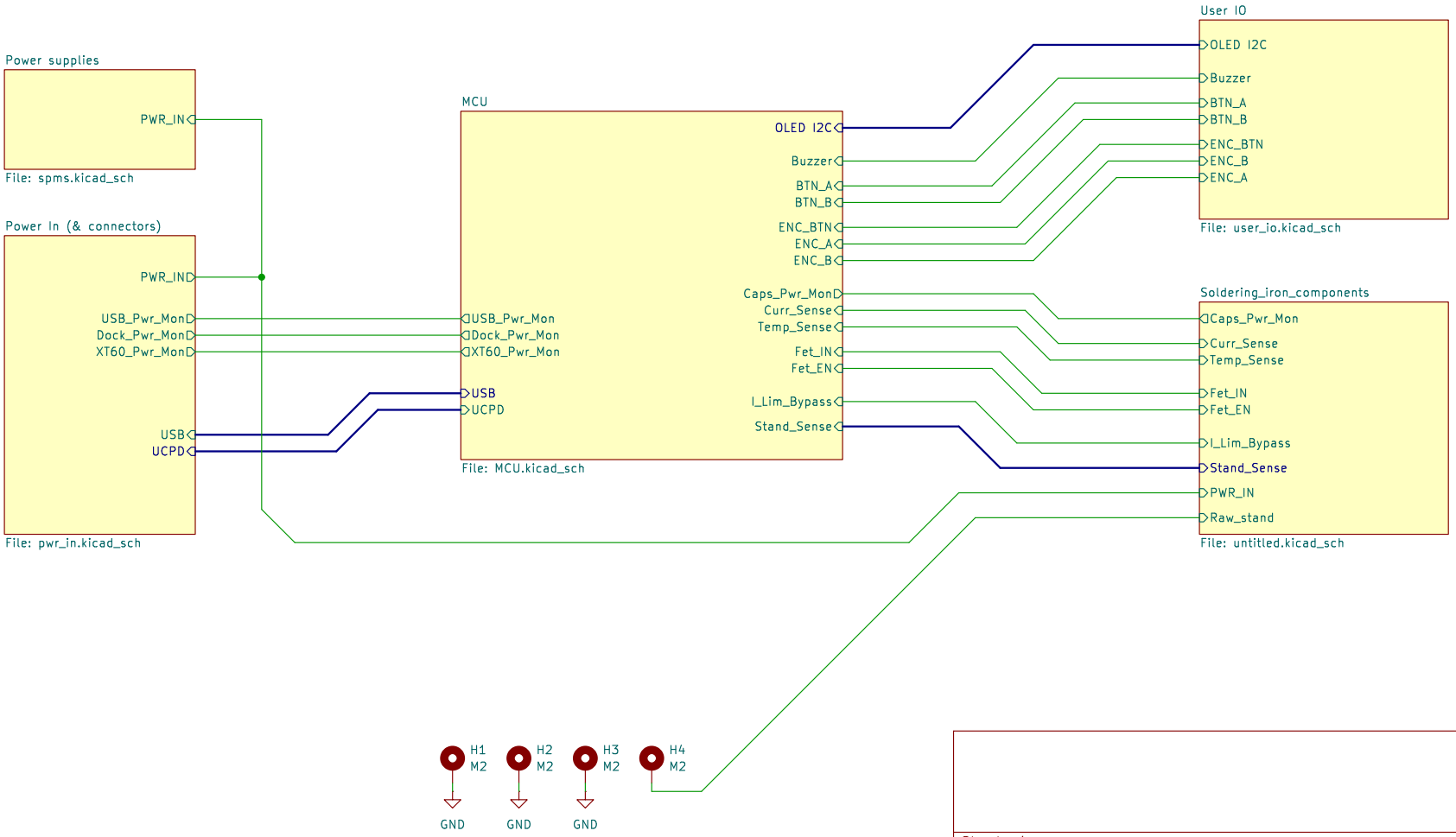
