\[ I = 10^{-14} \]

\[(e \mu / V_o) \]

\[ I = I_0 (e \mu / V_o) \]

\[ \text{Recall} \]

\[ \text{Recall 6} \]
NPN Transistor

- Actual Shape
- Width of Base < Width of Collector
- Not Same Conduction Levels
- Not Symmetrical

Base
Collection
Smntec
Smntec
Smntec

PND

Bipolar Junction Transistor
- In NPN, go (E-B)
- Change E to C
- Change C to E
- The NPN is "Narrow Enough"
- D.C. Space-Charge Region
- If B is Insufficient Than The Gater
- Electrons can Pass into the Gate
- If B is Insufficient Enough

B-C Function is Reversed - Biasing
B-E Function is Forward - Biasing

See Textbook: (Dual Active Region)
\[ \text{Morton C. Urelements} \]
Common-Emitter Configuration

\[ V_{BB} = \frac{R_B}{R_C} V_{CC} \]

\[ I_B = \frac{R_C}{R_B} I_E \]

\[ c = \frac{P_T}{I_E} \]

\[ \frac{P_T}{I_E} \ll 1 \] (Common-emitter Current Gain)\n
\[ B \gg B' \] and very small \[ m(0) \ll p(0) \] because \[ \frac{2}{N} \gg N \]
\[ I_C = \frac{1 - \alpha F}{\alpha F} \]

But \( I_C = \alpha I_E \)

\[ I_E = \frac{1 + \beta}{\beta} I_C = \frac{1 + \beta}{\beta} \cdot \alpha I_E \]

\[ I_C = -\frac{1}{\beta} \]

\[ I_E = I_C + I_B \]

\[ V_E > 0 \quad g = 0 \quad E = 0 \quad I_C = 0 \quad I_B = 0 \quad V_{CE} = 0 \quad I_E \quad V_E \quad I_C \quad V_{CE} \]

\[ R_C \quad R_E \quad R_B \]

\[ V_{CE} \quad I_E \quad I_C \quad V_E \]
(Nothing left) \( V_C = 0 \text{ V} \)

All Electronics (PNP)

Recall

As long as \( V_C > 0 \), B-C is reverse biased.

Ve changes \( V_e \)

Current - Voltage Characteristics