

Parallel-Plate Capacitor



- A : area of each plate
- d : distance between plates
- Q : magnitude of charge on inside surface of each plate
- Charge per unit area (magnitude) on each plate: $\sigma = \frac{Q}{A}$
- Uniform electric field between plates:

$$E = \frac{\sigma}{\epsilon_0} = \frac{Q}{\epsilon_0 A}$$

- Voltage between plates:

$$V \equiv V_+ - V_- = Ed = \frac{Qd}{\epsilon_0 A}$$

- Capacitance for parallel-plate geometry:

$$C \equiv \frac{Q}{V} = \frac{\epsilon_0 A}{d}$$

