SKYWORKS®

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 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 "environmentally friendly" packaging that is RoHS compliant (European Parliament for the Restriction of Hazardous Substances).

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, 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 must be employed at all times.*

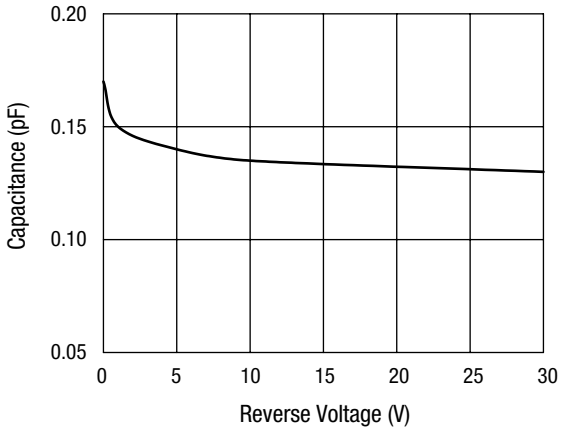
				
Common Anode	Common Cathode	Series Pair	Single	Ring
SOT-23	SOT-23	SOT-23	SC-79	LGA
SMP1345-003 Marking: PU9	**SMP1345-004** Marking: PU3	**SMP1345-005** Marking: PU2	**SMP1345-079**	**SMP1345-518 Lead (Pb)-Free** Marking: 0
SMP1345-003LF Marking: RU9	**SMP1345-004LF** Marking: RU3	**SMP1345-005LF** Marking: RU2	**SMP1345-079LF**	
L_S = 1.5 nH	L_S= 1.5 nH	L_S= 1.5 nH	L_S= 0.7 nH	L_S= 0.6 nH

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

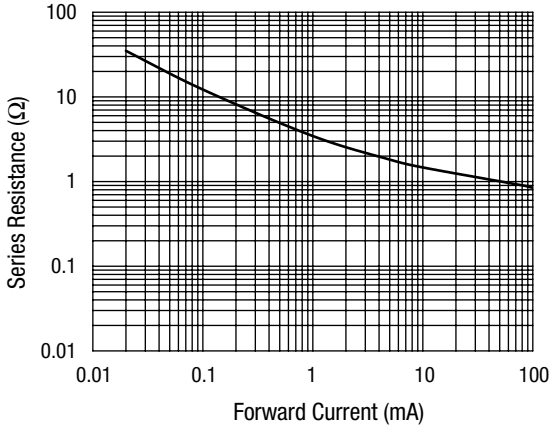
Electrical Specifications at 25 °C

Parameter	Condition	Typ.	Max.	Unit
Reverse current (I_R)	V_R = 50 V		10	µA
Capacitance (C_T)	F = 1 MHz, V = 1 V	0.19		pF
Capacitance (C_T)	F = 1 MHz, V = 5 V	0.18	0.20	pF
Resistance (R_S)	F = 100 MHz, I = 1 mA	3.50		Ω
Resistance (R_S)	F = 100 MHz, I = 10 mA	1.50	2.00	Ω
Forward voltage (V_F)	I_F = 10 mA	0.89		V
Carrier lifetime (TI)	I_F = 10 mA	100		ns
I region width		10		µm

