



MCU

File: MCU.kicad_sch

SENSORS

File: SENSORS.kicad_sch

POWER SUPPLY

File: POWER SUPPLY.kicad_sch

MECHANICS

File: MECHANICS.kicad_sch

SPŠ NA PROSEKU

Sheet: /
File: sumec.kicad_sch

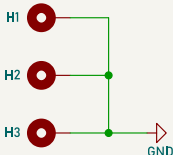
Title: SUMEC SMD

Size: A4	Date:	Rev:
KiCad E.D.A. 8.0.0		Id: 1/5

MOUNTING HOLES

Mounting holes M3


Mounting holes that are screwed to the threaded holes on the chassis.



TESTED - WORKS, INSPECTED

MAIN SWITCH

Main switch is at the top of the robot for ease of access




FOOTPRINT CREATED FROM 3D MODEL, INSPECTED

TEST BUTTON

Tactile swicth (button)

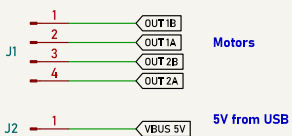
Used for starting test code program

LED is used as indicator of starting the said program
- (subject to change depending on different usage of LED, for example; multiple flashing for trouble-shooting or indicating)



TESTED - WORKS, INSPECTED

CONNECTORS



INSPECTED

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SUMEC

MINISUMO ROBOT

ESP32 - S3 - WROOM1

GPIO0 has an internal pullup resistor, so if it is left unconnected then it will pull high.
GPIO0, GPIO45, and GPIO46 are connected to the chip's internal weak pull-up/pull-down resistors at chip reset. These resistors determine the default bit values of the strapping pins. Also, these resistors determine the bit values if the strapping pins are connected to an external high-impedance circuit.

Default Configuration of Strapping Pins

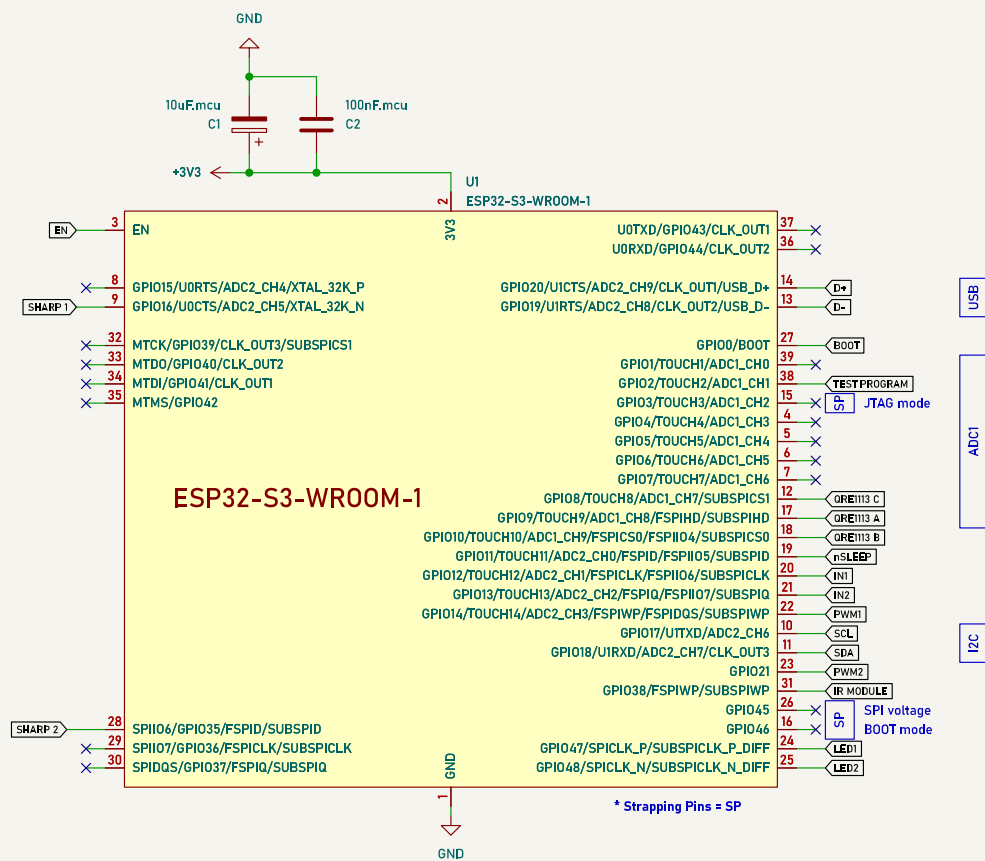
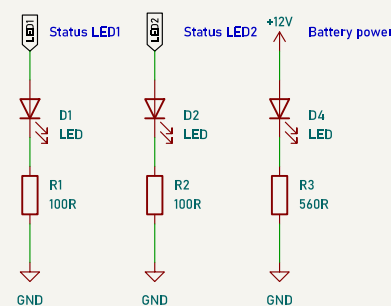
Strapping Pin	Default Configuration	Bit Value
GPIO0	Pull-up	1
GPIO3	Floating	-
GPIO45	Pull-down	0
GPIO46	Pull-down	0

