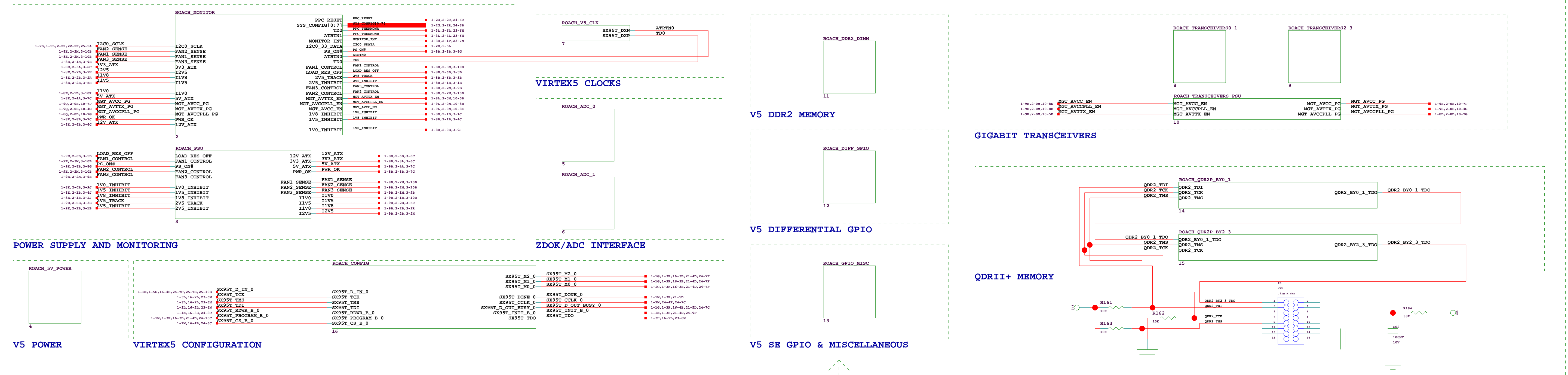
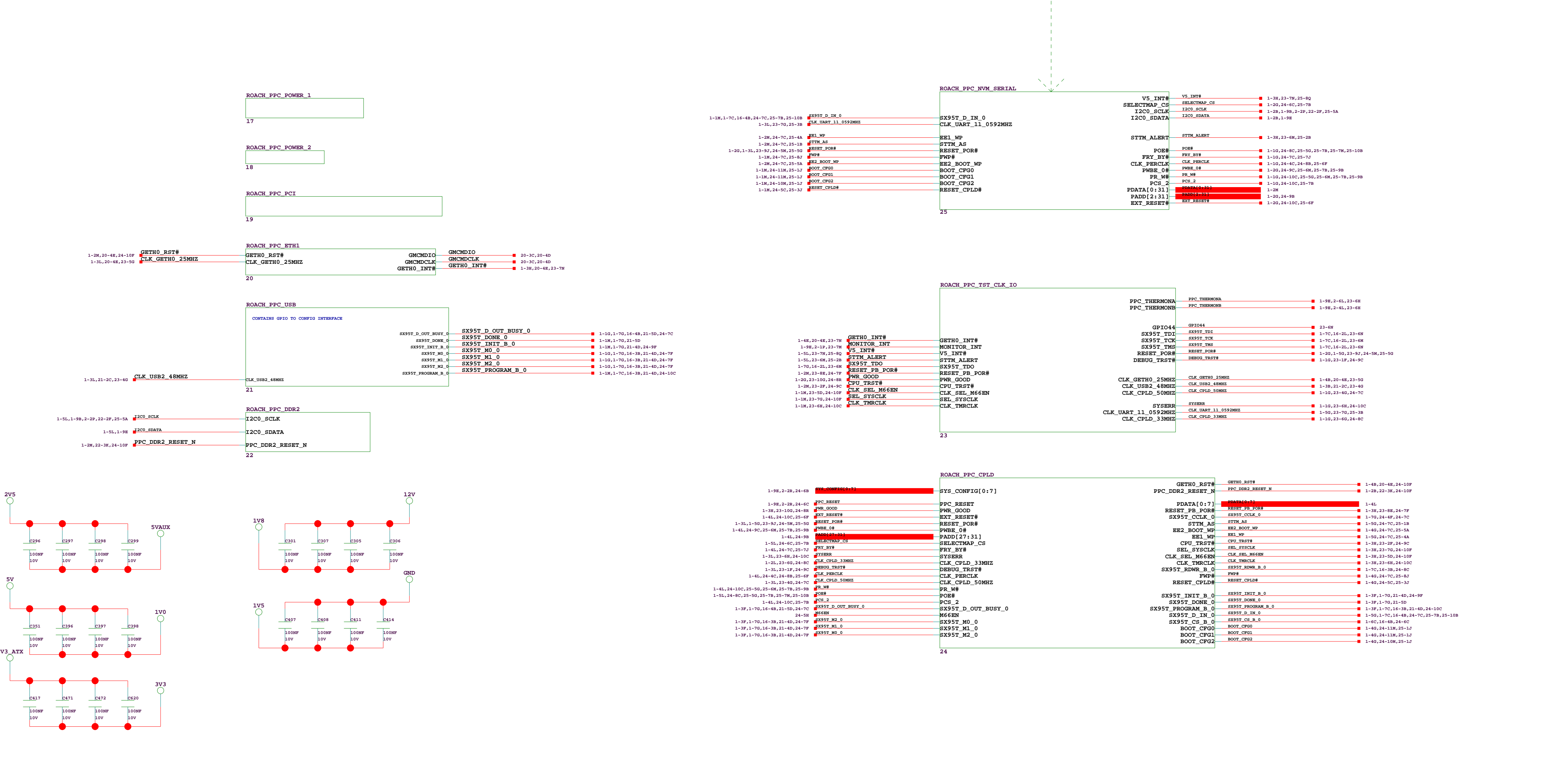


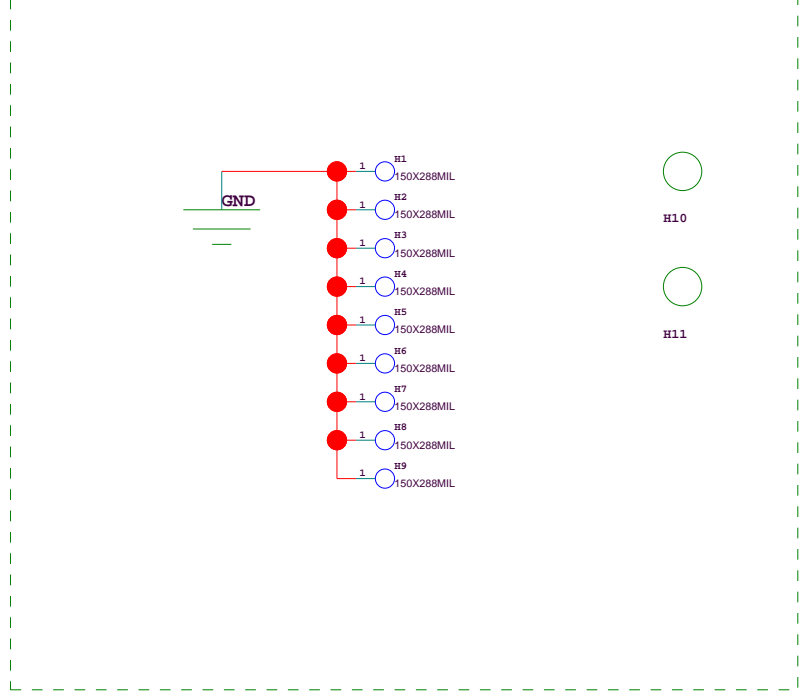
VIRTEX5



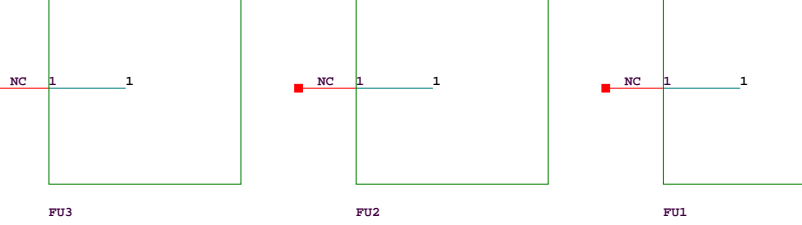
PPC



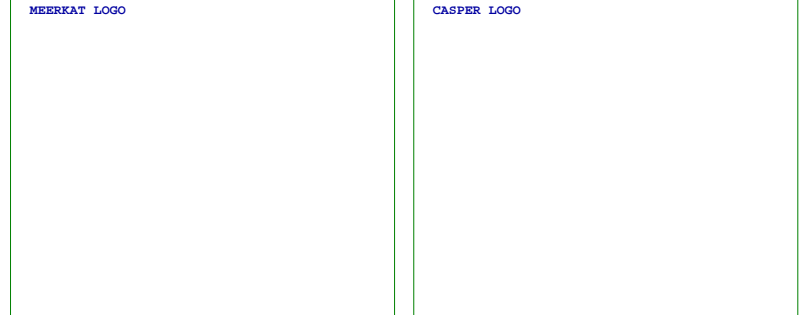
MECHANICAL



BOARD FIDUCIALS



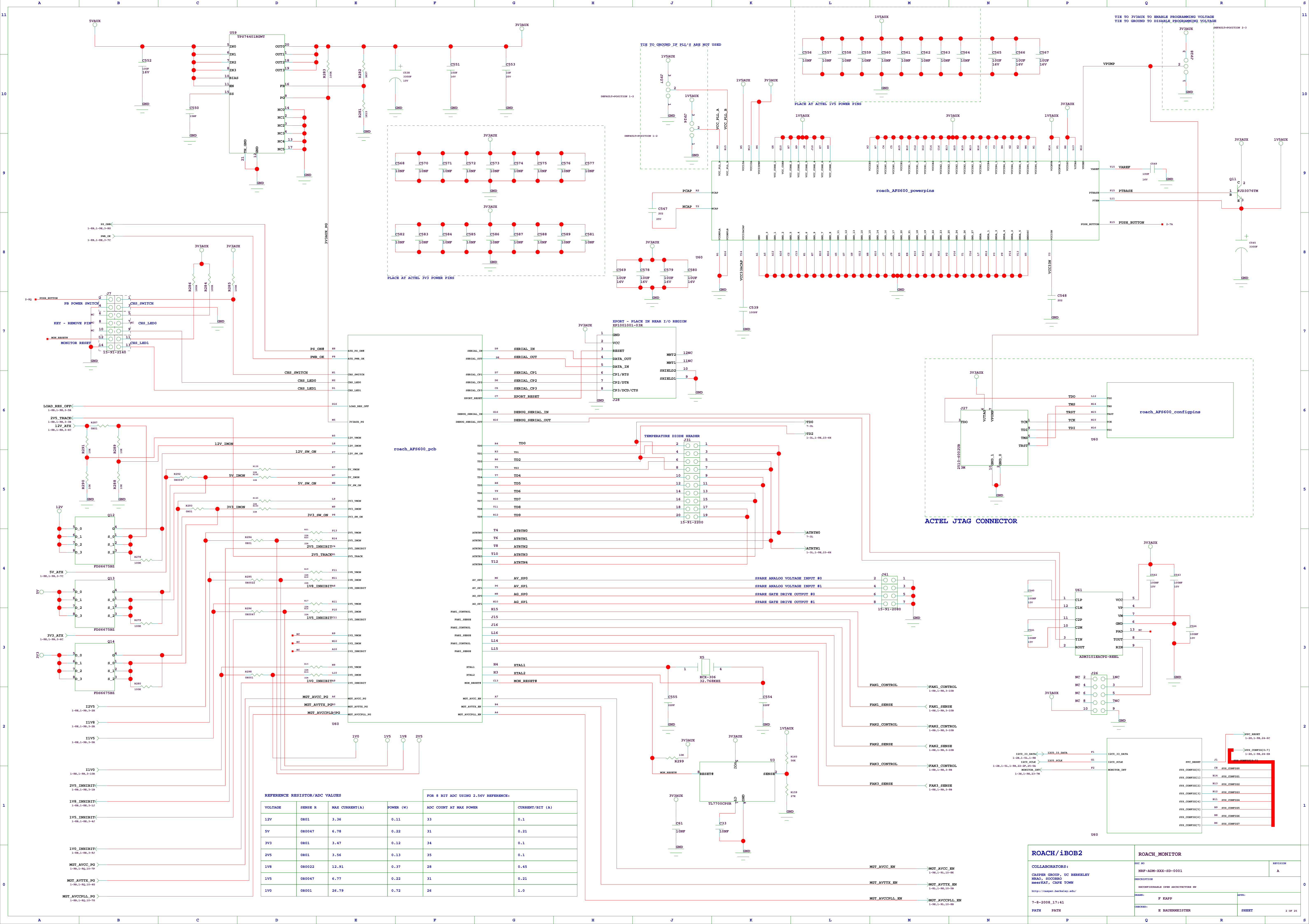
LOGO'S



CONTRIBUTORS

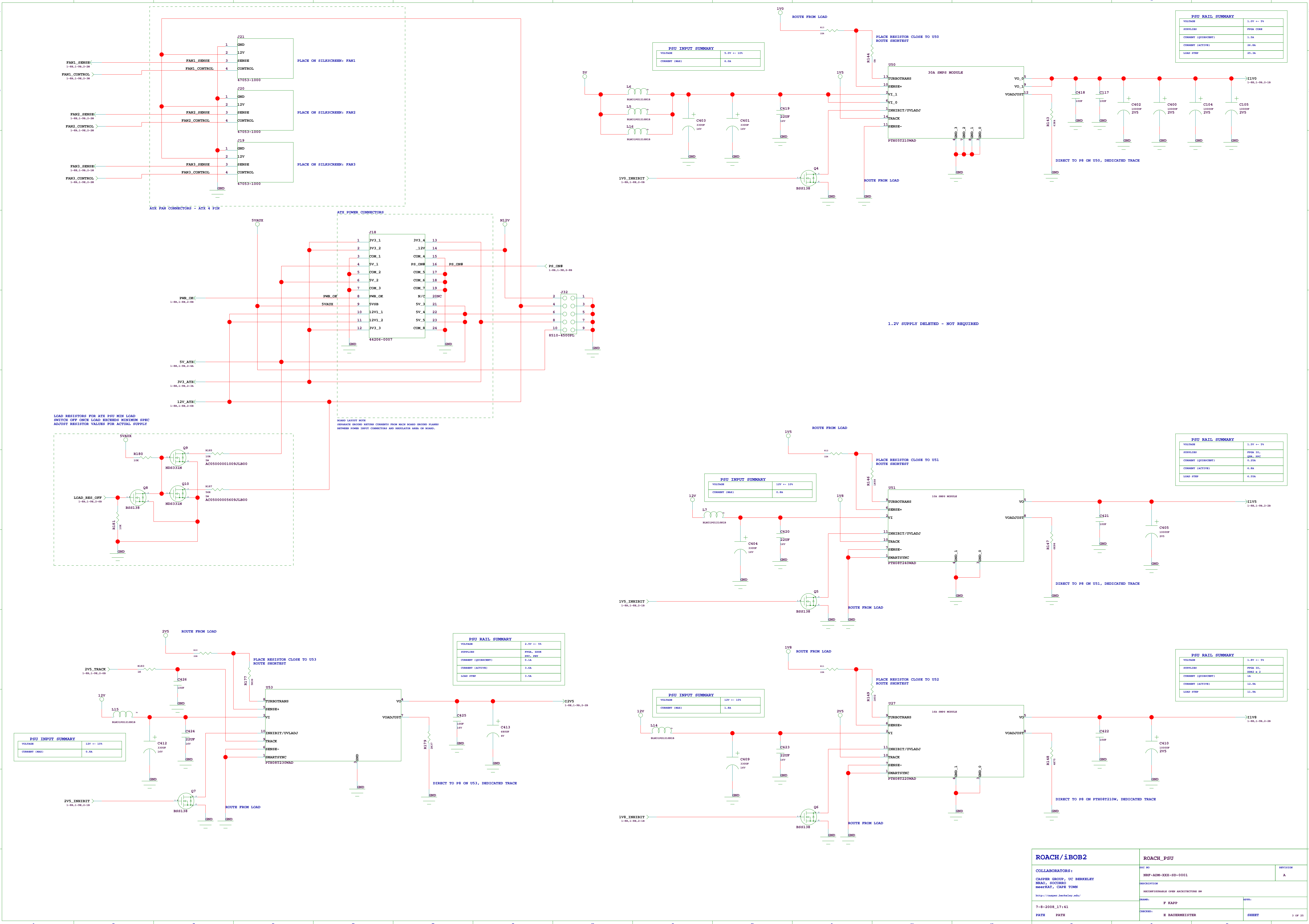
STEVEN BAUMGARTNER
FRANCIS KAPP
ALAN LAMARCA
GORDON PECK
MIKE REYNOLDS
DAN NEUTSCHNER

ROACH/iBOB2		ROACH_TOP	
COLLABORATORS: CASPER GROUP, UC BERKELEY NRAO, SOONERO Reconfigurable Open Architecture HW http://casper.berkeley.edu/	DOC NO NRF-ADM-XXX-SD-0001 DESCRIPTION RECONFIGURABLE OPEN ARCHITECTURE HW DRAWN: 7-8-2008 17:41 PATH	REVISION A F KAPP R BAUMGARTNER	SHEET 1 OF 25



REFERENCE RESISTOR/ADC VALUES				FOR 8 BIT ADC USING 2.56V REFERENCE:	
VOLTAGE	SENSE R	MAX CURRENT(A)	POWER (W)	ADC COUNT AT MAX POWER	CURRENT/BIT (A)
12V	0R01	3.36	0.11	33	0.1
5V	0R0047	6.78	0.22	31	0.21
3V3	0R01	3.47	0.12	34	0.1
2V5	0R01	3.56	0.13	35	0.1
1V8	0R0022	12.91	0.37	28	0.45
1V5	0R0047	6.77	0.22	31	0.21
1V0	0R001	26.79	0.72	26	1.0

ROACH/iBOE2		ROACH_MONITOR	
COLLABORATORS:		DOC NO	REVISION
CASPER GROUP, UC BERKELEY		NRF-ADM-XXX-SD-0001	A
NRAO, SOCCORRO		DESCRIPTION	
BAREKAT, CAPE TOWN		RECONFIGURABLE OPEN ARCHITECTURE HW	
http://casper.berkeley.edu/		DESIGNER	APPR
7-8-2008_17:41		F KAPP	
PATH PATH		CHECKED	R BAUERMBISTER
		SHEET	2 OF 25



