

Microelectronics Terminology

Accelerated Stress Test

A test conducted at a stress, e.g., chemical or physical, higher than that encountered in normal operation, for the purpose of producing a measurable effect, such as a fatigue failure, in a shorter time than experienced at operating stresses.

ASIC

Application Specific Integrated Circuit (IC). An integrated circuit designed to meet one specific requirement with no provision for programmability.

AMI Acoustic Micro Imaging

ATE

Automatic Test Equipment. Computer controlled equipment used in the production testing of integrated circuits (ICs).

Back-end Design

Part of the integrated circuit design methodology starting with a description of the circuit and ending with the actual layout (physical design) of the chip.

BSM

Backside Metallurgy. A metallization pad electrically connected to internal conductors within a multilayered ceramic package, to which pins are brazed.

BGA

Ball Grid Array. An area array of solder balls joined to a SCM or MCM and used to electrically and physically connect the package to the next level of package, usually a printed circuit board.

BiCMOS

A microelectronics technology that combines complementary metal-oxide semiconductor (CMOS) and bipolar junction transistors (BJTs) on the same chip.

BIST

Built-in Self Test. A testing strategy for single chips or microsystems in which the test procedures are within the chip or system itself.

BJT

Bipolar Junction Transistor. A three-terminal semiconductor device used in the design of analog or digital circuits and systems. Its operation depends on the properties of the interface (junction) between dissimilar types of semiconductors.

BLM

Ball Limiting Metallurgy. The solder wettable terminal metallurgy, which defines the size and area of a soldered connection, such as C4 and a chip. The BLM limits the flow of the solder ball to the desired area, and provides adhesion and contact to the chip wiring.

CAD Tools

Computer-Aided Design tools used to assist the microsystems designer with conceptualizing, visualizing, specifying, implementing, managing, and testing activities within a complex engineering project.

Cell Library

A set of computer data files containing all the information needed to model, simulate, and layout pre-designed microsystems modules which can then be automatically interconnected.

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Centres of Excellence

Networked partnerships between university, government, and industry formed to maximize the economic and social benefits resulting from the successful development and application of new ideas and products.

Characterization

The definition of the behavior of an integrated circuit component or module that enables it to be accurately modeled in a computer simulation.

C4 – Controlled collapse chip connection.

Ceramic

Inorganic, nonmetallic material, such as alumina, beryllia, or glass-ceramic, whose final characteristics are produced by subjection to high temperatures. Often used in forming ceramic-substrates for packaging semiconductor chips.

CBGA --Ceramic Ball Grid Array. A ceramic package using ball grid array technology.

Chip

Originally used to refer to a single die, containing a single integrated circuit, cut from a wafer, but increasingly used for non-microelectronic devices or components. The uncased and normally leadless form of an electronic component part, either passive or active, discrete or integrated. Also referred to as a die.

Chip Stacking

The technique of stacking single chips to reduce the space taken by a multi-chip system.

CMOS

Complementary Metal-Oxide-Semiconductor. An integrated circuit fabrication process that produces both p- and n-type field effect transistors.

COB

Chip-on-Board. One of the many configurations in which a chip is directly bonded to a circuit board or substrate. These approaches include wirebonding, TAB, or solder interconnections, similar to the C4 structure. In low-end consumer systems, chip-on-board generally refers to wirebonding of chips directly to board. See also Direct Chip Attach.

Component

An element of equipment which unto itself does not form a system. Components can be semiconductors, resistors, etc.

Core

A pre-designed block that requires little or no further development or verification effort to use as an element in a complex System-on-Chip (SoC) design.

COTS

Commercial Off-The-Shelf. A product that is commercially available for use. This includes field programmable gate arrays (FPGAs), intellectual property (IP) blocks, CAD tools, etc.

DARPA

Defense Advanced Research Projects Agency. A research and development agency within the U.S. Department of Defence (DOD).

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Design Kit

A collection of technical information, software, and computer data files that enable a design engineer to model, simulate, and layout microsystems modules using a specific technology (e.g., 0.18-micron CMOS or MEMS).

Design Flow

A documented sequence of activities undertaken by a chip or system designer to accomplish a specific design goal. A formal step-by-step description of a particular design methodology.

DFT

Design For Testability. The practice of adding special circuits as part of an IC to aid in the testing of the fabricated chip.

