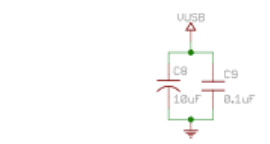
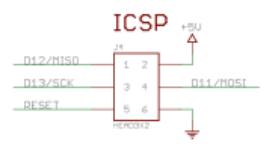
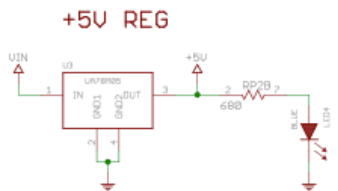
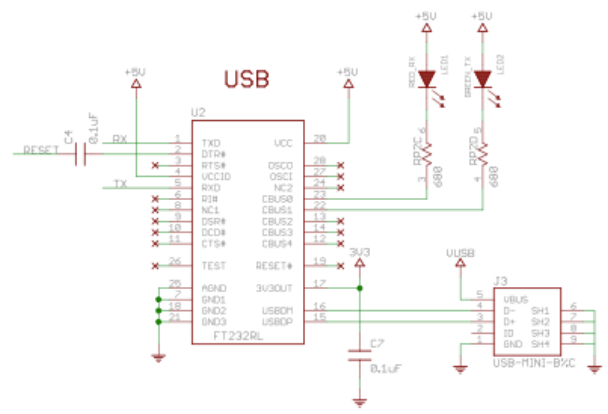
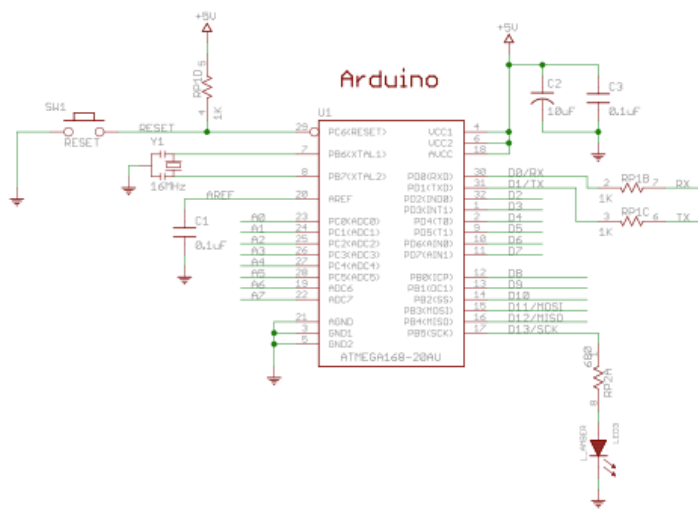
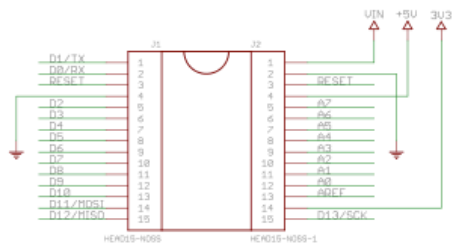


ETH Course 402-0248-00L: Electronics for Physicists II (Digital)

