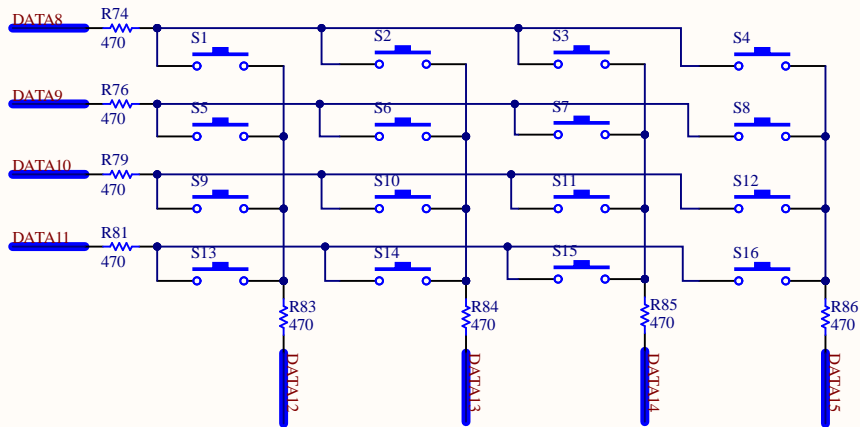
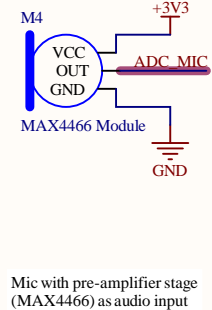




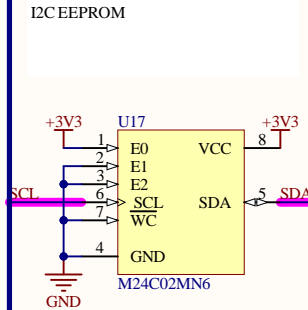
## Matrix Keypad



## Audio Input

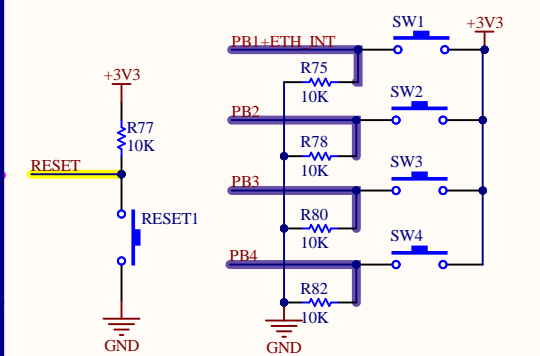


## EEPROM



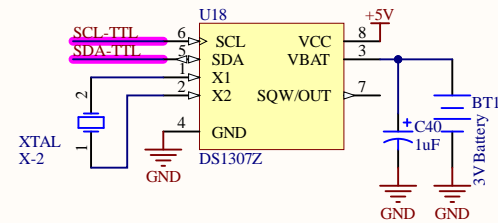
- Four Basic Single mom-Switch
- a Reset switch

## Basic Switches



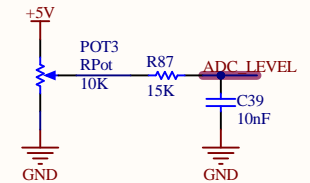
## Real Time Clock - RTC

DS1307 is Real Time Clock IC which work with 5V power supply , using a voltage translator we can read it at 0x68 address using I2C