DSP

Digital Signal Processing. Digital circuits designed to address a broad class of problems in signal reception and analysis that have traditionally been solved using analog components. DSP is used to enhance, analyse, filter, modulate or otherwise digitally manipulate standard analog functions, such as images, sounds, radar pluses and other such signals.

Die – Integrated circuit chip as cut (diced) from finished wafer. See chip.

Dielectric – Material that does not conduct electricity. Generally used for making capacitors, insulating conductors (as in crossover and multilayered circuits) and for encapsulating circuits.

Direct Chip Attach

A name applied to any of the chip-to-substrate connections used to eliminate the first level of packaging. See also Chip-on-Board.

DIP

Dual-in-Line Package. A package having two rows of leads extending at right angles from the base and having standard spacing between leads and between rows of leads. DIPs are made of ceramic (Cerdip) and plastic (Pdp).

Discrete Device

A device that contains one active element, such as a transistor or diode. In comparison, an integrated circuit could contain millions of active elements on a single chip.

Dk

Dielectric Constant. The term used to describe a material's ability to store charge when used as a capacitor dielectric. It is the ratio of the charge that would be stored with free space to that stored with the material in question as the dielectric.

DRAM

Dynamic Random Access Memory. A type of semiconductor memory that must be continually refreshed to maintain its contents.

DRC

Design Rule Check. The operation carried out by a computer aided design (CAD) tool that compares the physical features of a chip layout to the critical requirements specified by the design rules for a particular fabrication process.

DRC/LVS

Design Rule Checking and Layout Versus Schematic. DRC is where the designer verifies that the IC meets the limits of the manufacturing process. LVS is where the designer verifies that the

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connectivity on the physical layout is the same as on the logic. LVS is sometimes called NVL (Netlist vs Layout).

DSM

Deep Sub-Micron. A fabrication process that employs dimensions less than 0.5-micron.

EC

Engineering Change. A change in design. An electrical design change is frequently implanted by cutting out or adding an electrical path to the manufactured hardware, e.g., laser deleting a line or adding a wire on a ceramic substrate.

Echelle Grating

A spectroscopic device that gives higher resolution and dispersion than ordinary gratings in wavelength division multiplexing (WDM) applications.

EDA

Electronic Design Automation, (computer aided design - CAD) software applications used to create the electronic design schematic or high level description (HDL). A broad range of activities that includes computer aids used in chip design as well as the industrial sector making the aids.

Embedded Memory

A memory component implemented within an integrated circuit.

Embedded Metallization

The deposition of different metals inside a microfluidic channel making an array of electrodes to transport, identify, and analyze various biological materials/agents/cells in a microfluidic chip.

Embedded Processor

A computer chip that controls the function of its product. While embedded processors sometimes refer to the type of chips used in simple electronic toys, "talking" greeting cards and similar consumer products, they are also high functioning microcontrollers that are the brains of products such as laser printers.

ESW

Embedded Software. Programs and subroutines running on an embedded processor or digital signal processor that enable the control of other components within an embedded system.

Embedded System

A microsystem product or application that is implemented by a number of subsystems, including microelectronics, sensors, and actuators, integrated within the overall design.

Etch

A chemical process used to selectively remove parts or layers during fabrication of a semiconductor wafer.

ESD -- Electrostatic Discharge

Fabless Semiconductor Company

A semiconductor company with no wafer fabrication capability.

Fabrication

The production of chips through a series of processing steps carried out on a substrate or wafer, often a semiconductor wafer.

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Fixturing

A facility used in the testing of a packaged integrated circuit or microsystem that involves extending the inputs and outputs to an arrangement of accessible terminals for the application and analysis of test signals.

Flash Memory

A faster form of EPROM that permits more erase/write cycles. Flash memory is increasingly used instead of EPROM when there is a requirement for large amounts of non-volatile program memory. It is repairable in that there are redundant memory cells, which can be programmed to replace faulty cells.

Flip Chip

Unpackaged silicon dies that have been supplied with solder balls directly on the active side of the die. They are called flip chips because they are flipped upside-down, compared to a conventional wire bonded chip.

FMI -- Failure Mode Index

Foundry

A wafer fabrication and processing plant. Usually denotes a facility that is available on a contract basis to companies that do not have wafer fab capability of their own or that wish to supplement their own capabilities.

FPGA

Field Programmable Gate Array. A fabricated integrated circuit technology in which circuit behavior is electrically configured (programmed into the integrated circuit) by the user to meet a specific design requirement. The FPGA integrated circuit can be subsequently reprogrammed if necessary.

