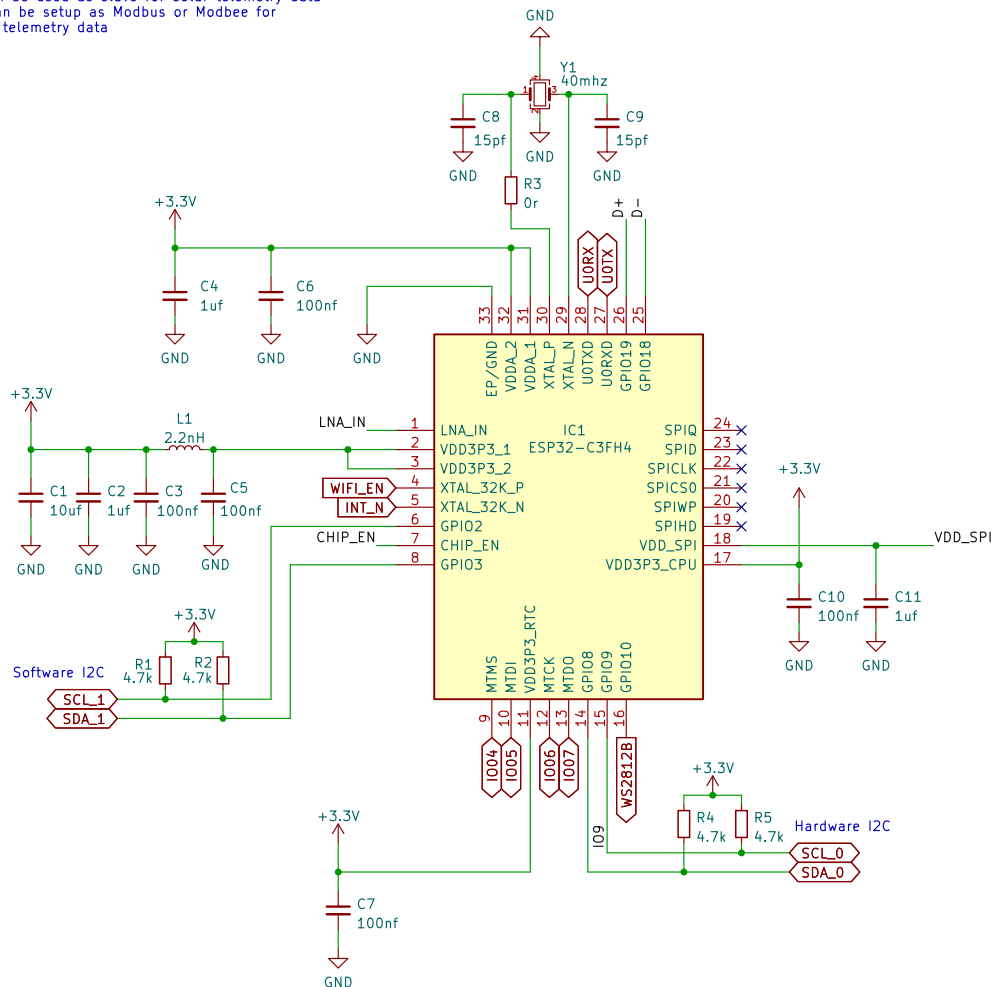


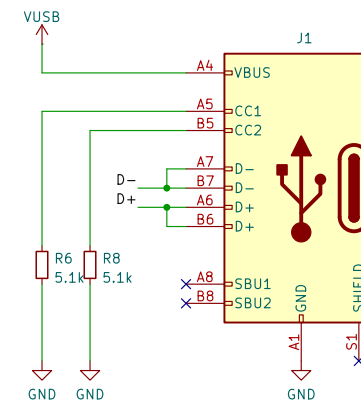
ESP32-C3

Notes:
Schematic design from reference hardware guide line.
Design based from model with internal flash and psram
Model: ESP32-C3FH4
See ESP-32-C3 Datasheet for pin details

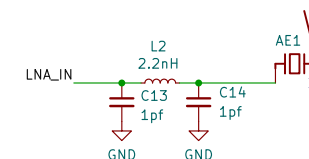
ESP32-C3 is a host to control the BQ25798 Power/MPPT
I2C_1 is software based to control the BQ25798
I2C_0 can be used as slave for solar telemetry data
RS485 can be setup as Modbus or Modbee for solar telemetry data



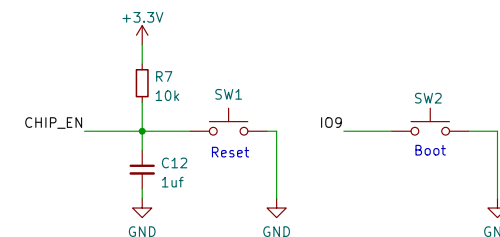
USB-C



Antenna Chip



Reset/Boot



Sheet: /
File: Modbee-MPPT-TI-C3.kicad_sch

Title: ModBee MPPT TI C3

Size: A4 Date: 2025-05-16

KiCad E.D.A. 9.0.1

Rev: 0.01

Id: 1/3

Synchronous Buck

The diagram illustrates a Synchronous Buck converter circuit. The input voltage is V_{DC_SYS} , which is connected to the VIN pin of the buck converter U1 through diode D1. A 10uF capacitor C15 is connected between V_{DC_SYS} and GND. The output of the buck converter is +3.3V. The circuit includes a bootstrap network with diode D2, capacitor C16, and a 100nF capacitor C52. The feedback network consists of resistors R13 (100k) and R14 (22k) connected to the FB pin. The output filter includes an inductor L3 (6.8uH) and capacitors C17 (100nF), C18 (68pF), C20 (22uF), C22 (22uF), and C23 (22uF).