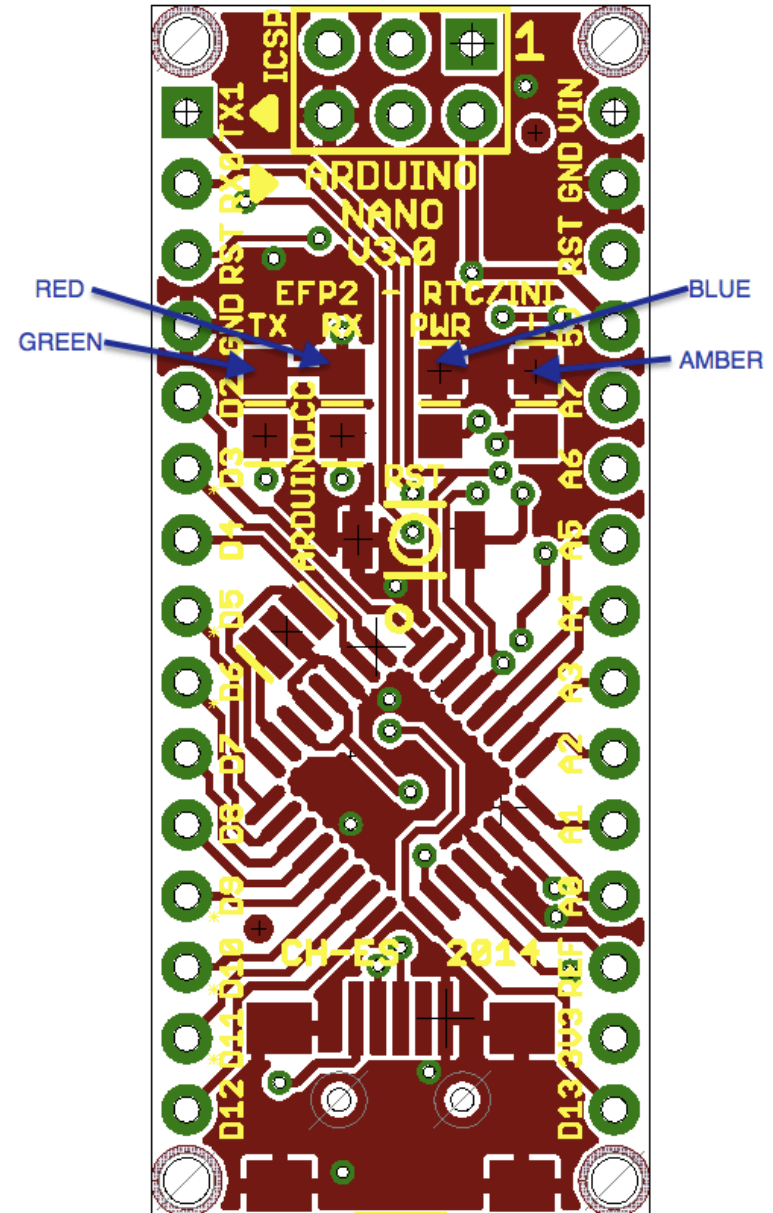
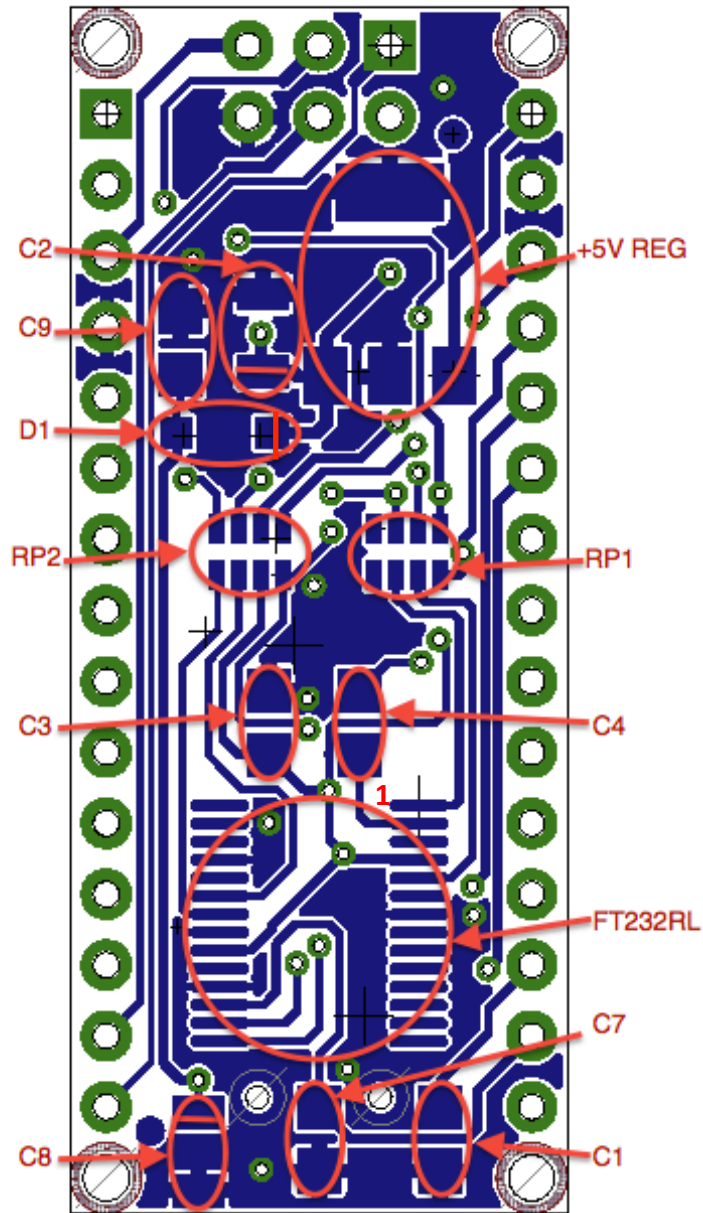
- **1: Setup uC tools, introduction**
- **2: Solder SMD Arduino Nano v3.0 board**
- **3: Build application around ATmega328P**
- **4: Design your own PCB schematic**
- **5: Place and route your PCB**
- **6: Start logic design with FPGAs**

Arduino Nano v3.0

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TITLE: Arduino Nano2	
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BE AWARE: BOTTOM VIEW IS MIRRORED

