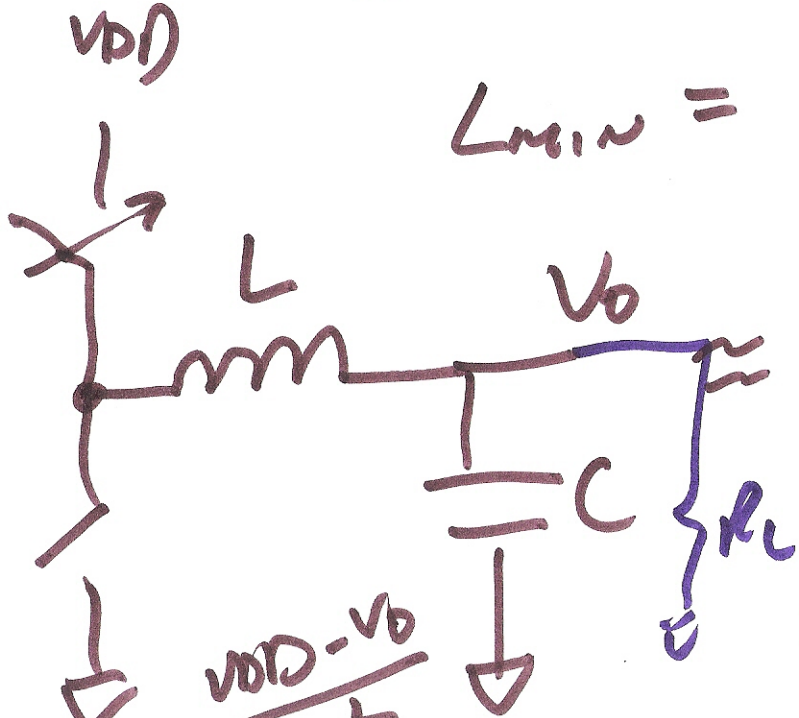
ECE 51472 Power Electronics

BOISE STATE UNIVERSITY

Lecture 37

NOV. 29, 2010

2V @ 100mA $R_L = 20$



$$L_{min} = \frac{(1-D)R_L}{2f}, \quad f \approx 1\,MHz$$

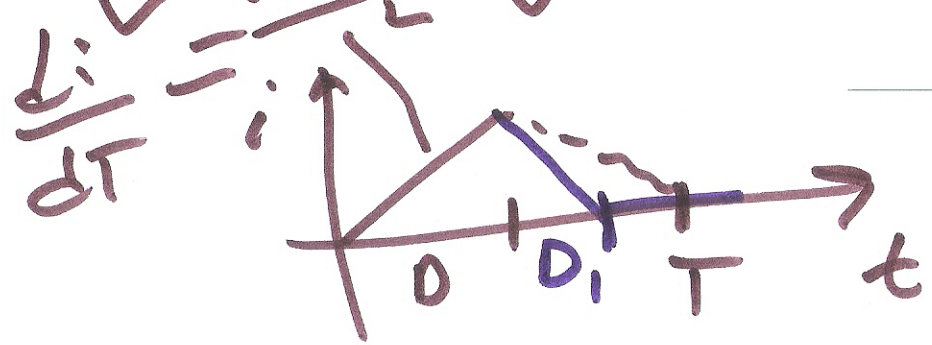
$5 \rightarrow 3$, $V_o = D \cdot V_s$

$\frac{2}{5}$

$.4 \leftarrow D \rightarrow .6$

$$\frac{R_L}{4 \cdot f}$$

$$= \frac{20}{4\,MHz} = \boxed{5\,\mu H}$$



$V_o = D \cdot V_s$ Cont. mode

$V_o = V_s \cdot \frac{D}{D - D_1}$ discont.

1)

Eq. 6-20

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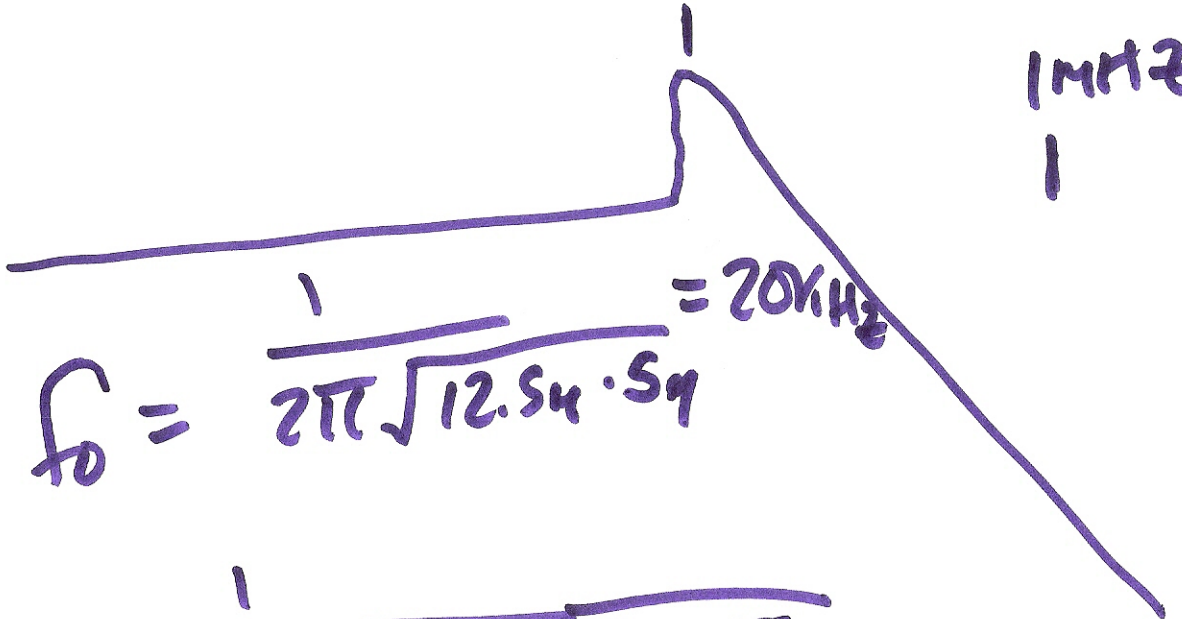
$$C = \frac{1-D}{8L\left(\frac{\Delta\omega}{V_0}\right)f^2}$$

