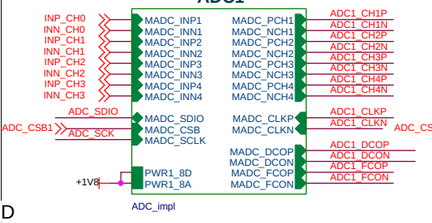

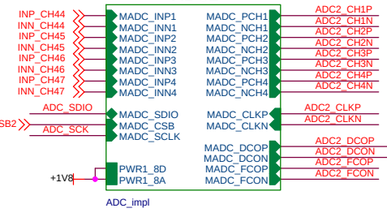

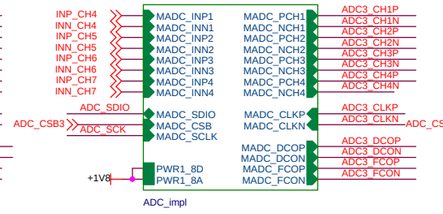

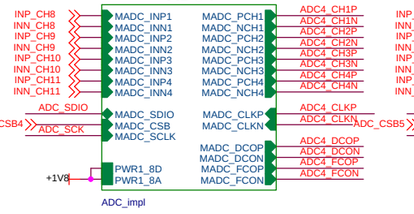

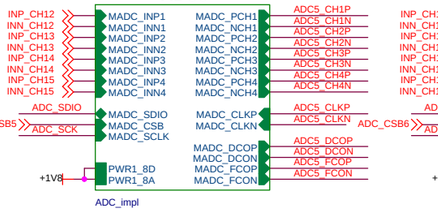

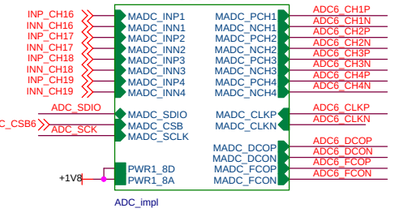

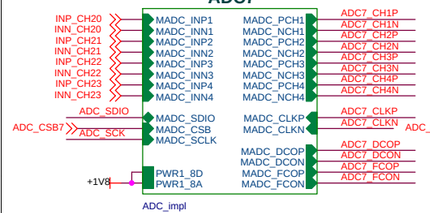

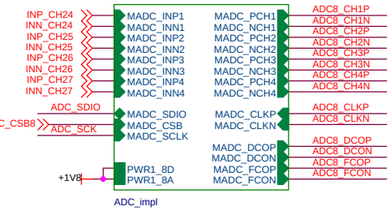

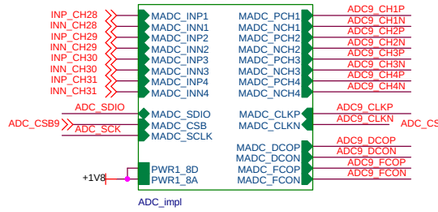

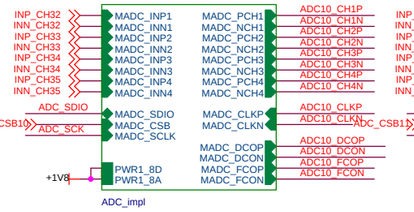

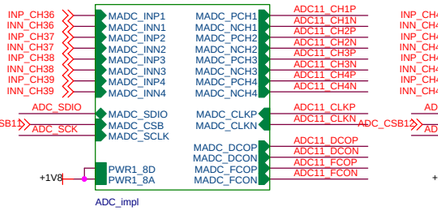

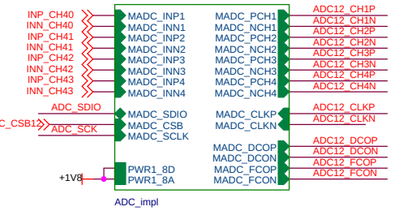

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dqLL0_8 (21), dqLL0_9(23)
dqLL0_4 (9), dqLL0_5(11)
dqLL0_6 (17), dqLL0_7(19)

dqLL1:
dqLL1_6 (18), dqLL1_7(20)
dqLL1_2 (30), dqLL1_3(32)
dqLL1_8 (22), dqLL1_9(24)

dqLL2:
dqLL2_6 (41), dqLL2_7(43)
dqLL2_2 (29), dqLL2_3(31)
dqLL2_8 (45), dqLL2_9(47)

dqLL3:
dqLL3_4 (10), dqLL3_5(12)
dqLL3_2 (06), dqLL3_3(08)
dqLL3_8 (22), dqLL3_9(24)

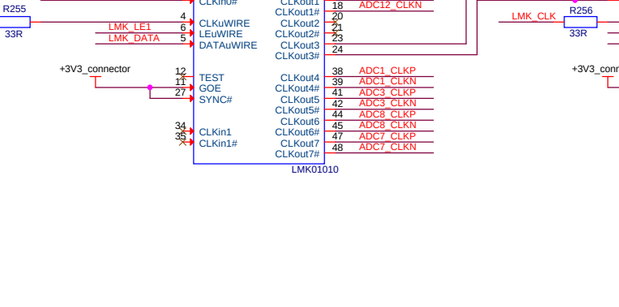
dqUL0:
dqUL0_4 (82), dqUL0_5(84)
dqUL0_2 (78), dqUL0_3(80)
dqUL0_8 (94), dqUL0_9(96)

dqUL1:
dqUL1_6 (89), dqUL1_7(91)
dqUL1_2 (77), dqUL1_3(79)
dqUL1_8 (93), dqUL1_9(95)

dqUL2:
dqUL2_4 (58), dqUL5_7(60)
dqUL2_2 (54), dqUL2_3(56)
dqUL2_8 (70), dqUL2_9(72)

dqUL3:
dqUL2_2 (53), dqUL2_3(55)

TRB_CONNECTOR1A



TRB_CONNECTOR1B

dqUR0:
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dqUR0_2 (109), dqUR0_3(111)
dqUR0_6 (121), dqUR0_7(123)

dqUR1:
dqUR1_2 (110), dqUR1_3(112)
dqUR1_8 (126), dqUR1_9(128)

dqUR2:
dqUR2_2 (134), dqUR2_3(136)
dqUR2_4 (138), dqUR2_5(140)
dqUR2_8 (150), dqUR2_9(152)

dqLR0:
dqLR0_2 (133), dqLR0_3(135)
dqLR0_4 (137), dqLR5_1(139)
dqLR0_6 (145), dqLR0_7(147)

dqLR1:
dqLR1_0 (169), dqLR0_1(171)
dqLR1_4 (177), dqLR0_5(179)
dqLR1_6 (185), dqLR0_7(187)

dqLR2:
dqLR2_2 (174), dqLR2_3(176)
dqLR2_6 (186), dqLR2_7(188)
dqLR2_8 (190), dqLR2_9(192)

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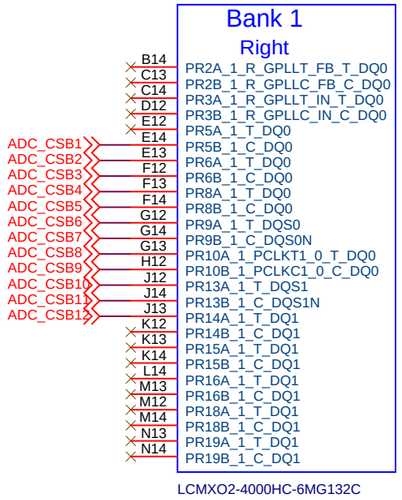
Size A2	Document Number <Doc>		Rev <RevCode>
Date: Wednesday, February 05, 2014	Sheet 1	of 16	

UMACH1G



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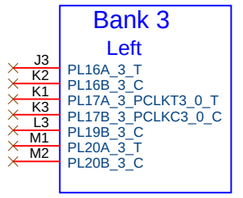

LCMXO2-4000HC-6MG132C

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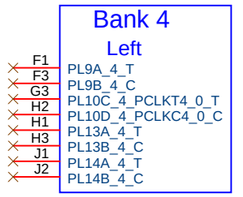

LCMXO2-4000HC-6MG132C

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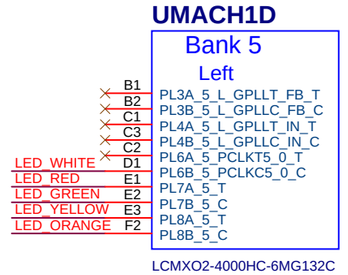

LCMXO2-4000HC-6MG132C

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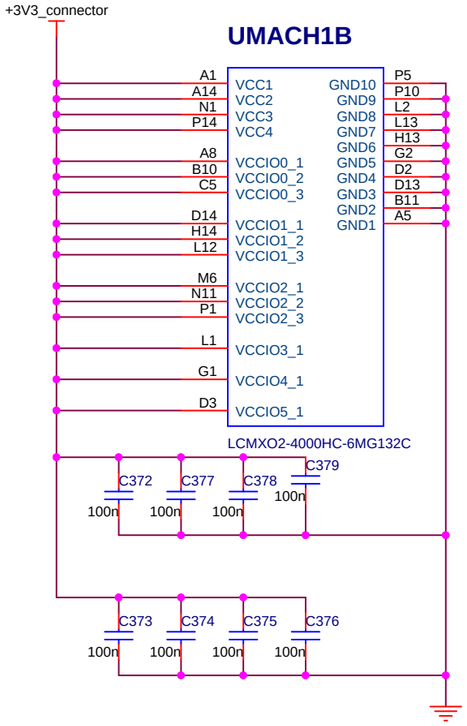

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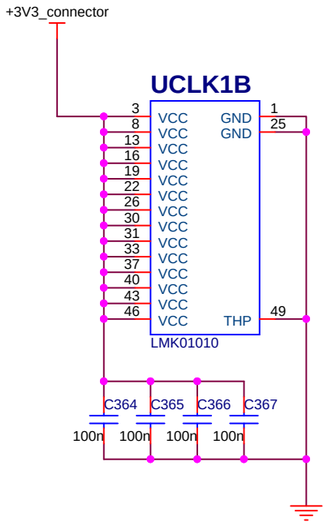

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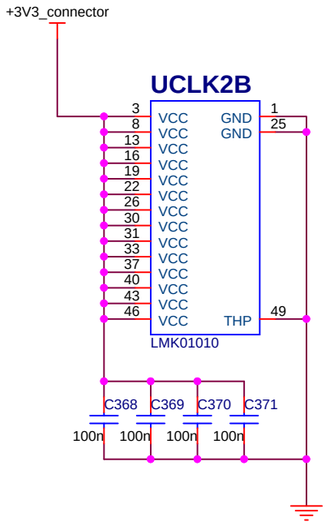

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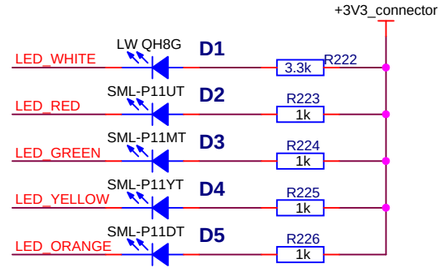

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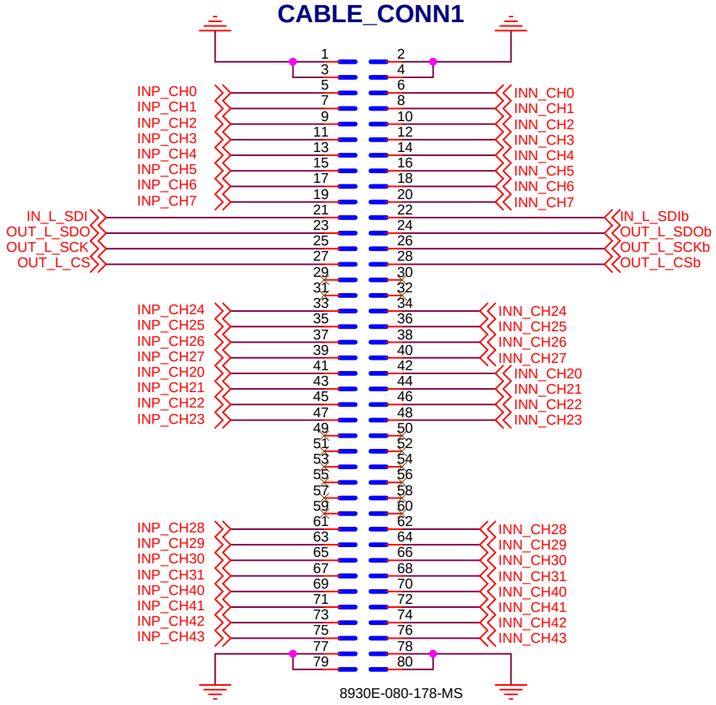
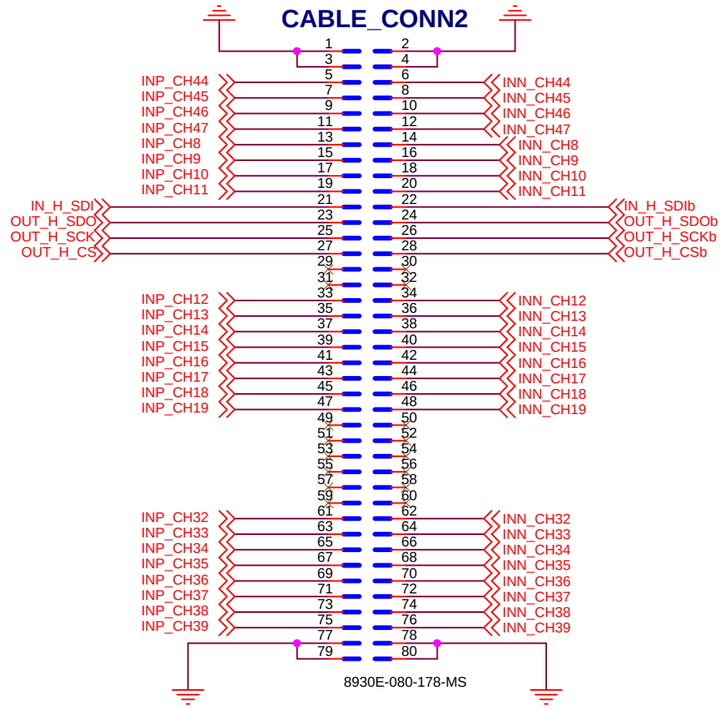
Size A3	Document Number <Doc>	Rev <Rev
Date: Wednesday, February 05, 2014	Sheet 2 of 16	

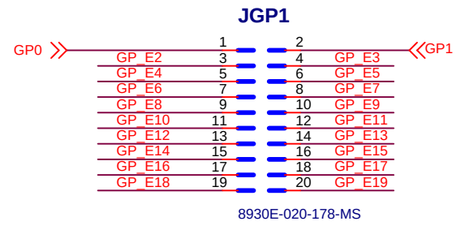


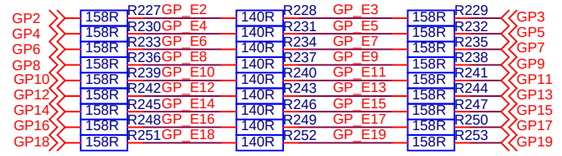
CHANNELS 0 to 23



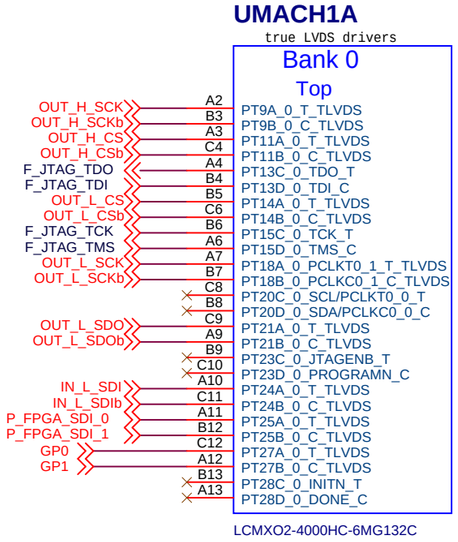
CHANNELS 24 to 47

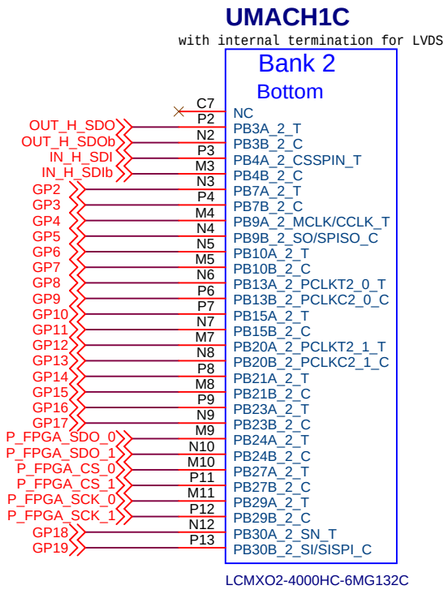
OUT muss TRUE LVDS sein

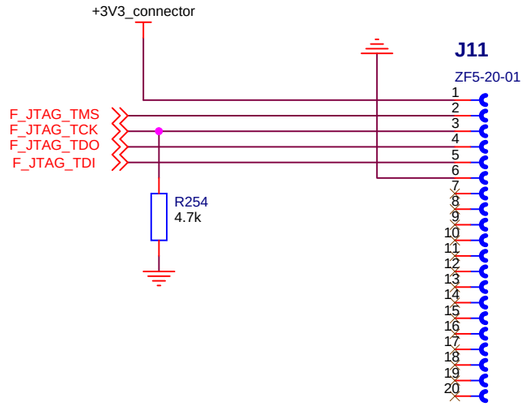




emulated LVDS output
remove 140Ohm and use 0Ohms for 158Ohms to get an LVDS input







