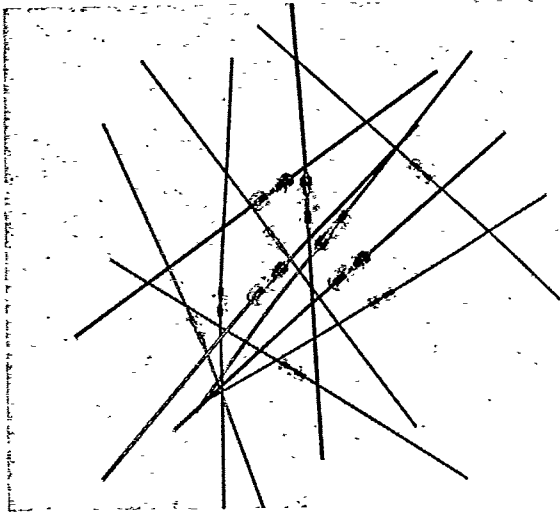


Hyperabrupt Tuning Varactors, DKV6520 Series



Features

- High to Very High Frequency Operation
- Capacitance Values of 20 pF to 200 pF at 4 Volts
- Octave Tuning from 4 to 20 Volts
- Linear Frequency vs. Voltage Characteristics

Description

Alpha uses ion implantation to provide this series of hyperabrupt tuning diodes with closely controlled characteristics. The highly-reproducible capacitance versus voltage behavior of this family permits Alpha to supply matched sets and also assures the customer of a long-term availability of parts having uniform electrical properties. Passivated, hermetically sealed construction allows their use under the most adverse conditions, both in commercial equipment and in high reliability space and military applications.

Applications

Designer oriented families offer types selected and tested with each customer's application in mind. Premium units DKV6520B through DKV6525B, and their corresponding close-tolerance units having a "D" suffix, are ideal for octave tuning up to 500 MHz. When tuned from 8 to 20 volts of reverse bias, they offer very high Q values and excellent large signal handling capabilities, along with a 2 to 1 capacitance ratio. Alpha's DKV6520A through DKV6525A, and the close-tolerance versions having a "C" suffix, give superior straight line frequency versus voltage characteristics when tuning wide deviation crystal circuits or when varying LC tanks over a 1.5 to 1 frequency ratio. They excel as frequency or phase modulators, for which purpose the customers can also substitute the DKV6520 through DKV6525 series when minimum cost is of prime importance. All devices typically handle one-volt rms signals at intermodulation/cross-modulation distortion levels of 1% or less.

Absolute Maximum Ratings

Symbol	Parameter	Value	Unit
V_R	Reverse Voltage	Same as V_{BR}	
I_F	Forward Current	50	mAdc
P_D	Power Dissipation ($T_A = 25^\circ\text{C}$)	250	mW
T_J	Junction Temperature	-55 to +125	$^\circ\text{C}$
T_{stg}	Storage Temperature	-55 to +175	$^\circ\text{C}$

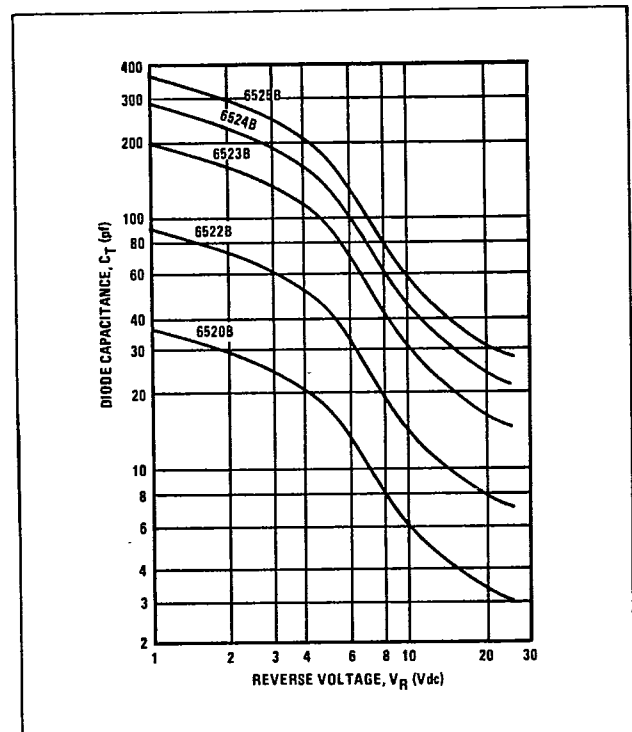


Figure 1. Typical Capacitance vs. Tuning Voltage
($T_A = 25^\circ\text{C}$)

