

# S4PB, S4PD, S4PG, S4PJ, S4PK, S4PM

Vishay General Semiconductor

## **High Current Density Surface-Mount Glass Passivated Rectifiers**



#### Anode 1 Cathode Anode 2

## **DESIGN SUPPORT TOOLS AVAILABLE**



PRIMARY CHARACTERISTICS						
I <sub>F(AV)</sub>	4.0 A					
V <sub>RRM</sub>	100 V, 200 V, 400 V, 600 V, 800 V, 1000 V					
I <sub>FSM</sub>	100 A					
I <sub>R</sub>	10 µA					
$V_F$ at $I_F = 4 A$	0.860 V					
T <sub>J</sub> max.	150 °C					
Package	SMPC (TO-277A)					
Circuit configuration	Single					

## **FEATURES**

- Very low profile typical height of 1.1 mm
- · Ideal for automated placement
- · Glass passivated pellet chip junction
- Low forward voltage drop
- High surge capability
- 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

## TYPICAL APPLICATIONS

For use in general purpose rectification of power supplies, inverters, converters and freewheeling diodes for consumer, automotive, and telecommunication.

## **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 gualified

("\_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 1A whisker test, HM3 suffix meets JESD 201 class 2 whisker test

<b>MAXIMUM RATINGS</b> ( $T_A = 25 \text{ °C}$ unless otherwise noted)								
PARAMETER	SYMBOL	S4PB	S4PD	S4PG	S4PJ	S4PK	S4PM	UNIT
Device marking code		S4PB	S4PD	S4PG	S4PJ	S4PK	S4PM	
Max. repetitive peak reverse voltage	V <sub>RRM</sub>	100	200	400	600	800	1000	V
Average forward current	I <sub>F(AV)</sub>	4.0 A					А	
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I <sub>FSM</sub>	100 A					А	
Operating junction and storage temperature range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +150 °C					°C	

1



COMPLIANT

HALOGEN FREE



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ELECTRICAL CHARACTERISTICS (T <sub>A</sub> = 25 °C unless otherwise noted)									
PARAMETER	TEST CO	TEST CONDITIONS		TYP.	MAX.	UNIT			
Instantaneous forward voltage	I <sub>F</sub> = 2.0 A	– T <sub>A</sub> = 25 °C	V <sub>F</sub> <sup>(1)</sup>	0.897	-	V			
	$I_{F} = 4.0 \text{ A}$			0.958	1.10				
	I <sub>F</sub> = 2.0 A	T <sub>A</sub> = 125 °C		0.783	-				
	I <sub>F</sub> = 4.0 A			0.860	0.95				
	T <sub>A</sub> = 25 °C	I <sub>R</sub> <sup>(2)</sup>	-	10					
	naleu v <sub>R</sub>	T <sub>A</sub> = 125 °C	'R (-/	55	100	μA			
Max. reverse recovery time	I <sub>F</sub> = 0.5 A, I <sub>R</sub> I <sub>rr</sub> = 0.25 A	I <sub>F</sub> = 0.5 A, I <sub>R</sub> = 1.0 A, I <sub>rr</sub> = 0.25 A		2.5	-	μs			
Typical junction capacitance	4.0 V, 1 MHz	4.0 V, 1 MHz		30	-	pF			

#### Notes

 $^{(1)}\,$  Pulse test: 300  $\mu s$  pulse width, 1 % duty cycle

<sup>(2)</sup> Pulse test: Pulse width  $\leq$  40 ms

<b>THERMAL CHARACTERISTICS</b> ( $T_A = 25 \text{ °C}$ unless otherwise specified)								
PARAMETER	SYMBOL	S4PB	S4PD	S4PG	S4PJ	S4PK	S4PM	UNIT
Typical thermal resistance	R <sub>0JA</sub> <sup>(1)</sup>	60						°C/W
Typical thermal resistance	$R_{ extsf{ heta}JL}$		0/11					

