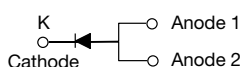


# High Current Density Surface-Mount Schottky Barrier Rectifier

## eSMP® Series



SMPC (TO-277A)



## FEATURES

- Very low profile - typical height of 1.1 mm
- Ideal for automated placement
- Guardring for overvoltage protection
- Low forward voltage drop, low power losses
- High efficiency
- Low thermal resistance
- Meet 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**

## LINKS TO ADDITIONAL RESOURCES



3D Models

## PRIMARY CHARACTERISTICS

$I_{F(AV)}$	10 A
$V_{RRM}$	50 V, 60 V
$I_{FSM}$	280 A
$E_{AS}$	20 mJ
$V_F$ at $I_F = 10$ A	0.55 V
$T_J$ max.	150 °C
Package	SMPC (TO-277A)
Circuit configuration	Single

## TYPICAL APPLICATIONS

For use in low voltage high frequency inverters, freewheeling diodes, DC/DC converters, and 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 ( $T_A = 25$ °C unless otherwise noted)

PARAMETER	SYMBOL	SS10P5	SS10P6	UNIT
Device marking code		S105	S106	
Maximum repetitive peak reverse voltage	$V_{RRM}$	50	60	V
Maximum average forward rectified current (fig. 1)	$I_{F(AV)}$	10 <sup>(1)</sup> 7 <sup>(2)</sup>		A
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	$I_{FSM}$	280		A
Non-repetitive avalanche energy at $I_{AS} = 2$ A, $T_J = 25$ °C	$E_{AS}$	20		mJ
Operating junction and storage temperature range	$T_J, T_{STG}$	-55 to +150		°C

## Notes

<sup>(1)</sup> Units mounted on infinite heatsink

<sup>(2)</sup> Units mounted on 5 cm x 5 cm, 2 oz. copper pad

**ELECTRICAL CHARACTERISTICS** ( $T_A = 25\text{ }^{\circ}\text{C}$  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>	0.51	-	V
	I <sub>F</sub> = 7 A			0.55	-	
	I <sub>F</sub> = 10 A			0.59	0.67	
	I <sub>F</sub> = 5 A	T <sub>A</sub> = 125 °C		0.42	-	
	I <sub>F</sub> = 7 A			0.47	-	
	I <sub>F</sub> = 10A			0.55	0.63	
Reverse current	Rated V <sub>R</sub>	T <sub>A</sub> = 25 °C	I <sub>R</sub> <sup>(2)</sup>	7.8	150	μA
		T <sub>A</sub> = 125 °C		5.9	15	mA
Typical junction capacitance	4.0 V, 1 MHz		C <sub>J</sub>	560	-	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	SS10P5	SS10P6	UNIT
Typical thermal resistance per diode	$R_{\theta JA}^{(1)}$	60		°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
SS10P6-M3/86A	0.10	86A	1500	7" diameter plastic tape and reel
SS10P6-M3/87A	0.10	87A	6500	13" diameter plastic tape and reel
SS10P6HM3_A/H <sup>(1)</sup>	0.10	H	1500	7" diameter plastic tape and reel
SS10P6HM3_A/I <sup>(1)</sup>	0.10	I	6500	13" diameter plastic tape and reel

**Note**

(1) AEC-Q101 qualified

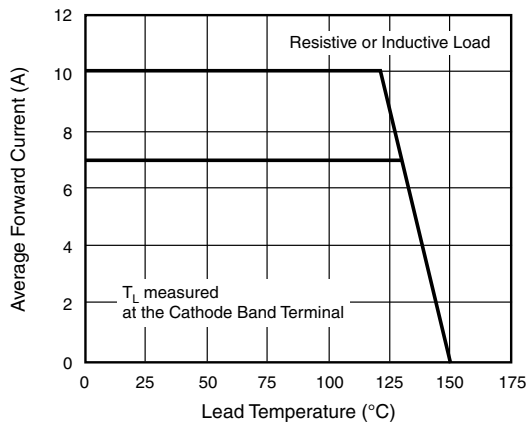
**RATINGS AND CHARACTERISTICS CURVES** ( $T_A = 25\text{ }^{\circ}\text{C}$  unless otherwise specified)


