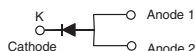


# High Current Density Surface Mount Schottky Rectifier

## eSMP® Series



TO-277A (SMPC)



## FEATURES

- Very low profile - typical height of 1.1 mm
- Ideal for automated placement
- Guardring for overvoltage protection
- High barrier technology,  $T_J = 175\text{ }^{\circ}\text{C}$  maximum
- Low leakage current
- Meets MSL level 1, per J-STD-020, LF maximum peak of  $260\text{ }^{\circ}\text{C}$
- AEC-Q101 qualified
- 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

## 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 automotive grade

**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
$V_{RRM}$	45 V
$I_{FSM}$	200 A
$E_{AS}$	20 mJ
$V_F$ at $I_F = 10\text{ A}$	0.56 V
$I_R$	5.5 $\mu\text{A}$
$T_J$ max.	$175\text{ }^{\circ}\text{C}$
Package	TO-277A (SMPC)
Diode variations	Single

## TYPICAL APPLICATIONS

For use in high frequency rectifier of switching mode power supplies, freewheeling diodes, DC/DC converters, or polarity protection application.

## MAXIMUM RATINGS ( $T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise noted)

PARAMETER	SYMBOL	SS10PH45	UNIT
Device marking code		10H45	
Maximum repetitive peak reverse voltage	$V_{RRM}$	45	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 $I_{AS} = 2\text{ A}$ , $T_J = 25\text{ }^{\circ}\text{C}$	$E_{AS}$	20	mJ
Operating junction and storage temperature range	$T_J, T_{STG}$	- 55 to + 175	$^{\circ}\text{C}$



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>	0.54	-	V
	I <sub>F</sub> = 10 A			0.64	0.72	
	I <sub>F</sub> = 5 A	T <sub>A</sub> = 125 °C		0.45	-	
	I <sub>F</sub> = 10 A			0.56	0.64	
Reverse current	Rated V <sub>R</sub>	T <sub>A</sub> = 25 °C	I <sub>R</sub> <sup>(2)</sup>	5.5	80	μA
		T <sub>A</sub> = 125 °C		3.9	10	mA
Typical junction capacitance	4.0 V, 1 MHz		C <sub>J</sub>	400	-	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 ( $T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise specified)			
PARAMETER	SYMBOL	SS10PH45	UNIT
Typical thermal resistance per diode	$R_{\theta JA}^{(1)}$	60	$^{\circ}\text{C/W}$
	$R_{\theta JL}$	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
SS10PH45-M3/86A	0.10	86A	1500	7" diameter plastic tape and reel
SS10PH45-M3/87A	0.10	87A	6500	13" diameter plastic tape and reel
SS10PH45HM3/86A <sup>(1)</sup>	0.10	86A	1500	7" diameter plastic tape and reel
SS10PH45HM3/87A <sup>(1)</sup>	0.10	87A	6500	13" diameter plastic tape and reel

**Note**

(1) Automotive grade

## RATINGS AND CHARACTERISTICS CURVES

( $T_A = 25\text{ }^{\circ}\text{C}$  unless otherwise noted)

