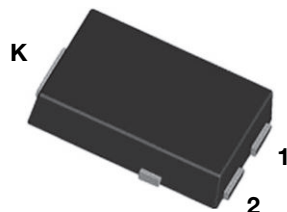


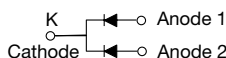
# High Current Density Surface-Mount TMBS® (Trench MOS Barrier Schottky) Rectifier

Ultra Low  $V_F = 0.61\text{ V}$  at  $I_F = 2\text{ A}$

## eSMP® Series



## SMPC (TO-277A)



AUTOMOTIVE  
GRADE



**RoHS**  
COMPLIANT  
HALOGEN  
**FREE**

## 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 [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)

## 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

## LINKS TO ADDITIONAL RESOURCES



PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2 x 4.0 A
$V_{RRM}$	200 V
$I_{FSM}$	80 A
$V_F$ at $I_F = 4\text{ A}$	0.69 V
$T_J$ max.	175 °C
Package	SMPC (TO-277A)
Circuit configuration	Common cathode

MAXIMUM RATINGS ( $T_A = 25\text{ °C}$ unless otherwise noted)			
PARAMETER	SYMBOL	V8P22C	UNIT
Device marking code		V822C	
Maximum repetitive peak reverse voltage	$V_{RRM}$	200	V
Maximum average forward rectified current per device (fig. 1)	$I_{F(AV)}^{(1)}$	8.0	A
	$I_{F(AV)}^{(2)}$	3.1	
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load per diode	$I_{FSM}$	80	A
Operating junction temperature range	$T_J^{(3)}$	-40 to +175	°C
Storage temperature range	$T_J, T_{STG}$	-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:  $dP_D/dT_J < 1/R_{\theta JA}$



ELECTRICAL CHARACTERISTICS (T <sub>J</sub> = 25 °C unless otherwise noted)						
PARAMETER	TEST CONDITIONS		SYMBOL	TYP.	MAX.	UNIT
Instantaneous forward voltage per diode	I <sub>F</sub> = 2.0 A	T <sub>J</sub> = 25 °C	V <sub>F</sub> <sup>(1)</sup>	0.76	-	V
	I <sub>F</sub> = 4.0 A			0.83	0.90	
	I <sub>F</sub> = 2.0 A	T <sub>J</sub> = 125 °C		0.61	-	
	I <sub>F</sub> = 4.0 A			0.69	0.74	
Reverse current per diode	V <sub>R</sub> = 160 V	T <sub>J</sub> = 25 °C	I <sub>R</sub> <sup>(2)</sup>	0.0002	-	mA
		T <sub>J</sub> = 125 °C		0.4	-	
	V <sub>R</sub> = 200 V	T <sub>J</sub> = 25 °C		-	0.08	
		T <sub>J</sub> = 125 °C		0.8	4	
Typical junction capacitance per diode	4.0 V, 1 MHz		C <sub>J</sub>	165	-	pF

**Notes**(1) Pulse test: 300  $\mu\text{s}$  pulse width, 1 % duty cycle(2) Pulse test: Pulse width  $\leq 40\text{ ms}$ 

THERMAL CHARACTERISTICS ( $T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise specified)			
PARAMETER	SYMBOL	V8P22C	UNIT
Typical thermal resistance per device	$R_{\theta JA}^{(1)(2)}$	85	$^{\circ}\text{C/W}$
	$R_{\theta JM}^{(3)}$	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  $R_{\theta JA}$  - junction-to-ambient(3) Units mounted on 30 mm x 30 mm aluminum PCB, thermal resistance  $R_{\theta JM}$  - junction-to-mount

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
V8P22C-M3/H	0.10	H	1500	7" diameter plastic tape and reel
V8P22C-M3/I	0.10	I	6500	13" diameter plastic tape and reel
V8P22CHM3_A/H <sup>(1)</sup>	0.10	H	1500	7" diameter plastic tape and reel
V8P22CHM3_A/I <sup>(1)</sup>	0.10	I	6500	13" diameter plastic tape and reel

