P140, NV31, 4Mx32, 128MB, VIDEO IN/OUT, DVI-I, VGA

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EXT_5V and EXT_12V

SKU	VARIANT	NVPN	ASSEMBLY
B	BASE	600-10140-0000-004	BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL
1	<UNDEFINED>	<UNDEFINED>	<UNDEFINED>
2	<UNDEFINED>	<UNDEFINED>	<UNDEFINED>
3	<UNDEFINED>	<UNDEFINED>	<UNDEFINED>
4	<UNDEFINED>	<UNDEFINED>	<UNDEFINED>
5	<UNDEFINED>	<UNDEFINED>	<UNDEFINED>
6	<UNDEFINED>	<UNDEFINED>	<UNDEFINED>
7	<UNDEFINED>	<UNDEFINED>	<UNDEFINED>
8	<UNDEFINED>	<UNDEFINED>	<UNDEFINED>
9	<UNDEFINED>	<UNDEFINED>	<UNDEFINED>
10	<UNDEFINED>	<UNDEFINED>	<UNDEFINED>
11	<UNDEFINED>	<UNDEFINED>	<UNDEFINED>
12	<UNDEFINED>	<UNDEFINED>	<UNDEFINED>
13	<UNDEFINED>	<UNDEFINED>	<UNDEFINED>
14	<UNDEFINED>	<UNDEFINED>	<UNDEFINED>
15	<UNDEFINED>	<UNDEFINED>	<UNDEFINED>

HISTORY:

A00

X00: INITIAL VERSION

X00: First Review

X00 - 12/04/02: Updated D30 Diode on Page 16

X00 - 12/05/02: Changed VGA Connectors to Slim, Added Bracket,
Added 2X5 Connector for TUNER Card

X00 - 12/06/02: Changed Pri VGA back to Original,
Changed Sec VGA to SLIM_DVIMTG, Hooked up 10 Pin Tuner Con
Replaced 27Mhz Crystal with low profile version
Corrected Error with PGND on 6529 circuit

X00 - 12/09/02: Added C Partition 120 ohm RPacks
Changed and Deleted components on all 3 Switchers
Deleted Parallel ROM.

X00 - 12/10/02: Replaced L26 and L31 with SMD_12X5MM Jedec type
Rearranged Mem U5,U7,U8,and U4 to be on the same pages
Added Other TMDS DVI connector with Hot Plug detect
Changed Pri VGA connector to SLIM_MTG

A01

X00 - 12/11/02: Swapped out J4 2X5 with 1X10 Header
Added two 200 ohm CLK term. Resistors
Added 2nd TMDS Diff Spacing Constraints
Added Power Supply I, II, and III Spacing Constraints
Backet Changed for Correct Jedec Type
Changed C571,C567,C562 to 7343 pkg to fit under FANSINK

X00 - 12/12/02: Changed R223 to 95.3K, Deleted 52MM HEATSINK symbol

X00 - 12/16/02: Added additional decoupling caps to Memory; Cleaned share footprint notes
Changed COMMON Attribute on a few components to NS (NO STUFF)

X00 - 01/22/03: Changed a few Rset values page 8, Crystal cap values, TV out ind value
added 2 res for USER_0 Strap (Apple), NVVDD changed D31, 12V_EXT to 5V_EXT
NVVDD changed a few Compensation component values, Added Optional Linear for A3V3

X00 - 01/23/03:

X00 - 01/29/03: Removed FBVDD ISL6529 and Linear Reg for A3V3 and Current Share
Changed stuff option NVDD33 reg from 3V3 to A3V3. Changed VGA conn to Regular.
NVVDD Supply changes: L27, C588, C586, C587, C584, added two share footprint ALE's
Changed a few other Power supply component values but no pkg changes.
Changed VGA / DVI-I conn. to a Slim VGA, Removed J9 Link C DVI-I and Link C components.
Changed TV in/out Inductors, deleted 2 filter caps on tuner header.

01/30/03: Added 2 Strap resistors for PCI_DEVID[3] GLbond.

02/03/03: Changed Current Share circuit to 0805 size, Change D30 and D33 diodes to FETS.

02/04/03: Deleted NVDD33 Linear not needed because no amplitude DDR-1 spec. violation.
Moved AGPSTOP pull-up to A3V3 from NVDD33. Added CGND2 to J3.25,R121,R94.
Changed Current Share Net Names and Changed BKT1 Jedec type.

A02

02/04/03: AGPSTOP R to net 3V3, R121 back to CGND, J2.16 to CGND2, fixed all un-named nets.

02/05/03: Modified BRK1 for correct Jedec type and NVPN, Current share R value change

02/06/03: Added 6 more 0805 R's to NVVDD Current Share CKT.

02/07/03: Cosmetic Cleanup and Added Notes Only.

A03

03/10/03: EMI fixes. Combine CGND to GND remove CGND to GND resistors.

03/11/03: EMI fix. Added Series Resistor to GND on TMDS IFPAIOGND and IFPBIOGND.

03/14/03: Moving C708 & C735 to the IFPAIOGND and IFPBIOGND nets. So at least one decoupling
cap is near the ball. Changed ISL6225 VIN pin 14 to be 6225_VCC_IN_F net. This provides
Feed-Forward rejection of the Input voltage variation.

A04

04/25/03: Added New TMDS termination to Link A, changed U509 3V3TMDS regulator to LT1117 (800ma)
Added bulk cap near Fan connector J6 and series resistor and cap on GPIO fan control.
Deleted R65 and R66 IFPxIOGND resistors because it did not help EMI.
Changed TP4 to 52P32 size. Removed Link B from DVI connector.

05/15/03: No Changes. PCB INT1 Layer change.

602-10140-0003-100 NV31 Flip Chip Schematic

ASSEMBLY	BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL
PAGE DETAIL	<edit here to insert page detail>

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AGP CONNECTOR AND NV31 AGP SECTION

CN501
CON_AGP

U8
NV31_DKTP_A1
BGA701
COMMON

1/11 PCI/AGP

AGP 2x,4x | AGP 8x

AGP2x4x | AGP8x | AGP2x4x

[..] = NOT USED ON NV18
[...] = NOT USED ON NV31/34

AGP_VREF_CG generation:

AGP1X VREF = internally, 40% AGPVDDQ
AGP2X and 4X: VREF = provided by Motherboard
AGP8X VREF = internally, 310mV

AGP1X VDDQ=3.3V, divider 301k/221k, VREF=1.39V
AGP8X VDDQ=1.5V, divider 301k/(221k|107k), VREF=0.29V

VDD33 balls do affect the Predriver for the Current mode clks. However the possible increaced amplitude on the clks do not exceed the VID spec (FBVDDQ+0.6) for the DDR-1 RAMS. Spec. interpetation?

AGP rules

	Net Name	Net Spacing	Net Physical
B1	PCIAD<31..0>	20MIL	
B1	PCICBE<3..0>	20MIL	
B1	PCICLK	20MIL	
B1	PCIRST*	10MIL	
B1	PCIREQ	10MIL	
B1	PCIGNT	10MIL	
B1	PCIFRAME	10MIL	
B1	PCIIRDY	10MIL	
B1	PCITRDY	10MIL	
B1	PCISTOP	10MIL	
B1	PCIDEVSEL	10MIL	
B1	PCIPAR	10MIL	
B1	PCIINTA	10MIL	
B1	PCIINTB	10MIL	
B1	AGPRBF	10MIL	
B1	AGPWBF	10MIL	
B1	AGPDBI_HI	20MIL	
B1	AGPDBI_LO	20MIL	
B1	AGPSTO	15MIL	
B1	AGPST1	15MIL	
B1	AGPST2	15MIL	
B1	AGPADSTBDF	25MIL	
B1	AGPADSTB0S	25MIL	
B1	AGPADSTB1F	25MIL	
B1	AGPADSTB1S	25MIL	
B1	AGPSBSTBF	25MIL	
B1	AGPSBSTB5	25MIL	
B1	AGPSBA<7..0>	20MIL	
B1	NV18_VREFCG	10MIL	12MIL_TRACE
B1	AGPVREFCG	10MIL	12MIL_TRACE
B1	AGPVREFGC	10MIL	12MIL_TRACE
B1	AGPMBDET	10MIL	
B1	AGPSTOP	10MIL	

ASSEMBLY	BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL
PAGE DETAIL	<edit here to insert page detail>

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NV_PN	600-10140-0003-100		
ID	p140_design	PAGE	2 OF 21
NAME	P140	DATE	15-MAY-2003

NV31 Framebuffer Interface

6.4B 4.4B 4.2A 4.1G — BI — FBCD<63..0>

U8
NV31_DKTP_A1
BGA701
COMMON

2/11 MEM_C

0	FBCD<60>	N25	FBCD<60>	
1	FBCD<62>	N27	FBCD<62>	
2	FBCD<61>	N26	FBCD<61>	
3	FBCD<63>	M25	FBCD<63>	
4	FBCD<59>	K26	FBCD<59>	
5	FBCD<57>	K27	FBCD<57>	
6	FBCD<58>	J27	FBCD<58>	
7	FBCD<56>	H27	FBCD<56>	
8	FBCD<52>	N29	FBCD<52>	
9	FBCD<54>	M29	FBCD<54>	
10	FBCD<53>	M28	FBCD<53>	
11	FBCD<55>	L29	FBCD<55>	
12	FBCD<49>	J29	FBCD<49>	
13	FBCD<50>	J28	FBCD<50>	
14	FBCD<51>	H29	FBCD<51>	
15	FBCD<48>	G30	FBCD<48>	
16	FBCD<45>	K25	FBCD<45>	
17	FBCD<46>	J26	FBCD<46>	
18	FBCD<47>	J25	FBCD<47>	
19	FBCD<42>	G26	FBCD<42>	
20	FBCD<43>	F28	FBCD<43>	
21	FBCD<44>	F26	FBCD<44>	
22	FBCD<41>	E27	FBCD<41>	
23	FBCD<40>	D27	FBCD<40>	
24	FBCD<39>	H28	FBCD<39>	
25	FBCD<36>	G29	FBCD<36>	
26	FBCD<37>	F29	FBCD<37>	
27	FBCD<38>	E29	FBCD<38>	
28	FBCD<35>	C30	FBCD<35>	
29	FBCD<33>	C29	FBCD<33>	
30	FBCD<32>	B30	FBCD<32>	
31	FBCD<34>	A30	FBCD<34>	
32	FBCD<31>	AJ29	FBCD<31>	
33	FBCD<28>	AJ30	FBCD<28>	
34	FBCD<29>	AH29	FBCD<29>	
35	FBCD<30>	AH30	FBCD<30>	
36	FBCD<25>	AF29	FBCD<25>	
37	FBCD<26>	AE29	FBCD<26>	
38	FBCD<27>	AD29	FBCD<27>	
39	FBCD<24>	AC28	FBCD<24>	
40	FBCD<22>	AG28	FBCD<22>	
41	FBCD<23>	AF27	FBCD<23>	
42	FBCD<19>	AE26	FBCD<19>	
43	FBCD<20>	AE28	FBCD<20>	
44	FBCD<21>	AD25	FBCD<21>	
45	FBCD<16>	AB25	FBCD<16>	
46	FBCD<17>	AB26	FBCD<17>	
47	FBCD<18>	AA25	FBCD<18>	
48	FBCD<15>	AD30	FBCD<15>	
49	FBCD<12>	AC29	FBCD<12>	
50	FBCD<13>	AB28	FBCD<13>	
51	FBCD<14>	AB29	FBCD<14>	
52	FBCD<8>	Y29	FBCD<8>	
53	FBCD<10>	W28	FBCD<10>	
54	FBCD<9>	W29	FBCD<9>	
55	FBCD<11>	V29	FBCD<11>	
56	FBCD<7>	AC27	FBCD<7>	
57	FBCD<5>	AB27	FBCD<5>	
58	FBCD<6>	AA27	FBCD<6>	
59	FBCD<4>	AA26	FBCD<4>	
60	FBCD<0>	W25	FBCD<0>	
61	FBCD<2>	V26	FBCD<2>	
62	FBCD<1>	V27	FBCD<1>	
63	FBCD<3>	V25	FBCD<3>	

6.5A 4.5A 4.1G — OUT — FBCDQM<7..0>

0	FBCDQM<7>	L27	FBCDQM<7>	
1	FBCDQM<6>	K29	FBCDQM<6>	
2	FBCDQM<5>	G25	FBCDQM<5>	
3	FBCDQM<4>	F28	FBCDQM<4>	
4	FBCDQM<3>	AF28	FBCDQM<3>	
5	FBCDQM<2>	AD27	FBCDQM<2>	
6	FBCDQM<1>	AA30	FBCDQM<1>	
7	FBCDQM<0>	Y27	FBCDQM<0>	

6.5A 4.5A 4.1G — BI — FBCDQS<7..0>

0	FBCDQS<7>	M27	FBCDQS<7>	
1	FBCDQS<6>	K30	FBCDQS<6>	
2	FBCDQS<5>	G27	FBCDQS<5>	
3	FBCDQS<4>	D30	FBCDQS<4>	
4	FBCDQS<3>	AG30	FBCDQS<3>	
5	FBCDQS<2>	AD26	FBCDQS<2>	
6	FBCDQS<1>	AA29	FBCDQS<1>	
7	FBCDQS<0>	W27	FBCDQS<0>	

NTP_FBCDQS<7>*	M26	FBCDQS<7>...	
NTP_FBCDQS<6>*	L28	FBCDQS<6>...	
NTP_FBCDQS<5>*	F27	FBCDQS<5>...	
NTP_FBCDQS<4>*	D29	FBCDQS<4>...	
NTP_FBCDQS<3>*	AG29	FBCDQS<3>...	
NTP_FBCDQS<2>*	AE27	FBCDQS<2>...	
NTP_FBCDQS<1>*	Y28	FBCDQS<1>...	
NTP_FBCDQS<0>*	W26	FBCDQS<0>...	

6.2B 4.2B 4.1G 4.1A — OUT — FBAA<11..0>

0	FBCA<0>	V30	FBCA<0>
1	FBCA<1>	U28	FBCA<1>
2	FBCA<2>	U29	FBCA<2>
3	FBCA<3>	T28	FBCA<3>
4	FBCA<4>	T29	FBCA<4>
5	FBCA<5>	T27	FBCA<5>
6	FBCA<6>	T30	FBCA<6>
7	FBCA<7>	T26	FBCA<7>
8	FBCA<8>	T25	FBCA<8>
9	FBCA<9>	R27	FBCA<9>
10	FBCA<10>	R25	FBCA<10>
11	FBCA<11>	R30	FBCA<11>
	TP_FBCA<12>	U24	FBCA<12>..

