

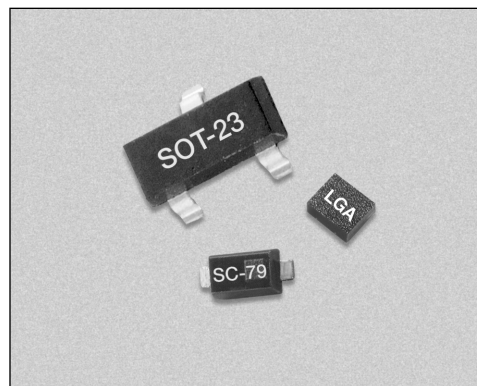
Very Low Capacitance Plastic Packaged Silicon PIN Diodes



SMP1345 Series

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 are 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 μ m, 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 Lead (Pb)-Free “environmentally friendly” packaging available: Skyworks offers the SMP1345-079LF and SMP1345-518 Lead (Pb)-Free package as a green alternative.

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

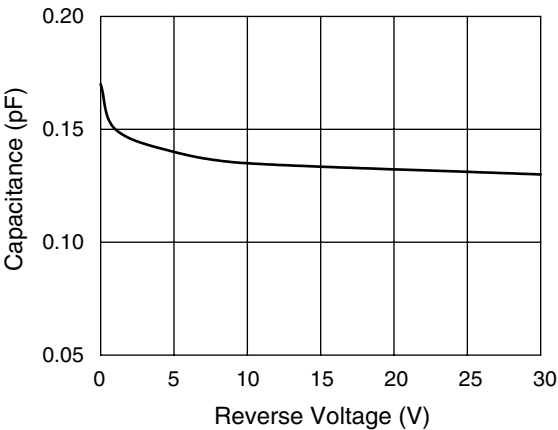
Common Anode	Common Cathode	Series Pair	Single	Ring
Marking: PU9	Marking: PU3	Marking: PU2		
SOT-23	SOT-23	SOT-23	SC-79	LGA
SMP1345-003	SMP1345-004	SMP1345-005	SMP1345-079	SMP1345-518
			SMP1345-079LF	
$L_S = 1.5$ nH	$L_S = 1.5$ nH	$L_S = 1.5$ nH	$L_S = 0.7$ nH	$L_S = 0.6$ nH

LF denotes Lead (Pb)-Free packaging.

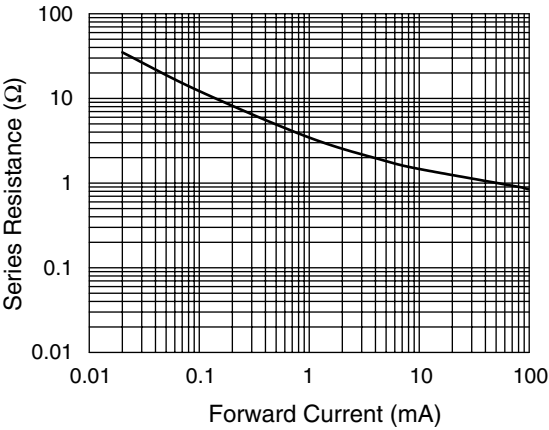
Electrical Specifications at 25°C

Parameter	Condition	Typ.	Max.	Unit
Reverse Current (I_R)	$V_R = 50\text{ V}$		10	μA
Capacitance (C_T)	$F = 1\text{ MHz}, V = 1\text{ V}$	0.19		pF
Capacitance (C_T)	$F = 1\text{ MHz}, V = 5\text{ V}$	0.18	0.20	pF
Resistance (R_S)	$F = 100\text{ MHz}, I = 1\text{ mA}$	3.50		Ω
Resistance (R_S)	$F = 100\text{ MHz}, I = 10\text{ mA}$	1.50	2.00	Ω
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		μm

