

HiveBoard

PMC

SwarmUS

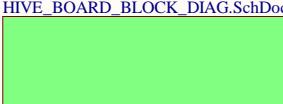
Revision 1.000

Date: 2020-06-01

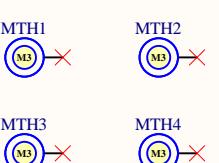
TOP
HIVE_BOARD_TOP.SchDoc



Block diagram
HIVE_BOARD_BLOCK_DIAG.SchDoc



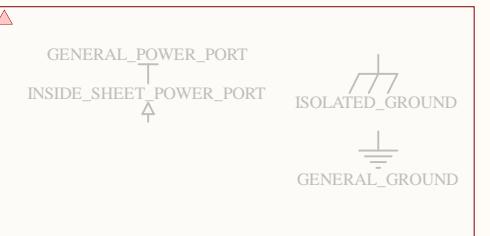
Mounting holes



Fiducials



Revision history	



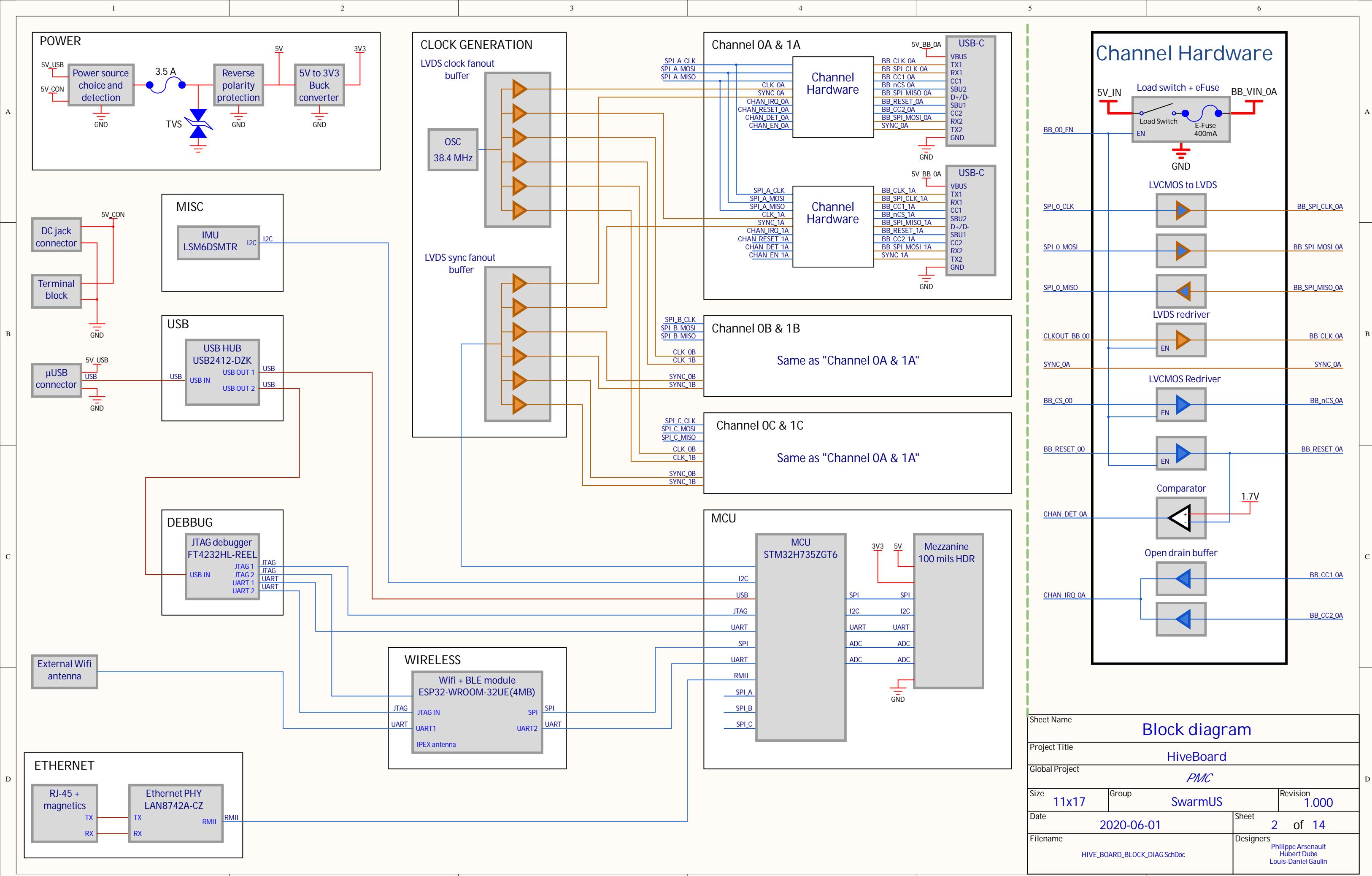
Package size conversion	
Metric	Imperial
1005	0402
1608	0603
2012	0805
3216	1206
3225	1210
6432	2512

- Usage notes
- Routing notes
- Power notes
- Questions / TODO

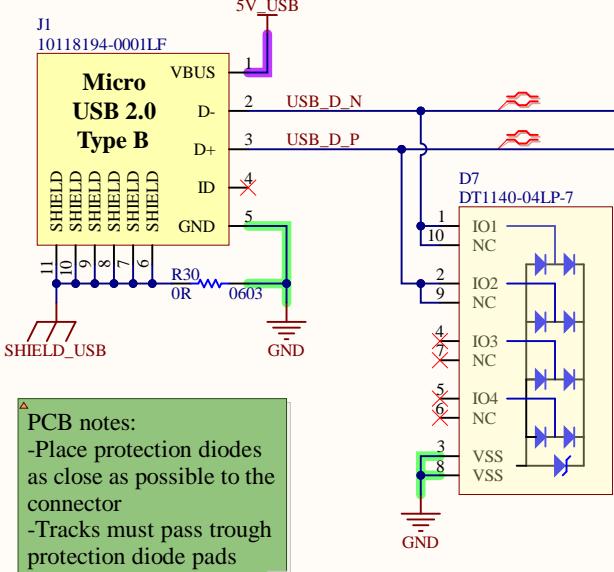
Section name

power

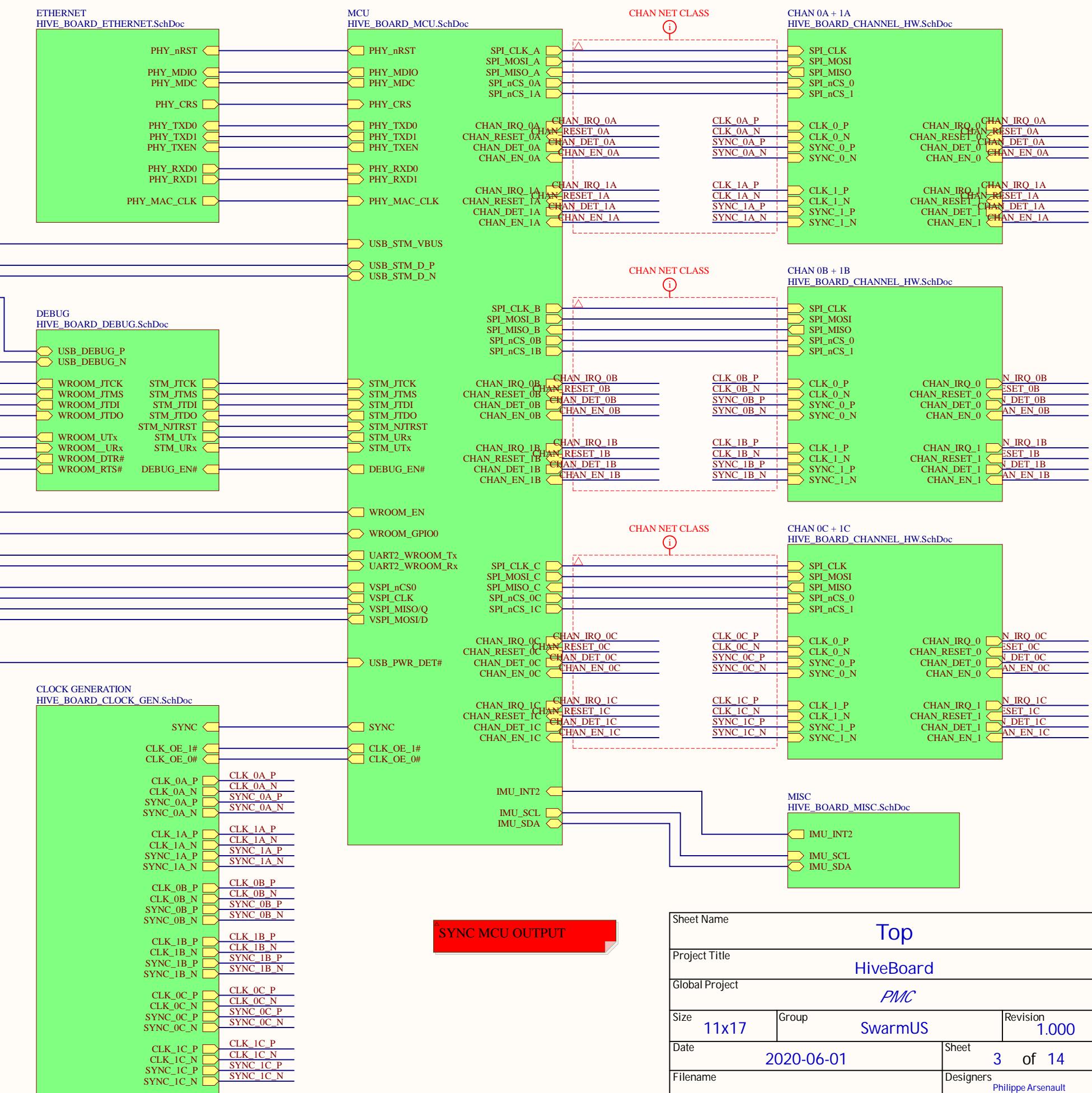
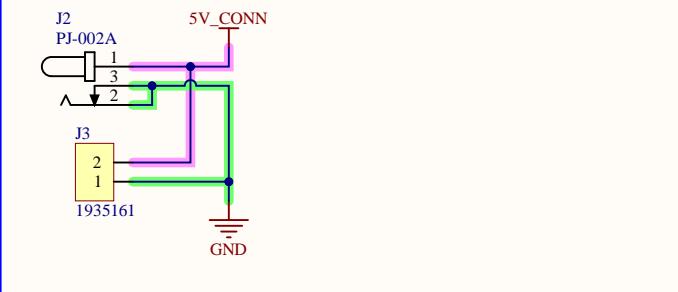
Project Title	HiveBoard		
Global Project	PMC		
Size	11x17	Group	SwarmUS
Date	2020-06-01	Revision	1.000
Filename	HIVE_BOARD_TITLE.SchDoc		
Designers	Philippe Arsenault Hubert Dube Louis-Daniel Gaulin		



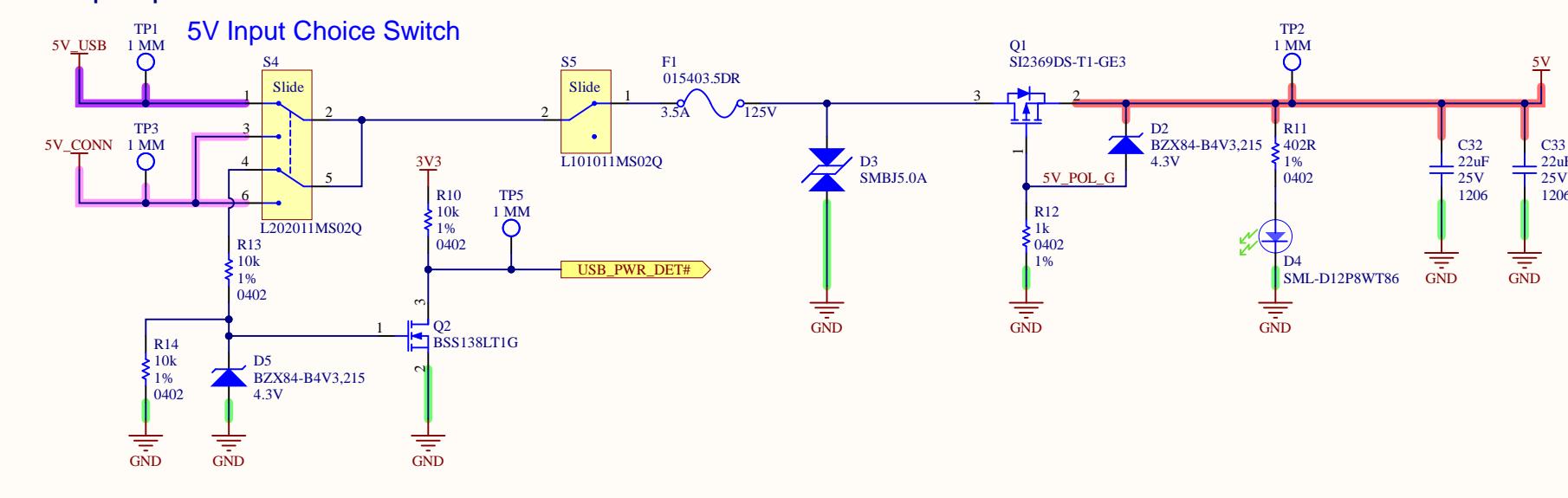
USB protection and input



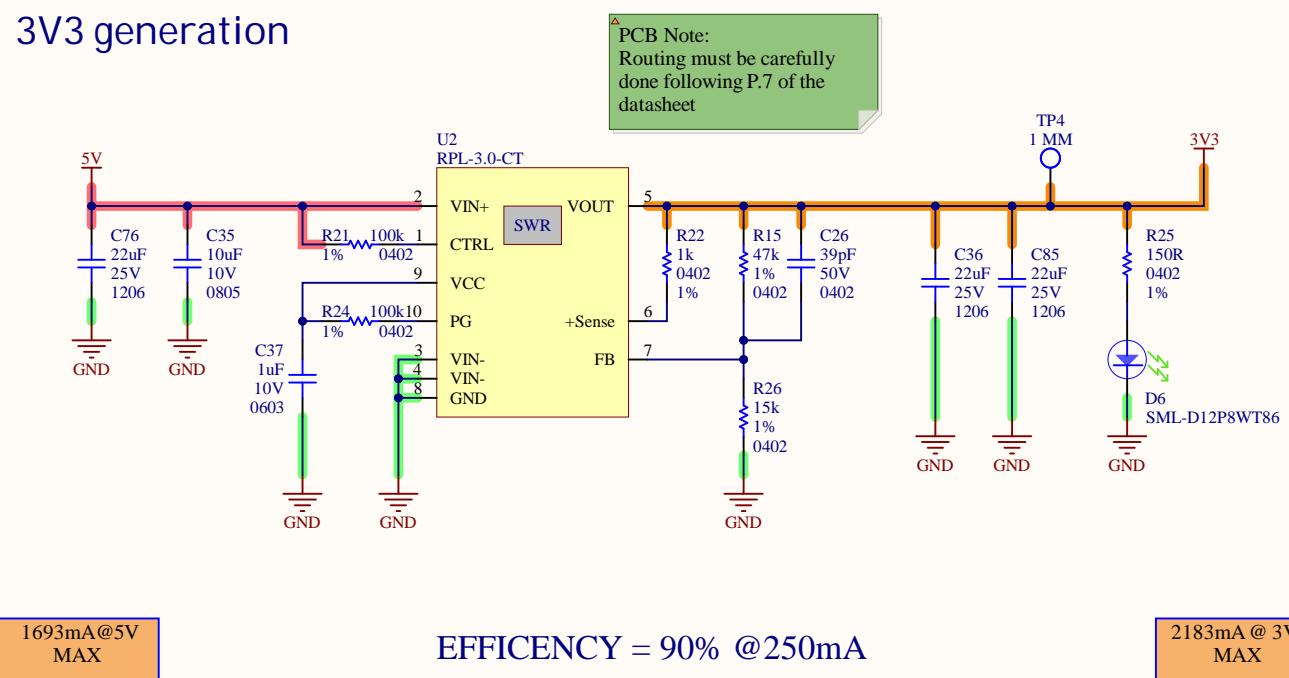
Power input DC jack + terminal



5V input protection + choice



3V3 generation



Power table

Sheet	Absolute maximum		Estimated - High Power		Estimated - Low Power	
	Current @ 5V	Current @ 3V3	Current @ 5V	Current @ 3V3	Current @ 5V	Current @ 3V3
MCU	-	620 mA	-	100 mA	-	100 mA
CLOCK_GEN	-	180mA+31mA/3Ch	-	180mA+31mA/3Ch	-	0 mA
CHANNEL_HW	395 mA/Ch	99 mA/Ch	395 mA/Ch	99 mA/Ch	-	0 mA
USB	-	62 mA	-	62 mA	-	54 mA
ETHERNET	-	117 mA	-	117 mA	-	0mA
DEBUG	-	153 mA	-	153 mA	-	0 mA
WIRELESS	-	394 mA	-	394 mA	-	394 mA
MISC	-	1 mA	-	1 mA	-	1 mA
Total - 3Ch	1185 mA	1855 mA	1185 mA	1335 mA	0 mA	549 mA
Total - 3 Ch @ 5V	2545 mA		2174 mA		402mA	
Total - 6 Ch	2370 mA	2183 mA	2370 mA	1645 mA	N/A	N/A
Total - 6 Ch @ 5V	3970 mA		3576 mA		N/A	

Sheet Name

POWER

Project Title

HiveBoard

Global Project

PMC

Size

11x17

Group Revision

SwarmUS

1.000

Date

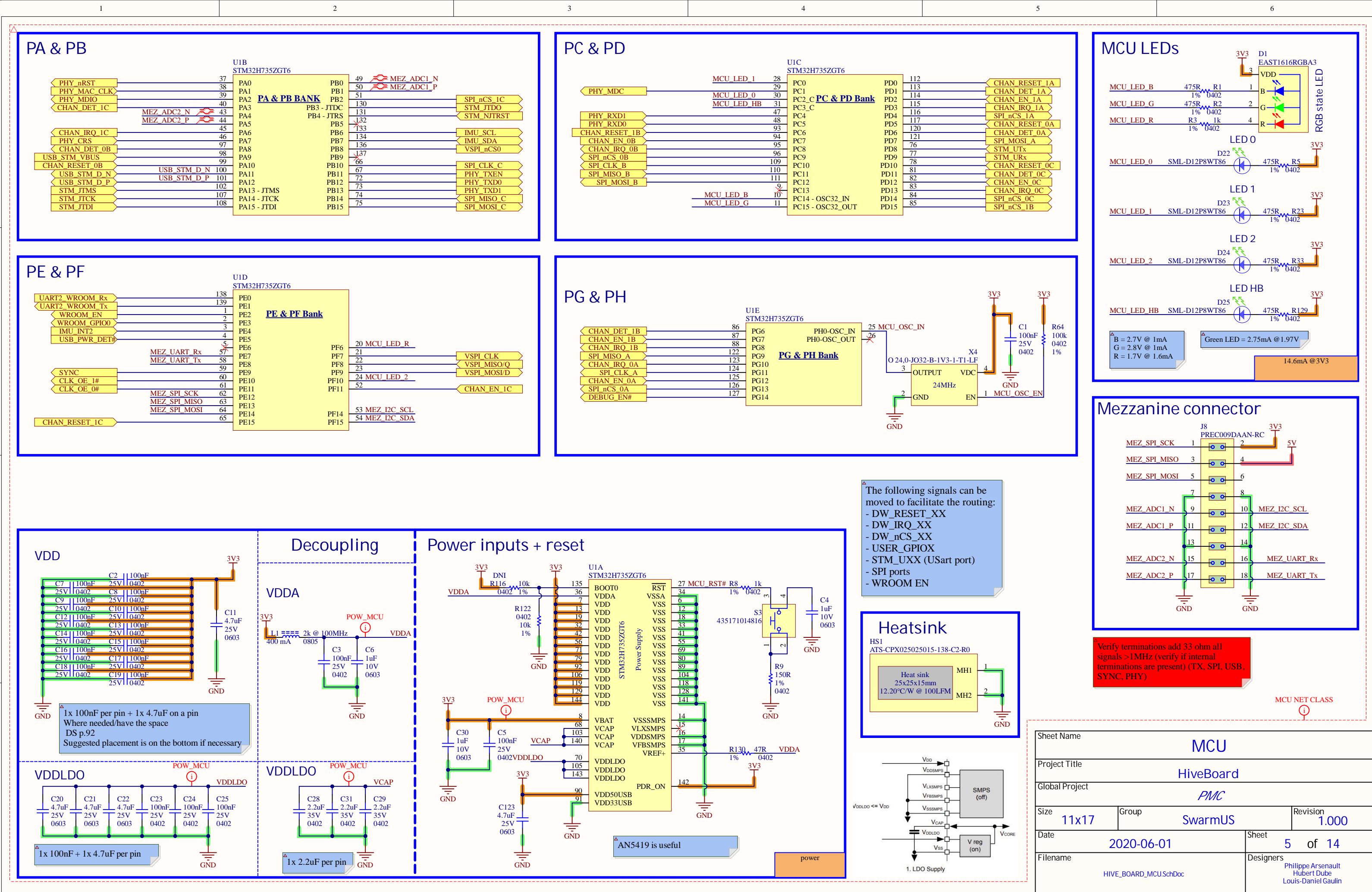
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Sheet 4 of 14

