



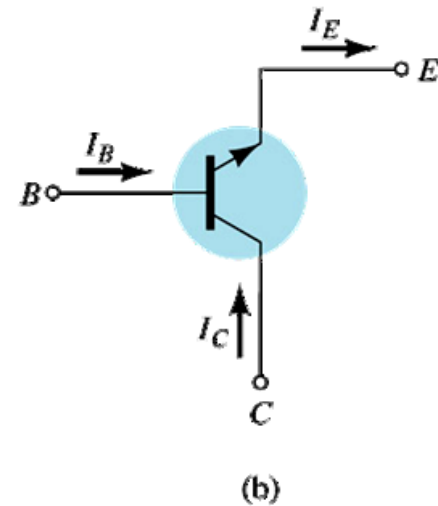
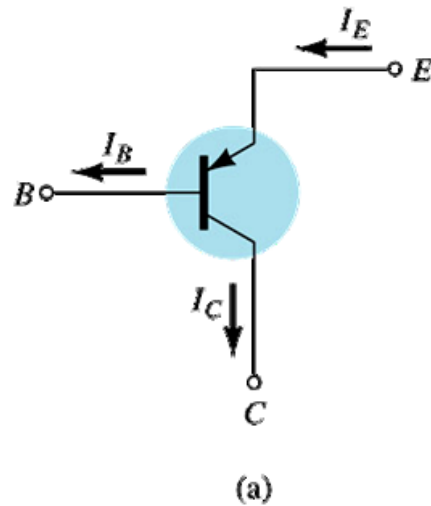
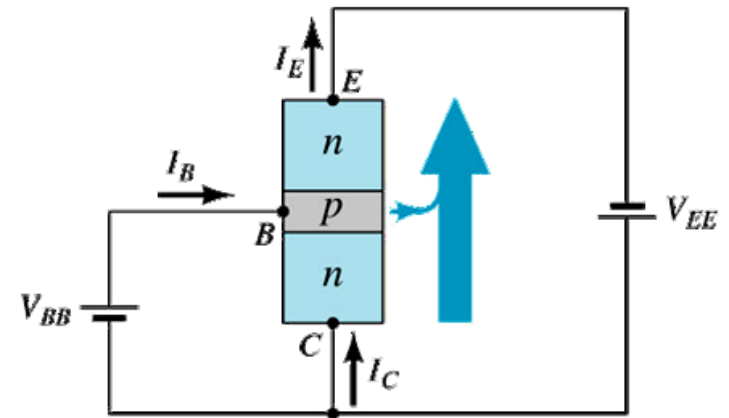
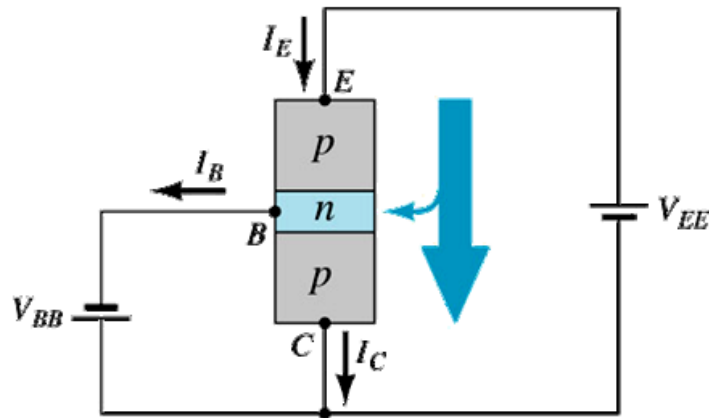
# **ELECTRONICS DEVICES AND CIRCUITS**

