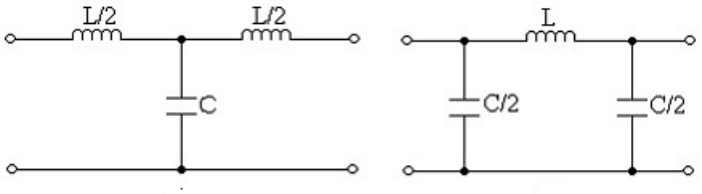
Answer on Question #75502, Physics Electric Circuits

Prove that the LC band pass filter is a constant K type filter.

Solution.



Resistance longitudinal and transverse branch:

$$Z_1 = \mathrm{j} \cdot \omega \cdot \mathrm{L}$$

$$Z_2 = \frac{1}{\mathrm{j} \cdot \omega \cdot \mathrm{C}}$$

Find the product of these resistances:

$$Z_1 \cdot Z_2 = \frac{\mathrm{j} \cdot \omega \cdot \mathrm{L}}{\mathrm{j} \cdot \omega \cdot \mathrm{C}} = \frac{L}{C} = k$$

We see that the product of the resistance of the filter branches, consisting of reactive elements, does not depend on the frequency and is equal to a constant number k. Such filters are called k-filters.