

MAIN
main.SchDoc

MECH
mechanical.SchDoc

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NOTE: DO ECP5 DESIGN CHECKLIST!
NOTE: ANALYZE JTAG PULL-UPS/DOWNS
NOTE: ANALYZE DDR3 TERMINATION

1. MATCH ALL DIFFERENTIAL PAIRS TO 0.2MM

C

C

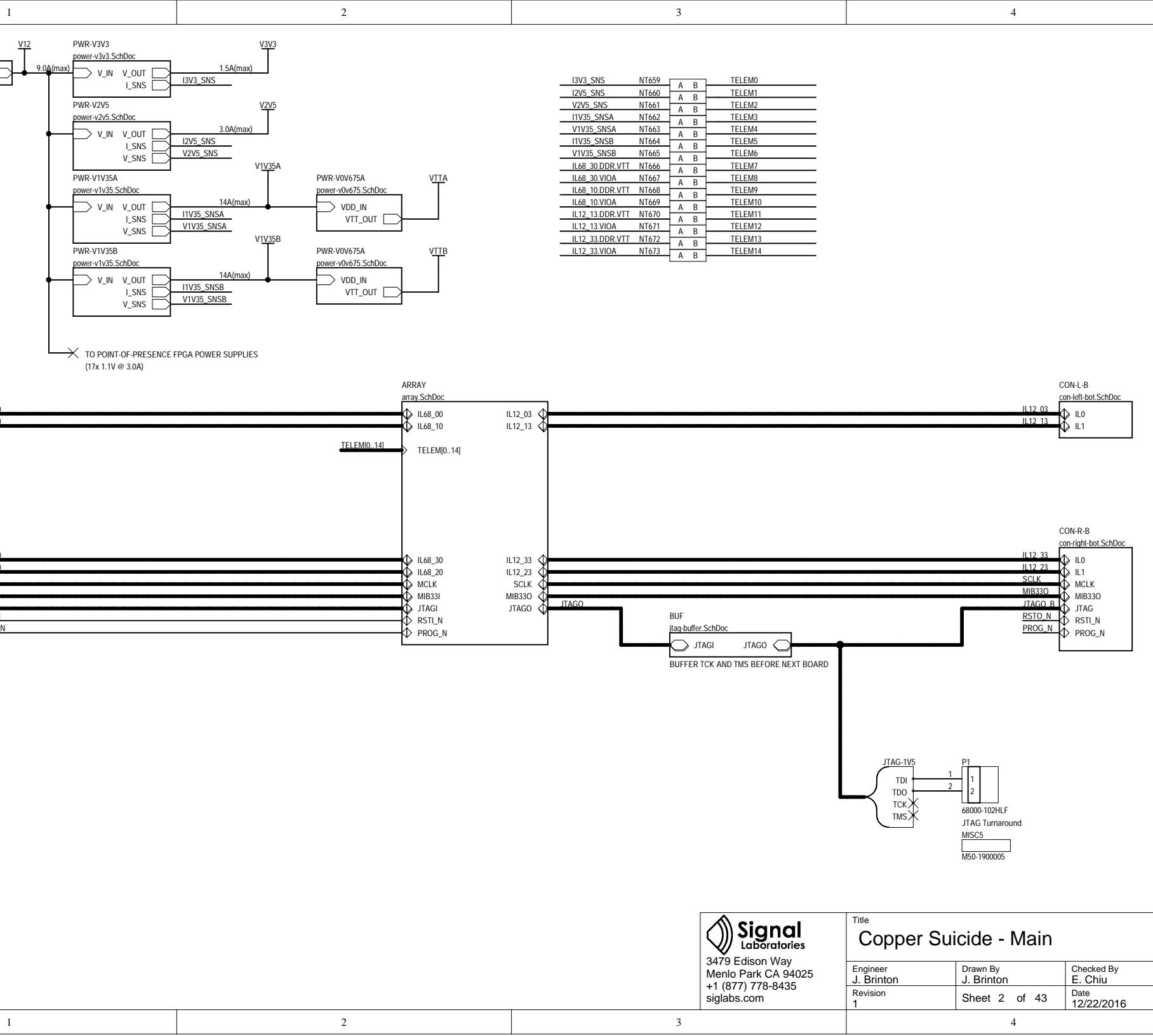
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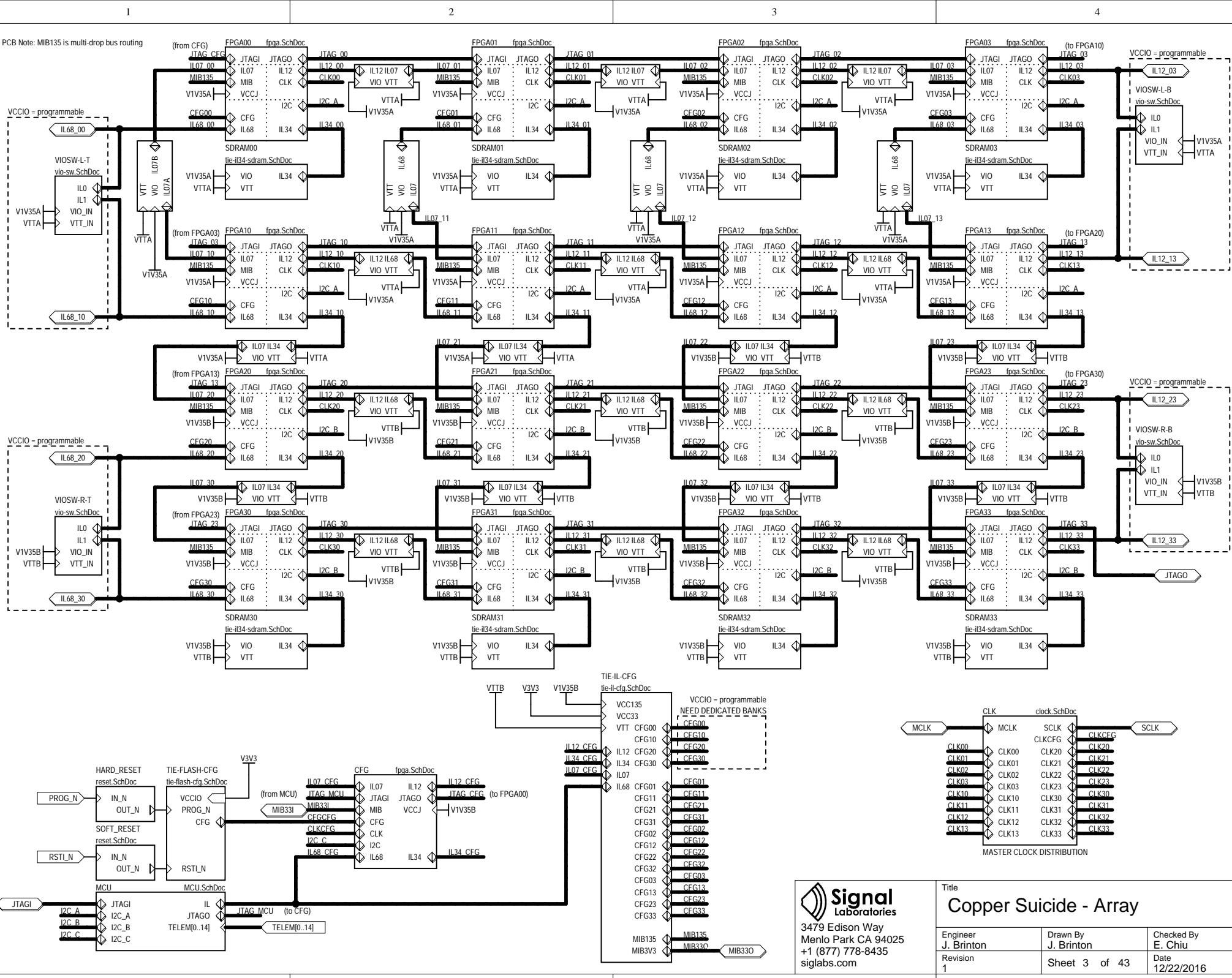
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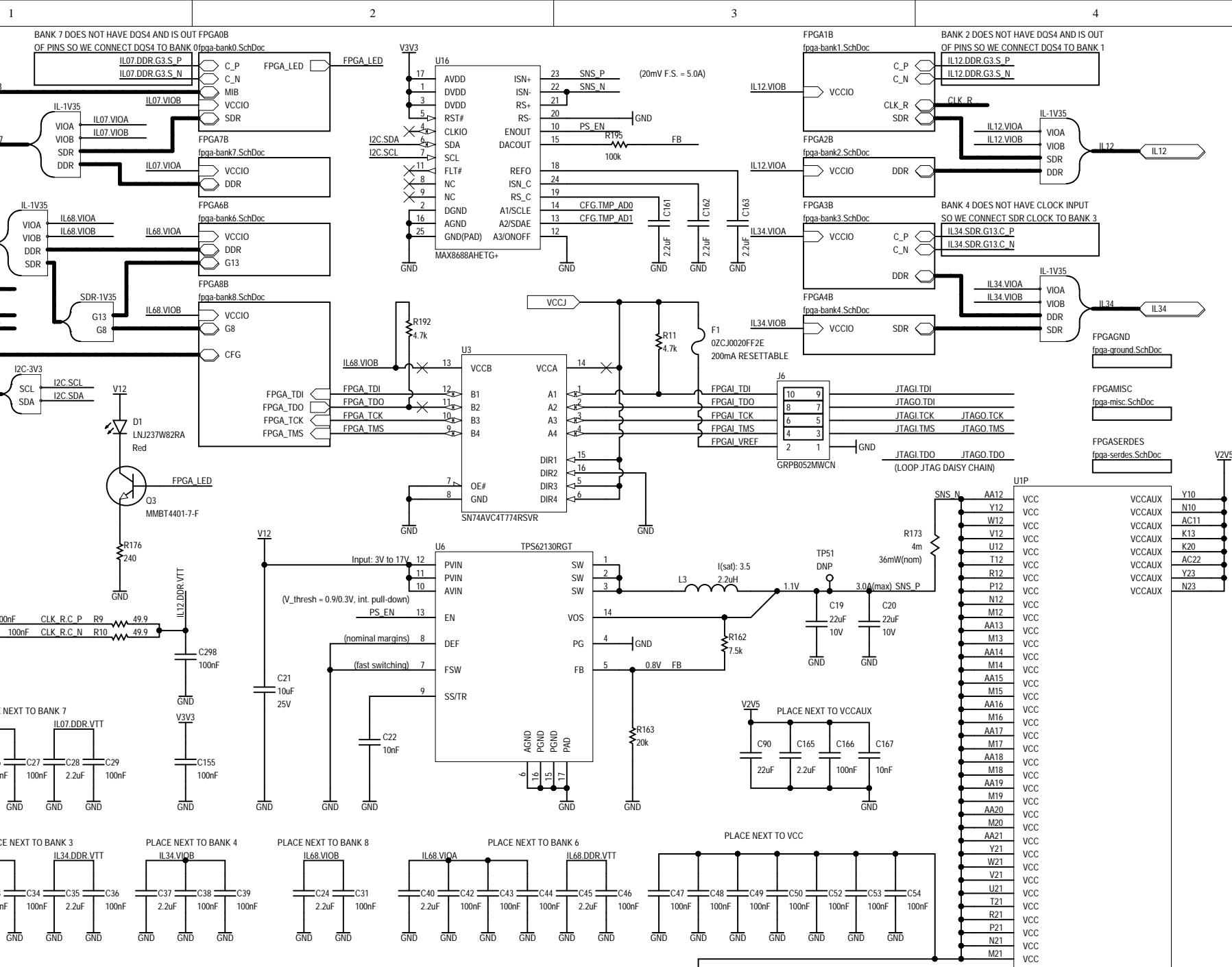


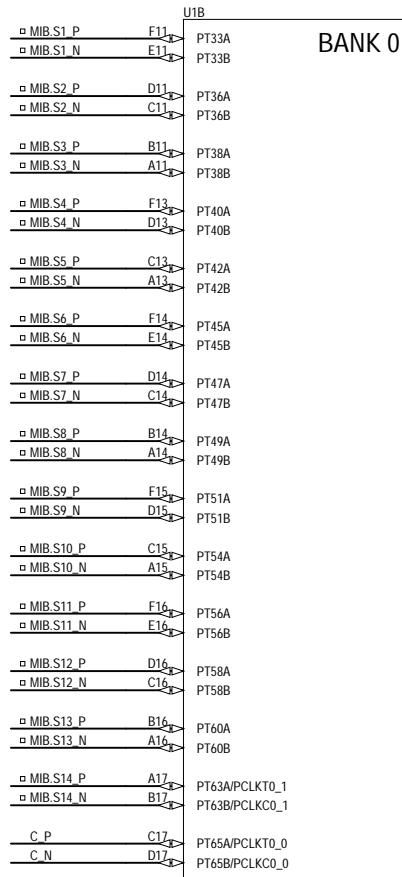
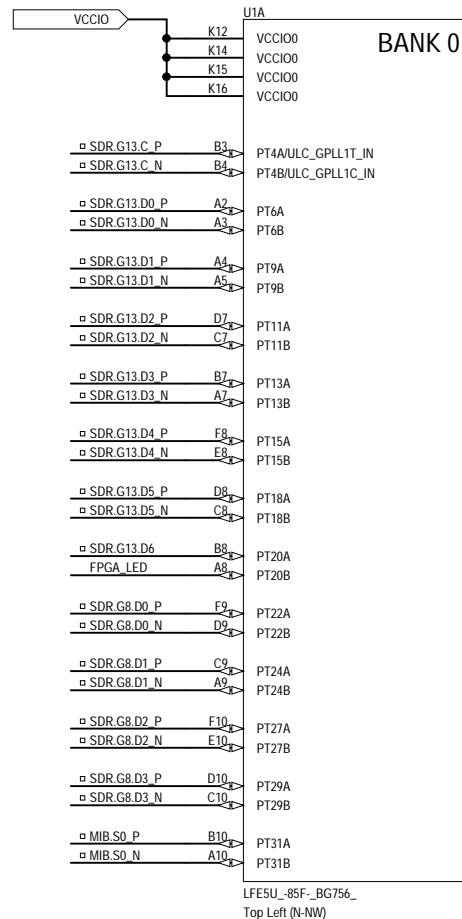
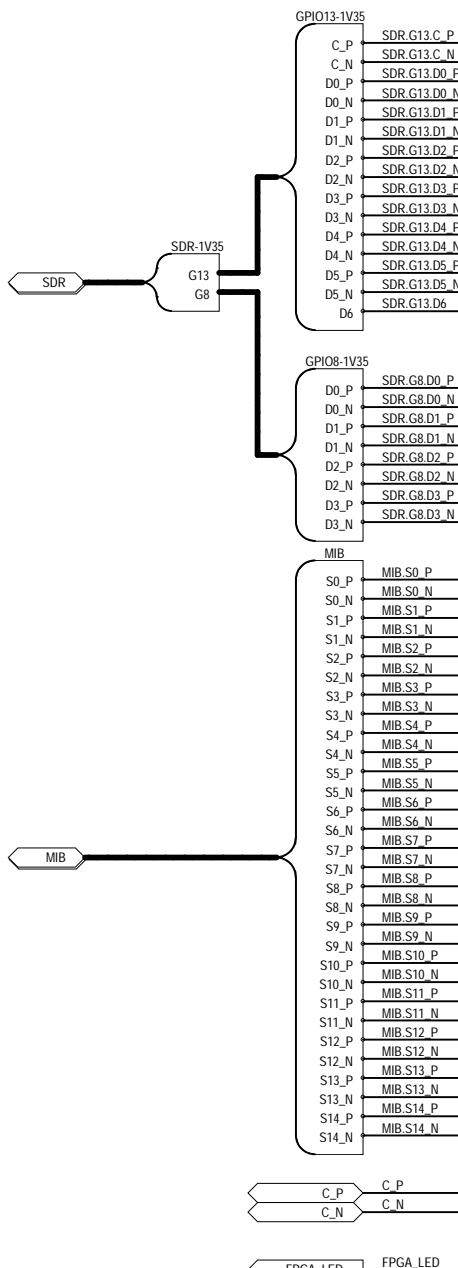
3479 Edison Way
Menlo Park CA 94025
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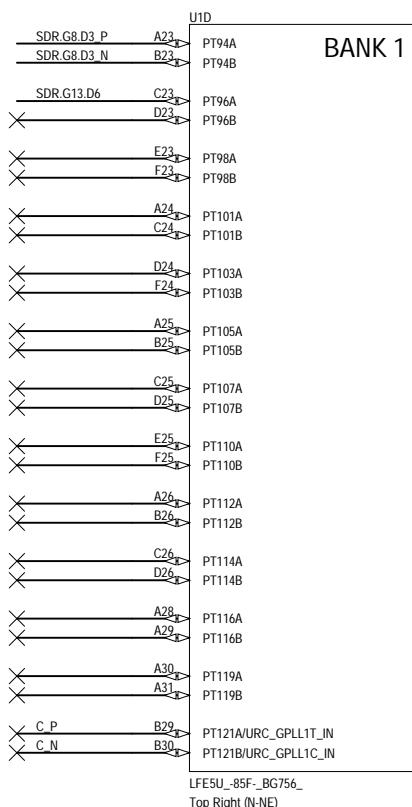
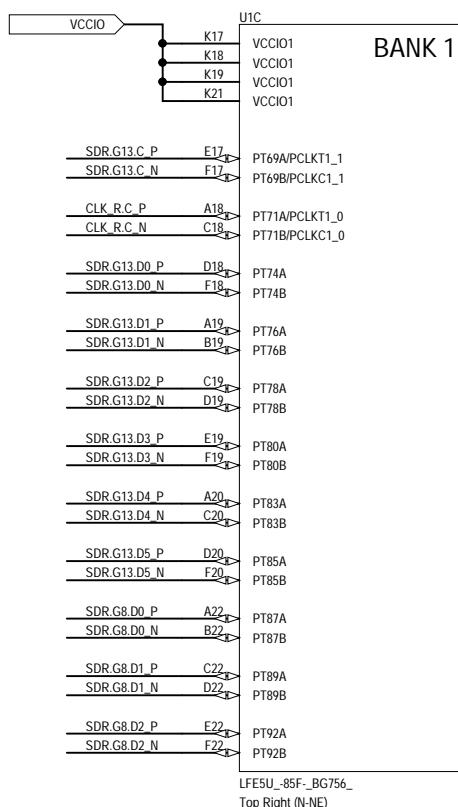
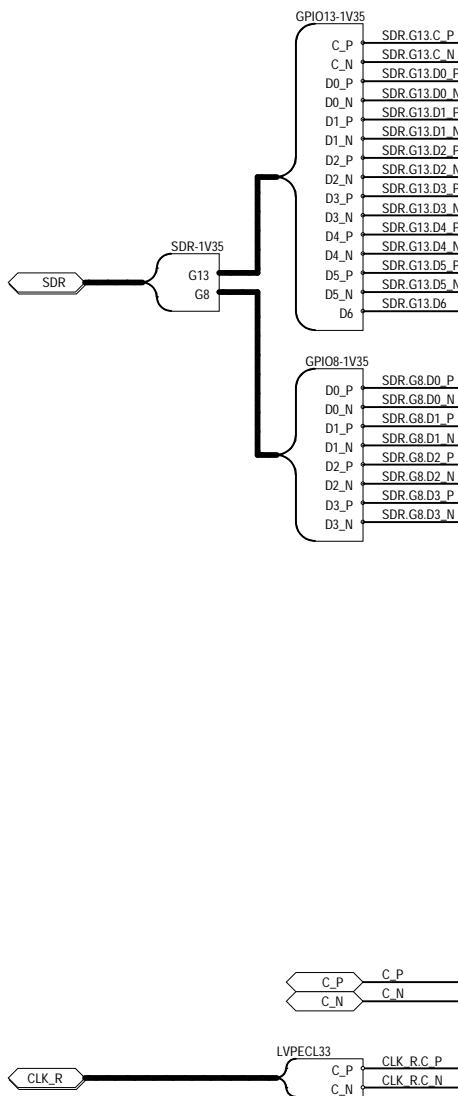
Title		
Copper Suicide - Top		
Engineer	Drawn By	Checked By
J. Brinton	J. Brinton	E. Chiu
Revision	Sheet 1 of 43	Date
1		12/22/2016