# OBJECTIVE

**BJT**

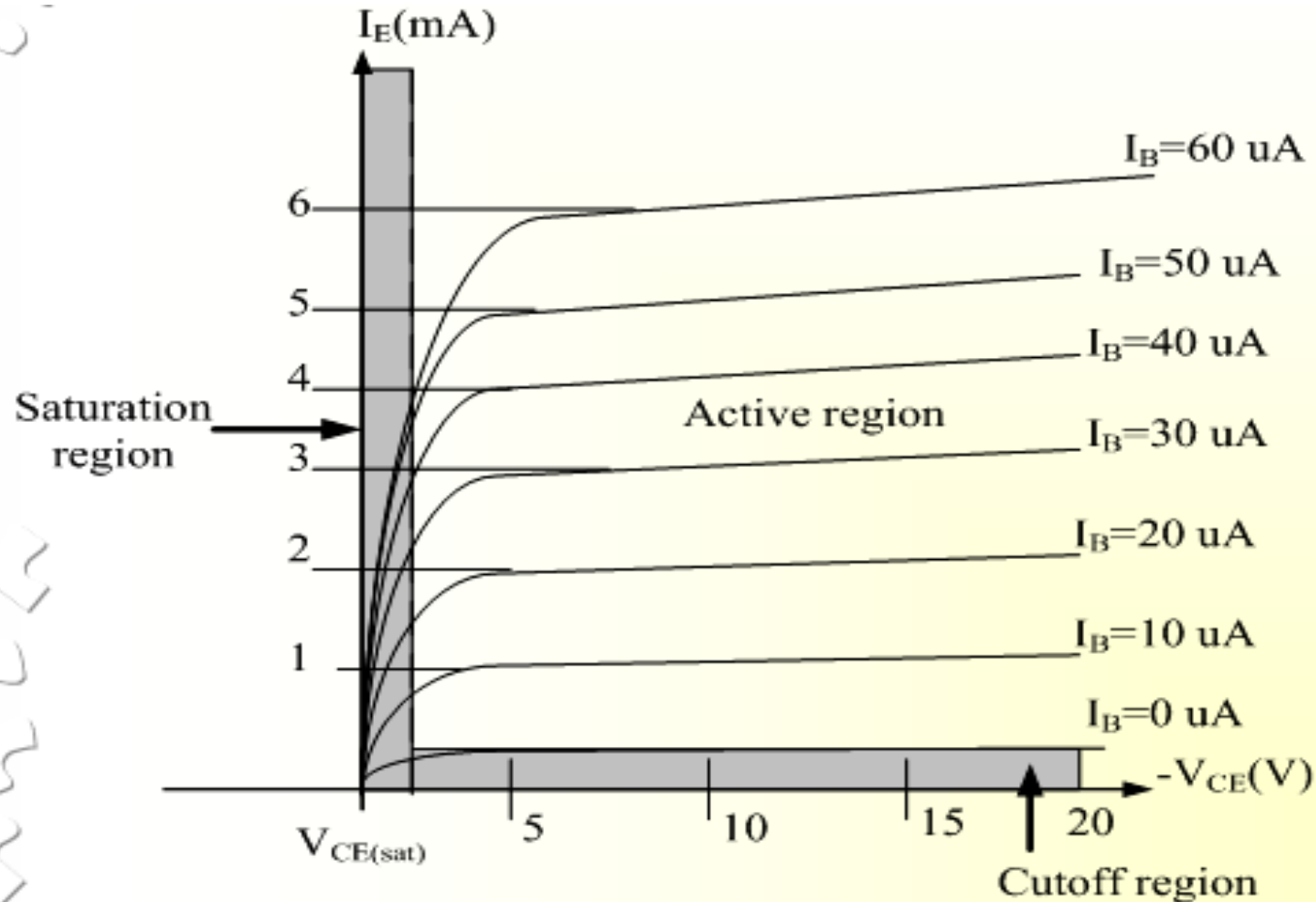
# Common – Collector Configuration

- Also called emitter-follower (EF).
- It is called common-emitter configuration since both the signal source and the load share the collector terminal as a common connection point.
- The output voltage is obtained at emitter terminal.
- The input characteristic of common-collector configuration is similar with common-emitter configuration.
- Common-collector circuit configuration is provided with the load resistor connected from emitter to ground.
- It is used primarily for impedance-matching purpose since it has high input impedance and low output impedance.



