

DATA SHEET

SMP1340 Series: Fast Switching Speed, Low Capacitance, Plastic Packaged PIN Diodes

Applications

- Fast speed wireless switch applications

Features

- Resistance: 1.0Ω @ 10 mA
- Capacitance: 0.3 pF
- Packages rated MSL1, 260 °C per JEDEC J-STD-020

NEW

Skyworks offers lead (Pb)-free, RoHS (Restriction of Hazardous Substances) compliant packaging.











Description

The SMP1340 series of plastic packaged, surface mountable PIN diodes is designed for high volume switch applications from 10 MHz to more than 2 GHz. The short carrier lifetime of 100 ns (typical), combined with their thin I-region width of $7 \mu\text{m}$ (nominal) results in a group of fast speed RF switching PIN diodes.

The RF performance of the SMP1340 series is assured by virtue of their low capacitance (0.3 pF) and low resistance (1.0Ω at 10 mA). The SMP1340-508 has been specifically designed for WLAN 802.11 a/b/g applications.

Table 1 describes the various packages and marking of the SMP1340 series.

Table 1. SMP1340 Series Packaging and Marking

							
Common Anode	Common Cathode	Series Pair	Single	Common Cathode	Single	Anti-Parallel	Low Inductance
SOT-23	SOT-23	SOT-23	SOD-323	SC-70	SC-79	LGA	SOT-23
SMP1340-003 Marking: PS9	◆ SMP1340-004 Marking: PS3	SMP1340-005 Marking: PS2		SMP1340-074 Marking: PS3		SMP1340-508 Marking: X Pb-free	SMP1340-007LF Marking: RSB
SMP1340-003LF Marking: RS9	◆ SMP1340-004LF Marking: RS3	SMP1340-005LF Marking: RS2	SMP1340-011LF Marking: RS	SMP1340-074LF Marking: RS3	◆ SMP1340-079LF		
$L_s = 1.5 \text{ nH}$	$L_s = 1.5 \text{ nH}$	$L_s = 1.5 \text{ nH}$	$L_s = 1.5 \text{ nH}$	$L_s = 1.4 \text{ nH}$	$L_s = 0.7 \text{ nH}$	$L_s = 0.6 \text{ nH}$	$L_s = 0.4 \text{ nH}$
		SC-70		SC-70			
		SMP1340-075LF Marking: RS2					
		$L_s = 1.4 \text{ nH}$					



LF denotes lead (Pb)-free, RoHS-compliant packaging option as an alternative to the standard Skyworks tin/lead (Sn/Pb) packaging.



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Table 2. SMP1340 Series Absolute Maximum Ratings

Parameter	Symbol	Minimum	Maximum	Units
Reverse voltage	V_R		50	V
Power dissipation @ 25 °C lead temperature	P_D		250	mW
Storage temperature	T_{STG}	-65	+150	°C
Operating temperature	T_A	-65	+150	°C

Note: Exposure to maximum rating conditions for extended periods may reduce device reliability. There is no damage to device with only one parameter set at the limit and all other parameters set at or below their nominal value. Exceeding any of the limits listed here may result in permanent damage to the device.

CAUTION: Although this device is designed to be as robust as possible, Electrostatic Discharge (ESD) can damage this device. This device must be protected at all times from ESD. Static charges may easily produce potentials of several kilovolts on the human body or equipment, which can discharge without detection. Industry-standard ESD precautions should be used at all times. The SMP1340 series PIN diodes are Class 1B ESD devices.

Electrical and Mechanical Specifications

The absolute maximum ratings of the SMP1340 series are provided in Table 2. Electrical specifications are provided in Table 3. Resistance versus temperature measurements are provided in Table 4.

Typical performance characteristics of the SMP1340 series are illustrated in Figures 1 to 4. Package dimensions are shown in Figures 5 to 9.

Package and Handling Information

Instructions on the shipping container label regarding exposure to moisture after the container seal is broken must be followed. Otherwise, problems related to moisture absorption may occur

when the part is subjected to high temperature during solder assembly.

The SMP1340 series is rated to Moisture Sensitivity Level 1 (MSL1) at 260 °C. It can be used for lead or lead-free soldering. For additional information, refer to the Skyworks Application Note, *Solder Reflow Information*, document number 200164

Care must be taken when attaching this product, whether it is done manually or in a production solder reflow environment. Production quantities of this product are shipped in a standard tape and reel format. For packaging details, refer to the Skyworks Application Note *Discrete Devices and IC Switch/Attenuators Tape and Reel Package Orientation*, document number 200083.

