Abstracts

Equivalent circuit of radiating longitudinal slots in dielectric filled rectangular waveguides obtained with FDTD method

R.V. Gatti, R. Sorrentino and M. Dionigi. "Equivalent circuit of radiating longitudinal slots in dielectric filled rectangular waveguides obtained with FDTD method." 2002 MTT-S International Microwave Symposium Digest 02.2 (2002 Vol. II [MWSYM]): 871-874 vol.2.

A rigorous FDTD characterization of a longitudinal radiating slot in a dielectric filled rectangular waveguide in terms of an equivalent shunt admittance is presented. The FDTD method allows one to account for a number of details that affect the antenna performance, such as the waveguide wall thickness, the presence of a finite or infinite flange, a dielectric layer over the slot. High numerical efficiency has been obtained by using Stegen's factorization of the slot admittance. Comparison with other methods (MoM) and with experimental results have shown very good agreement with FDTD simulations even in the computation of the resonant length, which is the most critical parameter. The proposed equivalent circuit allows for a fast and accurate analysis of a radiating slot in a frequency range of the order of 15%.

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