

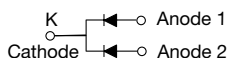
High Current Density Surface-Mount TMBS® (Trench MOS Barrier Schottky) Rectifier

Ultra Low $V_F = 0.61\text{ V}$ at $I_F = 2.5\text{ A}$

eSMP® Series



SMPC (TO-277A)



LINKS TO ADDITIONAL RESOURCES



PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2 x 5.0 A
V_{RRM}	200 V
I_{FSM}	90 A
V_F at $I_F = 5\text{ A}$	0.69 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 www.vishay.com/doc?99912

AUTOMOTIVE
GRADE

RoHS
COMPLIANT
HALOGEN
FREE

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 - 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	V10P22C	UNIT
Device marking code		V1022C	
Maximum repetitive peak reverse voltage	V_{RRM}	200	V
Maximum average forward rectified current per device (fig. 1)	$I_{F(AV)}^{(1)}$	10	A
	$I_{F(AV)}^{(2)}$	3.2	
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load per diode	I_{FSM}	90	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** ($T_J = 25\text{ }^{\circ}\text{C}$ 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 _F ⁽¹⁾	0.76	-	V
	I _F = 5.0 A			0.83	0.93	
	I _F = 2.5 A	T _J = 125 °C		0.61	-	
	I _F = 5.0 A			0.69	0.75	
Reverse current per diode	V _R = 160 V	T _J = 25 °C	I _R ⁽²⁾	0.0003	-	mA
		T _J = 125 °C		0.5	-	
	V _R = 200 V	T _J = 25 °C		-	0.1	
		T _J = 125 °C		1.0	5	
Typical junction capacitance per diode	4.0 V, 1 MHz		C _J	205	-	pF

Notes(1) Pulse test: 300 μs 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	V10P22C	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
V10P22C-M3/H	0.10	H	1500	7" diameter plastic tape and reel
V10P22C-M3/I	0.10	I	6500	13" diameter plastic tape and reel
V10P22CHM3/H ⁽¹⁾	0.10	H	1500	7" diameter plastic tape and reel
V10P22CHM3/I ⁽¹⁾	0.10	I	6500	13" diameter plastic tape and reel

Note

(1) AEC-Q101 qualified

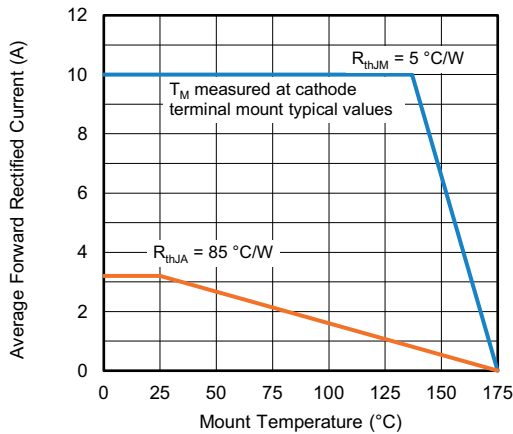
RATINGS AND CHARACTERISTICS CURVES ($T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise noted)