Hyperabrupt Tuning Varactors, DKV6520 Series

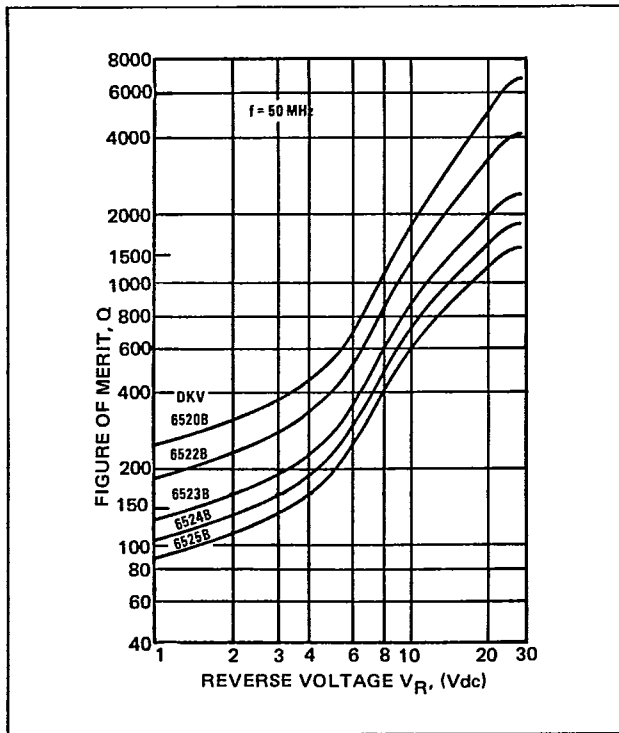


Figure 2. Typical Q vs. Tuning Voltage ($T_A = 25^\circ\text{C}$)

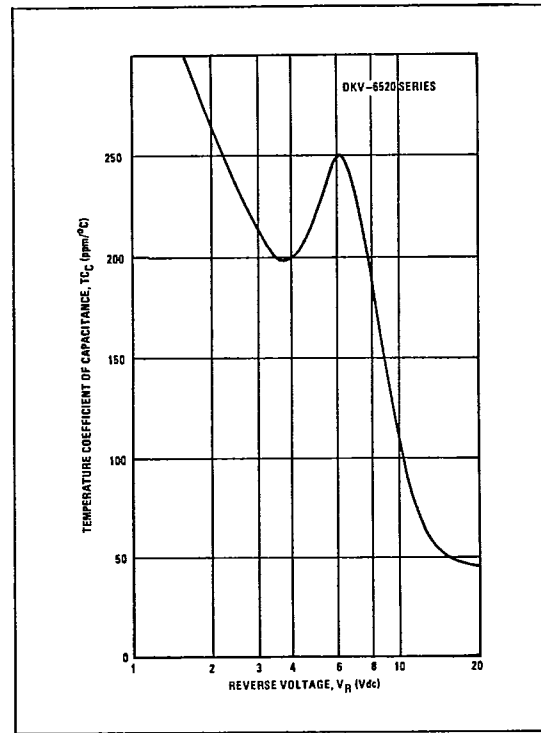


Figure 3. Temperature Coefficient of Capacitance vs. Tuning Voltage ($T_A = 25^\circ\text{C}$)

