

Glossary

Equivalent circuit of quartz crystal

The electrical circuit which has the same impedance as the unit in the immediate neighborhood of resonance.

Load capacitance (CL)

The effective external capacitance associated with the crystal unit which determines the load resonance frequency (fL).

Nominal frequency (f0)

The frequency assigned by the specification of the crystal unit.

Resonance frequency (fr)

The lower of the two frequencies of the crystal unit alone, under specified conditions, at which the electrical impedance of the crystal unit is resistive.

Load resonance frequency (fL)

One of the two frequencies of a crystal unit in association with a series or with a parallel load capacitance, under specified conditions, at which the electrical impedance of the combination is resistive. The frequency is the lower of the two frequencies when the load capacitance is in series.

Resonance resistance (Rr,R1)

The resistance of the crystal unit alone at the resonance frequency.

Load resonance resistance (RL)

The resistance of the crystal unit in series with a stated external capacitance at the load resonance frequency.

Motional inductance (L1)

The inductance in the motional (series) arm of the equivalent circuit.

Motional capacitance (C1)

The capacitance of the motional (series) arm of the equivalent circuit.

Shunt capacitance (C0)

The static capacitance between the electrodes, together with stray capacitances of the mounting system.

Capacitance ratio (C0/C1)

The ratio of the shunt capacitance to the motional capacitance.

Overtone order

The numbers allotted to the successive overtones of a given mode of vibration from the integral numbers commencing with the fundamental as unity.

Unwanted response

Frequency responses other than the main, or desired response, which the crystal elements have.

Frequency tolerance ($\Delta f/f_0$)

The permissible deviation from the nominal frequency at the reference temperature (usually 25°C).

Storage temperature range

The temperature range over which the standard characteristics of the crystal unit can be maintained when the crystal unit is not in operation.

Drive level, (Level of drive)

The level of power or current in the crystal unit when in the operating state.

Insulation resistance

Resistance between leads, or between lead and case.

Q value

In a resonance circuit composed of an L, C and R, a quantity that represents the sharpness of a resonance curve—a curve that shows the relationship between the circuit current and power frequency.

Frequency stability

Within operating temperature, operating voltage and output load range, deviation in actual frequency from nominal frequency.

Supply current

The electric current to supply (VDD) pin with no output load when output is enabled.

Duty

The 1/2 cycle to 1 cycle ratio (as expressed in percentages) of an output waveform at the specified voltage level.

Output load

The load that can be connected to the oscillator.

Rise time(t_r)

The time interval required for the leading edge of a pulse wave form to change from specified L voltage level to specified H voltage level.

Fall time(t_f)

The time interval required for the trailing edge of a pulse wave form to decay from specified H voltage level to specified L voltage level.

Start up time

The time interval between power on and supply voltage becomes the specified voltage until the output waveform becomes stable.

Output enable function

The function to change the output signal.

When pins OE are at H level or open : Specified frequency is output. (Enable)

When pins OE are at L level : Output has high impedance. (Disable).

Frequency adjustment range

Frequency adjustment (pulling) range of a crystal oscillator which enable to change the frequency with a variable component.

Phase noise

Unit of measurement of frequency sphere in short-term frequency stability of a crystal oscillator.

Harmonic distortion

Non-linear distortion by occurrence of the needless spectral element in a higher harmonic wave of the requisite signal frequency.

Each harmonic element is generally expressed in power ratio (dB) to output power of a requiring signal.

Allan variance fractional frequency fluctuation

Objective evaluation is defined by timedomain in short-term frequency stability of a crystal oscillator.

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