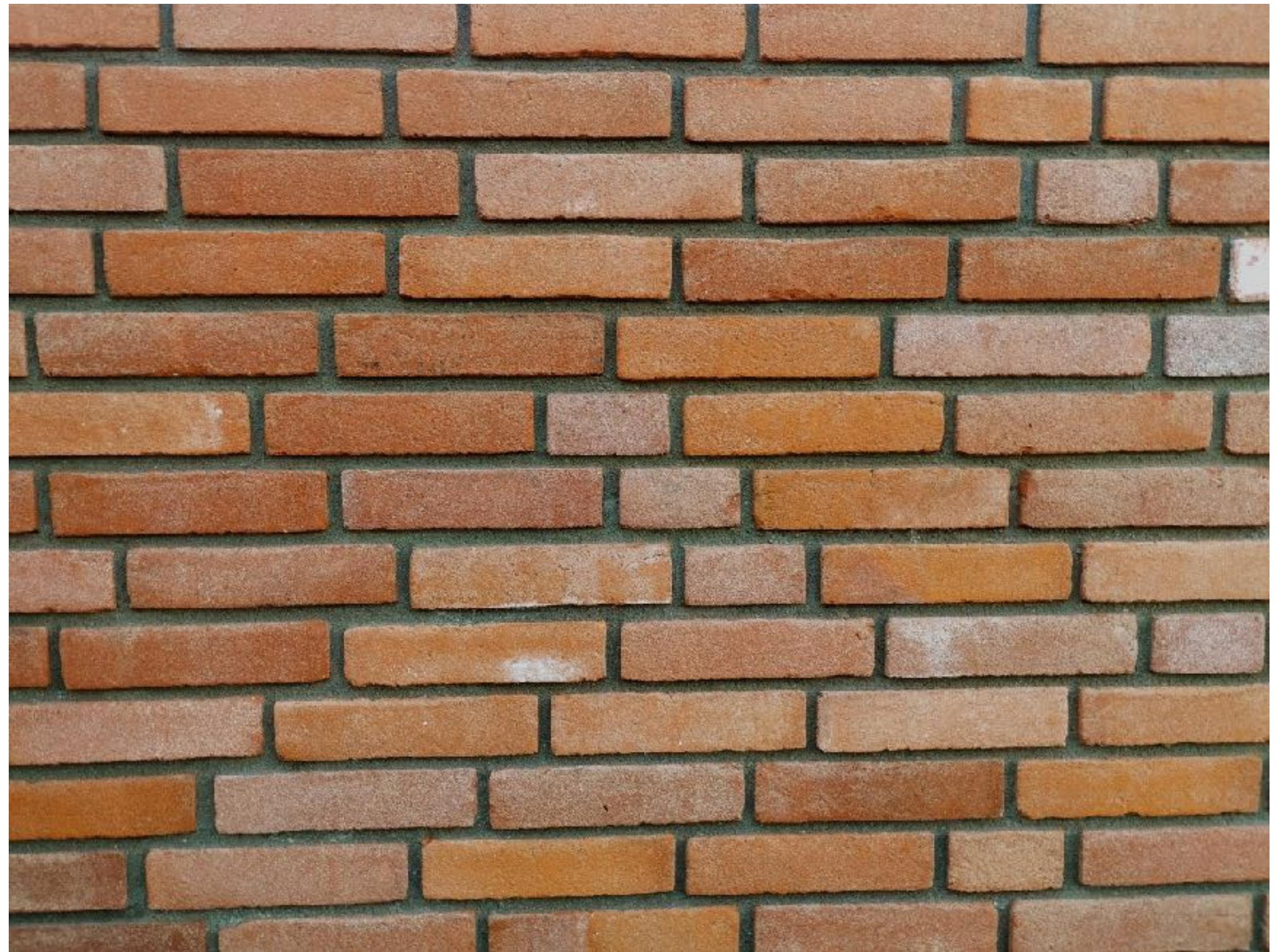
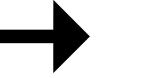


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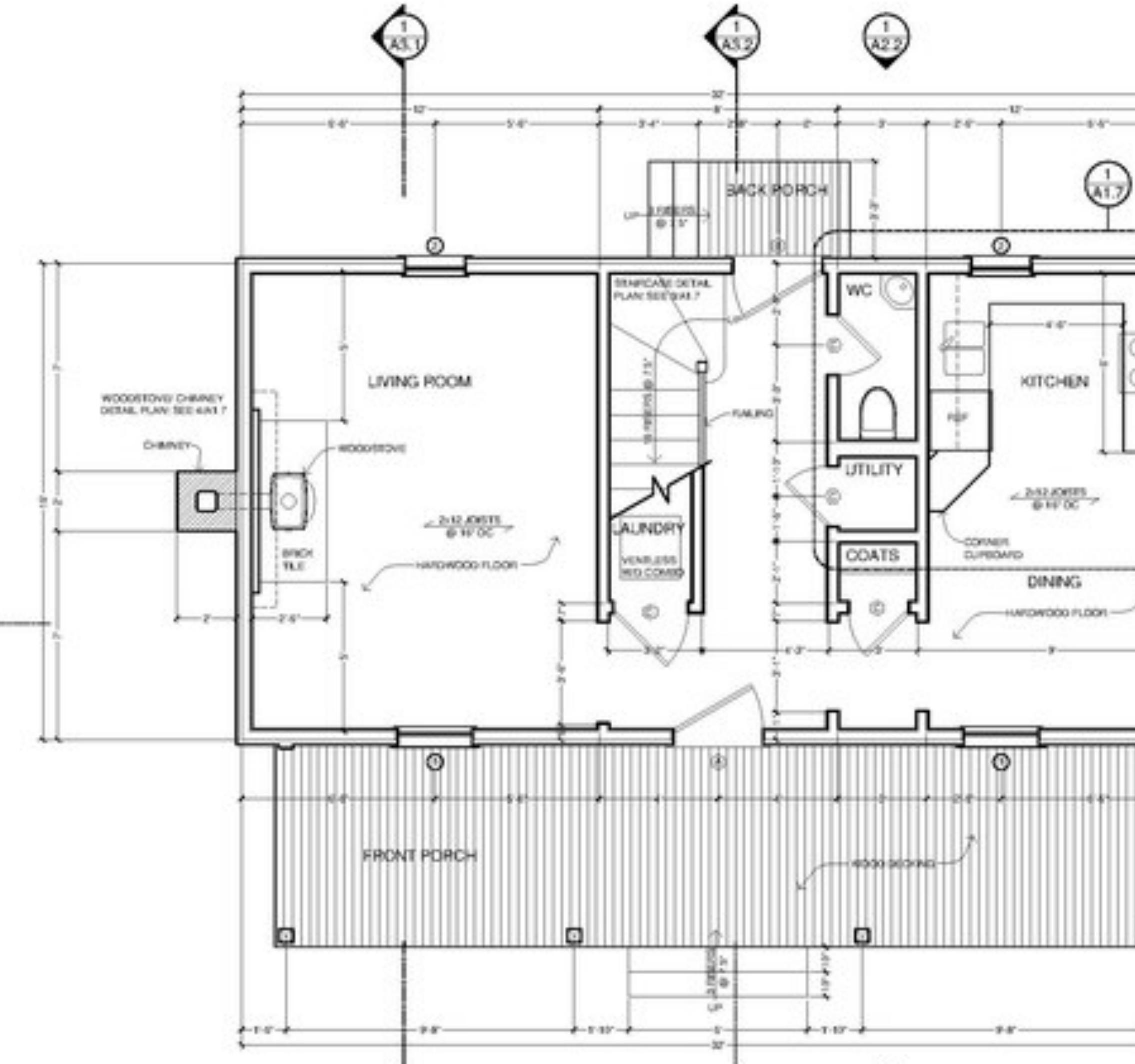
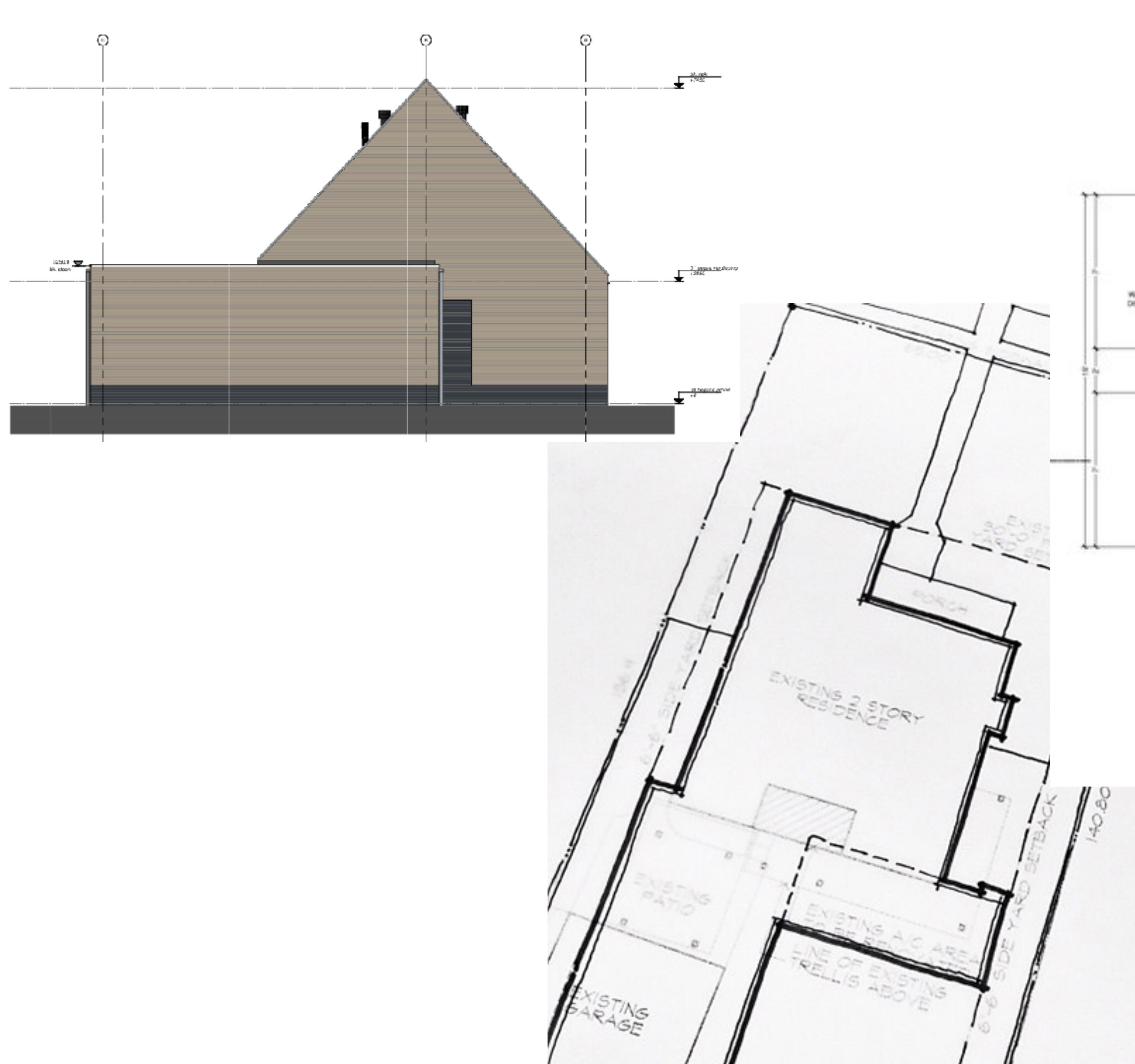
Josefine Quack — Forward Deployed Robotics Engineer



