P413: G86, DDR2 MEMORY 32MX16/16Mx16

REV HISTORY

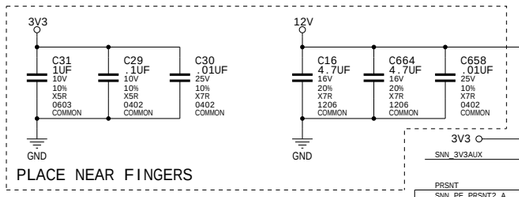
SKU	VARIANT	NVPN	ASSEMBLY
0	BASE	600-10413-xxxx-000	BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL
1	SKU0000	600-10413-0000-000	P413: G86-200, 64 BIT DDR2 16Mx16 MEMORY, VGA+DVI+HDout
2	SKU0001	600-10413-0001-000	P413: G86-200, 64 BIT DDR2 32Mx16 MEMORY, VGA+DVI+HDout
3	SKU0050	600-10413-0050-000	P413: G78-300, 64 BIT DDR2 16Mx16 MEMORY, VGA+DVI+HDout
4	SKU0051	600-10413-0051-000	P413: G78-300, 64 BIT DDR2 32Mx16 MEMORY, VGA+DVI+HDout
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>

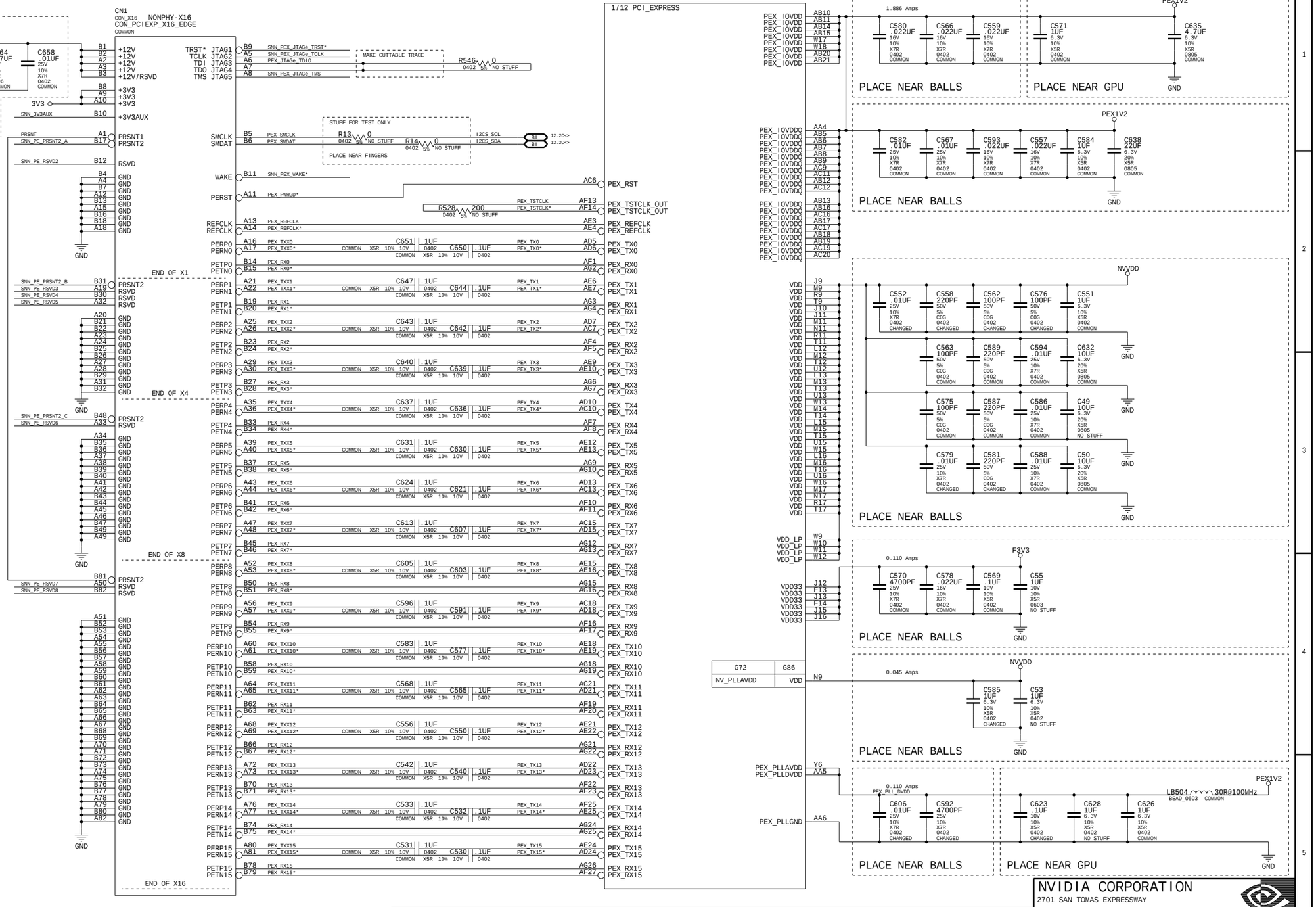
ASSEMBLY	P413: G86-200, 64 BIT DDR2 32Mx16 MEMORY, VGA+DVI+HDout
PAGE DETAIL	P413 Overview

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

NV_PN	600-10413-0001-000 F		
ID	p413	PAGE	1 OF 16
NAME	dawong	DATE	25-OCT-2006

PCI Express Interface





Net Name	DIFF_PAIR	CRITICAL	IMPEDANCE
PEX_TSTCLK	PEX_TSTCLK	1	100DIFF
PEX_TSTCLK*	PEX_TSTCLK	1	100DIFF
PEX_TX0	PEX_TX0	1	100DIFF
PEX_TX0*	PEX_TX0	1	100DIFF
PEX_TX1	PEX_TX1	1	100DIFF
PEX_TX1*	PEX_TX1	1	100DIFF
PEX_TX2	PEX_TX2	1	100DIFF
PEX_TX2*	PEX_TX2	1	100DIFF
PEX_TX3	PEX_TX3	1	100DIFF
PEX_TX3*	PEX_TX3	1	100DIFF
PEX_TX4	PEX_TX4	1	100DIFF
PEX_TX4*	PEX_TX4	1	100DIFF
PEX_TX5	PEX_TX5	1	100DIFF
PEX_TX5*	PEX_TX5	1	100DIFF
PEX_TX6	PEX_TX6	1	100DIFF
PEX_TX6*	PEX_TX6	1	100DIFF
PEX_TX7	PEX_TX7	1	100DIFF
PEX_TX7*	PEX_TX7	1	100DIFF
PEX_TX8	PEX_TX8	1	100DIFF
PEX_TX8*	PEX_TX8	1	100DIFF
PEX_TX9	PEX_TX9	1	100DIFF
PEX_TX9*	PEX_TX9	1	100DIFF
PEX_TX10	PEX_TX10	1	100DIFF
PEX_TX10*	PEX_TX10	1	100DIFF
PEX_TX11	PEX_TX11	1	100DIFF
PEX_TX11*	PEX_TX11	1	100DIFF
PEX_TX12	PEX_TX12	1	100DIFF
PEX_TX12*	PEX_TX12	1	100DIFF
PEX_TX13	PEX_TX13	1	100DIFF
PEX_TX13*	PEX_TX13	1	100DIFF
PEX_TX14	PEX_TX14	1	100DIFF
PEX_TX14*	PEX_TX14	1	100DIFF
PEX_TX15	PEX_TX15	1	100DIFF
PEX_TX15*	PEX_TX15	1	100DIFF
PEX_TXX0	PEX_TXX0	1	100DIFF
PEX_TXX0*	PEX_TXX0	1	100DIFF
PEX_TXX1	PEX_TXX1	1	100DIFF
PEX_TXX1*	PEX_TXX1	1	100DIFF
PEX_TXX2	PEX_TXX2	1	100DIFF
PEX_TXX2*	PEX_TXX2	1	100DIFF
PEX_TXX3	PEX_TXX3	1	100DIFF
PEX_TXX3*	PEX_TXX3	1	100DIFF
PEX_TXX4	PEX_TXX4	1	100DIFF
PEX_TXX4*	PEX_TXX4	1	100DIFF
PEX_TXX5	PEX_TXX5	1	100DIFF
PEX_TXX5*	PEX_TXX5	1	100DIFF
PEX_TXX6	PEX_TXX6	1	100DIFF
PEX_TXX6*	PEX_TXX6	1	100DIFF
PEX_TXX7	PEX_TXX7	1	100DIFF
PEX_TXX7*	PEX_TXX7	1	100DIFF
PEX_TXX8	PEX_TXX8	1	100DIFF
PEX_TXX8*	PEX_TXX8	1	100DIFF
PEX_TXX9	PEX_TXX9	1	100DIFF
PEX_TXX9*	PEX_TXX9	1	100DIFF
PEX_TXX10	PEX_TXX10	1	100DIFF
PEX_TXX10*	PEX_TXX10	1	100DIFF
PEX_TXX11	PEX_TXX11	1	100DIFF
PEX_TXX11*	PEX_TXX11	1	100DIFF
PEX_TXX12	PEX_TXX12	1	100DIFF
PEX_TXX12*	PEX_TXX12	1	100DIFF
PEX_TXX13	PEX_TXX13	1	100DIFF
PEX_TXX13*	PEX_TXX13	1	100DIFF
PEX_TXX14	PEX_TXX14	1	100DIFF
PEX_TXX14*	PEX_TXX14	1	100DIFF
PEX_TXX15	PEX_TXX15	1	100DIFF
PEX_TXX15*	PEX_TXX15	1	100DIFF
PEX_RX0	PEX_RX0	1	100DIFF
PEX_RX0*	PEX_RX0	1	100DIFF
PEX_RX1	PEX_RX1	1	100DIFF
PEX_RX1*	PEX_RX1	1	100DIFF
PEX_RX2	PEX_RX2	1	100DIFF
PEX_RX2*	PEX_RX2	1	100DIFF
PEX_RX3	PEX_RX3	1	100DIFF
PEX_RX3*	PEX_RX3	1	100DIFF
PEX_RX4	PEX_RX4	1	100DIFF
PEX_RX4*	PEX_RX4	1	100DIFF
PEX_RX5	PEX_RX5	1	100DIFF
PEX_RX5*	PEX_RX5	1	100DIFF
PEX_RX6	PEX_RX6	1	100DIFF
PEX_RX6*	PEX_RX6	1	100DIFF
PEX_RX7	PEX_RX7	1	100DIFF
PEX_RX7*	PEX_RX7	1	100DIFF
PEX_RX8	PEX_RX8	1	100DIFF
PEX_RX8*	PEX_RX8	1	100DIFF
PEX_RX9	PEX_RX9	1	100DIFF
PEX_RX9*	PEX_RX9	1	100DIFF
PEX_RX10	PEX_RX10	1	100DIFF
PEX_RX10*	PEX_RX10	1	100DIFF
PEX_RX11	PEX_RX11	1	100DIFF
PEX_RX11*	PEX_RX11	1	100DIFF
PEX_RX12	PEX_RX12	1	100DIFF
PEX_RX12*	PEX_RX12	1	100DIFF
PEX_RX13	PEX_RX13	1	100DIFF
PEX_RX13*	PEX_RX13	1	100DIFF
PEX_RX14	PEX_RX14	1	100DIFF
PEX_RX14*	PEX_RX14	1	100DIFF
PEX_RX15	PEX_RX15	1	100DIFF
PEX_RX15*	PEX_RX15	1	100DIFF
PEX_REFCLK	PEX_REFCLK	1	100DIFF
PEX_REFCLK*	PEX_REFCLK	1	100DIFF

ASSEMBLY	P413: G86-200, 64 BIT DDR2 32Mx16 MEMORY, VGA+DVI+HDout
PAGE DETAIL	PCI Express Interface

NVIDIA CORPORATION
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NV_PN	600-10413-0001-000 F		
ID	p413	PAGE	2 OF 16
NAME	dawong	DATE	25-OCT-2006