Full Custom Design

In this style of design, the designer designs all the physical layout of the IC by hand, or using auto layout techniques. Most suitable for analog & mixed signal design. Lengthy process and typically used on smaller designs (<50k gates).

GaAs

Gallium Arsenide. A semiconductor material which possesses some advantages over silicon in terms of the speed of electron flow.

Gate Array

An integrated circuit fabrication technology in which the final metal interconnect layers of an otherwise pre-fabricated chip are patterned in accordance with user-supplied design data. A semi-custom chip. The integrated circuit is pre-processed to the first interconnect level. The remainder of the interconnect is customized to meet specific requirements of the customer.

HDL

Hardware Description Language. A formal computer-like language that permits the description of the function and/or implementation of a system before it is actually fabricated. High level description language for example VHDL, verilog and VHDL -A (analog VHDL).

HPCVL

High Performance Computing Virtual Laboratory.

HQP

Highly Qualified Personnel. People with strong background, skills, and experience in a particular field, making them a valued asset to industrial and research organizations.

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HV Drivers

High-Voltage Drivers. Circuits that produce 20–100 V to activate MEMS devices and 100–1.5 kV to control fluid flow in microfluidic devices.

I/O

Input/Output.

IC

Integrated Circuit. The interconnection of multiple electronic circuit components fabricated on a semiconductor substrate. Most often used in reference to microelectronic chips but increasingly used in reference to chips using other technologies. A semiconductor chip in which many active or passive elements are fabricated and connected together on a continuous substrate, as opposed to discrete devices, such as transistors, resistors, capacitors and diodes that exist individually.

ICT

Information and Communications Technology.

IEEE – Institute of Electrical and Electronics Engineers. Founded in 1884, it is the world's largest technical professional society, consisting of over 360,000 member in over 150 countries.

IMS

Institute for Microstructural Sciences of the National Research Council of Canada (NRC).

In-kind

Donation of goods and/or services; discounts on purchased goods or services. The value of in-kind contributions is determined with reference to standard pricing for the good or service, where this exists, or otherwise the "next best customer" price. Goods or services that do not have a market price are assessed based on a potential market value.

Integration

The combination of various components to form a system. Heterogeneous integration includes blocks or subsystems from different technologies such as photonics, MEMS, CMOS.

Intellectual Property

The general term for intangible property rights that are a result of intellectual effort. Patents, trademarks, designs and copyright are the main intellectual property rights.

Interconnect

The paths on an integrated circuit that serve to electrically connect components and to supply power and distribute electrical data throughout the circuit. A highly conductive material, usually aluminum or polysilicon that carries electrical signals to different parts of a die.

ISO – International Standards Organization.

Layout

The physical implementation of the components and interconnections which make up an integrated circuit or microsystem chip.

Lithography – The process in semiconductor manufacturing in which chip designs are projected onto silicon wafers.

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Macro Cell

Similar to a standard cell but larger. Macro cells contain predefined circuit elements that may be selected and arranged to create a custom or semi-custom integrated circuit more easily than through design. Designers building ASICs use macro standard cells.

Mask

The photographic film used to isolate portions of a semiconductor wafer during the fabrication process. A photo-mask may be used to control the patterning of a layer of photoresist or other material on the surface of the wafer that defines the area of action for a particular process step.

MCM

Multi-Chip Module. An integrated circuit package which contains two or more interconnected chips.

MCP

Multichip Package. – An electronic package that carries a number of chips and interconnects them through several layers of conductive patterns. Each one is separated by an insulative layer and interconnected via holes.

MEMS

Micro Electro Mechanical Systems (MEMS). Microsystems that comprise mechanical sensors and actuators, and electronic signal processors. The goal is to detect mechanical energy from the outside world, convert it to electrical signals, carry out processing of the signals, and generate output in the form of electrical and mechanical energy.

Methodology

The structured series of steps used in the design of microsystems.

Microcontroller

A microcontroller is a stand alone device that performs computer functions within an electronic system without the need of other support circuits. A microcontroller contains memory functions. Microcontrollers are used in TV's, VCRs, microwave ovens and automobile engines.

Micron (u)

One-millionth of a meter. The diameter of a human hair is about 100 microns. Today's semi conductors have lines etched at 0.18 microns (0.18u).

Microelectronics

The techniques of designing and fabricating small electronic circuits whose key components measure only billionths of a metre in length. Microelectronics is the "structural steel" that supports electronic and photonic systems.

