

DATA SHEET

SMV1430-040LF: Surface Mount, 0402 Silicon Abrupt Tuning Varactor Diode

Applications

- High-Q resonators in wireless system VCOs
- Tuned phase shifters and filters

Features

- Low series resistance
- High capacitance ratio at low reverse voltage
- Industry-standard 0402 footprint
- Packages rated MSL1, 260 °C per JEDEC J-STD-020



Skyworks Green™ products are compliant with all applicable legislation and are halogen-free. For additional information, refer to *Skyworks Definition of Green™*, document number SQ04-0074.



Description

The SMV1430-040LF silicon abrupt junction varactor diode is designed for use in Voltage Controlled Oscillators (VCOs) or voltage controlled phase shifters requiring tight capacitance tolerances. The low resistance of this varactor also makes it appropriate for high-Q resonators in wireless systems at frequencies up to and above 10 GHz.

Table 1. SMV1430-040LF Absolute Maximum Ratings

Parameter	Symbol	Minimum	Maximum	Units
Forward current	I _F		20	mA
Reverse voltage	V _R		30	V
Dissipated power @ 25 °C	P _D		250	mW
Storage temperature	T _{STG}	-55	+200	°C
Junction temperature	T _J	-55	+175	°C
Solder interface temperature	T _S	-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. SMV1430-040LF Electrical Specifications (Note 1)
(T_s = +25 °C, Characteristic Impedance [Z₀] = 50 Ω, Unless Otherwise Noted)

Parameter	Symbol	Test Condition	Min	Typical	Max	Units
Reverse current	I _R	V _R = 24 V			20	nA
Capacitance	C _T	F = 1 MHz, V _R = 4.0 V	0.46		0.70	pF
Capacitance ratio	C _{TR}	C _T @ 0 V / C _T @ 30 V	3.80	4.25		-
Series resistance	R _S	F = 500 MHz, V _R = 4 V		2.7		Ω
Breakdown voltage	V _{BR}	I _R = 10 μA	30			V
Series inductance	L _S			0.45		nH

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

Electrical and Mechanical Specifications

The absolute maximum ratings of the SMV1430-040LF are provided in Table 1. Electrical specifications are provided in Table 2. Table 3 summarizes the capacitance for reverse voltages between 0 and 10 V.

Typical performance characteristics of the SMV1430-040LF are illustrated in Figures 1 and 2.

Package Dimensions

The PCB layout footprint for the SMV1430-040LF is provided in Figure 3. Typical case markings are shown in Figure 4. Package dimensions for the SMV1430-040LF 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 SMV1430-040LF 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.

Table 3. Capacitance vs Reverse Voltage

V _R (V)	C _T (pF)
0	1.29
1	0.91
2	0.75
3	0.66
4	0.60
5	0.56
6	0.52
7	0.49
8	0.47
9	0.45
10	0.43
12	0.40
14	0.38
16	0.36
18	0.34
20	0.33
25	0.31
30	0.30

Typical Performance Characteristics

(TA = 25 °C, Unless Otherwise Noted)