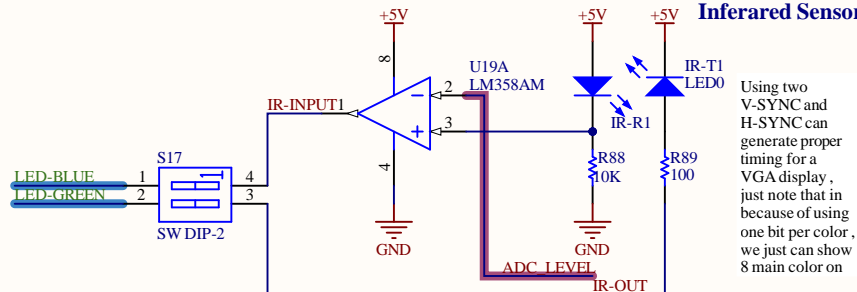


## Basic ADC

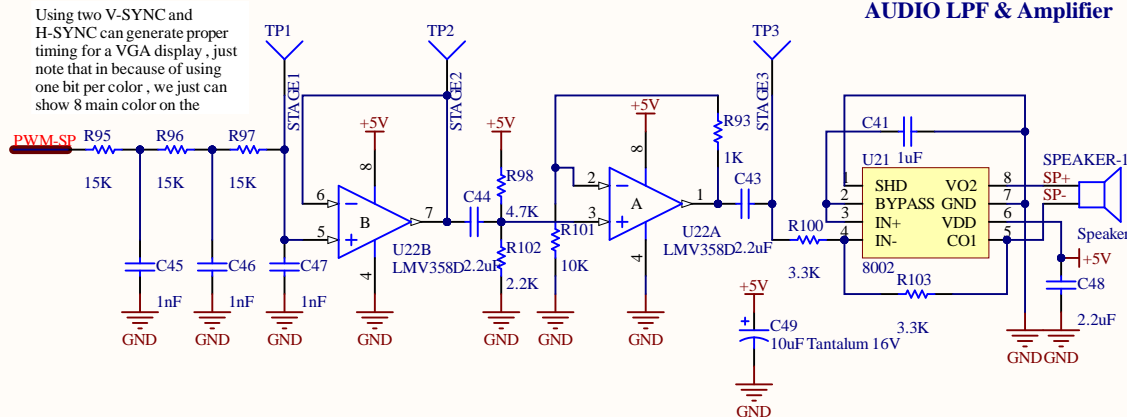
Using two V-SYNC and H-SYNC can generate proper timing for a VGA display , just note that in because of using one bit per color , we just can show 8 main color on the display



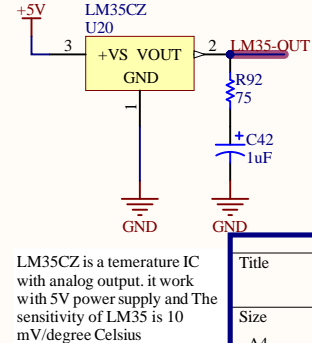
## Infrared Sensor



## AUDIO LPF &amp; Amplifier

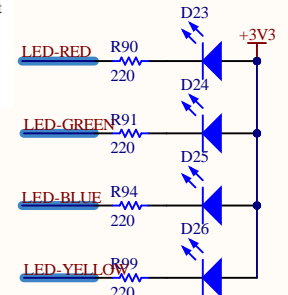


## LM35 - Temperature Sensor



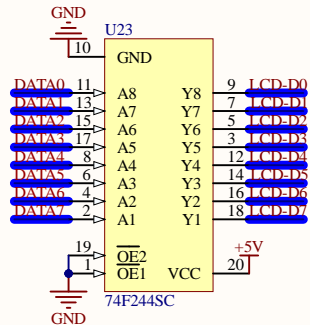
## Basic LEDs

Using two V-SYNC and H-SYNC can generate proper timing for a VGA display , just note that in because of using one bit per color , we just can show 8 main color on the display



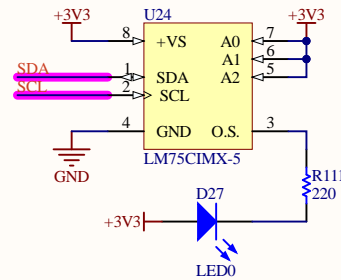
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### LOGIC LEVEL TRANSLATOR



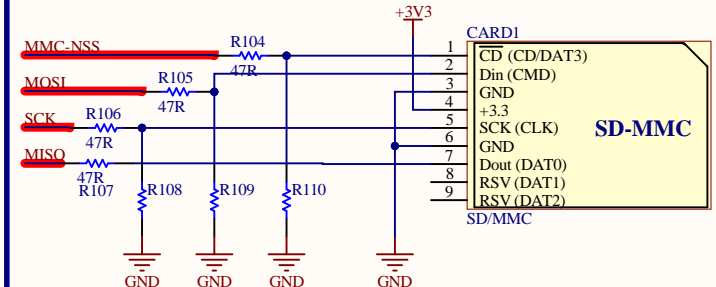
### LM75 - I2C Temperature sensor

The LM75 temperature sensor includes a delta-sigma analog-to-digital converter, and a digital overtemperature detector. you can control and read it via I2C protocol

