

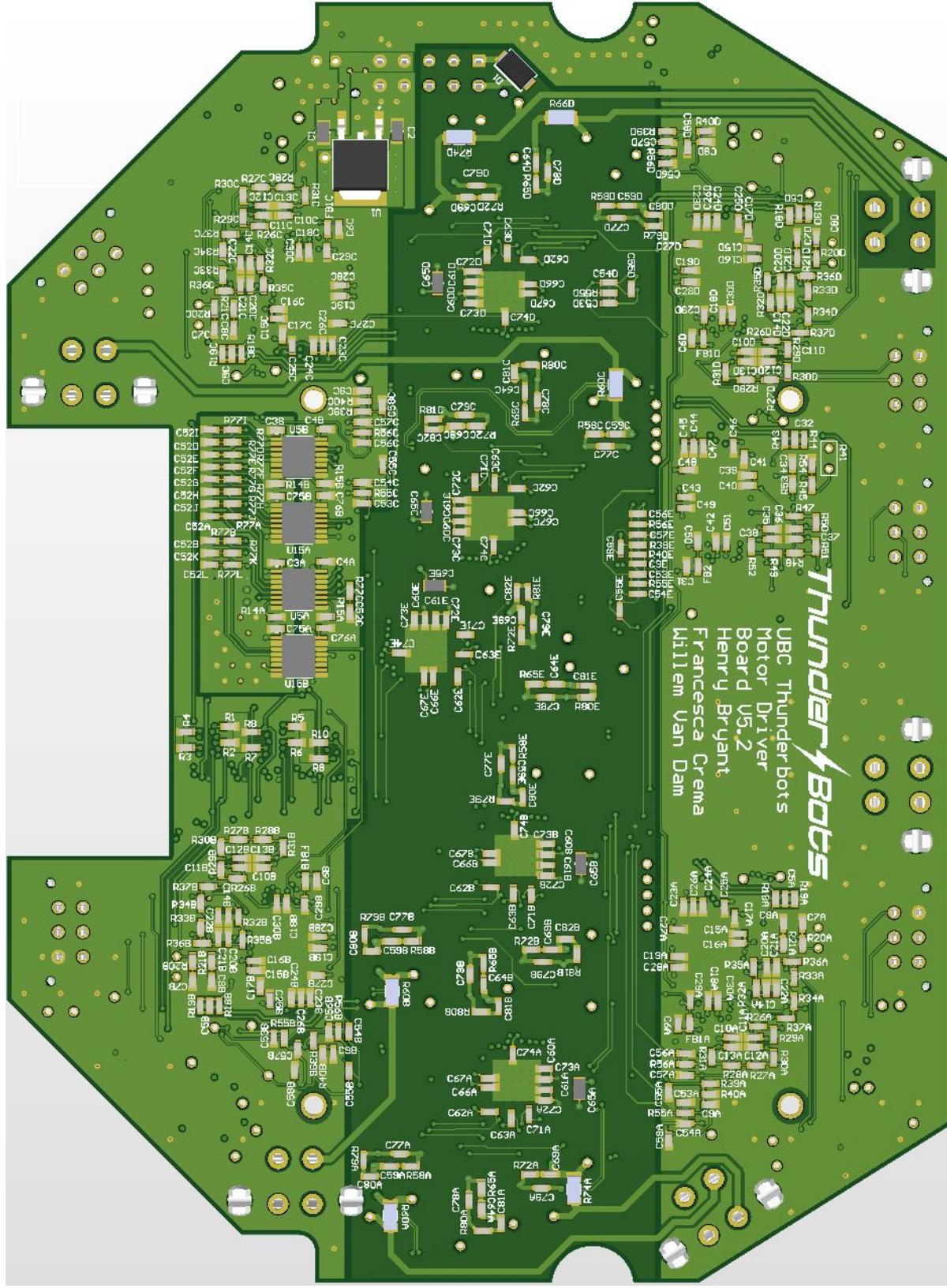
*Thunder***Bots**

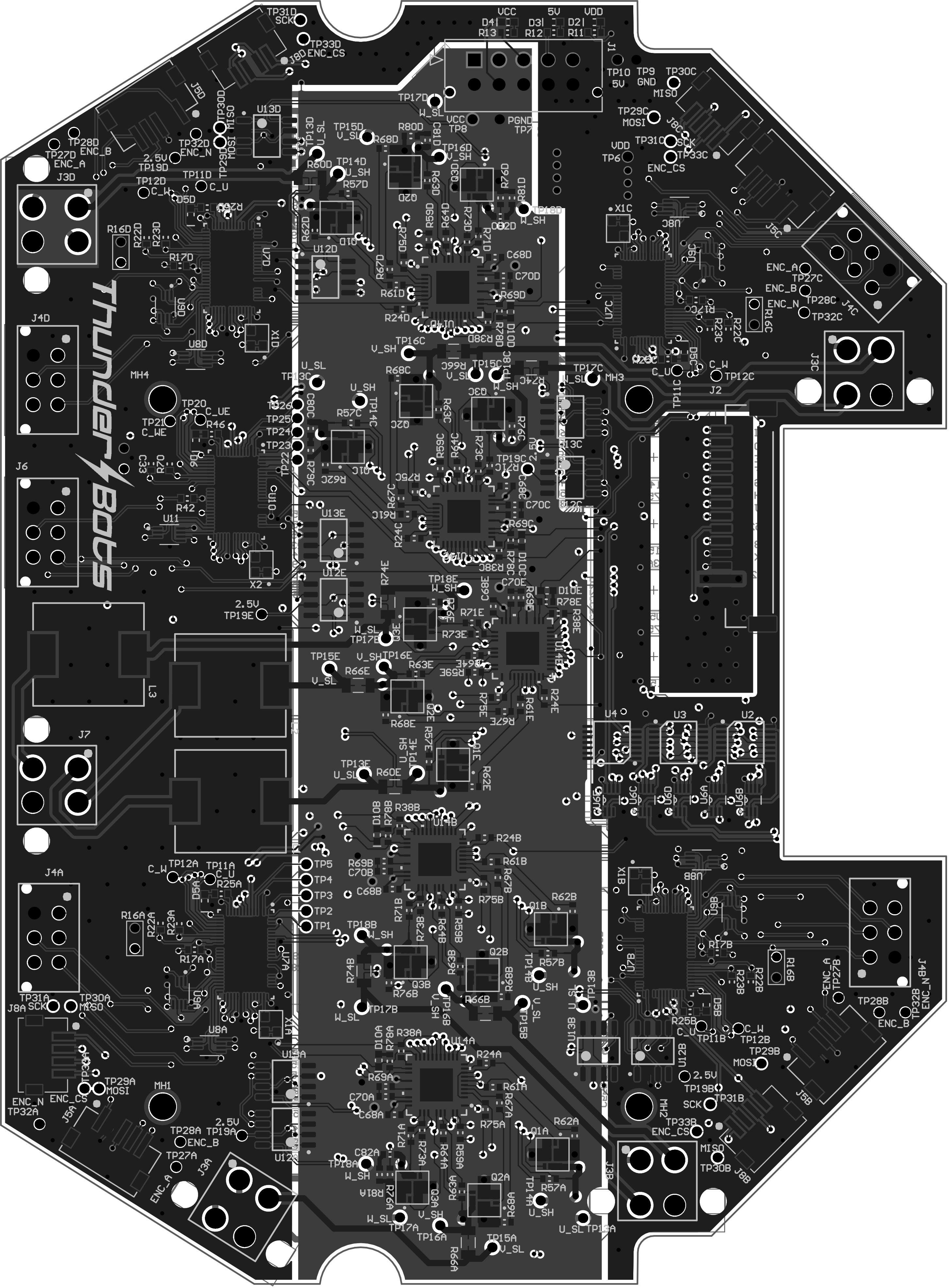
UBC Thunderbots
Motor
Driver
Board U5.2

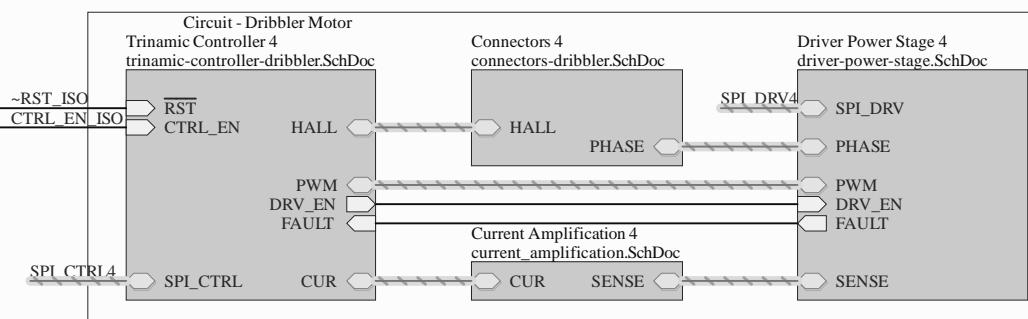
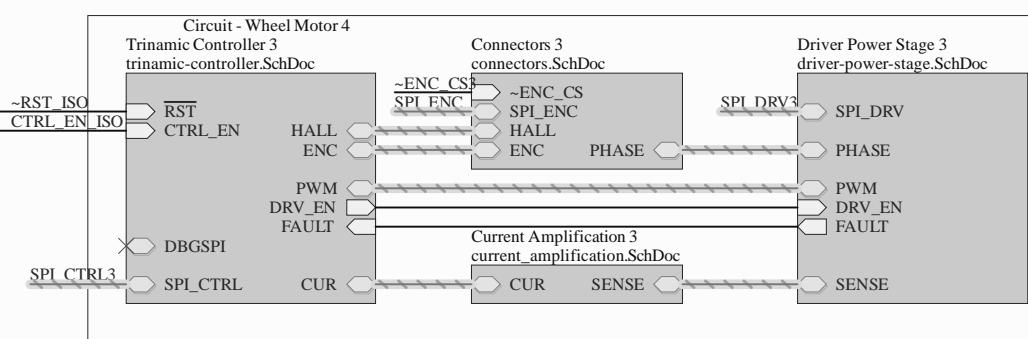
