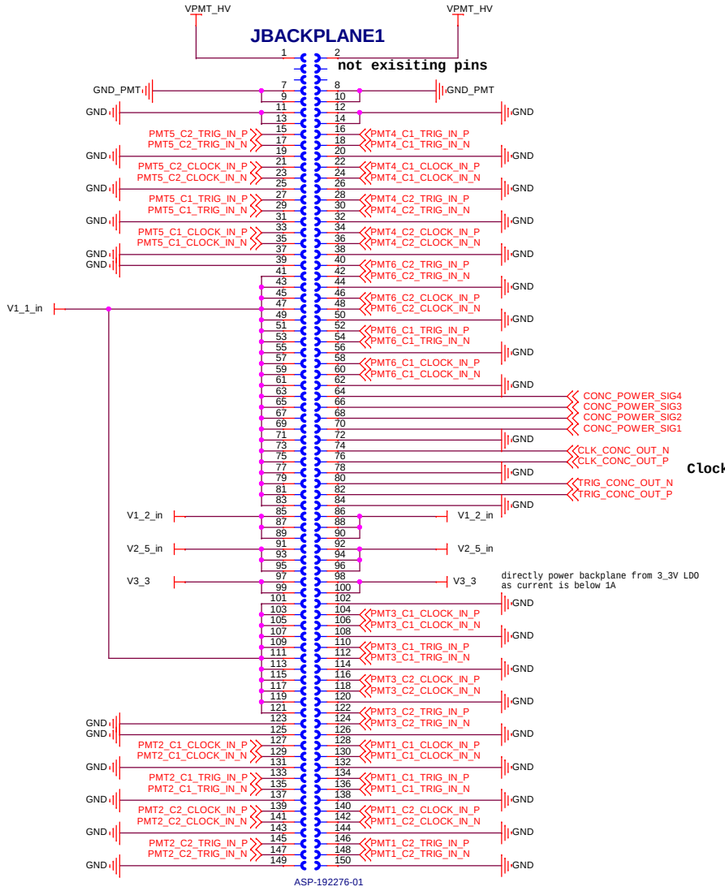
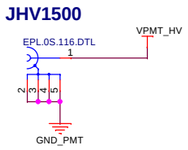
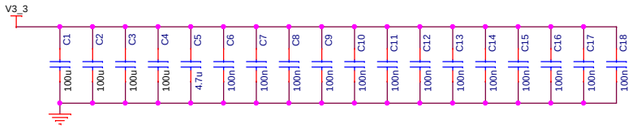
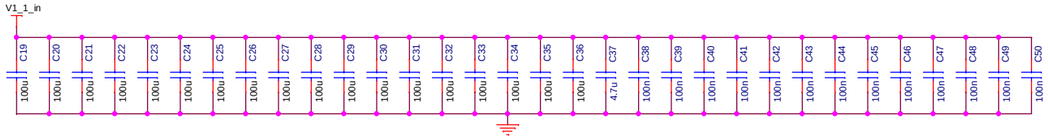
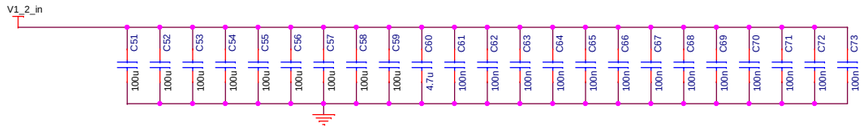


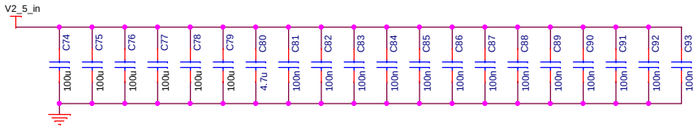


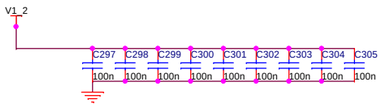
Clock and Trigger from Concentrator-Module

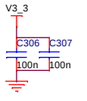


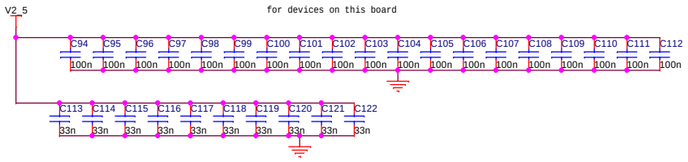


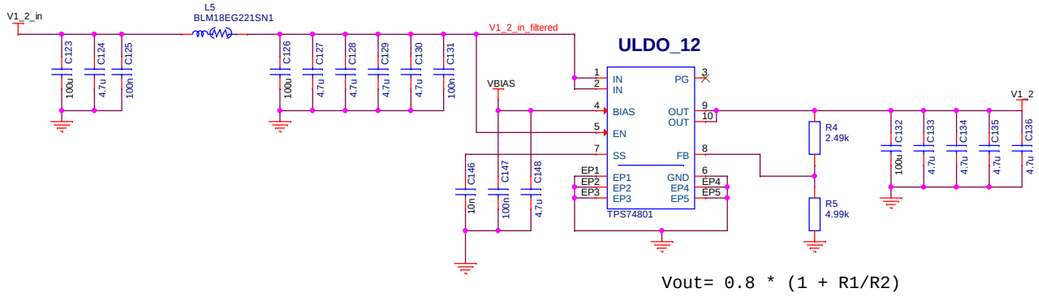




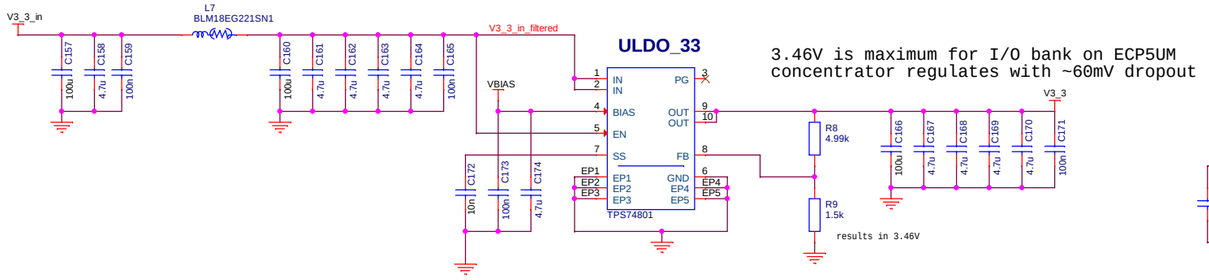




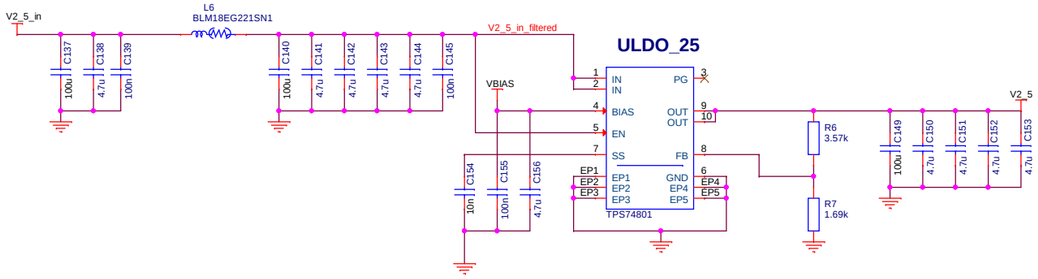


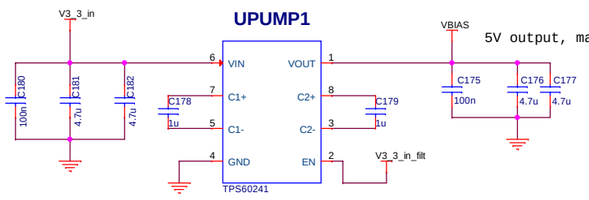


Vout= 0.8 * (1 + R1/R2)



3.46V is maximum for I/O bank on ECP5UM
concentrator regulates with ~60mV dropout





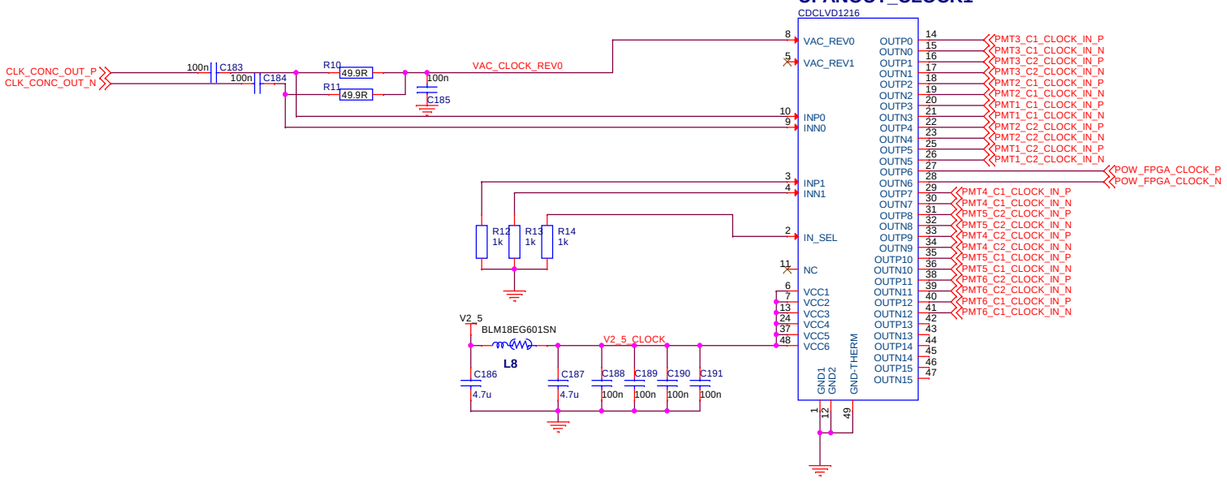
Gesellschaft für Schwerionenforschung mbH
Planckstrasse 1
D-64291 Darmstadt
GERMANY
www.gsi.de

