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

eSMP® Series

SMP (DO-220AA)

Cathode ○—▷|—○ Anode

LINKS TO ADDITIONAL RESOURCES

3D Models

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2.0 A
V_{RRM}	120 V
I_{FSM}	50 A
V_F at I_F = 2.0 A	0.60 V
T_J max.	175 °C
Package	SMP (DO-220AA)
Circuit configuration	Single

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

Pb
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: 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	V2PM12L	UNIT
Device marking code		2MS	
Maximum repetitive peak reverse voltage	V_{RRM}	120	V
Maximum DC forward current	I_F [1]	2	A
	I_F [2]	1.8	A
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I_{FSM}	50	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 = 1.0 A	T_A = 25 °C	V_F [1]	0.62	-	V
	I_F = 2.0 A			0.77	0.86	
	I_F = 1.0 A	T_A = 125 °C		0.52	-	
	I_F = 2.0 A			0.60	0.68	
Reverse current	V_R = 90 V	T_A = 25 °C	I_R [2]	0.001	-	mA
		T_A = 125 °C		0.4	-	
	V_R = 120 V	T_A = 25 °C		-	0.2	mA
		T_A = 125 °C		0.7	3.0	
Typical junction capacitance	4.0 V, 1 MHz		C_J	180	-	pF

Notes

[1] Pulse test: 300 µs pulse width, 1 % duty cycle

[2] Pulse test: pulse width ≤ 5 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise specified)

PARAMETER	SYMBOL	V2PM12L	UNIT
Typical thermal resistance	$R_{\theta JA}$ [1]	125	°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
V2PM12L-M3/H	0.024	H	3000	7" diameter plastic tape and reel
V2PM12L-M3/I	0.024	I	10 000	13" diameter plastic tape and reel
V2PM12LHM3/H [1]	0.024	H	3000	7" diameter plastic tape and reel
V2PM12LHM3/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 °C unless otherwise noted)
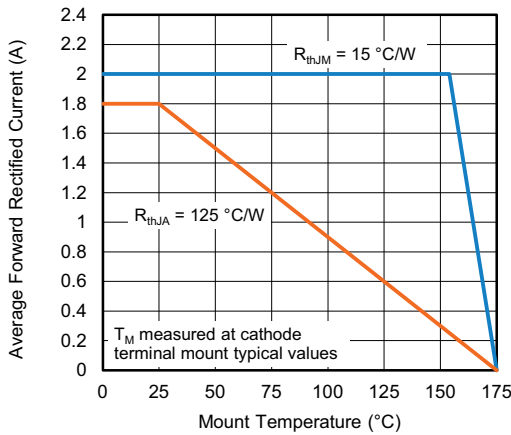

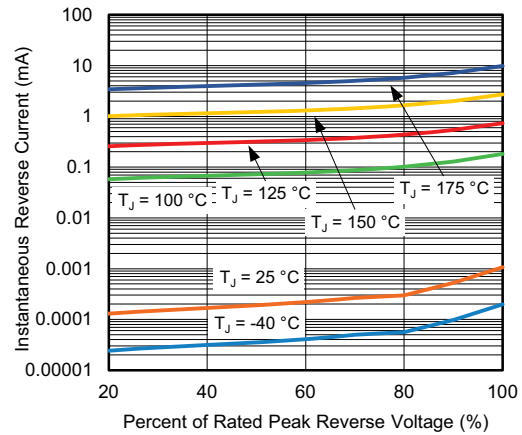Fig. 1 - Maximum Forward Current Derating Curve

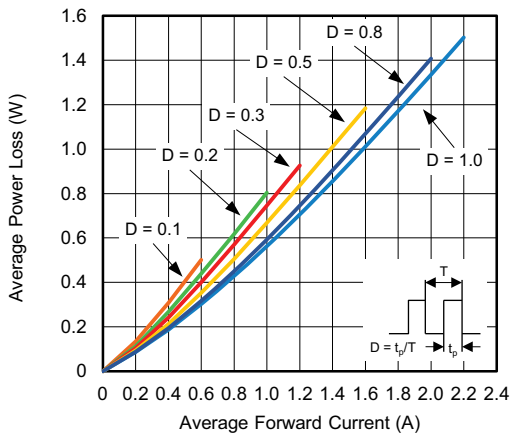Fig. 4 - Typical Reverse Characteristics
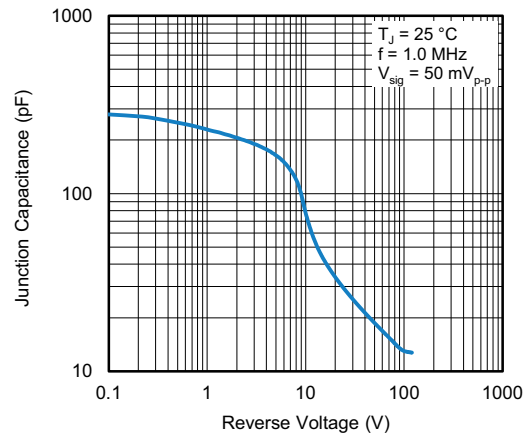

