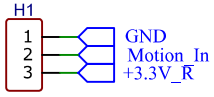
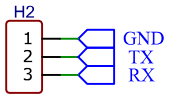
Luminator 14 by 21 Display - Driver Board

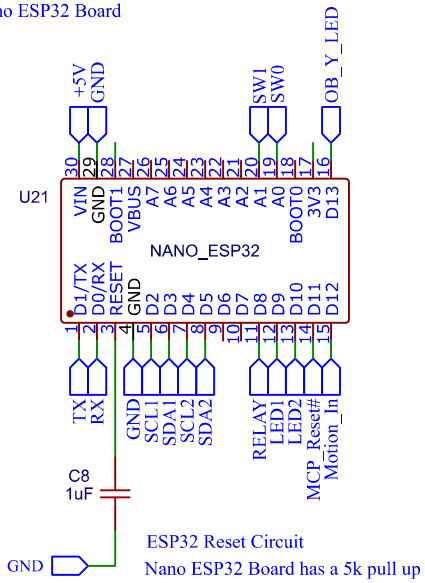
Motion detector



Serial

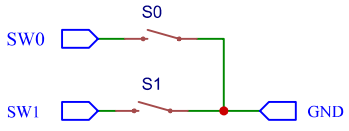


Nano ESP32 Board

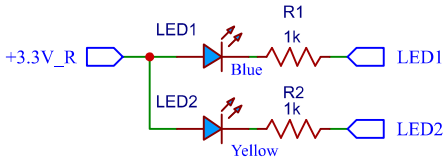


ESP32 Reset Circuit
Nano ESP32 Board has a 5k pull up
from RESET to +3.3V

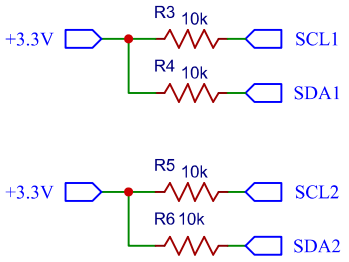
Input switches



LED indicators

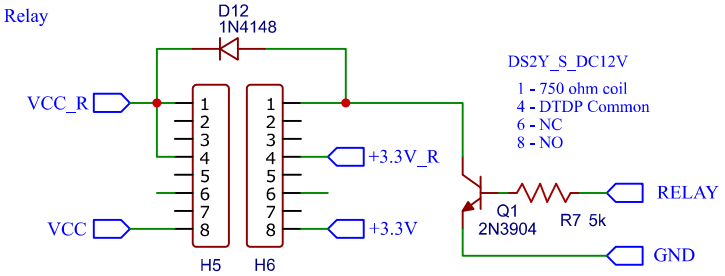


i2c pull ups

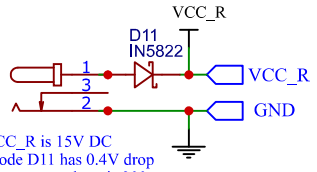


i2c2 selected on Secondary Boards
by cutting i2c1 traces at connector and jumping
i2c2 to i2c1 on Secondary Board at pull ups.

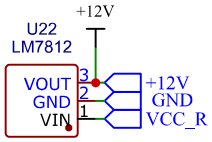
Power Relay



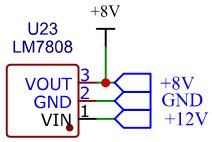
Power Jack



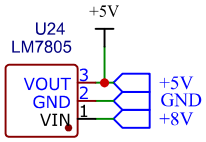
VCC_R is 15V DC
Diode D11 has 0.4V drop
Max current draw is 300ma
Relay open draw is 90ma



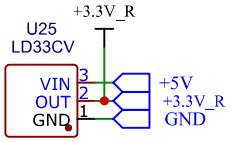
LM7812 acts as heat sink



LM7808 acts as heat sink



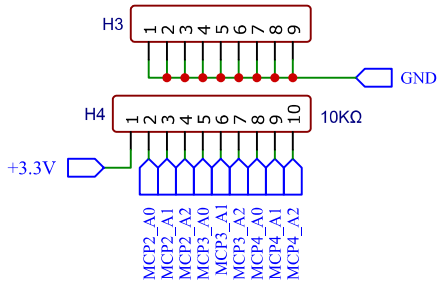
LM7805 5V output

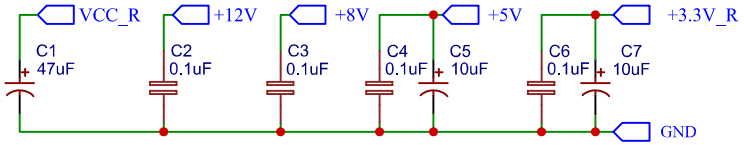


LD33CV 3.3 Volt output
(note unusual pin out)

