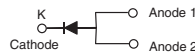


# High Current Density Surface Mount Schottky Rectifier

**eSMP® Series**

**SMPC (TO-277A)**

**FEATURES**

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

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 °C
Package	SMPC (TO-277A)
Circuit configuration	Single

**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:** 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\_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

MAXIMUM RATINGS ( $T_A = 25\text{ °C}$ 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 $I_{AS} = 2\text{ A}$ , $T_J = 25\text{ °C}$	$E_{AS}$	20	mJ
Operating junction and storage temperature range	$T_J, T_{STG}$	-55 to +175	°C



ELECTRICAL CHARACTERISTICS ( $T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted)						
PARAMETER	TEST CONDITIONS		SYMBOL	TYP.	MAX.	UNIT
Instantaneous forward voltage	$I_F = 5\text{ A}$	$T_A = 25\text{ }^\circ\text{C}$	$V_F^{(1)}$	0.54	-	V
	$I_F = 10\text{ A}$			0.64	0.72	
	$I_F = 5\text{ A}$	$T_A = 125\text{ }^\circ\text{C}$		0.45	-	
	$I_F = 10\text{ A}$			0.56	0.64	
Reverse current	Rated $V_R$	$T_A = 25\text{ }^\circ\text{C}$	$I_R^{(2)}$	5.5	80	$\mu\text{A}$
		$T_A = 125\text{ }^\circ\text{C}$		3.9	10	mA
Typical junction capacitance	4.0 V, 1 MHz		$C_J$	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_A/H <sup>(1)</sup>	0.10	H	1500	7" diameter plastic tape and reel
SS10PH45HM3_A/I <sup>(1)</sup>	0.10	I	6500	13" diameter plastic tape and reel

