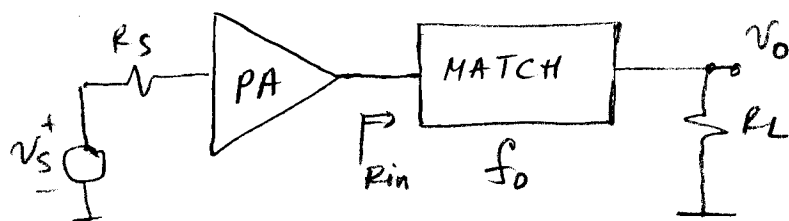
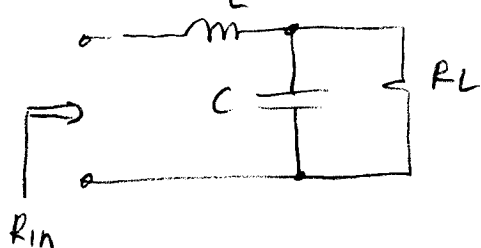


7



Potrebno je projektovati prilagođenje po snazi za potrošač $R_L = 50 \Omega$ na učestanosti $f = 16 \text{ MHz}$. Optimalne otpornost potrošača na izlazu pojačavača snage je $R_{in} = 5 \Omega$. Uporediti prilagođenja L-MATCH, π -MATCH ($Q=10$) i TAPPED-CAPACITOR ($Q=10$).

a) L-MATCH

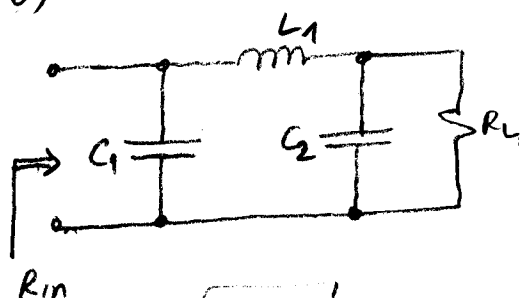


$$Q = \sqrt{\frac{R_L}{R_{in}} - 1} = 3$$

$$Q = \frac{\omega_0 L}{R_{in}} \Rightarrow L = 2.39 \text{ nH}$$

$$Q = \omega_0 R_L C \Rightarrow C = 9.54 \text{ pF}$$

b) π -MATCH



$$Q = Q_L + Q_R = \sqrt{\frac{R_{in}}{R_I} - 1} + \sqrt{\frac{R_L}{R_I} - 1}$$

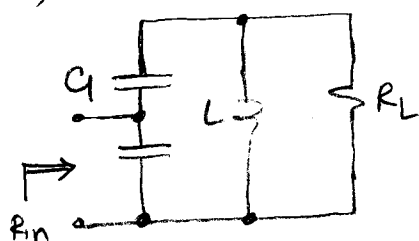
$$Q = 10 \Rightarrow R_I = 0.815 \Omega$$

$$Q = \frac{\omega_0 L_1}{R_I} \Rightarrow L_1 = \frac{Q}{\omega_0} R_I = 1.3 \text{ nH}$$

$$Q_L = \sqrt{\frac{R_{in}}{R_I} - 1} = 2.23, \quad Q_R = \sqrt{\frac{R_L}{R_I} - 1} = 7.77$$

$$C_1 = \frac{Q_L}{\omega_0 R_{in}} = 72.1 \text{ pF}, \quad C_2 = \frac{Q_R}{\omega_0 R_L} = 24.7 \text{ pF}$$

c) TAPPED-CAPACITOR



$$Q = \frac{R_L}{\omega_0 L} \Rightarrow L = \frac{R_L}{\omega_0 Q} = 0.8 \text{ nH} \quad !$$

$$Q_2 = \sqrt{\frac{R_{in}}{R_L} (Q^2 + 1) - 1} \approx 3$$

$$Q_2 = \omega_0 R_{in} C_2 \Rightarrow C_2 = \frac{Q_2}{\omega_0 R_{in}} = 95.9 \text{ pF}$$

$$C_1 = \frac{Q^2 + 1}{Q Q_2 - Q_2^2} \quad C_2 = 46.1 \text{ pF}$$