

DATA SHEET

# SMV1770-079, SMV1770-079LF: Hyperabrupt Junction Tuning Varactors

## Features

- Designed for high-volume, low-cost battery applications
- Low series resistance
- High capacitance ratio
- Ultrasmall SC-79 package
- Available lead (Pb)-free and RoHS-compliant MSL-1 @ 260 °C per JEDEC J-STD-020
- Available in tape and reel packaging



## Description

The SMV1770-079 is a silicon hyperabrupt junction varactor diode specifically designed for battery operation. The specified high capacitance ratio and low  $R_S$  of these varactors make them appropriate for low noise VCOs used at frequencies in wireless systems to beyond 2.5 GHz. Applications include low noise and wideband UHF and VHF VCO for GSM, PCS, CDMA and analog phones.

**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


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.

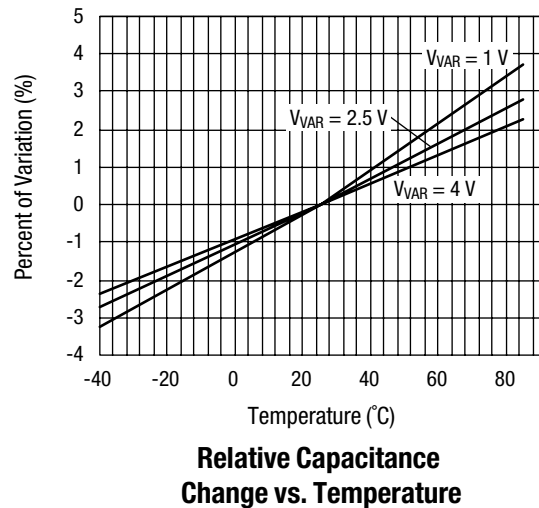
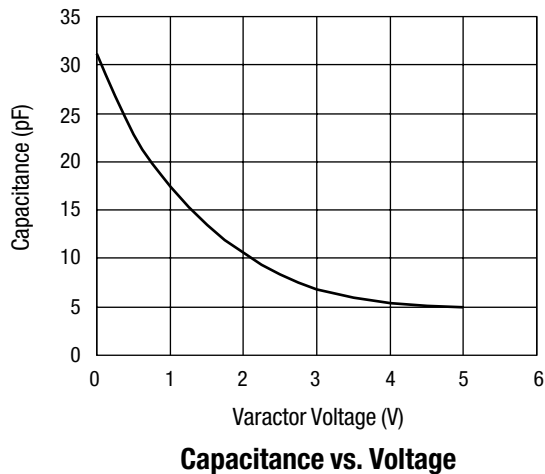
### Electrical Specifications at 25 °C

Parameter	Condition	Min.	Typ.	Max.	Unit
Reverse current ( $I_R$ )	$V_R = 8\text{ V}$			20	nA
Capacitance ( $C_T$ )	$C_T @ 0.5\text{ V}, V_R = 0.5\text{ V}, F = 1\text{ MHz}$	22.1	23.6	25.1	pF
Capacitance ( $C_T$ )	$C_T @ 2.5\text{ V}, V_R = 2.5\text{ V}, F = 1\text{ MHz}$	7.7	8.6	9.8	pF
Capacitance ratio ( $C_{TR}$ )	$C_T (0.5\text{ V})/C_T (2.5\text{ V})$	2.3	2.7		
Series resistance ( $R_S$ )	$V_R = 1\text{ V}, F = 470\text{ MHz}$		0.4	0.5	$\Omega$
Breakdown voltage ( $V_{BR}$ )	$I_R = 10\ \mu\text{A}$	12			V

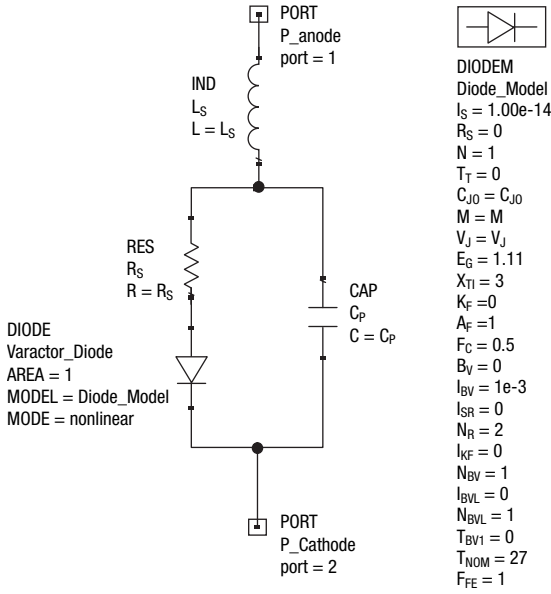

Single
SC-79
<b>SMV1770-079</b> Marking: Cathode
<b>SMV1770-079LF</b> Marking: Cathode
$L_S = 0.7\text{ nH}$

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

### Typical Performance Data



**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)	L <sub>S</sub> (nH)
SMV1770	31	12	8	2	0.4	0.8

**Capacitance vs. Voltage**

V <sub>R</sub> (V)	C <sub>T</sub> (pF)
0	31.2
0.5	23.6
1	17.8
1.5	13.7
2	10.7
2.5	8.6
3	7
3.5	5.9
4	5.5
4.5	5.2
5	5

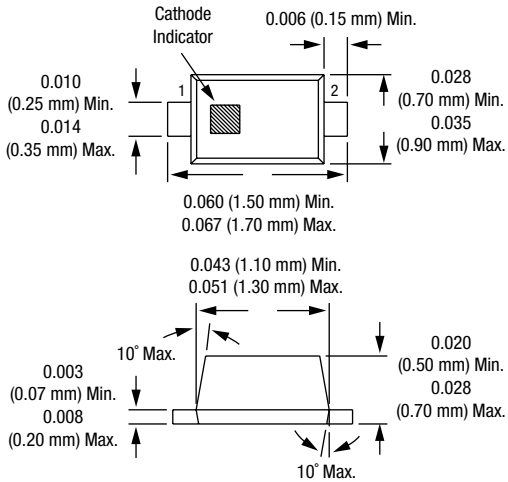
**Recommended Solder Reflow Profiles**

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**



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