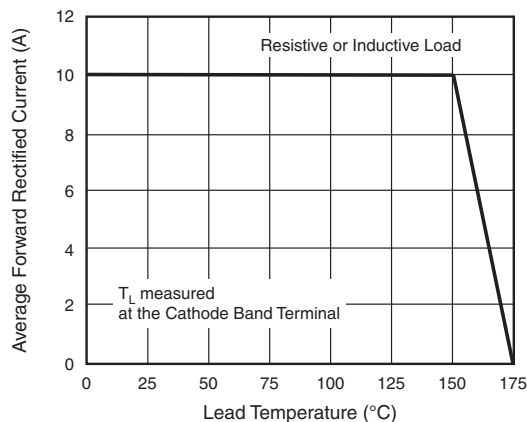


Fig. 1 - Maximum Forward Current Derating Curve

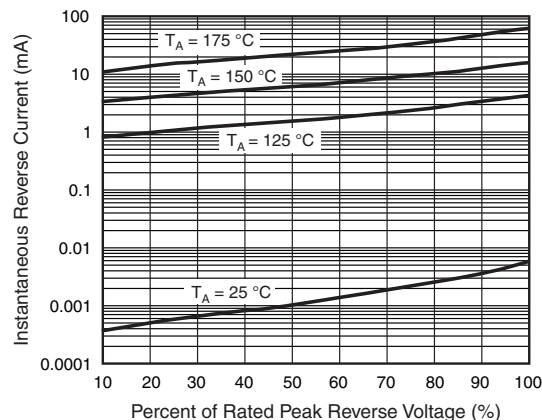


Fig. 4 - Typical Reverse Leakage Characteristics

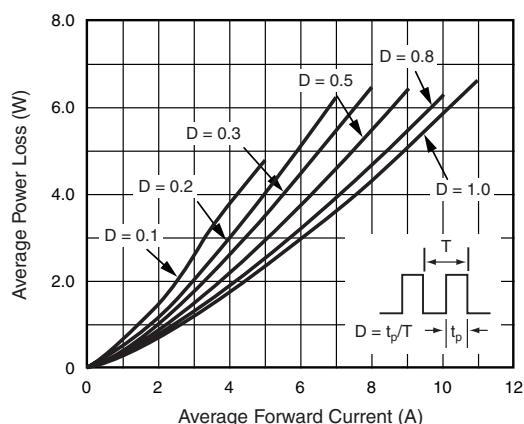


Fig. 2 - Forward Power Loss Characteristics

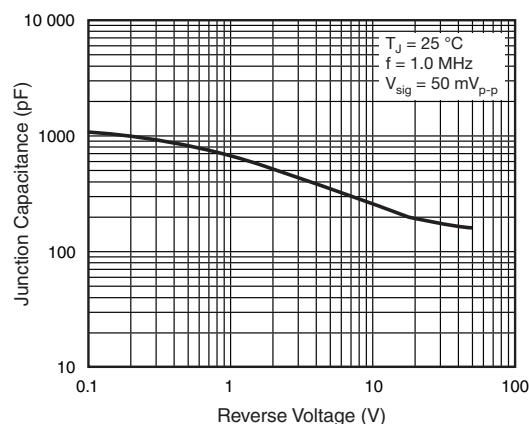


Fig. 5 - Typical Junction Capacitance

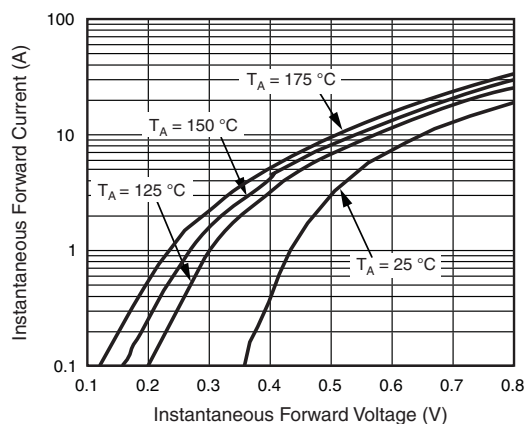


Fig. 3 - Typical Instantaneous Forward Characteristics

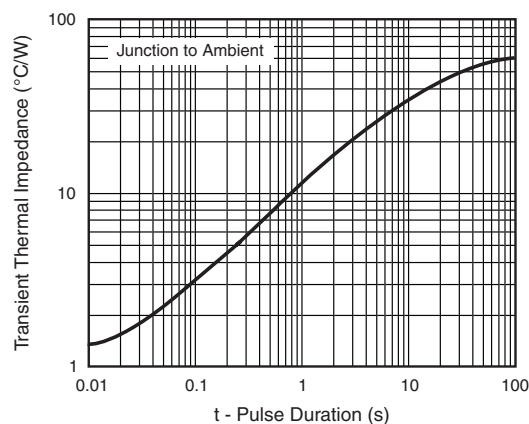
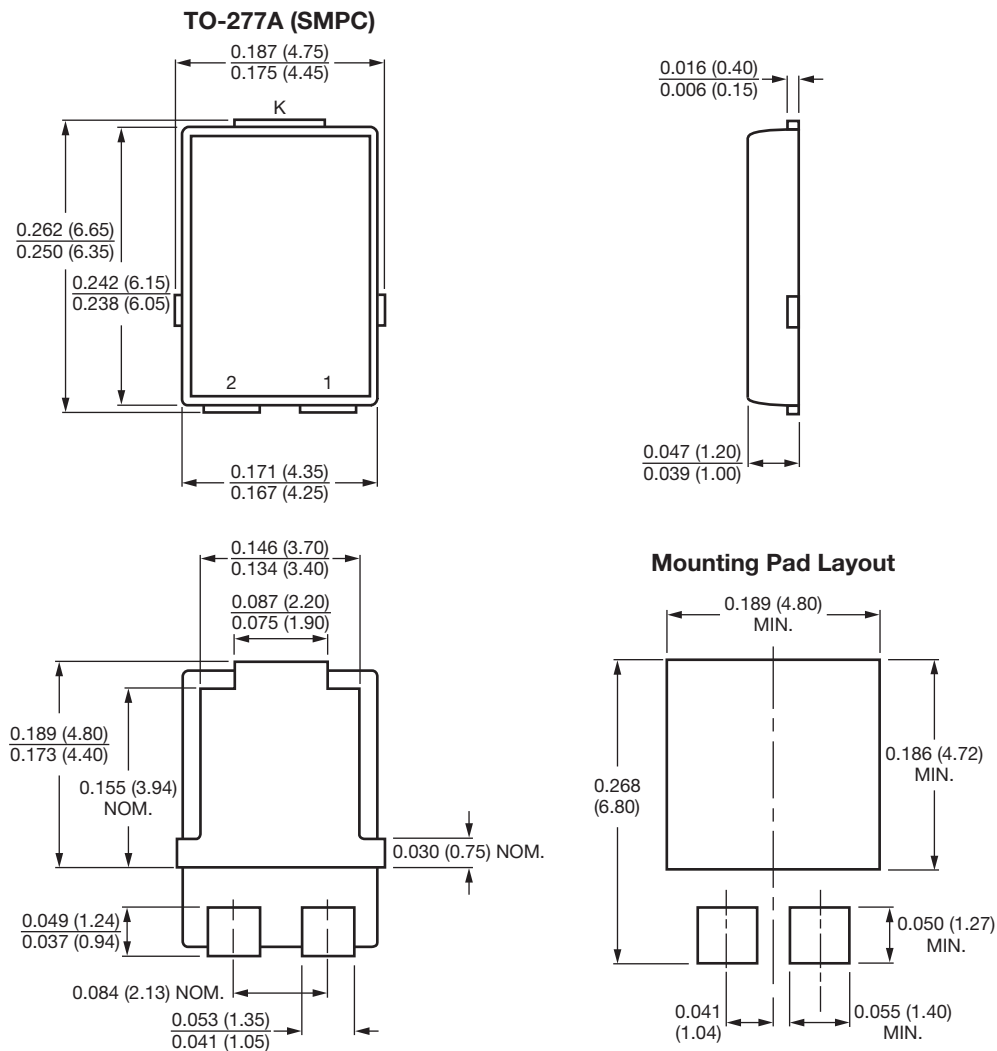


Fig. 6 - Typical Transient Thermal Impedance



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





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