



Integrated Circuit, Hybrid, and Multichip Module Package Design Guidelines: A Focus on Reliability

Michael Pecht

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Circuit designers, packaging engineers, printed board fabricators, and procurement personnel will find this book's microelectronic package design-for-reliability guidelines and approaches essential for achieving their life-cycle, cost-effectiveness, and on-time delivery goals.

Its uniquely organized, time-phased approach to design, development, qualification, manufacture, and in-service management shows you step-by-step how to:

- * Define realistic system requirements in terms of mission profile, operating life, performance expectations, size, weight, and cost
- * Define the system usage environment so that all operating, shipping, and storage conditions, including electrical, thermal, radiation, and mechanical loads, are assessed using realistic data
- * Identify potential failure modes, sites, mechanisms, and architecture-stress interactions--PLUS appropriate measures you can take to reduce, eliminate, or accommodate expected failures
- * Characterize materials and processes by the key controllable factors, such as types and levels of defects, variations in material properties and dimensions, and the manufacturing and assembly processes involved
- * Use experiment, step-stress, and accelerated methods to ensure optimum design before production begins

Detailed design guidelines for substrate...wire and wire, tape automated, and flip-chip bonding...element attachment and case, lead, lead and lid seals--incorporating dimensional and geometric configurations of package elements, manufacturing and assembly conditions, materials selection, and loading conditions--round out this guide's comprehensive coverage. Detailed guidelines for substrate...wire and wire, tape automated, and flip-chip bonding...element attachment and case, lead, lead and lid seals--incorporating dimensional and geometric configurations of package elements, manufacturing and assembly conditions, materials selection, and loading conditions--round out this guide's comprehensive coverage.

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PHYSICAL ARCHITECTURE OF VLSI SYSTEMS --Allan D. Kraus, Robert Hannemann and Michael Pecht

For the professional engineer involved in the design and manufacture of products containing electronic components, here is a comprehensive handbook to the theory and methods surrounding the assembly of microelectronic and electronic components. The book focuses on computers and consumer electronic products with internal subsystems that reflect mechanical design constraints, cost limitations, and aesthetic and ergonomic concerns. Taking a total system approach to packaging, the book systematically examines: basic chip and computer architecture; design and layout; interassembly and interconnections; cooling scheme; materials selection, including ceramics, glasses, and metals; stress, vibration, and acoustics; and manufacturing and assembly technology. 1994 (0-471-53299-1) pp.

SOLDERING PROCESSES AND EQUIPMENT --Michael G. Pecht

This comprehensive, fundamentals first handbook outlines the soldering methods and techniques used in the manufacture of microelectronic chips and electronic circuit boards. In a clear, easy-to-access format, the book discusses: soldering processes and classification; the material dynamics of heat soldering when assembling differing materials; wave and reflow soldering; controlling contamination during manufacturing cleanings; techniques for assuring reliability and quality control during manufacturing; rework, repair, and manual assembly; the modern assembly / repair station; and more. The book also provides clear guidelines on assembly techniques as well as an appendix of various solder equipment manufacturers.

1993 (0-471-59167-X) 312 pp.



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