**Note**

- (1) AEC-Q101 qualified

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

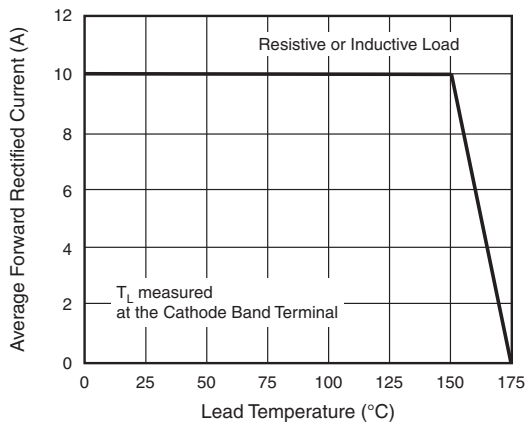


Fig. 1 - Maximum Forward Current Derating Curve

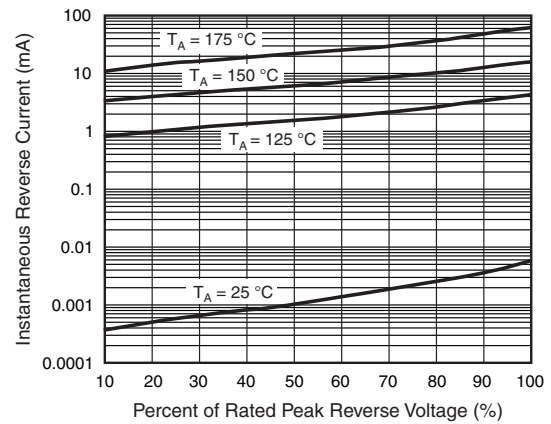


Fig. 4 - Typical Reverse Leakage Characteristics

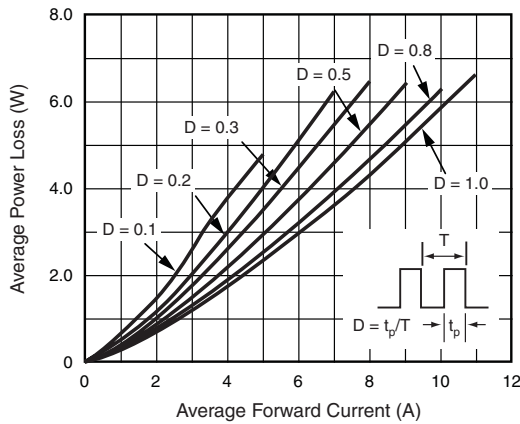


Fig. 2 - Forward Power Loss Characteristics

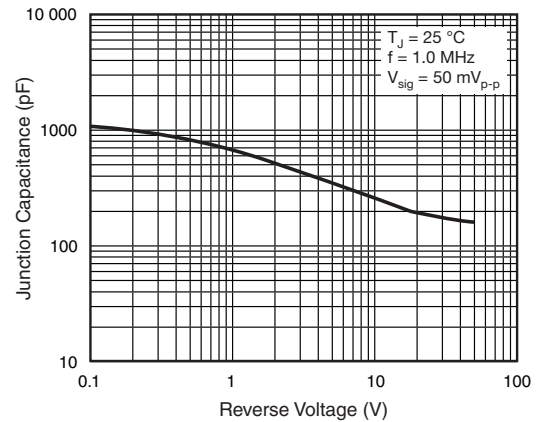


Fig. 5 - Typical Junction Capacitance

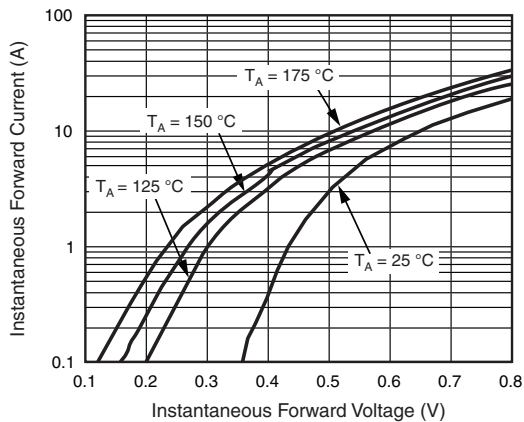


Fig. 3 - Typical Instantaneous Forward Characteristics

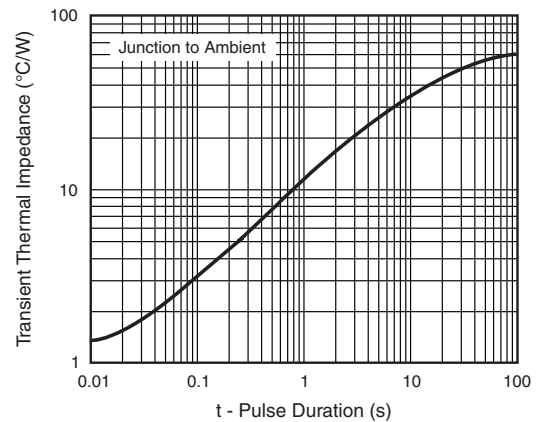
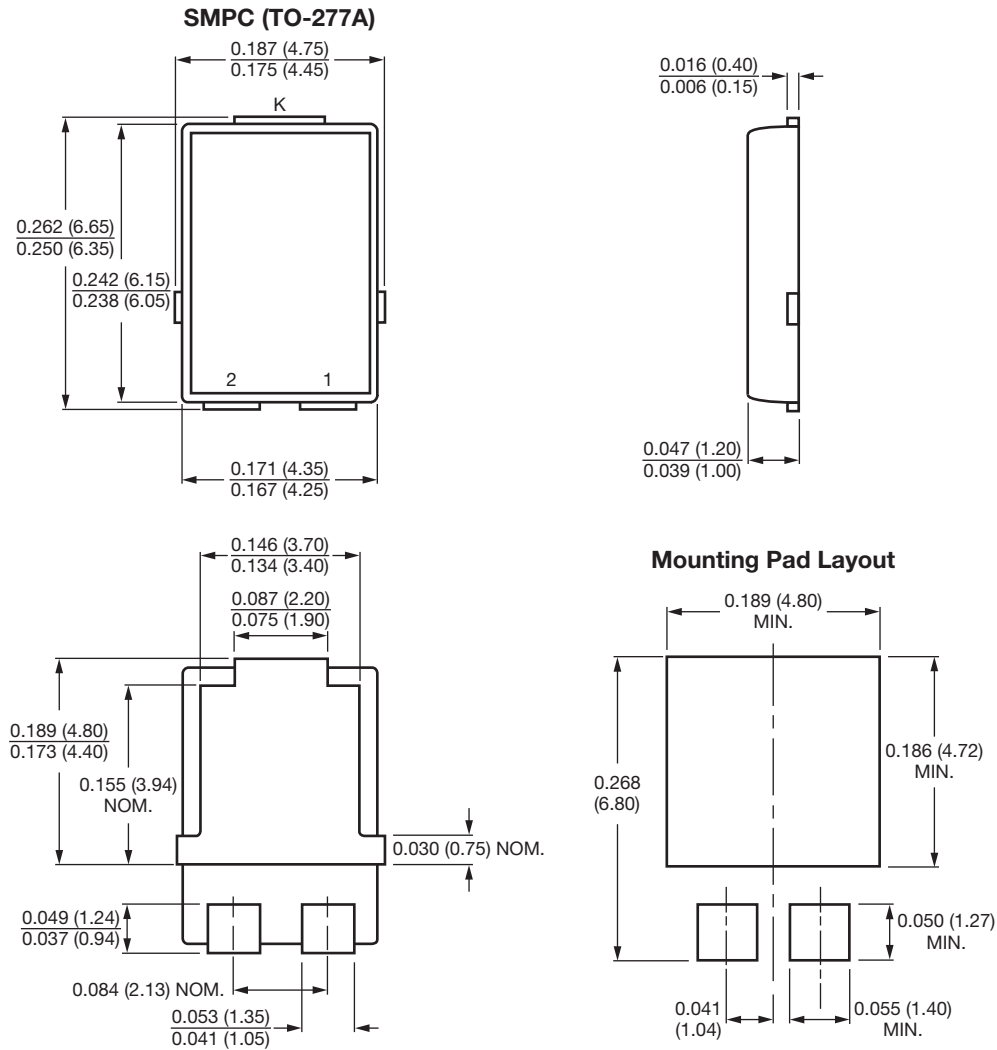


Fig. 6 - Typical Transient Thermal Impedance



PACKAGE OUTLINE DIMENSIONS in inches (millimeters)



Conform to JEDEC® TO-277A



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