Answer on Question #73361, Physics / Optics

Question. Could the alternating current resistance of a device depends on the frequency?

Answer. In general, if the device contains inductance and capacitance the alternating current resistance of a device depends on the frequency as

$$Z = \sqrt{R^2 + \left(\omega L - \frac{1}{\omega C}\right)^2},$$

where Z is the resistance of a device (impedance); R – is the resistance; L – is the inductance of a device; C – is the capacitance of a device and $\omega = 2\pi\nu$ – is the angular frequency (ν is the signal frequency).