# POWER SECTION

BARREL JACK INPUT
12V MAX

J7
Barrel_Jack_Switch
+12V
GND
D2
BZT52Bxx
R8
49.9R
GND

MPPT_SOLAR_CHARGER_CN3722
power_input
power_output_to_sys
File: MPPT_SOLAR_CHARGER_CN3722.kicad_sch

BUCK_BOOST_CONVERTER_TPS63070_5V
POWER_INPUT
POWER_OUTPUT
+5V
File: BUCK_BOOST_CONVERTER_TPS63070_5V.kicad_sch

+5V
R28
1K
D15
LED_RED
GND

RT6154AGQW_3V3_BUCK_CONVERTER
+5V
power_input
OUTPUT_3V3
File: RT6154AGQW_3V3_BUCK_CONVERTER.kicad_sch
+3V3
Q1
IRLML5203TRPBF
MODULES_PWR_3V3
R18
10K
R24
100R
MODULES_PWR_EN

## BATTERY VOLTAGE MONITOR

+BATT
R10
10K
R17
1K
Q3
IRLML5203TRPBF
R19
1K
bat_sense_en
Q4
IRLML0100TRPBF
R26
10K
R25
2.7K
BATTERY_VOLTAGE
R27
10K
GND

# INPUT PROTOTYPE SENSORS CONNECTORS

I2C AM2315
SOIL TEMEPERATURE SENSOR
MODULES_PWR_3V3
SCL
SDA
GND
J16
SOIL TEMPERATURE CONN

HUMIDITY TEMPERATURE SENSOR
MODULES_PWR_3V3
DATA_DHT
J14
DHT22 CONN
GND

AMBIENT LIGHT SENSOR
MODULES_PWR_3V3
LIGHT_SIG
GND
J17
AMBIENT LIGHT CONN

SOIL MOISTURE SENSOR
MODULES_PWR_3V3
DIGITAL_SIG
ANALOG_SIG
GND
J15
SOIL MOISTURE CONN

PH SENSOR
GND
MODULES_PWR_3V3
PH_SIG
J20
PH SENSOR

DS18B20 TEMPERATURE SENSOR
MODULES_PWR_3V3
R62
4.7K
DS18B20_SIGNAL
J9
DS18B20 CONN
GND

# USB INPUT

J1
USB_B_Micro
VBUS
D+
D-
ID
Shield
GND
USB_D+
USB_D-
TH2
BSMD0603L-150
D11
D_Schottky
+5V
Z1
MMSZ5231B-7-F
R61
100R
GND

# CONTROLLER AND COMMUNICATION

RP2040TR7_MCU
USB_D+
USB_D-
SCL
SDA
fan_A
fan_B
IND_SENSOR_1
IND_SENSOR_2
gpio_3
I2C1_SDA
I2C1_SCL
LORA_INT
LORA_DIO1
LORA_RST
LORA_MOSI
LORA_MISO
LORA_SCK
LORA_NSS
LIGHT_SIG
DATA_DHT
DIGITAL_SIG
ANALOG_SIG
PH_SIG
RS485_TX
TXD
RX
gpio_2
DS18B20_SIGNAL
RS485_DE
RS485_RE
File: RP2040TR7_MCU.kicad_sch

LORA_RA02
LORA_INT
LORA_DIO1
LORA_RST
LORA_MOSI
LORA_MISO
LORA_SCK
LORA_NSS
File: LORA_RA02.kicad_sch

## RS485 INTERFACE

UART_TO_RS485_SHIELDED
RS485_TX
RS485_RX
RS485_DE
RS485_RE
TX
RX
DE
RE
File: UART_TO_RS485_SHIELDED.kicad_sch

## I2C CONNECTOR

J25
Conn_01x04
MODULES_PWR_3V3
GND

## INDUSTRIAL SENSORS INPUT 4mA – 20mA SIGNALS

J2
Screw_Terminal_01x02
+12V
IND_SENSOR_1

J3
Screw_Terminal_01x02
+12V
IND_SENSOR_2

## MOSFET OUTPUTS

IO_EXPANDER_I2C
SCL
SDA
IO_SCL
IO_SDA
P0
P1
P2
P3
P4
P5
P6
P7
MODULES_PWR_EN
bat_sense_en
File: IO_EXPANDER_I2C.kicad_sch

MOSFET_DRIVEN_OUTPUTS
SIGNAL
MOSFET_DRIVEN_OUTPUTS1
SIGNAL
MOSFET_DRIVEN_OUTPUTS2
SIGNAL

## RELAY OUTPUTS ISOLATED

RELAY
SIGNAL
File: RELAY.kicad_sch
RELAY1
SIGNAL
File: RELAY.kicad_sch
RELAY2
SIGNAL
File: RELAY.kicad_sch