**Note**

(1) AEC-Q101 qualified

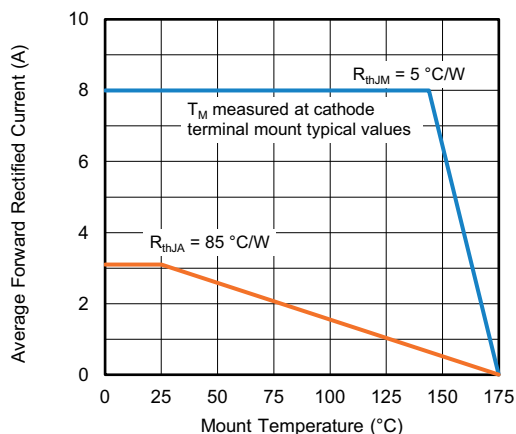
**RATINGS AND CHARACTERISTICS CURVES** ( $T_A = 25\text{ }^{\circ}\text{C}$  unless otherwise noted)


Fig. 1 - Maximum Forward Current Derating Curve

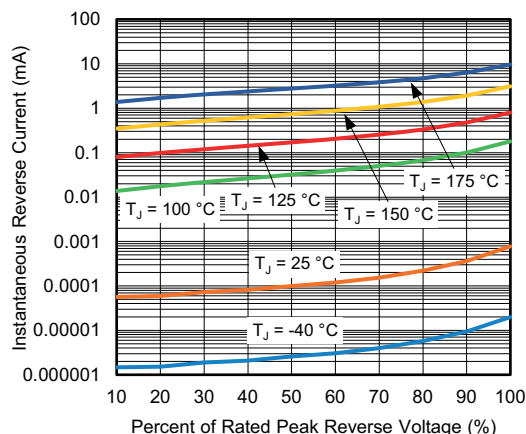


Fig. 4 - Typical Reverse Leakage Characteristics Per Diode

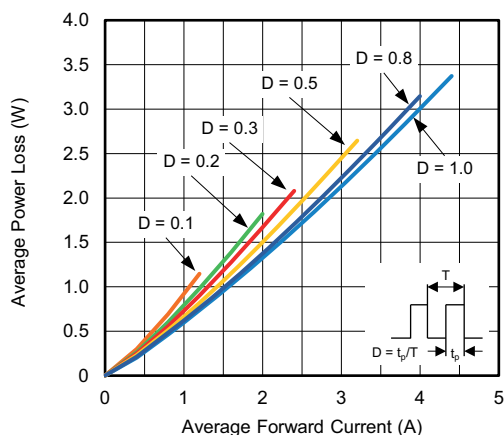


Fig. 2 - Forward Power Loss Characteristics Per Diode

