

Fast Switching Speed, Low Capacitance Plastic Packaged PIN Diodes



SMP1340 Series

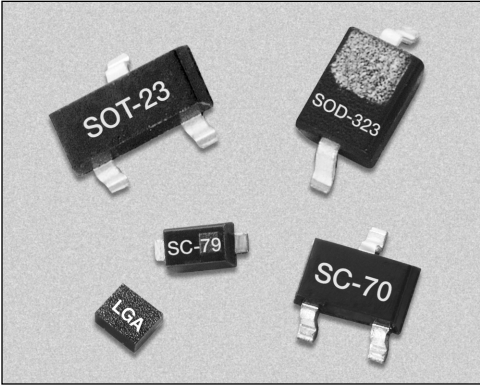
Features

- 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.

NEW Lead (Pb)-Free “environmentally friendly” packaging available: Skyworks offers the SMP1340-079LF and SMP1340-508 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

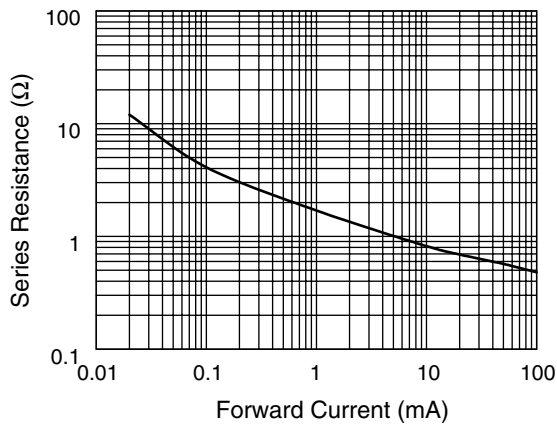
Single	Common Anode	Common Cathode	Series Pair	Single	Common Cathode	Single	Anti-Parallel
Marking: PS1	Marking: PS9	Marking: PS3	Marking: PS2		Marking: PS3		Marking: X
SOT-23	SOT-23	SOT-23	SOT-23	SOD-323	SC-70	SC-79	LGA
SMP1340-001	SMP1340-003	SMP1340-004	SMP1340-005	SMP1340-011	SMP1340-074	SMP1340-079	SMP1340-508
						SMP1340-079LF	
$L_S = 1.5 \text{ nH}$	$L_S = 1.5 \text{ nH}$	$L_S = 1.5 \text{ nH}$	$L_S = 1.5 \text{ nH}$	$L_S = 1.5 \text{ nH}$	$L_S = 1.4 \text{ nH}$	$L_S = 0.7 \text{ nH}$	$L_S = 0.6 \text{ nH}$

LF denotes Lead (Pb)-Free packaging.

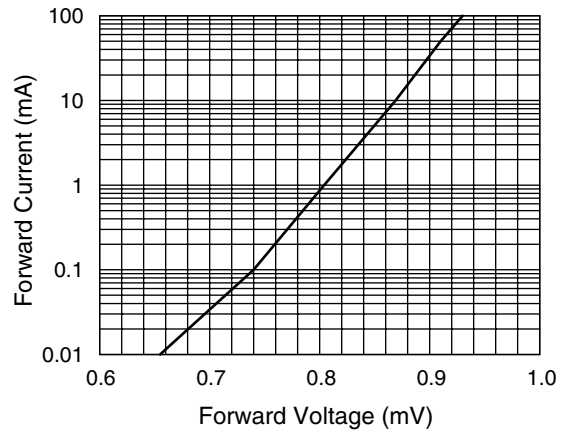
Electrical Specifications at 25°C

Parameter	Condition	Typ.	Max.	Unit
Reverse Current (I_R)	$V_R = 50\text{ V}$		10	μA
Capacitance (C_T)	$F = 1\text{ MHz}, V = 5\text{ V}$	0.21	0.30	pF
Resistance (R_S)	$F = 100\text{ MHz}, I = 1\text{ mA}$	1.7		Ω
Resistance (R_S)	$F = 100\text{ MHz}, I = 5\text{ mA}$	1.0	2.0	Ω
Resistance (R_S)	$F = 100\text{ MHz}, I = 10\text{ mA}$	0.85	1.2	Ω
Forward Voltage (V_F)	$I_F = 10\text{ mA}$	0.85		V
Carrier Lifetime (τ_I)	$I_F = 10\text{ mA}$	100		nS
I Region Width		7		μm

