

AC Circuit Overview

ChatGPT said:



Here is a list of formulae related to Alternating Current extracted from the provided PDF:

1. $v = v_m \sin(\omega t)$ — AC voltage in a sinusoidal form.
2. $i = i_m \sin(\omega t)$ — AC current in a sinusoidal form.
3. $v_m = i_m R$ — Ohm's law for AC circuits with resistance.
4. $P = \frac{1}{2} i_m^2 R$ — Average power dissipated in a resistor.
5. $X_L = \omega L$ — Inductive reactance.
6. $X_C = \frac{1}{\omega C}$ — Capacitive reactance.
7. $Z = \sqrt{R^2 + (X_L - X_C)^2}$ — Impedance of a series LCR circuit.
8. $P = VI \cos(\phi)$ — Power in AC circuits with power factor.
9. $\omega_0 = \frac{1}{\sqrt{LC}}$ — Resonant frequency for an LCR circuit.
10. $Q = \frac{1}{R} \sqrt{\frac{L}{C}}$ — Quality factor of a resonant circuit.
11. $V_{\text{rms}} = \frac{v_m}{\sqrt{2}}$ — RMS voltage.
12. $I_{\text{rms}} = \frac{i_m}{\sqrt{2}}$ — RMS current.
13. $V_s = \frac{N_s}{N_p} V_p$ — Transformer voltage ratio.
14. $I_s = \frac{N_p}{N_s} I_p$ — Transformer current ratio.
15. $P = I^2 R$ — Power dissipation in resistive circuits.

These formulae represent key relationships in the study of alternating current circuits.