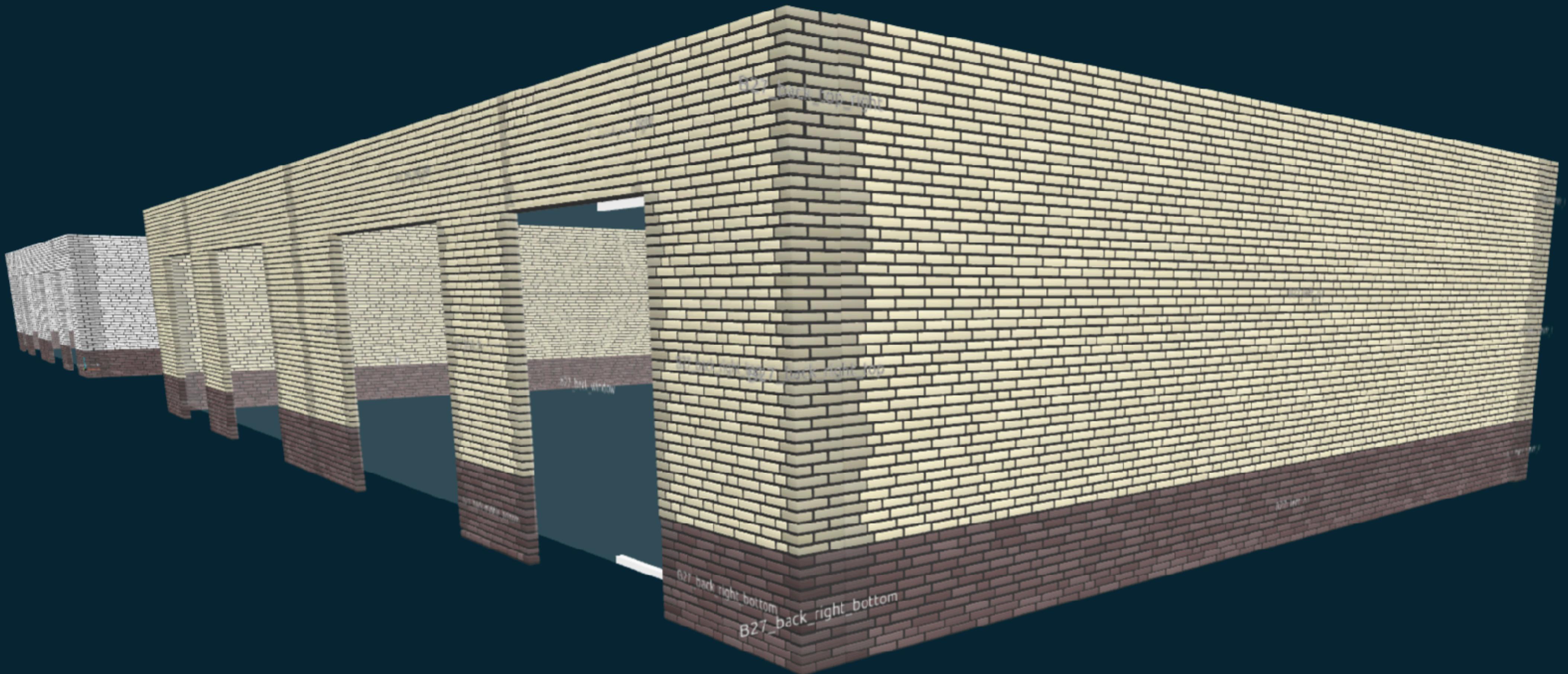
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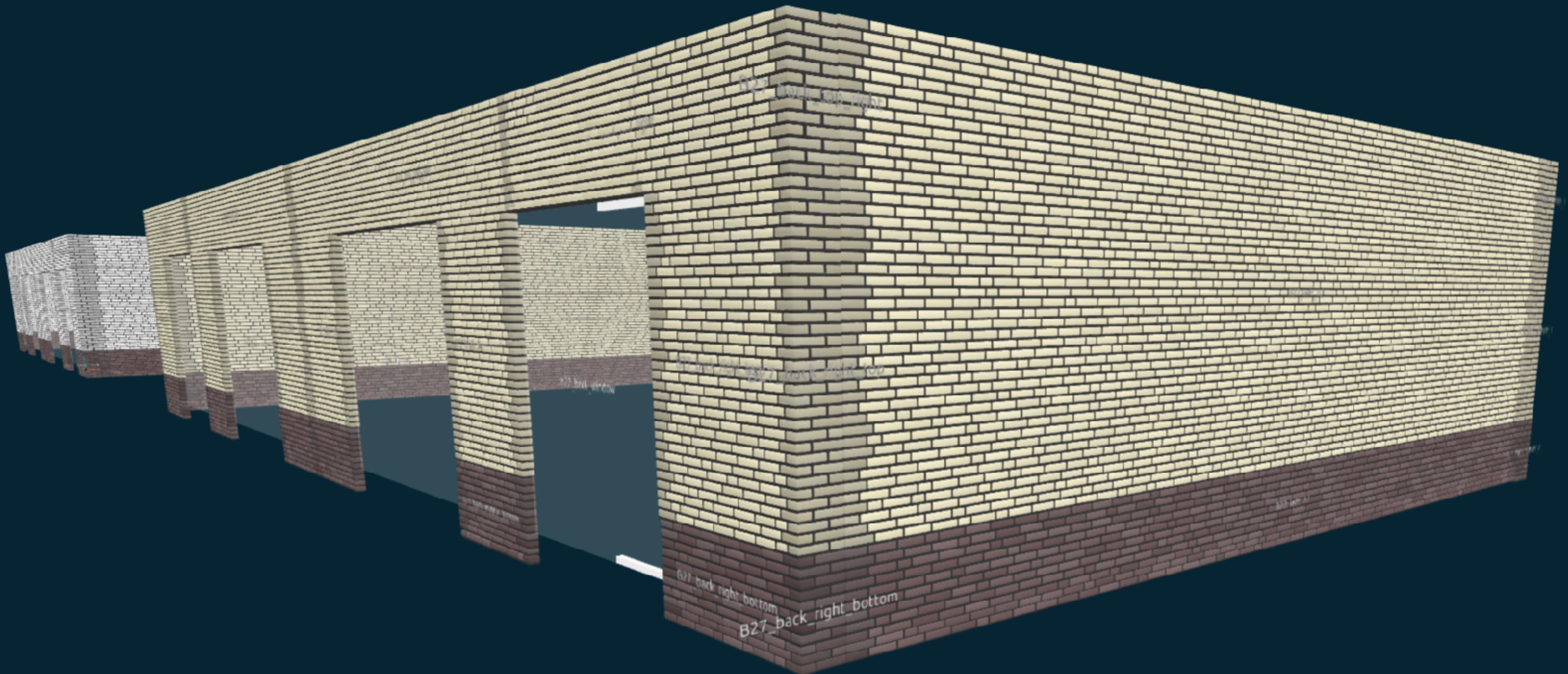


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Pisa



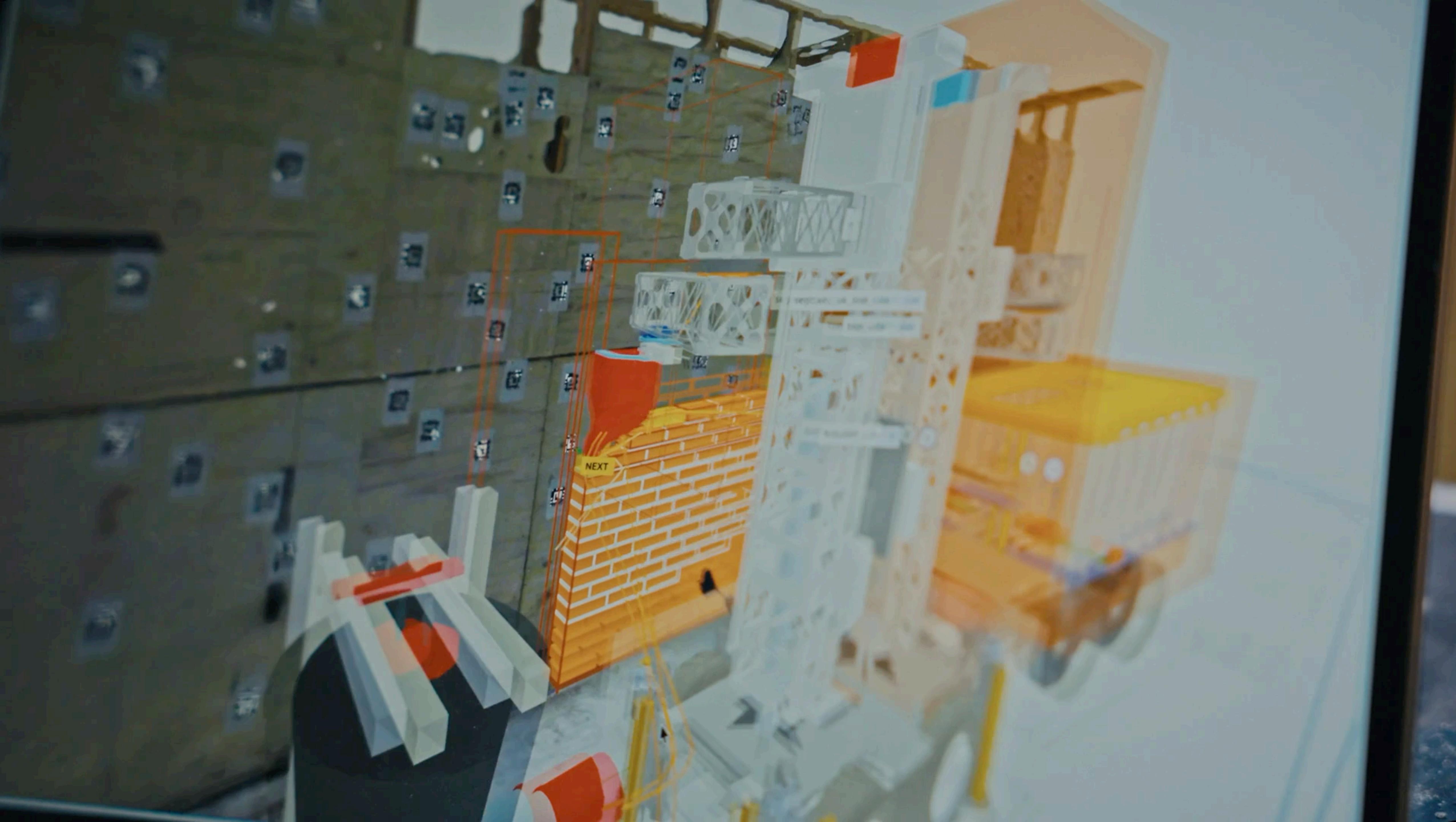
Pisa 30



Languages

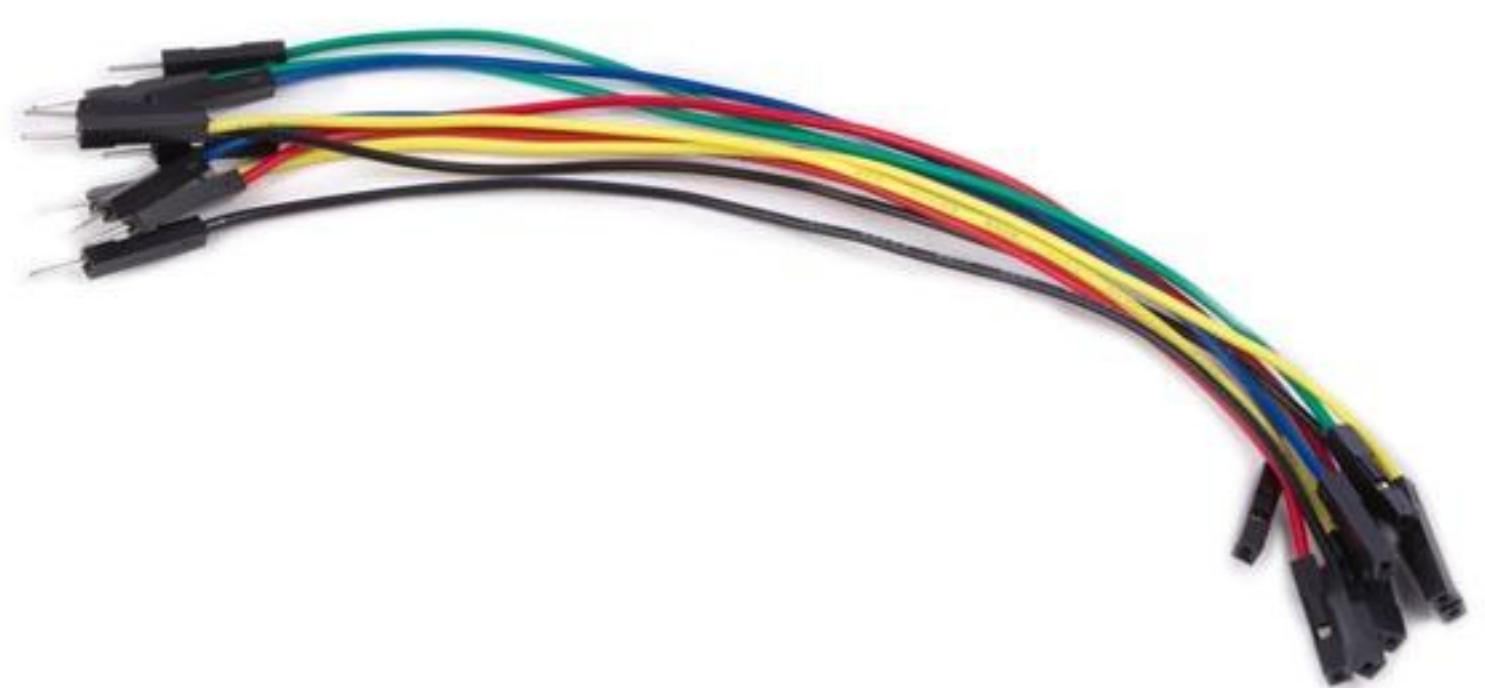
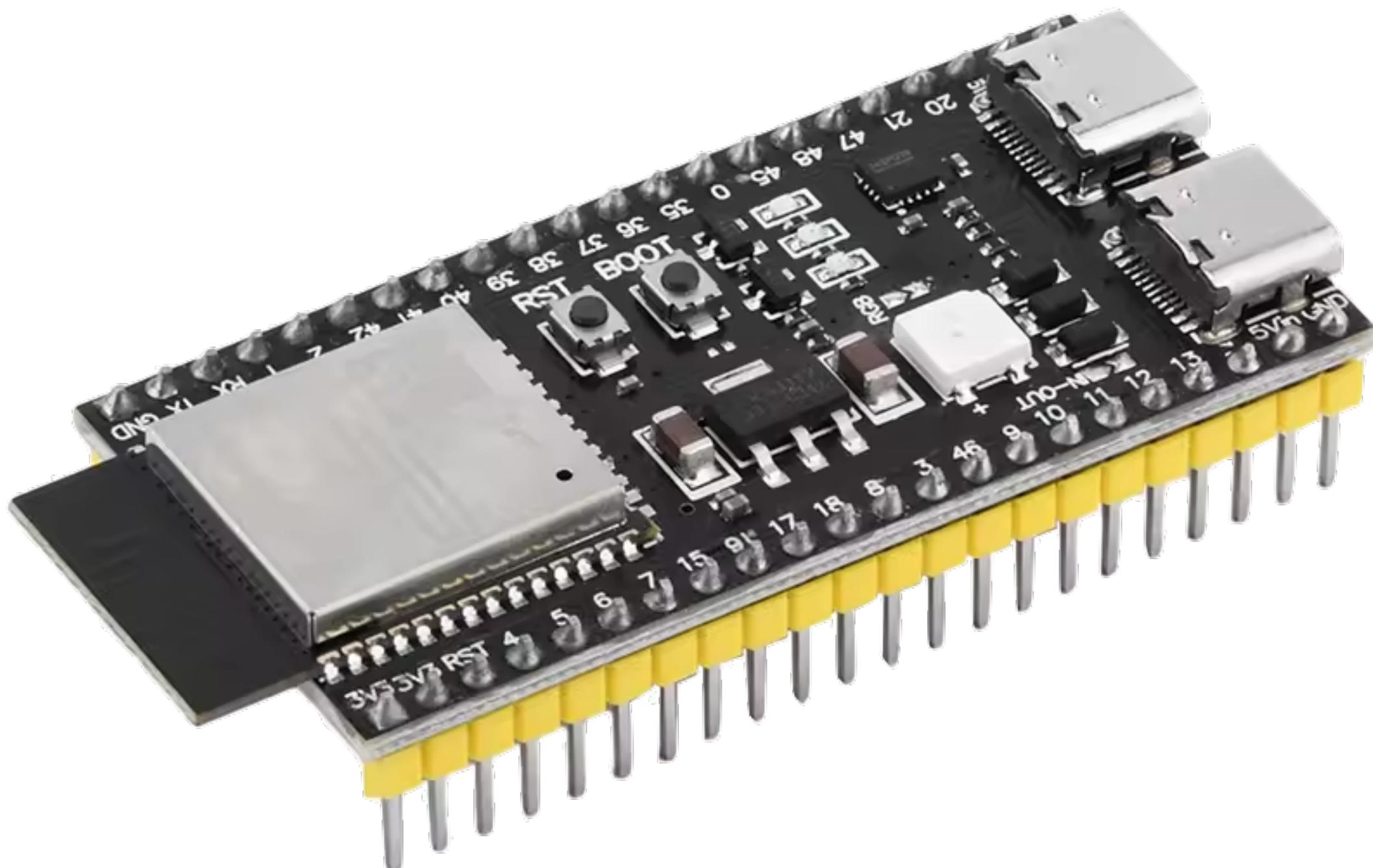


