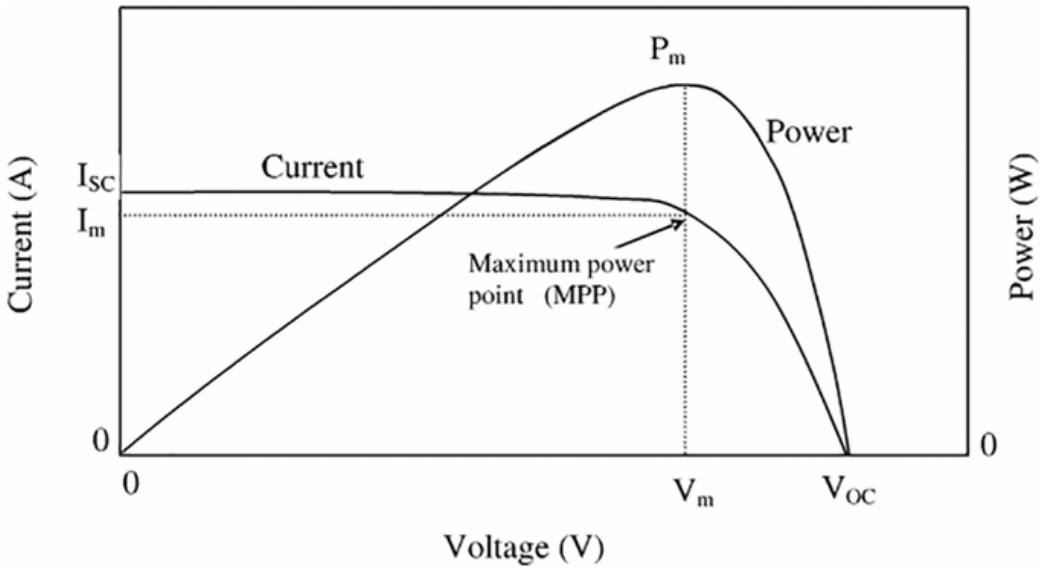
MPPT Algorithm

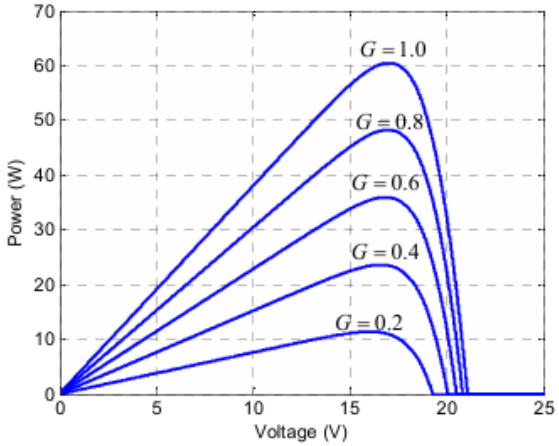
MPPT (Maximum Power Point Tracking) is a control algorithm used in solar PV systems to make sure the panel always delivers maximum possible power, even when sunlight or temperature changes.



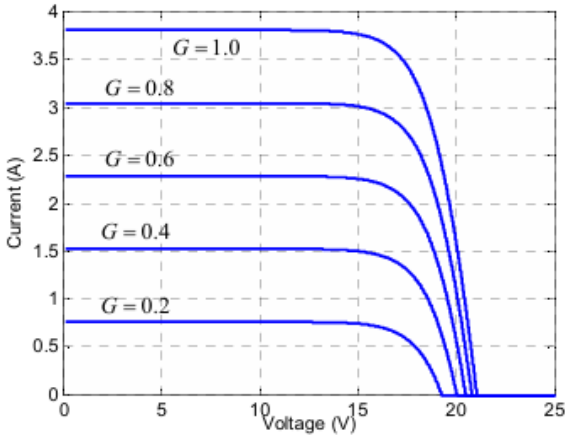
IV-PV curves to track maximum power point

Example :

Irradiation – G G=1 (1000 W/m^2)



(a)



(b)

Incremental Conductance MPPT

Incremental Conductance MPPT tracks the maximum power point by comparing incremental conductance (ΔI/ΔV) with instantaneous conductance (−I/V) and adjusting the PV operating voltage accordingly.

Power from a PV panel:

$$P = V \times I$$

To get **maximum power**, the slope of the **P–V curve** must be zero:

$$\frac{dP}{dV} = 0$$

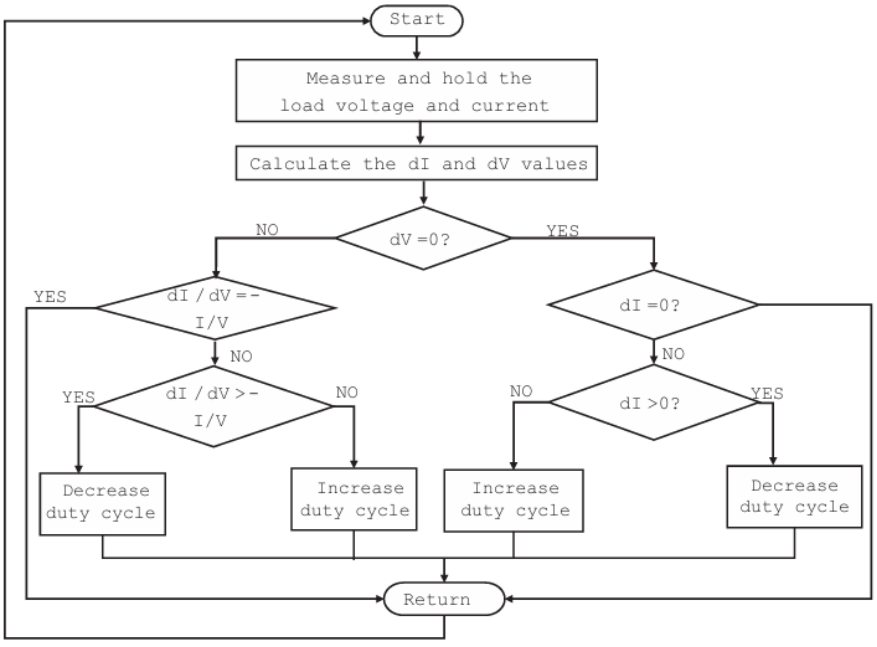
Expanding:

$$\frac{dP}{dV} = I + V\frac{dI}{dV}$$

At **Maximum Power Point (MPP)**:

$$\frac{dI}{dV} = -\frac{I}{V}$$

Flow Chart



IC algorithm in MPPT charge controller.