P141-A05, NV31
8Mx16, 128MB, VIDEO IN/OUT, DVI-I, VGA

Page Overview

HISTORY:

A00

X00: INITIAL VERSION

X01: First Review
- Replaced series resistors in sync lines with 33ohms
- Moved clamping diodes next to GPU
- Added parallel caps to EMI filter DACB
- Removed not needed strap on SAA7114
- Connected RESET and WP of SST ROM to ROMVCC
- Added parallel ROM and Strapps
- Added FBVDD regulator
- Added STEREO glasses circuit
- Removed Decoupling CAPs on VIP VDD, covered by Caps on page 2
- Added ROM_VCC for cleaner planes
- Changed used TMDS lines of IFPA and IFPB to TP from NTP
- Changed Resistor for AGP Vref circuit to 158k

X02: Final Review
- Added clock termination resistors
- Added net name for FBCALxxx
- Added cap on filter input for FB_DLLVDD, DACA_VDD & DACB_VDD
- Changed netnames for SAA7114 NTPs to NTP_xxx
- Added 1uF cap parallel to fan connector
- Changed all xxCALxx resistors to 50 Ohms
- Changed all FBxDQS*<x> to NTP_FBxDQS*<x> with NO_TEST property

A01

X00: Fixed pin swap on parallel ROM A12 & A13
- Added charge pump for SC2612
- Added resitstors to swap GPIO for DACB loadtest
- Added resitstors for I2C on internal Video IN connector

X01: Updated variant information for new Sbom structure

A02

X00: Added sw adjust for NVVDD
- Exchanged TMDSIOVDD regulator to lower the voltage drop
- Changed TMDSPLLVDD regulator bypass to A3V3
- Addrd 1k series resistor in DACB load detection circuit

A03

X00: Removed GPIO5 from NVVDD adjust
- Fixed values for DAC Rset resitors
- Removed Sync Buffer bypass
- Removed 2nd voltage selection fet
- Changed to new internal video connector
- Added snubber to NVVDD and FBVDD regulator

A04

X00: Added 100 ps skew to TMDS pairs

A05

X00: Merged CGND and GND

602-10141-0000-005 Base Schematic

NVIDIA CORPORATION
2701 SAN TOMAS EXPRESSWAY
SANTA CLARA, CA 95050, USA

DETAIL	OVERVIEW		
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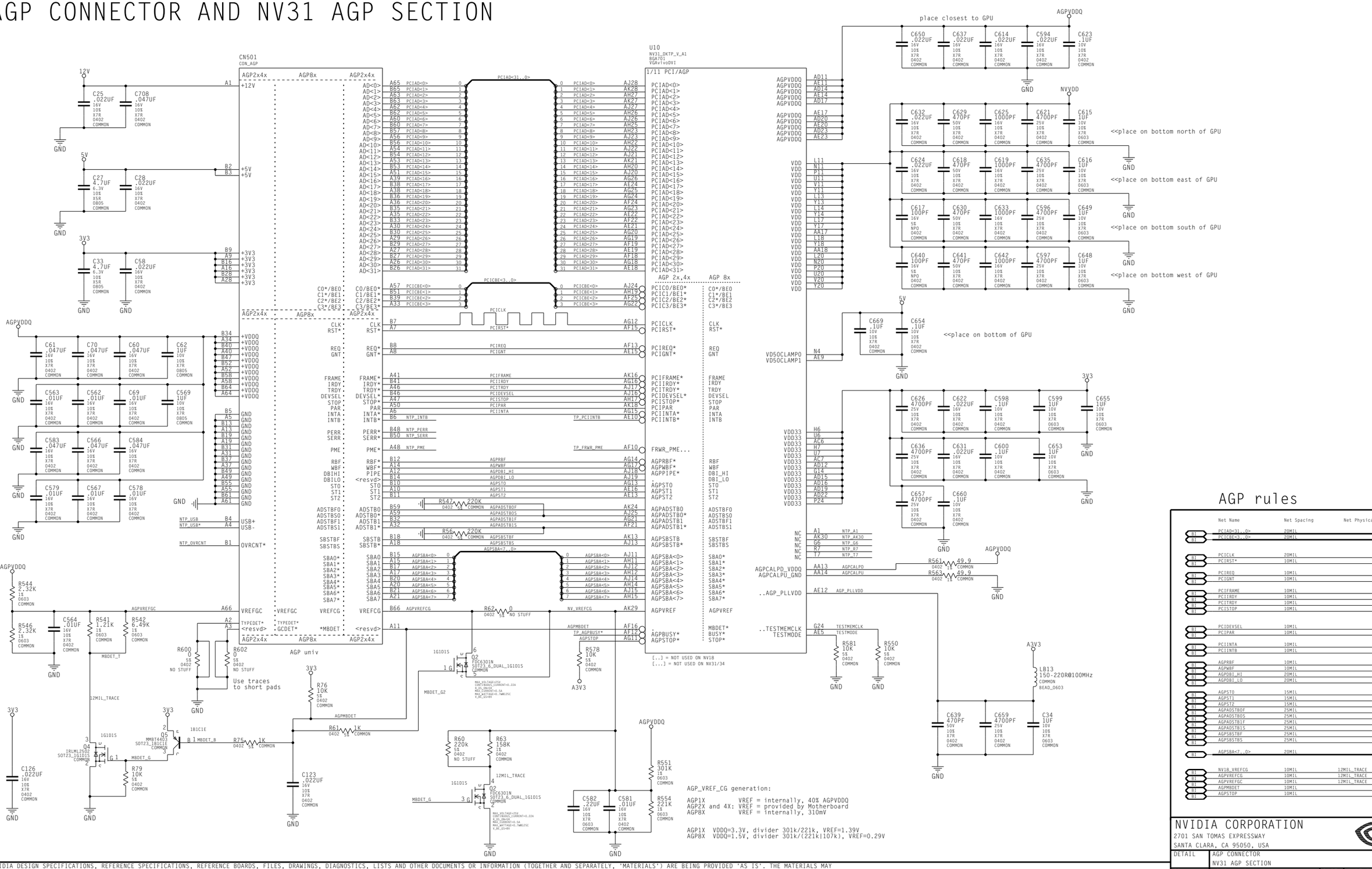
AGP CONNECTOR AND NV31 AGP SECTION



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

AGP rules

Net Name	Net Spacing	Net Physical
PCIAD<31..0>	20MIL	
PCICBE<3..0>	20MIL	
PCICLK	20MIL	
PCIRST*	10MIL	
PCIREQ	10MIL	
PCIGNT	10MIL	
PCIFRAME	10MIL	
PCIIRDY	10MIL	
PCITRDY	10MIL	
PCISTOP	10MIL	
PCIDEVSEL	10MIL	
PCIPAR	10MIL	
PCIINTA	10MIL	
PCIINTB	10MIL	
AGPRBF	10MIL	
AGPWBF	10MIL	
AGPDBI_HI	20MIL	
AGPDBI_LO	20MIL	
AGPSTO	15MIL	
AGPST1	15MIL	
AGPST2	15MIL	
AGPADSTB0F	25MIL	
AGPADSTB0S	25MIL	
AGPADSTB1F	25MIL	
AGPADSTB1S	25MIL	
AGPSBSTBF	25MIL	
AGPSBSTBS	25MIL	
AGPSBA<7..0>	20MIL	
NV18_VREFCG	10MIL	12MIL_TRACE
AGPVREFCG	10MIL	12MIL_TRACE
AGPVREFGC	10MIL	12MIL_TRACE
AGPMBDET	10MIL	
AGPSTOP	10MIL	

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DETAIL	AGP CONNECTOR NV31 AGP SECTION		
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NV31 Framebuffer Interface

U10
NV31_DKTP_V_A1
BGA701
VGAvivoDVI

2/11 MEM_A

5<> 4<>	B1	FBAD<63..0>		
	0	FBAD<0>	N25	FBAD<0>
	1	FBAD<1>	N27	FBAD<1>
	2	FBAD<2>	N26	FBAD<2>
	3	FBAD<3>	M25	FBAD<3>
	4	FBAD<4>	K26	FBAD<4>
	5	FBAD<5>	K27	FBAD<5>
	6	FBAD<6>	J27	FBAD<6>
	7	FBAD<7>	H27	FBAD<7>
	8	FBAD<8>	N29	FBAD<8>
	9	FBAD<9>	M29	FBAD<9>
	10	FBAD<10>	M28	FBAD<10>
	11	FBAD<11>	L29	FBAD<11>
	12	FBAD<12>	J29	FBAD<12>
	13	FBAD<13>	J28	FBAD<13>
	14	FBAD<14>	H29	FBAD<14>
	15	FBAD<15>	G30	FBAD<15>
	16	FBAD<16>	K25	FBAD<16>
	17	FBAD<17>	J26	FBAD<17>
	18	FBAD<18>	J25	FBAD<18>
	19	FBAD<19>	G26	FBAD<19>
	20	FBAD<20>	F28	FBAD<20>
	21	FBAD<21>	F26	FBAD<21>
	22	FBAD<22>	E27	FBAD<22>
	23	FBAD<23>	D27	FBAD<23>
	24	FBAD<24>	H28	FBAD<24>
	25	FBAD<25>	G29	FBAD<25>
	26	FBAD<26>	F29	FBAD<26>
	27	FBAD<27>	E29	FBAD<27>
	28	FBAD<28>	C30	FBAD<28>
	29	FBAD<29>	C29	FBAD<29>
	30	FBAD<30>	B30	FBAD<30>
	31	FBAD<31>	A30	FBAD<31>
	32	FBAD<32>	AJ29	FBAD<32>
	33	FBAD<33>	AJ30	FBAD<33>
	34	FBAD<34>	AH29	FBAD<34>
	35	FBAD<35>	AH30	FBAD<35>
	36	FBAD<36>	AF29	FBAD<36>
	37	FBAD<37>	AE29	FBAD<37>
	38	FBAD<38>	AD29	FBAD<38>
	39	FBAD<39>	AC28	FBAD<39>
	40	FBAD<40>	AG28	FBAD<40>
	41	FBAD<41>	AF27	FBAD<41>
	42	FBAD<42>	AE26	FBAD<42>
	43	FBAD<43>	AE28	FBAD<43>
	44	FBAD<44>	AD25	FBAD<44>
	45	FBAD<45>	AB25	FBAD<45>
	46	FBAD<46>	AB26	FBAD<46>
	47	FBAD<47>	AA25	FBAD<47>
	48	FBAD<48>	AD30	FBAD<48>
	49	FBAD<49>	AC29	FBAD<49>
	50	FBAD<50>	AB28	FBAD<50>
	51	FBAD<51>	AB29	FBAD<51>
	52	FBAD<52>	Y29	FBAD<52>
	53	FBAD<53>	W28	FBAD<53>
	54	FBAD<54>	W29	FBAD<54>
	55	FBAD<55>	V29	FBAD<55>
	56	FBAD<56>	AC27	FBAD<56>
	57	FBAD<57>	AB27	FBAD<57>
	58	FBAD<58>	AA27	FBAD<58>
	59	FBAD<59>	AA26	FBAD<59>
	60	FBAD<60>	W25	FBAD<60>
	61	FBAD<61>	Y26	FBAD<61>
	62	FBAD<62>	V27	FBAD<62>
	63	FBAD<63>	V25	FBAD<63>

5< 5< 4< 4<	OUT	FBADQM<63..0>		
	0	FBADQM<0>	L27	FBADQM<0>
	1	FBADQM<1>	K29	FBADQM<1>
	2	FBADQM<2>	G25	FBADQM<2>
	3	FBADQM<3>	E28	FBADQM<3>
	4	FBADQM<4>	AF28	FBADQM<4>
	5	FBADQM<5>	AD27	FBADQM<5>
	6	FBADQM<6>	AA30	FBADQM<6>
	7	FBADQM<7>	Y27	FBADQM<7>
5< 4<	B1	FBADQS<63..0>		
	0	FBADQS<0>	M27	FBADQS<0>
	1	FBADQS<1>	K30	FBADQS<1>
	2	FBADQS<2>	G27	FBADQS<2>
	3	FBADQS<3>	D30	FBADQS<3>
	4	FBADQS<4>	AG30	FBADQS<4>
	5	FBADQS<5>	AD26	FBADQS<5>
	6	FBADQS<6>	AA29	FBADQS<6>
	7	FBADQS<7>	W27	FBADQS<7>
	NTP_FBADQS<0>*		M26	FBADQS<0>...
	NTP_FBADQS<1>*		L28	FBADQS<1>...
	NTP_FBADQS<2>*		F27	FBADQS<2>...
	NTP_FBADQS<3>*		D29	FBADQS<3>...
	NTP_FBADQS<4>*		AG29	FBADQS<4>...
	NTP_FBADQS<5>*		AE27	FBADQS<5>...
	NTP_FBADQS<6>*		Y28	FBADQS<6>...
	NTP_FBADQS<7>*		W26	FBADQS<7>...
5< 5< 4< 4<	OUT	FBAA<63..0>		
	0	FBAA<0>	V30	FBAA<0>
	1	FBAA<1>	U28	FBAA<1>
	2	FBAA<2>	U29	FBAA<2>
	3	FBAA<3>	T28	FBAA<3>
	4	FBAA<4>	T29	FBAA<4>
	5	FBAA<5>	T27	FBAA<5>
	6	FBAA<6>	T30	FBAA<6>
	7	FBAA<7>	T26	FBAA<7>
	8	FBAA<8>	T25	FBAA<8>
	9	FBAA<9>	R27	FBAA<9>
	10	FBAA<10>	R25	FBAA<10>
	11	FBAA<11>	R30	FBAA<11>
	12	FBAA<12>	U24	FBAA<12>..
5< 5< 4< 4<	OUT	FBABA0	R26	FBABA<0>
5< 5< 4< 4<	OUT	FBABA1	R29	FBABA<1>
5< 5< 4< 4<	OUT	FBARAS*	P28	FBARAS
5< 5< 4< 4<	OUT	FBACAS*	P29	FBACAS
5< 5< 4< 4<	OUT	FBAWE*	R28	FBAWE
5< 5< 4< 4<	OUT	FBACS0*	U27	FBACS0
		TP_FBACS1*	P27	FBACS1
5< 5< 4< 4<	OUT	FBACKE	N30	FBACKE
5< 5< 4< 4<	OUT	FBACLK0	U21	FBACLK0
5< 5< 4< 4<	OUT	FBACLK0*	V21	FBACLK0
4< 4<	OUT	FBACLK1	N21	FBACLK1
4< 4<	OUT	FBACLK1*	P21	FBACLK1

		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	F30	
		GND	J30	
		GND	M30	
		GND	W30	
		GND	AB30	
		GND	AE30	

{..} = NOT USED ON NV18
{...} = USED FOR DDR2 ONLY

FBVDDQ

C662 4700PF 25V 10% X7R 0402 COMMON
C651 .022UF 16V 10% X7R 0402 COMMON
C634 .1UF 10V 10% X7R 0402 COMMON
C628 .1UF 10V 10% X7R 0402 COMMON
C620 4700PF 25V 10% X7R 0402 COMMON
C601 .022UF 16V 10% X7R 0402 COMMON
C593 .1UF 10V 10% X7R 0402 COMMON
C590 .1UF 10V 10% X7R 0402 COMMON
C587 4700PF 25V 10% X7R 0402 COMMON
C589 .022UF 16V 10% X7R 0402 COMMON
C595 .1UF 10V 10% X7R 0402 COMMON
C591 4700PF 25V 10% X7R 0402 COMMON
C592 .022UF 16V 10% X7R 0402 COMMON
C588 .1UF 10V 10% X7R 0402 COMMON
C565 1UF 10V 10% X7R 0603 COMMON
C675 1UF 10V 10% X7R 0603 COMMON
C580 1UF 10V 10% X7R 0603 COMMON
GND

FB_DLLVDD

A3V3
LB501 150-220R@100MHz COMMON BEAD_0603
C568 4.7UF 6.3V 10% X5R 0805 COMMON
FB_DLLVDD
C586 470PF 50V 10% X7R 0402 COMMON
C577 4700PF 25V 10% X7R 0402 COMMON
C570 4.7UF 6.3V 10% X5R 0805 COMMON
GND

FBA Clock Termination

FBACLK0
R559 100 5% 0402 NO STUFF
FBACLK0*
FBACLK1
R558 100 5% 0402 NO STUFF
FBACLK1*

FBVDDQ
R556 1K 5% 0402 COMMON
FB_VREF
R557 1K 5% 0402 COMMON
C585 .1UF 10V 10% X7R 0402 COMMON
R70 10K 5% 0402 COMMON
GND

Place CKE pull down at T-point!

