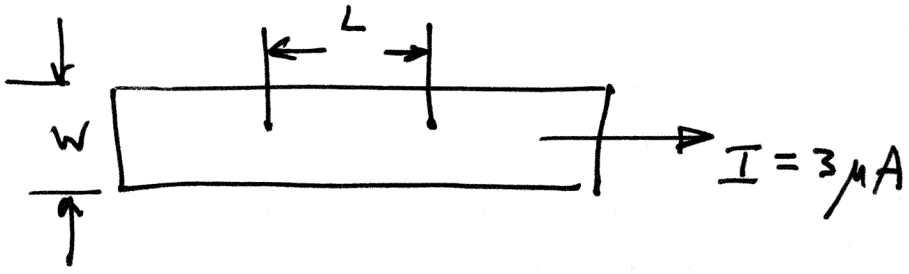
(5)



$W = 2\,\mu m$
$L = 8\,\mu m$ film thickness is t

- Since $V_{23} > 0$ for $B > 0$, carriers are holes.
- The Hall voltage at $B = 1\ T$ is about 1.75 mV. The Hall voltage is given by force balance to be

$$q\mathcal{E}_H = q\frac{V_{23}}{W} = qvB$$

Since $I = pqvA = pqvwt$

$$I = p'qvw \quad \text{where } p' = \#/\text{area}$$

So $$qv = \frac{I}{p'w} = \frac{qV_{23}}{wB} \Rightarrow p' = \frac{I}{q}\frac{B}{V_{23}}$$

$$\boxed{p' = 1.07 \times 10^{12}\ cm^{-2}}$$

- $$R = \frac{20\ mV}{3\ \mu A} = \frac{20}{3} \times 10^3\ \Omega = \frac{\rho L}{w \cdot t}$$

$$\frac{20}{3} \times 10^3 = \frac{L}{q\rho\mu \cdot w \cdot t} = \frac{L}{qp'w\mu}$$

$$\mu = \frac{L}{qp'w \cdot (20/3) \times 10^3} = \boxed{3500\ cm^2/Vs = \mu}$$