

# Scintilla Session 5 Electronic Tools 2.0

31-10-2019

## Abstract

Session 5 of scintilla was held on the 31st of October 2019. The session was held at Communication Lab. Staff-in-charge Vinod sir, as well as Instructor Sasi Kumar, was also present. The full team of Scintilla and other Elacsta members came prepared and ready to make the event possible, but unfortunately due to some unforeseen issues this session was canceled on the day, it was planned to be hosted.

## 1 Objectives of the Session

The session was conducted as an application to the knowledge gain in the previous session with an objective of developing a power-supply at the end of the session. As part of these session we designed the power-supply schematics with the knowledge gained in the previous sessions through EasyEDA. The next objective of the session was to familiarise the participants with process of PCB fabrication which includes the layout design, printing layout, transferring the artwork on to the copper plate and etching. The participants are provided with the objective of producing a working power-supply at the end.

## 2 Technical Details

### 2.1 Variable bench power supply

Here to design a variable bench power supply, the major process that we have to take are

1. Network step down transformer
2. Rectifier
3. Stabilization and current amplification

We use a Network step down transformer to produce the voltage of the desired level, we have to note that the parameter mainly depends on the transformer chosen and also the fact that output voltage of the power supply will be a few volts less than the rectifier voltage.

The second section is the rectifier which converts the AC voltage to DC voltage and the follow-up capacitor is used as a noise filter and for smoothing.

The third part of a stabilizer circuit and current amplification. The constant voltage after rectification is provided to the stabilizer whose stabilization level depends

on the Zener diode that sets a max output voltage to 15v, but we need to amplify the small current from the stabilizer using the two transistors as in the schematics. With the help of the vr1 which acts as a simple voltage divider, we can vary the max voltage across the Zener and produce a variable output voltage and with the variable resistor vr2, we can also vary the output current.

### 2.2 Schematic and PCB

Schematic was done on open source cloud platform easyEDA. The participants were encouraged to develop a PCB file in order to fabricate the PCB. The files are readily available at:

<https://easyeda.com/SCINTILLA01/power-supply>

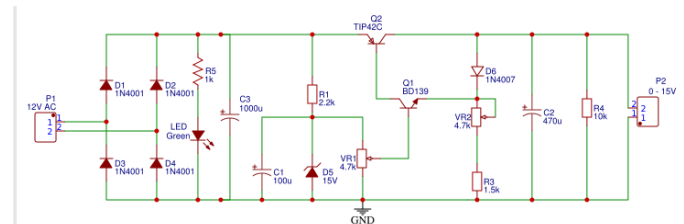


Figure 1: Schematic

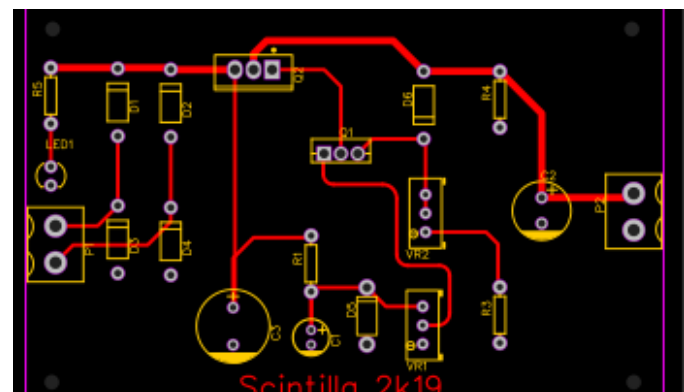


Figure 2: Artwork

### 3 Poster

This is the poster released as part of the session.



Figure 3: poster

### 4 Conclusions and Suggestions

Unfortunately, this session had to be dropped, due to the low number of participants. To prevent such unfortunate situations in the future the team is suggested to **check the availability of participants well before dates of future events**. It is also suggested that the next scintilla panel host the same session as we have to move on to the next session as per our tight schedule. Since all the preparations and planning are already done carrying out the session will be effortless.