

UNIVERSITY OF WEST LONDON

Engineering Application

Assignment 2

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Introduction

The task for this assignment was to build and test a printed board peak detector circuit. The building processes starts by first designing an OrCAD circuit diagram and assigning a footprint to all components, then transferring all components with connections, values and footprint to PCB and make a design for the printed board. then after the PCB design is completed the board has to be printed, then the circuit can be built by following the connections and the design of PCB layout. The aims of this assignment where to improve practical abilities like circuit design, circuit testing and circuit construction .

Circuit Description and OrCAD Diagram

Figure 1 show the OrCAD circuit diagram of a peak detector circuit. This circuit allows the peak voltage signal received microphone to hold for a short period of time by a capacitor to allow the signal to be properly displayed by the LEDs.

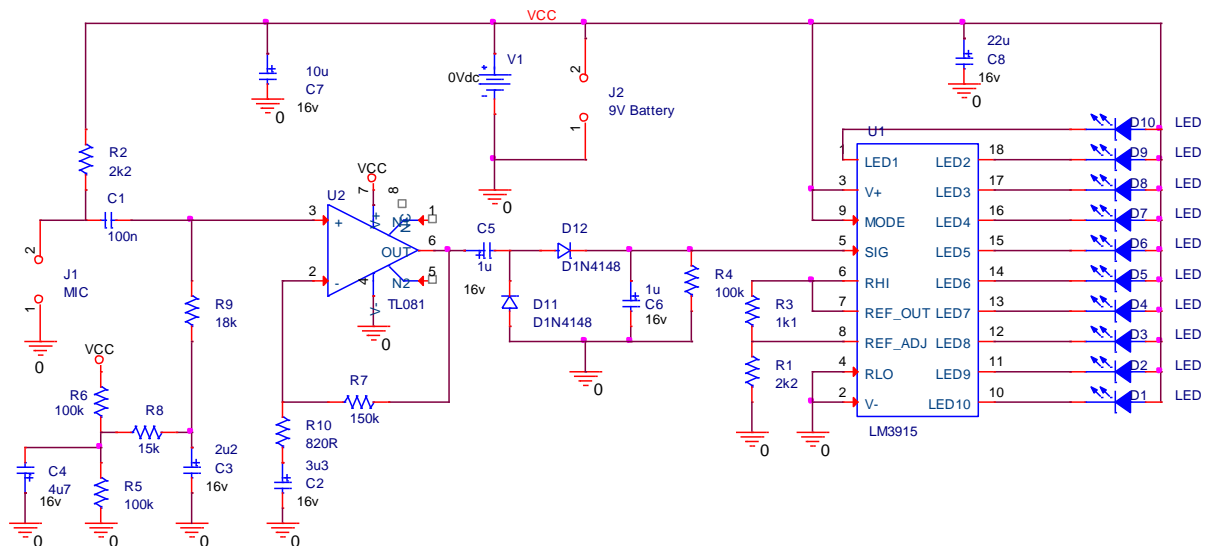


Figure 1

PCB Layout

In figure 2 is displayed the PCB layout the peak detector circuit shown before this design is used to make the printed board by using the footprints assigned to each component shown in table 1, the connection between the components to determine the size, shape and the placement of the holes on the board

