TLV376 Riso-Dual-Feedback Stability

Component selection

$f_{gbw} := 5.5\ MHz$ $C_{load} := 1100\ nF$ $R_o := 100\ k\Omega$

$$R_{iso} := \frac{1+\sqrt{1+8\cdot\pi\cdot R_o\cdot C_{load}\cdot f_{gbw}}}{4\cdot\pi\cdot C_{load}\cdot f_{gbw}} = 51.303\ \Omega$$

$R_{f\_min} := R_{iso}\cdot 100 = 5.13\ k\Omega$

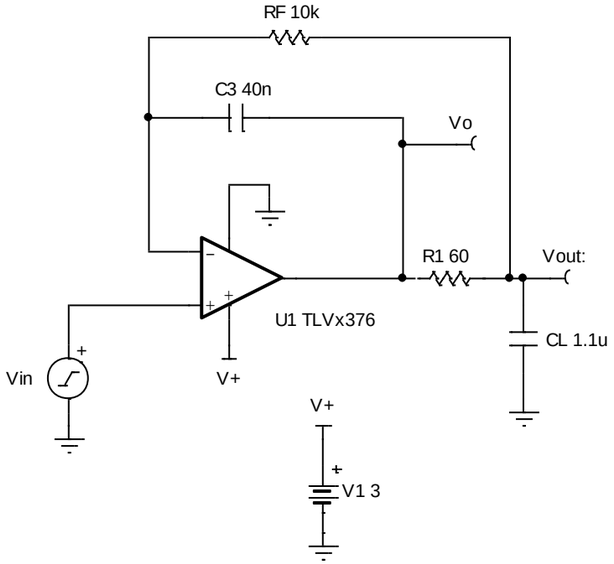
$R_f := 10\ k\Omega$

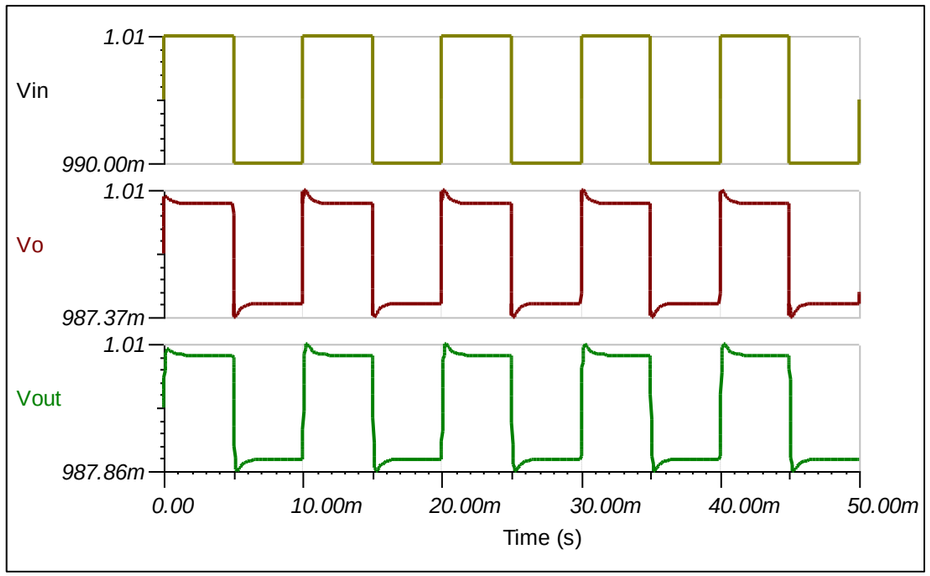
$$\frac{5\cdot R_{iso}\cdot C_{load}}{R_f} = 28.217\ nF$$

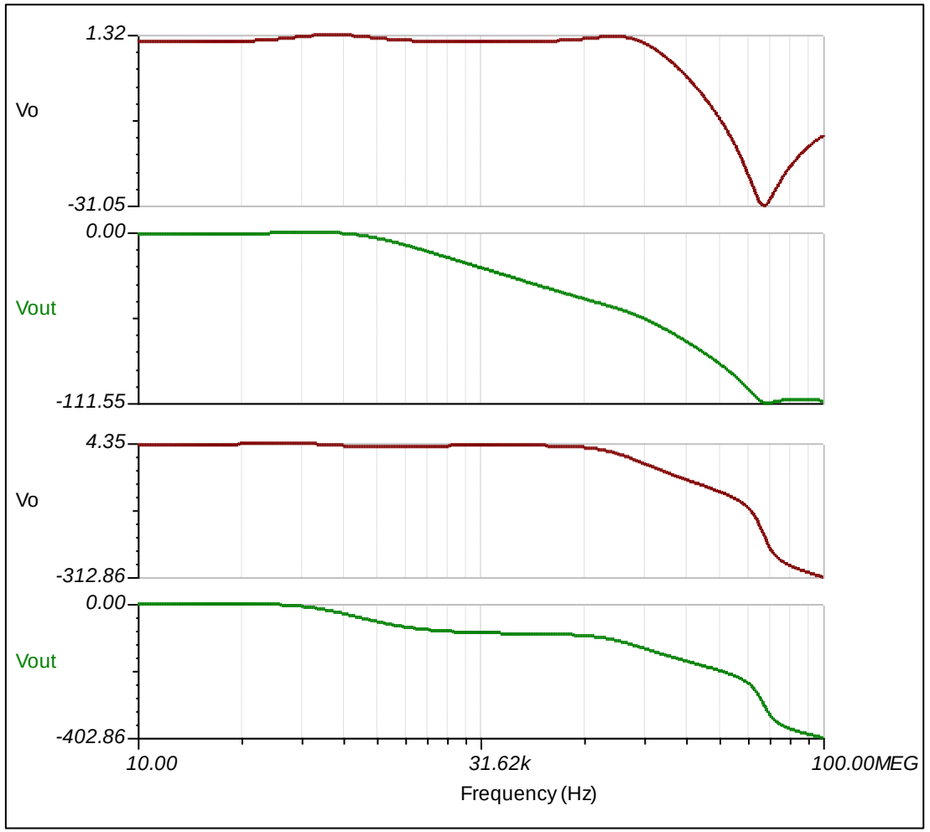
$$\frac{10\cdot R_{iso}\cdot C_{load}}{R_f} = 56.433\ nF$$

