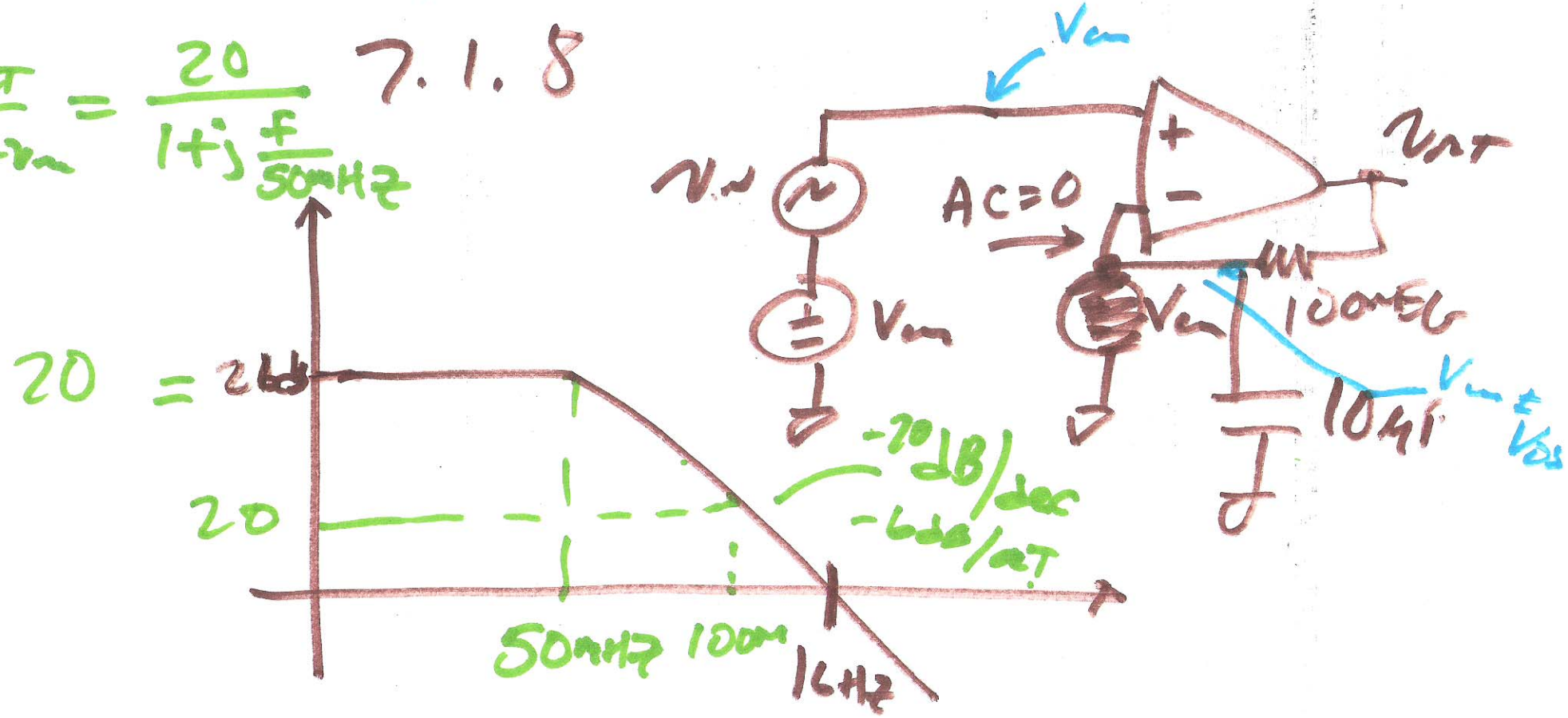
NOV. 5, 2014

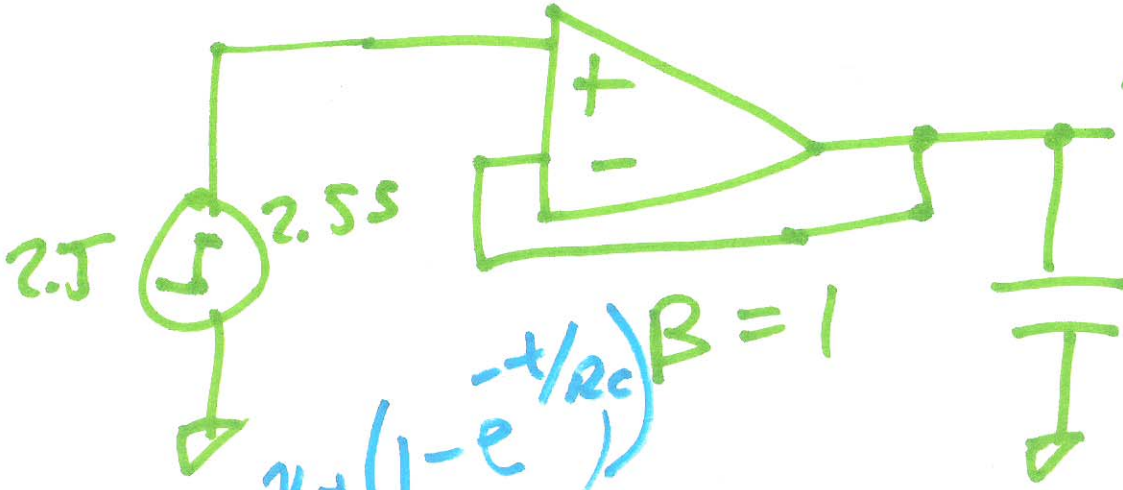
Op-Amp settling time

7.1.8

$$\frac{V_{out}}{V_{p-in}} = \frac{20}{1+j\frac{f}{50MHz}}$$



$$A_{OL} = \frac{v_{out}}{v_{in}} = \frac{20}{1 + j\frac{f}{50MHz}}$$

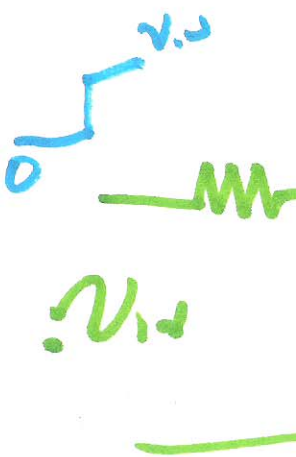


$v_{out} = 50mV\,(1 - e^{-t/15ps})$

$v_{out} = v_{in}(1 - e^{-t/RC})$

τ

$$A_{CL} = \frac{A_{OL}}{1 + \beta A_{OL}} = \frac{20}{20 + 1 + j\frac{f}{50MHz}}$$



β, A_{OL}, 1

$$\frac{v_{out}}{v_{in}} = \frac{1}{1 + j\frac{f}{1/2\pi RC}} \approx \frac{1}{1 + j\frac{f}{1GHz}}$$

$\frac{1}{2\pi\tau} = 1GHz$

