

**RESEARCH, DESIGN AND FABRICATION OF UHF WIDEBAND
TRANSMITTER, WITH THE MECHANISM OF FLEXIBLE FREQUENCY
CHANGE USING ADF7021**

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Abstract:

UHF spectrum is used world-wide for land mobile radio systems for commercial, industrial, public safety, and military purposes. Therefore, the studying of UHF transmitter systems is pressing need.

A critical element of any transmitter is the frequency synthesizer (FS). For a flexible system, it may be desirable to support multiple standards. A single FS capable of operating over a wide frequency range while meeting all the requirements of the individual standards can save area and design effort compared with multiple FS each supporting only one standard.

The Phase Locked Loop (PLL) synthesizer technique enables the generation of a stable periodic waveform whose frequency can be varied over a wide range in flexible frequency steps. It offers many advantages over the use of other techniques like DDS or DAS. It not only offers high levels of stability and accuracy, it is also easy to control from digital circuitry such as microprocessors. Hence, PLL synthesizer technique is most suitable technique for frequency synthesis purpose. Moreover, many types of PLL frequency synthesizer are available as integrated circuits, reducing cost and size now.

Therefore, in my thesis “Research, Design and Fabrication of UHF wideband transmitter, with the mechanism of flexible frequency change using ADF7021”, PLL frequency synthesizer technique is used to acquire flexible tuning range, accurate and low phase noise outputs in UHF band by using chip ADF7021. In this work, after studying about PLL frequency synthesizer technique, a UHF wideband transmitter – with flexible frequency change has been also designed, fabricated and measured.

Keywords: Frequency synthesizer, Phase Lock Loop synthesizer technique