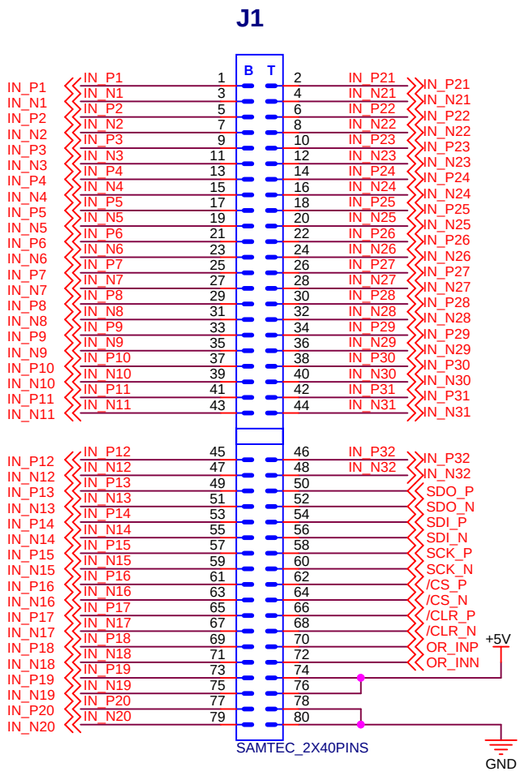

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01_ERNI-Connector

Design: K:\GSIJOB\COME_AND_KISS\CBM-TOF-FEE\CBM-TOF-FEE1\CBM-TOF-F	
Modified: Thursday, March 21, 2013	Size: A3 Page: 1 / 6
Designer: M.Traxler	Layouter: S.Voltz

VIO=2.5V

FPGA1E

INPUT OR PADI

OUTPUT DAC

INPUT DAC

UPPERLEFT

BANK7

LFE3-150EA-8FN672C

VIO=2.5V

FPGA1D

UPPER RIGHT

BANK2

TRUE_LVDS1

1002-161-080

LFE3-150EA-8FN672C

no adjacent pins should
be in use for changing signals

VIO=2.5V

FPGA1B

BANK3

LOWER RIGHT

BOTTOM RIGHT

LFE3-150EA-8FN672C

VIO=2.5V

FPGA1C

BANK6

LOWER LEFT

BOTTOM LEFT

LFE3-150EA-8FN672C

VIO=2.5V

TOP

FPGA1A

BANK0

LEFT

BANK1

RIGHT

LFE3-150EA-8FN672C

CK_IN1

200MHz

EPG.00.302.NLN

HPLA1

91930-21121

HPLA2

91930-21121

JTAG Connector

JTAG1

JTAG2

91930-21121

Place JTAG connector
close to the edge

D1 SML-P11MT green

D2 SML-P11DT orange

D3 SML-P11UT red

D4 SML-P11YT yellow

GSI

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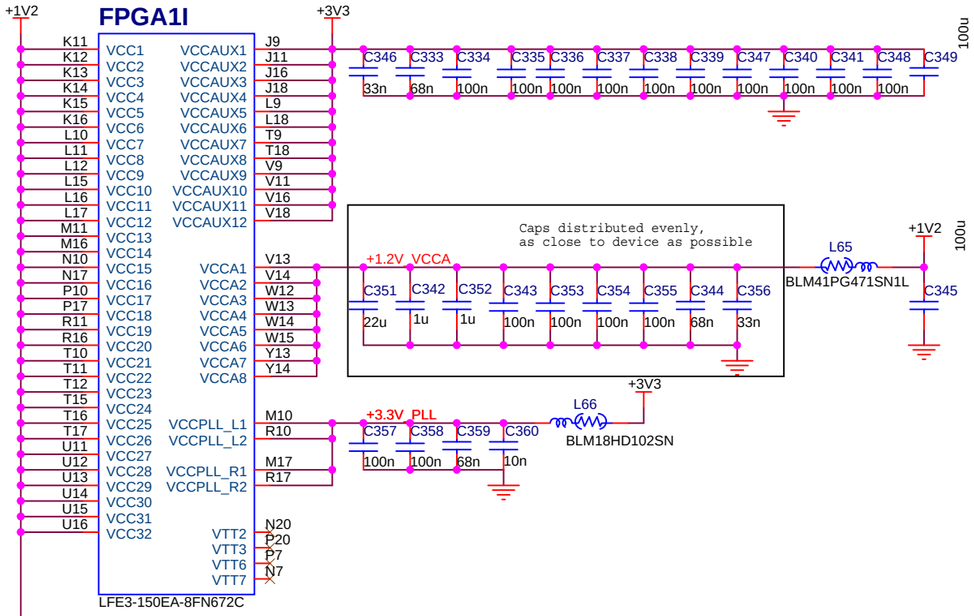
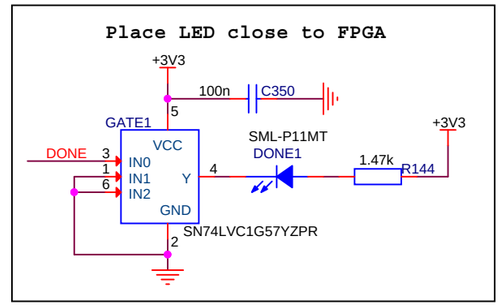
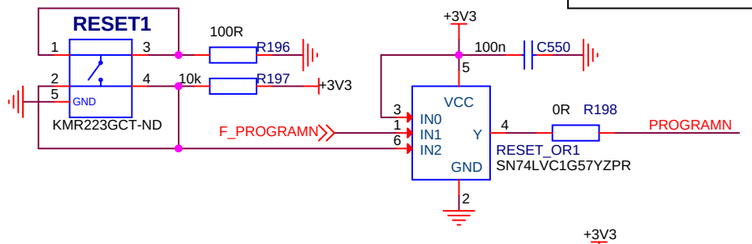
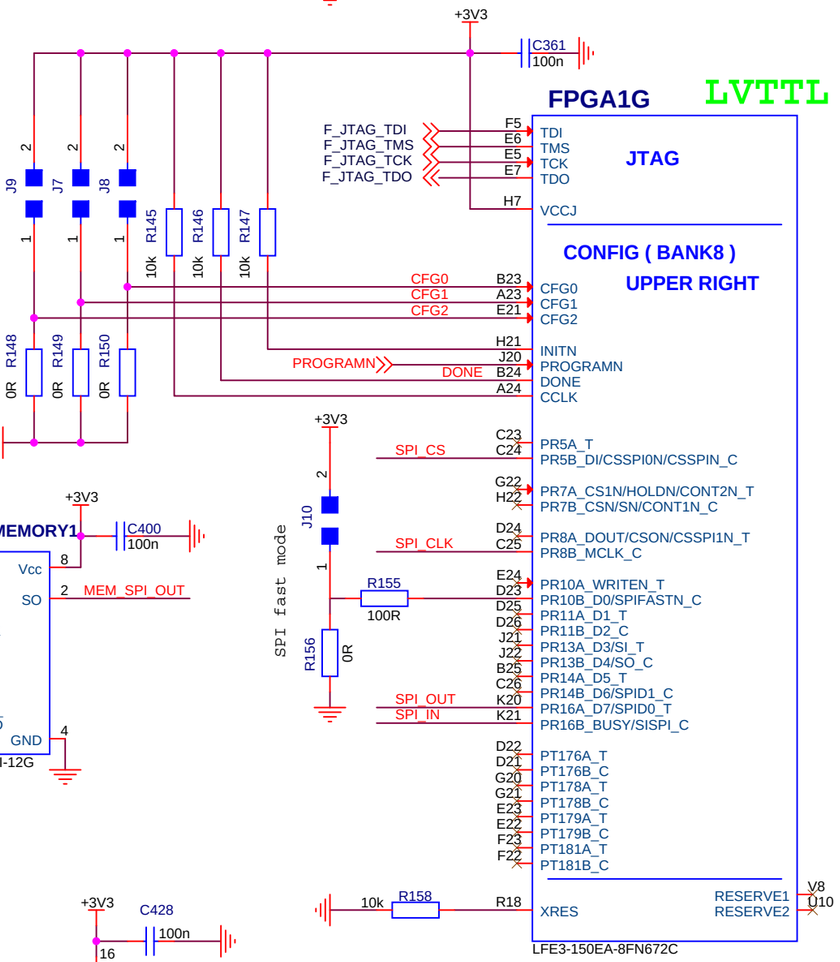
02_FPGA-Logic

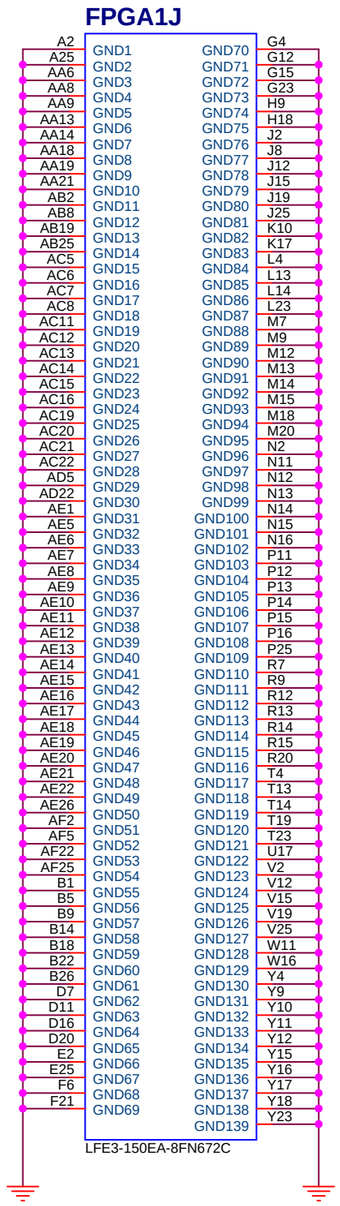
Design: K:\GSI\JOB\COME_AND_KISS\CBM-TOF-FEE\CBM-TOF-FEE1\CBM-TOF-FEE1-NE	
Modified: Thursday, March 21, 2013	Size: A2 Page: 2 / 6
Designer: M.Taxler	Layouter: S.Voltz

