Warsaw University of Technology

Faculty of Mechatronics

Design of Electric Modules

Report

PCB Circuit

Made by:

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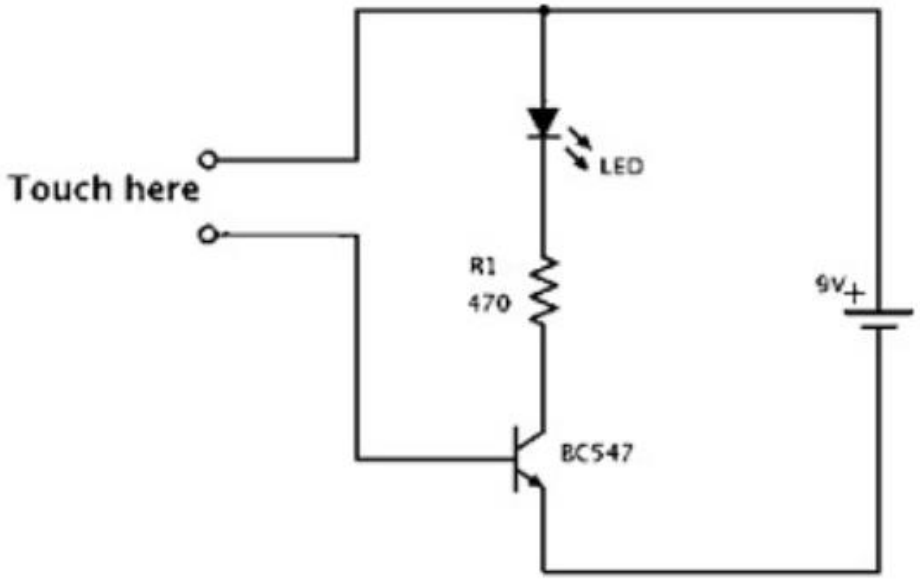
Warsaw 2023/2024

1. Touch Sensor Circuit

A touch sensor circuit is based on simple conductivity in a circuit. The circuit is left open, at the terminal of the touch sensor where the User can touch and the LED light up, suggesting that there is a touch exerted by the User.

2. Schematic



Touch Sensor Simple Electronic Circuit

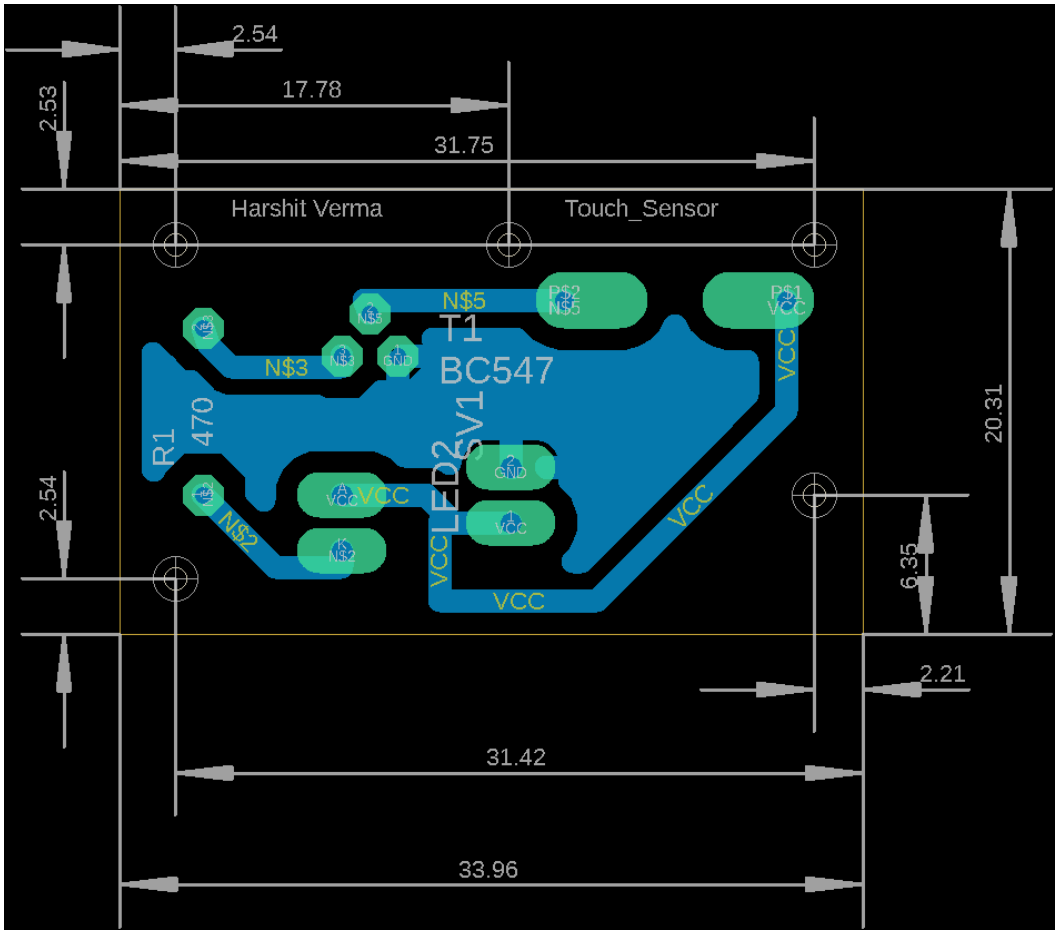
3. List of components

Part	Value	Package	Library	Position (mil)	Orientation
LED2		Q62902-B156	led	(400 200)	R270
R1	470	0204/7	rcl	(150 400)	R90
SV1		L02P	con-amp-mt	(950 250)	R270
T1	BC547	TO92	transistor	(450 500)	R0
U$1	TOUCH_PADSTOUCH_PADS	TOUCH_PADS	TOUCH_PADS	(900 600)	R180

