

**RKE TX TDA510X crystal oscillator calculation.**  
**Tolerance spread sheet ( all tolerances +/- 3 sigma assumed )**

Choose this values
Result calculated
Needed external capacitors (+/- tol.)
Fixed by design ( +/- production tolerance)

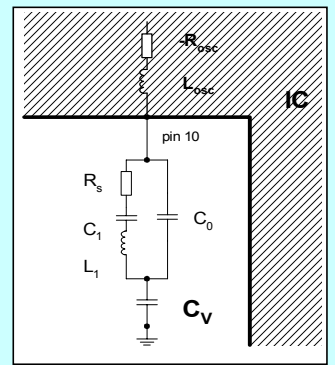
**TDA5100**

Frequency Range
TDA5100 869/434 MHz
TDA5101 315 MHz
TDA5102 915 MHz
TDA5103 345 MHz

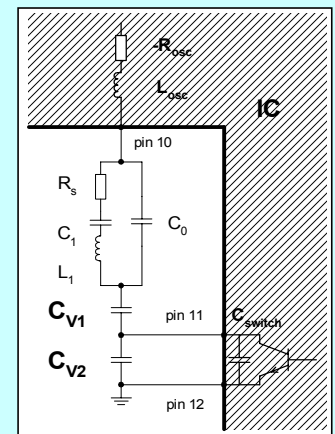
TX frequency range ( MHz )	868<	868.4	<870	1. Enter TX frequency 2. Enter crystal freq. Range
Crystal frequency range ( MHz )	6 or 13 <	13	< 7 or 14	

Crystal characteristics	Value	Tol. +/-	Unit	3. Enter values from crystal specification
Nominal frequency ( MHz )	13.56875	40	ppm	
Nominal load capacitor CL ( pF )	20			
Motional capacitor C1 ( fF )	6.6	20	%	
Shunt capacitor C0 ( pF )	1.8	20	%	

<b>ASK or FSK center frequency:</b>			
Crystal frequency (MHz)		13.56875	
Crystal load capacitance (pF)		20	4. Enter value
Crystal frequency spread (+/-ppm)		40.00	
Series load capacitor CV (pF)		7.33	
Capacitor tolerance ( +/- % )		2	5. Enter value
CV frequency spread (+/-ppm)		8	
Crystal oscillator inductance Losc (µH)		12	
Crystal oscillator frequency spread(+/-ppm)		48	
PLL divider factor		64	
VCO center frequency (MHz)		868.400	
Total frequency spread (+/-ppm)		63	
VCO frequency offset ( kHz )	-55		55



<b>FSK center frequency +/- deviation:</b>			
Positiv frequency deviation DF +(KHz)		50	6. Enter value
Crystal load capacitance (pF)		13.99	
Crystal frequency spread (+/-ppm)		40.20	
Series load capacitor CV+ (pF)		6.33	
CV+ capacitor tolerance ( +/- % )		1.57	
CV+ frequency spread (+/-ppm)		6	
Crystal oscillator inductance Losc (µH)		12	
Crystal oscillator frequency spread (+/-ppm)		45	
Upper VCO frequency (MHz)		868.450	
Total frequency spread (+/-ppm)		61	
VCO frequency offset ( kHz )	-53		53



Negativ frequency deviation DF -(KHz)		-50	7. Enter value
Crystal load capacitance (pF)		33.38	
Crystal frequency spread (+/-ppm)		39.94	
Series load capacitor CV- (pF)		8.59	
CV- capacitor tolerance ( +/- % )		2	
CV- frequency spread (ppm)		7	
Crystal oscillator inductance Losc (µH)		12	
Crystal oscillator frequency spread		51	
Lower VCO frequency (MHz)		868.350	
Total frequency spread (ppm)		65	
VCO frequency offset ( kHz )	-57		57
Peak-peak frequency deviation (KHz)	94	100	106
Tolerance of pp deviation (+/- %)		6	
Tolerance of pp deviation (kHz)	-6.1		6.1
FSK switch capacitance Cswitch (pF)		2.5	
Series load capacitor CV1 (pF)		8.59	
Series load capacitor CV2 (pF)		21.59	
CV1/CV2 capacitor tolerance ( +/- %)		2	8. Enter value