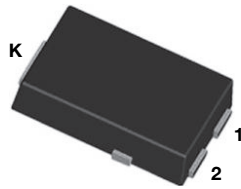


# High Current Density Surface-Mount TMBS<sup>®</sup> (Trench MOS Barrier Schottky) Rectifier

 Ultra Low  $V_F = 0.43 \text{ V}$  at  $I_F = 6 \text{ A}$ 
**eSMP<sup>®</sup> Series**

**SMPC (TO-277A)**

**LINKS TO ADDITIONAL RESOURCES**

**RoHS  
COMPLIANT  
HALOGEN  
FREE**
**FEATURES**

- Very low profile - typical height of 1.1 mm
- 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/doc?99912](http://www.vishay.com/doc?99912)

**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

**PRIMARY CHARACTERISTICS**

$I_{F(AV)}$	12.0 A
$V_{RRM}$	60 V
$I_{FSM}$	200 A
$V_F$ at $I_F = 12.0 \text{ A}$ ( $T_J = 125 \text{ °C}$ )	0.52 V
$T_J$ max.	175 °C
Package	SMPC (TO-277A)
Circuit configuration	Single

**MAXIMUM RATINGS** ( $T_A = 25 \text{ °C}$  unless otherwise noted)

PARAMETER	SYMBOL	V12PM63	UNIT
Device marking code		12M63	
Maximum repetitive peak reverse voltage	$V_{RRM}$	60	V
Maximum average forward rectified current (fig. 1)	$I_F^{(1)}$	12.0	A
	$I_F^{(2)}$	4.6	
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	$I_{FSM}$	200	A
Operating junction temperature range	$T_J^{(3)}$	-40 to +175	°C
Storage temperature range	$T_{STG}$	-55 to +175	°C

**Notes**

(1) Mounted on 30 mm x 30 mm pad areas aluminum PCB

(2) Free air, mounted on recommended 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** ( $T_J = 25\text{ }^\circ\text{C}$  unless otherwise noted)

PARAMETER	TEST CONDITIONS	SYMBOL	TYP.	MAX.	UNIT	
Instantaneous forward voltage	$I_F = 6.0\text{ A}$	$T_J = 25\text{ }^\circ\text{C}$	$V_F^{(1)}$	0.52	-	V
	$I_F = 12.0\text{ A}$			0.58	0.65	
	$I_F = 6.0\text{ A}$	$T_J = 125\text{ }^\circ\text{C}$		0.43	-	
	$I_F = 12.0\text{ A}$			0.52	0.58	
Reverse current	$V_R = 60\text{ V}$	$T_J = 25\text{ }^\circ\text{C}$	$I_R^{(2)}$	-	0.03	mA
		$T_J = 125\text{ }^\circ\text{C}$		2	6.0	
Typical junction capacitance	4.0 V, 1 MHz	$C_J$	2400	-	pF	

**Notes**(1) Pulse test: 300  $\mu\text{s}$  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 noted)

PARAMETER	SYMBOL	V12PM63	UNIT
Typical thermal resistance	$R_{\theta JA}^{(1)(2)}$	75	$^\circ\text{C/W}$
	$R_{\theta JM}^{(3)}$	4	

**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 30 mm x 30 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
V12PM63-M3/H	0.10	H	1500	7" diameter plastic tape and reel
V12PM63-M3/I	0.10	I	6500	13" diameter plastic tape and reel
V12PM63HM3/H <sup>(1)</sup>	0.10	H	1500	7" diameter plastic tape and reel
V12PM63HM3/I <sup>(1)</sup>	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)