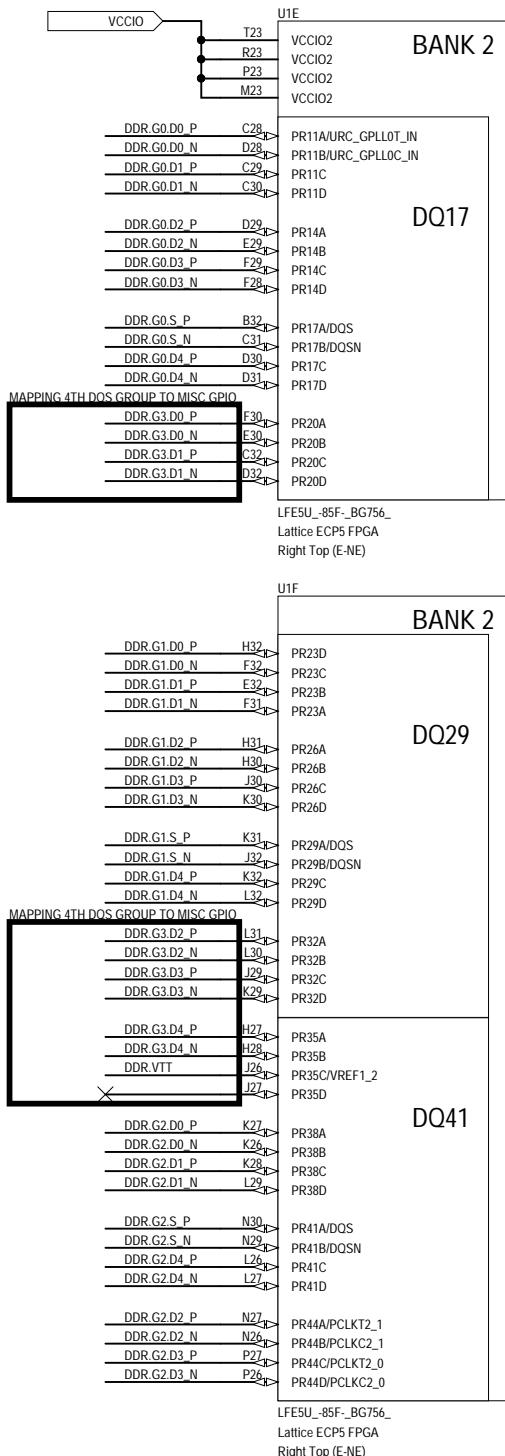
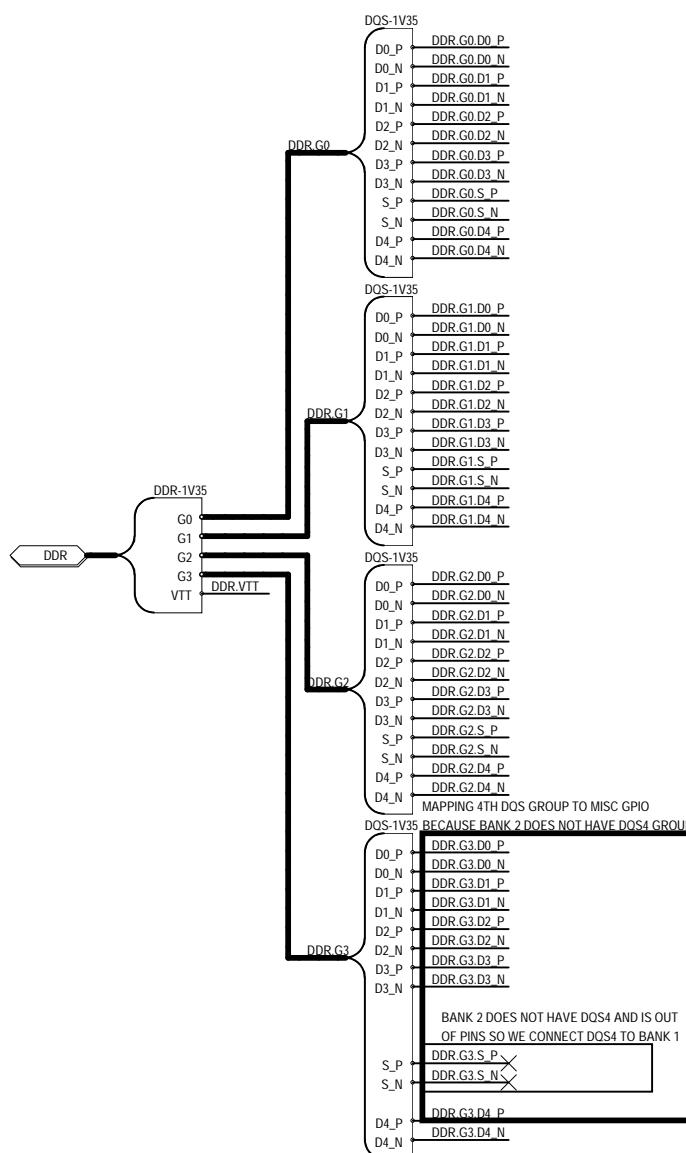


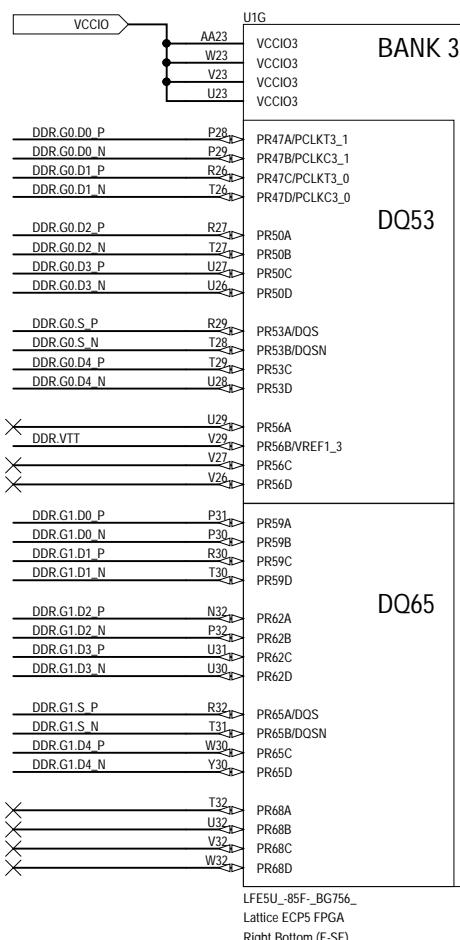
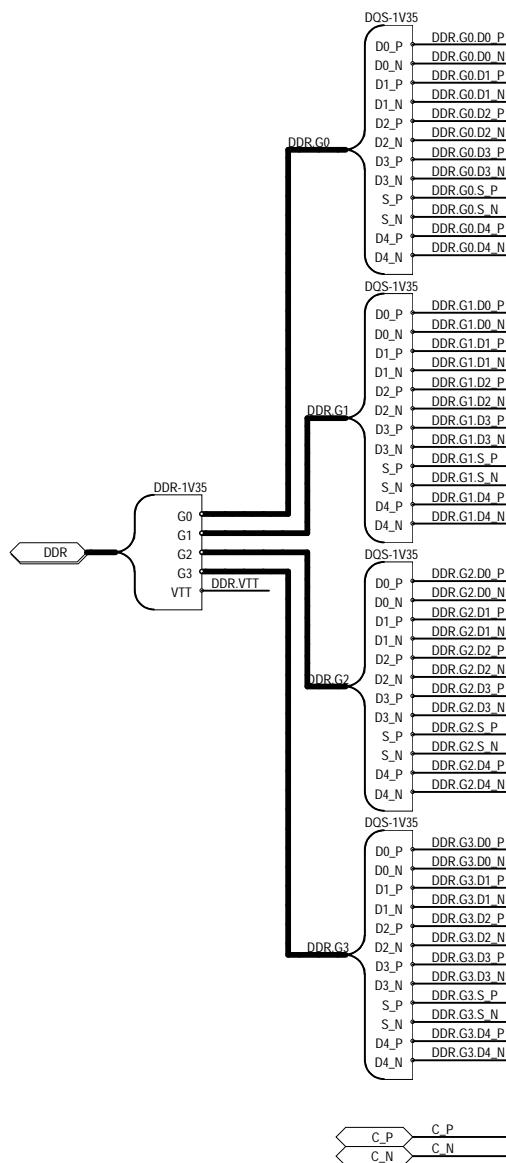


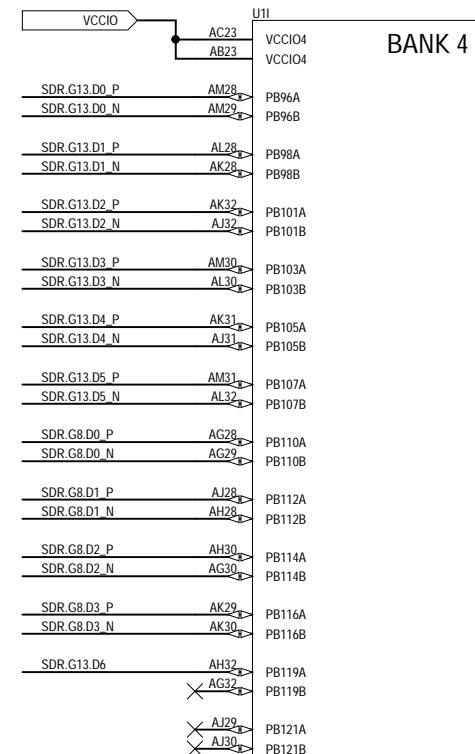
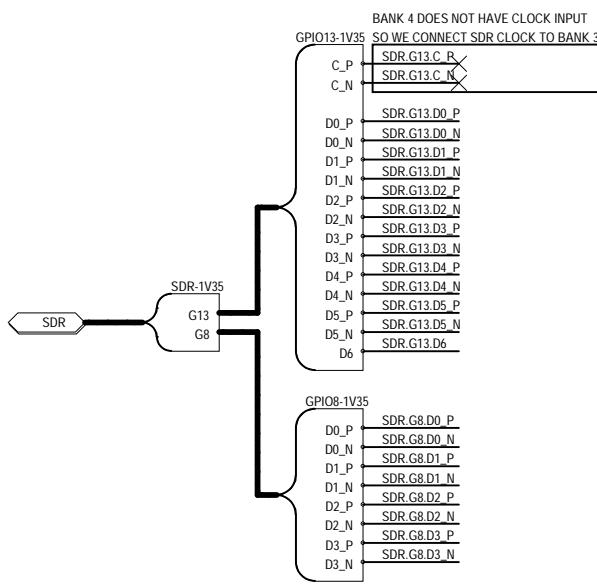




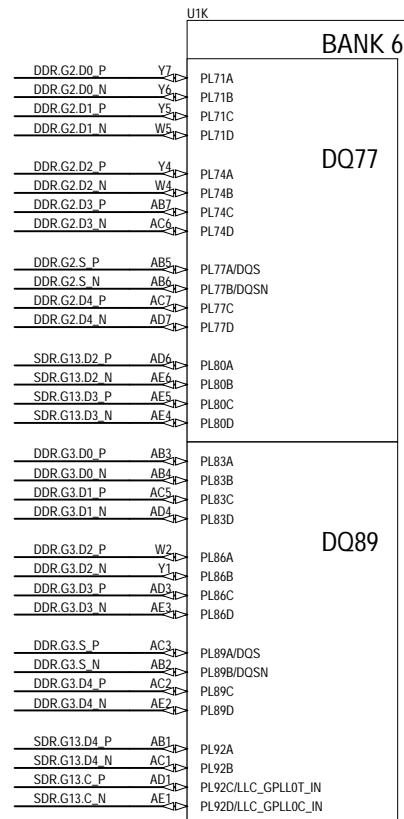
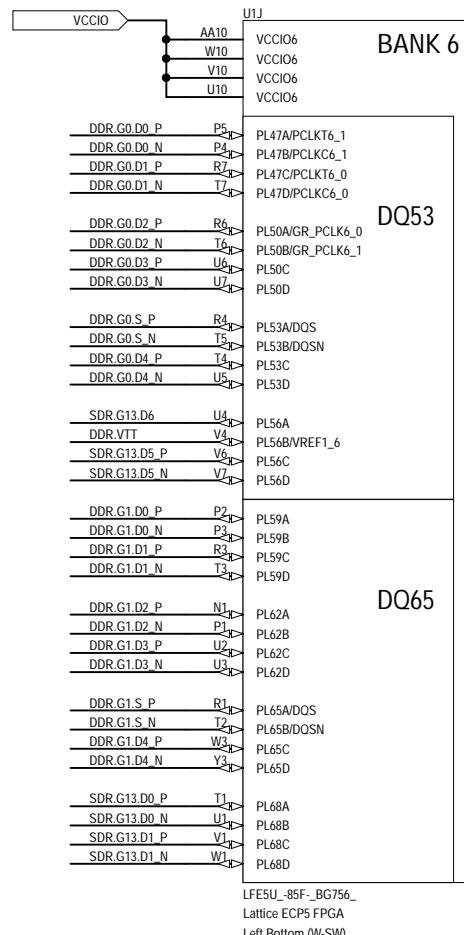
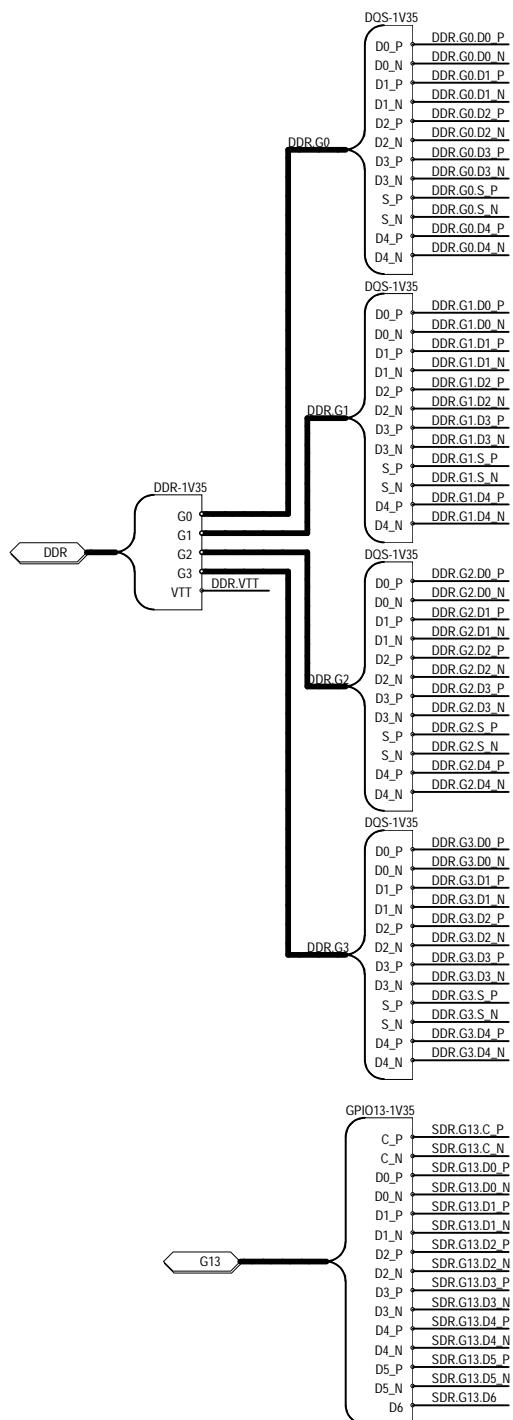


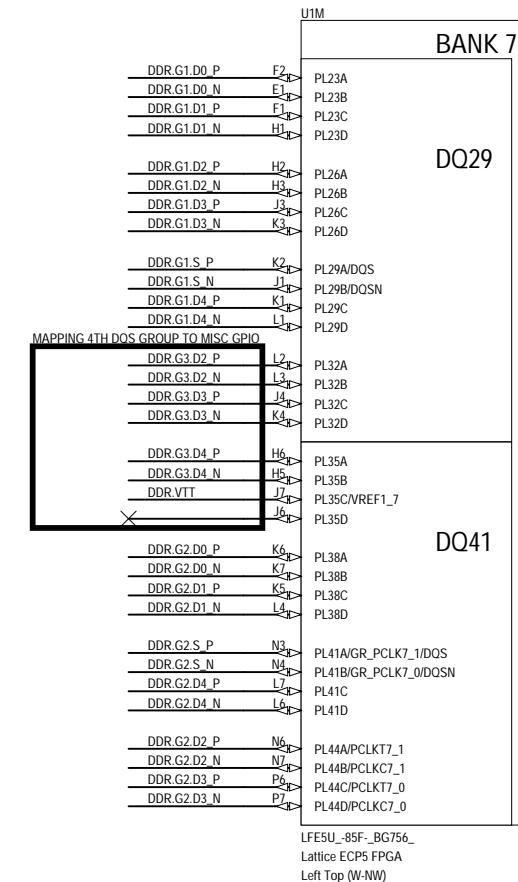
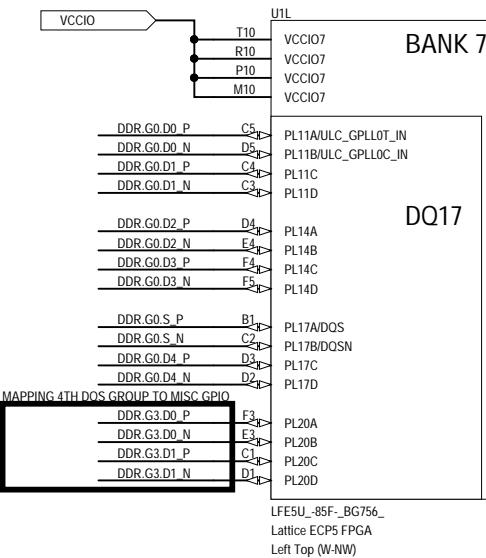
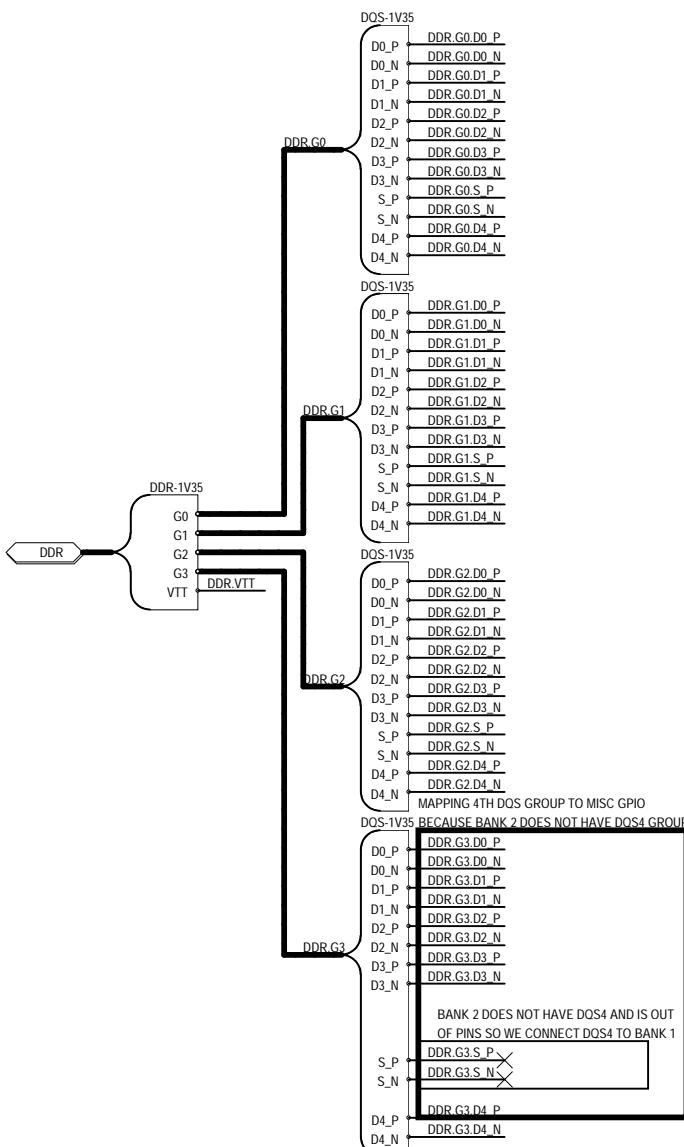




