P699-B00: GT215/6/8 MXM V3.0 TYPE A
512/1024MB 128/64-BIT DDR3
LVDS, QUAD DP, DVI, VGA

Table of Contents:

SKU	VARIANT	NVPN	ASSEMBLY
B	BASE	600-10699-base-sch	BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL.
1	SKU0001	600-10699-0001-000	P699-A00 SKU1 GT216-630 MXM3.0 TYPE-A 1024MB 8pcs 64Mx16
2	SKU0002	600-10699-0002-000	P699-A00 SKU2 GT216-600 MXM3.0 TYPE-A 1024MB 8pcs 64Mx16
3	SKU0003	600-10699-0003-000	P699-A00 SKU3 GT218-730 MXM3.0 TYPE-A 512 MB 4pcs 64Mx16
4	SKU0005	600-10699-0005-000	P699-A00 SKU5 GT216-640 MXM3.0 TYPE-A 1024 MB 8pcs 64Mx16
5	SKU501	600-50699-0501-000	P699-A00 SKU501 GT216-950 MXM3.0 TYPE-A 1024MB 8pcs 64Mx16
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	P699-A00 SKU1 GT216-630 MXM3.0 TYPE-A 1024MB 8pcs 64Mx16
PAGE DETAIL	Cover Page

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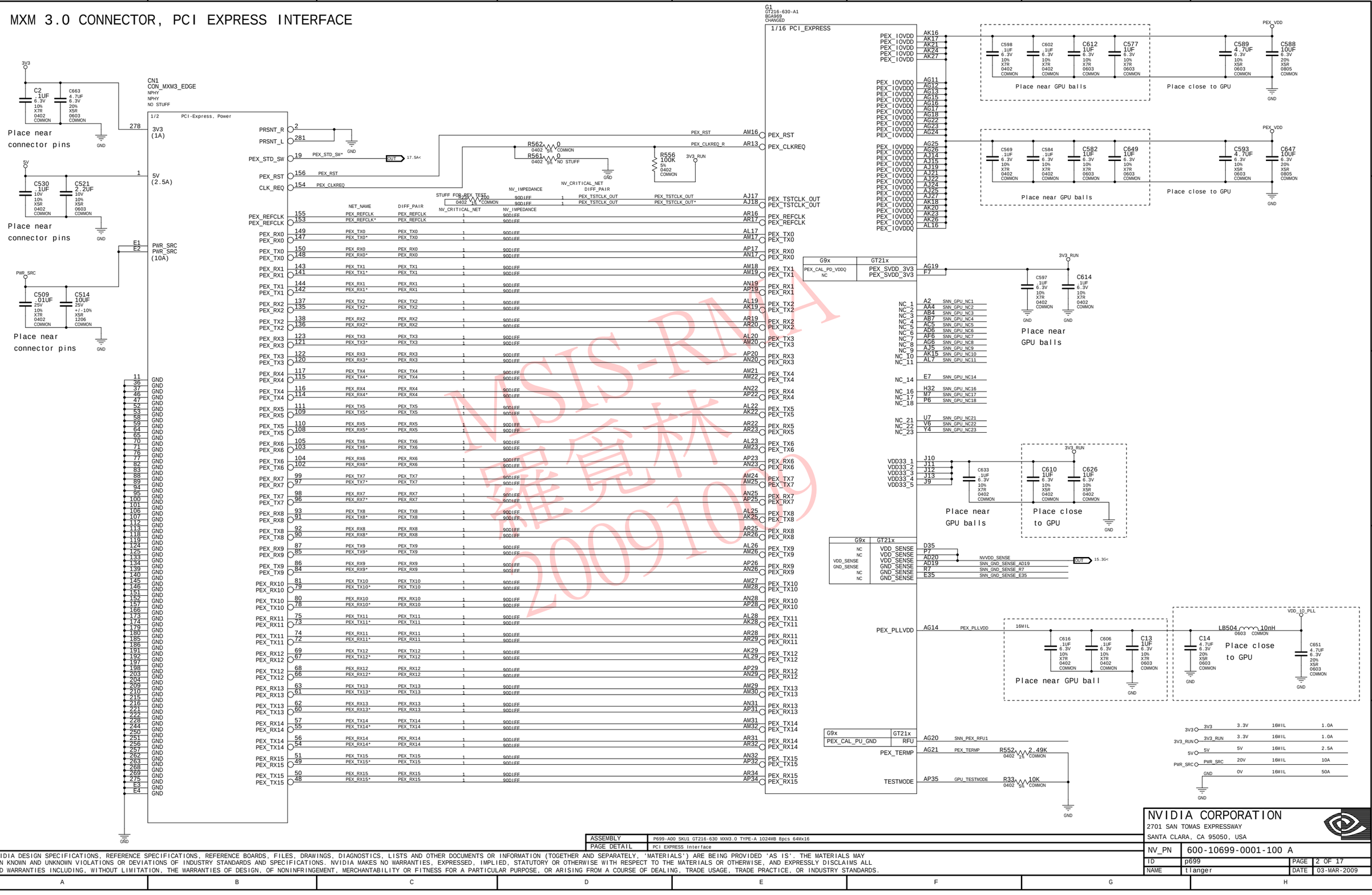
2. MXM 3.0 CONNECTOR, PCI EXPRESS INTERFACE



ASSEMBLY	P699-A00 SKU1 GT216-630 MXM3.0 TYPE-A 1024MB 8pcs 64Mx16
PAGE DETAIL	PCI EXPRESS Interface

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3. GPU MEMORY INTERFACE

G1
GT216-630-A1
BGA969
CHANGED

2/16 FBA

GT21x		G9x
FBA_D0	L32	FBA_D14
FBA_D1	N33	FBA_D15
FBA_D2	L33	FBA_D13
FBA_D3	N34	FBA_D12
FBA_D4	N35	FBA_D10
FBA_D5	P35	FBA_D11
FBA_D6	P33	FBA_D8
FBA_D7	P34	FBA_D9
FBA_D8	K35	FBA_D25
FBA_D9	K33	FBA_D26
FBA_D10	K34	FBA_D28
FBA_D11	H33	FBA_D24
FBA_D12	G34	FBA_D27
FBA_D13	G33	FBA_D31
FBA_D14	E34	FBA_D30
FBA_D15	E33	FBA_D29
FBA_D16	G31	FBA_D23
FBA_D17	F30	FBA_D22
FBA_D18	G30	FBA_D18
FBA_D19	G32	FBA_D20
FBA_D20	K30	FBA_D17
FBA_D21	K32	FBA_D19
FBA_D22	H30	FBA_D21
FBA_D23	K31	FBA_D16
FBA_D24	L31	FBA_D4
FBA_D25	L30	FBA_D7
FBA_D26	M32	FBA_D5
FBA_D27	N30	FBA_D3
FBA_D28	M30	FBA_D6
FBA_D29	P31	FBA_D2
FBA_D30	R32	FBA_D1
FBA_D31	R30	FBA_D0
FBA_D32	AG30	FBA_D32
FBA_D33	AG32	FBA_D34
FBA_D34	AH31	FBA_D33
FBA_D35	AF31	FBA_D35
FBA_D36	AF30	FBA_D36
FBA_D37	AE30	FBA_D37
FBA_D38	AC32	FBA_D38
FBA_D39	AD30	FBA_D39
FBA_D40	AN33	FBA_D48
FBA_D41	AL31	FBA_D52
FBA_D42	AM33	FBA_D51
FBA_D43	AL33	FBA_D50
FBA_D44	AK30	FBA_D53
FBA_D45	AK32	FBA_D49
FBA_D46	AJ30	FBA_D54
FBA_D47	AH30	FBA_D55
FBA_D48	AH33	FBA_D57
FBA_D49	AH35	FBA_D58
FBA_D50	AH34	FBA_D60
FBA_D51	AH32	FBA_D59
FBA_D52	AJ33	FBA_D62
FBA_D53	AL35	FBA_D63
FBA_D54	AM34	FBA_D61
FBA_D55	AM35	FBA_D56
FBA_D56	AF33	FBA_D55
FBA_D57	AE32	FBA_D57
FBA_D58	AF34	FBA_D58
FBA_D59	AE35	FBA_D59
FBA_D60	AE34	FBA_D60
FBA_D61	AE33	FBA_D61
FBA_D62	AB32	FBA_D62
FBA_D63	AC35	FBA_D63
FBA_DQM0	P32	FBA_DQM1
FBA_DQM1	H34	FBA_DQM3
FBA_DQM2	J30	FBA_DQM2
FBA_DQM3	P30	FBA_DQM0
FBA_DQM4	AF32	FBA_DQM4
FBA_DQM5	AL32	FBA_DQM6
FBA_DQM6	AL34	FBA_DQM7
FBA_DQM7	AF35	FBA_DQM5
FBA_DQS_WP0	L34	FBA_DQS_WP1
FBA_DQS_WP1	H35	FBA_DQS_WP3
FBA_DQS_WP2	J32	FBA_DQS_WP2
FBA_DQS_WP3	N31	FBA_DQS_WP0
FBA_DQS_WP4	AE31	FBA_DQS_WP4
FBA_DQS_WP5	AJ32	FBA_DQS_WP6
FBA_DQS_WP6	AJ34	FBA_DQS_WP7
FBA_DQS_WP7	AC33	FBA_DQS_WP5
FBA_DQS_RN0	L35	FBA_DQS_RN1
FBA_DQS_RN1	G35	FBA_DQS_RN3
FBA_DQS_RN2	H31	FBA_DQS_RN2
FBA_DQS_RN3	N32	FBA_DQS_RN0
FBA_DQS_RN4	AD32	FBA_DQS_RN4
FBA_DQS_RN5	AJ31	FBA_DQS_RN6
FBA_DQS_RN6	AJ35	FBA_DQS_RN7
FBA_DQS_RN7	AC34	FBA_DQS_RN5
SNN_FBA_WDS0	P29	FBA_WDS0_NC
SNN_FBA_WDS0*	R29	FBA_WDS0_N_NC
SNN_FBA_WDS1	L29	FBA_WDS1_NC
SNN_FBA_WDS1*	M29	FBA_WDS1_N_NC
SNN_FBA_WDS2	AG29	FBA_WDS3_NC
SNN_FBA_WDS2*	AH29	FBA_WDS3_N_NC
SNN_FBA_WDS3	AD29	FBA_WDS2_NC
SNN_FBA_WDS3*	AE29	FBA_WDS2_N_NC
FBA_WCK0	R29	
FBA_WCK0	L29	
FBA_WCK1	M29	
FBA_WCK1	AG29	
FBA_WCK2	AH29	
FBA_WCK2	AD29	
FBA_WCK3	AE29	
FBA_WCK3		

FBA_DATA<63..0> (5.4A<> 4.5F<> 4.4A<>) → FBA_D_0..63

FBA_DQM<7..0> (5.5A<> 4.5F<> 4.5A<>) → FBA_DQM_0..7

FBA_DQS_WP0..7 (4.4F<> 4.4B<> 4.4C<> 5.5B<> 5.5C<>) → FBA_DQS_WP_0..7

FBA_DQS_RN0..7 (4.4F<> 4.4B<> 4.4C<> 5.5C<> 5.5E<>) → FBA_DQS_RN_0..7

FBVDDQ J23 J24 J29 AA27 AA29 AA31 AB27 AB29 AC27 AD27 AE27 AJ28 B18 E21 G17 G18 G22 G8 G9 H29 J14 J15 J16 J17 J20 J21 J22

C565 .1UF 6.3V 10% X7R 0402 COMMON
C567 .1UF 6.3V 10% X7R 0402 COMMON
C564 .1UF 6.3V 10% X7R 0402 COMMON
C575 .1UF 6.3V 10% X7R 0402 COMMON
C562 .1UF 6.3V 10% X7R 0402 COMMON
Place under GPU WEST SIDE (FBA) near FBVDDQ balls
C566 1UF 6.3V 10% X7R 0603 COMMON
Place under GPU NE corner
GND

FBC_DATA<63..0> (7.4A<> 6.5F<> 6.4A<>) → FBC_D_0..63

G1
GT216-630-A1
BGA969
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3/16 FBC

