

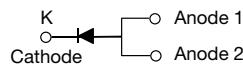
## High Current Density Surface Mount TMBS® (Trench MOS Barrier Schottky) Rectifier

Ultra Low  $V_F$  = 0.25 V at  $I_F$  = 5 A

### eSMP® Series



### SMPC (TO-277A)



### LINKS TO ADDITIONAL RESOURCES



### 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
- 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 DC/DC converters, freewheeling, 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

**Terminals:** matte tin plated leads, solderable per J-STD-002 and JESD 22-B102

M3 suffix meets JESD 201 class 2 whisker test

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	25 A
$V_{RRM}$	60 V
$I_{FSM}$	300 A
$V_F$ at $I_F$ = 25 A ( $T_A$ = 125 °C)	0.45 V
$T_J$ max.	150 °C
Package	SMPC (TO-277A)
Circuit configuration	Single

MAXIMUM RATINGS ( $T_A$ = 25 °C unless otherwise noted)			
PARAMETER	SYMBOL	V25PN60	UNIT
Device marking code		25N6	
Maximum repetitive peak reverse voltage	$V_{RRM}$	60	V
Maximum average forward rectified current (fig. 1)	$I_F$ (1)	25	A
	$I_F$ (2)	6.4	
Maximum DC reverse voltage	$V_{DC}$	45	V
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	$I_{FSM}$	300	A
Operating junction and storage temperature range	$T_J$ , $T_{STG}$	-40 to +150	°C

#### Notes

(1) Mounted on 30 mm x 30 mm pad areas aluminum PCB  
(2) Free air, mounted on recommended copper pad area

ELECTRICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ unless otherwise noted)							
PARAMETER	TEST CONDITIONS		SYMBOL	TYP.	MAX.	UNIT	
Instantaneous forward voltage	$I_F = 5.0 \text{ A}$	$T_A = 25^\circ\text{C}$	$V_F^{(1)}$	0.37	-	V	
	$I_F = 12.5 \text{ A}$			0.43	-		
	$I_F = 25 \text{ A}$			0.51	0.59		
	$I_F = 5.0 \text{ A}$	$T_A = 125^\circ\text{C}$		0.25	-		
	$I_F = 12.5 \text{ A}$			0.35	-		
	$I_F = 25 \text{ A}$			0.45	0.53		
Reverse current	$V_R = 45 \text{ V}$	$T_A = 25^\circ\text{C}$	$I_R^{(2)}$	133	-	$\mu\text{A}$	
		$T_A = 125^\circ\text{C}$		59	-	$\text{mA}$	
	$V_R = 60 \text{ V}$	$T_A = 25^\circ\text{C}$		-	6000	$\mu\text{A}$	
		$T_A = 125^\circ\text{C}$		140	300	$\text{mA}$	

**Notes**

(1) Pulse test: 300  $\mu\text{s}$  pulse width, 1 % duty cycle

(2) Pulse test: pulse width  $\leq 5 \text{ ms}$

THERMAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ unless otherwise noted)					
PARAMETER	SYMBOL	V25PN60			UNIT
Typical thermal resistance	$R_{\theta JA}^{(1)(2)}$	68			$^\circ\text{C}/\text{W}$
	$R_{\theta JM}^{(3)}$	4			

**Notes**

(1) Free air, mounted on recommended copper pad area; thermal resistance  $R_{\theta JA}$  - junction to ambient

(2) The heat generated must be less than the thermal conductivity from junction-to-ambient:  $dP_D/dT_J < 1/R_{\theta JA}$

(3) Mounted on 30 mm x 30 mm pad areas aluminum PCB; thermal resistance  $R_{\theta JM}$  - junction to mount measured at cathode side

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
V25PN60-M3/86A	0.10	86A	1500	7" diameter plastic tape and reel
V25PN60-M3/87A	0.10	87A	6500	13" diameter plastic tape and reel

