

A	B	C	D	E	F	G	H
---	---	---	---	---	---	---	---

1

2

3

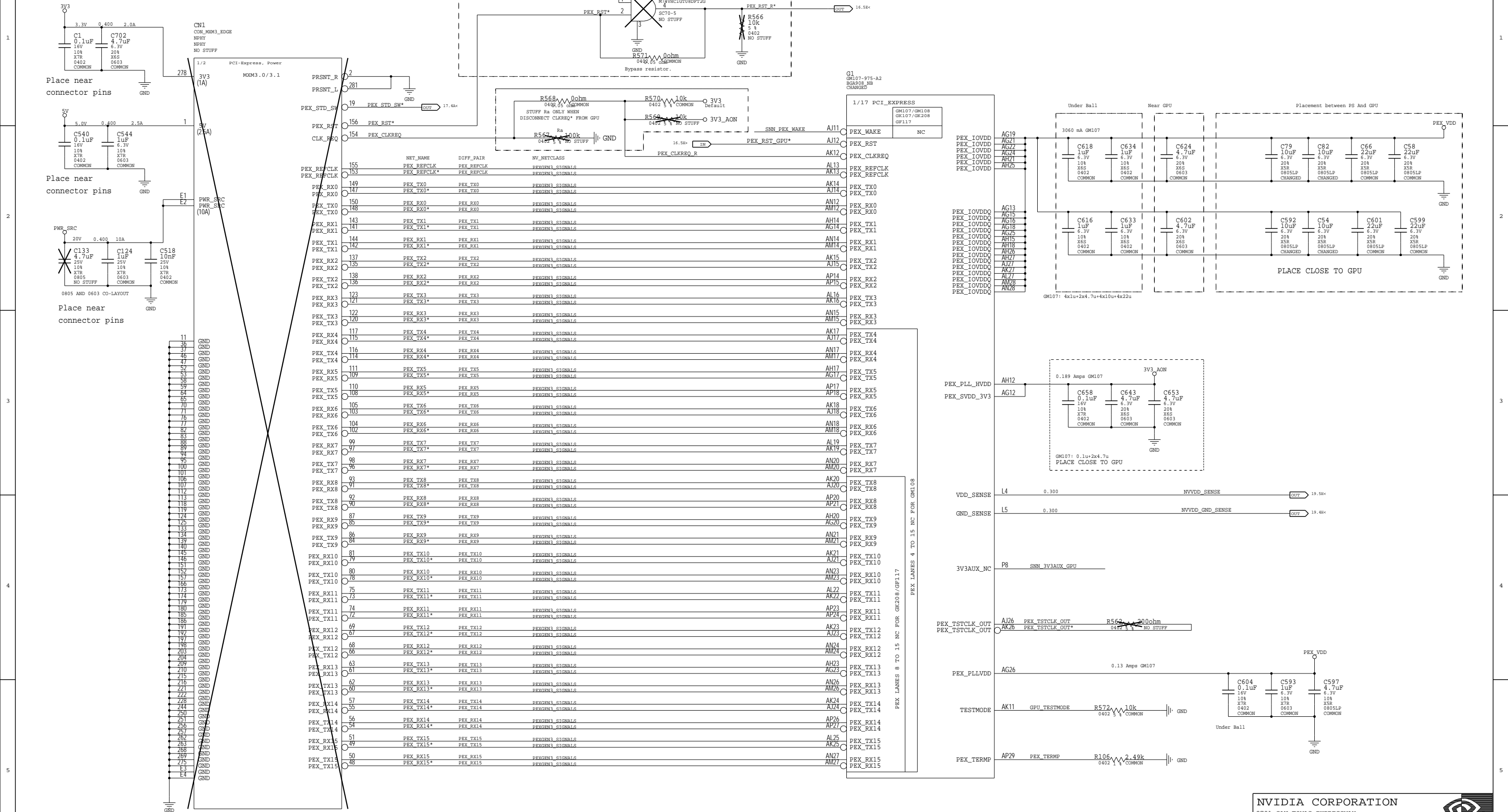
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7

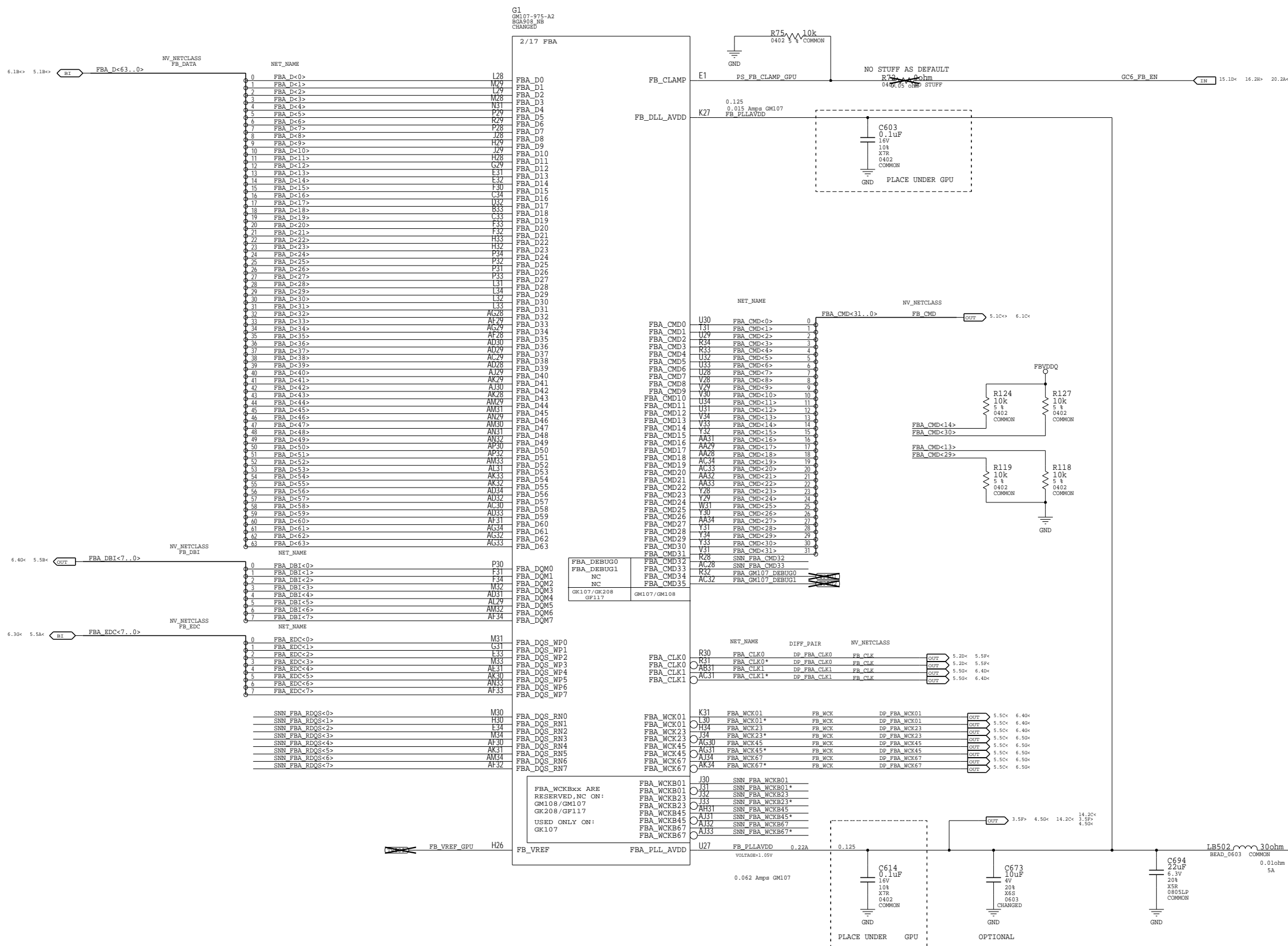
A	B	C	D	E	F	G	H
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PCI EXPRESS INTERFACE



FRAME BUFFER A GPU INTERFACE




```

GDDR5_BGA170_MIRR COMMAND MAP
-----
0_31      32_63
-----
CMD0      CS*
CMD1      A3_BA3
CMD2      A2_BA0
CMD3      A4_BA2
CMD4      A5_BA1
CMD5      WE*
CMD6      A7_A8
CMD7      A6_A11
CMD8      ABI*
CMD9      A12_RFU
CMD10     A0_A10
CMD11     A1_A9
CMD12     RAS*
CMD13     RST*
CMD14     CEK*
CMD15     CAS*
CMD16
CMD17     CS*
CMD18     A3_BA3
CMD19     A2_BA0
CMD19     A4_BA2
CMD20     A5_BA1
CMD21     WE*
CMD22     A7_A8
CMD23     A6_A11
CMD24     ABI*
CMD25     A12_RFU
CMD26     A0_A10
CMD27     A1_A9
CMD28     RAS*
CMD29     RST*
CMD30     CEK*
CMD31     CAS*

```

ASSEMBLY	SKU504 GM107 X16 GDDR5 MEMORY
PAGE DETAIL	FRAME BUFFER A GPU INTERFACE

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2701 SAN TOMAS EXPRESSWAY				
SANTA CLARA, CA 95050, USA				
NV_PN		600-52757-0504-200		
PCB REV	B2757-A01	PAGE	3 OF 20	
BOM REV	J	DATE	05-FEB-2015	



FRAME BUFFER B GPU INTERFACE

G1
GM107-975-A2
BGA908_NB
CHANGED

GDDR5_BGA170_MIRR COMMAND MAP

	D...31	32...63
CMD0	CS*	
CMD1	A3_BA3	
CMD2	A2_BA0	
CMD3	A4_BA2	
CMD4	A5_BA1	
CMD5	WE*	
CMD6	A7_A8	
CMD7	A6_A11	
CMD8	AB1*	
CMD9	A12_RFU	
CMD10	A0_A10	
CMD11	A1_A9	
CMD12	RAS*	
CMD13	RST*	
CMD14	CKE*	
CMD15	CAS*	
CMD16		CS*
CMD17	A3_BA3	
CMD18	A2_BA0	
CMD19	A4_BA2	
CMD20	A5_BA1	
CMD21	WE*	
CMD22	A7_A8	
CMD23	A6_A11	
CMD24	AB1*	
CMD25	A12_RFU	
CMD26	A0_A10	
CMD27	A1_A9	
CMD28	RAS*	
CMD29	RST*	
CMD30	CKE*	
CMD31	CAS*	

8.18c< 7.18c< BI FBB_D<63...0>

NV_NETCLASS
FB_DATA

NET_NAME

0	FBB_D<0>	G9	FBB_D0
1	FBB_D<1>	D7	FBB_D1
2	FBB_D<2>	C8	FBB_D2
3	FBB_D<3>	F9	FBB_D3
4	FBB_D<4>	F11	FBB_D4
5	FBB_D<5>	G11	FBB_D5
6	FBB_D<6>	F12	FBB_D6
7	FBB_D<7>	G12	FBB_D7
8	FBB_D<8>	G6	FBB_D8
9	FBB_D<9>	F5	FBB_D9
10	FBB_D<10>	E6	FBB_D10
11	FBB_D<11>	F6	FBB_D11
12	FBB_D<12>	F4	FBB_D12
13	FBB_D<13>	G4	FBB_D13
14	FBB_D<14>	E2	FBB_D14
15	FBB_D<15>	F3	FBB_D15
16	FBB_D<16>	C2	FBB_D16
17	FBB_D<17>	D4	FBB_D17
18	FBB_D<18>	D3	FBB_D18
19	FBB_D<19>	C3	FBB_D19
20	FBB_D<20>	B3	FBB_D20
21	FBB_D<21>	C4	FBB_D21
22	FBB_D<22>	B5	FBB_D22
23	FBB_D<23>	C5	FBB_D23
24	FBB_D<24>	A11	FBB_D24
25	FBB_D<25>	C11	FBB_D25
26	FBB_D<26>	D11	FBB_D26
27	FBB_D<27>	B11	FBB_D27
28	FBB_D<28>	D8	FBB_D28
29	FBB_D<29>	A8	FBB_D29
30	FBB_D<30>	C8	FBB_D30
31	FBB_D<31>	B8	FBB_D31
32	FBB_D<32>	F24	FBB_D32
33	FBB_D<33>	G24	FBB_D33
34	FBB_D<34>	E24	FBB_D34
35	FBB_D<35>	G24	FBB_D35
36	FBB_D<36>	D21	FBB_D36
37	FBB_D<37>	E21	FBB_D37
38	FBB_D<38>	G21	FBB_D38
39	FBB_D<39>	F21	FBB_D39
40	FBB_D<40>	G27	FBB_D40
41	FBB_D<41>	D27	FBB_D41
42	FBB_D<42>	G26	FBB_D42
43	FBB_D<43>	E27	FBB_D43
44	FBB_D<44>	E29	FBB_D44
45	FBB_D<45>	F29	FBB_D45
46	FBB_D<46>	E30	FBB_D46
47	FBB_D<47>	D30	FBB_D47
48	FBB_D<48>	A32	FBB_D48
49	FBB_D<49>	C31	FBB_D49
50	FBB_D<50>	C32	FBB_D50
51	FBB_D<51>	B32	FBB_D51
52	FBB_D<52>	D29	FBB_D52
53	FBB_D<53>	A29	FBB_D53
54	FBB_D<54>	C29	FBB_D54
55	FBB_D<55>	B29	FBB_D55
56	FBB_D<56>	B21	FBB_D56
57	FBB_D<57>	C23	FBB_D57
58	FBB_D<58>	A21	FBB_D58
59	FBB_D<59>	C21	FBB_D59
60	FBB_D<60>	B24	FBB_D60
61	FBB_D<61>	C24	FBB_D61
62	FBB_D<62>	B26	FBB_D62
63	FBB_D<63>	C26	FBB_D63

