

Varactor Diodes

For VCO and Tuner Applications



Never stop thinking.

VCO Applications

- hyperabrupt varactor diodes for VCOs in mobile phones
- high capacitance ratio at low tuning voltages supports 2 cell designs
- low series resistance provides low phase noise and high Q characteristics
- available in super mini flat lead SCD80 package as well as in common cathode configuration in SOT323 package
- new types: BBY55-0xW, BBY56-0xW, BBY57-0xW, BBY58-0xW

FM Tuner

- different types of dual varactor diodes with high capacitance ratio (up to 2.34) and low series resistance (down to 0.18Ω) available
- soon available in small SOT323 package

TV / VCR Tuner

- hyperabrupt VHF varactor diodes for use in 3-band or 2-band analogue and digital TV/VCR tuners
- excellent matching ($< 1\%$) and uniformity (parallel capacitance characteristics) due to in-line matching procedure
- high capacitance ratio (up to 20.9)
low series resistance (down to 0.6Ω)
- available in SOD323 (SC-76) and super mini flat lead SCD80 (SC-80) package
- new types: BB664, BB689

SAT Tuner

- hyperabrupt varactor diodes for use in analogue and digital SAT tuners
- excellent matching and uniformity (parallel capacitance characteristics) due to in-line matching procedure
- high capacitance ratio (up to 14.7)
low series resistance (down to 1.0Ω)
- available in SOD323 (SC-76) and super mini flat lead SCD80 (SC-80) package
- new types: BB831, BB857

Varicaps for VCO Applications

Simply the Better Solution

The new varicap family comprising BBY55, BBY56, BBY57 and BBY58 sets the standard for voltage controlled oscillator (VCO) applications in mobile phones.

As worldwide trends lead to smaller and lighter portables Infineon offers a new generation of varactor diodes with 3V capability in the extremely small SCD80 package. These varactor diodes do play an important role for the design of VCO (Voltage Controlled Oscillator).

Due to the hyper abrupt doping profile of the p/n junction a maximum capacitance variation over the applied reverse voltage is achieved. Currently there is a huge demand for high capacitance ratio at low tuning voltages down to 3V and below. A low series resistance r_s is important for a steep filter characteristic determining mainly the phase noise of VCOs.

Type	Package	Single Dual (Com. Cathode) Dual (Com. Anode)	VR (V)		IF (mHz)	C @ 0.3V (pF)			C @ 2V (pF)
			max	max		typ	typ	typ	
BBY51	SOT23	x		7,00	20,00	6,75	5,30	4,20	3,50
BBY51-03W	SOD323	x							
BBY51-02W	SCD80	x							
BBY52	SOT23	x		7,00	20,00	2,25	1,85	1,50	1,35
BBY52-03W	SOD323	x							
BBY52-02W	SCD80	x							
NEW BBY52-05W	SOT323	x							
BBY53	SOT23	x		6,00	20,00	6,75	5,30	3,60	2,40
BBY53-03W	SOD323	x							
BBY53-02W	SCD80	x							
NEW BBY53-05W	SOT323	x							
NEW BBY55-03W	SOD323	x		16,00	20,00	24,00	19,00	15,00	12,50
NEW BBY55-02W	SCD80	x							
NEW BBY55-05W	SOT323	x							
NEW BBY56-03W	SOD323	x		8,00	20,00	59,00	39,00	22,00	15,90
NEW BBY56-02W	SCD80	x							
NEW BBY57-03W	SOD323	x		8,00	20,00	26,00	17,50	10,90	7,10
NEW BBY57-02W	SCD80	x							
NEW BBY57-05W	SOT323	x							
NEW BBY58-03W	SOD323	x		8,00	20,00	26,20	18,30	12,35	8,60
NEW BBY58-02W	SCD80	x							
NEW BBY58-05W	SOT323	x							
NEW BBY58-06W	SOT323	x							

TV/VCR / SAT / FM Tuner Applications

Type	Package	Single Dual (Com. Cathode) Dual (Com. Anode)	VR (V)		IF (mHz)	C @ 0.3V (pF)		C @ 1V (pF)
			max	max		typ	typ	
BB535	SOD323	x		30,00	20,00	23,20	18,70	15,00
BB555	SCD80	x						
BB545	SOD323	x		30,00	20,00	26,20	20,00	14,80
BB565	SCD80	x						
BB439	SOD323	x		30,00	20,00	53,60	42,20	34,10
BB639	SOD323	x		30,00	20,00	48,75	38,30	30,10
BB659	SCD80	x						
BB639C	SOD323	x		30,00	20,00	49,75	39,00	30,30
BB659C	SCD80	x						
BB640	SOD323	x		30,00	20,00	87,00	69,00	54,60
NEW BB644	SOD323	x		30,00	20,00	53,90	41,80	31,80
NEW BB664	SCD80	x						
NEW BB669	SOD323	x		30,00	20,00	68,90	56,50	43,40
NEW BB689	SCD80	x						
NEW BB831	SOT223	x		30,00	20,00	11,05	8,80	7,12
BB833	SOD323	x		30,00	20,00	13,00	9,30	6,80
BB835	SOT23	x		30,00	20,00	11,63	9,10	6,70
NEW BB837	SOD323	x		30,00	20,00	8,55	6,60	5,10
NEW BB857	SCD80	x						
BB804	SOT23	x			20,00	50,00	69,60	55,50
BB814	SOT23	x		20,00	50,00	74,00	56,70	44,70
NEW BB834	SOT323	x		20,00	50,00	74,00	56,70	44,70
BB914	SOT23	x		20,00	50,00	74,64	57,20	43,70
NEW BB934	SOT323	x		20,00	50,00	74,00	56,70	44,70

