

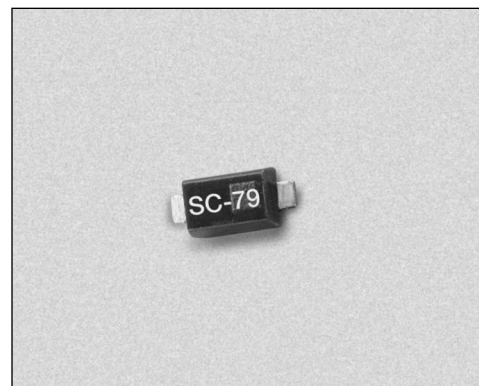
# Hyperabrupt Junction Tuning Varactor



SMV1770-079

## Features

- Low Series Resistance
- High Capacitance Ratio
- Ultra Small Size SC-79 Package
- Designed for High Volume, Low Cost Battery Applications
- Available in Tape and Reel Packaging



## Description

The SMV1770-079 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 beyond 2.5 GHz. Applications include low noise and wideband UHF and VHF VCO for GSM, PCS, CDMA and analog phones.

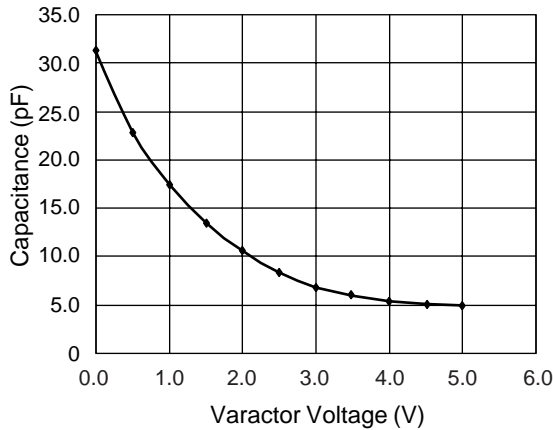
## Absolute Maximum Ratings

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

## Electrical Specifications at 25°C

Parameter	Condition	Min.	Typ.	Max.	Unit
Reverse Current ( $I_R$ )	$V_R = 8\text{ V}$			20.0	nA
Capacitance ( $C_T$ )	$C_T @ 0.5\text{ V}, V_R = 0.5\text{ V}, F = 1\text{ MHz}$	22.1	23.6	25.1	pF
Capacitance ( $C_T$ )	$C_T @ 2.5\text{ V}, V_R = 2.5\text{ V}, F = 1\text{ MHz}$	7.7	8.6	9.8	pF
Capacitance Ratio ( $C_{TR}$ )	$C_T (0.5\text{ V})/C_T (2.5\text{ V})$	2.3	2.7		
Series Resistance ( $R_S$ )	$V_R = 1\text{ V}, F = 470\text{ MHz}$		0.4	0.5	$\Omega$
Breakdown Voltage ( $V_{BR}$ )	$I_R = 10\ \mu\text{A}$	12.0			V

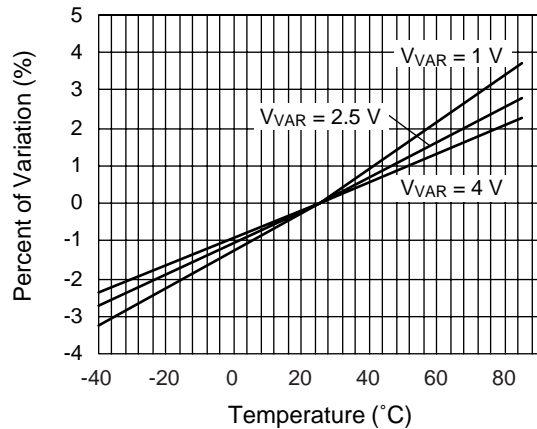
Typical Performance Data



Capacitance vs. Voltage

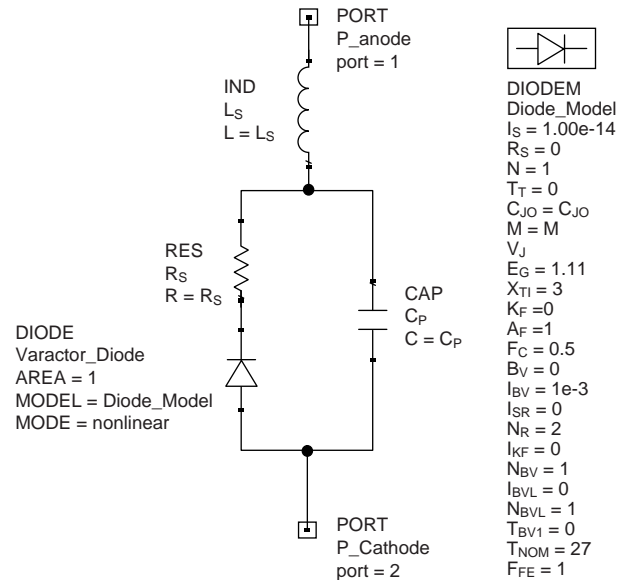
Capacitance vs. Voltage

$V_R$ (V)	$C_T$ (pF)
0.0	31.2
0.5	23.6
1.0	17.8
1.5	13.7
2.0	10.7
2.5	8.6
3.0	7.0
3.5	5.9
4.0	5.5
4.5	5.2
5.0	5.0

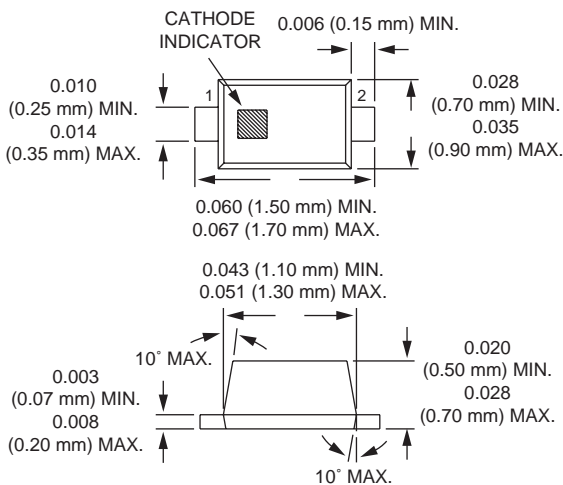


Relative Capacitance Change vs. Temperature

SPICE Model



SC-79



Part Number	$C_{JO}$ (pF)	$V_J$ (V)	M	$C_P$ (pF)	$R_S$ ( $\Omega$ )	$L_S$ (nH)
SMV1770-079	31	12	8	2	0.4	0.8