6.2B 4.2B 4.1G	OUT	FBCBA<0> R26	FBCBA<0>
6.2B 4.2B 4.1G	OUT	FBCBA<1> R29	FBCBA<1>
6.2B 4.2B 4.1G	OUT	FBCRAS* P28	FBCRAS
6.2B 4.2B 4.1G	OUT	FBCCAS* P29	FBCCAS
6.2B 4.2B 4.1G	OUT	FBCWE* R28	FBCWE
4.2B 4.1G	OUT	FBCCS0* U27	FBCCS0
6.2B 4.1G	OUT	FBCCS1* P27	FBCCS1
6.3B 4.3B 4.2G	OUT	FBCCKE N30	FBCCKE
6.3D 4.3D 4.1G	OUT	FBCCLK0 U21	FBCCLK0
6.3D 4.3D 4.1G	OUT	FBCCLK0* V21	FBCCLK0
6.3B 4.3B 4.1G	OUT	FBCCLK1 N21	FBCCLK1
6.3B 4.3B 4.1G	OUT	FBCCLK1* P21	FBCCLK1

FBVDDQ

R578 1K 5% 0402 COMMON

FB_VREF — C28 — FB_VREF

R579 1K 5% 0402 COMMON — C624 .1UF 10V 10% X7R 0402 COMMON — C631 22PF 50V +/-0.25PF C0G 0402 COMMON — R565 10K 5% 0402 COMMON

GND

[...] = NOT USED ON NV18
[...] = USED FOR DDR2 ONLY

FBVDDQ	F8		
FBVDDQ	G8		
FBVDDQ	F11		
FBVDDQ	G11		
FBVDDQ	F14		
FBVDDQ	F17		
FBVDDQ	F20		
FBVDDQ	G20		
FBVDDQ	F23		
FBVDDQ	G23		
FBVDDQ	H24		
FBVDDQ	L24		
FBVDDQ	Y24		
FBVDDQ	AC24		
FBVDDQ	H25		
FBVDDQ	L25		
FBVDDQ	P25		
FBVDDQ	U25		
FBVDDQ	Y25		
FBVDDQ	AC25		
..FB_DLLVDD	C27		
GND	F1		
GND	J1		
GND	M1		
GND	T1		
GND	W1		
GND	AB1		
GND	AE1		
GND	C3		
GND	G3		
GND	K3		
GND	N3		
GND	AH3		
GND	D4		
GND	AG4		
GND	E5		
GND	K5		
GND	AA5		
GND	AF5		
GND	A6		
GND	F6		
GND	AE6		
GND	AK6		
GND	C7		
GND	J7		
GND	AH7		
GND	E8		
GND	L8		
GND	Y8		
GND	AF8		
GND	A9		
GND	AK9		
GND	C10		
GND	AH10		
GND	E11		
GND	H11		
GND	AC11		
GND	AF11		
GND	A12		
GND	AK12		
GND	C13		
GND	AH13		
GND	E14		
GND	AF14		
GND	AK15		
GND	AH16		
GND	E17		
GND	AF17		
GND	C18		
GND	AH18		
GND	A19		
GND	AK19		
GND	E20		
GND	H20		
GND	AC20		
GND	AF20		
GND	C21		
GND	AH21		
GND	A22		
GND	AK22		
GND	E23		
GND	L23		
GND	Y23		
GND	AF23		
GND	C24		
GND	AH24		
GND	A25		
GND	F25		
GND	AE25		
GND	AK25		
GND	H26		
GND	L26		
GND	P26		
GND	U26		
GND	Y26		
GND	AC26		
GND	AF26		
GND	AG27		
GND	D28		
GND	G28		
GND	K28		
GND	N28		
GND	V28		
GND	AA28		
GND	AD28		
GND	AH28		
GND	E30		
GND	J30		
GND	M30		
GND	W30		
GND	AB30		
GND	AE30		

FBVDDQ

C642 470PF 16V 20% X7R 0402 COMMON — C647 .022UF 16V 10% X7R 0402 COMMON — C629 .1UF 10V 10% X7R 0402 COMMON — C632 .1UF 10V 10% X7R 0402 COMMON — GND

C43 470PF 16V 20% X7R 0402 COMMON — C646 .022UF 16V 10% X7R 0402 COMMON — C650 .1UF 10V 10% X7R 0402 COMMON — C671 .1UF 10V 10% X7R 0402 COMMON — GND

C715 470PF 16V 20% X7R 0402 COMMON — C702 .022UF 16V 10% X7R 0402 COMMON — C727 .1UF 10V 10% X7R 0402 COMMON — C643 .1UF 10V 10% X7R 0402 COMMON — GND

C691 470PF 16V 20% X7R 0402 COMMON — C662 .022UF 16V 10% X7R 0402 COMMON — GND

C628 1UF 10V 10% X7R 0603 COMMON — C630 1UF 10V 10% X7R 0603 COMMON — C722 1UF 10V 10% X7R 0603 COMMON — C623 4.7UF 6.3V 10% X5R 0805 COMMON — GND

A3V3

LB501 150-220R@100MHz COMMON BEAD_0603

FB_VDDPLL — C638 470PF 50V 10% X7R 0402 COMMON — C635 4700PF 16V 20% X7R 0402 COMMON — C639 4.7UF 6.3V 10% X5R 0805 COMMON — GND

If A3V3 not posssible, power from 3V3!

Place Near GPU

FBCCLK0 — FBCCLK0* — R582 100 0402 1% NO STUFF

FBCCLK1 — FBCCLK1* — R581 100 0402 1% NO STUFF

FBACLK0 — FBACLK0* — R586 100 0402 1% NO STUFF

FBACLK1 — FBACLK1* — R589 100 0402 1% NO STUFF

Place CKE pull down at T-point!

7.4B 5.4B 5.2A 5.1G — BI — FBAD<63..0>

U8
NV31_DKTP_A1
BGA701
COMMON

3/11 MEM_A

0	FBAD<63>	F13	FBAD<63>	
1	FBAD<62>	D13	FBAD<62>	
2	FBAD<61>	E13	FBAD<61>	
3	FBAD<60>	F12	FBAD<60>	
4	FBAD<59>	E10	FBAD<59>	
5	FBAD<56>	D10	FBAD<56>	
6	FBAD<57>	D9	FBAD<57>	
7	FBAD<58>	D8	FBAD<58>	
8	FBAD<52>	B13	FBAD<52>	
9	FBAD<54>	B12	FBAD<54>	
10	FBAD<53>	C12	FBAD<53>	
11	FBAD<55>	B11	FBAD<55>	
12	FBAD<49>	B9	FBAD<49>	
13	FBAD<50>	C9	FBAD<50>	
14	FBAD<51>	B8	FBAD<51>	
15	FBAD<48>	A7	FBAD<48>	
16	FBAD<47>	F10	FBAD<47>	
17	FBAD<46>	E9	FBAD<46>	
18	FBAD<45>	F9	FBAD<45>	
19	FBAD<44>	F7	FBAD<44>	
20	FBAD<43>	C6	FBAD<43>	
21	FBAD<42>	E6	FBAD<42>	
22	FBAD<40>	D5	FBAD<40>	
23	FBAD<41>	C4	FBAD<41>	
24	FBAD<39>	C8	FBAD<39>	
25	FBAD<38>	B7	FBAD<38>	
26	FBAD<37>	B6	FBAD<37>	
27	FBAD<36>	B5	FBAD<36>	
28	FBAD<33>	A3	FBAD<33>	
29	FBAD<32>	B3	FBAD<32>	
30	FBAD<35>	A2	FBAD<35>	
31	FBAD<34>	B2	FBAD<34>	
32	FBAD<29>	B29	FBAD<29>	
33	FBAD<28>	A29	FBAD<28>	
34	FBAD<31>	B28	FBAD<31>	
35	FBAD<30>	A28	FBAD<30>	
36	FBAD<27>	B26	FBAD<27>	
37	FBAD<26>	B25	FBAD<26>	
38	FBAD<25>	B24	FBAD<25>	
39	FBAD<24>	C23	FBAD<24>	
40	FBAD<22>	E26	FBAD<22>	
41	FBAD<23>	D26	FBAD<23>	
42	FBAD<21>	E25	FBAD<21>	
43	FBAD<20>	C25	FBAD<20>	
44	FBAD<19>	E24	FBAD<19>	
45	FBAD<18>	F22	FBAD<18>	
46	FBAD<17>	E22	FBAD<17>	
47	FBAD<16>	F21	FBAD<16>	
48	FBAD<15>	A24	FBAD<15>	
49	FBAD<12>	B23	FBAD<12>	
50	FBAD<13>	C22	FBAD<13>	
51	FBAD<14>	B22	FBAD<14>	
52	FBAD<8>	B20	FBAD<8>	
53	FBAD<10>	C19	FBAD<10>	
54	FBAD<9>	B19	FBAD<9>	
55	FBAD<11>	B18	FBAD<11>	
56	FBAD<5>	D23	FBAD<5>	
57	FBAD<6>	D22	FBAD<6>	
58	FBAD<7>	D21	FBAD<7>	
59	FBAD<4>	E21	FBAD<4>	
60	FBAD<3>	F19	FBAD<3>	
61	FBAD<2>	E18	FBAD<2>	
62	FBAD<1>	D18	FBAD<1>	
63	FBAD<0>	F18	FBAD<0>	

7.5A 5.5A 5.1G — OUT — FBADQM<7..0>

0	FBADQM<7>	D11	FBADQM<7>	
1	FBADQM<6>	B10	FBADQM<6>	
2	FBADQM<5>	D7	FBADQM<5>	
3	FBADQM<4>	C5	FBADQM<4>	
4	FBADQM<3>	C26	FBADQM<3>	
5	FBADQM<2>	F24	FBADQM<2>	
6	FBADQM<1>	B21	FBADQM<1>	
7	FBADQM<0>	D20	FBADQM<0>	

7.5A 5.5A 5.1G — BI — FBADQS<7..0>

0	FBADQS<7>	D12	FBADQS<7>	
1	FBADQS<6>	A10	FBADQS<6>	
2	FBADQS<5>	E7	FBADQS<5>	
3	FBADQS<4>	A4	FBADQS<4>	
4	FBADQS<3>	A27	FBADQS<3>	
5	FBADQS<2>	D24	FBADQS<2>	
6	FBADQS<1>	A21	FBADQS<1>	
7	FBADQS<0>	D19	FBADQS<0>	

NTP_FBADQS<7>*	E12	FBADQS<7>...	
NTP_FBADQS<6>*	C11	FBADQS<6>...	
NTP_FBADQS<5>*	D6	FBADQS<5>...	
NTP_FBADQS<4>*	B4	FBADQS<4>...	
NTP_FBADQS<3>*	B27	FBADQS<3>...	
NTP_FBADQS<2>*	D25	FBADQS<2>...	
NTP_FBADQS<1>*	C20	FBADQS<1>...	
NTP_FBADQS<0>*	E19	FBADQS<0>...	

7.2B 5.1G 5.1A — OUT — FBCA<11..0>

0	FBAA<0>	A18	FBAA<0>
1	FBAA<1>	C17	FBAA<1>
2	FBAA<2>	B17	FBAA<2>
3	FBAA<3>	C16	FBAA<3>
4	FBAA<4>	B16	FBAA<4>
5	FBAA<5>	D16	FBAA<5>
6	FBAA<6>	A16	FBAA<6>
7	FBAA<7>	E16	FBAA<7>
8	FBAA<8>	F16	FBAA<8>
9	FBAA<9>	D15	FBAA<9>
10	FBAA<10>	F15	FBAA<10>
11	FBAA<11>	A15	FBAA<11>
	TP_FBAA<12>	G17	FBAA<12>..

7.2B 5.2B 5.1G	OUT	FBABA<0> E15	FBABA<0>
7.2B 5.2B 5.1G	OUT	FBABA<1> B15	FBABA<1>
7.2B 5.2B 5.1G	OUT	FBARAS* C14	FBARAS
7.2B 5.2B 5.1G	OUT	FBACAS* B14	FBACAS
7.2B 5.2B 5.1G	OUT	FBAWE* C15	FBAWE
5.2B 5.1G	OUT	FBACS0* D17	FBACS0
7.2B 5.1G	OUT	FBACS1* D14	FBACS1
7.3B 5.3B 5.2G	OUT	FBACKE A13	FBACKE
7.3D 5.3D 5.1G	OUT	FBACLK0 K18	FBACLK0
7.3D 5.3D 5.1G	OUT	FBACLK0* K17	FBACLK0
7.3B 5.3B 5.1G	OUT	FBACLK1 K15	FBACLK1
7.3B 5.3B 5.1G	OUT	FBACLK1* K14	FBACLK1

R591 10K 5% 0402 COMMON — GND

[..] = NOT USED ON NV18
[...] = USED FOR DDR2 ONLY

...VTT	G9	NTP_FBVTT_1	
...VTT	G12	NTP_FBVTT_2	
...VTT	G15	NTP_FBVTT_3	
...VTT	G16	NTP_FBVTT_4	
...VTT	G19	NTP_FBVTT_5	
...VTT	G22	NTP_FBVTT_6	
...VTT	Y24	NTP_FBVTT_7	
...VTT	M24	NTP_FBVTT_8	
...VTT	R24	NTP_FBVTT_9	
...VTT	T24	NTP_FBVTT_10	
...VTT	W24	NTP_FBVTT_11	
...VTT	AB24	NTP_FBVTT_12	

FBVDDQ

...FBCAL_PD_VDDQ — F5 FBCAL_PD R594 60.4 0402 1% COMMON — Should Be 30.1ohm according to NV31 design guide?

...FBCAL_PU_GND — E4 FBCAL_PU R605 60.4 0402 1% COMMON — GND

...FBCAL_TERM_GND — D3 FBCAL_TGND R624 0 0402 5% COMMON — Should be 61.9 ohm according to NV31 design guide? — GND

...FBCAL_CLK_GND — E3 FBCAL_CGND R618 549 0402 1% COMMON — GND

GND_THERMAL	M12		
GND_THERMAL	N12		
GND_THERMAL	P12		
GND_THERMAL	R12		
GND_THERMAL	T12		
GND_THERMAL	U12		
GND_THERMAL	V12		
GND_THERMAL	W12		
GND_THERMAL	M13		
GND_THERMAL	N13		
GND_THERMAL	P13		
GND_THERMAL	R13		
GND_THERMAL	T13		
GND_THERMAL	U13		
GND_THERMAL	V13		
GND_THERMAL	W13		
GND_THERMAL	M14		
GND_THERMAL	N14		
GND_THERMAL	P14		
GND_THERMAL	R14		
GND_THERMAL	T14		
GND_THERMAL	U14		
GND_THERMAL	V14		
GND_THERMAL	W14		
GND_THERMAL	M15		
GND_THERMAL	N15		
GND_THERMAL	P15		
GND_THERMAL	R15		
GND_THERMAL	T15		
GND_THERMAL	U15		
GND_THERMAL	V15		
GND_THERMAL	M16		
GND_THERMAL	N16		
GND_THERMAL	P16		
GND_THERMAL	R16		
GND_THERMAL	T16		
GND_THERMAL	U16		
GND_THERMAL	V16		
GND_THERMAL	W16		
GND_THERMAL	M17		
GND_THERMAL	N17		
GND_THERMAL	P17		
GND_THERMAL	R17		
GND_THERMAL	T17		
GND_THERMAL	U17		
GND_THERMAL	V17		
GND_THERMAL	W17		
GND_THERMAL	M18		
GND_THERMAL	N18		
GND_THERMAL	P18		
GND_THERMAL	R18		
GND_THERMAL	T18		
GND_THERMAL	U18		
GND_THERMAL	V18		
GND_THERMAL	W18		
GND_THERMAL	M19		
GND_THERMAL	N19		
GND_THERMAL	P19		
GND_THERMAL	R19		
GND_THERMAL	T19		
GND_THERMAL	U19		
GND_THERMAL	V19		
GND_THERMAL	W19		

GND

ASSEMBLY	BASE LEVEL GENERIC SCHEMATIC ONLY. COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL
PAGE DETAIL	<edit here to insert page detail>

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Partition C: Top Side Memory

Bank 0: FBC[0..63]

NET	Diffpair	NET_SPACING_RULE
FBCCLK0	FBCCLK0	20MIL G2G 30MIL
FBCCLK0*	FBCCLK0	20MIL G2G 30MIL
FBCCLK1	FBCCLK1	20MIL G2G 30MIL
FBCCLK1*	FBCCLK1	20MIL G2G 30MIL
FBCD<63..0>		15MIL
FBCDQM<7..0>		15MIL
FBCDQS<7..0>		20MIL
FBAA<11..0>		10MIL
FBCRAS*		10MIL
FBCCAS*		10MIL
FBCWE*		10MIL
FBCCS0*		10MIL
FBCCS1*		10MIL
FBCBA<0>		10MIL
FBCBA<1>		10MIL
FBCCKE		10MIL

PLACE NEAR MEMORY

Place 5pF cap near DRAM

10K Pull-Down on Page 3

Place 200 Clk Term at Mem

Must be GND

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Partition A: Top Side Memory

Bank 0: FBA[0..63]

NET	Diffpair	NET_SPACING_RULE
FBACLK0	FBACLK0	20MIL G2G 30MIL
FBACLK0*	FBACLK0	20MIL G2G 30MIL
FBACLK1	FBACLK1	20MIL G2G 30MIL
FBACLK1*	FBACLK1	20MIL G2G 30MIL
FBAD<63..0>		15MIL
FBADM<7..0>		15MIL
FBADQS<7..0>		20MIL
FBCA<11..0>		10MIL
FBARAS*		10MIL
FBACAS*		10MIL
FBAWE*		10MIL
FBACS0*		10MIL
FBACS1*		10MIL
FBABA<0>		10MIL
FBABA<1>		10MIL
FBACKE		10MIL

