

Energy Density Between Parallel Plates



Energy is stored in the electric field between the plates of a capacitor.

- Capacitance: $C = \frac{\epsilon_0 A}{d}$.
- Voltage: $V = Ed$.
- Potential energy: $U = \frac{1}{2}CV^2 = \frac{1}{2}\epsilon_0 E^2(Ad)$.
- Volume between the plates: Ad .
- Energy density of the electric field: $u_E = \frac{U}{Ad} = \frac{1}{2}\epsilon_0 E^2$

