Abstracts

Monolithic packaging concepts for high isolation in circuits and antennas

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High-frequency planar circuits experience large electromagnetic (EM) coupling in dense circuit environments. As a result, individual components exhibit performance degradation that ultimately limits overall circuit response. This paper addresses crosstalk in planar microstrip lines by evaluating micromachined packages as a means to reduce coupling. Microstrip lines with straight and meandering paths can exhibit crosstalk coupling as high as -20 dB (i.e., when placed in a side-by-side arrangement). From our study, inclusion of a monolithic package reduces this effect by as much as: -30 dB and, consequently, offers the requisite electrical and environmental protection in addition to shielding of individual elements from parasitic radiation. Presented herein is the development of the micromachined package for microstrip geometries. Included in the discussion are crosstalk effects between straight and bending geometries in open and packaged configurations and an evaluation of package noise characteristics. A packaged antenna element is also included as a demonstration of the potential use of micromachined packaging in array applications.

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