Frame Buffer Interface

G1
G86-200-A1
BGA533
CHANGED

2/12 FRAME_BUFFER

4.1G< 5.3A< 4.3A<	B1	FBAD<63..0>	
0	FBAD<0>	A26	FB_DQ0
1	FBAD<1>	C24	FB_DQ1
2	FBAD<2>	B24	FB_DQ2
3	FBAD<3>	A24	FB_DQ3
4	FBAD<4>	C22	FB_DQ4
5	FBAD<5>	A25	FB_DQ5
6	FBAD<6>	B25	FB_DQ6
7	FBAD<7>	D23	FB_DQ7
8	FBAD<8>	G22	FB_DQ8
9	FBAD<9>	J23	FB_DQ9
10	FBAD<10>	E24	FB_DQ10
11	FBAD<11>	F23	FB_DQ11
12	FBAD<12>	J24	FB_DQ12
13	FBAD<13>	F24	FB_DQ13
14	FBAD<14>	G23	FB_DQ14
15	FBAD<15>	H24	FB_DQ15
16	FBAD<16>	D16	FB_DQ16
17	FBAD<17>	E16	FB_DQ17
18	FBAD<18>	D17	FB_DQ18
19	FBAD<19>	F18	FB_DQ19
20	FBAD<20>	E19	FB_DQ20
21	FBAD<21>	E18	FB_DQ21
22	FBAD<22>	D20	FB_DQ22
23	FBAD<23>	D19	FB_DQ23
24	FBAD<24>	A18	FB_DQ24
25	FBAD<25>	B18	FB_DQ25
26	FBAD<26>	A19	FB_DQ26
27	FBAD<27>	B19	FB_DQ27
28	FBAD<28>	D18	FB_DQ28
29	FBAD<29>	C19	FB_DQ29
30	FBAD<30>	C16	FB_DQ30
31	FBAD<31>	C18	FB_DQ31
32	FBAD<32>	N26	FB_DQ32
33	FBAD<33>	N25	FB_DQ33
34	FBAD<34>	R25	FB_DQ34
35	FBAD<35>	R26	FB_DQ35
36	FBAD<36>	R27	FB_DQ36
37	FBAD<37>	T25	FB_DQ37
38	FBAD<38>	T27	FB_DQ38
39	FBAD<39>	T26	FB_DQ39
40	FBAD<40>	AB23	FB_DQ40
41	FBAD<41>	Y24	FB_DQ41
42	FBAD<42>	AB24	FB_DQ42
43	FBAD<43>	AB22	FB_DQ43
44	FBAD<44>	AC24	FB_DQ44
45	FBAD<45>	AC22	FB_DQ45
46	FBAD<46>	AA23	FB_DQ46
47	FBAD<47>	AA22	FB_DQ47
48	FBAD<48>	T24	FB_DQ48
49	FBAD<49>	T23	FB_DQ49
50	FBAD<50>	R24	FB_DQ50
51	FBAD<51>	R23	FB_DQ51
52	FBAD<52>	R22	FB_DQ52
53	FBAD<53>	T22	FB_DQ53
54	FBAD<54>	N23	FB_DQ54
55	FBAD<55>	P24	FB_DQ55
56	FBAD<56>	AA24	FB_DQ56
57	FBAD<57>	AA27	FB_DQ57
58	FBAD<58>	AA26	FB_DQ58
59	FBAD<59>	AB25	FB_DQ59
60	FBAD<60>	AB26	FB_DQ60
61	FBAD<61>	AB27	FB_DQ61
62	FBAD<62>	AA25	FB_DQ62
63	FBAD<63>	W25	FB_DQ63

5.4A< 4.4A< 4.1G<	OUT	FBADQM<7..0>	
0	FBADQM<0>	D21	FB_DQM0
1	FBADQM<1>	F22	FB_DQM1
2	FBADQM<2>	F20	FB_DQM2
3	FBADQM<3>	A21	FB_DQM3
4	FBADQM<4>	V27	FB_DQM4
5	FBADQM<5>	W22	FB_DQM5
6	FBADQM<6>	V22	FB_DQM6
7	FBADQM<7>	V24	FB_DQM7

5.4A< 5.1G< 4.1G< 4.4A<	B1	FBADQS<7..0>	
0	FBADQS<0>	B22	FB_DQS_WP0
1	FBADQS<1>	D22	FB_DQS_WP1
2	FBADQS<2>	E21	FB_DQS_WP2
3	FBADQS<3>	C21	FB_DQS_WP3
4	FBADQS<4>	V25	FB_DQS_WP4
5	FBADQS<5>	W24	FB_DQS_WP5
6	FBADQS<6>	U24	FB_DQS_WP6
7	FBADQS<7>	W26	FB_DQS_WP7

5.4A< 5.1G< 4.1G< 4.4A<	B1	FBADQSN<7..0>	
0	FBADQSN<0>	A22	FB_DQS_RN0
1	FBADQSN<1>	E22	FB_DQS_RN1
2	FBADQSN<2>	F21	FB_DQS_RN2
3	FBADQSN<3>	B21	FB_DQS_RN3
4	FBADQSN<4>	V26	FB_DQS_RN4
5	FBADQSN<5>	W23	FB_DQS_RN5
6	FBADQSN<6>	V23	FB_DQS_RN6
7	FBADQSN<7>	W27	FB_DQS_RN7

		A16	FB_VREF

FBVDDQ
R512 1K 1% 0402 COMMON (Rt)
R513 1K 1% 0402 COMMON (Rb)
C564 .1UF 10V 10% X5R 0402 COMMON
GND
FBVREF = FBVDDQ * Rb/(Rt + Rb)
VREF = 0.5 * FBVDDQ
DDR2: 1.0V = 2.0V * 1K/(1K + 1K)

		E15	FB_VTT
		F15	FB_VTT
		F16	FB_VTT
		J17	FB_VTT
		J18	FB_VTT
		L19	FB_VTT
		N19	FB_VTT
		R19	FB_VTT
		U19	FB_VTT
		W19	FB_VTT

FBVDDQ
C548 .022UF 16V 10% X7R 0402 COMMON
C561 .022UF 16V 10% X7R 0402 COMMON
C546 .1UF 10V 10% X5R 0402 COMMON
C547 4700PF 25V 10% X7R 0402 CHANGED
C56 4.7UF 6.3V 10% X5R 0603 NO STUFF
C54 4.7UF 6.3V 10% X5R 0603 NO STUFF
GND
PLACE NEAR BGA

		F17	FB_VDDQ
		F19	FB_VDDQ
		J19	FB_VDDQ
		M19	FB_VDDQ
		T19	FB_VDDQ
		J22	FB_VDDQ
		L22	FB_VDDQ
		P22	FB_VDDQ
		U22	FB_VDDQ
		Y22	FB_VDDQ

FBVDDQ
C543 4700PF 25V 10% X7R 0402 COMMON
C545 4700PF 25V 10% X7R 0402 COMMON
C553 4700PF 25V 10% X7R 0402 COMMON
C535 .022UF 16V 10% X7R 0402 COMMON
C537 .1UF 10V 10% X5R 0402 COMMON
C549 1UF 6.3V 10% X5R 0402 CHANGED
C544 .1UF 10V 10% X5R 0402 CHANGED
C560 4700PF 25V 10% X7R 0402 COMMON
C554 .1UF 10V 10% X5R 0402 CHANGED
C538 .022UF 16V 10% X7R 0402 COMMON
C539 .022UF 16V 10% X7R 0402 COMMON
C534 .1UF 10V 10% X5R 0402 COMMON
C536 1UF 10V 10% X5R 0402 COMMON
C555 1UF 6.3V 10% X5R 0402 COMMON
GND
PLACE BELOW GPU

FBACMD<25..0> OUT 4.1A< 4.1G< 5.1A<

FB_CMD0	G27	FBACMD<0>	0
FB_CMD1	D25	FBACMD<1>	1
FB_CMD2	F26	FBACMD<2>	2
FB_CMD3	F25	FBACMD<3>	3
FB_CMD4	G25	FBACMD<4>	4
FB_CMD5	J25	FBACMD<5>	5
FB_CMD6	J27	FBACMD<6>	6
FB_CMD7	M26	FBACMD<7>	7
FB_CMD8	C27	FBACMD<8>	8
FB_CMD9	C25	FBACMD<9>	9
FB_CMD10	D24	FBACMD<10>	10
FB_CMD11	N27	FBACMD<11>	11
FB_CMD12	G24	FBACMD<12>	12
FB_CMD13	J26	FBACMD<13>	13
FB_CMD14	M27	FBACMD<14>	14
FB_CMD15	C26	FBACMD<15>	15
FB_CMD16	M25	FBACMD<16>	16
FB_CMD17	D26	FBACMD<17>	17
FB_CMD18	D27	FBACMD<18>	18
FB_CMD19	K26	FBACMD<19>	19
FB_CMD20	K25	FBACMD<20>	20
FB_CMD21	K24	FBACMD<21>	21
FB_CMD22	F27	FBACMD<22>	22
FB_CMD23	K27	FBACMD<23>	23
FB_CMD24	G26	FBACMD<24>	24
FB_CMD25	B27	FBACMD<25>	25
FB_CMD26	V24	SNN_FBA_CMD26	
FB_CMD27	M23	SNN_FBA_CMD27	
FB_CMD28	M24	SNN_FBA_CMD28	

PD REQUIRED FOR INITIALIZATION
CKE RESET/ODT
FBACMD<11>
R48 10K 5% 0402 COMMON
GND

FBACLK0	TP502	
FBACLK0*	TP501	
FBACLK1	TP504	
FBACLK1*	TP503	
FBADQS<1>	TP509	
FBADQSN<1>	TP505	

LAB TESTPOINTS

FB_CLK0	L24	FBACLK0	4.1G< 4.2A< 4.2C< 4.5B< OUT
FB_CLK0	K23	FBACLK0*	4.1G< 4.2A< 4.2C< 4.5B< OUT
FB_CLK1	M22	FBACLK1	5.1G< 5.2A< 5.2C< 5.5B< OUT
FB_CLK1	N22	FBACLK1*	5.1G< 5.2A< 5.2C< 5.5B< OUT

FBVDDQ
R511 40.2 1% 0402 COMMON

FB_CAL_PD_VDDQ	D15	FBCAL_PD_VDDQ
FB_CAL_PU_GND	E13	FBCAL_PU_GND
FB_CAL_TERM_GND	H22	FBCAL_TERM_GND

R510 40.2 1% 0402 COMMON
R514 30.1 1% 0402 COMMON
GND GND

FB_DEBUG	K22	FBA_DEBUG

G72	G86
NC	H_PLLVDD
FB_PLLAVDD	FB_PLLAVDD
FB_PLLGND	FB_PLLGND

	D14	FBA_PLLAVDD
	D13	
	C15	

0.057 Amps
C574 .01UF 25V 10% X7R 0402 COMMON
PLACE NEAR BALLS

PEX1V2
LB501 220R@100MHz BEAD_0402 COMMON
C573 1UF 6.3V 10% X5R 0402 COMMON
C572 4.7UF 6.3V 10% X5R 0805 COMMON
GND
PLACE NEAR GPU

5.2C< 5.2A< 4.2C< 4.2A< 3.4F>

IN	FBA_DEBUG	1	500HM	
IN	DDR_ODT	1	500HM	

PD REQUIRED FOR INITIALIZATION
RESET/ODT

FBACMD<12> R53 0 0402 5% COMMON
FBA_DEBUG R54 0 0402 5% NO STUFF
DDR_ODT OUT 5.2C< 3.1G< 4.2C< 4.2A< 5.2A<
R55 10K 5% 0402 NO STUFF
R52 10K 5% 0402 NO STUFF
R42 10K 5% 0402 COMMON
FBVDDQ
GND

FBVDDQ
FBACMD<0> RP9 150 0402X4 5% NO STUFF
FBACMD<1> RP9 150 0402X4 5% NO STUFF
FBACMD<2> RP8 150 0402X4 5% NO STUFF
FBACMD<3> RP8 150 0402X4 5% NO STUFF
FBACMD<4> RP3 150 0402X4 5% NO STUFF
FBACMD<5> RP3 150 0402X4 5% NO STUFF
FBACMD<6> RP3 150 0402X4 5% NO STUFF
FBACMD<8> RP3 150 0402X4 5% NO STUFF
FBACMD<9> RP4 150 0402X4 5% NO STUFF
FBACMD<10> RP4 150 0402X4 5% NO STUFF
FBACMD<13> RP5 150 0402X4 5% NO STUFF
FBACMD<14> RP5 150 0402X4 5% NO STUFF
FBACMD<15> RP7 150 0402X4 5% NO STUFF
FBACMD<16> RP7 150 0402X4 5% NO STUFF
FBACMD<17> RP10 150 0402X4 5% NO STUFF
FBACMD<18> RP10 150 0402X4 5% NO STUFF
FBACMD<19> RP1 150 0402X4 5% NO STUFF
FBACMD<20> RP1 150 0402X4 5% NO STUFF
FBACMD<21> RP12 150 0402X4 5% NO STUFF
FBACMD<22> RP12 150 0402X4 5% NO STUFF
FBACMD<23> RP11 150 0402X4 5% NO STUFF
FBACMD<24> RP11 150 0402X4 5% NO STUFF
FBACMD<25> RP11 150 0402X4 5% NO STUFF
FBACMD<7> RP11 150 0402X4 5% NO STUFF
GND
FBA CMD/Addr Terminations