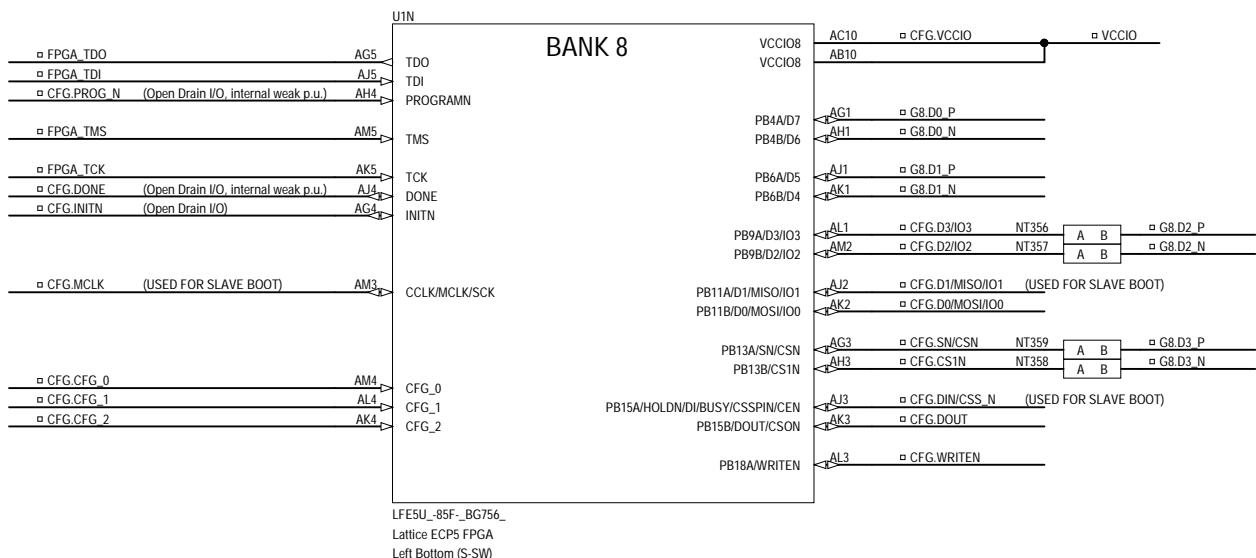
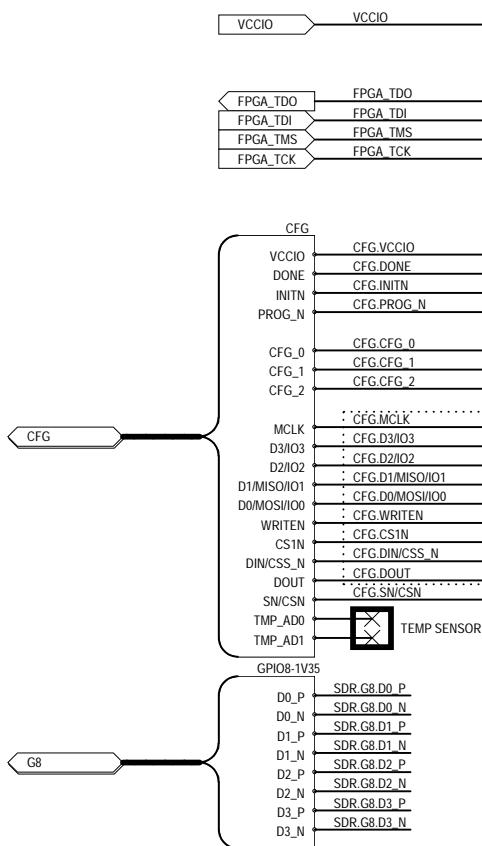


LFE5U-85F-BG756
Lattice ECP5 FPGA
Right Bottom (S-SE)





A



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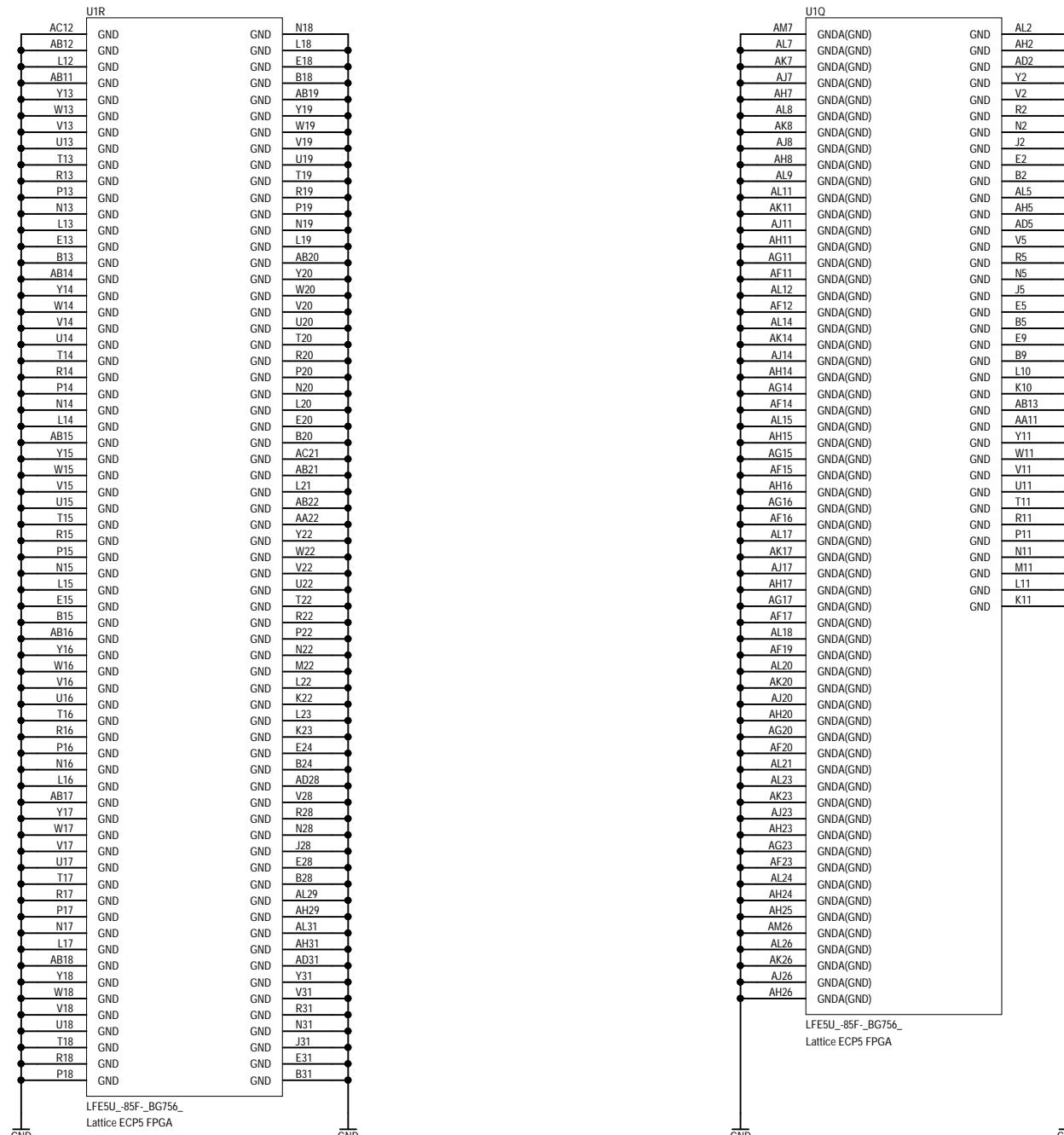
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Copper Suicide - FPGA - Ground		
Engineer J. Brinton	Drawn By J. Brinton	Checked By E. Chiu
Revision 1	Sheet 13 of 43	Date 12/22/2016

A

A

B

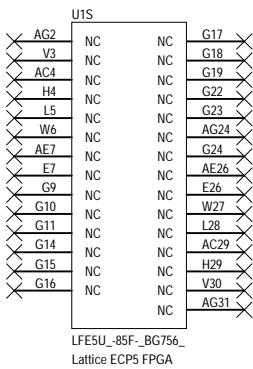
B

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Title		
Copper Suicide - FPGA - Misc		
Engineer J. Brinton	Drawn By J. Brinton	Checked By E. Chiu
Revision 1	Sheet 14 of 43	Date 12/22/2016

A

A

B

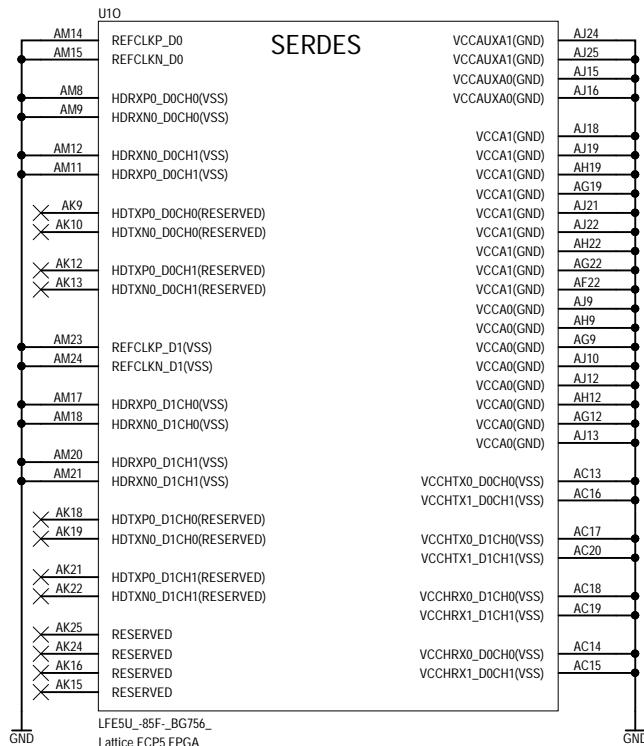
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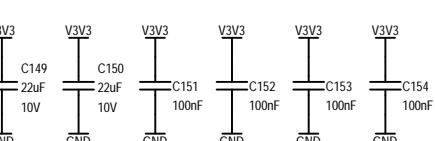
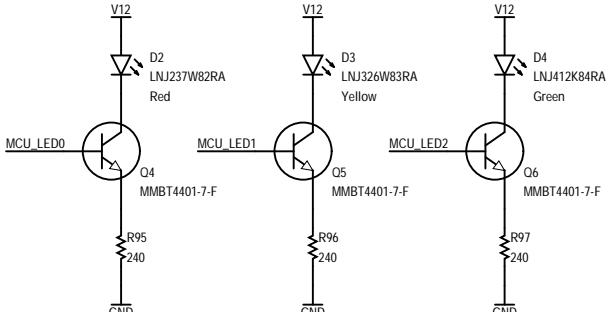
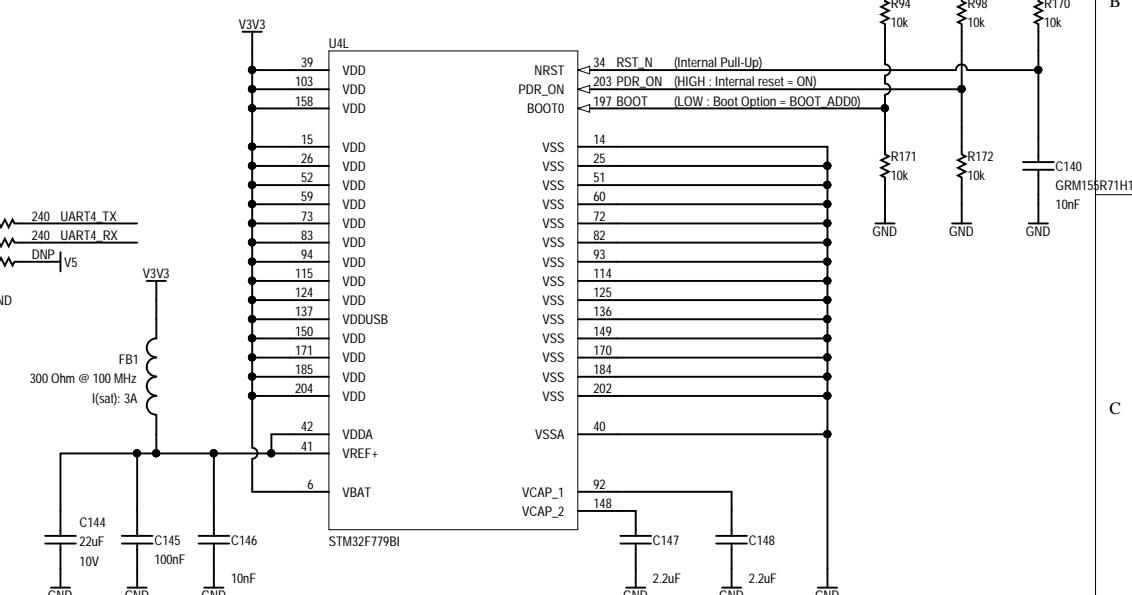
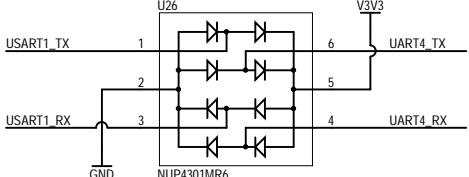
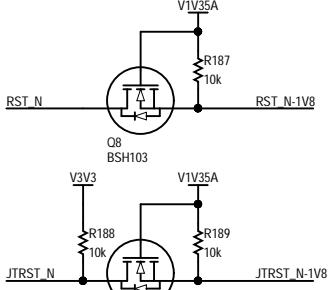
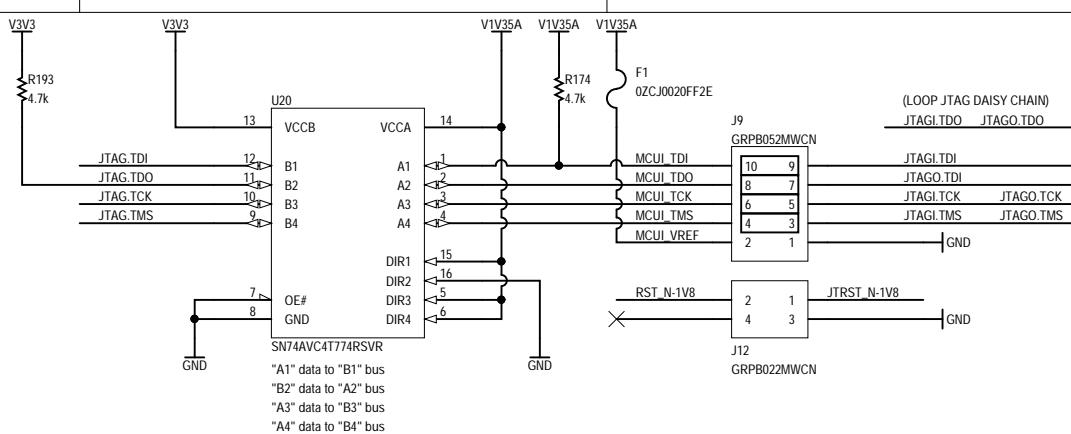
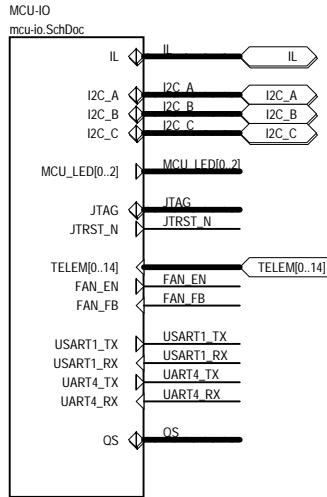
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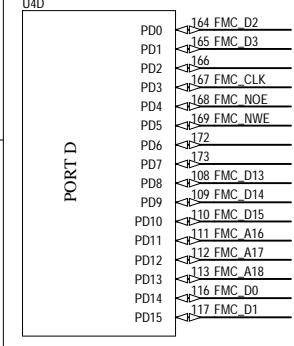
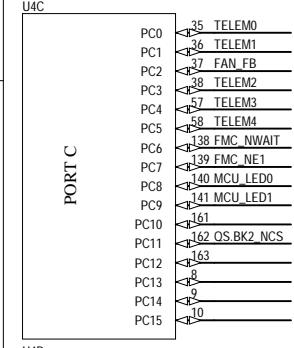
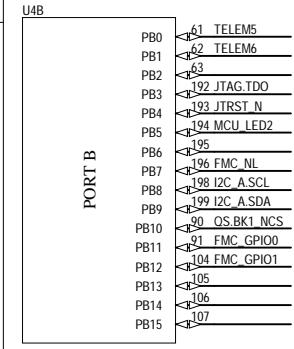
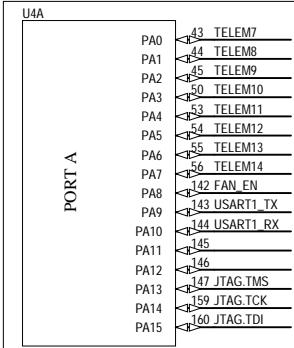
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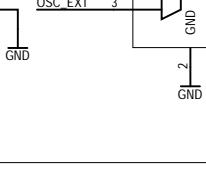
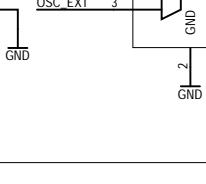
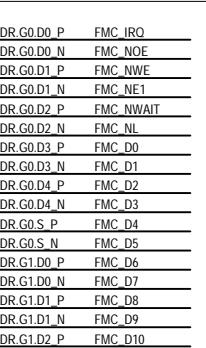
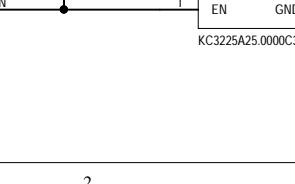
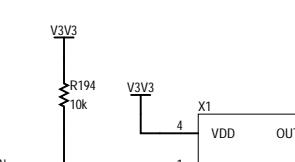
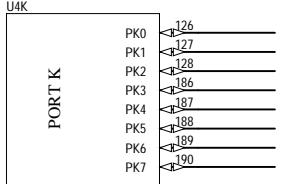
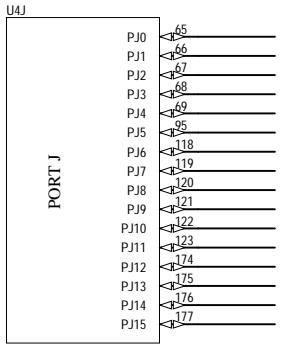
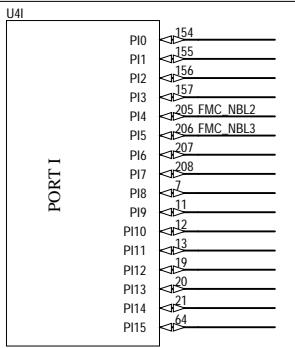
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Copper Suicide - FPGA - SERDES		
Engineer J. Brinton	Drawn By J. Brinton	Checked By E. Chiu
Revision 1	Sheet 15 of 43	Date 12/22/2016