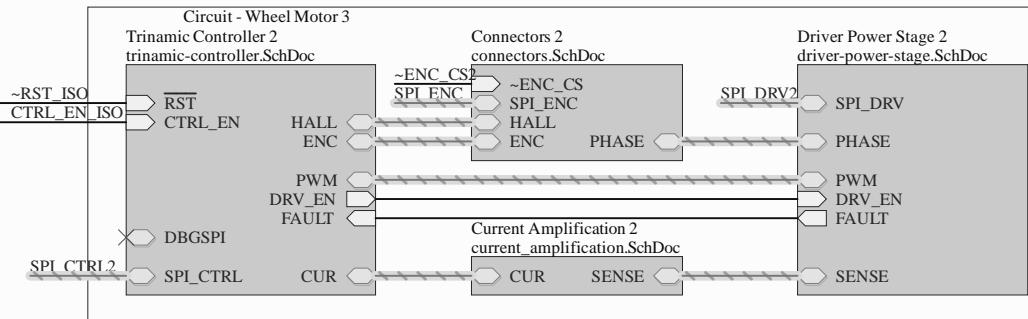
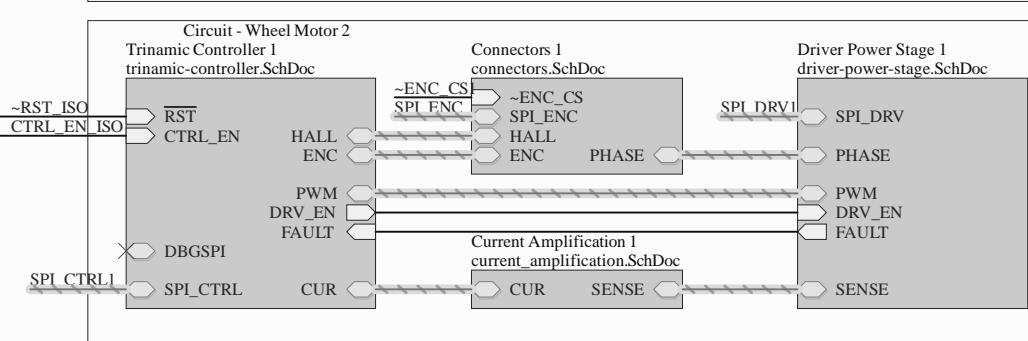
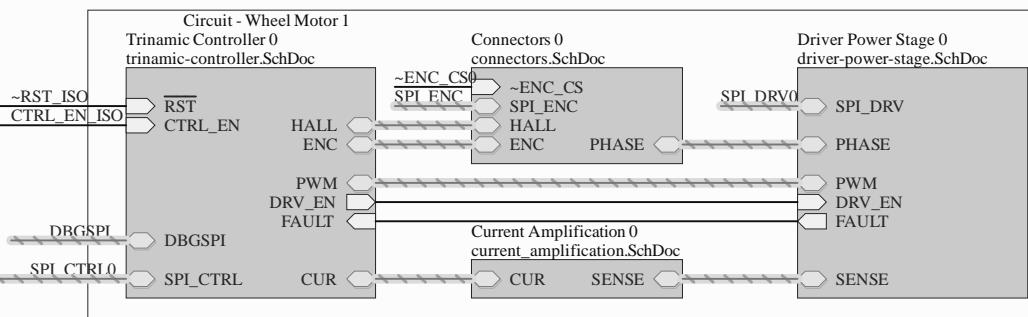
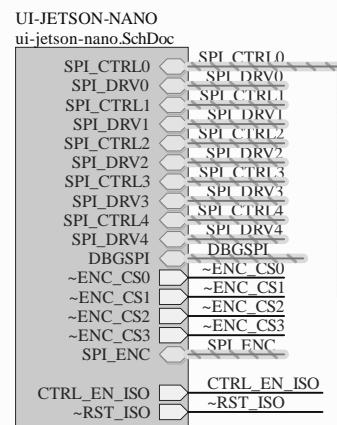
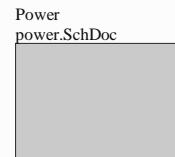
Henry Bryant

