1 Measurements & Parameter Extraction

1.1 Line Width/Misalignment

1.2 Four-Point Resistors [2a, 2b]

1.2.1 Measurement Setup

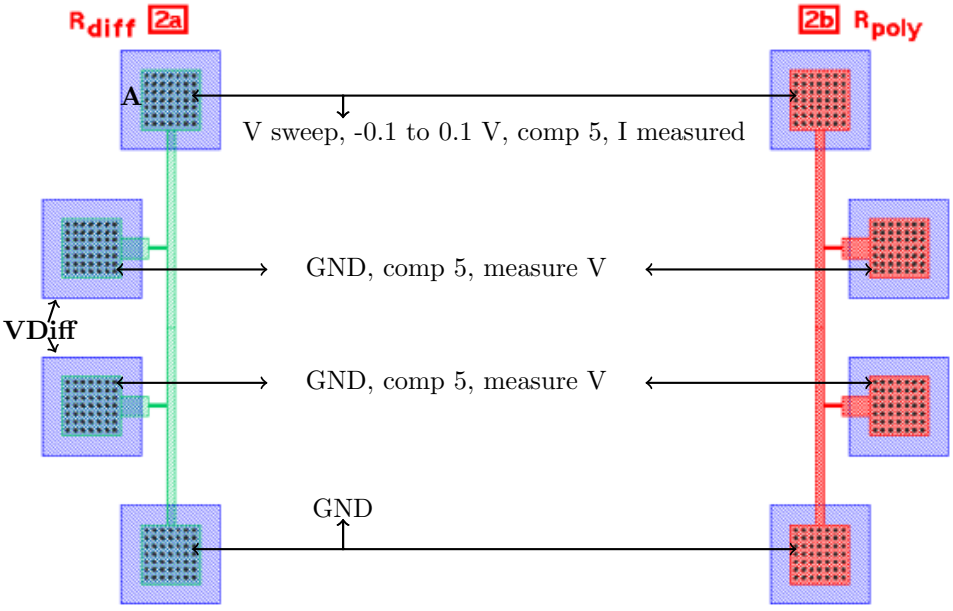

Figure 1: Device 2a is a diffusion resistor and 2b is a poly resistor.

1.2.2 I-V plot for the diffusion resistor, 2a

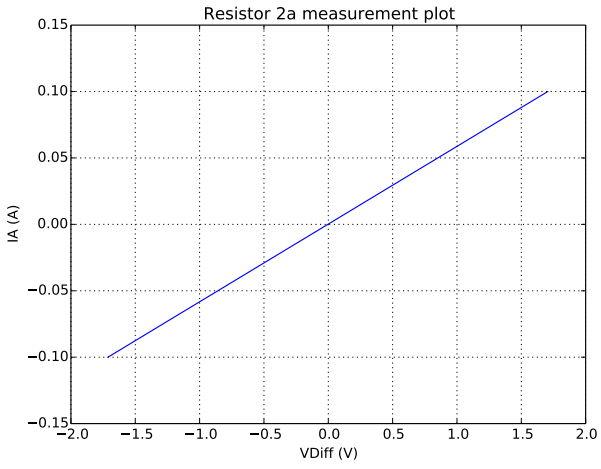

Figure 2: A plot of the measurement data taken for resistor 2a. The plot is based off of 2 data points.

Get resistance, sheet resistance, doping concentration, electron mobility ....

1.2.3 I-V plot for the poly resistor, 2b

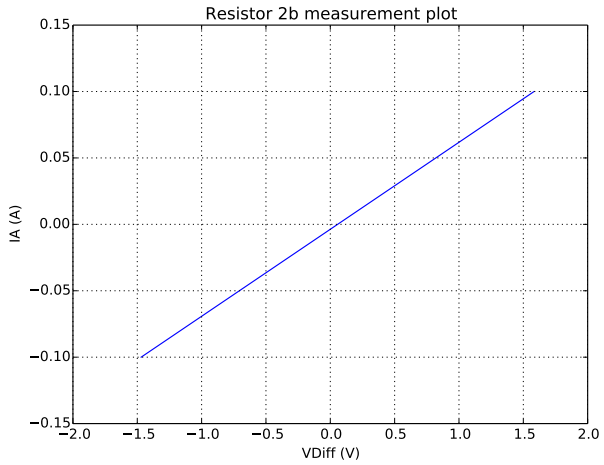

Figure 3: A plot of the measurement data taken for resistor 2b. The plot is based off of 2 data points.

