

$$U_{SHR, \max} = \text{MAX} \left(\frac{1}{\tau} \frac{n_i^2 (e^{V_a / V_t} - 1)}{n + p + 2n_i \cosh\left(\frac{E_t - E_i}{kT}\right)} \right) \approx \frac{n_i}{2\tau} (e^{V_a / 2V_t} - 1)$$