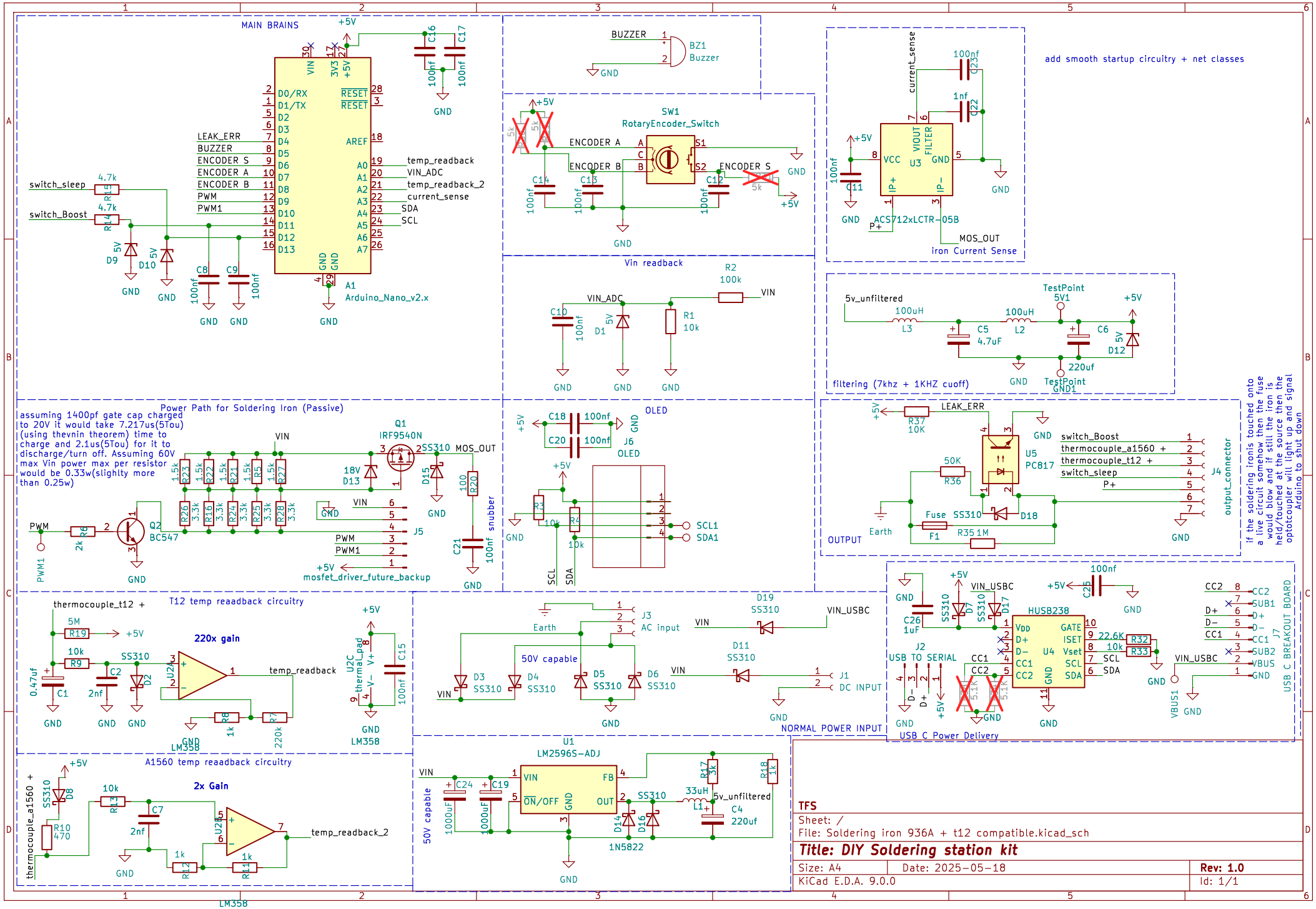
MAIN BRAINS
A1
Arduino_Nano_v2.x
D0/RX
D1/TX
D2
D3
D4
D5
D6
D7
D8
D9
D10
D11
D12
D13
RESET
AREF
A0
A1
A2
A3
A4
A5
A6
A7
LEAK_ERR
BUZZER
ENCODER S
ENCODER A
ENCODER B
PWM
PWM1
temp_readback
VIN_ADC
temp_readback_2
current_sense
SDA
SCL
switch_sleep
switch_Boost
BUZZER
BZ1
Buzzer
SW1
RotaryEncoder_Switch
ENCODER A
ENCODER B
ENCODER S
add smooth startup circuitry + net classes
current_sense
U3
ACS712xLCTR-05B
VCC
VIOUT
FILTER
GND
IP+
IP-
MOS_OUT
iron Current Sense
Vin readback
VIN_ADC
VIN
R2
100k
R1
10k
5v_unfiltered
TestPoint
5V1
L3
100uH
L2
100uH
C5
4.7uF
C6
220uf
D12
TestPoint
GND1
filtering (7khz + 1KHZ cuoff)
Power Path for Soldering Iron (Passive)
assuming 1400pf gate cap charged to 20V it would take 7.217us(5Tou) (using thevnin theorem) time to charge and 2.1us(5Tou) for it to discharge/turn off. Assuming 60V max Vin power max per resistor would be 0.33w(slighlty more than 0.25w)
Q1
IRF9540N
MOS_OUT
18V
D13
D15
R20
100
snubber
C21
100nf
Q2
BC547
PWM
PWM1
J5
mosfet_driver_future_backup
OLED
J6
OLED
SCL1
SDA1
SCL
SDA
LEAK_ERR
R37
10K
U5
PC817
R36
50K
Fuse
F1
R35
1M
D18
Earth
OUTPUT
switch_Boost
thermocouple_a1560 +
thermocouple_t12 +
switch_sleep
P+
J4
output_connector
if the soldering ironis touched onto a live circuit somehow then the fuse would blow and if still the iron is held/touched at the source then the optotcoupler will light up and signal Arduino to shut down
thermocouple_t12 +
T12 temp reaadback circuitry
220x gain
temp_readback
LM358
thermocouple_a1560 +
A1560 temp reaadback circuitry
2x Gain
temp_readback_2
LM358
J3
AC input
Earth
50V capable
D3
D4
D5
D6
SS310
D19
D11
J1
DC INPUT
NORMAL POWER INPUT
U1
LM2596S-ADJ
VIN
FB
ON/OFF
OUT
33uH
L1
5v_unfiltered
C4
220uf
1N5822
HUSB238
U4
VIN_USBC
J2
USB TO SERIAL
USB C Power Delivery
USB C BREAKOUT BOARD
J7
VBUS1
TFS
Sheet: /
File: Soldering iron 936A + t12 compatible.kicad_sch
Title: DIY Soldering station kit
Size: A4
Date: 2025-05-18
Rev: 1.0
KiCad E.D.A. 9.0.0
Id: 1/1