Francesca Crema

Willem Van Dam

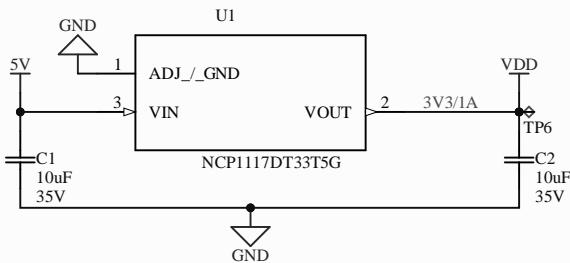






Power Regulation

3.3V Fixed LDO



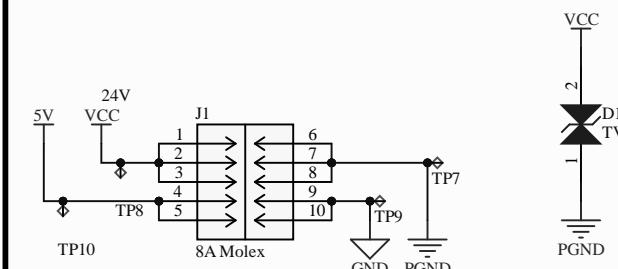
 3.3V LDO

Simple 3.3V fixed LDO

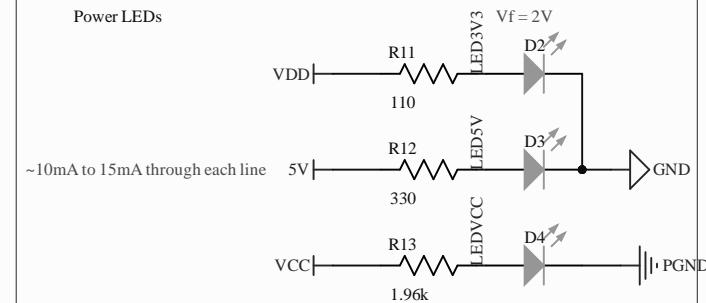
Specifications

- Vin = 1.35V - 18.0V
- Vout = 3.3V
- Iout = 1.0A
- Pout = 3.3W

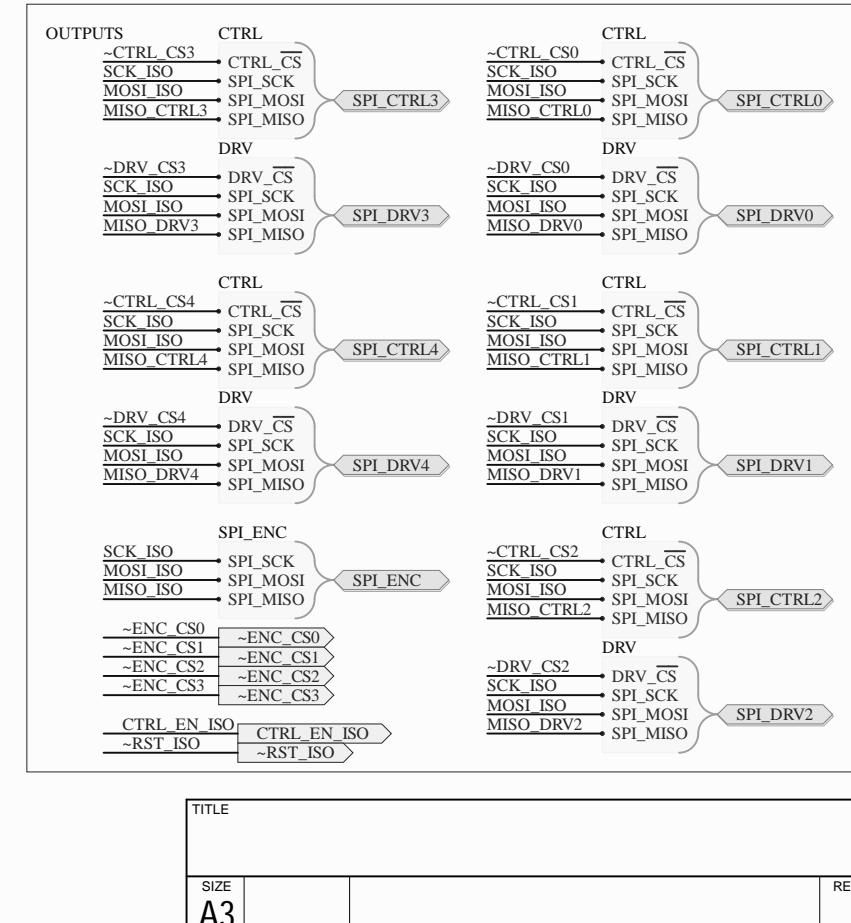