Microfluidics

The study of fluid flow in channels of 100 microns or less in dimension. The use of microfluidics includes applications in biotechnology.

Micromachine

Structures and machines with micron feature sizes. These machines can have many functions, including sensing, communication and actuation.

Micromirror

Mirrors of very small size and can be fabricated on a chip. Micromirrors are used to steer/scan a light beam at micron scale.

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Microsystems

Include microelectronics, photonics, optoelectronics, micromachining, microfluidics, embedded software and progressively nano-scale phenomena. Microminiaturized and integrated systems based on microelectronics, photonics, RF, micro-electro-mechanical systems (MEMS) and packaging technologies.

Mixed Signals

Mixed signal devices have analog and digital functions in the same chip. They are used to integrate complex functions of high speed telecommunications or real-time data processing. A design in which both analog and digital circuits are present on the same chip.

MLC

Multilayer Ceramic. Ceramic substrate consisting of multiple layers of metals and ceramics interconnected with vias.

Moore's law

In 1965, Intel Corporation co-founder Gordon Moore predicted that the number of transistors (and capacity) that can be squeezed onto a chip would double every eighteen months. If this trend continued, he reasoned, computing power would rise exponentially with each new generation of chips. His published observation holds to this day.

Mode 2 Research

Research that is often described as problem- or application-driven in which knowledge is generated in the context of the application. The research is typically carried out by a multidisciplinary team assembled to investigate the particular problem. The project is usually resource-intensive and upon completion, results in the partial or total disbanding of the research team.

Modeling

The capture of the physical and functional behaviour of a technology or component within a computer program that is then used to test its response to various stimuli without requiring actual realization.

Module

An interconnected subsystem of a number of microsystem components, usually designed to form a building block for more complex systems.

MPSoC

Multi-processor System-on-Chip.

MSL Moisture Sensitivity Level

MST

Micro-System-Technology. A more general statement of MEMS including optical and fluidic systems. MST is a more common term than MEMS in Europe and Japan. Similar to MEMS with or without the electronic circuitry (e. g. optical, mechanical or fluidic structures)

μTAS

Micro Total Analysis System.

Multidisciplinary

Combining the disciplines of different fields of study.

Multi-technology, Multi-domain

The integration of all or some of the following subsystems: MEMS, microfluidics, optoelectronics, photonics, microelectronics.

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MUMPs

Multi-User MEMS Processes. A commercial program that provides customers with cost-effective access to MEMS prototyping. Offered by MEMSCAP.

Nano-scale and nanotechnology

An area of science and technology where dimensions and tolerances are in the range of 0.1 nanometre to 100 nanometres. It is concerned with materials and systems whose structures and components exhibit novel and significantly different physical, chemical and biological properties, phenomena, and processes due to their nano-scale dimensions

NSF

National Science Foundation. A federal agency responsible for funding university R&D in the United States.

OEIC

Optoelectronic Integrated Circuit. A monolithic integration of several different photonic, optoelectronic, and/or electronic devices on the same chip..

Optical Routing

The routing of signals implemented via optical switches as opposed to electrical switches.

Optical Switch

A switch that enables signals in optical fibers or integrated optical circuits (IOCs) to be selectively switched from one circuit to another.

Optoelectronics

A subset of photonics concerned with the application of electronic devices that interact with light, including invisible forms of radiation such as ultraviolet and infrared. The combination of photonics and microelectronics. When they are packaged together, they provide the capacity to generate, transport and manipulate data at phenomenal rates.

Packaging

The process of enclosing a chip in a structure that facilitates connections to the larger subsystem, often used in relation to a microelectronics chip where the structure is plastic or ceramic and the connection is through a set of pins that are usually soldered to a printed circuit board. More generally, the package is designed to match the particular technology used for the chip.

Passives – Circuit elements such as resistors and capacitors which do not change state when subjected to voltage or current.

PCB

Printed Circuit Board.. A type of circuit board which has conducting tracks superimposed, or "printed," on one or both sides, and may also contain internal signal layers and power and ground planes. An alternative name, Printed Wire Board (PWB), is commonly used in America.

PGA

Pad Grid Array or Pin Grid Array. PGA may refer to a pad grid array or a pin grid array. A pad grid array refers to a packaging technology in which a device's external connections are arranged as an array of conducting pads on the base of the package. A pin grid array refers to a packaging technology in which a device's external connections are arranged as an array of conducting leads, or pins, on the base of the package.

Photonics – The technology that uses light particles (photons) to carry information over hair-thin fibers of very pure glass.