<Title>

Design: K:\GSI\JOB\COME_AND_KISS\DIRICH\DIRICH_POWER1\DIRICH_POWER1.DSN	
Modified: Thursday, March 31, 2016	Size: A2 Page: 1 / 4
Designer: <Designer>	Layouter: <Layouter>

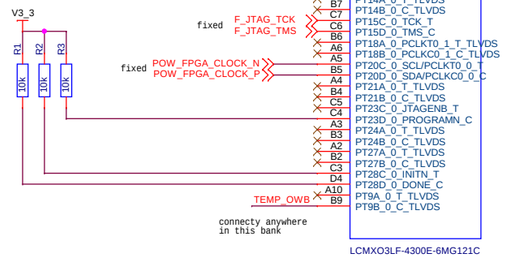
UFANOUT_CLOCK1

CDCLVD1216



BANK 0: 3.3V

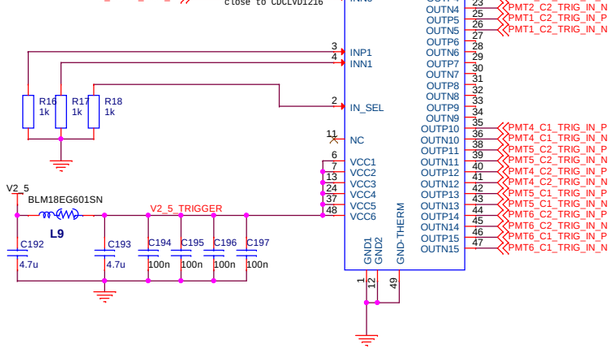
UFPGA1F BANK0 TOP



LCMXO3LF-4300E-6MG121C

UFANOUT_TRIGGER1

CDCLVD1216



BANK 1-5: 2.5V

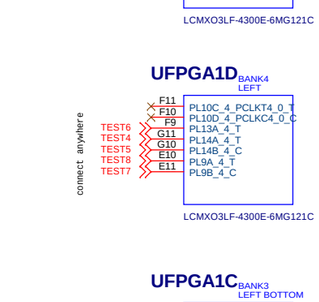
UFPGA1A BANK1 RIGHT

LCMXO3LF-4300E-6MG121C

UFPGA1B BANK2 BOTTOM

LCMXO3LF-4300E-6MG121C

UFPGA1E BANK5 LEFT TOP

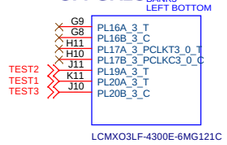


LCMXO3LF-4300E-6MG121C

UFPGA1D BANK4 LEFT

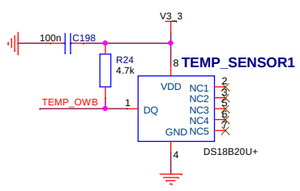
LCMXO3LF-4300E-6MG121C

UFPGA1C BANK3 LEFT BOTTOM



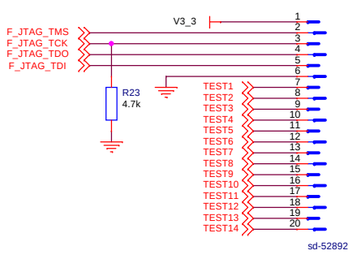
LCMXO3LF-4300E-6MG121C

ADC und Temperatursensor DS18B20
an weit auseinander liegenden, aber warmen
stellen positionieren,



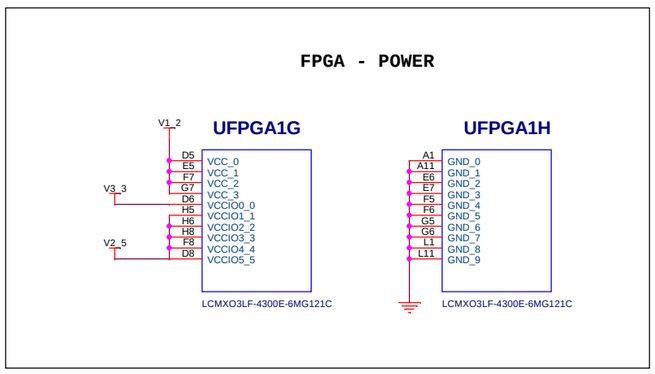
Place JTAG connector close to the edge

JTAG1



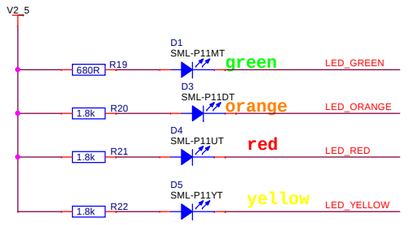
sd-52892

FPGA - POWER



LCMXO3LF-4300E-6MG121C

LCMXO3LF-4300E-6MG121C

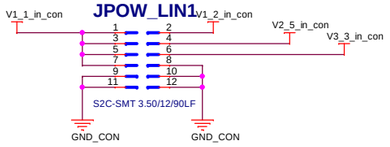


GSI

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

<Title>

Design: K:\GSI\JOB\COME_AND_KISS\DIRICH\DIRICH_POWER\DIRICH_POWER1\DIRICH_POWER1.DSN	
Modified: Thursday, March 31, 2016	Size: A2 Page: 2 / 4
Designer: <Designer>	Layouter: <Layouter>

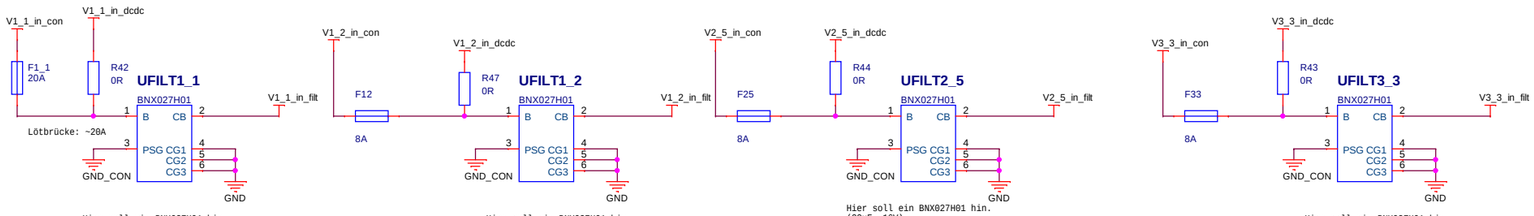


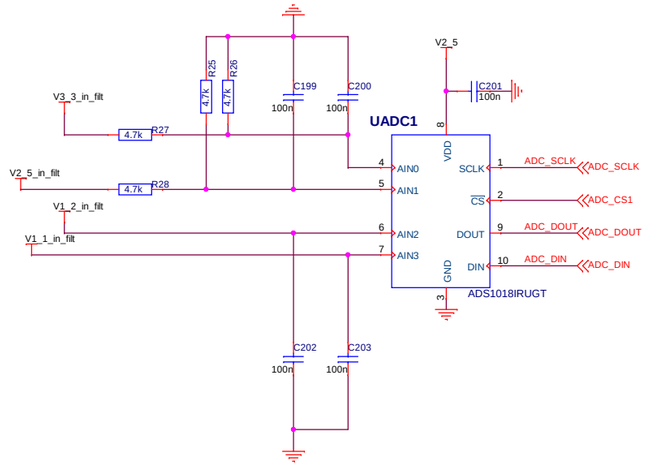
JPOW_LIN1:
S2C-SMT 3.50/12/90LF 1.5SN BK BX
Best.-Nr. 1289880000

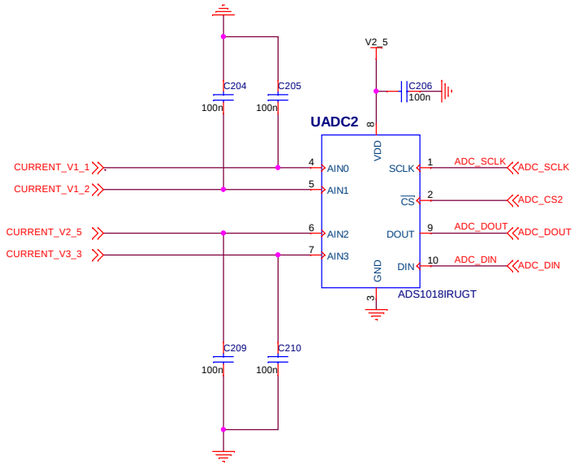
10-13A pro Kontakt.
12-polig, zwei reihig, mit Lötflansch, 90° , 1.5mm pins
muss liegend auf die Power-Karte
Die Auswerfer des Gegensteckers müssen bedienbar sein.
Passendes Gegenstück

