

Switching Circuit & Logic Design

Lecture 1 : Characteristics of Logic Families



Things to cover

- Introduction to Logic family
- What is Fan-out ?
- What is Noise Margin ?

Introduction to Logic Families

- RTL – Resistor Transistor Logic
- DTL – Diode Transistor Logic
- TTL – Transistor Transistor Logic
- ECL – Emitter Coupled Logic
- CMOS – Complementary Metal-oxide Semiconductor

Introduction to Logic Families

Fan out

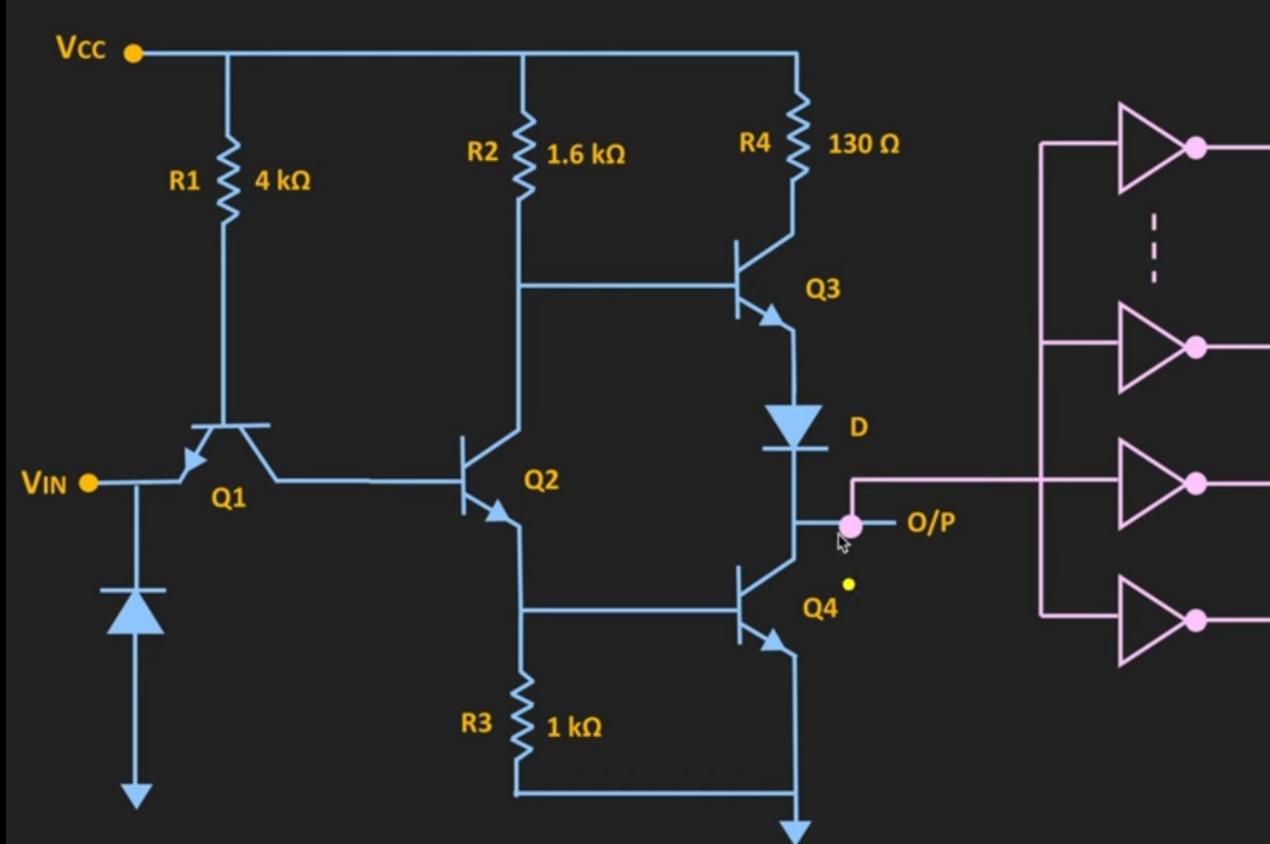
Voltage Levels

Speed

Power Consumption

