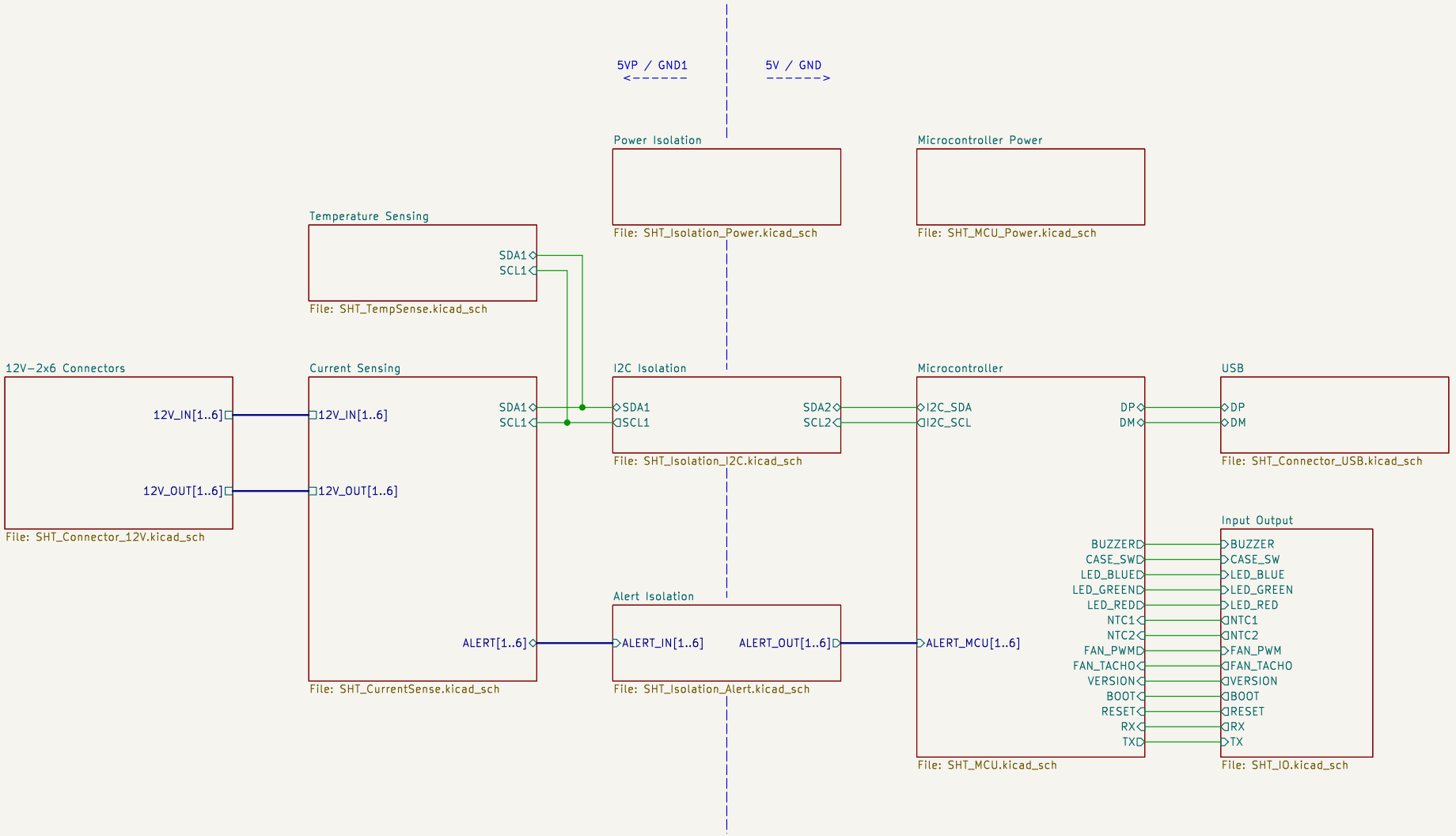
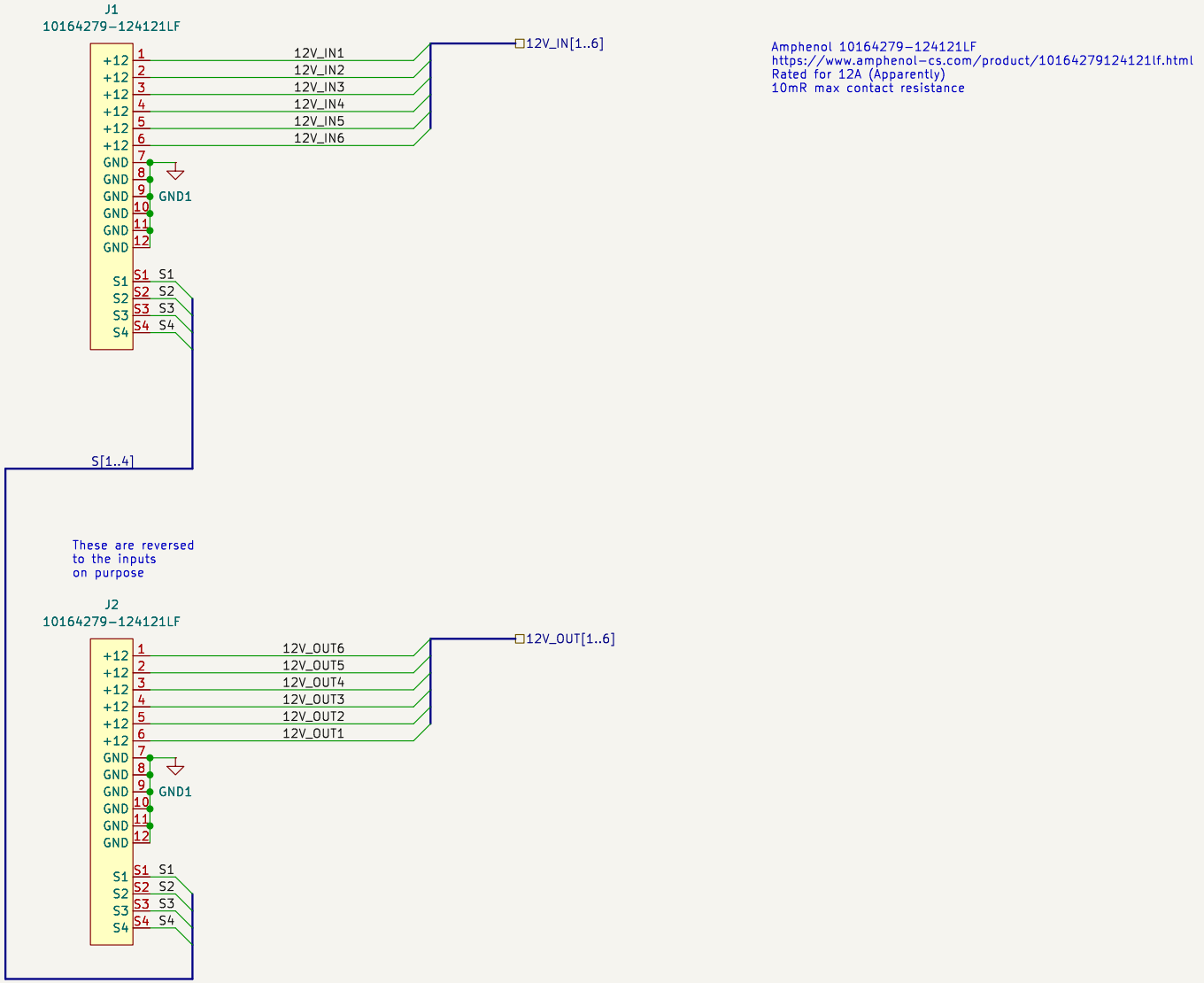


