AUTOMOTIVE GRADE

COMPLIANT

HALOGEN FREE



Vishay General Semiconductor

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

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



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>

LINKS TO ADDITIONAL RESOURCES



PRIMARY CHARACTERISTICS				
I _{F(AV)}	2 x 10 A			
V _{RRM} 60 V				
I _{FSM}	150 A			
V _F at I _F = 10 A (T _A = 125 °C)	0.51 V			
T _J max.	150 °C			
Package	SlimDPAK (TO-252AE)			
Circuit configuration Common cathode				

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	V20PW60C	UNIT
Device marking code			V20PW60C	
Maximum repetitive peak reverse voltage		V _{RRM}	60	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 superimposed on rated load per diode	I _{FSM}	150	А	
Operating junction temperature range		T _J ⁽²⁾	-40 to +150	°C
Storage temperature range	T _{STG}	-55 to +150	°C	

Notes

⁽¹⁾ With infinite heatsink

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



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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 = 5.0 A	T _A = 25 °C	V _F ⁽¹⁾	0.48	-	V
	I _F = 10 A			0.56	0.64	
	I _F = 5.0 A	T _A = 125 °C		0.40	-	
	I _F = 10 A			0.51	0.59	
Reverse current per diode	V 60.V	T _A = 25 °C	-	1.5	A	
	$V_R = 60 \text{ V}$	T _A = 125 °C	IR (=/	10	30	- mA
Typical junction capacitance per diode	4.0 V, 1 MHz		CJ	1140	-	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	V20PW60C	UNIT	
Typical thermal resistance	R _{θJA} (1)(2)	55	°C/W	
Typical thermal resistance	R _{0JM} (3)	1.8		

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		
V20PW60C-M3/I	0.20	I	4500	13" diameter plastic tape and reel	
V20PW60CHM3/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)

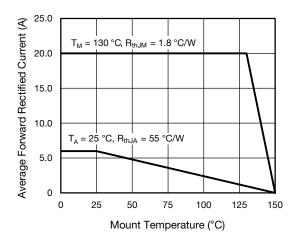


Fig. 1 - Maximum Forward Current Derating Curve

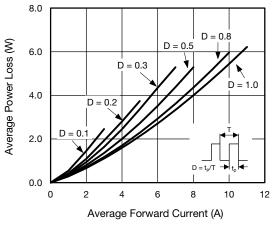


Fig. 2 - Forward Power Loss Characteristics

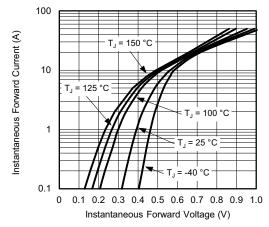


Fig. 3 - Typical Instantaneous Forward Characteristics

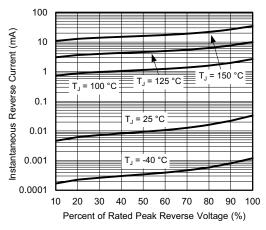


Fig. 4 - Typical Reverse Leakage Characteristics

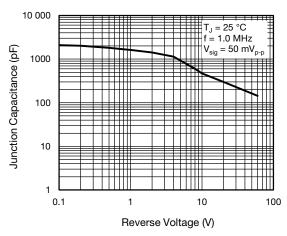


Fig. 5 - Typical Junction Capacitance

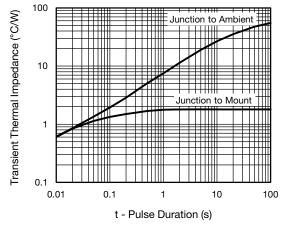


Fig. 6 - Typical Transient Thermal Impedance

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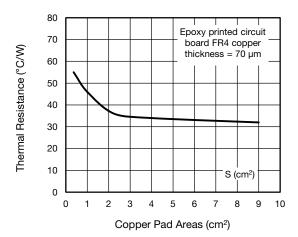
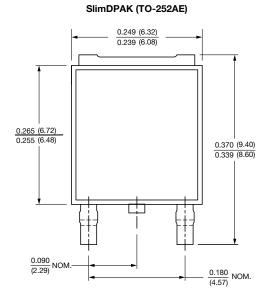


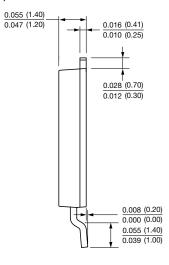
Fig. 7 - Typical Resistance Junction to Ambient vs. Copper Pad Areas



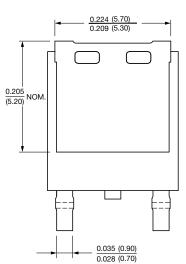
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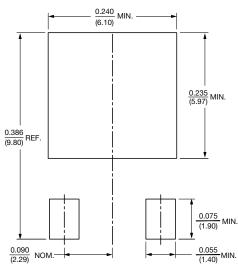
PACKAGE OUTLINE DIMENSIONS in inches (millimeters)





Mounting Pad Layout







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