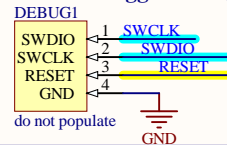


### External Memory

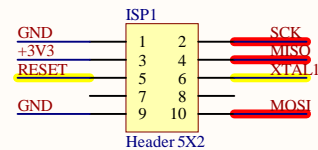
External SD/MMC using SPI protocol



### SWD Debugger Port (ARM only)

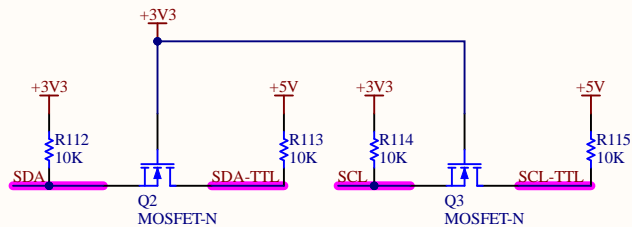
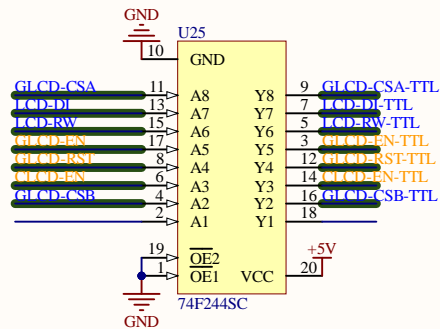
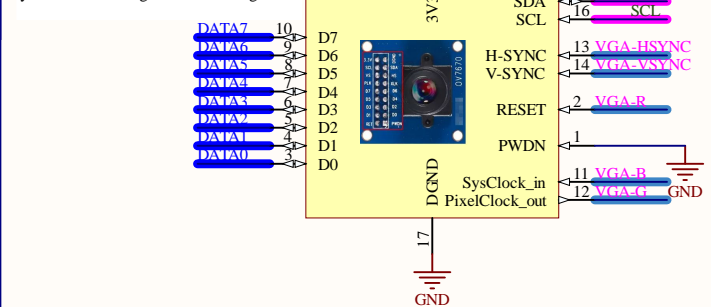


### SPI PROGRAMMER Port (AVR only)

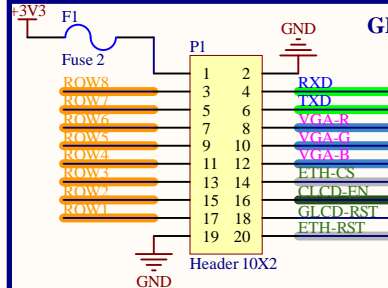


### Camera Module - OV7670

This is 0.3Mpixel ( 640 x 480 ) 30 FPS CMOS camera sensor. with a 10Mhz to 48Mhz clock at SysClock\_in pin and controlling the Reset and PWDN pins , it will generate data stream of sensors pixels information in DATA pins

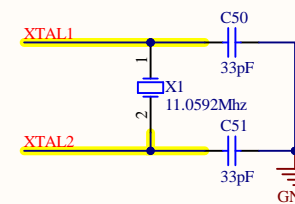


### GPIO



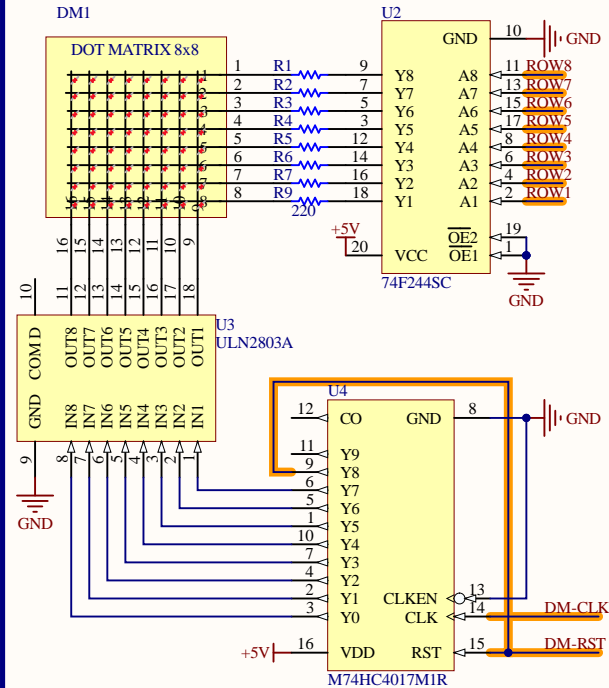
### External Clock - HSE

It's a basic 8Mhz crystal oscillator circuit for HSE clock source of the MCU. you can reach to upper clock freq



