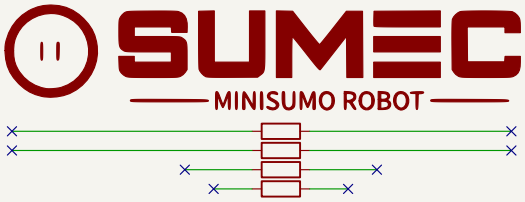


MCU

File: MCU.kicad_sch

SENSORS

File: SENSORS.kicad_sch

POWER SUPPLY

File: POWER SUPPLY.kicad_sch

MECHANICS

File: MECHANICS.kicad_sch

SUMEC MK III aka SMD-V2 board
Made by bismarx-v1
CONTACT: Savva Popov, savva.popov.sp@gmail.com, +420 605 570 366
Made in Prague, Czech Republic
SPŠ NA PROSEKU

Sheet: /
File: sumec.kicad_sch

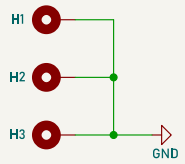
Title: SUMEC_MK_III

Size: A4	Date:	**Rev:**
KiCad E.D.A. 8.0.4		Id: 1/5

MOUNTING HOLES

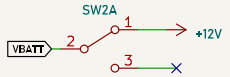
Mounting holes M3

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



MAIN SWITCH

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



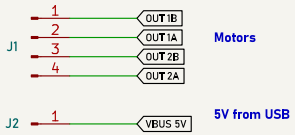
TEST BUTTON

Tactile swicth (button)

Used for starting test code program

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

CONNECTORS



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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

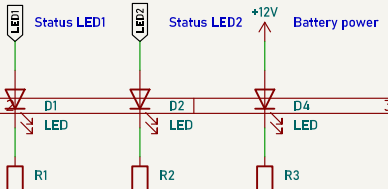
Strapping Pin	Default Configuration	Bit Value
GPIO0	Pull-up	1
GPIO3	Floating	-
GPIO45	Pull-down	0
GPIO46	Pull-down	0

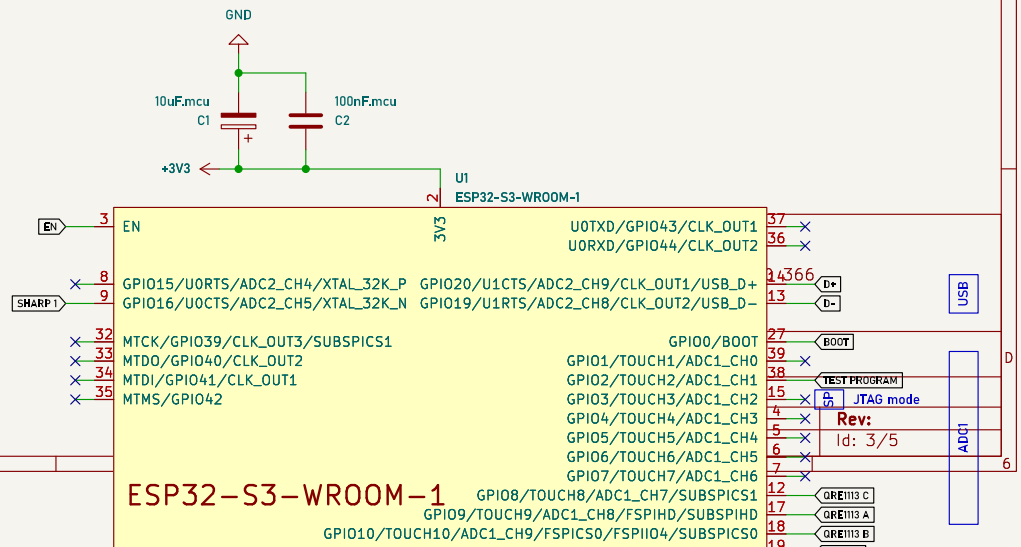
Typically these can be used, but you need to make sure they are not in the wrong state during boot.

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



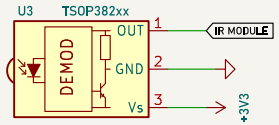


IR MODULE

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



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 100Ω resistor is placed in series with the LED to limit current. A 10kΩ 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.

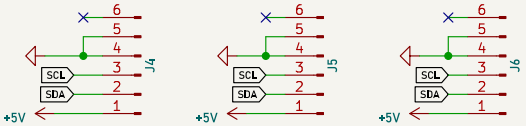
DISTANCE SENSORS

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.

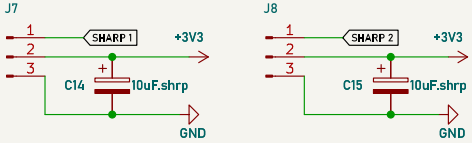
TF-LUNA MANUAL



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



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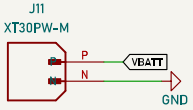
XT30M CONNECTOR

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)



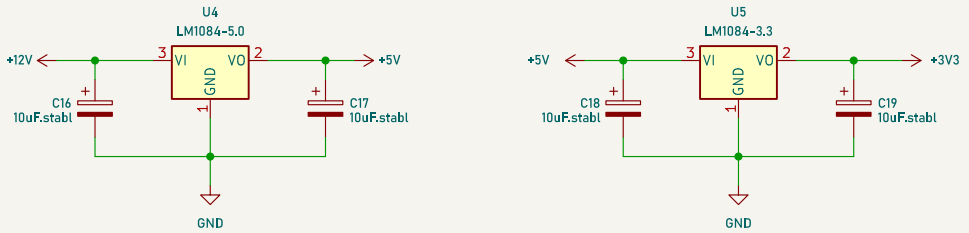
STABILISER

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



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