ADC1 is connected to 4 thermocouple amplifiers and 4 voltage/current measurement ports. These are (names of labels)

ADC2 is connected to 4 thermocouple amplifiers and 4 voltage/current measurement ports. These are (names of labels)

Can choose Wurth WE-XTAL 830108208809
CL = 10pF, C0= 5 pF max, ESR = 70 ohm
Drive level = 100 uW max.

Exposing some useful pins

Used values from E24 resistor series for voltage divider, hopefully makes it a bit cheaper? but get like 1%6

STM32 H723 FT_xxx* pins can be 5.5V** tolerant, so we use a reasonable Zener.
*All connected ADC pins in root sheet are FT_xxx
**Actually more like 7.3V, datasheet pg 151/257

Should this have an opamp or buffer?
Putting a zener directly on VCC seems a bit sketch lol

XT60 PCB Connectors or Terminal Block (second option preferred)

ST JTAG connector, using default KICAD design
Need to connect NJTRST somewhere or just NC?

Tie GND, GNDA, and GNDD

Add decoupling caps on each pin, and a big one on the supply
100n

PDR_ON HIGH => enable power supply supervisor

Guide suggests remapping RTC_TS from PC13. Transactions on this pin can affect RTC clock oscillator

Add decoupling caps on each pin, and a big one on the supply

Current limit to 20mA

Current limit to 20mA

Current limit to 20mA

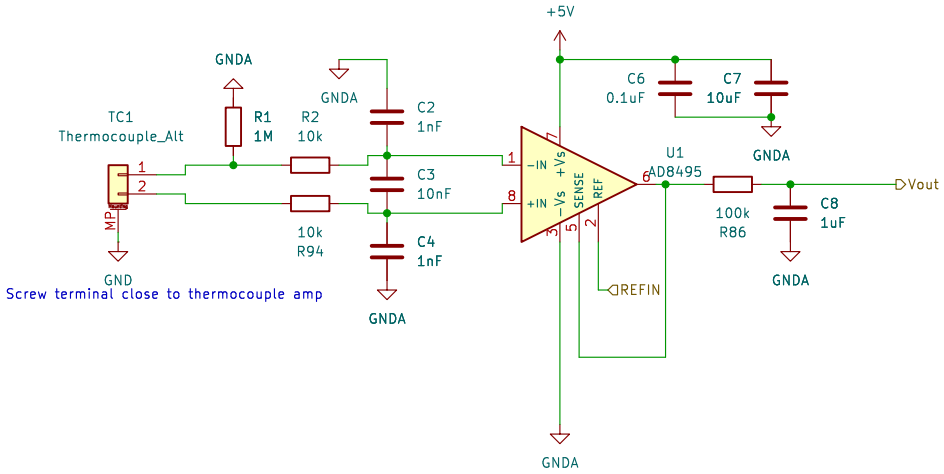
Current limit to 20mA

A1=GND, A0=GND: Address 0b01000000 (0x40)

A1=GND, A0=VS: Address 0b01000001 (0x41)

A1=VS, A0=GND: Address 0b01000100 (0x44)

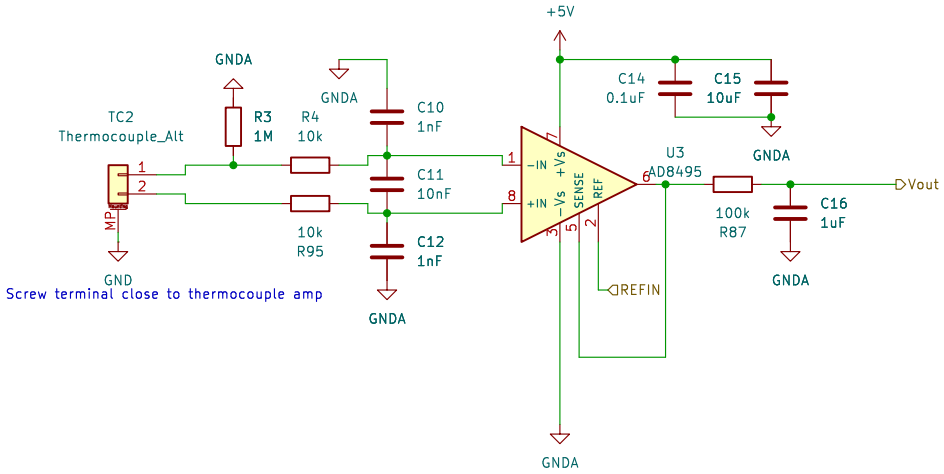
Sheet: /
File: launchpad-controller-v2.kicad_sch
Title:
Size: A1 | Date: | Rev:
KiCad E.D.A. 8.0.1 | Id: 1/40



Sheet: /ADC1/Thermocouple Input and Amplifier2/
File: thermocouple.kicad_sch

Title:

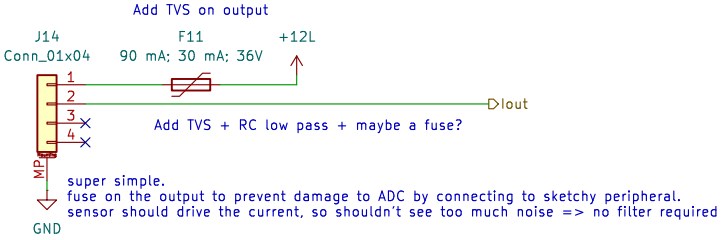
Size: A4	Date:	**Rev:**
KiCad E.D.A. 8.0.1		Id: 2/40



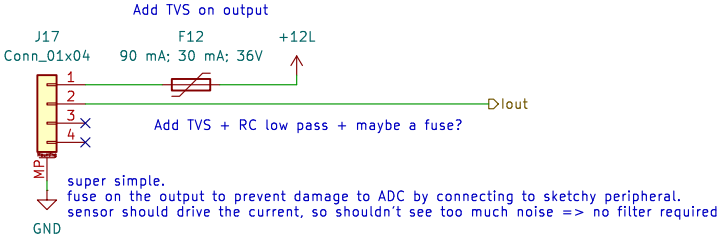
Sheet: /ADC1/Thermocouple Input and Amplifier/
File: thermocouple.kicad_sch

Title:

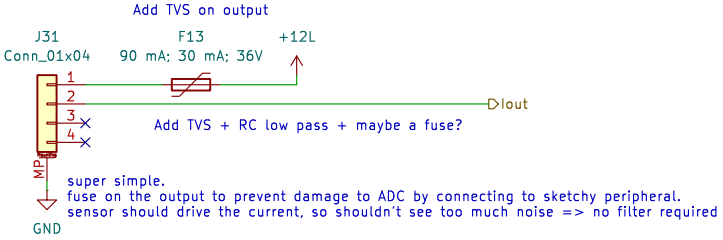
Size: A4	Date:	**Rev:**
KiCad E.D.A. 8.0.1		Id: 3/40



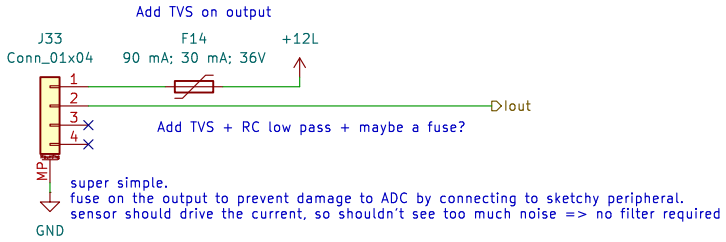
Sheet: /ADC1/Current Input Filtering2/		
File: current_input_filtering.kicad_sch		
Title:		
Size: A4	Date:	**Rev:**
KiCad E.D.A. 8.0.1		Id: 4/40



Sheet: /ADC1/Current Input Filtering3/		
File: current_input_filtering.kicad_sch		
Title:		
Size: A4	Date:	**Rev:**
KiCad E.D.A. 8.0.1		Id: 5/40

