

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

Ultra Low $V_F = 0.53 \text{ V}$ at $I_F = 4 \text{ A}$



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 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 www.vishay.com/doc299912

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 suffix meets JESD 201 class 1A whisker test, HM3 suffix meets JESD 201 class 2 whisker test

DESIGN SUPPORT TOOLS

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PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	8.0 A
V_{RRM}	120 V
I_{FSM}	140 A
E_{AS}	100 mJ
V_F at $I_F = 8.0 \text{ A}$	0.63 V
$T_J \text{ max.}$	150 °C
Package	SMPC (TO-277A)
Circuit configuration	Single

MAXIMUM RATINGS ($T_A = 25 \text{ °C}$ unless otherwise noted)			
PARAMETER	SYMBOL	V8P12	UNIT
Device marking code		V812	
Maximum repetitive peak reverse voltage	V_{RRM}	120	V
Maximum average forward rectified current (fig. 1)	$I_{F(AV)}$	8.0	A
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I_{FSM}	140	A
Non-repetitive avalanche energy at $I_{AS} = 2.0 \text{ A}$, $T_J = 25 \text{ °C}$	E_{AS}	100	mJ
Peak repetitive reverse current at $t_p = 2 \text{ } \mu\text{s}$, 1 kHz, $T_J = 38 \text{ °C} \pm 2 \text{ °C}$	I_{RRM}	0.5	A
Operating junction and storage temperature range	T_J, T_{STG}	-40 to +150	°C



ELECTRICAL CHARACTERISTICS (T _A = 25 °C unless otherwise noted)						
PARAMETER	TEST CONDITIONS		SYMBOL	TYP.	MAX.	UNIT
Breakdown voltage	I _R = 1.0 mA	T _A = 25 °C	V _{BR}	120 (minimum)	-	V
Instantaneous forward voltage	I _F = 4 A	T _A = 25 °C	V _F ⁽¹⁾	0.59	-	V
	I _F = 8 A			0.77	0.84	
	I _F = 4 A	T _A = 125 °C		0.53	-	
	I _F = 8 A			0.63	0.71	
Reverse current	V _R = 90 V	T _A = 25 °C	I _R ⁽²⁾	5	-	μA
		T _A = 125 °C		3	-	mA
	V _R = 120 V	T _A = 25 °C		15	300	μA
		T _A = 125 °C		6	20	mA

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 °C unless otherwise noted)			
PARAMETER	SYMBOL	V8P12	UNIT
Typical thermal resistance	R _{θJA} ⁽¹⁾	60	°C/W
	R _{θJL}	4	

Note

(1) Units mounted on recommended PCB 1 oz. pad layout

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
V8P12-M3/86A	0.10	86A	1500	7" diameter plastic tape and reel
V8P12-M3/87A	0.10	87A	6500	13" diameter plastic tape and reel
V8P12HM3_A/H ⁽¹⁾	0.10	H	1500	7" diameter plastic tape and reel
V8P12HM3_A/I ⁽¹⁾	0.10	I	6500	13" diameter plastic tape and reel

Note

(1) AEC-Q101 qualified

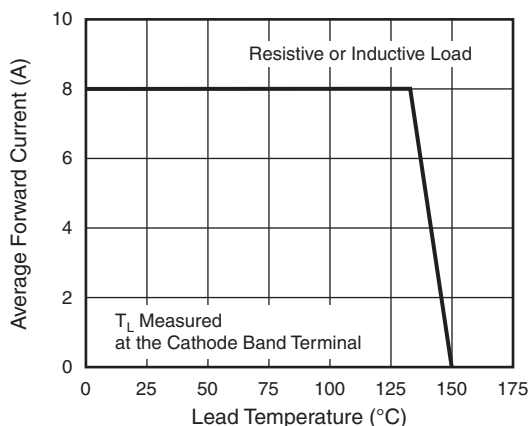
RATINGS AND CHARACTERISTICS CURVES ($T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise noted)