B2CF 3.50/12/180F SN OR BX
Best.-Nr. 1277720000

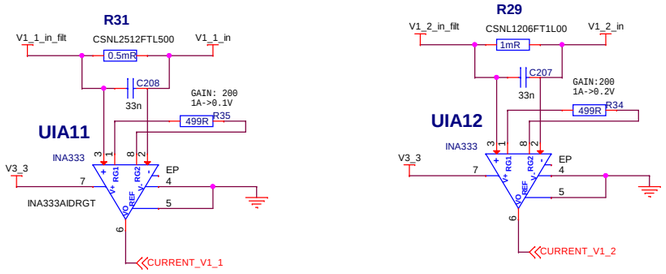
Hier soll folgende Sicherung hin:
0501020.WR (von Littlefuse)
Datenblatt:
http://www.littelfuse.com/~/media/electronics/datasheets/fuses/littelfuse_fuse_501_datasheet.pdf.pdf

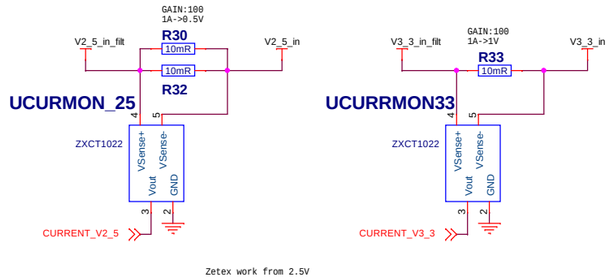




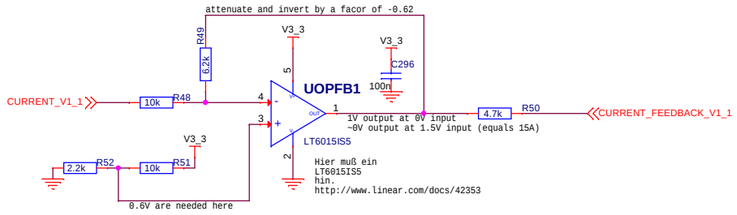


https://www.seielect.com/Catalog/SEI-csnl.pdf





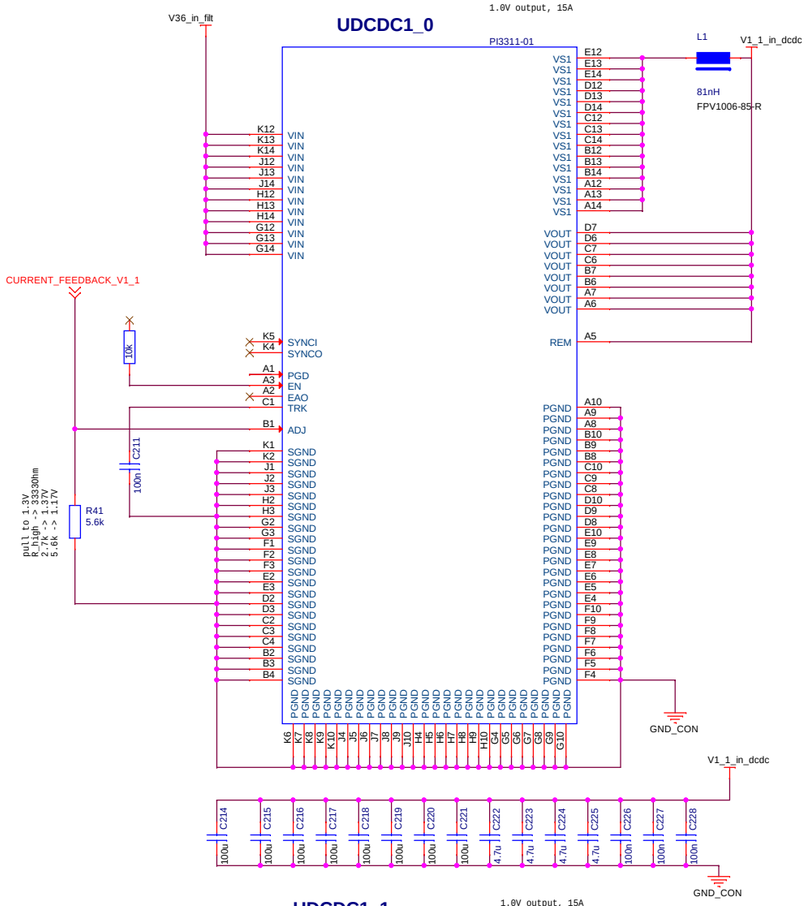
Zetex work from 2.5V

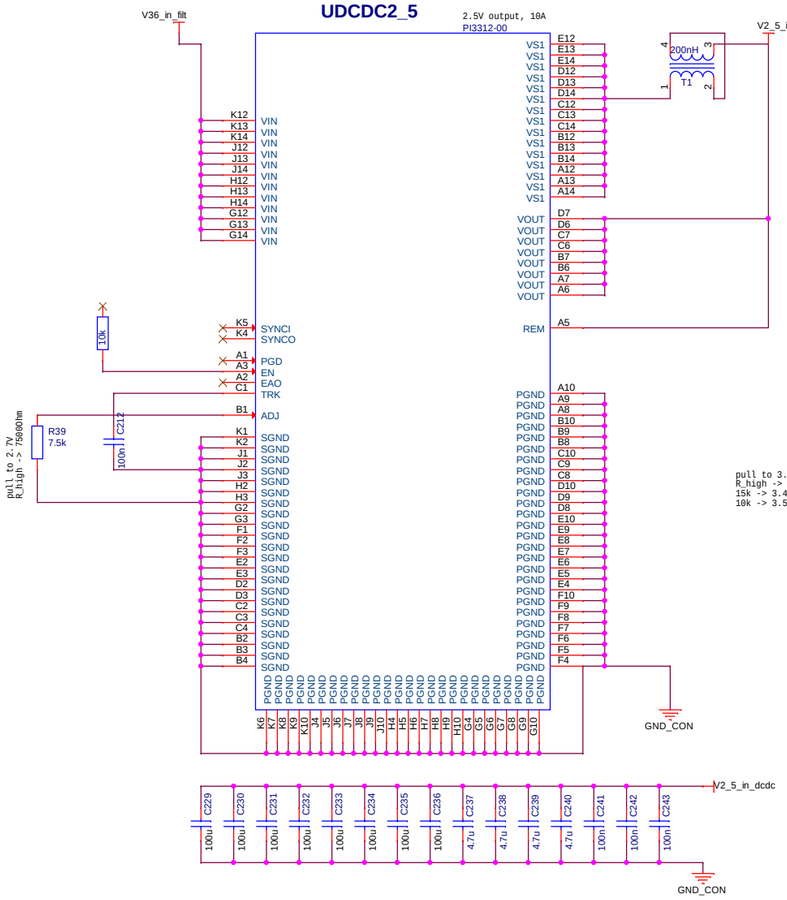


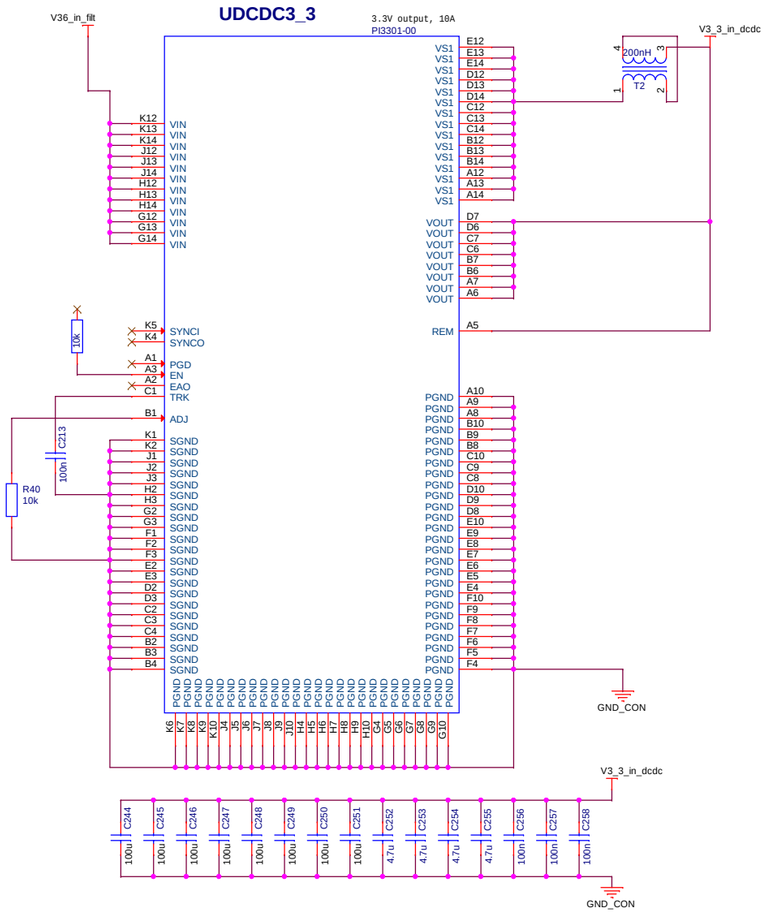
Gesellschaft für Schwerionenforschung mbH
Planckstrasse 1
D-64291 Darmstadt
GERMANY
www.gsi.de

