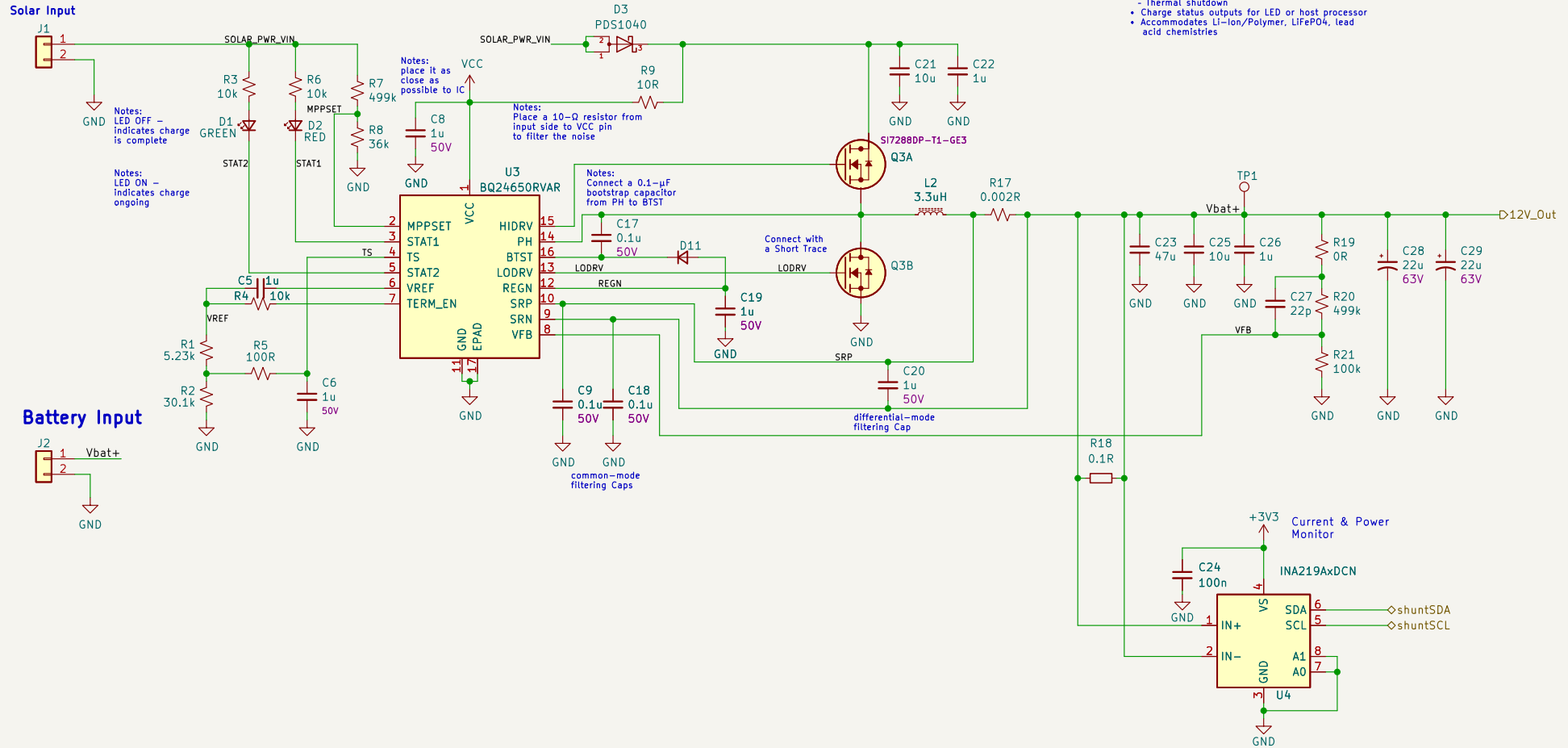


MKULIMA IOT DEVICE		
Project Lead: Peter Kirumba		
Designed By:		
Checked By:		
Sheet: /		
File: mkulima_hardware.kicad_sch		
Title: MKULIMA IOT DEVICE		
Size: A4	Date: 2022-10-26	Rev: v01
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# SOLAR CHARGER CONTROLLER (MPPT CAPABILITY)