Typical Performance Data

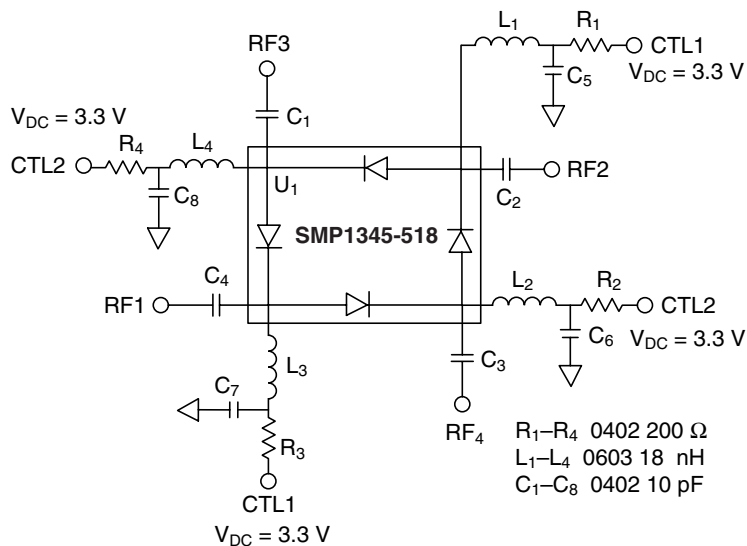


Total Capacitance vs. Reverse Voltage
Measured in an SC-79 Package

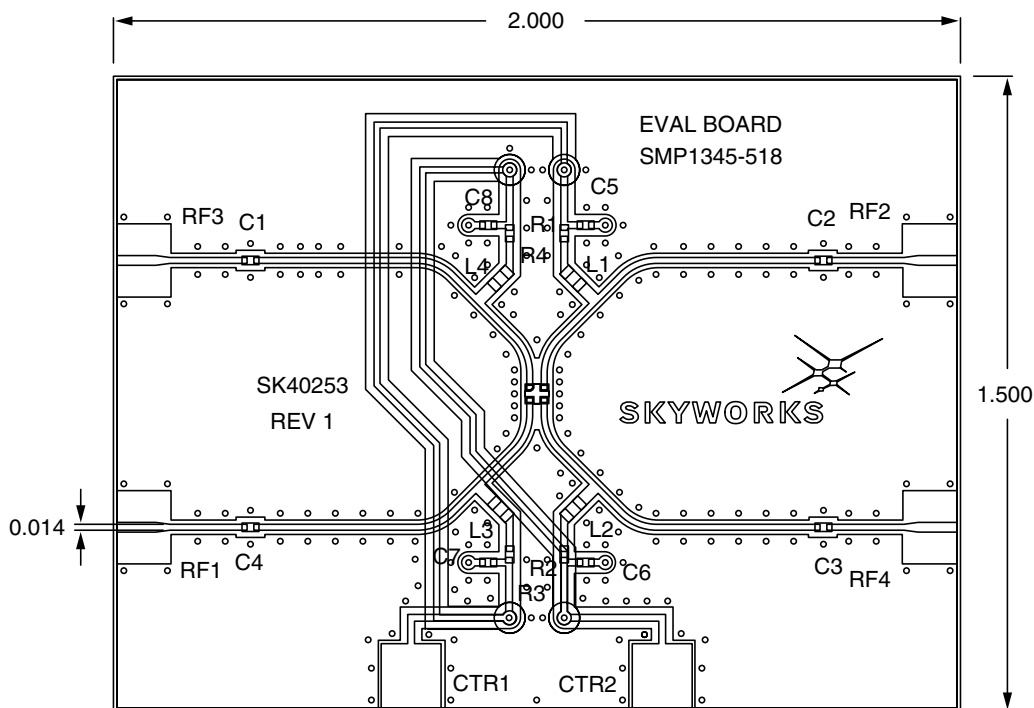


Series Resistance vs. Current @ 100 MHz

