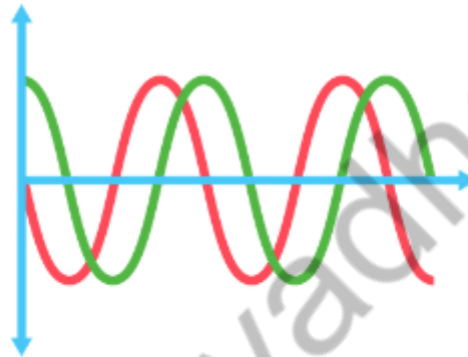


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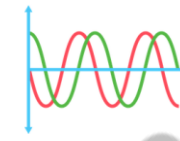
Lecture 1: Tuned Amplifier

Prof. Sanjay Vidhyadharan

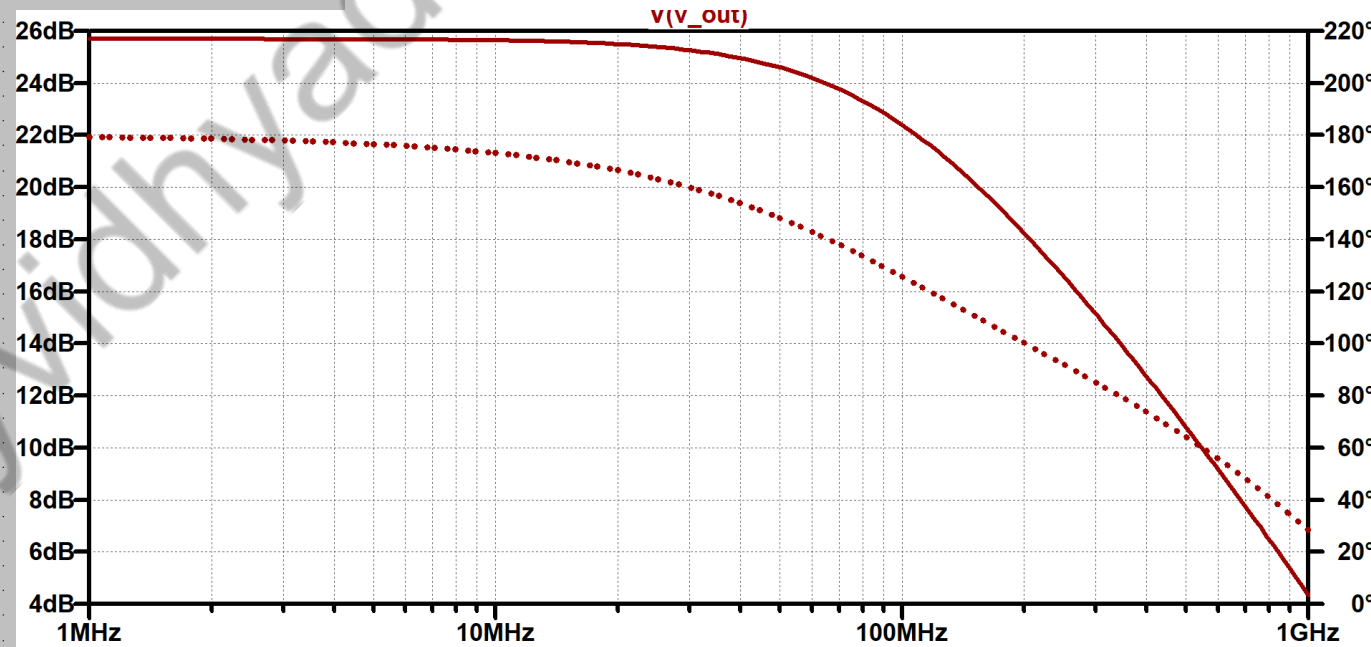
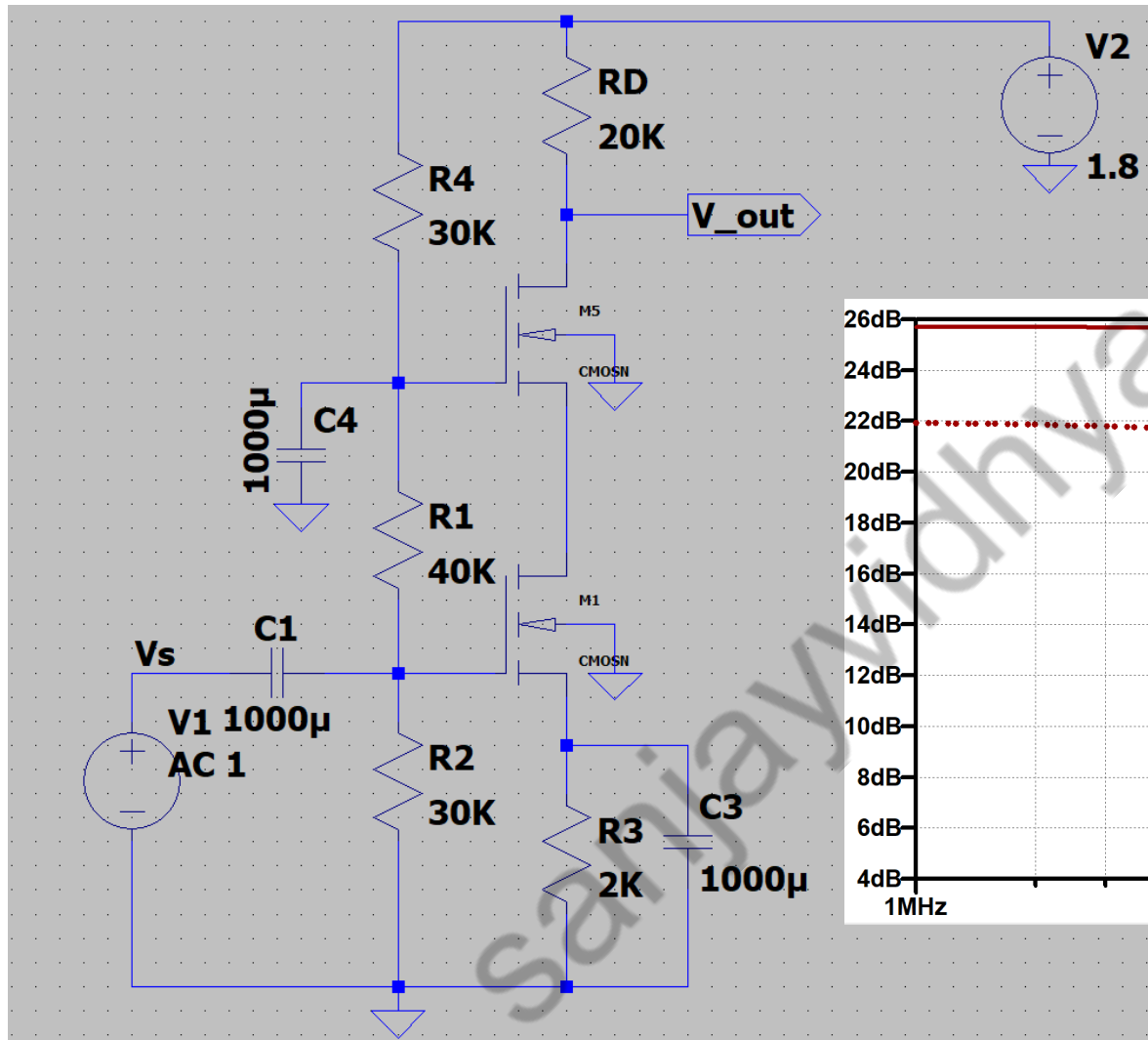


