

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

eSMP® Series



SMP (DO-220AA)

Cathode  Anode

FEATURES

- Low profile package
- Trench MOS Schottky technology
- Low power losses, high efficiency
- Low forward voltage drop
- 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
Available



RoHS
COMPLIANT
HALOGEN
FREE

DESIGN SUPPORT TOOLS AVAILABLE



PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	3.0 A
V_{RRM}	120 V
I_{FSM}	80 A
V_F at $I_F = 3.0$ A	0.61 V
T_J max.	175 °C
Package	SMP (DO-220AA)
Circuit configuration	Single

TYPICAL APPLICATIONS

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

MECHANICAL DATA

Case: SMP (DO-220AA)

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

Polarity: color band denotes the cathode end

MAXIMUM RATINGS ($T_A = 25$ °C unless otherwise noted)			
PARAMETER	SYMBOL	V3PM12	UNIT
Device marking code		3MS	
Maximum repetitive peak reverse voltage	V_{RRM}	120	V
Maximum DC forward current	$I_{F(AV)}^{(1)}$	3	A
	$I_{F(AV)}^{(2)}$	1.9	A
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I_{FSM}	80	A
Operating junction and storage temperature range	$T_J^{(3)}$	-40 to +175	°C
Operating junction and storage temperature range	T_{STG}	-55 to +175	°C

Notes

(1) Mounted on 10 mm x 10 mm copper pad area PCB

(2) Free air, mounted on recommended copper 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 _A = 25 °C unless otherwise noted)						
PARAMETER	TEST CONDITIONS		SYMBOL	TYP.	MAX.	UNIT
Instantaneous forward voltage	I _F = 1.5 A	T _A = 25 °C	V _F ⁽¹⁾	0.62	-	V
	I _F = 3.0 A			0.75	0.83	
	I _F = 1.5 A	T _A = 125 °C		0.52	-	
	I _F = 3.0 A			0.61	0.69	
Reverse current	V _R = 90 V	T _A = 25 °C	I _R ⁽²⁾	0.001	-	mA
		T _A = 125 °C		0.6	-	
	V _R = 120 V	T _A = 25 °C		-	0.3	mA
		T _A = 125 °C		1.0	3.0	
Typical junction capacitance	4.0 V, 1 MHz		C _J	290	-	pF

Notes(1) Pulse test: 300 μs pulse width, 1 % duty cycle(2) Pulse test: pulse width $\leq 5\text{ ms}$

THERMAL CHARACTERISTICS ($T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise specified)			
PARAMETER	SYMBOL	V3PM12	UNIT
Typical thermal resistance	$R_{\theta JA}^{(1)}$	125	$^{\circ}\text{C/W}$
	$R_{\theta JM}^{(2)}$	15	

Notes(1) Free air, mounted on recommended PCB, 1 oz. pad area; thermal resistance $R_{\theta JA}$ - junction-to-ambient(2) Units mounted on PCB with specific copper pad areas; $R_{\theta JM}$ - junction-to-mount

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
V3PM12-M3/H	0.024	H	3000	7" diameter plastic tape and reel
V3PM12-M3/I	0.024	I	10 000	13" diameter plastic tape and reel
V3PM12HM3/H ⁽¹⁾	0.024	H	3000	7" diameter plastic tape and reel
V3PM12HM3/I ⁽¹⁾	0.024	I	10 000	13" diameter plastic tape and reel

Note

(1) AEC-Q101 qualified

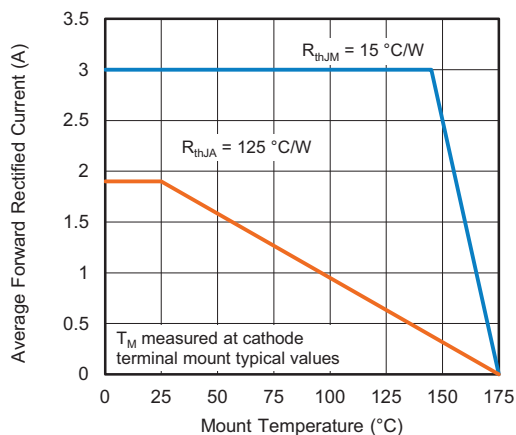
RATINGS AND CHARACTERISTICS CURVES ($T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise noted)


