SKYWORKS®

DATA SHEET

SMV1470-004, SMV1470-004LF: Abrupt Junction Tuning Varactor

Features

- High capacitance ratio
- Designed for high volume
- Available in tape and reel packaging
- Available lead (Pb)-free and RoHS-compliant MSL-1 @ 260 °C per JEDEC J-STD-020



Description

The SMV1470-004 is a dual silicon hyperabrupt junction varactor diode in a common cathode configuration. The specified high capacitance ratio and low R_S of this varactor make it appropriate for low noise VCOs and VCXOs in wireless systems. Applications include low noise and wideband VCO and VCXO 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 = 10 V			20.0	nA
Capacitance (C_T)	V_R = 1 V, F = 1 MHz	65.8	70.0	74.2	pF
Capacitance (C_T)	V_R = 4.5 V, F = 1 MHz	12.0	13.4	14.8	pF
Capacitance ratio (C_{TR})	C_T (1 V)/C_T (5 V)	5.0	6.0		
Series resistance (R_S)	V_R = 1.5 V, F = 900 MHz		0.5	0.8	Ω
Breakdown voltage (V_{BR})	I_R = 10 µA	10.0			V



Common Cathode

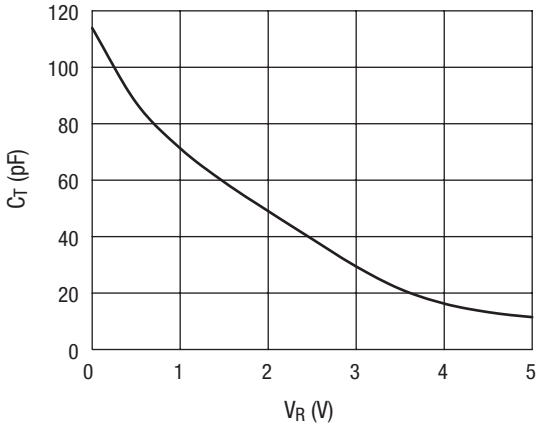
SOT-23

SMV1470-004
Marking: AT3

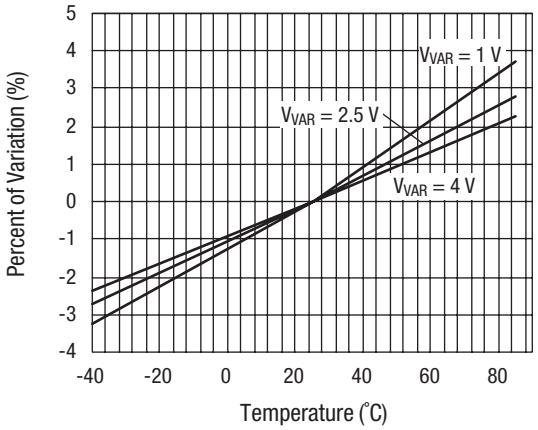
SMV1470-004LF
Marking: ET3

L_S = 1.4 nH

Typical Performance Data

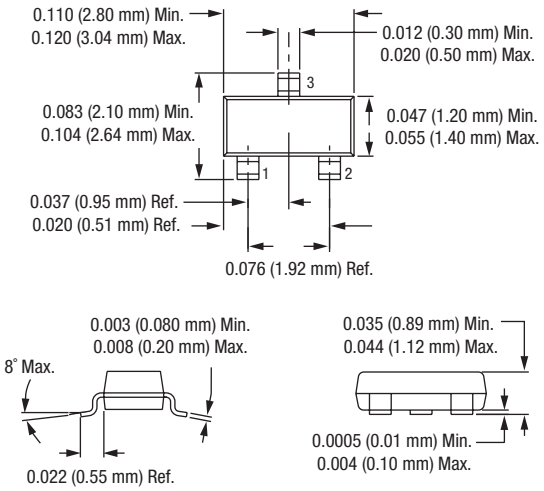


Capacitance vs. Voltage

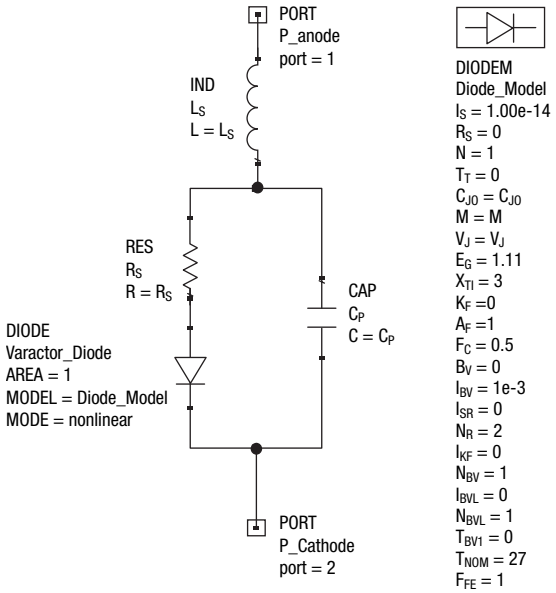


Relative Capacitance Change vs. Temperature

SOT-23



SPICE Model



DIODEM
Diode_Model
I_S = 1.00e-14
R_S = 0
N = 1
T_T = 0
C_{J0} = C_{J0}
M = M
V_J = V_J
E_G = 1.11
X_{TI} = 3
K_F =0
A_F =1
F_C = 0.5
B_V = 0
I_{BV} = 1e-3
I_{SR} = 0
N_R = 2
I_{KF} = 0
N_{BV} = 1
I_{BVL} = 0
N_{BVL} = 1
T_{BV1} = 0
T_{NOM} = 27
F_{FE} = 1

Part Number	C_{J0} (pF)	V_J (V)	M	C_P (pF)	R_S (Ω)	L_S (nH)
SMV1470-004	113	25	13	1	0.5	1.4

Capacitance vs. Voltage

V_R (V)	C_T (pF)
0.0	113.9
0.5	87.4
1.0	71.3
1.5	59.3
2.0	49.0
2.5	39.1
3.0	29.4
3.5	21.4
4.0	16.3
4.5	13.3
5.0	11.5
5.5	10.3
6.0	9.5
6.5	8.9
7.0	8.5
7.5	8.1
8.0	7.9
8.5	7.7
9.0	7.6
9.5	7.5
10.0	7.5

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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