



# **SNS COLLEGE OF TECHNOLOGY**

**(An Autonomous Institution)**



**19EET202 / ANALOG ELECTRONICS**

**II YEAR / III SEMESTER**

**UNIT-3: IC FABRICATION AND OPTO ELECTRONIC DEVICES**

10/21/2023

1

**SEVEN SEGMENT DISPLAY**



# What We'll Discuss



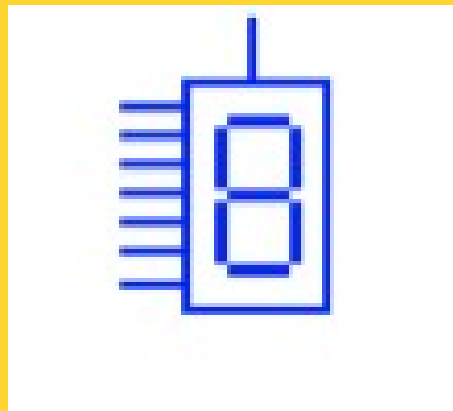
## TOPIC OUTLINE

Introduction  
Construction  
Working  
Applications



# Introduction

A seven segment display (also written as 7-Segment Display) is an electronic display device which is used to display numerical characters from 0 to 9 or some special characters.



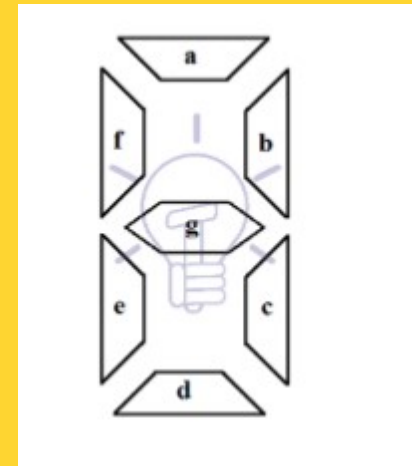
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## Construction of 7-Segment Display

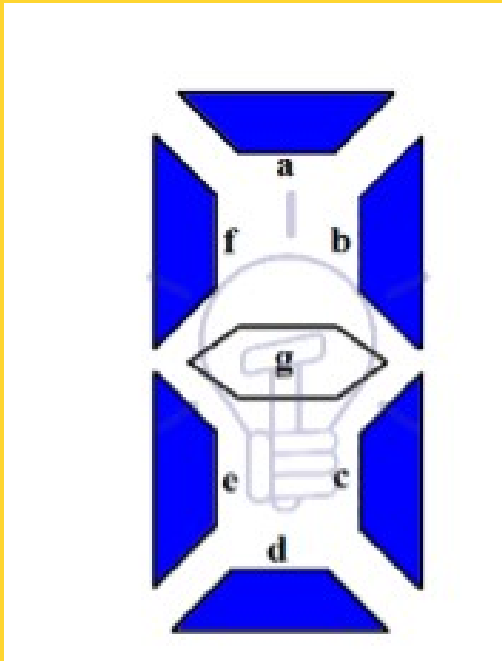


- There are seven small rectangular LEDs are present in a seven segment display and each led is called as segment. An additional led is also used in some displays for displaying decimal point to.
- Position of each led is set and named from A to G and this combination is used to display characters. One pin from each led is brought out to give the signal to glow.
- The other pins of the LEDs are connected together to form a common pin. Led glows only when it is forward biased therefore if we make particular pin in forward bias mode we can make the characters of desired choice.





# Working of Seven Segment Display



Seven LED segments of the display and their pins are “a”, “b”, “c”, “d”, “e”, “f” & “g” as shown in the figure.

Each of the pins will illuminate the specific segment only.

We assume common cathode LED segment as our example. Suppose we want to display digit ‘0’, in order to display 0, we need to turn on “a”, “b”, “c”, “d”, “e”, “f” and turn-off the “g”.



