

DATA SHEET

# SMV1135-004, SMV1135-004LF: Hyperabrupt Junction Tuning Varactor

## Features

- High tuning ratio
- Low series resistance
- SOT-23 package
- Designed for high-volume, low-cost applications
- Available in tape and reel packaging
- Available lead (Pb)-free and RoHS-compliant MSL-1 @ 260 °C per JEDEC J-STD-020




## Description

The SMV1135-004 is a surface mount varactor diode designed for very high capacitance tuning ratio while having low series resistance, which makes this device especially attractive for wideband VCO applications.

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




Common Cathode
SOT-23
<b>SMV1135-004</b> Marking: AG3
<b>SMV1135-004LF</b> Marking: EG3

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

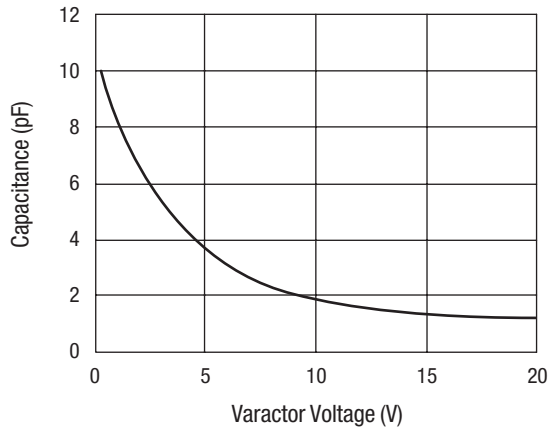
Performance is guaranteed only under the conditions listed in the specifications table and is not guaranteed under the full range(s) described by the Absolute Maximum specifications. Exceeding any of the absolute maximum/minimum specifications may result in permanent damage to the device and will void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

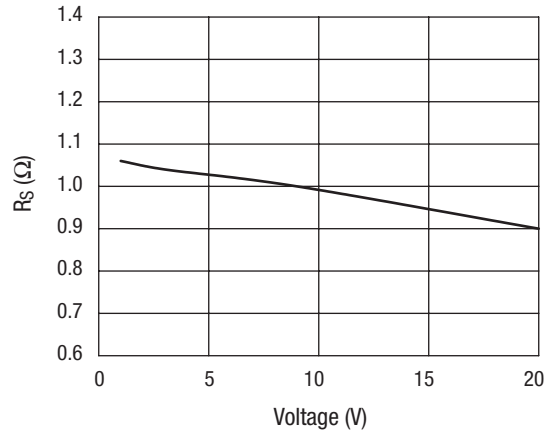
## Electrical Specifications at 25 °C

Parameter	Condition	Min.	Typ.	Max.	Unit
Reverse current ( $I_R$ )	$V_R = 21\text{ V}$			20	nA
Capacitance ( $C_T$ )	$C_T @ 1\text{ V}, V_R = 1\text{ V}, F = 1\text{ MHz}$	8.2		10	pF
Capacitance ratio ( $C_{TR}$ )	$C_T (1\text{ V})/C_T (3\text{ V})$	1.47		1.76	
Capacitance ratio ( $C_{TR}$ )	$C_T (1\text{ V})/C_T (9\text{ V})$	3.7		4.5	
Series resistance ( $R_S$ )	$V_R = 1\text{ V}, F = 500\text{ MHz}$			1.2	$\Omega$
Breakdown voltage ( $V_{BR}$ )	$I_R = 10\ \mu\text{A}$	28			V