Typical Performance Data



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

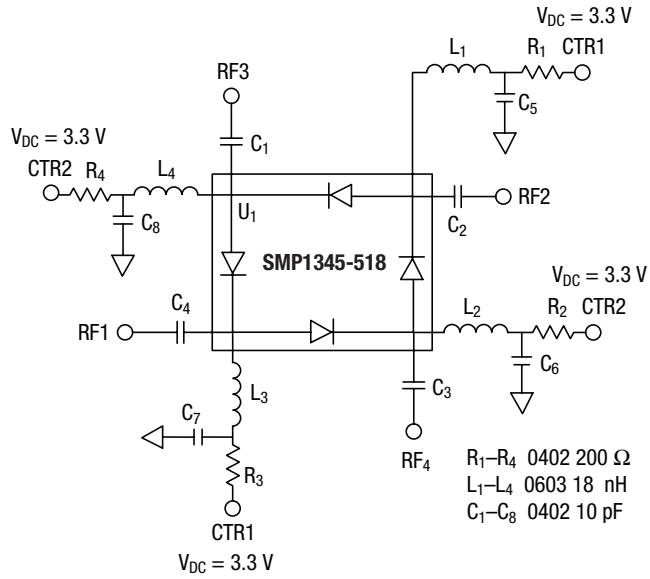


Series Resistance vs. Current @ 100 MHz

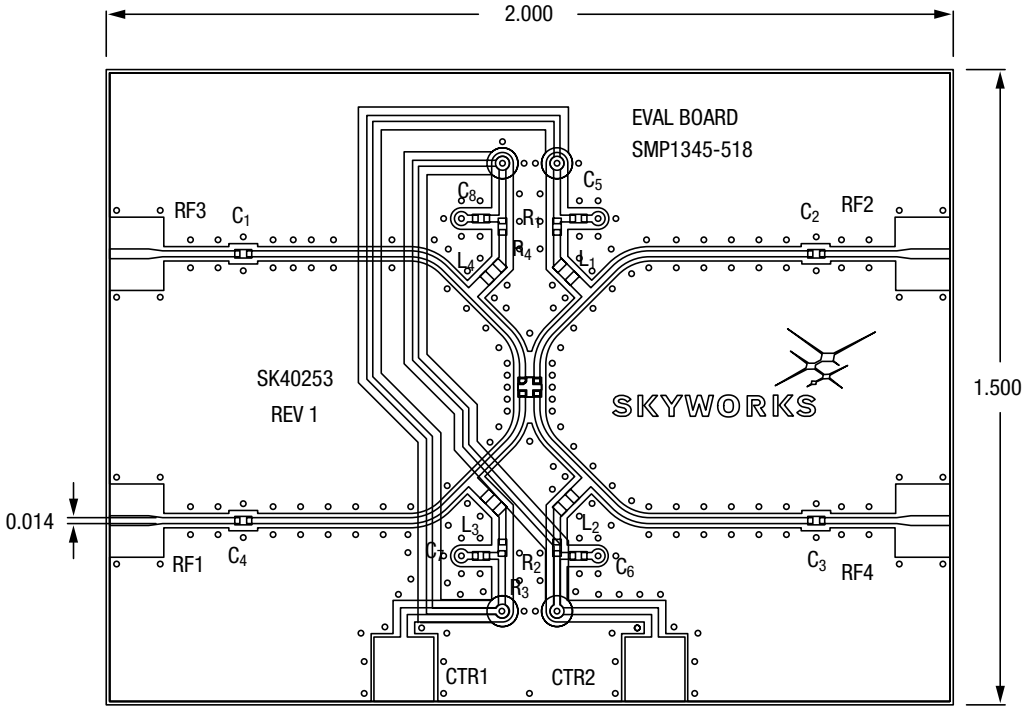
Truth Table

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

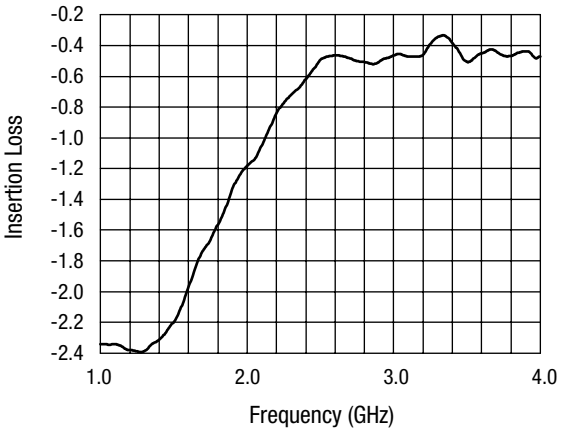


Bridge Switch Schematic

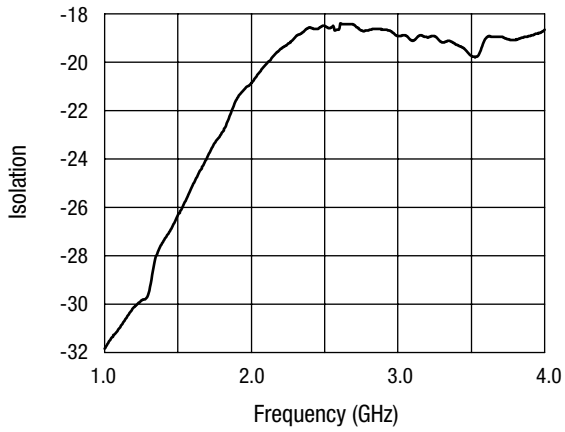