Table 3. SMP1340 Series Electrical Specifications (Note 1)
(T_A = +25 °C, Unless Otherwise Noted)

Parameter	Symbol	Test Condition	Min	Typical	Max	Units
Reverse current	I _R	V _R = 50 V			10	μA
Capacitance	C _T	F = 1 MHz, V = 5 V		0.21	0.30	pF
Resistance	R _S	F = 100 MHz				
		I = 1 mA		1.7		Ω
		I = 5 mA		1.0	2.0	Ω
		I = 10 mA		0.85	1.2	Ω
Forward voltage	V _F	I _F = 10 mA		0.85		V
Carrier lifetime	TI	I _F = 10 mA		100		ns
I region width				7		μm

Note 1: Performance is guaranteed only under the conditions listed in this Table and is not guaranteed over the full operating or storage temperature ranges. Operation at elevated temperatures may reduce reliability of the device.

Table 4. Resistance vs Temperature @ 500 MHz

I _F (mA)	R _S @ -55 °C (Ω)	R _S @ -40 °C (Ω)	R _S @ -15 °C (Ω)	R _S @ +25 °C (Ω)	R _S @ +65 °C (Ω)	R _S @ +85 °C (Ω)	R _S @ +100 °C (Ω)
0.02	9.92	9.68	9.30	8.95	8.95	9.01	9.12
0.10	3.90	3.86	3.79	3.80	3.85	3.94	4.03
0.30	2.32	2.33	2.30	2.33	2.35	2.43	2.49
0.50	1.91	1.93	1.90	1.92	1.92	1.99	2.05
1.0	1.54	1.55	1.52	1.53	1.50	1.56	1.61
10	0.95	0.96	0.91	0.90	0.82	0.85	0.89
20	0.86	0.87	0.82	0.81	0.73	0.75	0.79
100	0.72	0.73	0.70	0.68	0.59	0.62	0.65

