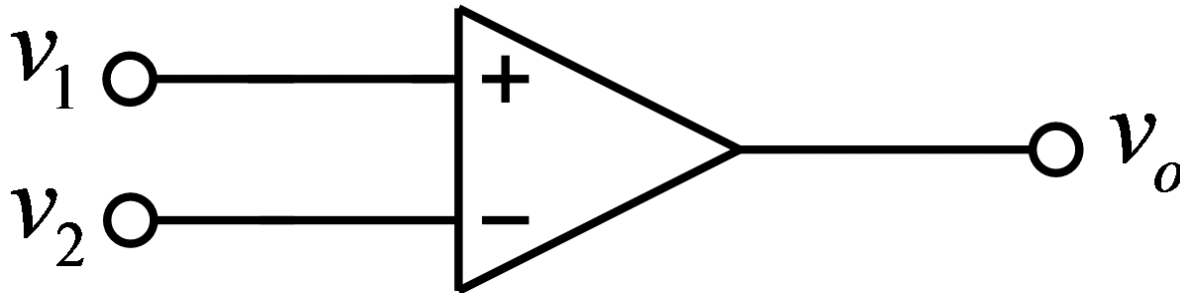

OP Amps

Basics

Circuit Symbol



$$v_o = G(v_1 - v_2)$$

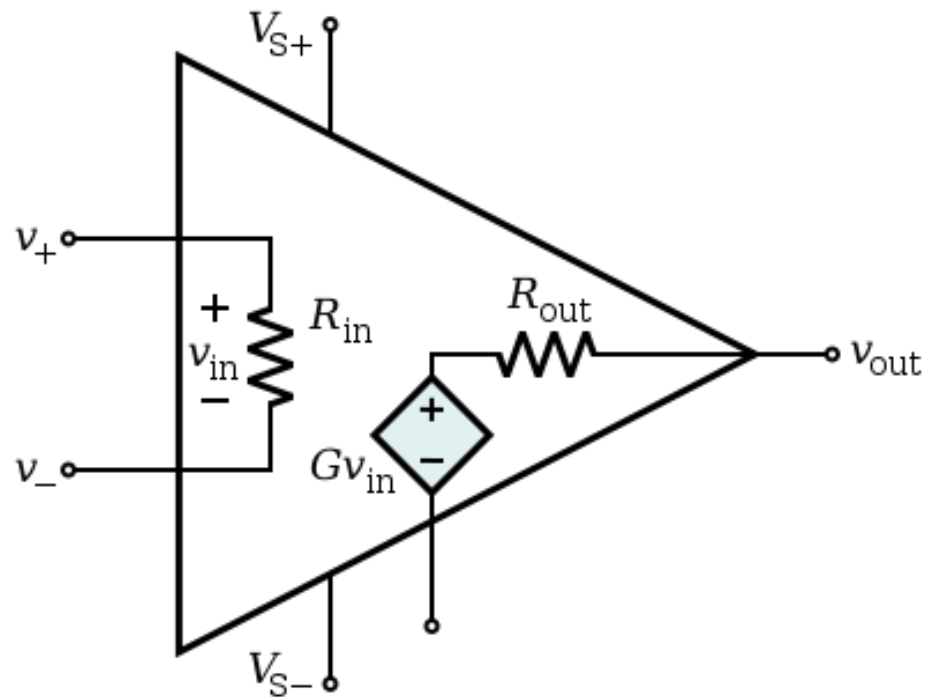
- Ideal OP amp

$$G = \infty$$

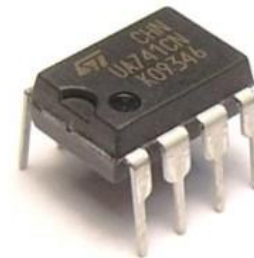
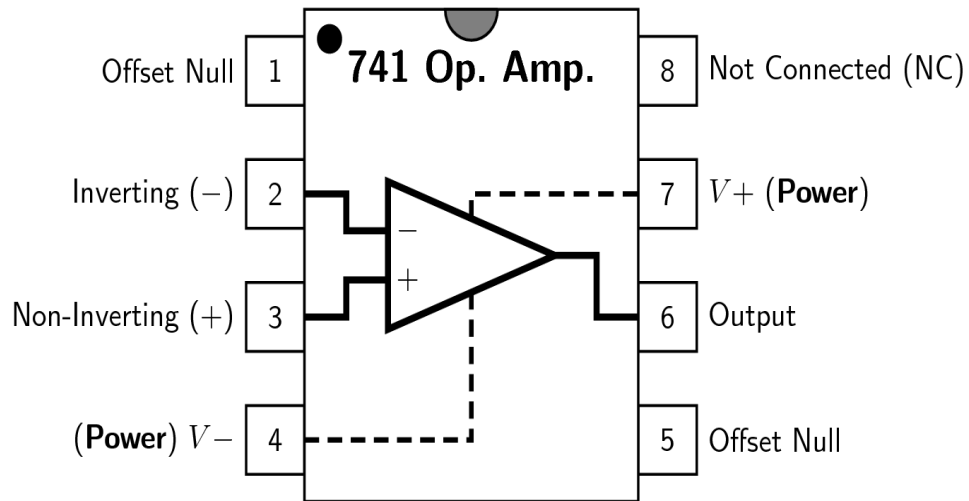
Input impednace = ∞

