

RP2350-PICO2-XXL

User Manual

Document 2.0 April 2025

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Introduction to RP2350-PICO2-XXL

[RP2350-PICO2-XXL](#) is a re-design of the popular “Raspberry Pi Pico 2” board with these improvements:

- All 48 RP2350 GPIOs exposed to the user
- USB-C connector for data and powering – it allows more current to be used by the board
- DCDC power supply voltage regulator 3.3V 2A (3A peak)
- 2MB or 16MB flash memory versions (-XL and -XXL variants)
- Extra 8MB PSRAM in the -XXL variant
- Micro SD card connector in the -XXL variant
- RESET button
- Four-layer board for better noise immunity and USB differential pair routing
- UEXT connector (pUEXT 1.0 mm step connector)
- Qwiic/Stemma connector
- Dimensions: (50 x 28)mm ~ (1.97 x 1.10)"

Notice

Both [RP2350-PICO2-XL](#) and [RP2350-PICO2-XXL](#) share the same PCB and silkscreen, despite that despite that only RP2350-PICO2-XXL! The only difference between variants are that in the -XL variant the PSRAM and the micro SD card (both on bottom side of the PCB) are not populated. Also the flash memory in the -XL variant is only 2MB.

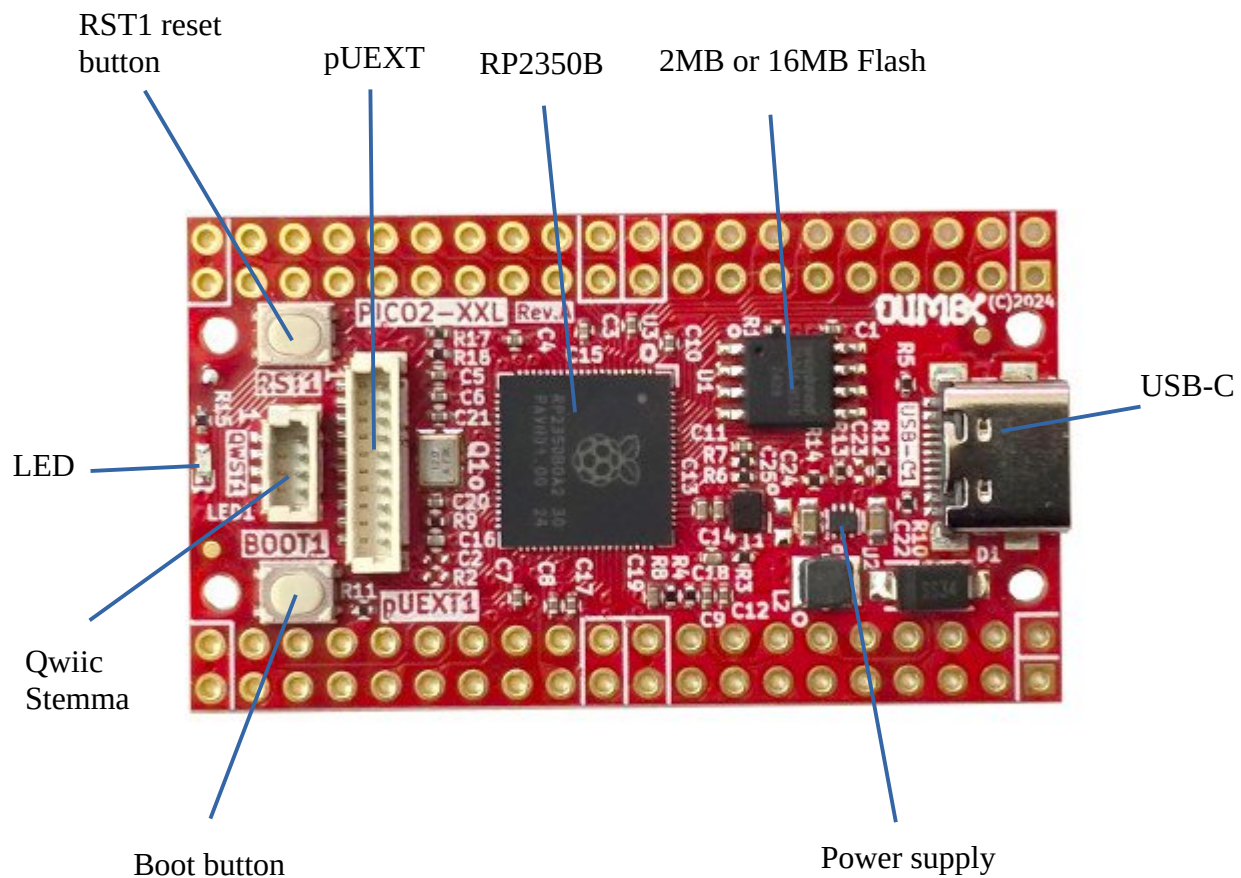
Order codes for RP2350-PICO2-XXL and accessories