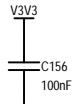
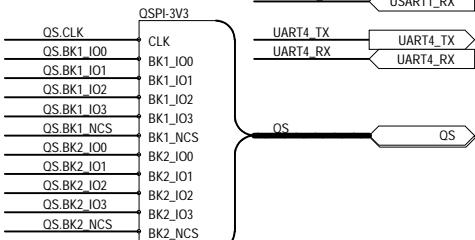
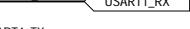
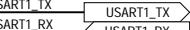
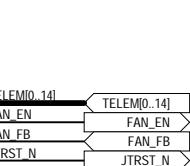
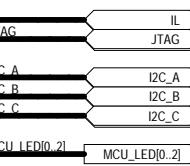
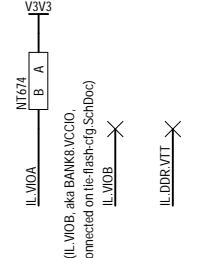
1 2 3 4



1 2 3 4



1 2 3 4



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3479 Edison Way
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Title

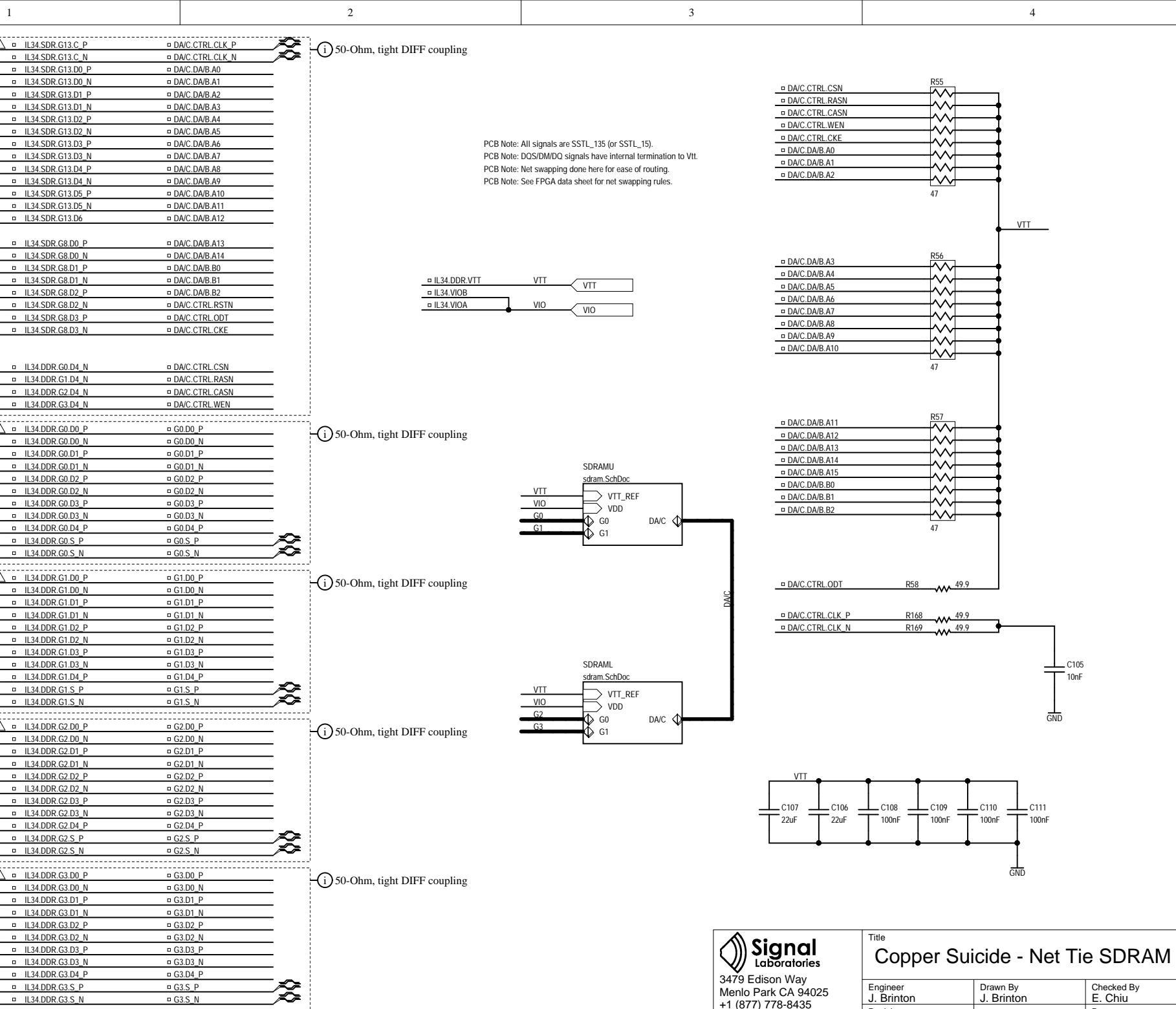
Copper Suicide - MCU - I/O

Engineer
J. BrintonDrawn By
J. BrintonChecked By
E. ChiuRevision
1

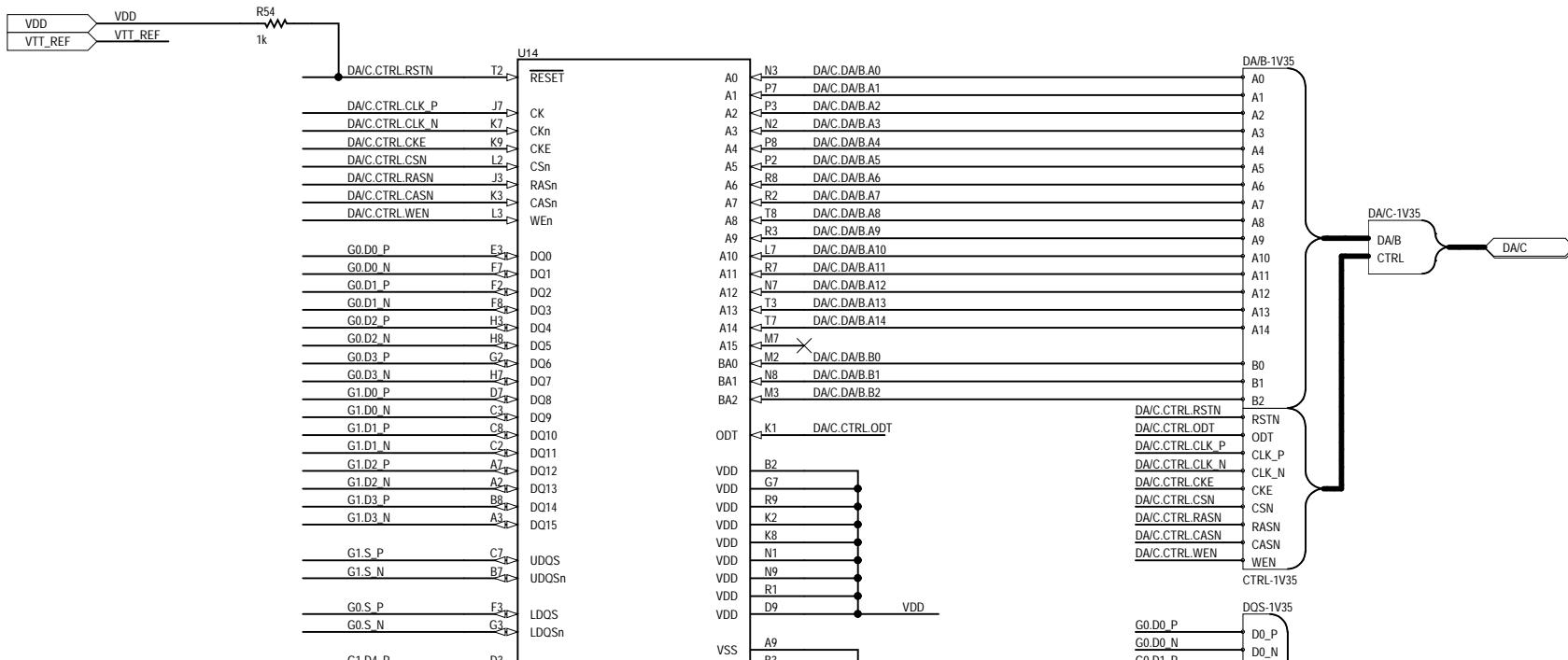
Sheet 17 of 43

Date
12/22/2016

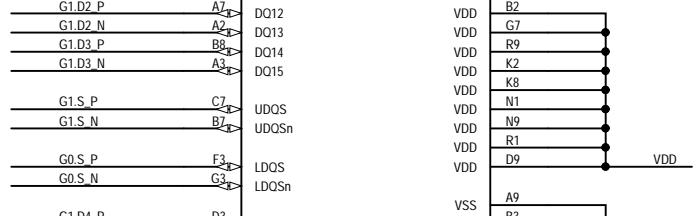
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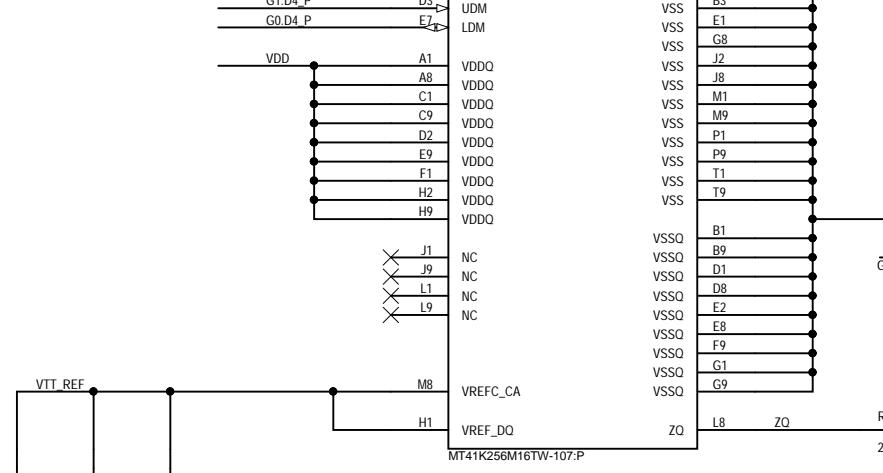
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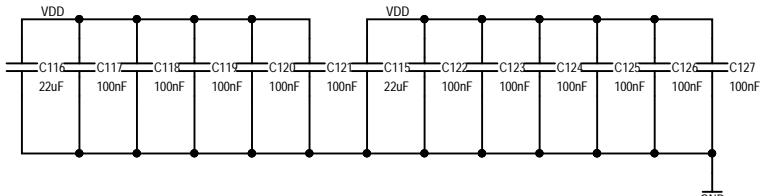
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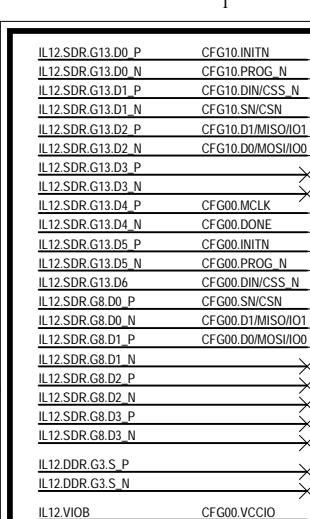
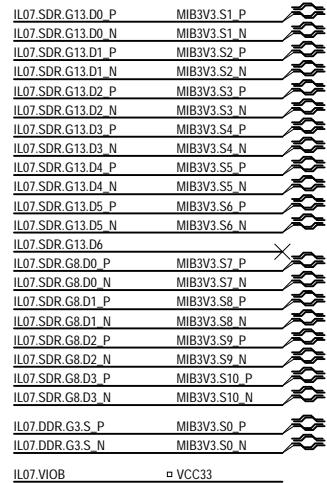
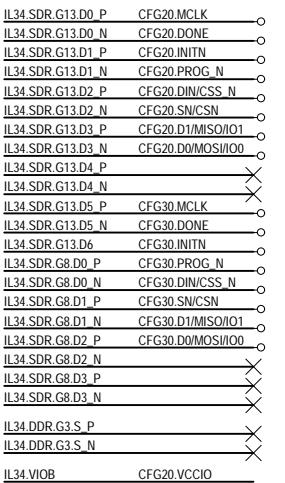
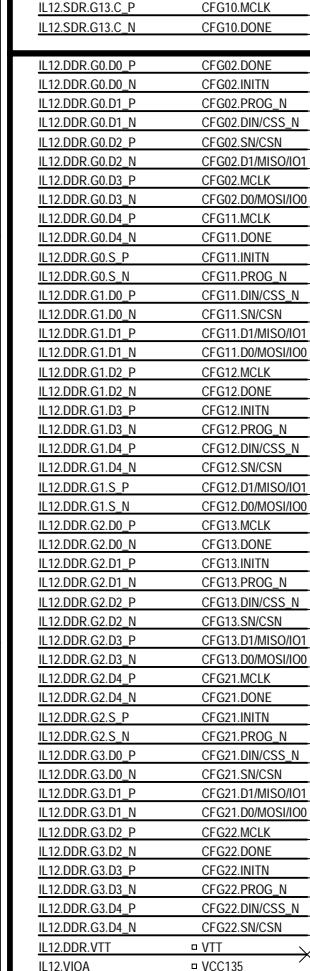
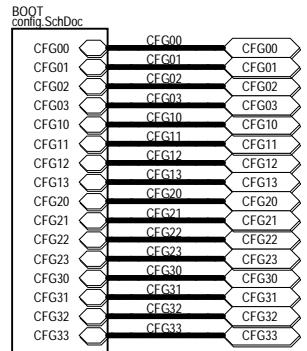
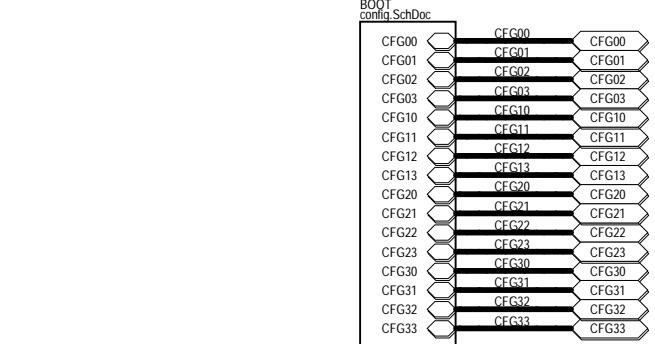


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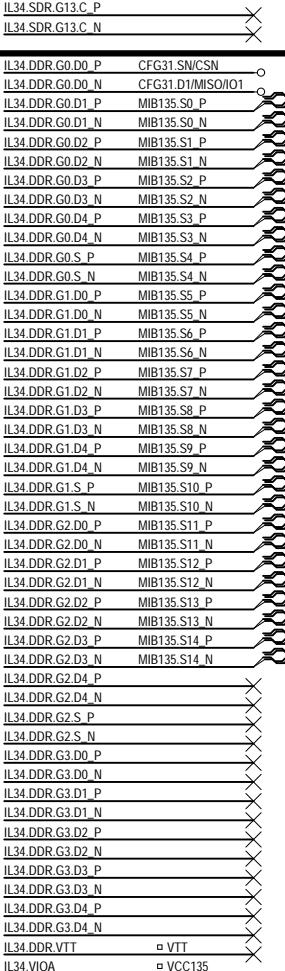


CONFIG FPGA BANK 1
VCCIO programmable on FPGA0/FPGA1, NEED DEDICATED CFG BANKCONFIG FPGA BANK 0
VCCIO set to 3.3V, and CFG BANK0 requires 3.3V for its MB harnessCONFIG FPGA BANK 4
VCCIO programmable on FPGA2/FPGA3, NEED DEDICATED CFG BANK

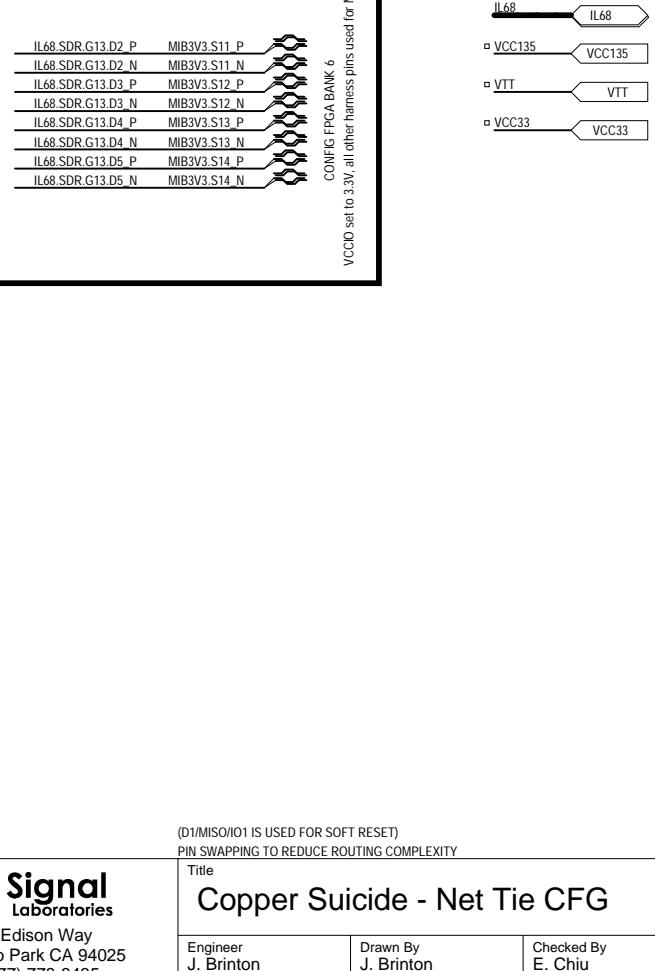
CONFIG FPGA BANK 2



CONFIG FPGA BANK 7

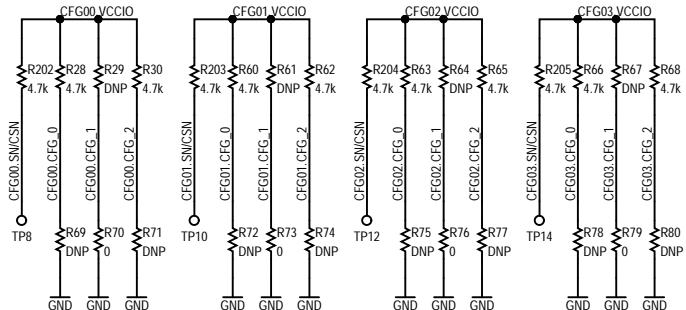


CONFIG FPGA BANK 3

(D1/MISO/I/O1 IS USED FOR SOFT RESET)
PIN SWAPPING TO REDUCE ROUTING COMPLEXITY

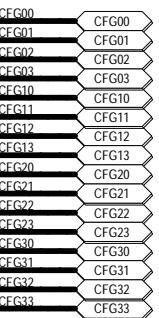
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Engineer	Drawn By	Checked By	
J. Brinton	J. Brinton	E. Chiu	
Revision 1	Sheet 20 of 43	Date 12/22/2016	