ASSEMBLY	P413: G86-200, 64 BIT DDR2 32Mx16 MEMORY, VGA+DVI+HDout
PAGE DETAIL	Frame Buffer Interface

NVIDIA CORPORATION
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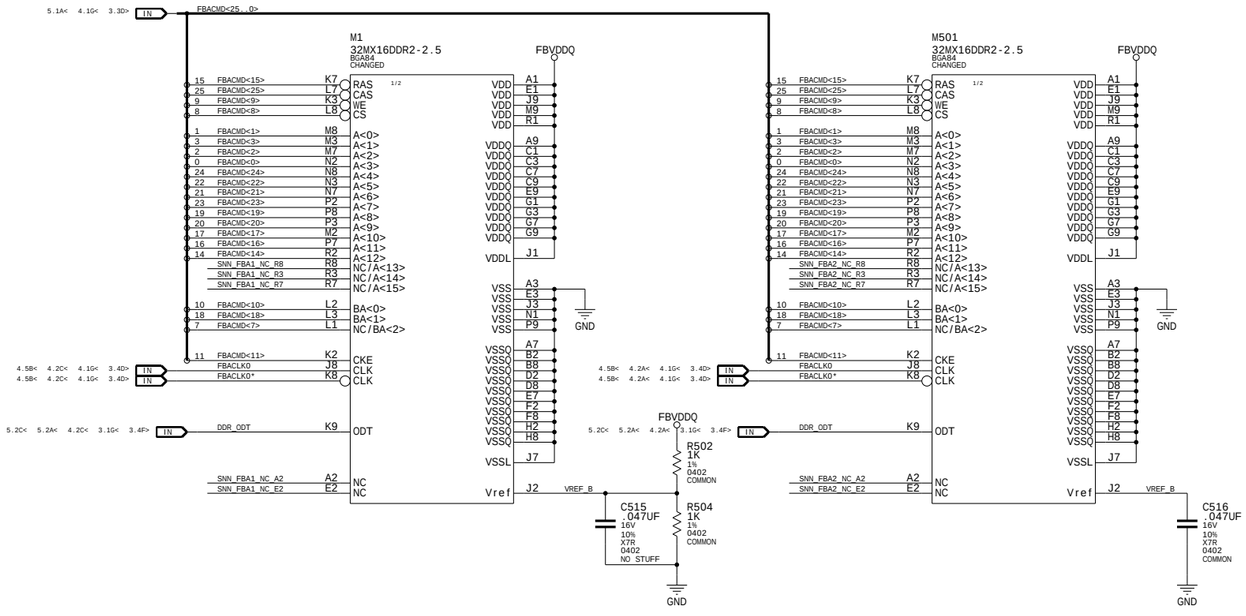
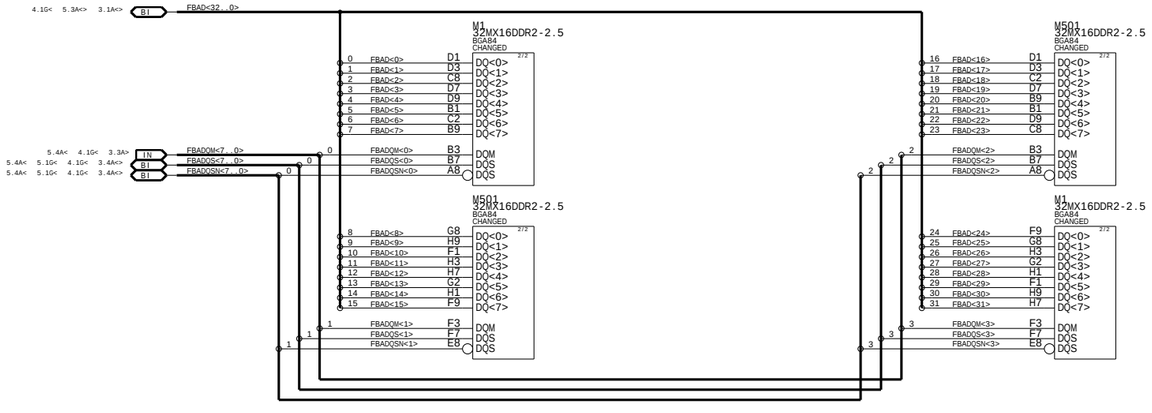
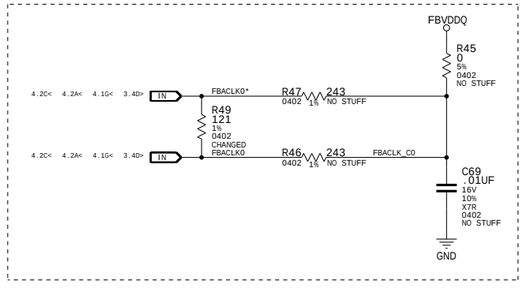
NV_PN	600-10413-0001-000 F		
ID	p413	PAGE	3 OF 16
NAME	dawong	DATE	25-OCT-2006

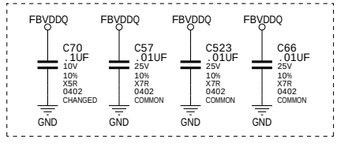
Memory 1st Bank 0..31



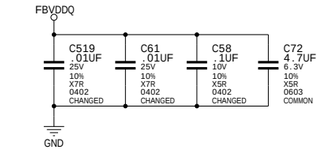


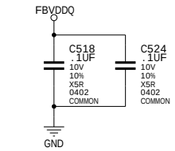


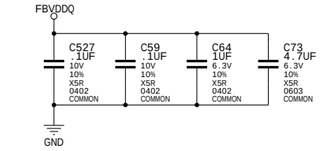
Place these caps next to plane transitions

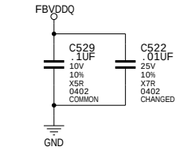


Net Name	DIFF_PAIR	CRITICAL	IMPEDANCE
FBACLK0	FBACLK0	1	100DIFF
FBACLK0*	FBACLK0	1	100DIFF
FBAD<63..0>		1	50OHM
FBACMD<25..0>		1	50OHM
FBADM<7..0>		1	50OHM
FBADS<7..0>	FBADS0	1	100DIFF
FBADSN<7..0>	FBADS0	1	100DIFF
FBADS<0>	FBADS0	1	100DIFF
FBADSN<0>	FBADS0	1	100DIFF
FBADS<1>	FBADS1	1	100DIFF
FBADSN<1>	FBADS1	1	100DIFF
FBADS<2>	FBADS2	1	100DIFF
FBADSN<2>	FBADS2	1	100DIFF
FBADS<3>	FBADS3	1	100DIFF
FBADSN<3>	FBADS3	1	100DIFF

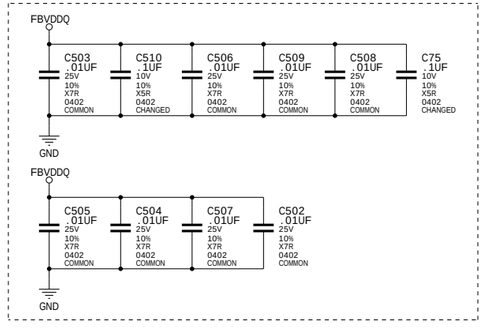








X-cap for CMD

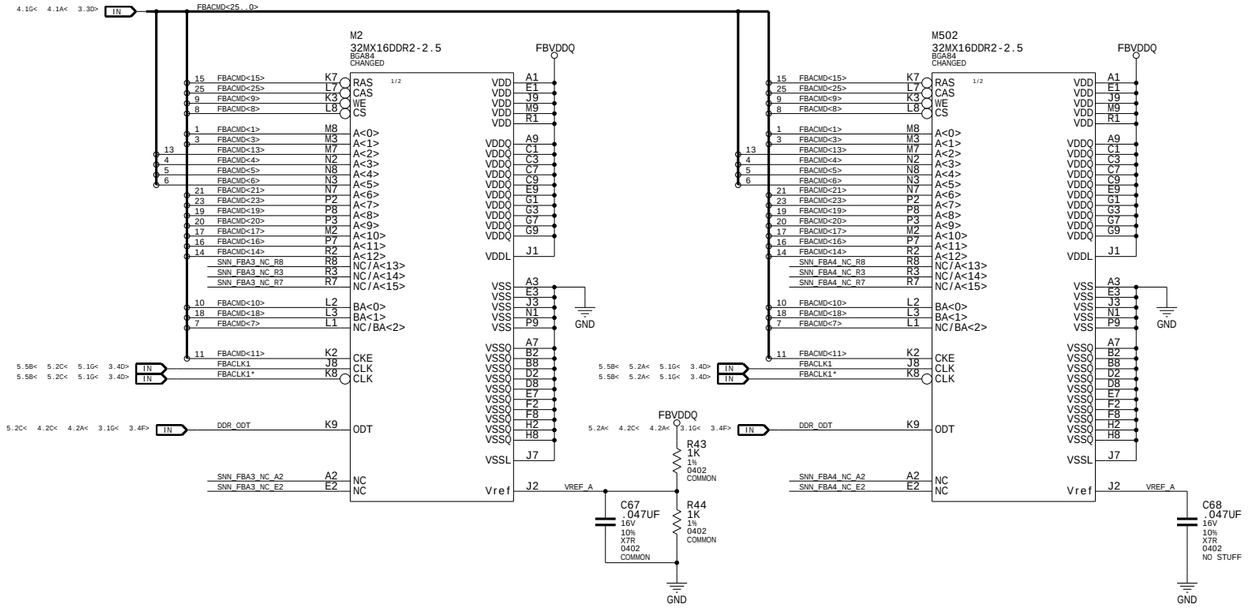


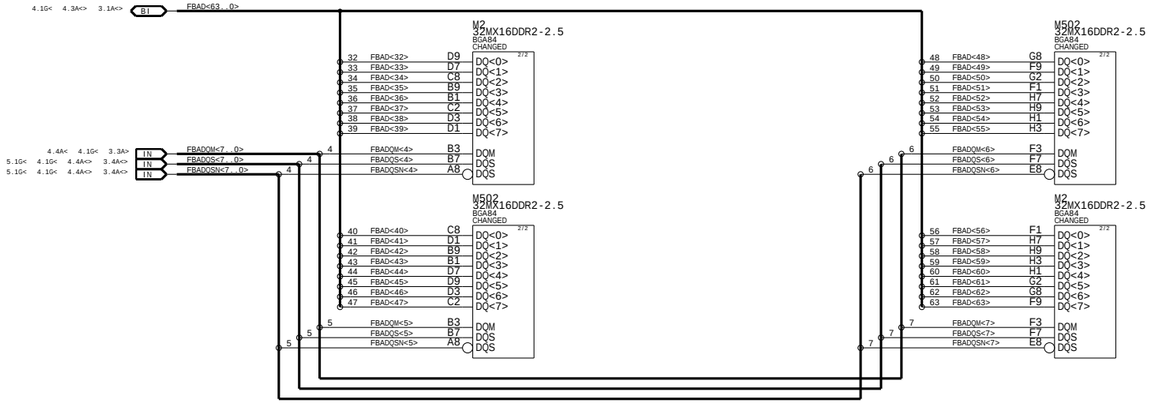
ASSEMBLY	P413: G86-200, 64 BIT DDR2 32Mx16 MEMORY, VGA+DVI+HDout
PAGE DETAIL	Memory 1st Bank 0..31

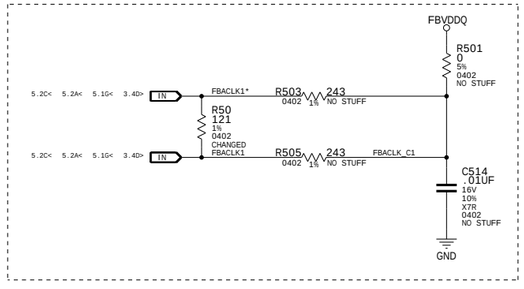
NVIDIA CORPORATION
2701 SAN TOMAS EXPRESSWAY
SANTA CLARA, CA 95050, USA