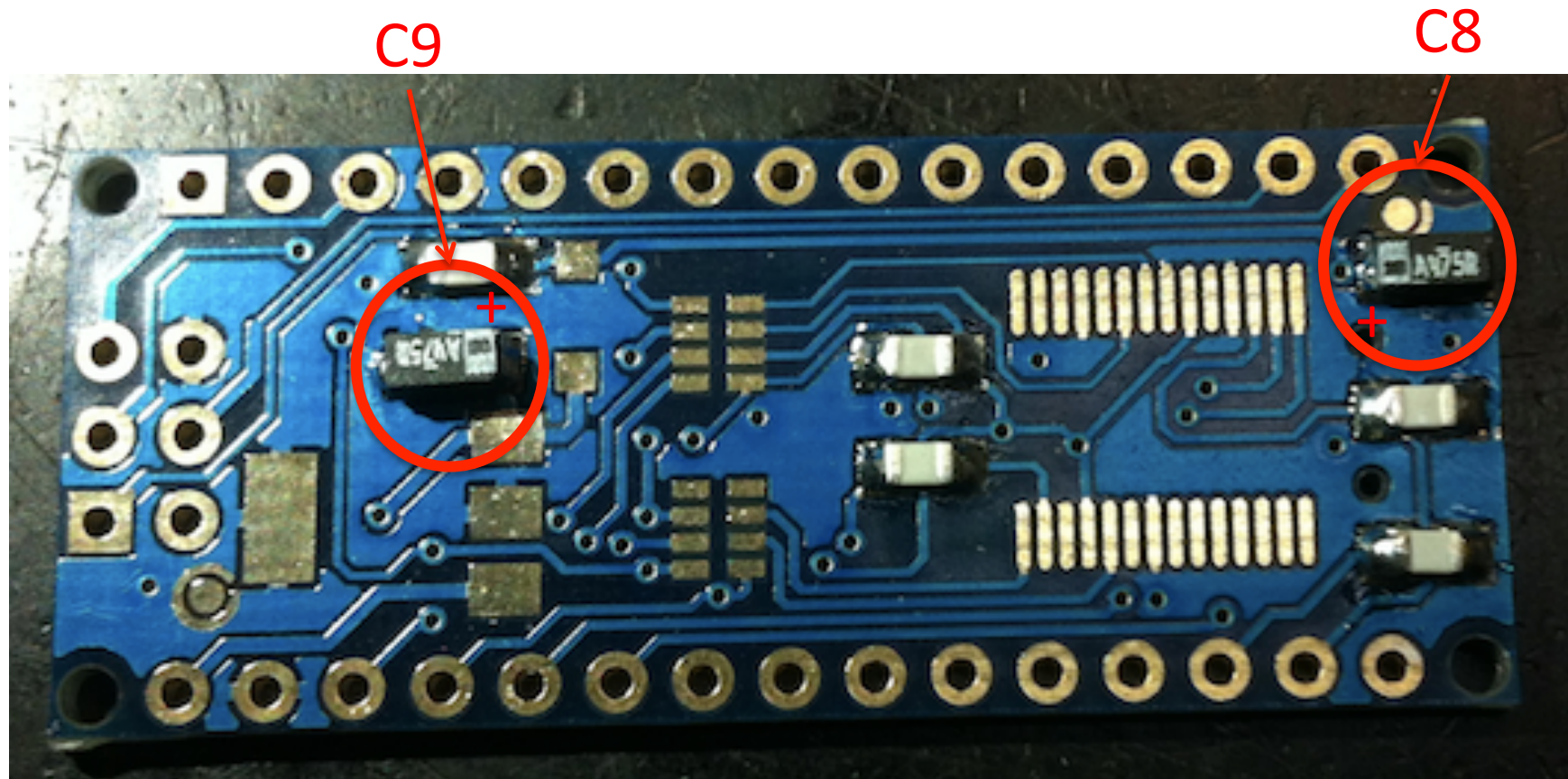
Bottom layer: Capacitors

- Start soldering 0.1uF caps C1,C3,C4,C7,C9 and then 10uF Tantalum caps C2,C8
- Special cares:
 - Fiducial point ring is connected to GND plane, and too close to Tantalum pad is +5V
 - Tantalum pads are too adjusted
Place the cap well aligned.
 - Polarity is very important!!



