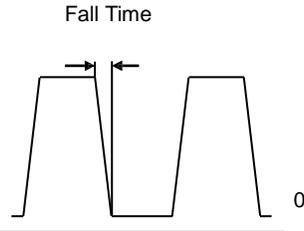
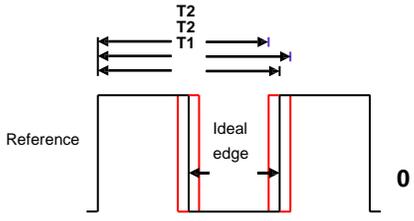
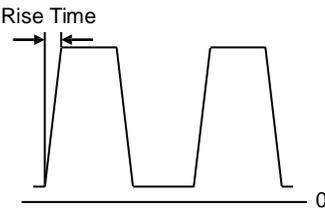
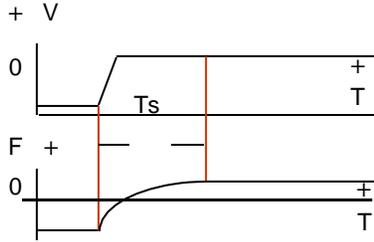


Term	Explanation
Aging	This is the ability of the oscillator to maintain its design frequency over a specified time period. This is usually specified as a maximum variation of plus and minus parts per million over a specified time period over a specified time period for a specified number of those time period.
ATCXO	Analog Temperature Controlled Crystal Oscillator
Calibration Tolerance	The allowable offset in ppm from nominal frequency usually referenced to 25°C
Center Frequency	A term describing the frequency at the center of the tuning range. This may differ from the nominal frequency in designs.
Clipped Sine Wave	An output voltage format achieved by driving the output circuit into clipping to achieve a rectangular wave form. Some applications use this format to reduce EMI in the product. However, this technique becomes less reliable as frequency increases and the rise/fall times may be too great at any frequency to make a useful clock oscillator from modern technology.
CMOS	Complementary metal–oxide–semiconductor. CMOS technology is used in microprocessors, micro controllers, static RAM, and other digital logic circuits. CMOS technology is also used for a wide variety of analog circuits such as image sensors, data converters, and highly integrated transceivers for many types of communication.
Control Voltage	A voltage applied to control the frequency of VCXOs.
Control Voltage Range	The range of voltage over which the tuning of the oscillator is valid.
Coupling	Description of the connection between the oscillator and the external circuit. The choices are AC and DC.
dB (Decibel)	A measure of relative amplitude of a sine wave.
dBm	Decibels referenced to 1 milliwatt, it must be specified with load impedance (usually 50 ohms).
Deviation	The amount by which a quantity differs from its nominal value. For our purposes, the amount by which a frequency differs from the nominal or specified frequency.
Direct Compensation	A technique of building crystal oscillators in which the circuit components affecting the crystal load reactance are selected to have temperature characteristics such that the crystal is re-tuned over temperature to reduce the effects of temperature on the frequency of the oscillator.
DTCXO	Digital Temperature Compensated Crystal Oscillator
Duty Cycle	<p>A term with identical meaning of SYMMETRY, which, the proportion of time during which a component, device, or system is operated</p> $D = \frac{T}{T}$ <p>where <i>T</i> is the duration that the function is non-zero; <i>T</i> is the period of the function</p>
ECL	Emitter-Coupled Logic
Enable/Disable	The enable/disable pin is similar to an on/off switch. A low or logic 0 on the enable/disable causes the unit not to oscillate. A High or logic 1 on the enable/disable pin allows the unit to work as normal (enabled) producing the specified output.