Typical Performance Characteristics

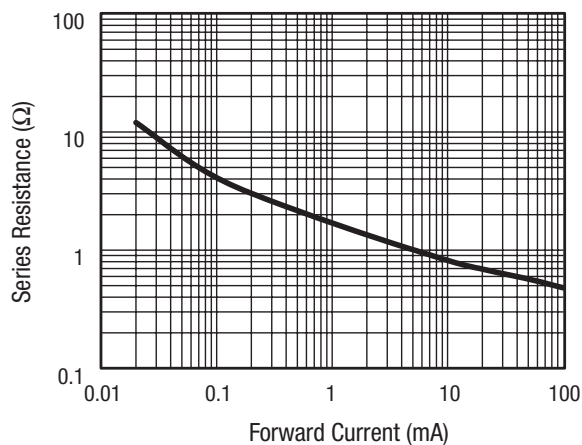


Figure 1. Series Resistance vs Current @ 100 MHz

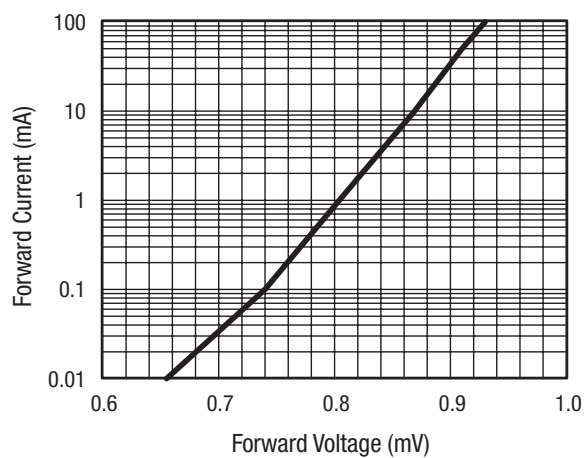


Figure 2. DC Characteristics

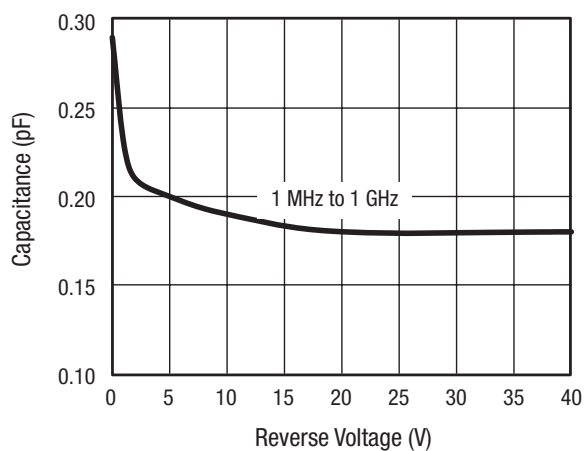


Figure 3. Capacitance vs Reverse Voltage

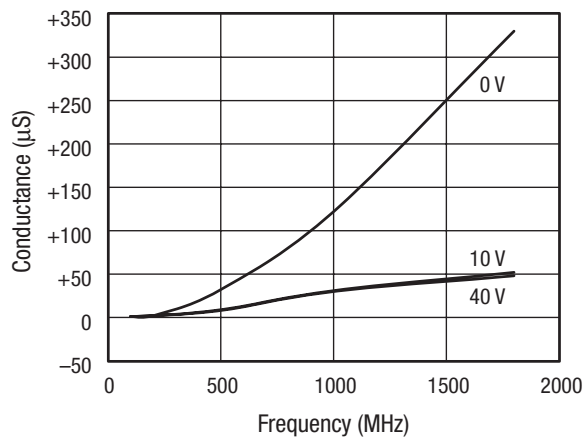
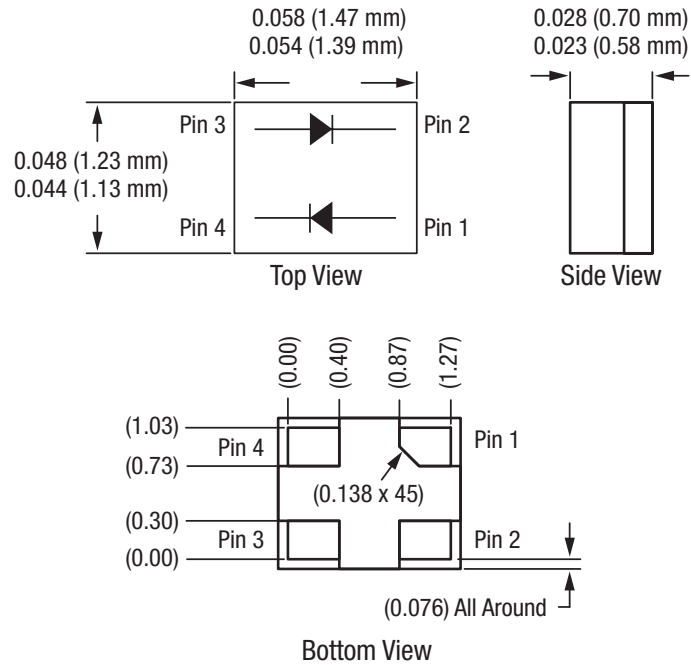


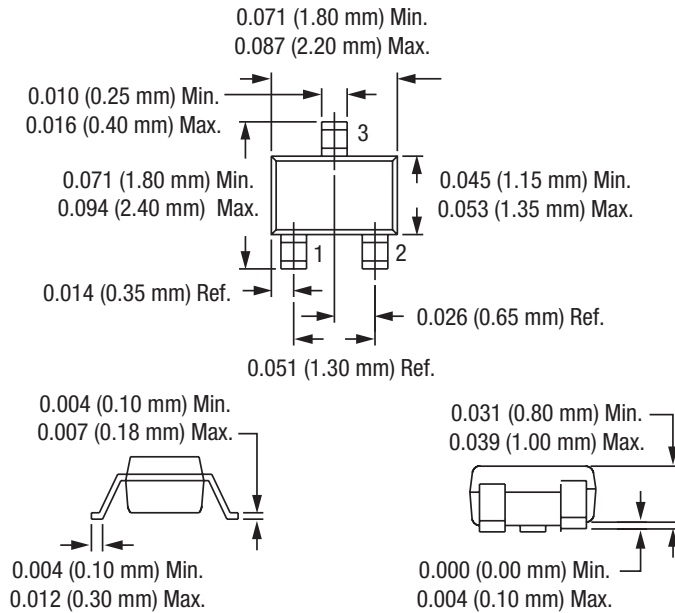
Figure 4. Conductance vs Frequency and Reverse Voltage



Dimensions are in inches (millimeters shown in parentheses)