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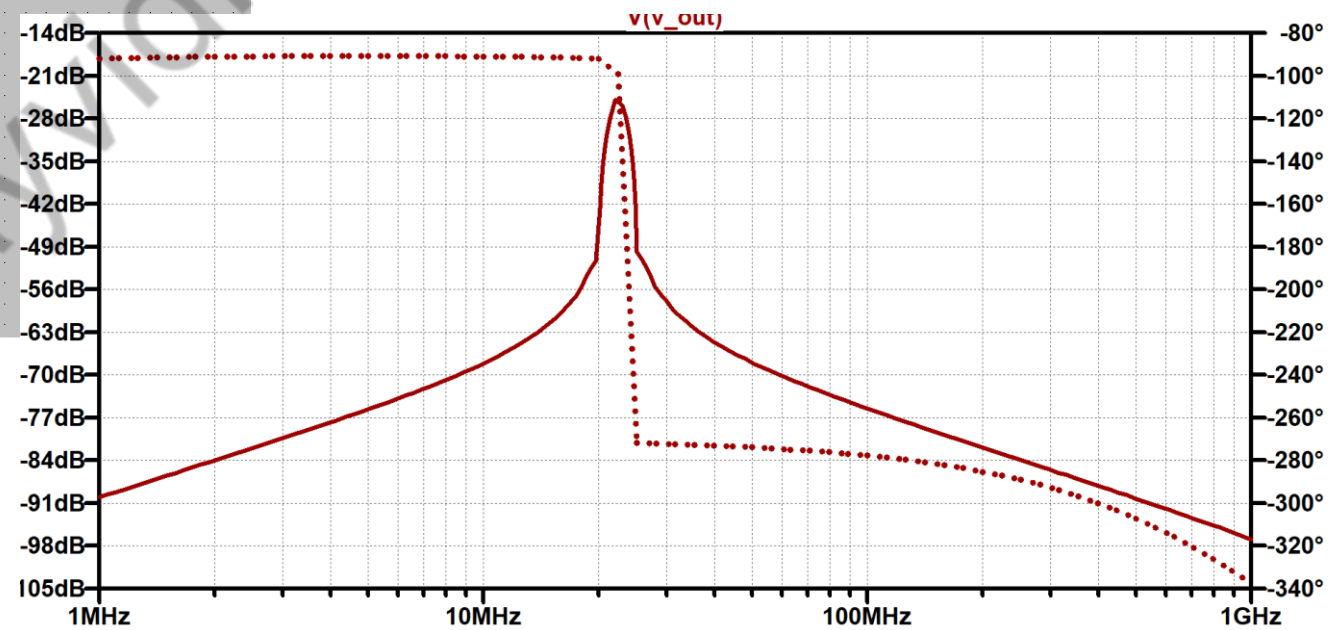
