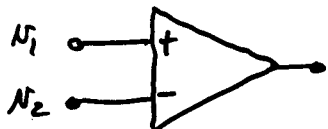


Differential Amplifiers

Differential amplifiers are amplifiers that sense and amplify the difference between two voltages and reject the average of the two voltages.



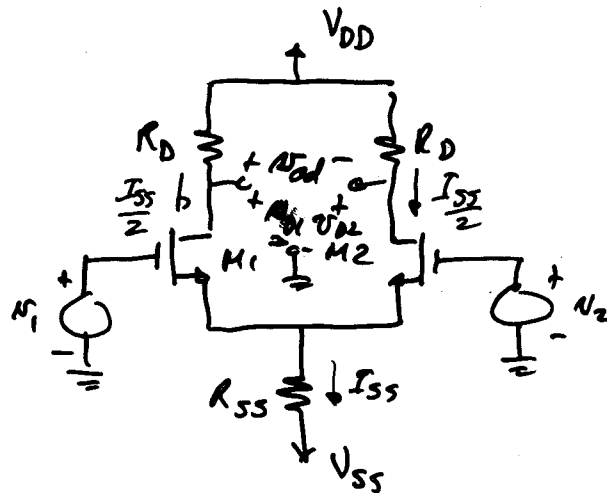
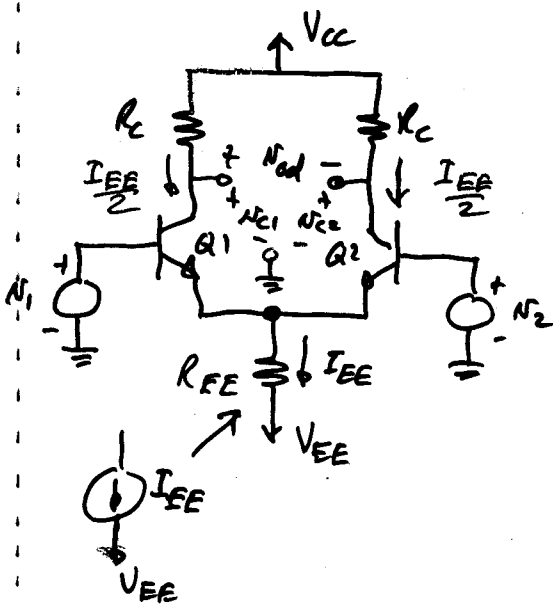
$$N_{out} = A_{nd}(N_1 - N_2) \pm A_{cm}\left(\frac{N_1 + N_2}{2}\right)$$

$$= A_{nd} N_{id} \pm A_{cm} N_{cm}$$

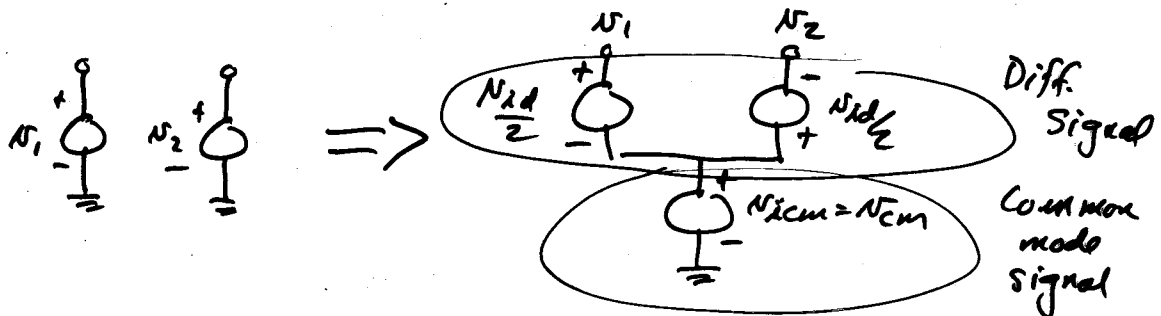
$\therefore N_{id} \equiv N_1 - N_2$ and $N_{cm} \equiv \frac{N_1 + N_2}{2}$

A "good" differential amplifier has $|A_{nd}| \gg |A_{cm}|$.

Circuits



AC Analysis of a Diff. Amp.



AC Analysis - Differential Mode