8.4P< 7.58P< IN FBB_DBI<7...0>
FB_DBI

8.3P< 7.5A< OUT FBB_EDC<7...0>
FB_EDC

0	FBB_DBI<0>	E11	FBB_DQM0
1	FBB_DBI<1>	E3	FBB_DQM1
2	FBB_DBI<2>	A3	FBB_DQM2
3	FBB_DBI<3>	C9	FBB_DQM3
4	FBB_DBI<4>	F23	FBB_DQM4
5	FBB_DBI<5>	F27	FBB_DQM5
6	FBB_DBI<6>	C30	FBB_DQM6
7	FBB_DBI<7>	A24	FBB_DQM7

0	FBB_EDC<0>	D10	FBB_DQS_WP0
1	FBB_EDC<1>	D6	FBB_DQS_WP1
2	FBB_EDC<2>	C3	FBB_DQS_WP2
3	FBB_EDC<3>	B9	FBB_DQS_WP3
4	FBB_EDC<4>	E23	FBB_DQS_WP4
5	FBB_EDC<5>	E26	FBB_DQS_WP5
6	FBB_EDC<6>	B30	FBB_DQS_WP6
7	FBB_EDC<7>	A23	FBB_DQS_WP7

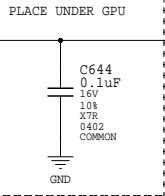
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SNN FBB_DQS_RN<1>	E4	FBB_DQS_RN1
SNN FBB_DQS_RN<2>	B2	FBB_DQS_RN2
SNN FBB_DQS_RN<3>	A9	FBB_DQS_RN3
SNN FBB_DQS_RN<4>	D22	FBB_DQS_RN4
SNN FBB_DQS_RN<5>	D28	FBB_DQS_RN5
SNN FBB_DQS_RN<6>	A30	FBB_DQS_RN6
SNN FBB_DQS_RN<7>	B23	FBB_DQS_RN7

FBB_WCKBxx ARE
RESERVED, NC ON:
GM108/GM107
USED ONLY ON:
GK107

FBB_WCKB01	FBB_WCKB01
FBB_WCKB01	FBB_WCKB01*
FBB_WCKB23	FBB_WCKB23
FBB_WCKB23	FBB_WCKB23*
FBB_WCKB45	FBB_WCKB45
FBB_WCKB45	FBB_WCKB45*
FBB_WCKB67	FBB_WCKB67
FBB_WCKB67	FBB_WCKB67*

FBB_PLL_AVDD

0.062 Amps GK107



FBB_CMD0	D13	FBB_CMD<0>	0	FBB_CMD<31...0>	0
FBB_CMD1	E14	FBB_CMD<1>	1		
FBB_CMD2	F14	FBB_CMD<2>	2		
FBB_CMD3	A12	FBB_CMD<3>	3		
FBB_CMD4	B12	FBB_CMD<4>	4		
FBB_CMD5	C14	FBB_CMD<5>	5		
FBB_CMD6	B14	FBB_CMD<6>	6		
FBB_CMD7	G15	FBB_CMD<7>	7		
FBB_CMD8	F15	FBB_CMD<8>	8		
FBB_CMD9	D15	FBB_CMD<9>	9		
FBB_CMD10	A14	FBB_CMD<10>	10		
FBB_CMD11	D14	FBB_CMD<11>	11		
FBB_CMD12	A15	FBB_CMD<12>	12		
FBB_CMD13	B15	FBB_CMD<13>	13		
FBB_CMD14	C15	FBB_CMD<14>	14		
FBB_CMD15	C17	FBB_CMD<15>	15		
FBB_CMD16	D18	FBB_CMD<16>	16		
FBB_CMD17	F18	FBB_CMD<17>	17		
FBB_CMD18	B20	FBB_CMD<18>	18		
FBB_CMD19	A20	FBB_CMD<19>	19		
FBB_CMD20	C18	FBB_CMD<20>	20		
FBB_CMD21	B18	FBB_CMD<21>	21		
FBB_CMD22	G18	FBB_CMD<22>	22		
FBB_CMD23	G17	FBB_CMD<23>	23		
FBB_CMD24	F17	FBB_CMD<24>	24		
FBB_CMD25	D16	FBB_CMD<25>	25		
FBB_CMD26	A18	FBB_CMD<26>	26		
FBB_CMD27	D17	FBB_CMD<27>	27		
FBB_CMD28	B17	FBB_CMD<28>	28		
FBB_CMD29	B17	FBB_CMD<29>	29		
FBB_CMD30	E17	FBB_CMD<30>	30		
FBB_CMD31	G14	FBB_CMD<31>	31		
FBB_CMD32	G20	SNN FBB_CMD32			
FBB_CMD33	C12	SNN FBB_CMD33			
FBB_CMD34	C20	FBB_CMD34			
FBB_CMD35	C20	FBB_CMD35			

NET_NAME	DIFF_PAIR	NV_NETCLASS			
D12	FBB_CLK0	DP_FBB_CLK0	FB_CLK	OUT	7.20+ 7.4P<
E12	FBB_CLK0*	DP_FBB_CLK0	FB_CLK	OUT	7.20+ 7.5P<
E20	FBB_CLK1	DP_FBB_CLK1	FB_CLK	OUT	7.40+ 8.4D<
F20	FBB_CLK1*	DP_FBB_CLK1	FB_CLK	OUT	7.50+ 8.4D<

F8	FBB_WCK01	FB_WCK	DP_FBB_WCK01	OUT	7.50+ 8.40+
A8	FBB_WCK01*	FB_WCK	DP_FBB_WCK01	OUT	7.50+ 8.50+
A5	FBB_WCK23	FB_WCK	DP_FBB_WCK23	OUT	7.50+ 8.50+
A6	FBB_WCK23*	FB_WCK	DP_FBB_WCK23	OUT	7.50+ 8.50+
D24	FBB_WCK45	FB_WCK	DP_FBB_WCK45	OUT	7.50+ 8.50+
D25	FBB_WCK45*	FB_WCK	DP_FBB_WCK45	OUT	7.50+ 8.50+
B27	FBB_WCK67	FB_WCK	DP_FBB_WCK67	OUT	7.50+ 8.50+
C27	FBB_WCK67*	FB_WCK	DP_FBB_WCK67	OUT	7.50+ 8.50+

ASSEMBLY	SKU504 GM107 X16 GDDR5 MEMORY
PAGE DETAIL	FRAME BUFFER B GPU INTERFACE

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NV_PN 600-52757-0504-200

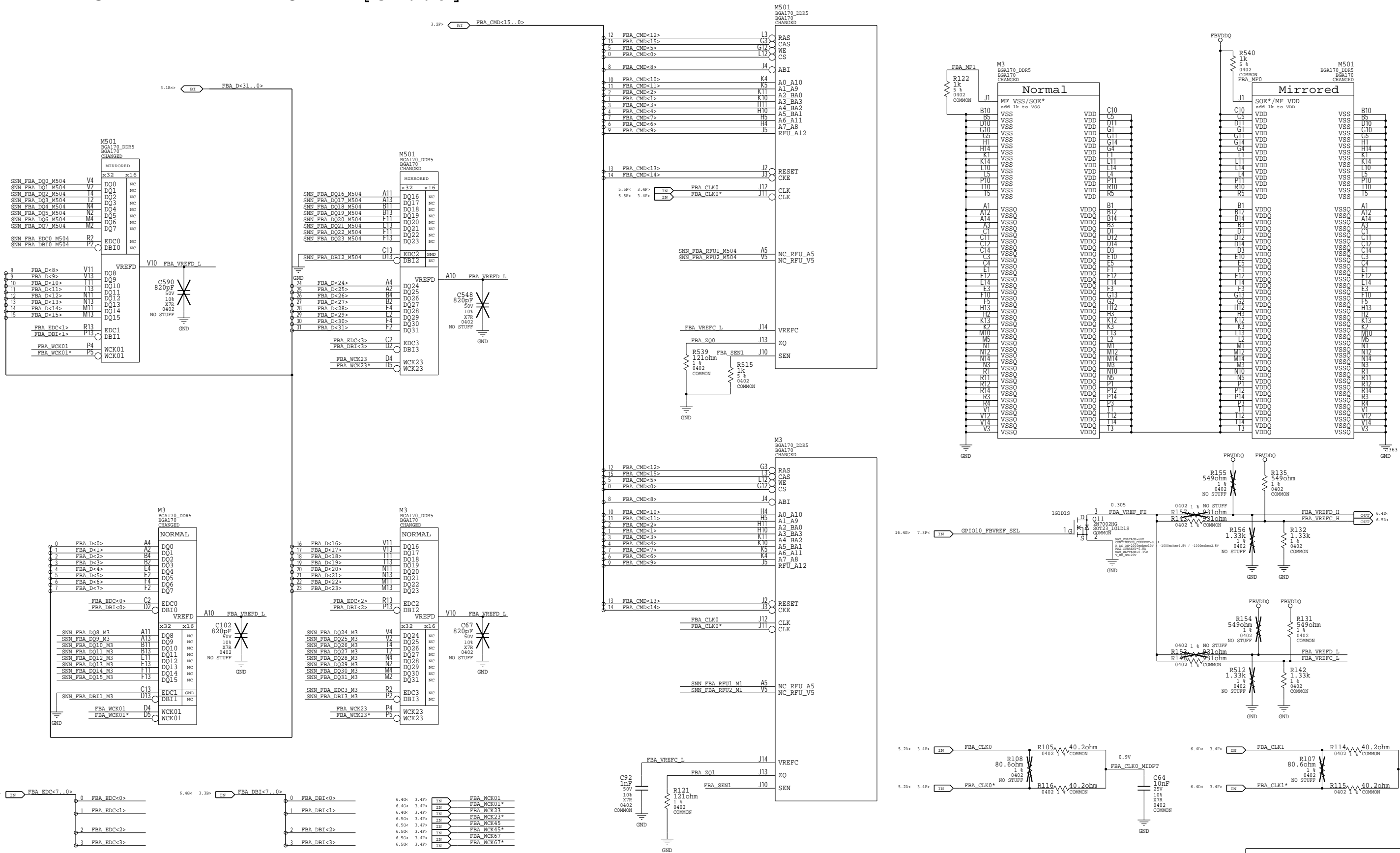
PCB REV P2757-A01

BOM REV J

PAGE 4 OF 20

DATE 05-FEB-2015

FRAME BUFFER PARTITION A [31..0]



FRAME BUFFER PARTITION A [63..32]

