

$$B(1.) \quad f_0 = \frac{1}{2\pi \sqrt{L^1 C^1}} = 3393 \text{ Hz}$$

$$L^1 = \bar{L} = 100,0 \mu\text{H} \quad C^1 = \bar{C} = 22,00 \mu\text{F}$$

$N = 121 \Rightarrow$ CFT mit
norm. elo.

$$\Delta C = \frac{\sigma_C}{\sqrt{N}} \cdot \underbrace{z_{0,005}}_{2,58} = 0,5207 \mu\text{F} \quad \Delta L = \frac{\sigma_L}{\sqrt{N}} z_{0,005} = 0,2885 \text{ mH}$$

$$P[L^1 - \Delta L < L < L^1 + \Delta L] = 99\% \Rightarrow P[99,71 \text{ mH} < L < 100,29 \text{ mH}] = 99\%$$

$$P[C^1 - \Delta C < C < C^1 + \Delta C] = 99\% \Rightarrow P[21,48 \mu\text{F} < C < 22,52 \mu\text{F}] = 99\%$$

$$C_L = \frac{\partial f_0}{\partial C} = -\frac{1}{4\pi} \cdot L^{-\frac{1}{2}} C^{-\frac{3}{2}} = -7,72 \cdot 10^{10} \text{ H}^{-\frac{1}{2}} \text{ F}^{-\frac{3}{2}} \quad C_L = \frac{\partial f_0}{\partial L} = -\frac{1}{4\pi} C^{-\frac{1}{2}} L^{-\frac{3}{2}} = 1,697 \cdot 10^4 \text{ H}^{-\frac{3}{2}} \cdot \text{F}^{-\frac{1}{2}}$$

$$\sigma_{f_0} = \sqrt{C_L^2 \sigma_C^2 + C_L^2 \sigma_L^2} \cdot \frac{1}{\sqrt{N}} = 15,68 \text{ Hz} \quad \Delta f_0 = \sigma_{f_0} \cdot z_{0,005} = 40,45 \text{ Hz} \quad P[3353 \text{ Hz} < f_0 < 3433 \text{ Hz}] = 99\%$$

$$B(1.) \quad \frac{R_x + j\omega L_x}{R_3} = R_2 Y_4 = R_2 \left(\frac{1}{R_4} + j\omega C_4 \right)$$

(1)

$$R_x = \frac{R_2 R_3}{R_4} = 0,4 \Omega$$

$$L_x = R_2 R_3 C_4 = 2,5 \text{ mH} \quad (1)$$

$$\frac{1}{R_p} + \frac{1}{j\omega L_p} = \frac{1}{Z_x} = \frac{1}{R_x + j\omega L_x} = \frac{R_x - j\omega L_x}{R_x^2 + \omega^2 L_x^2}$$

$$R_p = \frac{R_x^2 + \omega^2 L_x^2}{R_x} = 16,02 \Omega$$

$$L_p = \frac{R_x^2 + \omega^2 L_x^2}{\omega^2 L_x} = 2,564 \text{ mH} \quad (2) \quad (5)$$

$$D = \frac{R_x}{\omega L_x} = 0,16 \quad (1)$$