

1. Record Nr.	UNINA9910877711603321
Autore	lordache Octavian
Titolo	Evolvable designs of experiments : applications for circuits // Octavian lordache
Pubbl/distr/stampa	Weinheim, : Wiley-VCH, c2009
ISBN	1-282-02196-6 9786612021961 3-527-62402-3 3-527-62403-1
Descrizione fisica	1 online resource (232 p.)
Disciplina	621.3192
Soggetti	Chemical engineering - Mathematical models Experimental design Printed circuits - Design and construction
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 (p. 205-210) and index.
Nota di contenuto	Evolvable Designs of Experiments: Applications for Circuits; Contents; Preface; Abbreviations; Part One Introduction; 1 Printed Circuits; 1.1 Technology Presentation; 1.2 Inner-Layer Processing; 1.3 Materials Preparation; 1.4 Lamination; 1.5 Drilling; 1.6 Making the Hole Conductive; 1.7 Imaging; 1.8 Electroplating; 1.9 Copper Etching; 1.10 Solder Masking; 1.11 Surface Finishing; 1.12 Routing; 1.13 Testing and Inspection; 1.14 Assembling; 2 Problem Solving for Reliability and Quality; 2.1 Conventional Paradigms; 2.2 Complexity and Time Frames; 2.3 Quasilinearity, Circularity, and Closure 2.4 Advance of Reliability ParadigmsPart Two Evolvable Designs of Experiments (EDOE); 3 Polystochastic Models; 3.1 What Is PSM?; 3.2 Basic Notions for Categorical Frame; 3.3 Illustrative Examples of PSM and Categorical Frames; 3.3.1 Lumped Stochastic Chains; 3.3.2 Conditional Stochastic Chains; 4 First-Order Wave Equation; 4.1 Algebraic Frames for Time "T" and Space "Z"; 4.2 The First-Order Wave Equation; 4.3 "Kinetic" Model: Walsh-Hadamard Matrices; 4.4 "Convection" Model: Latin Squares; 4.4.1 GF(3) Solution; 4.4.2 GF(4) Solution; 4.5 Spectral Analysis: Correlation

5 Informational Analysis: EDOE Matrices5.1 Walsh-Hadamard Matrices and Latin Square Designs; 5.2 Classification Procedures: Informational Criteria; 5.3 Informational Entropy and Distances; 5.4 Adaptability in Classification; 5.5 Informational Results; 5.5.1 Proposition 1; 5.5.2 Proposition 2; 5.5.3 Proposition 3; 5.6 Relation with Thermodynamics; 5.7 Ranking, Discarding, and Replication of the Columns; 5.8 Lumping and Splitting Columns; 5.9 Juxtaposing and Cutting; 5.10 Tables of DOE Matrices; 6 EDOE Methodology; 6.1 Scientific and Engineering Methods; 6.2 Center Design and Hierarchy 6.3 Recursivity and Focusing6.4 Problem-Solving Framework for PCB Quality; 6.5 Forward and Backward Search; 6.6 Interactions: Dissociation-Integration; 6.7 EDOE Basic Steps; 6.7.1 Problem Statement; 6.7.2 Propose the Preliminary Problem-Solving Framework; 6.7.3 Select the DOE Matrices; 6.7.4 Run Center Design; 6.7.5 Analyze Results; 6.7.6 Run Multiple Forward and Backward Steps; 6.7.7 Perform Dissociation-Integration Experiments; 6.7.8 Establish the New Center Design; 6.7.9 Repeat the Testing Procedure from the New Center Design; 6.7.10 Run Simulations: Analyze the Solutions of the Problem 6.8 EDOE Frame and SKUP Schema6.9 Comparison of EDOE with other Methods; Part Three Case Studies; 7 Solder Wicking; 7.1 Illustrative Failure Analysis; 7.2 Illustrative EDOE Frame; 7.3 SKUP Schema for Solder Wicking; 8 Reliability Analysis; 8.1 EDOE for Reliability; 8.2 SKUP Schema for Reliability; 8.3 Reliability Management System: Main Elements; 8.4 Reliability Prediction Software; 8.5 Minicoupons; 8.6 Reliability Analysis; 8.7 IST Electrical Resistance Analysis; 9 Drilling; 9.1 Drilling Quality Framework; 9.2 Test Coupons; 9.3 Testing Small Plated Through Holes: SKUP Schema for Drilling 9.4 Reliability Tests

Sommario/riassunto

Adopting a groundbreaking approach, the highly regarded author shows how to design methods for planning increasingly complex experiments. He begins with a brief introduction to standard quality methods and the technology in standard electric circuits. The book then gives numerous examples of how to apply the proposed methodology in a series of real-life case studies. Although these case studies are taken from the printed circuit board industry, the methods are equally applicable to other fields of engineering.
