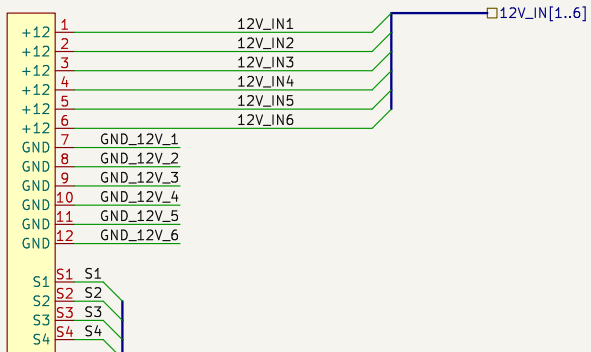


J1
10164279-124121LF

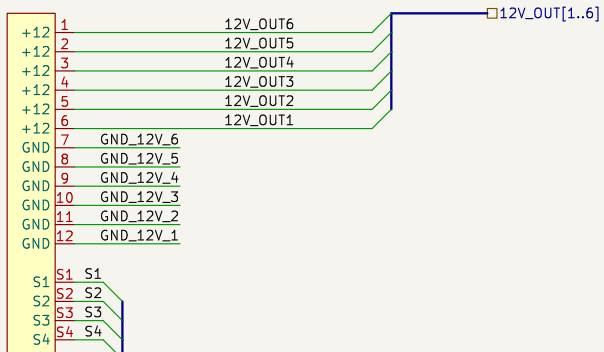


Amphenol 10164279-124121LF
<https://www.amphenol-cs.com/product/10164279124121lf.html>
Rated for 12A (Apparently)
10mR max contact resistance

S1..4]

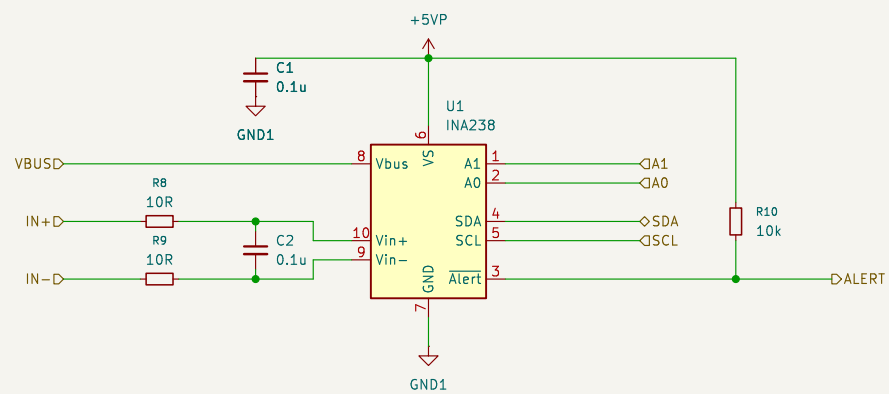
These are reversed
to the inputs
on purpose

J2
10164279-124121LF



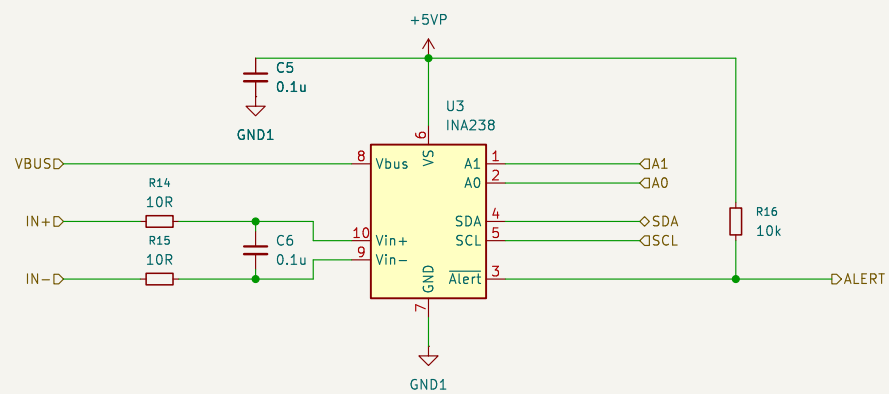
Title: 12V-2x6 Current Monitor	github.com/eggsampler	Rev: 1
Sheet: 12V-2x6 Connectors	Date: 2025-09-21	Page: 2/17
KiCad E.D.A. 9.0.5	File: SHT_Connector_12V.kicad_sch	



