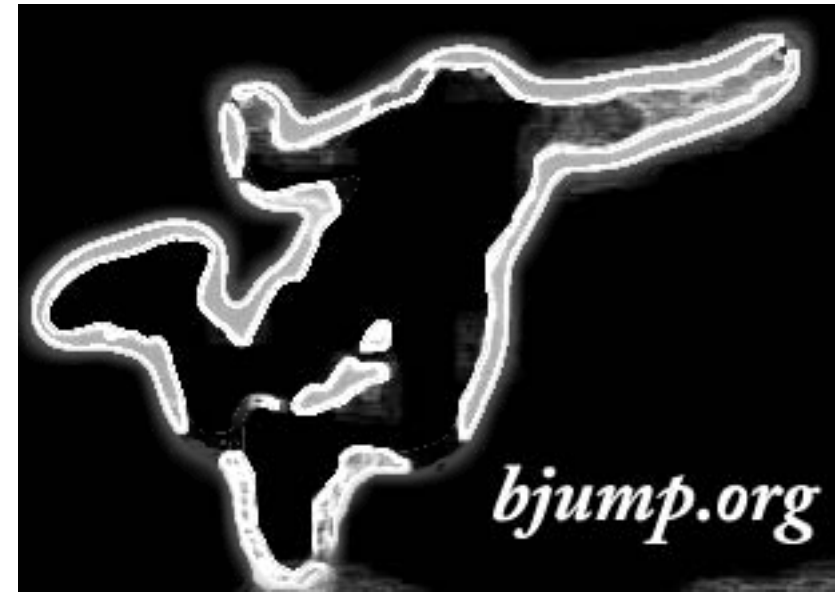


Double Trouble Board 1.00

Contact Info:

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Bespoke Silicon Group  
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mbtaylor@ucsd.edu

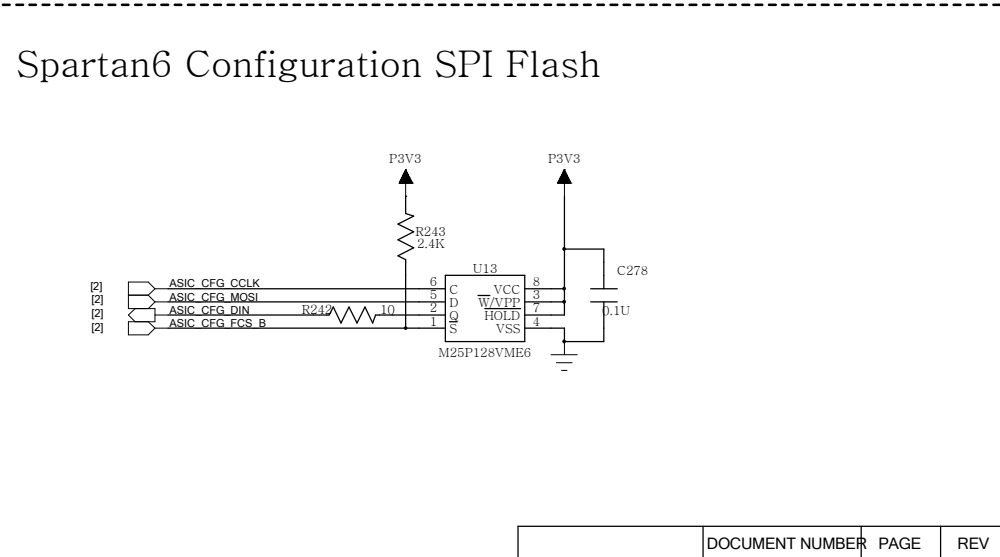
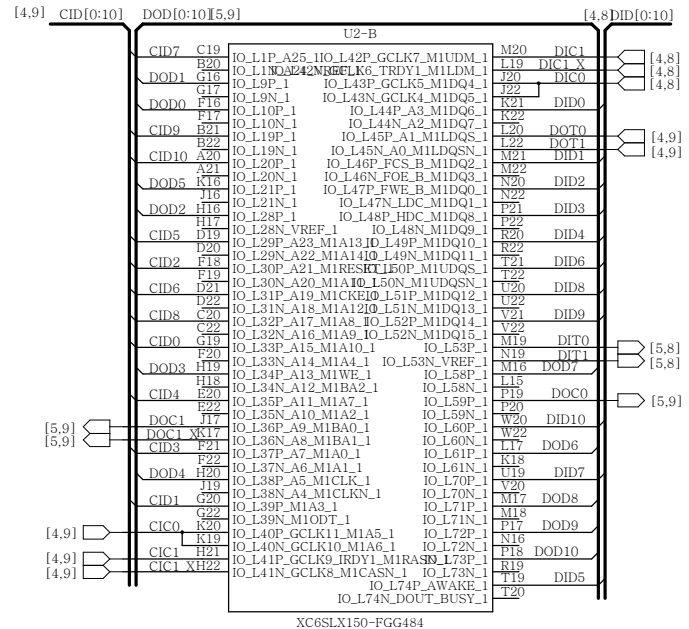
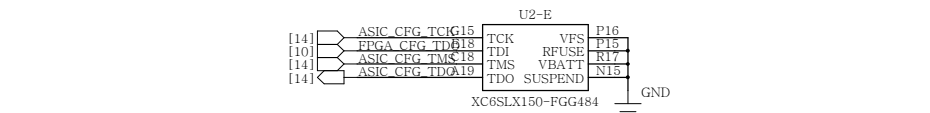
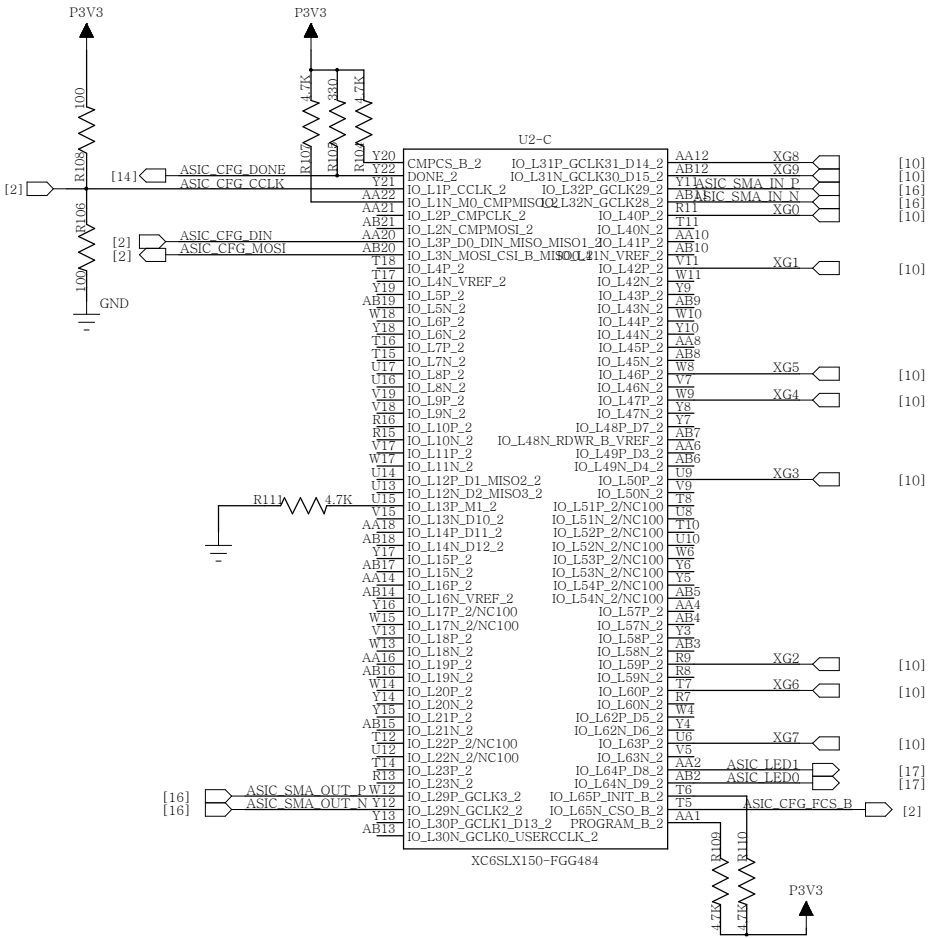


