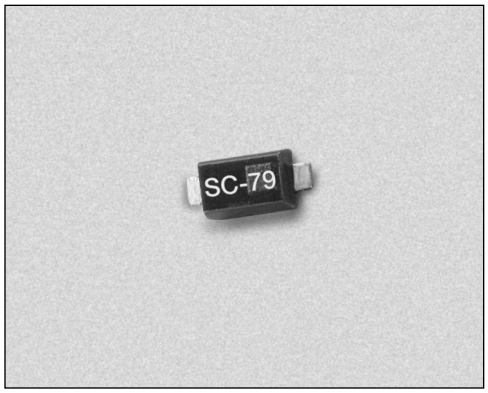
# Hyperabrupt Junction Tuning Varactor

Alpha

## SMV1763-079

## Features

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




## Description

The SMV1763-079 is a silicon hyperabrupt junction varactor diode specifically designed for 3 V platforms. The specified high capacitance ratio and low $R_S$ of this varactor make it attractive for low phase noise VCOs in wireless systems up to and beyond 2.5 GHz. Applications include low noise and wideband UHF and VHF VCO for GSM, PCS, CDMA and analog phones.

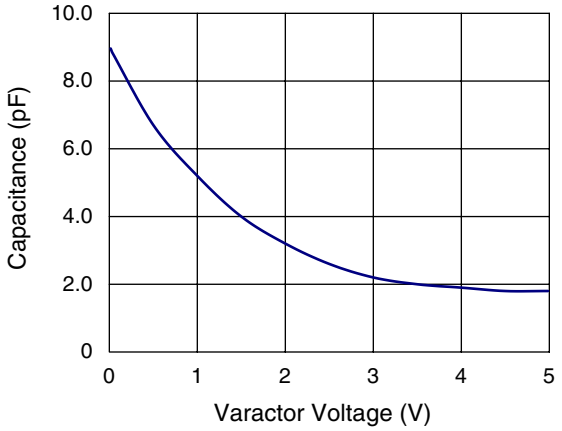
## Absolute Maximum Ratings

| 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 |

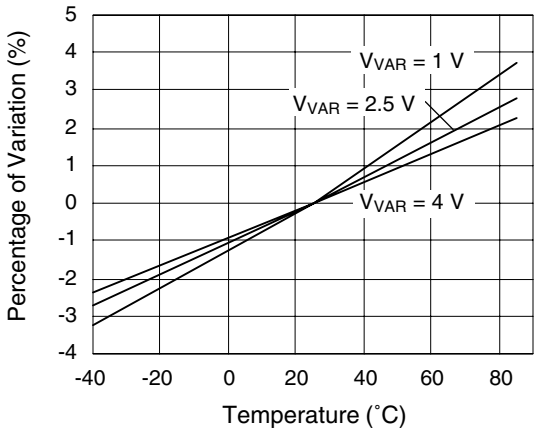
## Electrical Specifications at 25°C

| Parameter | Condition | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|
| Reverse Current ($I_R$) | $V_R$ = 8 V | | | 20.0 | nA |
| Capacitance ($C_T$) | $C_T$ @ 0.5 V, $V_R$ = 0.5 V, F = 1 MHz | 6.2 | 6.7 | 7.2 | pF |
| Capacitance ($C_T$) | $C_T$ @ 2.5 V, $V_R$ = 2.5 V, F = 1 MHz | 2.3 | 2.6 | 2.9 | pF |
| Capacitance Ratio ($C_{TR}$) | $C_T$ (0.5 V)/$C_T$ (2.5 V) | 2.3 | 2.5 | | |
| Series Resistance ($R_S$) | $V_R$ = 1 V, F = 900 MHz | | 0.5 | 0.7 | Ω |
| Breakdown Voltage ($V_{BR}$) | $I_R$ = 10 μA | 10.0 | | | V |

## Typical Performance Data




**Capacitance vs. Voltage**

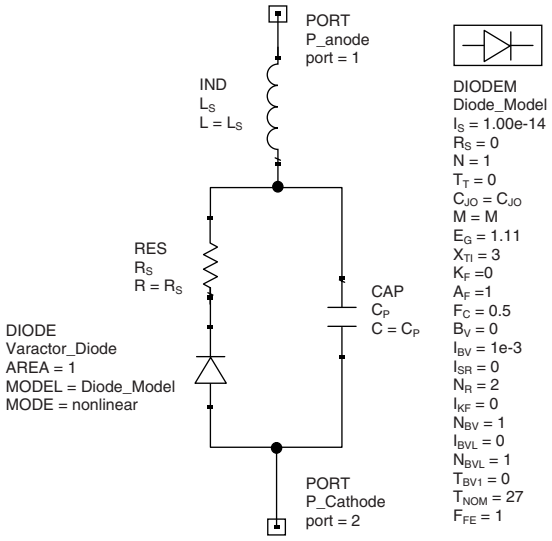



**Relative Capacitance Change vs. Temperature**

## Capacitance vs. Voltage

| $V_R$ (V) | $C_T$ (pF) |
|---|---|
| 0.0 | 9.0 |
| 0.5 | 6.7 |
| 1.0 | 5.2 |
| 1.5 | 4.0 |
| 2.0 | 3.2 |
| 2.5 | 2.6 |
| 3.0 | 2.2 |
| 3.5 | 2.0 |
| 4.0 | 1.9 |
| 4.5 | 1.8 |
| 5.0 | 1.8 |

## SPICE Model




| Part Number | $C_{J0}$ (pF) | $V_J$ (V) | M | $C_P$ (pF) | $R_S$ (Ω) | $L_S$ (nH) |
|---|---|---|---|---|---|---|
| SMV1763-079 | 8.2 | 15 | 9.5 | 0.67 | 0.5 | 0.8 |

## SC-79