

DATA SHEET

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

Features

- Designed for fast speed wireless switch applications
- 1.0 Ω resistance, 0.3 pF capacitance
- Available lead (Pb)-free MSL-1 @ 250 °C per JEDEC J-STD-020
- Available in tape and reel packaging

Description

The SMP1340 series of plastic packaged, surface mountable PIN diodes are designed for high volume switch applications from 10 MHz to beyond 2 GHz. The short carrier lifetime of typically 100 ns, combined with its thin I region width of nominally 7 μm , results in a fast speed RF switching PIN diode. The RF performance of the SMP1340 series is assured by virtue of its low capacitance (0.3 pF) and low resistance (1.0 Ω at 10 mA).

The SMP1340-508 has been specifically designed for WLAN 802.11 a, b, and g applications.



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.

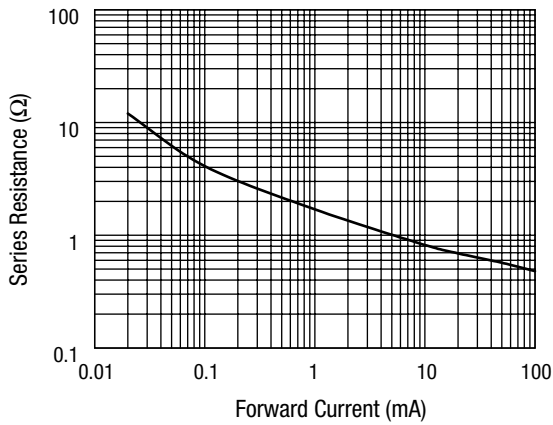
Single	Common Anode	Common Cathode	Series Pair	Single	Common Cathode	Single	Anti-Parallel
SOT-23	SOT-23	SOT-23	SOT-23	SOD-323	SC-70	SC-79	LGA
SMP1340-001	SMP1340-003	SMP1340-004	SMP1340-005	SMP1340-011	SMP1340-074	SMP1340-079	SMP1340-508 Lead (Pb)-Free
Marking: PS1	Marking: PS9	Marking: PS3	Marking: PS2	Marking: PS	Marking: PS3		Marking: X
		SMP1340-004LF	SMP1340-005LF			SMP1340-079LF	
		Marking: RS3	Marking: RS2				
$L_S = 1.5$ nH	$L_S = 1.5$ nH	$L_S = 1.5$ nH	$L_S = 1.5$ nH	$L_S = 1.5$ nH	$L_S = 1.4$ 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.

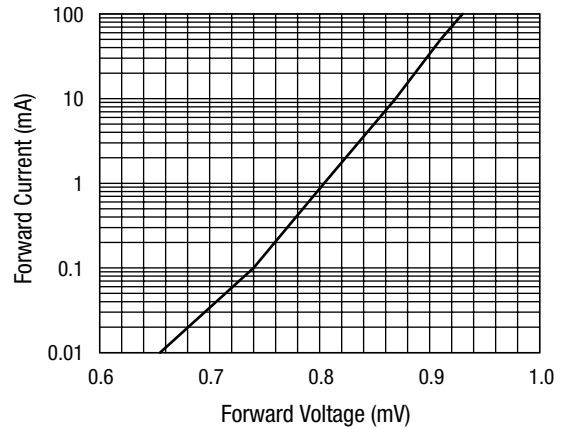
Electrical Specifications at 25 °C

Parameter	Condition	Typ.	Max.	Unit
Reverse current (I_R)	$V_R = 50$ V		10	μ A
Capacitance (C_T)	$F = 1$ MHz, $V = 5$ V	0.21	0.30	pF
Resistance (R_S)	$F = 100$ MHz, $I = 1$ mA	1.70		Ω
Resistance (R_S)	$F = 100$ MHz, $I = 5$ mA	1.00	2.00	Ω
Resistance (R_S)	$F = 100$ MHz, $I = 10$ mA	0.85	1.20	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		μ m