#### Note

<sup>(1)</sup> Units mounted on recommended PCB 1 oz. pad layout

ORDERING INFORMATION (Example)									
PREFERRED P/N	UNIT WEIGHT (g)	PACKAGE CODE	BASE QUANTITY	DELIVERY MODE					
S4PJ-M3/86A	0.10	86A	1500	7" diameter plastic tape and reel					
S4PJ-M3/87A	0.10	87A	6500	13" diameter plastic tape and reel					
S4PJHM3_B/H <sup>(1)</sup>	0.10	Н	1500	7" diameter plastic tape and reel					
S4PJHM3_B/I <sup>(1)</sup>	0.10	Ι	6500	13" diameter plastic tape and reel					

### Note

(1) AEC-Q101 qualified



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## RATINGS AND CHARACTERISTICS CURVES (T<sub>A</sub> = 25 °C unless otherwise noted)

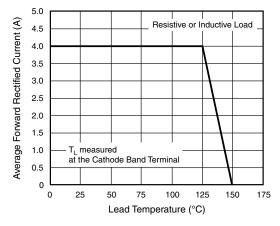


Fig. 1 - Maximum Forward Current Derating Curve

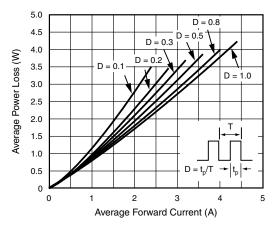


Fig. 2 - Forward Power Loss Characteristics

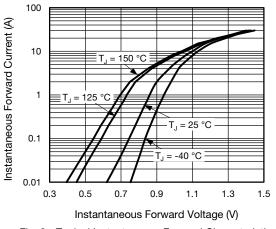


Fig. 3 - Typical Instantaneous Forward Characteristics

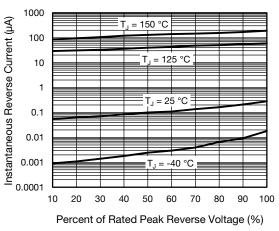


Fig. 4 - Typical Reverse Leakage Characteristics

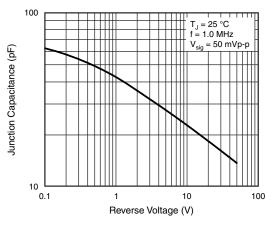


Fig. 5 - Typical Junction Capacitance

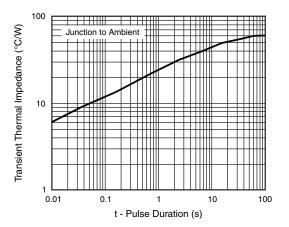


Fig. 6 - Typical Transient Thermal Impedance

### Revision: 09-Jan-2023

3

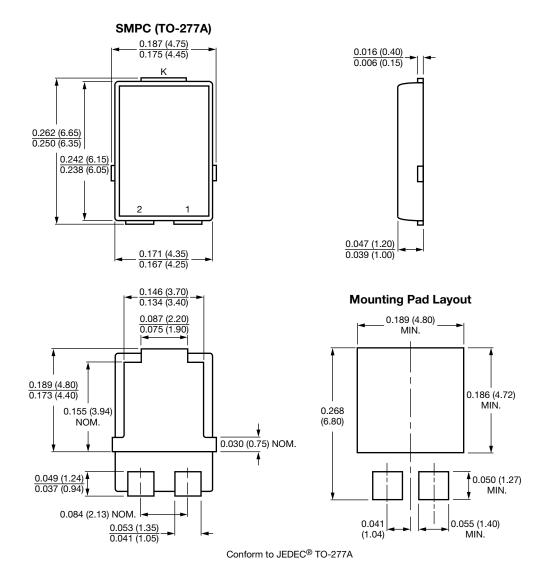
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## **PACKAGE OUTLINE DIMENSIONS** in inches (millimeters)





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1