MODULES_PWR_3V3
FAN OUTPUT
fan_A
fan_B
GND
J21
fan connector

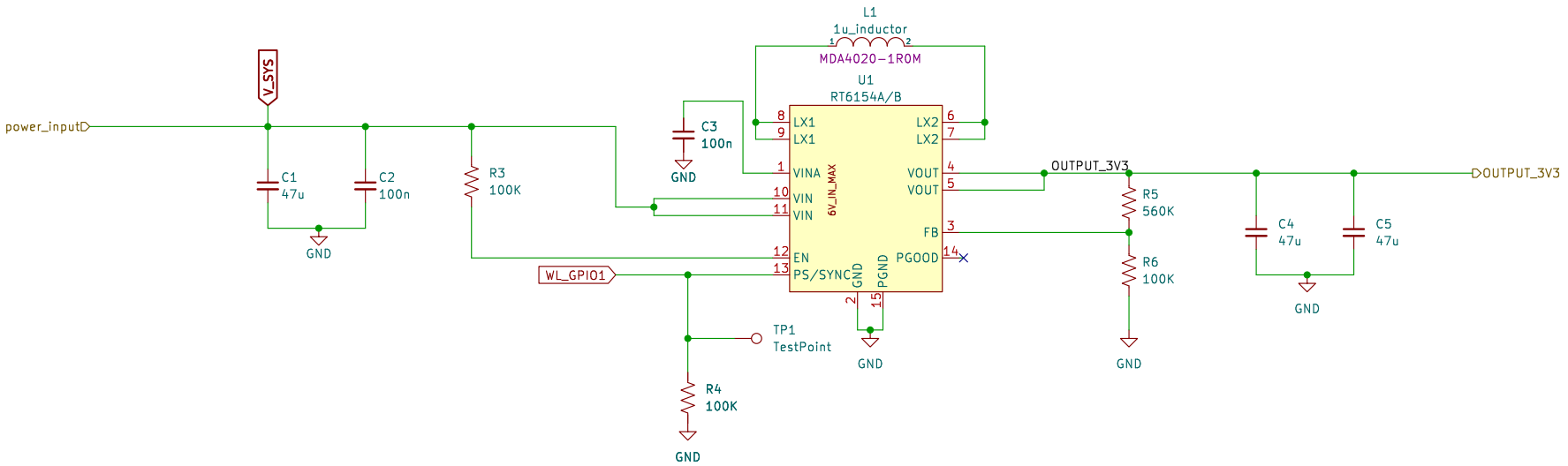
## POWER CONNECTORS

+12V
TH4
TLC-LSMD100
1A OUTPUT
J13
Screw_Terminal_01x02
GND
+5V
TH3
BSMD0603L-150
J18
Screw_Terminal_01x02
GND

FID3
Fiducial
FID1
Fiducial
FID2
Fiducial

Sheet: /
File: RpiPico_Agriboard.kicad_sch
**Title:**
Size: A3 | Date: | **Rev:**
KiCad E.D.A. kicad 7.0.2 | Id: 1/17

# 3V3 BUCK BOOST REGULATOR




| | | |
|---|---|---|
| Sheet: /RT6154AGQW_3V3_BUCK_CONVERTER/ | | |
| File: RT6154AGQW_3V3_BUCK_CONVERTER.kicad_sch | | |
| **Title:** | | |
| Size: A4 | Date: | **Rev:** |
| KiCad E.D.A. kicad 7.0.2 | | Id: 2/17 |