<u>RP2350-PICO2-XL</u>	industrial grade RP2350-PICO2 board with 48 GPIOs exposed
<u>RP2350-PICO2-XXL</u>	includes everything in XL, bigger flash, and extra 8MB PSRAM, and extra microSD card
<u>USB-CABLE-AM-USB3-C</u>	high quality USB 3.0 cable with type C connector for power and programming
<u>pUEXT pack of cables</u>	pack of 3pcs 200mm pUEXT cables
<u>UEXT-MPQ</u>	converter board from pUEXT to UEXT
<u>UEXT-PQ</u>	another converter board from pUEXT

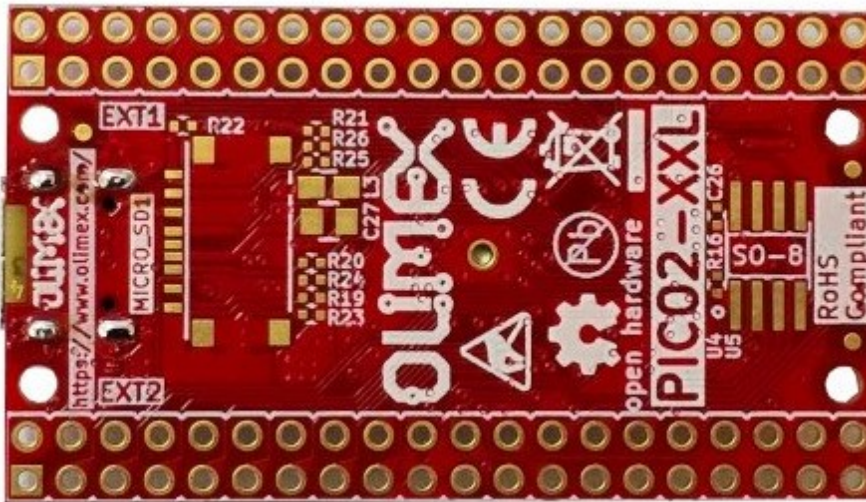
HARDWARE

RP2350-PICO2-XXL layout

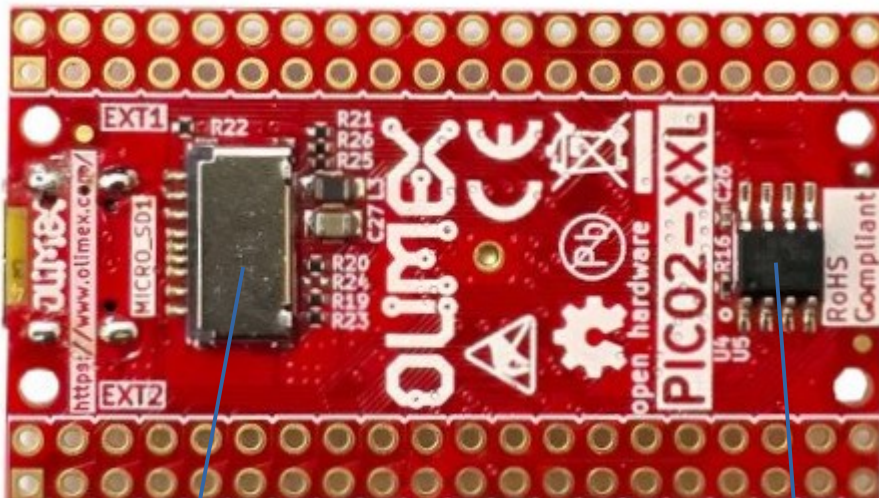
Top view for both -XL and -XXL



Bottom view for -XL variant:



Bottom view for -XXL variant:

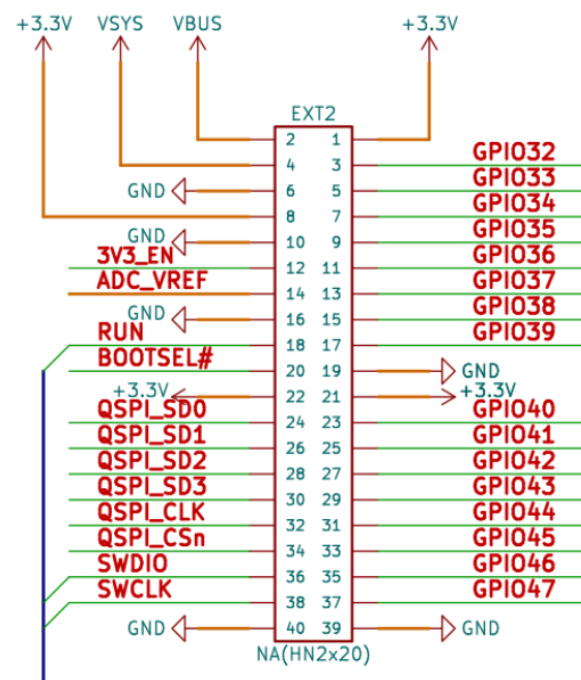
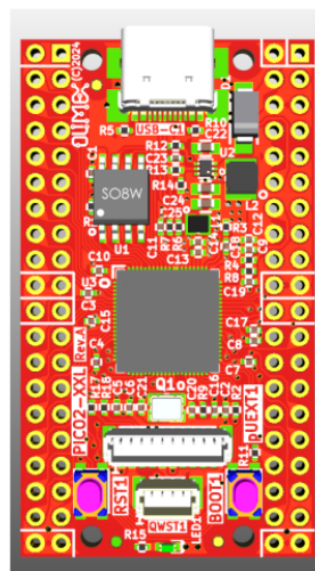
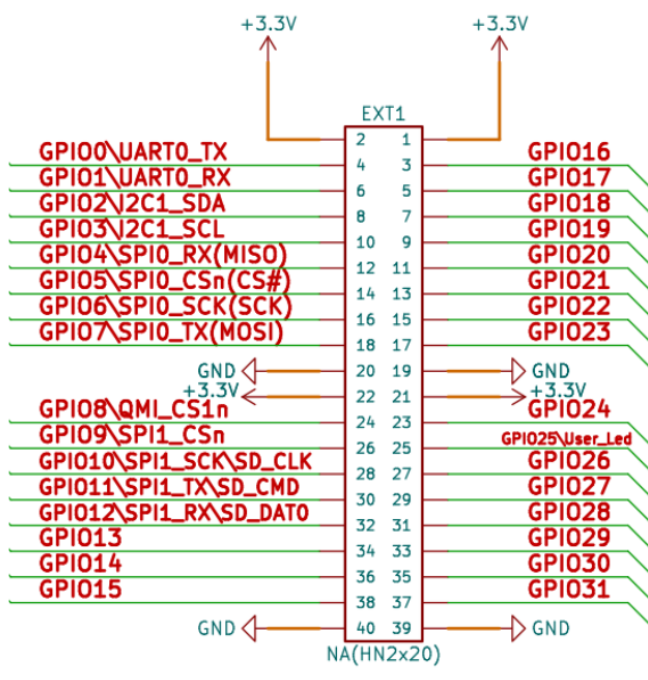