A

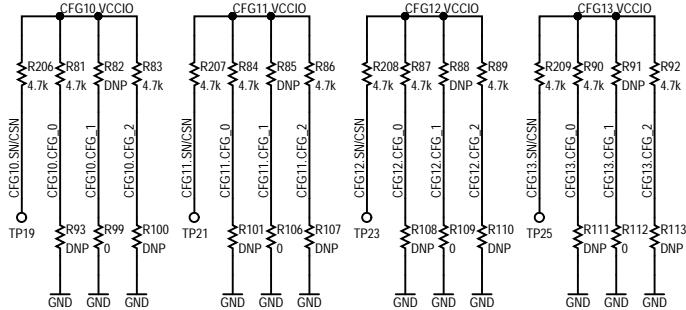


TEMP SENSOR I2C ADDRESS SELECT - I2C BUS A

CFG00.TMP_ADO	NT635	A B	GND	0b00 : 7'addr = 0x48
CFG01.TMP_ADO	NT636	A B	GND	0b0x : 7'addr = 0x49
CFG02.TMP_ADO	NT638	A B	V3V3	0b01 : 7'addr = 0x4A
CFG03.TMP_ADO	NT640	A B	GND	0b10 : 7'addr = 0x4B
CFG10.TMP_ADO	NT642	A B	V3V3	0b1x : 7'addr = 0x4C
CFG11.TMP_ADO	NT643	A B	V3V3	0b11 : 7'addr = 0x4D
CFG12.TMP_ADO	NT645	A B	GND	0bx0 : 7'addr = 0x4E
CFG13.TMP_ADO	NT646	A B	V3V3	0bx1 : 7'addr = 0x4F



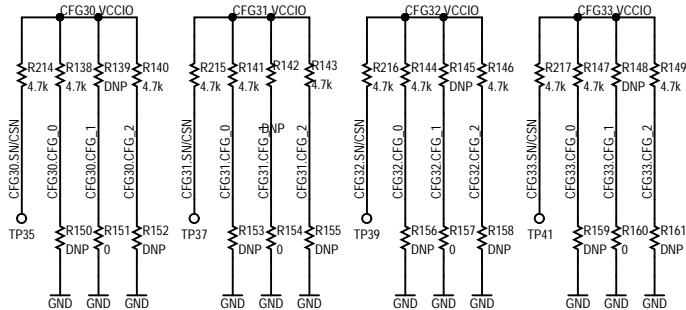
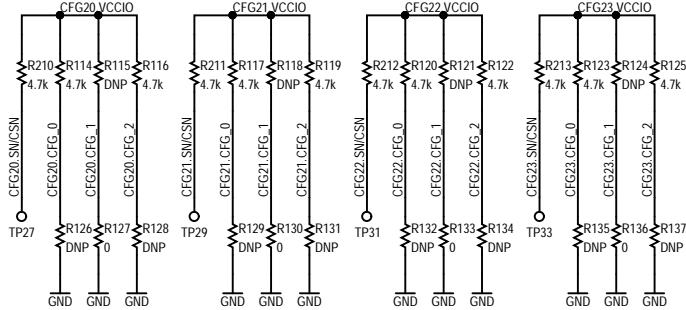
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TEMP SENSOR I2C ADDRESS SELECT - I2C BUS B

CFG20.TMP_ADO	NT647	A B	GND	0b00 : 7'addr = 0x48
CFG21.TMP_ADO	NT648	A B	GND	0b0x : 7'addr = 0x49
CFG22.TMP_ADO	NT649	A B	GND	0b01 : 7'addr = 0x4A
CFG23.TMP_ADO	NT650	A B	V3V3	0b10 : 7'addr = 0x4B
CFG30.TMP_ADO	NT652	A B	GND	0b1x : 7'addr = 0x4C
CFG31.TMP_ADO	NT655	A B	V3V3	0b11 : 7'addr = 0x4D
CFG32.TMP_ADO	NT657	A B	GND	0bx0 : 7'addr = 0x4E
CFG33.TMP_ADO	NT658	A B	V3V3	0bx1 : 7'addr = 0x4F

C



CFG00.SN/CSN	TP1
CFG00.MCLK	TP42
CFG00.DONE	TP43
CFG00.INITN	TP44
CFG00.PROG_N	TP45
CFG00.DIN/CSS_N	TP46
CFG00.D0/MOSI/IO0	TP47
CFG00.D1/MISO/IO1	TP48
CFG00.DOUT	TP49
CFG00.WRITTEN	TP50

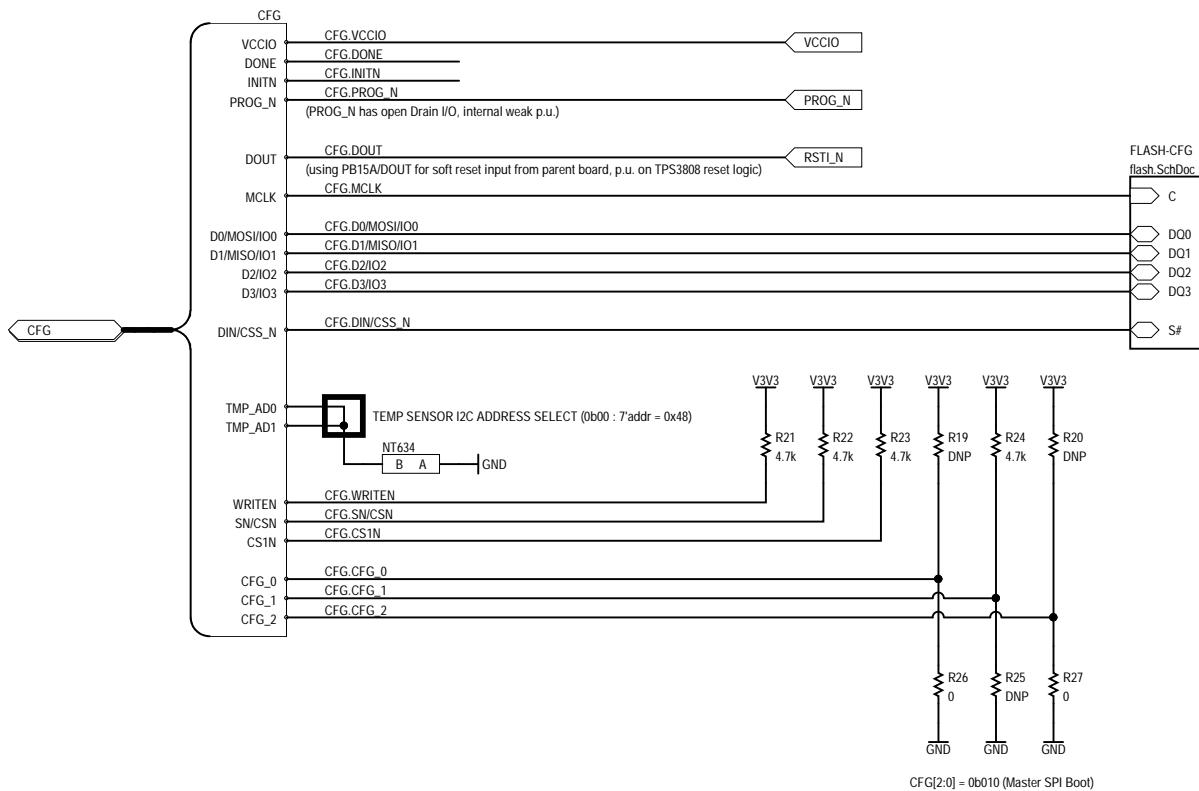
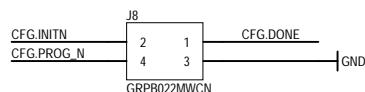
PCB NOTE: PLACE NEXT TO FPGA #00

CFG[2:0] = 0b101 (Slave Serial Boot)



Title		
Copper Suicide - Config Options		
Engineer J. Brinton	Drawn By J. Brinton	Checked By E. Chiu
Revision 1	Sheet 21 of 43	Date 12/22/2016

PCB NOTE: Place head next to JTAG per programming header



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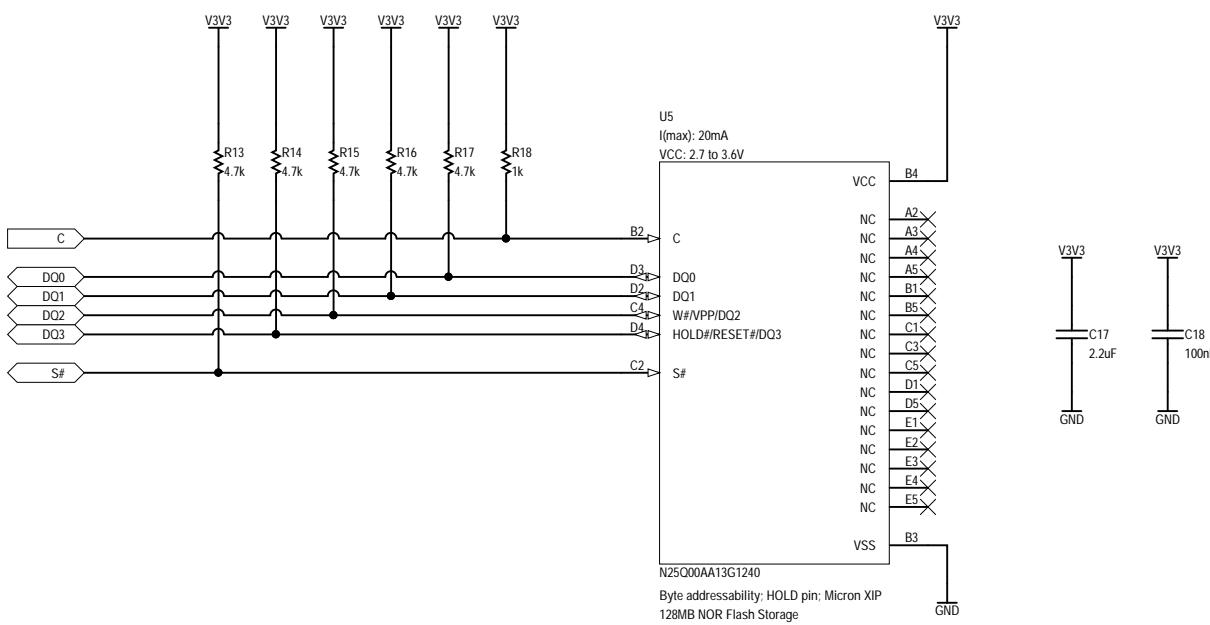
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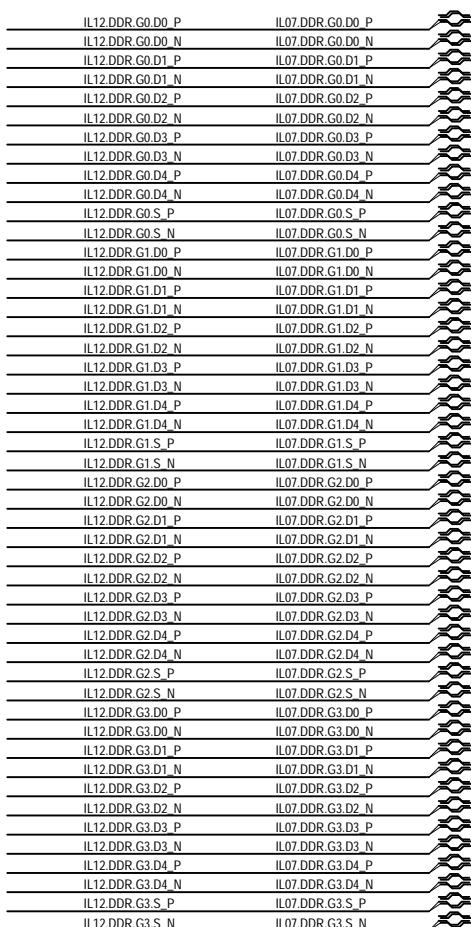
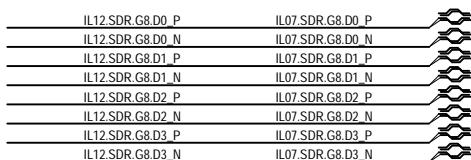
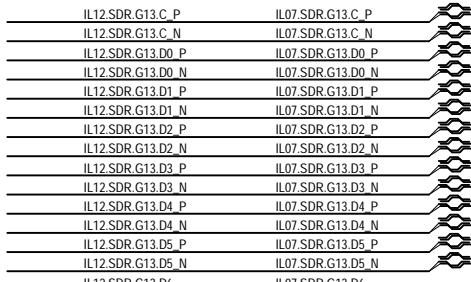
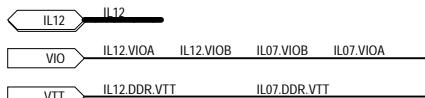
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B

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D

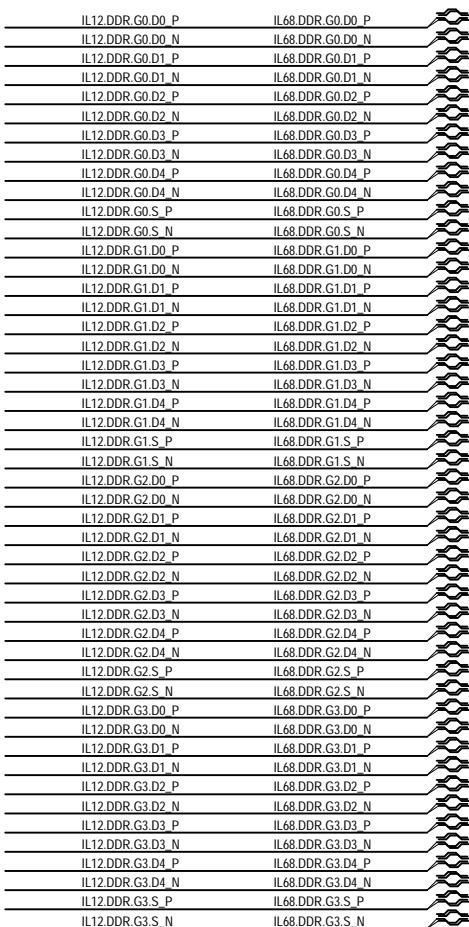
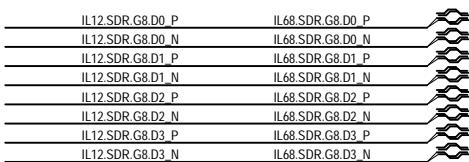
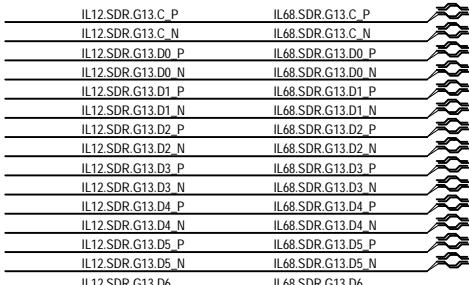
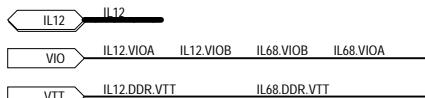




PIN SWAPPING TO REDUCE ROUTING COMPLEXITY



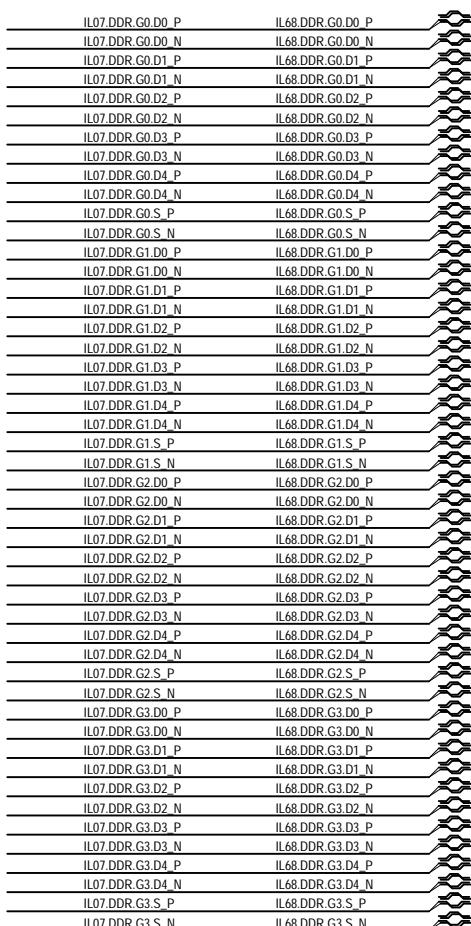
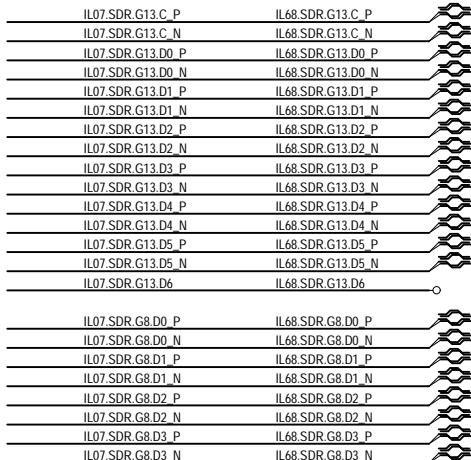
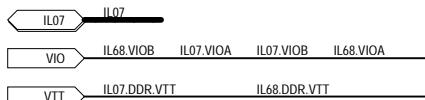
Copper Suicide - Net Tie 12:07		
Engineer J. Brinton	Drawn By J. Brinton	Checked By E. Chiu
Revision 1	Sheet 24 of 43	Date 12/22/2016



PIN SWAPPING TO REDUCE ROUTING COMPLEXITY



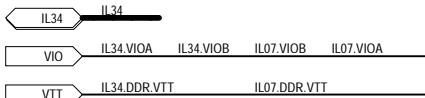
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Engineer J. Brinton	Drawn By J. Brinton	Checked By E. Chiu
Revision 1	Sheet 25 of 43	Date 12/22/2016



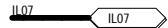
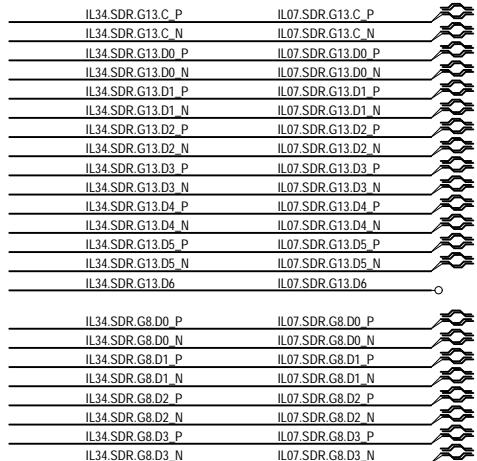
PIN SWAPPING TO REDUCE ROUTING COMPLEXITY



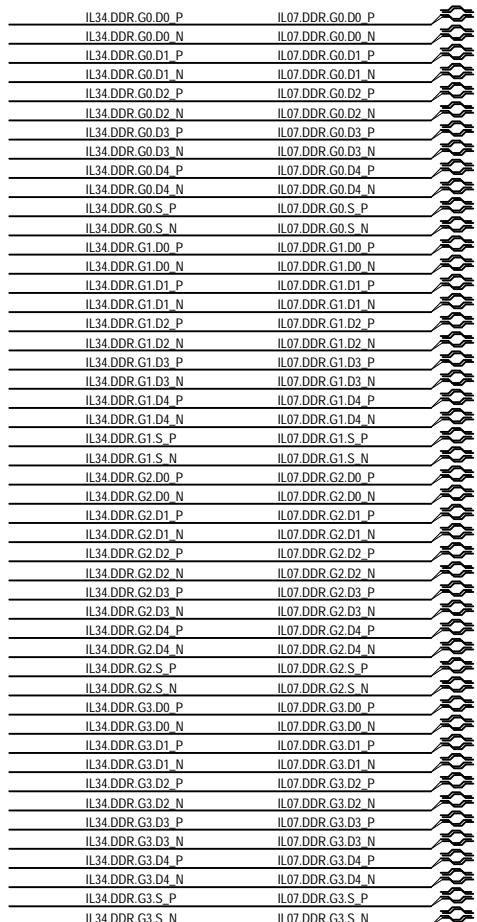
Copper Suicide - Net Tie 68:07		
Engineer J. Brinton	Drawn By J. Brinton	Checked By E. Chiu
Revision 1	Sheet 26 of 43	Date 12/22/2016



