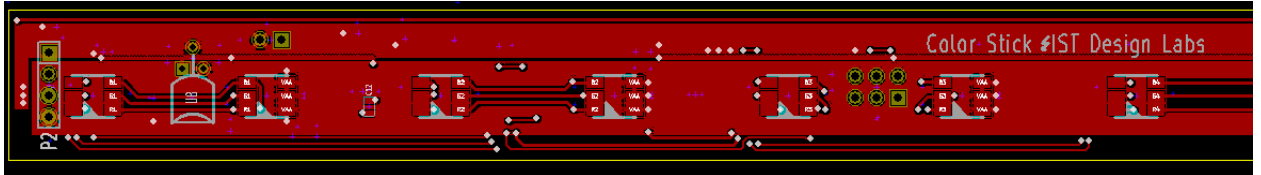


Color Stick assembly instructions

11 Nov 2010

Load front-side components:

- 1) Load U8 (78L05) flat-side towards the board
- 2) Load C12 (100nF)



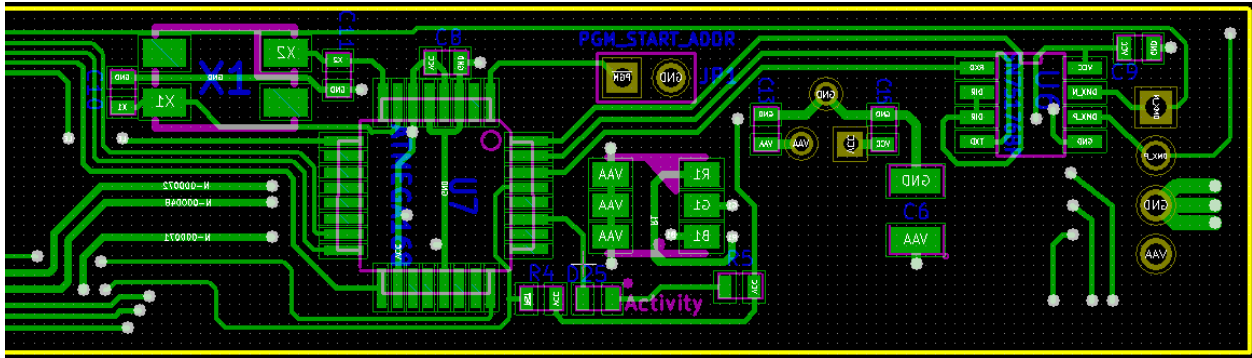
- 3) Load U9 (78L05) flat-side towards the board



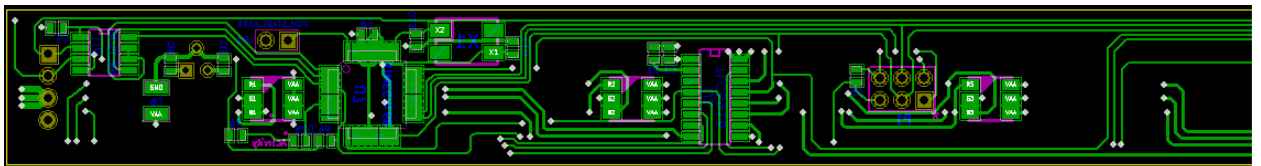
- 4) If using connectors, load P2 (4-pin male) and P3 (4-pin female) connectors.
- 5) For a board with LEDs all on one side, install RGB LEDs D1 – D16. For a board with LEDs on both sides, load RGB LEDs D1 – D8. With the “Color Stick” silkscreen text on top, D1 is the leftmost diode, closest to connector P2. Diode locations on this side alternate D1 D9 D2 D10 etc, so a board with LEDs on both sides will have alternating loaded and empty locations on this side. Note that the silkscreen orientation is incorrect. LEDs should be installed as shown (the marked corner is in the upper left when the “Color Stick” label is on top as shown):



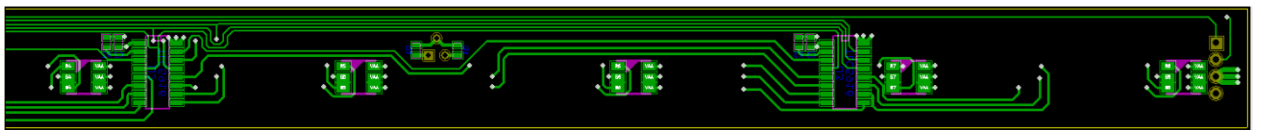
Load back-side components:



- 1) Load C13 (330nF). Note that 100nF will also work.
- 2) Load C8, C9, C15 (100nF)
- 3) Load C6 (10uF)
- 4) If desired, load activity LED D25 (anode to dot) and R5 (1k)
- 5) Load R4 (4k75)
- 6) Load X1 (20 MHz crystal). It will work in either orientation.
- 7) Load C10, C11 (22pF)
- 8) Load U7 (ATMega48). ATMega88, ATMega168, or ATMega328 would also work. Align pin 1 with circle
- 9) Load U6 (SN75176 or equivalent)
- 10) Load 2-pin header JP1



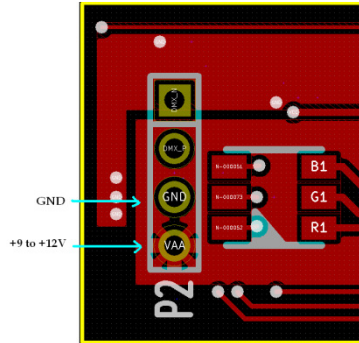
- 1) Load C1, C5 (100nF)
- 2) Load R1 (931R, 1K would also work)
- 3) Load U1 (TLC5916 or TLC5917)
- 4) Load 6-pin programming header P1



- 1) Load C2, C3 (100nF)
- 2) Load R2, R3 (931R, 1K would also work)
- 3) Load U2, U3 (TLC5916 or TLC5917)
- 4) If making a board with LEDs on both sides, load RGB LEDs D17 – D24. Note that the silkscreen orientation is incorrect

Program the processor:

- 1) Connect a 9-12v DC power supply to P2, positive to pin 3, negative to pin 4



- 2) Connect programmer to P1, with red stripe closest to the * on the silkscreen
- 3) Set the following fuses:
 - a. EESAVE
 - b. Brownout detection at VCC = 4.3V
 - c. Ext Crystal Osc: 8.0 – MHz Startup time 16k + 65 mS (the last choice in the dropdown)
- 4) Program the part

DMX Start address:

By default, the board starts up at DMX address 1. To change, place a jumper across the PGM START ADDR header, send DMX data with the low 8 bits of the new start address in channel 1, and the upper bit in channel 2, and power up the board. The board will write the new address in on-chip eeprom. Then power off the board and remove the jumper.

Interconnecting:

Each board presents one DMX load, and can draw up to 430mA when all LEDs are on full. You can daisy chain boards by either plugging them end to end or connecting them with wire jumpers. If using cat5 or similar wire, pay attention to the total power supply draw and voltage drop in the cable. More boards can be driven using a splitter.