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Photo-mask

The photographic film (glass plate) which contains the masking pattern required for a particular wafer processing step (see Mask).

Photonics

The science and technology of generating, manipulating, transmitting, and detecting light. It is a field that encompasses optics, quantum optics, lasers, optoelectronics, imaging, optical information processing, materials science, and their applications.

Photoresist

Light-sensitive chemical agents used to form selectively protective masking layers during wafer processing. A photo-mask is used to define the areas of photoresist exposed to light, which are subsequently removed by a solvent, leaving the required pattern on the wafer surface. The entire process is called photolithography.

PIC

Photonic Integrated Circuit. Integrated circuits that include active and passive photonic devices on the same chip.

Platform

Architecture, intellectual property blocks, and methodology useful as a basis to create a microsystem.

PLC

Planar Light-wave Circuit. A microchip containing passive photonic devices in a planar (all on the same plane) configuration.

PLCC

Plastic Leaded Chip Carrier: is a four-sided "J"-leaded plastic integrated circuit package with pin spacings of 0.05" (1.27 mm). Lead counts range from 20 to 84. PLCC packages can be square or rectangular. Body widths range from .35" to 1.15". PLCCs are JEDEC standard compliant. The PLCC "J" Lead configuration requires less board space versus equivalent gull leaded components. A less expensive version of the leadless chip carrier which is a housing with flat contacts, instead of pin connectors, on each side.

PLD

Programmable Logic Device. A digital IC that can be programmed by the user to perform a wide variety of logical operations. FPGAs (Field Programmable Gate Arrays) and CPLDs (Configurable Programmable Logic Devices) are classes of PLDs.

Poly-MUMPs

Multi-User MEMS Processes (see MUMPs). Polymer Based Microfluidics A network of microfluidic channels created in a polymer substrate.

Programmable Technologies

Technologies in which functionality is implemented via software programs and software commands.

Prototyping

The implementation of a microsystem, component, or system to verify functionality or show proof-of-concept.

RAM

Random Access Memory.

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Rapid Prototyping, Rapid Prototyping Platform

A platform of programmable technologies for rapid prototyping.

R&D intensity

A country's "R&D intensity" is usually measured in terms of total R&D expenditures as a percentage of gross domestic product (e.g., by the Organization for Economic Co-operation and Development, <http://www.oecd.org>); in reference to individual companies or industries, "R&D intensity" is often used interchangeably with "R&D activity" [e.g., Billings et al, 1999].

RF – Radio Frequency

That part of the spectrum from approximately 50kHz to gigahertz.

Real-time

Pertains to a system that controls an on-going process and delivers its outputs (or controls its inputs) not later than the time when these are needed for effective control.

Reuse

A design strategy that supports the use of pre-designed IP blocks in other systems.

RLP Registered Land Pattern

ROM

Read Only Memory. Memory in which data are permanently stored and cannot be erased or rewritten.

R&TD

Research and Technology Development.

RTL

Register Transfer Language. Used in describing the data storage elements (registers) of a computer or digital electronic system and the way in which data are transferred between them.

RTOS

Real-Time Operating System. A specialized operating system that guarantees performance levels for time-critical applications.

SCP

Single Chip Package. A package that supports a single microelectronics device so that its electrical, mechanical, thermal and chemical performance needs are adequately served.

Semiconductor

A class of materials (e.g., silicon (Si), gallium arsenide (GaAs)) that exhibit electrical properties mid-way between insulators (e.g., plastic) and conductors (e.g., copper). This is the generic name for discrete devices and integrated circuits that can control the flow of electrical signals. Silicon is the basic substrate material on which semiconductors are fabricated.

Signal Processing

Electronic functions that enhance the representation of physical or electrical phenomena. Temperature, pressure, vibration, acceleration and flow are examples of physical properties that rely on signal processing enhancements. The detection and conversion of RF, X-Ray or ultrasonic energy into images and sound is another form of signal processing.

SiGe

Silicon Germanium. A compound semiconductor (SiGe) that has improved conductivity resulting in faster circuits and increased performance with lower power consumption.

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Silicon - A brittle, gray, crystalline chemical element which, in its pure state, serves as a semiconductor substrate in microelectronics. It is naturally found in compounds such as silicon dioxide.

Simulation

The use of a CAD tool that mimics the behaviour of the actual circuit through a collection of sub-circuit models (see modelling) enabling designers to test, verify, and debug circuits before layout and fabrication.