	C @ 3V (pF)	C @ 4V (pF)	C1V/C3V	C1V/C4V	r _s (Ω)
	typ 3,10	typ 1,51	typ 1,71	typ 0,37	
	1,15	1,37	1,60	0,90	
		2,20		0,37	
	11,00	1,52	1,73	0,20	
	10,80	2,45	3,75	0,30	
	4,73	2,45	3,70	0,30	
	6,00	2,15	3,05	0,25	



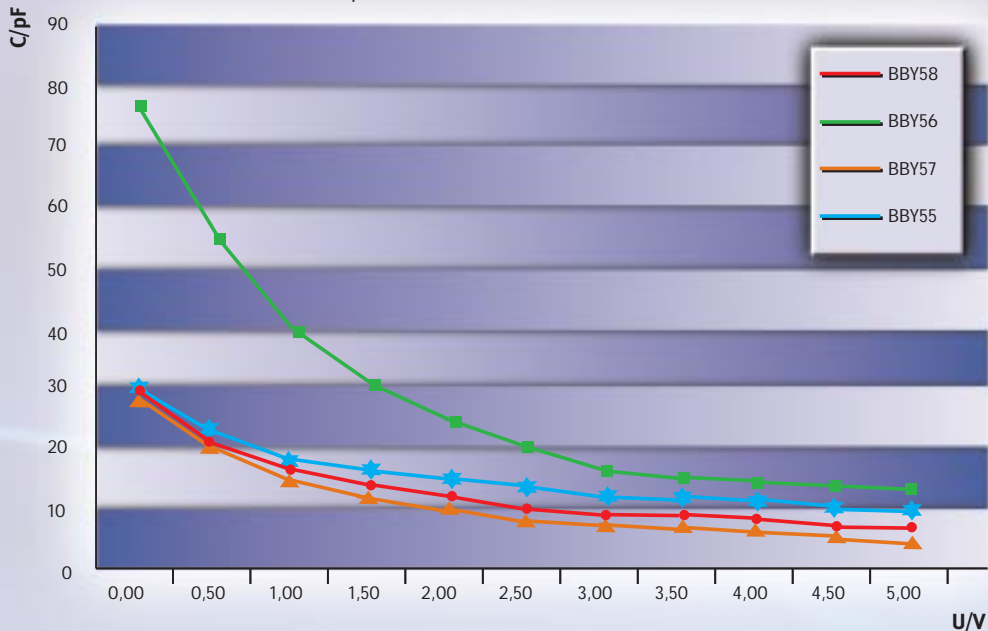
	C @ 2V (pF)	C @ 3V (pF)	C @ 4V (pF)	C @ 8V (pF)	C @ 25V (pF)	C @ 28V (pF)	C2V/8V	C2V/C25V	C1V/C28V	r _s (Ω)	Application
	typ	typ	typ	typ	typ						
0	12,80	11,20	7,00	2,24	2,10		6,70	8,90	0,58		
0	11,50	9,20	5,00	2,07	2,00		7,20	10,00			UHF tuning
5	29,00	25,15	14,70	5,00	4,80			8,95	0,31		
0	24,80	20,90	11,20	2,89	2,60		10,40	14,70	0,65		
0	24,55	20,15	9,60	2,72	2,55		11,10	15,30	0,60		VHF tuning
5	45,40	38,55	20,50	3,18	3,05		17,00	22,60	1,15		
5	25,50	20,65	9,40	2,70	2,55		11,80	16,40	0,60		
0	36,00	30,00	13,90	2,80	2,70		15,50	20,90	0,85		
	6,05	5,25	3,30	1,13	1,02		6,30	8,60	1,00		
0	5,10	3,95	1,71	0,77	0,75		8,80	12,40	1,80		
	5,03	4,15	1,25	0,65	0,62		10,30	14,70	2,40		SAT tuning
	4,00	3,25	1,67	0,55	0,54		9,30	12,20	2,00		
0	44,75	38,74	34,70	26,10			1,71			0,18	
5	36,50	31,35	20,80				2,15			0,18	FM tuning
5	36,50	31,35	20,80				2,15			0,18	FM tuning
5	36,25	30,80	18,70				2,34			0,28	
5	36,50	31,35	20,80				2,34			0,18	FM tuning

Serving all possible tuner concepts (2 or 3-band) Infineon offers two new VHF varactor diodes with high capacitance ratio as well as a new SAT tuner varactor diode.

