



# Multichip Modules

**Library of Congress**

## **Multichip Modules:**

Physical Design for Multichip Modules Mysore Sriram, Sung-Mo (Steve) Kang, 2012-12-06 Physical Design for Multichip Modules collects together a large body of important research work that has been conducted in recent years in the area of Multichip Module MCM design. The material consists of a survey of published results as well as original work by the authors. All major aspects of MCM physical design are discussed including interconnect analysis and modeling, system partitioning and placement, and multilayer routing. For readers unfamiliar with MCMs this book presents an overview of the different MCM technologies available today. An in depth discussion of various recent approaches to interconnect analysis are also presented. Remaining chapters discuss the problems of partitioning, placement and multilayer routing with an emphasis on timing performance. For the first time data from a wide range of sources is integrated to present a clear picture of a new challenging and very important research area. For students and researchers looking for interesting research topics open problems and suggestions for further research are clearly stated. Points of interest include: Clear overview of MCM technology and its relationship to physical design. Emphasis on performance driven design with a chapter devoted to recent techniques for rapid performance analysis and modeling of MCM interconnects. Different approaches to multilayer MCM routing collected together and compared for the first time. Explanation of algorithms is not overly mathematical yet is detailed enough to give readers a clear understanding of the approach. Quantitative data provided wherever possible for comparison of different approaches. A comprehensive list of references to recent literature on MCMs provided.

*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.

*Multichip Modules*, 1994

*Multichip Module Technology Handbook* Philip E. Garrou, Iwona Turlik, 1998 MCMs are electronic components that house multiple integrated circuits ICs upon a single chip.

Their use in design allow systems that are faster hotter and more reliable than those built with standalone ICs More and more the speed needs of electronic systems require MCMs This comprehensive handbook aims to provide designers with the knowledge needed to understand and work with MCMs **Proceedings** ,1995 [Multi-Chip Module Test Strategies](#)

Yervant Zorian,2012-12-06 MCMs today consist of complex and dense VLSI devices mounted into packages that allow little physical access to internal nodes The complexity and cost associated with their test and diagnosis are major obstacles to their use Multi Chip Module Test Strategies presents state of the art test strategies for MCMs This volume of original research is designed for engineers interested in practical implementations of MCM test solutions and for designers looking for leading edge test and design for testability solutions for their next designs Multi Chip Module Test Strategies consists of eight contributions by leading researchers It is designed to provide a comprehensive and well balanced coverage of the MCM test domain Multi Chip Module Test Strategies has also been published as a special issue of the Journal of Electronic Testing Theory and Applications JETTA Volume 10 Numbers 1 and 2

**Multichip Modules** R. Wayne Johnson,Robert K. F.

Teng,John W. Balde,1991 This volume provides the information essential for making the right decisions required for new equipment design *Multichip Modules and Related Technologies* Gerald L. Ginsberg,Donald P. Schnorr,1994

**Conceptual Design of Multichip Modules and Systems** Peter A. Sandborn,Hector Moreno,2013-03-14 Conceptual Design of Multichip Modules and Systems treats activities which take place at the conceptual and specification level of the design of complex multichip systems These activities include the formalization of design knowledge information modeling tradeoff analysis partitioning and decision process capture All of these functions occur prior to the traditional CAD activities of synthesis and physical design Inherent in the design of electronic modules are tradeoffs which must be understood before feasible technology material process and partitioning choices can be selected The lack of a complete set of technology information is an especially serious problem in the packaging and interconnect field since the number of technologies process and materials is substantial and selecting optimums is arduous and non trivial if one truly wants a balance in cost and performance Numerous tradeoff and design decisions have to be made intelligently and quickly at the beginning of the design cycle before physical design work begins These critical decisions made within the first 10% of the total design cycle ultimately define up to 80% of the final product cost Conceptual Design of Multichip Modules and Systems lays the groundwork for concurrent estimation level analysis including size routing electrical performance thermal performance cost reliability manufacturability and testing It will be useful both as a reference for system designers and as a text for those wishing to gain a perspective on the nature of packaging and interconnect design concurrent engineering computer aided design and system synthesis **Chip On Board** John H. Lau,1994-06-30 This book is a one stop guide to the state of the art of COB technology For professionals active in COB and MCM research and development those who wish to master COB and MCM problem solving methods and those who must choose a cost effective design and high yield manufacturing process for

their interconnect systems here is a timely summary of progress in all aspects of this fascinating field. It meets the reference needs of design, material, process, equipment, manufacturing, quality, reliability, packaging, and system engineers and technical managers working in electronic packaging and interconnection.

### **Introduction to Multichip Modules**

Naveed A. Sherwani, Qiong Yu, Sandeep Badida, 1995-11-23 Advantages of MCMs over traditional packaging methods for electronic based applications in computers, aviation and the military. Introduction to Multichip Modules discusses both custom built MCMs and programmable MCMs and their role in reducing cost and improving turnaround time. An invaluable resource for students and professionals in electrical engineering who design MCMs and MCM based systems and for those in computer science who develop CAD tools for MCMs.

this *Multichip Modules with Integrated Sensors* W.K. Jones, Gábor Harsányi, 1996-10-31 Proceedings of the May 1995 workshop. Contains 33 papers which review advances in Multichip Modules MCM technology including ceramic based MCM C, thin film MCM D and organic laminate based MCM L. Sensors based on micromachined silicon structures, thin and thick film technology are reviewed. Applications of MCM to higher level integration and sensor integration and reliability impacts are presented. The authors address new materials development, characterized methods and high level integration of sensors into electronic packaging.

Annotation copyrighted by Book News Inc, Portland OR. 1995 *International Conference on Multichip Modules*, 1995

### **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.

Proceedings, 1996 International Conference on Multichip Modules, 1996 *Library of Congress Subject Headings* Library of Congress. Cataloging Policy and Support

Office, 2013 **High Performance Design Automation For Multi-chip Modules And Packages** Jun Dong Cho, Paul D. Franzon, 1996-06-12 Today's electronics industry requires new design automation methodologies that allow designers to incorporate high performance integrated circuits into smaller packaging. The aim of this book is to present current and future techniques and algorithms of high performance multichip modules MCMs and other packaging methodologies. Innovative technical papers in this book cover design optimization and physical partitioning, global routing, multi layer assignment, timing driven interconnection design, timing models, clock and power design, crosstalk, reflection and simultaneous switching noise minimization, yield optimization, defect area minimization, low power physical layout and design methodologies. Two tutorial reviews review some of the most significant algorithms previously developed for the placement, partitioning and signal integrity issues respectively. The remaining articles review the trend of prime design automation algorithms to solve the above eight problems which arise in MCMs and other packages.

*Library of Congress Subject Headings* Library of Congress, 2011 **Optimal Design in Self-damped Lossy Transmission Lines for Multichip Modules** Jimmy

Shinn-Hwa Wang, 1993 Holographic Optical Interconnects for Multichip Modules, 1997 For the past few years we have

been working on the development of an optically interconnected Multichip Module MCM. The MCM is composed of a planar transparent substrate containing thin film electrical connections GaAs laser array chips and silicon CMOS VLSI chips with integrated photodetectors are flip chip bonded to one side of the substrate while Computer Generated Holograms CGHs are fabricated on the other side of the substrate. The purpose of this work is to develop the technology to enable high speed and high density connections between chips MCMs and PC boards. We believe that the basic approach and based on flip chip and CGH technology will provide 1-2 orders of magnitude increase in connection performance when compared with conventional electrical connectors.

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