

**DESCRIPTION**

These families of hyperabrupt junction RF varactor diodes feature computer controlled grown junction epitaxy which provides extraordinary consistency and the highest Q available in a 22 Volt hyperabrupt varactor. These series give the designer a full capacitance range of 10 to 500 pF at 3 or 4 volts of bias, depending on product series. They allow octave tuning of LC tanks through 500 MHz. With a reduced 1.5 to 1 frequency ratio, straight-line-frequency tuning over a 3 to 8 volt tuning range is possible. Ultrahigh Q and excellent large signal handling capabilities, along with a 2 to 1 capacitance ratio, is obtained by tuning from 9 to 20 volts of reverse bias. Linear, wide deviation tuning of VCXO/TCXO'S and frequency modulators also results when these diodes are tuned over a 3 to 8 volt bias range.

Closely matched sets of all HF-VHF diodes are available along with "A" suffix versions having  $\pm 5\%$  capacitance tolerance at 3 or 4 volts of reverse bias depending on series selected.

**APPLICATIONS**

These families of hyperabrupt varactors are ideal for wide bandwidth VCOs. They also provide excellent performance in frequency modulators, voltage variable filters, analog phase shifters, TCXOs and VCXOs.

**ABSOLUTE MAXIMUM RATINGS AT 25° C  
(UNLESS OTHERWISE SPECIFIED)**

Rating	Symbol	Value	Unit
Maximum Working Voltage	$V_R$	22	V
Storage Temperature	$T_{STG}$	-65 to +150	°C
Operating Temperature	$T_{OP}$	-55 to +150	°C

**KEY FEATURES**

- Available as packaged devices or as chips for hybrid applications
- Octave Tuning Range
- Ultrahigh Q
- Available with 5% Tolerance  $C_T$

**APPLICATIONS/BENEFITS**

- Values cover the entire HF / VHF / UHF spectrum;
- Highest Q / lowest VCO phase noise
- Tough MIL-Spec  $SiO_2$  passivation
- Dozens of package outlines available

**IMPORTANT:** For the most current data, consult our website: [www.MICROSEMI.com](http://www.MICROSEMI.com)  
 Specifications are subject to change. Consult factory for the latest information.



These devices are ESD sensitive and must be handled using ESD precautions.

<sup>1</sup> Unless otherwise specified, these products are supplied with Gold terminations suitable for RoHS compliant assembly.

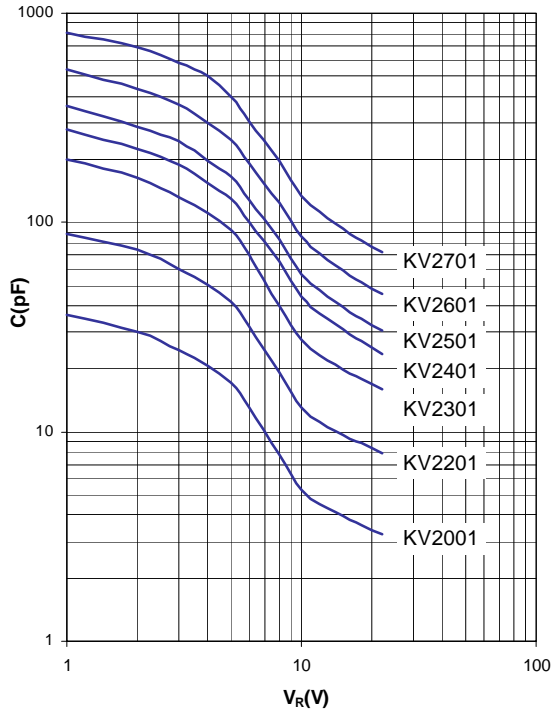
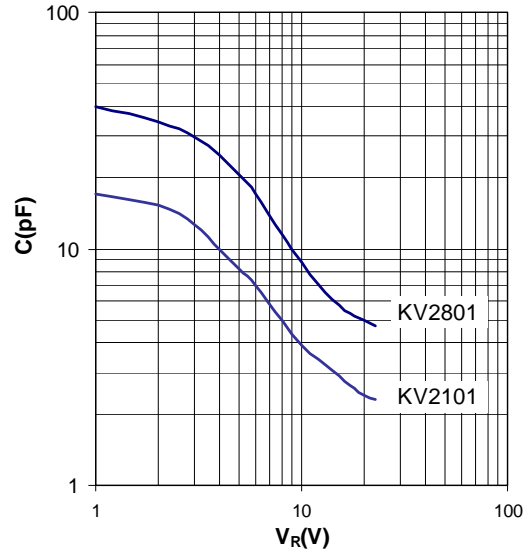
**HF / VHF – HYPERABRUPT VARACTORS**
**ELECTRICAL PARAMETERS @ 25°C (unless otherwise specified)**