WLAN Application Circuit for DPDT Diversity Switch Using SMP1345-518

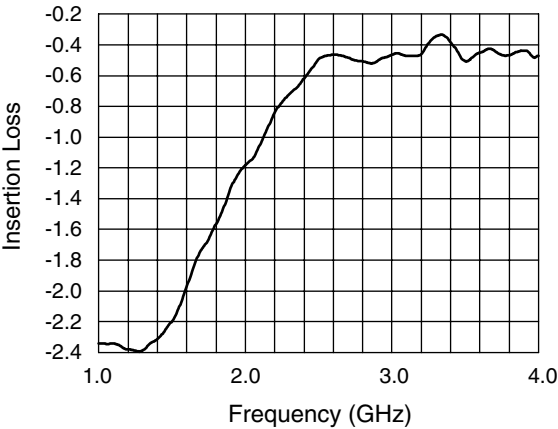


Bridge Switch Schematic

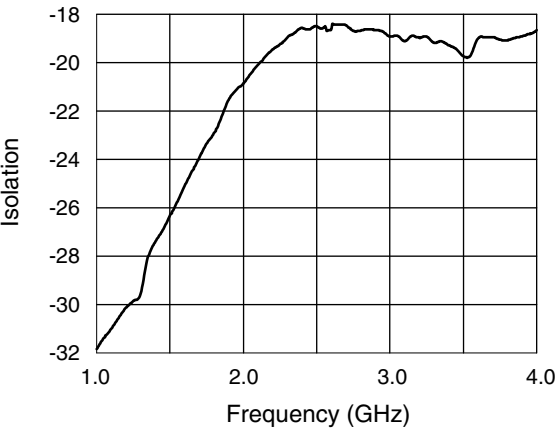


Evaluation Board

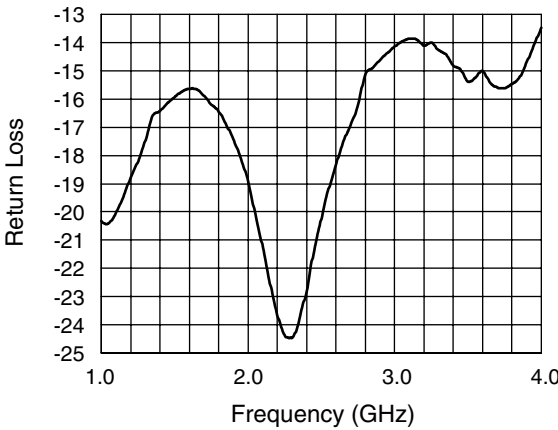
Typical Performance Data For SMP1345-518



