

8/11/13

Lec 41

Power Amplifiers

Class -A, -B & -AB

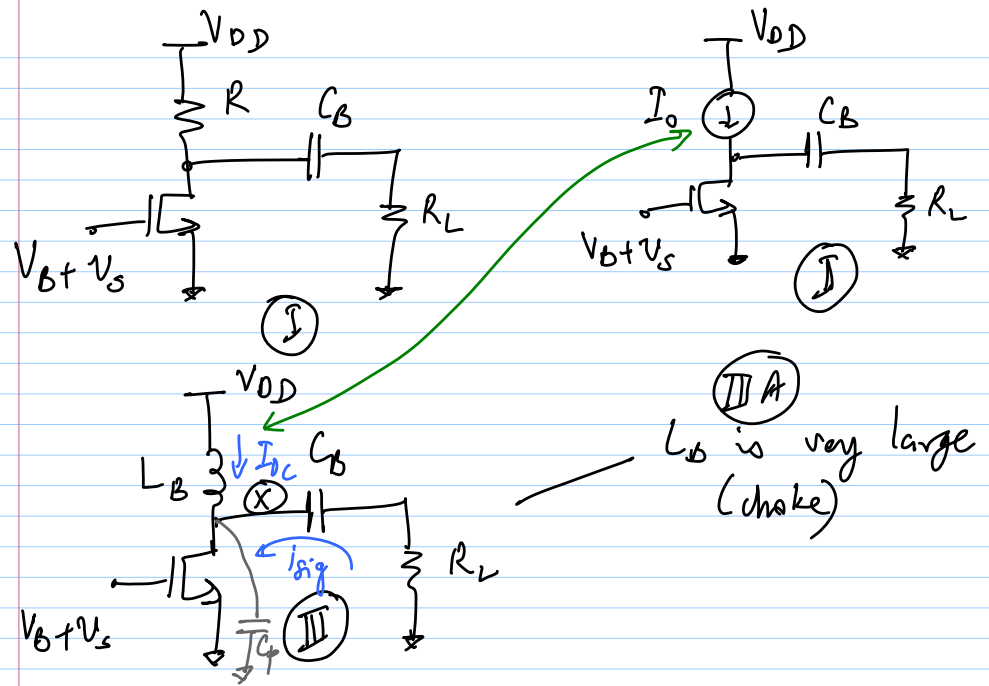
3) $180^\circ < \theta < 360^\circ$

1) 360° conduction angle

2) 180° conduction angle

$$V_a = V_{bias} + V_{sig}(t) \geq V_T \quad V_{a,bias} = V_T$$

$$I_D = I_{bias} + I_{sig}(t) \geq 0$$



L_B is very large (choke)

III A - L_B choke

* DC path for I_{bias}

* V_D = V_{DD}

* L_B = high impedance for RF signal

* i_{sig} splits between C_p & R_L

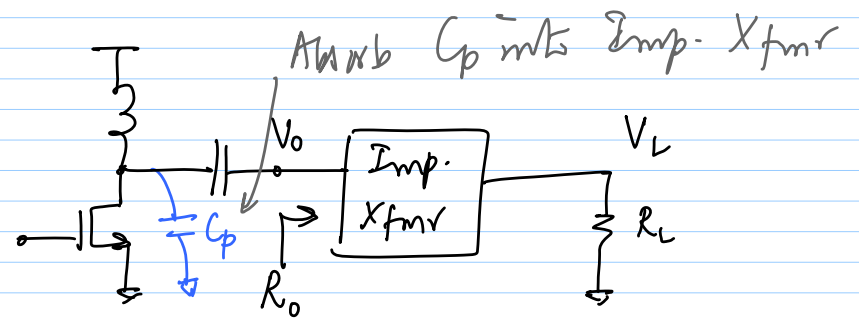
* e.g. R_L = 50Ω, V_{DD} = 2V

$$P_{out} = 1W = \frac{V_{out,pk}^2}{2R_L}$$

$$\Rightarrow V_{out,pk} = 10V$$

max swing possible = V_{DD} (2V)

* Use impedance X_{fmr} to reduce effective R_L



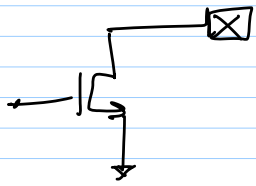
$$\frac{V_0^2}{2R_0} = \frac{V_L^2}{2R_L}$$

say R₀ = 5Ω
V₀ = √10 = 3.2V

R₀ = 2Ω
V₀ = √4 = 2V

$$\left(\frac{I_{bias}}{\sqrt{2}}\right)^2 \cdot R_o = 1W$$

$$\Rightarrow I_{bias} = 1A$$



Open Drain
config.

III-B

