Lec 40

Single-transistor oscillator

\[ Z_{in}(j\omega) = -\frac{g_m}{\omega^2 C_1 C_L} + \frac{1}{j\omega C_L} \]

\[ Z_{in} = \frac{V_T}{I_T} = \frac{g_m}{s^2 C_1 C_L} + \frac{1}{s C_0} \left\{ C_0 = \frac{C_1 C_L}{C_1 + C_L} \right\} \]

1) Ground gate

Colpitts oscillator

2) Hardly oscillator

\[ V_B \]
3) Quadrature Signal Generation

1) Duty cycle can vary and tradeoff between loading and phase shift. Higher current at high phase shift.

2) Freq. divider

3) Quadrature VCO

Polyphase Filter

Vco

Vco

Vco

Vco

Vco

Vco

Vco

Vco

Vco

Vco