

power electronic packaging design assembly process reliability and modeling

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Explore the critical aspects of power electronic packaging design, focusing on efficient assembly processes that ensure high reliability and robust performance. This includes advanced modeling techniques to optimize component integration, thermal dissipation, and overall system longevity for cutting-edge electronic applications.

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The World of Advanced Packaging - The World of Advanced Packaging by Applied Materials 33,844 views 2 years ago 1 minute, 11 seconds - Step into the world of advanced **packaging**, with this narrated animation showing the building blocks that enable the integration of ...

'Semiconductor Manufacturing Process' Explained | 'All About Semiconductor' by Samsung Semiconductor - 'Semiconductor Manufacturing Process' Explained | 'All About Semiconductor' by Samsung Semiconductor by Samsung Semiconductor Newsroom 354,617 views 1 year ago 7 minutes, 44 seconds - What is the **process**, by which silicon is transformed into a semiconductor chip? As the second most prevalent material on earth, ...

Prologue

Wafer Process

Oxidation Process

Photo Lithography Process

Deposition and Ion Implantation

Metal Wiring Process

EDS Process

Packaging Process

Epilogue

HC33-T2.1: Advanced Packaging, Part 1 - HC33-T2.1: Advanced Packaging, Part 1 by hotchipsvideos 24,381 views 2 years ago 2 hours, 2 minutes - Tutorial 2, Part 1, Hot Chips 33 (2021), Sunday, August 22, 2021. Organizer: Ralph Wittig, Xilinx This tutorial discusses advanced ...

Use Cases

Wiring Density

Traditional Organic Packages

3d Interconnects

Solder Based Interconnects

3d Scaling

Power Delivery

Advanced Substrates

How Do You Get Access to the Design Tools

Introduction

Component Solution for Hpc

New Thermal Solutions

Power Consumption

Optical Interface

Summary

[Eng Sub] Semiconductor Package Overall: Structure, Process - [Eng Sub] Semiconductor Package Overall: Structure, Process by Semicon Talk 73,111 views 3 years ago 3 minutes, 28 seconds - Semiconductor **package process**, step number one. This wafer is thinned to around 50 to 300um from backside which does not ...

A Brief History of Semiconductor Packaging - A Brief History of Semiconductor Packaging by Asianometry 151,486 views 11 months ago 18 minutes - Links: - The Asianometry Newsletter: <https://asianometry.com> - Patreon: <https://www.patreon.com/Asianometry> - Twitter: ...

Intro

Packaging

Packaging Techniques

Surface Mounting

Packaging Innovations

Advanced Packaging

Electronic Device Assembly & Packing Process From Start To Finish. - Electronic Device Assembly & Packing Process From Start To Finish. by Teltonika EMS 15,681 views 2 years ago 1 minute, 24 seconds - To picture the final result of **#electronic**, devices, it first needs to go through some assembling stages. That is why the precise work ...

Silicon Carbide: A Power Electronics Revolution - Silicon Carbide: A Power Electronics Revolution by Asianometry 194,724 views 1 year ago 15 minutes - In 2018, Tesla inverted our expectations and shook the EV industry when they adopted an ST Microelectronics silicon ...

Intro

History

Special Powers

Power Electronics

MOSFETs

Modern Power Electronics

Why haven't we seen Silicon Carbide Power Electronics

Silicon Carbide Wafers

Commercialization

Conclusion

Semiconductor Packaging - ASSEMBLY PROCESS FLOW - Semiconductor Packaging - ASSEMBLY PROCESS FLOW by WATCH LEARN 'N PLAY 80,212 views 1 year ago 26 minutes - This is a learning video about semiconductor **packaging process**, flow. This is a good starting point for beginners. - Watch Learn 'N ...

SEMICONDUCTOR PACKAGING

BASIC ASSEMBLY PROCESS FLOW

WAFER SIZES

WAFER SAW : WAFER MOUNT

MANUAL WAFER MOUNT VIDEO SOURCE: ULTRON SYSTEMS INC. YOUTUBE VIDEO LINK : [ItxeTSWc](#)

WAFER SAW : DICING

WAFER SAWING VIDEO SOURCE: ACCELONIX BENELUX - DISTRIBUTOR OF ADT DICING SAW YOUTUBE VIDEO LINK

DIE ATTACH: LEADFRAME / SUBSTRATE

DIAGRAM OF DIE ATTACH PROCESS

KNOWN GOOD DIE (KGD) & BAD DIE

AUTOMATIC DIE ATTACH VIDEO SOURCE: ANDY PAI

WIRE TYPES INGE SOURCE HERAEUS ELECTRONICS

WIRE BONDED DEVICE

BONDING CYCLE

WIRE BOND VIDEO (SLOW)

WIRE BOND VIDEO (FAST)

EPOXY MOLDING COMPOUND (EMC) & TRANSFER MOLDING

MARKING

TIN PLATING

TRIM / FORM / SINGULATION

WHAT'S NEXT?

