

DATA SHEET

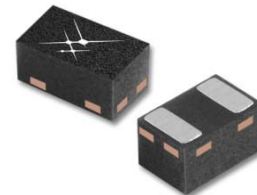
SMS7630-040LF: 0402 Surface Mount Zero Bias Detector Schottky Diode

Applications

- Sensitive detector circuits
- Sampling circuits
- Mixer circuits

Features

- Zero bias detector height
- Industry-standard 0402 footprint
- Packages rated MSL1, 260 °C per JEDEC J-STD-020



NEW



Skyworks Green™ products are RoHS (Restriction of Hazardous Substances)-compliant, conform to the EIA/EICTA/JEITA Joint Industry Guide (JIG) Level A guidelines, are halogen free according to IEC-61249-2-21, and contain <1,000 ppm antimony trioxide in polymeric materials.

Description

The SMS7630-040LF is a plastic packaged, surface mountable zero bias detector Schottky diode designed for sensitive detector applications up to 10 GHz. The low capacitance of this diode (0.3 pF) combined with its low forward voltage (180 mV typical at 1 mA) make the SMS7630-040LF particularly well suited for sensitive detector circuits.

The SMS7630-040LF is also available in a variety of plastic packages and configurations that include an SOT-23 (the SMS7630-001LF), a small footprint SC-79, and a miniature SC-70 among others. For more configurations and package styles, refer to the Skyworks Data Sheet, *Surface Mount Mixer and Detector Schottky Diodes*, document number 200041.

Table 1. SMS7630-040LF Absolute Maximum Ratings

Parameter	Symbol	Minimum	Maximum	Units
Reverse voltage	V _R		1	V
Forward current	I _F		150	mA
Dissipated power @ 25 °C	P _d		250	mW
Solder interface temperature	T _S	-40	+85	°C
Storage temperature	T _{STG}	-65	+150	°C
Junction temperature	T _J		+175	°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. The SMS7630-040LF is rated as a Human Body Model (HBM) ESD Class 1B device.

Table 2. SMS7630-040LF Electrical Specifications (Note 1)
(T_s = +25 °C, Unless Otherwise Noted)

Parameter	Symbol	Test Condition	Min	Typical	Max	Units
Breakdown voltage	V _B	I _R = 100 μA	1			V
Total capacitance	C _T	V _R = 0.15 V, f = 1 MHz		0.3		pF
Video resistance	R _v			5000		Ω
Series inductance	L _s			0.45		nH
Forward voltage	V _F	I _F = 0.1 mA I _F = 1 mA	60 135	180	120 240	mV mV

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

Electrical and Mechanical Specifications

The absolute maximum ratings of the SMS7630-040LF are provided in Table 1. Electrical specifications are provided in Table 2.

Typical performance characteristics of the SMS7630-040LF are illustrated in Figure 1.

The SPICE model for the SMS7630-040LF is shown in Figure 2 and the associated model parameters are provided in Table 3.

Package Dimensions

The PCB layout footprint for the SMS7630-040LF is provided in Figure 3. Typical case markings are shown in Figure 4. Package dimensions for the SMS7630-040LF 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 SMS7630-040LF 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

