

DATA SHEET

# SMP1345-040LF: 0402 Surface Mount PIN Diode

## Applications

- WLAN, WiMAX, cellular handsets
- Cellular infrastructure
- RFID readers
- Test instruments
- High isolation switches
- Series diode switches



## Features

- Low total capacitance: 0.2 pF maximum @ 5 V
- Low-series resistance: 2  $\Omega$  maximum @ 10 mA
- Industry-standard 0402 footprint
- Packages rated MSL1, 260 °C per JEDEC J-STD-020

**NEW**



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

## Description

The SMP1345-040LF is a surface mountable PIN diode excellent for use as a series element in an RF switch or attenuator circuit.

Maximum resistance at 10 mA is 2  $\Omega$  and maximum capacitance at 5 V is 0.2 pF. The combination of low capacitance, low parasitic inductance, and nominal 10  $\mu\text{m}$  I-region width, makes the SMP1345-040LF useful in fast, high isolation switch applications.

Design information for high power switches may be found in the Skyworks Application Note, *Design With PIN Diodes* (document number 200312).

**Table 1. SMP1345-040LF Absolute Maximum Ratings**

Parameter	Symbol	Minimum	Maximum	Units
Forward current	I <sub>F</sub>		150	mA
Reverse voltage	V <sub>R</sub>		50	V
Dissipated power @ 25 °C	P <sub>D</sub>		750	mW
Storage temperature	T <sub>STG</sub>	-55	+200	°C
Junction temperature	T <sub>J</sub>	-55	+175	°C
Solder interface temperature	T <sub>S</sub>	-40	+85	°C

**Note:** Exposure to maximum rating conditions for extended periods may reduce device reliability. There is no damage to device with only one parameter set at the limit and all other parameters set at or below their nominal value. Exceeding any of the limits listed here may result in permanent damage to the device.

**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 should be used at all times.

**Table 2. SMP1345-040LF Electrical Specifications (Note 1)**  
**(T<sub>S</sub> = +25 °C, Characteristic Impedance [Z<sub>0</sub>] = 50 Ω, Unless Otherwise Noted)**

Parameter	Symbol	Test Condition	Min	Typical	Max	Units
Forward voltage	V <sub>F</sub>	I <sub>F</sub> = 10 mA		0.89		V
Reverse leakage current	I <sub>R</sub>	V <sub>R</sub> = 50 V			10	μA
Series resistance	R <sub>S1</sub>	I <sub>F</sub> = 1 mA, f = 100 MHz		3.5		Ω
	R <sub>S10</sub>	I <sub>F</sub> = 10 mA, f = 100 MHz		1.5	2.0	Ω
Series inductance	L <sub>S</sub>			0.45		nH
Total capacitance	C <sub>T1</sub>	V <sub>R</sub> = 1 V, f = 1 MHz		0.14		pF
	C <sub>T5</sub>	V <sub>R</sub> = 5 V, f = 1 MHz		0.12	0.20	pF
Minority carrier lifetime	T <sub>L</sub>	I <sub>F</sub> = 10 mA		100		ns
I region width	W			10		μm

**Note 1:** Performance is guaranteed only under the conditions listed in this Table.

### Electrical and Mechanical Specifications

The absolute maximum ratings of the SMP1345-040LF are provided in Table 1. Electrical specifications are provided in Table 2.

Typical performance characteristics of the SMP1345-040LF are illustrated in Figures 1 and 2.

### Package Dimensions

The PCB layout footprint for the SMP1340-040LF is provided in Figure 3. Typical case markings are shown in Figure 4. Package dimensions for the SMP1345-040LF are provided in Figure 5. Tape and reel dimensions are provided in Figure 6.

### Package and Handling Information

Instructions on the shipping container label regarding exposure to moisture after the container seal is broken must be followed. Otherwise, problems related to moisture absorption may occur when the part is subjected to high temperature during solder assembly.

The SMP1345-040LF is rated to Moisture Sensitivity Level 1 (MSL1) at 260 °C. It can be used for lead or lead-free soldering. For additional information, refer to the Skyworks Application Note, *Solder Reflow Information*, document number 200164

Care must be taken when attaching this product, whether it is done manually or in a production solder reflow environment. Production quantities of this product are shipped in a standard tape and reel format.

