

DATA SHEET

SMV1801-079LF: Hyperabrupt Junction Tuning Varactor

Applications

- VHF TV tuner
- Voltage controlled oscillators (VCOs)



Features

- Cross to NXP's BB182
- Low series resistance
- High capacitance ratio
- Ultrasmall SC-79 package
- 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 SMV1801-079LF 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 at frequencies 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 Ratings. Exceeding any of the absolute maximum/minimum specifications may result in permanent damage to the device and will void the warranty.

CAUTION: *Although these devices are designed to be robust, ESD (Electrostatic Discharge) can cause permanent damage. 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.*

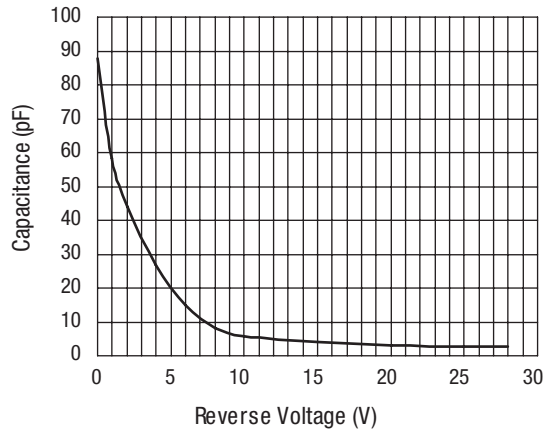
Electrical Specifications at 25 °C

Parameter	Condition	Min.	Typ.	Max.	Unit
Reverse current (I_R)	$V_R = 30\text{ V}$			10	nA
Capacitance (C_T)	$V_R = 1\text{ V}, F = 1\text{ MHz}$	54		62	pF
Capacitance (C_T)	$V_R = 28\text{ V}, F = 1\text{ MHz}$	2.48	2.7	2.89	pF
Capacitance ratio (C_{TR})	$C_T(1\text{ V})/C_T(2\text{ V})$		1.31		
Capacitance ratio (C_{TR})	$C_T(1\text{ V})/C_T(28\text{ V})$	20.6	22		
Capacitance ratio (C_{TR})	$C_T(25\text{ V})/C_T(28\text{ V})$		1.05		
Series resistance (R_S)	$V_R = 3\text{ V}, F = 470\text{ MHz}$			1.2	Ω
Breakdown voltage (V_{BR})	$I_R = 10\ \mu\text{A}$	32			V


Single
SC-79
SMV1801-079LF Marking: Cathode
$L_S = 0.7\text{ nH}$

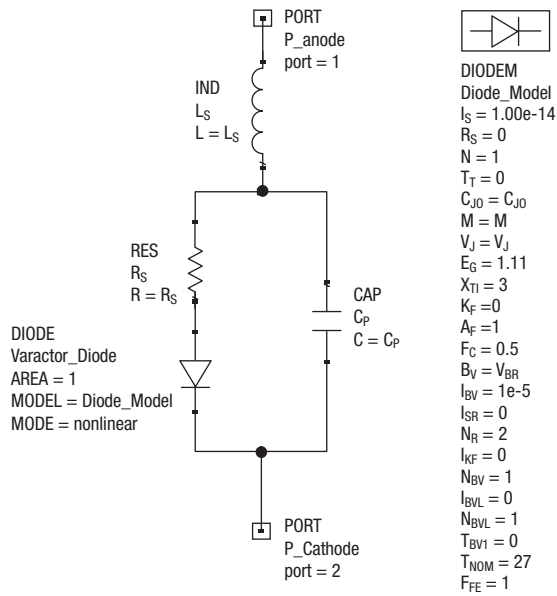
 LF denotes lead (Pb)-free, RoHS-compliant packaging option as an alternative to our standard tin/lead (Sn/Pb) packaging.

Typical Performance Data



Capacitance vs. Voltage Curve

SPICE Model

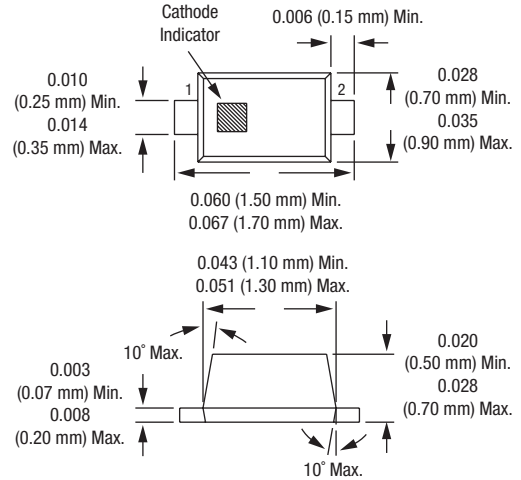


Part Number	CJO (pF)	VJ (V)	M	Cp (pF)	RS (Ω)	LS (nH)
SMV1801-079LF	85	10	4.4	2.6	1.1	0.8

Capacitance vs. Voltage

VR (V)	CT (pF)
0	87.66
0.5	69.34
1	58.25
2	44.14
4	26.90
6	14.80
8	8.00
10	5.69
15	3.91
20	3.20
25	2.81
28	2.71
30	2.65

SC-79



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.

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