A

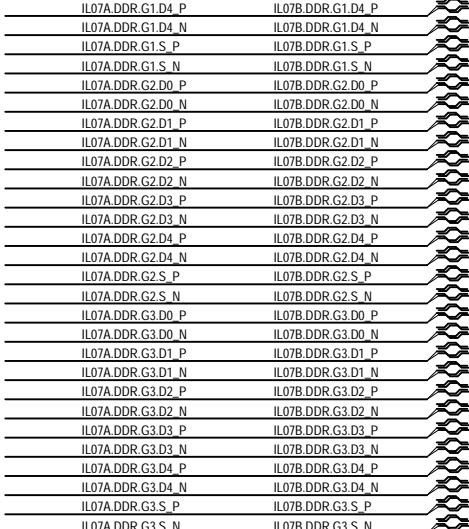
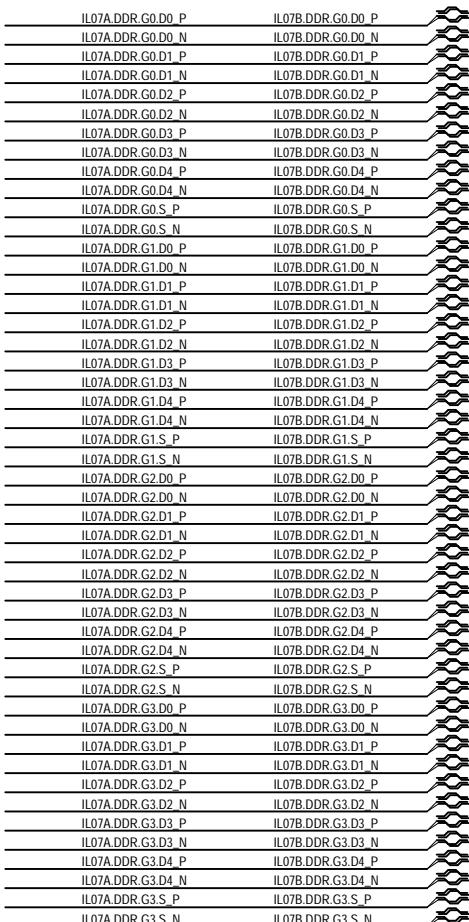
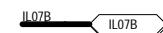
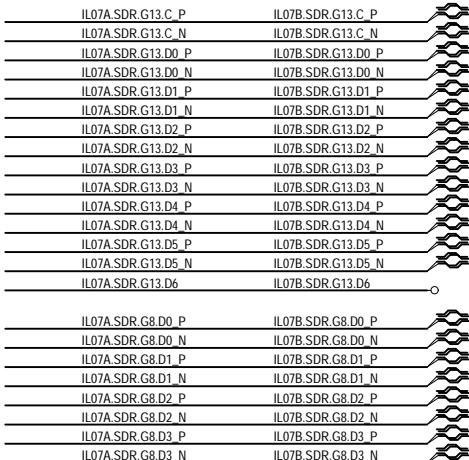
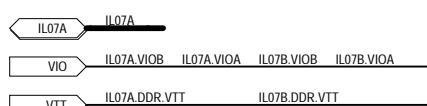


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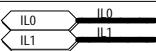
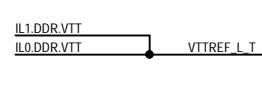
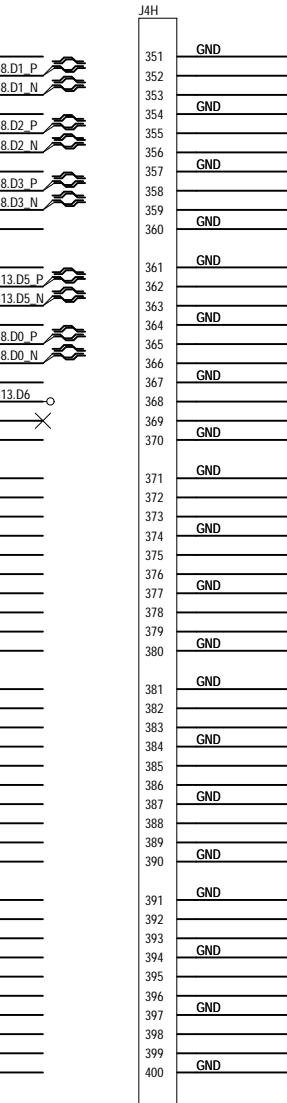
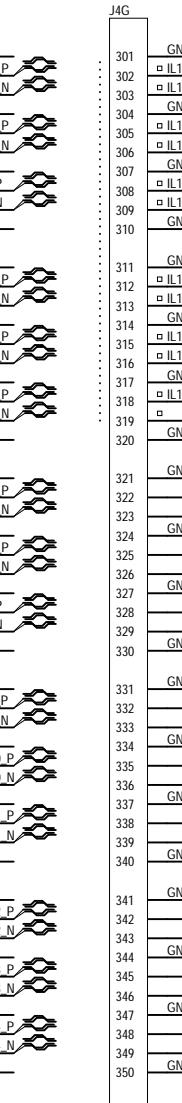
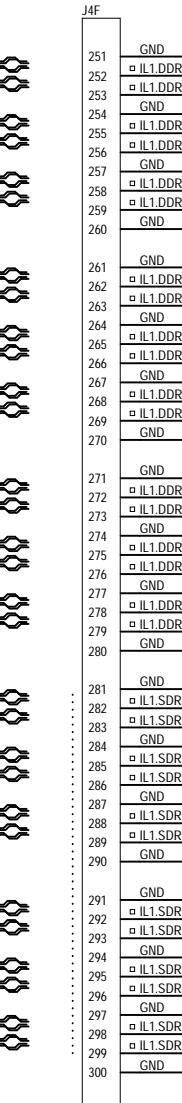
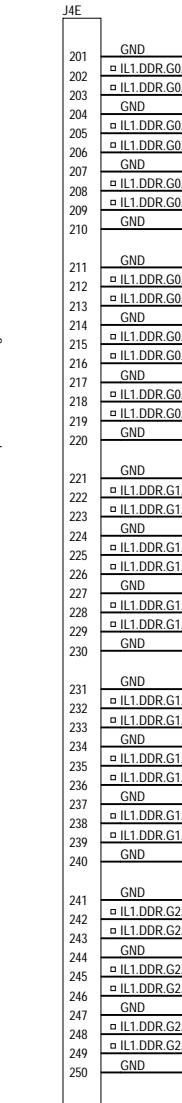
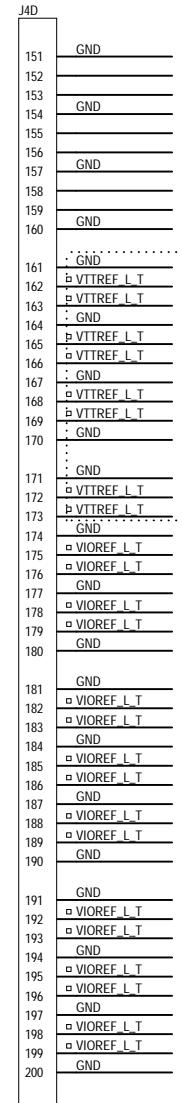
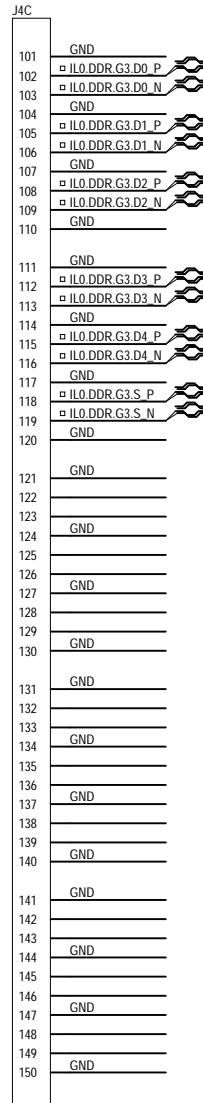
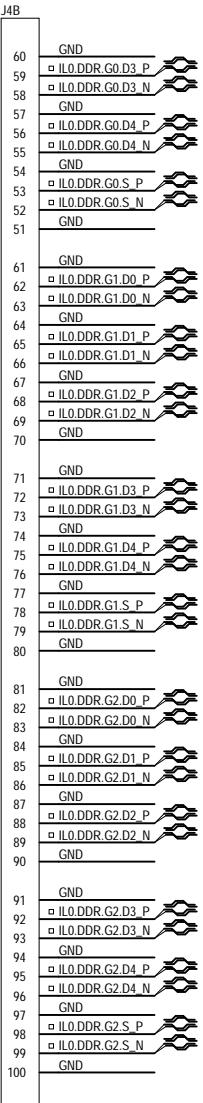
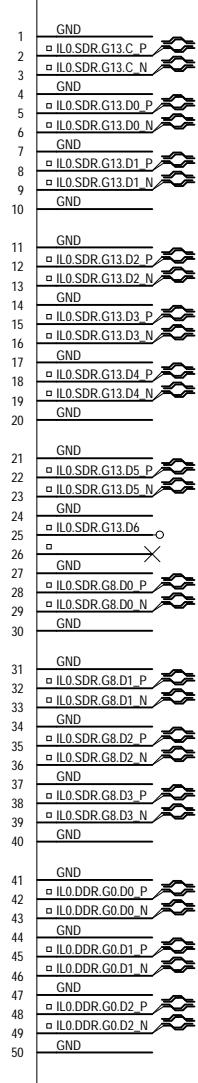


B

PIN SWAPPING TO REDUCE ROUTING COMPLEXITY



PIN SWAPPING TO REDUCE ROUTING COMPLEXITY

J4A
SEAM-40-11.0-S-10-2-A-K-TR

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Laboratories

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Menlo Park CA 94025
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Title

Copper Suicide - Left Top

Engineer
J. BrintonDrawn By
J. BrintonChecked By
E. ChiuRevision
1

Sheet 29 of 43

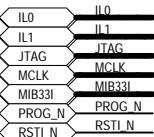
Date
12/22/2016

1

2

3

4

J3A
SEAM-40-11.0-S-10-2-A-K-TR

J3B

J3C

J3D

J3E

J3F

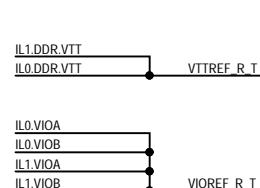
J3G

J3H

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4	GND
5	IL0.DDR.G0.D4.P
6	IL0.DDR.G0.D4.N
7	GND
8	IL0.DDR.G0.S.P
9	IL0.DDR.G0.S.N
10	GND
11	GND
12	IL0.DDR.G1.D0.P
13	IL0.DDR.G1.D0.N
14	GND
15	IL0.DDR.G1.D1.P
16	IL0.DDR.G1.D1.N
17	GND
18	IL0.DDR.G1.D2.P
19	IL0.DDR.G1.D2.N
20	GND
21	GND
22	IL0.DDR.G1.D3.P
23	IL0.DDR.G1.D3.N
24	GND
25	IL0.DDR.G1.D4.P
26	IL0.DDR.G1.D4.N
27	GND
28	IL0.DDR.G1.S.P
29	IL0.DDR.G1.S.N
30	GND
31	GND
32	IL0.DDR.G2.D0.P
33	IL0.DDR.G2.D0.N
34	GND
35	IL0.DDR.G2.D1.P
36	IL0.DDR.G2.D1.N
37	GND
38	IL0.DDR.G2.D2.P
39	IL0.DDR.G2.D2.N
40	GND
41	GND
42	IL0.DDR.G2.D3.P
43	IL0.DDR.G2.D3.N
44	GND
45	IL0.DDR.G2.D4.P
46	IL0.DDR.G2.D4.N
47	GND
48	IL0.DDR.G2.S.P
49	IL0.DDR.G2.S.N
50	GND

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58	GND
57	IL0.DDR.G3.D1.P
56	IL0.DDR.G3.D1.N
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54	IL0.DDR.G3.D2.P
53	IL0.DDR.G3.D2.N
52	GND
51	GND
61	GND
62	IL0.SDR.G3.D3.P
63	IL0.DDR.G3.D3.N
64	GND
65	IL0.DDR.G3.D4.P
66	IL0.DDR.G3.D4.N
67	GND
68	IL0.SDR.G3.S.P
69	IL0.DDR.G3.S.N
70	GND
71	GND
72	IL0.DDR.G0.D0.P
73	IL0.DDR.G0.D0.N
74	GND
75	IL0.DDR.G0.D1.P
76	IL0.DDR.G0.D1.N
77	GND
78	IL0.DDR.G0.D2.P
79	IL0.DDR.G0.D2.N
80	GND
81	GND
82	IL0.SDR.G13.C.P
83	IL0.SDR.G13.C.N
84	GND
85	IL0.SDR.G13.D0.P
86	GND
87	IL0.DDR.G13.D1.P
88	IL0.SDR.G13.D1.N
89	GND
90	GND
91	GND
92	IL0.SDR.G13.D2.P
93	IL0.DDR.G13.D2.N
94	GND
95	IL0.SDR.G13.D3.P
96	IL0.DDR.G13.D3.N
97	GND
98	IL0.SDR.G13.D4.P
99	IL0.DDR.G13.D4.N
100	GND

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104	IL0.SDR.G8.D2.P
105	IL0.SDR.G8.D2.N
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108	IL0.SDR.G8.D3.N
109	GND
110	GND
151	GND
152	IL0.SDR.G8.D1.N
153	GND
154	IL0.SDR.G8.D2.N
155	GND
156	IL0.SDR.G8.D3.N
157	GND
158	IL0.SDR.G8.D4.P
159	IL0.SDR.G8.D4.N
160	GND
201	GND
202	IL0.SDR.G8.D1.P
203	GND
204	IL0.SDR.G8.D1.N
205	GND
206	IL0.SDR.G8.D2.N
207	GND
208	IL0.SDR.G8.D3.N
209	GND
210	GND
211	GND
212	JTAG.TDI
213	JTAG.TMS
214	GND
215	JTAG.TCK
216	GND
217	MCLK.C.P
218	MCLK.C.N
219	GND
220	GND
221	GND
222	PROG.N
223	RSTL.N
224	GND
225	V48BB
226	V48BB
227	GND
228	V48BB
229	V48BB
230	GND
231	GND
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248	VIOREF.R.T
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255	IL0.SDR.G8.D1.N
256	GND
257	IL0.SDR.G8.D2.P
258	IL0.SDR.G8.D2.N
259	GND
260	GND
261	GND
262	IL0.SDR.G8.D1.N
263	GND
264	IL0.SDR.G8.D2.N
265	IL0.SDR.G8.D3.P
266	IL0.SDR.G8.D3.N
267	GND
268	IL0.SDR.G8.D4.P
269	IL0.SDR.G8.D4.N
270	GND
271	GND
272	IL0.SDR.G8.D1.N
273	GND
274	IL0.SDR.G8.D2.N
275	IL0.SDR.G8.D3.P
276	IL0.SDR.G8.D3.N
277	GND
278	IL0.SDR.G8.D4.P
279	IL0.SDR.G8.D4.N
280	GND
281	GND
282	IL1.SDR.G13.C.P
283	IL1.SDR.G13.C.N
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285	IL1.SDR.G13.D0.P
286	IL1.SDR.G13.D0.N
287	GND
288	IL1.SDR.G13.D1.P
289	IL1.SDR.G13.D1.N
290	GND
291	GND
292	IL1.SDR.G13.D2.P
293	IL1.SDR.G13.D2.N
294	GND
295	IL1.SDR.G13.D3.P
296	IL1.SDR.G13.D3.N
297	GND
298	IL1.SDR.G13.D4.P
299	IL1.SDR.G13.D4.N
300	GND
311	GND
312	IL1.SDR.G13.D2.P
313	IL1.SDR.G13.D2.N
314	GND
315	IL1.SDR.G13.D3.P
316	IL1.SDR.G13.D3.N
317	GND
318	IL1.SDR.G13.D4.P
319	IL1.SDR.G13.D4.N
320	GND
321	GND
322	IL1.DDR.G0.D0.P
323	IL1.DDR.G0.D0.N
324	GND
325	IL1.DDR.G0.D1.P
326	IL1.DDR.G0.D1.N
327	GND
328	IL1.DDR.G0.D2.P
329	IL1.DDR.G0.D2.N
330	GND
331	GND
332	IL1.DDR.G0.D3.P
333	IL1.DDR.G0.D3.N
334	GND
335	IL1.DDR.G0.D4.P
336	IL1.DDR.G0.D4.N
337	GND
338	IL1.SDR.G0.S.P
339	IL1.SDR.G0.S.N
340	GND
341	GND
342	IL1.DDR.G1.D0.P
343	IL1.DDR.G1.D0.N
344	GND
345	IL1.DDR.G1.D1.P
346	IL1.DDR.G1.D1.N
347	GND
348	IL1.DDR.G1.D2.P
349	IL1.DDR.G1.D2.N
350	GND



1

2

3

4



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Copper Suicide - Right Top

Title
Engineer J. Brinton

Drawn By J. Brinton

Checked By E. Chiu

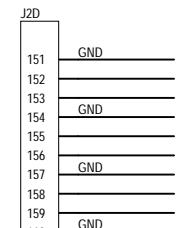
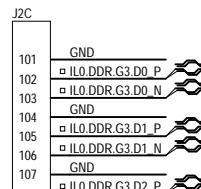
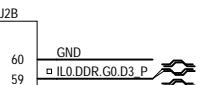
Revision 1

Sheet 30 of 43

Date 12/22/2016

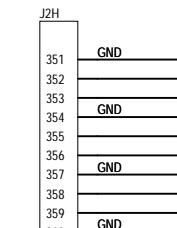
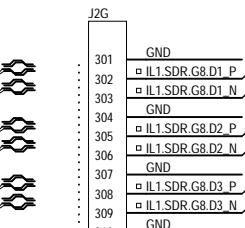
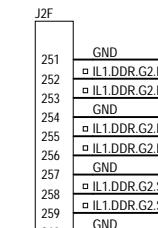
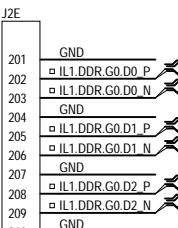
J2A
SEAF-40-06-S-10-2-A-K-TR

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3	GND
4	IL0.SDR.G13.D0 P
5	IL0.SDR.G13.D0 N
6	GND
7	IL0.SDR.G13.D1 P
8	IL0.SDR.G13.D1 N
9	GND
10	GND



Referenzeingang für Referenz-Voltages

Referenzeingang für Referenz-Voltages

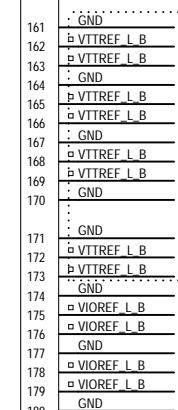
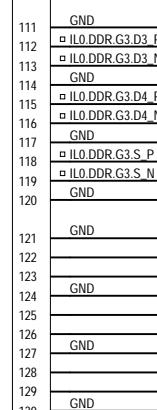
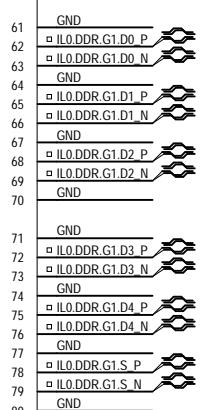


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13	IL0.SDR.G13.D2 N
14	GND
15	IL0.SDR.G13.D3 P
16	IL0.SDR.G13.D3 N
17	GND
18	IL0.SDR.G13.D4 P
19	IL0.SDR.G13.D4 N
20	GND

