

P682: GT216, GB1-128, DDR2 1024MB 64Mx16, DL-DVI,VGA, HDMI

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REV	VARIANT	NPVN	ASSEMBLY
B	BASE	600-10682-base-100	BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL
1	SKU000	600-10682-0000-100	GT216-200, 600MHz SKU
2	SKU001	600-10682-0001-100	GT216-200, 600/1500MHz 512MB 32Mx16 BGA84 500MHz DDR2 DVI+DP+HDMI
3	SKU002	600-10682-0002-100	GT216-300, 600/1500MHz 512MB 32Mx16 BGA84 500MHz DDR2 DVI+DP+HDMI
4	SKU003	600-10682-0003-100	GT216-100, 600/1500MHz 256MB 32Mx16 BGA84 500MHz DDR2 DVI+DP+HDMI
5	SKU011	600-10682-0011-100	GT216-300, 600/1500MHz 512MB 32Mx16 BGA84 500MHz DDR2 DVI+DVI+HDMI
6	SKU012	600-10682-0012-100	GT216-200, 600/1500MHz 512MB 32Mx16 BGA84 500MHz DDR2 DVI+DVI+HDMI
7	SKU013	600-10682-0013-100	GT216-100, 600/1500MHz 512MB 32Mx16 BGA84 500MHz DDR2 DVI+DVI+HDMI
8	SKU004	600-10682-0004-100	GT216-200, 600/1500MHz 1024MB 64Mx16 BGA84 500MHz DDR2 DVI+DP+HDMI
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ASSEMBLY	BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL
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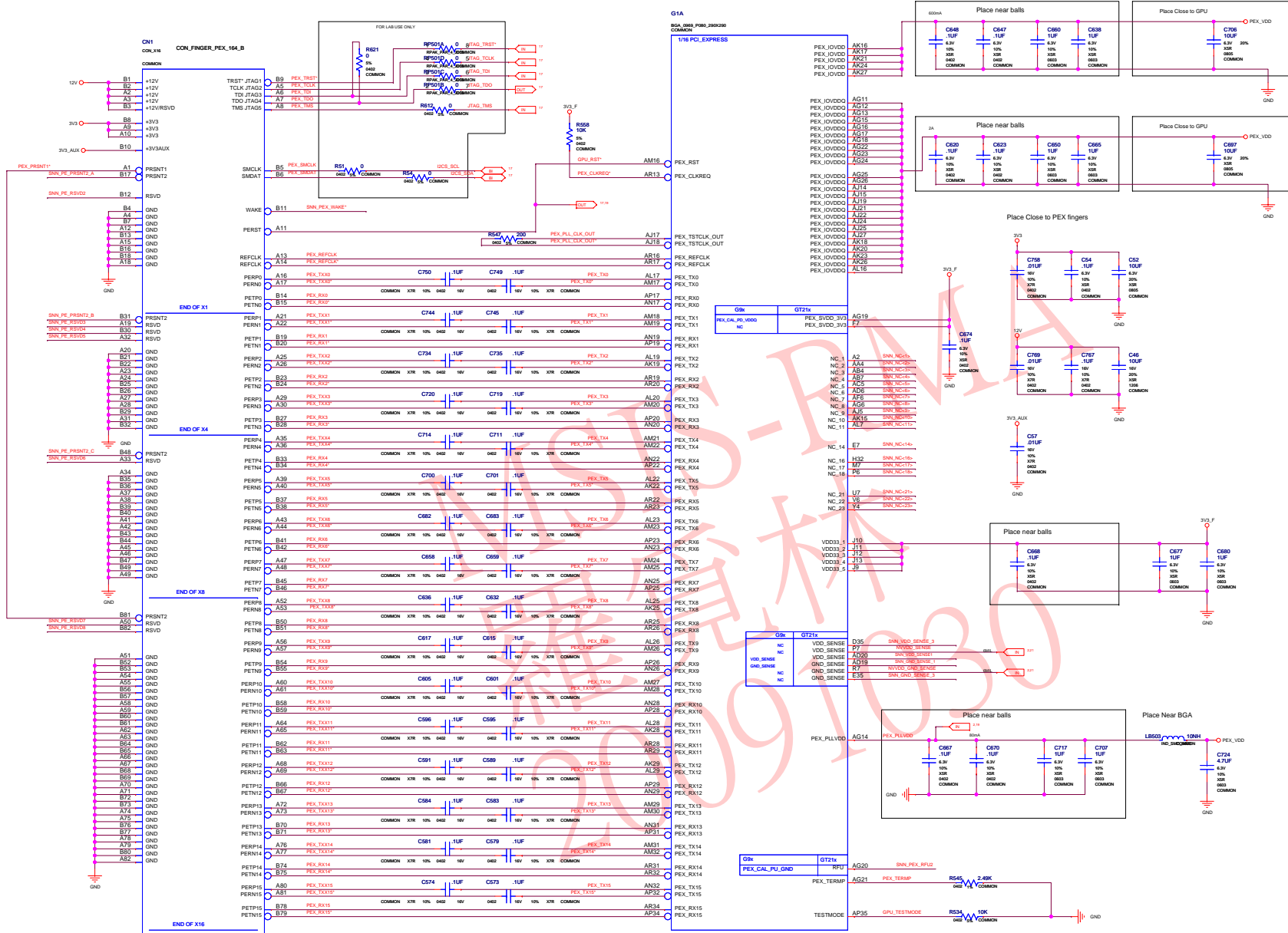
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PAGE

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15 MAY 2009

16X PEX INTERFACE



	PEX REFLEX	OFFPWR	MC APERTURE	MC OPTICAL
1	PEX REFLEX	PEX REFLEX	SCOFF	1
2	PEX REFLEX	PEX REFLEX	SCOFF	1
3				
4	PEX T00	PEX T00	SCOFF	1
5	PEX T00	PEX T00	SCOFF	1
6	PEX T01	PEX T01	SCOFF	1
7	PEX T01	PEX T01	SCOFF	1
8	PEX T02	PEX T02	SCOFF	1
9	PEX T02	PEX T02	SCOFF	1
10	PEX T03	PEX T03	SCOFF	1
11	PEX T03	PEX T03	SCOFF	1
12	PEX T04	PEX T04	SCOFF	1
13	PEX T04	PEX T04	SCOFF	1
14	PEX T05	PEX T05	SCOFF	1
15	PEX T05	PEX T05	SCOFF	1
16	PEX T06	PEX T06	SCOFF	1
17	PEX T06	PEX T06	SCOFF	1
18	PEX T07	PEX T07	SCOFF	1
19	PEX T07	PEX T07	SCOFF	1
20	PEX T08	PEX T08	SCOFF	1
21	PEX T08	PEX T08	SCOFF	1
22	PEX T09	PEX T09	SCOFF	1
23	PEX T09	PEX T09	SCOFF	1
24	PEX T10	PEX T10	SCOFF	1
25	PEX T10	PEX T10	SCOFF	1
26	PEX T11	PEX T11	SCOFF	1
27	PEX T11	PEX T11	SCOFF	1
28	PEX T12	PEX T12	SCOFF	1
29	PEX T12	PEX T12	SCOFF	1
30	PEX T13	PEX T13	SCOFF	1
31	PEX T13	PEX T13	SCOFF	1
32	PEX T14	PEX T14	SCOFF	1
33	PEX T14	PEX T14	SCOFF	1
34	PEX T15	PEX T15	SCOFF	1
35	PEX T15	PEX T15	SCOFF	1
36	PEX T16	PEX T16	SCOFF	1
37				
38	PEX T000	PEX T000	SCOFF	1
39	PEX T000	PEX T000	SCOFF	1
40	PEX T001	PEX T001	SCOFF	1
41	PEX T001	PEX T001	SCOFF	1
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52	PEX T007	PEX T007	SCOFF	1
53	PEX T007	PEX T007	SCOFF	1
54	PEX T008	PEX T008	SCOFF	1
55	PEX T008	PEX T008	SCOFF	1
56	PEX T009	PEX T009	SCOFF	1
57	PEX T009	PEX T009	SCOFF	1
58	PEX T010	PEX T010	SCOFF	1
59	PEX T010	PEX T010	SCOFF	1
60	PEX T011	PEX T011	SCOFF	1
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64	PEX T013	PEX T013	SCOFF	1
65	PEX T013	PEX T013	SCOFF	1
66	PEX T014	PEX T014	SCOFF	1
67	PEX T014	PEX T014	SCOFF	1
68	PEX T015	PEX T015	SCOFF	1
69	PEX T015	PEX T015	SCOFF	1
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71	PEX R00	PEX R00	SCOFF	1
72	PEX R00	PEX R00	SCOFF	1
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74	PEX R01	PEX R01	SCOFF	1
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79	PEX R04	PEX R04	SCOFF	1
80	PEX R04	PEX R04	SCOFF	1
81	PEX R05	PEX R05	SCOFF	1
82	PEX R05	PEX R05	SCOFF	1
83	PEX R06	PEX R06	SCOFF	1
84	PEX R06	PEX R06	SCOFF	1
85	PEX R07	PEX R07	SCOFF	1
86	PEX R07	PEX R07	SCOFF	1
87	PEX R08	PEX R08	SCOFF	1
88	PEX R08	PEX R08	SCOFF	1
89	PEX R09	PEX R09	SCOFF	1
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95	PEX R12	PEX R12	SCOFF	1
96	PEX R12	PEX R12	SCOFF	1
97	PEX R13	PEX R13	SCOFF	1
98	PEX R13	PEX R13	SCOFF	1
99	PEX R14	PEX R14	SCOFF	1
100	PEX R14	PEX R14	SCOFF	1
101	PEX R15	PEX R15	SCOFF	1
102	PEX R15	PEX R15	SCOFF	1
103	PEX R16	PEX R16	SCOFF	1

