SKYWORKS®

DATA SHEET

SMV1281 Series: Hyperabrupt Junction Tuning Varactors

Features

- High tuning ratio
- SC-79 and SOD-323 packages
- Available lead (Pb)-free and RoHS-compliant MSL-1 @ 260 °C per JEDEC J-STD-020
- Designed for high-volume, low-cost applications
- Available in tape and reel packaging

Description

The SMV1281 series are surface mount varactor diodes in the SC-79 and SOD-323 plastic packages. They are designed for very high capacitance tuning ratio while having low series resistance, which makes these devices especially attractive for wideband VCO applications.

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 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.*

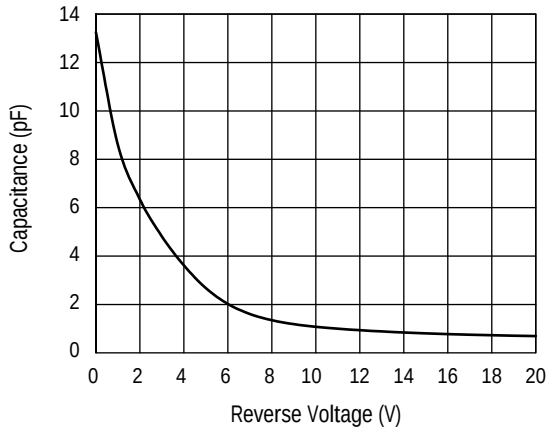
Electrical Specifications at 25 °C

Parameter	Condition	Min.	Typ.	Max.	Unit
Reverse Current (I_R)	V_R = 20 V			20	nA
Capacitance (C_T)	V_R = 1 V	7.8	8.6	9.5	pF
Capacitance (C_T)	V_R = 20 V	0.6	0.7	0.8	pF
Capacitance Ratio (C_{TR})	V_R = 1 V/20 V		12		
Series Resistance (R_S)	V_R = 1 V, F = 500 MHz		1.7		Ω
Breakdown Voltage (V_{BR})	I_R = 10 µA	24			V

	
Single	Single
SOD-323	SC-79
SMV1281-011 Marking: CP	
SMV1281-011LF Marking: HP	**SMV1281-079LF** Marking: Cathode
L_S = 1.5 nH	L_S = 0.7 nH

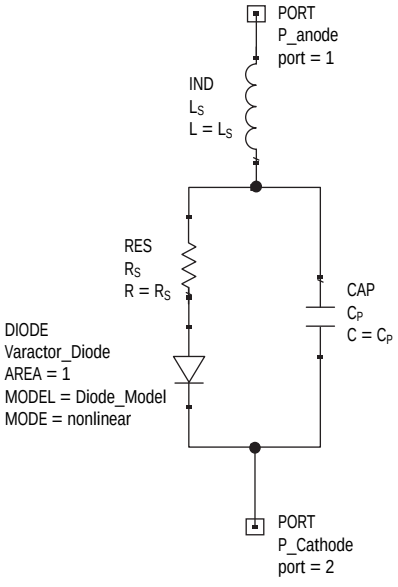
LF denotes lead (Pb)-free, RoHS-compliant packaging option as an alternative to our standard tin/lead (Sn/Pb) packaging.

Typical Performance Data



Capacitance vs. Reverse Voltage

SPICE Model





DIODEM
Diode_Model
I_S = 1.00e-14
R_S = 0
N = 1
T_T = 0
C_{JO} = C_{JO}
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)	L_S (nH)
SMV1281	13	14	6	0.62	1.7	1.2

Capacitance vs. Reverse Voltage

V_R (V)	C_T (pF)
0	13.3
1	8.6
2	6.3
3	4.8
4	3.6
5	2.7
6	2
7	1.6
8	1.4
9	1.2
10	1.1
11	1
12	0.94
13	0.89
14	0.85
15	0.81
16	0.78
17	0.75
18	0.73
19	0.71
20	0.69

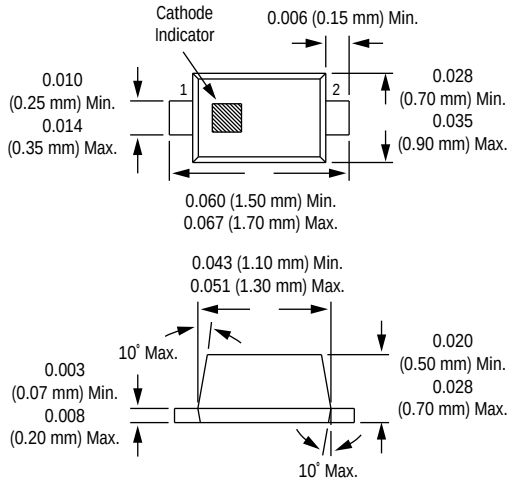
Recommended Solder Reflow Profiles

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

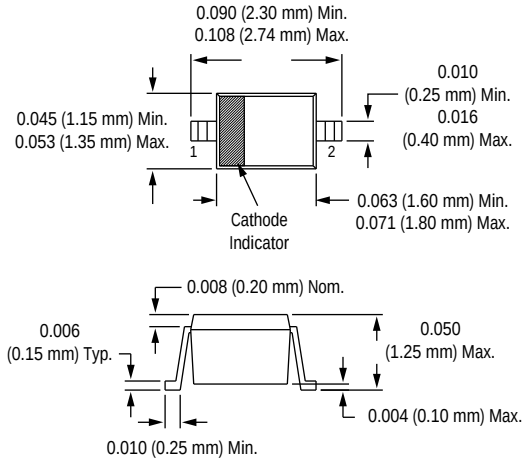
Tape and Reel Information

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

SC-79



SOD-323



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