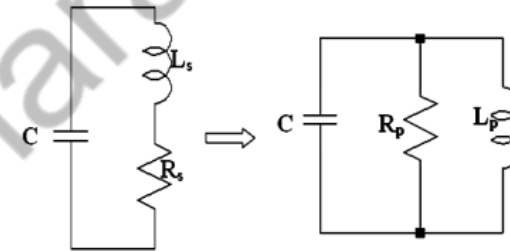
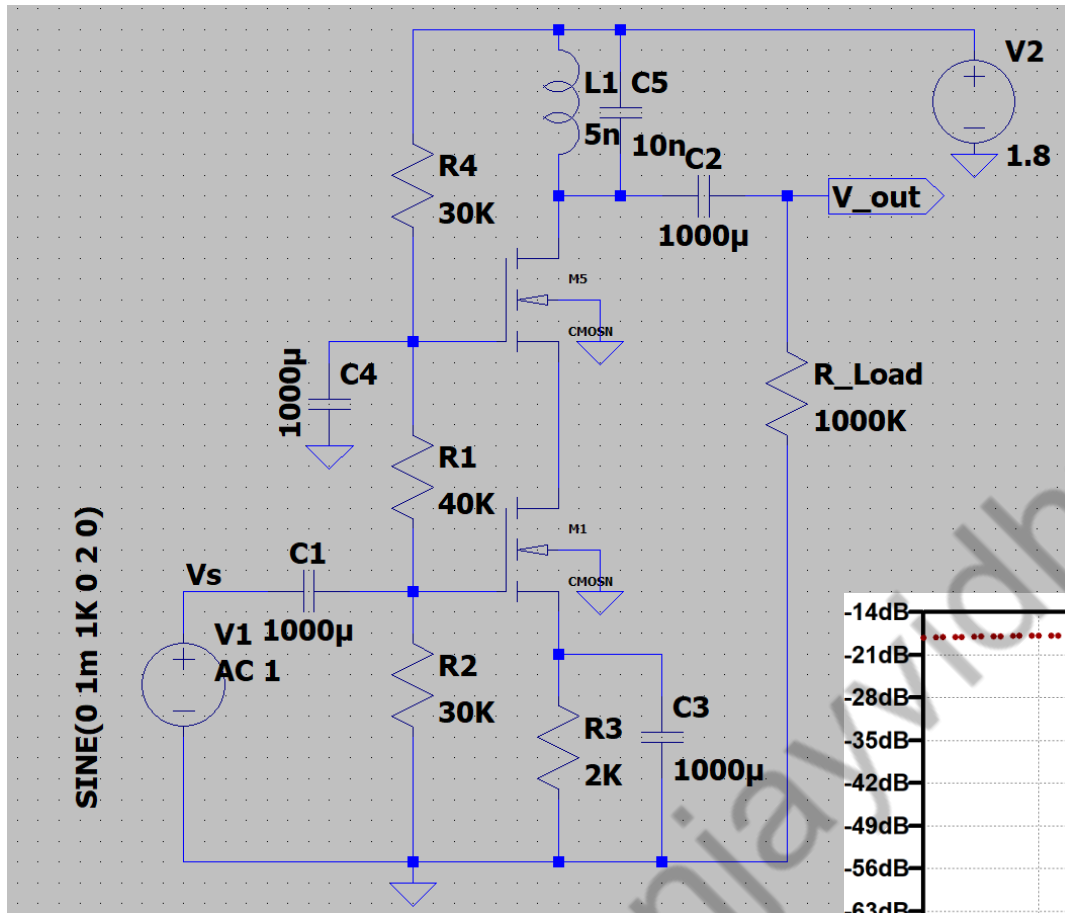
1. Cascode Circuit