### Typical Performance Characteristics

( $T_A = 25\text{ }^\circ\text{C}$ , Unless Otherwise Noted)

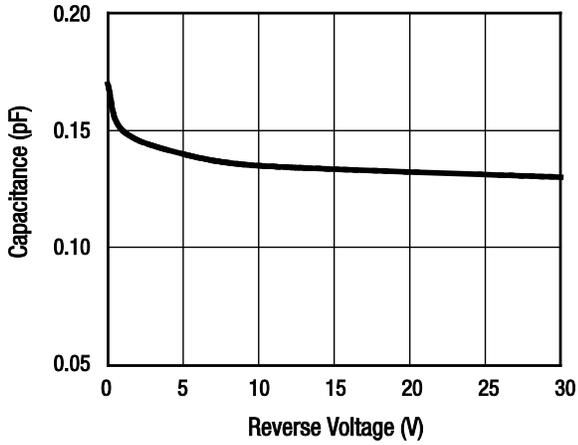


Figure 1. Capacitance vs Reverse Voltage

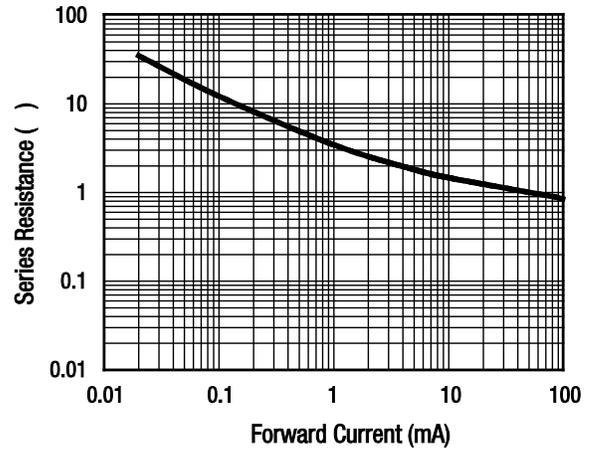
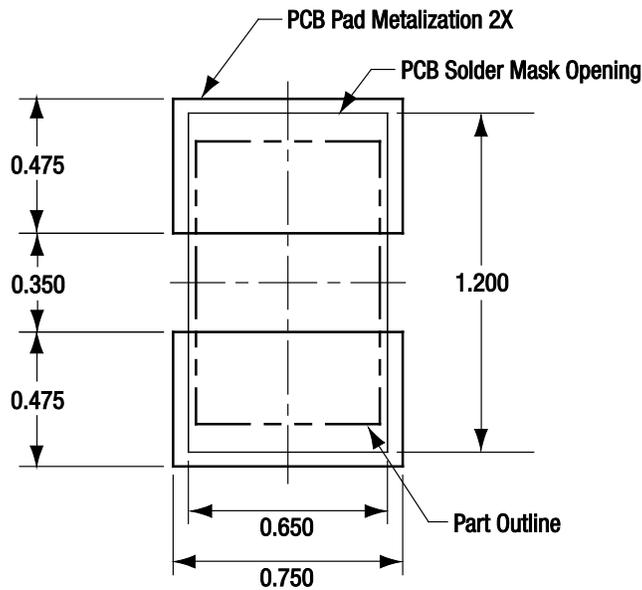