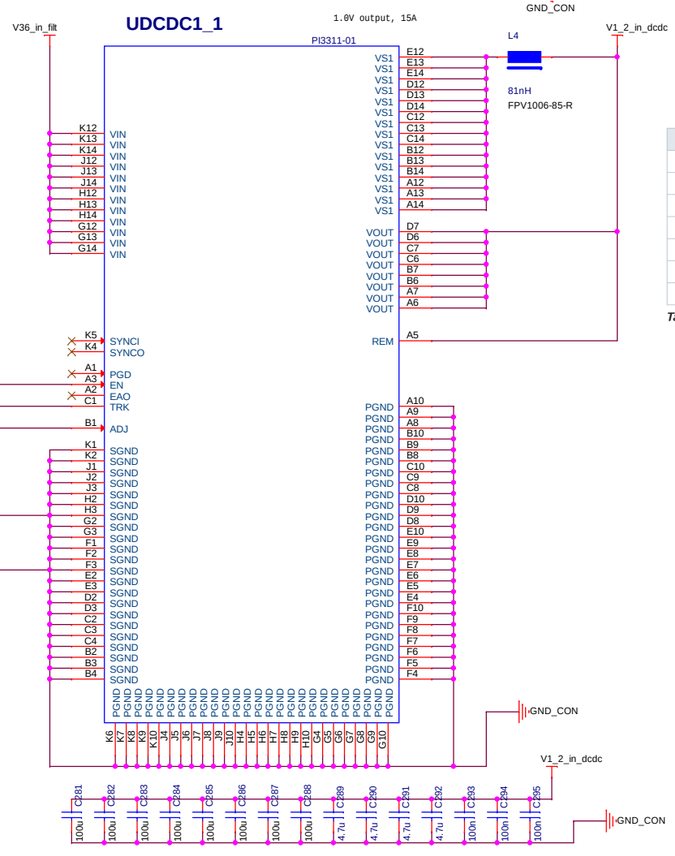
<Title>

Design: K:\GSI\JOB\COME_AND_KISS\DIRICH\DIRICH_POWER\DIRICH_POWER1\DIRICH_POWER1.DSN
Modified: Thursday, March 31, 2016 | Size: A2 | Page: 3 / 4
Designer: <Designer> | Layouter: <Layouter>









$$R_{high} = \frac{1}{\frac{(Vout - 1)}{R1} - \left(\frac{1}{R2}\right)} \qquad (1)$$

Device	R1	R2	R4
PI3311-x0-LGIZ	1 k	Open	100
PI3318-x0-LGIZ	0.806 k	1.0 k	100
PI3312-x0-LGIZ	1.5 k	1.0 k	100
PI3301-x0-LGIZ	2.61 k	1.13 k	100
PI3302-x0-LGIZ	4.53 k	1.13 k	100
PI3303-x0-LGIZ	11.0 k	1.0 k	100
PI3305-x0-LGIZ	14.0 k	1.0 k	100

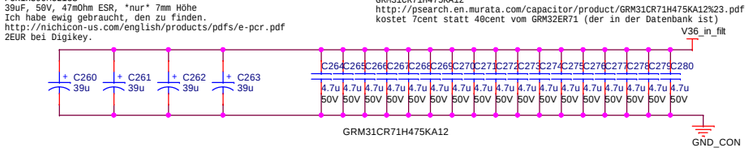
***Table 3** — PI33xx-x0 Internal divider values*

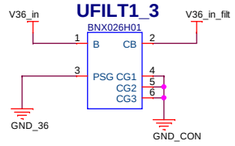
Same table for PI33XX-X1

anstatt der 4 330uF
PCR1H390MCL1GS
39uF, 50V, 47mOhm ESR, *nur* 7mm Höhe
Ich habe ewig gebraucht, den zu finden.
http://nichicon-us.com/english/products/pdfs/e-pcr.pdf
2EUR bei Digikey.

Jeweils 4 4.7uF pro Regler am Eingang.
Layout wie in Datenblatt angegeben.

GRM31CR71H475KA12
http://psearch.en.murata.com/capacitor/product/GRM31CR71H475KA12%23.pdf
kostet 7cent statt 40cent vom GRM32ER71 (der in der Datenbank ist)



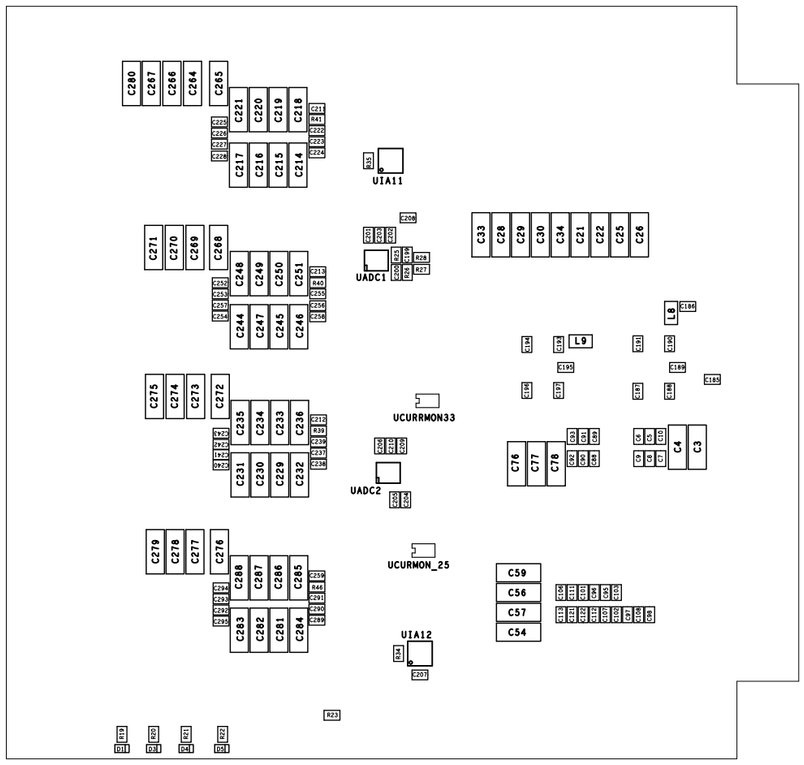


Hier soll ein BNX026H01 hin.
(10uF, 50V)

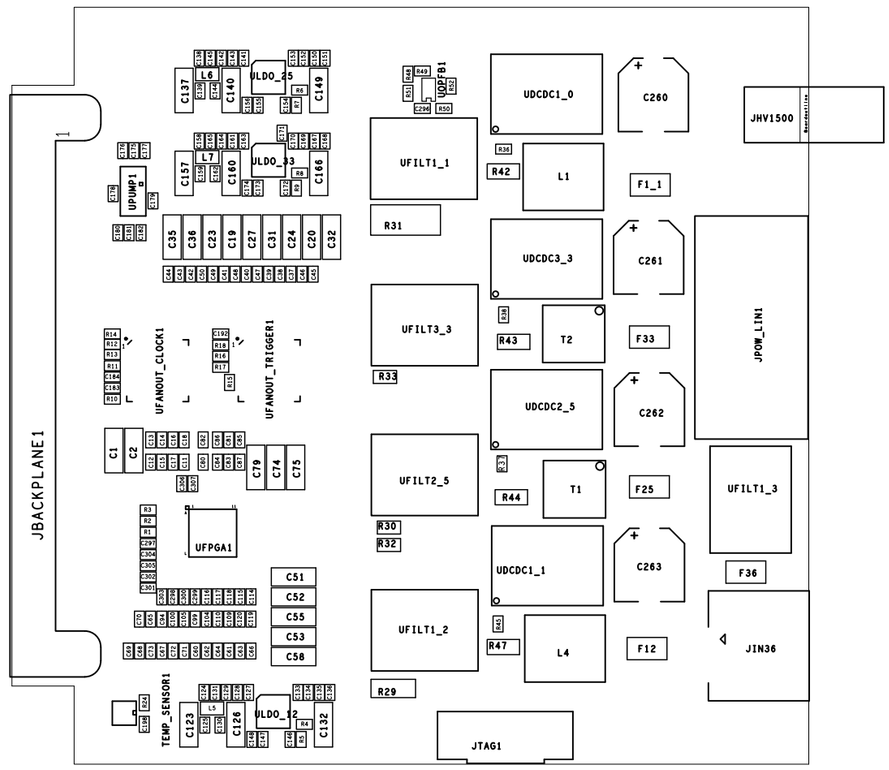
Gesellschaft für Schwerionenforschung mbH
Planckstrasse 1
D-64291 Darmstadt
GERMANY
www.gsi.de

<Title>

Design: K:\GSUOB\COME_AND_KISS\DIRICH\DIRICH_POWER\DIRICH_POWER1\DIRICH_POWER1.DSN	
Modified: Thursday, March 31, 2016	Size: A2 Page: 4 / 4
Designer: <Designer>	Layouter: <Layouter>



Jobname	Date	Designer	Layouter
DIRICH_Power1	03.2016	M.Traxler	P.Skott
Asb			
Layer Nickname			