~~How~~ Are Microchips Made? - ~~How~~ Are Microchips Made? by Interesting Engineering 6,229,674 views 2 years ago 5 minutes, 35 seconds - — How Are Microchips Made? Ever wondered how those tiny marvels powering our **electronic**, world are made?

How long it takes to make a microchip

How many transistors can be packed into a fingernail-sized area

Why silicon is used to make microchips

How ultrapure silicon is produced

Typical diameter of silicon wafers

Importance of sterile conditions in microchip production

First step of the microchip production process (deposition)

How the chip's blueprint is transferred to the wafer (lithography)

How the electrical conductivity of chip parts is altered (doping)

How individual chips are separated from the wafer (sawing)

Basic components of a microchip

Number of transistors on high-end graphics cards

Size of the smallest transistors today

SUBSCRIBE TODAY!

What is Business Process Modeling? - What is Business Process Modeling? by IBM Technology 60,907 views 1 year ago 6 minutes, 37 seconds - The shapes and lines of a business **process model**, are probably familiar to you, but what do they mean, how are they made, and ...

Business Process Modeling

Business Process Modeling Notation

Event Logs

Process Mining

Performance Metrics

Resource Utilization

Advantages

Simulate Change

Business Process Modeling Creates a Common Language

Inside a Small Chinese Electronics Factory - From the Archives - Inside a Small Chinese Electronics Factory - From the Archives by Strange Parts 1,767,978 views 3 years ago 26 minutes - What is a small Chinese **electronics**, factory like? We're visiting a factory that does PCB **assembly**, (PCBA), and final **assembly**, ...

Introduction to Wafer-Level Packaging - Introduction to Wafer-Level Packaging by JCET Group Co., Ltd. 34,322 views 1 year ago 2 minutes, 45 seconds - A brief introduction to Wafer-Level **Packaging**, by JCET!

Future of Semiconductors: Silicon Carbide & Gallium Nitride as Next-Gen Semiconductors - Future of Semiconductors: Silicon Carbide & Gallium Nitride as Next-Gen Semiconductors by Vertex Holdings 30,413 views 1 year ago 10 minutes, 40 seconds - Semiconductors **power**, virtually everything in our modern world - cars, mobile phones, satellites, health devices. But what are ...

How Microchips Are Made - Manufacturing of a Semiconductor - How Microchips Are Made - Manufacturing of a Semiconductor by CPU Galaxy 393,688 views 3 years ago 14 minutes, 36 seconds - chipmanufacturing How are microchips made - from sand to semiconductor: Microelectronics usually is hidden to society ...

Intro

Raw Material

Semiconductor

Transistors

Layout Design

Manufacturing

Assembly

Skilled Assembly Jobs in Electronics Manufacturing - Skilled Assembly Jobs in Electronics Manufacturing by Z-AXIS, Inc. 82,501 views 4 years ago 3 minutes, 12 seconds - What do skilled **assembly**, workers do in **electronic manufacturing**,? Here are just a few of the skilled **assembly**, jobs at

Z-AXIS, ...

Battery module assembly: Cell sorting, test and module assembly - Battery module assembly: Cell sorting, test and module assembly by teamtechnik Group 16,379 views 2 years ago 2 minutes, 36 seconds - teamtechnik is global market leader in end-of-line (EOL) testing of e-drives. This experience in testing was transferred to the ...

Why SiC MOSFET is better? Understanding Silicon Carbide MOSFET | SiC MOSFET vs Si MOSFET - Why SiC MOSFET is better? Understanding Silicon Carbide MOSFET | SiC MOSFET vs Si MOSFET by Foolish Engineer 9,413 views 1 year ago 8 minutes, 39 seconds - SiCMOSFET #SiC #SiliconCarbide #SicvsSi 0:00 Intro 00:21 Insights 00:52 Benifits 01:20 Critical breakdown strength 02:32 First ...

Intro

Insights

Benifits

Critical breakdown strength

First Benifit

Leakage current

Second Benifit

Third Benifit

Why not IGBT?

SIC is better

Si vs SiC MOSFET

The 300mm Silicon Wafer Transition - The 300mm Silicon Wafer Transition by Asianometry 240,322 views 1 year ago 15 minutes - At the turn of the century, the \$200 billion semiconductor **manufac-turing**, industry across the globe joined hands and underwent a ...

