

Lecture 4

Amplifiers

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- many applications

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Symbol

Characteristics

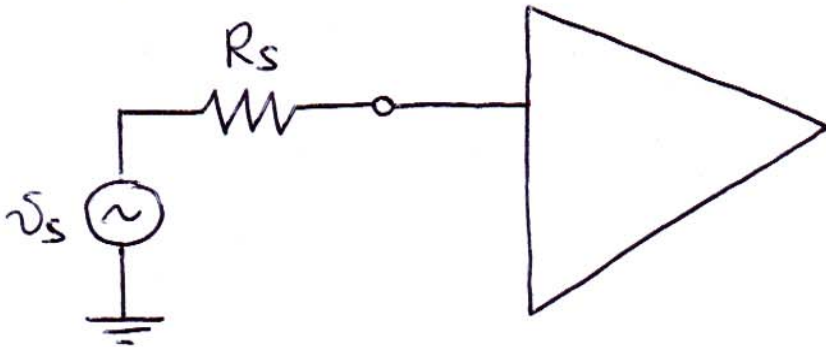
① Gain

decibels

Q: why dB?

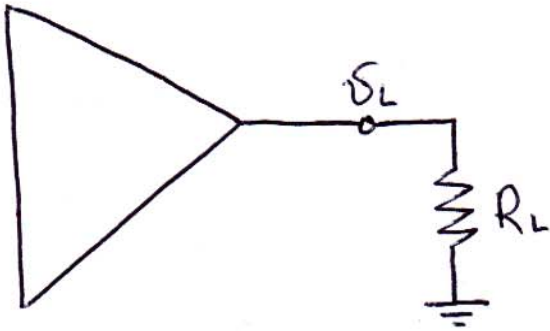
| $G = v_{out} / v_{in}$ | $G_{dB}$ |
|------------------------|----------|
| 1                      | 0 dB     |
| $\sqrt{2}$             | +3 dB    |
| 2                      | +6 dB    |
| 10                     | +20 dB   |
| $\frac{1}{10}$         | -20 dB   |

② Input resistance



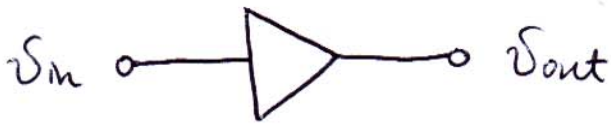
Q: what input impedance is ideal?

③ Output Impedance

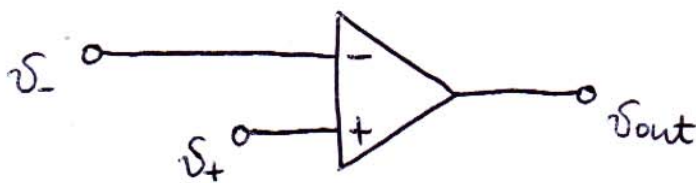


Input types

a) single input



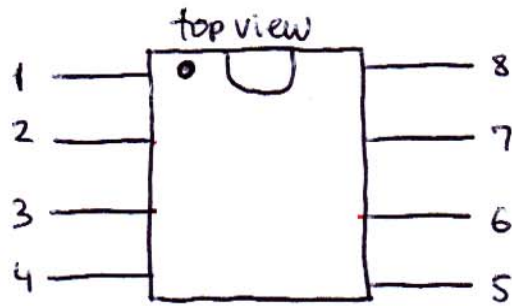
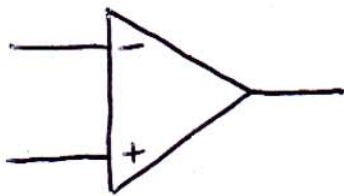
b) differential



# Operational amplifier

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741 and 3140 op-amps used in the lab

## Manufacturer spec sheets

- everything you need to know about an IC
- see PDF's on the course web-site / books in the lab

## Powering op-amp