Signal	Value	Unit
NVDD_SENSE	1.2V	V
NVDD_GND_SENSE	0V	V
PEX_PL1VDD	1.2V	V
SV3	3.3V	V
12V	12V	V
SV3_PEX_SVDD	3.3V	V

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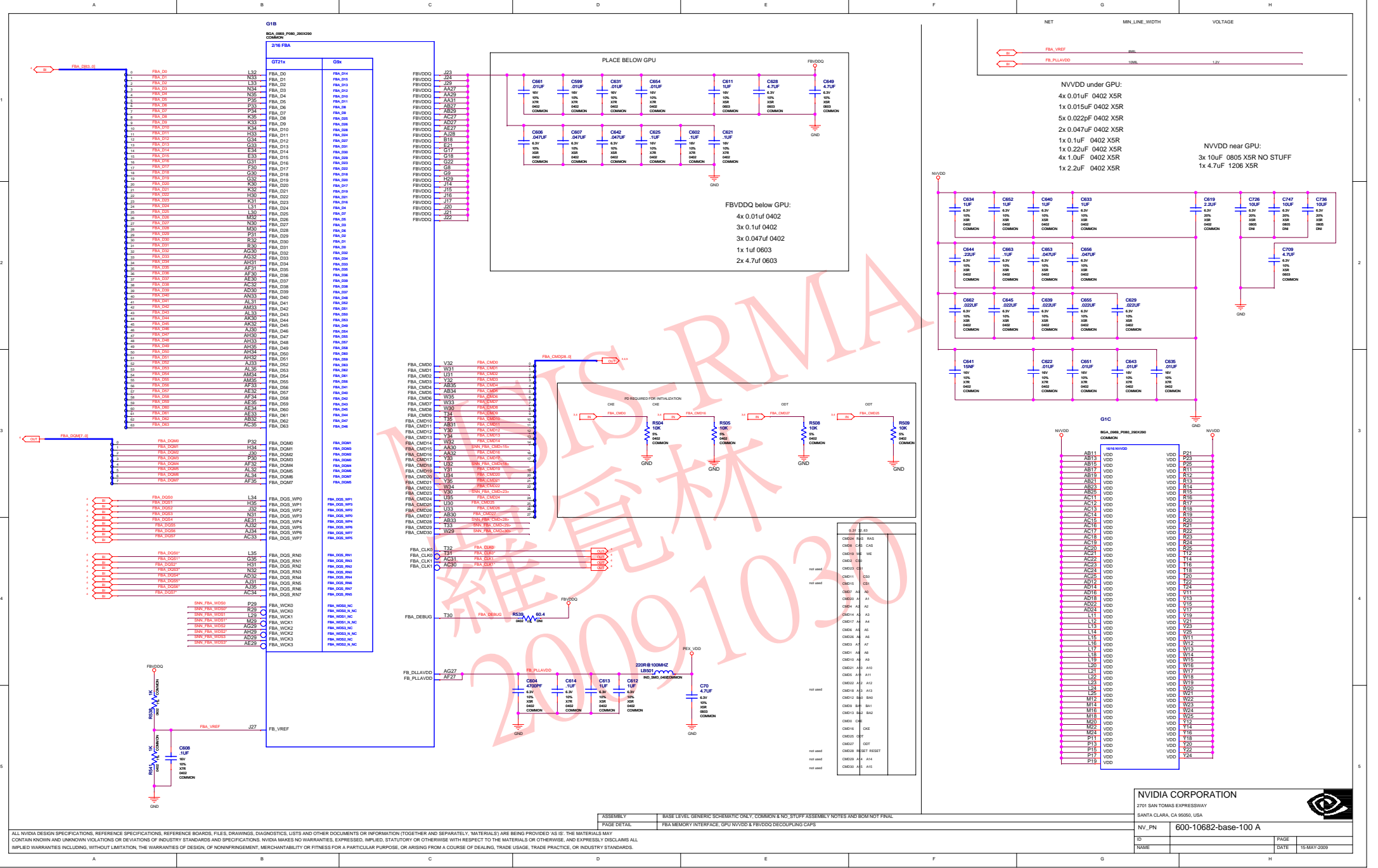


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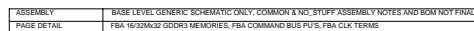
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ASSEMBLY	BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL
PAGE DETAIL	PCI EXPRESS INTERFACE, PEX_VDD DECOUPLING CAPS

ALLS MAY
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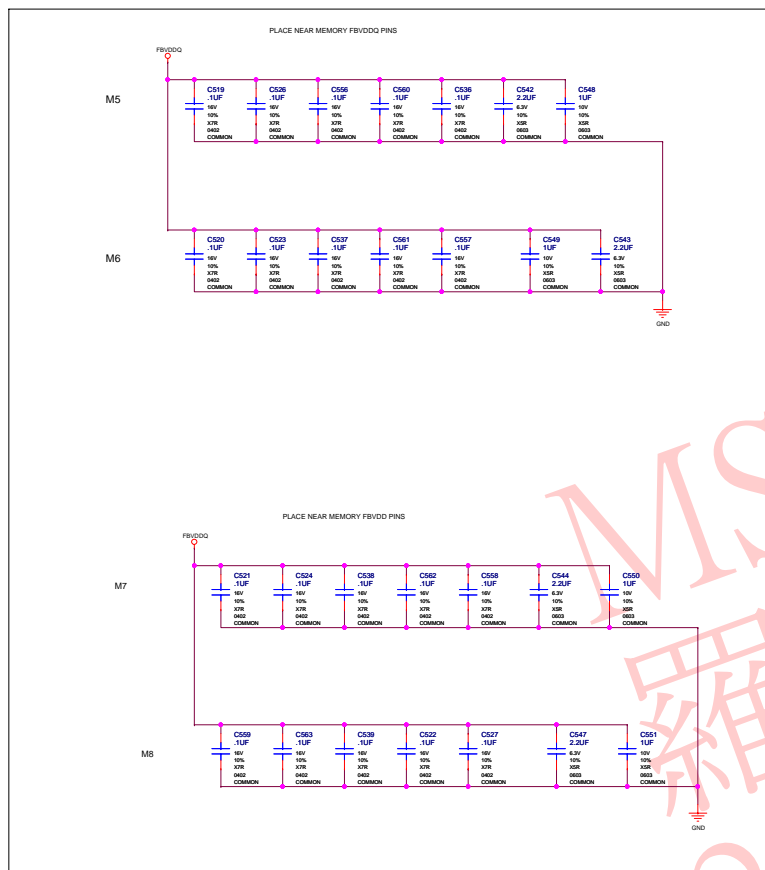
GT21x CMD MAP



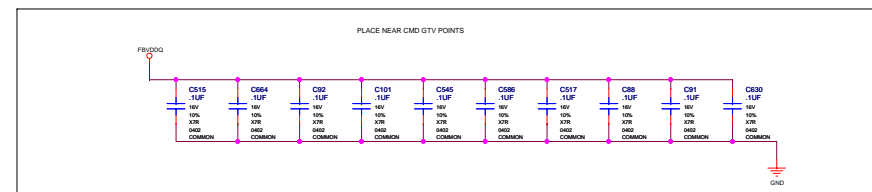
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FRAME BUFFER: PARTITION A DECOUPLING

