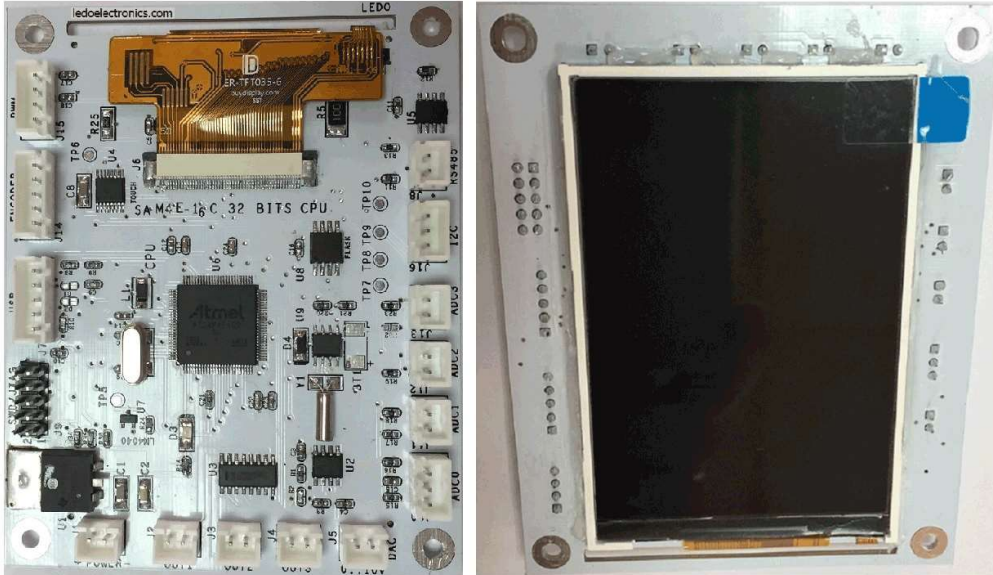


SAM TFT3.5 TOUCH BOARD



Hardware

- Control system based on the ATSAM4E-16C 32 bit arm with floating point
- 3.5 "320x480 TFT color display with integrated ILI9488 controller
Control by parallel interface of 16 bits
- Resistive touch screen with AD7843 controller
- Flash memory of 16 MBytes to store data or images
- Real-time clock with calendar and supercap backup
- 4 analog inputs of 12 bits, 0 ... 2.048V, 0 ... 10V, 4-20 mA
- An analog output 0 ... 10V of 12 bits
- Encoder and push-button connectors
- Three digital outputs 0 / 12V of 500 mA with ULN2003A
- Two PWM outputs
- USB Device 2.0 communication
- Communication Rs485
- I2C communication
- Sam-BA downloading

- **SWD / JTAG connector for programming in system**
- **12V supply voltage (from 9V to 15V DC)**
- **Maximum consumption current 120 mA**
- **Compact design. 100 mm x 80 mm**

Software

- **Several C and C ++ sample programs with separate classes for the treatment of each of the hardware modules.**
- **All projects compiled with the free IDE Atmel Studio 7**
- **Graphic library for representation of characters and images on the Display with great simplicity.**
- **Geometric graphic library (Lines, Triangles, Rectangles, Pixels, etc.).**
- **Windows application to transfer Bitmaps from the PC to the flash memory of the board, through the USB bus.**

Applications

- **Automatic pumping.**
- **Automatic irrigation.**
- **Automation control.**
- **Sequencer.**
- **Ventilation system.**
- **Dosage.**
- **Generator of waves of different shapes, up to a frequency of 1 MHz.**
- **MODBUS master / slave.**
- **Display / Remote keyboard.**
- **Remote sensor.**
- **Stepper motor control (optional, requires expansion module).**
- **PWM control.**
- **PID control.**
- **Pulse counter**
- **Training kit for students**
- **Etc.**

The board has been designed to guarantee high flexibility and comfort in its use. It has the necessary elements for the implementation of small control systems that require the measurement of unipolar analog magnitudes. It has a 12-bit digital analog

converter up to 2 Msps, with high stability external voltage reference source. The ADC has four channels enabled, so that four unipolar signals can be measured. Three of the channels have voltage dividers, to adapt to the levels required by the application. The presence of the real time clock with calendar, and the Flash memory of 16 MBytes allow the implementation of a Real Time Data Recorder. The USB bus allows data to be collected on a PC.