Evaluation Board

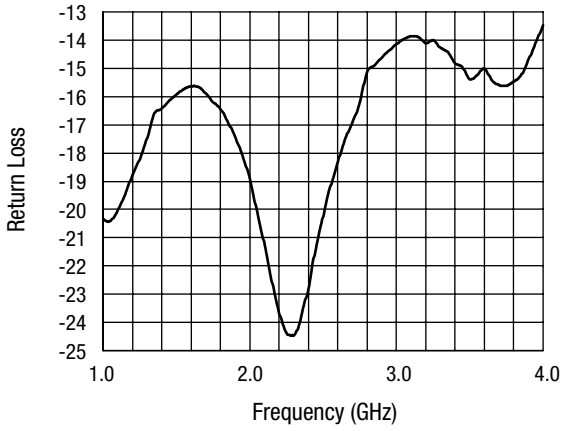
Typical Performance Data For SMP1345-518



Insertion Loss vs. Frequency



Isolation vs. Frequency

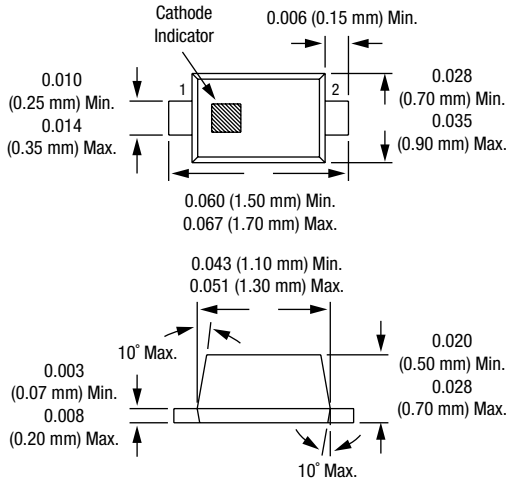


Return Loss vs. Frequency

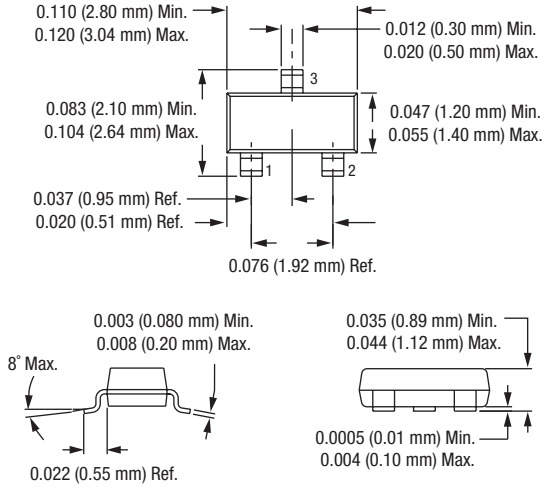
Recommended Solder Reflow Profiles

Refer to the “Recommended Solder Reflow Profile” Application Note.

SC-79



SOT-23



LGA