Notation and symbols used with the common-collector configuration:  
 (a) pnp transistor ; (b) npn transistor.

- For the common-collector configuration, the output characteristics are a plot of  $I_E$  vs  $V_{CE}$  for a range of values of  $I_B$ .



**Fig 4.9 : Output characteristic in CC configuration for npn transistor**

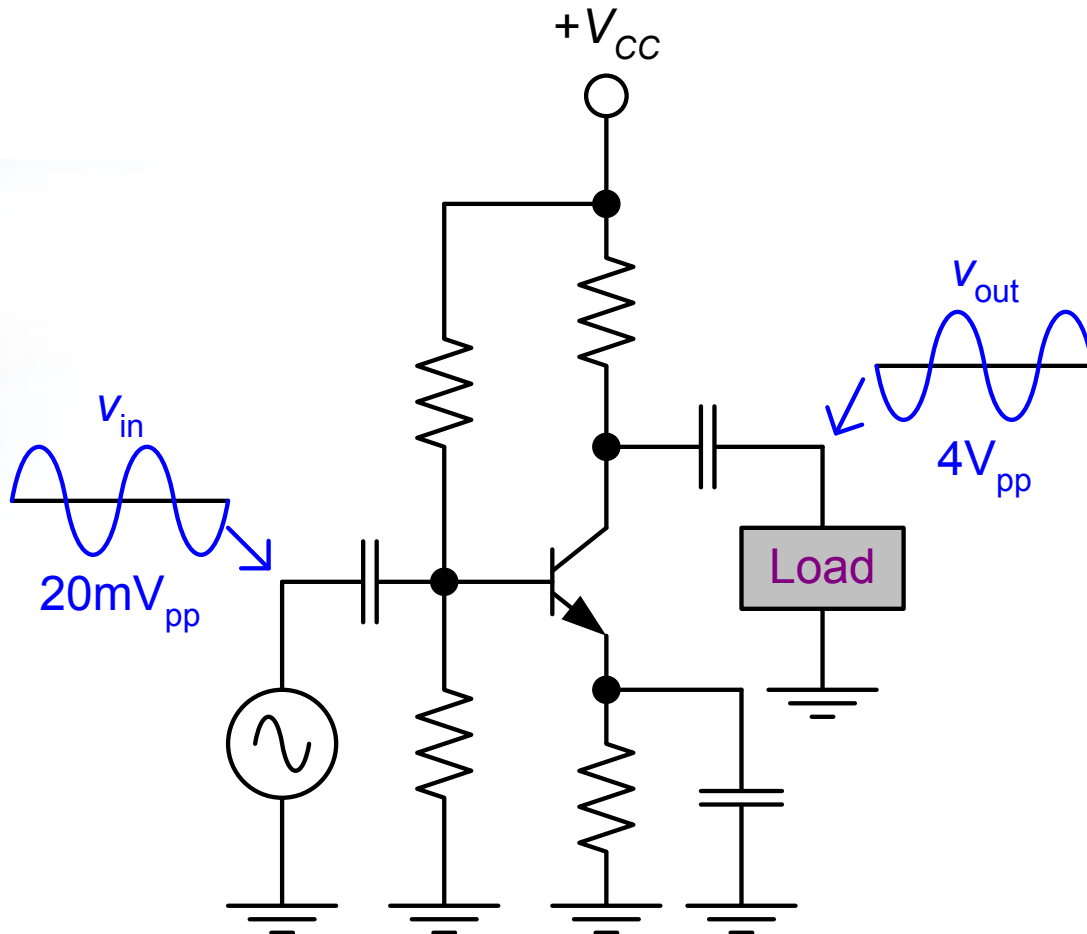
# BJT Amplifier Configurations

- Common-emitter (CE) amplifier
- Common-collector (CC) amplifier
- Common-base (CB) amplifier

# Property ranges.

Property	Low	Midrange	High
Gain	< 100	100-1000	> 1000
Impedance	< 1k $\Omega$	1k $\Omega$ -10k $\Omega$	> 10k $\Omega$