MODEL NUMBER	C <sub>T</sub> (pF) f = 1 MHz Min / Typ / Max			Capacitance Ratio Typ C(-4V) / C(-20V)	Quality Factor <sup>1</sup> Min/Typ Q @ -4V f = 50MHz	I <sub>R</sub> Typ/Max V <sub>R</sub> = 20V (nA)
	V <sub>R</sub> = 4V	V <sub>R</sub> = 8V	V <sub>R</sub> = 20V			
KV2001	18 / 20 / 22	7.5 / 8.5 / 10.5	3.1 / 3.5 / 3.9	5.8	160 / 220	15 / 100
KV2201	45 / 50 / 55	18 / 20 / 25	7.3 / 8.0 / 9.2	6.3	125 / 165	20 / 100
KV2301	100 / 110 / 120	39 / 45 / 55	15 / 17 / 19	6.6	80 / 110	30 / 100
KV2401	140 / 155 / 170	55 / 65 / 80	22.5 / 25 / 28	6.2	70 / 90	50 / 500
KV2501	180 / 200 / 220	70 / 85 / 105	29 / 32 / 36	6.3	60 / 80	70 / 500
KV2601	270 / 300 / 330	110 / 125 / 155	42.5 / 48 / 53.5	6.4	40 / 50	100 / 1000
KV2701	450 / 500 / 550	175 / 195 / 225	66 / 75 / 83	6.8	30 / 40	150 / 1000

**UHF – HYPERABRUPT VARACTORS**
**ELECTRICAL PARAMETERS @ 25°C (unless otherwise specified)**

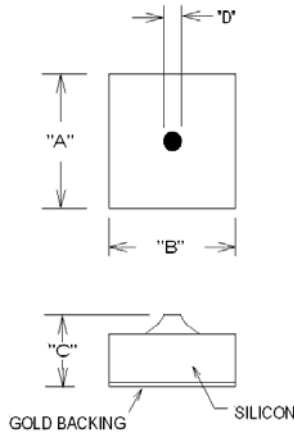
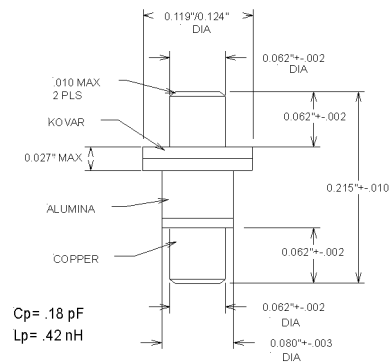
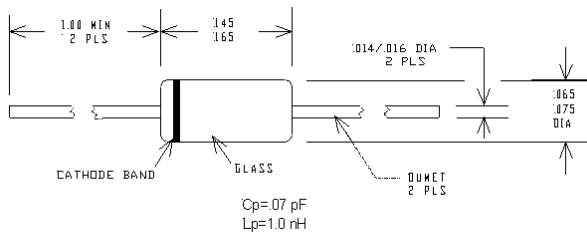
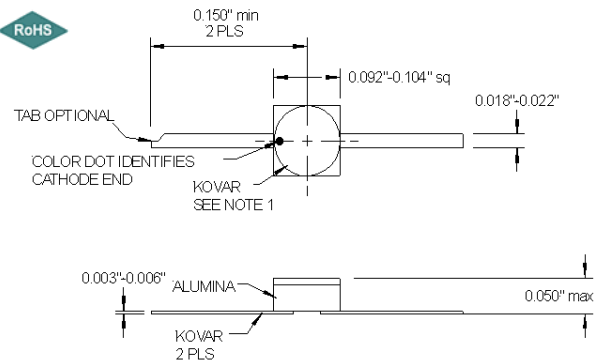
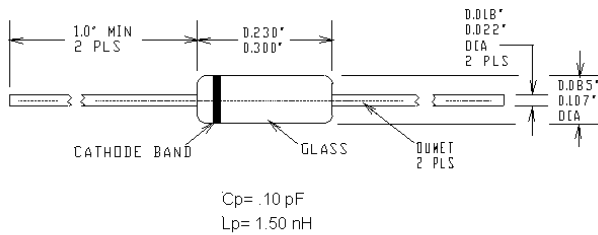
MODEL NUMBER	C <sub>T</sub> (pF) f = 1 MHz Min / Typ / Max			CAPACITANCE RATIO Typ C(-3V) / C(-20V)	QUALITY FACTOR <sup>1</sup> Min/Typ Q @ -3V f = 50MHz	I <sub>R</sub> Typ/Max V <sub>R</sub> = 20V (nA)
	V <sub>R</sub> = 3V	V <sub>R</sub> = 8V	V <sub>R</sub> = 20V			
KV2101	10.5 / 11.5 / 12.5	4.3 / 5.0 / 5.7	2.0 / 2.15 / 2.3	5.4	300 / 350	10 / 100
KV2801	25 / 28 / 31	10 / 12 / 13.5	4.5 / 4.8 / 5.1	5.9	200 / 250	20 / 100

1. Q is determined at V<sub>R</sub> = 4V, f = 50 MHz by  $Q = 1/(2\pi f R_s C_j)$

**C-V (HF-VHF HYPERABRUPT)**
**C-V (UHF HYPERABRUPT)**
**KV2001-KV2701 C-V Curves**

**KV2801 / KV2101 C-V Curves**


**TYPICAL PACKAGE STYLES**

Microsemi offers a variety of package styles to meet specific application requirements. Some limitations apply. Consult factory for details.

**PACKAGE STYLE 00**

**PACKAGE STYE 30**

**PACKAGE STYLE 15**

**PACKAGE STYLE 17**

**PACKAGE STYLE 11**

**NOTES**

The standard 11 and 15 package styles are not RoHS compliant. Consult Factory for RoHS complaint options.