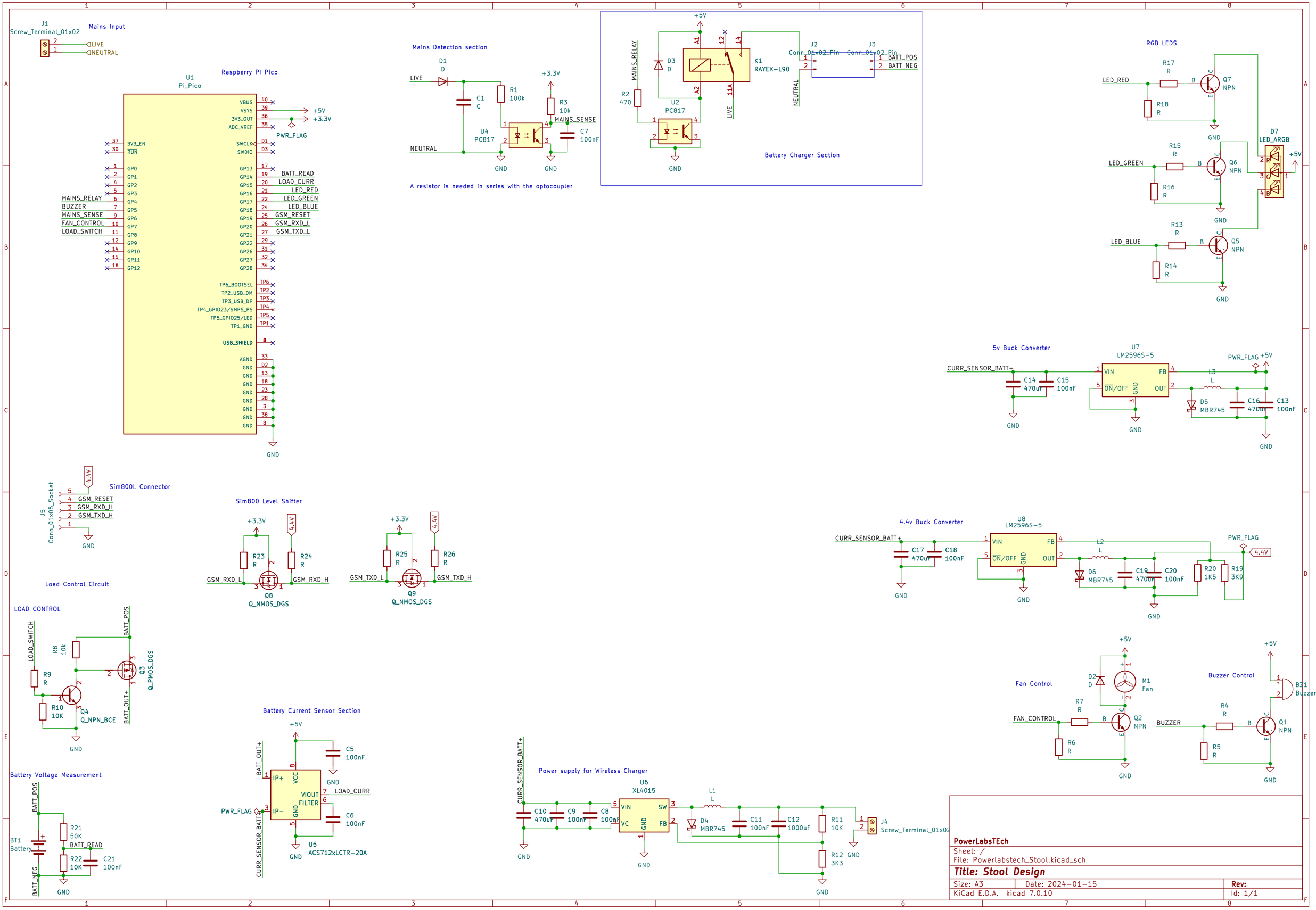
Mains Input
J1
Screw_Terminal_01x02
LIVE
NEUTRAL
Raspberry Pi Pico
U1
Pi_Pico
VBUS
VSYS
3V3_OUT
ADC_VREF
+5V
+3.3V
PWR_FLAG
3V3_EN
RUN
SWCLK
SWDIO
GP0
GP1
GP2
GP3
GP4
GP5
GP6
GP7
GP8
GP9
GP10
GP11
GP12
GP13
GP14
GP15
GP16
GP17
GP18
GP19
GP20
GP21
GP22
GP26
GP27
GP28
MAINS_RELAY
BUZZER
MAINS_SENSE
FAN_CONTROL
LOAD_SWITCH
BATT_READ
LOAD_CURR
LED_RED
LED_GREEN
LED_BLUE
GSM_RESET
GSM_RXD_L
GSM_TXD_L
TP6_BOOTSEL
TP2_USB_DM
TP3_USB_DP
TP4_GPIO23/SMPS_PS
TP5_GPIO25/LED
TP1_GND
USB_SHIELD
AGND
GND
Mains Detection section
D1
D
LIVE
NEUTRAL
C1
C
R1
100k
R3
10k
+3.3V
MAINS_SENSE
C7
100nF
U4
PC817
A resistor is needed in series with the optocoupler
+5V
MAINS_RELAY
D3
D
R2
470
U2
PC817
K1
RAYEX-L90
A1
A2
12
14
11A
LIVE
NEUTRAL
J2
Conn_01x02_Pin
J3
Conn_01x02_Pin
BATT_POS
BATT_NEG
Battery Charger Section
RGB LEDS
LED_RED
R17
R
R18
R
Q7
NPN
D7
LED_ARGB
LED_GREEN
R15
R
R16
R
Q6
NPN
LED_BLUE
R13
R
R14
R
Q5
NPN
5v Buck Converter
U7
LM2596S-5
CURR_SENSOR_BATT+
C14
470uF
C15
100nF
VIN
ON/OFF
FB
OUT
L3
L
D5
MBR745
C16
470uF
C13
100nF
Sim800L Connector
J5
Conn_01x05_Socket
4.4V
GSM_RESET
GSM_RXD_H
GSM_TXD_H
Sim800 Level Shifter
R23
R
R24
R
Q8
Q_NMOS_DGS
R25
R
R26
R
Q9
Q_NMOS_DGS
4.4v Buck Converter
U8
LM2596S-5
C17
470uF
C18
100nF
L2
L
D6
MBR745
C19
470uF
C20
100nF
R20
1K5
R19
3K9
Load Control Circuit
LOAD CONTROL
LOAD_SWITCH
R8
10k
R9
R
R10
10K
Q4
Q_NPN_BCE
BATT_POS
BATT_OUT+
Q3
Q_PMOS_DGS
Fan Control
D2
D
M1
Fan
R7
R
Q2
NPN
R6
R
Buzzer Control
BZ1
Buzzer
R4
R
Q1
NPN
R5
R
Battery Current Sensor Section
C5
100nF
IP+
VCC
VIOUT
FILTER
IP−
GND
C6
100nF
U5
ACS712xLCTR-20A
Battery Voltage Measurement
BT1
Battery
R21
50K
R22
10K
C21
100nF
Power supply for Wireless Charger
U6
XL4015
C10
470uF
C9
100nF
C8
100nF
VIN
VC
SW
FB
L1
L
D4
MBR745
C11
100nF
C12
1000uF
R11
10K
R12
3K3
J4
Screw_Terminal_01x02
PowerLabsTEch
Sheet: /
File: Powerlabstech_Stool.kicad_sch
Title: Stool Design
Size: A3
Date: 2024-01-15
Rev:
KiCad E.D.A. kicad 7.0.10
Id: 1/1