

P816_C01: G94-650/700/655/705, GB1-256, MXM V3.0 TYPE B
LVDS, QUAD DP, VGA, HDCP, SLI
16/32Mx32 GDDR3, 256Bit, 1024MB


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SKU	VARIANT	NVPN	ASSEMBLY
B	BASE	600-10816-BASE-300	BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL
1	SKU0001	600-10816-0001-300	G94-700-A1(65nm), 512MB, 8pcs 16Mx32 GDDR3
2	SKU0002	600-10816-0002-300	G94-650-A1(65nm), 512MB, 8pcs 16Mx32 GDDR3
3	SKU0003	600-10816-0003-300	G94-701-A1(65nm), 512MB, 8pcs 16Mx32 GDDR3
4	SKU0004	600-10816-0004-300	G94-705-B1(55nm), 1024MB, 8pcs 32Mx32 GDDR3
5	SKU0005	600-10816-0005-300	G94-655-B1(55nm), 1024MB, 8pcs 32Mx32 GDDR3
6	SKU0006	600-10816-0006-300	G94-706-B1(55nm), 1024MB, 8pcs 32Mx32 GDDR3
7	<UNDEFINED>	<UNDEFINED>	<UNDEFINED>
8	<UNDEFINED>	<UNDEFINED>	<UNDEFINED>
9	<UNDEFINED>	<UNDEFINED>	<UNDEFINED>
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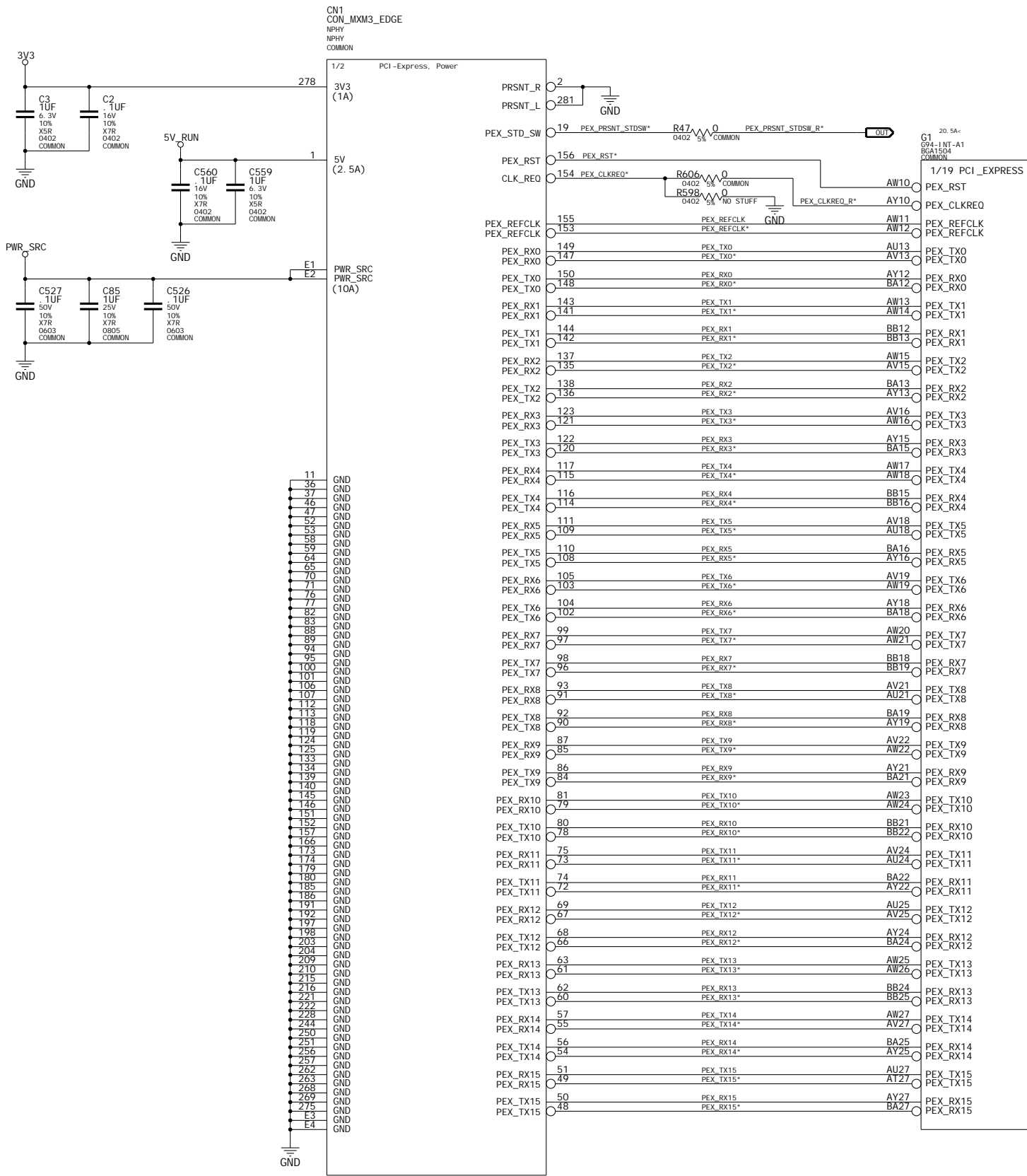
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POWER NET RULES

NET	VOLTAGE	MAX_CURRENT	MIN_LENGTH	WIDTH
PEX_PLLVDD	1.1V	0.25A	16MI L	

PLATFORM POWER NET RULES

NET	VOLTAGE	NV_NET_MAX_CURRENT	MIN_LENGTH	NV_SOURCE_POWER_NET
PWR_SRC	20V	10A	16MI L	TRUE
5V_RUN	5V	2.5A	16MI L	TRUE
3V3_RUN	3.3V	1.0A	16MI L	TRUE
3V3	3.3V	1.0A	16MI L	TRUE

NET RULES

NET	NV_CRTI_CAL_NET	DI_FPAI_R	NV_I_MPEDANCE
PEX_PLL_CLK_OUT	1	PEX_REFCLK	90DI FF
PEX_REFCLK	1	PEX_REFCLK	90DI FF
PEX_TX0	1	PEX_TX0	90DI FF
PEX_TX0*	1	PEX_TX0	90DI FF
PEX_TX1	1	PEX_TX1	90DI FF
PEX_TX1*	1	PEX_TX1	90DI FF
PEX_TX2	1	PEX_TX2	90DI FF
PEX_TX2*	1	PEX_TX2	90DI FF
PEX_TX3	1	PEX_TX3	90DI FF
PEX_TX3*	1	PEX_TX3	90DI FF
PEX_TX4	1	PEX_TX4	90DI FF
PEX_TX4*	1	PEX_TX4	90DI FF
PEX_TX5	1	PEX_TX5	90DI FF
PEX_TX5*	1	PEX_TX5	90DI FF
PEX_TX6	1	PEX_TX6	90DI FF
PEX_TX6*	1	PEX_TX6	90DI FF
PEX_TX7	1	PEX_TX7	90DI FF
PEX_TX7*	1	PEX_TX7	90DI FF
PEX_TX8	1	PEX_TX8	90DI FF
PEX_TX8*	1	PEX_TX8	90DI FF
PEX_TX9	1	PEX_TX9	90DI FF
PEX_TX9*	1	PEX_TX9	90DI FF
PEX_TX10	1	PEX_TX10	90DI FF
PEX_TX10*	1	PEX_TX10	90DI FF
PEX_TX11	1	PEX_TX11	90DI FF
PEX_TX11*	1	PEX_TX11	90DI FF
PEX_TX12	1	PEX_TX12	90DI FF
PEX_TX12*	1	PEX_TX12	90DI FF
PEX_TX13	1	PEX_TX13	90DI FF
PEX_TX13*	1	PEX_TX13	90DI FF
PEX_TX14	1	PEX_TX14	90DI FF
PEX_TX14*	1	PEX_TX14	90DI FF
PEX_TX15	1	PEX_TX15	90DI FF
PEX_TX15*	1	PEX_TX15	90DI FF

PEX_RX0	1	PEX_RX0	90DI FF
PEX_RX0*	1	PEX_RX0	90DI FF
PEX_RX1	1	PEX_RX1	90DI FF
PEX_RX1*	1	PEX_RX1	90DI FF
PEX_RX2	1	PEX_RX2	90DI FF
PEX_RX2*	1	PEX_RX2	90DI FF
PEX_RX3	1	PEX_RX3	90DI FF
PEX_RX3*	1	PEX_RX3	90DI FF
PEX_RX4	1	PEX_RX4	90DI FF
PEX_RX4*	1	PEX_RX4	90DI FF
PEX_RX5	1	PEX_RX5	90DI FF
PEX_RX5*	1	PEX_RX5	90DI FF
PEX_RX6	1	PEX_RX6	90DI FF
PEX_RX6*	1	PEX_RX6	90DI FF
PEX_RX7	1	PEX_RX7	90DI FF
PEX_RX7*	1	PEX_RX7	90DI FF
PEX_RX8	1	PEX_RX8	90DI FF
PEX_RX8*	1	PEX_RX8	90DI FF
PEX_RX9	1	PEX_RX9	90DI FF
PEX_RX9*	1	PEX_RX9	90DI FF
PEX_RX10	1	PEX_RX10	90DI FF
PEX_RX10*	1	PEX_RX10	90DI FF
PEX_RX11	1	PEX_RX11	90DI FF
PEX_RX11*	1	PEX_RX11	90DI FF
PEX_RX12	1	PEX_RX12	90DI FF
PEX_RX12*	1	PEX_RX12	90DI FF
PEX_RX13	1	PEX_RX13	90DI FF
PEX_RX13*	1	PEX_RX13	90DI FF
PEX_RX14	1	PEX_RX14	90DI FF
PEX_RX14*	1	PEX_RX14	90DI FF
PEX_RX15	1	PEX_RX15	90DI FF
PEX_RX15*	1	PEX_RX15	90DI FF

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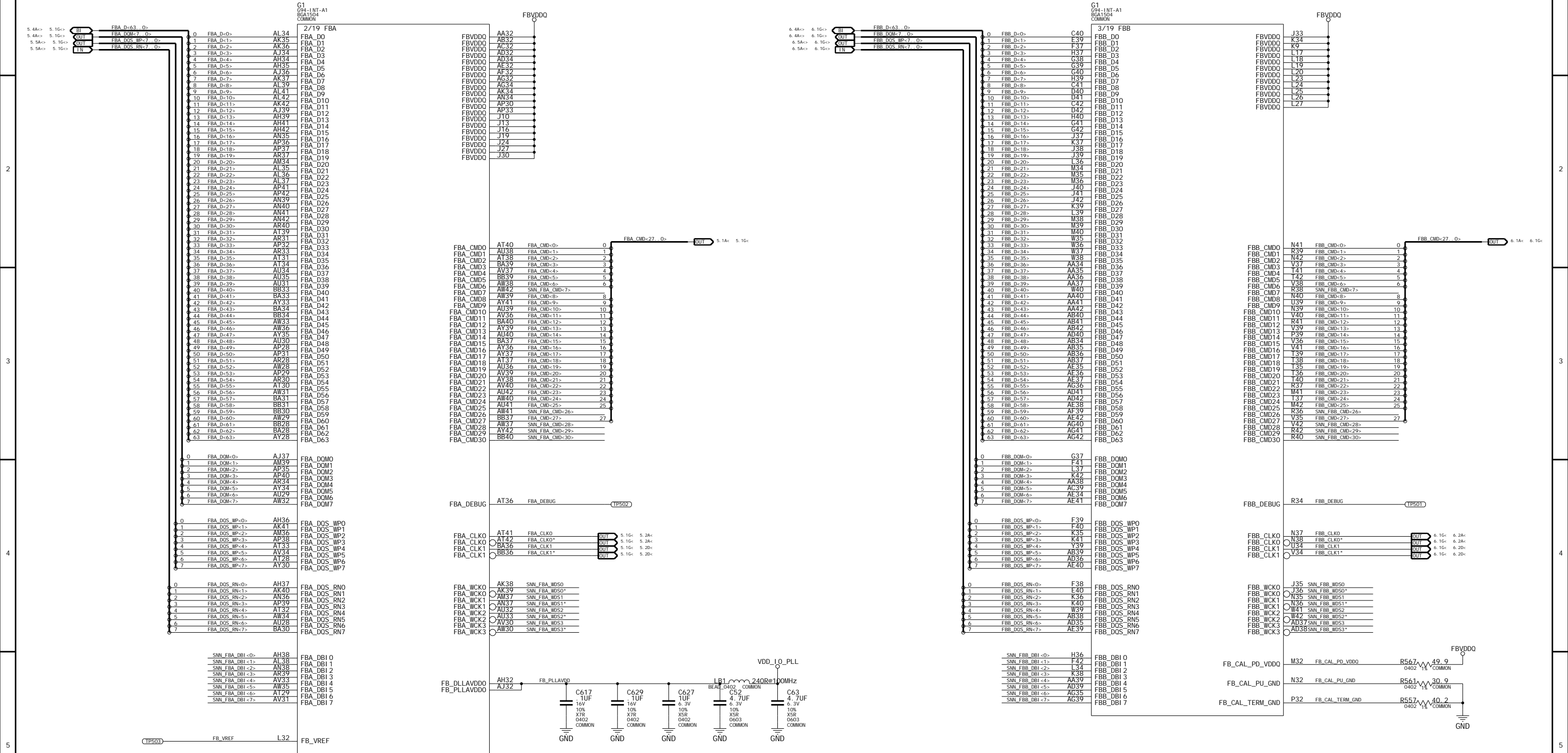


