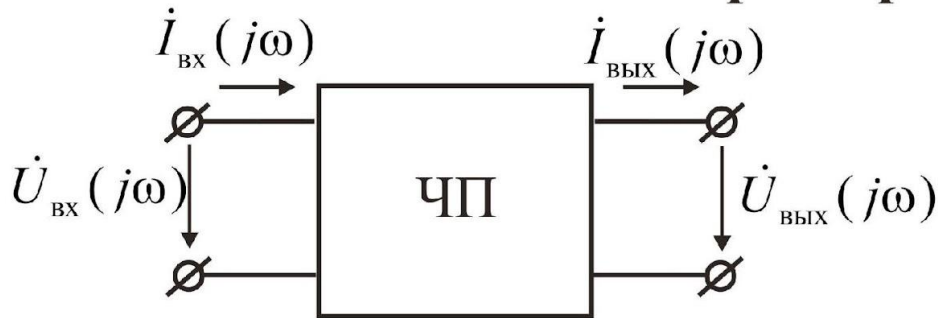


# Частотные характеристики электрических цепей

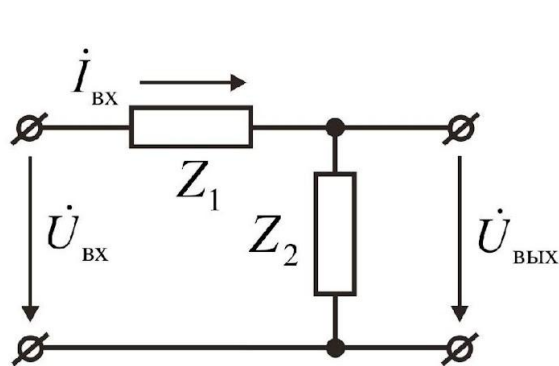
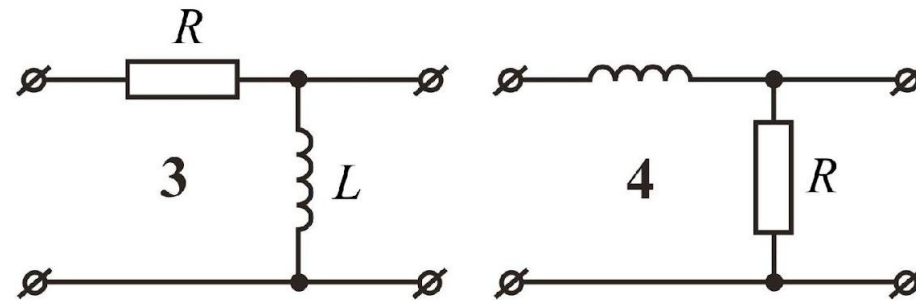
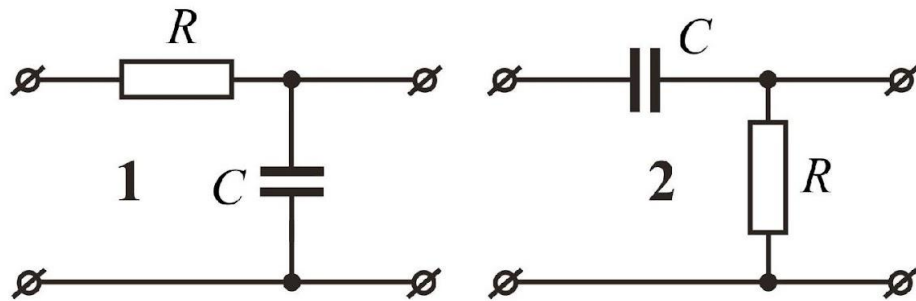


$$\dot{K}_U(j\omega) = \frac{\dot{U}_{\text{ВЫХ}}(j\omega)}{\dot{U}_{\text{ВХ}}(j\omega)} = K_U(\omega) \cdot e^{j\varphi_U(\omega)}$$

$K_U(\omega)$  - АЧХ     $\varphi_U(\omega)$  - ФЧХ

$$\dot{K}_I(j\omega) = \frac{\dot{i}_{\text{ВЫХ}}(j\omega)}{\dot{i}_{\text{ВХ}}(j\omega)} = K_I(\omega) \cdot e^{j\varphi_I(\omega)}$$

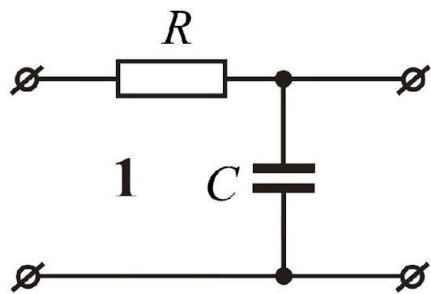
$$Z(j\omega) = \frac{\dot{U}_{\text{ВХ}}(j\omega)}{\dot{i}_{\text{ВХ}}(j\omega)}; Y(j\omega) = \frac{\dot{i}_{\text{ВХ}}(j\omega)}{\dot{U}_{\text{ВХ}}(j\omega)}$$