NV_PN	600-10413-0001-000 F		
ID	p413	PAGE	4 OF 16
NAME	dawong	DATE	25-OCT-2006

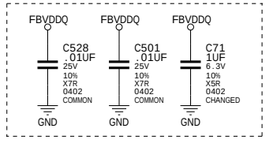
Memory 1st Bank 32..63



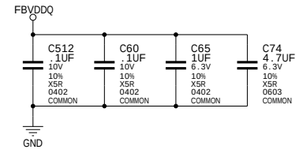


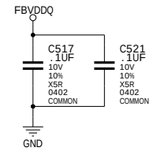


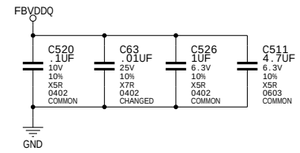
Place near signal transition area

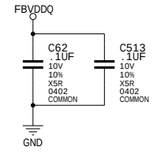


Net Name	DIFF_PAIR	CRITICAL	IMPEDANCE
FBACLK1	FBACLK1	1	100DIFF
FBACLK1*	FBACLK1	1	100DIFF
FBADQS<4>	FBADQS4	1	100DIFF
FBADQSN<4>	FBADQS4	1	100DIFF
FBADQS<5>	FBADQS5	1	100DIFF
FBADQSN<5>	FBADQS5	1	100DIFF
FBADQS<6>	FBADQS6	1	100DIFF
FBADQSN<6>	FBADQS6	1	100DIFF
FBADQS<7>	FBADQS7	1	100DIFF
FBADQSN<7>	FBADQS7	1	100DIFF









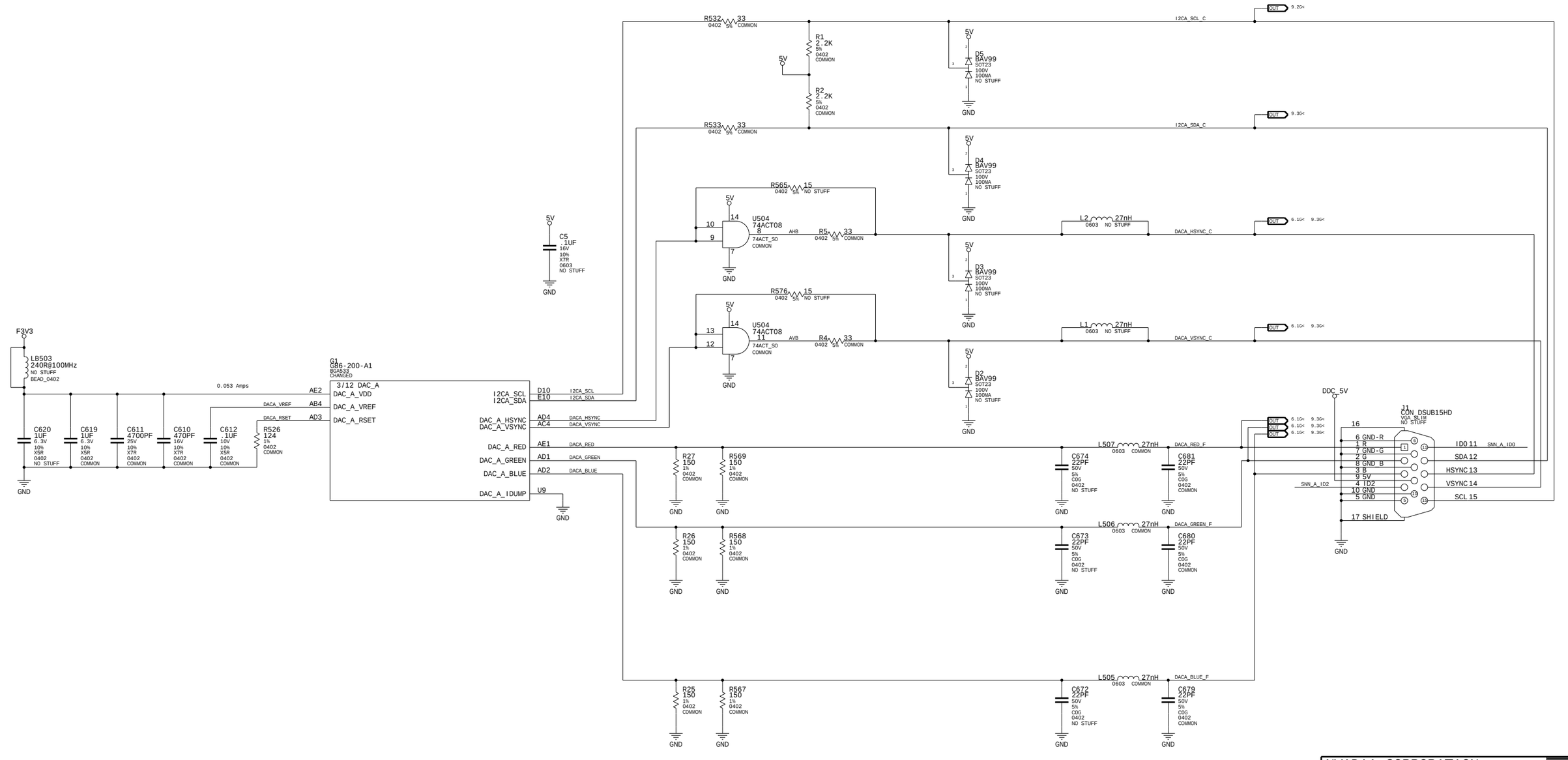
ASSEMBLY	P413: G86-200, 64 BIT DDR2 32Mx16 MEMORY, VGA+DVI+HDout
PAGE DETAIL	Memory 1st Bank 32..63

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

NV_PN	600-10413-0001-000 F		
ID	p413	PAGE	5 OF 16
NAME	dawong	DATE	25-OCT-2006

DACA, Slim DB15 Connector

Net Name	MIN_LINE_WIDTH	CRITICAL	IMPEDANCE
IN DACA_VREF	12MIL		
IN DACA_RSET	12MIL		
IN DACA_HSYNC		2	50OHM
IN DACA_VSYNC		2	50OHM
9.3G< 6.2G> IN DACA_HSYNC_C		2	50OHM
9.3G< 6.3G> IN DACA_VSYNC_C		2	50OHM
IN DACA_RED		1	50OHM
IN DACA_GREEN		1	50OHM
IN DACA_BLUE		1	50OHM
9.3G< 6.3G> IN DACA_RED_F		1	50OHM
9.3G< 6.3G> IN DACA_GREEN_F		1	50OHM
9.3G< 6.4G> IN DACA_BLUE_F		1	50OHM



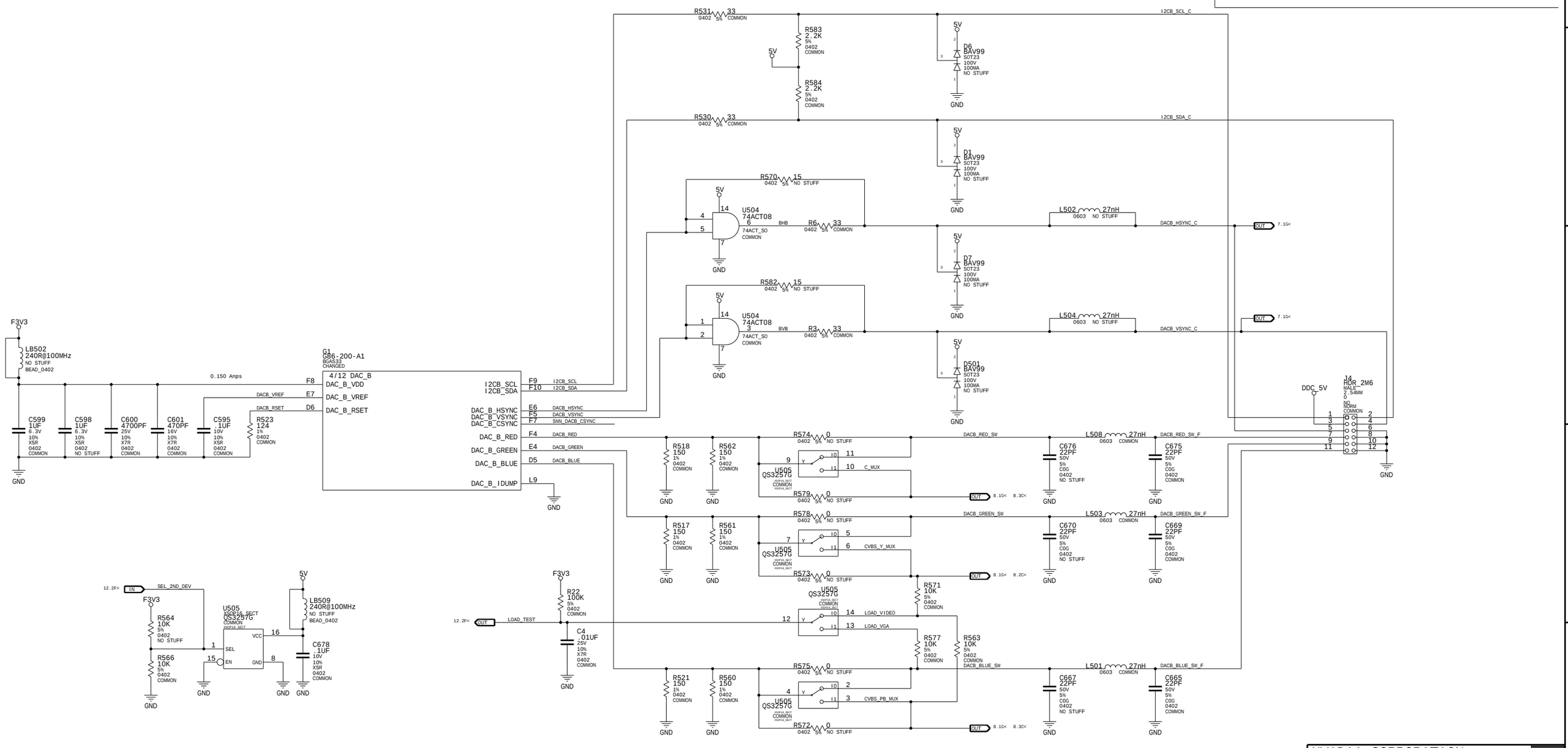
ASSEMBLY	P413: G86-200, 64 BIT DDR2 32Mx16 MEMORY, VGA+DVI+HDout
PAGE DETAIL	DACA, Slim DB15 Connector

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

NV_PN	600-10413-0001-000 F		
ID	p413	PAGE	6 OF 16
NAME	dawong	DATE	25-OCT-2006

DACB, MUX, 2x6 Header

Net Name	MIN_LINE_WIDTH	CRITICAL	IMPEDANCE
IN DACB_VREF	12MIL		
IN DACB_RSET	12MIL		
IN DACB_HSYNC		2	50OHM
IN DACB_VSYNC		2	50OHM
7.3G> IN DACB_HSYNC_C		2	50OHM
7.3G> IN DACB_VSYNC_C		2	50OHM
IN DACB_RED		1	56OHM
IN DACB_GREEN		1	56OHM
IN DACB_BLUE		1	56OHM
IN DACB_RED_SW_F		1	56OHM
IN DACB_GREEN_SW_F		1	56OHM
IN DACB_BLUE_SW_F		1	56OHM
IN DACB_RED_SW		1	56OHM
IN DACB_GREEN_SW		1	56OHM
IN DACB_BLUE_SW		1	56OHM



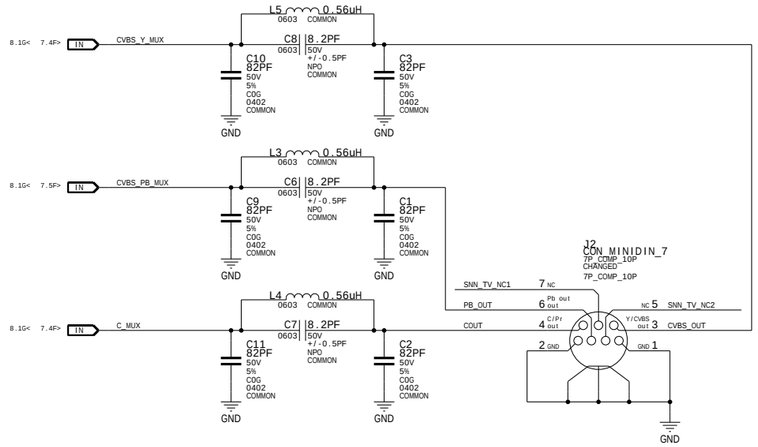
ASSEMBLY	P413: G86-200, 64 BIT DDR2 32Mx16 MEMORY, VGA+DVI+HDout
PAGE DETAIL	DACB, MUX, 2x6 Header