PLACE NEAR MEMORY

Place 5pF cap near DRAM

10K Pull-Down on Page 3

Place 200 Clk Term at Mem

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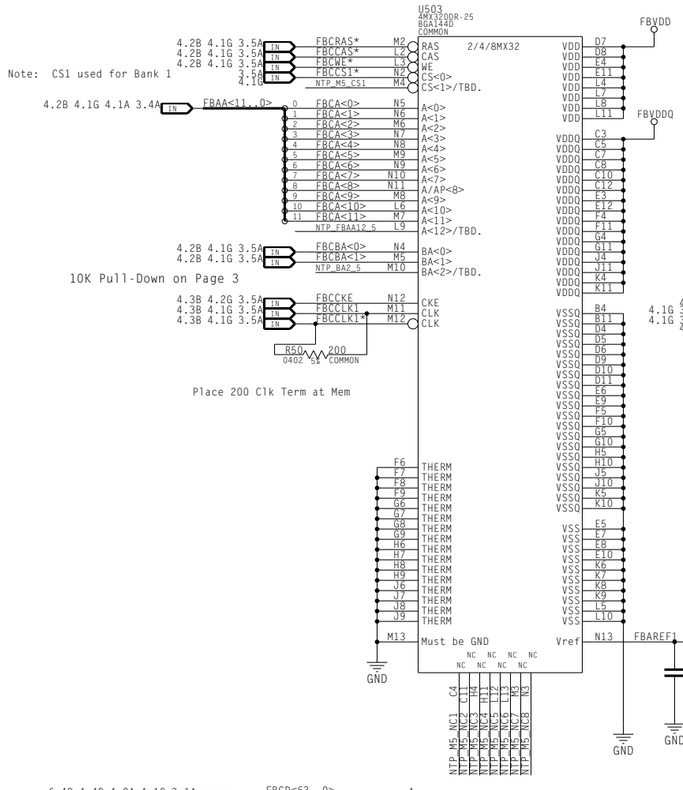
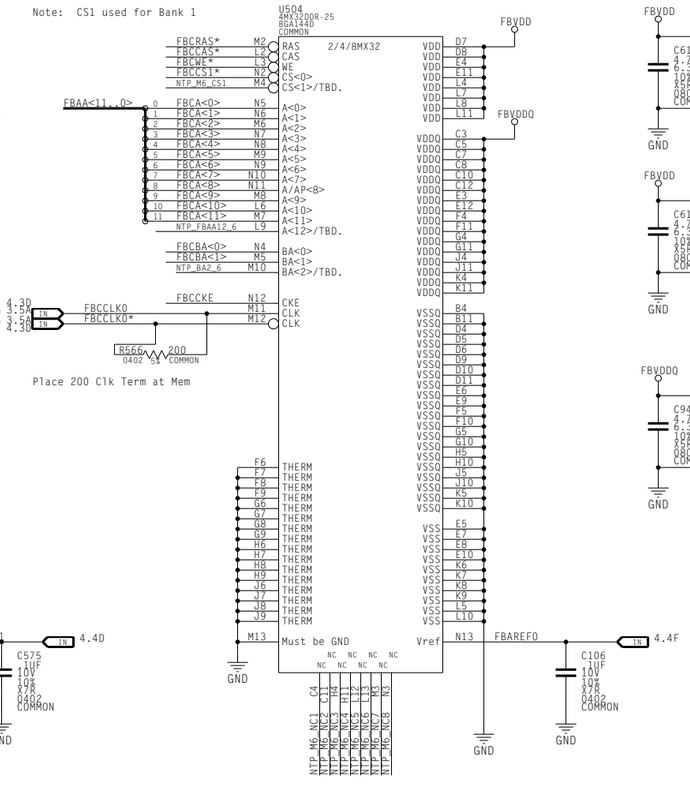
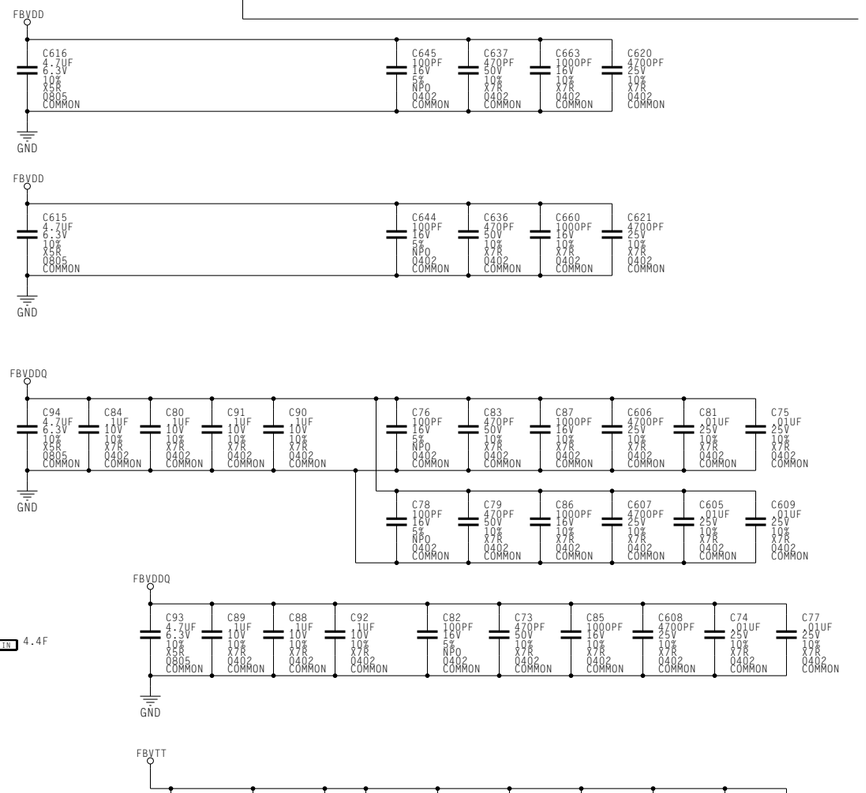
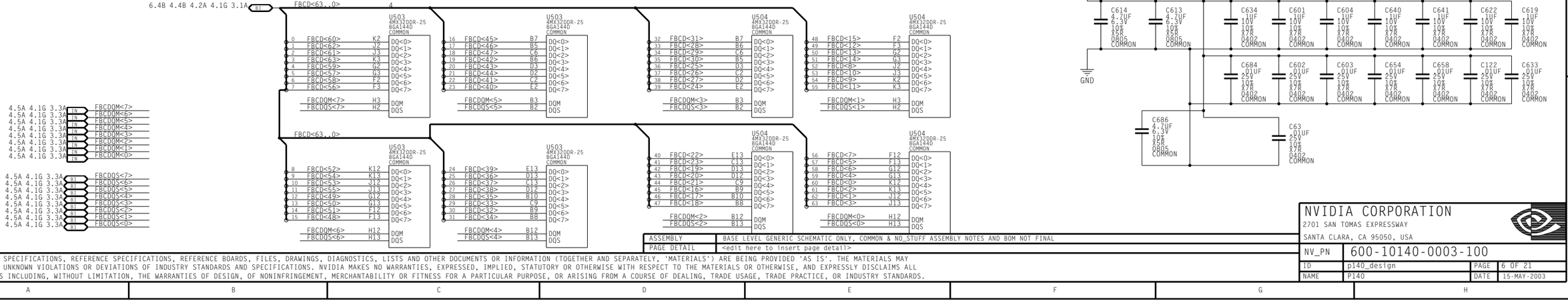
Partition C:Bottom Side Memory
Bank 1: FBC[0..63]

NET	Diffpair	NET_SPACING_RULE









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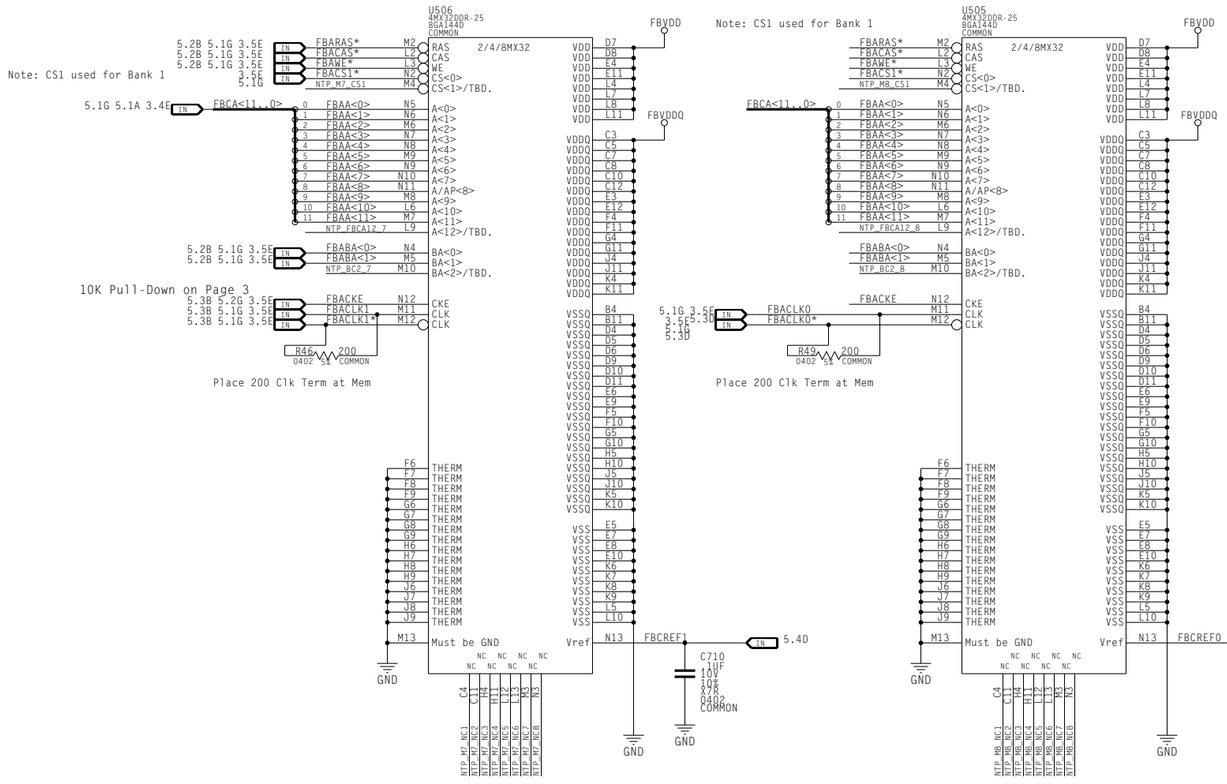
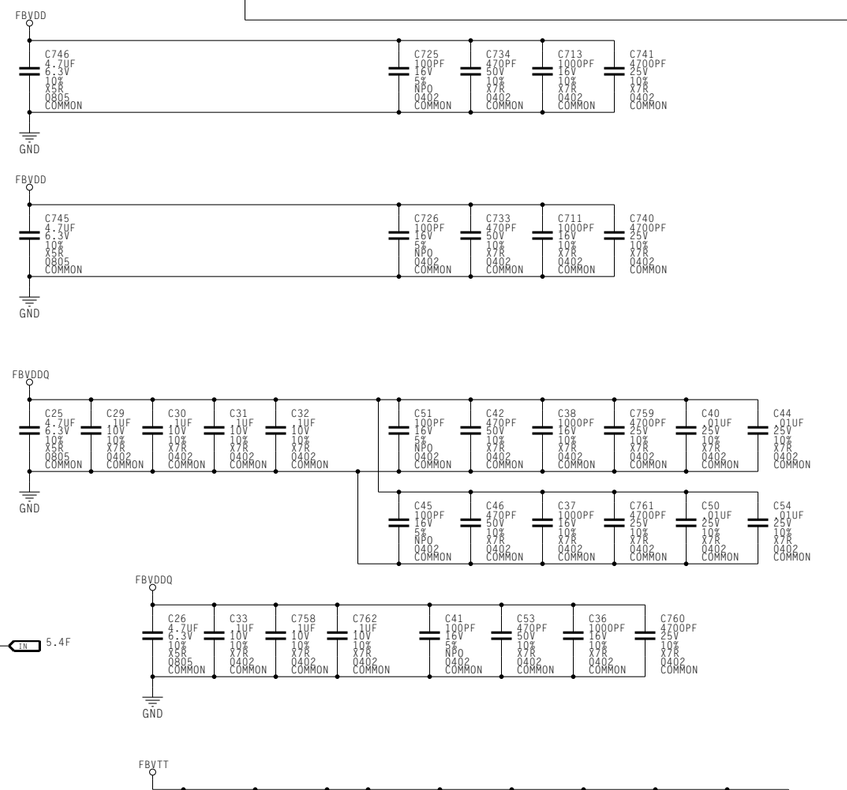
Partition A:Bottom Side Memory
Bank 1: FBA[0..63]

NET	Diffpair	NET_SPACING_RULE





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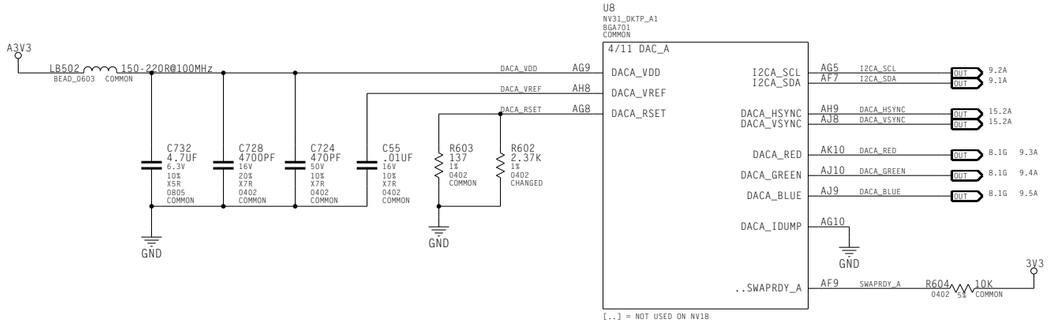
NV31/34 DAC_A, DAC_B, PLL, SYNC AMPL

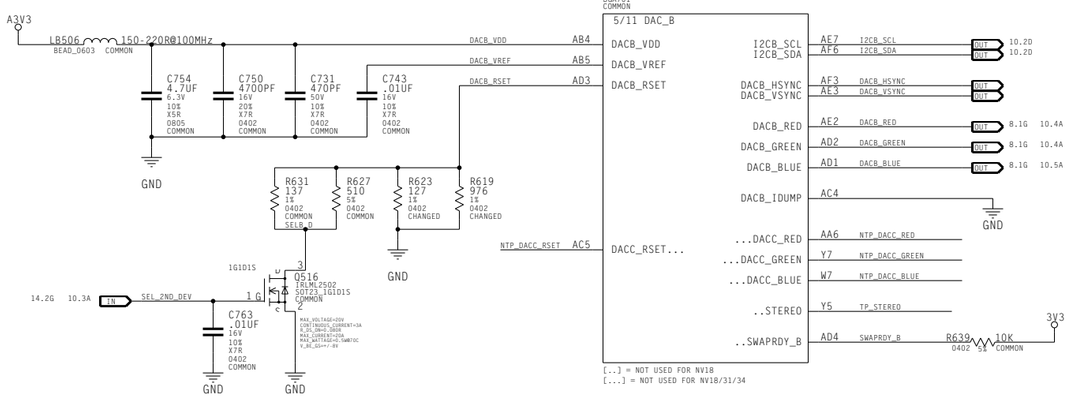
NET	NET_PHYSICAL_TYPE	VOLTAGE
DACA_VDD	12MIL_TRACE	3.3V
DACA_VREF	5MIL_TRACE	
DACA_RSET	5MIL_TRACE	
DACB_VDD	12MIL_TRACE	3.3V
DACB_VREF	5MIL_TRACE	
DACB_RSET	5MIL_TRACE	
PLLVDD	12MIL_TRACE	3.3V

