

Development of Millimeter-wave RFICs and LTCC Modules

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In this talk, the development of millimeter-wave (MMW) RFICs in National Taiwan University for the past years will be presented, including both GaAs and Si-based MMW MMICs for transceiver applications. The design of the embedded MMW antennas/array by using multilayer substrates can be either in low temperature cofired ceramic (LTCC) or low loss printed circuit board (PCB). The short wavelength of MMW makes it possible to realize a MMW transceiver module with antenna array in the size of a typical IC package in size of few centimeters. By embedding the antennas into suitable packaging substrate, for example, LTCC, and using flip-chip interconnect between die and substrate, a package with low loss at MMW frequency range can be realized. The multi-layer structure of LTCC allows the radiation of antenna structure not only in planar direction, but also in vertical direction.