Mon. 17 Oct 2016

- N_A small, N_D large

NPN Circuit Symbol

BE Junction is Forward biased
BC Junction is Reverse biased

$i_E = I_{ES} \left( e^{V_{BE}/V_T} - 1 \right)$

$i_C = B \cdot i_B$

$B \approx 100$ ??

Arrow on E in direction of current P to N
Current Equation

\[ i_E = I_{ES} e^{\frac{V_{BE}}{V_T}} \]

\[ i_C = \beta i_B \]

\[ i_E = i_B + i_C \]

\[ i_C = I_S e^{\frac{V_{BE}}{V_T}} \]

\[ I_S = \alpha I_{ES} \]

\[ \beta = \frac{B}{B+1} \]

\[ \alpha = \frac{B}{1-\alpha} \]

BE I-V Curves

EC I-V Curve (Parametric)

Saturation Region

\[ R_c = 25k \]

\[ V_{CE} = 12V \]

Cutoff Region