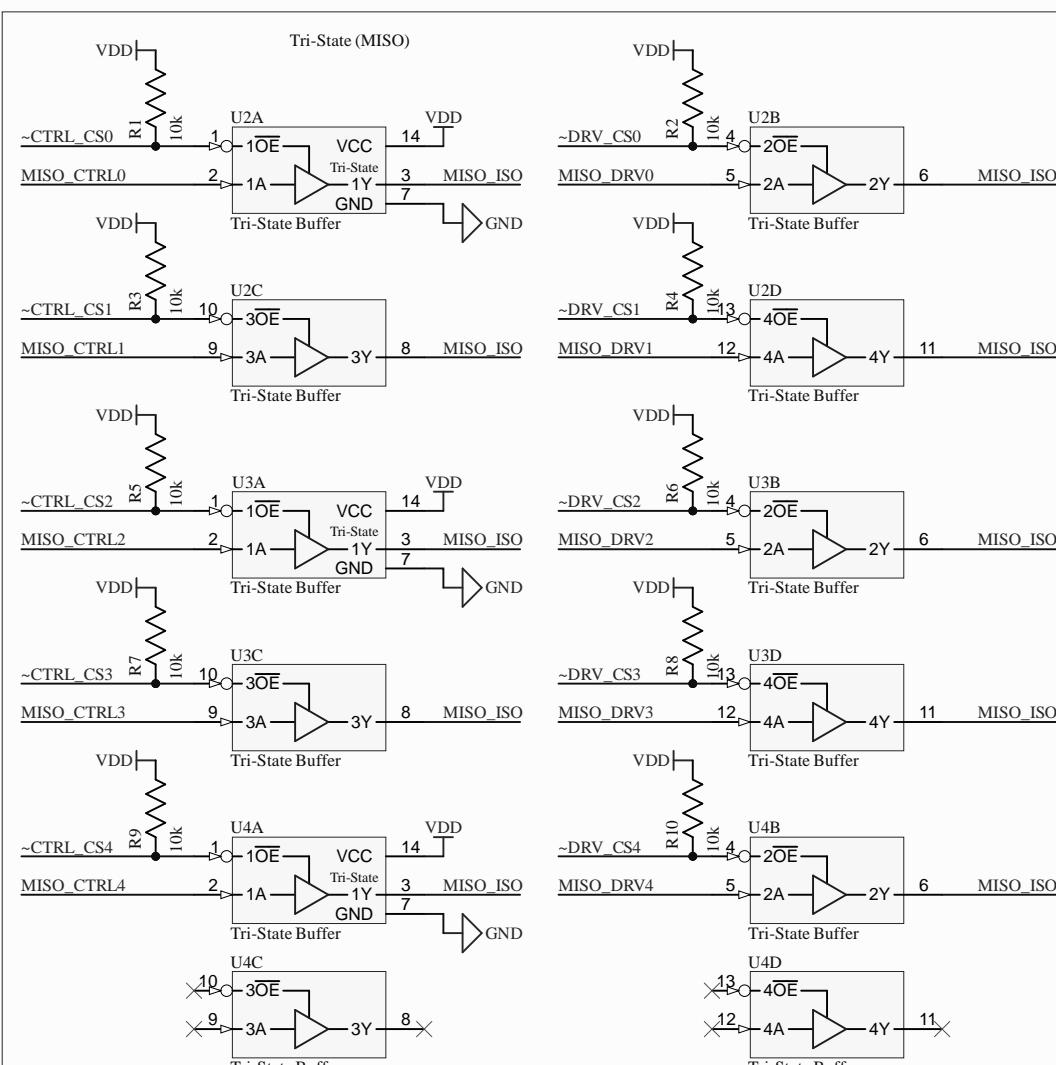
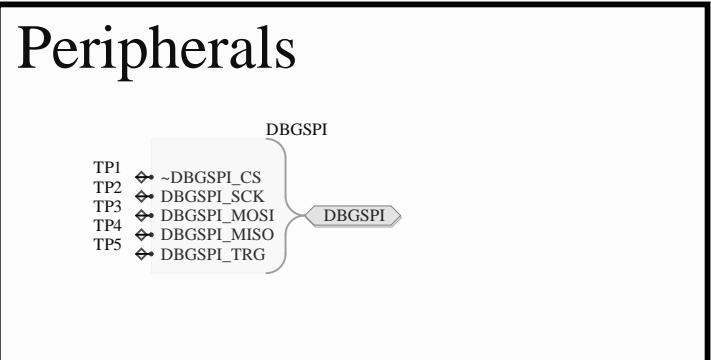
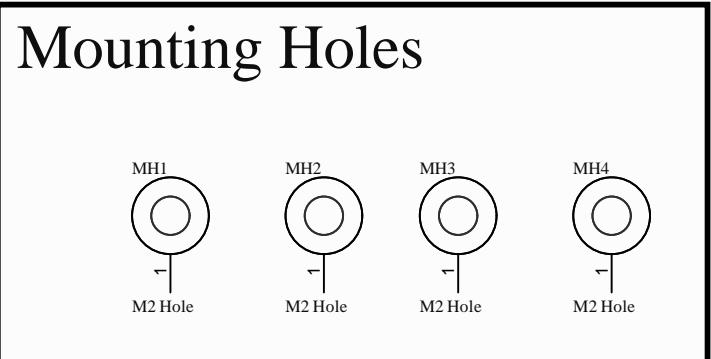
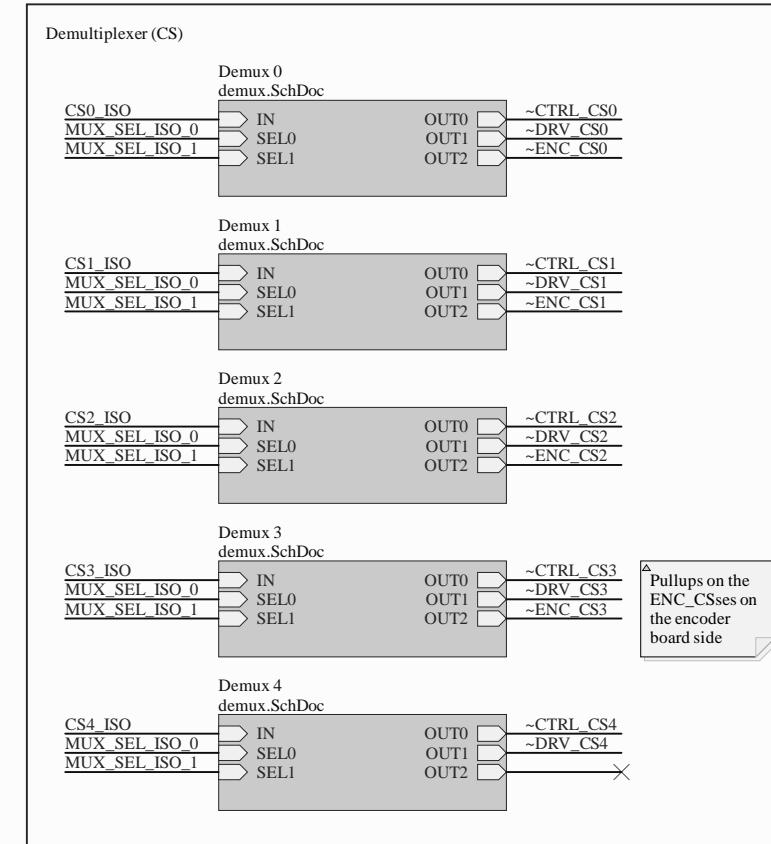
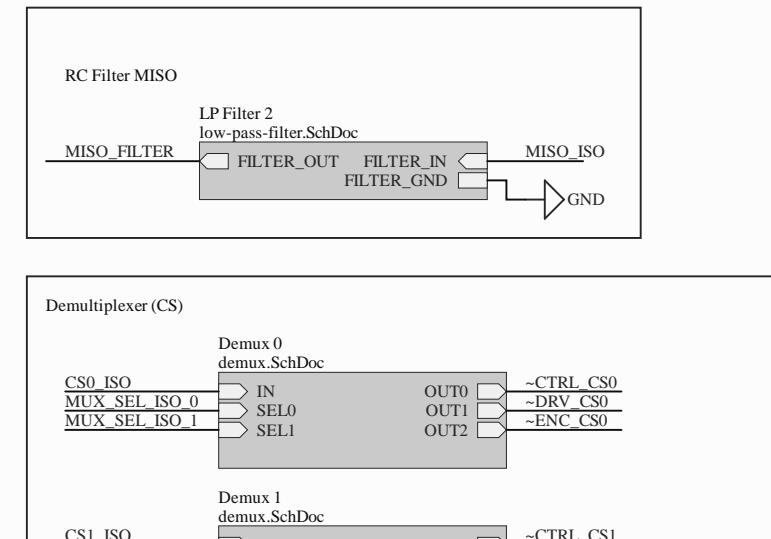
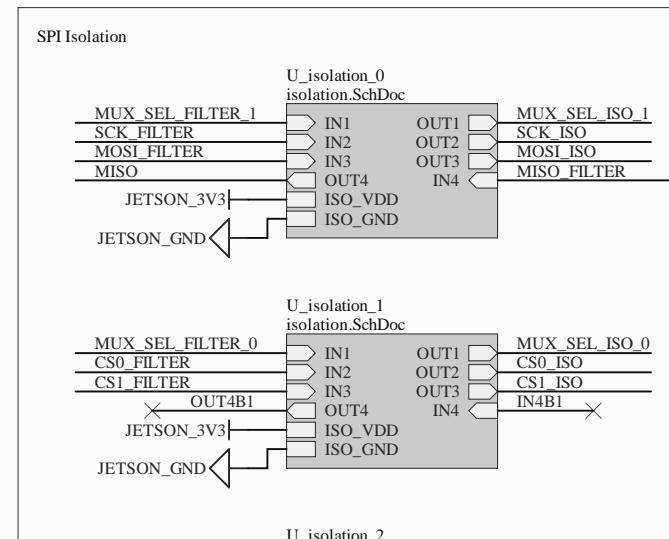
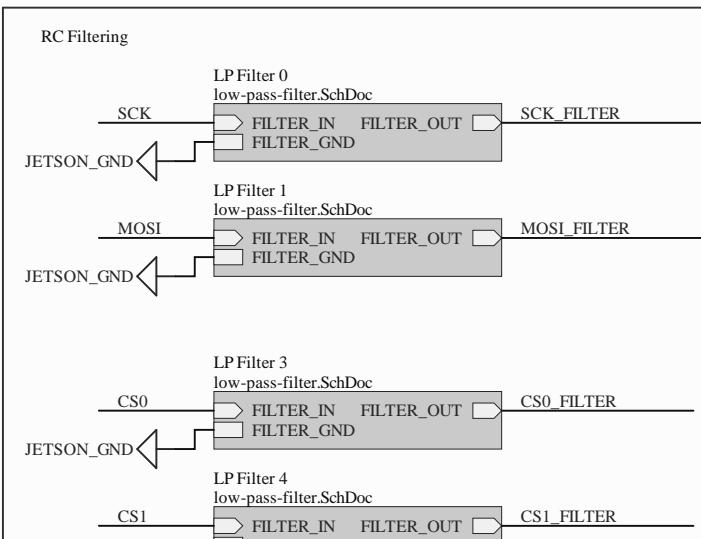
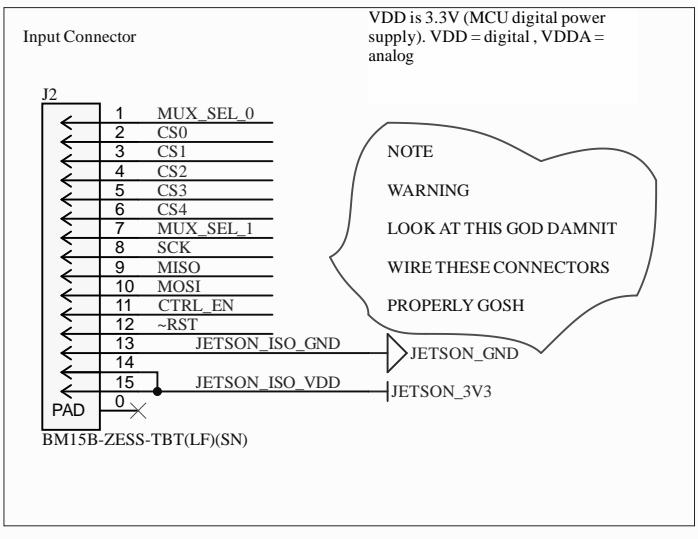
Power Board Connections



