G94-P545-A01 - GDDR3, DVI/VGA + DVI/VGA + HDTV/SDTV-Out

SKU	VARIANT	NVPN	ASSEMBLY
B	BASE	600-10545-base-100	P545 BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL
1	SKU9100	600-10545-9100-100	G94-400 650MHz/1000MHz 512MB 16Mx32 BGA136 GDDR3, DVI-I-DL+DVI-I-DL+HDTV-Out (Bring Up SKU)
2	SKU0000	600-10545-0000-100	G94-400 650MHz/1000MHz 512MB 16Mx32 BGA136 GDDR3, DVI-I-DL+DVI-I-DL+HDTV-Out
3	SKU0010	600-10545-0010-100	G94-300 500MHz/800MHz 512MB 16Mx32 BGA136 GDDR3, DVI-I-DL+DVI-I-DL+HDTV-Out
4	SKU0020	600-10545-0020-100	G94-200 500MHz/800MHz 384MB 16Mx32 BGA136 GDDR3, DVI-I-DL+DVI-I-DL+HDTV-Out
5	<UNDEFINED>	<UNDEFINED>	<UNDEFINED>
6	<UNDEFINED>	<UNDEFINED>	<UNDEFINED>
7	<UNDEFINED>	<UNDEFINED>	<UNDEFINED>
8	<UNDEFINED>	<UNDEFINED>	<UNDEFINED>
9	<UNDEFINED>	<UNDEFINED>	<UNDEFINED>
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11	<UNDEFINED>	<UNDEFINED>	<UNDEFINED>
12	<UNDEFINED>	<UNDEFINED>	<UNDEFINED>
13	<UNDEFINED>	<UNDEFINED>	<UNDEFINED>
14	<UNDEFINED>	<UNDEFINED>	<UNDEFINED>
15	<UNDEFINED>	<UNDEFINED>	<UNDEFINED>

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REVISION HISTORY:

ASSEMBLY	G94-300 500MHz/800MHz 512MB 16Mx32 BGA136 GDDR3, DVI-I-DL+DVI-I-DL+HDTV-Out
PAGE DETAIL	Overview

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2701 SAN TOMAS EXPRESSWAY
SANTA CLARA, CA 95050, USA

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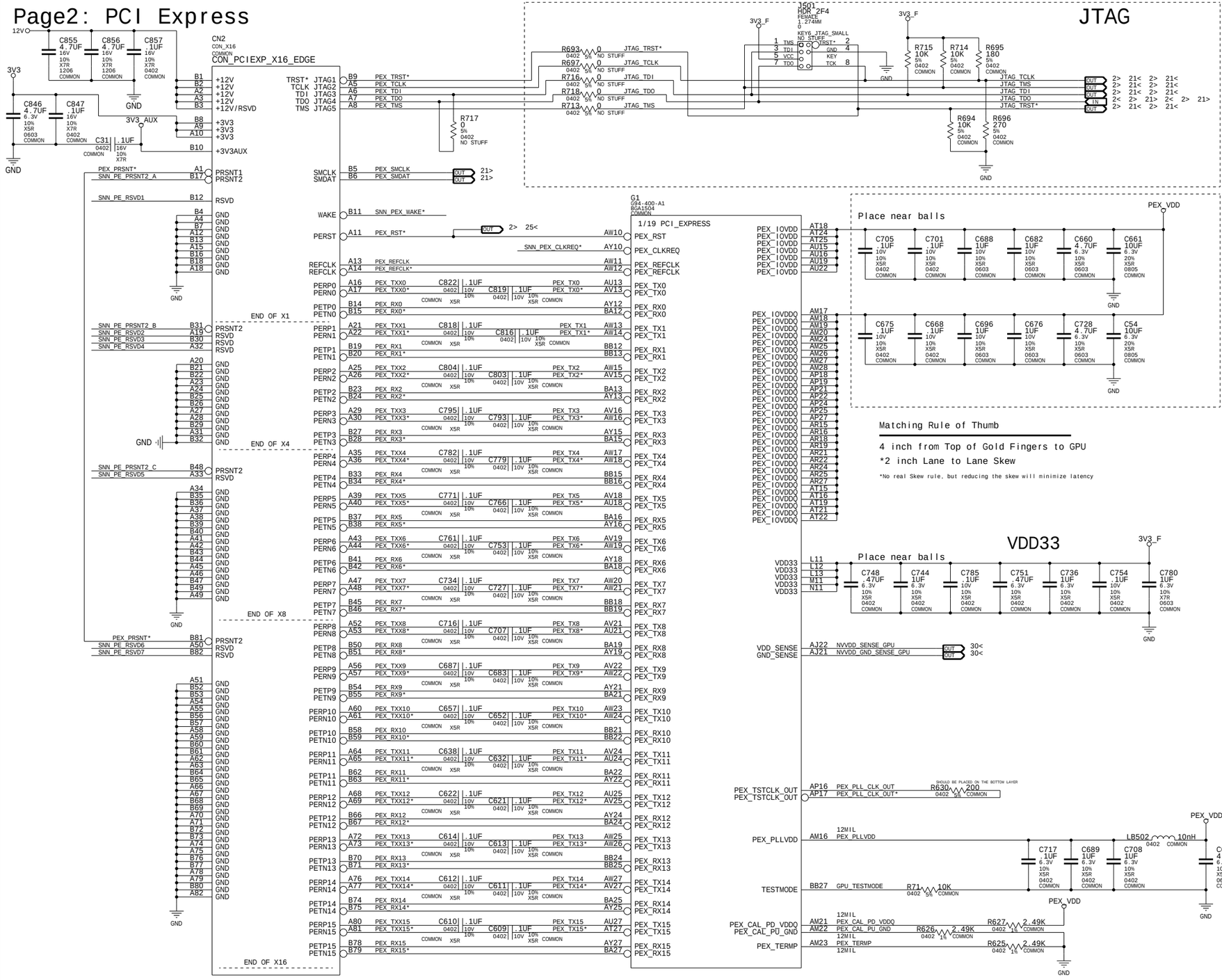
Page2: PCI Express



NET	NV_CRITICAL	NV_IMPEDANCE	DIFFPAIR
PEX_REFCLK	1	100DIFF	PEX_REFCLK
PEX_REFCLK*	1	100DIFF	PEX_REFCLK
PEX_TX0	1	90DIFF	PEX_TX0
PEX_TX0*	1	90DIFF	PEX_TX0
PEX_TX1	1	90DIFF	PEX_TX1
PEX_TX1*	1	90DIFF	PEX_TX1
PEX_TX2	1	90DIFF	PEX_TX2
PEX_TX2*	1	90DIFF	PEX_TX2
PEX_TX3	1	90DIFF	PEX_TX3
PEX_TX3*	1	90DIFF	PEX_TX3
PEX_TX4	1	90DIFF	PEX_TX4
PEX_TX4*	1	90DIFF	PEX_TX4
PEX_TX5	1	90DIFF	PEX_TX5
PEX_TX5*	1	90DIFF	PEX_TX5
PEX_TX6	1	90DIFF	PEX_TX6
PEX_TX6*	1	90DIFF	PEX_TX6
PEX_TX7	1	90DIFF	PEX_TX7
PEX_TX7*	1	90DIFF	PEX_TX7
PEX_TX8	1	90DIFF	PEX_TX8
PEX_TX8*	1	90DIFF	PEX_TX8
PEX_TX9	1	90DIFF	PEX_TX9
PEX_TX9*	1	90DIFF	PEX_TX9
PEX_TX10	1	90DIFF	PEX_TX10
PEX_TX10*	1	90DIFF	PEX_TX10
PEX_TX11	1	90DIFF	PEX_TX11
PEX_TX11*	1	90DIFF	PEX_TX11
PEX_TX12	1	90DIFF	PEX_TX12
PEX_TX12*	1	90DIFF	PEX_TX12
PEX_TX13	1	90DIFF	PEX_TX13
PEX_TX13*	1	90DIFF	PEX_TX13
PEX_TX14	1	90DIFF	PEX_TX14
PEX_TX14*	1	90DIFF	PEX_TX14
PEX_TX15	1	90DIFF	PEX_TX15
PEX_TX15*	1	90DIFF	PEX_TX15
PEX_RX0	1	90DIFF	PEX_RX0
PEX_RX0*	1	90DIFF	PEX_RX0
PEX_RX1	1	90DIFF	PEX_RX1
PEX_RX1*	1	90DIFF	PEX_RX1
PEX_RX2	1	90DIFF	PEX_RX2
PEX_RX2*	1	90DIFF	PEX_RX2
PEX_RX3	1	90DIFF	PEX_RX3
PEX_RX3*	1	90DIFF	PEX_RX3
PEX_RX4	1	90DIFF	PEX_RX4
PEX_RX4*	1	90DIFF	PEX_RX4
PEX_RX5	1	90DIFF	PEX_RX5
PEX_RX5*	1	90DIFF	PEX_RX5
PEX_RX6	1	90DIFF	PEX_RX6
PEX_RX6*	1	90DIFF	PEX_RX6
PEX_RX7	1	90DIFF	PEX_RX7
PEX_RX7*	1	90DIFF	PEX_RX7
PEX_RX8	1	90DIFF	PEX_RX8
PEX_RX8*	1	90DIFF	PEX_RX8
PEX_RX9	1	90DIFF	PEX_RX9
PEX_RX9*	1	90DIFF	PEX_RX9
PEX_RX10	1	90DIFF	PEX_RX10
PEX_RX10*	1	90DIFF	PEX_RX10
PEX_RX11	1	90DIFF	PEX_RX11
PEX_RX11*	1	90DIFF	PEX_RX11
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PEX_RX12*	1	90DIFF	PEX_RX12
PEX_RX13	1	90DIFF	PEX_RX13
PEX_RX13*	1	90DIFF	PEX_RX13
PEX_RX14	1	90DIFF	PEX_RX14
PEX_RX14*	1	90DIFF	PEX_RX14
PEX_RX15	1	90DIFF	PEX_RX15
PEX_RX15*	1	90DIFF	PEX_RX15
PEX_TX0	1	90DIFF	PEX_TX0
PEX_TX0*	1	90DIFF	PEX_TX0
PEX_TX1	1	90DIFF	PEX_TX1
PEX_TX1*	1	90DIFF	PEX_TX1
PEX_TX2	1	90DIFF	PEX_TX2
PEX_TX2*	1	90DIFF	PEX_TX2
PEX_TX3	1	90DIFF	PEX_TX3
PEX_TX3*	1	90DIFF	PEX_TX3
PEX_TX4	1	90DIFF	PEX_TX4
PEX_TX4*	1	90DIFF	PEX_TX4
PEX_TX5	1	90DIFF	PEX_TX5
PEX_TX5*	1	90DIFF	PEX_TX5
PEX_TX6	1	90DIFF	PEX_TX6
PEX_TX6*	1	90DIFF	PEX_TX6
PEX_TX7	1	90DIFF	PEX_TX7
PEX_TX7*	1	90DIFF	PEX_TX7
PEX_TX8	1	90DIFF	PEX_TX8
PEX_TX8*	1	90DIFF	PEX_TX8
PEX_TX9	1	90DIFF	PEX_TX9
PEX_TX9*	1	90DIFF	PEX_TX9
PEX_TX10	1	90DIFF	PEX_TX10
PEX_TX10*	1	90DIFF	PEX_TX10
PEX_TX11	1	90DIFF	PEX_TX11
PEX_TX11*	1	90DIFF	PEX_TX11
PEX_TX12	1	90DIFF	PEX_TX12
PEX_TX12*	1	90DIFF	PEX_TX12
PEX_TX13	1	90DIFF	PEX_TX13
PEX_TX13*	1	90DIFF	PEX_TX13
PEX_TX14	1	90DIFF	PEX_TX14
PEX_TX14*	1	90DIFF	PEX_TX14
PEX_TX15	1	90DIFF	PEX_TX15
PEX_TX15*	1	90DIFF	PEX_TX15
PEX_PLL_CLK_OUT	1	90DIFF	PEX_PLL_CLK_OUT
PEX_PLL_CLK_OUT*	1	90DIFF	PEX_PLL_CLK_OUT
PEX_RST*	3	50OHM	
PEX_PRSNT*	3	50OHM	
GPU_TESTMODE	3	50OHM	
NVVDD_SENSE_GPU	1	100DIFF	NVVDD_SENSE_GPU
NVVDD_GND_SENSE_GPU	1	100DIFF	NVVDD_SENSE_GPU

NET	VOLTAGE	MAX_CURRENT	MIN_WIDTH
PEX_PLLVDD	1.1V	0.16A	12MIL

ASSEMBLY	G94-300 500MHz/800MHz 512MB 16Mx32 BGA136 GDDR3, DVI-I-DL+DVI-I-DL+HDTV-Out
PAGE DETAIL	PCI Express

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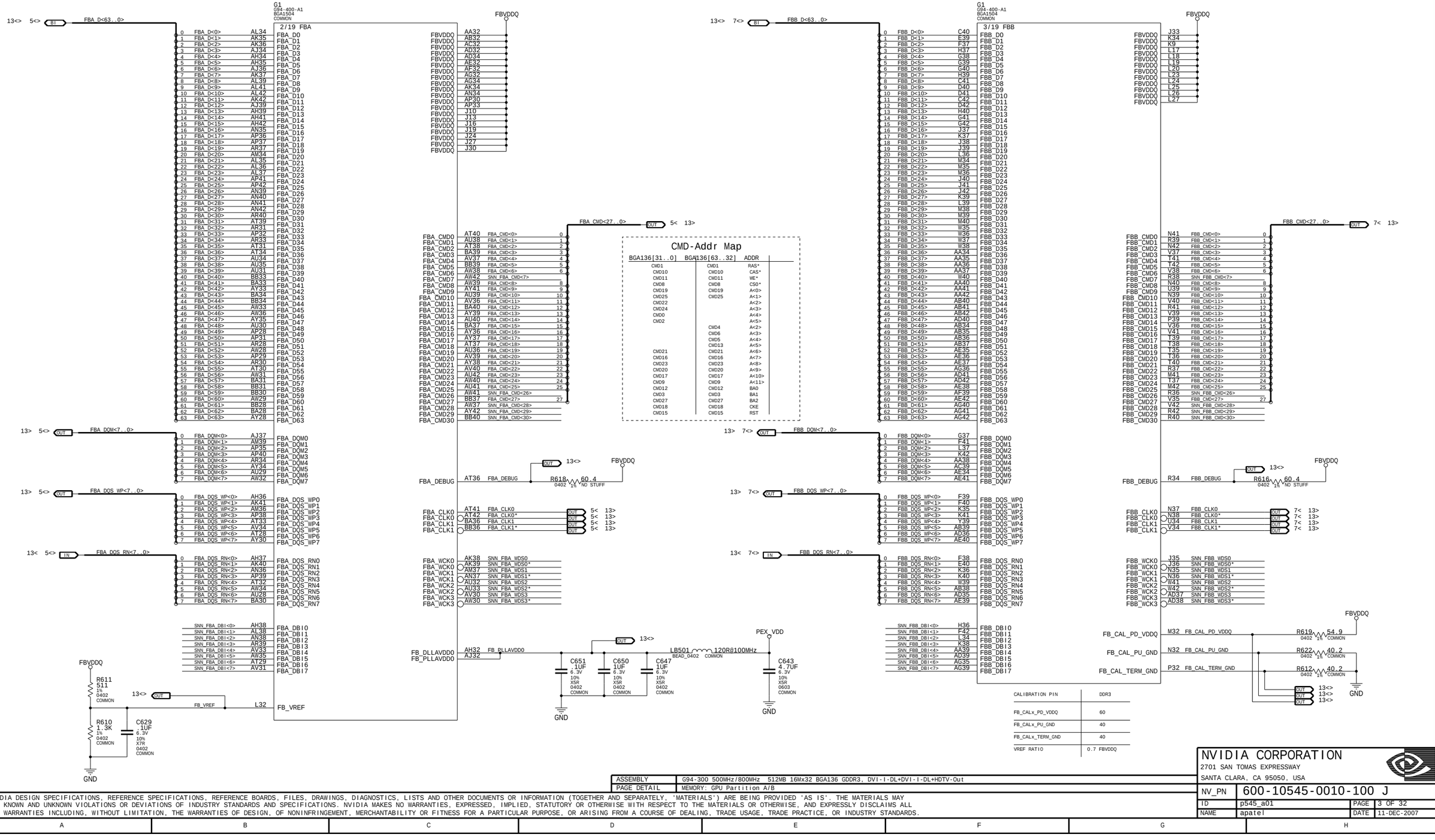
Page3: MEMORY: GPU Partition A/B