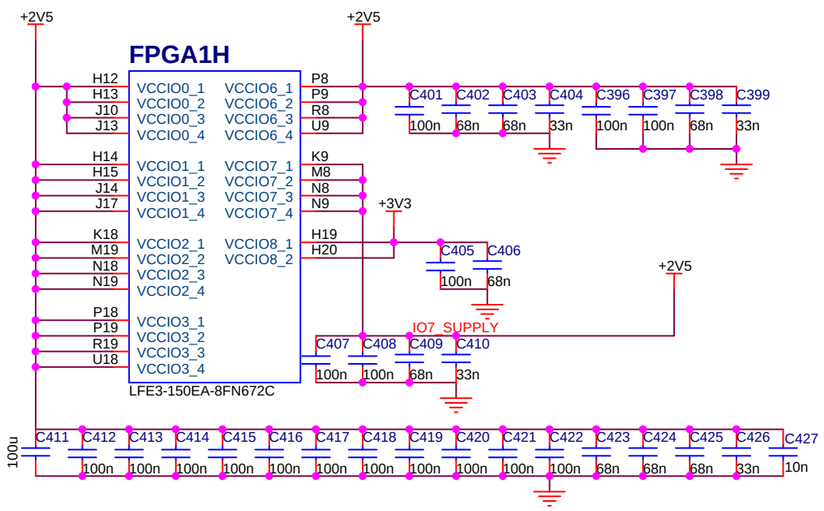


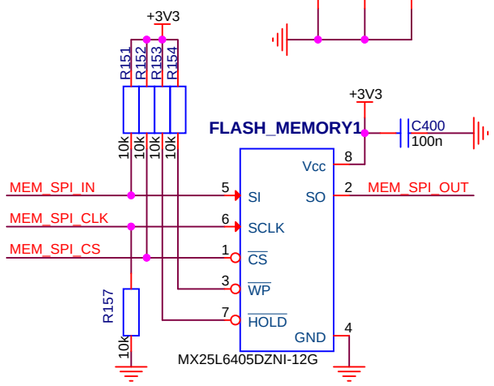


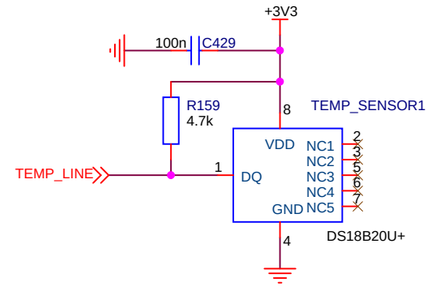


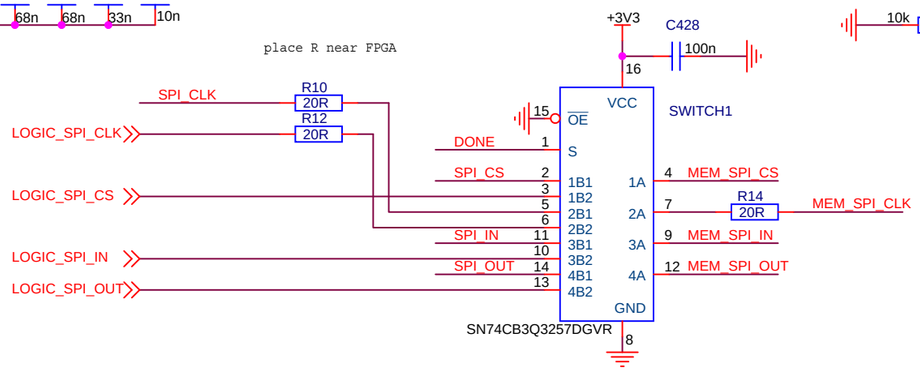












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03_FPGA-Power

Design: K:\GSIJOB\COME_AND_KISS\CBM-TOF-FEE\CBM-TOF-FEE1\CBM-TOF-F	
Modified: Thursday, March 21, 2013	Size: A3 Page: 3 / 6
Designer: M.Traxler	Layouter: S.Voltz

FPGA1F

SERDES
BOTTOM

RIGHT 50			LEFT 51	
SFP1_RXP / SFP1_RXN	AD21 / AD20	HDINP0_A / HDINN0_A	HDINP0_B / HDINN0_B	AD13 / AD12
	AD18 / AD19	HDINP1_A / HDINN1_A	HDINP1_B / HDINN1_B	AD10 / AD11
	AD17 / AD16	HDINP2_A / HDINN2_A	HDINP2_B / HDINN2_B	AD9 / AD8
	AD14 / AD15	HDINP3_A / HDINN3_A	HDINP3_B / HDINN3_B	AD6 / AD7
SFP1_TXP / SFP1_TXN	AF21 / AF20	HDOUTP0_A / HDOUTN0_A	HDOUTP0_B / HDOUTN0_B	AF13 / AF12
	AF18 / AF19	HDOUTP1_A / HDOUTN1_A	HDOUTP1_B / HDOUTN1_B	AF10 / AF11
	AF17 / AF16	HDOUTP2_A / HDOUTN2_A	HDOUTP2_B / HDOUTN2_B	AF9 / AF8
	AF14 / AF15	HDOUTP3_A / HDOUTN3_A	HDOUTP3_B / HDOUTN3_B	AF6 / AF7
CLK_MNGR1_P0 / CLK_MNGR1_N0	AC17 / AC18	REFCLKP_A / REFCLKN_A	REFCLKP_B / REFCLKN_B	AC9 / AC10

SERDES Supplies

VCCIB0_A	AB18	VCCIB0_B	AB13
VCCIB1_A	AA16	VCCIB1_B	AB11
VCCIB2_A	AA15	VCCIB2_B	AA11
VCCIB3_A	AB14	VCCIB3_B	AB9
VCCOB0_A	AA17	VCCOB0_B	AB12
VCCOB1_A	AB17	VCCOB1_B	AA12
VCCOB2_A	AB16	VCCOB2_B	AB10
VCCOB3_A	AB15	VCCOB3_B	AA10

LFE3-150EA-8FN672C

100Ohms here?
offen bitte

R169 OPEN

one cap per pin, located under device

+1.2V_IO_R: C442 22p, C443 47p, C444 56p, C445 68p, C446 100p, C447 150p, C448 680p, C449 1n

+1.2V_IO_R: C458 1u, C459 100n, C460 100n, C461 68n, C462 68n, C463 68n, C464 33n, C465 10n

distribute evenly as close to device as possible

one cap per pin, located under device

+1.2V_IO_L: C450 22p, C451 47p, C452 56p, C453 68p, C454 100p, C455 150p, C456 680p, C457 1n

+1.2V_IO_L: C466 1u, C467 100n, C468 100n, C469 68n, C470 68n, C471 68n, C472 33n, C473 10n

distribute evenly as close to device as possible

22u C438 +1.2V_IO_R — BLM18EG601SN L70 — +1V2; C439 100u

22u C440 +1.2V_IO_L — BLM18EG601SN L71 — +1V2; C441 100u

SFP1

1367073-1

SFP1_TX_FAULT	2	TxFault	
SFP1_TX_DIS	3	TxDis	
SFP1_RXN / SFP1_RXP	12 / 13	RD- / RD+	
SFP1_TXN / SFP1_TXP	19 / 18	TD- / TD+	
SFP1_LOS	8	LOS	
SFP1_MOD0 / SFP1_MOD1 / SFP1_MOD2	6 / 5 / 4	MOD-DEF0 / MOD-DEF1 / MOD-DEF2	
SFP1_RATE_SEL	7	Rate Select	
	16	VCC_T	VEE_T1 1, VEE_T2 17, VEE_T3 20
	15	VCC_R	VEE_R1 9, VEE_R2 10, VEE_R3 11, VEE_R4 14