GT21x		G9x
FBC_D0	B13	FBC_D26
FBC_D1	D13	FBC_D24
FBC_D2	A13	FBC_D25
FBC_D3	A14	FBC_D27
FBC_D4	C16	FBC_D28
FBC_D5	B16	FBC_D30
FBC_D6	A17	FBC_D29
FBC_D7	D16	FBC_D31
FBC_D8	C13	FBC_D9
FBC_D9	B11	FBC_D8
FBC_D10	C11	FBC_D14
FBC_D11	A11	FBC_D10
FBC_D12	C10	FBC_D15
FBC_D13	C8	FBC_D13
FBC_D14	B8	FBC_D11
FBC_D15	A8	FBC_D12
FBC_D16	E8	FBC_D6
FBC_D17	F8	FBC_D4
FBC_D18	F10	FBC_D2
FBC_D19	F9	FBC_D5
FBC_D20	F12	FBC_D7
FBC_D21	D8	FBC_D3
FBC_D22	D11	FBC_D0
FBC_D23	E11	FBC_D1
FBC_D24	D12	FBC_D16
FBC_D25	E13	FBC_D17
FBC_D26	F13	FBC_D23
FBC_D27	F14	FBC_D22
FBC_D28	F15	FBC_D19
FBC_D29	E16	FBC_D21
FBC_D30	F16	FBC_D20
FBC_D31	F17	FBC_D18
FBC_D32	D29	FBC_D39
FBC_D33	F27	FBC_D36
FBC_D34	F28	FBC_D38
FBC_D35	E28	FBC_D37
FBC_D36	D26	FBC_D35
FBC_D37	F25	FBC_D32
FBC_D38	D24	FBC_D34
FBC_D39	E25	FBC_D33
FBC_D40	E32	FBC_D55
FBC_D41	F32	FBC_D54
FBC_D42	D33	FBC_D53
FBC_D43	E31	FBC_D51
FBC_D44	C33	FBC_D52
FBC_D45	F29	FBC_D49
FBC_D46	D30	FBC_D50
FBC_D47	E29	FBC_D48
FBC_D48	B29	FBC_D56
FBC_D49	C31	FBC_D59
FBC_D50	C29	FBC_D57
FBC_D51	B31	FBC_D58
FBC_D52	C32	FBC_D61
FBC_D53	B32	FBC_D60
FBC_D54	B35	FBC_D63
FBC_D55	B34	FBC_D62
FBC_D56	A29	FBC_D47
FBC_D57	B28	FBC_D45
FBC_D58	A28	FBC_D46
FBC_D59	C28	FBC_D44
FBC_D60	C26	FBC_D43
FBC_D61	D25	FBC_D42
FBC_D62	B25	FBC_D41
FBC_D63	A25	FBC_D40
FBC_DQM0	A16	FBC_DQM3
FBC_DQM1	D10	FBC_DQM1
FBC_DQM2	F11	FBC_DQM0
FBC_DQM3	D15	FBC_DQM2
FBC_DQM4	D27	FBC_DQM4
FBC_DQM5	D34	FBC_DQM6
FBC_DQM6	A34	FBC_DQM7
FBC_DQM7	D28	FBC_DQM5
FBC_DQS_WP0	C14	FBC_DQS_WP3
FBC_DQS_WP1	A10	FBC_DQS_WP1
FBC_DQS_WP2	E10	FBC_DQS_WP0
FBC_DQS_WP3	D14	FBC_DQS_WP2
FBC_DQS_WP4	E26	FBC_DQS_WP4
FBC_DQS_WP5	D32	FBC_DQS_WP6
FBC_DQS_WP6	A32	FBC_DQS_WP7
FBC_DQS_WP7	B26	FBC_DQS_WP5
FBC_DQS_RN0	B14	FBC_DQS_RN3
FBC_DQS_RN1	B10	FBC_DQS_RN1
FBC_DQS_RN2	D9	FBC_DQS_RN0
FBC_DQS_RN3	E14	FBC_DQS_RN2
FBC_DQS_RN4	F26	FBC_DQS_RN4
FBC_DQS_RN5	D31	FBC_DQS_RN6
FBC_DQS_RN6	A31	FBC_DQS_RN7
FBC_DQS_RN7	A26	FBC_DQS_RN5
SNN_FBC_WDS0	G14	FBC_WDS1_NC
SNN_FBC_WDS0*	G15	FBC_WDS1_N_NC
SNN_FBC_WDS1	G11	FBC_WDS0_NC
SNN_FBC_WDS1*	G12	FBC_WDS0_N_NC
SNN_FBC_WDS2	G27	FBC_WDS3_NC
SNN_FBC_WDS2*	G28	FBC_WDS3_N_NC
SNN_FBC_WDS3	G24	FBC_WDS2_NC
SNN_FBC_WDS3*	G25	FBC_WDS2_N_NC
FBC_WCK0		
FBC_WCK0		
FBC_WCK1		
FBC_WCK1		
FBC_WCK2		
FBC_WCK2		
FBC_WCK3		
FBC_WCK3		

FBC_DQM7..0 (7.5A<> 6.5F<> 6.5A<>) → FBC_DQM_0..7

FBC_DQS_WP0..7 (6.4F<> 6.4B<> 6.4C<> 7.4B<> 7.4C<>) → FBC_DQS_WP_0..7

FBC_DQS_RN0..7 (6.4F<> 6.4B<> 6.4C<> 7.4B<> 7.4C<>) → FBC_DQS_RN_0..7

G9x	GT21x
FBAC_DLLAVDD1	RFU
FBAC_PLLAVDD1	RFU

FBVDDQ N27 P27 R27 T27 U27 U29 V27 V29 V34 W27 V27

C580 .1UF 6.3V 10% X7R 0402 COMMON
C625 .1UF 6.3V 10% X7R 0402 COMMON
C568 .1UF 6.3V 10% X7R 0402 COMMON
C600 .1UF 6.3V 10% X7R 0402 COMMON
C599 .1UF 6.3V 10% X7R 0402 COMMON
Place under GPU NORTH SIDE (FBC) near FBVDDQ balls
GND

FBA_CMD<30..0> (4.1A<> 4.1D<> 4.5F<> 5.1A<> 5.1D<>) → FBA_CMD_0..30

FBA_CMD0 V32 FBA_CMD1 W31 FBA_CMD2 U31 FBA_CMD3 V32 FBA_CMD4 AB35 FBA_CMD5 AB34 FBA_CMD6 W35 FBA_CMD7 W33 FBA_CMD8 W30 FBA_CMD9 T34 FBA_CMD10 T35 FBA_CMD11 AB31 FBA_CMD12 Y30 FBA_CMD13 Y34 FBA_CMD14 W32 FBA_CMD15 AA30 FBA_CMD16 AA32 FBA_CMD17 Y33 FBA_CMD18 U32 FBA_CMD19 Y31 FBA_CMD20 U34 FBA_CMD21 Y35 FBA_CMD22 W34 FBA_CMD23 V30 FBA_CMD24 U35 FBA_CMD25 U30 FBA_CMD26 U33 FBA_CMD27 AB30 FBA_CMD28 AB33 FBA_CMD29 T33 FBA_CMD30 W29

FBA_CLK0 T32 FBA_CLK0 (4.2D< 4.4F< 5.2D<)
FBA_CLK0 T31 FBA_CLK0* (4.2D< 4.4F< 5.2D<)
FBA_CLK1 AC31 FBA_CLK1 (4.2A< 4.4F< 5.2A<)
FBA_CLK1 AC30 FBA_CLK1* (4.2A< 4.4F< 5.2A<)

FBA_DEBUG T30 FBA_DEBUG R544 10K 0402 5% COMMON (FBVDDQ)

FB_DLLAVDD AG27
FB_PLLAVDD AF27
FBA_PLLAVDD_GPU 16MIL 1.1V
C576 1UF 6.3V 10% X7R 0402 COMMON
C572 1UF 6.3V 10% X7R 0402 COMMON
Place near GPU balls
VDD_IO_PLL
LB501 240R@100MHz BEAD_0402 COMMON
C563 4.7UF 6.3V 10% X5R 0603 COMMON
C571 4.7UF 6.3V 10% X5R 0603 COMMON
Place close to GPU
GND

FBC_CMD<30..0> (6.1A<> 6.1D<> 6.5F<> 7.1A<> 7.1D<>) → FBC_CMD_0..30

FBC_CMD0 C17 FBC_CMD1 B19 FBC_CMD2 F21 FBC_CMD3 A23 FBC_CMD4 D21 FBC_CMD5 B23 FBC_CMD6 E20 FBC_CMD7 G21 FBC_CMD8 F20 FBC_CMD9 F19 FBC_CMD10 F23 FBC_CMD11 A22 FBC_CMD12 C22 FBC_CMD13 B17 FBC_CMD14 F24 FBC_CMD15 C25 FBC_CMD16 E22 FBC_CMD17 C20 FBC_CMD18 B22 FBC_CMD19 A19 FBC_CMD20 D22 FBC_CMD21 D20 FBC_CMD22 E19 FBC_CMD23 D19 FBC_CMD24 F18 FBC_CMD25 C19 FBC_CMD26 F22 FBC_CMD27 C23 FBC_CMD28 B20 FBC_CMD29 A20 FBC_CMD30

FBC_CLK0 E17 FBC_CLK0 (6.2D< 6.4F< 7.2D<)
FBC_CLK0 D17 FBC_CLK0* (6.2D< 6.4F< 7.2D<)
FBC_CLK1 D23 FBC_CLK1 (6.2A< 6.4F< 7.2A<)
FBC_CLK1 E23 FBC_CLK1* (6.2A< 6.4F< 7.2A<)

FBC_DEBUG G19 FBC_DEBUG R551 10K 0402 5% COMMON (FBVDDQ)

J19 SNN_FBAC_RFU1
J18 SNN_FBAC_RFU2

FBCAL_PD_VDDQ K27 FB_CAL_PD_VDDQ R545 40.2 0402 1% CHANGED
FBCAL_PU_GND L27 FB_CAL_PU_GND R548 40.2 0402 1% CHANGED
FBCAL_TERM_GND M27 FB_CAL_TERM_GND R546 40.2 0402 1% COMMON
(FBVDDQ) GND

FBVDDQ
R547 1.1K 1% 0402 NO STUFF
Place close to GPU
FB_VREF 12MIL J27 FB_VREF
C590 .01UF 6.3V 10% X7R 0402 NO STUFF
R549 1.1K 1% 0402 NO STUFF
GND

ASSEMBLY	P699-A00 SKU1 GT216-630 MXM3.0 TYPE-A 1024MB 8pcs 64Mx16
PAGE DETAIL	Frame Buffer GPU Interface

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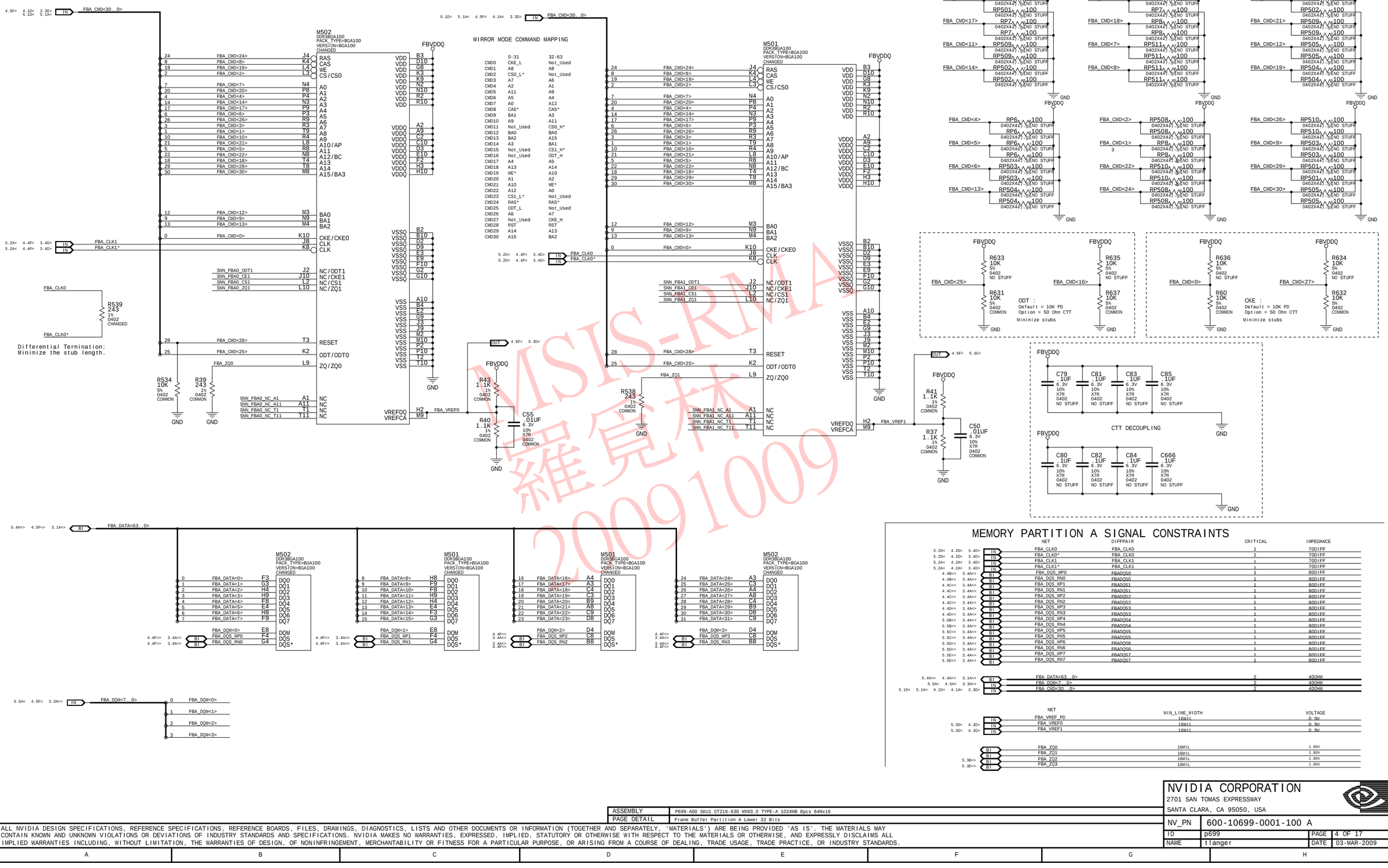
4. MEMORY PARTITION A LOWER 32 BITS



MEMORY PARTITION A SIGNAL CONSTRAINTS

NET	DIFFPAIR	CRITICAL	IMPEDANCE
FBA_CLK0	FBA_CLK0	1	70DIFF
FBA_CLK0*	FBA_CLK0	1	70DIFF
FBA_CLK1	FBA_CLK1	1	70DIFF
FBA_CLK1*	FBA_CLK1	1	70DIFF
FBA_DQS_WP0	FBADQS0	1	80DIFF
FBA_DQS_RN0	FBADQS0	1	80DIFF
FBA_DQS_WP1	FBADQS1	1	80DIFF
FBA_DQS_RN1	FBADQS1	1	80DIFF
FBA_DQS_WP2	FBADQS2	1	80DIFF
FBA_DQS_RN2	FBADQS2	1	80DIFF
FBA_DQS_WP3	FBADQS3	1	80DIFF
FBA_DQS_RN3	FBADQS3	1	80DIFF
FBA_DQS_WP4	FBADQS4	1	80DIFF
FBA_DQS_RN4	FBADQS4	1	80DIFF
FBA_DQS_WP5	FBADQS5	1	80DIFF
FBA_DQS_RN5	FBADQS5	1	80DIFF
FBA_DQS_WP6	FBADQS6	1	80DIFF
FBA_DQS_RN6	FBADQS6	1	80DIFF
FBA_DQS_WP7	FBADQS7	1	80DIFF
FBA_DQS_RN7	FBADQS7	1	80DIFF