1

2

3

4

5

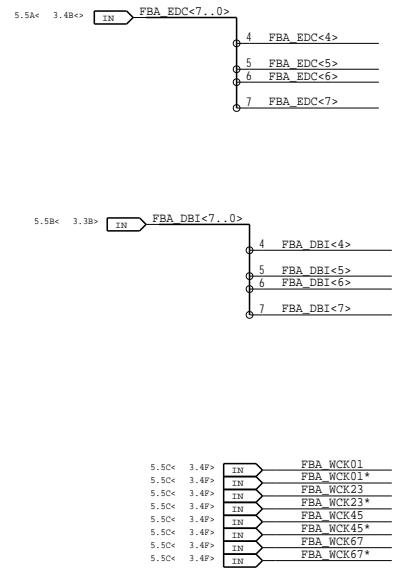
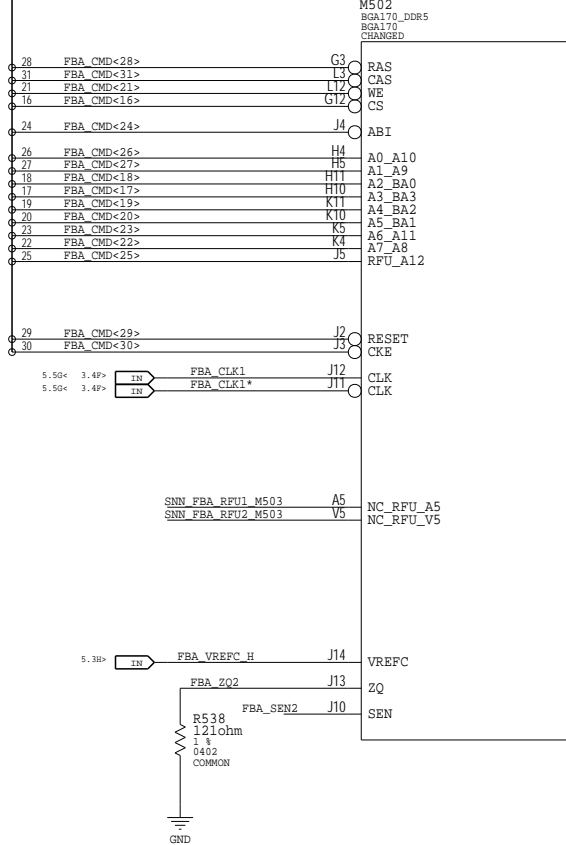
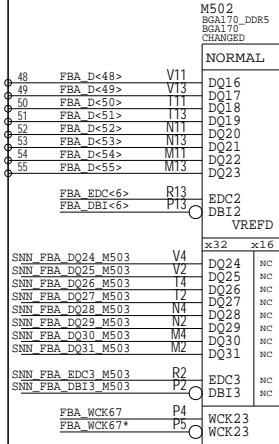
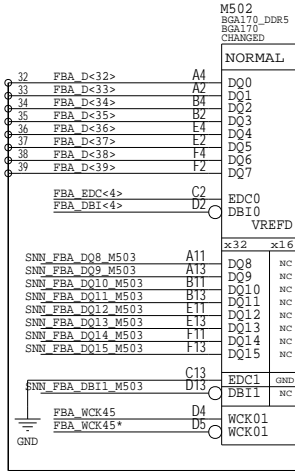
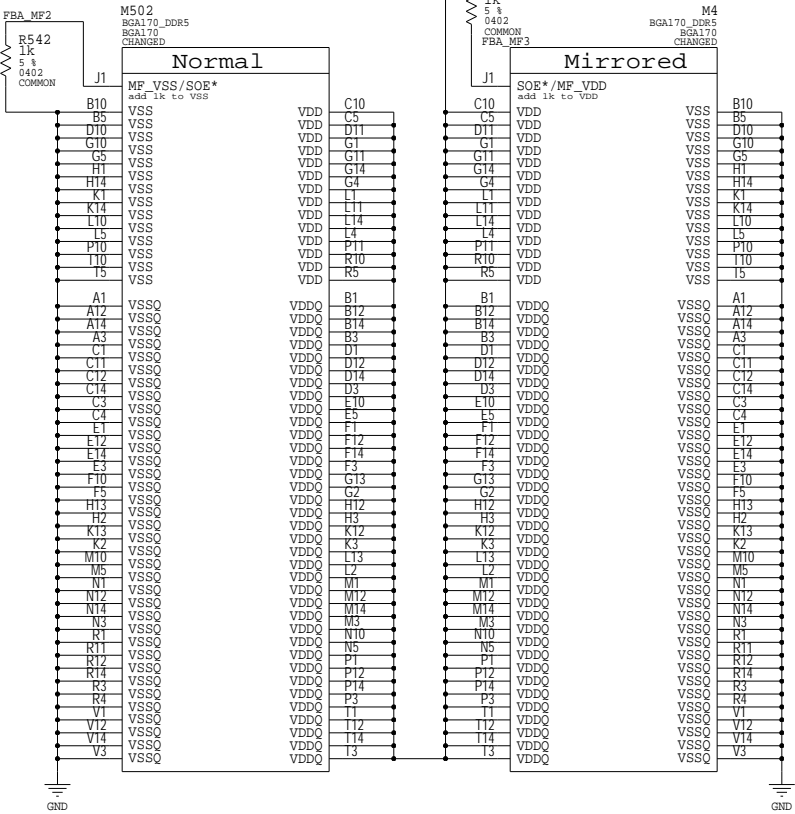
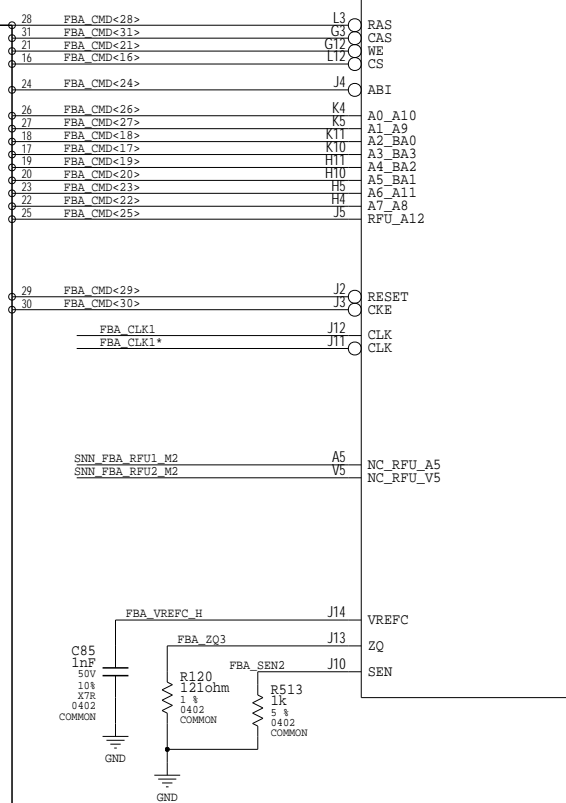
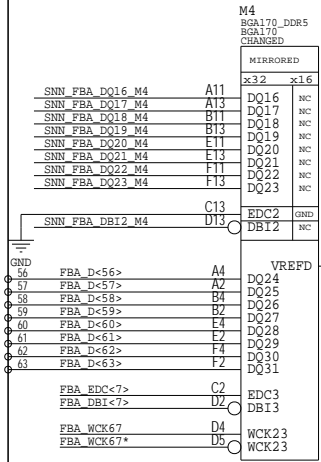
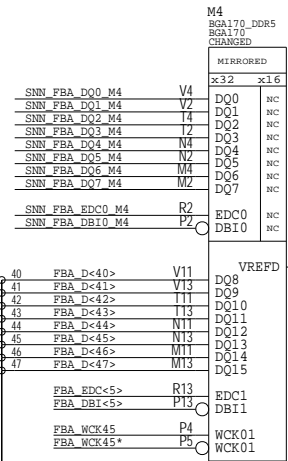
1

2

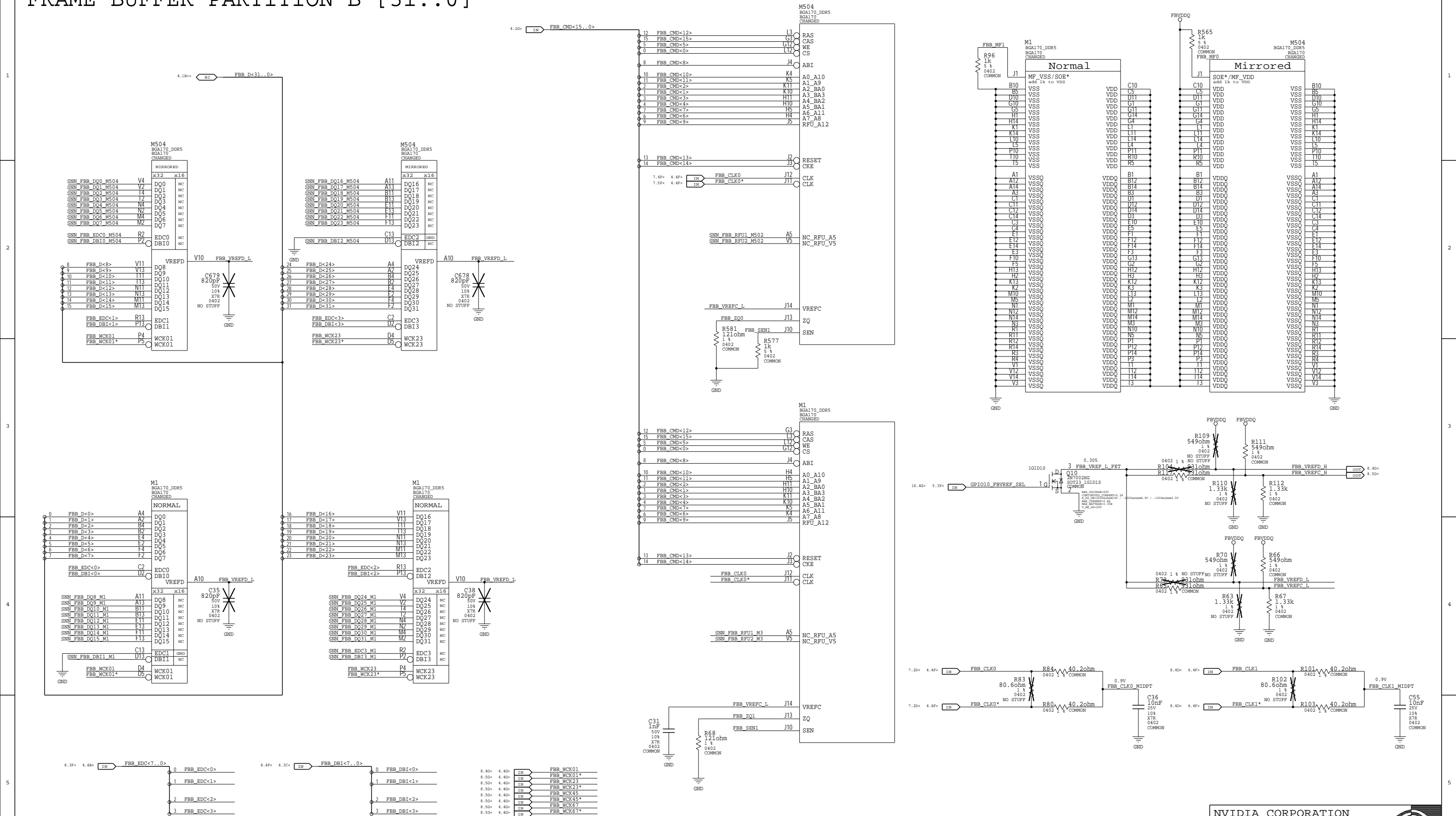
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4

