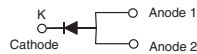


## High Current Density Surface Mount High Voltage Schottky Rectifiers

**eSMP® Series**

**TO-277A (SMPC)**

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

- Power pack
- Very low profile - typical height of 1.1 mm
- Ideal for automated placement
- Guardring for overvoltage protection
- High barrier technology,  $T_J = 175\text{ °C}$  maximum
- Low leakage current
- Meets MSL level 1, per J-STD-020
- 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 high frequency rectifier of switching mode power supplies, freewheeling diodes, DC/DC converters, or polarity protection application.

**MECHANICAL DATA**

**Case:** TO-277A (SMPC)

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

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

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	10 A
$V_{RRM}$	90 V, 100 V
$I_{FSM}$	200 A
$E_{AS}$	20 mJ
$V_F$ at $I_F = 10\text{ A}$	0.661 V
$I_R$	0.3 $\mu\text{A}$
$T_J$ max.	175 °C
Package	TO-277A (SMPC)
Diode variations	Single die

MAXIMUM RATINGS ( $T_A = 25\text{ °C}$ unless otherwise noted)				
PARAMETER	SYMBOL	SS10PH9	SS10PH10	UNIT
Device marking code		10H9	10H10	
Maximum repetitive peak reverse voltage	$V_{RRM}$	90	100	V
Maximum average forward rectified current (fig. 1)	$I_{F(AV)}$	10		A
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	$I_{FSM}$	200		A
Non-repetitive avalanche energy at $I_{AS} = 2.0\text{ A}$ , $T_J = 25\text{ °C}$	$E_{AS}$	20		mJ
Operating junction and storage temperature range	$T_J, T_{STG}$	-55 to +175		°C



ELECTRICAL CHARACTERISTICS (T <sub>A</sub> = 25 °C unless otherwise noted)						
PARAMETER	TEST CONDITIONS		SYMBOL	TYP.	MAX.	UNIT
Instantaneous forward voltage	I <sub>F</sub> = 5 A	T <sub>A</sub> = 25 °C	V <sub>F</sub> <sup>(1)</sup>	0.725	-	V
	I <sub>F</sub> = 10 A			0.800	0.88	
	I <sub>F</sub> = 5 A	T <sub>A</sub> = 125 °C		0.581	-	
	I <sub>F</sub> = 10 A			0.661	0.74	
Reverse current	Rated V <sub>R</sub>	T <sub>A</sub> = 25 °C	I <sub>R</sub> <sup>(2)</sup>	0.3	10	μA
		T <sub>A</sub> = 125 °C		0.3	3	mA
Typical junction capacitance	4.0 V, 1 MHz		C <sub>J</sub>	270	-	pF

**Notes**

- (1) Pulse test: 300 μs pulse width, 1 % duty cycle
- (2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T <sub>A</sub> = 25 °C unless otherwise specified)				
PARAMETER	SYMBOL	SS10PH9	SS10PH10	UNIT
Typical thermal resistance	R <sub>θJA</sub> <sup>(1)</sup>	60		°C/W
	R <sub>θJL</sub>	3		

**Note**

- (1) Units mounted on recommended PCB 1 oz. pad layout

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
SS10PH10-M3/86A	0.10	86A	1500	7" diameter plastic tape and reel
SS10PH10-M3/87A	0.10	87A	6500	13" diameter plastic tape and reel
SS10PH10HM3/86A <sup>(1)</sup>	0.10	86A	1500	7" diameter plastic tape and reel
SS10PH10HM3/87A <sup>(1)</sup>	0.10	87A	6500	13" diameter plastic tape and reel
SS10PH10HM3_A/H <sup>(1)</sup>	0.10	H	1500	7" diameter plastic tape and reel
SS10PH10HM3_A/I <sup>(1)</sup>	0.10	I	6500	13" diameter plastic tape and reel

