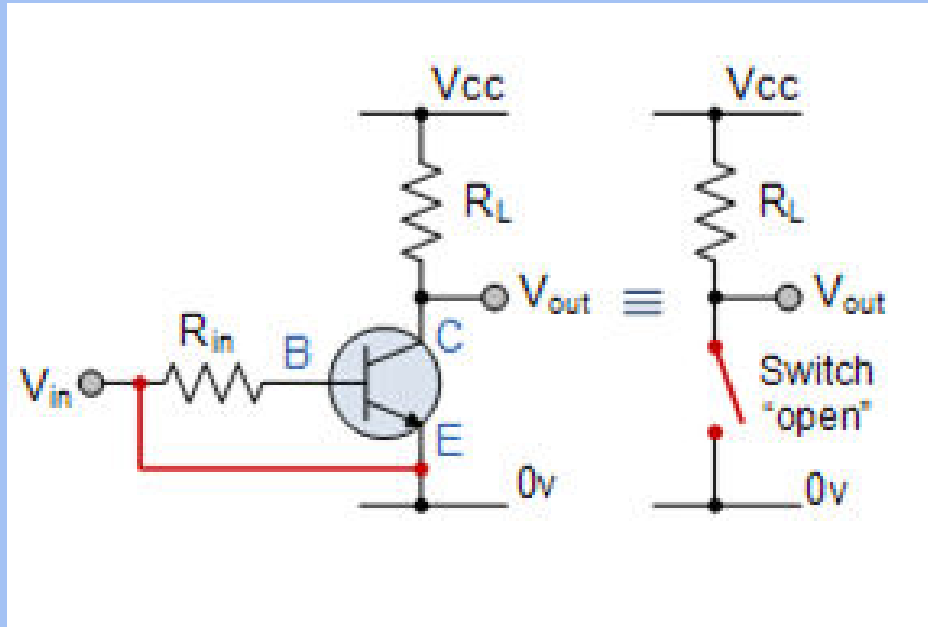# Transistor as a Switch

Elementrix Classes
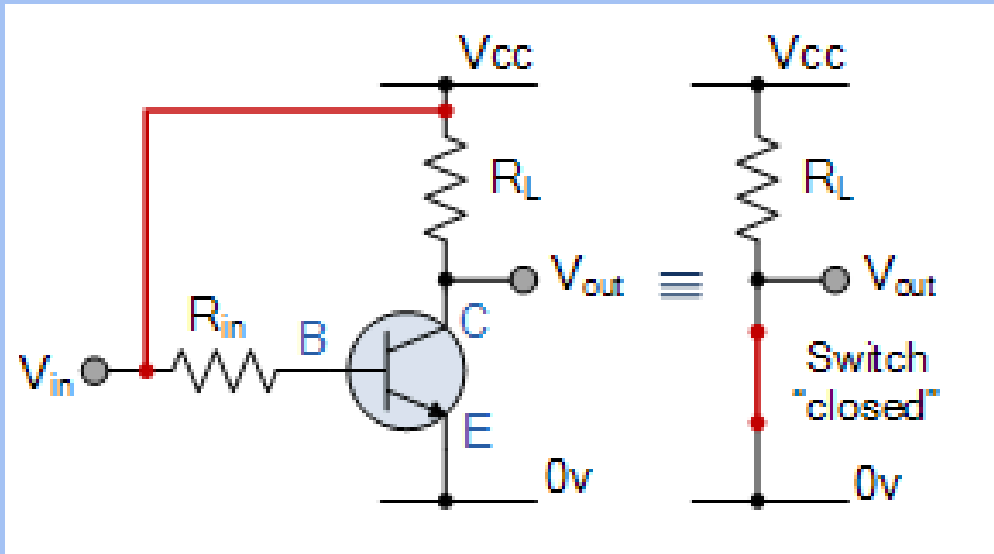
Transistor as a Switch

❏ **Cut-off Region**

- The input and Base are grounded (0v)
- Base-Emitter voltage V_{BE} < 0.7v
- Base-Emitter junction is reverse biased
- Base-Collector junction is reverse biased
- Transistor is "fully-OFF" (Cut-off region)
- No Collector current flows (I_C = 0)
- V_{OUT} = V_{CE} = V_{CC} = "1"
- Transistor operates as an "open switch"

