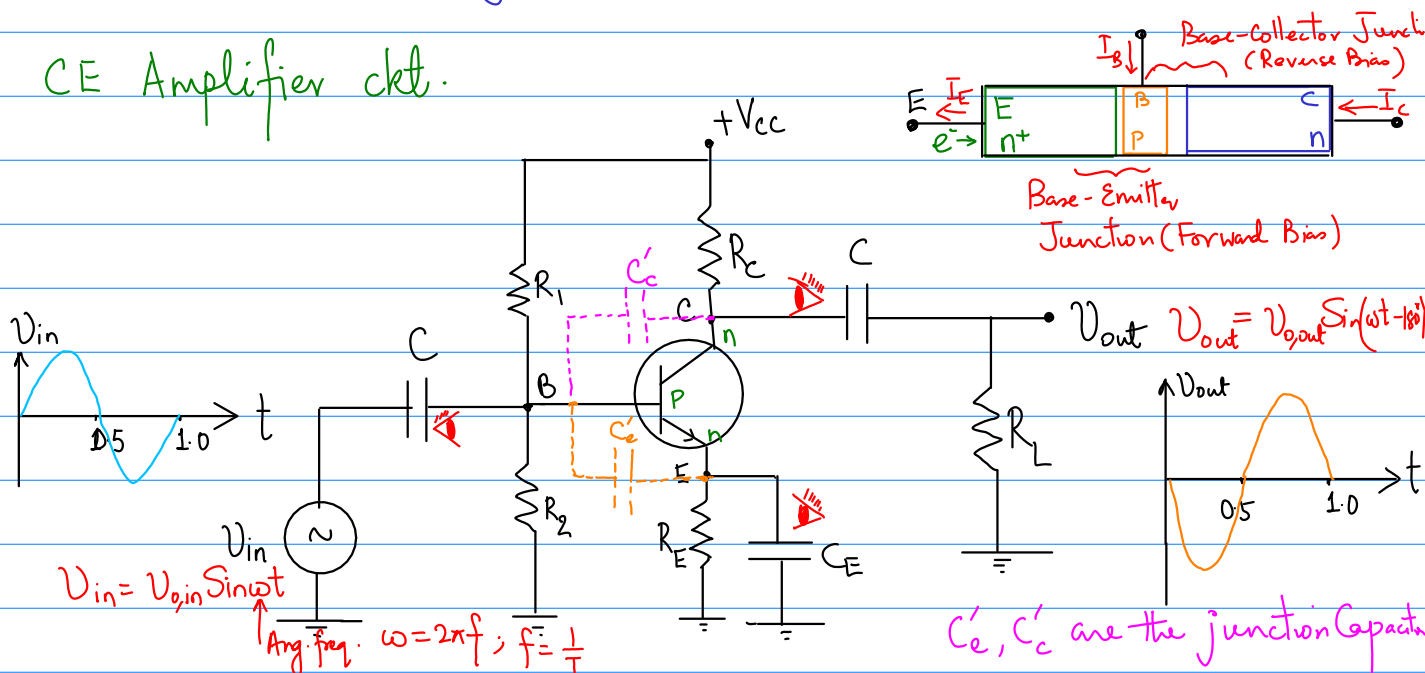


# Frequency Response of CE Amplifier

(Reference: Chapter 16, Malvino & Bates)

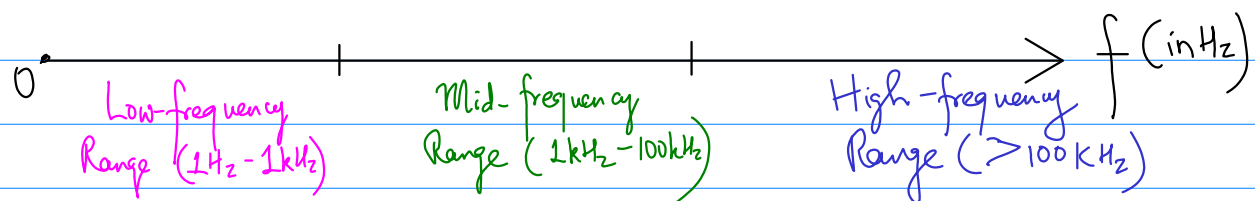
1. How voltage gain ( $A_v$ ) of the CE amplifier changes with varying the frequency of the input signal.
2. Representation of gain (voltage/power) in units of decibel (dB)

CE Amplifier ckt.

