

# ANTREX Electronics

## Electronic Components Sourcing Information

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### Product Reference Information

**Part Number:** SMV1263-040LF

**Manufacturer:** Skyworks Solutions Inc.

**Package:** Please confirm with sales

**Availability:** Please confirm with sales

**Product Page:**

<https://antrexco.com/product/details/skyworks-solutions-inc/smv1263-040lf.html>

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**Note:**

This PDF includes an ANTREX product reference cover page.

The original manufacturer datasheet follows from the next page.

**DATA SHEET**

# SMV1263 Series: Hyperabrupt Junction Tuning Varactors

## Applications

- Low-noise and wideband UHF and VHF VCOs
- High-volume, low-cost battery-powered tuning circuits

## Features

- High capacitance ratio at low reverse voltage
- Packages rated MSL1, 260 °C per JEDEC J-STD-020



## Description

The SMV1263 series of silicon hyperabrupt junction varactor diodes are designed for 3 V platforms. The high capacitance ratio and low reverse voltage of these varactors make them attractive for low phase noise Voltage Controlled Oscillators (VCOs) in wireless systems up to and over 2.5 GHz.

Table 1 describes the packages and markings of the SMV1263 series of varactors.

# DATA SHEET • SMV1263 SERIES VARACTORS

Table 1. Packaging and Marking

|                                                                                   |                                                                                   |                                                                                     |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|  |  |  |
| Single                                                                            | Common Cathode                                                                    | Single                                                                              |
| SOD-882<br>Green™                                                                 | SC-70<br>Green™                                                                   | SC-79<br>Green™                                                                     |
| <b>SMV1263-040LF</b><br>Marking: EN1                                              | <b>SMV1263-074LF</b><br>Marking: EN3                                              | <b>♦SMV1263-079LF</b><br>Marking: Cathode and KH                                    |
| LS = 0.45 nH                                                                      | LS = 1.4 nH                                                                       | LS = 0.7 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. SMV1263 Series Absolute Maximum Ratings<sup>1</sup>

| Parameter                                                    | Symbol    | Minimum | Typical | Maximum | Units |
|--------------------------------------------------------------|-----------|---------|---------|---------|-------|
| Reverse voltage                                              | $V_R$     |         |         | 20      | V     |
| Forward current                                              | $I_F$     |         |         | 20      | mA    |
| Power dissipation                                            | $P_{DIS}$ |         |         | 250     | mW    |
| Operating temperature                                        | $T_{OP}$  | -55     |         | +125    | °C    |
| Storage temperature                                          | $T_{STG}$ | -55     |         | +150    | °C    |
| Electrostatic discharge:<br>Human Body Model (HBM), Class 1A | ESD       |         |         | 500     | V     |

<sup>1</sup> 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.

**ESD HANDLING:** 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 when handling or transporting. Static charges may easily produce potentials of several kilovolts on the human body or equipment, which can discharge without detection.

Industry-standard ESD handling precautions should be used at all times.

Table 3. SMV1263 Series Electrical Specifications<sup>1</sup>  
( $T_{OP} = 25\text{ °C}$ , Unless Otherwise Noted)

| Parameter         | Symbol   | Test Condition                                                     | Min        | Typical    | Max        | Units    |
|-------------------|----------|--------------------------------------------------------------------|------------|------------|------------|----------|
| Reverse current   | $I_R$    | $V_R = 15\text{ V}$                                                |            |            | 20         | nA       |
| Capacitance       | $C_T$    | $F = 1\text{ MHz}$<br>$V_R = 0.5\text{ V}$<br>$V_R = 2.5\text{ V}$ | 6.2<br>2.3 | 6.7<br>2.6 | 7.2<br>2.9 | pF<br>pF |
| Capacitance ratio | $C_{TR}$ | $C_T @ 0.5\text{ V} / C_T @ 2.5\text{ V}$                          | 2.3        | 2.5        |            | —        |
| Series resistance | $R_S$    | $F = 900\text{ MHz}$ , $V_R = 1\text{ V}$                          |            |            | 1.2        | $\Omega$ |
| Breakdown voltage | $V_{BR}$ | $I_R = 10\text{ }\mu\text{A}$                                      | 20         |            |            | V        |

<sup>1</sup> Performance is guaranteed only under the conditions listed in this table.

## Electrical and Mechanical Specifications

The absolute maximum ratings of the SMV1263 varactors are provided in Table 2. Electrical specifications are provided in Table 3. Typical capacitance values are listed in Table 4. Typical performance characteristics of the SMV1263 varactors are illustrated in Figures 1 and 2.