NET	Diffpair	NET_SPACING_RULE
DACA_RED		20MIL_G2G_30MIL
DACA_GREEN		20MIL_G2G_30MIL
DACA_BLUE		20MIL_G2G_30MIL
DACB_RED		20MIL_G2G_30MIL
DACB_GREEN		20MIL_G2G_30MIL
DACB_BLUE		20MIL_G2G_30MIL
XTALIN		18MIL_TRACE
XTALOUT		18MIL_TRACE

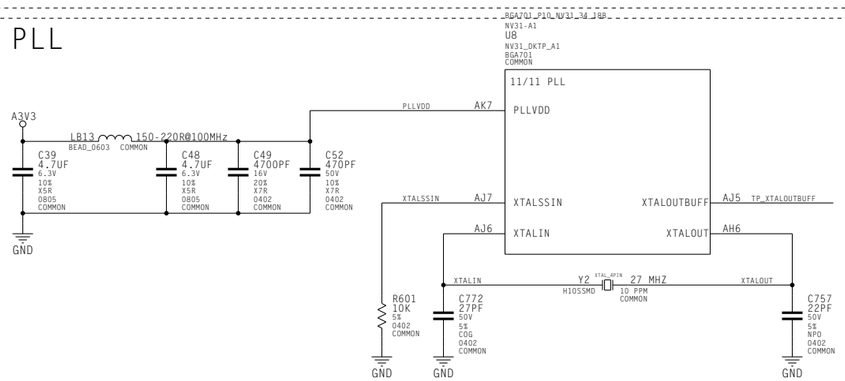
NV31/34 DAC_A



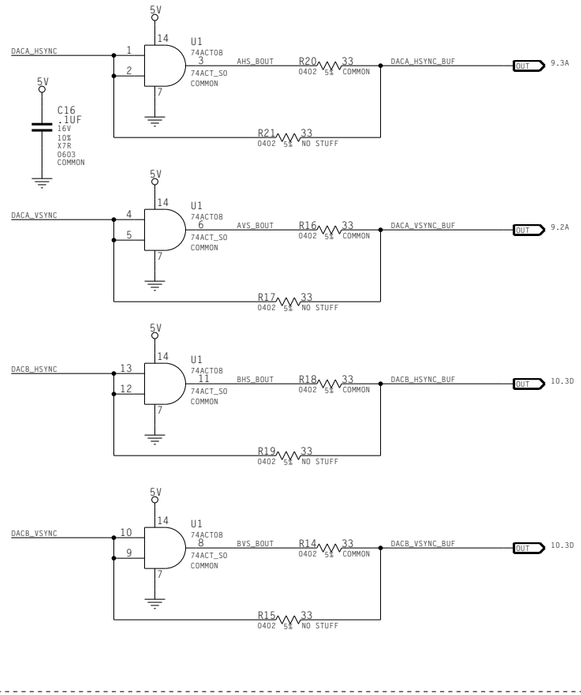
DAC_B with RSet select



NV31/34 PLL



SYNC Amplifier



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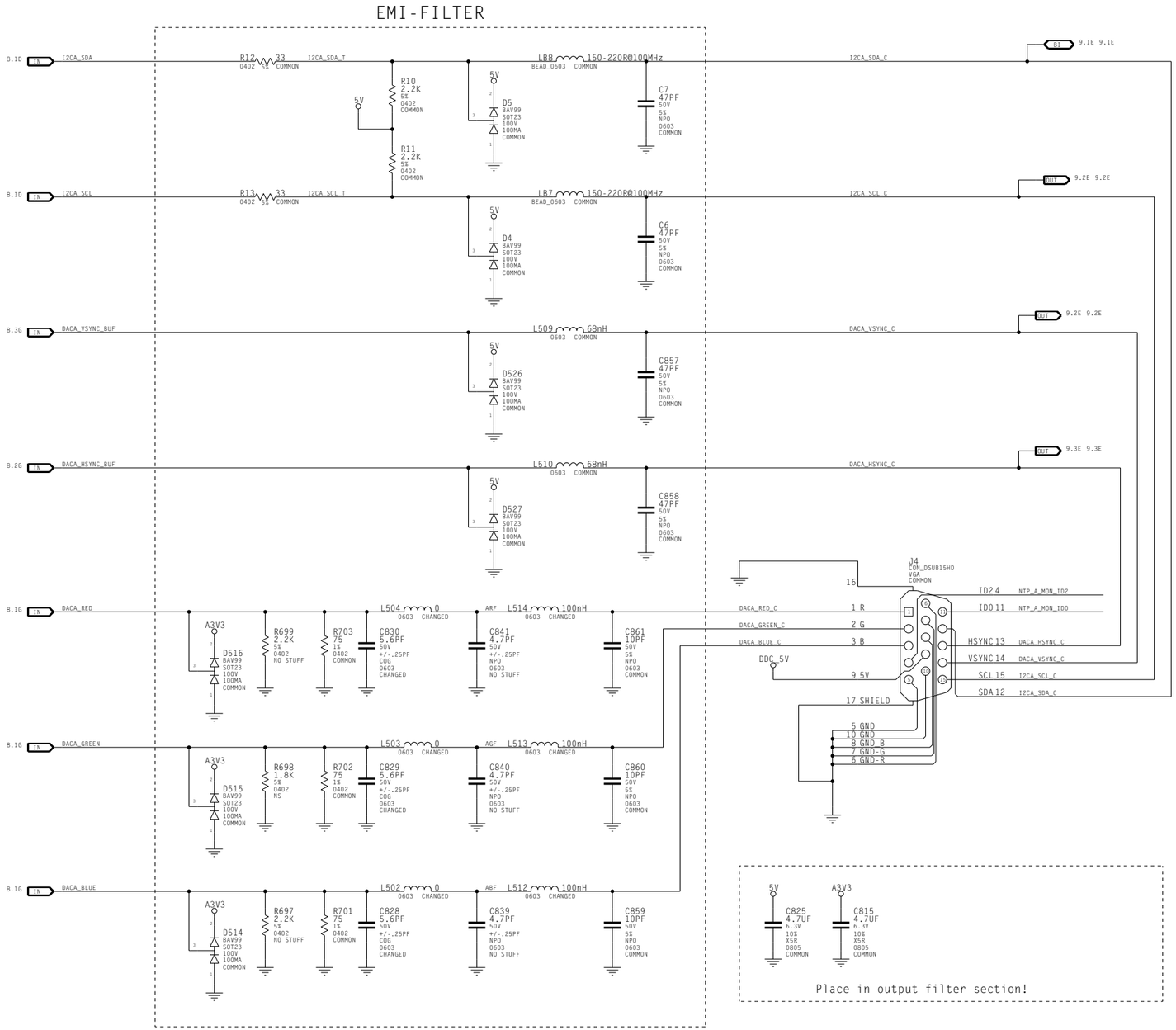
Primary Display (DACA), DB15 only!

NET	NET_SPACING_RULE
ARF	20MIL_G2G_30MIL
AGF	20MIL_G2G_30MIL
ABF	20MIL_G2G_30MIL
DACA_RED_C	20MIL_G2G_30MIL
DACA_GREEN_C	20MIL_G2G_30MIL
DACA_BLUE_C	20MIL_G2G_30MIL



Place all filter components on the side nearest to the reference GND plane!

Route all signals only on layers referenced to GND!

Don't split the reference GND plane beneath a RGB signal!

ASSEMBLY	BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL
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Secondary Display (DACB), Slim DB15 optional DVI-I

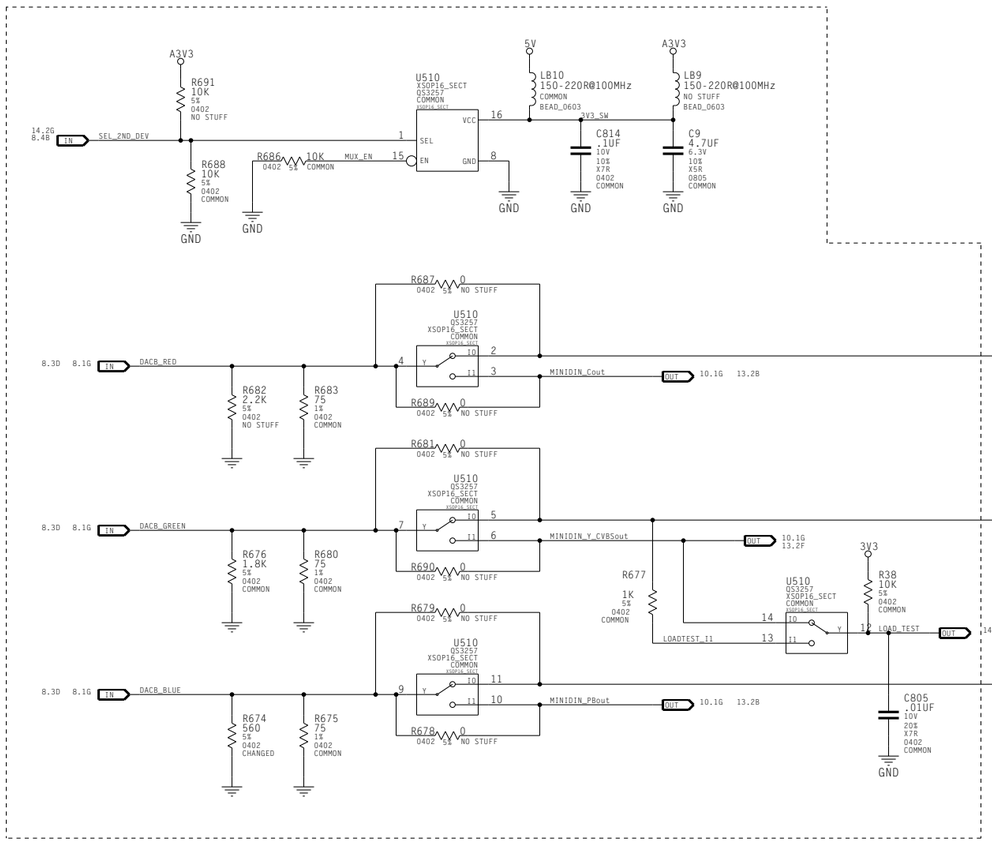
Place all filter components on the side nearest to the reference GND plane!

Route all signals only on layers referenced to GND!

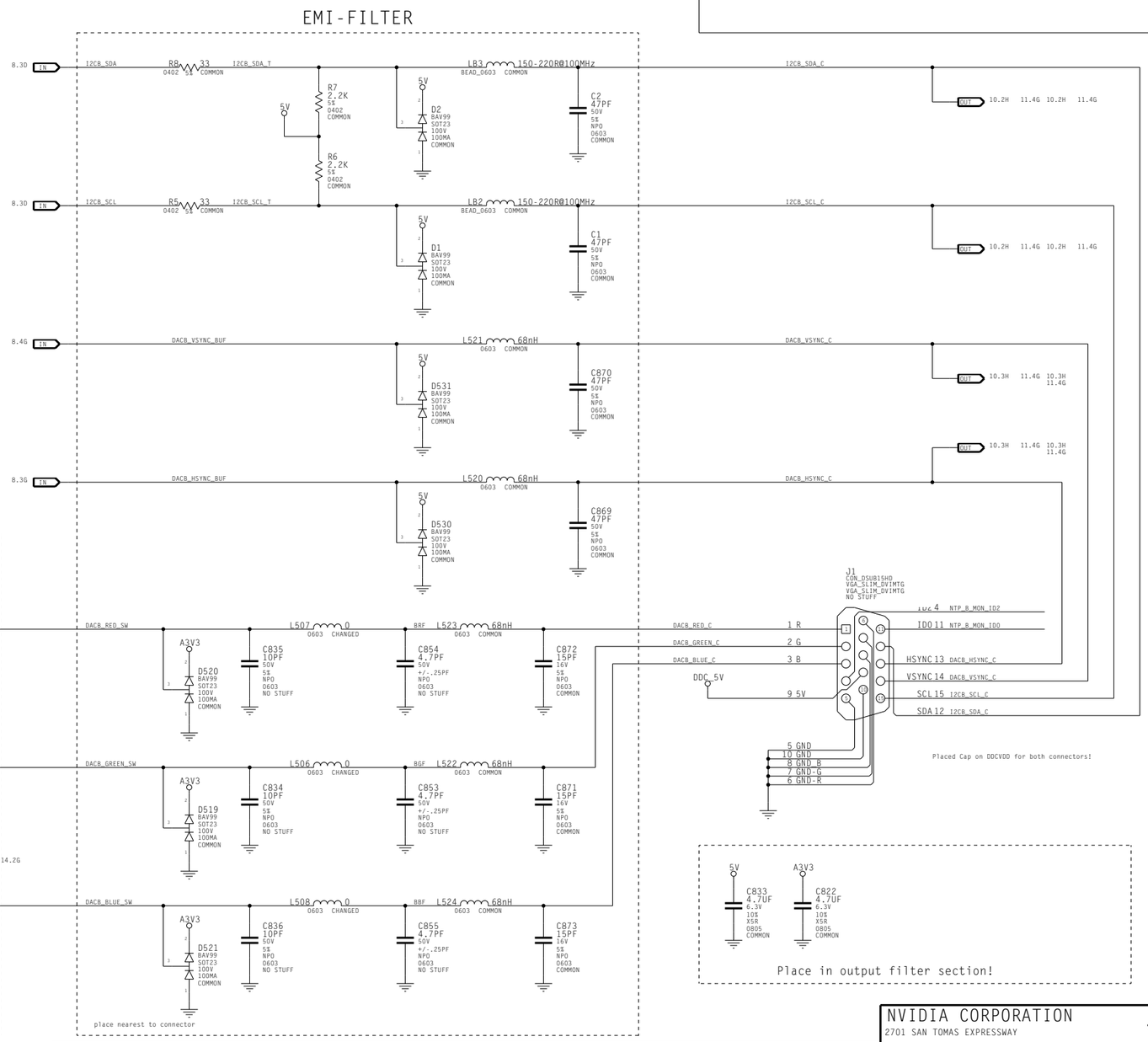
Don't split the reference GND plane beneath a RGB signal!