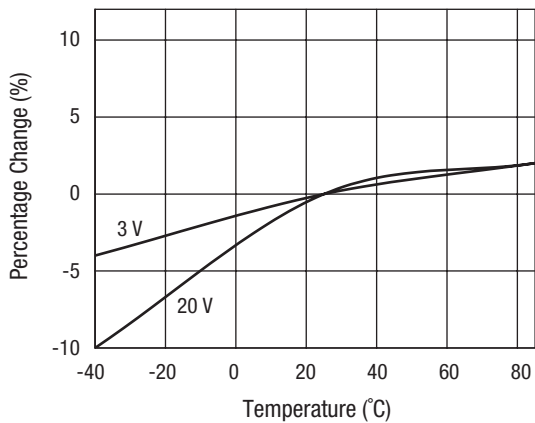
**Typical Performance Data**



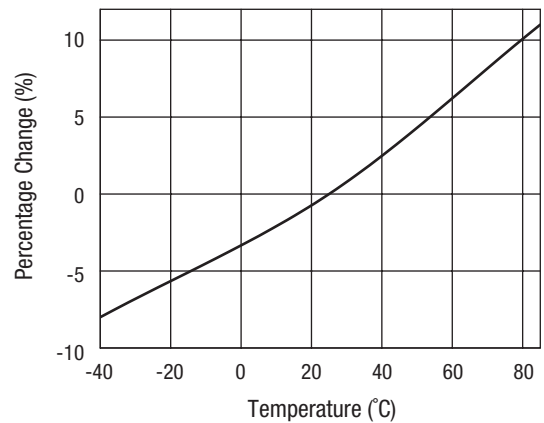
**Capacitance vs. Voltage**



**Series Resistance vs. Voltage**

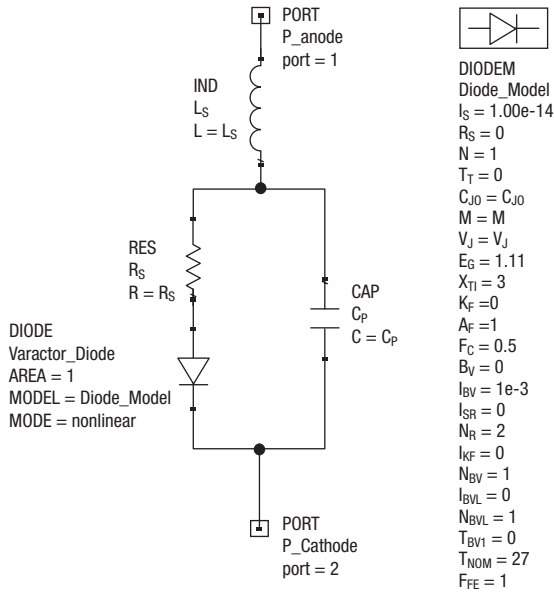


**Relative Capacitance Change vs. Temperature**



**Relative Series Resistance Change vs. Temperature**

**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)
SMV1135	10.3	8.6	2.9	0.8	1.2	1.5

**Recommended Solder Reflow Profiles**

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

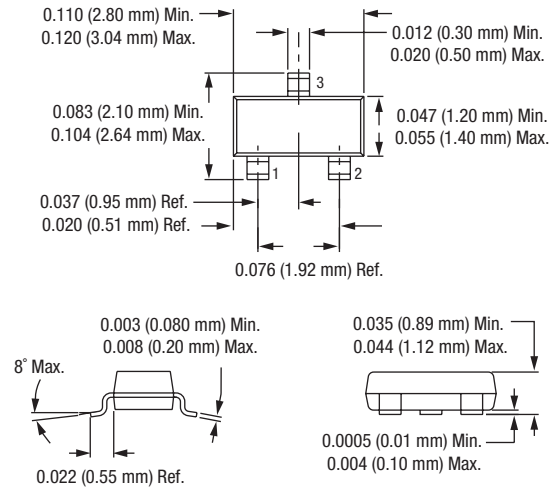
**Tape and Reel Information**

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

**Capacitance vs. Voltage**

V <sub>R</sub> (V)	C <sub>T</sub> (pF)
0.5	10.34
1	8.69
2.5	5.98
3	5.38
6	3.11
10	1.92
20	1.17

**SOT-23**



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