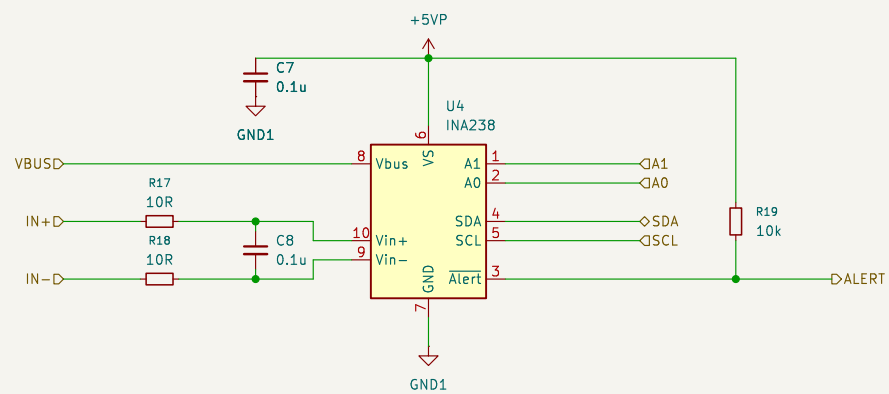


Title: 12V-2x6 Current Monitor	github.com/eggssampler	Rev: 1
Sheet: CurrentSense1	Date: 2025-09-21	Page: 4/17
KiCad E.D.A. 9.0.5	File: SHT_CurrentSense_IC.kicad_sch	

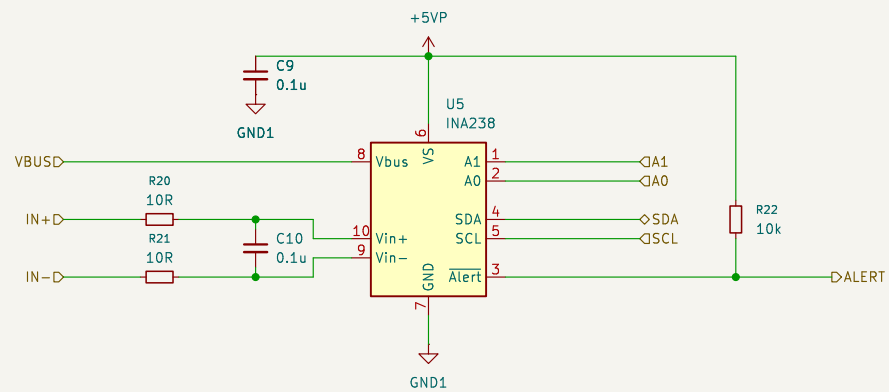




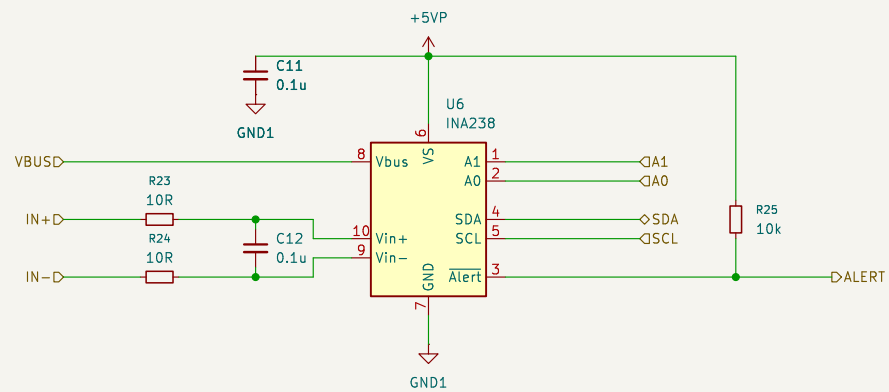
Title: 12V-2x6 Current Monitor	github.com/eggssampler	Rev: 1
Sheet: CurrentSense3	Date: 2025-09-21	Page: 6/17
KiCad E.D.A. 9.0.5	File: SHT_CurrentSense_IC.kicad_sch	



