Multichip Module Design, Fabrication, & Testing

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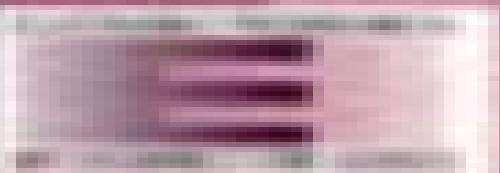
Multichip Module Design Fabrication And Testing

Jerry E. Sergent,Al Krum

Multichip Module Design Fabrication And Testing:

Multichip Module Design, Fabrication, and Testing James J. Licari,1995 The advent of multichip modules MCMs is revolutionizing the ways in which electronic systems and equipment are designed tested and manufactured This evolving technology for packaging printed circuit boards PCBs is commanding both interest and excitement **Multichip Module Technologies and Alternatives: The Basics** Daryl Ann Doane,Paul Franzon,1992-10-31 Far from being the passive containers for semiconductor devices of the past the packages in today s high performance computers pose numerous challenges in interconnecting powering cooling and protecting devices While semiconductor circuit performance measured in picoseconds continues to improve computer performance is expected to be in nanoseconds for the rest of this century a factor of 1000 difference between on chip and off chip performance which is attributable to losses associated with the package Thus the package which interconnects all the chips to form a particular function such as a central processor is likely to set the limits on how far computers can evolve Multichip packaging which can relax these limits and also improve the reliability and cost at the systems level is expected to be the basis of all advanced computers in the future In addition since this technology allows chips to be spaced more closely in less space and with less weight it has the added advantage of being useful in portable consumer electronics as well as in medical aerospace automotive and telecommunications products The multichip technologies with which these applications can be addressed are many They range from ceramics to polymer metal thin films to printed wiring boards for interconnections flip chip TAB or wire bond for chip to substrate connections and air or water cooling for the removal of heat **Economics of Electronic Design, Manufacture and Test** M. Abadir,T. Ambler,2013-06-29 The general understanding of design is that it should lead to a manufacturable product Neither the design nor the process of manufacturing is perfect As a result the product will be faulty will require testing and fixing Where does economics enter this scenario Consider the cost of testing and fixing the product If a manufactured product is grossly faulty or too many of the products are faulty the cost of testing and fixing will be high Suppose we do not like that We then ask what is the cause of the faulty product There must be something wrong in the manufacturing process We trace this cause and fix it Suppose we fix all possible causes and have no defective products We would have eliminated the need for testing Unfortunately things are not so perfect There is a cost involved with finding and eliminating the causes of faults We thus have two costs the cost of testing and fixing we will call it cost 1 and the cost of finding and eliminating causes of faults call it cost 2 Both costs in some way are included in the overall cost of the product If we try to eliminate cost 1 cost 2 goes up and vice versa An economic system of production will minimize the overall cost of the product Economics of Electronic Design Manufacture and Test is a collection of research contributions derived from the Second Workshop on Economics of Design Manufacture and Test written for inclusion in this book **Electronic Assembly Fabrication** Charles A. Harper,2002-04-10 Printed circuit history and overview Development and fabrication of IC chips Packaging of IC chips

Printed circuit board fabrication *Multi-Chip Module Conference* IEEE,1992 *Electronic Packaging of High Speed Circuitry* Stephen G. Konsowski,Arden R. Helland,1997 A comprehensive guide to the packaging of high speed circuits for today s advanced electronic products This is a unique and expert guide to the design and packaging of the high frequency circuitry crucial to the performance of today s advanced electronic products such as Pentium chips HDTV and mobile communications Written by two of the leading innovators in the field this book fully explains integrated design approaches that will enable you to take advantage of all the latest advances in electronic devices circuit design materials and circuit packaging You ll read about approaches that include basic signal transmission theory digital circuit design and how these are integrated with the packaging and interconnection characteristics There is detailed coverage of signal behavior in both high speed digital circuits as well as crucial aspects of materials selection and manufacturing This state of the art resource also provides you with practical design guidelines plus information on the major issues of design verification and perfomance evaluation **Printed Circuit Board Materials Handbook** Martin W. Jawitz,1997 Select PCB materials for top performing boards From weaving glass fiber mats to testing finished boards this materials database offers close up look at how to process and fabricate PCBs It gives you hands on working knowledge of the electrical mechanical and physical properties of PCB raw materials **Proceedings** ,1993 *Electronic Packaging and Interconnection Handbook* Charles A. Harper,1997 Charles A Harper s 2nd edition on designing and manufacturing all the major types of electronic systems is now double the size of the 1st edition It draws upon the expertise of a dozen experts to make sense of this highly interdisciplinary field **Electronic Connector Handbook** Robert S. Mroczkowski,1998 Includes data on connectors this handbook covers the basic functions of connectors and details the range of electronic connectors It discusses connector parameters in an application context to expedite implementation and provides design and materials selection criteria for the range of connectors Modern Solder Technology for Competitive Electronics Manufacturing Jennie S. Hwang,1996 Introduction Advanced Surface Mount Technology and Die Attach Techniques Solder Material Soldering Chemistry Solderability Microstructure of Solders Aqueous Cleaning Manufacture No Clean Manufacture Protective and Reactive Atmosphere Soldering Surface Mount Fine Pitch Technology Surface Mount BGA PAC Technology Soldering Methodology and Equipment Soldering and Soldering Related Issues Strengthened Solders Lead Free Solders Solder Joint Failure Mode Solder Joint Failure Assessment Case Studies Solder Joint Quality and Reliability New and Emerging Specifications and Standards Future Trends Optimizing Quality in Electronics Assembly: A Heretical Approach James Allen Smith,Frank B. Whitehall,1997 In a radical departure from the dozens of other quality books this one makes the case that the traditional TQM procedures used in the electronics assembly field are not only ineffective they contribute to many failures The only book to focus exclusively on quality in electronics manufacturing to propose a measurable cost benefit methodology this provocative volume shows what s lacking in current quality programs how fresh approaches can yet avoid a quality catastrophe in the electronics industry