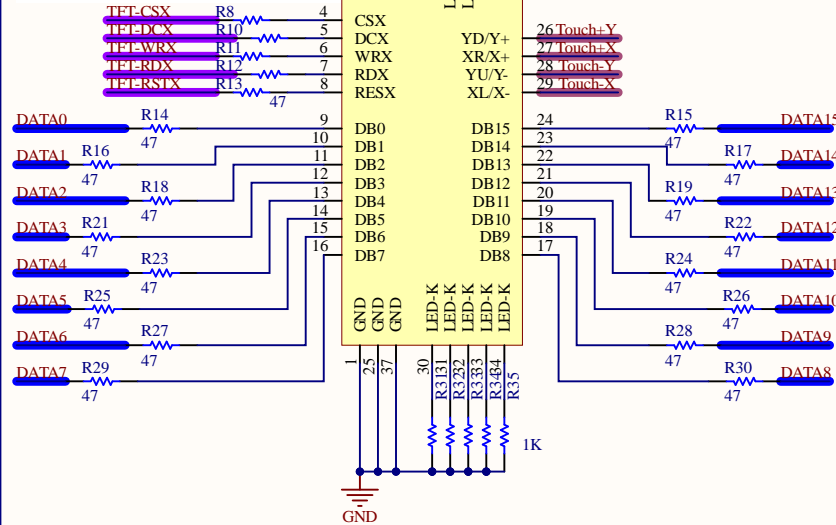
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### 8X8 Pixel Dot Matrix Driver



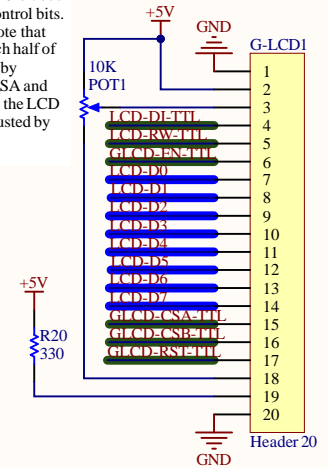
Z320IT002 - It is a 3.2 inch full-color TFT display which having a resolution of 320x240 pixels. The display employs ILI9341 as its controller. To manipulate the display, you can utilize a 16-bit bus accompanied by CSX, DCX, WRX, RDX, and RESX. Additionally, the touch screen is equipped with the ability to adjust its resistance in correspondence to the touch location. This adjustment can be translated into voltage readings through ADCs.

### Graphical Full-Color TFT Display



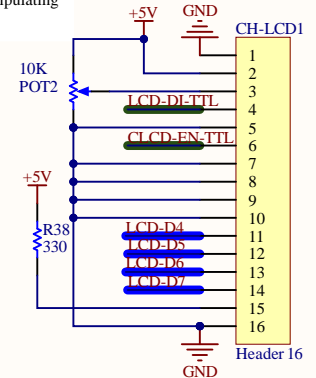
### Graphical Mono Color LCD

In order to control a mono-color Graphical LCD with a KS108 chipset, it is necessary to use an 8-bit bus along with other control bits. It is important to note that you can control each half of the display at once by selecting it using CSA and CSB. Furthermore, the LCD contrast can be adjusted by manipulating the potentiometer.