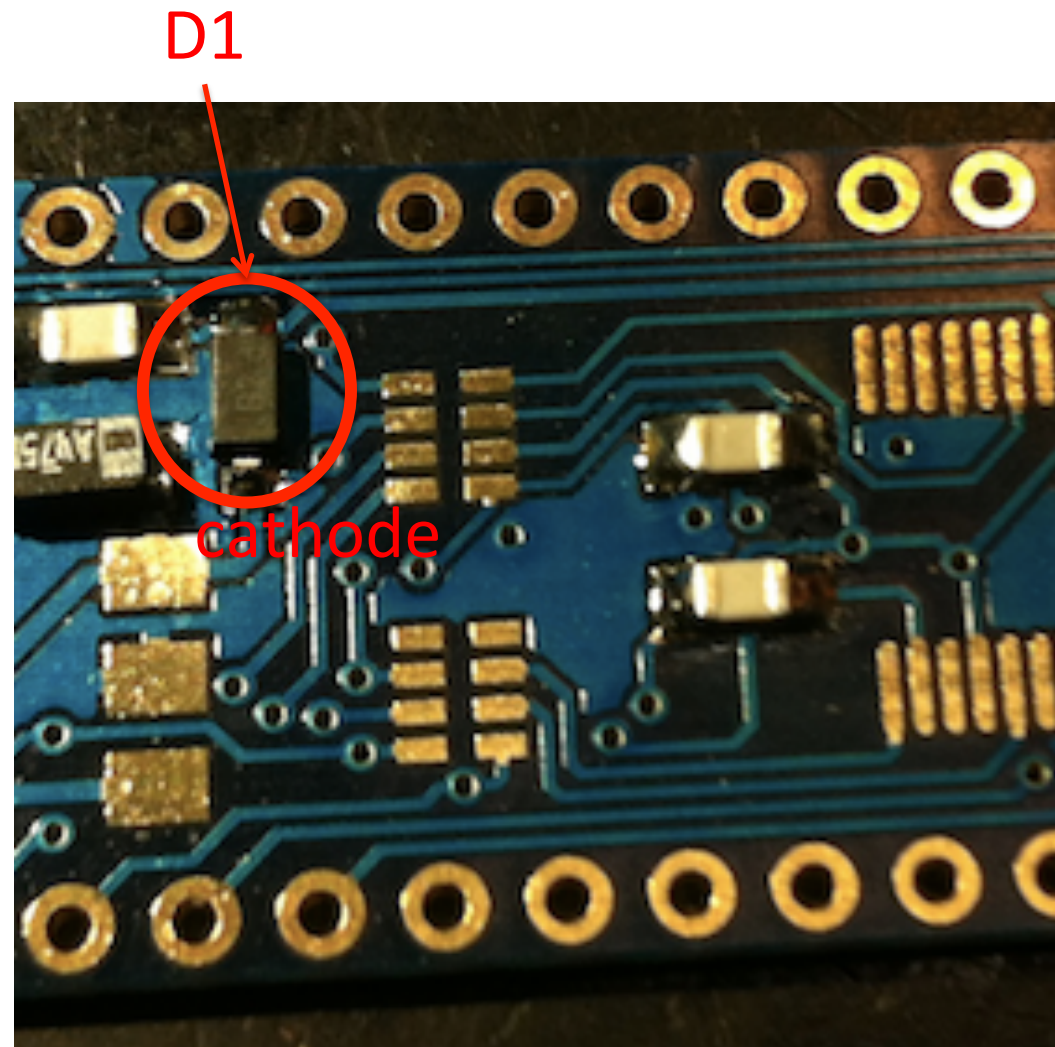
Bottom layer: Capacitors

PCB Eagle view is mirrored from PCB you are soldering



Bottom layer: Schottky diode

Place correctly the diode cathode

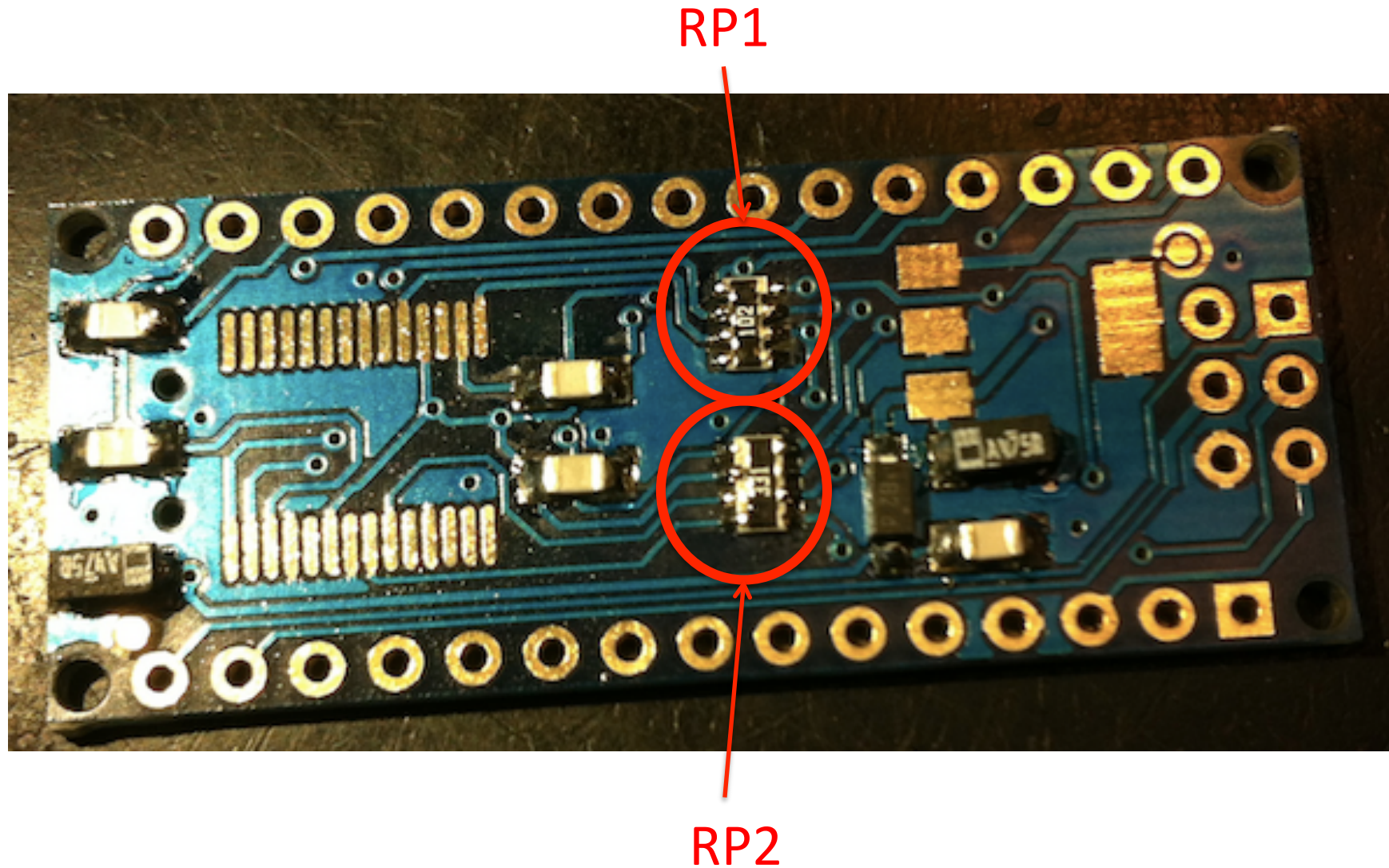


Bottom Layer: Resistor Arrays.

Special cares (taken from panasonic):

- (5). High-active flux as halogen-type (chlorine, bromine, etc) is not recommended as the residue may affect performance or reliability of resistors. Confirm it before use.
- (6). When soldering with soldering iron, never touch the body of the chip resistor with a tip of the soldering iron. When using a soldering iron with a tip at high temperature, solder for a time as short as possible.(up to 350 degree, less than 3 seconds)
- (7). Avoid physical shock to the resistor and nipping of the resistor with hard tool (pliers or tweezers) as it may damage protective coating or body of resistor and may affect resistor's performance.
- (8). Avoid immersion of chip resistor in solvent for a long time. Use solvent after the effect of immersion is confirmed.

