1)Support GT218 (G210)4pcs sDDR3X16 (128Mx16 for B Die,64Mx16 for A Die)

2)Support GF119 4pcs or 8pcs sDDR3X16 (64Mx16 or 128Mx16)

3)Fan confirm

PCI Express Interface

Net Name	VOLTAGE	MAX_CURRENT	MIN_WIDTH
IN PEX_PRSNT			12MIL
IN PEX_PLLVDD_GPU	1.05V	0.145A	12MIL

Net Name	DIFF_PAIR	CRITICAL	IMPEDANCE
IN PEX_TX0	PEX_TX0	1	90DIFF
IN PEX_TX0*	PEX_TX0	1	90DIFF
IN PEX_TX1	PEX_TX1	1	90DIFF
IN PEX_TX1*	PEX_TX1	1	90DIFF
IN PEX_TX2	PEX_TX2	1	90DIFF
IN PEX_TX2*	PEX_TX2	1	90DIFF
IN PEX_TX3	PEX_TX3	1	90DIFF
IN PEX_TX3*	PEX_TX3	1	90DIFF
IN PEX_TX4	PEX_TX4	1	90DIFF
IN PEX_TX4*	PEX_TX4	1	90DIFF
IN PEX_TX5	PEX_TX5	1	90DIFF
IN PEX_TX5*	PEX_TX5	1	90DIFF
IN PEX_TX6	PEX_TX6	1	90DIFF
IN PEX_TX6*	PEX_TX6	1	90DIFF
IN PEX_TX7	PEX_TX7	1	90DIFF
IN PEX_TX7*	PEX_TX7	1	90DIFF
IN PEX_TX8	PEX_TX8	1	90DIFF
IN PEX_TX8*	PEX_TX8	1	90DIFF
IN PEX_TX9	PEX_TX9	1	90DIFF
IN PEX_TX9*	PEX_TX9	1	90DIFF
IN PEX_TX10	PEX_TX10	1	90DIFF
IN PEX_TX10*	PEX_TX10	1	90DIFF
IN PEX_TX11	PEX_TX11	1	90DIFF
IN PEX_TX11*	PEX_TX11	1	90DIFF
IN PEX_TX12	PEX_TX12	1	90DIFF
IN PEX_TX12*	PEX_TX12	1	90DIFF
IN PEX_TX13	PEX_TX13	1	90DIFF
IN PEX_TX13*	PEX_TX13	1	90DIFF
IN PEX_TX14	PEX_TX14	1	90DIFF
IN PEX_TX14*	PEX_TX14	1	90DIFF
IN PEX_TX15	PEX_TX15	1	90DIFF
IN PEX_TX15*	PEX_TX15	1	90DIFF
IN PEX_TX0D	PEX_TX0D	1	90DIFF
IN PEX_TX0D*	PEX_TX0D	1	90DIFF
IN PEX_TX1D	PEX_TX1D	1	90DIFF
IN PEX_TX1D*	PEX_TX1D	1	90DIFF
IN PEX_TX2D	PEX_TX2D	1	90DIFF
IN PEX_TX2D*	PEX_TX2D	1	90DIFF
IN PEX_TX3D	PEX_TX3D	1	90DIFF
IN PEX_TX3D*	PEX_TX3D	1	90DIFF
IN PEX_TX4D	PEX_TX4D	1	90DIFF
IN PEX_TX4D*	PEX_TX4D	1	90DIFF
IN PEX_TX5D	PEX_TX5D	1	90DIFF
IN PEX_TX5D*	PEX_TX5D	1	90DIFF
IN PEX_TX6D	PEX_TX6D	1	90DIFF
IN PEX_TX6D*	PEX_TX6D	1	90DIFF
IN PEX_TX7D	PEX_TX7D	1	90DIFF
IN PEX_TX7D*	PEX_TX7D	1	90DIFF
IN PEX_TX8D	PEX_TX8D	1	90DIFF
IN PEX_TX8D*	PEX_TX8D	1	90DIFF
IN PEX_TX9D	PEX_TX9D	1	90DIFF
IN PEX_TX9D*	PEX_TX9D	1	90DIFF
IN PEX_TX10D	PEX_TX10D	1	90DIFF
IN PEX_TX10D*	PEX_TX10D	1	90DIFF
IN PEX_TX11D	PEX_TX11D	1	90DIFF
IN PEX_TX11D*	PEX_TX11D	1	90DIFF
IN PEX_TX12D	PEX_TX12D	1	90DIFF
IN PEX_TX12D*	PEX_TX12D	1	90DIFF
IN PEX_TX13D	PEX_TX13D	1	90DIFF
IN PEX_TX13D*	PEX_TX13D	1	90DIFF
IN PEX_TX14D	PEX_TX14D	1	90DIFF
IN PEX_TX14D*	PEX_TX14D	1	90DIFF
IN PEX_TX15D	PEX_TX15D	1	90DIFF
IN PEX_TX15D*	PEX_TX15D	1	90DIFF
IN PEX_RX0	PEX_RX0	1	90DIFF
IN PEX_RX0*	PEX_RX0	1	90DIFF
IN PEX_RX1	PEX_RX1	1	90DIFF
IN PEX_RX1*	PEX_RX1	1	90DIFF
IN PEX_RX2	PEX_RX2	1	90DIFF
IN PEX_RX2*	PEX_RX2	1	90DIFF
IN PEX_RX3	PEX_RX3	1	90DIFF
IN PEX_RX3*	PEX_RX3	1	90DIFF
IN PEX_RX4	PEX_RX4	1	90DIFF
IN PEX_RX4*	PEX_RX4	1	90DIFF
IN PEX_RX5	PEX_RX5	1	90DIFF
IN PEX_RX5*	PEX_RX5	1	90DIFF
IN PEX_RX6	PEX_RX6	1	90DIFF
IN PEX_RX6*	PEX_RX6	1	90DIFF
IN PEX_RX7	PEX_RX7	1	90DIFF
IN PEX_RX7*	PEX_RX7	1	90DIFF
IN PEX_RX8	PEX_RX8	1	90DIFF
IN PEX_RX8*	PEX_RX8	1	90DIFF
IN PEX_RX9	PEX_RX9	1	90DIFF
IN PEX_RX9*	PEX_RX9	1	90DIFF
IN PEX_RX10	PEX_RX10	1	90DIFF
IN PEX_RX10*	PEX_RX10	1	90DIFF
IN PEX_RX11	PEX_RX11	1	90DIFF
IN PEX_RX11*	PEX_RX11	1	90DIFF
IN PEX_RX12	PEX_RX12	1	90DIFF
IN PEX_RX12*	PEX_RX12	1	90DIFF
IN PEX_RX13	PEX_RX13	1	90DIFF
IN PEX_RX13*	PEX_RX13	1	90DIFF
IN PEX_RX14	PEX_RX14	1	90DIFF
IN PEX_RX14*	PEX_RX14	1	90DIFF
IN PEX_RX15	PEX_RX15	1	90DIFF
IN PEX_RX15*	PEX_RX15	1	90DIFF
IN PEX_REFCLK	PEX_REFCLK	1	90DIFF
IN PEX_REFCLK*	PEX_REFCLK	1	90DIFF

PLACE NEAR FINGERS

CN1
NONPHY-X16-124PIN
CON_X16
COMMON

G1A
BGA533
COMMON
1/12 PCI_EXPRESS

END OF X1
END OF X4
END OF X8
END OF X16

PLACE NEAR BALLS
PLACE NEAR GPU
TOP
BOTTOM
ALTERNATIVE

PLACE BACKSIDE & UNDER GPU
STUFF OPTION AT BOTTOM SIDE NEAR GPU
STUFF OPTION AT TOP SIDE NEAR GPU

PLACE NEAR GPU

Frame Buffer Interface

G1B

BGA533
COMMON

2/12 FRAME_BUFFER

GF119	GT218
FBA_D0	
FBA_D1	
FBA_D2	
FBA_D3	
FBA_D4	D7
FBA_D5	
FBA_D6	
FBA_D7	D4
FBA_D8	
FBA_D9	
FBA_D10	
FBA_D11	
FBA_D12	
FBA_D13	
FBA_D14	
FBA_D15	
FBA_D16	
FBA_D17	D19
FBA_D18	
FBA_D19	D17
FBA_D20	
FBA_D21	
FBA_D22	
FBA_D23	
FBA_D24	
FBA_D25	
FBA_D26	
FBA_D27	
FBA_D28	
FBA_D29	
FBA_D30	
FBA_D31	
FBA_D32	
FBA_D33	
FBA_D34	
FBA_D35	D36
FBA_D36	D35
FBA_D37	D38
FBA_D38	D39
FBA_D39	D37
FBA_D40	
FBA_D41	
FBA_D42	
FBA_D43	
FBA_D44	
FBA_D45	
FBA_D46	
FBA_D47	
FBA_D48	
FBA_D49	
FBA_D50	
FBA_D51	
FBA_D52	D55
FBA_D53	
FBA_D54	
FBA_D55	D52
FBA_D56	
FBA_D57	
FBA_D58	
FBA_D59	
FBA_D60	
FBA_D61	
FBA_D62	
FBA_D63	