Power LEDs



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A

B

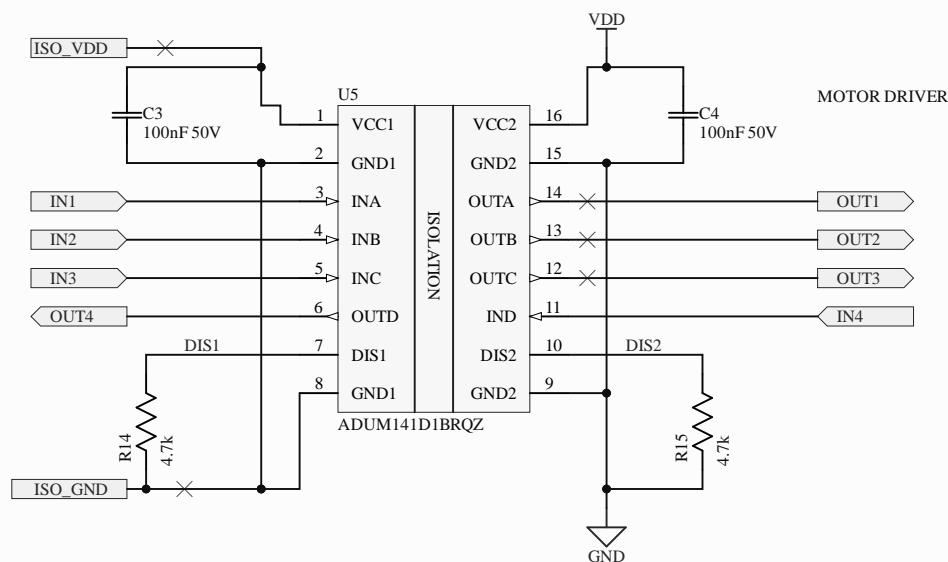
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C

C

D

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A

A

B

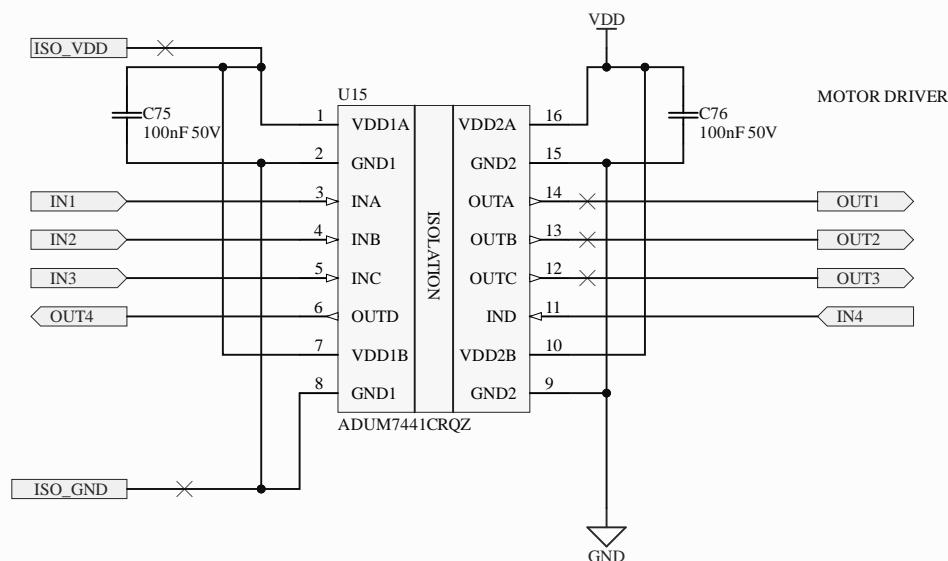
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C

C

D

D



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A

A

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B

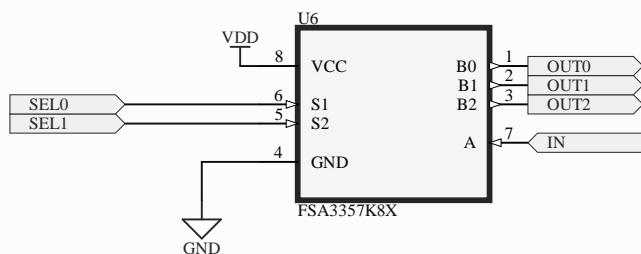
C

C

D

D

250 MHz



Title		
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A

A

B

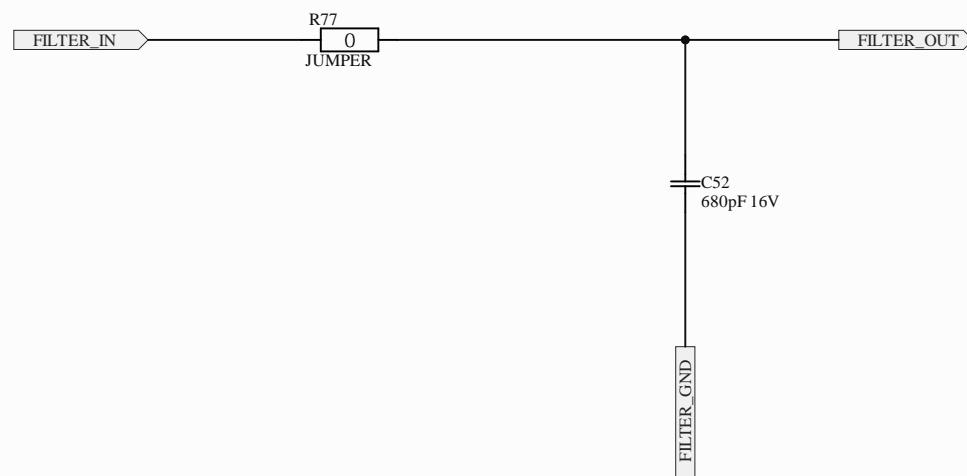
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C

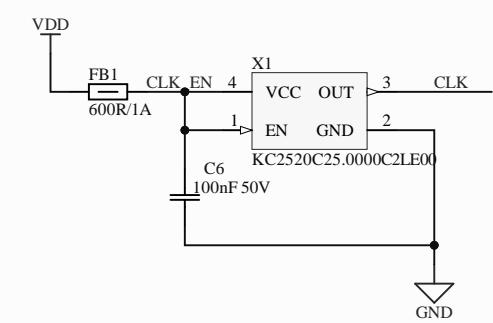
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D

D



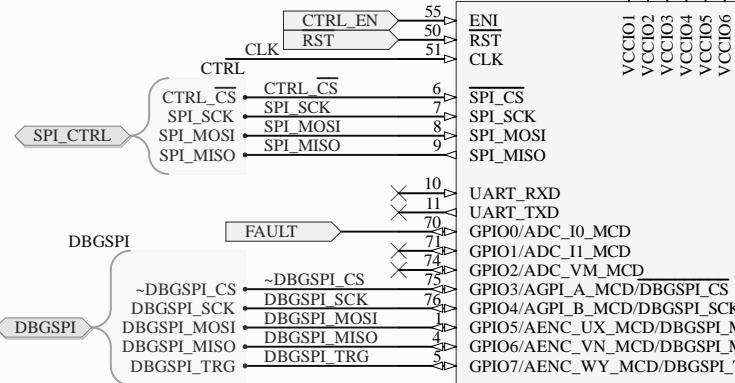
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A4		
Date: 5/15/2022	Sheet of	
File: C:\Users\...\low-pass-filter.SchDoc	Drawn By:	