RS485 Transceiver

Cut Bridge to disable 120ohm EOL termination resistor

The diagram illustrates the wiring for an RS485 Transceiver (U2). The transceiver's VCC pin (8) is connected to a +3.3V supply. The RE (2) and DE (3) pins are connected to ground. The RO (1) pin is connected to the U0RX signal line, and the DI (4) pin is connected to the U0TX signal line. The A (6) pin is connected to the RS485_A signal line through a 120-ohm resistor (R15). The B (7) pin is connected to the RS485_B signal line through a 120-ohm resistor (R15). A 1k-ohm resistor (R12) is connected from pin A to ground, and a 1k-ohm resistor (R11) is connected from pin B to ground. A 1uF capacitor (C19) and a 100nF capacitor (C21) are connected from VCC to ground. A 10k-ohm resistor (R9) is connected from U0RX to ground, and a 10k-ohm resistor (R10) is connected from U0TX to ground. A bridge (JP1) is shown between RS485_A and RS485_B, with a red 'X' indicating it should be cut to disable the 120-ohm EOL termination resistor.

Plug In Terminals/Connectors

Jumper to connect 3.3V to I2C 3.3V
 Only use this if connecting sensor only
 Do not connect this if Grove I2C is powered from another board

Debug/GPIO

WIFI/RESET

Short Press Enable WIFI
for set time

Long Press Reset EEPROM
Press > 30sec

The diagram shows a circuit for a button labeled 'WIFI/RESET'. The button is represented by a green circle with a vertical line through it. The top of the button is connected to a red line that goes up to a label '+3.3V'. The bottom of the button is connected to a green line that goes down to a label 'GND' with a triangle symbol. A horizontal green line branches off from the bottom of the button and connects to a label 'WIFLEN' inside a red-outlined box. A vertical green line also branches off from the bottom of the button and goes down to a label 'R16' and '10k' next to a rectangle representing a resistor.

BATT TEMP

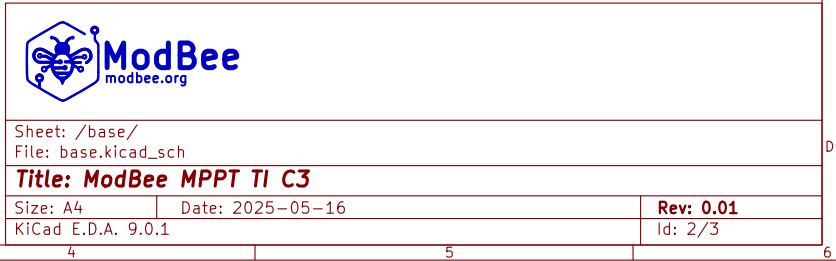
Negative temperature coefficient thermistor
10k

The diagram shows a circuit for measuring battery temperature. A green line connects the label **TS_1** to a junction. From this junction, a green line goes down through a thermistor labeled **R29** with a value of **10k** to a ground symbol labeled **GND**. Another green line goes from the junction to a connector labeled **J11** (pins 1 and 2), which is also connected to a ground symbol labeled **GND**. A red 'X' is drawn over the connection between the junction and the **JP2** connector.

