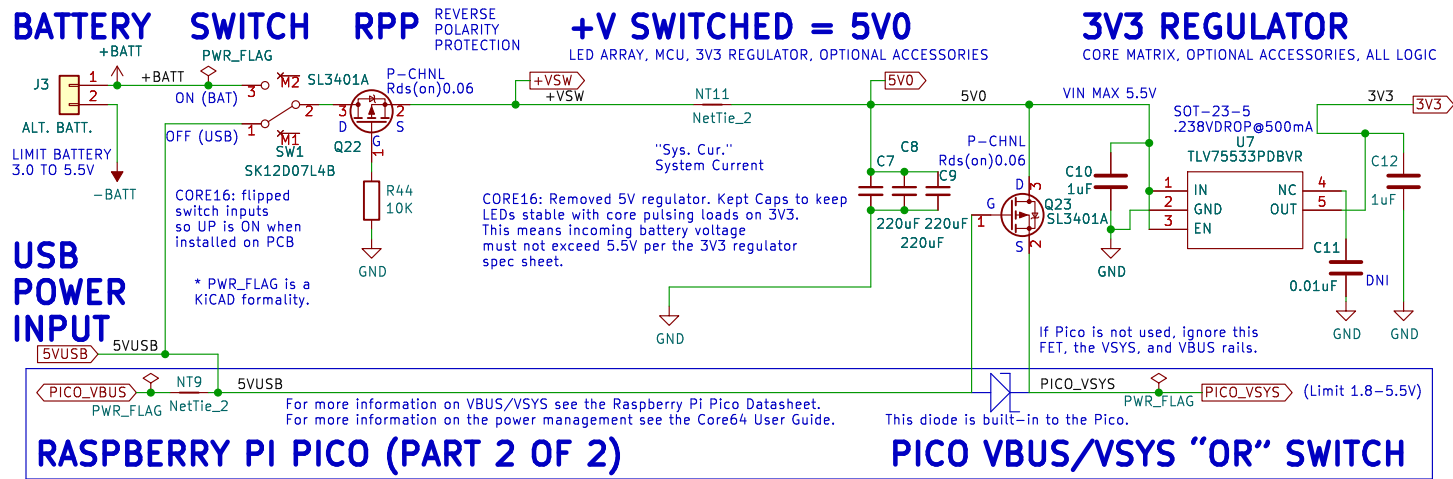


# POWER SUPPLY



## POWER FLOW MORE DETAIL IN CORE64 USER GUIDE

**PRIMARY SWITCHED POWER SOURCES:**  
ON (BAT) : From battery on LED Array Board  
OFF (USB) : From USB port on Pico

**ALTERNATE/OPTIONAL SWITCHED POWER SOURCES:**  
ON (BAT) : From battery on Logic Board  
OFF (USB) : From USB port of iPa Charger on LED Array Board  
Requires closing USB Charge Enable solder jumper on the back of the LED Array Board. \*

