AUTOMOTIVE

COMPLIANT

**FREE** 



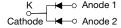
Vishay General Semiconductor

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

Ultra Low  $V_F = 0.61 \text{ V}$  at  $I_F = 1.5 \text{ A}$ 

# eSMP® Series K

#### **SMPC (TO-277A)**



#### **ADDITIONAL RESOURCES**



PRIMARY CHARACTERISTICS			
I <sub>F(AV)</sub>	2 x 3.0 A		
$V_{RRM}$	200 V		
I <sub>FSM</sub>	70 A		
V <sub>F</sub> at I <sub>F</sub> = 3 A	0.68 V		
T <sub>J</sub> 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 <a href="https://www.vishav.com/doc?99912"><u>www.vishav.com/doc?99912</u></a>

#### 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

("\_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

<b>MAXIMUM RATINGS</b> (T <sub>A</sub> = 25 °C unless otherwise noted)				
PARAMETER	SYMBOL	V6P22C	UNIT	
Device marking code		V622C		
Maximum repetitive peak reverse voltage	V <sub>RRM</sub>	200	V	
Maximum average forward rectified current per device (fig. 1)	I <sub>F(AV)</sub> (1)	6.0	А	
	I <sub>F(AV)</sub> (2)	3.0		
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load per diode	I <sub>FSM</sub>	70	А	
Operating junction temperature range	T <sub>J</sub> <sup>(3)</sup>	-40 to +175	°C	
Storage temperature range	T <sub>J</sub> , T <sub>STG</sub>	-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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<b>ELECTRICAL CHARACTERISTICS</b> (T <sub>A</sub> = 25 °C unless otherwise noted)						
PARAMETER	TEST CONDITIONS		SYMBOL	TYP.	MAX.	UNIT
Instantaneous forward voltage per diode	I <sub>F</sub> = 1.5 A	T <sub>A</sub> = 25 °C	V <sub>F</sub> <sup>(1)</sup>	0.79	-	V
	$I_F = 3.0 \text{ A}$			0.83	0.89	
	I <sub>F</sub> = 1.5 A	T <sub>A</sub> = 125 °C		0.61	-	
	$I_F = 3.0 \text{ A}$			0.68	0.76	
Reverse current per diode	V <sub>R</sub> = 160 V	T <sub>A</sub> = 25 °C	I <sub>R</sub> <sup>(2)</sup>	0.001	-	mA
		T <sub>A</sub> = 125 °C		0.3	-	
	V <sub>R</sub> = 200 V	T <sub>A</sub> = 25 °C		-	0.06	
	v <sub>R</sub> = 200 v	T <sub>A</sub> = 125 °C		0.7	3.5	
Typical junction capacitance per diode	4.0 V, 1 MHz		$C_{J}$	130	-	pF

#### Notes

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

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T <sub>A</sub> = 25 °C unless otherwise specified)				
PARAMETER SYMBOL V6P22C				
Typical thermal resistance per device	R <sub>0</sub> JA (1)(2)	R <sub>0</sub> JA (1)(2) 85	°C/W	
Typical thermal resistance per device	R <sub>eJM</sub> (3)	5		

#### 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<sub>0JA</sub> junction-to-ambient
- (3) Units mounted on 30 mm x 30 mm aluminum PCB, thermal resistance R<sub>BJM</sub> junction-to-mount

ORDERING INFORMATION (Example)					
PREFERRED P/N	UNIT WEIGHT (g)	PACKAGE CODE	BASE QUANTITY	DELIVERY MODE	
V6P22C-M3/H	0.10	Н	1500	7" diameter plastic tape and reel	
V6P22C-M3/I	0.10	I	6500	13" diameter plastic tape and reel	
V6P22CHM3_A/H (1)	0.10	Н	1500	7" diameter plastic tape and reel	
V6P22CHM3_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)

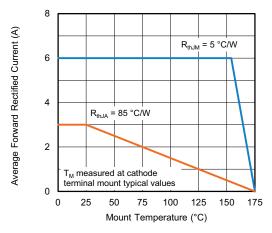


Fig. 1 - Maximum Forward Current Derating Curve

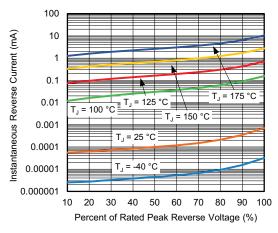


Fig. 4 - Typical Reverse Leakage Characteristics Per Diode

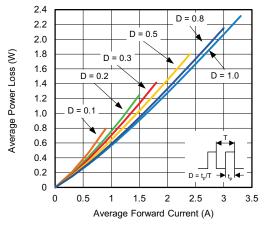


Fig. 2 - Forward Power Loss Characteristics Per Diode

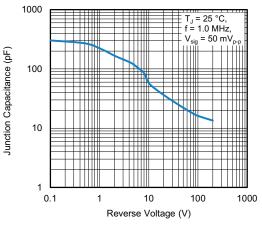


Fig. 5 - Typical Junction Capacitance Per Diode

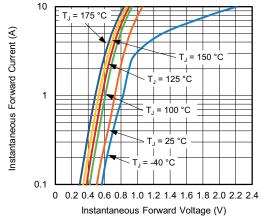


Fig. 3 - Typical Instantaneous Forward Characteristics Per Diode

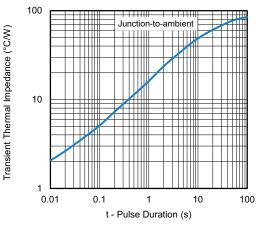
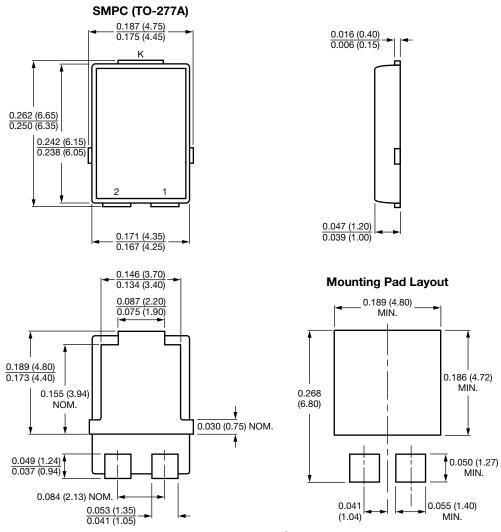


Fig. 6 - Typical Transient Thermal Impedance



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#### **PACKAGE OUTLINE DIMENSIONS** in inches (millimeters)





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