



**KV1913A – GC1311**  
ENHANCED PERFORMANCE SURFACE MOUNT  
EPSM™ Hyperabrupt Varactor Diodes  
RoHS Compliant

### GENERAL DESCRIPTION

Our EPSM packaged devices are designed for the most demanding commercial and Military requirements where the inconsistent performance inherent in plastic surface mount packages cannot be tolerated. These package styles extend the surface mount construction format to 6 GHz for high performance wireless applications. Select varactors from three families of C/V curves for designs through 6 GHz. They are available in multiple chip configuration as well as outlines which directly replace SOT23 and SOD323 devices. Other devices and values are always available. Contact our applications engineering department for more details.

### APPLICATIONS

Specify EPSM package style 450A or 454. For 3 terminal style 454, refer to configuration page. Example: GC1303-454-4 is a common cathode pair of abrupt junction varactors with 1.5 pF capacitance @4V (per device); for the 2 terminal style 450A, refer to the outline dimension table. Example: GC1303-450A is a single abrupt junction varactor with 1.5 pF capacitance at 4V in an 450A footprint.

### KEY FEATURES

- Wide Range of Capacitance Values
- For Frequencies from VHF to 6 GHz
- Lower Parasitics
- Superior Consistency/Repeatability
- Footprints Available for SOT23/SOD323/SOD123
- Dozens of Configurations Available
- Mil Grade Ceramic/Epoxy Amalgam
- Tape & Reel Available for Pick and Place Assembly
- RoHS Compliant <sup>1</sup>

1- The EPSM products are supplied with a RoHS compliant Gold Finish.

### APPLICATION/BENEFITS

- High Performance Wireless Surface Mount Options for GSM, TAGS, WANS, PCS
- Wideband VCO Applications
- Voltage Tuned Filters
- VCXOs

### ABSOLUTE MAXIMUM RATINGS @ 25°C

Rating	Symbol	Value	Unit
Maximum Leakage Current @80% of minimum Rated $V_B$	$I_R$	50	nA
Operating Temperature	$T_{OP}$	-55 to +125	°C
Storage Temperature	$T_{STG}$	-55 to +125	°C

### DEVICE ELECTRICAL PARAMETERS AT 25°C

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**KV1900 SUPER HYPERABRUPT VARACTORS  
 FOR 1-8 VOLT HIGH SENSITIVITY VCO'S**

Model Number	V <sub>B</sub> (V) I <sub>R</sub> =10μA (Min)	C <sub>T</sub> (pF) @1V (Min)	C <sub>T</sub> (pF) @2.5V	C <sub>T</sub> (pF) @4V (Max)	C <sub>T</sub> (pF) @8V (Max)	Q <sup>1</sup> @4V, 50 MHz (Min)
KV1913A	12	36.0	18 – 27	12.0	6.20	400
KV1953A	12	26.0	13 - 20	9.0	4.70	500
KV1923A	12	17.0	8.5 - 13	6.0	3.20	600
KV1933A	12	13.0	6.5 – 10	4.5	2.70	750
KV1943A	12	9.0	4.5 – 6.5	3.0	1.70	900
KV1963A	12	4.0	2.0 – 3.0	1.5	1.00	1200
KV1973A	12	1.8	1.1 – 1.5	0.8	0.55	1400
KV1983A	12	1.2	0.8 – 1.1	0.6	0.45	1600
KV1993A	12	0.6	0.5 – 0.8	0.4	0.35	1800

**KV2100 MICROWAVE HYPERABRUPT VARACTORS  
 FOR 2-15 VOLT WIDE BANDWIDTH VCO'S**

Model Number	V <sub>B</sub> (V) I <sub>R</sub> =10μA (Min)	C <sub>T</sub> (pF) @0V (Typ)	C <sub>T</sub> (pF) @4V	C <sub>T</sub> (pF) @20V (Max)	Q <sup>1</sup> @4V, 50 MHz (Min)
KV2163	22	26.0	8.75 – 10.80	2.50	400
KV2153	22	14.0	4.45 – 5.50	1.30	600
KV2143	22	7.0	2.65 – 3.30	0.90	700
KV2133	22	5.0	1.75 – 2.20	0.70	850
KV2123	22	3.0	1.30 – 1.65	0.55	1000
KV2113	22	2.0	0.85 – 1.10	0.45	1200

