

DATA SHEET

# SMP1345 Series: Very Low Capacitance, Plastic Packaged Silicon PIN Diodes

## Features

- Designed for high-isolation LNB, WLAN and wireless switch applications
- Very low insertion loss (0.4 dB)
- 0.15 pF capacitance
- Available lead (Pb)-free and RoHS-compliant MSL-1 @ 250 °C per JEDEC J-STD-020
- Available in tape and reel packaging



## Description

The SMP1345 series of plastic packaged, surface mountable PIN diodes is designed for high-volume LNB, WLAN and switch applications from 10 MHz to 6 GHz. The short carrier lifetime of typically 100 ns, combined with its thin I region width of nominally, 10 μm, results in a fast speed, RF switching PIN diode. The RF performance of the SMP1345 series is assured by virtue of its very low capacitance (0.15 pF) and low resistance (1.5 Ω at 10 mA).

The SMP1345-518 has been specifically designed for WLAN 802.11 a, b, and g applications. It is ideally used for diversity switch applications.

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









## Absolute Maximum Ratings

Characteristic	Value
Reverse voltage ( $V_R$ )	50 V
Power dissipation @ 25 °C lead temperature ( $P_D$ )	250 mW
Storage temperature ( $T_{ST}$ )	-65 °C to +150 °C
Operating temperature ( $T_{OP}$ )	-65 °C to +150 °C
ESD human body model	Class 1B

Performance is guaranteed only under the conditions listed in the specifications table and is not guaranteed under the full range(s) described by the Absolute Maximum specifications. Exceeding any of the absolute maximum/minimum specifications may result in permanent damage to the device and will void the warranty.

**CAUTION:** Although this device is designed to be as robust as possible, ESD (Electrostatic Discharge) 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 must be employed at all times.

				
Common Anode	Common Cathode	Series Pair	Single	Ring
SOT-23	SOT-23	SOT-23	SC-79	LGA
<b>SMP1345-003</b> Marking: PU9	<b>SMP1345-004</b> Marking: PU3	<b>SMP1345-005</b> Marking: PU2	<b>SMP1345-079</b>	◆ <b>SMP1345-518</b> <b>Lead (Pb)-Free</b> Marking: 0
<b>SMP1345-003LF</b> Marking: RU9	<b>SMP1345-004LF</b> Marking: RU3	<b>SMP1345-005LF</b> Marking: RU2	<b>SMP1345-079LF</b>	
$L_S = 1.5 \text{ nH}$	$L_S = 1.5 \text{ nH}$	$L_S = 1.5 \text{ nH}$	$L_S = 0.7 \text{ nH}$	$L_S = 0.6 \text{ nH}$
		SC-70		
		<b>SMP1345-075LF</b> Marking: RU2		
		$L_S = 1.4 \text{ nH}$		

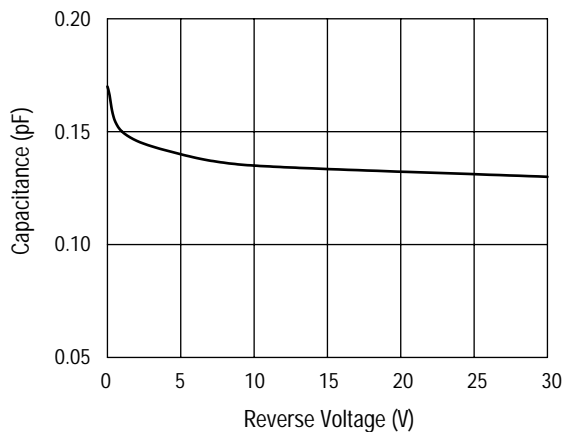
 LF denotes lead (Pb)-free, RoHS-compliant packaging option as an alternative to our standard tin/lead (Sn/Pb) packaging.