VDD is 3.3V (MCU digital power supply). VDD=digital , VDDA=analog



U7
TMC4671-LA



AENC_UX_POS
AENC_UX_NEG
AENC_VN_POS
AENC_VN_NEG
AENC_WY_POS
AENC_WY_NEG

HALL_UX
HALL_V
HALL_WY

74LVC3G17DC,125

check the freq

74LVC3G17DC,125

ENC_A_CTRL
ENC_B_CTRL
ENC_N_CTRL

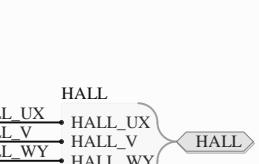
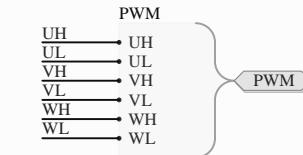
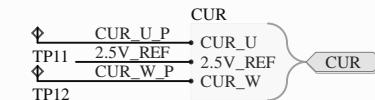
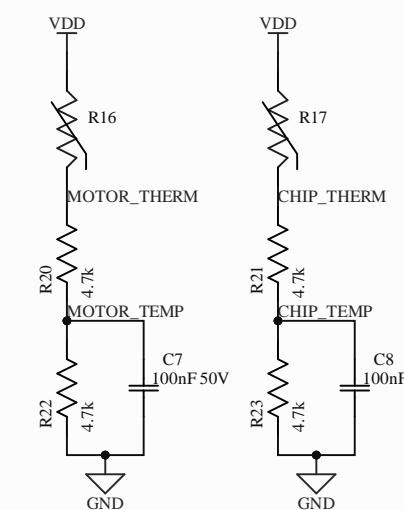
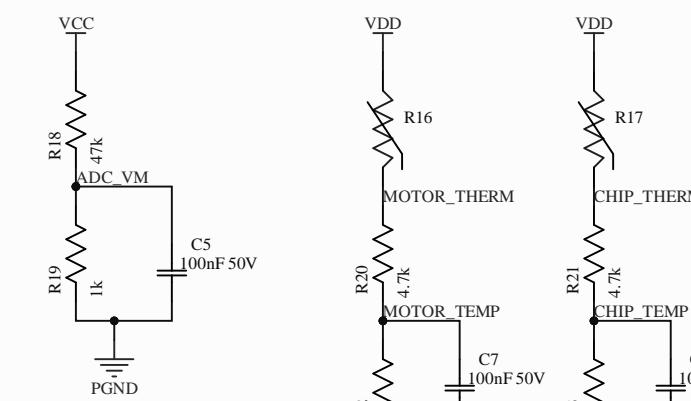
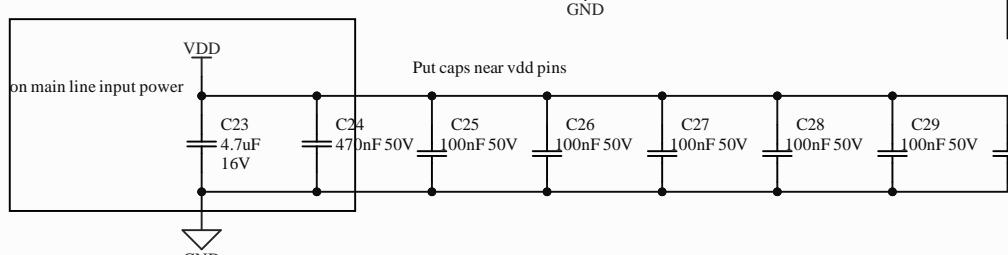
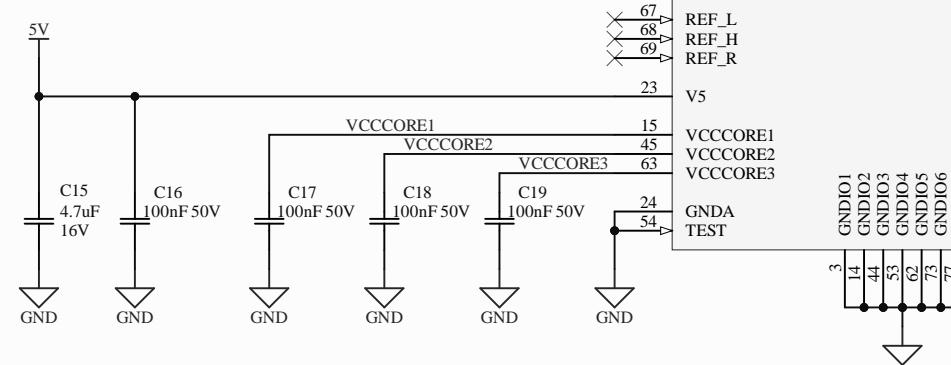
ENC2_A
ENC2_B
ENC2_N