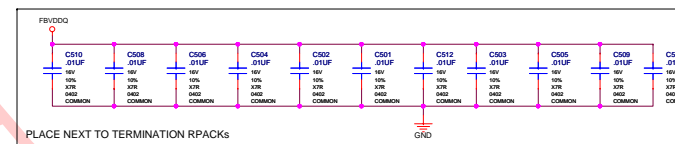
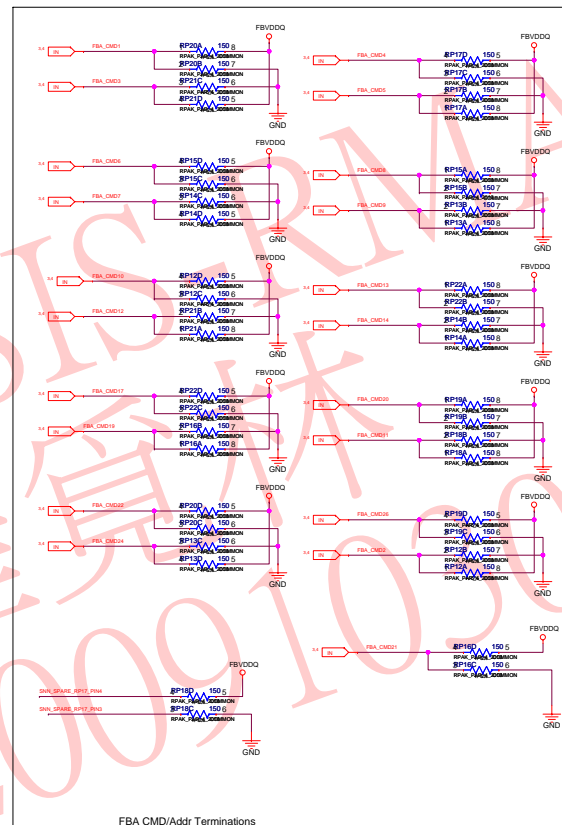
Decoupling for FBA

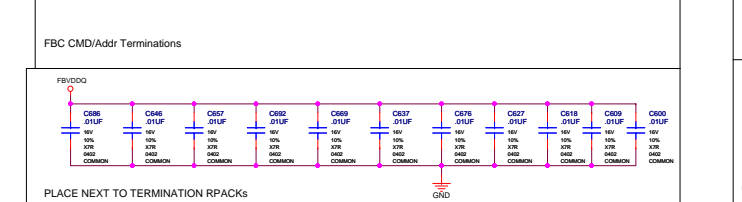
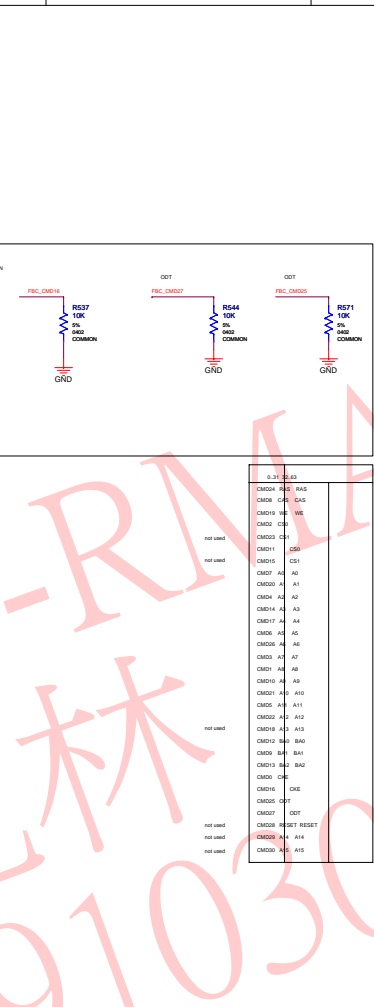


