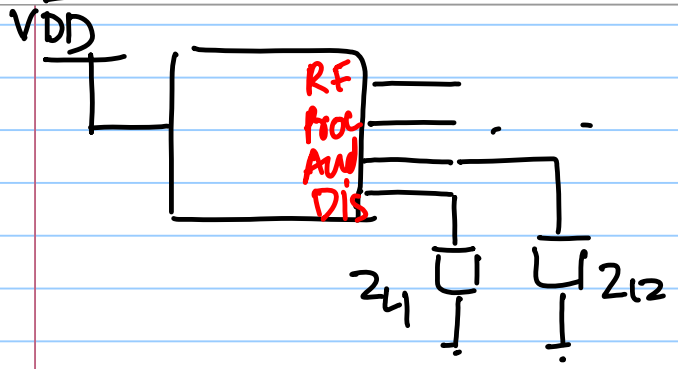
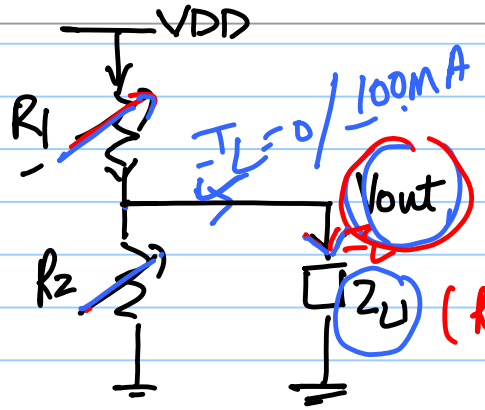
Note Title 13-03-2020

lecture # 27.





$Z_L = 100\Omega$ /

ON : $P_1 \geq P_2$

OFF : P_2

$Z_L = \infty$.

η = Power delivered to load / Power drawn from supply.

Linear Regulators

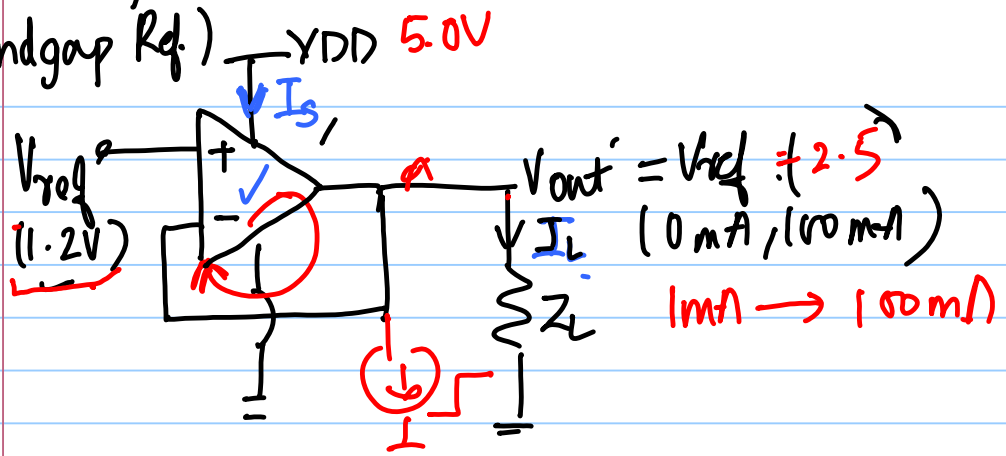
$$\frac{R_2}{R_1+R_2} VDD = Vout$$

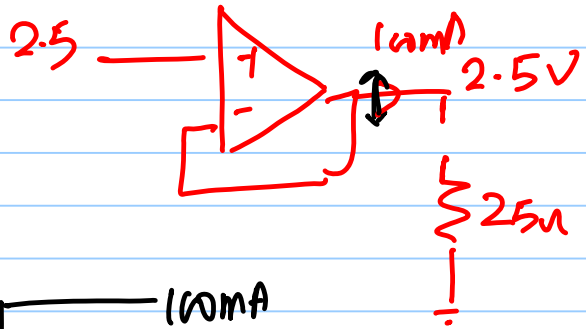
$$Vout = VDD \cdot \frac{1}{\frac{R_1}{R_2}+1}$$