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Page3: FrameBuffer - GPU Partition A/B

NET	VOLTAGE	MAX_CURRENT	MIN_LINE_WIDTH
FB_PLLAVDD	1.2V	0.25A	16MIL
FB_VREF			12MIL
FB_CAL_PD_VDDO			12MIL
FB_CAL_PU_GND			12MIL
FB_CAL_TERM_GND			12MIL



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ASSEMBLY

G94-701-A1(65nm), 512MB, 8pcs 16Mx32 GDDR3

PAGE DETAIL

FrameBuffer - GPU Partition A/B

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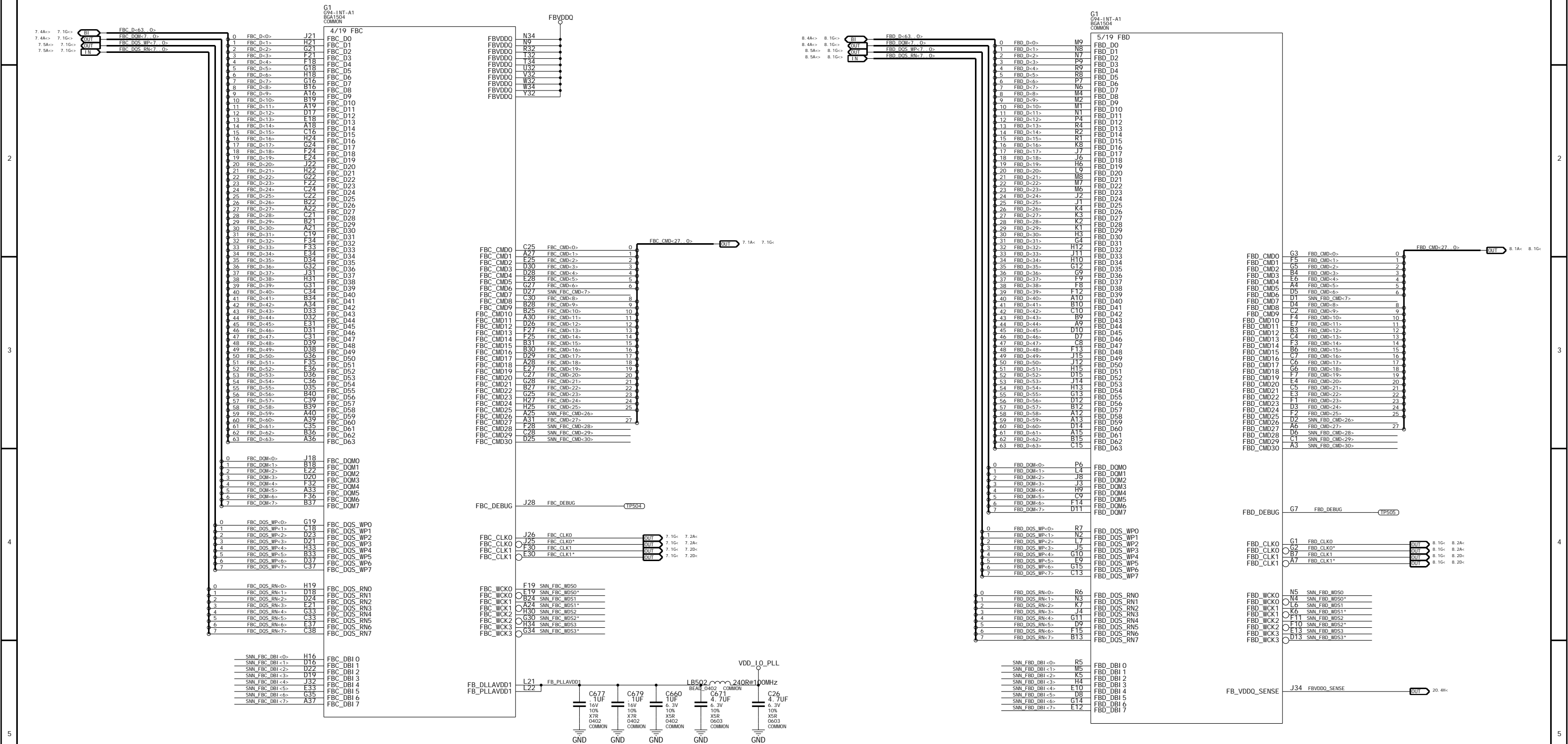
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Page4: FrameBuffer - GPU Parti ti on C/D

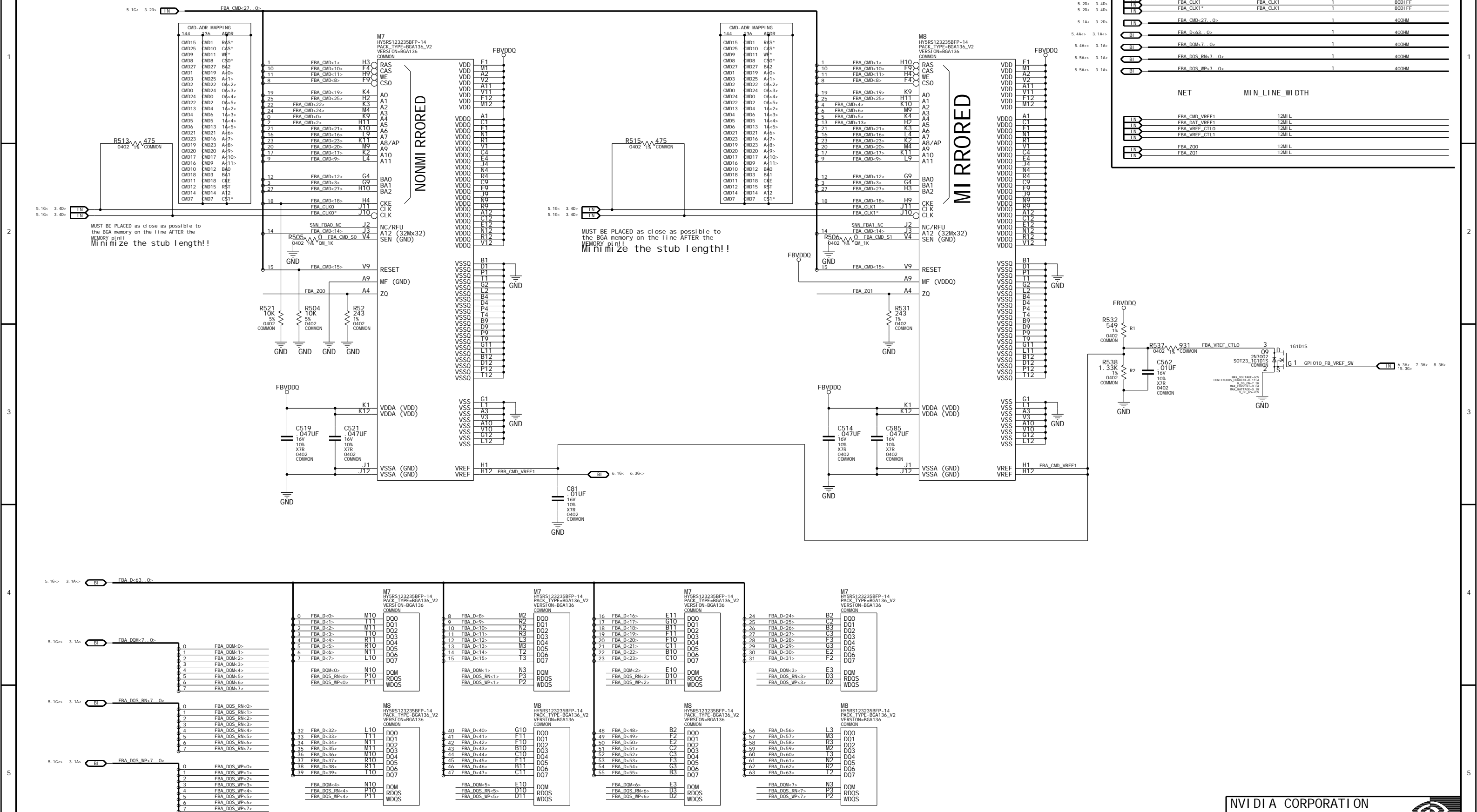
	NET	VOLTAGE	MAX_CURRENT	MIN_L1 NE_WIDTH
IN	FB_PLLAVDD1	1.2V	0.25A	16MIL



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Page5: FrameBuffer - Parti ti on A 16/32Mx32 BGA136 GDDR3



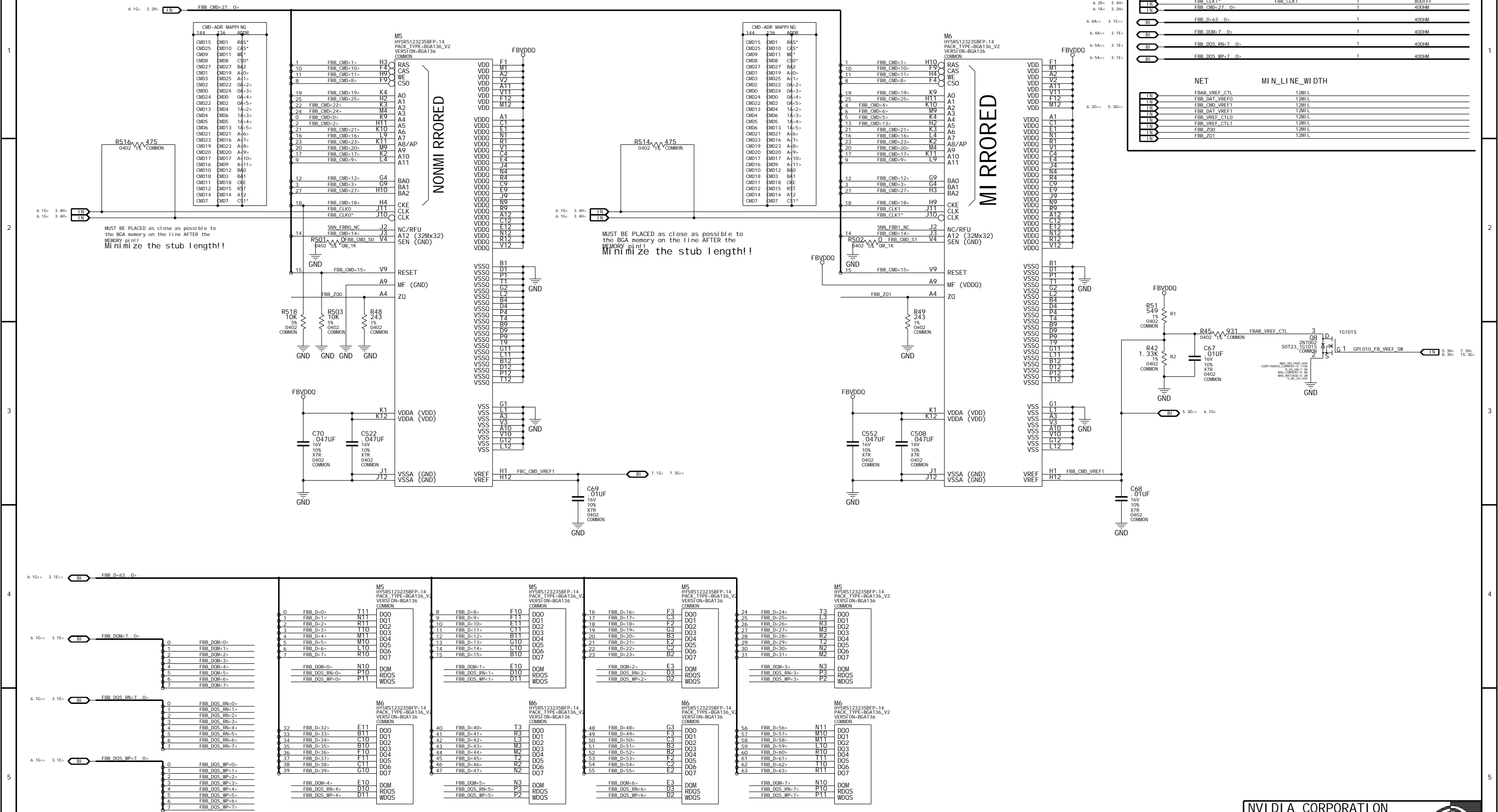
	NET	DI FFPAIR	NV_CRI TI CAL	NV_I MPEDANCE
IN	FBA_CLK0	FBA_CLK0	1	80DI FF
IN	FBA_CLK0*	FBA_CLK0	1	80DI FF
IN	FBA_CLK1	FBA_CLK1	1	80DI FF
IN	FBA_CLK1*	FBA_CLK1	1	80DI FF
IN	FBA_CMD<27..0>		1	400HM
BI	FBA_D<63..0>		1	400HM
BI	FBA_DOM<7..0>		1	400HM
BI	FBA_DQS_RN<7..0>		1	400HM
BI	FBA_DQS_WP<7..0>		1	400HM
	NET	MI N_LINE_WIDTH		
IN	FBA_CMD_VREF1	12MI L		
IN	FBA_DAT_VREF1	12MI L		
IN	FBA_VREF_CTL0	12MI L		
IN	FBA_VREF_CTL1	12MI L		
IN	FBA_Z00	12MI L		
IN	FBA_Z01	12MI L		