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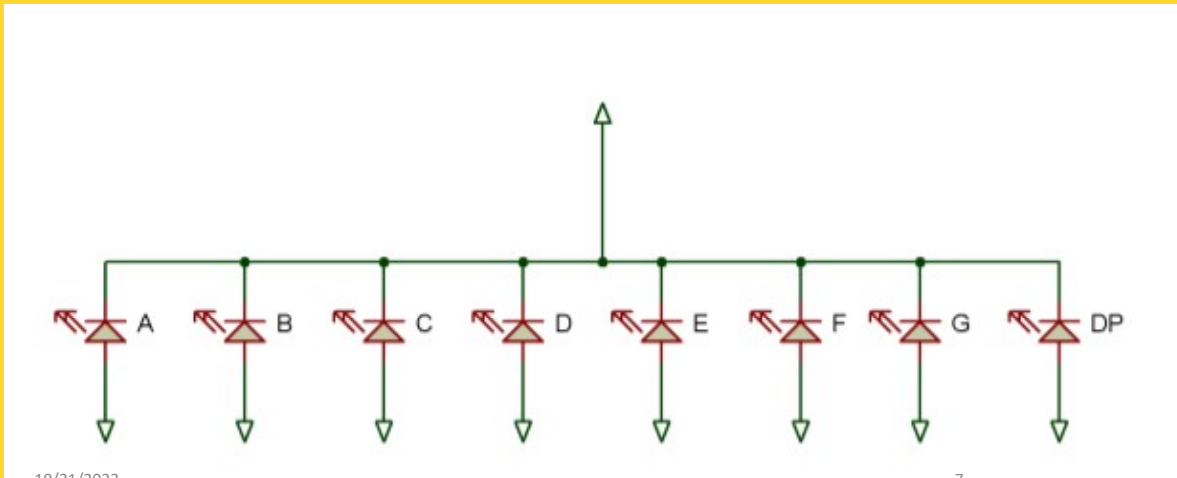
## Types of Seven Segment Display

- An LED has two pins one cathode and one anode. Therefore, there exists two types of seven segment displays:
  - Common Cathode and
  - Common Anode.
- 
- The difference in both types of seven segment is that: In common cathode all the cathode pins of seven LEDs is connected together whereas in common anode all the anode pins are connected together.





# Common Cathode (CC) Seven Segment Display



10/21/2023

7

- In common cathode display all the cathode pins are connected together to ground or logic 0. The other anode pin is taken out and are given high or logic 1 signal to illuminate the particular led segment from “a” to “g”.





# Common Anode (CA) Seven Segment Display

Integrated circuits offer a wide range of applications and could be broadly classified as:

1. Digital ICs
2. Linear ICs

Based on these two requirements. Two distinctly different IC Technology namely

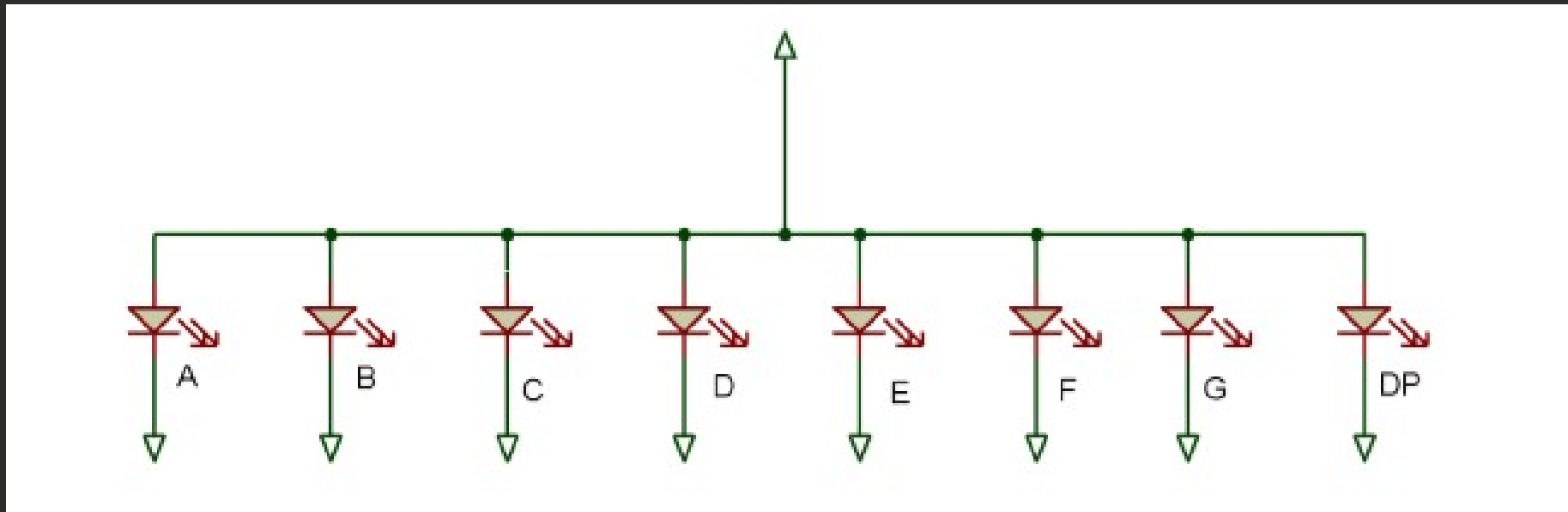
1. Monolithic Technology and
  2. Hybrid Technology
- 1. Monolithic Technology-Based on the active devices used
  - Bipolar(Using BJT)
  - Unipolar(using FET)