Fig. 1 - Maximum Forward Current Derating Curve

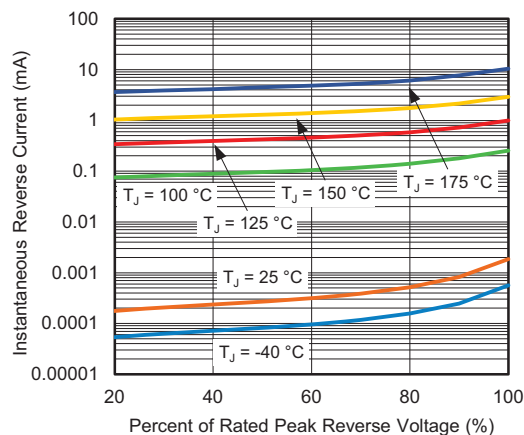


Fig. 4 - Typical Reverse Characteristics

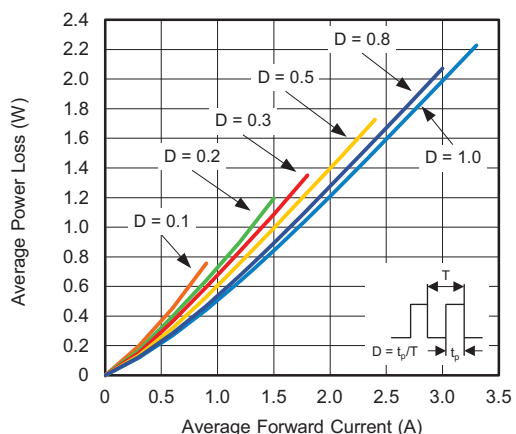


Fig. 2 - Forward Power Loss Characteristics

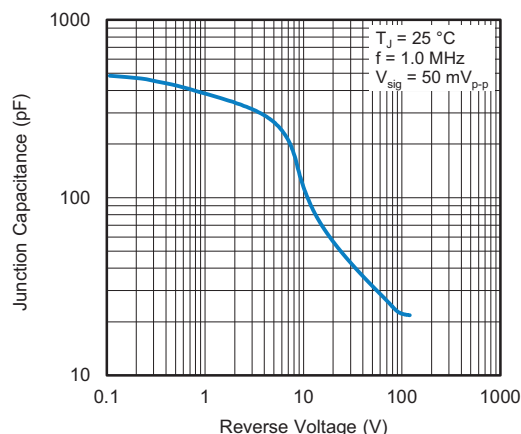


Fig. 5 - Typical Junction Capacitance

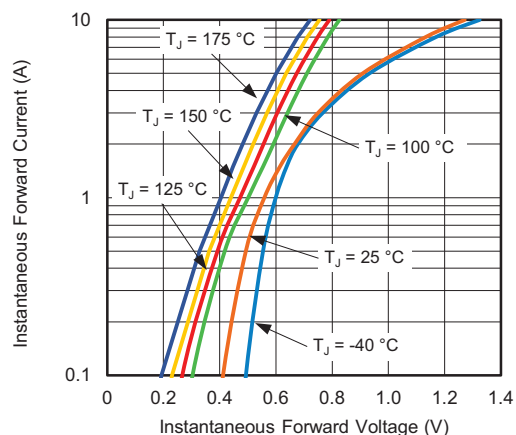


Fig. 3 - Typical Instantaneous Forward Characteristics

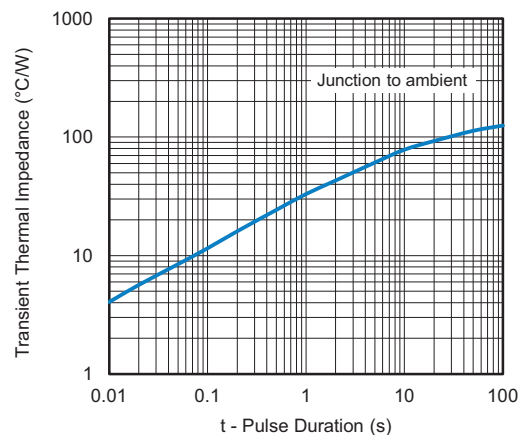
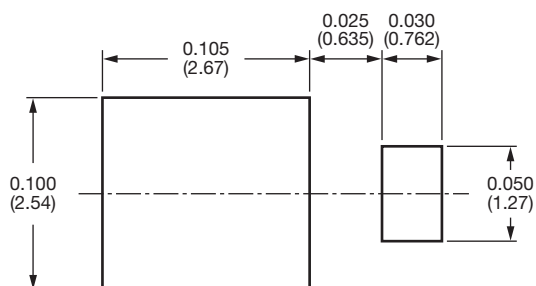
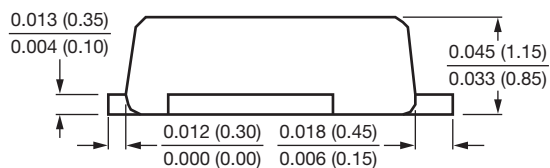
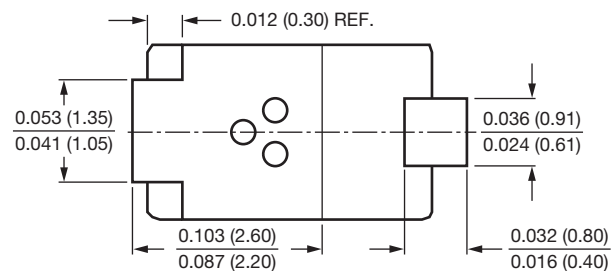
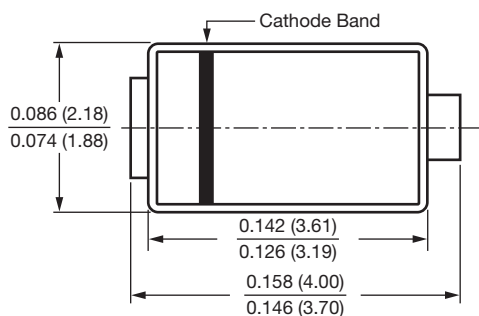


Fig. 6 - Typical Transient Thermal Impedance



PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

SMP (DO-220AA)





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