The SPICE model for the SMV1263 varactors is shown in Figure 3 and the associated model parameters are provided in Table 5.

Package dimensions are shown in Figures 4 to 8 (even numbers), and tape and reel dimensions are provided in Figures 5 to 9 (odd numbers).

## Package and Handling Information

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 SMV1263 series of varactors are rated to Moisture Sensitivity Level 1 (MSL1) at 260 °C. They 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.

Table 4. Capacitance vs Reverse Voltage

| VR<br>(V) | CT<br>(pF) |
|-----------|------------|
| 0         | 8.87       |
| 0.25      | 7.68       |
| 0.50      | 6.68       |
| 0.75      | 5.83       |
| 1.00      | 5.11       |
| 1.25      | 4.50       |
| 1.50      | 3.99       |
| 1.75      | 3.54       |
| 2.00      | 3.17       |
| 2.25      | 2.84       |
| 2.50      | 2.57       |
| 2.75      | 2.33       |
| 3.00      | 2.12       |
| 3.25      | 1.94       |
| 3.50      | 1.79       |
| 3.75      | 1.65       |
| 4.00      | 1.54       |
| 4.25      | 1.44       |
| 4.50      | 1.35       |
| 4.75      | 1.27       |
| 5.00      | 1.20       |

Typical Performance Characteristics

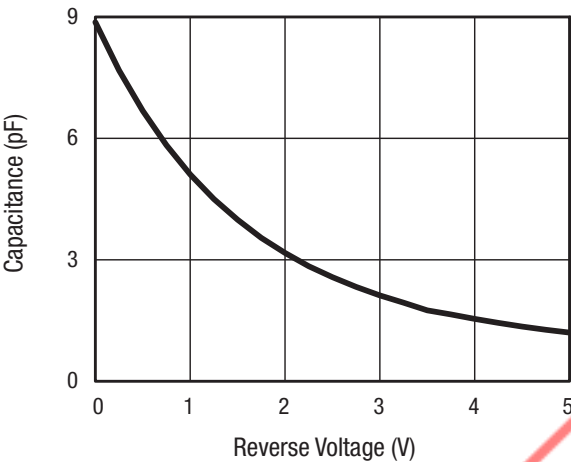


Figure 1. Capacitance vs Voltage

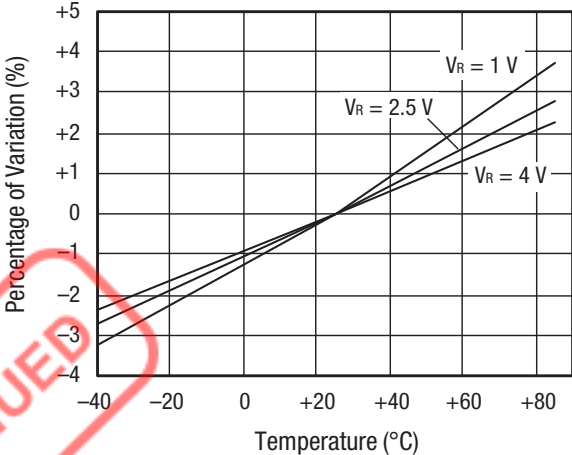


Figure 2. Relative Capacitance Change vs Temperature

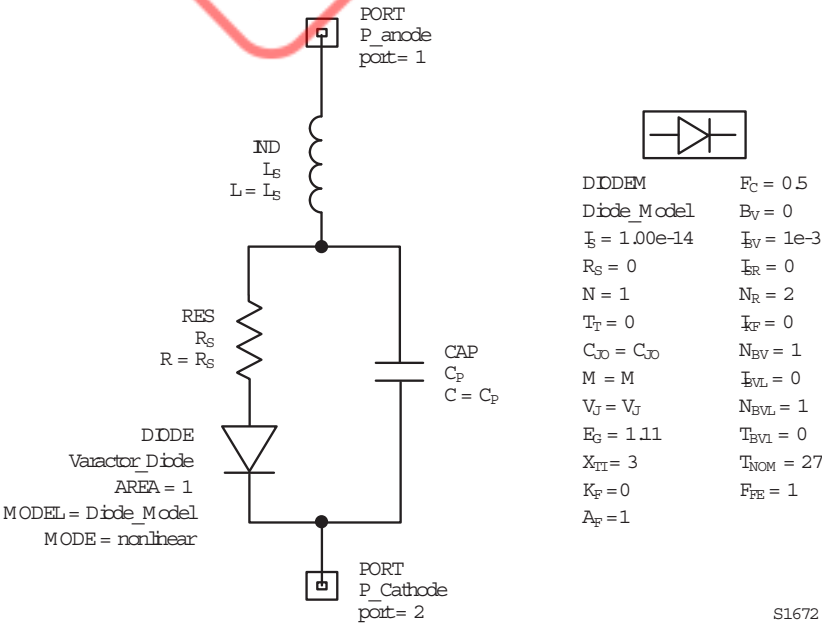


Figure 3. SPICE Model

Table 5. SPICE Model Parameters

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

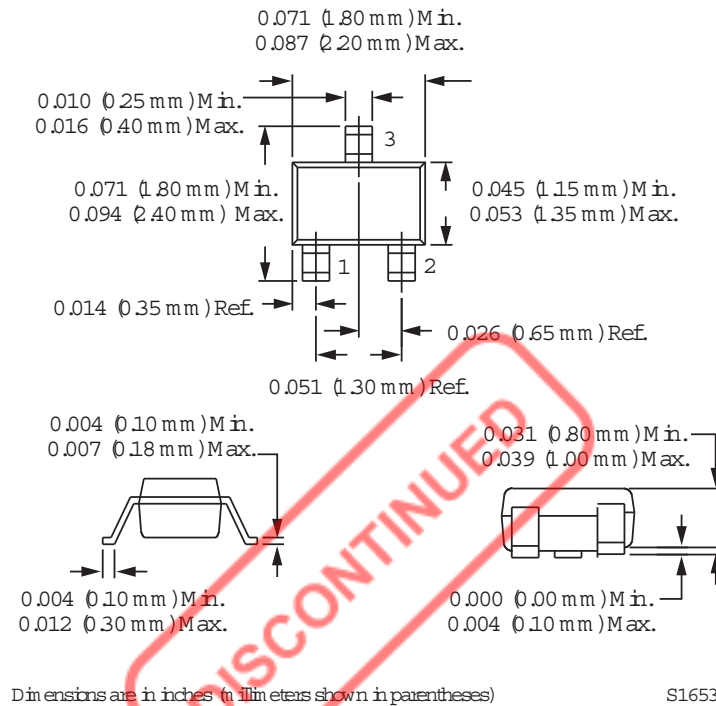
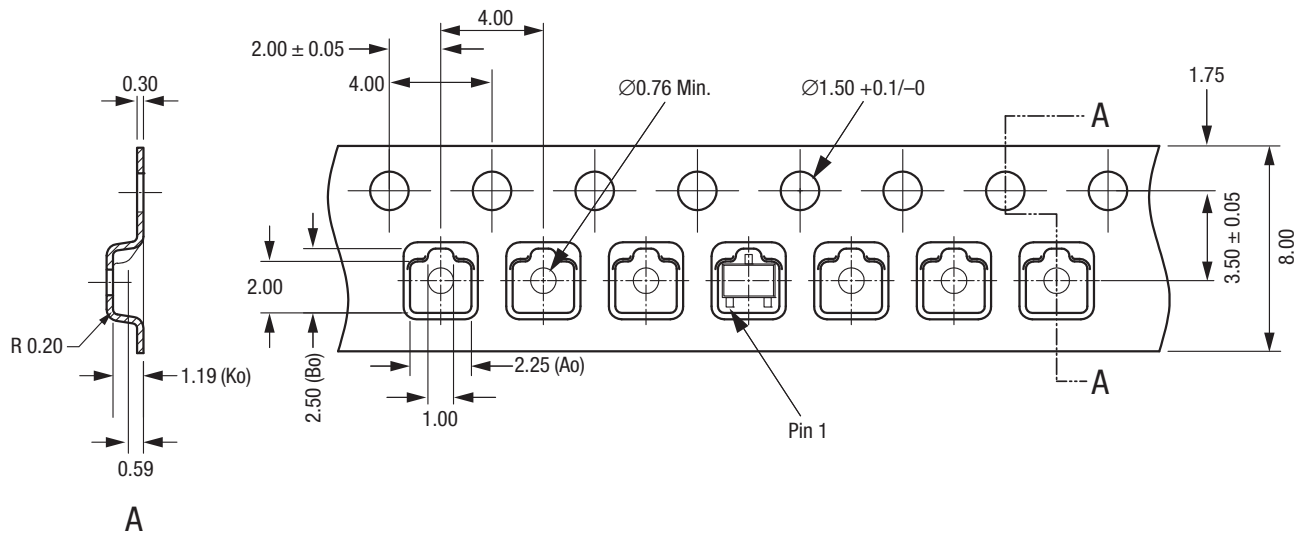


