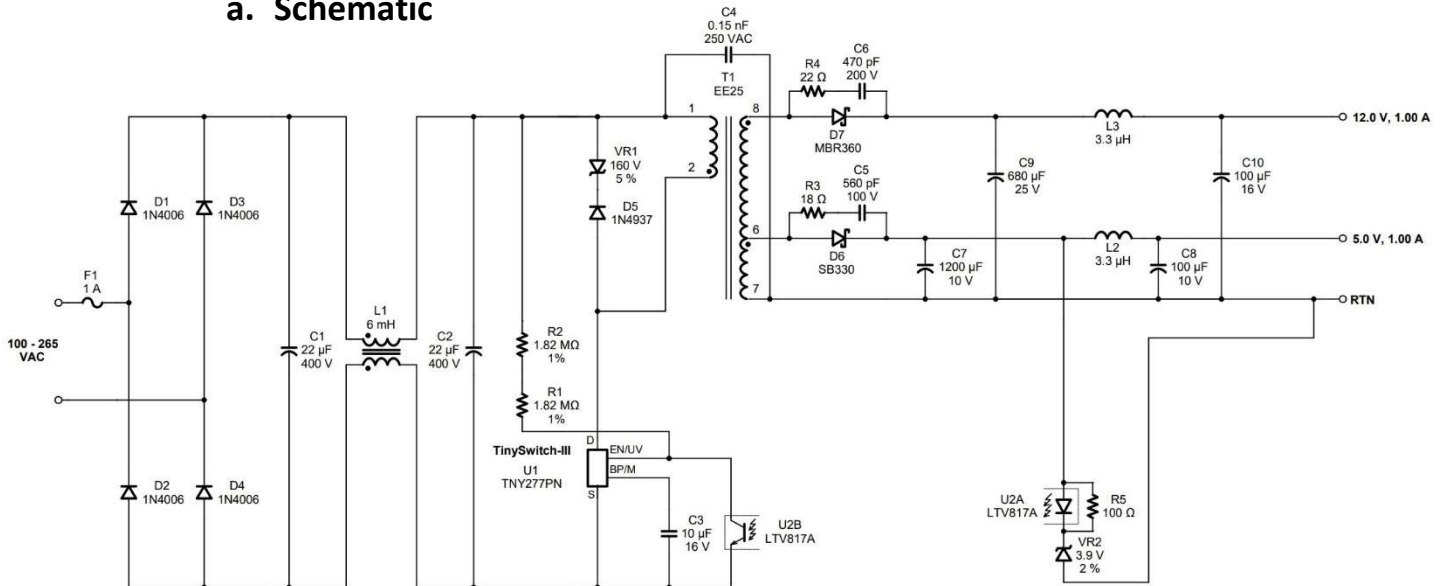


Problem with +12V – 1A and +5V – 1A SMPS design

1. Circuit of this SMPS was simulated using Power Integration PI Suite software

a. Schematic

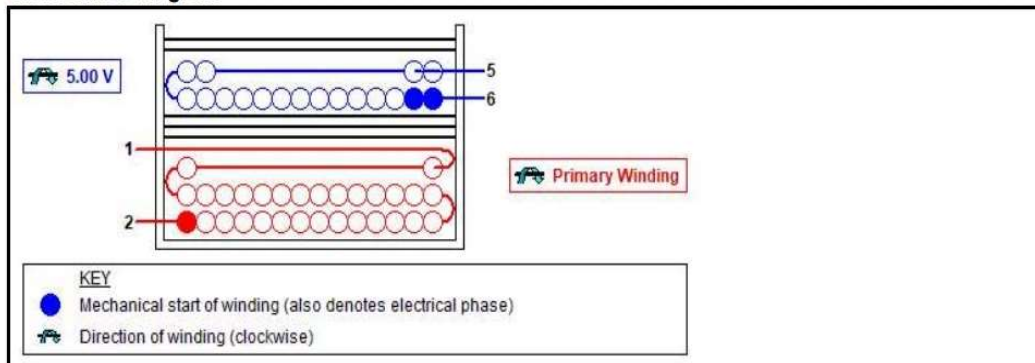


b. Transformer Winding details

Electrical Diagram



Mechanical Diagram



Winding Instruction

Primary Winding

Start on pin(s) 2 and wind 107 turns (x 1 filar) of item [5], in 3 layer(s) from left to right. Winding direction is clockwise. At the end of 1st layer, continue to wind the next layer from right to left. At the end of 2nd layer, continue to wind the next layer from left to right. On the final layer, spread the winding evenly across entire bobbin. Finish this winding on pin(s) 1.

Add 3 layers of tape, item [3], for insulation.

Secondary Winding

Start on pin(s) 6 and wind 6 turns (x 2 filar) of item [6]. Spread the winding evenly across entire bobbin. Winding direction is clockwise. Finish this winding on pin(s) 5.

Add 2 layers of tape, item [3], for insulation.

Core Assembly

Assemble and secure core halves. Item [1].

