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## High Current Density Surface Mount Schottky Barrier Rectifiers



### 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](http://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:** TO-277A (SMPC)

Molding compound meets UL 94 V-0 flammability rating  
 Base P/N-M3 - halogen-free, RoHS-compliant, and commercial grade

Base P/NHM3 - halogen-free, RoHS-compliant, and AEC-Q101 qualified

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

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	5.0 A
$V_{RRM}$	90 V, 100 V
$I_{FSM}$	150 A
$V_F$ at $I_F = 5.0$ A	0.649 V
$I_R$	4.5 $\mu$ A
$T_J$ max.	150 °C
Package	TO-277A (SMPC)
Diode variations	Single

MAXIMUM RATINGS ( $T_A = 25$ °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)	$I_{F(AV)}$	5.0		A
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	$I_{FSM}$	150		A
Non-repetitive avalanche energy at $I_{AS} = 2.0$ A, $T_J = 25$ °C	$E_{AS}$	20		mJ
Operating junction and storage temperature range	$T_J, T_{STG}$	-55 to +150		°C



ELECTRICAL CHARACTERISTICS ( $T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted)						
PARAMETER	TEST CONDITIONS		SYMBOL	TYP.	MAX.	UNIT
Instantaneous forward voltage	$I_F = 2.5\text{ A}$	$T_A = 25\text{ }^\circ\text{C}$	$V_F^{(1)}$	0.708	-	V
	$I_F = 5.0\text{ A}$			0.832	0.88	
	$I_F = 2.5\text{ A}$	$T_A = 125\text{ }^\circ\text{C}$		0.571	-	
	$I_F = 5.0\text{ A}$			0.649	0.68	
Reverse current	Rated $V_R$	$T_A = 25\text{ }^\circ\text{C}$	$I_R^{(2)}$	4.5	15	$\mu\text{A}$
		$T_A = 125\text{ }^\circ\text{C}$		2.7	5	mA
Typical junction capacitance	4.0 V, 1 MHz		$C_J$	130	-	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	SS5P9	SS5P10	UNIT
Typical thermal resistance	$R_{\theta JA}^{(1)}$	65		$^\circ\text{C/W}$
	$R_{\theta JL}$	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
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
SS5P10HM3/86A <sup>(1)</sup>	0.10	86A	1500	7" diameter plastic tape and reel
SS5P10HM3/87A <sup>(1)</sup>	0.10	87A	6500	13" diameter plastic tape and reel
SS5P10HM3_A/H <sup>(1)</sup>	0.10	H	1500	7" diameter plastic tape and reel
SS5P10HM3_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)