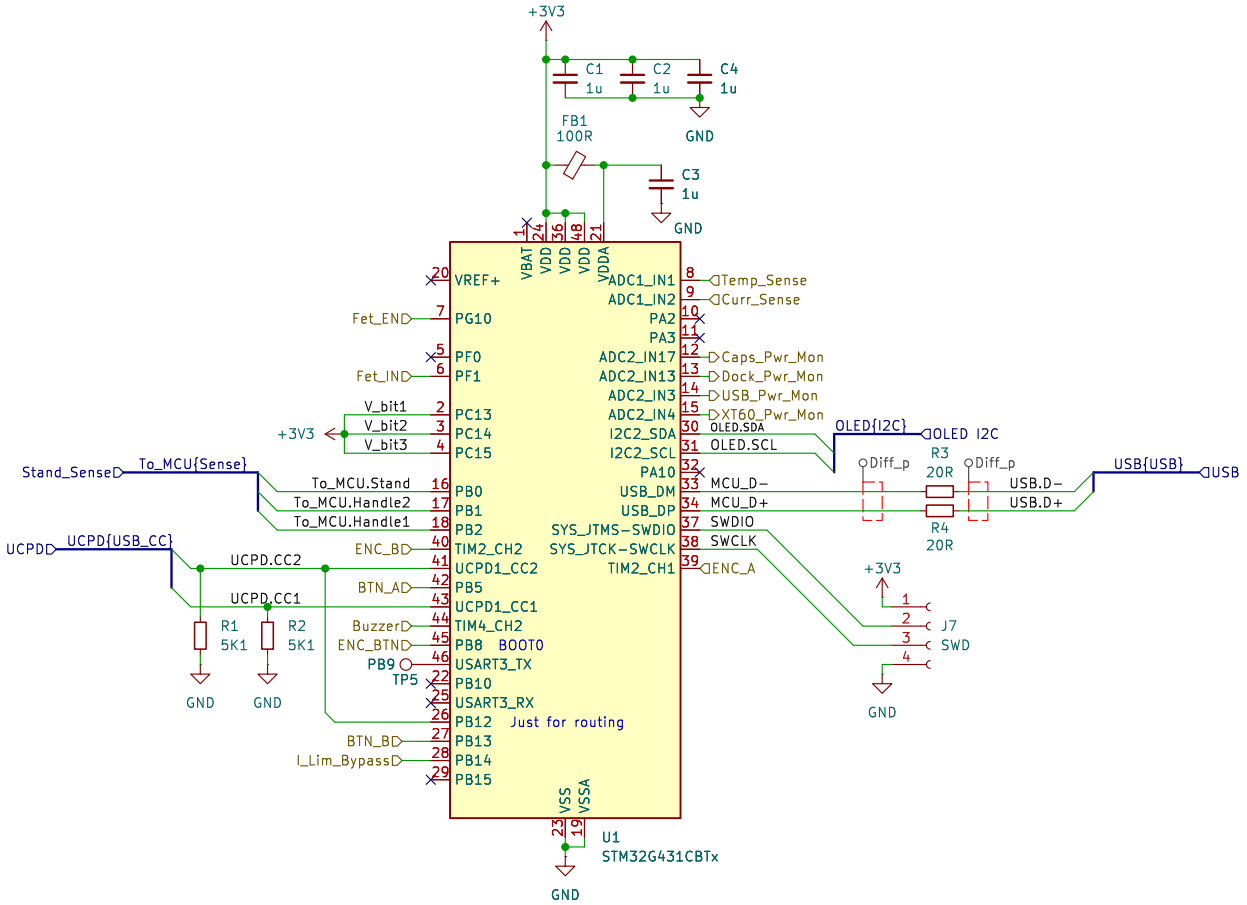
Top level block diagram