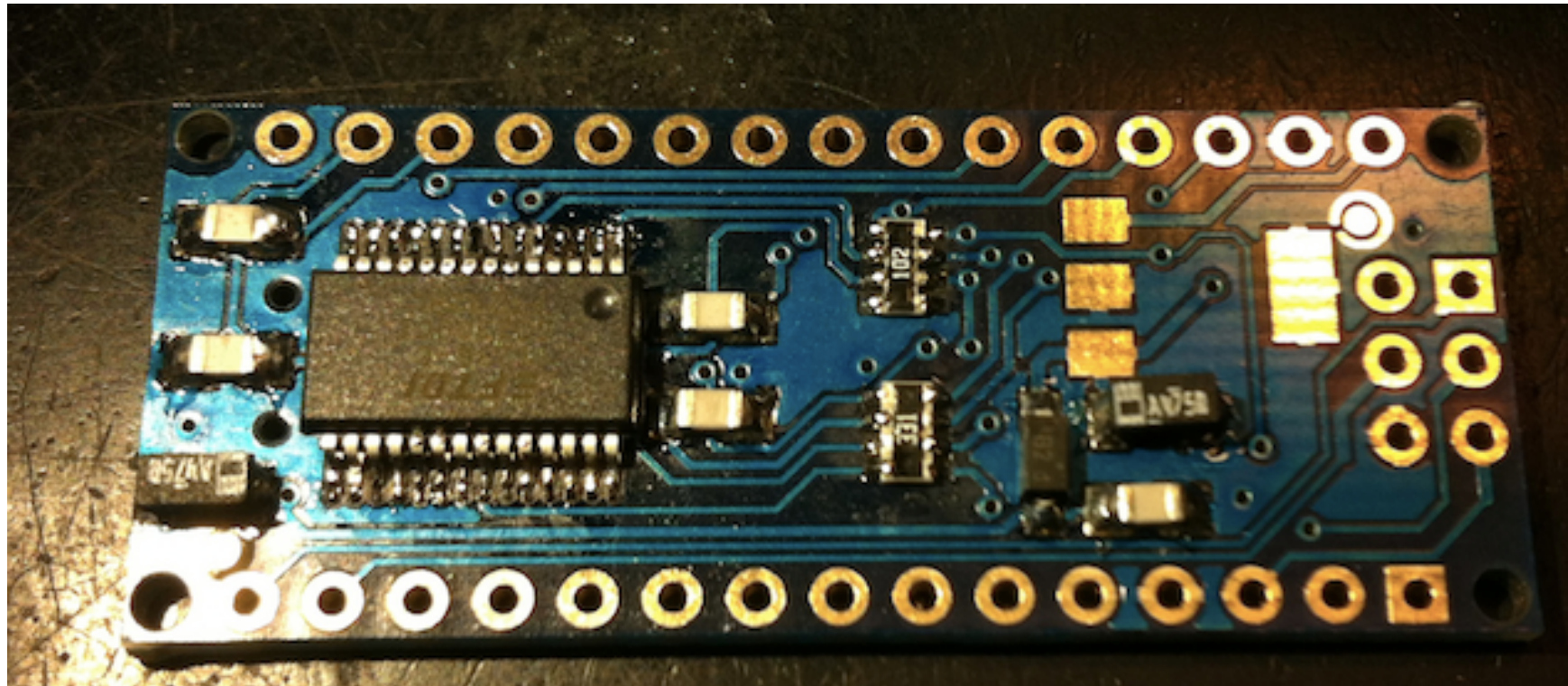
Bottom layer: Resistor Arrays



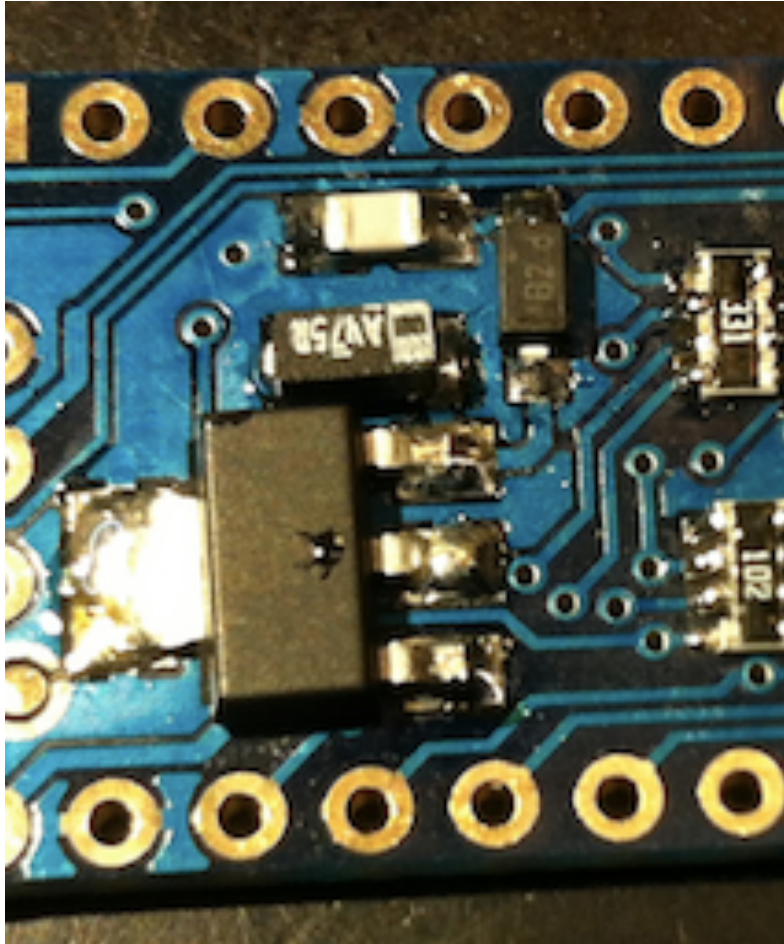
Bottom layer: FT232RL chip

Align correctly before starting to solder. It is recommended to use soldering paste, but it