Extra Credit Assignment (Option #3)

ECE 0257 – Spring 2019

Name

Avery Peiffer

Hand Analysis

      (a)

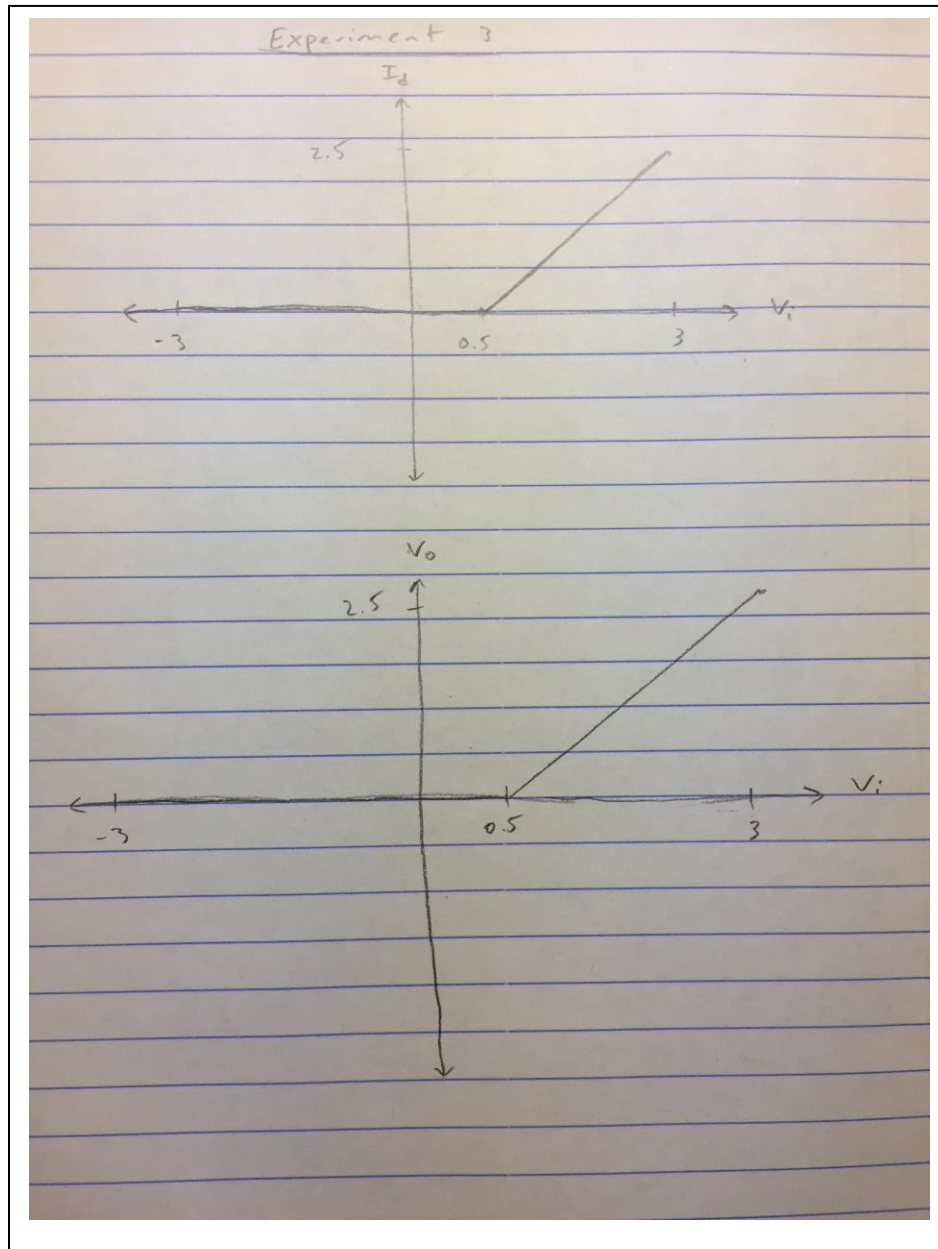**Simulation**

      (a)

Prototype

      (a)-(g)