PSU RAIL SUMMARY	
VOLTAGE	1.0V +- 5%
SUPPLIES	PP0A CORR
CURRENT (QUIESCENT)	1.5A
CURRENT (ACTIVE)	26.8A
LOAD STEP	25.3A

PSU INPUT SUMMARY	
VOLTAGE	5.0V +- 10%
CURRENT (MAX)	4.0A

PSU RAIL SUMMARY	
VOLTAGE	1.0V +- 5%
SUPPLIES	PP0A 10V
CURRENT (QUIESCENT)	0.25A
CURRENT (ACTIVE)	4.8A
LOAD STEP	6.55A

PSU INPUT SUMMARY	
VOLTAGE	12V +- 10%
CURRENT (MAX)	0.8A

PSU RAIL SUMMARY	
VOLTAGE	1.0V +- 5%
SUPPLIES	PP0A 10V
CURRENT (QUIESCENT)	1A
CURRENT (ACTIVE)	12.9A
LOAD STEP	11.9A

PSU INPUT SUMMARY	
VOLTAGE	12V +- 10%
CURRENT (MAX)	1.8A

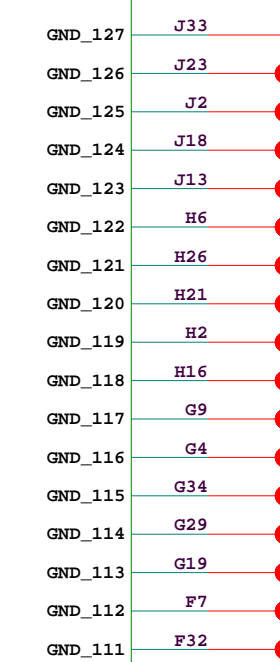
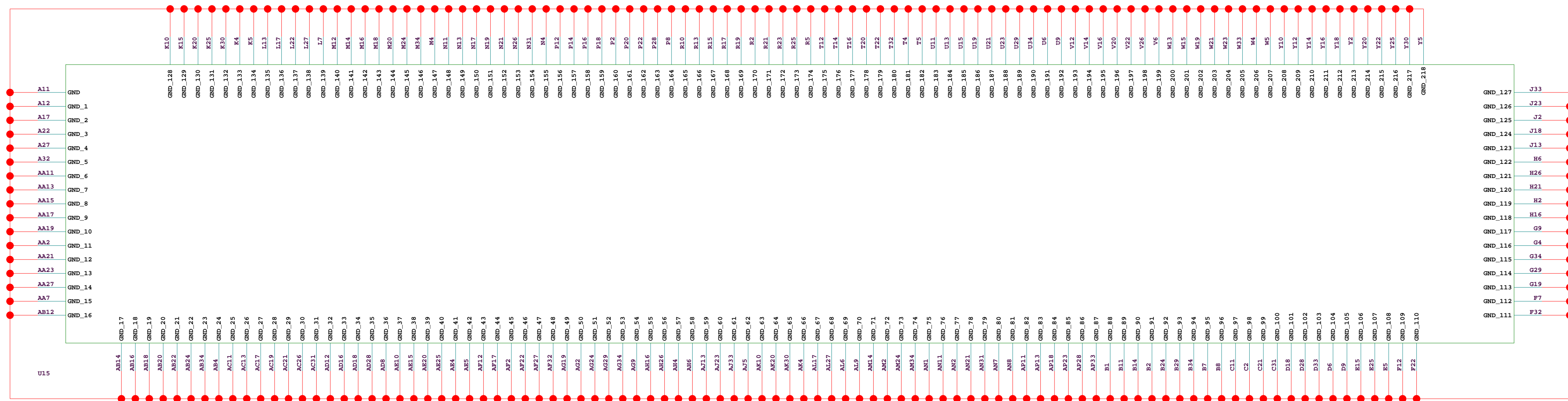
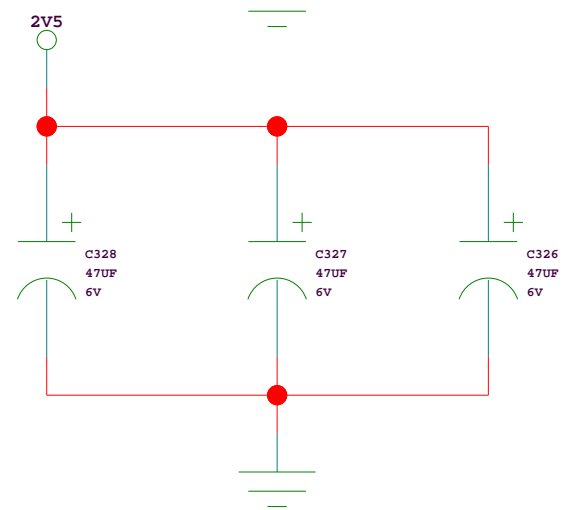
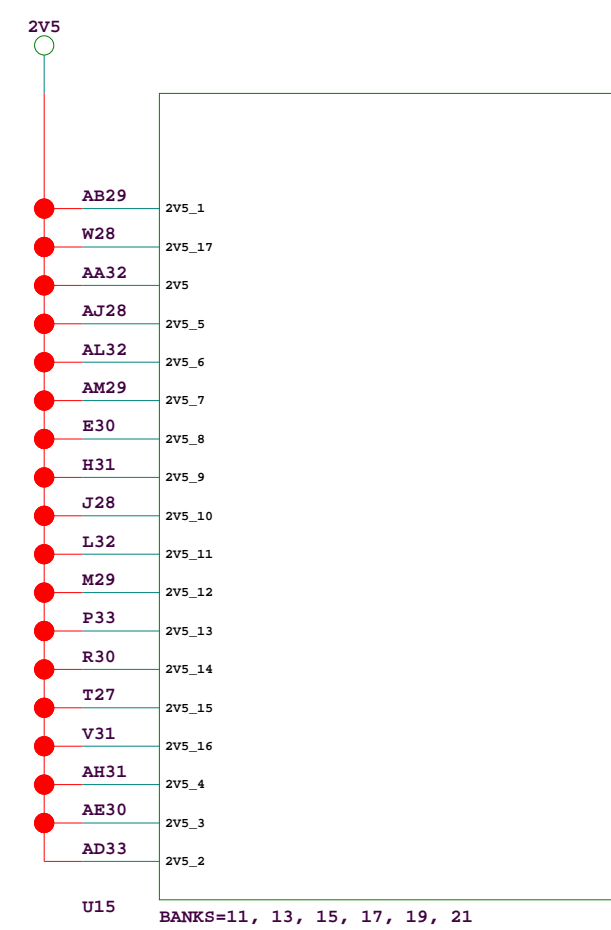
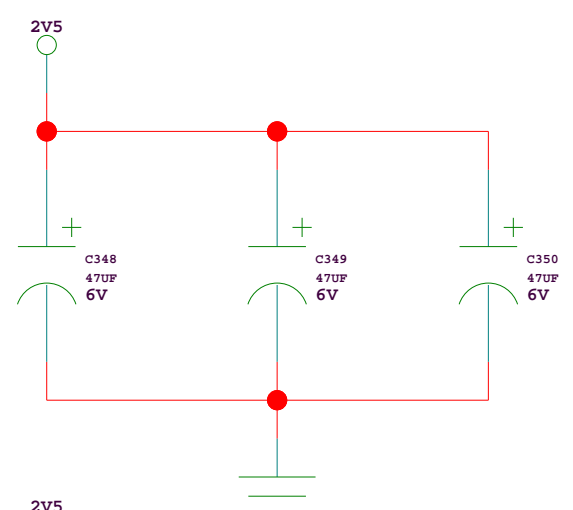
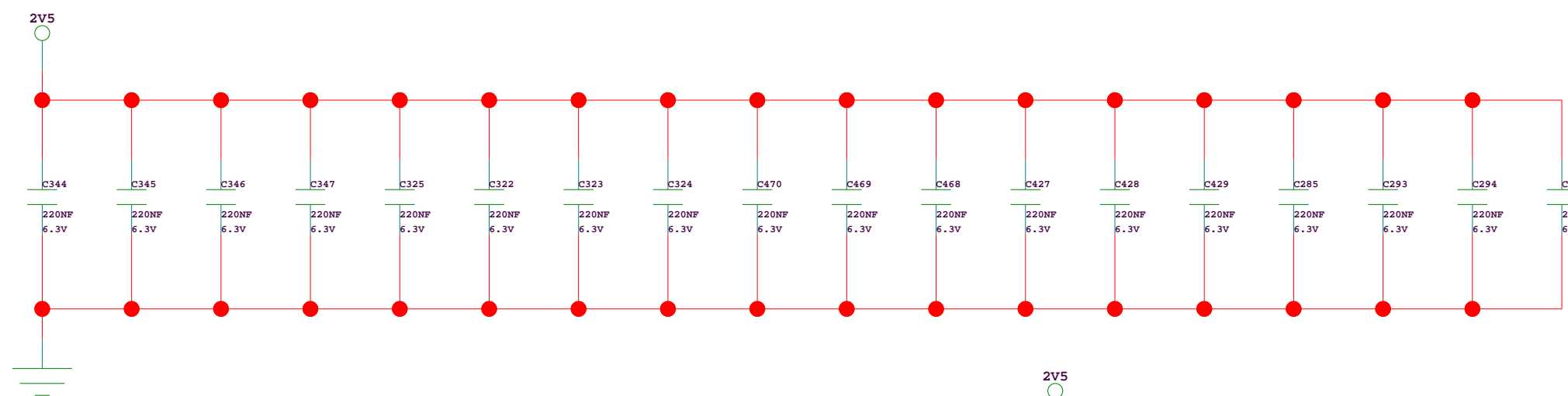
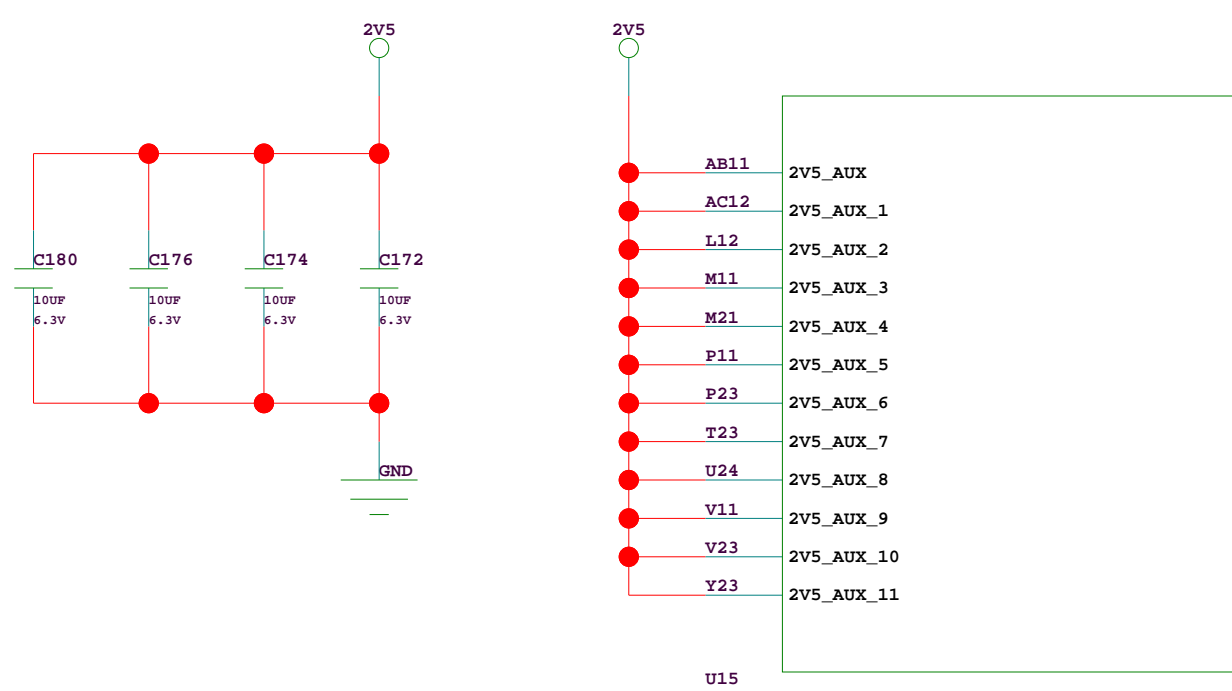
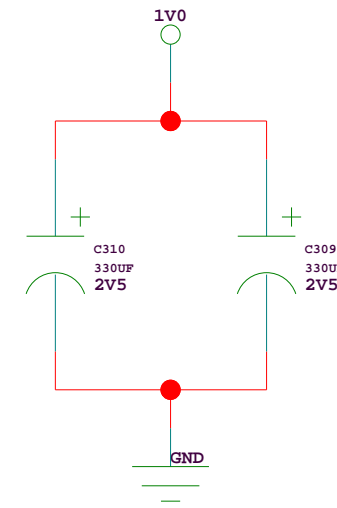
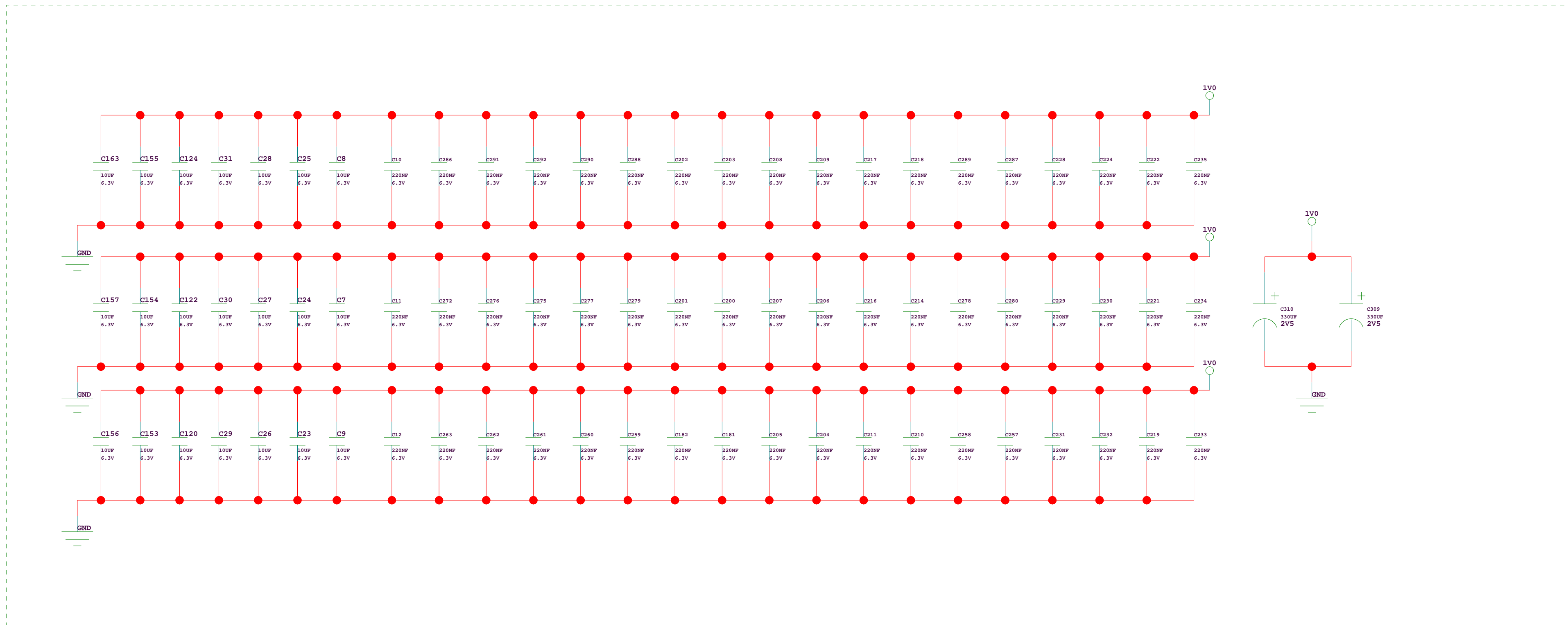
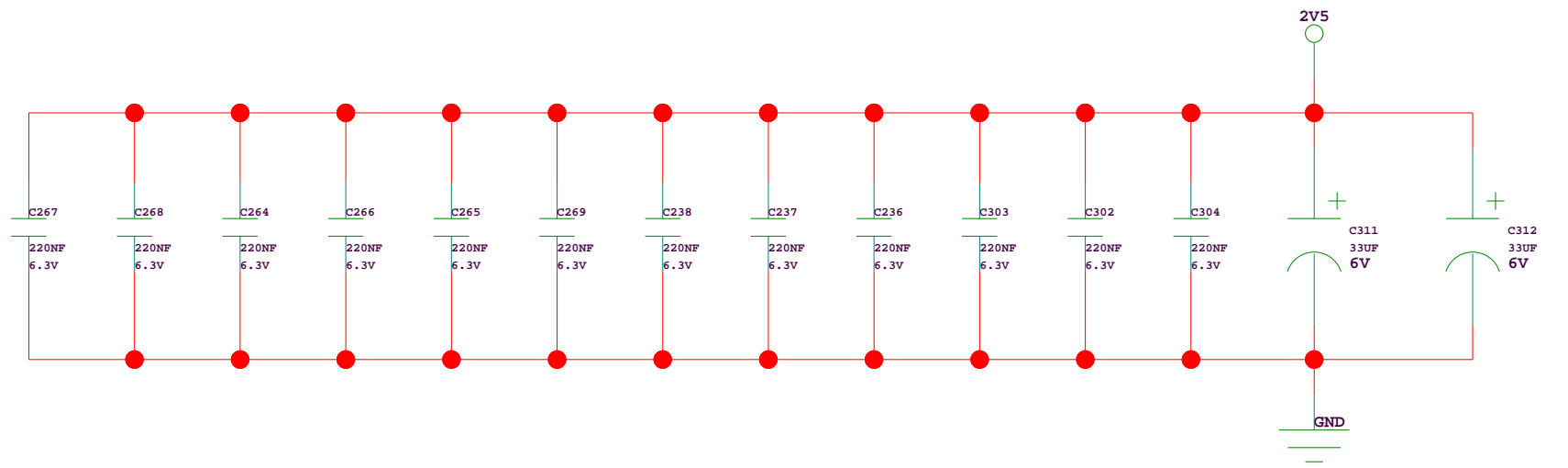
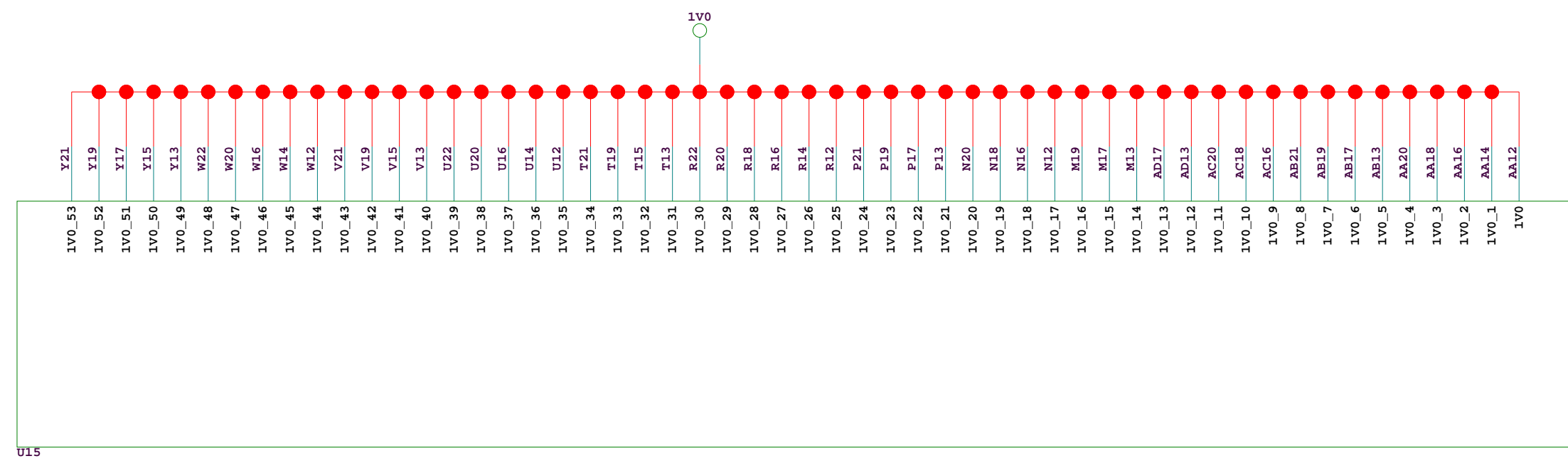
PSU RAIL SUMMARY	
VOLTAGE	2.5V +- 5%
SUPPLIES	PP0A, B00E
CURRENT (QUIESCENT)	PPC_P0E
CURRENT (ACTIVE)	3.6A
LOAD STEP	3.5A

