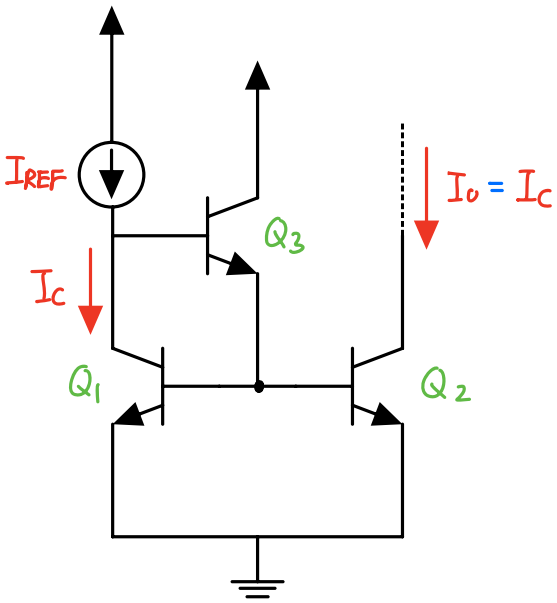
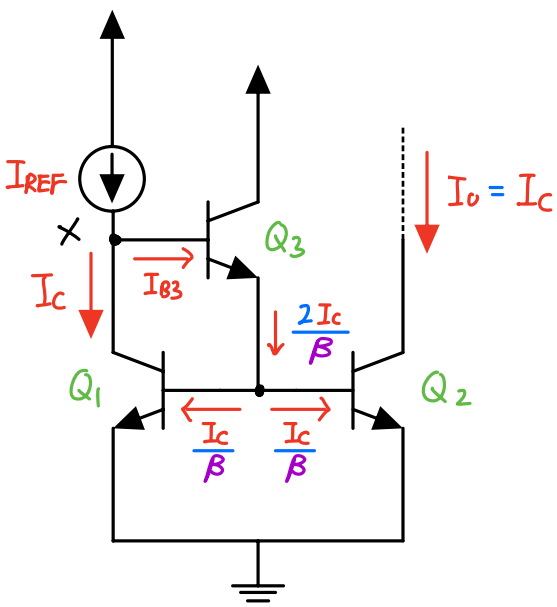
A Bipolar Mirror with Base-Current Compensation



假設 Q_1 和 Q_2 matched 因此 $I_{C1} = I_{C2} = I_C$



node X :

$$I_{B3} = \frac{1}{\beta+1} \times \frac{2I_C}{\beta} = \frac{2 \times I_C}{\beta \times (\beta+1)}$$

$$I_{REF} = I_C + I_{B3}$$

$$I_{REF} = I_C \times \left[1 + \frac{2}{\beta \times (\beta+1)}\right]$$

其中 $I_o = I_C$ 因此可得

$$\frac{I_o}{I_{REF}} = \frac{1}{1 + \frac{2}{\beta^2+\beta}}$$

忽略 $\beta^2+\beta$ 的 β 可得

$$\frac{I_o}{I_{REF}} = \frac{1}{1 + \frac{2}{\beta^2}}$$ ※

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