SMT

Surface Mount Technology. A method of assembling hybrid circuits and printed wiring boards where component parts are mounted onto, rather than into, the printed-wiring boards, as in the mounting components on substrates in hybrid technology.

SOA

Semiconductor Optical Amplifier.

SoC

System on a Chip. A single chip that is a self-contained system, including CPU processing, memory and input-output functions. A large, complex integrated circuit with high functionality and performance. Often characterized by the presence of embedded processors, embedded memory, and a multitude of other components.

SOI

Silicon On Insulator.

SOIC

Small-Outline Integrated Circuit. An IC carrier which occupies an area about 30 - 50% less than an equivalent DIP, with a typical thickness that is 70% less. They are generally available in the same pinouts as their counterpart DIP ICs. The convention for naming the package is 'SOIC' or sometimes just 'SO' followed by the number of pins. For example, a 14-pin 4011 would be housed in a SOIC-14 or SO-14 package

Solder

A low melting point alloy used in numerous joining applications in microelectronics. The most common solders are lead-tin alloys. Typical solder contains 60% tin and 40% lead - increasing the proportion of lead results in a softer solder with a lower melting point, while decreasing the proportion of lead results in a harder solder with a higher melting point.

SOP

System-on-Package. A single component, multi-function, multi-chip package providing all the needed system-level functions. Functions include analog, digital, optical, RF and MEMS.

Software

Computer programs and data that are used in conjunction with hardware to implement a complete microelectronics system (e.g., a personal computer or a telecommunications network).

Software-defined Radio

Wireless communication in which the transmitter modulation is generated or defined by a computer and in which the receiver uses a computer to recover the signal intelligence.

SRAM

Static Random Access Memory.

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Standard Cell

Standard cells are designed to be interconnected with other cells from the same cell library. Predefined circuit elements that may be selected and arranged to create a custom or semi-custom integrated circuit more easily than through design. Designers build ASICs using standard cells.

StepNP Platform

System-Level Exploration Platform for Multi-Processors: A multiprocessor based simulation environment.

Substrate

The body or base layer of an integrated circuit onto which other layers are deposited to form the circuit. The substrate is usually silicon, although sapphire is used for certain applications, particularly military, where radiation resistance is important. The substrate is originally part of the wafer from which the die is cut. It is used as the electrical ground for the circuit. Germanium is another substrate material currently being developed.

Synthesis

The CAD operation of automatically generating an integrated circuit layout from a high-level description (see HDL).

System Level

A behavioral description of a system that is an abstraction of the hardware/software implementation level.

System Level Prototyping Station

A rapid prototyping station configured for system design activities.

TAB

Tape Automated Bonding. The process where silicon chips are joined to patterned metal on polymer tape (e.g., copper on polyimide), using thermocompression bonding, and subsequently attached to a substrate or board by outer lead bonding. Intermediate processing may be carried out in strip form through operations such as testing, encapsulation, burn-in, and excising the individual packages from the tape.

Telematics

Wireless communications designed for the collection and distribution of data.

Testing Collaboratory

The National Microelectronics and Photonics Testing Collaboratory.

Top Down Design

This is a method of design, where the designer starts at a high level describing the design in conceptual terms. He then uses an HDL (High level description language such as VHDL, Verilog) to describe the specification of the design. The next stage is to synthesis the design to produce logic gates from the HDL. Typically used for a digital design but for analog designs a Schematic diagram is more commonly used as the starting point.

TRL

Technology Readiness Level.

TR Labs

A group of government, industrial, and academic sponsors that perform research in the telecommunications field. Based in Edmonton, Alberta.

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Valley of Death

The period during which a technology or product of research is too new to market; it shows commercial promise, but more research is needed to validate its potential.

Validation

The processes of comparing the behaviour of a physical system against the original design specification.

Verification

The process of measuring the behaviour of the system in relation to specific benchmarks.

VLSI

Very Large Scale Integration. A generic term for integrated circuits that is comprised of millions of individual components.

Wafer

The thin (a few hundred microns) slice sawn from a cylindrical semiconductor crystal that serves as the substrate for the fabrication of multiple individual integrated circuits or chips.

Slices of semiconductor crystal materials used as substrates for monolithic ICs, diodes and transistors.

Wire Bonding - The method used to attach very fine wire to semiconductor components to interconnect these components with each other or with package leads.

XRF X-Ray Fluorescence

Yield

The percentage of good chips compared to the total chips produced per wafer.