TEAM 3

SUBASSEMBLY SPECIFICATION

SAFE USB PROJECT

TEAM 3

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Mustafa Çağrı İmamoğlu

Mustafa Kantekin

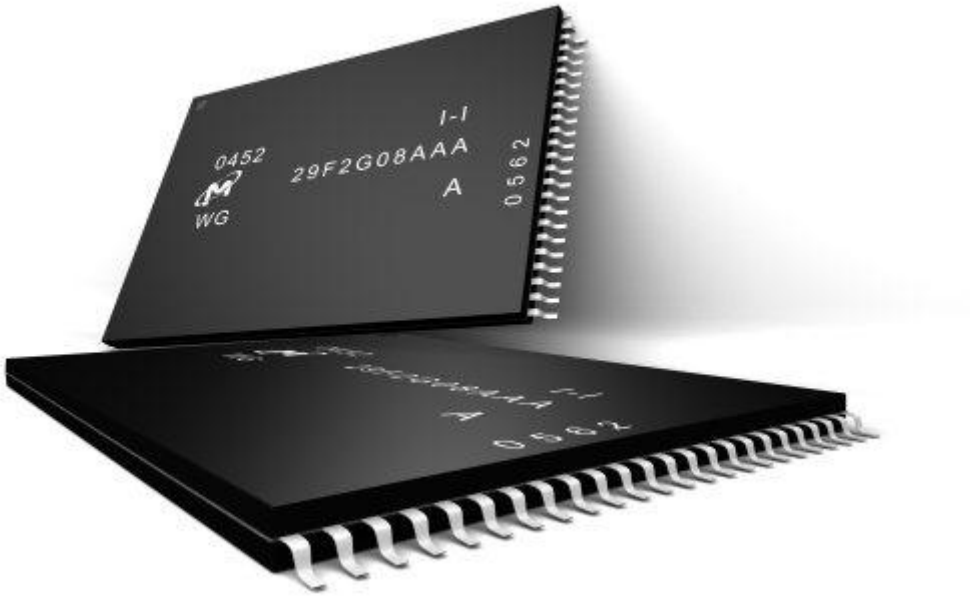
Esat Emre Erdem

Aykut Yıldırım

Okan Çalıkoğlu

Contents

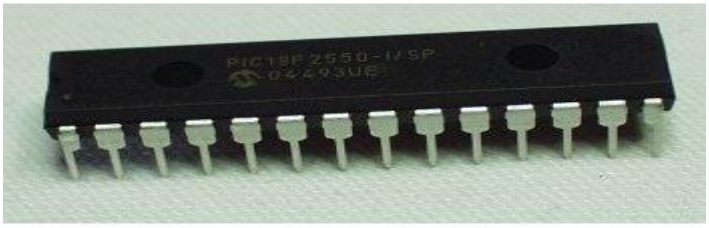
Flash Memory Chip Unit:



This Unit is the Mass Storage Unit of our safe USB design. It is a specific type of EEPROM (electrically erasable programmable read-only memory) that is erased and programmed. This Unit is connected and controlled by the microcontroller with I2C BUS interface. For this interface, only two bus lines are required; a serial data line (SDA) and a serial clock line (SCL). Each device connected to the bus is being software addressable. Therefore, our mass storage unit is also software addressible for data storage and control. There will be a data flow speed upto 1Mb/sec by the help of this interface.

- **Data Storage Capacity** :It will be as the used USB(2GB/4GB/8GB/16GB etc..)
- **Access Control**: Password protected unit as user defined keyword consits of numbers.
- **Power Supply**: 3.3-5 V USB (powered from the USB connected host device)
- **Operating Temperature Range**: +0°C and +70°C
- **Storage Temperature Between Range:** -20°C and +65°C
- **Relative Humidity:** Between 10% and 90% relative humidity at 40°C

PIC18F2550 MICROCONTROLLER:



This microcontroller is commonly used in controlling some EEPROMs like the ones we intend to use like above. This microcontroller has the speciality of full speed USB 2.0 communication interface. There is I2C BUS serial communication interface between this microcontroller and the Flash Memory Chip (Data Storage Unit). We will control the data flow to and from the Flash Memory Chip and PC with the help of this microcontroller. In addition to these specifications, we will also control the password that is entered from the keypad with the help of this microcontroller. This password will consist of numbers and it will be kept in this microcontroller's memory. The user will have 3 chance of password entrance. If the user cannot enter the password correctly in the range of password entrance limits, the device will be locked and cannot be reachable for the user.

