ECE2101L
Electrical Circuit Analysis II Laboratory

Lab 8
Op Amp in AC Circuits

Prelab

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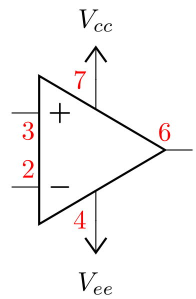
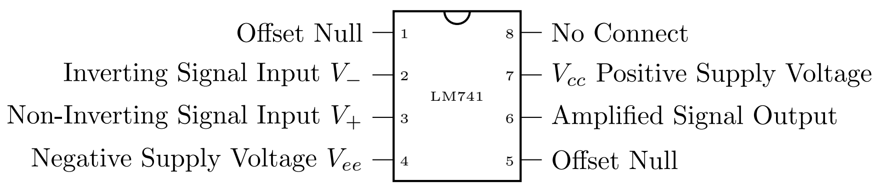
1 Op amp LM 741

1.1 Pinout and circuit diagram of LM741





1.2 Specification of LM741

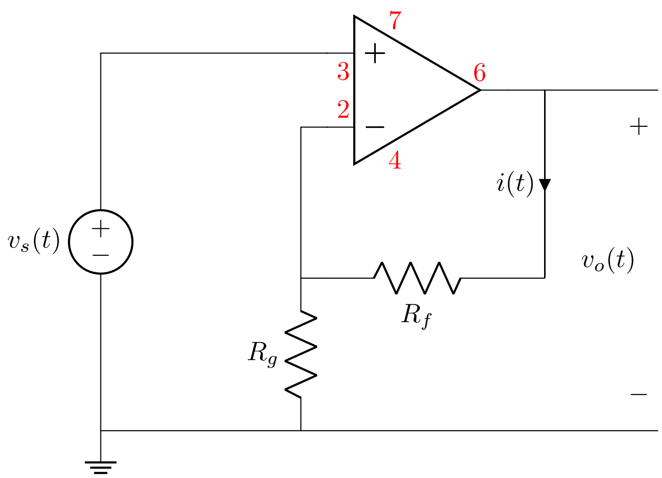
Texas Instrument's LM741 Datasheet section Absolute Maximum Rating is referenced for the information below:

1.2.a Supply voltage rating: $\pm 22\,\mathrm{V}$

1.2.b Input voltage rating: $\pm 15\,\mathrm{V}$

1.2.c Differential Input voltage rating: $\pm 30\,\mathrm{V}$

2 Voltage and current relation in op amp circuit



2.1 Output voltage v_o and current i

Assuming ideal op amp, no current is flowing into inverting input and there is no voltage difference between inverting and non-inverting input, therefore i is both the current flowing across R_f and across R_g and voltage at inverting input is v_s. Then:

$$i = \frac{v_s}{R_g}$$

$$v_o = iR = \frac{v_s}{R_g}(R_f + R_g) = (\frac{R_f}{R_g} + 1)v_s$$

2.2 Gain

$$G = \frac{v_o}{v_s} = (\frac{R_f}{R_g} + 1)\frac{v_s}{v_s} = \frac{R_f}{R_g} + 1$$