MAXIMUM RATINGS (T _A = 25 °C unless otherwise noted)					
PARAMETER		SYMBOL	V20DM150C	UNIT	
Device marking code			V20DM150C		
Maximum repetitive peak reverse voltage		V _{RRM}	150	V	
Maximum average forward rectified current (fig. 1)	per device	I _{F(AV)} (1)	20	Α	
	per diode		10	Α	
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load		I _{FSM}	120	А	
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: $dP_D/dT_J < 1/R_{\theta,JA}$



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ELECTRICAL CHARACTERISTICS (T _A = 25 °C unless otherwise noted)						
PARAMETER	TEST CONDITIONS		SYMBOL	TYP.	MAX.	UNIT
Instantaneous forward voltage per diode	I _F = 5 A	T _A = 25 °C	- V _F ⁽¹⁾	0.81	-	V
	I _F = 10 A			1.15	1.24	
	I _F = 5 A	T _A = 125 °C		0.6	-	
	I _F = 10 A			0.69	0.75	
Reverse current at rated V _R per diode	V _R = 100 V	T _A = 25 °C	I _R ⁽²⁾	0.01	-	mA
		T _A = 125 °C		1.5	-	
	V _R = 150 V	T _A = 25 °C		-	0.15	
	v _R = 150 v	T _A = 125 °C		3	10	
Typical junction capacitance	4.0 V, 1 MHz		СЈ	530	-	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 SYM		V20DM150C	UNIT	
Typical thermal resistance per device	R ₀ JC ⁽¹⁾	2.0	°C/W	
	R _{0JA} (1)(3)	58	C/VV	

Notes

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

ORDERING INFORMATION (Example)						
PREFERRED P/N	UNIT WEIGHT (g)	PACKAGE CODE	BASE QUANTITY	DELIVERY MODE		
V20DM150C-M3/I	0.55	I	2000/reel	13" diameter plastic tape and reel		
V20DM150CHM3/I (1)	0.55	I	2000/reel	13" diameter plastic tape and reel		

Note

(1) AEC-Q101 qualified



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RATINGS AND CHARACTERISTICS CURVES (T_A = 25 °C unless otherwise noted)

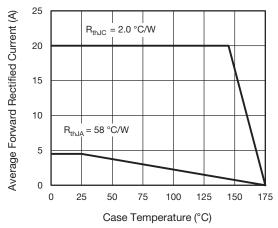


Fig. 1 - Maximum Forward Current Derating Curve

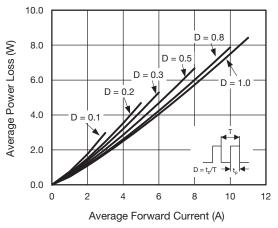


Fig. 2 - Average Power Loss Characteristics

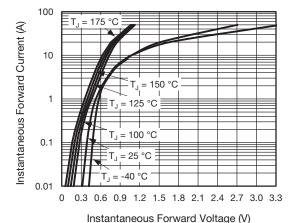


Fig. 3 - Typical Instantaneous Forward Characteristics

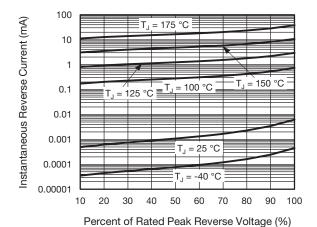


Fig. 4 - Typical Reverse Leakage Characteristics

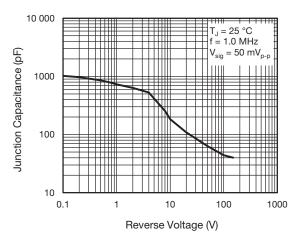


Fig. 5 - Typical Junction Capacitance

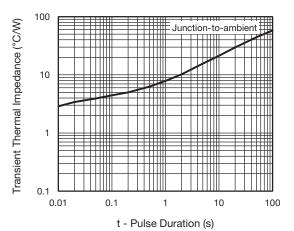


Fig. 6 - Typical Transient Thermal Impedance



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0.105 (2.67)

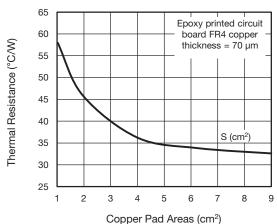
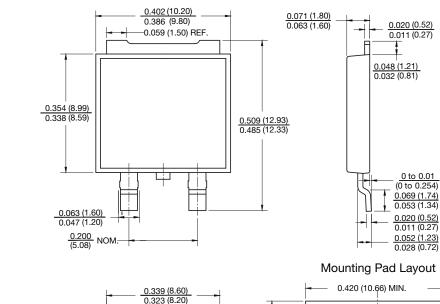


Fig. 7 - Thermal Resistance Junction-to-Ambient vs. Copper Pad Areas

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

SMPD (TO-263AC)



0.323 (8.20) 0.276 (7.00) 0.260 (6.60) 0.194 NOM. 0.604 (15.33) 0.525 (13.33) 0.120 (3.05) REF.

0.080 (2.03) MIN.



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