1. Record Nr. UNINA9910821099603321

Titolo	Modern RF and microwave measurement techniques / / edited by Valeria Teppati, ETH Zurich, Andrea Ferrero, Politecnico di Torino, Mohamed Sayed, Microwave and Millimeter Wave Solutions [[electronic resource]]
Pubbl/distr/stampa	Cambridge : , : Cambridge University Press, , 2013
ISBN	1-107-24180-4 1-316-09075-2 1-62870-512-4 1-107-25048-X 1-139-56762-4 1-107-24882-5 1-107-24799-3 1-107-24965-1
Descrizione fisica	1 online resource (xxv, 447 pages) : digital, PDF file(s)
Collana	The Cambridge RF and microwave engineering series
Classificazione	TEC024000
Disciplina	621.382028/7
Soggetti	Radio measurements Microwave measurements Radio circuits
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Title from publisher's bibliographic system (viewed on 05 Oct 2015).
Nota di bibliografia	Includes bibliographical references at the end of each chapters and index.
Nota di contenuto	cover.pdf; Cover; Modern RF and Microwave Measurement Techniques; Title; Copyright page; Contents; Preface; Contributors; Abbreviations; Part I General concepts; 1 Transmission lines and scattering parameters; 1.1 Introduction; 1.2 Fundamentals of transmission lines, models and equations; 1.2.1 Introduction; 1.2.2 Propagation and characteristic impedance; 1.2.3 Terminations, reflection coefficient, SWR, return loss; 1.2.4 Power transfer to load; 1.3 Scattering parameters; 1.4 Microwave directional coupler; 1.4.1 General concepts; 1.4.2 The reflectometer; 1.5 Smith Chart; 1.6 Conclusions 2 Microwave interconnections, probing, and fixturing2.1 Introduction; 2.2 Device boundaries and measurement reference planes; 2.2.1

Devices; 2.2.2 Transmission lines; 2.2.3 Circuits; 2.3 Signal-path fixture performance measures; 2.3.1 Delay; 2.3.2 Loss; 2.3.3 Mismatch; 2.3.4 Crosstalk; 2.3.5 Multiple-modes; 2.3.6 Electromagnetic discontinuity; 2.4 Power-ground fixture performance measures; 2.4.1 Non-ideal power; 2.4.2 Non-ideal ground; 2.5 Fixture loss performance and measurement accuracy; 2.6 Microwave probing; 2.6.1 Probing system elements; 2.6.2 VNA calibration of a probing system
2.6.3 Probing applications -- in situ test2.6.4 Probing applications -- transistor characterization; 2.7 Conclusion; Part II Microwave instrumentation; 3 Microwave synthesizers; 3.1 Introduction; 3.2 Synthesizer characteristics; 3.2.1 Frequency and timing; 3.2.2 Spectral purity; 3.2.3 Output power; 3.3 Synthesizer architectures; 3.3.1 Direct analog synthesizers; 3.3.2 Direct digital synthesizers; 3.3.3 Indirect synthesizers; 3.3.4 Hybrid architectures; 3.4 Signal generators; 3.4.1 Power calibration and control; 3.4.2 Frequency and power sweep; 3.4.3 Modulation; 3.5 Conclusions
4 Real-time spectrum analysis and time-correlated measurements4.1 Introduction; 4.1.1 Types of spectrum analyzers; 4.2 Spectrum analysis in real-time; 4.2.1 Real-time criteria; 4.2.2 Theoretical background; 4.3 Spectrum analysis using discrete Fourier transforms; 4.3.1 The Fourier transform for discrete-time signals; 4.3.2 Regularly spaced sequential DFTs; 4.4 Windowing and resolution bandwidth (RBW); 4.4.1 Windowing considerations; 4.4.2 Resolution bandwidth (RBW); 4.5 Real-time specifications; 4.5.1 Real-time criteria
4.5.2 Minimum event duration for 100% probability of intercept at thespecified accuracy4.5.3 Comparison with swept analyzers; 4.5.4 Processing all information within a signal with no loss of information; 4.5.5 Windowing and overlap; 4.5.6 Sequential DFTs as a parallel bank of filters; 4.5.7 Relating frame rate, frame overlap, and RBW; 4.5.8 Criteria for processing all signals in the input waveform with no loss of information; 4.6 Applications of real-time spectrum analysis; 4.6.1 Displaying real-time spectrum analysis data; 4.6.2 Digital persistence displays
4.6.3 The DPX spectrum display engine

Sommario/riassunto

This comprehensive, hands-on review of the most up-to-date techniques in RF and microwave measurement combines microwave circuit theory and metrology, in-depth analysis of advanced modern instrumentation, methods and systems, and practical advice for professional RF and microwave engineers and researchers. Topics covered include microwave instrumentation, such as network analyzers, real-time spectrum analyzers and microwave synthesizers; linear measurements, such as VNA calibrations, noise figure measurements, time domain reflectometry and multiport measurements; and non-linear measurements, such as load- and source-pull techniques, broadband signal measurements, and non-linear NVAs. Each technique is discussed in detail and accompanied by state-of-the-art solutions to the unique technical challenges associated with its use. With each chapter written by internationally recognised experts in the field, this is an invaluable resource for researchers and professionals involved with microwave measurements.