NET		CRITICAL	IMPEDANCE
FBA_DATA<63..0>		2	40OHM
FBA_DQM<7..0>		2	40OHM
FBA_CMD<30..0>		2	40OHM

NET	MIN_LINE_WIDTH	VOLTAGE
FBA_VREF_PD	16MIL	0.9V
FBA_VREF0	16MIL	0.9V
FBA_VREF1	16MIL	0.9V
FBA_ZQ0	16MIL	1.80V
FBA_ZQ1	16MIL	1.80V
FBA_ZQ2	16MIL	1.80V
FBA_ZQ3	16MIL	1.80V

ASSEMBLY	P699-A00 SKU1 GT216-630 MXM3.0 TYPE-A 1024MB 8pcs 64Mx16
PAGE DETAIL	Frame Buffer Partition A Lower 32 Bits

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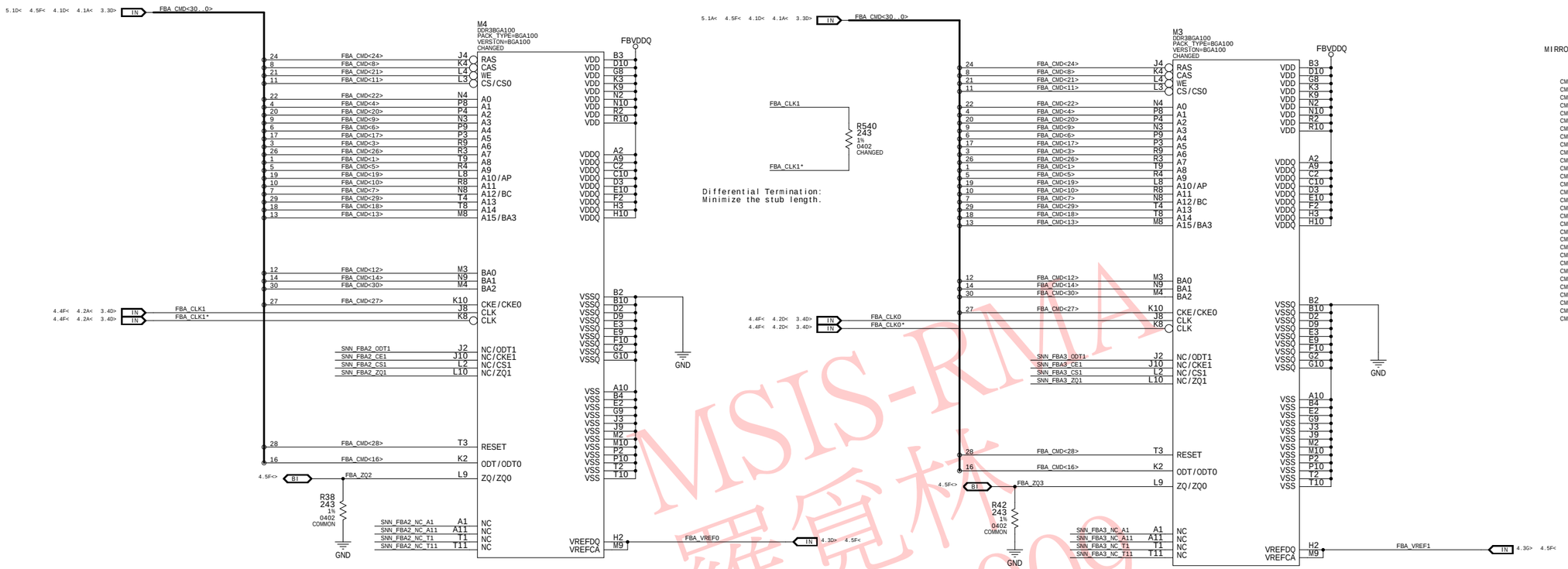
5. MEMORY PARTITION A UPPER 32 BITS



MIRROR MODE COMMAND MAPPING

	0-31	32-63
CMD0	CKE_L	Not_Used
CMD1	A8	A8
CMD2	CS0_L*	Not_Used
CMD3	A7	A6
CMD4	A2	A1
CMD5	A11	A9
CMD6	A5	A4
CMD7	A0	A12
CMD8	CAS*	CAS*
CMD9	BA1	A3
CMD10	A9	A11
CMD11	Not_Used	CS0_H*
CMD12	BA0	BA0
CMD13	BA2	A15
CMD14	A3	BA1
CMD15	Not_Used	CS1_H*
CMD16	Not_Used	ODT_H
CMD17	A4	A5
CMD18	A13	A14
CMD19	WE*	A10
CMD20	A1	A2
CMD21	A10	WE*
CMD22	A12	A0
CMD23	CS1_L*	Not_Used
CMD24	RAS*	RAS*
CMD25	ODT_L	Not_Used
CMD26	A6	A7
CMD27	Not_Used	CKE_H
CMD28	RST	RST
CMD29	A14	A13
CMD30	A15	BA2

ASSEMBLY	P699-A00 SKU1 GT216-630 NXM3.0 TYPE-A 1024MB 8pcs 64Mx16
PAGE DETAIL	Frame Buffer Partition A Upper 32 Bits

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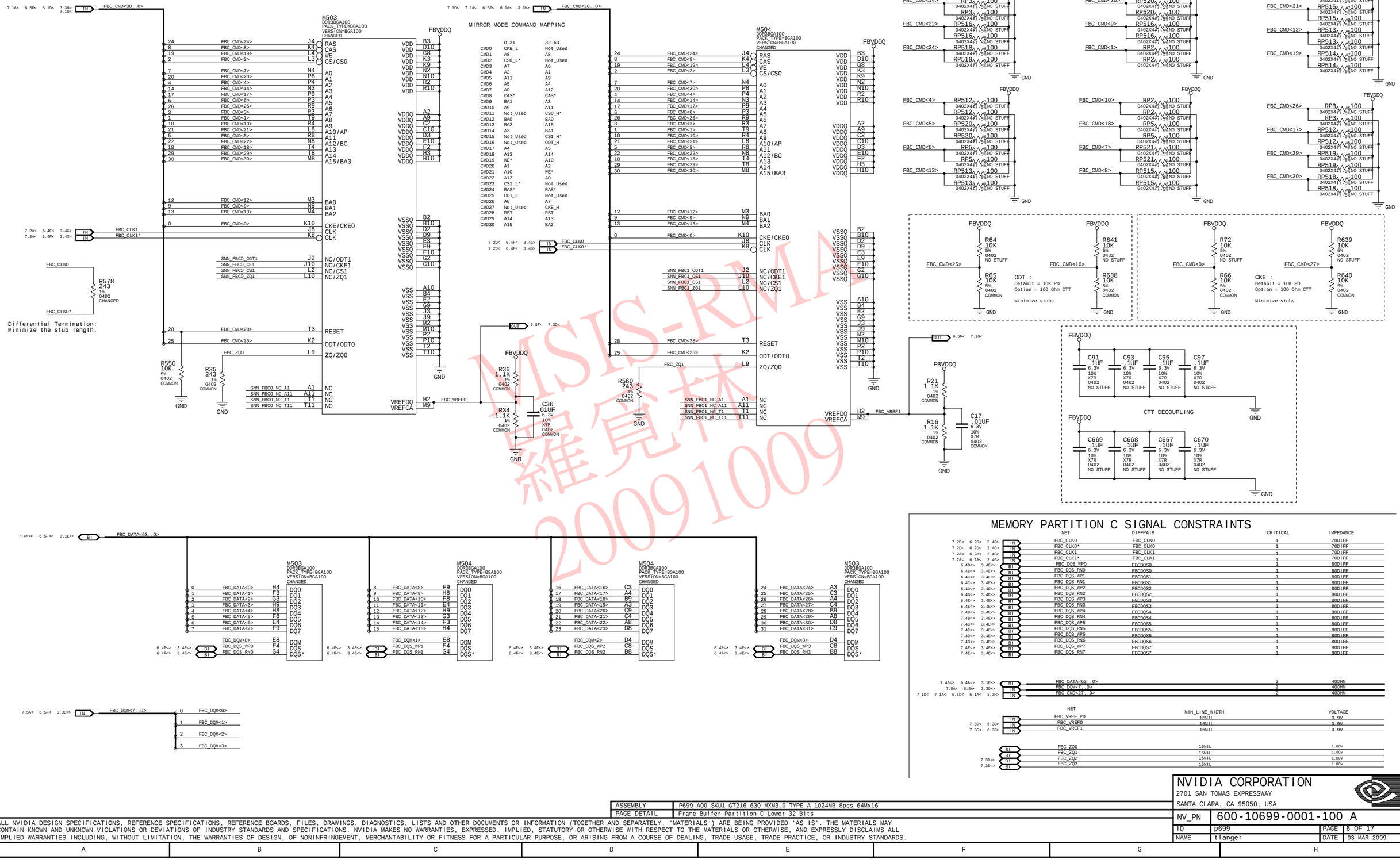
6. MEMORY PARTITION C LOWER 32 BITS



MEMORY PARTITION C SIGNAL CONSTRAINTS

	NET	DIFFPAIR	CRITICAL	IMPEDANCE
7.2D< 6.2D< 3.4G> IN	FBC_CLK0	FBC_CLK0	1	70DIFF
7.2D< 6.2D< 3.4G> IN	FBC_CLK0*	FBC_CLK0	1	70DIFF
7.2A< 6.2A< 3.4G> IN	FBC_CLK1	FBC_CLK1	1	70DIFF
7.2A< 6.2A< 3.4G> IN	FBC_CLK1*	FBC_CLK1	1	70DIFF
6.4B<> 3.4E<> BI	FBC_DQS_WP0	FBCDQS0	1	80DIFF
6.4B<> 3.4E<> BI	FBC_DQS_RN0	FBCDQS0	1	80DIFF
6.4C<> 3.4E<> BI	FBC_DQS_WP1	FBCDQS1	1	80DIFF
6.4C<> 3.4E<> BI	FBC_DQS_RN1	FBCDQS1	1	80DIFF
6.4D<> 3.4E<> BI	FBC_DQS_WP2	FBCDQS2	1	80DIFF
6.4D<> 3.4E<> BI	FBC_DQS_RN2	FBCDQS2	1	80DIFF
6.4E<> 3.4E<> BI	FBC_DQS_WP3	FBCDQS3	1	80DIFF
6.4E<> 3.4E<> BI	FBC_DQS_RN3	FBCDQS3	1	80DIFF
7.4B<> 3.4E<> BI	FBC_DQS_WP4	FBCDQS4	1	80DIFF
7.4B<> 3.4E<> BI	FBC_DQS_RN4	FBCDQS4	1	80DIFF
7.4C<> 3.4E<> BI	FBC_DQS_WP5	FBCDQS5	1	80DIFF
7.4C<> 3.4E<> BI	FBC_DQS_RN5	FBCDQS5	1	80DIFF
7.4D<> 3.4E<> BI	FBC_DQS_WP6	FBCDQS6	1	80DIFF
7.4D<> 3.4E<> BI	FBC_DQS_RN6	FBCDQS6	1	80DIFF
7.4E<> 3.4E<> BI	FBC_DQS_WP7	FBCDQS7	1	80DIFF
7.4E<> 3.4E<> BI	FBC_DQS_RN7	FBCDQS7	1	80DIFF

	NET	CRITICAL	IMPEDANCE
7.4A<> 6.4A<> 3.1E<> BI	FBC_DATA<63..0>	2	40OHM
7.5A< 6.5A< 3.3D<> IN	FBC_DQM<7..0>	2	40OHM
7.1D< 7.1A< 6.1D< 6.1A< 3.3H> IN	FBC_CMD<27..0>	2	40OHM

	NET	MIN_LINE_WIDTH	VOLTAGE
IN	FBC_VREF_PD	16MIL	0.9V
7.3D< 6.3D> IN	FBC_VREF0	16MIL	0.9V
7.3C< 6.3F> IN	FBC_VREF1	16MIL	0.9V
BI	FBC_ZQ0	16MIL	1.80V
BI	FBC_ZQ1	16MIL	1.80V
7.3B<> BI	FBC_ZQ2	16MIL	1.80V
7.3E<> BI	FBC_ZQ3	16MIL	1.80V

ASSEMBLY	P699-A00 SKU1 GT216-630 MXM3.0 TYPE-A 1024MB 8pcs 64Mx16
PAGE DETAIL	Frame Buffer Partition C Lower 32 Bits