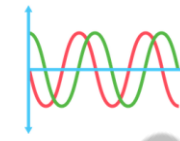
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1. LC Tuned Circuit

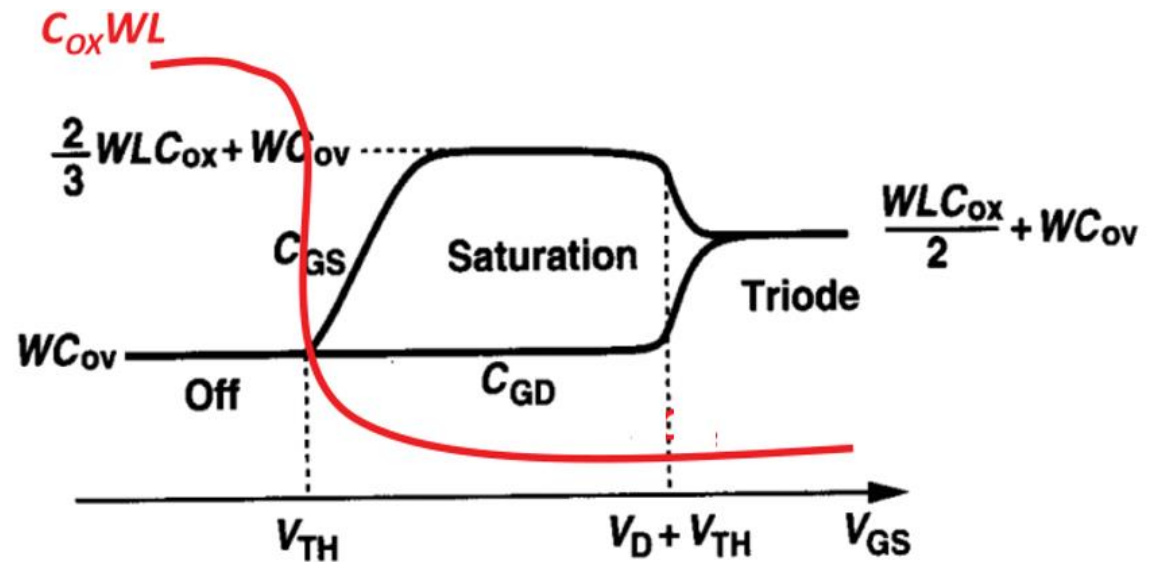
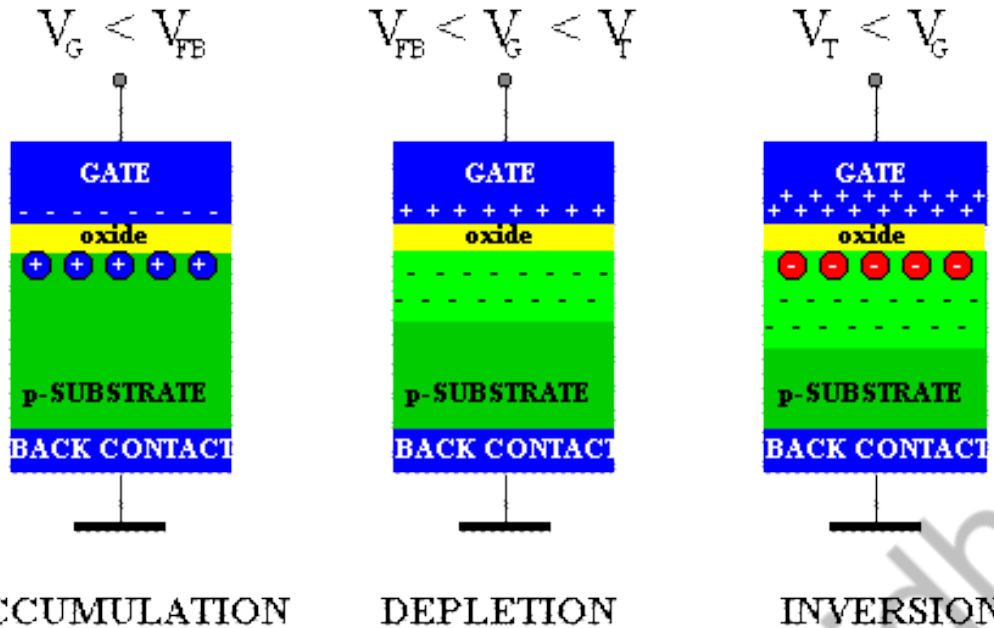