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

NV_PN	600-10413-0001-000 F		
ID	p413	PAGE	7 OF 16
NAME	dawong	DATE	25-OCT-2006

MiniDIN Connector

Net Name	CRITICAL	IMPEDANCE
C_MUX	1	56OHM
CVBS_Y_MUX	1	56OHM
CVBS_PB_MUX	1	56OHM
COUT	1	56OHM
CVBS_OUT	1	56OHM
PB_OUT	1	56OHM



ASSEMBLY	P413: G86-200, 64 BIT DDR2 32Mx16 MEMORY, VGA+DVI+HDout
PAGE DETAIL	MiniDIN Connector

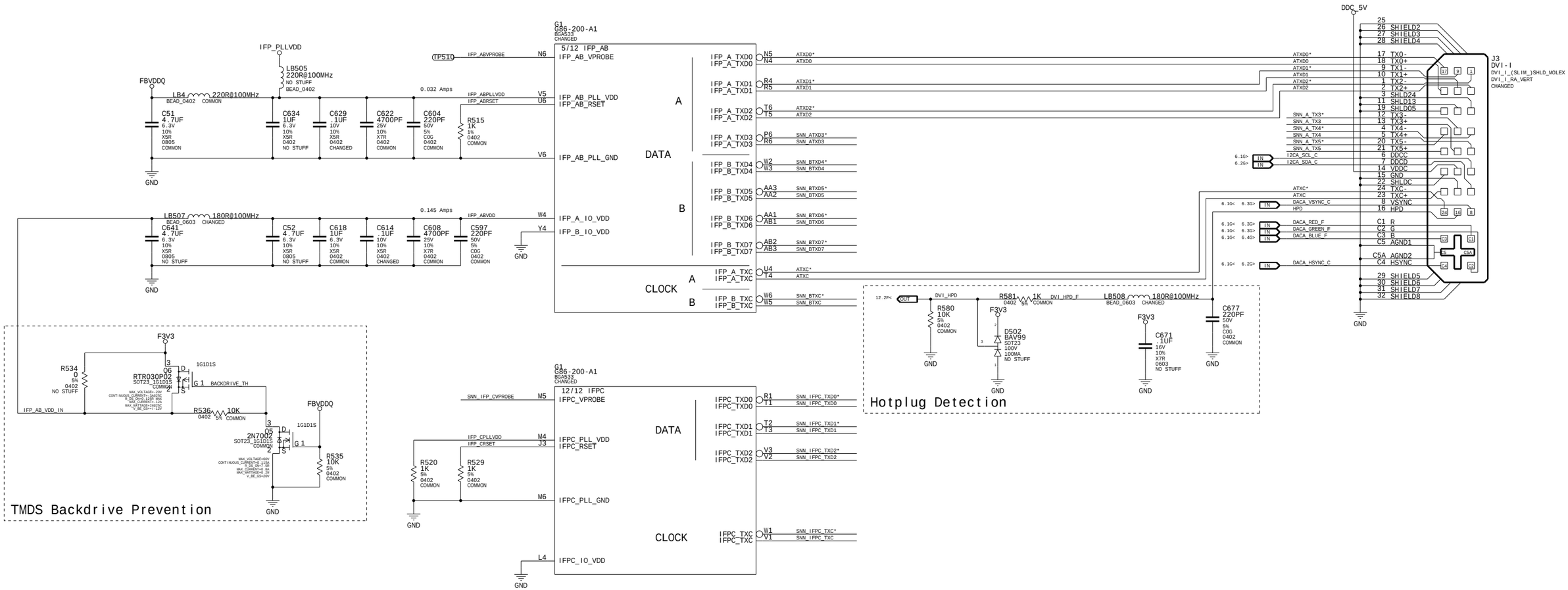
NVIDIA CORPORATION
2701 SAN TOMAS EXPRESSWAY
SANTA CLARA, CA 95050, USA

NV_PN	600-10413-0001-000 F		
ID	p413	PAGE	8 OF 16
NAME	dawong	DATE	25-OCT-2006

TMDS Interface

	Net Name	DIFF_PAIR	CRITICAL	IMPEDANCE
IN	ATXC	ATXC	1	100DIFF
IN	ATXC*	ATXC	1	100DIFF
IN	ATXD0	ATXD0	1	100DIFF
IN	ATXD0*	ATXD0	1	100DIFF
IN	ATXD1	ATXD1	1	100DIFF
IN	ATXD1*	ATXD1	1	100DIFF
IN	ATXD2	ATXD2	1	100DIFF
IN	ATXD2*	ATXD2	1	100DIFF

	Net Name	MIN_LINE_WIDTH	VOLTAGE
IN	IFP_ABPLLVDD	16MIL	3.3V
IN	IFP_ABVDD	16MIL	3.3V
IN	IFP_ABVDD_IN	16MIL	3.3V

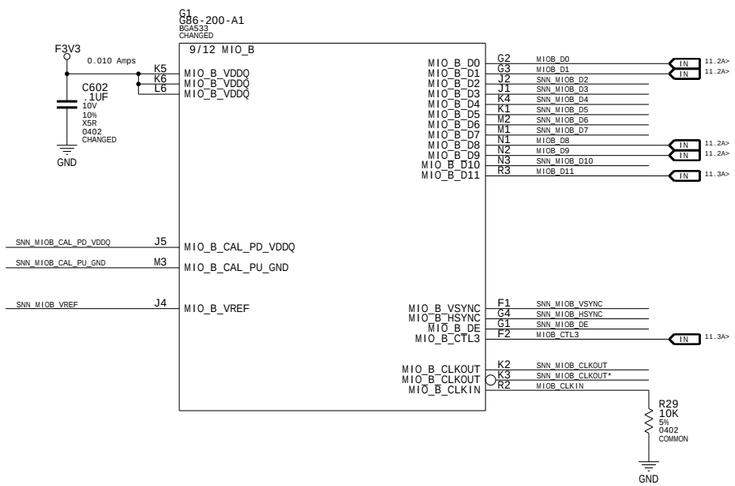


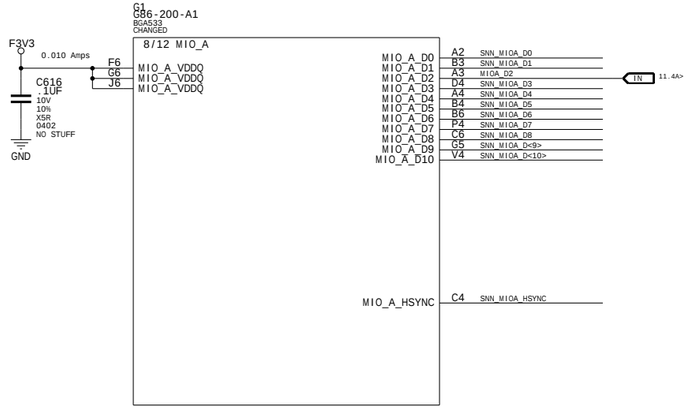
ASSEMBLY	P413: G86-200, 64 BIT DDR2 32Mx16 MEMORY, VGA+DVI+HDout
PAGE DETAIL	TMDS Interface

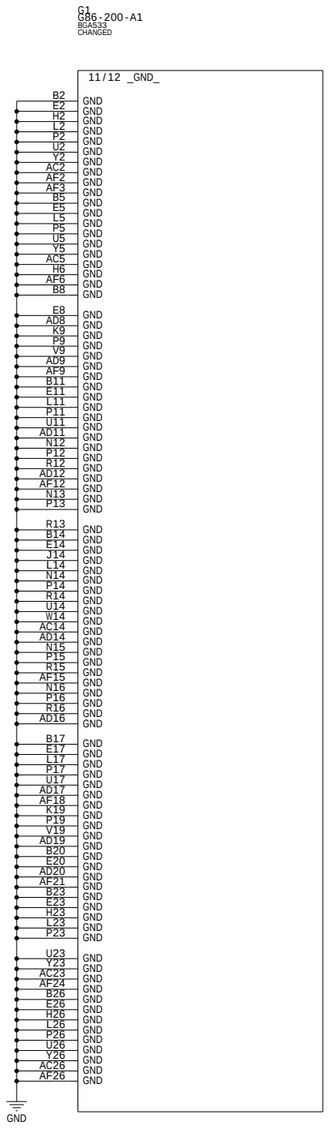
NVIDIA CORPORATION
2701 SAN TOMAS EXPRESSWAY
SANTA CLARA, CA 95050, USA

NV_PN	600-10413-0001-000 F		
ID	p413	PAGE	9 OF 16
NAME	dawong	DATE	25-OCT-2006

MIOA, MIOB Interface





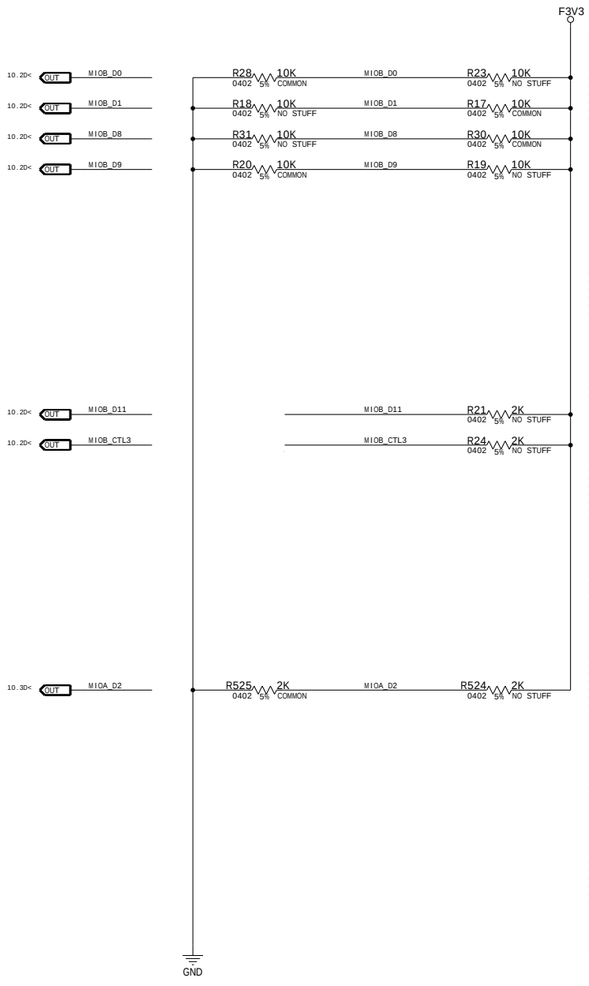


ASSEMBLY	P413: G86-200, 64 BIT DDR2 32Mx16 MEMORY, VGA+DVI+HDout
PAGE DETAIL	MIOA, MIOB Interface

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

NV_PN	600-10413-0001-000 F		
ID	p413	PAGE	10 OF 16
NAME	dawong	DATE	25-OCT-2006

Straps, Mechanical Parts



G86 Straps

Bit	Signal	Values		
01:	SUB_VENDOR	0 NO_BIOS 1 BIOS		
02:	RAM_CFG_0	0000 16Mx16 DDR2 64bit Elpida	1000 RFU	
		0001 16Mx16 DDR2 64bit Samsung, Micron	1001 RFU	
		0010 16Mx16 DDR2 64bit Infineon	1010 RFU	
03:	RAM_CFG_1	0011 16Mx16 DDR2 64bit Hynix	1011 RFU	
		0100 32Mx16 DDR2 64bit Elpida	1100 RFU	
		0101 32Mx16 DDR2 64bit Samsung	1101 RFU	
04:	RAM_CFG_2	0110 32Mx16 DDR2 64bit Infineon	1110 RFU	
		0111 32Mx16 DDR2 64bit Hynix	1111 RFU	
05:	RAM_CFG_3			
06:	CRYSTAL	0 27000K 1 14318K		
07:	TV_MODE_0	000 NTSC_M 001 NTSC_J 010 PAL_M		
08:	TV_MODE_1	011 PAL_N 100 PAL_CN 101 PAL_BDGHI		
09:	TV_MODE_2	110 RESERVED0 111 RESERVED1		
10:	PCI_DEVID_0	0010 (G86-200-A1: 0X0422) 0001 (G78-300-A1: 0X04C1)		
11:	PCI_DEVID_1			
12:	PCI_DEVID_2			
13:	PCI_DEVID_3			
	PCI_DEVID_4	G96 Strap		
17:	PEX_PLL_EN_TERM100	0 EN 1 DIS		
18:	3GIO_PADCFG_LUT_ADR_0	0000 DSKTOP_DEFAULT	1000 DSKTOP_HTHRS	
		0001 MOBILE_DEFAULT	1001 MOBILE_HTHRS_NAMP	
		0010 MOBILE_NTHRS_LLAMP	1010 MOBILE_HTHRS_LLAMP	
19:	3GIO_PADCFG_LUT_ADR_1	0011 MOBILE_NTHRS_LAMP	1011 MOBILE_HTHRS_LAMP	
		0100 MOBILE_NTHRS_HAMP	1100 MOBILE_HTHRS_HAMP	
		0101 MOBILE_NTHRS_HHAMP	1101 MOBILE_HTHRS_HHAMP	
20:	3GIO_PADCFG_LUT_ADR_2	0110 MOBILE_NTHRS_HHHAMP	1110 MOBILE_HTHRS_HHHAMP	
		0111 MOBILE_NTHRS_HHHHAMP	1111 MOBILE_HTHRS_HHHHAMP	
21:	3GIO_PADCFG_LUT_ADR_3			
22:	ROMTYPE_0	00 PARALLEL 01 SERIAL_AT25F 10 SERIAL_SST45VF		
23:	ROMTYPE_1	11 RESERVED		
24:	USER_0	0000 DEFAULT		
25:	USER_1			
26:	USER_2			
27:	USER_3			
12:	MIO_EN_33V_0	0 DISABLED 1 ENABLED		
13:	MIO_EN_33V_1	0 DISABLED 1 ENABLED		
15:	SLOT_CLK_CFG	0 DISABLED 1 ENABLED		
16:	PCI_IOBAR	0 DISABLED 1 ENABLED		
23:	BAR2_SIZE	0 32MB 1 16MB		