ASSEMBLY	G94-701-A1(65nm), 512MB, 8pcs 16Mx32 GDDR3
PAGE DETAIL	FrameBuffer - Partition A 16/32Mx32 BGA136 GDDR3

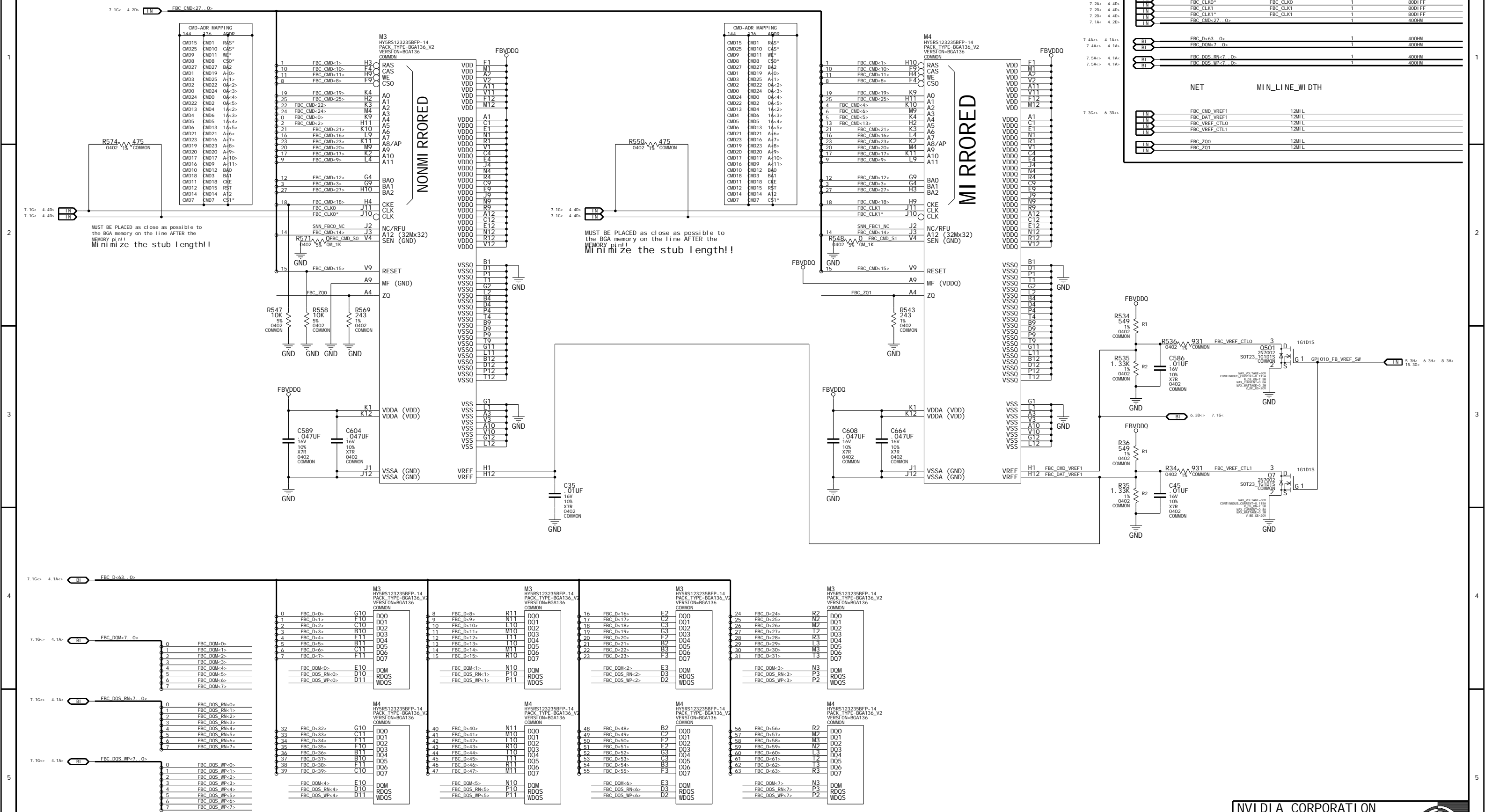
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Page6: FrameBuffer - Parti ti on B 16/32Mx32 BGA136 GDDR3




Page7: FrameBuffer - Parti ti on C 16/32Mx32 BGA136 GDDR3

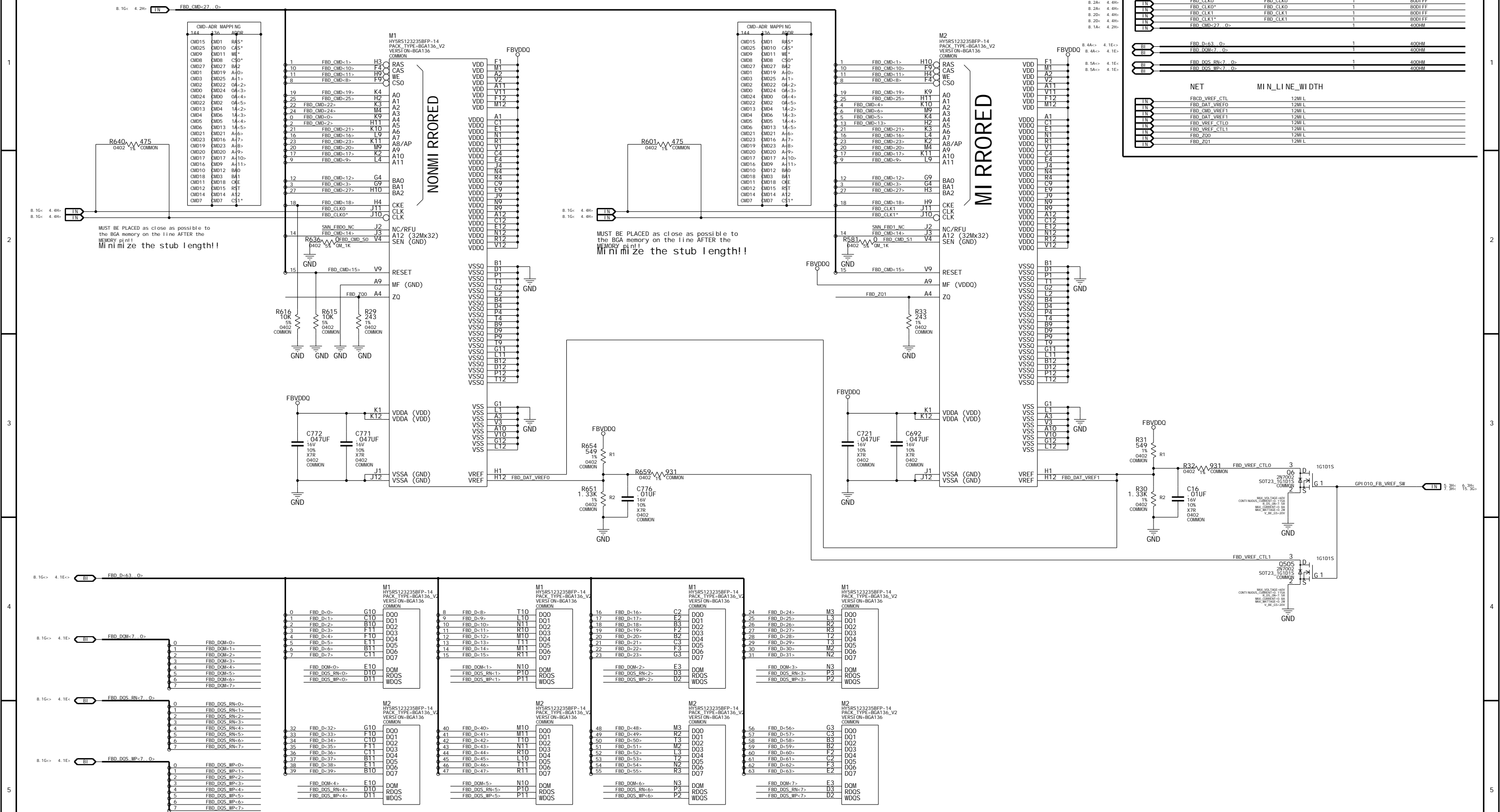


ASSEMBLY	G94-701-A1(65nm), 512MB, 8pcs 16Mx32 GDDR3
PAGE DETAIL	FrameBuffer - Partition C 16/32Mx32 BGA136 GDDR3

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Page8: FrameBuffer - Parti ti on D 16/32Mx32 BGA136 GDDR3




	NET	DIFFPAIR	NV_CRTICAL	NV_IMPEDANCE
1B	FBD_CLK0	FBD_CLK0	1	8001FF
1B	FBD_CLK0*	FBD_CLK0	1	8001FF
1B	FBD_CLK1	FBD_CLK1	1	8001FF
1B	FBD_CLK1*	FBD_CLK1	1	8001FF
1B	FBD_CMD<27_0>		1	4000H

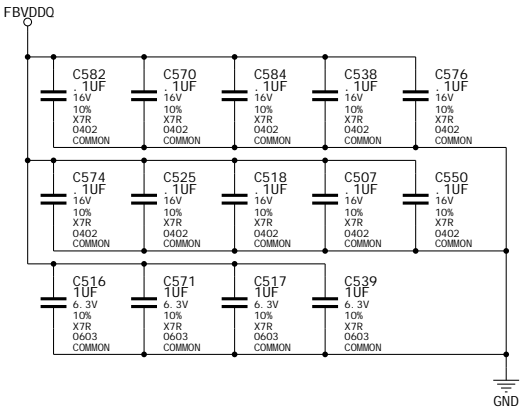
NET		MI_N_LI_NE_WI_DTH
120	FBD_VREF_CTL	120H L
120	FBD_DAT_VREF0	120H L
120	FBD_CMD_VREF1	120H L
120	FBD_DAT_VREF1	120H L
120	FBD_VREF_CTL0	120H L
120	FBD_VREF_CTL1	120H L
120	FBD_Z00	120H L
120	FBD_Z01	120H L

