Abstracts

Complete characterization of transmission losses in generalized nonradiative dielectric (NRD) waveguide

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In this paper, transmission losses of the generalized nonradiative dielectric (NRD) waveguide are modeled and presented by our closed-form equations for the design of hybrid and monolithic millimeter-wave integrated circuits. This generalized structure includes our recently proposed channelized NRD-guide. Parametric effects are studied with respect to complex propagation constant and characteristic impedance, and some useful guidelines are generated for practical design considerations. Calculated results are discussed separately for the conductor and dielectric losses for the two fundamental longitudinal section electric (LSE) and longitudinal section magnetic (LSM) modes. It is found that the LSE mode may have losses, in some cases, comparable or even smaller than those of its LSM counterpart, contradicting what has usually been perceived for the conventional NRD-guide design.

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