

DDS Integrated PLL Synthesizer

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Abstract

A new scheme for hybrid PLL/DDS frequency synthesizer is proposed in this paper. Here a Direct Digital Synthesizer (DDS) is integrated into a Phase Lock Loop (PLL) feedback path using a Single Side Band (SSB) modulator, preventing a need for cumbersome filtering and false locking phenomenon. Such scheme can easily be implemented in hardware using commercially available quadrature DDS and quadrature modulator. Very fast settling time, low spurious level, high resolution and low phase noise can simultaneously be achieved, which makes the proposal scheme a very cost effective solution to extremely strenuous specifications.

A synthesizer cover the frequency range of 900-1600MHz, spurious level of -65dBc, frequency resolution of 25Hz and switching time of 0.5mSec was successfully implemented.