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

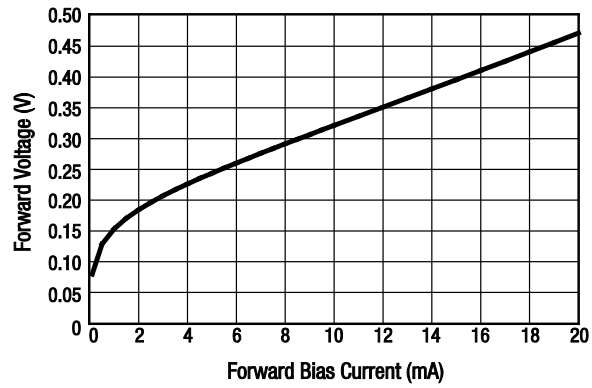


Figure 1. Forward Voltage vs Forward Current

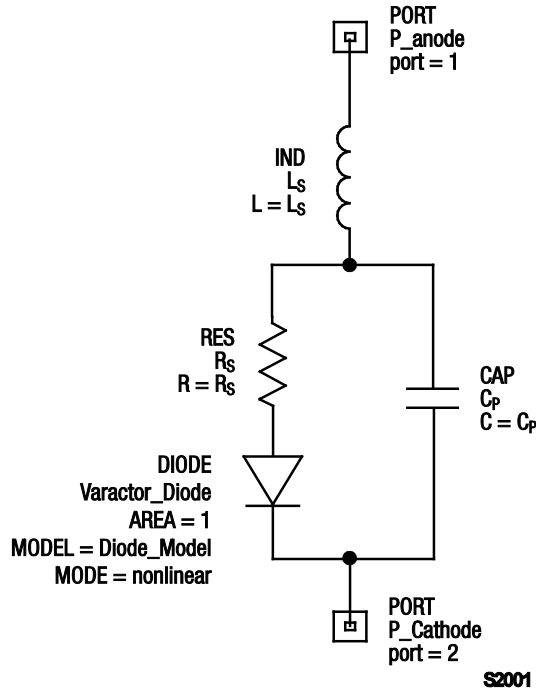
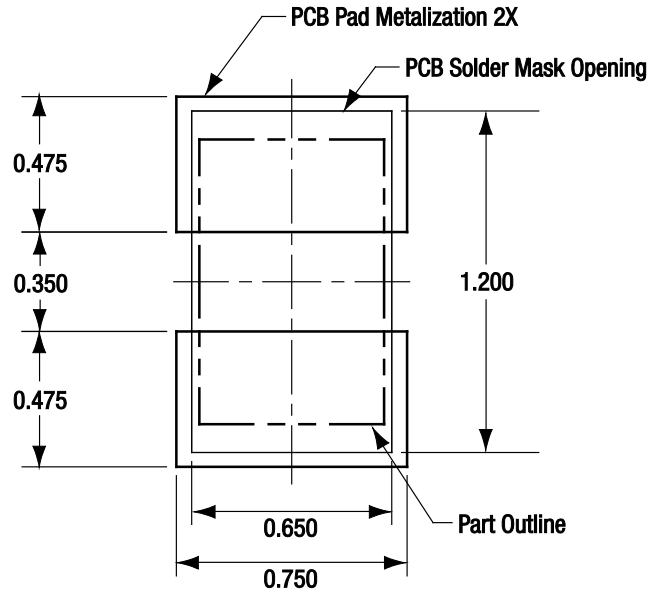


Figure 2. SMS7630-040LF SPICE Model

Table 3. SPICE Model Parameters

Parameter	Units	Value
Is	A	5e-6
Rs	Ω	20
N	-	1.05
Tt	sec	1e-11
Cj0	pF	0.14
M	-	0.4
Eg	eV	0.69
Xtt	-	2
Fc	-	0.5
Bv	V	2
Ibv	A	1e-4
Vj	V	0.51
Ls	nH	0.45
Cp	pF	0.07



All measurements in millimeters

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Figure 3. SMS7630-040LF PCB Layout Footprint

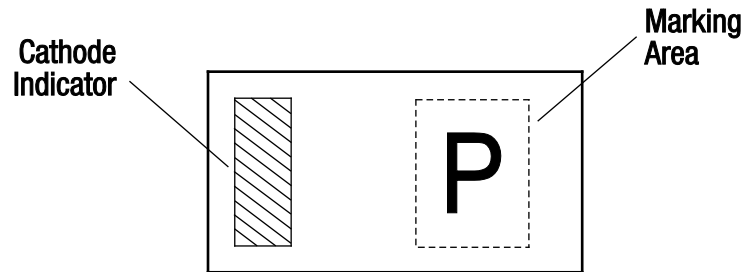
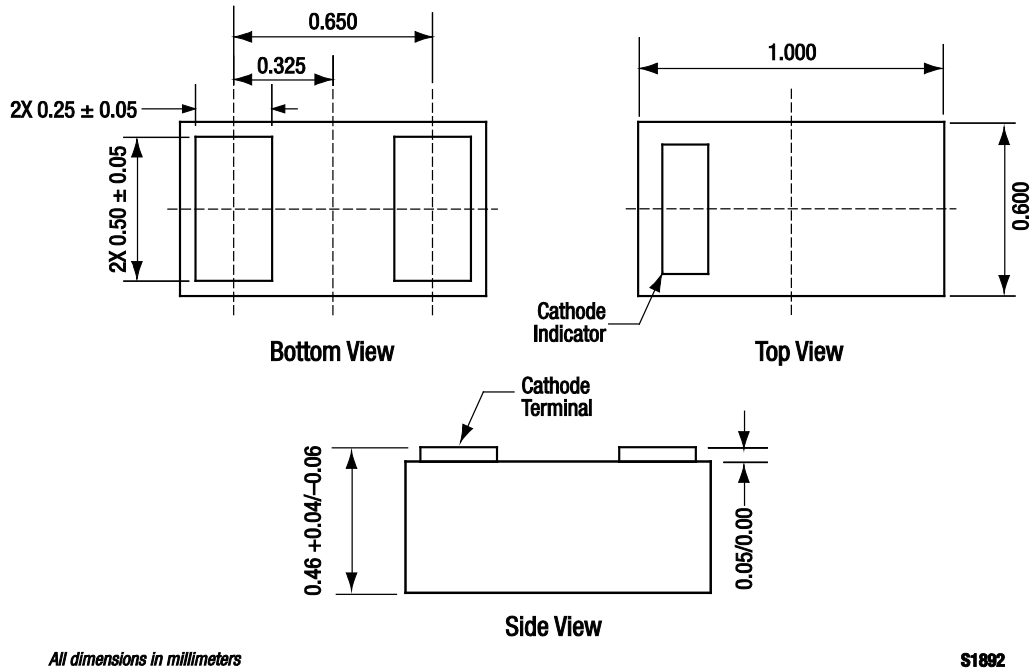