Fig. 1 - Maximum Forward Current Derating Curve

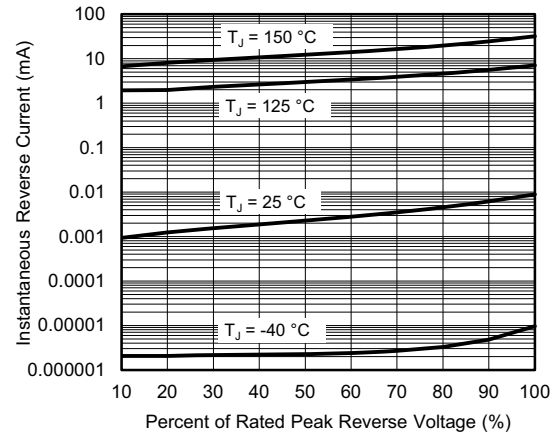


Fig. 4 - Typical Reverse Leakage Characteristics

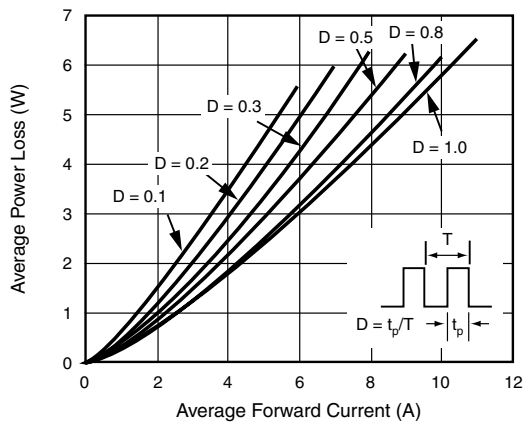


Fig. 2 - Forward Power Loss Characteristics

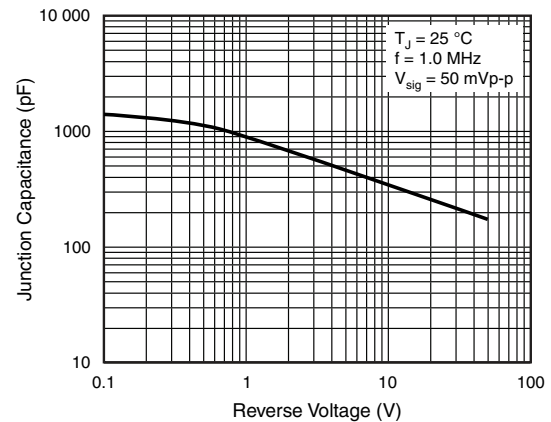


Fig. 5 - Typical Junction Capacitance

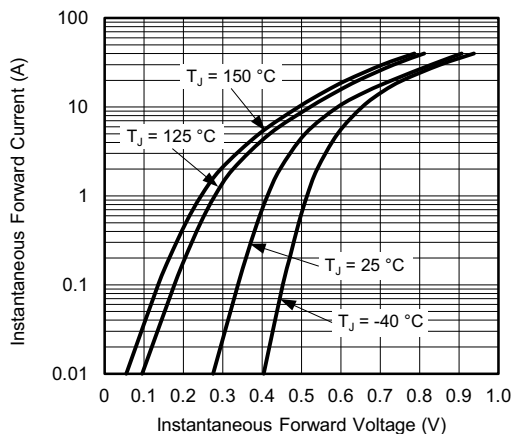


