

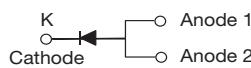
## High Current Density Surface-Mount TMBS® (Trench MOS Barrier Schottky) Rectifier

Ultra Low  $V_F = 0.48$  V at  $I_F = 5$  A

### eSMP® Series



### SMPC (TO-277A)



### DESIGN SUPPORT TOOLS

[click logo to get started](#)

**3D**  
Models  
Available

### 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
- 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)

 AUTOMOTIVE GRADE Available

 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: 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 meet JESD 201 class 2 whisker test

### PRIMARY CHARACTERISTICS

$I_{F(AV)}$	15 A
$V_{RRM}$	120 V
$I_{FSM}$	220 A
$V_F$ at $I_F = 15$ A (125 °C)	0.63 V
$T_J$ max.	175 °C
Package	SMPC (TO-277A)
Circuit configuration	Single

### MAXIMUM RATINGS ( $T_A = 25$ °C unless otherwise noted)

PARAMETER	SYMBOL	V15PM12	UNIT
Device marking code		15M12	
Maximum repetitive peak reverse voltage	$V_{RRM}$	120	V
Maximum DC forward current	$I_{F(AV)}^{(1)}$	15	A
	$I_{F(AV)}^{(2)}$	4.2	
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	$I_{FSM}$	220	A
Operating junction temperature range	$T_J$ <sup>(3)</sup>	-40 to +175	°C
Storage temperature range	$T_{STG}$	-55 to +175	°C

#### Notes

<sup>(1)</sup> Mounted on 30 mm x 30 mm pad areas aluminum PCB

<sup>(2)</sup> Free air, mounted on recommended pad area

<sup>(3)</sup> The heat generated must be less than the thermal conductivity from junction to ambient:  $dP_D/dT_J < 1/R_{\theta JA}$

ELECTRICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ unless otherwise noted)					
PARAMETER	TEST CONDITIONS	SYMBOL	TYP.	MAX.	UNIT
Instantaneous forward voltage	$I_F = 5 \text{ A}$	$T_A = 25^\circ\text{C}$	0.55	-	V
	$I_F = 7.5 \text{ A}$		0.62	-	
	$I_F = 15 \text{ A}$		0.76	0.84	
	$I_F = 5 \text{ A}$	$T_A = 125^\circ\text{C}$	0.48	-	
	$I_F = 7.5 \text{ A}$		0.53	-	
	$I_F = 15 \text{ A}$		0.63	0.71	
Reverse current	$V_R = 90 \text{ V}$	$T_A = 25^\circ\text{C}$	0.02	-	mA
		$T_A = 125^\circ\text{C}$	3	-	
	$V_R = 120 \text{ V}$	$T_A = 25^\circ\text{C}$	-	0.80	
		$T_A = 125^\circ\text{C}$	6	36	
Typical junction capacitance	4.0 V, 1 MHz	$C_J$	1450	-	pF

**Notes**

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

(2) Pulse test: Pulse width  $\leq 40 \text{ ms}$

THERMAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ unless otherwise specified)			
PARAMETER	SYMBOL	V15PM12	UNIT
Typical thermal resistance	$R_{\theta JA}^{(1)(2)}$	75	°C/W
	$R_{\theta JM}^{(3)}$	4	