Band width = ∞

Real OP amp equivalent circuit

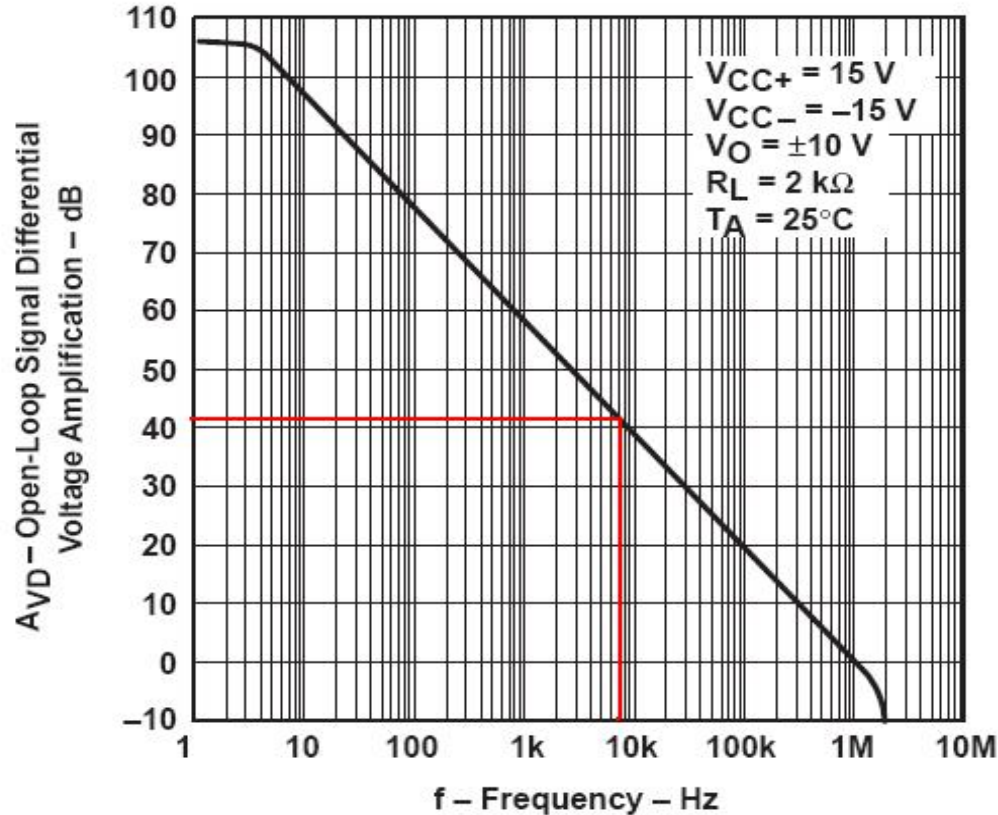


Real OP amp

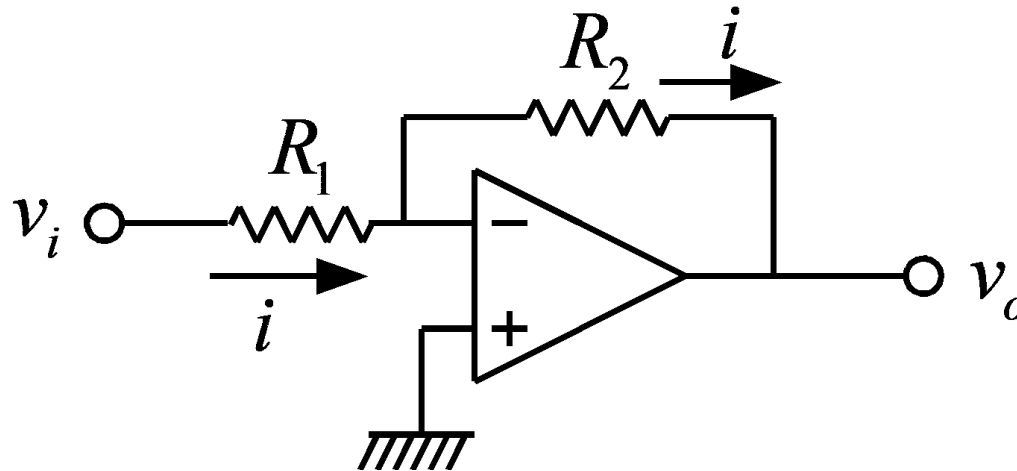


Frequency Response

OPEN-LOOP LARGE-SIGNAL DIFFERENTIAL