Figure 4. SC-70 Package Dimensions

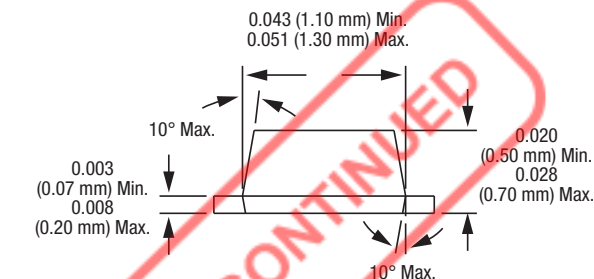
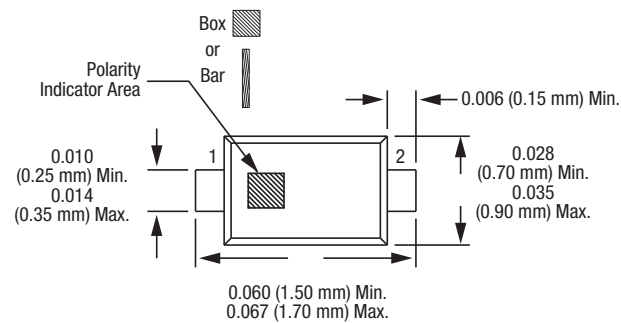


Notes:

1. Carrier tape: black conductive polystyrene bakeable material at 125 °C.
2. Cover tape material: transparent conductive PSA.
3. Cover tape size: 5.40 mm width.
4. ESD surface resistivity is  $\geq 1 \times 10^4$  and approx.  $\leq 1 \times 10^8$  Ohms/square per EIA, JEDEC TNR Specification.
5. All measurements are in millimeters.

S1685b

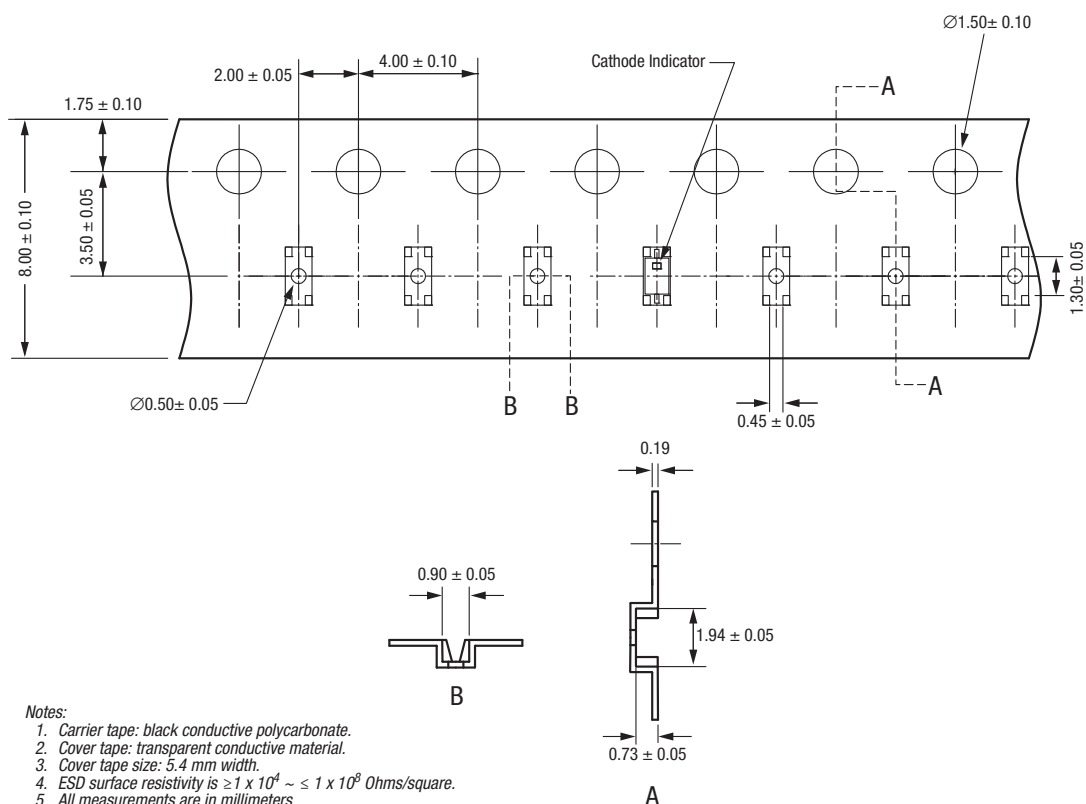
Figure 5. SC-70 Tape and Reel Dimensions