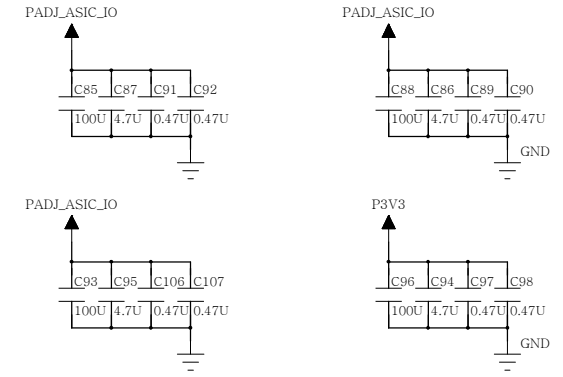
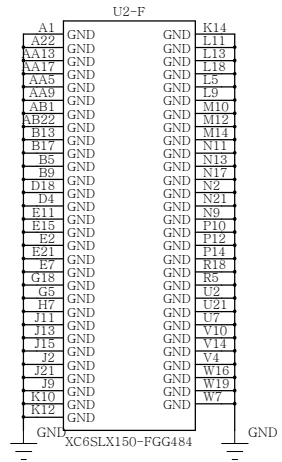
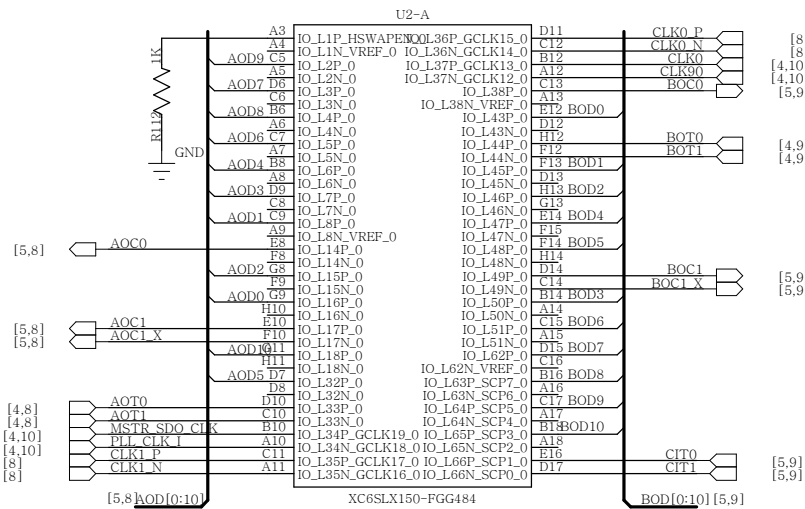
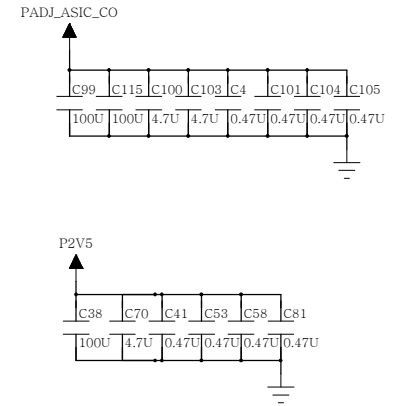
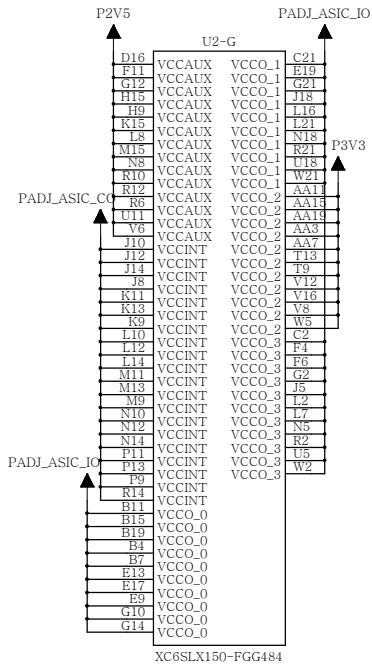
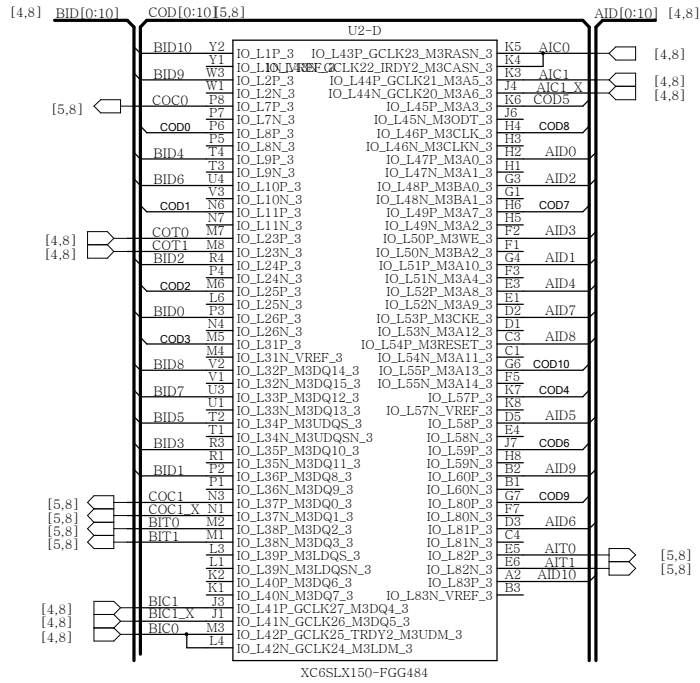
This design is free for general use; provide you accept that we provide no warranties of suitability for any purpose and are not liable for anything that happens.

Designed by Ningxiao Sun and Michael Taylor.  
Many thanks to Scott Davidson, Luis Vega, Bunnie Huang, Lu Zhang, Chris Batten and Shengye Wang for contributing to the design.