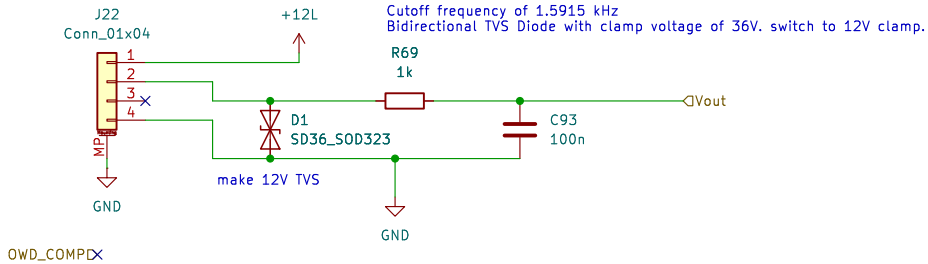


Sheet: /ADC1/Current Input Filtering1/		
File: current_input_filtering.kicad_sch		
Title:		
Size: A4	Date:	**Rev:**
KiCad E.D.A. 8.0.1		Id: 6/40



Sheet: /ADC1/Current Input Filtering/		
File: current_input_filtering.kicad_sch		
Title:		
Size: A4	Date:	**Rev:**
KiCad E.D.A. 8.0.1		Id: 7/40

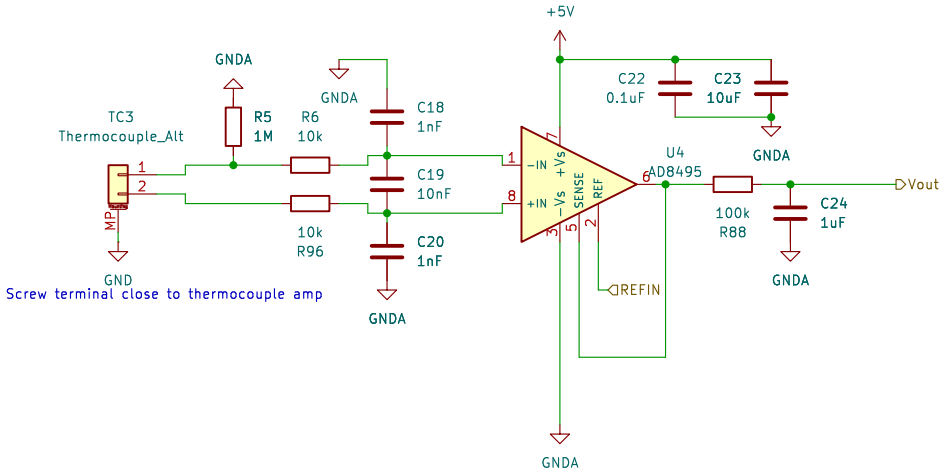
TVS should be as close to connector as possible



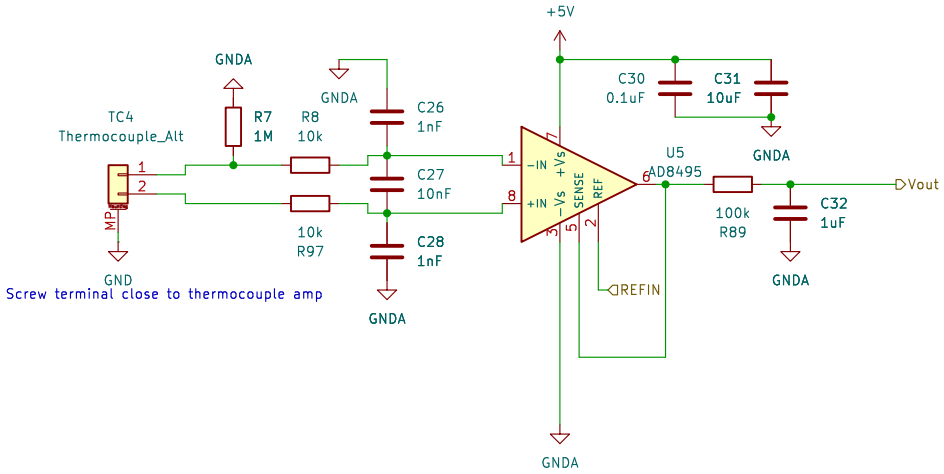
OWD_COMP

Not gonna do open-wire detection.
Left it as a NC to make it easier to add later though

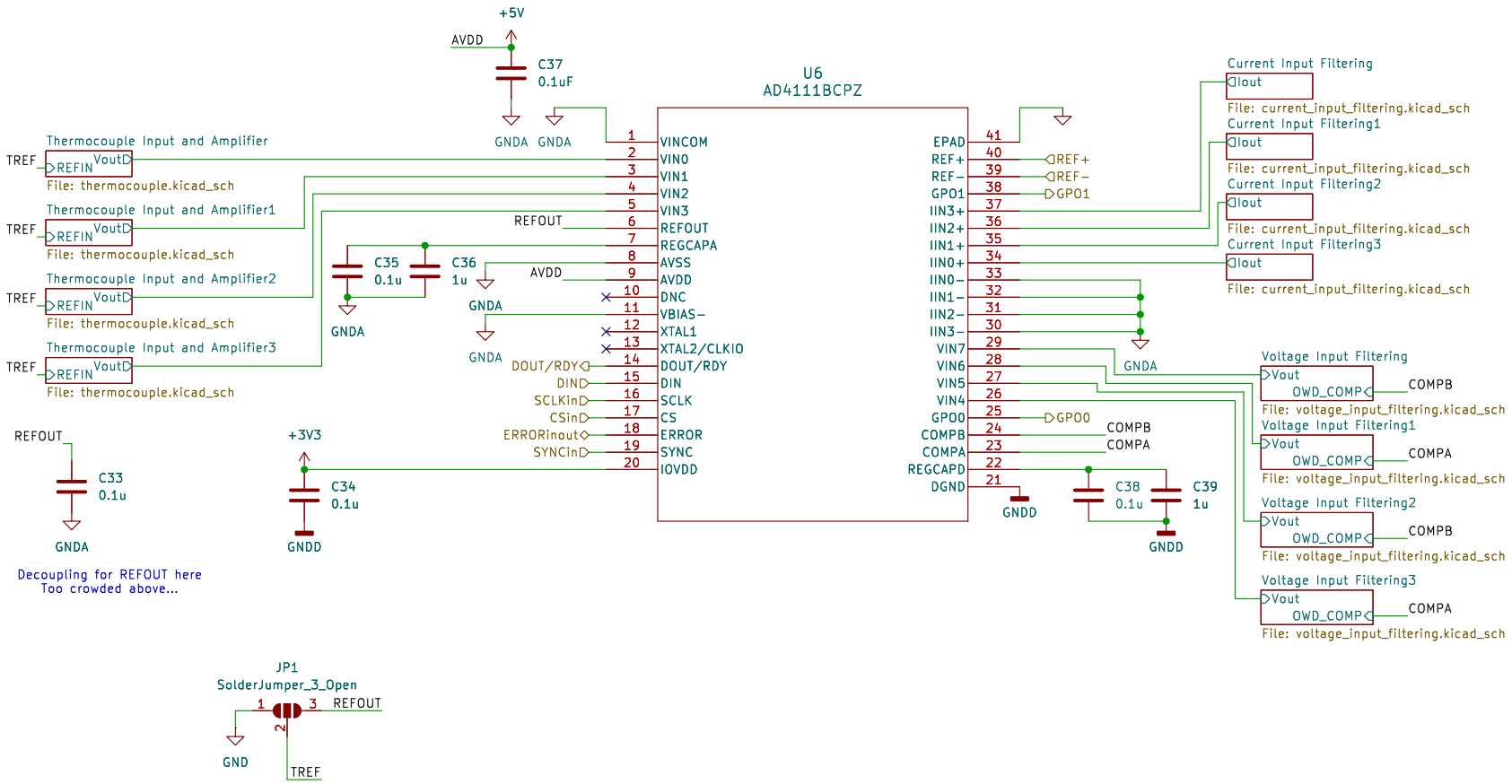
Sheet: /ADC1/Voltage Input Filtering/		
File: voltage_input_filtering.kicad_sch		
Title:		
Size: A4	Date:	**Rev:**
KiCad E.D.A. 8.0.1		Id: 8/40