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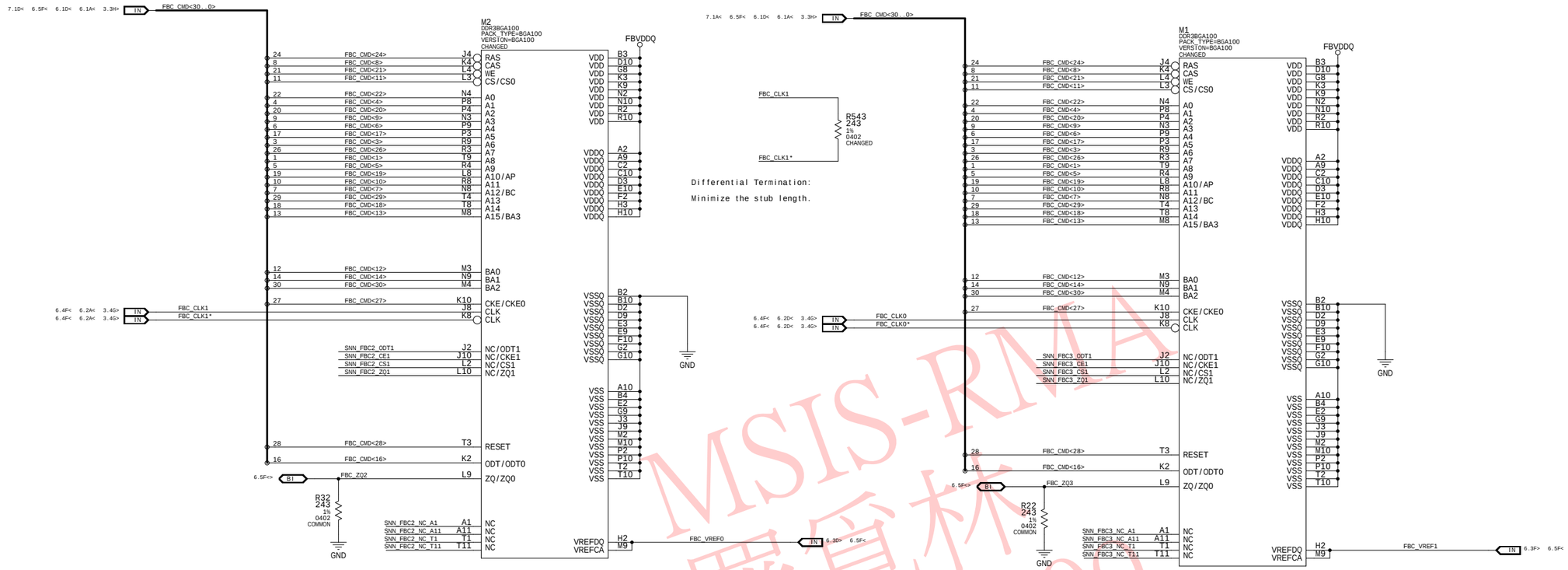
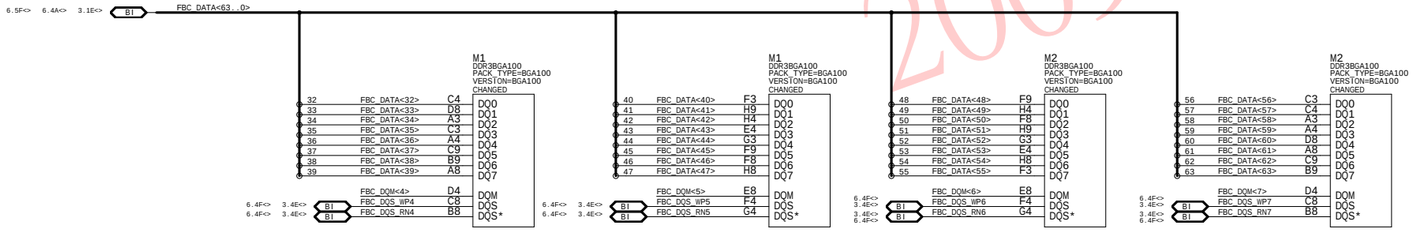
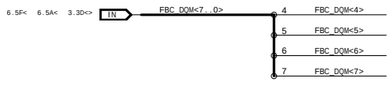
7. MEMORY PARTITION C UPPER 32 BITS







ASSEMBLY	P699-A00 SKU1 GT216-630 MXM3.0 TYPE-A 1024MB 8pcs 64Mx16
PAGE DETAIL	Frame Buffer Partition C Upper 32 Bits

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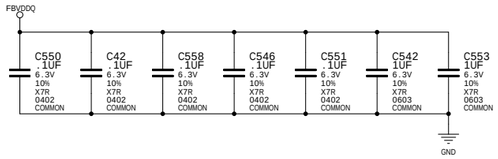
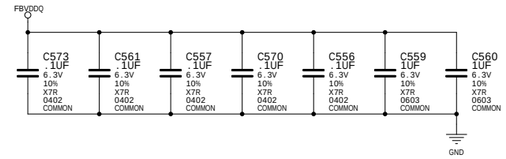
8. MEMORY DECOUPLING CAPS

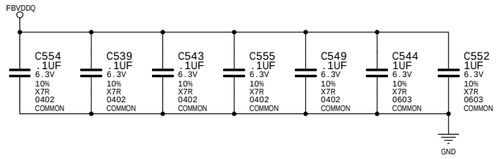
DECOUPLING CAPS FOR ONE MEMORY OF PARTION A LOWER BITS 0-15



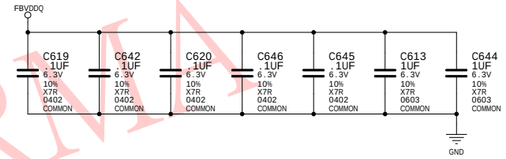
DECOUPLING CAPS FOR ONE MEMORY OF PARTION C LOWER BITS 0-15



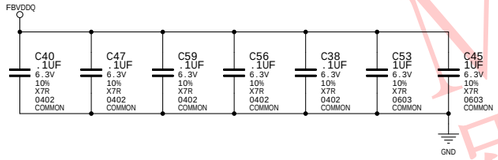
DECOUPLING CAPS FOR ONE MEMORY OF PARTION A LOWER BITS 16-31



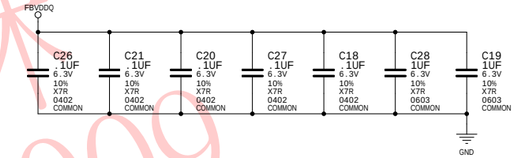
DECOUPLING CAPS FOR ONE MEMORY OF PARTION C LOWER BITS 16-31



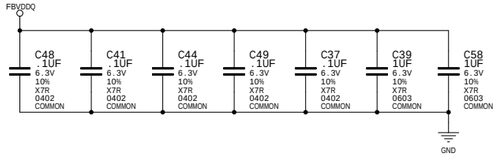
DECOUPLING CAPS FOR ONE MEMORY OF PARTION A UPPER BITS 32-47



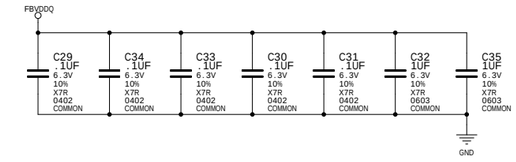
DECOUPLING CAPS FOR ONE MEMORY OF PARTION C UPPER BITS 32-47



DECOUPLING CAPS FOR ONE MEMORY OF PARTION A UPPER BITS 48-63



DECOUPLING CAPS FOR ONE MEMORY OF PARTION C UPPER BITS 48-63



ASSEMBLY	P699-A00 SKU1 GT216-630 MXM3.0 TYPE-A 1024MB 8pcs 64Mx16
PAGE DETAIL	Memory Decoupling Caps

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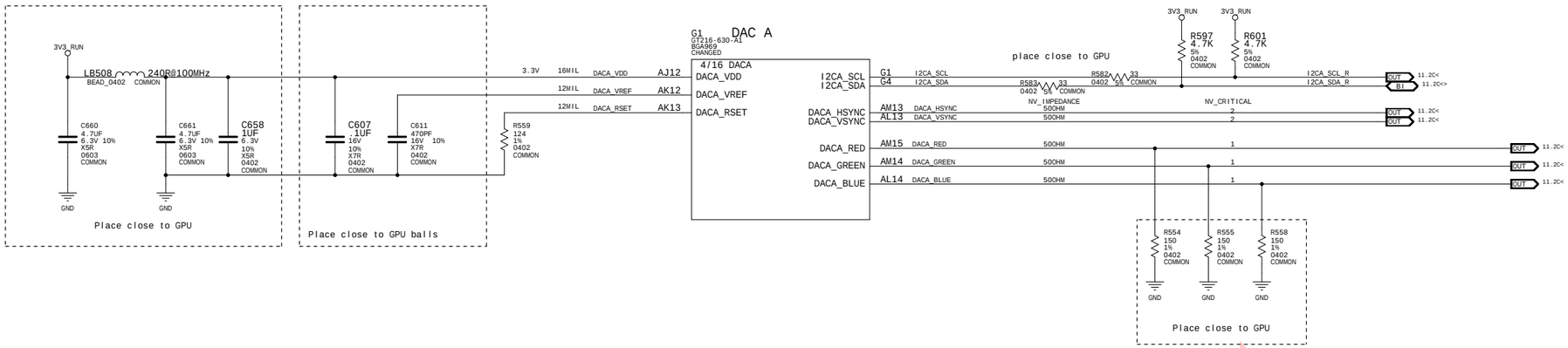
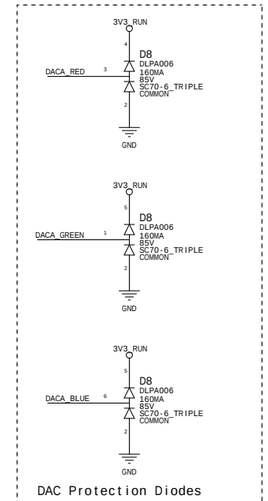
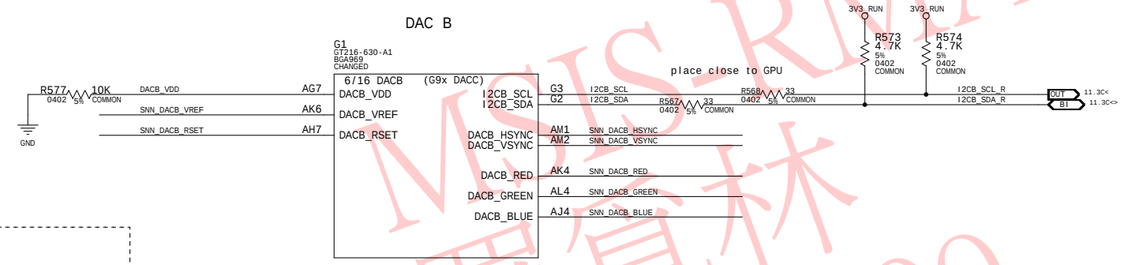
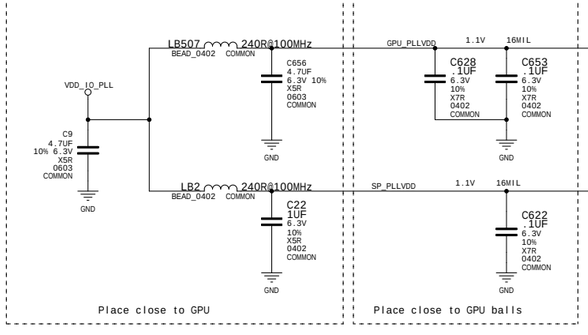
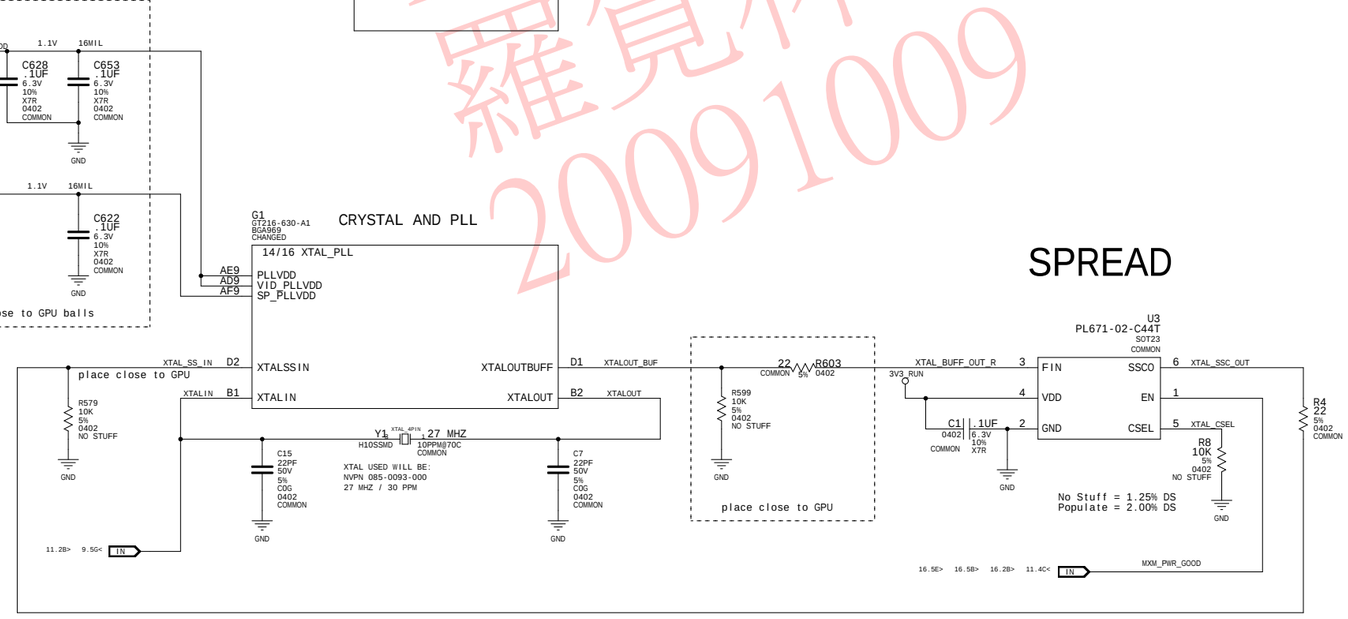
9. DAC_A, DAC_B, SPREAD, PLL, CRYSTAL











