DATA SHEET

SMV1705 Series: Hyperabrupt Junction Tuning Varactors

Features

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

Description

The SMV1705 devices are silicon hyperabrupt junction varactor diodes specifically designed for battery operation. The specified high capacitance ratio and low R_S of these varactors make them 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.

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.*

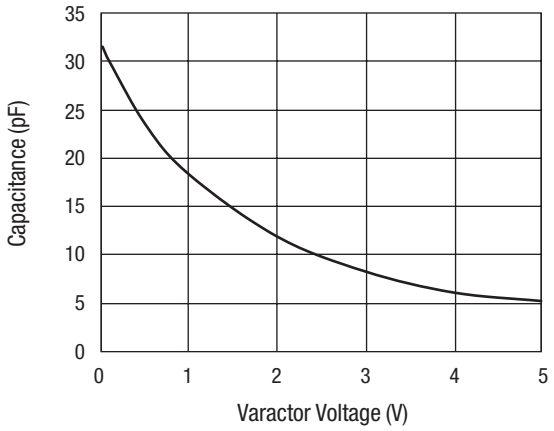
Electrical Specifications at 25 °C

Parameter	Condition	Min.	Typ.	Max.	Unit
Reverse current (I_R)	V_R = 8 V		< 0.01	20	nA
Capacitance (C_T)	V_R = 1 V, F = 1 MHz	17.3	18.3	19.3	pF
Capacitance (C_T)	V_R = 4 V, F = 1 MHz	5.3	6.1	6.6	pF
Capacitance ratio (C_{TR})	C_T (1 V)/C_T (4 V)	2.8	3		
Series resistance (R_S)	V_R = 1 V, F = 470 MHz		0.32		Ω
Breakdown voltage (V_{BR})	I_R = 10 µA	12			V

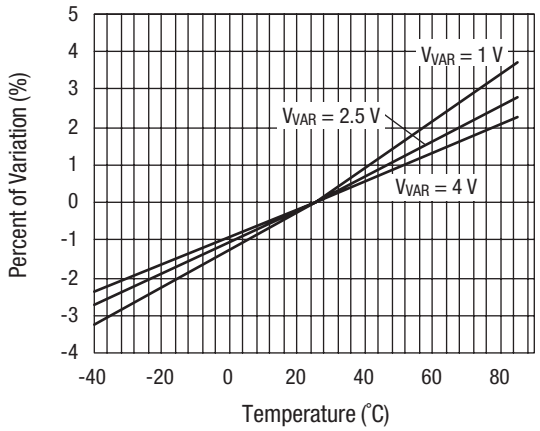
		
Common Cathode	Common Cathode	Single
SOT-23	SC-70	SC-79
SMV1705-004 Marking: CY3	**SMV1705-074** Marking: CY3	**SMV1705-079** Marking: Cathode
SMV1705-004LF Marking: HY3	**SMV1705-074LF** Marking: HY3	**SMV1705-079LF** Marking: Cathode
L_S = 1.4 nH		L_S = 0.7 nH

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

Typical Performance Data

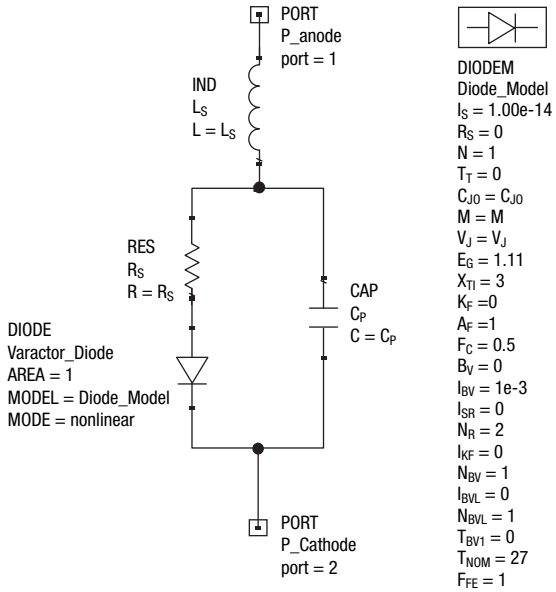


Capacitance vs. Voltage



Relative Capacitance Change vs. Temperature

SPICE Model



Part Number	C_{J0} (pF)	V_J (V)	M	C_P (pF)	R_S (Ω)	L_S (nH)
SMV1705	31	3	2	0.5	0.32	0.8

Capacitance vs. Voltage

V_R (V)	C_T (pF)
0	31.5
0.5	23.5
1	18.3
1.5	14.3
2	11.9
2.5	9.7
3	8.3
3.5	7.1
4	6.1
4.5	5.5
5	5.2

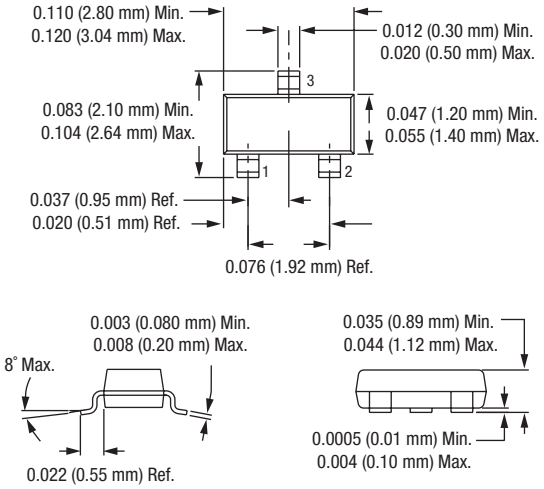
Recommended Solder Reflow Profiles

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

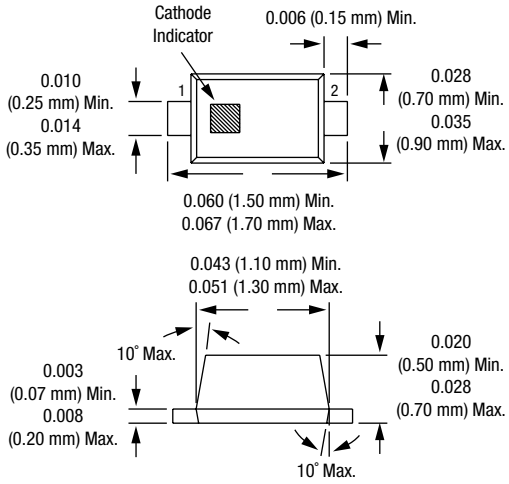
Tape and Reel Information

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

SOT-23



SC-79



SC-70