For the prototype design of our device, we will just use the microcontroller's memory as the Mass Storage Unit. It will be approximately 4 KB. For the development process, we intend to add the Flash Memory Chip to our microcontroller with the I2C BUS communication interface and we will try to use this Flash Memory Chip as the Mass Storage Unit for our USB device.

KEYPAD:

We will be using the keypad like above for the password entrance. This keypad has 4X3 matrix design for the keys. Therefore, we will have 4X3 matrix algorithm that will describe the keys to the microcontroller as software module. While the password entrance is being done, there will be a trible-led unit mode which will show the underlying process. The password will be kept in our microcontroller's memory and it will not be reachable for outer interference.

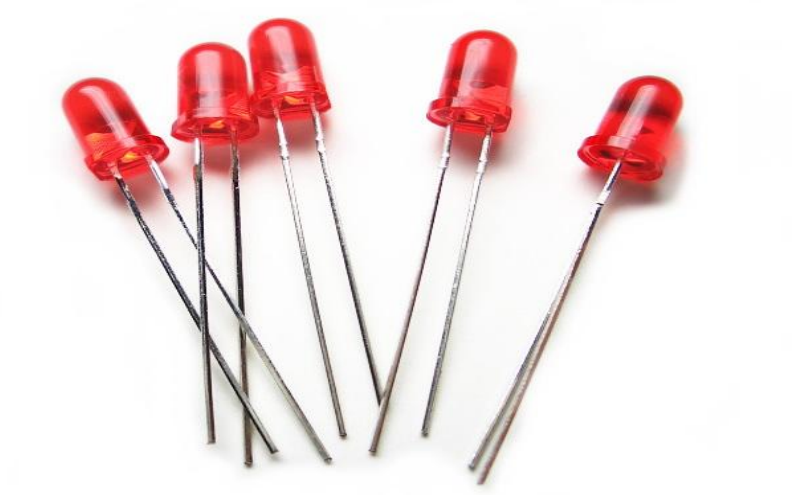
- **Operating Voltage:** 3.3-5 Vdc scale
- **Current Draw:** Average 5mA,
- **Operating Temperature:** -20~+70°C
- **Ambient Humidity:** 5~95% relative humidity non-condensing

OTHER COMPONENTS AND MECHANICAL PARTS:

- **LEDS:** We will be using three different colored leds for password entrance process.

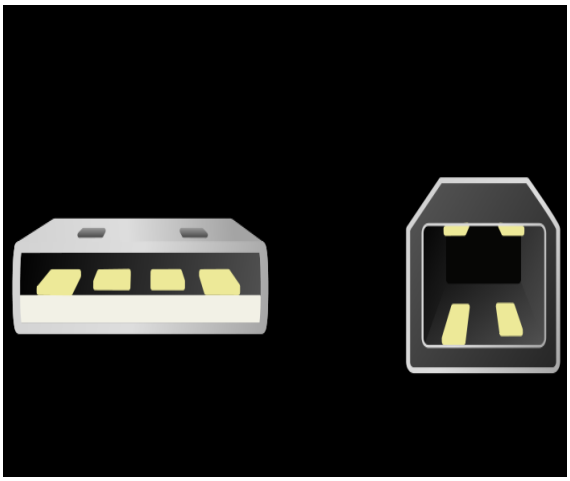
  Red LED works approximately at 1,8V and 15mA
  Yellow LED works approximately at 2V and 15mA
  Green LED works approximately at 2,2V and 15mA