ASSEMBLY	G94-300 500MHz/800MHz 512MB 16Mx32 BGA136 GDDR3, DVI-I-DL+DVI-I-DL+HDTV-Out
PAGE DETAIL	MEMORY: GPU Partition A/B

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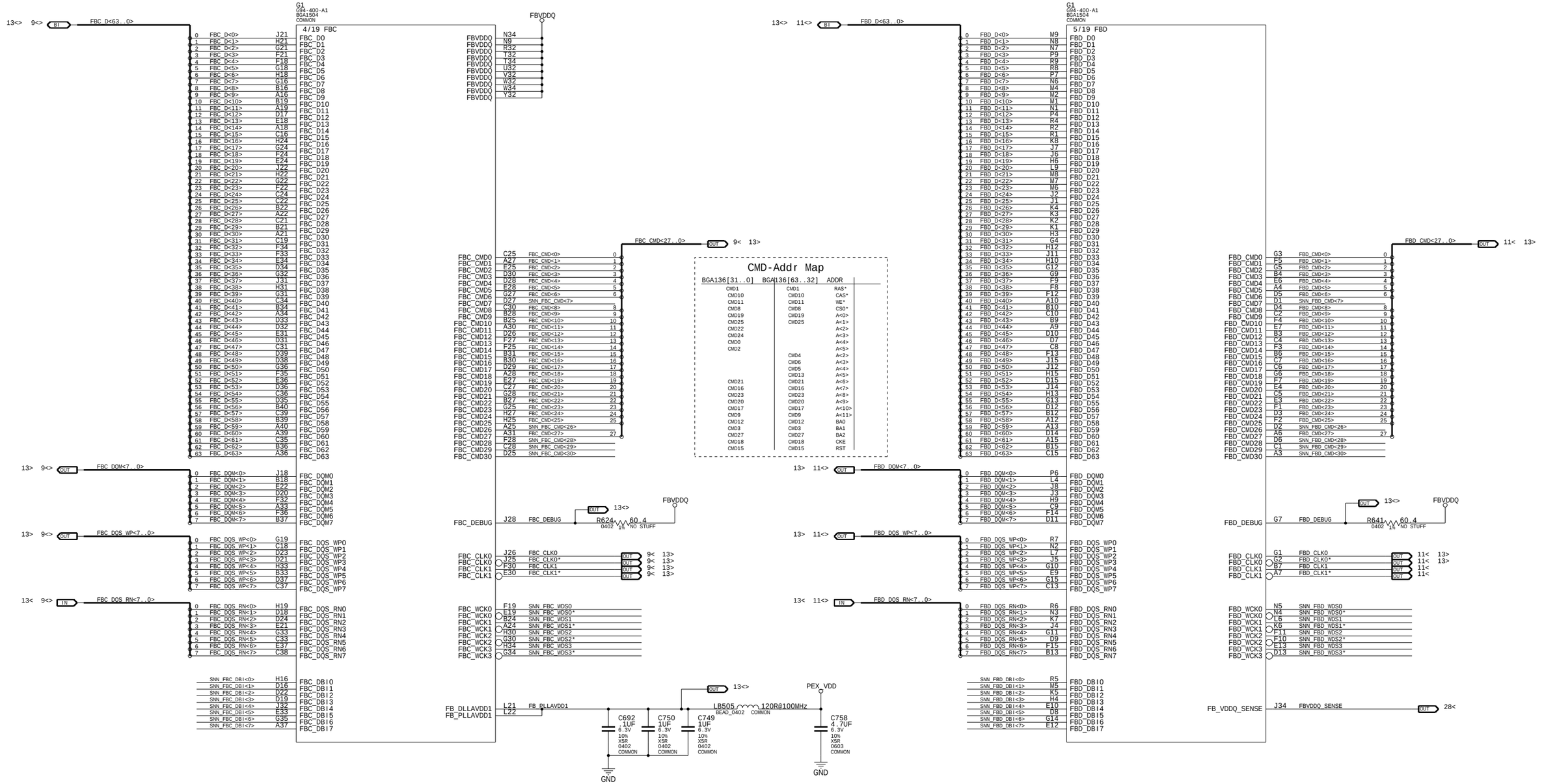
Page4: MEMORY: GPU Partition C/D



ASSEMBLY	G94-300 500MHz/800MHz 512MB 16Mx32 BGA136 GDDR3, DVI-I-DL+DVI-I-DL+HDTV-Out
PAGE DETAIL	MEMORY: GPU Partition C/D

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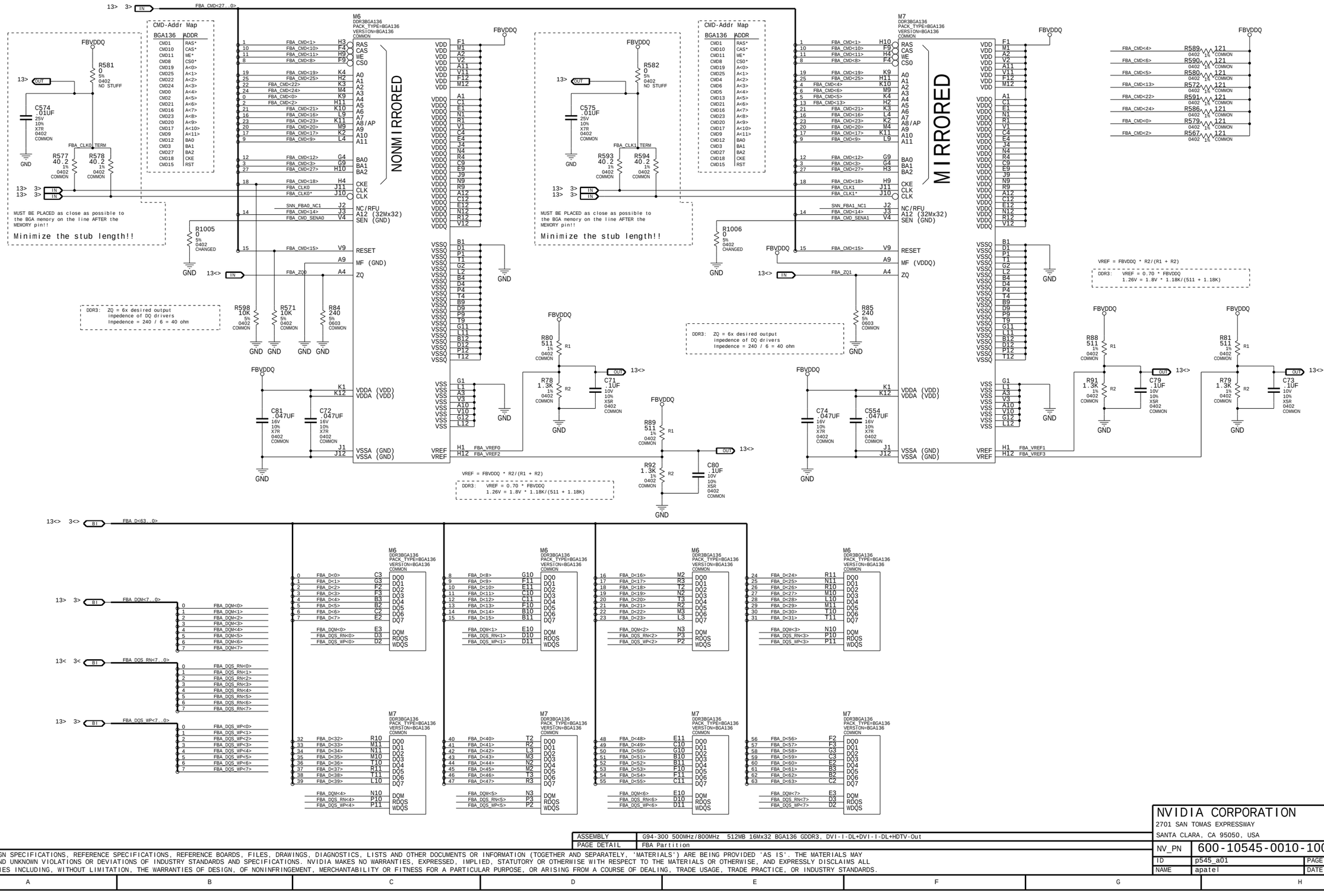
Page5: FBA Partition



ASSEMBLY	G94-300 500MHz/800MHz 512MB 16Mx32 BGA136 GDDR3, DVI-I-DL+DVI-I-DL+HDTV-Out
PAGE DETAIL	FBA Partition

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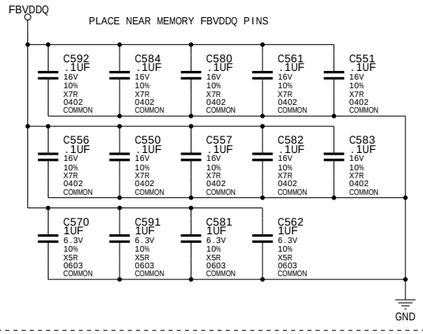
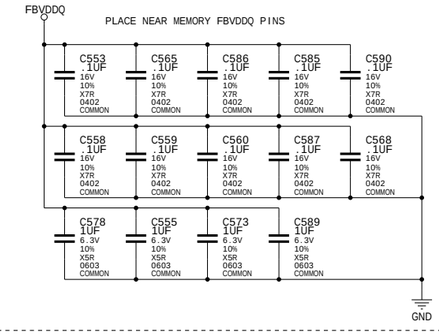
Page6: FBA Partition Decoupling

Decoupling for FBA 31..0



Decoupling for FBA 63..32



ASSEMBLY	G94-300 500MHz/800MHz 512MB 16Mx32 BGA136 GDDR3, DVI-I-DL+DVI-I-DL+HDTV-Out
PAGE DETAIL	FBA Partition Decoupling

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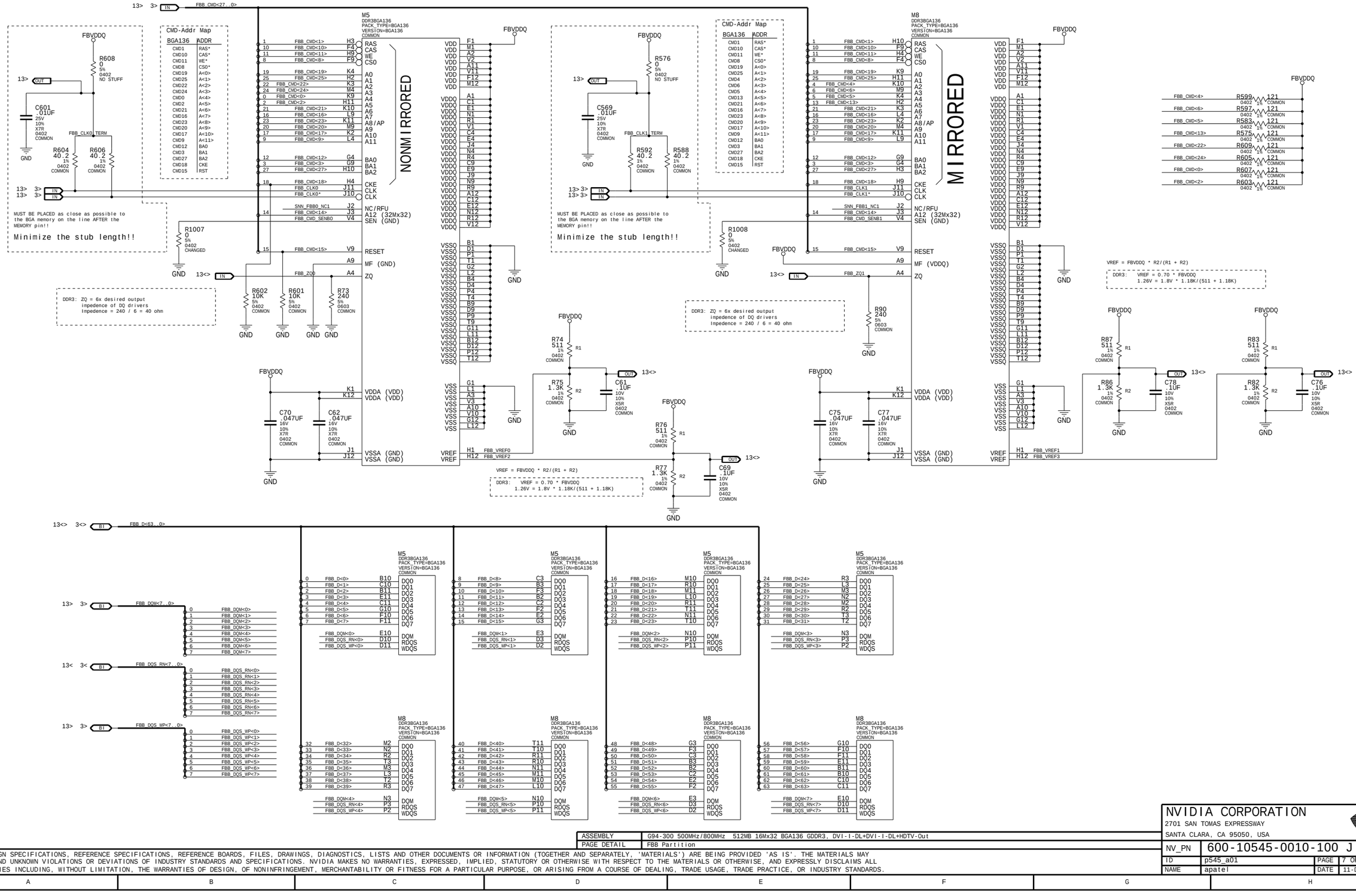
Page7: FBB Partition



ASSEMBLY	G94-300 500MHz/800MHz 512MB 16Mx32 BGA136 GDDR3, DVI-I-DL+DVI-I-DL+HDTV-Out
PAGE DETAIL	FBB Partition

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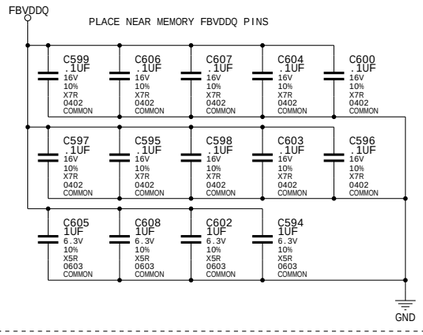
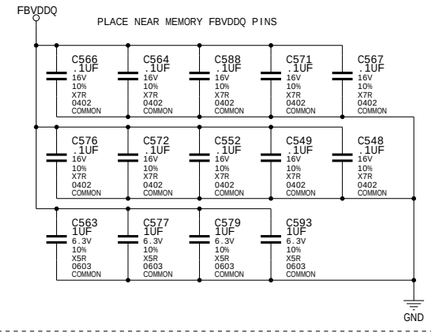
Page8: FBB Partition Decoupling

Decoupling for FBB 31..0



Decoupling for FBB 63..32



ASSEMBLY	G94-300 500MHz/800MHz 512MB 16Mx32 BGA136 GDDR3, DVI-I-DL+DVI-I-DL+HDTV-Out
PAGE DETAIL	FBB Partion Decoupling

