

# A Balanced Colpitts SAW Oscillator with Cross-Coupled Pair Enhancement

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## Abstract

The balanced SAW oscillator in the Colpitts configuration is studied. To enhance the start up the crosscoupled pairs are employed. Owing to the insulating feature of SAW resonator, the problem of latch may happen. With a careful design in the aspect ratio of CMOS transistors between main amplifier and cross coupled pair, this problem is solved. By the aid of inherent opposite polarity appeared on the terminals of SAW resonator, the star up grows fast. As compared to the well known Colpitts oscillator, the transition period is significantly shrunked. For completeness three kinds of oscillator with single ended, balanced Colpitts, and cross coupled one are compared in terms of figure of merit (FOM) under the same magnitude across the resonator. Also the power consumption and phase noise are indicated.

Keyword : saw oscillator, differential, CMOS, Balance