The analog output from 0 to 10V, as well as the three power outputs for the control of conventional relays or solid state, facilitate the implementation of a PID for the control of temperature, humidity, pressure, etc. or the speed regulation of a motor by means of a Inverter. The analog output can be used as a wave generator of various shapes and variable frequency.

The Rs485 bus allows the expansion of the system, using any of the Ledoelectronics expansion modules or any standard module; it can be configured in Master or Slave mode.

The presence of a color graphic display with a resolution of 320x480, with built-in touch screen, increases the versatility of the board. The libraries supplied with the module make the difficult simple, and allow the representation of characters, images and figures by simple commands with drawBitmap (..), printChar (..), printString (...), drawLine (..), drawRect (..), drawCircle (..), etc.

Using a Windows application, the images can be transferred from a PC to the Flash memory of the board through the USB bus.

SAM Tft3.5 Touch Board Schematics

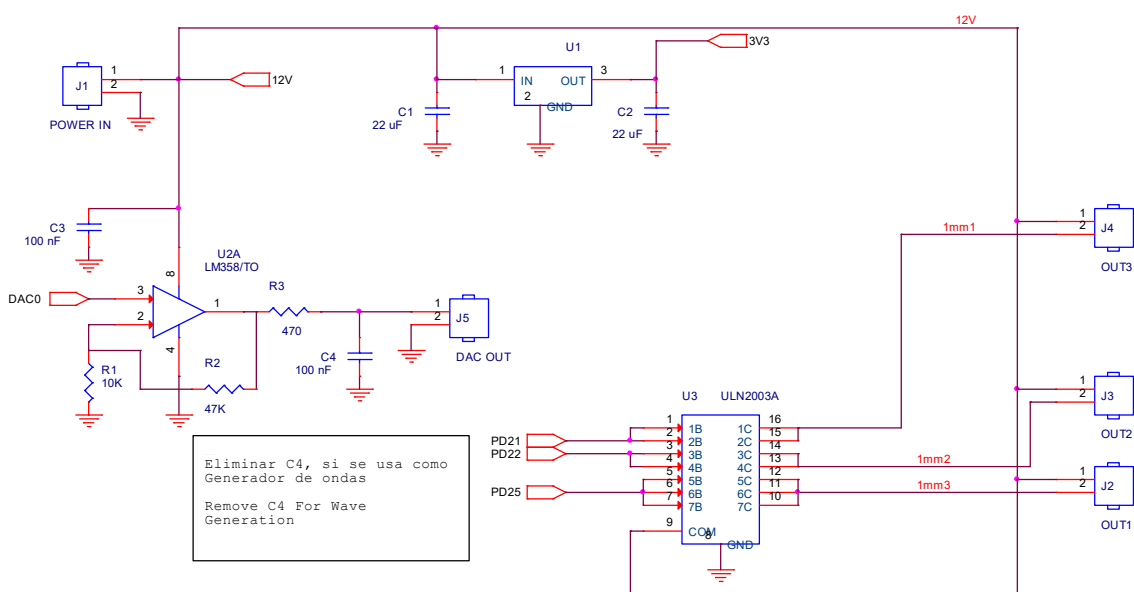


Fig.1. Power supply and outputs.

