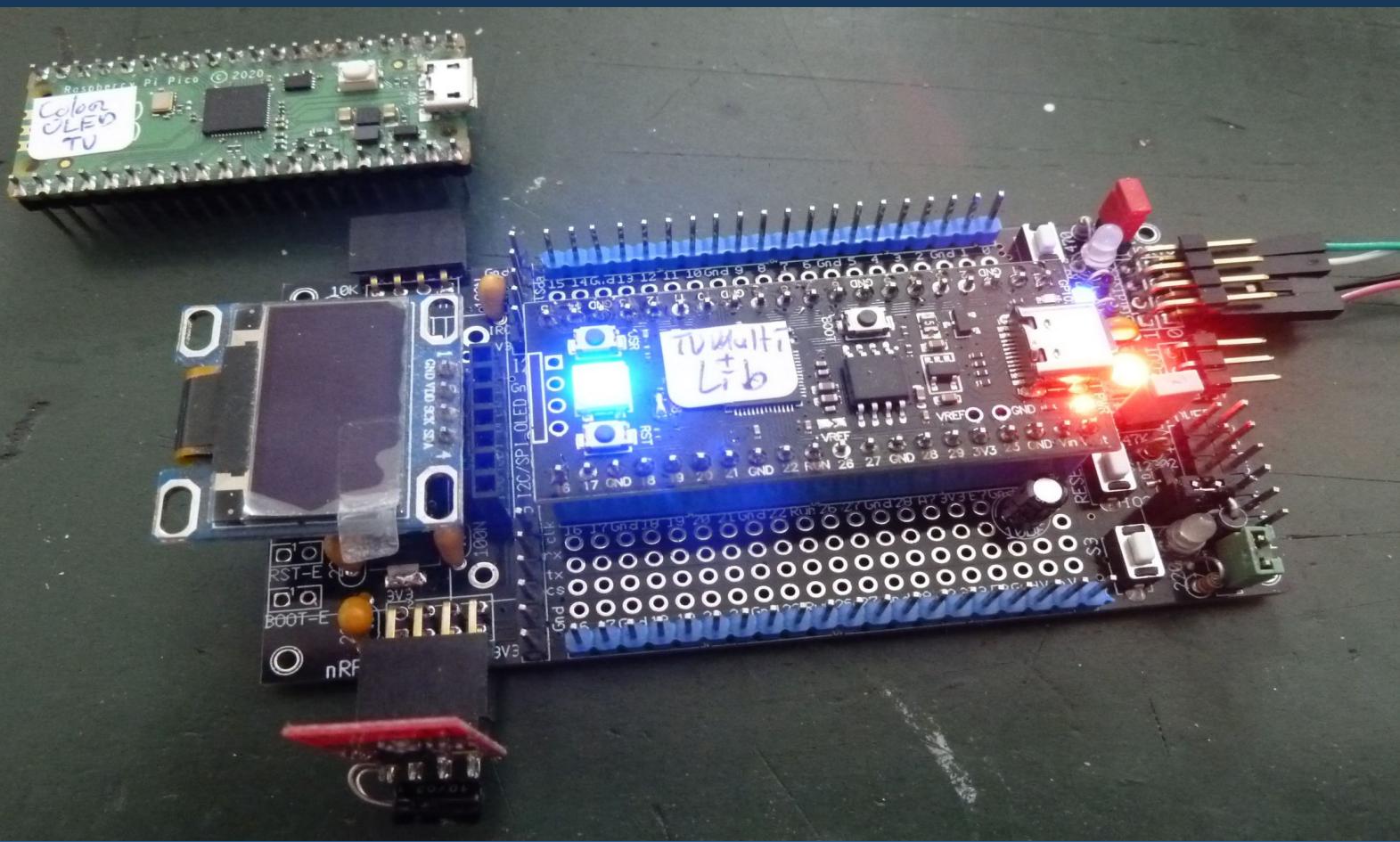
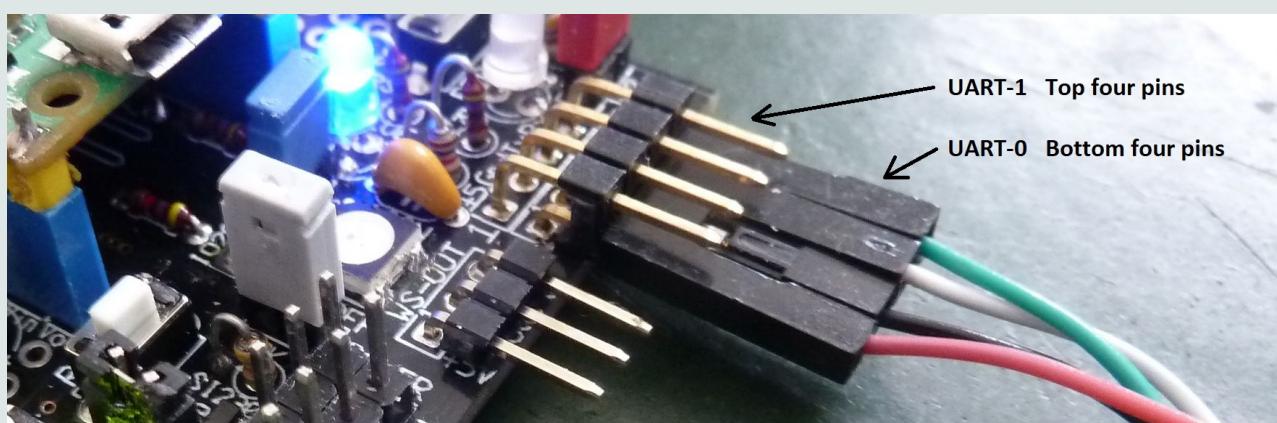