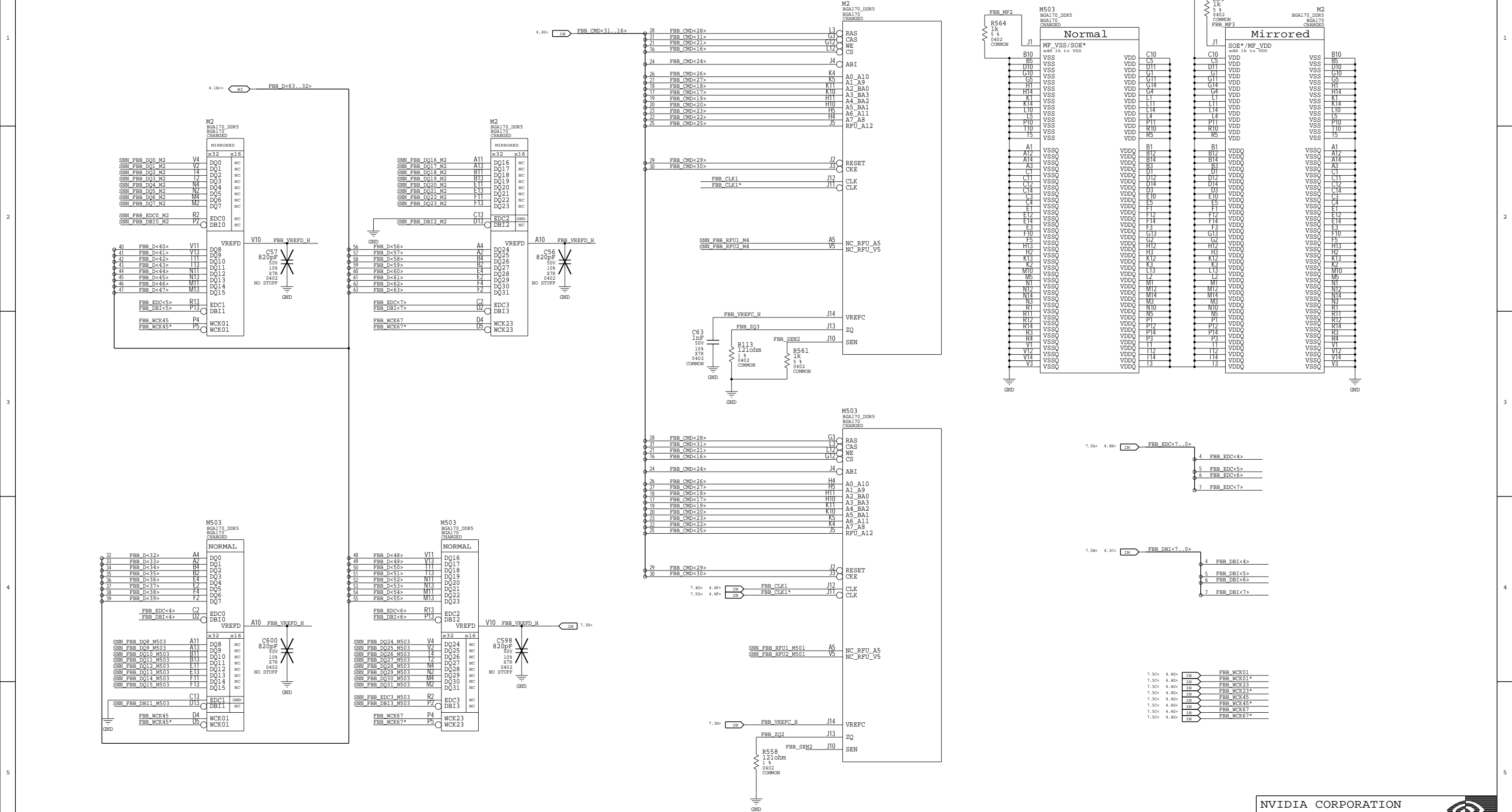
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```
FRAME BUFFER PARTITION B [31..0]
```

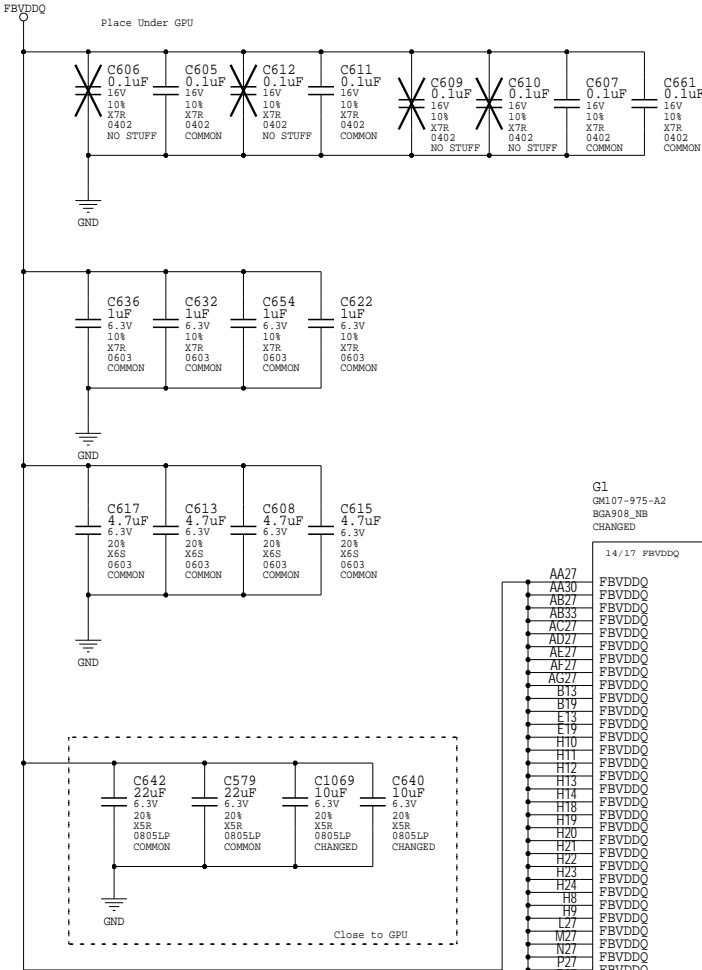


FRAME BUFFER PARTITION B [63..32]



MEMORY DECOUPLING CAPS

0402 x 0.1uF x4(4pcs Option)
0603 x 1uF x4
0603 x 4.7uF x4
0805 X 10uF x2
0805 X 22uF x2



G1
GM107-975-A2
BGA908_NB
CHANGED

14/17 FBVDDQ

- AA27 FBVDDQ
- AB27 FBVDDQ
- AB33 FBVDDQ
- AC27 FBVDDQ
- AE27 FBVDDQ
- AF27 FBVDDQ
- AG27 FBVDDQ
- B13 FBVDDQ
- B19 FBVDDQ
- E13 FBVDDQ
- E19 FBVDDQ
- H10 FBVDDQ
- H11 FBVDDQ
- H12 FBVDDQ
- H13 FBVDDQ
- H14 FBVDDQ
- H18 FBVDDQ
- H19 FBVDDQ
- H20 FBVDDQ
- H21 FBVDDQ
- H22 FBVDDQ
- H23 FBVDDQ
- H24 FBVDDQ
- H8 FBVDDQ
- H9 FBVDDQ
- L27 FBVDDQ
- M27 FBVDDQ
- N27 FBVDDQ
- P27 FBVDDQ
- R27 FBVDDQ
- R30 FBVDDQ
- R33 FBVDDQ
- Y27 FBVDDQ

- B16 FBVDDQ_AON
- E16 FBVDDQ_AON
- H15 FBVDDQ_AON
- H16 FBVDDQ_AON
- V27 FBVDDQ_AON
- W27 FBVDDQ_AON
- W30 FBVDDQ_AON
- W33 FBVDDQ_AON

GM107/GM108

FB_VDDQ_SENSE

FB_GND_SENSE

FB_CAL_PD_VDDQ

FB_CAL_PU_GND

FB_CALTERM_GND

F1

F2

J27

H27

H25

0.100

0.100

FB CAL PD VDDQ

FB CAL PU GND

FB CAL TERM GND

FBVDDQ_SENSE

FBVDD_GND_SENSE

OUT

OUT