GT218	GF119
FBA_CMD25	FBA_CMD0
FBA_CMD23	FBA_CMD1
FBA_CMD2	FBA_CMD2
FBA_CMD0	FBA_CMD3
FBA_CMD26	FBA_CMD4
FBA_CMD14	FBA_CMD5
FBA_CMD7	FBA_CMD6
FBA_CMD1	FBA_CMD7
FBA_CMD22	FBA_CMD8
FBA_CMD20	FBA_CMD9
FBA_CMD24	FBA_CMD10
FBA_CMD18	FBA_CMD11
FBA_CMD9	FBA_CMD12
FBA_CMD29	FBA_CMD13
FBA_CMD8	FBA_CMD14
FBA_CMD27	FBA_CMD15
FBA_CMD15	FBA_CMD16
FBA_CMD11	FBA_CMD17
FBA_CMD16	FBA_CMD18
FBA_CMD28	FBA_CMD19
FBA_CMD3	FBA_CMD20
FBA_CMD17	FBA_CMD21
FBA_CMD5	FBA_CMD22
FBA_CMD4	FBA_CMD23
FBA_CMD21	FBA_CMD24
FBA_CMD6	FBA_CMD25
FBA_CMD13	FBA_CMD26
FBA_CMD19	FBA_CMD27
FBA_CMD12	FBA_CMD28
FBA_CMD30	FBA_CMD29
FBA_DEBUG	FBA_CMD30

PLACE BACKSIDE

2.54A

C518 0.1UF 16V 10% X7R 0402 COMMON
C529 0.1UF 16V 10% X7R 0402 COMMON
C519 0.1UF 16V 10% X7R 0402 COMMON
C520 0.1UF 16V 10% X7R 0402 COMMON
C527 4.7UF 6.3V 20% X5R 0603 COMMON
C522 4.7UF 6.3V 20% X5R 0603 COMMON

FBVDDQ

PLACE UNDER GPU

GND

C149 0.1UF/NS 16V 10% X7R 0402 COMMON
C156 0.1UF/NS 16V 10% X7R 0402 COMMON
C157 0.1UF/NS 16V 10% X7R 0402 COMMON
C154 0.1UF/NS 16V 10% X7R 0402 COMMON
C159 4.7UF/NS 6.3V 20% X5R 0603 COMMON
C162 4.7UF/NS 6.3V 20% X5R 0603 COMMON

PLACE TOPSIDE

PLACE NEAR GPU

GND

FBVDDQ: A13, B13, C13, D13, D14, E13, F13, F14, F15, F16, F17, F19, F22, H23, H26, J15, J16, J18, J19, L19, L23, L26, M19, N22, U22, Y22

GF119 CMD	RANK0 <31..0>	<63..32>	RANK1 <31..0>	<63..32>
CMD0	CDT_L	NOT USED	CDT_L	NOT USED
CMD1	NOT USED	NOT USED	CS1_L*	NOT USED
CMD2	CS0_L*	NOT USED	NOT USED	NOT USED
CMD3	CKE_L	NOT USED	CKE_L	NOT USED
CMD4	A<9>	A<9>	A<11>	A<11>
CMD5	A<6>	A<6>	A<7>	A<7>
CMD6	A<3>	A<3>	BA1	BA1
CMD7	A<0>	A<0>	A<12>	A<12>
CMD8	A<8>	A<8>	A<8>	A<8>
CMD9	A<12>	A<12>	A<0>	A<0>
CMD10	A<1>	A<1>	A<2>	A<2>
CMD11	RAS*	RAS*	RAS*	RAS*
CMD12	A<13>	A<13>	A<14>	A<14>
CMD13	BA1	BA1	A<3>	A<3>
CMD14	A14	A14	A<13>	A<13>
CMD15	CAS*	CAS*	CAS*	CAS*
CMD16	NOT USED	ODT_H	NOT USED	ODT_H
CMD17	NOT USED	NOT USED	NOT USED	CS1_H*
CMD18	NOT USED	CS0_H*	NOT USED	NOT USED
CMD19	NOT USED	CKE_H	NOT USED	CKE_H
CMD20	RST	RST	RST	RST
CMD21	A<7>	A<7>	A<6>	A<6>
CMD22	A<4>	A<4>	A<5>	A<5>
CMD23	A<11>	A<11>	A<9>	A<9>
CMD24	A<2>	A<2>	A<1>	A<1>
CMD25	A<10>	A<10>	WE*	WE*
CMD26	A<5>	A<5>	A<4>	A<4>
CMD27	BA2	BA2	NOT USED	NOT USED
CMD28	WE*	WE*	A<10>	A<10>
CMD29	BA0	BA0	BA0	BA0
CMD30	NOT USED	NOT USED	BA2	BA2

Net Name	DIFF_PAIR	CRITICAL	IMPEDANCE
FBA_CMD[30..0]		2	45OHM
FBA_D[63..0]		2	45OHM
FBA_DQM[7..0]		2	45OHM
FBA_CLK0	FBA_CLK0	1	60OHM
FBA_CLK0*	FBA_CLK0	1	60OHM
FBA_CLK1	FBA_CLK1	1	60OHM
FBA_CLK1*	FBA_CLK1	1	60OHM
FBA_DQS_WP[7..0]			
FBA_DQS_RN[7..0]			
FBA_DQS_WP0	FBA_DQS0	1	60OHM
FBA_DQS_RN0	FBA_DQS0	1	60OHM
FBA_DQS_WP1	FBA_DQS1	1	60OHM
FBA_DQS_RN1	FBA_DQS1	1	60OHM
FBA_DQS_WP2	FBA_DQS2	1	60OHM
FBA_DQS_RN2	FBA_DQS2	1	60OHM
FBA_DQS_WP3	FBA_DQS3	1	60OHM
FBA_DQS_RN3	FBA_DQS3	1	60OHM
FBA_DQS_WP4	FBA_DQS4	1	60OHM
FBA_DQS_RN4	FBA_DQS4	1	60OHM
FBA_DQS_WP5	FBA_DQS5	1	60OHM
FBA_DQS_RN5	FBA_DQS5	1	60OHM
FBA_DQS_WP6	FBA_DQS6	1	60OHM
FBA_DQS_RN6	FBA_DQS6	1	60OHM
FBA_DQS_WP7	FBA_DQS7	1	60OHM
FBA_DQS_RN7	FBA_DQS7	1	60OHM

Net Name	VOLTAGE	MAX_CURRENT
FB_PLLAVDD	1.05V	0.08A 12MIL

PD REQUIRED FOR INITIALIZATION

ODT FBA_CMD0 — R142 10K 5% 0402 COMMON — CKE FBA_CMD3 — R146 10K 5% 0402 COMMON
RST FBA_CMD20 — R147 10K 5% 0402 COMMON
ODT FBA_CMD16 — R144 10K 5% 0402 COMMON — CKE FBA_CMD19 — R145 10K 5% 0402 COMMON
GND

CLK TERMINATION

FBA_CLK0 — R134 243 1% 0402 COMMON — FBA_CLK0*
FBA_CLK1 — R135 243 1% 0402 COMMON — FBA_CLK1*

CMD TERMINATION

FBVDDQ

FBA_CMD5	1RP4A	100 8
	2RP4B	100 7
FBA_CMD12	3RP4C	100 6
	4RP4D	100 5
FBA_CMD9	1RP7A	100 8
	2RP7B	100 7
FBA_CMD8	3RP7C	100 6
	4RP7D	100 5
FBA_CMD28	1RP9A	100 8
	2RP9B	100 7
FBA_CMD27	3RP9C	100 6
	4RP9D	100 5
FBA_CMD13	1RP10A	100 8
	2RP10B	100 7
FBA_CMD10	3RP10C	100 6
	4RP10D	100 5
FBA_CMD23	1RP2A	100 8
	2RP2B	100 7
FBA_CMD24	3RP2C	100 6
	4RP2D	100 5
FBA_CMD6	1RP1A	100 8
	2RP1B	100 7
FBA_CMD4	3RP1C	100 6
	4RP1D	100 5
FBA_CMD11	1RP8A	100 8
	2RP8B	100 7
FBA_CMD15	3RP8C	100 6
	4RP8D	100 5
FBA_CMD14	1RP11A	100 8
	2RP11B	100 7
FBA_CMD7	3RP11C	100 6
	4RP11D	100 5
FBA_CMD30	1RP6A	100 8
	2RP6B	100 7
FBA_CMD21	3RP6C	100 6
	4RP6D	100 5
FBA_CMD26	1RP5A	100 8
	2RP5B	100 7
FBA_CMD22	3RP5C	100 6
	4RP5D	100 5
FBA_CMD29	1RP3A	100 8
	2RP3B	100 7
FBA_CMD25	3RP3C	100 6
	4RP3D	100 5