VOLTAGE AMPLIFICATION
VS
FREQUENCY



Feedback: Inverting Amplifier

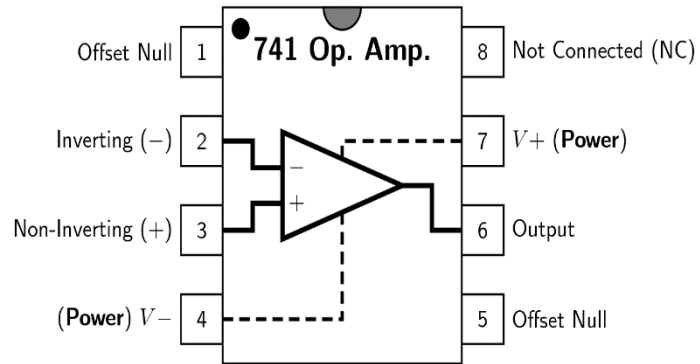


- Virtual ground

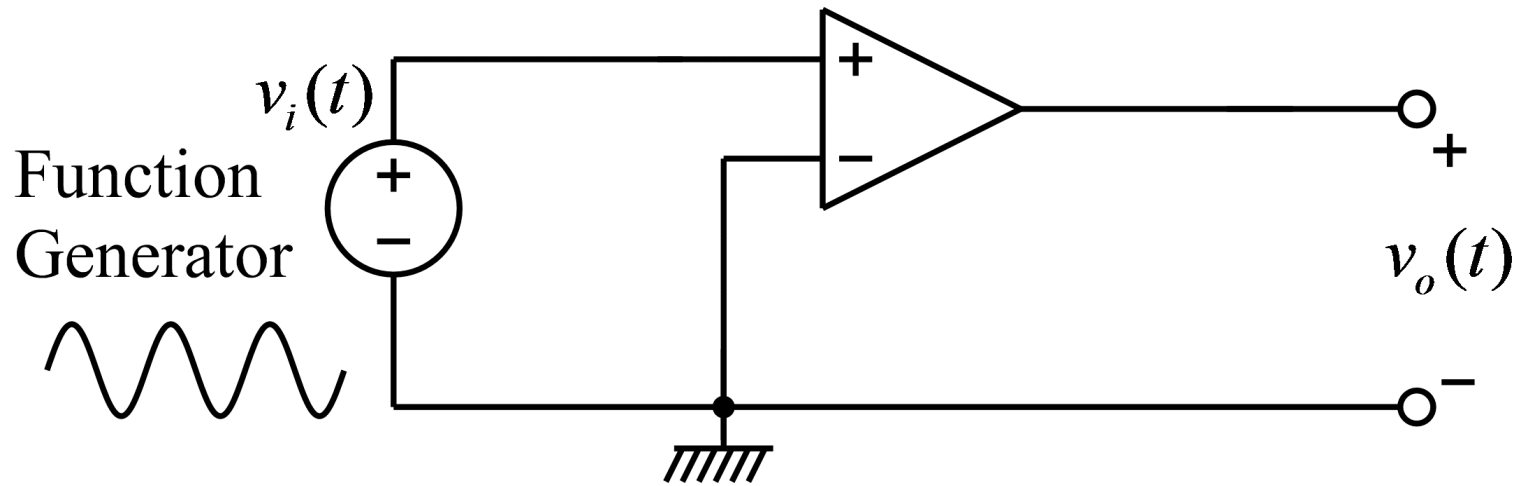