FBVDDQ

20.3H<

20.4C<

COMMON

COMMON

COMMON

0402

0402

0402

0402

0402

40.2ohm

40.2ohm

60.4ohm

COMMON

COMMON

COMMON

COMMON

COMMON

COMMON

COMMON

GND

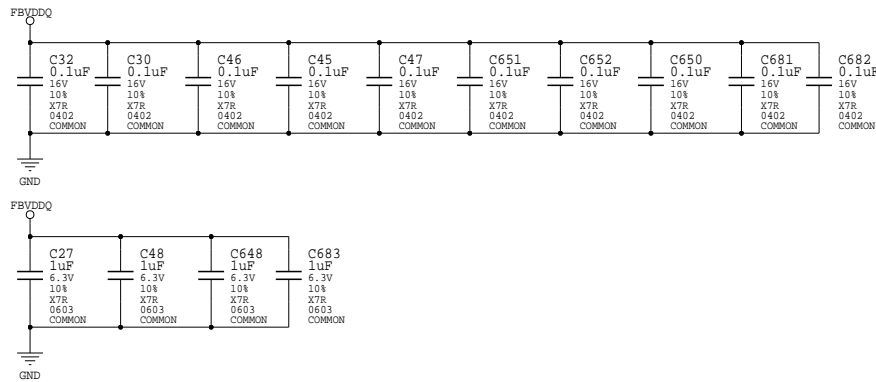
GND

GND

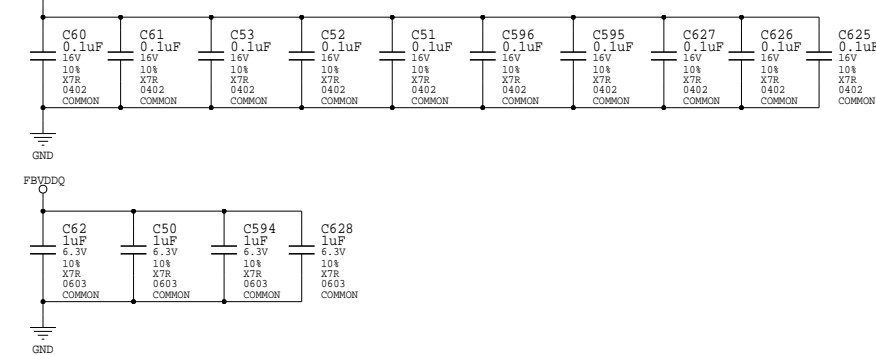
GND

GND

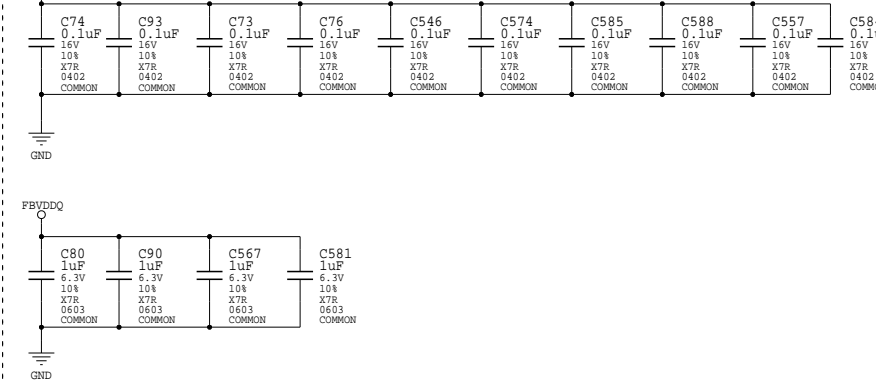
Place Near Partition B Memory



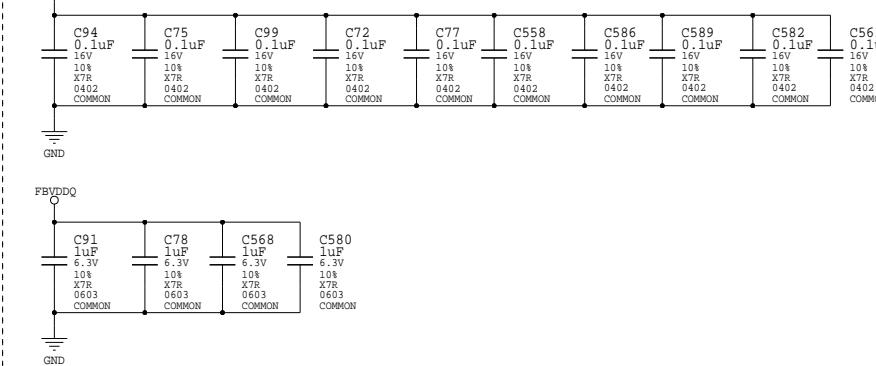
Place Near Partition B Memory



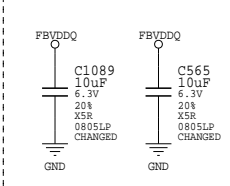
Place Near Partition A Memory



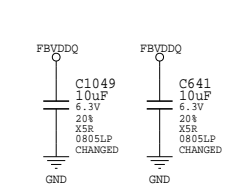
Place Near Partition A Memory



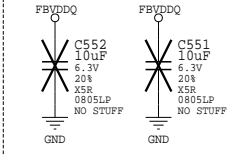
Place Near Partition A Memory



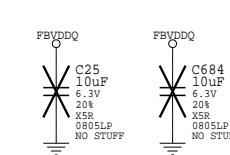
Place Near Partition B Memory



Place as option
If there is space near Partition A



Place as option
If there is space near Partition B



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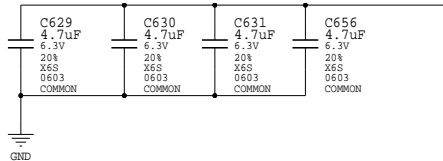
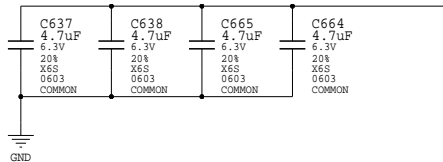
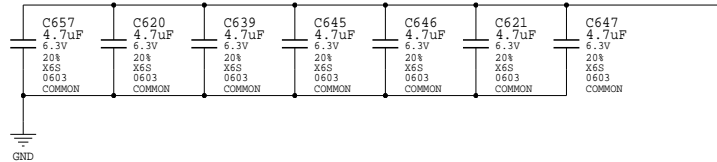
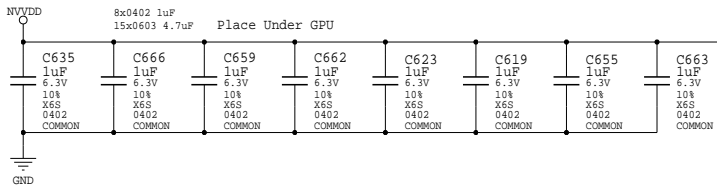
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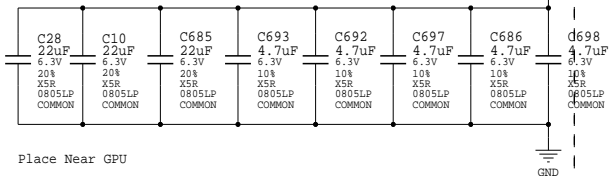
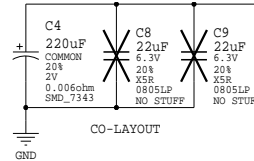