NET	NET_SPACING_RULE
BRF	20MIL_G2G_30MIL
BGF	20MIL_G2G_30MIL
BBF	20MIL_G2G_30MIL
DACB_RED_C	20MIL_G2G_30MIL
DACB_GREEN_C	20MIL_G2G_30MIL
DACB_BLUE_C	20MIL_G2G_30MIL
DACB_RED_SW	20MIL_G2G_30MIL
DACB_GREEN_SW	20MIL_G2G_30MIL
DACB_BLUE_SW	20MIL_G2G_30MIL
MINIDIN_Cout	20MIL_G2G_30MIL
MINIDIN_Y_CVBSout	20MIL_G2G_30MIL
MINIDIN_PBout	20MIL_G2G_30MIL

DACB Multiplexer



EMI-FILTER



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PAGE DETAIL	<edit here to insert page detail>

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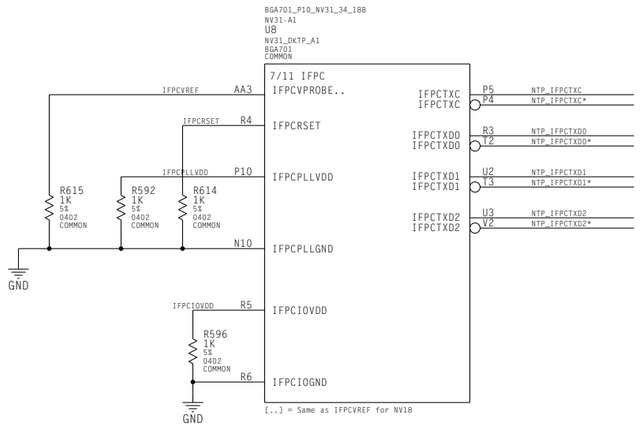
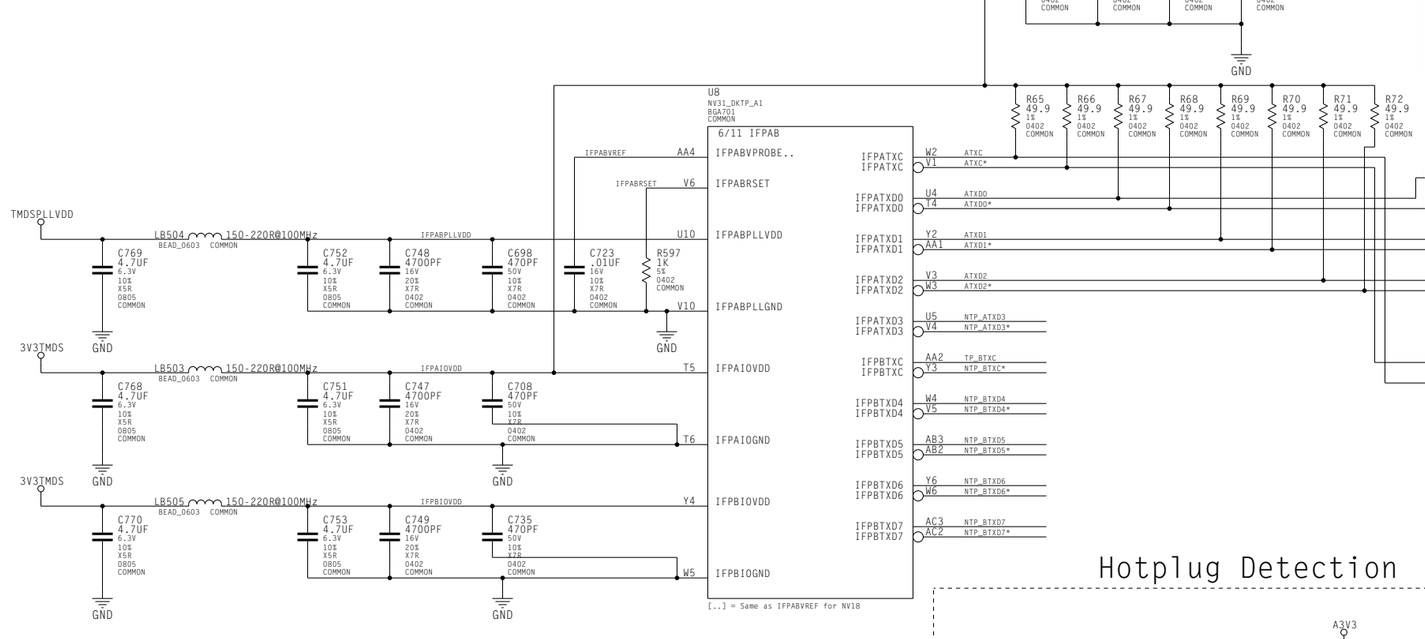
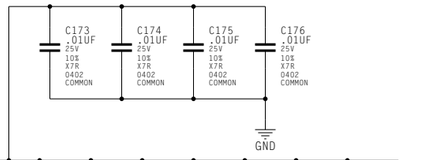
INTERNAL DUAL LINK TMDS POWER AND DECOUPLING





DualLink Transmitter



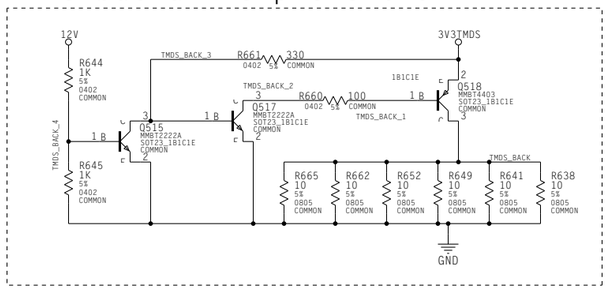
NET	Diffpair	NET_SPACING_RULE
IFPCTXD0	CTX0	20MIL_G2G_30MIL
IFPCTXD0*	CTX0	20MIL_G2G_30MIL
IFPCTXD1	CTX1	20MIL_G2G_30MIL
IFPCTXD1*	CTX1	20MIL_G2G_30MIL
IFPCTXD2	CTX2	20MIL_G2G_30MIL
IFPCTXD2*	CTX2	20MIL_G2G_30MIL
IFPCTXC	CTXC	20MIL_G2G_30MIL
IFPCTXC*	CTXC	20MIL_G2G_30MIL

NET	NET_PHYSICAL_TYPE	VOLTAGE
TMDS_BACK_4	12MIL_TRACE	3.3V
TMDS_BACK_3	12MIL_TRACE	3.3V
TMDS_BACK_2	12MIL_TRACE	3.3V
TMDS_BACK_1	12MIL_TRACE	3.3V

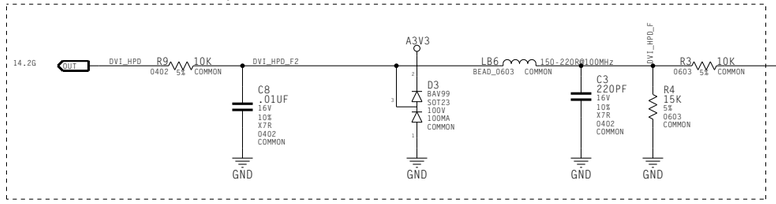
NET	NET_PHYSICAL_TYPE	VOLTAGE
IFPABVREF	12MIL_TRACE	3.3V
IFPABPLLVDD	12MIL_TRACE	3.3V
IFPAIOVDD	12MIL_TRACE	3.3V
IFPBIOVDD	12MIL_TRACE	3.3V
IFPCVREF	12MIL_TRACE	3.3V
IFPCPLLVDD	12MIL_TRACE	3.3V
IFPCIOVDD	12MIL_TRACE	3.3V
FAN_RETURN	12MIL_TRACE	3.3V
TMDS_BACK	12MIL_TRACE	3.3V

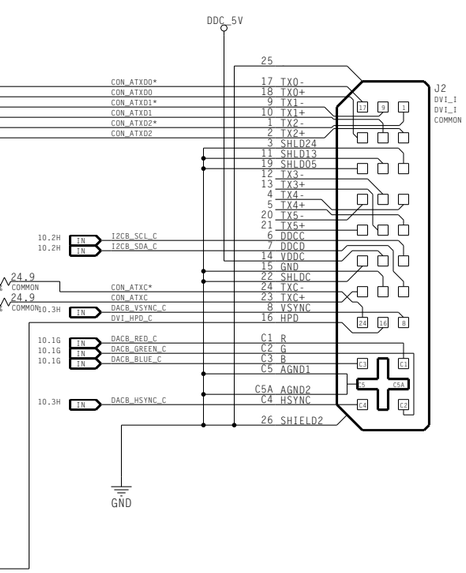
NET	Diffpair	NET_SPACING_RULE
ATXD0	ATXD	20MIL_G2G_30MIL
ATXD0*	ATXD	20MIL_G2G_30MIL
ATXD1	ATXD1	20MIL_G2G_30MIL
ATXD1*	ATXD1	20MIL_G2G_30MIL
ATXD2	ATXD2	20MIL_G2G_30MIL
ATXD2*	ATXD2	20MIL_G2G_30MIL
ATXC	ATXC	20MIL_G2G_30MIL
ATXC*	ATXC	20MIL_G2G_30MIL
BTXD4	BTX4	20MIL_G2G_30MIL
BTXD4*	BTX4	20MIL_G2G_30MIL
BTXD5	BTX5	20MIL_G2G_30MIL
BTXD5*	BTX5	20MIL_G2G_30MIL
BTXD6	BTX6	20MIL_G2G_30MIL
BTXD6*	BTX6	20MIL_G2G_30MIL

TMDS backdrive prevention



Hotplug Detection





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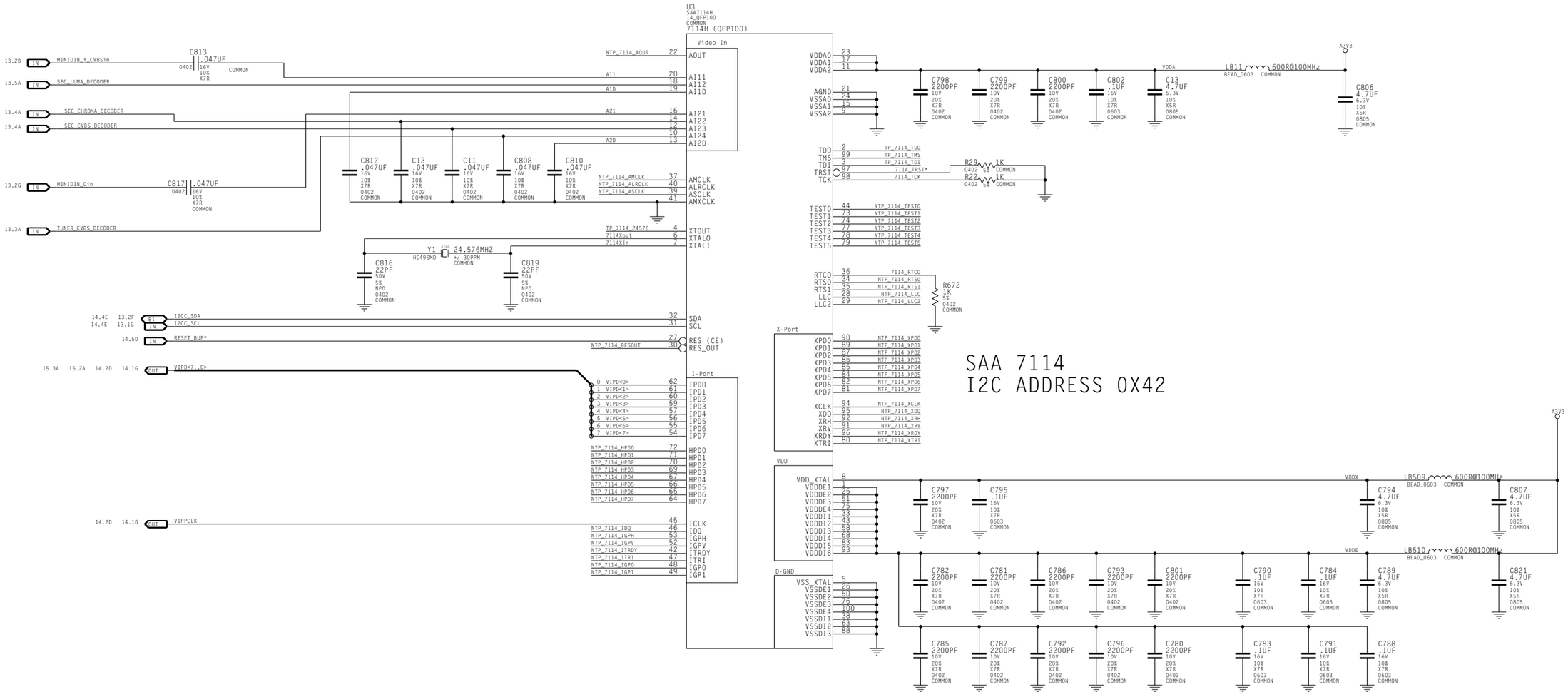
VIDEO CAPTURE



SAA 7114
I2C ADDRESS 0X42

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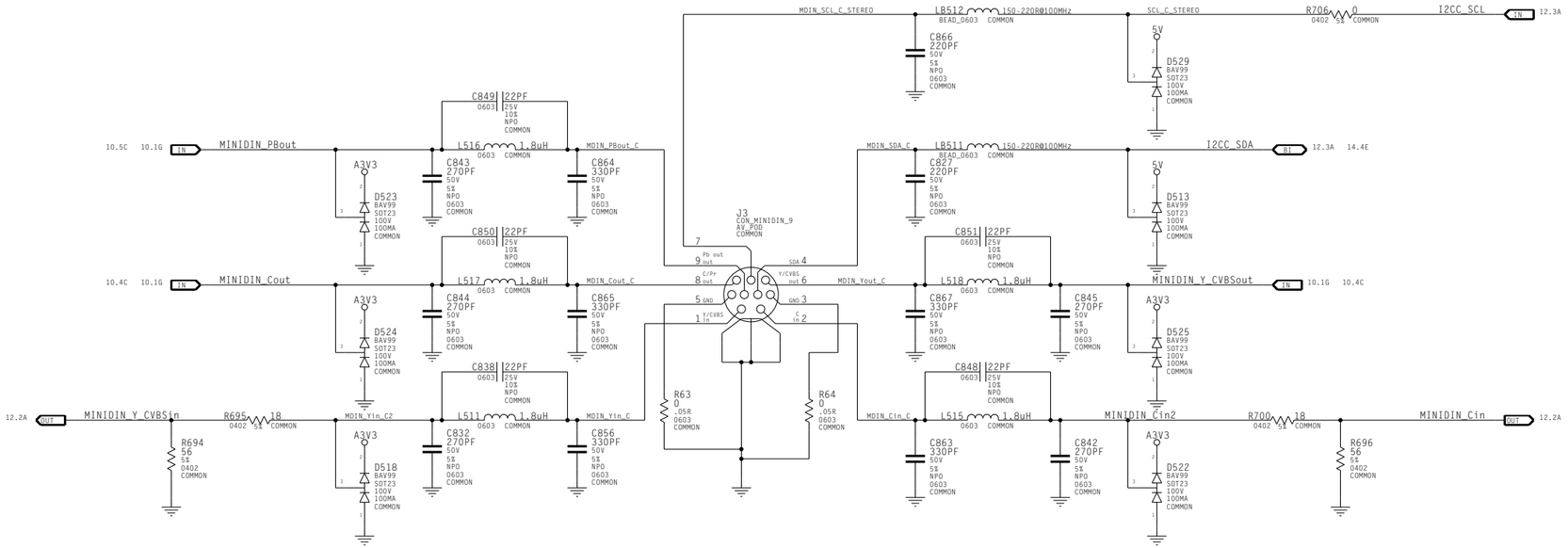
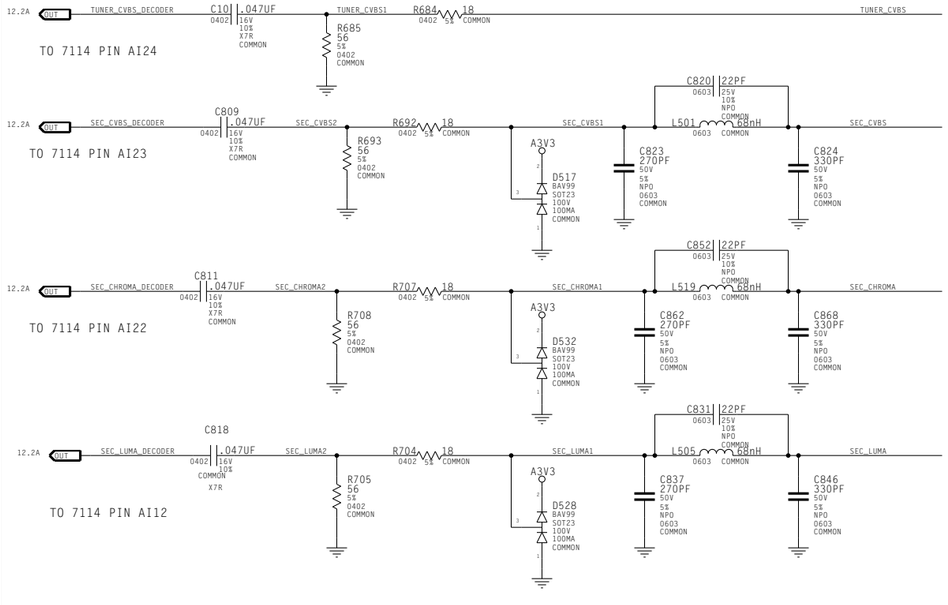
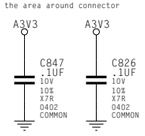
MiniDIN VIDEO IN/OUT CONNECTOR



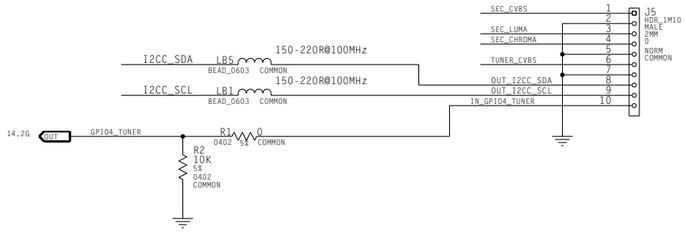
INTERNAL VIDEO IN CONNECTOR



Place in the area around connector



CONNECTION TO PCI TUNER CARD



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NV31/34 DVO, VIP AND GPIO SECTION, FAN CONTROL AND TEMP SENSOR

NET	NET_PHYSICAL_TYPE	VOLTAGE
FAN_RETURN	12MIL_TRACE	3.3V
THERM	10MIL_TRACE	
THERM*	10MIL_TRACE	

NET	NET_SPACING_RULE
VIPD<7..0>	10MIL
VIPPCLK	20MIL_G2G_30MIL

NV31/34 VIP

U8 NV31_DKTP_A1 BGA701 COMMON

10/11 VIP

eliminate the LB21

A3V3

C738 4.7UF 6.3V 10% X5R 0805 COMMON
C718 4700PF 16V 20% X7R 0402 COMMON
C717 470PF 50V 10% X7R 0402 COMMON

VIPVDDQ L6, VIPVDDQ L7, VIPVDDQ M7

R600 60.4 0402 1% COMMON — VIPCAL_PD_VDDQ P6 — VIPCAL_PD_VDDQ..
R595 60.4 0402 1% COMMON — VIPCAL_PU_GND P7 — VIPCAL_PU_GND..