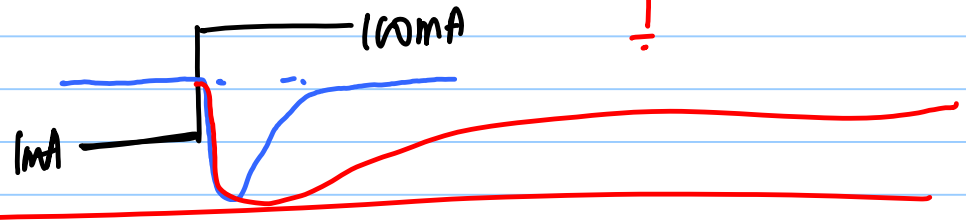
$$\frac{R_1}{R_2}$$

$$Vout = \frac{R_2 \| Z_L}{R_2 \| Z_L + R_1} VDD$$

(Bandgap Ref.)





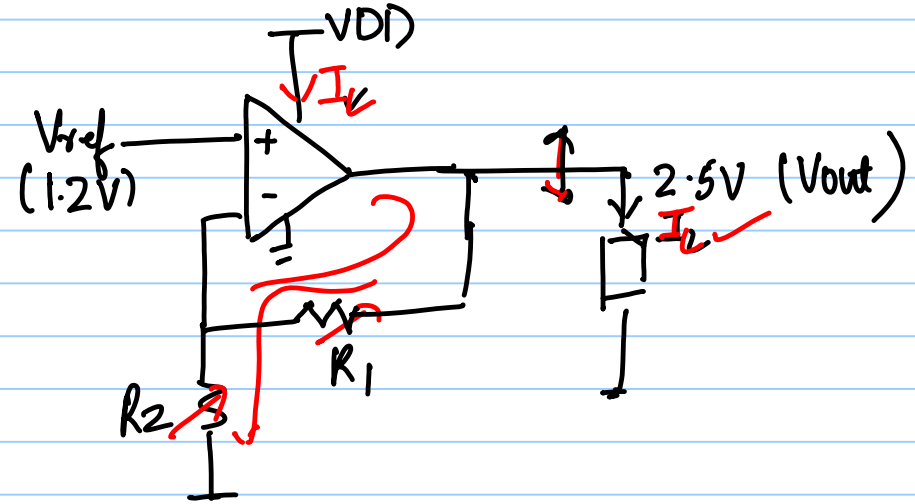


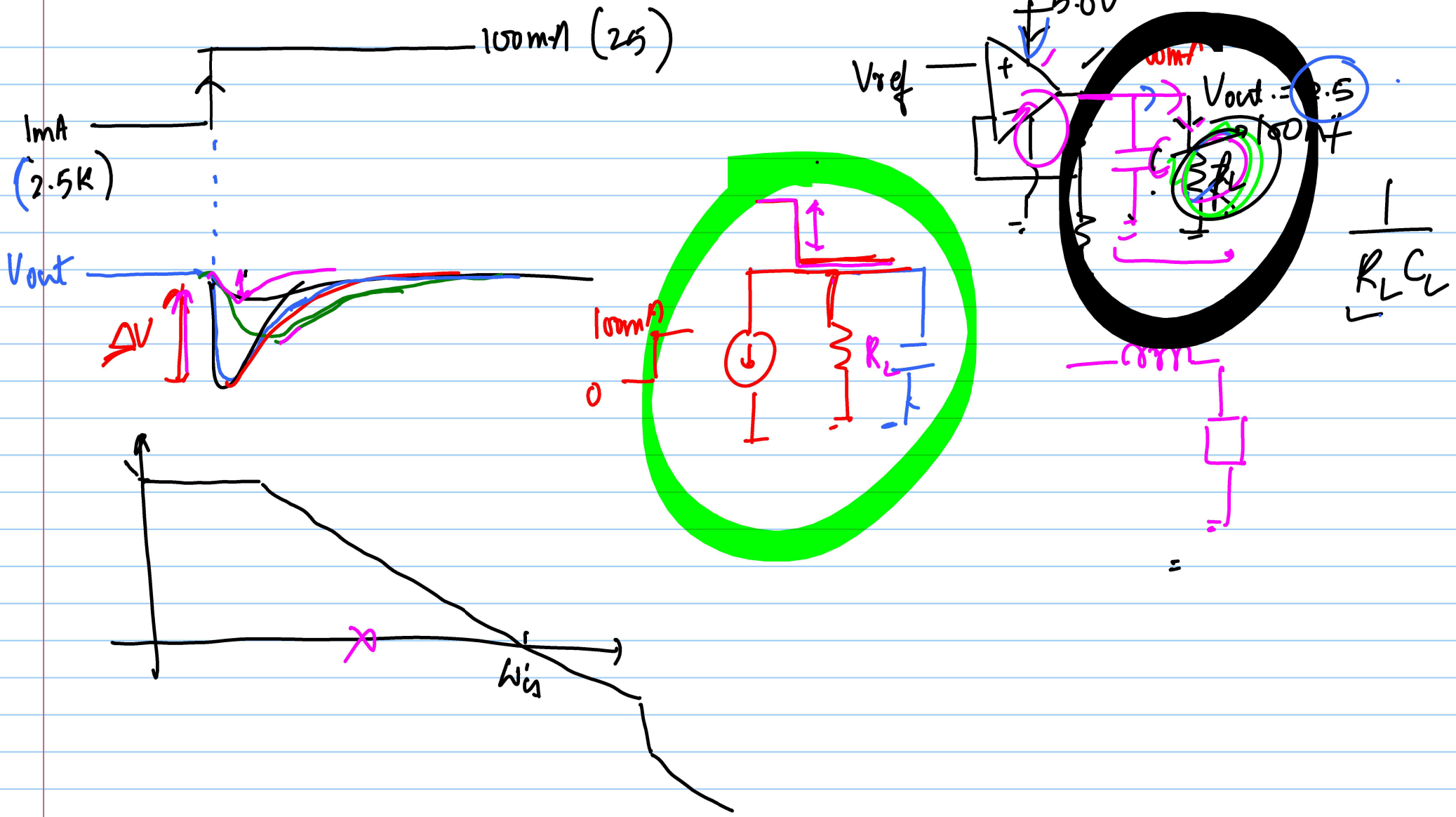
$$A(s) = \frac{A_0}{(1+s/p_1)(1+s/p_2)}$$