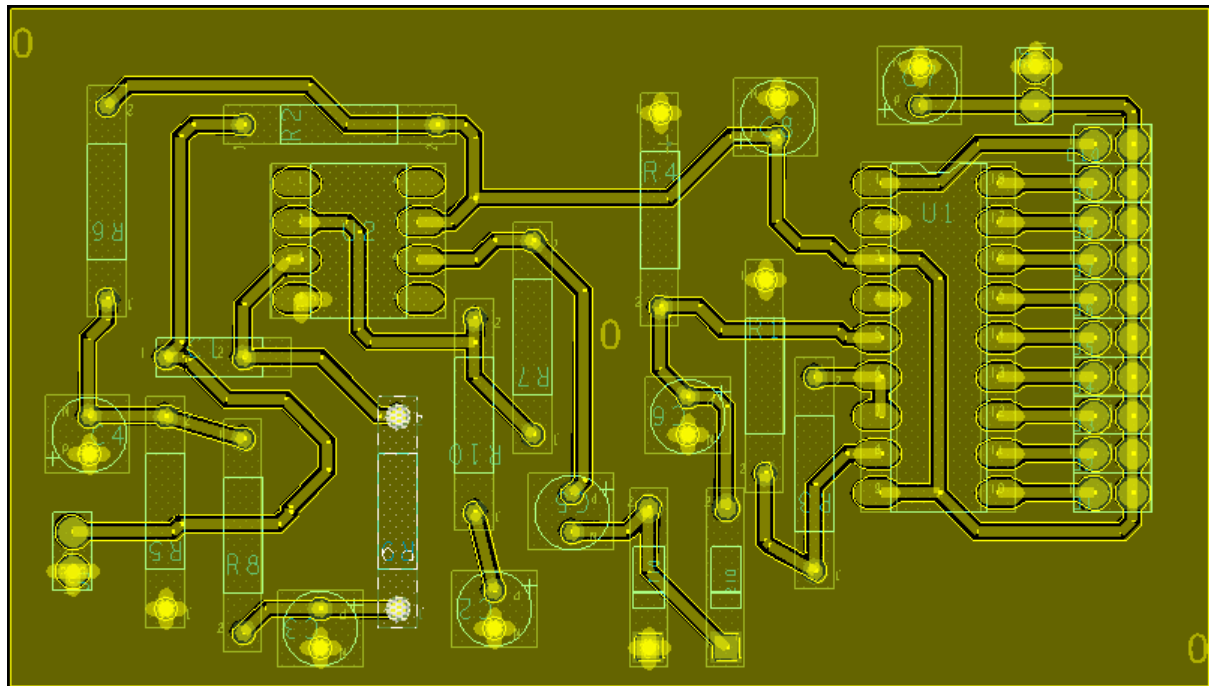


Figure 2

| components | footprint |
|------------|------------|
| Resistor | res500ad |
| capacitor | cap196_ad |
| TL081 | dip8_ad |
| Jumper | jumper2_ad |
| Diode | do35 |
| LM3915 | dip18_ad |
| LED | LED_ad |

Table 1

Testing Procedure and Results

For the testing of this circuit ,the circuit was first plug to the power supply at 9V to check if the circuit had any short circuits and if the component where placed properly by checking for any voltage drops .Then the circuit was connected to the oscilloscope to verify that when applying sound to the microphone the signal was being received by pin 5 of the LM3915, then the signal received was recorded as displayed in figure 3.This testing procedure is use to insure that the circuit is working as designed.

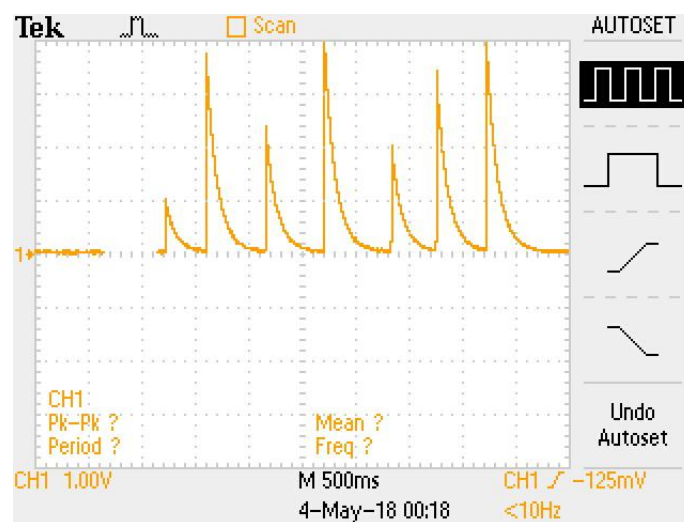


Figure 3

PCB for second circuit

figure 4 shows the PCB design of the same peak detector circuit shown in figure 2 but the design and components are replaced by smd counterparts ,this design is a smaller and more compact . This design was made by using the same OrCAD diagram as figure 2 but with the footprint assigned to each component changed for the footprint of a smd circuit as shown in table 2.