R170 10k

+3V3 — BLM18EG601SN L72 — BLM18EG601SN L73 — SFP1_VCC

C474 10u, C475 100n, C476 100n, C477 68n

C478 10u, C479 100n, C480 100n, C481 68n

Connector only

SFP1_MOD0	10k	R171
SFP1_MOD1	10k	R172
SFP1_MOD2	10k	R173
SFP1_TX_FAULT	10k	R174
SFP1_LOS	10k	R175

MODDEF0 is grounded by module when inserted

JTRBCAGE1

1489962-1

Cage zu Connector AMP_1367073-1

1	1	NC1	12
2	2	NC2	13
3	3	NC3	14
4	4	NC4	15
5	5	NC5	16
6	6	NC6	18
7	7	NC7	19
8	8	NC8	20
9	9	NC9	21
10	10		
11	11		

+3V3 — unter SFP cage

1.47k R165 — D5 SML-P11MT green — SFP_LED_GREEN

1.47k R166 — D6 SML-P11UT red — SFP_LED_RED

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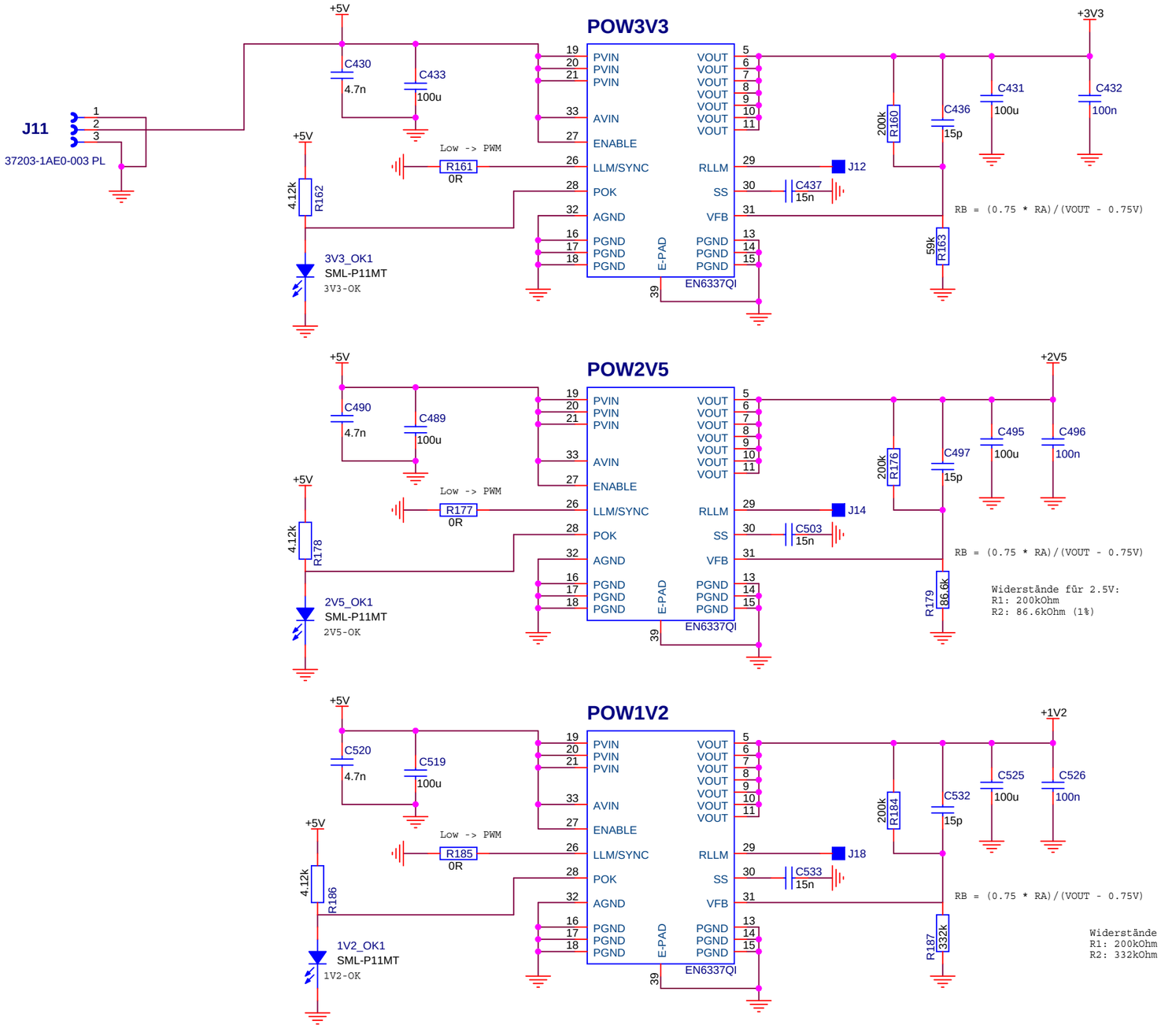
04_SERDES + SFP

Design: K:\GSIJOB\COME_AND_KISS\CBM-TOF-FEE\CBM-TOF-FEE1\CBM-TOF-F
Modified: Thursday, March 21, 2013 | Size: A3 | Page: 4 / 6
Designer: M.Traxler | Layouter: S.Voltz



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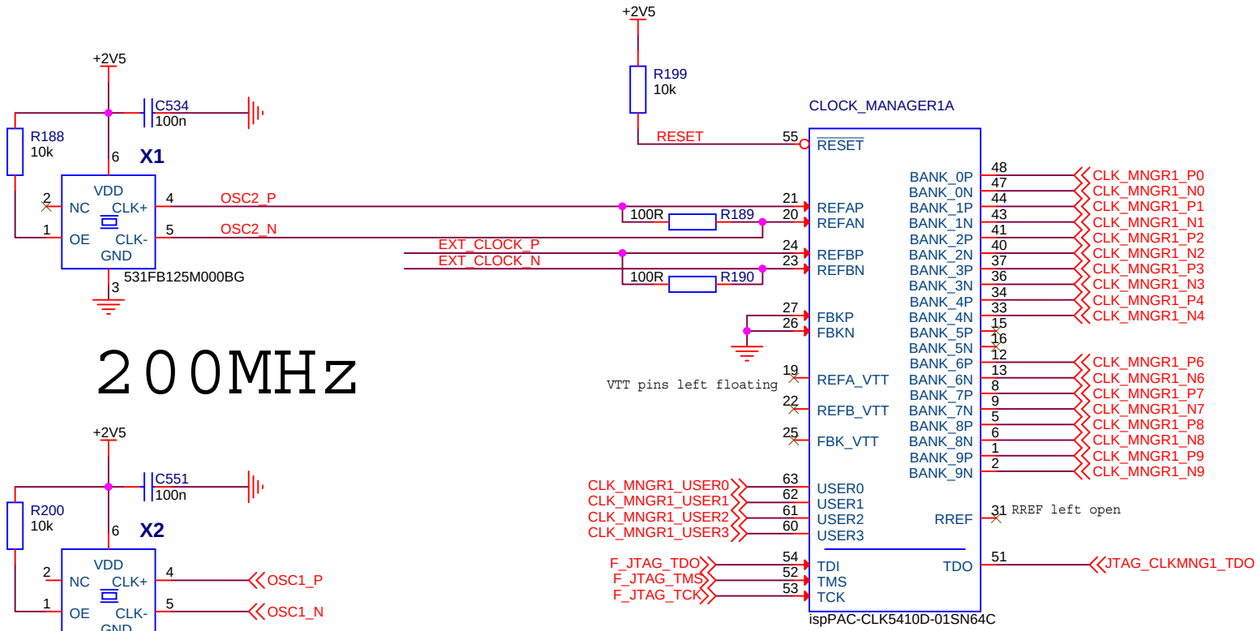
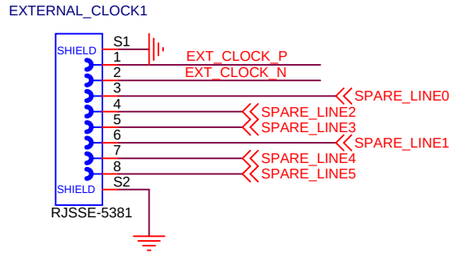
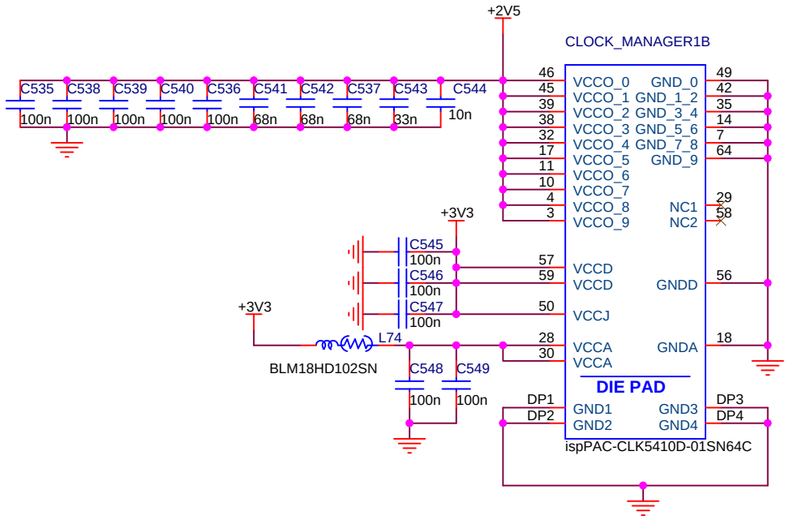
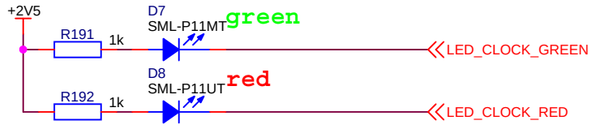
05_Power

Design: K:\GSIJOB\COME_AND_KISS\CBM-TOF-FEE\CBM-TOF-FEE1\CBM-TOF-F	
Modified: Thursday, March 21, 2013	Size: A3 Page: 5 / 6
Designer: M.Traxler	Layouter: S.Voltz









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GERMANY
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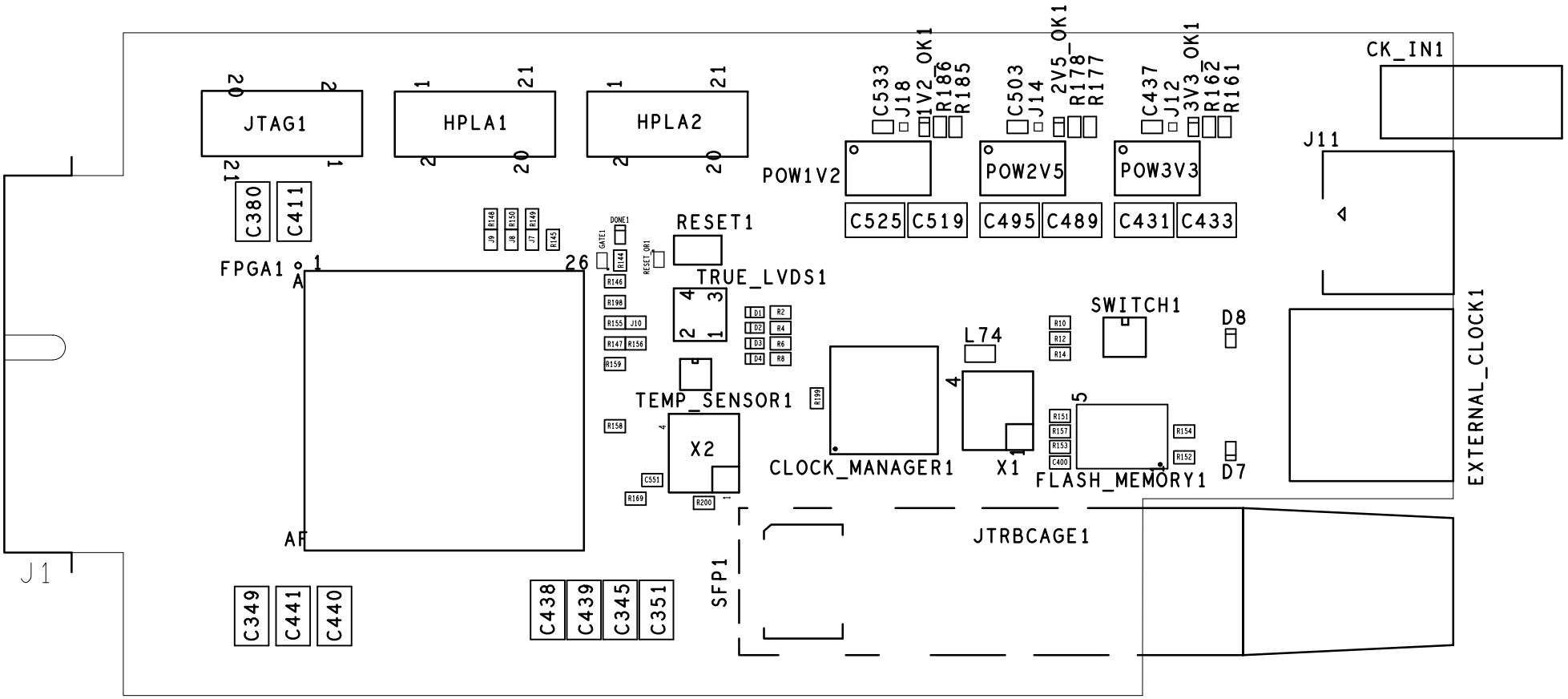
06_Clock

