AUTOMOTIVE GRADE

COMPLIANT

HALOGEN FREE



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Vishay General Semiconductor

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

Ultra Low $V_F = 0.44 \text{ V}$ at $I_F = 5 \text{ A}$





LINKS TO ADDITIONAL RESOURCES



PRIMARY CHARACTERISTICS				
I _{F(AV)}	2 x 20 A			
V_{RRM}	100 V			
I _{FSM}	240 A			
V_F at $I_F = 20$ A $(T_A = 125 ^{\circ}C)$	0.70 V			
T _J max.	150 °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	YMBOL V40PW10C		
Device marking code	ce marking code		V40PW10C		
Maximum repetitive peak reverse voltage		V_{RRM}	100	V	
Maximum average forward rectified current (fig. 1)	per device	I _{F(AV)} (1)	40	А	
	per diode		20	Α	
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load per diode		I _{FSM}	240	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 CO	TEST CONDITIONS		TYP.	MAX.	UNIT
Instantaneous forward voltage	$I_F = 5.0 \text{ A}$	T _A = 25 °C	V _F ⁽¹⁾	0.52	-	- V
	I _F = 10 A			0.62	-	
	I _F = 20 A			0.81	0.89	
	$I_F = 5.0 \text{ A}$	T _A = 125 °C		0.44	-	
	I _F = 10 A			0.56	-	
	I _F = 20 A			0.70	0.78	
Reverse current	V _R = 70 V	T _A = 25 °C	I _R ⁽²⁾	0.01	-	mA
	V _R = 70 V	T _A = 125 °C		8.0	-	
	V _R = 100 V	T _A = 25 °C		-	0.5	
	VR = 100 V	T _A = 125 °C		16	35	
Typical junction capacitance	4.0 V, 1 MHz		CJ	1470	-	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	UNIT			
Typical thermal registence	R ₀ JA (1)(2)	55	°C/W		
Typical thermal resistance	R _{0JM} (3)	1.5]		

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	PREFERRED P/N UNIT WEIGHT (g) PREFERRED PACKAGE CODE		BASE QUANTITY	DELIVERY MODE		
V40PW10C-M3/I	0.20	1	4500	13" diameter plastic tape and reel		
V40PW10CHM3/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)

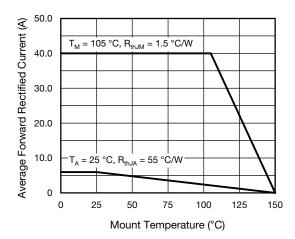


Fig. 1 - Maximum Forward Current Derating Curve

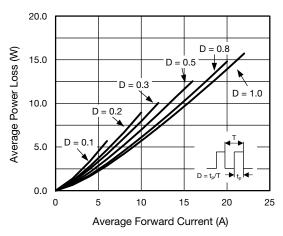


Fig. 2 - Forward Power Loss Characteristics

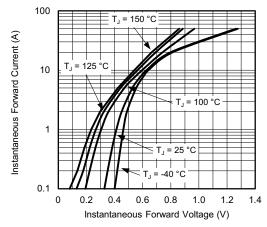


Fig. 3 - Typical Instantaneous Forward Characteristics

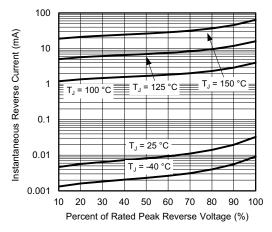


Fig. 4 - Typical Reverse Leakage Characteristics

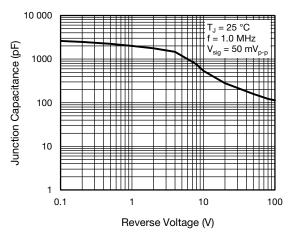


Fig. 5 - Typical Junction Capacitance

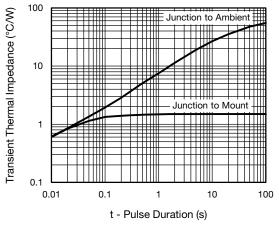


Fig. 6 - Typical Transient Thermal Impedance



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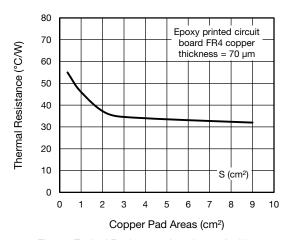
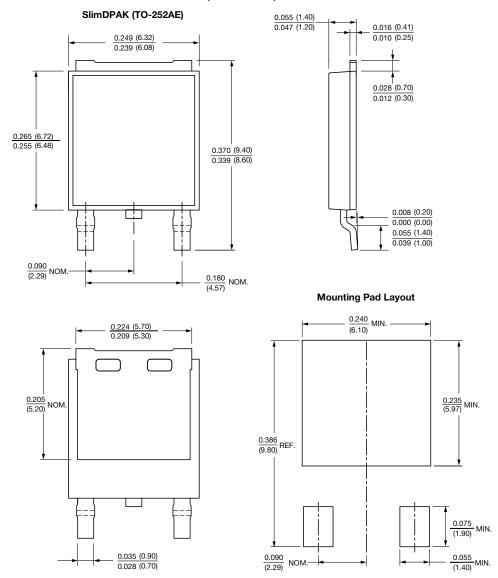


Fig. 7 - Typical Resistance Junction to Ambient vs. Copper Pad Areas

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)





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