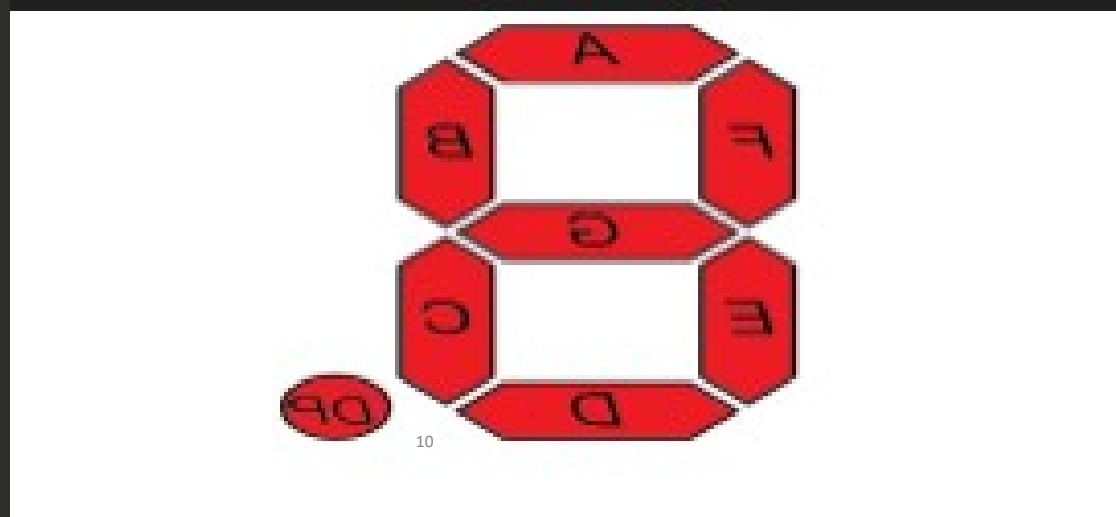
# Common Anode (CA) Seven Segment Display