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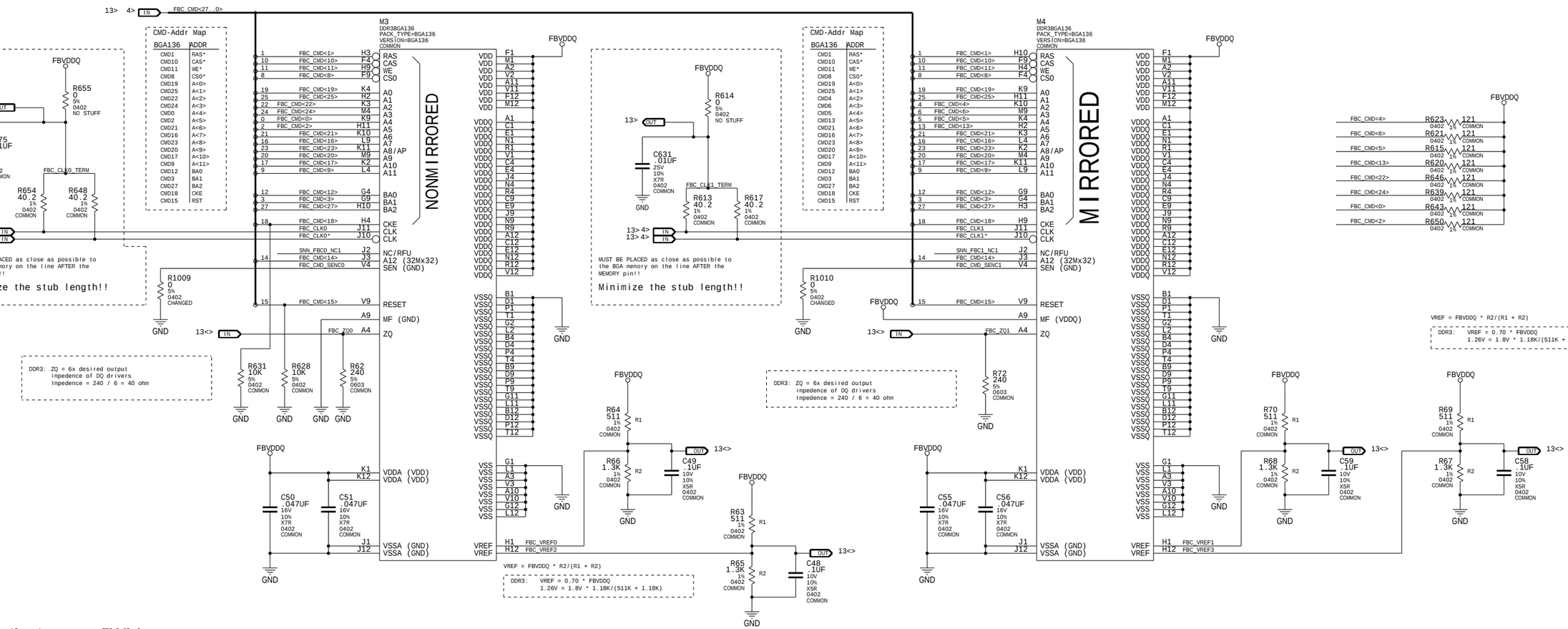
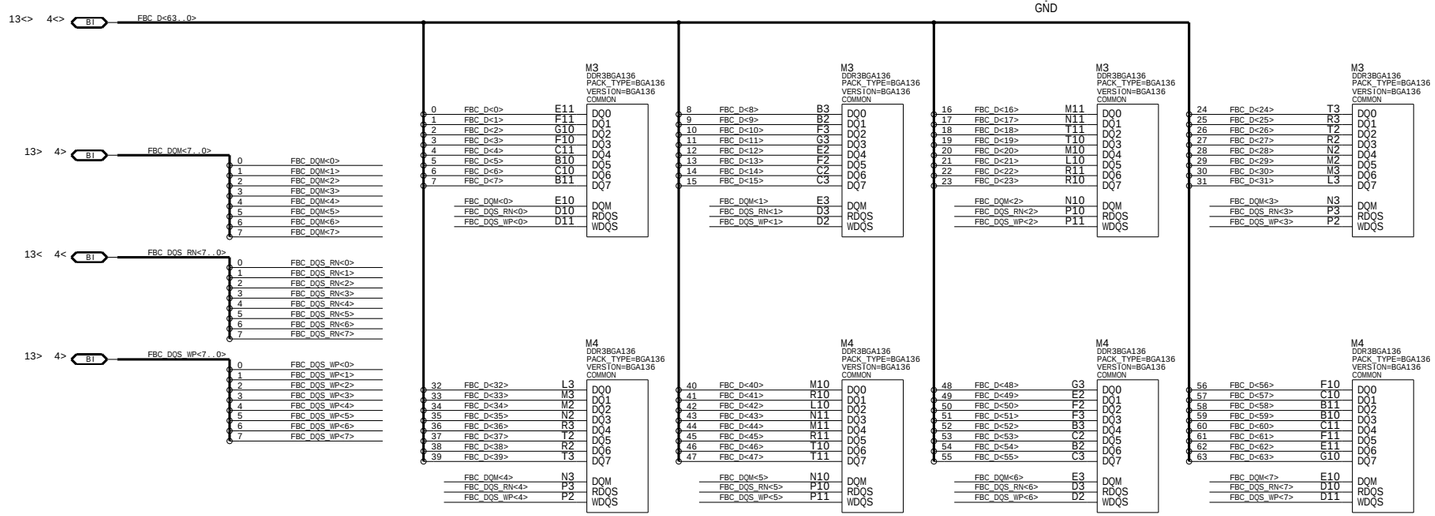
Page9: FBC Partition





ASSEMBLY	G94-300 500MHz/800MHz 512MB 16Mx32 BGA136 GDDR3, DVI-I-DL+DVI-I-DL+HDTV-Out
PAGE DETAIL	FBC Partition

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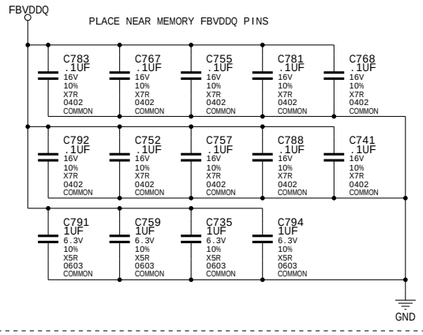
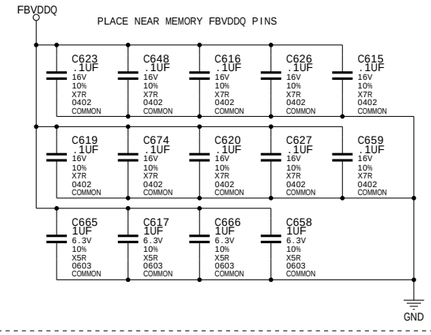
Page10: FBC Partition

Decoupling for FBC 31..0



Decoupling for FBC 63..32



ASSEMBLY	G94-300 500MHz/800MHz 512MB 16Mx32 BGA136 GDDR3, DVI-I-DL+DVI-I-DL+HDTV-Out
PAGE DETAIL	FBC Partition Decoupling

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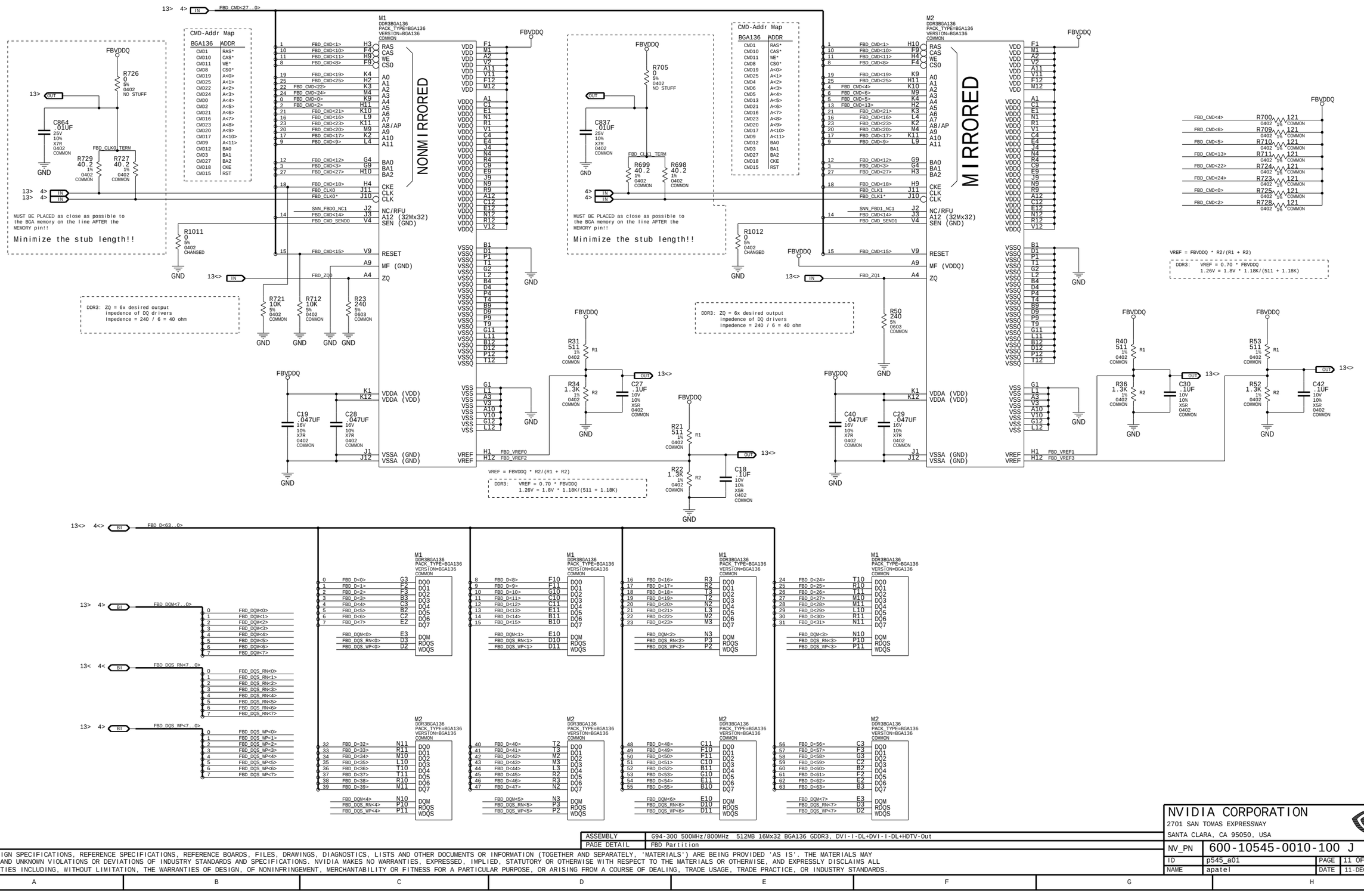
Page11: FBD Partition



ASSEMBLY	G94-300 500MHz/800MHz 512MB 16Mx32 BGA136 GDDR3, DVI-I-DL+DVI-I-DL+HDTV-Out
PAGE DETAIL	FBD Partition

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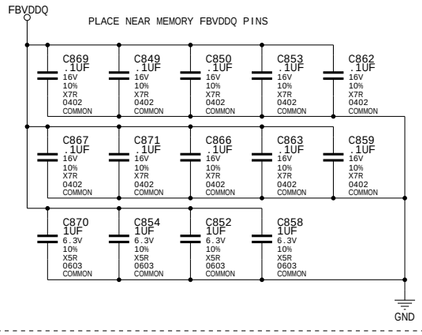
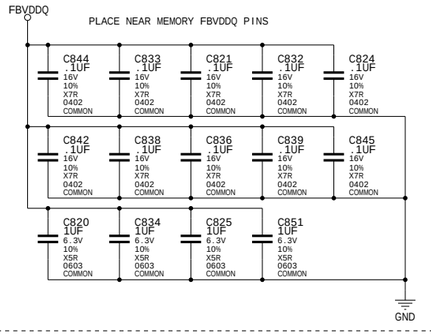
Page12: FBD Partition Decoupling

Decoupling for FBD 31..0



Decoupling for FBD 63..32



ASSEMBLY	G94-300 500MHz/800MHz 512MB 16Mx32 BGA136 GDDR3, DVI-I-DL+DVI-I-DL+HDTV-Out
PAGE DETAIL	FBD Partition Decoupling

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Page13: FB Net Properties

NET RULES for FBA and FBB

	NET	NV_CRITICAL_NET	IMPEDANCE	DIFFPAIR
5< 3> OUT	FBA_CLK0	1	80DIFF	FBA_CLK0
5< 3> OUT	FBA_CLK0*	1	80DIFF	FBA_CLK0
5> OUT	FBA_CLK0_TERM	1	40OHM	
5< 3> OUT	FBA_CLK1	1	80DIFF	FBA_CLK1
5< 3> OUT	FBA_CLK1*	1	80DIFF	FBA_CLK1
5> OUT	FBA_CLK1_TERM	1	40OHM	

	NET	NV_CRITICAL_NET	IMPEDANCE
5< 3> OUT	FBA_CMD<27..0>	1	40OHM
5<> 3> OUT	FBA_DQS_WP<7..0>	1	40OHM
5<> 3< IN	FBA_DQS_RN<7..0>	1	40OHM
5<> 3> OUT	FBA_DQM<7..0>	1	40OHM
5<> 3<> BI	FBA_D<63..0>	1	40OHM

	NET	NV_CRITICAL_NET	IMPEDANCE	DIFFPAIR
7< 3> OUT	FBB_CLK0	1	80DIFF	FBB_CLK0
7< 3> OUT	FBB_CLK0*	1	80DIFF	FBB_CLK0
7> OUT	FBB_CLK0_TERM	1	40OHM	
OUT	FBB_CLK1	1	80DIFF	FBB_CLK1
OUT	FBB_CLK1*	1	80DIFF	FBB_CLK1
13> 7> OUT	FBB_CLK1_TERM	1	40OHM	

	NET	NV_CRITICAL_NET	IMPEDANCE
7< 3> OUT	FBB_CMD<27..0>	1	40OHM
7<> 3> OUT	FBB_DQS_WP<7..0>	1	40OHM
7<> 3< IN	FBB_DQS_RN<7..0>	1	40OHM
7<> 3> OUT	FBB_DQM<7..0>	1	40OHM
7<> 3<> BI	FBB_D<63..0>	1	40OHM

	NET	MIN_LINE_WIDTH	VOLTAGE	NV_NET_MAX_CURRENT
3> BI	FB_PLLAVDD0	12MIL	1.1V	0.04A
3> BI	FB_VREF	12MIL	1.26V	0.02A
5> BI	FBA_VREF0	12MIL	1.26V	0.02A
5> BI	FBA_VREF1	12MIL	1.26V	0.02A
5> BI	FBA_VREF2	12MIL	1.26V	0.02A
5> BI	FBA_VREF3	12MIL	1.26V	0.02A
5< BI	FBA_ZQ0	12MIL	1.26V	0.02A
5< BI	FBA_ZQ1	12MIL	1.26V	0.02A
7> BI	FBB_VREF0	12MIL	1.26V	0.02A
7> BI	FBB_VREF1	12MIL	1.26V	0.02A
7> BI	FBB_VREF2	12MIL	1.26V	0.02A
7> BI	FBB_VREF3	12MIL	1.26V	0.02A
7< BI	FBB_ZQ0	12MIL	1.26V	0.02A
7< BI	FBB_ZQ1	12MIL	1.26V	0.02A