PSU INPUT SUMMARY	
VOLTAGE	12V +- 10%
CURRENT (MAX)	6.8A

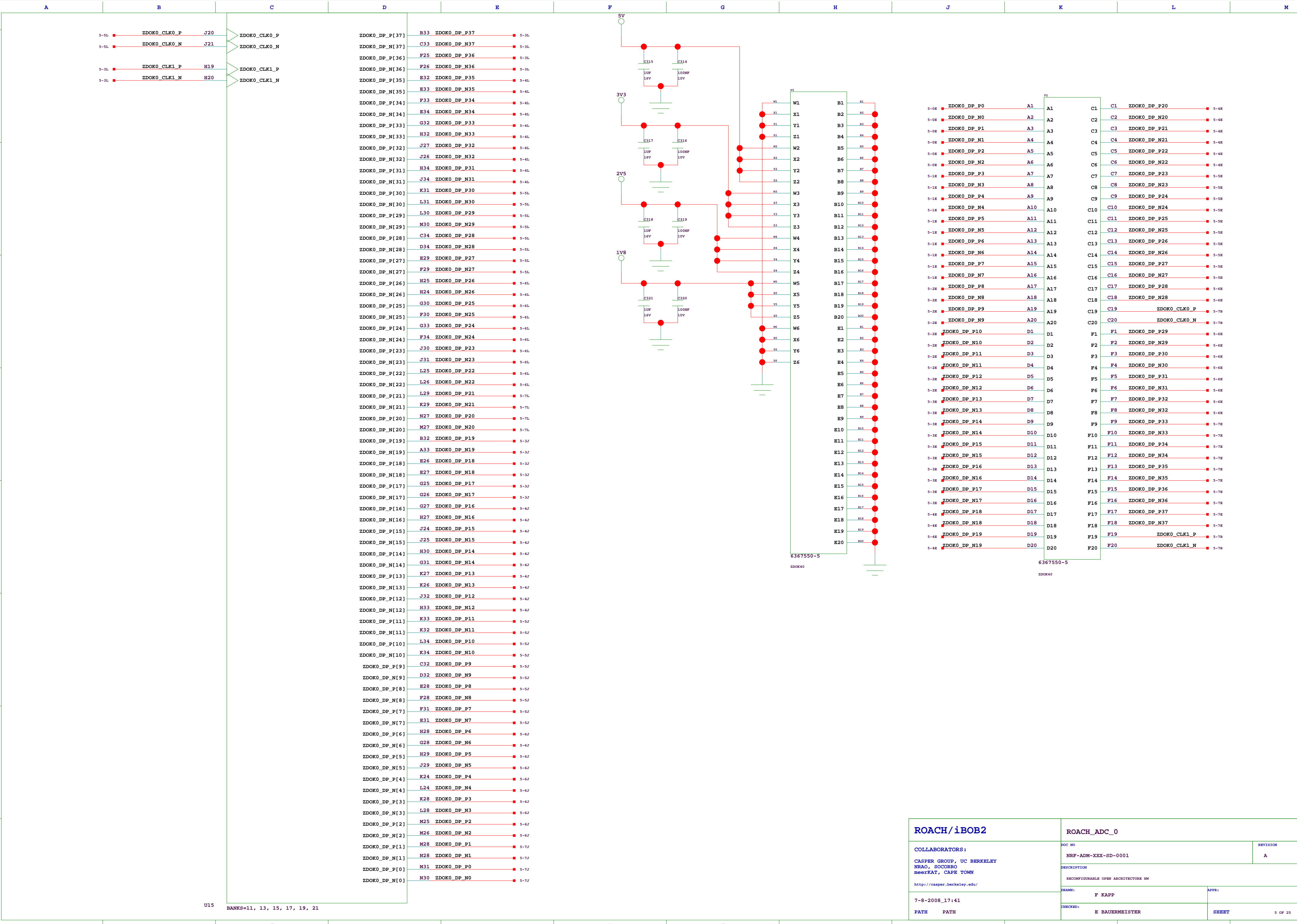
ROACH/iBOE2	
COLLABORATORS:	DOC NO
CASPER GROUP, UC BERKELEY	NRF-ADM-XXX-SD-0001
NRAO, SOCCORRO	DESCRIPTION
RECONFIGURABLE OPEN ARCHITECTURE HW	REVISION
7-8-2008_17:41	7-8-2008_17:41
PATH	PATH
PATH	PATH

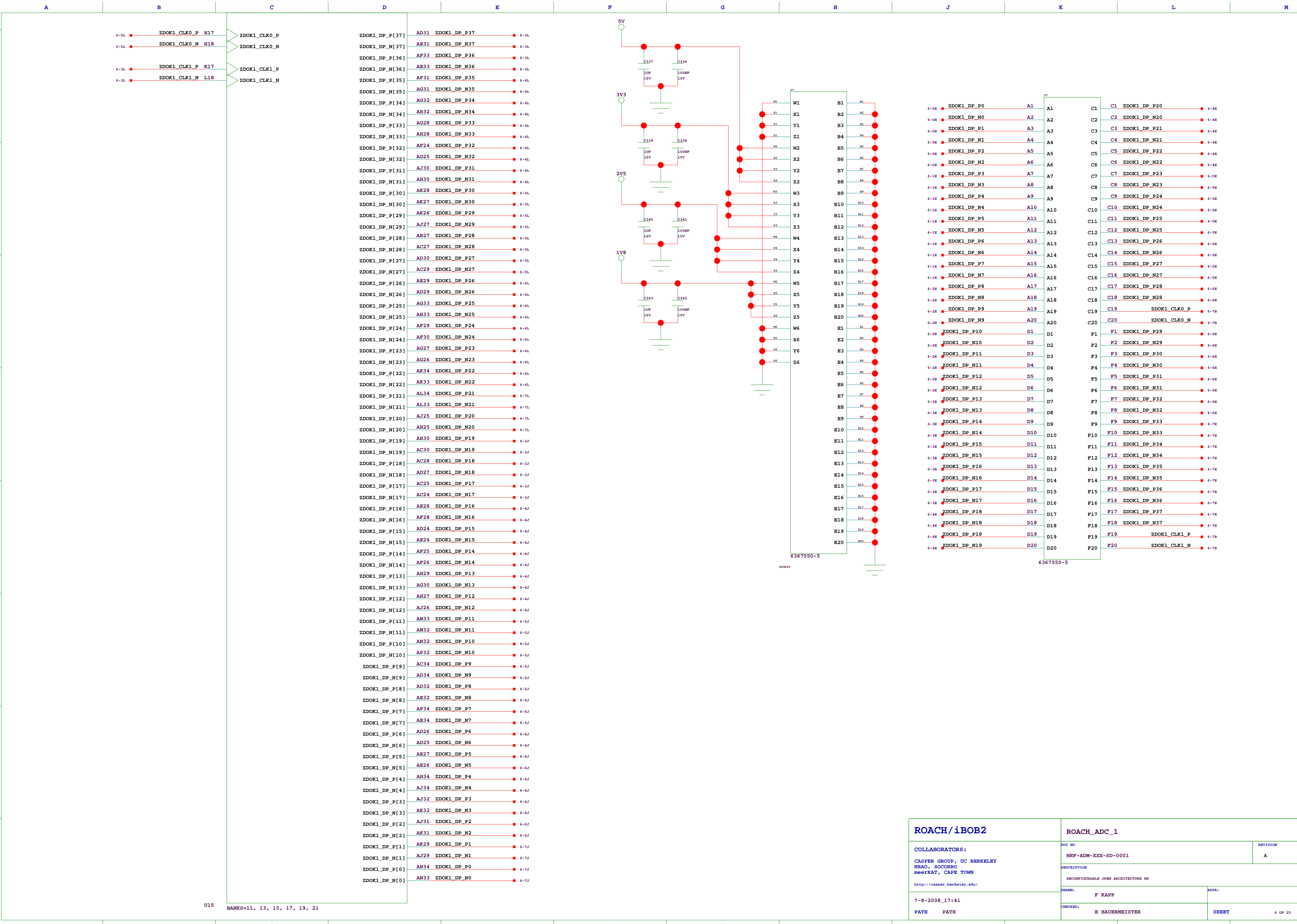
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DOC NO	REVISION
NRF-ADM-XXX-SD-0001	A
DESCRIPTION	DESCRIPTION
RECONFIGURABLE OPEN ARCHITECTURE HW	REVISION
7-8-2008_17:41	7-8-2008_17:41
PATH	PATH
PATH	PATH

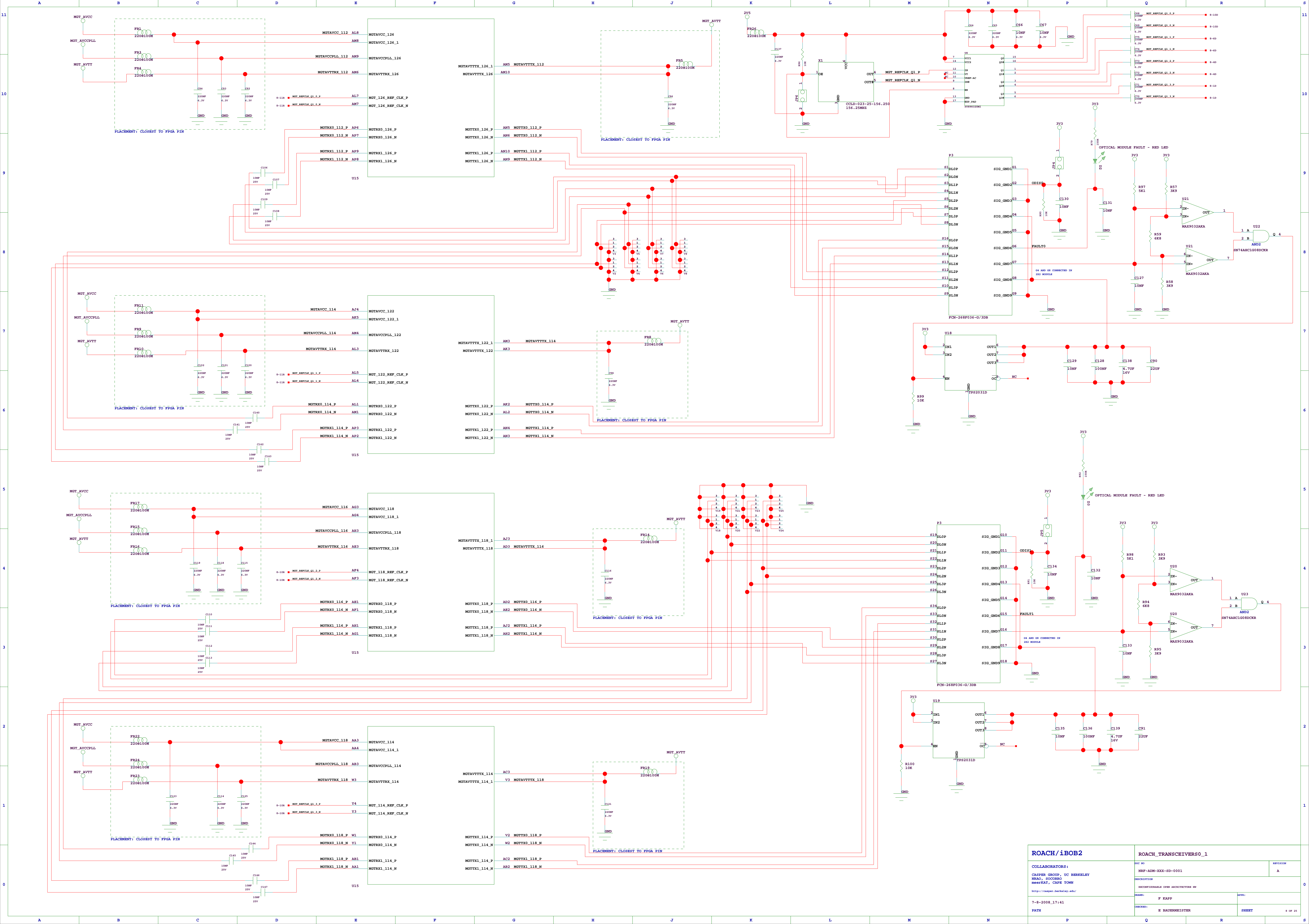
ROACH/iBOE2	
COLLABORATORS:	DOC NO
CASPER GROUP, UC BERKELEY	NRF-ADM-XXX-SD-0001
NRAO, SOCCORRO	DESCRIPTION
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7-8-2008_17:41	7-8-2008_17:41
PATH	PATH
PATH	PATH

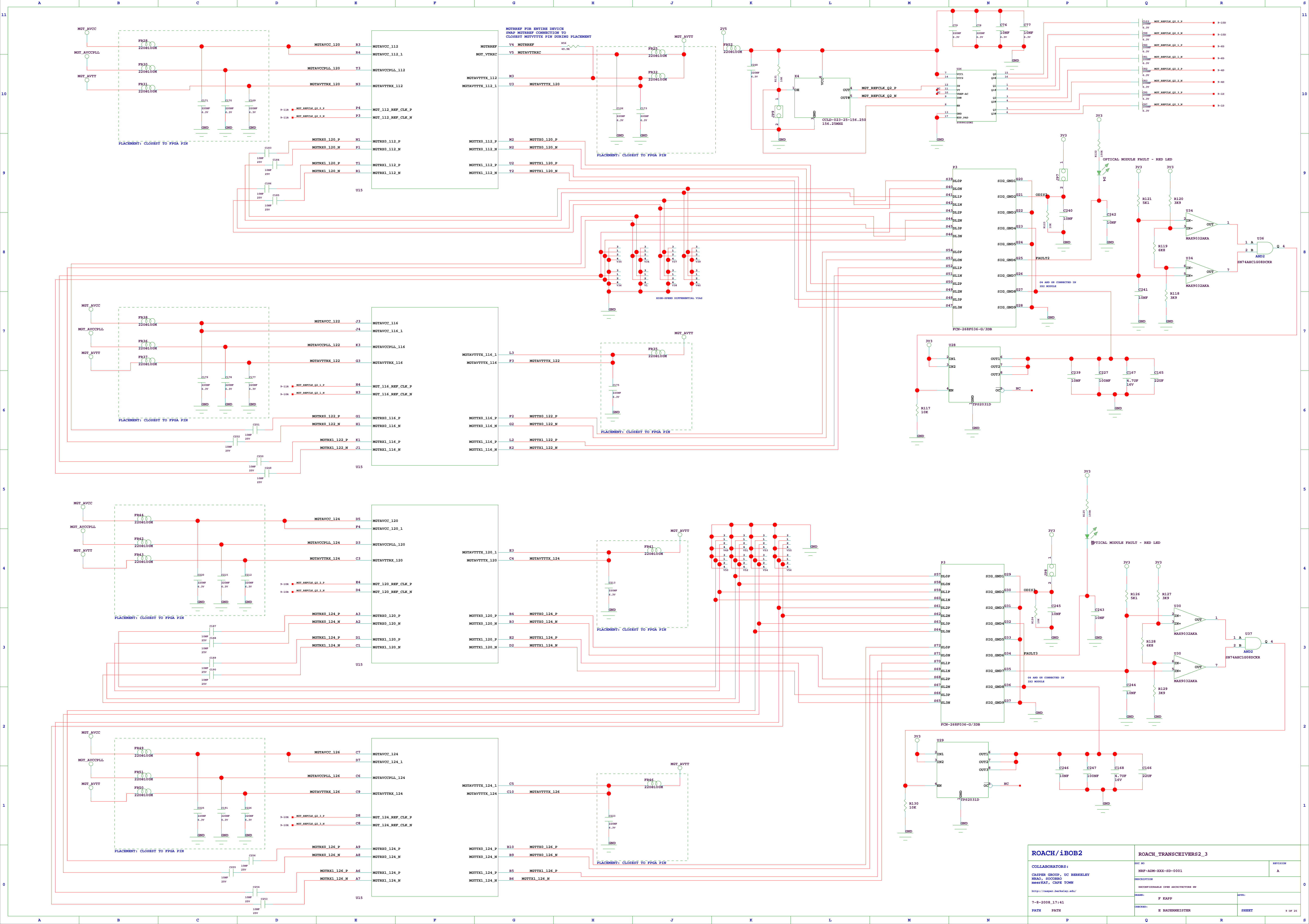


ROACH/iBOB2		ROACH_5V_POWER		
COLLABORATORS:		DOC NO		REVISION
CASPER GROUP, UC BERKELEY MRS. SCORCO meerFAT, CAPE TOWN		HRF-ADM-XXX-SD-0001		A
		DESCRIPTION		
		RECONFIGURABLE OPEN ARCHITECTURE ON		
http://casper.berkeley.edu/		ISSUE:		
7-8-2008_17:41		F KAPP	APP:	
PATH PATH		CHECKED:		
		E BAUERMEISTER		
			SHEET	4 OF 2









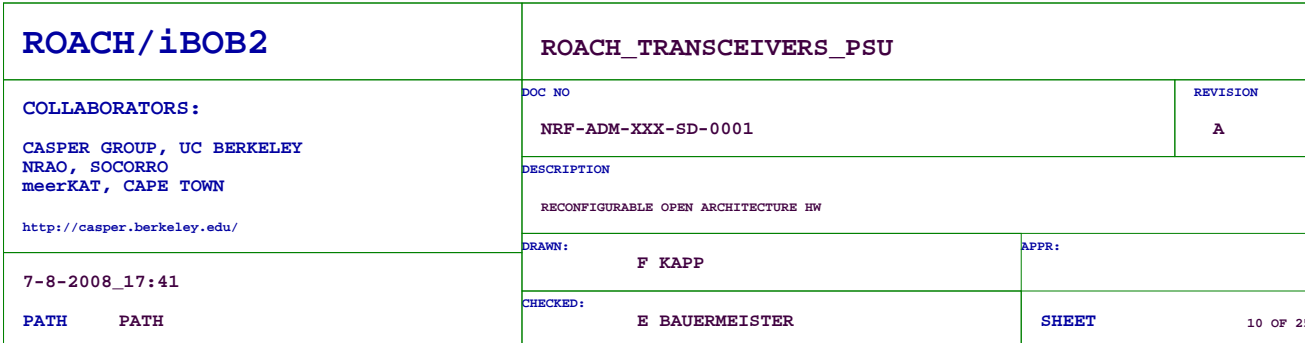
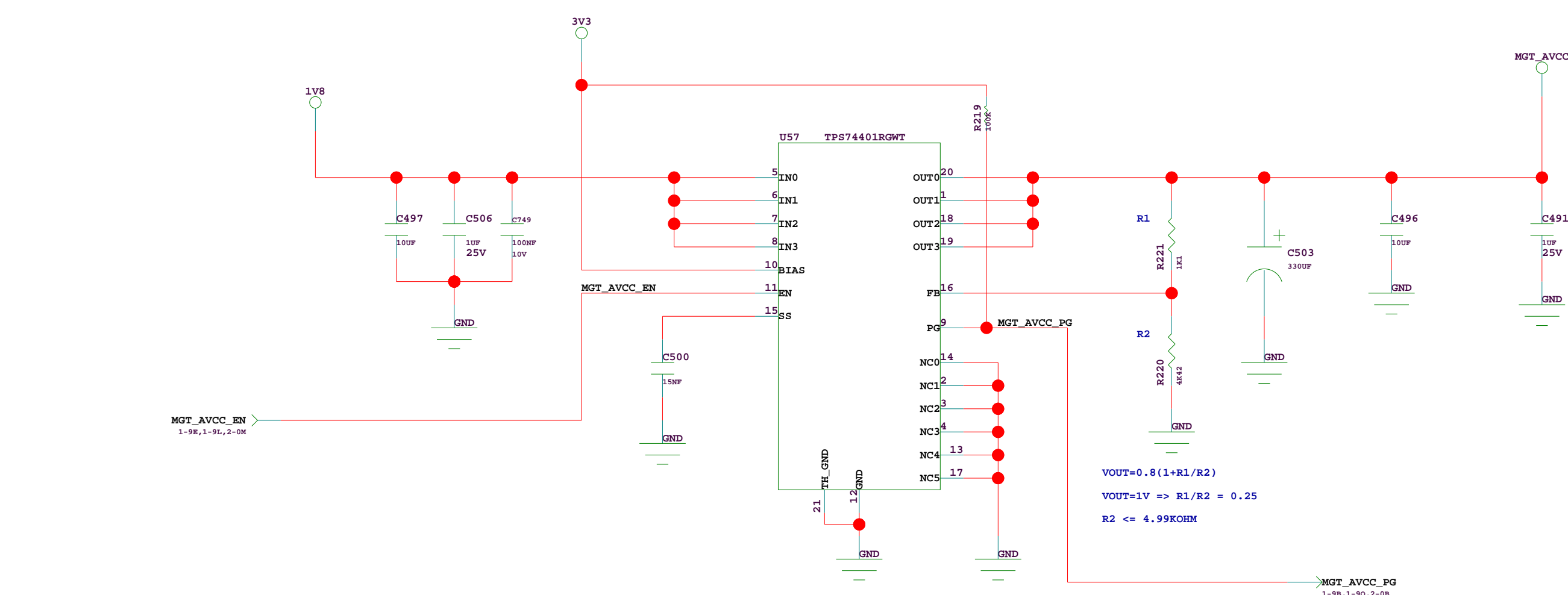
ROACH/iBOE2