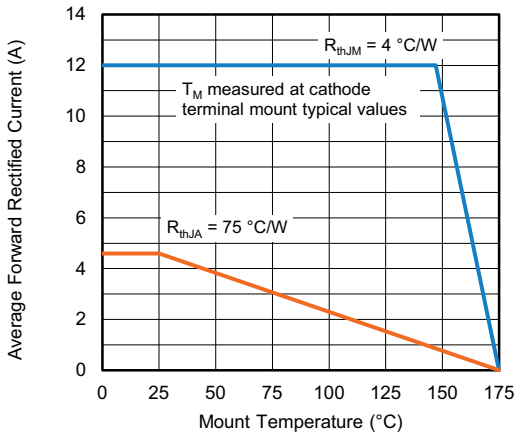


Fig. 1 - Forward Current Derating Curve

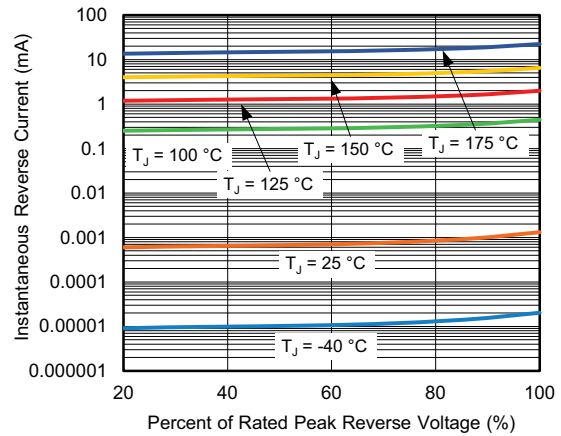


Fig. 4 - Typical Reverse Leakage Characteristics Per Diode

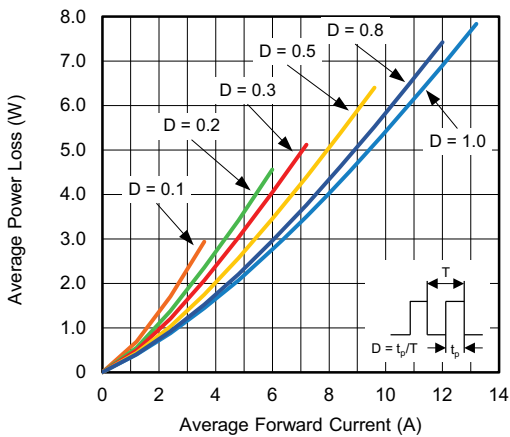


Fig. 2 - Forward Power Loss Characteristics

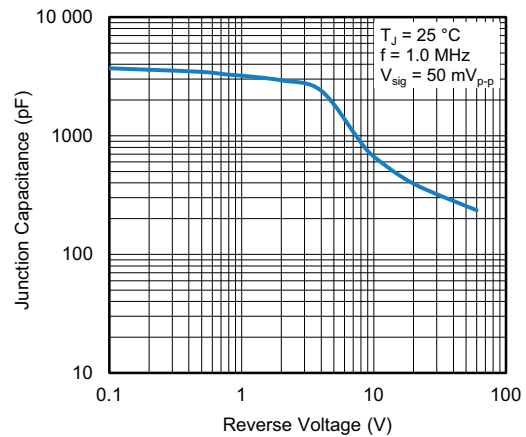


Fig. 5 - Typical Junction Capacitance

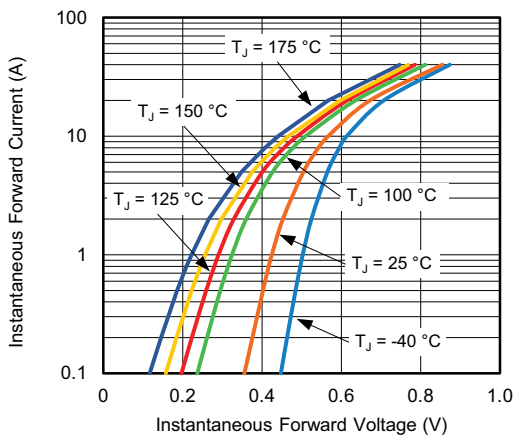


Fig. 3 - Typical Instantaneous Forward Characteristics

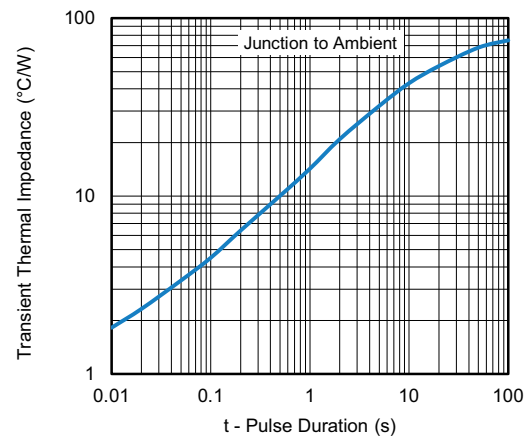


Fig. 6 - Typical Transient Thermal Impedance



**PACKAGE OUTLINE DIMENSIONS** in inches (millimeters)



Conform to JEDEC® TO-277A



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