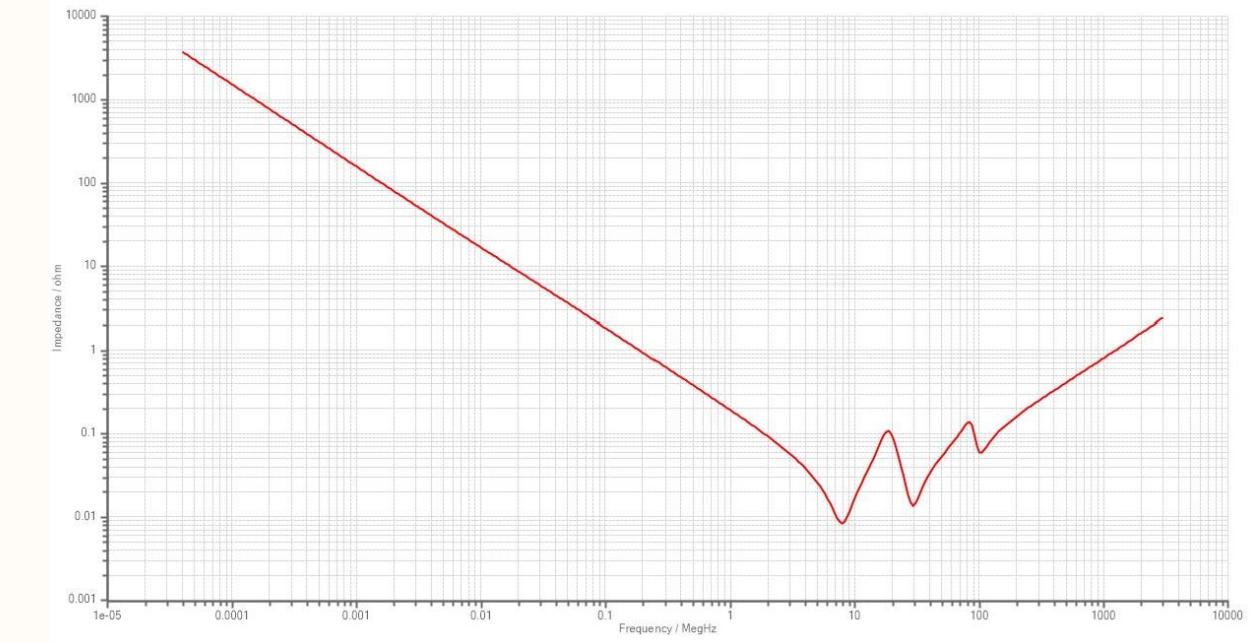
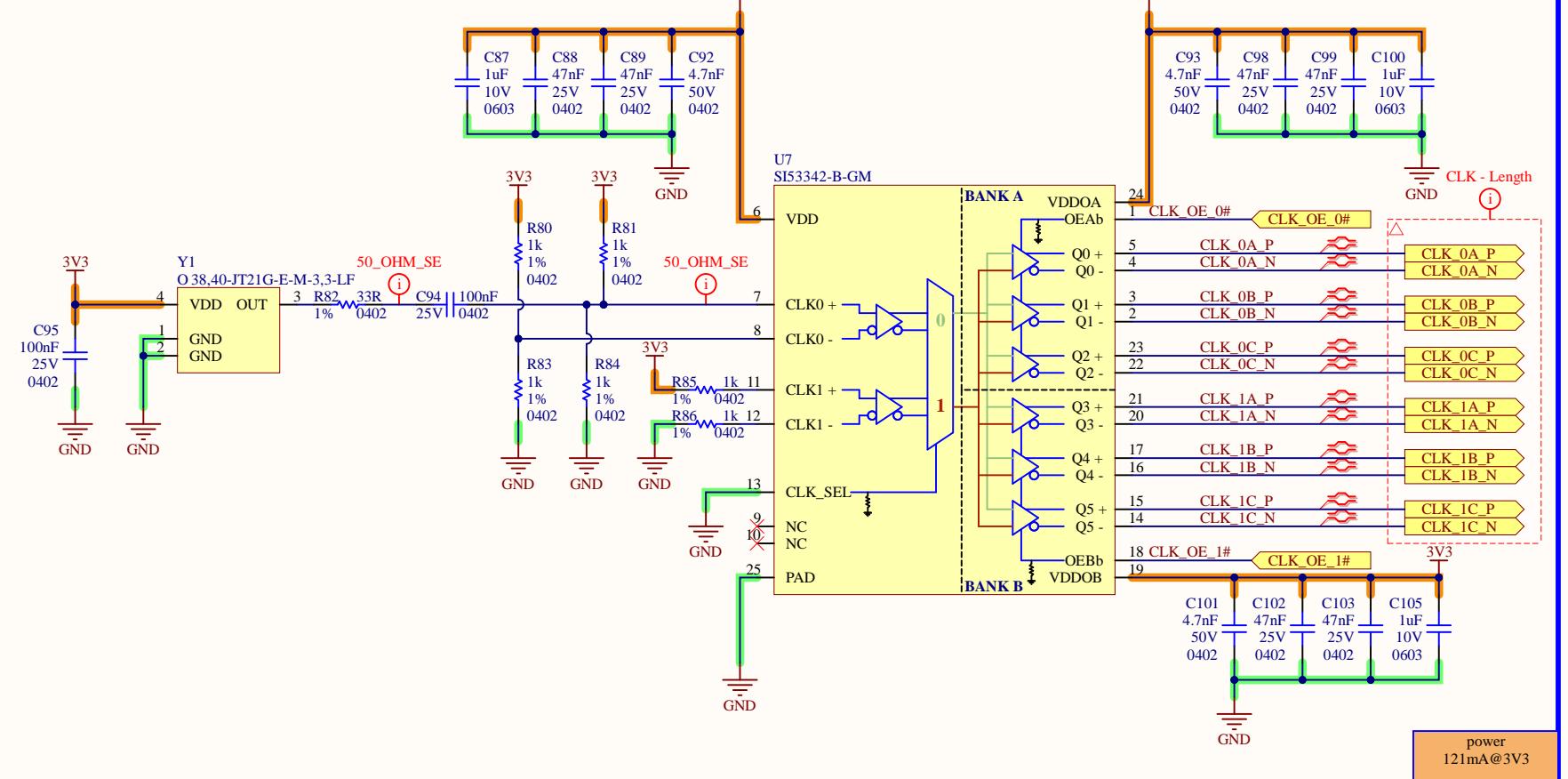
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HIVE_BOARD_POWER.SchDoc

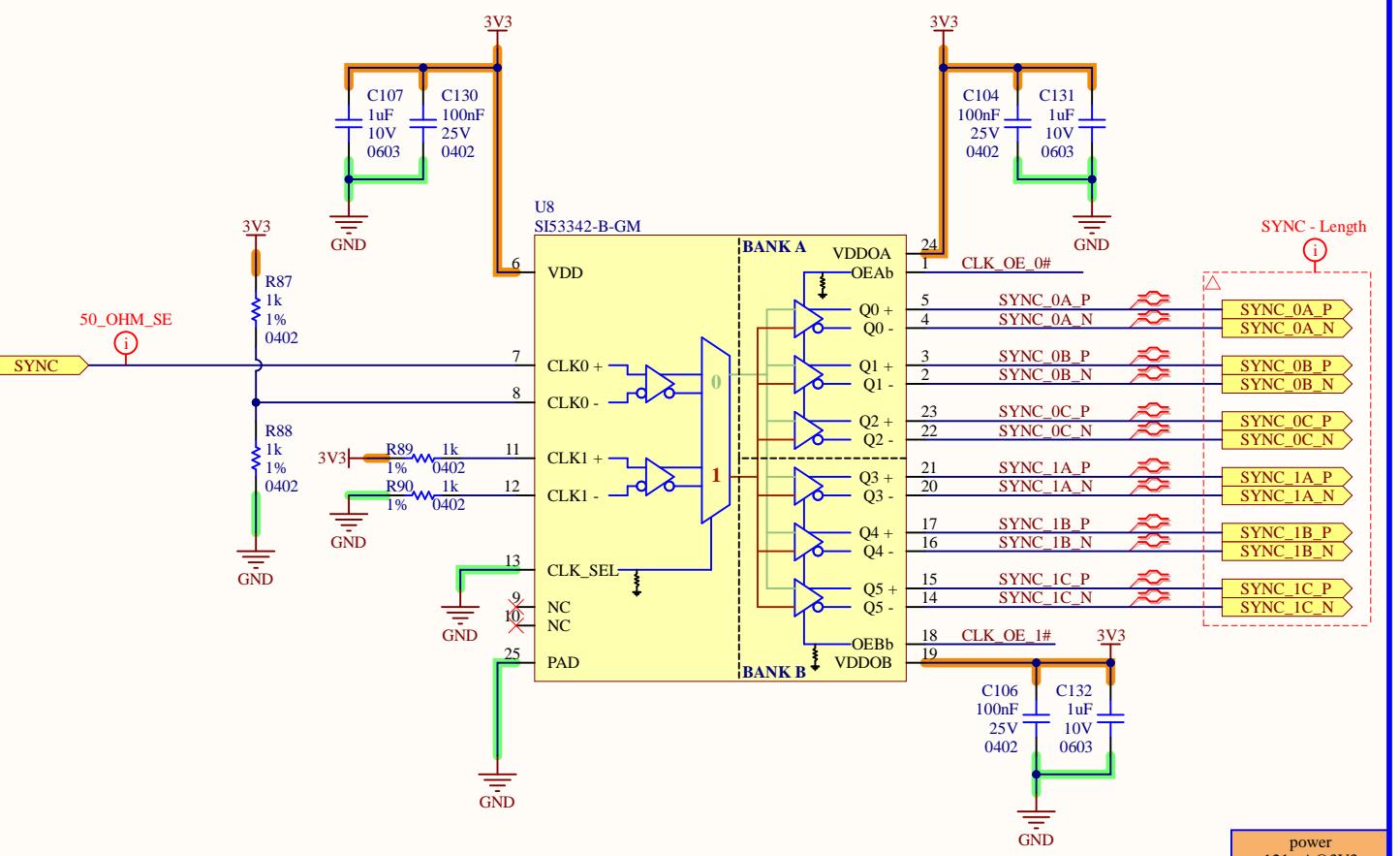
Designers
Philippe Arsenault
Hubert Dubé
Louis-Daniel Gaulin