Fig. 3 - Typical Instantaneous Forward Characteristics

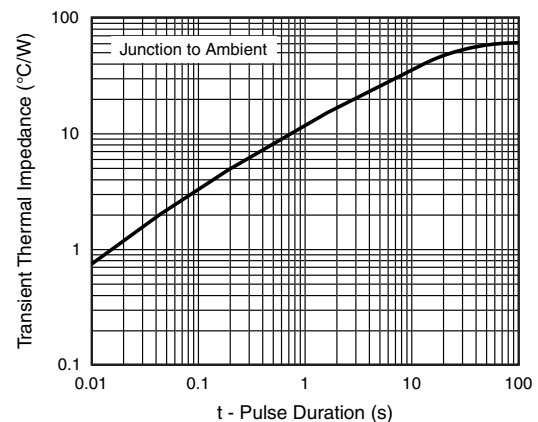
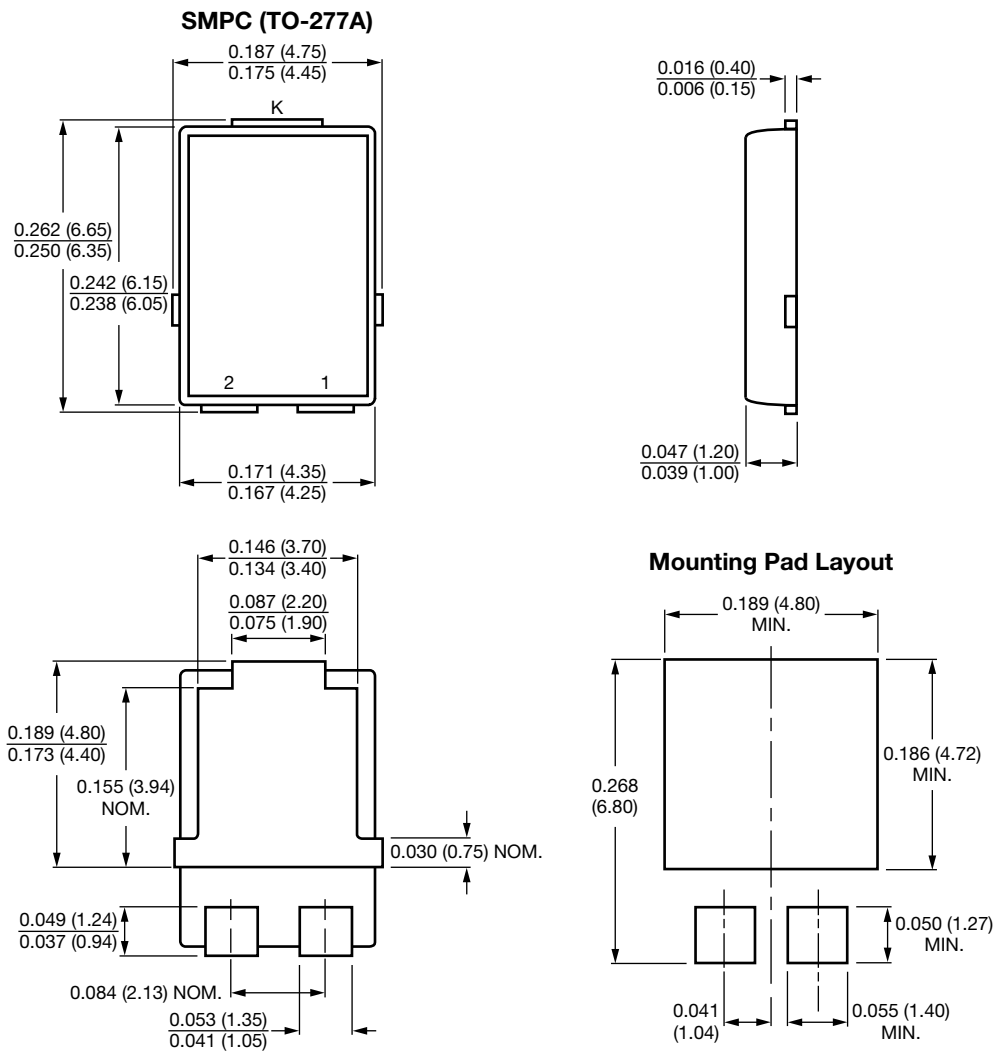


Fig. 6 - Typical Transient Thermal Impedance



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



Conform to JEDEC® TO-277A



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