

ESU Tester v1.0

Assembly Manual

Kit Contents

Your ESU Tester Kit should contain the following:

- 1 Warning Label
- 1 500Ω 50W Resistor
- 1 15 Ω Resistor
- 1 PCB
- 8 Red LEDs
- 7 SMT Resistors
 - 1 560 Ω
 - 1 475 Ω
 - 1 402 Ω
 - 1 316 Ω
 - 1 240 Ω
 - 1 160 Ω
 - 1 80.6 Ω
- 7 SMT Zener Diodes
 - 1 2.0V
 - 1 3.9 V
 - 1 6.0V
 - 1 8.2 V
 - 1 10V
 - 1 12V
 - 1 14V

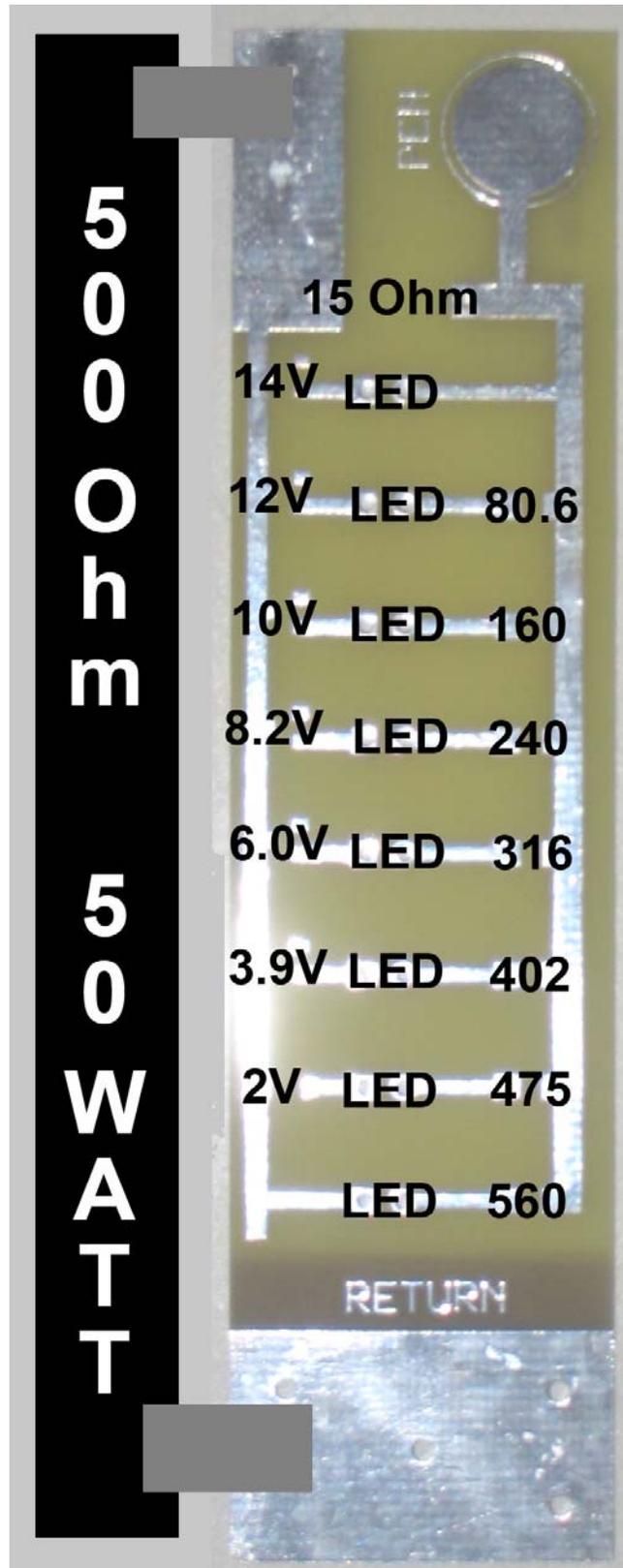


Tools You Will Need:

- Soldering Iron
- Regular Solder
- Wire Cutters
- Tweezers
- Low Temp Solder
- Griddle / Hotplate

