

$$\begin{aligned}
 I &= I_s (e^{V_a/V_t} - 1) = qA \left[\frac{D_n n_{p0}}{L_n} + \frac{D_p p_{n0}}{L_p} \right] (e^{V_a/V_t} - 1) \\
 &= qA \left[\frac{n_{p0} L_n}{\tau_n} + \frac{p_{n0} L_p}{\tau_p} \right] (e^{V_a/V_t} - 1)
 \end{aligned}$$