Abstracts

The Open-Ring Line: A Low-Loss Surface Waveguide

C. Fray and A. Papiernik. "The Open-Ring Line: A Low-Loss Surface Waveguide." 1978 Transactions on Microwave Theory and Techniques 26.11 (Nov. 1978 [T-MTT]): 886-892.

This paper presents the theoretical analysis of the electromagnetic properties of the open-ring line by means of the Hankel transform. Fields components, stored energy, power flow, dispersion relation, and energy distribution are calculated. Measurements have corroborated our theoretical results. These results help in the design of low-loss line operating in the fundamental dipolar hybrid mode. The measured attenuation on a prototype line consisting of equally spaced aluminum rings held by a metal rod is less than 5 dB/km below 1.8 GHz. Among the possible applications are railway traffic control and railway obstacle detection.

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