The Last Transition

Growing a 300 mm Wafer

Czochralski method

Defect Engineering for Crystals

Redesigning the Factory

Automation

Completion and Future

Lecture 35: Electronic Packaging Reliability -1 - Lecture 35: Electronic Packaging Reliability -1 by IIT Kharagpur July 2018 4,153 views 4 years ago 23 minutes - And today, we start a new topic on **electronic packaging reliability**,. Extremely important andprobably its very very critical as you ... Powerful Knowledge 11 - Packaging of power semiconductors - Powerful Knowledge 11 - Packaging of power semiconductors by Electronic Minds 979 views 1 year ago 1 hour, 17 minutes - In this episode, Jose from Warwick University provides a fascinating deep dive into the requirements of **packaging**, for **power**, ...

Introduction

Welcome

Outline

Evaluation

Objectives

Packaging Methods

Power Modules

Discrete Power Devices

Power Module

Failure Mechanisms

Double Devices

Packaging Fundamentals

Source Inductance

Packaging Materials

Power Dissipation

Thermal Impedance

Cover Network

Foster Network

RC Elements

Conclusion

Structure Functions

Financial District Function

Cumulative Structure Function

Recommendations

Important stuff

Silicon vs Silicon carbide

Diodes

Summary

Collaborators

Lecture 39: Power Electronics Packaging - Lecture 39: Power Electronics Packaging by IIT Kharagpur

July 2018 2,825 views 4 years ago 35 minutes - So, what are the trends in **power electronic packaging**; if I look at it its increasingly becoming the the **packaging**, and therefore, and ...

Electronic Packaging Design and Cooling with CFD: Thermal Design of Electronic Equipment -

Electronic Packaging Design and Cooling with CFD: Thermal Design of Electronic Equipment by

SimScale 21,936 views 6 years ago 35 minutes - In this webinar, SimScale's CEO David Heiny explains how conjugate heat transfer **simulation**, with SimScale can help engineers ...

Intro

As more electronics are put into products...

High-Power Density Electronics Design

SimScale - the world's first cloud-based simulation platform

Thermodynamics Analysis Capabilities

Multiple Analysis Types on one platform.

Baseline: 0.3 m/s airflow from fan

Baseline: Velocity Field

Baseline: Air Temperature and Velocity

Baseline: Air Velocity and Component Temperature

Baseline: Component Temperature

Design Study: 3 Different Fans

Design Study: Velocity Field

Design Study: Component Temperature

Simulation ROI in a nutshell

How to start?

Design, Packaging and Life Cycle Engineering of Electronic Systems (1st Half) - Design, Packaging and Life Cycle Engineering of Electronic Systems (1st Half) by GIAN - MHRD, IIT Kharagpur 375

views Streamed 6 years ago 2 hours, 58 minutes - Coordinator: Dr. Anandaroop Bhattacharya,

Associate Professor, Department of Mechanical Engineering IIT Kharagpur ...

Introduction

Transistor Packages

Dual Inline Packages

Thermomechanical stresses

Manufacturing processes

Lead configurations

Package configurations

Package examples

Pin Small Outline

QFPs

Package Dimensions

Summary

Questions

Assembly Flowchart

Lead Frame

Lead Frame Materials

Packaging Part 8 - Failure Analysis for IC Packaging - Packaging Part 8 - Failure Analysis for IC Packaging by Navid Asadi 13,929 views 2 years ago 20 minutes - Design,/**Simulation**, Product based on guidelines In **Process**, Testing Some can only be done during fabrication (wires) Failure ...

Lecture 38: Electronic Packaging Reliability -4 - Lecture 38: Electronic Packaging Reliability -4 by IIT Kharagpur July 2018 4,793 views 4 years ago 36 minutes - So, todays **electronic packaging reliability**, lecture number 4. The concepts that we are going to cover today is the physics of failure ...

Design, Packaging and Life Cycle Engineering of Electronic Systems 9/1/2018 (1st Half) - Design, Packaging and Life Cycle Engineering of Electronic Systems 9/1/2018 (1st Half) by GIAN - MHRD,

IIT Kharagpur 277 views Streamed 6 years ago 2 hours, 49 minutes - Coordinator: Dr. Anandaroop Bhattacharya, Associate Professor, Department of Mechanical Engineering IIT Kharagpur ...

Intro

Physics of Failure

Bathtub Curve

Failure Distributions

Failure Terminology

Fatigue Models

Postprocessing

Stress Analysis

Failure Sites

Package Design

Printed Assembly

Mechanical Design

Stress Distribution

Design Process

FMEA

High Density Power module Packaging - High Density Power module Packaging by Colin Zhao 1,751 views 3 years ago 1 hour, 26 minutes - Okay so here um yeah so now i'm going to share our thought **process**, of how we **design**, a **power**, module in terms of **reliability**, ...