**TWO POWER INPUT SOURCES SELECTED BY SPDT SWITCH.**

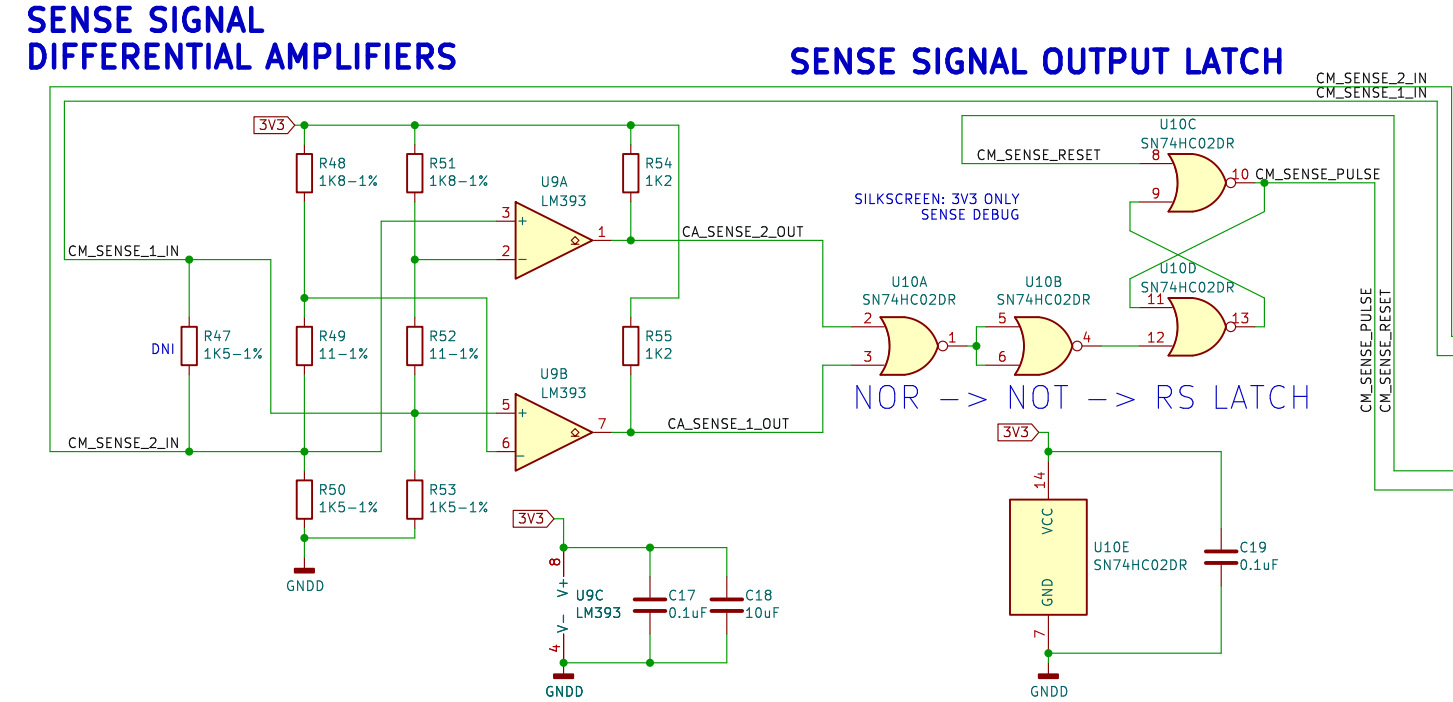
Power Switch ON (BAT), USB cable is NOT connected:  
P-FET (gate is low) conducts 5V0 (or less if the battery is less than about 5.2V) so that PICO\_SYS is powered.  
PICO\_VBUS is not energized because of built-in Zener diode on the Pico.

Power Switch OFF (USB), USB cable is NOT connected:  
System is off and does not receive power from the battery.