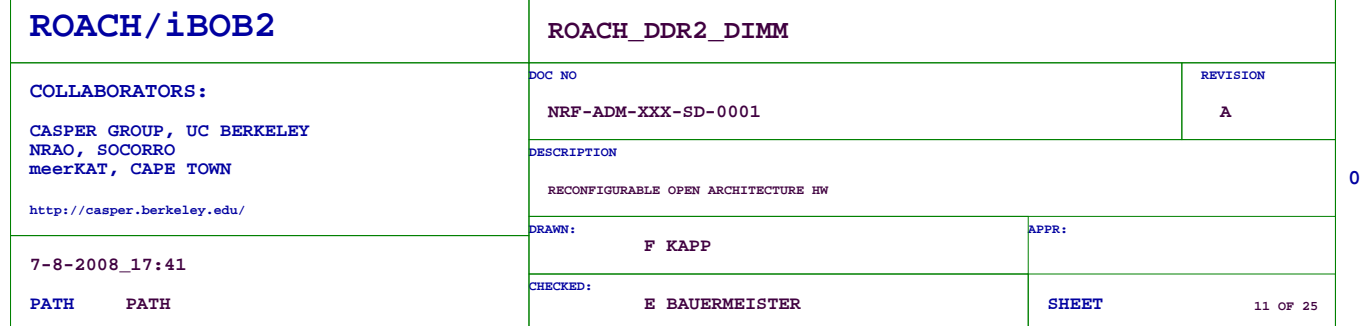
COLLABORATORS:
CASPER GROUP, UC BERKELEY
NRAO, SOONERO
BEEHIVE, CAPE TOWN
<http://casper.berkeley.edu/>

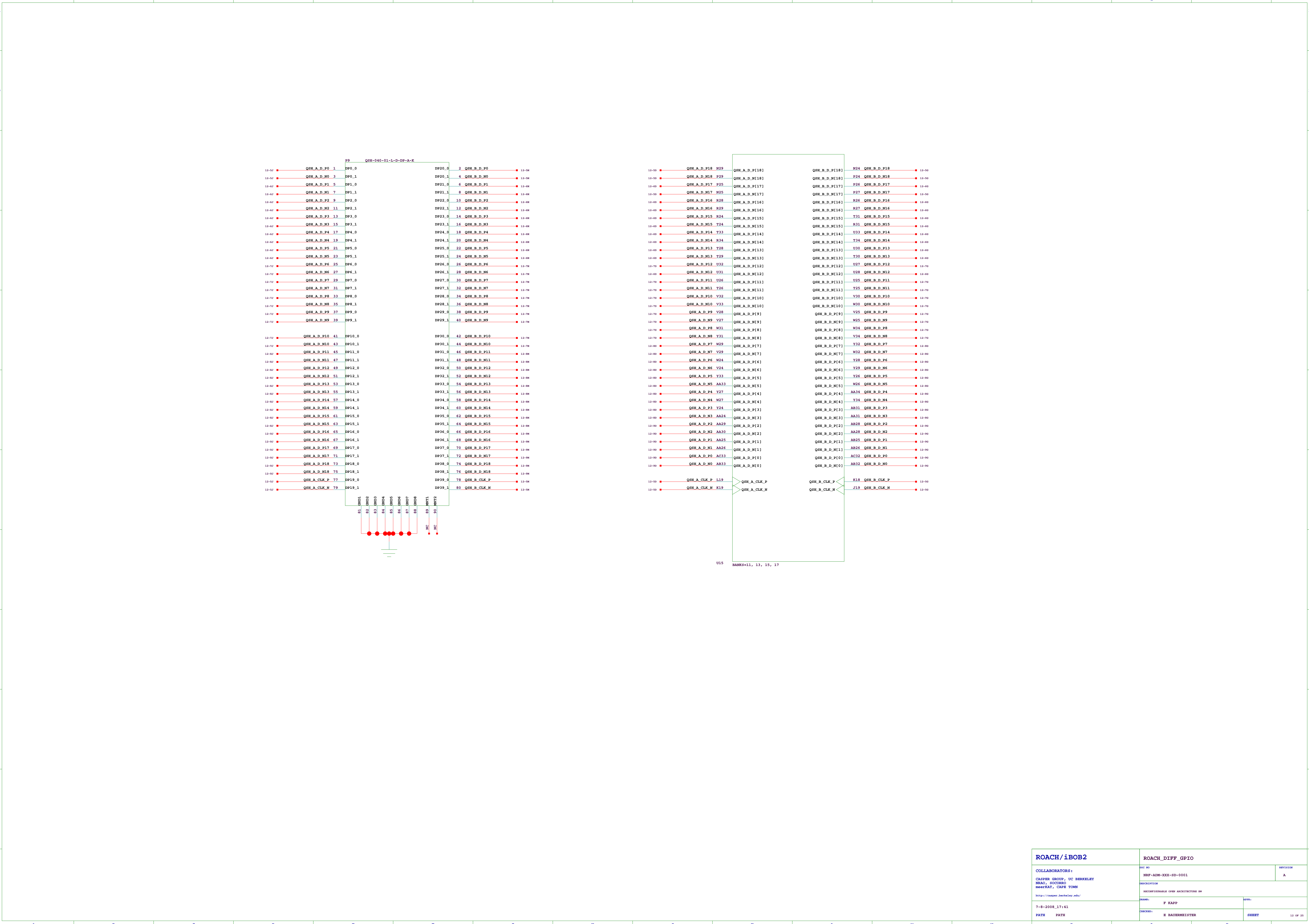
7-8-2008 17:41
PATH PATH

ROACH_TRANSCEIVERS2_3

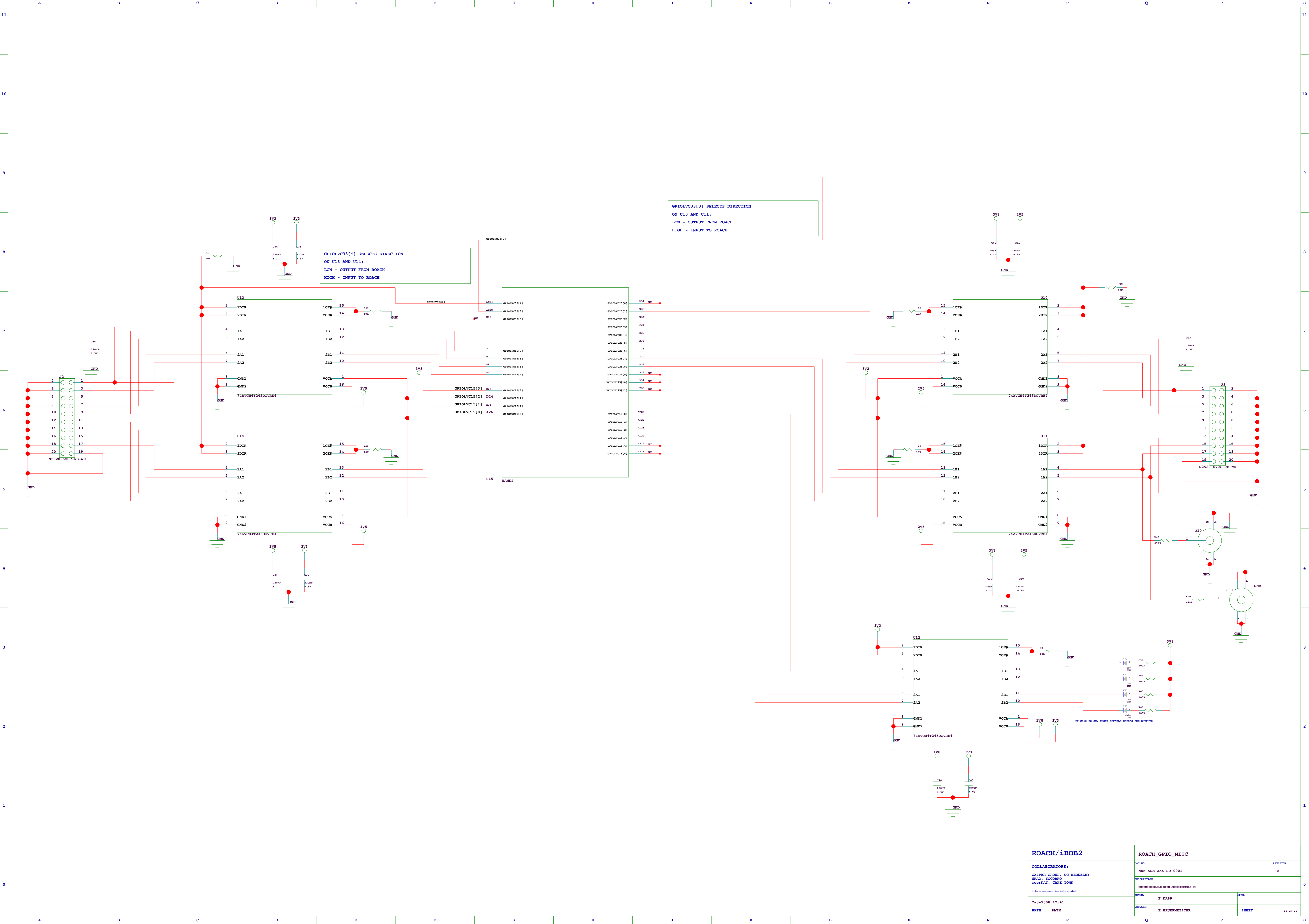
DOC NO	NRF-ADM-XXX-SD-0001	REVISION	A
DESCRIPTION	RECONFIGURABLE OPEN ARCHITECTURE RF		
DESIGNER	F KAPP	CHECKED	R BAUERMASTER
SHEET		9 OF 25	

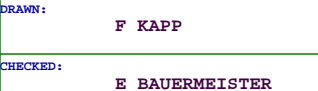
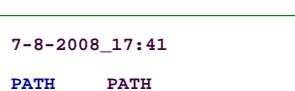
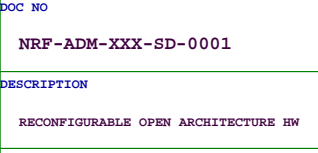
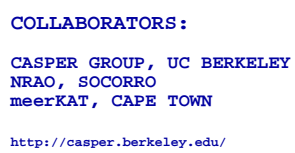
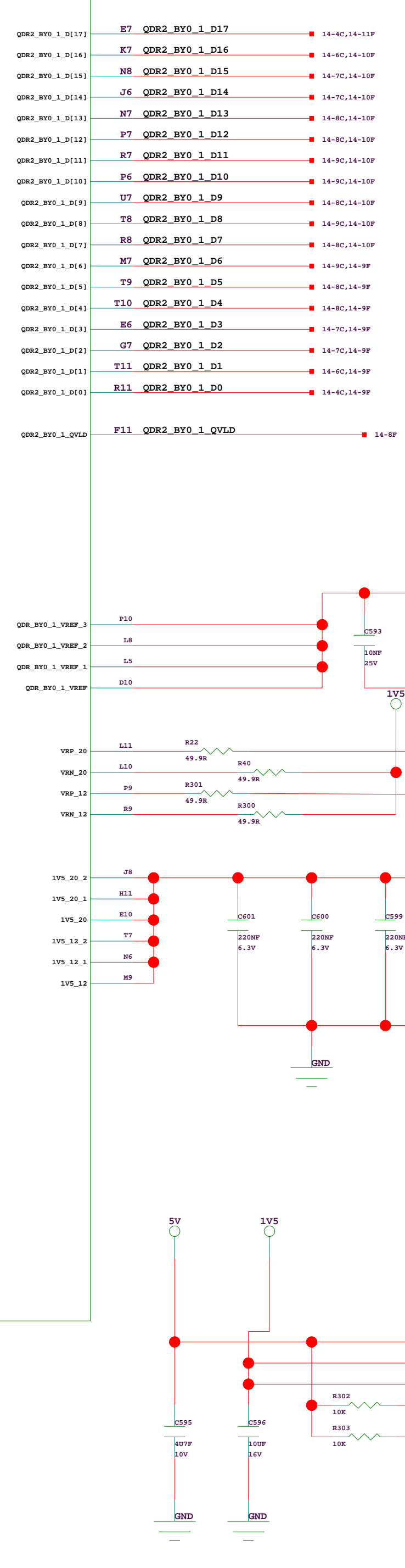
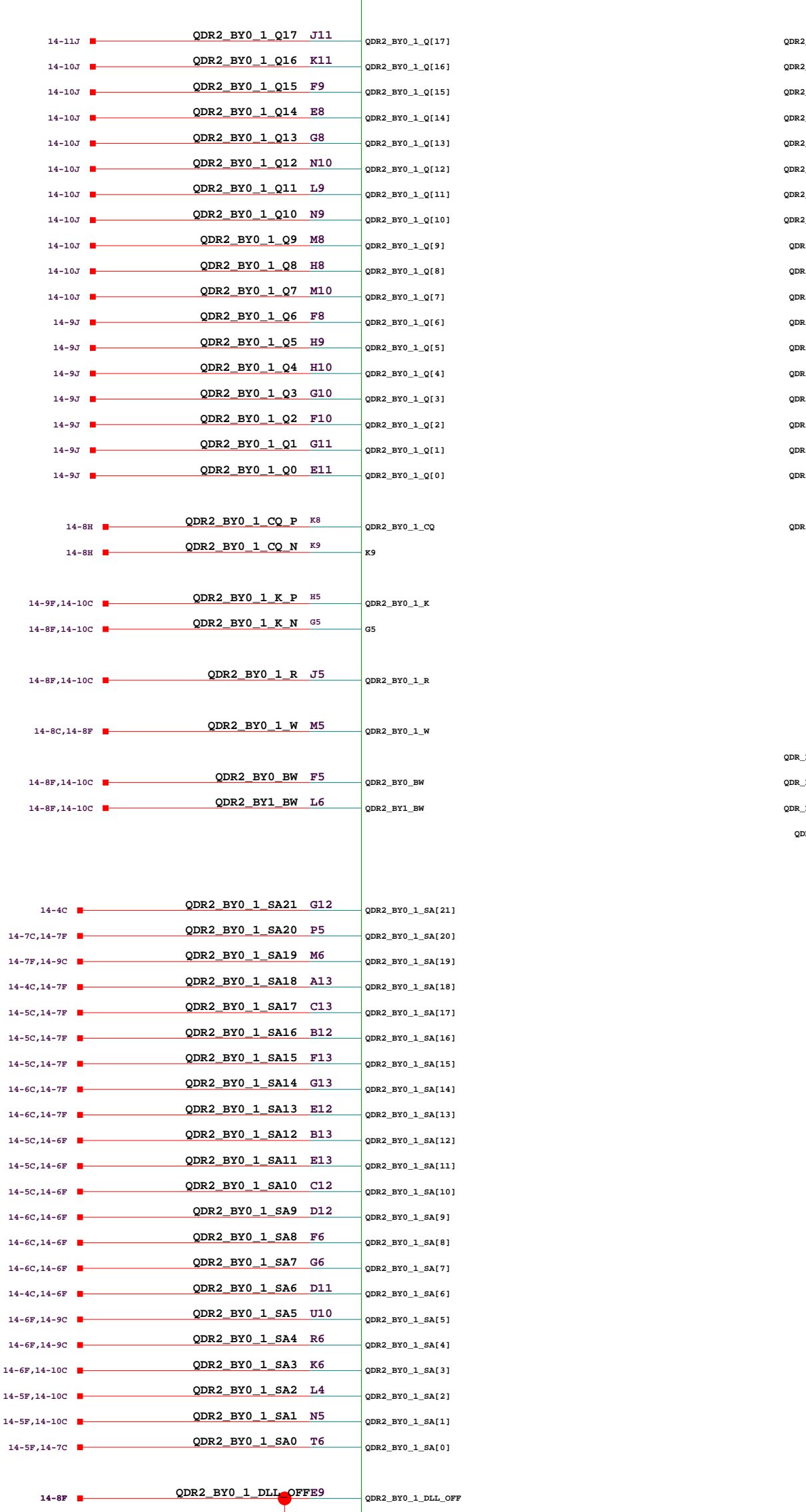
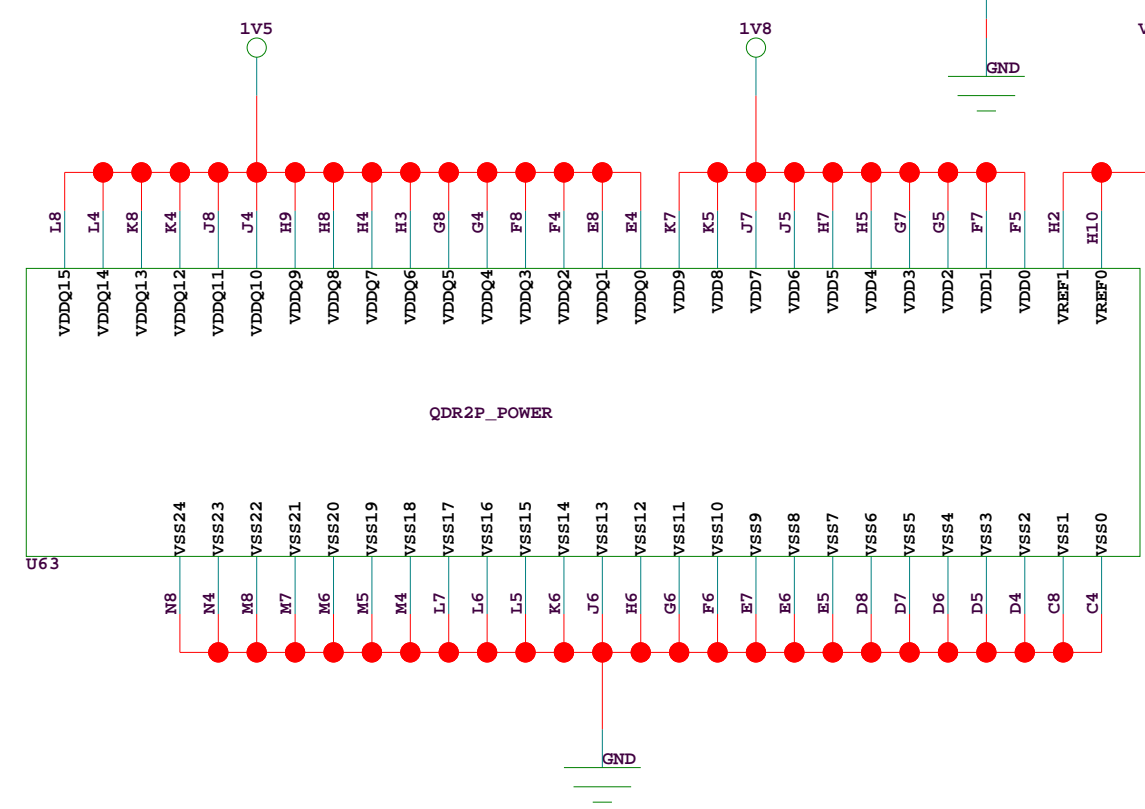
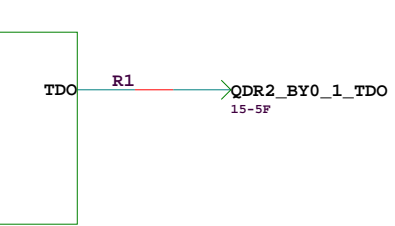
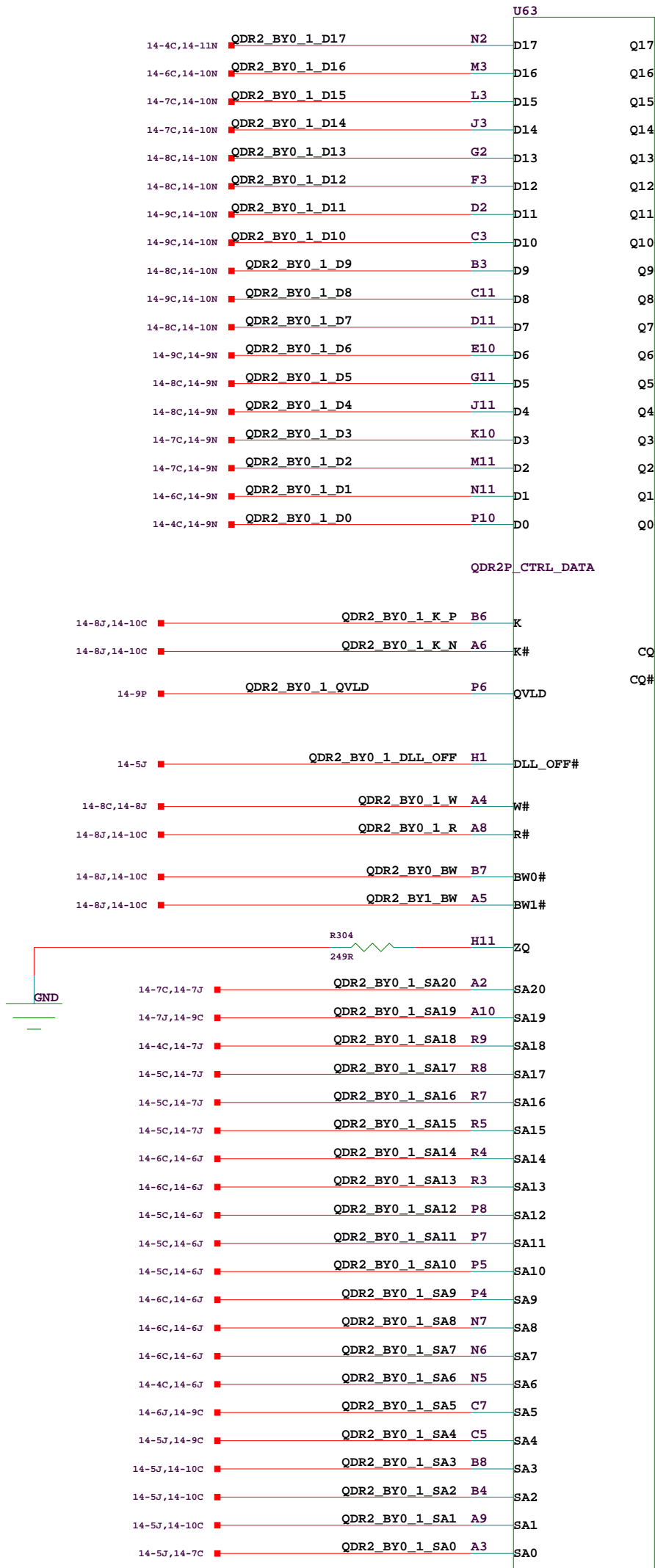
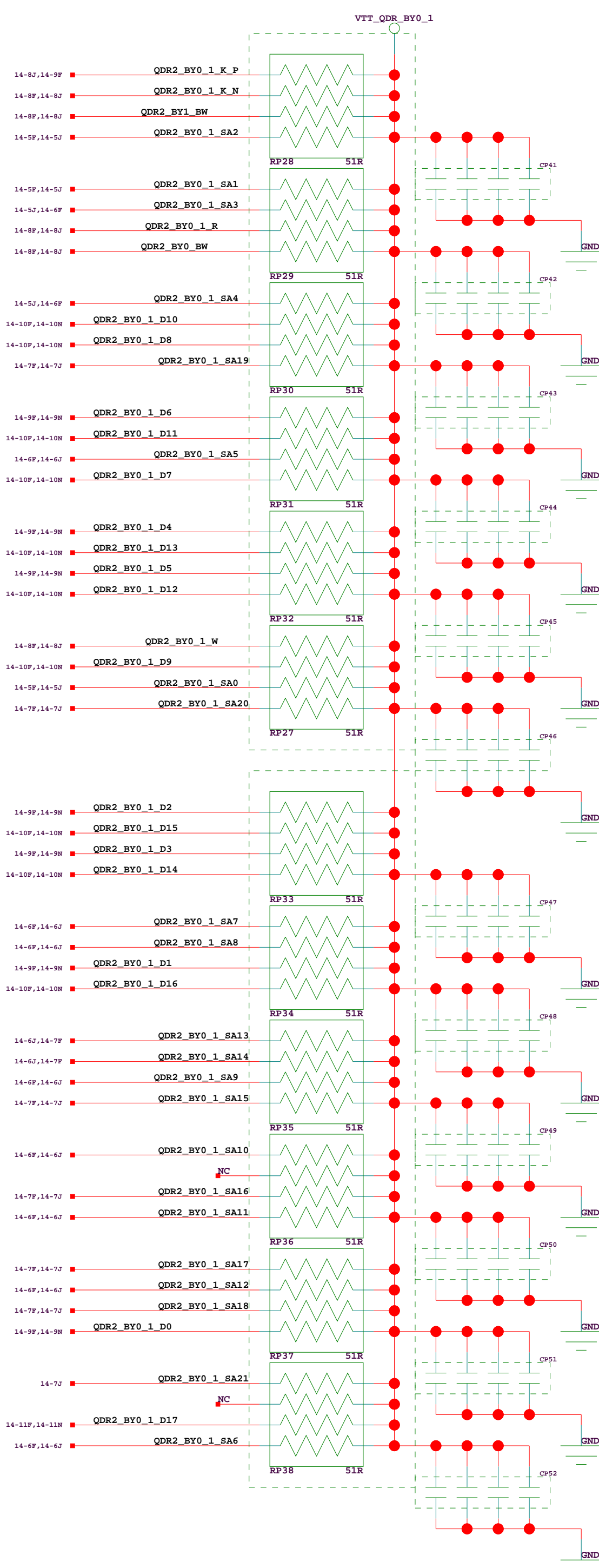