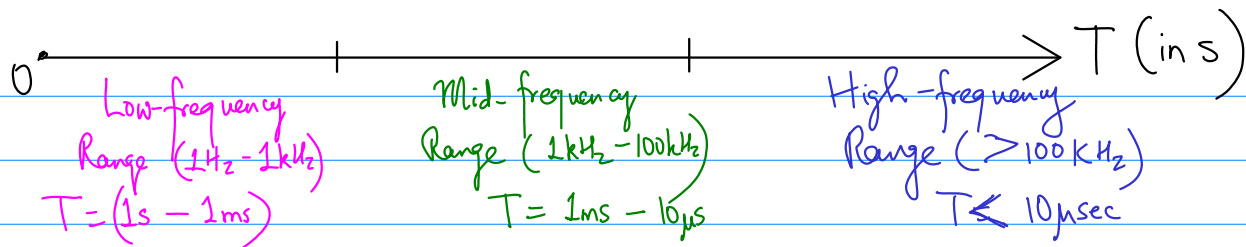


- 1) In dc analysis: All capacitor are "OPEN".
- 2) In ac analysis: All capacitors are "SHORT".

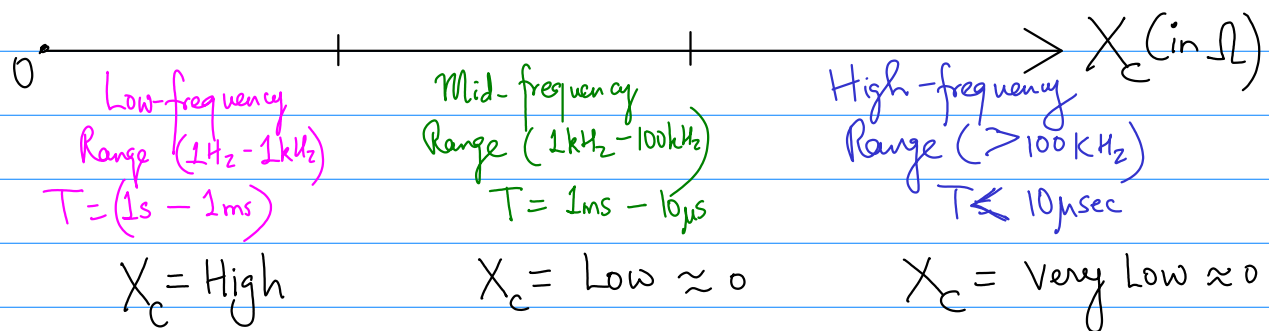
$$X_C = \frac{1}{\omega C} = \frac{1}{2\pi f C}$$



$$T = \frac{1}{f}$$



$$X_C = \frac{1}{2\pi fC}$$



Upto now, we have analyzed the CE amplifier in which the frequency of the input signal fall in the mid-frequency range.

Therefore, the <sup>value of</sup> reactance of the capacitors are small as compared to the equivalent resistance seen by the capacitors. Hence, the capacitors are "SHORT".

Ques: Is this assumption valid in Low-frequency range?

- NO -  $\Rightarrow$  Effectively the voltage gain REDUCES.

Ques: Is this assumption valid in high-frequency range?

- YES -  $\Rightarrow$  Effectively the voltage gain "REDUCES".

At high-frequencies, the base-emitter junction and base-collector junction effectively behaves as a capacitor. Thereby, they offer reactance to the input & output signal.

Hence, the gain reduces.