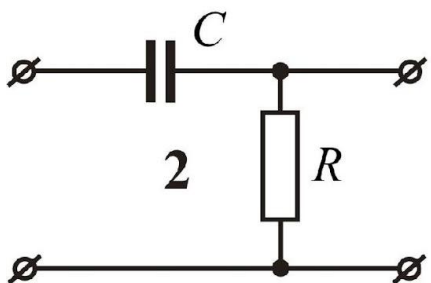
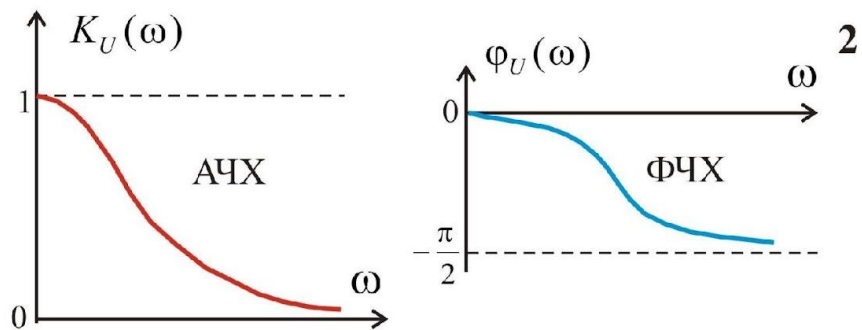
$$\dot{i}_{\text{ВХ}} = \frac{\dot{U}_{\text{ВХ}}}{Z_1 + Z_2}; \dot{U}_{\text{ВЫХ}} = \dot{i}_{\text{ВХ}} \cdot Z_2 = \frac{\dot{U}_{\text{ВХ}} \cdot Z_2}{Z_1 + Z_2} \Rightarrow \dot{K}_U = \frac{\dot{U}_{\text{ВЫХ}}}{\dot{U}_{\text{ВХ}}} = \frac{Z_2}{Z_1 + Z_2}$$

$$Z_1 = R; Z_2 = \frac{1}{j\omega C} \Rightarrow \dot{K}_U = \frac{1}{1 + j\omega RC} = \frac{1}{\sqrt{1 + (\omega RC)^2}} \cdot e^{-j \arctg(\omega RC)}$$

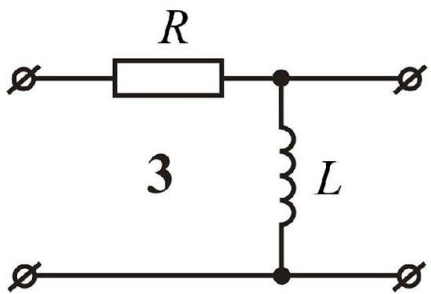
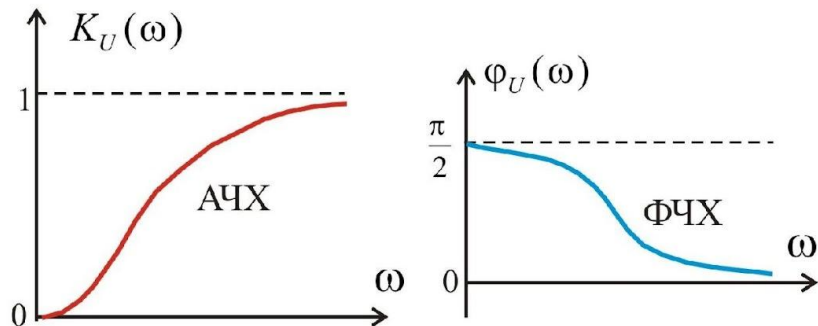
$$K_U(\omega) = \frac{1}{\sqrt{1 + (\omega RC)^2}}; \varphi_U(\omega) = -\arctg(\omega RC)$$