Jobname	Date	Designer	Layouter
DIRICH_Power1	03.2016	M.Traxler	P.Skott

Layer Nickname

Ast

DIRICH_Power1

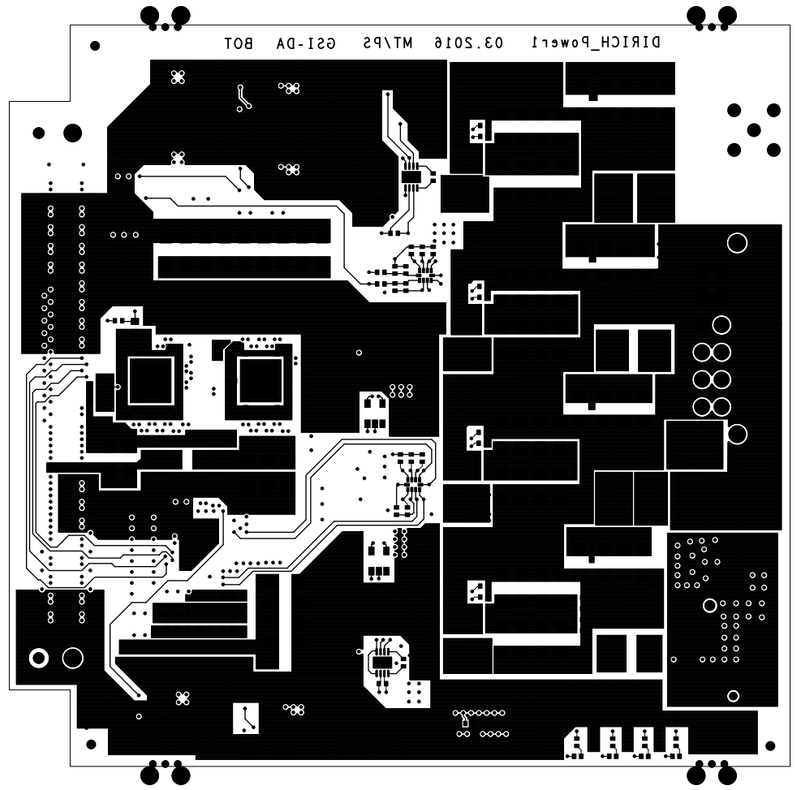
Capture CIS Standard Bill Of Materials - Compressed Report
Report Created on Thursday Mar 31 09:07:18 2016

Layouter = P.Skott
Designer = M.Traxler

Item Number	Quantity	Part Reference	DESCRIPTION	PART_CASE	Value	MANUFACTUF	MANUFACTUF	DATASHEET	GSI_STOCK_N	COMMISSION	APPROVED	COMPONENT_
1	78	C1-C4,C19-C3(	Capacitor, Cer	SMD-1206	100u	GRM31CR60J1	Murata	K:\GsiLib\Data		M.Traxler	P.Skott	25187
2	58	C5,C37,C60,C8	Capacitor, Cer	SMD-0402	4.7u	C1005X5R0J47	TDK	K:\GsiLib\Data		M.Traxler	P.Skott	25745
3	133	C6-C18,C38-C5	Capacitor, Cer	SMD-0402	100n					G.May	G.May	24583
4	12	C113-C122,C2	Capacitor, Cer	SMD-0402	33n	GRM155R71E3	Murata			G.May	G.May	21809
5	3	C146,C154,C1	Capacitor, Cer	SMD-0402	10n	GRM155R71E1	Murata			G.May	P.Skott	24600
6	2	C178,C179	Capacitor, Cer	SMD-0402	1u	GRM155R61A	Murata			G.May	G.May	21815
7	4	C260-C263	Capacitor, Alu		39u	PCR1H390MC	Nichicon	K:\GsiLib\Data		M.Traxler	P.Skott	26031
8	17	C264-C280	Capacitor, Cer	SMD-1206	4.7u	GRM31CR71H	Murata	K:\GsiLib\Data		M.Traxler	P.Skott	26032
9	1	D1	LED, Single, Gr	SMD-0402	SML-P11MT	SML-P11MT	Rohm	K:\GsiLib\Data		M.Traxler	P.Skott	25441
10	1	D3	LED, Single, Or	SMD-0402	SML-P11DT	SML-P11DT	Rohm	K:\GsiLib\Data		M.Traxler	P.Skott	25443
11	1	D4	LED, Single, Re	SMD-0402	SML-P11UT	SML-P11UT	Rohm	K:\GsiLib\Data		M.Traxler	P.Skott	25444
12	1	D5	LED, Single, Ye	SMD-0402	SML-P11YT	SML-P11YT	Rohm	K:\GsiLib\Data		M.Traxler	P.Skott	25442
13	4	F12,F25,F33,F	Fuse, SMD, Fa	SMD-1206	8A	C1F8	Belfuse	K:\GsiLib\Data		H.Heggen	P.Skott	25978
14	1	F1_1	Fuse, SMD, Fa	SMD-1206	20A	0501020.WR	Littelfuse	K:\GsiLib\Data		M.Traxler	P.Skott	26037
15	1	JBACKPLANE1	Connector, So		ASP-192276-0	ASP-192276-0	Samtec	K:\GsiLib\Data		M.Traxler	P.Skott	26039
16	1	JHV1500	Connector, Jac		EPL.0S.116.DT	EPL.0S.116.DT	Lemo	K:\GsiLib\Data		M.Traxler	P.Skott	26038
17	1	JIN36	Connector, So		37203-1AE0-0	37203-1AE0-0	3M	K:\GsiLib\Data		J.Hoffmann	S.Voltz	25193
18	1	JPOW_LIN1	Connector, Pir		S2C-SMT 3.50,	S2C-SMT 3.50,	Weidmüller	K:\GsiLib\Data		M.Traxler	G.May	26022
19	1	JTAG1	Connector, So		sd-52892	52892-2096	Molex	K:\GsiLib\Data		M.Traxler	P.Skott	25990
20	2	L1,L4	Inductor, Pow		81nH	FPV1006-85-R	Eaton	K:\GsiLib\Data		M.Traxler	G.May	26019
21	3	L5-L7	Inductor, RF-C	SMD-0603	BLM18EG221S	BLM18EG221S	Murata	K:\GsiLib\Data		W.Panschow	S.Voltz	25469
22	2	L8,L9	Inductor, RF-C	SMD-0603	BLM18EG601S	BLM18EG601S	Murata	K:\GsiLib\Data		M.Traxler	P.Skott	25264
23	10	R1-R3,R36-R3	Resistor, Thick	SMD-0402	10k	RC1005F103C	Samsung			G.May	G.May	21248
24	1	R4	Resistor, Thick	SMD-0402	2.49k					G.May	G.May	21190
25	2	R5,R8	Resistor, Thick	SMD-0402	4.99k					G.May	G.May	21219
26	1	R6	Resistor, Thick	SMD-0402	3.57k					G.May	G.May	21205
27	1	R7	Resistor, Thick	SMD-0402	1.69k					G.May	G.May	21175
28	1	R9	Resistor, Thick	SMD-0402	1.5k					G.May	G.May	21170
29	2	R10,R11	Resistor, Thick	SMD-0402	49.9R					G.May	G.May	21028
30	6	R12-R14,R16-I	Resistor, Thick	SMD-0402	1k					G.May	G.May	21153
31	1	R15	Resistor, Thick	SMD-0402	100R					G.May	G.May	21057
32	1	R19	Resistor, Thick	SMD-0402	680R					G.May	G.May	22821

33	3	R20-R22	Resistor, Thick	SMD-0402	1.8k				G.May	G.May	22826
34	7	R23-R28,R50	Resistor, Thick	SMD-0402	4.7k				G.May	G.May	22835
35	1	R29	Resistor, Low	SMD-1206	1mR	CSNL1206FT1	Stackpole	K:\GsiLib\Data	M.Traxler	G.May	26010
36	3	R30,R32,R33	Resistor, Low	SMD-0603	10mR	WSL0603R010	Vishay	K:\GsiLib\Data	M.Traxler	P.Skott	25213
37	1	R31	Resistor, Low	SMD-2512	0.5mR	CSNL2512FTL5	Stackpole	K:\GsiLib\Data	M.Traxler	G.May	26009
38	2	R34,R35	Resistor, Thick	SMD-0402	499R				G.May	G.May	21124
39	1	R39	Resistor, Thick	SMD-0402	7.5k				G.May	G.May	21236
40	1	R41	Resistor, Thick	SMD-0402	5.6k				G.May	G.May	22837
41	4	R42-R44,R47	Resistor, Thick	SMD-0805	0R	CRCW080500(	Vishay	K:\GsiLib\Data	G.May	G.May	23005
42	1	R46	Resistor, Thick	SMD-0402	2.7k				G.May	G.May	22829
43	1	R49	Resistor, Thick	SMD-0402	6.2k				G.May	G.May	22838
44	1	R52	Resistor, Thick	SMD-0402	2.2k				G.May	G.May	22827
45	2	T1,T2	Inductor, Pow		200nH	FPT-705-200R	Eaton	K:\GsiLib\Data	M.Traxler	G.May	26018
46	1	TEMP_SENSOI	IC-Mixedsigna	uSOP-8	DS18B20U+	DS18B20U+	Maxim	K:\GsiLib\Data	M.Traxler	S.Voltz	24395
47	2	UADC1,UADC2	IC-Mixedsigna	PQFP-N10	ADS1018IRUG	ADS1018IRUG	Texas Instrum	K:\GsiLib\Data	M.Traxler	P.Skott	25865
48	2	UCURMON_2!	IC-Power, Curr	SOT-23-5	ZXCT1022	ZXCT1022	Zetex	K:\GsiLib\Data	A.Gil	S.Voltz	24818
49	2	UDCDC1_0,UD	IC-Power, DC-I	LGA-123	PI3311-01	PI3311-01-LGI	Vicor	K:\GsiLib\Data	M.Traxler	G.May	26012
50	1	UDCDC2_5	IC-Power, DC-I	LGA-123	PI3312-00	PI3312-00-LGI	Vicor	K:\GsiLib\Data	M.Traxler	G.May	26015
51	1	UDCDC3_3	IC-Power, DC-I	LGA-123	PI3301-00	PI3301-00-LGI	Vicor	K:\GsiLib\Data	M.Traxler	G.May	26016
52	2	UFANOUT_CLI	IC-Digital, Cloc	PVQFN-48	CDCLVD1216	CDCLVD1216R	Texas Instrum	K:\GsiLib\Data	M.Traxler	P.Skott	25424
53	4	UFILT1_1,UFIL	Inductor, RF-C		BNX027H01	BNX027H01L	Murata	K:\GsiLib\Data	J.Hoffmann	P.Skott	26034
54	1	UFILT1_3	Inductor, RF-C		BNX026H01	BNX026H01L	Murata	K:\GsiLib\Data	J.Hoffmann	P.Skott	26035
55	1	UFPGA1	IC-Digital, FPG	csfBGA121	LCMXO3LF-43	LCMXO3LF-43	Lattice	K:\GsiLib\Data	M.Traxler	P.Skott	26005
56	2	UIA11,UIA12	IC-Analog, Inst	WSON-8	INA333	INA333AIDRG	Texas Instrum	K:\GsiLib\Data	M.Traxler	G.May	26011
57	3	ULDO_12,ULD	IC-Power, Volt	SON-10	TPS74801	TPS74801DRC	Texas Instrum	K:\GsiLib\Data	A.Klaus	G.May	25509
58	1	UOPFB1	IC-Analog, Am	SOT-23-5	LT6015IS5	LT6015IS5	Linear Techno	K:\GsiLib\Data	M.Traxler	P.Skott	26036
59	1	UPUMP1	IC-Power, DC-I	MSOP-8	TPS60241	TPS60241DGK	Texas Instrum	K:\GsiLib\Data	M.Traxler	P.Skott	25859