ASSEMBLY	G94-701-A1(65nm), 512MB, 8pcs 16Mx32 GDDR3
PAGE DETAIL	FrameBuffer - Partition D 16/32Mx32 BGA136 GDDR3

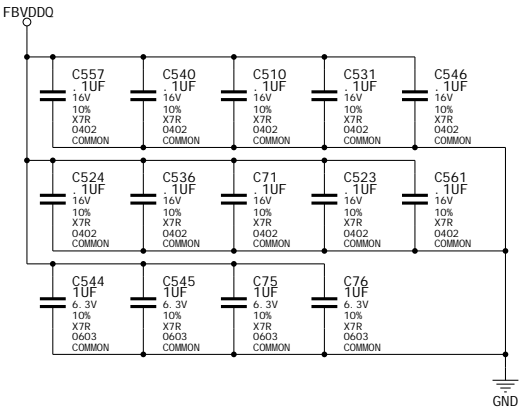
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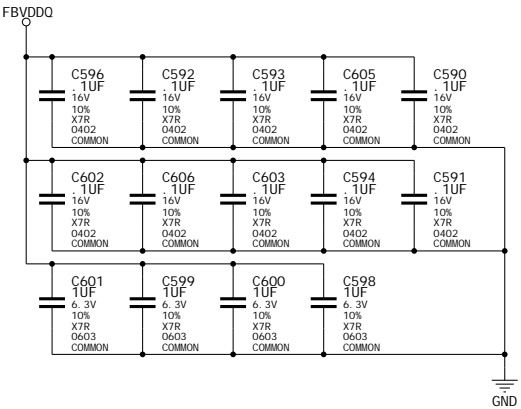
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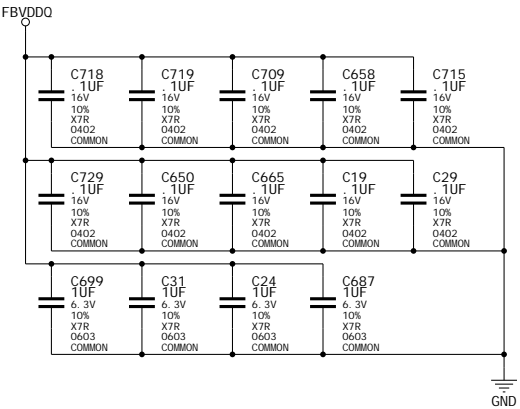
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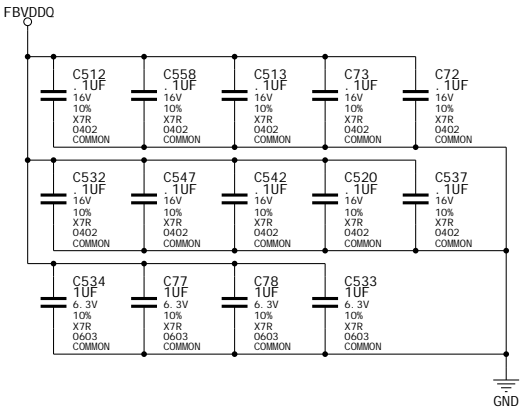
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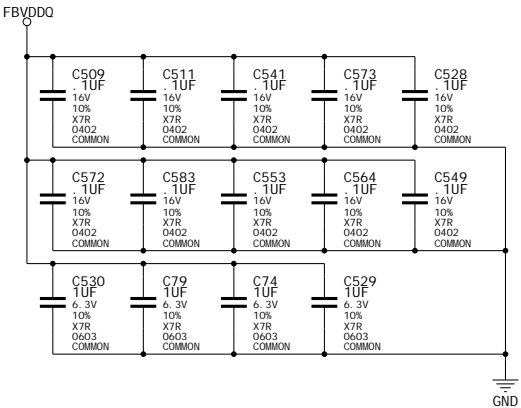
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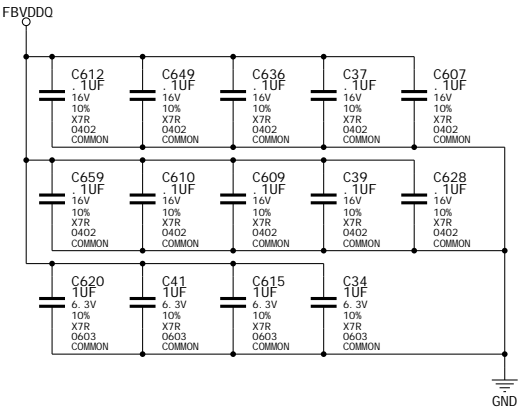
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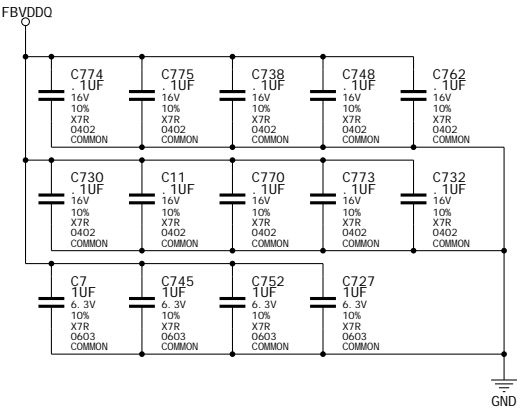
FBB - bottom



FBC - bottom



FBD - bottom



Page10: DACA, DACB, and DACC Interface

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NET	VOLTAGE	MAX_CURRENT	MIN_LINE_WIDTH
IN DACA_VDD	3.3V	0.35A	16MIL
IN DACB_VDD			12MIL
IN DACC_VDD			12MIL
IN DACA_VREF			12MIL
IN DACA_RSET			12MIL

NET	NV_IMPEDANCE	NV_CRITICAL_NET
OUT DACA_RED	50OHM	1
OUT DACA_GREEN	50OHM	1
OUT DACA_BLUE	50OHM	1
OUT DACA_HSYNC	50OHM	2
OUT DACA_VSYNC	50OHM	2

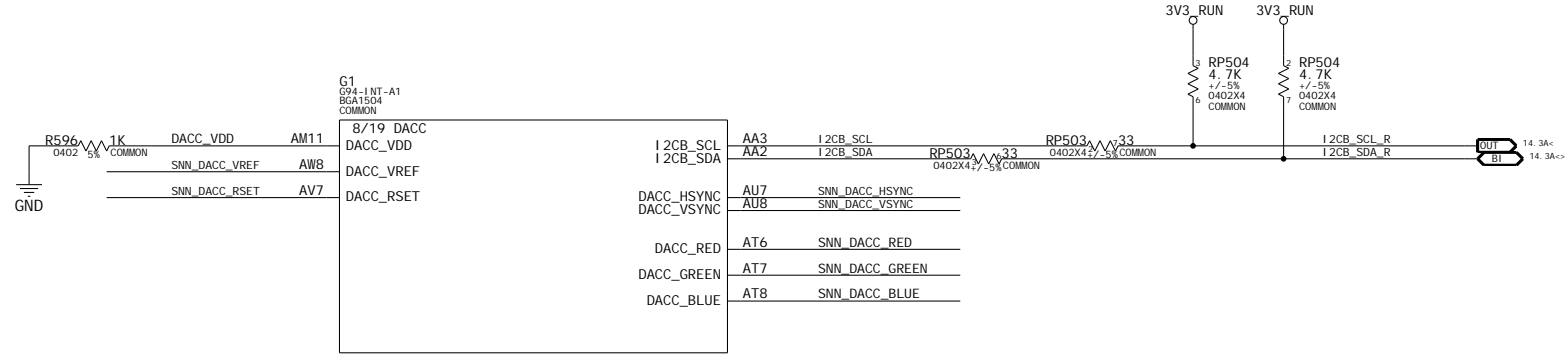
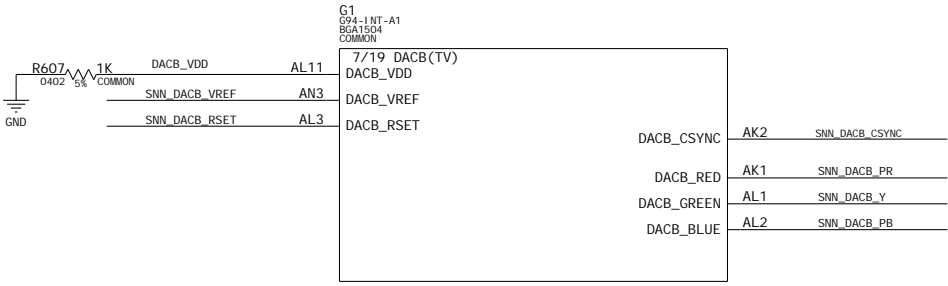
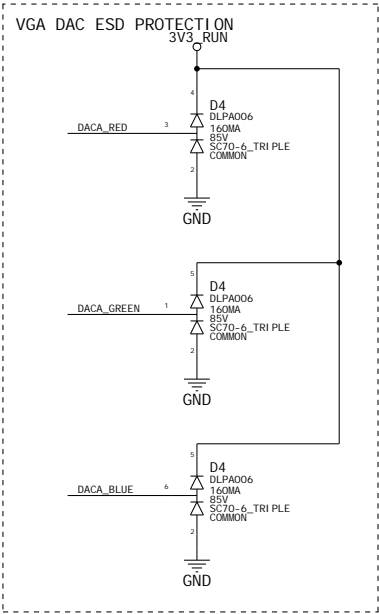
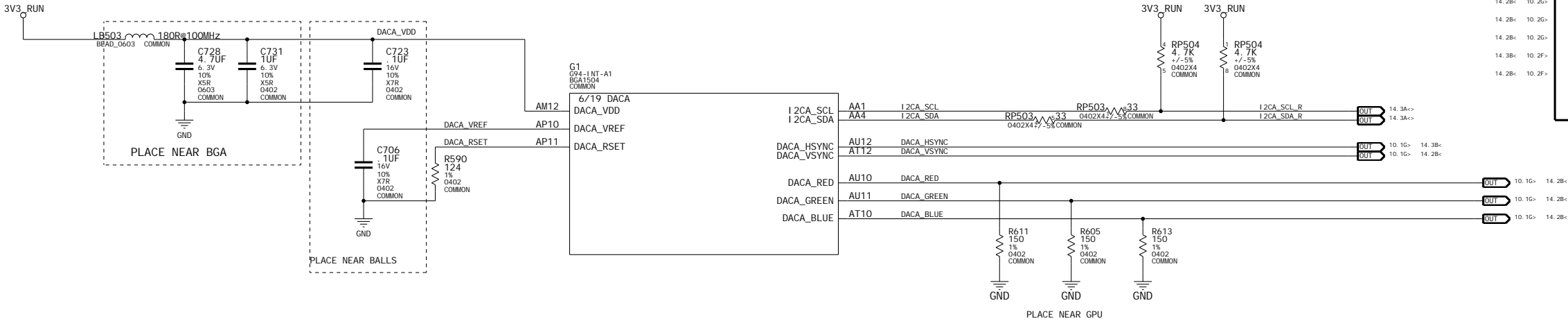
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ASSEMBLY

