A VCXO is a quartz crystal oscillator that includes a varactor diode and associated circuitry allowing the frequency to be changed by application of a voltage across that diode. By varying the control voltage, the capacitance of the varactor changes accordingly, thus forces the output frequency changed. This can be accomplished in a simple logic clock or sine wave crystal oscillator. In addition to those terms that define the fixed frequency crystal oscillators, there are several characteristics peculiar to VCXOs.

Control voltage (V_C): An external voltage applied to the input of the VCXO. By changing the voltage, the frequency varies accordingly. Typical V_C is 0V to 5V; 0.5V to 4.5V; -0.5V to –4.5V.

Deviation or Frequency pullability: The minimum change in the output frequency with respect to the change in control voltage. Unit is measured in ppm. Standard pullability is ±50 ppm minimum, ±100 ppm minimum.

Linearity: The deviation from the best straight-line slope of the frequency vs. control voltage curve. If the specification for an oscillator requires a linearity of ±10% and the actual deviation is 10 kHz total as an example, the curve of output frequency vs control voltage input could vary as much as ±1 kHz (10 kHz ±10%) from the Best Straight Line. On the other hand, if the maximum deviation from the Best Straight Line is 20 ppm and the total deviation is 200 ppm, the linearity is ± 20 ppm/200 ppm = ± 10%, which is the linearity value for a typical VCXO.

Input impedance: A measure of isolation between the input port of the VCXO network and the voltage control source. Typical input impedance is > 50 Ohms @ 10 KHz.

Center frequency or nominal frequency: User specified frequency at center control voltage. Standard control voltage for center frequency is 2.5V for 5V applications (with control voltage range 2.5V ± 2.0V) and 1.65V for 3.3V applications (with control voltage range 1.65V ± 1.5V).