Return path coupling GND/FBVDDQ



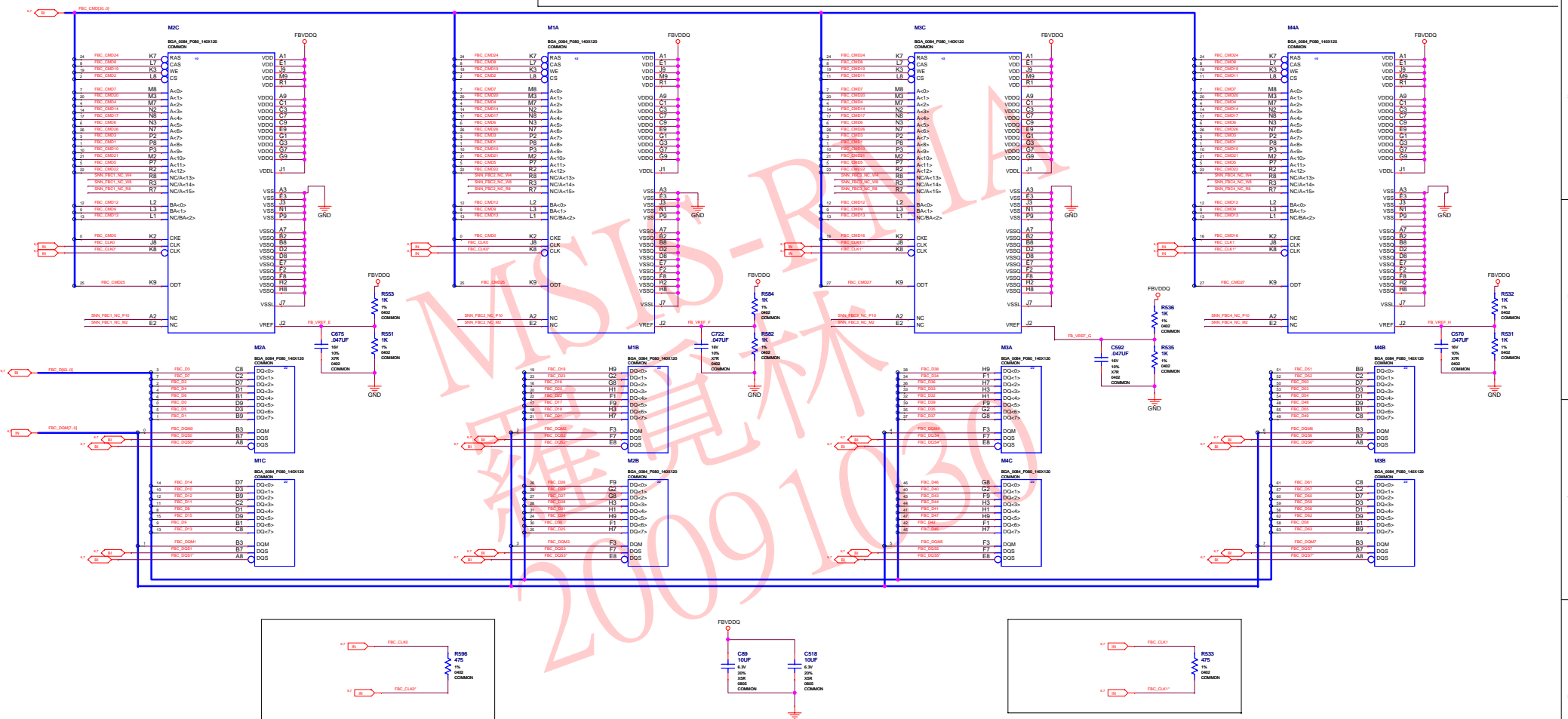
FB A Addr/CMD termination





Partition C Memories

GT21x CMD MAP



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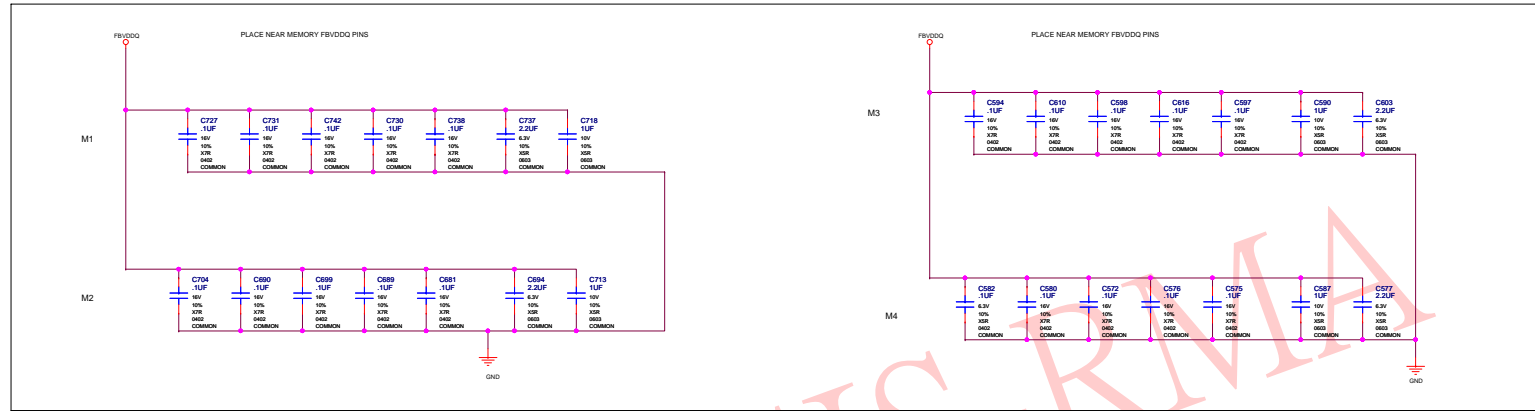
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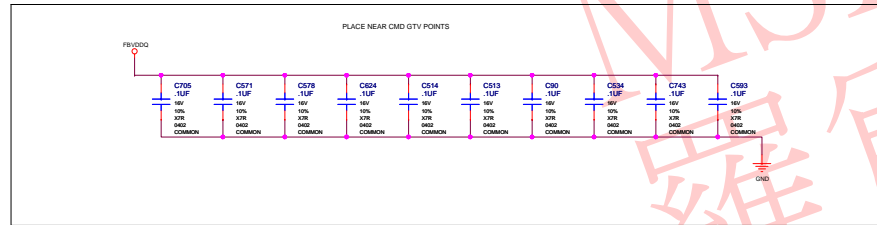
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FRAMEBUFFER: PARTITION C DECOUPLING

Decoupling for FBC

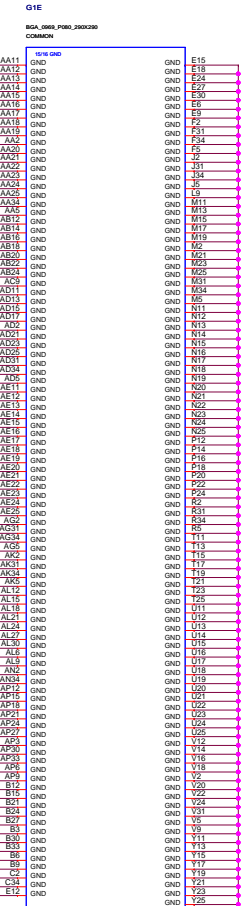
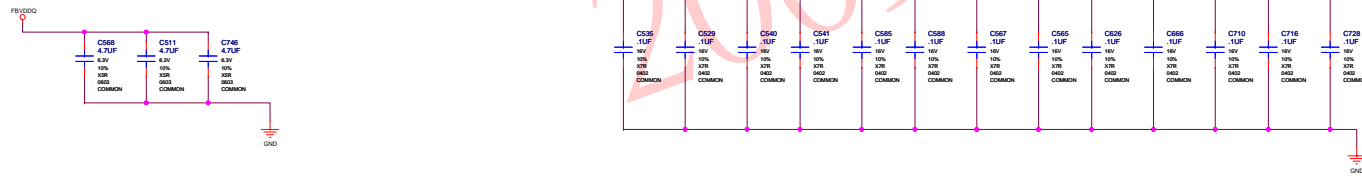


Return path coupling GND/FBVDDQ




Capacitors bounding the FB area

on each side and in middle



ASSEMBLY	BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO. STUFF ASSEMBLY NOTES AND BOM NOT FINAL
PAGE DETAIL	FBC MEMORY FBVDDQ DECOUPLING CAPS, GPU GND CONNECTIONS

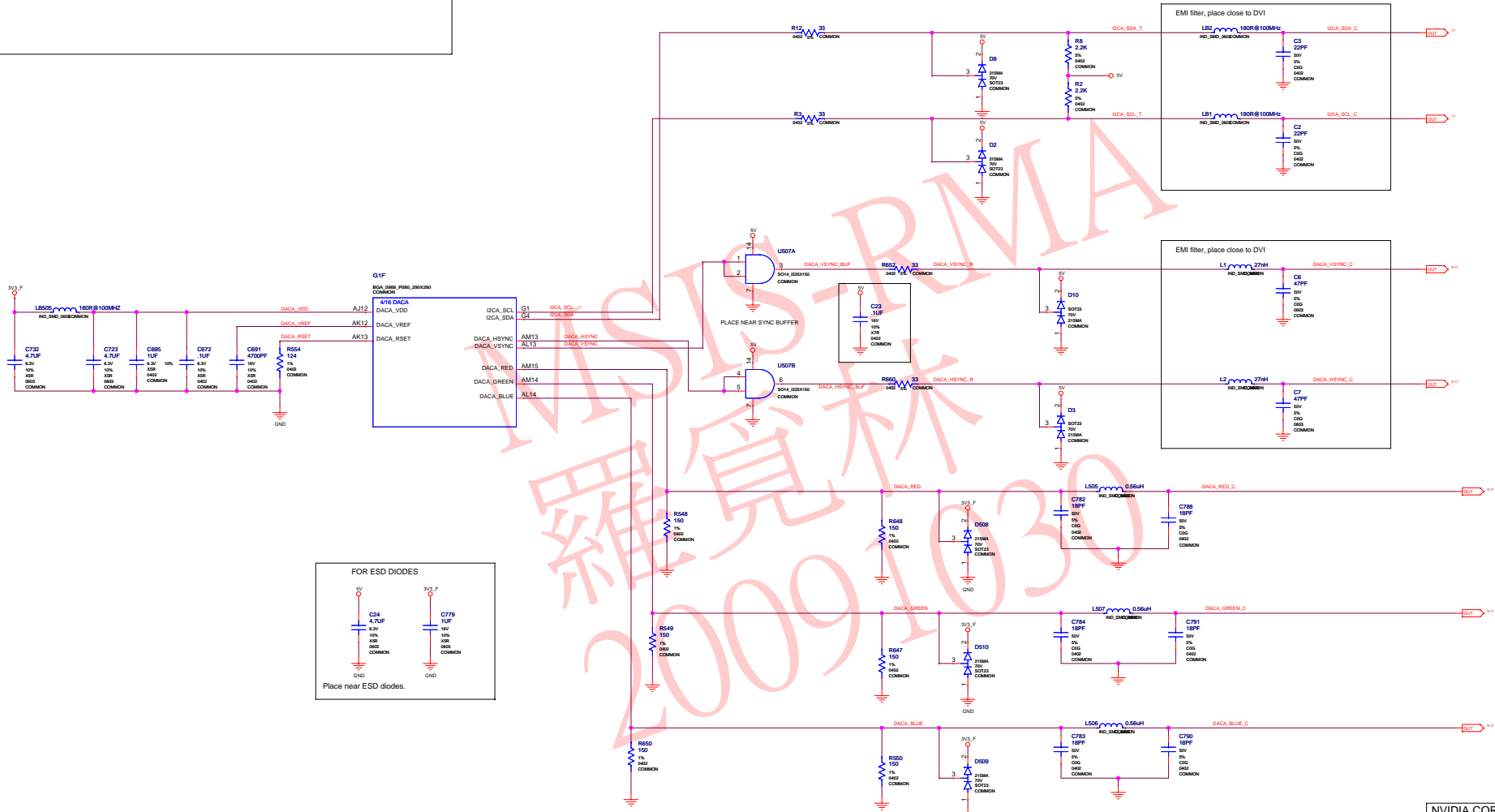
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NET_NAME	NV_CRITICAL_NET	IMPEDANCE	MIN_LINE_WIDTH
DACA_VDD		3.3V	120M
DACA_VREF		120M	
DACA_VREF_F		120M	
DACA_RED	1	50OHM	
DACA_GREEN	1	50OHM	
DACA_BLUE	1	50OHM	
DACA_RED_C	1	50OHM	
DACA_GREEN_C	1	50OHM	
DACA_BLUE_C	1	50OHM	
DACA_HSYNC	2	50OHM	
DACA_VSYNC	2	50OHM	
DACA_HSYNC_F	2	50OHM	
DACA_VSYNC_F	2	50OHM	
DACA_HSYNC_F_F	2	50OHM	
DACA_VSYNC_F_F	2	50OHM	
DACA_HSYNC_C	2	50OHM	
DACA_VSYNC_C	2	50OHM	