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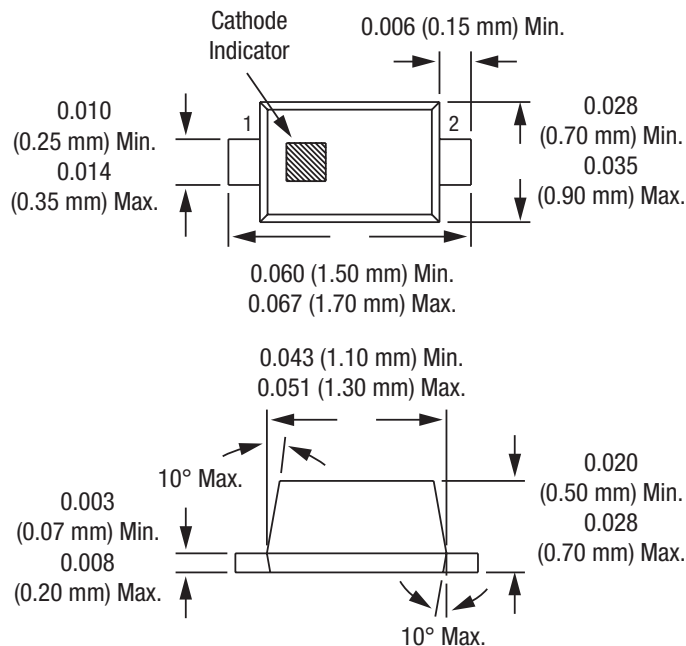
Figure 5. LGA Package Dimension Drawing



Dimensions are in inches (millimeters shown in parentheses)

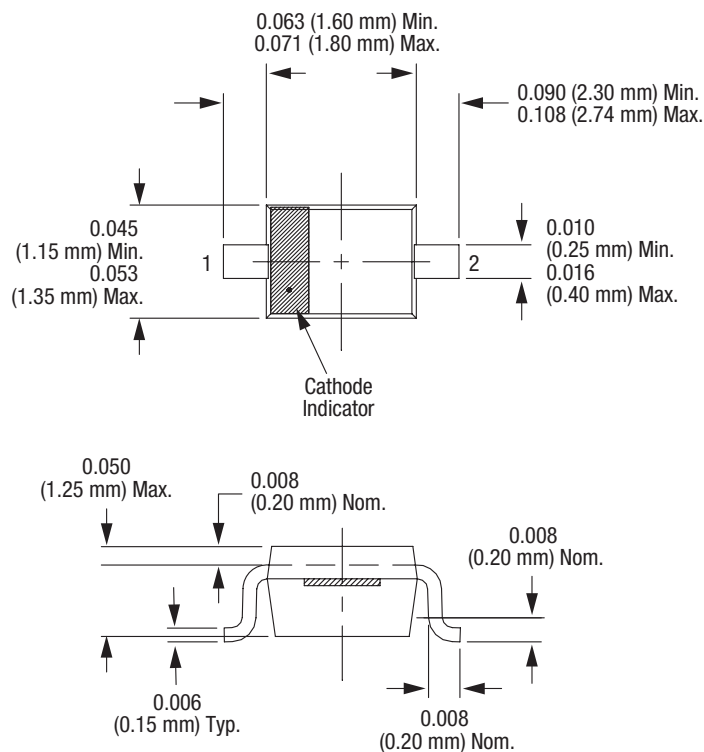
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Figure 6. SC-70 Package Dimension Drawing



Dimensions are in inches (millimeters shown in parentheses) **S1652**

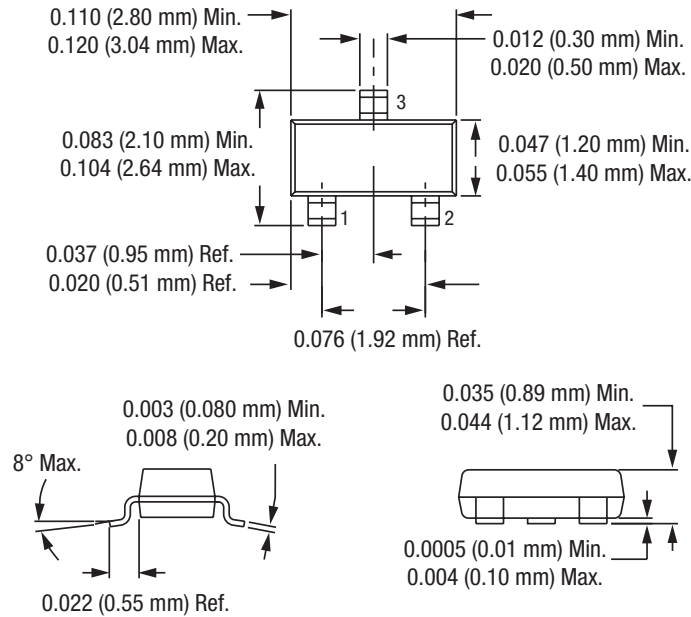
Figure 7. SC-79 Package Dimension Drawing



Dimensions are in inches (millimeters shown in parentheses)

S1619

Figure 8. SOD-323 Package Dimension Drawing



Dimensions are in inches (millimeters shown in parentheses)

S1389

Figure 9. SOT-23 Package Dimension Drawing

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