Status LED

Green = MCU OK
Red = Fault
Blue = Status

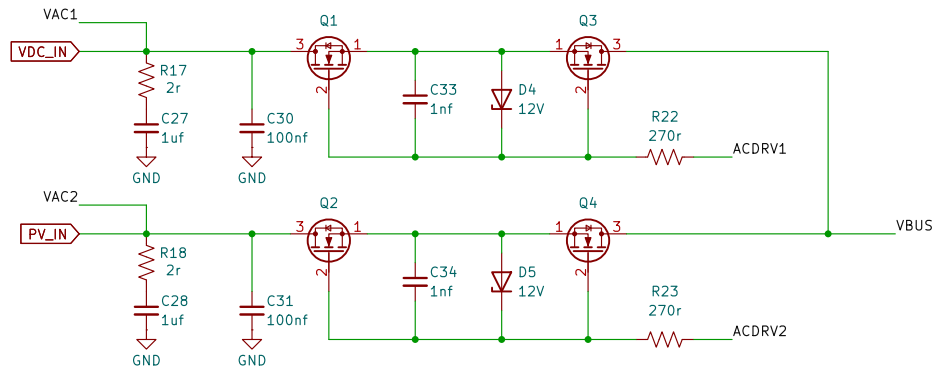
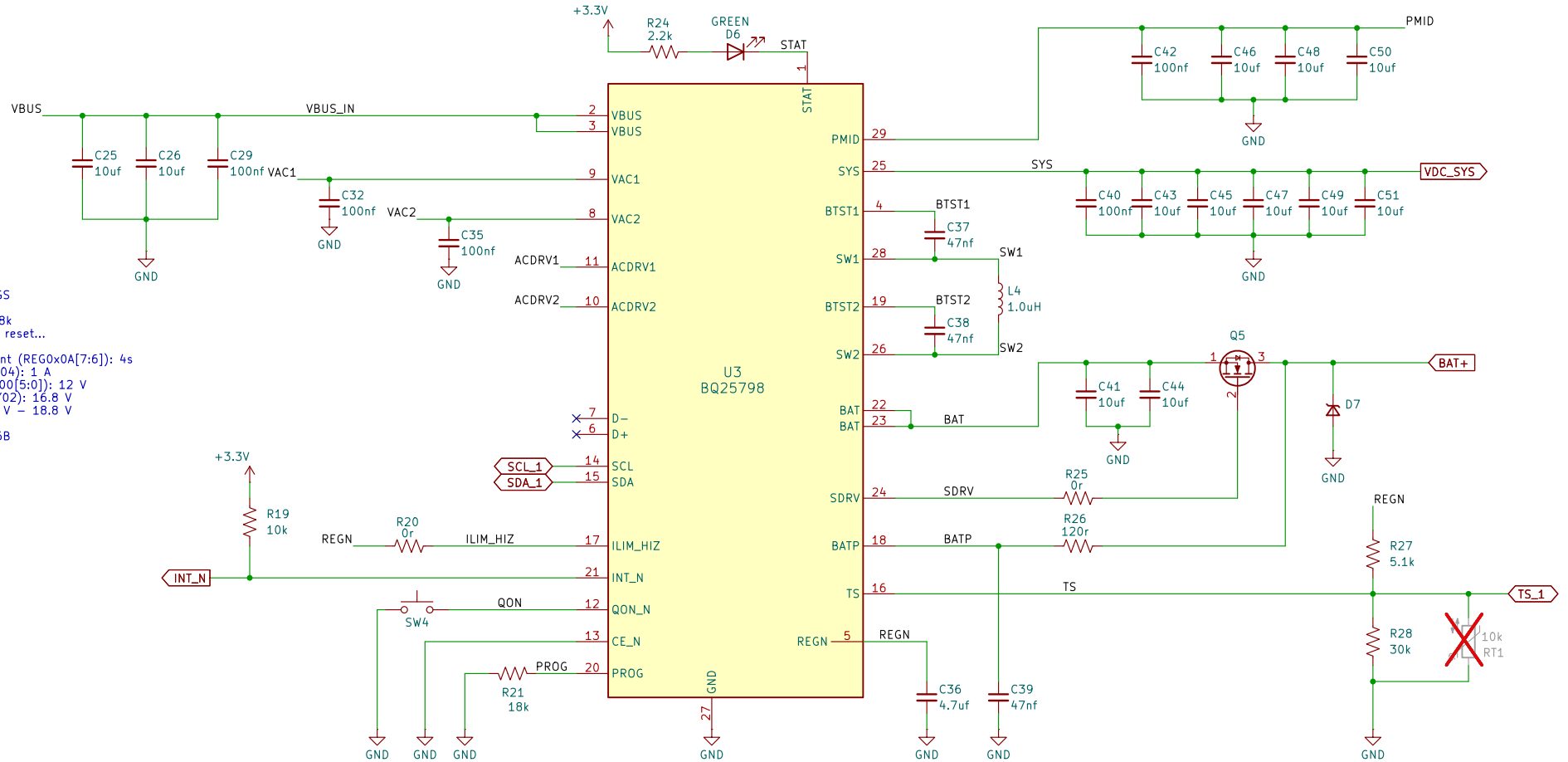
The diagram shows a WS2812B LED strip connected to a 3.3V supply and ground. The DIN pin (3) is connected to the VDD pin (4) of a 74VHC04 hex inverter. The VDD pin (4) is connected to +3.3V. The VSS pin (2) is connected to ground. The VOUT pin (1) is connected to the LED strip. A 100nf capacitor (C24) is connected between the VOUT pin (1) and ground.



BQ25798 Battery/MPPT Charger

DEFAULT SETTINGS

Default PROG: 18k
At POR and WDT reset...
Fsw = 1.5 MHz
Battery Cell Count (REG0x0A[7:6]): 4s
ICHG (REG0x03/04): 1 A
VSYSMIN (REG0x00[5:0]): 12 V
VREG (REG0x01/02): 16.8 V
VREG Range: 14 V - 18.8 V
I2C Address: 0x6B



Sheet: /mppt-charger/
File: mppt-charger.kicad_sch

Title: ModBee MPPT TI C3

Size: A4 Date: 2025-05-16

KiCad E.D.A. 9.0.1

Rev: 0.01

Id: 3/3