AUTOMOTIVE GRADE

COMPLIANT

HALOGEN FREE

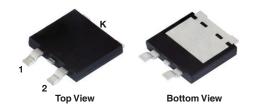


Vishay General Semiconductor

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

Ultra Low $V_F = 0.40 \text{ V}$ at $I_F = 5 \text{ A}$

eSMP[®] Series SMPD (TO-263AC)





LINKS TO ADDITIONAL RESOURCES



PRIMARY CHARACTERISTICS				
I _{F(AV)}	2 x 20 A			
V_{RRM}	100 V			
I _{FSM}	250 A			
V _F at I _F = 20 A (T _A = 125 °C)	0.63 V			
T _J max.	150 °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 www.vishay.com/doc?99912

TYPICAL APPLICATIONS

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

MAXIMUM RATINGS (T _A = 25 °C unless otherwise noted)					
PARAMETER		SYMBOL	V40D100C	UNIT	
Maximum repetitive peak reverse voltage		V_{RRM}	100	V	
Maximum average forward rectified current (fig. 1)	per device	I _{F(AV)}	40	^	
	per diode		20	A	
Peak forward surge current 10 ms single half sine-wave superimposed on rated load		I _{FSM}	250	А	
Voltage rate of change (rated V _R)		dV/dt	10 000	V/µs	
Operating junction and storage temperature range		T _J , T _{STG}	-40 to +150	°C	



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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⁾	0.48	-	V	
	I _F = 10 A			0.56	-		
	I _F = 20 A			0.71	0.75		
	I _F = 5 A	T _A = 125 °C		0.40	-		
	I _F = 10 A			0.51	-		
	I _F = 20 A			0.63	0.69		
Reverse current at rated V _R per diode	V _R = 70 V	T _A = 25 °C	- I _R ⁽²⁾	11	-	μA	
		T _A = 125 °C		11	-	mA	
	V _R = 100 V	T _A = 25 °C		-	1000	μΑ	
		T _A = 125 °C		24	80	mA	

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		SYMBOL	V40D100C	UNIT
	per diode	R _{θJC}	1.9	
Typical thermal resistance	per device		1.0	°C/W
	per device	R ₀ JA (1)(2)	45	

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)					
PACKAGE	PREFERRED P/N	UNIT WEIGHT (g)	PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
SMPD (TO-263AC)	V40D100C-M3/I	0.55	I	2000/reel	13" diameter plastic tape and reel
SMPD (TO-263AC)	V40D100CHM3/I (1)	0.55	I	2000/reel	13" diameter plastic tape and reel

Note

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

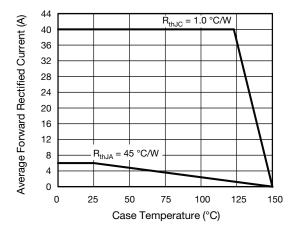


Fig. 1 - Forward Current Derating Curve

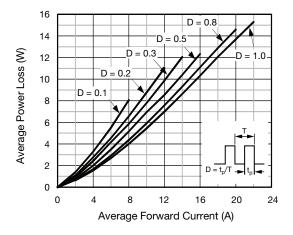


Fig. 2 - Forward Power Loss Characteristics Per Diode

⁽¹⁾ AEC-Q101 qualified



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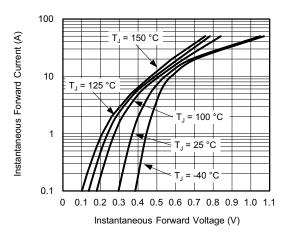


Fig. 3 - Typical Instantaneous Forward Characteristics Per Diode

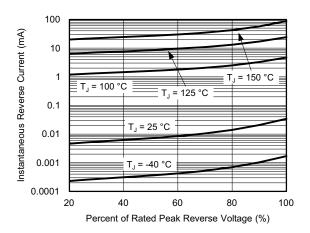


Fig. 4 - Typical Reverse Characteristics Per Diode

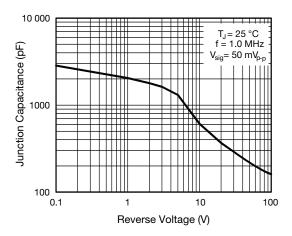


Fig. 5 - Typical Junction Capacitance Per Diode

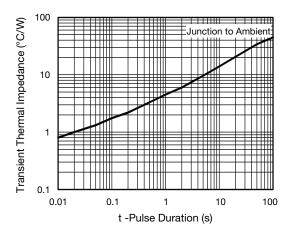


Fig. 6 - Typical Transient Thermal Impedance Per Device

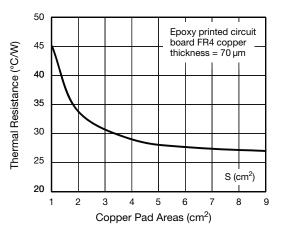
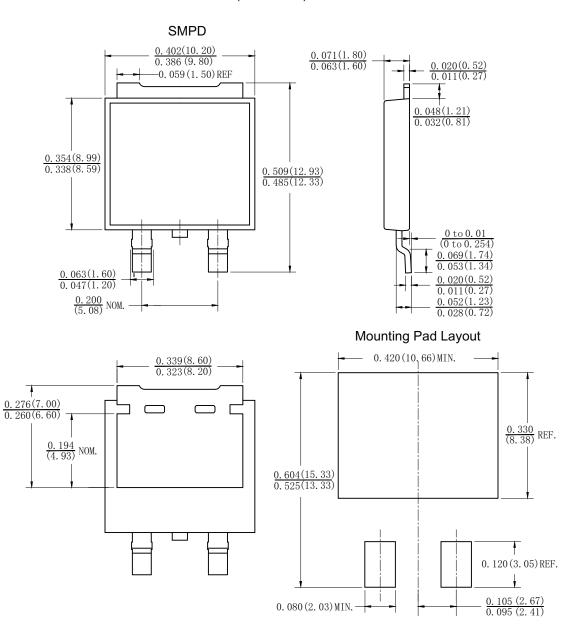


Fig. 7 - Thermal Resistance Junction-to-Ambient vs.
Copper Pad Areas



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PACKAGE OUTLINE DIMENSIONS in inches (millimeters)





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