EXPLAINING THE TECHNOLOGY BEHIND THE CIRCUIT LAYOUTS BILL (Cth.)

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Before reading the Circuit Layouts Bill (Cth.) (the "Bill") it may be helpful to understand the meaning of the technological terms used in this Bill. These are explained below along with some other commonly used technological terms.

Circuit Layout

Clause 5 of the Bill defines "circuit layout" to mean:

"a plan comprising a two-dimensional representation, fixed in any material form, of the three-dimensional location of the active and passive elements and interconnections making up an integrated circuit".

A less legalistic definition is:

"A two–dimensional representation of the configuration of one of the many layers in a three-dimensional integrated circuit."

Integrated Circuit (or micro chip, silicon chip, or chip)

Clause 5 of the Bill defines integrated circuit to mean:

"a circuit whether in a final form or an intermediate form, the purpose, or one of the purposes, of which is to perform an electronic function being a circuit in which the active and passive elements, and any of the inter connections, are integrally formed in or on a piece of material."

Composition

An integrated circuit consists of very thin layers of conducting, semi–conducting and insulating materials in the shape of grids bound one on top of the other on to a tiny silicon wafer (that is, a semi–conductor layer).

The combination of all these layers creates areas of resistance (where current is slowed down) capacitance (which stores current) and transistors (which may amplify current).

How an integrated circuit works

All of the above layers are linked together by certain configurations and combinations of connectors (that is, conductor layers) to create circuits which perform a designated function.

Integrated Circuits in Computers

Computers consist of a combination of chips which are all linked together and all perform different functions.

Examples of different types of chips are:

(a) RAMS which are Random Access Memory chips or read/write chips and are used for temporary storage of data which is input (that is, read) and can be printed (that is, written).

(b) ROMS which are Read Only Memory chips. These are used for permanent storage of programs that are inbuilt into the computer.

(c) Microprocessing chips which contain thousands of separate circuits representing different logical functions or switches; and

(d) Input/output chips which connect all the above chips to a keyboard and printer.

How Integrated Circuits are made

Integrated circuits are made by first applying the negative image of the layout required for a particular layer of the chip on to glass and then photo reducing this image many times until it is as small as a tiny silicon wafer. This image is called a mask. It is then placed on top of the silicon wafer and the

particular layer is then applied on top of the mask. When the mask is removed, the positive image of the layout remaining on the silicon wafer (masks are also referred to in the Schedule to the Bill under subsection 4(1) of the Designs Act 1906).

Source Code

This term made an appearance in the *Apple Computer Case* (1984) 53 ALR 225 and at its simplest means a list of instructions or the computer program for a computer, written by an author in a particular computer language. It instructs the computer to carry out different functions.

Object Code

This term made an appearance in the *Apple Computer case*. Object code is source code which has been converted by means of a compiler into a machine language which is ultimately expressed to the computer's parts as a series of zeros and ones in a sequence which in turn act as switches to the various logical functions contained in the microprocessing chips and other chips in the computer.

Bibliography: Bit by Bit – An Illustrated History of Computers" by Stan Angarten, 1984).

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