Title: 12V-2x6 Current Monitor	github.com/eggsampler	Rev: 1
Sheet: CurrentSense4	Date: 2025-09-21	Page: 7/17
KiCad E.D.A. 9.0.5	File: SHT_CurrentSense_IC.kicad_sch	



Title: 12V-2x6 Current Monitor	github.com/eggssampler	Rev: 1
Sheet: CurrentSense5	Date: 2025-09-21	Page: 8/17
KiCad E.D.A. 9.0.5	File: SHT_CurrentSense_IC.kicad_sch	

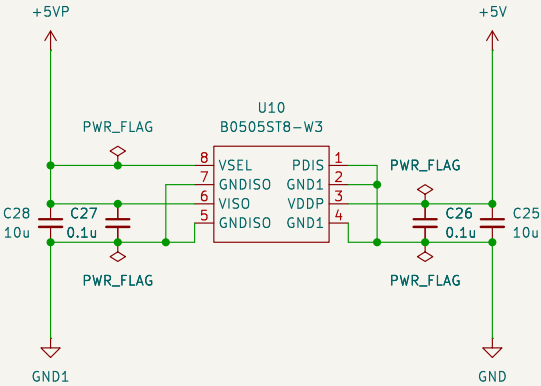


Title: 12V-2x6 Current Monitor	github.com/eggssampler	Rev: 1
Sheet: CurrentSense6	Date: 2025-09-21	Page: 9/17
KiCad E.D.A. 9.0.5	File: SHT_CurrentSense_IC.kicad_sch	

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.

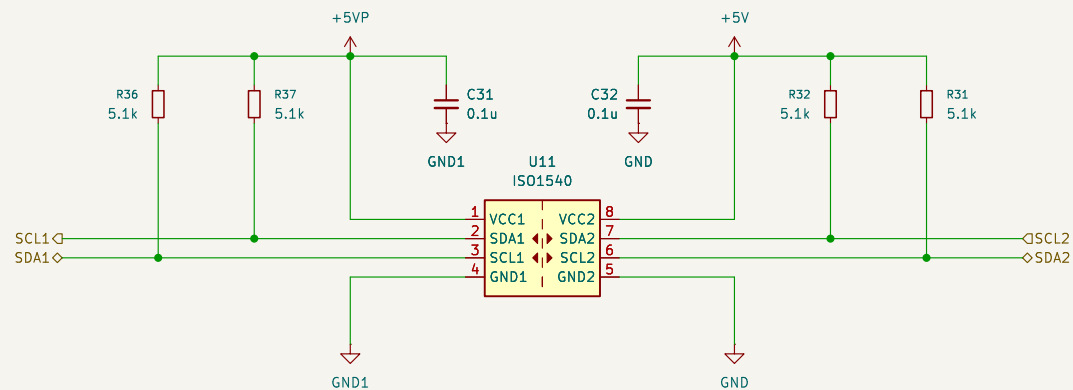
输出电压选择。将VSEL连接到VISO以获得5 V输出或将VSEL连接到GNDISO以获得3.3 V输出。这个引脚有一个较弱的内部上拉；因此，不要让它引脚悬空。
Output voltage selection – connect VSEL to VISO for a 5 V output, or connect VSEL to GNDISO for a 3.3 V output. This pin has a weak internal pull-up, so it should not be left floating.