**Note**

- (1) AEC-Q101 qualified

**RATINGS AND CHARACTERISTICS CURVES (T<sub>A</sub> = 25 °C unless otherwise specified)**

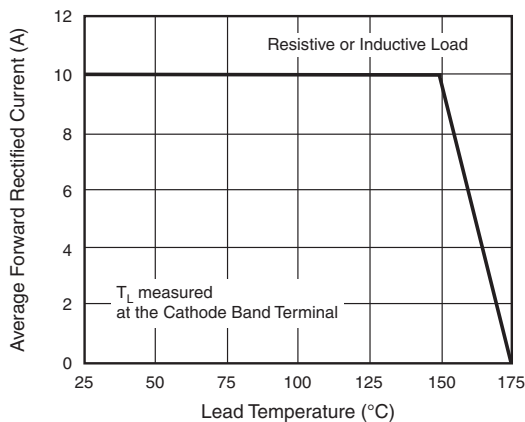


Fig. 1 - Maximum Forward Current Derating Curve

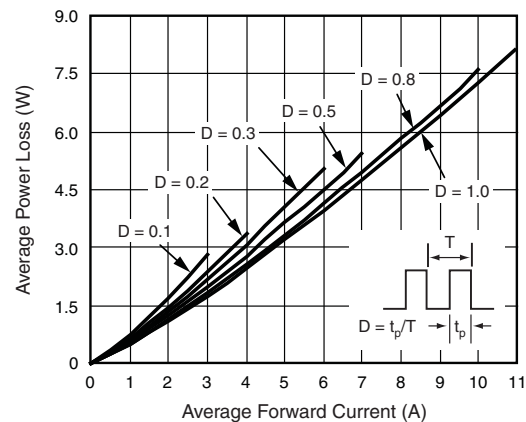


Fig. 2 - Forward Power Loss Characteristics

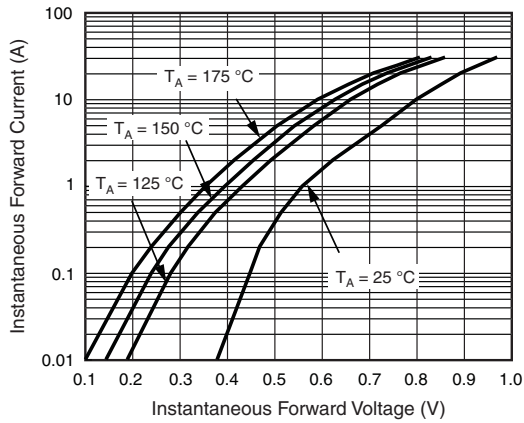


Fig. 3 - Typical Instantaneous Forward Characteristics

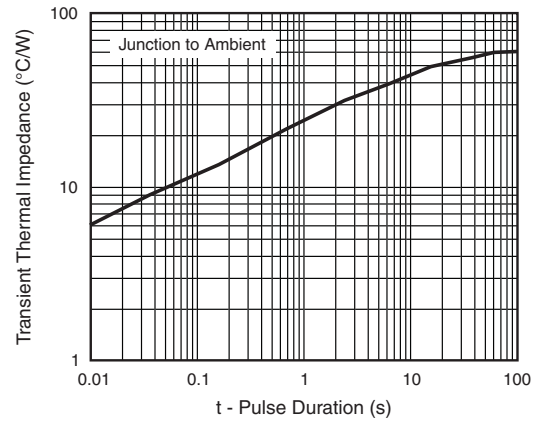


Fig. 6 - Typical Transient Thermal Impedance

