AUTOMOTIVE

COMPLIANT

FREE



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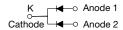
Vishay General Semiconductor

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

Ultra Low $V_F = 0.58 \text{ V}$ at $I_F = 1 \text{ A}$



SMPC (TO-277A)



ADDITIONAL RESOURCES



PRIMARY CHARACTERISTICS			
I _{F(AV)}	2 x 2.0 A		
V_{RRM}	200 V		
I _{FSM}	60 A		
V _F at I _F = 2 A	0.65 V		
T _J max.	175 °C		
Package	SMPC (TO-277A)		
Circuit configuration	Common cathode		

FEATURES

- Very low profile typical height of 1.1 mm
- Ideal for automated placement
- Trench MOS Schottky technology
- Low forward voltage drop, low power losses
- · High efficiency
- 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.vishav.com/doc?99912</u>

TYPICAL APPLICATIONS

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

MECHANICAL DATA

Case: SMPC (TO-277A)

Molding compound meets UL 94 V-0 flammability rating Base P/N-M3 - halogen-free, RoHS-compliant, and commercial grade

Base P/NHM3_X - halogen-free, RoHS-compliant, and AEC-Q101 qualified

AEC-Q101 quaimed

("_X" denotes revision code e.g. A, B,.....)

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	V4P22C	UNIT	
Device marking code		V422C		
Maximum repetitive peak reverse voltage	V _{RRM}	200	V	
Maximum average forward rectified current per device (fig. 1)	I _{F(AV)} (1)	4.0	Α	
	I _{F(AV)} (2)	2.8		
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load per diode	I _{FSM}	60	А	
Operating junction temperature range	T _J ⁽³⁾	-40 to +175	°C	
Storage temperature range	T _{STG}	-55 to +175	°C	

Notes

- (1) Mounted on 30 mm x 30 mm pad areas aluminum PCB
- (2) Free air, mounted on recommended pad area
- $^{(3)}$ 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 = 1 A	T _A = 25 °C	V _F (1)	0.74	-	V	
	I _F = 2 A			0.79	0.87		
	I _F = 1 A	T _A = 125 °C	· ·	VF (*/	0.58	i	V
	I _F = 2 A		A = 125 C	0.65	0.73		
Reverse current per diode		T _A = 25 °C	I _R ⁽²⁾	0.001	1	mA	
		T _A = 125 °C		0.3	i		
	V _R = 200 V	T _A = 25 °C		-	0.05		
		T _A = 125 °C		0.7	3		
Typical junction capacitance per diode	4.0 V, 1 MHz		CJ	125	-	pF	

Notes

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

(2) Pulse test: pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T _A = 25 °C unless otherwise specified)				
PARAMETER SYMBOL V4P22C			UNIT	
Typical thermal resistance per device	R ₀ JA (1)(2)	85	°C/W	
Typical thermal resistance per device	R _{eJM} (3)	5	O/VV	

Notes

- (1) The heat generated must be less than the thermal conductivity from junction-to-ambient: $dP_D/dT_J < 1/R_{\theta JA}$
- (2) Free air, mounted on recommended copper pad area, 2 oz., FR4 PCB, thermal resistance R_{0JA} junction-to-ambient
- (3) Units mounted on 30 mm x 30 mm aluminum PCB, thermal resistance R_{BJM} junction-to-mount

ORDERING INFORMATION (Example)					
PREFERRED P/N	UNIT WEIGHT (g)	PACKAGE CODE	BASE QUANTITY	DELIVERY MODE	
V4P22C-M3/H	0.10	Н	1500	7" diameter plastic tape and reel	
V4P22C-M3/I	0.10	I	6500	13" diameter plastic tape and reel	
V4P22CHM3_A/H (1)	0.10	Н	1500	7" diameter plastic tape and reel	
V4P22CHM3_A/I (1)	0.10	I	6500	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)

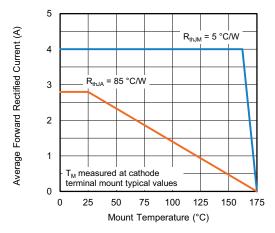


Fig. 1 - Maximum Forward Current Derating Curve

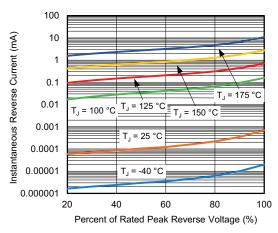


Fig. 4 - Typical Reverse Leakage Characteristics Per Diode

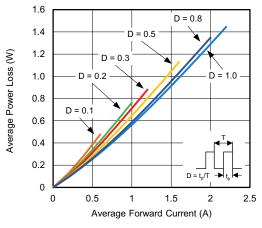


Fig. 2 - Forward Power Loss Characteristics Per Diode

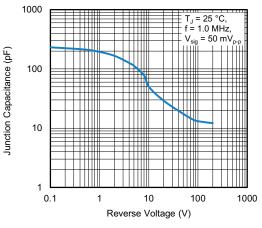


Fig. 5 - Typical Junction Capacitance Per Diode

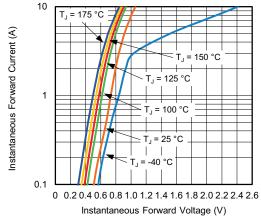


Fig. 3 - Typical Instantaneous Forward Characteristics Per Diode

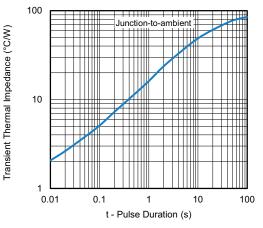
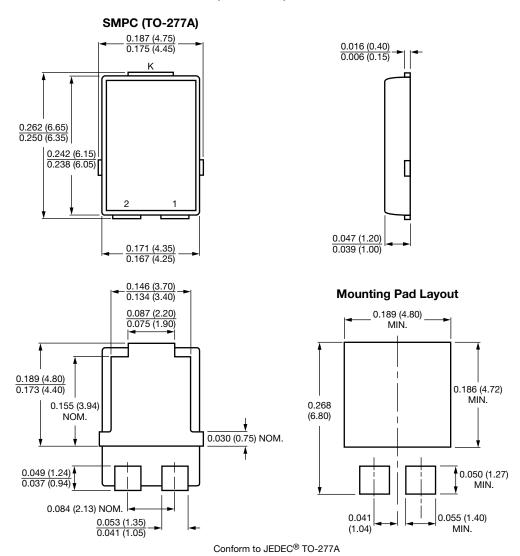


Fig. 6 - Typical Transient Thermal Impedance



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PACKAGE OUTLINE DIMENSIONS in inches (millimeters)





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