AUTOMOTIVI GRADE

COMPLIANT

HALOGEN FREE



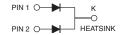
Vishay General Semiconductor

High Current Density Surface-Mount TMBS® (Trench MOS Barrier Schottky) Rectifier

Ultra Low $V_F = 0.5 \text{ V}$ at $I_F = 5 \text{ A}$







LINKS TO ADDITIONAL RESOURCES



PRIMARY CHARACTERISTICS			
I _{F(AV)}	2 x 10 A		
V_{RRM}	100 V		
I _{FSM}	150 A		
V_F at $I_F = 10 A (T_J = 125 °C)$	0.59 V		
T _J max.	175 °C		
Package	SlimDPAK (TO-252AE)		
Circuit configuration	Common cathode		

FEATURES

- Very low profile typical height of 1.3 mm
- Trench MOS Schottky technology
- 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.vishay.com/doc?99912</u>

TYPICAL APPLICATIONS

For use in low voltage high frequency DC/DC converters, freewheeling diodes, and polarity protection applications.

MECHANICAL DATA

Case: SlimDPAK (TO-252AE)

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

MAXIMUM RATINGS (T _A = 25 °C unless otherwise noted)				
PARAMETER		SYMBOL	V20PWM103C	UNIT
Device marking code			V20PWM103C	
Maximum repetitive peak reverse voltage	V_{RRM}	100	V	
Maximum average forward rectified current (Fig. 1)	per device	I _{F(AV)} (1)	20	Α
	per diode		10	А
Peak forward surge current 8.3 ms single half sine-was uperimposed on rated load per diode	I _{FSM}	150	А	
Operating junction temperature range		T _J ⁽²⁾	-40 to +175	°C
Storage temperature range	T _{STG}	-55 to +175	°C	

Notes

⁽¹⁾ With infinite heatsink

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



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ELECTRICAL CHARACTERISTICS (T _J = 25 °C unless otherwise noted)						
PARAMETER	TEST CO	TEST CONDITIONS		TYP.	MAX.	UNIT
Instantaneous forward voltage per diode	I _F = 5.0 A	T _J = 25 °C	V _E (1)	0.57	-	V
	I _F = 10 A			0.69	0.76	
	I _F = 5.0 A	T _J = 125 °C	1 ' 1	0.50	-	
	I _F = 10 A			0.59	0.66	
Reverse current per diode	V _R = 70 V	T _J = 25 °C	I _R ⁽²⁾	0.01	-	mA
	v _R = 70 v	T _J = 125 °C		1.5	-	
	V _R = 100 V	T _J = 25 °C		-	0.17	
	v _R = 100 v	T _J = 125 °C		3.5	9	
Typical junction capacitance	4.0 V, 1 MHz		CJ	1120	-	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	SYMBOL	V20PWM103C	UNIT	
Typical thermal resistance	R ₀ JA (1)(2)	65	°C/W	
Typical triefmal resistance	R _{0JM} (3)	1.8	C/VV	

Notes

- $^{(1)}$ The heat generated must be less than thermal conductivity from junction-to-ambient: $dP_D/dT_J < 1/R_{\theta JA}$
- $^{(2)}$ Free air, mounted on recommended copper pad area; thermal resistance $R_{\theta JA}$ junction to ambient
- $^{(3)}$ Mounted on infinite heat sink; thermal resistance $R_{\theta JM}$ junction-to-mount

ORDERING INFORMATION (Example)					
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE	
V20PWM103C-M3/I	0.20	I	4500	13" diameter plastic tape and reel	
V20PWM103CHM3/I (1)	0.20	I	4500	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)

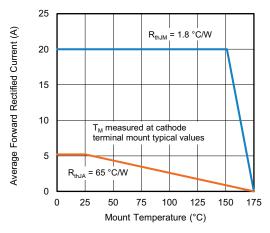


Fig. 1 - Maximum Forward Current Derating Curve

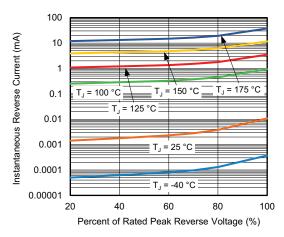


Fig. 4 - Typical Reverse Leakage Characteristics

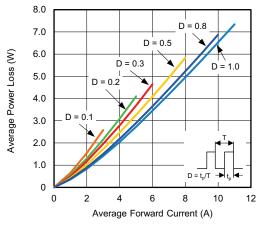


Fig. 2 - Forward Power Loss Characteristics

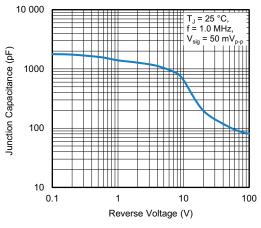


Fig. 5 - Typical Junction Capacitance

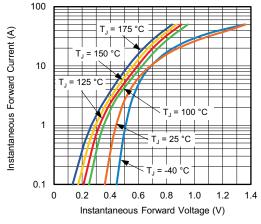


Fig. 3 - Typical Instantaneous Forward Characteristics

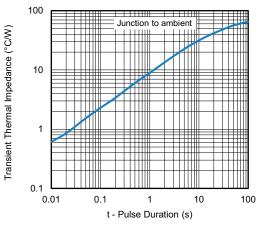


Fig. 6 - Typical Transient Thermal Impedance



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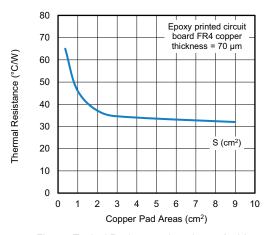
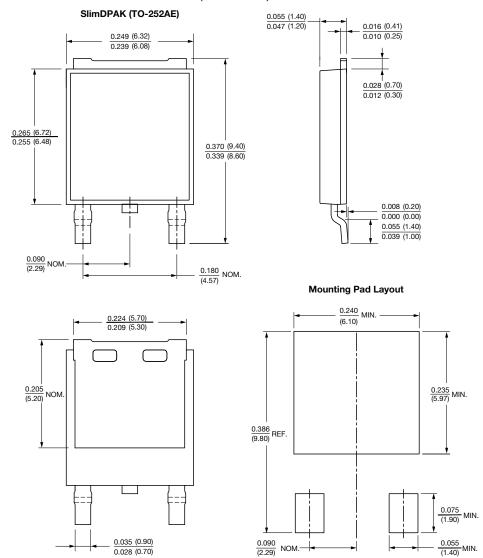


Fig. 7 - Typical Resistance Junction to Ambient vs. Copper Pad Areas

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)





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