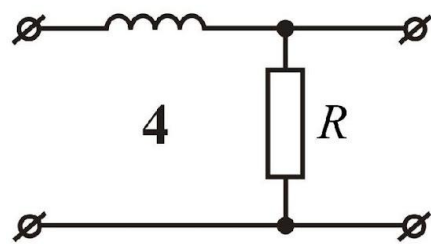
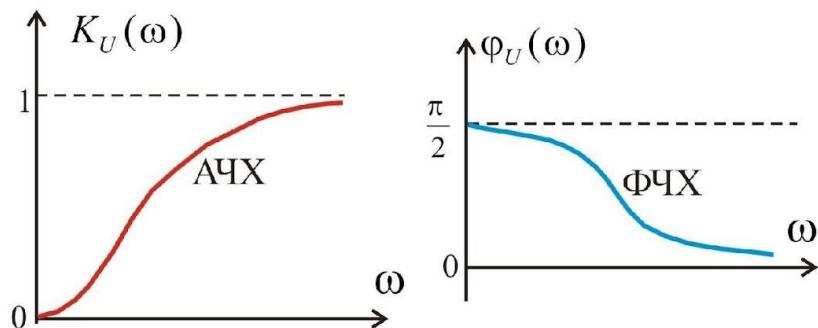
$$\dot{K}_{U1} = \frac{1}{\sqrt{1 + (\omega RC)^2}} \cdot e^{-j \arctg \omega RC}$$



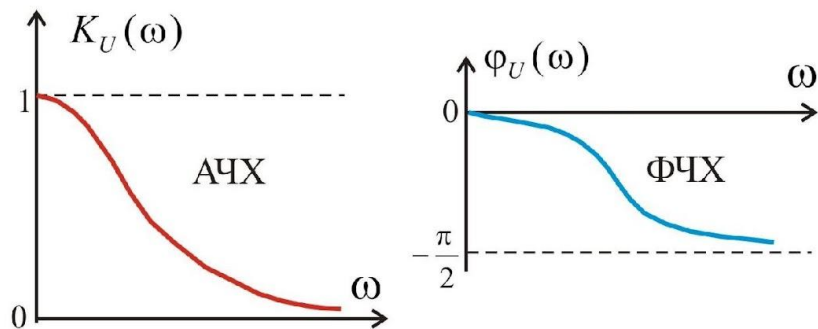
$$\dot{K}_{U2} = \frac{\omega RC}{\sqrt{1 + (\omega RC)^2}} \cdot e^{j(\frac{\pi}{2} - \arctg \omega RC)}$$