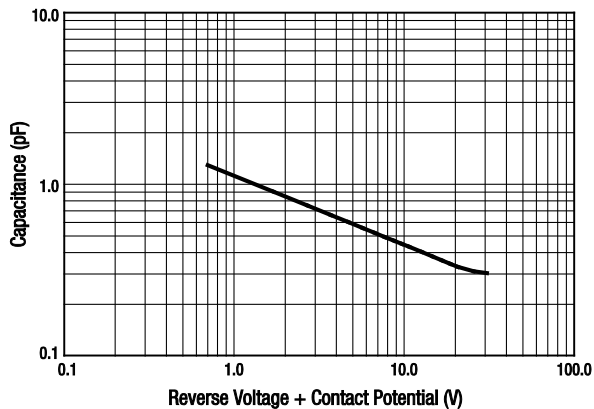


Figure 1. Capacitance vs Reverse Voltage + Contact Potential

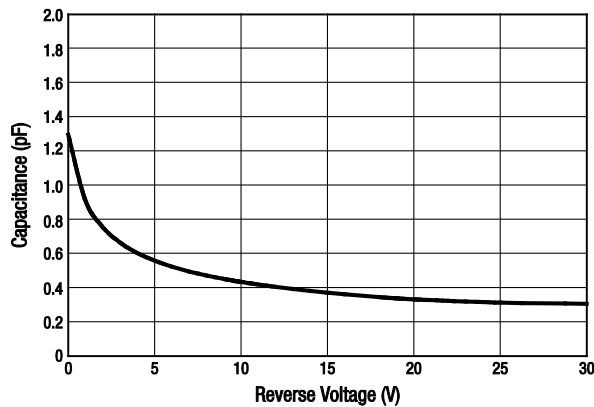
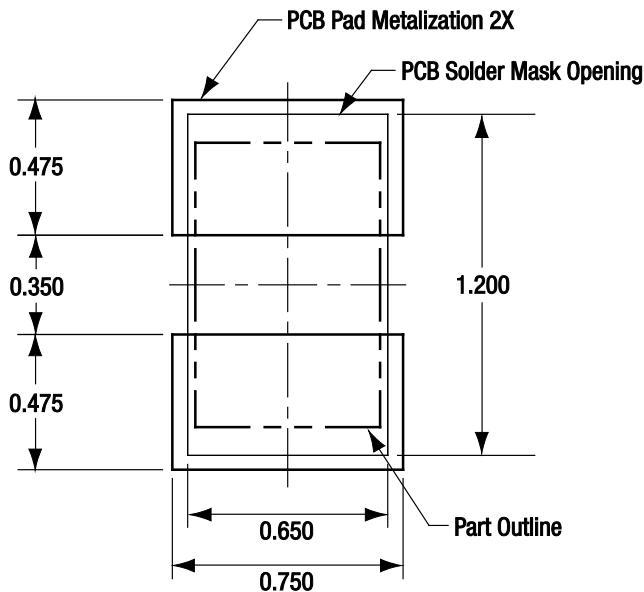


Figure 2. Capacitance vs Reverse Voltage



All measurements in millimeters

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Figure 3. SMV1430-040LF PCB Layout Footprint

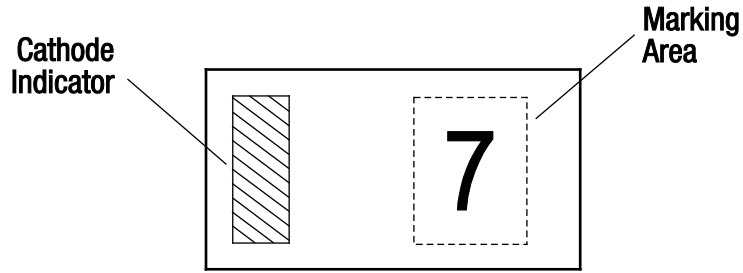
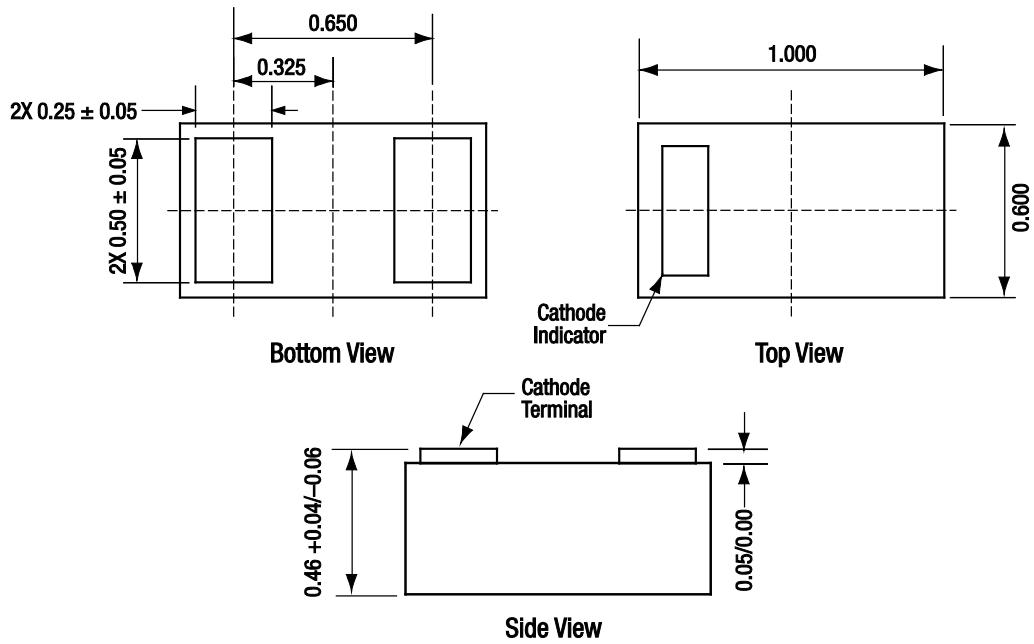