# RPI PICO MCU

## BOOT SELECT

R7 1K
SW1 SW_Push
TP2 TestPoint GND TO GND
GND

## FLASH MEMORY QUAD SPI

+3V3
C6 100n
U2 W25Q16JVUXIQ
QSPI_SS
QSPI_CLK
QSPI_SD0
QSPI_SD1
QSPI_SD2
QSPI_SD3
GND

## OSCILLATOR

C7 22p
C8 22p
Y1 12MHz
OSC_XIN
OSC_XOUT
GND

## PULLUPS

+3V3
R20 4.7K
R21 4.7K
SDA
SCL

+3V3
R35 4.7K
R67 4.7K
I2C1_SDA
I2C1_SCL

## DECOUPLING

+3V3
C9 100n
C10 100n
C11 100n
C14 100n
C16 100n
GND

+3V3
C12 100n
C13 100n
GND

+3V3
SW2 SW_Push
R9 10K
GND

+1V1
C17 100n
C18 100n
GND

+3V3
R11 200R
R12 1R
C19 2.2u
GND

+1V1
+1V1
C20 100n
GND

## DEBUG PINS

+3V3
J4 Conn_01x04
SWCLK
SWDIO
GND

## DEBUG LED

DEBUG_LED
R30 470R
D1 LED
GND

U3 RP2040TR7

IOVDD
DVDD
ADC_AVDD
USB_VDD
VREG_VIN
VREG_VOUT
RUN
TESTEN
SWCLK
SWDIO
USB_DM
USB_DP
27R R13
27R R14
USB_D-
USB_D+
QSPI_CLK
QSPI_SS
QSPI_SD0
QSPI_SD1
QSPI_SD2
QSPI_SD3
QSPI_SCLK
QSPI_SS_N
UART0_TX
UART0_RX
gpio_2
gpio_3
LORA_MISO
LORA_NSS
LORA_SCK
LORA_MOSI
TX
RX
DATA_DHT
DIGITAL_SIG
fan_B
fan_A
I2C1_SDA
OSC_XIN
OSC_XOUT
XIN
XOUT
GPIO0
GPIO1
GPIO2
GPIO3
GPIO4
GPIO5
GPIO6
GPIO7
GPIO8
GPIO9
GPIO10
GPIO11
GPIO12
GPIO13
GPIO14
GPIO15
GPIO16
GPIO17
GPIO18
GPIO19
GPIO20
GPIO21
GPIO22
GPIO23
GPIO24
GPIO25
GPIO26/ADC0
GPIO27/ADC1
GPIO28/ADC2
GPIO29/ADC3
I2C1_SCL
MOSI
SCK
CS
MISO
SDA
SCL
R22 150R
IND_SENSOR_1
LORA_RST
LORA_INT
LORA_DIO1
ANALOG_SIG
IND_SENSOR_2
LIGHT_SIG
R23 150R

## 4mA–20mA SENSOR INPUT

PH_SIG

## GPIO HEADER

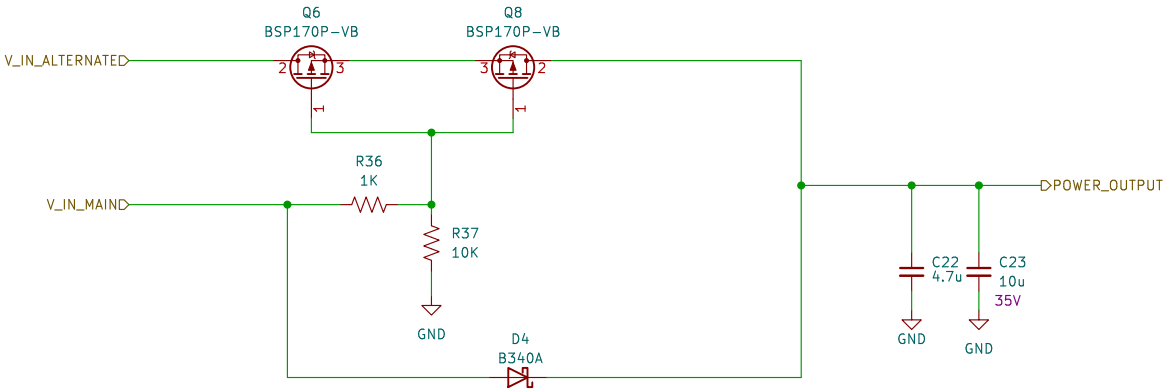
J5 Conn_02x07_Odd_Even
+3V3
MOSI
SCK
CS
MISO
fan_A
fan_B
gpio_2
gpio_3
+3V3
GND GND

ESP-12F_wifi_module
ESP8266_RX_out
ESP8266_TX_out
reset
UART0_TX
UART0_RX
File: ESP-12F_wifi_module.kicad_sch

IO_EXPANDER
File: IO_EXPANDER.kicad_sch
SCL
SDA
IO_SCL
IO_SDA
IO0
IO1
IO2
IO3
RS485_DE
RS485_RE

Sheet: /RP2040TR7_MCU/
File: RP2040TR7_MCU.kicad_sch
**Title:**
Size: A4 | Date: | **Rev:**
KiCad E.D.A. kicad 7.0.2 | Id: 3/17