Design: K:\GSIJOB\COME_AND_KISS\CBM-TOF-FEE\CBM-TOF-FEE1\CBM-TOF-F	
Modified: Thursday, March 21, 2013	Size: A3 Page: 6 / 6
Designer: M.Traxler	Layouter: S.Voltz



Jobname	Date	Designer	Layouter
CBM-TOF-FEE1	04.2013	J.FRUEHAUF	P.SKOTT

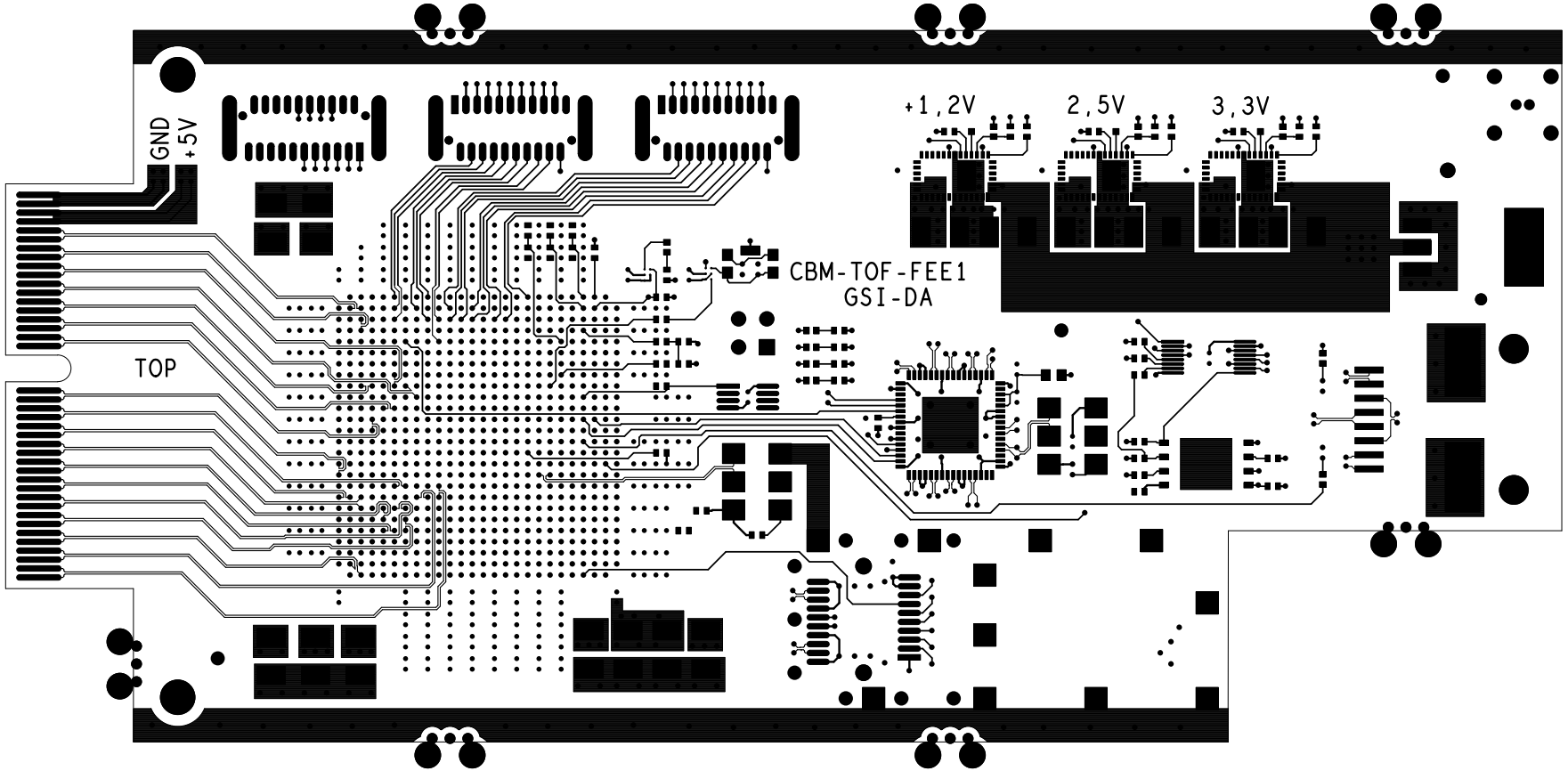
Layer Nickname

Ast

Layer Micron

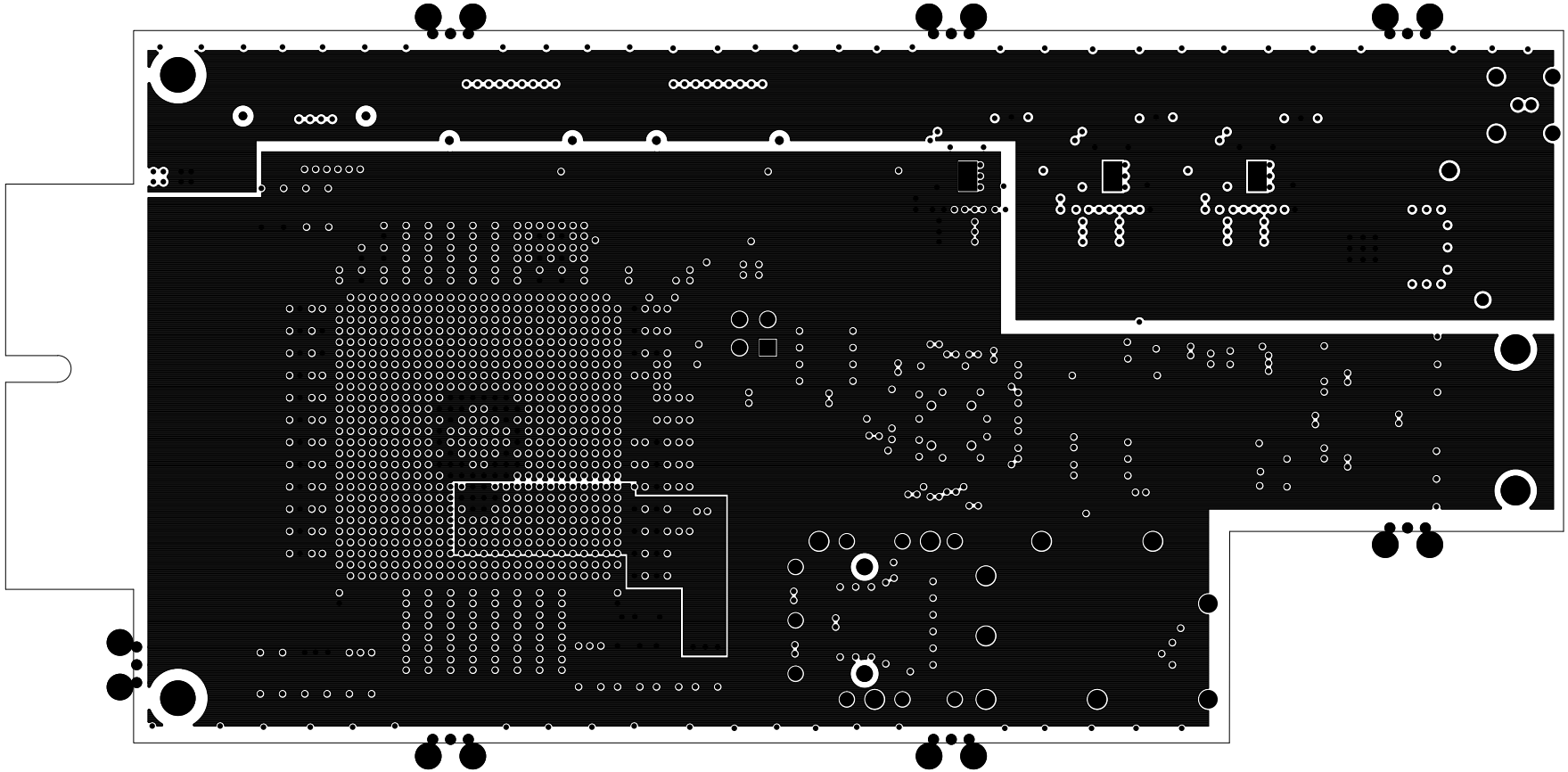
Asb

Jobname	Date	Designer	Layouter
CBM-TOF-FEE1	04.2013	J.FRUEHAUF	P.SKOTT



Jobname	Date	Designer	Layouter
CBM-TOF-FEE1	04.2013	J.FRUEHAUF	P.SKOTT