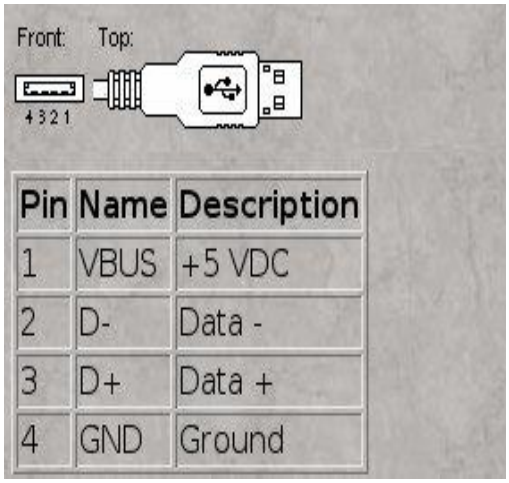
As it seen above, they works at the same range of current flow, but they need different levels of voltage supplies to work properly. They will be controlled with the proper connections of the microcontroller's pins and they will act according to the software regulations.



- **USB CONNECTOR:** We will be using the USB female standard A type USB connector like below for our device. Since the connection of PCs to the USB devices is the one like below, we choose to use it. The pin configuration of the connector is like below.

Standard A type **standard B type**

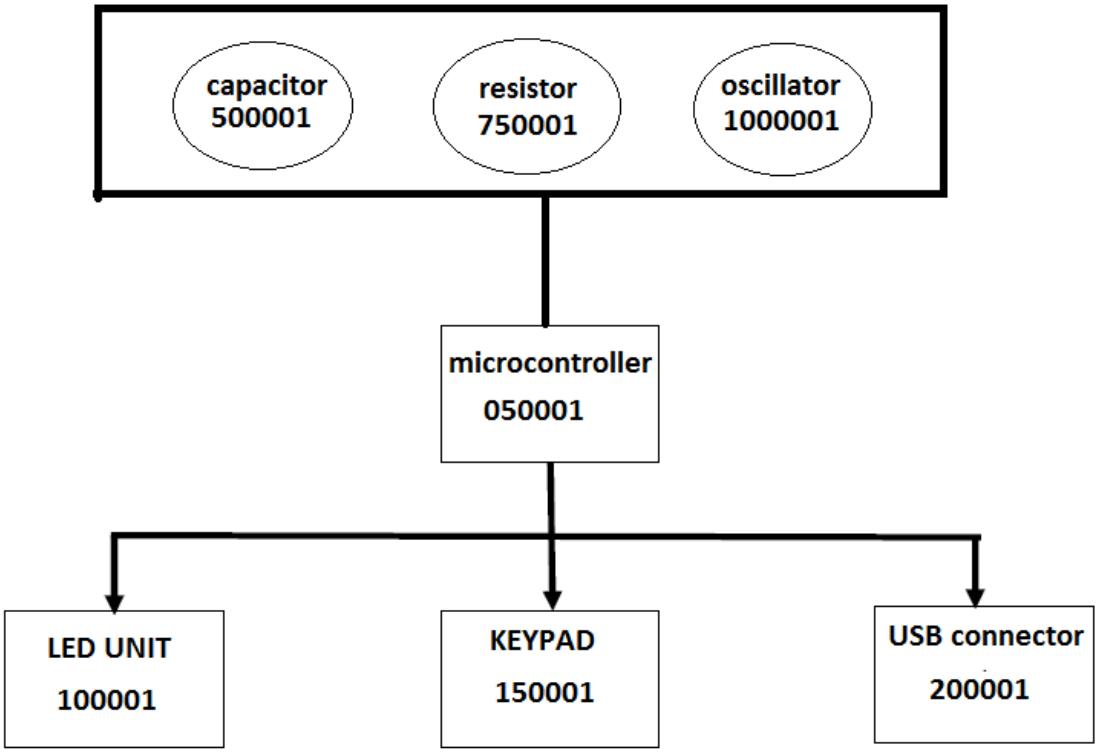




Pin	Name	Description
1	VBUS	+5 VDC
2	D-	Data -
3	D+	Data +
4	GND	Ground

- **PERIPHERAL COMPONENTS OF MICROCONTROLLER:**
  There will be 20 MHz Crystal oscillator, 10 pF and 470 nF capacitors, resistors related to leds load.

Product Tree



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