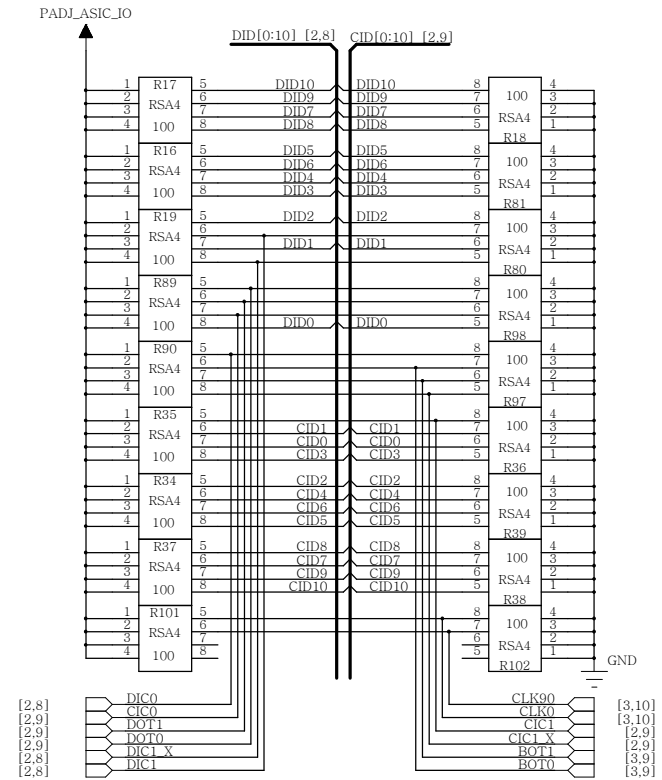
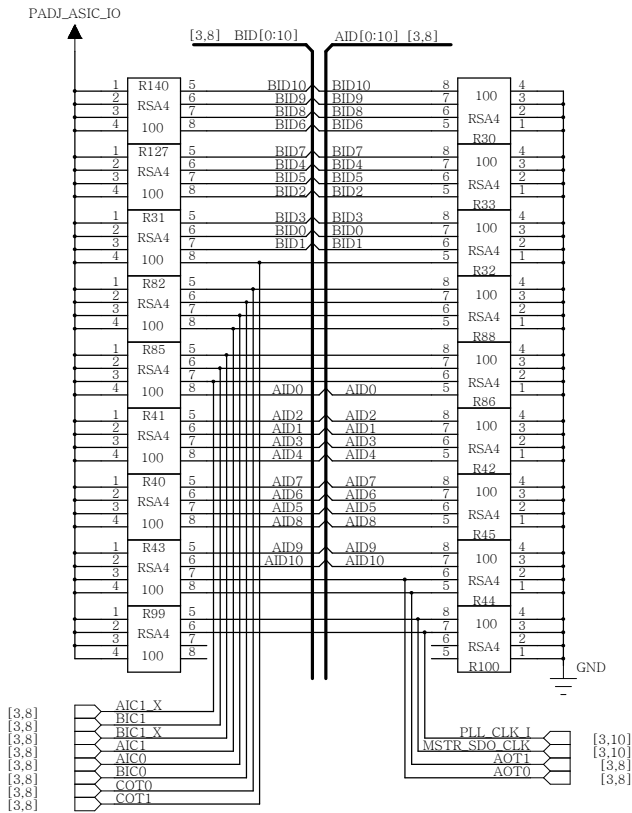
This work funded by US National Science Foundation Grant #1059333.

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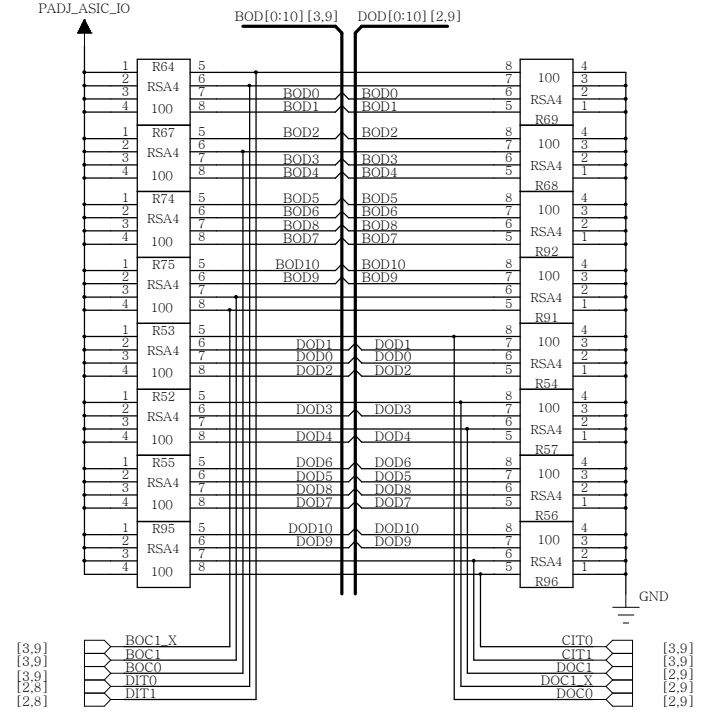
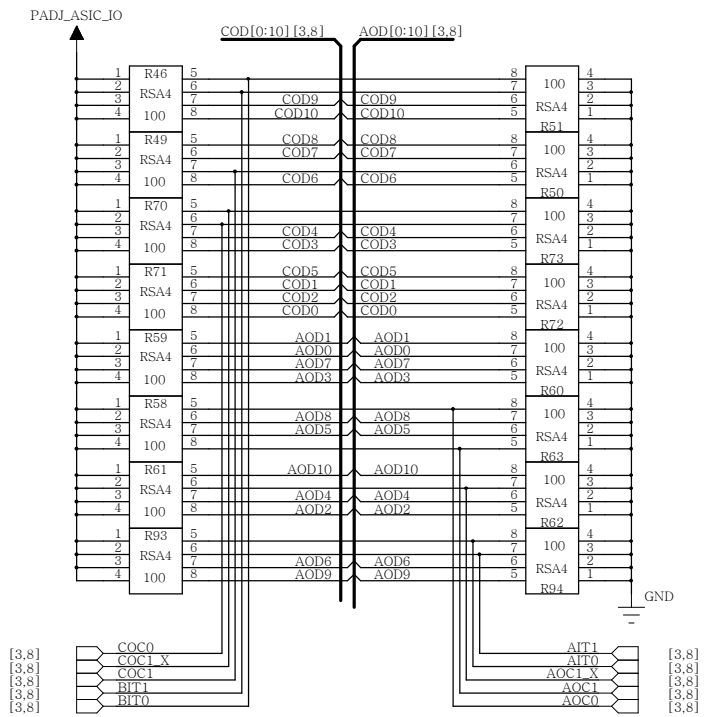




