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

eSMP® Series



SMP (DO-220AA)

Cathode ○—|◀—○ Anode

LINKS TO ADDITIONAL RESOURCES

3D Models

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	3.0 A
V_{RRM}	200 V
I_{FSM}	60 A
V_F at I_F = 3.0 A	0.70 V
T_J max.	175 °C
Package	SMP (DO-220AA)
Circuit configuration	Single

FEATURES

AUTOMOTIVE GRADE Available

- 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

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_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 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**	**V3P22**	**UNIT**
Device marking code		V3D	
Maximum repetitive peak reverse voltage	V_{RRM}	200	V
Maximum DC forward current	$I_{F(AV)}$ (1)	3	A
	$I_{F(AV)}$ (2)	1.7	A
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I_{FSM}	60	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 PCB pad area
(2) Free air, mounted on recommended copper pad area
(3) The heat generated must be less than the thermal conductivity from junction-to-ambient: $dP_D/dT_J < 1/R_{\theta JA}$

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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)	0.78	-	V
	I_F = 3 A			0.85	0.94	
	I_F = 1.5 A	T_A = 125 °C		0.62	-	
	I_F = 3 A			0.70	0.78	
Reverse current	V_R = 160 V	T_A = 25 °C	I_R (2)	0.001	-	mA
		T_A = 125 °C		0.3	-	
	V_R = 200 V	T_A = 25 °C		-	0.05	mA
		T_A = 125 °C		0.7	3.0	
Typical junction capacitance	4.0 V, 1 MHz		C_J	120	-	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**	**V3P22**	**UNIT**
Typical thermal resistance	$R_{\theta JA}$ (1)(2)	125	°C/W
	$R_{\theta JM}$ (3)	15	

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; thermal resistance $R_{\theta JA}$ - junction-to-ambient

(3) Mounted on 10 mm x 10 mm aluminum PCB; thermal resistance $R_{\theta JM}$ - junction-to-mount

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
V3P22-M3/H	0.024	H	3000	7" diameter plastic tape and reel
V3P22-M3/I	0.024	I	10 000	13" diameter plastic tape and reel
V3P22HM3_A/H (1)	0.024	H	3000	7" diameter plastic tape and reel
V3P22HM3_A/I (1)	0.024	I	10 000	13" diameter plastic tape and reel

Note

(1) AEC-Q101 qualified

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RATINGS AND CHARACTERISTICS CURVES (T_A = 25 °C unless otherwise noted)