G94-701-A1(65nm), 512MB, 8pcs 16Mx32 GDDR3

PAGE DETAIL

DACA, DACB, and DACC Interface

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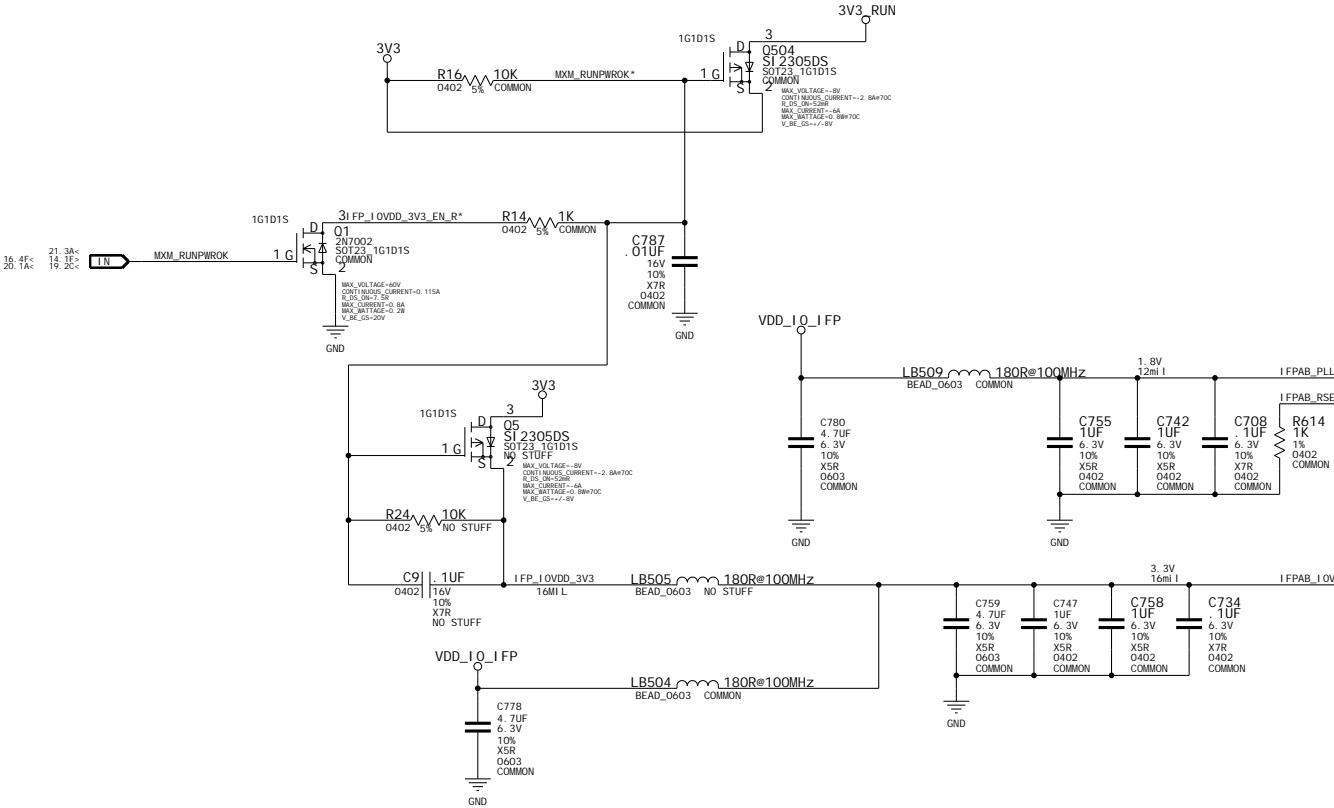
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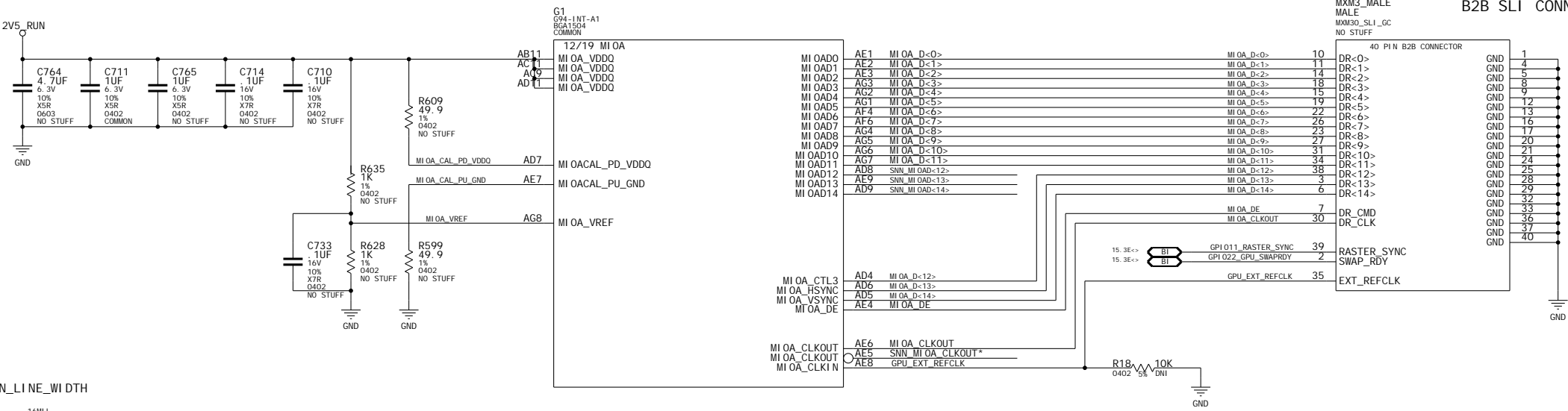
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LVDS(L i n k A&B)

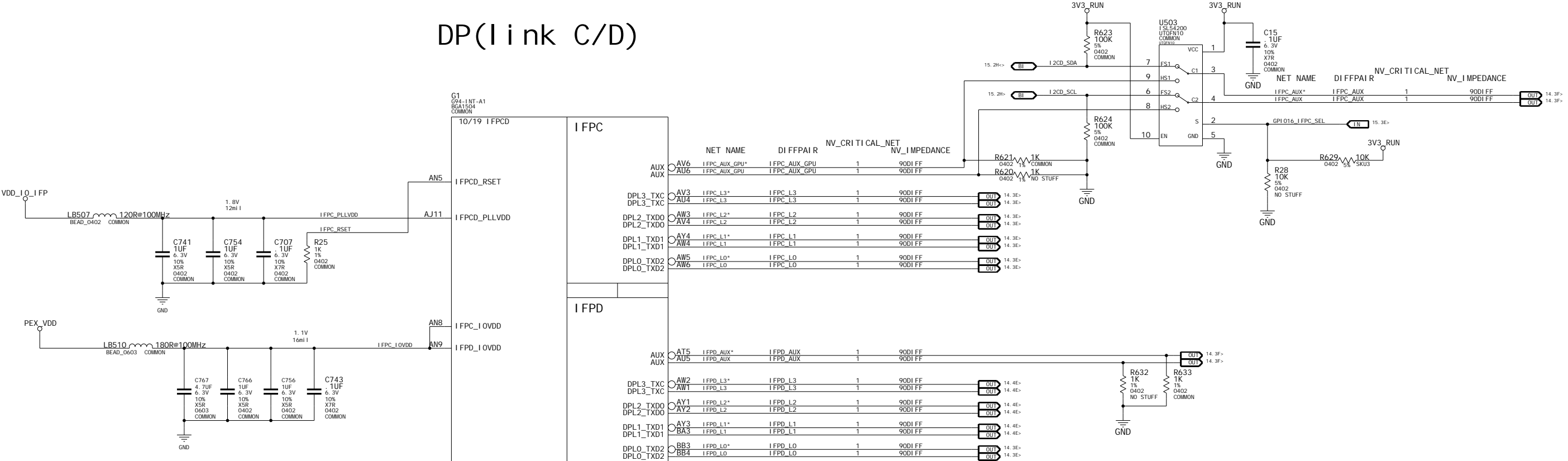
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I FPA_TXC	AR9	I FPA_TXC	I FPA_TXC
I FPA_TXD0	AY6	I FPA_TXD0*	I FPA_TXD0
I FPA_TXD0	AW7	I FPA_TXD0	I FPA_TXD0
I FPA_TXD1	AY7	I FPA_TXD1*	I FPA_TXD1
I FPA_TXD1	AY8	I FPA_TXD1	I FPA_TXD1
I FPA_TXD2	AW9	I FPA_TXD2*	I FPA_TXD2
I FPA_TXD2	AY9	I FPA_TXD2	I FPA_TXD2
I FPA_TXD3	AV9	I FPA_TXD3*	I FPA_TXD3
I FPA_TXD3	AU9	I FPA_TXD3	I FPA_TXD3
I FPB_TXC	BA10	I FPB_TXC*	I FPB_TXC
I FPB_TXC	BB10	I FPB_TXC	I FPB_TXC
I FPB_TXD4	BA4	I FPB_TXD4*	I FPB_TXD4
I FPB_TXD4	AY5	I FPB_TXD4	I FPB_TXD4
I FPB_TXD5	BB6	I FPB_TXD5*	I FPB_TXD5
I FPB_TXD5	BA6	I FPB_TXD5	I FPB_TXD5
I FPB_TXD6	BB7	I FPB_TXD6*	I FPB_TXD6
I FPB_TXD6	BA7	I FPB_TXD6	I FPB_TXD6
I FPB_TXD7	BA9	I FPB_TXD7*	I FPB_TXD7
I FPB_TXD7	BB9	I FPB_TXD7	I FPB_TXD7



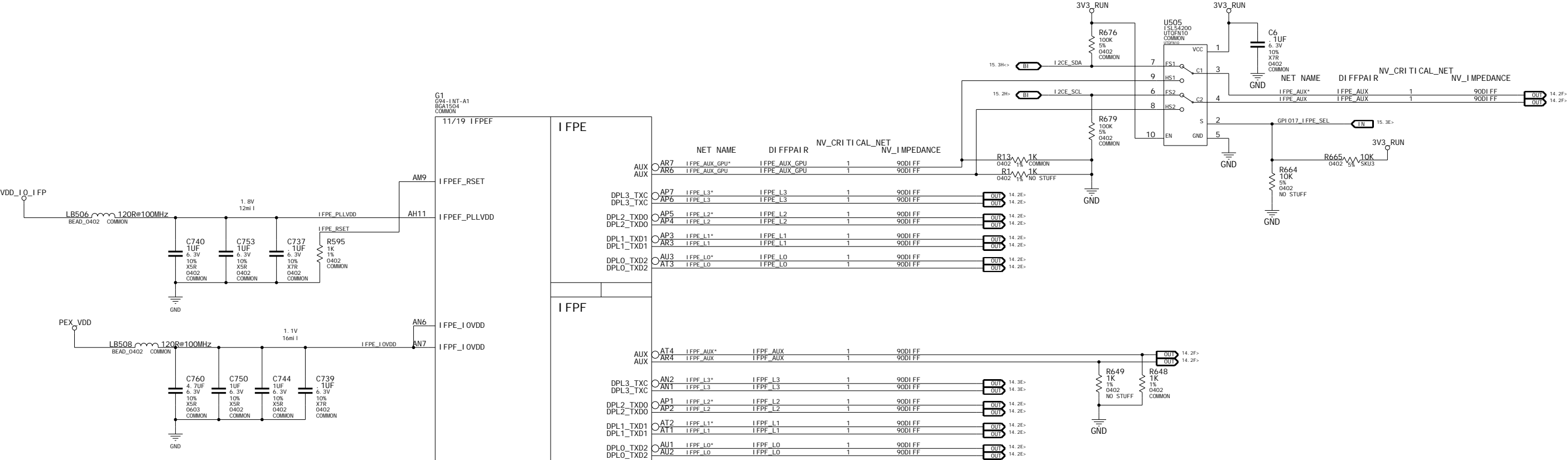
NET	VOLTAGE	MAX_CURRENT	MIN LINE WIDTH
2V5_RUN	2.5V	0.5A	16MIL
MI OA_VREF			12MIL
MI OA_CAL_PD_VDDQ			12MIL
MI OA_CAL_PU_GND			12MIL

NET	NV_I M P E D A N C E	NV_CRI T I C A L_N E T
MI OA_D<14>_D<	500HM	1
MI OA_DE	500HM	1
MI OA_CLKOUT	500HM	1
GPU_EXT_REFCLK	500HM	1

