DATA SHEET

SMS7630-061: Surface Mount, 0201 Zero Bias Silicon Schottky Detector Diode

Applications

- Sensitive detector circuits
- Sampling circuits

Features

- Extremely low barrier height
- Suitable for use above 26 GHz
- Low parasitic impedance: $C_P < 0.05$ pF, $L_S < 0.2$ nH
- Low profile, ultra-miniature 0201 SMT package rated MSL1, 260 °C per JEDEC J-STD-020

NEW

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

Description

The SMS7630-061 is a silicon, zero bias Schottky detector diode with an ultra-miniature 0201 footprint and very low barrier height. This P-type diode can be used for sensitive video detector circuits and sampling circuits.

The low barrier height results in good detector sensitivity without the need for external bias current. The low junction capacitance of this diode makes it an excellent detector at frequencies up to 26 GHz and higher.

A pinout diagram for the SMS7630-061 is shown in Figure 1.

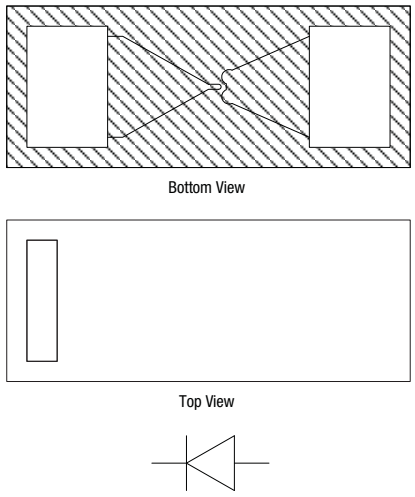

Figure 1. SMS7630-061 Pinout Diagram

Table 1. SMS7630-061 Series Absolute Maximum Ratings

Parameter	Symbol	Minimum	Maximum	Units
Reverse voltage	V_R		Minimum reverse breakdown voltage	V
Forward current	I_F		50	mA
Power dissipation	P_D		75	mW
Storage temperature	T_{STG}	–65	+200	°C
Operating temperature	T_A	–65	+150	°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 SMS7630-061 Schottky diode is rated Class 0 ESD, Human Body Model (HBM).*

Table 2. SMS7630-061 Electrical Specifications (Note 1)
(T_A = +25 °C, Unless Otherwise Noted)

Minimum Breakdown Voltage @ I_R = 10 µA (V)	Typical Total Capacitance @ V_R = 0.15 V (pF)	Forward Voltage @ I_F = 0.1 mA (mV)	Forward Voltage @ I_F = 1.0 mA (mV)	Video Resistance @ V_R = 0 V (Ω)
1	0.3	60 to 120	135 to 240	3000 to 7000

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

Electrical and Mechanical Specifications

The absolute maximum ratings of the SMS7630-061 are provided in Table 1. Electrical specifications are provided in Table 2. The associated SPICE model parameters are provided in Table 3.

Typical performance characteristics are shown in Figures 2 and 3. The PCB layout footprint for the SMS7630-061 is provided in Figure 4. Package dimensions are shown in Figure 5, and 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 SMS7630-061 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. SPICE Model Parameters

Parameter	Units	SMS7630-061
I_S	A	5E-06
R_S	Ω	20
N	–	1.05
TT	sec	1E-11
C_{J0}	pF	0.14
M	–	0.4
E_G	eV	0.69
XTI	–	2
F_C	–	0.5
B_V	V	2
I_{BV}	A	1E-04
V_J	V	0.34

