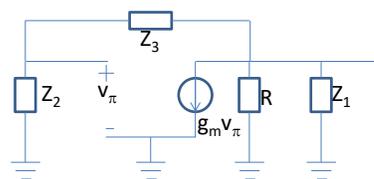
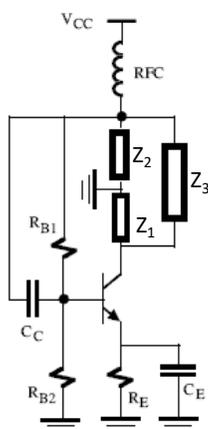


# EE 530 Eletrônica Básica I

## OSCILADORES

Prof. Pedro Xavier

### Osciladores LC



$$L(s) = -g_m \cdot \frac{R \cdot Z_1 \cdot Z_2}{R_s \cdot (Z_1 + Z_2 + Z_3) + Z_1 \cdot (Z_2 + Z_3)}$$

$$L(s) = -g_m \cdot \frac{-R \cdot X_1 \cdot X_2}{j \cdot R_s \cdot (X_1 + X_2 + X_3) - X_1 \cdot (X_2 + X_3)}$$

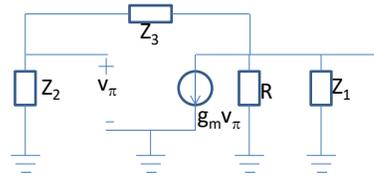
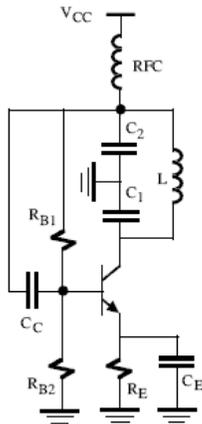
$$\angle L(j\omega_0) = 0 \Rightarrow X_1(\omega_{osc}) + X_2(\omega_{osc}) + X_3(\omega_{osc}) = 0$$

$$|L(j\omega_0)| = 1 \Rightarrow |L(j\omega_0)| = g_m \cdot \frac{R \cdot X_2(\omega_{osc})}{X_1(\omega_{osc})} = 1$$

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## Osciladores LC

- Oscilador Colpitts ( $Z_1:C_1$ ;  $Z_2:C_2$ ;  $Z_3:L$ )



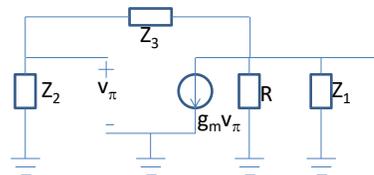
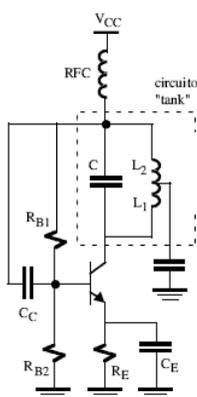
$$\omega_0 = \frac{1}{\sqrt{L \frac{C_1 C_2}{C_1 + C_2}}}$$

$$\frac{C_2}{C_1} = g_m R$$

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## Osciladores LC

- Oscilador Oscilador Hartley ( $Z_1:L_1$ ;  $L_2:C_2$ ;  $Z_3:C$ )



$$\omega_0 = \sqrt{\frac{1}{(L_1 + L_2)C}}$$

$$\frac{L_1}{L_2} = g_m R$$

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## Osciladores LC

- Fazer exercício 13.9 do Sedra (5ª Ed.)
- Para casa e para nota

Prof. Pedro Xavier

## Fontes de figuras da aula

- Aula do prof. Fabiano Fruett
- Microeletrônica (Sedra)

Prof. Pedro Xavier

## Sugestão de estudo

- Sedra/Smith, cap. 13
- Savant, cap. 11.11

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