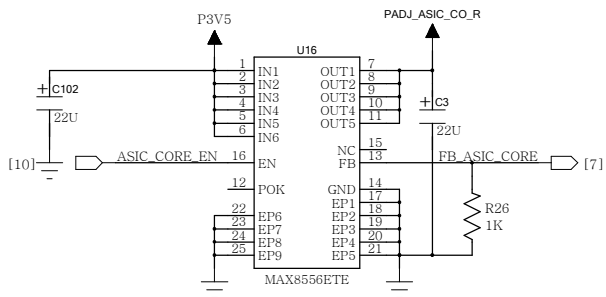
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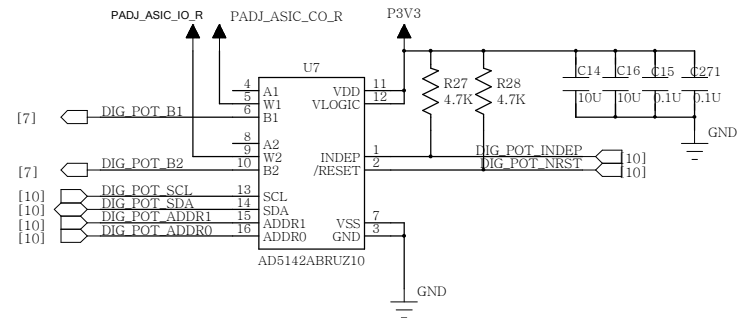
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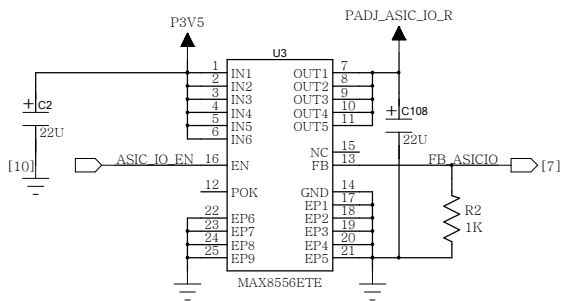
### ASIC\_CORE



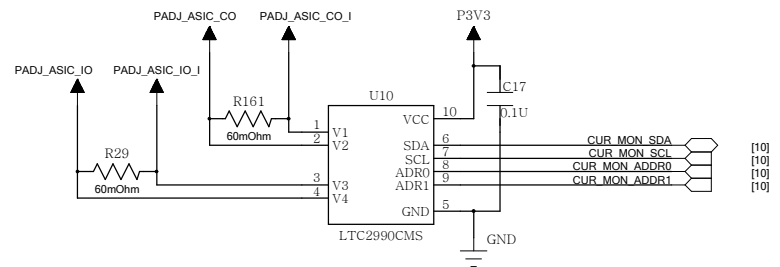
### Digital Potentiometer



### ASIC\_IO

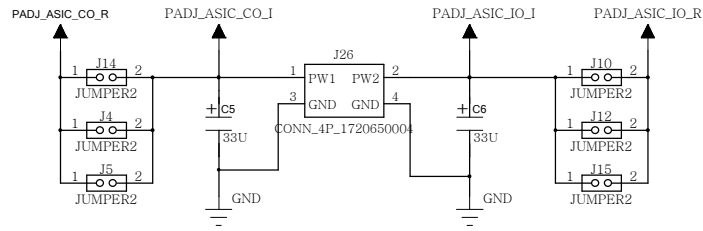


### Current Monitor



D

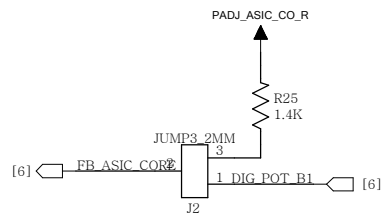
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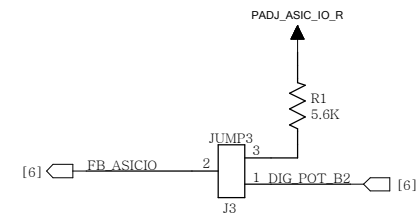
C