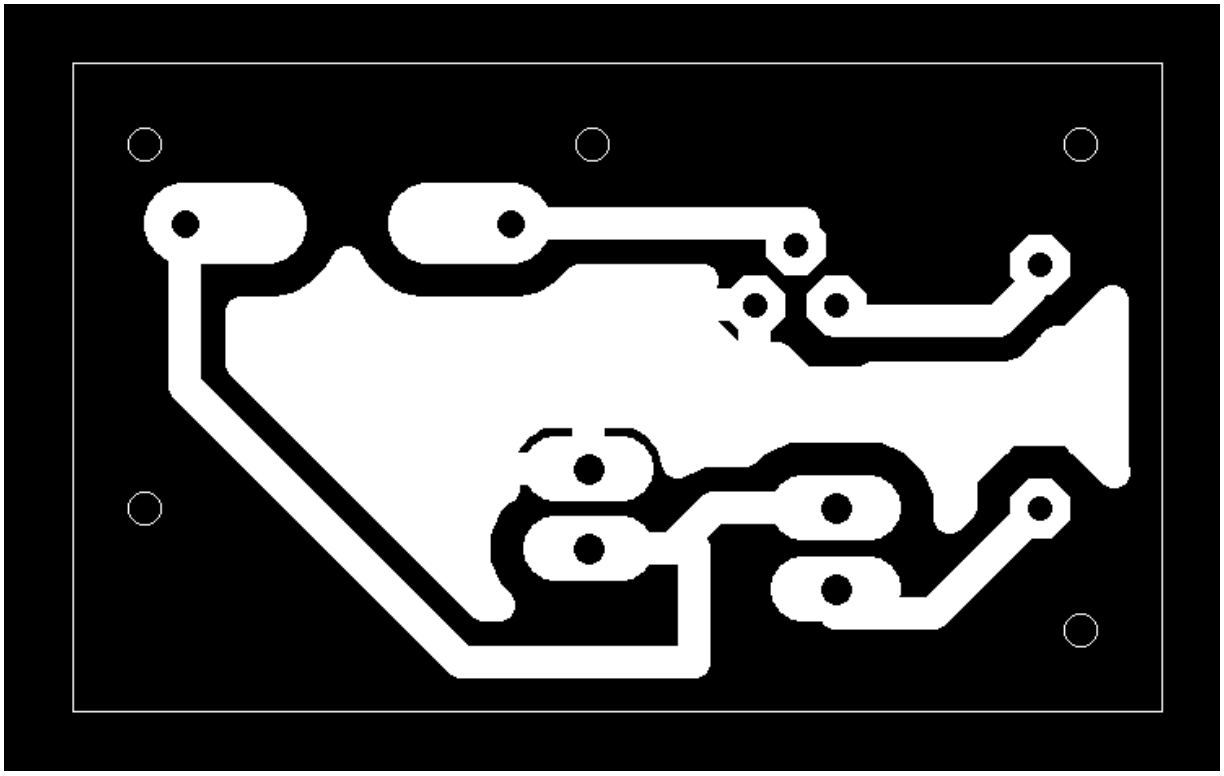
Component	Type	Source
LED	Q62902-B156	From Eagle Library
Resistor	470 ohms	From Eagle Library
Transistor	BC547	From Eagle Library
Touch Pads	A simple resistor-based device with open terminals.	New Element based on a simple resistor.

Power Source	9V	From Eagle Library

4. **Board design image with mounting holes and overall dimensions and mounting holes spacing dimensions.**



5. **.png file used for laser engraving**



6. How did your manufacturing method differ from industry standard (dry-film photoresist+photomask+etching)

The method used in the laboratory is called Chemical Etching. In this process, photoresist is applied to the copper surface, and it is removed via photomask to reveal the circuit pattern. Then the unexposed photoresist is removed to reveal copper areas to be etched. Etching is done by using a chemical solution. The final copper circuit is achieved by removing the remaining photoresist.

A popular way to manufacture a PCB circuit used in today's industry is called Laser Direct Imaging (or Direct Imaging). In this process, the method remains the same, but the photoresist is removed using laser (or high-resolution LED).

7. Conclusions

- Chemical Etching and Laser diode etching, both are effective, but LDI (or DI) is more efficient.
- Eagle is a good tool to effectively design a PCB circuit and produce the layout of it. There are some challenges like creating your own library, and sometimes the Software not registering the Schematic board.
- This is very important to keep in mind and implement correct dimensioning, tolerances between the pads and paths to avoid mistakes in processes like soldering or printing of the PCB.
- Thanking Professor Walter and Professor Sandra for their help into the project.
- The PCB circuit should work fine when physically produced and can be used to create a simple Touch Sensor.