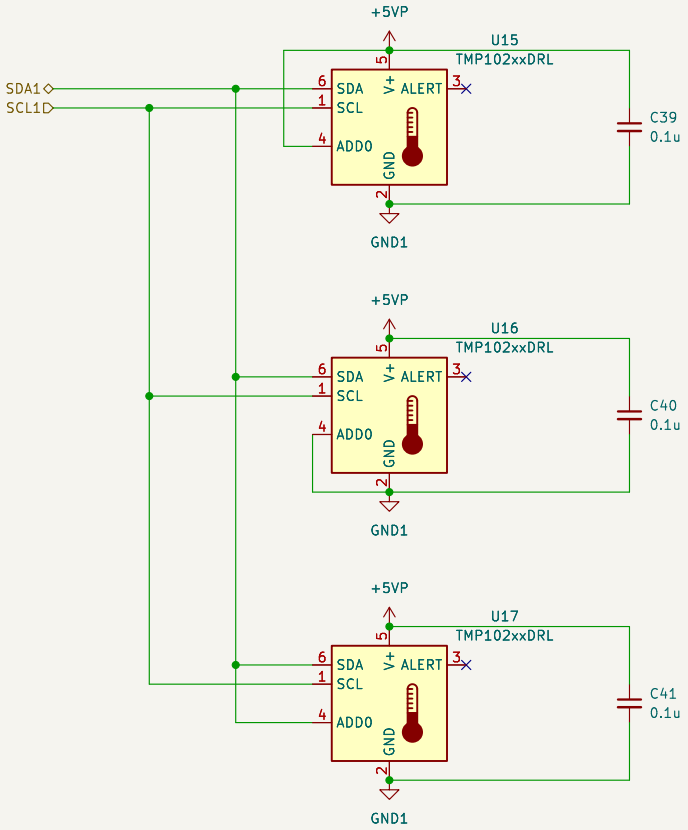
Title: 12V-2x6 Current Monitor	github.com/eggsampler	Rev: 1
Sheet: Root	Date: 2025-09-21	Page: 1/17
KiCad E.D.A. 9.0.3	File: 12v-2x6.kicad_sch	