Typically these can be used, but you need to make sure they are not in the wrong state during boot.

gpio.0 Boot Mode. Weak pullup during reset. (Boot Mode 0=Boot from Flash, 1=Download)
gpio.3 JTAG Mode. Weak pull down during reset. (JTAG Config)
gpio.45 SPI voltage. Weak pull down during reset. (SPI Voltage 0=3.3v 1=1.8v)
gpio.46 Boot mode. Weak pull down during reset. (Enabling/Disabling ROM Messages Print During Booting)

ESP32: Only pins that support both input & output have integrated pull-up and pull-down resistors. Input-only GPIOs 34-39 do not.

ESP32-S3 Datasheet



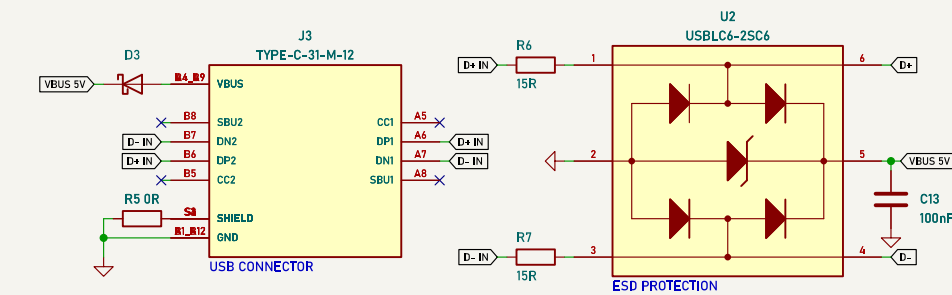
PINOUT INPSECTED

USB

USB Type-C Connector

Data transfer USB connector connected to ESP32 using CDC method

GPIO	USB
20	D+ (green)
19	D- (white)
GND	GND (black)
NC	+5V (red)



TESTED - WORKS, INSPECTED

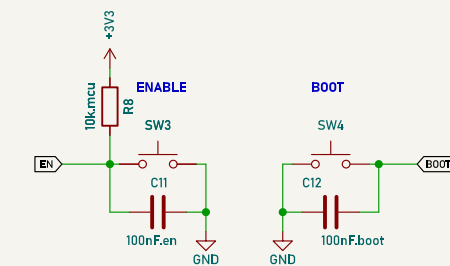
PUSH BUTTONS

Buttons for BOOT and ENABLE functions.

If the device does not support the auto download mode, you need to get into the download mode manually. To do so, press and hold the BOOT button and then press the RESET button once. After that release the BOOT button.

EN=RESET, BOOT=bootloader mode

Enable (EN) is the 3.3V regulator's enable pin. It's pulled up, so connect to ground to disable the 3.3V regulator. This means that you can use this pin connected to a pushbutton to restart your ESP32, for example.

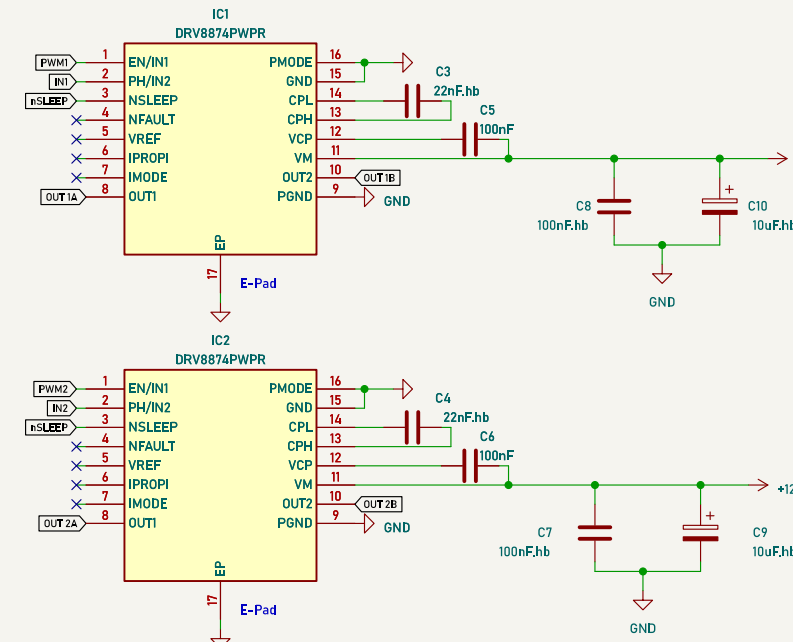


TESTED - WORKS, INSPECTED

H-BRIDGE / DRIVER

(nFault)Fault indicator output. Pulled low during a fault condition. Connect an external pullup resistor for open-drain operation.

