DIGITAL PREDISTORTION FOR 5G TESTBED

A Project Report

submitted by

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THESIS CERTIFICATE

This is to certify that the thesis titled **Digital Pre-distortion for 5G testbed**, submitted by **Athira U V (EE17M071)** , to the Indian Institute of Technology, Madras, for the award of the degree of Master of Technology, is a bona fide record of the project work done by her under my supervision. The contents of this thesis, in full or in parts, have not been submitted to any other Institute or University for the award of any degree or diploma.

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ABSTRACT

Power Amplifiers are inevitable components in communication systems. But their non-linear nature and memory effects makes it very difficult to use them at high efficiency. Due to this, Adjacent Channel Leakage Ratio (ACLR) increases, also in-band distortions occur. Power amplifier efficiency will be reduced as we are forced to push to lower operating levels. To overcome this, we need to include Digital Predistortion (DPD). DPD introduces a block to predistort the signal before passing on to the power amplifier so that the input to output relation becomes linear. DPD using Memory Polynomial model and RLS algorithm are employed in this project. Software modelling and simulation of power amplifiers and DPD was performed. Real time tests were done to measure the effectiveness of the algorithm, using SKY 66293-21 Power Amplifier and AD9364 and ADRV9009 transceivers. Hardware implementation of non-linear DPD filter was done.

CHAPTER 1

Due to confidentiality issues only abstract is uploaded. Complete thesis has been submitted to Dr. Radha Krishna Ganti. Kindly contact professor for full thesis