

## Logic Families Introduction

### Logic Family:

Logic families means it is a collection of different IC's with the same input and output characteristics and internal circuit characteristics but these perform different logic functions.

Two types of logic families

TTL → transistor transistor logic families

CMOS → Complementary metal oxide semiconductor logic families

Complexity of classification of fixed functions IC's:-

**SSI:-** Includes up to 12 number of electronic components are fabricated in a single chip

SSI means Small Scale Integration. They include Basic logic gates and flip flops.

MSI → Circuit Complexity includes 12-99 electronic components

MSI → Medium Scale Integration

MSI Includes Shift Registers, encoders, decoders multiplexers, demuxes, code converters

**LSI:** Large Scale Integration technology requires 100-9999 electronic components are fabricated on single chip. It includes memory i. e, ROM, Hard wares

**VLSI:** Very large Scale Integration. It includes 10,000 to 1,00,000 Components. It also microprocessors

**ULSI:** Ultra large Scale Integration

It includes greater than > 1,00,000. It includes microprocessors and large memories

### IC's Classification:

Based on the electronic devices used in IC technology. They are classified 2 types. By using BJT

1) TTL

2) ECL (Emitter Coupled Logic)

**Note:-** ECL has very very high switching speed compared to all other logics but it has more power dissipation delay

By using MOSFET

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- 1) CMOS → Complementally Metal Oxide Semi Conductor
- 2) NMOS → N type mos

There are two types of CMOS base on voltage dc supplies. They are

(1) 5V cmos

(2) 3v cmos

74XX → xx means letter ; 54XX → 54 means military purpose ; 74 → Commercial purpose

### CMOS Sense for 5V:-

→ HC means High Speed CMOS

→ HCT means High Speed Compared to TTL

→ 74AC, 74ACT (advanced CMOS)

→ 74AHC, 74AHCT (advanced high speed CMOS)

CMOS Series for 3V

→ 74LV, 74LVC (low voltage CMOS)

→ 74ALC (advanced low voltage CMOS)

BICMOS means it is a series Combination of TTL CMOS

74BCT Standard Bi CMOS

74ABT advanced Bi CMOS

74LVT low voltage Bi CMOS

74 ALB advanced low voltage Bi CMOS

**TTL:** 74 Standard TTL

74S Schotty TTL

74AS Advanced Schotty TTL

74LS low power Schotty TTL

74ALS advanced low power schotty TTL

74F fast TTL