❏ **Saturation Region**

- The input and Base are connected to V_{CC}
- Base-Emitter voltage V_{BE} > 0.7v
- Base-Emitter junction is forward biased
- Base-Collector junction is forward biased
- Transistor is "fully-ON" (saturation region)
- Max Collector current flows ($I_C = V_{CC}/R_L$)
- $V_{CE} = 0$ (ideal saturation)
- $V_{OUT} = V_{CE} = $ "0"
- Transistor operates as a "closed switch"

Operating Regions
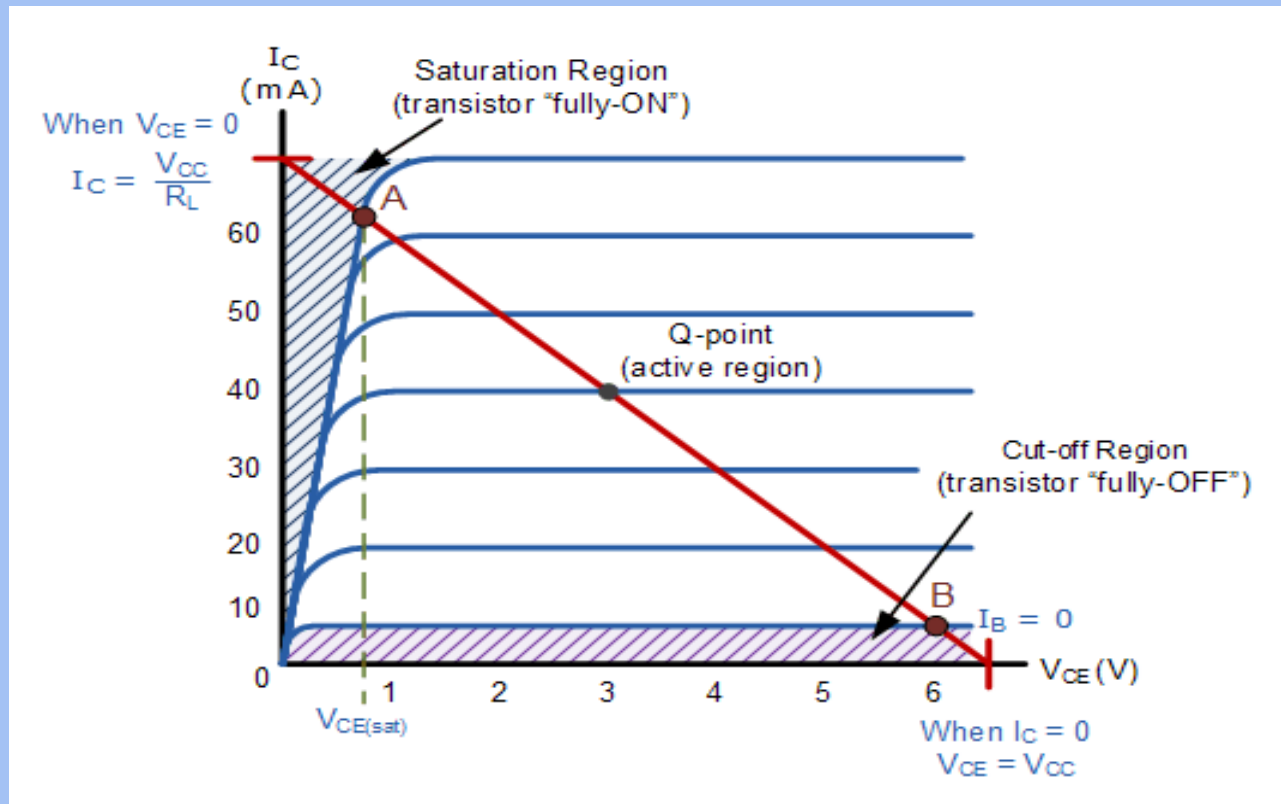
पढ़िए और पढ़ाइये

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