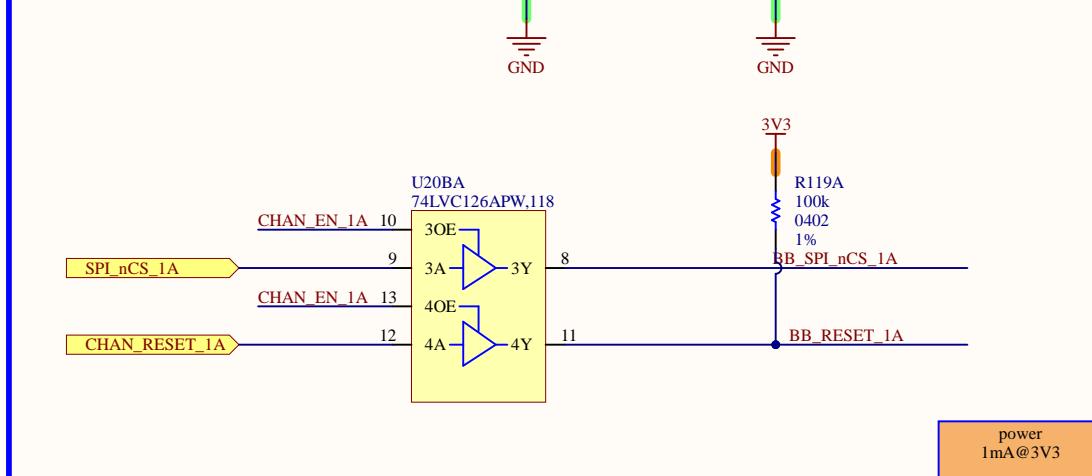
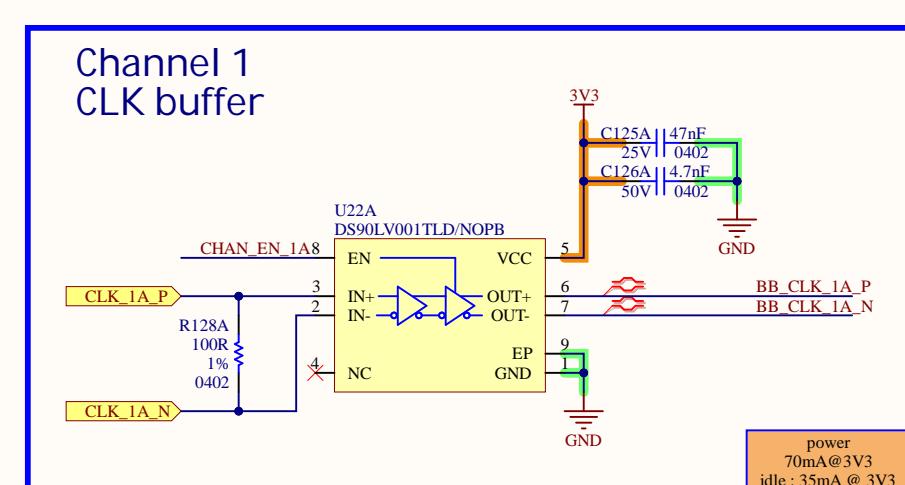
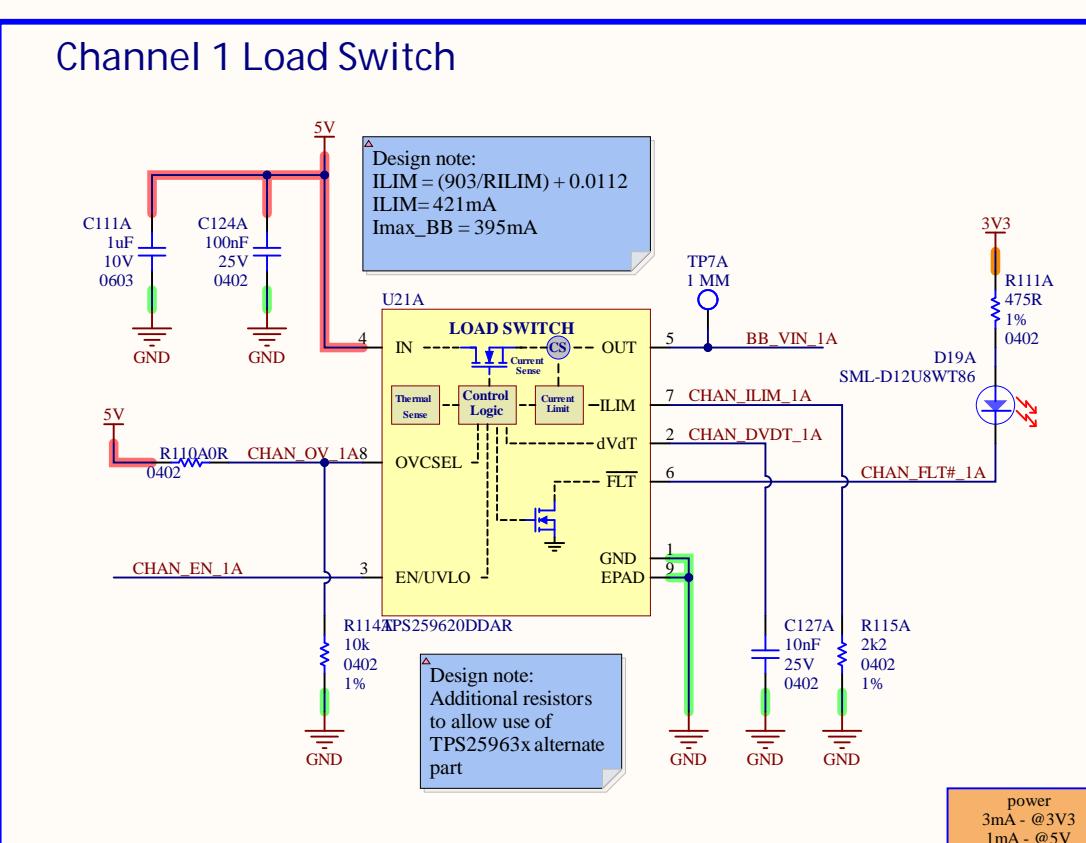
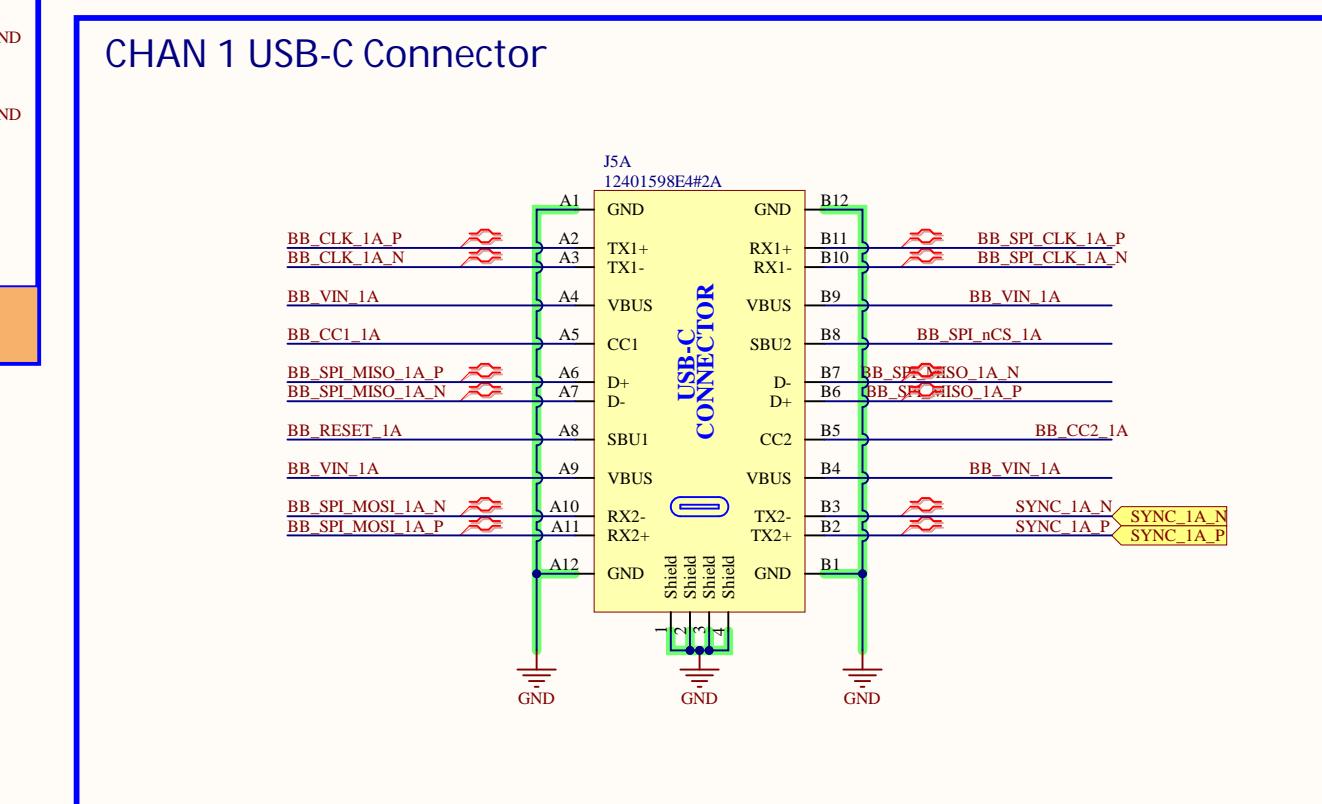
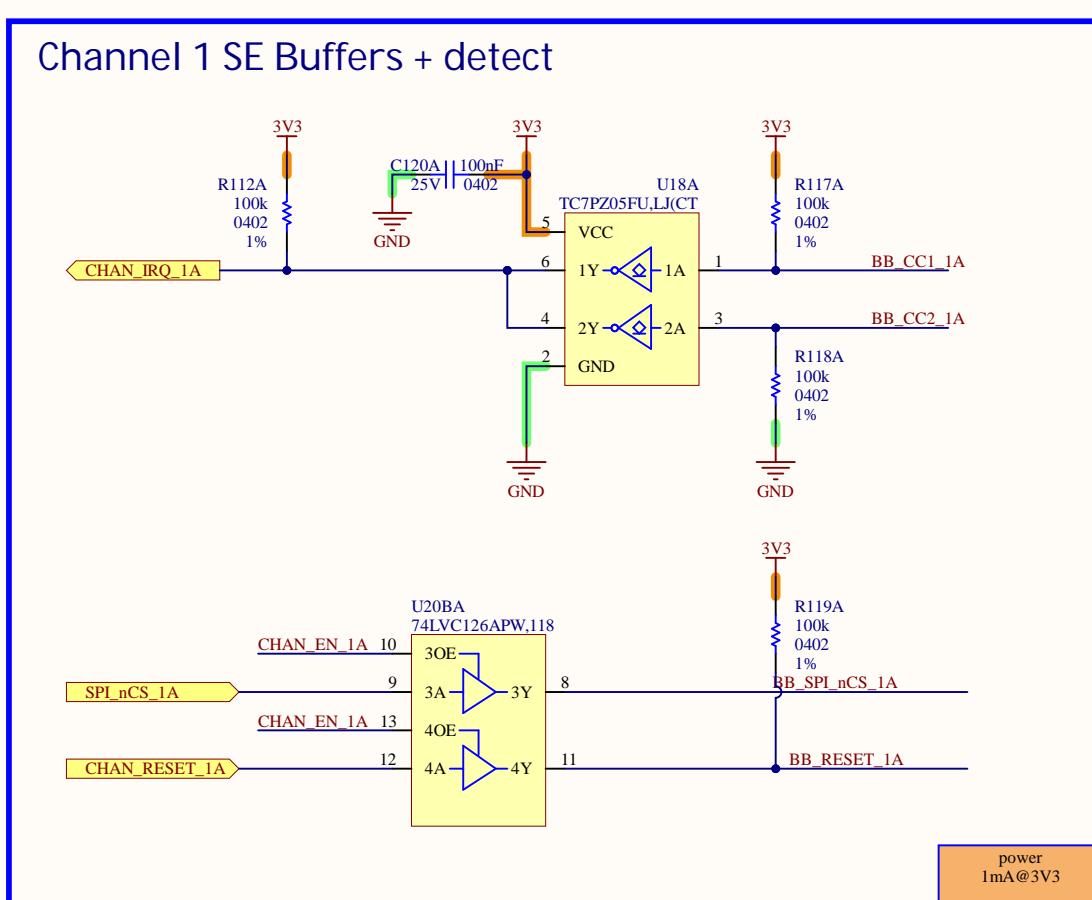
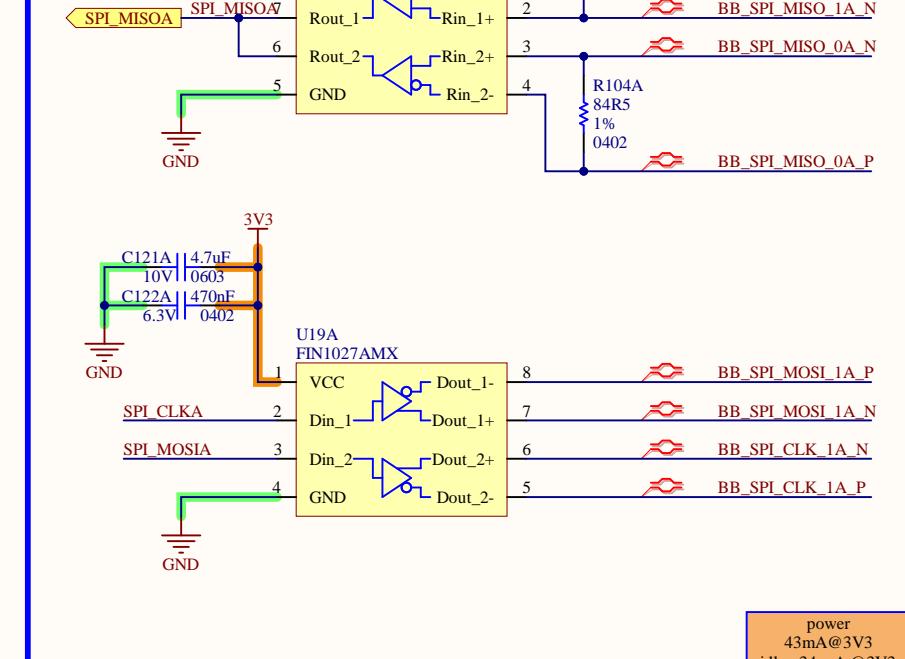
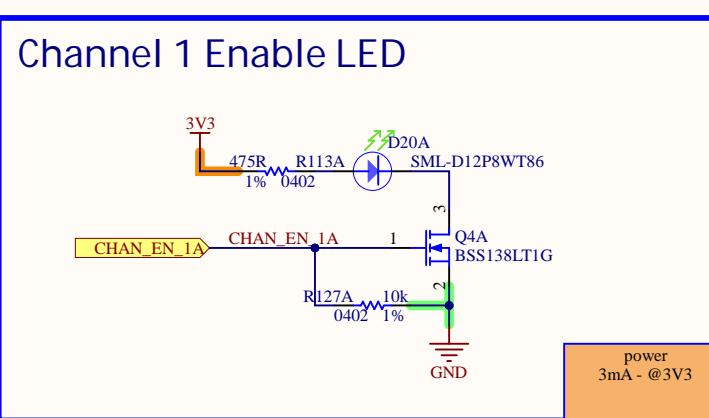
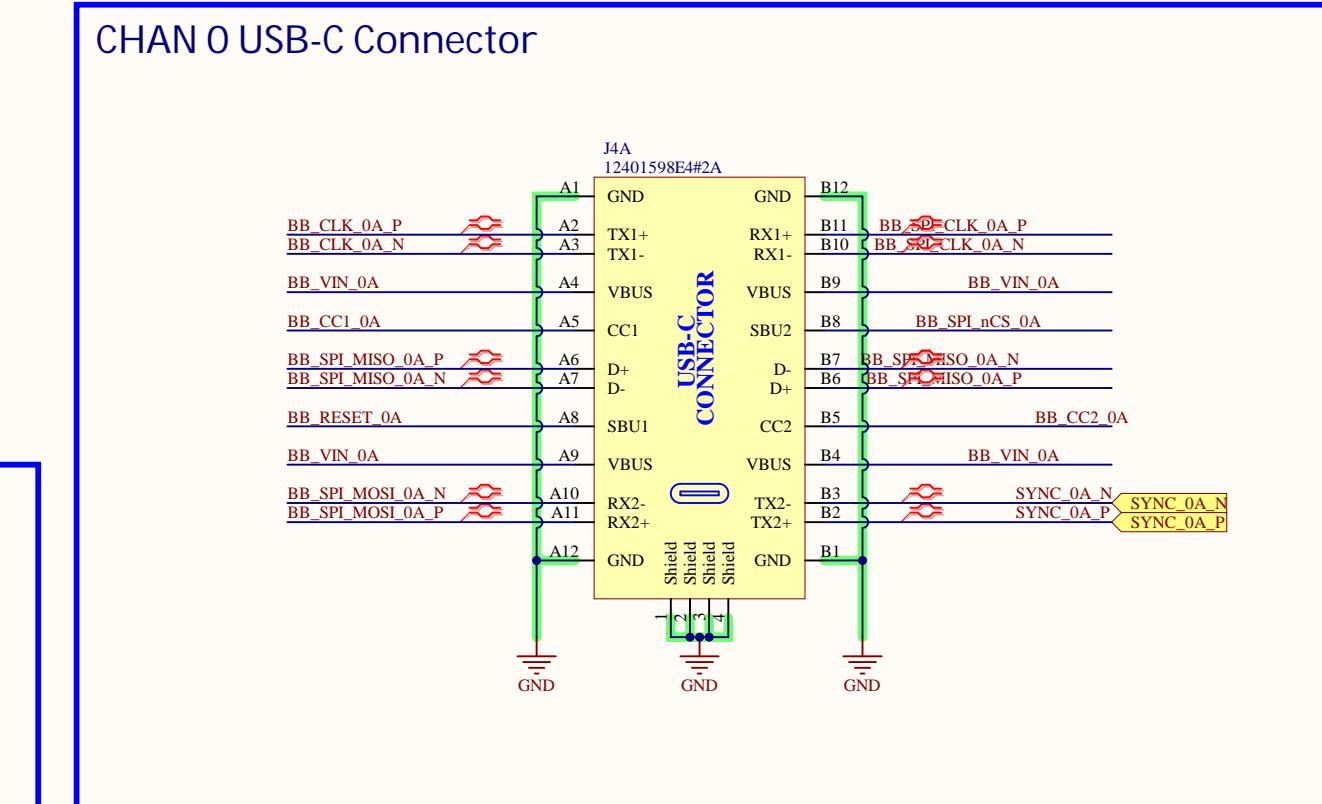