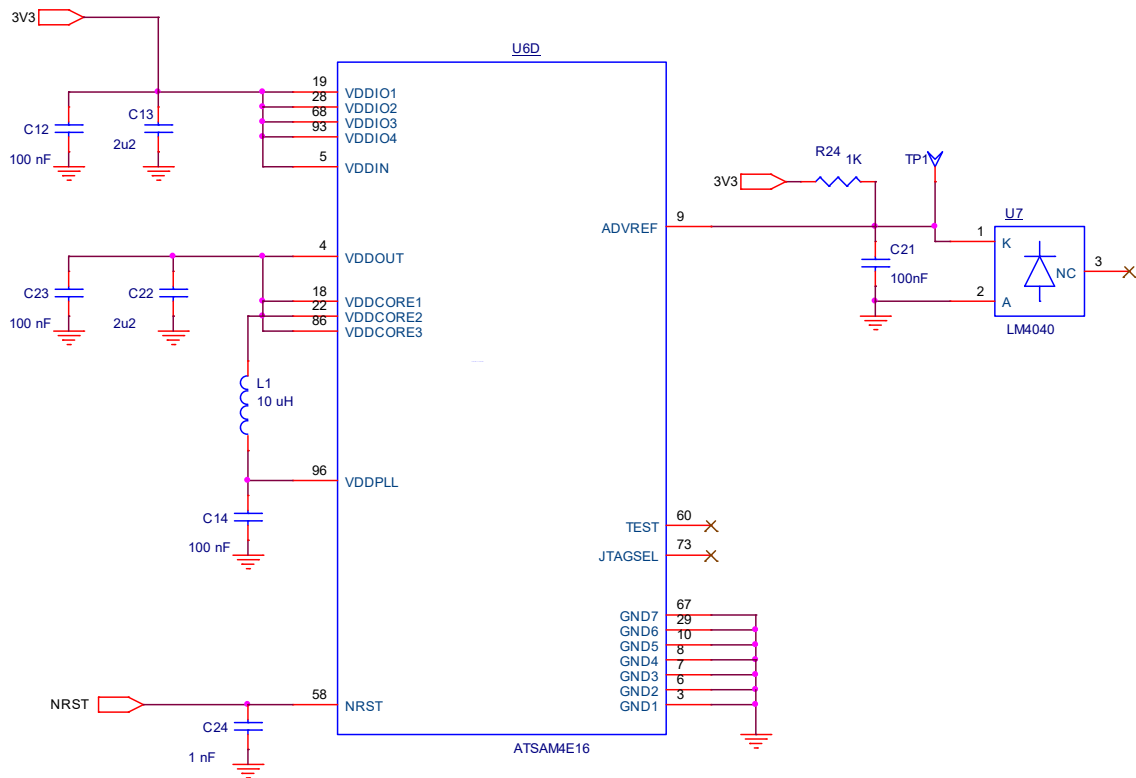


Fig.2. CPU Core.