# Pico-kit v2 manual

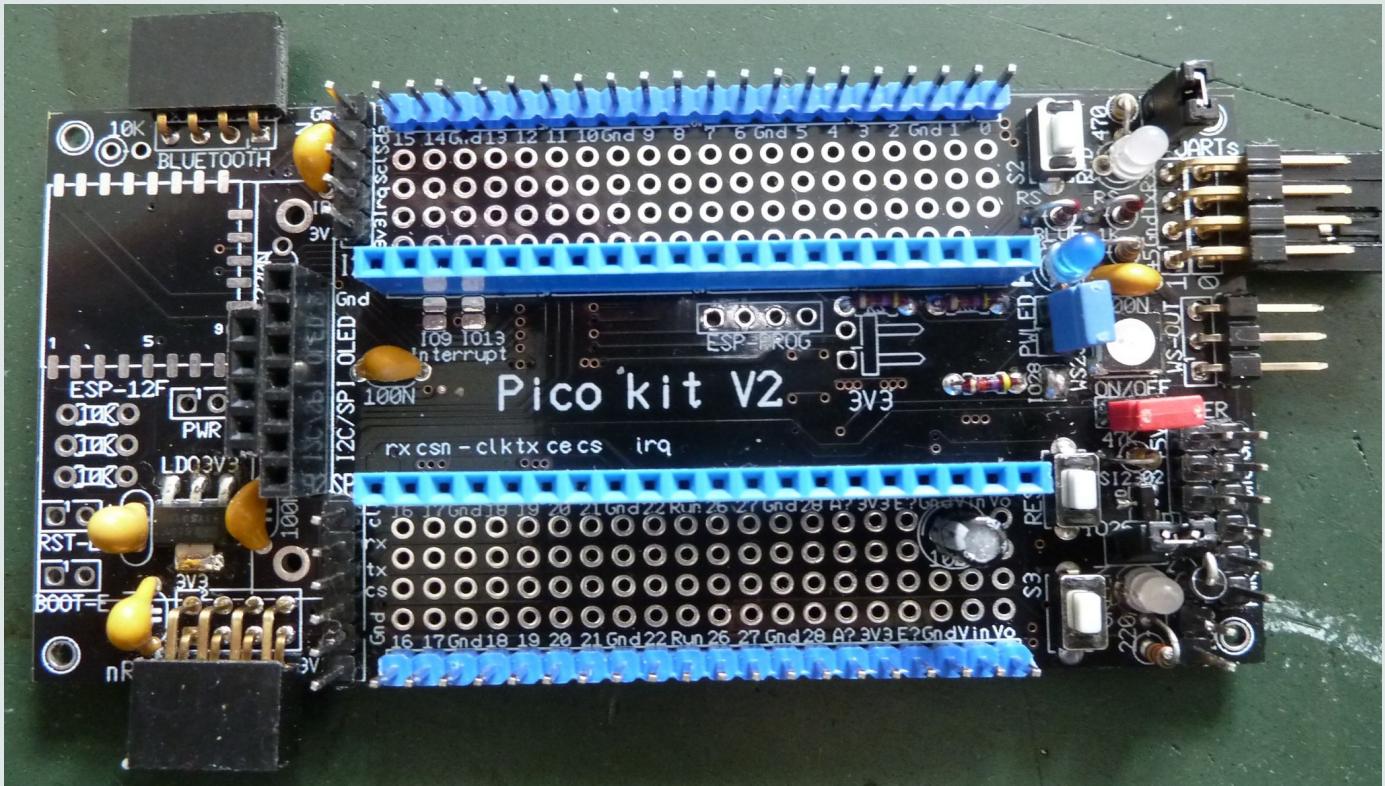


# Pico-kit I/O

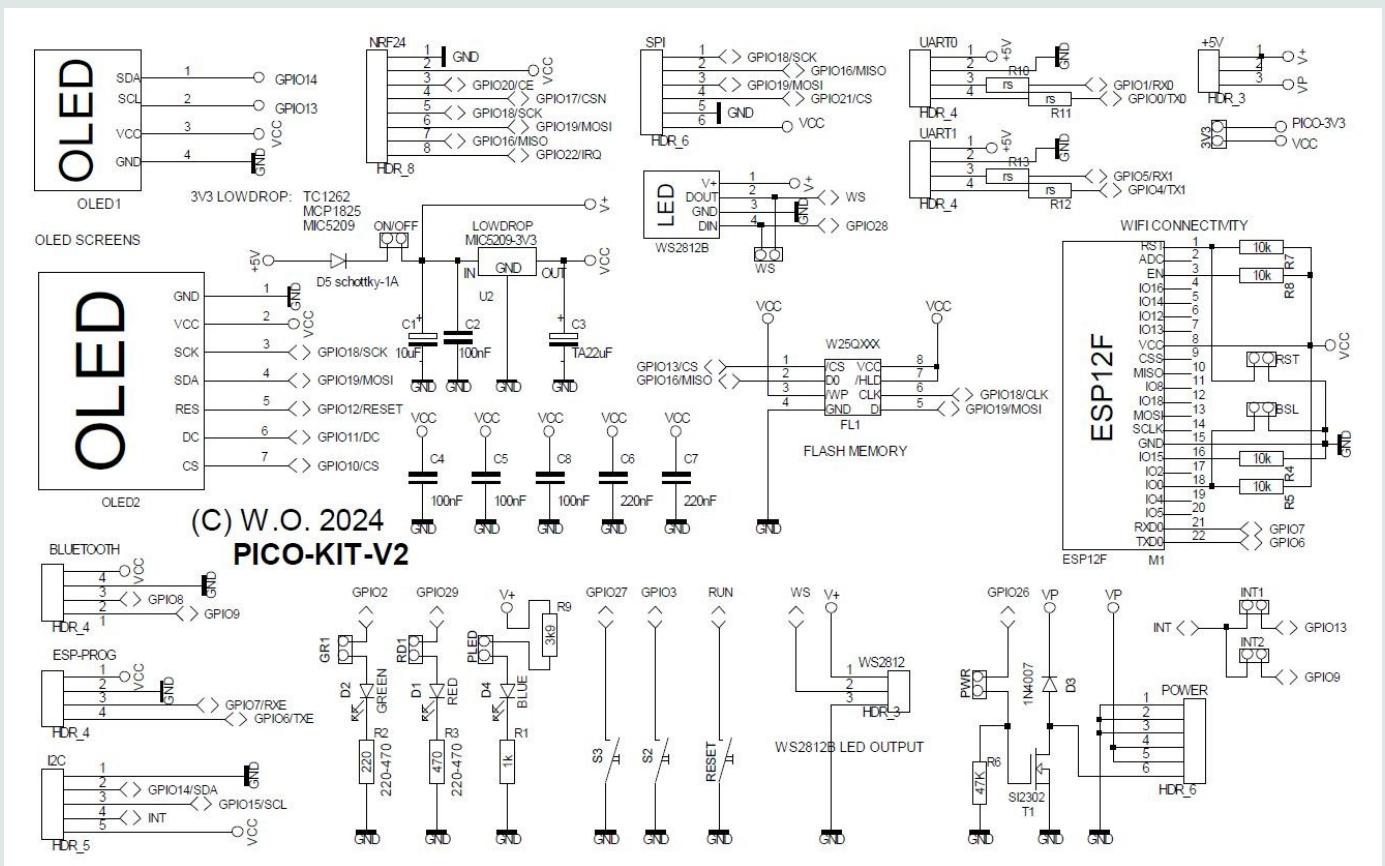
GPIO	Function on Pico-kit and CPU boards
0	RS232 TX0 (UART-0)
1	RS232 RX0
2	Red LED
3	Switch S2
4	RS232 TX1 (UART01)
5	RS232 RX1
6	ESP-12F TX
7	ESP-12F RX
8	Bluetooth TX
9	Bluetooth RX/I <sup>2</sup> C interrupt input
10	SPI OLED CS
11	SPI OLED DC
12	SPI OLED RES(et)
13	I <sup>2</sup> C interrupt input or SPI Flash /CS
14	I <sup>2</sup> C SDA
15	I <sup>2</sup> C SCL
16	SPI0 Miso
17	NRF24L01 CSN
18	SPI0 Clk
19	SPI0 Mosi
20	nRF24L01 CE
21	SPI header CS
22	NRF24L01 IRQ
23	WS2812 (on YD-RP2040) or Power save (on Pico board)
24	USR switch (on YD-RP2040) or VBUS ADC in (on Pico board)
25	LED on Pico (compatible) board
26	Power out to MOSFET
27	Switch S3
28	WS2812
29	VSYS ADC in (on Pico board) or green LED



