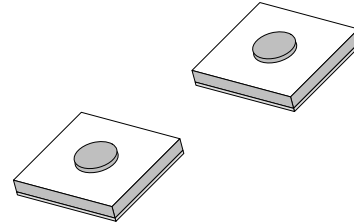# Silicon Low Capacitance Hyperabrupt Junction Varactor Diodes

Alpha

SMV2019 to SMV2023

Features

■ Octave Frequency Tuning from 0 to 10 Volts

■ Good Linearity Tuning Ratio Without Compensation Network

■ Offered in Package Styles Suitable for a Wide Range of Applications

Description

Alpha microwave hyperabrupt diodes are designed for wideband tuning of microwave filters, resonators, and local oscillators. Linear tuning, not possible with conventional abrupt–junction tuning diodes, is accomplished by maintaining an accurate silicon doping profile using ion–implantation precision control techniques.

This series of hyperabrupt diodes offer wide bandwidth tuning with low bias voltage. For example, a 22 volt hyperabrupt diode can provide the same tuning variation as a 90 volt abrupt–junction diode.

When capacitance and tuning ratio values are equal, a hyperabrupt diode will have a Q (measured at –4 volts, 50 MHz) approximately 1/2 to 1/3 that of an abrupt–junction diode.

Maximum Ratings

Reverse Voltage, V_R:	22V
Forward Current, I_F:	100 mA
Power Dissipation at 25°C:	250 mW
Operating Temperature:	–55 to 150°C
Storage Temperature:	–65 to 200°C

These diodes are available in many Alpha ceramic packages. They can be supplied in chip form or mounted on a variety of packages. All chips are passivated with silicon dioxide for reliability and low leakage current.

The specifications table indicates chip capacitance measured at 1 MHz. For packaged varactors add appropriate package capacitance, e.g., 0.22 pF for package 210, to obtain total capacitance.

Electrical Specifications at 25°C

Square Passivated Silicon Chips

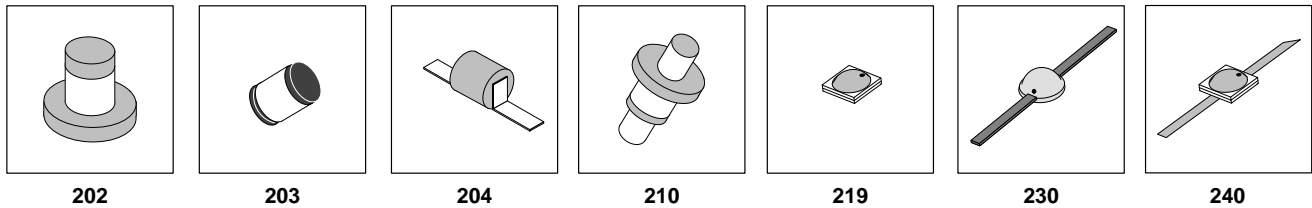| Part Number	V_B @ 10 μA (V) Min.	I_R @ 17.6V (nA) Max.	C_J @ 4V (pF) Min.	C_J @ 4V (pF) Max.	C_J @ 20V (pF) Min.	C_J @ 20V (pF) Max.	Q @ 4V 50 MHz Min.	Chip Outline Number
▶ SMV2019–000	22	50	0.68	0.88	0.13	0.23	500	149–801
SMV2020–000	22	50	1.13	1.43	0.23	0.33	500	149–801
SMV2021–000	22	50	1.58	1.98	0.32	0.44	500	149–801
SMV2022–000	22	50	2.48	3.08	0.48	0.68	400	149–801
▶ SMV2023–000	22	50	4.28	5.28	0.78	1.08	400	149–801

▶ Available through distribution.

2

Ordering Information

The following packages are also available. To order part in a different package just replace the dash number with a package style listed below. For example, SMV2019–000 becomes SMV2019–210.

Available Package Outlines: 202, 203, 204, 210, 219, 230, 240

Refer to the Outline Drawings section in this catalog for the total selection of outline (package) dimensions.

| 202 | 203 | 204 | 210 | 219 | 230 | 240 |

Outline Dimensions

149–801

.012 ± .002   .012 ± .002

.005 NOM.

SILICON

METALIZED BACK
CONTACT - GOLD

METALIZED GOLD DOT
.002 DIA. MIN.