Electronics Packaging Forum Multichip Module Technology Issues

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important topics covered include building long term reliability by increasing polyimide stability recent discoveries in the

field of soldering phenomena relating to fundamental fluid mechanical processes circuit and electromagnetic solutions to problems of modeling highspeed electrical interconnections how to use the finite difference time domain approach in electromagnetic modeling and the development of dedicated test chips for package evaluation in varied field conditions

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

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

a comprehensive guide to tsv and other enabling technologies for 3d integration written by an expert with more than 30 years of experience in the electronics industry through silicon vias for 3d integration provides cutting edge information on tsv wafer thinning thin wafer handling microbumping and assembly and thermal management technologies applications to highperformance high density low power consumption wide bandwidth and small form factor electronic products are discussed this book offers a timely summary of progress in all aspects of this fascinating field for professionals active in 3d integration research and development those who wish to master 3d integration problem solving methods and anyone in need of a low power wide bandwidth design and high yield manufacturing process for interconnect systems coverage includes nanotechnology and 3d integration for the semiconductor industry tsv etching dielectric barrier and seed layer deposition cu plating cmp and cu revealing tsvs mechanical thermal and electrical behaviors thin wafer strength measurement wafer thinning and thin wafer handling microbumping assembly and reliability microbump electromigration transient liquid phase bonding c2c c2w and w2w 2 5d ic integration with interposers 3d ic integration with interposers thermal management of 3d ic integration 3d ic packaging

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

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 al 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

a world list of books in the english language

unfriendly to conventional electronic devices circuits and systems extreme environments represent a serious challenge to

designers and mission architects the first truly comprehensive guide to this specialized field extreme environment electronics explains the essential aspects of designing and using devices circuits and electronic systems intended to operate in extreme environments including across wide temperature ranges and in radiation intense scenarios such as space the definitive guide to extreme environment electronics featuring contributions by some of the world s foremost experts in extreme environment electronics the book provides in depth information on a wide array of topics it begins by describing the extreme conditions and then delves into a description of suitable semiconductor technologies and the modeling of devices within those technologies it also discusses reliability issues and failure mechanisms that readers need to be aware of as well as best practices for the design of these electronics continuing beyond just the paper design of building blocks the book rounds out coverage of the design realization process with verification techniques and chapters on electronic packaging for extreme environments the final set of chapters describes actual chip level designs for applications in energy and space exploration requiring only a basic background in electronics the book combines theoretical and practical aspects in each self contained chapter appendices supply additional background material with its broad coverage and depth and the expertise of the contributing authors this is an invaluable reference for engineers scientists and technical managers as well as researchers and graduate students a hands on resource it explores what is required to successfully operate electronics in the most demanding conditions

issues for 1973 cover the entire ieee technical literature

electronics manufactuirng with lead free halogen free and conductive adhestive materials this comprehensive guide provides cutting edge information on lead free halogen free and conductive adhesive technologies and their application to low cost high density reliable and green products essential for electronics manufacturing and packaging professionals who wish to master lead free halogen free and conductive adhesive problem solving methods and those demanding cost effective designs and high yield environmental benign manufacturing processes this valuable reference covers all aspects of this fast growing field written for design materials process equipment manufacturing reliability component packaging and system engineers and technical and marketing managers in electronics and photonics packaging and interconnection this book teaches a practical understanding of the cost design materials process equipment manufacturing and reliability issues of lead free halogen free and conductive adhesive technologies among the topics explored chip wafer level interconnects with lead free solder bumps lead free solder wafer bumping with micro ball

mounting and paste printing methods lead free solder joint reliability of wlcsps on organic and ceramic substrates chip wafer level interconnects with solderless bumps such as ni au au and cu cu wires au wires au studs and cu studs design materials process and reliability of wlcsps with solderless interconnects on pcb substrate halogen free molding compounds for pqfp pbga and map pbga packages environmentally benign die attach films for pqfp and pbga packages and lead free die attach bonding techniques for ic packaging environmental issues for conventional pcbs and substrates some environmentally conscious flame retardants for pcbs and organic substrates emerging technologies for fabricating environmental friendly pcbs such as design for environment green pcb manufacturing and environmental safety lead free soldering activities such as legislation consortia programs and regional preferences on lead free solder alternatives criteria development approaches and varieties of alloys and properties of lead free solders physical mechanical chemical electrical and soldering properties of lead free solders manufacturing process and performance of lead free surface finishes for both pcb and component applications implementation and execution challenges of lead free soldering especially for the reflow and wave soldering process fundamental understanding of electrically conductive adhesive eca technology effects of lubricant removal and cure shrinkage on ecas mechanisms underlying the contact resistance shifts of ecas effects of electrolytes and moisture absorption on contact resistance shifts of ecas stabilization of contact resistance of ecas using various additives

papers presented at asap 94 held in august 1994 the conference serves as a forum for researchers from universities as well as industry who are interested in the fundamental aspects of application specific computing systems sessions are devoted to signal image processing cad case studies meth

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