Primary Display (DACA), DVI-I

DACA RGB-FILTER

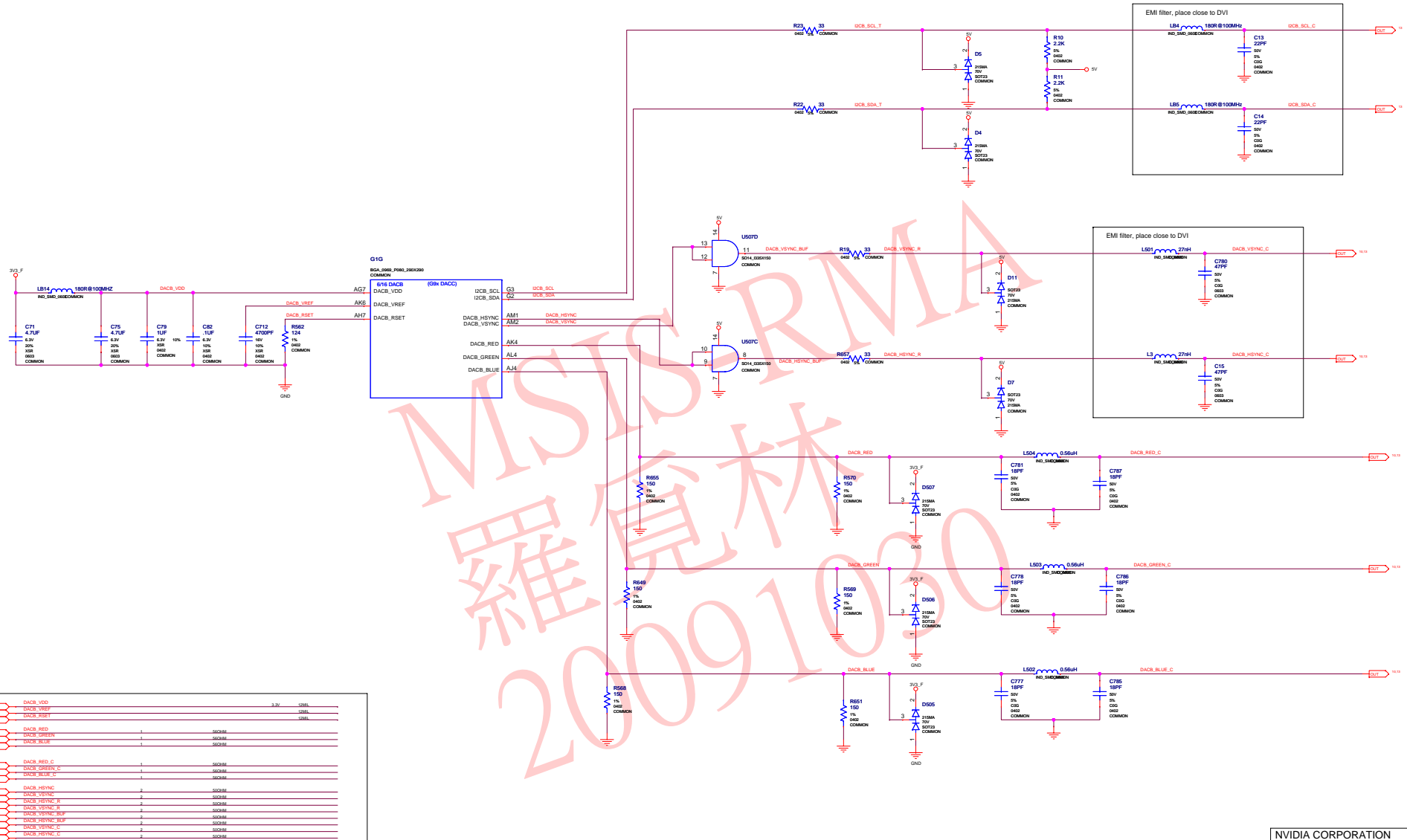


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PAGE DETAIL	DACA (PRIMARY DVI-I)

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DACB, SECONDARY VGA

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PAGE DETAIL	DACB, SECONDARY DVI-I

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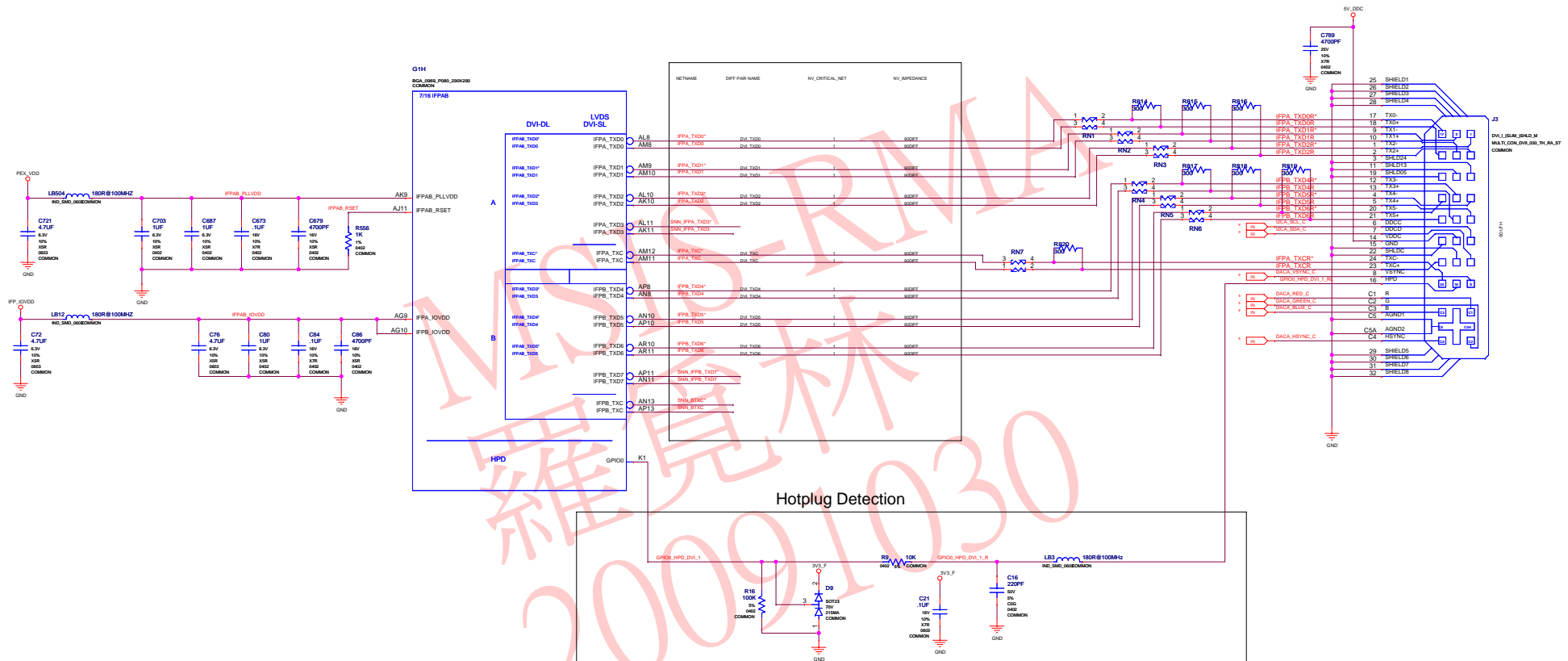
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TMDS LINK A/B: DVI-I DUALLINK, SOUTH



	NETNAME	MIN_LINE_WIDTH	VOLTAGE
52	FPAS_PLLVDD	120MIL	1.00V
53	FPAS_IOVDD	120MIL	3.3V
54	FPAS_RSET	120MIL	

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ASSEMBLY	BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL
PAGE DETAIL	TMDS LINK A/B: DVI-I (SOUTH)

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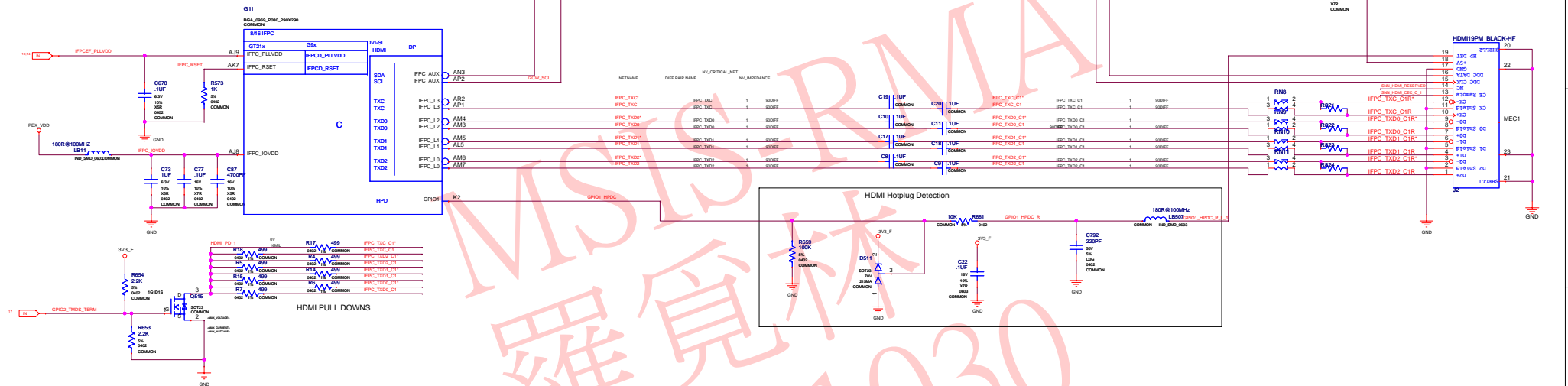
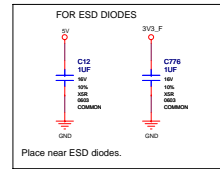
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LINK C: HDMI
HDMI (NORTH)