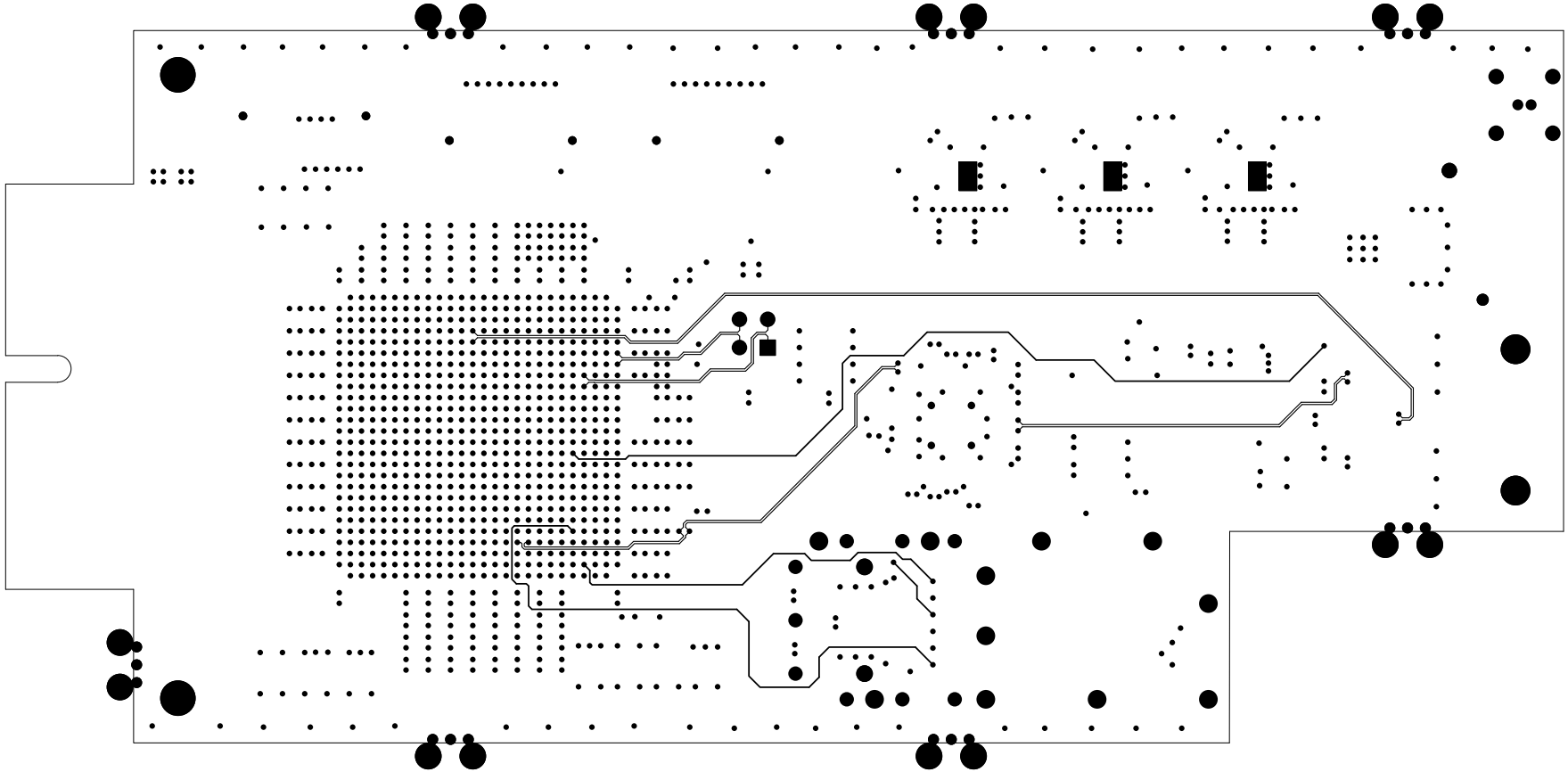
Layer Nickname: Top



Jobname	Date	Designer	Layouter
CBM-TOF-FEE1	04.2013	J.FRUEHAUF	P.SKOTT

Layer Nickname

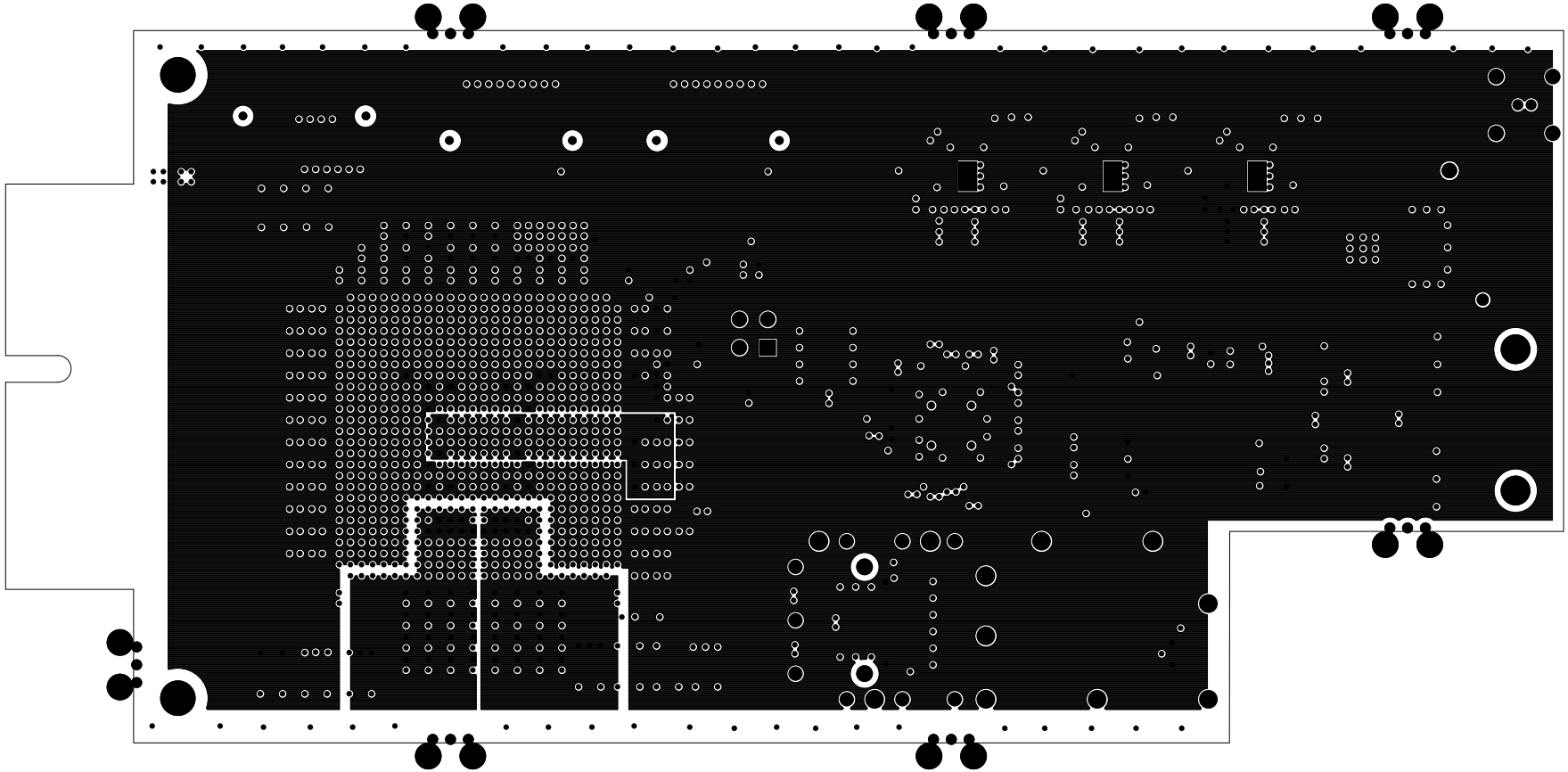
I01



Jobname	Date	Designer	Layouter
CBM-TOF-FEE1	04.2013	J.FRUEHAUF	P.SKOTT

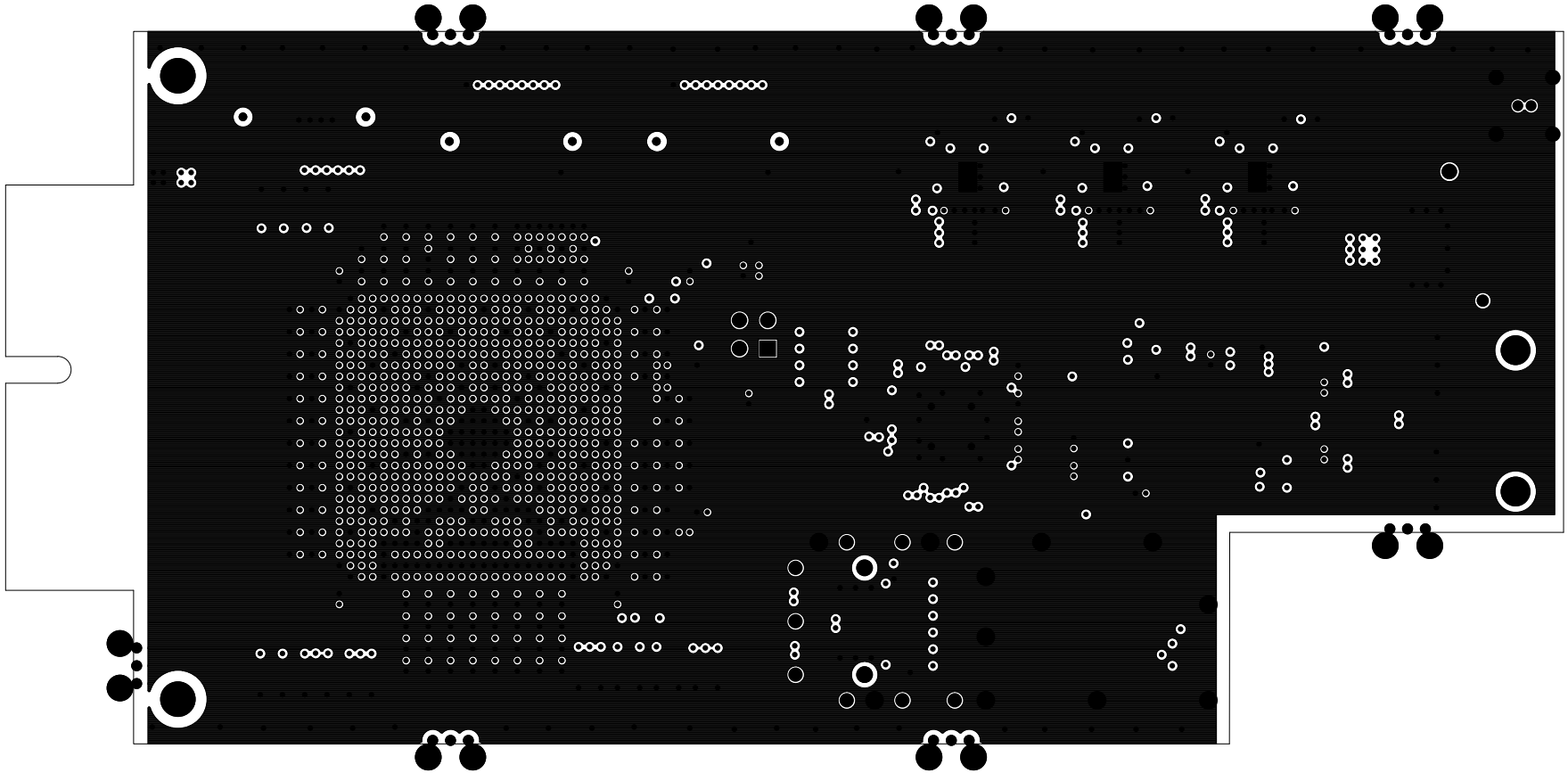
Layer Nickname

I02



Jobname	Date	Designer	Layouter
CBM-TOF-FEE1	04.2013	J.FRUEHAUF	P.SKOTT

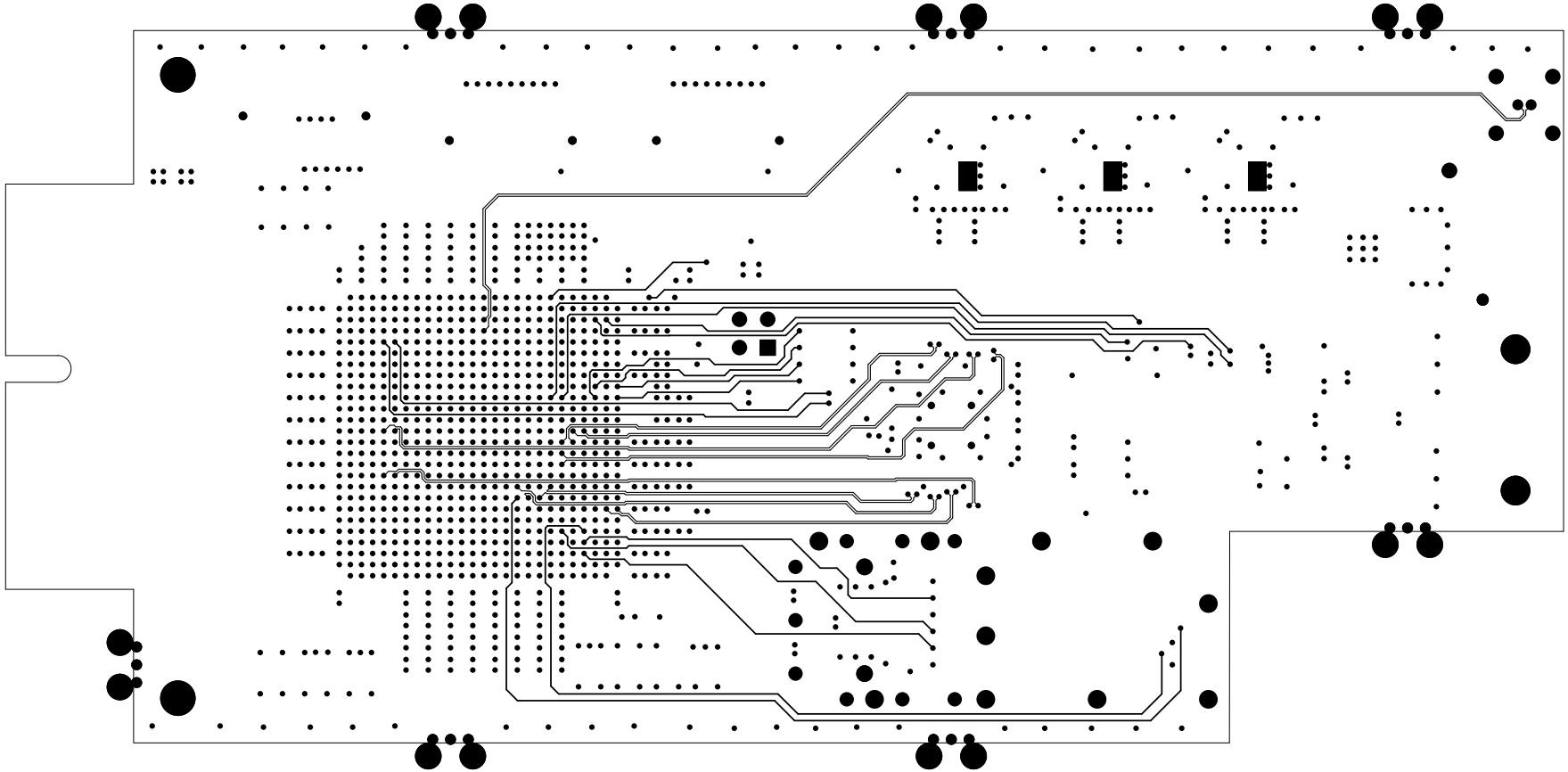
Layer Nickname I03



Jobname	Date	Designer	Layouter