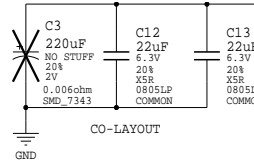
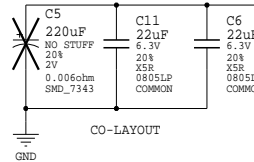
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GPU VDD\DCPLNG\GND

GM107-Under GPU(default)
0603x15x4.7uF X6S
0402x8x1.0uF X6S

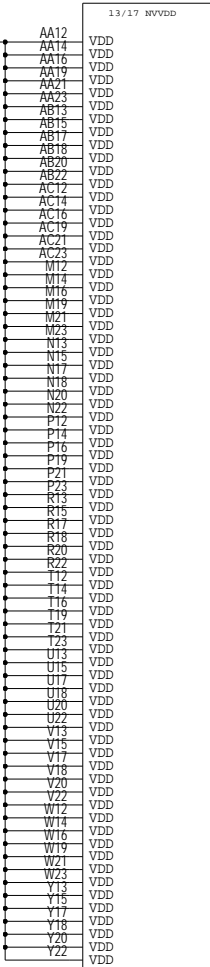


GM107-Near GPU(default)
7 x 0805 22uF X5R
5 x 0805 4.7uF X5R
1x 220uF POSCAP(3 X 7343 Footprint)

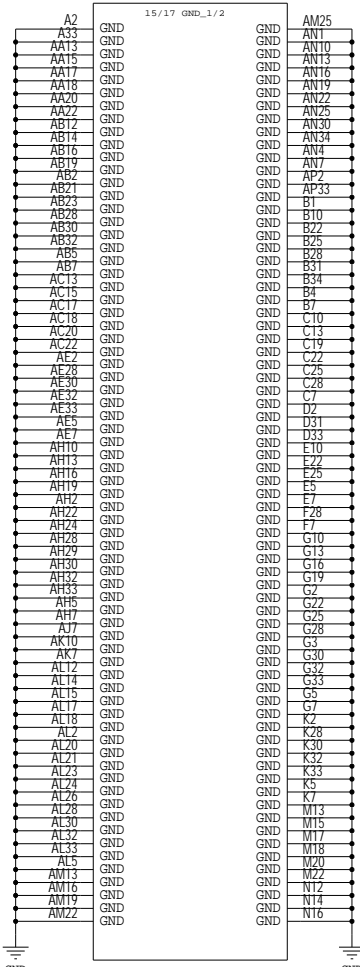


Place Near GPU

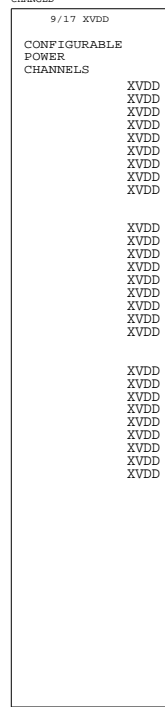
G1
GM107-975-A2
BGA908_NB
CHANGED



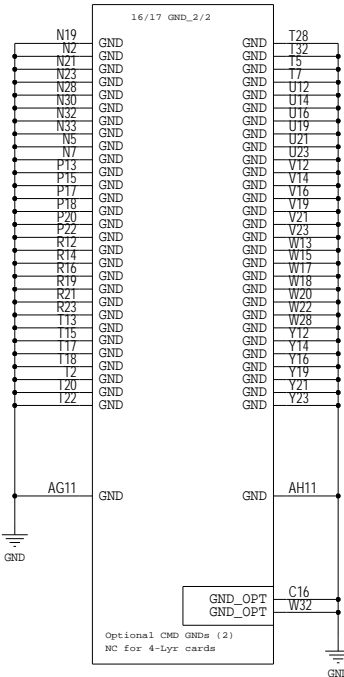
G1
GM107-975-A2
BGA908_NB
CHANGED



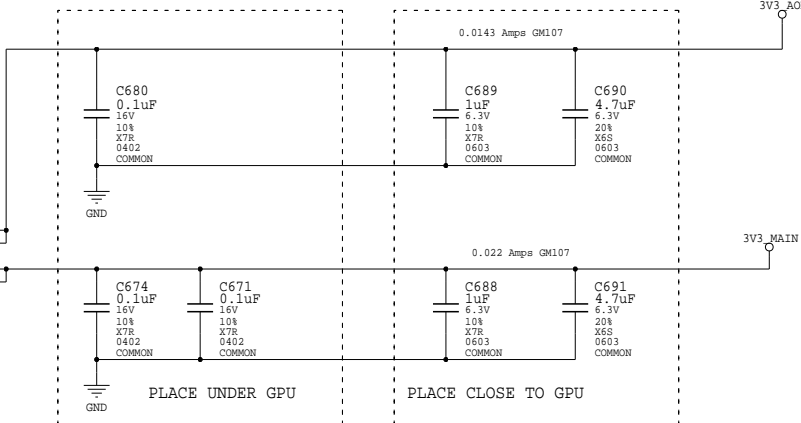
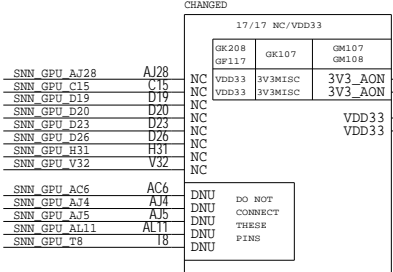
G1
GM107-975-A2
BGA908_NB
CHANGED



G1
GM107-975-A2
BGA908_NB
CHANGED



G1
GM107-975-A2
BGA908_NB
CHANGED



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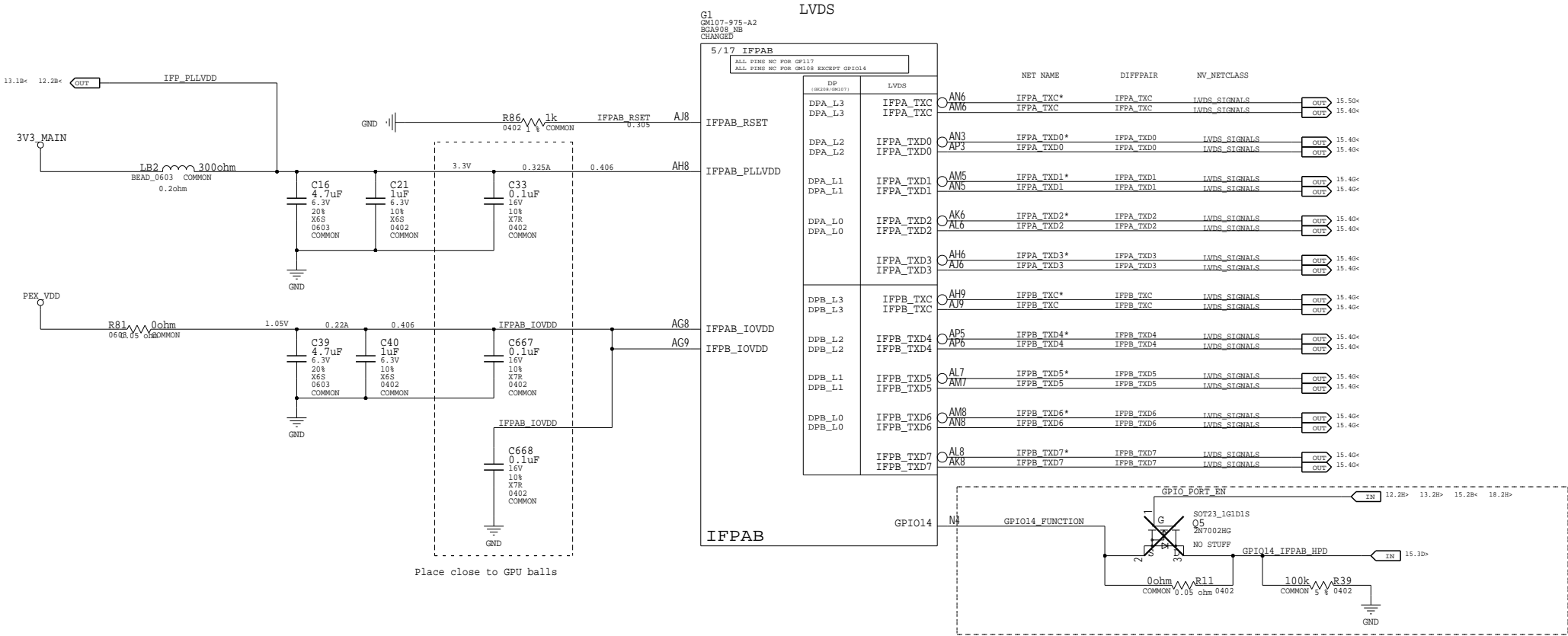
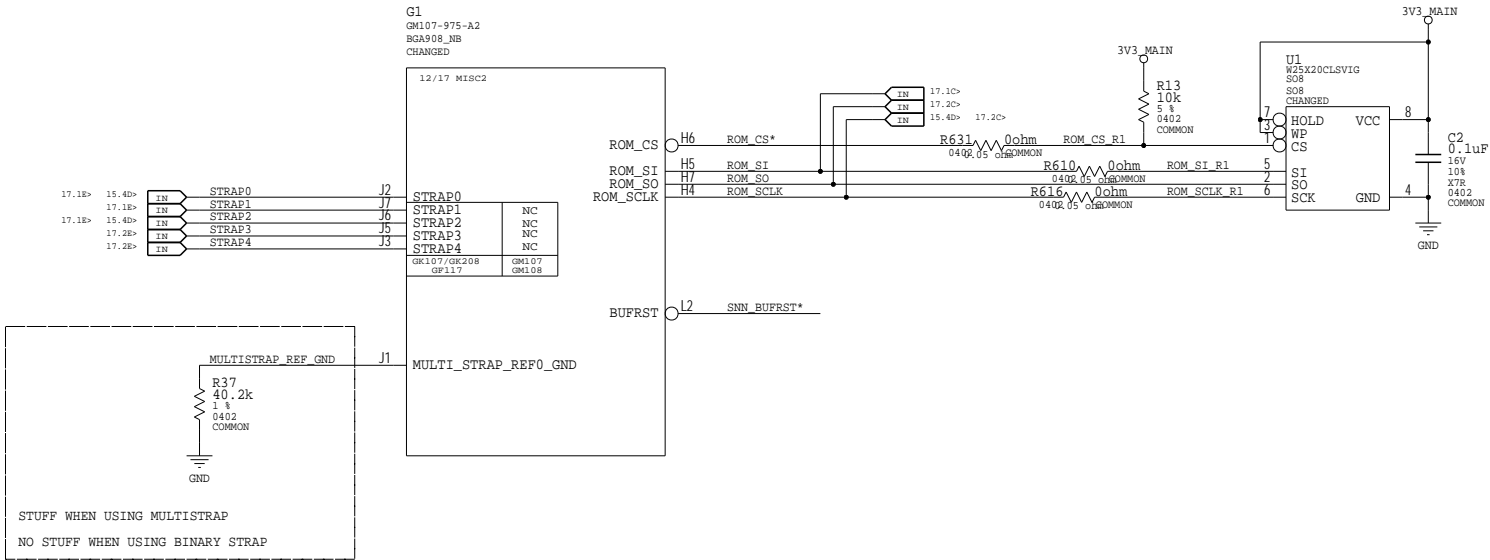
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LVDS, VBIOS



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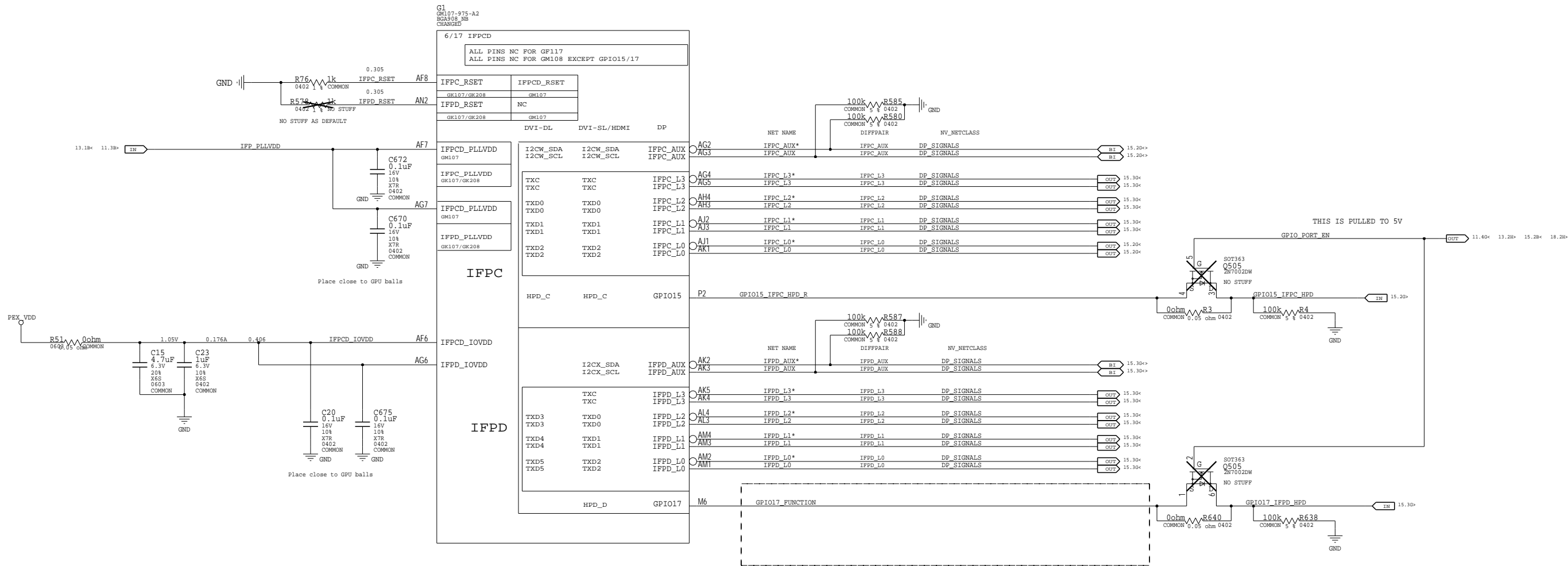
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DP LINKS C,D



