SINGLE BIPOLAR TRANSISTOR

AMPLIFIER TYPES

1 - Common Emitter
2 - Common Collector
3 - Common Base

- Definition
- Configuration
- Basic Characteristics
- Typical Uses
1. Common Emitter

- Most common type of G.P. Amplifier

- Input signal connected to base
- Output taken from collector

Features

- Moderate/high input impedance
- Moderate output impedance
- High voltage gain
- High current gain

Example

- Output is inverted
- Most common amplifier for many applications

\[ R_e = \frac{1}{g_m} = \frac{V_I}{I_C} \approx \frac{26 \text{mV}}{I_C} \]

\[ A_{V} \approx \frac{R_e}{R_e + R_F} \]
Common Collector
- Also called Emitter Follower

- Input connected to base
- Output from emitter

Features
- Moderate/high input impedance
- Low output impedance
- Low (unity) voltage gain
- High current gain

Example
- Most often used as a buffer
- Easily drives various loads
③ COMMON BASE

- LEAST COMMON, GOOD FOR RF, HIGH FREQUENCY

- INPUT CONNECTED TO Emitter
- OUTPUT TAKEN FROM Collector

FEATURES

- LOW INPUT IMPEDANCE
- MODERATE / HIGH OUTPUT IMPEDANCE
- HIGH VOLTAGE GAIN
- ≅ UNITY CURRENT GAIN

EXAMPLE

- RF AMPLIFIERS