

task_9xy69axg3gi3nr26_with_calculation

Student Group

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complex voltage divider, exam ee2 SS2021

Exercise E15 Complex series circuit (written test, approx. 8 % of a 120-minute written test, SS2021)

A) Determine the absolute value of the Result impedance of the Series circuit using an impedance vector diagram. Pay attention to the correct dimensioning.

a) Determine the complex impedance $\underline{Z}_C$.

Result

$\underline{Z}_C = -j \cdot 804 \, \Omega$

Path

The complex impedance $\underline{Z}_C$ is given as

$$\underline{Z}_C = \frac{1}{j \cdot 2\pi \cdot f \cdot C} = \frac{-j}{2\pi \cdot 40 \cdot 10^3 \, \text{Hz} \cdot 4.95 \cdot 10^{-9} \, \text{F}} = -j \cdot 803.81... \, \Omega$$

Based on the diagram: $|\underline{Z}| = 828 \, \Omega$

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