NET	MIN_LINE_WIDTH	VOLTAGE	NV_NET_MAX_CURRENT
13.1	20	1.8V	0.1A
20	20	1.1V	0.15A
21	20		

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PAGE DETAIL	LINK C: HDMI (NORTH)

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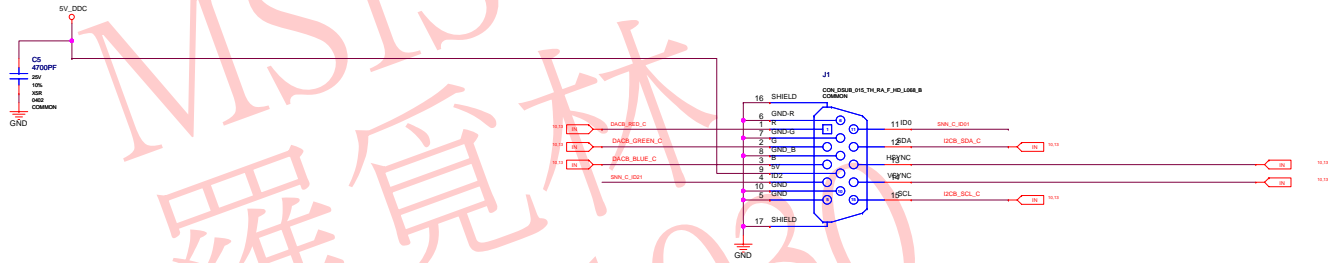
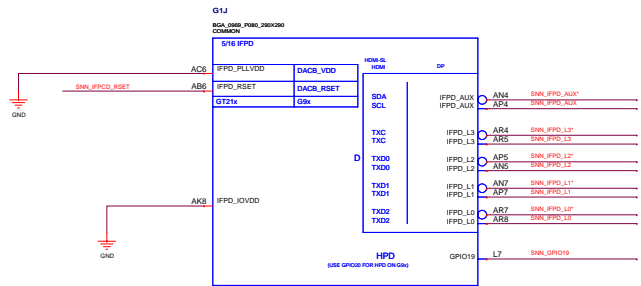


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LINK D (UNUSED) DISPLAYPORT, MID




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PAGE DETAIL	LINK D: DISPLAYPORT (MID)

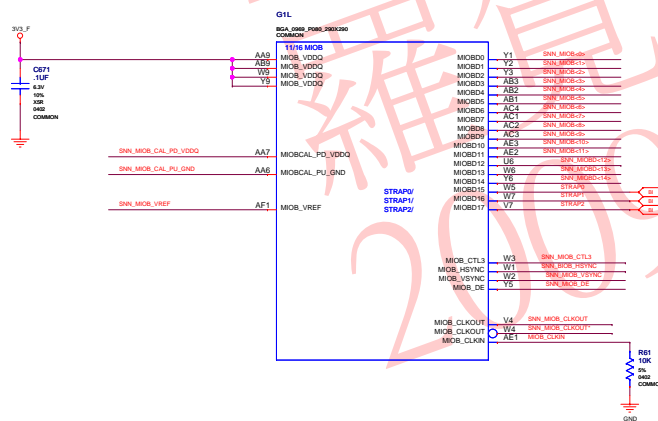
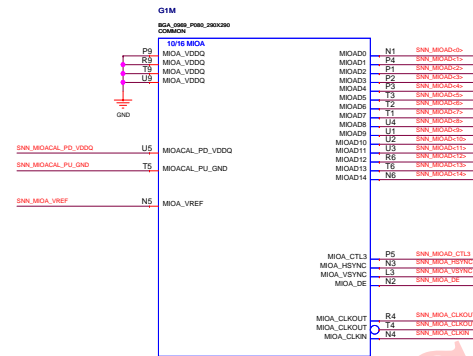
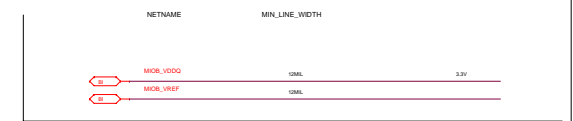
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PAGE DETAIL	LINK E/F: DVI-1 (MID)

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MIOA/B SLI



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PAGE DETAIL	MIOA & MIOB, SLI CONNECTOR

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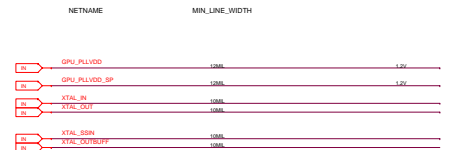
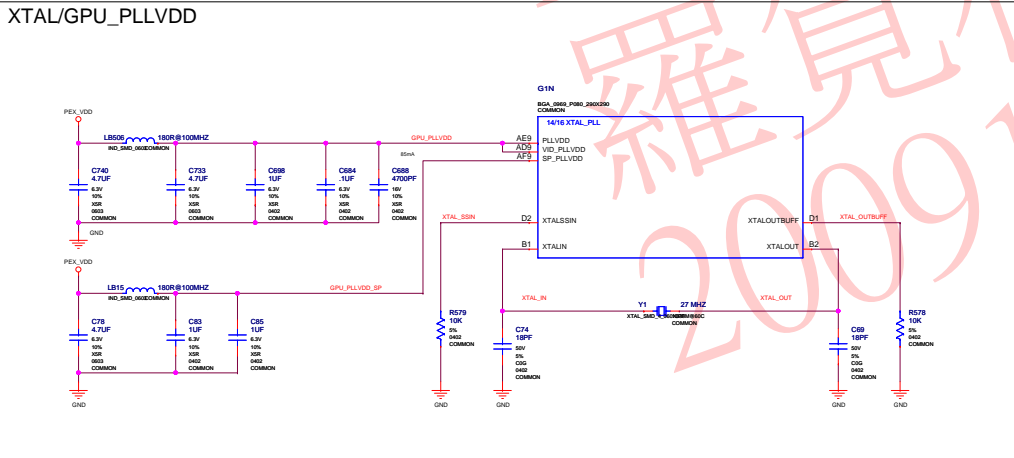