Get resistance and sheet resistance...

1.3 Four-Point Contact-Chain Resistor [2c, 2d]

1.3.1 Measurement Setup

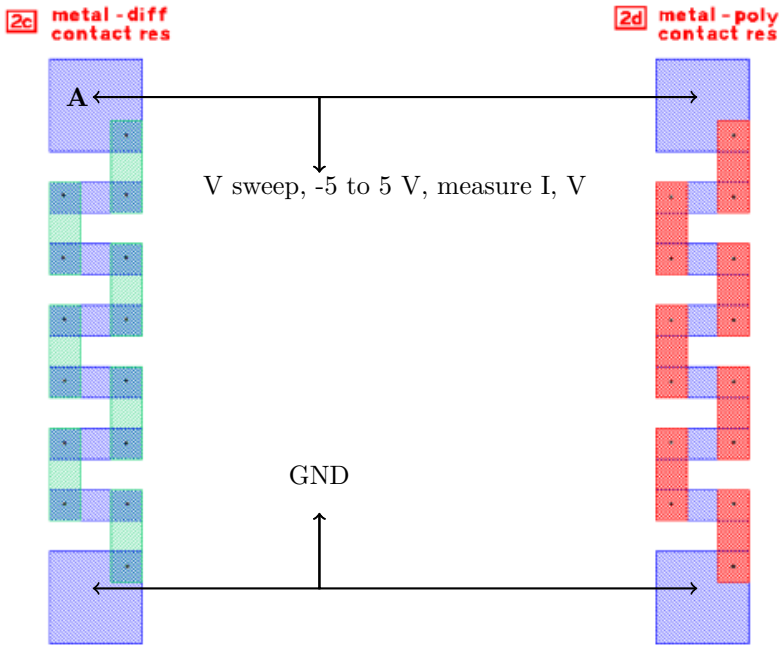

Figure 4: Chain resistor setup for diffusion and poly resistors.

1.3.2 b. I-V plot for diffusion resistor, 2c

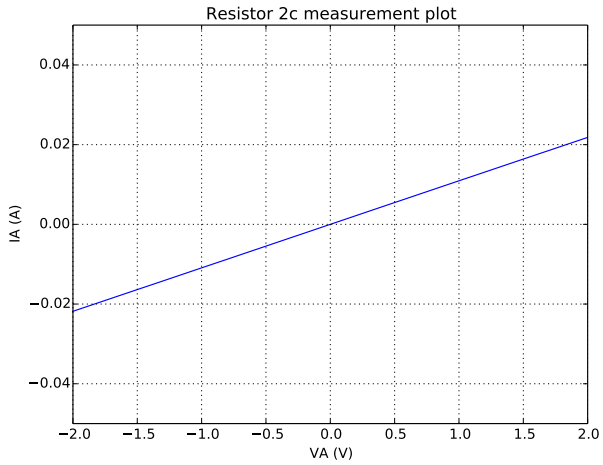

Figure 5: A plot of the measurement data taken for resistor 2c. The plot is based off of 2 data points.

i. Extract the resistance
ii. Extract metal-to-diffusion contact resistance

1.3.3 b. I-V plot for poly resistor, 2d

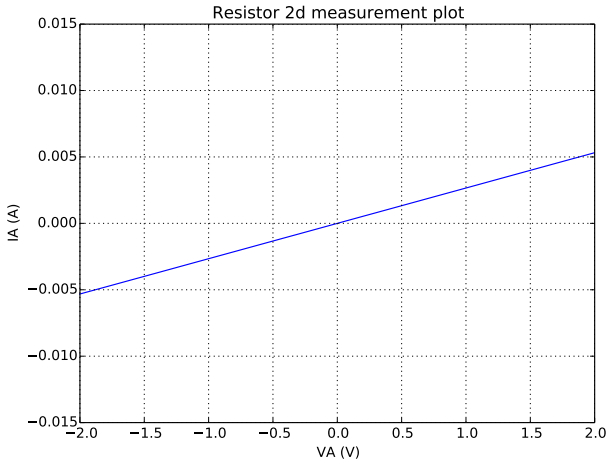

Figure 6: A plot of the measurement data taken for resistor 2d. The plot is based off of 2 data points.

