

PRELIMINARY DATA SHEET

SMV1771-079: Hyperabrupt Junction Tuning Varactor

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 SMV1771-079 is a silicon hyperabrupt junction varactor diode specifically designed for battery operation. The specified high capacitance ratio and low RS 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 |
| 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.

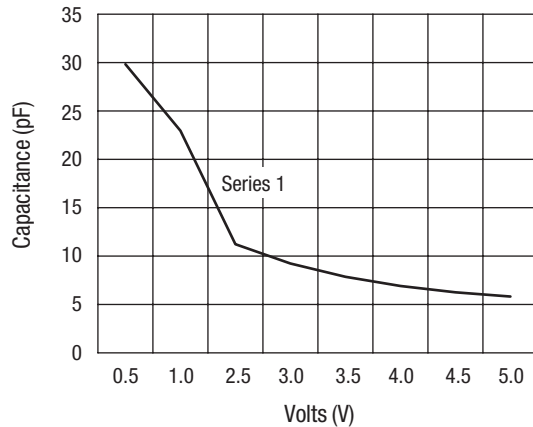
CAUTION: Although this device is designed to be as robust as possible, Electrostatic Discharge (ESD) can damage this device. This device must be protected at all times from ESD. Static charges may easily produce potentials of several kilovolts on the human body or equipment, which can discharge without 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) | $V_R = 8\text{ V}$ | | | 20.0 | nA |
| Capacitance (C_T) | $V_R = 1\text{ V}, F = 1\text{ MHz}$ | 22.0 | | 24.0 | pF |
| Capacitance (C_T) | $V_R = 2.5\text{ V}, F = 1\text{ MHz}$ | 9.5 | | 12.5 | 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 | Ω |
| Breakdown voltage (V_{BR}) | $I_R = 10\ \mu\text{A}$ | 12.0 | | | V |

| |
|---|
|  |
| Single |
| Marking: Cathode |
| SC-79 |
| SMV1771-079 |
| $L_S = 0.7\text{ nH}$ |

Typical Performance Data

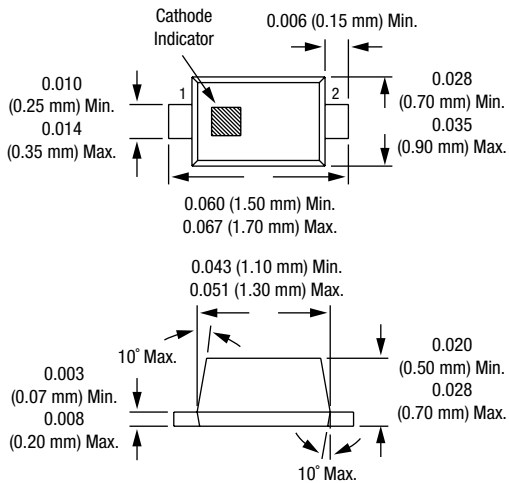


Capacitance MEAN Test Data

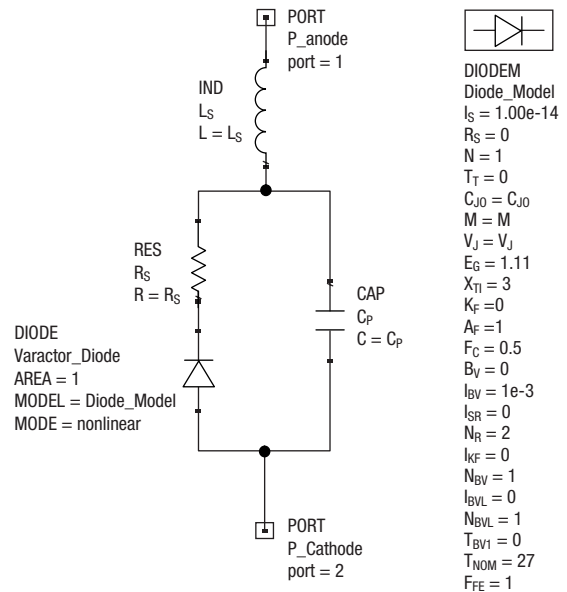
Capacitance vs. Voltage

| V_R (V) | C_T (pF) |
|-----------|------------|
| 0.5 | 29.8 |
| 1.0 | 22.9 |
| 2.0 | 14.07 |
| 2.5 | 11.23 |
| 3.0 | 9.23 |
| 3.5 | 7.86 |
| 4.0 | 6.90 |
| 4.5 | 6.25 |
| 5.0 | 5.80 |

SC-79



SPICE Model



| Part Number | C_{JO} (pF) | V_J (V) | M | C_P (pF) | R_S (Ω) | L_S (nH) |
|-------------|---------------|-----------|---|------------|--------------------|------------|
| SMV1771-079 | 31 | 12 | 8 | 2 | 0.4 | 0.8 |

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