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LOW-NOISE HIGH-STABILITY CRYSTAL OSCILLATOR

ABSTRACT

Circuits, methods, and apparatus that provide low-noise, high-stability crystal oscillators having controlled-amplitude differential output signals and DC level control. A crystal oscillator circuit has two feedback loops, one for setting the DC level of its signals, the other for adjusting the amplitude of those signals. The DC level feedback loop can set the DC component of the oscillator signals to a voltage midway between two supply voltages. The amplitude control loop sets the amplitude of the output of the crystal oscillator signal to be within a range. The amplitude can be set to provide a maximum swing without clipping the supply voltages in order to provide high-stability and minimal jitter. The amplitude control circuit can also be digital for improved noise performance. The time constants of these two loops can be separated such that instabilities are avoided.

Figure 1

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