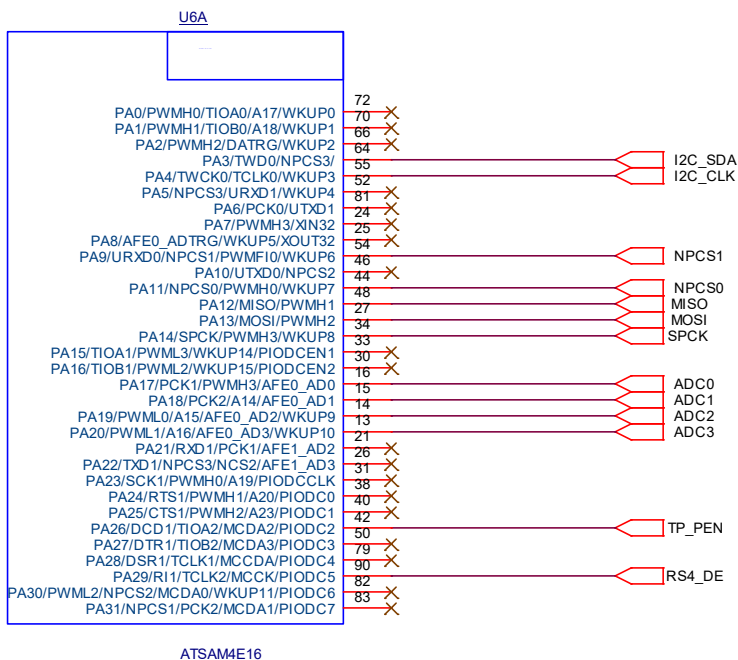


Fig.3. CPU PIOA

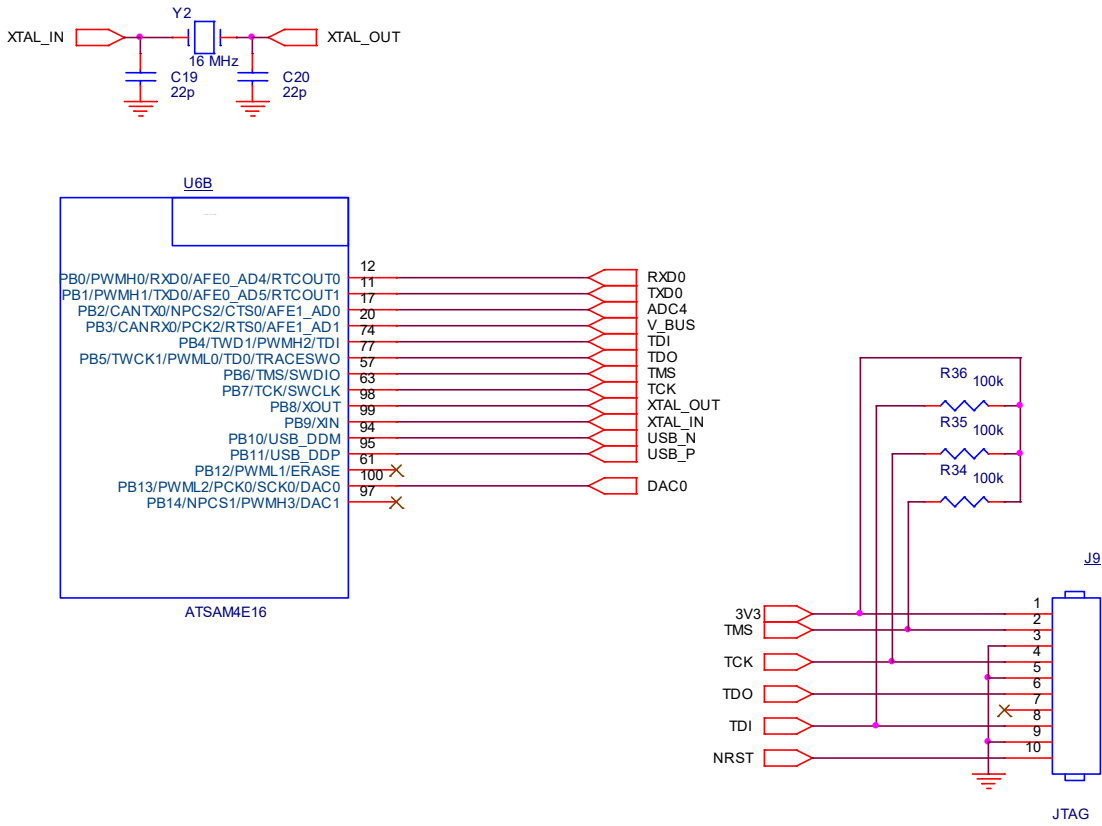


Fig.4. CPU PIOB