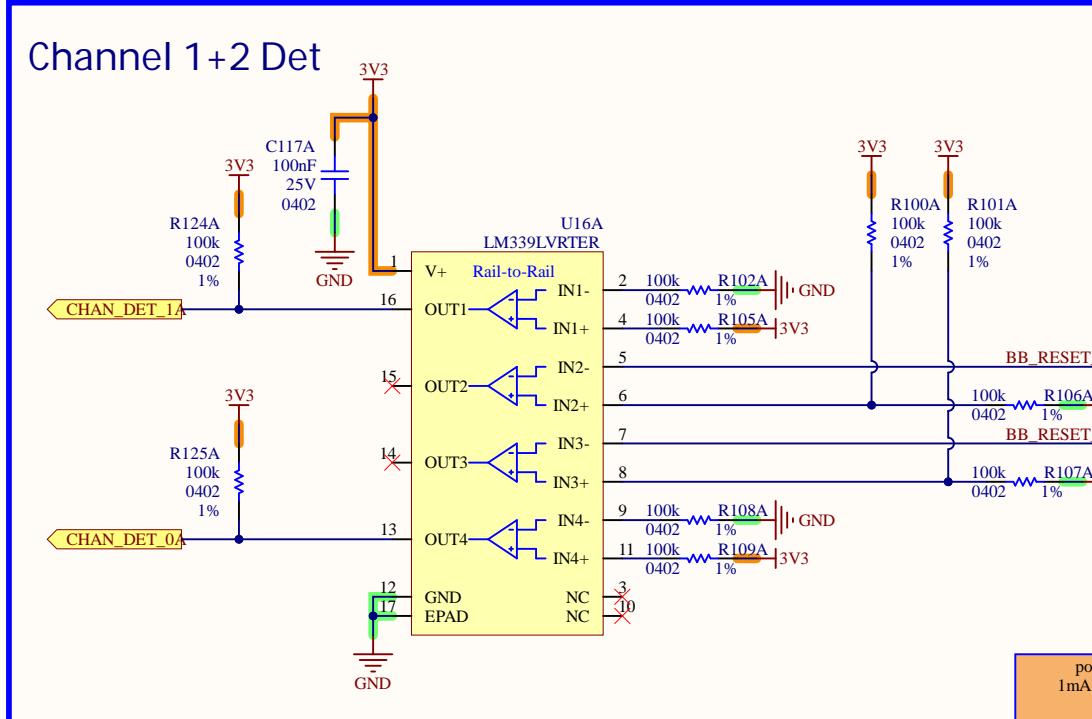
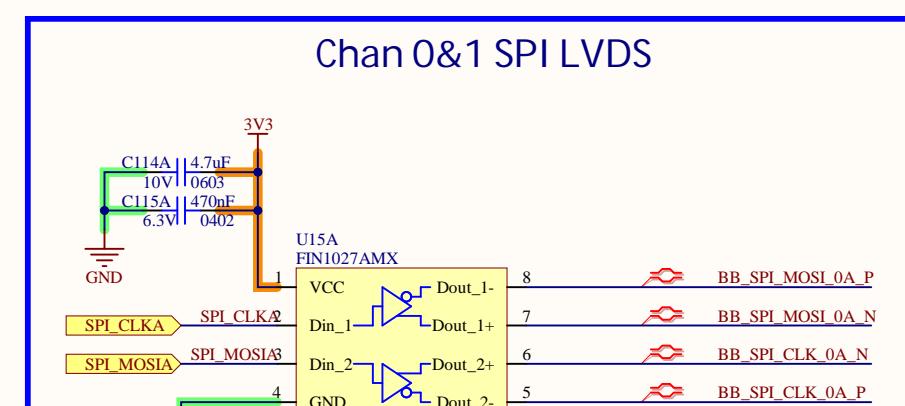
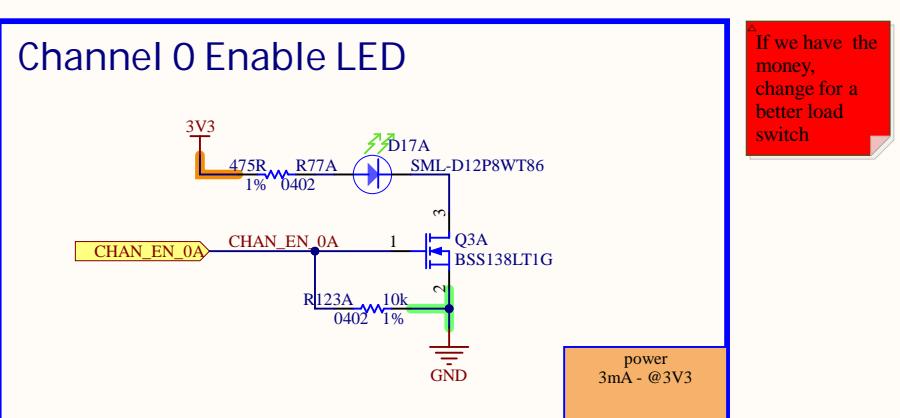
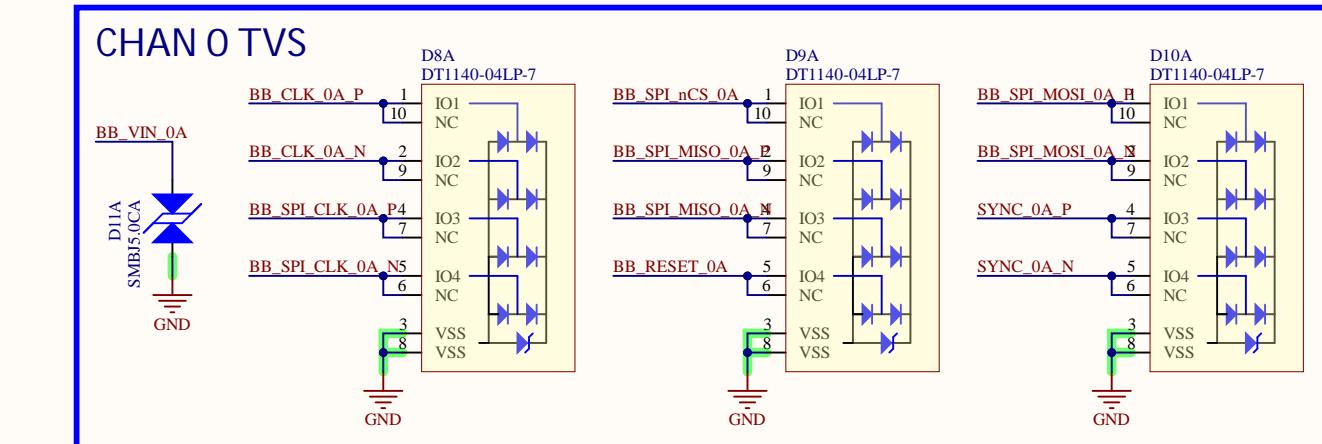
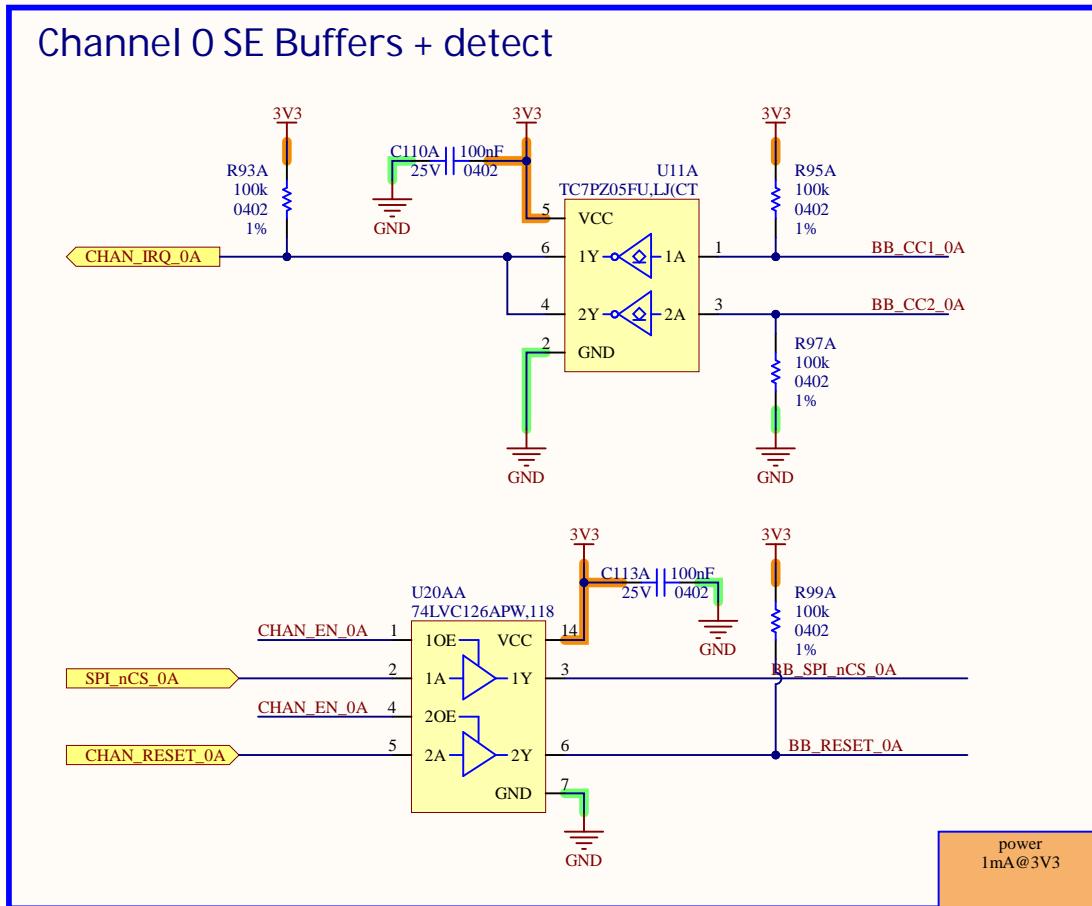
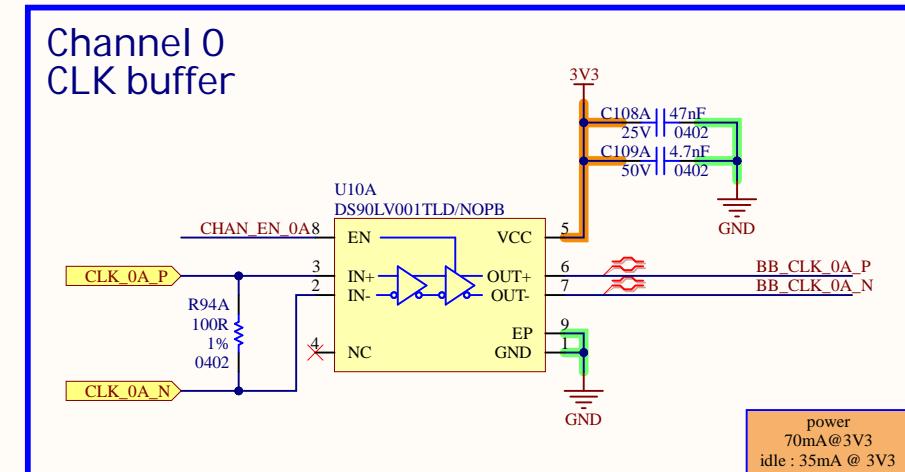
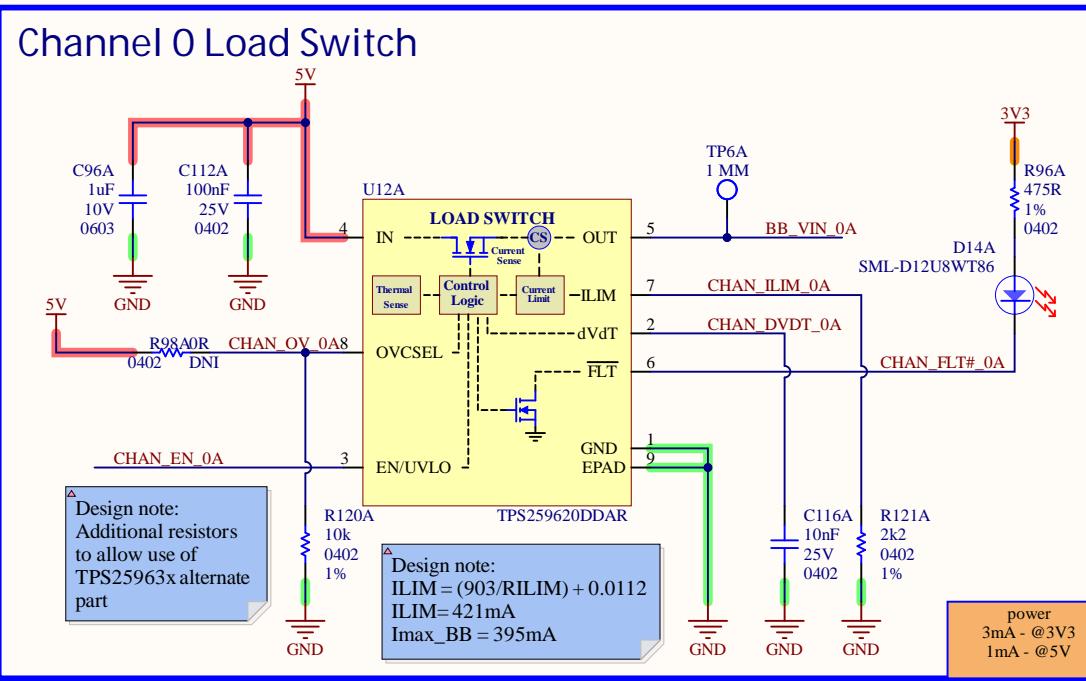
CLK GEN (38.4MHz) + Fanout