Fig. 1 - Maximum Forward Current Derating Curve

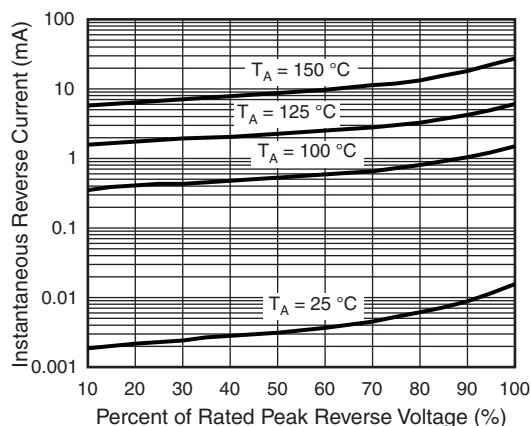


Fig. 4 - Typical Reverse Characteristics

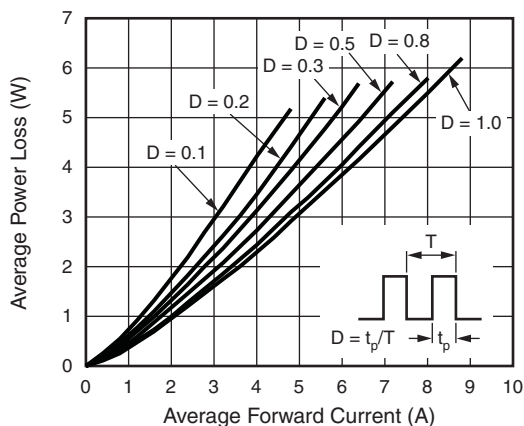


Fig. 2 - Forward Power Loss Characteristics

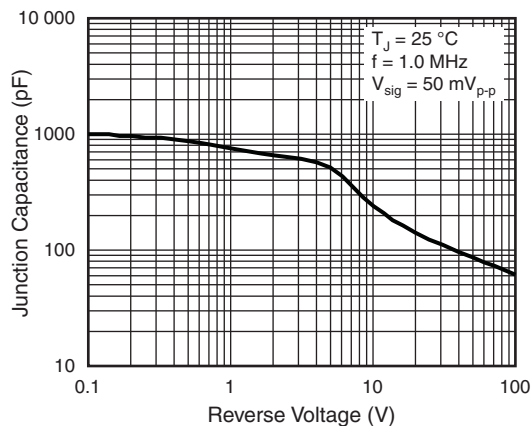


Fig. 5 - Typical Junction Capacitance

