

Alternating currents

Cambridge International AS & A Level Physics

Unlike IGCSE, 9702 gives you a data sheet: it is page 2 of Papers 1, 2 and 4, with more formulae on page 3 of Paper 4. Everything marked GIVEN is printed for you; everything else you must recall. Compiled by GioPhysics from the published syllabus. This is an independent study aid, not a Cambridge document; the official syllabus is the authority.

21.1 Characteristics of alternating currents

A LEVEL Sinusoidal alternating current or voltage

$$x = x_0 \sin \omega t$$

- x — current or voltage at time t
 x_0 — peak value
 ω — angular frequency (rad s^{-1})

A LEVEL Root-mean-square values

$$I_{\text{r.m.s.}} = I_0/\sqrt{2} \quad V_{\text{r.m.s.}} = V_0/\sqrt{2}$$

I_0, V_0 — peak current and voltage (A, V)

For a sinusoidal alternating current only.

A LEVEL Mean power in a resistive load

$$\text{mean power} = \frac{1}{2} \times \text{maximum power}$$

P — power (W)

For a sinusoidally alternating current.