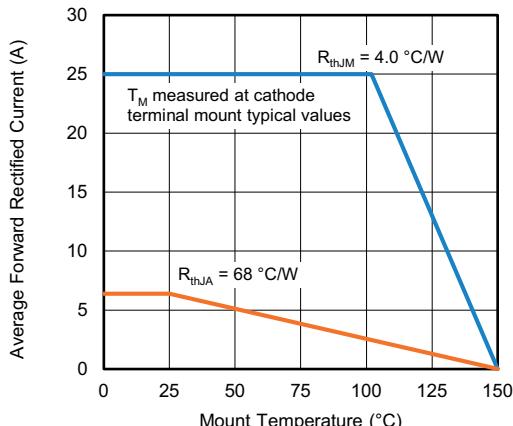
**RATINGS AND CHARACTERISTICS CURVES** ( $T_A = 25^\circ\text{C}$  unless otherwise noted)


Fig. 1 - Maximum Forward Current Derating Curve

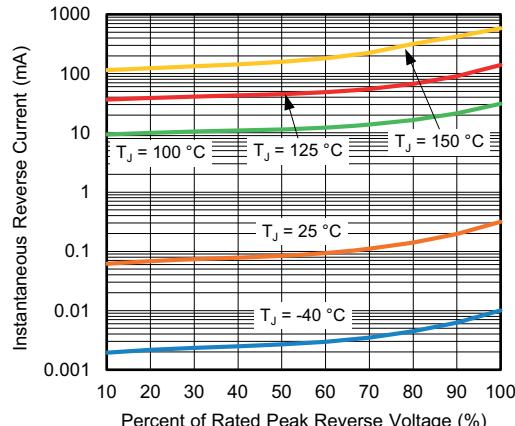


Fig. 4 - Typical Reverse Characteristics

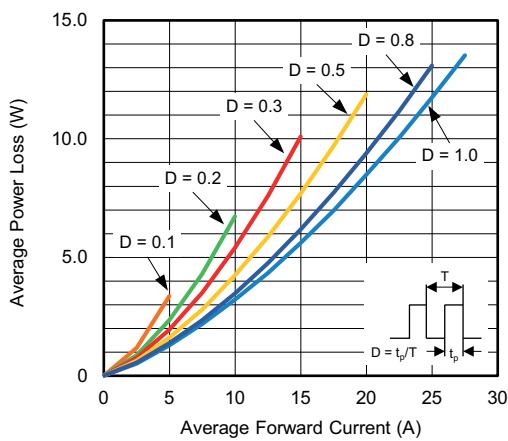


Fig. 2 - Forward Power Loss Characteristics

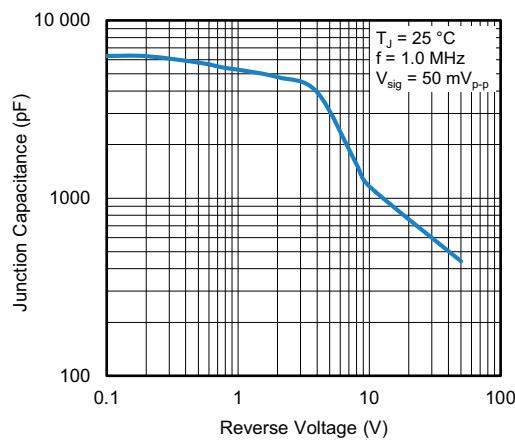