# Common-emitter (CE) amplifier.

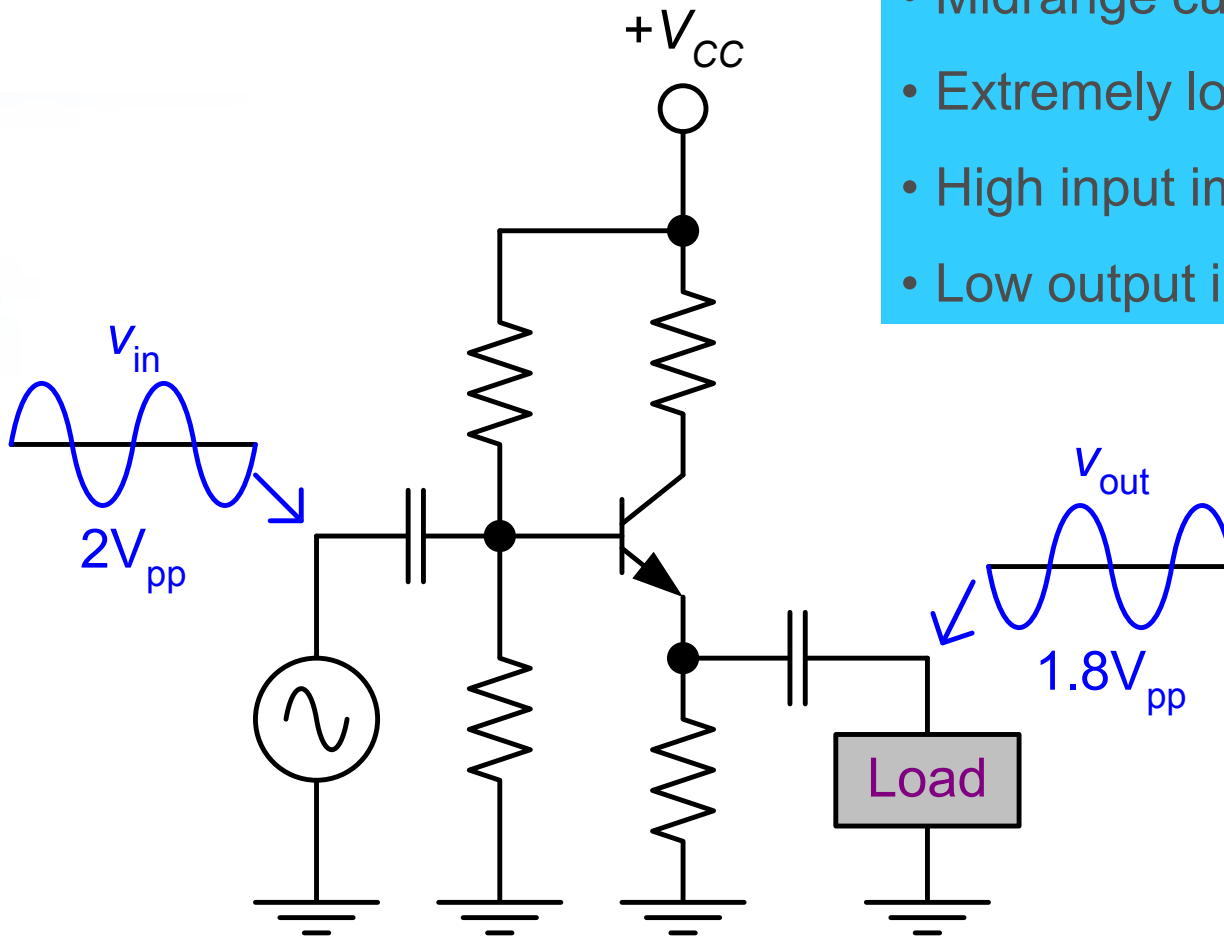


- Midrange values of voltage and current gain.
- High power gain
- Midrange input impedance
- Midrange output impedance