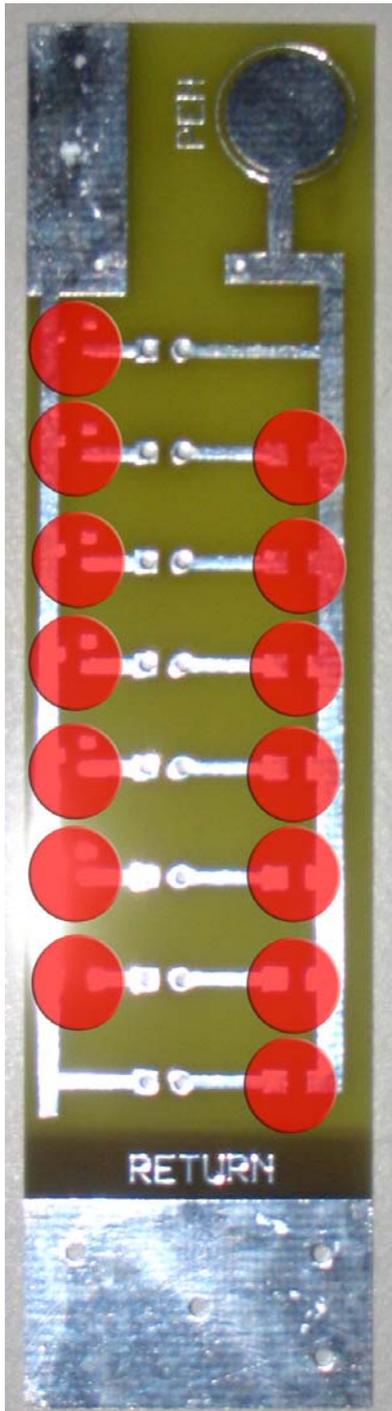
PCB Schematic

**Note: Be sure to refer back to this page as you build the ESU tester, in order to insure that you are doing it correctly.*

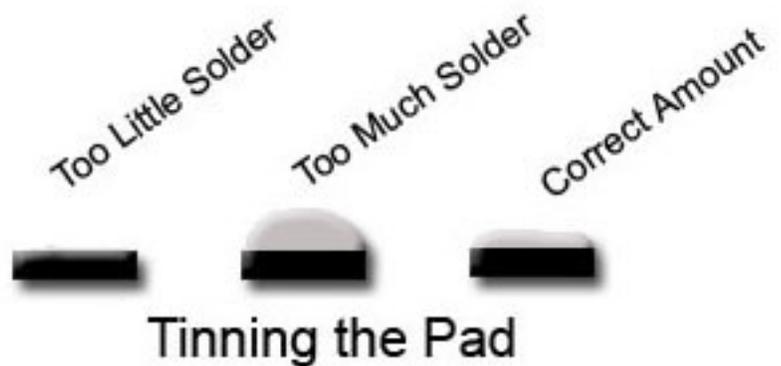


Step 1: Tin the SMD Pads

Using the Low Temp Solder and a soldering iron, drip a small amount of solder onto each of the pads where SMDs will attach, as seen below.

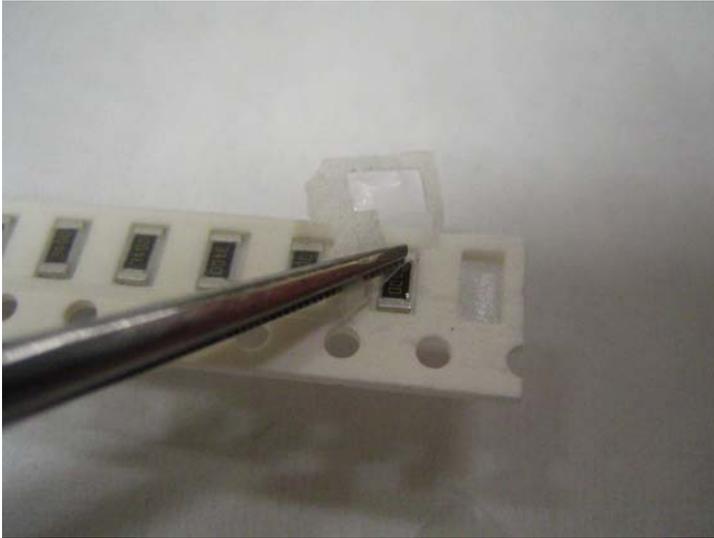


Be sure not to get too much solder on the pads, as it will make reflowing the board much more difficult. The correct amount of solder is shown below.