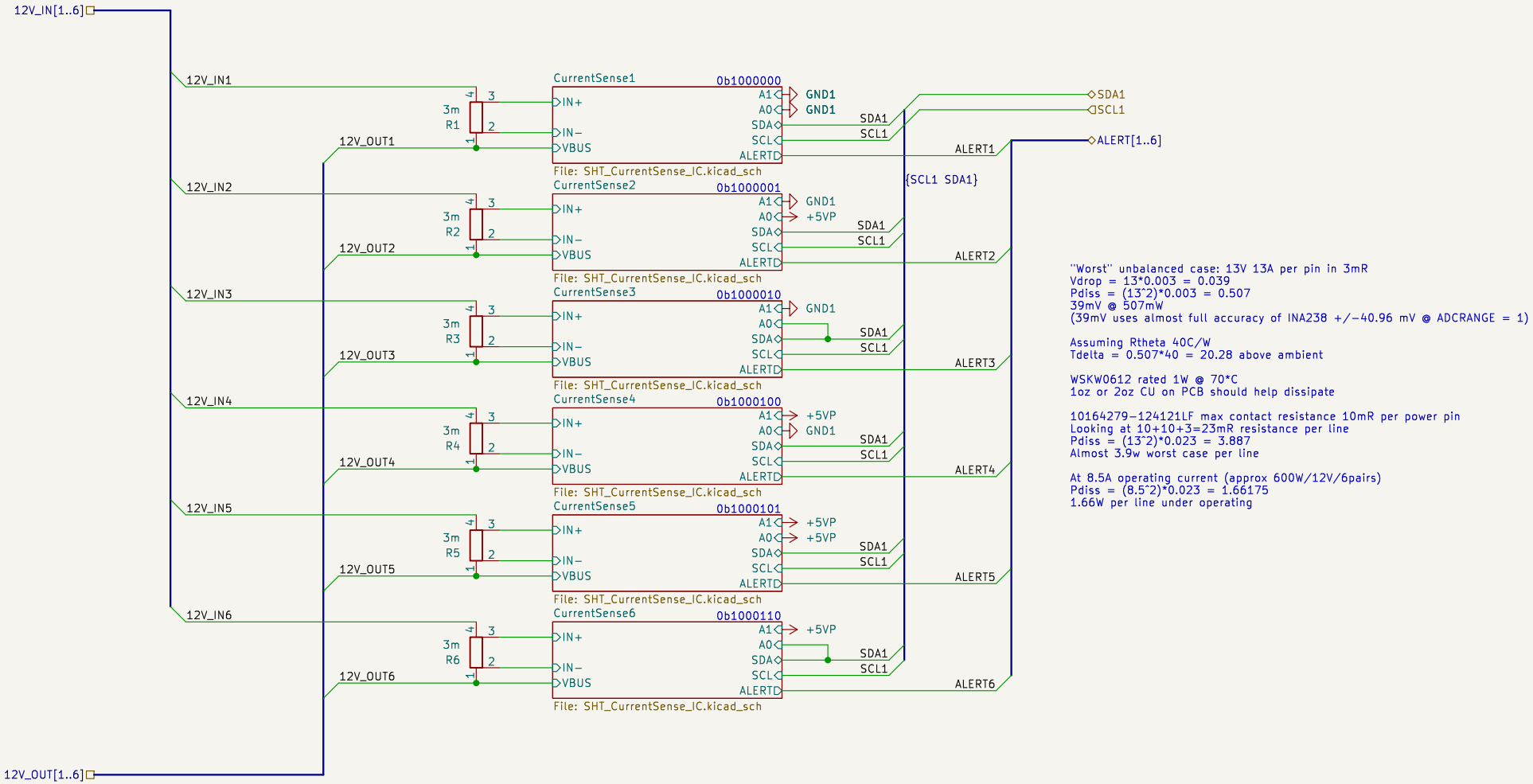
Amphenol 10164279-124121LF
https://www.amphenol-cs.com/product/10164279124121lf.html
Rated for 12A (Apparently)
10mR max contact resistance

Title: 12V-2x6 Current Monitor	github.com/eggsampler	Rev: 1
Sheet: 12V-2x6 Connectors	Date: 2025-09-21	Page: 2/17
KiCad E.D.A. 9.0.3	File: SHT_Connector_12V.kicad_sch	

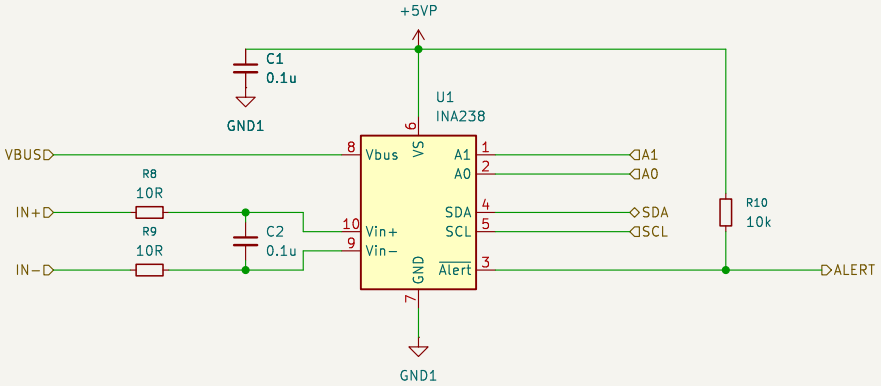
Placed near the 12v-2x6 connectors to infer close temperature