PIN
1 +3.3V
2 TMS
3 TCK
4 TDO
5 TDI
6 GND

Place JTAG connector close to the edge

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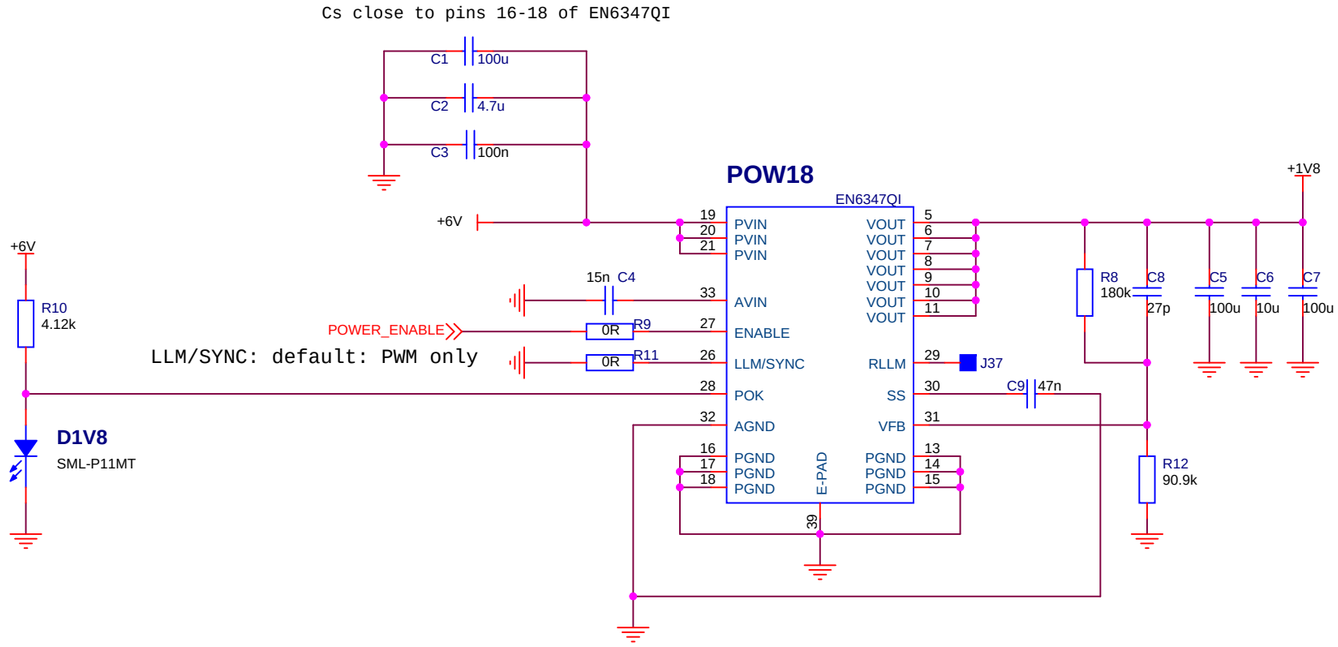
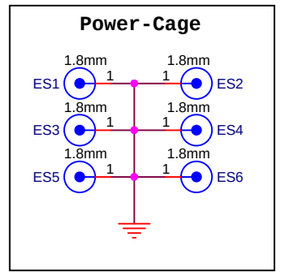
Size A3	Document Number <Doc>	Rev <Rev
Date: Wednesday, February 05, 2014	Sheet 3 of 16	





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Size A3	Document Number <Doc>	Rev <Rev
Date: Wednesday, February 05, 2014	Sheet 4 of 16	

All pairs are differential lines

ALL SIGNALS HERE ARE DIFFERENTIAL

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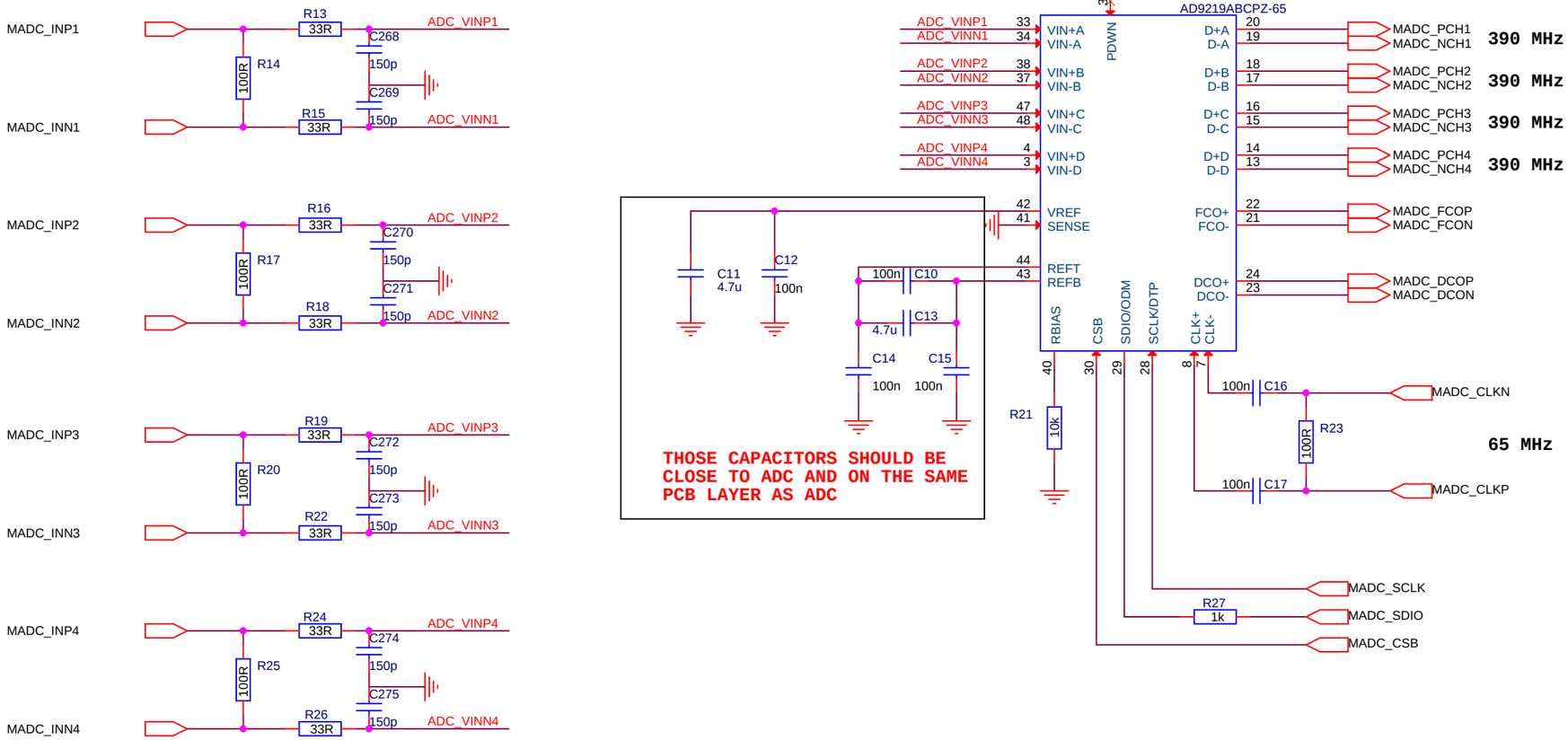

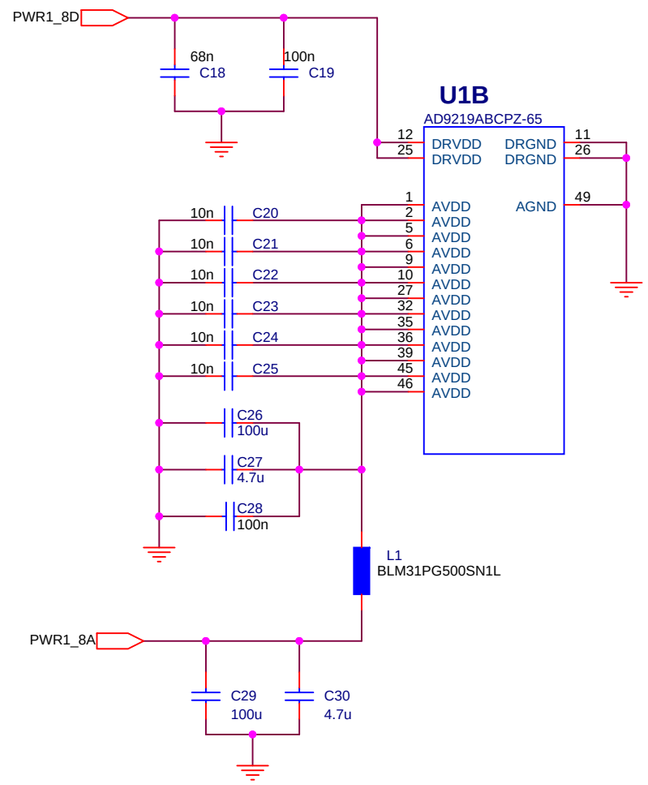

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MULTICHANNEL ADC

Design: K:\GSIJOB\HADES\TRBV3\ADDON_ADC1\ADDON_ADC1.DSN		
Modified: Wednesday, February 05, 2014	Size: A3	Page: 5 / 16
Designer: M.Kajetanowicz	Layouter: S.Voltz	

All pairs are differential lines

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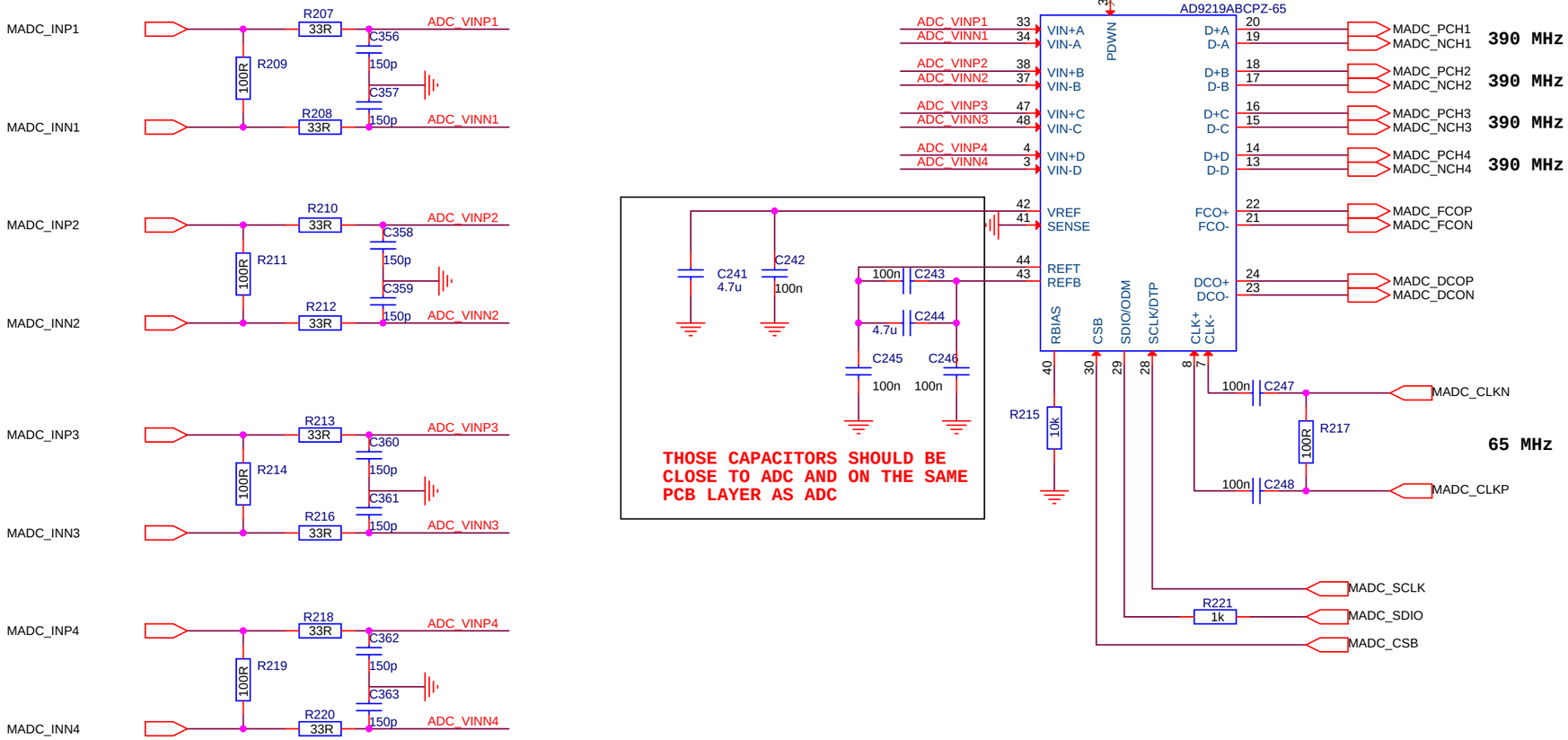

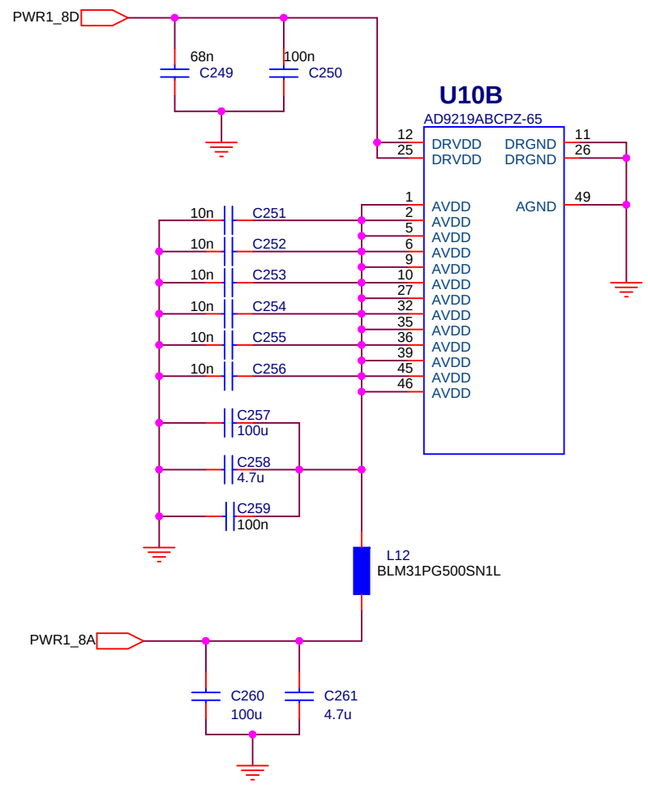

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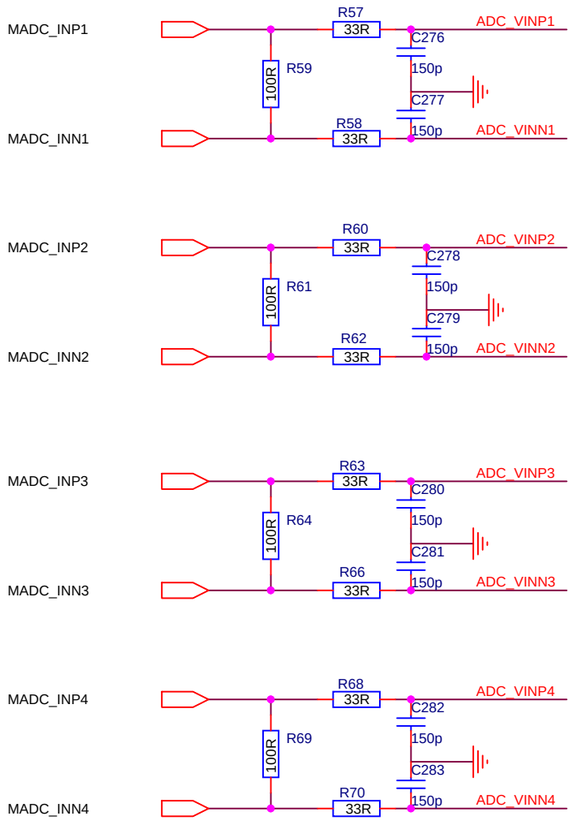
MULTICHANNEL ADC	
Design: K:\GSIJOB\HADES\TRBV3\ADDON_ADC1\ADDON_ADC1.DSN	
Modified: Wednesday, February 05, 2014	Size: A3 Page: 6 / 16
Designer: M.Kajetanowicz	Layouter: S.Voltz