i. Extract the resistance
ii. Extract metal-to-poly contact resistance

1.4 Gate Oxide Capacitor, 4

1.4.1 Measurement Setup

1.4.2 C-V plot of gate oxide capacitor w/ lights ON

Minimum capacitance

1.4.3 C-V plot of gate oxide capacitor w/ lights OFF

minimum capacitance ...

1.5 Field Oxide Capacitor, 3

1.5.1 Measurement Setup

1.5.2 C-V plot of field oxide capacitor

Minimum capacitance

1.5.3 Capacitance in the accumulation region

minimum capacitance ...

1.5.4 Field oxide thickness

stuff...

1.6 Intermediate Oxide Capacitors, 5

1.6.1 Measurement Setup

1.6.2 C-V plot of intermediate oxide capacitor

stuff ...

1.6.3 Capacitance in the accumulation region

stuff...

1.7 Diode, 7

1.7.1 Measurement setups for forward and reverse operations

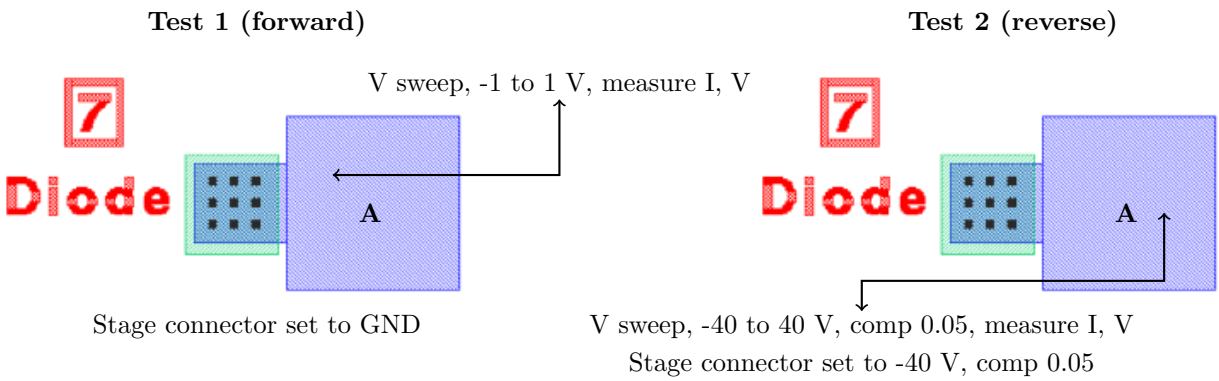

Figure 7: Two tests were performed on this diode; both measurement setups are shown above.

