

Design of Low Complexity Phased Arrays for Commercial Applications

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Recent growth in advanced communication systems has drawn an increasing interest in utilizing phased array technologies. Bandwidth intensive applications such as real-time video streaming and emerging gigabit wireless communications demand higher data rates than ever before. The spatial selectivity of phased arrays can increase the channel capacity and data rate without requiring extra bandwidth. Furthermore, the spatial filtering nature of the phased array systems alleviate the problem of multipath fading and co-channel interference by suppressing signals emanating from undesirable directions. Unfortunately the high cost of phased arrays has been the primary impediment to their deployment in many large-scale applications. Often the major cost of traditional phased arrays is associated with the high cost of phase shifters. Several new phased array designs based on the extended resonance technique and other approaches will be presented aiming to significantly reduce the size, complexity and power consumption of the conventional phased arrays. An overview of my work in the areas of low phase noise oscillators, high efficiency power amplifiers and filters with inherent switching capability will also be provided.