See app note below for details:
Determine Optimal Isolation Resistance for Driving Capacitive Load
https://www.ti.com/lit/an/sboa418/sboa418.pdf

Step and AC response

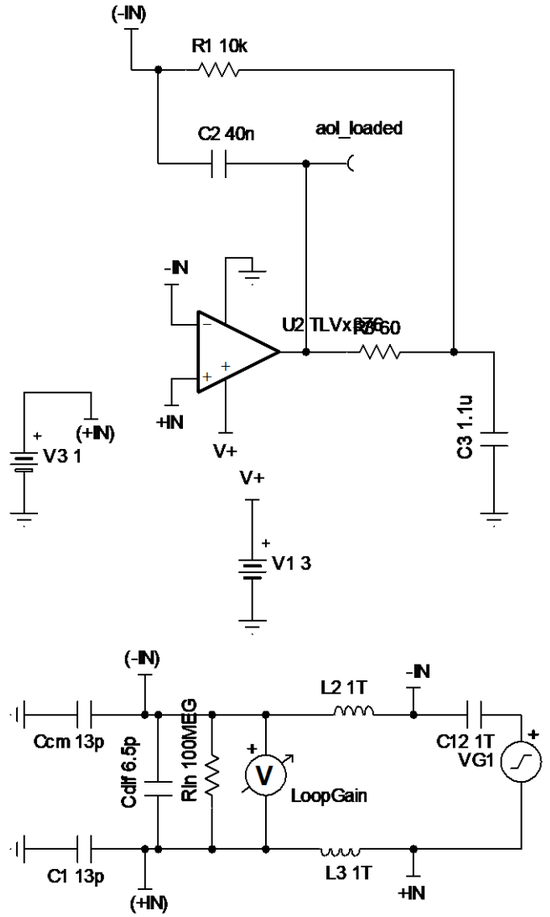


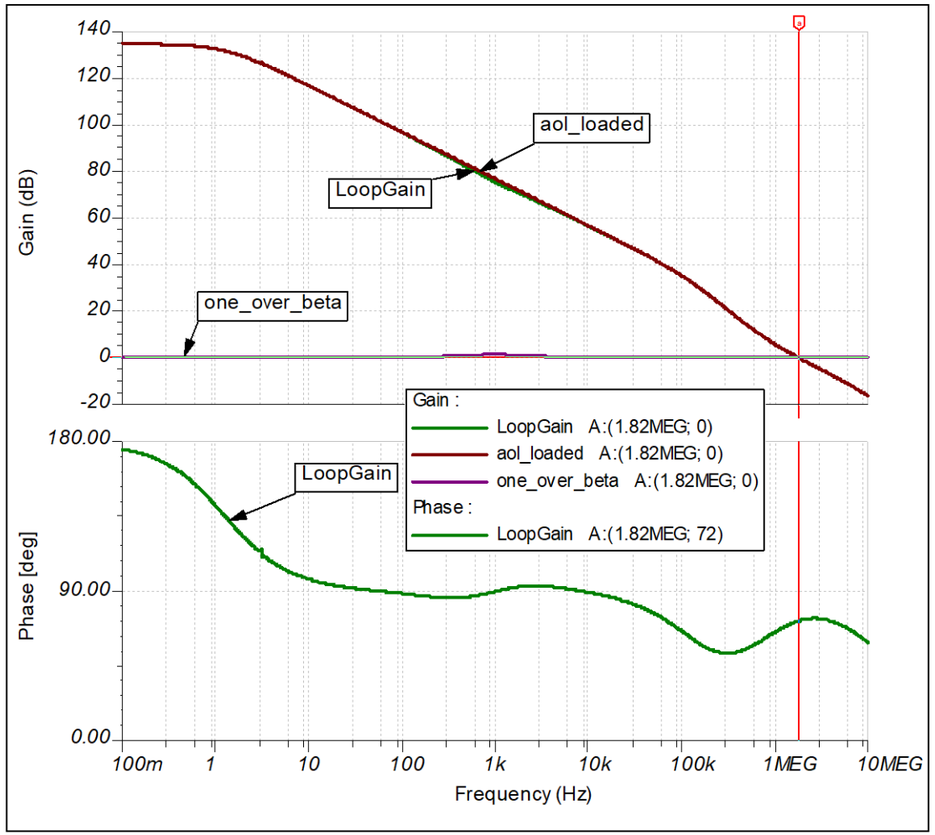




- Minimal overshoot on step response
- Minimal gain peaking in AC response

Loop stability test (Phase Margin 72deg)





See video series below for details:
Precision labs series: Op amps | TI.com
https://www.ti.com/video/series/precision-labs.html