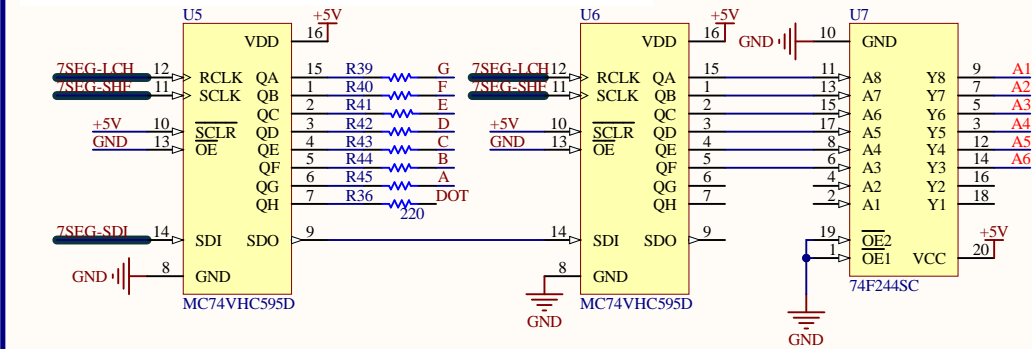
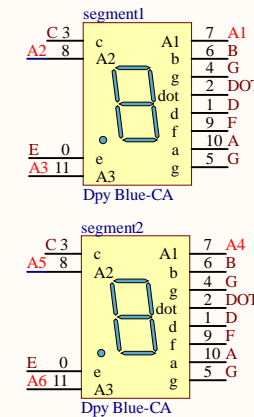
### 2x16 Character LCD

To control a 2x16 character LCD, use the 4-bit mode with only the four upper data bits, as well as the Enable and Data/Instruction pins. Additionally, you can adjust the LCD contrast by manipulating the potentiometer.



Two 3-Digit Multiplexed 7-Segment, Driven through a buffer and 74LS247 (seven segment decoder) ICs, similar to DOT matrix driving, here also use a 4017 IC as a counter with automatic reset function which automatically switch between different segment on each clock pulse. you can reset the counter manually or just read the reset pin to know when it'll reset the counter.

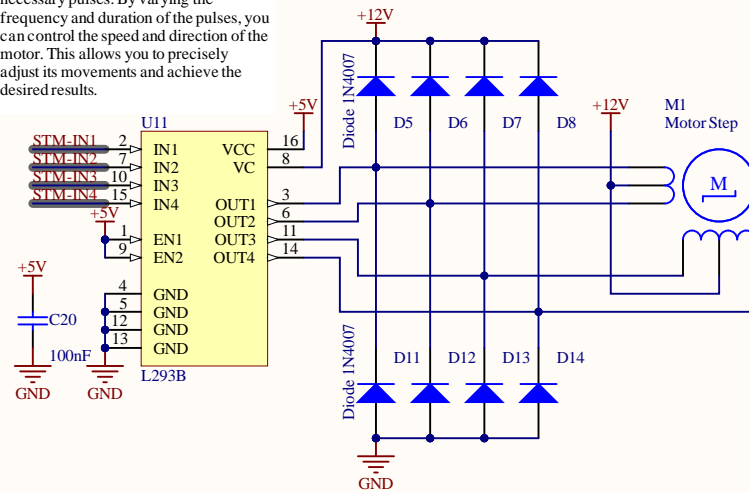
### Multiplexed Seven Segment Display



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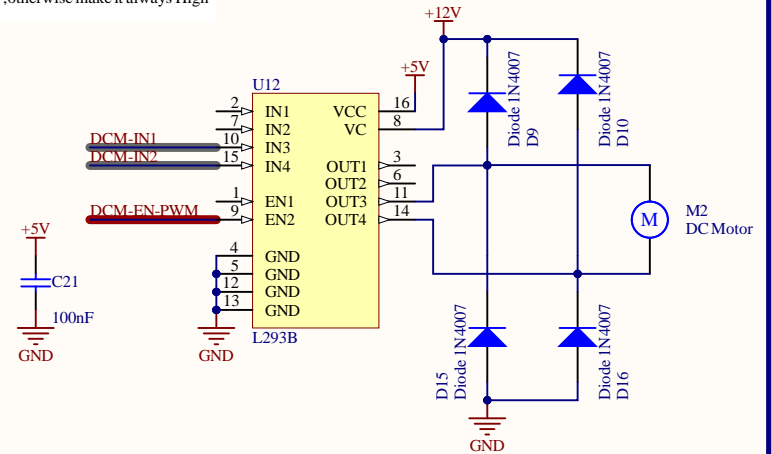
**STEPPER MOTOR DRIVER**

To drive a stepper motor using the L293 driver, you need to send pulses to IN1, IN2, IN3, and IN4. This can be done using a microcontroller or other electronics that can generate the necessary pulses. By varying the frequency and duration of the pulses, you can control the speed and direction of the motor. This allows you to precisely adjust its movements and achieve the desired results.