2. MOS CAP

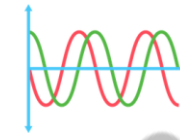


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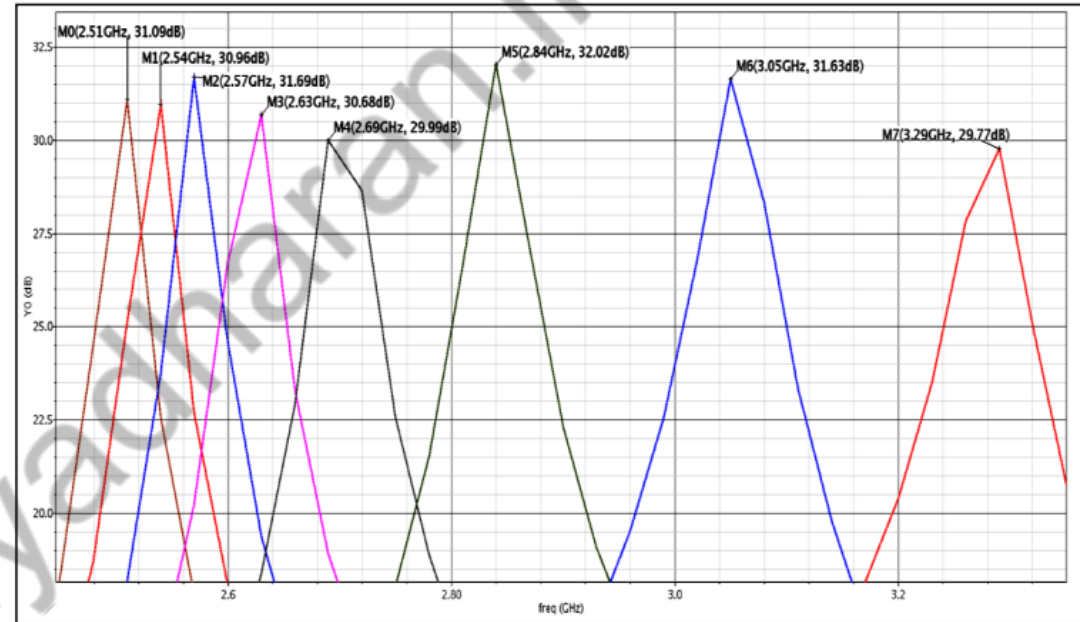
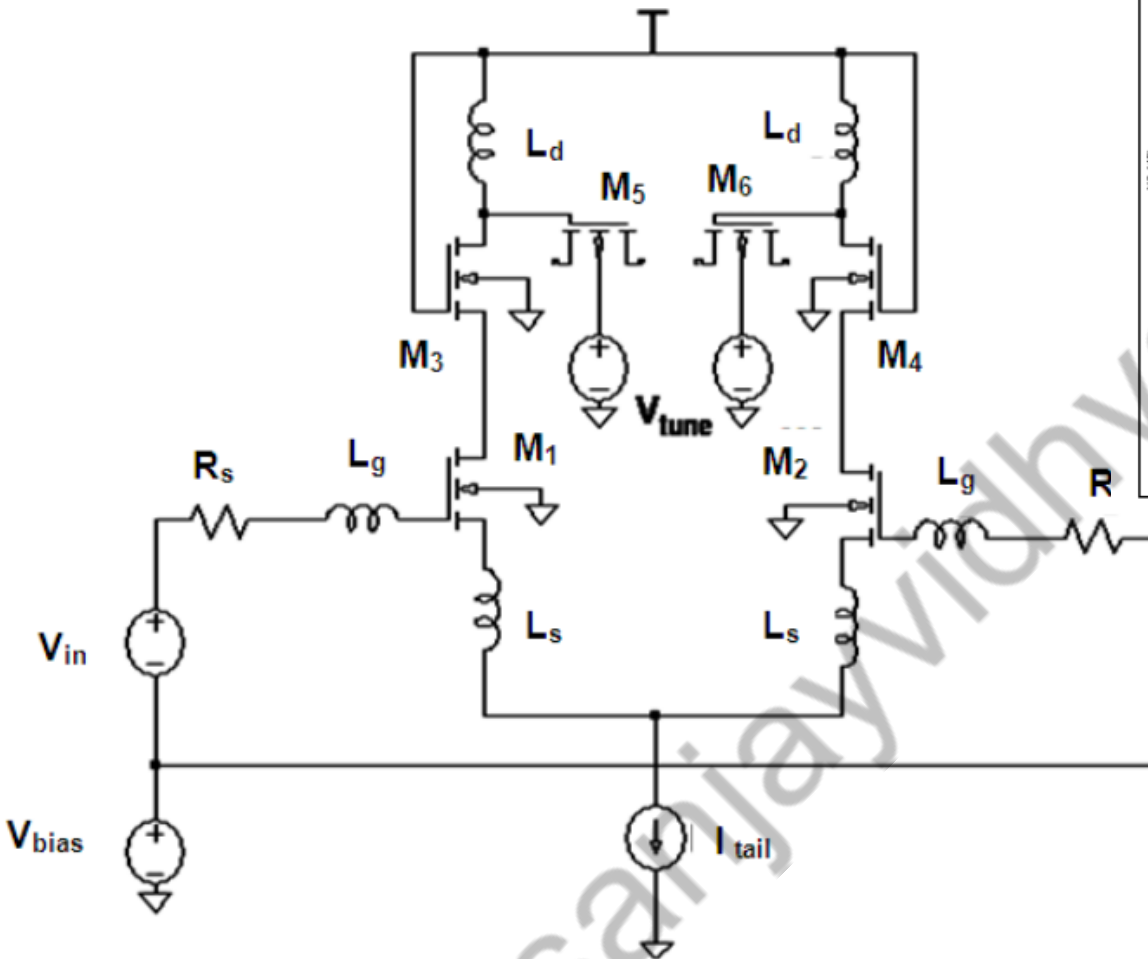
MOSFET Gate Capacitances



