# I. CONCLUSION

## APPENDIX A
## PROOF OF EQ.XXX

If there is a mismatch between the two reference MOSTFETs, the $\Delta G_m$ would be derived in this section. Based on the error models shown in Section **??**. As shown in Fig.**??**, the operating points will be locked by the feedback loop, while the difference of output currents is **XXXX** and the difference of input voltages is **xxxx**.

The current equations of different operating points are **don't assume square-law!!!**

$$I_2 = k^x/2(W/L)(V_2^x - V_t)^2 \tag{A.1}$$

As a result,

$$XXXXXXXXXXXXXXXXXXXXXXXXXX \tag{A.2}$$

Define the transconductance which is referred to $M_2$ as

$$XXXXXXXXXXX \tag{A.3}$$

Eq.XXX can be expressed as Assuming XXXXX, we have

$$yyyy. \tag{A.4}$$

Since

$$\tag{A.5}$$

$G_{m2}^x$ is obtained as

$$zzzzzzz. \tag{A.6}$$

## APPENDIX B
## RELATIONSHIPS BETWEEN SMALL-SIGNAL $g_m$ AND $1/R$

Taylor's expansion of $I_{out}$ at $V_0$ is:

$$I_{out}(V_0 + v) = I_0 + \sum_{i=1}^{\infty} a_i \cdot v^i \tag{B.1}$$

, with $a_i$ being the $i$-th coefficient of the expansion. Subtracting $I_{out}(V_0)$ from $I_{out}(V_0 + \Delta V)$, and dividing it by $\Delta V$ will result in:

$$\frac{\Delta I}{\Delta V} = \sum_{i=1}^{\infty} a_i \cdot \Delta V^{i-1} \equiv \frac{1}{R} \tag{B.2}$$