

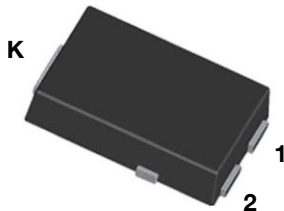


**THE DATASHEET OF  
SS12P4CHM3\_A/I**

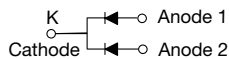


## High Current Density Surface-Mount Schottky Barrier Rectifier

### 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	
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 $t_p = 2$ μs, 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 <sub>A</sub> = 25 °C unless otherwise noted)						
PARAMETER	TEST CONDITIONS	SYMBOL	TYP.	MAX.	UNIT	
Instantaneous forward voltage per diode	I <sub>F</sub> = 1 A	T <sub>A</sub> = 25 °C	V <sub>F</sub> <sup>(1)</sup>	0.34	-	V
	I <sub>F</sub> = 3 A			0.40	-	
	I <sub>F</sub> = 6 A			0.46	0.52	
	I <sub>F</sub> = 1 A	T <sub>A</sub> = 100 °C		0.24	-	
	I <sub>F</sub> = 3 A			0.31	-	
	I <sub>F</sub> = 6 A			0.40	0.45	
Reverse current per diode	Rated V <sub>R</sub>	T <sub>A</sub> = 25 °C	I <sub>R</sub> <sup>(2)</sup>	129	500	μA
		T <sub>A</sub> = 100 °C	11.9	25	mA	
Typical junction capacitance per diode	4.0 V, 1 MHz	C <sub>J</sub>	400	-	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 noted)			
PARAMETER	SYMBOL	SS12P4C	UNIT
Typical thermal resistance	R <sub>θJA</sub> <sup>(1)</sup>	100	°C/W
	R <sub>θJM</sub> <sup>(2)</sup>	3	

**Notes**

- (1) Free air, mounted on recommended copper pad area. Thermal resistance R<sub>θJA</sub> - 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<sub>θJM</sub> - 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<sub>A</sub> = 25 °C unless otherwise noted)**

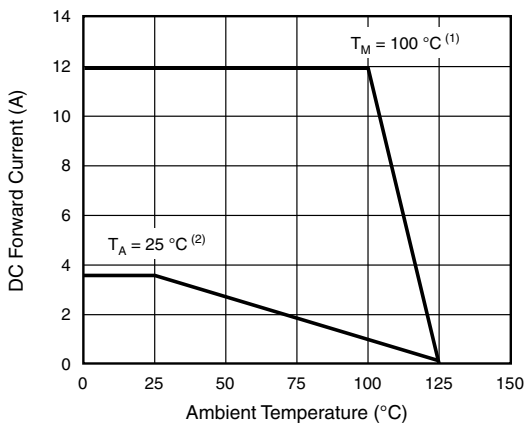


Fig. 1 - Maximum Forward Current Derating Curve

**Notes**

- Mounted on 30 mm x 30 mm Al PCB with 50 mm x 25 mm x 100 mm fin heat sink, T<sub>M</sub> measured at the terminal of cathode band (R<sub>θJM</sub> = 3 °C/W)
- Free air, mounted on recommended copper pad area (R<sub>θJA</sub> = 100 °C/W)