GND

FBA_D[63..0] ↔ FBA_D0..FBA_D63

FBA_DQM[7..0] → FBA_DQM0..FBA_DQM7: C26, B19, D19, D23, T24, AA23, AB27, T26

FBA_DQS_WP[7..0] ↔ FBA_DQS_WP0..FBA_DQS_WP7: C25, A19, E19, A24, T22, AA24, AA26, T27

FBA_DQS_RN[7..0] ↔ FBA_DQS_RN0..FBA_DQS_RN7: D25, A18, E18, B24, R22, Y24, AA27, R27

SNN_FB_VREF — A16 — FB_VREF

FBA_CMD[30..0] → FBA_CMD0..FBA_CMD30: G24, F27, F25, F26, G26, G27, G25, J25, J24, H24, H22, J26, G22, G23, J27, M24, L24, J23, K23, K22, M23, K24, M27, N27, M26, K26, K27, K25, M25, L22, M22

FBA_CMD12_R — R57 0 5% 0402 COMMON — FBA_CMD12
FBA_CMD14_R — R61 0 5% 0402 COMMON — FBA_CMD14

FBA_CLK0 — F24 — FBA_CLK0 → FBA_CLK0*
FBA_CLK0* — F23 — FBA_CLK0*
FBA_CLK1 — N24 — FBA_CLK1 → FBA_CLK1*
FBA_CLK1* — N23 — FBA_CLK1*

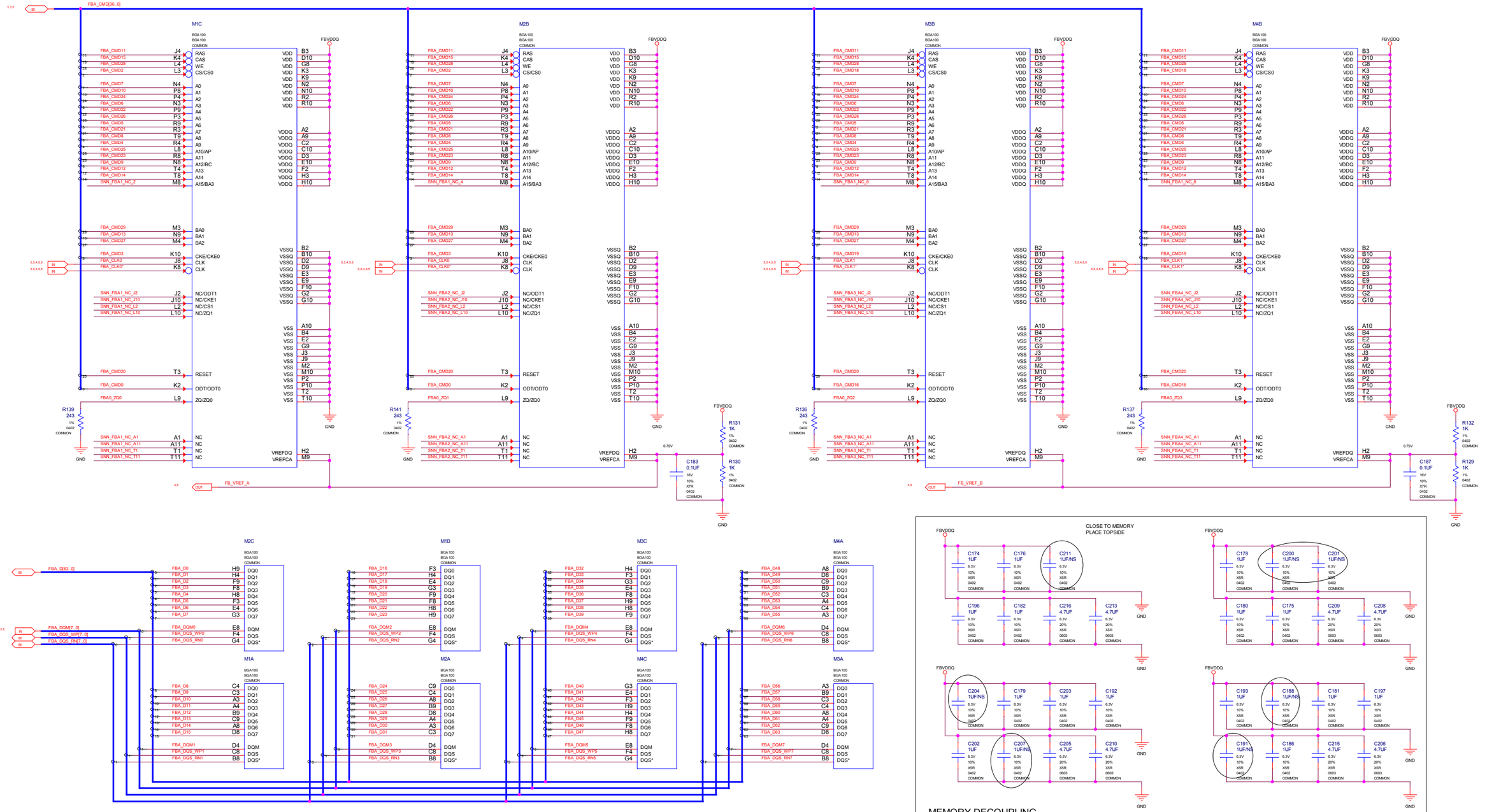
FBVDDQ
R150 10K 5% 0402 COMMON — FBA_CMD12 — R152 10K 5% 0402 COMMON — GND
R151 10K 5% 0402 COMMON — FBA_CMD14 — R153 10K 5% 0402 COMMON — GND

FBVDDQ
FB_CAL_PD_VDDQ — B15 — FB_CAL_PD_VDDQ — R125 40.2 0402 1% COMMON
FB_CAL_PU_GND — A15 — FB_CAL_PU_GND — R126 40.2 0402 1% COMMON
FB_CAL_TERM_GND — B16 — FB_CAL_TERM_GND — R127 60.4 0402 1% COMMON
GND

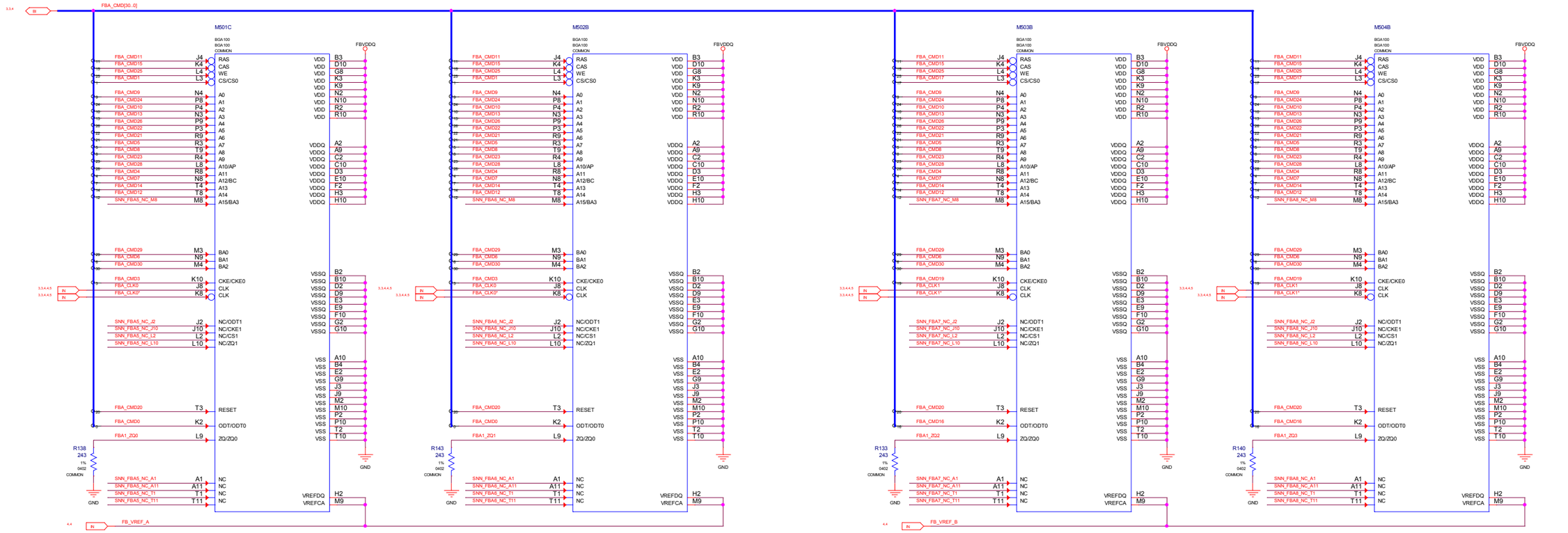
FB_PLLAVDD — R19
FB_DLLAVDD — T19
FB_PLLAVDD — AC19