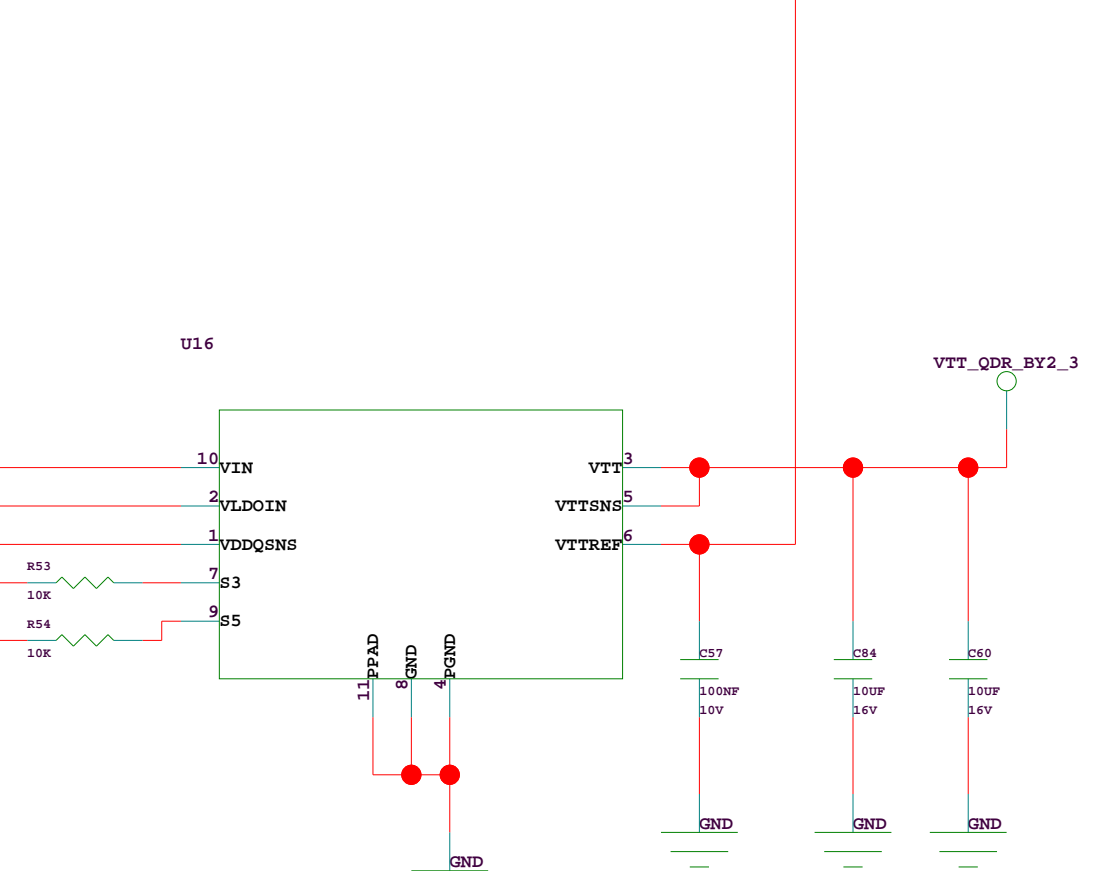
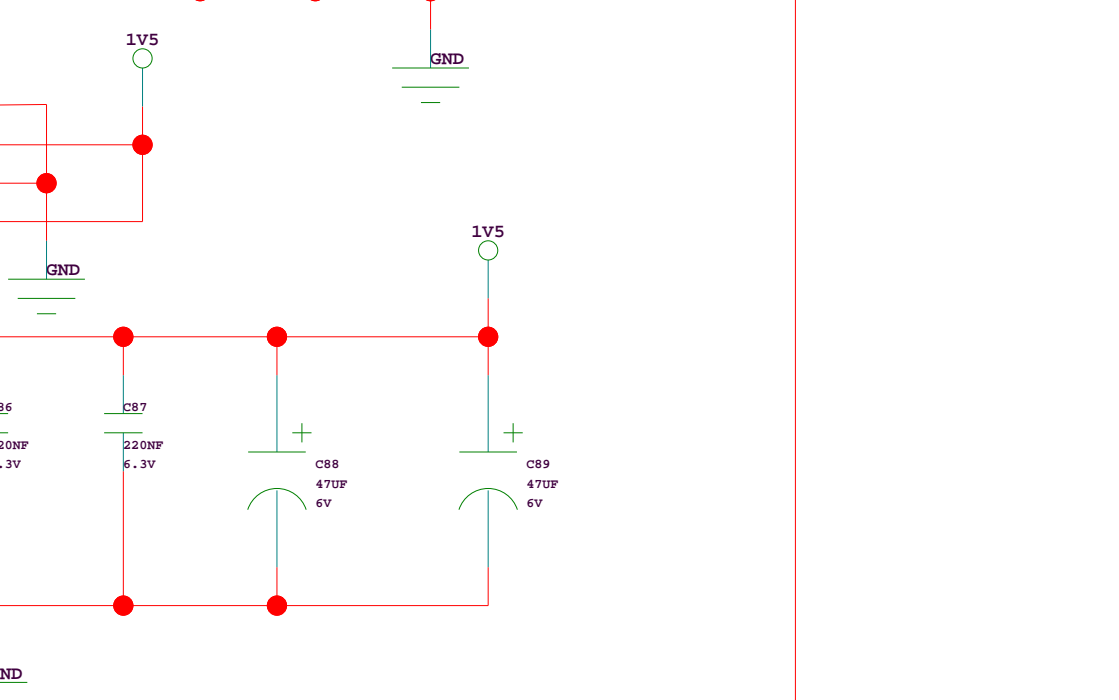
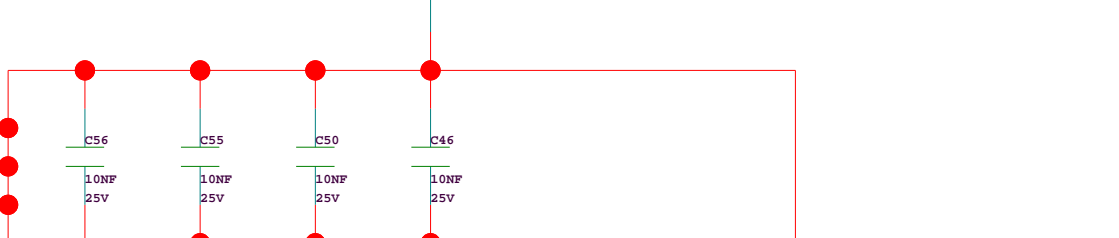
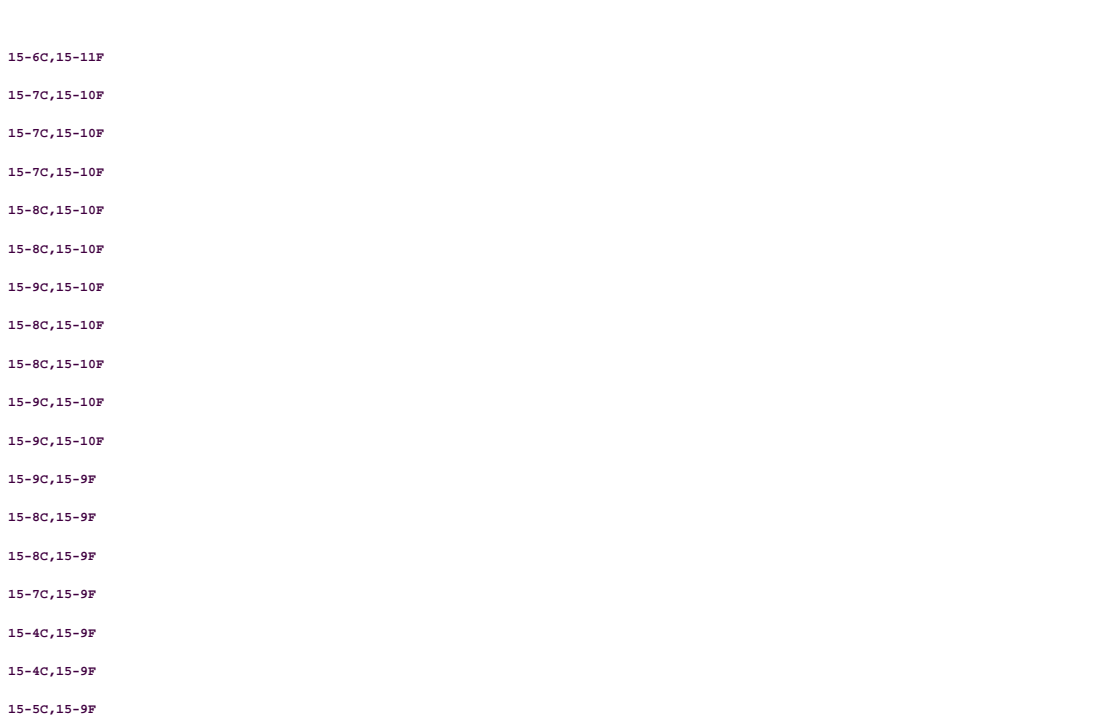
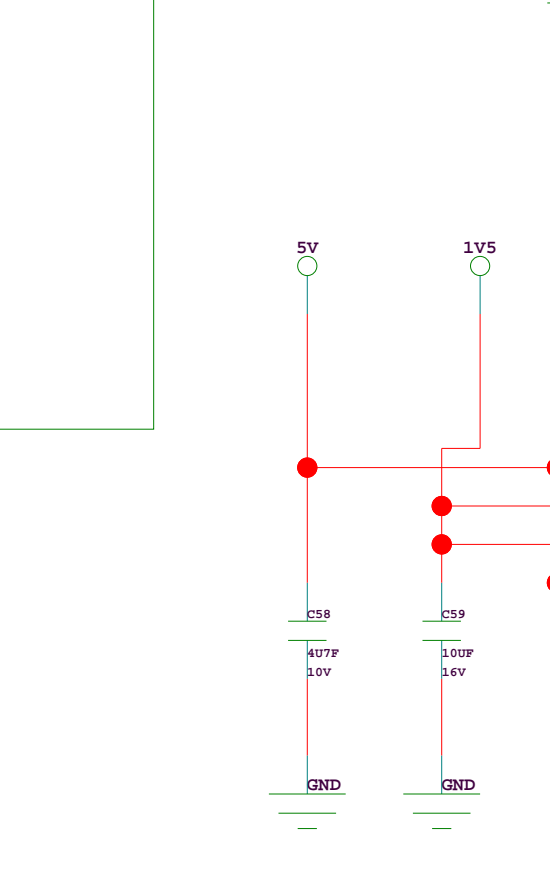
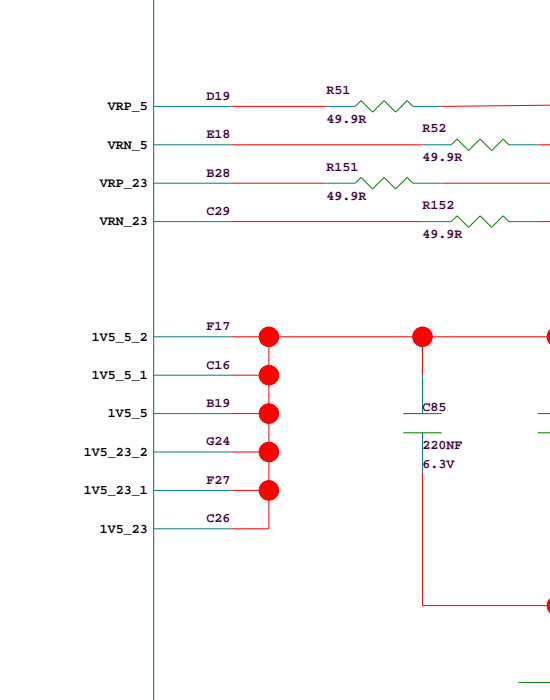
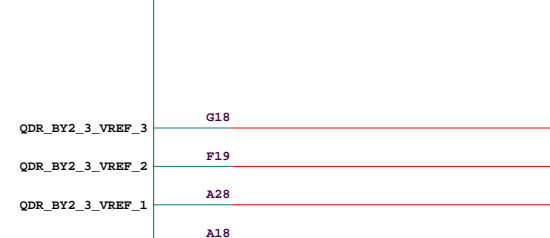
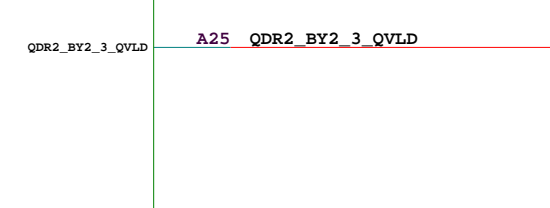
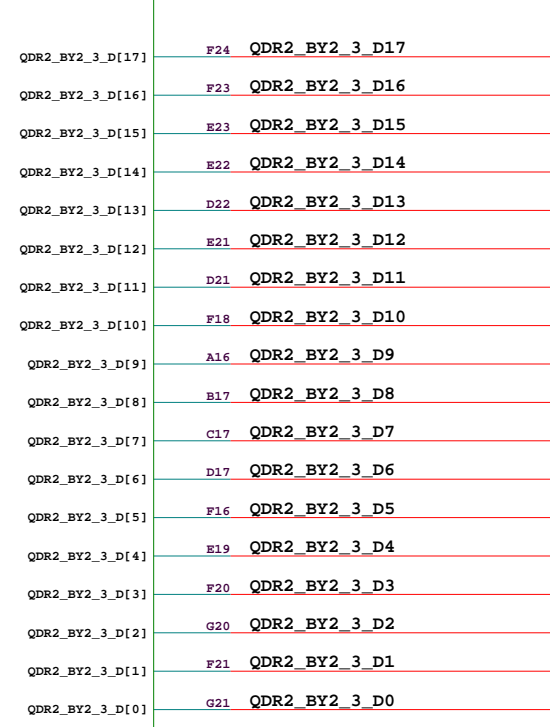
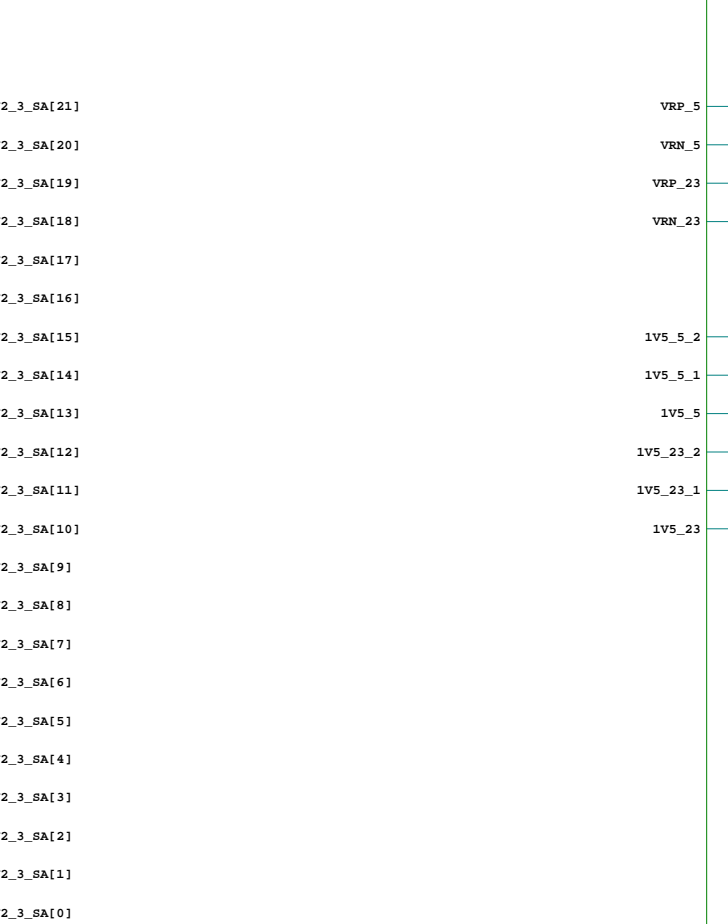
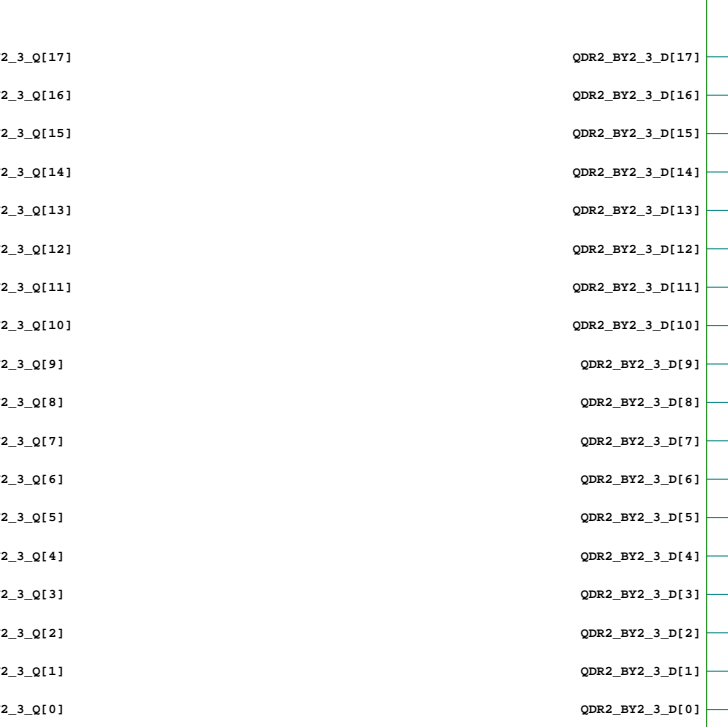
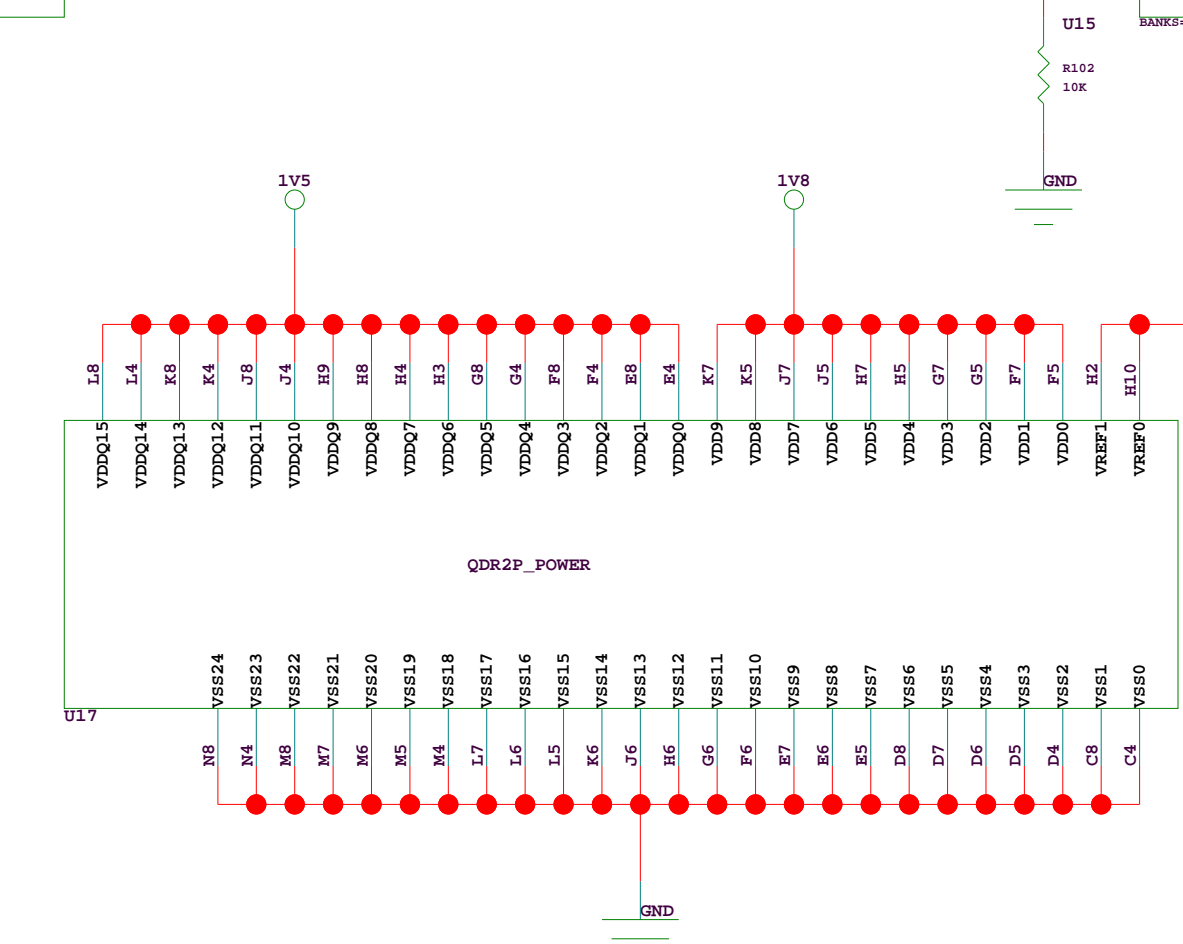
