Title:
Design of Impedance Matching For RF Power Amplifier with very low Input & Output Impedance in UHF band

Abstract:
Nowadays solid state transmitters are as common as tube transmitters. Solidstate transmitters are superior to tube transmitter beacause of lower DC voltage supply and easier maintenance and repairing requirements. RF power amplifier is the most important element in solidstate transmitters. Several RF power amplifiers with equal phase and amplitude are combined in parallel form to encrease RF power output from transmitter. There are several parameters in RF power amplifiers which depending on the application, contribute more to the amplifier performance. One of these parameters is amplifier bandwidth. Die transistors have more bandwidth than packaged transistors. Because packaging increase parasitic elements for transistor and then decrease bandwidth. The synthesis of impedance-matching networks plays an important role in the design of modern wireless communication systems. Depending on the specific purpose of the circuit, maximum power deliverd to the load, maximum gain or efficiency, input and out put impedance of transistor is different. For any RF amplifier, impedance matching network should provide matching over the complete frequency band of interest. Input and output impedances from load pull test are in datasheet transistor. In RF power transistors input and output impedance are very low value and these impedances must be matched to 50Ω in transformation ratios of 40, 50 or eve 100. Design of impedance matching network with this ratio over a specific frequency band is difficult. The purpose of this thesis is to achieve a simple way for design of impedance matching network with transformation ratios of 50 to 100 in VHF and UHF band. The base of design is four reactance matching network. Simulation is done with ADS software. To verify the performance of synthesized circuits, the results are applied to design of two RF transistor power amplifiers.

Keywords:
High power amplifier, Impedance matching, RF power transistor.