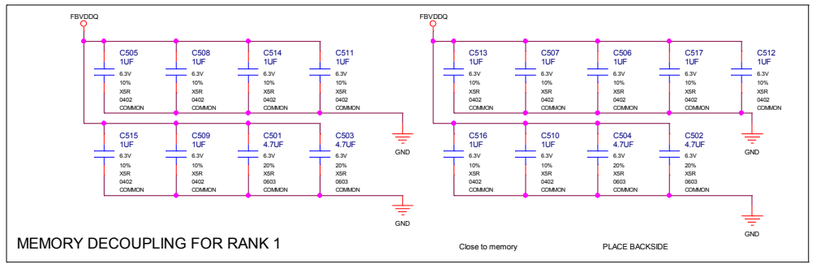
0.9V FB_PLLAVDD
C99 0.1UF 16V 10% X7R 0402 COMMON
C88 0.1UF/NS 16V 10% X7R 0402 COMMON
C110 1UF 6.3V 10% X7R 0603 COMMON
C82 10UF 6.3V 20% X5R 0805 COMMON
LB8 30R@100MHZ BEAD_0603 COMMON
PEX_VDD
GND
PLACE NEAR GPU

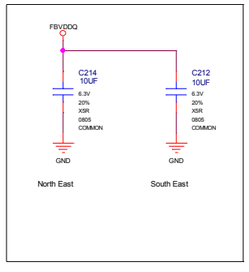
DDR3 Memories Rank 0

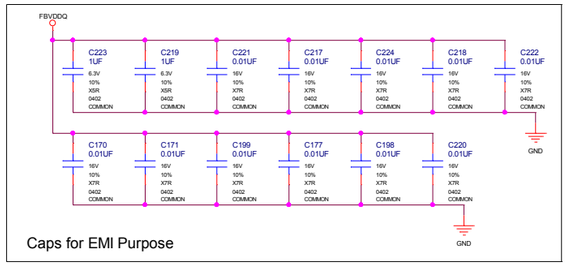


DDR3 Memories Rank 1









A

DAC A VGA

Net Name	CRITICAL	IMDEDANCE
DACA_RED	1	50OHM
DACA_GREEN	1	50OHM
DACA_BLUE	1	50OHM
DACA_RED_C	1	53OHM
DACA_GREEN_C	1	53OHM
DACA_BLUE_C	1	53OHM
DACA_HSYNC	2	50OHM
DACA_VSYNC	2	50OHM
DACA_HS_BUF	2	50OHM
DACA_VS_BUF	2	50OHM
DACA_HSYNC_C	2	50OHM
DACA_VSYNC_C	2	50OHM

Net Name	MIN_WIDTH	MAX_CURRENT
DACAB_VDD	12MIL	0.14A

EMI Filter
Close to connector

3V3_PEX
LB4 300R@100MHz BEAD_0603 COMMON
C81 10UF/NS 6.3V 20% X5R 0805LP COMMON
0805 OPTION
C92 4.7UF 6.3V 20% X5R 0603 COMMON
PLACE NEAR GPU
C116 0.1UF 16V 10% X7R 0402 COMMON
C95 0.1UF 16V 10% X7R 0402 COMMON
PLACE NEAR BALLS
R114 124 1% 0402 COMMON
GND

G1C
BGA533 COMMON
3/12 DACA

0.1A DACAB_VDD	AG2	DACA_VDD	
DACA_VREF	AF1	DACA_VREF	
DACA_RSET	AE1	DACA_RSET	
DACA_HSYNC	AD2	DACA_HSYNC	DACA_HSYNC
DACA_VSYNC	AD1	DACA_VSYNC	DACA_VSYNC
DACA_RED	AE2	DACA_RED	DACA_RED
DACA_GREEN	AE3	DACA_GREEN	DACA_GREEN
DACA_BLUE	AD3	DACA_BLUE	DACA_BLUE

8,11 IN
8V
R4 2.2K 5% 0402 COMMON
R1 2.2K 5% 0402 COMMON
8,11 IN
I2CA_SCL
I2CA_SDA
C578 22PF 50V 5% C0G 0402 COMMON
C577 22PF 50V 5% C0G 0402 COMMON
GND

R84 33 0402 5% COMMON
R90 33 0402 5% COMMON
DACA_HSYNC_C
DACA_VSYNC_C
C579 22PF/NS 50V 5% C0G 0402 COMMON
C580 22PF/NS 50V 5% C0G 0402 COMMON
OUT 6,8

R113 150 1% 0402 COMMON
R8 150 1% 0402 COMMON
R115 150 1% 0402 COMMON
R19 150 1% 0402 COMMON
R112 150 1% 0402 COMMON
R7 150 1% 0402 COMMON

L1 27nH 0402 COMMON
C575 2.7PF/NS 50V 0.25PF C0G 0402 COMMON
C4 2.7PF 50V 0.25PF C0G 0402 COMMON
DACA_RED_C
L3 27nH 0402 COMMON
C576 2.7PF/NS 50V 0.25PF C0G 0402 COMMON
C5 2.7PF 50V 0.25PF C0G 0402 COMMON
DACA_GREEN_C
L2 27nH 0402 COMMON
C574 2.7PF/NS 50V 0.25PF C0G 0402 COMMON
C6 2.7PF 50V 0.25PF C0G 0402 COMMON
DACA_BLUE_C
OUT 6,8

DAC B VGA Header

Net Name	CRITICAL	IMPEDANCE
DACB_RED	1	50OHM
DACB_GREEN	1	50OHM
DACB_BLUE	1	50OHM
DACB_RED_C	1	53OHM
DACB_GREEN_C	1	53OHM
DACB_BLUE_C	1	53OHM
DACB_HSYNC	2	50OHM
DACB_VSYNC	2	50OHM
DACB_HSYNC_C	2	50OHM
DACB_VSYNC_C	2	50OHM
DACB_HS_BUF	2	50OHM
DACB_VS_BUF	2	50OHM

EMI Filter
Close to connector

IN
I2CB_SDA
5V
R22 2.2K 5% 0402 COMMON
R21 2.2K 5% 0402 COMMON
C16 22PF 50V 5% C0G 0402 COMMON
C14 22PF 50V 5% C0G 0402 COMMON
C559 22PF/NS 50V 5% C0G 0402 COMMON
C560 22PF/NS 50V 5% C0G 0402 COMMON
GND

R83 33 0402 5% COMMON
R89 33 0402 5% COMMON
DACB_VSYNC_C

G1D
BGA533
COMMON
4/12 DACB

DACAB_VDD W5 DACB_VDD
DACB_VREF R6 DACB_VREF
DACB_RSET V6 DACB_RSET
C117 1UF 6.3V 10% X5R 0402 COMMON
C94 0.1UF/NS 16V 10% X7R 0402 COMMON
C111 0.1UF 16V 10% X7R 0402 COMMON
C121 0.1UF 16V 10% X7R 0402 COMMON
R101 124 1% 0402 COMMON

DACB_HSYNC U6 DACB_HSYNC
DACB_VSYNC U4 DACB_VSYNC
DACB_RED T5 DACB_RED
DACB_GREEN T4 DACB_GREEN
DACB_BLUE R4 DACB_BLUE

R108 150 1% 0402 COMMON
R47 150 1% 0402 COMMON
R107 150 1% 0402 COMMON
R50 150 1% 0402 COMMON
R106 150 1% 0402 COMMON
R54 150 1% 0402 COMMON