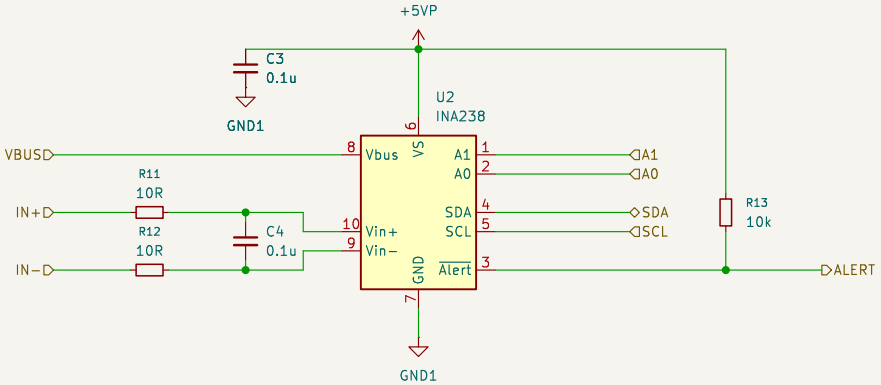
Title: 12V-2x6 Current Monitor	github.com/eggsampler	Rev: 1
Sheet: Temperature Sensing	Date: 2025-09-21	Page: 17/17
KiCad E.D.A. 9.0.3	File: SHT_TempSense.kicad_sch	



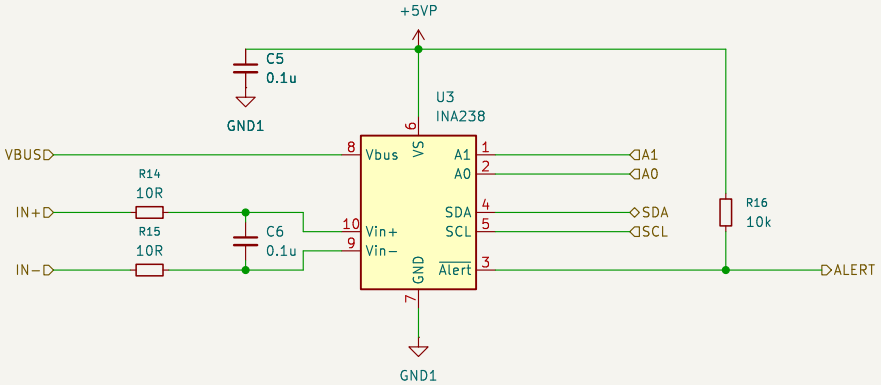
Title: 12V−2x6 Current Monitor	github.com/eggsampler	Rev: 1
Sheet: Current Sensing	Date: 2025−09−21	Page: 3/17
KiCad E.D.A. 9.0.3	File: SHT_CurrentSense.kicad_sch	



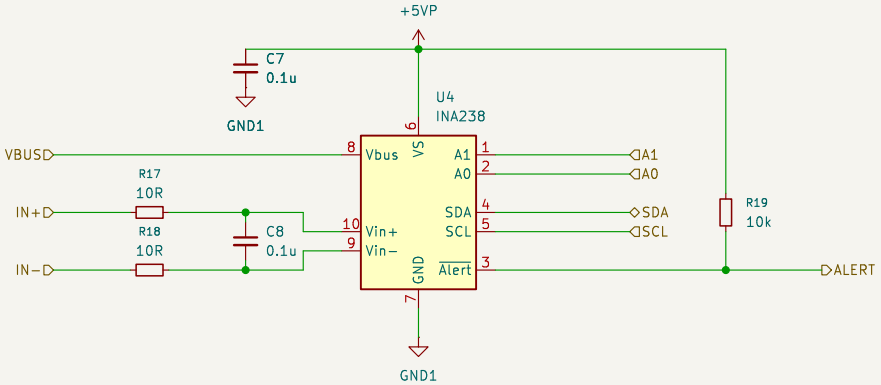
Title: 12V–2x6 Current Monitor	github.com/eggsampler	Rev: 1
Sheet: CurrentSense1	Date: 2025–09–21	Page: 4/17
KiCad E.D.A. 9.0.3	File: SHT_CurrentSense_IC.kicad_sch	



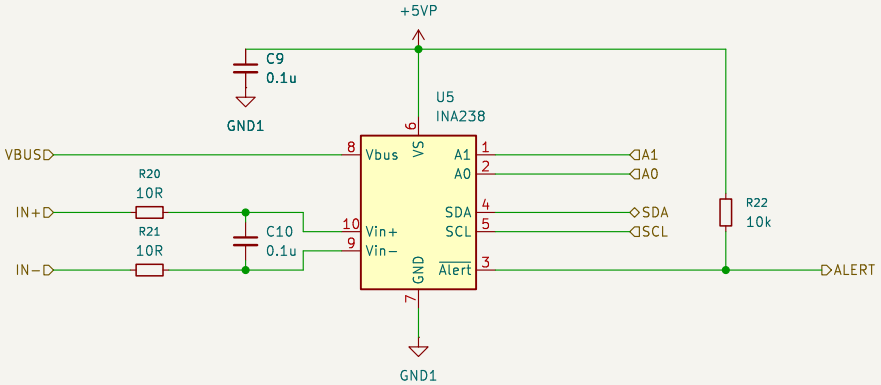
Title: 12V–2x6 Current Monitor	github.com/eggsampler	Rev: 1
Sheet: CurrentSense2	Date: 2025–09–21	Page: 5/17
KiCad E.D.A. 9.0.3	File: SHT_CurrentSense_IC.kicad_sch	