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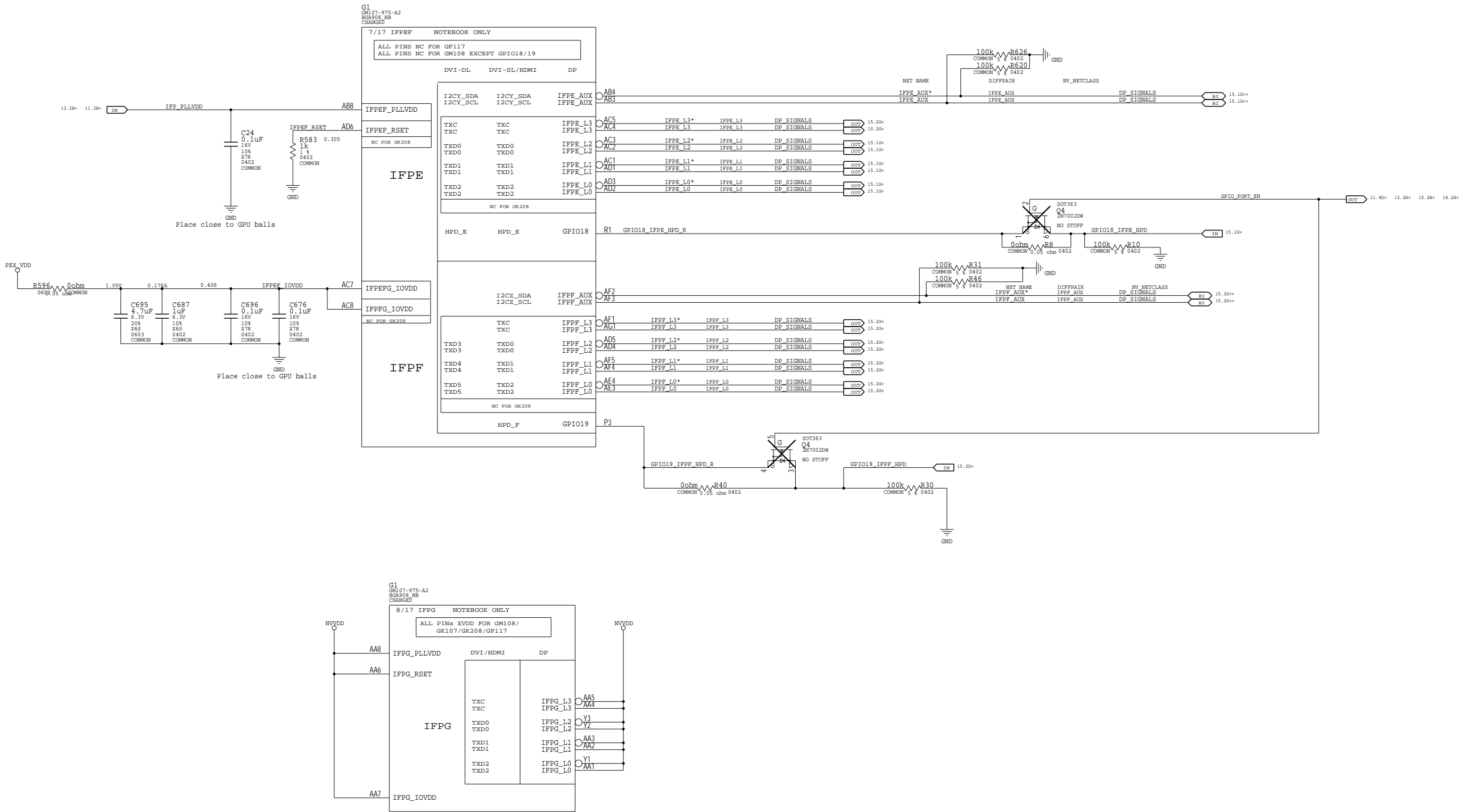
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DP LINKS E,F,G



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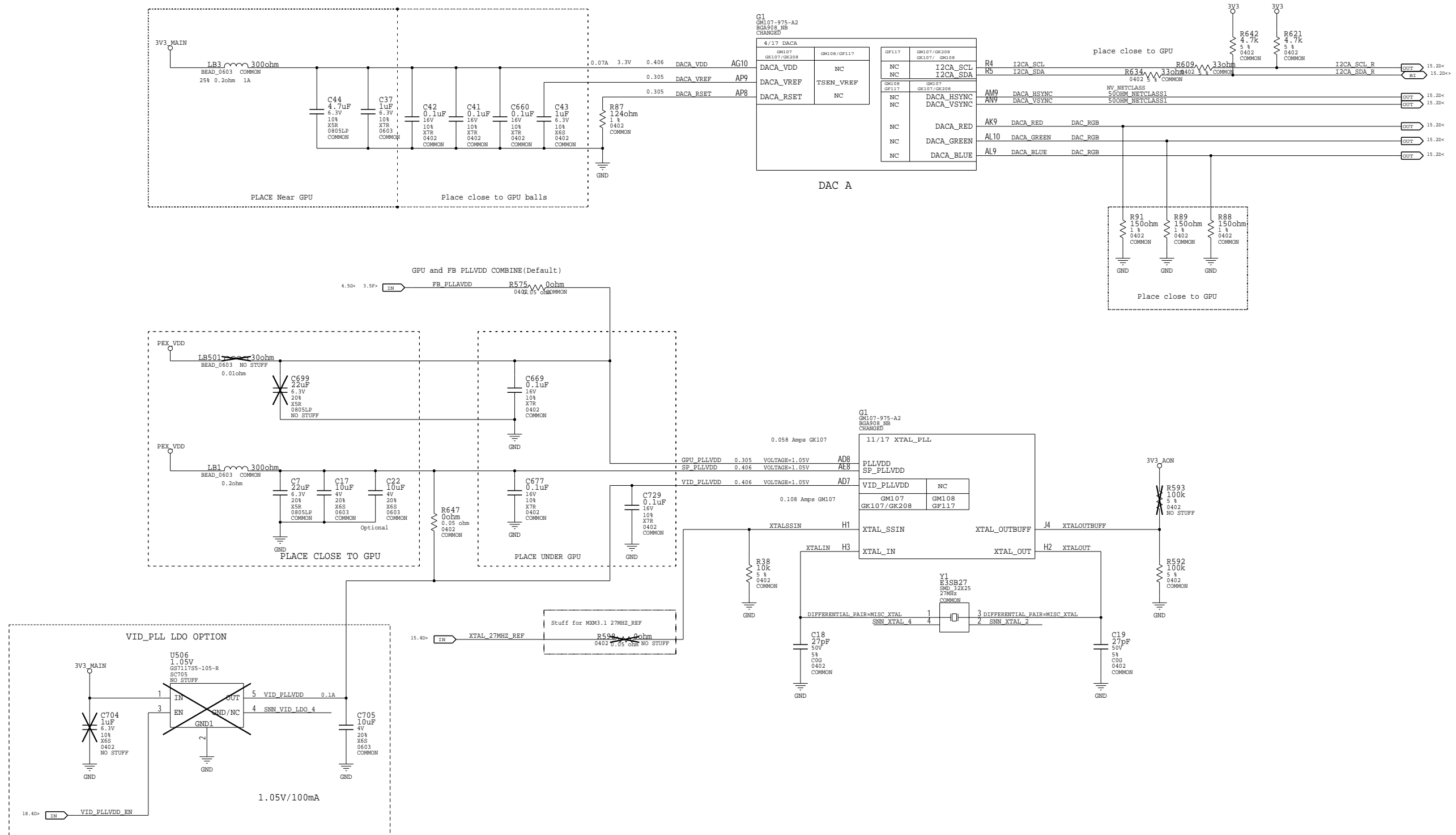
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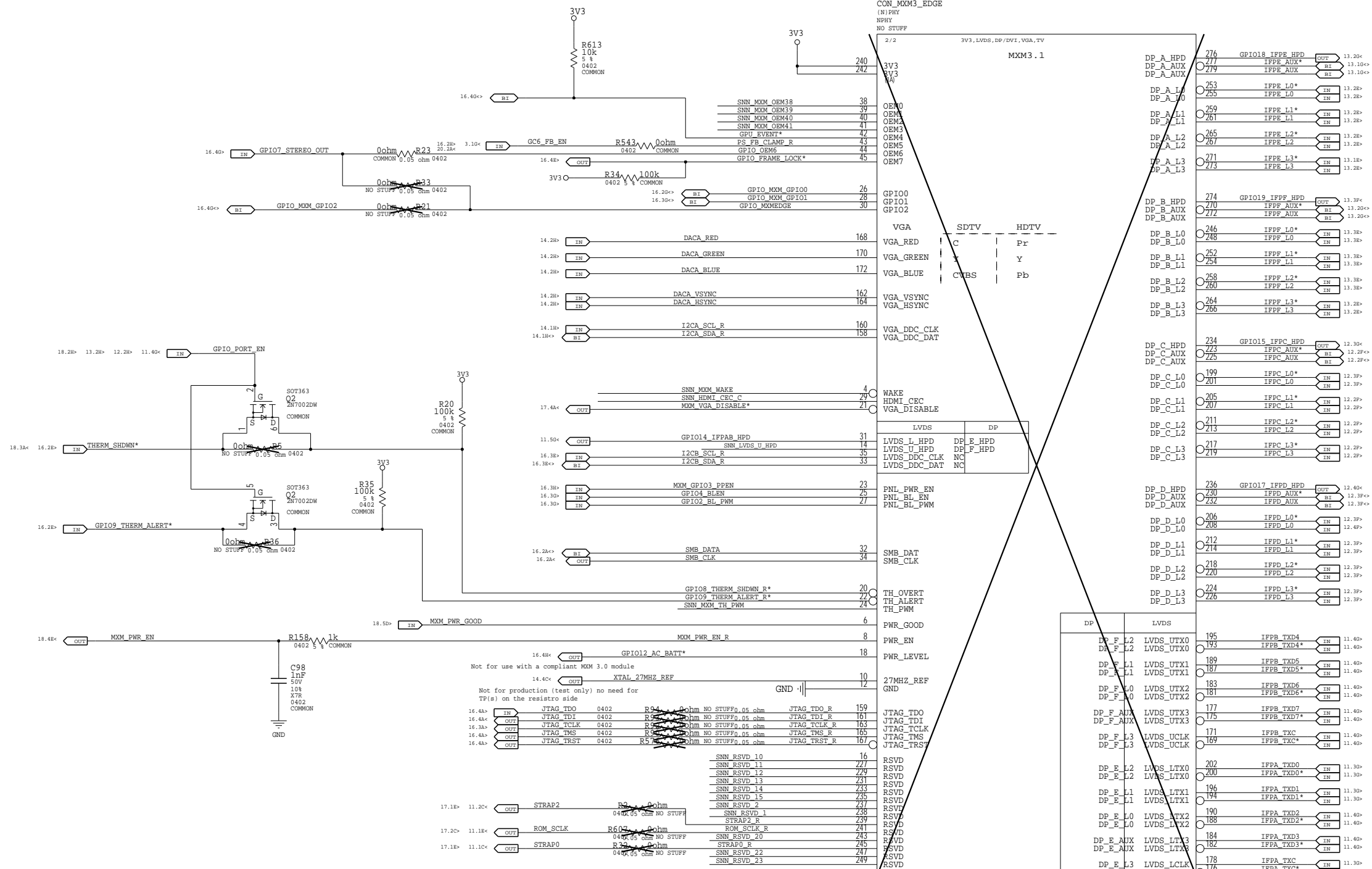
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DACA PLL, CRYSTAL




MXM CONNECTOR, IO-SECTION

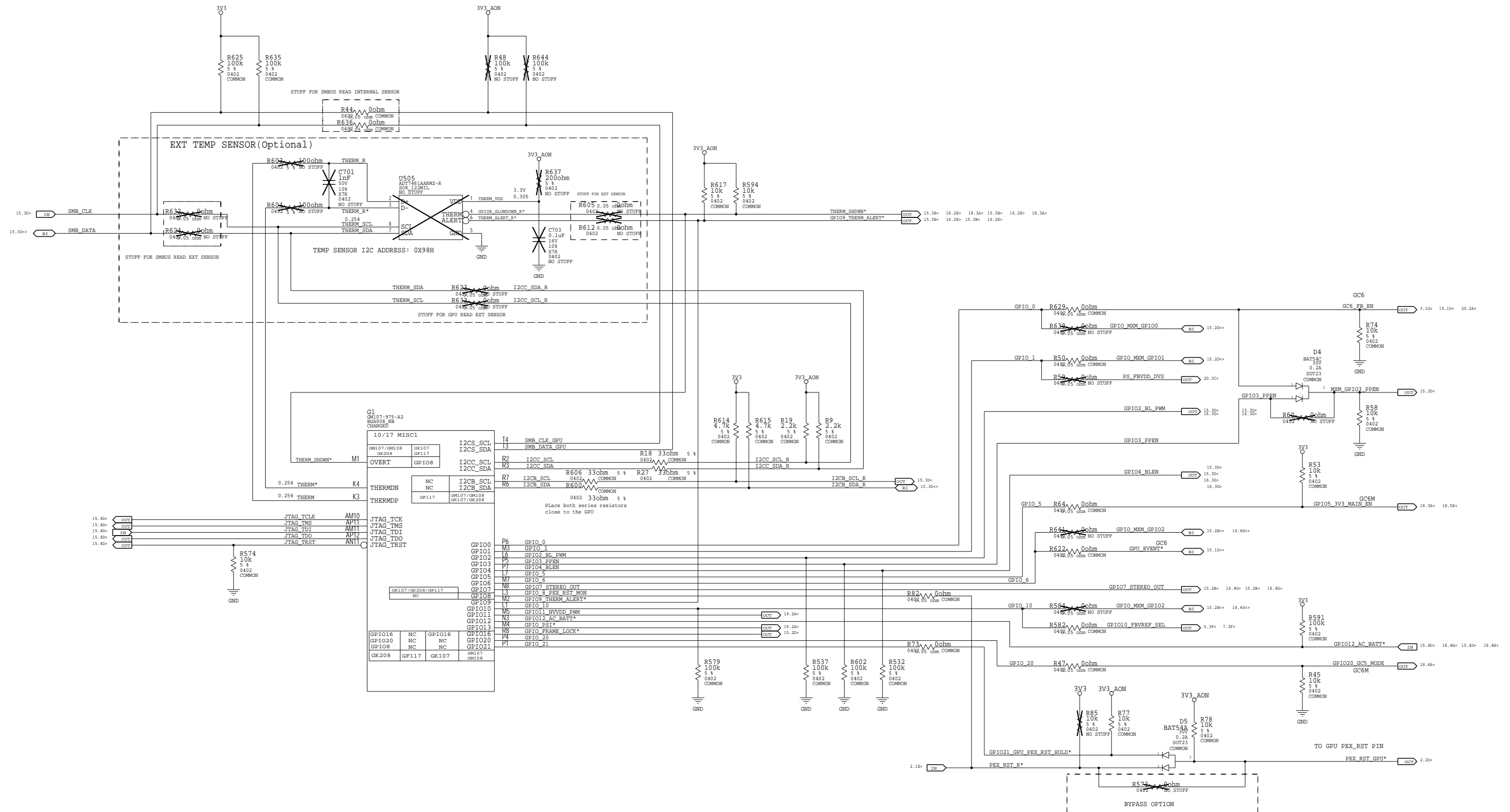


ASSEMBLY	SKU504 GM107 X16 GDDR5 MEMORY
PAGE DETAIL	MXM CONNECTOR, IO-SECTION

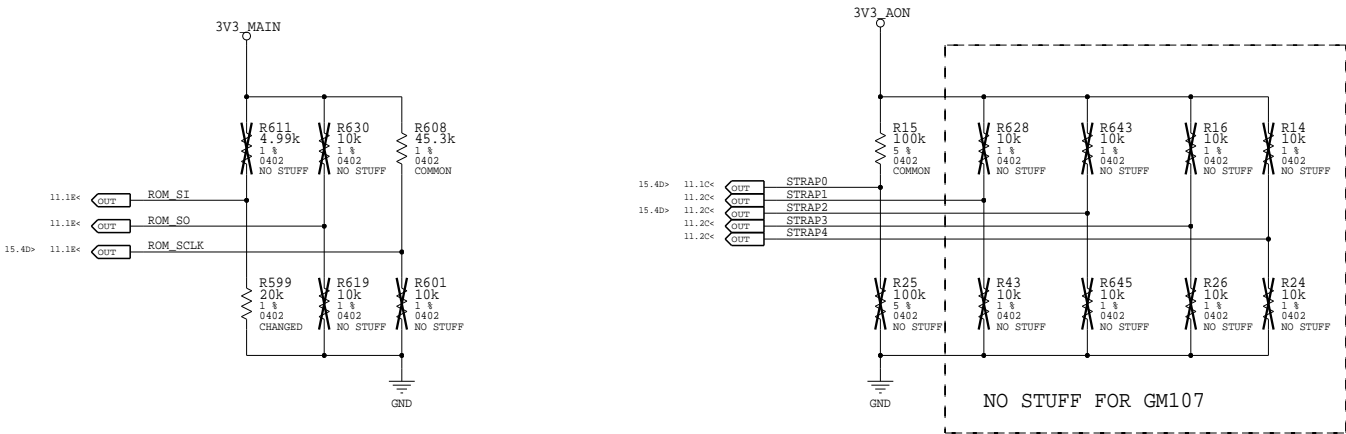
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GPIO, JTAG, TEMP SENSOR



STRAPS AND MOUNTING HOLES



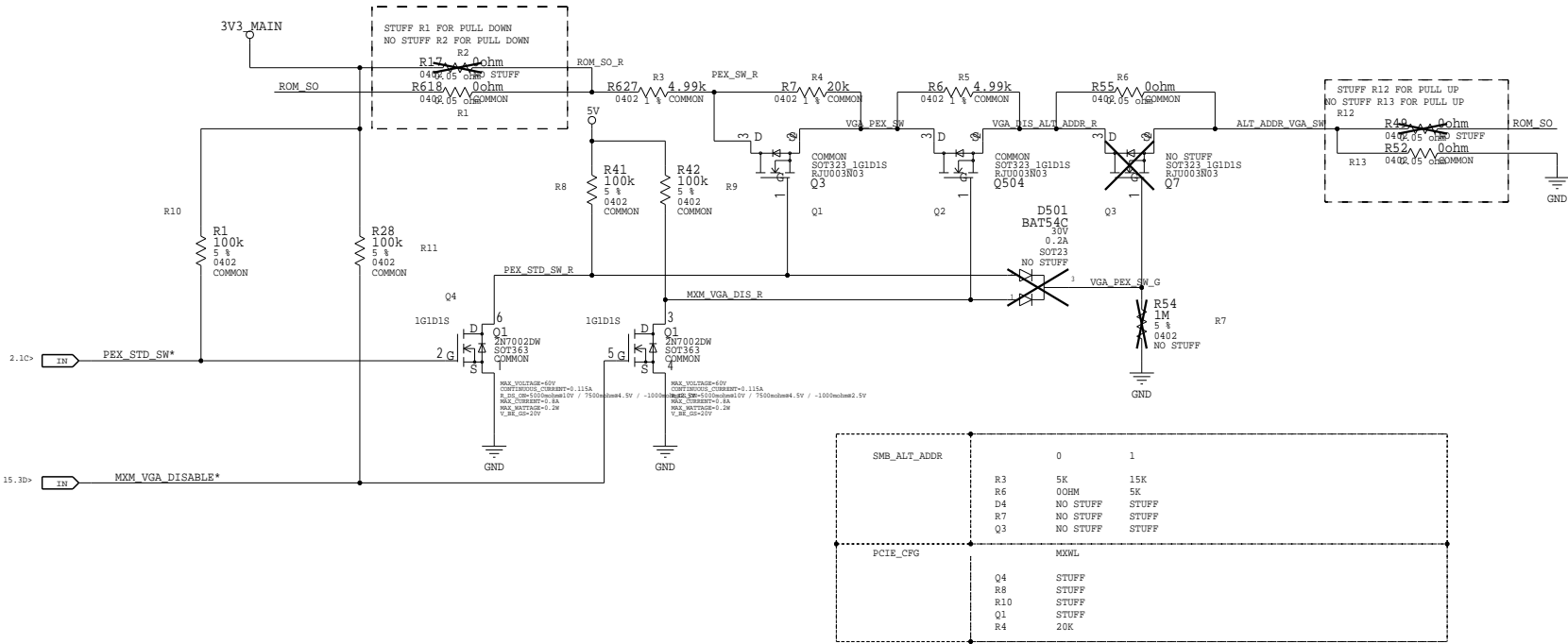
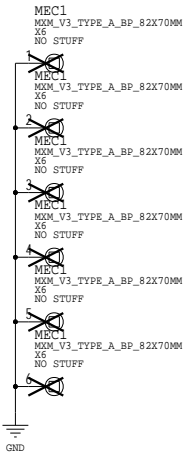
GB4B-128 Straps

Maxwell Bit Signal Values

ROM_SI	03: RAMCFG[3]			
	02: RAMCFG[2]	0011	256Mx16 128bit Samsung	Primary
	01: RAMCFG[1]	0110	256Mx16 128bit Hynix-A	Second
	00: RAMCFG[0]	0100	256Mx16 128bit Elpida	Third
ROM_SO	03: DEVID_SEL	0	DEFAULT	
	02: PCIE_CFG	0	HS	1 LS
	01: SMB_ALT_ADDR	0	DISABLED	1 ENABLED
	00: VGA_DEVICE	0	DISABLED	1 ENABLED
ROM_SCLK	03: SOR3_EXPOSED	0	DISABLED	1 ENABLED