- **TypeScript** 43.3%
- **Rust** 22.3%
- **Python** 22.3%
- **C++** 5.6%
- **C** 2.3%
- **Nix** 2.2%
- **Other** 2.0%

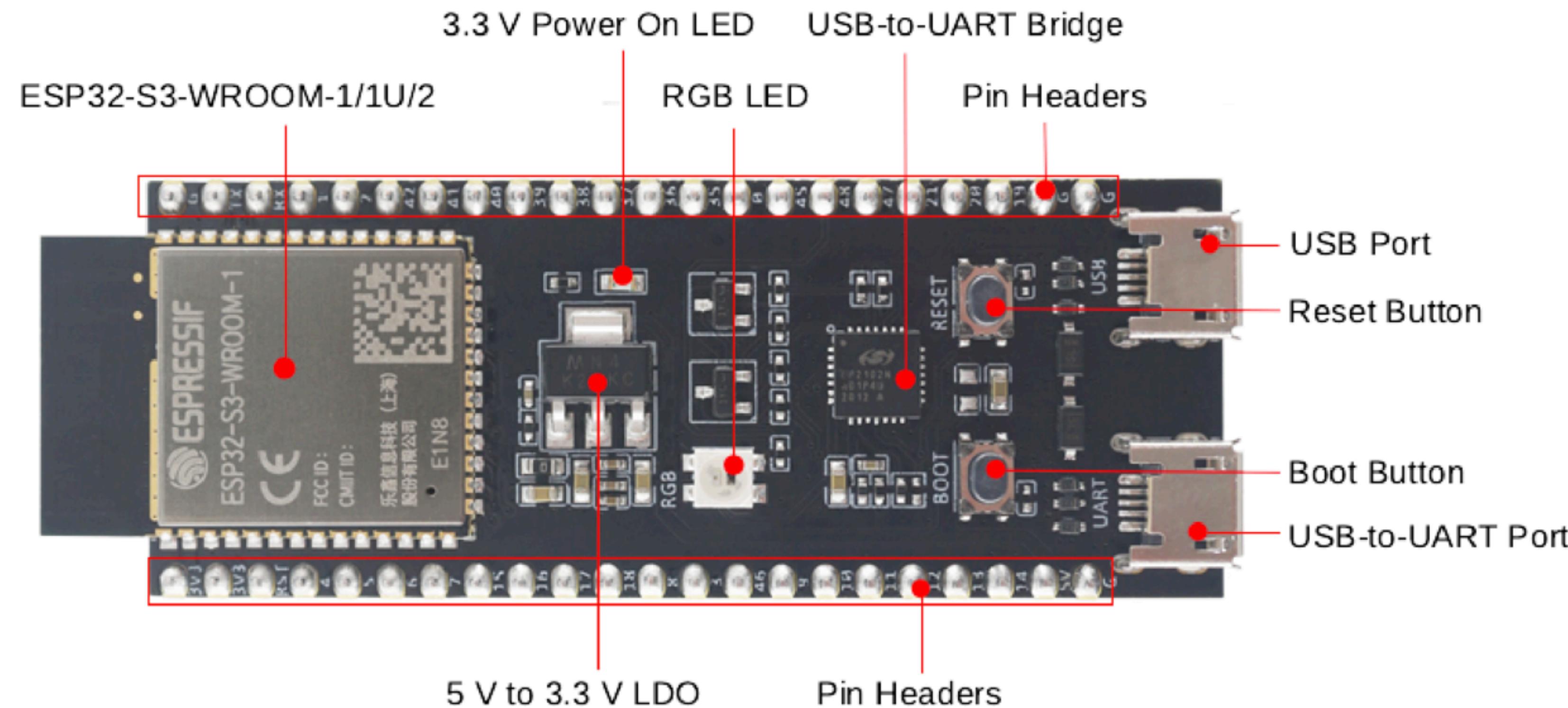




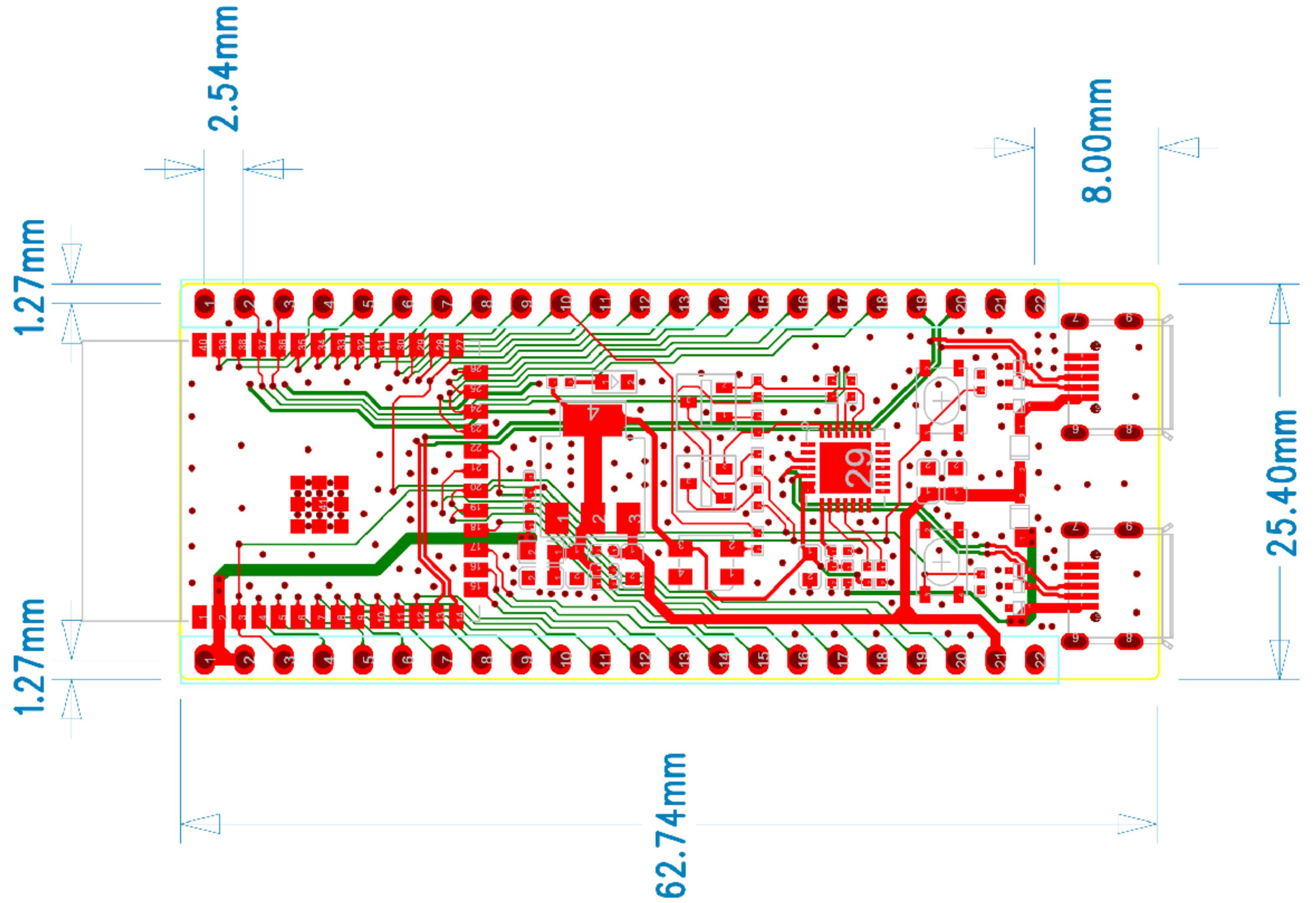




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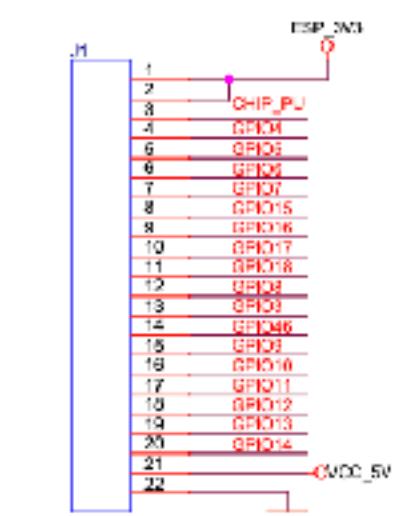
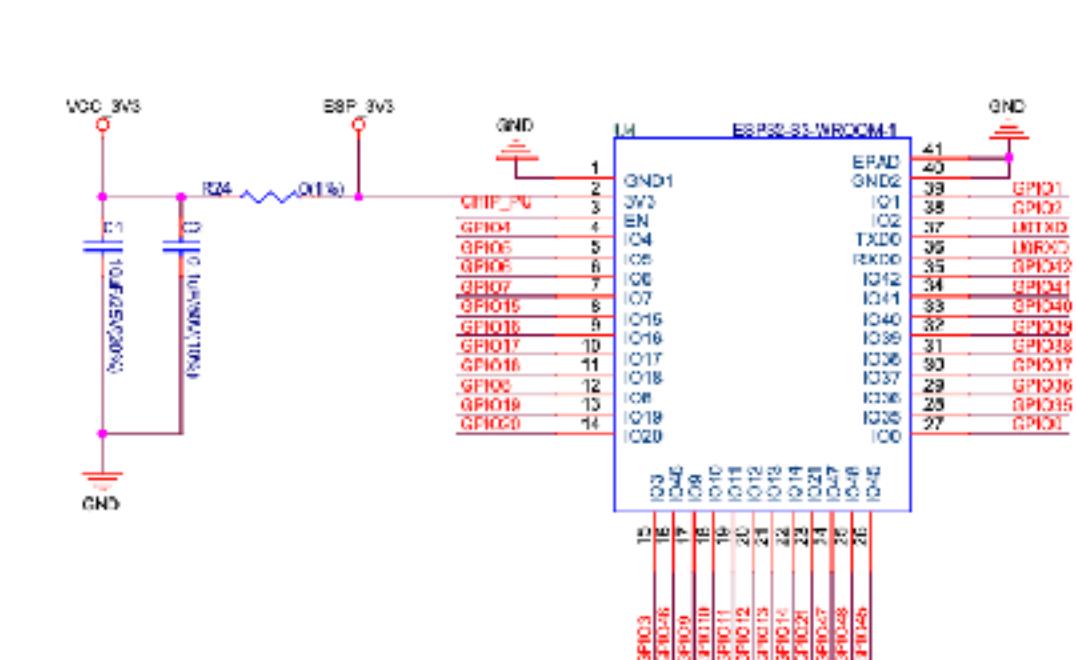
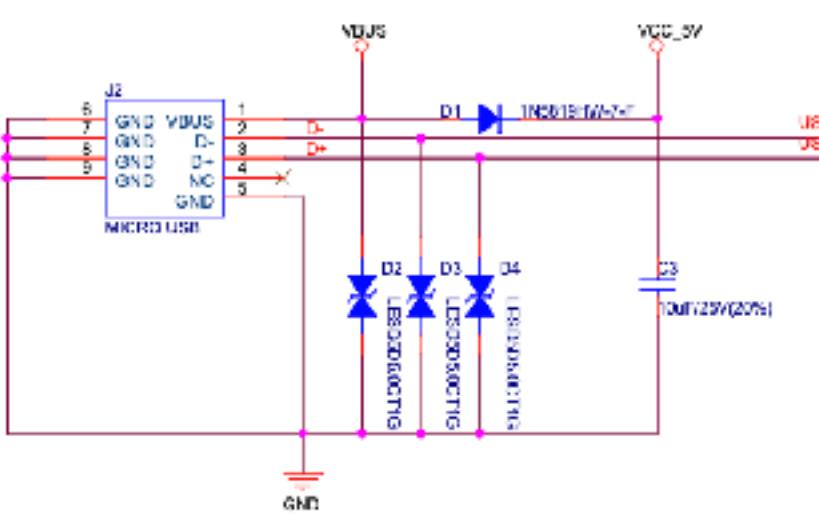


