

**DATA SHEET**

# SMV1270-079: Hyperabrupt Junction Tuning Varactor

## Features

- High capacitance ratio
- Ultra small size SC-79 package
- Designed for high volume, low cost battery applications
- Available in tape and reel packaging



## Description

The SMV1270-079 is a silicon hyperabrupt junction varactor diode specifically designed for battery operation. The specified high capacitance ratio and low  $R_S$  of this varactor make it 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.

## 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.

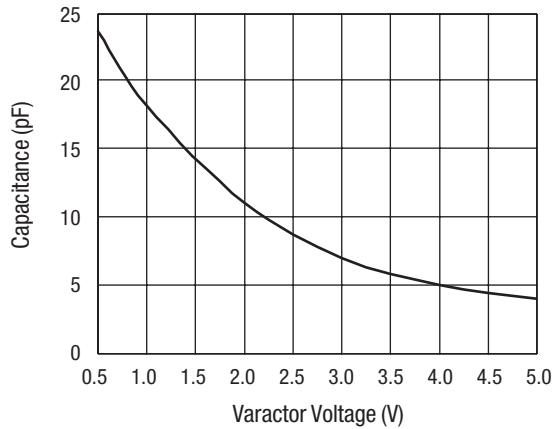
**CAUTION:** Although this device is designed to be as robust as possible, Electrostatic Discharge (ESD) can damage this device. This device must be protected at all times from ESD. Static charges may easily produce potentials of several kilovolts on the human body or equipment, which can discharge without detection. Industry-standard ESD precautions must be employed at all times.

## Electrical Specifications at 25 °C

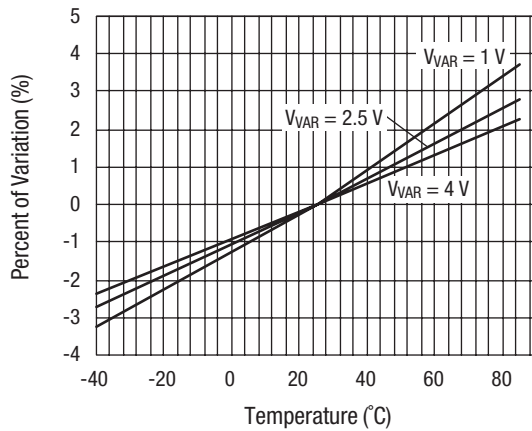
Parameter	Condition	Min.	Typ.	Max.	Unit
Reverse current ( $I_R$ )	$V_R = 20\text{ V}$			20.0	nA
Capacitance ( $C_T$ )	$C_T @ 0.5\text{ V}, V_R = 0.5\text{ V}, F = 1\text{ MHz}$	22.1	23.6	25.1	pF
Capacitance ( $C_T$ )	$C_T @ 2.5\text{ V}, V_R = 2.5\text{ V}, F = 1\text{ MHz}$	7.7	8.6	9.8	pF
Capacitance ratio ( $C_{TR}$ )	$C_T(0.5\text{ V})/C_T(2.5\text{ V})$	2.3	2.7		
Series resistance ( $R_S$ )	$V_R = 1\text{ V}, F = 470\text{ MHz}$		0.7		$\Omega$
Breakdown voltage ( $V_{BR}$ )	$I_R = 10\ \mu\text{A}$	20.0			V


