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Design and Evaluation of an L-Band Current-Mode Class-D Power Amplifier
Integrated Circuit

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Abstract

Power amplifiers (PAs) convert energy from DC to high frequencies in all radio and microwave transmitter systems be they wireless base stations, handsets, radars, heaters, and so on. PAs are the dominant consumers of energy in these systems and, therefore, the dominant sources of system cost and inefficiency. Research has focused on efficient solid-state PA circuit topologies and their optimization since the 1960s. The 2000s saw the current-mode class-D (CMCD) topology, potentially suitable for today's wireless communications systems, show promise in the UHF frequency band. This thesis describes the design and testing of a high-efficiency CMCD amplifier with an integrated driver stage. In addition, analysis of a merged PA-mixer circuit based on the CMCD is provided.

First Advisor

Robert W Jackson

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