1.7.2 I-V plots for forward and reverse operation

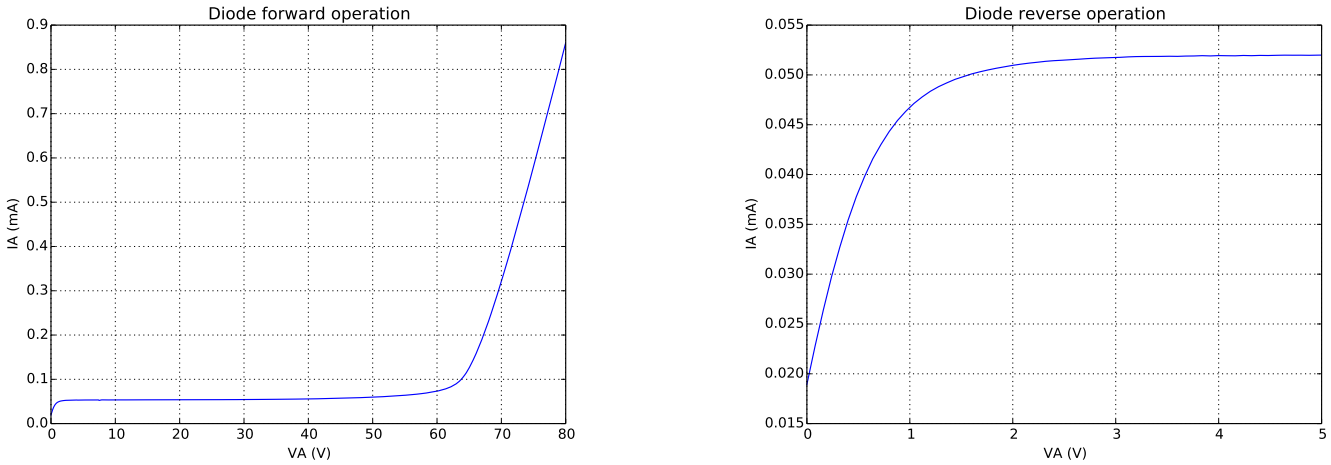

Figure 8: Plots of forward and reverse operation of Diode 7.

1.7.3 Extract the turn-on voltage and the series resistance

1.8 MOSFETs of Varying Length, [8a-d]

1.8.1 Measurement setups

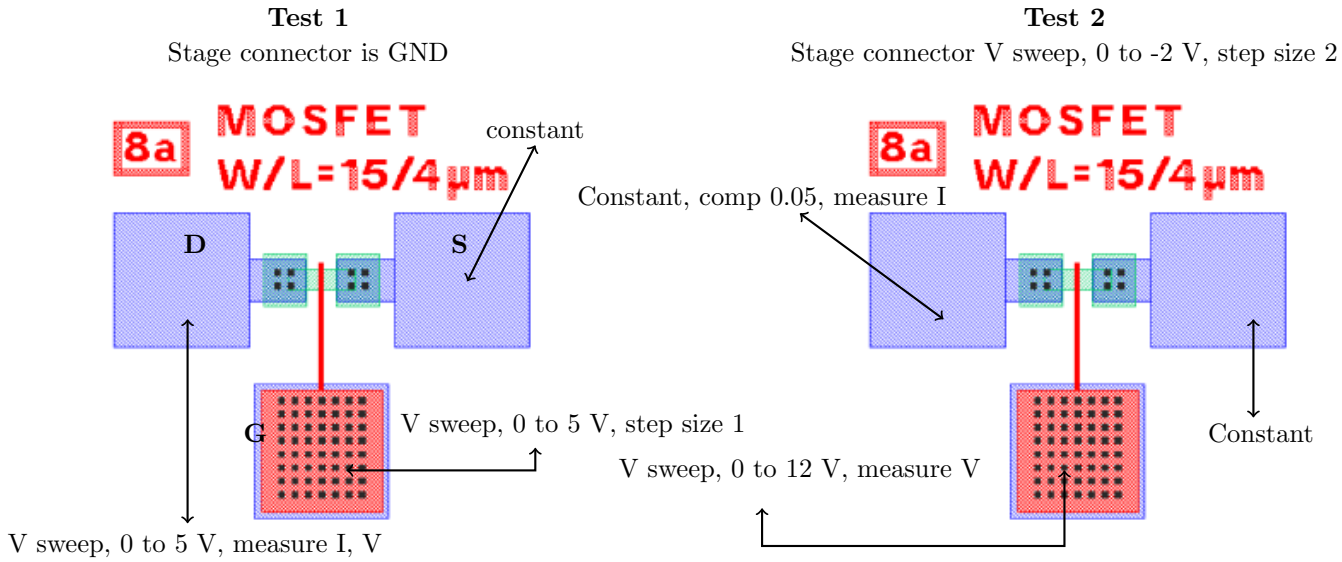

Figure 9: Measurement setup for Mosfet 8a. The same setup is used for Mosfets 8a-d. The only difference is the channel length which changes from 4 (8a) to 6 (8b) to 8 (8c) to 10 (8d) microns.

1.8.2 Plots of I_D-V_{DS}, sweeping V_G

Mosfet 8a

2 References

1. Jaeger, Richard. *Introduction to microelectronic fabrication.* New Jersey: Prentice Hall, 2002. Print.