Design, Packaging and Life Cycle Engineering of Electronic Systems 8/1/2018 (1st Half) - Design,

Packaging and Life Cycle Engineering of Electronic Systems 8/1/2018 (1st Half) by GIAN - MHRD,

IIT Kharagpur 231 views Streamed 6 years ago 1 hour, 50 minutes - Coordinator: Dr. Anandaroop

Bhattacharya, Associate Professor, Department of Mechanical Engineering IIT Kharagpur ...

Characteristics of a Good Solder . Good wettability

Sn-Pb Binary Phase Diagram

SAC (Sn/Ag/Cu) Solder

SnAgCu Phase Diagram

Lead Finish Requirements

Lead-free Terminal Finish Materials

Tin Whiskers

Temperature Hierarchy in Flip Chip BGA

Fluxes

Printed Wiring Board Assembly Flow

Automated Stencil Printing

Electroformed Stencils

Automated Pick and Place Machines

Wave Soldering

Solder Reflow Oven

Mounting Defects

Moisture Sensitivity Levels

Black Pad Problem

Conformal Coatings

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Retrieved 24 May 2014. Yong Liu (2012). Power Electronic Packaging: Design, Assembly Process, Reliability and Modeling. Springer Science & Business Media.... 12 KB (1,234 words) - 14:49, 27 September 2023

reliability testing and reliability modeling. Availability, testability, maintainability and maintenance are often defined as a part of "reliability engineering"... 96 KB (13,239 words) - 19:39, 25 January 2024

Processor design is a subfield of computer science and computer engineering (fabrication) that deals with creating a processor, a key component of computer... 20 KB (2,351 words) - 09:04, 15 January 2024

The process of circuit design can cover systems ranging from complex electronic systems down to the

individual transistors within an integrated circuit... 19 KB (2,355 words) - 10:13, 20 January 2024

modeling, direct modeling has the ability to include the relationships between selected geometry (e.g., tangency, concentricity). Assembly modelling is... 21 KB (2,640 words) - 00:37, 26 February 2024

solder joint reliability modeling and testing of QFN and PowerQFN packages." Microelectronics Reliability 43 (2003): 1329–1338. Vianco, P. and Neilsen, M... 15 KB (1,875 words) - 09:14, 6 March 2024

corrugated plastic boxes with the functional physical, processing and end-use requirements. Packaging engineers work to meet the performance requirements... 24 KB (2,677 words) - 13:47, 16 January 2024

machine, material, and process (for example, less than 70 degrees from vertical). Design for X Electronic design automation Reliability engineering Six Sigma... 19 KB (2,449 words) - 04:50, 28 February 2024

Design for Six Sigma (DFSS) is a collection of best-practices for the development of new products and processes. It is sometimes deployed as an engineering... 17 KB (2,283 words) - 13:21, 15 November 2023

design effort to lay out the circuit, but manufacturing and assembly can be automated. Electronic design automation software is available to do much of the... 85 KB (10,940 words) - 18:01, 29 February 2024

primarily for modeling large object-oriented (Java, C++, C#) programs and design patterns. Unified Modeling Language (UML) is a general modeling language to... 19 KB (2,584 words) - 11:49, 28 November 2023

situations Design for electronic assemblies (Bralla, 1996: 267–279) Design for low-quantity production (Bralla, 1996: 280–288) Design to cost and design to standards... 16 KB (1,990 words) - 05:38, 6 December 2023

engineering, process design is the choice and sequencing of units for desired physical and/or chemical transformation of materials. Process design is central... 8 KB (1,017 words) - 06:40, 2 March 2024

engineering design process, also known as the engineering method, is a common series of steps that engineers use in creating functional products and processes. The... 13 KB (1,600 words) - 18:16, 24 February 2024

life and disposal. Electronic systems design is therefore the process of defining and developing complex electronic devices to satisfy specified requirements... 36 KB (3,355 words) - 06:24, 6 March 2024

design is an early phase of the design process, in which the broad outlines of function and form of something are articulated. It includes the design... 902 bytes (81 words) - 16:14, 22 July 2022

Object–relationship modeling Object–role modeling Physical data model Principle of orthogonal design (POOD) Relational database Relational model Semantic Web... 13 KB (1,748 words) - 22:08, 15 January 2024

less power and have a lower cost and higher reliability than the multi-chip systems that they replace. With fewer packages in the system, assembly costs... 43 KB (4,748 words) - 22:43, 13 February 2024

A design engineer is an engineer focused on the engineering design process in any of the various engineering disciplines (including civil, mechanical,... 7 KB (843 words) - 03:09, 13 February 2024

Modular design, or modularity in design, is a design principle that subdivides a system into smaller parts called modules (such as modular process skids)... 20 KB (2,428 words) - 04:03, 29 February 2024