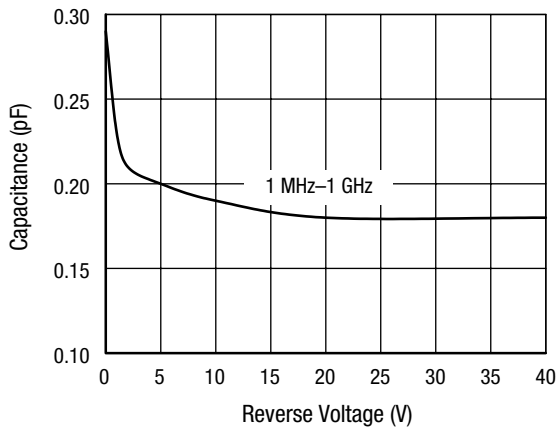
Typical Performance Data



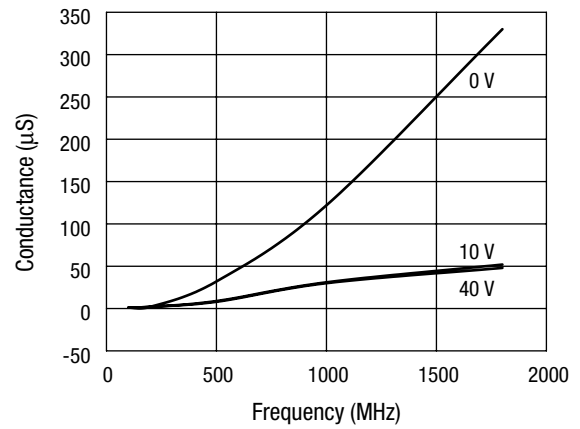
Series Resistance vs. Current @ 100 MHz



DC Characteristic



Capacitance vs. Reverse Voltage

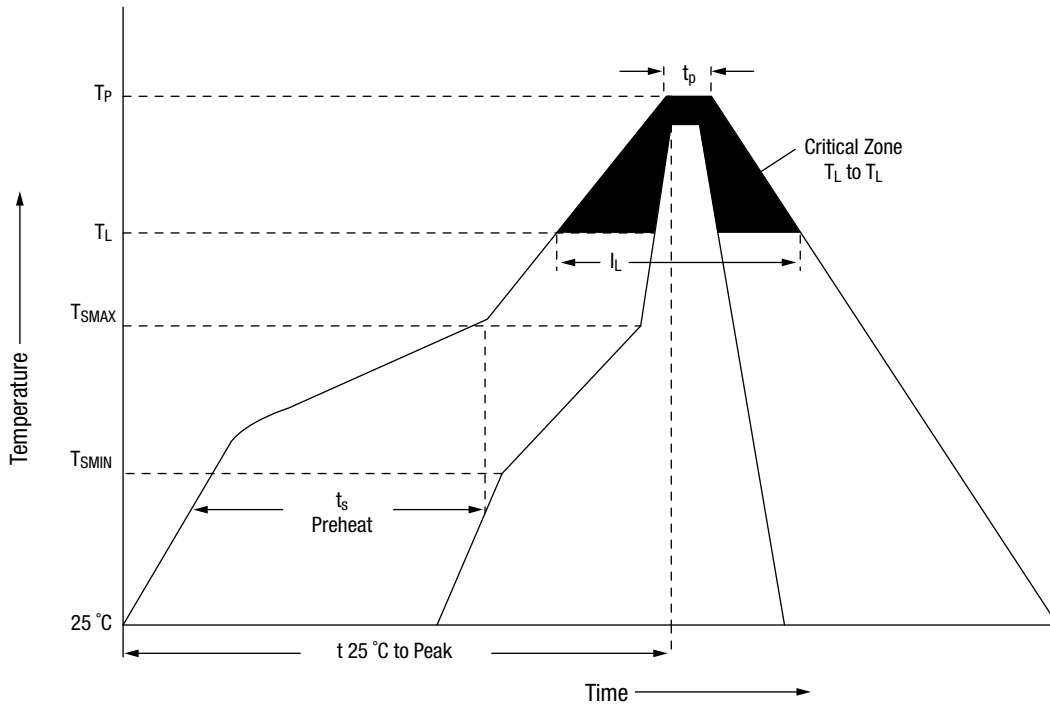


Conductance vs. Frequency and Reverse Voltage

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.) (ts)	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 (tp)	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 top side of the package, measured on the package body surface.
Reference JEDEC J-STD-020B.

