

task_uzbbnoz8abe6201d_with_calculation

Student Group

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exam ee1 SS2023

Exercise E9 Impedances at Frequencies
(written test, approx. 14 % of a 60-minute written test, SS2023)

At an inductor with $X_{L1} = 60 \text{ m}\Omega$ and $L_1 = 15.9 \text{ }\mu\text{H}$, the voltage V_L across it is measured with $I = 5.6 \text{ mA}$.
1. An inductor with $X_{L1} = 60 \text{ m}\Omega$ and $L_1 = 15.9 \text{ }\mu\text{H}$.

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Solution
Solution
\begin{align*} f_0 = 3000 \text{ Hz} \end{align*}
\begin{align*} X_{L1} = \omega L_1 = 2\pi \cdot 3000 \cdot 15.9 \cdot 10^{-6} = 0.6 \text{ m}\Omega \end{align*}
\begin{align*} V_L = I \cdot X_{L1} = 5.6 \cdot 10^{-3} \cdot 0.6 \cdot 10^{-3} = 3.36 \cdot 10^{-6} \text{ V} \end{align*}

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