Term	Explanation
Fall Time	<p>The time required for a signal to go from logic 1 to logic 0.</p> 
Fan Out	<p>A specification of the number of TTL or HCMOS loads to which the oscillator will be subjected.</p>
Frequency	<p>The repetition rate of signal output from the oscillator. It is measured in repetitions per second or Hertz.</p>
Frequency Adjustment Range	<p>The range over which the oscillators frequency may be adjusted above and below its nominal frequency. This may be achieved either by a mechanical trimmer or via a tuning voltage.</p>
Frequency Load Tolerance	<p>A specification of the allowable change in frequency when the load impedance is changed from the minimum to the maximum specified values.</p>
Harmonic Distortion	<p>The levels of harmonic distortion are measured with respect to the fundamental signal and are specified in dB.</p>
HCMOS	<p>An output signal format defined as a rectangular wave capable of driving a multiple of CMOS loads.</p>
Hertz	<p>A measure of frequency, informally defined as the number of cycles occurring per second. It is the basic unit of frequency in the International System of Units (SI), and is used worldwide in both general-purpose and scientific contexts. Hertz can be used to measure any periodic event; the most common uses for hertz are to describe radio and audio frequencies, more or less sinusoidal contexts in which case a frequency of 1 Hz is equal to one cycle per second.</p>
Indirect Compensation	<p>A technique for temperature compensation in which a temperature sensitive circuit external to the oscillator is used to modify the crystal load reactance with temperature so that oscillator tuning is modified to reduce or eliminate the effects of temperature on the frequency of the oscillator.</p> <p>A specification of the allowable range of frequencies within which the oscillator will operate at the time of shipment from the manufacturer and at a temperature of 25°C unless otherwise specified. This applies only to oscillators that ate of fixed frequency.</p>
Input impedance	<p>The load represented by input connections on the oscillator used for voltage control or tri-state control.</p>
Jitter	<p>A measure of the short-term frequency stability of the oscillator. It applies only to rectangular waveforms. It is measured as the uncertainty in the location of one edge of the signal with respect to other edges. It is usually specified in units of time (nano seconds or pico seconds), but may also be specified in degrees. This measurement has particular application to the digital communications industry.</p> 

Term	Explanation
Linearity	The term that applies only to VCXO and TCVCXO. It describes the maximum frequency error in following a straight-line curve fitted to the actual frequencies measured at different control voltages within the control voltage range. This error is measured in percent according to the maximum deviation from the curve as a percentage of the total tuning range.
Load (Fan Out)	The capacity of the oscillator to drive other devices. TTL devices are specified in the number of gates that can be driven; i.e., 10TTL gates. CMOS outputs are specified in pF; 15pF or 50pF loads.
Load Impedance	The characteristics of the circuit connected to the output. Normally this specification will be used as part of the performance specification.
Load Stability	The ability of the oscillator to maintain its design frequency over a range in load impedance. This is usually specified as a maximum variation of plus and minus parts per million over a specified percentage change in load impedance
LVDS	Low-Voltage Differential Signaling
LVPECL	Low Voltage Positive Emitter-Coupled Logic
MCXO	Microcomputer-Compensated Crystal Oscillator
Mechanical frequency adjustment	The range in parts per million, both above and below the center frequency to which the oscillator can be tuned by an internal or external trimmer
Modulation	A term referring to the ability of a VCXO to be voltage controlled using a time-varying signal.
Modulation Frequency Response	The range of frequencies over which the modulation signal produces frequency variations of the same magnitude of Hz/volt. It can be measured by observing the sidebands produced by the modulation to be of fixed amplitude within 3 dB
Modulation Range	The point at which the frequency deviation of the oscillators turning decreases to 70.7% of its d.c. value while being modulated.
Nominal Frequency	The center or nominal output frequency of crystal oscillator.
Non-Harmonic Distortion	Unwanted non-harmonic or spurious responses are found in the output signal of an oscillator. Their content is specified in dBc. (Spurious responses)
OCXO	Oven controlled crystal oscillator. A crystal oscillator maintained, during operation, at a fixed temperature so that frequency changes due to ambient temperature changes do not affect its performance.
Operable Temperature	The temperature range over which the oscillator may be operated without damage. The oscillator is not required to perform within specification over this range. To avoid confusion this parameter is normally not specified and will never be specified when its values are the same as operating temperature.
Operating Temperature	The temperature range over which the oscillator will operate within its specifications.
Oscillator (XO)	A circuit or device that produces an alternating current of a specific frequency at its output terminals.
Output Impedance	A specification that allows calculation of the change in output amplitude with changing load impedance.
Output Power	The output power calculated from the RMS output voltage and the load impedance or measured directly.

