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Titolo	Applications of Advanced Electromagnetics : Microwave Components and Systems // by Guennadi A. Kouzaev
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ISBN	9783031738920 3031738926
Edizione	[2nd ed. 2024.]
Descrizione fisica	1 online resource (386 pages)
Collana	Lecture Notes in Electrical Engineering, , 1876-1119 ; ; 1272
Disciplina	621.3
Soggetti	Electrical engineering Telecommunication Electronic circuits Electrical and Electronic Engineering Microwaves, RF Engineering and Optical Communications Electronic Circuits and Systems
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	Introductory Electromagnetism; Plane Waves, Waveguide Modes and their Reflection and Diffraction at Discontinuities -- Theory of Waveguides -- Waveguide Discontinuities and Components -- Integrated Transmission Lines and their EM Models for Extended Frequency Bandwidth Applications -- Waveguides for Terahertz Frequencies -- Variable-logic Processor on Paired Wires for Artificial Intelligence Acceleration -- Liquid Heating in Miniature Reactors -- MW Coaxial Reactors: Scaling up and down -- Electron-Transfer Chemical Reactions in the Microwave Field.
Sommario/riassunto	This book addresses microwave researchers, engineers, and Master's and Ph.D. students. It follows the idea of the first Edition to educate the readers on fundamental electromagnetics and show how this brilliant theory is used in developing modern multi-physics microwave and terahertz hardware. The first three chapters discuss the main ideas and methods of electromagnetism, explained in a manner that is clear for readers who have had some initial knowledge of electromagnetism. Chapters 4 and 5 are on transmission lines. The first text is on the

integrated ones for digital applications, which have been working since DC up to several tens or hundreds of gigahertz. The next chapter is on the waveguides for terahertz frequencies. In this book, the space-modulated signals application, compared to the 1st Edition, is considered using the example of a novel predicate variable logic processor designed and verified in an FPGA environment (Chapter 6). This idea, born initially in microwaves, allowed an eight-logic-style reconfigurable on-the-fly processor. Chapters 7–9 discuss microwaves in heating liquids and the initiation of rapid chemical reactions in novel miniature quasi-TEM wave reactors. Chapter 10 involves results on trapping and transporting ultra-cold matter using combined techniques. The new results described here are on numerical simulation of trapping of ultra-cold atoms in random 3D optical potentials using the Anderson effect. In conclusion, the author hopes this book will strengthen the young generation's interest in microwave field theory. He believes that advanced electromagnetism, combined with other physics branches, will play a crucial role in developing new, improved components and systems, and this book is a stepping-stone example in that journey.

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