U10
NV31_DKTP_V_A1
BGA701
VGAvivoDVI

3/11 MEM_C

7< 6<	B1	FBCD<63..0>		
	0	FBCD<0>	F13	FBCD<0>
	1	FBCD<1>	D13	FBCD<1>
	2	FBCD<2>	E13	FBCD<2>
	3	FBCD<3>	F12	FBCD<3>
	4	FBCD<4>	E10	FBCD<4>
	5	FBCD<5>	D10	FBCD<5>
	6	FBCD<6>	D9	FBCD<6>
	7	FBCD<7>	D8	FBCD<7>
	8	FBCD<8>	B13	FBCD<8>
	9	FBCD<9>	B12	FBCD<9>
	10	FBCD<10>	C12	FBCD<10>
	11	FBCD<11>	B11	FBCD<11>
	12	FBCD<12>	B9	FBCD<12>
	13	FBCD<13>	C9	FBCD<13>
	14	FBCD<14>	B8	FBCD<14>
	15	FBCD<15>	A7	FBCD<15>
	16	FBCD<16>	F10	FBCD<16>
	17	FBCD<17>	E9	FBCD<17>
	18	FBCD<18>	F9	FBCD<18>
	19	FBCD<19>	F7	FBCD<19>
	20	FBCD<20>	C6	FBCD<20>
	21	FBCD<21>	E6	FBCD<21>
	22	FBCD<22>	D5	FBCD<22>
	23	FBCD<23>	C4	FBCD<23>
	24	FBCD<24>	C8	FBCD<24>
	25	FBCD<25>	B7	FBCD<25>
	26	FBCD<26>	B6	FBCD<26>
	27	FBCD<27>	B5	FBCD<27>
	28	FBCD<28>	A3	FBCD<28>
	29	FBCD<29>	B3	FBCD<29>
	30	FBCD<30>	A2	FBCD<30>
	31	FBCD<31>	B2	FBCD<31>
	32	FBCD<32>	B29	FBCD<32>
	33	FBCD<33>	A29	FBCD<33>
	34	FBCD<34>	B28	FBCD<34>
	35	FBCD<35>	A28	FBCD<35>
	36	FBCD<36>	B26	FBCD<36>
	37	FBCD<37>	B25	FBCD<37>
	38	FBCD<38>	B24	FBCD<38>
	39	FBCD<39>	C23	FBCD<39>
	40	FBCD<40>	E26	FBCD<40>
	41	FBCD<41>	D26	FBCD<41>
	42	FBCD<42>	E25	FBCD<42>
	43	FBCD<43>	C25	FBCD<43>
	44	FBCD<44>	E24	FBCD<44>
	45	FBCD<45>	F22	FBCD<45>
	46	FBCD<46>	E22	FBCD<46>
	47	FBCD<47>	F21	FBCD<47>
	48	FBCD<48>	A24	FBCD<48>
	49	FBCD<49>	B23	FBCD<49>
	50	FBCD<50>	C22	FBCD<50>
	51	FBCD<51>	B22	FBCD<51>
	52	FBCD<52>	B20	FBCD<52>
	53	FBCD<53>	C19	FBCD<53>
	54	FBCD<54>	B19	FBCD<54>
	55	FBCD<55>	B18	FBCD<55>
	56	FBCD<56>	D23	FBCD<56>
	57	FBCD<57>	D22	FBCD<57>
	58	FBCD<58>	D21	FBCD<58>
	59	FBCD<59>	E21	FBCD<59>
	60	FBCD<60>	F19	FBCD<60>
	61	FBCD<61>	E18	FBCD<61>
	62	FBCD<62>	D18	FBCD<62>
	63	FBCD<63>	F18	FBCD<63>

7< 7< 6< 6<	OUT	FBCDQM<63..0>		
	0	FBCDQM<0>	D11	FBCDQM<0>
	1	FBCDQM<1>	B10	FBCDQM<1>
	2	FBCDQM<2>	D7	FBCDQM<2>
	3	FBCDQM<3>	C5	FBCDQM<3>
	4	FBCDQM<4>	C26	FBCDQM<4>
	5	FBCDQM<5>	F24	FBCDQM<5>
	6	FBCDQM<6>	B21	FBCDQM<6>
	7	FBCDQM<7>	D20	FBCDQM<7>
7< 6<	B1	FBCDQS<63..0>		
	0	FBCDQS<0>	D12	FBCDQS<0>
	1	FBCDQS<1>	A10	FBCDQS<1>
	2	FBCDQS<2>	E7	FBCDQS<2>
	3	FBCDQS<3>	A4	FBCDQS<3>
	4	FBCDQS<4>	A27	FBCDQS<4>
	5	FBCDQS<5>	D24	FBCDQS<5>
	6	FBCDQS<6>	A21	FBCDQS<6>
	7	FBCDQS<7>	D19	FBCDQS<7>
	NTP_FBCDQS<0>*		E12	FBCDQS<8>...
	NTP_FBCDQS<1>*		C11	FBCDQS<9>...
	NTP_FBCDQS<2>*		D6	FBCDQS<10>...
	NTP_FBCDQS<3>*		B4	FBCDQS<11>...
	NTP_FBCDQS<4>*		B27	FBCDQS<12>...
	NTP_FBCDQS<5>*		D25	FBCDQS<13>,,,
	NTP_FBCDQS<6>*		C20	FBCDQS<14>,,,
	NTP_FBCDQS<7>*		E19	FBCDQS<15>...
7< 7< 6< 6<	OUT	FBCA<63..0>		
	0	FBCA<0>	A18	FBCA<0>
	1	FBCA<1>	C17	FBCA<1>
	2	FBCA<2>	B17	FBCA<2>
	3	FBCA<3>	C16	FBCA<3>
	4	FBCA<4>	B16	FBCA<4>
	5	FBCA<5>	D16	FBCA<5>
	6	FBCA<6>	A16	FBCA<6>
	7	FBCA<7>	E16	FBCA<7>
	8	FBCA<8>	F16	FBCA<8>
	9	FBCA<9>	D15	FBCA<9>
	10	FBCA<10>	F15	FBCA<10>
	11	FBCA<11>	A15	FBCA<11>
	12	FBCA<12>	G17	FBCA<12>..
7< 7< 6< 6<	OUT	FBCBA0	E15	FBCBA<0>
7< 7< 6< 6<	OUT	FBCBA1	B15	FBCBA<1>
7< 7< 6< 6<	OUT	FBCRAS*	C14	FBCRAS
7< 7< 6< 6<	OUT	FBCCAS*	B12	FBCCAS
7< 7< 6< 6<	OUT	FBCWE*	C15	FBCWE
7< 7< 6< 6<	OUT	FBCCS0*	D17	FBCCS0
		TP_FBCCS1*	D14	FBCCS1
7< 7< 6< 6<	OUT	FBCCKE	A13	FBCCKE
7< 7< 6< 6<	OUT	FBCCLK0	K18	FBCCLK0
7< 7< 6< 6<	OUT	FBCCLK0*	K17	FBCCLK0
7< 7< 6< 6<	OUT	FBCCLK1	K13	FBCCLK1
6< 6<	OUT	FBCCLK1*	K14	FBCCLK1

...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 J24 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 R575 49.9 0402 1% COMMON
...FBCAL_PU_GND E4 FBCAL_PU R577 49.9 0402 1% COMMON
GND
...FBCAL_TERM_GND D3 FBCAL_TERM R574 0 0402 1% COMMON
GND
...FBCAL_CLK_GND E3 FBCAL_CLK R583 301 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 W15
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

{..} = NOT USED ON NV18
{...} = USED FOR DDR2 ONLY

R55 10K 5% 0402 COMMON
GND

FBC Clock Termination

FBCCLK0
R560 100 5% 0402 NO STUFF
FBCCLK0*
FBCCLK1
R562 100 5% 0402 NO STUFF
FBCCLK1*

NVIDIA CORPORATION
2701 SAN TOMAS EXPRESSWAY
SANTA CLARA, CA 95050, USA

DETAIL	NV31 Framebuffer Interface Clock Termination GPU side		
ID	p141_design	PAGE	3 OF 21
NAME	602-10141-0000-005	DATE	FEB 21 2003

MEMORY 8(16)Mx16DDR Partition A , Bits 0..31

PLACE ALL DISCRETE COMPONENTS AS NEAR AS POSSIBLE TO MEMORY!

NET	Diffpair	NET_SPACING_RULE
FBACLK1	FBACLK0	18MIL_G2G_25MIL
FBACLK1*	FBACLK0	18MIL_G2G_25MIL
FBAD<31..0>		10MIL
FBADQM<3..0>		10MIL
FBADQS<3..0>		15MIL
MFBAD<31..0>		10MIL
MFBADQM<3..0>		10MIL
MFBADQS<3..0>		15MIL
FBAA<12..0>		10MIL
FBARAS*		10MIL
FBACAS*		10MIL
FBAWE*		10MIL
FBACS0*		10MIL
FBACS1*		10MIL
FBABA0		10MIL
FBABA1		10MIL
FBACKE		10MIL

FBAD<63..0> → MFBAD<63..0>

RP505 RP504 RP15 RP14 RP502 RP501 RP12 RP11 — 0402X4 5% 15 COMMON

	FBAD	MFBAD
0	FBAD<0>	MFBAD<0>
1	FBAD<1>	MFBAD<1>
2	FBAD<2>	MFBAD<2>
3	FBAD<3>	MFBAD<3>
4	FBAD<4>	MFBAD<4>
5	FBAD<5>	MFBAD<5>
6	FBAD<6>	MFBAD<6>
7	FBAD<7>	MFBAD<7>
8	FBAD<8>	MFBAD<8>
9	FBAD<9>	MFBAD<9>
10	FBAD<10>	MFBAD<10>
11	FBAD<11>	MFBAD<11>
12	FBAD<12>	MFBAD<12>
13	FBAD<13>	MFBAD<13>
14	FBAD<14>	MFBAD<14>
15	FBAD<15>	MFBAD<15>
16	FBAD<16>	MFBAD<16>
17	FBAD<17>	MFBAD<17>
18	FBAD<18>	MFBAD<18>
19	FBAD<19>	MFBAD<19>
20	FBAD<20>	MFBAD<20>
21	FBAD<21>	MFBAD<21>
22	FBAD<22>	MFBAD<22>
23	FBAD<23>	MFBAD<23>
24	FBAD<24>	MFBAD<24>
25	FBAD<25>	MFBAD<25>
26	FBAD<26>	MFBAD<26>
27	FBAD<27>	MFBAD<27>
28	FBAD<28>	MFBAD<28>
29	FBAD<29>	MFBAD<29>
30	FBAD<30>	MFBAD<30>
31	FBAD<31>	MFBAD<31>

RP503 RP13 — 0402X4 5% 15 COMMON

	FBADQM	MFBADQM
0	FBADQM<0>	MFBADQM<0>
1	FBADQM<1>	MFBADQM<1>
2	FBADQM<2>	MFBADQM<2>
3	FBADQM<3>	MFBADQM<3>

RP503 RP13 — 0402X4 5% 15 COMMON

	FBADQS	MFBADQS
0	FBADQS<0>	MFBADQS<0>
1	FBADQS<1>	MFBADQS<1>
2	FBADQS<2>	MFBADQS<2>
3	FBADQS<3>	MFBADQS<3>

U504 / U12 — 8MX16DDR-3.6 16M66 16M66 COMMON

	MFBAD	DQ
0	MFBAD<0>	65
1	MFBAD<1>	63
2	MFBAD<2>	62
3	MFBAD<3>	60
4	MFBAD<4>	59
5	MFBAD<5>	57
6	MFBAD<6>	56
7	MFBAD<7>	54
	MFBADQM<0>	47
	MFBADQS<0>	51

DQ<0> DQ<1> DQ<2> DQ<3> DQ<4> DQ<5> DQ<6> DQ<7> DQM DQS

	MFBAD	DQ
8	MFBAD<8>	2
9	MFBAD<9>	4
10	MFBAD<10>	5
11	MFBAD<11>	7
12	MFBAD<12>	8
13	MFBAD<13>	10
14	MFBAD<14>	11
15	MFBAD<15>	13
	MFBADQM<1>	20
	MFBADQS<1>	16

DQ<0> DQ<1> DQ<2> DQ<3> DQ<4> DQ<5> DQ<6> DQ<7> DQM DQS

U504 / U12 — 8MX16DDR-3.6 16M66 16M66 COMMON

	MFBAD	DQ
16	MFBAD<16>	13
17	MFBAD<17>	11
18	MFBAD<18>	10
19	MFBAD<19>	8
20	MFBAD<20>	7
21	MFBAD<21>	5
22	MFBAD<22>	4
23	MFBAD<23>	2
	MFBADQM<2>	20
	MFBADQS<2>	16

DQ<0> DQ<1> DQ<2> DQ<3> DQ<4> DQ<5> DQ<6> DQ<7> DQM DQS

	MFBAD	DQ
24	MFBAD<24>	54
25	MFBAD<25>	56
26	MFBAD<26>	57
27	MFBAD<27>	59
28	MFBAD<28>	60
29	MFBAD<29>	62
30	MFBAD<30>	63
31	MFBAD<31>	65
	MFBADQM<3>	47
	MFBADQS<3>	51

DQ<0> DQ<1> DQ<2> DQ<3> DQ<4> DQ<5> DQ<6> DQ<7> DQM DQS

U12 — 8MX16DDR-3.6 16M66 16M66 COMMON

FBAA<12..0> → A<0> A<1> A<2> A<3> A<4> A<5> A<6> A<7> A<8> A<9> AP/A<10> A<11> A<12>

FBARAS* FBACAS* FBAWE* FBACS0* → RAS CAS WE CS

FBABA0 FBABA1 → BA<0> BA<1>

FBACKE → CKE

FBACLK1 → CLK

FBACLK1* → CLK

VDD 1 18 33 — VDDQ 3 9 15 55 61 — VSS 34 48 66 — VSSQ 6 12 52 58 64 — Vref 49 FB_VREF_M1 — GND

NC 14 17 19 25 43 50 53 — NTP_M1_NC1 NTP_M1_NC2 NTP_M1_NC3 NTP_M1_NC4 NTP_M1_NC5 NTP_M1_NC6 NTP_M1_NC7

R533 200 5% 0402 COMMON

C117 .047UF 16V 10% X7R 0402 COMMON

U504 / U12 — 8MX16DDR-3.6 16M66 16M66 COMMON

FBAA<12..0> → A<0> A<1> A<2> A<3> A<4> A<5> A<6> A<7> A<8> A<9> AP/A<10> A<11> A<12>

FBARAS* FBACAS* FBAWE* FBACS0* → RAS CAS WE CS

FBABA0 FBABA1 → BA<0> BA<1>

FBACKE → CKE

FBACLK1 → CLK

FBACLK1* → CLK

VDD 1 18 33 — VDDQ 3 9 15 55 61 — VSS 34 48 66 — VSSQ 6 12 52 58 64 — Vref 49 FB_VREF_M1 — GND

NC 14 17 19 25 43 50 53 — NTP_M1_NC8 NTP_M1_NC9 NTP_M1_NC10 NTP_M1_NC11 NTP_M1_NC12 NTP_M1_NC13 NTP_M1_NC14

R71 200 5% 0402 COMMON

C532 .047UF 16V X7R 0402 COMMON

FBVDD

C534 .022UF 16V 10% X7R 0402 COMMON
C560 4700PF 25V 10% X7R 0402 COMMON
C556 .022UF 16V 10% X7R 0402 COMMON
C519 4700PF 25V 10% X7R 0402 COMMON
C521 .022UF 16V 10% X7R 0402 COMMON
C529 4700PF 25V 10% X7R 0402 COMMON
C525 4.7UF 6.3V 10% X5R 0805 COMMON

GND

FBVDDQ

C540 220PF 16V 10% X7R 0402 COMMON
C546 220PF 16V 10% X7R 0402 COMMON
C536 220PF 16V 10% X7R 0402 COMMON
C552 220PF 16V 10% X7R 0402 COMMON
C549 220PF 16V 10% X7R 0402 COMMON

GND

FBVDDQ

C542 .047UF 16V 10% X7R 0402 COMMON
C544 4700PF 25V 10% X7R 0402 COMMON
C538 4700PF 25V 10% X7R 0402 COMMON
C548 4700PF 25V 10% X7R 0402 COMMON
C553 .047UF 16V 10% X7R 0402 COMMON
C558 4.7UF 6.3V 10% X5R 0805 COMMON

GND

FBVDD

C535 .022UF 16V 10% X7R 0402 COMMON
C561 4700PF 25V 10% X7R 0402 COMMON
C557 .022UF 16V 10% X7R 0402 COMMON
C520 4700PF 25V 10% X7R 0402 COMMON
C522 .022UF 16V 10% X7R 0402 COMMON
C530 4700PF 25V 10% X7R 0402 COMMON
C515 4.7UF 6.3V 10% X5R 0805 COMMON

GND

FBVDDQ

C537 220PF 16V 10% X7R 0402 COMMON
C541 220PF 16V 10% X7R 0402 COMMON
C551 220PF 16V 10% X7R 0402 COMMON
C554 220PF 16V 10% X7R 0402 COMMON
C547 220PF 16V 10% X7R 0402 COMMON

GND

FBVDDQ

C555 .047UF 16V 10% X7R 0402 COMMON
C545 4700PF 25V 10% X7R 0402 COMMON
C550 4700PF 25V 10% X7R 0402 COMMON
C539 4700PF 25V 10% X7R 0402 COMMON
C543 .047UF 16V 10% X7R 0402 COMMON
C559 4.7UF 6.3V 10% X5R 0805 COMMON

GND

Clock Termination

FBVDDQ

R73 240 5% 0402 NO STUFF
R68 240 5% 0402 NO STUFF
R74 240 5% 0402 NO STUFF
R69 240 5% 0402 NO STUFF

FBACLK1
FBACLK1*

GND

FB_VREF

FBVDDQ

R64 1K 1% 0402 COMMON
R66 1K 1% 0402 COMMON

FB_VREF_M1

GND

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2701 SAN TOMAS EXPRESSWAY
SANTA CLARA, CA 95050, USA

DETAIL	Memory Partition A Bits 0..31		
ID	p141_design	PAGE	4 OF 21
NAME	602-10141-0000-005	DATE	FEB 21 2003

MEMORY 8(16)Mx16DDR Partition A , Bits 32..63

PLACE ALL DISCRETE COMPONENTS AS NEAR AS POSSIBLE TO MEMORY!

NET	Diffpair	NET_SPACING_RULE
FBACLK0	FBACLK1	18MIL_G2G_25MIL
FBACLK0*	FBACLK1	18MIL_G2G_25MIL
FBAD<63..32>		10MIL
FBADQM<7..4>		10MIL
FBADQS<7..4>		15MIL
MFBAD<63..32>		10MIL
MFBADQM<7..4>		10MIL
MFBADQS<7..4>		15MIL
FBAA<12..0>		10MIL
FBARAS*		10MIL
FBACAS*		10MIL
FBAWE*		10MIL
FBACS0*		10MIL
FBABA0		10MIL
FBABA1		10MIL
FBACKE		10MIL

FBAD<63..32> MFBAD<63..32>

FBADQM<4> FBADQM<5> FBADQM<6> FBADQM<7>

FBADQS<4> FBADQS<5> FBADQS<6> FBADQS<7>

RP20 RP19 RP509 RP508 RP17 RP16 RP506 RP510 RP18 RP507 — 0402X4 5% COMMON

U13 / U505 — 8MX16DDR-3.6 16M66 COMMON

U13: FBAD<32>→MFBAD<32> … FBAD<47>→MFBAD<47>; FBADQM<4>→MFBADQM<6>; FBADQS<4>→MFBADQS<6>

U505: FBAD<48>→MFBAD<48> … FBAD<63>→MFBAD<63>; FBADQM<5>→MFBADQM<7>; FBADQS<5>→MFBADQS<7>

U505 — 8MX16DDR-3.6 16M66 COMMON

FBAA<12..0> → FBAA<0>…FBAA<12>; FBABA0 FBABA1; FBARAS* FBACAS* FBAWE* FBACS0*; FBACKE FBACLK0 FBACLK0*

FBVDD: VDD ×3, VDDQ ×4; FBVDDQ: VDDQ ×4; VSS ×3, VSSQ ×4; GND; Vref ← FB_VREF_M2

R534 200 5% 0402 COMMON

C119 .047UF 16V 10% X7R 0402 COMMON

NTP_M2_NC1 … NTP_M2_NC7 (NC ×7)

U13 / U505 — 8MX16DDR-3.6 16M66 COMMON

FBAA<12..0> → FBAA<0>…FBAA<12>; FBABA0 FBABA1; FBARAS* FBACAS* FBAWE* FBACS0*; FBACKE FBACLK0 FBACLK0*

FBVDD: VDD ×3, VDDQ ×4; FBVDDQ: VDDQ ×4; VSS ×3, VSSQ ×4; GND; Vref ← FB_VREF_M2

R72 200 5% 0402 COMMON

C533 .047UF 16V 10% X7R 0402 COMMON

NTP_M2_NC8 … NTP_M2_NC14 (NC ×7)

FBVDD

C89 .022UF 16V 10% X7R 0402 COMMON
C93 4700PF 25V 10% X7R 0402 COMMON
C121 .022UF 16V 10% X7R 0402 COMMON
C118 4700PF 25V 10% X7R 0402 COMMON
C128 .022UF 16V 10% X7R 0402 COMMON
C130 4700PF 25V 10% X7R 0402 COMMON
C136 4.7UF 6.3V 10% X5R 0805 COMMON

GND

FBVDDQ

C99 220PF 16V 10% X7R 0402 COMMON
C111 220PF 16V 10% X7R 0402 COMMON
C96 220PF 16V 10% X7R 0402 COMMON
C104 220PF 16V 10% X7R 0402 COMMON
C115 220PF 16V 10% X7R 0402 COMMON