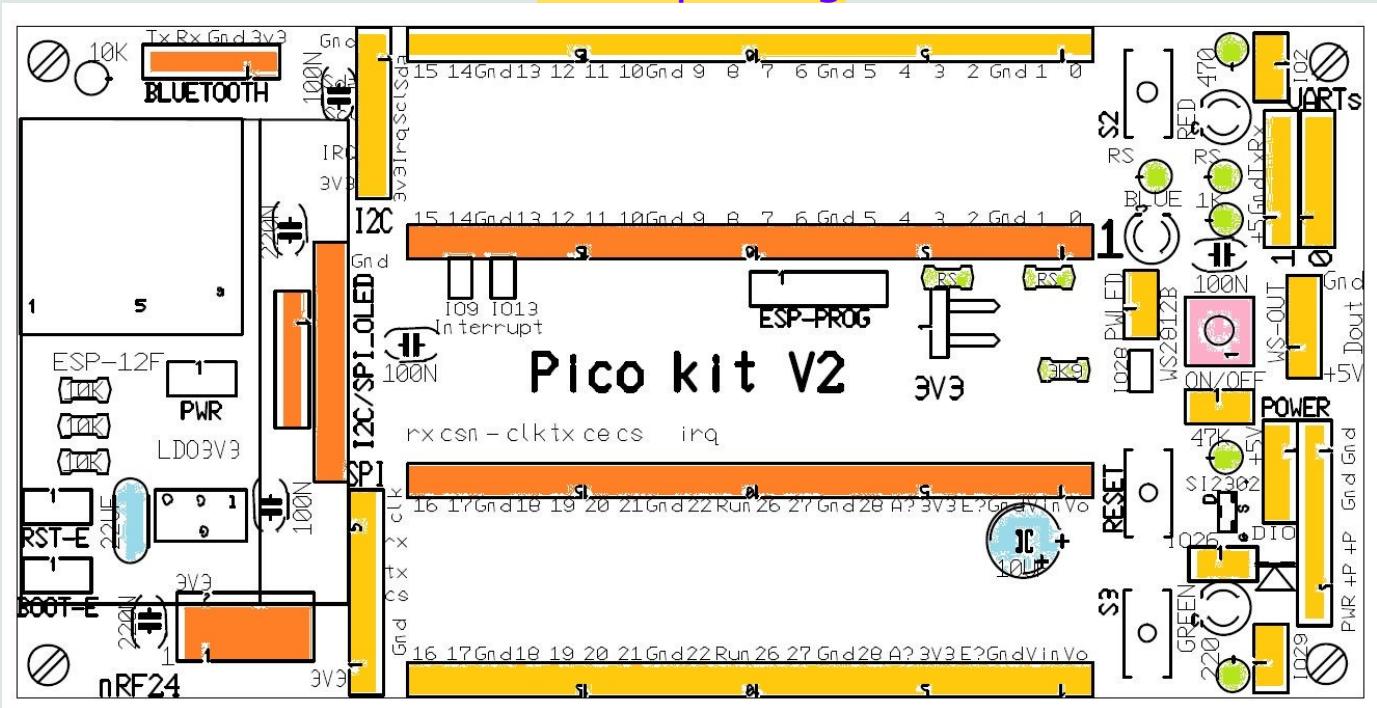
# Constructing the Pico-kit



## Pico-kit v2 schematics

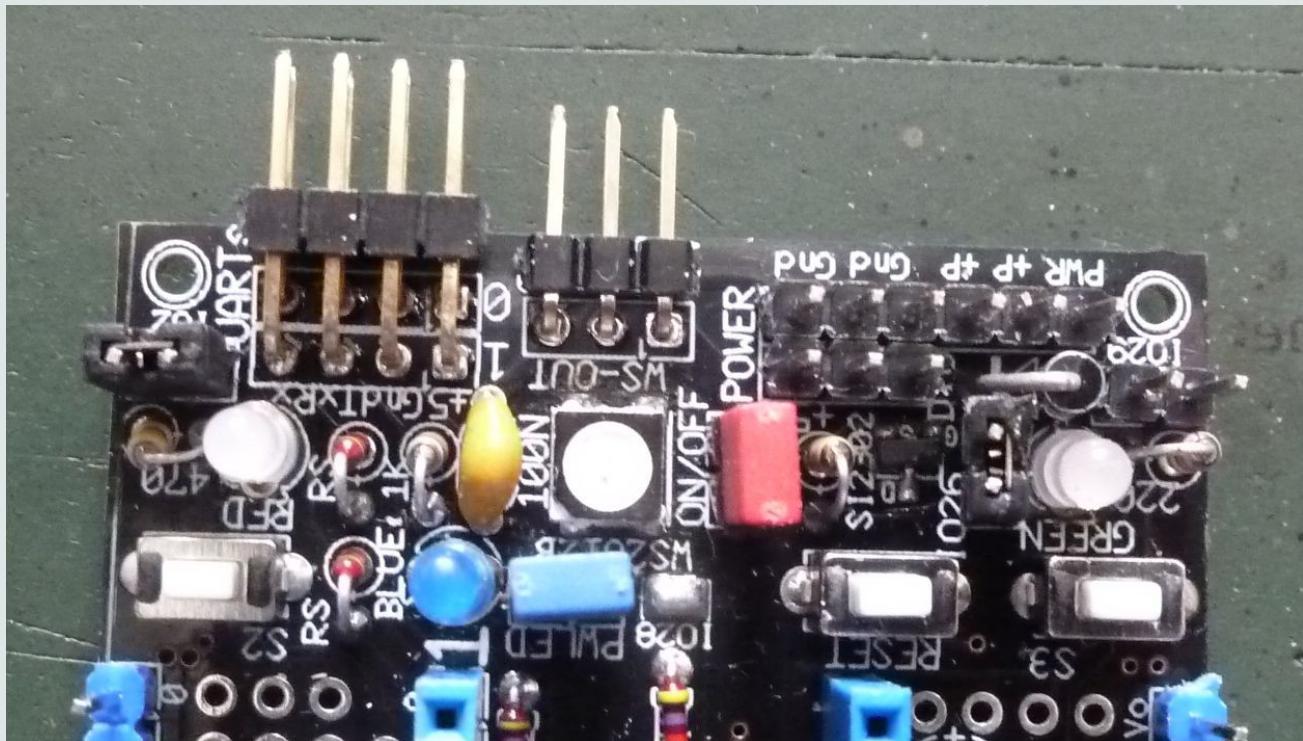


## Parts placing



- Green = resistors
  - Pink = WS2812
  - Red = MIC5209
  - Blue = Electrolytic capacitors
  - Yellow = male headers
  - Orange = female headers