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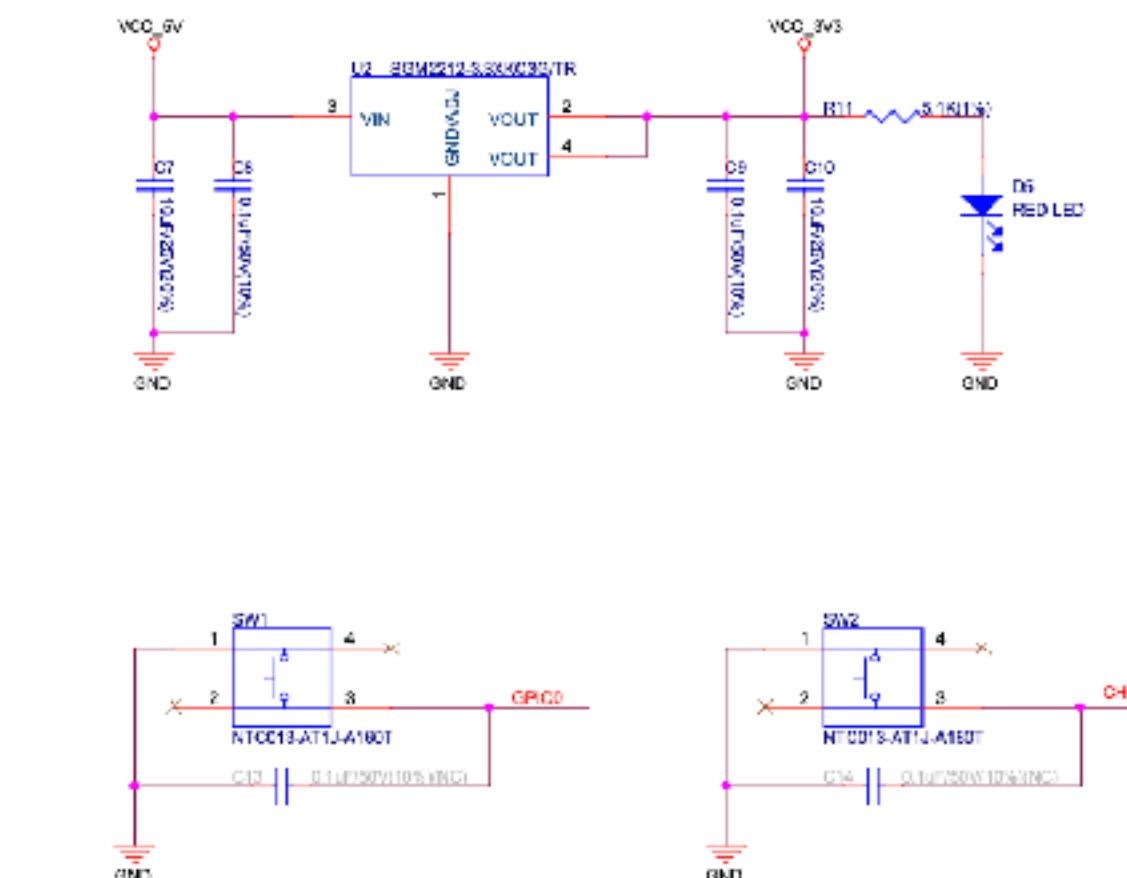
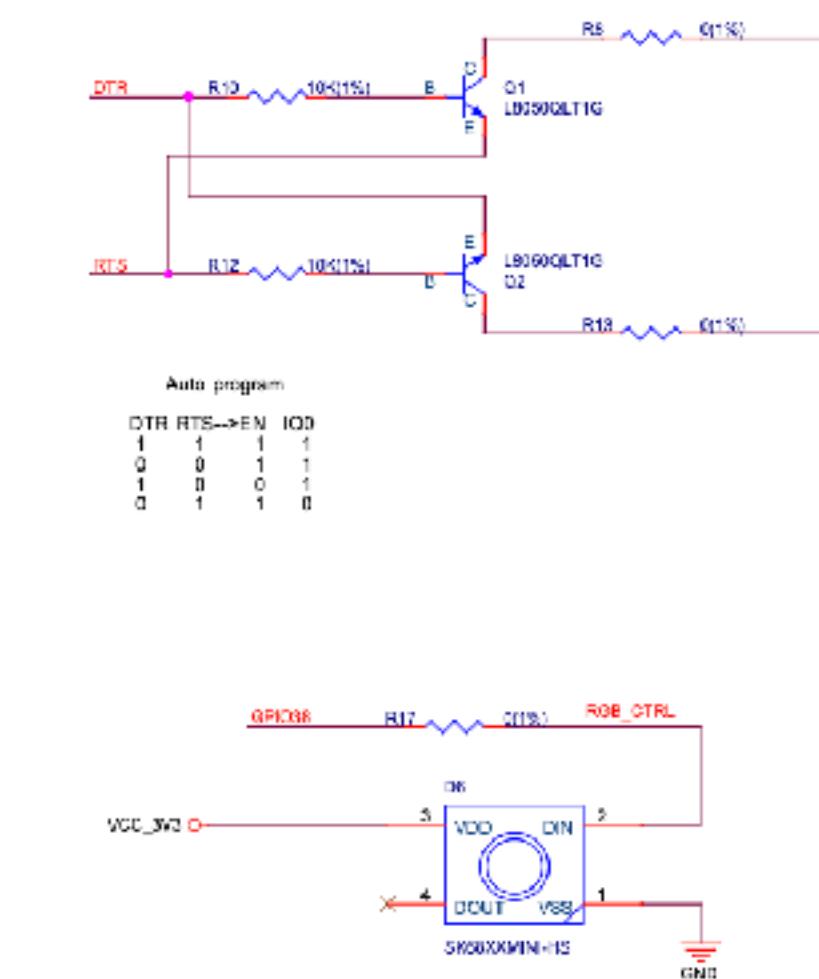
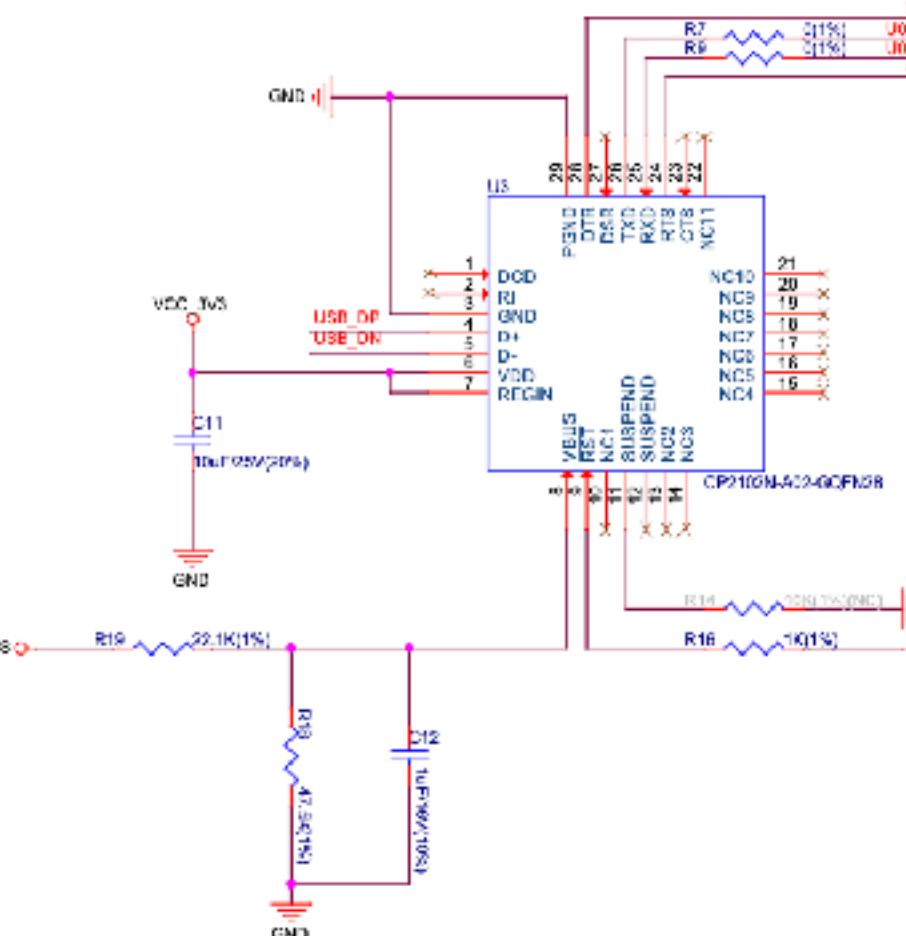
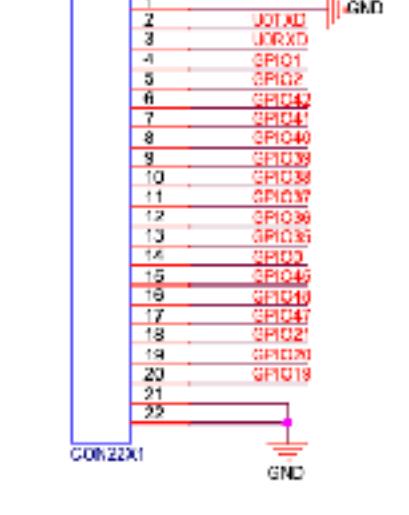
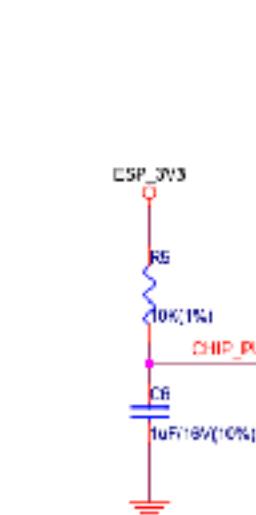
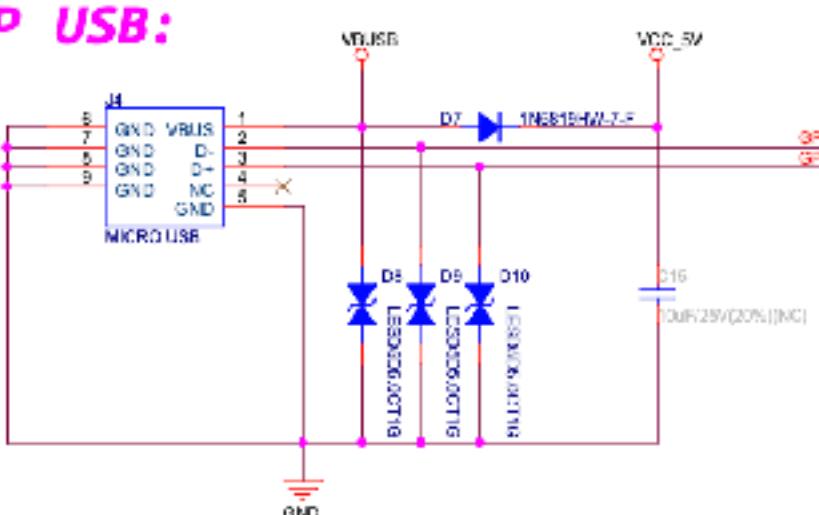