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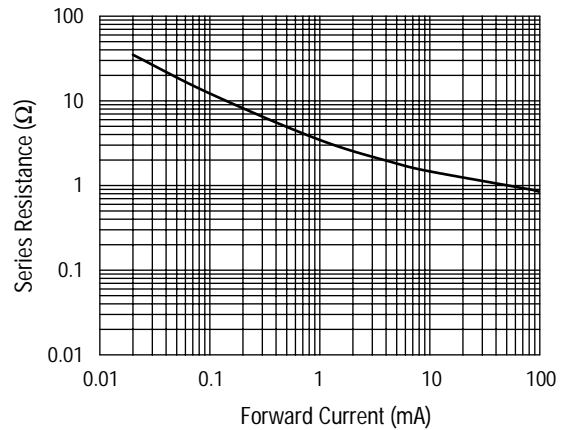
### Electrical Specifications at 25 °C

Parameter	Condition	Typ.	Max.	Unit
Reverse current ( $I_R$ )	$V_R = 50 \text{ V}$		10	$\mu\text{A}$
Capacitance ( $C_T$ )	$F = 1 \text{ MHz}, V = 1 \text{ V}$	0.19		$\text{pF}$
Capacitance ( $C_T$ )	$F = 1 \text{ MHz}, V = 5 \text{ V}$	0.18	0.2	$\text{pF}$
Resistance ( $R_S$ )	$F = 100 \text{ MHz}, I = 1 \text{ mA}$	3.5		$\Omega$
Resistance ( $R_S$ )	$F = 100 \text{ MHz}, I = 10 \text{ mA}$	1.5	2	$\Omega$
Forward voltage ( $V_F$ )	$I_F = 10 \text{ mA}$	0.89		V
Carrier lifetime (TI)	$I_F = 10 \text{ mA}$	100		ns
I region width		10		$\mu\text{m}$