Single
Marking: Cathode
SC-79
<b>SMV1270-079</b>
$L_S = 1.7\text{ nH}$

**Typical Performance Data**



**Capacitance vs. Voltage**

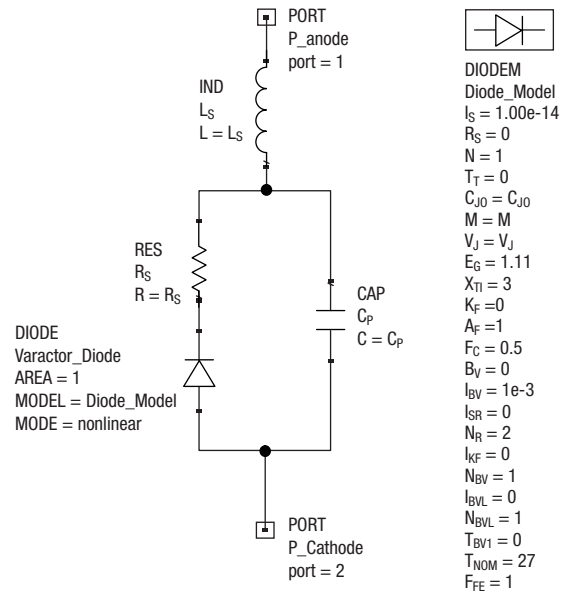


**Relative Capacitance Change vs. Temperature**

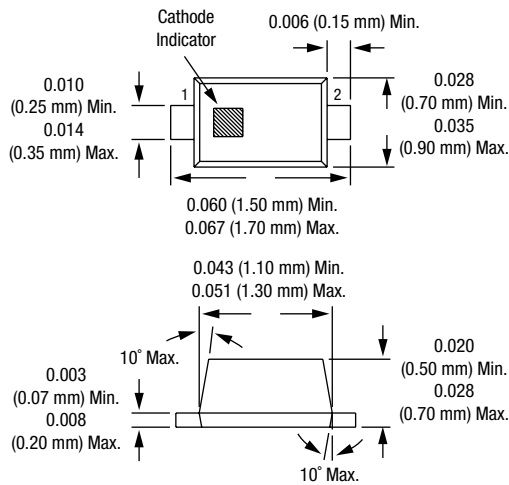
**Capacitance vs. Voltage**

$V_R$ (V)	$C_T$ (pF)
0.5	23.64
1.0	17.81
1.5	13.69
2.0	10.74
2.5	8.60
3.0	7.03
3.5	5.87
4.0	5.00
4.5	4.35
5.0	3.85

**SPICE Model**



**SC-79**



Part Number	$C_{JO}$ (pF)	$V_J$ (V)	M	$C_P$ (pF)	$R_S$ ( $\Omega$ )	$L_S$ (nH)
SMV1270-079	30	12	8	2	0.7	1.7

Copyright © 2002, 2003, 2004, Skyworks Solutions, Inc. All Rights Reserved.

Information in this document is provided in connection with Skyworks Solutions, Inc. ("Skyworks") products. These materials are provided by Skyworks as a service to its customers and may be used for informational purposes only by the customer. Skyworks assumes no responsibility for errors or omissions in these materials. Skyworks may make changes to its documentation, products, specifications and product descriptions at any time, without notice. Skyworks makes no commitment to update the information and shall have no responsibility whatsoever for conflicts, incompatibilities, or other difficulties arising from future changes to its documentation, products, specifications and product descriptions.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by or under this document. Except as may be provided in Skyworks Terms and Conditions of Sale for such products, Skyworks assumes no liability whatsoever in association with its documentation, products, specifications and product descriptions.

THESE MATERIALS ARE PROVIDED "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED OR OTHERWISE, RELATING TO SALE AND/OR USE OF SKYWORKS PRODUCTS INCLUDING WARRANTIES RELATING TO FITNESS FOR A PARTICULAR PURPOSE, MERCHANTABILITY, PERFORMANCE, QUALITY OR NON-INFRINGEMENT OF ANY PATENT, COPYRIGHT OR OTHER INTELLECTUAL PROPERTY RIGHT. SKYWORKS FURTHER DOES NOT WARRANT THE ACCURACY OR COMPLETENESS OF THE INFORMATION, TEXT, GRAPHICS OR OTHER ITEMS CONTAINED WITHIN THESE MATERIALS. SKYWORKS SHALL NOT BE LIABLE FOR ANY DAMAGES, INCLUDING SPECIAL, INDIRECT, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, INCLUDING WITHOUT LIMITATION, LOST REVENUES OR LOST PROFITS THAT MAY RESULT FROM THE USE OF THESE MATERIALS WHETHER OR NOT THE RECIPIENT OF MATERIALS HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

Skyworks products are not intended for use in medical, lifesaving or life-sustaining applications. Skyworks customers using or selling Skyworks products for use in such applications do so at their own risk and agree to fully indemnify Skyworks for any damages resulting from such improper use or sale.

The following are trademarks of Skyworks Solutions, Inc.: Skyworks™, the Skyworks logo, and Breakthrough Simplicity™. Product names or services listed in this publication are for identification purposes only, and may be trademarks of Skyworks or other third parties. Third-party brands and names are the property of their respective owners. Additional information, posted at [www.skyworksinc.com](http://www.skyworksinc.com), is incorporated by reference.