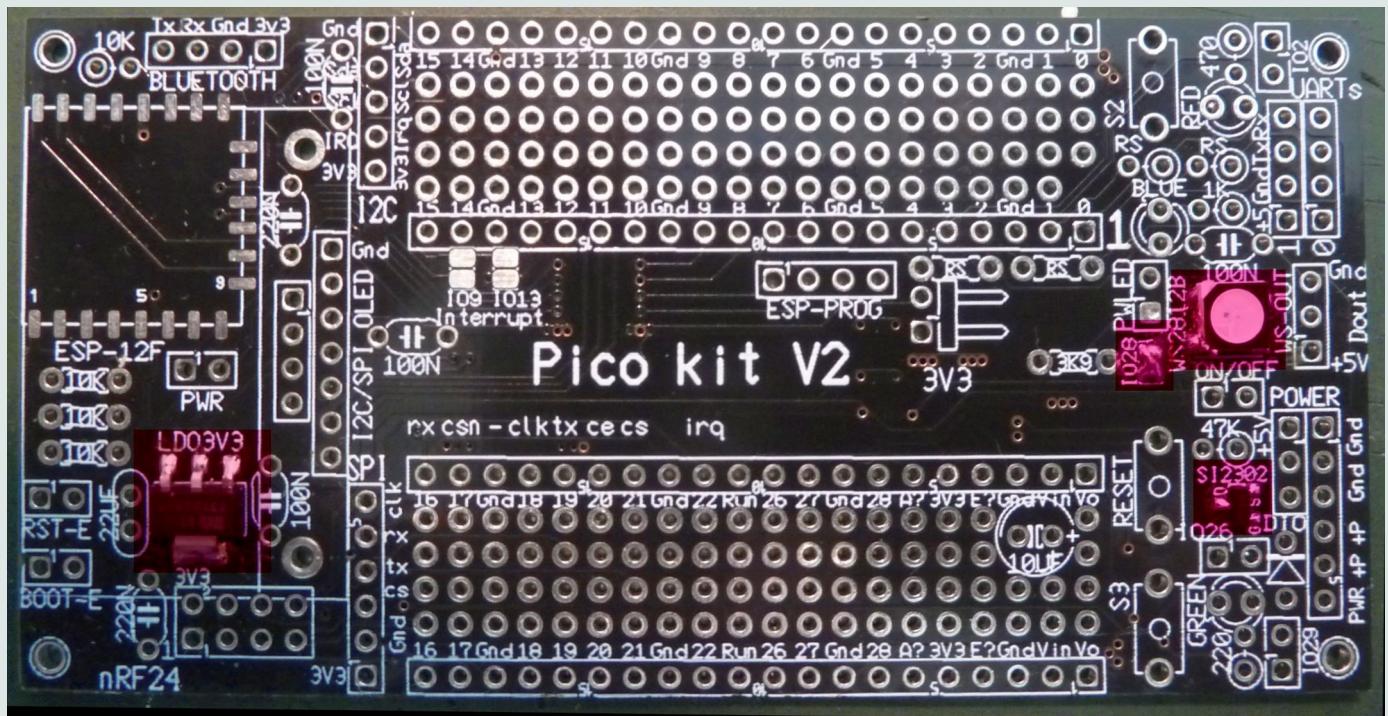
## Pico-kit front end



## Construction of the Pico-kit

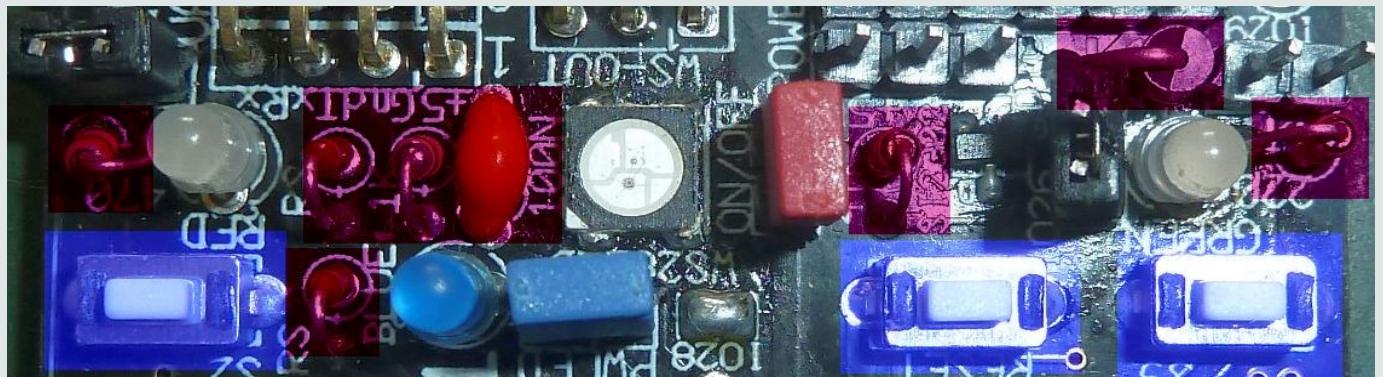
- 1) First the **red** solder bridge, then the SMD parts, the MOSFET, WS2812 & MIC5209 and optional ESP-12F

**1a)** Turn the board upside down and mount the SMD schottky-diode on the bottom side of the board (the position is marked SS34)

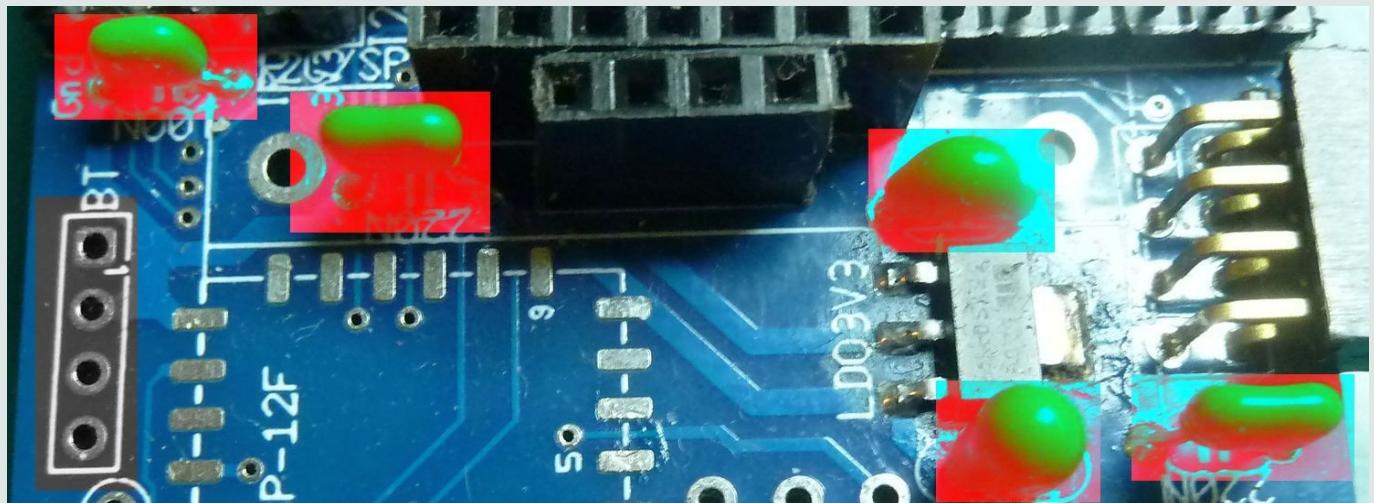


- 2)** We do not use the 3V3 jumper & ESP programming connector!