GND

FBVDDQ

C95 .047UF 16V 10% X7R 0402 COMMON
C100 4700PF 25V 10% X7R 0402 COMMON
C107 4700PF 25V 10% X7R 0402 COMMON
C113 4700PF 25V 10% X7R 0402 COMMON
C109 .047UF 16V 10% X7R 0402 COMMON
C91 4.7UF 6.3V 10% X5R 0805 COMMON

GND

FBVDD

C90 .022UF 16V 10% X7R 0402 COMMON
C94 4700PF 25V 10% X7R 0402 COMMON
C122 .022UF 16V 10% X7R 0402 COMMON
C120 4700PF 25V 10% X7R 0402 COMMON
C129 .022UF 16V 10% X7R 0402 COMMON
C131 4700PF 25V 10% X7R 0402 COMMON
C127 4.7UF 6.3V 10% X5R 0805 COMMON

GND

FBVDDQ

C98 220PF 16V 10% X7R 0402 COMMON
C105 220PF 16V 10% X7R 0402 COMMON
C116 220PF 16V 10% X7R 0402 COMMON
C101 220PF 16V 10% X7R 0402 COMMON
C112 220PF 16V 10% X7R 0402 COMMON

GND

FBVDDQ

C97 .047UF 16V 10% X7R 0402 COMMON
C102 4700PF 25V 10% X7R 0402 COMMON
C108 4700PF 25V 10% X7R 0402 COMMON
C114 4700PF 25V 10% X7R 0402 COMMON
C110 .047UF 16V 10% X7R 0402 COMMON
C92 4.7UF 6.3V 10% X5R 0805 COMMON

GND

Clock Termination

FBVDDQ

R527 240 5% 0402 NO STUFF — FBACLK0
R538 240 5% 0402 NO STUFF
R526 240 5% 0402 NO STUFF — FBACLK0*
R537 240 5% 0402 NO STUFF

GND

FB_VREF

FBVDDQ

R65 1K 5% 0402 COMMON — FB_VREF_M2
R67 1K 5% 0402 COMMON

GND

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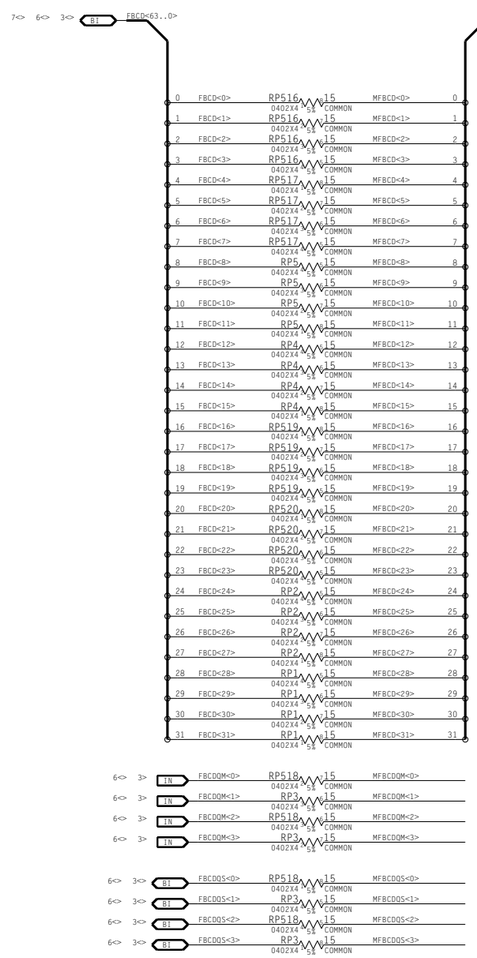
SANTA CLARA, CA 95050, USA

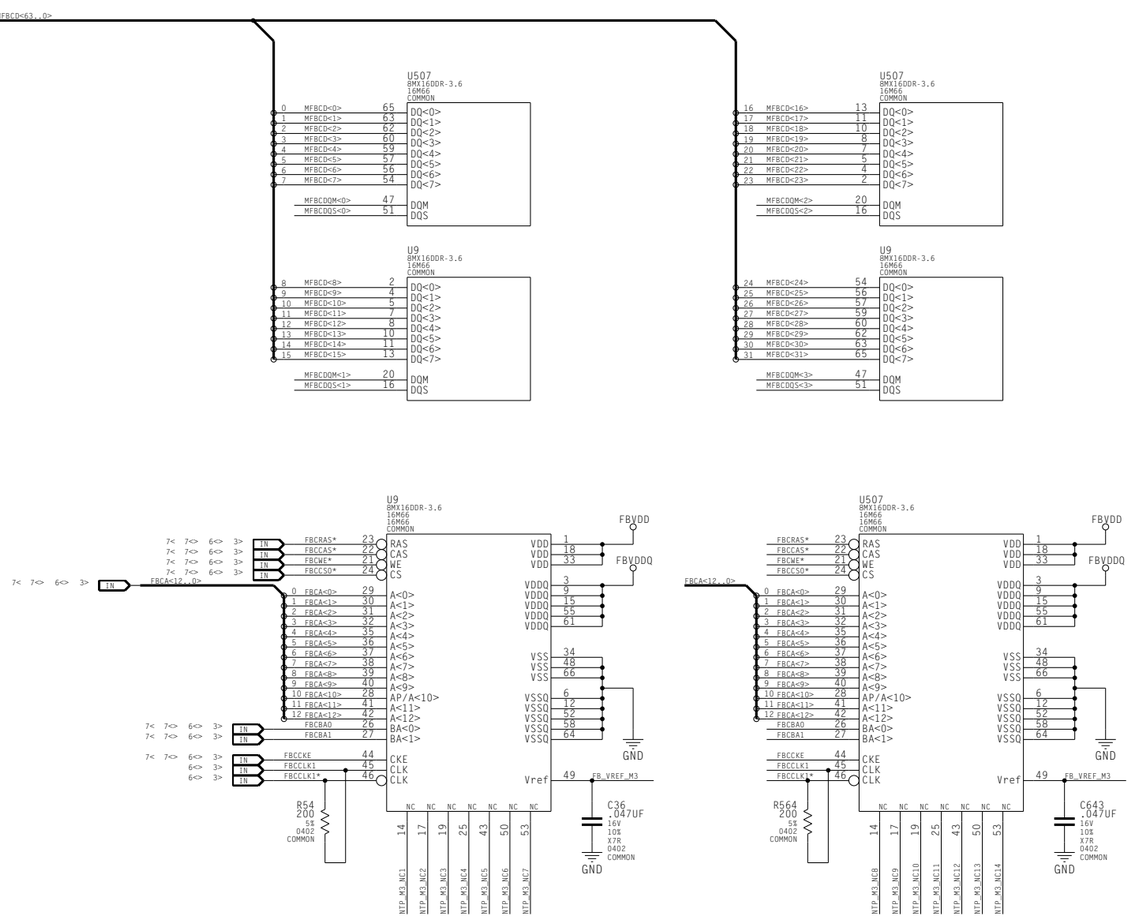
DETAIL	Memory Partition A Bits 32..63		
ID	p141_design	PAGE	5 OF 21
NAME	602-10141-0000-005	DATE	FEB 21 2003

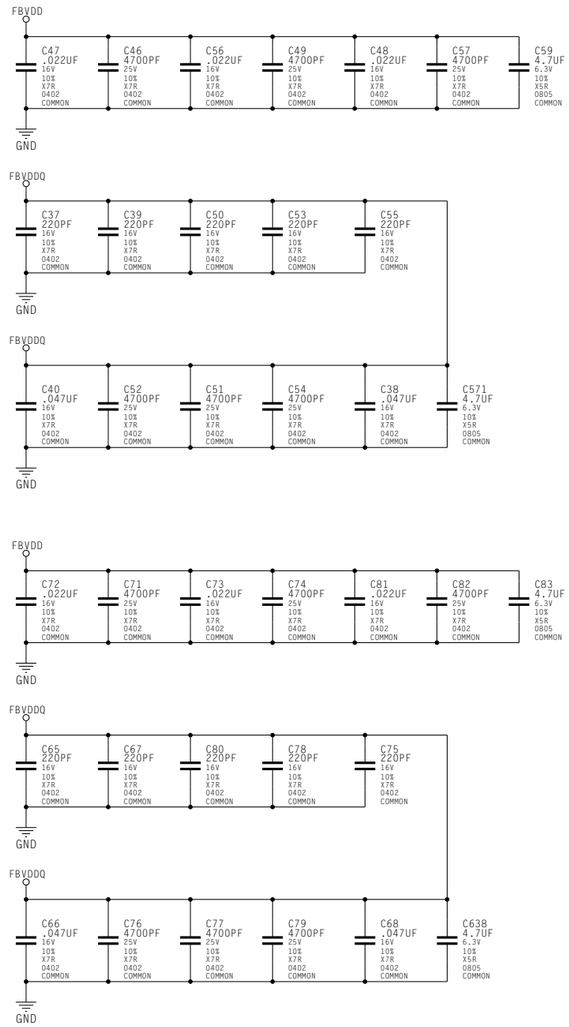
MEMORY 8(16)Mx16DDR Partition C , Bits 0..31

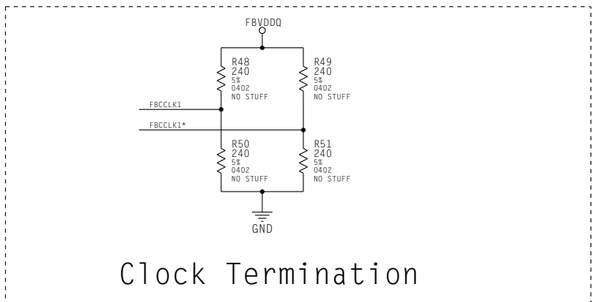
PLACE ALL DISCRETE COMPONENTS AS NEAR AS POSSIBLE TO MEMORY!

NET	Diffpair	NET_SPACING_RULE
FBCCLK1	FBCCLK0	18MIL_G2G_25MIL
FBCCLK1*	FBCCLK0	18MIL_G2G_25MIL
FBCD<31..0>		10MIL
FBCDQM<3..0>		10MIL
FBCDQS<3..0>		15MIL
MFBCD<31..0>		10MIL
MFBCDQM<3..0>		10MIL
MFBCDQS<3..0>		15MIL
FBCA<12..0>		10MIL
FBCRAS*		10MIL
FBCCAS*		10MIL
FBCWE*		10MIL
FBCCS0*		10MIL
FBCCS1*		10MIL
FBCBA0		10MIL
FBCBA1		10MIL
FBCCKE		10MIL

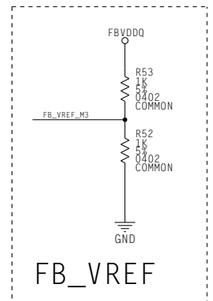








Clock Termination



FB_VREF

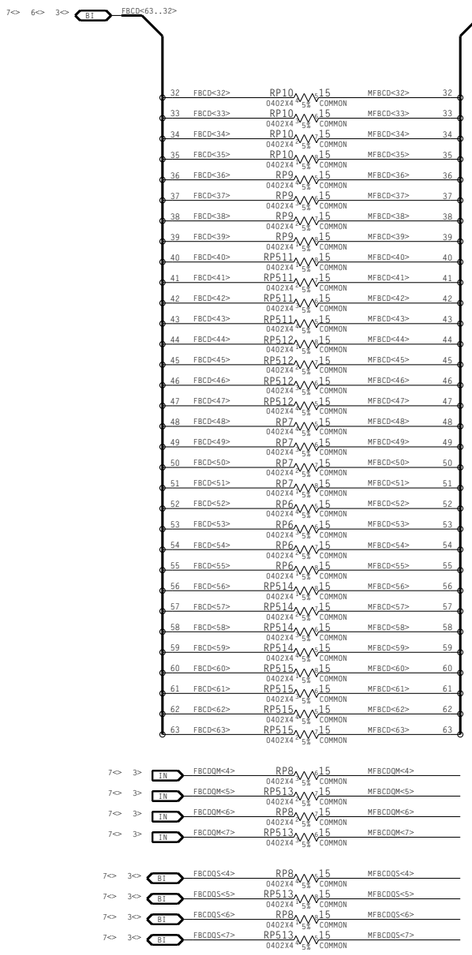
NVIDIA CORPORATION
2701 SAN TOMAS EXPRESSWAY
SANTA CLARA, CA 95050, USA

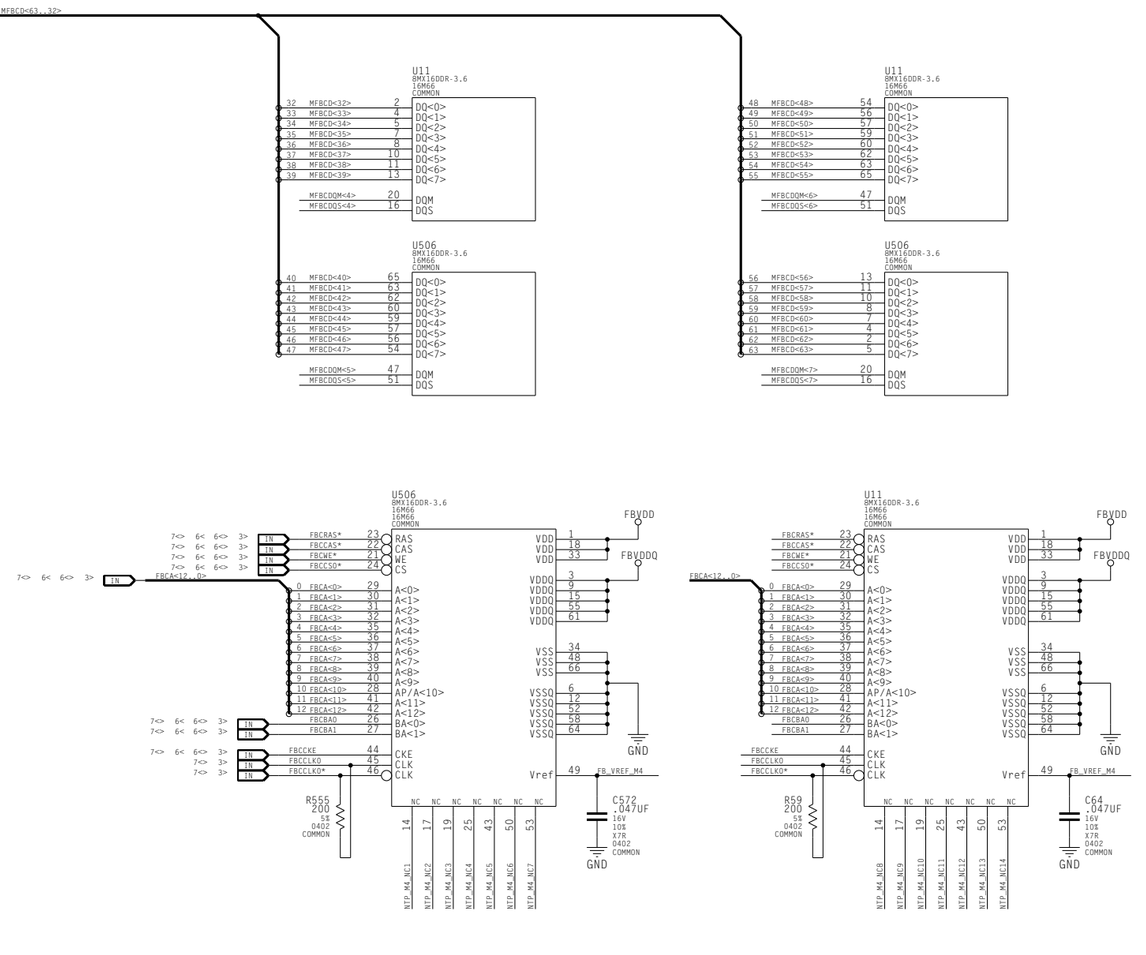
DETAIL	Memory Partition C Bits 0..31		
ID	p141_design	PAGE	6 OF 21
NAME	602-10141-0000-005	DATE	FEB 21 2003

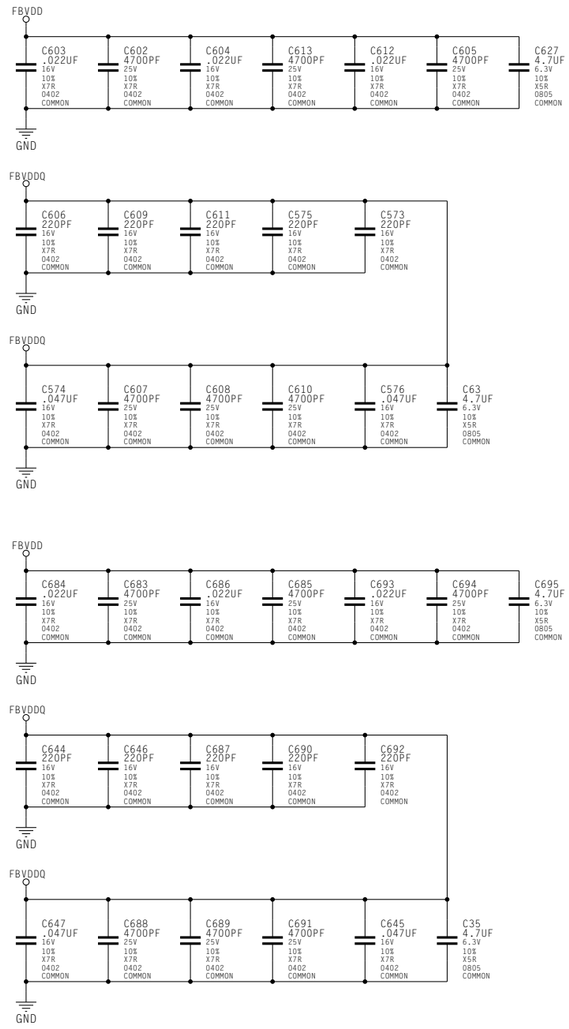
MEMORY 8(16)Mx16DDR Partition C , Bits 32..63

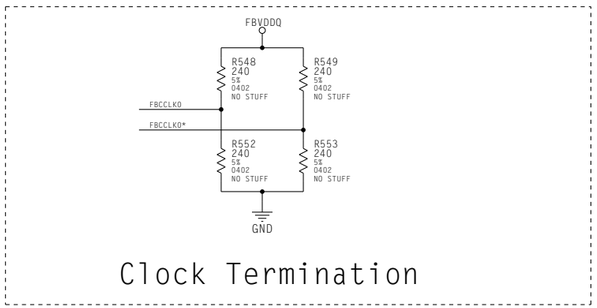
PLACE ALL DISCRETE COMPONENTS AS NEAR AS POSSIBLE TO MEMORY!