MCP Solder Jumper Selector

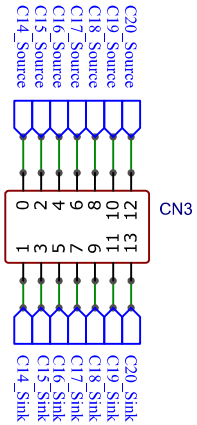
Select MCP column addresses on each board
by soldering pins to GND

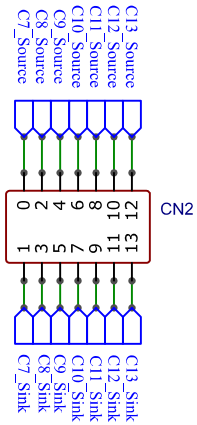


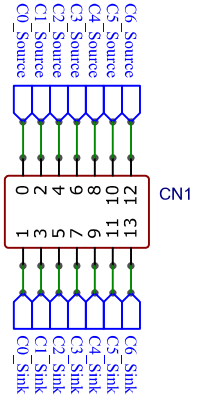


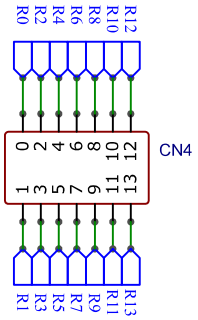
TITLE: Luminator 14 by 21 Display Driver V2		REV: 1.0
EasyEDA	Company: John Wolfe	Sheet: 1
	Date: 2024-04-17 Drawn By: jpwolfe31	

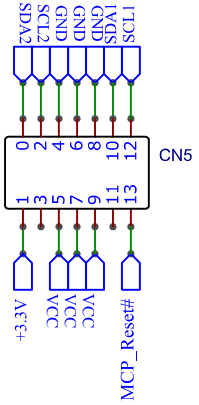
Display connectors

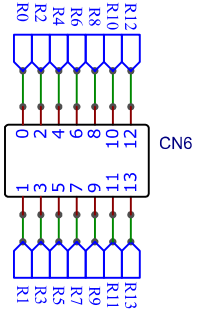












Main driver board plugs into display through connectors CN1 to CN4
Secondary driver boards plugs into display in the same way.
Main driver board also connects to secondary driver boards with CN5 and CN6.
Secondary driver boards only contain components for the column drivers.
allowing the same pcb to be used for the main and secondary driver boards.

Display

Row 0 is top row
Column 0 is left column
(right side when viewing from back)