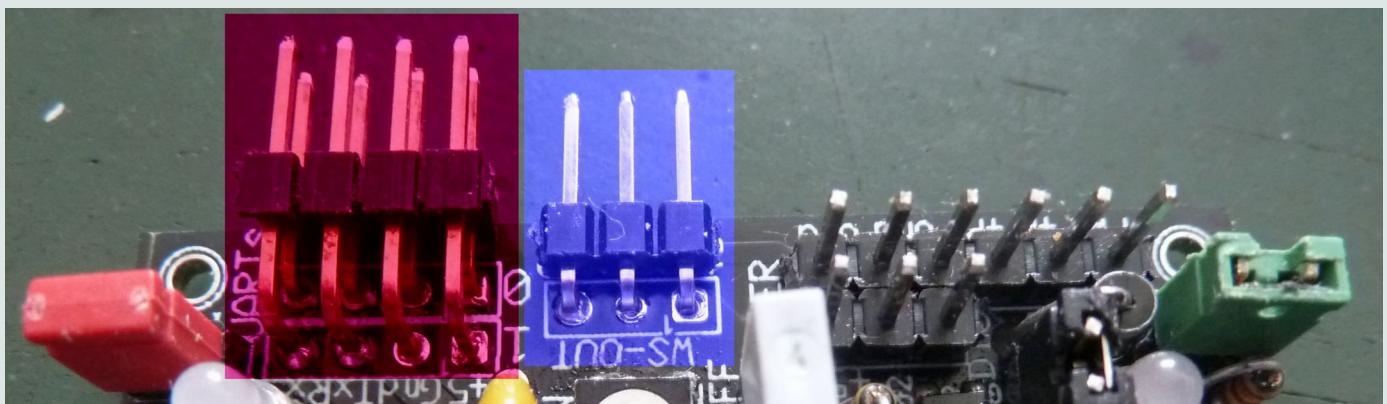
- 3a)** Then the three switches all resistors, capacitors and the diode. The switches – blue, other parts red



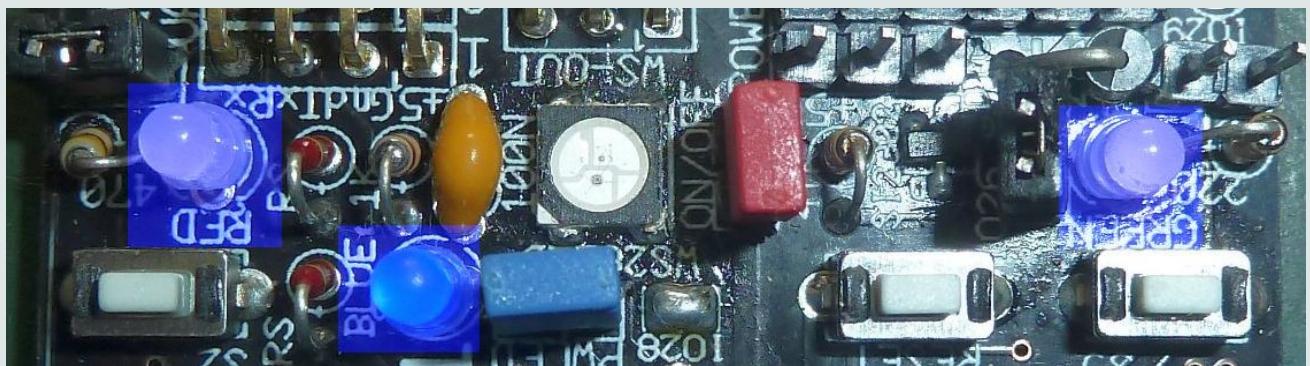
**3b)** Some more capacitors in **red** and then the right-angle header for the nRF24



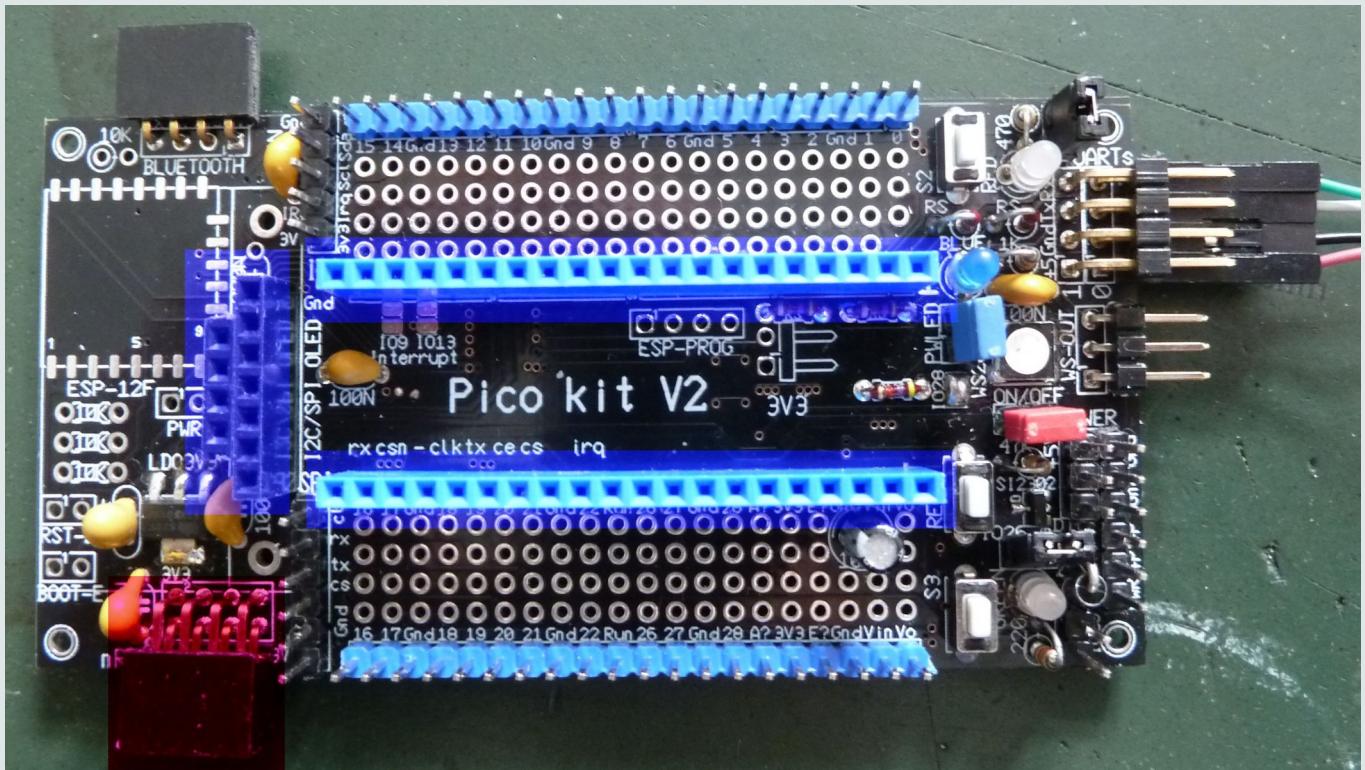
**5)** Now the **blue** 3-pins squared header, then the **red** 8-pins dual row squared header