Fig. 5 - Typical Junction Capacitance

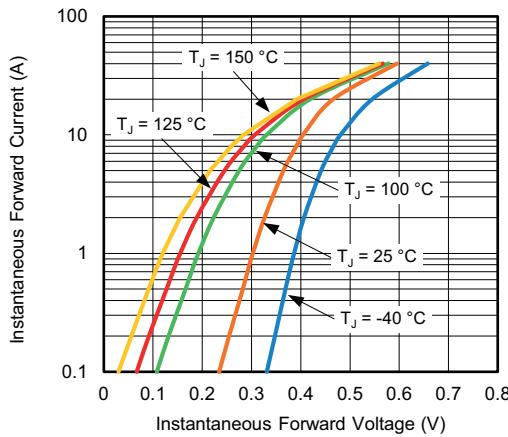


Fig. 3 - Typical Instantaneous Forward Characteristics

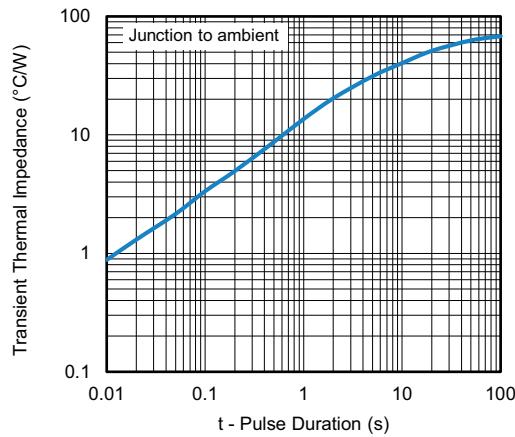
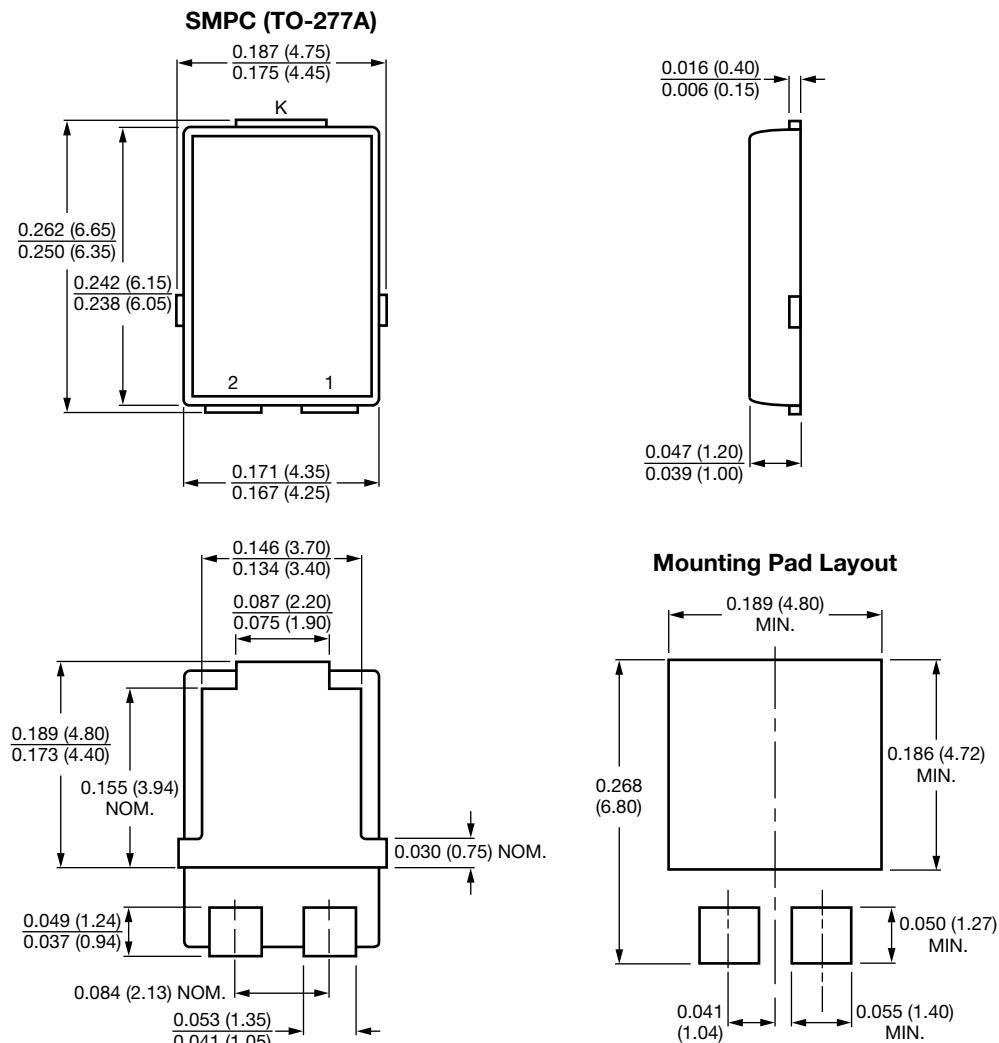


Fig. 6 - Typical Transient Thermal Impedance

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


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