

DATA SHEET

# SMV1263 Series: Hyperabrupt Junction Tuning Varactors

## Features

- High capacitance ratio at low reverse voltage
- Designed for high-volume, low-cost battery applications
- Multiple packages: SC-79 and SC-70
- Available lead (Pb)-free and RoHS-compliant MSL-1 @ 260 °C per JEDEC J-STD-020
- Available in tape and reel packaging



## Description

The SMV1263 devices are silicon hyperabrupt junction varactor diodes specifically designed for 3 V platforms. The specified high capacitance ratio and low  $R_S$  of these varactors make them attractive for low phase noise VCOs in wireless systems up to and 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 |
| ESD human body model               | Class 1A          |

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

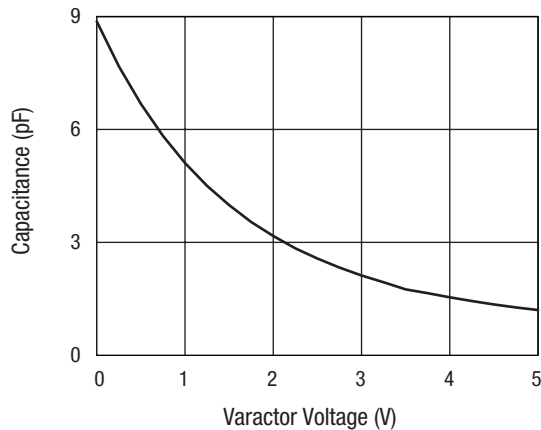
| Parameter                      | Condition  | Min. | Typ. | Max. | Unit     |
|--------------------------------|--|------|------|------|----------|
| Reverse Current ( $I_R$ )      | $V_R = 15\text{ V}$  |      |      | 20   | nA       |
| Capacitance ( $C_T$ )          | $C_T @ 0.5\text{ V}, V_R = 0.5\text{ V}, F = 1\text{ MHz}$ | 6.2  | 6.7  | 7.2  | pF       |
| Capacitance ( $C_T$ )          | $C_T @ 2.5\text{ V}, V_R = 2.5\text{ V}, F = 1\text{ MHz}$ | 2.3  | 2.6  | 2.9  | pF       |
| Capacitance Ratio ( $C_{TR}$ ) | $C_T (0.5\text{ V})/C_T (2.5\text{ V})$                    | 2.3  | 2.5  |      |          |
| Series Resistance ( $R_S$ )    | $V_R = 1\text{ V}, F = 900\text{ MHz}$                     |      |      | 1.2  | $\Omega$ |
| Breakdown Voltage ( $V_{BR}$ ) | $I_R = 10\ \mu\text{A}$                                    | 20   |      |      | V        |

|   |   |
|---|---|
|  |  |
| Common Cathode  | Single  |
| SC-70   | SC-79   |
|   | ◆SMV1263-079<br>Marking: Cathode  |
| SMV1263-074LF<br>Marking: EN3   | ◆SMV1263-079LF<br>Marking: Cathode  |
| $L_S = 1.4\text{ nH}$   | $L_S = 0.7\text{ nH}$   |

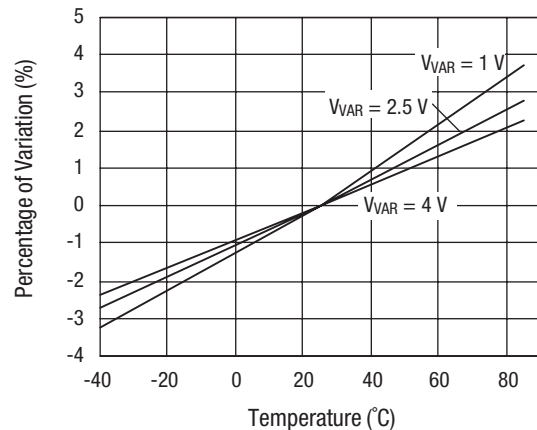
 LF denotes lead (Pb)-free, RoHS-compliant packaging option as an alternative to our standard tin/lead (Sn/Pb) packaging.