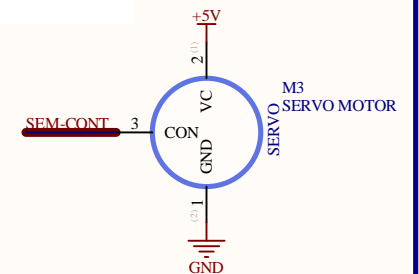
**DC MOTOR DRIVER**

Use IN1 and IN2 to run motor in CW or CCW direction or even break the motor!

You can also use EN2 for speed control purpose using PWM, otherwise make it always High

**SERVO MOTOR**

To control an SG-5010 servo motor, you need to send pulses of varying duration to its control input pin. The duration of the pulse determines the angle at which the servo motor rotates.



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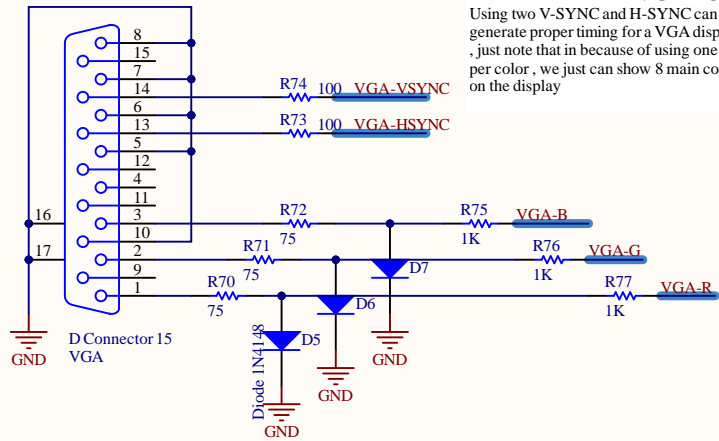
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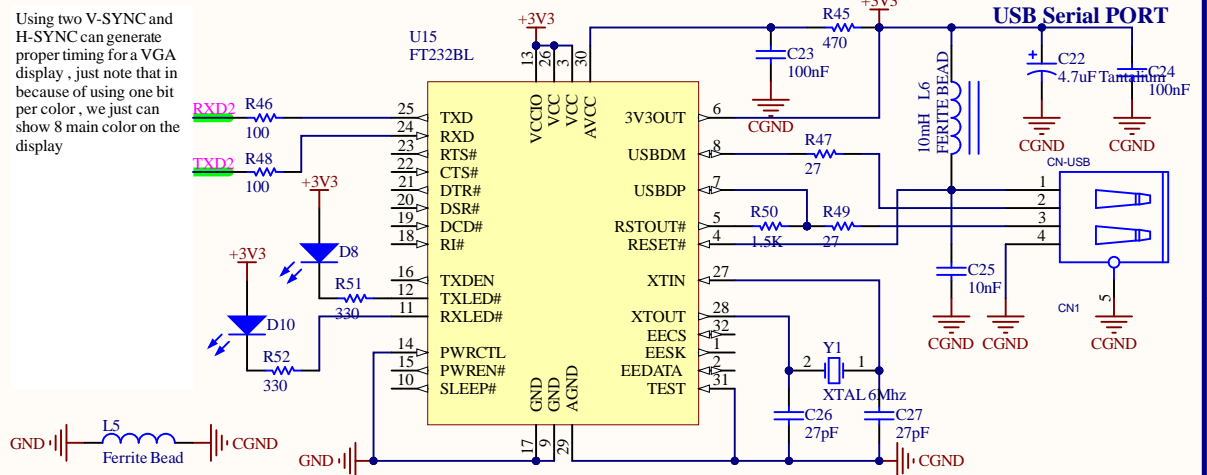
4

