

2 Stage CMOS Regulated Cascode Distributed Amplifier Design Based On Inductive Coupling Technique in Submicron CMOS Process

Authors : Kittipong Tripetch, Nobuhiko Nakano

Abstract : This paper proposes one stage and two stage CMOS Complementary Regulated Cascode Distributed Amplifier (CRCDA) design based on Inductive and Transformer coupling techniques. Usually, Distributed amplifier is based on inductor coupling between gate and gate of MOSFET and between drain and drain of MOSFET. But this paper propose some new idea, by coupling with differential primary windings of transformer between gate and gate of MOSFET first stage and second stage of regulated cascode amplifier and by coupling with differential secondary windings transformer of MOSFET between drain and drain of MOSFET first stage and second stage of regulated cascode amplifier. This paper also proposes polynomial modeling of Silicon Transformer passive equivalent circuit from Nanyang Technological University which is used to extract frequency response of transformer. Cadence simulation results are used to verify validity of transformer polynomial modeling which can be used to design distributed amplifier without Cadence. 4 parameters of scattering matrix of 2 port of the propose circuit is derived as a function of 4 parameters of impedance matrix.

Keywords : CMOS regulated cascode distributed amplifier, silicon transformer modeling with polynomial, low power consumption, distribute amplification technique

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