All pairs are differential lines



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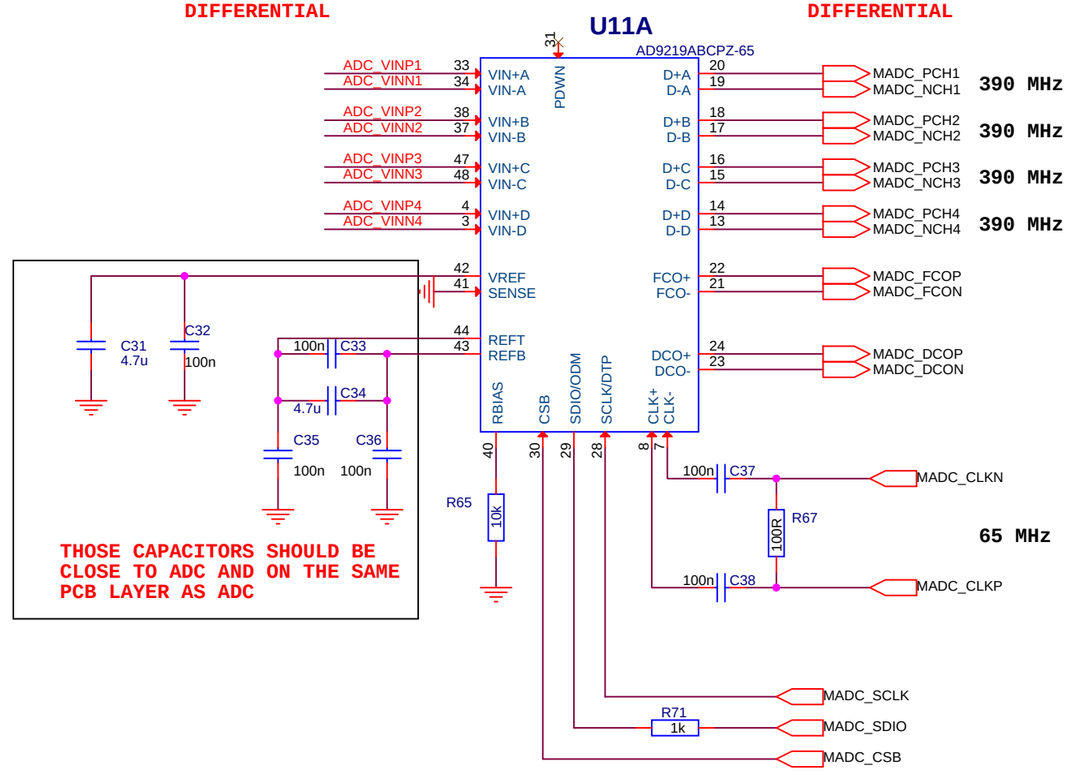
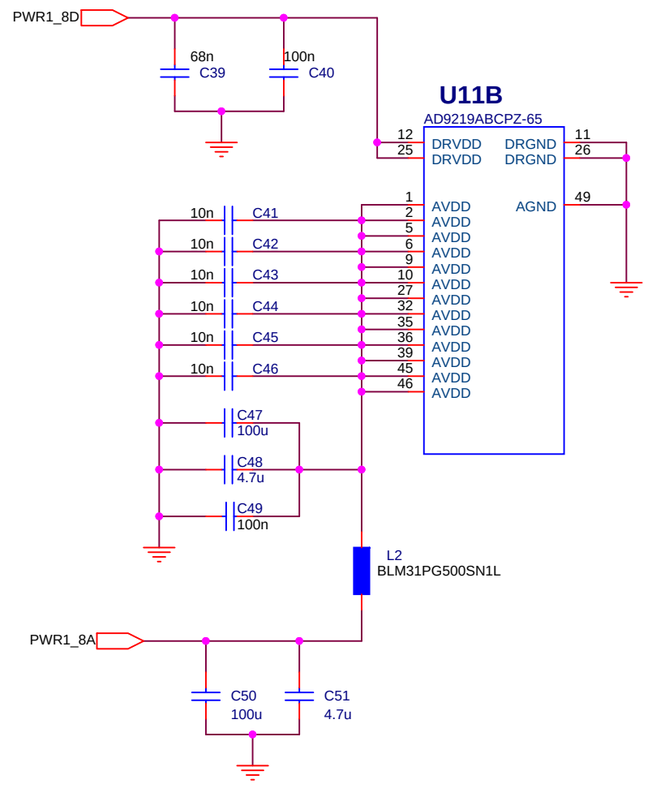


THOSE CAPACITORS SHOULD BE CLOSE TO ADC AND ON THE SAME PCB LAYER AS ADC



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MULTICHANNEL ADC

Design: K:\GSIJOB\HADES\TRBV3\ADDON_ADC1\ADDON_ADC1.DSN		
Modified: Wednesday, February 05, 2014	Size: A3	Page: 7 / 16
Designer: M.Kajetanowicz	Layouter: S.Voltz	

All pairs are differential lines

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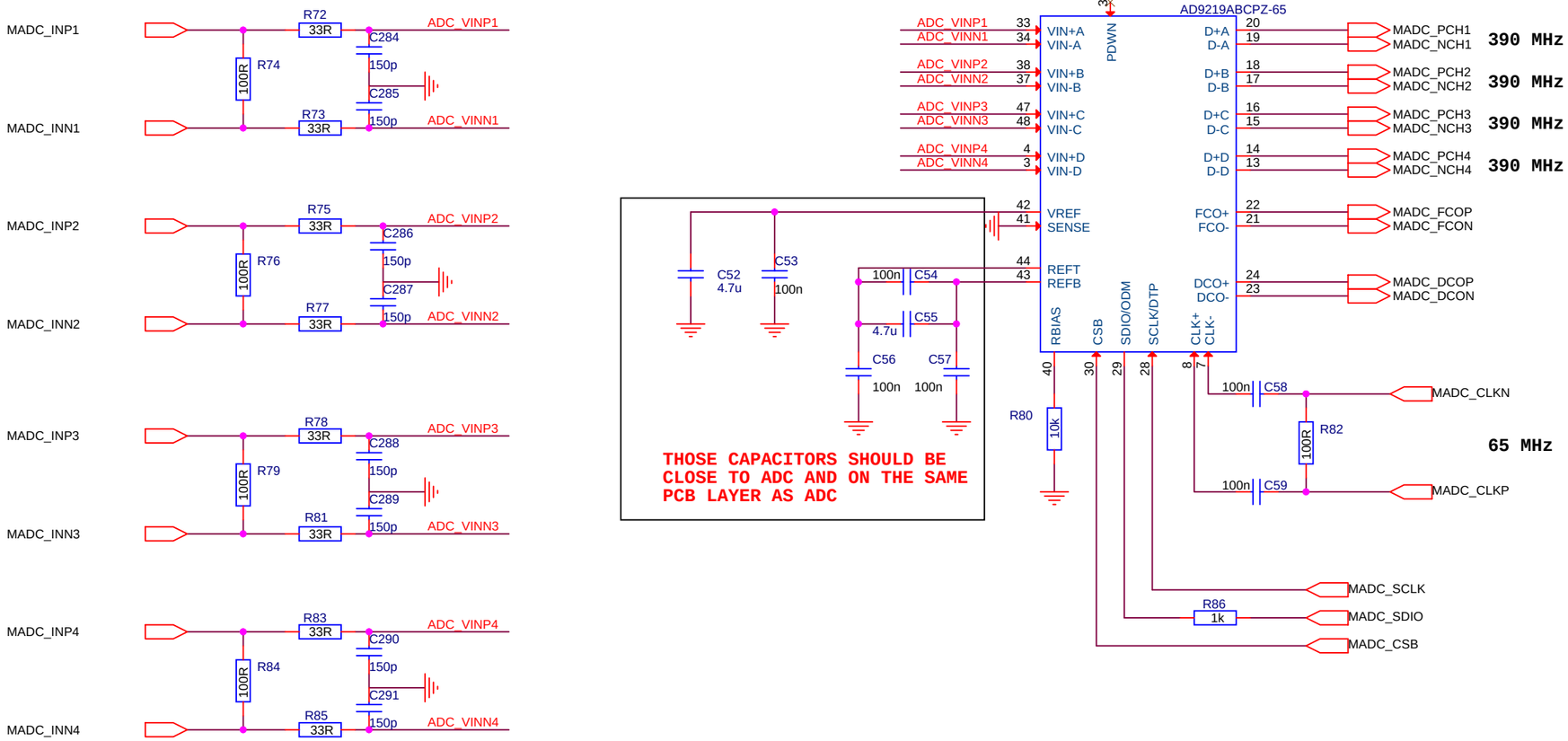

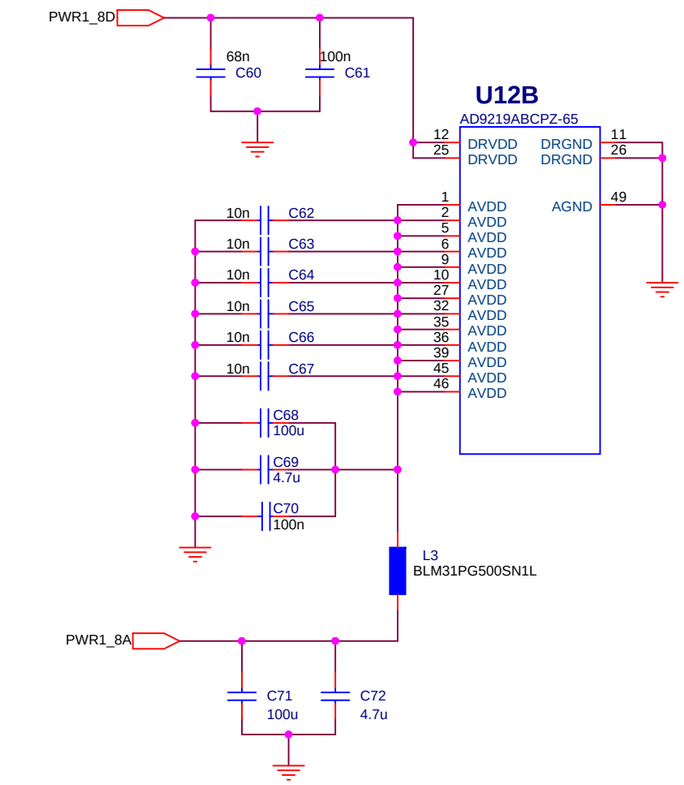

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Modified: Wednesday, February 05, 2014	Size: A3	Page: 8 / 16
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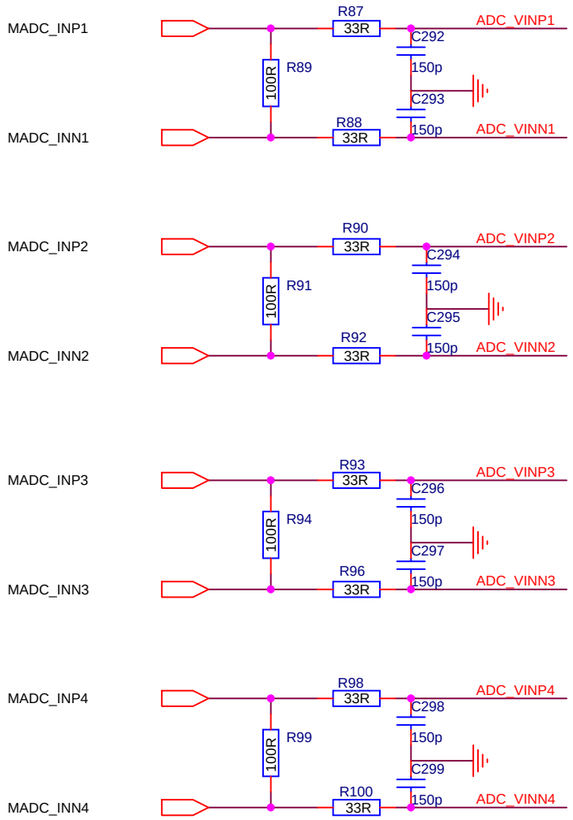

ALL SIGNALS HERE ARE DIFFERENTIAL

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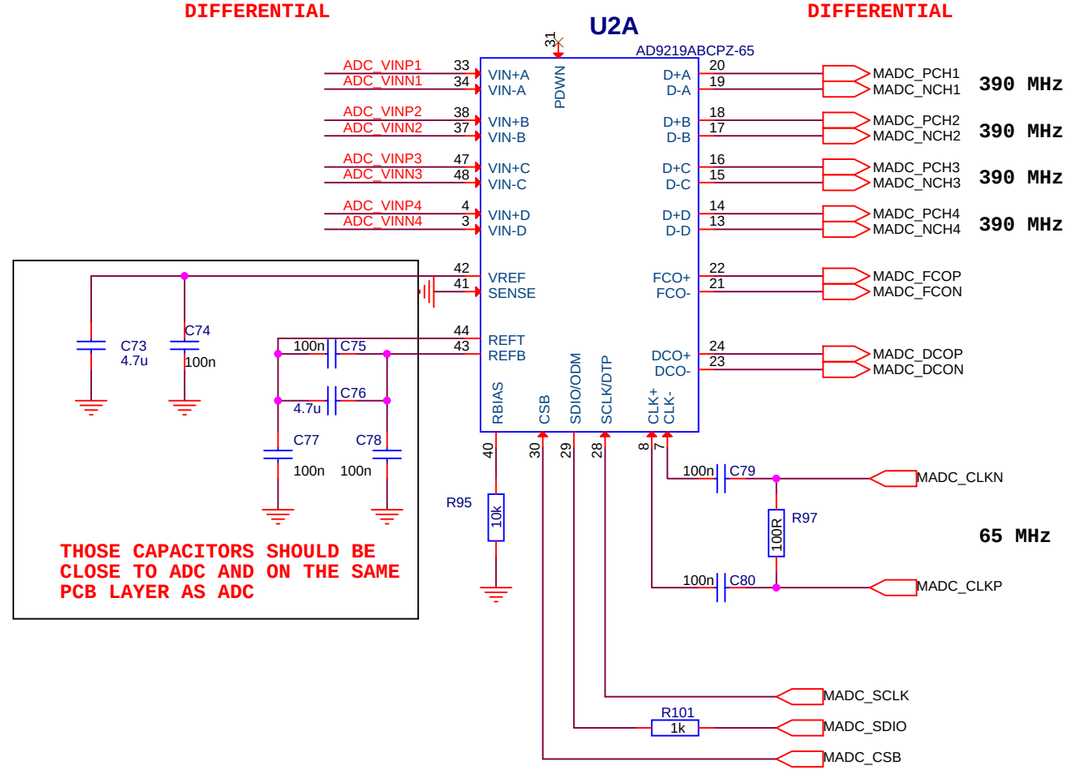

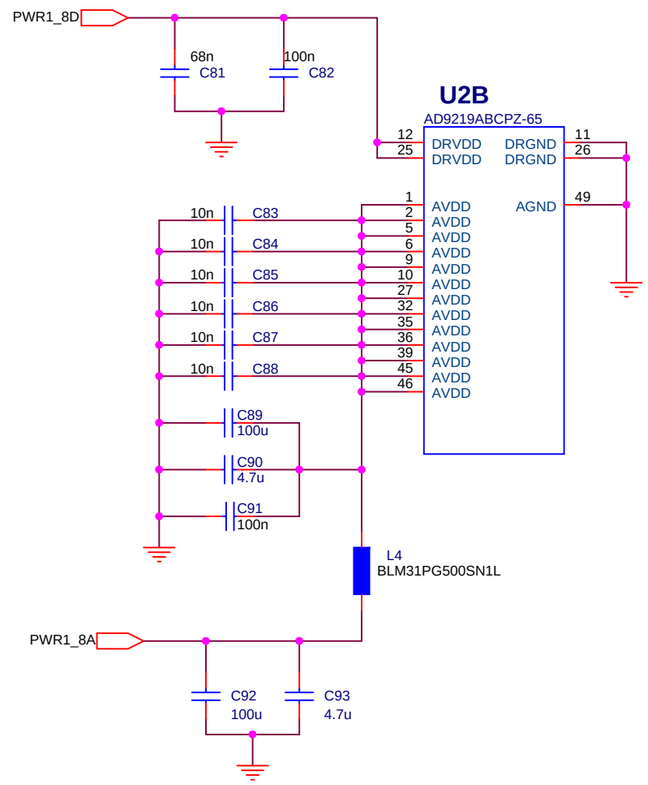

Gesellschaft für Schwerionenforschung mbH Planckstrasse 1 D-64291 Darmstadt GERMANY www.gsi.de	
MULTICHANNEL ADC	
Design: K:\GSIJOB\HADES\TRBV3\ADDON_ADC1\ADDON_ADC1.DSN	
Modified: Wednesday, February 05, 2014	Size: A3 Page: 9 / 16
Designer: M.Kajetanowicz	Layouter: S.Voltz