- Features:
- 5-V to 28-V Input solar panel
  - Safety
    - Input overvoltage protection
    - Battery temperature-sensing
    - Battery absent detection
    - Thermal shutdown
  - Charge status outputs for LED or host processor
  - Accommodates Li-Ion/Polymer, LiFePO4, lead acid chemistries



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 Project Lead: Peter Kirumba  
 Designed By:  
 Checked By:

Sheet: /solar\_mppt\_power\_supply/  
 File: solar\_mppt\_power\_supply.kicad\_sch

**Title: MKULIMA IOT DEVICE**

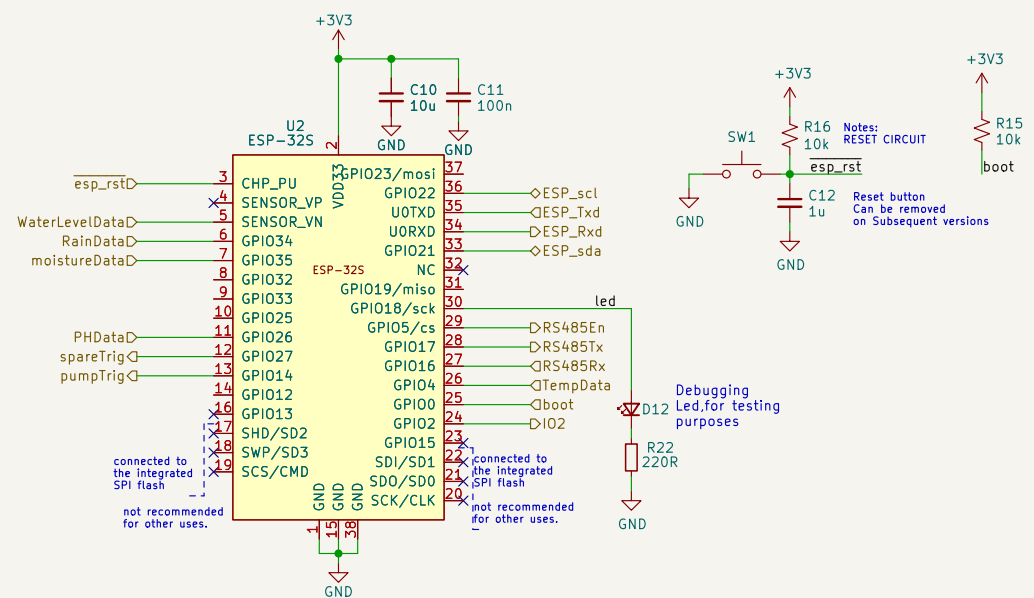
Size: A4 Date: 2022-10-26

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**Rev: v01**

Id: 2/7

Controller Logic Section Enhanced Over WiFi & Bluetooth SoC (ESP-32S)



DESIGN NOTES / USE GUIDE

DERIVED FROM VERIFIED SCHEMATIC SRC: Datasheet reference/SparkFun & Adafruit Modules

DESCRIPTION:  
ESP32 Basic Interface Circuit

RECOMMENDED FOR: All devices that Need a Power MCU with WiFi Capabilities

HIRACHICAL SHEET STATUS: "ADD THE NEW STATUS OF THE THE DESIGN I.E  
verified, in testing etc"

STATUS\_1:VERIFIED

STATUS\_2:YES OK!