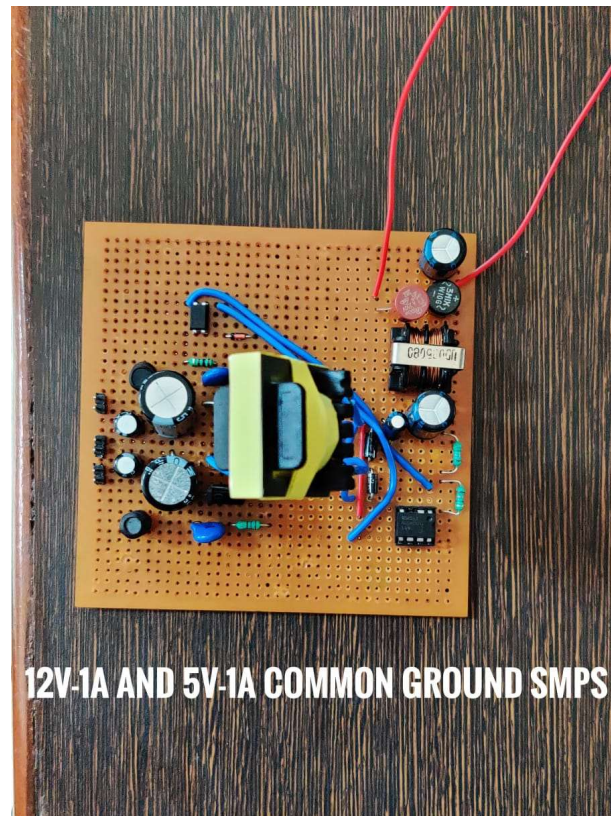
Varnish

Dip varnish uniformly in item [4]. Do not vacuum impregnate.

2. Circuit design

The circuit was designed according to schematic and transformer winding “ was done by hand “ as per constructional details.

Circuit

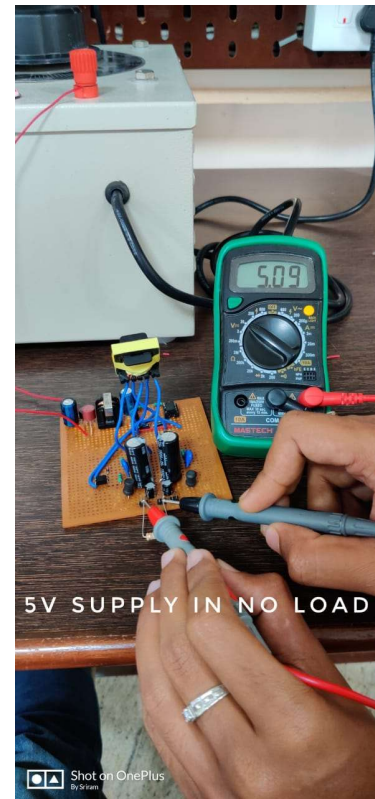
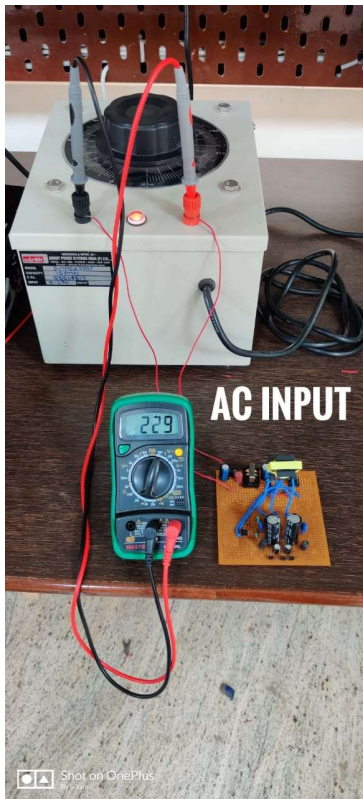


Wounded Transformer (EE25)



3. Problem faced

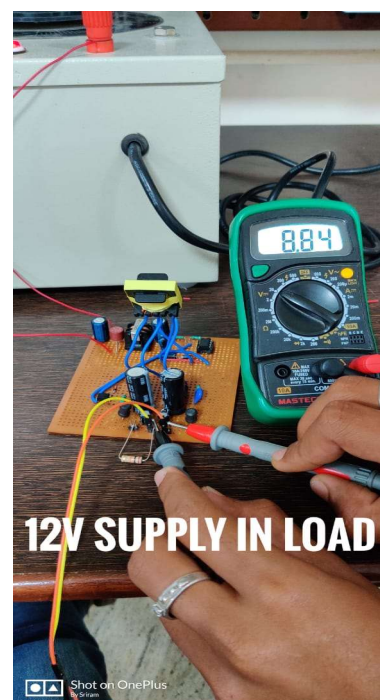
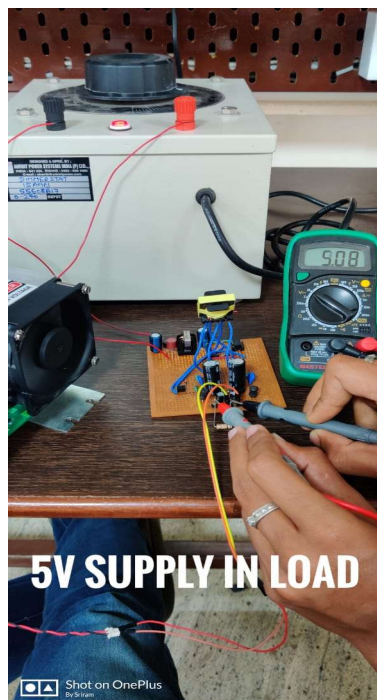
With AC input 230V, +5V – 1A output was stable whereas the +12V – 1A output was not stable in NO LOAD condition.



In Load Condition

Load = 12V – 600mA DC Motor was used as load.

+15V – 1A dropped drastically with load voltage dropping to +8.8V, whereas +5V – 1A output was stable in those load condition



There is an instability in +12V – 1A output of SMPS, even though +5V – 1A is stable in both load and no-load conditions. Changing the value of bulk capacitor and pi inductor value at output had no significant improvement.

Cause of this instability is still unknown.