SYNC FANOUT

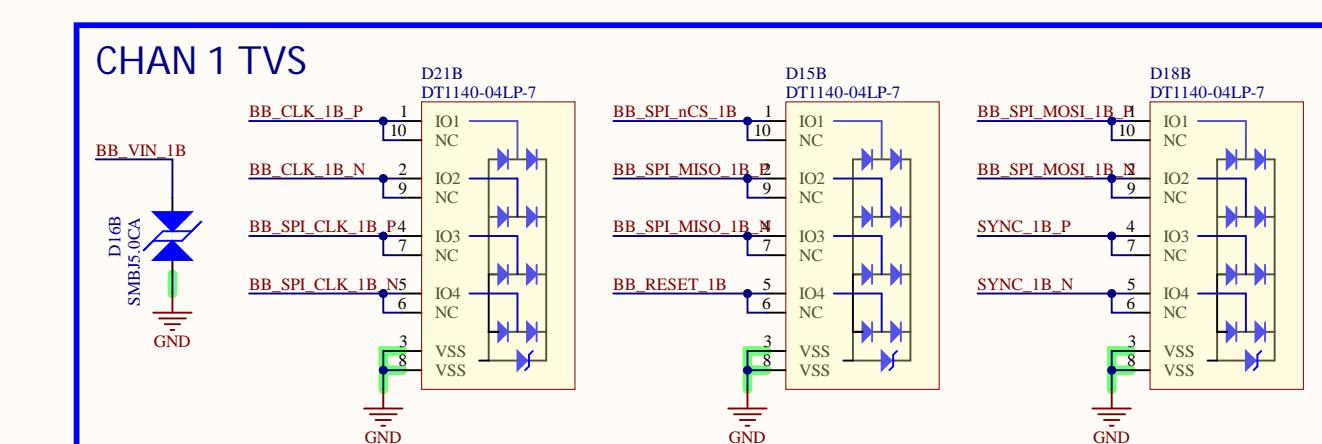
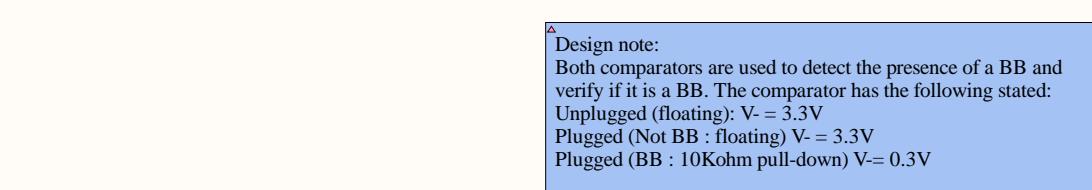
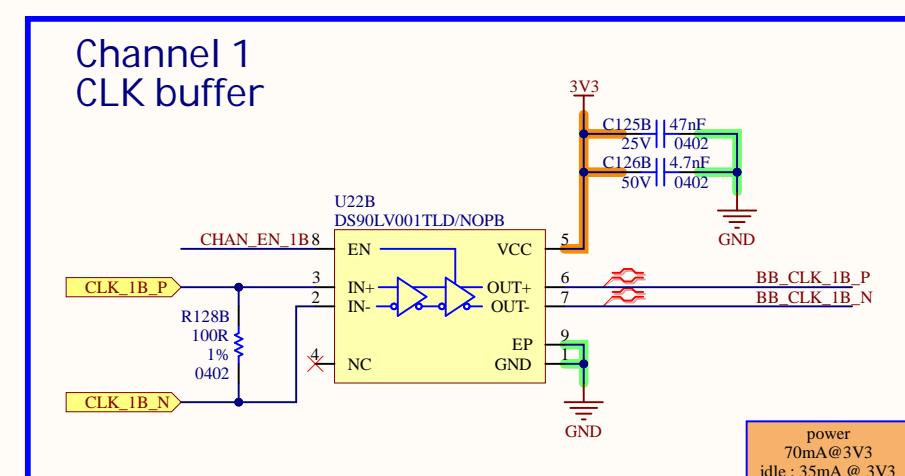
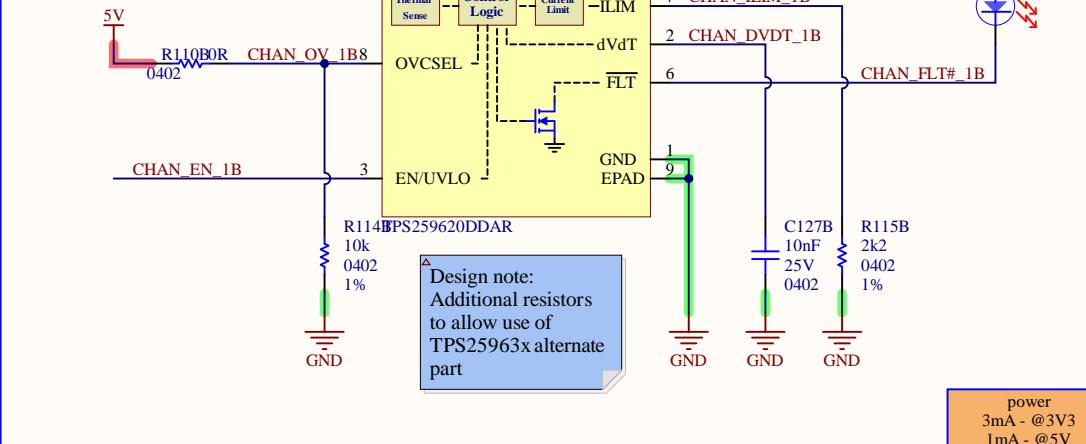
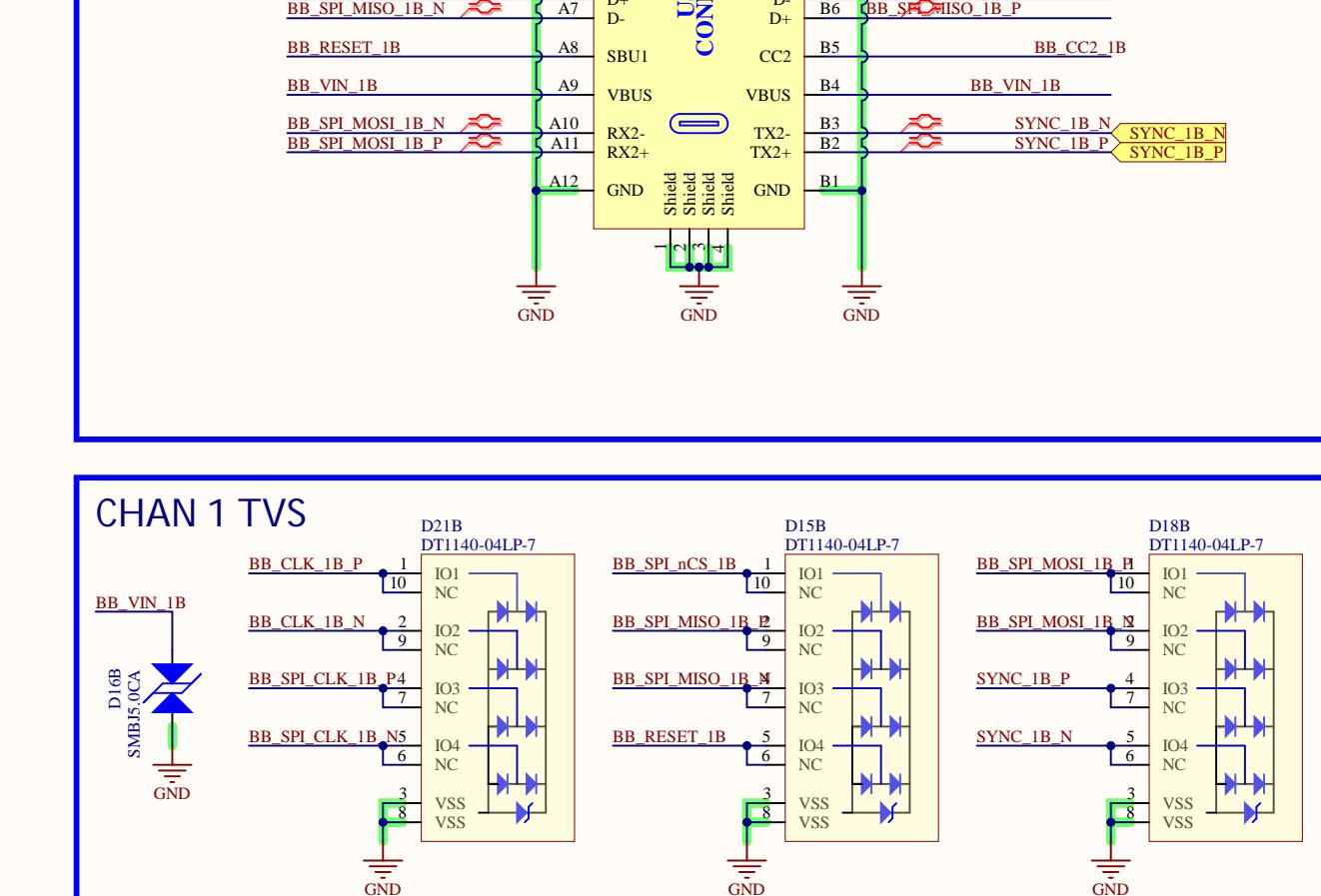
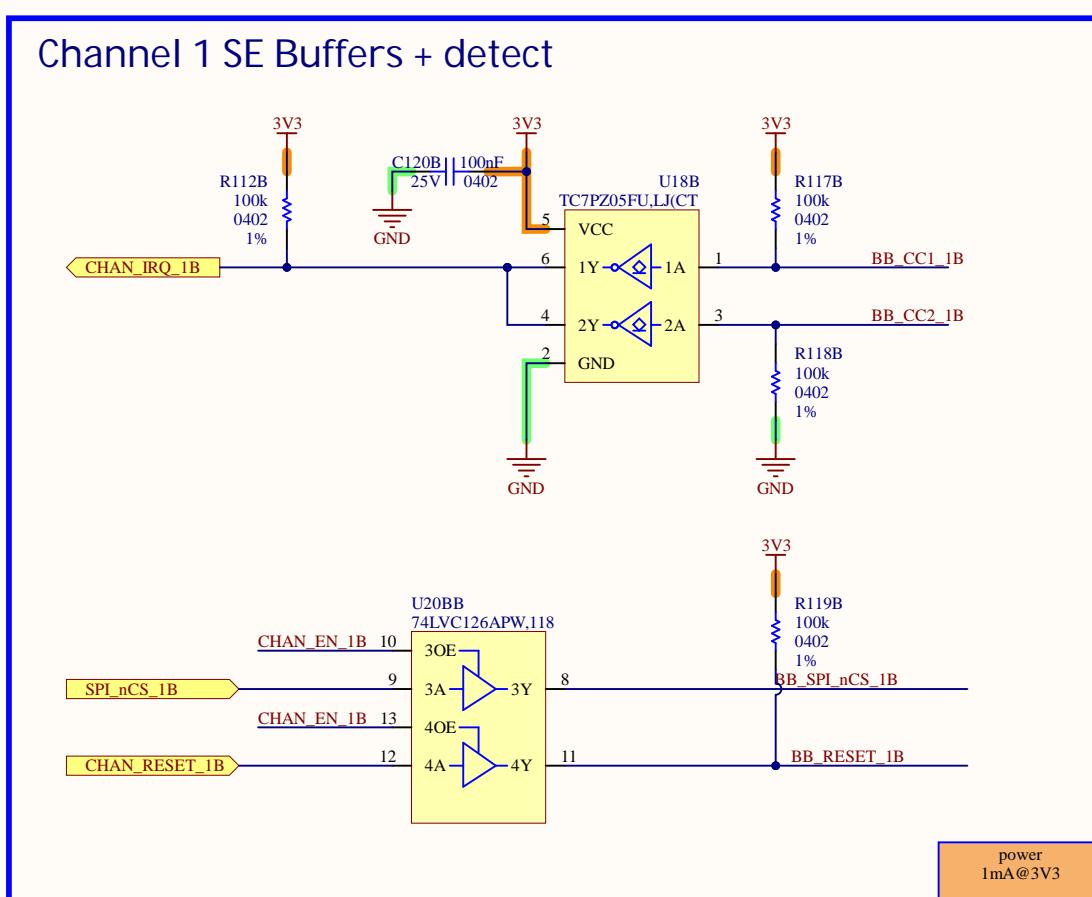
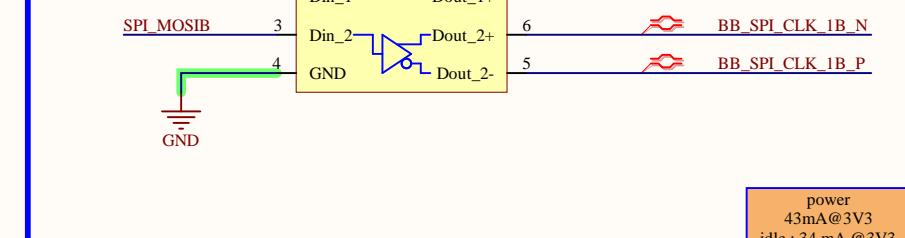
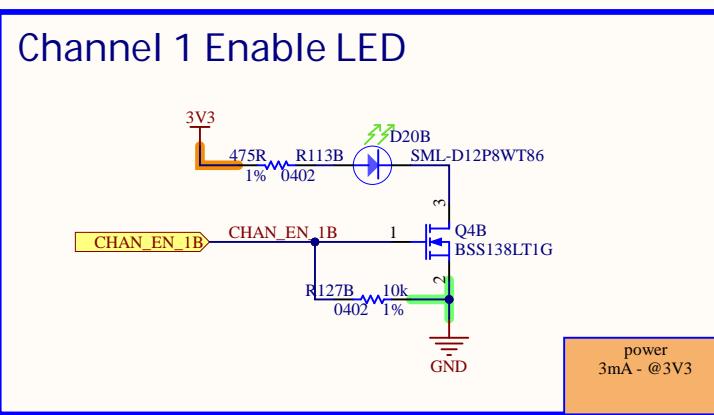
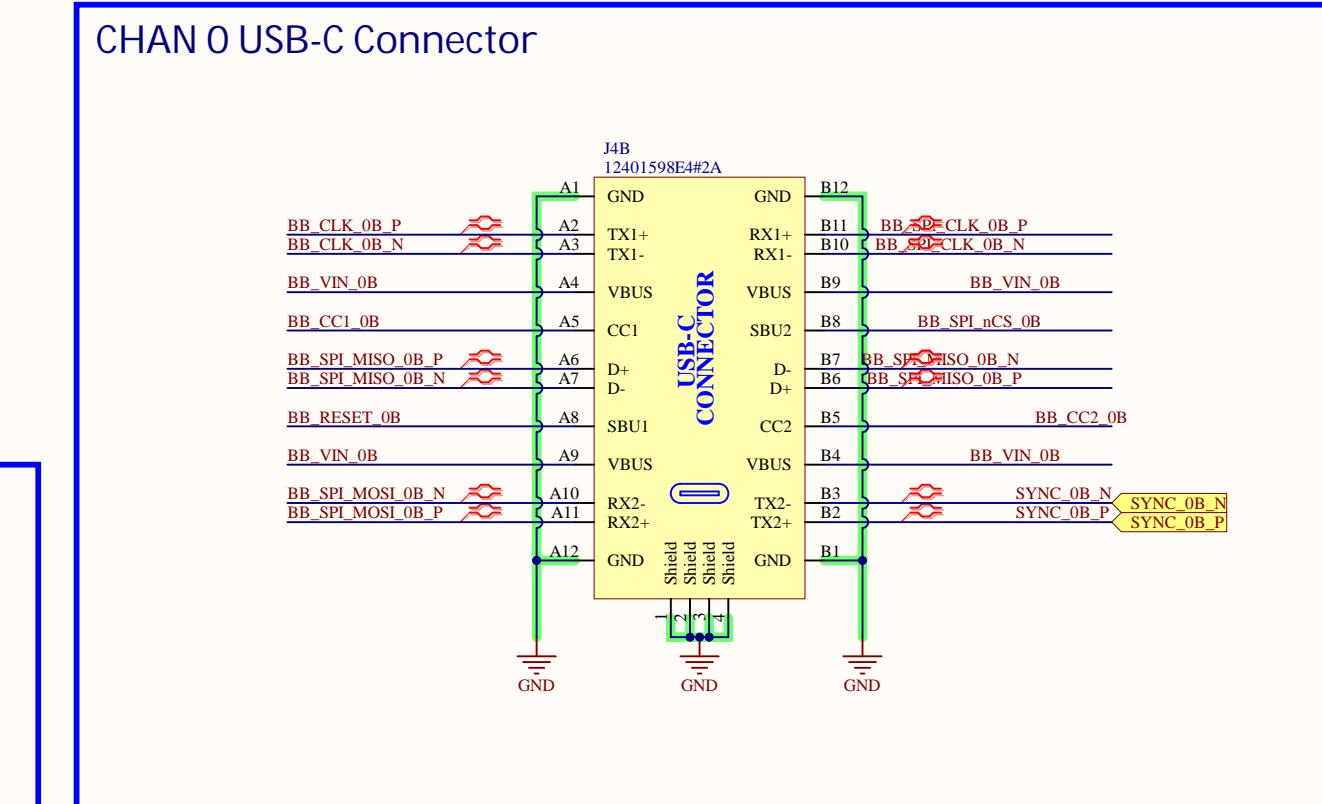
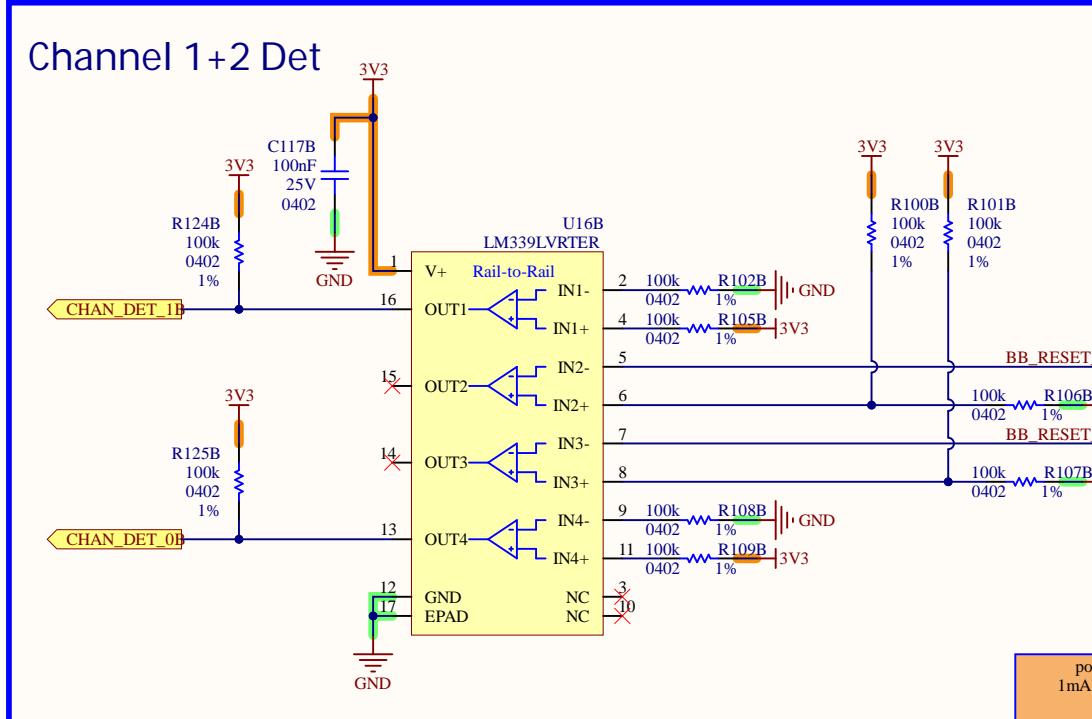
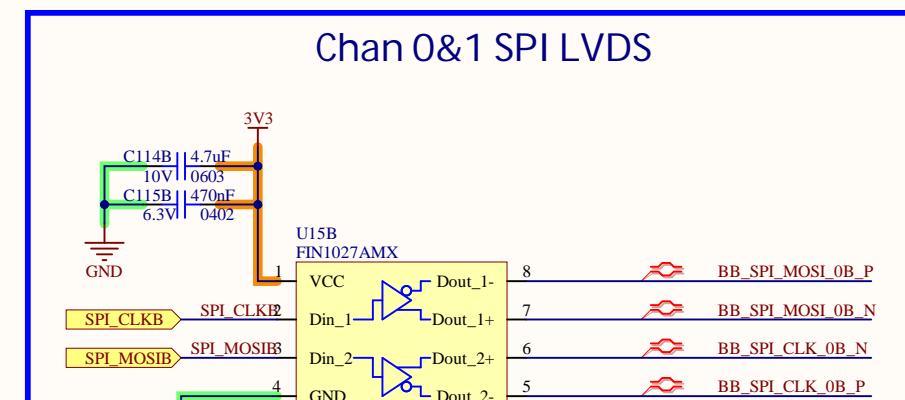
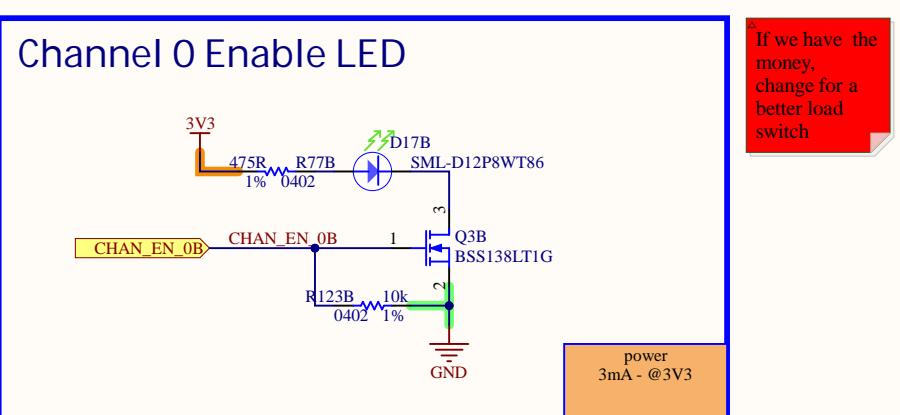
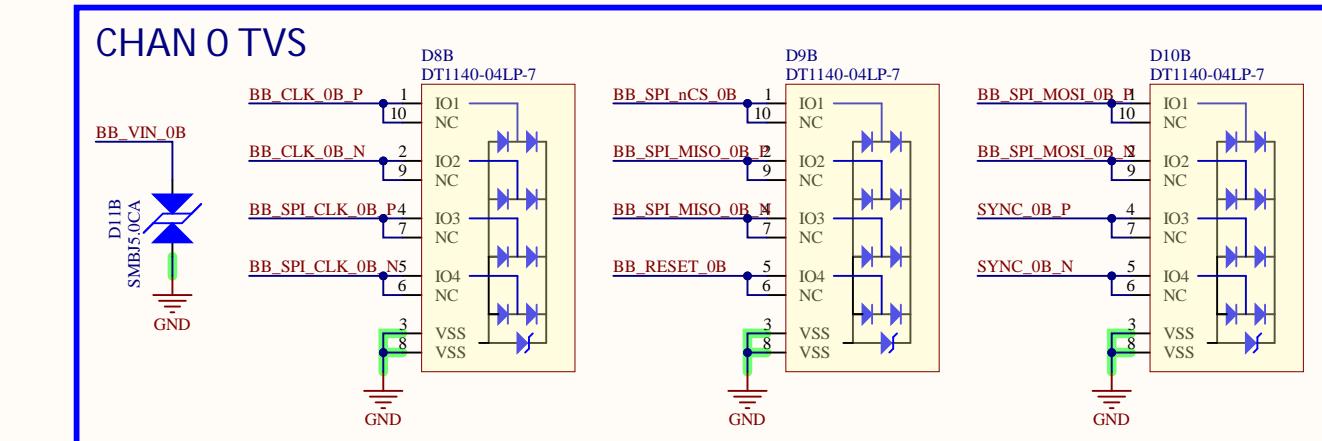
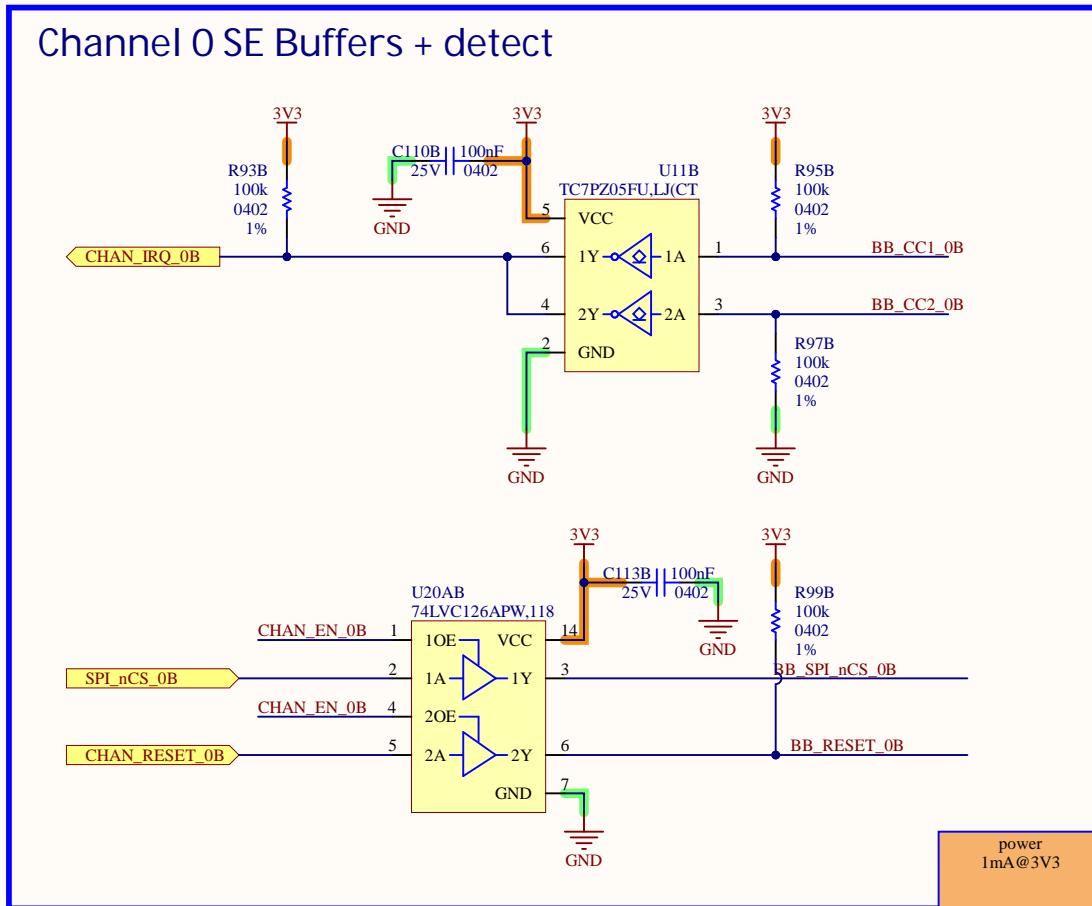
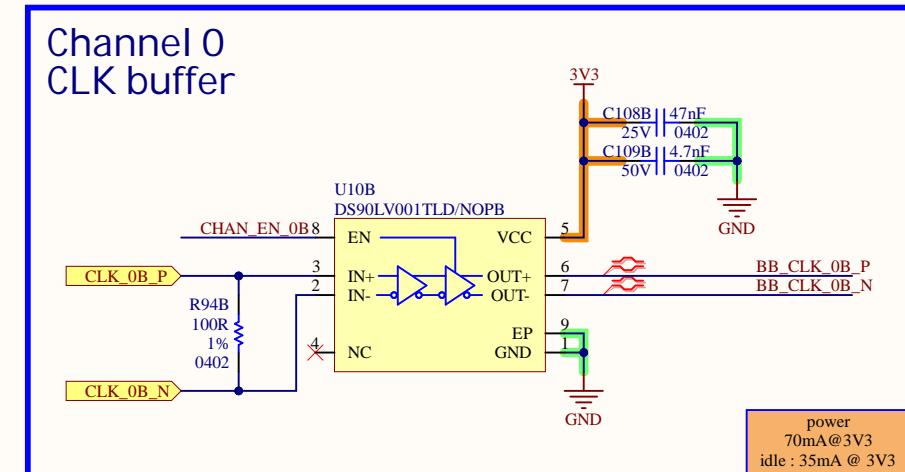
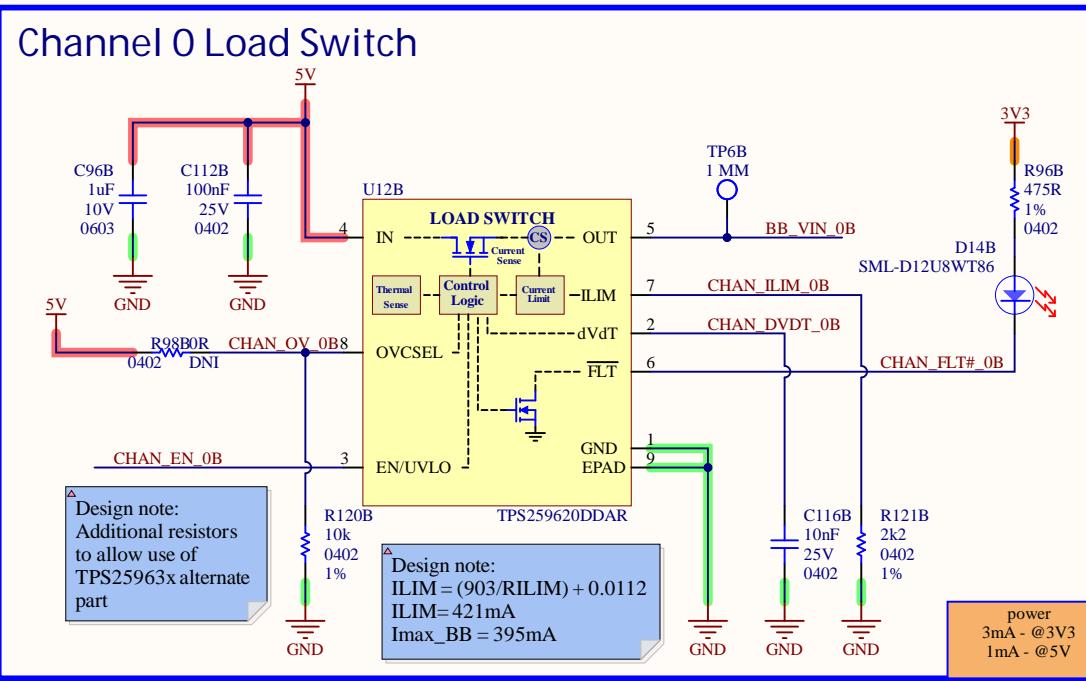