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Project Lead: Peter Kirumba  
Designed By:  
Checked By:

Sheet: /ESP32\_logic\_control/  
File: ESP32\_logic\_control.kicad\_sch

Title: MKULIMA IOT DEVICE

Size: A4 Date: 2022-10-26  
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Id: 3/7

**USB To TTL Conveter Section**

Micro USB Interface  
J5  
USB\_B\_Micro

VBUS  
D+  
D-  
ID

Shield  
GND

FB2  
10n  
C11

GND

D4  
D5

GND

GND

C12  
10u

+5V

R10 10k  
R11 10k

U7  
CH340T(SSOP20W)

VCC TXD  
V3 RXD  
GND RTS#  
8 CTS#  
6 UD+ DTR#  
7 UD- DSR#  
9 DCD#  
XI RI#  
XO NOS#  
IR#

22uF C13  
100nF C14

22pF C15  
22pF C16  
Y1 12MHz

R12 10k  
R13 10k

Q1  
Q2

dtr  
rts

D7  
D8

TTL\_Txd  
TTL\_Rxd

D9

esp\_rst

Auto program

DTR	RTS->	EN	I/O
1	1	1	1
0	0	1	1
1	0	0	1
0	1	1	0

Dboot  
220R R14  
D10 BAT54C  
I/O2

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Designed By:  
Checked By:

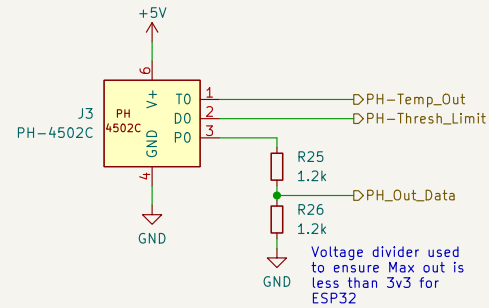
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**Title: MKULIMA IOT DEVICE**

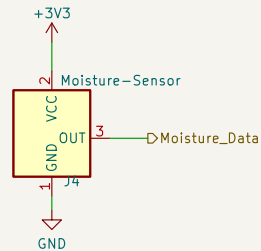
Size: A4	Date: 2022-10-26	Rev: v01
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Id: 4/7

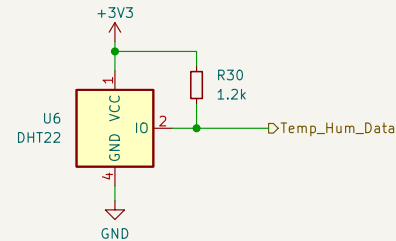
## PH Meter (PH-4502C)



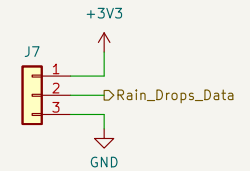
## Soil Moisture Sensor



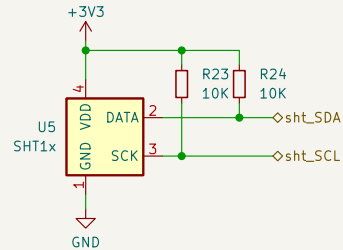
## Ambient Temperature and Humidity Sensor



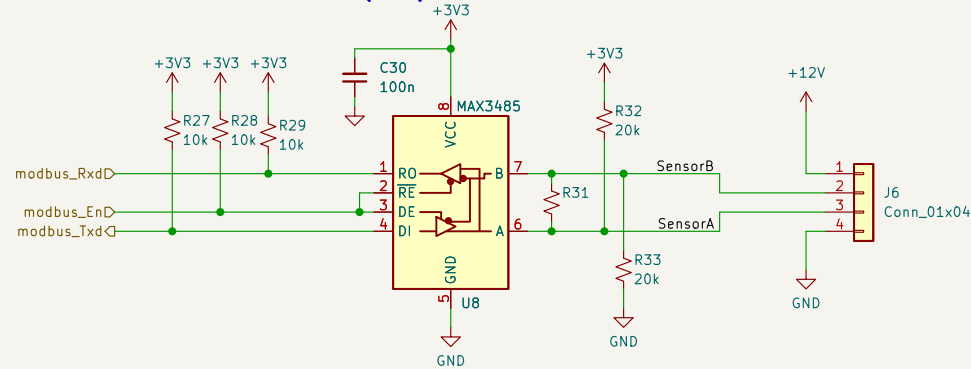
## Rainfall Sensor



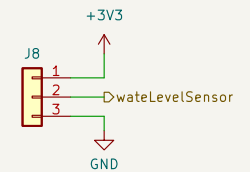
## Soil Temperature and Humidity Sensor



## Soil Nutrients Sensor(NPK) or Other Modbus Based sensor



## Water Level Sensor



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Project Lead: Peter Kirumba  
Designed By:  
Checked By:

Sheet: /sensors/  
File: sensors.kicad\_sch

**Title: MKULIMA IOT DEVICE**

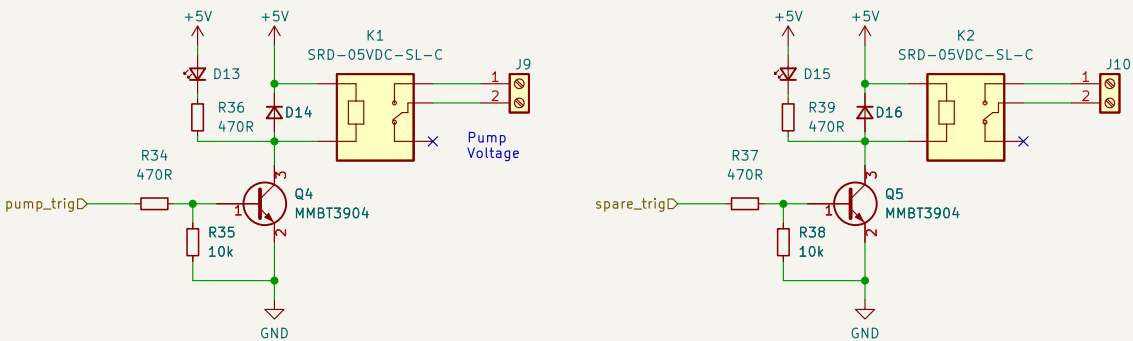
Size: A4 Date: 2022-10-26

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Rev: v01

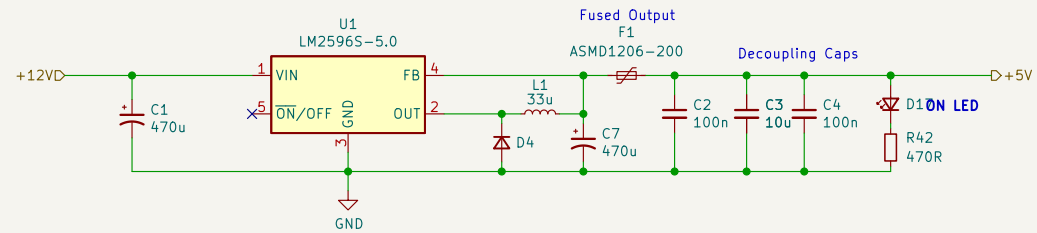
Id: 5/7

Relay Triggers for some other Devices

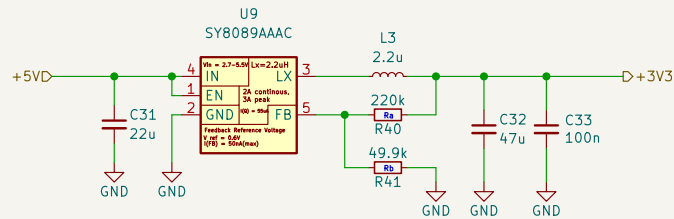


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Project Lead: Peter Kirumba		
Designed By:		
Checked By:		
Sheet: /actuators/		
File: actuators.kicad_sch		
Title: MKULIMA IOT DEVICE		
Size: A4	Date: 2022-10-26	Rev: v01
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## DC To DC Regulation 12 To 5V



## DC to DC Regulator from 5V to 3v3 Logic for the MCU and Lan



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Project Lead: Peter Kirumba  
Designed By:  
Checked By:

Sheet: /dc\_dc\_conveter/  
File: dc\_dc\_conveter.kicad\_sch

**Title: MKULIMA IOT DEVICE**

Size: A4 Date: 2022-10-26

KiCad E.D.A. kicad (6.0.7-1)-1

**Rev: v01**

Id: 7/7