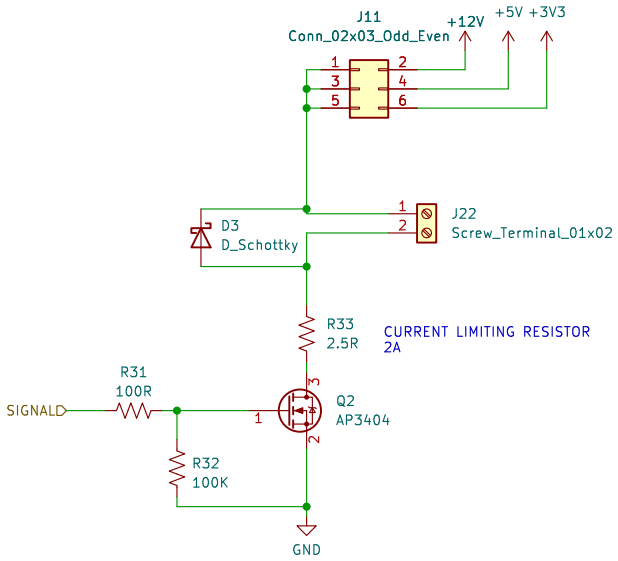
# POWER PATH SELECTOR WITH LOW QUIESCENT/LEAKAGE CURRENT




WHEN CIRUCIT IS ON 24v is Connected
– voltage across the gate is at a max of 20V(our gate can handle upto 25v)
– when not connected the gateis at 0V and source at 5V which enable power to flow through the circuit

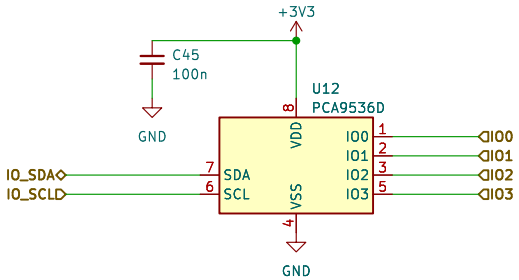
| | | |
|---|---|---|
| Sheet: /MPPT_SOLAR_CHARGER_CN3722/power_path_simple/ | | |
| File: power_path_simple.kicad_sch | | |
| **Title:** | | |
| Size: A4 | Date: | **Rev:** |
| KiCad E.D.A. kicad 7.0.2 | | Id: 4/17 |

# MOSFET DRIVER




| | | |
|---|---|---|
| Sheet: /MOSFET_DRIVEN_OUTPUTS1/ | | |
| File: MOSFET_DRIVEN_OUTPUTS.kicad_sch | | |
| **Title:** | | |
| Size: A4 | Date: | **Rev:** |
| KiCad E.D.A. kicad 7.0.2 | | Id: 5/17 |

# io expander PCA95360

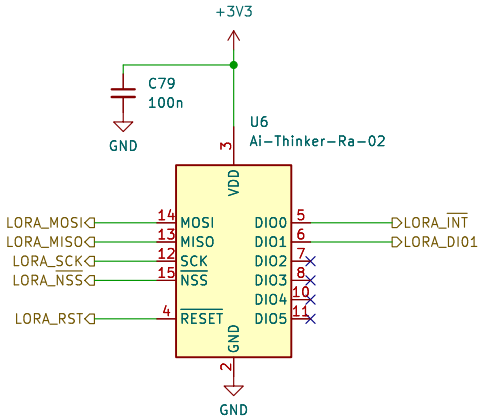



Sheet: /RP2040TR7_MCU/IO_EXPANDER/
File: IO_EXPANDER.kicad_sch

**Title:**

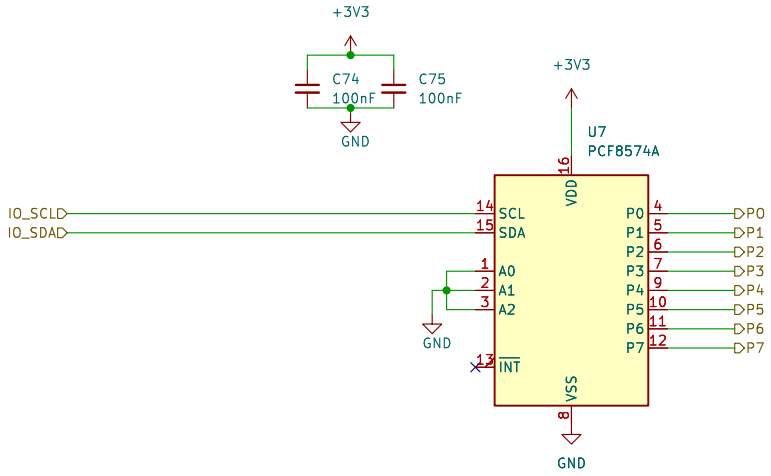
| Size: A4 | Date: | **Rev:** |
|---|---|---|
| KiCad E.D.A. kicad 7.0.2 | | Id: 6/17 |