Cx_Source 15V and Rx 0V
- dot flips yellow

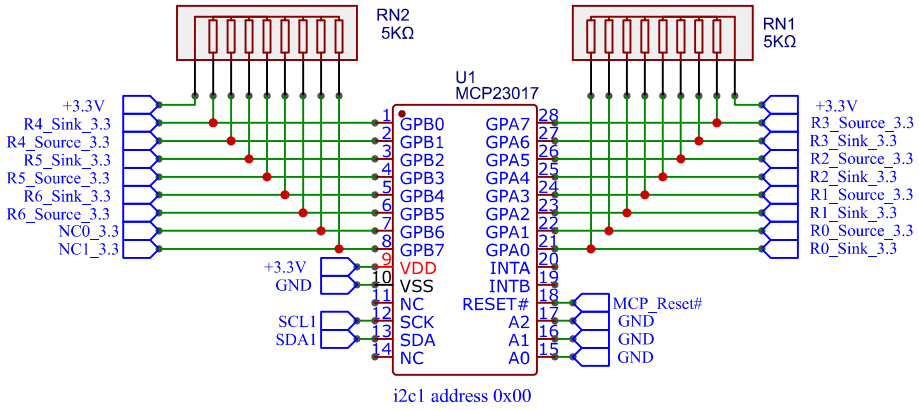
Cx_Sink 0V and Rx 15V
- dot flips black

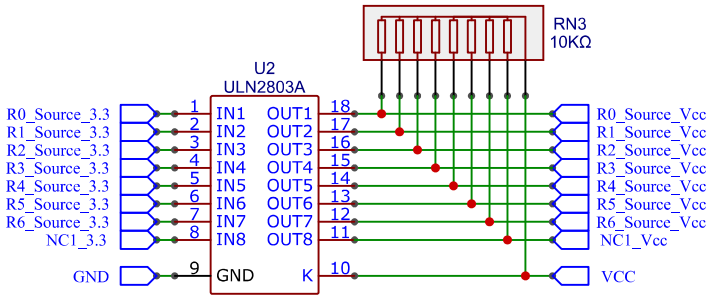
CAUTION - Do not turn on Cx_Source with
Cx_Sink as display diodes may burn out

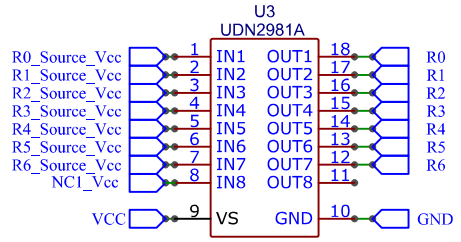
Display shows number 0076A

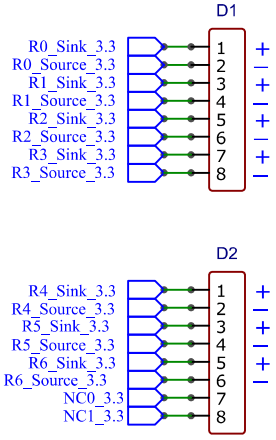
TITLE: Luminator 14 by 21 Display Driver V2		REV: 1.0
EasyEDA	Company: John Wolfe	Sheet: 2
	Date: 2024-04-17 Drawn By: jpwolfe31	

Row Drivers 1

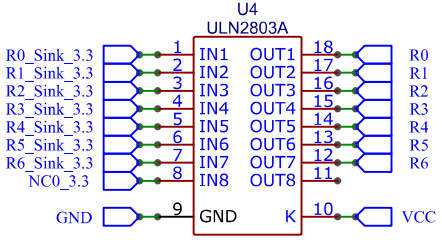






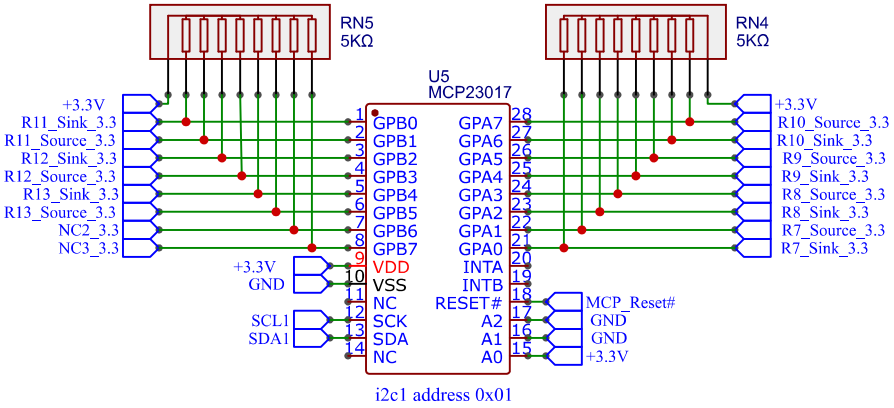


Open Collector Outputs
IN4148 Protection Diodes
Source_3.3 on at 0V.
Sink_3.3 on at 3.3V
When this occurs, diode pulls down sink