L4 68nH 0402 COMMON
L5 68nH 0402 COMMON
L6 68nH 0402 COMMON
C568 2.7PF/NS 50V 0.25PF C0G 0402 COMMON
C563 2.7PF/NS 50V 0.25PF C0G 0402 COMMON
C561 2.7PF/NS 50V 0.25PF C0G 0402 COMMON
C36 2.7PF 50V 0.25PF C0G 0402 COMMON
C40 2.7PF 50V 0.25PF C0G 0402 COMMON
C44 2.7PF 50V 0.25PF C0G 0402 COMMON

C15 4700PF/NS 50V 10% X7R 0402 COMMON
I2CB_SCL
DACB_HSYNC_C
DACB_RED_C
DACB_BLUE_C
DACB_GREEN_C

J4
MALE 2.54MM 0 NO NORM COMMON
1 2 3 4 5 6 7 8 9 10 11 12

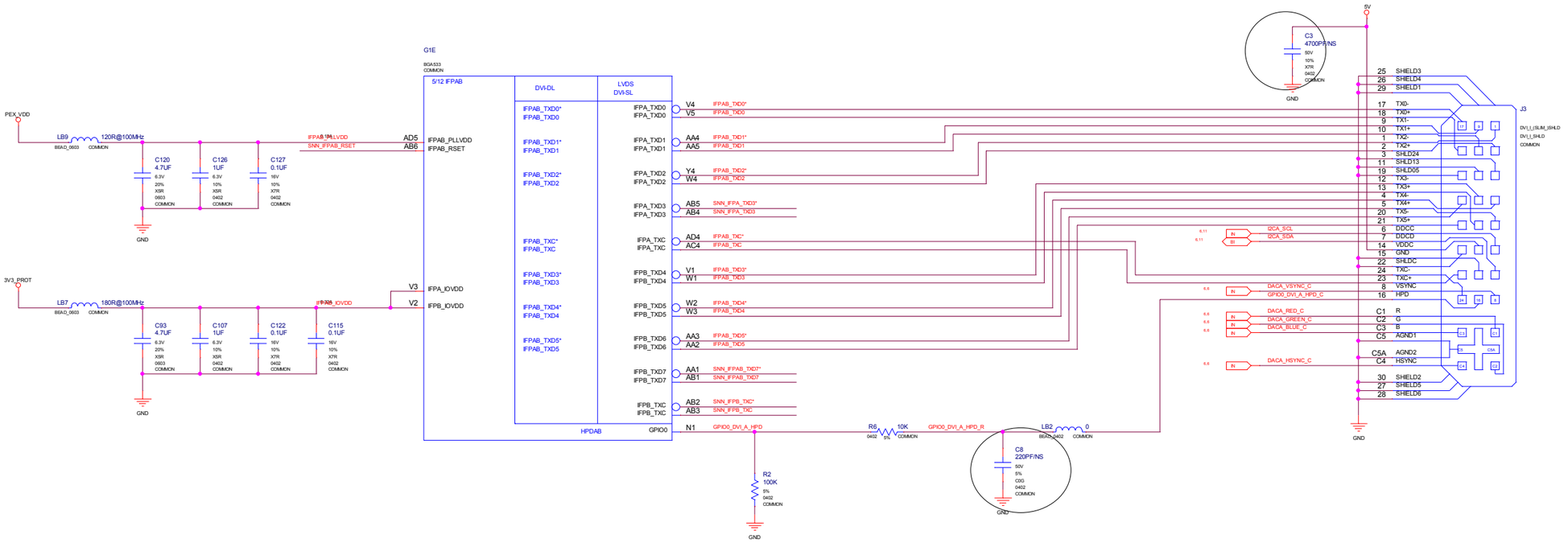
SPECIAL MECHANIC
No connected mounting pins
MEC2 NOPIN COMMON

Stuff 030-0221-000

IFPAB TMDS Interface

Net Name	DIFF_PAIR	CRITICAL	IMPEDANCE
IFPAB_TXD0*	IFPAB_TXD0	1	90DIFF
IFPAB_TXD0	IFPAB_TXD0	1	90DIFF
IFPAB_TXD1*	IFPAB_TXD1	1	90DIFF
IFPAB_TXD1	IFPAB_TXD1	1	90DIFF
IFPAB_TXD2*	IFPAB_TXD2	1	90DIFF
IFPAB_TXD2	IFPAB_TXD2	1	90DIFF
IFPAB_TXD3*	IFPAB_TXD3	1	90DIFF
IFPAB_TXD3	IFPAB_TXD3	1	90DIFF
IFPAB_TXD4*	IFPAB_TXD4	1	90DIFF
IFPAB_TXD4	IFPAB_TXD4	1	90DIFF
IFPAB_TXD5*	IFPAB_TXD5	1	90DIFF
IFPAB_TXD5	IFPAB_TXD5	1	90DIFF
IFPAB_TXC*	IFPAB_TXC	1	90DIFF
IFPAB_TXC	IFPAB_TXC	1	90DIFF

Net Name	VOLTAGE	MAX_CURRENT	
IFPAB_PLLVDD	1.05V	0.13A	18MIL
IFPAB_IOVDD	3.3V	0.32A	18MIL



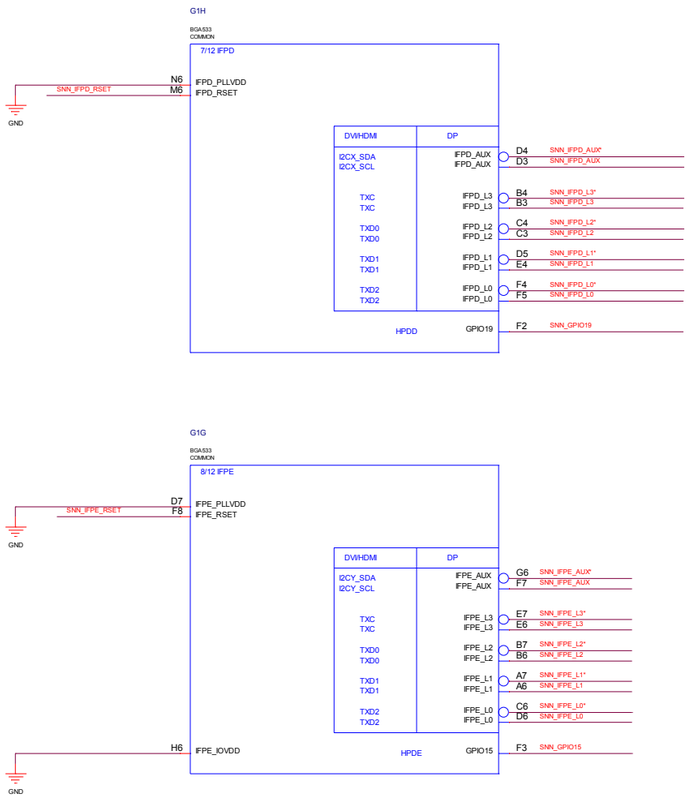
IFPC HDMI/DP Connector

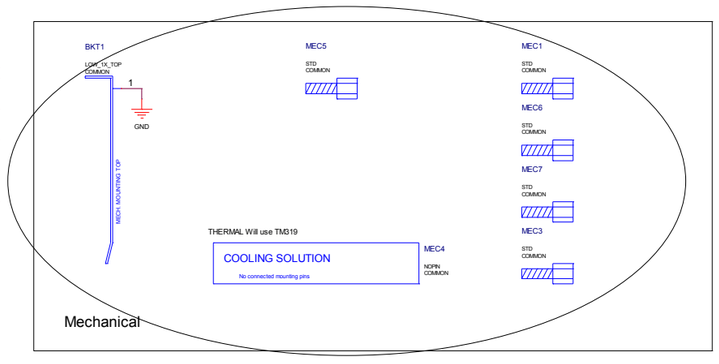
Net Name	DIFF_PAIR	CRITICAL	IMPEDANCE
IN IFPC_TXD0*	IFPC_TXD0	1	90DIFF
IN IFPC_TXD0	IFPC_TXD0	1	90DIFF
IN IFPC_TXD1*	IFPC_TXD1	1	90DIFF
IN IFPC_TXD1	IFPC_TXD1	1	90DIFF
IN IFPC_TXD2*	IFPC_TXD2	1	90DIFF
IN IFPC_TXD2	IFPC_TXD2	1	90DIFF
IN IFPC_TXD0_C*	IFPC_TXD0_C	1	90DIFF
IN IFPC_TXD0_C	IFPC_TXD0_C	1	90DIFF
IN IFPC_TXD1_C*	IFPC_TXD1_C	1	90DIFF
IN IFPC_TXD1_C	IFPC_TXD1_C	1	90DIFF
IN IFPC_TXD2_C*	IFPC_TXD2_C	1	90DIFF
IN IFPC_TXD2_C	IFPC_TXD2_C	1	90DIFF
IN IFPC_TXC*	IFPC_TXC	1	90DIFF
IN IFPC_TXC	IFPC_TXC	1	90DIFF
IN IFPC_TXC_C*	IFPC_TXC_C	1	90DIFF
IN IFPC_TXC_C	IFPC_TXC_C	1	90DIFF