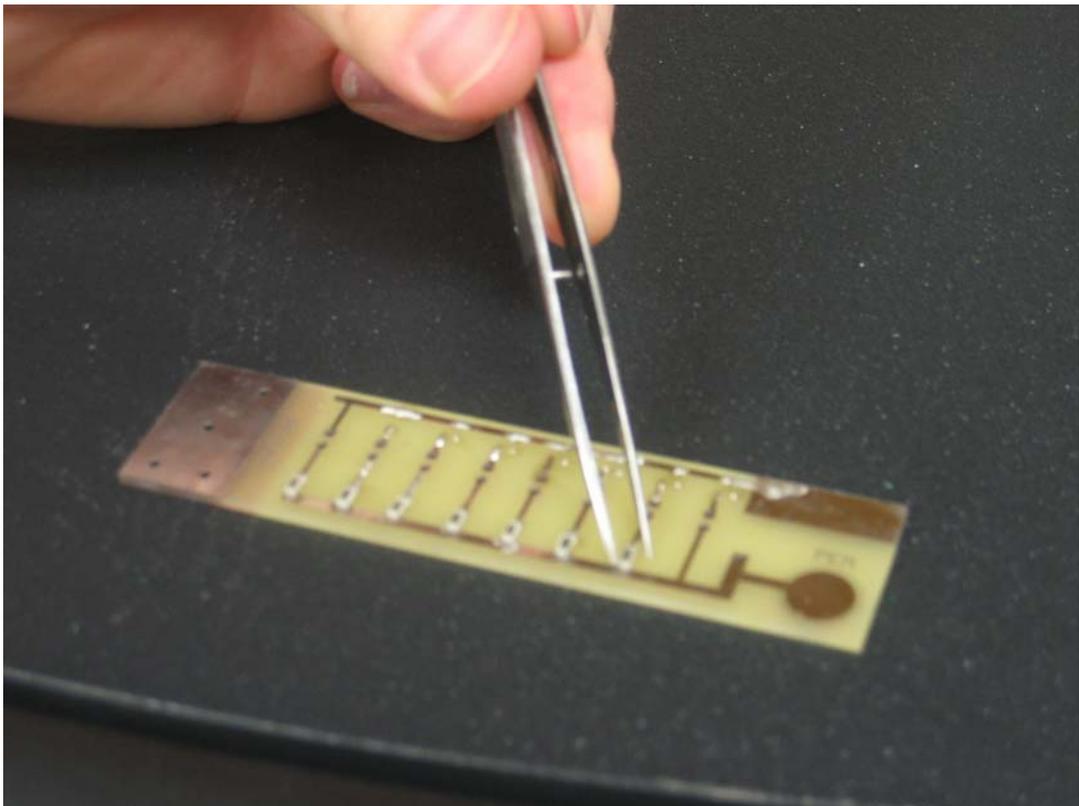
If you still have questions, consult the “SMT Stoplight Lab” for a more in-depth discussion of working with SMT.

Step 2: Place the SMD Components



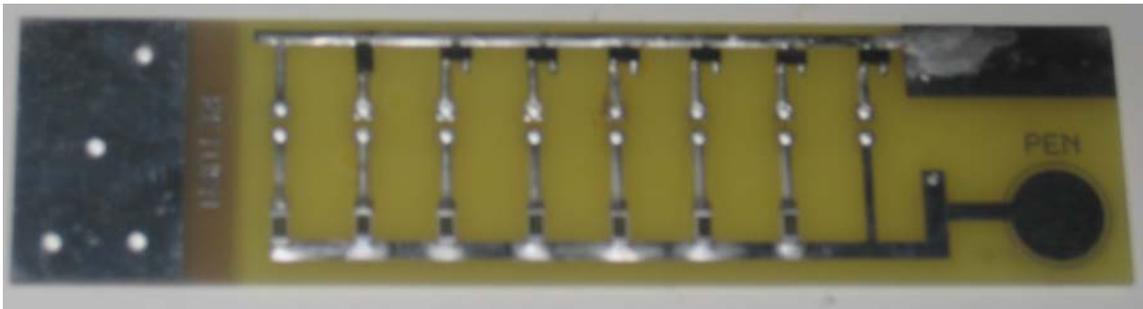
Using a pair of tweezers, remove the SMD components from their baggies and begin placing them on their appropriate tinned pads. As you are doing this, you will notice that the SMDs come in a strip of “tape”, which consists of a plastic rail with small wells that hold

*the components. Peel back the film, pull out a component with a pair of tweezers and then replace the film. **BE SURE** to place the tape back in the Digi-key bag which has the part number and component information on it. If you forget to do this, you’ll wind up with a dozen strips of components that all look the same and you won’t be able to tell them apart!*



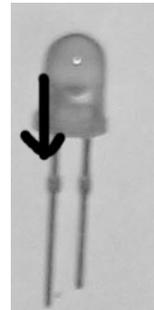
Step 3: Reflow

Once all the components have been placed on their respective pads, heat up the griddle and reflow the solder. Once all the solder has melted, immediately remove the PCB from the heat source and allow it to cool. Inspect the board to ensure that the component are all soldered into place correctly.