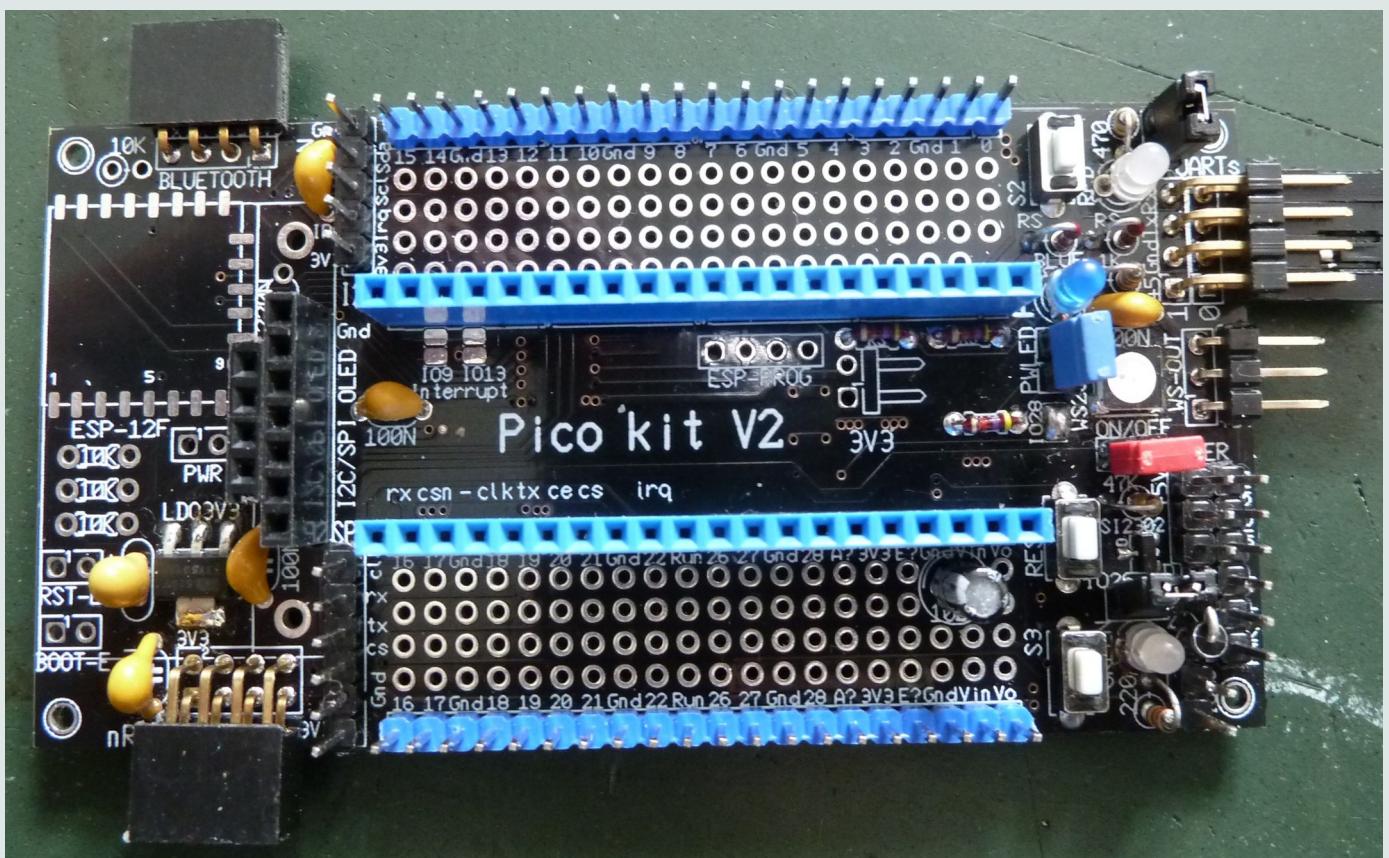
**5)** The three LEDs, not too high otherwise the remaining headers will be difficult to place. Note, the not colored leds have the long wire and flat spot at the lower position in this picture!



- 5) The **female** headers first, then the male headers, place them carefully vertically! NOTE the not present optional ESP-12F!



Almost completed



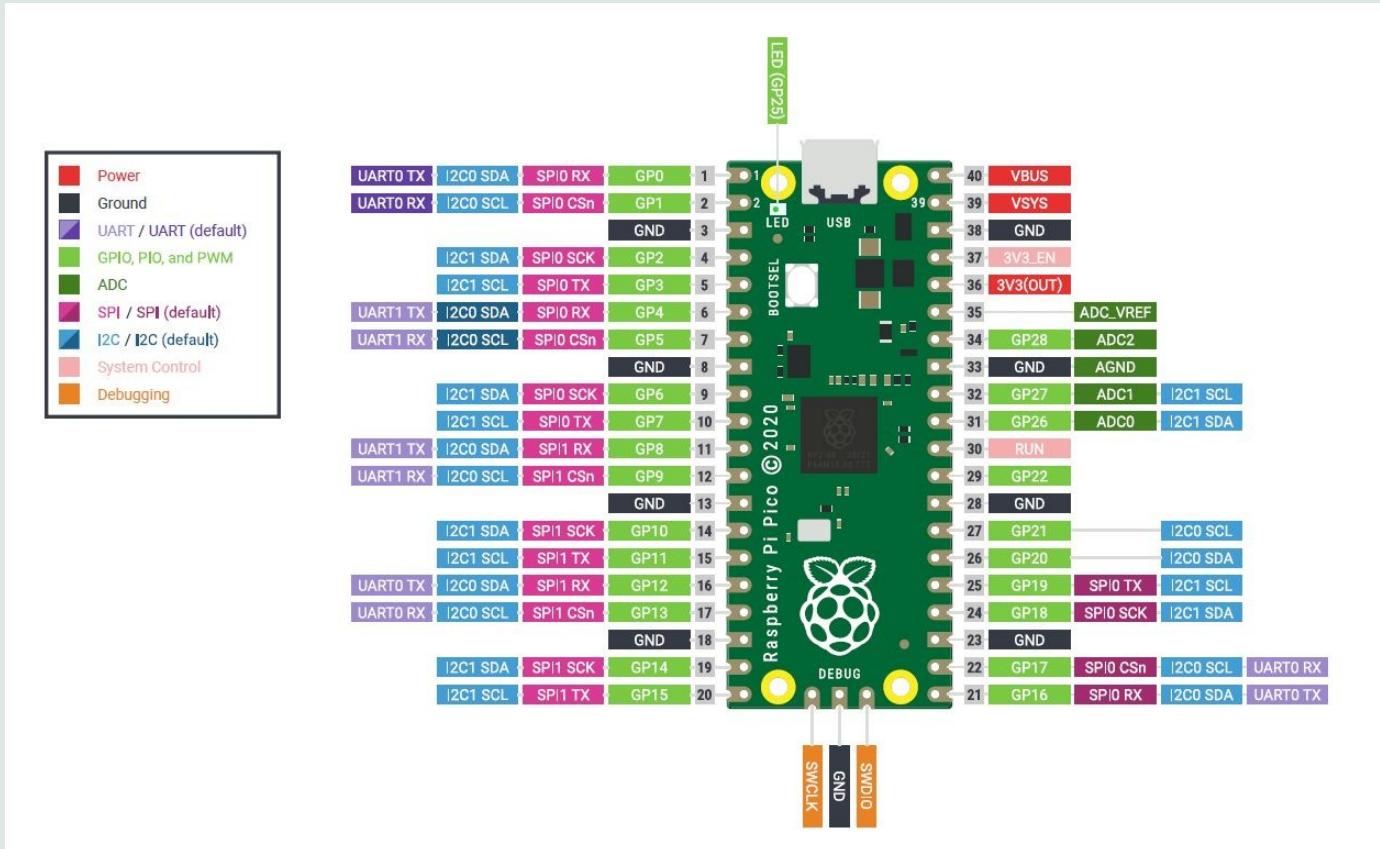
## Bill of present materials

Number	Component
1	PCB board
4	RS = 470 $\Omega$
1	220 $\Omega$
1	470 $\Omega$
1	1 k $\Omega$ & 4k7
1	47 k $\Omega$
3	100nF
1	220nF
1	22 $\mu$ F tant.
1	10 $\mu$ F elco
2	3mm LED gr/rd
1	3mm LED blue
1	1N4007, SS34 (SMD Schottky)
1	Mosfet SI2302
1	WS2812B LED
1	MIC5209-3.3ys
3	Switch
5	2 pins male header
1	3 pins male header & 3 pins squared male header
1	2x4 pins squared male header
1	5 pins male header
2	6 pins male header
2	20 pins male header
1	4 pins female header
1	7 pins female header
2	20 pins female header
1	2x4 pins square female header
5	jumper
4	Female jumper wire