Sheet: /ADC1/Thermocouple Input and Amplifier3/		
File: thermocouple.kicad_sch		
Title:		
Size: A4	Date:	**Rev:**
KiCad E.D.A. 8.0.1		Id: 9/40

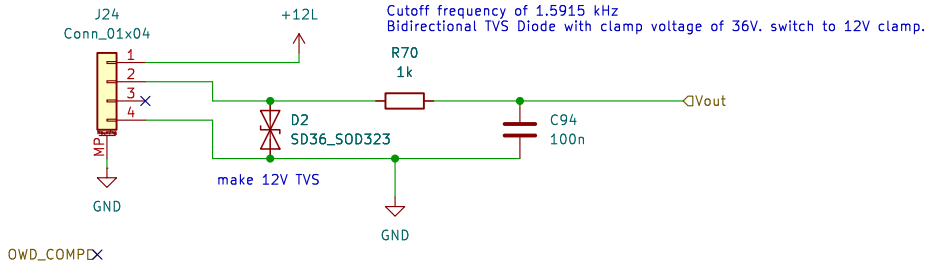


Sheet: /ADC1/Thermocouple Input and Amplifier1/		
File: thermocouple.kicad_sch		
Title:		
Size: A4	Date:	**Rev:**
KiCad E.D.A. 8.0.1		Id: 10/40



Sheet: /ADC1/		
File: adc.kicad_sch		
Title:		
Size: A4	Date:	**Rev:**
KiCad E.D.A. 8.0.1		Id: 11/40

TVS should be as close to connector as possible

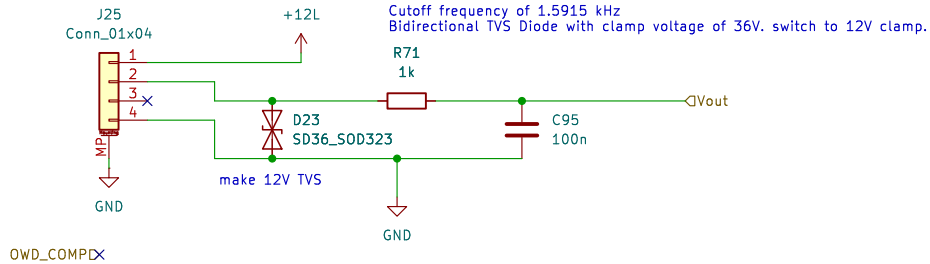


OWD_COMP

Not gonna do open-wire detection.
Left it as a NC to make it easier to add later though

Sheet: /ADC1/Voltage Input Filtering1/		
File: voltage_input_filtering.kicad_sch		
Title:		
Size: A4	Date:	**Rev:**
KiCad E.D.A. 8.0.1		Id: 12/40

TVS should be as close to connector as possible

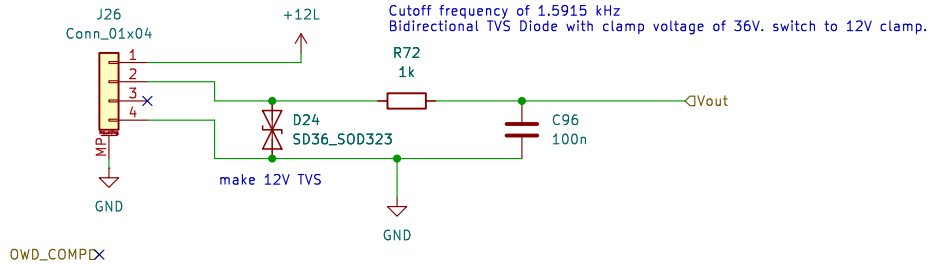


OWD_COMP

Not gonna do open-wire detection.
Left it as a NC to make it easier to add later though

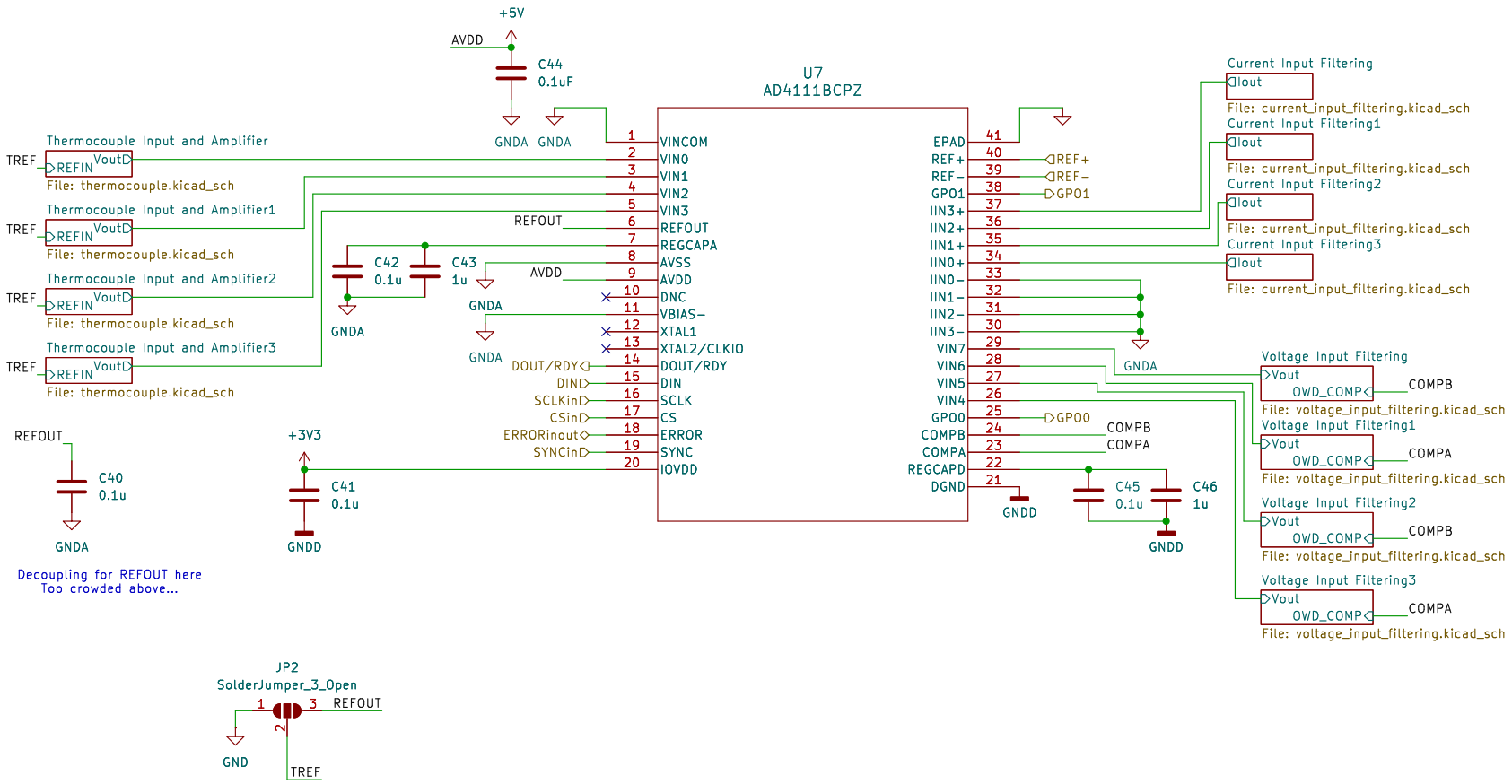
Sheet: /ADC1/Voltage Input Filtering2/		
File: voltage_input_filtering.kicad_sch		
Title:		
Size: A4	Date:	**Rev:**
KiCad E.D.A. 8.0.1		Id: 13/40