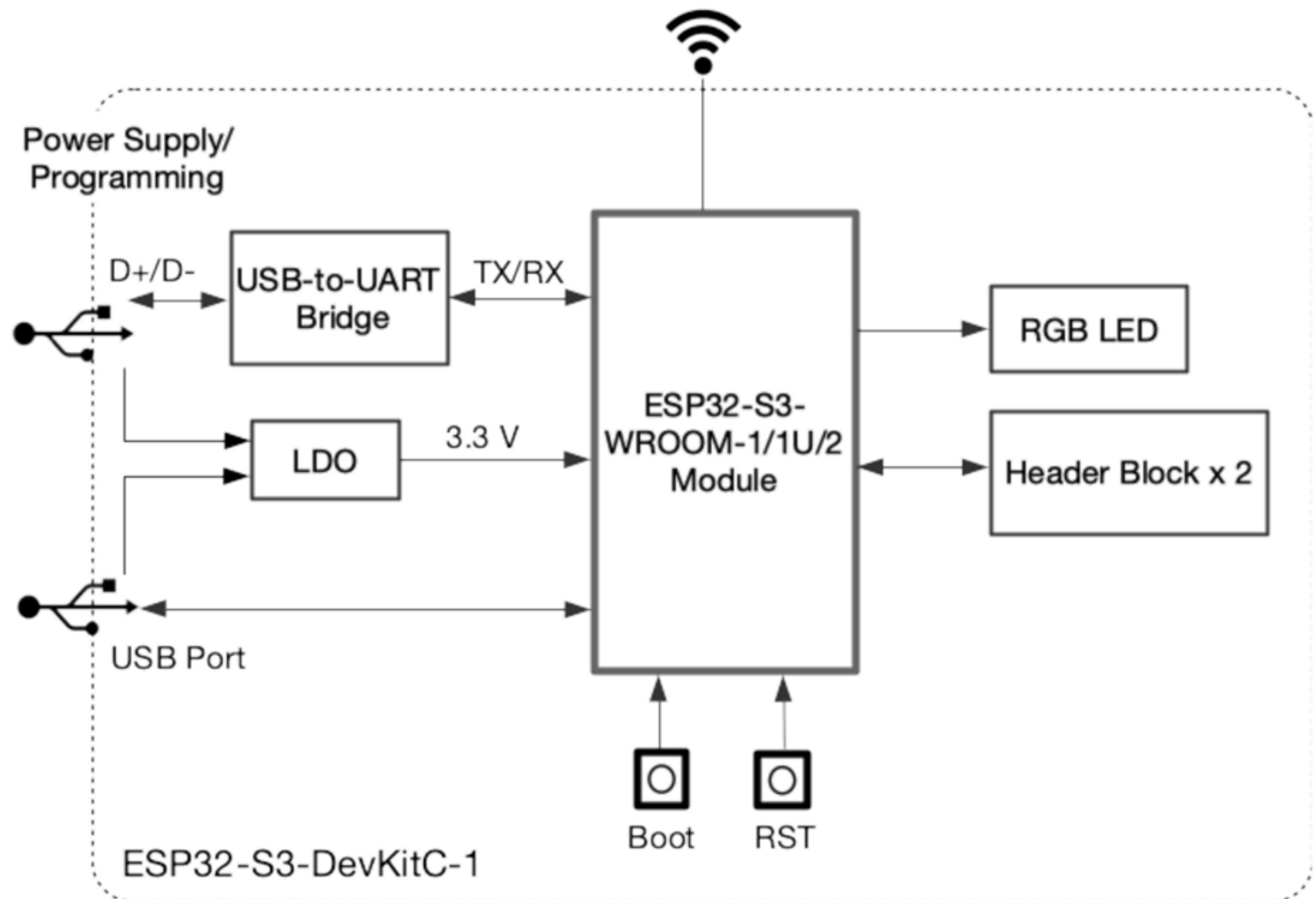
<https://docs.espressif.com/projects/esp-dev-kits/en/latest/esp32s3/esp-dev-kits-en-master-esp32s3.pdf>

USB to UART:



ESP USB:





Key Component	Description
ESP32-S3-WROOM-1/1U	ESP32-S3-WROOM-1 and ESP32-S3-WROOM-1U are two powerful, generic Wi-Fi + Bluetooth LE MCU modules that have a rich set of peripherals. They provide acceleration for neural network computing and signal processing workloads. ESP32-S3-WROOM-1 comes with a PCB antenna. ESP32-S3-WROOM-1U comes with an external antenna connector.
5 V to 3.3 V LDO	Power regulator that converts a 5 V supply into a 3.3 V output.
Pin Headers	All available GPIO pins (except for the SPI bus for flash) are broken out to the pin headers on the board for easy interfacing and programming. For details, please see Header Block .
USB-to-UART Port	A Micro-USB port used for power supply to the board, for flashing applications to the chip, as well as for communication with the chip via the on-board USB-to-UART bridge.
Boot Button	Download button. Holding down Boot and then pressing Reset initiates Firmware Download mode for downloading firmware through the serial port.
Reset Button	Press this button to restart the system.
ESP32-S3 USB Port	ESP32-S3 full-speed USB OTG interface, compliant with the USB 1.1 specification. The interface is used for power supply to the board, for flashing applications to the chip, for communication with the chip using USB 1.1 protocols, as well as for JTAG debugging.
USB-to-UART Bridge	Single USB-to-UART bridge chip provides transfer rates up to 3 Mbps.
RGB LED	Addressable RGB LED, driven by GPIO48.
3.3 V Power On LED	Turns on when the USB power is connected to the board.

LED BLINK

```
from machine import Pin
import neopixel
import time

LED_PIN = 0 # TODO

NUMBER_OF_PIXELS = 1

pixel = neopixel.NeoPixel(Pin(LED_PIN), NUMBER_OF_PIXELS)

def turnLEDOn():
    pixel[0] = (255, 255, 255)
    pixel.write()

def turnLEDOff():
    pixel[0] = (0, 0, 0)
    pixel.write()

while True:
    turnLEDOn()
    time.sleep(0.5)
    turnLEDOff()
    time.sleep(0.5)
```

LED BLINK

```
from machine import Pin
import neopixel
import time

LED_PIN = 0 # TODO

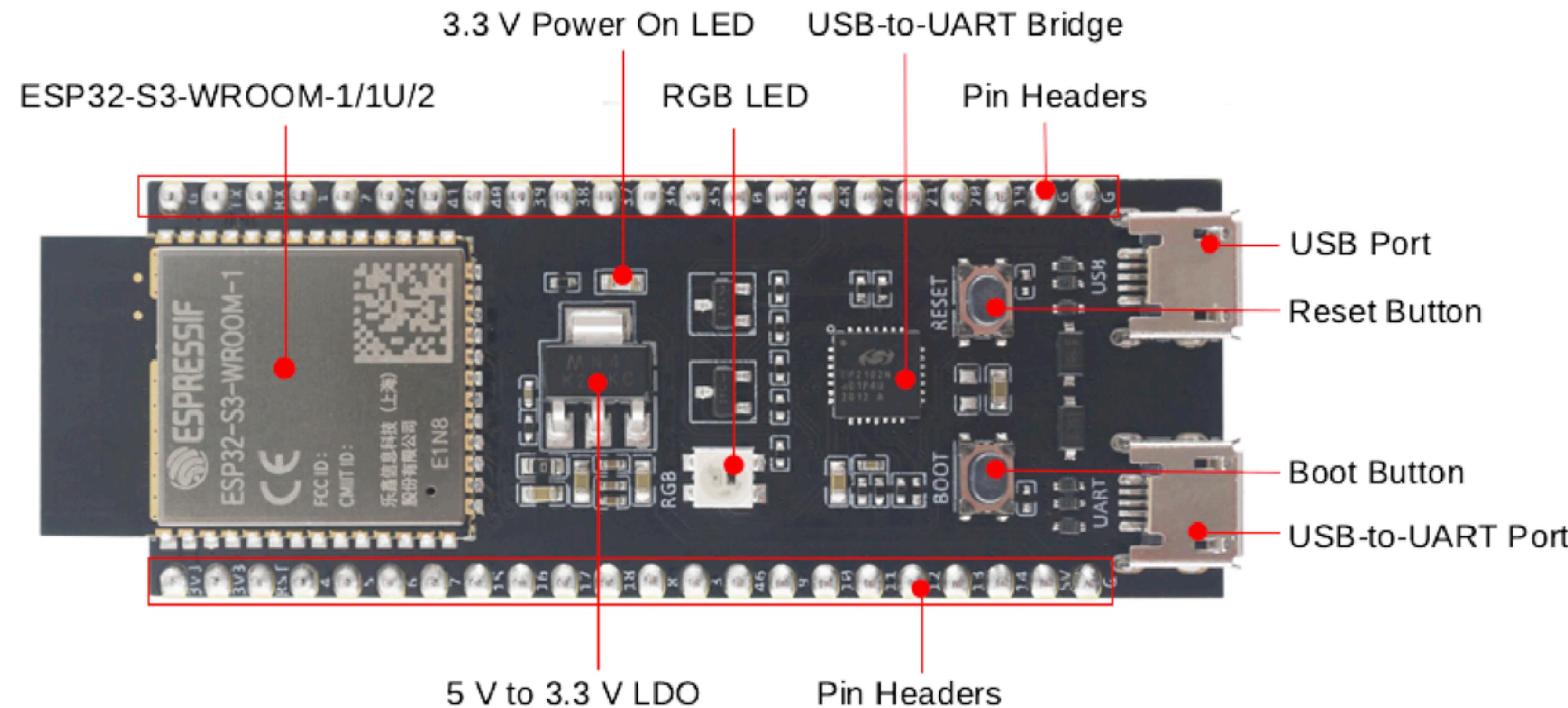
NUMBER_OF_PIXELS = 1

pixel = neopixel.NeoPixel(Pin(LED_PIN), NUMBER_OF_PIXELS)

def turnLEDOn():
    pixel[0] = (255, 255, 255)
    pixel.write()

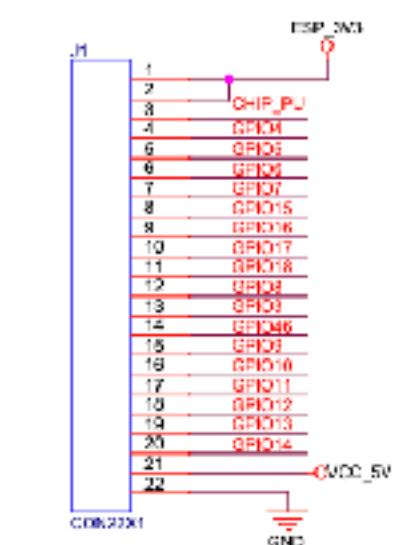
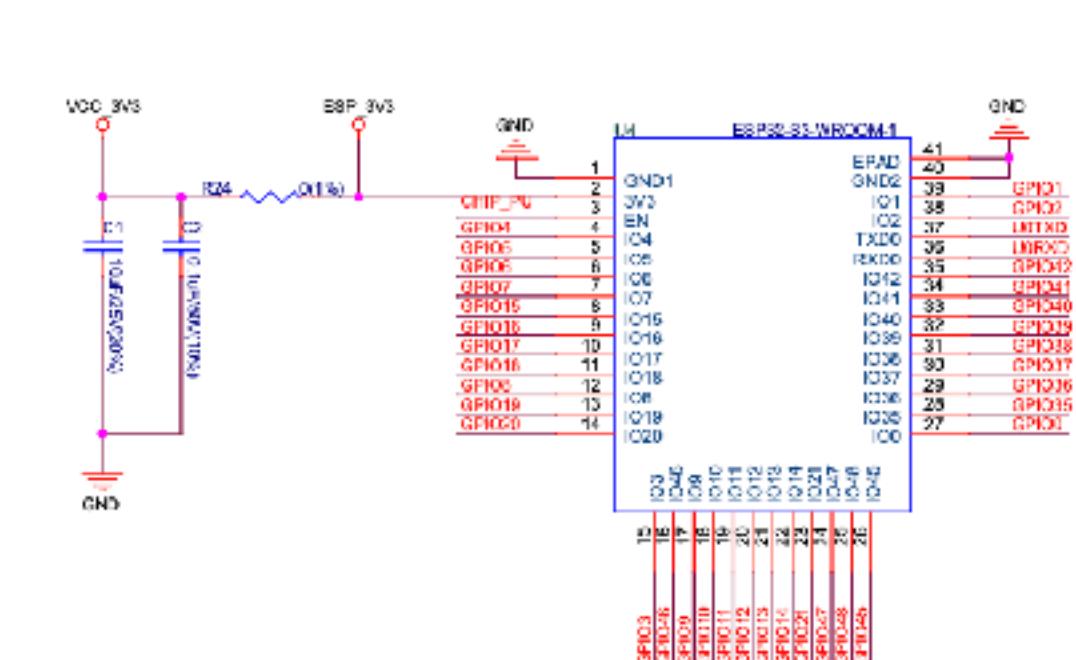
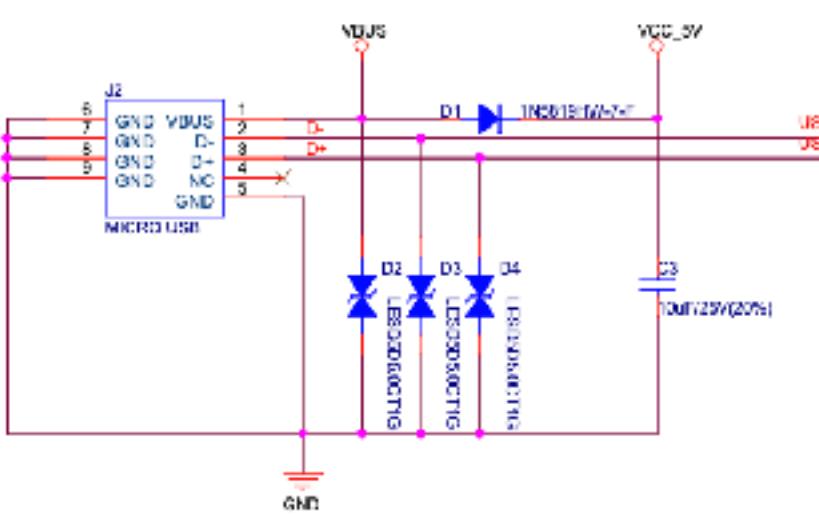
def turnLEDOff():
    pixel[0] = (0, 0, 0)
    pixel.write()

while True:
    turnLEDOn()
    time.sleep(0.5)
    turnLEDOff()
    time.sleep(0.5)
```