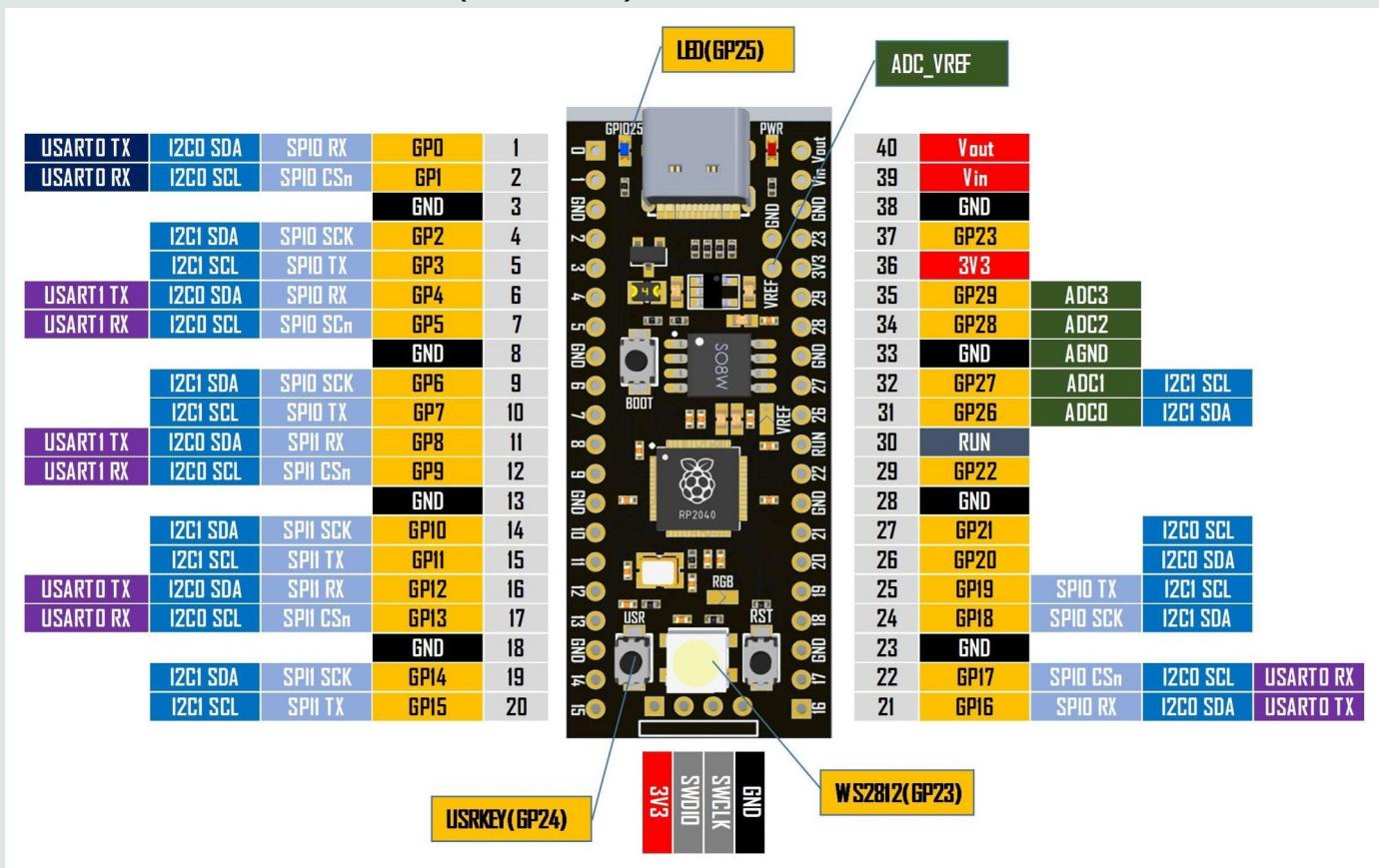
## Bill of optional parts (not present)

1	220nF
1	47k $\Omega$
4	10 k $\Omega$
3	2 pins male header
1	4 pins male header
1	4 pins squared female header
3	jumper
1	2 pins squared male header
1	W25Q16BV to W25Q128BV
1	Bluetooth module (HC-05/HC-06)
1	ESP-12F wifi module
1	SSD1306 or SSD1351 OLED with I <sup>2</sup> C or SPI bus
1	Pi Pico board or YD-RP2040 or RP2040 Plus, etc.