can be done by using rosin-core solder wire.

If pins get soldered together remove excess solder with the solder wick



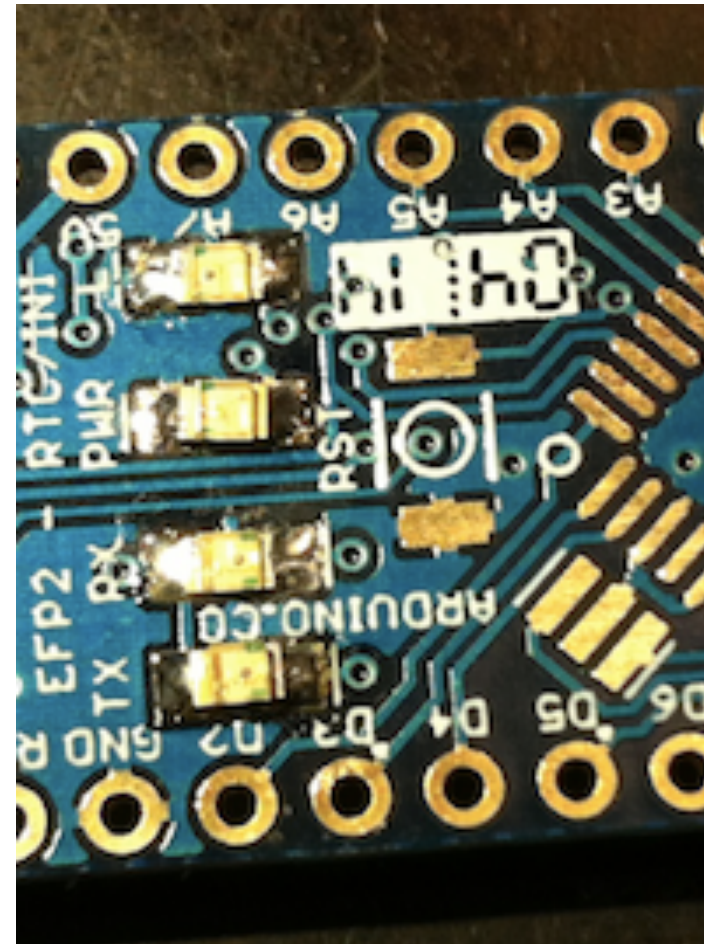
Bottom layer: +5v REG



This component need more temperature. Be patient.