All pairs are differential lines

ALL SIGNALS HERE ARE DIFFERENTIAL

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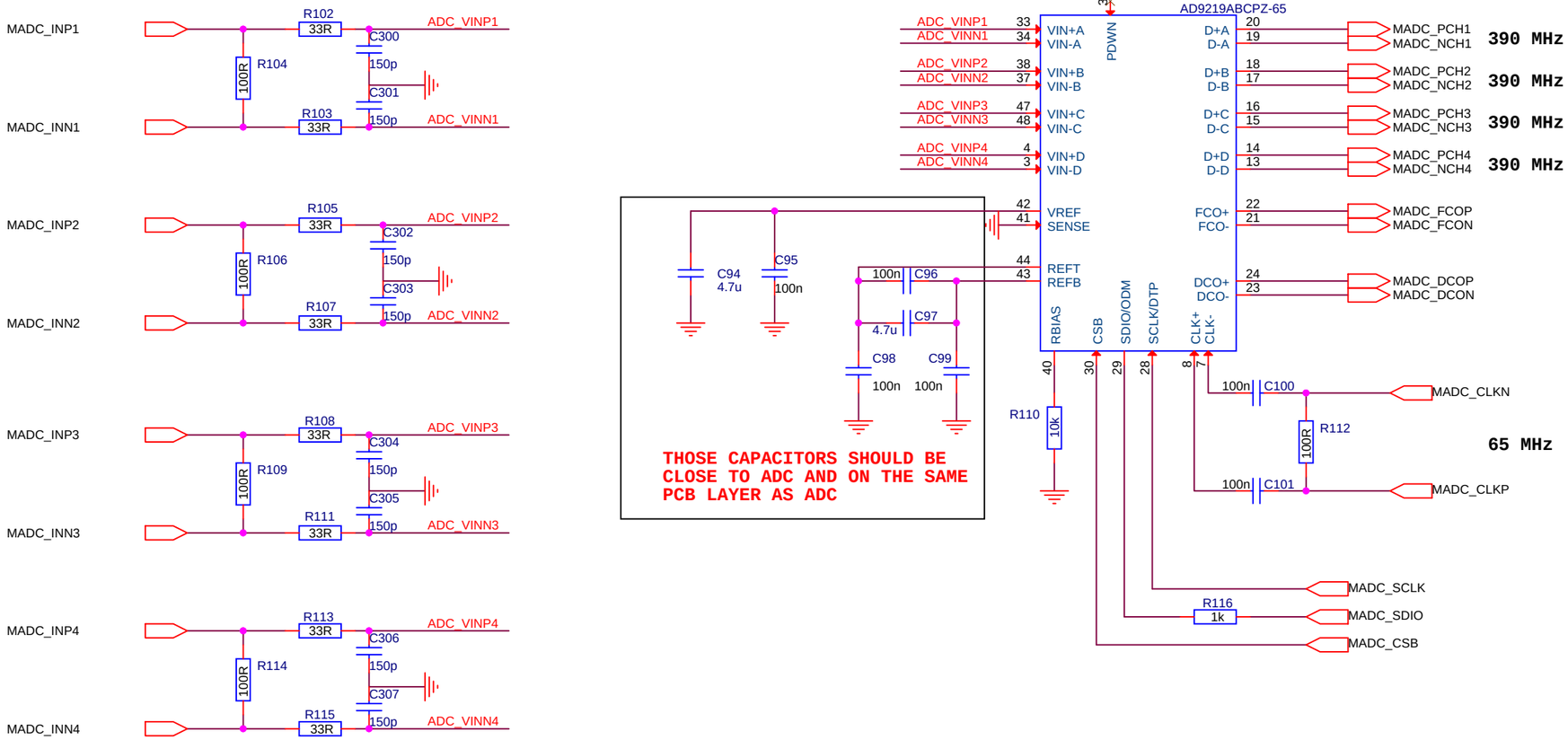

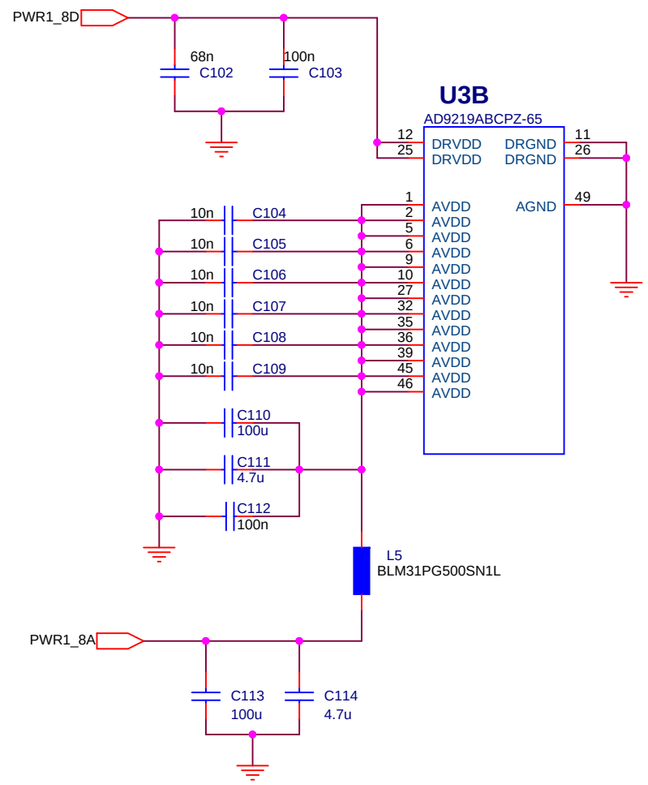

Gesellschaft für Schwerionenforschung mbH Planckstrasse 1 D-64291 Darmstadt GERMANY www.gsi.de	
MULTICHANNEL ADC	
Design: K:\GSIJOB\HADES\TRBV3\ADDON_ADC1\ADDON_ADC1.DSN	
Modified: Wednesday, February 05, 2014	Size: A3 Page: 10/ 16
Designer: M.Kajetanowicz	Layouter: S.Voltz

All pairs are differential lines

ALL SIGNALS HERE ARE DIFFERENTIAL

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MADC_INP1 — R117 33R — C308 150p — ADC_VINP1
R119 100R
MADC_INN1 — R118 33R — C309 150p — ADC_VINN1

MADC_INP2 — R120 33R — C310 150p — ADC_VINP2
R121 100R
MADC_INN2 — R122 33R — C311 150p — ADC_VINN2

MADC_INP3 — R123 33R — C312 150p — ADC_VINP3
R124 100R
MADC_INN3 — R126 33R — C313 150p — ADC_VINN3

MADC_INP4 — R128 33R — C314 150p — ADC_VINP4
R129 100R
MADC_INN4 — R130 33R — C315 150p — ADC_VINN4

U4A
AD9219ABCPZ-65

ADC_VINP1	33	VIN+A	D+A	20	MADC_PCH1
ADC_VINN1	34	VIN-A	D-A	19	MADC_NCH1
ADC_VINP2	38	VIN+B	D+B	18	MADC_PCH2
ADC_VINN2	37	VIN-B	D-B	17	MADC_NCH2
ADC_VINP3	47	VIN+C	D+C	16	MADC_PCH3
ADC_VINN3	48	VIN-C	D-C	15	MADC_NCH3
ADC_VINP4	4	VIN+D	D+D	14	MADC_PCH4
ADC_VINN4	3	VIN-D	D-D	13	MADC_NCH4
	42	VREF	FCO+	22	MADC_FCOP
	41	SENSE	FCO-	21	MADC_FCON
	44	REFT	DCO+	24	MADC_DCOP
	43	REFB	DCO-	23	MADC_DCON

PDWN 31
RBIAS 40 — R125 10k
CSB 30
SDIO/ODM 29
SCLK/DTP 28
CLK+ 8 — 100n C121 — R127 100R — MADC_CLKN
CLK- 7 — 100n C122 — MADC_CLKP

390 MHz
390 MHz
390 MHz
390 MHz
65 MHz

C115 4.7u
C116 100n
100n C117
4.7u C118
C119 100n
C120 100n

THOSE CAPACITORS SHOULD BE CLOSE TO ADC AND ON THE SAME PCB LAYER AS ADC

R131 1k — MADC_SCLK, MADC_SDIO, MADC_CSB

PWR1_8D
68n C123
100n C124

U4B
AD9219ABCPZ-65

	12	DRVDD	DRGND	11	
	25	DRVDD	DRGND	26	
	1	AVDD	AGND	49	
	2	AVDD			
	5	AVDD			
	6	AVDD			
	9	AVDD			
	10	AVDD			
	27	AVDD			
	32	AVDD			
	35	AVDD			
	36	AVDD			
	39	AVDD			
	45	AVDD			
	46	AVDD			

10n C125
10n C126
10n C127
10n C128
10n C129
10n C130
C131 100u
C132 4.7u
C133 100n

L6 BLM31PG500SN1L

PWR1_8A
C134 100u
C135 4.7u

Gesellschaft für Schwerionenforschung mbH
Planckstrasse 1
D-64291 Darmstadt
GERMANY
www.gsi.de

MULTICHANNEL ADC

Design: K:\GSIJOB\HADES\TRBV3\ADDON_ADC1\ADDON_ADC1.DSN		
Modified: Wednesday, February 05, 2014	Size: A3	Page: 11/ 16
Designer: M.Kajetanowicz	Layouter: S.Voltz	

All pairs are differential lines

ALL SIGNALS HERE ARE DIFFERENTIAL

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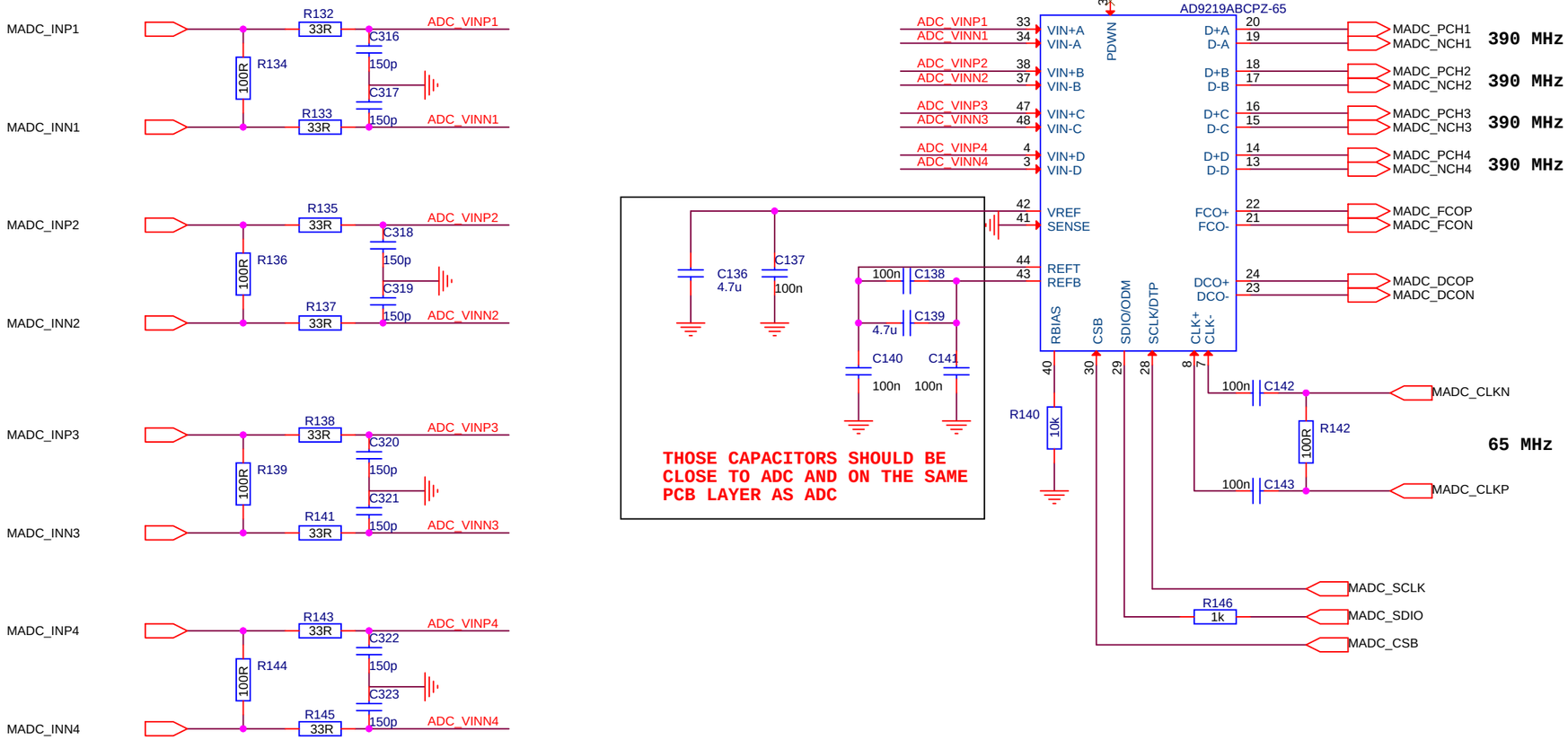

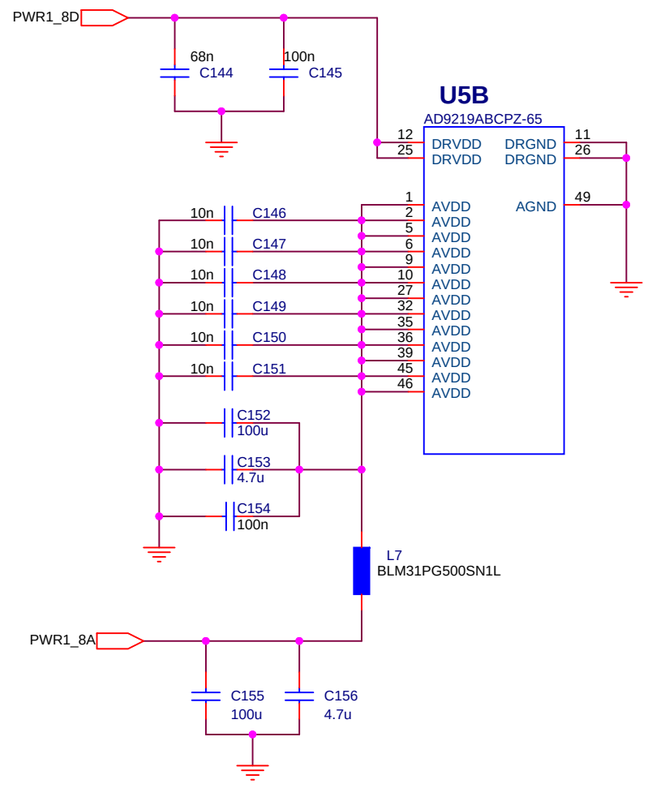

Gesellschaft für Schwerionenforschung mbH
Planckstrasse 1
D-64291 Darmstadt
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www.gsi.de

MULTICHANNEL ADC

Design: K:\GSIJOB\HADES\TRBV3\ADDON_ADC1\ADDON_ADC1.DSN		
Modified: Wednesday, February 05, 2014	Size: A3	Page: 12/ 16
Designer: M.Kajetanowicz	Layouter: S.Voltz	

All pairs are differential lines

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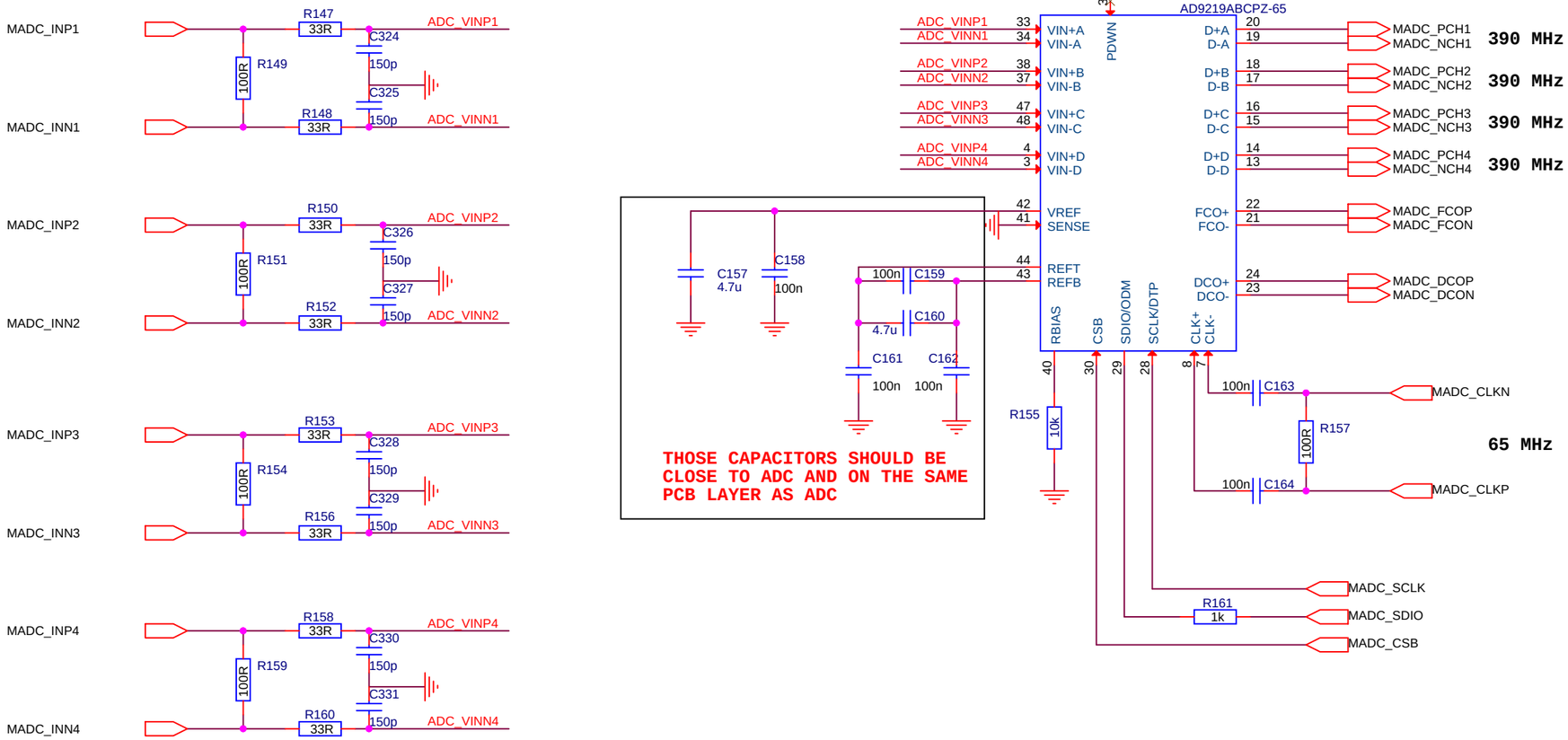