# LORA MODULE RA-02



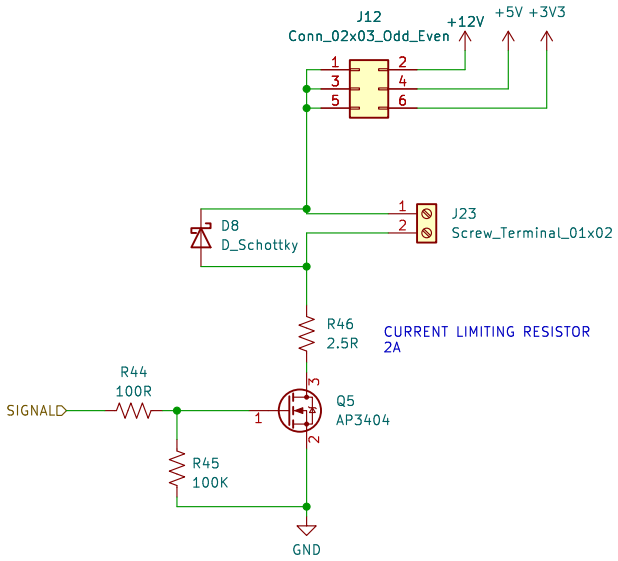

| | | |
|---|---|---|
| Sheet: /LORA_RA02/ | | |
| File: LORA_RA02.kicad_sch | | |
| **Title:** | | |
| Size: A4 | Date: | **Rev:** |
| KiCad E.D.A. kicad 7.0.2 | | Id: 8/17 |

# IO EXPANDER



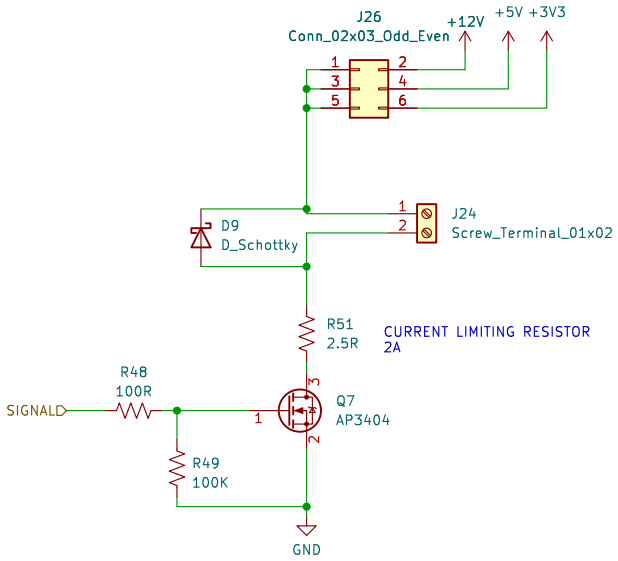

| | | |
|---|---|---|
| Sheet: /IO_EXPANDER_I2C/ | | |
| File: IO_EXPANDER_I2C.kicad_sch | | |
| **Title:** | | |
| Size: A4 | Date: | **Rev:** |
| KiCad E.D.A. kicad 7.0.2 | | Id: 9/17 |

# MOSFET DRIVER



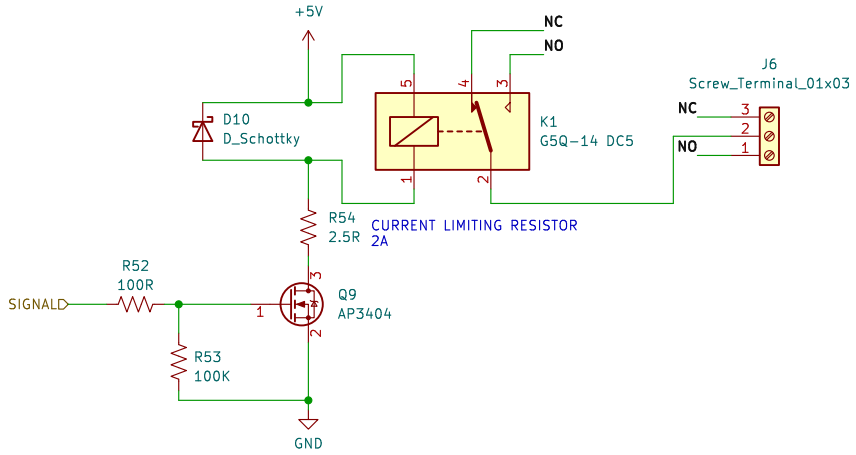

| | | |
|---|---|---|
| Sheet: /MOSFET_DRIVEN_OUTPUTS/ | | |
| File: MOSFET_DRIVEN_OUTPUTS.kicad_sch | | |
| **Title:** | | |
| Size: A4 | Date: | **Rev:** |
| KiCad E.D.A. kicad 7.0.2 | | Id: 10/17 |