Figure 2. Series Resistance vs Forward Current



All measurements in millimeters

S1987

Figure 3. SMP1345-040LF PCB Layout Footprint

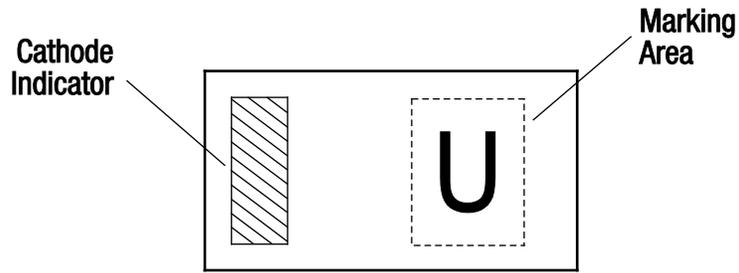
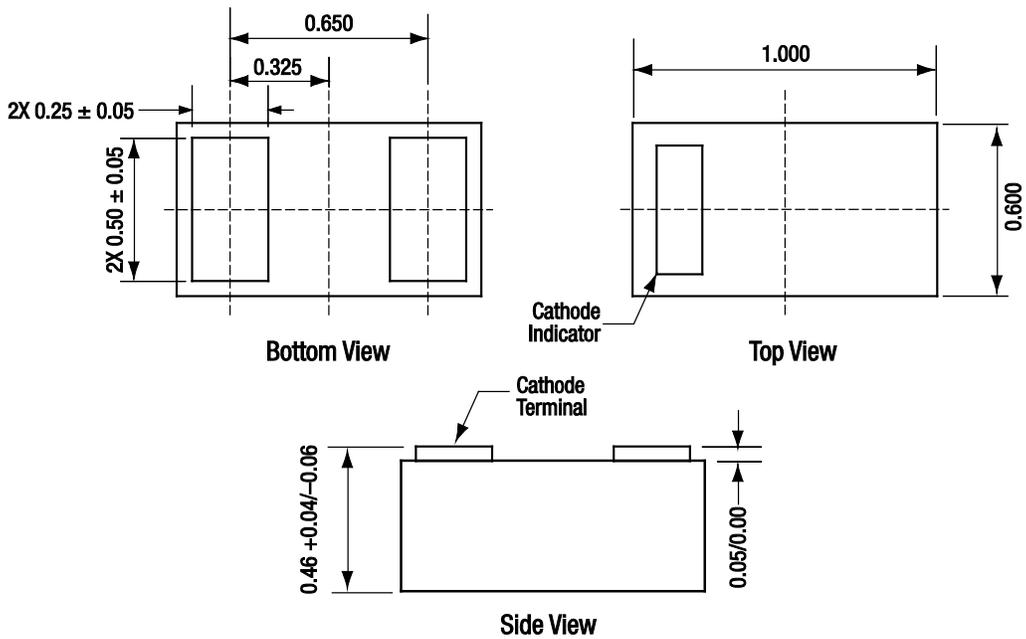


Figure 4. Typical Case Markings (Top View)



All dimensions in millimeters

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Figure 5. SMP1345-040LF Package Dimensions

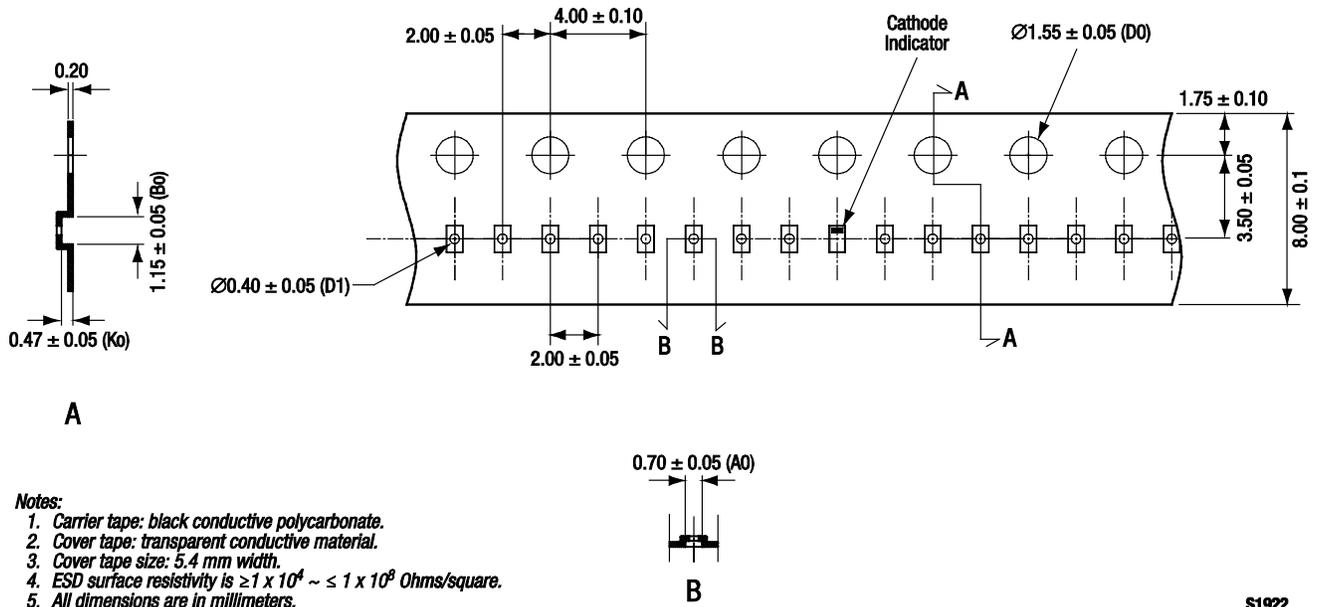


Figure 6. SMP1345-040LF Tape and Reel Dimensions

S1922

## Ordering Information

Model Name	Manufacturing Part Number
SMP1345-040LF Surface Mount PIN Diode	SMP1345-040LF

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