Along the way numerous quality myths are exploded hidden issues are confronted an array of electronics specific solutions are offered **Thermal Management Handbook: For Electronic Assemblies** Jerry E. Sergent,Al Krum,1998 Publisher s Note Products purchased from Third Party sellers are not guaranteed by the publisher for quality authenticity or access to any online entitlements included with the product The hands on guide to thermal management In recent years heat sensitive electronic systems have been miniaturized far more than their heat producing power supplies leading to major design and reliability challenges and making thermal management a critical design factor This timely handbook covers all the practical issues that any packaging engineer must consider with regard to the thermal management of printed circuit boards hybrid circuits and multichip modules Readers will also benefit from the extensive data on material properties and circuit functions thus enabling more intelligent decisions at the design stage and preventing thermal related problems from occurring in the first place Electronic Systems Quality Management Handbook Marsha Ludwig-Becker,1997 Annotation Quality management for electronic systems has grown far beyond the basic inspection techniques of the past New performance based quality management approaches are now used at every electronics company from huge corporations to small start ups This book goes beyond generic quality approaches to present an electronics specific program for quality management Optoelectronic Interconnects VII ; Photonics Packaging and Integration II Michael R. Feldman,2000 Electronic Failure Analysis Handbook Perry L. Martin,1999 Annotation In the Electronic Failure Analysis Handbook you ll find top to bottom coverage of this rapidly developing field encompassing breakthrough techniques and technologies for both components and systems reliability testing performance evaluation and liability avoidance BOOK JACKET Title Summary field provided by Blackwell North America Inc All Rights Reserved Solder Joint Reliability of BGA, CSP, Flip Chip, and Fine Pitch SMT Assemblies John H. Lau,Yi-hsin Pao,1997 The explosive growth of high density packaging has created a tremendous impact on the electronic assembly and manufacturing industry Ball grid array BGA chip scale package CSP and solder bumped flip chip technologies are taking the lead in this advanced manufacturing process Many major equipment makers and leading electronic companies are now gearing up for these emerging and advanced packaging technologies For these technologies solder is the electrical and mechanical glue and thus solder joint reliability is one of the most critical issues in the development of these technologies This book is a one stop guide to the state of the art of solder joint reliability problem solving methods or choose a creative high performance robust and cost effective design and high yield manufacturing process for their interconnect systems will be able to do so with this unique sourcebook It meets the reference needs of design material process equipment manufacturing quality control product assurance reliability component packaging vendor marketing and system engineers and technical managers working in electronic packaging and interconnection This book is structured to provide readers with the necessary know how for practical on the job problem solving guidance The book covers the solder joint reliability of BGA CSP flip chip and FPT assemblies completely proceeding

from the theoretical basics to applications Specific areas covered include Definition of reliability life distribution failure rate mean time to failure etc Some well known life distributions Accelerated testing Parameter estimation of life distributions Acceleration factors for solders Solder mechanics plasticity creep and constitutive equations Design material and manufacturing processes of BGA CSP flip chip and FTP Failure analysis and root cause of failure for BGA CSP flip chip and FPT solder joints Design for reliability of BGA CSP flip chip and FPT solder joints Solder joint reliability of CBGA PBGA DBGA and TBGA assemblies under thermal fatigue mechanical bending and twisting and shock and vibration conditions solder joint reliability of flip chip e g high temperature and eutectic solder bumped flip chips on ceramic and PCB assemblies under thermal fatigue mechanical pulling shearing bending and twisting and shock and vibration conditions Solder joint reliability of CSP e g LG Semicon s Mitsubishi s Motorola s Tessera s NEC s nitto Denko s and Toshiba s assemblies under thermal fatigue and mechanical bending conditions Solder joint reliability of PQFP and TSOP assemblies under thermal fatigue mechanical bending and twisting and vibration conditions   Design Specifications for Manufacturability of MCM-C Multichip Modules ,1995 The scope of this document is to establish design guidelines for electronic circuitry packaged as multichip modules of the ceramic substrate variety although many of these guidelines are applicable to other types of multichip modules The guidelines begin with prerequisite information which must be developed between customer and designer of the multichip module The core of the guidelines focuses on the many considerations that must be addressed during the multichip module design The guidelines conclude with the resulting deliverables from the design which satisfy customer requirements and or support the multichip module fabrication and testing processes Considerable supporting information checklists and design constraints are captured in specific appendices and used as reference information in the main body text Finally some real examples of multichip module design are presented   **Flip Chip Technologies** John H. Lau,1996 A guide to flip chip technologies for professionals in flip chip and MCM research and development and for engineers and technical managers choosing design and manufacturing processes for electronic packaging and interconnect systems Discusses economic design material quality and reliability issues of flip chip technologies and details aspects of classical solder bumped flip chip interconnect technologies the next generations of flip chip technologies and known good die testing for multiple module applications Annotation copyright by Book News Inc Portland OR   *1997 International Symposium on Microelectronics* ,1997 Contains the proceedings of IMAPS 97 in Adobe portable document format PDF

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