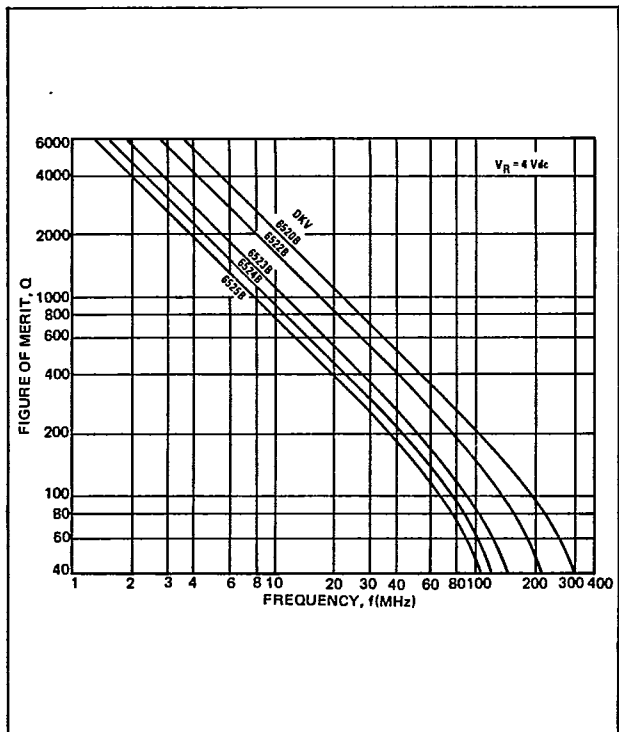


Figure 4. Typical Q vs. Frequency ($T_A = 25^\circ\text{C}$)

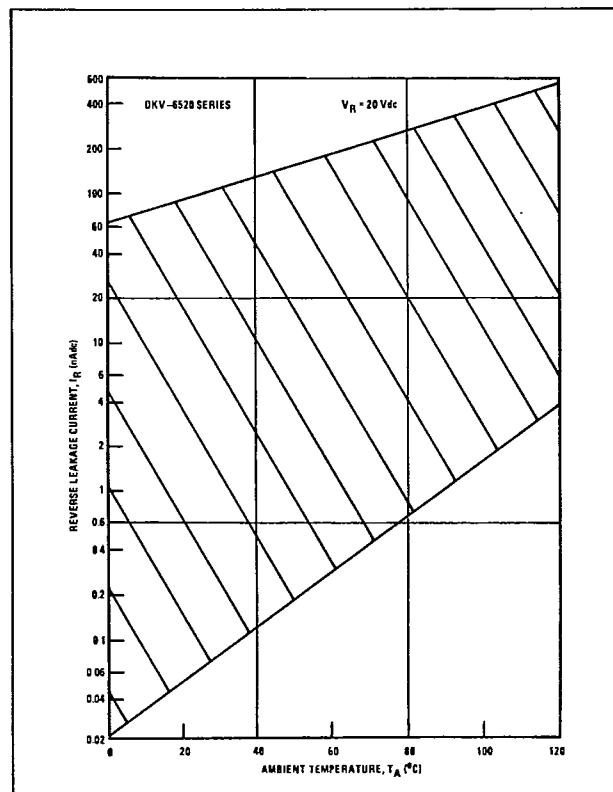


Figure 5. Reverse Leakage Current vs. Ambient Temperature

Hyperabrupt Tuning Varactors, DKV6520 Series

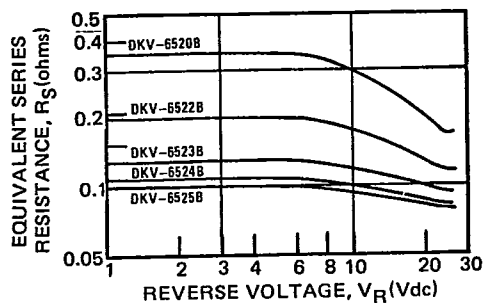


Figure 6. Equivalent Series Resistance vs. Tuning Voltage ($T_A = 25^\circ\text{C}$)

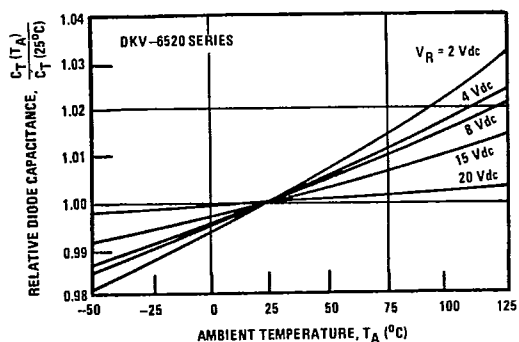


Figure 7. Capacitance vs. Ambient Temperature

Electrical Characteristics ($T_A = 25^\circ\text{C}$)