**Notes**

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

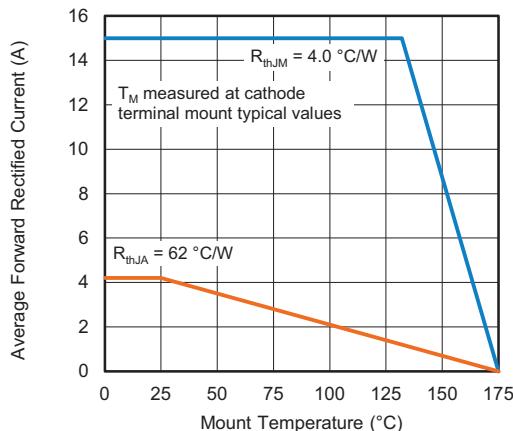
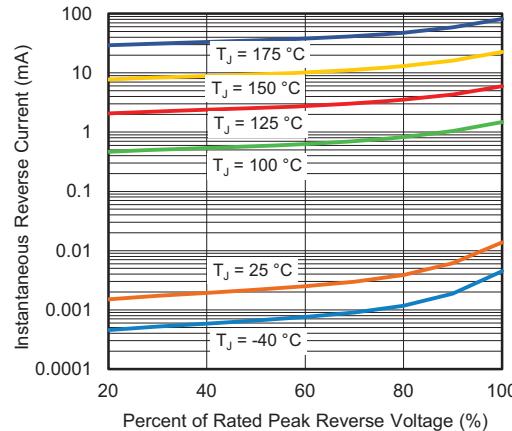
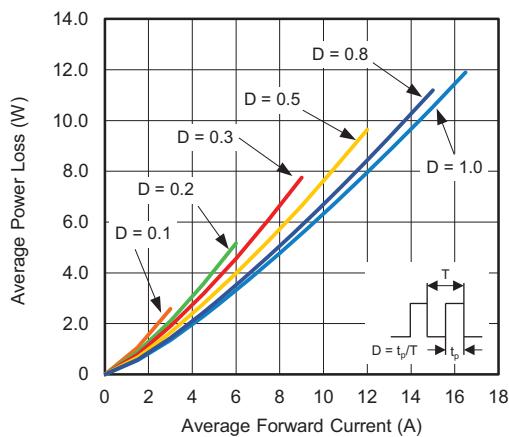
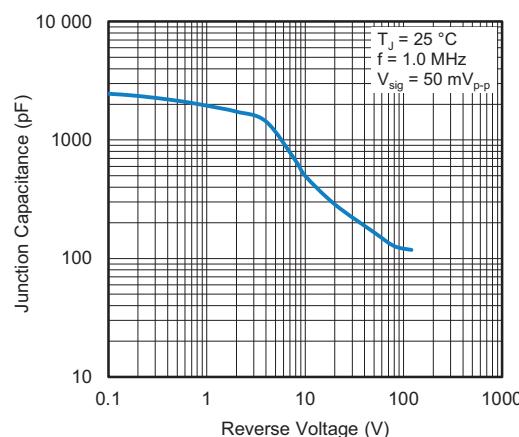
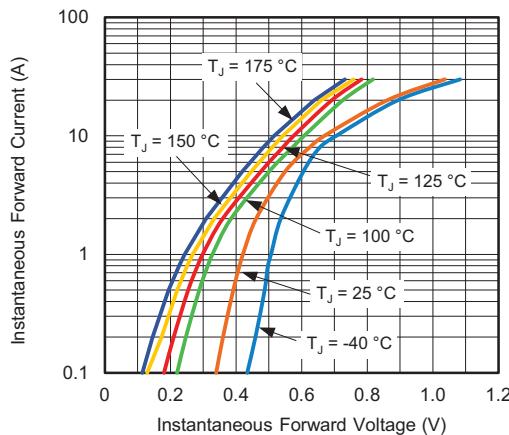
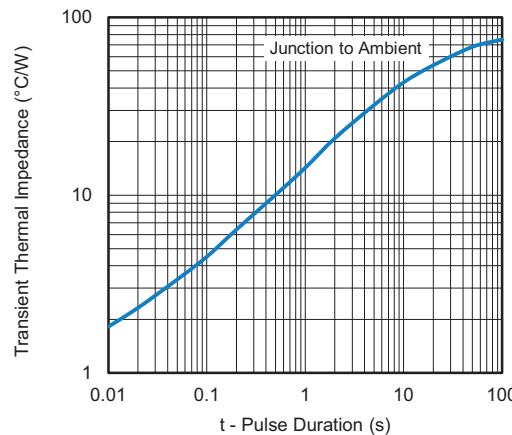
(2) Free air, mounted on recommended PCB, 2 oz. pad area; thermal resistance  $R_{\theta JA}$  - junction to ambient