NET RULES for FBC and FBD

	NET	NV_CRITICAL_NET	IMPEDANCE	DIFFPAIR
9< 4> OUT	FBC_CLK0	1	80DIFF	FBC_CLK0
9< 4> OUT	FBC_CLK0*	1	80DIFF	FBC_CLK0
9> OUT	FBC_CLK0_TERM	1	40OHM	
9< 4> OUT	FBC_CLK1	1	80DIFF	FBC_CLK1
9< 4> OUT	FBC_CLK1*	1	80DIFF	FBC_CLK1
9> OUT	FBC_CLK1_TERM	1	40OHM	

	NET	NV_CRITICAL_NET	IMPEDANCE
9< 4> OUT	FBC_CMD<27..0>	1	40OHM
9<> 4> OUT	FBC_DQS_WP<7..0>	1	40OHM
9<> 4< IN	FBC_DQS_RN<7..0>	1	40OHM
9<> 4> OUT	FBC_DQM<7..0>	1	40OHM
9<> 4<> BI	FBC_D<63..0>	1	40OHM

	NET	NV_CRITICAL_NET	IMPEDANCE	DIFFPAIR
11< 4> OUT	FBD_CLK0	1	80DIFF	FBD_CLK0
11< 4> OUT	FBD_CLK0*	1	80DIFF	FBD_CLK0
11> OUT	FBD_CLK0_TERM	1	40OHM	
13> 7< 3> OUT	FBD_CLK1	1	80DIFF	FBD_CLK1
13> 7< 3> OUT	FBD_CLK1*	1	80DIFF	FBD_CLK1
13> 7> OUT	FBD_CLK1_TERM	1	40OHM	

	NET	NV_CRITICAL_NET	IMPEDANCE
11< 4> OUT	FBD_CMD<27..0>	1	40OHM
11<> 4> OUT	FBD_DQS_WP<7..0>	1	40OHM
11<> 4< IN	FBD_DQS_RN<7..0>	1	40OHM
11<> 4> OUT	FBD_DQM<7..0>	1	40OHM
11<> 4<> BI	FBD_D<63..0>	1	40OHM

	NET	MIN_LINE_WIDTH	VOLTAGE	NV_NET_MAX_CURRENT
4> BI	FB_PLLAVDD1	12MIL	1.1V	0.04A
9> BI	FBC_VREF0	12MIL	1.26V	0.02A
9> BI	FBC_VREF1	12MIL	1.26V	0.02A
9> BI	FBC_VREF2	12MIL	1.26V	0.02A
9> BI	FBC_VREF3	12MIL	1.26V	0.02A
9< BI	FBC_ZQ0	12MIL	1.26V	0.02A
9< BI	FBC_ZQ1	12MIL	1.26V	0.02A
11> BI	FBD_VREF0	12MIL	1.26V	0.02A
11> BI	FBD_VREF1	12MIL	1.26V	0.02A
11> BI	FBD_VREF2	12MIL	1.26V	0.02A
11> BI	FBD_VREF3	12MIL	1.26V	0.02A
11< BI	FBD_ZQ0	12MIL	1.26V	0.02A
11< BI	FBD_ZQ1	12MIL	1.26V	0.02A

ASSEMBLY	G94-300 500MHz/800MHz 512MB 16Mx32 BGA136 GDDR3, DVI-I-DL+DVI-I-DL+HDTV-Out
PAGE DETAIL	FB Net Properties

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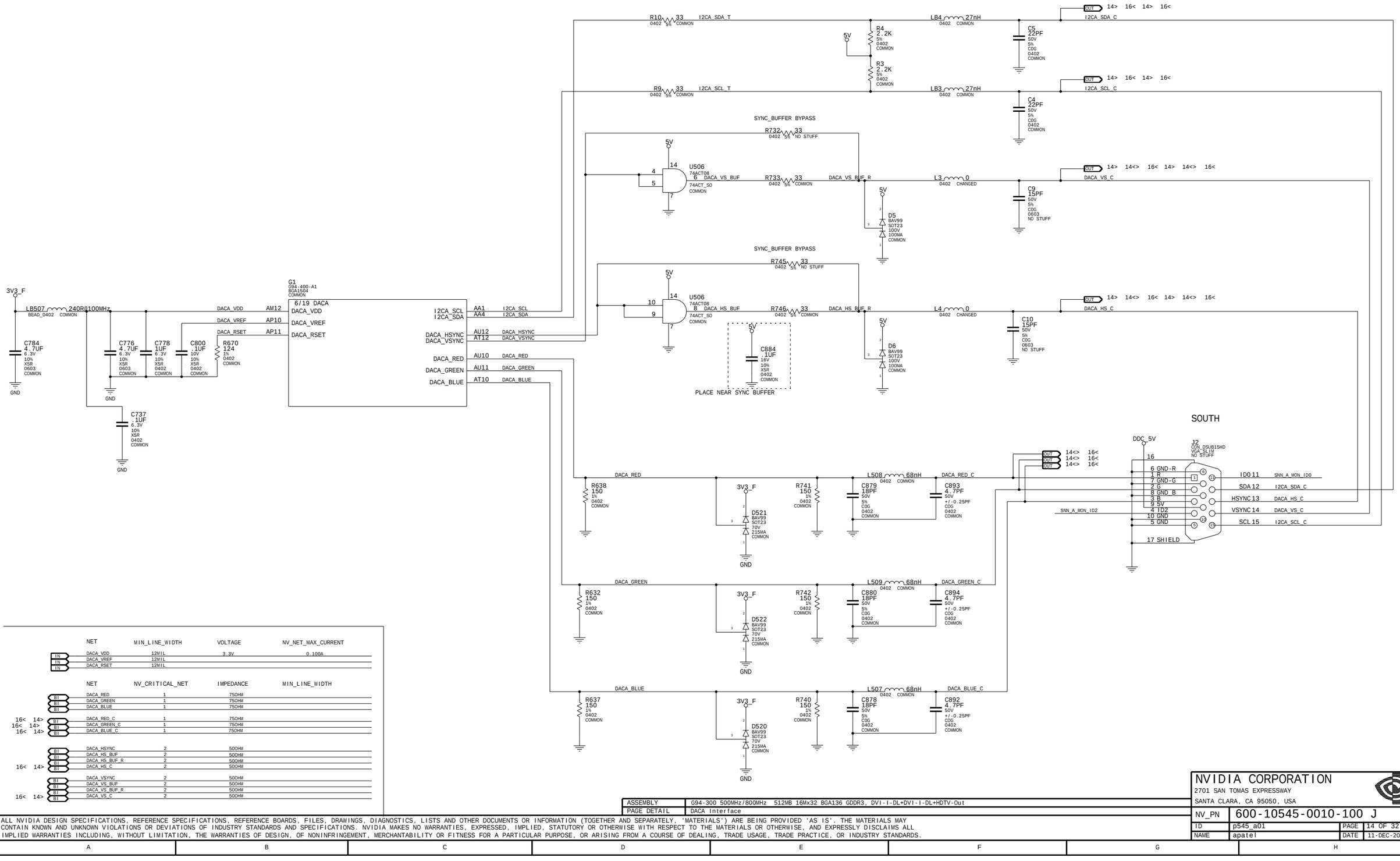
Page14: DACA Interface

DACA RGB-FILTER



NET	MIN_LINE_WIDTH	VOLTAGE	NV_NET_MAX_CURRENT
IN DACA_VDD	12MIL	3.3V	0.100A
IN DACA_VREF	12MIL		
IN DACA_RSET	12MIL		

	NET	NV_CRITICAL_NET	IMPEDANCE	MIN_LINE_WIDTH
BI	DACA_RED	1	75OHM	
BI	DACA_GREEN	1	75OHM	
BI	DACA_BLUE	1	75OHM	
16< 14> BI	DACA_RED_C	1	75OHM	
16< 14> BI	DACA_GREEN_C	1	75OHM	
16< 14> BI	DACA_BLUE_C	1	75OHM	
BI	DACA_HSYNC	2	50OHM	
BI	DACA_HS_BUF	2	50OHM	
BI	DACA_HS_BUF_R	2	50OHM	
16< 14> BI	DACA_HS_C	2	50OHM	
BI	DACA_VSYNC	2	50OHM	
BI	DACA_VS_BUF	2	50OHM	
BI	DACA_VS_BUF_R	2	50OHM	
16< 14> BI	DACA_VS_C	2	50OHM	

ASSEMBLY	G94-300 500MHz/800MHz 512MB 16Mx32 BGA136 GDDR3, DVI-I-DL+DVI-I-DL+HDTV-Out
PAGE DETAIL	DACA Interface

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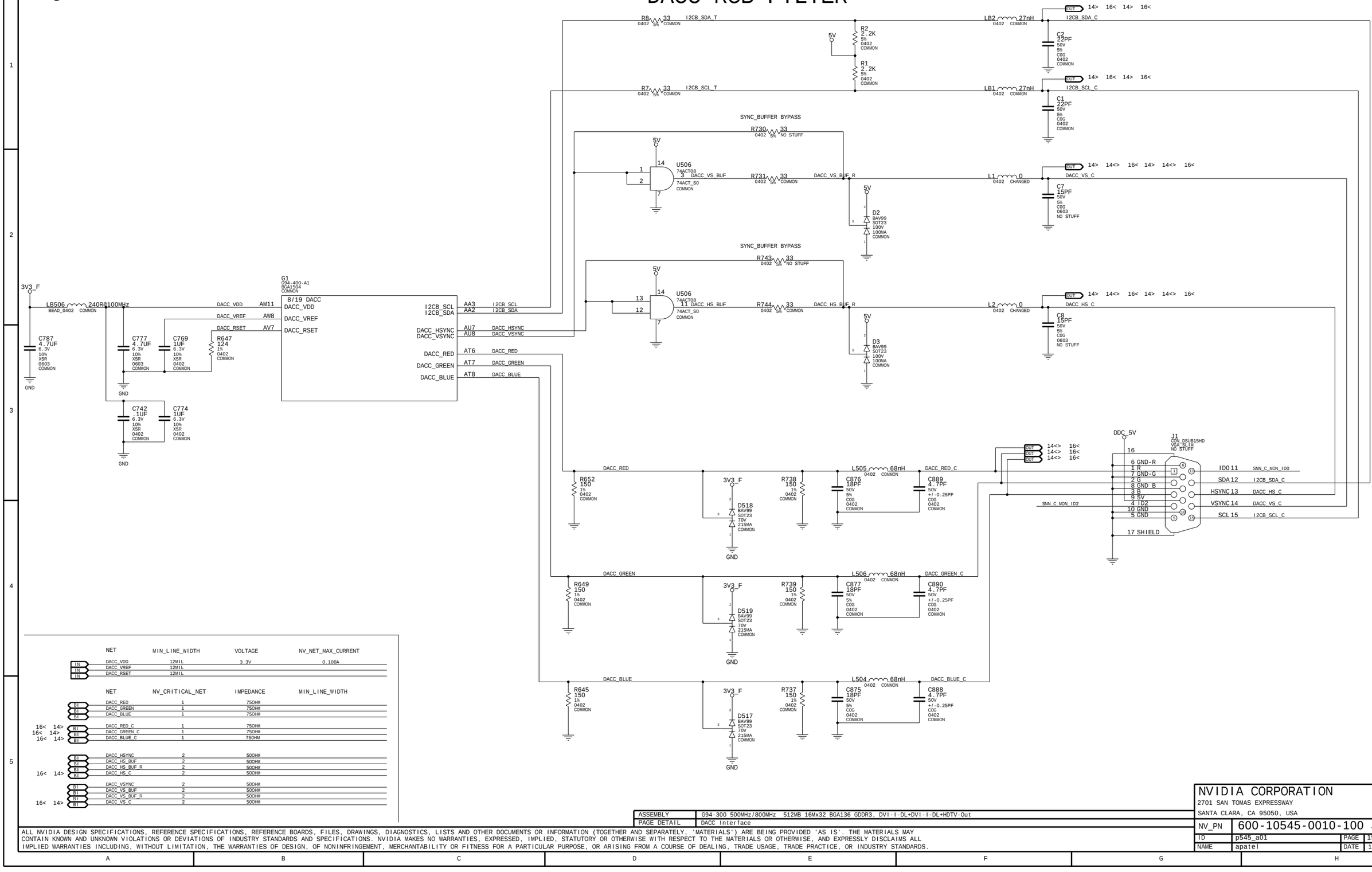
Page15: DACC Interface

DACC RGB-FILTER



	NET	MIN_LINE_WIDTH	VOLTAGE	NV_NET_MAX_CURRENT
IN	DACC_VDD	12MIL	3.3V	0.100A
IN	DACC_VREF	12MIL		
IN	DACC_RSET	12MIL		

	NET	NV_CRITICAL_NET	IMPEDANCE	MIN_LINE_WIDTH
BI	DACC_RED	1	75OHM	
BI	DACC_GREEN	1	75OHM	
BI	DACC_BLUE	1	75OHM	
16< 14> BI	DACC_RED_C	1	75OHM	
16< 14> BI	DACC_GREEN_C	1	75OHM	
16< 14> BI	DACC_BLUE_C	1	75OHM	
BI	DACC_HSYNC	2	50OHM	
BI	DACC_HS_BUF	2	50OHM	
BI	DACC_HS_BUF_R	2	50OHM	
16< 14> BI	DACC_HS_C	2	50OHM	
BI	DACC_VSYNC	2	50OHM	
BI	DACC_VS_BUF	2	50OHM	
BI	DACC_VS_BUF_R	2	50OHM	
16< 14> BI	DACC_VS_C	2	50OHM	

ASSEMBLY	G94-300 500MHz/800MHz 512MB 16Mx32 BGA136 GDDR3, DVI-I-DL+DVI-I-DL+HDTV-Out
PAGE DETAIL	DACC Interface

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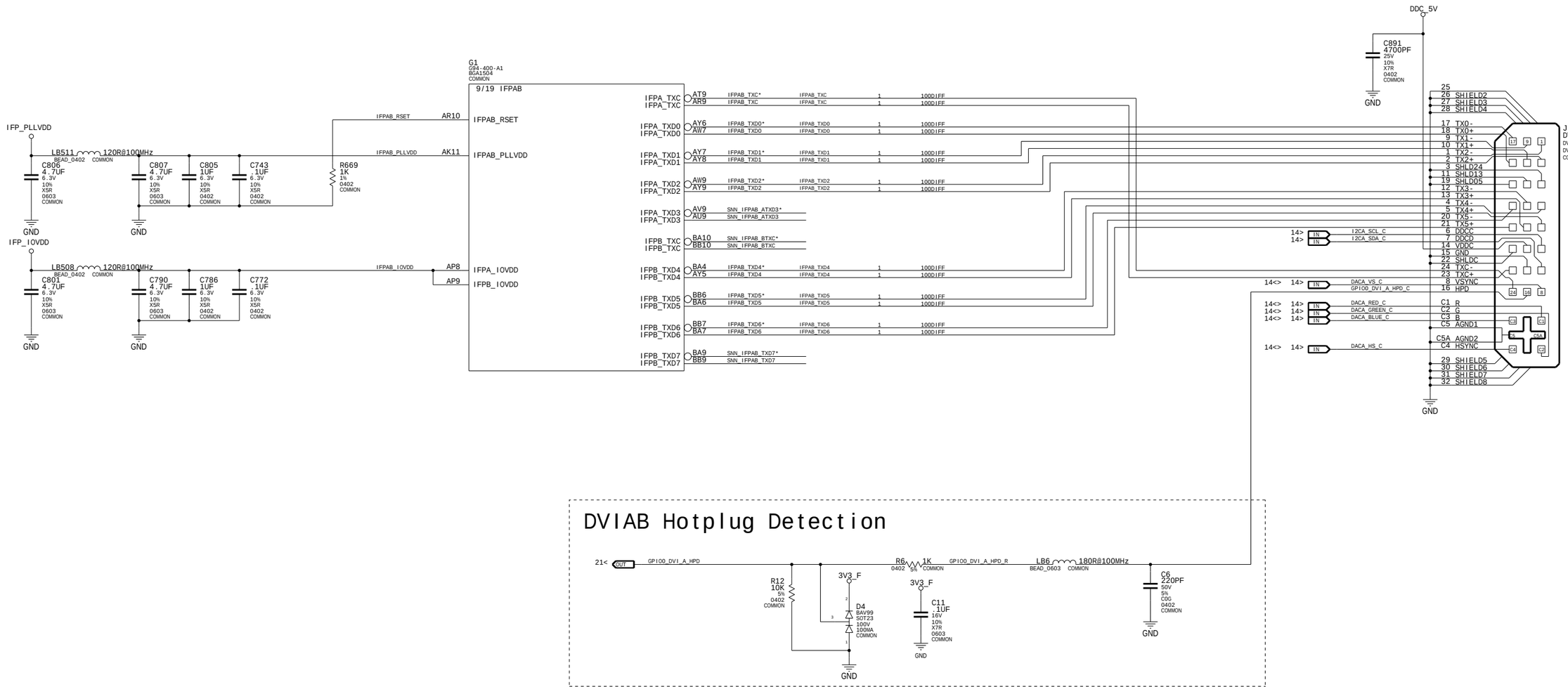
Page16: IFP A/B Interface -- DVI Connector South