TVS should be as close to connector as possible

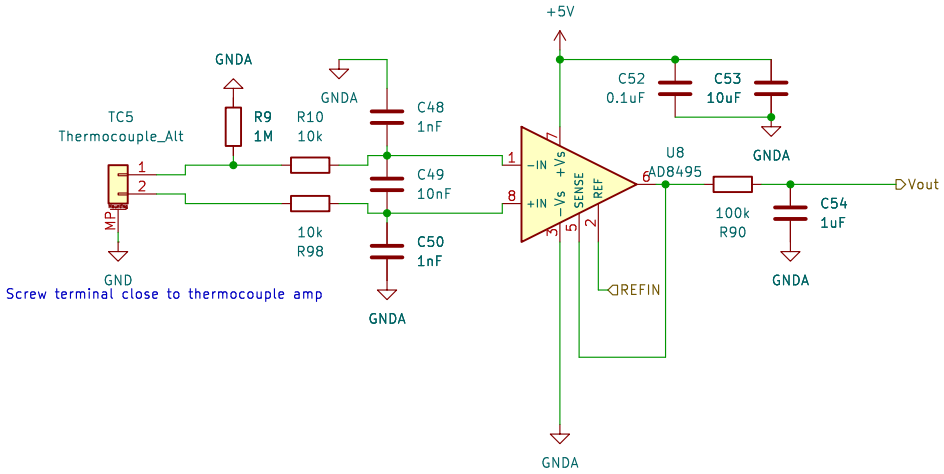


Not gonna do open-wire detection.
Left it as a NC to make it easier to add later though

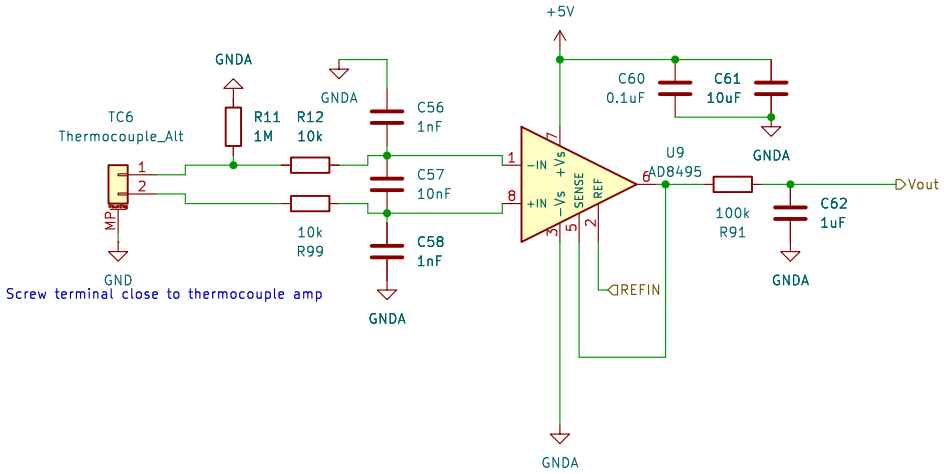
Sheet: /ADC1/Voltage Input Filtering3/		
File: voltage_input_filtering.kicad_sch		
Title:		
Size: A4	Date:	**Rev:**
KiCad E.D.A. 8.0.1		Id: 14/40



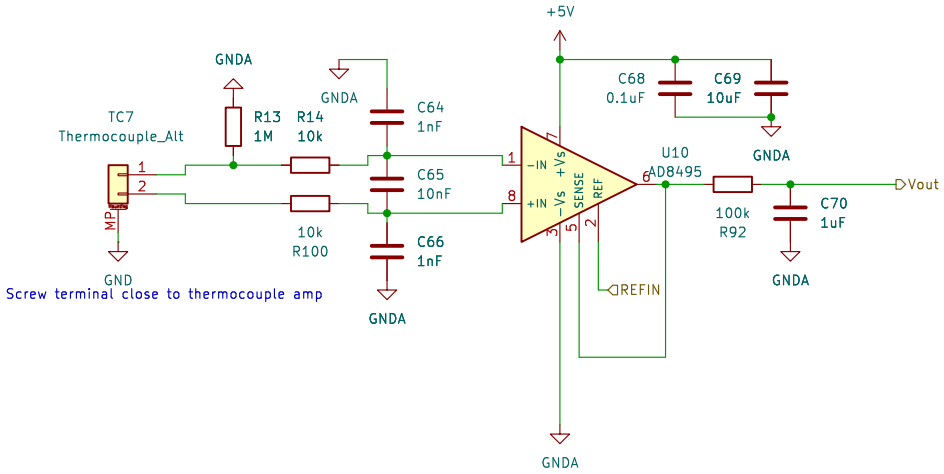
Sheet: /ADC2/		
File: adc.kicad_sch		
Title:		
Size: A4	Date:	**Rev:**
KiCad E.D.A. 8.0.1		Id: 15/40



Sheet: /ADC2/Thermocouple Input and Amplifier/		
File: thermocouple.kicad_sch		
Title:		
Size: A4	Date:	**Rev:**
KiCad E.D.A. 8.0.1		Id: 16/40

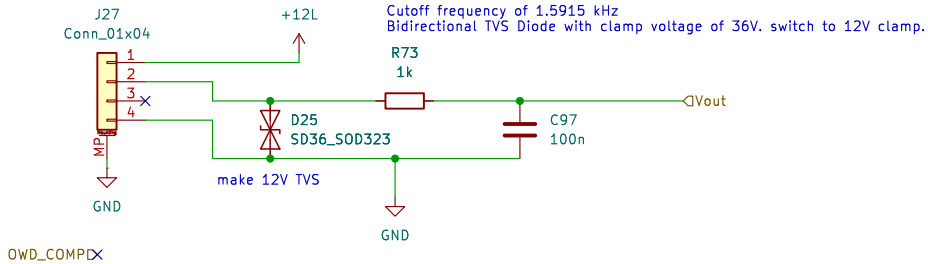


Sheet: /ADC2/Thermocouple Input and Amplifier1/		
File: thermocouple.kicad_sch		
Title:		
Size: A4	Date:	**Rev:**
KiCad E.D.A. 8.0.1		Id: 17/40



Sheet: /ADC2/Thermocouple Input and Amplifier3/		
File: thermocouple.kicad_sch		
Title:		
Size: A4	Date:	**Rev:**
KiCad E.D.A. 8.0.1		Id: 18/40

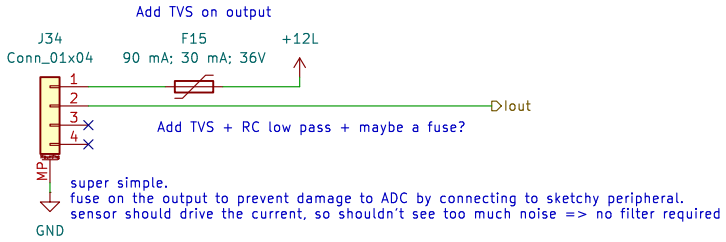
TVS should be as close to connector as possible



OWD_COMP

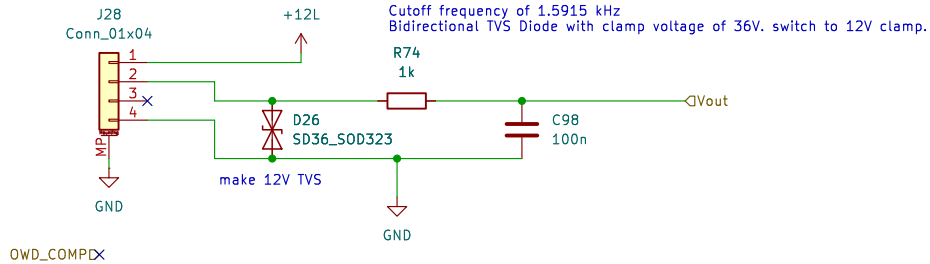
Not gonna do open-wire detection.
Left it as a NC to make it easier to add later though