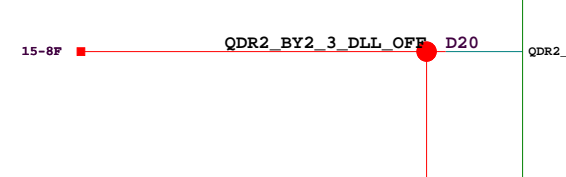
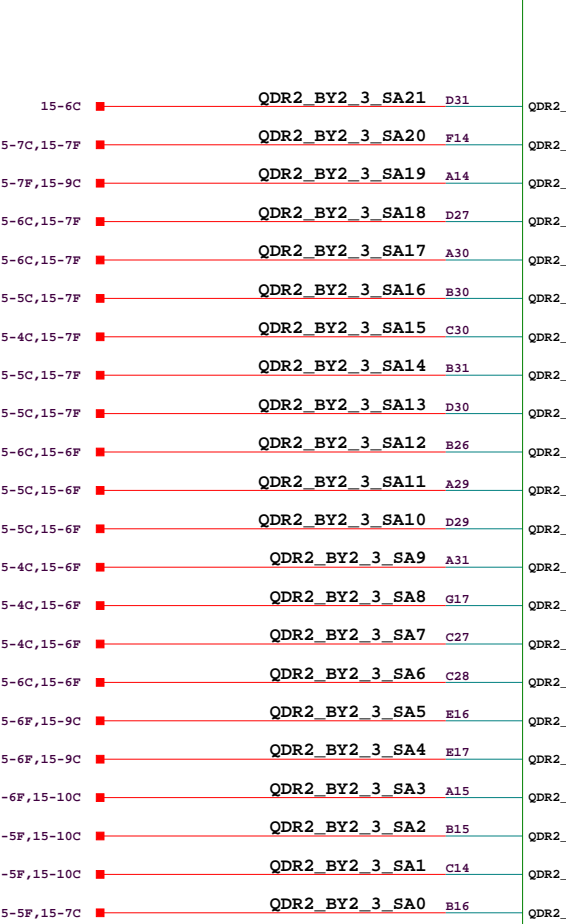
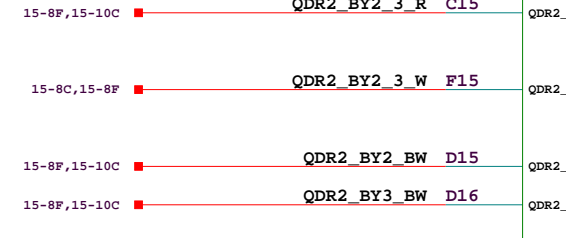
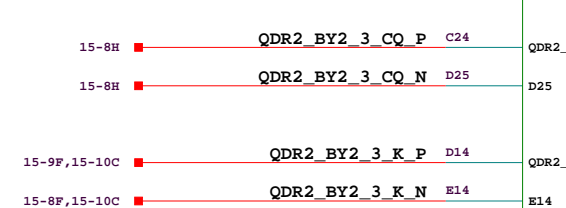
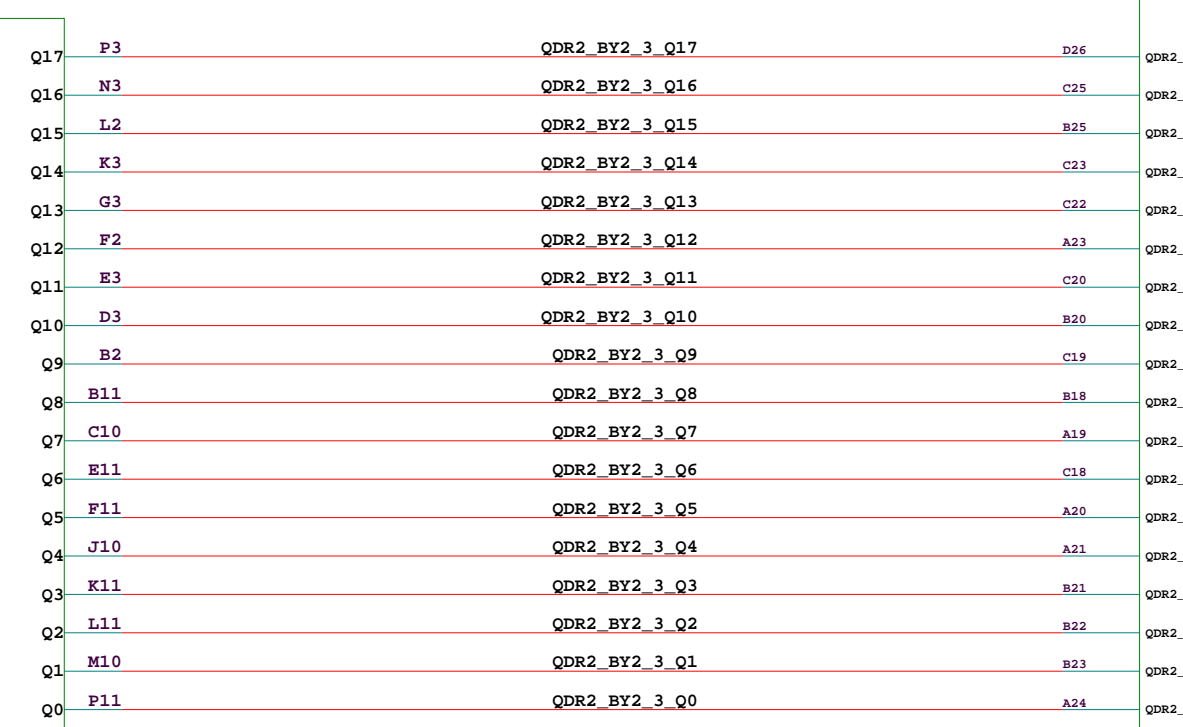
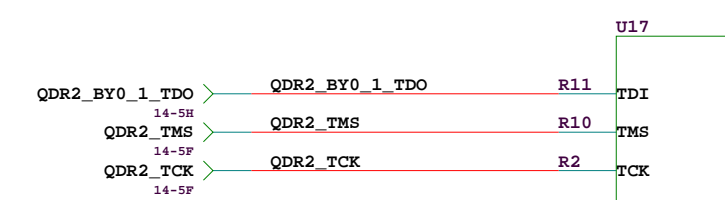
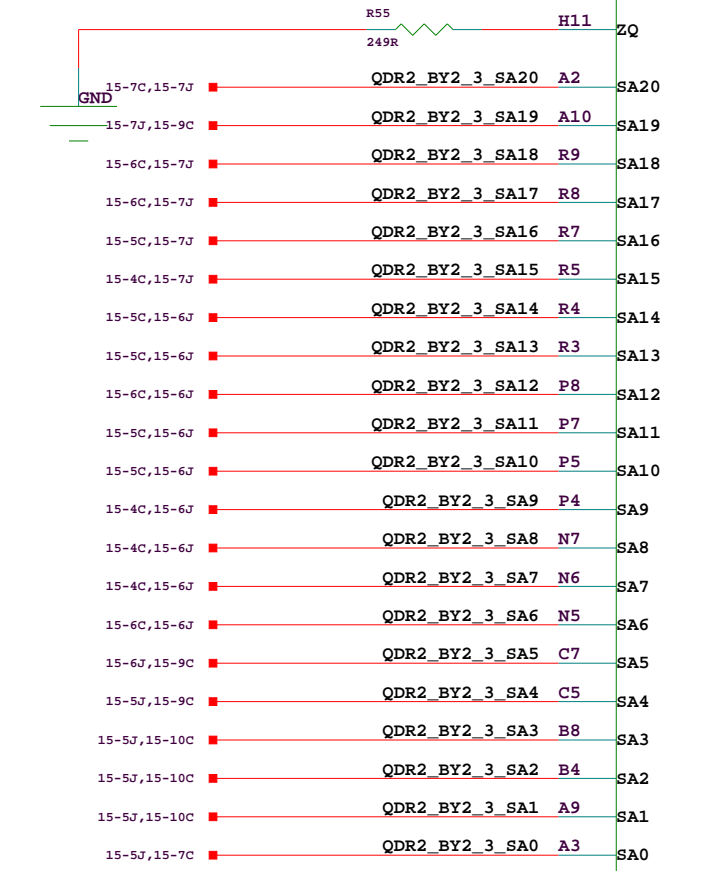
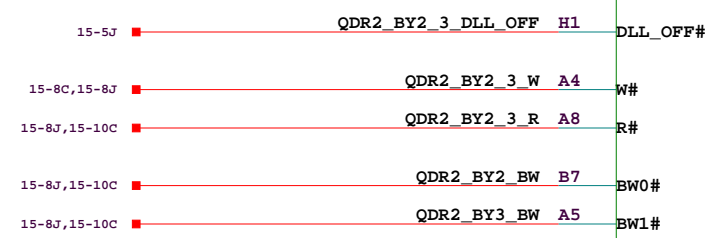
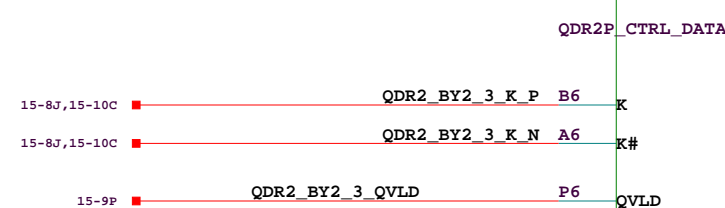
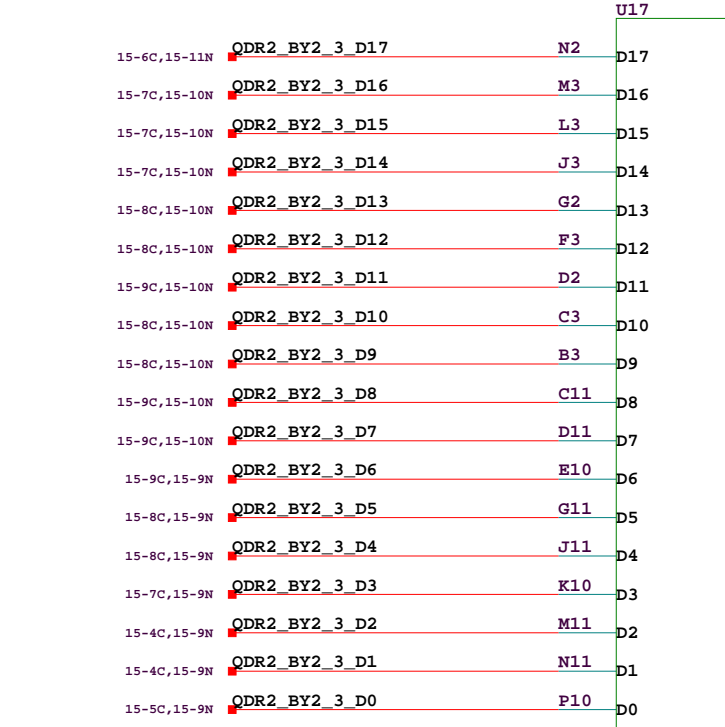
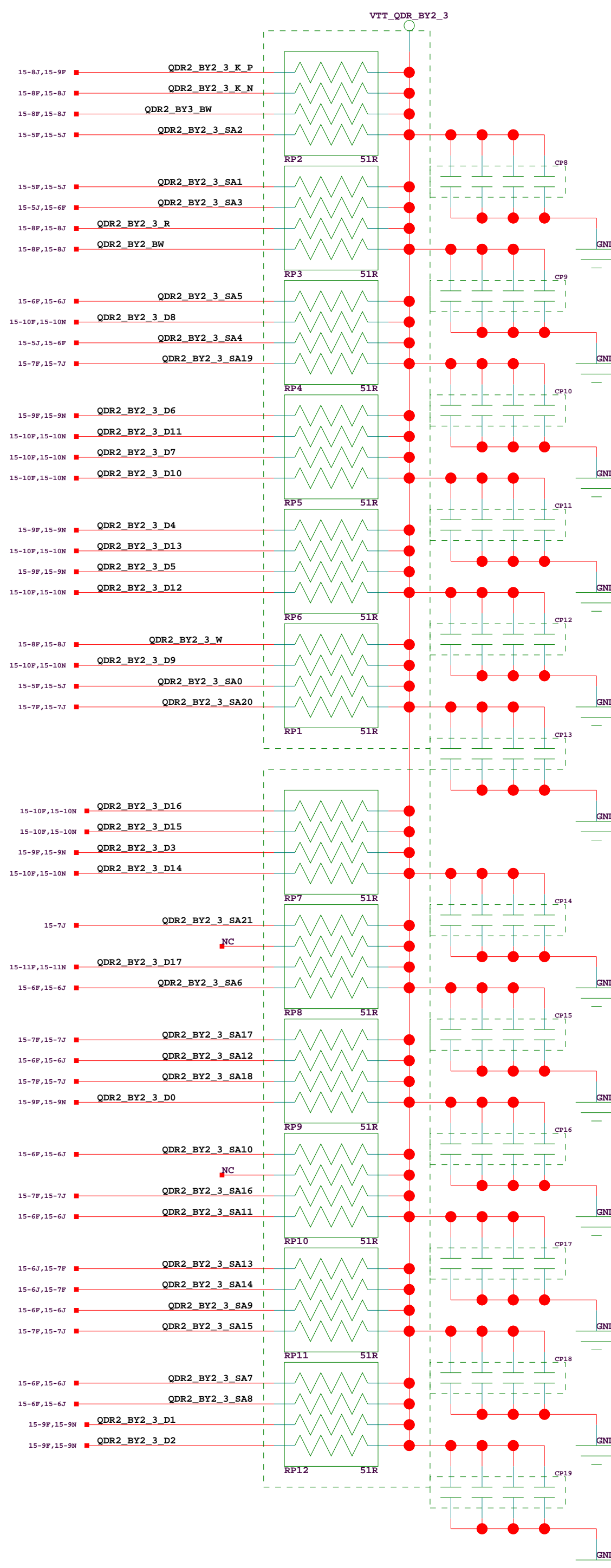