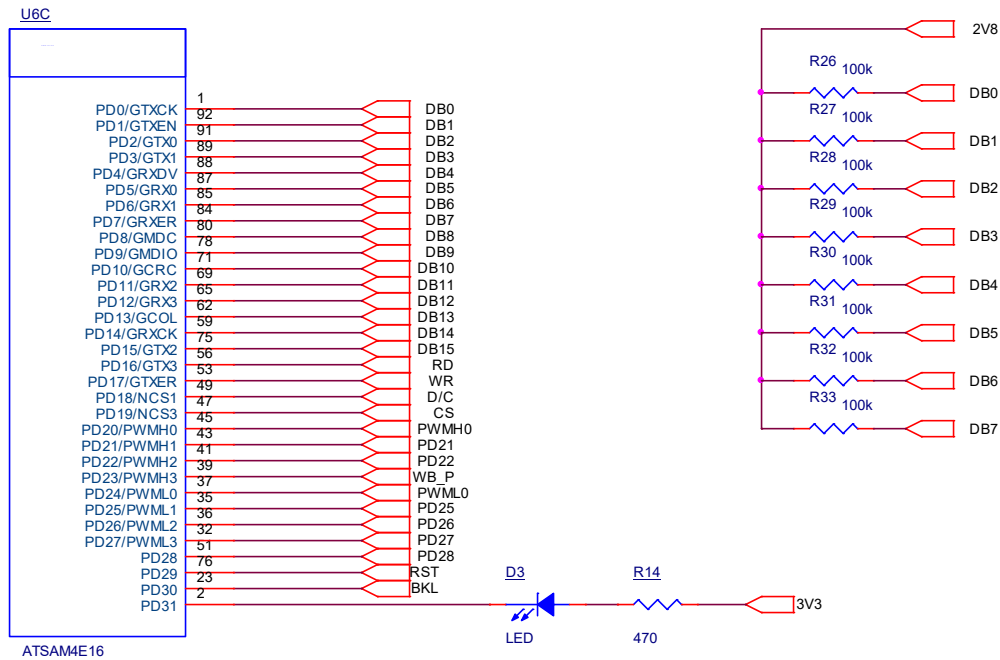


Fig.5. CPU PIOD

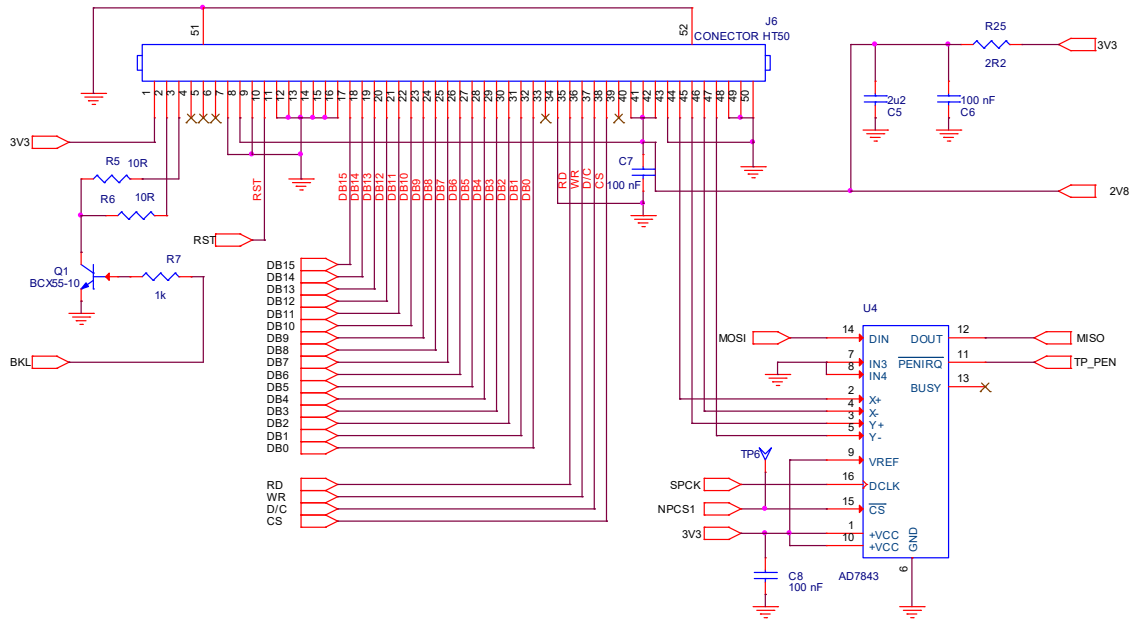


Fig.3. TFT and touch screen.