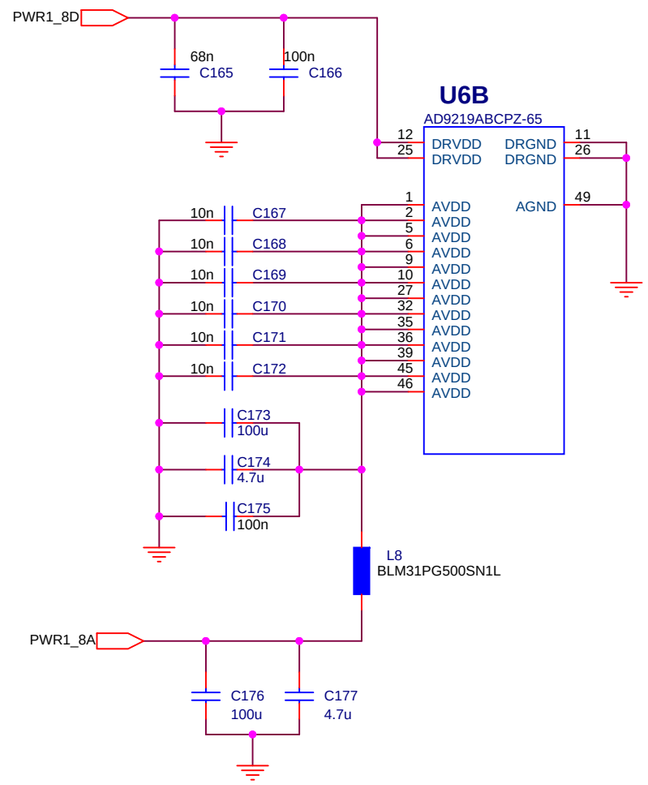

Gesellschaft für Schwerionenforschung mbH
Planckstrasse 1
D-64291 Darmstadt
GERMANY
www.gsi.de

MULTICHANNEL ADC

Design: K:\GSIJOB\HADES\TRBV3\ADDON_ADC1\ADDON_ADC1.DSN		
Modified: Wednesday, February 05, 2014	Size: A3	Page: 13/ 16
Designer: M.Kajetanowicz	Layouter: S.Voltz	

All pairs are differential lines

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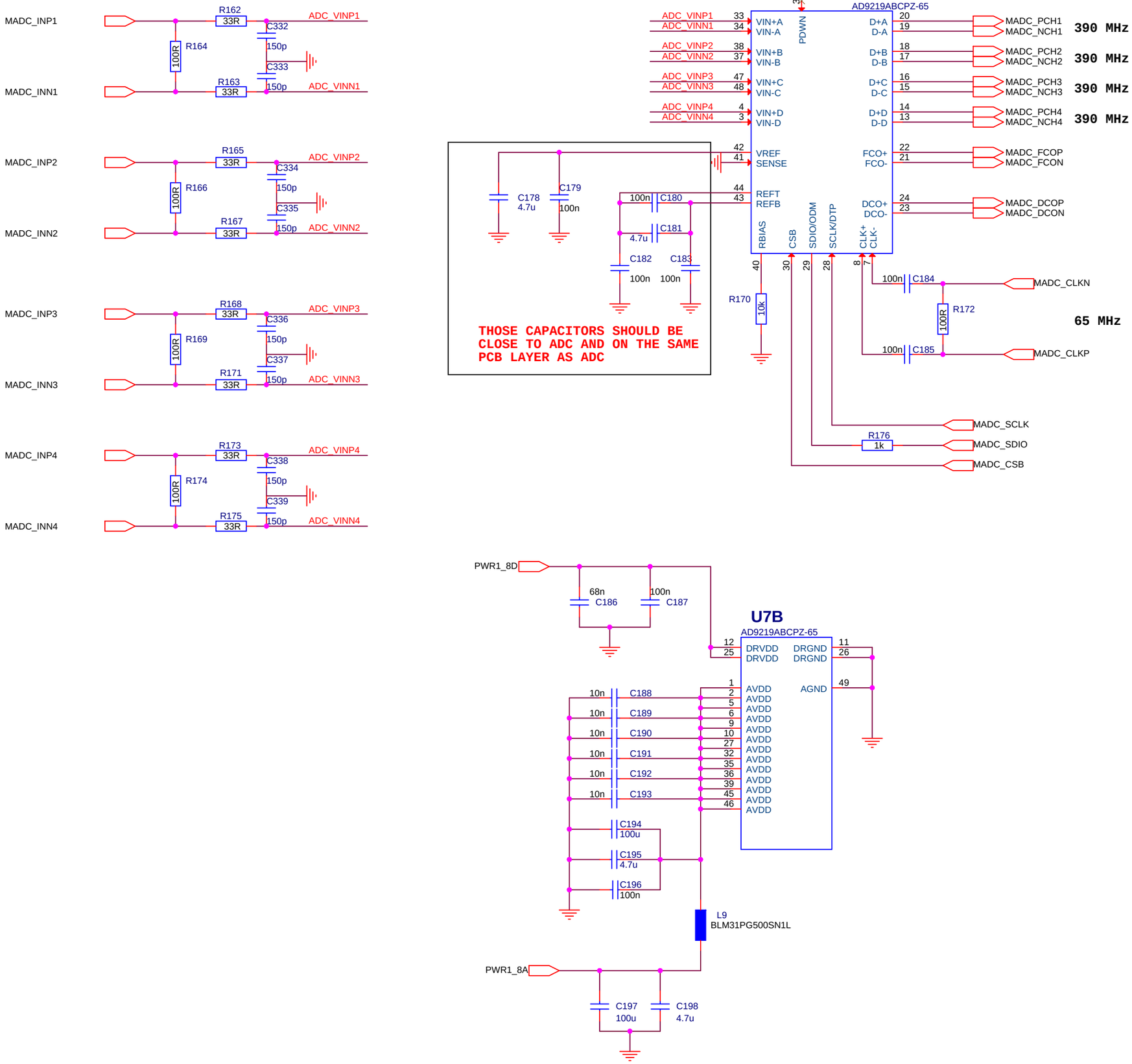

Gesellschaft für Schwerionenforschung mbH Planckstrasse 1 D-64291 Darmstadt GERMANY www.gsi.de	
MULTICHANNEL ADC	
Design: K:\GSIJOB\HADES\TRBV3\ADDON_ADC1\ADDON_ADC1.DSN	
Modified: Wednesday, February 05, 2014	Size: A3 Page: 14/ 16
Designer: M.Kajetanowicz	Layouter: S.Voltz

All pairs are differential lines

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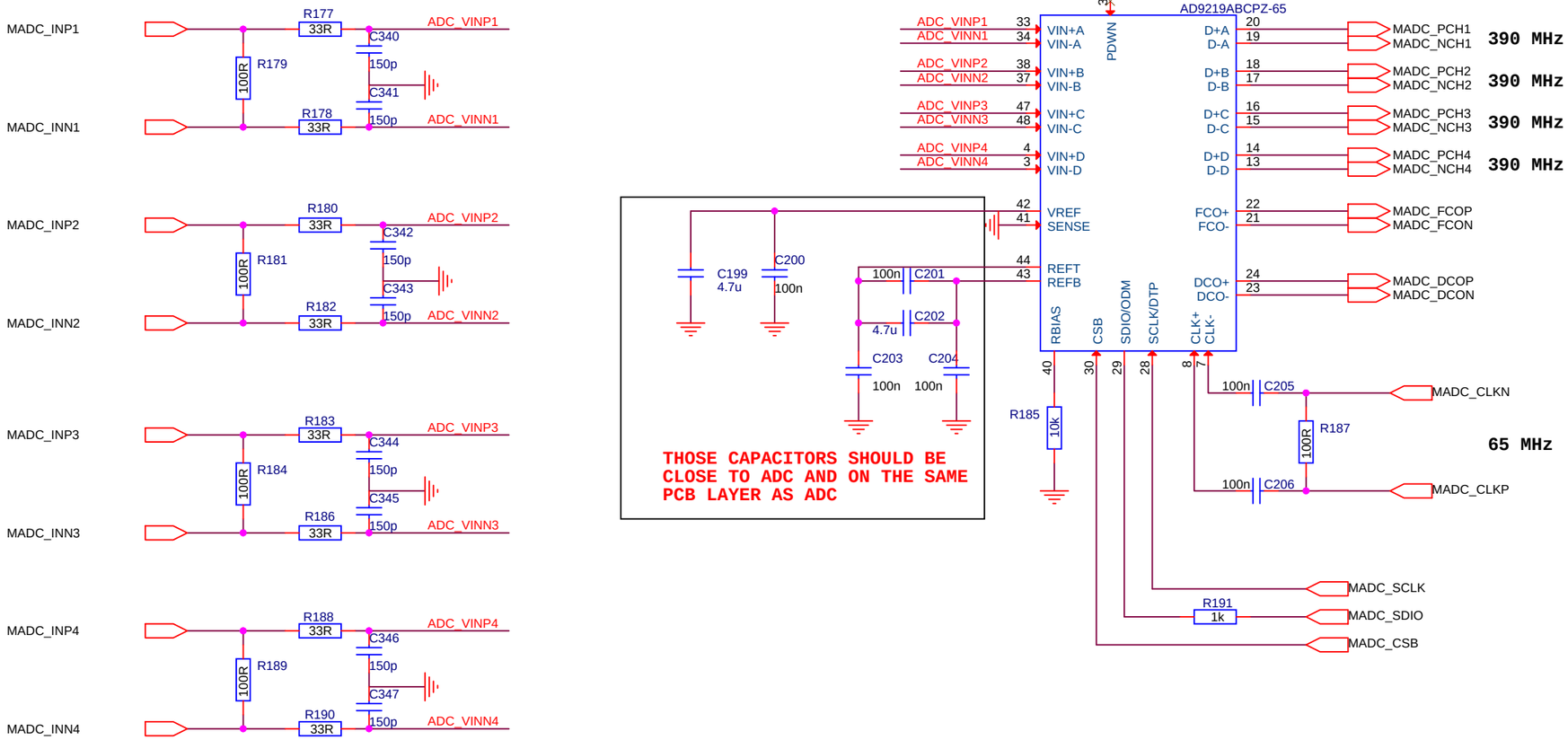

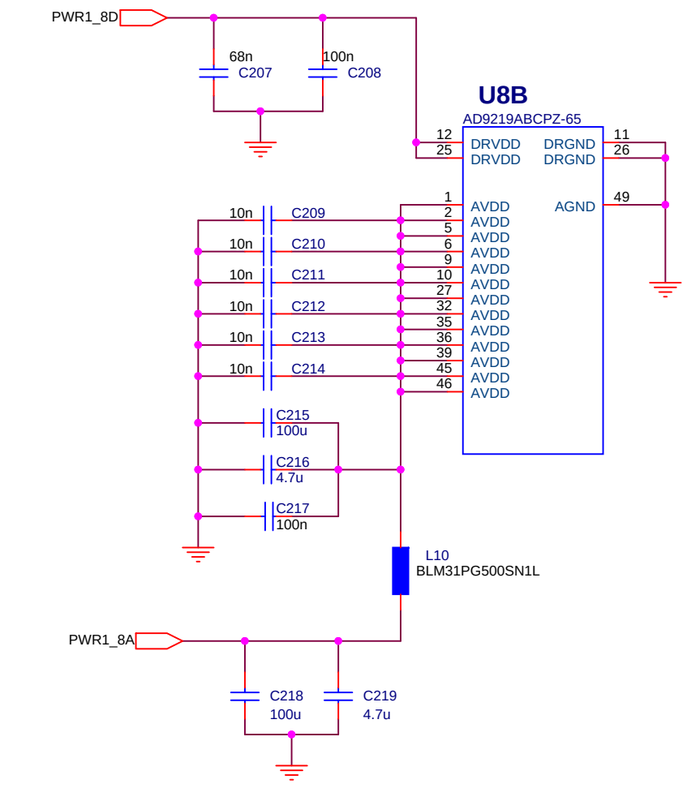

Gesellschaft für Schwerionenforschung mbH Planckstrasse 1 D-64291 Darmstadt GERMANY www.gsi.de	
MULTICHANNEL ADC	
Design: K:\GSIJOB\HADES\TRBV3\ADDON_ADC1\ADDON_ADC1.DSN	
Modified: Wednesday, February 05, 2014	Size: A3 Page: 15/ 16
Designer: M.Kajetanowicz	Layouter: S.Voltz

All pairs are differential lines

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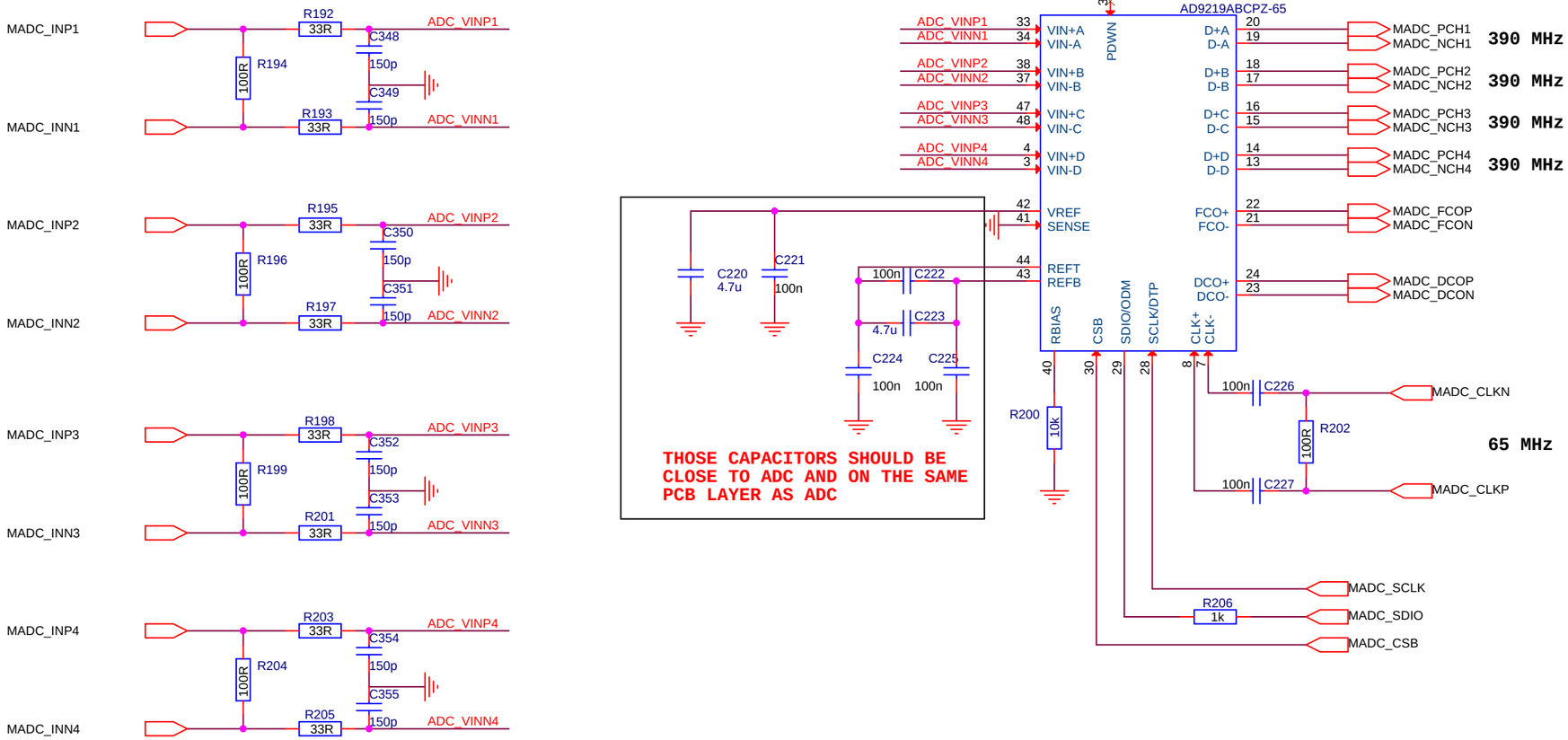
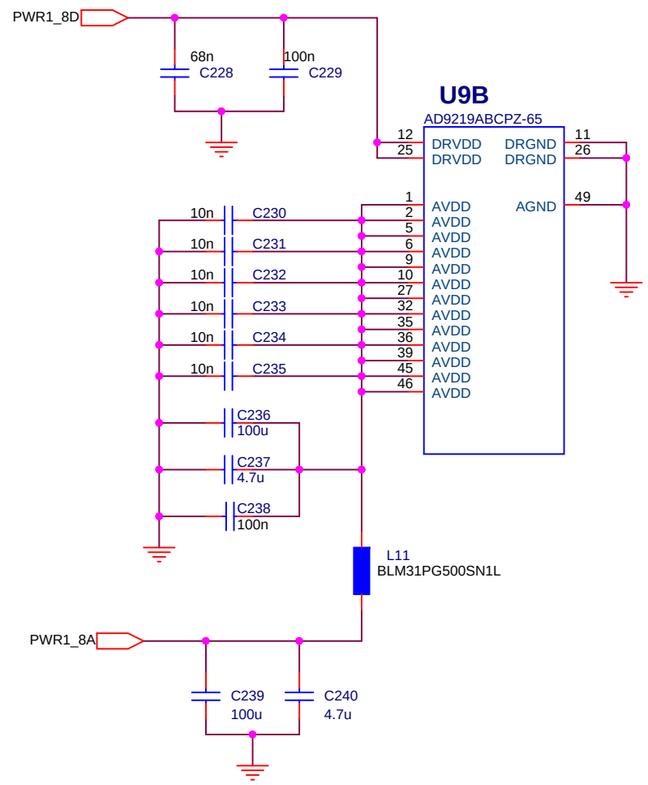
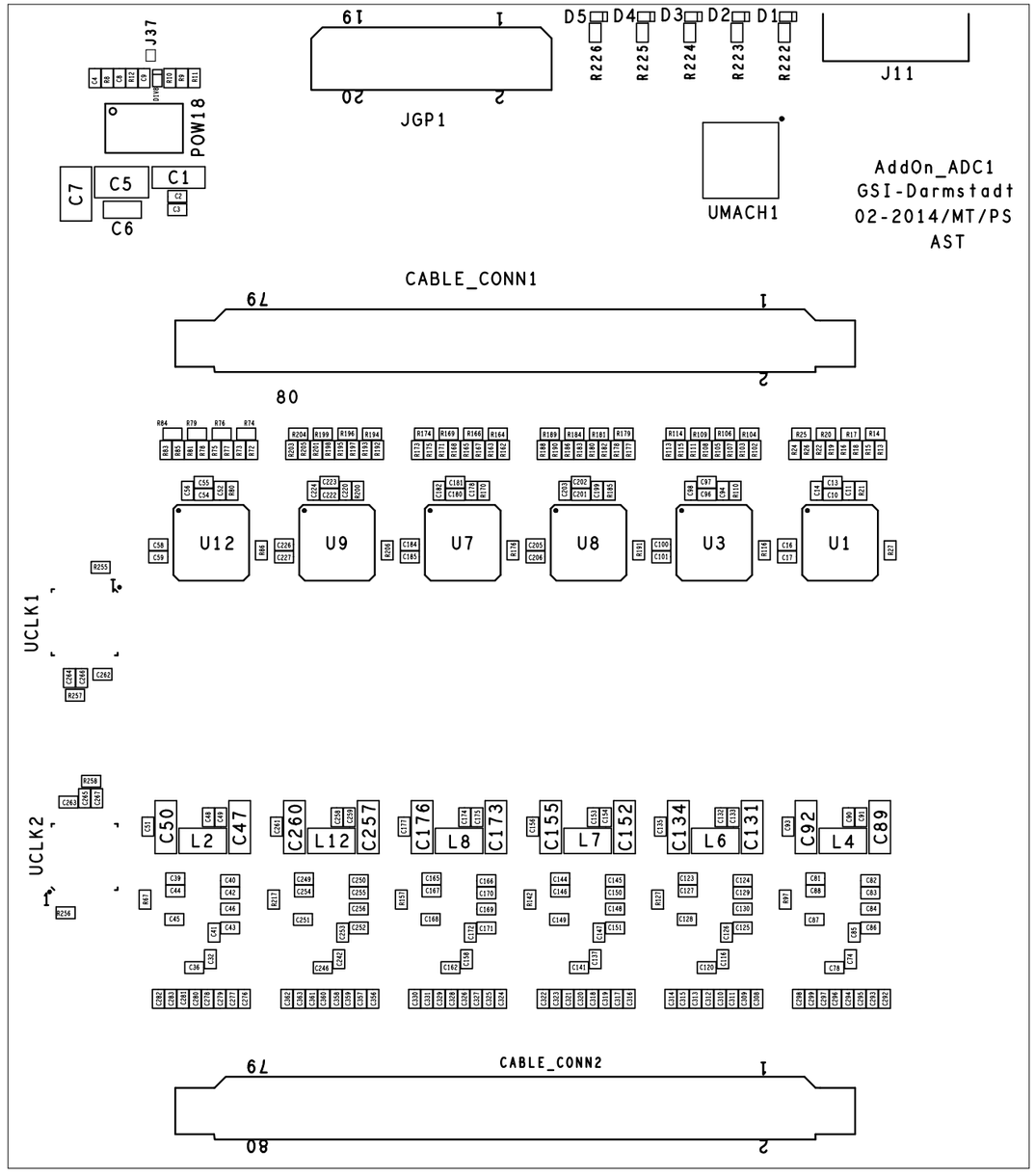