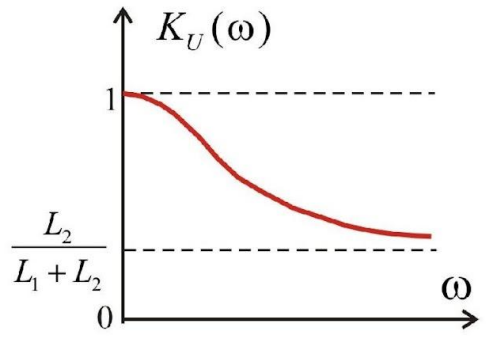
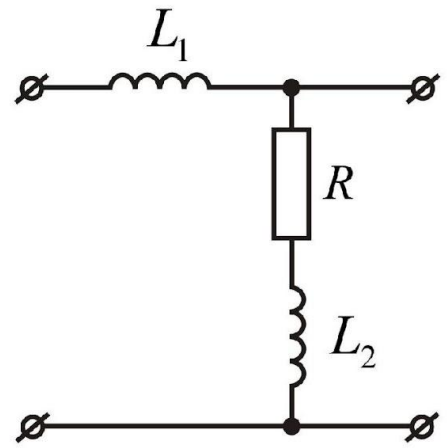
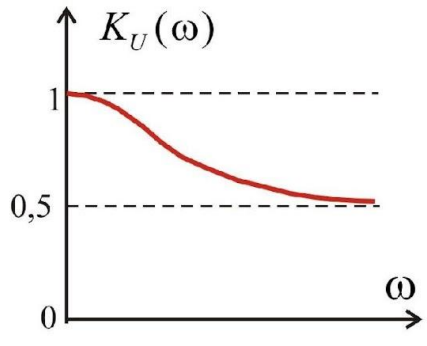
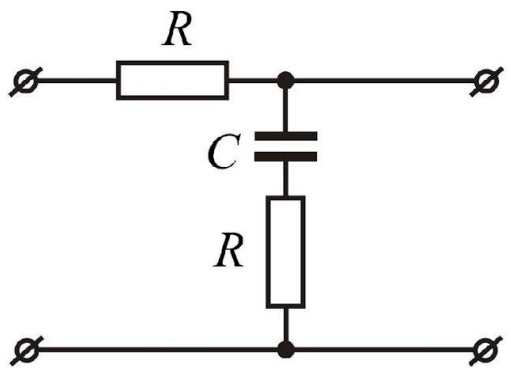
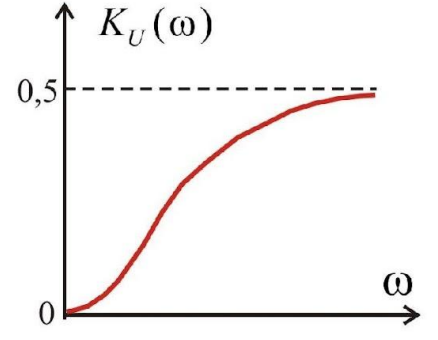
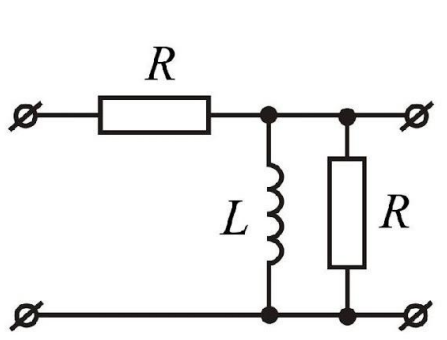
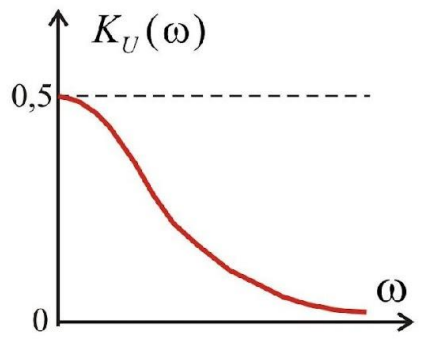
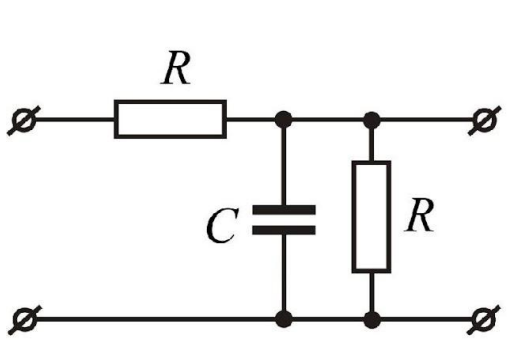
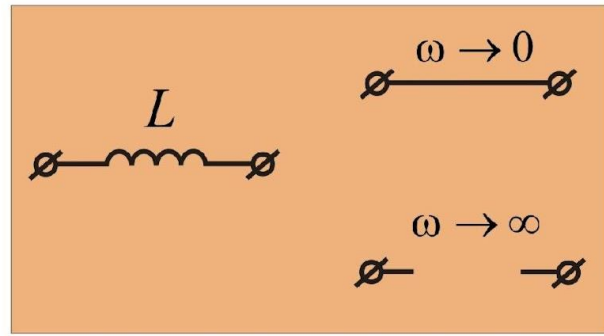
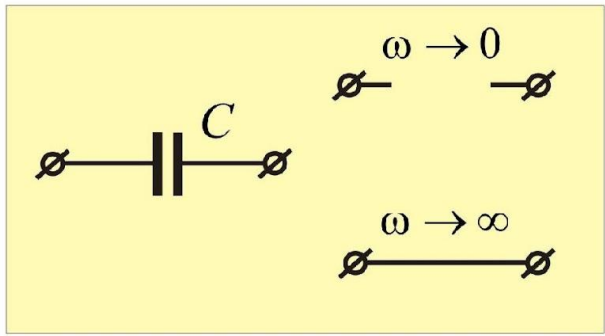
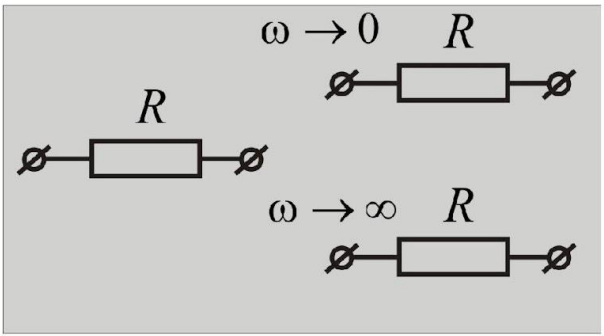


$$\dot{K}_{U3} = \frac{\frac{\omega L}{R}}{\sqrt{1 + \left(\frac{\omega L}{R}\right)^2}} \cdot e^{j(\frac{\pi}{2} - \arctg \frac{\omega L}{R})}$$



$$\dot{K}_{U4} = \frac{1}{\sqrt{1 + \left(\frac{\omega L}{R}\right)^2}} \cdot e^{-j \arctg \frac{\omega L}{R}}$$





$$\frac{j\omega L_2}{j\omega L_1 + j\omega L_2} = \frac{L_2}{L_1 + L_2}$$