NET	Diffpair	NET_SPACING_RULE
FBCCLK0	FBCCLK1	18MIL_G2G_25MIL
FBCCLK0*	FBCCLK1	18MIL_G2G_25MIL
FBCD<63..32>		10MIL
FBCDQM<7..4>		10MIL
FBCDQS<7..4>		15MIL
MFBCD<63..32>		10MIL
MFBCDQM<7..4>		10MIL
MFBCDQS<7..4>		15MIL
FBCA<12..0>		10MIL
FBCRAS*		10MIL
FBCCAS*		10MIL
FBCWE*		10MIL
FBCCS0*		10MIL
FBCBA0		10MIL
FBCBA1		10MIL
FBCCKE		10MIL

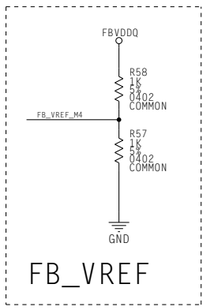








Clock Termination



FB_VREF

NVIDIA CORPORATION
2701 SAN TOMAS EXPRESSWAY
SANTA CLARA, CA 95050, USA

DETAIL	Memory Partition C Bits 32..63		
ID	p141_design	PAGE	7 OF 21
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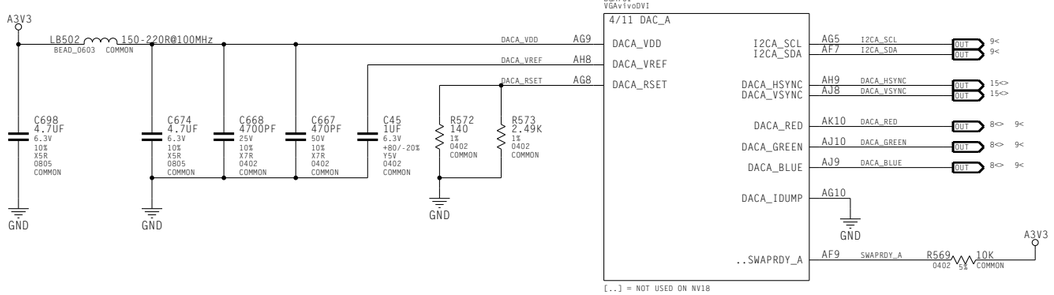
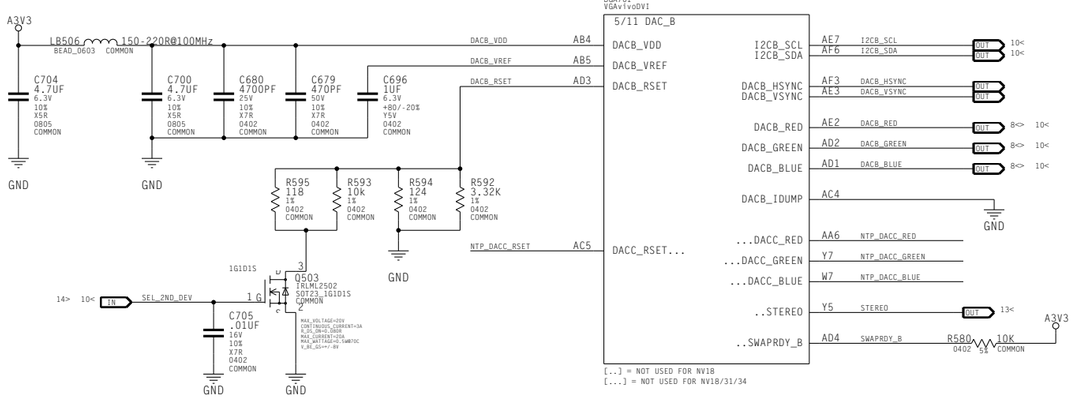
NV31 DAC_A, DAC_B, PLL, SYNC Buffer

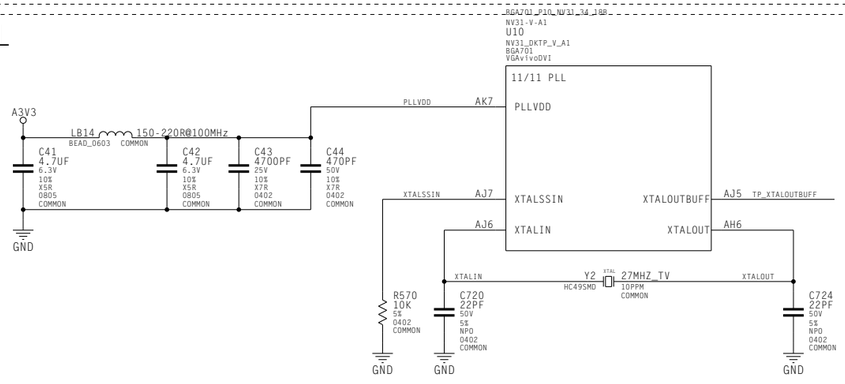
NV31 DAC_A



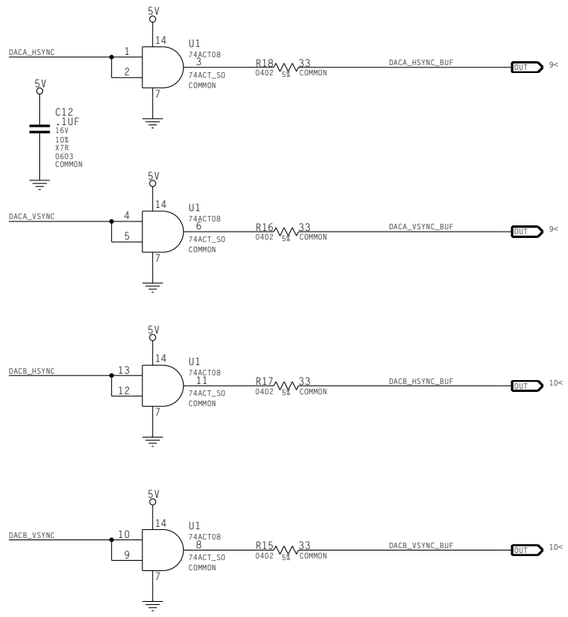
NV31 DAC_B with RSet select



NV31 PLL



SYNC Buffer



NET / NET_PHYSICAL_TYPE / VOLTAGE

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	NET_PHYSICAL_TYPE	NET_SPACING_RULE
XTALIN	5MIL_TRACE	15MIL
XTALOUT	5MIL_TRACE	15MIL

NET / NET_SPACING_RULE

NET	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

NVIDIA CORPORATION
2701 SAN TOMAS EXPRESSWAY
SANTA CLARA, CA 95050, USA

DETAIL	NV31 DAC A & B PLL and Sync Buffer		
ID	p141_design	PAGE	8 OF 21
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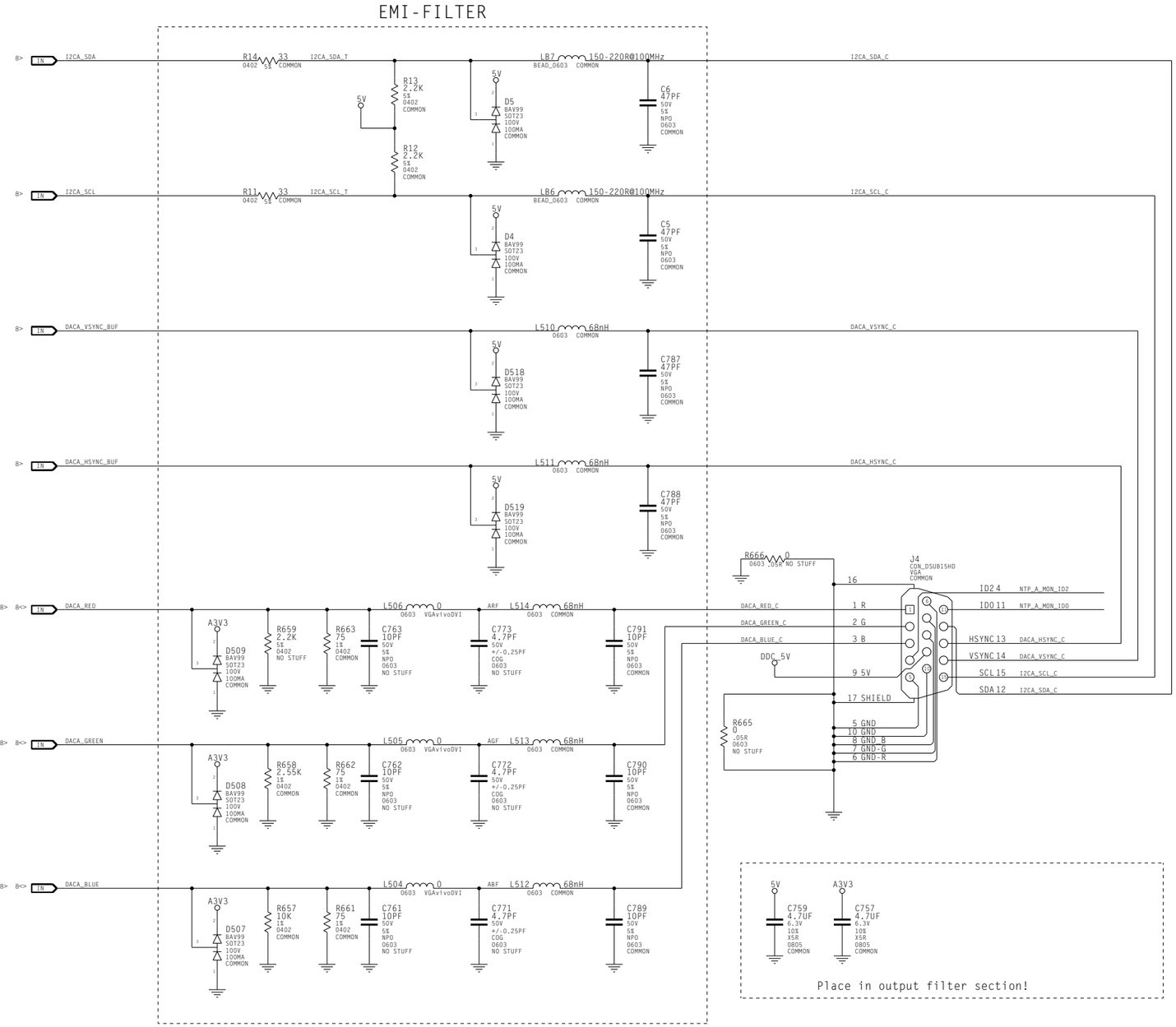
Primary Display (DACA), DB15 only!

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!

NVIDIA CORPORATION
2701 SAN TOMAS EXPRESSWAY
SANTA CLARA, CA 95050, USA

DETAIL	Primary Display RGB-Filter and DB15 connector.		
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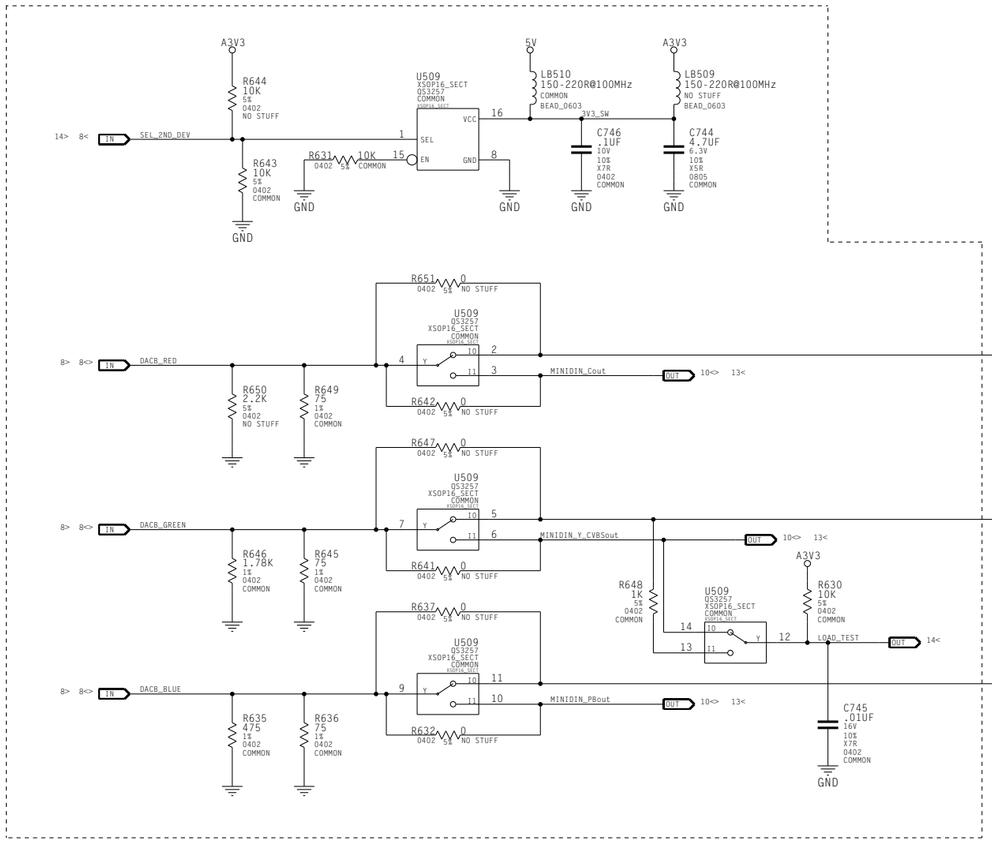
Secondary Display (DACB), long DB15 optional DVI-I

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

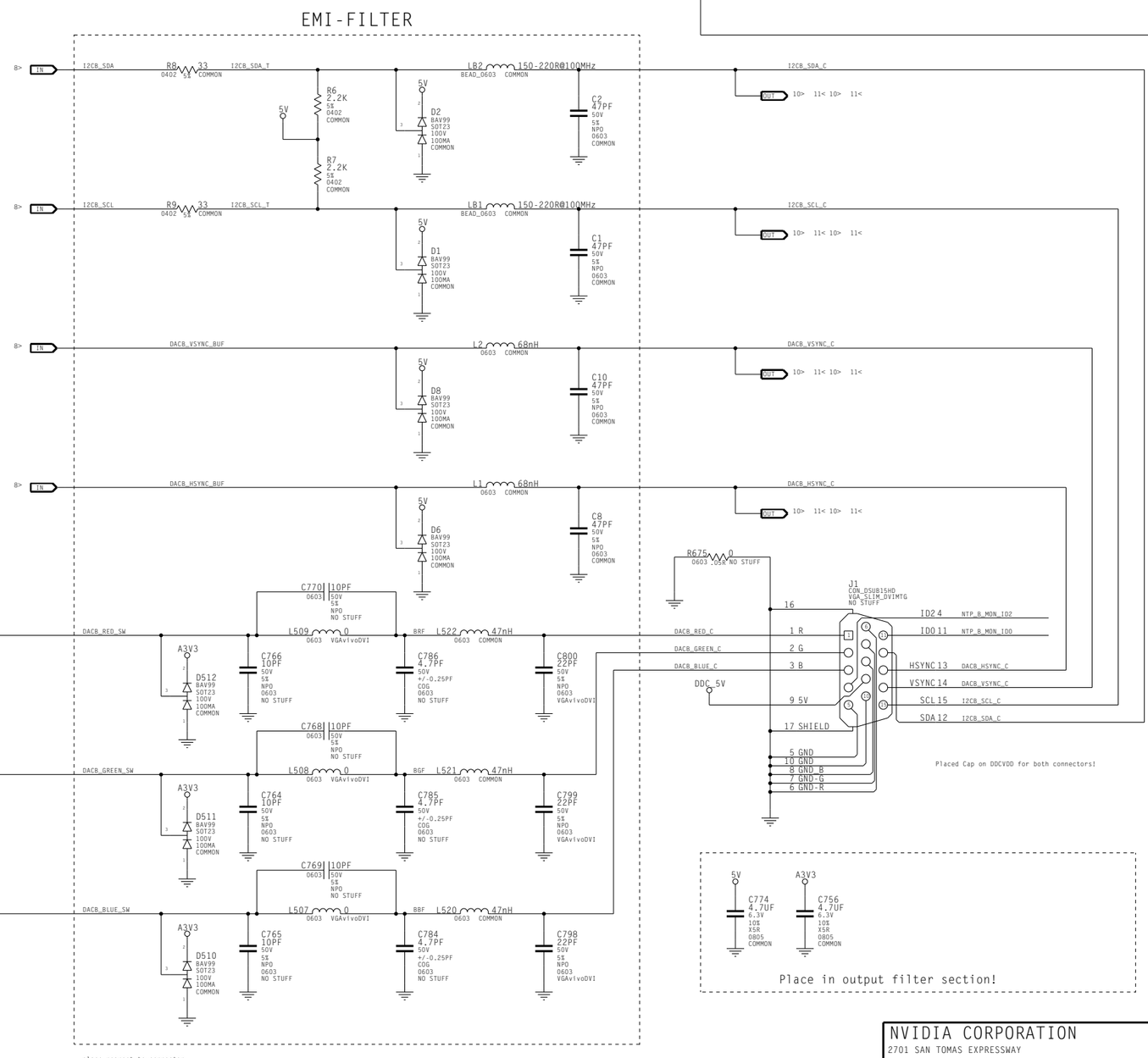
Route all signals only on layers referenced to GND!