Noise Margin

Fan-out



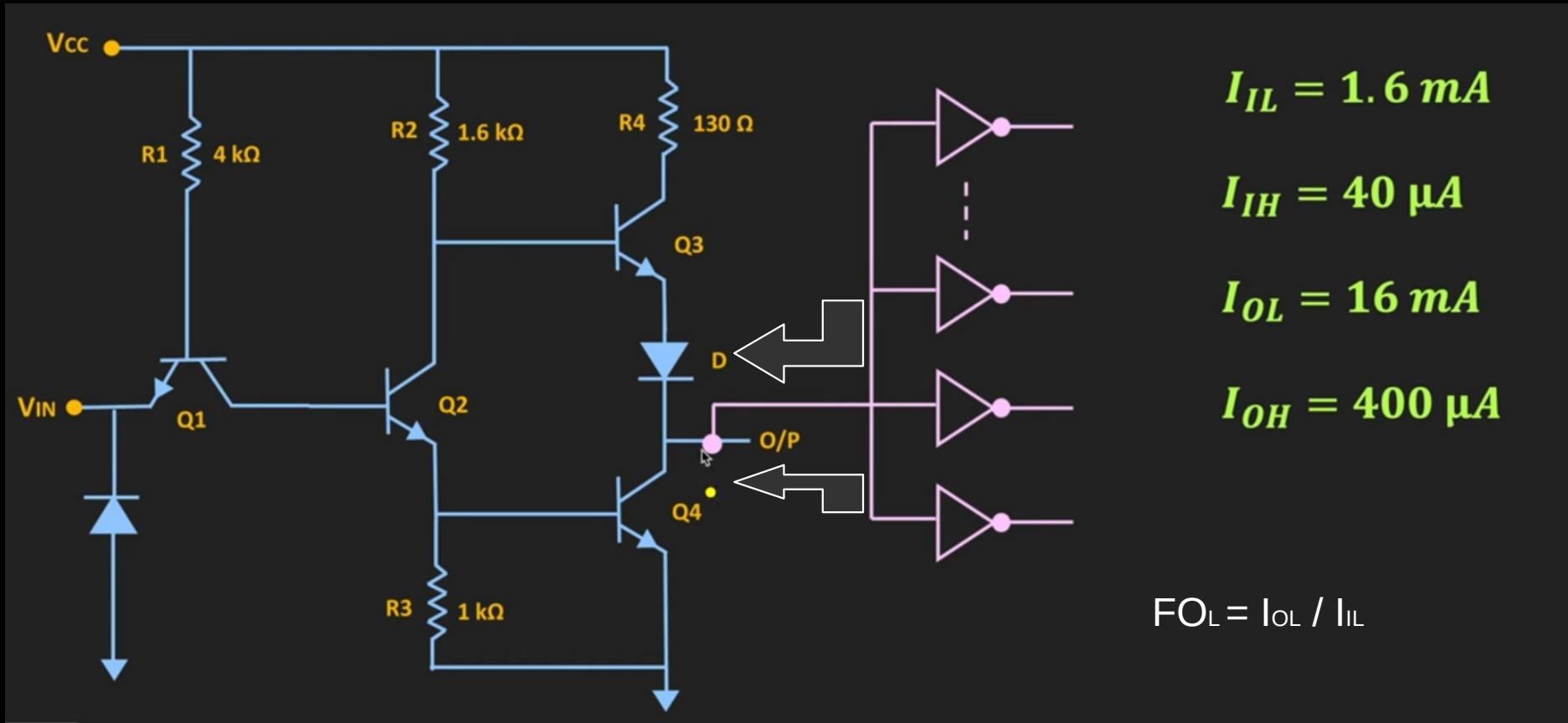
$$I_{IL} = 1.6 \text{ mA}$$

$$I_{IH} = 40 \mu\text{A}$$

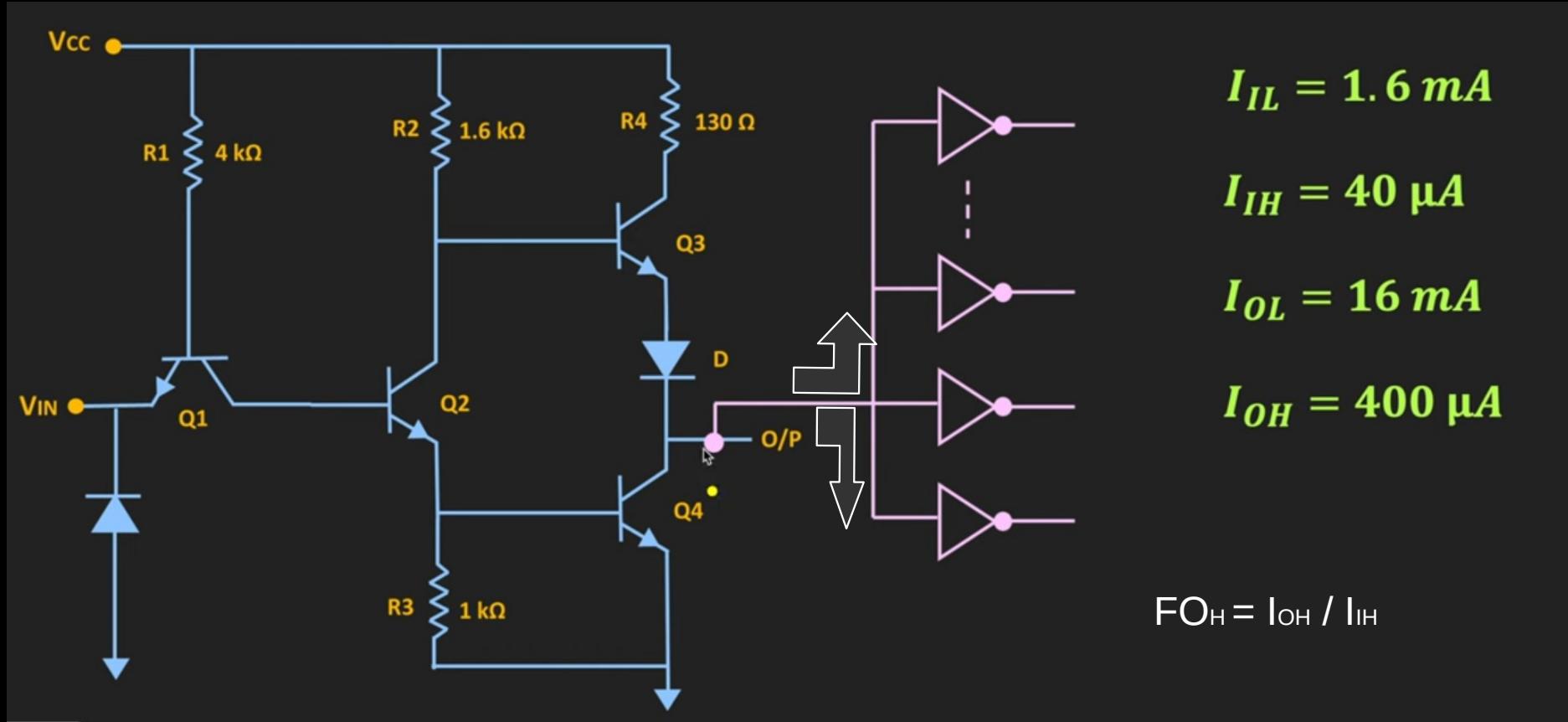
$$I_{OL} = 16 \text{ mA}$$

$$I_{OH} = 400 \mu\text{A}$$

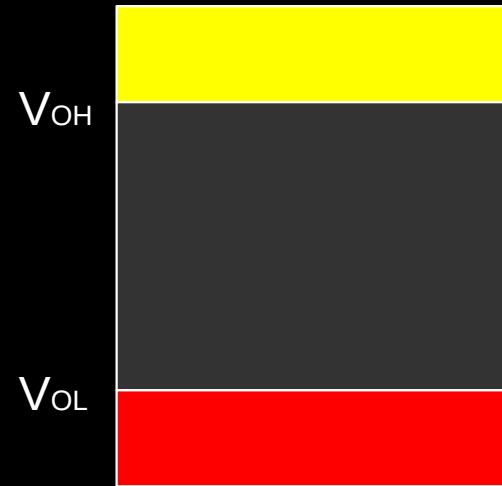