### VGA PORT

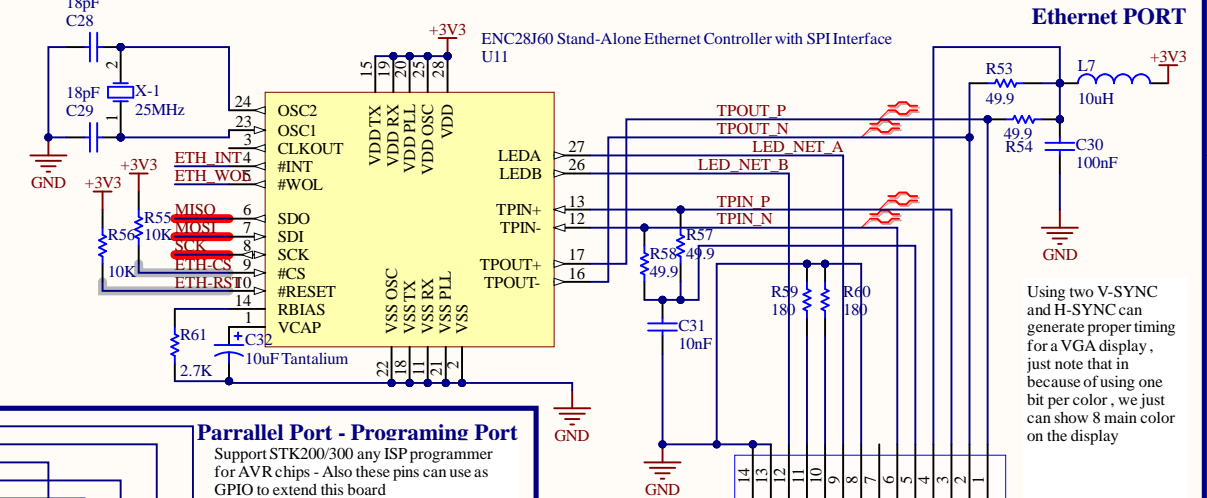
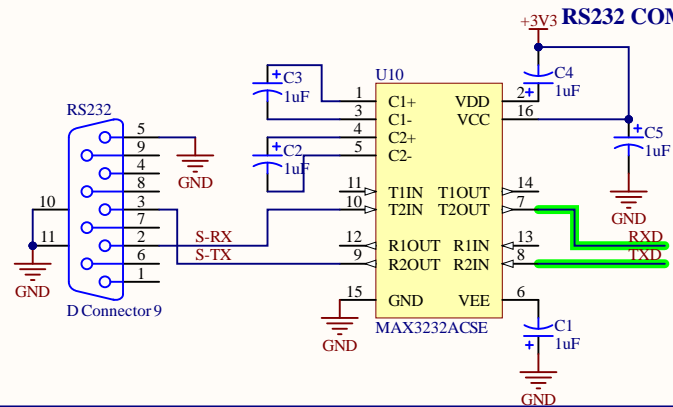
Using two V-SYNC and H-SYNC can generate proper timing for a VGA display , just note that in because of using one bit per color , we just can show 8 main color on the display



Using two V-SYNC and H-SYNC can generate proper timing for a VGA display , just note that in because of using one bit per color , we just can show 8 main color on the display

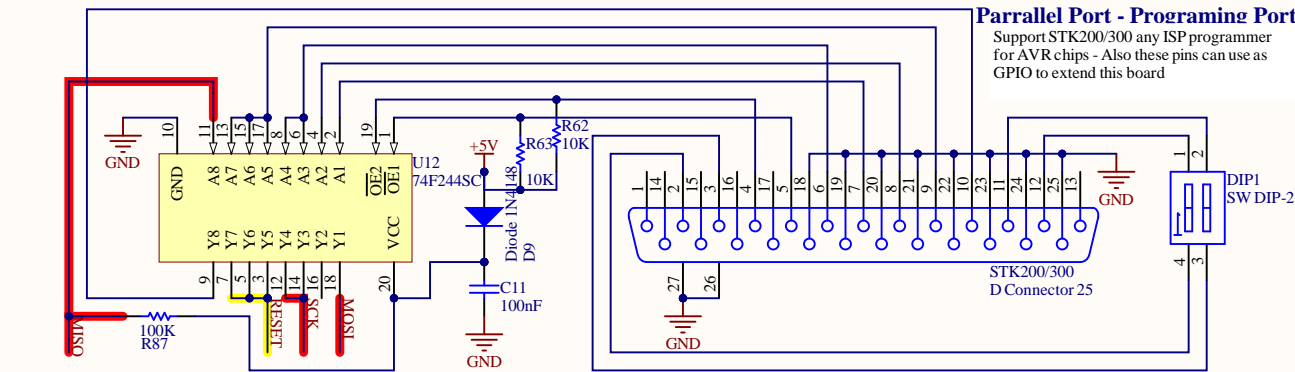


### RS232 COM PORT



### Parallel Port - Programing Port

Support STK200/300 any ISP programmer for AVR chips - Also these pins can use as GPIO to extend this board