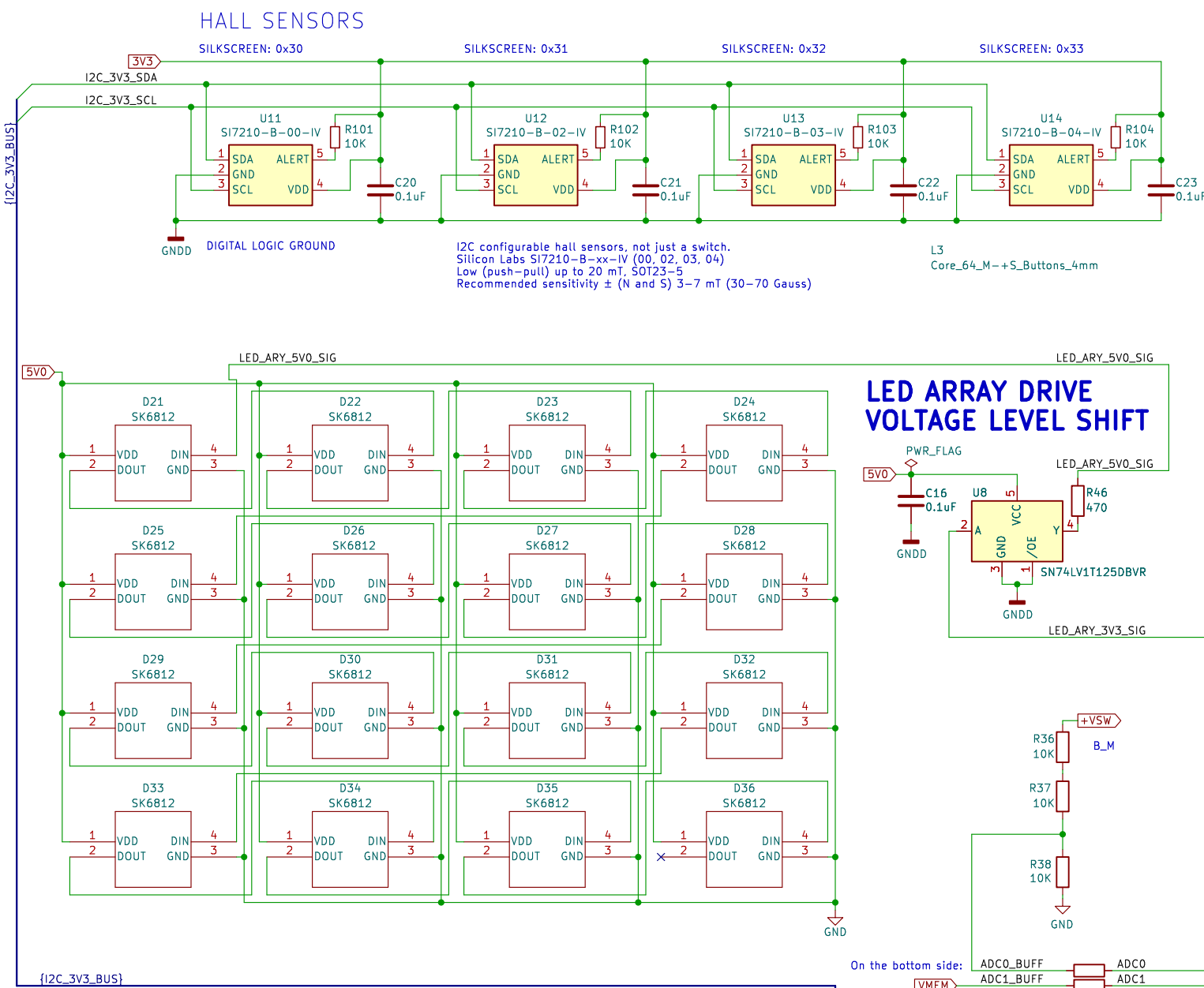
Power Switch ON (BAT), USB cable IS connected:  
If USB voltage is greater than 5V0, the Pico will operate with VSYS at the USB voltage. The rest of the system will operate from whatever the 5V0 rail voltage is.  
If USB voltage is less than 5V0, the Pico will operate with VSYS at 5V0 along with the rest of the system. The Pico diode prevents current flow from 5V0 back out through USB.

Power Switch OFF (USB), USB cable IS connected:  
The USB voltage will be greater than 5V0 (because there is a voltage drop through the 5V0 regulator). The P-FET will be off, the Pico will run at the USB voltage, the rest of the system will run at slightly less than the USB voltage.

# CORE MATRIX SENSE



# RGB LED MATRIX AND HALL SENSOR BUTTONS



# HACKER PLAYGROUND

USER-PROVIDED OPTIONAL ADD-ONS  
SEE CORE64 HACKER GUIDE

## OLED MONOCHROME I2C

Connect via SA0.  
Generic 0.96" (128x64) or 1.5" (128x128)  
I2C 4-pins, often ADDRESS: 0x3C (60 decimal)  
Alternate is 0x3D, not 0x7A or 0x78 (wrong 8-bit!)