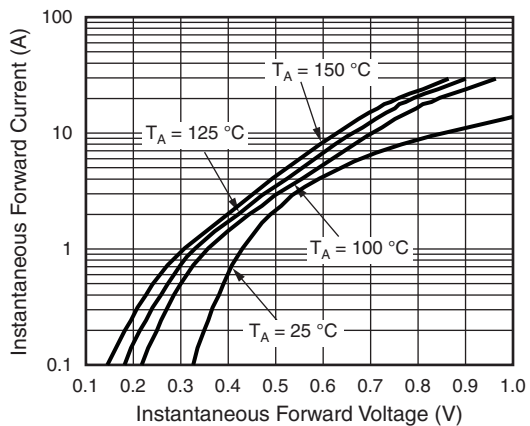


Fig. 3 - Typical Instantaneous Forward Characteristics

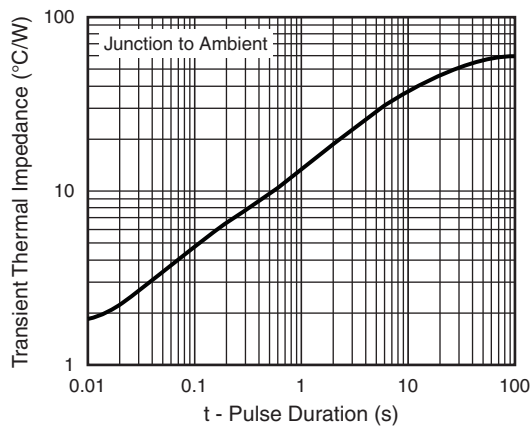
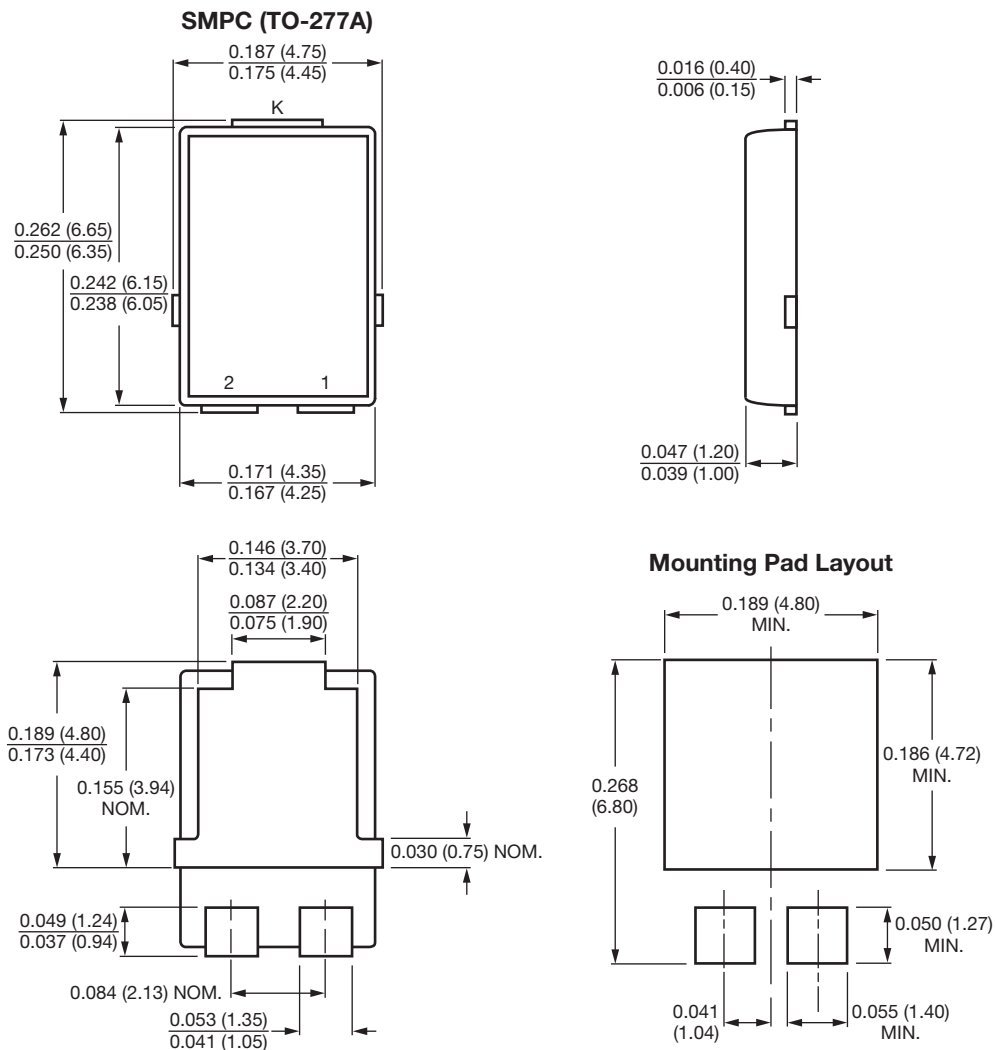


Fig. 6 - Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)


Conform to JEDEC® TO-277A



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