ROACH/iBOB2				ROACH_DIFF_GPIO			
COLLABORATORS: CASPER GROUP, UC BERKELEY NRAO, SOCCERO BaeKAT, CAPE TOWN http://casper.berkeley.edu/ 7-8-2008, 17:41				DOC NO: NRF-ADM-XXX-BD-0001		REVISION: A	
				DESCRIPTION: RECONFIGURABLE OPEN ARCHITECTURE HW			
				DRAWN: F KAPP		APPR:	
CHECKED: E BAUERMEISTER		SHEET		12 OF 25			

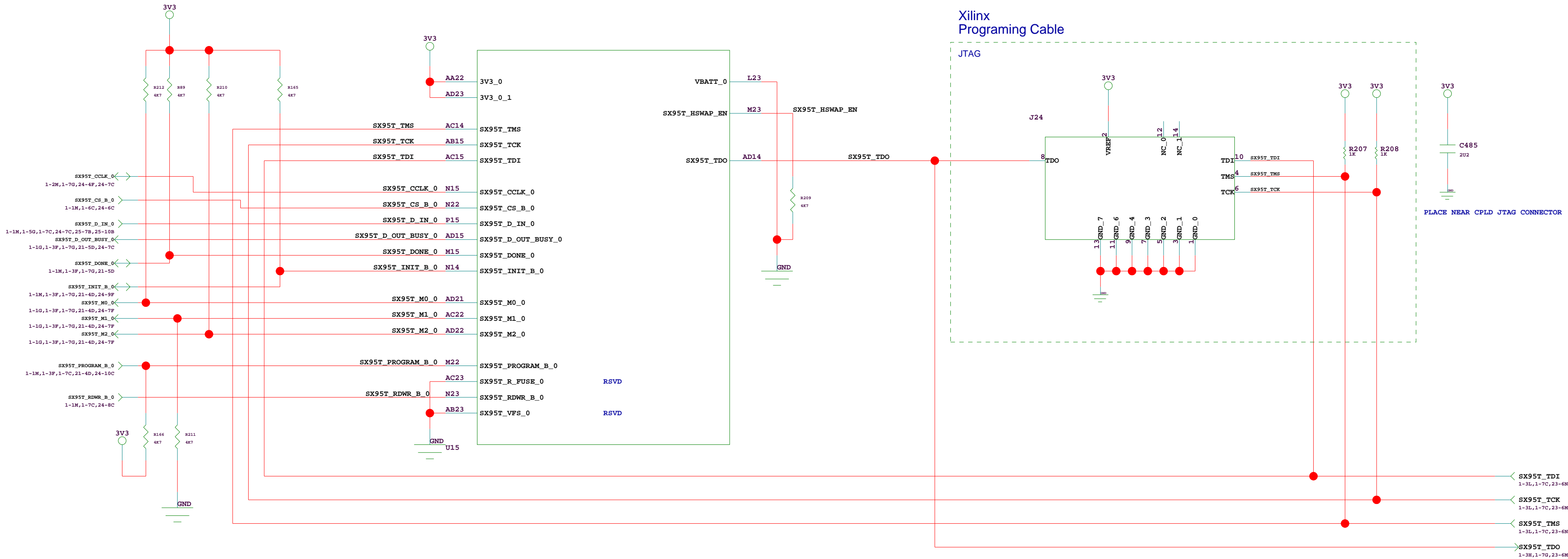




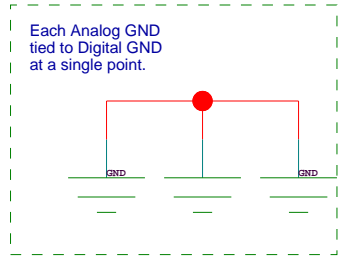
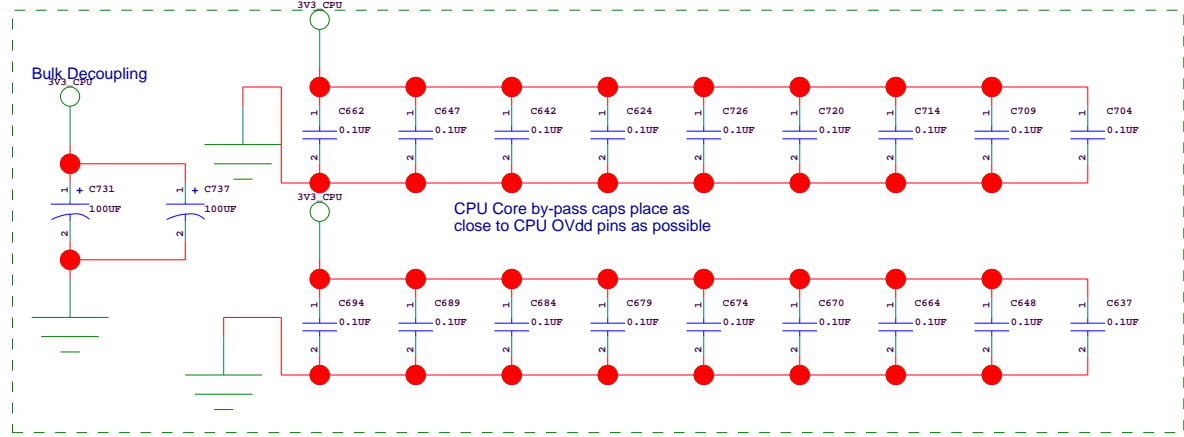
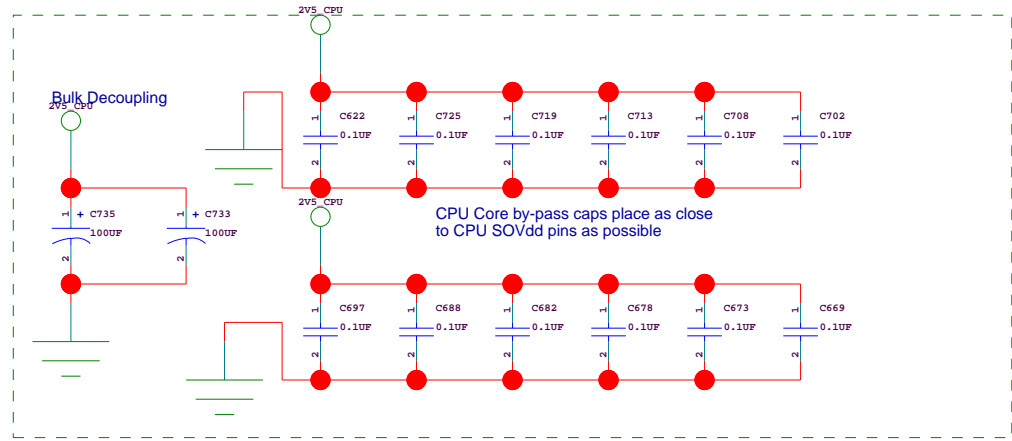
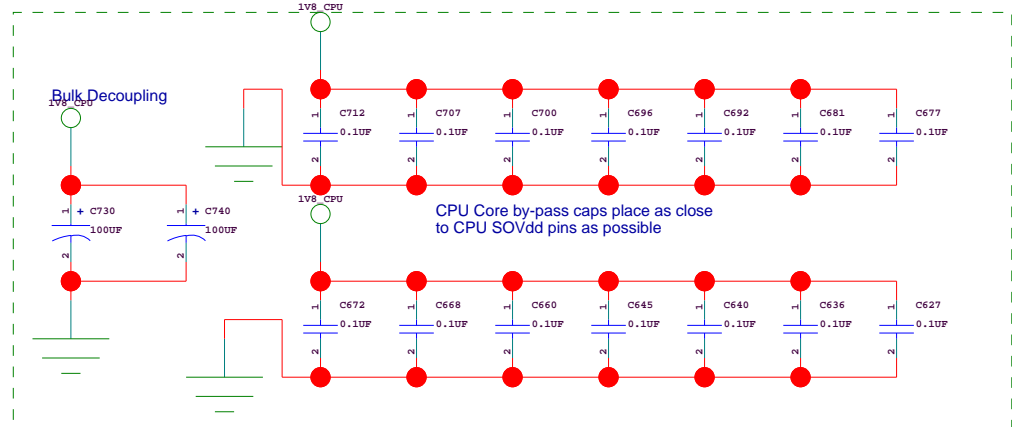
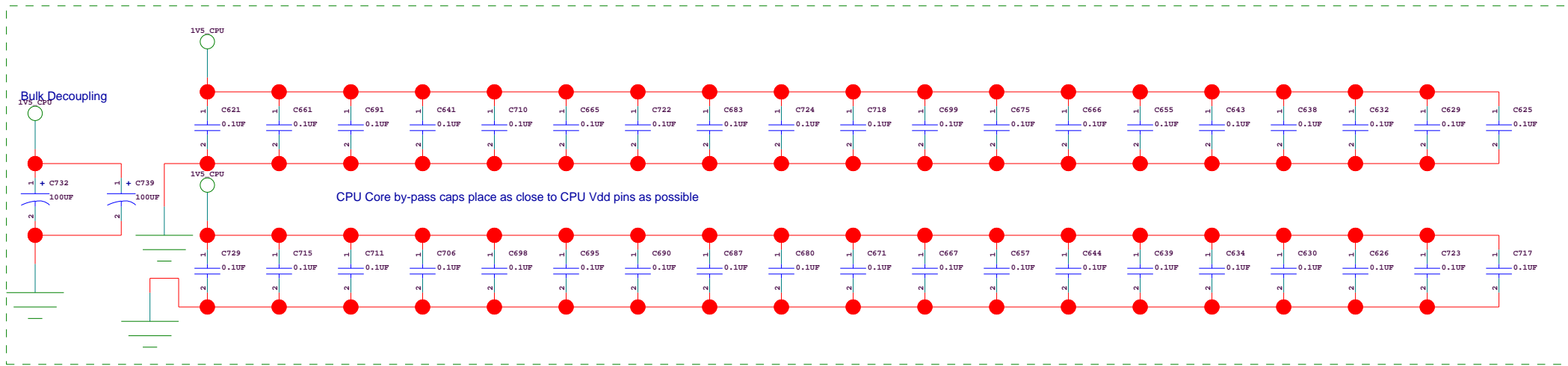
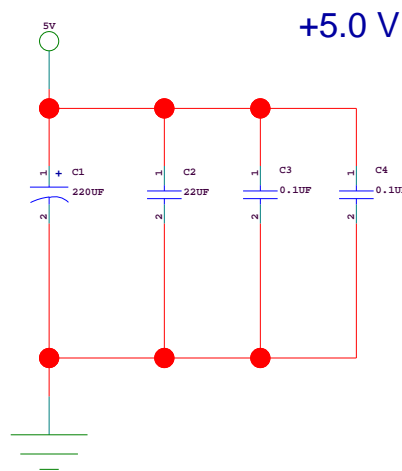
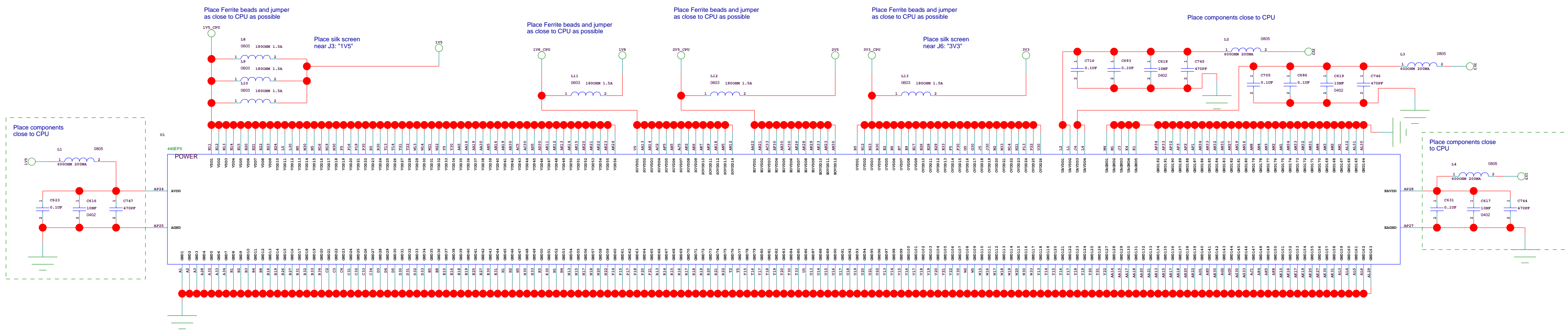


ROACH/iBOB2		ROACH_QDR2P_BY2_3	
COLLABORATORS:		DOC NO	REVISION
CASPER GROUP, UC BERKELEY WRAJ, EGOORNO meerCAT, CAPE TOWN		NRF-ADM-XXX-SD-0001	A
http://casper.berkeley.edu/		RECKSTRON	
		RECOVERABLE/OPEN ARCHITECTURE HW	
7-8-2008 17:41		NAME: F KAPP	APP:
PATH PATH		CHECKED: E BAUERMEISTER	SHEET 15 OF 21

VALID CONFIGURATION MODES			
Configuration Mode	M[2:0]	Bus Width	CCLK Direction
Master Serial	000	1	Output
Master SPI	001	1	Output
Master BPI-Up	010	8, 16	Output
Master BPI-Down	011	8, 16	Output
Master SelectMAP	100	8, 16	Output
JTAG	101	1	Input (TCK)
Slave SelectMAP	110	8, 16, 32	Input
Slave Serial	111	1	Input



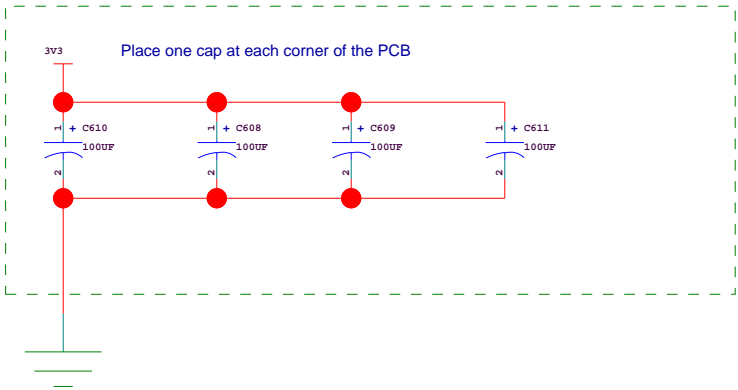
ROACH/iBOB2		DOCH_CONFIG	
COLLABORATORS: CASPER GROUP, UC BERKELEY NRAO, SOCORRO meerKAT, CAPE TOWN http://casper.berkeley.edu/		DOC NO	REVISION
		NRF-ADM-XXX-SD-0001	A
		DESCRIPTION RECONFIGURABLE OPEN ARCHITECTURE NW	
7-8-2008_17:41 PATH PATH		DRAWN: F KAPP	APPR:
		CHECKED: E BAUERMEISTER	SHEET 16 OF 25



