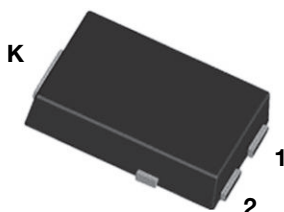
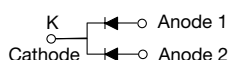


# High Current Density Surface-Mount Schottky Barrier Rectifier

## eSMP® Series



### SMPC (TO-277A)



## LINKS TO ADDITIONAL RESOURCES



PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2 x 6.0 A
$V_{RRM}$	40 V
$I_{FSM}$	150 A
$E_{AS}$	20 mJ
$V_F$ at $I_F = 6.0$ A	0.40 V
$T_J$ max.	125 °C
Package	SMPC (TO-277A)
Circuit configuration	Common cathode

## FEATURES

- Very low profile - typical height of 1.1 mm
- Ideal for automated placement
- Low forward voltage drop, low power losses
- High efficiency
- Low thermal impedance
- 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)



**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\_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	SS12P4C	UNIT
Device marking code		S124C	
Maximum repetitive peak reverse voltage	$V_{RRM}$	40	V
Maximum average forward rectified current (fig. 1) <sup>(1)</sup>	total device	12	A
	per diode	6.0	A
Maximum average forward rectified current <sup>(2)</sup>	total device	3.5	A
Peak forward surge current 10 ms single half sine-wave superimposed on rated load per diode	$I_{FSM}$	150	A
Non-repetitive avalanche energy at $T_J = 25$ °C, $L = 60$ mH per diode	$E_{AS}$	20	mJ
Peak repetitive reverse current at $t_p = 2$ $\mu$ s, 1 kHz, at $T_J = 25$ °C per diode	$I_{RRM}$	1.0	A
Operating junction and storage temperature range	$T_J, T_{STG}$	-55 to +125	°C

## Notes

- <sup>(1)</sup> Mounted on 30 mm x 30 mm Al PCB with 50 mm x 25 mm x 100 mm fin heat sink  
<sup>(2)</sup> Free air, mounted on recommended copper pad area

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

PARAMETER	TEST CONDITIONS	SYMBOL	TYP.	MAX.	UNIT
Instantaneous forward voltage per diode	$I_F = 1\text{ A}$	$V_F^{(1)}$	0.34	-	V
	$I_F = 3\text{ A}$		0.40	-	
	$I_F = 6\text{ A}$		0.46	0.52	
	$I_F = 1\text{ A}$		0.24	-	
	$I_F = 3\text{ A}$		0.31	-	
	$I_F = 6\text{ A}$		0.40	0.45	
Reverse current per diode	Rated $V_R$	$I_R^{(2)}$	129	500	$\mu\text{A}$
			11.9	25	mA
Typical junction capacitance per diode	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 noted)

PARAMETER	SYMBOL	SS12P4C	UNIT
Typical thermal resistance	$R_{\theta JA}^{(1)}$	100	$^{\circ}\text{C/W}$
	$R_{\theta JM}^{(2)}$	3	

**Notes**

(1) Free air, mounted on recommended copper pad area. Thermal resistance  $R_{\theta JA}$  - junction to ambient

(2) Mounted on 30 mm x 30 mm Al PCB with 50 mm x 25 mm x 100 mm fin heat sink. Thermal resistance  $R_{\theta JM}$  - junction to mount

**ORDERING INFORMATION** (Example)

PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
SS12P4C-M3/86A	0.10	86A	1500	7" diameter plastic tape and reel
SS12P4C-M3/87A	0.10	87A	6500	13" diameter plastic tape and reel
SS12P4CHM3_A/H <sup>(1)</sup>	0.10	H	1500	7" diameter plastic tape and reel
SS12P4CHM3_A/I <sup>(1)</sup>	0.10	I	6500	13" diameter plastic tape and reel