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### Typical Performance Data

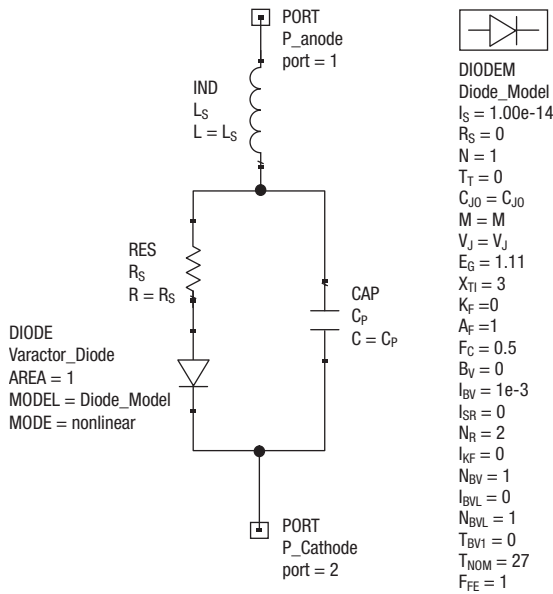


Capacitance vs. Voltage



Relative Capacitance Change vs. Temperature

**SPICE Model**



| Part Number | C <sub>JO</sub> (pF) | V <sub>J</sub> (V) | M   | C <sub>P</sub> (pF) | R <sub>S</sub> (Ω) | L <sub>S</sub> (nH) |
|-------------|----------------------|--------------------|-----|---------------------|--------------------|---------------------|
| SMV1263-079 | 8.2                  | 15                 | 9.5 | 0.67                | 1.2                | 1.7                 |

**Capacitance vs. Voltage**

| V <sub>R</sub> (V) | C <sub>T</sub> (pF) |
|--------------------|---------------------|
| 0                  | 8.87                |
| 0.25               | 7.68                |
| 0.5                | 6.68                |
| 0.75               | 5.83                |
| 1                  | 5.11                |
| 1.25               | 4.5                 |
| 1.5                | 3.99                |
| 1.75               | 3.54                |
| 2                  | 3.17                |
| 2.25               | 2.84                |
| 2.5                | 2.57                |
| 2.75               | 2.33                |
| 3                  | 2.12                |
| 3.25               | 1.94                |
| 3.5                | 1.79                |
| 3.75               | 1.65                |
| 4                  | 1.54                |
| 4.25               | 1.44                |
| 4.5                | 1.35                |
| 4.75               | 1.27                |
| 5                  | 1.2                 |

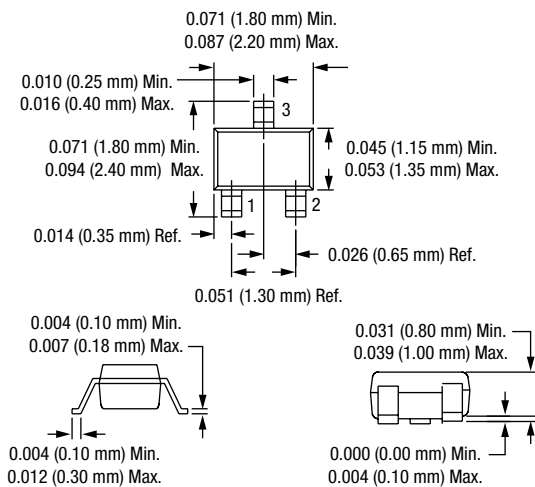
**Recommended Solder Reflow Profiles**

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

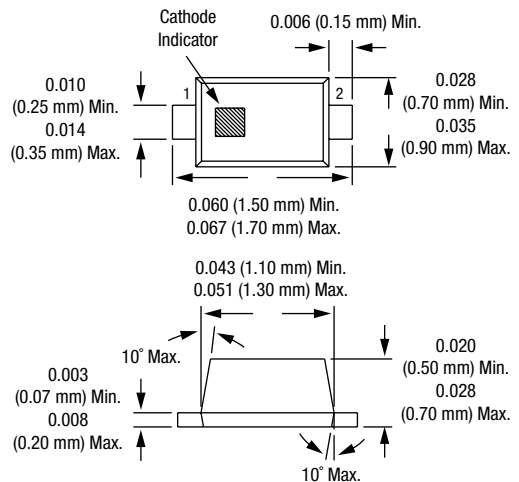
**Tape and Reel Information**

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

**SC-70**



**SC-79**



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