

DATA SHEET

# SMV1493-079, SMV1493-079LF, SMV1494-079, SMV1494-079LF: Abrupt Junction Tuning Varactors

## Features

- High Q
- Low series resistance for low phase noise
- Ultrasmall SC-79 package
- Available lead (Pb)-free and RoHS-compliant MSL-1 @ 260 °C per JEDEC J-STD-020
- Designed for high-volume commercial applications
- SPICE models are available



## Description

The SMV1493 and SMV1494 silicon abrupt junction varactor diodes are designed for use in VCOs requiring tight capacitance tolerances. The low resistance of these varactors makes them appropriate for high Q resonators in wireless system VCOs to frequencies beyond 2.5 GHz.

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



## Absolute Maximum Ratings

Characteristic	Value
Forward current ( $I_F$ )	20 mA
Power dissipation ( $P_D$ )	250 mW
Storage temperature ( $T_{ST}$ )	-55 °C to +150 °C
Operating temperature ( $T_{OP}$ )	-55 °C to +125 °C
ESD human body model	Class 0


Performance is guaranteed only under the conditions listed in the specifications table and is not guaranteed under the full range(s) described by the Absolute Maximum specifications. Exceeding any of the absolute maximum/minimum specifications may result in permanent damage to the device and will void the warranty.


**CAUTION:** Although this device is designed to be as robust as possible, ESD (Electrostatic Discharge) 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 must be employed at all times.

**Electrical Specifications at 25 °C**

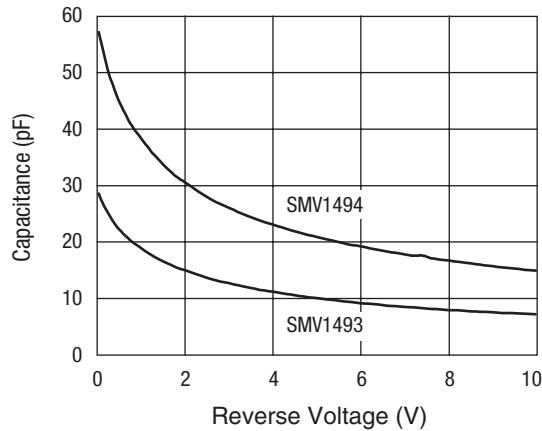
Part Number	C <sub>T</sub> @ 1 V (pF)		C <sub>T</sub> @ 4 V (pF)		R <sub>S</sub> @ 1 V 500 MHz (Ω)
	Min.	Max.	Min.	Max.	Max.
SMV1493	17.4	20	10	12.1	0.5
SMV1494	36.3	41.7	20.7	25.3	0.45

Reverse Voltage V<sub>R</sub> (I<sub>R</sub> = 10 μA): 12 V minimum.  
 Reverse Current I<sub>R</sub> (V<sub>R</sub> = 10 V): 20 nA maximum.


Single
SC-79
<b>SMV1493-079</b> Marking: Cathode
<b>SMV1493-079LF</b> Marking: Cathode
<b>SMV1494-079</b> Marking: Cathode
<b>SMV1494-079LF</b> Marking: Cathode
L <sub>S</sub> = 0.7 nH

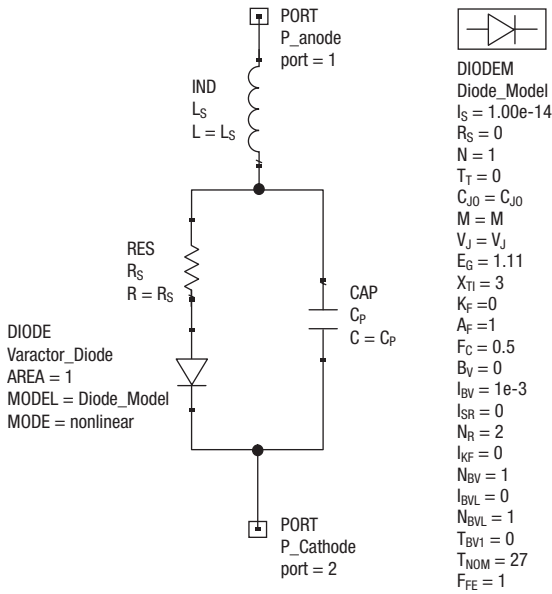
 LF denotes lead (Pb)-free, RoHS-compliant packaging option as an alternative to our standard tin/lead (Sn/Pb) packaging.

**Typical Performance Data**



**Capacitance vs. Reverse Voltage**

**SPICE Model**



Part Number	C <sub>J0</sub> (pF)	V <sub>J</sub> (V)	M	C <sub>P</sub> (pF)	R <sub>S</sub> (Ω)
SMV1493	29	0.63	0.47	0	0.5
SMV1494	58	0.63	0.47	0	0.45

Values extracted from measured performance.  
 For package inductance (L<sub>S</sub>) refer to package type.  
 For more details refer to the "Varactor SPICE Models for RF VCO Applications" Application Note.

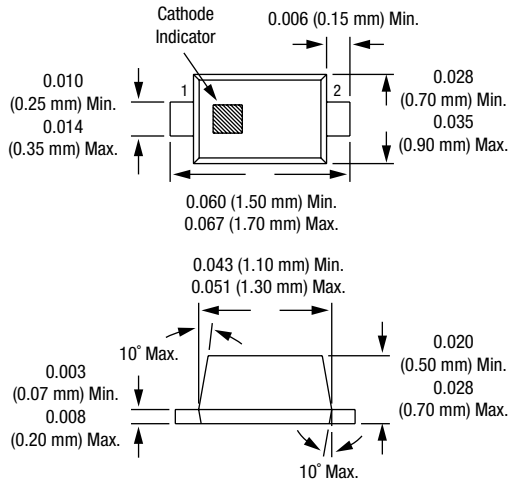
**Recommended Solder Reflow Profiles**

Refer to the ["Recommended Solder Reflow Profile"](#) Application Note.

**Tape and Reel Information**

Refer to the ["Discrete Devices and IC Switch/Attenuators Tape and Reel Package Orientation"](#) Application Note.

**SC-79**



**Capacitance vs. Reverse Voltage**

V <sub>R</sub> (V)	SMV1493	SMV1494
	C <sub>T</sub> (pF)	C <sub>T</sub> (pF)
0	28.7	57.8
0.2	25.6	51.5
0.4	23.3	46.9
0.6	21.5	43.4
0.8	20.1	40.5
1	19	38.4
1.2	17.9	36.3
1.4	17	34.6
1.6	16.2	33
1.8	15.5	31.6
2	15	30.6
2.2	14.4	29.5
2.4	13.9	28.5
2.6	13.5	27.6
2.8	13.1	26.7
3	12.7	26.1
3.2	12.4	25.3
3.4	12	24.7
3.6	11.7	24.1
3.8	11.4	23.5
4	11.2	23.1
4.2	10.9	22.6
4.4	10.7	22.1
4.6	10.5	21.7
4.8	10.3	21.3
5	10.1	20.9
6	9.2	19.2
7	8.5	17.9
8	8	16.7
9	7.6	15.7
10	7.1	14.7

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