Sheet Name		CLOCK GEN & FANOUT	
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Global Project		PMC	
Size	11x17	Group	Revision
		SwarmUS	
Date	2020-06-01	Sheet	6 of 14
Filename	HIVE_BOARD_CLOCK_GEN.SchDoc		Designers
	Philippe Arsenault Hubert Dubé Louis-Daniel Gaulin		

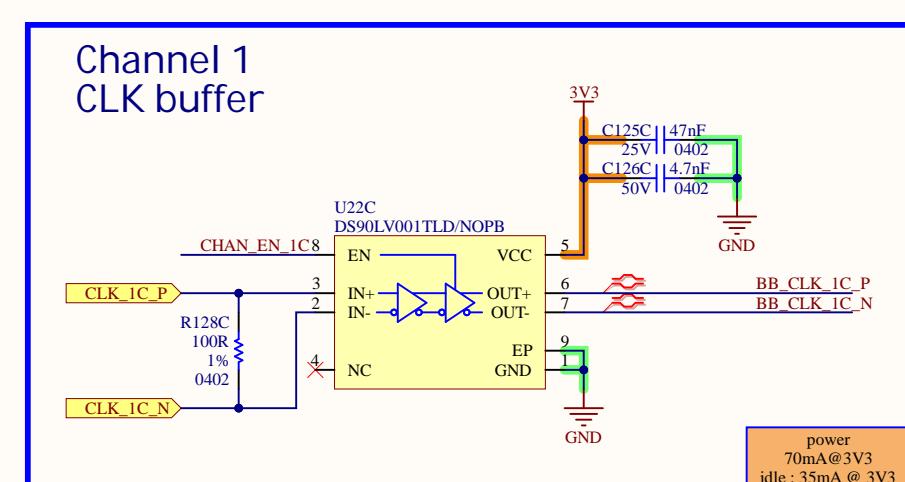
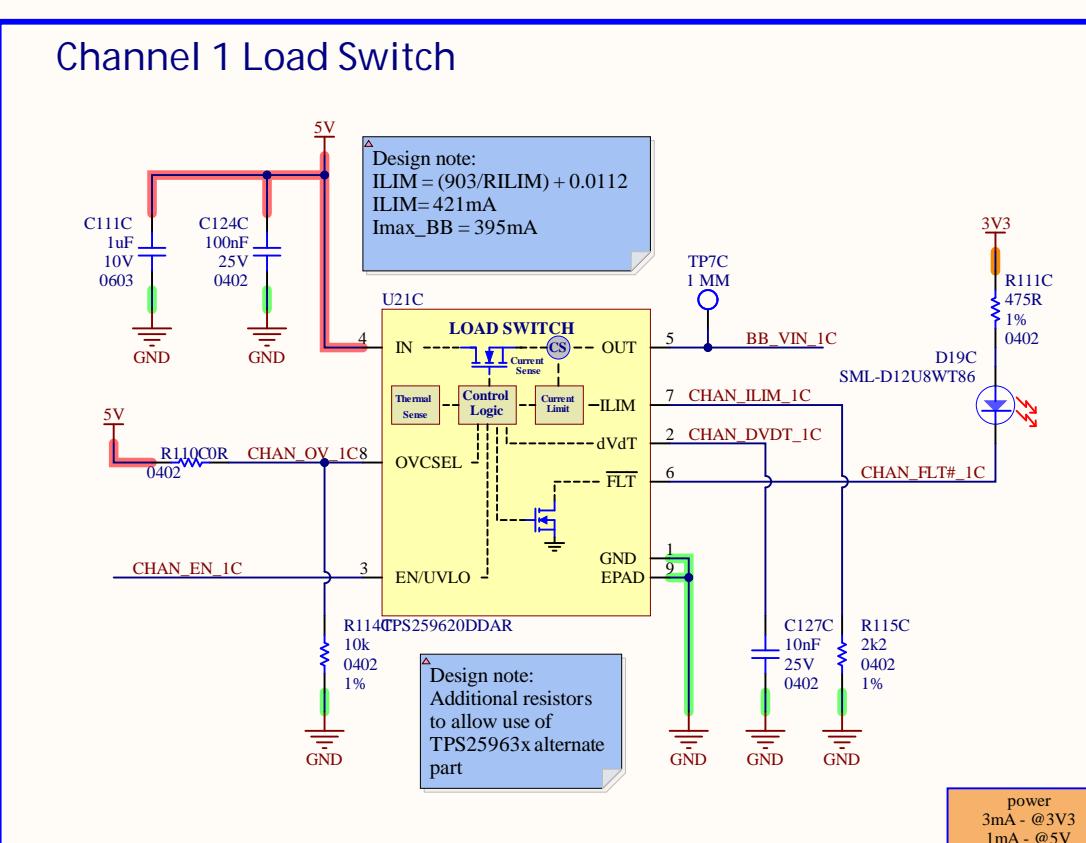
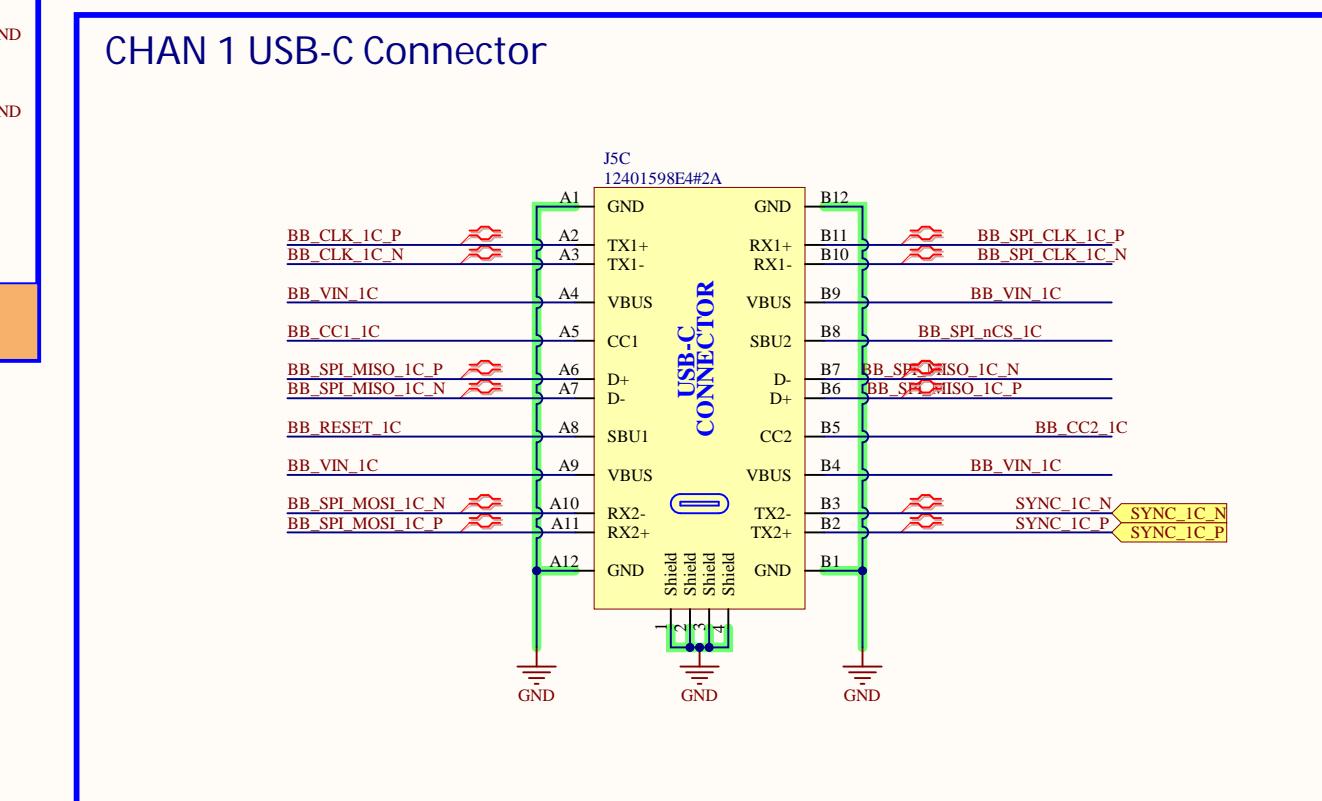
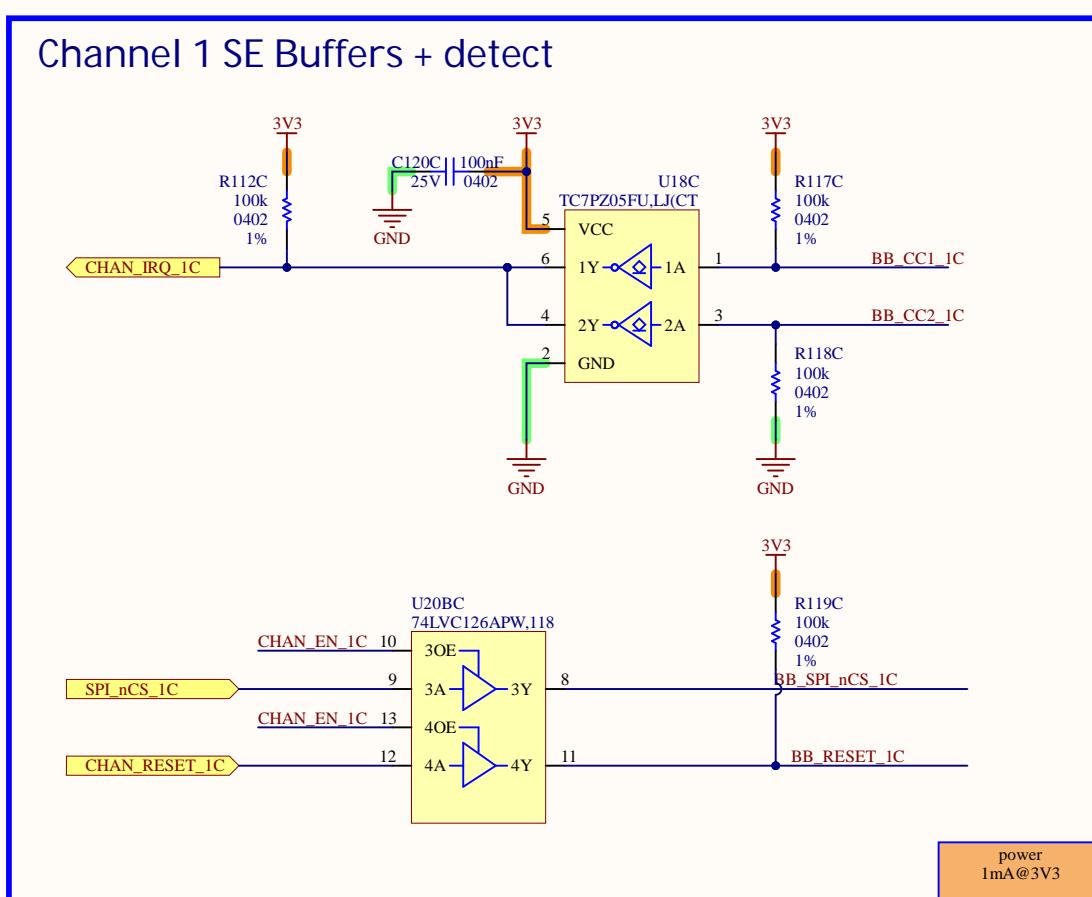
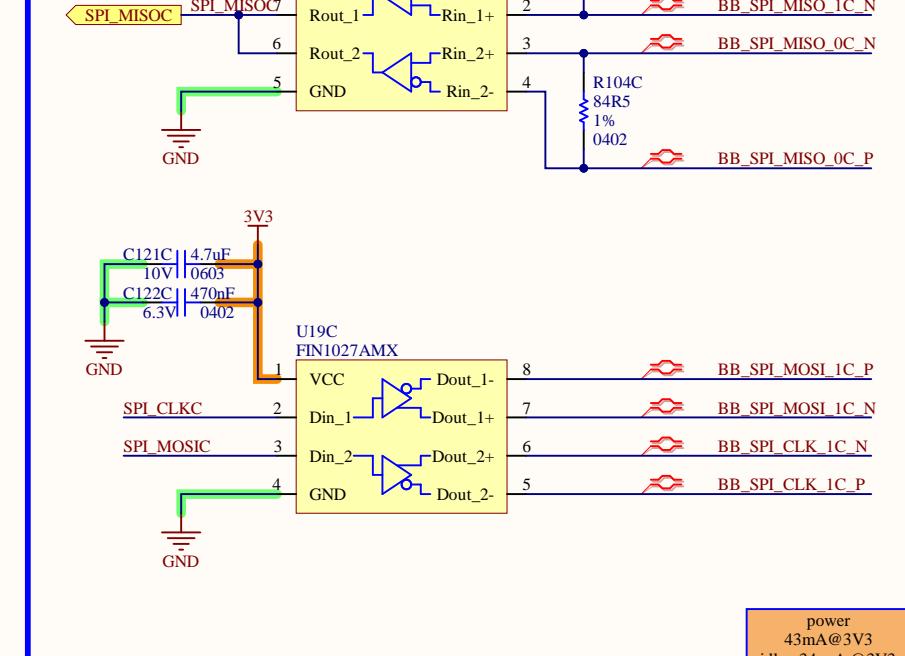
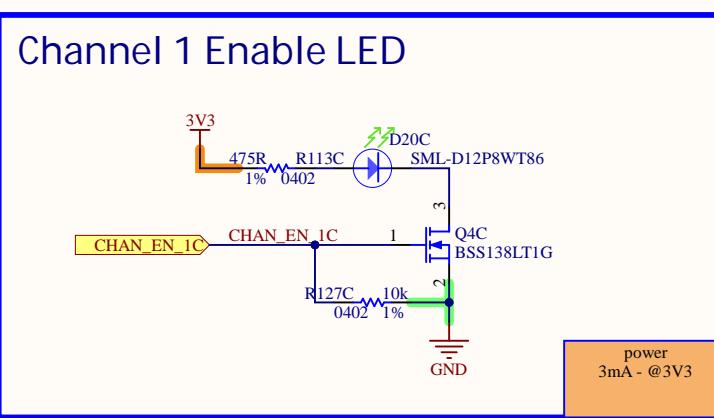
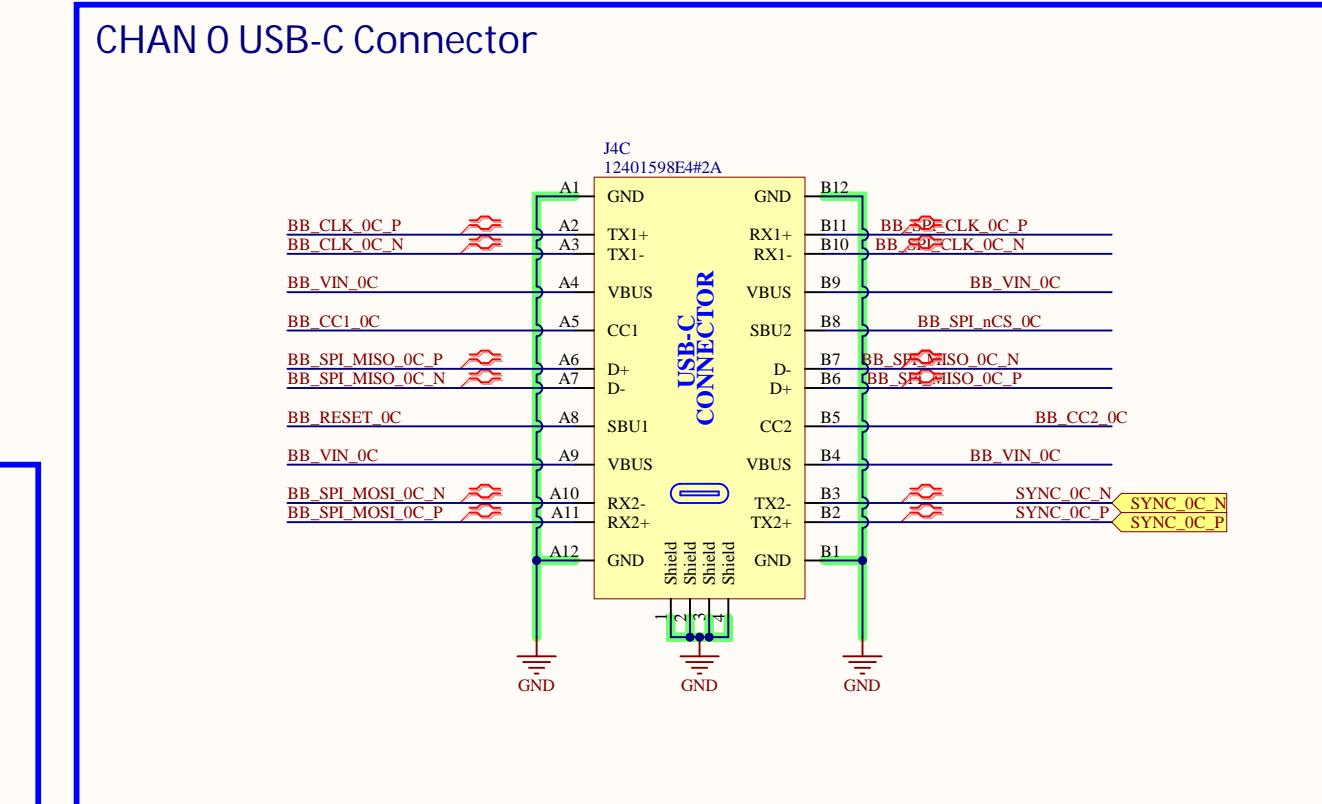
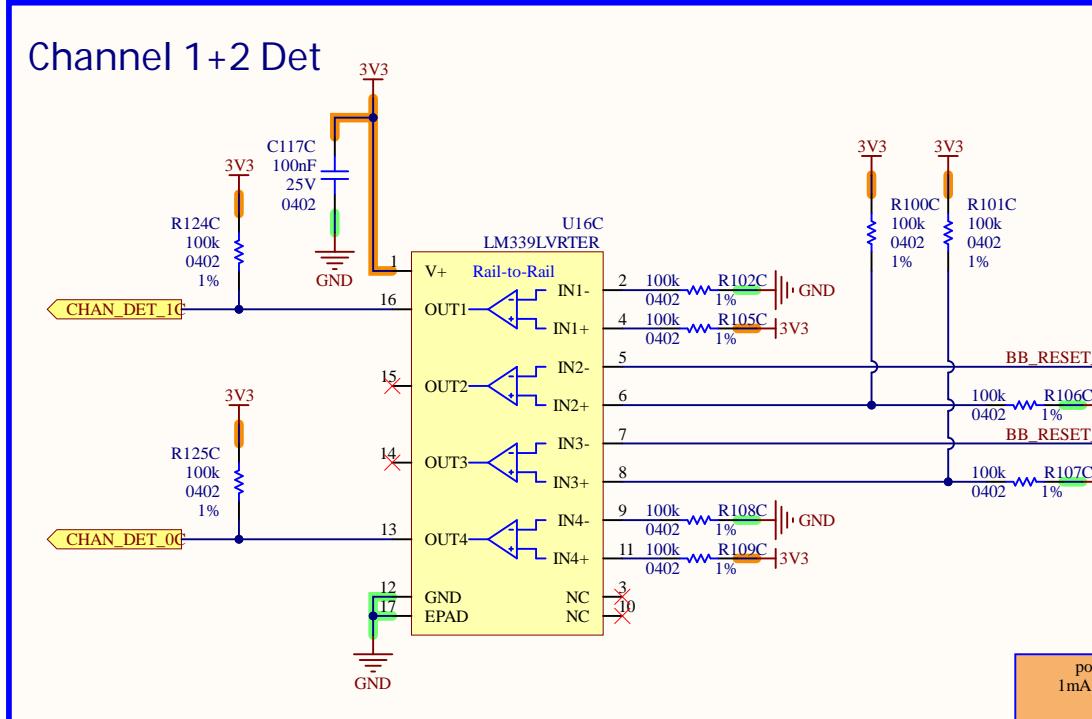
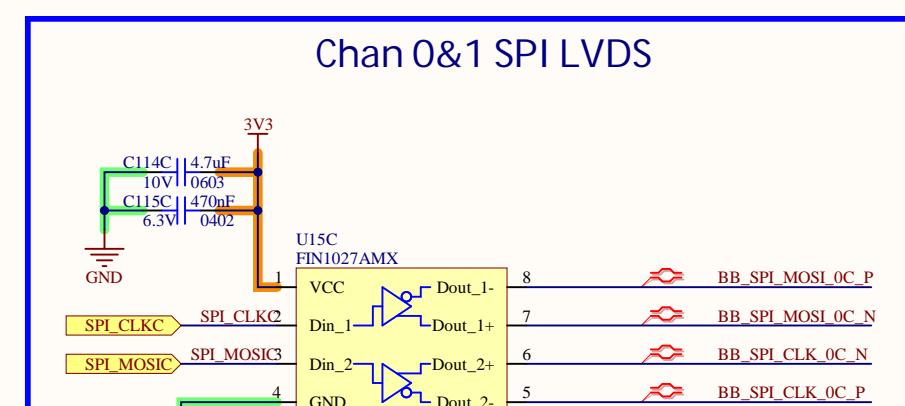
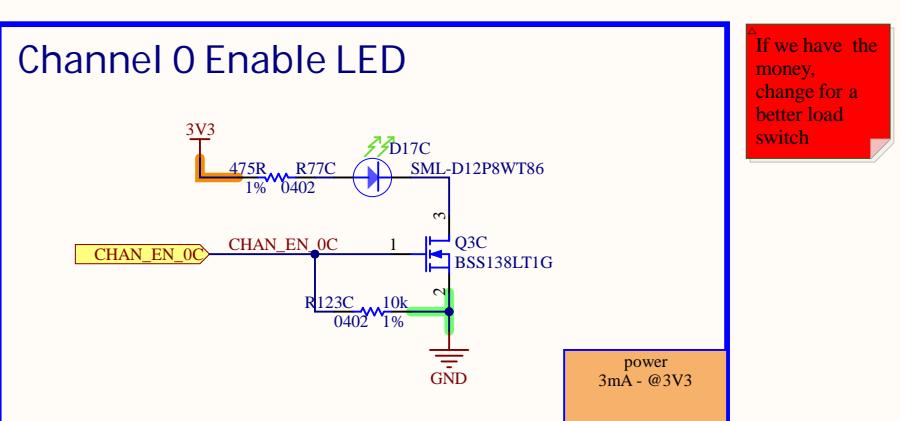
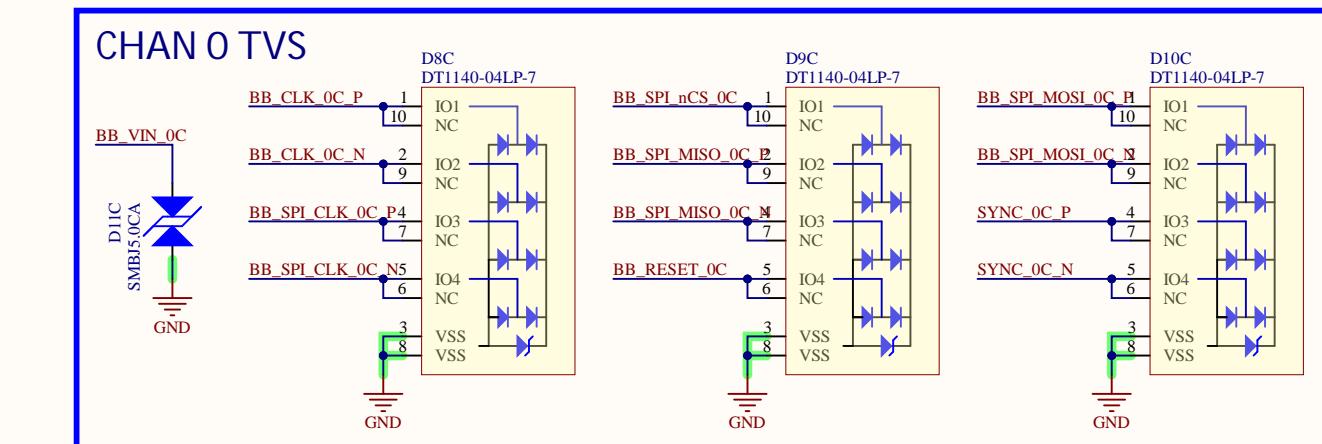
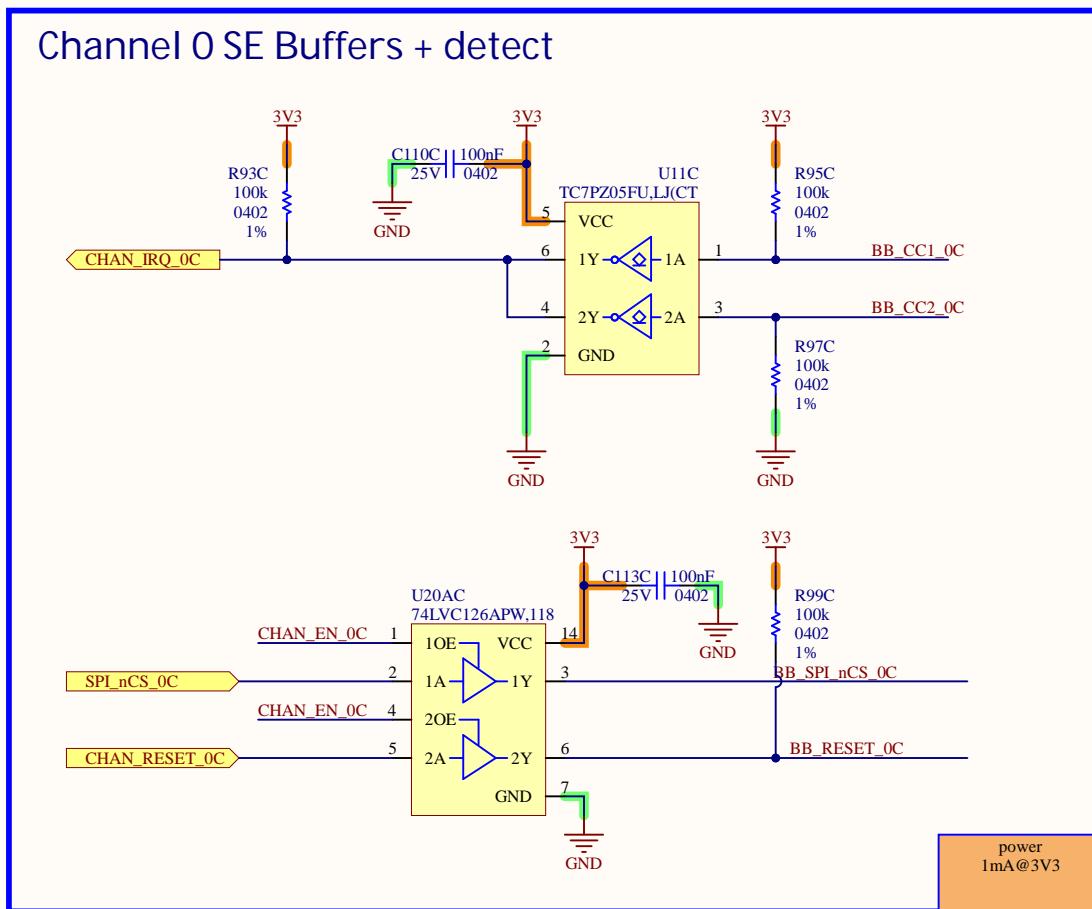
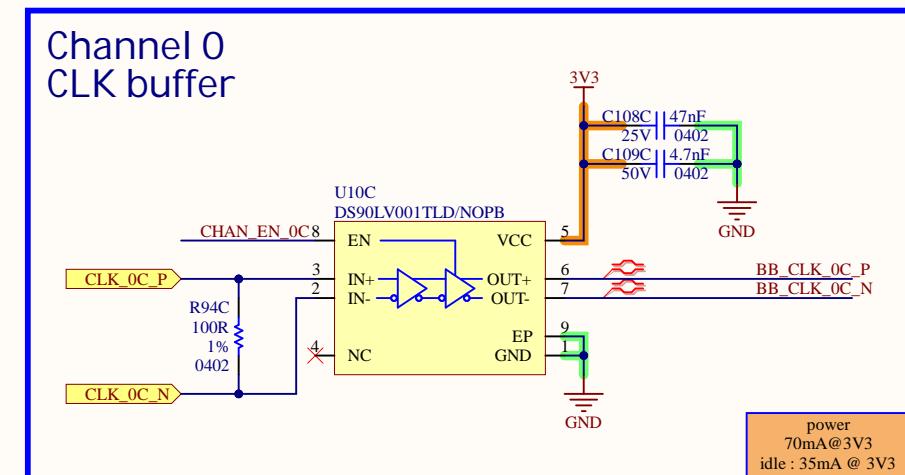
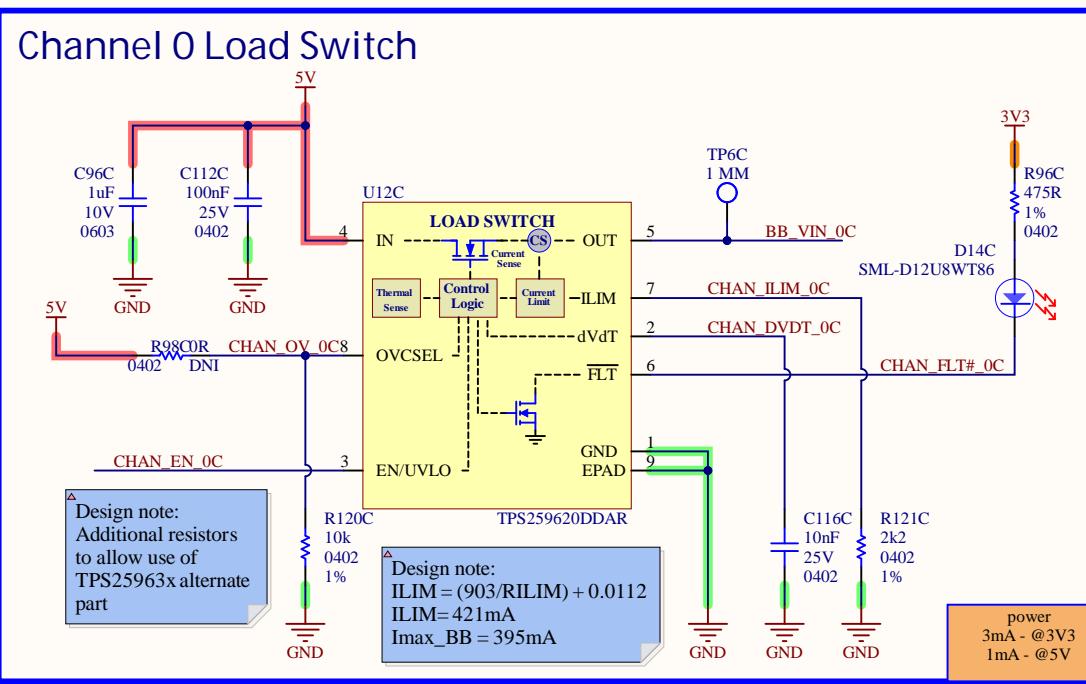