Title: 12V-2x6 Current Monitor	github.com/eggssampler	Rev: 1
Sheet: Power Isolation	Date: 2025-09-21	Page: 10/17
KiCad E.D.A. 9.0.5	File: SHT_Isolation_Power.kicad_sch	

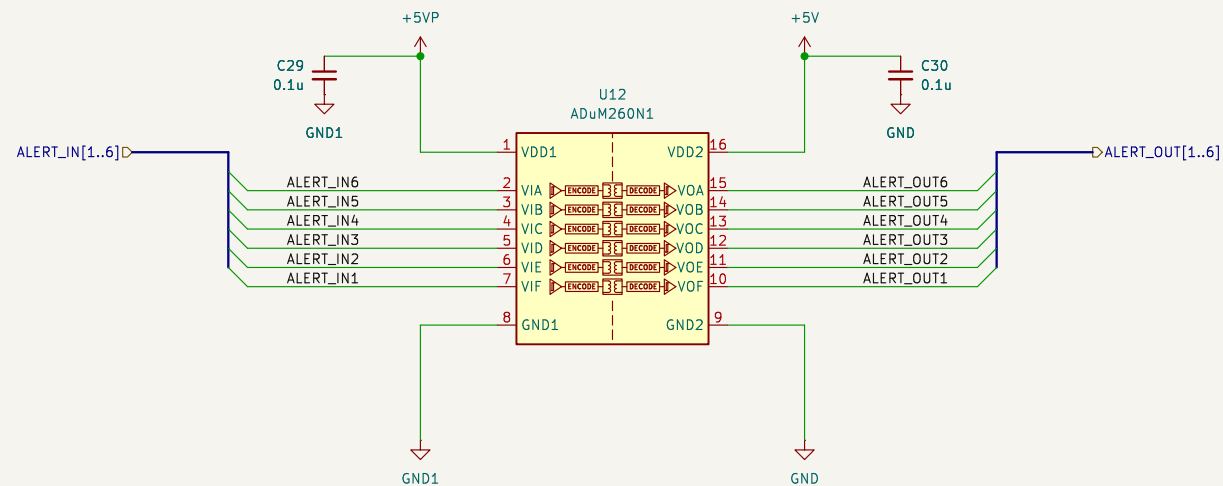
SDA and SCL are interchangeable as the internal circuitry for each is identical
These connections are swapped for PCB placement reasons

ISO1640 is a drop-in replacement



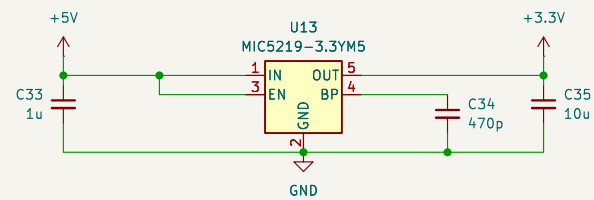
Title: 12V-2x6 Current Monitor	github.com/eggssampler	Rev: 1
Sheet: I2C Isolation	Date: 2025-09-21	Page: 11/17
KiCad E.D.A. 9.0.5	File: SHT_Isolation_I2C.kicad_sch	