## SAO #1 SIMPLE ADD-ONS

SAO#2 is on the Core Board  
3V3 ONLY I2C\_3V3\_SDA  
GPIO1\_SA01  
GPIO2\_SA02  
I2C\_3V3\_SCL

<https://hackaday.io/project/175182-simple-add-ons-sao>  
using Sullins SFH11-NBPC-D03-ST-BK female header.  
Sullins SFH11-NBPC-D03-ST-BK/S9717-ND/4558818

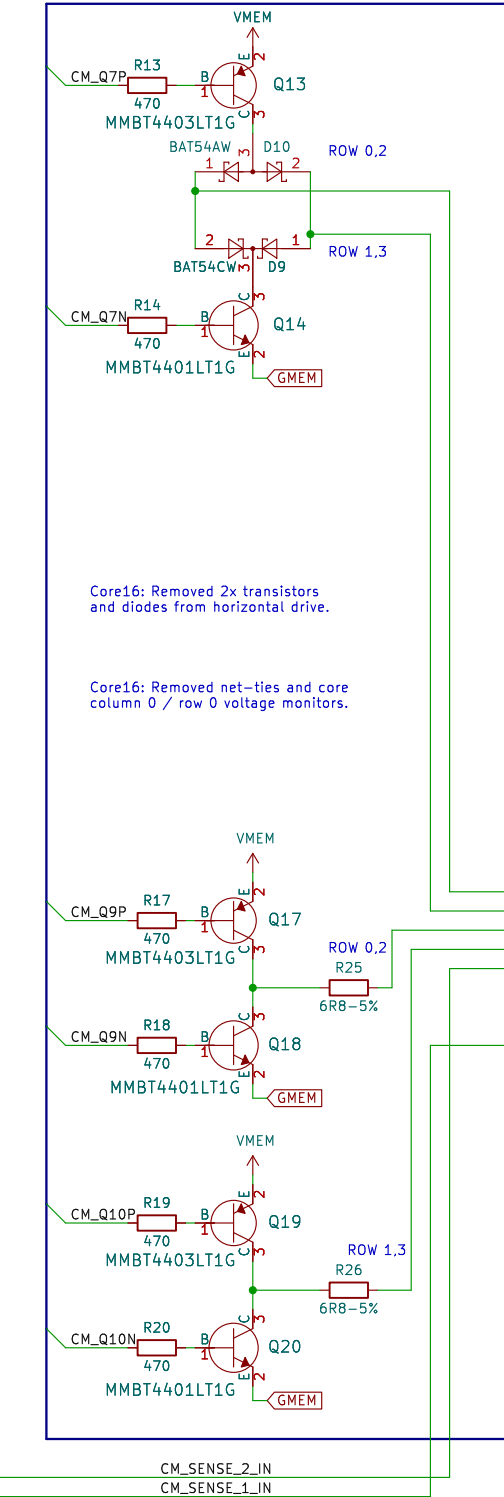
## QWII I2C

3V3 ONLY  
I2C\_3V3\_SCL  
I2C\_3V3\_SDA  
GPIO1\_SA01  
GPIO2\_SA02  
I2C\_3V3\_SCL

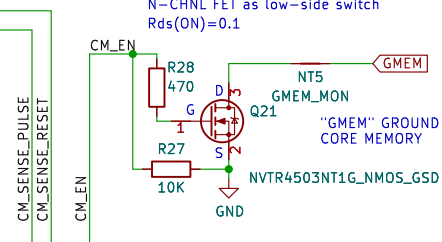
**I2C ADDRESS TABLE**

OPTIONAL:	0x38 (56)
AMBIENT PROX. SENSOR	0x3C (60)
OLED	0x20 (32)
ANDIXOR Exp. MCP23017	0x50 (80)
ANDIXOR EEPROM AT24C32	0x50-53
NFC CLICK PN7120	