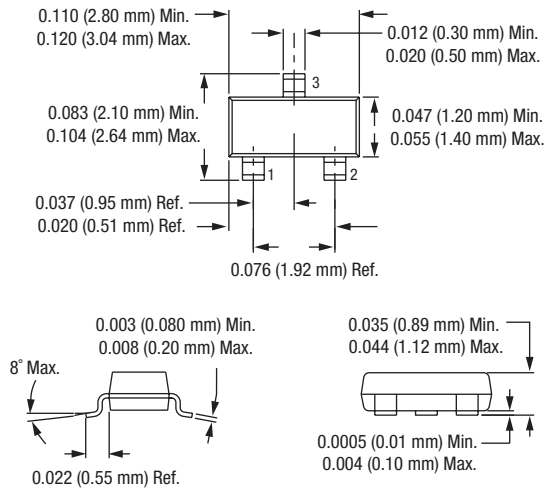


Reference JEDEC J-STD-020

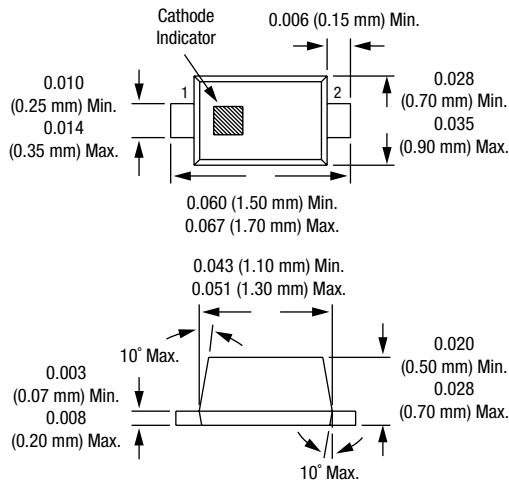
Resistance vs. Temperature @ 500 MHz

I_F (mA)	R -55 °C (Ω)	R -40 °C (Ω)	R -15 °C (Ω)	R +25 °C (Ω)	R +65 °C (Ω)	R +85 °C (Ω)	R +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
1.00	1.54	1.55	1.52	1.53	1.50	1.56	1.61
10.00	0.95	0.96	0.91	0.90	0.82	0.85	0.89
20.00	0.86	0.87	0.82	0.81	0.73	0.75	0.79
100.00	0.72	0.73	0.70	0.68	0.59	0.62	0.65

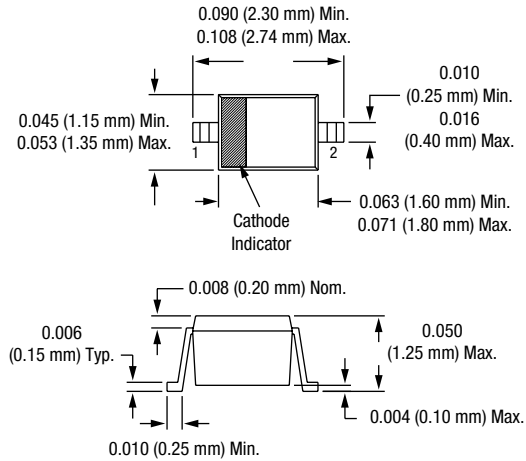
SOT-23



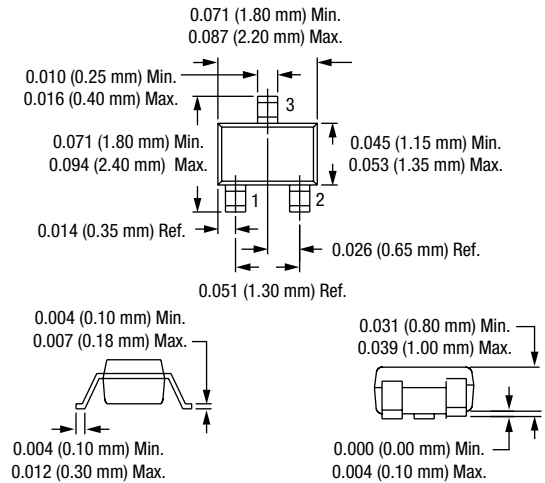
SC-79



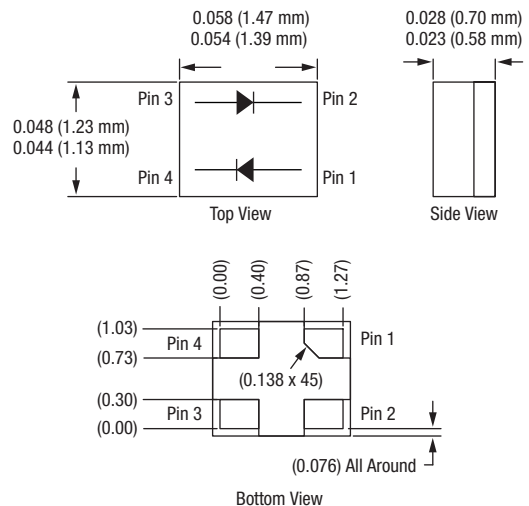
SOD-323



SC-70



LGA



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