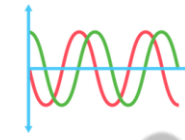
3. LC Tuneable Amplifier



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3. LC Tuneable Amplifier



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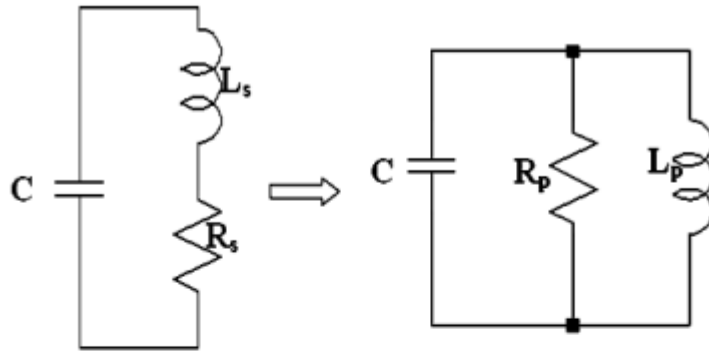
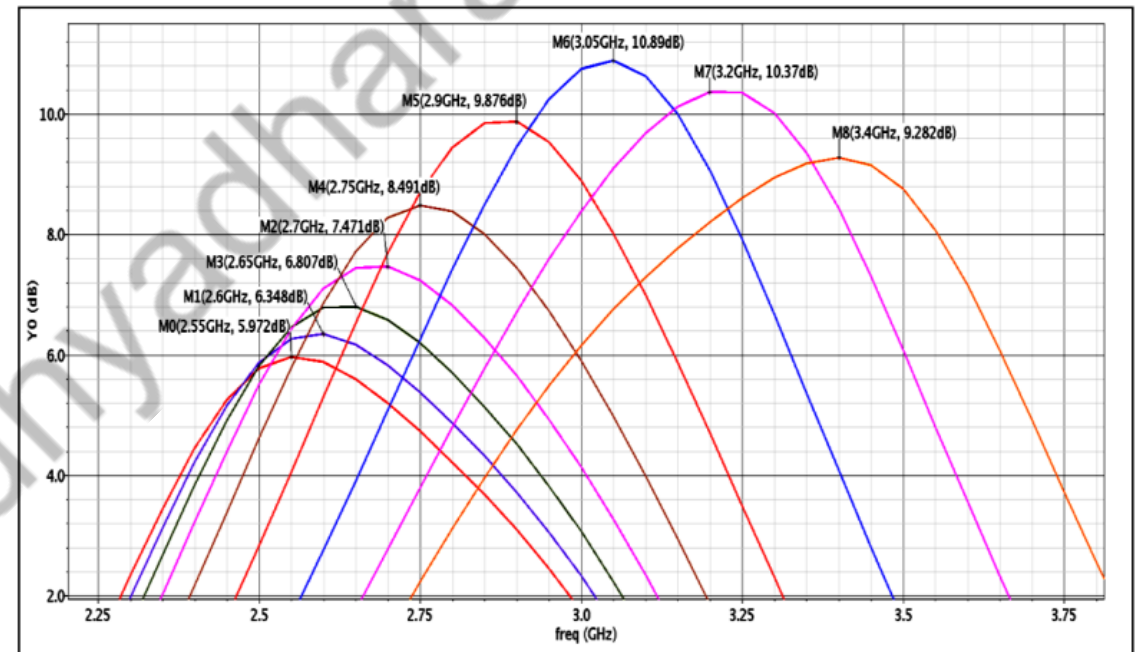


Figure 4.6: Equivalent tank circuit.

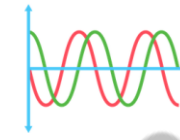
$$R_p = R_s (Q^2 + 1) \approx \frac{L^2 \omega^2}{R_s}$$

$$L_p = L_s \frac{(Q^2 + 1)}{Q^2}$$

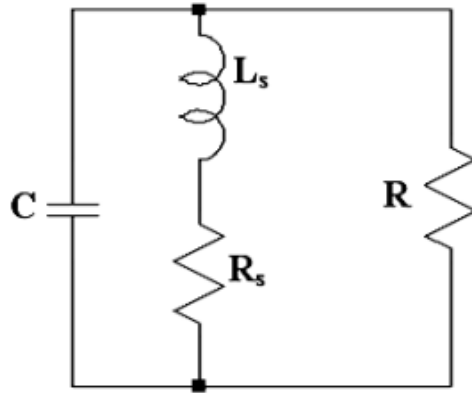
$$Z_{in} = \frac{L^2 \omega^2}{R_s} + L \omega s + \frac{1}{C \omega s}$$