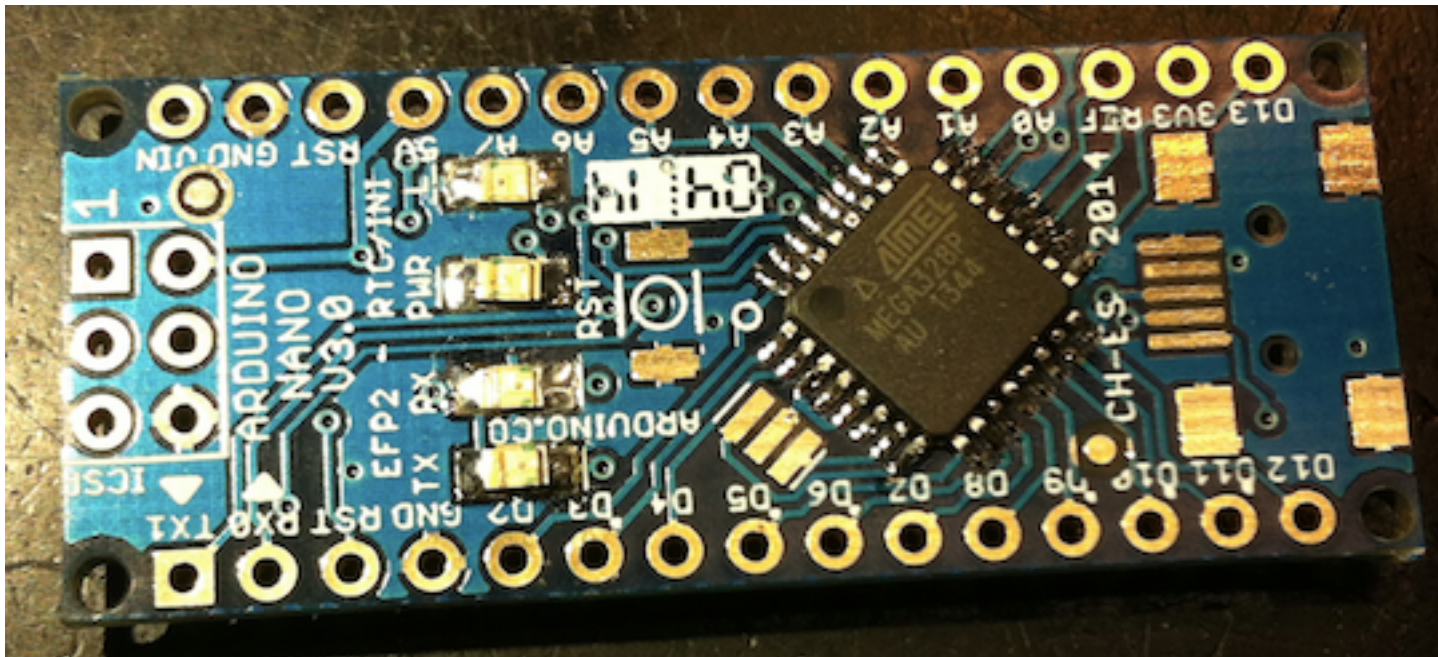
Top layer: LEDs

- LED's cathode is represented with a green line.
- L and PWR LEDs have the cathode on the left of this figure, and TX/RX on the right.
- Select the colors carefully: L is amber, PWR blue, RX red and TX green