REMOVED 1.8V AND 1.5V REGULATORS, CONNECTED TO V5 RAILS

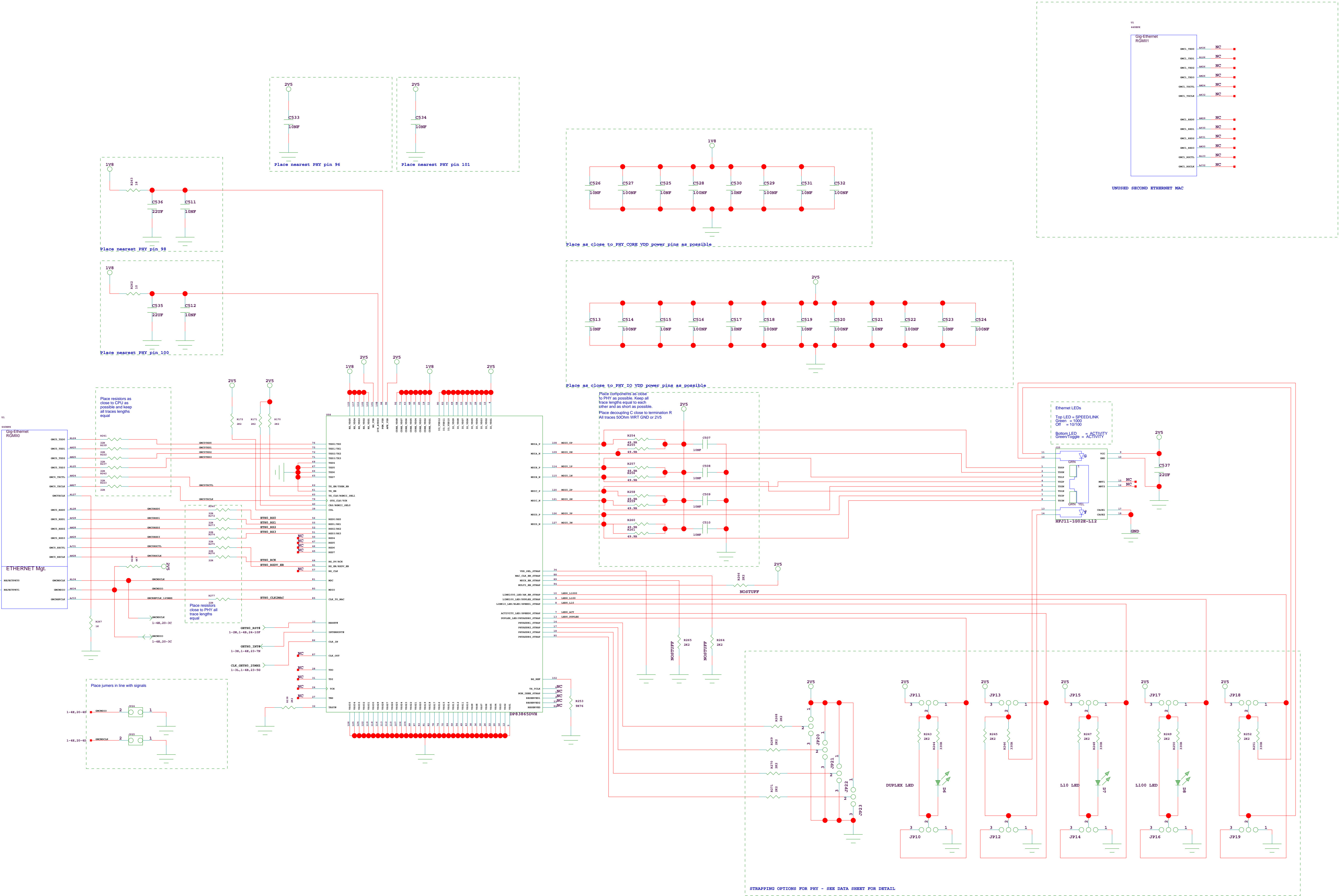
REMOVED VTT AND VREF - INCLUDED ON ROACH_PPC_DDR2

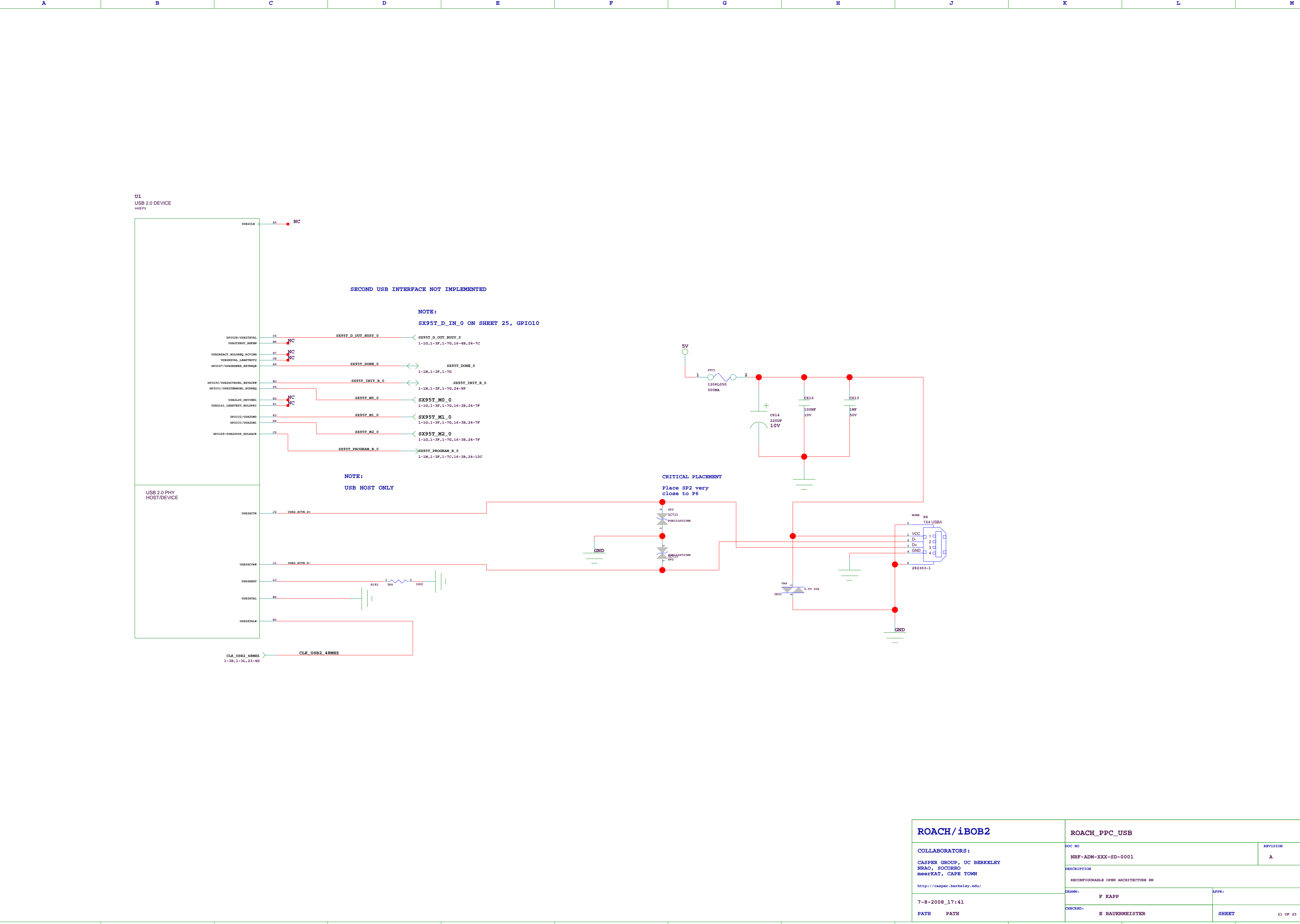
ROACH/iBOE2		ROACH_PPC_POWER_1	
COLLABORATORS: CASPER GROUP, UC BERKELEY NRAO, SOONERO BaeKAT, CAPE TOWN http://casper.berkeley.edu/ 7-8-2008_17:41 PATH PATH	DOC NO NRF-ADM-XXX-SD-0001		REVISION A
	DESCRIPTION RECONFIGURABLE OPEN ARCHITECTURE HW		
	DRAWN: F KAPP		CHECKED: R BAUERNBLISTER
	SHEET		17 OF 25

A	B	C	D	E	F	G	H	J	K	L	M																			
7											7																			
6		REMOVED 3V3 GENERATION									6																			
5											5																			
4	REMOVED +12V GENERATION			REMOVED -12V GENERATION							4																			
3											3																			
2											2																			
1	REMOVED +1V GENERATION			REMOVED +2V5 GENERATION							1																			
0								<table><tr><td colspan="2">ROACH/iBOB2</td><td colspan="2">ROACH_PPC_POWER_2</td></tr><tr><td colspan="2" rowspan="2">COLLABORATORS: CASPER GROUP, UC BERKELEY NRAO, SOCORRO meerKAT, CAPE TOWN http://casper.berkeley.edu/</td><td>DOC NO NRF-ADM-XXX-SD-0001</td><td>REVISION A</td></tr><tr><td colspan="2">DESCRIPTION RECONFIGURABLE OPEN ARCHITECTURE HW</td></tr><tr><td colspan="2">7-8-2008_17:41</td><td>DRAWN: F KAPP</td><td>APPR: </td></tr><tr><td>PATH</td><td>PATH</td><td>CHECKED: E BAUERMEISTER</td><td>SHEET 18 OF 25</td></tr></table>	ROACH/iBOB2		ROACH_PPC_POWER_2		COLLABORATORS: CASPER GROUP, UC BERKELEY NRAO, SOCORRO meerKAT, CAPE TOWN http://casper.berkeley.edu/		DOC NO NRF-ADM-XXX-SD-0001	REVISION A	DESCRIPTION RECONFIGURABLE OPEN ARCHITECTURE HW		7-8-2008_17:41		DRAWN: F KAPP	APPR: 	PATH	PATH	CHECKED: E BAUERMEISTER	SHEET 18 OF 25				0
ROACH/iBOB2		ROACH_PPC_POWER_2																												
COLLABORATORS: CASPER GROUP, UC BERKELEY NRAO, SOCORRO meerKAT, CAPE TOWN http://casper.berkeley.edu/		DOC NO NRF-ADM-XXX-SD-0001	REVISION A																											
		DESCRIPTION RECONFIGURABLE OPEN ARCHITECTURE HW																												
7-8-2008_17:41		DRAWN: F KAPP	APPR: 																											
PATH	PATH	CHECKED: E BAUERMEISTER	SHEET 18 OF 25																											
A	B	C	D	E	F	G	H	J	K	L	M																			

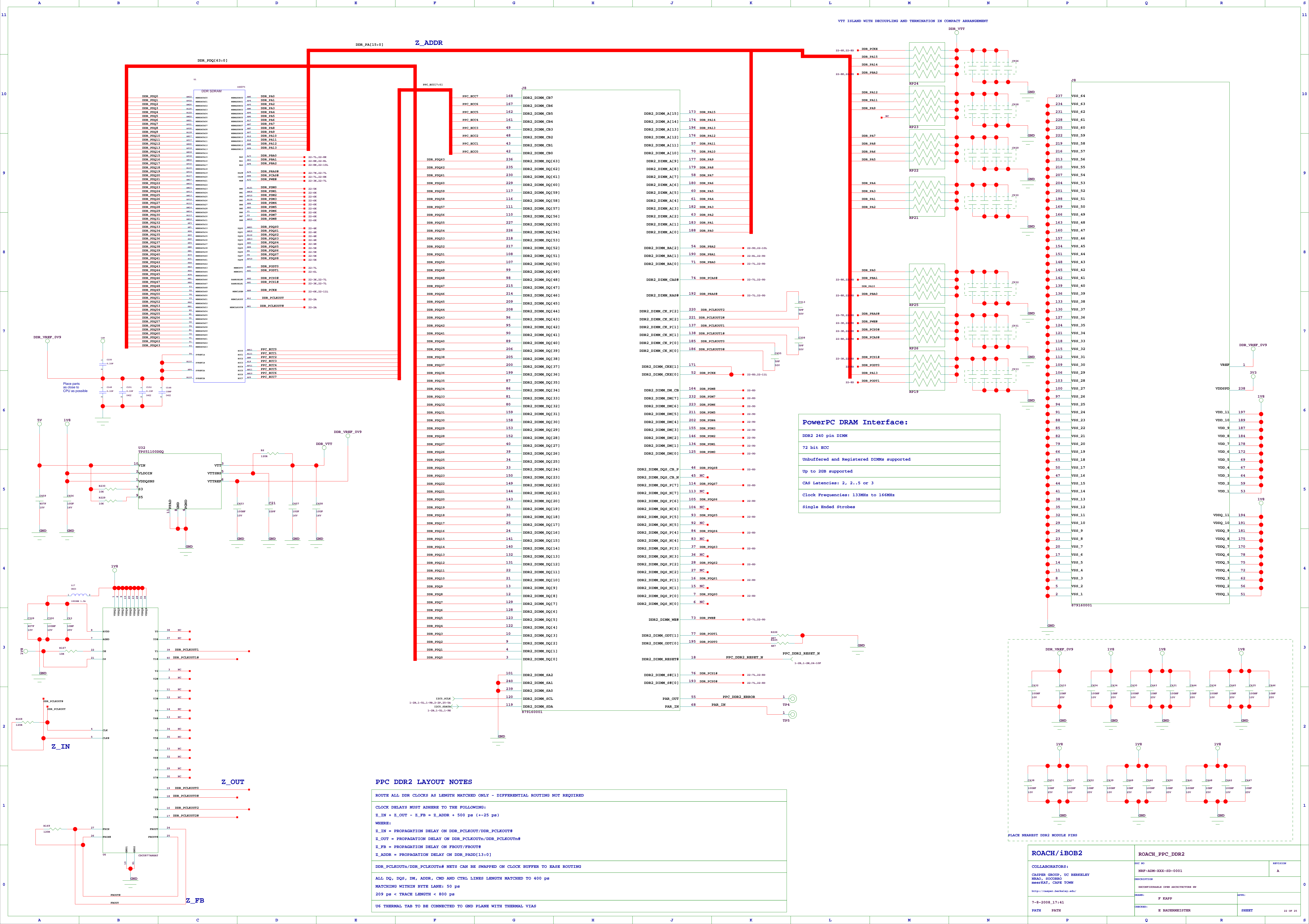
The RGMII signaling is 125 MHz using both rising and falling edges of the clock.
The Tx and the Rx side trace length should be matched within the signal group to minimize timing skew.
It is advised to match the trace length within 0.1 inch within the Tx and Rx signal groups.
Minimize the number of vias on the RGMII lines to minimize timing skew.
Since the signal rise and fall time are sub-nano second, transmission line design guidelines should be followed.

CONFIRMED NC'S ON PINS WITH AMCC TECH SUPPORT IN EMAIL DATED 2007/08/30





ROACH/iBOB2		ROACH_PPC_USB	
COLLABORATORS: CASPER GROUP, UC BERKELEY NRAO, SOCORRO meerKAT, CAPE TOWN http://casper.berkeley.edu/	DOC NO NRF-ADM-XXX-SD-0001		REVISION A
	DESCRIPTION RECONFIGURABLE OPEN ARCHITECTURE HW		
	DRAWN: F KAPP		APPR:
	CHECKED: E BAUERMEISTER		SHEET 21 OF 25
7-8-2008_17:41 PATH PATH			



Critical Placement and Route
Clock Rules:

Clock Rules:
CLK_UART_11_0592MHz = as short as possible
CLK_SYS_33MHz = as short as possible
CLK_CPLD_33MHz = CLK_SYS_33MHz

Critical Placement and Route
Clock Rules:

Clock Rules:
CLK_PC13_6633MHz = as short as possible
CLK_PC12_6633MHz = CLK_PC13_6633MHz
CLK_PC11_6633MHz = CLK_PC12_6633MHz + 2.5°
CLK_GETH0_25MHz = as short as possible
CLK_GETH1_25MHz = CLK_GETH0_25MHz
CLK_CPLD_50MHz = as short as possible
CLK_USB2_0_48MHz = as short as possible
CLK_USB2_0_12MHz = as short as possible

TRACE & JTAG CONNECTORS

Critical placement and routing
of the Trace connector and nets.
Up to CPU frequency!

TRACE PORT

ROACH/iBOE2

ROACH_PPC_TST_CLK_IO

COLLABORATORS:

CASPER GROUP, UC BERKELEY
NRAO, SOONERO
Bharat, CAPE TOWN

<http://casper.berkeley.edu/>

7-8-2008_17:41

PATH PATH

DOC NO

NRF-ADM-XXX-SD-0001

DESCRIPTION

RECONFIGURABLE OPEN ARCHITECTURE HW

DESIGN:

F KAPP

CHECKED:

R BAUERMEISTER

REVISION

A

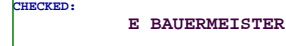
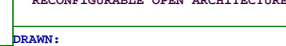
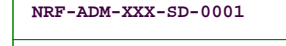
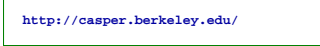
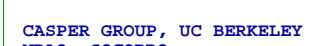
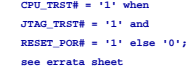
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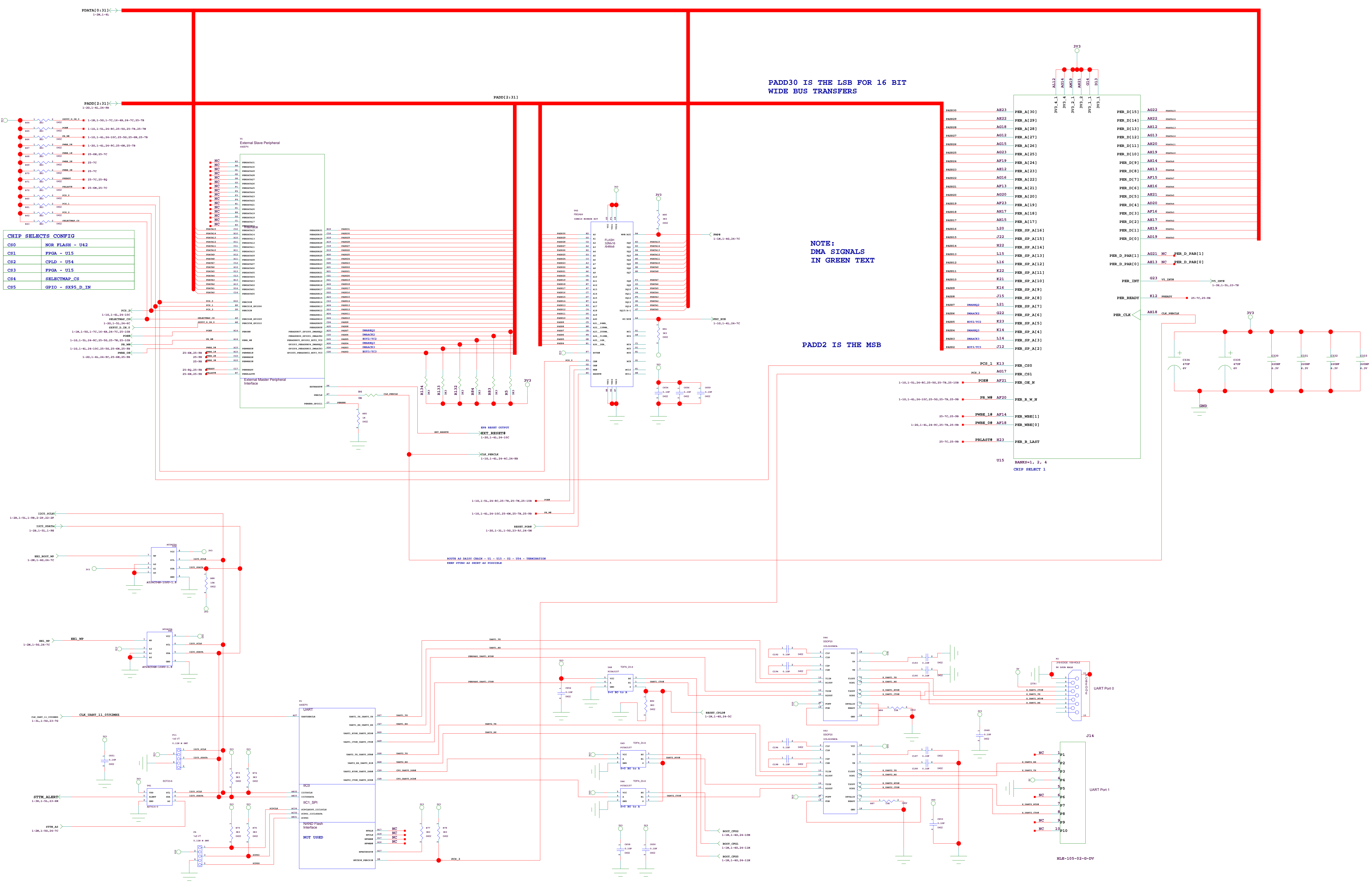
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PATH PATH

SHEET

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ROACH/iBOB2		ROACH_PPC_NVM_SERIAL	
COLLABORATORS:		DOC NO	REVISION
CASPER GROUP, UC BERKELEY		NRF-ADM-XXX-BD-0001	A
NRAO, SOONERO		DESCRIPTION	
Reconfigurable Open Architecture SW		REVISION	
http://casper.berkeley.edu/		DATE	7-8-2008 17:41
7-8-2008 17:41		DESIGNED BY	F KAPP
PATH		CHECKED BY	R BAUERMEISTER
		SHEET	25 OF 25