Abstracts

Computer-Aided Design and Optimization of NRD-Guide Mode Suppressors

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A novel class of optimized nonradiative dielectric waveguide (NRD-guide) mode suppressors are proposed for wide-band applications in passive and active NRD integrated circuits. A rigorous field-theoretical analysis is made by using the frequency-domain TLM technique. The optimum design is based on a filter-like scheme with a low-pass filter simulation tech-nique and its performance-prediction algorithm. Compared to the existing choke metallic pattern, the proposed mode suppressor demonstrates excellent capabilities of effectively suppressing un-wanted modes while offering a more compact geometry. Using the geometry proposed in this work for a three-section low-pass tilter, for example, it is found that the transmission loss of the mode suppressor is better than -30 dB over the frequency band of interest which is well confirmed theoretically and experimentally. In addition, the length of the resulting mode suppressor becomes shorter than its counterpart using the choke metallic pattern by 20%. The theoretical prediction of electrical performance is well confirmed by our measurements.

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