Design note:
Both comparators are used to detect the presence of a BB and verify if it is a BB. The comparator has the following stated:
Unplugged (floating): V = 3.3V
Plugged (Not BB : floating) V = 3.3V
Plugged (BB : 10Kohm pull-down) V = 0.3V

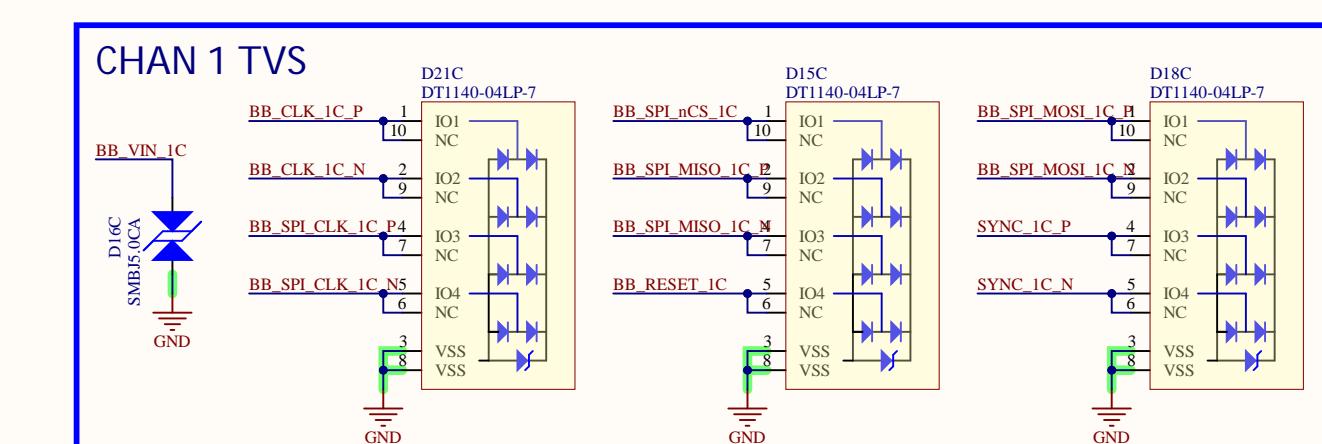
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Project Title		HiveBoard	
Global Project		PMC	
Size	11x17	Group	SwarmUS
Date	2020-06-01	Revision	1.000
Filename	HIVE_BOARD_CHANNEL_HWSchDoc	Designers	Philippe Arsenault Hubert Dubé Louis-Daniel Gaulin
Sheet		7.1 of 14	



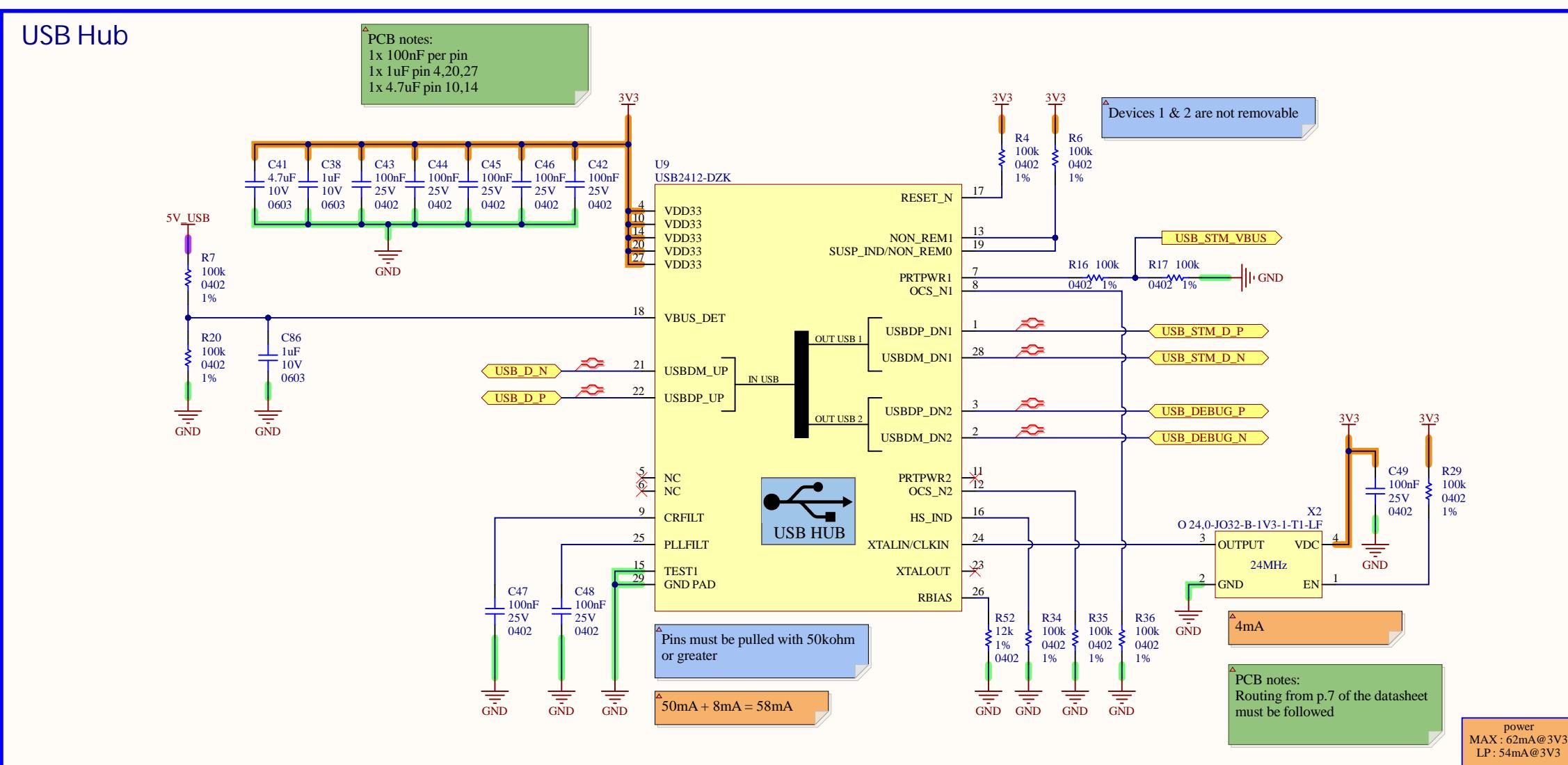
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Project Title		HiveBoard	
Global Project		PMC	
Size	11x17	Group	SwarmUS
Date	2020-06-01	Revision	1.000
Filename	HIVE_BOARD_CHANNEL_HWSchDoc	Designers	Philippe Arsenault Hubert Dubé Louis-Daniel Gaulin
			7.2 of 14



Design note:
Both comparators are used to detect the presence of a BB and verify if it is a BB. The comparator has the following stated:
Unplugged (floating): V = 3.3V
Plugged (Not BB : floating) V = 3.3V
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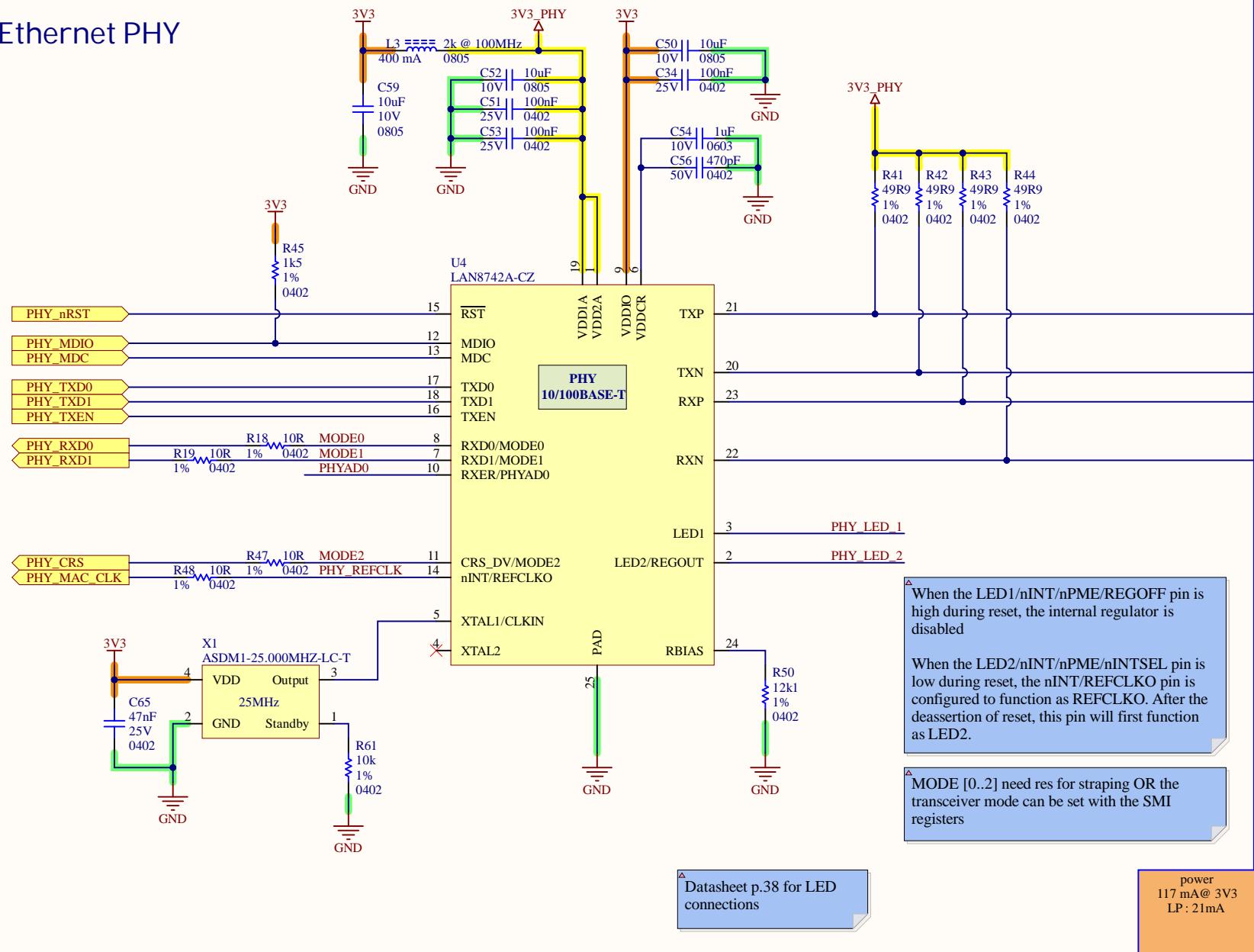


Sheet Name		CHANNEL HARDWARE & CONNECTOR	
Project Title		HiveBoard	
Global Project		PMC	
Size	11x17	Group	SwarmUS
Date	2020-06-01	Revision	1.000
Filename	HIVE_BOARD_CHANNEL_HWSchDoc	Designers	Philippe Arsenault Hubert Dubé Louis-Daniel Gaulin
Sheet		7.3 of 14	

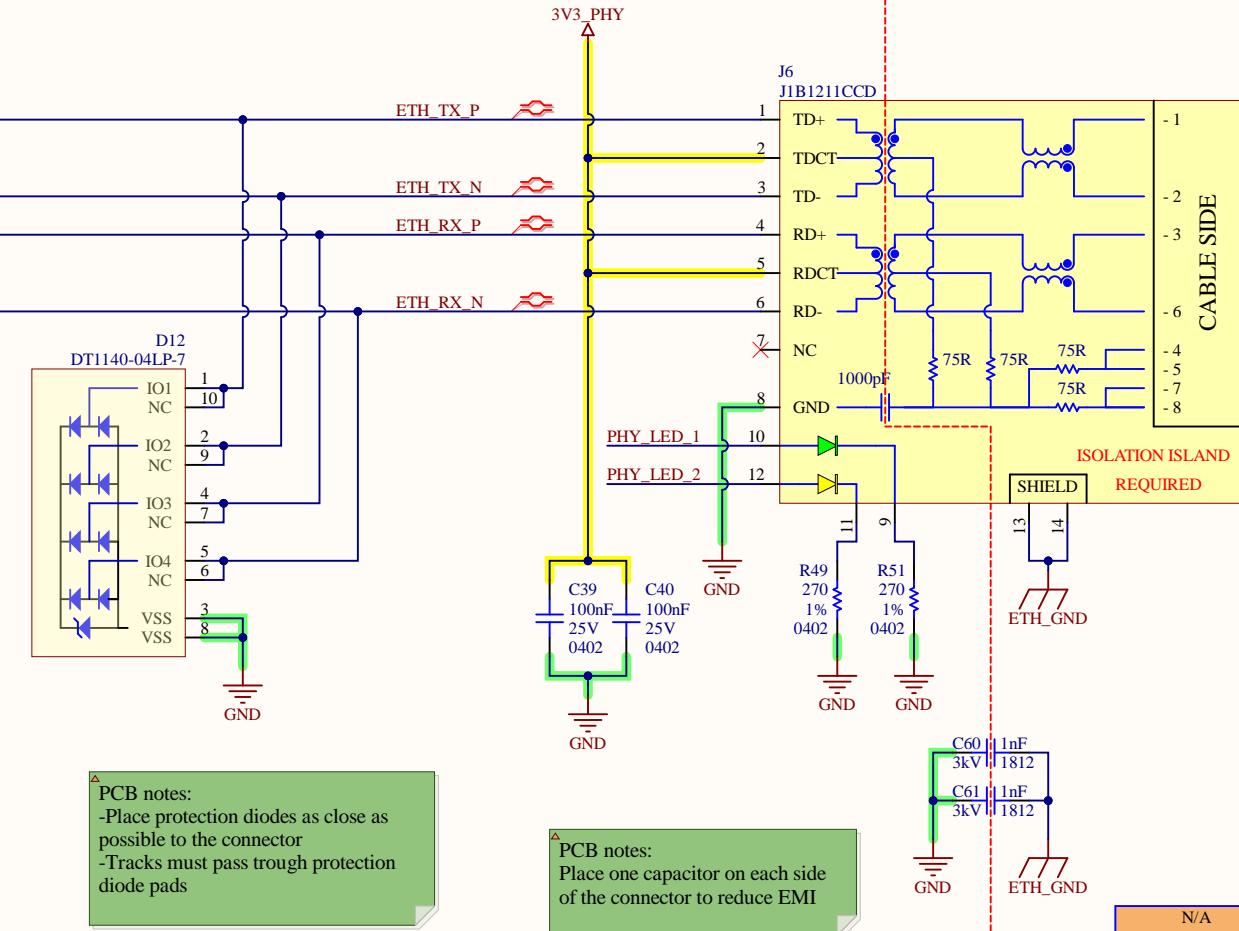


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Project Title		HiveBoard	
Global Project		PMC	
Size	Group	Revision	
11x17		SwarmUS	1.000
Date	2020-06-01	Sheet	8 of 14
Filename	HIVE_BOARD_USB.SchDoc		Designers
	Philippe Arsenault Hubert Dube Louis-Daniel Gaulin		

