

Definitions and Concepts for WJEC (Eduqas) Physics A-level

Component 3 - Option A: Alternating Currents

Alternating Current: Electric current that periodically changes direction and constantly changes its magnitude.

Capacitor Phase Lead: The phase difference between the current and the potential difference in a capacitor. The potential difference leads the current by $\frac{\pi}{2}$ radians.

Current-Voltage Phase Lag: The phase difference between current and potential difference in an AC circuit.

Flux Linkage: The product of the number of turns in a coil and the magnetic flux.

Impedance: The overall opposition to current in a circuit.

Inductor Phase Lag: The phase difference between the current and the potential difference in an inductor. The current lags behind the potential difference by $\frac{\pi}{2}$ radians.

Inductor: A component in a circuit that stores energy in a magnetic field when a current flows through it.

Oscilloscope: A device used to display and analyse waveforms.

Peak Value: The maximum value achieved by a waveform.

Phase Angle: The difference in phase between two waves (such as the potential difference and current in an AC circuit) measured as an angle.

Power Dissipated: The amount of power dissipated in a resistor. $P = IV = I^2R = \frac{V^2}{R}$

Q Factor: A dimensionless parameter describing the dampening in a circuit. $Q = \frac{2\pi f_0 L}{R}$ where f_0 is the resonant frequency.

RC Circuit: A circuit containing a resistor and a capacitor.

RCL Circuit: A circuit containing a resistor, capacitor and an inductor.

Reactance: The opposition of a circuit element to the flow of current due to that element's inductance or capacitance

This work by [PMT Education](https://www.pmt.education) is licensed under [CC BY-NC-ND 4.0](https://creativecommons.org/licenses/by-nc-nd/4.0/)



Resonance: Resonance occurs when the frequency of oscillations is equal to the natural frequency of the oscillating system. The rate of energy transfer is at a maximum during resonance. In an AC circuit the resonant frequency is given by $f_0 = \frac{1}{\sqrt{LC}}$.

RL Circuit: A circuit containing a resistor and an inductor.

Rms Value: The amount of DC current required to achieve the same power as a given AC current. $V_{rms} = \frac{V_{peak}}{\sqrt{2}}$ where V_{peak} is the peak voltage of the AC current.

Sharpness of Resonance: Is the Q factor. The larger the Q factor the sharper the resonant frequency curve.