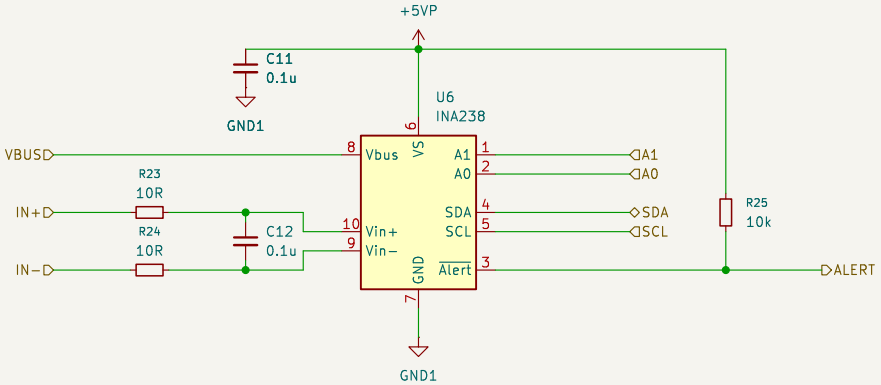
Title: 12V–2x6 Current Monitor	github.com/eggsampler	Rev: 1
Sheet: CurrentSense3	Date: 2025–09–21	Page: 6/17
KiCad E.D.A. 9.0.3	File: SHT_CurrentSense_IC.kicad_sch	



Title: 12V–2x6 Current Monitor	github.com/eggsampler	Rev: 1
Sheet: CurrentSense4	Date: 2025–09–21	Page: 7/17
KiCad E.D.A. 9.0.3	File: SHT_CurrentSense_IC.kicad_sch	



Title: 12V–2x6 Current Monitor	github.com/eggsampler	Rev: 1
Sheet: CurrentSense5	Date: 2025–09–21	Page: 8/17
KiCad E.D.A. 9.0.3	File: SHT_CurrentSense_IC.kicad_sch	

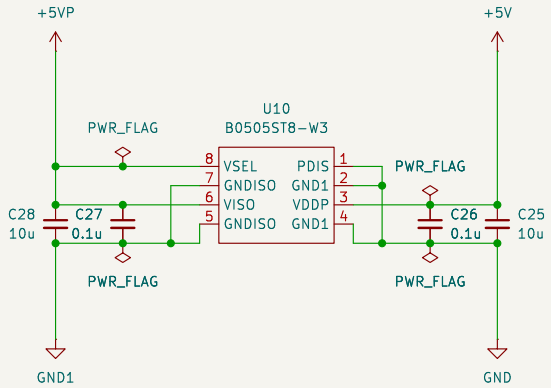


Title: 12V–2x6 Current Monitor	github.com/eggsampler	Rev: 1
Sheet: CurrentSense6	Date: 2025–09–21	Page: 9/17
KiCad E.D.A. 9.0.3	File: SHT_CurrentSense_IC.kicad_sch	

Translated from datasheet

电源关断管脚，接GND1芯片正常工作，接逻辑高电平，芯片停止工作。
The power shutdown pin – connect it to GND1 for normal operation; connect it to a logic high level to stop the chip from operating.

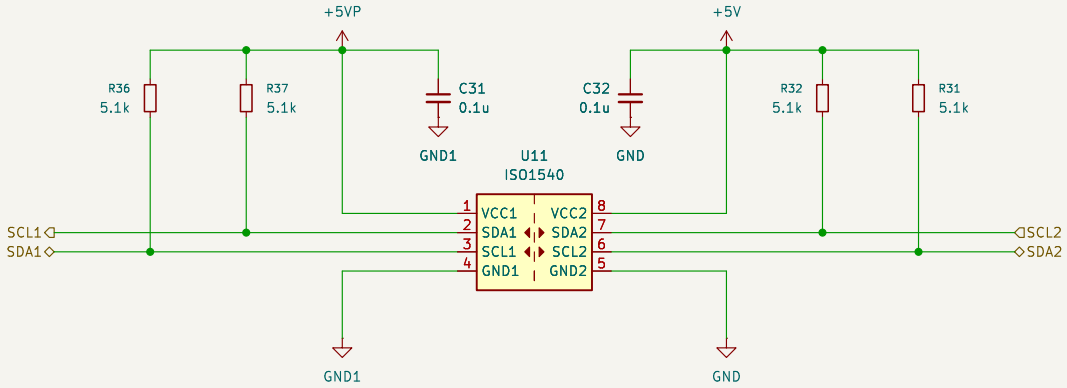
输出电压选择。将VSEL连接到VISO以获得5 V输出或将VSEL连接到GNDISO以获得3.3 V输出。这个引脚有一个较弱的内部上拉；因此，不要让该引脚悬空。
Output voltage selection – connect VSEL to VISO for a 5 V output, or connect VSEL to GNDISO for a 3.3 V output. This pin has a weak internal pull-up, so it should not be left floating.



