

1. Record Nr.	UNINA9910208820103321
Autore	Kazimierczuk Marian K
Titolo	High-frequency magnetic components / / Marian K. Kazimierczuk
Pubbl/distr/stampa	Chichester, West Sussex : , : Wiley Blackwell, , [2014] ©2014
ISBN	1-118-71773-2 1-118-71771-6 1-118-71780-5 1-119-96491-1
Edizione	[Second edition.]
Descrizione fisica	1 online resource (999 p.)
Classificazione	TEC031000
Disciplina	621.3815
Soggetti	Electromagnetic devices Magnetic devices Resonance
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Cover; Title Page; Copyright; Dedication; Preface; About the Author; List of Symbols; 1: Fundamentals of Magnetic Devices; 1.1 Introduction; 1.2 Magnetic Relationships; 1.3 Magnetic Circuits; 1.4 Magnetic Laws; 1.5 Eddy Currents; 1.6 Core Saturation; 1.7 Volt-Second Balance; 1.8 Inductance; 1.9 Inductance Factor; 1.10 Magnetic Energy; 1.11 Self-Resonant Frequency; 1.12 Classification of Power Losses in Magnetic Components; 1.13 Noninductive Coils; 1.14 Summary; 1.15 References; 1.16 Review Questions; 1.17 Problems; 2: Magnetic Cores; 2.1 Introduction; 2.2 Properties of Core Materials 2.3 Magnetic Dipoles2.4 Magnetic Domains; 2.5 Curie Temperature; 2.6 Magnetization; 2.7 Magnetic Materials; 2.8 Hysteresis; 2.9 Core Permeability; 2.10 Core Geometries; 2.11 Iron Alloy Cores; 2.12 Amorphous Alloy Cores; 2.13 Nickel-Iron and Cobalt-Iron Cores; 2.14 Ferrite Cores; 2.15 Powder Cores; 2.16 Nanocrystalline Cores; 2.17 Superconductors; 2.18 Hysteresis Core Loss; 2.19 Eddy-Current Core Loss; 2.20 Total Core Loss; 2.21 Complex Permeability; 2.22 Summary; 2.23 References; 2.24 Review Questions; 2.25 Problems; 3: Skin Effect; 3.1 Introduction; 3.2 Skin Depth

3.3 Ratio of AC-to-DC Winding Resistance; 3.4 Skin Effect in Long Single Round Conductor; 3.5 Current Density in Single Round Conductor; 3.6 Impedance of Round Conductor; 3.7 Magnetic Field Intensity for Round Wire; 3.8 Other Methods of Determining the Round Wire Inductance; 3.9 Power Density in Round Conductor; 3.10 Skin Effect on Single Rectangular Plate; 3.11 Summary; 3.12 References; 3.13 Review Questions; 3.14 Problems; 4: Proximity Effect; 4.1 Introduction; 4.2 Proximity and Skin Effects in Two Parallel Plates; 4.3 Antiproximity and Skin Effects in Two Parallel Plates; 4.4 Proximity Effect in Multiple-Layer Inductor; 4.5 Summary; 4.6 Appendix: Derivation of Proximity Power Loss; 4.7 References; 4.8 Review Questions; 4.9 Problems; 5: Winding Resistance at High Frequencies; 5.1 Introduction; 5.2 Winding Resistance; 5.3 Square and Round Conductors; 5.4 Winding Resistance of Rectangular Conductor; 5.5 Winding Resistance of Square Wire; 5.6 Winding Resistance of Round Wire; 5.7 Leakage Inductance; 5.8 Solution for Round Conductor Winding in Cylindrical Coordinates; 5.9 Litz Wire; 5.10 Winding Power Loss for Inductor Current with Harmonics; 5.11 Effective Winding Resistance for Nonsinusoidal Inductor Current; 5.12 Thermal Model of Inductors; 5.13 Summary; 5.14 References; 5.15 Review Questions; 5.16 Problems; 6: Laminated Cores; 6.1 Introduction; 6.2 Low-Frequency Solution; 6.3 General Solution; 6.4 Summary; 6.5 References; 6.6 Review Questions; 6.7 Problems; 7: Transformers; 7.1 Introduction; 7.2 Ideal Transformer; 7.3 Voltage Polarities and Current Directions in Transformers; 7.4 Nonideal Transformers; 7.5 Neumann's Formula for Mutual Inductance; 7.6 Mutual Inductance; 7.7 Coupling Coefficient; 7.8 Dot Convention; 7.9 Series-Aiding and Series-Opposing Connections

Sommario/riassunto

If you are looking for a complete study of the fundamental concepts in magnetic theory, read this book. No other textbook covers magnetic components of inductors and transformers for high-frequency applications in detail. This unique text examines design techniques of the major types of inductors and transformers used for a wide variety of high-frequency applications including switching-mode power supplies (SMPS) and resonant circuits. It describes skin effect and proximity effect in detail to provide you with a sound understanding of high-frequency phenomena. As well as this, you will discover