Abstracts

Radiation Loss from Open-Circuited Dielectric Resonators (Short Papers)

J. Watkins. "Radiation Loss from Open-Circuited Dielectric Resonators (Short Papers)." 1973 Transactions on Microwave Theory and Techniques 21.10 (Oct. 1973 [T-MTT]): 636-639.

The Q factor of an open-circuited resonator is influenced by dielectric, conductor, and radiation losses. This short paper discusses these losses and shows that insight into the radiation loss can be obtained by an extension to the analysis given by Lewin. This shows that the radiation loss is a maximum for the dominant mode and that provided the permittivity is not less than 9.0 the radiation losses are at a minimum for the second mode. It is suggested that these results may be applied to the design of filters based on dielectric resonators. The application of the results to stripline resonators in which the dielectric extends past the termination of the upper conducting strip is more difficult, and it is suggested that experimental work is required to investigate postulated improvements. Finally, some of the radiation patterns of the open-circuited dielectric resonators, obtained in this paper, show interesting directional properties which may be applied to the design of antenna systems.

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