NV_NET_NAME	NV_IMPEDANCE	NV_CRITICAL_NET
XTALOUT	50OHM	1
XTALIN	50OHM	1
XTALOUT_BUF	50OHM	2
XTAL_SSC_OUT	50OHM	2

ASSEMBLY	P699-A00 SKU1 GT216-630 MXM3.0 TYPE-A 1024MB 8pcs 64Mx16
PAGE DETAIL	DAC_A, DAC_B, SPREAD, PLL, CRYSTAL

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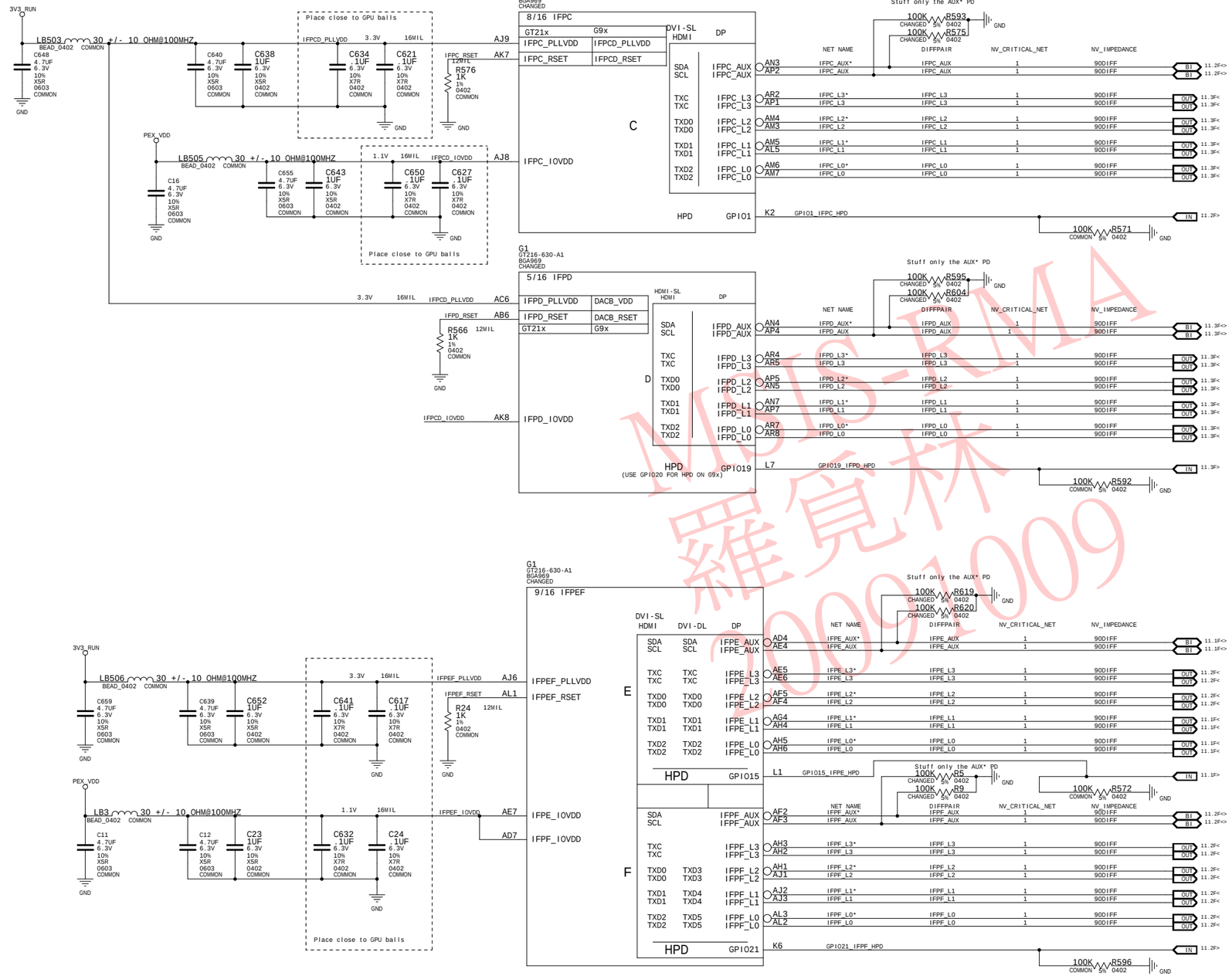
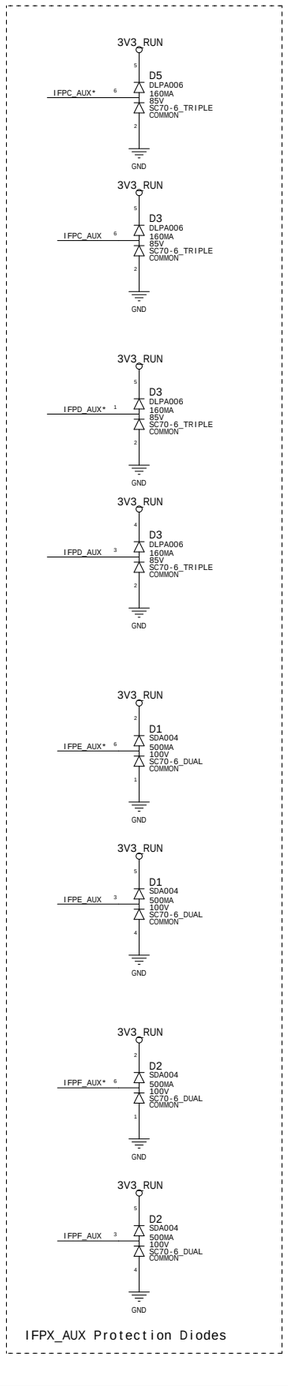
10. DP LINKS CD, LINK EF





ASSEMBLY	P699-A00 SKU1 GT216-630 MXM3.0 TYPE-A 1024MB 8pcs 64Mx16
PAGE DETAIL	DP LINKS C,D,E,F

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11. MXM CONNECTOR

MXM CONNECTOR

NV_NET_NAME	NV_IMPEDANCE	NV_CRITICAL_NET
XTAL_SYS_27MHZ	50OHM	1

CN1
CON_MXM3_EDGE
(N)PHY
NPHY
NO STUFF

2/2 IO - LVDS,DP/DVI,VGA,TV

No Stuff the resistor and populate the xtal componenets for a compliant MXM 3.0 module which can not use any OEM pin

XTAL IN — R17 0 0402 5% NO STUFF

SNN_MXM_OEM38	38	OEM0	
SNN_MXM_OEM39	39	OEM1	
SNN_MXM_OEM40	40	OEM2	
SNN_MXM_OEM41	41	OEM3	
SNN_MXM_OEM42	42	OEM4	
SNN_MXM_OEM43	43	OEM5	
SNN_MXM_OEM44	44	OEM6	
XTAL_SYS_27MHZ	45	OEM7	
GPIO17_MXM0	26	GPIO0	
GPIO18_MXM1	28	GPIO1	
GPIO11_MXM2	30	GPIO2	
DACA_RED	168	VGA_RED	C
DACA_GREEN	170	VGA_GREEN	Y
DACA_BLUE	172	VGA_BLUE	CVBS
DACA_VSYNC	162	VGA_VSYNC	
DACA_HSYNC	164	VGA_HSYNC	
I2CA_SCL_R	160	VGA_DDC_CLK	
I2CA_SDA_R	158	VGA_DDC_DAT	
SNN_MXM_WAKE	4	WAKE	
HDMI_CEC	29	HDMI_CEC	
MXM_VGA_DISABLE*	21	VGA_DISABLE	
GPIO0_IFPAB_HPD	31	DVI_HPD	
I2CB_SCL_R	35	LVDS_DDC_CLK	
I2CB_SDA_R	33	LVDS_DDC_DAT	
GPIO3_PPEN	23	PNL_PWR_EN	
GPIO4_BLEN	25	PNL_BL_EN	
GPIO2_BL_PWM	27	PNL_BL_PWM	
SMB_DATA	32	SMB_DAT	
SMB_CLK	34	SMB_CLK	
GPIO8_THERM_SHDWN*	20	TH_OVERT	
GPIO9_THERM_ALERT*	22	TH_ALERT	
MXM_TH_PWM	24	TH_PWM	
MXM_PWR_GOOD	6	PWR_GOOD	
MXM_PWR_EN_R	8	PWR_EN	
GPIO12_AC_BATT*	18	PWR_LEVEL	
SNN_RSVD_0	10	RSVD	
SNN_RSVD_1	12	RSVD	
SNN_RSVD_2	14	RSVD	
SNN_RSVD_3	16	RSVD	
JTAG_TDO	159	RSVD	
JTAG_TDI	161	RSVD	
JTAG_TCLK	163	RSVD	
JTAG_TMS	165	RSVD	
JTAG_TRST	167	RSVD	
SNN_RSVD_9	227	RSVD	
SNN_RSVD_10	229	RSVD	
SNN_RSVD_11	231	RSVD	
SNN_RSVD_12	233	RSVD	
SNN_RSVD_13	235	RSVD	
SNN_RSVD_14	237	RSVD	
SNN_RSVD_15	238	RSVD	
SNN_RSVD_16	239	RSVD	
SNN_RSVD_17	240	RSVD	
SNN_RSVD_18	241	RSVD	
SNN_RSVD_19	242	RSVD	
SNN_RSVD_20	243	RSVD	
SNN_RSVD_21	245	RSVD	
SNN_RSVD_22	247	RSVD	
SNN_RSVD_23	249	RSVD	

JTAG_TDO — RP1 0 0.05R_MAX — JTAG_TDO_R
JTAG_TDI — 0402X4 RP1 0 NO STUFF 0.05R_MAX — JTAG_TDI_R
JTAG_TCLK — 0402X4 RP1 0 NO STUFF 0.05R_MAX — JTAG_TCLK_R
JTAG_TMS — 0402X4 RP1 0 NO STUFF 0.05R_MAX — JTAG_TMS_R
JTAG_TRST — 0402X4 R553 0 NO STUFF — JTAG_TRST_R
0402 1 5% NO STUFF

Not for use with a compliant MXM 3.0 module
Not for production (test only) no need for TP(s) on the resistro side

MXM_PWR_EN — R532 1K 0402 1% COMMON
C538 1000PF 50V 10% X7R 0402 COMMON
GND
ESD Protection for MOSFET Gates

DP_A_HPD	276	GPIO15_IFPE_HPD	
DP_A_AUX	277	IFPE_AUX*	
DP_A_AUX	279	IFPE_AUX	
DP_A_L0	253	IFPE_L0*	
DP_A_L0	255	IFPE_L0	
DP_A_L1	259	IFPE_L1*	
DP_A_L1	261	IFPE_L1	
DP_A_L2	265	IFPE_L2*	
DP_A_L2	267	IFPE_L2	
DP_A_L3	271	IFPE_L3*	
DP_A_L3	273	IFPE_L3	
DP_B_HPD	274	GPIO21_IFPF_HPD	
DP_B_AUX	270	IFPF_AUX*	
DP_B_AUX	272	IFPF_AUX	
DP_B_L0	246	IFPF_L0*	
DP_B_L0	248	IFPF_L0	
DP_B_L1	252	IFPF_L1*	
DP_B_L1	254	IFPF_L1	
DP_B_L2	258	IFPF_L2*	
DP_B_L2	260	IFPF_L2	
DP_B_L3	264	IFPF_L3*	
DP_B_L3	266	IFPF_L3	
DP_C_HPD	234	GPIO1_IFPC_HPD	
DP_C_AUX	223	IFPC_AUX*	
DP_C_AUX	225	IFPC_AUX	
DP_C_L0	199	IFPC_L0*	
DP_C_L0	201	IFPC_L0	
DP_C_L1	205	IFPC_L1*	
DP_C_L1	207	IFPC_L1	
DP_C_L2	211	IFPC_L2*	
DP_C_L2	213	IFPC_L2	
DP_C_L3	217	IFPC_L3*	
DP_C_L3	219	IFPC_L3	
DP_D_HPD	236	GPIO19_IFPD_HPD	
DP_D_AUX	230	IFPD_AUX*	
DP_D_AUX	232	IFPD_AUX	
DP_D_L0	206	IFPD_L0*	
DP_D_L0	208	IFPD_L0	
DP_D_L1	212	IFPD_L1*	
DP_D_L1	214	IFPD_L1	
DP_D_L2	218	IFPD_L2*	
DP_D_L2	220	IFPD_L2	
DP_D_L3	224	IFPD_L3*	
DP_D_L3	226	IFPD_L3	
LVDS_UTX0	195	IFPB_TXD4	
LVDS_UTX0	193	IFPB_TXD4*	
LVDS_UTX1	189	IFPB_TXD5	
LVDS_UTX1	187	IFPB_TXD5*	
LVDS_UTX2	183	IFPB_TXD6	
LVDS_UTX2	181	IFPB_TXD6*	
LVDS_UTX3	177	IFPB_TXD7	
LVDS_UTX3	175	IFPB_TXD7*	
LVDS_UCLK	171	IFPB_TXC	
LVDS_UCLK	169	IFPB_TXC*	
LVDS_LTX0	202	IFPA_TXD0	
LVDS_LTX0	200	IFPA_TXD0*	
LVDS_LTX1	196	IFPA_TXD1	
LVDS_LTX1	194	IFPA_TXD1*	
LVDS_LTX2	190	IFPA_TXD2	
LVDS_LTX2	188	IFPA_TXD2*	
LVDS_LTX3	184	IFPA_TXD3	
LVDS_LTX3	182	IFPA_TXD3*	
LVDS_LCLK	178	IFPA_TXC	
LVDS_LCLK	176	IFPA_TXC*	

ASSEMBLY	P699-A00 SKU1 GT216-630 MXM3.0 TYPE-A 1024MB 8pcs 64Mx16
PAGE DETAIL	MXM Connector, IO-Section

