PWR_FLAG +5V PWR_FLAG +3V3 PWR_FLAG

GND

SPI Flash

+3V3

C3
100nF

GND

R2
10k

U1
W25Q16JVUXIQ

R1
1k

QSPI_SS

QSPI_SCLK

GND BOOTSEL
TP6 TP5

CS
CLK
GND
EP

VCC
DI(IO0)
DO(IO1)
IO2
IO3

QSPI_SD0
QSPI_SD1
QSPI_SD2
QSPI_SD3

GND

GND

SWD Debug

+3V3

2.54mm pitch

TP1 SWCLK
TP2 SWD
TP3
TP4

GND

Crystal

C1 22pF

Y1
12.000MHz

XIN

C2 22pF

R3 1k

XOUT

GND

+1V1

C4   C5
100nF   100nF

GND

C6
1uF

GND

Make sure C6 is close to pin 45 of RP2040

+3V3

C7   C9   C10   C11   C12   C13   C14
100nF 100nF 100nF 100nF 100nF 100nF 100nF

GND

C8
1uF   Make sure C8 is close to pin 44 of RP2040

GND

R5
27

R6
27

USB_DP

USB_DN

Make sure R6 and R7 are close to RP2040

U2

Raspberry Pi
RP2040

DVDD
DVDD
VREG_VOUT
VREG_IN
IOVDD
IOVDD
IOVDD
IOVDD
IOVDD
IOVDD
USB_VDD
ADC_AVDD

USB_DP
USB_DM

QSPI_SS
QSPI_SD0
QSPI_SD1
QSPI_SD2
QSPI_SD3
QSPI_SCLK

GPIO0
GPIO1
GPIO2
GPIO3
GPIO4
GPIO5
GPIO6
GPIO7
GPIO8
GPIO9
GPIO10
GPIO11
GPIO12
GPIO13
GPIO14
GPIO15
GPIO16
GPIO17
GPIO18
GPIO19
GPIO20
GPIO21
GPIO22
GPIO23
GPIO24
GPIO25

SLEEP

NEOPIXEL

XIN
XOUT

XIN
XOUT

+3V3

R4
10k

RUN

RUN

SW2
SW_Push

GND

SWCLK
SWD

SWCLK
SWD

RP2040 supposedly has an internal
50k pull-up on RUN, but it's not
documented. Adding a pull-up to
be safe

TESTEN GND

GND   GND

GPIO26_ADC0
GPIO27_ADC1
GPIO28_ADC2
GPIO29_ADC3

I2C1_SDA
I2C1_SCL

SDB

+3V3

R8 R10
2k 2k

R9
100k

C19
100nF

GND

Driver

I2C1_SDA
I2C1_SCL
NEOPIXEL
SDB

SDA
SCL
NEOPIXEL
SDB

File: Driver.kicad_sch

+5V +3V3

D1 D_TVS
D2 D_TVS
D3 D_TVS
USB_DP
D4 D_TVS
USB_DN
D5 D_TVS
SLEEP

GND

+3V3   +5V

C16   C15
10uF   10uF

GND   GND

+5V   +3V3

H1
24929

H2
24929

H3
MountingHole

H4
MountingHole

H5
Tooling Hole

H6
Tooling Hole

H7
Tooling Hole GND

H8
Tooling Hole

BOARD_ID
SLEEP

R7 180k

GND

J1
Conn_02x04_Odd_Even

USB_DP
USB_DN

+3V3

C17
1uF

C18
100nF

GND

U3
IS31FL3729-QFLS4-TR

PVCC   23

SDA   26   SDA
SCL   27   SCL

SDB   29   SDB

SW1   22   LED_SW0
SW2   21   LED_SW1
SW3   20   LED_SW2
SW4   19   LED_SW3
SW5   18   LED_SW4
SW6   17   LED_SW5
SW7   16   LED_SW6
SW8   15   LED_SW7
SW9/CS16   14   LED_SW8

LED_SW[0..8]

CS1   30   CS0
CS2   31   CS1
CS3   32   CS2
CS4   1   CS3
CS5   2   CS4
CS6   3   CS5
CS7   4   CS6
CS8   5   CS7
CS9   6   ✕
CS10   7   ✕
CS11   8   ✕
CS12   10   ✕
CS13   11   ✕
CS14   12   ✕
CS15   13   ✕

ISET   25   ISET
ADDR   28   ADDR

R12
33k

GND

GND   9
GND   24
GND   33

GND

Datasheet says the series resistors on CSx aren't
necessary if single-color LEDs are run from
3.3V -- and we're short on space, so let's
do exactly that!

Matrix

CS[0..32]

LED_SW[0..8]
LED_CS[0..32]

NEOPIXEL   NEOPIXEL

File: Matrix.kicad_sch

Sheet: /Driver/
File: Driver.kicad_sch
Title: LED Matrix Input Module — LED Driver
Size: A4   Date: 2022-12-18   Rev:
KiCad E.D.A. 8.0.3   Id: 2/3

LED_SW[0..8]

LED_SW0
LED_SW1
LED_SW2
LED_SW3
LED_SW4
LED_SW5
LED_SW6
LED_SW7
LED_SW8

U4
VDMR10A1

LED_CS0
LED_CS1
LED_CS2
LED_CS3
LED_CS4
LED_CS5
LED_CS6
LED_CS7
LED_SW0

U5
VDMR10A1

LED_CS0
LED_CS1
LED_CS2
LED_CS3
LED_CS4
LED_CS5
LED_CS6
LED_CS7
LED_SW1

U6
VDMR10A1

LED_CS0
LED_CS1
LED_CS2
LED_CS3
LED_CS4
LED_CS5
LED_CS6
LED_CS7
LED_SW2

U7
VDMR10A1

LED_CS0
LED_CS1
LED_CS2
LED_CS3
LED_CS4
LED_CS5
LED_CS6
LED_CS7
LED_SW3

U8
VDMR10A1

LED_CS0
LED_CS1
LED_CS2
LED_CS3
LED_CS4
LED_CS5
LED_CS6
LED_CS7
LED_SW4

U9
VDMR10A1

LED_CS0
LED_CS1
LED_CS2
LED_CS3
LED_CS4
LED_CS5
LED_CS6
LED_CS7
LED_SW5

U10
VDMR10A1

LED_CS0
LED_CS1
LED_CS2
LED_CS3
LED_CS4
LED_CS5
LED_CS6
LED_CS7
LED_SW6

U11
VDMR10A1

LED_CS0
LED_CS1
LED_CS2
LED_CS3
LED_CS4
LED_CS5
LED_CS6
LED_CS7
LED_SW7

U12
VDMR10A1

LED_CS0
LED_CS1
LED_CS2
LED_CS3
LED_CS4
LED_CS5
LED_CS6
LED_CS7
LED_SW8

LED_CS0
LED_CS1
LED_CS2
LED_CS3
LED_CS4
LED_CS5
LED_CS6
LED_CS7

LED_CS[0..32]

NEOPIXELD

+5V

D6
WS2812B-4020
DIN VDD DO VSS

D7
WS2812B-4020
DIN VDD DO VSS

D8
WS2812B-4020
DIN VDD DO VSS

D9
WS2812B-4020
DIN VDD DO VSS

D10
WS2812B-4020
DIN VDD DO VSS

C20
100nF

C21
100nF

C22
100nF

GND

Framework Computer Inc
Sheet: /Driver/Matrix/
File: Matrix.kicad_sch
Title: LED Matrix Input Module – Matrix
Size: A2   Date: 2022-12-18   Rev:
KiCad E.D.A. 8.0.3   Id: 3/3