Abstracts

Three-dimensional high-frequency distribution networks. I. Optimization of CPW discontinuities

This paper describes a systematic study of coplanar waveguide discontinuities that are requisite components of high-frequency distribution networks. The specific geometries addressed are air bridges, right-angle bends, tee junctions, and Wilkinson dividers. Relative to typical monolithic-microwave integrated-circuit designs, the components studied herein are electrically large in order to minimize signal attenuation. The large size leads to pronounced parasitic effects, and the emphasis of this study was to optimize the electrical performance using simple compensation techniques. The optimization methods are developed using full-wave simulation and equivalent-circuit modeling, and are verified experimentally up to 60 GHz. Part II of this paper describes the implementation and packaging of the components to realize a three-dimensional W-band distribution network.

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