Term	Explanation
Output Voltage	The specified output voltage magnitude and waveform. It may be specified several different ways TTL output, HCMOS output, 1 volt +/- 25% Sine wave output, or as output power.
Overshoot	A characteristic of circuits employing high performance rectangular wave techniques. Overshoot is the tendency of the rising and falling edges of the signal to have a damped oscillation superimposed upon them causing the voltage to momentarily rise above the normal peak signal voltage by as much as several volts.
Package	A definition of the style of enclosure in which the oscillator will be packaged. This may be done by drawing or may be selected from a set of standard packages. The package includes all dimensions and connection definitions.
PECL	Positive Emitter-Coupled Logic
Period	The time required for one repetition (cycle) of the output waveform measured in seconds or fractions of seconds. It is mathematically identical to the inverse of frequency (1/frequency).
Phase Locked Loop	A circuit in which a crystal oscillator is used as a time base for a voltage controlled oscillator maintaining frequency and phase lock between the two oscillators. This is a useful technique for achieving a frequency programmable crystal oscillator and output frequencies that are out of the range of a crystal manufactured to achieve certain performance specifications. However, short-term frequency stability is one or two orders of magnitude worse than for a true crystal oscillator.
Phase Noise	The ratio of the power density of one phase modulation sideband to the total signal. All phases" noise data in the catalog are normalized to a one Hertz equivalent bandwidth.
PPM	The abbreviation for "PARTS PER MILLION," a method of calculation used to specify the permissible frequency deviation of a crystal or oscillator. May also be seen as "PPM".
Pullability	The frequency shift of a VCXO as a function of control voltage.
Rise Time	The time required for a signal to go from Logic „0" to logic „1". 
Shock	A specification referring to the ability of the oscillator to withstand, without performance degradation, a non-repetitive acceleration.
Sine Wave	An output waveform described by a sine curve. A voltage or decibel value and tolerance must be included to complete the specification.
Square Wave	A rectangular wave output waveform having a 50% symmetry. If specified, the tolerance to the symmetry must be specified. TTL, LSTTL, CMOS and HCMOS outputs are described as square wave and comply to the wave form drawing at right.
Stability	The ability of the oscillator to maintain its design frequency with changing environmental and electrical conditions. Parameters, which may affect stability, include temperature, time, supply voltage, load impedance, humidity, and vibration.
Start-up Time	The maximum time that the oscillator requires to reach stable operation within specifications after application of the supply voltage

Term	Explanation
Start-up Time	
Storage Temperature	The temperature range over which the oscillator may be stored, non-powered, without damage
Supply Current	The maximum operating current of the oscillator at the nominal supply voltage
Supply Voltage	The operating voltage (or range) of the oscillator.
Symmetry	The percentage of each period that a signal is in logic high. This parameter is measured at a specified voltage threshold or at a percentage of the output waveform amplitude.
TCXO	Temperature compensated crystal oscillator
TCVCXO	Temperature compensated voltage controlled crystal oscillator
Temperature	As applied to crystal oscillators, temperature is specified in degrees Celsius. Normally the center of all temperature ranges is +25 degrees Celsius.
Temperature Compensation	A technique used to stabilize the frequency of a crystal oscillator over a compensation specified temperature range. The temperature range and the limits of frequency change are specified.
Temperature Stability	The ability of the oscillator to maintain its design frequency over a temperature range. This is usually specified as a maximum variation of plus and minus parts per million over the specified temperature range.
Test Load Impedance	Usually identical to the load impedance, this is the characteristic of the external circuit connected to the oscillator during performance testing.
Trimmer	A mechanical device used to tune the crystal oscillator. It may be a variable capacitor or some other suitable device.
Tri-state	The tri-state option is similar to the Enable/Disable. When you have a “logic 1” on pin 1, the unit works as normal “enabled” producing the specified output. When the pin is disabled, “logic 0” it goes into high impedance or tri-state mode. The tri-state mode allows the customer to remove the oscillator from their circuit without physically removing it.
TTL	An output signal format defined as a rectangular wave capable of driving a multiple of TTL loads. It has a positive signal peak greater than +2.4 volts and a negative signal peak less than +0.4 volts. The number of loads must be specified.
Voltage Coefficient	The amount of frequency deviation caused by a change in the oscillators supply voltage.
Voltage Frequency Adjustment	The range in parts per million, both above and below the center frequency to which the oscillator can be tuned by the control voltage.
VCXO	Voltage controlled crystal oscillator
Vibration	A specification referring to the ability of the oscillator to withstand, without performance degradation, a repetitive acceleration.
Warm Up	The time required for an oscillator’s frequency to settle to within a given tolerance of the frequency.