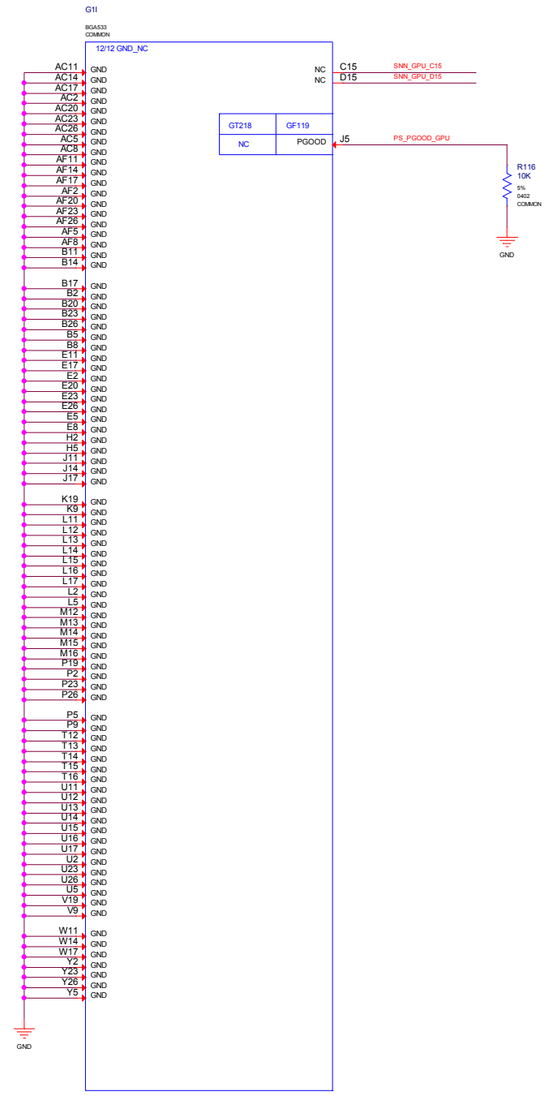
Net Name	VOLTAGE	MAX_CURRENT	
IN IFPC_IOVDD	1.05V	0.1A	10MIL
IN IFPC_PLLVDD	3.3V	0.085A	10MIL

3V3_PEX
R39 10K 5% 0402 COMMON
HDMI-SKU
R38 0 0402 +0.05R COMMON
I2CW_SDA_R
S D
2
3
Q6 SOT23_1G1D1S COMMON
1
ALL-SKU
DP-SKU
5V
R31 2.2K 5% 0402 COMMON
HDMI-SKU
DP-SKU
3V3_PEX
R33 0 +0.05R 0402 COMMON
DP_MODE_E
DP-SKU PLACE NEAR FET GATE
3V3_PEX
R37 10K 5% 0402 COMMON
HDMI-SKU
R36 0 0402 +0.05R COMMON
I2CW_SCL_R
ALL-SKU
G
Q8 SOT23_1G1D1S COMMON
2
S D
3
1
DP-SKU
5V
R34 2.2K 5% 0402 COMMON
HDMI-SKU
DP-SKU
5V
C1 4700PF/NS 50V 10% X7R 0402 COMMON
GND
J2 RECEPTACLE HDMI_A_SMD COMMON
20 SHIELD1
21 SHIELD2
19 HP_DET
18 +5V
17 DDC/CEC_GND
16 SDA
15 SCL
14 RESERVED
13 CEC
12 CK-
11 CK_SHIELD
10 CK+
9 D0-
8 D0_SHIELD
7 D0+
6 D1-
5 D1_SHIELD
4 D1+
3 D2-
2 D2_SHIELD
1 D2+
22 SHIELD3
23 SHIELD4
24
GND
SNN_HDMI_RESERVED
SNN_HDMI_CEC
IFPC_TXC_C*
IFPC_TXC_C
IFPC_TXD0_C*
IFPC_TXD0_C
IFPC_TXD1_C*
IFPC_TXD1_C
IFPC_TXD2_C*
IFPC_TXD2_C
G1F
BGA533 COMMON
6/12 IFPC
3V3_PEX
LB3 300R@100MHz BEAD_0603 COMMON
C89 4.7UF 6.3V 20% X5R 0603 COMMON
C91 1UF 6.3V 10% X5R 0402 COMMON
C103 0.1UF 16V 10% X7R 0402 COMMON
R98 1K 1% 0402 COMMON
IFPC_PLLVDD
IFPC_RSET
P6
R5
IFPC_PLLVDD
IFPC_RSET
GND
PEX_VDD
LB5 220R@100MHz BEAD_0603 COMMON
C84 4.7UF 6.3V X5R 0603 COMMON
C100 1UF 6.3V X5R 0402 COMMON
C104 0.1UF 16V 10% X7R 0402 COMMON
C112 0.1UF 16V 10% X7R 0402 COMMON
IFPC_IOVDD
J6
IFPCD_IOVDD
GND
DVI/HDMI
DP
I2CW_SDA
I2CW_SCL
IFPC_AUX
IFPC_AUX
G5
G4
I2CW_SDA
I2CW_SCL
TXC
TXC
IFPC_L3
IFPC_L3
J4
H4
IFPC_TXC*
IFPC_TXC
TXD0
TXD0
IFPC_L2
IFPC_L2
K4
L4
IFPC_TXD0*
IFPC_TXD0
TXD1
TXD1
IFPC_L1
IFPC_L1
M4
M5
IFPC_TXD1*
IFPC_TXD1
TXD2
TXD2
IFPC_L0
IFPC_L0
N4
P4
IFPC_TXD2*
IFPC_TXD2
HPDC
GPIO1
G1
GPIO1_IFPC_HPD
C23 0.1UF 10% X7R 0402 16V COMMON
C22 0.1UF 10% X7R 0402 16V COMMON
C28 0.1UF 10% X7R 0402 16V COMMON
C25 0.1UF 10% X7R 0402 16V COMMON
C24 0.1UF 10% X7R 0402 16V COMMON
C21 0.1UF 10% X7R 0402 16V COMMON
C26 0.1UF 10% X7R 0402 16V COMMON
C27 0.1UF 10% X7R 0402 16V COMMON
R5 100K 5% 0402 COMMON
GND
R3 10K 0402 5% COMMON
GPIO1_IFPC_HPD_R
LB1 0 BEAD_0402 COMMON
C2 220PF/NS 50V 5% C0G 0402 COMMON
GND
IFPC_TXC_C*
IFPC_TXC_C
IFPC_TXD0_C*
IFPC_TXD0_C
IFPC_TXD1_C*
IFPC_TXD1_C
IFPC_TXD2_C*
IFPC_TXD2_C
R17 499/NS 0402 1% COMMON
R13 499/NS 0402 1% COMMON
R12 499/NS 0402 1% COMMON
R11 499/NS 0402 1% COMMON
R16 499/NS 0402 1% COMMON
R18 499/NS 0402 1% COMMON
R15 499/NS 0402 1% COMMON
R14 499/NS 0402 1% COMMON
12MIL
IFPC_TERM
3V3_PEX
3
Q3
D
G1
S
1G1D1S
SOT23_1G1D1S COMMON
2
GND