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

DACB Multiplexer



EMI-FILTER



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

NVIDIA CORPORATION
2701 SAN TOMAS EXPRESSWAY
SANTA CLARA, CA 95050, USA

DETAIL	Secondary Display RGB-Filter and long DB15 connector.		
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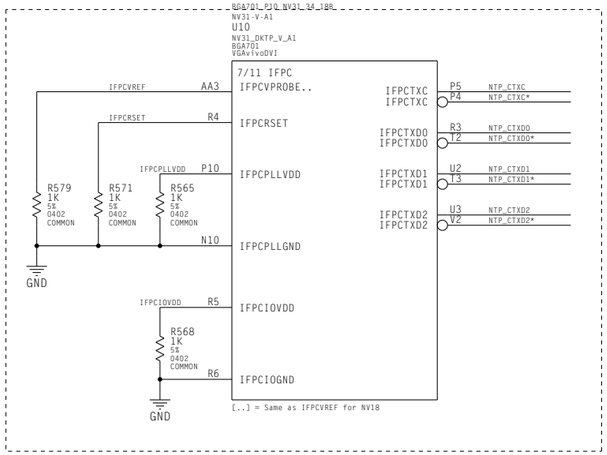
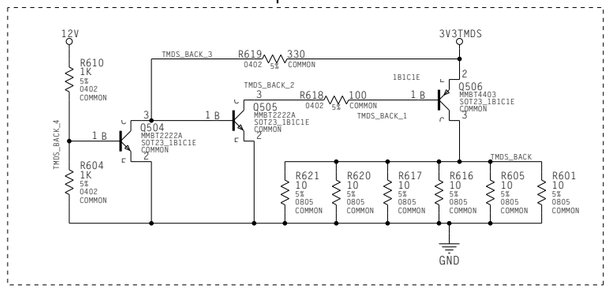
INTERNAL DUAL LINK TMDS POWER AND DECOUPLING

Unused Transmitter



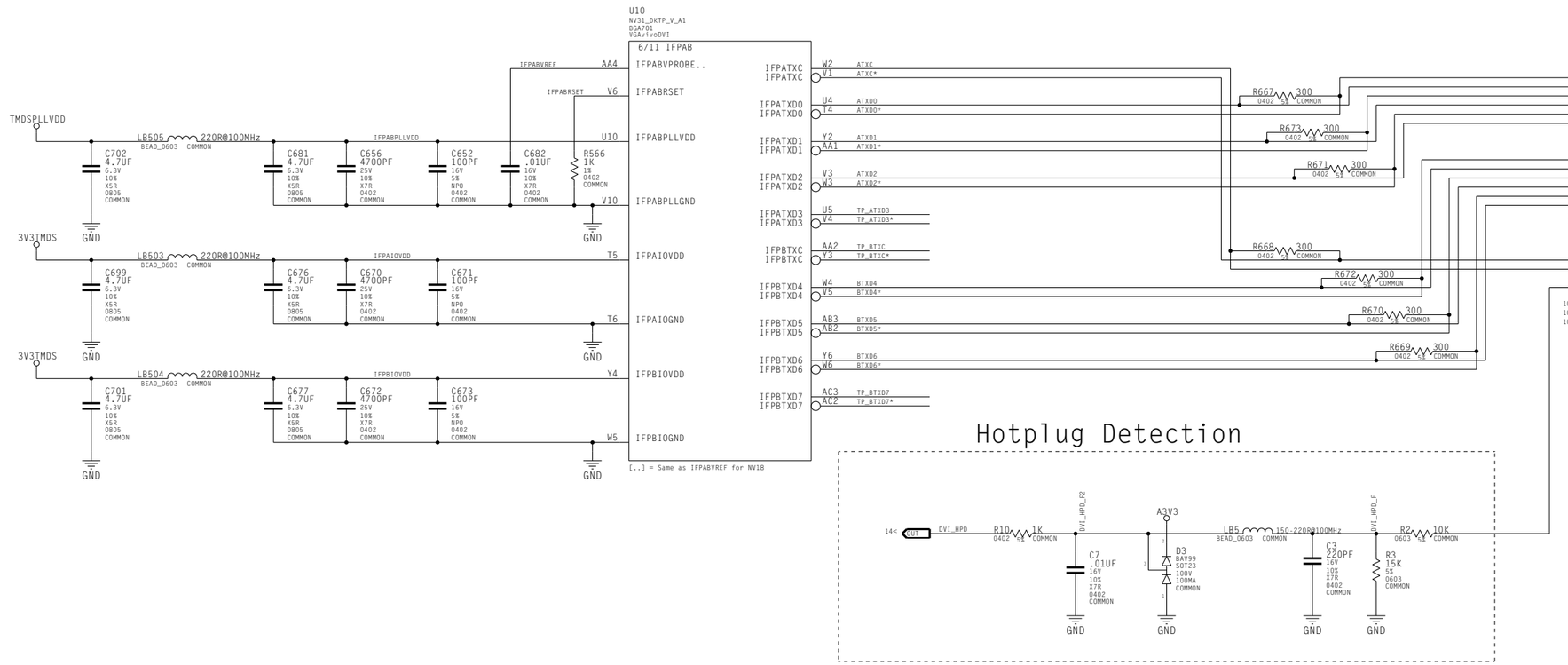
TMDS backdrive prevention



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	ATX0	20MIL_G2G_30MIL
ATXD0*	ATX0	20MIL_G2G_30MIL
ATXD1	ATX1	20MIL_G2G_30MIL
ATXD1*	ATX1	20MIL_G2G_30MIL
ATXD2	ATX2	20MIL_G2G_30MIL
ATXD2*	ATX2	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

DualLink Transmitter



Hotplug Detection

NVIDIA CORPORATION
2701 SAN TOMAS EXPRESSWAY
SANTA CLARA, CA 95050, USA

DETAIL	Nv 31 Internal TMDS Trasmitter DVI-Connector and Backdrive Prevention		
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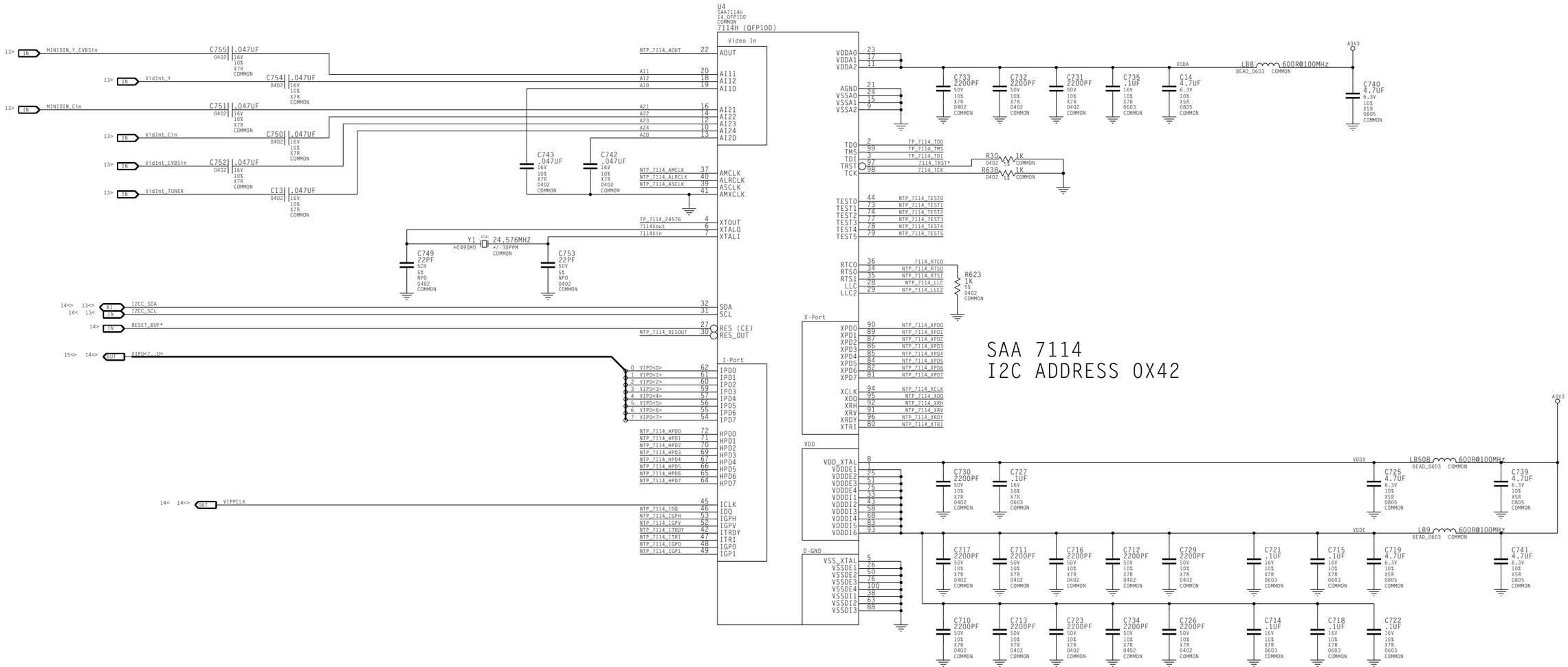
VIDEO CAPTURE



SAA 7114
I2C ADDRESS 0X42

NVIDIA CORPORATION
2701 SAN TOMAS EXPRESSWAY
SANTA CLARA, CA 95050, USA

DETAIL	Video Capture SAA7114		
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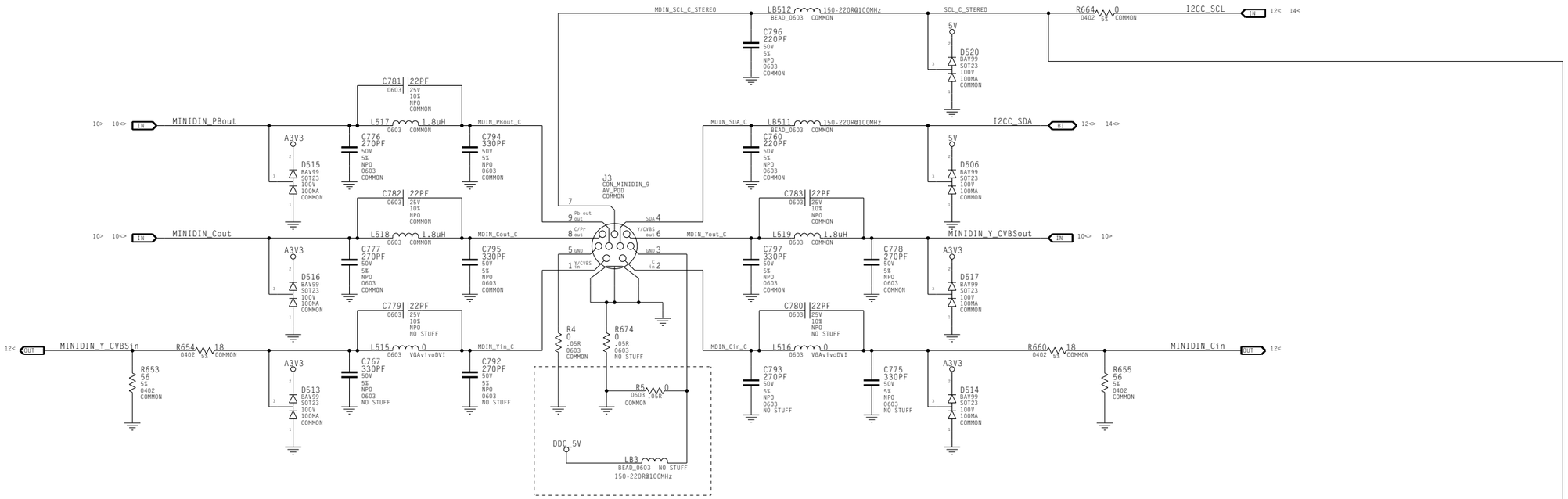
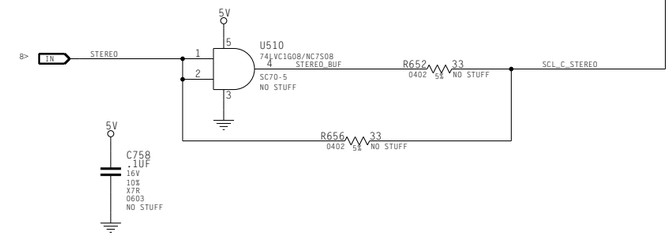
MiniDIN VIDEO IN/OUT CONNECTOR /STEREO GLASSES



INTERNAL VIDEO IN CONNECTOR

STEREO GLASSES BUFFER

Place close to MiniDIN connector!



NVIDIA CORPORATION
2701 SAN TOMAS EXPRESSWAY
SANTA CLARA, CA 95050, USA

DETAIL	ViVo/STEREO MiniDIN connector Internal VideoIn connector		
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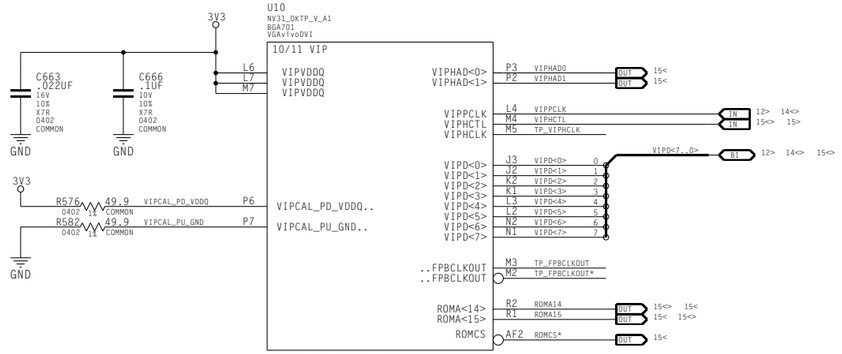
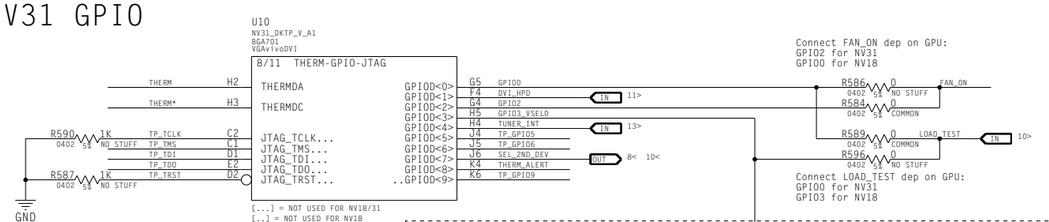
NV31 DVO, VIP AND GPIO SECTION, FAN CONTROL AND TEMP SENSOR

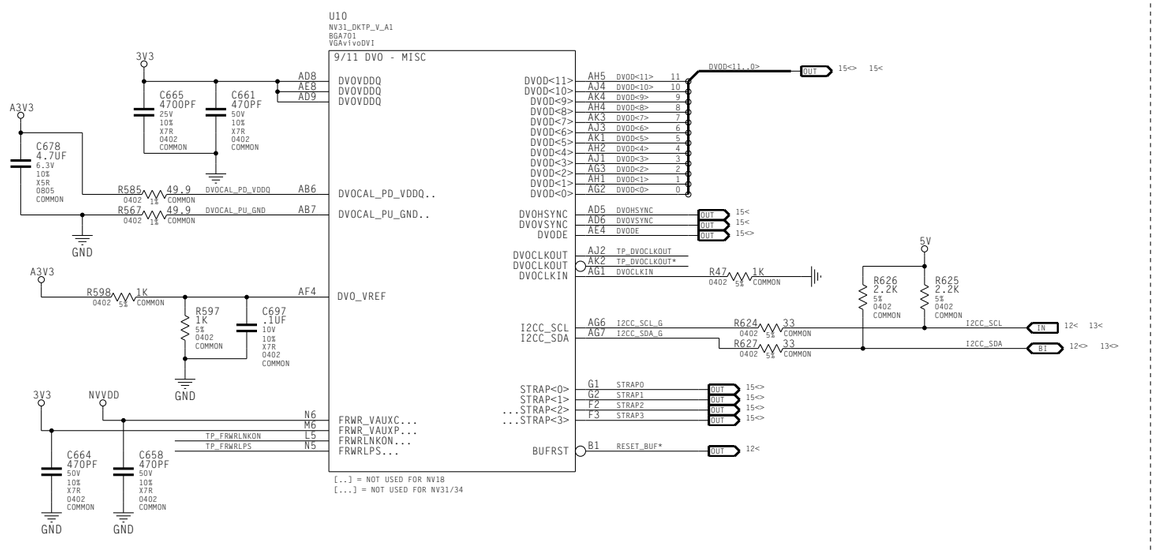
NV31 VIP



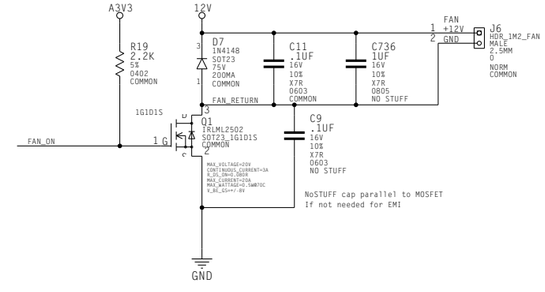
NV31 GPIO



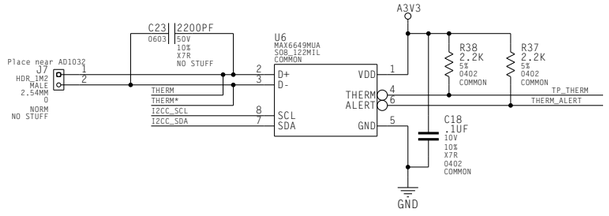
NV31 DVO



FAN Control



TEMP Sensor



NVIDIA CORPORATION
2701 SAN TOMAS EXPRESSWAY
SANTA CLARA, CA 95050, USA

DETAIL	NV31, DVO,VIP and GPIO Interface FAN control, Tempsensor		
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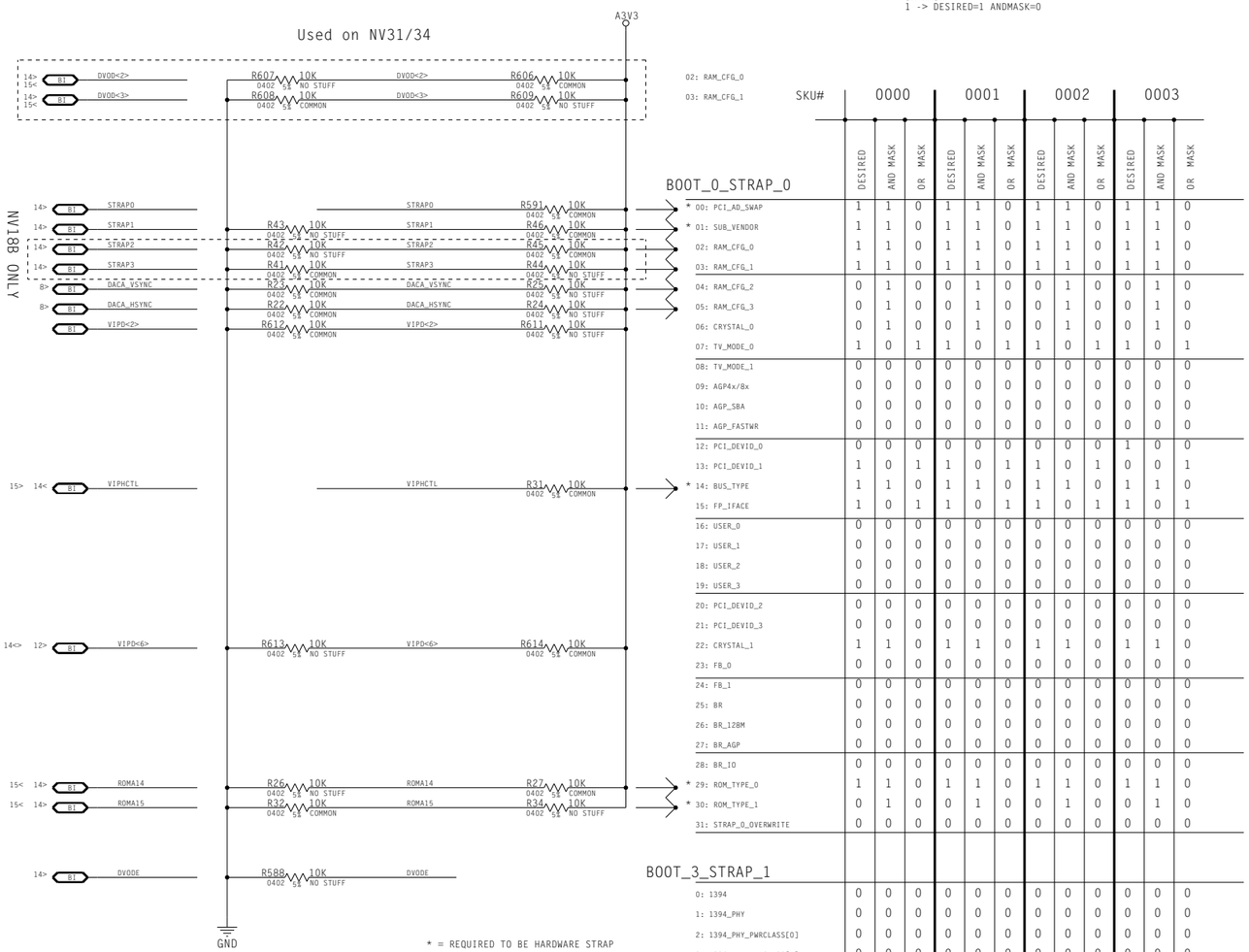
NV31 BIOS STRAPPING