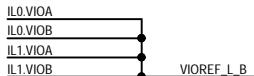
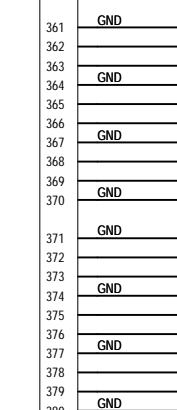
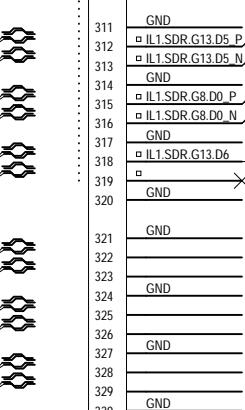
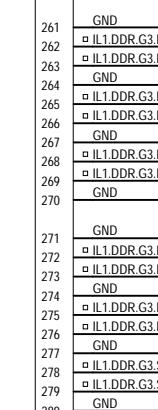
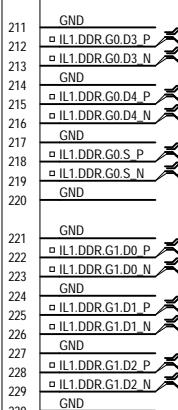
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26	GND
27	IL0.SDR.G8.D0 P
28	IL0.SDR.G8.D0 N
29	GND
30	GND

31	GND
32	IL0.SDR.G8.D1 P
33	IL0.SDR.G8.D1 N
34	GND
35	IL0.SDR.G8.D2 P
36	IL0.SDR.G8.D2 N
37	GND
38	IL0.SDR.G8.D3 P
39	IL0.SDR.G8.D3 N
40	GND

41	GND
42	IL0.DDR.G0.D0 P
43	IL0.DDR.G0.D0 N
44	GND
45	IL0.DDR.G0.D1 P
46	IL0.DDR.G0.D1 N
47	GND
48	IL0.DDR.G0.D2 P
49	IL0.DDR.G0.D2 N
50	GND



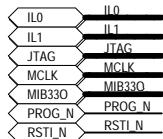
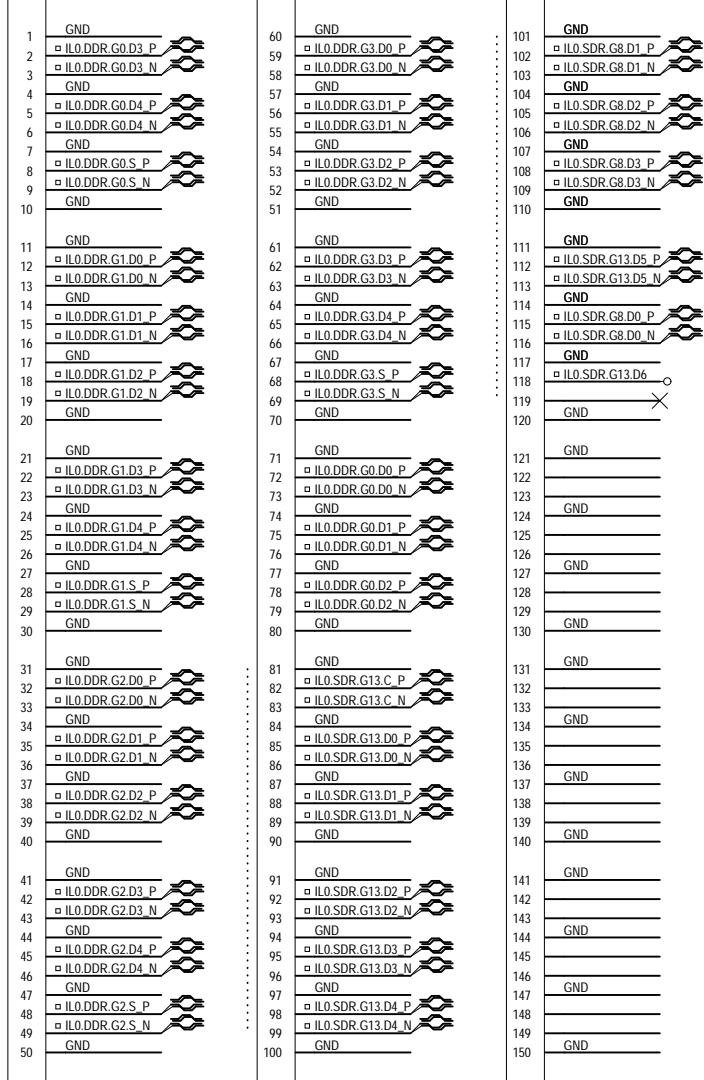
Referenzeingang für Referenz-Voltages



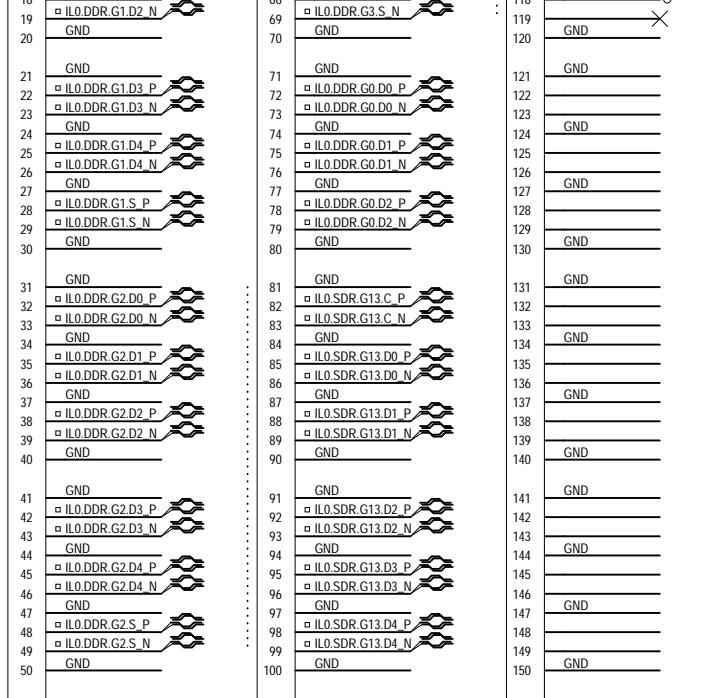
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Title
Copper Suicide - Left Bottom

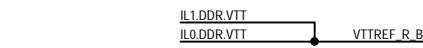
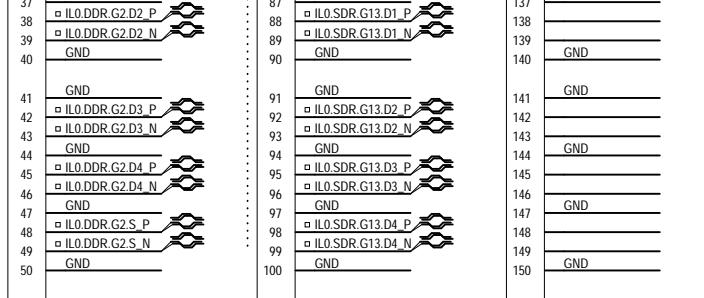
Engineer J. Brinton	Drawn By J. Brinton	Checked By E. Chiu
Revision 1	Sheet 31 of 43	Date 12/22/2016

A
J1A
SEAF-40-06-S-10-2-A-K-TR

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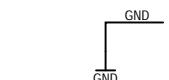


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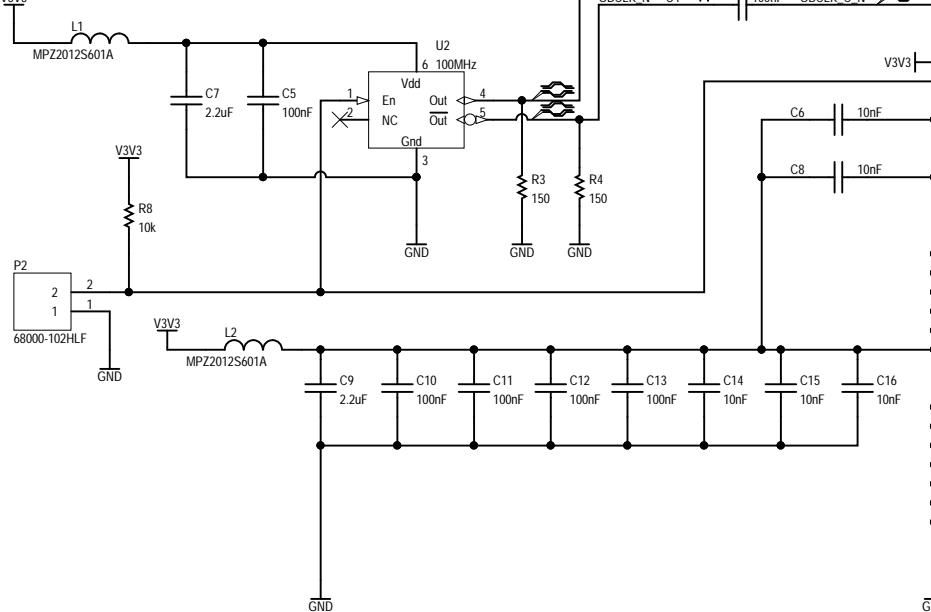
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Title

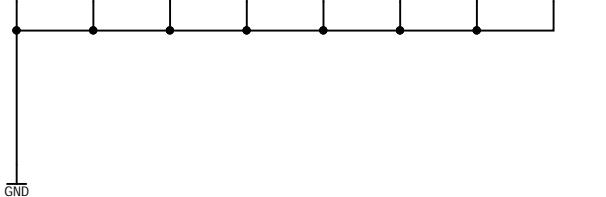
Copper Suicide - Right Bottom

Engineer J. Brinton	Drawn By J. Brinton	Checked By E. Chiu
Revision 1	Sheet 32 of 43	Date 12/22/2016

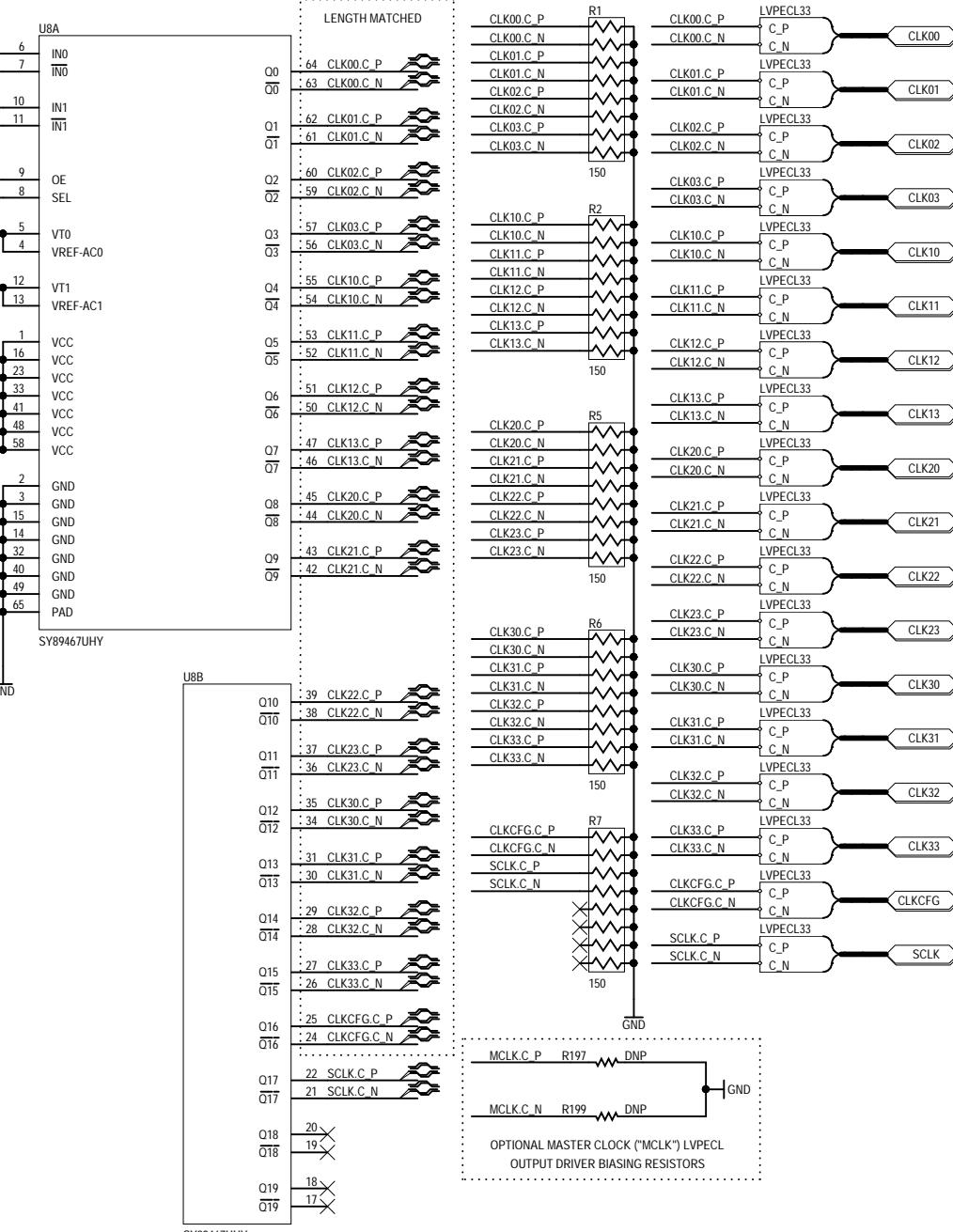
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REVIEW COMPLETE: JDB 10/7/2016



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Copper Suicide - Clock Fanout

Engineer J. Brinton	Drawn By J. Brinton	Checked By E. Chiu
Revision 1	Sheet 33 of 43	Date 12/22/2016

