1. Record Nr. UNINA9910523902903321

Autore Hamedi-Hagh Sotoudeh

Titolo Computational electronic circuits: simulation and analysis with MATLAB

// Sotoudeh Hamedi-Hagh

Cham, Switzerland: ,: Springer, , [2022] Pubbl/distr/stampa

©2022

ISBN 3-030-75568-1

Edizione [1st ed. 2022.]

Descrizione fisica 1 online resource (XXXI, 431 p. 482 illus., 189 illus. in color.)

Disciplina 621.3815

Soggetti Electronic circuits

Electronic circuit design

Lingua di pubblicazione Inglese

Formato Materiale a stampa

Livello bibliografico Monografia

Nota di contenuto Introduction -- Framework -- DC Analysis -- Transient Analysis -- AC

Analysis -- Noise Analysis -- Behavioral Analysis.

Sommario/riassunto This textbook teaches in one, coherent presentation the three distinct

topics of analysis of electronic circuits, mathematical numerical algorithms and coding in a software such as MATLAB®. By combining the capabilities of circuit simulators and mathematical software, the author teaches key concepts of circuit analysis and algorithms, using a modern approach. The DC, Transient, AC, Noise and behavioral analyses are implemented in MATLAB to study the complete characteristics of a variety of electronic circuits, such as amplifiers, rectifiers, hysteresis circuits, harmonic traps and passes, polyphaser filters, directional couplers, electro-static discharge and piezoelectric crystals. This book teaches basic and advanced circuit analysis, by incorporating algorithms and simulations that teach readers how to develop their own simulators and fully characterize and design electronic circuits. Teaches students and practitioners DC, AC,

Transient, Noise and Behavioral analyses using MATLAB; Shows readers how to create their own complete simulator in MATLAB by adding materials learned in all 6 chapters of the book; Balances theory, math and analysis; Introduces many examples such as noise minimization, parameter optimization, power splitters, harmonic traps and passes,

directional couplers, polyphase filters and electro-static discharge that

are hardly referenced in other textbooks; Teaches how to create the fundamental analysis functions such as linear and nonlinear equation solvers, determinant calculation, random number generation and Fast Fourier transformation rather than using the built-in native MATLAB codes.