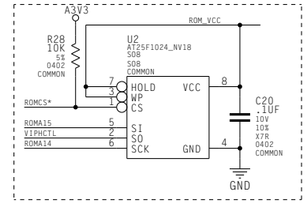
* = REQUIRED TO BE HARDWARE STRAP

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

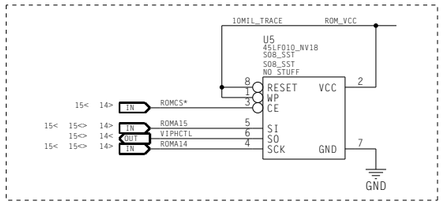
OR MASK
1 -> DESIRED=1 ANDMASK=0

SKU#	0000			0001			0002			0003		
	DESIRED	AND MASK	OR MASK	DESIRED	AND MASK	OR MASK	DESIRED	AND MASK	OR MASK	DESIRED	AND MASK	OR MASK
BOOT_0_STRAP_0												
* 00: PCI_AD_SWAP	1	1	0	1	1	0	1	1	0	1	1	0
* 01: SUB_VENDOR	1	1	0	1	1	0	1	1	0	1	1	0
02: RAM_CFG_0	1	1	0	1	1	0	1	1	0	1	1	0
03: RAM_CFG_1	1	1	0	1	1	0	1	1	0	1	1	0
04: RAM_CFG_2	0	1	0	0	1	0	0	1	0	0	1	0
05: RAM_CFG_3	0	1	0	0	1	0	0	1	0	0	1	0
06: CRYSTAL_0	0	1	0	0	1	0	0	1	0	0	1	0
07: TV_MODE_0	1	0	1	1	0	1	1	0	1	1	0	1
08: TV_MODE_1	0	0	0	0	0	0	0	0	0	0	0	0
09: AGP4x/8x	0	0	0	0	0	0	0	0	0	0	0	0
10: AGP_SBA	0	0	0	0	0	0	0	0	0	0	0	0
11: AGP_FASTWR	0	0	0	0	0	0	0	0	0	0	0	0
12: PCI_DEVID_0	0	0	0	0	0	0	0	0	0	1	0	0
13: PCI_DEVID_1	1	0	1	1	0	1	1	0	1	0	0	1
* 14: BUS_TYPE	1	1	0	1	1	0	1	1	0	1	1	0
15: FP_IFACE	1	0	1	1	0	1	1	0	1	1	0	1
16: USER_0	0	0	0	0	0	0	0	0	0	0	0	0
17: USER_1	0	0	0	0	0	0	0	0	0	0	0	0
18: USER_2	0	0	0	0	0	0	0	0	0	0	0	0
19: USER_3	0	0	0	0	0	0	0	0	0	0	0	0
20: PCI_DEVID_2	0	0	0	0	0	0	0	0	0	0	0	0
21: PCI_DEVID_3	0	0	0	0	0	0	0	0	0	0	0	0
22: CRYSTAL_1	1	1	0	1	1	0	1	1	0	1	1	0
23: FB_0	0	0	0	0	0	0	0	0	0	0	0	0
24: FB_1	0	0	0	0	0	0	0	0	0	0	0	0
25: BR	0	0	0	0	0	0	0	0	0	0	0	0
26: BR_128M	0	0	0	0	0	0	0	0	0	0	0	0
27: BR_AGP	0	0	0	0	0	0	0	0	0	0	0	0
28: BR_IO	0	0	0	0	0	0	0	0	0	0	0	0
* 29: ROM_TYPE_0	1	1	0	1	1	0	1	1	0	1	1	0
* 30: ROM_TYPE_1	0	1	0	0	1	0	0	1	0	0	1	0
31: STRAP_0_OVERWRITE	0	0	0	0	0	0	0	0	0	0	0	0
BOOT_3_STRAP_1												
0: 1394	0	0	0	0	0	0	0	0	0	0	0	0
1: 1394_PHY	0	0	0	0	0	0	0	0	0	0	0	0
2: 1394_PHY_PWRCLASS[0]	0	0	0	0	0	0	0	0	0	0	0	0
3: 1394_PHY_PWRCLASS[1]	0	0	0	0	0	0	0	0	0	0	0	0
4: VGA_DEVICE	1	0	1	1	0	1	1	0	1	1	0	1
5: MEM_LSB_SWAP	0	0	0	0	0	0	0	0	0	0	0	0
6: BR_LAST_DEV	0	0	0	0	0	0	0	0	0	0	0	0
7: BR_BAR1_BCASTONLY	0	0	0	0	0	0	0	0	0	0	0	0
31: STRAP_1_OVERWRITE	0	0	0	0	0	0	0	0	0	0	0	0

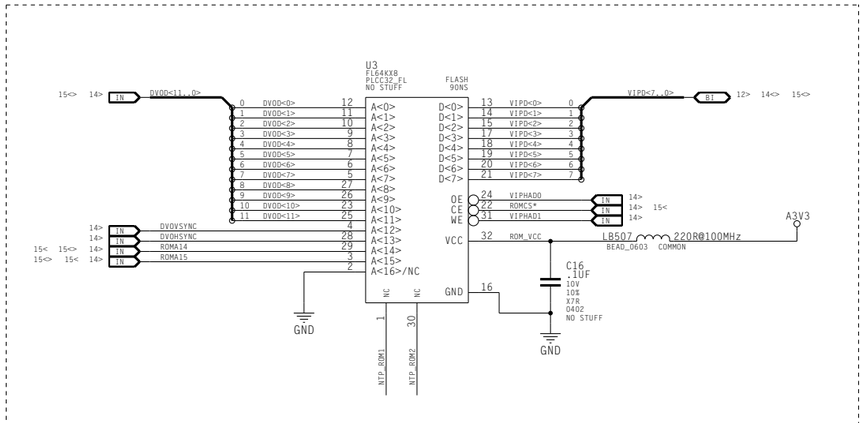
BIOS (serial)



BIOS (serial alternative)



BIOS (parallel alternative)



600-10141-0000
600-10141-0001
600-10141-0002

600-10141-0003

NV Register Description	NV Address	BIOS Address	Data SKU#0000-0002	Data SKU#0003
BOOT_0_STRAP_0	0x00101000		0x2040E08F	0x2040C08F
BOOT_1_STRAP_0_ANDMASK	0x00101004	0x58	0x6040407F	0x6040407F
BOOT_2_STRAP_0_ORMASK	0x00101008	0x5C	0x00008080	0x00008080
BOOT_3_STRAP_1	0x0010100C		0x00000010	0x00000010
BOOT_4_STRAP_1_ANDMASK	0x00101010	0x60	0x00000000	0x00000000
BOOT_5_STRAP_1_ORMASK	0x00101014	0x64	0x00000010	0x00000010

NVIDIA CORPORATION
2701 SAN TOMAS EXPRESSWAY
SANTA CLARA, CA 95050, USA

DETAIL	NV31 Strapps Serial and Parallel BIOS ROM		
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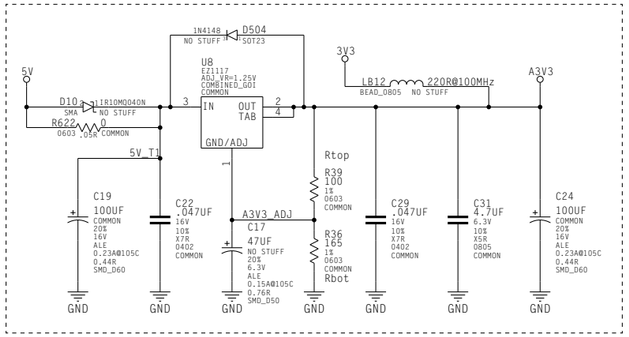
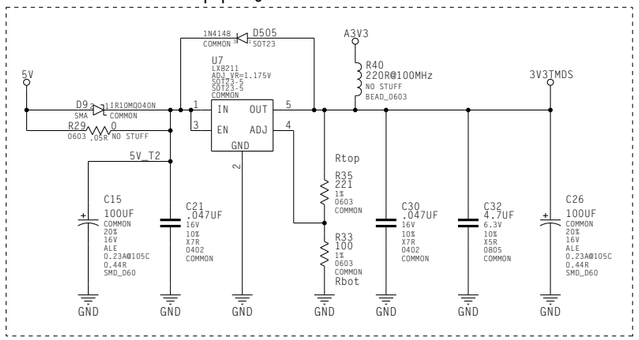
POWER SUPPLY

ANALOG 3V3



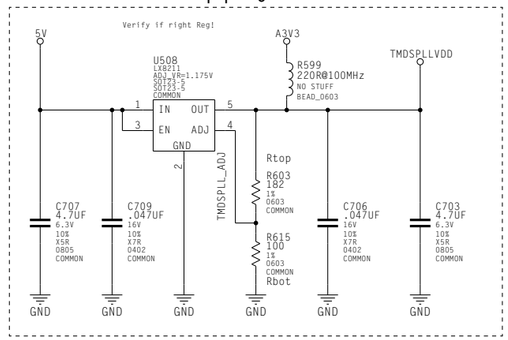
Vout = VRef * (1+Rbot/Rtop)
3.31V = 1.25V * (1+(165/100))

TMDS 3V3 Supply



Vout = VRef * (1+Rtop/Rbot)
3.76V = 1.175V * (1+(221/100))

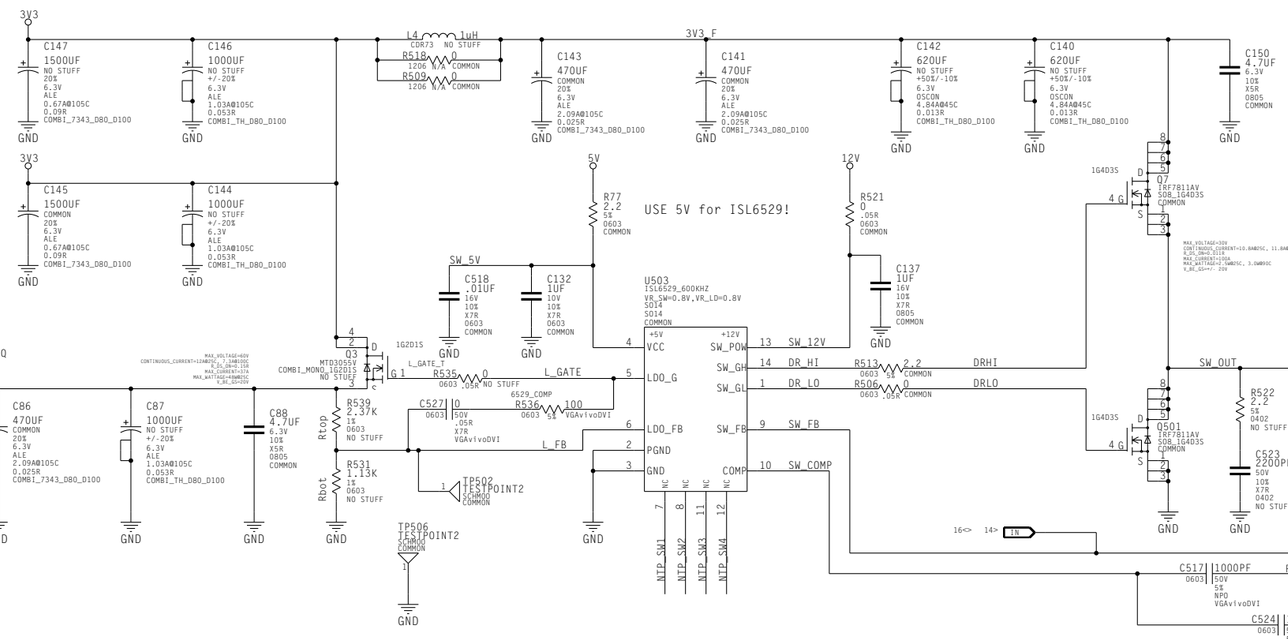
TMDS PLL Supply



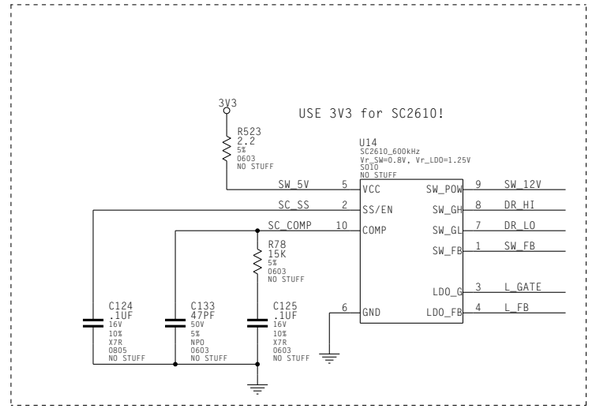
Vout = VRef * (1+Rtop/Rbot)
3.31V = 1.175V * (1+(100/182))

NET	NET_PHYSICAL_TYPE	VOLTAGE
3V3	12MIL_TRACE	3.3V
A3V3	12MIL_TRACE	3.3V
3V3TMDS	12MIL_TRACE	3.3V
FBVDD	12MIL_TRACE	2.5V
NVVDD	12MIL_TRACE	1.65V
5V	12MIL_TRACE	5V
12V	12MIL_TRACE	12V
3V3_F	12MIL_TRACE	3.3V
12V_F	12MIL_TRACE	12V
DDC_5V	12MIL_TRACE	5V
SW_12V	10MIL_TRACE	12V
SW_5V	10MIL_TRACE	5V
DR_HI	10MIL_TRACE	
DR_LO	10MIL_TRACE	
DRHI	10MIL_TRACE	
DRLO	10MIL_TRACE	
SW_FB	10MIL_TRACE	
SW_COMP	10MIL_TRACE	
A3V3_ADJ	10MIL_TRACE	
3V3TMDS_ADJ	10MIL_TRACE	
TMDSPLL_ADJ	10MIL_TRACE	
TMDSPLLVDD	12MIL_TRACE	3.3V

NVVDD-SWITCHER / FBVDDQ-LDO CONTROLER ISL6529



ALTERNATIVE TO ISL6529



	FBVDDQ= VRef * (1+Rtop/ Rbot)
ISL6529	2.5V = 0.800V * (1+2.37k/1.13k)
SC2610	2.5V = 1.250V * (1+1.02k/1.02k)

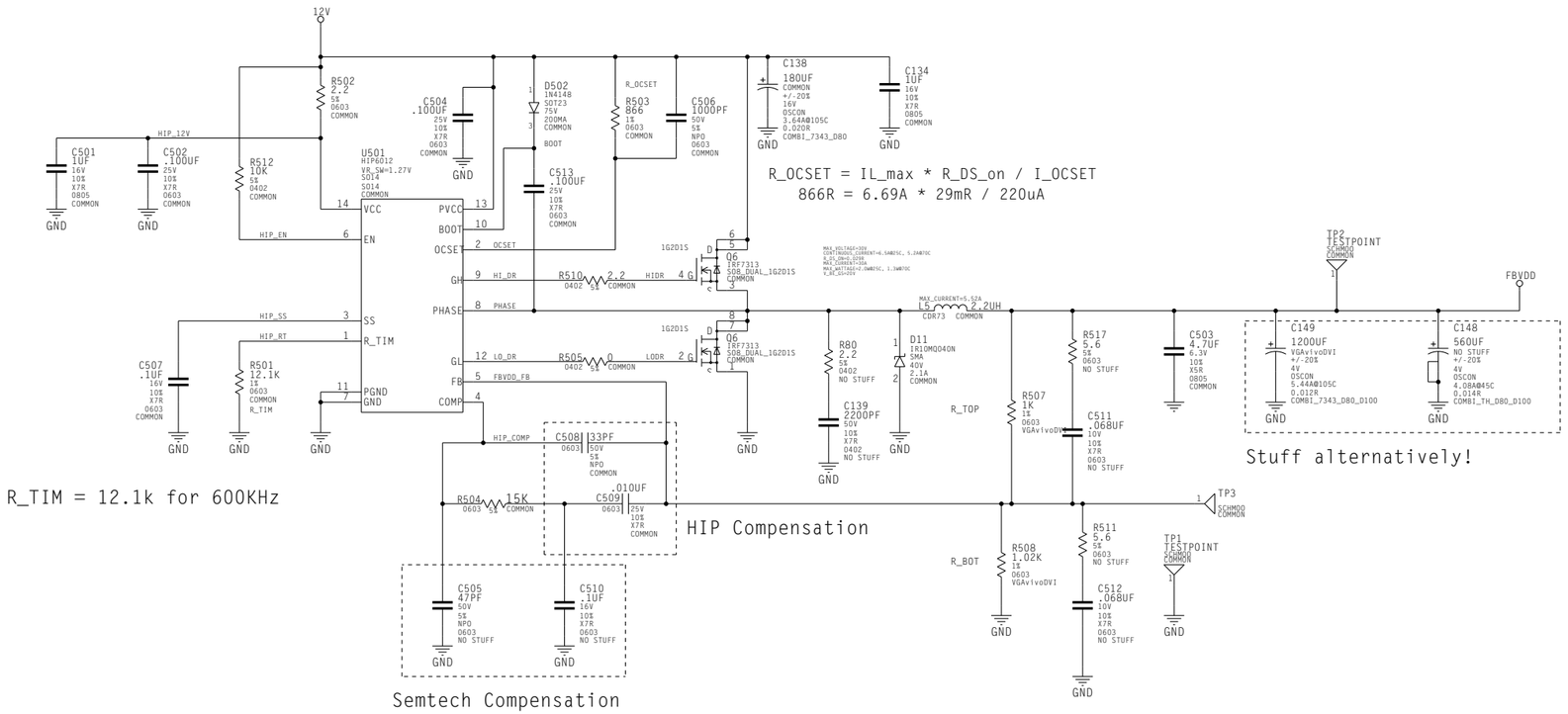
	NVVDD = VRef * (1+Rtop/ Rbot)
NV18B	1.656V = 0.800V * (1+1070/1000)
NV31	1.309V = 0.800V * (1+649/1020)
NV34	1.45V = 0.800V * (1+866/1070)

See page 14 GPIO section for NVVDD Software adjustable!

NVIDIA CORPORATION
2701 SAN TOMAS EXPRESSWAY
SANTA CLARA, CA 95050, USA

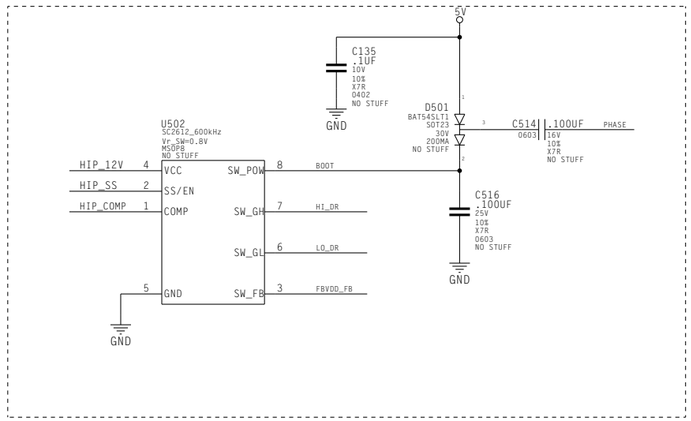
DETAIL	Power Supplies: A3V3,TMDS3V3, TMDSPLLVDD, FBVDDQ, NVVDD		
ID	p141_design	PAGE	16 OF 21
NAME	602-10141-0000-005	DATE	FEB 21 2003

FBVDD Switcher (3.3V out of 12V Rail)

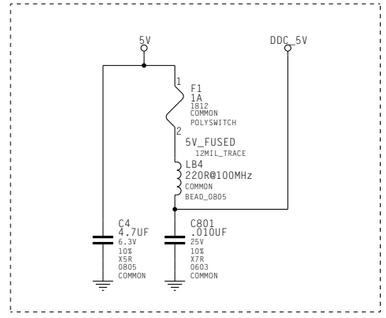


NET	NET_PHYSICAL_TYPE
HI_DR	10MIL_TRACE
LO_DR	10MIL_TRACE
HIDR	10MIL_TRACE
LODR	10MIL_TRACE
HIP_12V	10MIL_TRACE
BOOT	10MIL_TRACE
PHASE	10MIL_TRACE
FBVDD_FB	10MIL_TRACE
HIP_COMP	10MIL_TRACE
OCSET	10MIL_TRACE
HIP_SS	10MIL_TRACE
HIP_RT	10MIL_TRACE

Semtech Sc2612
Stuff alternatively to ISL & HIP!



