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# Vishay General Semiconductor

# **High Current Density Surface-Mount Schottky Barrier Rectifiers**



### **LINKS TO ADDITIONAL RESOURCES**



PRIMARY CHARACTERISTICS				
I <sub>F(AV)</sub>	5.0 A			
$V_{RRM}$	90 V, 100 V			
I <sub>FSM</sub>	150 A			
V <sub>F</sub> at I <sub>F</sub> = 5.0 A	0.649 V			
I <sub>R</sub>	4.5 μA			
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
- · Guardring for overvoltage protection
- · Low forward voltage drop, low power losses
- · High efficiency
- · Low thermal resistance
- 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 high frequency rectifier of switching mode power supplies, 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

<b>MAXIMUM RATINGS</b> (T <sub>A</sub> = 25 °C unless otherwise noted)				
PARAMETER	SYMBOL	SS5P9	SS5P10	UNIT
Device marking code		S59	S510	
Maximum repetitive peak reverse voltage	$V_{RRM}$	90	100	V
Maximum average forward rectified current (fig. 1)	I <sub>F(AV)</sub>	5.0		Α
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I <sub>FSM</sub>	150		А
Non-repetitive avalanche energy at $I_{AS} = 2.0 \text{ A}$ , $T_{J} = 25 ^{\circ}\text{C}$	E <sub>AS</sub>	20		mJ
Operating junction and storage temperature range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +150		°C



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<b>ELECTRICAL CHARACTERISTICS</b> (T <sub>A</sub> = 25 °C unless otherwise noted)								
PARAMETER	TEST CO	TEST CONDITIONS		TEST CONDITIONS		TYP.	MAX.	UNIT
Instantaneous forward voltage	I <sub>F</sub> = 2.5 A	T <sub>A</sub> = 25 °C	V <sub>F</sub> <sup>(1)</sup>	0.708	-	V		
	I <sub>F</sub> = 5.0 A			0.832	0.88			
	I <sub>F</sub> = 2.5 A	T <sub>A</sub> = 125 °C		0.571	-			
	I <sub>F</sub> = 5.0 A			0.649	0.68			
Reverse current	Datad V	Rated $V_R$ $T_A = 25 \text{ °C}$ $T_A = 125 \text{ °C}$	I <sub>R</sub> <sup>(2)</sup>	4.5	15	μΑ		
	nateu v <sub>R</sub>			2.7	5	mA		
Typical junction capacitance	4.0 V, 1 MHz	4.0 V, 1 MHz		130	-	pF		

### Notes

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

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T <sub>A</sub> = 25 °C unless otherwise specified)						
PARAMETER	SYMBOL	SS5P9 SS5P10 UN				
Typical thermal resistance	R <sub>0JA</sub> (1)	65		°C/W		
	$R_{ hetaJL}$	3				

### 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		
SS5P10-M3/86A	0.10	86A	1500	7" diameter plastic tape and reel		
SS5P10-M3/87A	0.10	87A	6500	13" diameter plastic tape and reel		
SS5P10HM3_A/H (1)	0.10	Н	1500	7" diameter plastic tape and reel		
SS5P10HM3_A/I (1)	0.10	I	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)

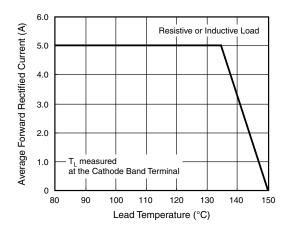


Fig. 1 - Maximum Forward Current Derating Curve

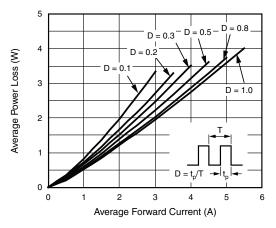


Fig. 2 - Forward Power Loss Characteristics

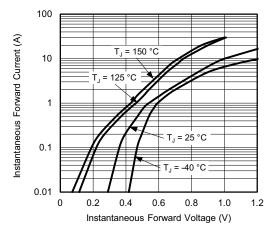


Fig. 3 - Typical Instantaneous Forward Characteristics

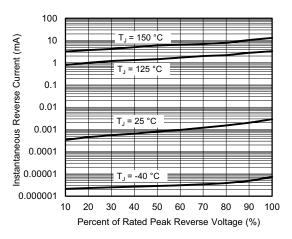


Fig. 4 - Typical Reverse Characteristics

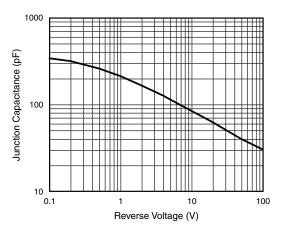


Fig. 5 - Typical Junction Capacitance

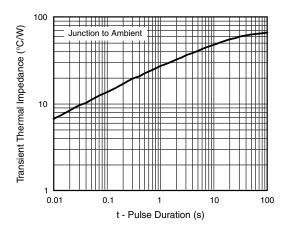
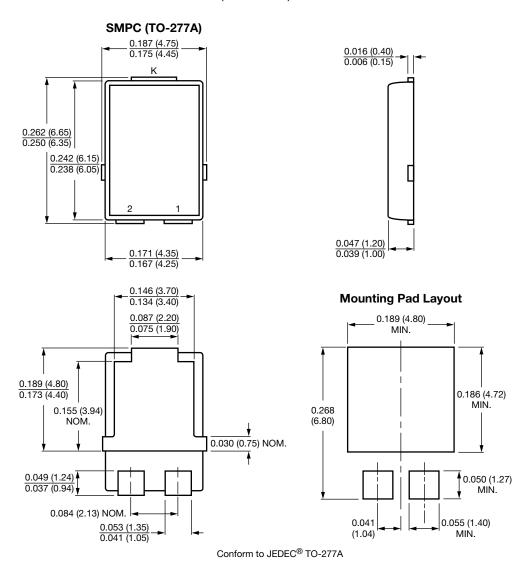


Fig. 6 - Typical Transient Thermal Impedance



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





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