Micro SD card

8MB PSRAM

RP2350-PICO2-XXL GPIOs

EXTENSIONS



POWER SUPPLY:

VBUS +5V from, USB-C output

VDD_SYS +5V may be output or input

if you want to use as input i.e. to feed power from external 5V to this line make sure board is not connected to USB!

when you use as output i.e. you feed external electronics from it up to 1A @ 5V

+3.3V output which can source up to 2A @ 3.3V

3V3_EN input, when pulled to GND stops the 3.3V DCDC convertor

RP2350-PICO2-XXL schematics

[RP2350-PICO2-XXL](#) schematics can be found at [GitHub](#):

<https://github.com/OLIMEX/RP2350-PICO2-XXL/tree/main/HARDWARE>

UEXT connector

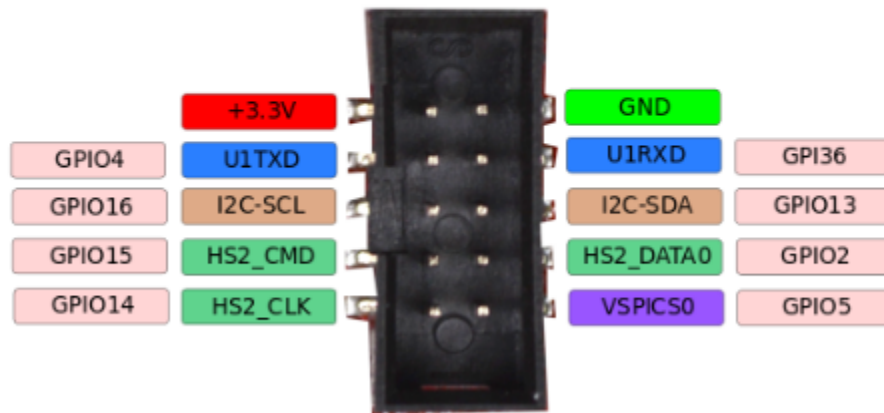
UEXT connector stands for Universal EXTension connector and contain +3.3V, GND, I2C, SPI, UART signals.

UEXT connector can be in different shapes.

The original UEXT connector is 0.1" 2.54mm step boxed plastic connector. All signals are with 3.3V levels.