GND

VIPHAD<0> P3 TP_VIPHAD<0> (OUT)
VIPHAD<1> P2 TP_VIPHAD<1> (OUT)

VIPPCLK L4 VIPPCLK (OUT) 12.4A 14.1G
VIPHCTL M4 VIPHCTL (OUT) 15.2A
VIPHCLK M5 TP_VIPHCLK

VIPD<0> J3 VIPD<0> 0
VIPD<1> J2 VIPD<1> 1
VIPD<2> K2 VIPD<2> 2
VIPD<3> K1 VIPD<3> 3
VIPD<4> L3 VIPD<4> 4
VIPD<5> L2 VIPD<5> 5
VIPD<6> N2 VIPD<6> 6
VIPD<7> N1 VIPD<7> 7
VIPD<7..0> (OUT) 12.3A 14.1G 15.2A 15.3A

..FPBCLKOUT M3 TP_FPBCLKOUT
..FPBCLKOUT M2 TP_FPBCLKOUT*

ROMA<14> R2 ROMA14 (OUT) 15.3A
ROMA<15> R1 ROMA15 (OUT) 15.4A
ROMCS AF2 ROMCS* (OUT) 15.2F

[..] = NOT USED FOR NV18

NV31/34 DVO

U8 NV31_DKTP_A1 BGA701 COMMON

9/11 DVO - MISC

3V3

C709 4.7UF 6.3V 10% X5R 0805 COMMON
C714 4700PF 16V 20% X7R 0402 COMMON
C712 470PF 50V 10% X7R 0402 COMMON

DVOVDDQ AD8, DVOVDDQ AE8, DVOVDDQ AD9

R637 60.4 0402 1% COMMON — DVOCAL_PD_VDDQ AB6 — DVOCAL_PD_VDDQ..
R593 60.4 0402 1% COMMON — DVOCAL_PU_GND AB7 — DVOCAL_PU_GND..

GND

R633 1K 0402 5% COMMON — DVO_VREF AF4 — DVO_VREF
R625 1K 5% 0402 COMMON
C744 1UF 10V 10% X7R 0402 COMMON

NVVDD

C706 470PF 50V 10% X7R 0402 COMMON
C707 470PF 50V 10% X7R 0402 COMMON

FRWR_VAUXC... N6, FRWR_VAUXP... M6, FRWRLNKON... L5, FRWRLPS... N5
TP_FRWRLNKON
TP_FRWRLPS

Can I remove this Firewire stuff?

DVOD<11> AH5 TP_DVOD11 11
DVOD<10> AJ4 TP_DVOD10 10
DVOD<9> AK4 DVOD<9> 9
DVOD<8> AH4 DVOD<8> 8
DVOD<7> AK3 TP_DVOD7 7
DVOD<6> AJ3 TP_DVOD6 6
DVOD<5> AK1 TP_DVOD5 5
DVOD<4> AH2 TP_DVOD4 4
DVOD<3> AJ1 DVOD<3> 3
DVOD<2> AG3 DVOD<2> 3
DVOD<1> AH1 TP_DVOD1 1
DVOD<0> AG2 TP_DVOD0 0
DVOD<11..0> (OUT) 15.1A 15.2A

DVOHSYNC AD5 DVOHSYNC (OUT) 15.3A
DVOVSYNC AD6 NTP_DVOVSYNC (OUT)
DVODE AE4 DVODE (OUT) 15.4A

DVOCLKOUT AJ2 TP_DVOCLKOUT
DVOCLKOUT AK2 TP_DVOCLKOUT*
DVOCLKIN AG1 DVOCLKIN — R41 1K 0402 5% COMMENT

I2CC_SCL AG6 I2CC_SCL_G — R628 33 0402 5% COMMON — I2CC_SCL (OUT) 12.3A 13.1G
I2CC_SDA AG7 I2CC_SDA_G — R636 33 0402 5% COMMON — I2CC_SDA (BI) 12.3A 13.2F

5V
R634 2.2K 5% 0402 COMMON
R630 2.2K 5% 0402 COMMON

STRAP<0> G1 STRAP<0> (BI) 15.2A
STRAP<1> G2 STRAP<1> (BI) 15.2A
...STRAP<2> F2 STRAP<2> (BI) 15.2A
...STRAP<3> F3 STRAP<3> (BI) 15.2A

BUFRST B1 RESET_BUF* (BI) 12.3A

[..] = NOT USED FOR NV18
[...] = NOT USED FOR NV31/34

GPIO

U8 NV31_DKTP_A1 BGA701 COMMON

8/11 THERM-GPIO-JTAG

THERM H2
THERM* H3

R629 1K 0402 5% COMMON — TCLK C2
R622 1K 0402 5% COMMON — TMS C1, TDI D1, TP_TDO E2, TRST D2

THERMDA, THERMDC

JTAG_TCLK..., JTAG_TMS..., JTAG_TDI..., JTAG_TDO..., JTAG_TRST...

GND

R632 10K 5% 0402 NS — 3V3
R626 10K 5% 0402 NS

[...] = NOT USED FOR NV18/31
[..] = NOT USED FOR NV18

GPIO<0> G5 LOAD_TEST (OUT) 10.5D
GPIO<1> F4 DVI_HPD (OUT) 11.5D
GPIO<2> G4 GPIO2_FAN_CTRL
GPIO<3> H5 GPIO3_VSELO (OUT) 16.5A
GPIO<4> H4 GPIO4_TUNER (OUT) 13.4E
GPIO<5> J4 GPIO5_VSEL1 (OUT) 16.5A
GPIO<6> J5 GPIO6_VSEL2 (OUT) 16.5A
GPIO<7> J6 SEL_2ND_DEV (OUT) 8.4B 10.3A
GPIO<8> K4 GPU_SLOW_MODE*
GPIO<9> K6 EXTSENSE

Connect FAN_ON dep on GPU:

5V
R656 15K 5% 0402 NO STUFF
FAN_ON (OUT)

R651 47 0402 5% COMMON — SLOWMODE_OUT

U507 74LVC1G08/NC7SO8 SC70-5 COMMON
5V
EXTSENSE_IN — R663 0 0402 5% COMMON
THERM_ALERT
GND

R664 1K 5% 0402 COMMON
GND

FAN Control

5V
R673 2.2K 5% 0402 COMMON

GPIO2_FAN_CTRL — R81 200 0402 5% CHANGED — 1GID1S

C177 470PF 16V 20% X7R 0402 CHANGED

Added RC to slowly turn on Fan MOSFET to help minimize the 12V AGP spike when FAN initially turns on. Causes some Mother boards to shut down and reboot.

12V
D512 1N4148 SOT23 75V 200MA COMMON
C804 .1UF 25V 10% X7R 0805 COMMON
FAN_RETURN
D519 TRLML2502 SOT23_1GID1S COMMON
MAX_VOLTAGE=30V CONTINUOUS_CURRENT=3A MAX_POWER=1W MAX_CURRENT=10A MAX_RATTAGE=0.5W@70C V_BE_ON=~/-0V
C803 .1UF 25V 10% X7R 0805 COMMON

FAN
+12V
GND
J6 HDR_1MM2_FAN MALE 2.5MM 0 NORM COMMON

Check with EMI team if Cap is needed!
NoSTUFF cap parallel to MOSFET

GND

TEMP Sensor

Place near AD1032

3V3
U6 MAX6649MUA SO8_122MIL COMMON
VDD
D+
D-
SCL
SDA
THERM
THERM*
I2CC_SCL
I2CC_SDA
THERM ALERT
GND

R36 2.2K 5% 0402 COMMON
R37 2.2K 5% 0402 COMMON
TP_THERM*
THERM_ALERT
C21 1UF 10V 10% X7R 0402 COMMON
GND

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NV31/34 BIOS STRAPPING

AND MASK
1 -> HARDWARE STRAP
0 -> BIOS STRAP

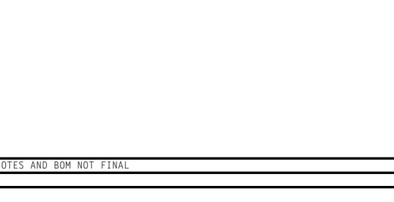
OR MASK
1 -> DESIRED=1 ANDMASK=0

SKU#	0000			???		
BOOT_0_STRAP_0	DESIRED	AND MASK	OR MASK	DESIRED	AND MASK	OR MASK
* 00: PCI_AD_SWAP	1	1	0	X	X	X
* 01: SUB_VENDOR	1	1	0	X	X	X
02: RAM_CFG_0	1	1	0	X	X	X
03: RAM_CFG_1	1	1	0	X	X	X
04: RAM_CFG_2	0	1	0	X	X	X
05: RAM_CFG_3	0	1	0	X	X	X
06: CRYSTAL_0	0	1	0	X	X	X
07: TV_MODE_0	1	0	1	X	X	X
08: TV_MODE_1	0	0	0	X	X	X
09: AGP4x/8x	0	0	0	X	X	X
10: AGP_SBA	0	0	0	X	X	X
11: AGP_FASTWR	0	0	0	X	X	X
12: PCI_DEVID_0	0	0	0	X	X	X
13: PCI_DEVID_1	1	0	1	X	X	X
* 14: BUS_TYPE	1	1	0	X	X	X
15: FP_IFACE	1	0	1	X	X	X
16: USER_0	0	0	0	X	X	X
17: USER_1	0	0	0	X	X	X
18: USER_2	0	0	0	X	X	X
19: USER_3	0	0	0	X	X	X
20: PCI_DEVID_2	0	0	0	X	X	X
21: PCI_DEVID_3	0	0	0	X	X	X
22: CRYSTAL_1	1	1	0	X	X	X
23: FB_0	0	0	0	X	X	X
24: FB_1	0	0	0	X	X	X
25: BR	0	0	0	X	X	X
26: BR_128M	0	0	0	X	X	X
27: BR_AGP	0	0	0	X	X	X
28: BR_IO	0	0	0	X	X	X
* 29: ROM_TYPE_0	1	1	0	X	X	X
* 30: ROM_TYPE_1	0	1	0	X	X	X
31: STRAP_0_OVERWRITE	0	0	0	X	X	X
BOOT_3_STRAP_1						
0: 1394	0	0	0	X	X	X
1: 1394_PHY	0	0	0	X	X	X
2: 1394_PHY_PWRCLASS[0]	0	0	0	X	X	X
3: 1394_PHY_PWRCLASS[1]	0	0	0	X	X	X
4: VGA_DEVICE	1	0	1	X	X	X
5: MEM_LSB_SWAP	0	0	0	X	X	X
6: BR_LAST_DEV	0	0	0	X	X	X
7: BR_BAR1_BCASTONLY	0	0	0	X	X	X
31: STRAP_1_OVERWRITE	0	0	0	X	X	X

* = REQUIRED TO BE HARDWARE STRAP

BIOS (serial)

BIOS (serial alternative)



NV Register Description	NV Address	BIOS Address	600-10140-0000 Data SKU#0000	600-10140-0??? Data SKU#?
BOOT_0_STRAP_0	0x00101000		0x2040E08F	0x????????
BOOT_1_STRAP_0_ANDMASK	0x00101004	0x58	0x6070707F	0x????????
BOOT_2_STRAP_0_ORMASK	0x00101008	0x5C	0x00008080	0x????????
BOOT_3_STRAP_1	0x0010100C		0x00000010	0x????????
BOOT_4_STRAP_1_ANDMASK	0x00101010	0x60	0x00000000	0x????????
BOOT_5_STRAP_1_ORMASK	0x00101014	0x64	0x00000010	0x????????

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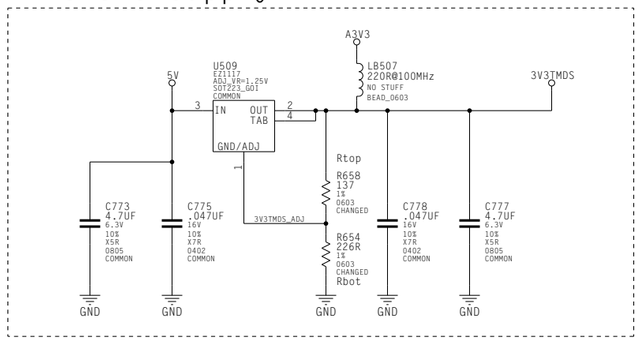
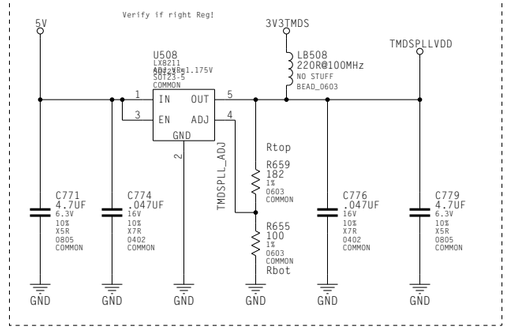
POWER SUPPLY I: NVVDD, 3V3TMDS, and TMDSPLLVDD

TMDS 3V3 Supply



Vout = VRef * (1+Rbot/Rtop)
3.30V = 1.25V * (1+(R654/R658)) NV31

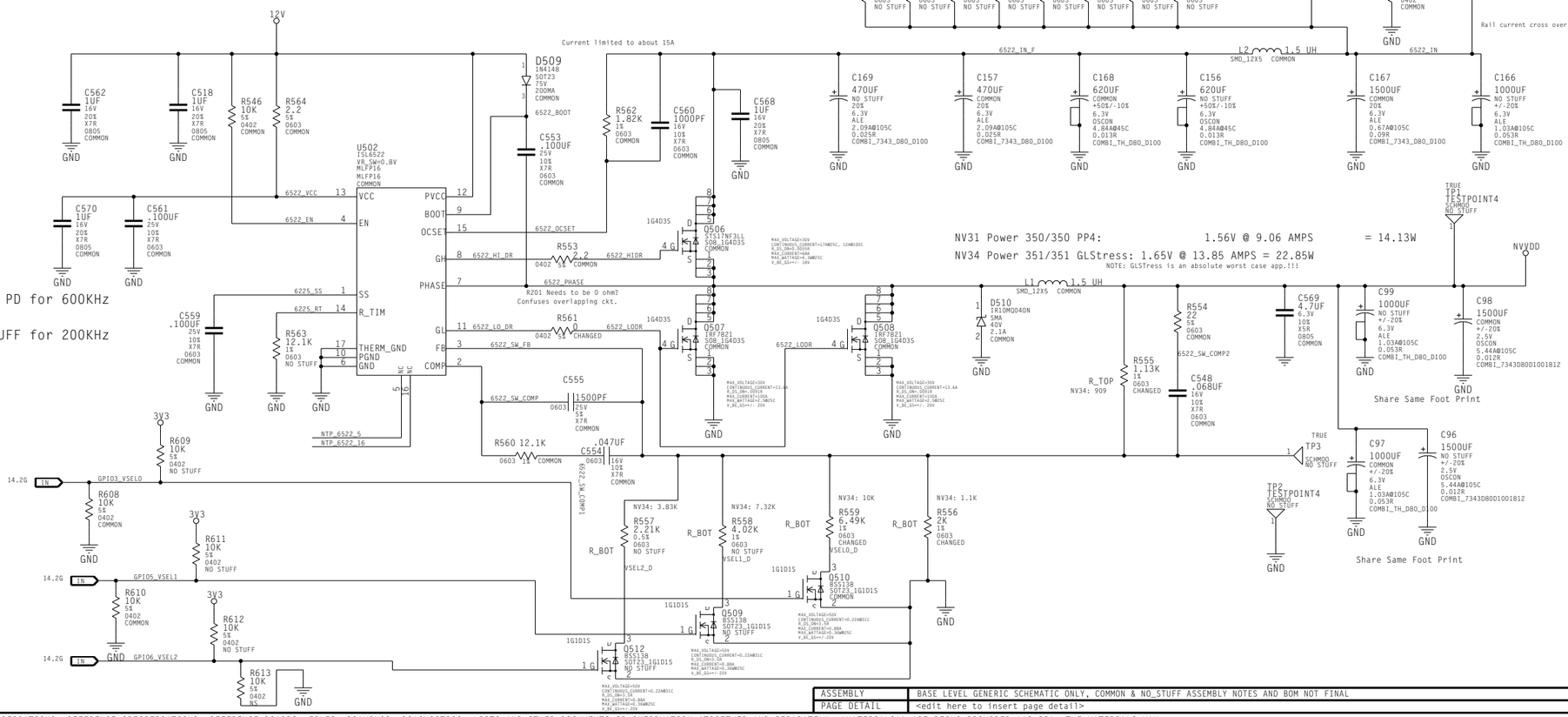
TMDS PLL Supply



Vout = VRef * (1+Rtop/Rbot)
3.31V = 1.175V * (1+(100/182))