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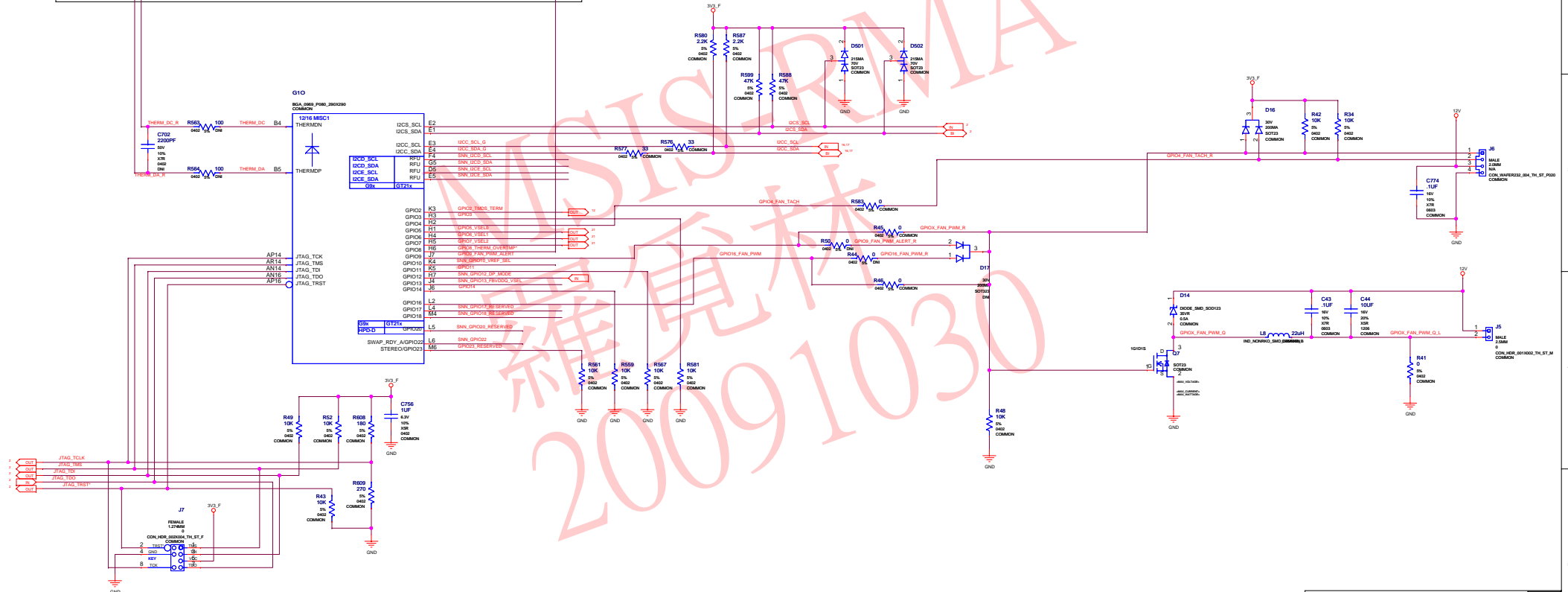
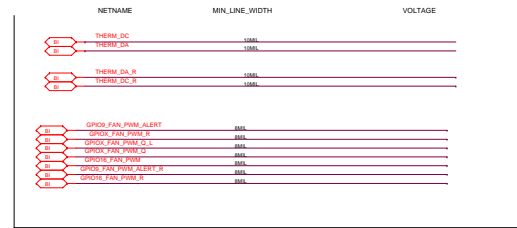
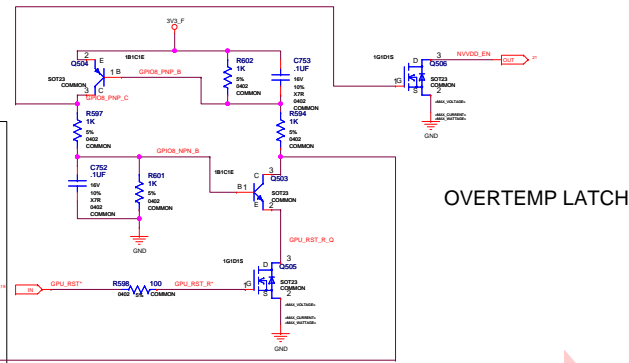
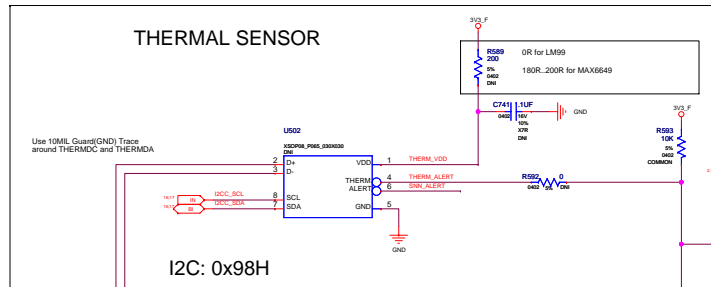
MECHANICALS & THERMALS



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GPIO & JTAG



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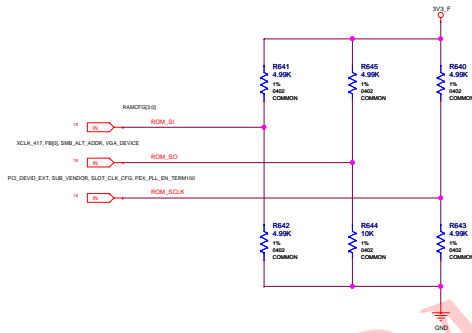
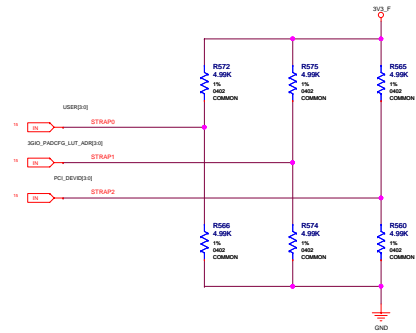
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ASSEMBLY	BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL
PAGE DETAIL	EXTERNAL THERMAL SENSOR, FAN CONTROL, GPIO, JTAG

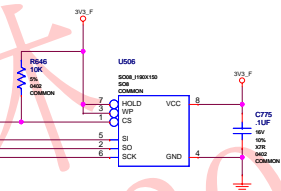
STRAPPING OPTIONS



Strap0	USER0[1]	ESD0: 1111	45A PU
Strap1	SGD_PACCFG[1]	DESKTOP: 0000	5A PD
Strap2	PCI_DEV0[1]	GT216-000 (BAY: 000)	15A PD
ROM_SI	RAMCFG[1]	0001: 1080a 64Mb/16 DDR2 Samsung 0010: 1080a 64Mb/16 DDR2 Omron 0011: 1080a 64Mb/16 DDR2 Hynix 0101: 1080a 32Mb/16 DDR2 Samsung 0110: 1080a 32Mb/16 DDR2 Omron 0111: 1080a 32Mb/16 DDR2 Hynix	1001: 64Mb 64Mb/16 DDR2 Samsung 1010: 64Mb 64Mb/16 DDR2 Omron 1011: 64Mb 64Mb/16 DDR2 Hynix 1101: 64Mb 32Mb/16 DDR2 Samsung 1110: 64Mb 32Mb/16 DDR2 Omron 1111: 64Mb 32Mb/16 DDR2 Hynix
ROM_SCLK			25A PD
ROM_SO			5A PD

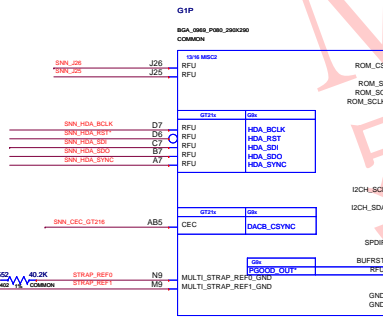
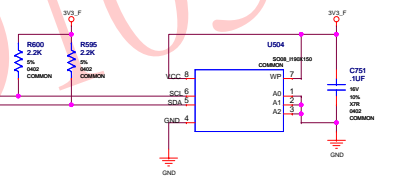
0	PD 5A	6	PU 5A
1	PD 15A	8	PU 15A
2	PD 15A	10	PU 15A
3	PD 25A	11	PU 25A
4	PD 25A	12	PU 25A
5	PD 25A	13	PU 25A
6	PD 25A	14	PU 25A
7	PD 45A	15	PU 45A

BIOS ROM(serial)



HDCP I2C EEROM

NOTE: replace it with 190-00007-0000-000



	MULTI_STRAP_REF1_GND	MULTI_STRAP_REF1_GND
BINARY PRODUCTION STRAP MODE:	40.2k 1% TO GND	NC
BINARY BRINGUP STRAP MODE:	NC	NC
MULTI-LEVEL STRAP MODE:	40.2k 1% TO GND	40.2k 1% TO GND

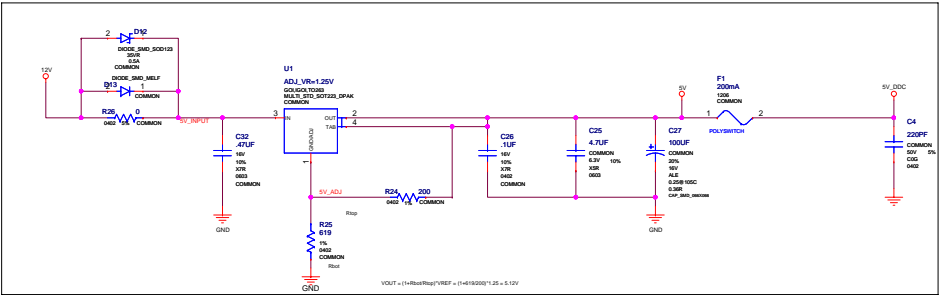
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ASSEMBLY	BASE LEVEL GENERIC SCHEMATIC ONLY; COMMON & NO_STRAP ASSEMBLY NOTES AND BOM NOT FINAL
PAGE DETAIL	BIOS ROM, HDCP ROM, STRAPPING OPTIONS

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Power Supply: 5V, 5V_DDC, 1V8, EXT PWR

