Simulation Report 1

Yifu Huang

Codes for plotting and problem solving: https://github.com/yifuhhh/EE396V_TFT

1. Transfer curve and output curve

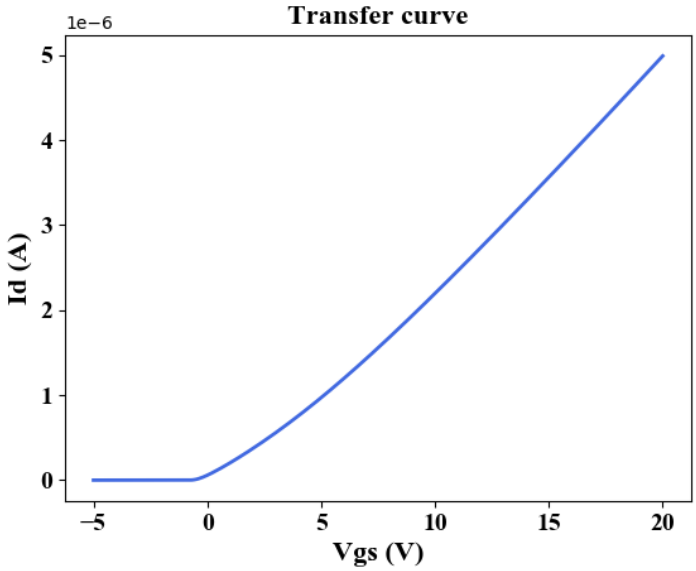

Figure 1. Transfer curve

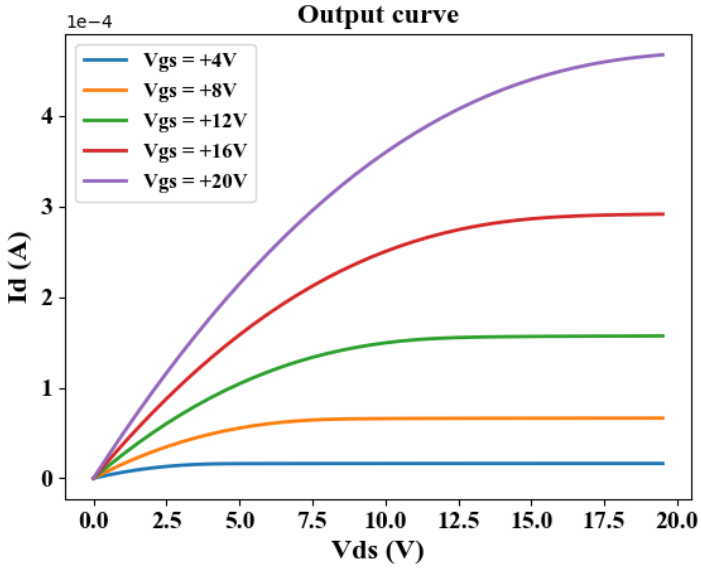

Figure 2. Output curve

2. Field effect mobility plot

$$\mu_{EFF} = \frac{g_d}{\frac{Z}{L} C_G (V_{GS} - V_T)}$$

In this model, the size parameters are as following:

- t_{SiO2} = 0.1 um
- t_{IGZO} = 0.02 um
- Z = 180 um
- L = 30 um
- C_G = 3.45e-4 F/m^2
- V_T = 2.23 V (Given by Fig. 3)

