

$$J_n(x) = qD_n \frac{dn}{dx} \quad , \quad -w_p \leq x \leq -x_p$$

$$= \frac{qD_n n_{p0}}{L_n} (e^{V_a/V_t} - 1) \left[\sinh \frac{x + x_p}{L_n} + \coth \frac{w_p}{L_n} \cosh \frac{x + x_p}{L_n} \right]$$