Ethernet PHY



RJ45 magnetics + protections



A

A

B

B

C

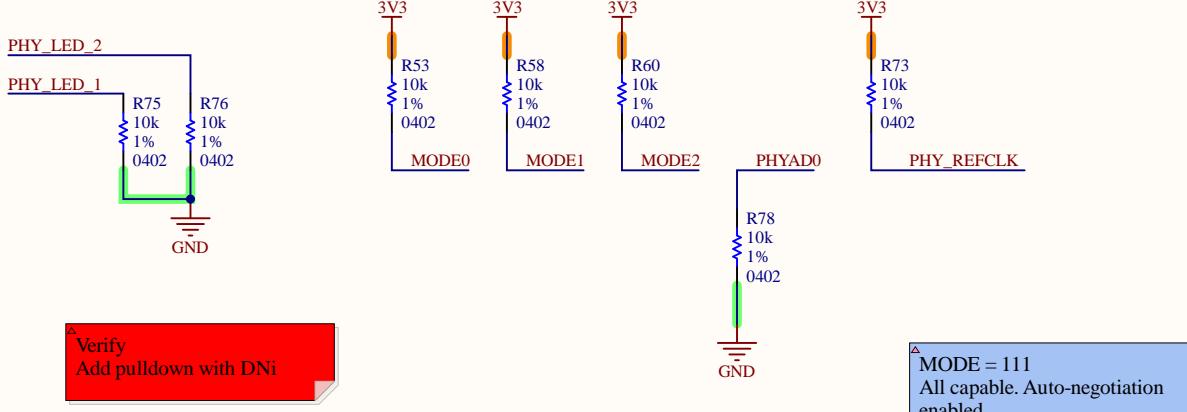
C

D

D

RMII CLOCK frequency is 50MHz.
13ième harmonique is 650MHz.
Wavelength is 46cm
IF MAC CLK is less than 11cm : not considered a transmission line

Straps



Sheet Name

ETHERNET

HiveBoard

PMC

Project Title

Global Project

Size

11x17

Group

SwarmUS

Revision

1.000

Date

2020-06-01

Sheet

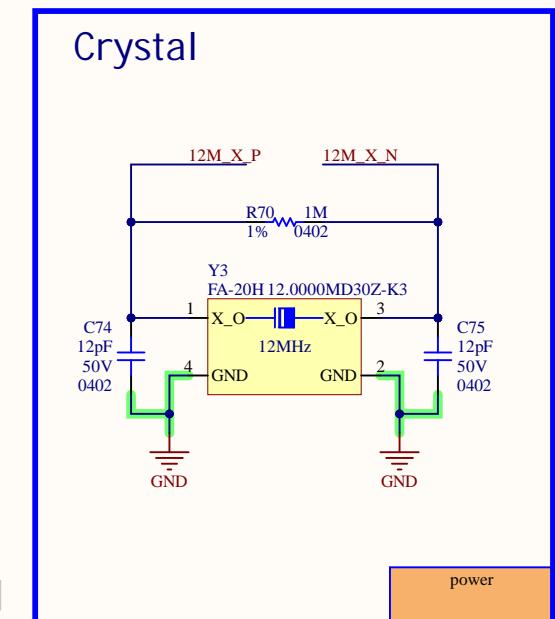
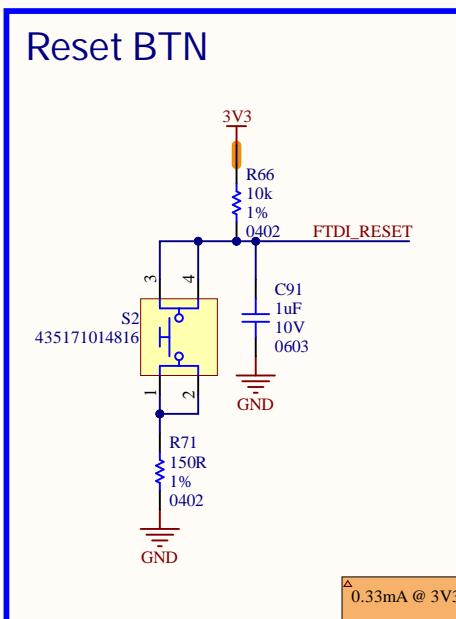
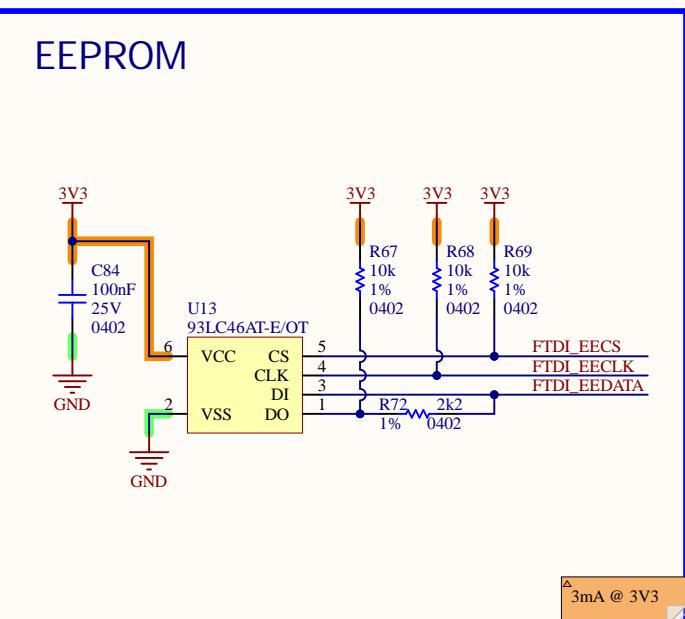
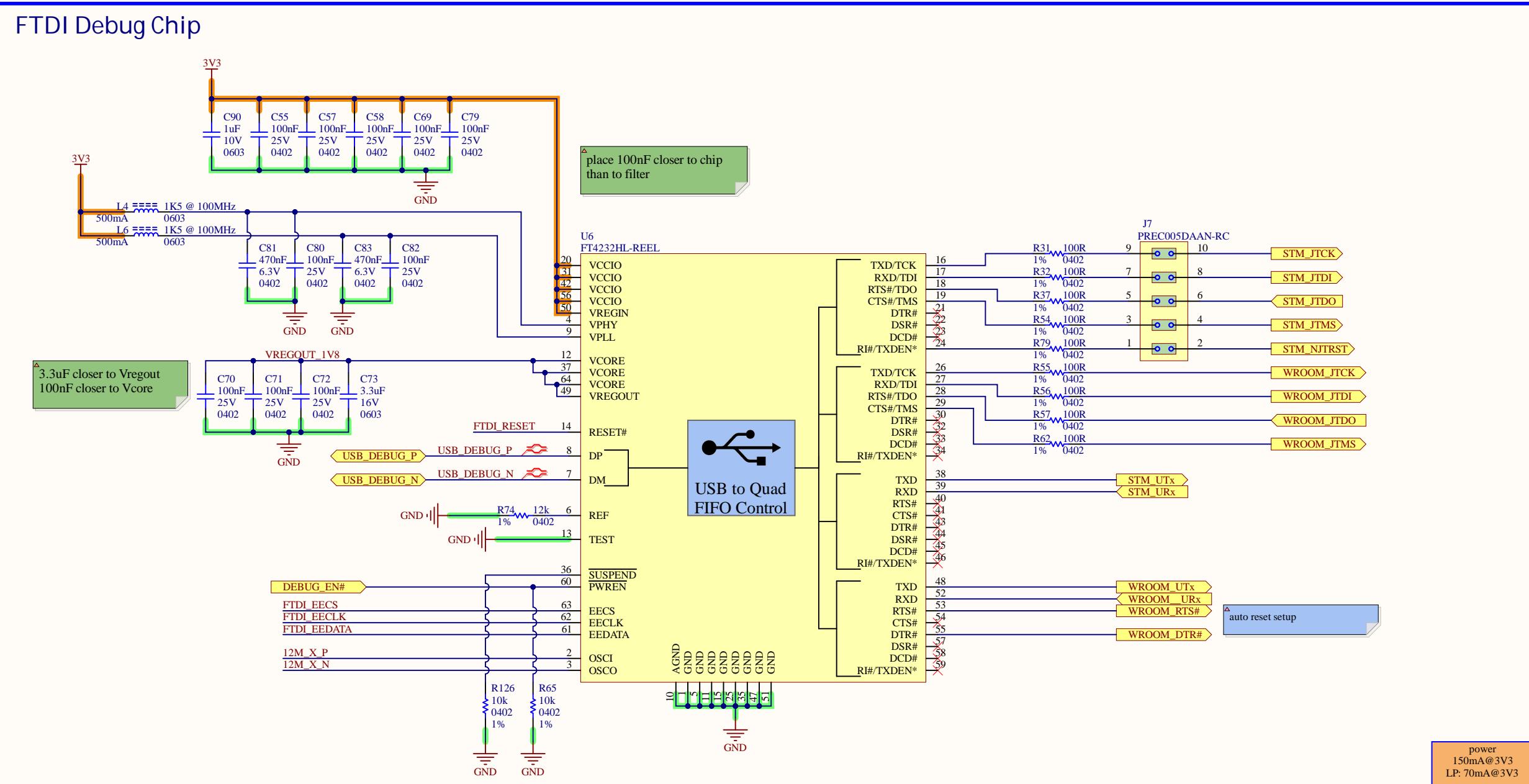
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Filename

HIVE_BOARD_ETHERNET.SchDoc

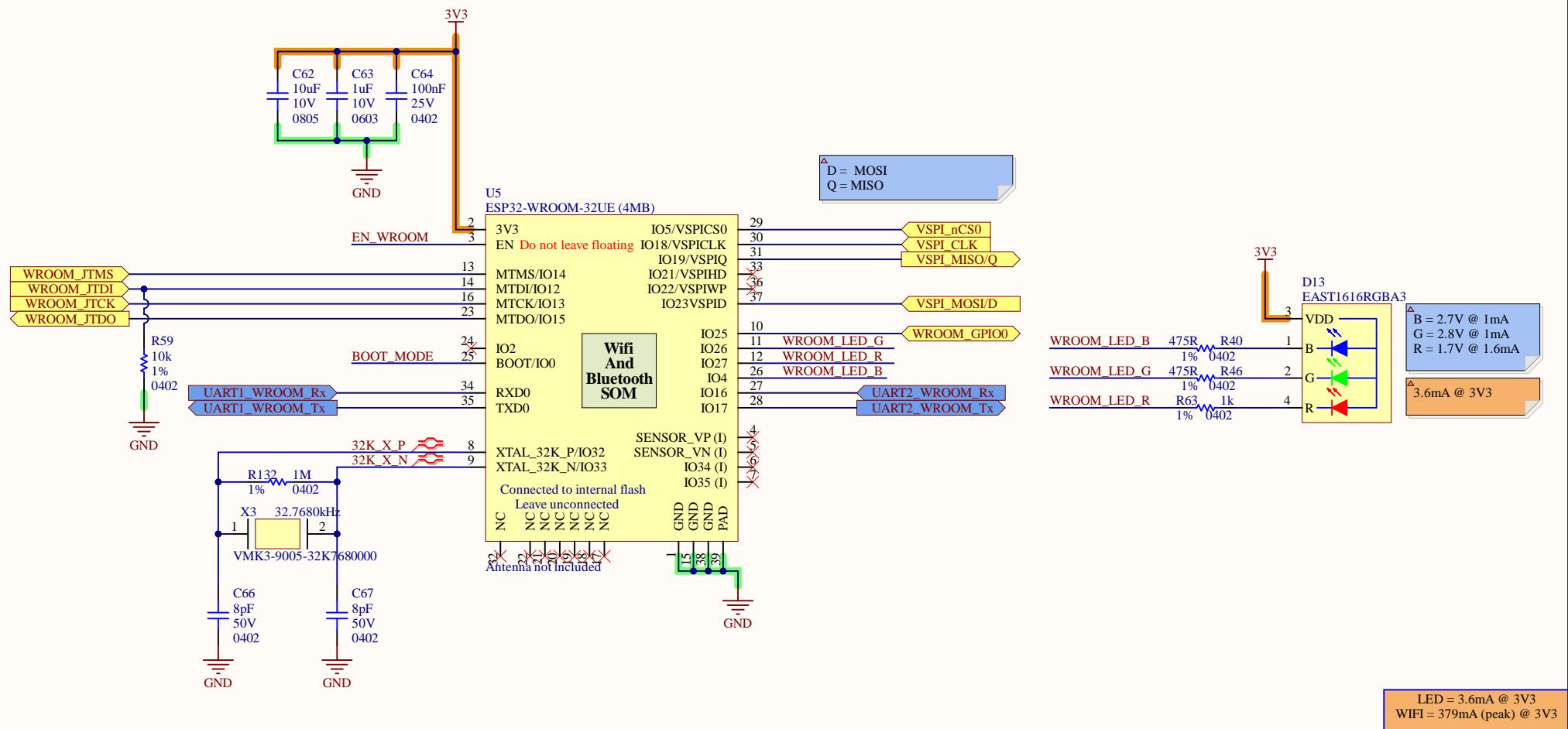
Designers

 Philippe Arsenault
 Hubert Dubé
 Louis-Daniel Gaulin

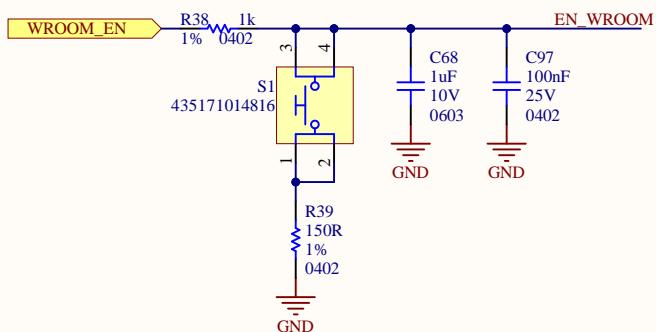


Sheet Name	DEBUG		
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Global Project	PMC		
Size	Group	SwarmUS	Revision
11x17			1.000
Date	2020-06-01	Sheet 10 of 14	
Filename	HIVE_BOARD_DEBUG.SchDoc	Designers	Philippe Arsenault Hubert Dube Louis-Daniel Gaulin

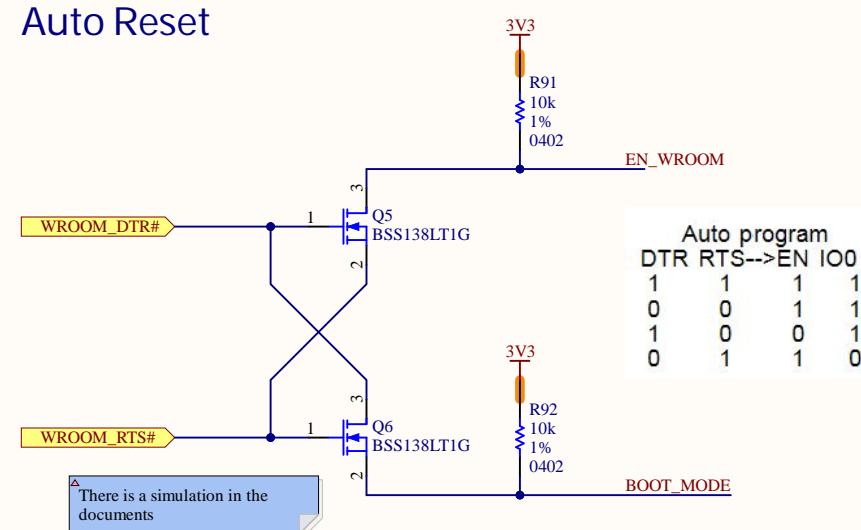
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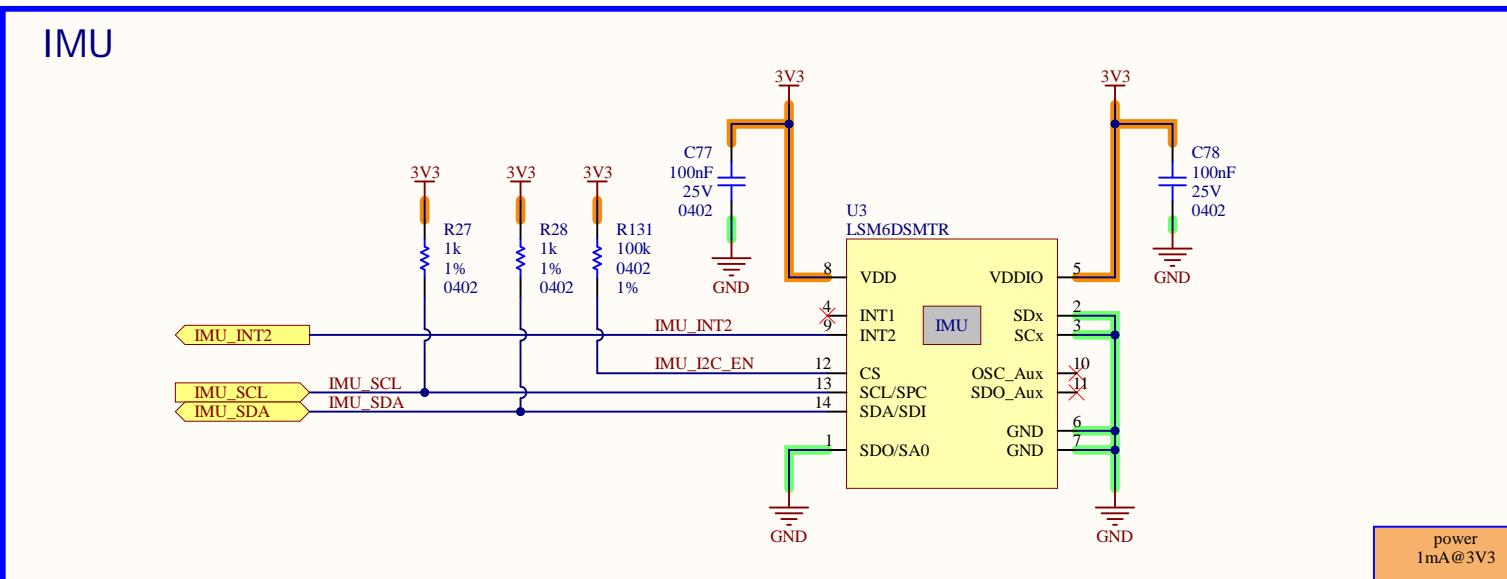
Reset BTN



Auto Reset



Sheet Name		WIRELESS	
Project Title		HiveBoard	
Global Project		PMC	
Size	Group	Revision	1.000
11x17	SwarmUS		
Date	2020-06-01	Sheet	11 of 14
Filename		Designers	
HIVE_BOARD_WIRELESS.SchDoc		Philippe Arsenault Hubert Dubé Louis-Daniel Gaulin	



Sheet Name	MISC	
Project Title	HiveBoard	
Global Project	PMC	
Size	11x17	Group
	SwarmUS	
Date	2020-06-01	Sheet
	12 of 14	
Filename	HIVE_BOARD_MISC.SchDoc	
Designers	Philippe Arsenault Hubert Dubé Louis-Daniel Gaulin	