**GC1300 MICROWAVE ABRUPT VARACTORS  
 FOR 0-30 VOLT MODERATE BANDWIDTH LOW NOISE VCO'S**

Model Number	V <sub>B</sub> (V) I <sub>R</sub> =10μA (Min)	C <sub>T</sub> (pF) @4V (+/-10%)	Ratio C <sub>T0</sub> / C <sub>T4</sub> (Min)	Ratio C <sub>T4</sub> / C <sub>T30</sub> (Min)	Q <sup>1</sup> @4V, 50 MHz (Min)
GC1300	30	0.8	1.5	1.45	3900
GC1301	30	1.0	1.6	1.55	3800
GC1302	30	1.2	1.7	1.60	3700
GC1303	30	1.5	1.8	1.65	3600
GC1304	30	1.8	1.9	1.70	3500
GC1305	30	2.2	2.0	1.75	3400
GC1306	30	2.7	2.0	1.80	3300
GC1307	30	3.3	2.1	1.85	3100
GC1308	30	3.9	2.1	1.90	2700
GC1309	30	4.7	2.2	1.95	2600
GC1310	30	5.6	2.2	2.00	2500
GC1311	30	6.8	2.2	2.05	2300

Notes: 1 - Q is measured using the 30 package during lot evaluation.



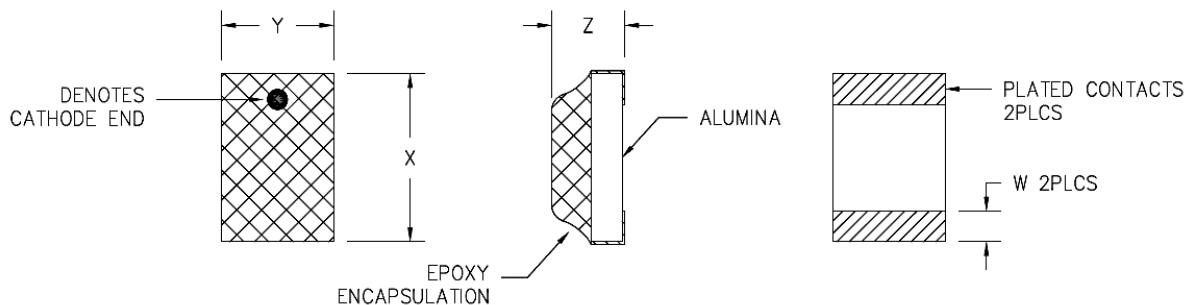
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**MECHANICAL OPTIONS**

EPSM products are available in a broad range of mechanical configurations. The standard package style is the 450 series. This series has several sizes available to accommodate the internal chip configurations. The 450A is the most common configuration for single diode applications. The 454 series package style is a three terminal configuration designed to accommodate 2 chips for 'T' and common anode/cathode designs. With uniform 'flat-top' construction, the 450 series of EPSM products are ideally suited for tape and reel / automated assembly.

The 150 series of EPSM products have a 'glob-top' construction and are traditionally used in smaller volume applications.

**PACKAGE STYLE 150X**

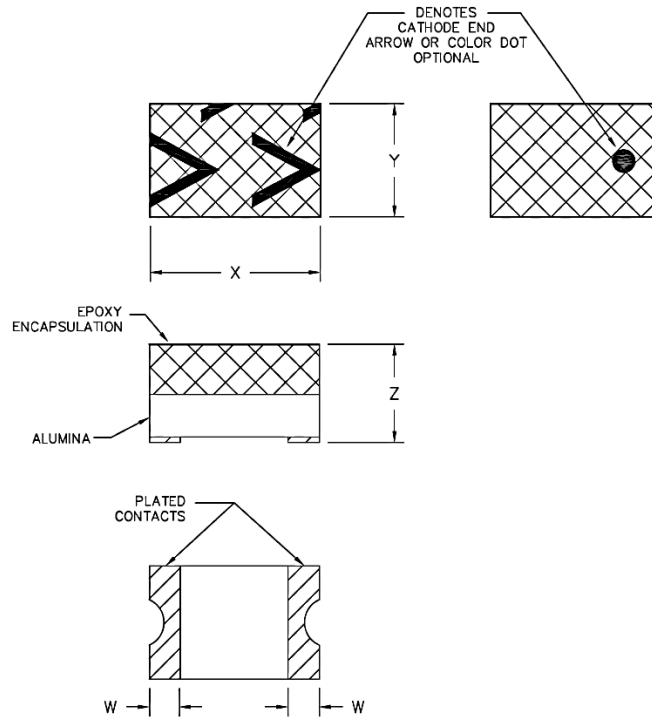
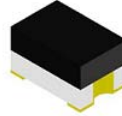