UEXT connector

note it share same pins with EXT1 and EXT2

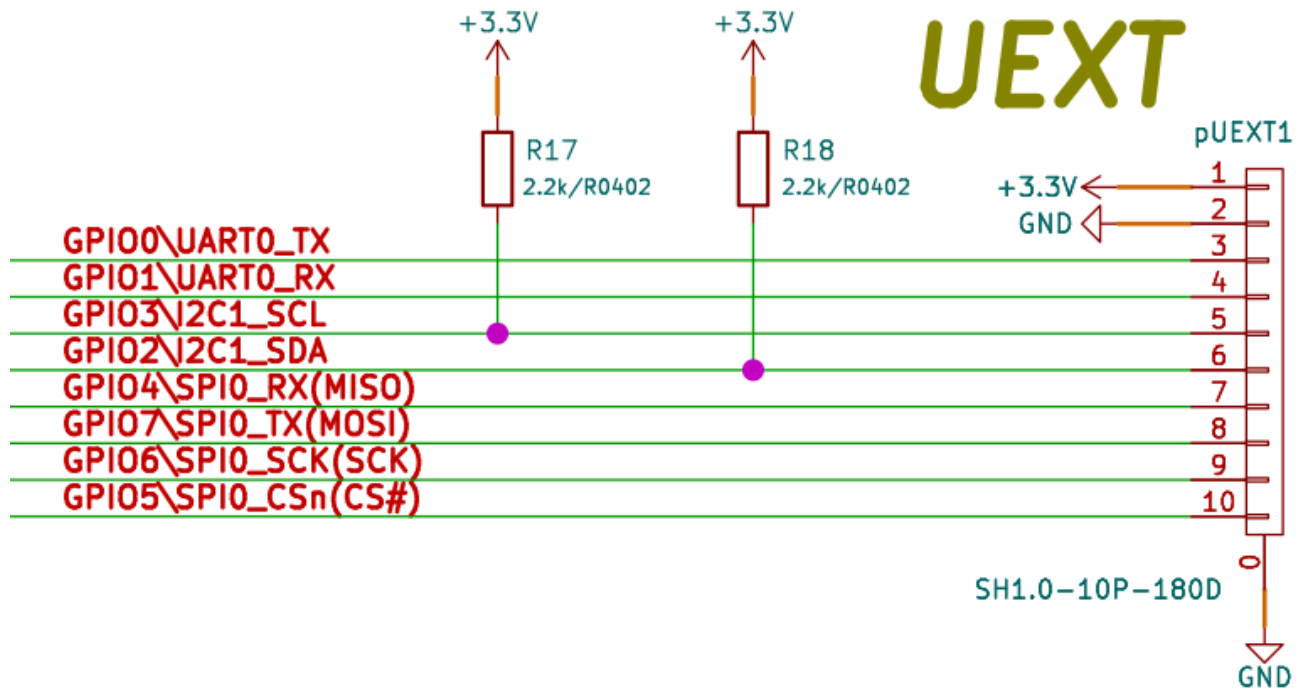


As the boards become smaller and smaller some smaller packages were introduced too beside the original UEXT connector

- mUEXT is 1.27 mm step boxed header connector which is with same layout as UEXT
- pUEXT is 1.0 mm single row connector (this is the connector used in RP2040-PICO30)

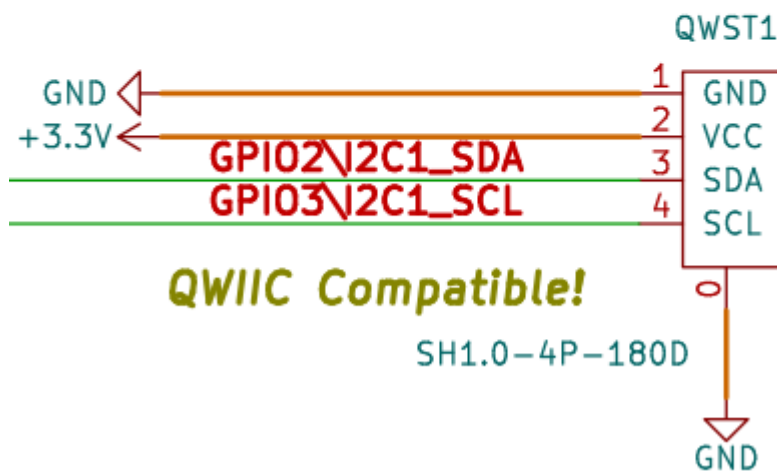
Olimex has developed number of [MODULES](#) with this connector. There are temperature, humidity, pressure, magnetic field, light sensors. Modules with LCDs, LED matrix, Relays, Bluetooth, Zigbee, WiFi, GSM, GPS, RFID, RTC, EKG, sensors and etc.