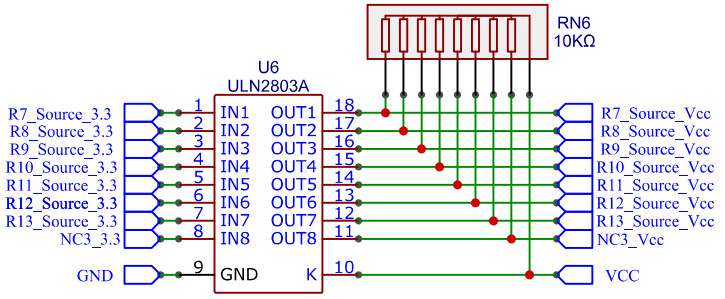


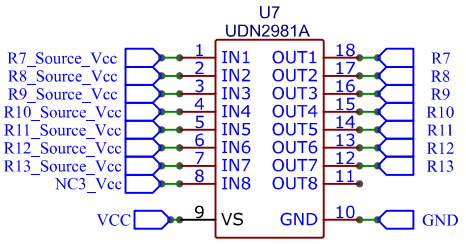
TITLE: Luminator 14 by 21 Display Driver V2		REV: 1.0
EasyEDA	Company: Your Company	Sheet: 3
	Date: 2024-04-17 Drawn By: jpwolfe31	

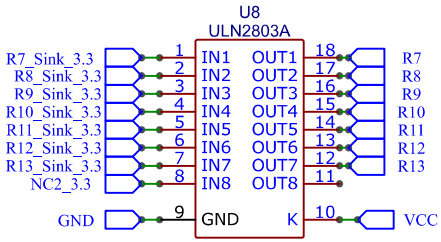
Row Drivers 2

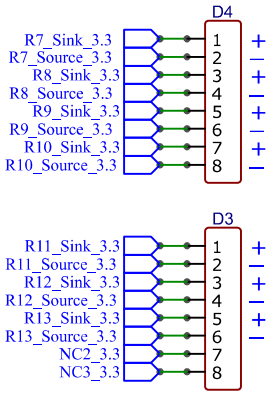


i2c1 address 0x01









Open Collector Outputs

IN4148 Protection Diodes

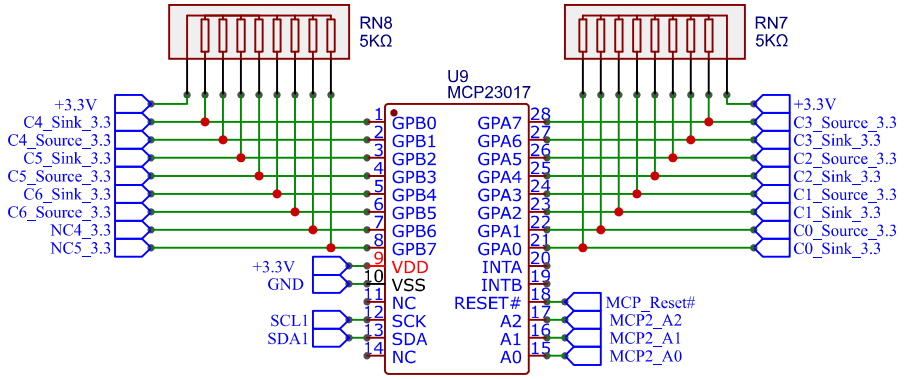
Source_3.3 on at 0V.

Sink_3.3 on at 3.3V

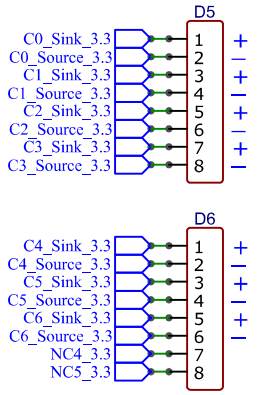
When this occurs, diode pulls down sink

TITLE: Luminator 14 by 21 Display Driver V2		REV: 1.0
EasyEDA	Company: Your Company	Sheet: 4
	Date: 2024-04-17 Drawn By: jpwolfe31	