Sheet: /ADC2/Voltage Input Filtering/		
File: voltage_input_filtering.kicad_sch		
Title:		
Size: A4	Date:	**Rev:**
KiCad E.D.A. 8.0.1		Id: 19/40



Sheet: /ADC2/Current Input Filtering/		
File: current_input_filtering.kicad_sch		
Title:		
Size: A4	Date:	**Rev:**
KiCad E.D.A. 8.0.1		Id: 20/40

TVS should be as close to connector as possible

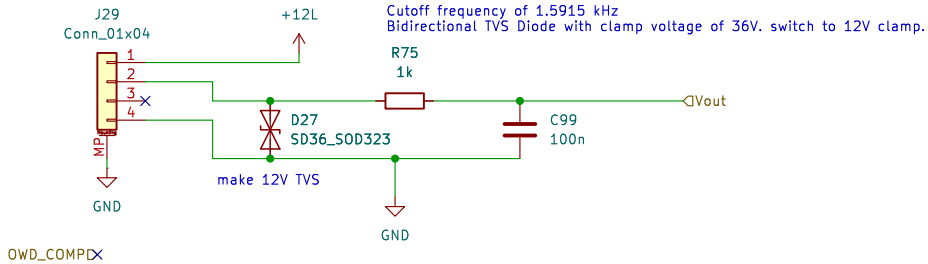


OWD_COMP

Not gonna do open-wire detection.
Left it as a NC to make it easier to add later though

Sheet: /ADC2/Voltage Input Filtering2/		
File: voltage_input_filtering.kicad_sch		
Title:		
Size: A4	Date:	**Rev:**
KiCad E.D.A. 8.0.1		Id: 21/40

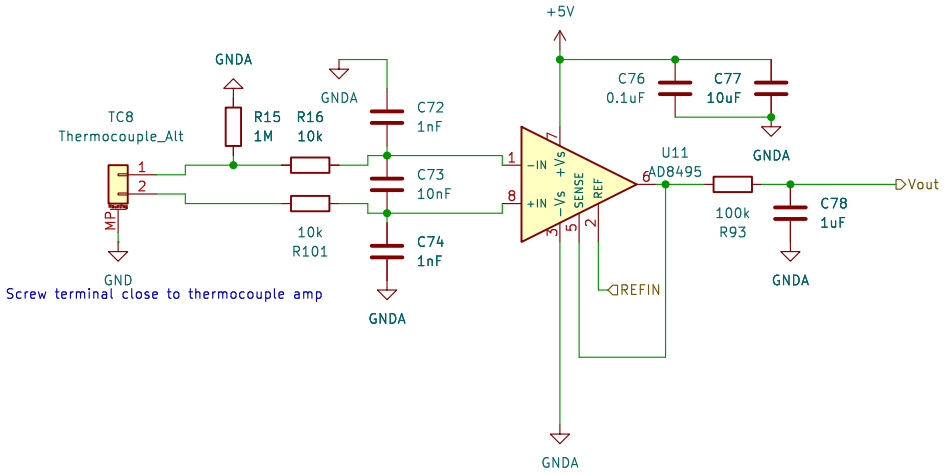
TVS should be as close to connector as possible



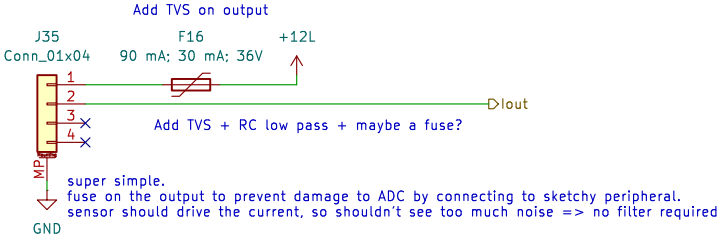
OWD_COMP

Not gonna do open-wire detection.
Left it as a NC to make it easier to add later though

Sheet: /ADC2/Voltage Input Filtering3/		
File: voltage_input_filtering.kicad_sch		
Title:		
Size: A4	Date:	**Rev:**
KiCad E.D.A. 8.0.1		Id: 22/40



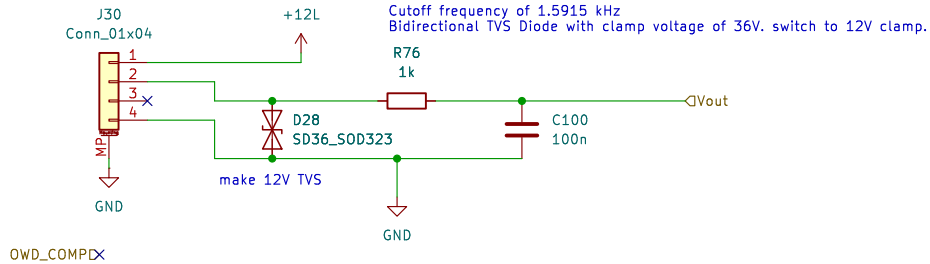
Sheet: /ADC2/Thermocouple Input and Amplifier2/		
File: thermocouple.kicad_sch		
Title:		
Size: A4	Date:	**Rev:**
KiCad E.D.A. 8.0.1		Id: 23/40



super simple.
fuse on the output to prevent damage to ADC by connecting to sketchy peripheral.
sensor should drive the current, so shouldn't see too much noise => no filter required

Sheet: /ADC2/Current Input Filtering1/		
File: current_input_filtering.kicad_sch		
Title:		
Size: A4	Date:	**Rev:**
KiCad E.D.A. 8.0.1		Id: 24/40

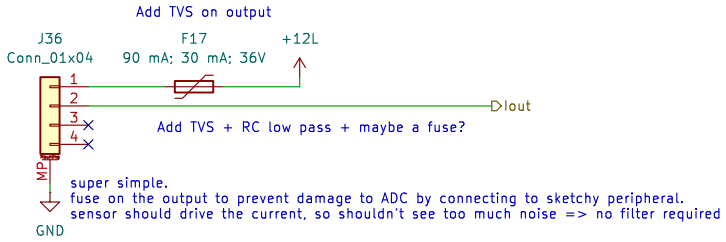
TVS should be as close to connector as possible



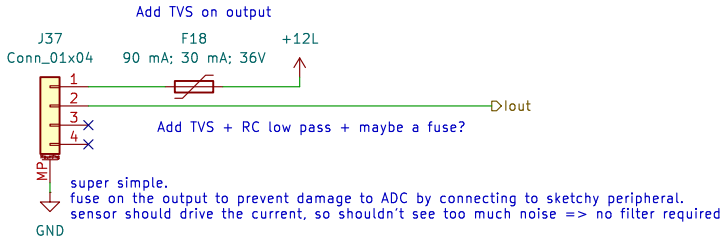
OWD_COMP

Not gonna do open-wire detection.
Left it as a NC to make it easier to add later though

Sheet: /ADC2/Voltage Input Filtering1/		
File: voltage_input_filtering.kicad_sch		
Title:		
Size: A4	Date:	**Rev:**
KiCad E.D.A. 8.0.1		Id: 25/40