IFPD, IFPE Interface(Not used), Mechanical parts



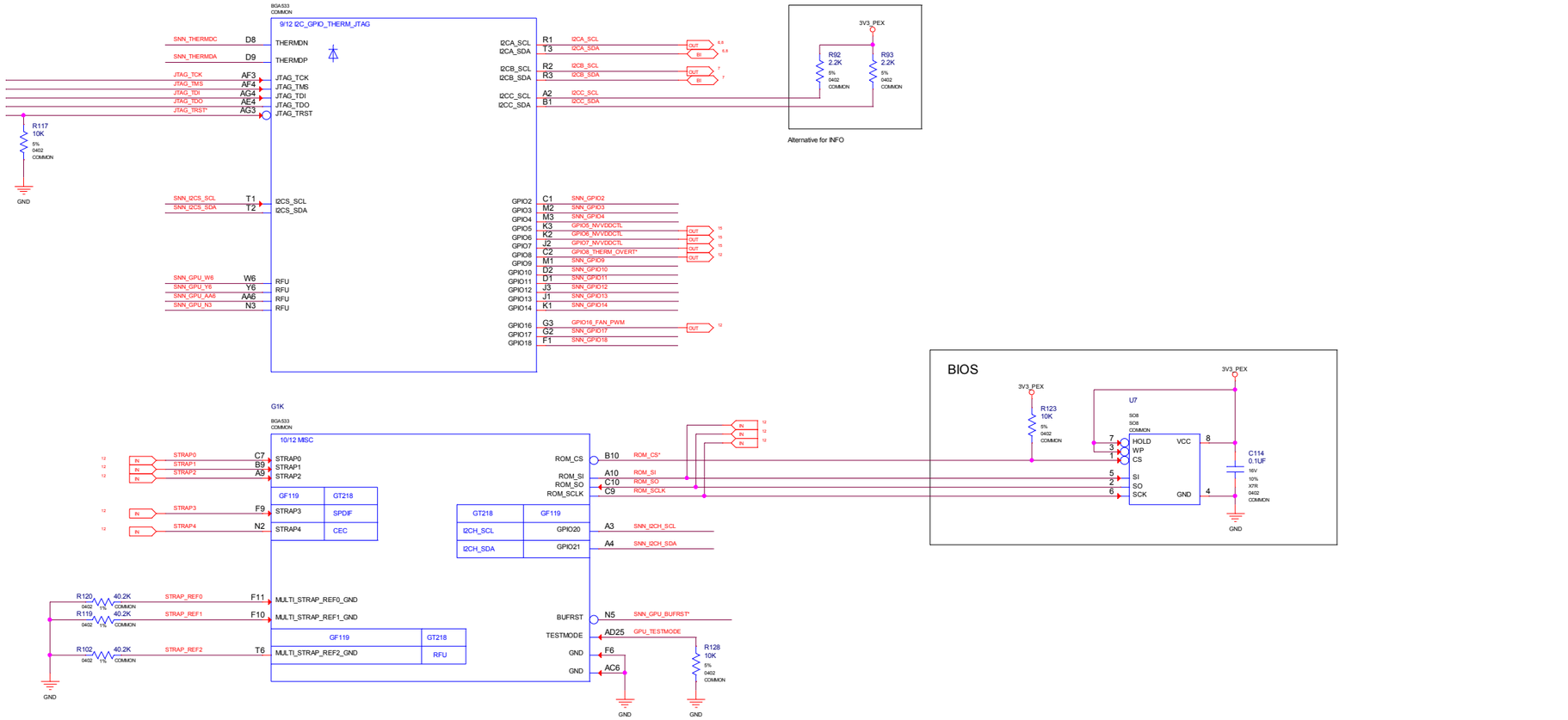


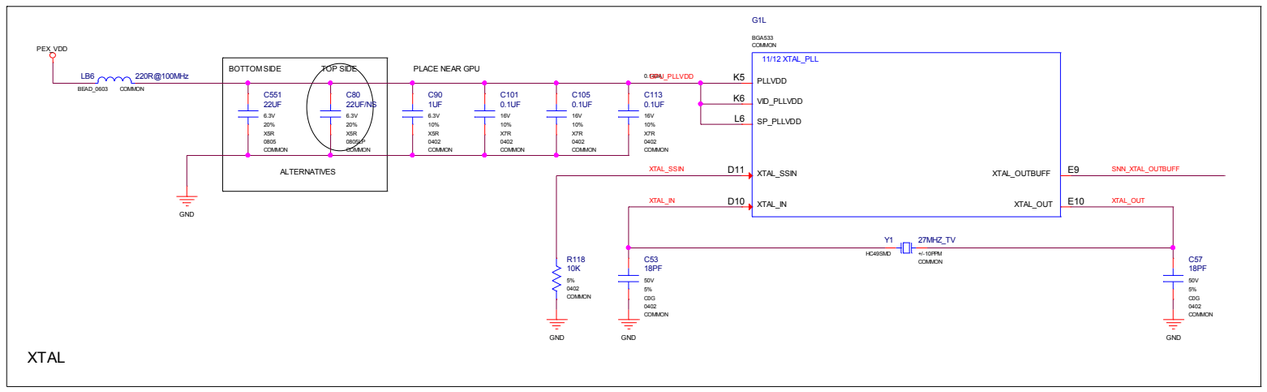


XTAL, ROM, INFO ROM,JTAG

Net Name	DIFF_PAIR	CRITICAL	IMPEDANCE
XTAL_OUT	XTAL	1	90DIFF
XTAL_IN	XTAL	1	90DIFF

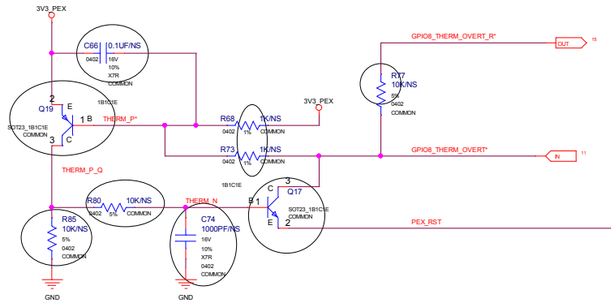
Net Name	VOLTAGE	MAX_CURRENT
GPU_PLLVDD	1.05V	0.143A
3V3_D		



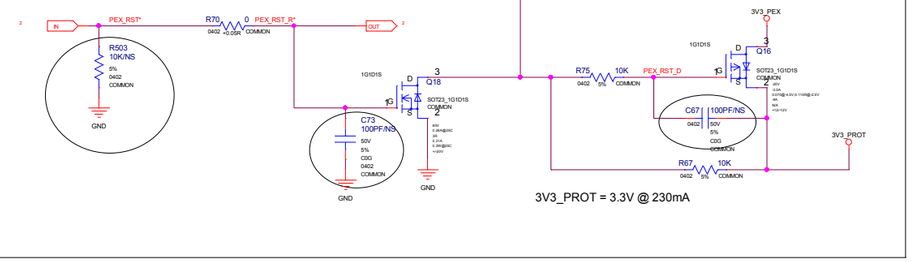


Thermal Protection, Protected 3V3, Straps, Fan

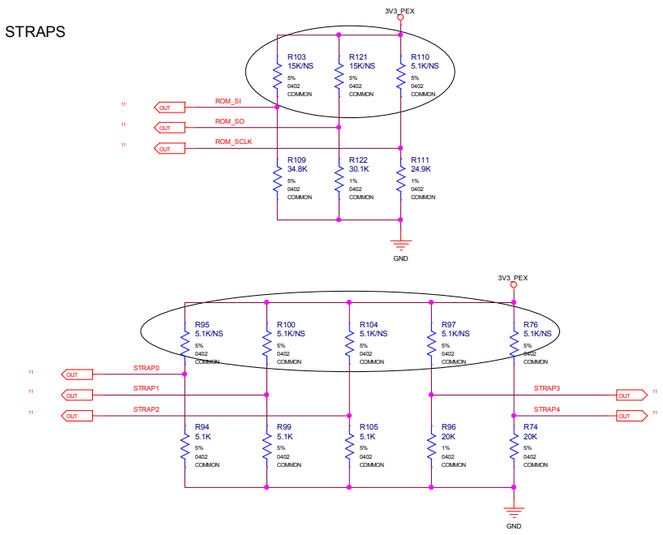
Thermal Latch



Backdrive Prevention



STRAPS



Strap	PU/PD	Rval
0	PD	5k
1	PD	10k
2	PD	15k
3	PD	20k
4	PD	25k
5	PD	30k
6	PD	35k
7	PD	45k
8	PU	5k
9	PU	10k
A	PU	15k
B	PU	20k
C	PU	25k
D	PU	30k
E	PU	35k
F	PU	45k

