

THEORY AND EXPERIMENTAL RESULTS OF FLYING-ADDER FREQUENCY SYNTHESIZER

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ABSTRACT

Flying-Adder frequency synthesis architecture is a comparatively new technique of generating fractional frequency derived from reference frequency. The first advantage is that system consists of pure digital circuits. The second advantage is fast response. On the other hand, this synthesizer generates a desired average frequency, which is not spectrally pure. Since its invention, it has been utilized in many commercial products. During the evolution of this architecture, the issues related to circuit and system level implementations have been studied in prior publications. In this paper, we attempt to present the signal characteristics in time and frequency domain based on another approach, which was not so far published. The theoretical results are confirmed by simulation and also supported by experimental results, gained through the construction of simple flying adder frequency synthesizer.

KEYWORDS: Direct Digital Synthesis, Fractional Synthesizer, Flying Adder, Frequency Synthesis, Phase Locked Loop, Sigma Delta, Time-Average-Frequency