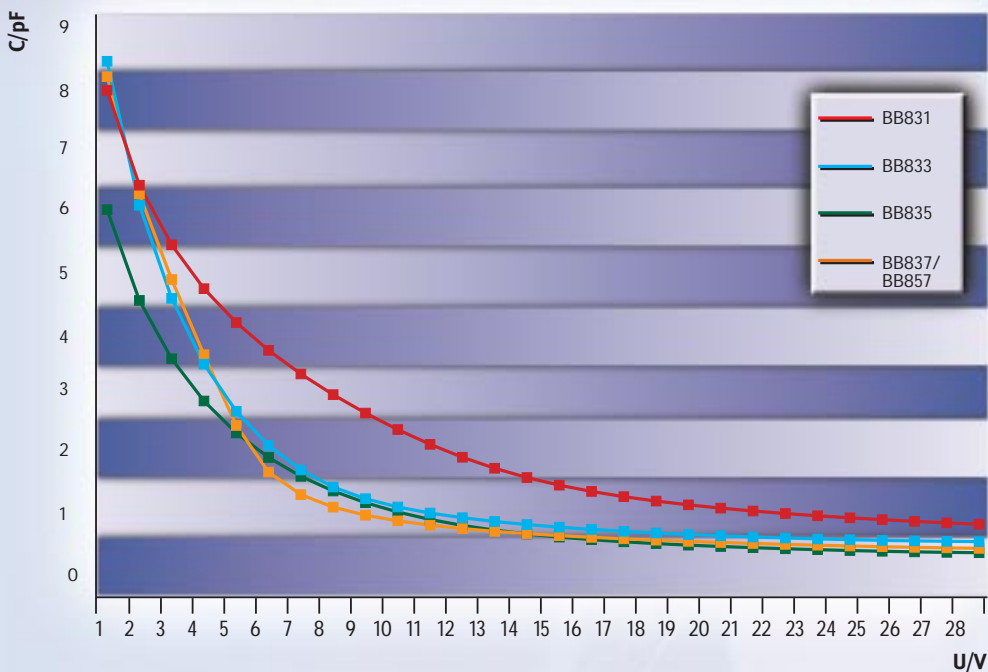
Improved hyperabrupt doping profiles enable increased maximum capacitance variation over the applied reverse voltage range. In addition a low series resistance r_s allows low phase noise values due to possible steep filter characteristics. This is particularly important for new digital tuner concepts.

All types provide advanced capacitance uniformity (parallel capacitance characteristics over the complete voltage range) and low tolerance values due to a so called in-line matching procedure. Typical tolerance values of 0.2% – 0.3% enable state-of-the-art tuning performance and reduced alignment work.

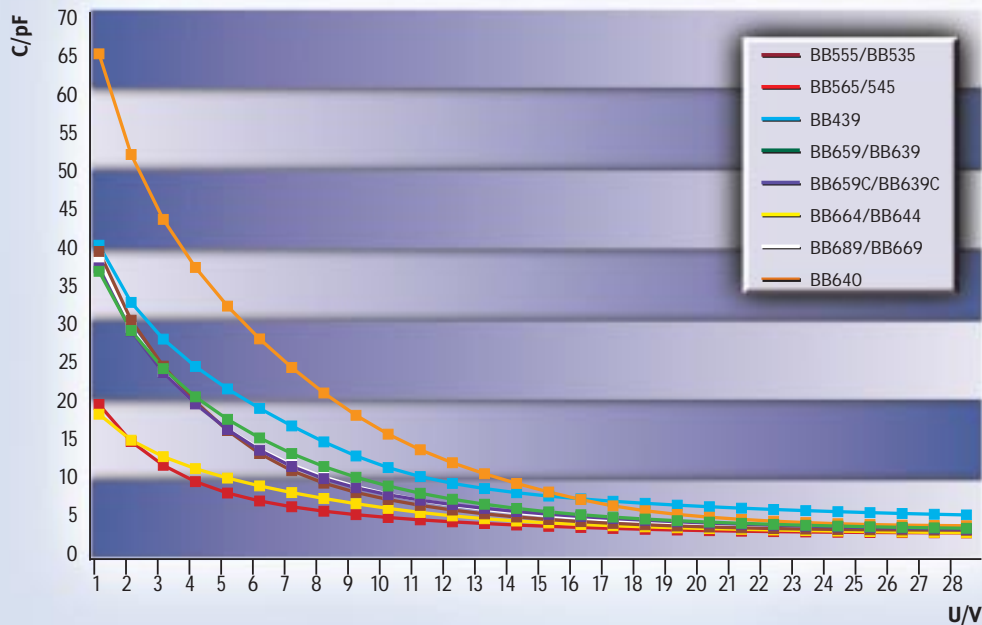
Capacitance Characteristics of VCO Varactor Diodes



Capacitance Characteristics of SAT Varactor Diodes



Capacitance Characteristics of VHF / UHF Varactor Diodes





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