NET	MIN_LINE_WIDTH	VOLTAGE	NV_NET_MAX_CURRENT
BT IFPAB_PLLVDD	12MIL	1.8V	0.035A
BT IFPAB_IOVDD	12MIL	3.3V	0.145A
BT IFPAB_RSET	12MIL		



DVIAB Hotplug Detection

ASSEMBLY	G94-300 500MHz/800MHz 512MB 16Mx32 BGA136 GDDR3, DVI-I-DL+DVI-I-DL+HDTV-Out
PAGE DETAIL	IFP A/B Interface -- DVI Connector South

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Page17: IFP C/D Interface -- DVI Connector MID

NET	MIN_LINE_WIDTH	VOLTAGE	NV_NET_MAX_CURRENT
IFPCD_PLLVDD	12MIL	1.8V	0.035A
IFPCD_LOVDD	12MIL	1.1V	0.800A
IFPCD_RSET	12MIL		

G1
G94-400-A1
BGA1504
COMMON

10/19 IFPCD

IFPC

IFPD

IFP_PLLVDD
LB509 120R@100MHz BEAD_0402 COMMON
C799 4.7UF 6.3V 10% X5R 0603 COMMON
C796 4.7UF 6.3V 10% X5R 0603 COMMON
C789 1UF 6.3V 10% X5R 0402 COMMON
C762 .1UF 6.3V 10% X5R 0402 COMMON
R656 1K 1% 0402 COMMON
GND

PEX_VDD
LB504 120R@100MHz BEAD_0402 COMMON
C725 4.7UF 6.3V 10% X5R 0603 COMMON
C710 4.7UF 6.3V 10% X5R 0603 COMMON
C720 1UF 6.3V 10% X5R 0402 COMMON
C763 .1UF 6.3V 10% X5R 0402 COMMON
GND

IFPCD_RSET AN5 → IFPCD_RSET
IFPCD_PLLVDD AJ11 → IFPCD_PLLVDD
IFPCD_IOVDD AN8 → IFPC_IOVDD
AN9 → IFPD_IOVDD

AUX	AV6	SNN_IFPC_AUX*											
AUX	AU6	SNN_IFPC_AUX											
DPL3_TXC	AV3	IFPC_TXC*	IFPC_TXC	1	100DIFF	C809	.1UF COMMON	IFPCD_TXC*	IFPCD_TXC	1	100DIFF		
DPL3_TXC	AU4	IFPC_TXC	IFPC_TXC	1	100DIFF	C808	.1UF COMMON	IFPCD_TXC	IFPCD_TXC	1	100DIFF		
DPL2_TXD0	AW3	IFPC_TXD0*	IFPC_TXD0	1	100DIFF	C811	.1UF COMMON	IFPCD_TXD0*	IFPCD_TXD0	1	100DIFF		
DPL2_TXD0	AV4	IFPC_TXD0	IFPC_TXD0	1	100DIFF	C810	.1UF COMMON	IFPCD_TXD0	IFPCD_TXD0	1	100DIFF		
DPL1_TXD1	AY4	IFPC_TXD1*	IFPC_TXD1	1	100DIFF	C813	.1UF COMMON	IFPCD_TXD1*	IFPCD_TXD1	1	100DIFF		
DPL1_TXD1	AW4	IFPC_TXD1	IFPC_TXD1	1	100DIFF	C812	.1UF COMMON	IFPCD_TXD1	IFPCD_TXD1	1	100DIFF		
DPL0_TXD2	AW5	IFPC_TXD2*	IFPC_TXD2	1	100DIFF	C814	.1UF COMMON	IFPCD_TXD2*	IFPCD_TXD2	1	100DIFF		
DPL0_TXD2	AW6	IFPC_TXD2	IFPC_TXD2	1	100DIFF	C815	.1UF COMMON	IFPCD_TXD2	IFPCD_TXD2	1	100DIFF		
AUX	AT5	SNN_IFPD_AUX*											
AUX	AU5	SNN_IFPD_AUX											
DPL3_TXC	AW2	SNN_IFPD_L3*											
DPL3_TXC	AW1	SNN_IFPD_L3											
DPL2_TXD0	AY1	IFPD_TXD4*	IFPD_TXD4	1	100DIFF	C826	.1UF COMMON	IFPCD_TXD4*	IFPCD_TXD4	1	100DIFF		
DPL2_TXD0	AY2	IFPD_TXD4	IFPD_TXD4	1	100DIFF	C827	.1UF COMMON	IFPCD_TXD4	IFPCD_TXD4	1	100DIFF		
DPL1_TXD1	AY3	IFPD_TXD5*	IFPD_TXD5	1	100DIFF	C828	.1UF COMMON	IFPCD_TXD5*	IFPCD_TXD5	1	100DIFF		
DPL1_TXD1	BA3	IFPD_TXD5	IFPD_TXD5	1	100DIFF	C829	.1UF COMMON	IFPCD_TXD5	IFPCD_TXD5	1	100DIFF		
DPL0_TXD2	BB3	IFPD_TXD6*	IFPD_TXD6	1	100DIFF	C830	.1UF COMMON	IFPCD_TXD6*	IFPCD_TXD6	1	100DIFF		
DPL0_TXD2	BB4	IFPD_TXD6	IFPD_TXD6	1	100DIFF	C831	.1UF COMMON	IFPCD_TXD6	IFPCD_TXD6	1	100DIFF		

DVI PULL DOWNS

IFPCD_TXC*			R685 499 0402 1% COMMON		
IFPCD_TXC	R684 499 0402 1% COMMON		R687 499 0402 1% COMMON		
IFPCD_TXD0*					
IFPCD_TXD0	R686 499 0402 1% COMMON		R689 499 0402 1% COMMON		
IFPCD_TXD1*					
IFPCD_TXD1	R688 499 0402 1% COMMON		R690 499 0402 1% COMMON		
IFPCD_TXD2*					
IFPCD_TXD2	R691 499 0402 1% COMMON		R701 499 0402 1% COMMON		
IFPCD_TXD4*					
IFPCD_TXD4	R702 499 0402 1% COMMON		R703 499 0402 1% COMMON		
IFPCD_TXD5*					
IFPCD_TXD5	R704 499 0402 1% COMMON		R706 499 0402 1% COMMON		
IFPCD_TXD6*					
IFPCD_TXD6	R707 499 0402 1% COMMON				

GND

DDC_5V
C895 4700PF 25V 10% X7R 0402 COMMON
GND

J4
DVI-I-FOXCONN2
DVI_I_(SLIM_)SHLD_M
DVI_I_SLIM_SHLD_M
COMMON

25			
26	SHIELD2		
27	SHIELD3		
28	SHIELD4		
17	TX0-	IFPCD_TXD4*	
18	TX0+	IFPCD_TXD4	
9	TX1-	IFPCD_TXD5*	
10	TX1+	IFPCD_TXD5	
1	TX2-	IFPCD_TXD6*	
2	TX2+	IFPCD_TXD6	
3	SHLD24		
11	SHLD13		
19	SHLD05		
12	TX3-		
13	TX3+		
4	TX4-		
5	TX4+		
20	TX5-		
21	TX5+		
6	DDCC	11< 11> IN I2CB_SCL_C	
7	DDCD	11< 11> IN I2CB_SDA_C	
14	VDDC		
15	GND		
22	SHLDC		
24	TXC-		
23	TXC+		
8	VSYNC	11<11> IN DACC_VS_C / GPIO1_DVI_C_HPD_C	
16	HPD		
C1	R	11<11> IN DACC_RED_C	
C2	G	11< 11> IN DACC_GREEN_C	
C3	B	11< 11> IN DACC_BLUE_C	
C5	AGND1		
C5A	AGND2		
C4	HSYNC	11< 11> IN DACC_HS_C	
29	SHIELD5		
30	SHIELD6		
31	SHIELD7		
32	SHIELD8		

GND

Hotplug Detection

16< OUT GPIO1_DVI_C_HPD
R11 10K 5% 0402 COMMON → GND
R5 1K 5% 0402 COMMON GPIO1_DVI_C_HPD_R
LB5 180R@100MHz BEAD_0603 COMMON
C3 220PF 50V 5% C0G 0402 COMMON → GND
3V3_F
D1 BAV99 SOT23 100V 100MA COMMON → GND
3V3_F
C12 .1UF 16V 10% X7R 0603 COMMON → GND

ASSEMBLY	G94-300 500MHz/800MHz 512MB 16Mx32 BGA136 GDDR3, DVI-I-DL+DVI-I-DL+HDTV-Out
PAGE DETAIL	IFP C/D Interface -- DVI Connector MID

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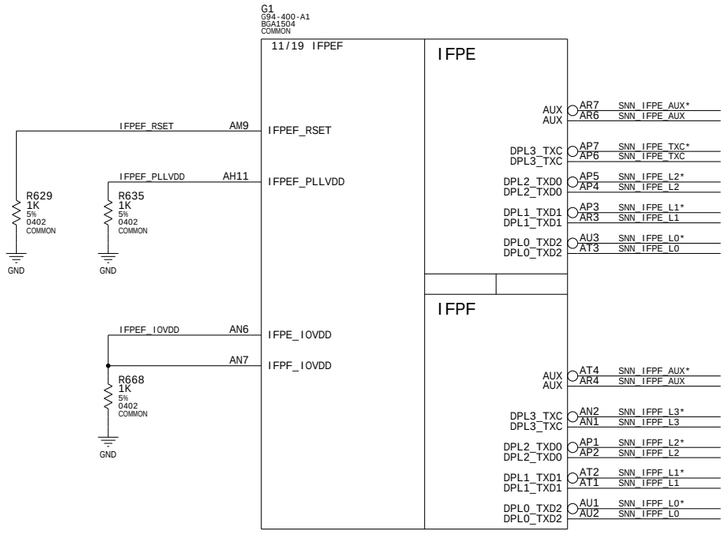
Page18: IFP E/F Interface -- Unused



NET	MIN_LINE_WIDTH	VOLTAGE	NV_NET_MAX_CURRENT
IFPEF_PLLVDD	12MIL		
IFPEF_IOVDD	12MIL		
IFPEF_RSET	12MIL		

ASSEMBLY	G94-300 500MHz/800MHz 512MB 16Mx32 BGA136 GDDR3, DVI-I-DL+DVI-I-DL+HDTV-Out
PAGE_DETAIL	IFP E/F Interface -- Unused

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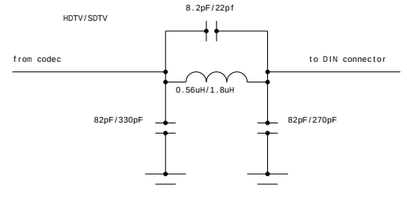
Page19: DACB and HDTV/SDTV-Out

	NET	NET	NV_CRITICAL_NET	IMPEDANCE
IN	DACB_COUT		1	75OHM
IN	DACB_COUT_C		1	75OHM
IN	DACB_YOUT		1	75OHM
IN	DACB_YOUT_C		1	75OHM
IN	DACB_PBOUT		1	75OHM
IN	DACB_PBOUT_C		1	75OHM

	NET	MIN_LINE_WIDTH	VOLTAGE	NV_NET_MAX_CURRENT
19< IN	DACB_VREF	12MIL	3.3V	0.100A
19< IN	DACB_VREF	12MIL		
IN	DACB_RSET	12MIL		

FILTER CIRCUIT



ASSEMBLY	G94-300 500MHz/800MHz 512MB 16Mx32 BGA136 GDDR3, DVI-I-DL+DVI-I-DL+HDTV-Out
PAGE DETAIL	DACB and HDTV/SDTV-Out

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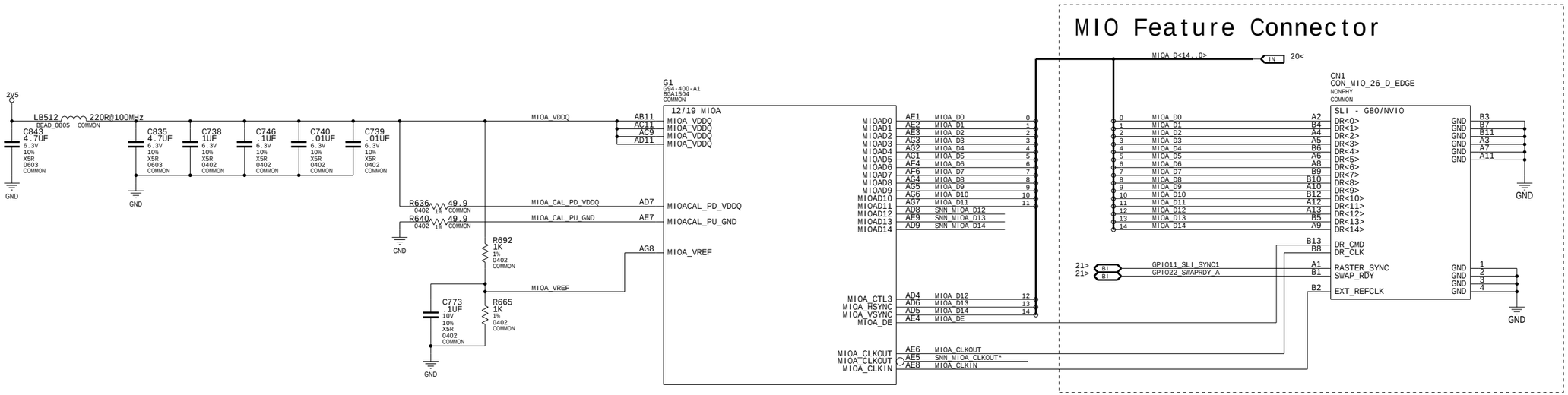
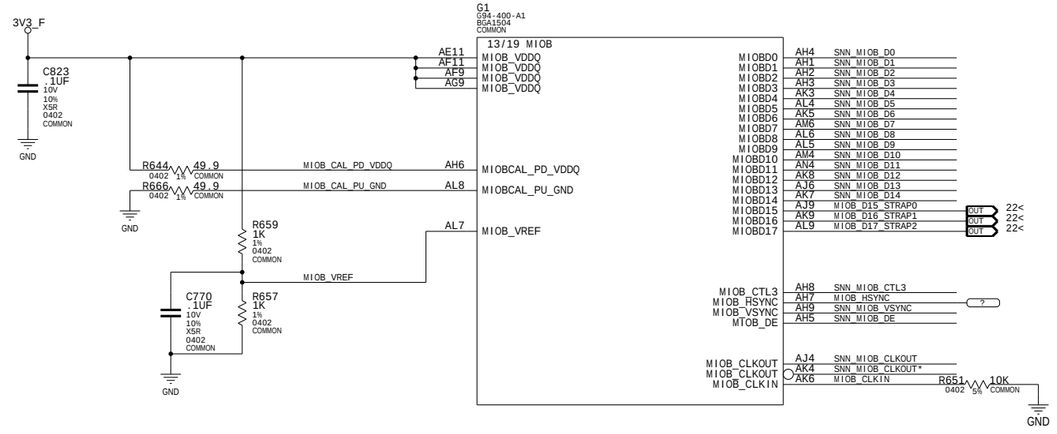
Page20: MIO A/B Interface