Fan-out: Current Sink



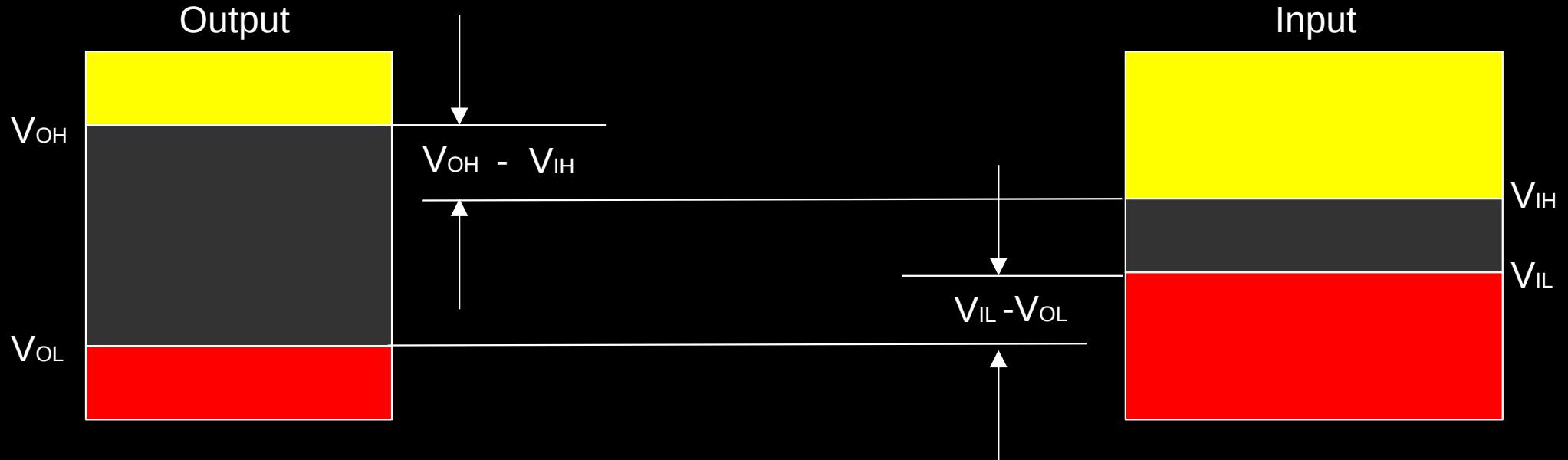
Fan-out: Current Source



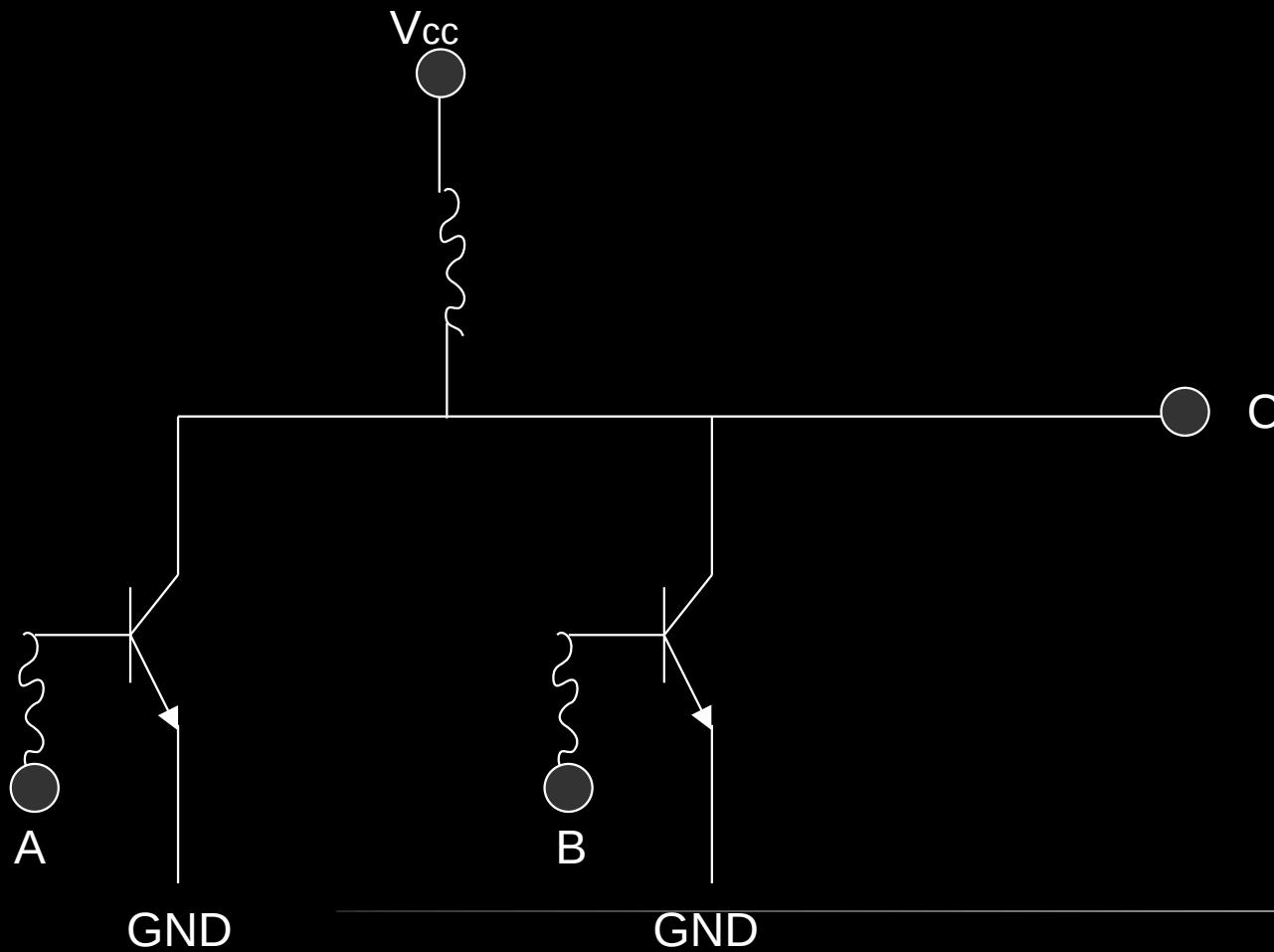
Noise Margin



Noise Margin



Resistor Transistor Logic (RTL)



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