LED MATRIX

Matrix of WS2813 LEDs (D1–D64) arranged in an 8×8 grid with 0.1uF decoupling capacitors C1–C8.

Row 1: D1, D2, D3, D4, D5, D6, D7, D8 (WS2813) — C1 0.1uF
Row 2: D9, D10, D11, D12, D13, D14, D15, D16 (WS2813) — C2 0.1uF
Row 3: D17, D18, D19, D20, D21, D22, D23, D24 (WS2813) — C3 0.1uF
Row 4: D25, D26, D27, D28, D29, D30, D31, D32 (WS2813) — C4 0.1uF
Row 5: D33, D34, D35, D36, D37, D38, D39, D40 (WS2813) — C5 0.1uF
Row 6: D41, D42, D43, D44, D45, D46, D47, D48 (WS2813) — C6 0.1uF
Row 7: D49, D50, D51, D52, D53, D54, D55, D56 (WS2813) — C7 0.1uF
Row 8: D57, D58, D59, D60, D61, D62, D63, D64 (WS2813) — C8 0.1uF

Signals: LED_MATRIX_5V0_SIG, 5V0, GND
Row chaining: R1DO, R1DIN, R2DO, R2DIN, R3DO, R3DIN, R4DO, R4DIN, R5DO, R5DIN, R6DO, R6DIN, R7DO, R7DIN

SILKSCREEN MISC.

SILKSCREEN F/B:
L: LSIG, USER
L: SCL, SDA, 3V3, GNDD
L: N/C, N/C
R: 5V0, GND
R: +BATT, 5VUSB

CORE64 LED MATRIX (LM)   V[version]
Project information at www.Core64.io   [Design Release Date]
Designed by Andy Geppert at www.MachineIdeas.com
WS2813 LEDs

L1
Core_64_Logo_9mm_tall

J2 / PASS THROUGH BOARD
J1 / PASS THROUGH BOARD
POWER GROUND
5V0, GND
LED_MATRIX_5V0_SIG
I2C_CLOCK, I2C_DATA, 3V3, GNDD
5VUSB, +BATT

SILKSCREEN:
Pixel 0–7 –>   <–bit 63–56
SILKSCREEN:
Pixel 56–63–>   <–bit 7–0

All capacitors ceramic X7R unless otherwise noted.

*** Work in progress ***
Visit www.Core64.io for information on assembly and optional features.
Concept and design by Andy Geppert @ www.MachineIdeas.com

Sheet: /
File: Core64 LM v0.1.sch

Sheet: LED MATRIX EXPANSION
File: Core64 LM v0.1 Expansion.sch

Title: Core64 LM (LED MATRIX)

Size: A	Date: 2021-02-17	**Rev: 0.1**
KiCad E.D.A. kicad (5.1.2-1)-1		Id: 1/2

EVERYTHING ON THIS SHEET IS USER-PROVIDED OPTIONAL ADD-ONS

OLED MONOCHROME I2C

0.96" (128x64)
I2C 4-pins, ADDRESS: 0x3C (60 decimal)
Alternate is 0x3D, not 0x7A or 0x78 (wrong 8-bit)!
Must choose power polarity by soldering SJs.

I2C_DATA
I2C_CLOCK

3V3
JP1

JP2

XLM2
Conn_01x04_Male
4-pin 0.1" header

GNDD

SILKSCREEN: 3V3 ONLY, 3V3/GNDD sides of jumpers,
I2C OLED and pin names

QWIIC I2C

XLM3
QWIIC

4 I2C_CLOCK
3 I2C_DATA
2 3V3
1

GNDD

SILKSCREEN: 3V3 ONLY
QWIIC I2C and pin names
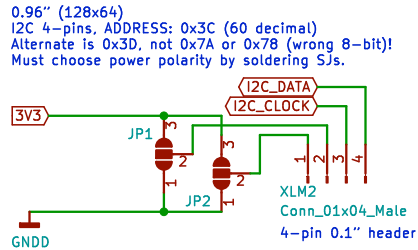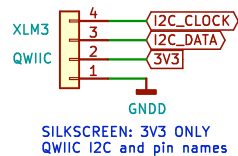
ALTERNATE 1S LIPO BATTERY – USER SUPPLIED

* Do not connect AAAs to a LiPo charger! You will destroy it.

1) Remove the 4x "AAA" battery pack.

2) Purchase and install a LiPo charge manager.
   a) The logic board is designed to accept this one: https://www.adafruit.com/product/1904 (Micro USB) or 4410 (USB C).
   b) Solder the the charge manager directly to the board without headers to keep a low profile.

3) Purchase and install a 1S LiPo using double-sided tape.
   a) Choose a 1S LiPo with built-in cell over/under voltage protection. Recommended:
      2500mAh https://www.adafruit.com/product/328   1.8" x 2.4" x 0.26" (47mm x 61mm x 6.7mm)
      2000mAh https://www.adafruit.com/product/2011   2.4" x 1.4" x 0.3" (60mm x 36mm x 7mm)
      1200mAh https://www.adafruit.com/product/258   1.3" x 2.4" x 0.2" (34mm x 62mm x 5mm)
   b) The LiPo can be up to 50 x 65 x 15mm.
   a) Make sure no part of the LiPo foil pouch can short-out adjacent pins or pads in the area. Insulate it with Kapton tape or similar.

Configuration of the Teensy_Charge_Enable Solder Jumper (SJ):
A) DEFAULT SJ OPEN:
    If you do NOT want the system to be powered from the USB port of the charger, leave the Teensy_Charge_Enable SJ open.
    Connecting a USB cable to the LiPo charger will ONLY charge the battery and power the system when the power switch is ON (up position).
    Connecting a USB cable to the Teensy will NOT charge the battery.
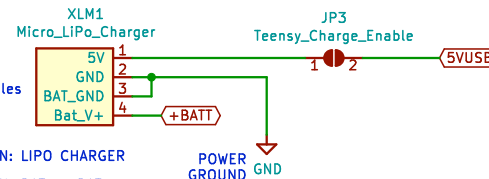
B) OPTIONAL SJ CLOSED:
    The LiPo charger 5V pin (Lipo Charger USB port) may be connected to the Teensy USB port through TEENSY_VUSB. Close the SJ to connect them.
    Connecting a USB cable to the LiPo charger will charge the battery and power the system
    Connecting a USB cable to the Teensy will power the Core64 board, charge the battery and connect to the serial port of the Teensy.

LIPO BATTERY CONNECTION AND USB CHARGER

SILKSCREEN:
1S ONLY
ADAFRUIT #1904 MICRO USB
ADAFRUIT #4410 USB C

Mounting
4x 0.1" holes

XLM1
Micro_LiPo_Charger
1 5V
2 GND
3 BAT_GND
4 Bat_V+   +BATT

JP3
Teensy_Charge_Enable
1   2   5VUSB

POWER
GROUND GND

SILKSCREEN: LIPO CHARGER

SILKSCREEN: BAT. + BAT. –

SILKSCREEN: +/– pins

1S LIPO ONLY !!!

ALTERNATE PIMORONI UNICORN HAT LED MATRIX

5V0
LED_MATRIX_5V0_SIG

3 XLM4
2 Conn_01x03_Male
1

GND

SILKSCREEN F/B:
5V0, LSIG, GND

All capacitors ceramic X7R unless otherwise noted.

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