THOSE CAPACITORS SHOULD BE CLOSE TO ADC AND ON THE SAME PCB LAYER AS ADC



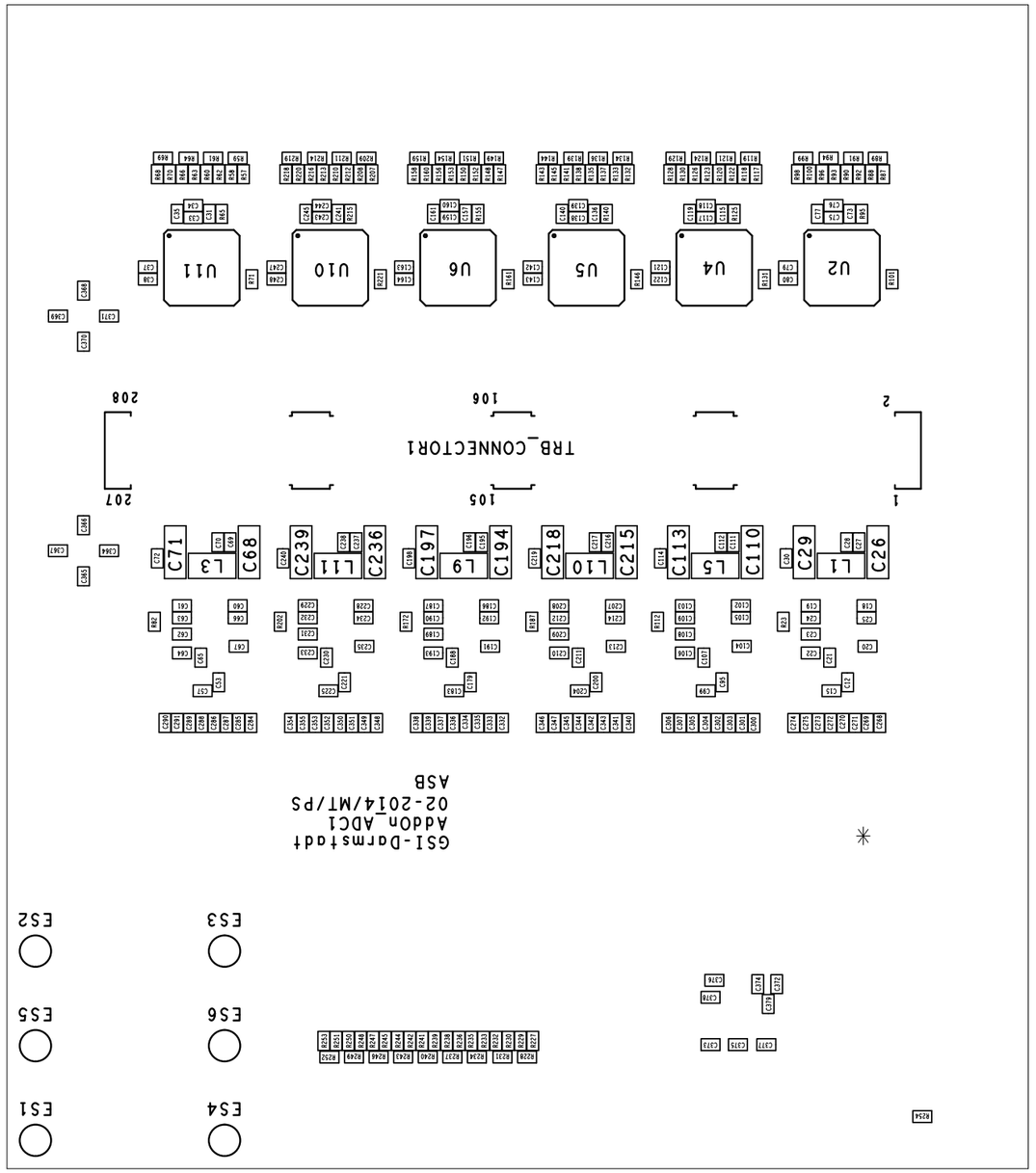
Gesellschaft für Schwerionenforschung mbH Planckstrasse 1 D-64291 Darmstadt GERMANY www.gsi.de	
MULTICHANNEL ADC	
Design: K:\GSIJOB\HADES\TRBV3\ADDON_ADC1\ADDON_ADC1.DSN	
Modified: Wednesday, February 05, 2014	Size: A3 Page: 16/ 16
Designer: M.Kajetanowicz	Layouter: S.Voltz