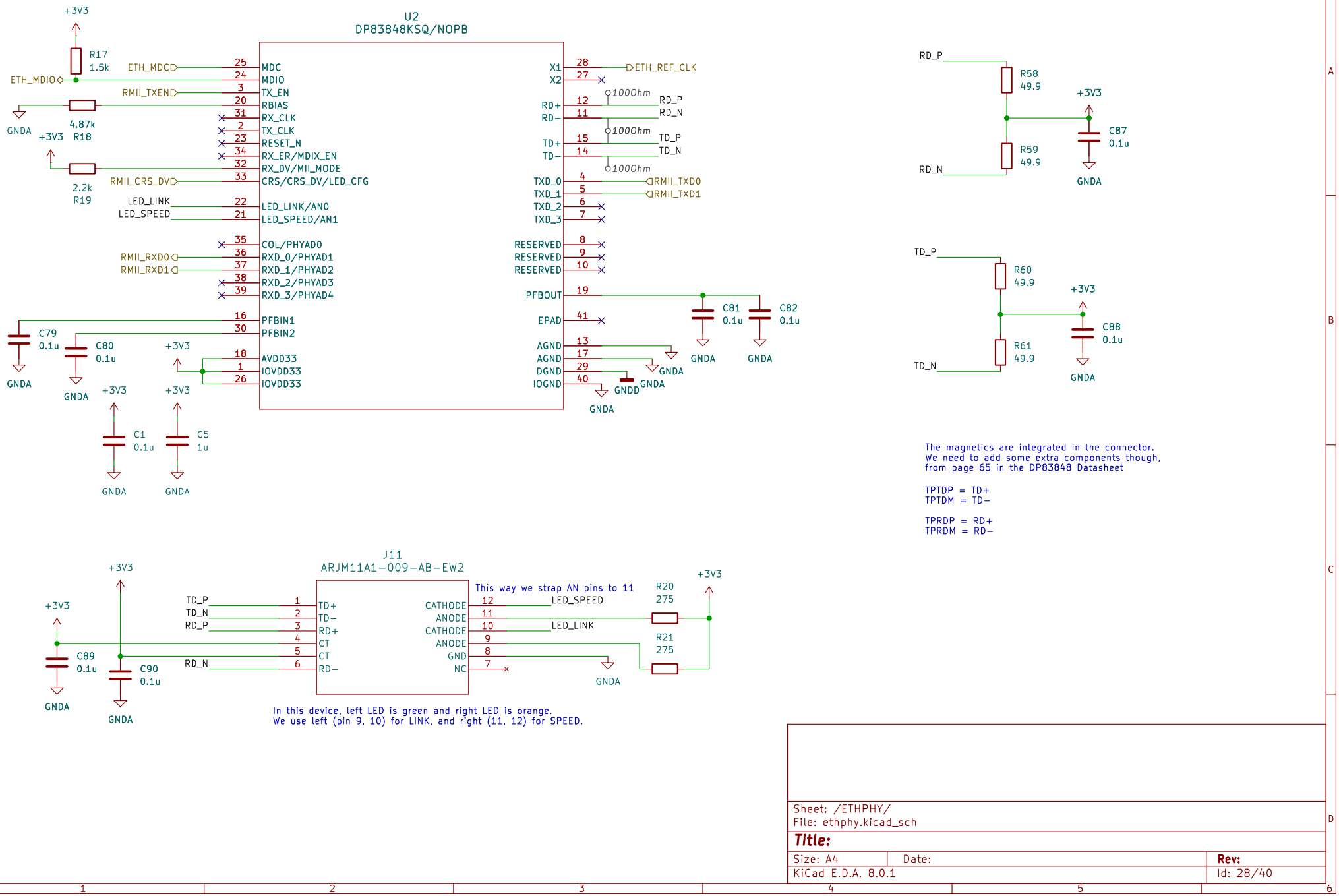
Sheet: /ADC2/Current Input Filtering2/		
File: current_input_filtering.kicad_sch		
Title:		
Size: A4	Date:	**Rev:**
KiCad E.D.A. 8.0.1		Id: 26/40

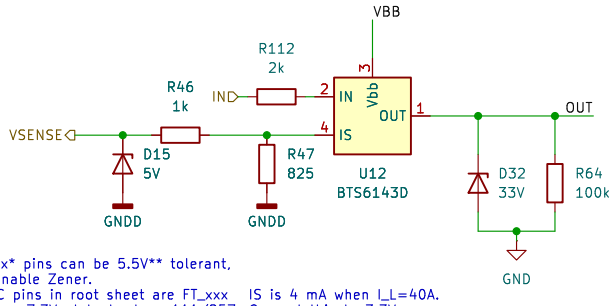


Sheet: /ADC2/Current Input Filtering3/
File: current_input_filtering.kicad_sch

Title:

Size: A4	Date:	**Rev:**
KiCad E.D.A. 8.0.1		Id: 27/40

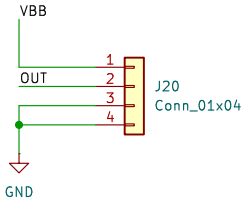

U2
DP83848KSQ/NOPB
+3V3
R17
1.5k
ETH_MDIO
ETH_MDC
RMII_TXEN
RMII_CRS_DV
LED_LINK
LED_SPEED
RMII_RXD0
RMII_RXD1
GNDA
4.87k
R18
2.2k
R19
MDC
MDIO
TX_EN
RBIAS
RX_CLK
TX_CLK
RESET_N
RX_ER/MDIX_EN
RX_DV/MII_MODE
CRS/CRS_DV/LED_CFG
LED_LINK/AN0
LED_SPEED/AN1
COL/PHYAD0
RXD_0/PHYAD1
RXD_1/PHYAD2
RXD_2/PHYAD3
RXD_3/PHYAD4
PFBIN1
PFBIN2
AVDD33
IOVDD33
IOVDD33
X1
X2
RD+
RD−
TD+
TD−
TXD_0
TXD_1
TXD_2
TXD_3
RESERVED
RESERVED
RESERVED
PFBOUT
EPAD
AGND
AGND
DGND
IOGND
ETH_REF_CLK
100Ohm
RD_P
RD_N
TD_P
TD_N
RMII_TXD0
RMII_TXD1
GNDD
C79
0.1u
C80
0.1u
C1
0.1u
C5
1u
C81
0.1u
C82
0.1u
RD_P
R58
49.9
R59
49.9
C87
0.1u
RD_N
TD_P
R60
49.9
R61
49.9
C88
0.1u
TD_N
The magnetics are integrated in the connector.
We need to add some extra components though,
from page 65 in the DP83848 Datasheet
TPTDP = TD+
TPTDM = TD−
TPRDP = RD+
TPRDM = RD−
J11
ARJM11A1-009-AB-EW2
TD_P
TD_N
RD_P
RD_N
TD+
TD−
RD+
CT
CT
RD−
CATHODE
ANODE
CATHODE
ANODE
GND
NC
This way we strap AN pins to 11
LED_SPEED
LED_LINK
R20
275
R21
275
C89
0.1u
C90
0.1u
In this device, left LED is green and right LED is orange.
We use left (pin 9, 10) for LINK, and right (11, 12) for SPEED.
Sheet: /ETHPHY/
File: ethphy.kicad_sch
Title:
Size: A4
Date:
Rev:
KiCad E.D.A. 8.0.1
Id: 28/40



STM32 H723 FT_xxx* pins can be 5.5V** tolerant,
so we use a reasonable Zener.
*All connected ADC pins in root sheet are FT_xxx
**Actually more like 7.3V, datasheet pg 111/257

IS is 4 mA when I_L=40A.
Convert this to 3.3V

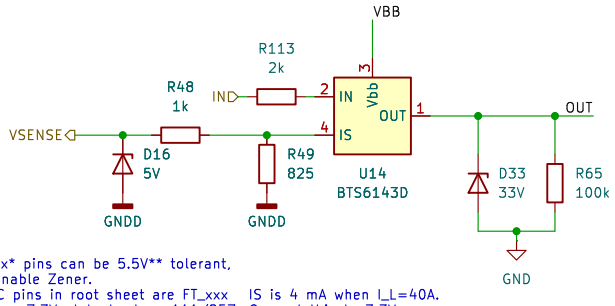
Should be a unidirectional TVS diode,
to absorb ESD and clamp inductive loads.
Reverse breakdown >= 24V



Sheet: /High Side Switch4/
File: hss.kicad_sch

Title:

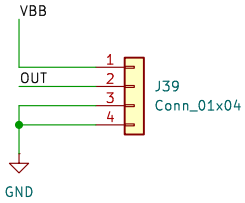
Size: A4	Date:	**Rev:**
KiCad E.D.A. 8.0.1		Id: 29/40