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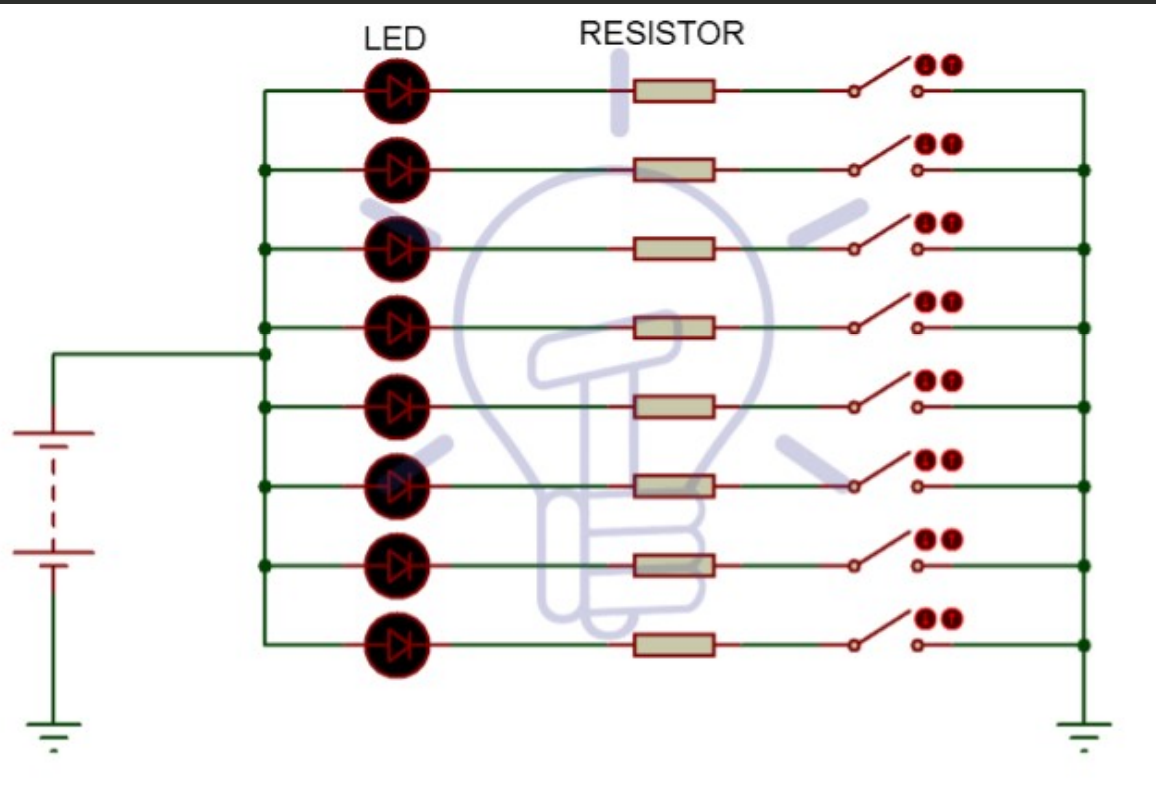
“A” to “G” and one dot point as “DP”.



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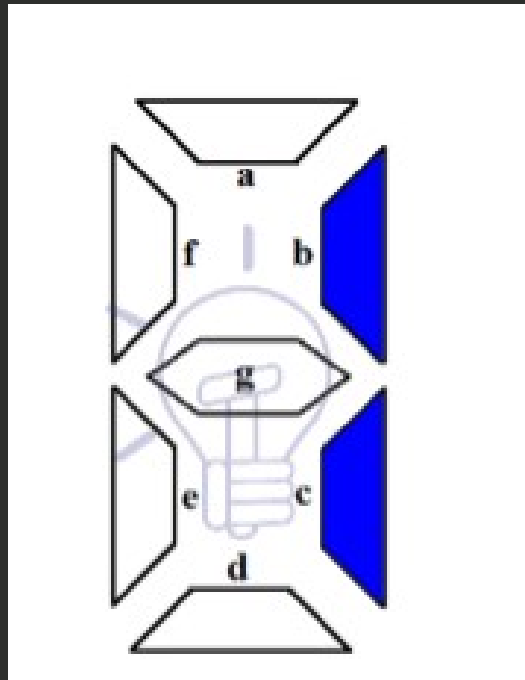
# Protection of LEDs from High Currents



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To make things much easier we generally use an integrated circuit (IC) CMOS 4511 which is a seven segment decoder or driver. This seven segment display decoder is also known as Binary Coded Decimal (BCD) to seven segment display decoder and driver. .



10/21/2023



10/21/2023

13

# THANK YOU

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13/13