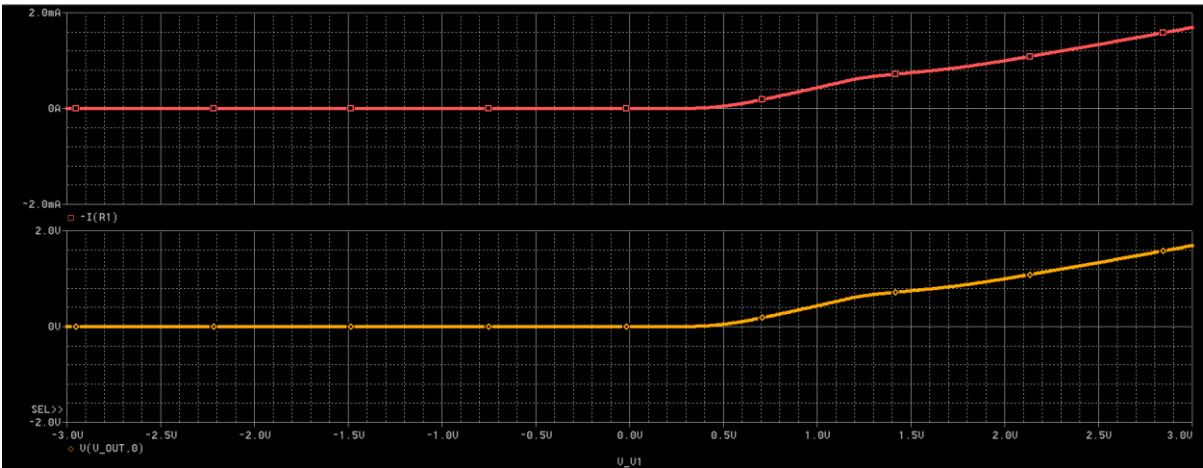**Check-list Before Submission**

☐ Write within boxes, no boxes are moved

☐ Write your full names in designated area

☐ Save this file as a PDF before uploading, keep the number of pages (**13**) unchanged

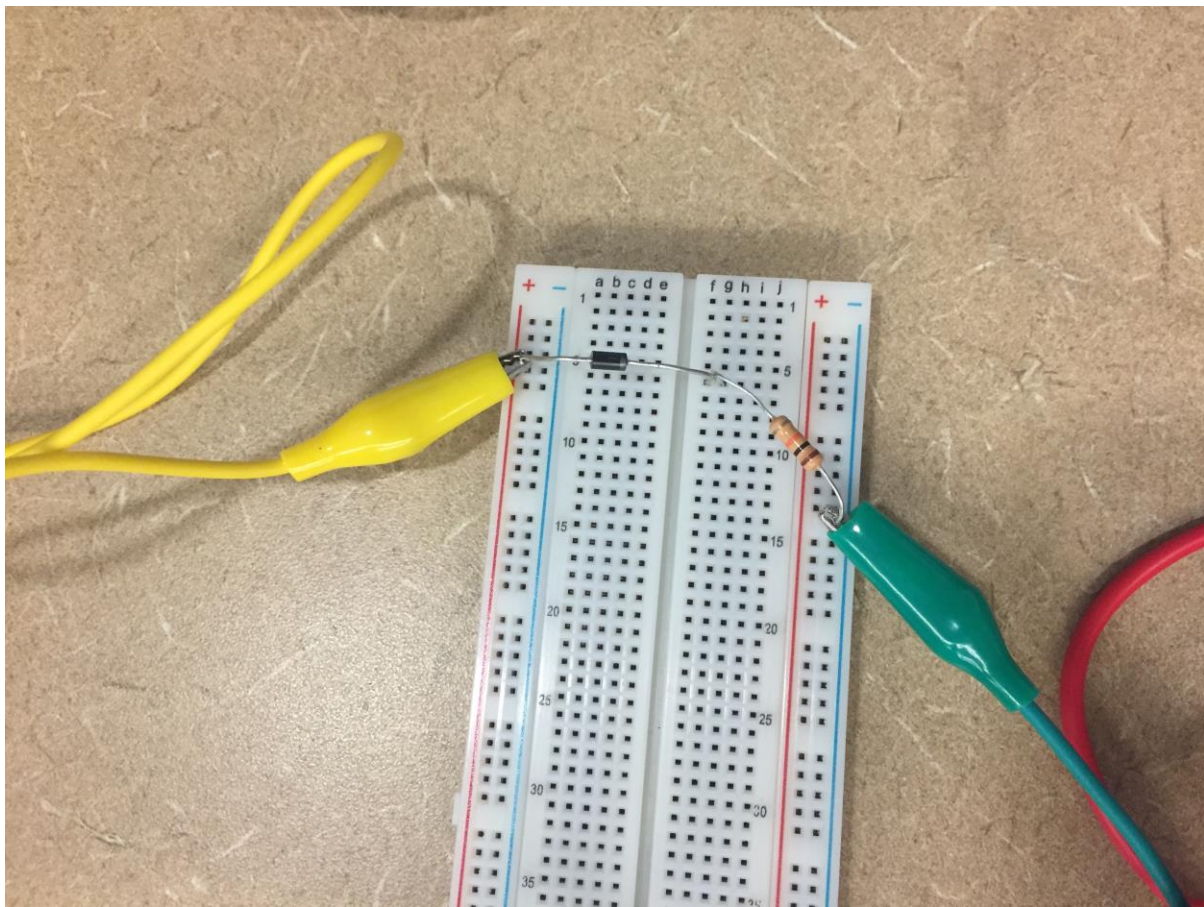☐ Notify "TO BE CONTINUED" accordingly if you used the extra pages (page 11-13)