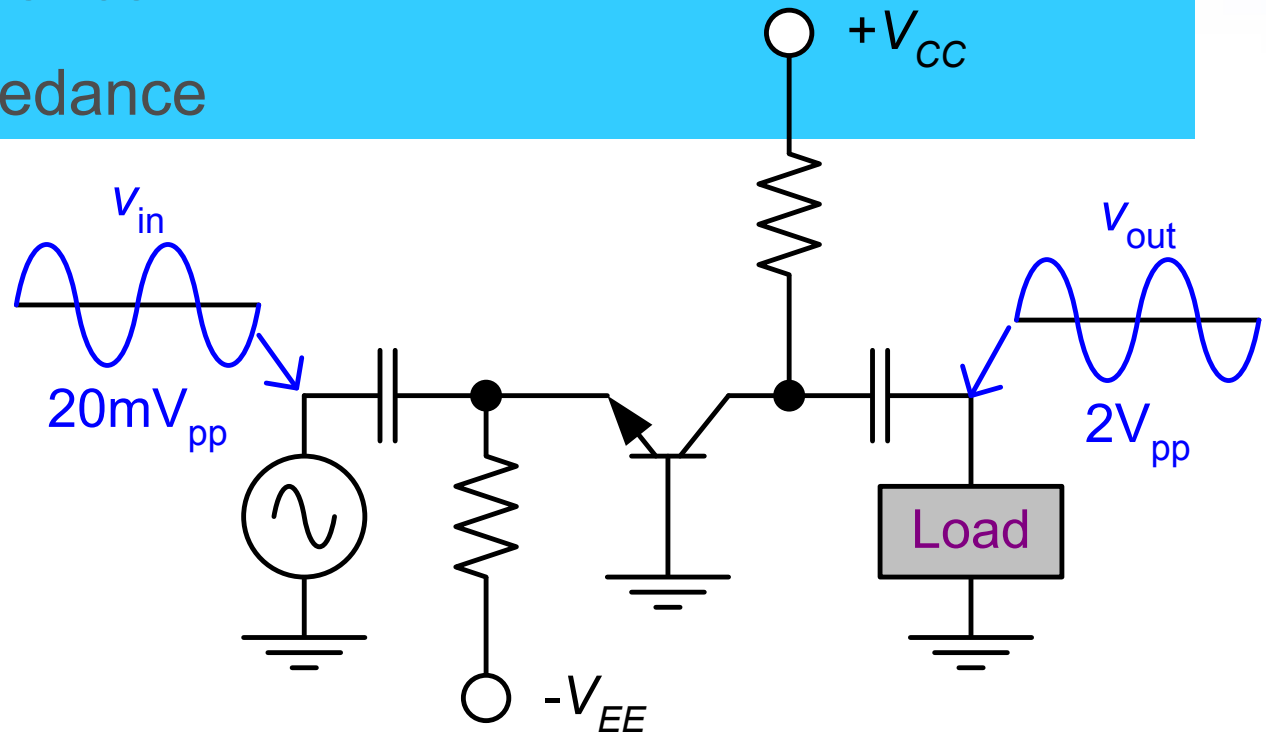
# Common-collector (CC) amplifier.

- Midrange current gain.
- Extremely low voltage gain
- High input impedance
- Low output impedance



# Common-base (CB) amplifier.

- Midrange voltage gain
- Extremely low current gain (slightly less than 1)
- Low input impedance
- High output impedance



# A comparison of CE, CC, and CB circuit characteristics.

Type	$A_v$	$A_i$	$A_p$	$Z_{in}$	$Z_{out}$
CE	Midrange	Midrange	High	Midrange	Midrange
CC	$< 1$	Midrange	$\cong A_i$	High	Low
CB	Midrange	$< 1$	$\cong A_v$	Low	High

$$(A_p = A_v A_i)$$

# BJT Terminal Connections

Type	Emitter	Base	Collector
CE	Common	Input	Output
CC	Output	Input	Common
CB	Input	Common	Output