GND
TEST

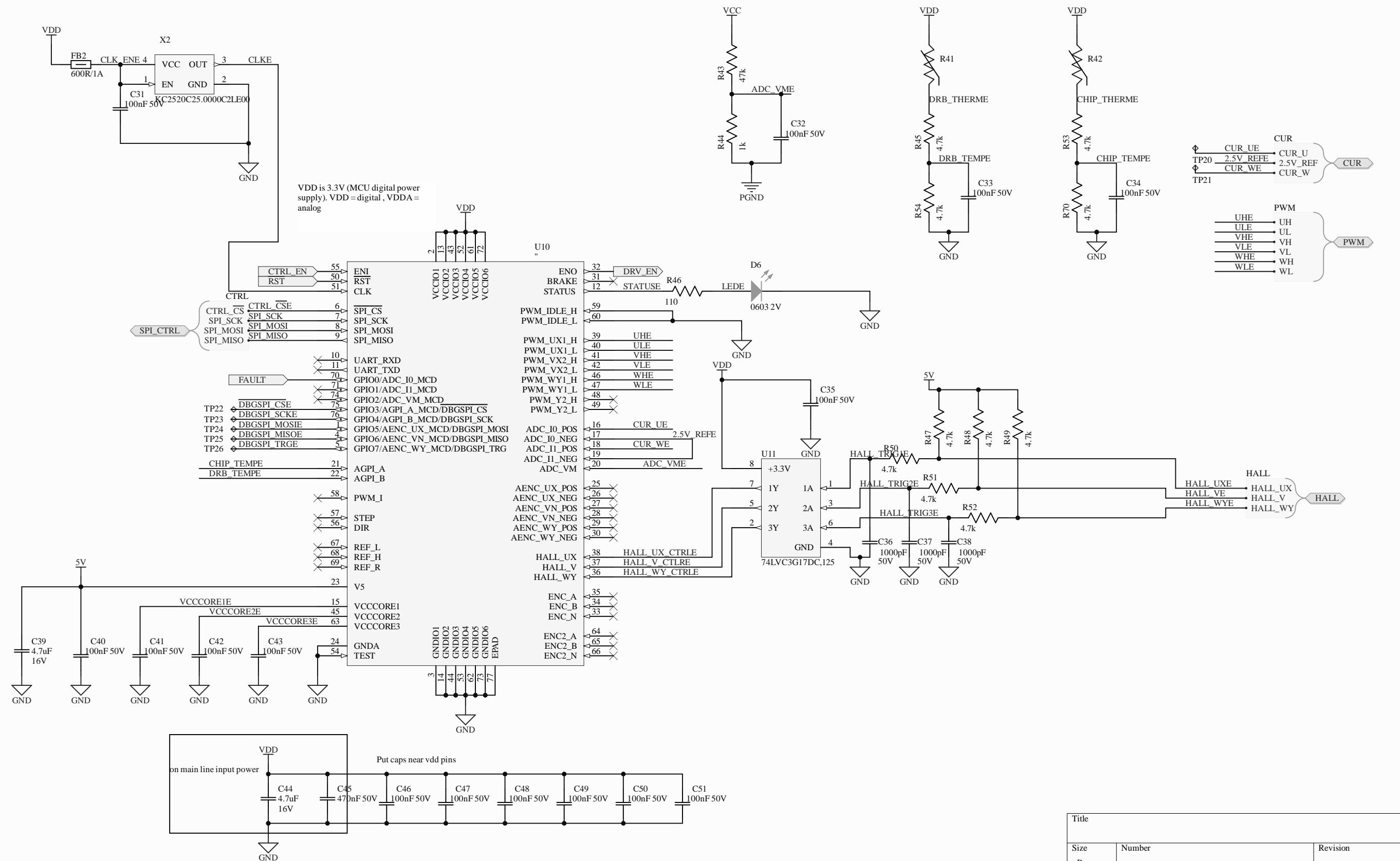
GND
GND
GND
GND
GND

14
44
53
62
73
77

GNDA
EPAD

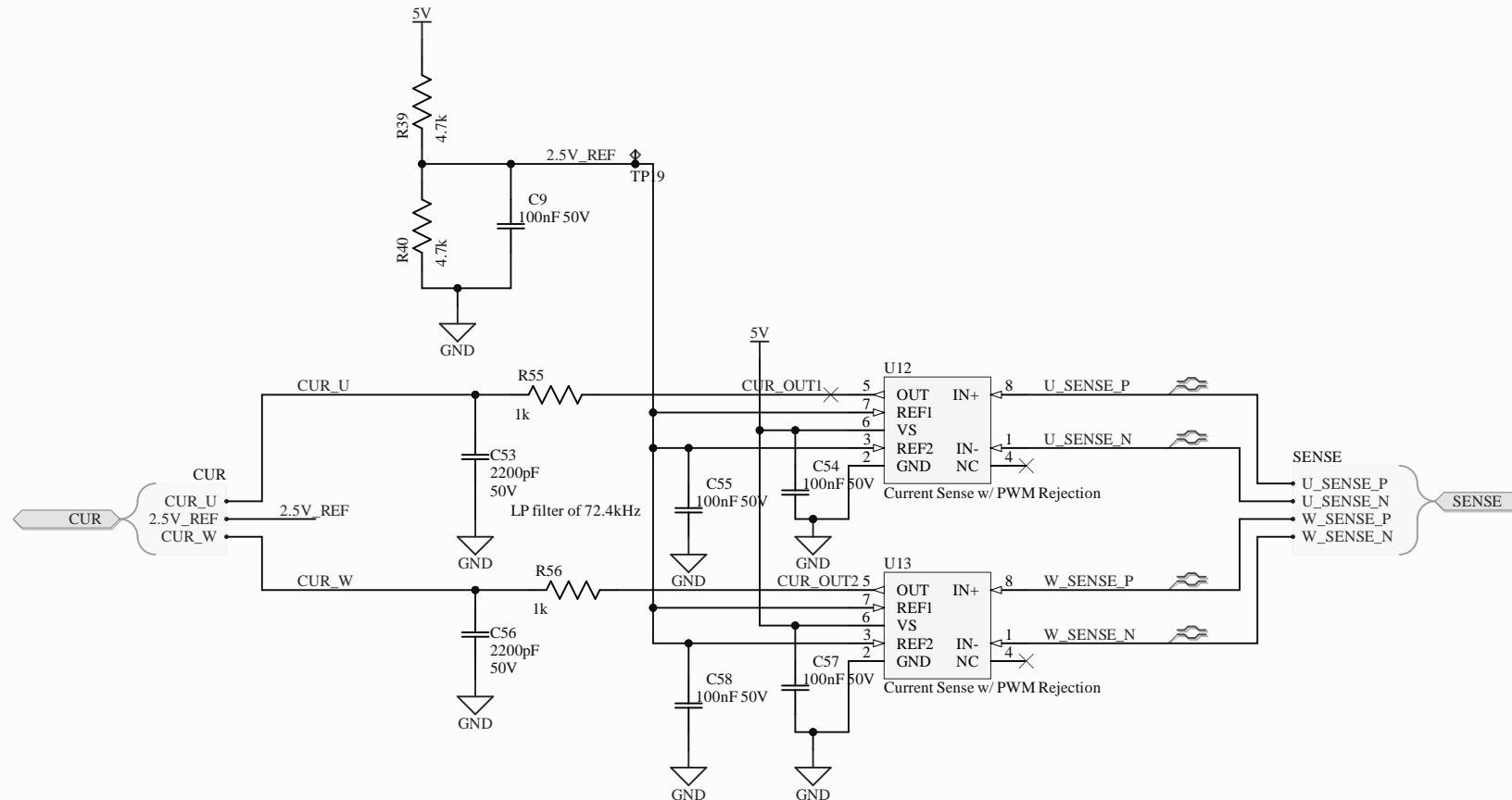


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Title		
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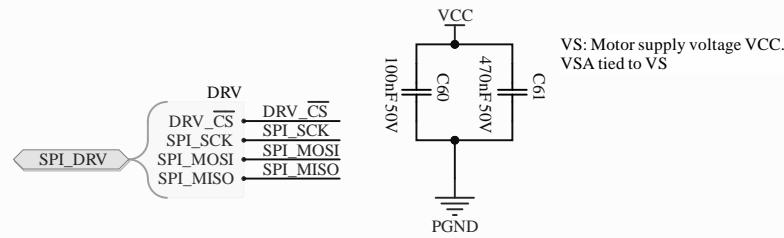
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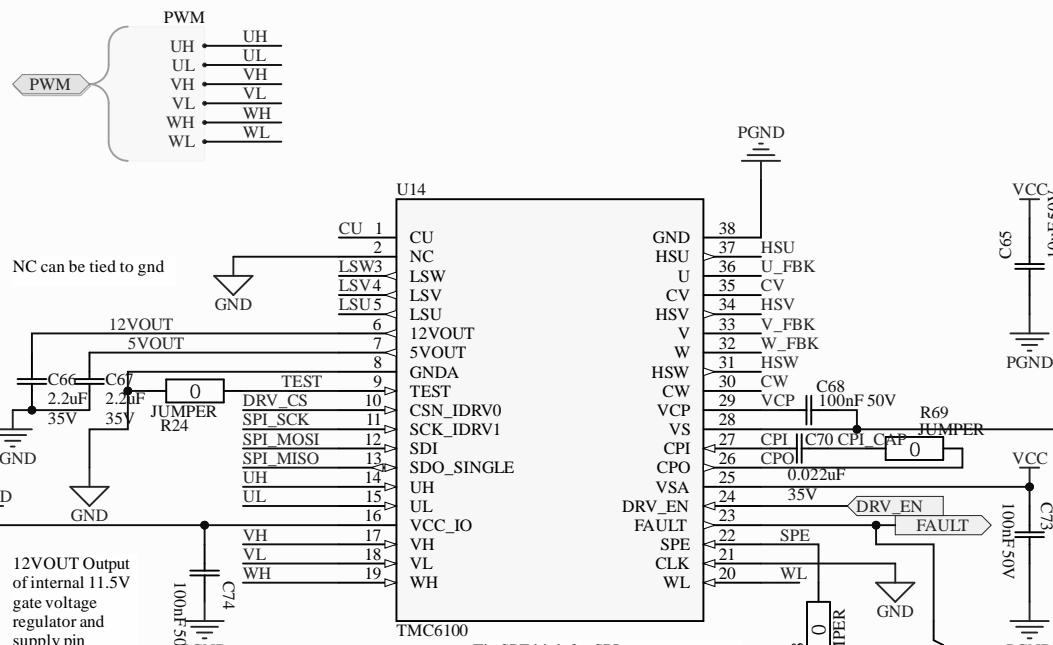
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A