Jobname	Date	Designer	Layouter
AddOn_ADC1	02.2014	M.Traxler	P.Skott

Layer Nickname

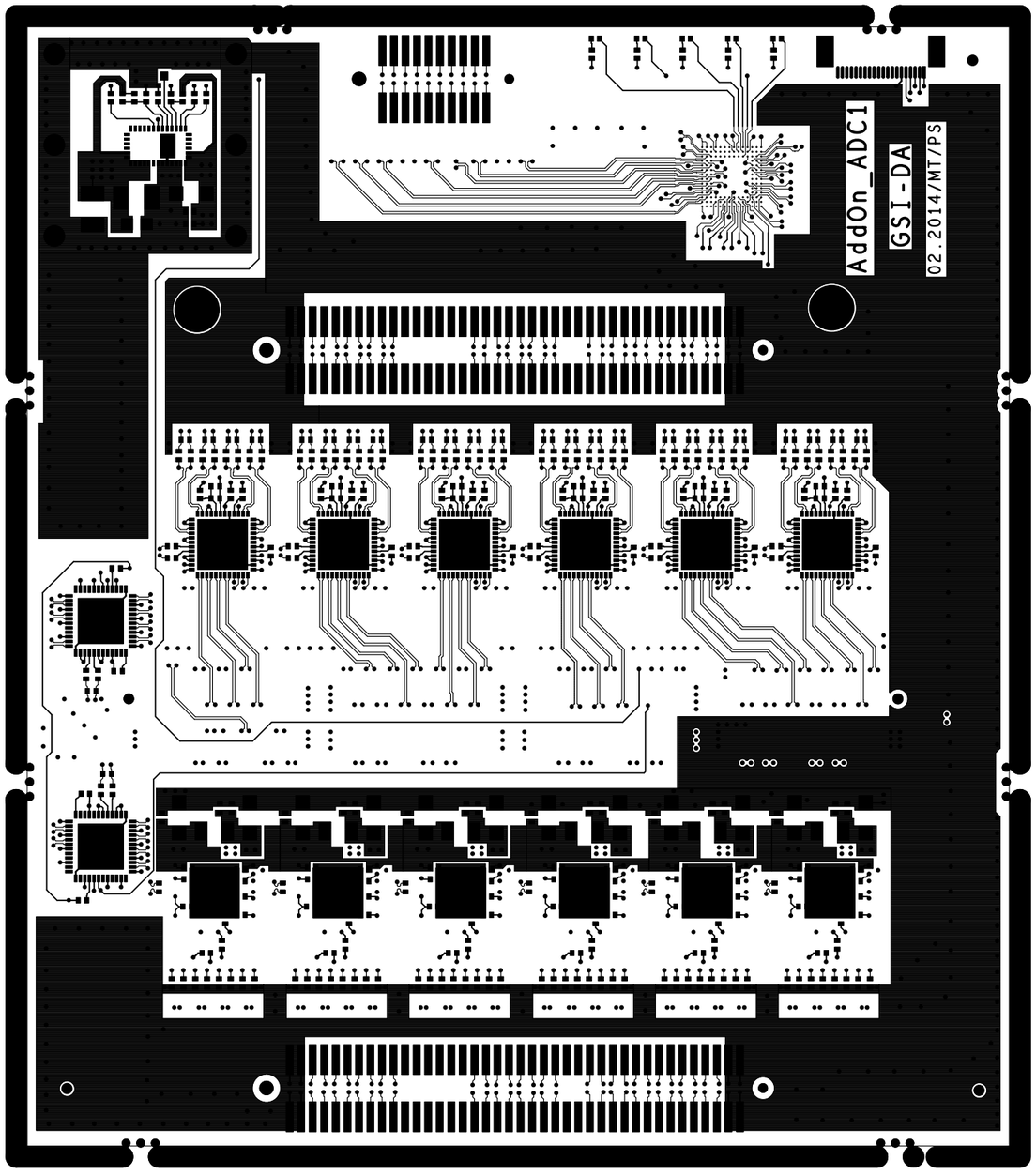
Ast



Layouter	Designer	Date	Name
P.Skott	M.Traxler	05.05.14	ADdOn_ADC1

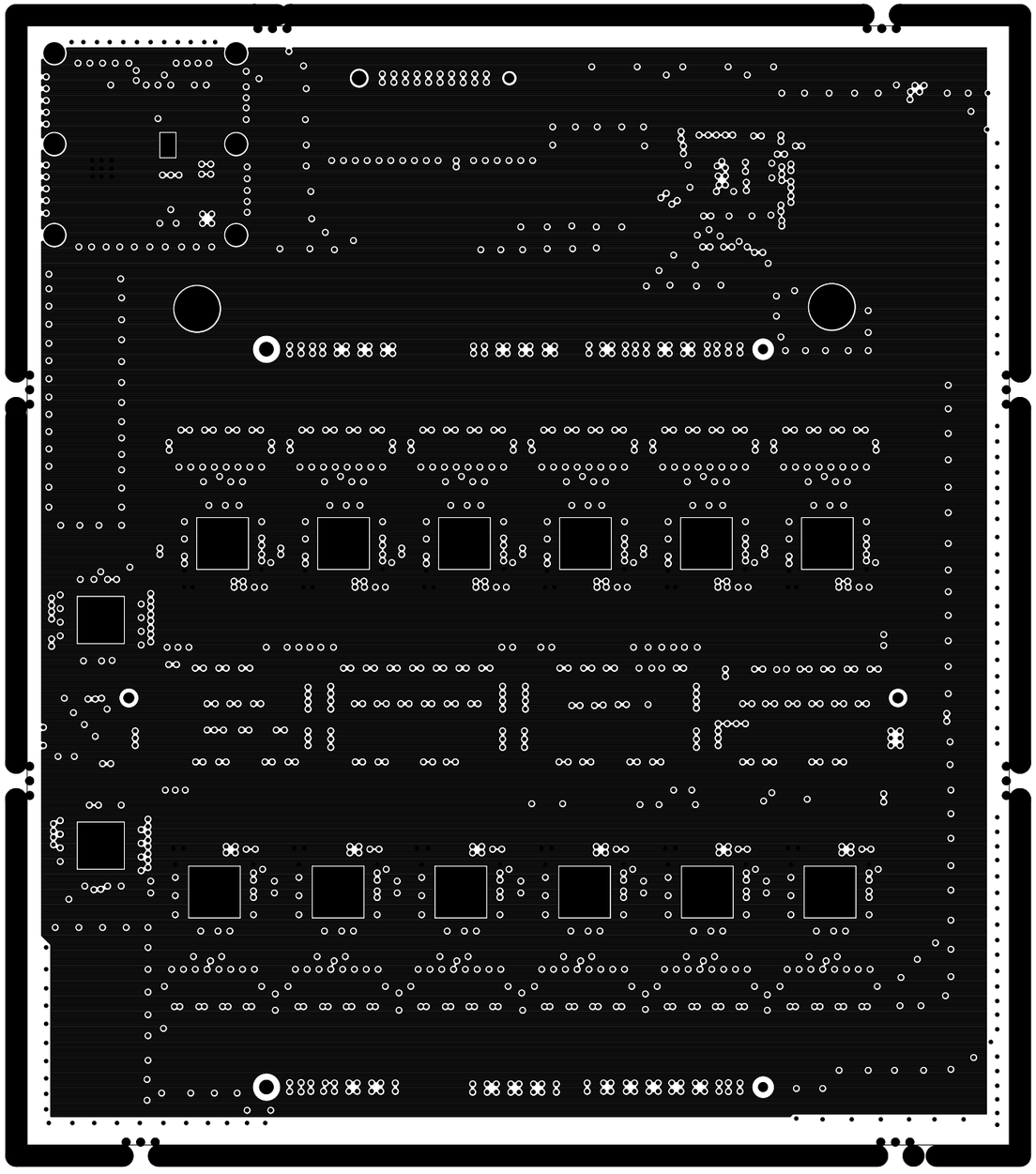
Asp

Faxel Nickmann



Jobname	Date	Designer	Layouter
AddOn_ADC1 Top	02.2014	M.Traxler	P.Skott

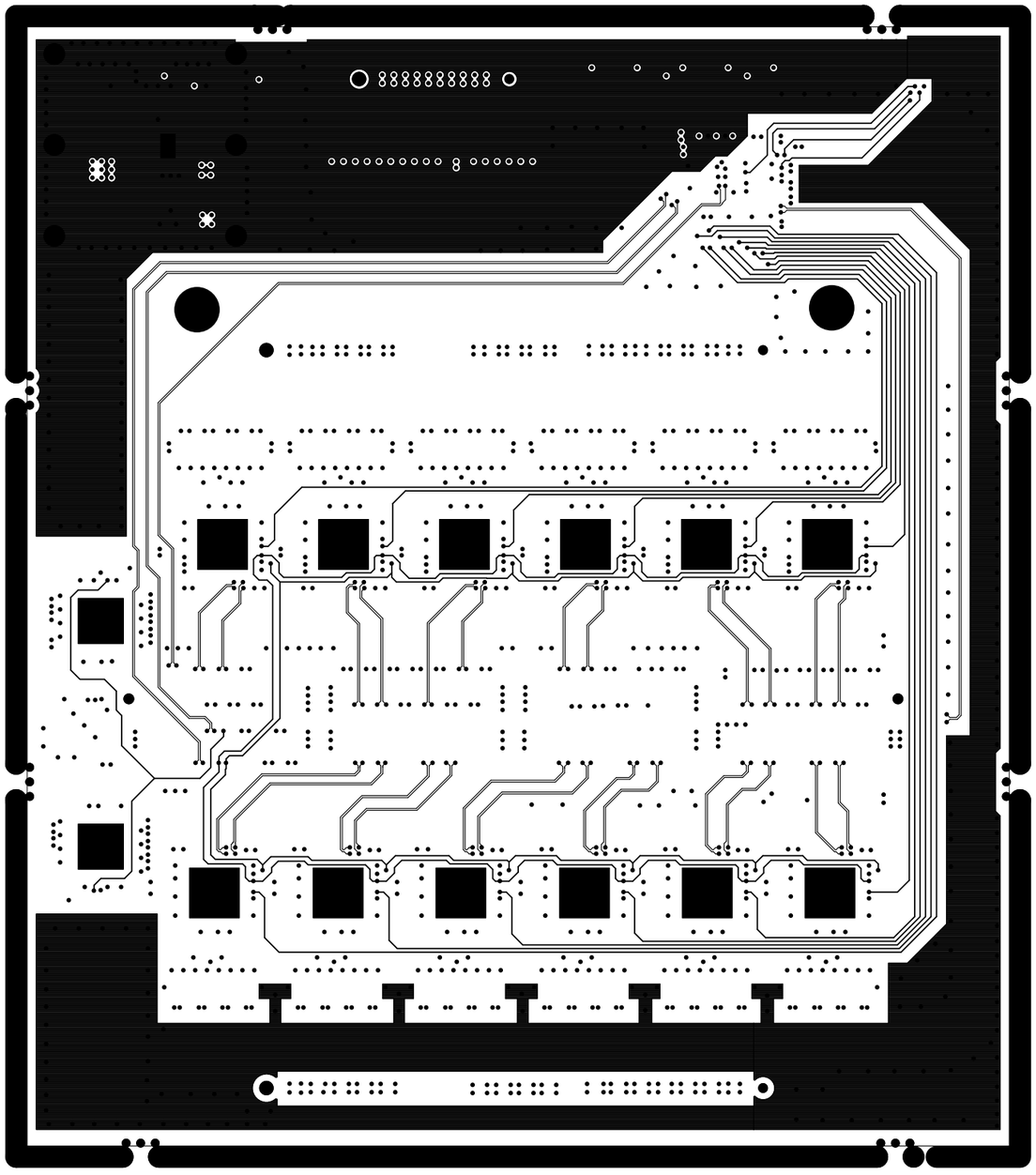
Layer Nickname



Jobname	Date	Designer	Layouter
AddOn_ADC1	02.2014	M.Traxler	P.Skott

I01

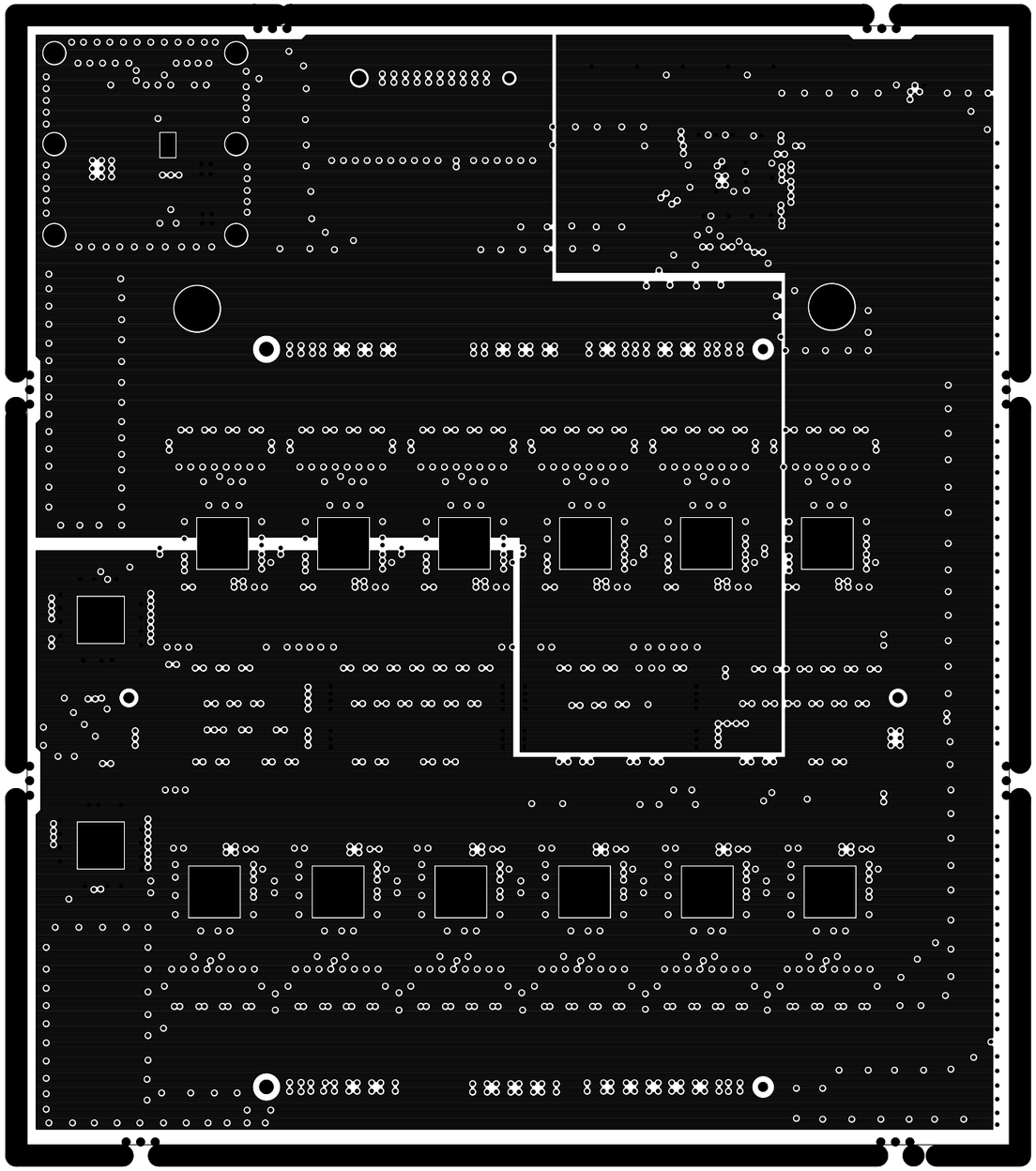
Layer Nickname



Jobname	Date	Designer	Layouter
AddOn_ADC1	02.2014	M.Traxler	P.Skott

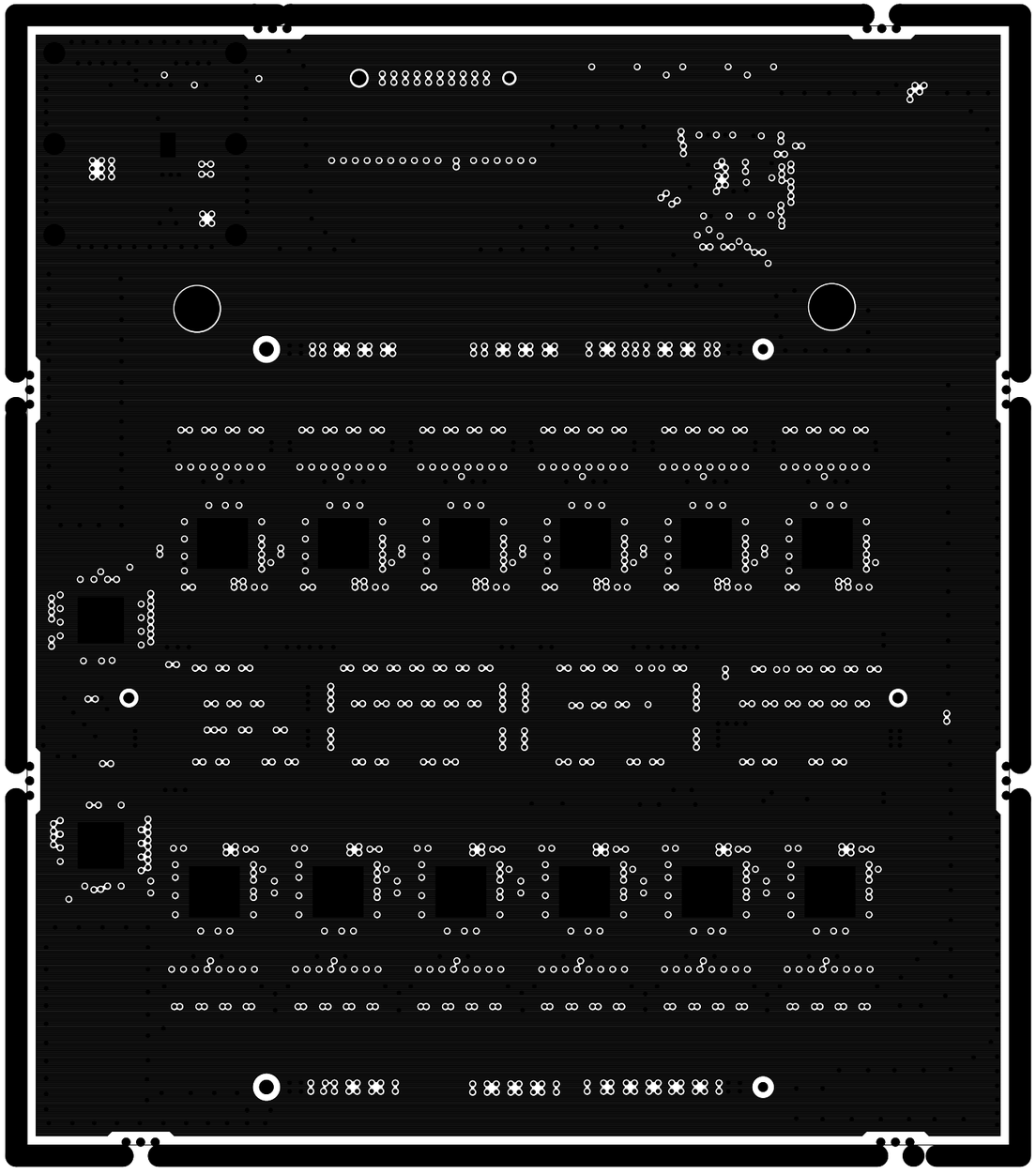
Layer Nickname

I02



Jobname	Date	Designer	Layouter
AddOn_ADC1	02.2014	M.Traxler	P.Skott

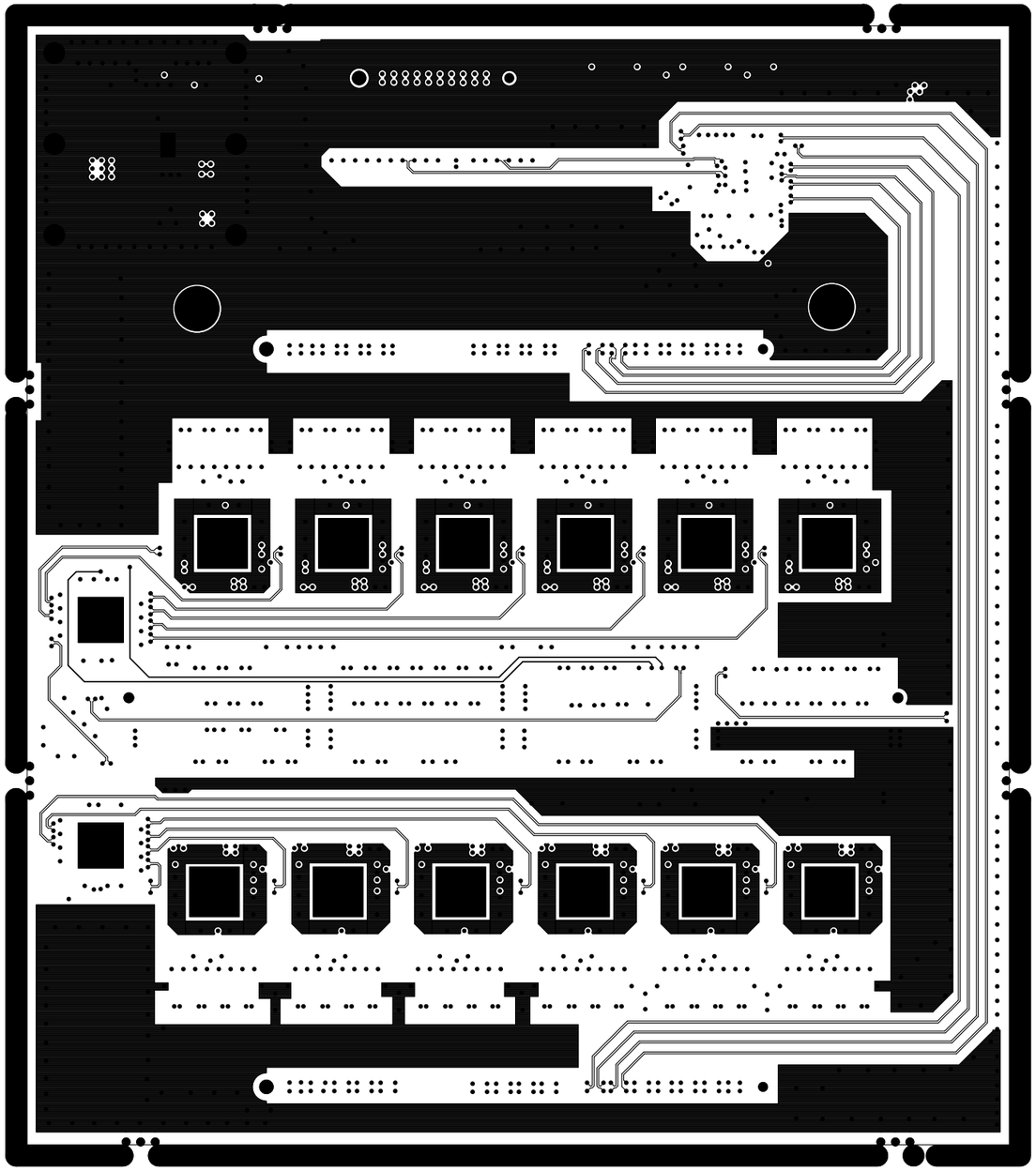
Layer Nickname I03



Jobname	Date	Designer	Layouter
AddOn_ADC1	02.2014	M.Traxler	P.Skott

Layer Nickname

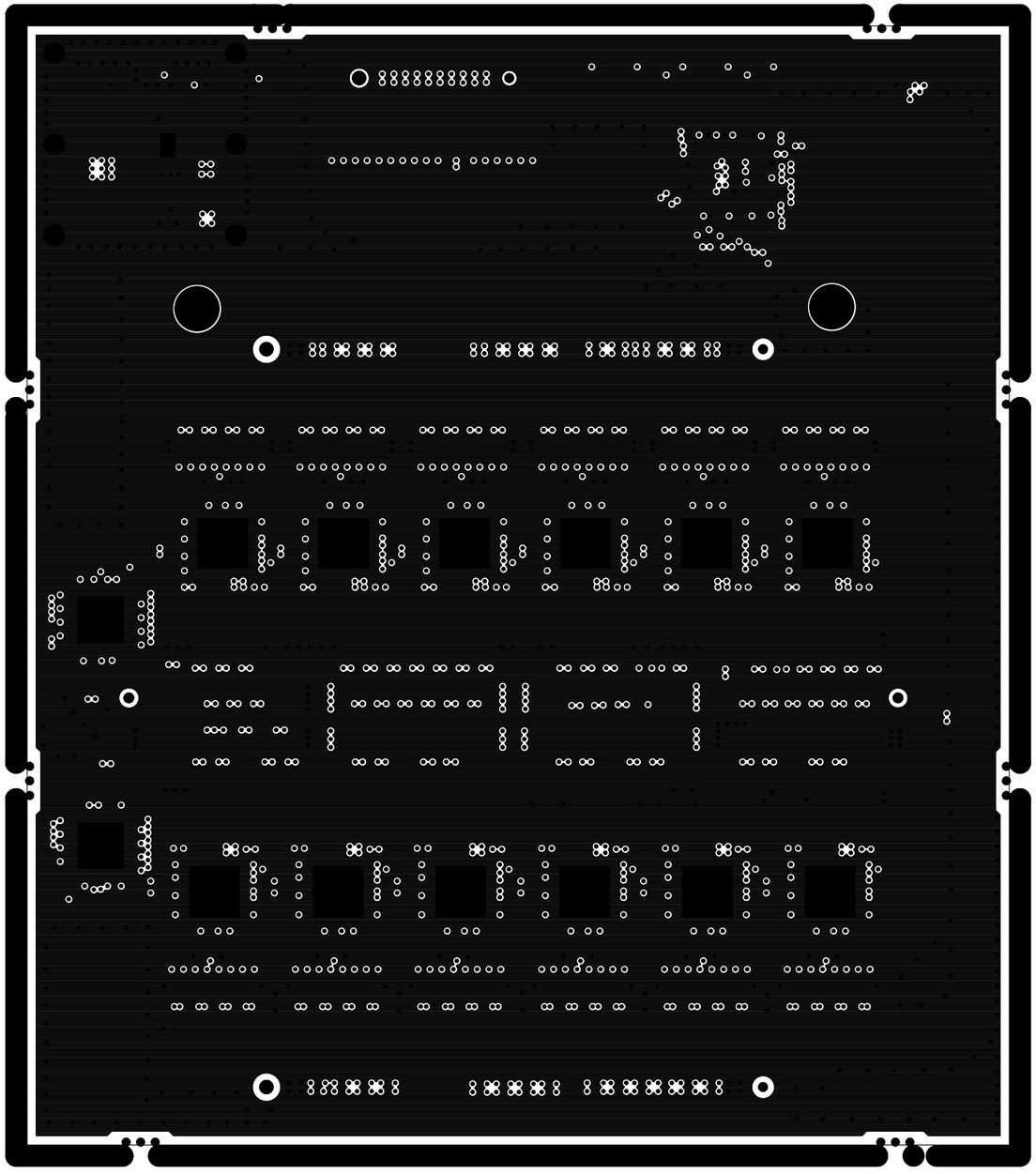
I04



Jobname	Date	Designer	Layouter
AddOn_ADC1	02.2014	M.Traxler	P.Skott

Layer Nickname

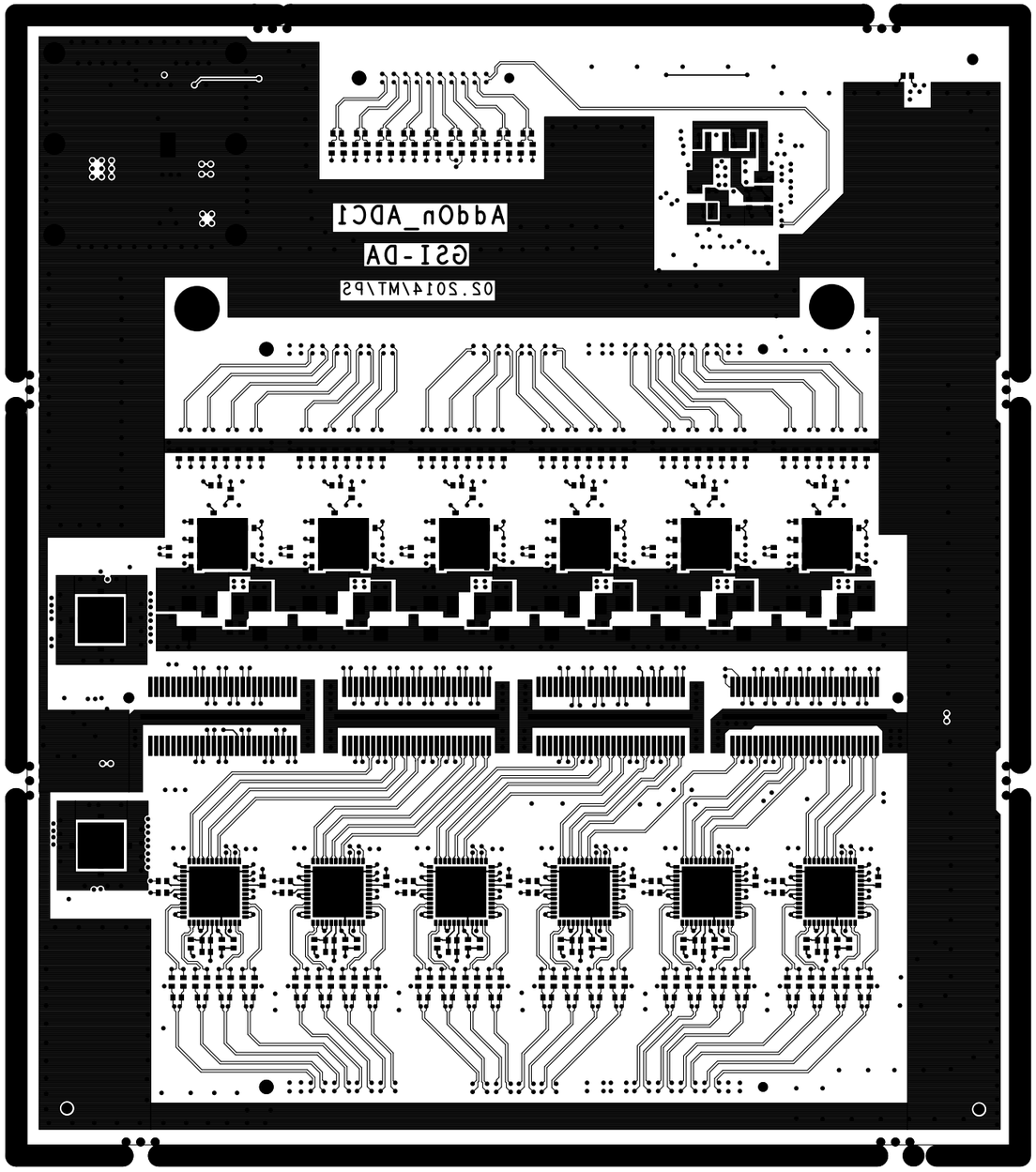
I05



Jobname	Date	Designer	Layouter
AddOn_ADC1	02.2014	M.Traxler	P.Skott

Layer Nickname

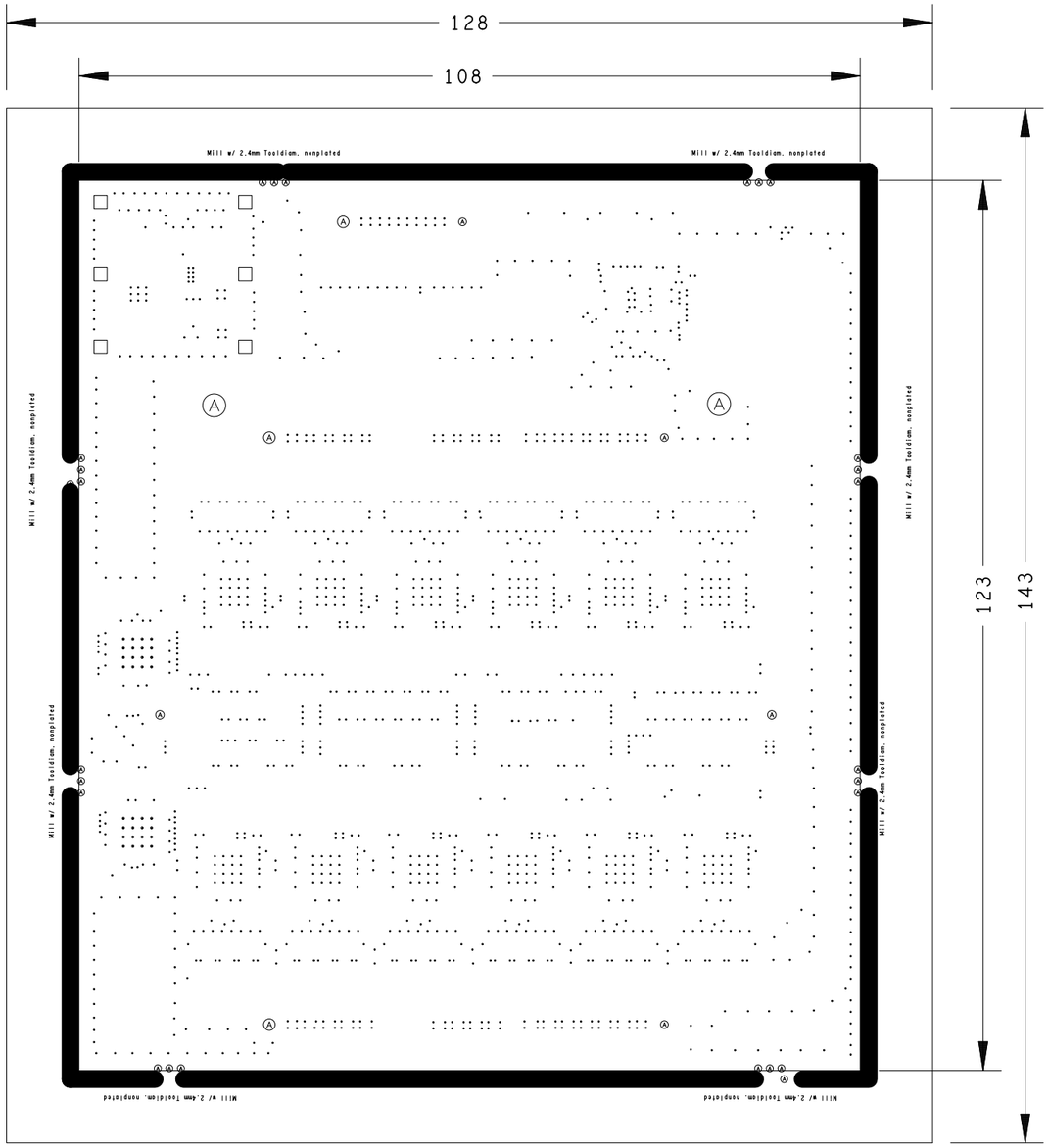
I06



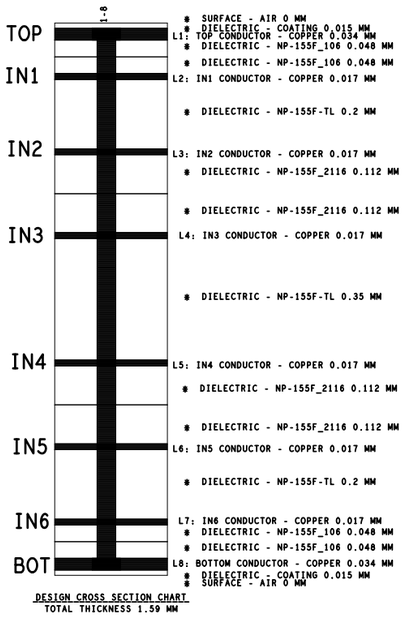
Jobname	Date	Designer	Layouter
AddOn_ADC1	02.2014	M.Traxler	P.Skott

Bot

Layer Nickname



LAGENAUFBAU



DESIGN CROSS SECTION CHART
TOTAL THICKNESS 1.59 MM

Jobname	Date	Designer	Layouter
AddOn_ADC1	02.2014	M.Traxler	P.Skott

Layer Nickname

Drd
Fab

DRILL CHART: TOP to BOTTOM			
ALL UNITS ARE IN MILLIMETERS			
FIGURE	SIZE	PLATED	QTY
·	0.2	PLATED	1568
•	0.3	PLATED	32
◦	0.4	PLATED	1
□	1.8	PLATED	6
Ⓐ	3.2	PLATED	2
Ⓐ	1.0	NON-PLATED	24
Ⓐ	1.1	NON-PLATED	3
Ⓐ	1.2	NON-PLATED	2
Ⓐ	1.6	NON-PLATED	3
Ⓐ	2.4	NON-PLATED	16

TOTAL HOLES: 1657

AddOn_ADC1

Capture CIS Standard Bill Of Materials - Compressed Report

Report Created on Wednesday Feb 05 16:40:44 2014

Item Number	Quantity	Part Referenc	DESCRIPTION	PART_CASE	Value	MANUFACTUI	MANUFACTUI	DATASHEET	GSI_STOCK_N	COMMISSION	APPROVED	COMPONENT_
1	25	C1,C26,C29,C	Capacitor, Cer	SMD-1206	100u	GRM31CR60J	Murata	K:\GsiLib\Data		M.Traxler	P.Skott	25187
2	49	C2,C11,C13,C	Capacitor, Cer	SMD-0402	4.7u	C1005X5R0J4	TDK	K:\GsiLib\Data		M.Traxler	P.Skott	25745
3	119	C3,C10,C12,C	Capacitor, Cer	SMD-0402	100n					G.May	G.May	24583
4	1	C4	Capacitor, Cer	SMD-0402	15n					G.May	G.May	21807
5	2	C5,C7	Capacitor, Cer	SMD-1210	100u	LMK325ABJ1(	Taiyo Yuden	K:\GsiLib\Data		M.Traxler	P.Skott	25431
6	1	C6	Capacitor, Cer	SMD-0805	10u	GRM21BR61C	Murata			G.May	G.May	24357
7	1	C8	Capacitor, Cer	SMD-0402	27p					E.Badura	G.May	21782
8	1	C9	Capacitor, Cer	SMD-0402	47n					G.May	G.May	21810