Fig. 1 - Maximum Forward Current Derating Curve

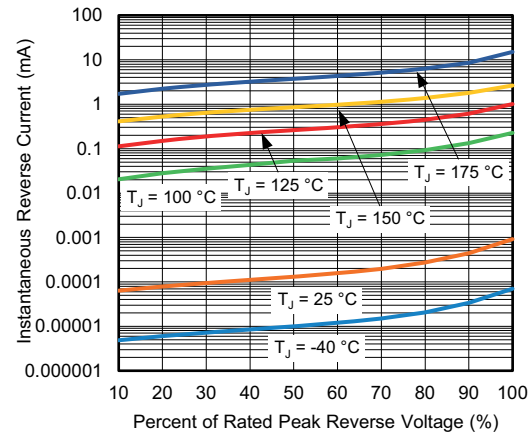


Fig. 4 - Typical Reverse Leakage Characteristics Per Diode

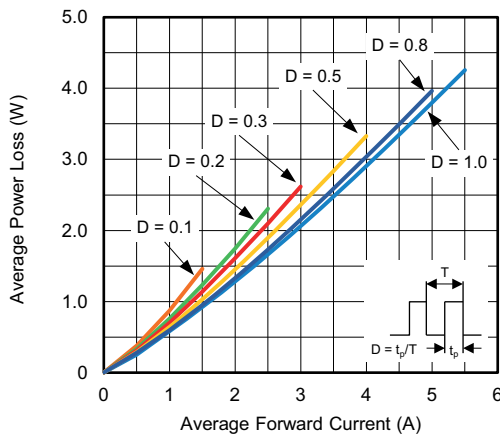


Fig. 2 - Forward Power Loss Characteristics Per Diode

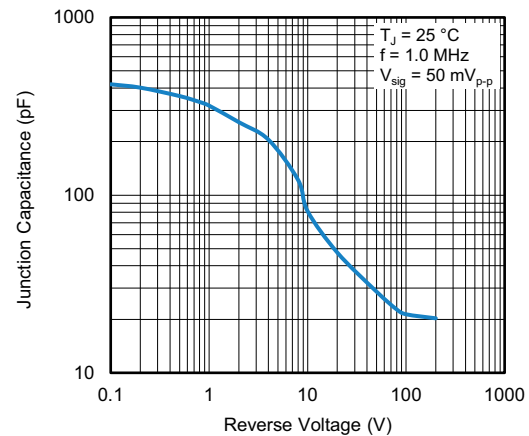


Fig. 5 - Typical Junction Capacitance Per Diode

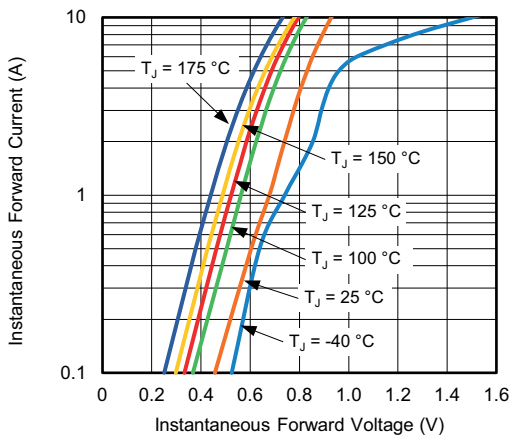


Fig. 3 - Typical Instantaneous Forward Characteristics Per Diode

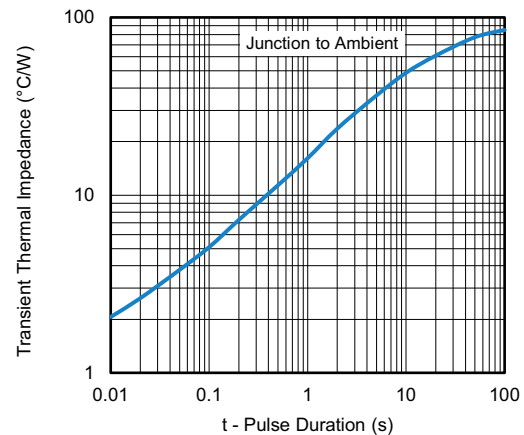
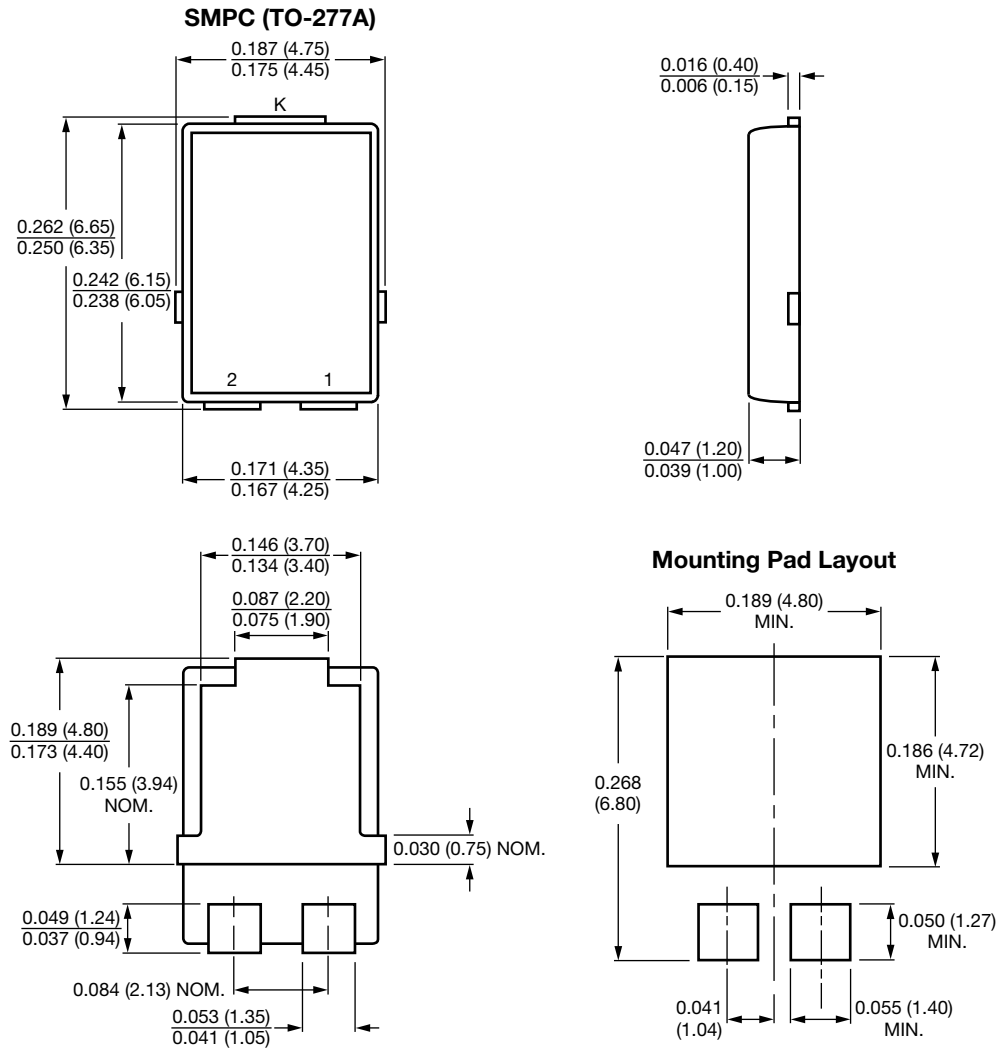


Fig. 6 - Typical Transient Thermal Impedance



PACKAGE OUTLINE DIMENSIONS in inches (millimeters)





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