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COMMENTS AND CORRECTIONS

# Corrections to “Design-Oriented All-Regime All-Region 7-Parameter Short-Channel MOSFET Model Based on Inversion Charge”

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In the above article [1], equations (33) and (36) had a typing error. The correct equations are:

$$\frac{\partial q_D}{\partial v_d} = \left(\frac{\sigma}{n} - 1\right) \frac{q_D}{q_D + 1}, \tag{33}$$

$$\frac{\partial q_S}{\partial v_s} = \left(\frac{\sigma}{n} - 1\right) \frac{q_S}{q_S + 1}. \tag{36}$$

Equation (37) was incomplete. The complete equation is:

$$g_m = \frac{\partial i_d}{\partial v_g} = \frac{2}{nB} \left[ q_S - q_D - i_d \frac{\theta}{4} \left( \frac{q_S}{1 + q_S} + \frac{q_D}{1 + q_D} \right) \right] \tag{37}$$

Equation (38) has a typing error. The correct equation is:

$$\frac{\partial i_{dsat}}{\partial v_x} = \frac{\partial i_{dsat}}{\partial q_S} \frac{\partial q_S}{\partial v_x} = 2 \frac{E}{D + \frac{\theta}{2} E} \frac{\partial q_S}{\partial v_x} \tag{38}$$

Equations (41) and (42) were incomplete. The complete equations are:

$$g_{m2} = \frac{\partial^2 i_d}{\partial v_g^2} = \frac{2}{n^2 B} \left[ \frac{q_S}{1 + q_S} - \frac{q_D}{1 + q_D} - \frac{\theta}{4} \left[ 2ng_m \left( \frac{q_S}{1 + q_S} + \frac{q_D}{1 + q_D} \right) \right] \right]$$

$$+ i_d \left( \frac{q_S}{(1 + q_S)^3} + \frac{q_D}{(1 + q_D)^3} \right) \tag{41}$$

$$g_{m3} = \frac{\partial^3 i_d}{\partial v_g^3} = \frac{2}{n^3 B} \left[ \frac{q_S}{(1 + q_S)^3} - \frac{q_D}{(1 + q_D)^3} - \frac{\theta}{4} \left[ 3n^2 g_{m2} \left( \frac{q_S}{1 + q_S} + \frac{q_D}{1 + q_D} \right) + 3ng_m \left( \frac{q_S}{(1 + q_S)^3} + \frac{q_D}{(1 + q_D)^3} \right) + i_d \left( \frac{q_S (1 - 2q_S)}{(1 + q_S)^5} + \frac{q_D (1 - 2q_D)}{(1 + q_D)^5} \right) \right] \right] \tag{42}$$

The authors request this correction to provide the correct equations, as they may be useful to the community for future work on the subject.

REFERENCES

[1] D. A. Pino-Monroy, P. Scheer, M. K. Bouchoucha, C. Galup-Montoro, M. J. Barragan, P. Cathelin, J.-M. Fournier, A. Cathelin, and S. Bourdel, “Design-oriented all-regime all-region 7-parameter short-channel MOSFET model based on inversion charge,” *IEEE Access*, vol. 10, pp. 86270–86285, 2022, doi: 10.1109/ACCESS.2022.3198644.