Microwave Ring Circuits and Antennas (Wiley Series in Microwave and Optical Engineering)

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Microwave ring circuits are remarkably simple in design and their performance is usually easy to predict. Because of these advantages, they are common components in everything from measurements to filters, oscillators to antennas, mixers to frequency selective surfaces. Yet despite their many uses, up until now a clear and detailed description of these vital components could be obtained only by sifting through numerous papers and books.

Microwave Ring Circuits and Antennas provides the first fully dedicated treatment of ring circuits, with the aims of promoting a greater understanding of their design and operation and stimulating further applications. Based on ten years of research results and publications by the author and his students, as well as the work of other professional groups, Dr. Chang's text covers most ring resonators and cavities as they are utilized in a variety of transmission lines, including microstrip, slotline, coplanar waveguide, and waveguide.

Microwave Ring Circuits and Antennas begins with a general introduction to the ring circuit, its history, as well as its past and present applications. It then provides a general description of simple models, field analysis, transmission line models, modes, perturbation methods, and coupling methods of ring resonators. The author introduces electronically tunable and switchable ring resonators, which can be achieved by incorporating varactor and PIN diodes into the ring circuits. Major coverage is devoted to the applications of ring resonators to microwave measurements, filters, couplers, and magic-T's. The final chapters offer a concise discussion of ring antennas and frequency selective surfaces, as well as a broad survey of the potential applications of ring circuits in mixers, active antennas, oscillators, and optoelectronics. Throughout the text, practical applications are clearly illustrated with figures and actual performances.

The most complete book available today on these vital and useful components, Microwave Ring Circuits and Antennas makes a significant contribution to the microwave engineering literature. The latest addition to the Wiley Series in Microwave and Optical Engineering, Dr. Chang's book will be useful to engineers, researchers, and graduate students in the fields of circuit and antenna design and solid-state electronics.

The definitive guide to microwave circuit design and operation

A unique new addition to the microwave engineering literature, Microwave Ring Circuits and Antennas provides the first comprehensive coverage of ring circuits and antennas, including theoretical analyses and a wealth of practical applications.

Following a general discussion of analysis, theory, modeling, modes, coupling methods, and perturbation methods, Dr. Chang examines various ring circuit applications. All are supported by real circuit demonstrations and actual circuit performances. The text also includes a discussion of the implementation of solid-state devices for tuning and switching the resonances.

This text will serve as an invaluable resource for engineers, designers, researchers, and graduate students in the field.

Topics covered include:

- Analysis and Modeling of Ring Resonators
- Modes, Perturbations, and Coupling Methods of Ring Resonators
- Electronically Tunable Ring Resonators
- Electronically Switchable Ring Resonators
- Measurement Applications Using Ring Resonators
- Filter Applications
- Ring Couplers
- Ring Magic-T Circuits
- Waveguide Ring Resonators and Filters
- Ring Antennas and Frequency Selective Surfaces
- Additional Applications

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