CBM-TOF-FEE1	04.2013	J.FRUEHAUF	P.SKOTT

Layer Nickname

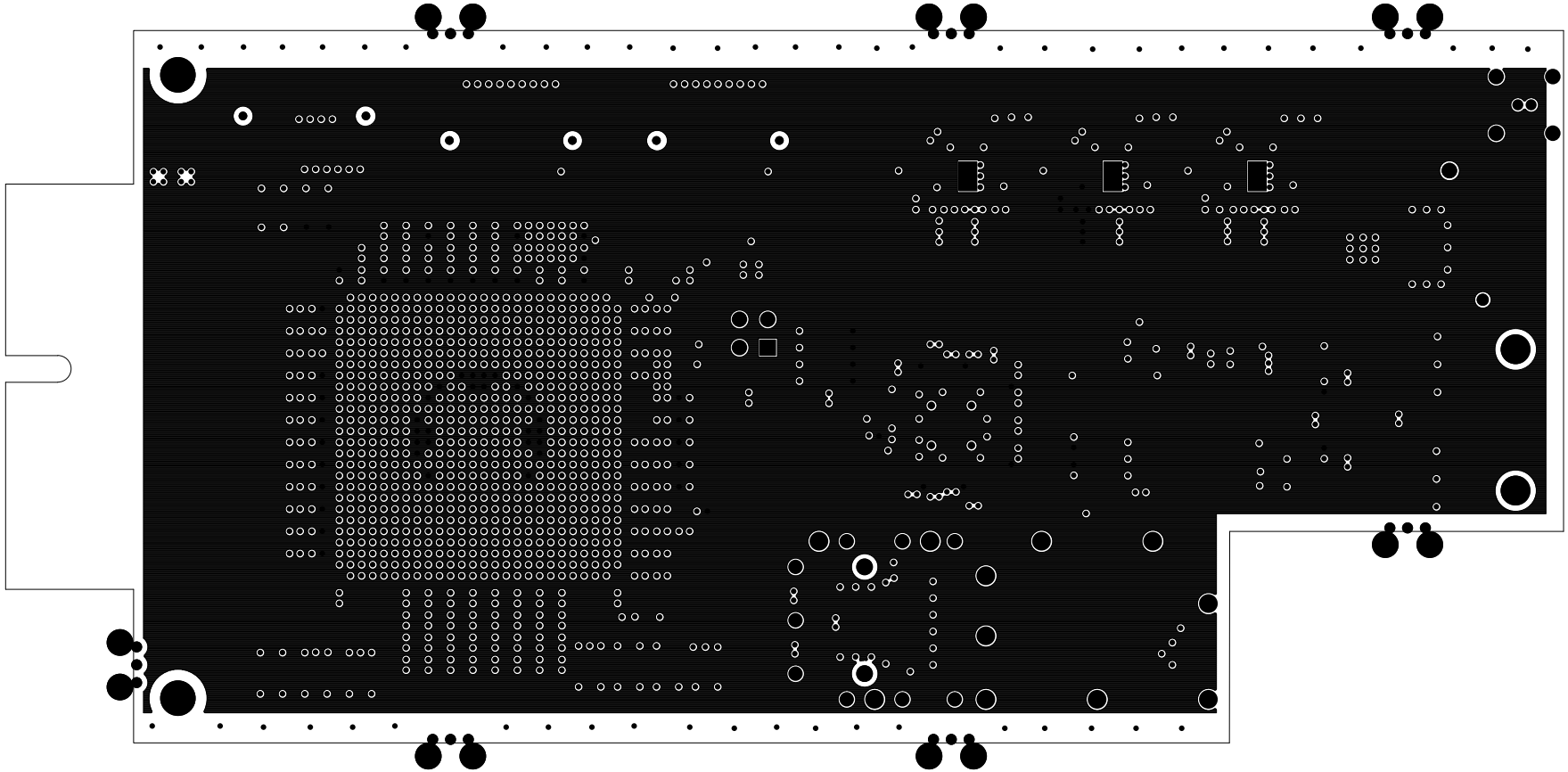
I04



Jobname	Date	Designer	Layouter
CBM-TOF-FEE1	04.2013	J.FRUEHAUF	P.SKOTT

Layer Nickname

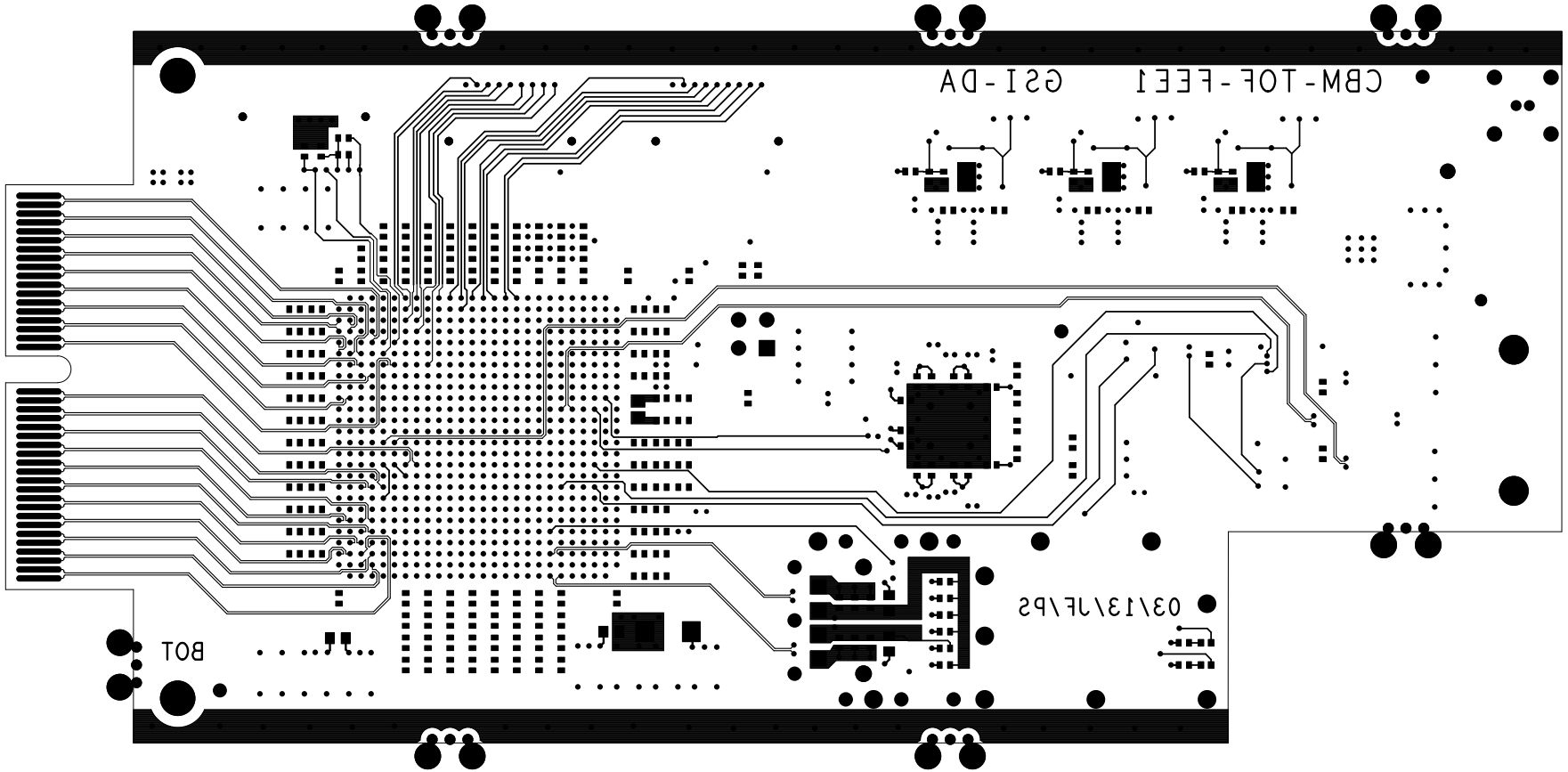
I05



Jobname	Date	Designer	Layouter
CBM-TOF-FEE1	04.2013	J.FRUEHAUF	P.SKOTT

Layer Nickname

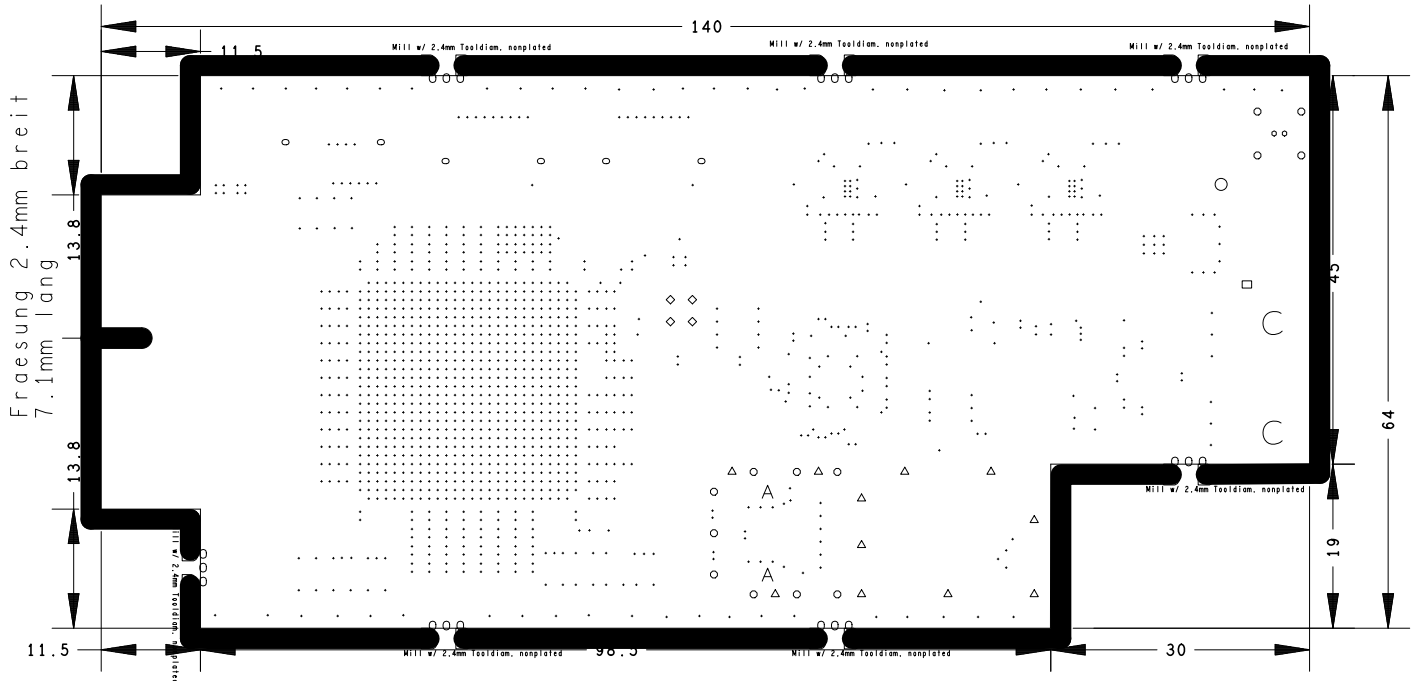
I06



Jobname	Date	Designer	Layouter
CBM-TOF-FEE1	04.2013	J.FRUEHAUF	P.SKOTT

Layer Nickname

Bot



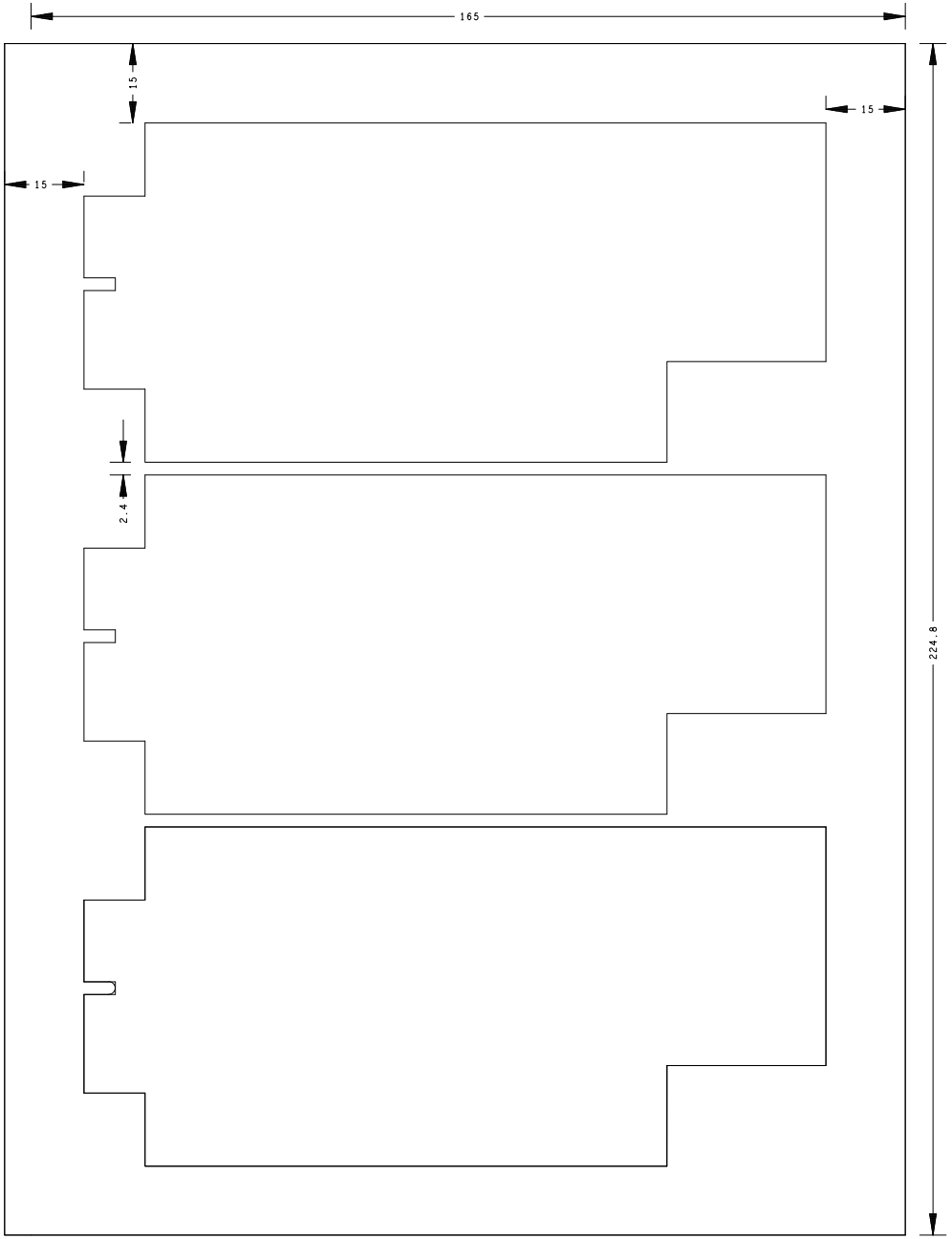
DRILL CHART: TOP to BOTTOM			
ALL UNITS ARE IN MILLIMETERS			
FIGURE	SIZE	PLATED	QTY
·	0.2	PLATED	1353
◦	0.4	PLATED	1
◦	0.6	PLATED	2
○	0.8	PLATED	13
◇	1.0	PLATED	4
△	1.1	PLATED	11
○	0.8	NON-PLATED	6
○	1.0	NON-PLATED	21
□	1.1	NON-PLATED	1
○	1.4	NON-PLATED	1
A	1.5	NON-PLATED	2
B	2.4	NON-PLATED	14
C	2.7	NON-PLATED	2

TOTAL HOLES: 1431

Jobname	Date	Designer	Layouter
CBM-TOF-FEE1	04.2013	J.FRUEHAUF	P.SKOTT

Layer Nickname

Drd



ALLE 0,2mm BOHRUNGEN MIT PLUGGING VERSCHLIESSEN:
BOHRLOCH MIT HARZ VERFUELLEN UND MIT KUPFER DECKELN.