C

### Default 1.2V



### Default 3.3V

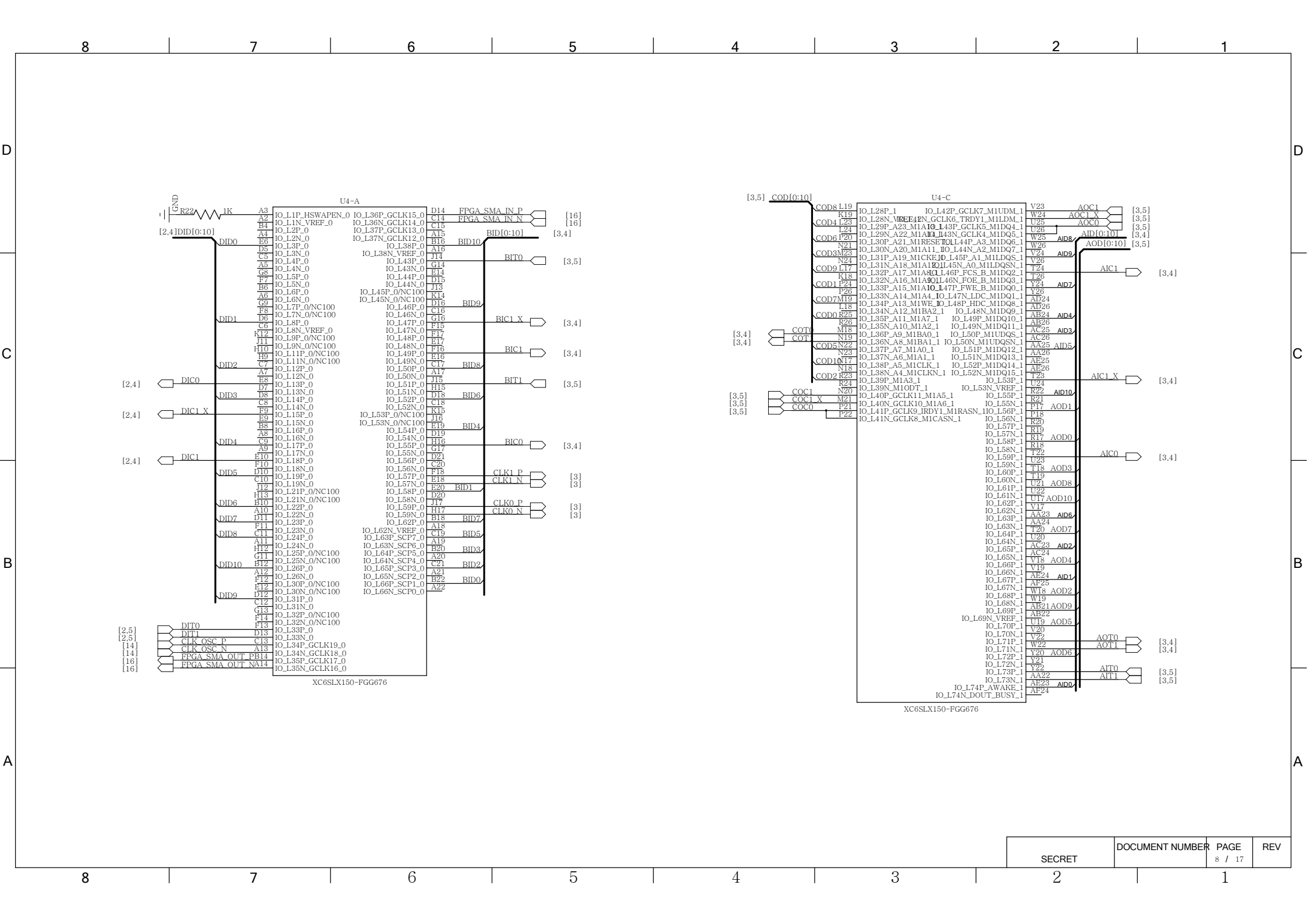


B

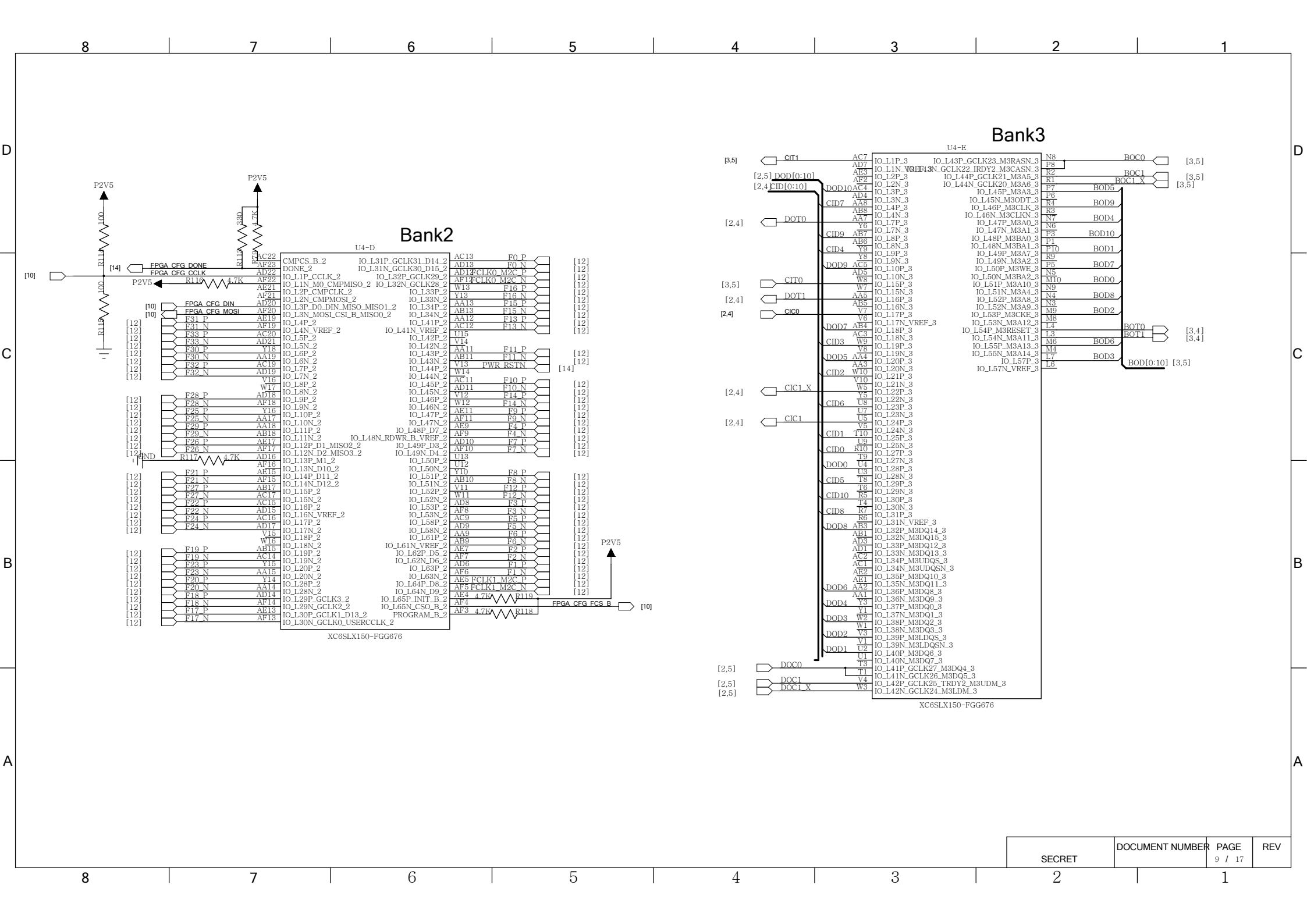
B

A

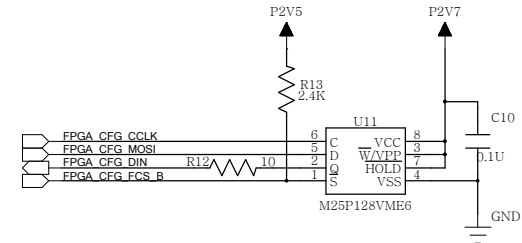
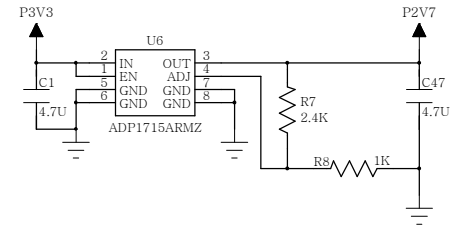
A