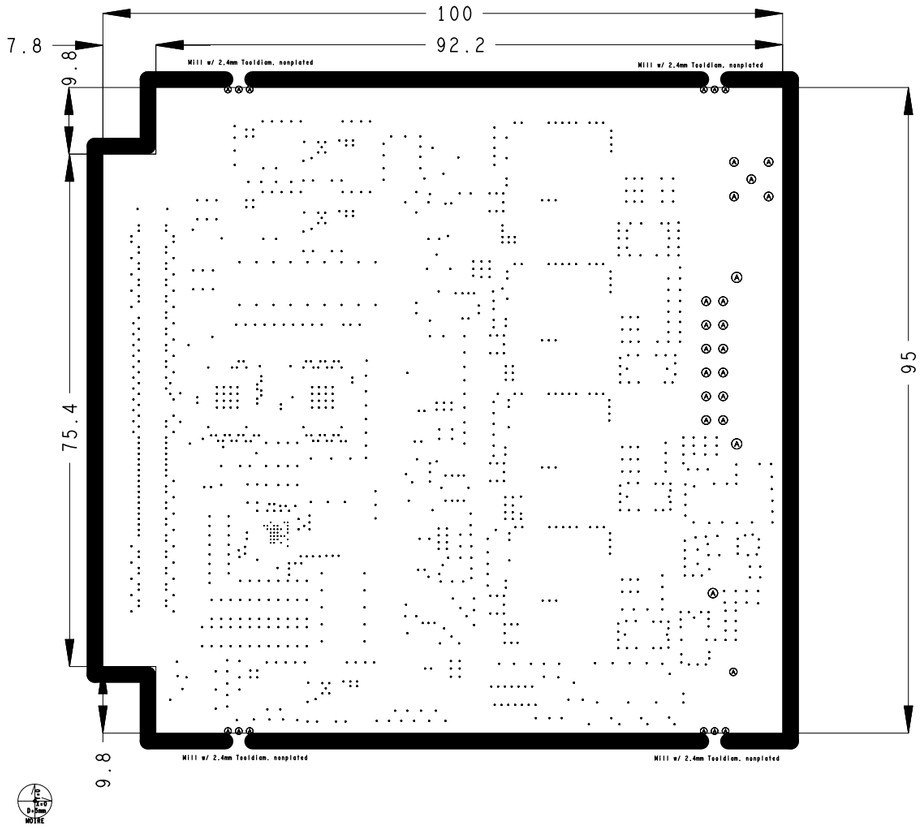
.ID



.

Jobname	Date	Designer	Layouter
DIRICH_Power1	03.2016	M.Traxler	P.Skott

Layer Nickname: Bot



10-Lagen Multilayer:

		GERBER-DATEN:
LAYER 1	: TOP	DIRICH_Concentrator1-TOP.art
LAYER 2	: INNER1	DIRICH_Concentrator1-I01.art
LAYER 3	: INNER2	DIRICH_Concentrator1-I02.art
LAYER 4	: INNER3	DIRICH_Concentrator1-I03.art
LAYER 5	: INNER4	DIRICH_Concentrator1-I04.art
LAYER 6	: INNER5	DIRICH_Concentrator1-I09.art
LAYER 7	: INNER6	DIRICH_Concentrator1-I10.art
LAYER 8	: INNER7	DIRICH_Concentrator1-I11.art
LAYER 9	: INNER8	DIRICH_Concentrator1-I12.art
LAYER10	: BOTTOM	DIRICH_Concentrator1-BOT.art

LAYER 1 und 12 muessen eine Impedanz von
100 Ohm differenziell erreichen.
Bitte beim Lagenaufbau beruecksichtigen.

DRILL CHART: TOP to BOTTOM

ALL UNITS ARE IN MILLIMETERS

FIGURE	SIZE	PLATED	QTY
·	0.2	PLATED	1191
✱	0.4	PLATED	1
Ⓐ	1.3	PLATED	17
Ⓐ	1.5	PLATED	4
Ⓐ	2.0	PLATED	2
Ⓐ	1.0	NON-PLATED	12
Ⓐ	1.1	NON-PLATED	1
Ⓐ	1.4	NON-PLATED	1
Ⓐ	2.4	NON-PLATED	8