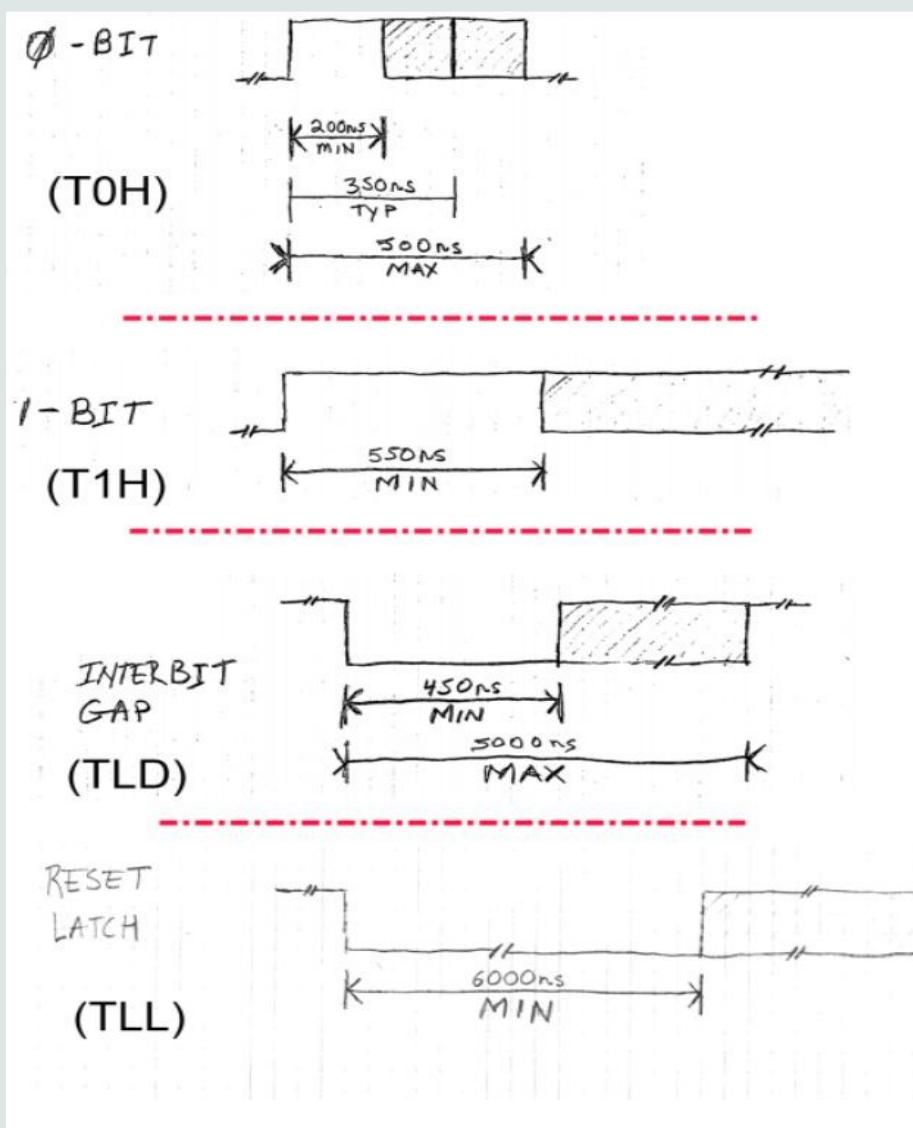
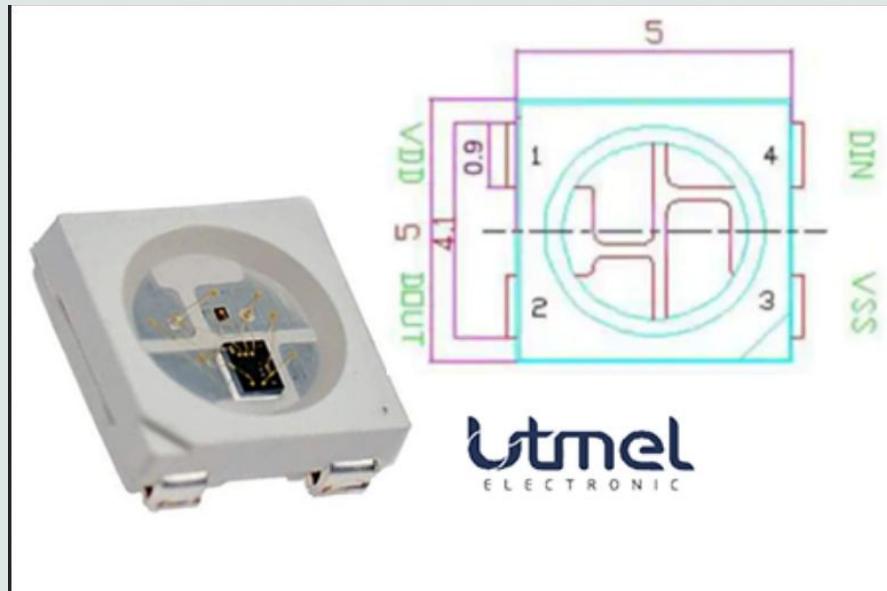
## Original Pico board



## (VCC-GND) YD-RP2040 board



## WS2812B a full color digitally controlled serial LED



WS2812B control signals

# nRF24L01P transceiver module

## 1. Introduction

E01-ML01D



E01-ML01D is a 1mW , industrial-grade wireless transceiver module, operates at 2.4GHz with high air data rate (2Mbps maximum). SPI interface, inline pin, high stability, cost-effective and Batch production, which makes the module is suitable for various applications.

E01-ML01D is based on original imported nRF24L01P form Nordic in Norway. The module uses industrial component with sufficient transmitting power, good spectral characteristics and small volumes. With high-performance PCB antenna and impedance matching precision, there is no need for an external antenna for embedded development.

## 2. Electrical parameter

E01-ML01D

No.	Parameter item	Parameter details	Description
1	RF IC	nRF24L01P	Nordic
2	Size	12.6 * 22.6 mm	
3	Production process	Machine	Lead-free
4	Connector	2 * 4 * 2.54mm	Plug-in
6	Supply voltage	1.9 ~ 3.6V DC	Notes: the voltage higher than 3.6V is forbidden
3	Frequency	2400 ~ 2525MHz	Adjustable
7	Communication level	0.7VCC ~ 3.6V	VCC refers to the supply voltage
8	Operation Range	100m	Test condition: Clear and open area, 0dBm , antenna gain: 5dBi , height: 2m , Air date rate: 250Kbps
9	Max Power	Maximum 0dbm	About 1mW
10	Air data rate	3 level adjustable	250kbps, 1Mbps, 2Mbps
11	Sleep current	1.0uA	nRF24L01P sets as power-down
12	Transmitting current	13mA@0dBm	The largest emission current
13	Receiving current	13mA	CE=1
14	Communication interface	SPI	Data rate: up to 10Mbps
15	Transmitting length	3 level FIFO.	32 bytes (maximum) for one package
16	Receiving length	3 level FIFO.	32 bytes (maximum) for one package
17	RSSI support	N/A	Support simple data packet loss statistics
18	Antenna type	PCB	50 ohm characteristic impedance
19	Sensitivity	-106dBm	250kbps
20	Operating temperature	-40 ~ +85°C	Industrial-grade
21	Operating humidity	10% ~ 90%	Relative humidity, without condensation
22	Storage temperature	-40 ~ +125°C	Industrial-grade

# HC05 to HC08 Bluetooth module

## HC-08 BLUETOOTH UART COMMUNICATION MODULE USER MANUAL

### Version

Software:HC-08 V3.1, Hardware: V2.0

### Date

2017-07-07

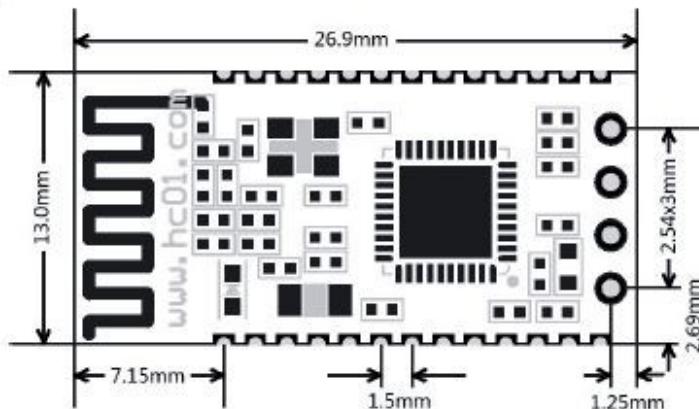
### Product introduction

HC-08 Bluetooth UART communication module is a new generation of Bluetooth specification V4.0 BLE Bluetooth protocol based on the transmission module. Wireless working frequency is 2.4GHz ISM, modulation is GFSK. The maximum transmit power module 4dBm, the receiving sensitivity is -93dBm, and iphone4s can achieve 80 meters of super long distance communication under open environment.

The module uses the stamp hole encapsulation, can patch welding, module size is 26.9mm \* 13mm \* 2.2mm, very convenient to the customer within the embedded application system.

The module uses the CC2540 chip, the configuration of the 256K Byte space, supports AT command, the user can according to need to change role and the serial baud rate, equipment name and other parameters, the use of flexible.

### Product size



### Pin definition

