

DATA SHEET

SMV1206-079LF Hyperabrupt Junction Tuning Varactor

Applications

- Wideband RF and microwave VCOs

Features

- High tuning ratio
- Low series resistance
- Designed for high volume, low-cost applications
- Ultra-small SC-79 package (MSL1, 260 °C per JEDEC J-STD-020)




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 SMV1206-079LF is a surface mount varactor diode designed for very low series resistance applications such as RF and microwave VCOs.

The SC-79 packaging option is defined in Table 1. The absolute maximum ratings of the SMV1206-079LF varactor are provided in Table 2. Electrical specifications are specified in Table 3. Figure 1 shows the typical performance of capacitance versus reverse voltage. The SPICE model for the SMV1206-079LF is shown in Figure 2 and the associated model parameters are provided in Table 4. The relationship between voltage and capacitance for the SMV1206-079LF is shown in Table 5.

Table 1. Packaging and Marking


Single
SC-79 Green™
SMV1206-079LF Marking: Cathode
$L_s = 0.7 \text{ nH}$



The Pb-free symbol or "LF" in the part number denotes a lead-free, RoHS-compliant package unless otherwise noted as Green™. Tin/lead (Sn/Pb) packaging is not recommended for new designs.

Table 2. SMV1206-079LF Absolute Maximum Ratings

Parameter	Symbol	Minimum	Typical	Maximum	Units
Power dissipation	P_{DIS}			250	mW
Forward current	I_F			20	mA
Operating temperature	T_{OP}	-55		+125	°C
Storage temperature	T_{STG}	-55		+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.

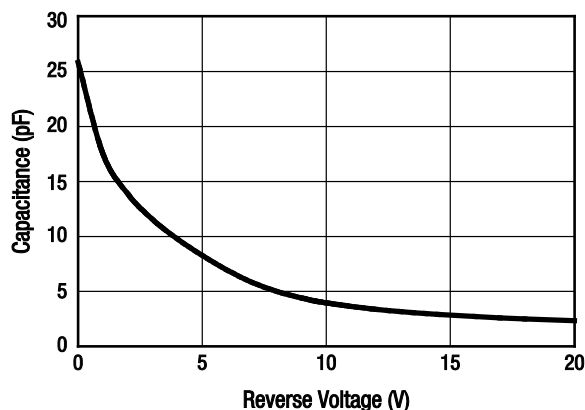
CAUTION: Although this device is designed to be as robust as possible, Electrostatic Discharge (ESD) can damage this device. This device must be protected at all times from ESD. Static charges may easily produce potentials of several kilovolts on the human body or equipment, which can discharge without detection. Industry-standard ESD precautions should be used at all times. The SMV1206-079LF varactor is a Class 0 Human Body Model (HBM) ESD device.

Table 3. SMV1206-079LF Electrical Specifications (Note 1)
($T_{OP} = 25\text{ °C}$, Unless Otherwise Noted)

Parameter	Symbol	Test Condition	Min	Typical	Max	Units
Reverse leakage current	I_R	$V_R = 17.6\text{ V}$			50	nA
Reverse breakdown voltage	V_{BR}	$I_R = 10\text{ }\mu\text{A}$	22			V
Capacitance	C_T	$V_R = 3\text{ V}, f = 1\text{ MHz}$ $V_R = 20\text{ V}, f = 1\text{ MHz}$	10.6 2.15		12.6 2.60	pF pF
Capacitance ratio	C_{TR}	$C_T(3\text{ V})/C_T(20\text{ V})$	4.45			—
Quality factor	Q	$V_R = 3\text{ V}, f = 50\text{ MHz}$		400		—

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

Typical Performance Characteristics

**Figure 1. Capacitance vs Reverse Voltage @ 25 °C**

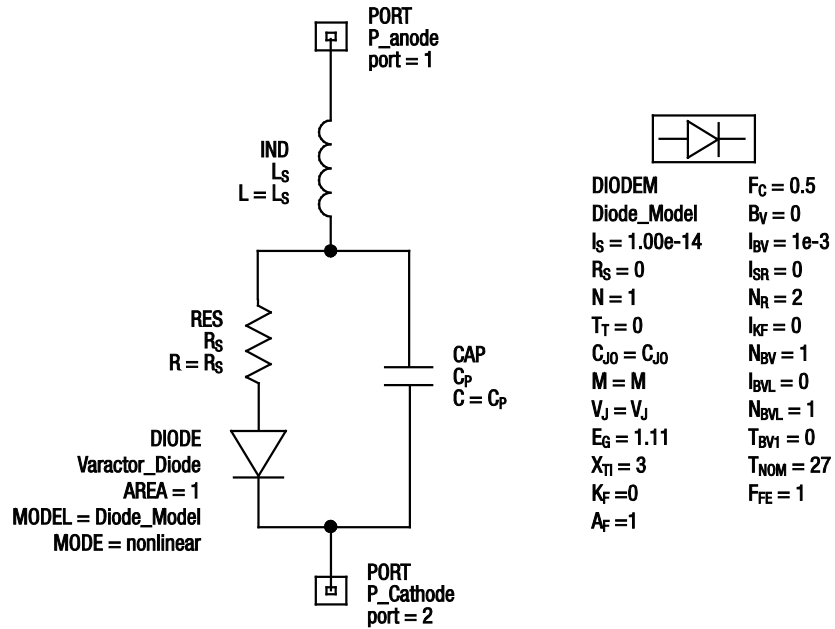


Figure 2. SPICE Model

Table 4. SPICE Model Parameters

Part Number	C _{J0} (pF)	V _J (V)	M	C _p (pF)	R _s (Ω)	L _s (nH)
SMV1206-079LF	26.5	1.1	0.85	0.25	0.63	0.7