0010 64Mx16 sDDR3 64-bit Hynix

0011 64Mx16 sDDR3 64-bit Samsung

0110 128Mx16 sDDR3 64-bit Hynix

0111 128Mx16 sDDR3 64-bit Samsung

1010 64Mx16 sDDR3 64-bit DR Hynix

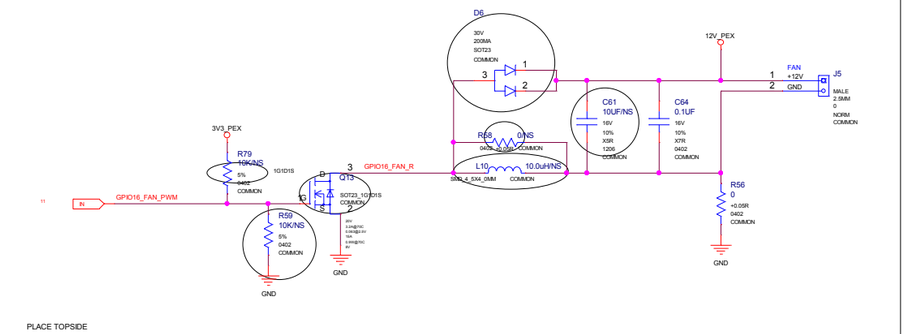
1011 64Mx16 sDDR3 64-bit DR Samsung

1110 128Mx16 sDDR3 64-bit DR Hynix

1111 128Mx16 sDDR3 64-bit DR Samsung

FAN CIRCUIT

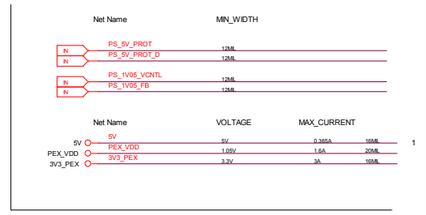
PLACE BACKSIDE



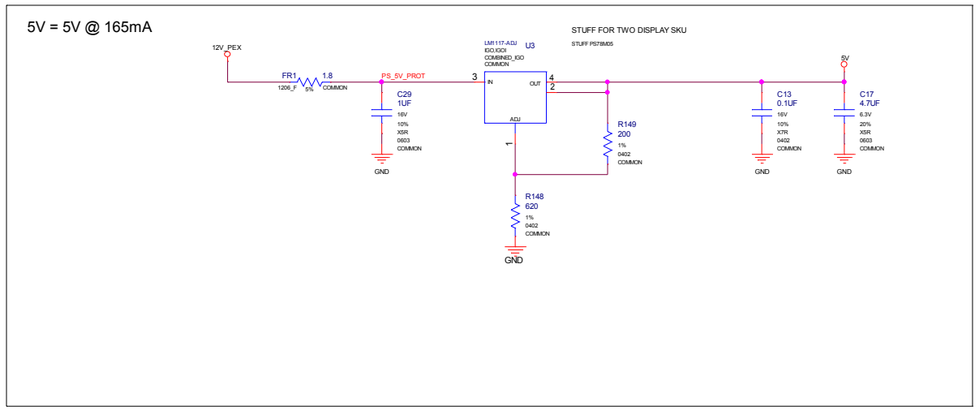
PLACE TOPSIDE

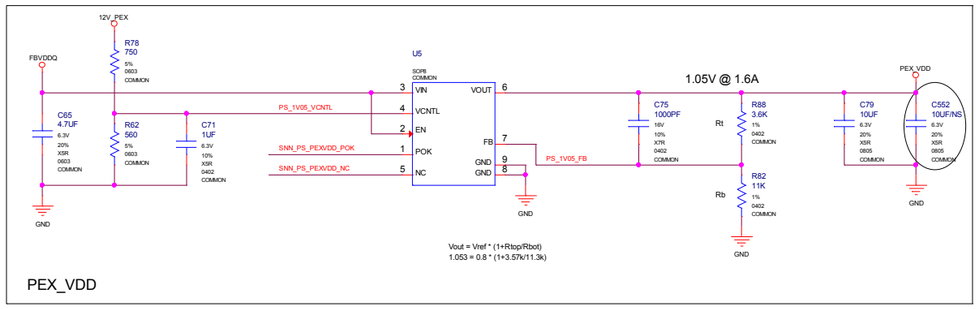
STRAP PIN MODE TABLE

	PIN NAME	MULTI-LEVEL bit [3:0]	BINARY PRODUCTION	BINARY BRINGUP
	STRAP0	USER[3:0]	RAMCFG0	3GIO_PADCFG_LUT_ADR0
	STRAP1	3GIO_PADCFG_ADR[3:0]	RAMCFG1	3GIO_PADCFG_LUT_ADR1
	STRAP2	PCI_DEVID[3:0]	RAMCFG2	3GIO_PADCFG_LUT_ADR2
GF119	STRAP3	SOR[3:0]_EXPOSED	TBD	TBD
GF119	STRAP4	RESERVED,RESERVED,PCIE_MAX_SPEED,DP_PLL_VDD33V	TBD	TBD
	ROM_SCLK	PCIDEVID[4], SUB_VENDOR, SLOT_CLK, PEX_PLL_EN_TERM	PCI_DEVID3	3GIO_PADCFG_LUT_ADR3
GF119	ROM_SCLK	PCI_DEVID[4],SUB_VENDOR,PCI_DEVID[5],PEX_PLL_EN_TERM	TBD	TBD
	ROM_SI	RAMCFG[3:0]	PCI_DEVID_EXT	SUB_VENDOR
	ROM_SO	XCLK_417, FB0_BAR_SIZE, SMB_ALT_ADDR, VGA_DEVICE	XCLK_417	XCLK_277
GF119	ROM_SO	FB[1],FB[0],SMB_ALT_ADDR,VGA_DEVICE	TBD	TBD



Power Supply I: 3V3_FUSE,5V,PEXVDD





Power Supply II: FBVDDQ

Net Name	MIN_LINE_WIDTH	VOLTAGE	NV_NET_MAX_CURRENT
FBVDDQ	12MIL	1.5V	6A
PS_FB_VCC12	10MIL		
PS_FB_FS	8MIL		
PS_FB_FB	8MIL		
PS_FB_RC_FB	8MIL		
PS_FB_RC_CP	8MIL		
PS_FB_BOOT	10MIL		
PS_FB_UG	10MIL		
PS_FB_PHASE	10MIL		
PS_FB_LG	10MIL		
PS_FB_UG_R	10MIL		
PS_FB_RC_SNUB	10MIL		

FBVDDQ = 6A @ 1.5V

FOR 3V3 INPUT:
Ripple Current: ~2.7A
Ripple Voltage: ~20mV

FOR 12V INPUT:
Ripple Current: ~4.4A
Ripple Voltage: ~30mV

PS Freq Vref(V)
RB120AGS 300kHz, 0.6V
FP6329 300kHz, 0.6V
NCP1579CR2G 275kHz, 0.8V
RT8105GS 300kHz, 0.8V
RT8101 300kHz, 0.8V
APW7165AKAE 300kHz, 0.8V
APW7120KE 300kHz, 0.8V
L6727TR 300kHz, 0.8V
L6726ATR 270kHz, 0.8V

Vout = Vref * (1+Rtop/Rbot)
1.527V = 0.6V * (1+2.55K/1.65k)
1.528V = 0.8V * (1+2.32k/2.55k)

FBVDDQ Power Sequencing

FBVDDQ Power INPUT Option for DP SKU

Power Supply III: NVVDD

Net Name	MIN_WIDTH
PS_NVVDD_EN	8MIL
PS_NVVDD_VCC	16MIL
PS_NVVDD_BOOT	16MIL
PS_NVVDD_UG	16MIL
PS_NVVDD_UG_R	16MIL
PS_NVVDD_LG	16MIL
PS_NVVDD_PHASE	16MIL
PS_NVVDD_FET_RC	16MIL
PS_NVVDD_FB	8MIL
PS_NVVDD_FB_RC	8MIL
PS_NVVDD_CP_RC	8MIL

Net Name	VOLTAGE	MAX_CURRENT	
NVVDD	1.00V	18A	20MIL
12V_PEX	12V	3A	20MIL

Input Ripple: ~5A

NVVDD = 1.0V @ 18A

Ripple Current: ~6.5A
Ripple Voltage: ~45mV

NVVDD Power Sequencing

Vout = Vref * (1+Rtop/Rbot)

GPIO[7:6:5]	NVVDD
PB(BOOT) --> 0 0 0	0.899V
0 0 1	0.929V
0 1 0	0.952V
0 1 1	0.982V
PD(VB1) --> 1 0 0	1.022V
1 0 1	1.052V
1 1 0	1.075V
PD(VB0) --> 1 1 1	1.105V

PWM Freq Vref(V)	
RT8120AGS:	300kHz, 0.6V
FP6329:	300kHz, 0.6V
NCP1579DR2G:	275kHz, 0.8V
RT8105GS:	300kHz, 0.8V
RT8101:	300kHz, 0.8V
APW7165AKAE:	300kHz, 0.8V
APW7120KE:	300kHz, 0.8V
L6727TR:	300kHz, 0.8V
L6726ATR:	270kHz, 0.8V