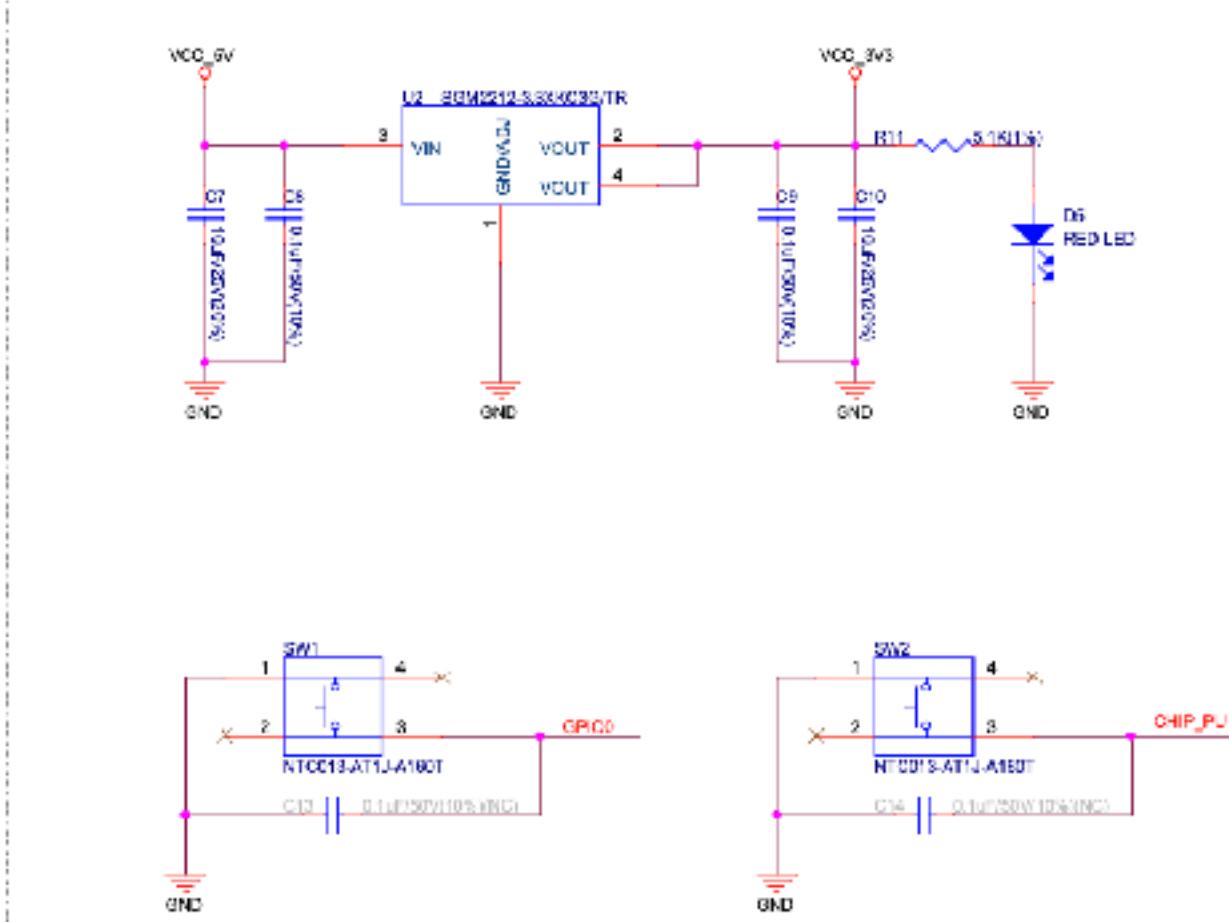
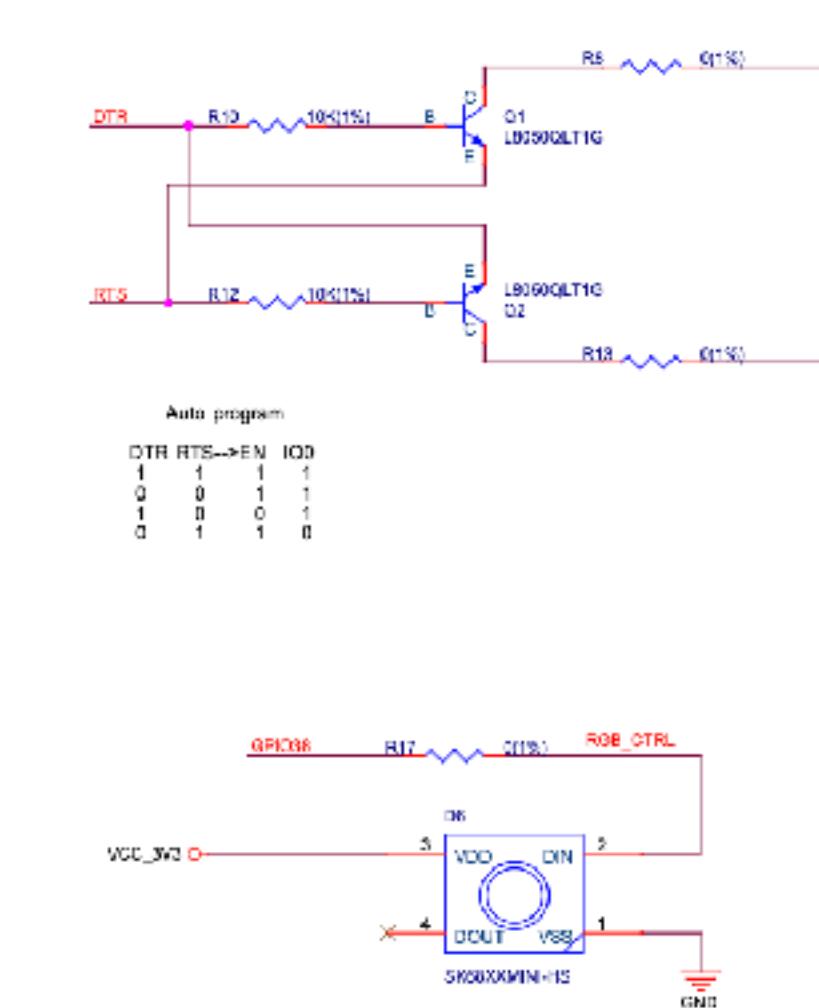
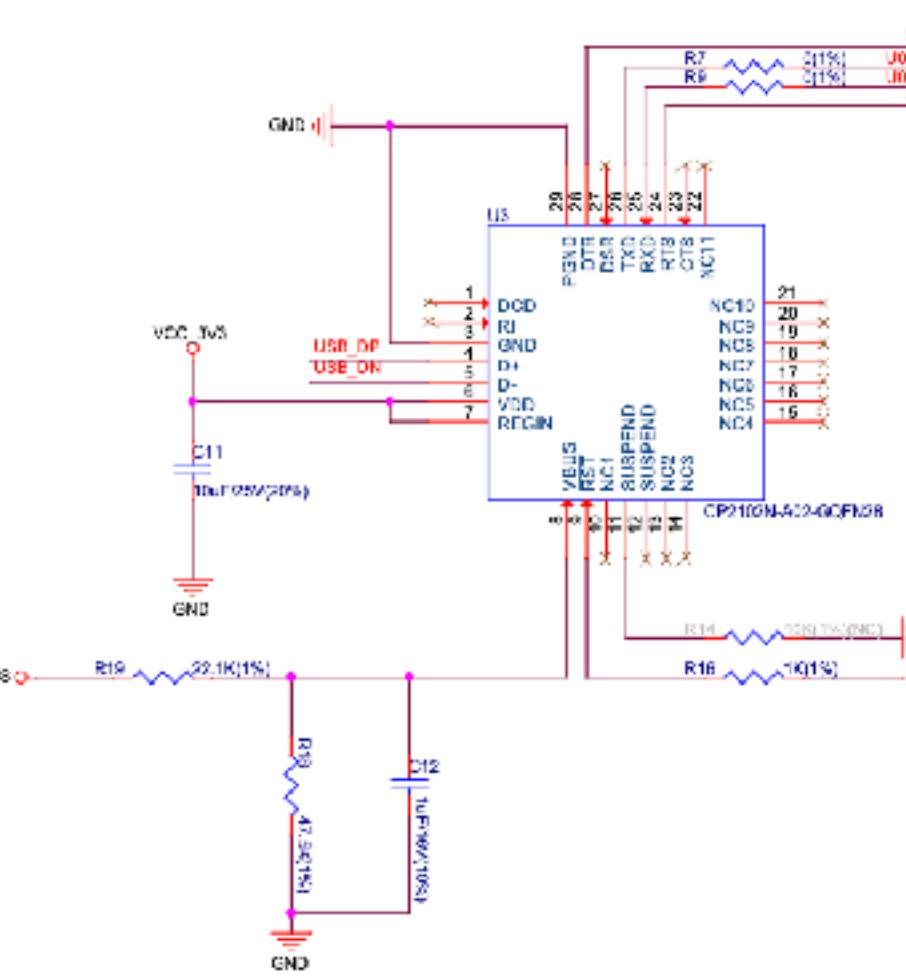
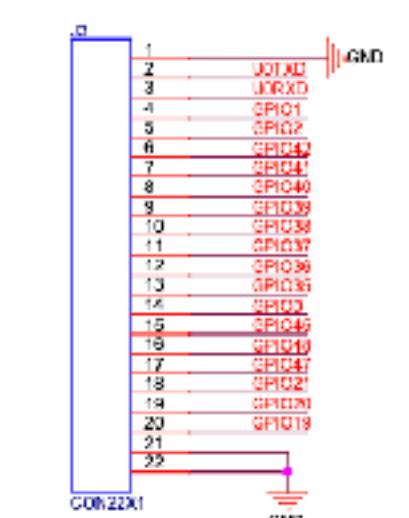
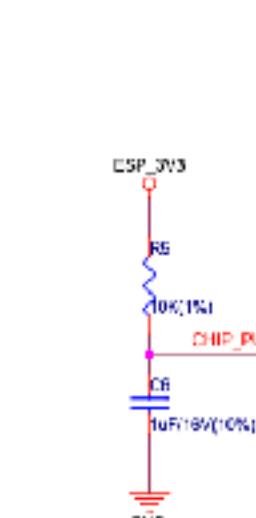
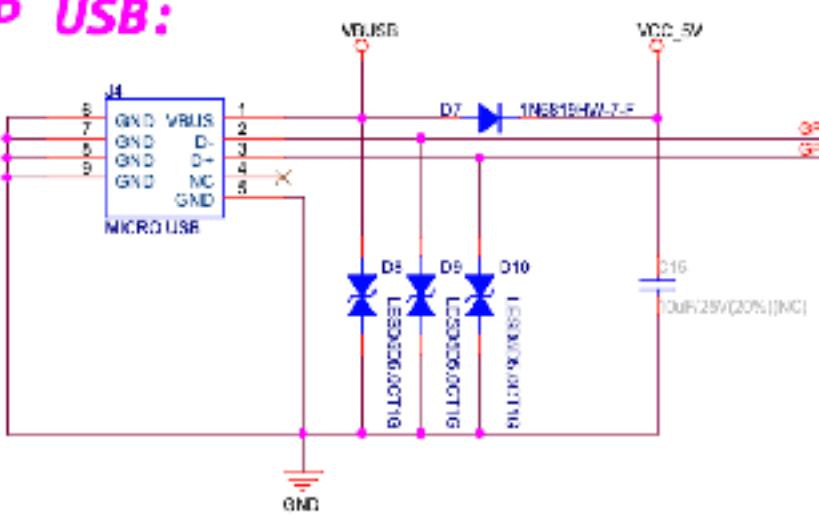


<https://docs.espressif.com/projects/esp-dev-kits/en/latest/esp32s3/esp-dev-kits-en-master-esp32s3.pdf>

USB to UART:



ESP USB:

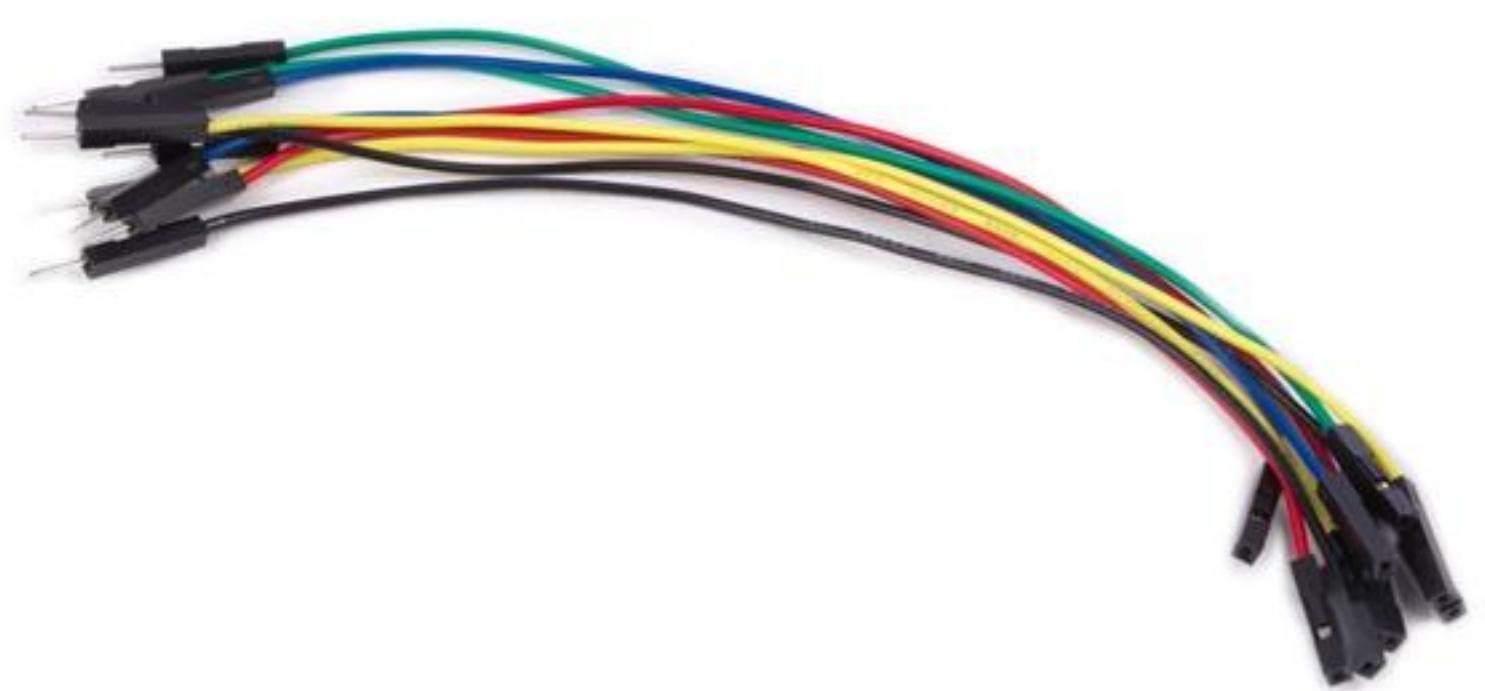


LED BLINK

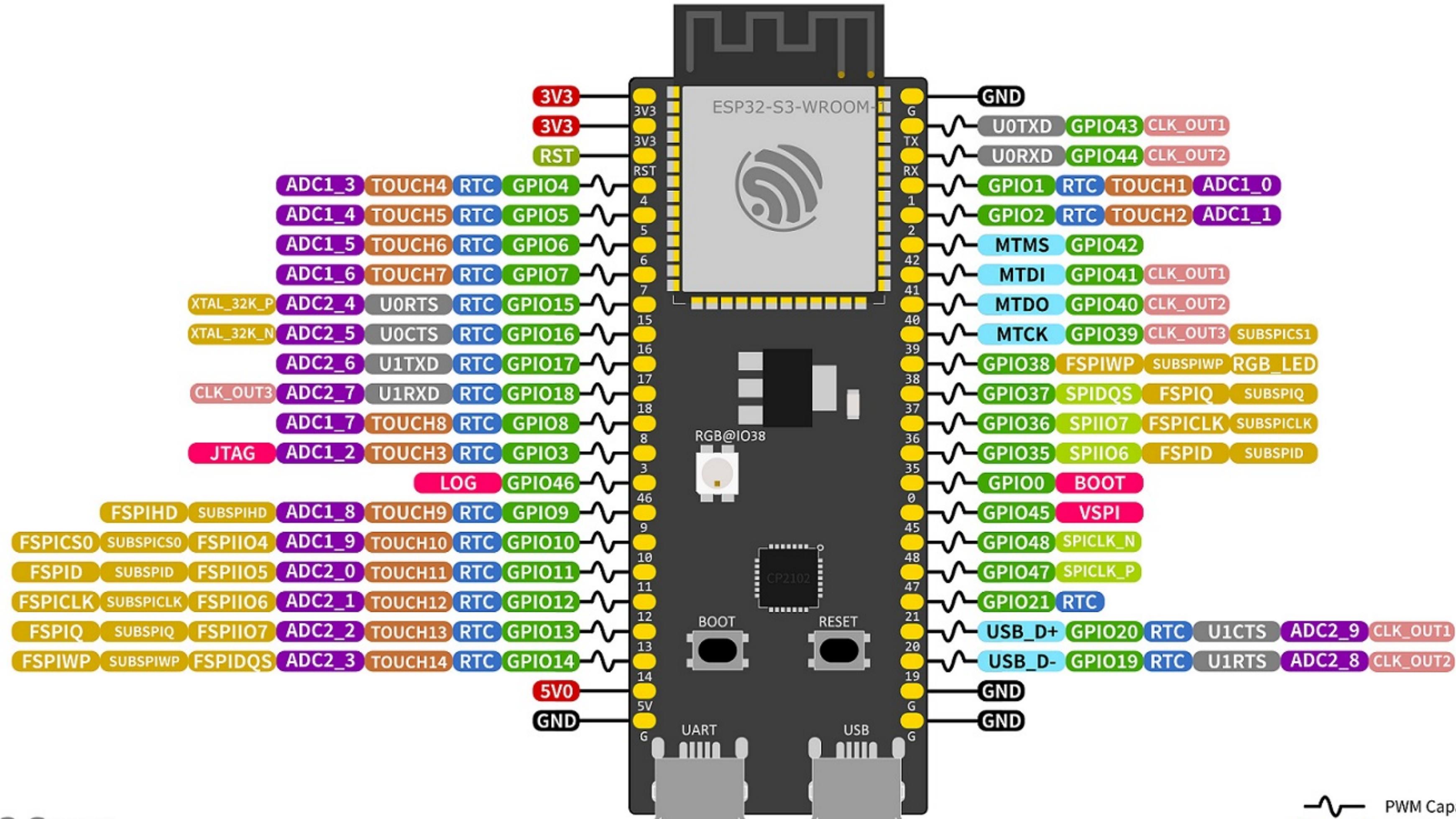
- Neopixel library
- 1 Pixel

TODO:

- To which pin is it connected?



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ESP32-S3 Specs

32-bit Xtensa® dual-core @240MHz
 Wi-Fi IEEE 802.11 b/g/n 2.4GHz + BLE 5 Mesh
 512 KB SRAM (16 KB SRAM in RTC)
 384 KB ROM
 45 GPIOs, 4x SPI, 3x UART, 2x I2C,
 14x Touch, 2x I2S, RMT, LED PWM, USB-OTG,
 TWAI®, 2x 12-bit ADC, 1x LCD interface, DVP

MISC Miscellaneous/SPI functions
CLK_OUTx Clock Output

- PWM Capable Pin**
- GPIO** GPIO Input and Output
- JTAG/USB** JTAG for Debugging and USB
- ADCX_CH** Analog-to-Digital Converter
- TOUCHX** Touch Sensor Input Channel
- OTHER** Other Related Functions
- SERIAL** Serial for Debug/Programming
- STRAP** Strapping Pin Functions
- RTC** RTC Power Domain (VDD3P3_RTC)
- GND** Ground
- PWD** Power Rails (3V3 and 5V)

SG90 Micro Servo

Servo motor for Arduino and Raspberry-Pi robotics projects.
Typical use: Model aircraft, cars and robots.
Rotates forward or backwards to a given position.
Bidirectional rotation - pulse duration determines the direction.

Item no: 87897 single pack, 90720 pack of 4 pcs.

Model no: SG90

Weight: 11g.

Rotation Angle: 180°

Torque: 1,8 kg/cm (11 Ncm) (at 4,8 V).

Torque: 2,4 kg/cm (15 Ncm) (at 6 V).

Speed: 0,12 sec/60° (at 4,8 V).

Speed: 0,10 sec/60° (at 6 V).

Linear response to PWM for easy ramping.

Operating voltage: 4,8-6 V.

Operating temperature: -10 to 50 °C.

Current max: < 600 mA.

Cable length: 250 mm.