Table 5. Capacitance vs Reverse Voltage

Voltage (V_R) (V)	Typical Capacitance (C_T) (pF)
0	25.84
1.0	17.53
2.0	13.89
3.0	11.55
4.0	9.78
5.0	8.28
6.0	6.95
7.0	5.83
8.0	5.00
9.0	4.40
10.0	3.96
12.0	3.37
14.0	2.98
16.0	2.71
18.0	2.50
20.0	2.34

Package and Handling Information

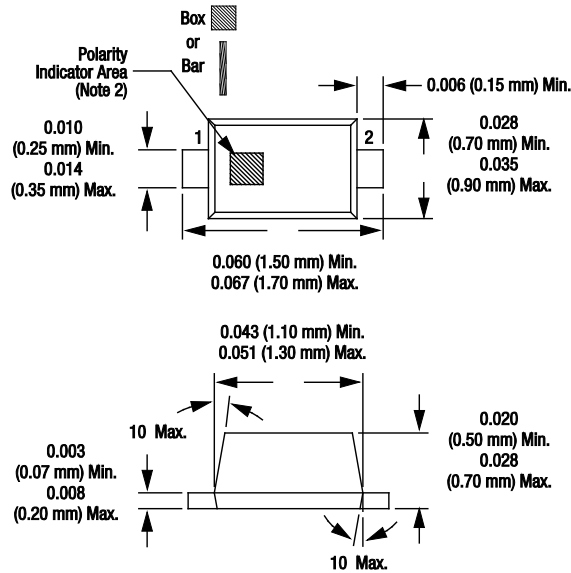
Package dimensions for the SC-79 are shown in Figure 3, and tape and reel dimensions are provided in Figure 4.

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 SMV1206-079LF 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.

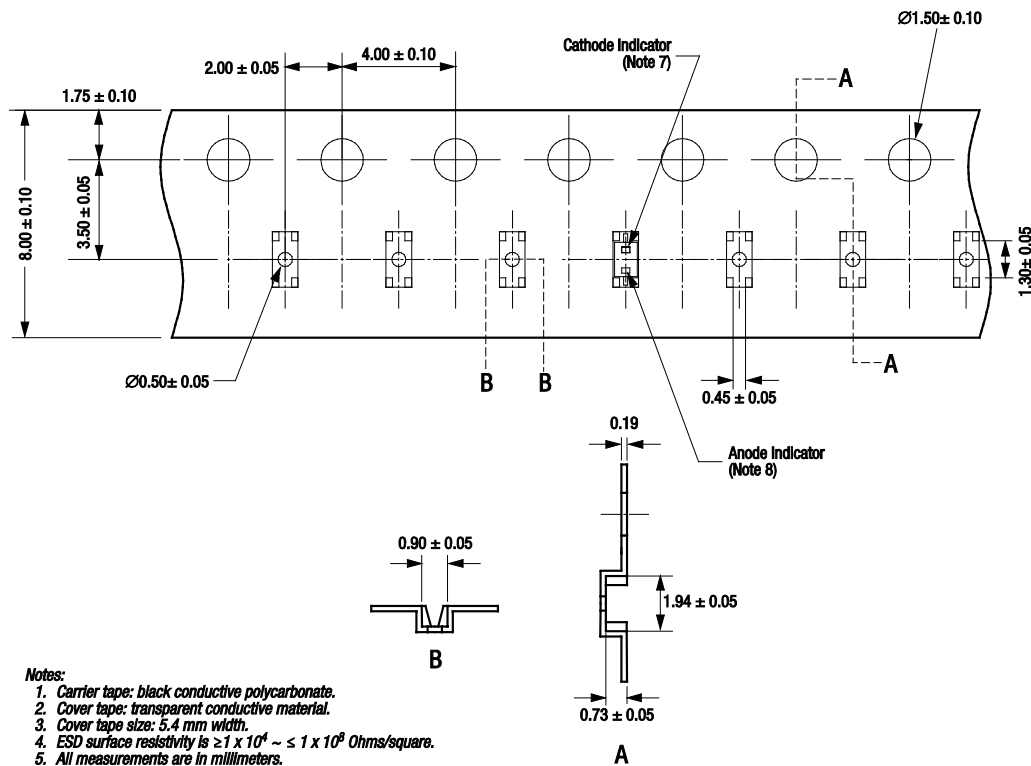


Notes:

1. Dimensions are in inches (millimeters shown in parentheses).
2. Cathode indicator for SMS7621-079LF
Anode indicator for SMS7630-079LF

S1652a

Figure 3. SMV1206-079LF SC-79 Package Dimensions



Notes:

1. Carrier tape: black conductive polycarbonate.
2. Cover tape: transparent conductive material.
3. Cover tape size: 5.4 mm width.
4. ESD surface resistivity is $\geq 1 \times 10^4 \sim 1 \times 10^8$ Ohms/square.
5. All measurements are in millimeters.
6. Standard reel size is 7 inches. Standard reel quantity is 3000 pcs.
7. Cathode indicator for all devices except for the SMS7630-079LF.
8. Anode indicator for the SMS7630-079LF only.

S2188

Figure 4. SMV1206-079LF Tape and Reel Dimensions

Ordering Information

Model Name	Manufacturing Part Number
SMV1206-079LF Hyperabrupt Junction Tuning Varactors	SMV1206-079LF

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