

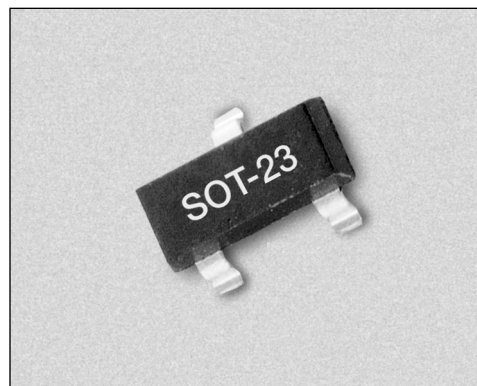
Hyperabrupt Junction Tuning Varactor



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

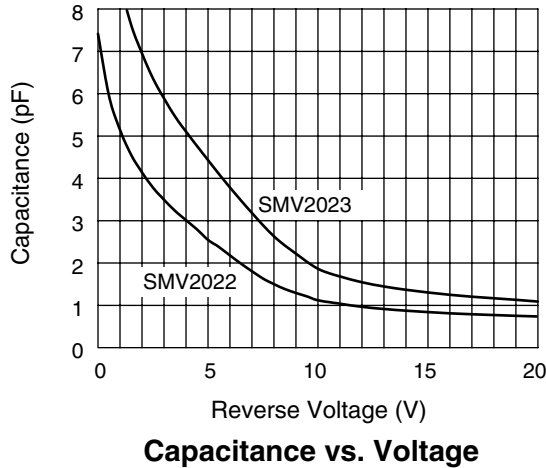
Electrical Specifications at 25°C

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 50 MHz
	Min.	Max.	Min.	Max.	Min.	
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

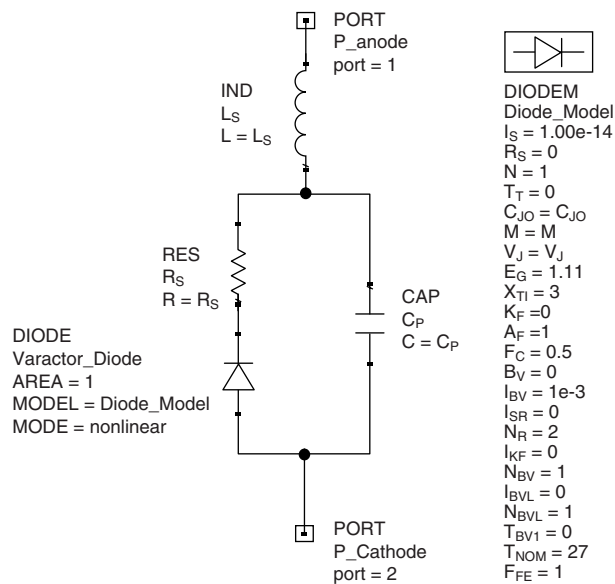
Typical Performance Data



Capacitance vs. Voltage

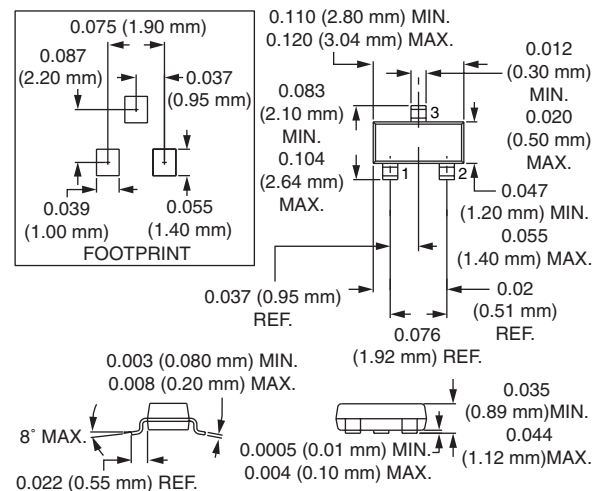
V _R (V)	SMV2022 C _T (pF)	SMV2023 C _T (pF)
0.0	7.41	12.33
0.5	5.94	9.90
1.0	5.14	8.60
1.5	4.56	7.62
2.0	4.14	6.94
2.5	3.78	6.34
3.0	3.49	5.88
3.5	3.23	5.45
4.0	3.01	5.09
5.0	2.54	4.42
6.0	2.18	3.77
7.0	1.8	3.18
8.0	1.5	2.63
9.0	1.29	2.21
10.0	1.11	1.86
11.0	1.03	1.68
12.0	0.96	1.54
13.0	0.91	1.44
14.0	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

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

SOT-23



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