task_uzbbnoz8abe6201d_with_calculation

Student Group

First Name	Surname	Matrikel Nr.

Table of Contents

exam ee1 SS2023

Exercise E1 Impedances at Frequencies
(written test, approx. 14 % of a 60-minute written test, SS2023)

At which frequencies shown in the following, do we have the absolute value of the impedance as a result? 2. An inductor with $C_2 = 502 ~\rm nF$ / $L_2 = 6.8 ~\rm V$ ... 3. A capacitor with $C_3 = 5.6 ~\rm nF$ ... current of $I = 1 ~\rm mA$ ...
Result
1. An inductor with $X_{L1} = 60 ~\rm m\Omega$ and $L_1 = 15.9 ~\rm \mu H$.

Solution
Solution

\begin{align*} f_1 = 600.59... ~{\rm Hz} \rightarrow f_1 = 600 ~{\rm Hz} \end{align*}
\begin{align*} f_2 = 3.6... ~{\rm kHz} \rightarrow f_2 = 4 ~{\rm kHz} \end{align*}
\begin{align*} f_3 = ... ~{\rm kHz}\end{align*}

\begin{align*} X_{C3} &= X_{C3} \over{\omega_3 \cdot C_3} = {1}\over{2\pi f_2 \cdot C_2} ...

\begin{align*} X_{L1} &= \omega_1 \cdot L = 2\pi f_1 \cdot L_1 \\ \rightarrow f_1 &= {{X_{L1}}\over{2\pi \cdot L_1}} \\ &= {{60 ~\rm m\Omega}\over{2\pi \cdot 15.9 ~\rm \mu H}} \\ &= {{60 \cdot 10^{-3}}\over{2\pi \cdot 15.9 \cdot 10^{-6}}} \rm {{{V}\over{A}}} \over {{{Vs}\over{A}}} \\ \end{align*}

\cdot C_2 ... \sqrt{...} ... \cdot 6.8 ... {{1}\over \rm {V/As \cdot A/Vs}} \\ \end{align*}

From:
https://mexle.te.hs-heilbronn.de/ - **MEXLE Wiki**

Permanent link:
https://mexle.te.hs-heilbronn.de/ee1/task_uzbbnoz8abe6201d_with_calculation

Last update: **2023/08/17 06:46**