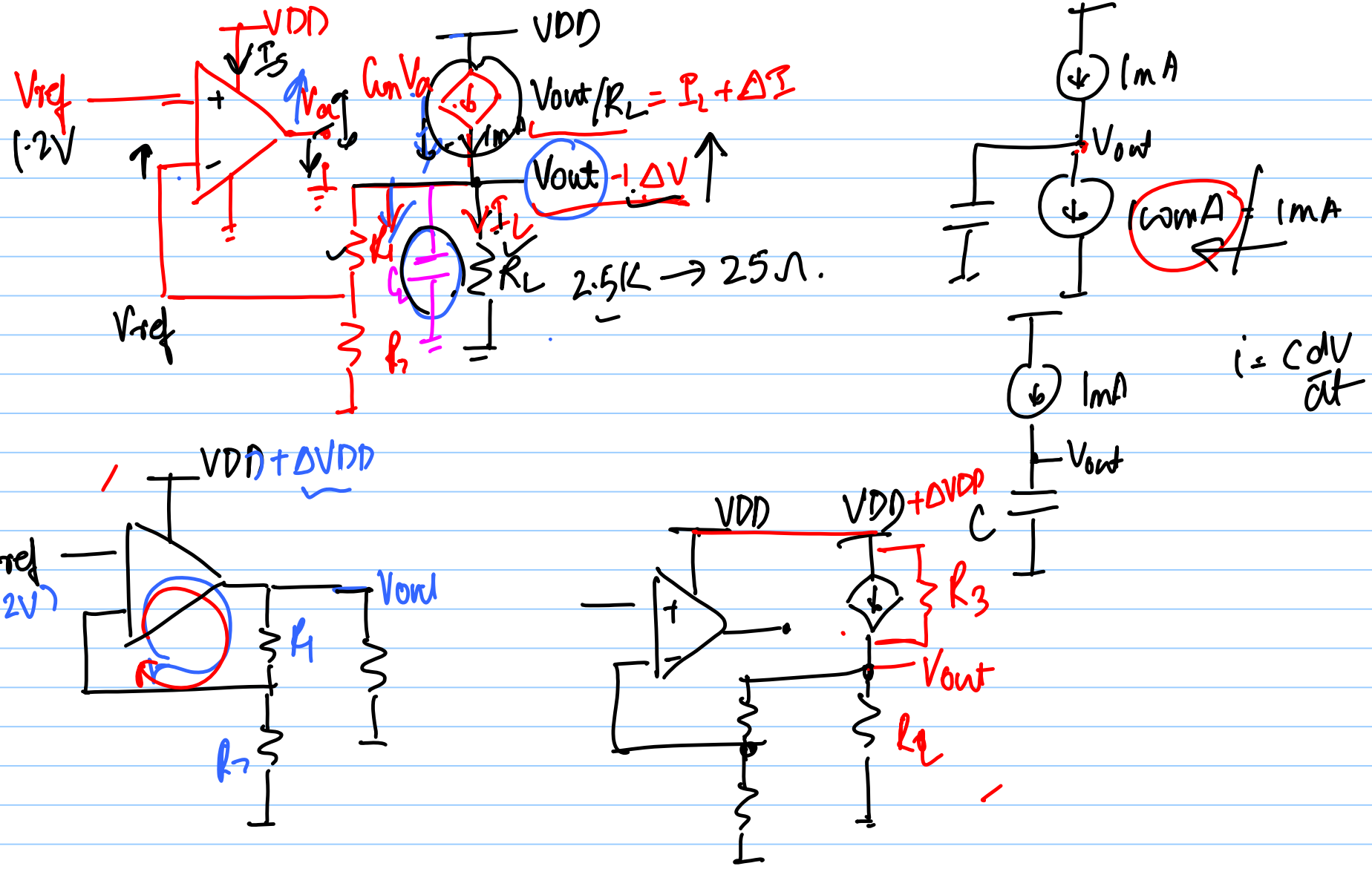
$P_L = V_{out} \times I_L$

$P_S = VDD \times (I_S)$

$\eta = \frac{P_L}{P_S} < 1$




100mA (25)
1mA
(2.5K)
Vout
ΔV
100mA
0
R_L
5.0V
Vref
Vout = 2.5
100nF
C_L
R_L
$\frac{1}{R_L C_L}$
W_{is}


VDD
Vref
1.2V
Vout/RL = I1 + ΔI
Vout - 1.ΔV
RL
2.5K → 25Ω.
1mA
Vout
50mA ≠ 1mA
i = C dV/dt
VDD + ΔVDD
R1
R2
VDD + ΔVDD
R3
R4
C

Line Regulation = $\frac{\Delta V_{out}}{\Delta V_{DD}}$ ≈ 0

Load Regulation = $\frac{\Delta V_{out}}{\Delta I_L}$ ≈ 0

Load Transient =