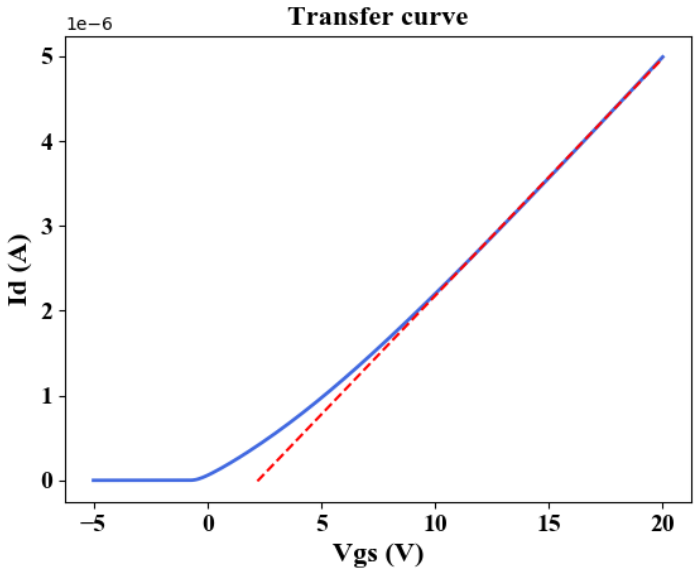

Figure 3. Solve for threshold voltage

The output conductance g_d is given by the slope of I_D – V_{DS} in linear region. Here, the output conductance under V_{GS} ranging from 0 to 20 V is shown as Fig. 4.

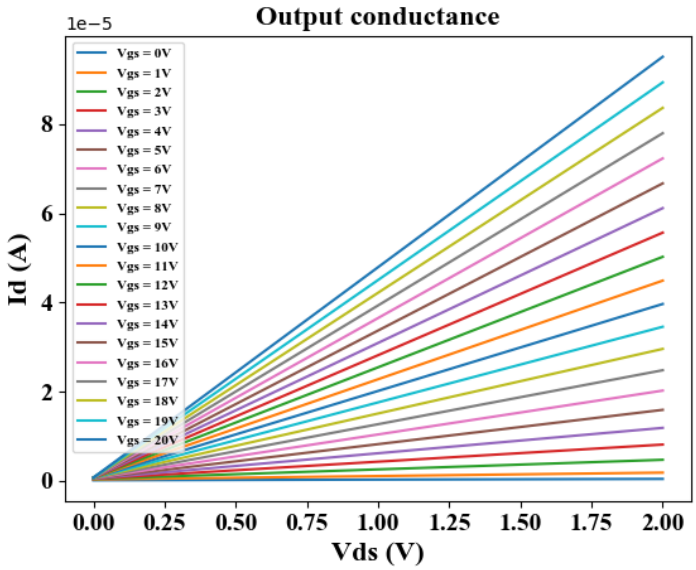

Figure 4. Solve for output conductance under different V_{GS}

Finally, the effective mobility plot is shown as Fig. 5.

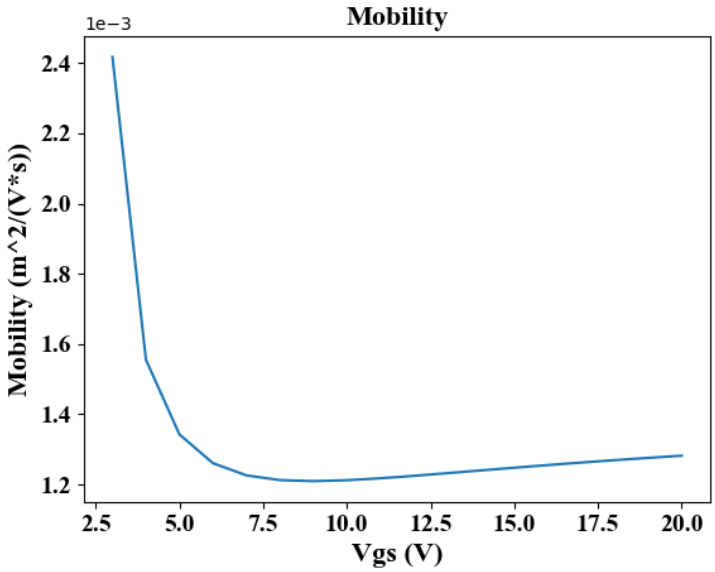

Figure 5. Mobility