

# Formula Sheet

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$$\textcircled{1} \quad v_d \propto E$$

$$\textcircled{2} \quad v_d = \frac{e\tau}{m} E$$

$\mu$  → mobility

$$\star \textcircled{3} \quad I = A n e v_d$$

$$J = I/A = n e v_d$$

$$J = \underbrace{ne\mu}_{\sigma} E$$

→ Conductivity

$$\textcircled{4} \quad J = \sigma E \quad \text{"Ohm's Law"}$$

$E$  = electric field

$e$  = charge of electron

$\tau$  = collision time

$m$  = mass of electron

$v_d$  = drift velocity

⑤

Ionisation

energy

=

$$\frac{m e^4}{2 (4 \pi \epsilon_0)^2 n^2 h^2}$$