TOTAL HOLES: 1237

DRILL CHART: TOP to INNER1

ALL UNITS ARE IN MILLIMETERS

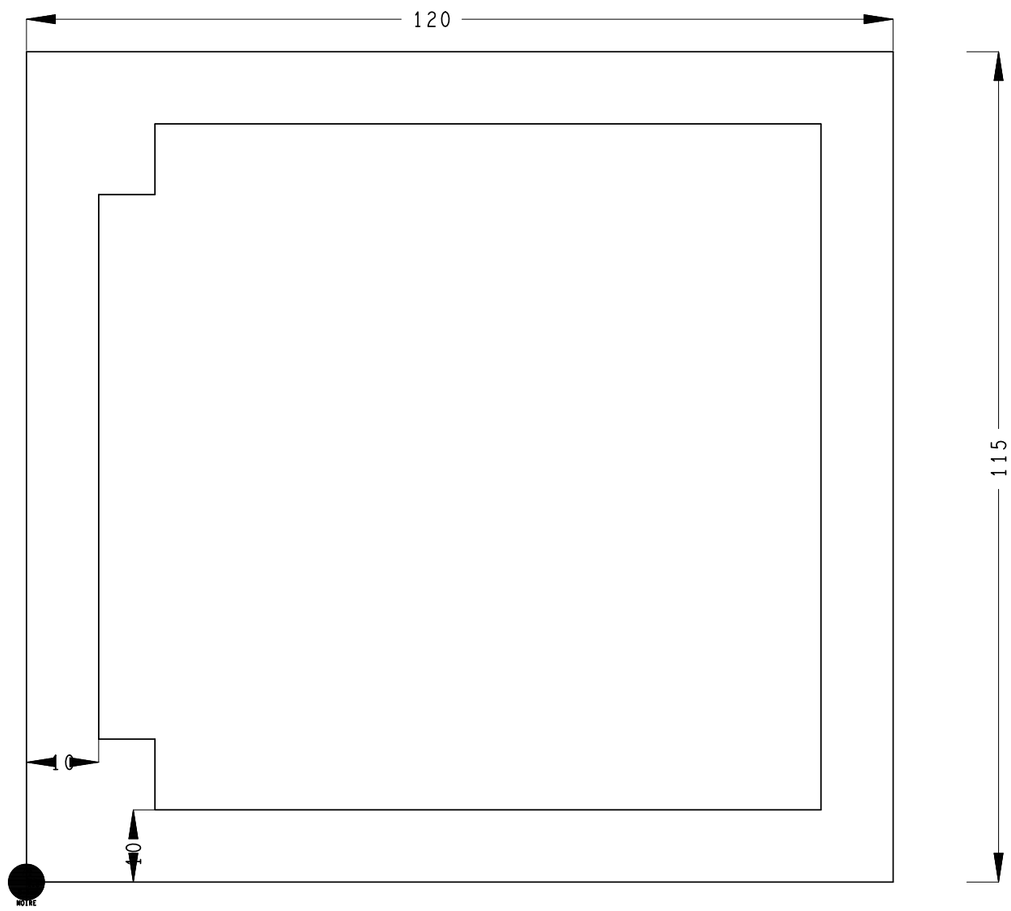
FIGURE	SIZE	PLATED	QTY
·	0.1	PLATED	31

TOTAL HOLES: 31

Jobname	Date	Designer	Layouter
DIRICH_Power1	03.2016	M.Traxler	P.Skott

Layer Nickname

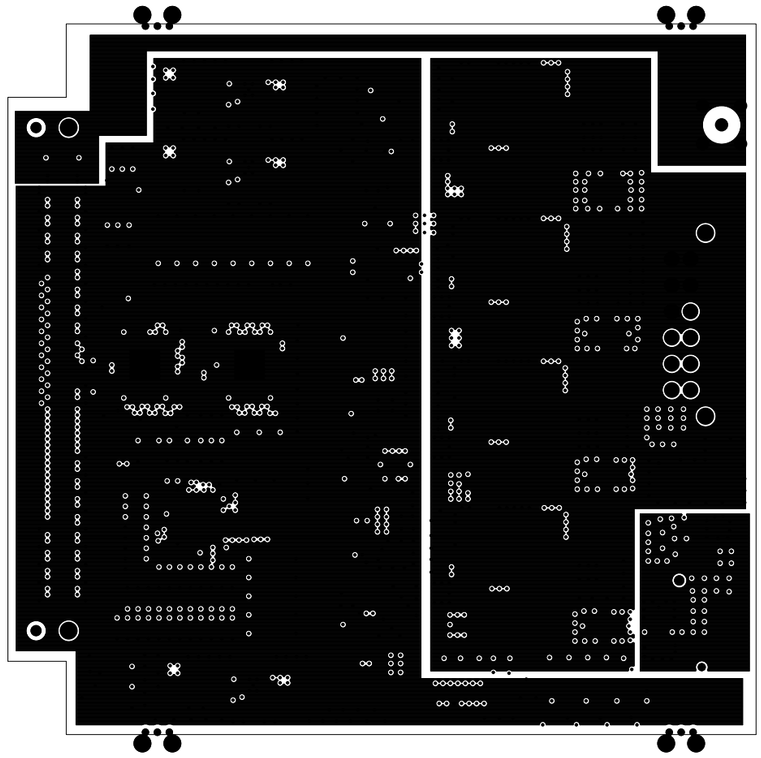
Drd



Jobname	Date	Designer	Layouter
DIRICH_Power1	03.2016	M.Traxler	P.Skott

Layer Nickname

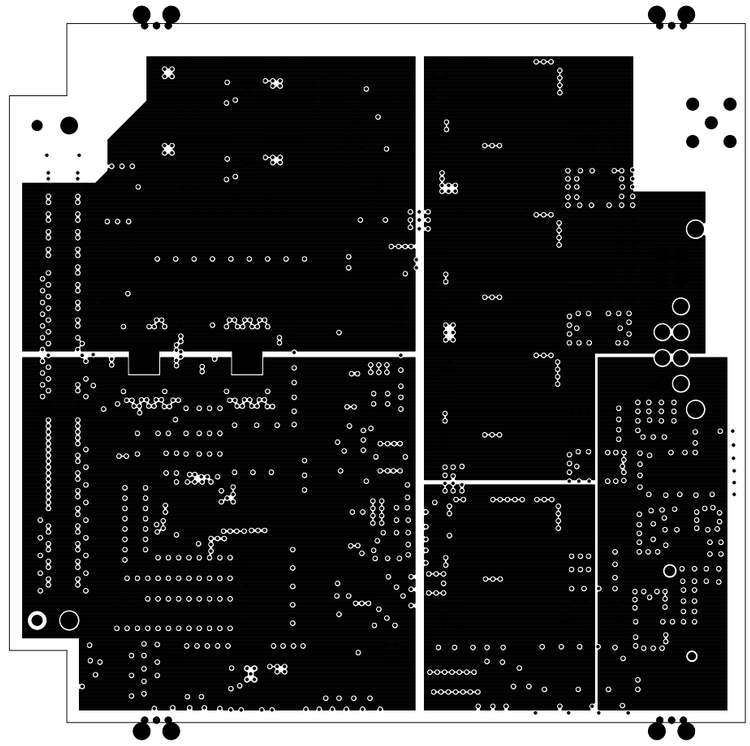
Fab



Jobname	Date	Designer	Layouter
DIRICH_Power1	03.2016	M.Traxler	P.Skott

Layer Nickname

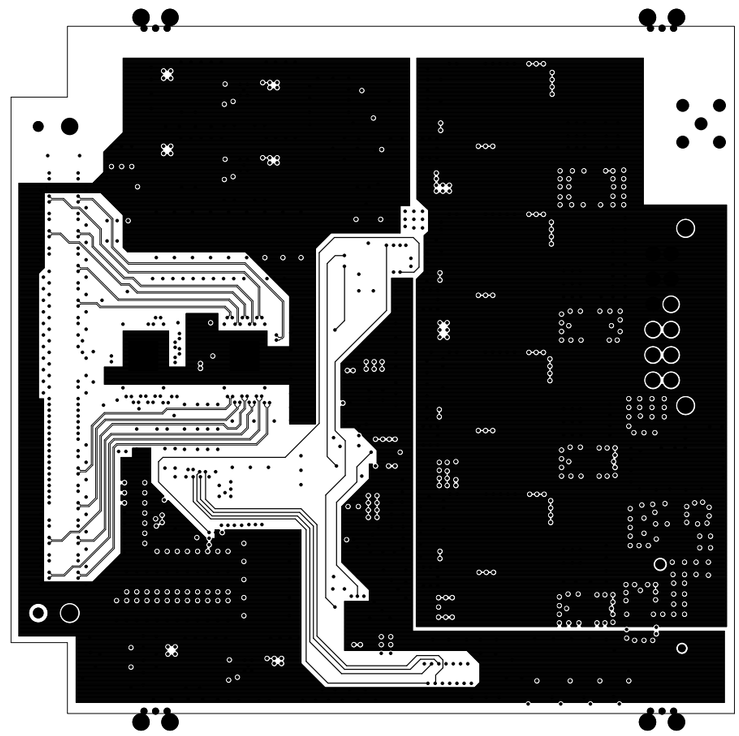
I10



Jobname	Date	Designer	Layouter
DIRICH_Power1	03.2016	M.Traxler	P.Skott

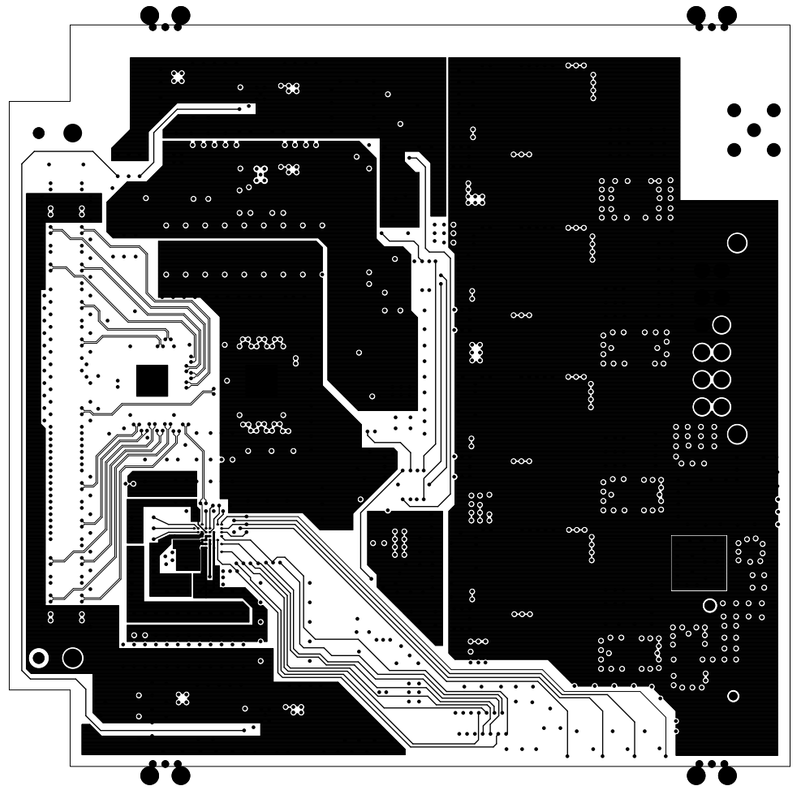
Layer Nickname

I11



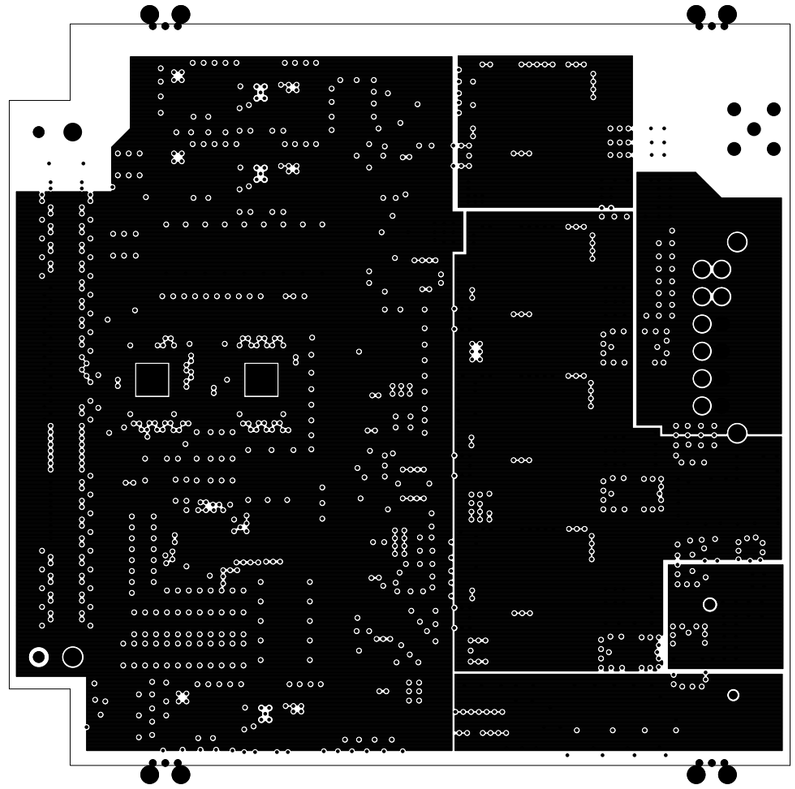
Jobname	Date	Designer	Layouter
DIRICH_Power1	03.2016	M.Traxler	P.Skott

