

# Electric Current (H.1)

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Based on  
Engineering Electromagnetics  
Hayt & Buck

$$E_{\rho} = \frac{\rho_L}{2\pi\epsilon_0\rho}$$

$$\mathbf{E} = \frac{\rho_L}{2\pi\epsilon_0\rho} \mathbf{a}_{\rho}$$

$$\mathbf{E} = \frac{\rho_s}{2\epsilon_0} \mathbf{a}_N$$

$$I = \int_S \mathbf{J} \cdot d\mathbf{S}$$

$$\mathbf{J} = \rho_v \mathbf{v}$$

$$(\nabla \cdot \mathbf{J}) = - \frac{\partial \rho_v}{\partial t}$$

$$\mathbf{J} = - \rho_e \mu_e \mathbf{E}$$

$$\mathbf{J} = \sigma \mathbf{E}$$

$$\sigma = - \rho_e \mu_e$$

$$V = IR$$

$$R = \frac{L}{\sigma S}$$

$$D_t = E_t = 0$$

$$D_n = \epsilon_0 E_n = \rho_s$$

$$\sigma = -p_e \mu_e + p_n \mu_n$$