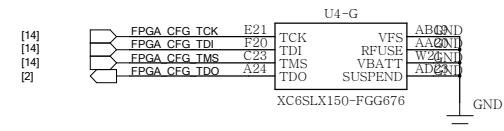




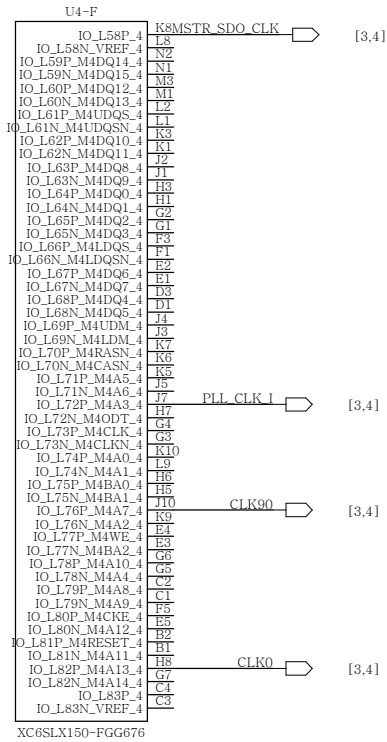
SPI FLASH



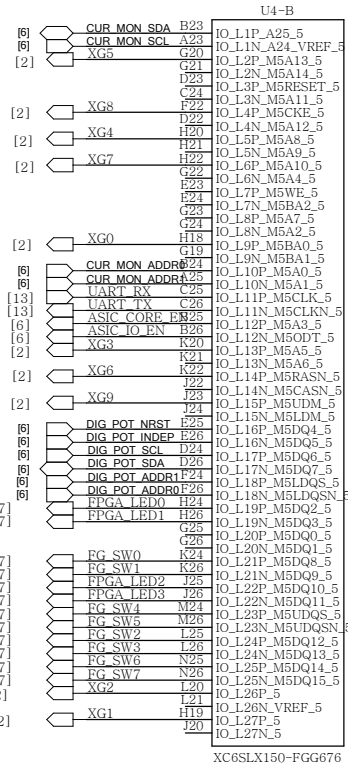
JTAG

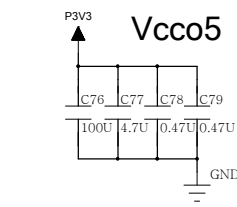
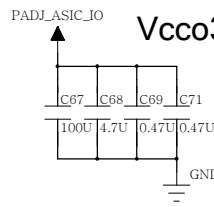
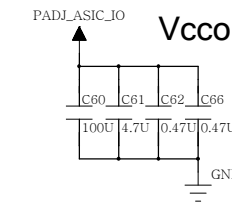
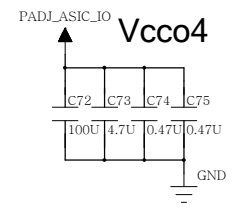
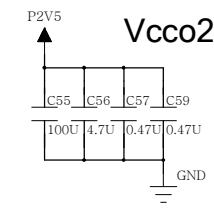
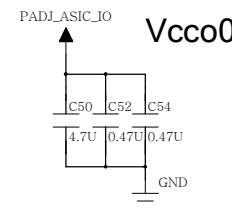
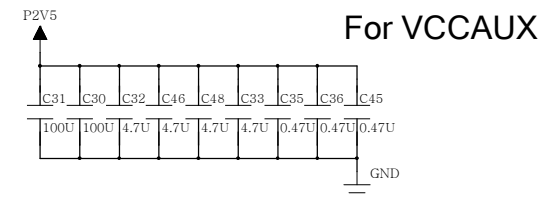
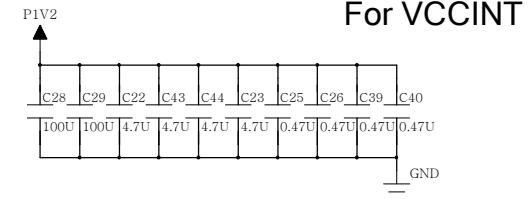
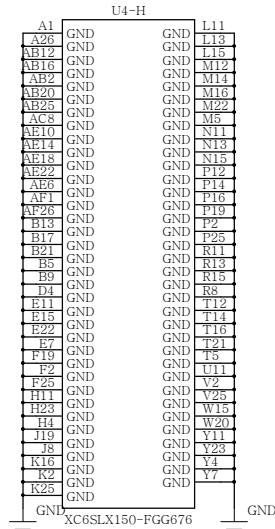
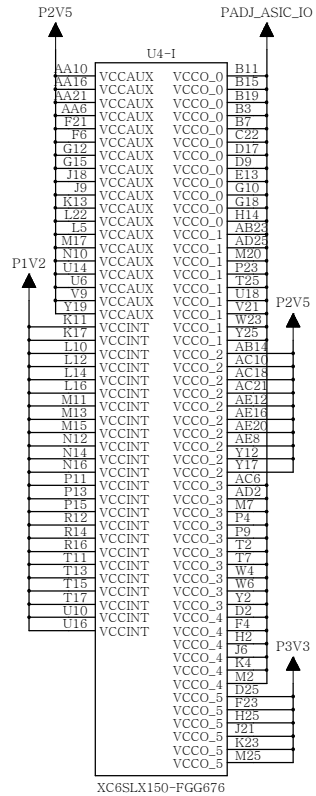


Bank4



Bank5





J1-D

HB00_N_CC	K26
HB00_P_CC	K25
HB01_N	J24
HB01_P	J24
HB02_N	E23
HB02_P	E22
HB03_N	E21
HB03_P	E20
HB04_N	E19
HB04_P	E18
HB05_N	E17
HB05_P	E16
HB06_N_CC	K28
HB06_P_CC	K28
HB07_N	J27
HB07_P	J27
HB08_N	E28
HB08_P	E28
HB09_N	E27
HB09_P	E27
HB10_N	K31
HB10_P	K31
HB11_N	J30
HB11_P	J30
HB12_N	E31
HB12_P	E31
HB13_N	E30
HB13_P	E30
HB14_N	K33
HB14_P	K33
HB15_N	J34
HB15_P	J34
HB16_N	E35
HB16_P	E35
HB17_N_CC	K38
HB17_P_CC	K37
HB18_N	J36
HB18_P	J36
HB19_N	E34
HB19_P	E34
HB20_N	E33
HB20_P	E33
HB21_N	E37
HB21_P	E37
HB22_N	E36
HB22_P	E36

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J1-F

GA0	C34
D35	D35
GA1	D1
PG_C2M	F1
PG_M2C	F1
PRNST_M2C_L	H2
RES0	B40
RES1	B1
SCL	C30
SDA	C31
TCK	D29
TDI	D30
TDO	D33
TMS	D34
TRST_L	E39
VADI	G39
VADI	F40
VADI	H40
VADI	I39
VIO_B_M2C	K40
VIO_B_M2C	H1
VREF_A_M2C	K1
VREF_B_M2C	K1

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J1-C

HA00_N_CC	F5
HA00_P_CC	F4
HA01_N_CC	E3
HA01_P_CC	E2
HA02_N	K8
HA02_P	K7
HA03_N	J6
HA03_P	J7
HA04_N	F8
HA04_P	F7
HA05_N	E7
HA05_P	E6
HA06_N	K10
HA06_P	K10
HA07_N	J9
HA07_P	J9
HA08_N	F11
HA08_P	F10
HA09_N	E9
HA09_P	E9
HA10_N	K14
HA10_P	K13
HA11_N	J13
HA11_P	J12
HA12_N	F13
HA12_P	E13
HA13_N	E12
HA13_P	E12
HA14_N	J16
HA14_P	J15
HA15_N	F16
HA15_P	E16
HA16_N	E15
HA16_P	E15
HA17_N_CC	K17
HA17_P_CC	K16
HA18_N	J19
HA18_P	J18
HA19_N	F20
HA19_P	F19
HA20_N	E19
HA20_P	E19
HA21_N	K20
HA21_P	K19
HA22_N	J22
HA22_P	J21
HA23_N	K23
HA23_P	K22

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J1-B

CLK0_C2M_N	G3	FCLK1 M2C N	[9]
CLK0_C2M_P	G2	FCLK1 M2C P	[9]
CLK0_M2C_N	H5	FCLK0 M2C N	[9]
CLK0_M2C_P	H4	FCLK0 M2C P	[9]
CLK1_C2M_N	J3		
CLK1_C2M_P	J2		
CLK1_M2C_N	K5		
CLK1_M2C_P	K4		

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J1-E

LA00_N_CC	G7	F0 P	[9]
LA00_P_CC	G6	F0 N	[9]
LA01_N_CC	D9	F1 P	[9]
LA01_P_CC	D8	F1 N	[9]
LA02_N	H8	F2 P	[9]
LA02_P	H7	F2 N	[9]
LA03_N	G10	F3 P	[9]
LA03_P	G9	F3 N	[9]
LA04_N	H11	F4 P	[9]
LA04_P	H10	F4 N	[9]
LA05_N	D12	F5 P	[9]
LA05_P	D11	F5 N	[9]
LA06_N	C11	F6 P	[9]
LA06_P	C10	F6 N	[9]
LA07_N	H14	F7 P	[9]
LA07_P	H13	F7 N	[9]
LA08_N	G13	F8 P	[9]
LA08_P	G12	F8 N	[9]
LA09_N	D14	F9 N	[9]
LA09_P	C15	F10 P	[9]
LA10_N	C14	F10 N	[9]
LA11_N	H17	F11 P	[9]
LA11_P	H16	F11 N	[9]
LA12_N	G16	F12 P	[9]
LA12_P	G15	F12 N	[9]
LA13_N	D18	F13 P	[9]
LA13_P	D17	F13 N	[9]
LA14_N	C19	F14 P	[9]
LA14_P	C18	F14 N	[9]
LA15_N	H20	F15 P	[9]
LA15_P	H19	F15 N	[9]
LA16_N	G19	F16 P	[9]
LA16_P	G18	F16 N	[9]
LA17_N_CC	D21	F17 P	[9]
LA17_P_CC	D20	F17 N	[9]
LA18_N_CC	C23	F18 P	[9]
LA18_P_CC	C22	F18 N	[9]
LA19_N	H23	F19 P	[9]
LA19_P	H22	F19 N	[9]
LA20_N	G22	F20 P	[9]
LA20_P	G21	F20 N	[9]
LA21_N	H26	F21 P	[9]
LA21_P	H25	F21 N	[9]
LA22_N	G25	F22 P	[9]
LA22_P	G24	F22 N	[9]
LA23_N	D24	F23 P	[9]
LA23_P	D23	F23 N	[9]
LA24_N	H29	F24 P	[9]
LA24_P	H28	F24 N	[9]
LA25_N	G28	F25 P	[9]
LA25_P	G27	F25 N	[9]
LA26_N	D27	F26 P	[9]
LA26_P	D26	F26 N	[9]
LA27_N	C27	F27 P	[9]
LA27_P	C26	F27 N	[9]
LA28_N	H32	F28 P	[9]
LA28_P	H31	F28 N	[9]
LA29_N	G31	F29 P	[9]
LA29_P	G30	F29 N	[9]
LA30_N	H35	F30 P	[9]
LA30_P	H34	F30 N	[9]
LA31_N	G34	F31 P	[9]
LA31_P	G33	F31 N	[9]
LA32_P	H38	F32 P	[9]
LA32_N	H37	F32 N	[9]
LA33_P	G37	F33 P	[9]
LA33_N	G36	F33 N	[9]