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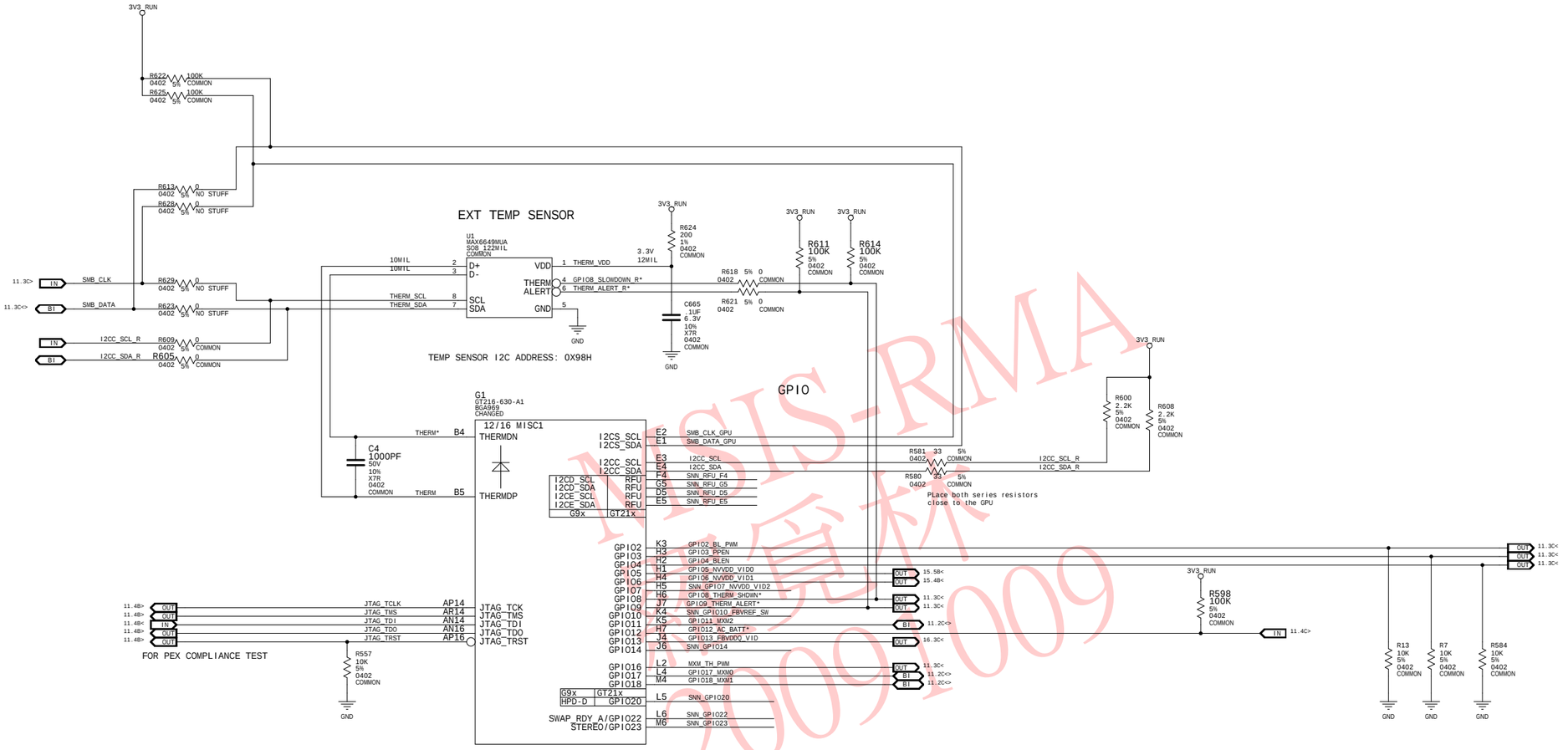
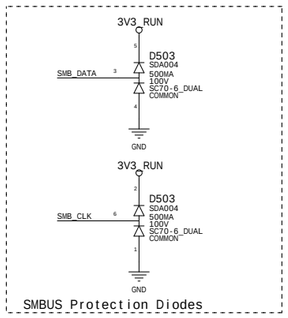
12. GPIO, JTAG, TEMP SENSOR





ASSEMBLY	P699-A00 SKU1 GT216-630 MXM3.0 TYPE-A 1024MB 8pcs 64Mx16
PAGE DETAIL	GPIOs, JTAG, Thermal Sensor

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13. LVDS, VBIOS, HDCP ROM, CEC

LVDS

G1
GT216-630-A1
BGA969
CHANGED

7/16 IFPAB

DVI-DL	LVDS DVI-SL		NET NAME	DIFFPAIR	NV_CRITICAL_NET	NV_IMPEDANCE	
IFPAB_TXD0* / IFPAB_TXD0	IFPA_TXD0	AL8 / AM8	IFPA_TXD0* / IFPA_TXD0	IFPA_TXD0	1	90DIFF	OUT 11.4F<
IFPAB_TXD1* / IFPAB_TXD1	IFPA_TXD1	AM9 / AM10	IFPA_TXD1* / IFPA_TXD1	IFPA_TXD1	1	90DIFF	OUT 11.4F<
IFPAB_TXD2* / IFPAB_TXD2	IFPA_TXD2	AL10 / AK10	IFPA_TXD2* / IFPA_TXD2	IFPA_TXD2	1	90DIFF	OUT 11.4F<
	IFPA_TXD3	AL11 / AK11	IFPA_TXD3* / IFPA_TXD3	IFPA_TXD3	1	90DIFF	OUT 11.4F<
IFPAB_TXC* / IFPAB_TXC	IFPA_TXC	AM12 / AM11	IFPA_TXC* / IFPA_TXC	IFPA_TXC	1	90DIFF	OUT 11.5F<
IFPAB_TXD3* / IFPAB_TXD3	IFPB_TXD4	AP8 / AN8	IFPB_TXD4* / IFPB_TXD4	IFPB_TXD4	1	90DIFF	OUT 11.4F<
IFPAB_TXD4* / IFPAB_TXD4	IFPB_TXD5	AN10 / AP10	IFPB_TXD5* / IFPB_TXD5	IFPB_TXD5	1	90DIFF	OUT 11.4F<
IFPAB_TXD5* / IFPAB_TXD5	IFPB_TXD6	AR10 / AR11	IFPB_TXD6* / IFPB_TXD6	IFPB_TXD6	1	90DIFF	OUT 11.4F<
	IFPB_TXD7	AP11 / AN11	IFPB_TXD7* / IFPB_TXD7	IFPB_TXD7	1	90DIFF	OUT 11.4F<
	IFPB_TXC	AN13 / AP13	IFPB_TXC* / IFPB_TXC	IFPB_TXC	1	90DIFF	OUT 11.4F<

IFPAB_PLLVDD A — AK9 — LB502 120R@100MHz BEAD_0402 COMMON — 1.1V 12MIL IFPAB_PLLVDD
IFPAB_RSET — AJ11 — R563 1K 1% 0402 COMMON
IFPA_IOVDD / IFPB_IOVDD B — AG9 / AG10 — LB1 120R@100MHz BEAD_0402 COMMON — 3.3V 12MIL IFPAB_IOVDD
HPD — GPIO0 — K1 — GPIO0_IFPAB_HPD — R602 100K 5% 0402 NO STUFF

Place close to GPU balls

Populate backdrive switch for TMDS SKU(s)

IFPAB_IOVDD_EN* — Q5 2N7002 SOT23_1G1D1S NO STUFF — R12 1K 0402 1% NO STUFF — IFPAB_IOVDD_EN_R* — Q2 NTR2101P SOT23_1G1D1S NO STUFF — 3V3_RUN
MXM_PWR_EN — 13.5C< 11.4A> 15.5F<
R6 10K 0402 5% NO STUFF
C10 .1UF 0402 16V 10% X7R NO STUFF

Populate bypass for LVDS SKU(s)

R1 0 0805 5% COMMON — 3V3_RUN

C636 4.7UF 6.3V 10% X5R 0603 COMMON
C630 4.7UF 6.3V 10% X5R 0603 COMMON
C635 1UF 6.3V 10% X5R 0402 COMMON
C631 .1UF 6.3V 10% X7R 0402 COMMON
C629 .1UF 6.3V 10% X7R 0402 COMMON
C5 4.7UF 6.3V 10% X5R 0603 COMMON
C662 4.7UF 6.3V 10% X5R 0603 COMMON
C637 1UF 6.3V 10% X5R 0402 COMMON
C623 .1UF 6.3V 10% X7R 0402 COMMON

VBIOS ROM

G1
GT216-630-A1
BGA969
CHANGED

13/16 MISC2

			GT21x	G9x
SNN_RFU_J26	J26	RFU		
SNN_RFU_J25	J25	RFU		
SNN_RFU_D7	D7	RFU		HDA_BCLK
SNN_RFU_D6	D6	RFU		HDA_RST
SNN_RFU_C7	C7	RFU		HDA_SDI
SNN_RFU_B7	B7	RFU		HDA_SDO
SNN_RFU_A7	A7	RFU		HDA_SYNC
	AB5	CEC		DACB_CSYNC
		PSOOD_OUT*		
STRAP_REF0	N9	MULTI_STRAP_REF0_GND		
STRAP_REF1	M9	MULTI_STRAP_REF1_GND		
	AK14	GND		
		GND		

ROM_CS — C3 — ROM_CS*
ROM_SI — D3 — ROM_SI
ROM_SO — C4 — ROM_SO
ROM_SCLK — D4 — ROM_SCLK
I2CH_SCL — F6 — I2CH_SCL
I2CH_SDA — G6 — I2CH_SDA
SPDIF — A5 — SPDIF
BUFRST — A4 — SNN_BUFRST
RFU — C5 — SNN_RFU_C5

U2 MX25L1005 SOB SOB COMMON
HOLD 7, WP 3, CS 1, SI 5, SO 2, SCK 6, VCC 8, GND 4
C664 1UF 6.3V 10% X7R 0402 COMMON
R615 10K 5% 0402 COMMON
17.3B< 17.3B< 17.4E> 17.3B<

1Mb ROM required for sDDR3 images (default)

Some SKU(s) will require 2Mb ROM:170-0031-000

R565 100K 5% 0402 NO STUFF
R585 40.2K 1% 0402 COMMON
R564 40.2K 1% 0402 COMMON
R594 10K 0402 5% COMMON

HDCP ROM

R606 2.2K 5% 0402 COMMON
R607 2.2K 5% 0402 COMMON
C657 1UF 6.3V 10% X7R 0402 COMMON
U4 HDCP_I2CROM_PROGD SOB COMMON
VCC 8, WP 7, SCL 6, SDA 5, GND 4, A0 1, A1 2, A2 3
I2CH_SCL, I2CH_SDA

CEC

PWR_SRC — R28 10K 0402 5% NO STUFF — PS_CA_R — R29 22K 0402 5% NO STUFF — PS_CA
R19 47K 5% 0402 NO STUFF
R20 47K 5% 0402 NO STUFF
D7 MMBZ5232BLT1-5.6V SOT23 5.6VR 350MW@25C NO STUFF SOT23
HDMI_CEC_EN — Q4 BSS138 SOT23_1G1D1S NO STUFF
HDMI_CEC_EN* — Q3 BSS138 SOT23_1G1D1S NO STUFF
MXM_PWR_EN — 15.5F< 13.2A< 11.4A>
Q9 NDS0605 SOT23_1G1D1S
HDMI_CEC_L — HDMI_CEC_Q
D4 AOZ8231 NORM 24KV PULSE N/A NO STUFF
LB4 600R@100MHZ NO STUFF BEAD_0603 — HDMI_CEC — B1 11.3C<>

ASSEMBLY	P699-A00 SKU1 GT216-630 MXM3.0 TYPE-A 1024MB 8pcs 64Mx16
PAGE DETAIL	LVDS, VBIOS HDCP ROM, and CEC

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2701 SAN TOMAS EXPRESSWAY
SANTA CLARA, CA 95050, USA

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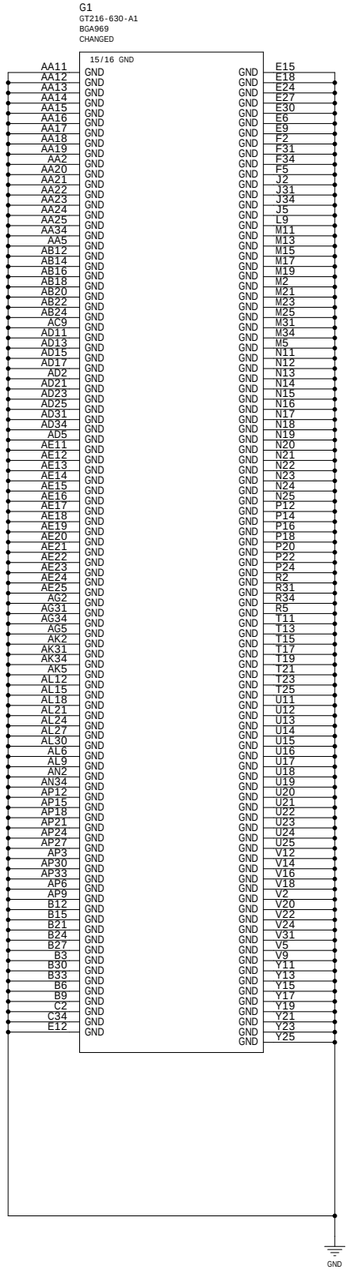
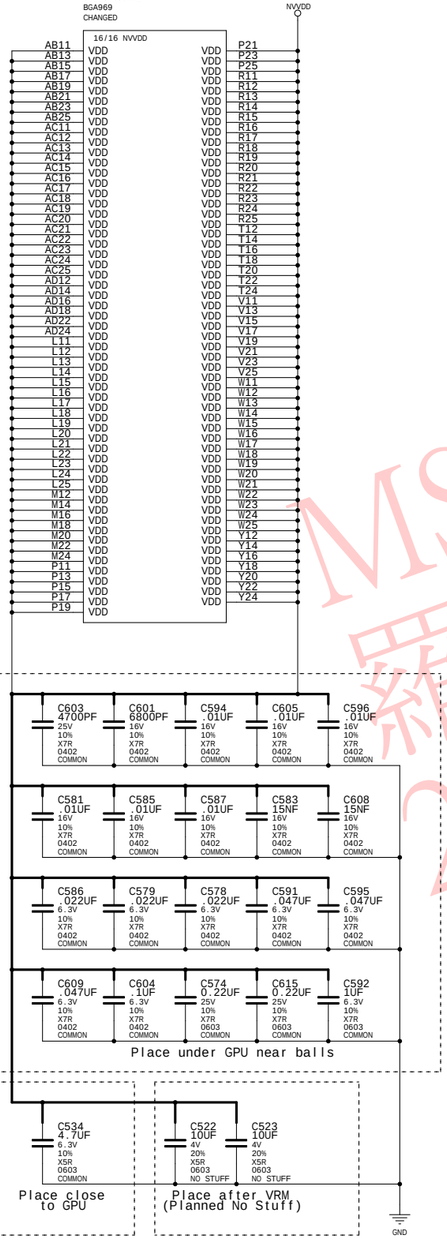
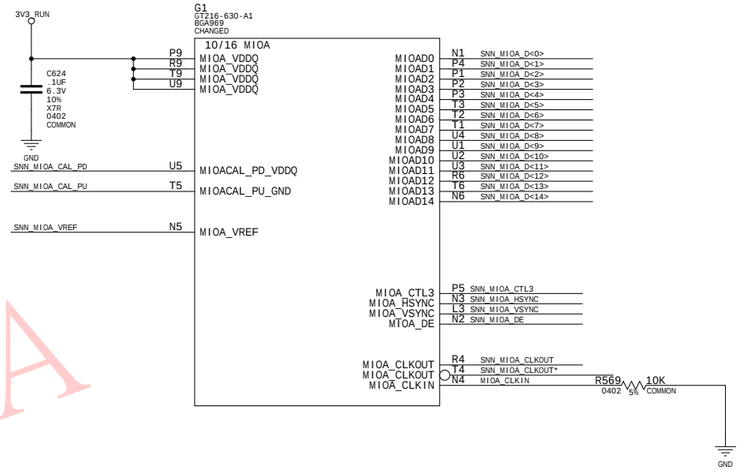
14. MIOA, MIOB, GPU VDD/DCPLNG/GND