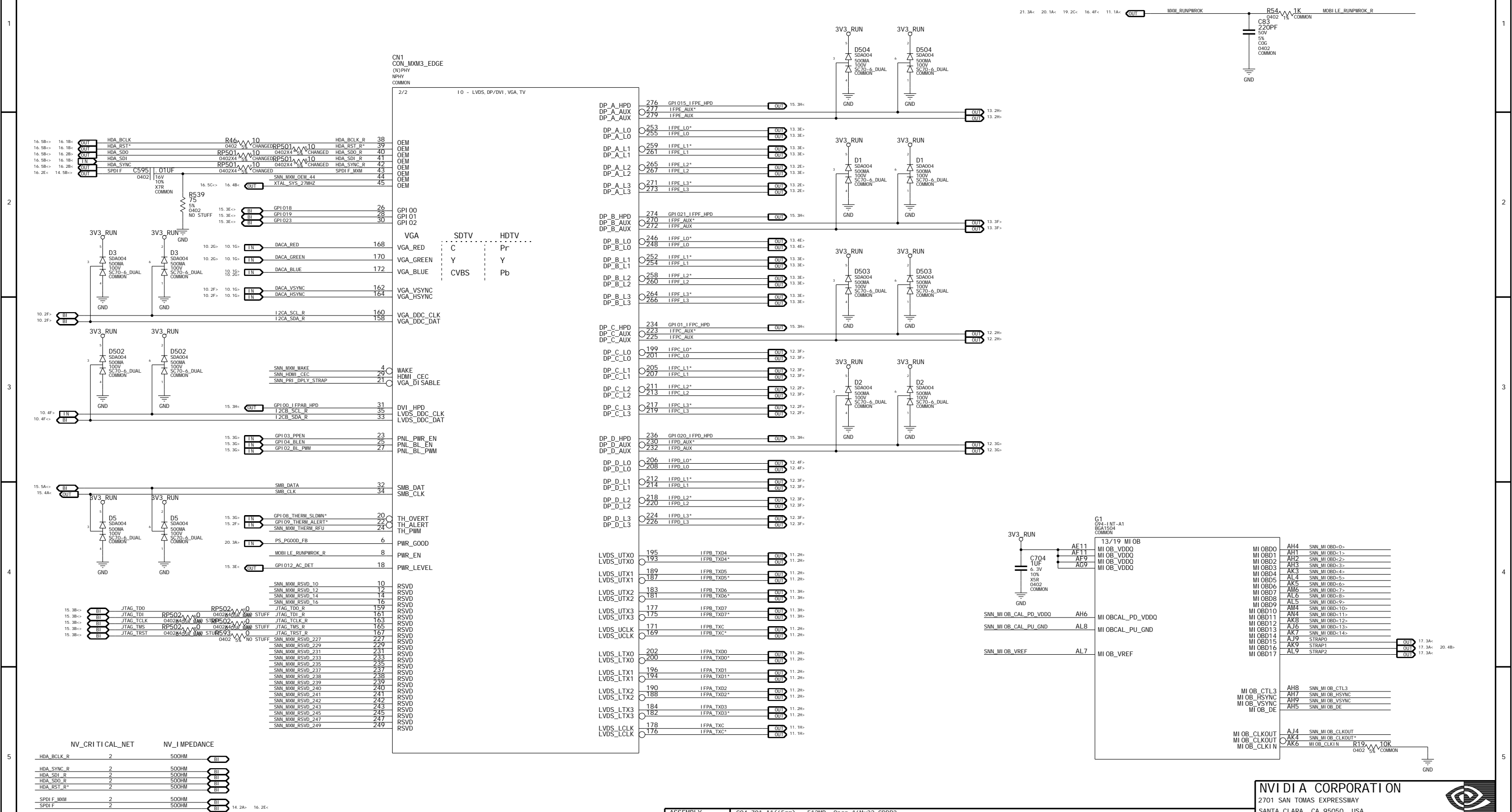
DP(Link C/D)

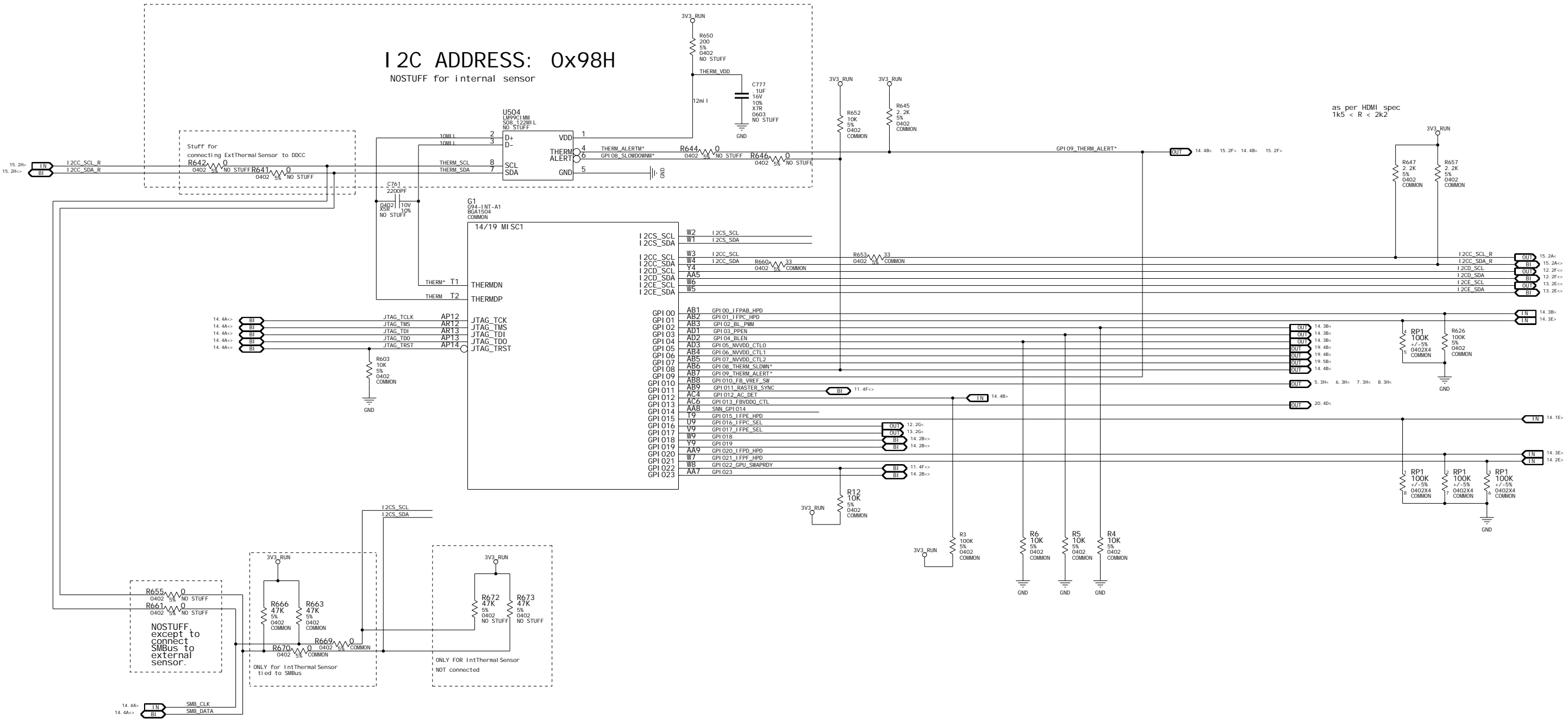


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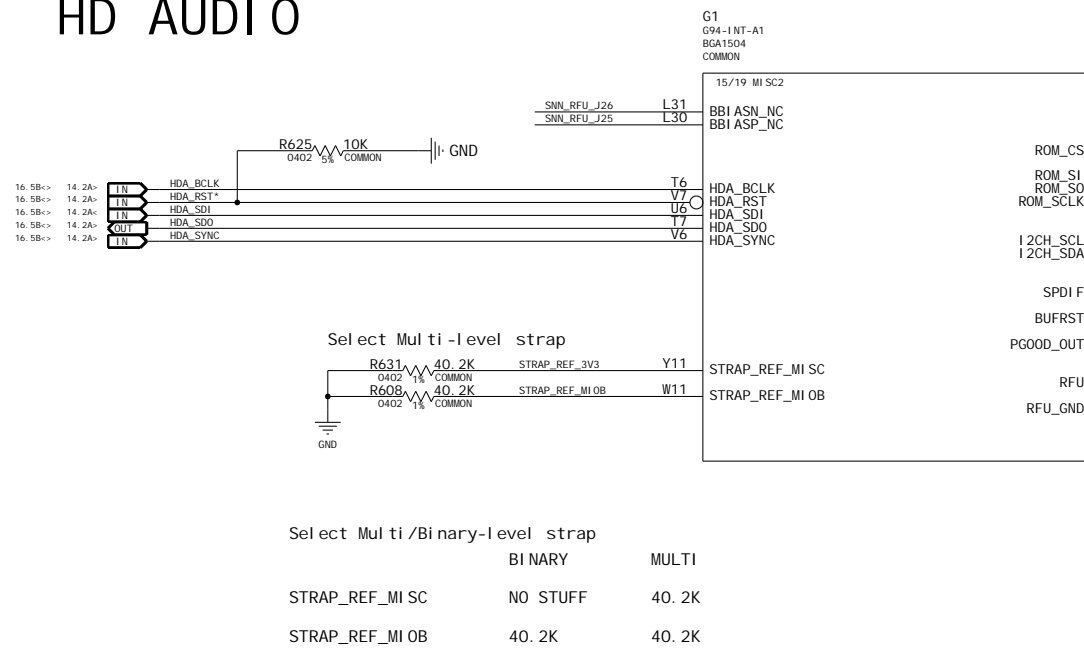
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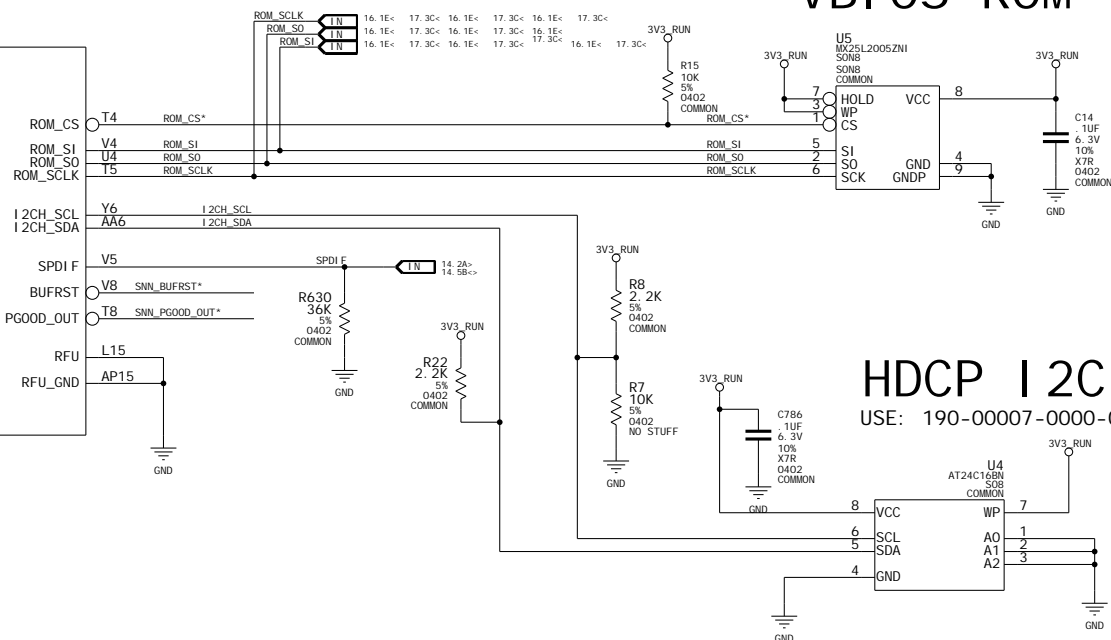