# MOSFET DRIVER



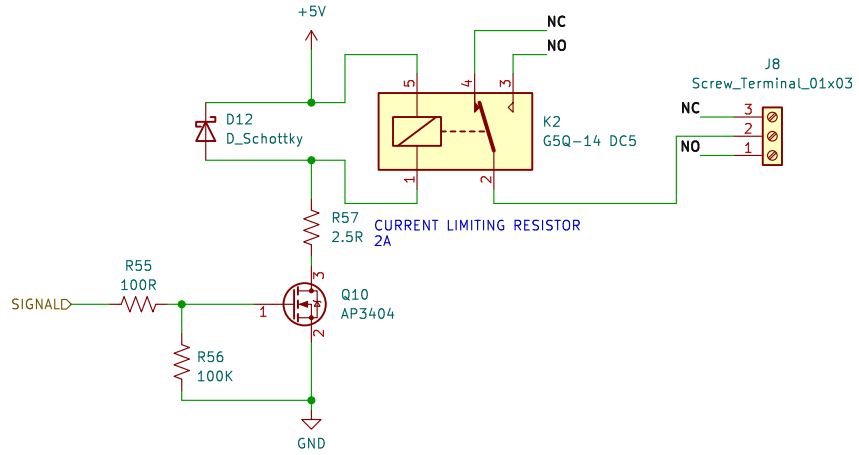

| | | |
|---|---|---|
| Sheet: /MOSFET_DRIVEN_OUTPUTS2/ | | |
| File: MOSFET_DRIVEN_OUTPUTS.kicad_sch | | |
| **Title:** | | |
| Size: A4 | Date: | **Rev:** |
| KiCad E.D.A. kicad 7.0.2 | | Id: 11/17 |

# RELAY DRIVER



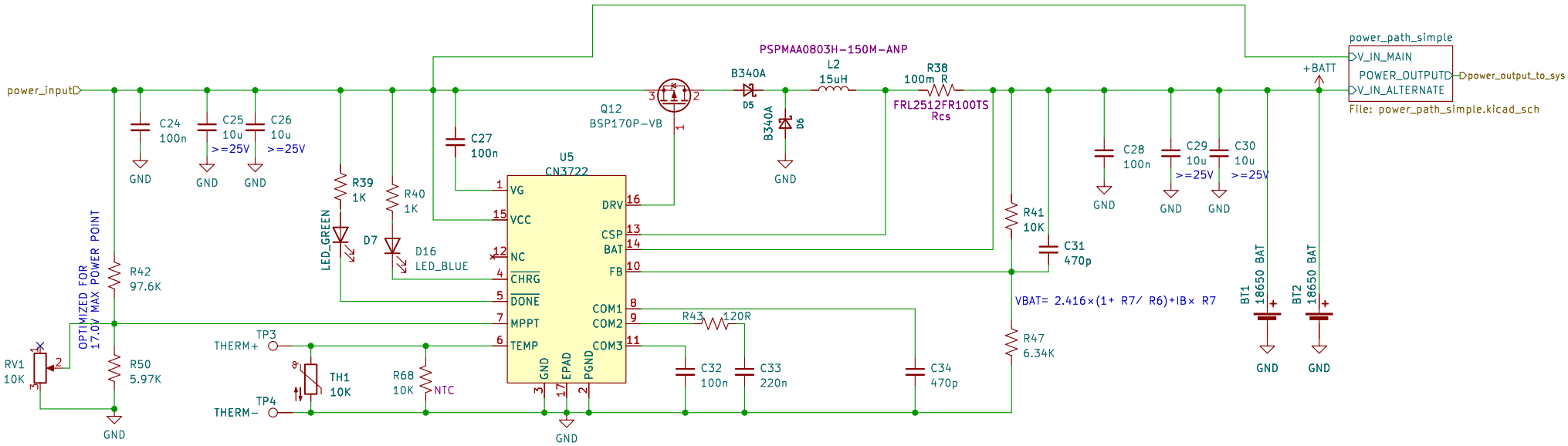

| | | |
|---|---|---|
| Sheet: /RELAY1/ | | |
| File: RELAY.kicad_sch | | |
| **Title:** | | |
| Size: A4 | Date: | **Rev:** |
| KiCad E.D.A. kicad 7.0.2 | | Id: 12/17 |