pUEXT signals



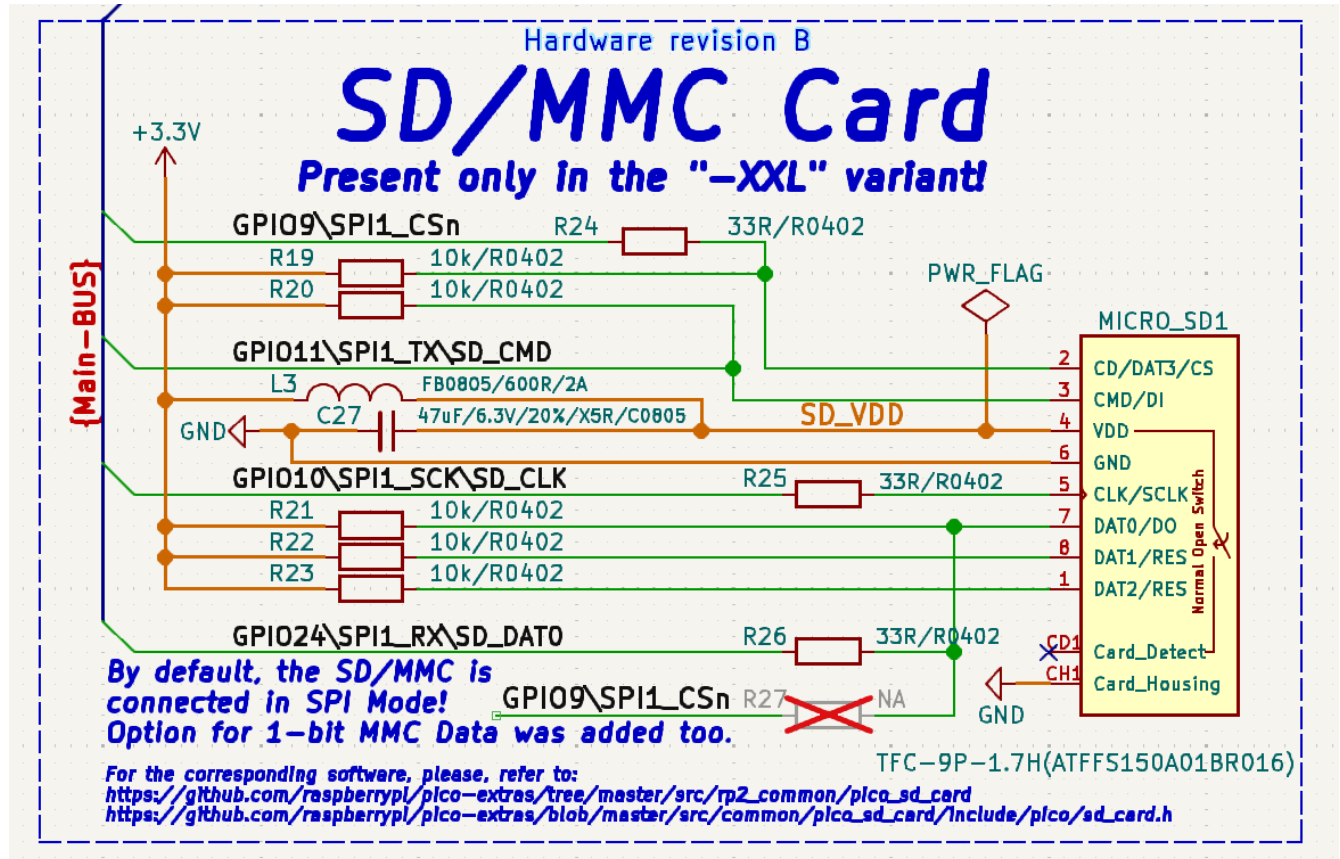
Qwiic/Stemma connector

QWST



Micro SD card connector

In latest hardware revisions (B and newer) the SD card is connected in SPI data mode:



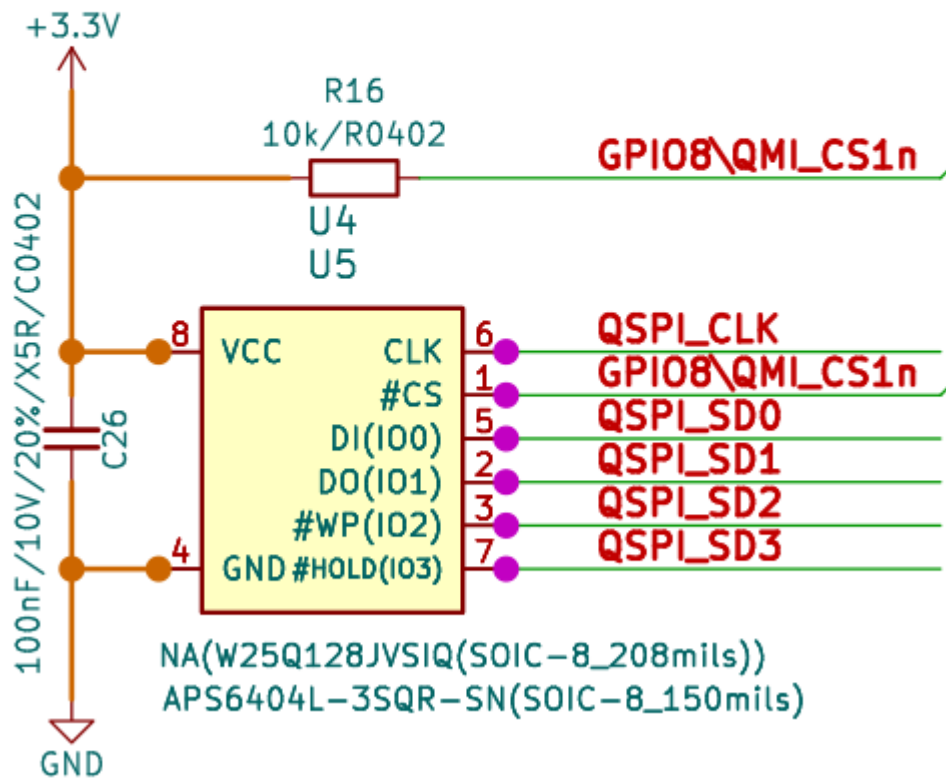
Notice that in hardware revision A the board was connected in 1-bit MMC data mode.

PSRAM connection

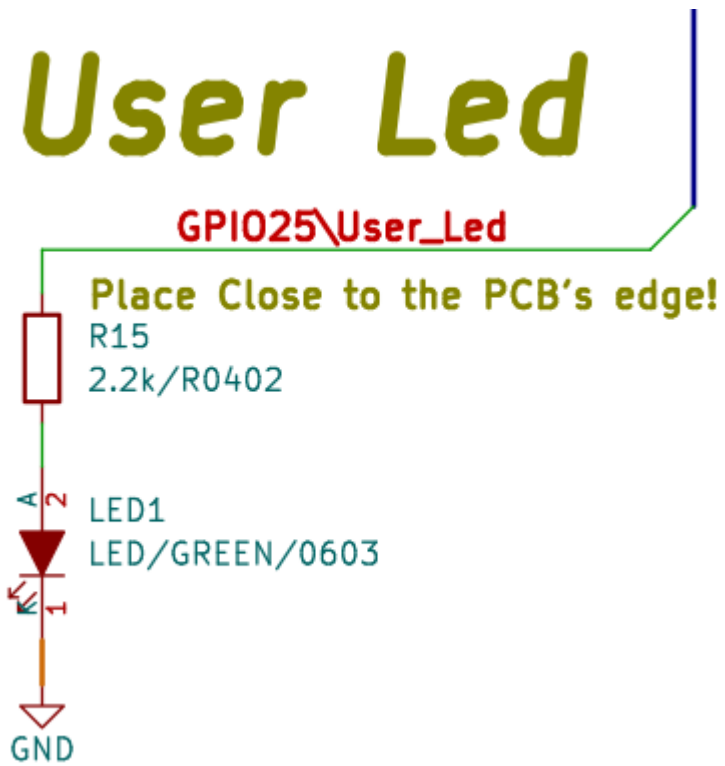
PSRAM
Present only in the "-XXL" variant!

Options:

- > PSRAM with Size: 8MB
- > Additional Flash



LED connection



SOFTWARE

RP2350-PICO2-XXL uses same software as PICO2

- Raspberry PI C-SDK
- MicroPython SDK (note that to the current date RP2350B chip support is not implemented in MicroPython and the access of the GPIO30-47 in MicroPython is not implemented.
- CircuitPython from Adafruit – all 48 GPIOs are implemented.

Document Revision History

Revision 2.0 April 2005

- Added latest schematics
- Improved formatting

Revision 1.0 January 2025