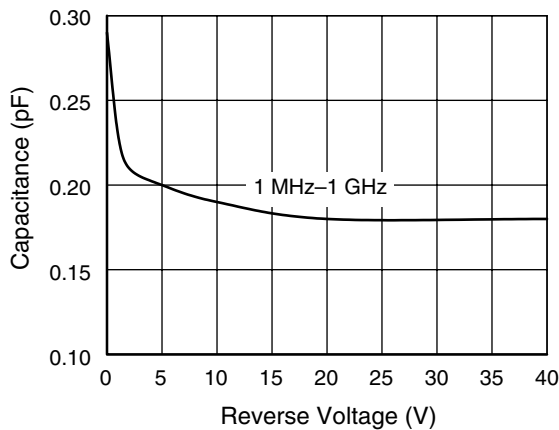
Typical Performance Data



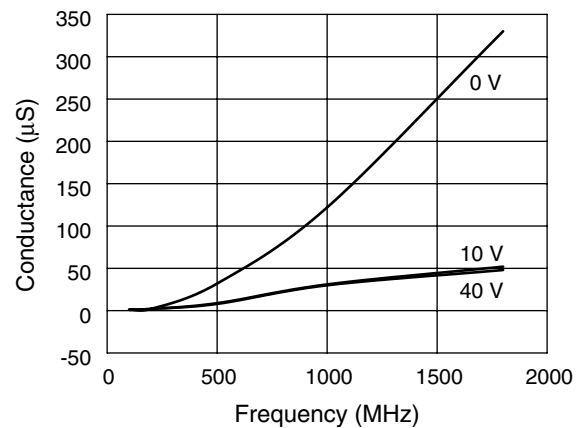
Series Resistance vs. Current @ 100 MHz



DC Characteristic



Capacitance vs. Reverse Voltage

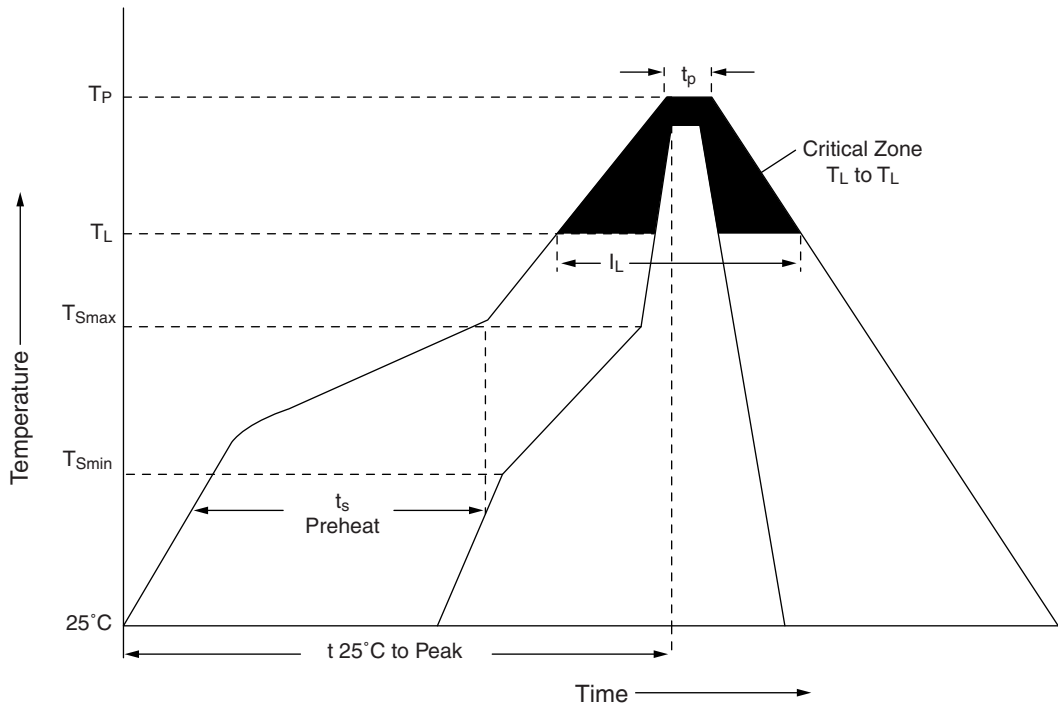


Conductance vs. Frequency and Reverse Voltage

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})	100°C	150°C
Temperature Max. (T_{Smax})	150°C	200°C
Time (Min. to Max.) (t_s)	60–120 Seconds	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.