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J1-H

A1	GND	GND	G20
C1	GND	GND	J20
E1	GND	GND	A21
G1	GND	GND	C21
I1	GND	GND	F21
K3	GND	GND	H21
D2	GND	GND	K21
F2	GND	GND	B22
K2	GND	GND	D22
B3	GND	GND	B23
D3	GND	GND	E23
F3	GND	GND	G23
H3	GND	GND	J23
K3	GND	GND	A24
C4	GND	GND	C24
E4	GND	GND	F24
G4	GND	GND	H24
I4	GND	GND	A25
K4	GND	GND	C25
D5	GND	GND	D25
E5	GND	GND	B26
G5	GND	GND	E26
I5	GND	GND	G26
K5	GND	GND	J26
D6	GND	GND	B27
F6	GND	GND	F27
H6	GND	GND	H27
K6	GND	GND	K27
B7	GND	GND	A28
D7	GND	GND	C28
F7	GND	GND	D28
H7	GND	GND	A29
I7	GND	GND	C29
K7	GND	GND	E29
D8	GND	GND	G29
F8	GND	GND	B30
H8	GND	GND	F30
I8	GND	GND	H30
K8	GND	GND	K30
D9	GND	GND	B31
F9	GND	GND	A32
H9	GND	GND	C32
I9	GND	GND	E32
K9	GND	GND	G32
D10	GND	GND	J32
F10	GND	GND	A33
H10	GND	GND	C33
I10	GND	GND	F33
K10	GND	GND	H33
D11	GND	GND	K33
F11	GND	GND	B34
H11	GND	GND	C34
I11	GND	GND	E34
K11	GND	GND	G34
D12	GND	GND	J34
F12	GND	GND	A36
H12	GND	GND	C36
I12	GND	GND	F36
K12	GND	GND	H36
D13	GND	GND	B37
F13	GND	GND	C37
H13	GND	GND	E37
I13	GND	GND	G37
K13	GND	GND	J37
D14	GND	GND	A38
F14	GND	GND	C38
H14	GND	GND	F38
I14	GND	GND	H38
K14	GND	GND	K38
D15	GND	GND	B39
F15	GND	GND	A40
H15	GND	GND	C40
I15	GND	GND	E40
K15	GND	GND	G40
D16	GND	GND	J40
F16	GND	GND	
H16	GND	GND	
I16	GND	GND	
K16	GND	GND	
D17	GND	GND	
F17	GND	GND	
H17	GND	GND	
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K18	GND	GND	
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F19	GND	GND	
H19	GND	GND	
I19	GND	GND	
K19	GND	GND	
D20	GND	GND	
F20	GND	GND	
H20	GND	GND	
I20	GND	GND	
K20	GND	GND	

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D

C

B

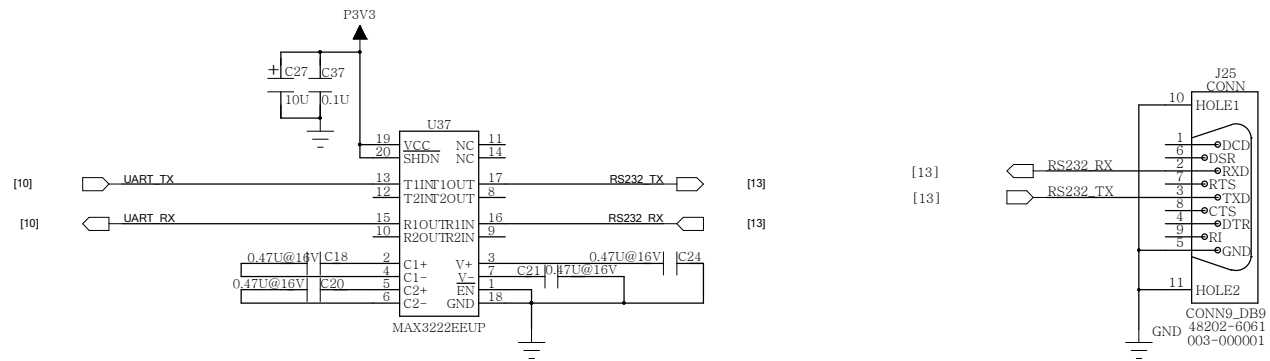
A

D

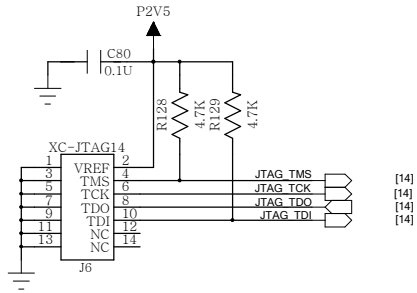
C

B

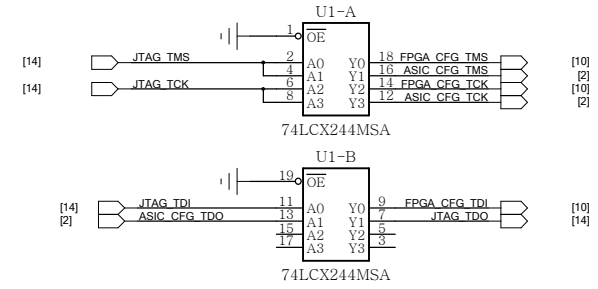
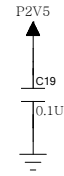
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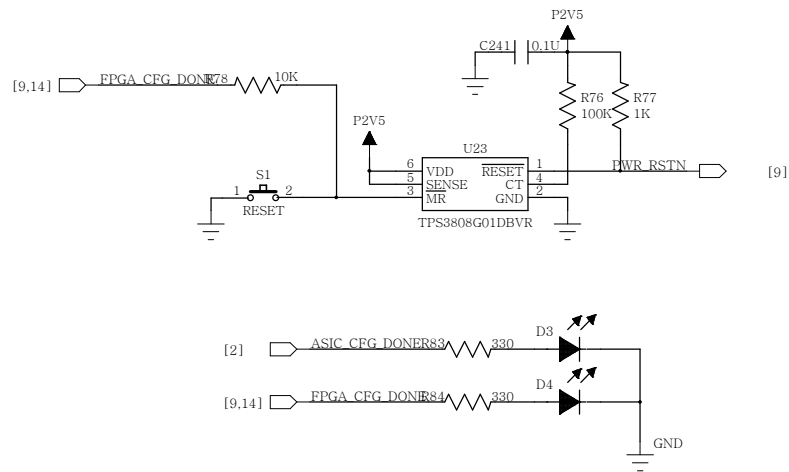
### JTAG Connector