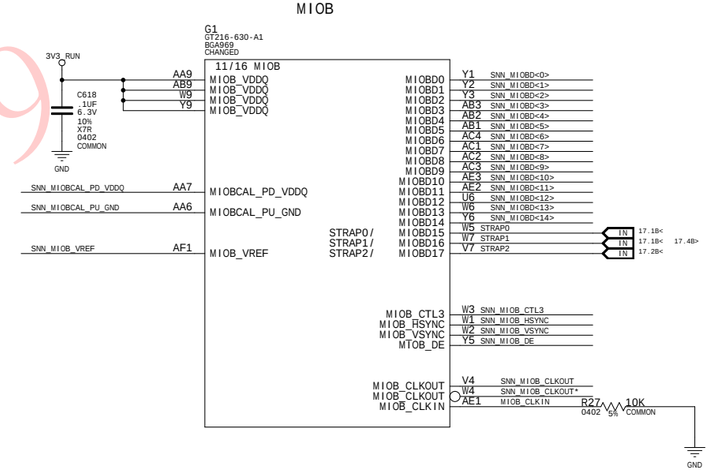




MIOA



MIOB



ASSEMBLY	P699-A00 SKU1 GT216-630 MXM3.0 TYPE-A 1024MB 8pcs 64Mx16
PAGE DETAIL	MIOA, MIOB, GPU VDD\DCPLNG\GND

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

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15. NVVDD POWER SUPPLY AND 3V3_RUN

NET	VOLTAGE	MIN_WIDTH_LINE	NV_NET_MAX_CURRENT
NVVDD	1V	20MIL	30A

Mode 1: INPUT CURRENT RMS = 4.3A @ 7.0V INPUT AND 1.0V OUTPUT
Mode 2: INPUT CURRENT RMS = 9.2A @ 7.0V INPUT AND 1.0V OUTPUT

PWR_SRC

C535 .1UF 50V 10% X7R 0603 COMMON
C65 .1UF 50V 10% X7R 0603 COMMON
C68 .1UF 50V 10% X7R 0603 COMMON
C536 4.7UF 25V 10% X5R 1206 COMMON
C70 4.7UF 25V 10% X5R 1206 COMMON
C67 4.7UF 25V 10% X5R 1206 COMMON
C527 4.7UF 25V 10% X5R 1206 COMMON
C528 4.7UF 25V 10% X5R 1206 COMMON
C529 4.7UF 25V 10% X5R 1206 COMMON
Mode 2: STUFF FOR GT215/6

stuff for NCP5212
D501 BAT43 SOD323 40V 400MA NO STUFF

U501 ISL6269ACRZ VR_SW=0.6V MLFP16 MLFP16 COMMON

5V
R518 0402 0 5% COMMON
C511 1uF 16V 10% X5R 0402 COMMON
PS1_VCC
R524 10K 5% 0402 COMMON
C532 1uF 16V 10% X5R 0402 COMMON
DEM USED

3V3_RUN
16.5E< 16.4A< 16.2B< OUT
R525 1K 0402 5% COMMON
C526 .1UF 6.3V 10% X5R 0402 COMMON
PS_NVVDD_PGOOD
PS_NVVDD_EN
PS1_FS 12MIL
SET TO 350KHZ
R512 38.3K 1% 0402 COMMON
C516 .01UF 16V 10% X7R 0402 COMMON
SW_FREQ = 1/(Rfset*75 10^-12)

PS1_CP 12MIL
R523 0402 124K 1% CHANGED
PS1_CP_R 12MIL
C531 0402 .01UF 16V 10% X7R COMMON
C519 0402 68PF 50V 5% C0G CHANGED

R514 0402 10K 1% NO STUFF
stuff for NCP5212

PVCC VCC UG BOOT PHASE ISEN LG PGOOD EN FSET GND(PAD) COMP VIN PS1_UG PS1_BOOT PS1_PH PS1_ISEN PS1_LG PGOOD EN FSET TP PS1_CP VO FB PGND

C525 .01UF 0402 25V 10% X7R COMMON

LFPAK
Q12 NTMFS4821N LFPAK COMMON
MAX_VOLTAGE=30V CONTINUOUS_CURRENT=13 BAQ25C R_DS_ON=0.010RR10V MAX_CURRENT=117A MAX_WATTAGE=2.14W@25C V_BE_GS=+/-16V

R511 0402 0 5% COMMON PS1_BOOT_R 12MIL
C515 0603 1UF 50V 10% X7R COMMON 12MIL

Q15 NTMFS4834N LFPAK COMMON
MAX_VOLTAGE=30V CONTINUOUS_CURRENT=21A@25C R_DS_ON=0.004@4.5V MAX_CURRENT=21A MAX_WATTAGE=2.31W@25C V_BE_GS=20V

stuff for NCP5212
R504 10K 5% 0402 NO STUFF
C502 1000PF 50V 10% X7R 0402 NO STUFF

LFPAK
Q14 NTMFS4834N LFPAK COMMON
MAX_VOLTAGE=30V CONTINUOUS_CURRENT=21A@25C R_DS_ON=0.004@4.5V MAX_CURRENT=21A MAX_WATTAGE=2.31W@25C V_BE_GS=20V
Mode 2: STUFF FOR GT215/6

D9 BAT760 SOD323 40V 100MA NO STUFF
16MIL PS1_RC
C73 1000PF 50V 10% X7R 0402 COMMON
DCR: 0.0035 Ohm MAX_I: 40A CONT_I: 24A
R49 1 5% 1206 COMMON

PS1_ISEN
C510 .001UF 0402 50V 10% X7R NO STUFF
R507 0402 4.7K 5% COMMON
R503 0402 549K 1% NO STUFF
stuff for NCP5212

ALTERNATE: 131-0297-000
L3 1.0 uH TOP COMMON

C71 330UF +/-20% 2.5V COMMON CONDUCTIVE POLYMER 2.2A W/DT=20C@-55 TO 85C 0.025 OHM SMD_7343
C75 330UF +/-20% 2.5V COMMON CONDUCTIVE POLYMER 2.2A W/DT=20C@-55 TO 85C 0.025 OHM SMD_7343
Mode 2: STUFF FOR GT215/6

NVVDD=1V
Mode 1: 11A @ 350KHZ
Mode 2: 25A @ 350KHZ
C508 10UF 6.3V 20% X5R 0805 NO STUFF
C520 10UF 6.3V 20% X5R 0805 NO STUFF
C507 10UF 6.3V 20% X5R 0805 NO STUFF
C78 .1UF 16V 10% X7R 0402 COMMON
C505 .1UF 16V 10% X7R 0402 COMMON
NVVDD

R516 100 5% 0402 COMMON FOR NVVDD OUTPUT SIDE SENSE

NVVDD_SENSE_FB 12MIL
R520 0402 0 5% COMMON 12MIL FOR GPU REMOTE SIDE SENSE
NVVDD_SENSE 1N 2.4G>
R630 0402 0 5% NO STUFF SNN_NVVDD_SENSE_TP
TEST ONLY NOT FOR PRODUCTION

stuff for NCP5212
R522 10K 1% 0402 NO STUFF
PS1_CP_TPIII
C518 .22UF 10V 10% X5R 0402 NO STUFF

R521 3.4K 1% 0402 CHANGED Rtop
R55 0402 0 5% NO STUFF SNN_PS1_FB_TP
TEST ONLY NOT FOR PRODUCTION

PS1_FB 12MIL
R517 20.5K 1% 0402 CHANGED Rbot1
R513 39.2K 1% 0402 COMMON Rbot0
R527 10.2K 1% 0402 CHANGED Rbot
12MIL PS1_VID1_Q
12MIL PS1_VID0_Q

VOUT = ((RT +RB)/RB) X 0.6

VID<1:0>	VO	RTop	RBot	GPIO6	GPIO5
00	0.80V	3.4K	10.2K	Low	Low
01	0.85V	3.4K	10.2K || 39.2K	Low	High
10	0.90V	3.4K	10.2K || 20.5k	High	Low
11	0.95V	3.4K	10.2K || 20.5K || 39.2K	High	HIGH

Note: Actual RT/RBx values are SKU dependent so they may be different than above.

3V3_RUN
R530 0402 10K 5% NO STUFF
12.3E> IN GPIO6_NVVDD_VID1
R529 0402 10K 5% COMMON PS1_VID1
1G1D1S Q502 2N7002 SOT23_1G1D1S COMMON
C533 0402 .01UF 16V 10% X7R COMMON
R528 10K 5% 0402 COMMON

3V3_RUN
R53 0402 10K 5% COMMON
12.3E> IN GPIO5_NVVDD_VID0
R502 0402 10K 5% COMMON PS1_VID0
1G1D1S Q501 2N7002 SOT23_1G1D1S COMMON
C506 0402 .01UF 16V 10% X7R COMMON
R51 10K 5% 0402 NO STUFF

3V3_RUN
R2 0402 100K 5% COMMON 3V3_RUN_EN_R
1G1D1S Q1 NTR2101P SOT23_1G1D1S COMMON
MAX_VOLTAGE=-8.0V CONTINUOUS_CURRENT=-3.7A@25C R_DS_ON=0.060@-4.5V MAX_CURRENT=-3.7A MAX_WATTAGE=0.98W@25C V_BE_GS=+/-8V

3V3_RUN
13.5C< 13.2A< 11.4A< IN MXM_PWR_EN
1G1D1S Q11 2N7002 SOT23_1G1D1S COMMON 3V3_RUN_EN
R31 0402 1K 1% COMMON
C25 .01UF 16V 10% X7R 0402 COMMON

ASSEMBLY	P699-A00 SKU1 GT216-630 MXM3.0 TYPE-A 1024MB 8pcs 64Mx16
PAGE DETAIL	NVVDD Power Supply and 3V3_RUN

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2701 SAN TOMAS EXPRESSWAY
SANTA CLARA, CA 95050, USA

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16. FBVDDQ,PEXVDD,AND VDD_IO_PLL POWER SUPPLIES

INPUT CURRENT RMS = 3.6A @ 7.0V INPUT / 1.5V output

NET	VOLTAGE	MIN_WIDTH_LINE	NV_NET_MAX_CURRENT
PEX_VDD	1.1V	16MIL	4.0A
FBVDDQ	1.8V	16MIL	10A
VDD_IO_PLL	1.1V	16MIL	1.0A

U7 ISL6269ACRZ VR_SI=0.6V MLPP16 MLFP16 COMMON

PVCC, VCC, FCCM, PGOOD, EN, FSET, GND(PAD), COMP, VIN, UG, BOOT, PHASE, ISEN, LG, PGND, VO, FB

5V — R48 0 0402 5% COMMON — PS_VCC — 16MIL

C513 1UF 16V 10% X5R 0402 COMMON

C76 1UF 16V 10% X5R 0402 COMMON DEM USED

3V3_RUN — R45 10K 5% 0402 COMMON

16.5E> 16.5B> 11.4C< 9.5E< OUT MXM_PWR_GOOD

16.5E< 16.2A> 16.4A< IN PS_NVVDD_PGOOD

PS2_FB — R506 10K 0402 1% NO STUFF

stuff for NCP5212

SW_FREQ = 1/(Rfset*75 10^-12)

PS2_FS 12MIL — SET TO 400KHZ — R505 33.2K 1% 0402 COMMON — C501 .01UF 16V 10% X7R 0402 COMMON

PS2_CP 12MIL — R501 21.5K 1% 0402 CHANGED — PS2_CP_R 12MIL — C504 6800PF 16V 10% X7R 0402 CHANGED — C503 68PF 50V 5% C0G 0402 CHANGED

PS2_UG 20MIL — PS2_BOOT 12MIL — R519 0 5% 0402 COMMON — PS2_BOOT_R — .1UF 16V 10% X7R C517 0402 COMMON

PS2_PHASE 20MIL

PS2_ISEN 12MIL

PS2_LG 20MIL

1G1D1S Q13 BSC150N03LD_G LFPAK_DUAL_ASYMM COMMON — ALT 300-0309-000

MAX_VOLTAGE=30V CONTINUOUS_CURRENT=17A@Tc=100C, Vgs=4.5V RDS_ON=0.021-0mΩ@Vgs=4.5V MAX_CURRENT=40A MAX_WATTAGE=1.5W@Ta=25C V_GE_GS=+/-20V