3. LC Tuneable Amplifier

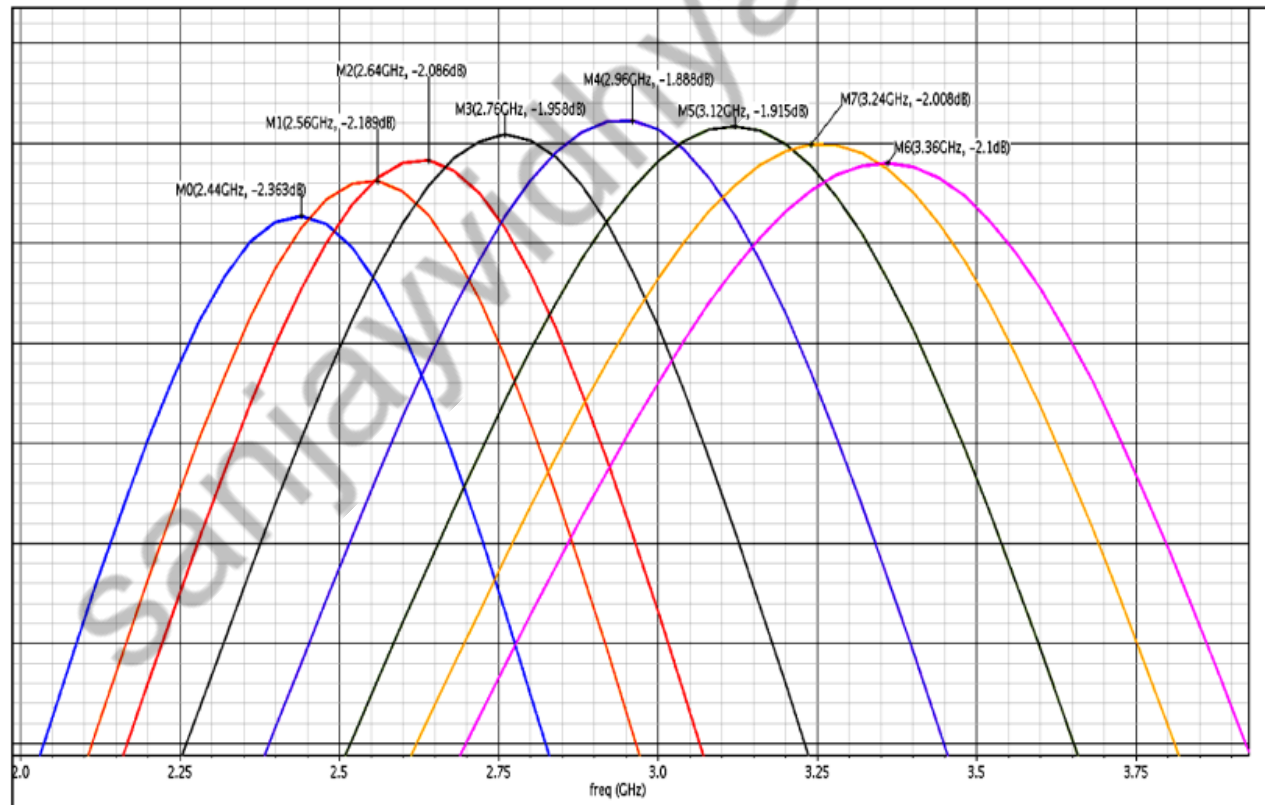


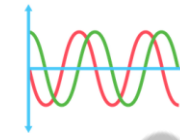
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$$R \ll R_s Q^2$$

$$Z_{in} = R // \frac{L^2 \omega^2}{R_s} + L \omega s + \frac{1}{C \omega s}$$
$$= R + L \omega s + \frac{1}{C \omega s}$$





Thankyou