Sheet: / File: mSolder.kicad_sch		
Title:		
Size: A4	Date:	**Rev:**
KiCad E.D.A. 9.0.0		Id: 1/6

MCU



Sheet: /MCU/		
File: MCU.kicad_sch		
Title:		
Size: A4	Date:	**Rev:**
KiCad E.D.A. 9.0.0		Id: 2/6

Power Input Connectors

XT60

J2
XT60PW-M
MP
GND GND

Earthing plug

J4
Earth banana
Earth

Stand

J1
Stand
Earth
GND

USB

J3
USB_C_Receptacle_USB2.0_16P
VBUS A4
CC1 A5
CC2 B5
D- A7
D- B7
D+ A6
D+ B6
SBU1 A8
SBU2 B8
SHIELD GND S1 A1
GND

U3
USBLC6-2P6
UCPD.CC1
UCPD.CC2
UCPD{USB_CC}
UCPD
GND

U2
USBLC6-2P6
USB.D-
USB.D+
USB{USB}
USB
GND

Ideal diodes

Q1
DMT6008LFG
PWR_XT60
PWR_IN_U

D1
30V
C5
22n
C8
100n
C11
10u

U4
LM74700
ANODE GATE CATHODE
VCAP EN GND
GND

Q2
DMT6008LFG
PWR_Dock
PWR_IN_U

D2
30V
C6
22n
C9
100n
C12
10u

U5
LM74700
GND

Q3
DMT6008LFG
PWR_USB
PWR_IN_U

D3
30V
C7
22n
C10
100n
C13
10u

U6
LM74700
GND

7A Fuse
0154007.DR
F1
PWR_IN

Monitoring

10/(220+10) = 1/23
Max 76V
UORIG = 23 * UADC

PWR_USB
R7
220k
USB_Pwr_Mon
R8
10k
GND

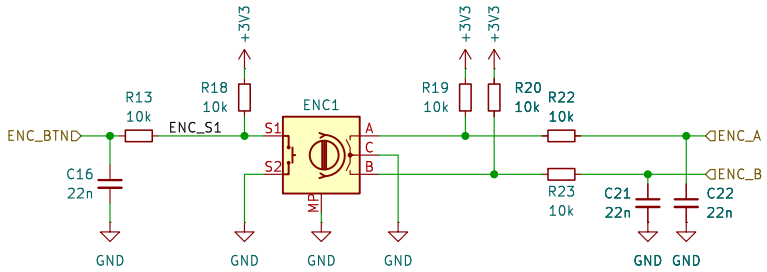
PWR_XT60
R9
220k
XT60_Pwr_Mon
R10
10k
GND

PWR_Dock
R5
220k
Dock_Pwr_Mon
R6
10k
GND

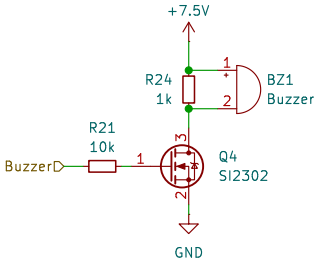
Sheet: /Power In (& connectors)/		
File: pwr_in.kicad_sch		
Title:		
Size: A4	Date:	**Rev:**
KiCad E.D.A. 9.0.0		Id: 3/6