Title: 12V–2x6 Current Monitor	github.com/eggsampler	Rev: 1
Sheet: Power Isolation	Date: 2025-09-21	Page: 10/17
KiCad E.D.A. 9.0.3	File: SHT_Isolation_Power.kicad_sch	

SDA and SCL are interchangeable as the internal circuitry for each is identical
These connections are swapped for PCB placement reasons

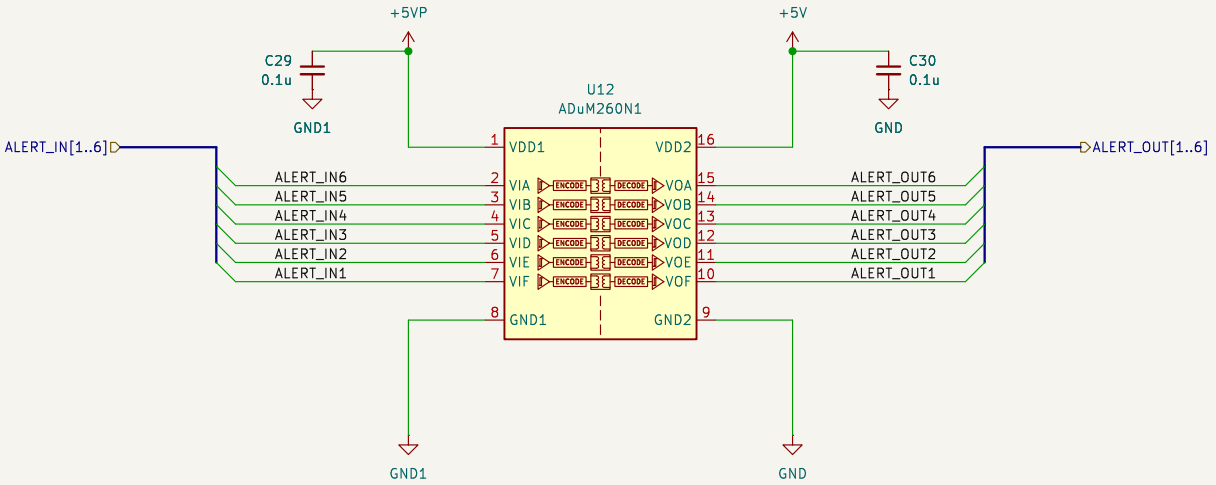
ISO1640 is a drop-in replacement



Title: 12V-2x6 Current Monitor	github.com/eggsampler	Rev: 1
Sheet: I2C Isolation	Date: 2025-09-21	Page: 11/17
KiCad E.D.A. 9.0.3	File: SHT_Isolation_I2C.kicad_sch	

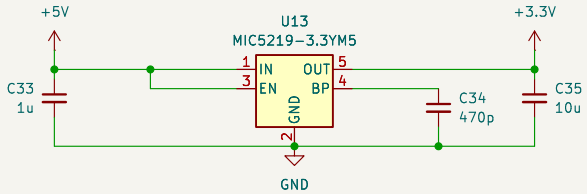
INA238 ALERT pin is an open-drain and active-low by default, using fail safe high state as default