Figure 4. Typical Case Markings (Top View)



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Figure 5. SMS7630-040LF Package Dimensions

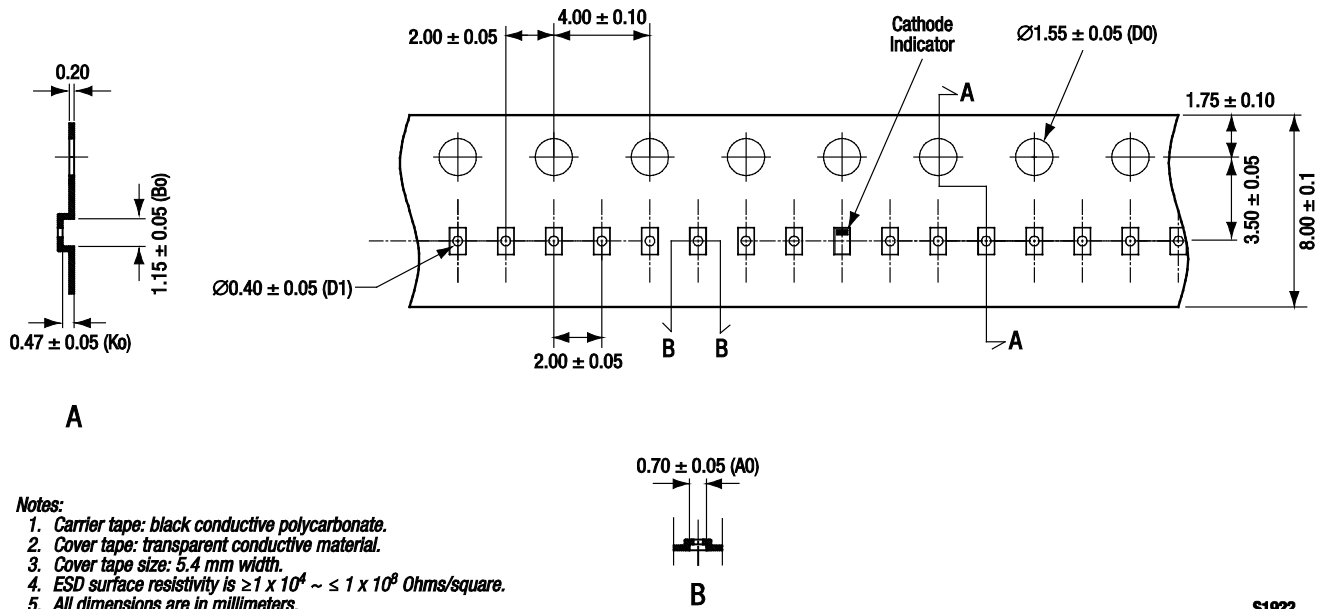


Figure 6. SMS7630-040LF Tape and Reel Dimensions

Ordering Information

Model Name	Manufacturing Part Number
SMS7630-040LF Surface Mount Zero Bias Detector Schottky Diode	SMS7630-040LF

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