DDC 5V

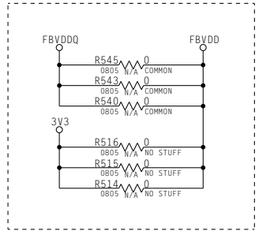


FBVDD = VRef * (1+Rtop/ Rbot)

HIP6012
3.29V = 1.270V * (1 + 1.82K / 1.13K)
2.5V = 1.270V * (1 + 1 K / 1.02K)

ISL6522/SC2612
3.34V = 0.8V * (1 + 3.32K / 1.07K)
2.5V = 0.8V * (1 + 2.37K / 1.02K)

Switcher Bypass



MECHANICAL COMPONENTS

BRACKET

BKT1 DS15HD-MDIN,DVII ATX_I/_NO COMMON
MECH. MOUNT VIA CONNECTOR

SCREWS

MEC2 HEX_JACK_SCREW 3TD COMMON
MEC3 HEX_JACK_SCREW 3TD COMMON
MEC4 HEX_JACK_SCREW 3TD COMMON
MEC5 HEX_JACK_SCREW 3TD COMMON

HEATSINK

MEC1 FANSINK_52X52X12 GPU COMMON

NVIDIA CORPORATION
2701 SAN TOMAS EXPRESSWAY
SANTA CLARA, CA 95050, USA

DETAIL	Power Supllies: FBVDD, FBVDD Bypass DDC5V, Mechanical Components		
ID	p141_design	PAGE	17 OF 21
NAME	602-10141-0000-005	DATE	FEB 21 2003

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

3V3TMDS_ADJ	16.1G<>
3V3_F	16.1G<> 16.3C
12V_F	16.1G<>
A3V3_ADJ	16.1G<> 16.2A
ABF	9.1G<> 9.5C
AGF	9.1G<> 9.4C
AGPADSTB0F	2.3C 2.5G<>
AGPADSTB0S	2.3C 2.5G<>
AGPADSTB1F	2.3C 2.5G<>
AGPADSTB1S	2.3C 2.5G<>
AGPDBI_HI	2.3C 2.4G<>
AGPDBI_LO	2.3C 2.4G<>
AGPMBDET	2.4D 2.5C 2.5G<>
AGPRBF	2.3C 2.4G<>
AGPSBA<0>	2.4C 2.4D
AGPSBA<7..0>	2.4C 2.5G<>
AGPSBA<1>	2.4C 2.4D
AGPSBA<2>	2.4C 2.4D
AGPSBA<3>	2.4C 2.4D
AGPSBA<4>	2.4C 2.4D
AGPSBA<5>	2.4C 2.4D
AGPSBA<6>	2.4C 2.4D
AGPSBA<7>	2.4C 2.4D
AGPSBSTBF	2.4C 2.5G<>
AGPSBSTBS	2.4C 2.5G<>
AGPSTO	2.3C 2.4G<>
AGPST1	2.3C 2.4G<>
AGPST2	2.3C 2.5G<>
AGPSTOP	2.4D 2.5G<>
AGPVREFCG	2.4C 2.5G<>
AGPVREFGC	2.4A 2.5G<>
AGPWBF	2.3C 2.4G<>
ARF	9.1G<> 9.3C
ATXC	11.1G<> 11.3D 11.4G
ATXC*	11.1G<> 11.3D 11.4G
ATXD0	11.1G<> 11.3D 11.3G
ATXD0*	11.1G<> 11.3D 11.3G
ATXD1	11.1G<> 11.3D 11.3G
ATXD1*	11.1G<> 11.3D 11.3G
ATXD2	11.1G<> 11.3G 11.4D
ATXD2*	11.1G<> 11.3G 11.4D
BBF	10.1G<> 10.5E
BGF	10.1G<> 10.4E
BOOT	17.1G<> 17.2C 17.2G
BRF	10.1G<> 10.4E
BTXD4	11.2G<> 11.4D 11.4G
BTXD4*	11.2G<> 11.3G 11.4D
BTXD5	11.2G<> 11.4D 11.4G
BTXD5*	11.2G<> 11.4D 11.4G
BTXD6	11.2G<> 11.4D 11.4G
BTXD6*	11.2G<> 11.4D 11.4G
CGND1	10.3G> 11.3G<
DACA_BLUE	8.1G<> 8.2D> 9.5A<
DACA_BLUE_C	9.1G<> 9.4D
DACA_GREEN	8.1G<> 8.2D> 9.4A<
DACA_GREEN_C	9.1G<> 9.3D
DACA_HSYNC	8.1D> 8.2F 15.2A<> 15.2B
DACA_HSYNC_BUF	8.2G> 9.3A<
DACA_RED	8.1G<> 8.2D> 9.3A<
DACA_RED_C	9.1G<> 9.3D
DACA_RSET	8.1C 8.1G<>
DACA_VDD	8.1C 8.1G<>
DACA_VREF	8.1C 8.1G<>
DACA_VSYNC	8.2D> 8.3F 15.2A<> 15.2B
DACA_VSYNC_BUF	8.3G> 9.2A<
DACB_BLUE	8.1G<> 8.3D> 10.5A<
DACB_BLUE_C	10.1G<> 10.4F 11.4G<
DACB_BLUE_SW	10.1G<> 10.5D
DACB_GREEN	8.1G<> 8.3D> 10.4A<
DACB_GREEN_C	10.1G<> 10.4F 11.4G<
DACB_GREEN_SW	10.1G<> 10.4D
DACB_HSYNC	8.3D> 8.3F
DACB_HSYNC_BUF	8.3G> 10.3D<
DACB_HSYNC_C	10.3G> 10.3G> 11.4G<
DACB_RED	8.1G<> 8.3D> 10.4A<
DACB_RED_C	10.1G<> 10.4F 11.4G<
DACB_RED_SW	10.1G<> 10.4D
DACB_RSET	8.1G<> 8.3C
DACB_VDD	8.1G<> 8.3C
DACB_VREF	8.1G<> 8.3C
DACB_VSYNC	8.3D> 8.4F
DACB_VSYNC_BUF	8.4G> 10.3D<
DACB_VSYNC_C	10.3G> 10.3G> 11.4G<
DRHI	16.1G<> 16.4D
DRLO	16.1G<> 16.4D
DR_HI	16.1G<> 16.3H 16.4D
DR_LO	16.1G<> 16.3H 16.4D
DVI_HPD	11.5D> 14.2F<
DVDD<0>	14.4C 15.3F
DVDD<11..0>	14.3D> 15.3F<
DVDD<1>	14.4C 15.3F
DVDD<2>	14.4C 15.1A<> 15.1B 15.4F
DVDD<3>	14.4C 15.1A<> 15.1B 15.4F
DVDD<4>	14.4C 15.4F
DVDD<5>	14.4C 15.4F
DVDD<6>	14.4C 15.4F
DVDD<7>	14.4C 15.4F
DVDD<8>	14.4C 15.4F
DVDD<9>	14.3C 15.4F
DVDD<10>	14.3C 15.4F
DVDD<11>	14.3C 15.4F
DVDDE	14.4C> 15.4A<> 15.4B
DVOHSYNC	14.4C> 15.4F<
DVOVSYNC	14.4C> 15.4F<
FAN_RETURN	11.1G<> 14.1G<> 14.3F
FBAA<0>	3.4B 4.3C 4.3E 5.3C 5.3E
FBAA<12..0>	4.1G<> 4.3C< 4.3E 5.1G<> 5.3C< 5.3E
FBAA<63..0>	3.4A>
FBAA<1>	3.4B 4.3C 4.3E 5.3C 5.3E
FBAA<2>	3.4B 4.3C 4.3E 5.3C 5.3E

FBAA<3>	3.4B 4.3C 4.3E 5.3C 5.3E
FBAA<4>	3.4B 4.3C 4.3E 5.3C 5.3E
FBAA<5>	3.4B 4.3C 4.3E 5.3C 5.3E
FBAA<6>	3.4B 4.3C 4.3E 5.3C 5.3E
FBAA<7>	3.4B 4.3C 4.3E 5.3C 5.3E
FBAA<8>	3.4B 4.3C 4.3E 5.3C 5.3E
FBAA<9>	3.4B 4.3C 4.3E 5.3C 5.3E
FBAA<10>	3.4B 4.3C 4.3E 5.3C 5.3E
FBAA<11>	3.4B 4.3C 4.3E 5.3C 5.3E
FBAA<12>	3.4B 4.3C 4.3E 5.3C 5.3E
FBABA0	3.5B> 4.1G<> 4.4C< 4.4E 5.1G<> 5.4C< 5.4E
FBABA1	3.5B> 4.1G<> 4.4C< 4.4E 5.1G<> 5.4C< 5.4E
FBACAS*	3.5B> 4.1G<> 4.3C< 4.3E 5.1G<> 5.3C< 5.3E
FBACKE	3.5B> 4.2G<> 4.4C< 4.4E 5.2G<> 5.4C< 5.4E
FBACLK0	3.4D 3.5B> 5.1G<> 5.4C< 5.4E 5.5D
FBACLK0*	3.4D 3.5B> 5.1G<> 5.4C< 5.4E 5.5D
FBACLK1	3.4D 3.5B> 4.1G<> 4.4C< 4.4E 4.5D
FBACLK1*	3.4D 3.5B> 4.1G<> 4.4C< 4.4E 4.5D
FBACS0*	3.5B> 4.1G<> 4.3C< 4.3E 5.1G<> 5.3C< 5.3E
FBACS1*	4.1G<>
FBAD<0>	3.1B 4.1A
FBAD<31..0>	4.1G<>
FBAD<63..0>	3.1A<> 4.1A<>
FBAD<1>	3.1B 4.2A
FBAD<2>	3.1B 4.2A
FBAD<3>	3.1B 4.2A
FBAD<4>	3.1B 4.2A
FBAD<5>	3.1B 4.2A
FBAD<6>	3.1B 4.2A
FBAD<7>	3.1B 4.2A
FBAD<8>	3.1B 4.2A
FBAD<9>	3.1B 4.2A
FBAD<10>	3.1B 4.2A
FBAD<11>	3.1B 4.2A
FBAD<12>	3.1B 4.2A
FBAD<13>	3.1B 4.2A
FBAD<14>	3.1B 4.2A
FBAD<15>	3.1B 4.2A
FBAD<16>	3.1B 4.3A
FBAD<17>	3.1B 4.3A
FBAD<18>	3.1B 4.3A
FBAD<19>	3.1B 4.3A
FBAD<20>	3.2B 4.3A
FBAD<21>	3.2B 4.3A
FBAD<22>	3.2B 4.3A
FBAD<23>	3.2B 4.3A
FBAD<24>	3.2B 4.3A
FBAD<25>	3.2B 4.3A
FBAD<26>	3.2B 4.3A
FBAD<27>	3.2B 4.3A
FBAD<28>	3.2B 4.3A
FBAD<29>	3.2B 4.3A
FBAD<30>	3.2B 4.3A
FBAD<31>	3.2B 4.4A
FBAD<32>	3.2B 5.1A
FBAD<63..32>	5.1A<> 5.1G<>
FBAD<33>	3.2B 5.2A
FBAD<34>	3.2B 5.2A
FBAD<35>	3.2B 5.2A
FBAD<36>	3.2B 5.2A
FBAD<37>	3.2B 5.2A
FBAD<38>	3.2B 5.2A
FBAD<39>	3.2B 5.2A
FBAD<40>	3.2B 5.2A
FBAD<41>	3.2B 5.2A
FBAD<42>	3.2B 5.2A
FBAD<43>	3.2B 5.2A
FBAD<44>	3.2B 5.2A
FBAD<45>	3.2B 5.2A
FBAD<46>	3.2B 5.2A
FBAD<47>	3.2B 5.2A
FBAD<48>	3.2B 5.3A
FBAD<49>	3.2B 5.3A
FBAD<50>	3.3B 5.3A
FBAD<51>	3.3B 5.3A
FBAD<52>	3.3B 5.3A
FBAD<53>	3.3B 5.3A
FBAD<54>	3.3B 5.3A
FBAD<55>	3.3B 5.3A
FBAD<56>	3.3B 5.3A
FBAD<57>	3.3B 5.3A
FBAD<58>	3.3B 5.3A
FBAD<59>	3.3B 5.3A
FBAD<60>	3.3B 5.3A
FBAD<61>	3.3B 5.3A
FBAD<62>	3.3B 5.3A
FBAD<63>	3.3B 5.4A
FBADM<0>	3.3B 4.4A<
FBADM<3..0>	4.1G<>
FBADM<63..0>	3.3A>
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FBADM<2>	3.3B 4.4A<
FBADM<3>	3.3B 4.4A<
FBADM<4>	3.3B 5.4A<
FBADM<7..4>	5.1G<>
FBADM<5>	3.3B 5.4A<
FBADM<6>	3.3B 5.4A<
FBADM<7>	3.3B 5.4A<
FBADQS<0>	3.3B 4.4A<>
FBADQS<3..0>	4.1G<>
FBADQS<63..0>	3.3A<>
FBADQS<1>	3.3B 4.4A<>
FBADQS<2>	3.3B 4.4A<>
FBADQS<3>	3.3B 4.4A<>
FBADQS<4>	3.4B 5.4A<>
FBADQS<7..4>	5.1G<>
FBADQS<5>	3.4B 5.4A<>
FBADQS<6>	3.4B 5.4A<>

FBADQS<7>	3.4B 5.4A<>
FBARAS*	3.5B> 4.1G<> 4.3C< 4.3E 5.1G<> 5.3C< 5.3E
FBAWE*	3.5B> 4.1G<> 4.3C< 4.3E 5.1G<> 5.3C< 5.3E
FBCA<0>	3.4F 6.3C 6.3E 7.3C 7.3E
FBCA<12..0>	6.1G<> 6.3C< 6.3E 7.1G<> 7.3C< 7.3E
FBCA<63..0>	3.4E>
FBCA<1>	3.4F 6.3C 6.3E 7.3C 7.3E
FBCA<2>	3.4F 6.3C 6.3E 7.3C 7.3E
FBCA<3>	3.4F 6.3C 6.3E 7.3C 7.3E
FBCA<4>	3.4F 6.3C 6.3E 7.3C 7.3E
FBCA<5>	3.4F 6.3C 6.3E 7.3C 7.3E
FBCA<6>	3.4F 6.3C 6.3E 7.3C 7.3E
FBCA<7>	3.4F 6.3C 6.3E 7.3C 7.3E
FBCA<8>	3.4F 6.3C 6.3E 7.3C 7.3E
FBCA<9>	3.4F 6.3C 6.3E 7.3C 7.3E
FBCA<10>	3.4F 6.3C 6.3E 7.3C 7.3E
FBCA<11>	3.4F 6.3C 6.3E 7.3C 7.3E
FBCA<12>	3.4F 6.3C 6.3E 7.3C 7.3E
FBCBA0	3.5E> 6.1G<> 6.4C< 6.4E 7.1G<> 7.4C< 7.4E
FBCBA1	3.5E> 6.1G<> 6.4C< 6.4E 7.1G<> 7.4C< 7.4E
FBCCAS*	3.5E> 6.1G<> 6.3C< 6.3E 7.1G<> 7.3C< 7.3E
FBCCKE	3.5E> 6.2G<> 6.4C< 6.4E 7.2G<> 7.4C< 7.4E
FBCCLK0	3.4G 3.5E> 7.1G<> 7.4C< 7.4E 7.5D
FBCCLK0*	3.4G 3.5E> 7.1G<> 7.4C< 7.4E 7.5D
FBCCLK1	3.4G 3.5E> 6.1G<> 6.4C< 6.4E 6.5D
FBCCLK1*	3.4G 3.5E> 6.1G<> 6.4C< 6.4E 6.5D
FBCCS0*	3.5E> 6.1G<> 6.3C< 6.3E 7.1G<> 7.3C< 7.3E
FBCCS1*	6.1G<>
FBCD<0>	3.1F 6.1A
FBCD<31..0>	6.1G<>
FBCD<63..0>	3.1E<> 6.1A<>
FBCD<1>	3.1F 6.2A
FBCD<2>	3.1F 6.2A
FBCD<3>	3.1F 6.2A
FBCD<4>	3.1F 6.2A
FBCD<5>	3.1F 6.2A
FBCD<6>	3.1F 6.2A
FBCD<7>	3.1F 6.2A
FBCD<8>	3.1F 6.2A
FBCD<9>	3.1F 6.2A
FBCD<10>	3.1F 6.2A
FBCD<11>	3.1F 6.2A
FBCD<12>	3.1F 6.2A
FBCD<13>	3.1F 6.2A
FBCD<14>	3.1F 6.2A
FBCD<15>	3.1F 6.2A
FBCD<16>	3.1F 6.3A
FBCD<17>	3.1F 6.3A
FBCD<18>	3.1F 6.3A
FBCD<19>	3.1F 6.3A
FBCD<20>	3.2F 6.3A
FBCD<21>	3.2F 6.3A
FBCD<22>	3.2F 6.3A
FBCD<23>	3.2F 6.3A
FBCD<24>	3.2F 6.3A
FBCD<25>	3.2F 6.3A
FBCD<26>	3.2F 6.3A
FBCD<27>	3.2F 6.3A
FBCD<28>	3.2F 6.3A
FBCD<29>	3.2F 6.3A
FBCD<30>	3.2F 6.3A
FBCD<31>	3.2F 6.4A
FBCD<32>	3.2F 7.1A
FBCD<63..32>	7.1A<> 7.1G<>
FBCD<33>	3.2F 7.2A
FBCD<34>	3.2F 7.2A
FBCD<35>	3.2F 7.2A
FBCD<36>	3.2F 7.2A
FBCD<37>	3.2F 7.2A
FBCD<38>	3.2F 7.2A
FBCD<39>	3.2F 7.2A
FBCD<40>	3.2F 7.2A
FBCD<41>	3.2F 7.2A
FBCD<42>	3.2F 7.2A
FBCD<43>	3.2F 7.2A
FBCD<44>	3.2F 7.2A
FBCD<45>	3.2F 7.2A
FBCD<46>	3.2F 7.2A
FBCD<47>	3.2F 7.2A
FBCD<48>	3.2F 7.3A
FBCD<49>	3.2F 7.3A
FBCD<50>	3.3F 7.3A
FBCD<51>	3.3F 7.3A
FBCD<52>	3.3F 7.3A
FBCD<53>	3.3F 7.3A
FBCD<54>	3.3F 7.3A
FBCD<55>	3.3F 7.3A
FBCD<56>	3.3F 7.3A
FBCD<57>	3.3F 7.3A
FBCD<58>	3.3F 7.3A
FBCD<59>	3.3F 7.3A
FBCD<60>	3.3F 7.3A
FBCD<61>	3.3F 7.3A
FBCD<62>	3.3F 7.3A
FBCD<63>	3.3F 7.4A
FBCDQM<0>	3.3F 6.4A<
FBCDQM<3..0>	6.1G<>
FBCDQM<63..0>	3.3E>
FBCDQM<1>	3.3F 6.4A<
FBCDQM<2>	3.3F 6.4A<
FBCDQM<3>	3.3F 6.4A<
FBCDQM<4>	3.3F 7.4A<
FBCDQM<7..4>	7.1G<>
FBCDQM<5>	3.3F 7.4A<
FBCDQM<6>	3.3F 7.4A<