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

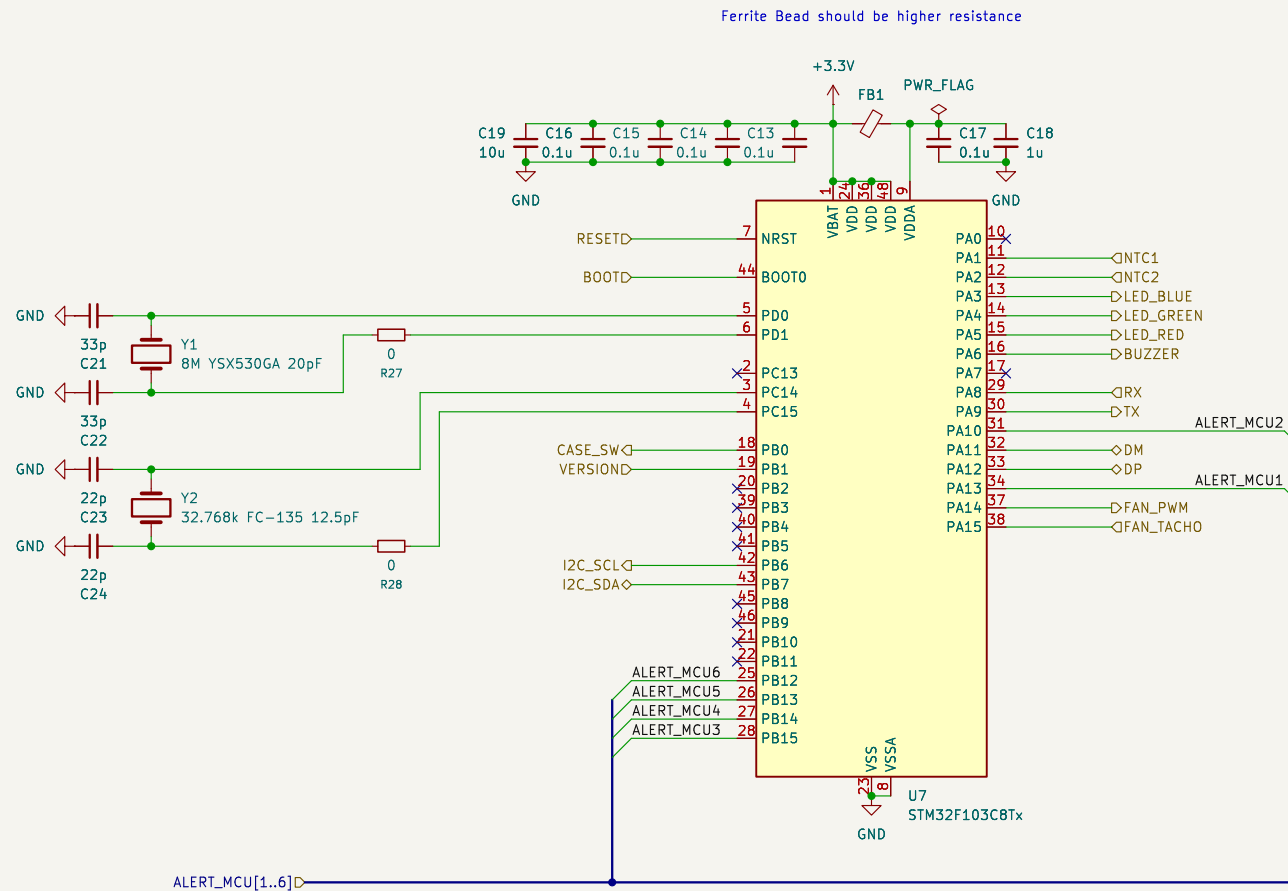


Title: 12V-2x6 Current Monitor	github.com/eggsampler	Rev: 1
Sheet: Alert Isolation	Date: 2025-09-21	Page: 12/17
KiCad E.D.A. 9.0.5	File: SHT_Isolation_Alert.kicad_sch	