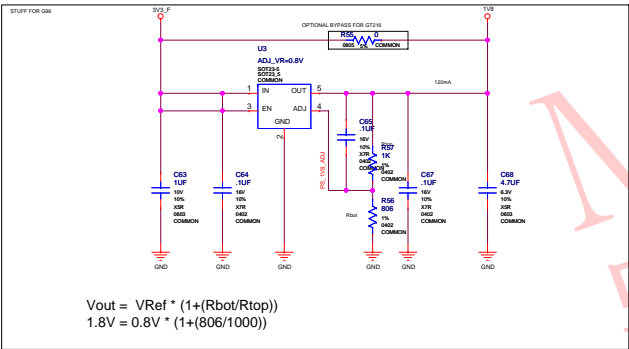
5V REGULATOR



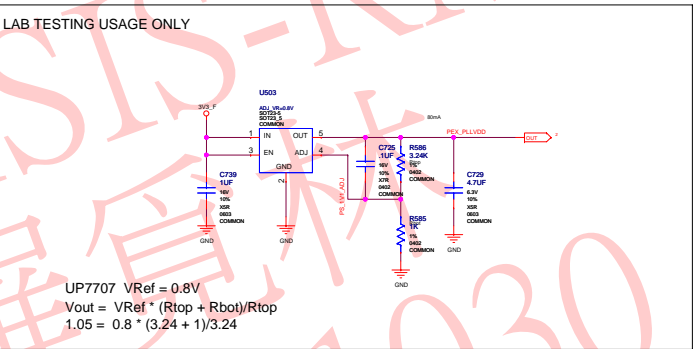
5V DDC

NETNAME	MAX_CURRENT	MIN_LINE_WIDTH	VOLTAGE
5V_FUSED	0.5A	120ML	5V
5V_500V	0.5A	120ML	5V
5V_DDC	0.5A	120ML	5V
5V	0.5A	120ML	5V
PS_1V8_ADJ		120ML	1.8V
1V8	0.15A	120ML	1.8V
GND		100ML	0V
3V3_F	AA	200ML	3.3V
IFP_IOVDD	0.3A	120ML	3.3V
12V_F	AA	200ML	12V

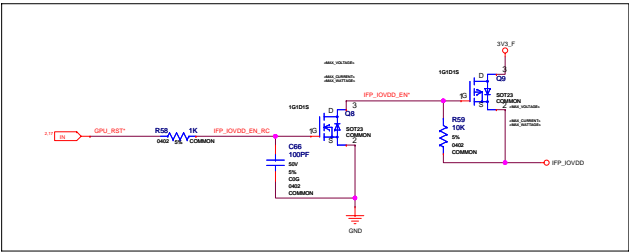
IFP PLL Supply 1.8V



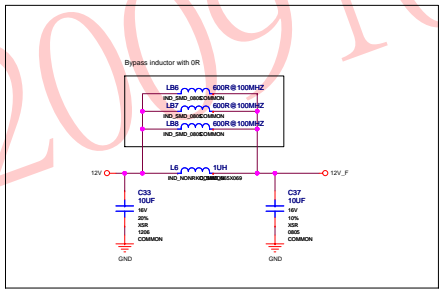
PEX PLLVDD optional Supply



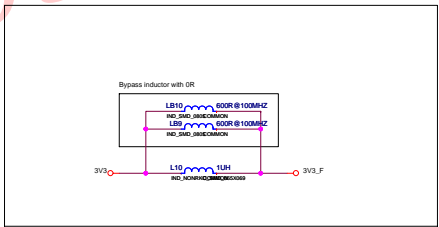
IFP_IOVDD BACKDRIVE PREVENTION



12V filter



3.3V filter

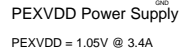


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ASSEMBLY: 6336 LEVEL GENERIC SCHEMATIC ONLY; COMMON & NO. 3100F ASSEMBLY NOTES AND BOM NOT FINAL
PAGE DETAIL: POWER SUPPLY LINEARS: 5V, DDC5V, IFP_IOVDD, 3V3_FILTER, 12V_FILTER, 12V_EXT


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FBVDDQ: 1.8-2.0V @ 12.7A

[illegible]

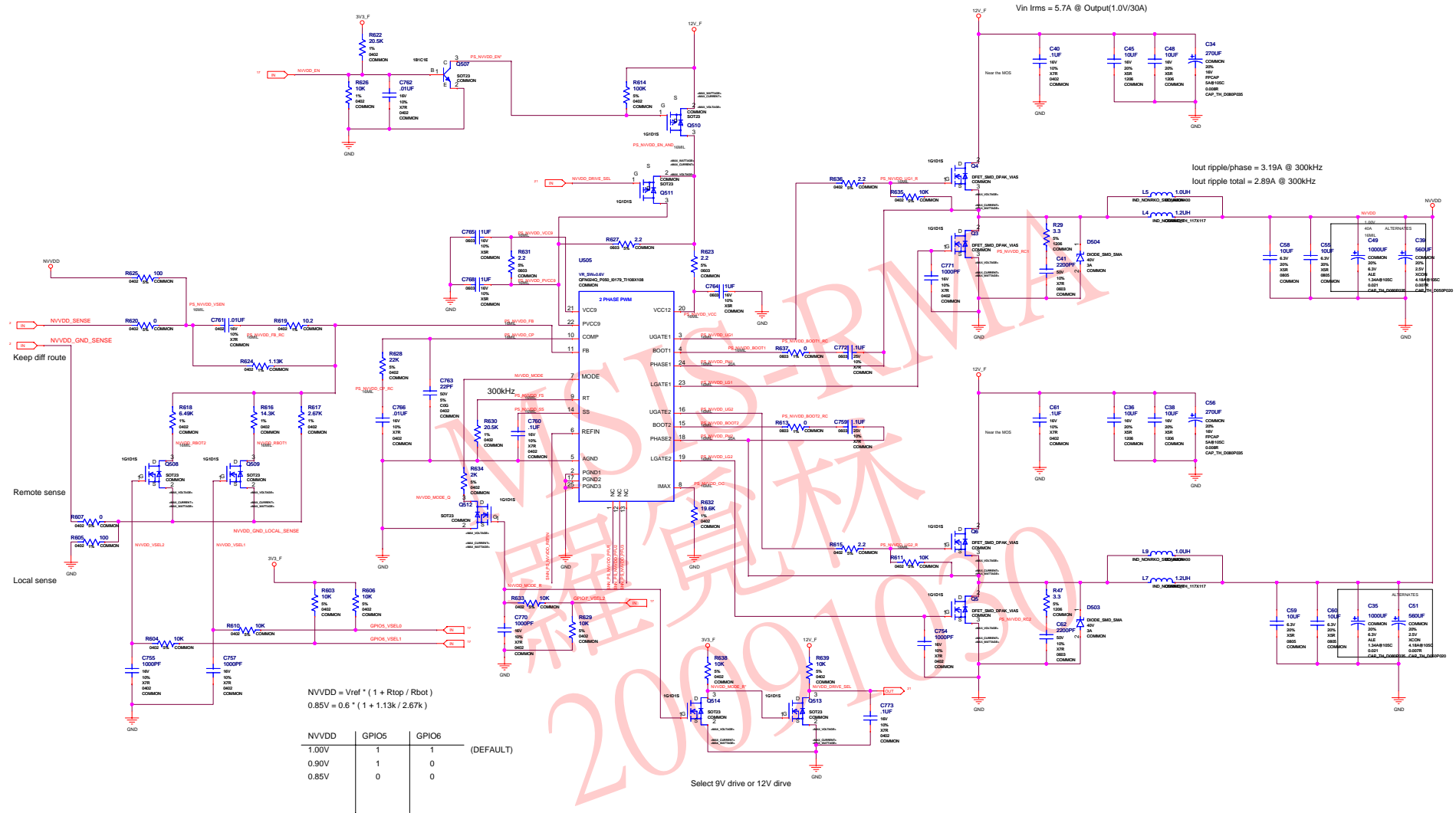
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ASSEMBLY	BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL
PAGE DETAIL	POWER SUPPLY: FBVDDQ SINGLE PHASE SWITCHER, PEX_VDD LINEAR

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POWER SUPPLY: NVVDD


$$NVDD = V_{ref} * (1 + R_{top} / R_{bot})$$

$$0.85V = 0.6 * (1 + 1.13k / 2.67k)$$

NVDD	GPIO5	GPIO6	
1.00V	1	1	(DEFAULT)
0.90V	1	0	
0.85V	0	0	

Select 9V drive or 12V drive

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PAGE DETAIL	POWER SUPPLY: NVVDD DUAL PHASE SWITCHER