$\tau = \left(\frac{1GHz}{6.28}\right)^{-1} = 159ps$

$\frac{1ns}{6.28} = \frac{1}{1G \cdot 2\pi}$

$\tau = RC$

$$\beta \cdot v_{out} = v_f = v_{out}\frac{C_F}{C_I + C_F}$$

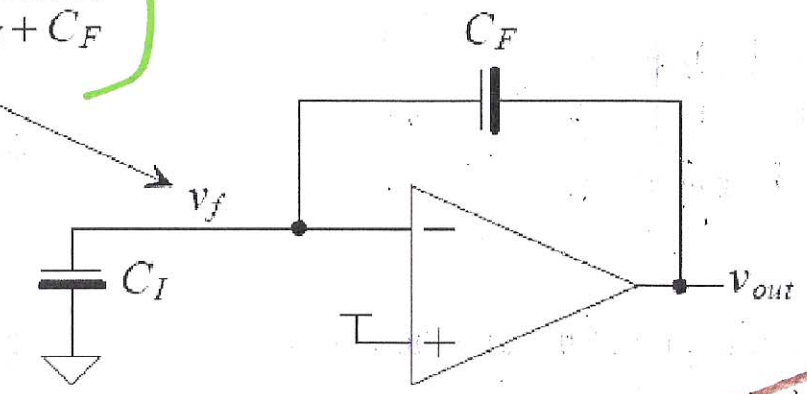


Figure 7.18 The feedback factor in the DAI.

$$-\frac{+}{\frac{1}{2\pi f_{uu}\cdot\beta}}$$

$$v_{out} = v_{out,final}\left(1 - e^{-t/\tau}\right) \qquad \tau = \frac{1}{2\pi f_{uu}\cdot\beta}$$

$$v_{out} = v_{out,final}\left(1 - e^{-t\left/\frac{1}{2\pi f_{uu}\cdot\beta}\right.}\right)$$

$$\frac{T_s}{2} = \frac{1}{2f_s}$$

$$v_{out} = v_{out,final}\left(1 - e^{-\pi\beta\cdot\left(\frac{f_{uu}}{f_s}\right)}\right)$$