Typical Performance Characteristics @ 25 °C

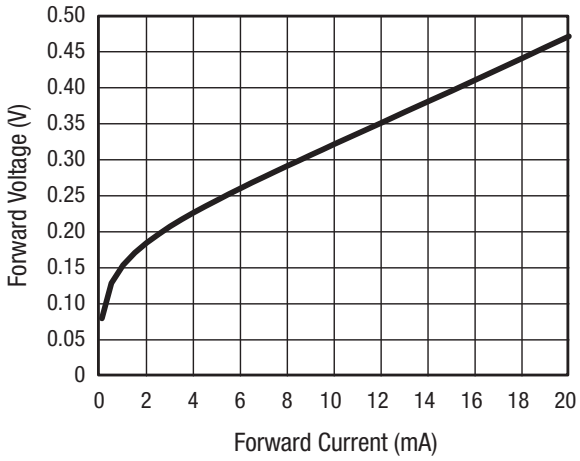

Figure 2. Forward Voltage vs Forward Current

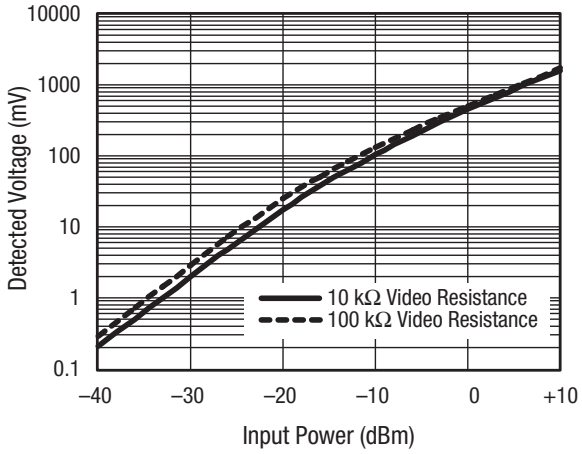

Figure 3. Detector Voltage vs Input Power

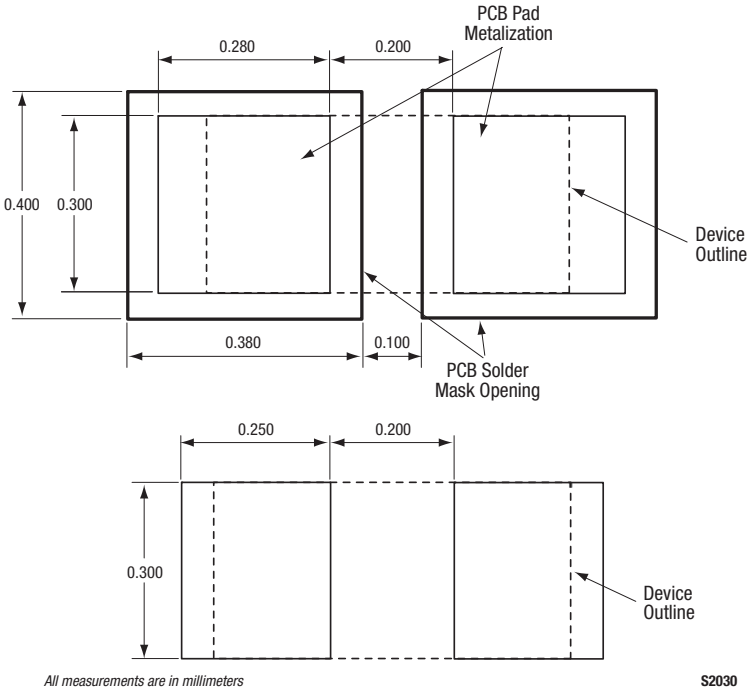

Figure 4. SMS7630-061 PCB Layout Footprint

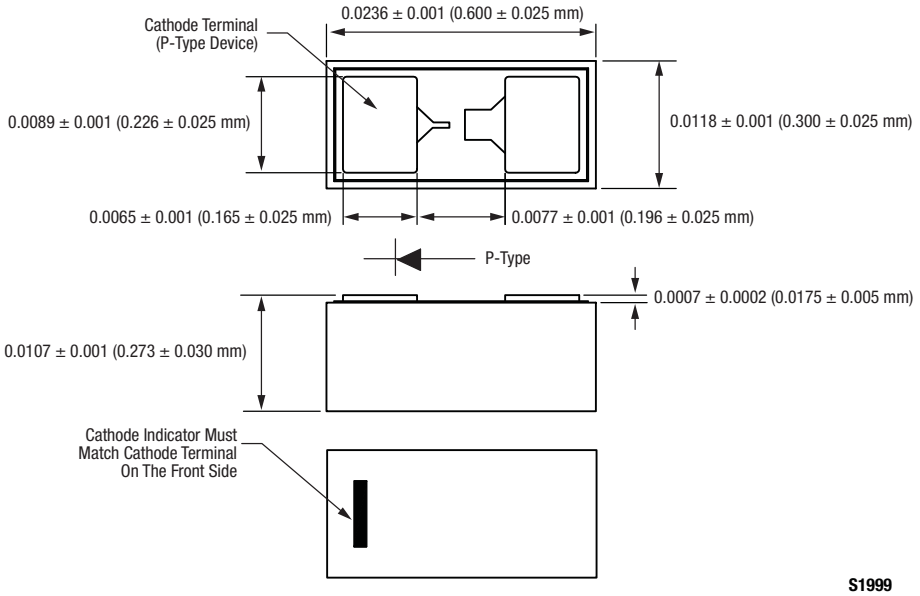

Figure 5. SMS7630-061 Package Dimension Drawing

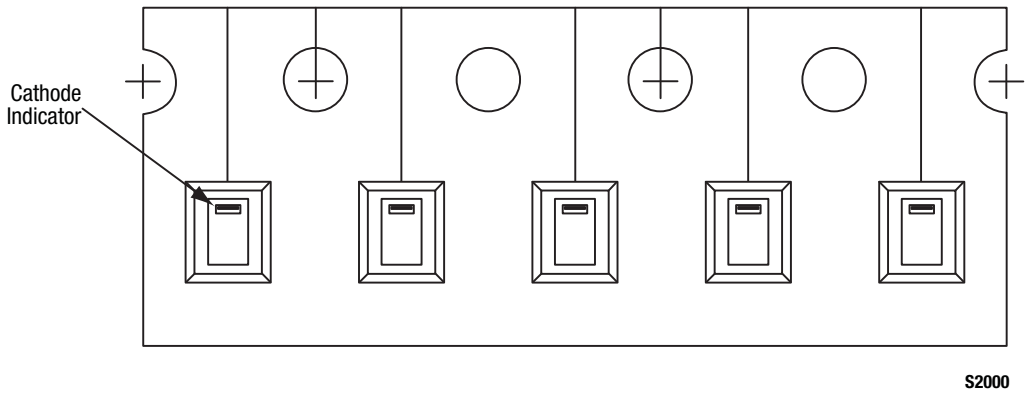

Figure 6. SMS7630-061 Tape and Reel Dimensions