

$$V_{ADIBLC} = \frac{(V_{gsteff} + 2V_t)}{\theta_{ROUT}(1 + P_{DIBLCB}V_{bseff})} \left(1 - \frac{A_{bulk}V_{dsat}}{A_{bulk}V_{dsat} + V_{gsteff} + 2V_t} \right)$$

$$\theta_{ROUT} = P_{DIBLC1} \left[\exp(-D_{ROUT} \frac{L_{eff}}{2l_{t0}}) + 2 \exp(-D_{ROUT} \frac{L_{eff}}{l_{t0}}) \right] + P_{DIBLC2}$$

$$\frac{1}{V_{ASCBE}} = \frac{P_{scbe2}}{L_{eff}} \exp\left(\frac{-P_{scbe1} \text{litl}}{V_{ds} - V_{dseff}}\right)$$

$$V_{Asat} = \frac{E_{sat}L_{eff} + V_{dsat} + 2R_{DS}V_{sat}C_{ox}W_{eff}V_{gsteff} \left[1 - \frac{A_{bulk}V_{dsat}}{2(V_{gsteff} + 2V_t)} \right]}{2/\lambda - 1 + R_{DS}V_{sat}C_{ox}W_{eff}A_{bulk}}$$

$$\text{litl} = \sqrt{\frac{\epsilon_{si}T_{ox}X_j}{\epsilon_{ox}}}$$

B.1.7 Substrate Current

$$I_{sub} = \frac{\alpha_0 + \alpha_1 \cdot L_{eff}}{L_{eff}} (V_{ds} - V_{dseff}) \exp\left(-\frac{\beta_0}{V_{ds} - V_{dseff}}\right) \frac{I_{ds0}}{1 + \frac{R_{ds}I_{ds0}}{V_{dseff}}} \left(1 + \frac{V_{ds} - V_{dseff}}{V_A} \right)$$