NET	NV_CRITICAL_NET	IMPEDANCE	DIFFPAIR
20< IN MIOA_D<14..0>	1	50OHM	
IN MIOA_CLKIN	1	50OHM	
IN MIOA_CLKOUT	1	50OHM	
IN MIOA_DE	1	50OHM	

NET	MIN_LINE_WIDTH	VOLTAGE	NV_NET_MAX_CURRENT
IN MIOA_VDDQ	16MIL	2.5V	0.80A
IN MIOA_VREF	12MIL	1.65V	
IN MIOA_CAL_PD_VDDQ	12MIL	2.5V	
IN MIOA_CAL_PU_GND	12MIL	0.0V	

ASSEMBLY	G94-300 500MHz/800MHz 512MB 16Mx32 BGA136 GDDR3, DVI-I-DL+DVI-I-DL+HDTV-Out
PAGE DETAIL	MIO A/B Interface

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Page21: MISC: GPIO, I2C, ROM, HDCP, and XTAL

NET	NV_CRITICAL	NV_IMPEDANCE	DIFFPAIR
XTALSSIN	1	500HM	
XTALIN	1	500HM	
XTALOUT	1	500HM	
XTALOUTBUFF	1	500HM	

NET	VOLTAGE	MAX_CURRENT	MIN_WIDTH
GPU_PLLVDD	1.1V	0.03A	12MIL

GPIO TABLE

GPIO	I/O	Function
0	IN	DVI_HOTPLUG_DET_A
1	IN	HDMI_HOTPLUG_DET_E
2	N/A	SWAPREADY
3	N/A	NVVDD_PHASE_CONTROL
4	N/A	PWM_TACH_SIGNAL
5	OUT	VOLTAGE_SELECT_0
6	OUT	VOLTAGE_SELECT_1
7	N/A	FBVVDQ_VOLTAGE_CONTROL
8	IN	GPU_SLOW*
9	OUT	PWM_FAN_CONTROL
10	N/A	UNUSED
11	N/A	SLI_RASTERY_SYNC
12	IN	EXT_12V_DETECT
13	OUT	UNUSED
14	IN	UNUSED
15	IN	UNUSED
16	IN	DP_MODE
17	IN	HDMI_EF
18	IN	UNUSED
19	IN	HDMI_CEC
20	IN	DP_HOTPLUG_DET_F
21	IN	UNUSED
22	IN	SWAPREADY_A
23	OUT	UNUSED

Binary Production Strap Mode:
STRAP_CALPD_MIOB = 40.2K 1%
STRAP_CALPD_MISC = NO STUFF

ASSEMBLY	G94-300 500MHz/800MHz 512MB 16Mx32 BGA136 GDDR3, DVI-I-DL+DVI-I-DL+HDTV-Out
PAGE DETAIL	MISC: GPIO, I2C, ROM, HDCP, and XTAL

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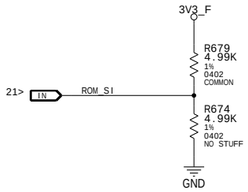
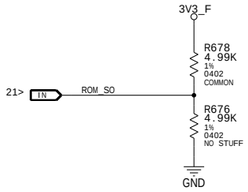
Page22: Strap Configuration

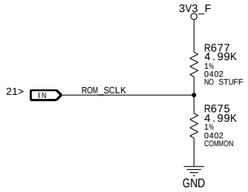


STRAP PIN	STRAP NAME
ROM_SI	PCI_DEVID_EXT

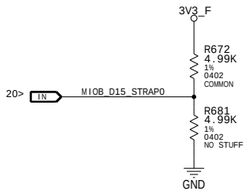
	3V3	GND
5K	1	0

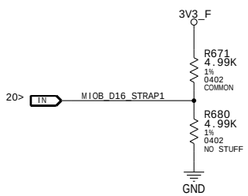


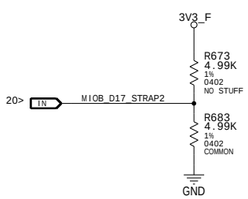
STRAP PIN	STRAP NAME
ROM_SO	SLOT_CLK_CFG



STRAP PIN	STRAP NAME
ROM_SCLK	PCI_DEVID[3]







STRAP PIN	STRAP NAME
STRAP0	RAMCFG0
STRAP1	RAMCFG1
STRAP2	RAMCFG2

* RAMCFG[2:0]

256MB (8Mx32)	512MB (16Mx32)	1024MB (32Mx32)
101 --- 256-bit Qimonda	001 --- 256-bit Qimonda	101 --- 256-bit Hynix
110 --- 256-bit Hynix	010 --- 256-bit Hynix	110 --- 256-bit Hynix
111 --- 256-bit Samsung	011 --- 256-bit Samsung	111 --- 256-bit Samsung

* VBIOS will be defined on a per SKU basis.

G1
G94-400-A1
BGA1504
COMMON

19/19 NC

SNN_NC<1>	AC34	NC
SNN_NC<2>	AC36	NC
SNN_NC<3>	AC37	NC
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SNN_NC<30>	AU26	NC
SNN_NC<31>	AV10	NC
SNN_NC<32>	AV12	NC
SNN_NC<33>	AV28	NC
SNN_NC<34>	AY31	NC
SNN_NC<35>	C12	NC
SNN_NC<36>	E15	NC
SNN_NC<37>	E16	NC
SNN_NC<38>	F16	NC
SNN_NC<39>	F17	NC
SNN_NC<40>	F20	NC
SNN_NC<41>	F23	NC
SNN_NC<42>	F31	NC
SNN_NC<43>	G17	NC
SNN_NC<44>	G20	NC
SNN_NC<45>	G23	NC
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SNN_NC<51>	J17	NC
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SNN_NC<53>	J23	NC
SNN_NC<54>	J29	NC
SNN_NC<55>	J9	NC
SNN_NC<56>	L14	NC
SNN_NC<57>	L16	NC
SNN_NC<58>	L28	NC
SNN_NC<59>	L29	NC
SNN_NC<60>	M3	NC
SNN_NC<61>	M37	NC
SNN_NC<62>	P11	NC
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SNN_NC<65>	R11	NC
SNN_NC<66>	R3	NC
SNN_NC<67>	R35	NC
SNN_NC<68>	T11	NC
SNN_NC<69>	U11	NC
SNN_NC<70>	U36	NC
SNN_NC<71>	U7	NC
SNN_NC<72>	Y34	NC
SNN_NC<73>	Y36	NC
SNN_NC<74>	Y37	NC
SNN_NC<75>	Y7	NC

ASSEMBLY	G94-300 500MHz/800MHz 512MB 16Mx32 BGA136 GDDR3, DVI-I-DL+DVI-I-DL+HDTV-Out
PAGE DETAIL	Strap Configuration

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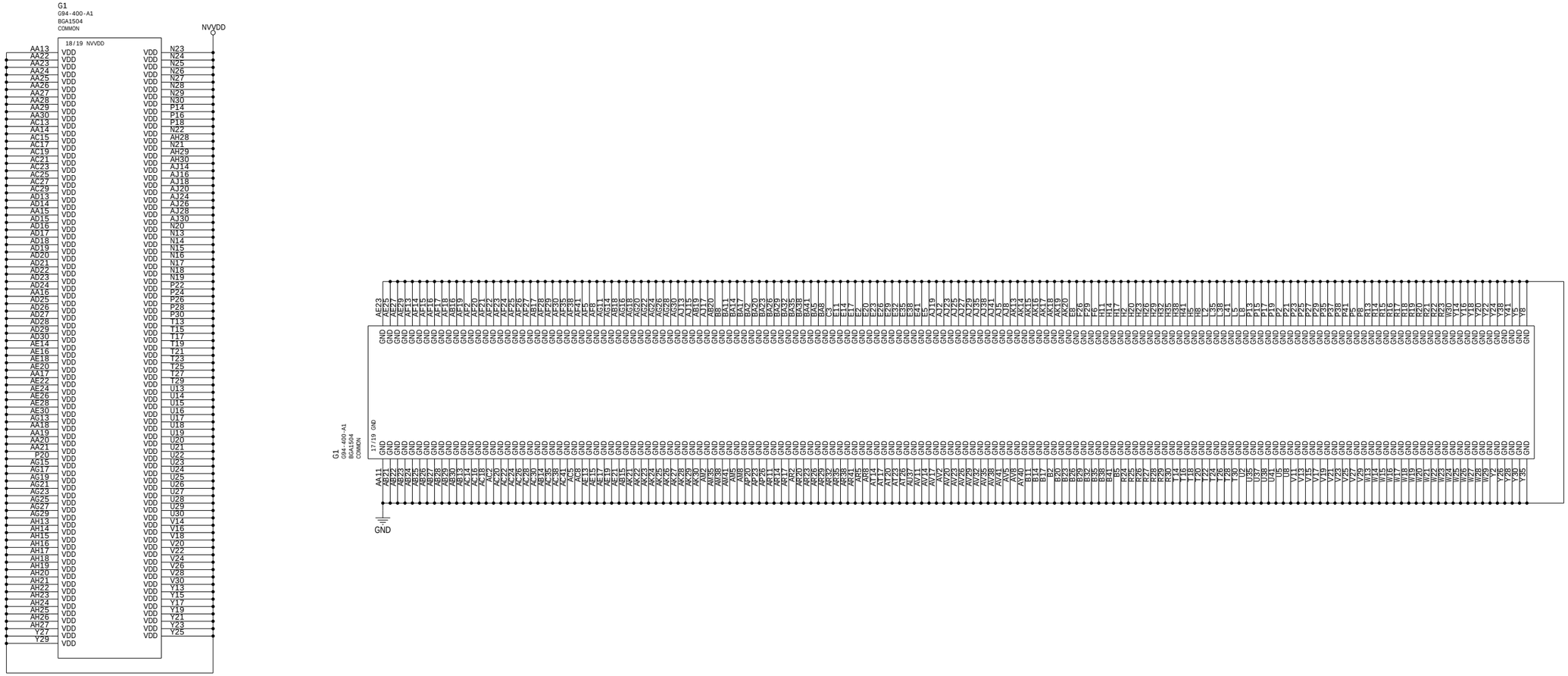
Page23: PWR and GND Signals



ASSEMBLY	G94-300 500MHz/800MHz 512MB 16Mx32 BGA136 GDDR3, DVI-I-DL+DVI-I-DL+HDTV-Out
PAGE DETAIL	PWR and GND Signals

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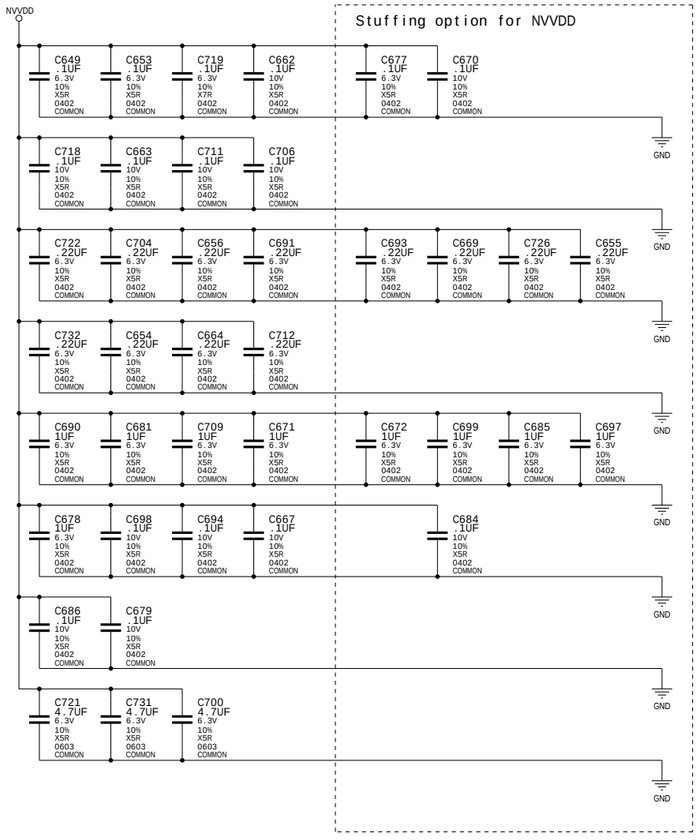
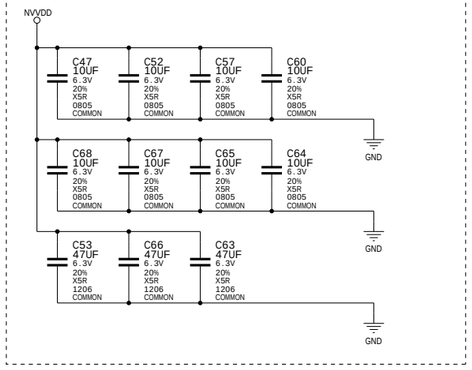
Page24: NVVDD and FBVDDQ Decoupling

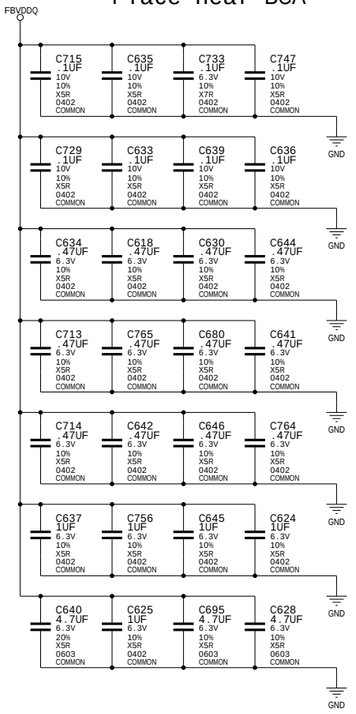
NVVDD
Place under GPU



NVVDD
Place close to GPU



FBVDDQ
Place near BGA



ASSEMBLY	G94-300 500MHz/800MHz 512MB 16Mx32 BGA136 GDDR3, DVI-I-DL+DVI-I-DL+HDTV-Out
PAGE DETAIL	NVVDD and FBVDDQ Decoupling

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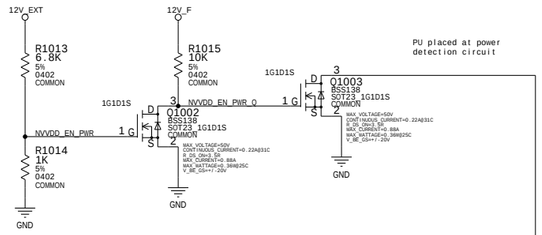
Page25: SPDIF Input, Thermal Protection, and IFP_IOVDD Power Supply