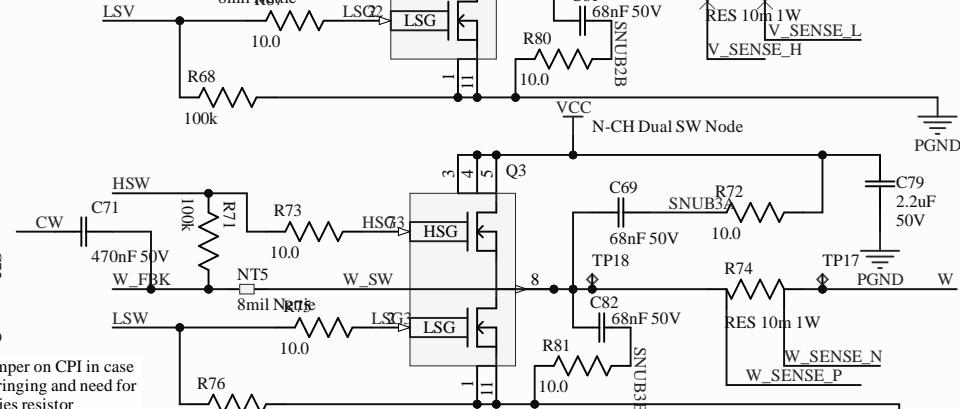
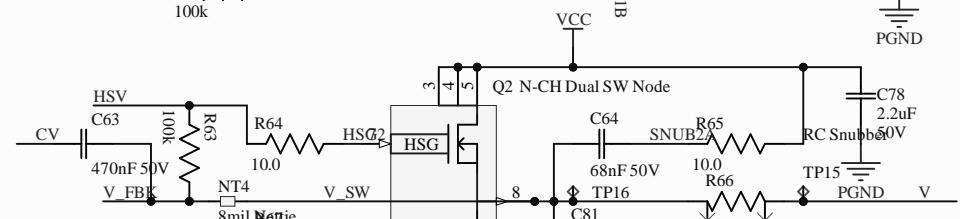
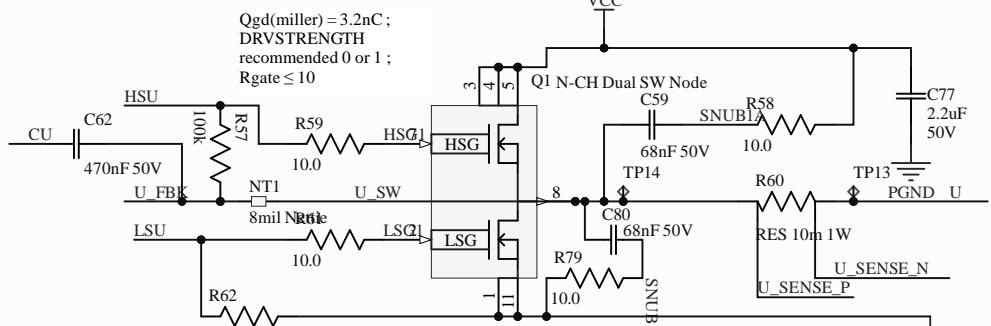
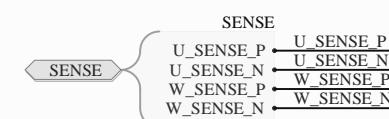
B



C

VDD: 3.3V to 5V IO supply voltage for all digital pins

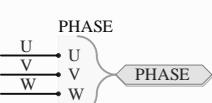
It is safest to use the same source for VCC_IO as for the controller driving the motor - therefore VCC_IO should be powered with the LDO



Stall Current = 26A
I_Inrush = $26.1V/(0.942 + 0.01\text{ OHM}) = 27.416A$

TVS shall be sized for >= 28A

Max current Imax = 2.52A
Max Power Dissipation = 0.13W



Title		
Size	Number	Revision
A4		
Date: 5/15/2022		Sheet of
File: C:\Users...\driver-power-stage.SchDoc		Drawn By:

A

B

C

D

A

A

B

B

C

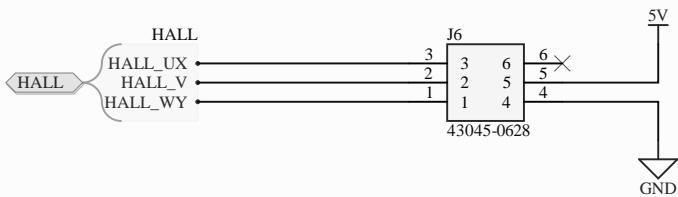
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D

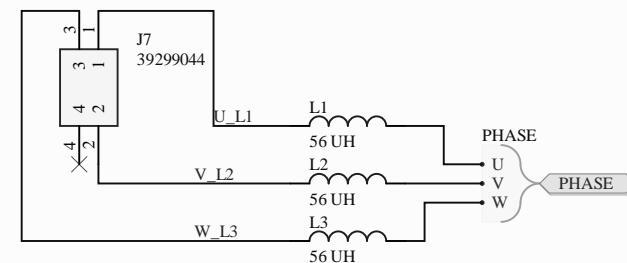
Hall Sensor Connector

possibly 43045-0628 for vertical TH



Motor Connector

39299044 vertical molex, 4000 on stock on mouser



Title		
Size A4	Number	Revision
Date: 5/15/2022	Sheet of 1	
File: C:\Users\...\connectors-dribbler.SchDoc	Drawn By:	

A

A

B

B

C

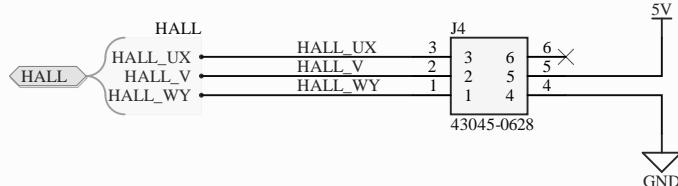
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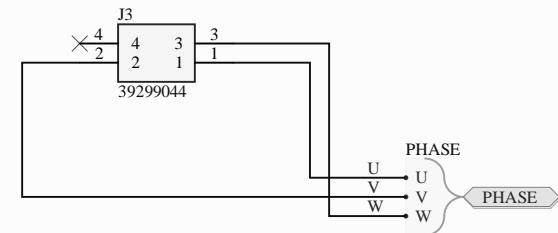
Hall Sensor Connector

possibly 43045-0628 for vertical TH

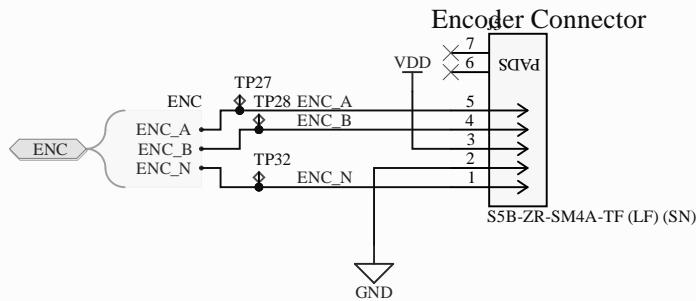


Motor Connector

39299044 vertical molex, 4000 on stock on mouser

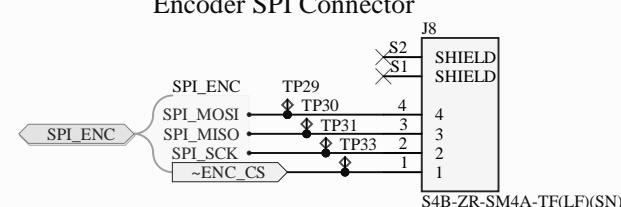


Encoder Connector



Should we use a vertical connector for this?

Encoder SPI Connector



Title		
Size A4	Number	Revision
Date: 5/15/2022	Sheet of	
File: C:\Users\...\connectors.SchDoc	Drawn By:	