### Ethernet PORT

Using two V-SYNC and H-SYNC can generate proper timing for a VGA display , just note that in because of using one bit per color , we just can show 8 main color on the display

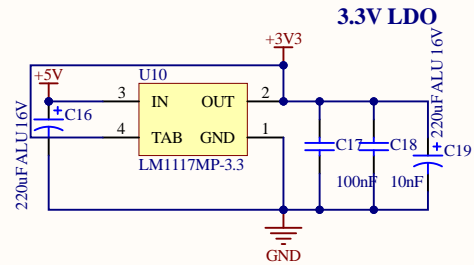
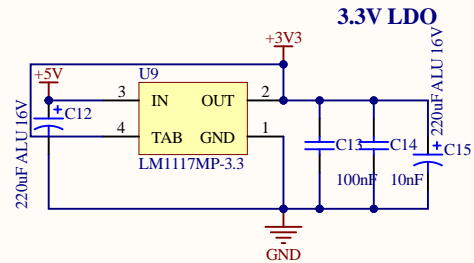
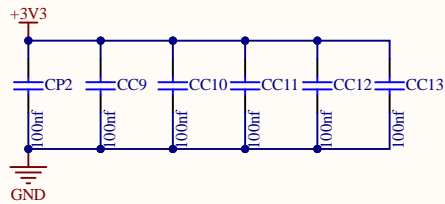
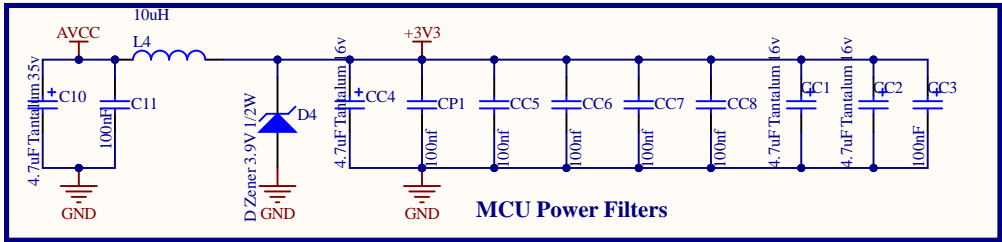
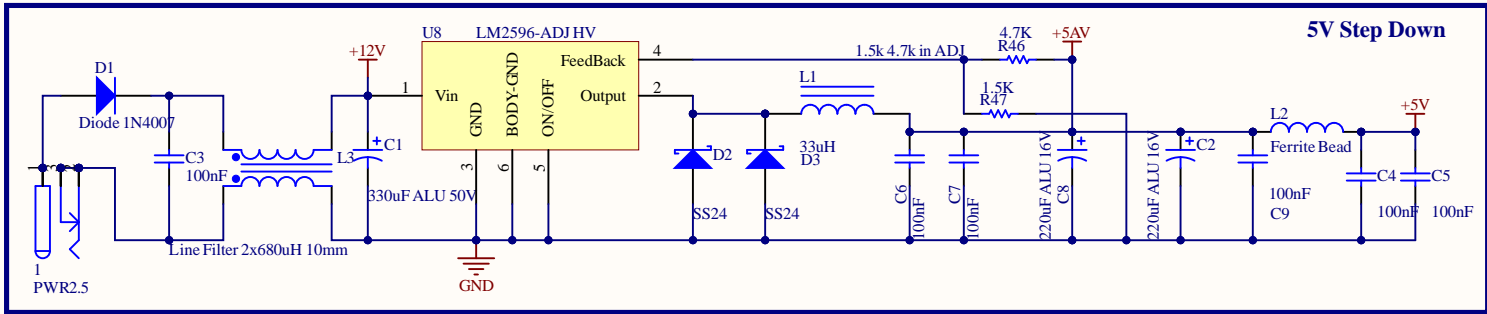
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