PKG STYLE	DIMENSIONS (MILS)					DIMENSIONS (MILLIMETERS)				
	W	X	Y	Z		W	X	Y	Z	
				MAX	NOM				MAX	NOM
150A	11±3	62±3	42±3	50	35	0.279±0.076	1.575±0.076	1.067±0.076	1.270	0.889
150B	15±3	75±3	50±3	50	35	0.381±0.076	1.575±0.076	1.270±0.076	1.270	0.889
150C	15±3	100±5	50±3	50	35	0.381±0.076	2.540±0.127	1.270±0.076	1.270	0.889
150D	20±3	120±5	60±3	50	35	0.508±0.076	3.048±0.127	1.524±0.076	1.270	0.889
150E	20±3	200±5	100±5	50	35	0.508±0.076	5.080±0.127	2.540±0.127	1.270	0.889
150F	18±3	50±3	50±3	60	45	0.457±0.076	1.575±0.076	1.270±0.076	1.524	1.143



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**PACKAGE STYLE 450X**

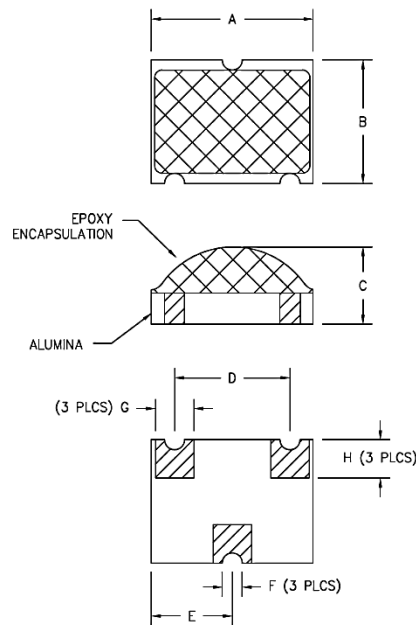
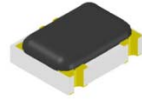


PKG STYLE	DIMENSIONS (MILS)				
	W	X	Y	Z	Z
450A	11±3	62	42	50	35
450B	15±4	75	50	50	35
450C	15±4	100	50	50	35
450D	20±5	120	60	50	35
450E	20±5	200	100	50	35
TOL	—	±5	±5	MAX	NOM



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**PACKAGE STYLE 154**



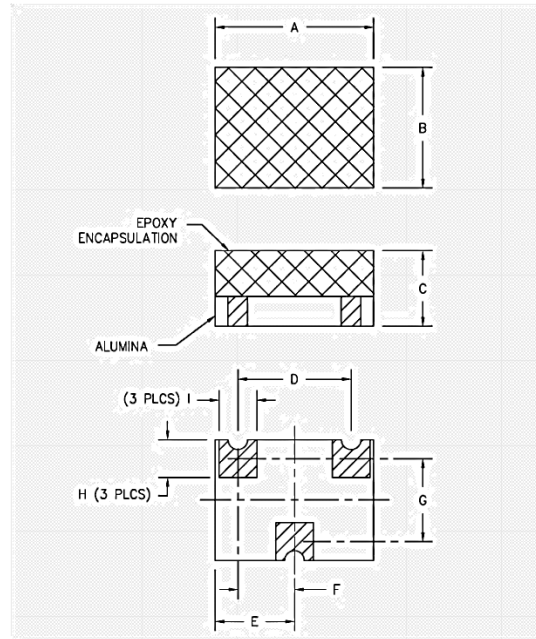
DIM	INCHES			MM		
	MIN	TYP	MAX	MIN	TYP	MAX
A	0.100	0.105	0.110	2.540	2.667	2.794
B	0.075	0.080	0.085	1.905	2.032	2.159
C	–	–	0.050	–	–	1.270
D	0.070	0.075	0.080	1.778	1.905	2.032
E	0.048	0.053	0.058	1.219	1.346	1.473
F	0.008	–	0.013	0.203	–	0.330
G	0.020	0.025	0.030	0.508	0.635	0.762
H	0.020	0.025	0.030	0.508	0.635	0.762

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**PACKAGE STYLE 454**



DIM	INCHES			MM		
	MIN	TYP	MAX	MIN	TYP	MAX
A	0.097	–	0.113	2.464	–	2.870
B	0.080	0.085	0.090	2.032	2.159	2.286
C	–	–	0.050	–	–	1.270
D	0.072	–	0.078	1.829	–	1.981
E	0.047	0.052	0.057	1.194	1.321	1.448
F	0.032	0.037	0.042	0.813	0.940	1.067
G	0.045	0.050	0.055	1.143	1.270	1.397
H	0.022	0.027	0.032	0.559	0.686	0.813
I	0.022	0.027	0.032	0.559	0.686	0.813

Packages are designed with wrap-around metallized castellations for superior assembly results.

**Revision History**

Revision Level / Date	Para. Affected	Description
1 / 2009-01-06	-	Initial Release
2 / 11 February 2015	-	Reformat and add GC1311
3 / 23 May 2018	KV2100 Electrical Parameters table	Delete CT20 min parameters

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