

$$\frac{I_o}{I_i} = 1 - \frac{R_a}{R_2 + R_a + R_b}$$

$$\frac{V_o}{V_i} = \frac{R_o}{R_i \left[ 1 + \frac{R_a}{R_2 + R_b} \right] - R_a \frac{(R_1 - R_2 - R_b)}{R_2 + R_b}}$$

$$\frac{I_o}{I_i} = 1$$

$$\frac{V_o}{V_i} = \frac{R_o}{R_i + R_a}$$

$$Z_i = (\text{Beta})_{\text{nnp}} (\text{Beta})_{\text{pnp}} (R_i + R_a)$$