**Note**

(1) AEC-Q101 qualified

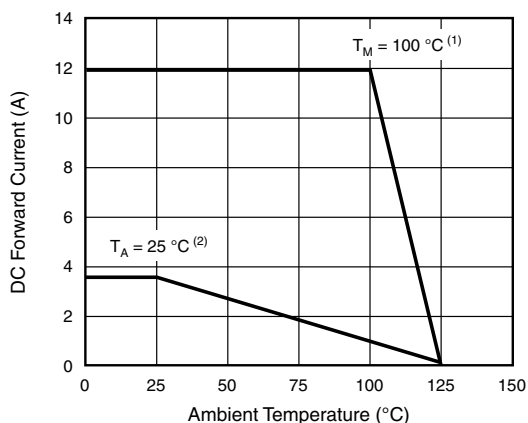
**RATINGS AND CHARACTERISTICS CURVES** ( $T_A = 25\text{ }^{\circ}\text{C}$  unless otherwise noted)


Fig. 1 - Maximum Forward Current Derating Curve

**Notes**

- Mounted on 30 mm x 30 mm Al PCB with 50 mm x 25 mm x 100 mm fin heat sink,  $T_M$  measured at the terminal of cathode band ( $R_{\theta JM} = 3\text{ }^{\circ}\text{C/W}$ )
- Free air, mounted on recommended copper pad area ( $R_{\theta JA} = 100\text{ }^{\circ}\text{C/W}$ )