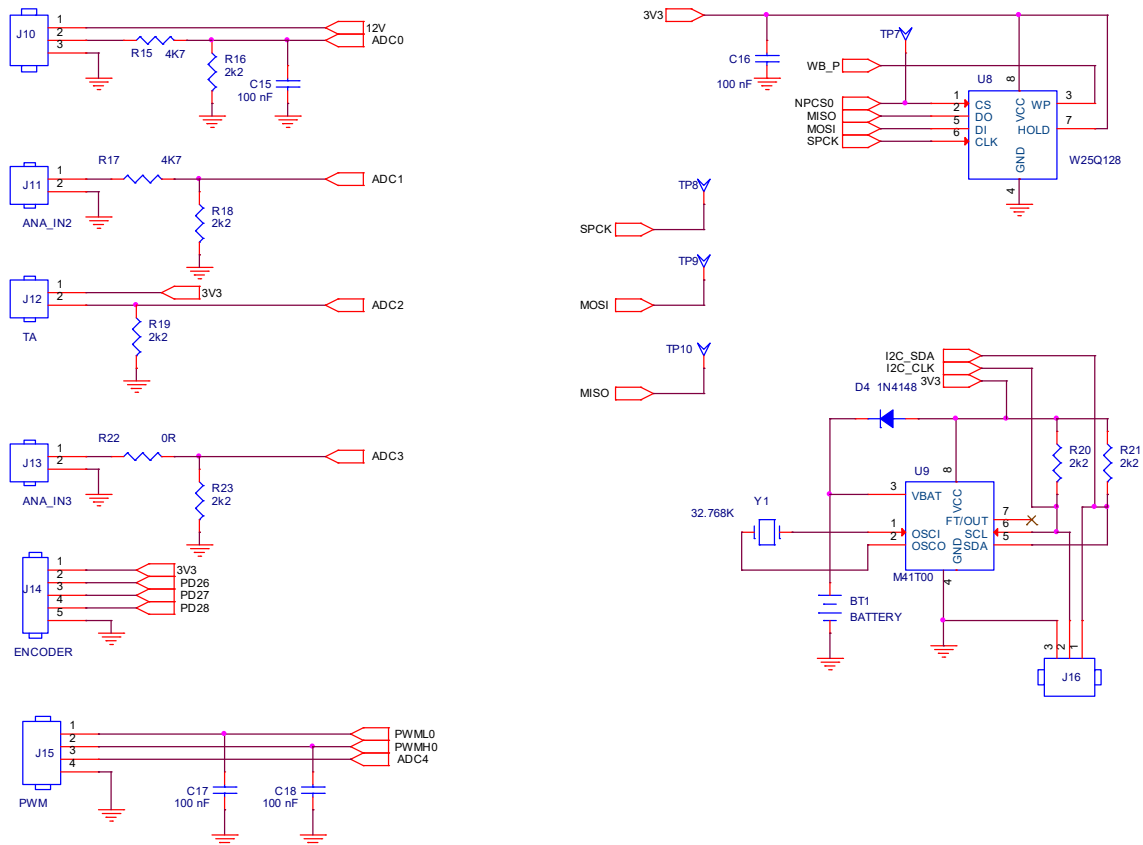


Fig.4. Connectors. RTC y Flash

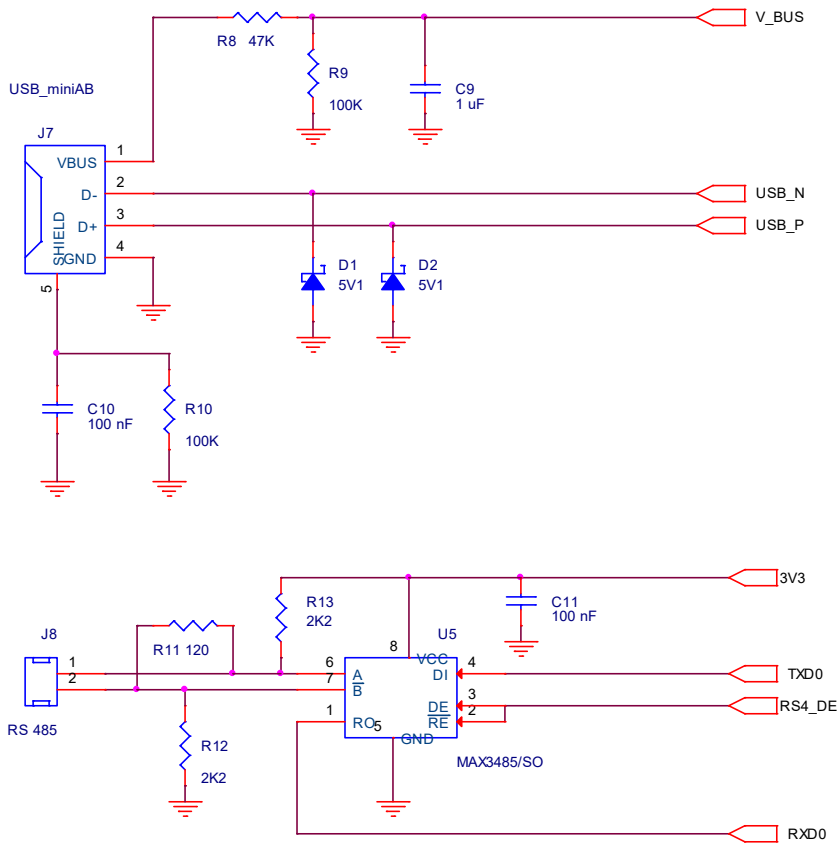