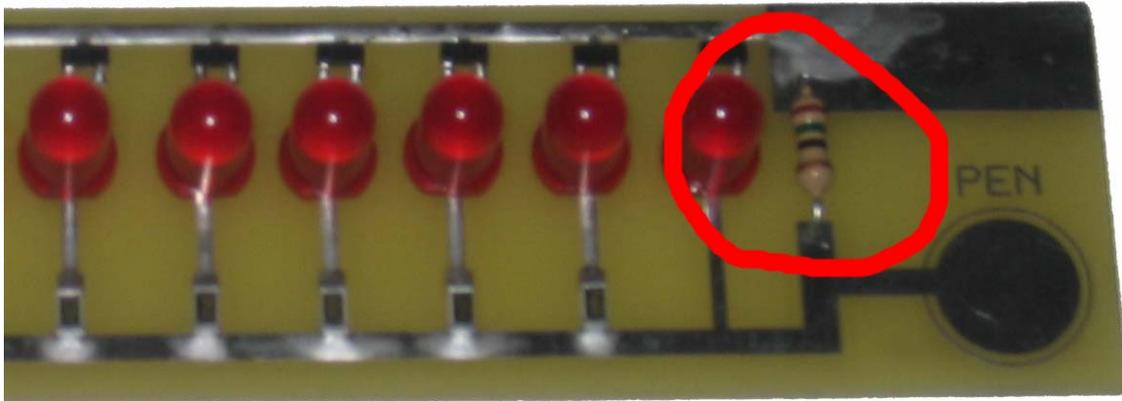


Step 4: Install the LEDs

*Using the regular solder and the soldering iron, solder the 8 LEDs into place. NOTE: Make sure that the **longer leg** is facing towards the **top of the board** (i.e. towards the Zener diode).*

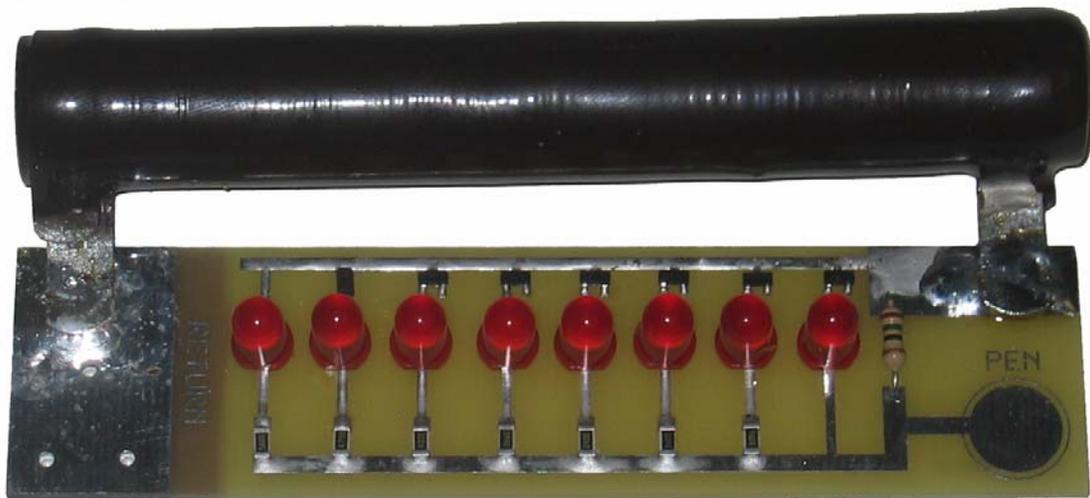


Step 5: Install the 15Ω Resistor



Step 6: Install the 500 Ω Resistor

*Solder the two terminals of the 500 Ω resistor onto the two pads at the top of the PCB that align with them. Be sure to use **A LOT** of the regular temperature solder in order to ensure a solid connection.*



Step 7: Drip Solder Onto PEN / RETURN Pads

This is done to improve the longevity of the device, as repeated contact with PEN and RETURN electrodes can wear the pads off.

Step 8: Apply Warning Label to 500Ω Resistor

Ensure that the orientation is as shown in the final picture

Finished ESU Tester