$$i = \frac{v_i}{R_1}$$

$$v_o = -R_2 i = -\frac{R_2}{R_1} v_i$$

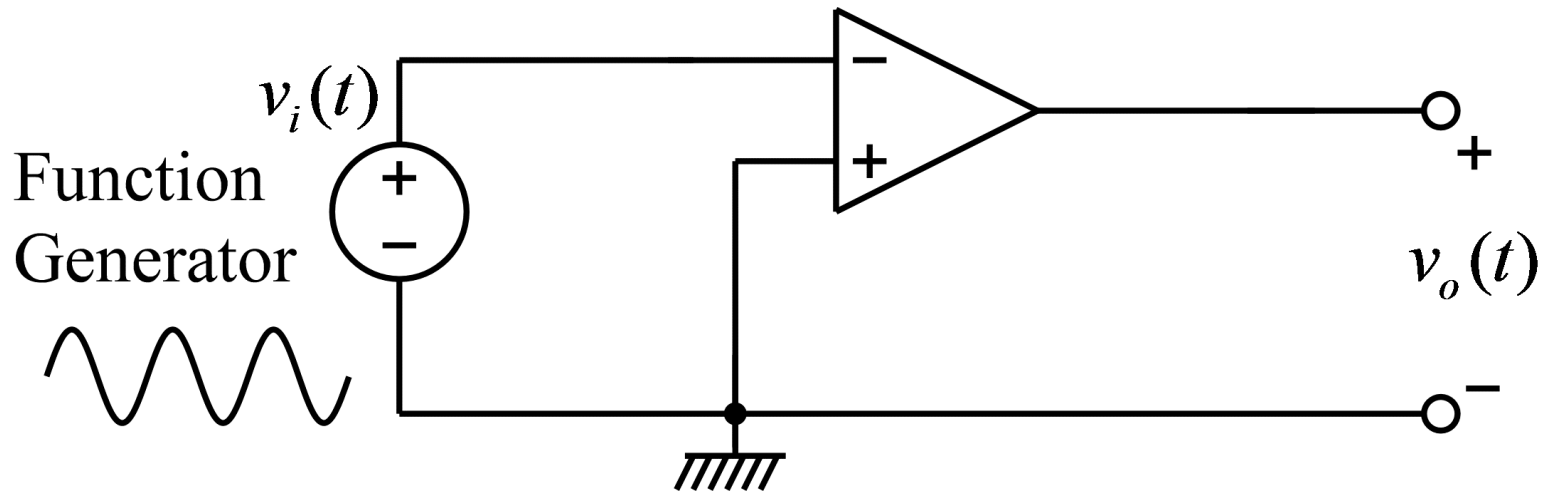
Power Supply: +/- 15 Volts



Open Circuit



Open Circuit



Frequency Response