Dimensions are in inches (millimeters shown in parentheses)

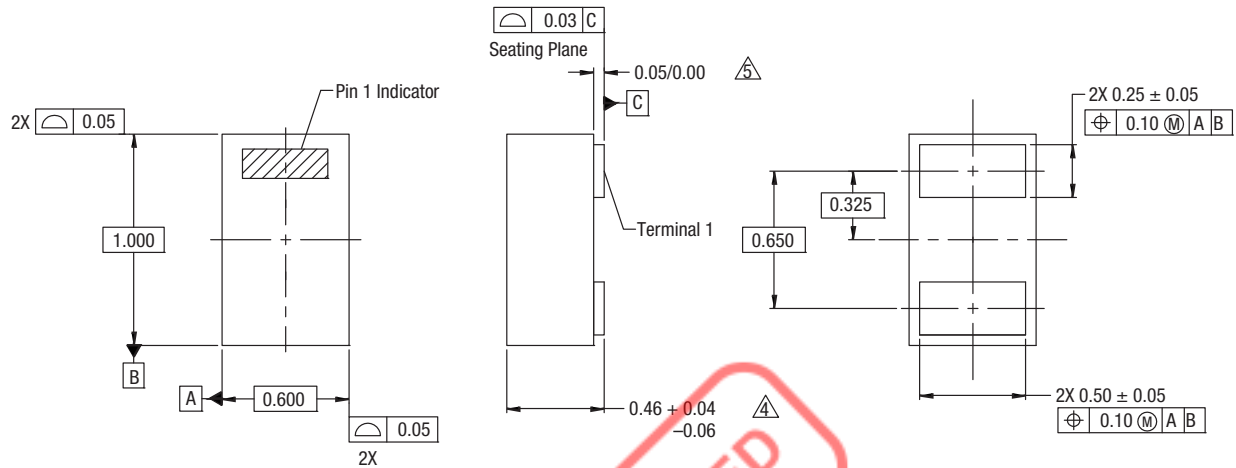
S1652

Figure 6. SC-79 Package Dimensions



S2188

Figure 7. SC-79 Tape and Reel Dimensions

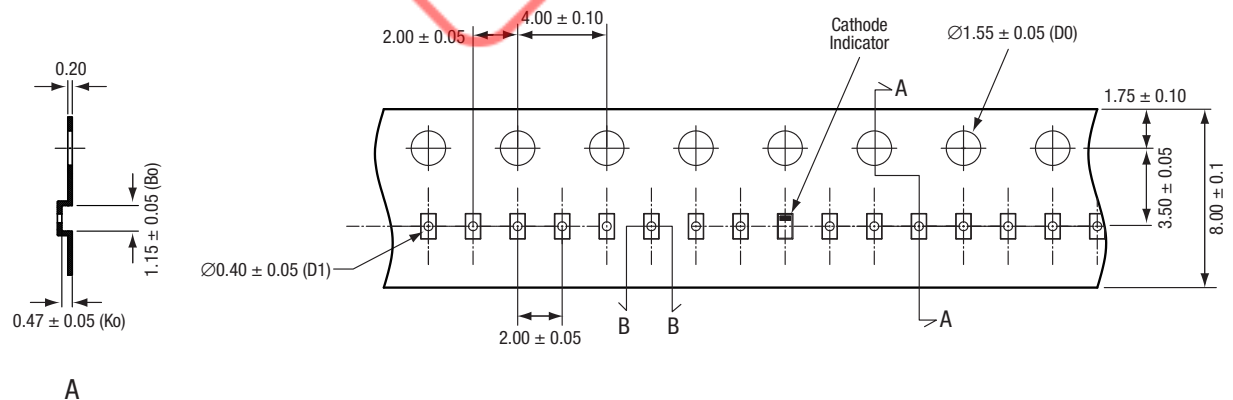


NOTES:

1. All measurements are in millimeters.
2. Dimensions and tolerances according to ASME Y14.5M-1994.
3. These packages are used principally for discrete devices.
4. This dimension includes stand-off height and package body thickness, but does not include attached features, e.g., external heatsink or chip capacitors. An integral heatslug is not considered an attached feature.
5. This dimension is primarily terminal plating, but does not include small metal protrusion.

Y1410

Figure 8. SOD-882 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  $\geq 1 \times 10^4 \sim \leq 1 \times 10^8$  Ohms/square.
5. All dimensions are in millimeters.

S1922

Figure 9. SOD-882 Tape and Reel Dimensions



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