Fig.5. USB and Rs485 Communications.

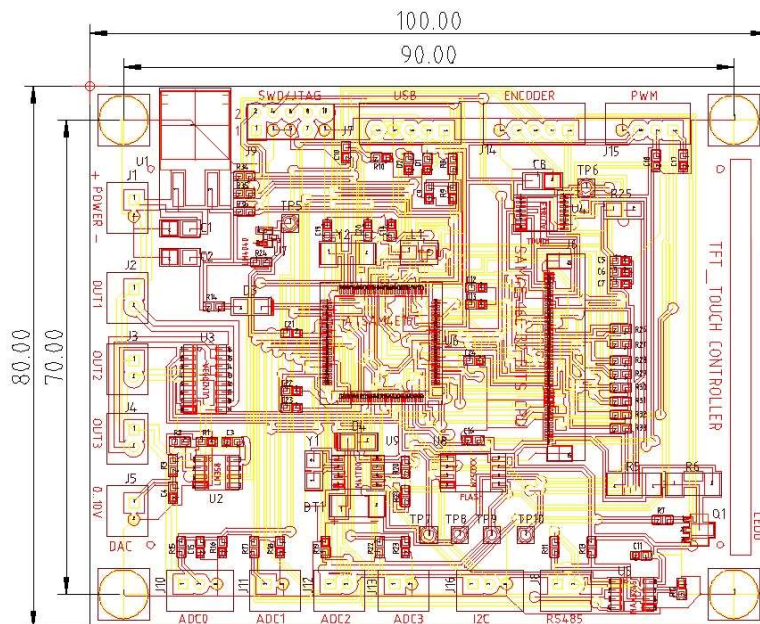


Fig.6. Board outline.