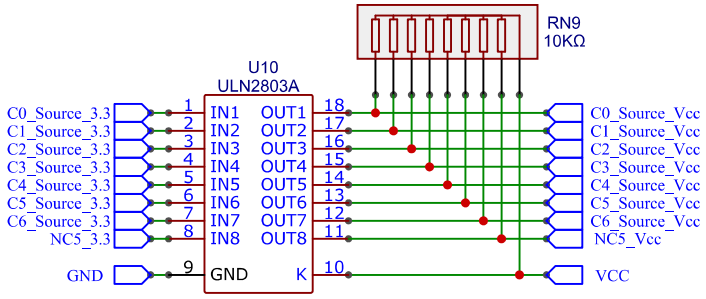
Column Drivers 1

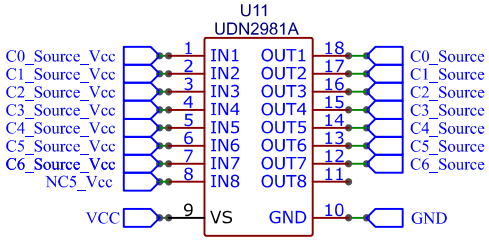


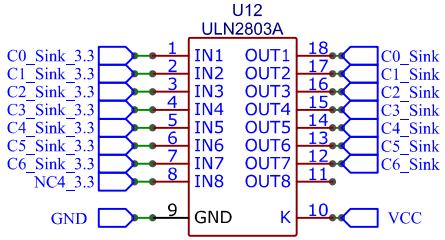
i2c1 address seelected by jumpers
Select 0x02 on main driver board



Open Collector Outputs
IN4148 Protection Diodes
Source_3.3 on at 0V.
Sink_3.3 on at 3.3V
When this occurs, diode pulls down sink

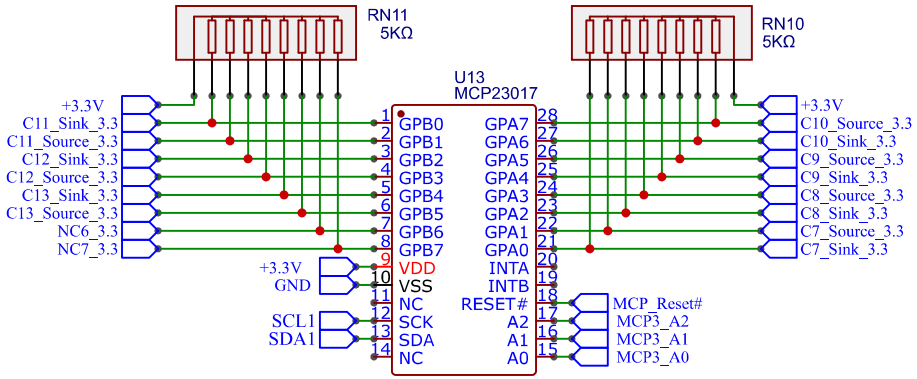




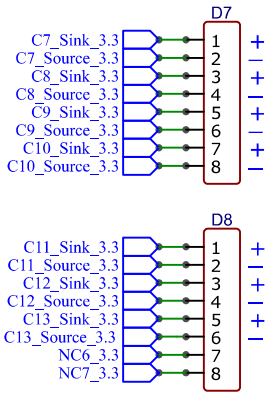


TITLE: Luminator 14 by 21 Display Driver V2		REV: 1.0
EasyEDA	Company: Your Company	Sheet: 5
	Date: 2024-04-17 Drawn By: jpwolfe31	

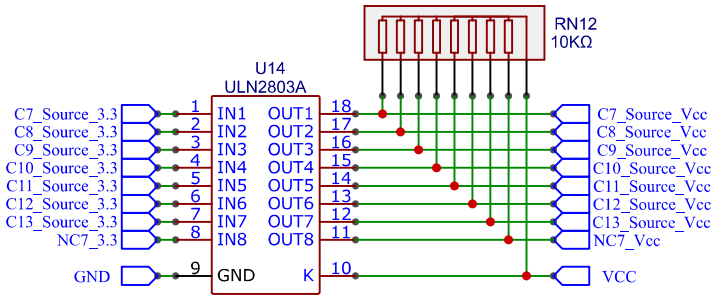
Column Drivers 2

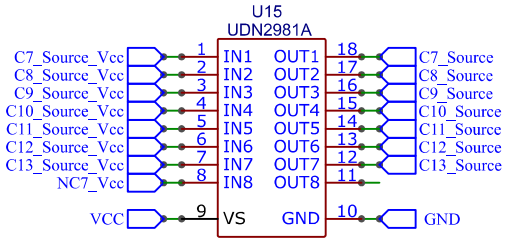


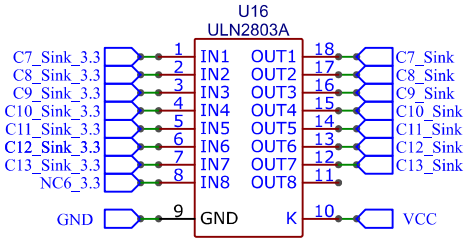
i2c1 address seelected by jumpers
Select 0x03 on main driver board