Insertion Loss vs. Frequency



Isolation vs. Frequency

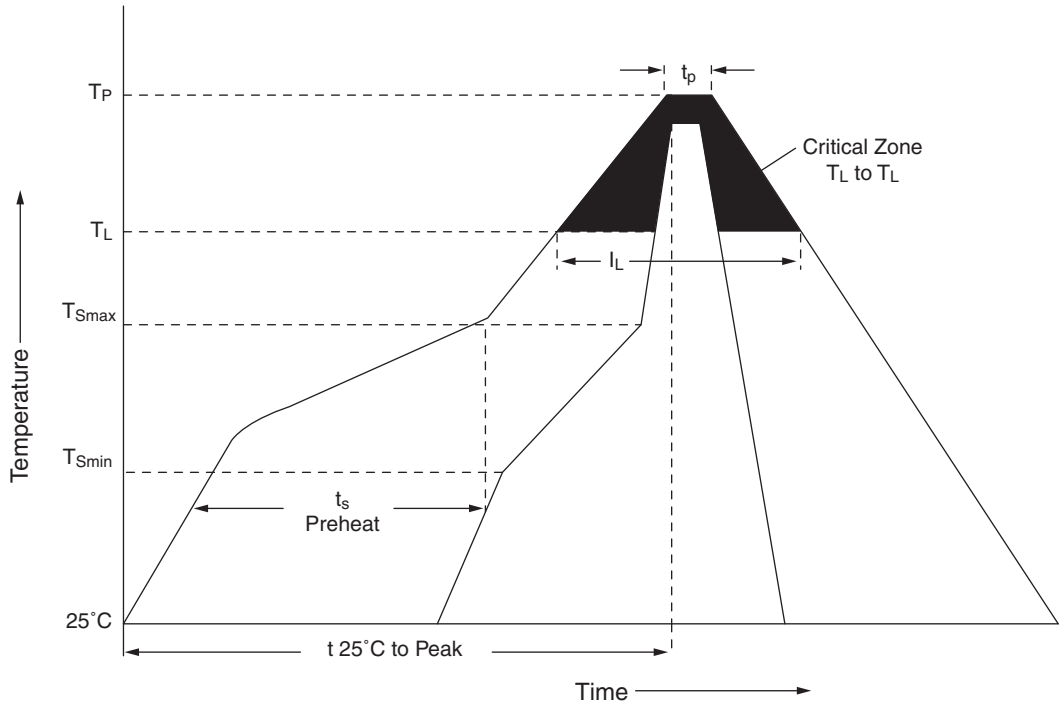


Return Loss vs. Frequency

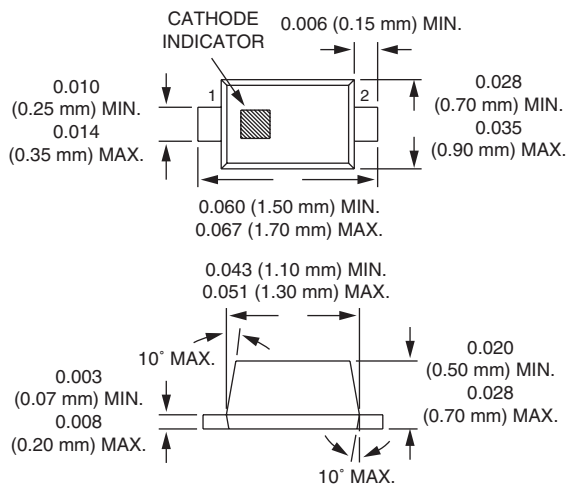
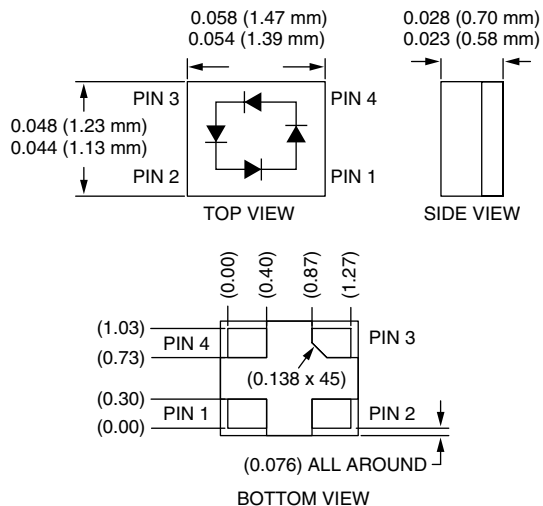
Recommended Solder Reflow Profiles

Profile Feature	SnPb Eutectic Assembly	Lead (Pb)-Free Assembly 100% Sn
Average Ramp-Up Rate (T_L to T_P)	3°C/Second Max.	3°C/Second Max.
Preheat Temperature Min. (T_{Smin}) Temperature Max. (T_{Smax}) Time (Min. to Max.) (t_s)	100°C 150°C 60–120 Seconds	150°C 200°C 60–80 Seconds
T_{Smax} to T_L Ramp-up Rate	—	3°C/Second Max.
Time Maintained Above: Temperature (T_L) Time (t_L)	183°C 60–150 Seconds	217°C 60–150 Seconds
Peak Temperature (T_P)	240 +0/-5°C	250 +0/-5°C
Time Within 5°C of Actual Peak Temperature (t_p)	10–30 Seconds	20–40 Seconds
Ramp-Down Rate	6°C/Second Max.	6°C/Second Max.
Time 25°C to Peak Temperature	6 Minutes Max.	8 Minutes Max.

All temperatures refer to the topside of the package, measured on the package body surface.
Reference JEDEC J-STD-020B.



Reference JEDEC J-STD-020

SC-79**LGA****SOT-23**