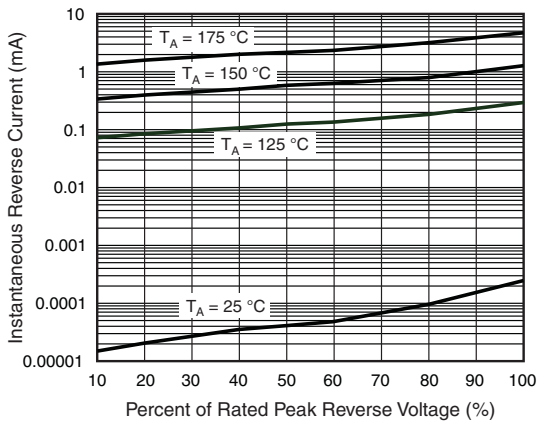


Fig. 4 - Typical Reverse Characteristics

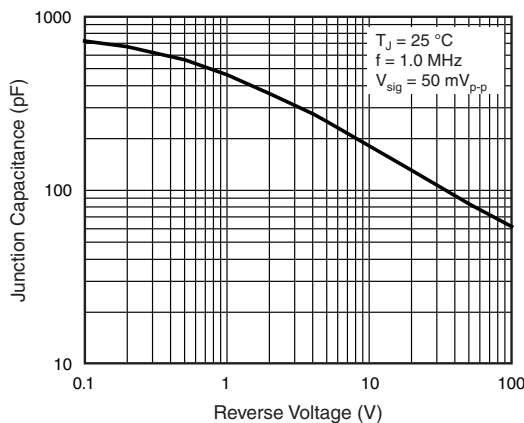
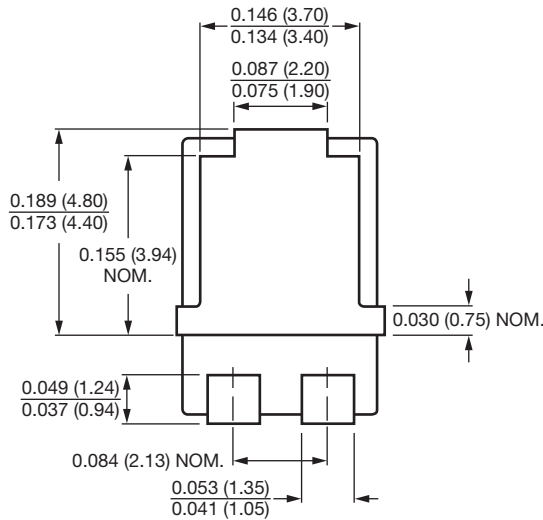
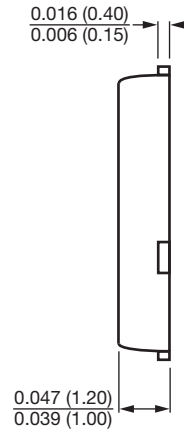
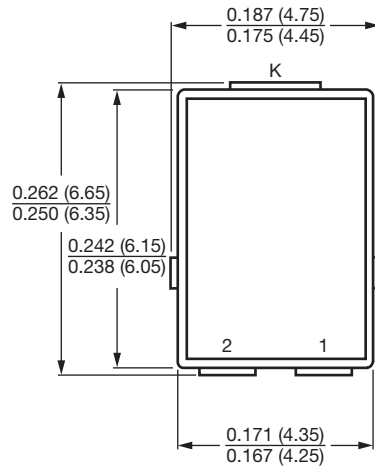


Fig. 5 - Typical Junction Capacitance

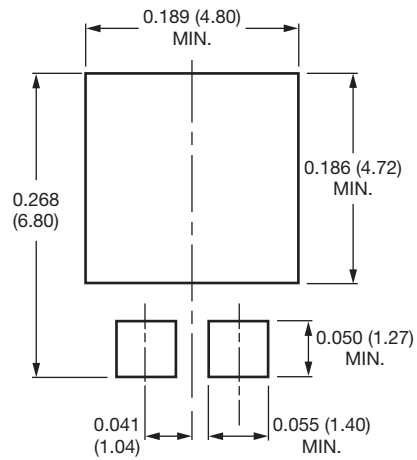


### PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

#### TO-277A (SMPC)



#### Mounting Pad Layout



Conform to JEDEC® TO-277A



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