Figure 4. Typical Case Markings (Top View)



All dimensions in millimeters

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Figure 5. SMV1430-040LF Package Dimensions

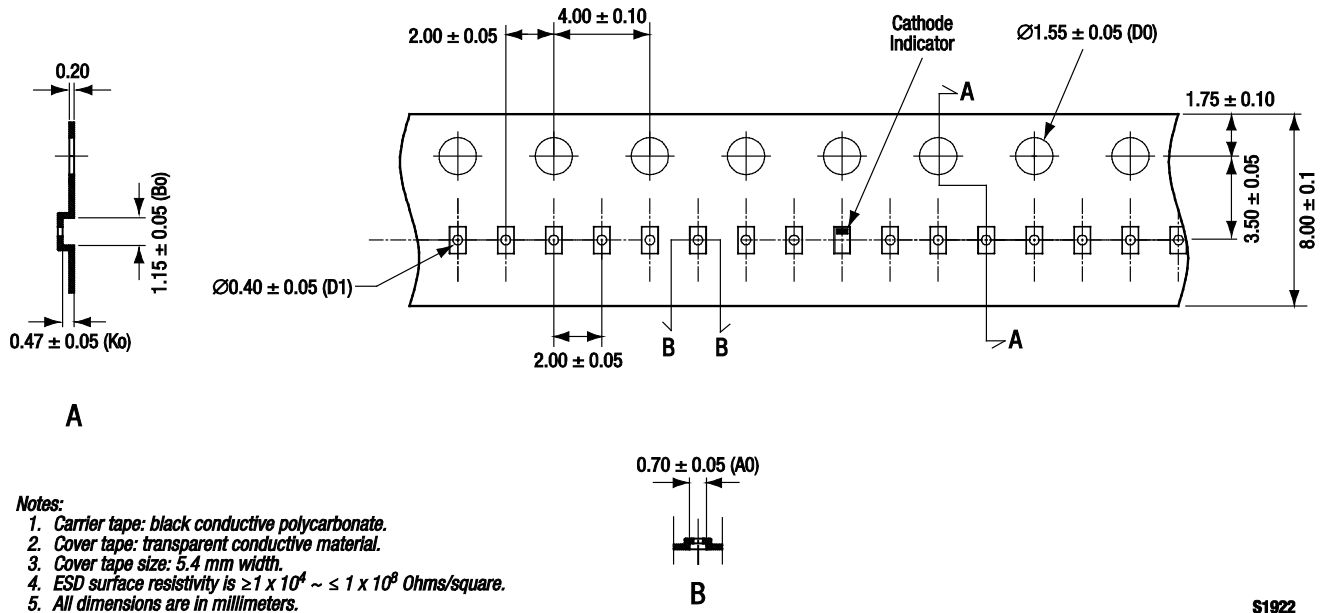


Figure 6. SMV1430-040LF Tape and Reel Dimensions

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Ordering Information

Model Name	Manufacturing Part Number
SMV1430-040LF Surface Mount Abrupt Tuning Varactor Diode	SMV1430-040LF

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