NET	NET_PHYSICAL_TYPE	VOLTAGE
3V3	12MIL_TRACE	3.3V
A3V3	12MIL_TRACE	3.3V
3V3TMDS	12MIL_TRACE	3.3V
5V	12MIL_TRACE	5V
12V	12MIL_TRACE	12V
3V3_F	12MIL_TRACE	3.3V
12V_F	12MIL_TRACE	12V
DDC_5V	12MIL_TRACE	5V
5W_12V	10MIL_TRACE	12V
5W_5V	10MIL_TRACE	5V
6522_HI_DR	10MIL_TRACE	
6522_LO_DR	10MIL_TRACE	
6522_HIDR	10MIL_TRACE	
6522_LODR	10MIL_TRACE	
6522_SW_FB	10MIL_TRACE	
6522_SW_COMP	10MIL_TRACE	
6522_PHASE	10MIL_TRACE	
6522_BOOT	10MIL_TRACE	
A3V3_ADJ	10MIL_TRACE	
3V3TMDS_ADJ	10MIL_TRACE	
TMDSPLL_ADJ	10MIL_TRACE	
TMDSPLLVDD	12MIL_TRACE	3.3V
5V_T2	12MIL_TRACE	5V
6522_OCSET	10MIL_TRACE	
6522_IN_F	60MIL_TRACE	
6522_IN	60MIL_TRACE	
6522_SW_COMP1	10MIL_TRACE	
6522_SW_COMP2	10MIL_TRACE	

NVVDD Switcher



R_TIM = 12.1k PD for 600KHz

R_TIM = NO_STUFF for 200KHz

NV34 MOJO

VSEL 2	VSEL 1	VSEL 0	NVVDD	R_BOT	R_TOP
0	0	0	1.46V	1100	909
0	0	1	1.53V	990.9	909
0	1	0	1.56V	956.3	909
0	1	1	1.63V	872.8	909
1	0	0	1.65V	854.5	909
1	0	1	1.72V	787.3	909
1	1	0	1.75V	765.2	909
1	1	1	1.82V	710.8	909

NV31 MOJO

ISL6522

NVVDD = 0.8 * (1 + R_TOP/R_BOT)

VSEL 2	VSEL 1	VSEL 0	NVVDD	R_BOT	R_TOP
0	0	0	1.26V	2000	1130
0	0	1	1.39V	6.49K||2K	1130
0	1	0	NA	NA	NA
0	1	1	NA	NA	NA
1	0	0	NA	NA	NA
1	0	1	NA	NA	NA
1	1	0	NA	NA	NA
1	1	1	NA	NA	NA

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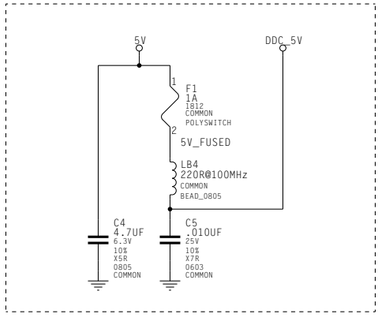
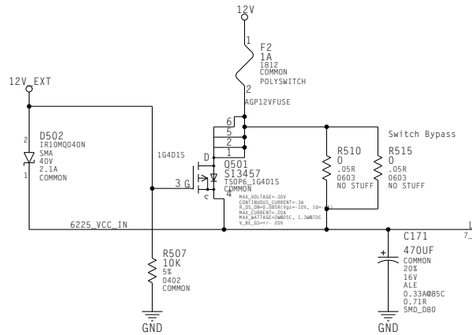
Power Supply II: FBVDDQ/FBVDD and FBVTT

DDC 5V





~180mS min after rail stable

NV31: Nature 350/350 FBVDDQ/FBVDD = 2.8V @ 5.19A MAX. = 14.5W

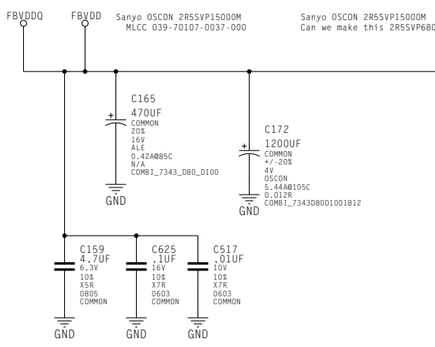
NV34: WfMats 351/351 FBVDDQ/FBVDD = 2.8V @ 5.68A MAX. = 15.9W

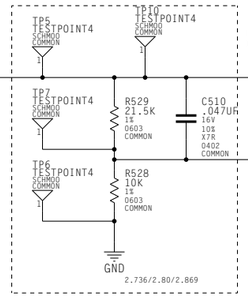
NOTE: FBVDD also Supplies FBVTT!

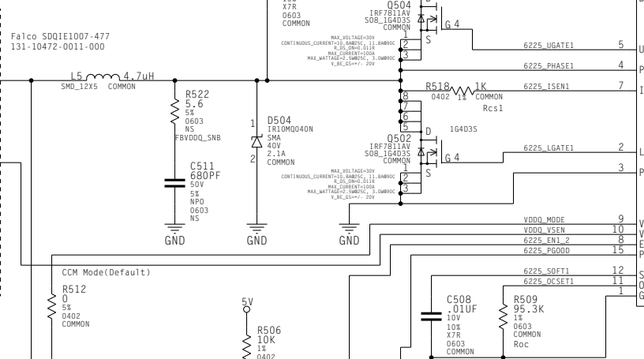
FBVDDQ

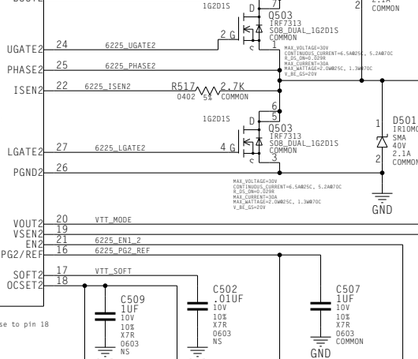
Vout1 = VRef * (1+Rtop/Rbot)

2.8V = 0.9V * (1+(21.5K/10K))



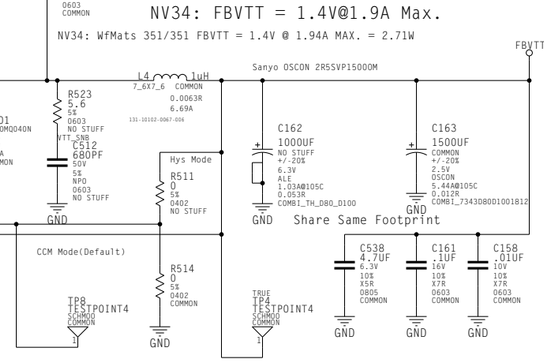


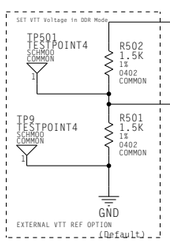




NV34: FBVTT = 1.4V@1.9A Max.

NV34: WfMats 351/351 FBVTT = 1.4V @ 1.94A MAX. = 2.71W

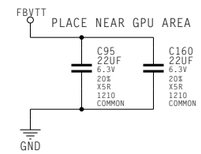


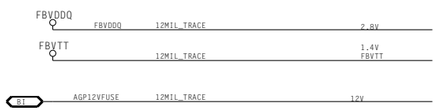


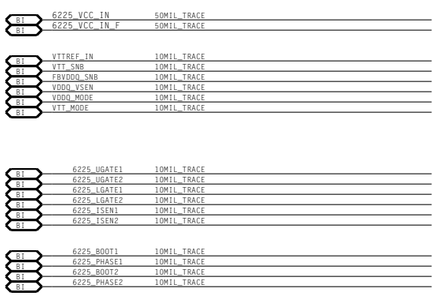
FBVTT

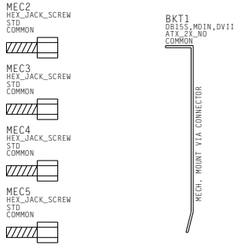
Vout2 = Vout1/2

1.4V = 2.8V/2









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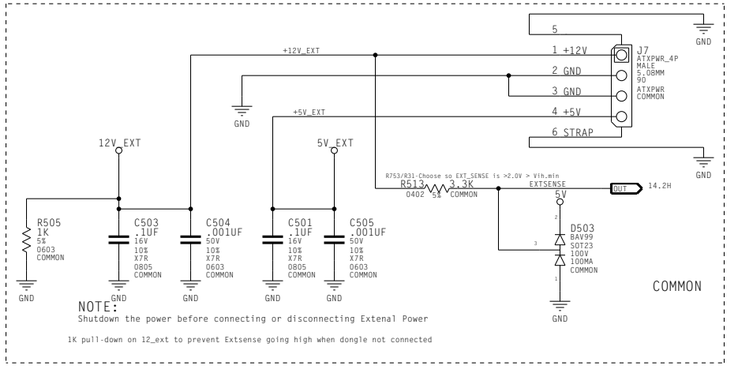
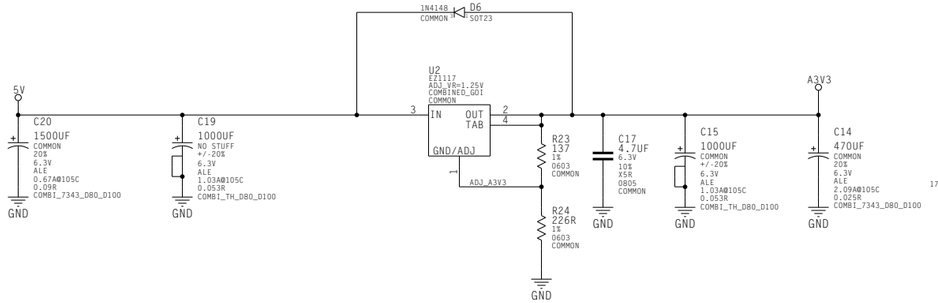
Power Supply III: A3.3V and External Power

EXT POWER



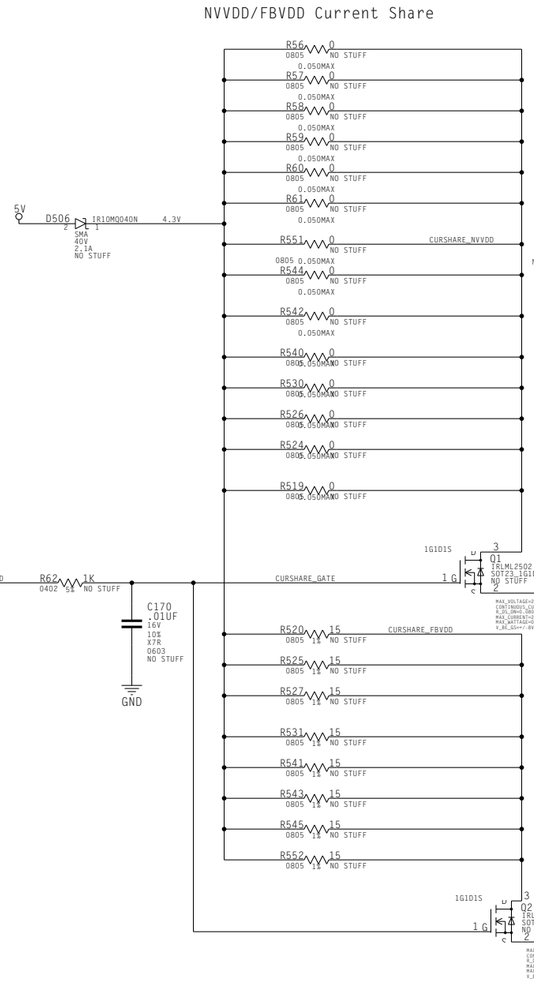
A3V3 Linear Regulator

A3.3V = 1.25 (1 + 226/137) = 3.31V



NV34: ClockGating Off: 351/351 3.3V @ 0.2817 Amps = 0.929W

NVVDD/FBVDD Current Share



Note: NVVDD Current Share is not Yet determined!

