

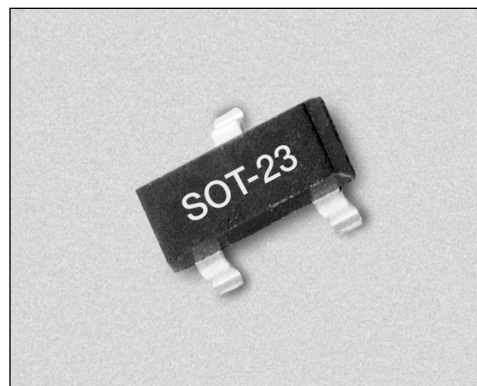
Hyperabrupt Junction Tuning Varactor



SMV2022–SMV2023

Features

- Low Series Resistance
- High Capacitance Ratio at Low Reverse Voltage
- SOT-23 Single and Common Cathode
- Designed for High Volume, Low Cost Battery Applications
- Available in Tape and Reel Packaging



Description

The SMV2022 and SMV2023 devices are silicon hyperabrupt junction varactor diodes. The specified high capacitance ratio and low R_S of these varactors make them attractive for low phase noise VCOs in wireless systems.

Absolute Maximum Ratings

Characteristic	Value
Reverse Voltage (V_R)	22 V
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

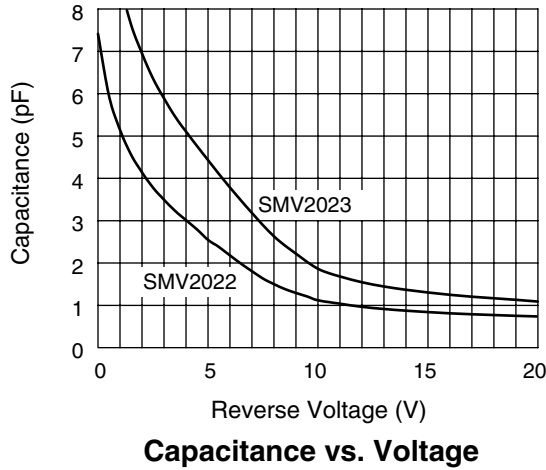
Electrical Specifications at 25°C

Part Number	C_T @ 4 V (pF)		C_T @ 20 V (pF)		$\frac{C_T @ 4 V}{C_T @ 20 V}$ (Ratio)	Q @ 4 V
	Min.	Max.	Min.	Max.	Min.	50 MHz
SMV2022	2.5	3.3	0.6	0.85	3.0	500
SMV2023	4.4	5.4	0.9	1.20	4.2	500

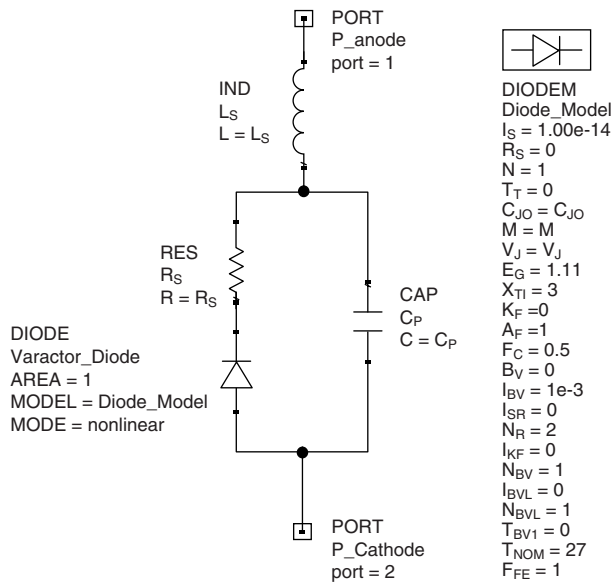
Reverse current I_R ($V_R = 16$ nA): 50 nA.

Single	Common Cathode
SOT-23	SOT-23
SMV2022-001	SMV2022-004
SMV2023-001	SMV2023-004
$L_S = 1.5$ nH	$L_S = 1.5$ nH

Typical Performance Data



SPICE Model



Part Number	C_{JO} (pF)	V_J (V)	M	C_P (pF)	R_S (Ω)	L_S (nH)
SMV2022	7.30	4.0	1.4	0	2.2	1.5
SMV2023	12.23	4.0	1.4	0	1.6	1.5

Capacitance vs. Voltage

V_R (V)	SMV2022 C_T (pF)	SMV2023 C_T (pF)
0.0	7.41	12.33
0.5	5.94	9.90
1.0	5.14	8.60
1.5	4.56	7.62
2.0	4.14	6.94
2.5	3.78	6.34
3.0	3.49	5.88
3.5	3.23	5.45
4.0	3.01	5.09
5.0	2.54	4.42
6.0	2.18	3.77
7.0	1.8	3.18
8.0	1.5	2.63
9.0	1.29	2.21
10.0	1.11	1.86
11.0	1.03	1.68
12.0	0.96	1.54
13.0	0.91	1.44
14.0	0.87	1.37
15.0	0.83	1.30
16.0	0.81	1.25
17.0	0.78	1.20
18.0	0.76	1.16
19.0	0.75	1.13
20.0	0.73	1.09

SOT-23

