Georgia Institute of Technology

School of Electrical and Computer Engineering

ECE 3043 Electrical and Electronic Circuits Laboratory Verification Sheet

NAME:_____ SECTION:_____

AD LOGIN:_____

Experiment 11: Diodes

Procedure	Time Completed	Date Completed	Verification (Must demonstrate circuit)	Points Possible	Points Received
2. Resistance Measurement				7	
3. Diode parameter measurement				7	
5. I-V Curve				7	
6. Half Wave Rectifier				7	
7. Full Wave Rectifier				7	
8. Diode Limiter				7	
9. Rectifier Limiter				7	
10. Voltage Doubler				7	
11. Envelope Detector				7	
12. Half Wave Rectifiers				7	
13. Full Wave Rectifier				7	
14. Peak Hold Circuit				7	
15. Bar Graph Array				7	
16. Level Indicator				9	

To be permitted to complete the experiment during the open lab hours, you must complete at least **nine** procedures during your scheduled lab period or spend your entire scheduled lab session attempting to do so. A signature below by your lab instructor, Dr. Brewer, or Dr. Robinson permits you to attend the open lab hours to complete the experiment and receive full credit on the report. Without this signature, you may use the open lab to perform the experiment at a 50% penalty.

SIGNATURE:_____ DATE:_____

ECE 3043 Check-off Requirements for Experiment 11

Make sure you have made all required measurements before requesting a check-off. For all check-offs, you must demonstrate the circuit or measurement to a lab instructor. All screen captures must have a time/date stamp.

2. Resistance Measurement
   - ✓ Table showing forward and reverse biased resistance measurements for the three diodes
   - ✓ Table showing forward and reverse biased diode check measurements for the three diodes
3. Diode parameter measurement
   - ✓ Series resistance measurement
   - ✓ Table showing Is and n for each diode
   - ✓ Plots of ln(ID) versus VD for each diode
5. I-V Curve
   - ✓ Scope captures of XY plots for each of the three diodes
6. Half Wave Rectifier
   - ✓ Scope capture showing resistor and diode voltages
   - ✓ VTC plot
7. Full Wave Rectifier
   - ✓ Scope capture showing resistor voltage
   - ✓ Ac and dc voltage measurements of resistor voltage with multimeter
   - ✓ Ac and dc voltage measurements of resistor voltage with multimeter after adding parallel cap
   - ✓ Recording of vertical shift on scope as coupling is changed from ac to dc
   - ✓ Scope capture showing ac component of resistor voltage after adding parallel cap
8. Diode Limiter
   - ✓ Scope capture of XY plot with cursors indicating break points
   - ✓ VTC plot
9. Rectifier Limiter
   - ✓ Scope capture of XY plot with cursors indicating break points
10. Voltage Doubler
    - ✓ Scope capture showing input and output voltages
    - ✓ Ac and dc voltage measurements of output voltage with multimeter
    - ✓ Comparison of multimeter measurements with scope measurements
11. Envelope Detector
    - ✓ Scope capture of output voltage
12. Half-Wave Rectifiers
    - ✓ Screen captures displaying input and output of the three rectifiers for 100Hz, 10kHz, and 100kHz input frequencies. Show measured Vpp for each channel.
    - ✓ Screen captures displaying XY plots of the three rectifiers for 100 Hz, 10kHz, and 100kHz input frequencies.
13. Full-Wave Rectifier
    - ✓ Screen capture displaying input and output of rectifier for 100Hz input frequency. Show measured Vpp for each channel.
    - ✓ Screen capture displaying XY plot of rectifier for 100 Hz input frequency.
14. Peak-Hold Circuit

- ✓ Screen capture displaying input sine wave and output dc voltage. Make sure the volts per division settings are the same for both channels and that both channels are dc coupled. Also set the ground level for both channels to be the same (use the vertical position control to place the ground level indicators on the left side of the scope trace on top of each other).
- ✓ Description of how the output responds as the input is varied both up and down.
- ✓ Answer to question: Why does the output voltage go up faster than it goes down?
- ✓ Retain this circuit for possible use in procedure 16.

15. Bar-Graph Array
    - Note that there is a 10k pot and a fixed 10k resistor in the circuit of Fig. 11.34. The wiper of the pot connects to pin 5 of the bar graph display. The dmm is connected between pin 5 and ground to measure the dc voltage.
    - ✓ Table of voltages at which each LED in the array lights.
16. Level Indicator
    - ✓ Demonstration and explanation of designed circuit. The last LED must just turn on for the input voltage found from the table below. Remember, the voltage at pin 5 of the display driver must be a dc voltage but the input signal is a sinusoid.
    - ✓ Schematic of designed circuit.

Last Digit of GTID	0,1	2,3	4,5	6,7	8,9
Input Voltage for Level Indicator	1 Vrms	1.6 Vrms	2.2 Vrms	3 Vrms	5 Vrms