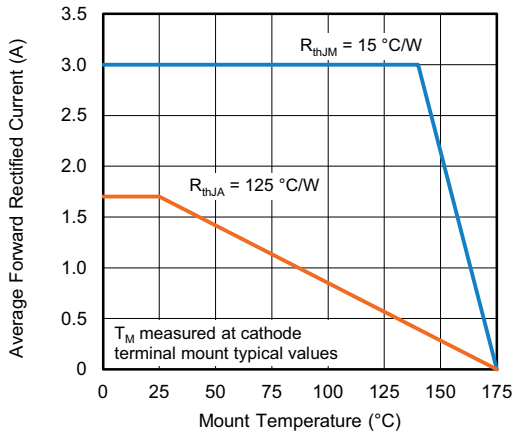


Fig. 1 - Maximum Forward Current Derating Curve

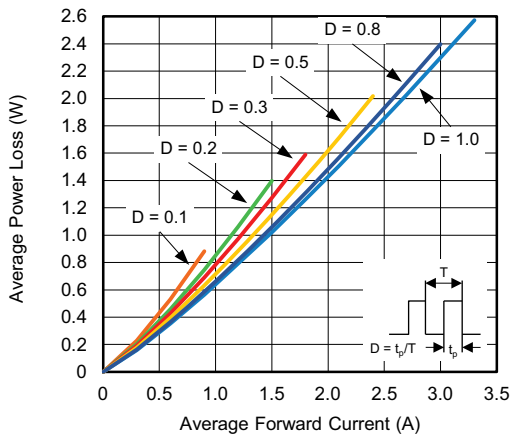


Fig. 2 - Forward Power Loss Characteristics

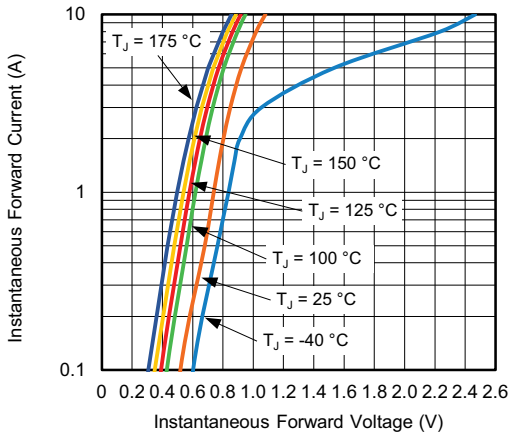


Fig. 3 - Typical Instantaneous Forward Characteristics

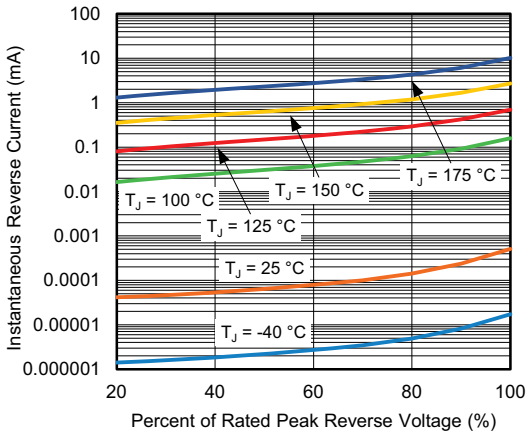


Fig. 4 - Typical Reverse Characteristics

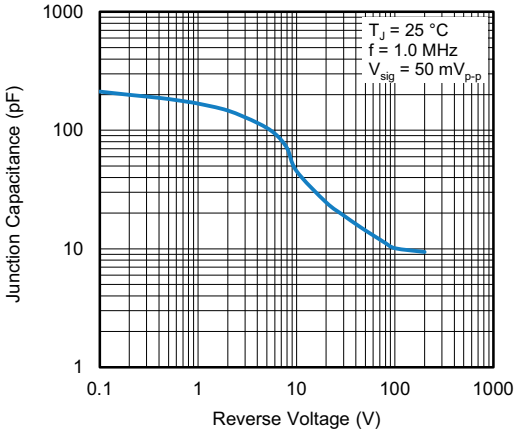


Fig. 5 - Typical Junction Capacitance

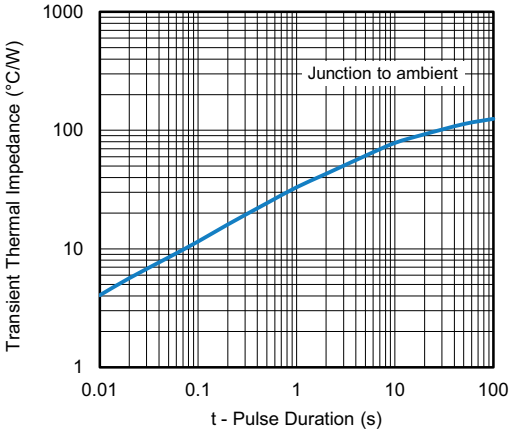
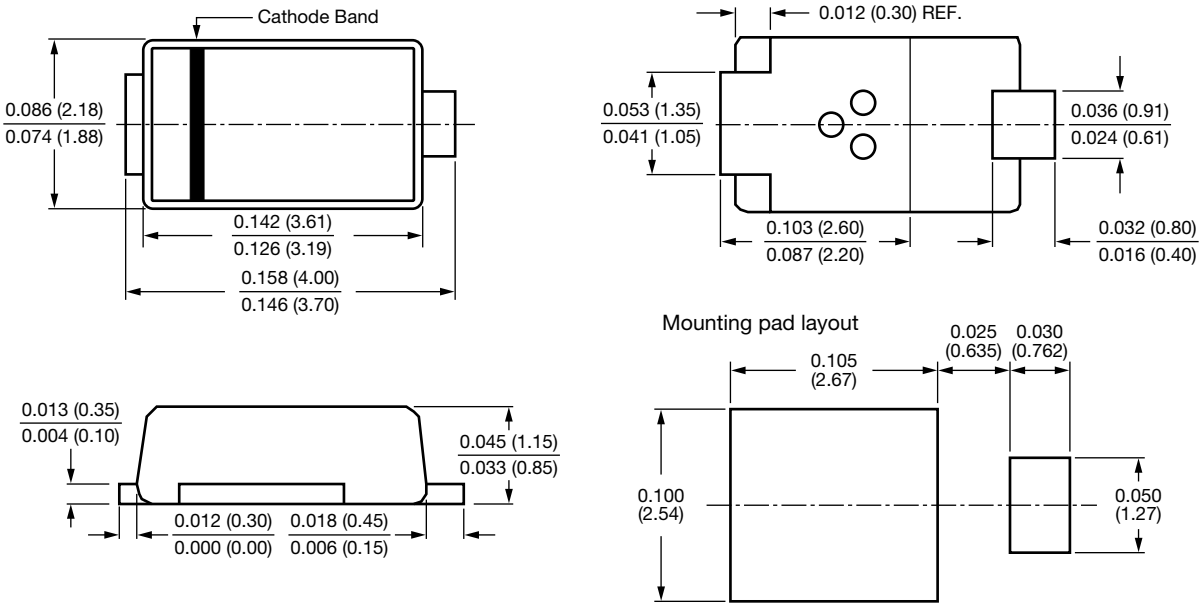


Fig. 6 - Typical Transient Thermal Impedance

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PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

SMP (DO-220AA)



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