Layer Nickname



Jobname	Date	Designer	Layouter
DIRICH_Power1	03.2016	M.Traxler	P.Skott

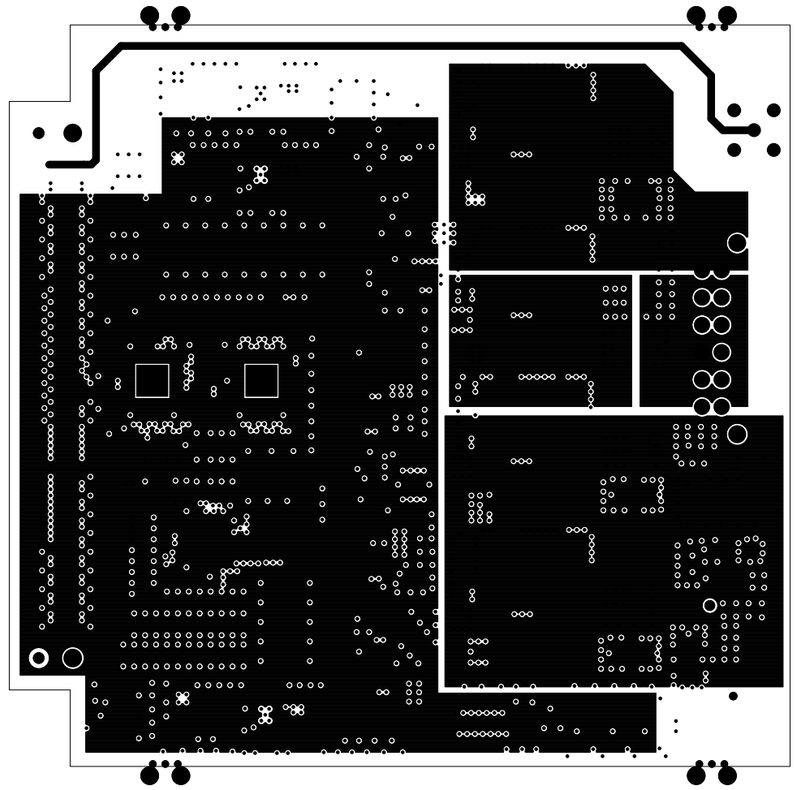
Layer Nickname: I01



Jobname	Date	Designer	Layouter
DIRICH_Power1	03.2016	M.Traxler	P.Skott

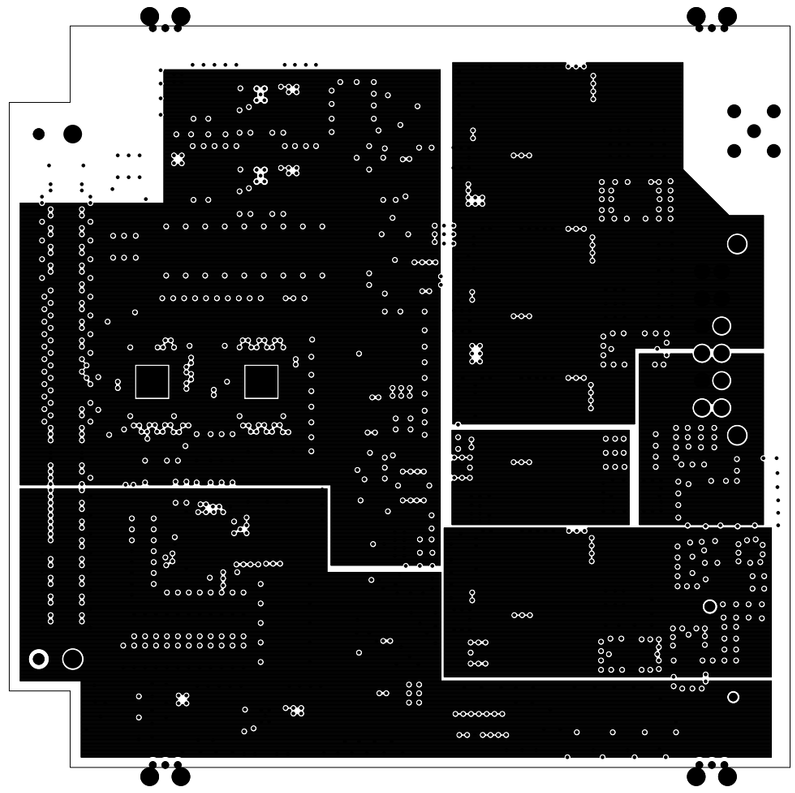
Layer Nickname

I02



Jobname	Date	Designer	Layouter
DIRICH_Power1	03.2016	M.Traxler	P.Skott

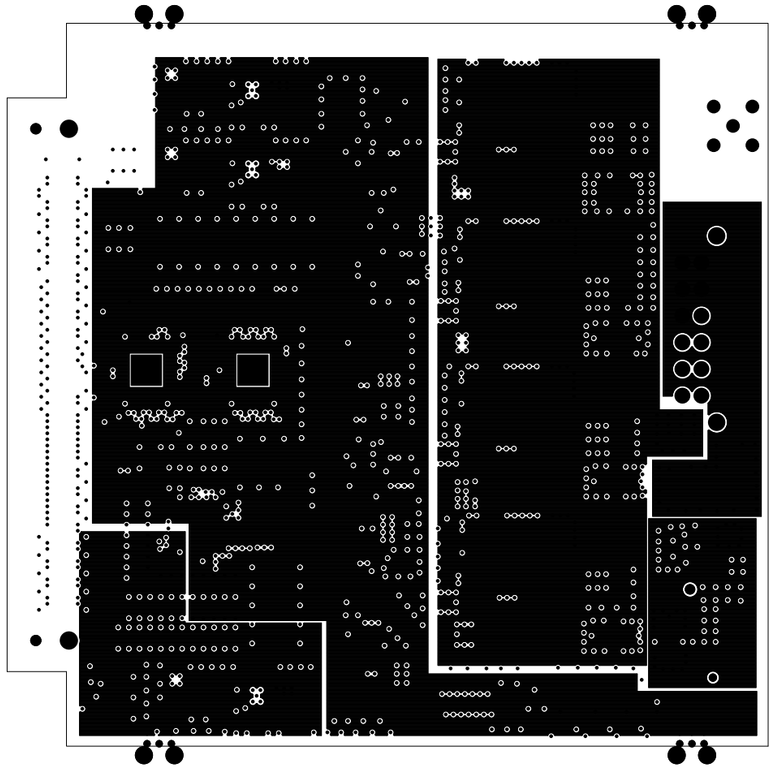
Layer Nickname I03



Jobname	Date	Designer	Layouter
DIRICH_Power1	03.2016	M.Traxler	P.Skott

Layer Nickname

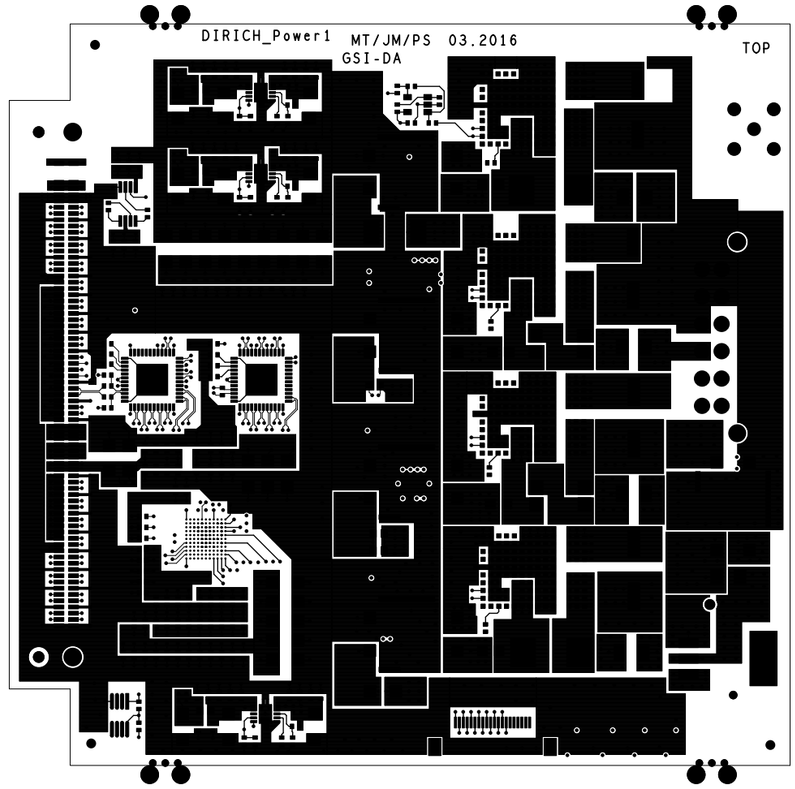
I04



Jobname	Date	Designer	Layouter
DIRICH_Power1	03.2016	M.Traxler	P.Skott

Layer Nickname

I09



Jobname	Date	Designer	Layouter
DIRICH_Power1	03.2016	M.Traxler	P.Skott

Layer Nickname: Top