DATA SHEET

SMV1800-079LF: Hyperabrupt Junction Tuning Varactor

Applications

- Satellite tuners
- Voltage controlled oscillators (VCOs)
- Tuneable coupling

Features

- Cross to NXP's BB181
- Low series resistance
- High capacitance ratio
- Ultrasmall SC-79 package
- Available lead (Pb)-free and RoHS-compliant MSL-1 @ 260 °C per JEDEC J-STD-020
- Designed for high-volume, low-cost battery applications
- Available in tape and reel packaging

Description

The SMV1800-079LF is a silicon hyperabrupt junction varactor diode specifically designed for battery operation.The specified high capacitance ratio and low R_S of this varactor make it appropriate for low noise VCOs used in wireless systems to frequencies 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 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 = 30 V			10	nA
Capacitance (C_T)	V_R = 0.5 V, F = 1 MHz	10.25		14.25	pF
Capacitance (C_T)	V_R = 28 V, F = 1 MHz	0.7		1.05	pF
Capacitance ratio (C_{TR})	C_T (0.5 V)/C_T (28 V)	12		16	
Series resistance (R_S)	V_R = 1.5 V, F = 470 MHz			3	Ω
Breakdown voltage (V_{BR})	I_R = 10 µA	30			V

Single

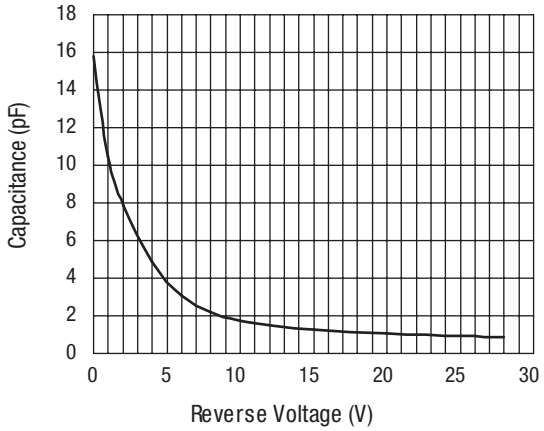
SC-79

SMV1800-079LF
Marking: Cathode

L_S = 0.7 nH

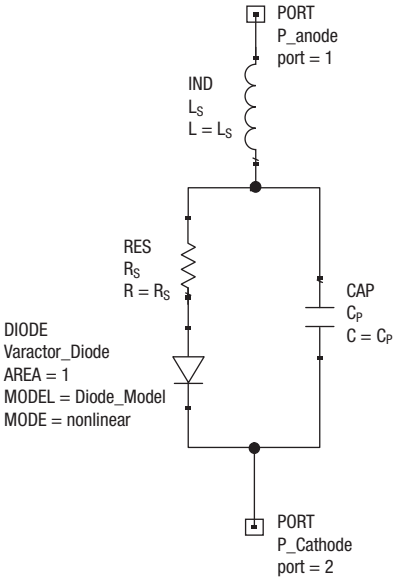
LF denotes lead (Pb)-free, RoHS-compliant packaging option as an alternative to our standard tin/lead (Sn/Pb) packaging.

Typical Performance Data



Capacitance vs. Voltage Curve

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 = V_{BR}
I_{BV} = 1e-5
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_{JO} (pF)	V_J (V)	M	C_P (pF)	R_S (Ω)	L_S (nH)
SMV1800-079LF	14.5	16	6	0.9	2.5	0.8

Recommended Solder Reflow Profiles

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

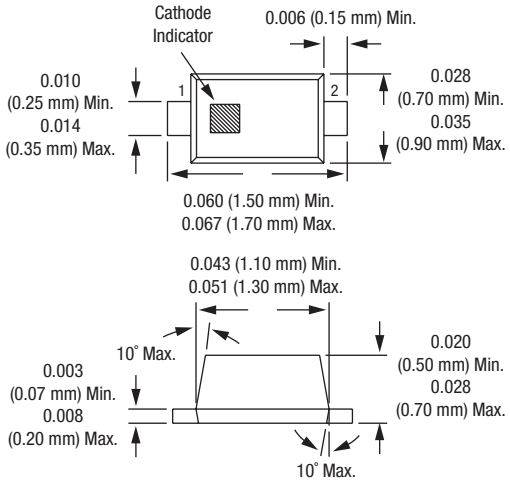
Tape and Reel Information

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

Capacitance vs. Voltage

V_R (V)	C_T (pF)
0	15.78
0.5	12.45
1	10.43
2	7.87
4	4.85
6	3.07
8	2.17
10	1.72
15	1.26
20	1.06
25	0.93
28	0.88
30	0.84

SC-79



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