$$f_0 = \frac{1}{2\pi\sqrt{LC}}$$



$$f_0 = \frac{1}{2\pi\sqrt{12.5\mu \cdot 5\eta}} = 20\text{kHz}$$

$$C = \frac{1}{16.5\cancel{k} \cdot .001 \cdot 10^{+2}6}$$

$$= \frac{1}{.08}\ \mu F = 12.5\,\mu F$$

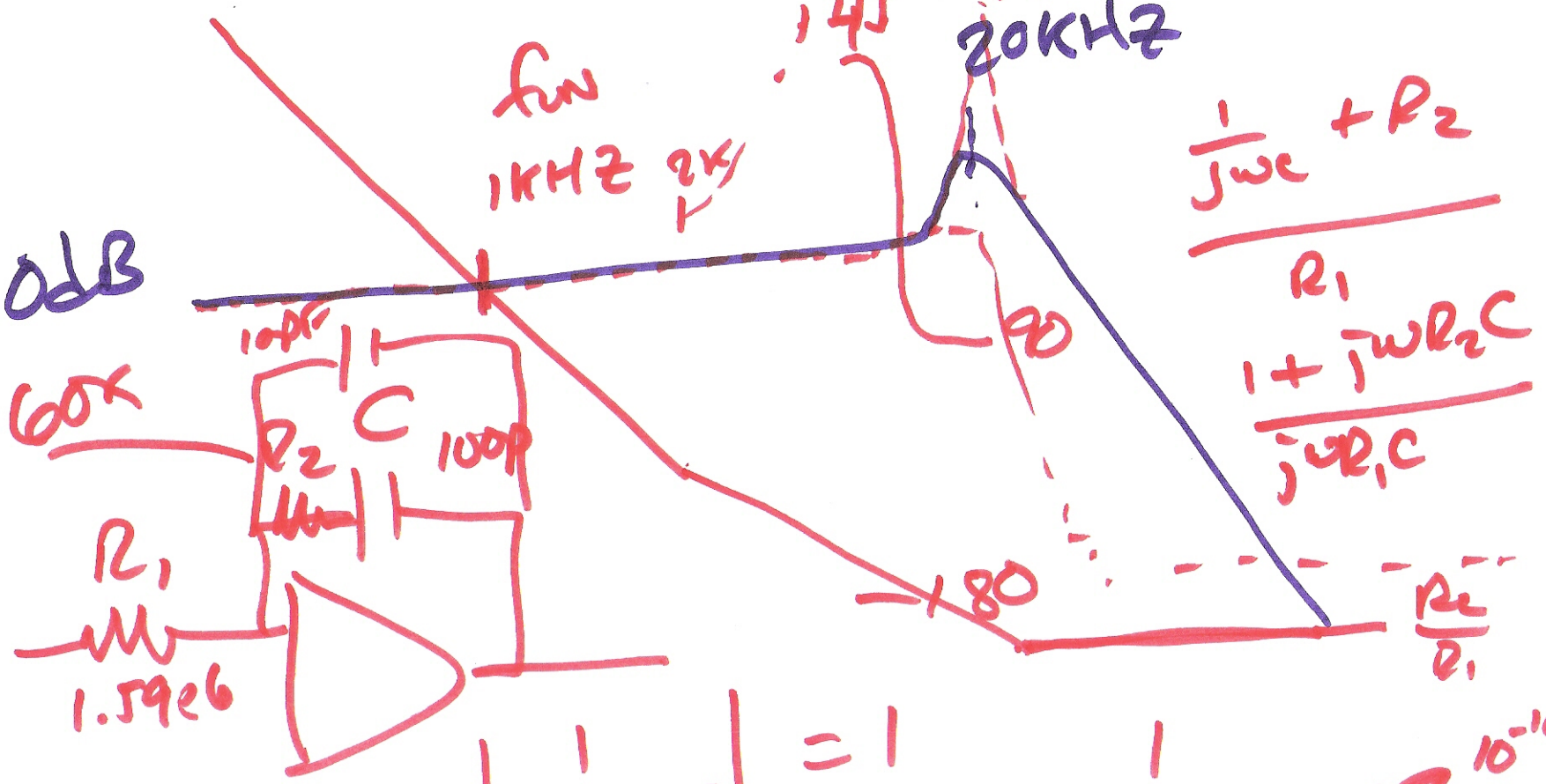
2)

$f_0 = 20\text{KHz}$

$L = 5\,\mu\text{H}$, $C = 12.5\,\mu\text{F}$

$f = \frac{1}{2\pi R_2 C}$

$f_2 = f_0 =$ 20KHz



$$\left| \frac{1}{f \cdot 2\pi R_1 C} \right| = 1$$

$f = 1\text{K}$

$$R = \frac{1}{2\pi \cdot 10^3 \cdot 100\text{pF}}$$

$\frac{1}{2\pi} \cdot 10^7$

10^{-10}

3)