Connector type: JR / Futaba / GWS

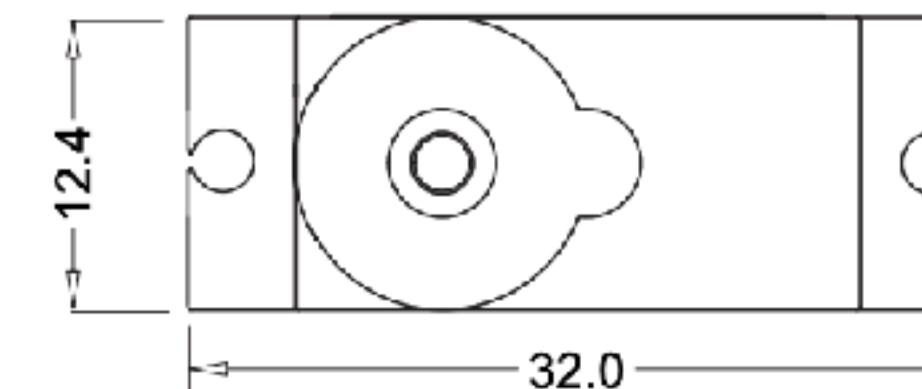
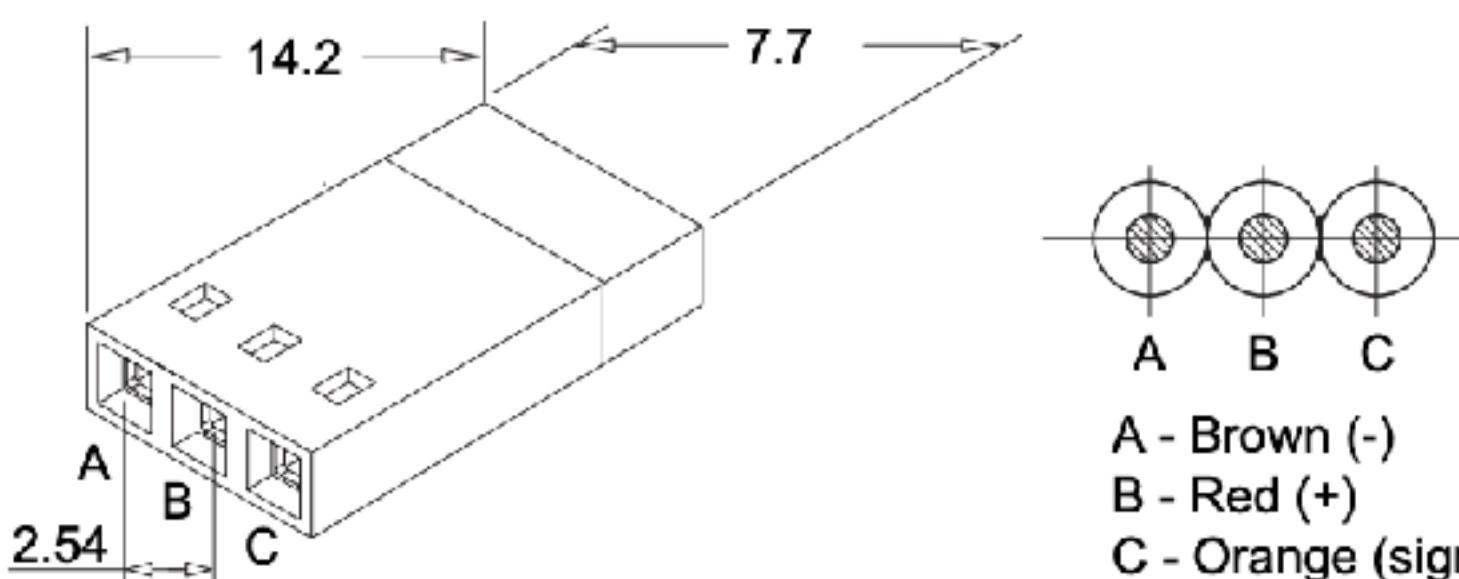
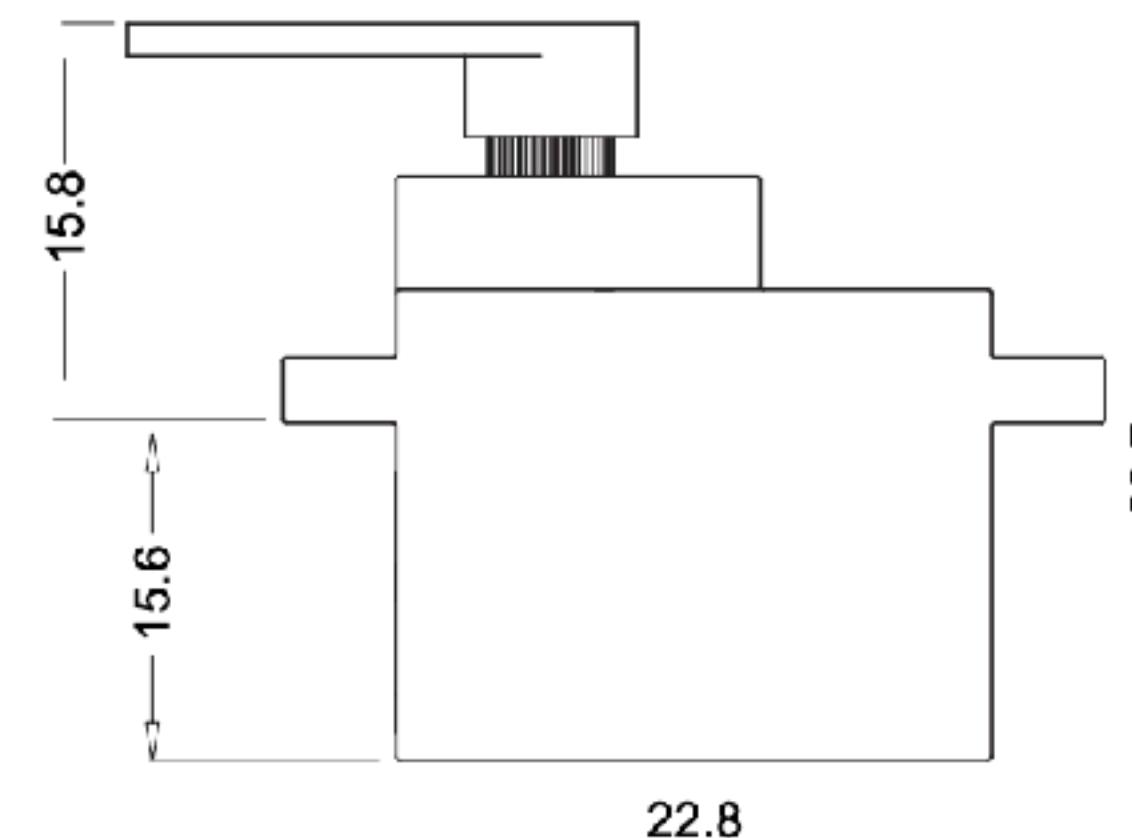
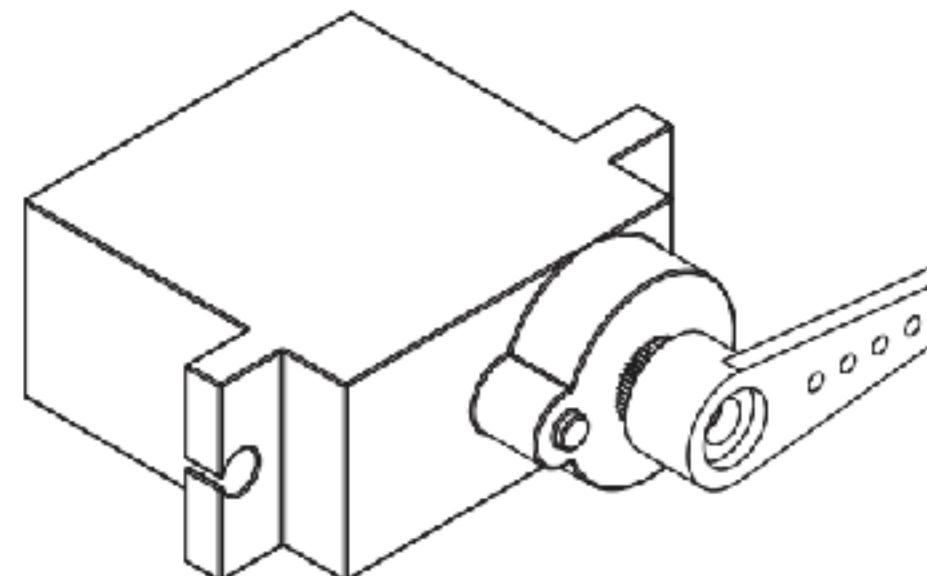
Breadboard friendly connector 2,54 mm pitch.

Connector wire gauge: 28 AWG.

Control system: PWM (Pulse Width Modulation)

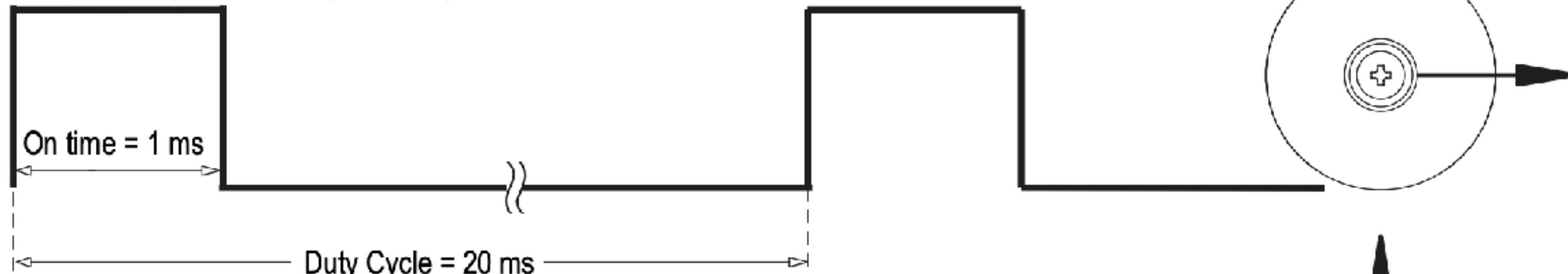
Pulse Frequency / Duty cycle: 50 Hz / 20 ms square wave

Direction w/ Increasing PWM Signal: Counter Clockwise

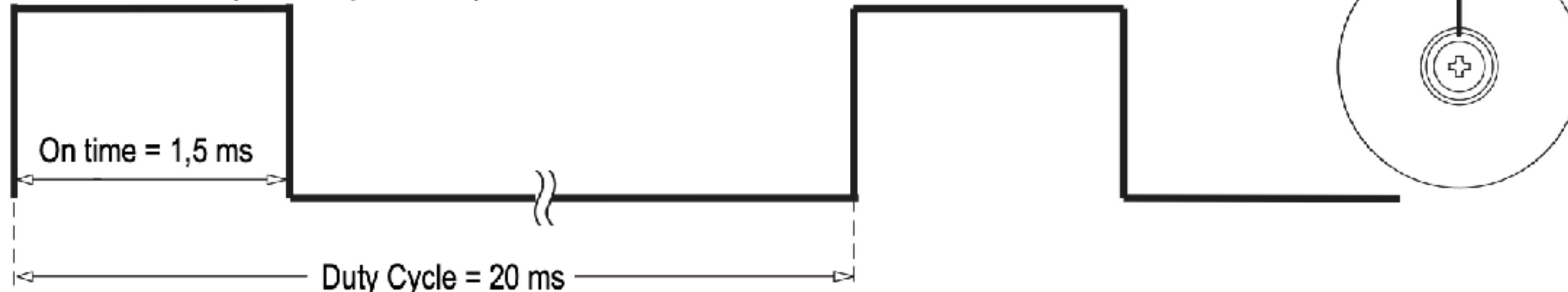


180° servo PWM signal timings

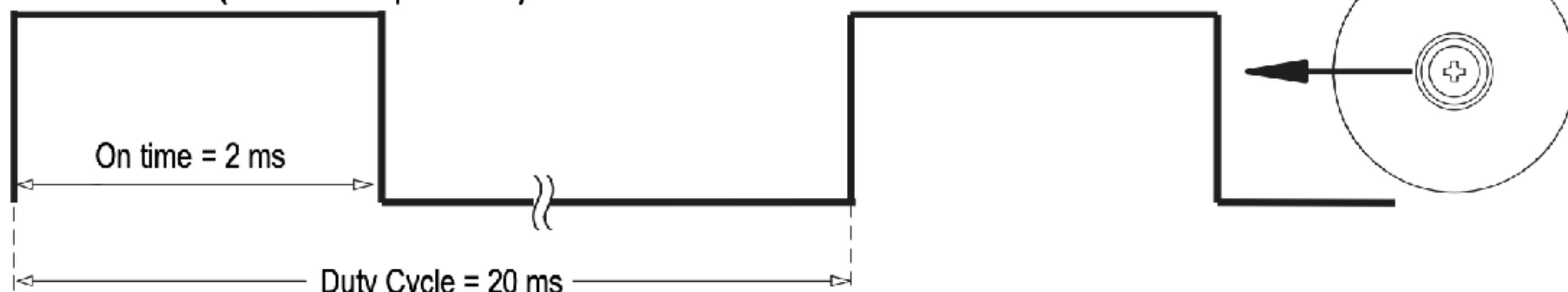
1 ms = 0° (minimum position)



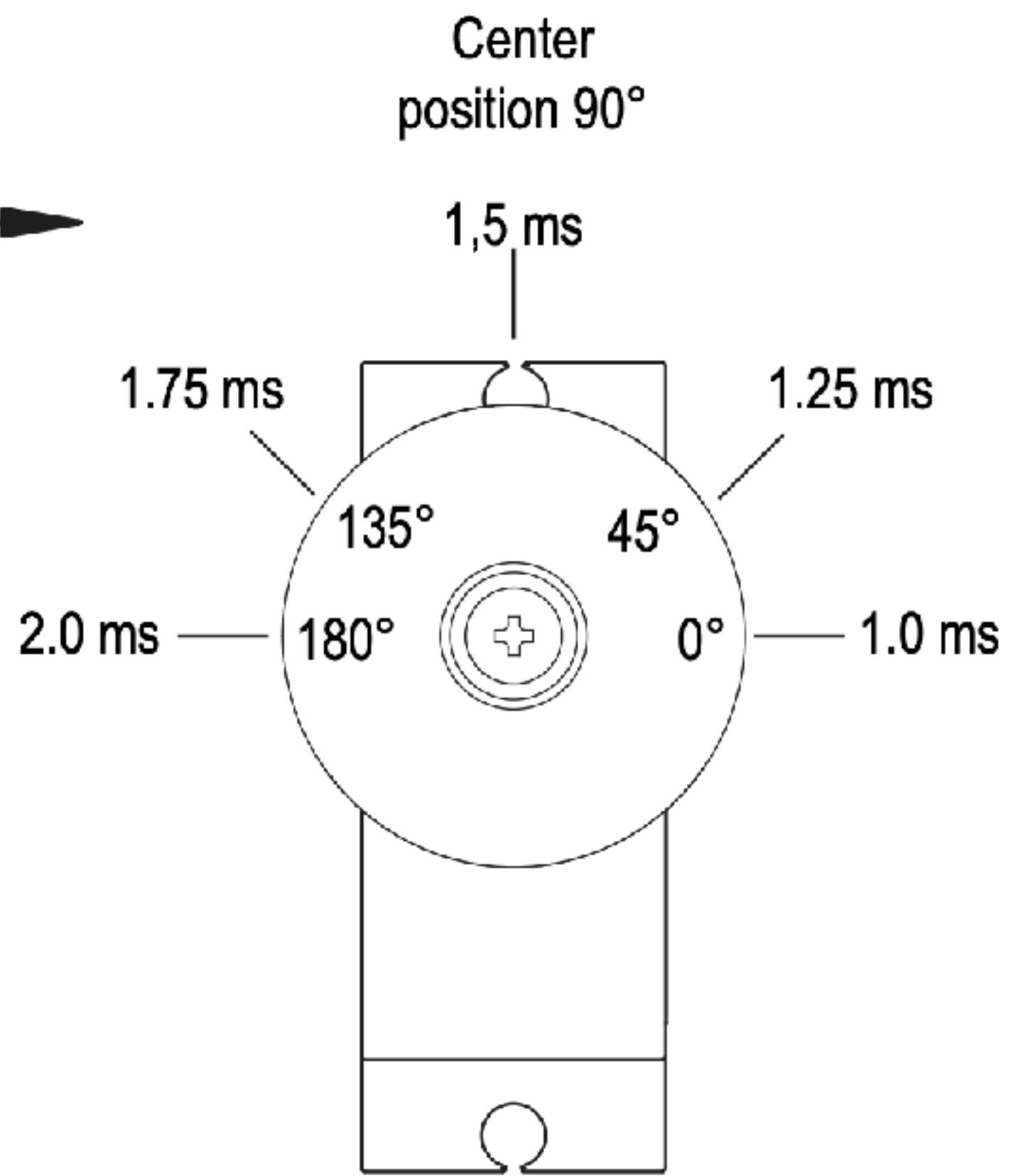
1,5 ms = 90° (center position)



2 ms = 180° (maximum position)



Center
position 90°





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