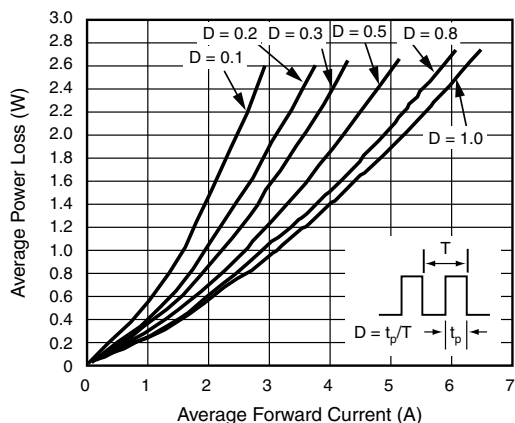


Fig. 2 - Forward Power Loss Characteristics Per Diode

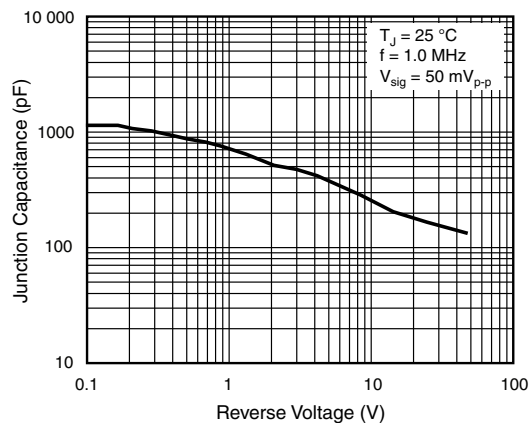


Fig. 5 - Typical Junction Capacitance Per Diode

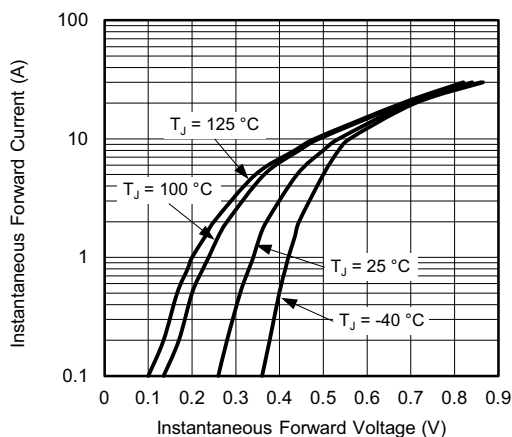


Fig. 3 - Typical Instantaneous Forward Characteristics Per Diode

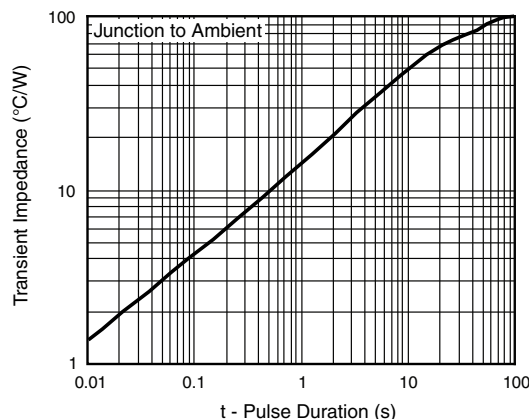


Fig. 6 - Typical Transient Thermal Impedance Per Diode

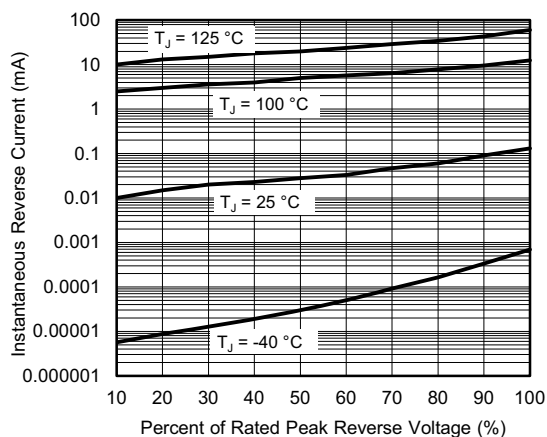
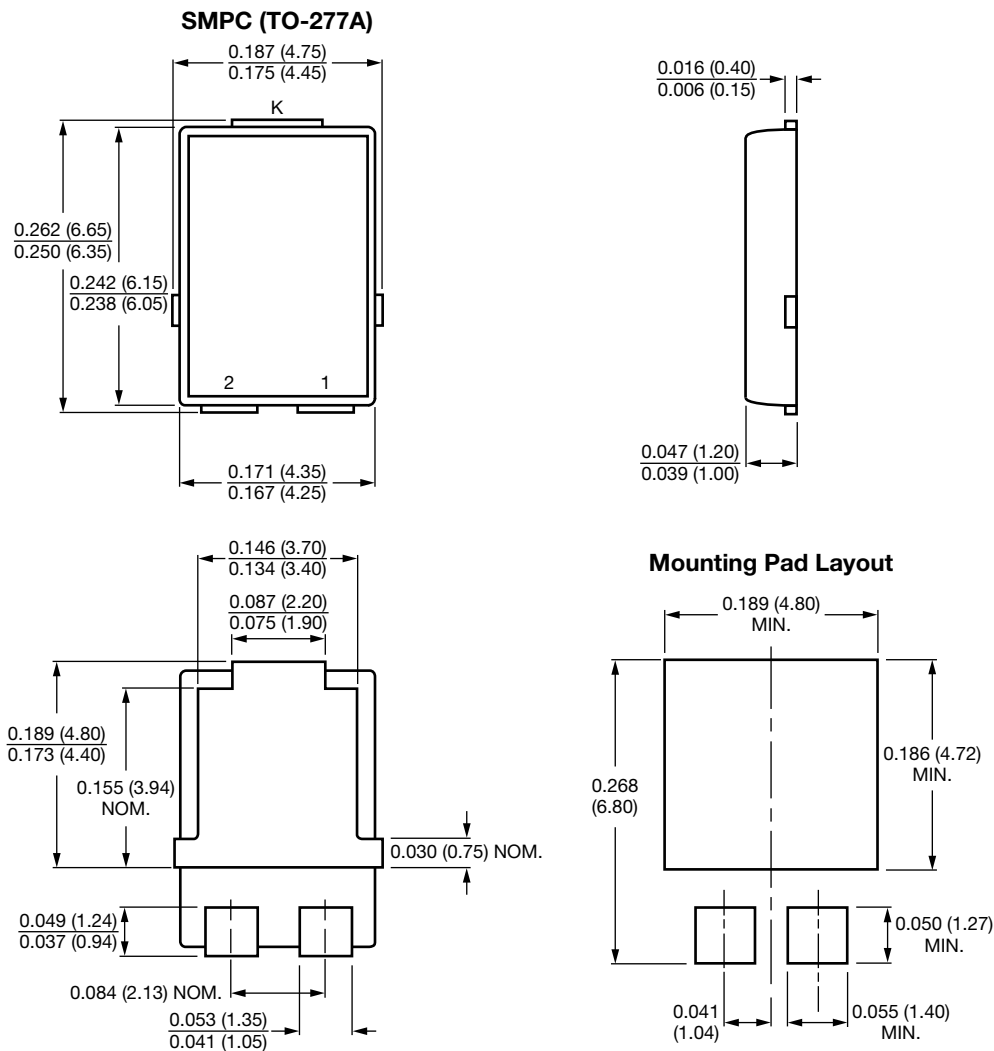


Fig. 4 - Typical Reverse Leakage Characteristics Per Diode

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




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