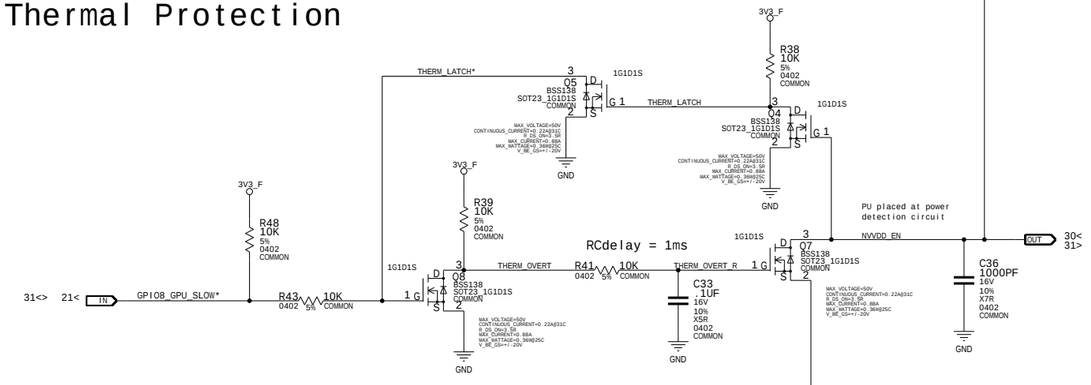
	NET	IMPEDANCE	NV_CRITICAL_NET
IN	SPDIFIN_C	56OHM	1
IN	SPDIFIN_C2	56OHM	1
IN	SPDIFIN_COMP	56OHM	1
IN	SPDIFIN_COMP_R	56OHM	1
IN	SPDIFIN_COMP_R1	56OHM	1
IN	SPDIFIN_C3	56OHM	1
IN	SPDIFIN_COMP2	56OHM	1
IN	SPDIFIN_COMP2_Q	56OHM	1
IN	SPDIFIN	50OHM	1
IN	SPDIF	50OHM	1

25> 21<

NVVDD Sequence

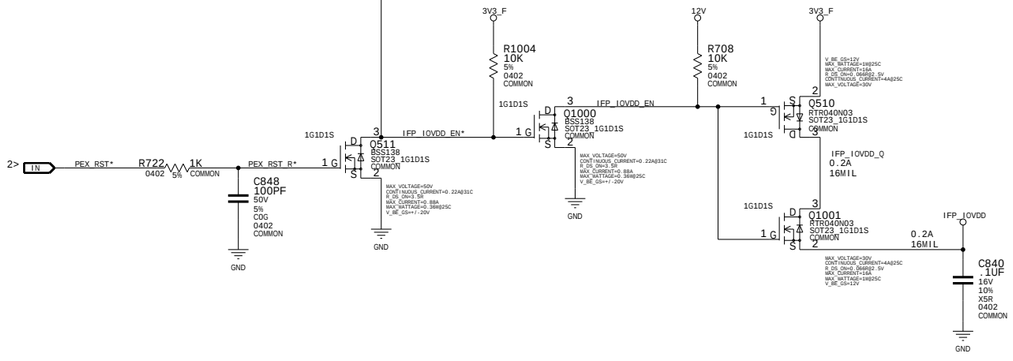


Thermal Protection

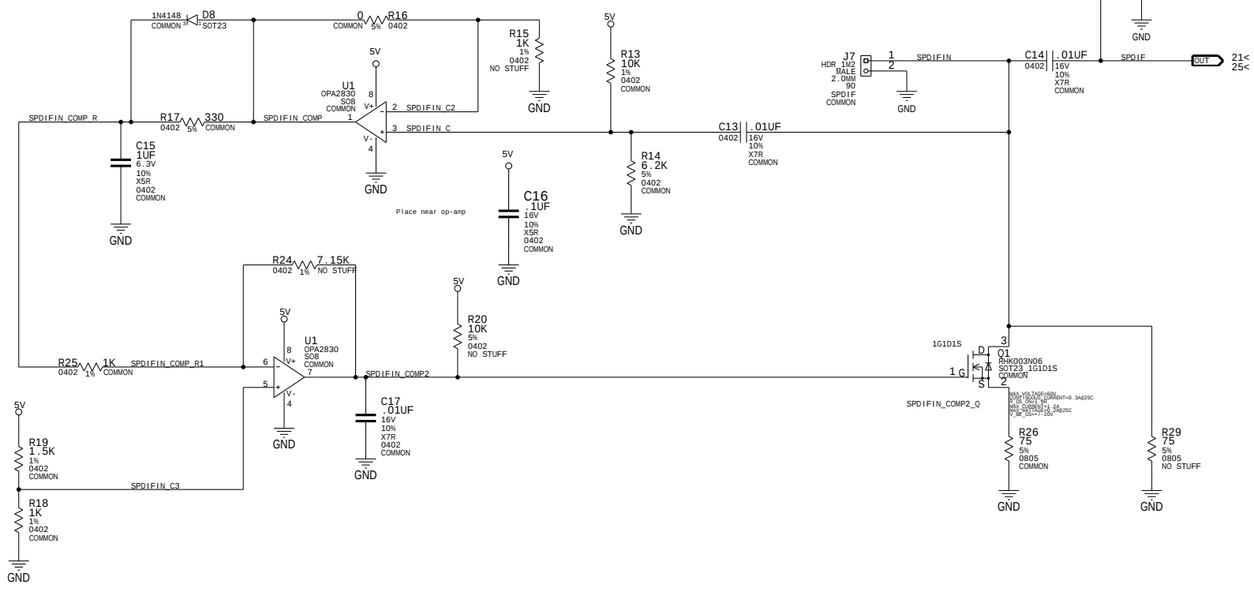


IFP_IOVDD Backdrive Prevention

Stuffing posibilities for thermal control and protection:



SPDIF Input



ASSEMBLY	G94-300 500MHz/800MHz 512MB 16Mx32 BGA136 GDDR3, DVI-I-DL+DVI-I-DL+HDTV-Out
PAGE DETAIL	SPDIF Input, Backdrive Protection, and IFP_IOVDD Power Supply

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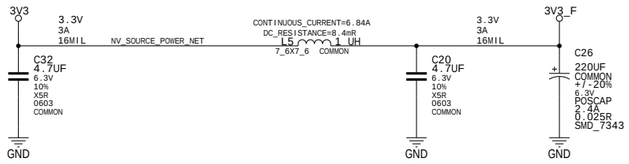
Page26: PS I: 3V3, 12V, and 12V_EXT Power Supply Filter

NET		VOLTAGE	MAX_CURRENT	MIN_WIDTH
12V_EXT	NV_SOURCE_POWER_NET	12V	6.25A	16MIL
12V	NV_SOURCE_POWER_NET	12V	5.5A	16MIL
GND	NV_SOURCE_POWER_NET	0V	28A	16MIL

3V3 Power Supply Filter

3V3_F = 3.3V @ 2.5A



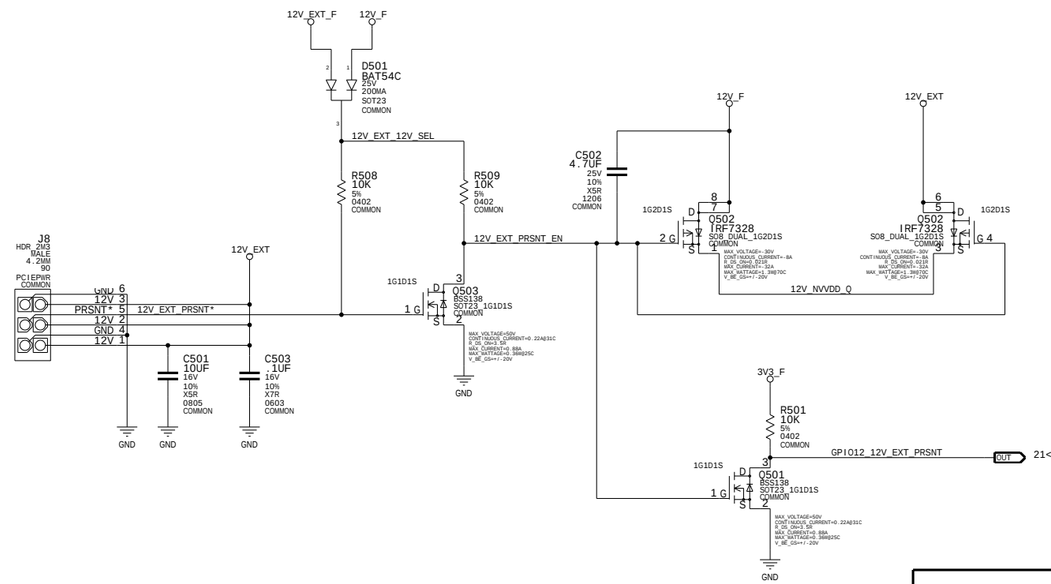
12V Power Supply Filter

12V_F = 12V @ 5.5A

12V_EXT Power Supply Filter

12V_EXT_F = 12V @ 6.25A

INPUT POWER SELECTION for NVVDD



	GPIO12
EMERENCY MODE (12V_EXT present)	0
150W POWER MODE (12V_EXT NOT present)	1

ASSEMBLY	G94-300 500MHz/800MHz 512MB 16Mx32 BGA136 GDDR3, DVI-I-DL+DVI-I-DL+HDTV-Out
PAGE DETAIL	PS I: 3V3, 12V, and 12V_EXT Power Supply Filter

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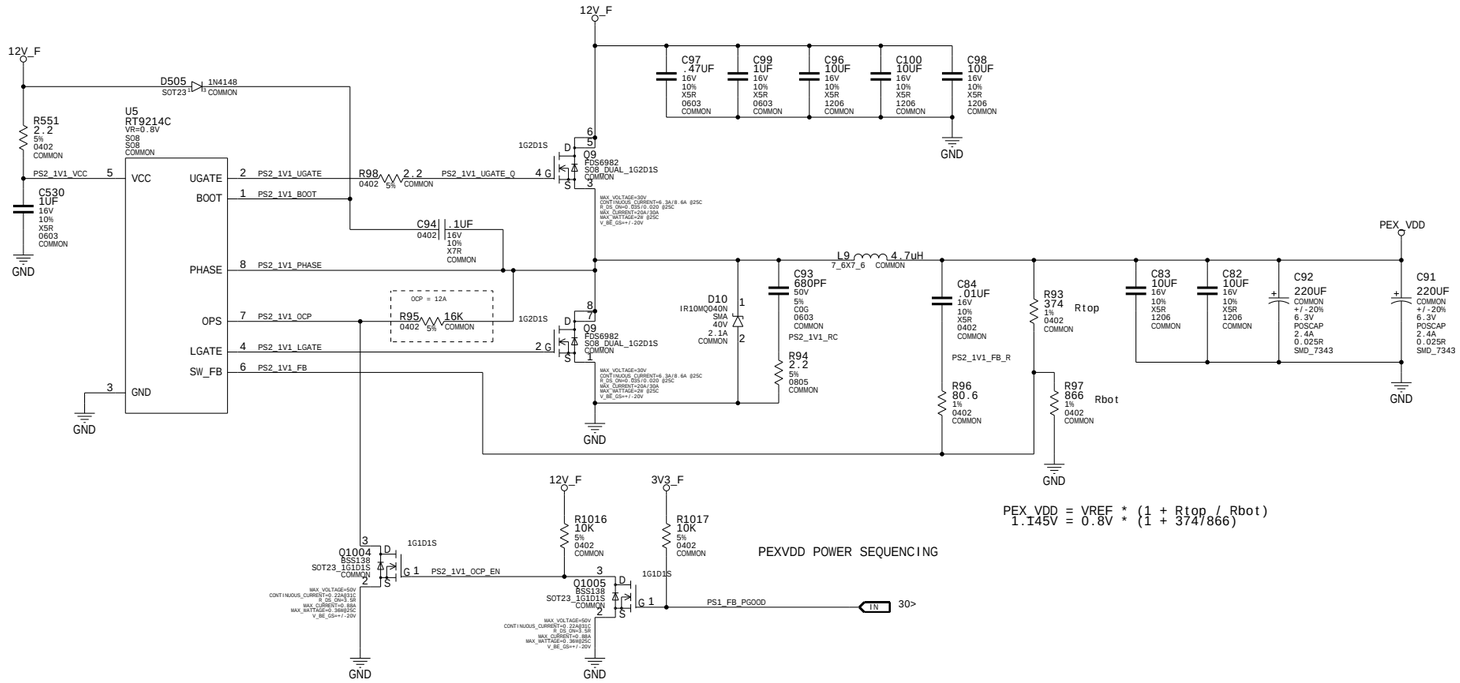
Page27: PS II: PEX_VDD, IFP_PLLVDD, 2V5, 5V, and DDC_5V Power Supply

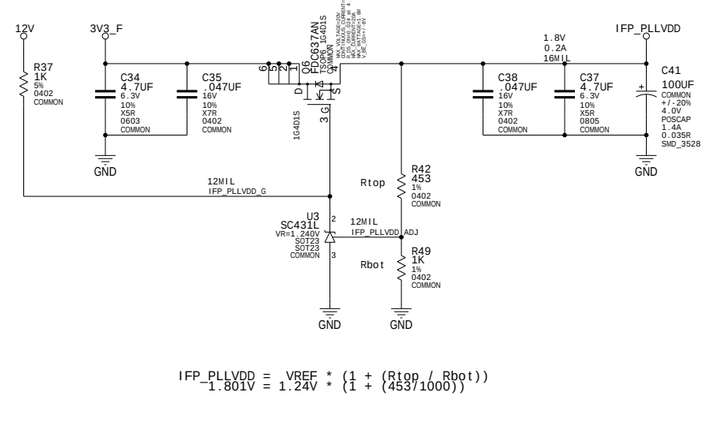
PEX_VDD Power Supply

PEX_VDD = 1.1V @ 3A



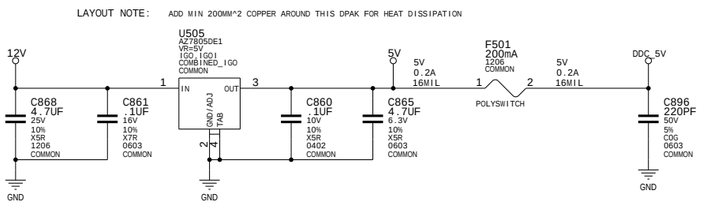
IFP_PLLVDD Power Supply

IFP_PLLVDD = 1.8V @ 200mA



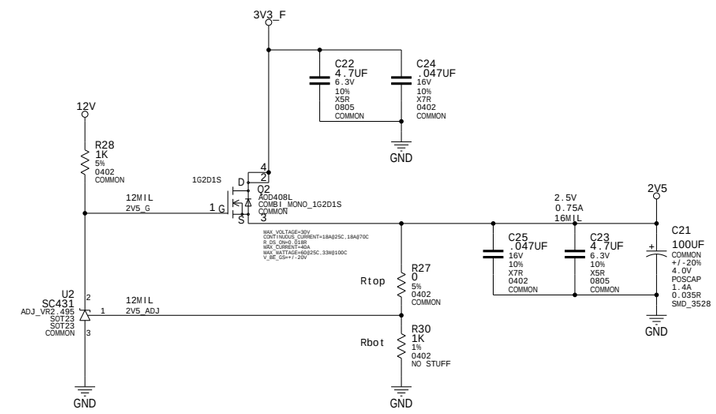
5V and DDC_5V Power Supply

DDC_5V = 5V @ 200mA



2V5 Power Supply

2V5 = 2.5V @ 750mA



NET	MIN_LINE_WIDTH	VOLTAGE	NV_NET_MAX_CURRENT
PEX_VDD	16MIL	1.1V	3A
PS2_1V1_UGATE	16MIL		
PS2_1V1_UGATE_Q	16MIL		
PS2_1V1_BOOT	16MIL		
PS2_1V1_PHASE	16MIL		3A
PS2_1V1_OCP	16MIL		
PS2_1V1_LGATE	16MIL		
PS2_1V1_FB	16MIL		
PS2_1V1_FB_R	16MIL		
PS2_1V1_RC	16MIL		
PS2_1V1_VCC	16MIL		