page16: HD AUDIO, VBI OS/HDCP ROM, XTAL, SPREAD SPECTRUM, SPDIF

HD AUDIO



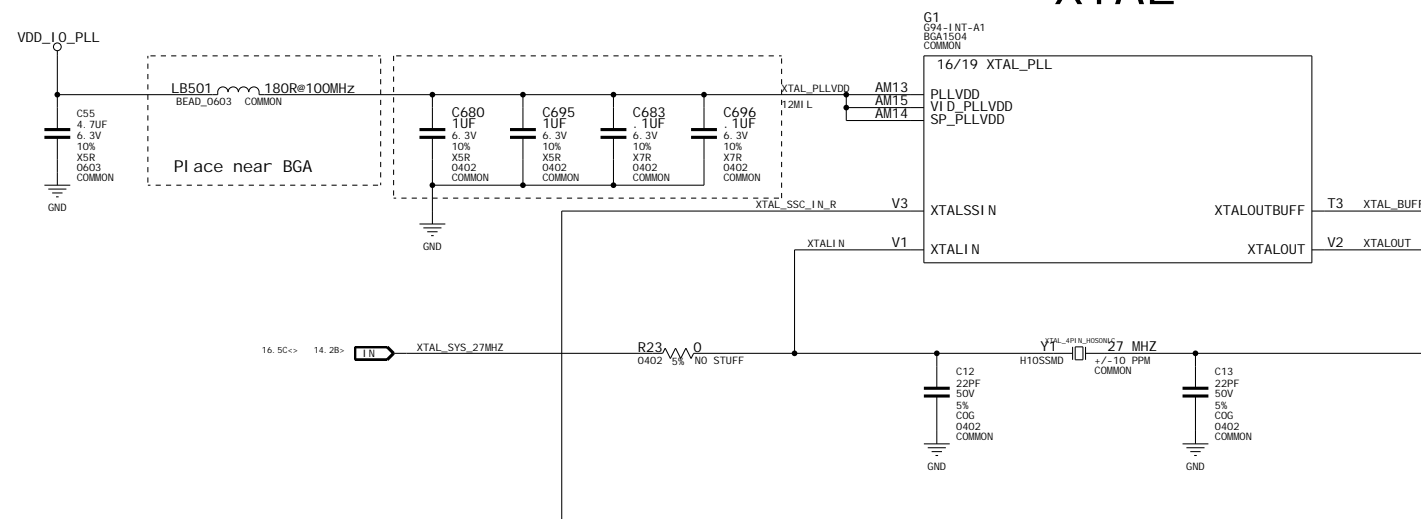
VBI OS ROM



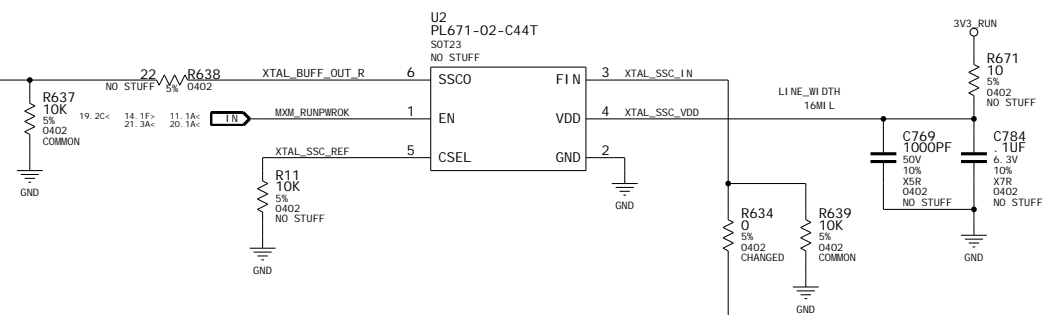
HDCP I2C ROM

USE: 190-00007-0000-000

XTAL



SPREAD



NV_CRI TI CAL_NET		NV_I IMPEDANCE		NV_CRI TI C		NV_I IMPEDANCE	
				XTAL_I_N	1	500HM	BI
				XTAL_OUT	1	500HM	BI
				XTAL_SSC_I_N_R	1	500HM	BI
				XTAL_SSC_I_N	1	500HM	BI
				XTAL_BUFF_OUT_R	1	500HM	BI
				XTAL_BUFF_OUT	1	500HM	BI
				XTAL_SYS_27MHZ	1	500HM	BI
HDA_BCLK	2	500HM	BI	14. 2A<	16. 1B<		
HDA_SYNC	2	500HM	BI	14. 2A<	16. 2B<		
HDA_SDI	2	500HM	BI	14. 2A<	16. 1B<		
HDA_SDO	2	500HM	BI	14. 2A<	16. 2B<		
HDA_RST*	2	500HM	BI	14. 2A<	16. 1B<		

ASSEMBLY	G94-701-A1(65nm), 512MB, 8pcs 16Mx32 GDDR3
PAGE DETAIL	HD AUDIO, VBIOS/HDCP ROM, XTAL, SPREAD SPECTRUM, SPDIF

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NVIDIA CORPORATION

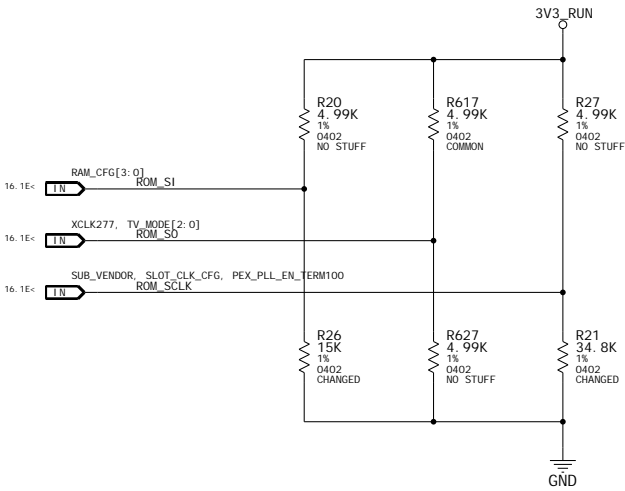
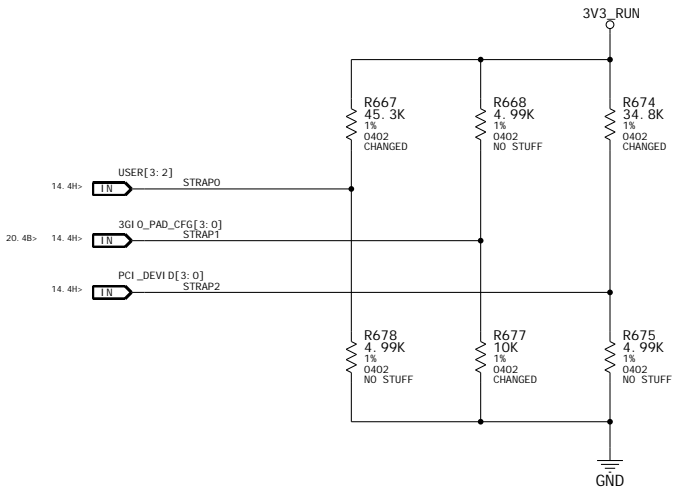
2701 SAN TOMAS EXPRESSWAY

SANTA CLARA, CA 95050, USA

NV_PN	600-10816-0003-300 A
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ID	p816_c01	PAGE	16 OF 21
NAME	daho	DATE	08-JUL-2008





STRAPO	USER_BI T0	0xF: 45K PU
	USER_BI T1	
	USER_BI T2	
	USER_BI T3	
STRAP1	3GI O_PADCFG_LUT_ADR0	0001: 10K PD
	3GI O_PADCFG_LUT_ADR1	
	3GI O_PADCFG_LUT_ADR2	
	3GI O_PADCFG_LUT_ADR3	
STRAP2	PCI_DEVI D_0	0x0628: 5K PU(NB9E-GT)
	PCI_DEVI D_1	0x062A: 15K PU(NB9E-GS)
	PCI_DEVI D_2	0x063A: 15K PU(NB9E-GLM2)
	PCI_DEVI D_3	
ROM_S0	TV_MODE_BI T0	0x0: NTSC-M
	TV_MODE_BI T1	
	TV_MODE_BI T2	
	XCLK_277	1: 27M
ROM_SI	RAM_CFG_0	512 MB (8pcs. 16Mx32)
	RAM_CFG_1	RAM_CFG[3:0] Defi ni ti ons
	RAM_CFG_2	0000 0001 0010 0011 0100
	RAM_CFG_3	RESERVED QI MONDA HYNIX SAMSUNG RESERVED
ROM_SCLK	PCI_DEVI D_EXT	0: 0x0628/0x062A 1: 0x063A
	SUB_VENDOR	1: SUB_VENDOR BI OS
	SLOT_CLK_CONFI G	1:
	PEX_PLL_EN_TERM100	0: TERM100 DI SABLED (Defaul t)

1 GB (8pcs. 32Mx32)
RAM_CFG[3:0] Defi ni ti ons
0101 0110 0111
QI MONDA HYNIX SAMSUNG

BINARY STRAP MODE

STRAP[2..0]	1 GB (8pcs. 32Mx32)
RAM_CFG[2:0] Defi ni ti ons	
101 110 111	QI MONDA HYNIX SAMSUNG

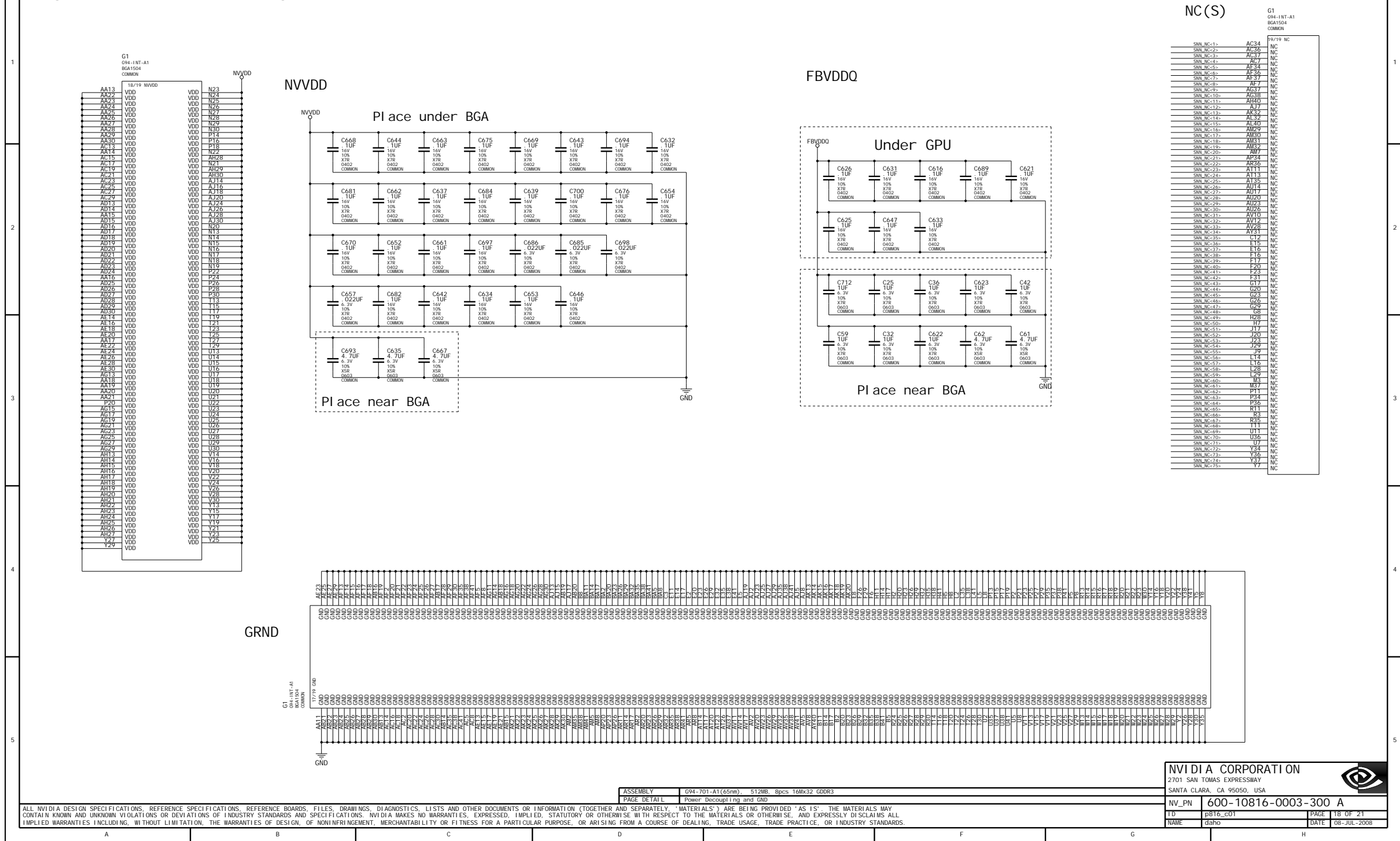
ROM_SCLK	PCI_DEVI D[3]	705-B1	655-B1	706-B1
		1	1	1