Pin Name
MIOAD1
MIOBD0
MIOBD1
MIOBD8
MIOBD9
MIOBD2
MIOAD7
MIOAD10
MIOBD6
MIOBD4
MIOBD5
MIOBD3
MIOBD11
MIOBCTL3
MIOAD0
MIOAD6
MIOAD8
MIOAD9
MIOB_HSYNC
MIOBD10
MIOB_VSYNC
MIOAD2
MIOAD3
MIOAD4
MIOAD5
ROM_SI
ROM_SCLK
MIOA_HSYNC
MIOBD7
MIOB_DE

G78 Straps

Bit	Signal	Values		
01:	SUB_VENDOR	0 NO_BIOS 1 BIOS		
02:	RAM_CFG_0	0000 16Mx16 DDR2 64bit Elpida	1000 16Mx16 DDR2 32bit Elpida	
		0001 16Mx16 DDR2 64bit Samsung, Micron	1001 16Mx16 DDR2 32bit Samsung, Micron	
		0010 16Mx16 DDR2 64bit Infineon	1010 16Mx16 DDR2 32bit Infineon	
03:	RAM_CFG_1	0011 16Mx16 DDR2 64bit Hynix	1011 16Mx16 DDR2 32bit Hynix	
		0100 32Mx16 DDR2 64bit Elpida	1100 32Mx16 DDR2 32bit Elpida	
		0101 32Mx16 DDR2 64bit Samsung	1101 32Mx16 DDR2 32bit Samsung	
04:	RAM_CFG_2	0110 32Mx16 DDR2 64bit Infineon	1110 32Mx16 DDR2 32bit Infineon	
		0111 32Mx16 DDR2 64bit Hynix	1111 32Mx16 DDR2 32bit Hynix	
05:	RAM_CFG_3			
06:	CRYSTAL	0 27000K OR 13500K 1 14318K OR UNKWN		
07:	TV_MODE_0	00 SECAM 01 NTSC 10 PAL		
08:	TV_MODE_1	11 CRT		
22:	CRYSTAL_1	0 13500K OR 14318K 1 27000K OR UNKWN		
12:	PCI_DEVID_0	TBD (G78: 0X????)		
13:	PCI_DEVID_1			
20:	PCI_DEVID_2			
21:	PCI_DEVID_3			
	PCI_DEVID_4			
11:	PEX_PLL_EN_TERM100	0 EN 1 DIS		
12:	3GIO_PADCFG_LUT_ADR_0	000 DEFAULT		
		001 MOBILE		
		010 MOBILE_LPWR		
13:	3GIO_PADCFG_LUT_ADR_1	011 MOBILE_LOWEST_PWR		
		100 MOBILE_LTHR		
		101 MOBILE_HTHR		
14:	3GIO_PADCFG_LUT_ADR_2	110 MOBILE_LTHR_LPWR		
		111 MOBILE_HTHR_LPWR		
16:	SLOT_CLK_CFG	0 PULLDN 1 INIT		
29:	ROMTYPE_0	00 PARALLEL 01 SERIAL_AT25F 10 SERIAL_SST45VF		
30:	ROMTYPE_1	11 LPC		
16:	USER_0	0000 DEFAULT		
17:	USER_1			
18:	USER_2			
19:	USER_3			
25:	BR	0 ENABLED 1 DISABLED		
15:	MOBILE_GPIO	0 PULLDN 1 FLOAT		

MEC2
TM31-1LP_4400RPM
NOPIN
COMMON
COOLING SOLUTION
No connected mounting pins

MEC1
HS116-1-DB-NBL
NOPIN
NO STUFF
COOLING SOLUTION
No connected mounting pins

BKT1
DVI3186_MDIN2108_DB15865_TAB
ATX_1X_TOP
COMMON
1
GND
MECH: MOUNTING TOP

MEC7
PH_4_40X.1875_SCREW
STD
COMMON

MEC5
HEX_JACK_SCREW
STD
COMMON

MEC6
HEX_JACK_SCREW
STD
COMMON

MEC3
HEX_JACK_SCREW
STD
COMMON

MEC4
HEX_JACK_SCREW
STD
COMMON

ASSEMBLY	P413: G86-200, 64 BIT DDR2 32Mx16 MEMORY, VGA+DVI+HDout
PAGE DETAIL	Straps, Mechanical Parts

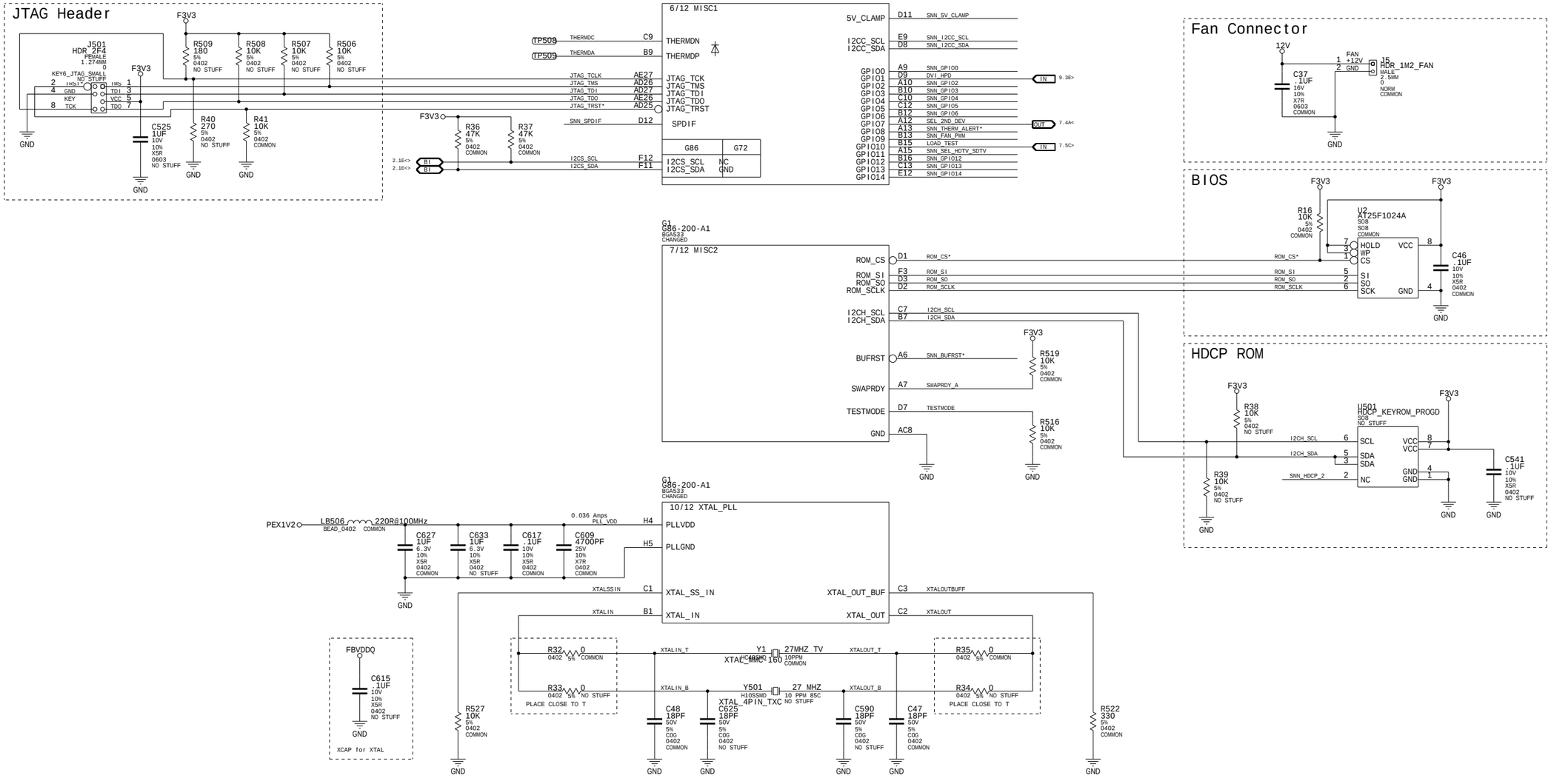
NVIDIA CORPORATION
2701 SAN TOMAS EXPRESSWAY
SANTA CLARA, CA 95050, USA

NV_PN	600-10413-0001-000 F		
ID	p413	PAGE	11 OF 16
NAME	dawong	DATE	25-OCT-2006

XTAL, GPIO, BIOS, FAN, JTAG, HDCP

	Net Name	CRITICAL	IMPEDANCE
IN	XTALIN	1	50OHM
IN	XTALOUT	1	50OHM
IN	XTALIN_T	1	50OHM
IN	XTALOUT_T	1	50OHM
IN	XTALIN_B	1	50OHM
IN	XTALOUT_B	1	50OHM

	Net Name	MIN_LINE_WIDTH	VOLTAGE
IN	PLL_VDD	12MIL	1.2V



ASSEMBLY	P413: G86-200, 64 BIT DDR2 32Mx16 MEMORY, VGA+DVI+HDout
PAGE DETAIL	XTAL, GPIO, BIOS, FAN, JTAG, HDCP

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

NV_PN	600-10413-0001-000 F		
ID	p413	PAGE	12 OF 16
NAME	dawong	DATE	25-OCT-2006

Power Supply I: NVVDD, PLLVDD

Net Name	LINE_WIDTH	Current	Voltage
12V	36MIL	4A	12V
12V_F	36MIL	3A	12V
NVVDD	36MIL	20A	1.2V
PEX1V2	24MIL	2A	1.2V
GND	16MIL		0V

IFP_PLLVDD

Vout = VRef * (1+Rtop/Rbot)

1.816V = 0.8V * (1+(1.27K/1K))

Iripple ~ 6.1A @19A Iout

TOP FET: IRF7811A

BOT FET: AOL1412 X1

ISL6549

45.3K for 620KHz (APW7067)
47K for 600KHz (ISL6549)

NVVDD

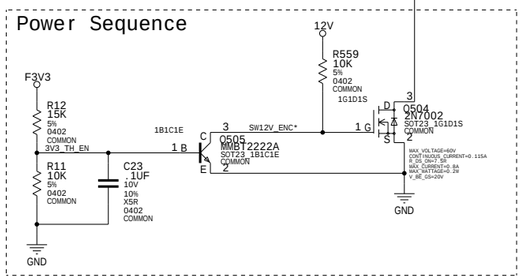
Vout = VRef * (1+Rtop/Rbot)

1.20V = 0.8V * (1+(1.54k/3.09k)) (ISL6549)

1.22V = 0.8V * (1+(1.54k/2.94k)) (ISL6549)

Current(G86) Estimate
NV86@300MHz: 17.74A
PEX Current: 1.887A

Power Sequence



ASSEMBLY	P413: G86-200, 64 BIT DDR2 32Mx16 MEMORY, VGA+DVI+HDout
PAGE DETAIL	Power Supply I: NVVDD, PLLVDD

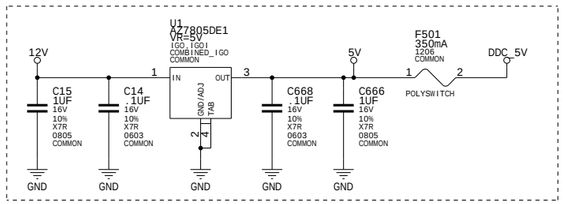
NVIDIA CORPORATION
2701 SAN TOMAS EXPRESSWAY
SANTA CLARA, CA 95050, USA