FBCDQM<7>	3.3F 7.4A<
FBCDQS<0>	3.3F 6.4A<>
FBCDQS<3..0>	6.1G<>
FBCDQS<63..0>	3.3E<>
FBCDQS<1>	3.3F 6.4A<>
FBCDQS<2>	3.3F 6.4A<>
FBCDQS<3>	3.3F 6.4A<>
FBCDQS<4>	3.4F 7.4A<>
FBCDQS<7..4>	7.1G<>
FBCDQS<5>	3.4F 7.4A<>
FBCDQS<6>	3.4F 7.4A<>
FBCDQS<7>	3.4F 7.4A<>
FBCRAS*	3.5E> 6.1G<> 6.3C< 6.3E 7.1G<> 7.3C< 7.3E
FBCWE*	3.5E> 6.1G<> 6.3C< 6.3E 7.1G<> 7.3C< 7.3E
FBVDD_FB	17.1G<> 17.2C 17.3G
HIDR	17.1G<> 17.2C
HIP_12V	17.1A 17.1G<> 17.2F
HIP_COMP	17.1G<> 17.2C 17.2F
HIP_RT	17.1G<> 17.2B
HIP_SS	17.1G<> 17.2B 17.2F
HI_DR	17.1G<> 17.2C 17.2G
I2CA_SCL	8.1D> 9.2A<
I2CA_SDA	8.1D> 9.1A<
I2CB_SCL	8.3D> 10.2D<
I2CB_SCL_C	10.2G> 10.2G> 11.4G<
I2CB_SDA	8.3D> 10.1D<
I2CB_SDA_C	10.2G> 10.2G> 11.4G<
I2CC_SCL	12.3A< 13.1G< 13.4D 14.4D< 14.5E
I2CC_SDA	12.3A<> 13.2F<> 13.4D 14.4D<> 14.5E
IFPABPLLVDD	11.1G<> 11.3B
IFPABVREF	11.1G<> 11.3C
IFPA1OVDD	11.1G<> 11.4B
IFPB1OVDD	11.1G<> 11.4B
IFPC1OVDD	11.1G<> 11.2A
IFPCPLLVDD	11.1G<> 11.2A
IFPCVREF	11.1G<> 11.2A
LOAD_TEST	10.5D> 14.2H<
LODR	17.1G<> 17.2C
LO_DR	17.1G<> 17.2C 17.3G
MFBAD<0>	4.1B 4.2C
MFBAD<31..0>	4.1G<>
MFBAD<63..0>	4.1B
MFBAD<1>	4.2B 4.2C
MFBAD<2>	4.2B 4.2C
MFBAD<3>	4.2B 4.2C
MFBAD<4>	4.2B 4.2C
MFBAD<5>	4.2B 4.2C
MFBAD<6>	4.2B 4.2C
MFBAD<7>	4.2B 4.2C
MFBAD<8>	4.2B 4.2C
MFBAD<9>	4.2B 4.2C
MFBAD<10>	4.2B 4.2C
MFBAD<11>	4.2B 4.2C
MFBAD<12>	4.2B 4.2C
MFBAD<13>	4.2B 4.2C
MFBAD<14>	4.2B 4.2C
MFBAD<15>	4.2B 4.2C
MFBAD<16>	4.2E 4.3B
MFBAD<17>	4.2E 4.3B
MFBAD<18>	4.2E 4.3B
MFBAD<19>	4.2E 4.3B
MFBAD<20>	4.2E 4.3B
MFBAD<21>	4.2E 4.3B
MFBAD<22>	4.2E 4.3B
MFBAD<23>	4.2E 4.3B
MFBAD<24>	4.2E 4.3B
MFBAD<25>	4.2E 4.3B
MFBAD<26>	4.2E 4.3B
MFBAD<27>	4.2E 4.3B
MFBAD<28>	4.2E 4.3B
MFBAD<29>	4.2E 4.3B
MFBAD<30>	4.2E 4.3B
MFBAD<31>	4.2E 4.4B
MFBAD<32>	5.1B 5.2C
MFBAD<63..32>	5.1B 5.1G<>
MFBAD<33>	5.2B 5.2C
MFBAD<34>	5.2B 5.2C
MFBAD<35>	5.2B 5.2C
MFBAD<36>	5.2B 5.2C
MFBAD<37>	5.2B 5.2C
MFBAD<38>	5.2B 5.2C
MFBAD<39>	5.2B 5.2C
MFBAD<40>	5.2B 5.2C
MFBAD<41>	5.2B 5.2C
MFBAD<42>	5.2B 5.2C
MFBAD<43>	5.2B 5.2C
MFBAD<44>	5.2B 5.2C
MFBAD<45>	5.2B 5.2C
MFBAD<46>	5.2B 5.2C
MFBAD<47>	5.2B 5.2C
MFBAD<48>	5.2E 5.3B
MFBAD<49>	5.2E 5.3B
MFBAD<50>	5.2E 5.3B
MFBAD<51>	5.2E 5.3B
MFBAD<52>	5.2E 5.3B
MFBAD<53>	5.2E 5.3B
MFBAD<54>	5.2E 5.3B
MFBAD<55>	5.2E 5.3B
MFBAD<56>	5.2E 5.3B
MFBAD<57>	5.2E 5.3B
MFBAD<58>	5.2E 5.3B
MFBAD<59>	5.2E 5.3B
MFBAD<60>	5.2E 5.3B
MFBAD<61>	5.2E 5.3B
MFBAD<62>	5.2E 5.4B
MFBADM<0>	4.2C 4.4B
MFBADM<3..0>	4.1G<>
MFBADM<63..0>	4.1B
MFBADM<1>	4.2B 4.2C
MFBADM<2>	4.2B 4.2C
MFBADM<3>	4.2B 4.2C
MFBADM<4>	4.2B 4.2C
MFBADM<5>	4.2B 4.2C
MFBADM<6>	4.2B 4.2C
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MFBADM<13>	4.2B 4.2C
MFBADM<14>	4.2B 4.2C
MFBADM<15>	4.2B 4.2C
MFBADM<16>	4.2E 4.3B
MFBADM<17>	4.2E 4.3B
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MFBADM<23>	4.2E 4.3B
MFBADM<24>	4.2E 4.3B
MFBADM<25>	4.2E 4.3B
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MFBADM<30>	4.2E 4.3B
MFBADM<31>	4.2E 4.4B
MFBADM<32>	5.1B 5.2C
MFBADM<63..32>	5.1B 5.1G<>
MFBADM<33>	5.2B 5.2C
MFBADM<34>	5.2B 5.2C
MFBADM<35>	5.2B 5.2C
MFBADM<36>	5.2B 5.2C
MFBADM<37>	5.2B 5.2C
MFBADM<38>	5.2B 5.2C
MFBADM<39>	5.2B 5.2C
MFBADM<40>	5.2B 5.2C
MFBADM<41>	5.2B 5.2C
MFBADM<42>	5.2B 5.2C
MFBADM<43>	5.2B 5.2C
MFBADM<44>	5.2B 5.2C
MFBADM<45>	5.2B 5.2C
MFBADM<46>	5.2B 5.2C
MFBADM<47>	5.2B 5.2C
MFBADM<48>	5.2E 5.3B
MFBADM<49>	5.2E 5.3B
MFBADM<50>	5.2E 5.3B
MFBADM<51>	5.2E 5.3B
MFBADM<52>	5.2E 5.3B
MFBADM<53>	5.2E 5.3B
MFBADM<54>	5.2E 5.3B
MFBADM<55>	5.2E 5.3B
MFBADM<56>	5.2E 5.3B
MFBADM<57>	5.2E 5.3B
MFBADM<58>	5.2E 5.3B
MFBADM<59>	5.2E 5.3B
MFBADM<60>	5.2E 5.3B
MFBADM<61>	5.2E 5.3B
MFBADM<62>	5.2E 5.3B
MFBADM<63>	5.2E 5.4B
MFBADQM<0>	4.2C 4.4B
MFBADQM<3..0>	4.1G<>
MFBADQM<63..0>	4.1B
MFBADQM<1>	4.2B 4.2C
MFBADQM<2>	4.2B 4.2C
MFBADQM<3>	4.2B 4.2C
MFBADQM<4>	4.2B 4.2C
MFBADQM<5>	4.2E 4.3B
MFBADQM<6>	4.2E 4.3B
MFBADQM<7>	4.2E 4.3B
MFBADQS<0>	4.2C 4.4B
MFBADQS<3..0>	4.1G<>
MFBADQS<1>	4.2C 4.4B
MFBADQS<2>	4.2E 4.4B
MFBADQS<3>	4.2E 4.4B
MFBADQS<4>	5.2C 5.4B
MFBADQS<7..4>	5.1G<>
MFBADQS<5>	5.2C 5.4B
MFBADQS<6>	5.2E 5.4B
MFBADQS<7>	5.2E 5.4B
MFBCD<0>	6.1B 6.2C
MFBCD<31..0>	6.1G<>
MFBCD<63..0>	6.1B
MFBCD<1>	6.2B 6.2C
MFBCD<2>	6.2B 6.2C
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MFBCD<6>	6.2B 6.2C
MFBCD<7>	6.2B 6.2C
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MFBCD<13>	6.2B 6.2C
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MFBCD<16>	6.2E 6.3B
MFBCD<17>	6.2E 6.3B
MFBCD<18>	6.2E 6.3B
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MFBCD<23>	6.2E 6.3B
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MFBCD<25>	6.2E 6.3B
MFBCD<26>	6.2E 6.3B
MFBCD<27>	6.2E 6.3B
MFBCD<28>	6.2E 6.3B
MFBCD<29>	6.2E 6.3B
MFBCD<30>	6.2E 6.3B
MFBCD<31>	6.2E 6.4B
MFBCD<32>	7.1B 7.2C
MFBCD<63..32>	7.1B 7.1G<>
MFBCD<33>	7.2B 7.2C
MFBCD<34>	7.2B 7.2C
MFBCD<35>	7.2B 7.2C
MFBCD<36>	7.2B 7.2C
MFBCD<37>	7.2B 7.2C
MFBCD<38>	7.2B 7.2C
MFBCD<39>	7.2B 7.2C
MFBCD<40>	7.2B 7.2C
MFBCD<41>	7.2B 7.2C
MFBCD<42>	7.2B 7.2C
MFBCD<43>	7.2B 7.2C
MFBCD<44>	7.2B 7.2C
MFBCD<45>	7.2B 7.2C
MFBCD<46>	7.2B 7.2C
MFBCD<47>	7.2B 7.2C
MFBCD<48>	7.2E 7.3B
MFBCD<49>	7.2E 7.3B
MFBCD<50>	7.2E 7.3B
MFBCD<51>	7.2E 7.3B
MFBCD<52>	7.2E 7.3B
MFBCD<53>	7.2E 7.3B
MFBCD<54>	7.2E 7.3B
MFBCD<55>	7.2E 7.3B
MFBCD<56>	7.2E 7.3B
MFBCD<57>	7.2E 7.3B
MFBCD<58>	7.2E 7.3B
MFBCD<59>	7.2E 7.3B
MFBCD<60>	7.2E 7.3B
MFBCD<61>	7.2E 7.3B
MFBCD<62>	7.2E 7.3B
MFBCD<63>	7.2E 7.4B
MFBCDQM<0>	6.2C 6.4B
MFBCDQM<3..0>	6.1G<>
MFBCDQM<1>	6.2C 6.4B
MFBCDQM<2>	6.2E 6.4B
MFBCDQM<3>	6.2E 6.4B
MFBCDQM<4>	7.2C 7.4B
MFBCDQM<7..4>	7.1G<>
MFBCDQM<5>	7.2C 7.4B
MFBCDQM<6>	7.2E 7.4B
MFBCDQM<7>	7.2E 7.4B
MFBCDQS<0>	6.2C 6.4B
MFBCDQS<3..0>	6.1G<>
MFBCDQS<1>	6.2C 6.4B
MFBCDQS<2>	6.2E 6.4B
MFBCDQS<3>	6.2E 6.4B
MFBCDQS<4>	7.2C 7.4B
MFBCDQS<7..4>	7.1G<>
MFBCDQS<5>	7.2C 7.4B
MFBCDQS<6>	7.2E 7.4B
MFBCDQS<7>	7.2E 7.4B
MINIDIN_CIN	12.2A< 13.2G>
MINIDIN_COUT	10.1G<> 10.4C> 13.2B<
MINIDIN_PBOUT	10.1G<> 10.5C> 13.2B<
MINIDIN_Y_CVBSIN	12.2A< 13.2B>
MINIDIN_Y_CVBSOUT	10.1G<> 10.4C> 13.2F<
NV18_VREFCG	2.5G<>
OCSET	17.1G<> 17.2C
PCIAD<0>	2.1C 2.1D
PCIAD<31..0>	2.1D 2.4G<>
PCIAD<1>	2.1C 2.1D

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PCIAD<2>	2.1C 2.1D
PCIAD<3>	2.1C 2.1D
PCIAD<4>	2.1C 2.1D
PCIAD<5>	2.1C 2.1D
PCIAD<6>	2.1C 2.1D
PCIAD<7>	2.1C 2.1D
PCIAD<8>	2.1C 2.1D
PCIAD<9>	2.1C 2.1D
PCIAD<10>	2.1C 2.1D
PCIAD<11>	2.1C 2.1D
PCIAD<12>	2.1C 2.1D
PCIAD<13>	2.1C 2.1D
PCIAD<14>	2.1C 2.1D
PCIAD<15>	2.2C 2.2D
PCIAD<16>	2.2C 2.2D
PCIAD<17>	2.2C 2.2D
PCIAD<18>	2.2C 2.2D
PCIAD<19>	2.2C 2.2D
PCIAD<20>	2.2C 2.2D
PCIAD<21>	2.2C 2.2D
PCIAD<22>	2.2C 2.2D
PCIAD<23>	2.2C 2.2D
PCIAD<24>	2.2C 2.2D
PCIAD<25>	2.2C 2.2D
PCIAD<26>	2.2C 2.2D
PCIAD<27>	2.2C 2.2D
PCIAD<28>	2.2C 2.2D
PCIAD<29>	2.2C 2.2D
PCIAD<30>	2.2C 2.2D
PCIAD<31>	2.2C 2.2D
PCICBE<0>	2.2C 2.2D
PCICBE<3..0>	2.2C 2.4G<>
PCICBE<1>	2.2C 2.2D
PCICBE<2>	2.2C 2.2D
PCICBE<3>	2.2C 2.2D
PCICLK	2.2C 2.4G<>
PCIDEVSEL	2.3C 2.4G<>
PCIFRAME	2.3C 2.4G<>
PCIGNT	2.3C 2.4G<>
PCIINTA	2.3C 2.4G<>
PCIINTB	2.4G<>
PCIIRDY	2.3C 2.4G<>
PCIPAR	2.3C 2.4G<>
PCIREQ	2.2C 2.4G<>
PCIRST*	2.2C 2.4G<>
PCISTOP	2.3C 2.4G<>
PCITRDY	2.3C 2.4G<>
PHASE	17.1G<> 17.2C 17.2H
PLLVDD	8.1G<> 8.4C
RESET_BUF*	12.3A< 14.5C>
ROMA14	14.2C> 15.2F 15.3A<> 15.3B 15.3F< 15.4F<
ROMA15	14.2C> 15.2F 15.3F< 15.4A<> 15.4B 15.4F<
ROMCS*	14.2C> 15.2F 15.3F< 15.4G<
SEL_2ND_DEV	8.4B< 10.3A< 14.2F>
STEREO	8.4D> 13.4F<
STRAP0	14.4C> 15.2A<> 15.2B
STRAP1	14.4C> 15.2A<> 15.2B
STRAP2	14.5C> 15.2A<> 15.2B
STRAP3	14.5C> 15.2A<> 15.2B
SW_5V	16.1G<> 16.3G 16.4C
SW_12V	16.1G<> 16.3H 16.4D
SW_COMP	16.1G<> 16.4D
SW_FB	14.2H> 16.1G<> 16.3H 16.4D<
THERM	14.1E 14.1G<> 14.5E
THERM*	14.1G<> 14.2E 14.5E
TMDSPLL_ADJ	16.2F 16.2G<>
TMDS_BACK	11.1G<> 11.2F
TUNER_INT	13.4D> 14.2F<
VIDINT_CIN	12.2A< 13.4A>
VIDINT_CVBSIN	12.2A< 13.4A>
VIDINT_TUNER	12.2A< 13.5A>
VIDINT_Y	12.2A< 13.4A>
VIPD<0>	12.3D 14.2C 15.3G
VIPD<7..0>	12.3A> 14.1G<> 14.2D<> 15.3H<>
VIPD<1>	12.3D 14.2C 15.3G
VIPD<2>	12.3D 14.2C 15.2A<> 15.2B 15.4G
VIPD<3>	12.3D 14.2C 15.4G
VIPD<4>	12.3D 14.2C 15.4G
VIPD<5>	12.3D 14.2C 15.4G
VIPD<6>	12.3D 14.2C 15.3A<> 15.3B 15.4G
VIPD<7>	12.3D 14.2C 15.4G
VIPHAD0	14.2C> 15.4G<
VIPHAD1	14.2C> 15.4G<
VIPHCTL	14.2D< 15.2A<> 15.2B 15.2F 15.3F>
VIPPCLK	12.4B> 14.1G<> 14.2D<
XTALIN	8.1G<> 8.5C
XTALOUT	8.1G<> 8.5D

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

BKT1	BRACKET	17
C1	C	10
C2	C	10
C3	C	11
C4	C	17
C5	C	9
C6	C	9
C7	C	11
C8	C	10
C9	C	14
C10	C	10
C11	C	14
C12	C	8
C13	C	12
C14	C	12
C15	C_POL	16
C16	C	15
C17	C_POL	16
C18	C	14
C19	C_POL	16
C20	C	15
C21	C	16
C22	C	16
C23	C	14
C24	C_POL	16
C25	C	2
C26	C_POL	16
C27	C	2
C28	C	2
C29	C	16
C30	C	16
C31	C	16
C32	C	16
C33	C	2
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