STM32 H723 FT_xxx* pins can be 5.5V** tolerant,
so we use a reasonable Zener.
*All connected ADC pins in root sheet are FT_xxx
**Actually more like 7.3V, datasheet pg 111/257

IS is 4 mA when I_L=40A.
Convert this to 3.3V

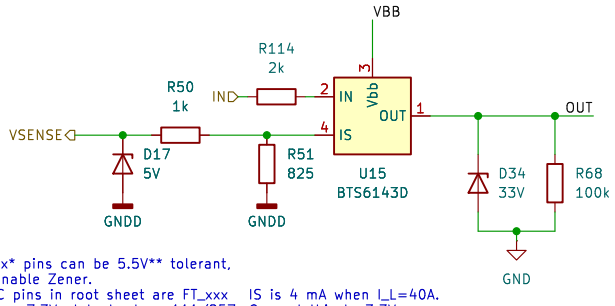
Should be a unidirectional TVS diode,
to absorb ESD and clamp inductive loads.
Reverse breakdown >= 24V



Sheet: /High Side Switch5/
File: hss.kicad_sch

Title:

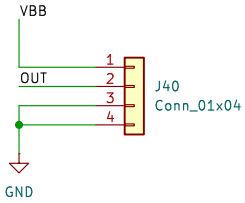
Size: A4	Date:	**Rev:**
KiCad E.D.A. 8.0.1		Id: 30/40



STM32 H723 FT_xxx* pins can be 5.5V** tolerant,
so we use a reasonable Zener.
*All connected ADC pins in root sheet are FT_xxx
**Actually more like 7.3V, datasheet pg 111/257

IS is 4 mA when I_L=40A.
Convert this to 3.3V

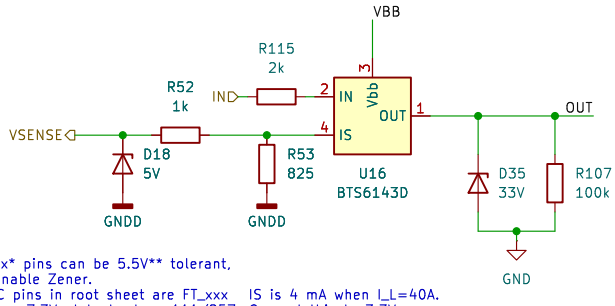
Should be a unidirectional TVS diode,
to absorb ESD and clamp inductive loads.
Reverse breakdown >= 24V



Sheet: /High Side Switch6/
File: hss.kicad_sch

Title:

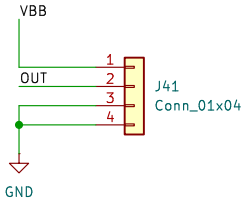
Size: A4	Date:	**Rev:**
KiCad E.D.A. 8.0.1		Id: 31/40



STM32 H723 FT_xxx* pins can be 5.5V** tolerant,
so we use a reasonable Zener.
*All connected ADC pins in root sheet are FT_xxx
**Actually more like 7.3V, datasheet pg 111/257

IS is 4 mA when I_L=40A.
Convert this to 3.3V

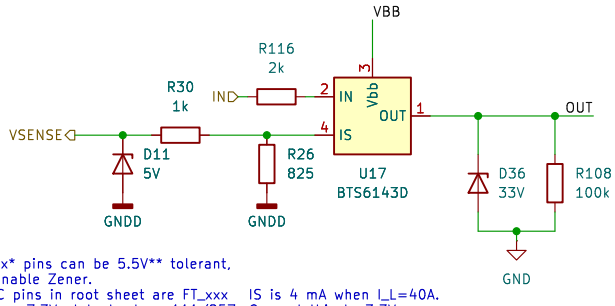
Should be a unidirectional TVS diode,
to absorb ESD and clamp inductive loads.
Reverse breakdown >= 24V



Sheet: /High Side Switch7/
File: hss.kicad_sch

Title:

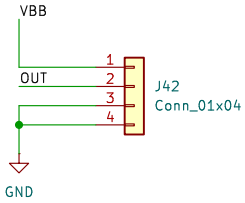
Size: A4	Date:	**Rev:**
KiCad E.D.A. 8.0.1		Id: 32/40



STM32 H723 FT_xxx* pins can be 5.5V** tolerant,
so we use a reasonable Zener.
*All connected ADC pins in root sheet are FT_xxx
**Actually more like 7.3V, datasheet pg 111/257

IS is 4 mA when I_L=40A.
Convert this to 3.3V

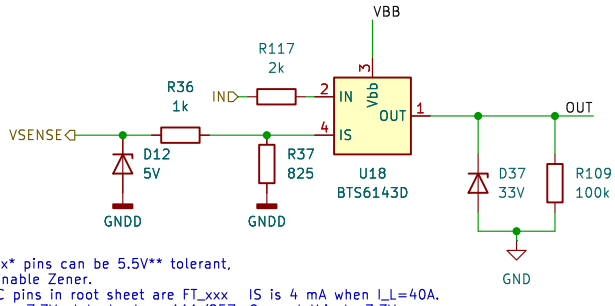
Should be a unidirectional TVS diode,
to absorb ESD and clamp inductive loads.
Reverse breakdown >= 24V



Sheet: /High Side Switch/
File: hss.kicad_sch

Title:

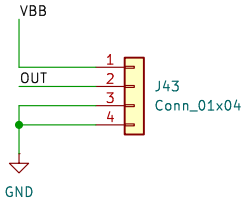
Size: A4	Date:	**Rev:**
KiCad E.D.A. 8.0.1		Id: 33/40



STM32 H723 FT_xxx* pins can be 5.5V** tolerant,
so we use a reasonable Zener.
*All connected ADC pins in root sheet are FT_xxx
**Actually more like 7.3V, datasheet pg 111/257

IS is 4 mA when I_L=40A.
Convert this to 3.3V

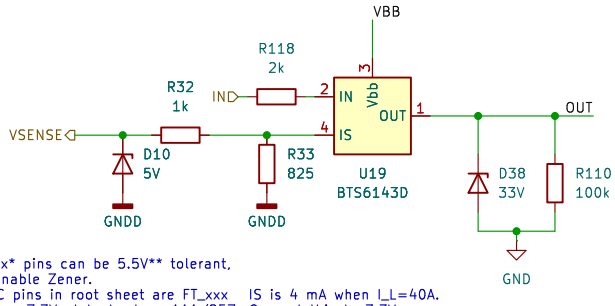
Should be a unidirectional TVS diode,
to absorb ESD and clamp inductive loads.
Reverse breakdown >= 24V



Sheet: /High Side Switch1/
File: hss.kicad_sch

Title:

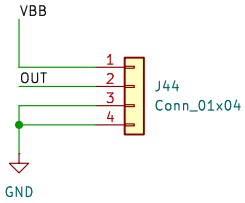
Size: A4	Date:	**Rev:**
KiCad E.D.A. 8.0.1		Id: 34/40



STM32 H723 FT_xxx* pins can be 5.5V** tolerant,
so we use a reasonable Zener.
*All connected ADC pins in root sheet are FT_xxx
**Actually more like 7.3V, datasheet pg 111/257

IS is 4 mA when I_L=40A.
Convert this to 3.3V

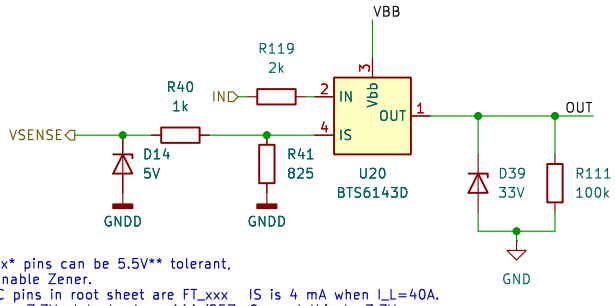
Should be a unidirectional TVS diode,
to absorb ESD and clamp inductive loads.
Reverse breakdown >= 24V