User IO

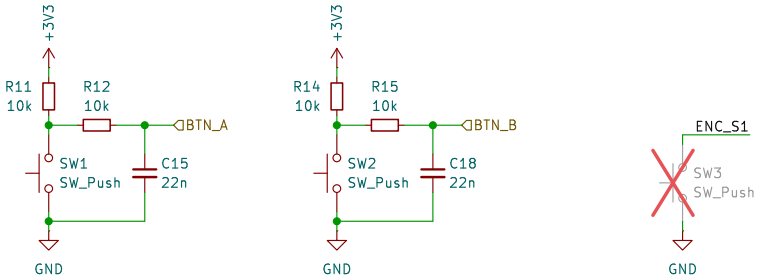
Encoder



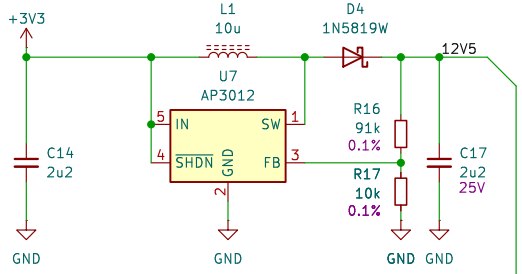
Buzzer



Buttons

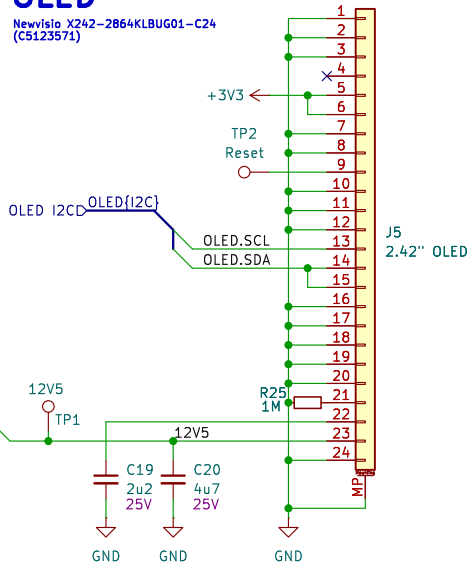


OLED power supply

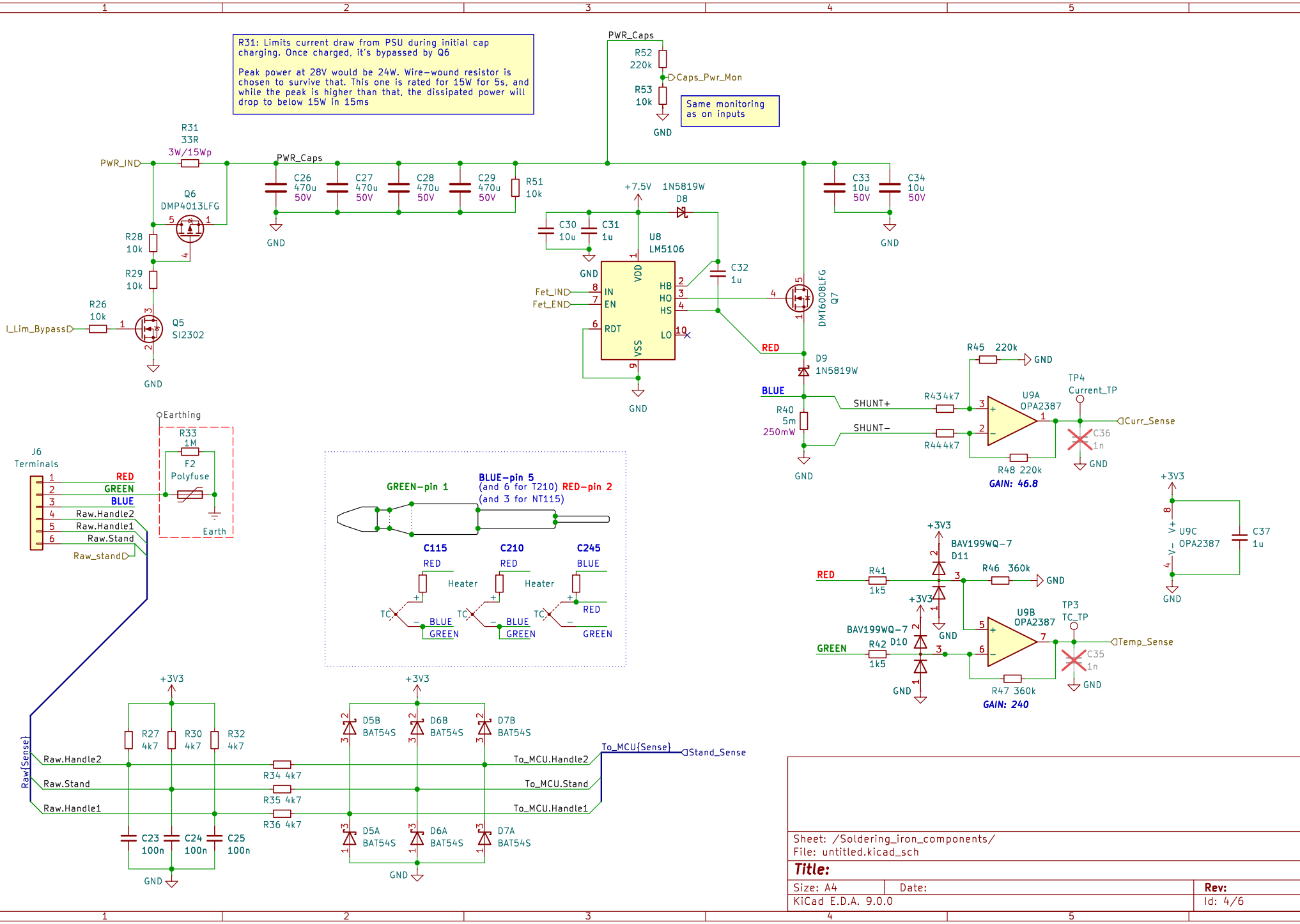


OLED

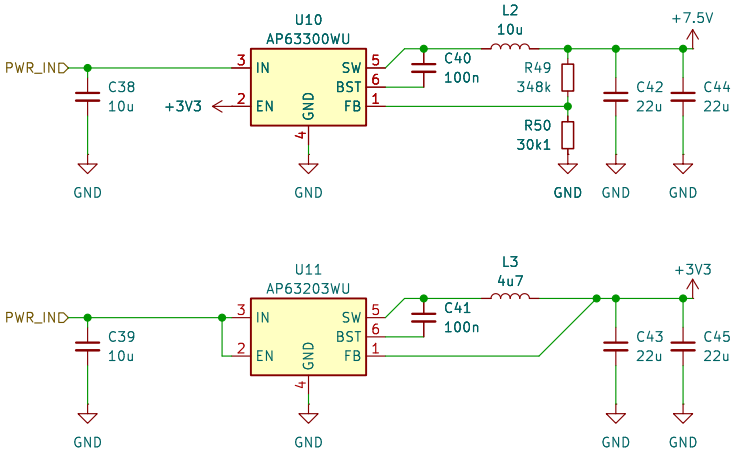
Newvisio X242-2864KLBUG01-C24
(C5123571)



Sheet: /User IO/		
File: user_io.kicad_sch		
Title:		
Size: A4	Date:	**Rev:**
KiCad E.D.A. 9.0.0		Id: 4/6


R31: Limits current draw from PSU during initial cap charging. Once charged, it's bypassed by Q6
Peak power at 28V would be 24W. Wire-wound resistor is chosen to survive that. This one is rated for 15W for 5s, and while the peak is higher than that, the dissipated power will drop to below 15W in 15ms
Same monitoring as on inputs
PWR_Caps
R52 220k
Caps_Pwr_Mon
R53 10k
GND
R31 33R 3W/15Wp
PWR_IN
Q6 DMP4013LFG
R28 10k
R29 10k
R26 10k
I_Lim_Bypass
Q5 SI2302
C26 470u 50V
C27 470u 50V
C28 470u 50V
C29 470u 50V
R51 10k
+7.5V
1N5819W D8
C30 10u
C31 1u
U8 LM5106
VDD
HB
HO
HS
LO
VSS
IN
EN