# RELAY DRIVER



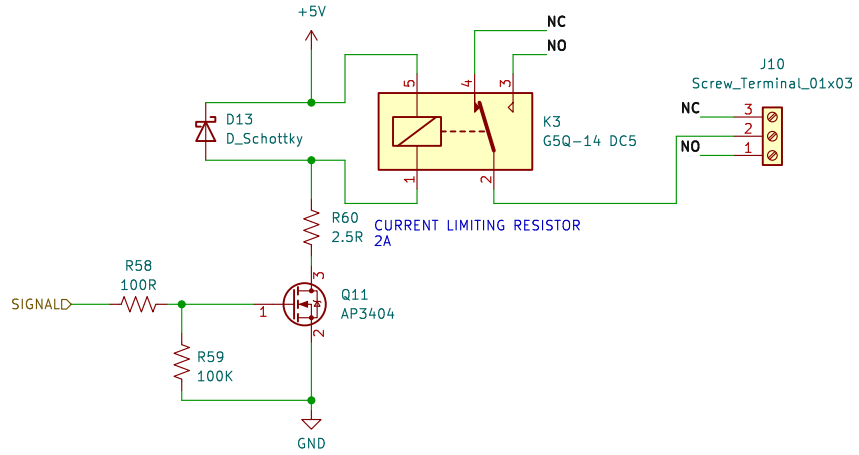

| | | |
|---|---|---|
| Sheet: /RELAY/ | | |
| File: RELAY.kicad_sch | | |
| **Title:** | | |
| Size: A4 | Date: | **Rev:** |
| KiCad E.D.A. kicad 7.0.2 | | Id: 13/17 |

# MPPT CHARGER CONTROLLER WITH BATTERY CHARGER



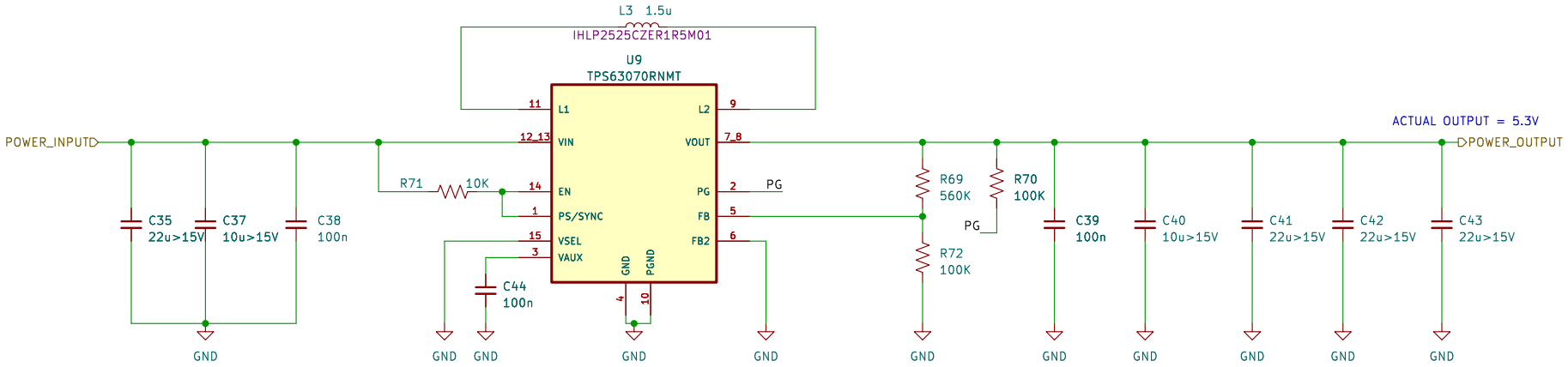

| | | |
|---|---|---|
| Sheet: /MPPT_SOLAR_CHARGER_CN3722/ | | |
| File: MPPT_SOLAR_CHARGER_CN3722.kicad_sch | | |
| **Title:** | | |
| Size: A4 | Date: | **Rev:** |
| KiCad E.D.A. kicad 7.0.2 | | Id: 14/17 |