NV_PN	600-10413-0001-000 F		
ID	p413	PAGE	13 OF 16
NAME	dawong	DATE	25-OCT-2006

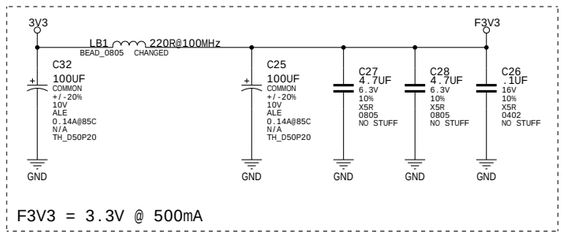
Power Supply II: 5V, DDC5V, F3V3, FBVDDQ

Net Name	MIN_LINE_WIDTH	CURRENT	VOLTAGE
5V	12MIL	0.25A	5V
DDC_5V	12MIL	0.2A	5V
F3V3	12MIL	1A	3.3V
3V3	36MIL	3A	3.3V
FBVDDQ	36MIL	3A	2.0V

5V, DDC5V



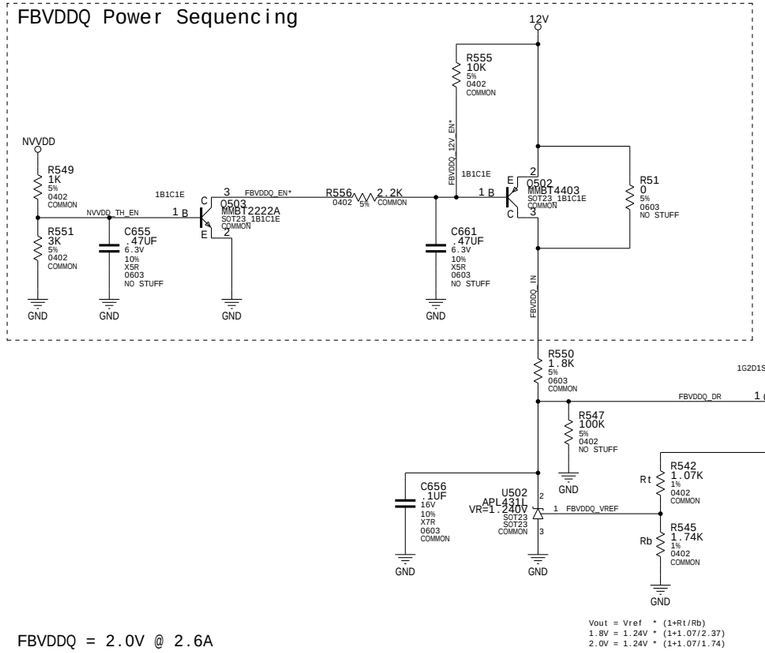
F3V3



F3V3 = 3.3V @ 500mA

FBVDDQ

FBVDDQ Power Sequencing



Vout = Vref * (1+Rt/Rb)
1.8V = 1.24V * (1+1.07/2.37)
2.0V = 1.24V * (1+1.07/1.74)

FBVDDQ = 2.0V @ 2.6A

ASSEMBLY	P413: G86-200, 64 BIT DDR2 32Mx16 MEMORY, VGA+DVI+HDout
PAGE DETAIL	Power Supply II: F3V3, 5V, DDC5V, FBVDDQ

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

NV_PN	600-10413-0001-000 F		
ID	p413	PAGE	14 OF 16
NAME	dawong	DATE	25-OCT-2006

Title: Basenet Report
Design: p413
Date: Sep 29 14:42:41 2006

Base nets and synonyms for
p413_lib.P413(@p413_lib.p413(sch_1))