### Typical Performance Data



**Total Capacitance vs. Reverse Voltage  
Measured in an SC-79 Package**

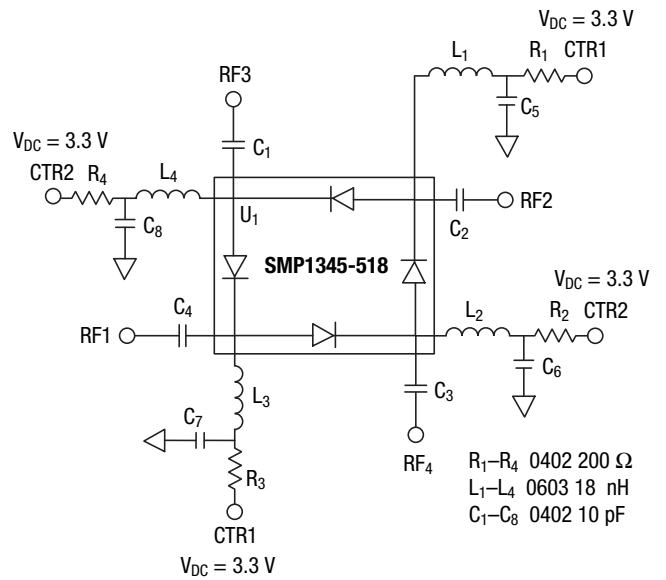


**Series Resistance vs. Current @ 100 MHz**

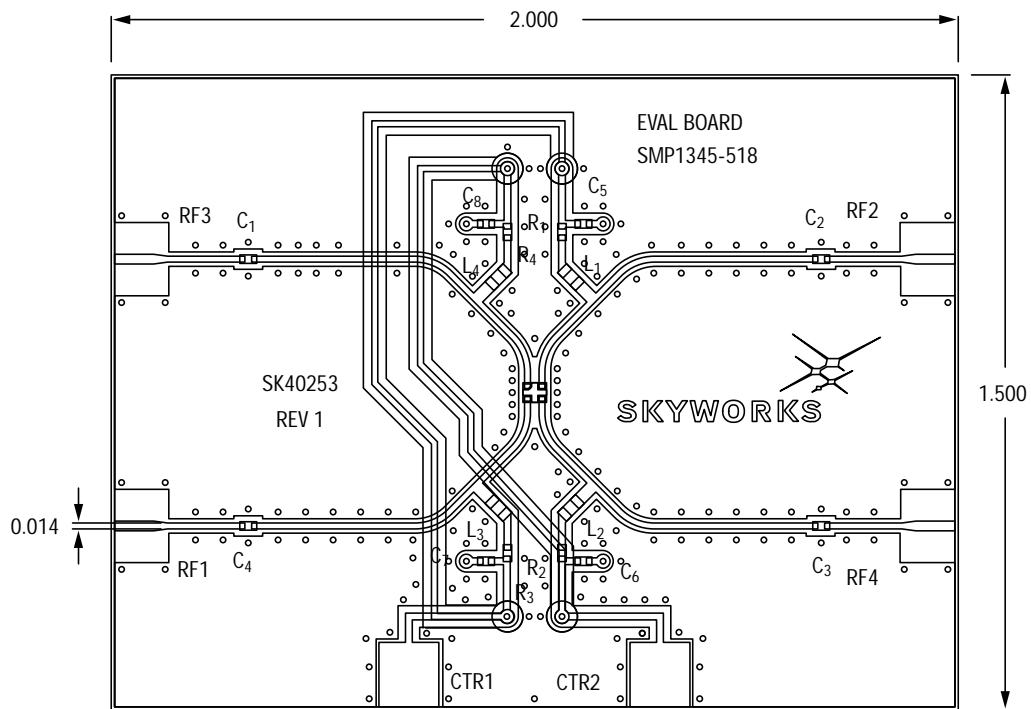
**Truth Table**

CTR1	CTR2	Low Loss Paths
3.3 V	0 V	RF1-RF4 RF2-RF3
0 V	3.3 V	RF1-RF3 RF2-RF4

**WLAN Application Circuit for DPDT Diversity Switch Using SMP1345-518**

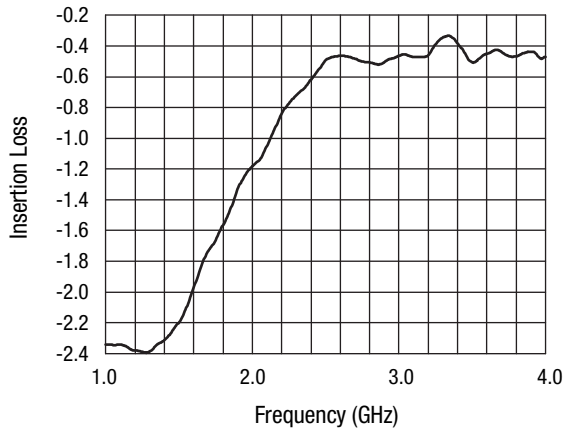


**Bridge Switch Schematic**

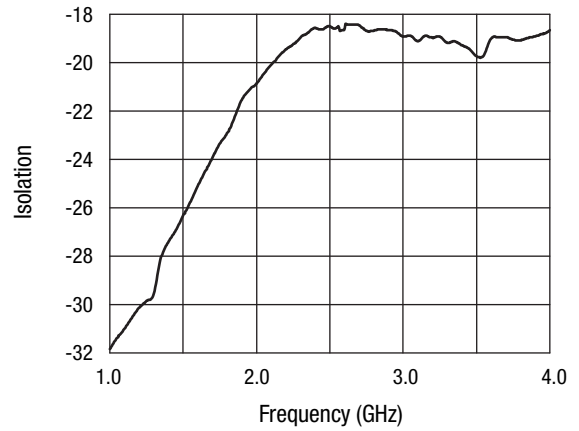


**Evaluation Board**

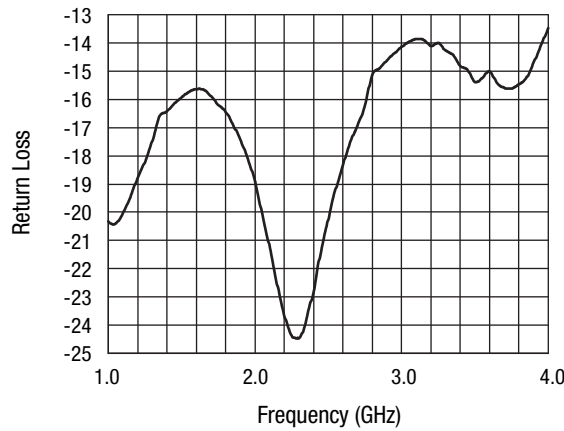
**Typical Performance Data For SMP1345-518**



