Topic:- Integrated Circuit

Sometimes called as chip, microchip

→ It is a electric and electronic circuit in which electric componets are attached. with each other like capacitor, inductor and Resistor

→ It is Usally called IC, or chips

It is a semiconductor device in which thousand and millions electronic componets are arranged like:

amplifier,
capacitor,
Inductor

(1)
Cons
cost

Merits of IC

→ Lowe power consumption because of their smaller Size.

→ No component projected above the chip surface in an IC as all the componets are formeted within the chip.

→ Extremely Small size — thousands times smaller than discrete circuit.

→ The weight of IC is very Small.

→ The cost of IC is very low because hundreds of similar circuits are Used.

(1) Extremly small in size. (2) Low powe consumption (3) Reliablity (4) Reduced cost (5) very small weight (6) Easy Replacement

Drawbacks of IC

1) Voltage depends on IC is capacitor or Inductor.
2) It is not possible to fabricate coils and inductor on them
3) Isolation between different componets ~~of 30 pF~~ on IC's is poor due to being congested closely. As a Result short circuit may occur. In such condition IC can become completely damaged.
4) IC operate on very low voltage and very low current that's they cannot withstand extreme voltage and current.
5) Due to high ~~current~~ current Used in IC cause a

damage to IC.

6) It is difficult to fibricate a resistor in an IC similar to a capacitor.

7) components within an IC cannot be separated or isolated, there repair of ante grand circuit is not possible also.

8) low temprature cofficent is difficult to achived

9) high temprature can effect the IC.

Scale of a Integration:-

The integration scale in ICs denotes the number of a transistor or gates integrated on a single chip.

① SSI (small scale Integration) (less then 100 transistor per chip.

② MSI (Medium scale Integration)
(100 - 1000 transistor per chip)

③ LSI (large scale Integration)
(1000 - 10000) transistor per chip.

Merits of IC

→ Extremely Small physical size

As a size of an integreted circuit is 1000 times less compared to a discrete circuit. Therefore its different componets and mutual connections can only be seen through a powerful microscope.

→ very Small weight

The weight of a IC is very Small.

→ Reduce Cost

The greatest advantage of an IC is its low cost. All componets on circuit are fitted inside or above

a wafer. Hundreds of such wafers can be fabricated, this is the reason that due to fabrication of ICs of same type cost per unit becoms low and price of an IC is very low.

→ Suitable for Small signal opearation.

As different componets on an Ic are located very close within or above a Silicon wafer, Therefor, this quality of an Ic enables it for Small signal opearation.

→ Low power Consumption

As Size of an IC is quiet Small compared to the individual and large circuit, there it consumes less powerd relative to a ordinory circuit and less voltage are required for their operation.

Easy Replacement

As a result, failure of an IC due to Some Kind of a defect, it is very difficult or nearly impossible to get it repaired. Instead of it's repair, it's replacement is quiet easy and more beneficial.

→ Less effect of Tempreture:-

As a effect of a tempreture on all ICs is negligible and same, therefore they can work exellently on a normal tempreture to a some what higer tempreture and there is no need of a cooling system for keeping these cool either.

→ Good frequency Responce:-

The frequency responce of IC is quiet better and they can operate on even high frequencies

quiet Successfully.

Greater gain:

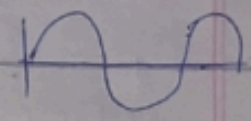
All ICs are capable of relatively a high gain.

In 12 Sep 1958, IC is invented by Jack Kilby. And Jack Kilby got a noble prize in 2000.

Types of IC

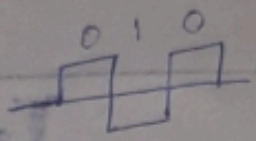
1) Linear or analog IC
2) Digital IC

Linear IC



→ also known as analog IC
→ The linear integrated circuit ~~giv~~ gain contionous input and provide continous output depending on input
→ The linear IC perform functions like amplification, active filtering, demodulation, and mixing.
→ Analog IC, such as sensor, operational amplifier, work by processing contionous signal.

Digital IC



→ Digital IC gain discrete value of input.

→ The fundamental building of digital IC is based upon logical gate.

→ Logical gate perform different opration on binary numbers.

→ The Digital IC allow high speed, low power dissipation

→ The digital IC work on binary number Such as '0' & '1'.