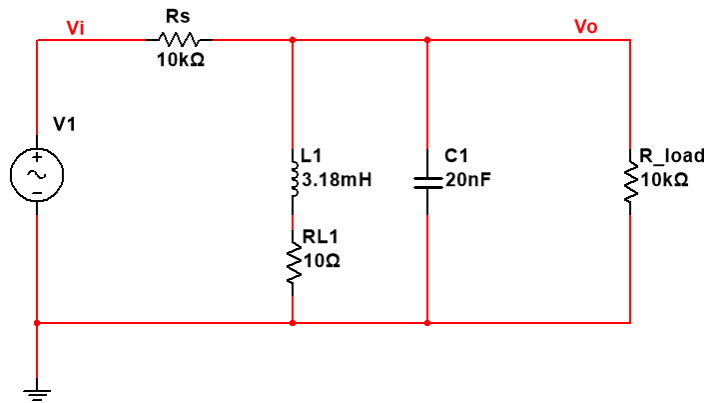


BPF with Source and Load - ICP



Find:

- fp (resonant frequency)
- Qp (circuit Q or "loaded" Q)
- BW
- Vo/Vi (at resonance)

$$f_p = \frac{1}{2\pi\sqrt{LC}} = \underline{19.95 \text{ kHz}}$$

$$\begin{aligned}\vec{Z}_{Tp} &= R_s // Q_i^2 R_L // R_{load} \\ &= 10k\Omega // (39.9)^2 (10\Omega) // 10k\Omega\end{aligned}$$

$$\vec{Z}_{Tp} = 3.80k\Omega$$

$$Q_p = \frac{\vec{Z}_{Tp}}{X_L} = \frac{3.80k\Omega}{398.8\Omega} = \boxed{9.54}$$

$$BW = \frac{f_p}{Q_p} = \frac{19.95 \text{ kHz}}{9.54} = \boxed{2.09 \text{ kHz}}$$

$$\frac{\vec{V}_o}{\vec{V}_i} = \frac{Q_i^2 R_L // R_{load}}{R_s + Q_i^2 R_L // R_{load}} =$$

$$\frac{\vec{V}_o}{\vec{V}_i} = \boxed{0.380}$$

Or -8.4dB