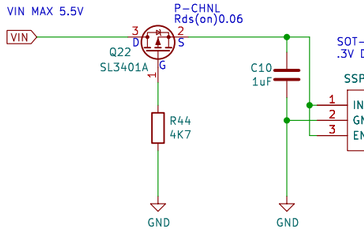
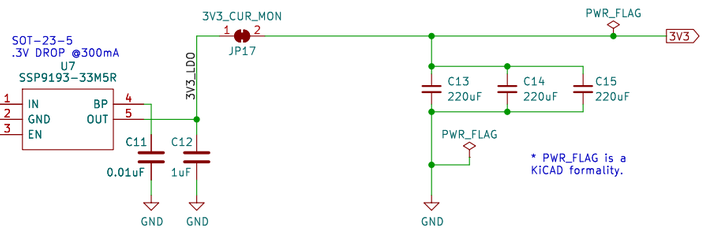
POWER SUPPLY: 5.5V MAX!!!

RPP REVERSE POLARITY PROTECTION



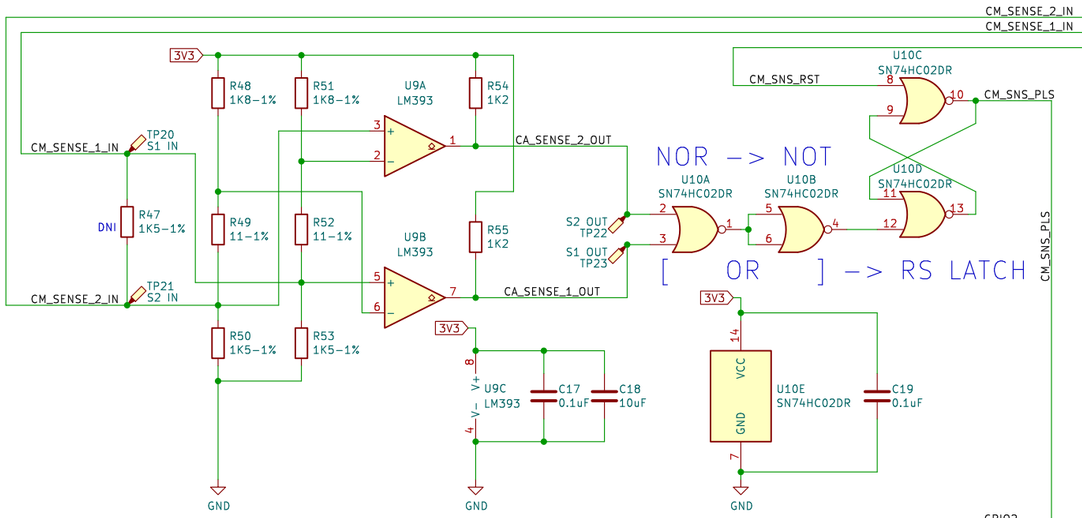
3V3 REGULATOR



CORE MATRIX POWER

CORE MATRIX SENSE

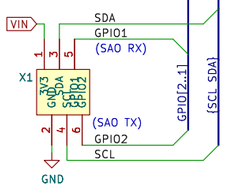
SENSE SIGNAL DIFFERENTIAL AMPLIFIERS



SENSE SIGNAL OUTPUT LATCH

SAO, I2C

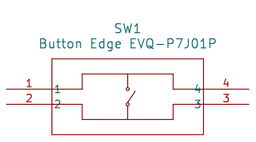
SAO #1 (IN/BOTTOM)



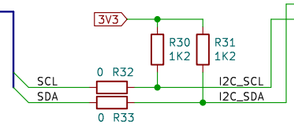
SAO_conn_SFH11-NBPC-D03-ST-BK

https://hackaday.io/project/175182-simple-add-ons-sao
using Sullins SFH11-NBPC-D03-ST-BK female header
https://www.digikey.com/product-detail/en/sullins-connector-solutions/SFH11-NBPC-D03-ST-BK/S9717-ND/4558818

5.5V MAX!!!



I2C BUFFER



I2C ADDRESS TABLE

All 7-bit addresses should be greater than 0x07 and less than 0x78 (120).

CORE4 USAGE:

CORE MATRIX IO EXP. MCP23017	0x27 (39)

CORE16/64/c USAGE:

AMBIENT LIGHT SENSOR	0x29 (47)
HALL SENSOR 1	0x30 (48)
HALL SENSOR 2	0x31 (49)
HALL SENSOR 3	0x32 (50)
HALL SENSOR 4	0x33 (51)
EEPROM (BOARD ID)	0x57 (87)
SAO OLED V2 EEPROM	0x58 (88)

OTHER:

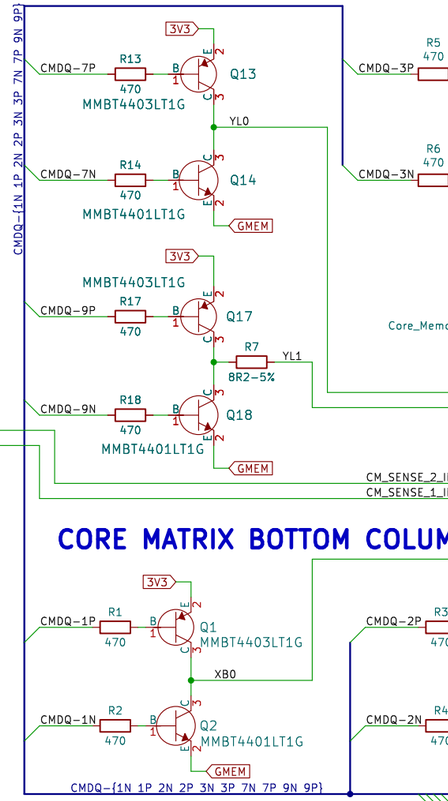
AMBIENT PROX. SENSOR	0x38 (56)
OLED	0x3C (60)
AND!XOR IO Exp. MCP23017	0x20 (32)
AND!XOR EEPROM AT24C32r	0x50 (80)
NFC CLICK PN7120	0x50-53

CORE MATRIX DRIVER

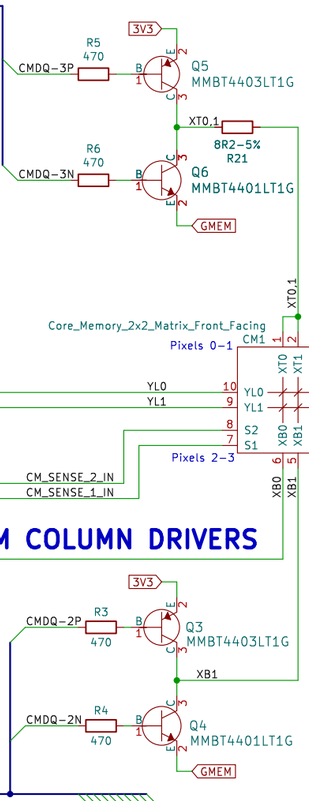
QxN (NPN) is normally low, high to activate matrix transistor.
QxP (PNP) is normally high, low to activate matrix transistor.

Drive Transistor
Current: 3.3/470=7mA

CORE MATRIX ROW DRIVERS



CORE MATRIX TOP COLUMN DRIVERS



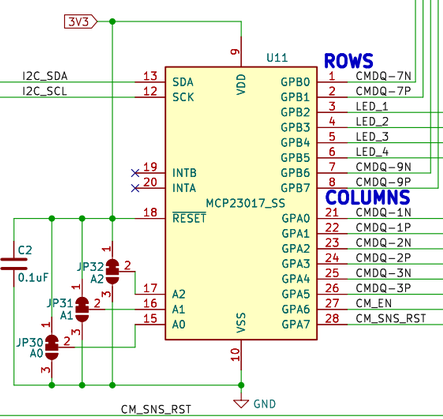
CORE MATRIX

CORE MATRIX BOTTOM COLUMN DRIVERS

Write Drive Sequence (with sense read always along for the ride):
ROW Port: Set ROW transistor left.
COL Port: Set CM_EN LOW, CM_SNS_RST HIGH, transistor up/down.
COL Port: Set CM_EN HIGH, CM_SNS_RST LOW.
DELAY as needed
GPIO 1 (or COL Port B2): Read CM_SNS_PLS and store to SENSE data
COL Port: Set CM_EN CM_EN LOW

GPIO EXPANDER

Learn about I2C GPIO Expanders here:
https://learn.adafruit.com/adafruit-mcp23017-i2c-gpio-expander
7 Address bits: 010 0[A2-A1-A0]
HEX 0x20 to 0x27 (default 27)
DEC 32 to 39 (default 39)



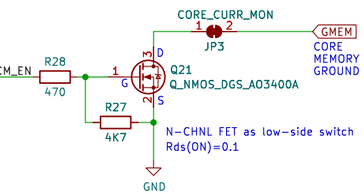
ROWS

1	CMDQ-7N
2	CMDQ-7P
3	LED_1
4	LED_2
5	LED_3
6	LED_4
7	CMDQ-9N
8	CMDQ-9P

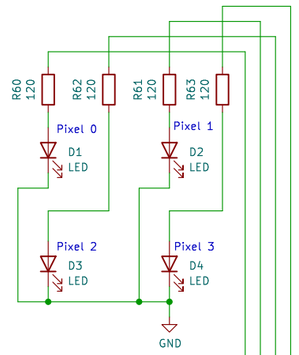
COLUMNS

21	CMDQ-1N
22	CMDQ-1P
23	CMDQ-2N
24	CMDQ-2P
25	CMDQ-3N
26	CMDQ-3P
27	CM_EN
28	CM_SNS_RST

CORE MATRIX ENABLE



LED ARRAY



TODO: Shift LED connections up 2 pins, tying B3/4 to 7N/7P. The order will look cleaner, and LED pixel numbering will match GPB numbers.

L2
Core4 Logo w/symbol Machine Ideas Logo

All non-polarized capacitors are X7R or X5R ceramic unless otherwise noted.

Visit www.Core64.io for information on assembly and optional features.

Concept and design by Andy Geppert @ www.MachineIdeas.com

Sheet: /
File: SAO_Core4.kicad_sch

Title: SAO Core4

Size: B	Date: 2024-08-31	**Rev: 0.2**
KiCad E.D.A. 8.0.4		Id: 1/1

WIP