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



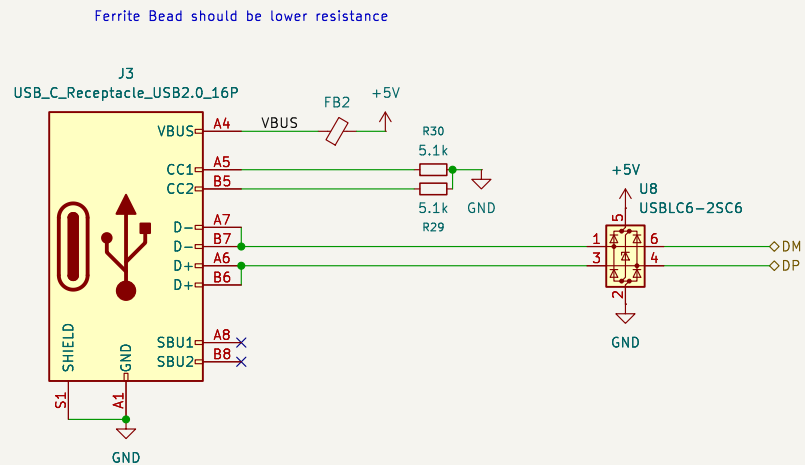
Title: 12V–2x6 Current Monitor	github.com/eggsampler	Rev: 1
Sheet: Microcontroller Power	Date: 2025–09–21	Page: 13/17
KiCad E.D.A. 9.0.5	File: SHT_MCU_Power.kicad_sch	



YSX530GA 8MHz 20pF Crystal
 $CL = ((C1 * C2) / (C1 + C2)) + C_{stray}$
 Assume
 - $C1 = C2$
 - $C_{stray} = 5pF$
 $20 = C / 2 + 5$
 $C = 30pF$ (or 36pF if $C_s = 2$)
 Pick 33pF as closest standard value

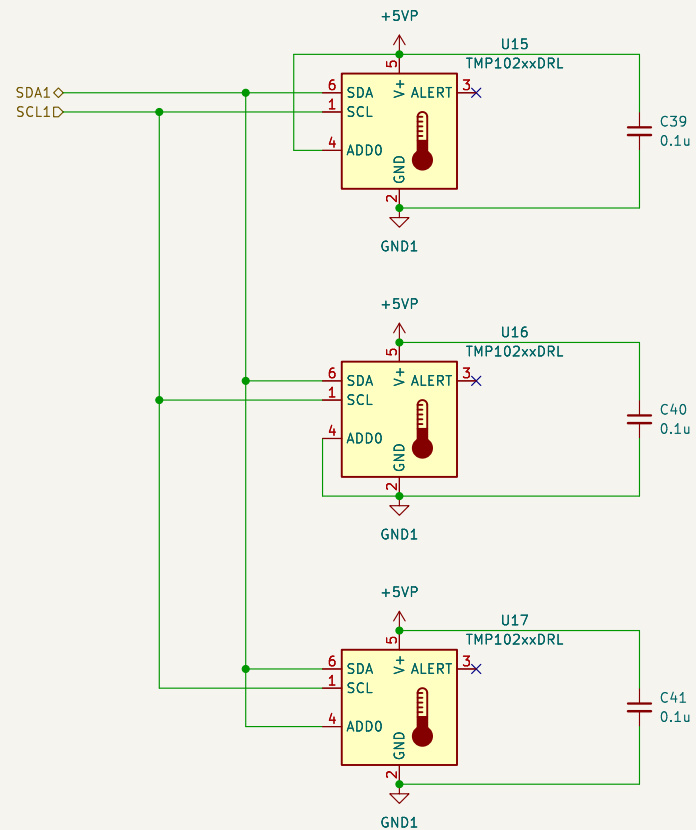
FC-135 32.768kHz 12.5pF
 $CL = ((C1 * C2) / (C1 + C2)) + C_{stray}$
 Assume
 - $C1 = C2$
 - $C_{stray} = 5pF$
 $12.5 = C / 2 + 5$
 $C = 15pF$ (or 21pF $C_s = 2$)
 Pick 22pF as closest standard value

Title: 12V-2x6 Current Monitor	github.com/eggsampler	Rev: 1
Sheet: Microcontroller	Date: 2025-09-21	Page: 14/17
KiCad E.D.A. 9.0.5	File: SHT_MCU.kicad_sch	



Title: 12V-2x6 Current Monitor	github.com/eggssampler	Rev: 1
Sheet: USB	Date: 2025-09-21	Page: 15/17
KiCad E.D.A. 9.0.5	File: SHT_Connector_USB.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. 9.0.5	File: SHT_TempSense.kicad_sch	