DATA SHEET

SMV1129 and SMV1139: Hyperabrupt Junction Tuning Varactors

Features

- High Q
- Low series resistance for low phase noise
- Available in SOD-323 and SC-79
- Designed for high-volume commercial applications
- SPICE models are available
- Available lead (Pb)-free and RoHS-compliant MSL-1 @ 260 °C per JEDEC J-STD-020

Description

The SMV1129 and SMV1139 silicon hyperabrupt junction varactor diodes are designed for use in VCOs requiring low resistance. The low resistance of these varactors makes them appropriate for high Q resonators in wireless system VCOs to frequencies beyond 2.5 GHz.

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

	
Single	Single
SOD-323	SC-79
	SMV1129-079 Marking: Cathode
	SMV1129-079LF Marking: Cathode
SMV1139-011 Marking: CG	
SMV1139-011LF Marking: HG	
L_S = 1.5 nH	L_S = 0.7 nH

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.

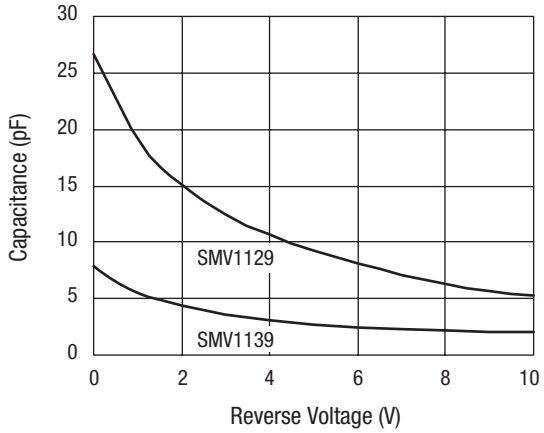
CAUTION: *Although this device is designed to be as robust as possible, ESD (Electrostatic Discharge) can damage this device. This device must be protected at all times from ESD. Static charges may easily produce potentials of several kilovolts on the human body or equipment, which can discharge without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

Electrical Specifications at 25 °C

Part Number	C_T @ 1 V (pF)			$\frac{C_T \text{ @ 1 V}}{C_T \text{ @ 3 V}}$ (Ratio)		$\frac{C_T \text{ @ 1 V}}{C_T \text{ @ 6 V}}$ (Ratio)		R_S @ 1 V 500 MHz (Ω)
	Min.	Typ.	Max.	Min.	Typ.	Min.	Typ.	Max.
SMV1129	17.5	19	20.5	1.4	1.53	2	2.5	0.4
SMV1139	4.95	5.4	5.85	1.4	1.53	2	2.5	0.6

Reverse Voltage V_R (I_R = 10 µA): 12 V minimum.
Reverse Current I_R (V_R = 10 V): 20 nA maximum.

Typical Performance Data

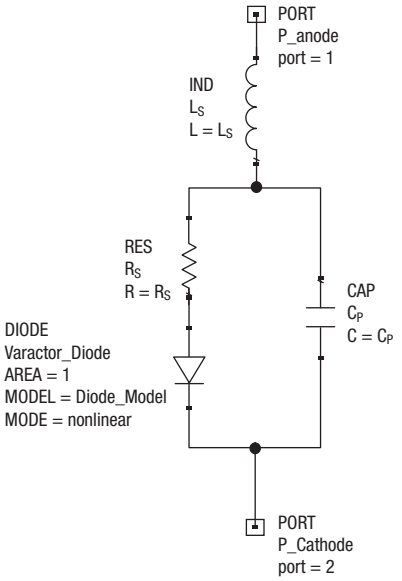


Capacitance vs. Reverse Voltage

Capacitance vs. Reverse Voltage

V_R (V)	SMV1129 C_T (pF)	SMV1139 C_T (pF)
0	27.5	8
1	18.9	5.5
2	15	4.4
3	12.5	3.7
4	10.7	3.1
5	9.3	2.7
6	8.1	2.5
7	7.1	2.3
8	6.3	2.2
9	5.7	2.1
10	5.2	2
11	4.9	2
12	4.7	1.9

SPICE Model



DIODEM
Diode_Model
I_S = 1.00e-14
R_S = 0
N = 1
T_T = 0
C_{J0} = C_{J0}
M = M
V_J = V_J
E_G = 1.11
X_{TI} = 3
K_F =0
A_F =1
F_C = 0.5
B_V = 0
I_{BV} = 1e-3
I_{SR} = 0
N_R = 2
I_{KF} = 0
N_{BV} = 1
I_{BVL} = 0
N_{BVL} = 1
T_{BV1} = 0
T_{NOM} = 27
F_{FE} = 1

Part Number	C_{J0} (pF)	V_J (V)	M	C_P (pF)	R_S (Ω)
SMV1129	27.5	2.8	1.1	0	0.4
SMV1139	8	1.2	0.65	0	0.6

Values extracted from measured performance.
For package inductance (L_S) refer to package type.
For more details refer to the "Varactor SPICE Models for RF VCO Applications" Application Note.

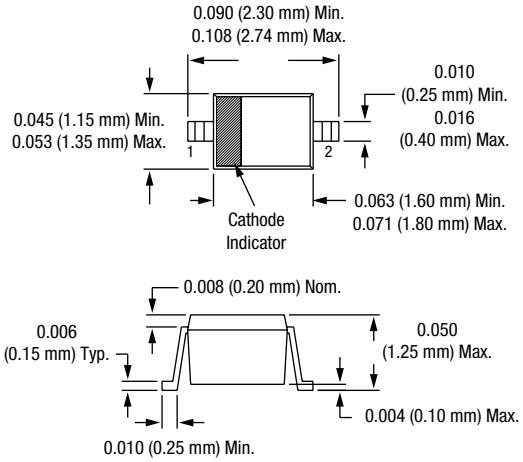
Recommended Solder Reflow Profiles

Refer to the *"Recommended Solder Reflow Profile"* Application Note.

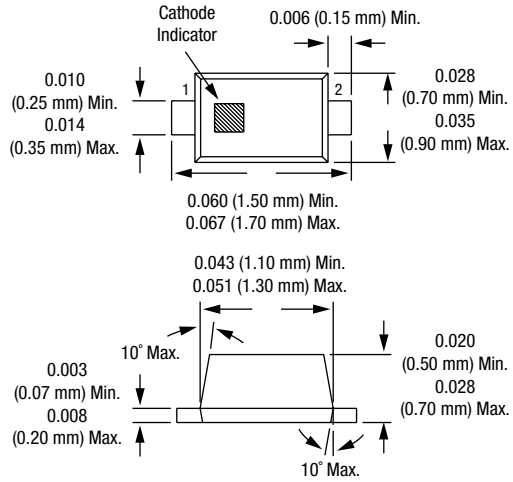
Tape and Reel Information

Refer to the *"Discrete Devices and IC Switch/Attenuators Tape and Reel Package Orientation"* Application Note.

SOD-323



SC-79



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