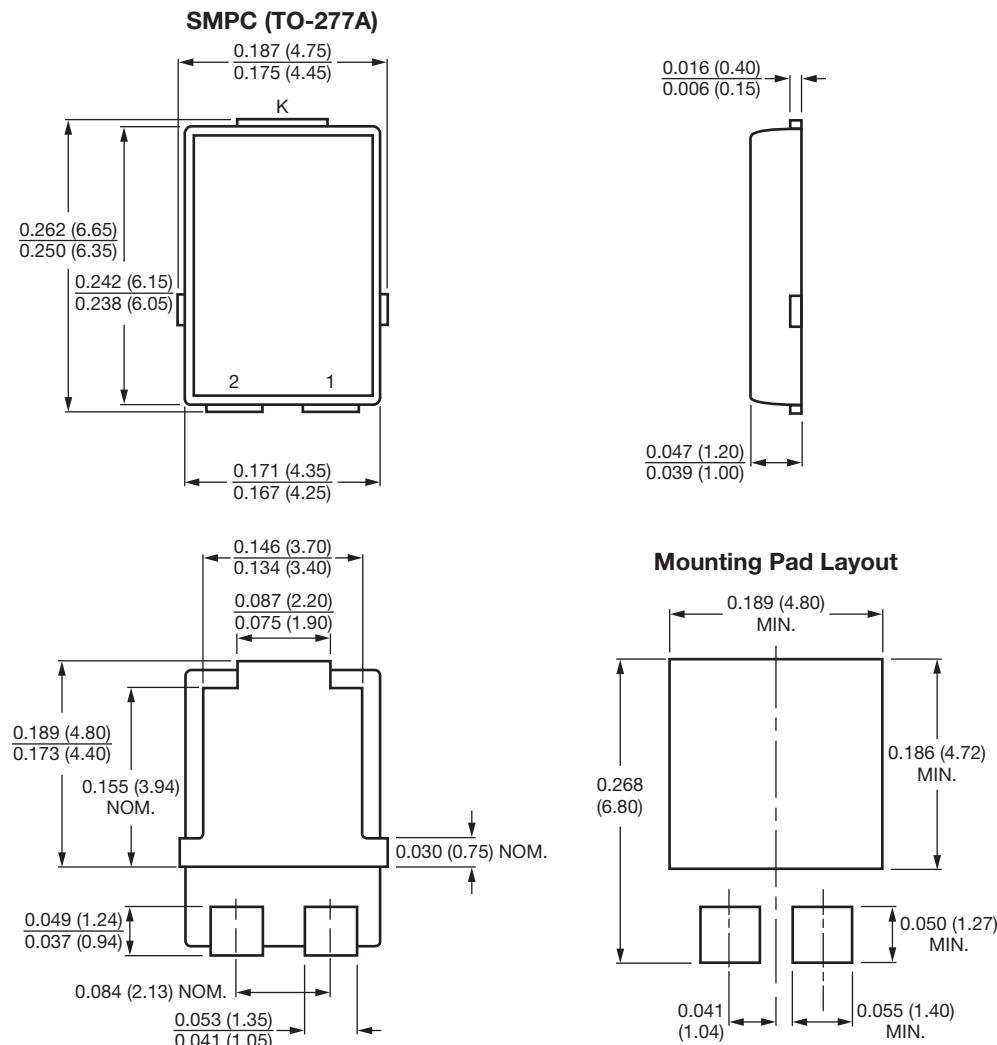
(3) Units mounted on 30 mm x 30 mm aluminum PCB, thermal resistance  $R_{\theta JM}$  - junction to mount

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
V15PM12-M3/H	0.10	H	1500	7" diameter plastic tape and reel
V15PM12-M3/I	0.10	I	6500	13" diameter plastic tape and reel
V15PM12HM3/H <sup>(1)</sup>	0.10	H	1500	7" diameter plastic tape and reel
V15PM12HM3/I <sup>(1)</sup>	0.10	I	6500	13" diameter plastic tape and reel

**Note**

(1) AEC-Q101 qualified

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

**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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