Abstracts

CAD of waveguide structures with production based radii at arbitrary double (E-H) plane steps and junction ports

J.M. Reiter, R. Beyer and U. Rosenberg. "CAD of waveguide structures with production based radii at arbitrary double (E-H) plane steps and junction ports." 2002 MTT-S International Microwave Symposium Digest 02.3 (2002 Vol. III [MWSYM]): 2081-2084 vol.3.

The introduction of an enhanced Boundary Contour Mode Matching (BCMM) approach is shown to provide accurate and efficient analysis of waveguide structures with curved shapes at double (E-H) plane discontinuities of junctions and steps. Such geometries take account or the capabilities of state-of-the-art CNC milling production techniques, commonly used for integrated waveguide subsystems. The method is based on direct expansion of the electromagnetic fields of the double-plane discontinuities into the modes of the connecting rectangular waveguides and additionally in case of junctions into cylindrical cavity modes. Validation of the approach has been proven by several component designs, that exhibit almost coincidence of computed and measured responses. The results of a special 4-pole filter design at 10 GHz using bypass couplings for a tailored asymmetric response and a 3 dB E-plane short-slot coupler, operating at 32 GHz, are presented as quite different examples.

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