DKV6520 SERIES

Symbol		V_{BR}	I_R			C_T								T_R			
Parameter		Reverse Breakdown Voltage	Reverse Leakage Current			Diode Capacitance								Tuning Ratio			
Unit		Vdc	nAdc			pF								$f = 1 \text{ MHz}$			
Test Conditions		$I_R = 10 \mu\text{A}$	$V_R = 6 \text{ Vdc}$	$V_R = 10 \text{ Vdc}$	$V_R = 20 \text{ Vdc}$	$V_R = 2.5 \text{ Vdc}$		$V_R = 4 \text{ Vdc}$		$V_R = 8 \text{ Vdc}$		$V_R = 20 \text{ Vdc}$		$C(4v)/C(8v)$	$C(4v)/C(20v)$		
Type Number for 099 Package	Type Number for Chip(1)	Min.	Max.	Max.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
DKV6520	CKV2020-16	8	250	100	100	25	29	18	22	7.5	10.5	3.1	3.9	1.7	2.9	4.6	7.1
DKV6520A	CKV2020-17	15						18	22	7.5	10.5			2.0	2.7		
DKV6520B	CKV2020-18	22						18	22	7.8	9.2			2.0	2.7		
DKV6520C	CKV2020-19	15						19	21	7.8	9.2			2.0	2.7		
DKV6520D	CKV2020-20	22						19	21	7.8	9.2			2.0	2.7		
DKV6522	CKV2020-21	8	250	100	100	62	72	45	55	18	25	7.3	9.2	1.8	3.1	4.9	7.5
DKV6522A	CKV2020-22	15						45	55	18	25			2.2	2.8		
DKV6522B	CKV2020-23	22						45	55	18	25			2.2	2.8		
DKV6522C	CKV2020-24	15						47.5	52.5	18.4	21.6			2.2	2.8		
DKV6522D	CKV2020-25	22						47.5	52.5	18.4	21.6			2.2	2.8		
DKV6523	CKV2020-26	8	250	100	100	135	160	100	120	39	55	16	20	1.8	3.1	5.0	7.5
DKV6523A	CKV2020-27	15						100	120	39	55			2.15	2.8		
DKV6523B	CKV2020-28	22						100	120	39	55			2.15	2.8		
DKV6523C	CKV2020-29	15						104.5	115.5	41.4	48.6			2.15	2.8		
DKV6523D	CKV2020-30	22						104.5	115.5	41.4	48.6			2.15	2.8		
DKV6524	CKV2020-31	8	500	500	500	195	225	140	170	55	80	22.5	28	1.7	3.1	5.0	7.6
DKV6524A	CKV2020-32	15						140	170	55	80			2.1	2.8		
DKV6524B	CKV2020-33	22						140	170	55	80			2.1	2.8		
DKV6524C	CKV2020-34	15						147	163	59.8	70.2			2.1	2.8		
DKV6524D	CKV2020-35	22						147	163	59.8	70.2			2.1	2.8		
DKV6525	CKV2020-36	8	500	500	500	250	290	180	220	70	105	29	36	1.7	3.1	5.0	7.6
DKV6525A	CKV2020-37	15						180	220	70	105			2.0	2.7		
DKV6525B	CKV2020-38	22						180	220	70	105			2.0	2.7		
DKV6525C	CKV2020-39	15						190	210	78	92			2.0	2.7		
DKV6525D	CKV2020-40	22						190	210	78	92			2.0	2.7		

Symbol		Q	Package
Parameter		Figure of Merit	
Unit			
Test Conditions		$f = 50 \text{ MHz}$ $V_R = 4 \text{ Vdc}$	
Type Number for 099 Package	Type Number for Chip(1)	Min.	
DKV6520	CKV2020-16	150	099
DKV6520A	CKV2020-17	300	099
DKV6520B	CKV2020-18	300	099
DKV6520C	CKV2020-19	300	099
DKV6520D	CKV2020-20	300	099
DKV6522	CKV2020-21	100	099
DKV6522A	CKV2020-22	200	099
DKV6522B	CKV2020-23	200	099
DKV6522C	CKV2020-24	200	099
DKV6522D	CKV2020-25	200	099
DKV6523	CKV2020-26	65	099
DKV6523A	CKV2020-27	125	099
DKV6523B	CKV2020-28	125	099
DKV6523C	CKV2020-29	125	099
DKV6523D	CKV2020-30	125	099
DKV6524	CKV2020-31	50	099
DKV6524A	CKV2020-32	100	099
DKV6524B	CKV2020-33	100	099
DKV6524C	CKV2020-34	100	099
DKV6524D	CKV2020-35	100	099
DKV6525	CKV2020-36	45	099
DKV6525A	CKV2020-37	90	099
DKV6525B	CKV2020-38	90	099
DKV6525C	CKV2020-39	90	099
DKV6525D	CKV2020-40	90	099

Note:

- Chip styles
 CKV2020-16 through 25 are 149-802
 CKV2020-26 through 30 are 149-803
 CKV2020-31 through 40 are 149-804.