Hand Analysis (a)

Experiment 3

I_d

2.5

−3   0.5   3 V_i

V_o

2.5

−3   0.5   3 V_i

Experiment 3

Simulation (a)

Prototype (a)

Prototype (b)

Resistance = 0.993 kiloohms

Prototype (c)

| Vi	Vo (V)	Id = Ir (mA)
-3	-0.000003	-0.000003
-2.75	-0.000005	-0.000005
-2.5	-0.0000025	-2.5E-06
-2.25	-0.000002	-0.000002
-2	-0.000002	-0.000002
-1.75	-0.000002	-0.000002
-1.5	-0.000001	-0.000001
-1.25	-0.000001	-0.000001
-1	-0.000001	-0.000001
-0.75	-0.000001	-0.000001
-0.5	-0.000001	-0.000001
-0.25	-0.000001	-0.000001
0	0	0
0.25	0.00022	0.00022
0.5	0.0465	0.0465
0.75	0.227	0.227
1	0.445	0.445
1.25	0.675	0.675
1.5	0.909	0.909
1.75	1.148	1.148
2	1.388	1.388
2.25	1.631	1.631
2.5	1.874	1.874
2.75	2.118	2.118
3	2.363	2.363

Prototype (d)

Vo vs Vi

Prototype (e)

Id vs Vi

Prototype (f)