Sheet: /High Side Switch2/
File: hss.kicad_sch

Title:

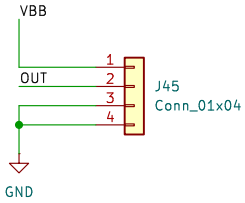
Size: A4	Date:	**Rev:**
KiCad E.D.A. 8.0.1		Id: 35/40



Should be a unidirectional TVS diode,
to absorb ESD and clamp inductive loads.
Reverse breakdown >= 24V

STM32 H723 FT_xxx* pins can be 5.5V** tolerant,
so we use a reasonable Zener.
*All connected ADC pins in root sheet are FT_xxx
**Actually more like 7.3V, datasheet pg 111/257

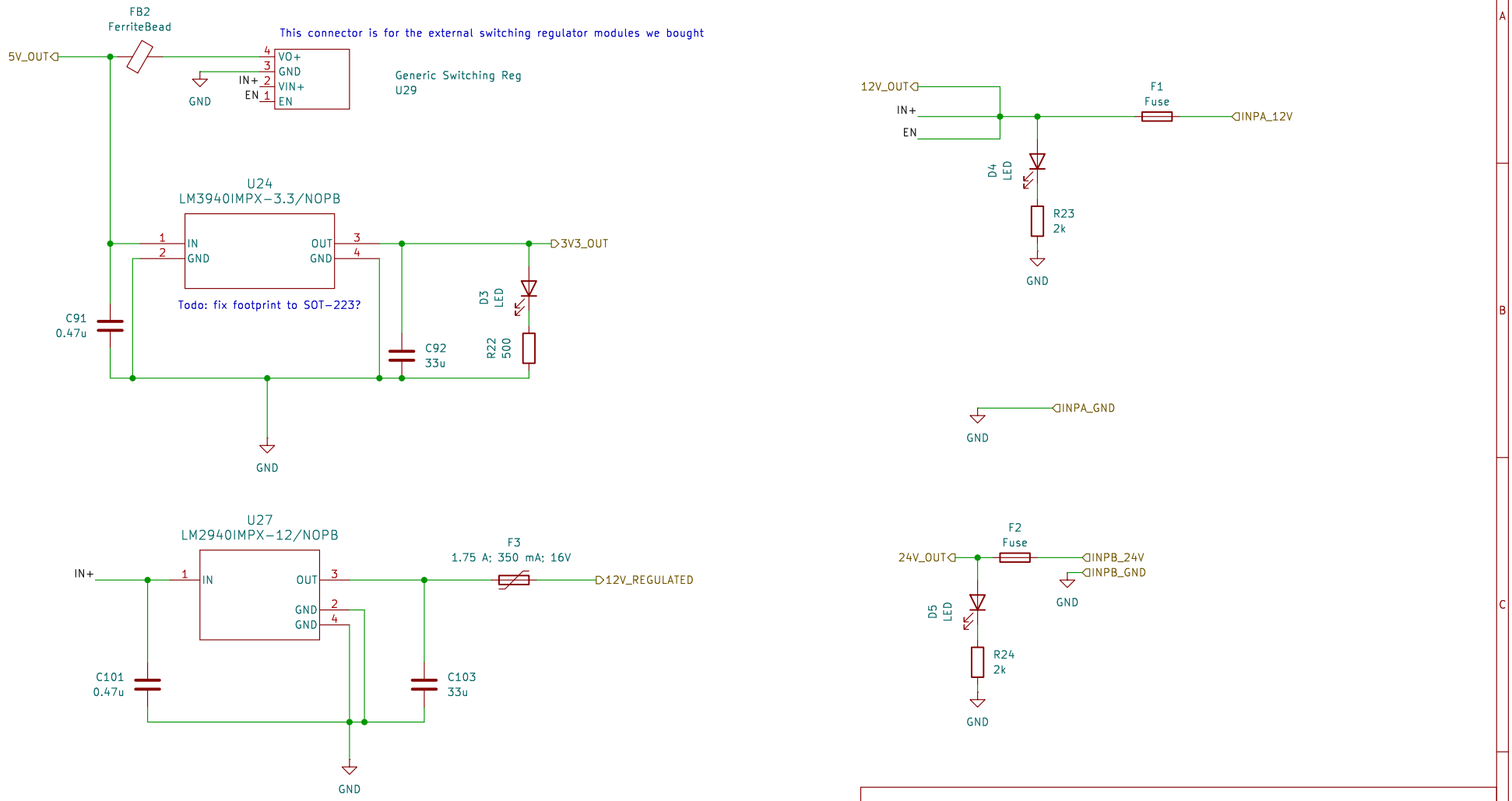
IS is 4 mA when I_L=40A.
Convert this to 3.3V



Sheet: /High Side Switch3/
File: hss.kicad_sch

Title:

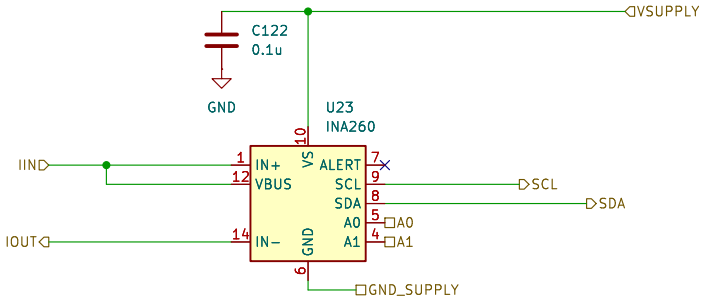
Size: A4 | Date: | **Rev:**
KiCad E.D.A. 8.0.1 | Id: 36/40



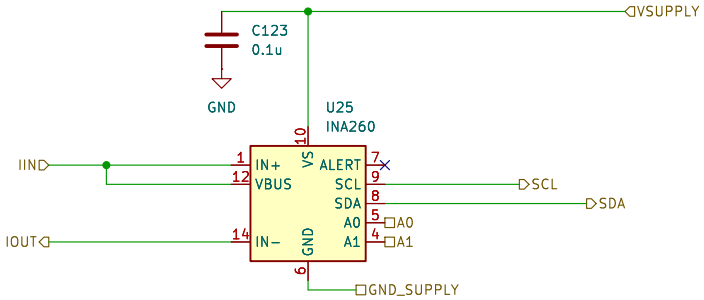
Sheet: /Power/
File: power.kicad_sch

Title:

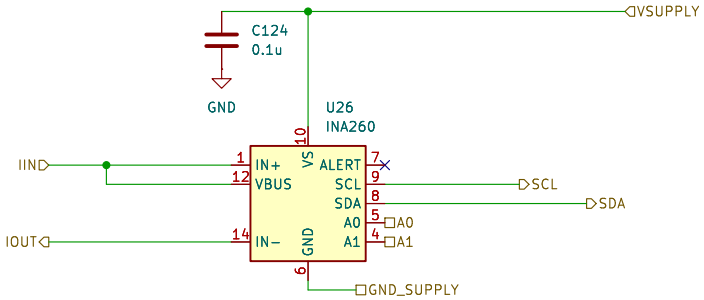
Size: A4	Date:	**Rev:**
KiCad E.D.A. 8.0.1		Id: 40/40



Sheet: /Current Sense Block/ File: ina260sense.kicad_sch		
Title:		
Size: A4	Date:	**Rev:**
KiCad E.D.A. 8.0.1		Id: 41/40



Sheet: /Current Sense Block1/		
File: ina260sense.kicad_sch		
Title:		
Size: A4	Date:	**Rev:**
KiCad E.D.A. 8.0.1		Id: 42/40



Sheet: /Current Sense Block2/		
File: ina260sense.kicad_sch		
Title:		
Size: A4	Date:	**Rev:**
KiCad E.D.A. 8.0.1		Id: 43/40