H-bridge control input mode.
Sleep mode input. Logic high to enable device. Logic low to enter low-power sleep mode.
0.1-µF bypass capacitor to ground, as well as sufficient Bulk Capacitance rated for VM.
Analog current output proportional to load current.
Overcurrent protection - Current regulation



INPSECTED

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IR MODULE

IR LED Reciver module

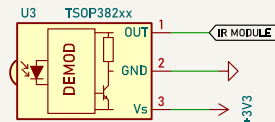
Operating voltage: 2.7V to 5.5V

Frequency: 38kHz

High immunity against ambient light.

For more than 1 input use - Hexadecimal code

Used as a main program starter



TESTED - WORKS, INSPECTED

SENZORY ČÁRY

Miniature Reflective Object Sensor - QRE1113

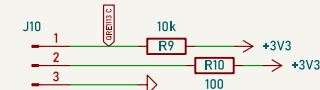
IR reflectance sensor is comprised of two parts - an IR emitting LED and an IR sensitive phototransistor.

Analog output

A 100k resistor is placed in series with the LED to limit current. A 10k resistor pulls the output pin high, but when the light from the LED is reflected back onto the phototransistor the output will begin to go lower.

2 front sensors will be connected to the "QRE MiniBoard", rear sensor will be connected using the same connector.

MIRRORED



INSPECTED

conn molex 4pin picoblade pro zadni QRE, 2 conn 1, pro predni board, a 2. pro samostatni qre.

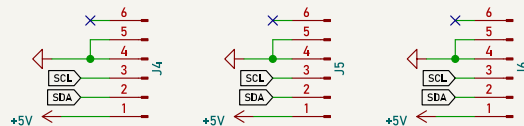
DISTANCE SENSORS

Time-of-Flight(ToF) laser-ranging module - TF-Luna COMMUNICATION PROTOCOL: I²C

When pin 5 is connected to ground, TF-Luna enters I2C mode, then its pin 2 is used as SDA data and pin 3 is the SCL clock sending data.

Addresses are saved using Nat Simak's program.

TF-LUNA MANUAL



INSPECTED

DISTANCE SENSORS - SIDE

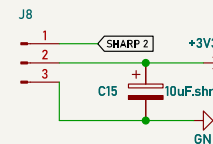
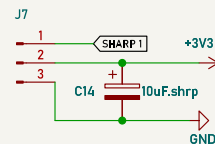
Digital distance sensor - Sharp GP2Y0D810Z0F

Sensor detects objects between 2 cm and 10 cm

Low when detecting an object, high otherwise.

Frequency - 390 Hz

Operating voltage 2.7V - 6.2V



INSPECTED

Description about Line Sequence and Connection

No.	Function	Description
1	+5V	Power supply
2	SDA	Serial data
3	SCL	Serial clock
4	GND	Ground
5	Configuration input	Default: I2C mode (pin 5 to GND) Serial port: I2C mode (pin 5 to +5V)
6	Monitoring output	Default: I2C mode (pin 6 to GND) Serial port: I2C mode (pin 6 to +5V)

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XT30M CONNECTOR

XT-30 Connector (male)

*Connector with 2mm bullets contacts for currents up to 30 A.
Gold-plated contacts
Non-interchangeable polarity.
connected with XT-30 female type connector that is wired to the battery*

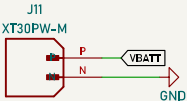
Battery specs:

- 2S LiPo
- 3.7V nominal voltage on one cell
- 8,4 in total (4,2 fully charged)
- 400mAh

1 Bought and 1 Home-made (Terrorist-like)

TESTED - WORKS, INSPECTED

J11
XT30PW-M



STABILISER

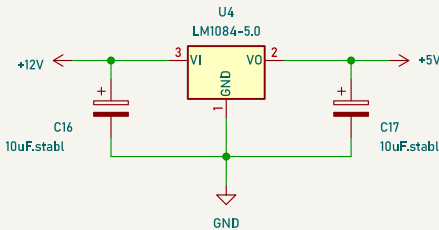
Texas Instruments

2 LDO Voltage Regulators
5A - 3.3V and 5V.

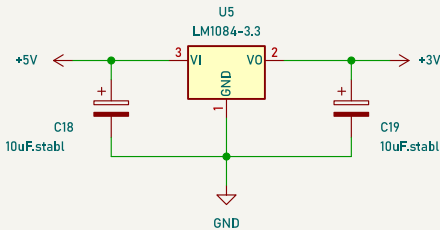
LM1084IS-5.0/NOPB 5V
LM1084IS-3.3/NOPB 3.3V

Using TO-263-3 footprint

U4
LM1084-5.0



U5
LM1084-3.3



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