RDT
Fet_IN
Fet_EN
C32 1u
DMT6008LFG Q7
C33 10u 50V
C34 10u 50V
RED
D9 1N5819W
BLUE
R40 5m 250mW
SHUNT+
SHUNT-
R45 220k
R43 4k7
R44 4k7
R48 220k
GAIN: 46.8
U9A OPA2387
TP4 Current_TP
Curr_Sense
C36 1n
J6 Terminals
RED
GREEN
BLUE
Raw.Handle2
Raw.Handle1
Raw.Stand
Raw_stand
Earthing
R33 1M
F2 Polyfuse
Earth
GREEN-pin 1
BLUE-pin 5 (and 6 for T210) RED-pin 2 (and 3 for NT115)
C115
C210
C245
Heater
TC
+3V3
BAV199WQ-7 D11
R41 1k5
R46 360k
U9B OPA2387
TP3 TC_TP
Temp_Sense
C35 1n
R42 1k5
R47 360k
GAIN: 240
U9C OPA2387
C37 1u
R27 4k7
R30 4k7
R32 4k7
Raw{Sense}
R34 4k7
R35 4k7
R36 4k7
D5B BAT54S
D6B BAT54S
D7B BAT54S
D5A BAT54S
D6A BAT54S
D7A BAT54S
To_MCU{Sense}
To_MCU.Handle2
To_MCU.Stand
To_MCU.Handle1
Stand_Sense
C23 100n
C24 100n
C25 100n
Sheet: /Soldering_iron_components/
File: untitled.kicad_sch
Title:
Size: A4
Date:
Rev:
KiCad E.D.A. 9.0.0
Id: 4/6

Power Supplies



Both chips have
U_{MAX} = 32V

Sheet: /Power supplies/ File: spms.kicad_sch		
Title:		
Size: A4	Date:	**Rev:**
KiCad E.D.A. 9.0.0		Id: 5/6