DIE KONTAKTE DES DIREKTSTECKERS BITTE HARTVERGOLDEN.

DIE LANGEN KANTEN DER PLATINE MIT KANTENMETALLISIERUNG VERSEHEN.

DEN STECKBEREICH MIT 30GRAD ANFASEN.

Jobname	Date	Designer	Layouter
CBM-TOF-FEE1	04.2013	J.FRUEHAUF	P.SKOTT

Layer Nickname

Fab

CBM-TOF-FEE1

Capture CIS Standard Bill Of Materials - Compressed Report

Report Created on Tuesday Apr 02 13:35:33 2013

Layouter = P.Skott

Designer = J.Fruehauf

Item Number	Quantity	Part Referenc	DESCRIPTION	PART_CASE	Value	MANUFACTUI	MANUFACTUI	DATASHEET	GSI_STOCK_N	COMMISSION	APPROVED	COMPONENT_
1	7	1V2_OK1,2V5	LED, Single, G	SMD-0402	SML-P11MT	SML-P11MT	Rohm	K:\GsiLib\Data		M.Traxler	P.Skott	25441
2	76	C37,C334-C34	Capacitor, Cer	SMD-0402	100n					G.May	G.May	24583
3	32	C333,C344,C3	Capacitor, Cer	SMD-0402	68n					G.May	G.May	21811
4	5	C342,C352,C3	Capacitor, Cer	SMD-0402	1u	GRM155R61A	Murata			G.May	G.May	21815
5	12	C345,C349,C3	Capacitor, Cer	SMD-1210	100u	LMK325ABJ10	Taiyo Yuden	K:\GsiLib\Data		M.Traxler	P.Skott	25431
6	16	C346,C356,C3	Capacitor, Cer	SMD-0402	33n	GRM155R71E	Murata			G.May	G.May	21809
7	3	C351,C438,C4	Capacitor, Cer	SMD-1210	22u	CL32A226KPN	Samsung			S.Lange	S.Voltz	24477
8	7	C360,C379,C3	Capacitor, Cer	SMD-0402	10n	GRM36X7R10	Murata			G.May	G.May	21804
9	3	C430,C490,C5	Capacitor, Cer	SMD-0402	4.7n	GRM155R72A	Murata			H.G.Koenig	P.Skott	25281
10	3	C436,C497,C5	Capacitor, Cer	SMD-0402	15p					E.Badura	G.May	21779
11	3	C437,C503,C5	Capacitor, Cer	SMD-0402	15n					G.May	G.May	21807
12	2	C442,C450	Capacitor, Cer	SMD-0402	22p					E.Badura	G.May	21781
13	2	C443,C451	Capacitor, Cer	SMD-0402	47p					E.Badura	G.May	21785
14	2	C444,C452	Capacitor, Cer	SMD-0402	56p					E.Badura	G.May	21786
15	2	C445,C453	Capacitor, Cer	SMD-0402	68p					E.Badura	G.May	21787
16	2	C446,C454	Capacitor, Cer	SMD-0402	100p					E.Badura	G.May	21789
17	2	C447,C455	Capacitor, Cer	SMD-0402	150p					G.May	G.May	21792
18	2	C448,C456	Capacitor, Cer	SMD-0402	680p					G.May	G.May	21796
19	2	C449,C457	Capacitor, Cer	SMD-0402	1n	GRM155R71H	Murata			G.May	G.May	21798
20	2	C474,C478	Capacitor, Cer	SMD-0805	10u	GRM21BR71A	Murata	K:\GsiLib\Data		M.Traxler	P.Skott	24740
21	1	CK_IN1	Connector, Ja		EPG.00.302.N	EPG.00.302.N	Lemo	K:\GsiLib\Data		H.Hahn	S.Voltz	23088
22	1	CLOCK_MANA	IC-Digital, Clo	QFNS-64	ispPAC-CLK54	ispPAC-CLK54	Lattice	K:\GsiLib\Data		M.Traxler	P.Skott	25426
23	1	D2	LED, Single, O	SMD-0402	SML-P11DT	SML-P11DT	Rohm	K:\GsiLib\Data		M.Traxler	P.Skott	25443
24	3	D3,D6,D8	LED, Single, R	SMD-0402	SML-P11UT	SML-P11UT	Rohm	K:\GsiLib\Data		M.Traxler	P.Skott	25444
25	1	D4	LED, Single, Y	SMD-0402	SML-P11YT	SML-P11YT	Rohm	K:\GsiLib\Data		M.Traxler	P.Skott	25442
26	1	EXTERNAL_CL	Connector, Ja		RJSSE-5381	RJSSE-5381	Amphenol	K:\GsiLib\Data		M.Traxler	S.Voltz	25470
27	1	FLASH_MEMC	IC-Digital, Me	WSON-8	MX25L6405D	MX25L6405D	Macronix	K:\GsiLib\Data		J.Hoffmann	S.Voltz	25113
28	1	FPGA1	IC-Digital, FPG	FPBGA-672	LFE3-150EA-8	LFE3-150EA-8	Lattice	K:\GsiLib\Data		J.Hoffmann	S.Voltz	25377
29	2	GATE1,RESET_	IC-Digital, Log	DSBGA-6	SN74LVC1G57	SN74LVC1G57	Texas Instrum	K:\GsiLib\Data		M.Traxler	P.Skott	25033
30	3	HPLA1,HPLA2	Connector, So		91930-21121	91930-21121I	Fci	K:\GsiLib\Data		J.Hoffmann	S.Voltz	20548
31	1	J1	Connector, Ca		SAMTEC_2X4(	Do not order	None			J.Hoffmann	S.Voltz	25056

32	4	J7-J10	Connector, Ju	SMD-0402	Jumper2P	Do not order	None			M.Traxler	S.Voltz	21914
33	1	J11	Connector, So		37203-1AE0-0	37203-1AE0-0	3M	K:\GsiLib\Data		J.Hoffmann	S.Voltz	25193
34	3	J12,J14,J18	Connector, Te		Testpin-0402					M.Traxler	S.Voltz	22992
35	1	JTRBCAGE1	Connector, Ca		1489962-1	1489962-1	AMP	K:\GsiLib\Data		M.Traxler	S.Voltz	20874
36	1	L65	Inductor, RF-C	SMD-1806	BLM41PG471	BLM41PG471	Murata	K:\GsiLib\Data		M.Traxler	S.Voltz	24601
37	2	L66,L74	Inductor, RF-C	SMD-0603	BLM18HD102	BLM18HD102	Murata	K:\GsiLib\Data		M.Traxler	P.Skott	25263
38	4	L70-L73	Inductor, RF-C	SMD-0603	BLM18EG601	BLM18EG601	Murata	K:\GsiLib\Data		M.Traxler	P.Skott	25264
39	3	POW1V2,POW	IC-Power, DC-	QFN-38	EN6337QI	EN6337QI-T	Enpirion	K:\GsiLib\Data		M.Traxler	S.Voltz	25591
40	7	R2,R4,R6,R8,R	Resistor, Thicl	SMD-0402	1.47k					G.May	G.May	21169
41	3	R10,R12,R14	Resistor, Thicl	SMD-0402	20R					G.May	G.May	20990
42	22	R60-R62,R145	Resistor, Thicl	SMD-0402	10k	RC1005F103C	Samsung			G.May	G.May	21248
43	8	R148-R150,R1	Resistor, Thicl	SMD-0402	0R	CRCW040200	Vishay	K:\GsiLib\Data		E.Badura	G.May	4950
44	4	R155,R189,R1	Resistor, Thicl	SMD-0402	100R					G.May	G.May	21057
45	1	R159	Resistor, Thicl	SMD-0402	4.7k					G.May	G.May	22835
46	3	R160,R176,R1	Resistor, Thicl	SMD-0402	200k					G.May	G.May	21372
47	3	R162,R178,R1	Resistor, Thicl	SMD-0402	4.12k					G.May	G.May	21211
48	1	R163	Resistor, Thicl	SMD-0402	59k					G.May	G.May	21321
49	1	R169	Resistor, Thicl	SMD-0402	OPEN	Do not order				J.Hoffmann	S.Voltz	24848
50	1	R179	Resistor, Thicl	SMD-0402	86.6k					G.May	G.May	21337
51	1	R187	Resistor, Thicl	SMD-0402	332k					G.May	G.May	21393
52	2	R191,R192	Resistor, Thicl	SMD-0402	1k					G.May	G.May	21153
53	1	RESET1	Switch, Pushb		KMR223GCT-I	KMR223GCT-I	ITT-Cannon	K:\GsiLib\Data		J.Hoffmann	S.Voltz	23119
54	1	SFP1	Connector, So		1367073-1	1367073-1	AMP	K:\GsiLib\Data		M.Traxler	S.Voltz	20871
55	1	SWITCH1	IC-Mixedsigna	TVSOP-16	SN74CB3Q32	SN74CB3Q32	Texas Instrum	K:\GsiLib\Data		M.Traxler	P.Skott	25262
56	1	TEMP_SENSO	IC-Mixedsigna	uSOP-8	DS18B20U+	DS18B20U+	Maxim	K:\GsiLib\Data		M.Traxler	S.Voltz	24395
57	1	TRUE_LVDS1	Connector, Pi		1002-161-080	1002-161-080	Preci-Dip	K:\GsiLib\Data	2502	M.Traxler	S.Voltz	25592
58	1	X1	Crystal, Oscill		531FB125M0(	531FB125M0(	Silicon-Lab	K:\GsiLib\Data		M.Traxler	P.Skott	25268
59	1	X2	Crystal, Oscill		531FB200M0(	531FB200M0(	Silicon-Lab	K:\GsiLib\Data		M.Traxler	P.Skott	25295