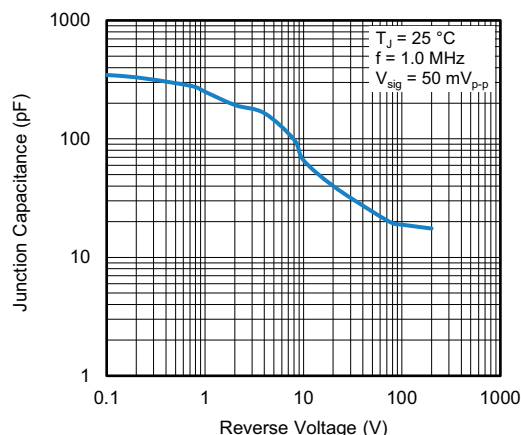


Fig. 5 - Typical Junction Capacitance Per Diode

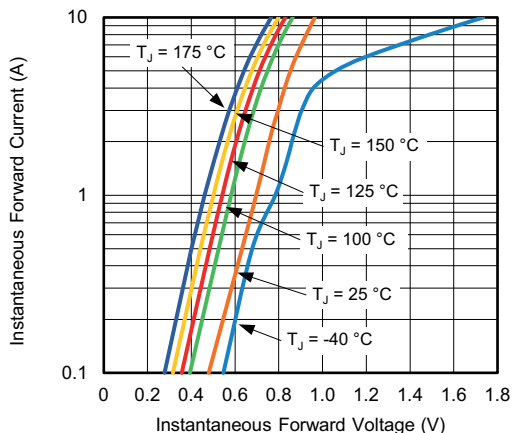


Fig. 3 - Typical Instantaneous Forward Characteristics Per Diode

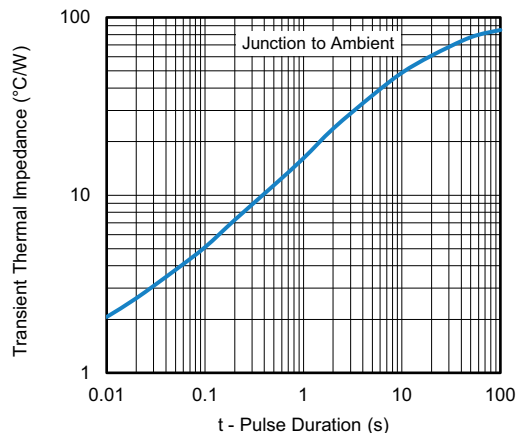
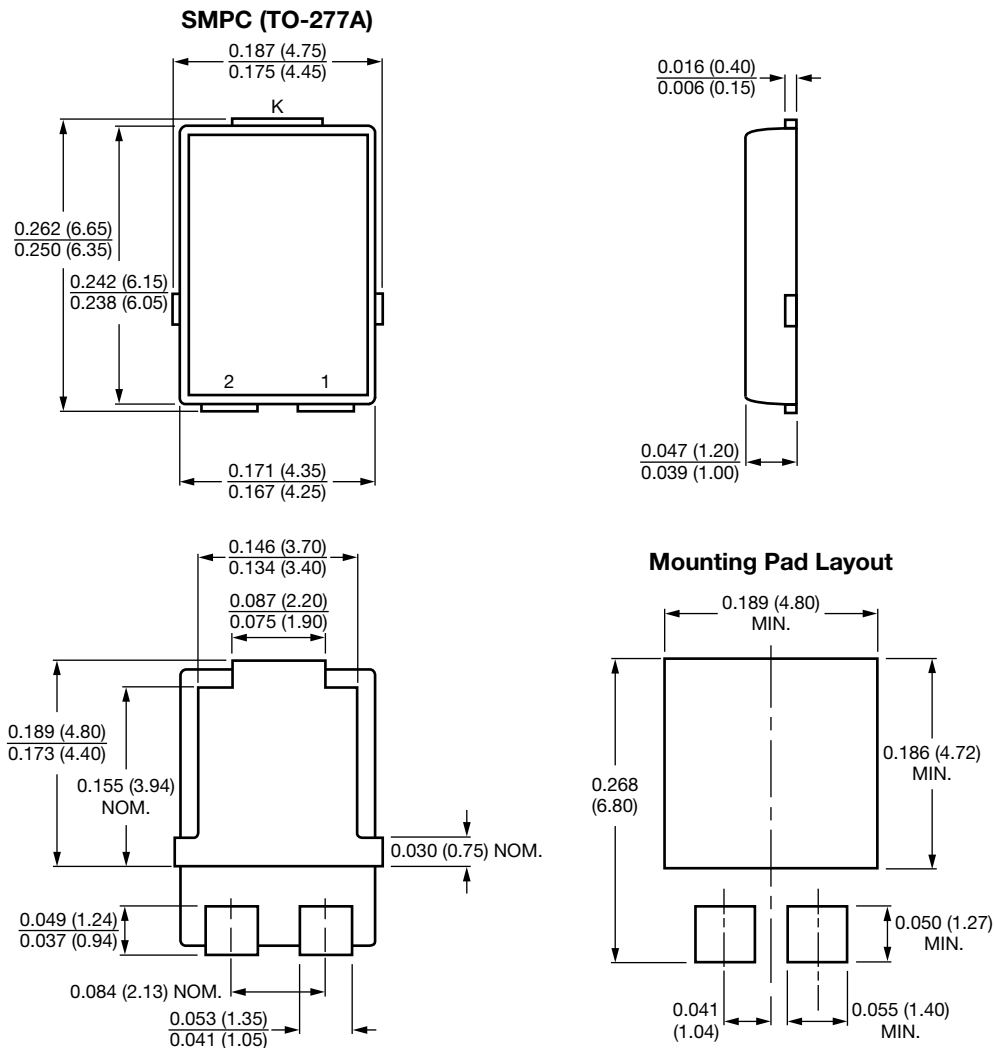


Fig. 6 - Typical Transient Thermal Impedance

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




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