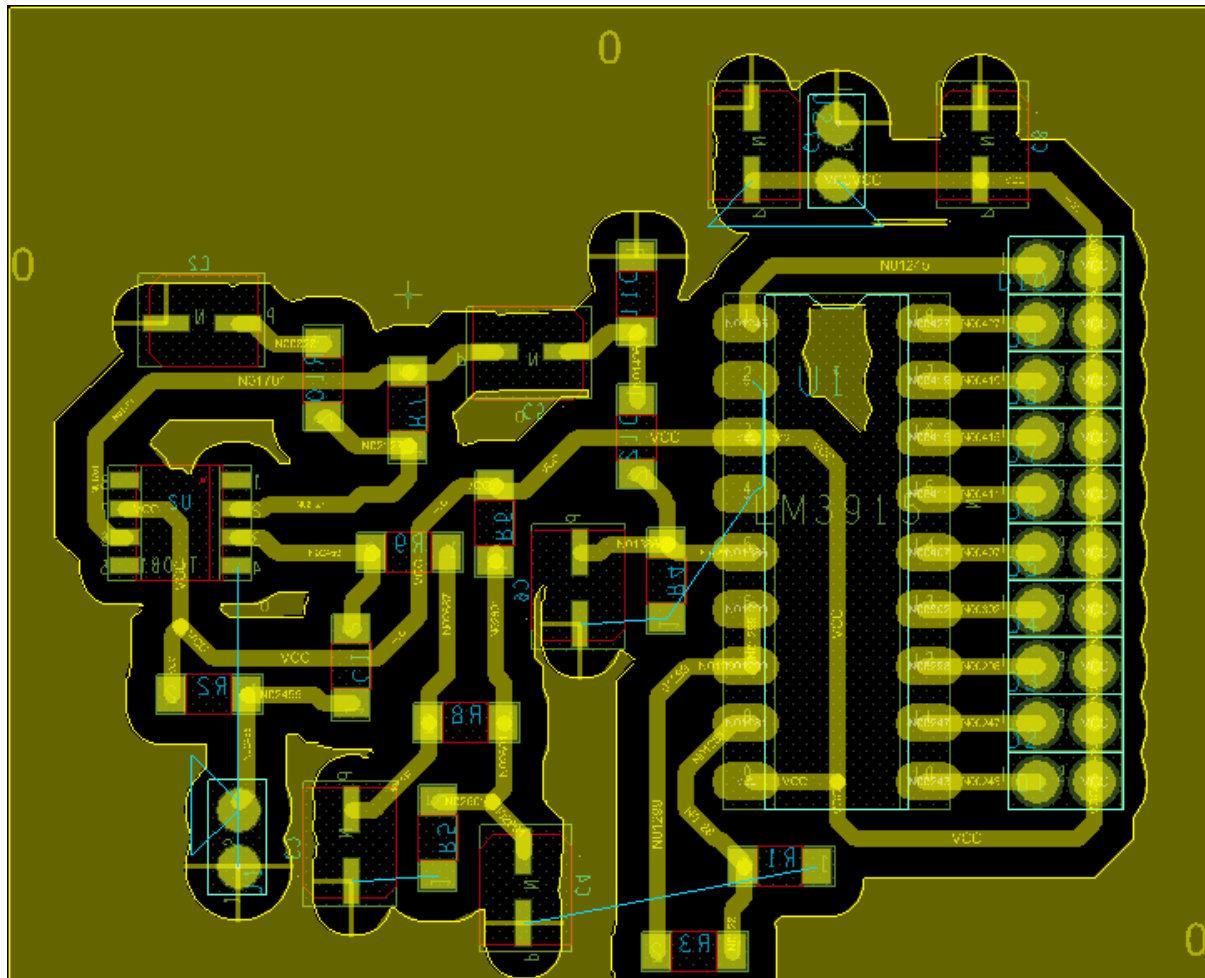


Figure 4

| Components | Footprint |
|-----------------------|-------------|
| Resistor | smdres |
| Capacitor | smdcap |
| No Polarity Capacitor | smdelectcap |
| TL081 | soic8 |
| Diode | smdres |
| LM3915 | dip18_ad |
| LED | LED_ad |

Table 2