Use ADuM260N1 so default idle state is high to match INA238

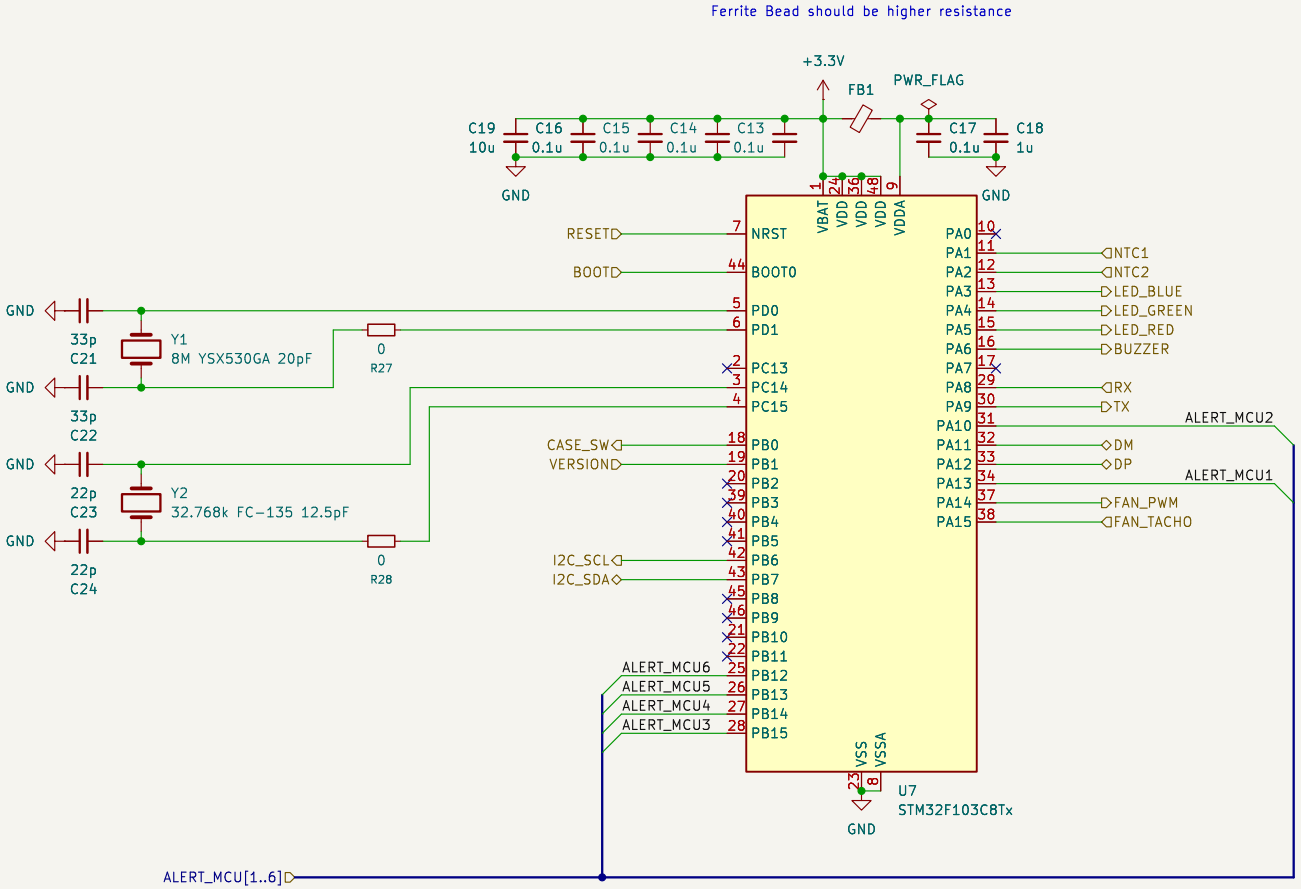


Title: 12V-2x6 Current Monitor	github.com/eggsampler	Rev: 1
Sheet: Alert Isolation	Date: 2025-09-21	Page: 12/17
KiCad E.D.A. 9.0.3	File: SHT_Isolation_Alert.kicad_sch	

Using linear regulator not switching for less noise
MIC5219 typically 10mV-500mV dropout, heaps of headroom from 5->3.3
500mA should be more than enough for the STM32



Title: 12V-2x6 Current Monitor	github.com/eggsampler	Rev: 1
Sheet: Microcontroller Power	Date: 2025-09-21	Page: 13/17
KiCad E.D.A. 9.0.3	File: SHT_MCU_Power.kicad_sch	

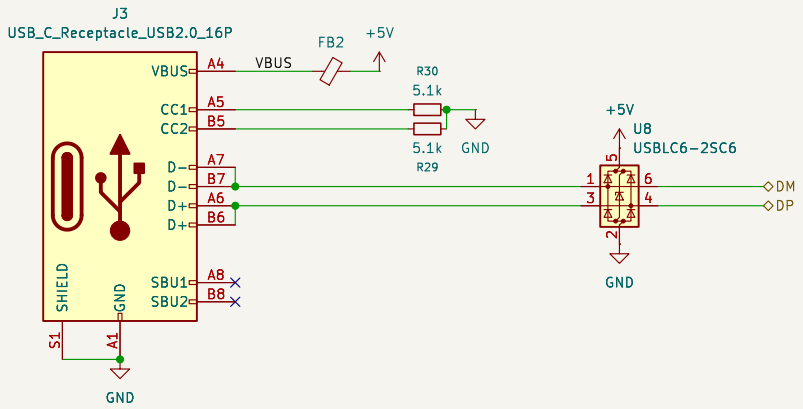


YSX530GA 8MHz 20pF Crystal
CL=((C1*C2)/(C1+C2)) + Cstray
Assume
- C1=C2
- Cstray=5pF
20=C/2+5
C=30pF (or 36pF if Cs=2)
Pick 33pF as closest standard value