9	12	C18,C39,C60,(	Capacitor, Cer	SMD-0402	68n					G.May	G.May	21811
10	72	C20-C25,C41-(	Capacitor, Cer	SMD-0402	10n	GRM155R71E	Murata			G.May	P.Skott	24600
11	96	C268-C363	Capacitor, Cer	SMD-0402	150p					G.May	G.May	21792
12	2	CABLE_CONN	Connector, Pi		8930E-080-17	8930E-080-17	KEL	K:\GsiLib\Data		M.Traxler	G.May	23880
13	1	D1	LED, Single, W	SMD-0402	LW QH8G	LW QH8G-Q2!	Osram	K:\GsiLib\Data		J.Hoffmann	S.Voltz	25489
14	2	D1V8,D3	LED, Single, G	SMD-0402	SML-P11MT	SML-P11MT	Rohm	K:\GsiLib\Data		M.Traxler	P.Skott	25441
15	1	D2	LED, Single, R	SMD-0402	SML-P11UT	SML-P11UT	Rohm	K:\GsiLib\Data		M.Traxler	P.Skott	25444
16	1	D4	LED, Single, Y	SMD-0402	SML-P11YT	SML-P11YT	Rohm	K:\GsiLib\Data		M.Traxler	P.Skott	25442
17	1	D5	LED, Single, O	SMD-0402	SML-P11DT	SML-P11DT	Rohm	K:\GsiLib\Data		M.Traxler	P.Skott	25443
18	6	ES1-ES6	Connector, Dr		1.8mm	Do not order	None			M.Traxler	P.Skott	25244
19	1	J11	Connector, So		ZF5-20-01	ZF5S-20-01-T-	Samtec	K:\GsiLib\Data		J.Hoffmann	S.Voltz	20936
20	1	J37	Connector, Te		Testpin-0603		None	K:\GsiLib\Data		M.Traxler	S.Voltz	22993
21	1	JGP1	Connector, Pi		8930E-020-17	8930E-020-17	KEL	K:\GsiLib\Data		M.Traxler	G.May	23883
22	12	L1-L12	Inductor, RF-C	SMD-1206	BLM31PG500	BLM31PG500	Murata	K:\GsiLib\Data		M.Traxler	P.Skott	24341
23	1	POW18	IC-Power, DC-	QFN-38	EN6347QI	EN6347QI-T	Enpirion	K:\GsiLib\Data		M.Traxler	P.Skott	25788
24	1	R8	Resistor, Thicl	SMD-0402	180k					G.May	G.May	22862
25	2	R9,R11	Resistor, Thicl	SMD-0402	0R	CRCW040200	Vishay	K:\GsiLib\Data		E.Badura	G.May	4950
26	1	R10	Resistor, Thicl	SMD-0402	4.12k					G.May	G.May	21211
27	1	R12	Resistor, Thicl	SMD-0402	90.9k					G.May	G.May	21339
28	98	R13,R15,R16,I	Resistor, Thicl	SMD-0402	33R					G.May	G.May	22795
29	62	R14,R17,R20,I	Resistor, Thicl	SMD-0402	100R					G.May	G.May	21057
30	12	R21,R65,R80,I	Resistor, Thicl	SMD-0402	10k	RC1005F103C	Samsung			G.May	G.May	21248
31	16	R27,R71,R86,I	Resistor, Thicl	SMD-0402	1k					G.May	G.May	21153
32	1	R222	Resistor, Thicl	SMD-0402	3.3k					G.May	G.May	22831
33	18	R227,R229,R2	Resistor, Thicl	SMD-0402	158R					G.May	G.May	21076

34	9	R228,R231,R2	Resistor, Thicl	SMD-0402	140R				G.May	G.May	21071
35	1	R254	Resistor, Thicl	SMD-0402	4.7k				G.May	G.May	22835
36	1	TRB_CONNEC	Connector, So		QFS-104-06.2	QFS-104-06.2	Samtec	K:\GsiLib\Data	M.Traxler	P.Skott	25423
37	12	U1-U12	IC-Mixedsigna	CP-48-8	AD9219ABCP2	AD9219ABCP2	Analog Device	K:\GsiLib\Data	R.Lalik	P.Skott	25792
38	2	UCLK1,UCLK2	IC-Digital, Clo	QFNS-48	LMK01010	LMK01010	Texas Instrum	K:\GsiLib\Data	M.Traxler	P.Skott	25808
39	1	UMACH1	IC-Digital, FPG	csBGA-132	LCMXO2-400(	LCMXO2-400(	Lattice	K:\GsiLib\Data	M.Traxler	P.Skott	25810