Fig. 2 - Forward Power Loss Characteristics
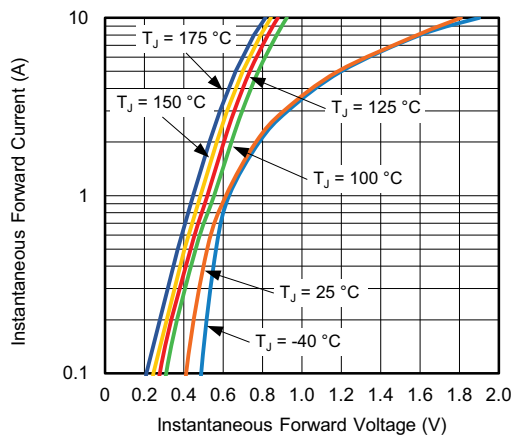

Fig. 5 - Typical Junction Capacitance

Fig. 3 - Typical Instantaneous Forward Characteristics

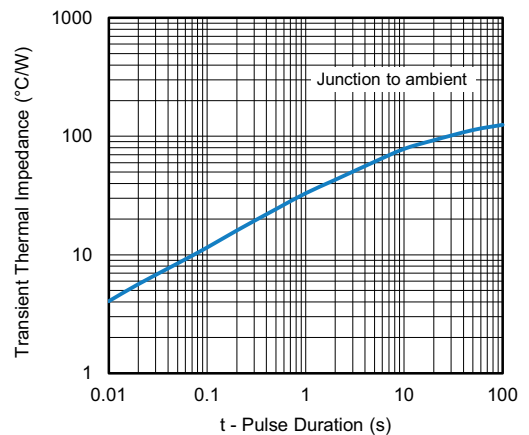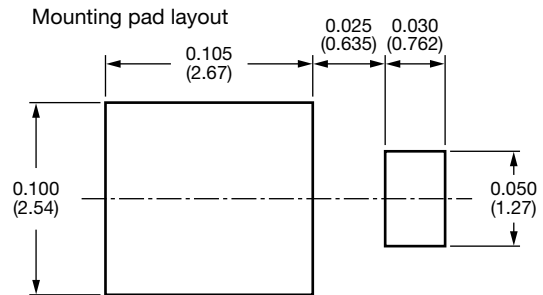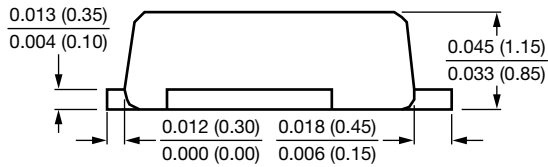Fig. 6 - Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

SMP (DO-220AA)

Cathode Band

0.086 (2.18)
0.074 (1.88)

0.142 (3.61)
0.126 (3.19)

0.158 (4.00)
0.146 (3.70)

0.012 (0.30) REF.

0.053 (1.35)
0.041 (1.05)

0.036 (0.91)
0.024 (0.61)

0.103 (2.60)
0.087 (2.20)

0.032 (0.80)
0.016 (0.40)

0.013 (0.35)
0.004 (0.10)

0.045 (1.15)
0.033 (0.85)

0.012 (0.30)
0.000 (0.00)

0.018 (0.45)
0.006 (0.15)

Mounting pad layout

0.025 (0.635)

0.030 (0.762)

0.105 (2.67)

0.100 (2.54)

0.050 (1.27)
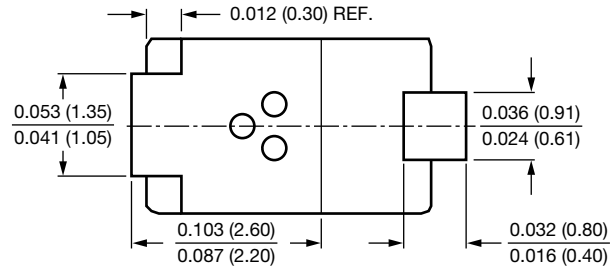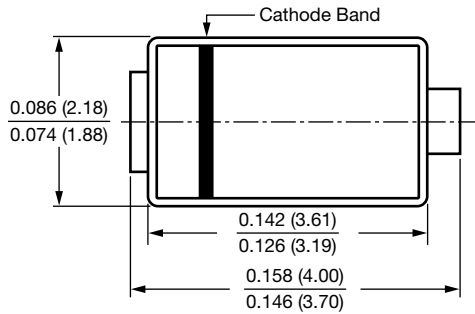
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