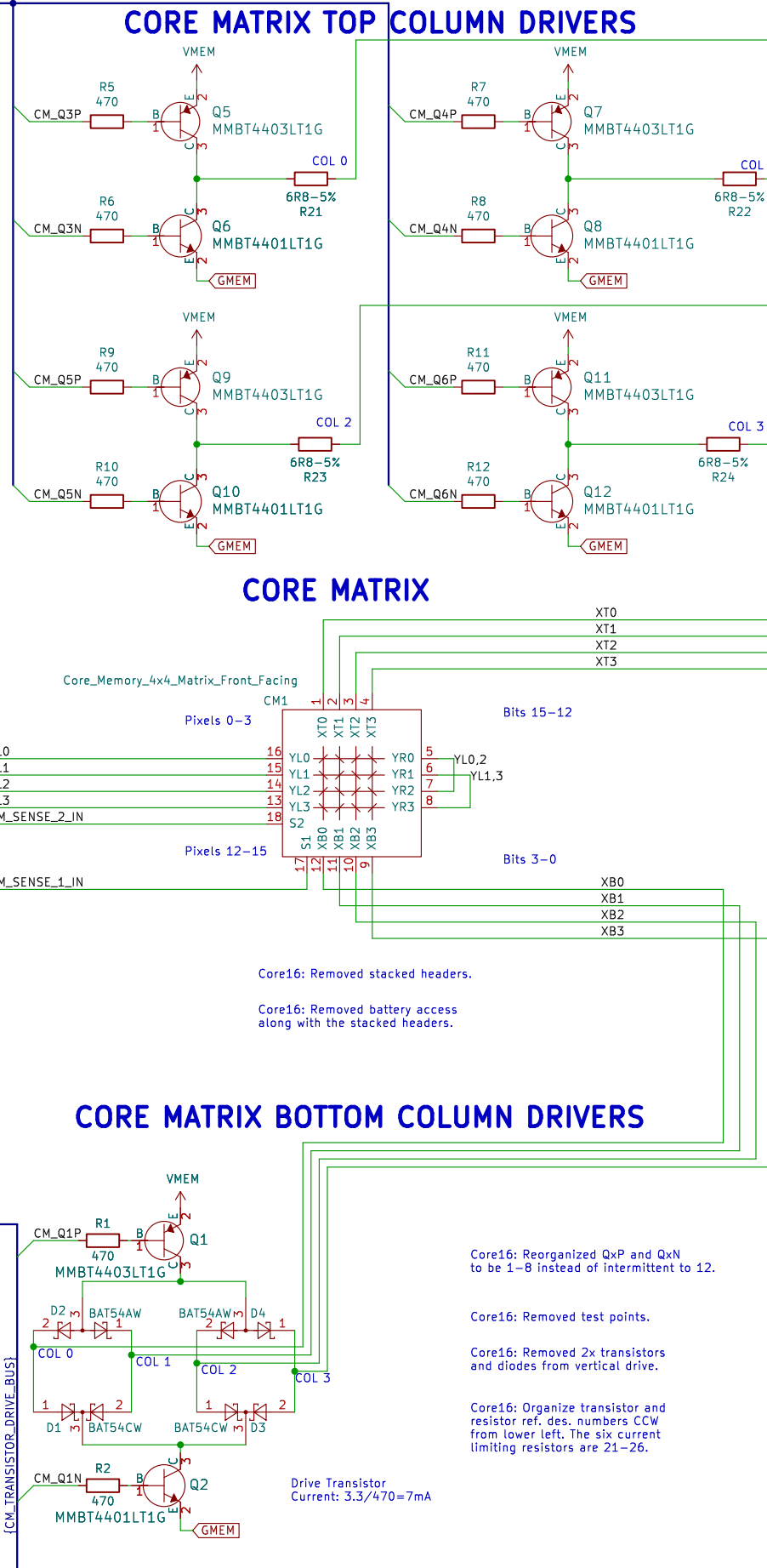
# CORE MATRIX ROW DRIVERS



## CORE MATRIX ENABLE



# CORE MATRIX DRIVER

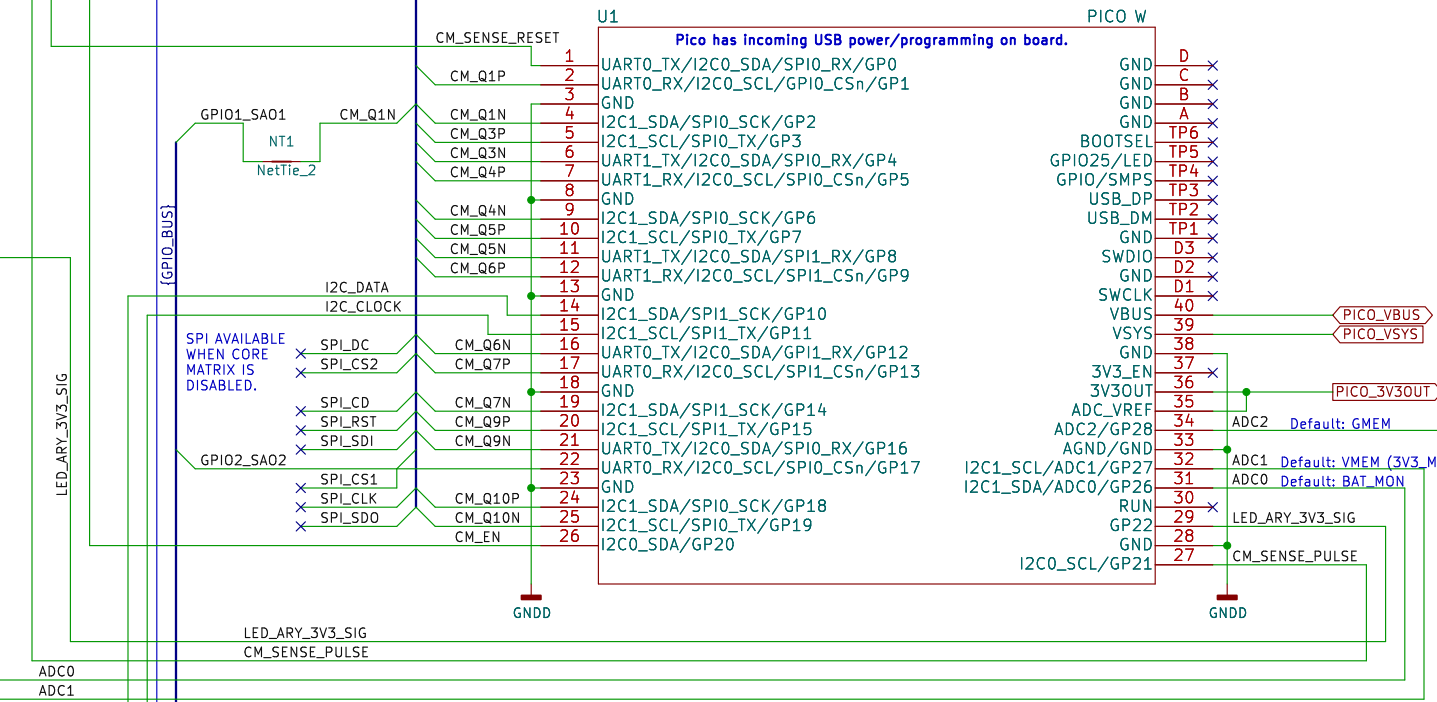


# PICO MICROCONTROLLER RASPBERRY PI PICO (PART 1 OF 2)

See Core64 User Manual for more detail on Pico and optional Pico W.

RP2040 PINS RESERVED FOR USE ON PICO BOARD:  
GPIO29 : Input, used in ADC mode (ADC3) to measure VSYS/3 (approx. 5/3=1.667)  
GPIO25 : Output, user LED built-in to Pico  
GPIO24 : Input, VBUS sense - high if VBUS is present, else low  
GPIO23 : Output, controls the on-board SMP5 Power Save pin

PICO\_3V3OUT is only used for ADC\_VREF. Current is limited to 300 mA. Be careful if you use this.



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

Visit [www.Core64.io](http://www.Core64.io) for information on assembly and optional features.

Please read the Core64 User Guide for more details.

Concept and design by Andy Geppert @ [www.MachineIdeas.com](http://www.MachineIdeas.com)

Sheet: /

File: Core16\_LB.kicad\_sch

Title: Core16 Logic Board

Size: C Date: 2023-09-16

KiCad E.D.A. kicad (7.0.0-0)

Rev: 0.2

Id: 1/1