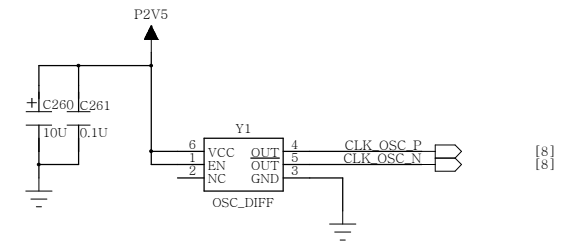
### Isolation Chip



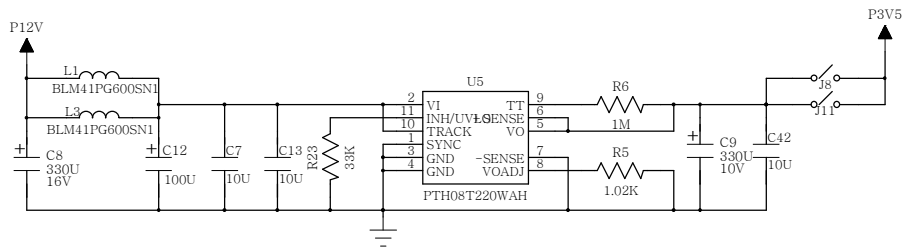
### RESET/LED



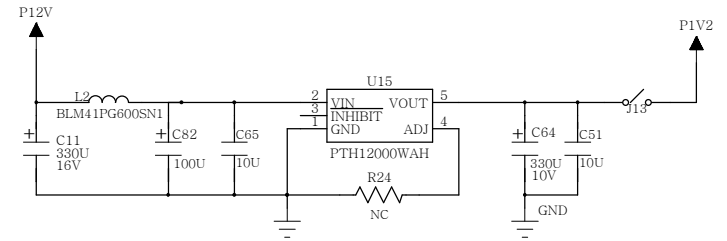
### Oscillator



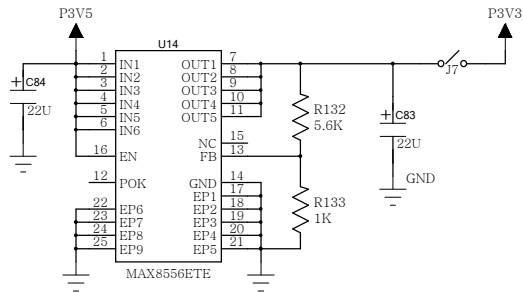
P3V5 16A



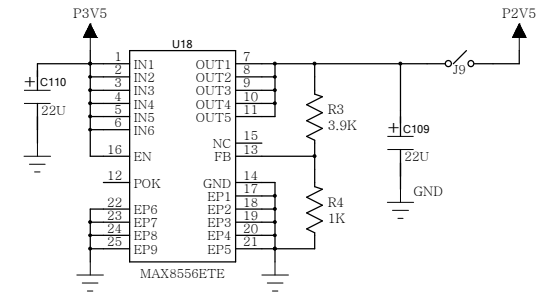
P1V2 6A(FPGA CORE)



P3V3 4A



P2V5 4A



D

D

C

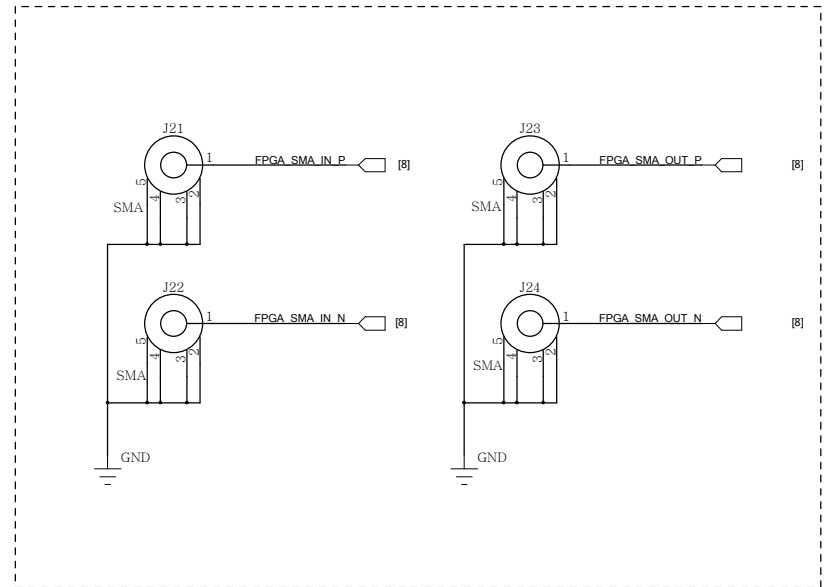
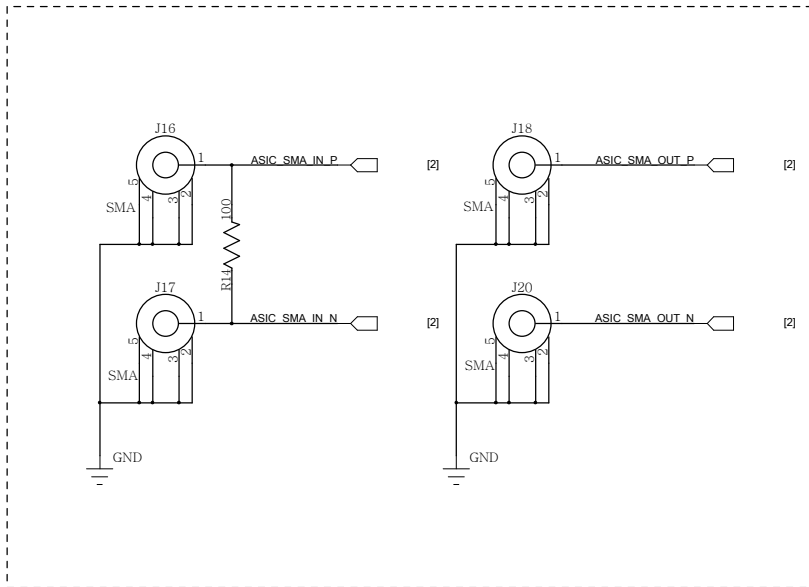
C

B

B

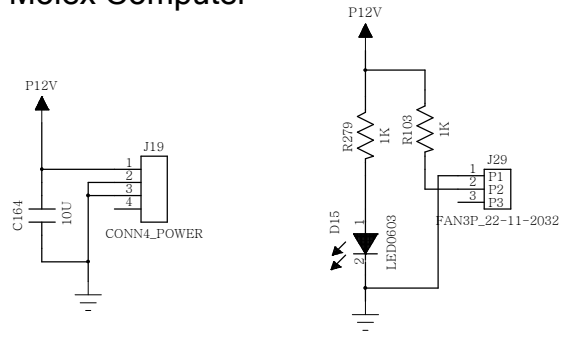
A

A





### Molex Computer



### LED