Base Signal	Location([Zone][dir])
3V3	14.1G
3V3_TH_EN	13.5B
5V	14.1G
12V	13.1F
12V_F	13.1F
AHB	6.2E
ATXC	9.1G< 9.3E 9.3G
ATXC*	9.1G< 9.3E 9.3G
ATXD0	9.1G< 9.2E 9.2G
ATXD0*	9.1G< 9.2E 9.2G
ATXD1	9.1G< 9.2E 9.2G
ATXD1*	9.1G< 9.2E 9.2G
ATXD2	9.1G< 9.2E 9.2G
ATXD2*	9.1G< 9.2E 9.2G
AVB	6.3E
BACKDRIVE_TH	9.4B
BHB	7.2E
BVB	7.3E
COUT	8.1G< 8.3E
CVBS_OUT	8.1G< 8.3E
CVBS_PB_MUX	7.5F> 8.1G< 8.3C<
CVBS_Y_MUX	7.4F> 8.1G< 8.2C<
C_MUX	7.4F> 8.1G< 8.3C<
DACA_BLUE	6.1G< 6.4C
DACA_BLUE_F	6.4G> 6.1G< 9.3G<
DACA_GREEN	6.1G< 6.4C
DACA_GREEN_F	6.3G> 6.1G< 9.3G<
DACA_HSYNC	6.1G< 6.3C
DACA_HSYNC_C	6.2G> 6.1G< 9.3G<
DACA_RED	6.1G< 6.4C
DACA_RED_F	6.3G> 6.1G< 9.3G<
DACA_RSET	6.1G< 6.3B
DACA_VREF	6.1G< 6.3B
DACA_VSYNC	6.1G< 6.3C
DACA_VSYNC_C	6.3G> 6.1G< 9.3G<
DACB_BLUE	7.1G< 7.4C
DACB_BLUE_SW	7.1G< 7.5E
DACB_BLUE_SW_F	7.1G< 7.5F
DACB_GREEN	7.1G< 7.4C
DACB_GREEN_SW	7.1G< 7.4E
DACB_GREEN_SW_F	7.1G< 7.4F
DACB_HSYNC	7.1G< 7.3C
DACB_HSYNC_C	7.3G> 7.1G<
DACB_RED	7.1G< 7.4C
DACB_RED_SW	7.1G< 7.4E
DACB_RED_SW_F	7.1G< 7.4F
DACB_RSET	7.1G< 7.3B
DACB_VREF	7.1G< 7.3B
DACB_VSYNC	7.1G< 7.3C
DACB_VSYNC_C	7.3G> 7.1G<
DDC_5V	14.1G
DDR_ODT	3.4F> 3.1G< 4.2A< 4.2C< 5.2A< 5.2C<
DVI_HPD	9.3E> 12.2F<
DVI_HPD_F	9.3F
F3V3	14.1G
FBACLK0	3.4D> 3.3D 4.1G< 4.2A< 4.2C< 4.5B<
FBACLK0*	3.4D> 3.3D 4.1G< 4.2A< 4.2C< 4.5B<
FBACLK1	3.4D> 3.3D 5.1G< 5.2A< 5.2C< 5.5B<
FBACLK1*	3.4D> 3.3D 5.1G< 5.2A< 5.2C< 5.5B<
FBACLK_C0	4.5B
FBACLK_C1	5.5B
FBACMD<0>	3.2F 3.3C 4.2B 4.2C
FBACMD<25..0>	3.3D> 4.1A< 4.1G< 5.1A<
FBACMD<1>	3.2F 3.3C 4.1B 4.1C 5.1B 5.1C
FBACMD<2>	3.2G 3.3C 4.1B 4.1C
FBACMD<3>	3.2G 3.3C 4.1B 4.1C 5.1B 5.1C
FBACMD<4>	3.2F 3.3C 5.2B 5.2C
FBACMD<5>	3.2F 3.3C 5.2B 5.2C
FBACMD<6>	3.2G 3.3C 5.2B 5.2C
FBACMD<7>	3.3C 3.4G 4.2B 4.2C 5.2B 5.2C
FBACMD<8>	3.2G 3.3C 4.1B 4.1C 5.1B 5.1C
FBACMD<9>	3.2F 3.3C 4.1B 4.1C 5.1B 5.1C
FBACMD<10>	3.3C 3.3F 4.2B 4.2C 5.2B 5.2C
FBACMD<11>	3.3C 3.3D 4.2B 4.2C 5.2B 5.2C
FBACMD<12>	3.3C 3.4E
FBACMD<13>	3.2G 3.3C 5.1B 5.1C
FBACMD<14>	3.3C 3.3G 4.2B 4.2C 5.2B 5.2C
FBACMD<15>	3.3C 3.3F 4.1B 4.1C 5.1B 5.1C
FBACMD<16>	3.3C 3.3F 4.2B 4.2C 5.2B 5.2C
FBACMD<17>	3.3C 3.3G 4.2B 4.2C 5.2B 5.2C
FBACMD<18>	3.3C 3.3G 4.2B 4.2C 5.2B 5.2C
FBACMD<19>	3.3C 3.3F 4.2B 4.2C 5.2B 5.2C
FBACMD<20>	3.3C 3.3F 4.2B 4.2C 5.2B 5.2C
FBACMD<21>	3.3C 3.3G 4.2B 4.2C 5.2B 5.2C
FBACMD<22>	3.3C 3.3G 4.2B 4.2C
FBACMD<23>	3.4C 3.4F 4.2B 4.2C 5.2B 5.2C
FBACMD<24>	3.4C 3.4F 4.2B 4.2C
FBACMD<25>	3.4C 3.4G 4.1B 4.1C 5.1B 5.1C
FBAD<0>	3.1B 4.3B
FBAD<32..0>	4.3A<> 3.1A<> 5.3A<> 4.1G<
FBAD<63..0>	3.1A<> 5.3A<> 4.1G<
FBAD<1>	3.1B 4.3B
FBAD<2>	3.1B 4.3B
FBAD<3>	3.1B 4.3B
FBAD<4>	3.1B 4.3B
FBAD<5>	3.1B 4.3B
FBAD<6>	3.1B 4.3B
FBAD<7>	3.1B 4.3B
FBAD<8>	3.1B 4.4B
FBAD<9>	3.1B 4.4B
FBAD<10>	3.1B 4.4B
FBAD<11>	3.1B 4.4B
FBAD<12>	3.1B 4.4B
FBAD<13>	3.1B 4.4B
FBAD<14>	3.1B 4.4B
FBAD<15>	3.2B 4.4B
FBAD<16>	3.2B 4.3D
FBAD<17>	3.2B 4.3D
FBAD<18>	3.2B 4.3D
FBAD<19>	3.2B 4.3D
FBAD<20>	3.2B 4.3D
FBAD<21>	3.2B 4.3D
FBAD<22>	3.2B 4.3D
FBAD<23>	3.2B 4.3D
FBAD<24>	3.2B 4.4D
FBAD<25>	3.2B 4.4D
FBAD<26>	3.2B 4.4D
FBAD<27>	3.2B 4.4D
FBAD<28>	3.2B 4.4D
FBAD<29>	3.2B 4.4D
FBAD<30>	3.2B 4.4D
FBAD<31>	3.2B 4.4D
FBAD<32>	3.2B 5.3B
FBAD<33>	3.2B 5.3B
FBAD<34>	3.2B 5.3B
FBAD<35>	3.2B 5.3B
FBAD<36>	3.2B 5.3B
FBAD<37>	3.2B 5.3B
FBAD<38>	3.2B 5.3B
FBAD<39>	3.2B 5.3B
FBAD<40>	3.2B 5.4B
FBAD<41>	3.2B 5.4B
FBAD<42>	3.2B 5.4B
FBAD<43>	3.2B 5.4B
FBAD<44>	3.2B 5.4B
FBAD<45>	3.3B 5.4B
FBAD<46>	3.3B 5.4B
FBAD<47>	3.3B 5.4B
FBAD<48>	3.3B 5.3D
FBAD<49>	3.3B 5.3D
FBAD<50>	3.3B 5.3D
FBAD<51>	3.3B 5.3D
FBAD<52>	3.3B 5.3D
FBAD<53>	3.3B 5.3D
FBAD<54>	3.3B 5.3D
FBAD<55>	3.3B 5.3D
FBAD<56>	3.3B 5.4D
FBAD<57>	3.3B 5.4D
FBAD<58>	3.3B 5.4D
FBAD<59>	3.3B 5.4D
FBAD<60>	3.3B 5.4D
FBAD<61>	3.3B 5.4D
FBAD<62>	3.3B 5.4D
FBAD<63>	3.3B 5.4D
FBADQM<0>	3.3B 4.3B
FBADQM<7..0>	3.3A> 4.1G< 4.4A< 5.4A<
FBADQM<1>	3.3B 4.4B
FBADQM<2>	3.3B 4.3D
FBADQM<3>	3.3B 4.4D
FBADQM<4>	3.3B 5.3B
FBADQM<5>	3.3B 5.4B
FBADQM<6>	3.3B 5.3D
FBADQM<7>	3.3B 5.4D
FBADQS<0>	3.4B 4.1G 4.4B
FBADQS<7..0>	3.4A<> 4.4A<> 4.1G< 5.1G< 5.4A<
FBADQS<1>	3.3D 3.4B 4.1G 4.4B
FBADQS<2>	3.4B 4.1G 4.4D
FBADQS<3>	3.4B 4.1G 4.4D
FBADQS<4>	3.4B 5.1G 5.4B
FBADQS<5>	3.4B 5.1G 5.4B
FBADQS<6>	3.4B 5.1G 5.4D
FBADQS<7>	3.4B 5.1G 5.4D
FBADQSN<0>	3.4B 4.1G 4.4B
FBADQSN<7..0>	3.4A<> 4.4A<> 4.1G< 5.1G< 5.4A<
FBADQSN<1>	3.3D 3.4B 4.1G 4.4B
FBADQSN<2>	3.4B 4.1G 4.4D
FBADQSN<3>	3.4B 4.1G 4.4D
FBADQSN<4>	3.4B 5.1G 5.4B
FBADQSN<5>	3.4B 5.1G 5.4B
FBADQSN<6>	3.4B 5.1G 5.4D
FBADQSN<7>	3.4B 5.1G 5.4D
FBA_DEBUG	3.1G< 3.4C 3.4E
FBA_PLLAVDD	3.5C
FBCAL_PD_VDDQ	3.4C
FBCAL_PU_GND	3.4C
FBCAL_TERM_GND	3.4C
FBVDDQ	14.1G
FBVDDQ_12V_EN*	14.3E
FBVDDQ_DR	14.3F
FBVDDQ_EN*	14.3E
FBVDDQ_IN	14.3F
FBVDDQ_VREF	14.4F
FBVREF	3.5B
FS_DIS	13.4C
HPD	9.3G
I2CA_SCL	6.3C
I2CA_SCL_C	6.1G> 9.2G<
I2CA_SDA	6.3C
I2CA_SDA_C	6.2G> 9.3G<
I2CB_SCL	7.3C
I2CB_SCL_C	7.1F
I2CB_SDA	7.3C
I2CB_SDA_C	7.2F
I2CH_SCL	12.3E 12.3G
I2CH_SDA	12.3E 12.4G
I2CS_SCL	2.1E<> 12.2C<>
I2CS_SDA	2.1E<> 12.2C<>
IFP_ABPLLVDD	9.1G< 9.2C
IFP_ABRSET	9.2C
IFP_ABVDD	9.1G< 9.3C
IFP_ABVDD_IN	9.1G<
IFP_ABVPROBE	9.2C
IFP_AB_VDD_IN	9.4A
IFP_CPLLVDD	9.4C
IFP_CRSET	9.4C
JTAG_TCLK	12.2C
JTAG_TDI	12.2C
JTAG_TDO	12.2C
JTAG_TMS	12.2C
JTAG_TRST*	12.2C
LDO_COMP	13.4C
LDO_FB	13.4C
LDO_G	13.3C
LDO_GR	13.3B
LOAD_TEST	7.5C> 12.2F<
LOAD_VGA	7.5E
LOAD_VIDEO	7.4E
MIOA_D2	11.4A> 10.3D< 11.4B
MIOB_CLKIN	10.3C
MIOB_CTL3	11.3A> 10.2D< 11.3B
MIOB_D0	11.2A> 10.2D< 11.2B
MIOB_D1	11.2A> 10.2D< 11.2B
MIOB_D8	11.2A> 10.2D< 11.2B
MIOB_D9	11.2A> 10.2D< 11.2B
MIOB_D11	11.3A> 10.2D< 11.3B
NVVDD	13.1F
NVVDD_TH_EN	14.3D
NV_BG	13.4D
NV_BG_D	13.4E
NV_BOOT	13.3D
NV_COMP	13.4D
NV_FB	13.4D
NV_PHASE	13.3E
NV_RC_FB	13.4D
NV_RC_IN	13.4F
NV_SNUBBER	13.4G
NV_UG	13.3E
NV_UGR	13.3E
PB_OUT	8.1G< 8.3E
PEX1V2	13.1F
PEX_JTAGE_TDIO	2.1C
PEX_PLL_DVDD	2.5F
PEX_PWRGD*	2.2C
PEX_REFCLK	2.2C 2.5A<
PEX_REFCLK*	2.2C 2.5A<
PEX_RX0	2.2C 2.4A<
PEX_RX0*	2.2C 2.4A<
PEX_RX1	2.2C 2.4A<
PEX_RX1*	2.2C 2.4A<
PEX_RX2	2.2C 2.4A<
PEX_RX2*	2.2C 2.4A<
PEX_RX3	2.3C 2.4A<
PEX_RX3*	2.3C 2.4A<
PEX_RX4	2.3C 2.4A<
PEX_RX4*	2.3C 2.4A<
PEX_RX5	2.3C 2.5A<
PEX_RX5*	2.3C 2.5A<
PEX_RX6	2.3C 2.5A<
PEX_RX6*	2.3C 2.5A<
PEX_RX7	2.3C 2.5A<
PEX_RX7*	2.3C 2.5A<
PEX_RX8	2.4C 2.5A<
PEX_RX8*	2.4C 2.5A<
PEX_RX9	2.4C 2.5A<
PEX_RX9*	2.4C 2.5A<
PEX_RX10	2.4C 2.5A<
PEX_RX10*	2.4C 2.5A<
PEX_RX11	2.4C 2.5A<
PEX_RX11*	2.4C 2.5A<
PEX_RX12	2.4C 2.5A<
PEX_RX12*	2.4C 2.5A<
PEX_RX13	2.5A< 2.5C
PEX_RX13*	2.5A< 2.5C
PEX_RX14	2.5A< 2.5C
PEX_RX14*	2.5A< 2.5C
PEX_RX15	2.5A< 2.5C
PEX_RX15*	2.5A< 2.5C
PEX_SMCLK	2.1C
PEX_SMDAT	2.1C
PEX_TSTCLK	2.2A< 2.2E
PEX_TSTCLK*	2.2A< 2.2E
PEX_TX0	2.2A< 2.2E
PEX_TX0*	2.2A< 2.2E
PEX_TX1	2.2A< 2.2E
PEX_TX1*	2.2A< 2.2E
PEX_TX2	2.2A< 2.2E
PEX_TX2*	2.2A< 2.2E
PEX_TX3	2.2A< 2.3E
PEX_TX3*	2.2A< 2.3E
PEX_TX4	2.2A< 2.3E
PEX_TX4*	2.2A< 2.3E
PEX_TX5	2.2A< 2.3E
PEX_TX5*	2.2A< 2.3E
PEX_TX6	2.2A< 2.3E
PEX_TX6*	2.2A< 2.3E
PEX_TX7	2.2A< 2.3E
PEX_TX7*	2.2A< 2.3E
PEX_TX8	2.3A< 2.4E
PEX_TX8*	2.3A< 2.4E
PEX_TX9	2.3A< 2.4E
PEX_TX9*	2.3A< 2.4E
PEX_TX10	2.3A< 2.4E
PEX_TX10*	2.3A< 2.4E
PEX_TX11	2.3A< 2.4E
PEX_TX11*	2.3A< 2.4E
PEX_TX12	2.3A< 2.4E
PEX_TX12*	2.3A< 2.4E
PEX_TX13	2.3A< 2.5E
PEX_TX13*	2.3A< 2.5E
PEX_TX14	2.3A< 2.5E
PEX_TX14*	2.3A< 2.5E
PEX_TX15	2.3A< 2.5E
PEX_TX15*	2.3A< 2.5E
PEX_TXX0	2.2C 2.3A<
PEX_TXX0*	2.2C 2.3A<
PEX_TXX1	2.2C 2.3A<
PEX_TXX1*	2.2C 2.3A<
PEX_TXX2	2.2C 2.3A<
PEX_TXX2*	2.2C 2.3A<
PEX_TXX3	2.3A< 2.3C
PEX_TXX3*	2.3A< 2.3C
PEX_TXX4	2.3A< 2.3C
PEX_TXX4*	2.3A< 2.3C
PEX_TXX5	2.3A< 2.3C
PEX_TXX5*	2.3A< 2.3C
PEX_TXX6	2.3A< 2.3C
PEX_TXX6*	2.3C 2.4A<
PEX_TXX7	2.3C 2.4A<
PEX_TXX7*	2.3C 2.4A<
PEX_TXX8	2.4A< 2.4C
PEX_TXX8*	2.4A< 2.4C
PEX_TXX9	2.4A< 2.4C
PEX_TXX9*	2.4A< 2.4C
PEX_TXX10	2.4A< 2.4C
PEX_TXX10*	2.4A< 2.4C
PEX_TXX11	2.4A< 2.4C
PEX_TXX11*	2.4A< 2.4C
PEX_TXX12	2.4A< 2.4C
PEX_TXX12*	2.4A< 2.4C
PEX_TXX13	2.4A< 2.5C
PEX_TXX13*	2.4A< 2.5C
PEX_TXX14	2.4A< 2.5C
PEX_TXX14*	2.4A< 2.5C
PEX_TXX15	2.4A< 2.5C
PEX_TXX15*	2.4A< 2.5C
PLL_VDD	12.1G< 12.4C
PRSNT	2.1B
PVCC5_DRV	13.3D
ROM_CS*	12.3E 12.3F
ROM_SCLK	12.3E 12.3F
ROM_SI	12.3E 12.3F
ROM_SO	12.3E 12.3F
SEL_2ND_DEV	12.2F> 7.4A<
SNN_3V3AUX	2.1B
SNN_5V_CLAMP	12.2E
SNN_ACDRIVE	13.4E
SNN_ATXD3	9.2E
SNN_ATXD3*	9.2E
SNN_A_ID0	6.4H
SNN_A_ID2	6.4G
SNN_A_TX3	9.2G
SNN_A_TX3*	9.2G
SNN_A_TX4	9.2G
SNN_A_TX4*	9.2G
SNN_A_TX5	9.2G
SNN_A_TX5*	9.2G
SNN_BTXC	9.3E
SNN_BTXC*	9.3E
SNN_BTXD4	9.3E
SNN_BTXD4*	9.2E
SNN_BTXD5	9.3E
SNN_BTXD5*	9.3E
SNN_BTXD6	9.3E
SNN_BTXD6*	9.3E
SNN_BTXD7	9.3E
SNN_BTXD7*	9.3E
SNN_BUFRST*	12.3E
SNN_DACB_CSYNC	7.3C
SNN_FAN_PWM	12.2E
SNN_FBA1_NC_A2	4.3B
SNN_FBA1_NC_E2	4.3B
SNN_FBA1_NC_R3	4.2B
SNN_FBA1_NC_R7	4.2B
SNN_FBA1_NC_R8	4.2B
SNN_FBA2_NC_A2	4.3C
SNN_FBA2_NC_E2	4.3C
SNN_FBA2_NC_R3	4.2C
SNN_FBA2_NC_R7	4.2C
SNN_FBA2_NC_R8	4.2C
SNN_FBA3_NC_A2	5.3B
SNN_FBA3_NC_E2	5.3B
SNN_FBA3_NC_R3	5.2B
SNN_FBA3_NC_R7	5.2B
SNN_FBA3_NC_R8	5.2B
SNN_FBA4_NC_A2	5.3C
SNN_FBA4_NC_E2	5.3C
SNN_FBA4_NC_R3	5.2C
SNN_FBA4_NC_R7	5.2C
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SNN_MIOA_HSYNC	10.4C
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SNN_PE_RSVD8	2.4B
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SNN_SPDIF	12.2C
SNN_THERM_ALERT*	12.2E
SNN_TV_NC1	8.3E
SNN_TV_NC2	8.3E
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SW12V_ENC*	13.5C
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ASSEMBLY	P413: G86-200, 64 BIT DDR2 32Mx16 MEMORY, VGA+DVI+HDout
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NV_PN	600-10413-0001-000 F		
ID	p413	PAGE	15 OF 16
NAME	dawong	DATE	25-OCT-2006

Title: Cref Part Report
Design: p413
Date: Sep 29 14:42:41 2006

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ASSEMBLY	P413: G86-200, 64 BIT DDR2 32Mx16 MEMORY, VGA+DVI+HDout
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NV_PN	600-10413-0001-000 F		
ID	p413	PAGE	16 OF 16
NAME	dawong	DATE	25-OCT-2006