**Insertion Loss vs. Frequency**



**Isolation vs. Frequency**



**Return Loss vs. Frequency**

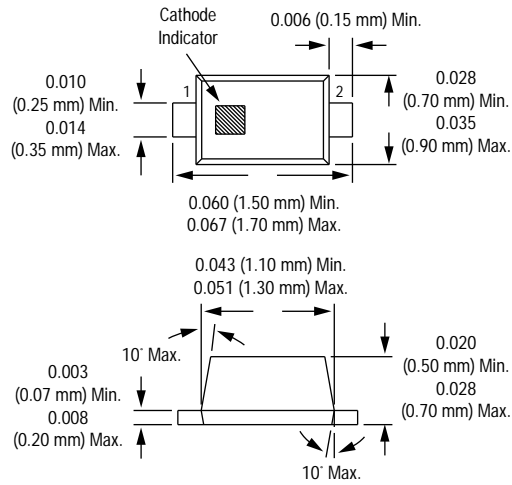
**Recommended Solder Reflow Profiles**

Refer to the [“Recommended Solder Reflow Profile”](#) Application Note.

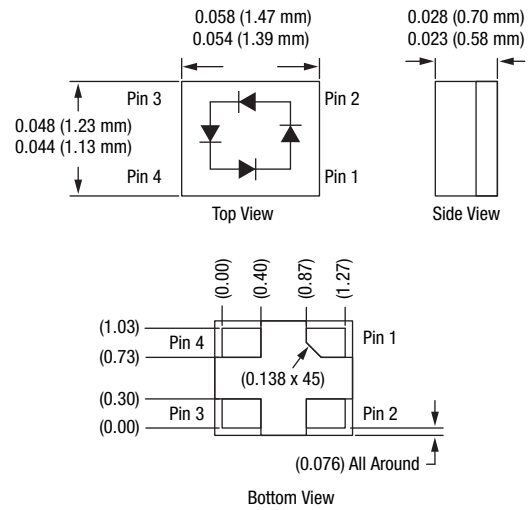
**Tape and Reel Information**

Refer to the [“Discrete Devices and IC Switch/Attenuators Tape and Reel Package Orientation”](#) Application Note.

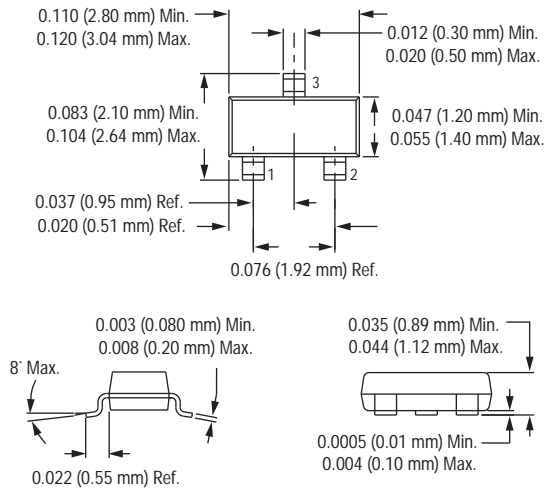
**SC-79**



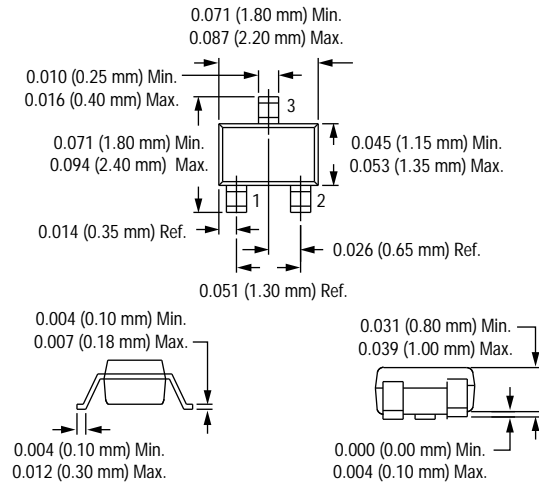
**LGA**



**SOT-23**



**SC-70**



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