V10PWM12C

Vishay General Semiconductor

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

Ultra Low $V_F = 0.54$ V at $I_F = 2.5$ A



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SlimDPAK (TO-252AE)

LINKS TO ADDITIONAL RESOURCES



PRIMARY CHARACTERISTICS				
I _{F(AV)}	2 x 5 A			
V _{RRM}	120 V			
I _{FSM}	80 A			
V _F at I _F = 5 A (T _J = 125 °C)	0.63 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	V10PWM12C	UNIT	
Device marking code			V10PWM12C		
Maximum repetitive peak reverse voltage	V _{RRM}	120	V		
Maximum average forward rectified current (Fig. 1)	per device	I (1)	10	А	
	per diode	I _{F(AV)} ⁽¹⁾	5	А	
Peak forward surge current 8.3 ms single half sine-was superimposed on rated load per diode	I _{FSM}	80	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: $dP_D/dT_J < 1/R_{\theta JA}$





COMPLIANT HALOGEN

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ELECTRICAL CHARACTERISTICS (T_J = 25 °C unless otherwise noted)							
PARAMETER	TEST CONDITIONS		SYMBOL	TYP.	MAX.	UNIT	
Instantaneous forward voltage per diode	I _F = 2.5 A	T _J = 25 °C	V _E (1)	0.64	-	V	
	I _F = 5 A			0.78	0.86		
	I _F = 2.5 A	- T _J = 125 °C		VF ()	0.54	-	v
	I _F = 5 A			0.63	0.7		
Reverse current per diode	V 00 V	, T _J = 25 °C	I _R ⁽²⁾	0.0003	-	- mA	
	V _R = 90 V	T _J = 125 °C		0.5	-		
	V _R = 120 V	T _J = 25 °C		-	0.15		
		T _J = 125 °C		1	5		
Typical junction capacitance per diode	4.0 V, 1 MHz		CJ	420	-	pF	

Notes

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

⁽²⁾ Pulse test: pulse width \leq 5 ms

THERMAL CHARACTERISTICS ($T_A = 25 \text{ °C}$ unless otherwise noted)						
PARAMETER	SYMBOL	V10PWM12C	UNIT			
Typical thermal resistance per device	R _{0JA} (1)(2)	65	°C/W			
	R _{0JM} ⁽³⁾	2.1	- 0/10			

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		
V10PWM12C-M3/I	0.20	I	4500	13" diameter plastic tape and reel		
V10PWM12CHM3/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 Per Diode



Fig. 3 - Typical Instantaneous Forward Characteristics Per Diode



Fig. 4 - Typical Reverse Leakage Characteristics Per Diode



Fig. 5 - Typical Junction Capacitance Per Diode



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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