R47 10K 5% 0402 NO STUFF — stuff for NCP5212

D502 BAT43 SOD323 40V 400MA NO STUFF — stuff for NCP5212

PWR_SRC

C540 1UF 50V 10% X7R 0603 COMMON — C61 1UF 50V 10% X7R 0603 COMMON — C60 1UF 50V 10% X7R 0603 COMMON — C66 4.7UF 25V 10% X5R 1206 COMMON — C69 4.7UF 25V 10% X5R 1206 COMMON — C72 4.7UF 25V 10% X5R 1206 COMMON

C74 .01UF 0402 25V 10% X7R COMMON — GND

10A

L2 2.2UH SMD_6X6 COMMON — DCR: 0.020R — MAX_I: 14A — CONT_I: 8A — ALT 131-0055-000 — ALT 131-0129-000

C62 1000PF 50V 10% X7R 0402 COMMON — PS2_RC 1.82K — R44 1 5% 1206 COMMON

RS1 0.01 OHM 0.25% RSENSE_4PIN NO STUFF

SNN_FBVDDQ_POS — SNN_FBVDDQ_NEG — TEST ONLY NOT FOR PRODUCTION

R46 8.2K 0402 5% COMMON — C77 .001UF 0402 50V X7R NO STUFF — R50 549K 0402 1% NO STUFF — stuff for NCP5212

FBVDDQ=1.50V
8A @ 400KHZ

C57 330UF COMMON +/-20% 2.5V CONDUCTIVE POLYMER 2.2A W/DT=20C@-55 TO 85C 0.025 OHM SMD_7343 — C51 10UF 6.3V 20% X5R 0805 NO STUFF — C46 10UF 6.3V 20% X5R 0805 NO STUFF — C43 1UF 16V 10% X7R 0402 COMMON — FBVDDQ

R52 0 5% 0402 COMMON — PS2_FB_R — Rtop — R510 4.12K 1% 0402 CHANGED

stuff for NCP5212

R515 0 5% 0402 CHANGED — PS2_CP_TPIII — C512 15PF 50V 5% C0G 0402 CHANGED

R509 11.8K 1% 0402 NO STUFF — Rbot — R508 2.74K 1% 0402 CHANGED

R56 0 0402 5% NO STUFF — SNN_PS2_FB_TP — TEST ONLY NOT FOR PRODUCTION

3V3_RUN — R536 10K 5% 0402 NO STUFF — R535 0 0402 5% NO STUFF — GPIO13_FBVDDQ_VID — GPIO13_FBVDDQ_VID_R — C541 .01UF 6.3V 10% X7R 0402 NO STUFF

12.3E> IN GPIO13_FBVDDQ_VID

1G1D1S Q503 2N7002 SOT23_1G1D1S NO STUFF — PS2_FB_GND

MAX_VOLTAGE=60V CONTINUOUS_CURRENT=0.115A R_DS_ON=7.5Ω MAX_CURRENT=0.8A MAX_WATTAGE=0.2W V_BE_GS=20V

Vout = Vref * (1 + Rtop / Rbot)

DVS 1.50/1.35 [V]

GPIO_13 = 1: 1.502V = 0.6V * (1 + 3.09K/(2.49k||11.8k))

GPIO_13 = 0: 1.345V = 0.6V * (1 + 3.09K/2.49k)

No DVS 1.5V: 1.504V = 0.6V * (1 + 3.09K/(2.05k)

No DVS 1.8V: 1.804V = 0.6V * (1 + 3.09K/(1.54k)

Primary PEXVDD PS

U6 MP38115 VR=0.8V DFN10 COMMON

IN, IN, VCC, EN/SYNC, GND, GND, THERMAL, BST, SW, SW, FB

5V — C63 22UF 6.3V 20% X5R 0805 COMMON — C64 22UF 6.3V 20% X5R 0805 COMMON — C524 .1UF 16V 10% X7R 0402 COMMON

R54 0 0402 5% COMMON — PS_VCC_PEX 16MIL

STUFF FOR MP38115/MP2207
NO STUFF FOR MP28115

PS_BOOT_PEX 16MIL — C537 .01UF 0402 16V 10% X7R COMMON

PS_PHASE_PEX 16MIL — L1 0.47uH SMD_045_041 COMMON — DCR: 0.021R — MAX_I: 6A — CONT_I: 6A

PEX_VDD — R541 0 5% 0402 COMMON — C545 22UF 6.3V 20% X5R 0805 NO STUFF — C548 22UF 6.3V 20% X5R 0805 NO STUFF — C54 22UF 6.3V 20% X5R 0805 COMMON — C52 22UF 6.3V 20% X5R 0805 COMMON

PS_FB_PEX

MP38115
Type III No Stuff
RT = 1254K
RB = 392K

MP28115
Type III No Stuff
RT = 97.6K
RB = 309K

Alternate PEXVDD PS

16.5E< 16.2B< 15.2A> IN PS_NVVDD_PGOOD

U502 ISL9013IRZ VR=0.8V MLFP MLFP16 NO STUFF

5V — VIN1, VIN2, VDD, EN, PGOOD, SYNCH, NC1, NC2, LX1, LX2, LX3, VFB, SGND1, SGND2, PGND1, PGND2, GND(PAD)

16.5E> 16.2B> 11.4C< 9.5E< OUT MXM_PWR_GOOD

R531 10K 0402 5% NO STUFF — PS_FS_MODE

R526 10K 0402 5% NO STUFF — SNN_NC1 — SNN_NC2

PS_PHASE_PEX — PS_FB_PEX

PS_FB_R_PEX — R542 0 5% 0402 NO STUFF — PS_CP_RC

RT — R537 124K 1% 0402 CHANGED — C547 47PF 50V 5% C0G 0402 NO STUFF

RB — R533 392K 1% 0402 CHANGED

R57 0 0402 5% NO STUFF — SNN_PS_FB_PEX_TP — TEST ONLY NOT FOR PRODUCTION

ISL8045

No Stuff R531
Stuff R526 0 Ohm

SEPERATE THE SGND AND PGND

PEXVDD = 1.05V @ 4A

Vout = Vref * (1+R1/R2)
1.05V = 0.8V * (1+200K/634K)

VDD_IO_PLL

PEX_VDD — R10 0 0805 5% COMMON — Place bead close to cap — VDD_IO_PLL

U5 UP7706A SOP8 NO STUFF — VIN, VDD, EN, PGOOD, GND, THERMGND, VOUT, NC, ADJ

FBVDDQ — C3 22UF 6.3V 20% X5R 0805 NO STUFF

5V — C6 .1UF 10V 10% X5R 0402 NO STUFF

PS3_PGOOD — 5 SNN_PS3_NC — PS3_FB_1V05

RT — R15 4.32K 1% 0402 NO STUFF — C654 47PF 50V 5% C0G 0402 NO STUFF — C8 22UF 6.3V 20% X5R 0805 NO STUFF

RB — R14 13.7K 1% 0402 NO STUFF

16.4A< 16.2B< 15.2A> IN PS_NVVDD_PGOOD

16.5B> 16.2B> 11.4C< 9.5E< OUT MXM_PWR_GOOD — R3 0 0402 5% NO STUFF

Vout = 0.80*[1+(RT/RB)]

Vout	RT	RB
1.05V	4.32K	13.7K

Keep I_fdbk in the range of 50 - 100 uA

Alternate: RT9018A/B NVPN: 315-0334-000

ASSEMBLY	P699-A00 SKU1 GT216-630 MXM3.0 TYPE-A 1024MB 8pcs 64Mx16
PAGE DETAIL	FBVDDQ, PEXVDD, and VDD_IO_PLL Power Supplies

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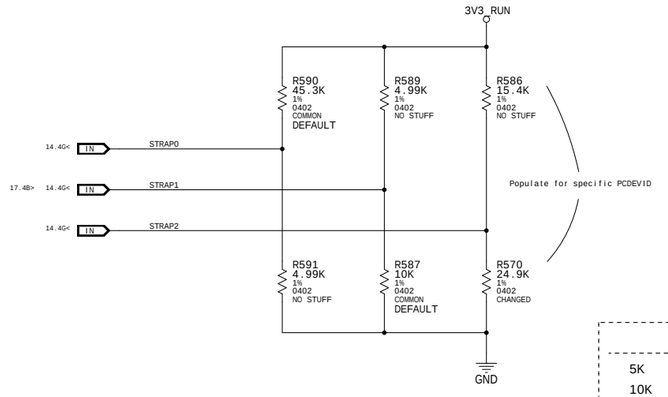
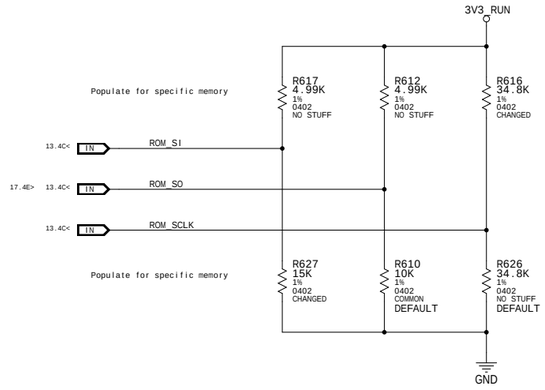
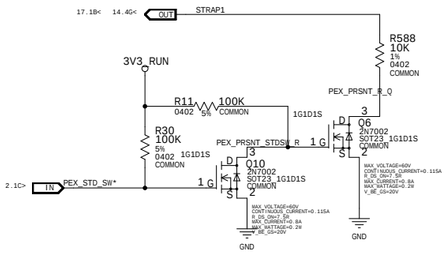
17. STRAPS, MOUNTING HOLES



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

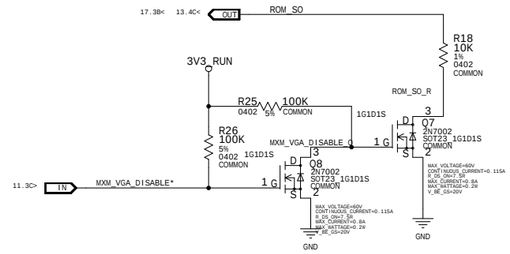


PEX_PADCFG DETECT

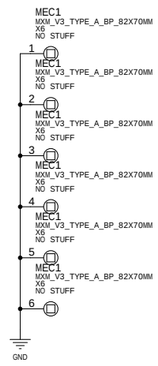


PEX_PRSNT_STDSW*	R_STRAP1	3_GIO_PADCFG_LUT<3..0>
FLOAT	10k	0x1 MOBILE_DEFAULT
GND	5k (10k ll 10k)	0x0 DESKTOP_DEFAULT

DEVICE DETECT



VGA_DISABLE#	R_ROM_SO	MODE
FLOAT	10k	0x1 VGA MODE
GND	5k (10k ll 10k)	0x0 3D ACCELERATOR



STRAP0	USER_BIT0 USER_BIT1 USER_BIT2 USER_BIT3	Default All SKU(s): 0xF = 45K PU LVDS Panel EDID Mode
STRAP1	3GIO_PADCFG_LUT_ADR0 3GIO_PADCFG_LUT_ADR1 3GIO_PADCFG_LUT_ADR2 3GIO_PADCFG_LUT_ADR3	Set at HW reset by the PEX_PADCFG Circuit 0x0: Desktop default (normal swing) - 5k PD 0x1: Mobile default (low swing) - 10k PD
STRAP2	PCI_DEVID_0 PCI_DEVID_1 PCI_DEVID_2 PCI_DEVID_3	PCDEVID_3:0] Definitions (Note Actual DEVID set also depends on PCI_DEVID_4)
ROM_SO	VGA_DEVICE	0: 3D DEVICE 1: VGA DEVICE Set at HW reset by the Device Detect Circuit
	SMB_ALT_ADDR	0: Thermal Sensor ADR = 0x9E 0x1 = 10K PD
	FB_0_BAR_SIZE	0: Default
ROM_SI	XCLK_417	0: Default
ROM_SCLK	RAM_CFG_0 RAM_CFG_1 RAM_CFG_2 RAM_CFG_3	RAM_CFG[3:0] Definitions GT218 64Mx16: 0000 5K PD Reserved; 0001 10K PD QIMONDA; 0010 15K PD HYNIX; 0011 20K PD SAMSUNG GT218 128Mx16: 0100 25k PD Reserved; 0101 30k PD QIMONDA; 0110 35K PD HYNIX; 0111 45K PD SAMSUNG GT216/5: 0001 Reserved; 0001 64Mx16 128-bit 10K PD Qimonda; 0010 64Mx16 128-bit 15K PD Hynix; 0011 64Mx16 128-bit 20K PD Samsung; 0100 Reserved; 0101 32Mx16 128-bit 30K PD Qimonda; 0110 32Mx16 128-bit 35K PD Hynix; 0111 32Mx16 WAY BE 64Mx16 run at 1/2 density GT216/6: 1001 Reserved; 1001 64Mx16 64-bit 10K PU Qimonda; 1010 64Mx16 64-bit 15K PU Hynix; 1011 64Mx16 64-bit 20K PU Samsung; 1100 Reserved; 1101 128Mx16 64-bit 30K PU Qimonda; 1110 128Mx16 64-bit 35K PU Hynix; 1111 128Mx16 64-bit 45K PU Samsung GT215: TBD
	PEX_PLL_EN_TERM100	0: DISABLED
	SLOT_CLK_CONFIG	1: GPU and MCH COMMON REFCLK
	SUB_VENDOR	1: VBIOS ROM IS PRESENT 0x6 = 35K PD PCDEVID_EXT=0 0xE = 35K PU PCDEVID_EXT=1
	PCI_DEVID_EXT	0: PCDEVID[4] = 0 or 1 (SKU Specific)

ASSEMBLY	P699-A00 SKU1 GT216-630 MXM3.0 TYPE-A 1024MB 8pcs 64Mx16
PAGE DETAIL	STRAPS and MOUNTING HOLES

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