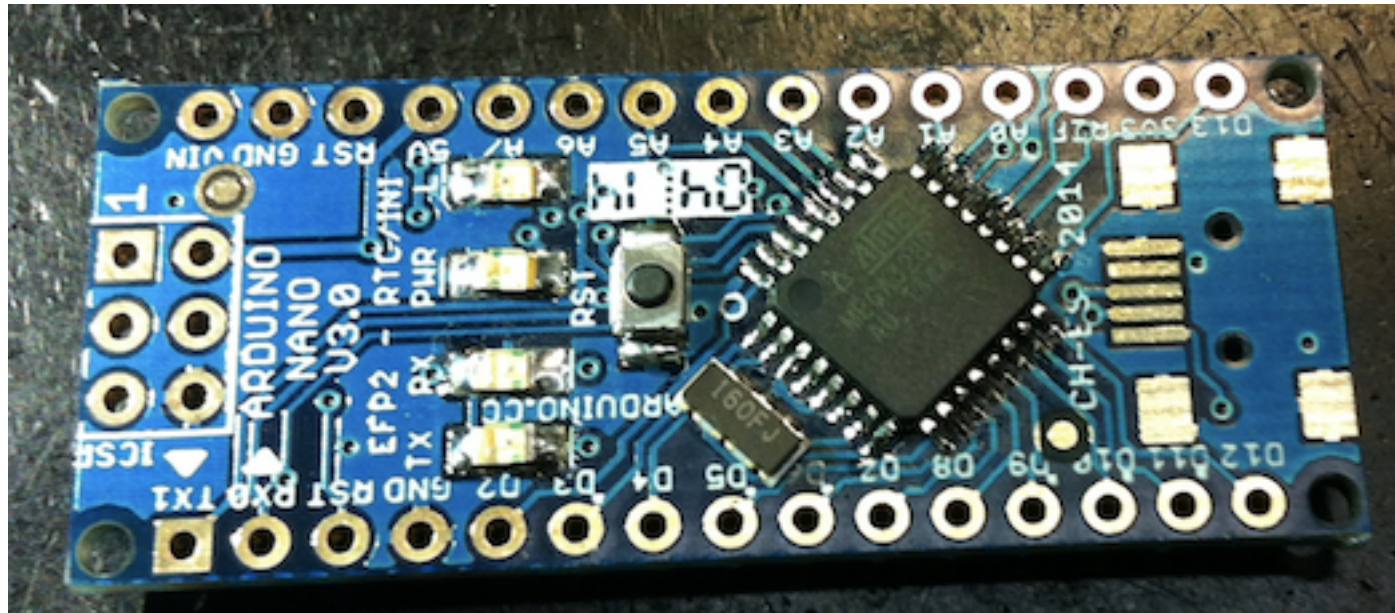
Top layer: Atmega328P

- Place correctly the microcontroller. Its mark correspond to pin1 and this is also marked on the PCB.



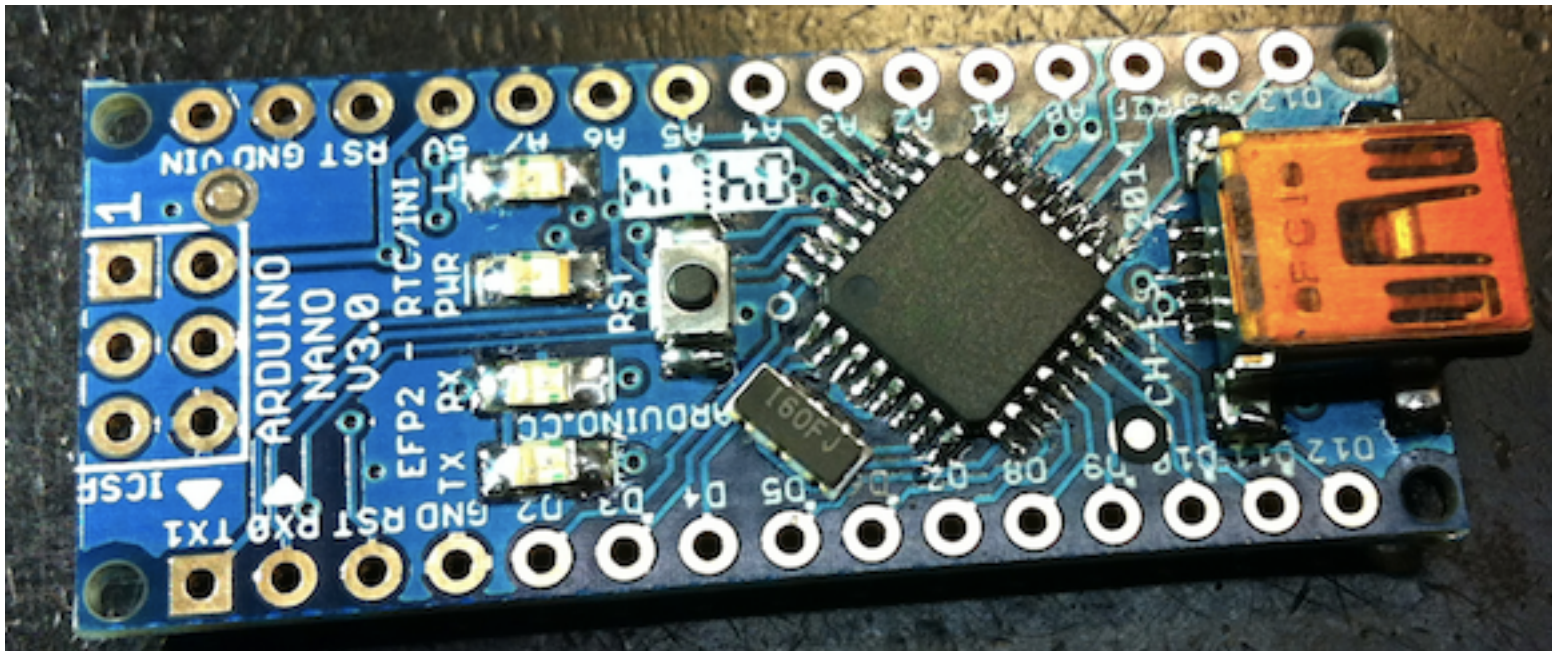
Top layer: Resonator and Reset button

- Resonator has no polarity. Central pad is GND. It doesn't matter the orientation.
- Reset button has only two pads. It hasn't had polarity neither.



Top layer: USB connector

- The only tricky thing with this connector is that you must push the connector in order to ensure that the pins touch the pads. There are two small holes where the connector must fit and it needs some extra force to fit them.



Pin Arrays

- Your last step before programming it is to solder the 2 rows of 15 pins and the ISCP connector.

Does it works?

- If yes, you can go to the instructions to make your Arduino board compatible with Sketches.
- If not (most probably):
 - Inspect and review with the microscope all the solders.
 - Be careful with resistor arrays, they are too delicate. Not exceed 3s of ironing!!
 - C8 Tantalum cap can give you too much headache if not soldered properly.