V40PWM10C

Vishay General Semiconductor

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

Ultra Low $V_F = 0.46$ V at $I_F = 5$ A



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SlimDPAK (TO-252AE)

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 °C)	0.68 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 ($T_A = 25 \text{ °C}$ unless otherwise noted)				
PARAMETER		SYMBOL	V40PWM10C	UNIT
Device marking code			V40PWM10C	
Maximum repetitive peak reverse voltage		V _{RRM}	100	V
Maximum average forward rectified current (Fig. 1)	per device	L	40	А
Maximum average forward rectiled current (Fig. 1)	per diode	I _{F(AV)} ⁽¹⁾	20	A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load per diode	I _{FSM} 240		A	
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: $dP_D/dT_J < 1/R_{\theta JA}$

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HALOGEN





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ELECTRICAL CHARACTERISTICS ($T_A = 25 \text{ °C}$ 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⁾	0.54	-	V
	I _F = 10 A			0.64	-	
	I _F = 20 A			0.81	0.89	
	I _F = 5.0 A	T _A = 125 °C		0.46	-	
	I _F = 10 A			0.57	-	
	I _F = 20 A			0.68	0.76	
Reverse current per diode	V _B = 70 V	T _A = 25 °C	I _R ⁽²⁾	0.01	-	mA
	v _R = 70 v	T _A = 125 °C		3.5	-	
	V _R = 100 V	T _A = 25 °C		-	0.4	
		T _A = 125 °C		7	21	
Typical junction capacitance	4.0 V, 1 MHz		CJ	1500	_	pF

Notes

 $^{(1)}\,$ Pulse test: 300 μs pulse width, 1 % duty cycle

⁽²⁾ Pulse test: pulse width \leq 5 ms

THERMAL CHARACTERISTICS ($T_A = 25$ °C unless otherwise noted)					
PARAMETER	SYMBOL	V40PWM10C	UNIT		
Typical thermal resistance	R _{0JA} (1)(2)	55	°C/W		
	R _{θJM} ⁽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	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE		
V40PWM10C-M3/I	0.20	I	4500	13" diameter plastic tape and reel		
V40PWM10CHM3/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)

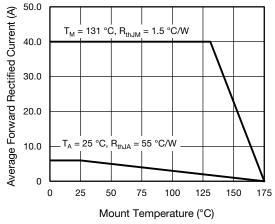


Fig. 1 - Maximum Forward Current Derating Curve

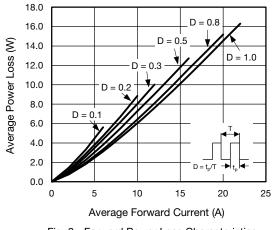


Fig. 2 - Forward Power Loss Characteristics

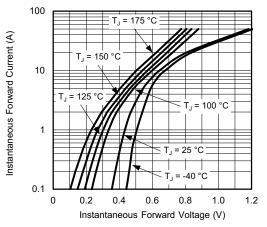
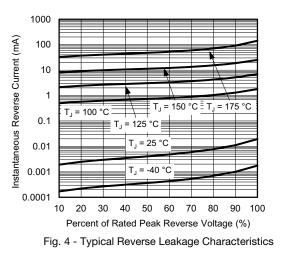
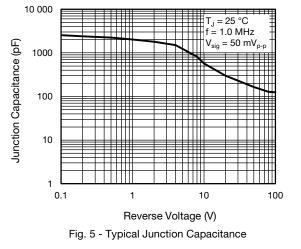


Fig. 3 - Typical Instantaneous Forward Characteristics





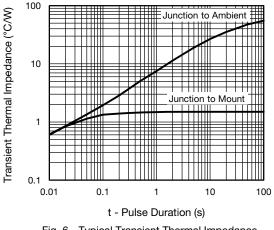


Fig. 6 - Typical Transient Thermal Impedance

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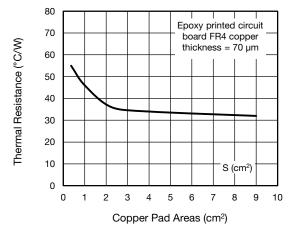
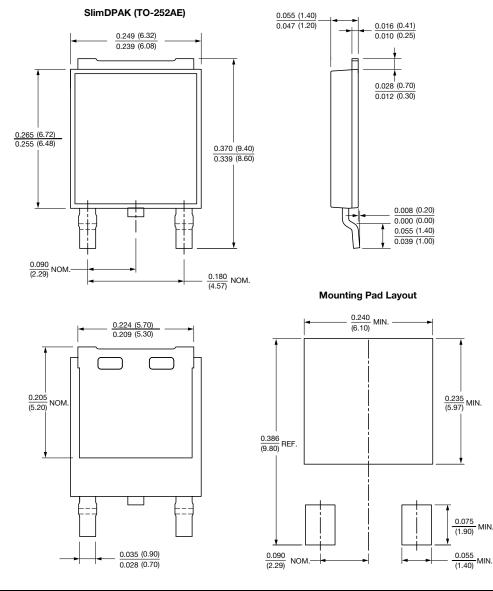


Fig. 7 - Typical Resistance Junction to Ambient vs. Copper Pad Areas





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