Open Collector Outputs
IN4148 Protection Diodes
Source_3.3 on at 0V.
Sink_3.3 on at 3.3V
When this occurs, diode pulls down sink

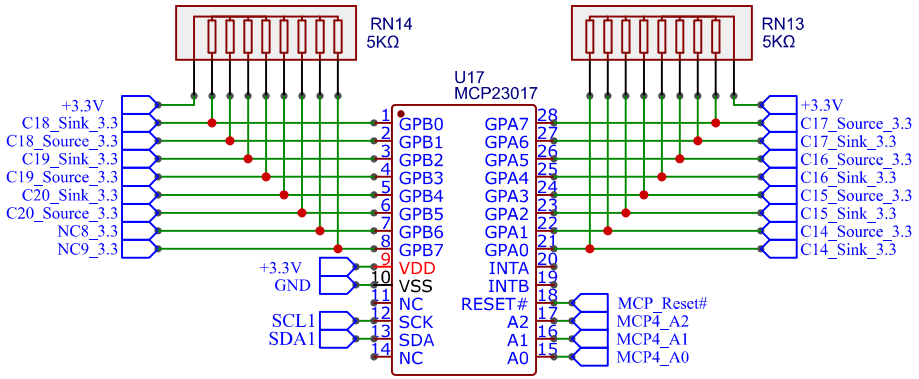




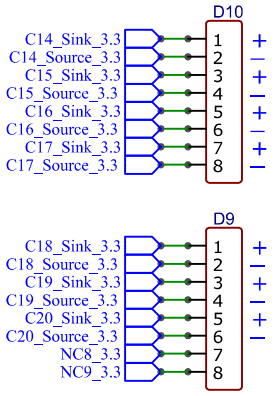


TITLE: Luminator 14 by 21 Display Driver V2		REV: 1.0
EasyEDA	Company: Your Company	Sheet: 6
	Date: 2024-04-17 Drawn By: jpwolfe31	

Column Drivers 3

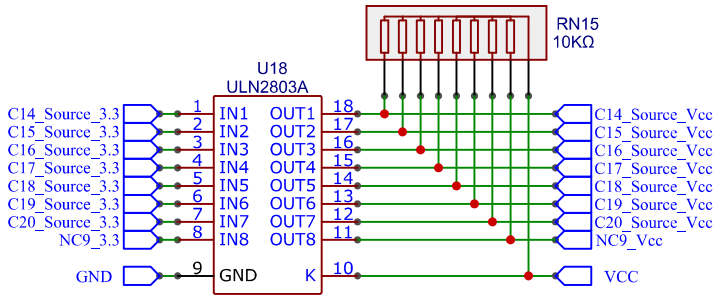


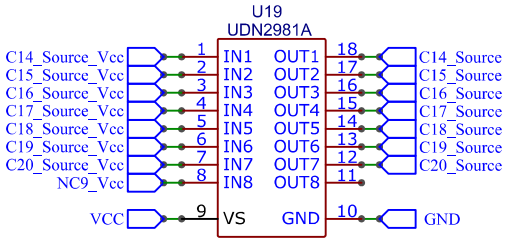
i2c1 address seelected by jumpers
Select 0x04 on main driver board

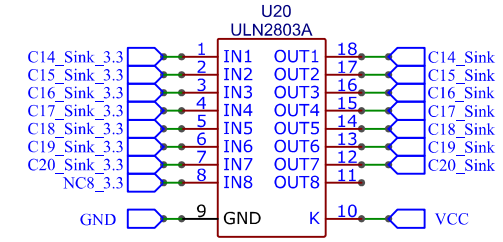


Open Collector Outputs
IN4148 Protection Diodes
Source_3.3 on at 0V.
Sink_3.3 on at 3.3V
When this occurs, diode pulls down sink

For secondary driver boards, use i2c2 addresses 00x00,
0x01, 0x02 for column drivers on first board and 0x03,
0x04, 0x05 for column drivers on one additional board







TITLE: Luminator 14 by 21 Display Driver V2		REV: 1.0
EasyEDA	Company: Your Company	Sheet: 7
	Date: 2024-04-17 Drawn By: jpwolfe31	