ASSEMBLY	G94-300 500MHz/800MHz 512MB 16Mx32 BGA136 GDDR3, DVI-I-DL+DVI-I-DL+HDTV-Out
PAGE DETAIL	PS II: PEX_VDD, IFP_PLLVDD, 2V5, 5V, and DDC_5V Power Supply

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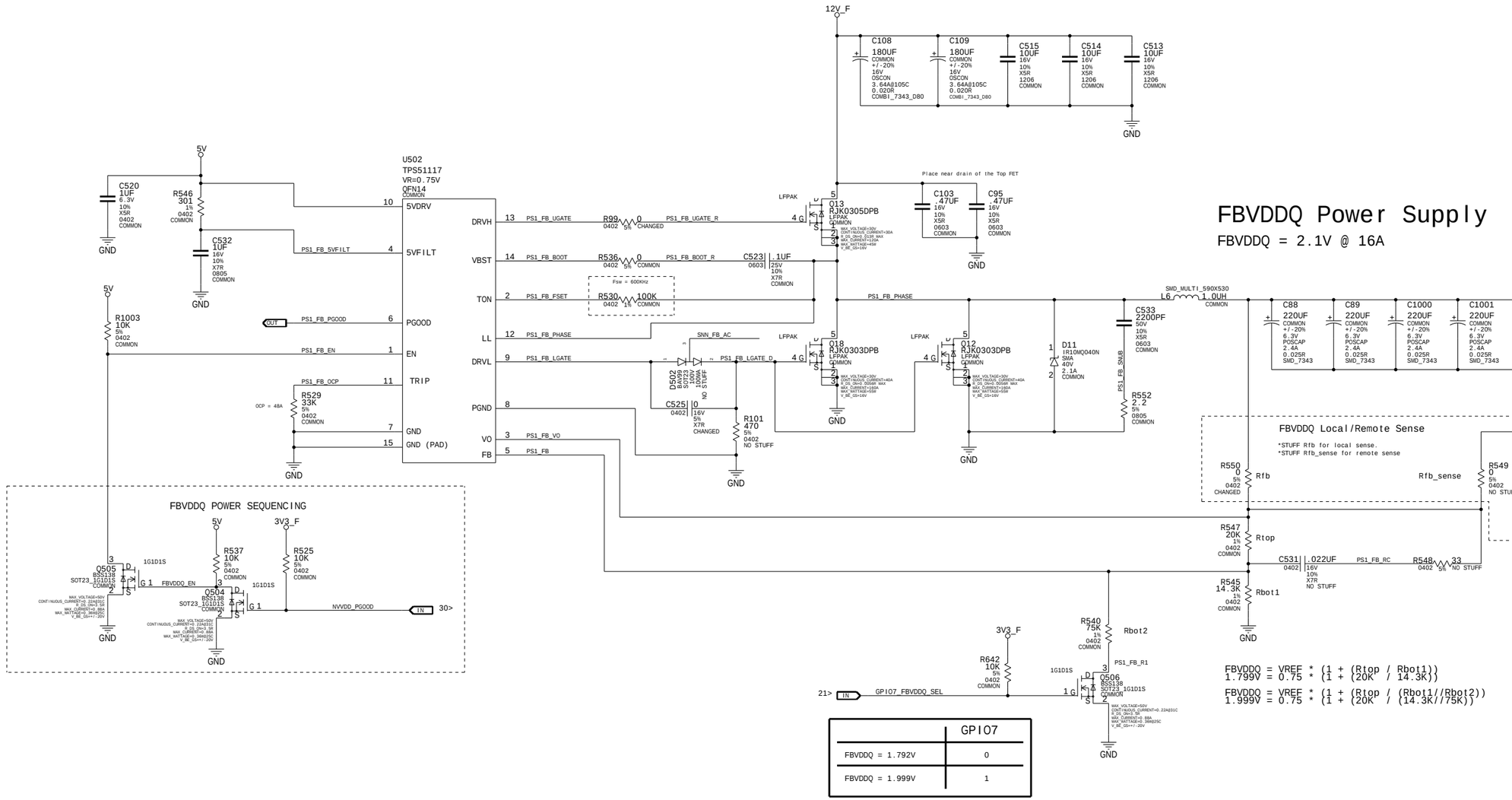
Page28: PS III: FBVDDQ Power Supply

NET	MIN_LINE_WIDTH	VOLTAGE	NV_NET_MAX_CURRENT
FBVDDQ	20MIL	2.1V	16A
PS1_FB_BOOT	20MIL		
PS1_FB_BOOT	20MIL		
PS1_FB_UGATE	20MIL		
PS1_FB_UGATE_R	20MIL		
PS1_FB_PHASE	20MIL		16A
PS1_FB_LGATE	20MIL		
PS1_FB_LGATE_D	20MIL		
PS1_FB_FDBACK	20MIL		
PS1_FB_COMP	20MIL		
PS1_FB_COMP1	20MIL		
PS1_FB_SNUB	20MIL		
PS1_FB_FSET	20MIL		
PS1_FB_5VFILT	20MIL		
PS1_FB	20MIL		
PS1_VO	20MIL		
PVCC5	20MIL		
VCC5	20MIL		
FBVDDQ_FS_DIS	12MIL		
FBVDDQ_EN	12MIL		



	GPIO7
FBVDDQ = 1.792V	0
FBVDDQ = 1.999V	1

FBVDDQ Power Supply

FBVDDQ = 2.1V @ 16A

FBVDDQ = VREF * (1 + (Rtop / Rbot1))
1.799V = 0.75 * (1 + (20K / 14.3K))

FBVDDQ = VREF * (1 + (Rtop / (Rbot1//Rbot2))
1.999V = 0.75 * (1 + (20K / (14.3K//75K))

ASSEMBLY	G94-300 500MHz/800MHz 512MB 16Mx32 BGA136 GDDR3, DVI-I-DL+DVI-I-DL+HDTV-Out
PAGE DETAIL	PS III: FBVDDQ Power Supply

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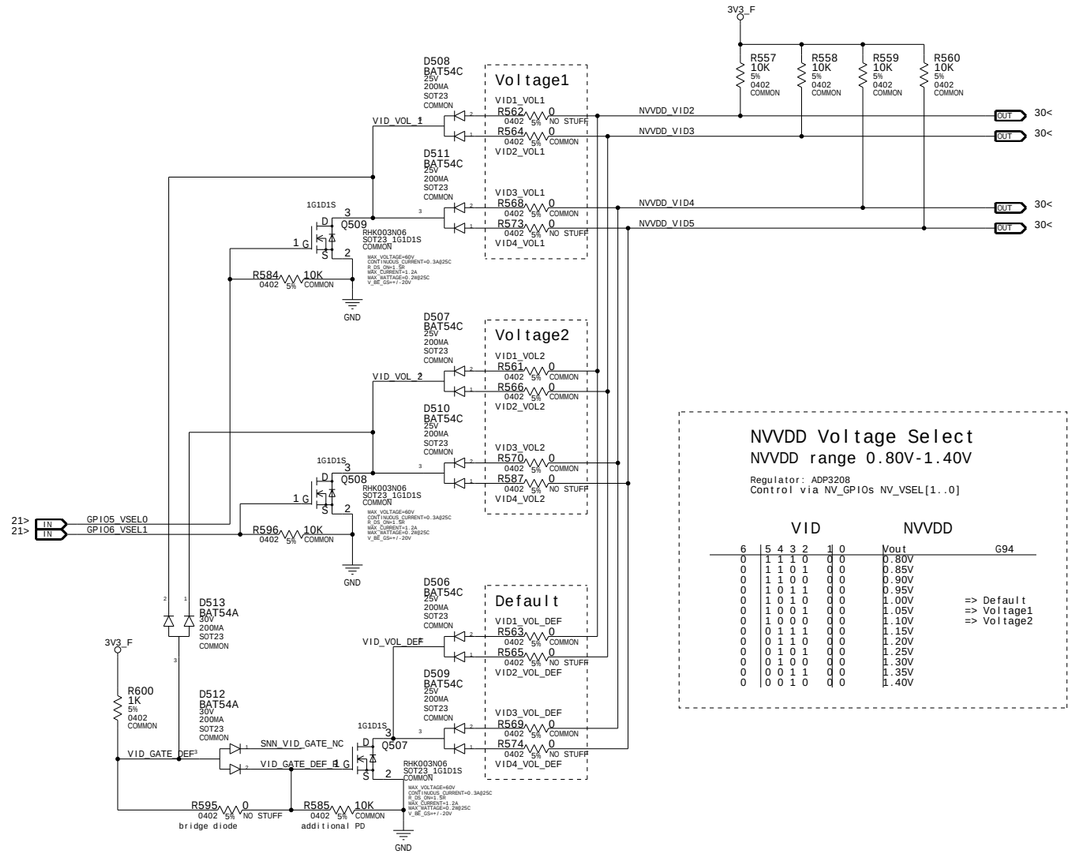
Page29: PS IV: NVVDD VID Control



Default selection for NVVDD_VID[5..2]

NVVDD Voltage Select

NVVDD range 0.80V-1.40V

Regulator: ADP3208
Control via NV_GPIOs NV_VSEL[1..0]

VID						NVVDD	
6	5	4	3	2	1 0	Vout	G94
0	1	1	1	0	0 0	0.80V	
0	1	1	0	1	0 0	0.85V	
0	1	1	0	0	0 0	0.90V	
0	1	0	1	1	0 0	0.95V	
0	1	0	1	0	0 0	1.00V	=> Default
0	1	0	0	1	0 0	1.05V	=> Voltage1
0	1	0	0	0	0 0	1.10V	=> Voltage2
0	0	1	1	1	0 0	1.15V	
0	0	1	1	0	0 0	1.20V	
0	0	1	0	1	0 0	1.25V	
0	0	1	0	0	0 0	1.30V	
0	0	0	1	1	0 0	1.35V	
0	0	0	1	0	0 0	1.40V	

ASSEMBLY	G94-300 500MHz/800MHz 512MB 16Mx32 BGA136 GDDR3, DVI-I-DL+DVI-I-DL+HDTV-Out
PAGE DETAIL	PS IV: NVVDD VID Control

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Page30: PS V: NVVDD Power Supply

	GPIO3
2-PHASE CONFIG	0
1-PHASE CONFIG	1

NET	VOLTAGE	MAX_CURRENT	MIN_WIDTH
NVVDD	1.2V	48A	30MIL
NVVDD_VCC	5V	0.02A	30MIL
NVVDD_BST1			30MIL
NVVDD_BST1_R			30MIL
NVVDD_DRVH1			30MIL
NVVDD_DRVH1_G			30MIL
NVVDD_SW1		24A	30MIL
NVVDD_DRVL1			30MIL
NVVDD_BST2			30MIL
NVVDD_BST2_R			30MIL
NVVDD_DRVH2			30MIL
NVVDD_SW2		24A	30MIL
NVVDD_DRVL2			30MIL
NVVDD_DRVL2_G			30MIL
NVVDD_ISEN1			30MIL
NVVDD_ISEN2			30MIL
NVVDD_SW1_RC			12MIL
NVVDD_SW2_RC			12MIL
NVVDD_CSSUM			12MIL
NVVDD_CSCOMP			12MIL
NVVDD_CSREF			12MIL
NVVDD_LLINE			12MIL
NVVDD_TTSNS			12MIL
NVVDD_COMP			12MIL
NVVDD_COMP_R			12MIL
NVVDD_COMP_RC			12MIL
NVVDD_FB			12MIL
NVVDD_FBRTN			12MIL
NVVDD_PMON			12MIL
NVVDD_PMON_R			12MIL
NVVDD_PMONFS			12MIL
NVVDD_CLIM			12MIL
NVVDD_RAMP			12MIL
NVVDD_RAMP_R			12MIL
NVVDD_VRPM			12MIL
NVVDD_RPM			12MIL
NVVDD_RT			12MIL
NVVDD_VARFREQ			12MIL
NVVDD_ST			12MIL
NVVDD_SS			12MIL

NVVDD Power Supply

NVVDD = 0.9-1.2V @ 40-50A

ASSEMBLY	G94-300 500MHz/800MHz 512MB 16Mx32 BGA136 GDDR3, DVI-I-DL+DVI-I-DL+HDTV-Out
PAGE DETAIL	PS V: NVVDD Power Supply

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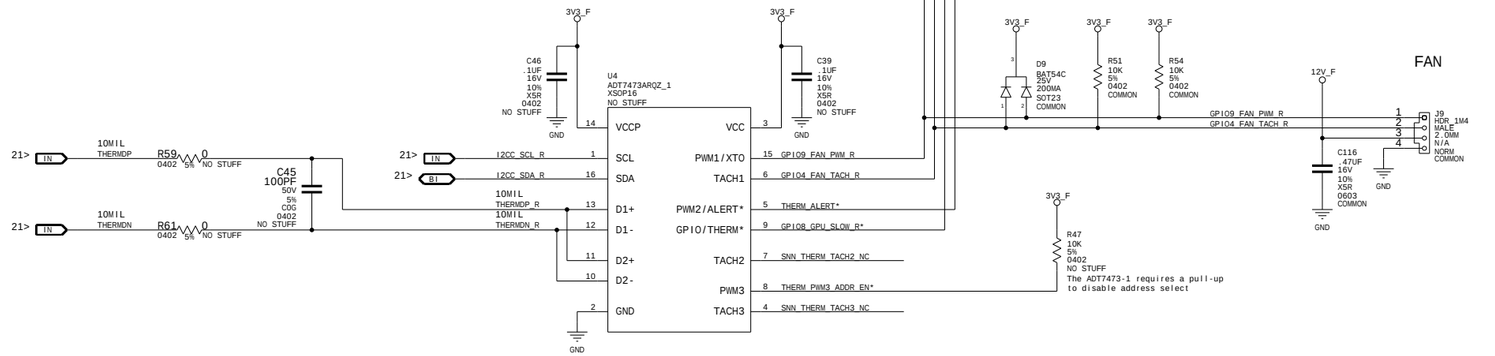
Page31: Thermal Diode and Fan Control

ADT7473 External Fan/Thermal Control



ASSEMBLY	G94-300 500MHz/800MHz 512MB 16Mx32 BGA136 GDDR3, DVI-I-DL+DVI-I-DL+HDTV-Out
PAGE DETAIL	Thermal Diode and Fan Control

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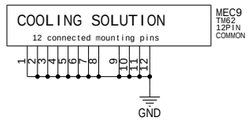
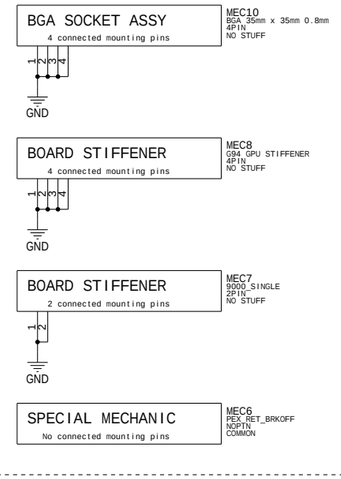
Page32: Thermal, Mechanical, and Bracket

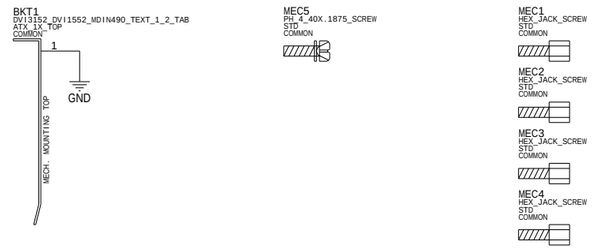
Thermal



Mechanical



Bracket



ASSEMBLY	G94-300 500MHz/800MHz 512MB 16Mx32 BGA136 GDDR3, DVI-I-DL+DVI-I-DL+HDTV-Out
PAGE DETAIL	Thermal, Mechanical, and Bracket

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