



RF Circuit Design Techniques for MF-UHF Applications

By Abdullah Eroglu

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Magnetic resonance imaging, semiconductor processing, and RFID are some of the critical applications within the medium frequency (MF) to ultrahigh frequency (UHF) range that require RF designers to have a solid understanding of analytical and experimental RF techniques. Designers need to be able to design components and devices cost effectively, and integrate them with high efficiency, minimal loss, and required power. Computer-aided design (CAD) tools also play an important part in helping to reduce costs and improve accuracy through optimization. **RF Circuit Design Techniques for MF-UHF Applications** explains how to design, simulate, and implement RF/microwave components and devices for applications within the medium frequency (MF) to ultrahigh frequency (UHF) range. The book makes RF design simple by expertly blending theory, simulation, and practical application examples.

A Practical Guide to RF Circuit Design in the MF-UHF Range: Theory, Simulation, and Real-World Application Examples

After a review of network parameters used in the analysis of RF components and devices, the book examines MF-UHF design techniques in detail. These include techniques for designing high-power microstrip circuits, directional couplers, transformers, composite and multilayer inductors, filters, combiners/dividers, and RFID systems. For every device, the book gives the required theory and then explains the verification process with CAD tools. In addition, each design is illustrated with real-life implementation examples that use a variety of CAD tools such as MATLAB®, Mathcad, HFSS™, Ansoft Designer®, Sonnet®, and PSpice®. Design tables, curves, and charts are included to demonstrate an efficient design process. Throughout, the book also offers practical hints to help engineers shorten the design time.

Design MF-UHF Devices More Cost-Effectively

The book reflects the optimum design methodology used in RF engineering, from the application of theory, to simulation for verification, to experimentation. Packed with useful techniques, tips, and examples, it is an invaluable resource for

engineers, researchers, and students working in the MF-UHF range.

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Editorial Review

Review

"Throughout, the book contains practical methods to help designers reduce design time. It is an outstanding resource for RF component designers in the MF and UHF range and for engineering students interested in RF design and theory. It reflects the best design methodology used in RF engineering available today, from the application of theory to modeling for verification, optimization, and experimentation. It is filled with useful methods, tips, and techniques and will be an invaluable reference book for those working in the MF and UHF field."

--John J. Shea, *IEEE Electrical Insulation Magazine*, May/June 2014 - Vol. 30, No. 3

About the Author

Abdullah Eroglu, Ph.D., is an associate professor of electrical engineering in the Engineering Department at Indiana University–Purdue University Fort Wayne, USA. From 2000 to 2008 he worked as RF senior design engineer at MKS Instruments, where he was involved with the design of RF power amplifiers and systems. His teaching and research interests include RF circuit design, microwave engineering, development of nonreciprocal devices, electromagnetic fields, wave propagation, radiation, and scattering in anisotropic and gyrotropic media. He has published more than 70 peer reviewed journal and conference papers and has authored two books. Dr. Eroglu is a reviewer of several journals and on the editorial board of the *Journal of Communications and Network*. He is the recipient of the 2013 IPFW Featured Faculty Award, 2011 Sigma Xi Researcher of the Year Award, 2010 ETCS Excellence in Research Award, and 2004 Outstanding Graduate Student award from the Electrical Engineering and Computer Science Department at Syracuse University, USA.

For more information, see Dr. Eroglu's profile at IPFW.

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