ROM_SI	PCI_DEVI D[4]	0	0	0
--------	---------------	---	---	---

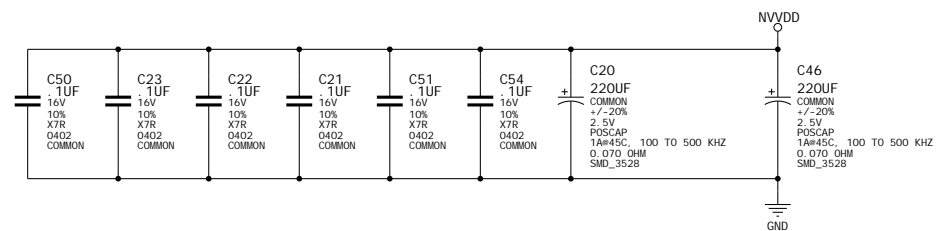
ROM_S0	XCLK_277	1: 27M
--------	----------	--------

	3V3	GND
5K	1000	0000
10K	1001	0001
15K	1010	0010
20K	1011	0011
25K	1100	0100
30K	1101	0101
35K	1110	0110
45K	1111	0111

Page18: Power Decoupling and GND

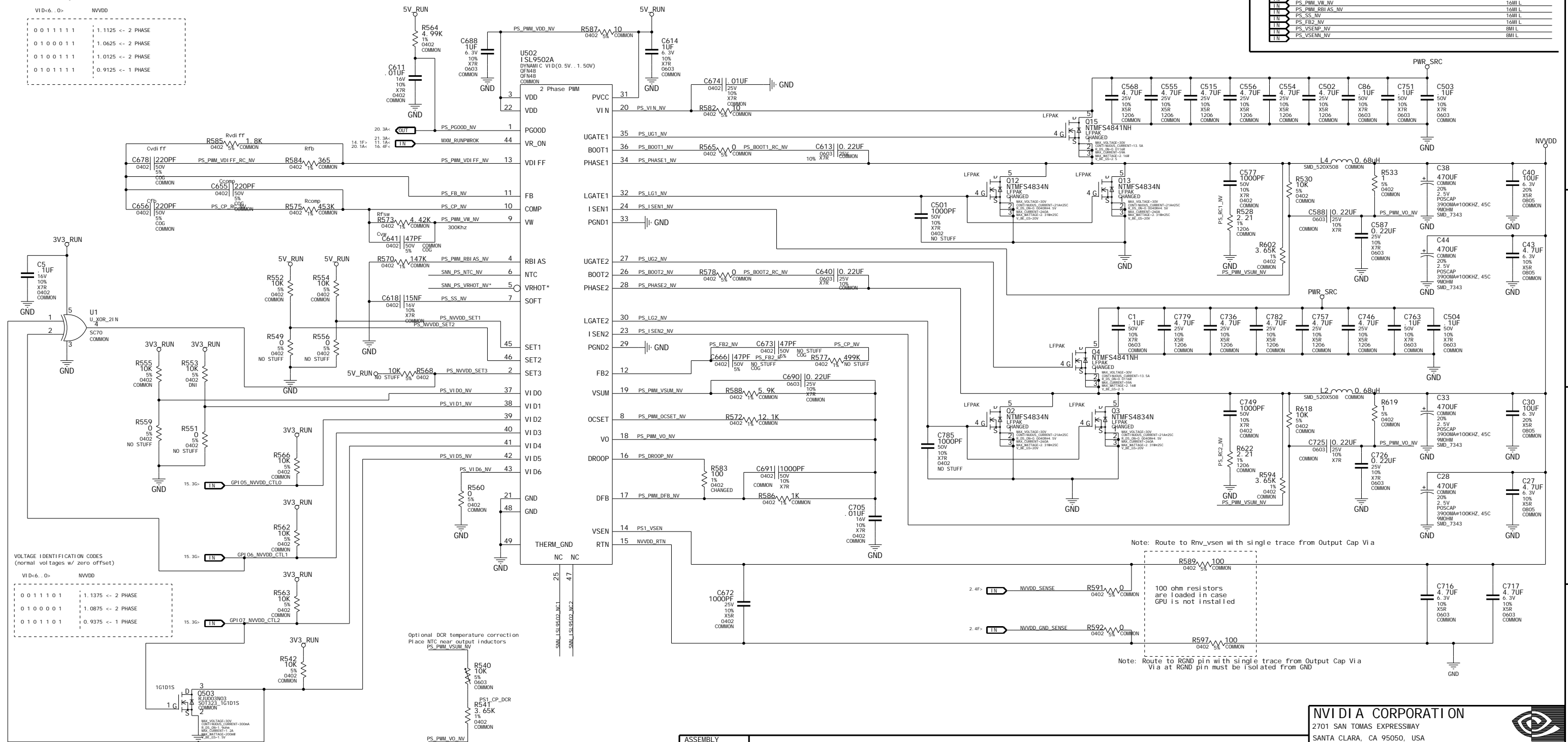


	NET	VOLTAGE	CURRENT	LINE_XI_DTH
NVWD00	NVWD0	1. 20V	25A	20MI L
1N	PS_P1ASE1_NV		12. 5A	
1N	PS_P1ASE2_NV		12. 5A	20MI L
1N	PS_V1N_NV			16MI L
1N	PS_UG1_NV			20MI L
1N	PS_B00T1_NV			20MI L
1N	PS_B00T1_RC_NV			20MI L
1N	PS_LG1_NV			20MI L
1N	PS_1SEN1_NV			16MI L
1N	PS_RC1_NV			25MI L
1N	PS_UG2_NV			20MI L
1N	PS_B00T2_NV			20MI L
1N	PS_B00T2_RC_NV			20MI L
1N	PS_LG2_NV			20MI L
1N	PS_1SEN2_NV			20MI L
1N	PS_RC2_NV			20MI L
1N	PS_P1M1_VSUM_NV			16MI L
1N	PS_P1M1_OCSET_NV			16MI L
1N	PS_DROOP_NV			16MI L
1N	PS_P1M1_DFB_NV			16MI L
1N	PS_P1M1_VO_NV			16MI L
1N	PS_P1M1_VDD_NV			20MI L
1N	PS_P1M1_VDI FF_NV			16MI L
1N	PS_P1M1_VDI FF_RC_NV			16MI L
1N	PS_C1B_NV			16MI L
1N	PS_CP_NV			16MI L
1N	PS_CP_RC_NV			16MI L
1N	PS_P1M1_V1B_NV			16MI L
1N	PS_P1M1_RBI AS_NV			16MI L
1N	PS_SS_NV			16MI L
1N	PS_FB2_NV			16MI L
1N	PS_VSENP_NV			8MI L
1N	PS_VSENN_NV			8MI L



VOLTAGE IDENTIFICATION CODES SKU3&6
(normal voltages w/ zero offset)

VID<6..0>	NVVD
0 0 1 1 1 1 1	1.1125 <- 2 PHASE
0 1 0 0 0 1 1	1.0625 <- 2 PHASE
0 1 0 0 1 1 1	1.0125 <- 2 PHASE
0 1 0 1 1 1 1	0.9125 <- 1 PHASE




Note: Route to Rnv_vsen with single trace from Output Cap Via

0
COMMON

100 ohm resistors
are loaded in case
GPU is not installed

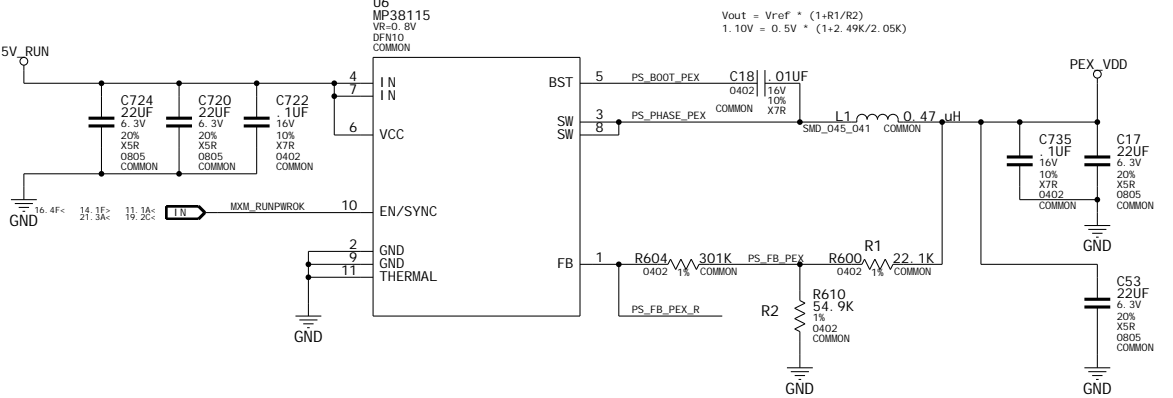
Note: Route to RGND pin with single trace from Output Cap Via
Via at RGND pin must be isolated from GND

NVI DI A CORPORATI ON		
2701 SAN TOMAS EXPRESSWAY SANTA CLARA, CA 95050, USA		
NV_PN	600-10816-0003-300 A	
ID	p816_c01	PAGE 19 OF 21
NAME	daho	DATE 08-JUL-2008

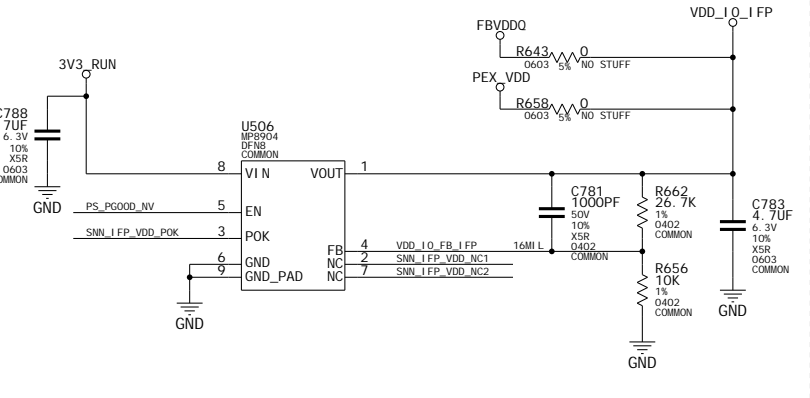
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Page20: Power Supply II - FBVDDQ, PEX_VDD, I FP_VDD, 2V5_RUN

PEX_VDD



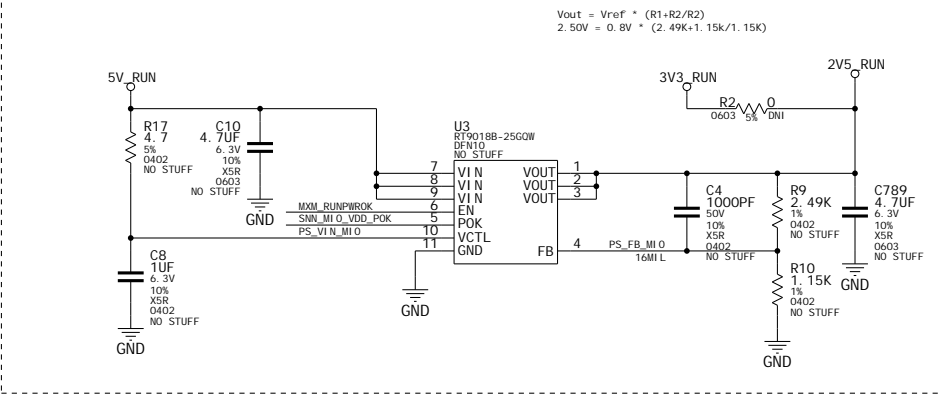
I FP_VDD



NET	VOLTAGE	CURRENT	LINE_WIDTH
VDD_I0_1FP	1.8V	0.5A	20MIL
FBVDDQ	1.8V	14A	20MIL
PEX_VDD	1.1V	4.0A	20MIL

1N	PS_FB_PEX		16MIL
1N	PS_PHASE_FB	13A	20MIL
1N	PS_PIM_VCC_FB		20MIL
1N	PS_UC_FB		20MIL
1N	PS_LG_FB		20MIL
1N	PS_BOOT_FB		20MIL
1N	PS_BOOT_RC_FB		20MIL
1N	PS_FB_VCTL*		20MIL
1N	PS_CP_FB		16MIL
1N	PS_ISEN_FB		16MIL
1N	PS_FB_FB		16MIL
1N	PS_CP_RC_FB		16MIL
1N	PS_FSET_FB		16MIL
1N	PS_RC_FB		25MIL

MI O_VDD



FBVDDQ