NET	NET_PHYSICAL_TYPE	VOLTAGE
3V3	12MIL_TRACE	3.3V
A3V3	12MIL_TRACE	3.3V
FBVDD	12MIL_TRACE	2.5V
5V	12MIL_TRACE	5V
12V	12MIL_TRACE	12V
BI 6529_5V_F	12MIL_TRACE	5V
BI 6529_5V_IN	12MIL_TRACE	5V
DDC_5V	12MIL_TRACE	5V
BI 6529_SW_12V	10MIL_TRACE	12V
BI 6529_SW_5V	10MIL_TRACE	5V
BI 6529_DR_HI	10MIL_TRACE	
BI 6529_DR_LO	10MIL_TRACE	
BI 6529_DRHI	10MIL_TRACE	
BI 6529_DRLO	10MIL_TRACE	
BI 6529_SW_FB	10MIL_TRACE	
BI 6529_SW_COMP	10MIL_TRACE	
5V_EXT		
12V_EXT +5V_EXT	12MIL_TRACE	5V
12V_EXT +12V_EXT	60MIL_TRACE	12V
BI 6529_SW_OUT	12MIL_TRACE	
BI 6529_L_GATE	10MIL_TRACE	
BI 6529_COMP	10MIL_TRACE	
BI 6529_L_FB	10MIL_TRACE	
BI L_GATE_T	10MIL_TRACE	
BI 6529_SW_COMP2	10MIL_TRACE	
BI 6529_SW_COMP1	10MIL_TRACE	
BI AGP5VFUSE	12MIL_TRACE	5V

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*** Signal Cross-Reference for the entire design ***

3V3TMDS_ADJ	16.2G
3V3_F	16.1G
5V_T2	16.2G
12V_F	16.1G
6225_BOOT1	17.5A
6225_BOOT2	17.5A
6225_ISEN1	17.5A
6225_ISEN2	17.5A
6225_LGATE1	17.5A
6225_LGATE2	17.5A
6225_PGOOD	17.4D 18.3D
6225_PHASE1	17.5A
6225_PHASE2	17.5A
6225_UGATE1	17.5A
6225_UGATE2	17.5A
6225_VCC_IN	17.4A
6225_VCC_IN_F	17.4A
6522_BOOT	16.2G
6522_HIDR	16.1G
6522_HI_DR	16.1G
6522_IN	16.2G
6522_IN_F	16.2G
6522_LODR	16.1G
6522_LO_DR	16.1G
6522_OCSET	16.2G
6522_PHASE	16.1G
6522_SW_COMP	16.1G
6522_SW_COMP1	16.2G
6522_SW_COMP2	16.2G
6522_SW_FB	16.1G
6529_5V_F	18.1G
6529_5V_IN	18.1G
6529_COMP	18.2G
6529_DRHI	18.1G
6529_DRLO	18.1G
6529_DR_HI	18.1G
6529_DR_LO	18.1G
6529_L_FB	18.2G
6529_L_GATE	18.2G
6529_SW_5V	18.1G
6529_SW_12V	18.1G
6529_SW_COMP	18.1G
6529_SW_COMP1	18.2G
6529_SW_COMP2	18.2G
6529_SW_FB	18.1G
6529_SW_OUT	18.2G
A3V3_ADJ	16.2G
ABF	9.1G
AGF	9.1G
AGP5VFUSE	18.2G
AGP12VFUSE	17.4A
AGPADSTB0F	2.5G
AGPADSTB0S	2.5G
AGPADSTB1F	2.5G
AGPADSTB1S	2.5G
AGPDBI_HI	2.4G
AGPDBI_LO	2.4G
AGPMBDET	2.5G
AGPRBF	2.4G
AGPSBA<0>	2.5G
AGPSBA<7..0>	2.5G
AGPSBA<1>	2.5G
AGPSBA<2>	2.5G
AGPSBA<3>	2.5G
AGPSBA<4>	2.5G
AGPSBA<5>	2.5G
AGPSBA<6>	2.5G
AGPSBA<7>	2.5G
AGPSBSTBF	2.5G
AGPSBSTBS	2.5G
AGPSTO	2.4G
AGPST1	2.4G
AGPST2	2.4G
AGPSTOP	2.5G
AGPVREFCG	2.5G
AGPVREFGC	2.5G
AGPWBF	2.4G
ARF	9.1G
ATXC	11.1G
ATXC*	11.1G
ATXD0	11.1G
ATXD0*	11.1G
ATXD1	11.1G
ATXD1*	11.1G
ATXD2	11.1G
ATXD2*	11.1G
BBF	10.1G
BGF	10.1G
BRF	10.1G
BTXD4	11.2G
BTXD4*	11.2G
BTXD5	11.2G
BTXD5*	11.2G
BTXD6	11.2G
BTXD6*	11.2G
CGND2	10.3G 11.3G
DACA_BLUE	8.1G 8.2D 9.5A
DACA_BLUE_C	9.1G
DACA_GREEN	8.1G 8.2D 9.4A
DACA_GREEN_C	9.1G
DACA_HSYNC	8.2D 15.2A
DACA_HSYNC_BUF	8.2G 9.3A
DACA_HSYNC_C	9.3E
DACA_RED	8.1G 8.2D 9.3A
DACA_RED_C	9.1G
DACA_RSET	8.1G
DACA_VDD	8.1G
DACA_VREF	8.1G
DACA_VSYNC	8.2D 15.2A
DACA_VSYNC_BUF	8.3G 9.2A
DACA_VSYNC_C	9.2E

DACB_BLUE	8.1G 8.3D 10.5A
DACB_BLUE_C	10.1G 11.4G
DACB_BLUE_SW	10.1G
DACB_GREEN	8.1G 8.3D 10.4A
DACB_GREEN_C	10.1G 11.4G
DACB_GREEN_SW	10.1G
DACB_HSYNC	8.3D
DACB_HSYNC_BUF	8.3G 10.3D
DACB_HSYNC_C	10.3H 11.4G
DACB_RED	8.1G 8.3D 10.4A
DACB_RED_C	10.1G 11.4G
DACB_RED_SW	10.1G
DACB_RSET	8.1G
DACB_VDD	8.1G
DACB_VREF	8.1G
DACB_VSYNC	8.3D
DACB_VSYNC_BUF	8.4G 10.3D
DACB_VSYNC_C	10.3H 11.4G
DVI_HPD	11.5D 14.2G
DVOD<11..0>	14.3E 15.1A 15.2A
DVOD<2>	14.3E 15.1A
DVOD<3>	14.3E 15.1A
DVOD<8>	14.3E 15.2A
DVOD<9>	14.3E 15.2A
DVODE	14.4D 15.4A
DVOHSYNC	14.4D 15.3A
EXTSENSE	14.2H 18.1D
FAN_RETURN	11.1G 14.1G
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GPIO3_VSEL0	14.2G 16.5A
GPIO4_TUNER	13.4E 14.2G
GPIO5_VSEL1	14.2G 16.5A
GPIO6_VSEL2	14.2G 16.5A
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MINIDIN_Y_CVBSIN	12.2A 13.2B
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ROMA15	14.2D 15.4A
ROMCS*	14.2D 15.2F
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SEC_CVBS_DECODER	12.2A 13.4A
SEC_LUMA_DECODER	12.2A 13.5A
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TP_VIPHAD<1>	14.2D
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ASSEMBLY	BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL
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*** Part Cross-Reference for the entire design ***

BKT1	BRACKET	17.5D
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C2	C	2.2A
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R17	R	2.5D
R18	R	2.5D
R19	R	2.4E
R20	R	2.4F
R21	R	2.4F
R22	R	2.4F
R23	R	3.5A
R24	R	3.5A
R25	R	3.5B
R26	R	3.5F
R27	R	3.2G
R28	R	3.1G
R29	R	3.2G
R30	R	3.2G
R31	R	4.3B
R32	R	4.4D
R33	R	4.4D
R34	R	4.3D
R35	R	4.3F
R36	R	4.4F
R37	R	5.3B
R38	R	5.4D
R39	R	5.4D
R40	R	5.3D
R41	R	5.3F
R42	R	5.4F
R43	R	8.3B
R44	R	8.3B
R45	R	8.3C
R46	R	8.2C
R47	R	8.3C
R48	R	8.5C
R49	R	8.2C
R50	R	8.2D
R51	R	8.4D
R52	R	8.2G
R53	R	8.2F
R54	R	8.3G
R55	R	8.3F
R56	R	8.3G
R57	R	8.3F
R58	R	8.4G
R59	R	8.4F
R60	R	9.1B
R61	R	9.2B
R62	R	9.4B
R63	R	9.4B
R64	R	9.5B
R65	R	9.4B
R66	R	9.4B
R67	R	9.5B
R68	R	9.1B
R69	R	9.2B
R70	R	9.4D
R71	R	9.3D
R72	R	10.4A
R73	R	10.4A
R74	R	10.5A
R75	R	10.3A
R76	R	10.3A
R77	R	10.4B
R78	R	10.4B
R79	R	10.5B
R80	R	10.3B
R81	R	10.3B
R82	R	10.4B
R83	R	10.4B
R84	R	10.4B
R85	R	10.4B
R86	R	10.5B
R87	R	10.4C
R88	R	10.4C
R89	R	10.1D
R90	R	10.2D
R91	R	10.2E
R92	R	10.2E
R93	R	10.4F
R94	R	10.3F
R95	R	14.2F
R96	R	11.2B
R98	R	11.2B
R99	R	11.4C
R100	R	11.2F
R101	R	11.3F
R103	R	11.2G
R104	R	11.3G
R105	R	11.2G
R106	R	11.3G
R107	R	14.2F
R108	R	11.3G
R109	R	11.3G
R110	R	11.3G
R111	R	11.3H
R112	R	11.3F
R113	R	11.4F
R114	R	11.3F
R115	R	11.4F
R116	R	11.4F
R117	R	11.5F
R118	R	11.4F
R119	R	11.4F
R120	R	11.5F
R121	R	11.4G
R122	R	12.3E
R123	R	12.2E
R124	R	12.2E
R125	R	13.4B
R126	R	13.4B
R127	R	13.5B
R128	R	13.4B
R129	R	13.4B

R130	R	13.5B
R131	R	13.3B
R132	R	13.2B
R133	R	13.2D
R134	R	16.4B
R135	R	13.2F
R136	R	13.1F
R137	R	13.3F
R138	R	14.4B
R139	R	14.4B
R140	R	14.4B
R141	R	14.2B
R142	R	14.2B
R143	R	14.4B
R144	R	14.4D
R145	R	14.4D
R146	R	14.4D
R147	R	14.4D
R148	R	14.4E
R149	R	14.2E
R150	R	14.2E
R151	R	14.3F
R152	R	14.4G
R153	R	14.4G
R154	R	14.2G
R155	R	16.5B
R156	R	14.2H
R157	R	14.2H
R158	R	14.2H
R159	R	15.1B
R160	R	15.1B
R161	R	15.2B
R162	R	15.2B
R163	R	15.2B
R164	R	15.2B
R165	R	15.2B
R166	R	15.2B
R167	R	15.2B
R168	R	15.2B
R169	R	15.3B
R170	R	15.3B
R171	R	15.3B
R172	R	15.4B
R173	R	15.1C
R174	R	15.1C
R175	R	15.1C
R176	R	15.2C
R177	R	15.2C
R178	R	15.2C
R179	R	15.2C
R180	R	15.2C
R181	R	15.2C
R182	R	15.2C
R183	R	15.2C
R184	R	15.2C
R185	R	15.3C
R186	R	15.3C
R187	R	15.3C
R188	R	15.1F
R189	R	16.5A
R190	R	16.1A
R191	R	16.5A
R192	R	16.5B
R193	R	16.3B
R194	R	16.3B
R196	R	16.4B
R197	R	16.2B
R198	R	16.2B
R199	R	16.4C
R200	R	16.4C
R201	R	16.4C
R202	R	16.3C
R203	R	16.5C
R204	R	16.5D
R205	R	16.5D
R206	R	16.5D
R207	R	16.4E
R209	R	16.2E
R210	R	16.2E
R211	R	16.4E
R212	R	16.3E
R213	R	16.3E
R214	R	16.3E
R215	R	16.3E
R216	R	16.3E
R217	R	16.3E
R218	R	17.4D
R219	R	17.1B
R220	R	17.1B
R221	R	17.3C
R222	R	17.3C
R223	R	17.3E
R224	R	17.2E
R248	R	3.4D
R249	R	3.4D
R250	R	3.4D
R251	R	3.5D
R252	R	13.3B
R253	R	13.3B
R254	R	13.4E
R255	R	13.4E
R259	R	6.3B
R260	R	6.3D
R261	R	7.3B
R262	R	7.3D
R263	R	16.5B
R264	R	18.2B
R528	R	17.3D
R532	R	17.2E
R538	R	17.3F
R539	R	17.3C
R540	R	17.4C
R542	R	17.4C

R543	R	17.3G
R544	R	17.3G
R545	R	17.3D
R546	R	17.2D
R548	R	17.3G
R549	R	17.2F
R753	R	18.1D
RP1	R_PAK	4.1A 4.1B 4.2A 4.2B
RP2	R_PAK	4.2A 4.2A 4.2B 4.2B
RP3	R_PAK	4.1A 4.1C
RP4	R_PAK	4.1C
RP5	R_PAK	4.3A 4.3B 4.5B
RP6	R_PAK	4.3A 4.5A
RP7	R_PAK	4.3A 4.3B
RP8	R_PAK	4.4A 4.4B
RP9	R_PAK	4.4A 4.4A 4.4B 4.5B
RP10	R_PAK	5.3A 5.3B 5.5B
RP11	R_PAK	4.1A 4.1C 4.2A
RP12	R_PAK	4.1C
RP13	R_PAK	4.3A 4.3A 4.3B 4.3B
RP14	R_PAK	4.2A 4.2B 4.5A
RP15	R_PAK	4.2A 4.3A 4.3B 4.3B
RP16	R_PAK	4.2A 4.2B 4.3B
RP17	R_PAK	4.3A 4.3B
RP18	R_PAK	4.4A 4.4B 4.5A
RP19	R_PAK	4.4A 4.4B
RP20	R_PAK	4.4A 4.4B 4.5A
RP21	R_PAK	4.4A 4.4B 4.5B
RP22	R_PAK	4.4A 4.4B
RP23	R_PAK	5.4A 5.4B
RP24	R_PAK	4.1C 4.2A 4.2B 5.1C
RP25	R_PAK	4.1A 4.1B
RP26	R_PAK	4.1C 5.1B 5.1C 5.2A
RP27	R_PAK	4.4A 4.4A 4.4B 4.4B
RP28	R_PAK	5.2A 5.3A 5.3B
RP29	R_PAK	5.3A 5.3A 5.3B 5.3B
RP30	R_PAK	5.3A 5.5A
RP31	R_PAK	4.1A 4.1B 4.1C 4.1C
RP32	R_PAK	5.4A 5.4B
RP33	R_PAK	5.3A 5.3B 5.5B
RP34	R_PAK	5.2A 5.2B 5.3B
RP35	R_PAK	5.4A 5.4A 5.4B 5.4B
RP37	R_PAK	5.3A 5.3B
RP38	R_PAK	5.4A 5.4B
RP39	R_PAK	5.4B 5.5B
RP40	R_PAK	5.1A 5.1B
RP41	R_PAK	5.2A 5.2B
RP42	R_PAK	5.3A 5.3B
RP44	R_PAK	4.3A 4.3B 4.5B
RP45	R_PAK	5.4A 5.4B 5.5A
RP46	R_PAK	5.2A 5.2B 5.5A
RP47	R_PAK	5.4A 5.4B 5.5B
RP48	R_PAK	5.3A 5.3B
RP49	R_PAK	4.4B 4.5B
RP50	R_PAK	4.3A 4.3B
RP51	R_PAK	5.4A 5.4B 5.5B
RP52	R_PAK	4.1A 4.1A 4.1B 4.2B
RP53	R_PAK	4.1A 4.1B 4.2B
RP54	R_PAK	5.4A 5.4B 5.5A
RP55	R_PAK	5.1A 5.1B 5.1B 5.2B
RP56	R_PAK	5.1A 5.2A 5.2B
RP57	R_PAK	5.1A 5.1B 5.1B
RP58	R_PAK	5.1A 5.1C
RP59	R_PAK	5.1C
RP60	R_PAK	5.1A 5.1C 5.2A
RP61	R_PAK	5.1C
RP62	R_PAK	5.1A 5.1C 5.2B
TP1	TESTPOINT	16.5F
TP2	TESTPOINT	16.4F
TP3	TESTPOINT	16.4F
TP6	TESTPOINT	17.3B
TP8	TESTPOINT	17.3G
TP9	TESTPOINT	17.3G
TP11	TESTPOINT	17.3B
TP12	TESTPOINT	17.2B
TP13	TESTPOINT	17.3B
U1	U_MEM_SD_DDR_X32	7.2C 7.4C 7.4D 7.5C 7.5D
U2	U_MEM_SD_DDR_X32	4.2E 4.4E 4.5E
U3	U_MEM_SD_DDR_X32	5.2C 5.4C 5.4D 5.5C 5.5D
U4	U_MEM_SD_DDR_X32	5.2E 5.4E 7.5E
U5	U_MEM_SD_DDR_X32	6.2C 6.4C 6.4D 6.5C 6.5D
U6	U_MEM_SD_DDR_X32	6.2E 6.4E 6.5E
U7	U_MEM_SD_DDR_X32	4.2C 4.4C 4.4D 4.5C 4.5D
U8	U_MEM_SD_DDR_X32	5.5E 7.2E 7.4E
U9	U_AND_2IN	14.2H
U11	U_GPU_DDR2M64X2_V1	2.1D 3.1B 3.1F 8.1C 8.3C 8.4C 11.1B 11.3C 14.1C 14.1F 14.3C
U12	U_VDEC_SAA71XX	12.1D
U13	U_TEMP_AD1032	14.4F
U14	U_MEM_FL_SER_128KX8	15.1F
U15	U_MEM_FL_SER_128KX8	15.2F
U17	U_AND_2IN	8.2F 8.3F 8.4F
U18	U_SW_ANA_3257	10.3B 10.4B 10.4B 10.4C 10.5B
U19	U_VREG_5PIN	16.1B
U20	U_SWREG_ISL6522	16.3B
U21	U_VREG_5PIN	16.1D
U23	U_SWREG_ISL6225	17.2E
Y1	XTAL_4PIN	8.5C
Y2	XTAL	12.2C

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