# RELAY DRIVER



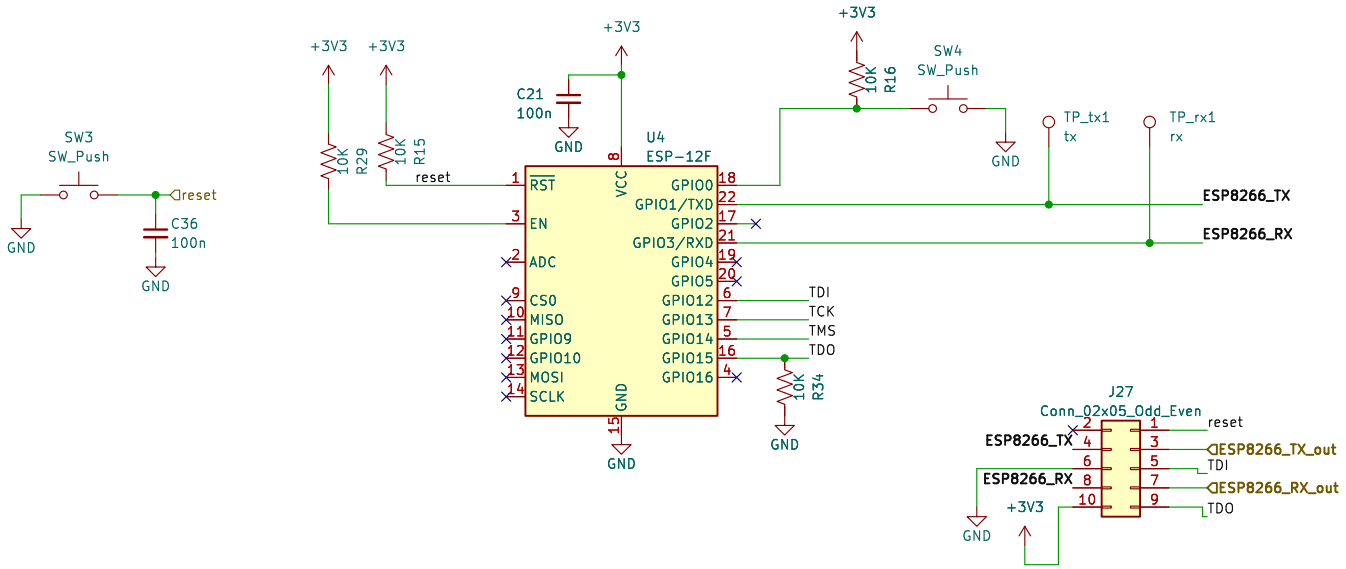

| | | |
|---|---|---|
| Sheet: /RELAY2/ | | |
| File: RELAY.kicad_sch | | |
| **Title:** | | |
| Size: A4 | Date: | **Rev:** |
| KiCad E.D.A. kicad 7.0.2 | | Id: 14/17 |

# BUCK BOOST CONVERTER 5V 1.5 A OUTPUT




| | | |
|---|---|---|
| Sheet: /BUCK_BOOST_CONVERTER_TPS63070_5V/ | | |
| File: BUCK_BOOST_CONVERTER_TPS63070_5V.kicad_sch | | |
| **Title:** | | |
| Size: A4 | Date: | **Rev:** |
| KiCad E.D.A. kicad 7.0.2 | | Id: 16/17 |

# ESP 12F WiFi/BLE MODULE

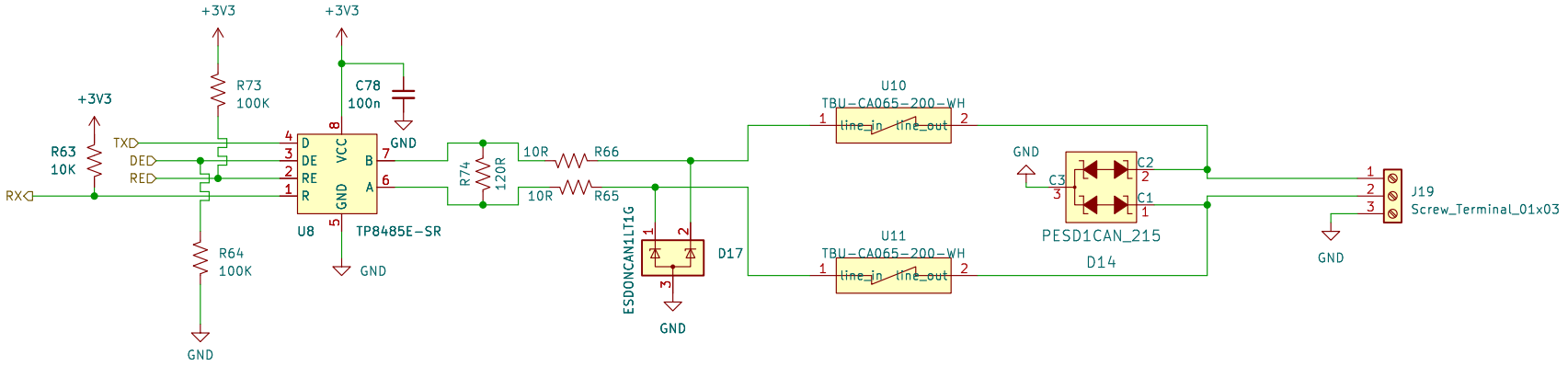



Sheet: /RP2040TR7_MCU/ESP-12F_wifi_module/
File: ESP-12F_wifi_module.kicad_sch

**Title:**

| Size: A4 | Date: | **Rev:** |
|---|---|---|
| KiCad E.D.A. kicad 7.0.2 | | Id: 16/17 |

# RS485




| | | |
|---|---|---|
| Sheet: /UART_TO_RS485_SHIELDED/ | | |
| File: UART_TO_RS485_SHIELDED.kicad_sch | | |
| **Title:** | | |
| Size: A4 | Date: | **Rev:** |
| KiCad E.D.A. kicad 7.0.2 | | Id: 16/17 |