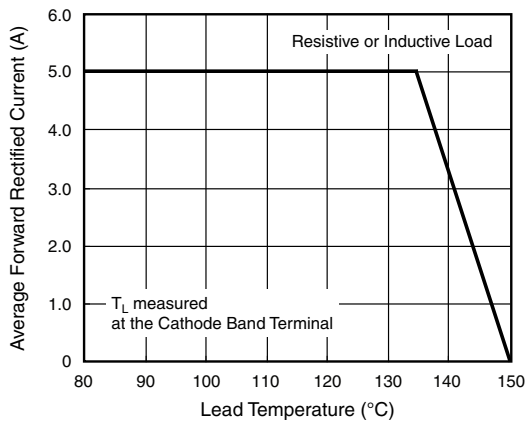


Fig. 1 - Maximum Forward Current Derating Curve

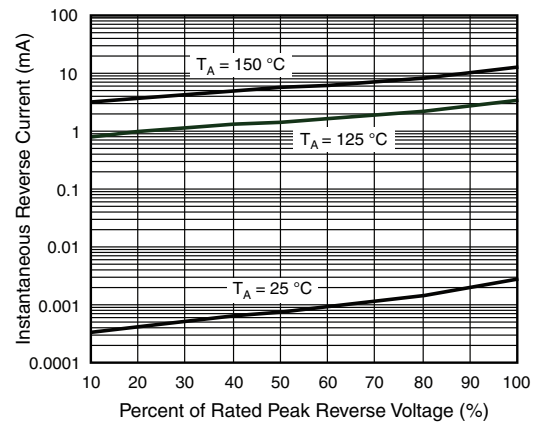


Fig. 4 - Typical Reverse Characteristics

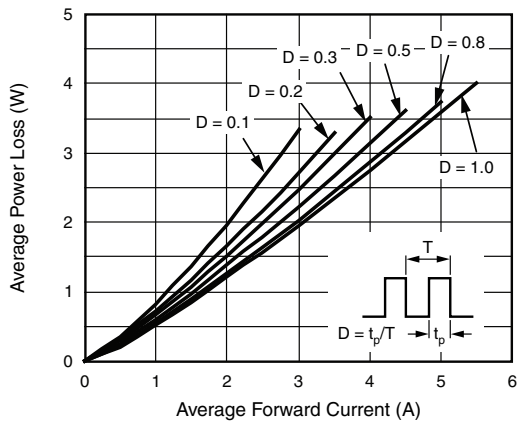


Fig. 2 - Forward Power Loss Characteristics

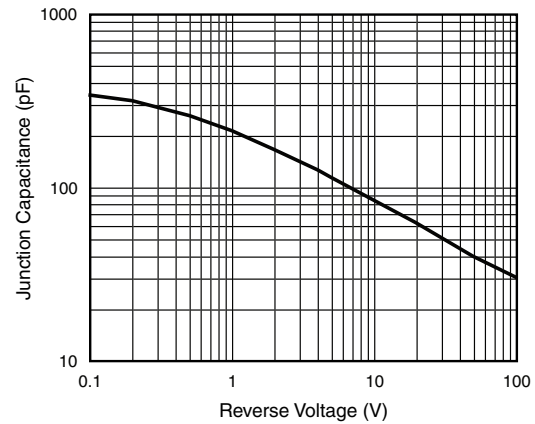


Fig. 5 - Typical Junction Capacitance

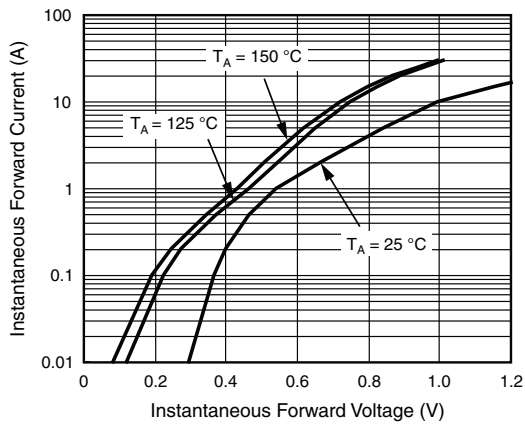


Fig. 3 - Typical Instantaneous Forward Characteristics

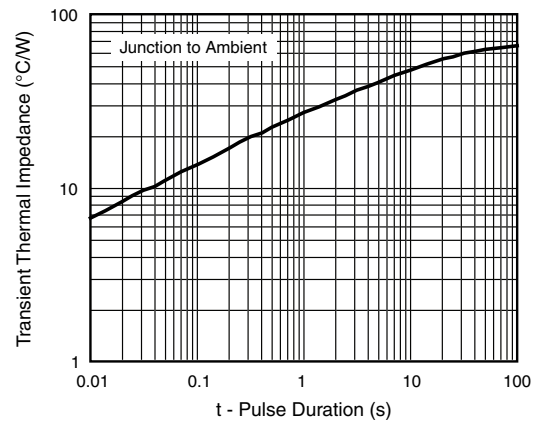
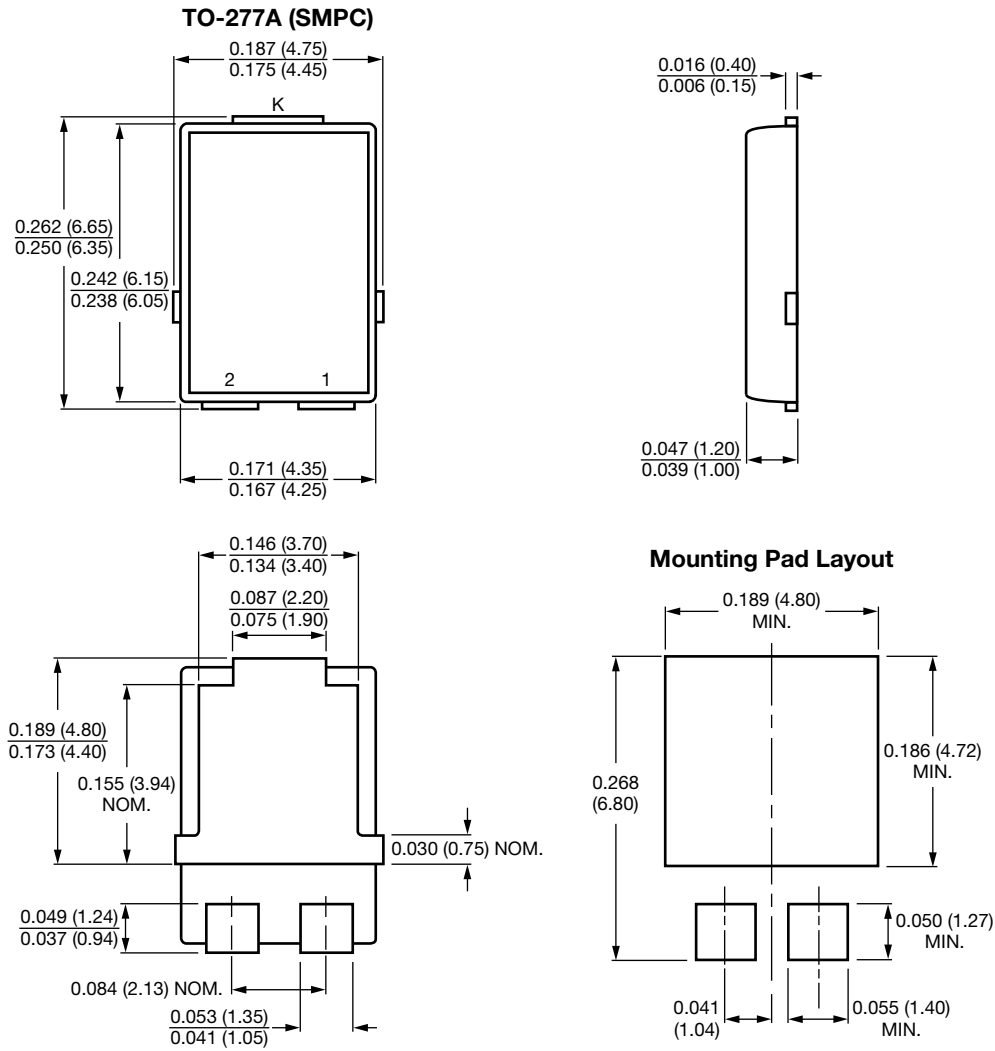


Fig. 6 - Typical Transient Thermal Impedance



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



Conform to JEDEC® TO-277A



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