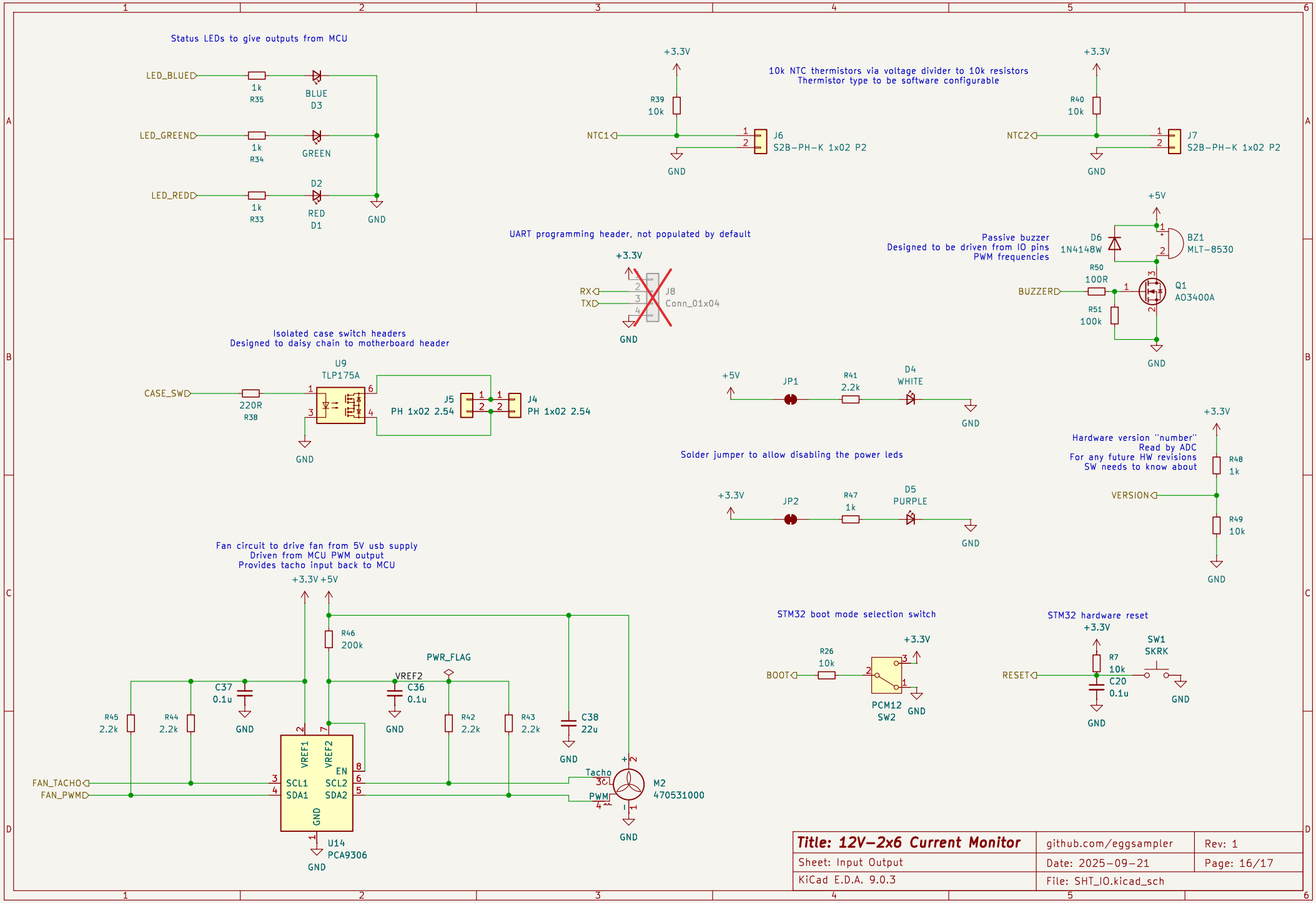
FC-135 32.768kHz 12.5pF
CL=((C1*C2)/(C1+C2)) + Cstray
Assume
- C1=C2
- Cstray=5pF
12.5=C/2+5
C=15pF (or 21pF Cs=2)
Pick 22pF as closest standard value

Title: 12V-2x6 Current Monitor	github.com/eggsampler	Rev: 1
Sheet: Microcontroller	Date: 2025-09-21	Page: 14/17
KiCad E.D.A. 9.0.3	File: SHT_MCU.kicad_sch	

Ferrite Bead should be lower resistance



Title: 12V−2x6 Current Monitor	github.com/eggsampler	Rev: 1
Sheet: USB	Date: 2025−09−21	Page: 15/17
KiCad E.D.A. 9.0.3	File: SHT_Connector_USB.kicad_sch	


Status LEDs to give outputs from MCU
LED_BLUE
1k
R35
BLUE
D3
LED_GREEN
1k
R34
GREEN
LED_RED
1k
R33
D2
RED
D1
GND
+3.3V
R39
10k
NTC1
J6
S2B-PH-K 1x02 P2
GND
10k NTC thermistors via voltage divider to 10k resistors
Thermistor type to be software configurable
+3.3V
R40
10k
NTC2
J7
S2B-PH-K 1x02 P2
GND
UART programming header, not populated by default
+3.3V
RX
TX
J8
Conn_01x04
GND
Passive buzzer
Designed to be driven from IO pins
PWM frequencies
+5V
D6
1N4148W
BZ1
MLT-8530
R50
100R
BUZZER
Q1
AO3400A
R51
100k
GND
Isolated case switch headers
Designed to daisy chain to motherboard header
U9
TLP175A
CASE_SW
220R
R38
J5
PH 1x02 2.54
J4
PH 1x02 2.54
GND
+5V
JP1
R41
2.2k
D4
WHITE
GND
Solder jumper to allow disabling the power leds
+3.3V
JP2
R47
1k
D5
PURPLE
GND
Hardware version "number"
Read by ADC
For any future HW revisions
SW needs to know about
+3.3V
R48
1k
VERSION
R49
10k
GND
Fan circuit to drive fan from 5V usb supply
Driven from MCU PWM output
Provides tacho input back to MCU
+3.3V
+5V
R46
200k
PWR_FLAG
VREF2
C37
0.1u
C36
0.1u
C38
22u
R45
2.2k
R44
2.2k
R42
2.2k
R43
2.2k
GND
FAN_TACHO
FAN_PWM
VREF1
VREF2
EN
SCL1
SDA1
SCL2
SDA2
GND
U14
PCA9306
Tacho
PWM
M2
470531000
STM32 boot mode selection switch
+3.3V
R26
10k
BOOT
PCM12
SW2
GND
STM32 hardware reset
+3.3V
R7
10k
C20
0.1u
SW1
SKRK
RESET
GND
Title: 12V-2x6 Current Monitor
github.com/eggsampler
Rev: 1
Sheet: Input Output
Date: 2025-09-21
Page: 16/17
KiCad E.D.A. 9.0.3
File: SHT_IO.kicad_sch