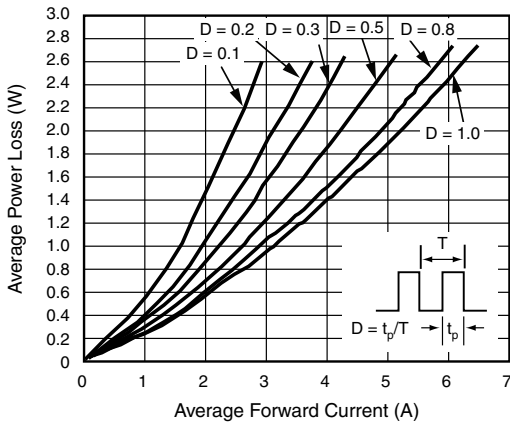


Fig. 2 - Forward Power Loss Characteristics Per Diode

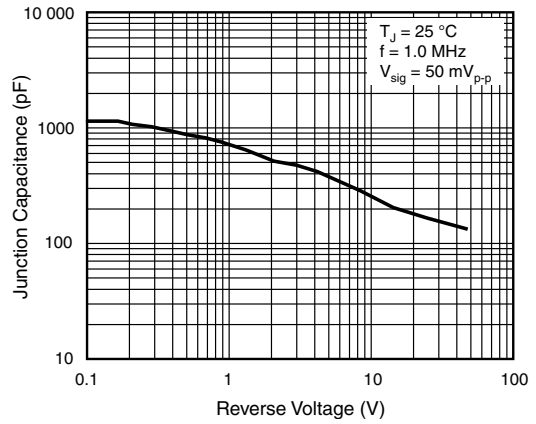


Fig. 5 - Typical Junction Capacitance Per Diode

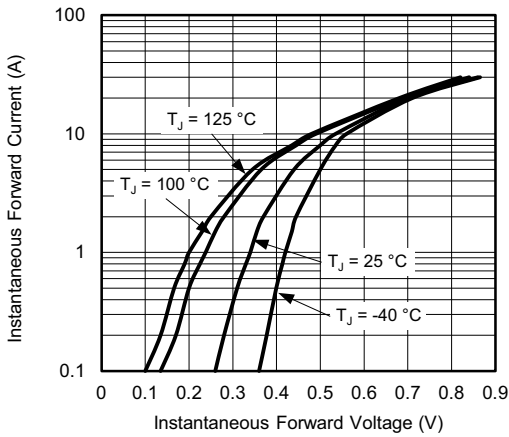


Fig. 3 - Typical Instantaneous Forward Characteristics Per Diode

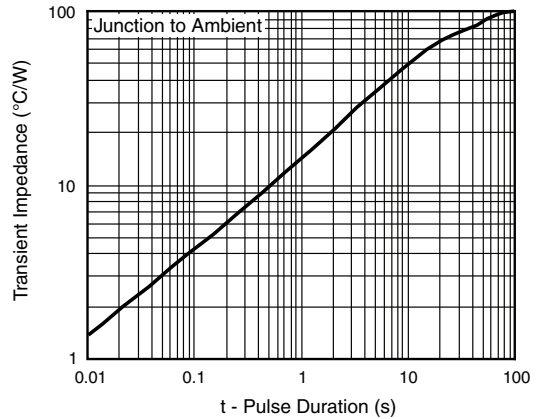


Fig. 6 - Typical Transient Thermal Impedance Per Diode

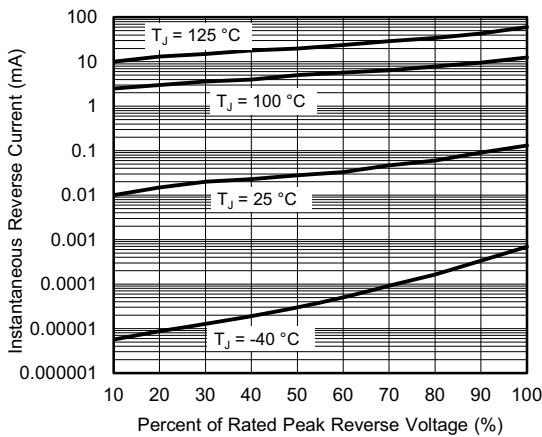
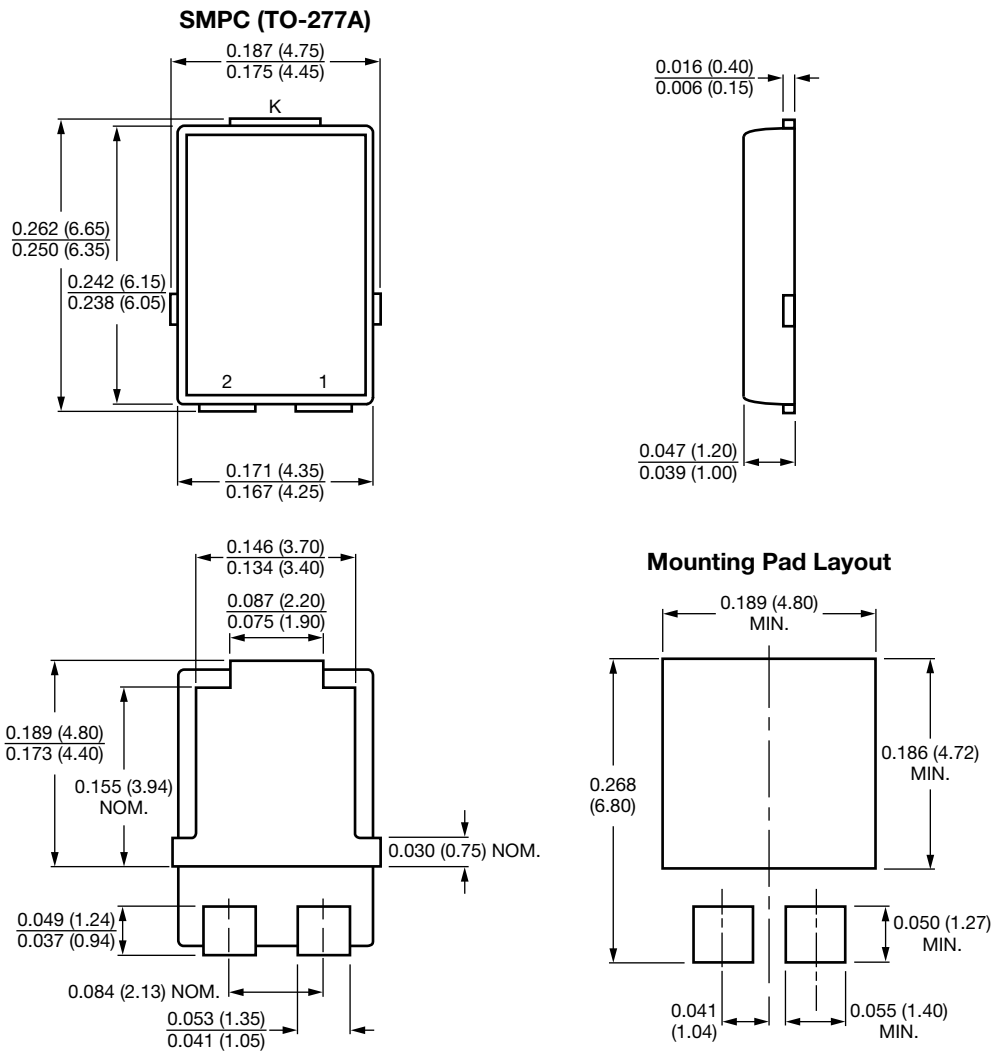


Fig. 4 - Typical Reverse Leakage Characteristics Per Diode



PACKAGE OUTLINE DIMENSIONS in inches (millimeters)



Conform to JEDEC® TO-277A



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