Id vs Vd
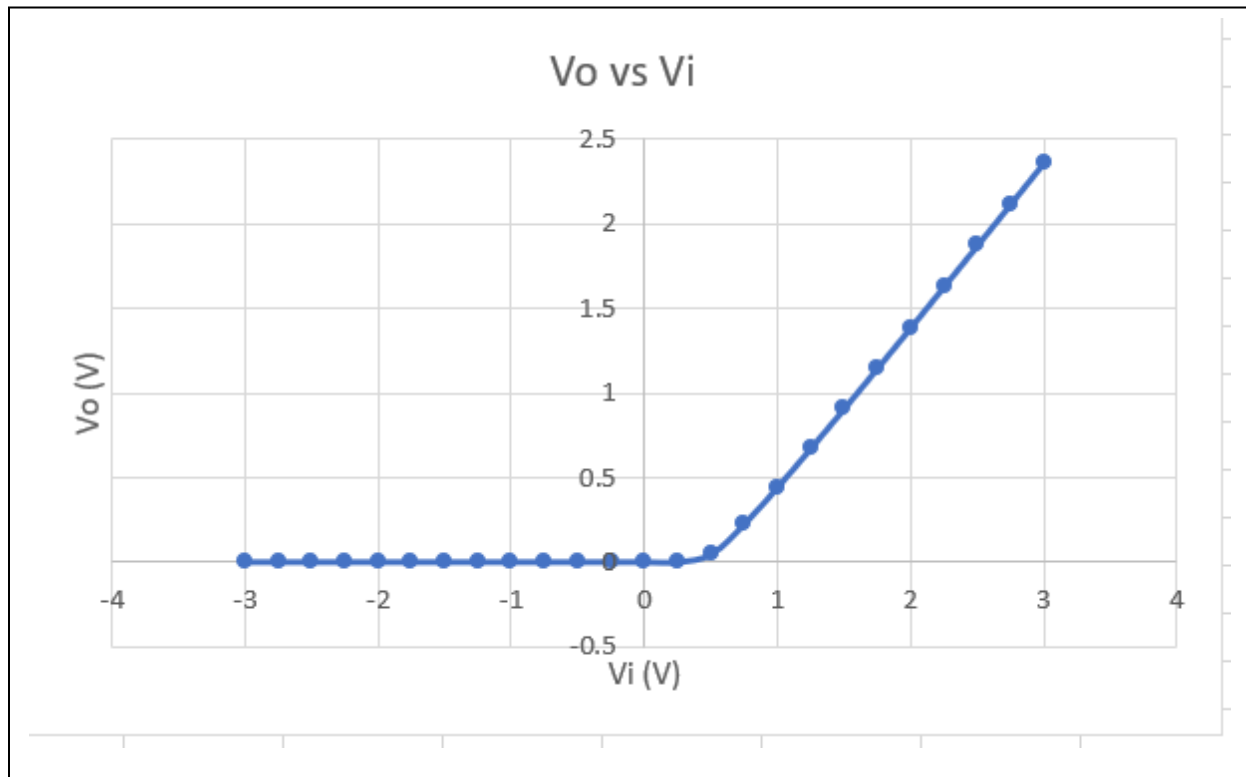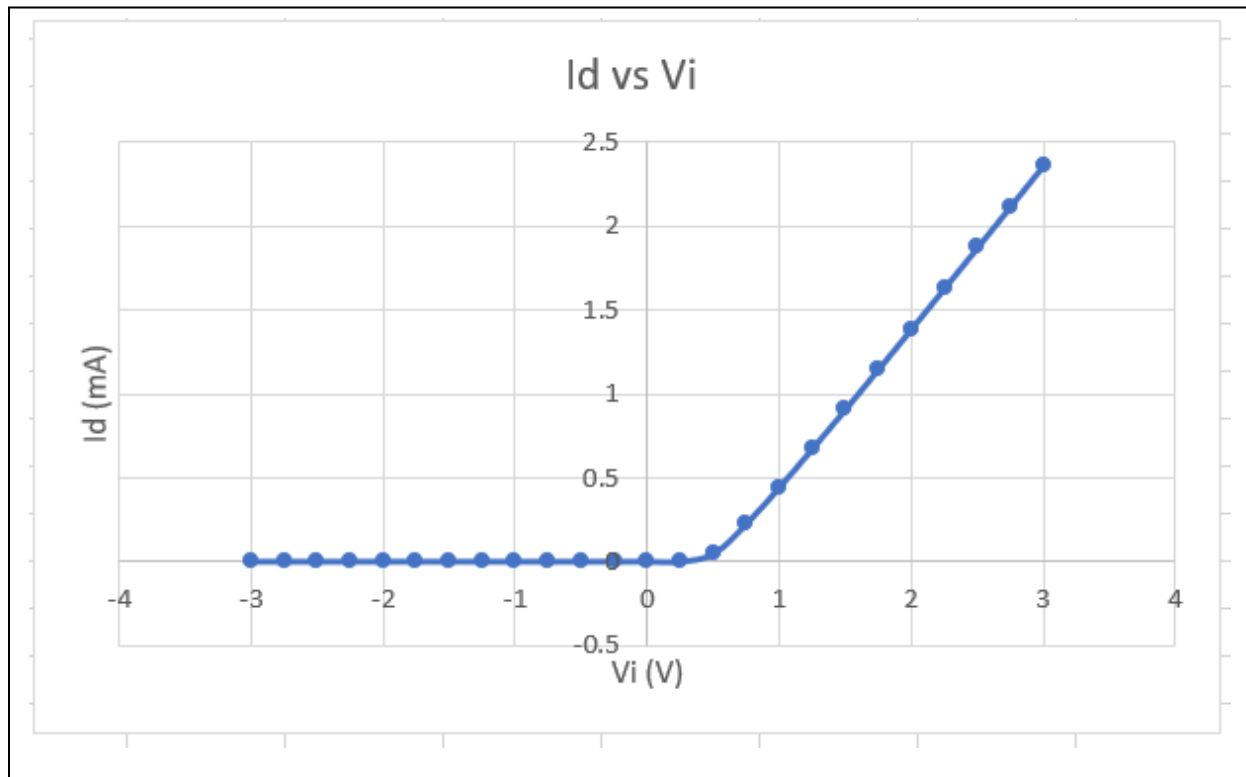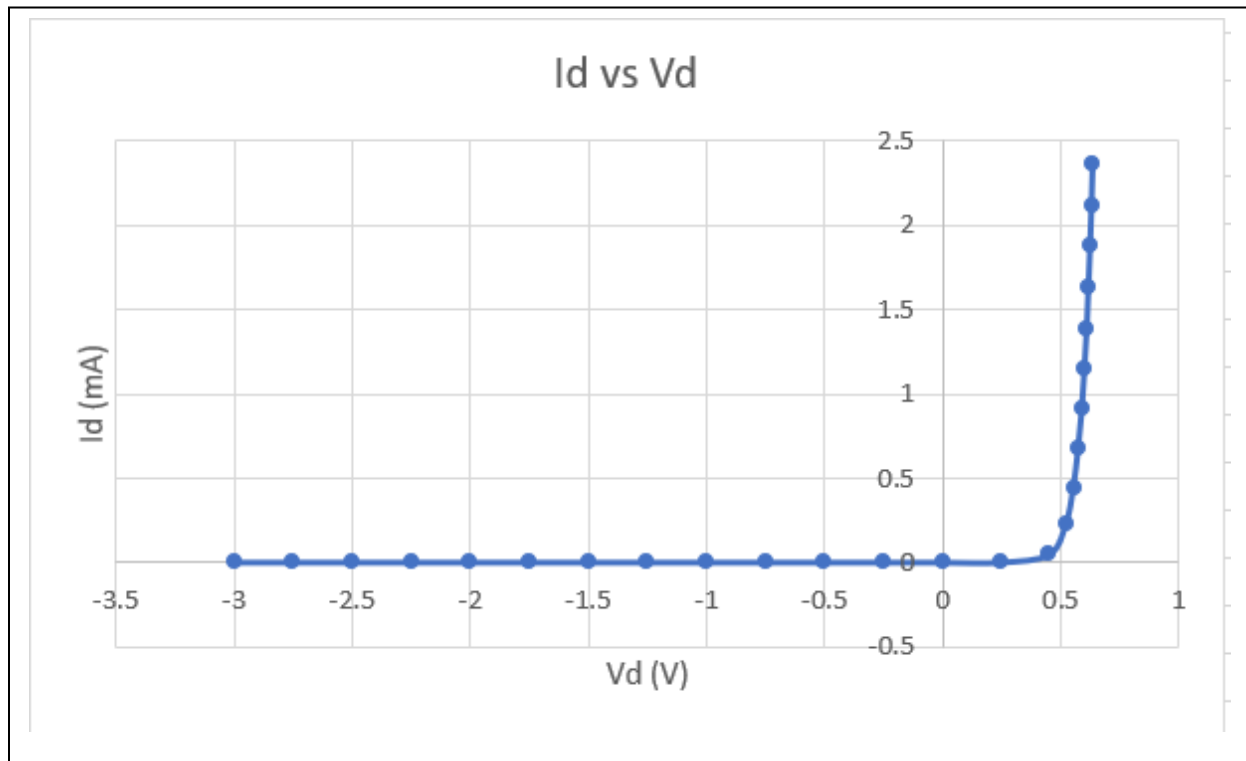
Prototype (g)

There is a slight discrepancy between the hand calculations/measurements and the simulation. In the simulation, the curve is not entirely linear from 0.5 V – 1.5 V. I attribute this to the PSpice model of a diode being more detailed than the precision used for the hand calculations and measurements. This distortion in the curves is likely due to the diode being a non-linear device and not entirely fitting the model used for it throughout the experiment.

EXTRA PAGES

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