A

A

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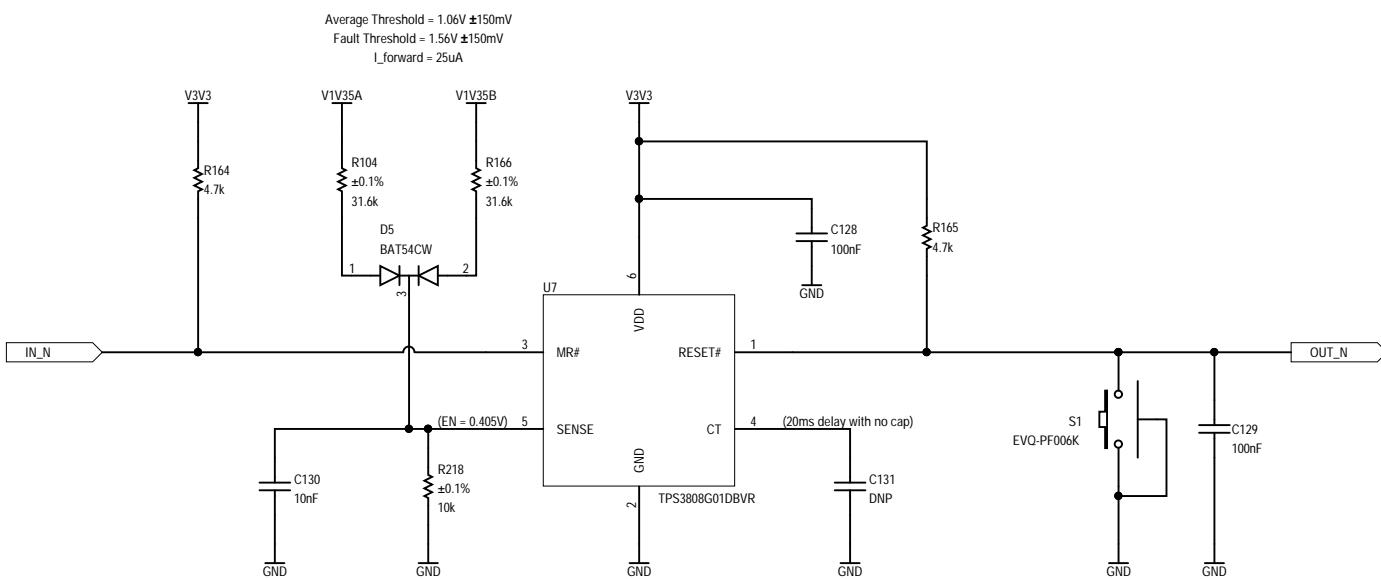
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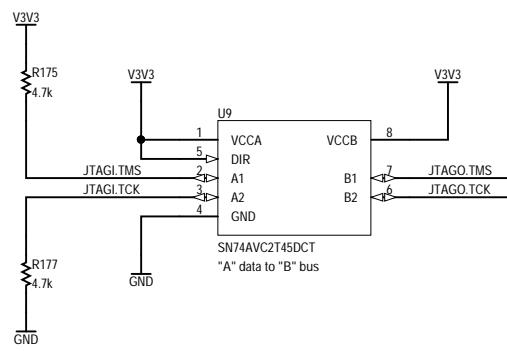
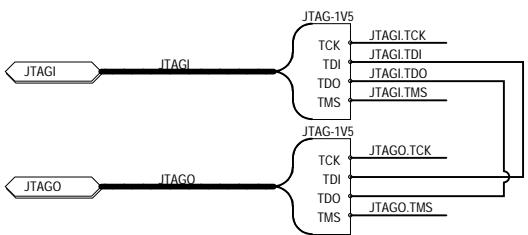
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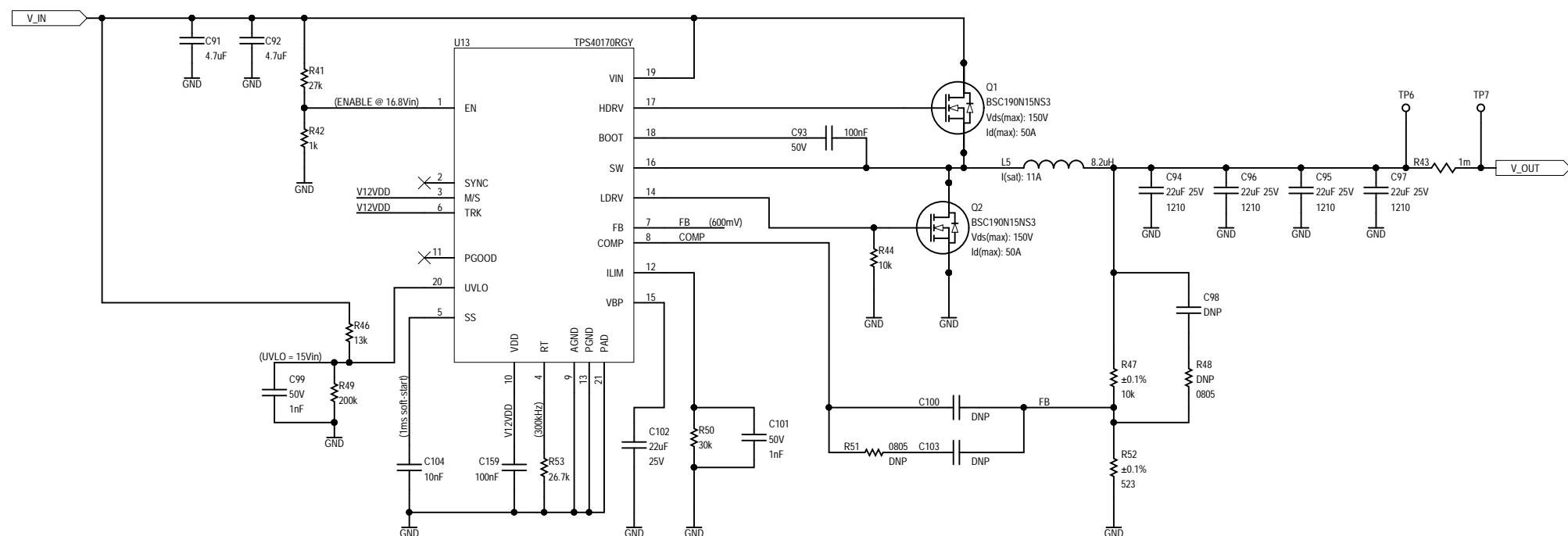
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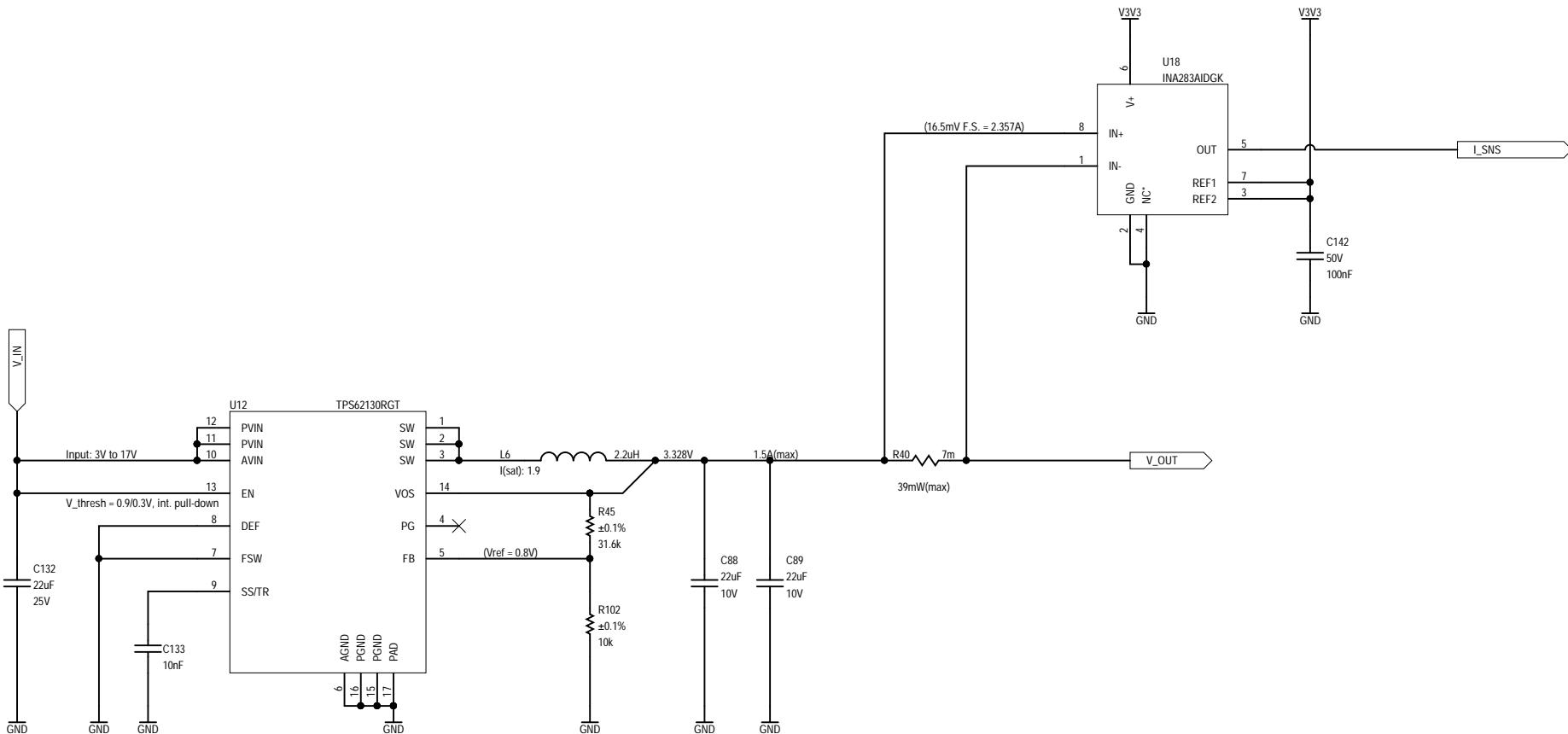
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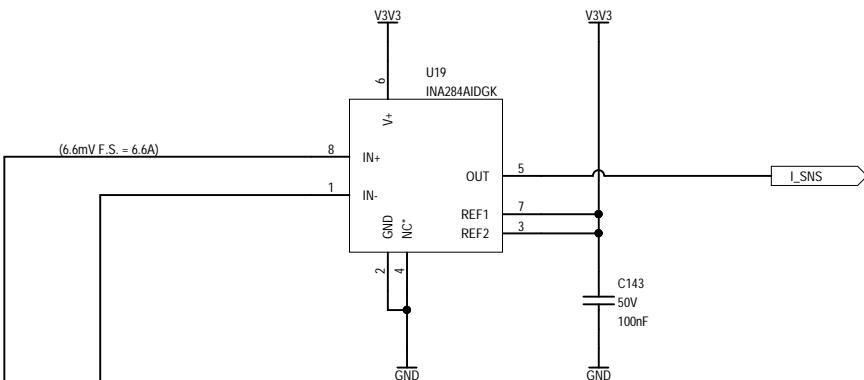
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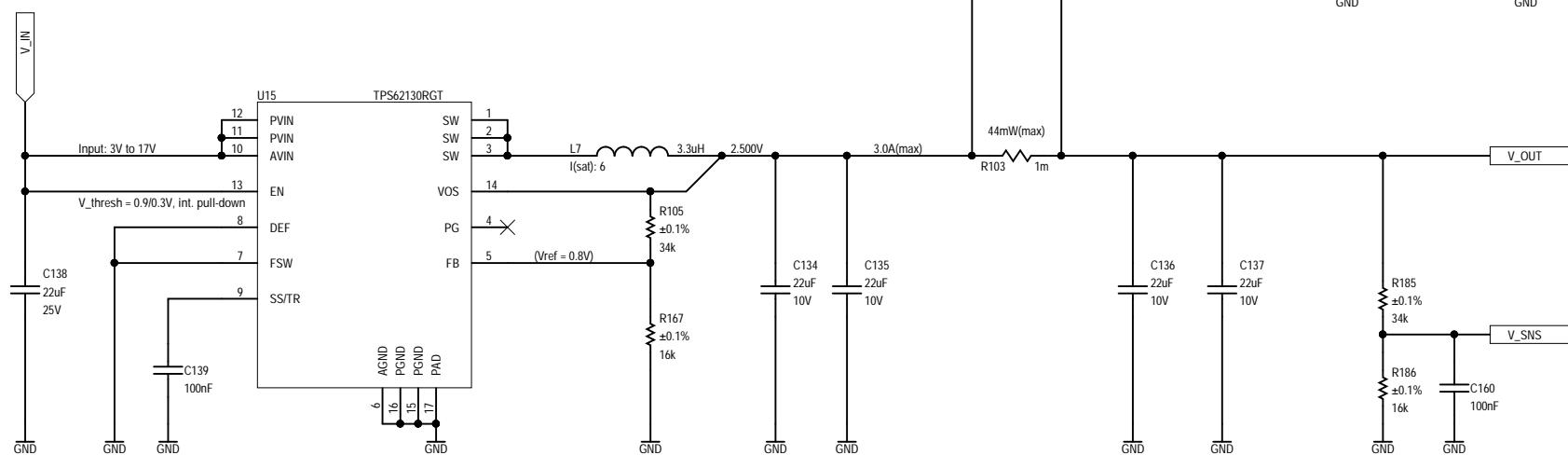




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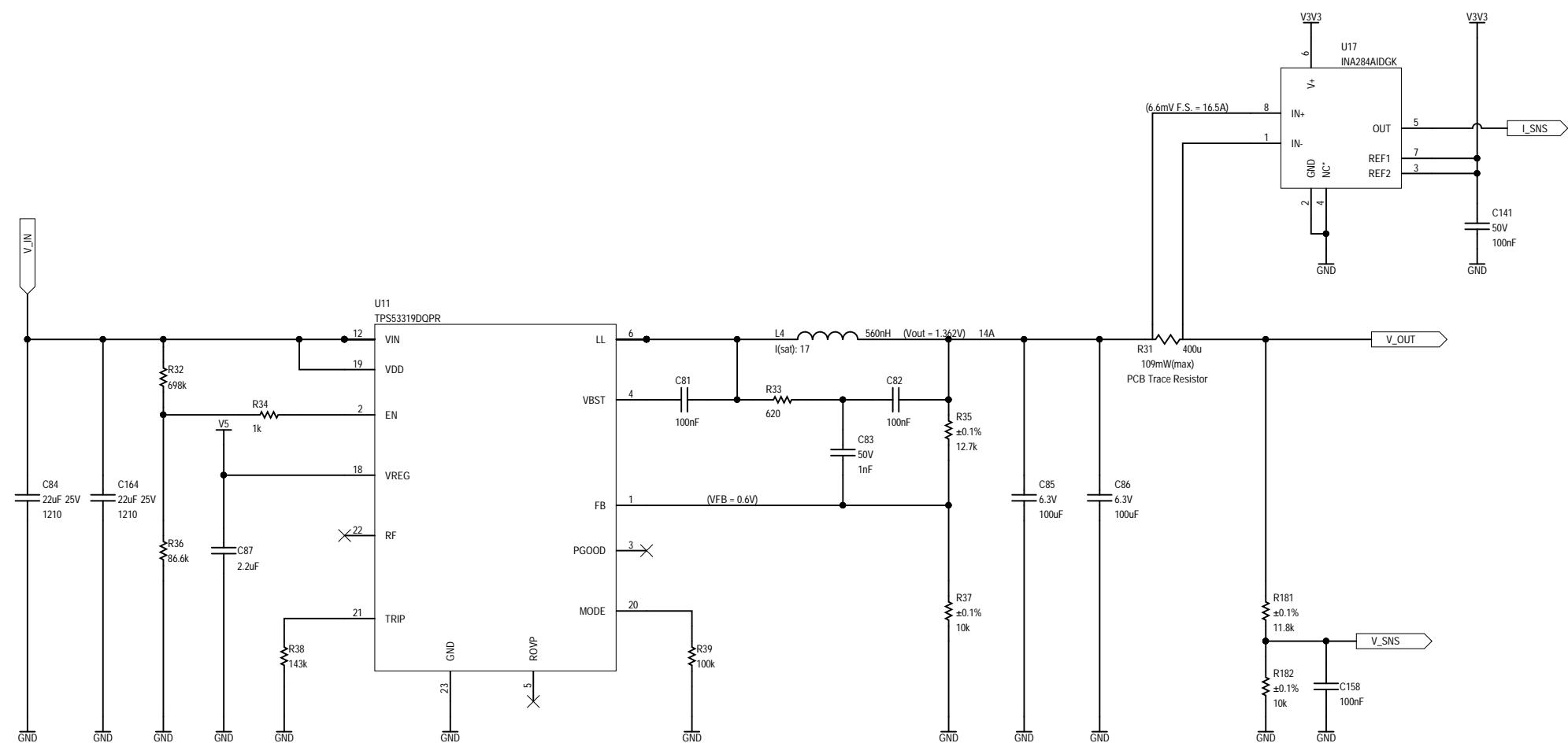


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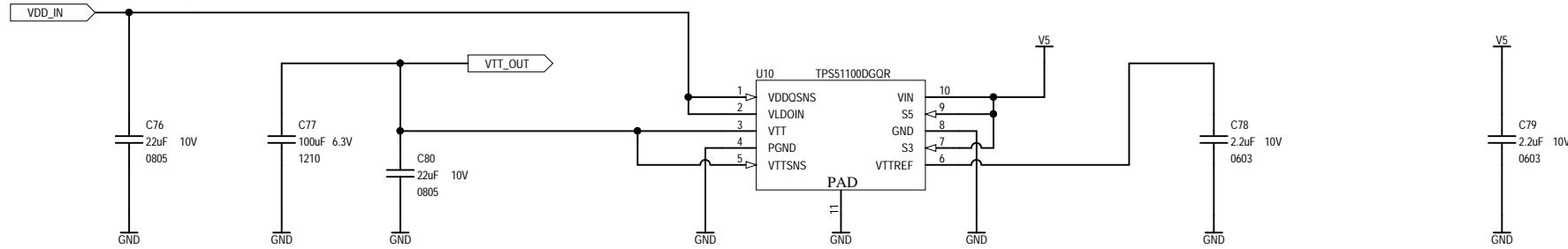
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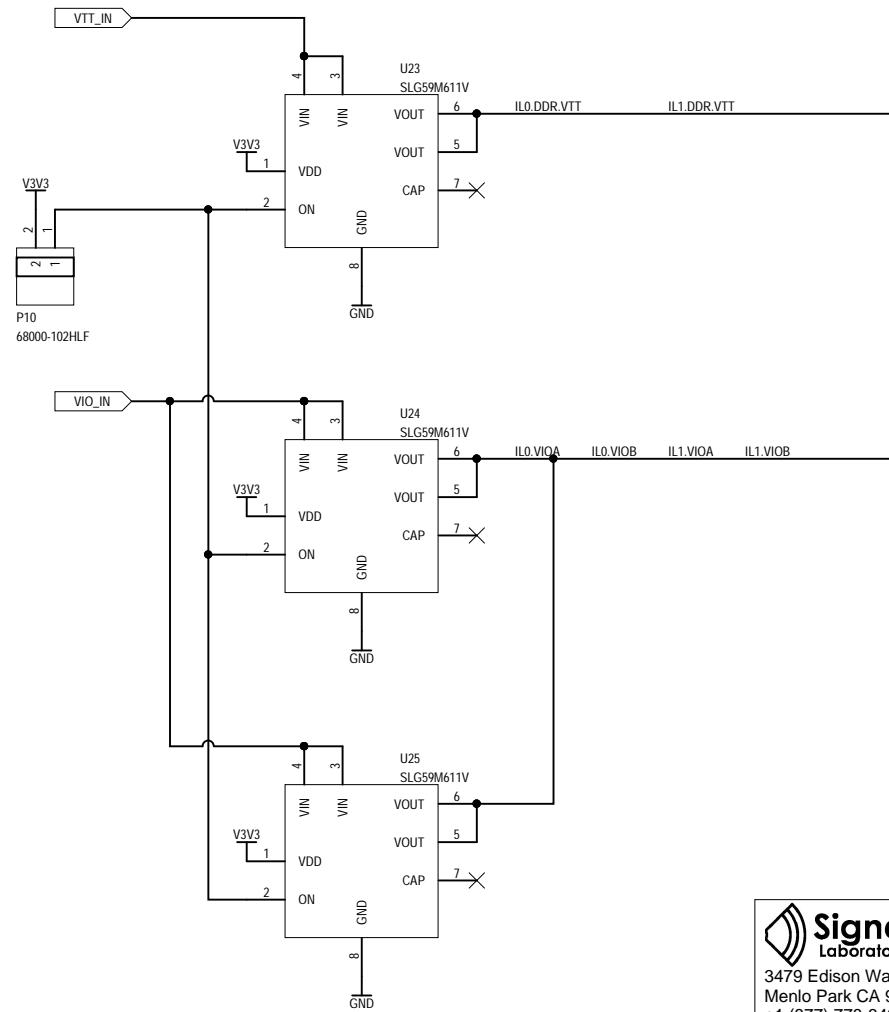
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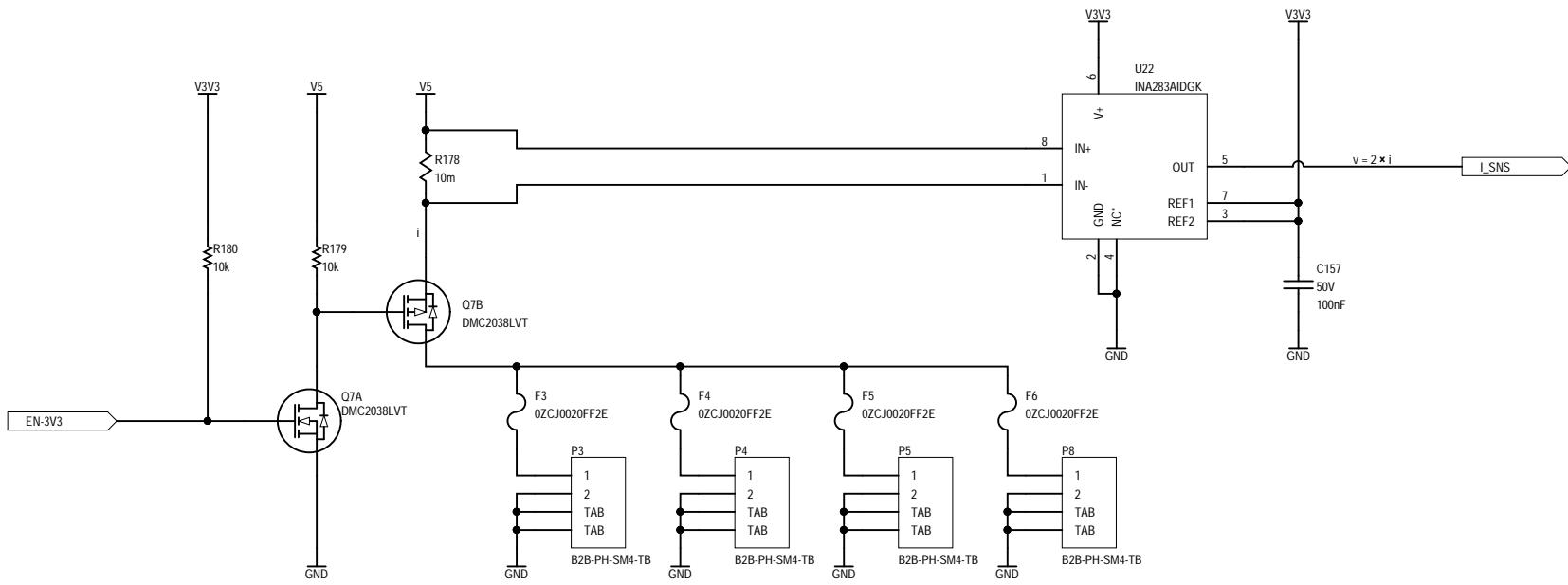


MISC10
M50-1900005

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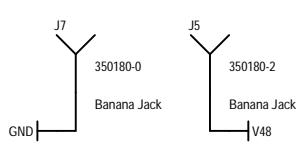


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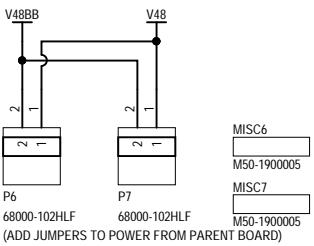
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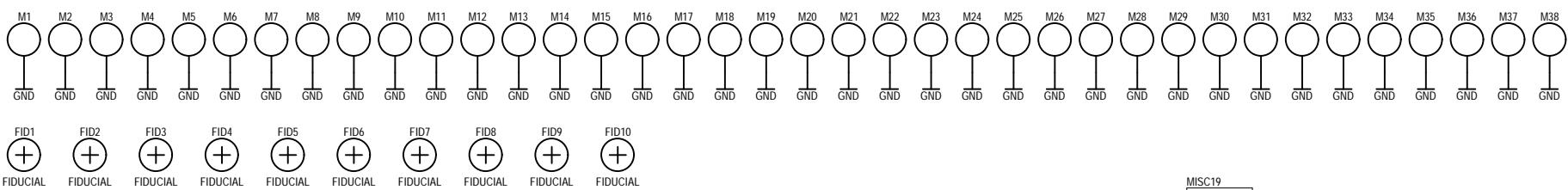
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MISC19
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Title
Copper Suicide - Mechanical

Engineer J. Brinton	Drawn By J. Brinton	Checked By E. Chiu
Revision 1	Sheet 43 of 43	Date 12/22/2016