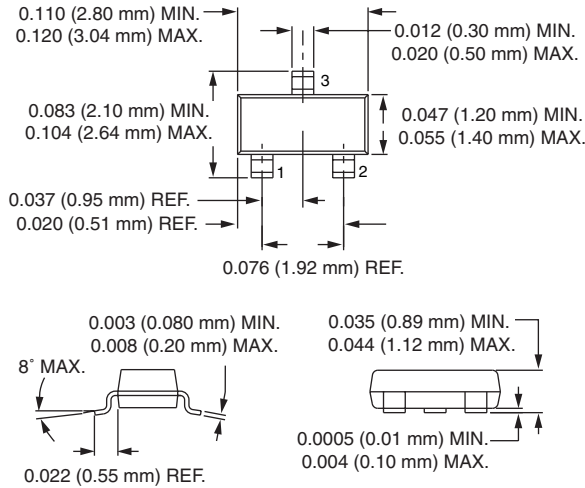


Reference JEDEC J-STD-020

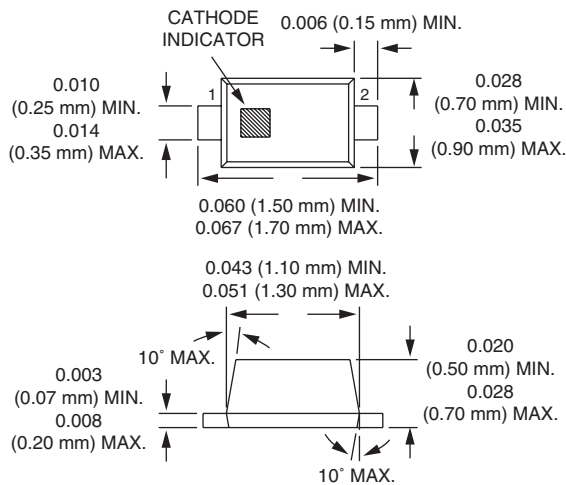
Resistance vs. Temperature @ 500 MHz

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

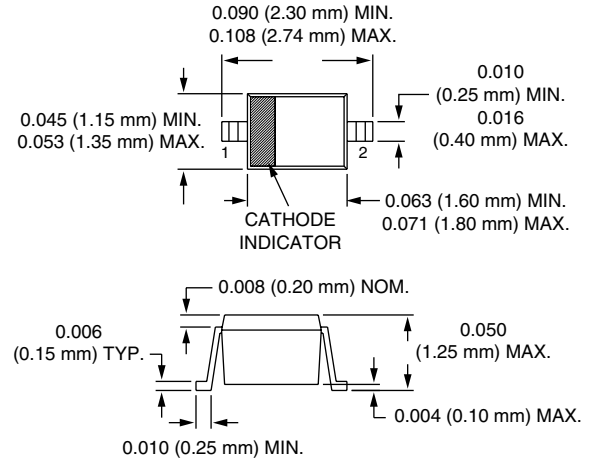
SOT-23



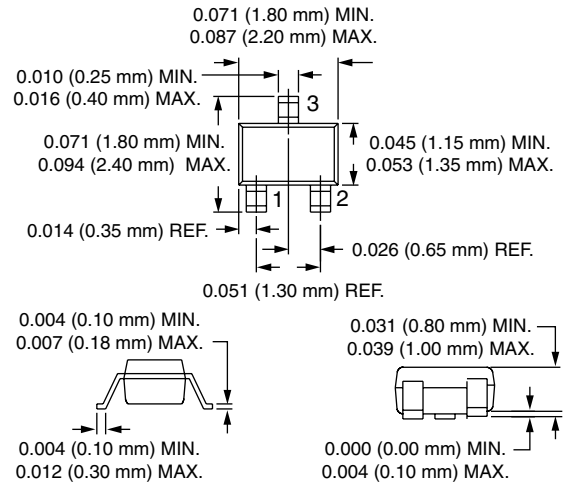
SC-79



SOD-323



SC-70



LGA