	02: SOR2_EXPOSED	0	DISABLED	1 ENABLED
	01: SOR1_EXPOSED	0	DISABLED	1 ENABLED
	00: SOR0_EXPOSED	0	DISABLED	1 ENABLED
STRAP0				
STRAP1				
STRAP2				
STRAP3				
STRAP4				

Multilevel Straps

0000	4.99K to GND	1000	4.99K to VCC
0001	10K to GND	1001	10K to VCC
0010	15K to GND	1010	15K to VCC
0011	20K to GND	1011	20K to VCC
0100	24.9K to GND	1100	24.9K to VCC
0101	30.1K to GND	1101	30.1K to VCC
0110	34.8K to GND	1110	34.8K to VCC
0111	45.3K to GND	1111	45.3K to VCC



SMB_ALT_ADDR	0	1
	R3	5K 15K
	R6	00HM 5K
	D4	NO STUFF STUFF
PCIE_CFG	R7	NO STUFF STUFF
	Q3	NO STUFF STUFF
	Q4	STUFF
	R8	STUFF
PCIE_CFG	R10	STUFF
	Q1	STUFF
	Q2	STUFF
	R4	20K

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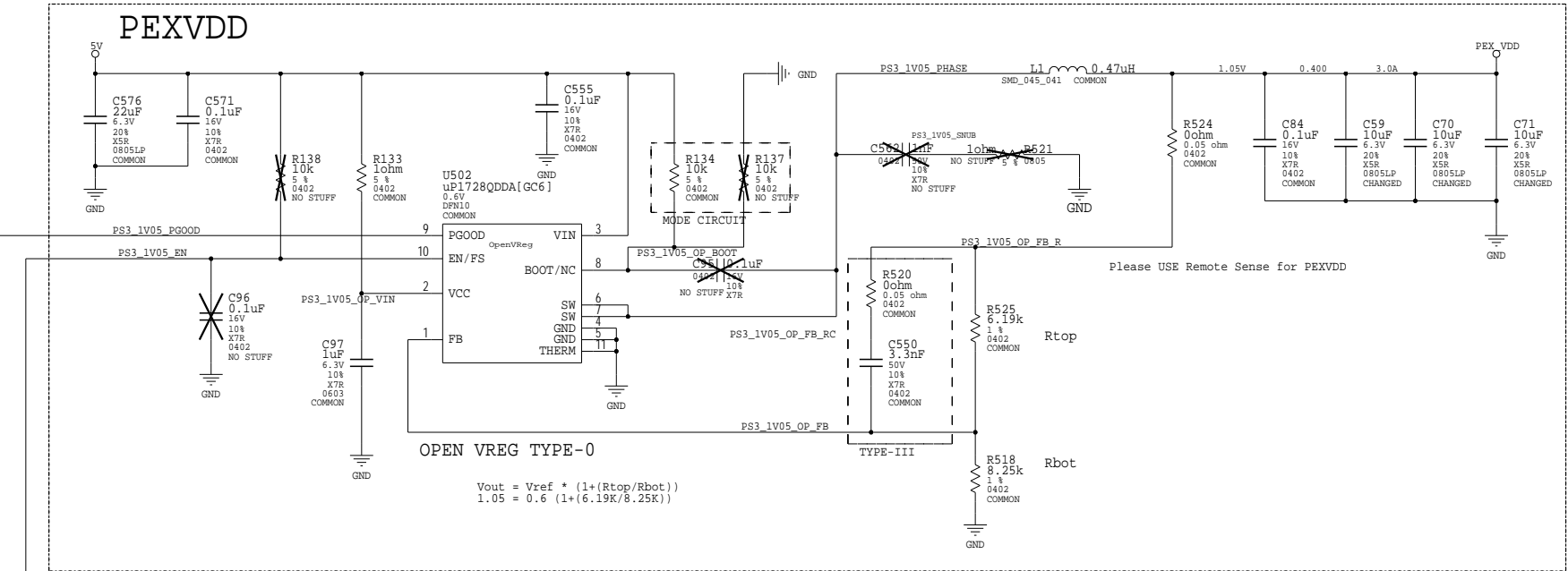
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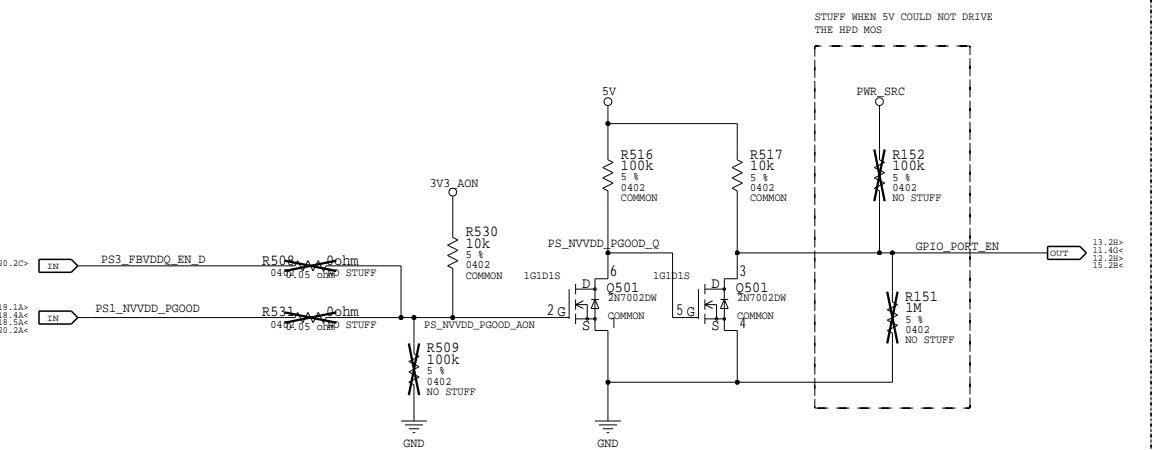
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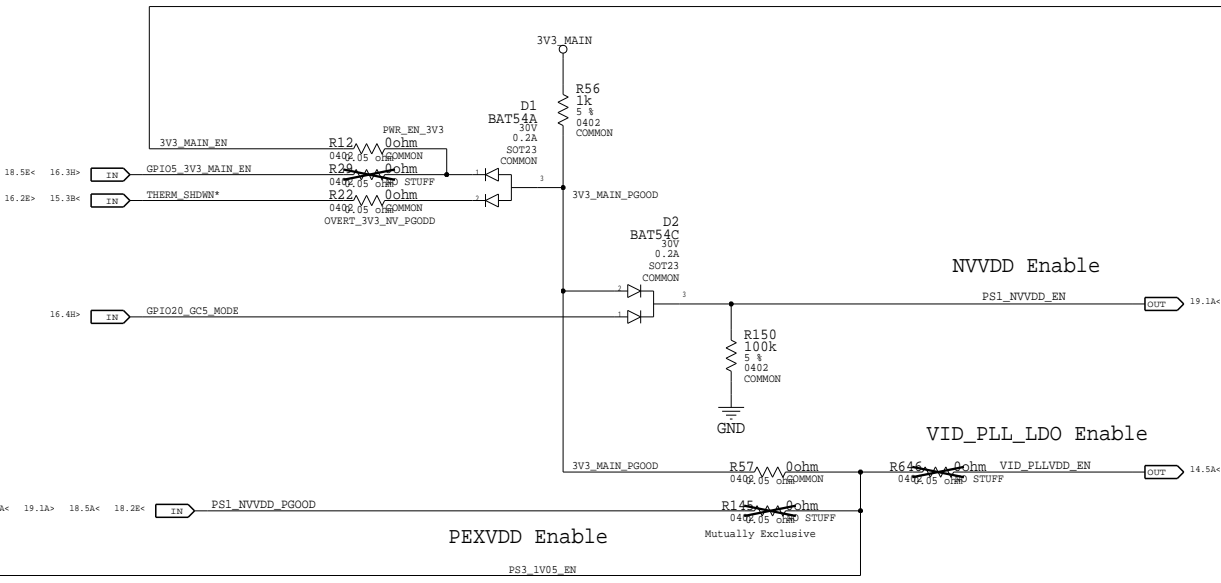
PEXVDD 3V3_AON 3V3_MAIN



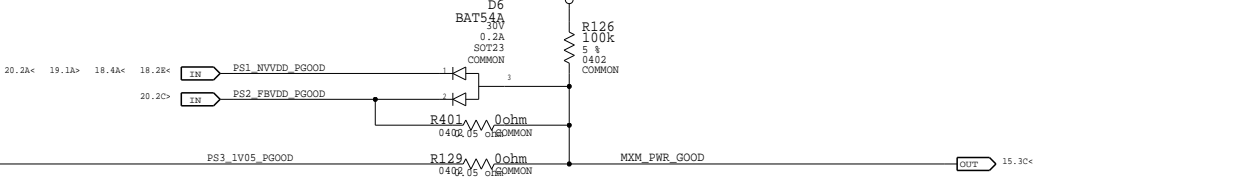
GPIO PROTECT ENABLE



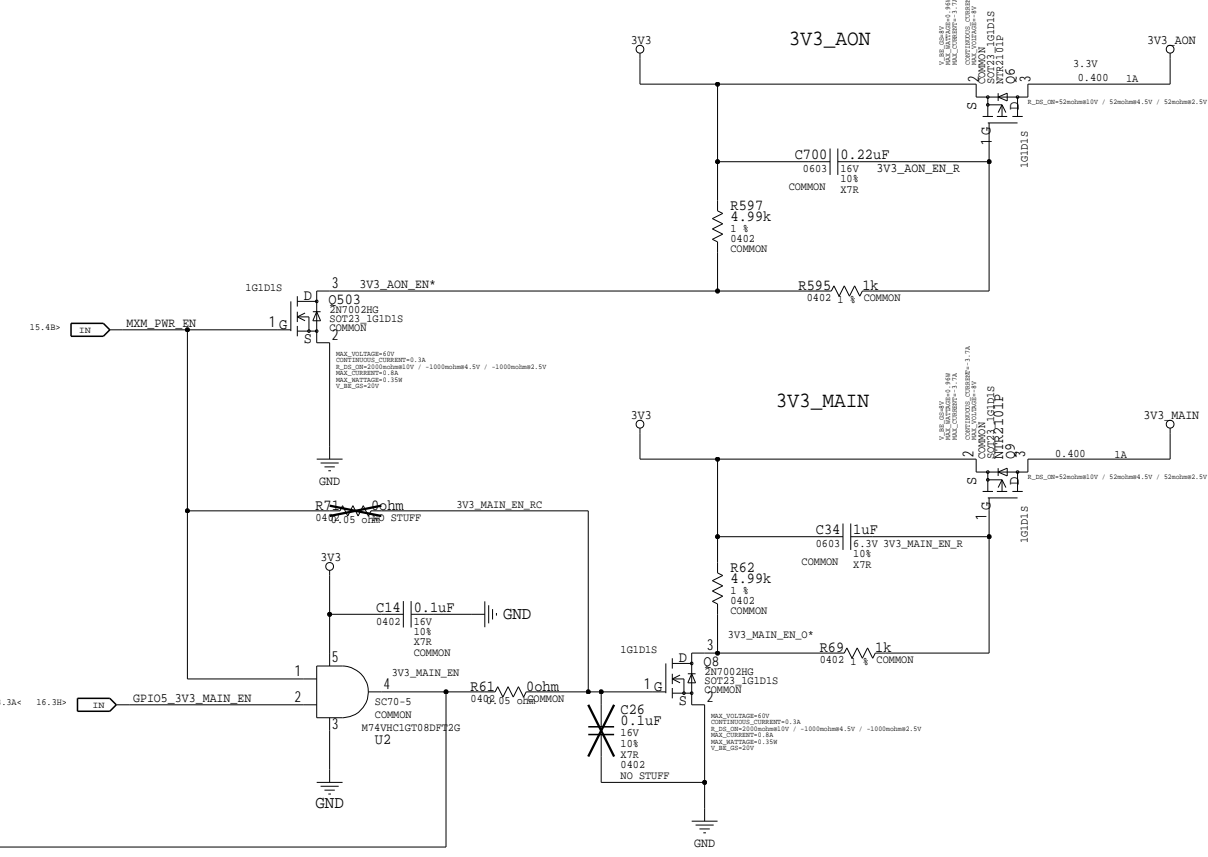
NVVDD&PEXVDD ENABLE



MXM POWER GOOD



3V3_MAIN&3V3_AON ENABLE



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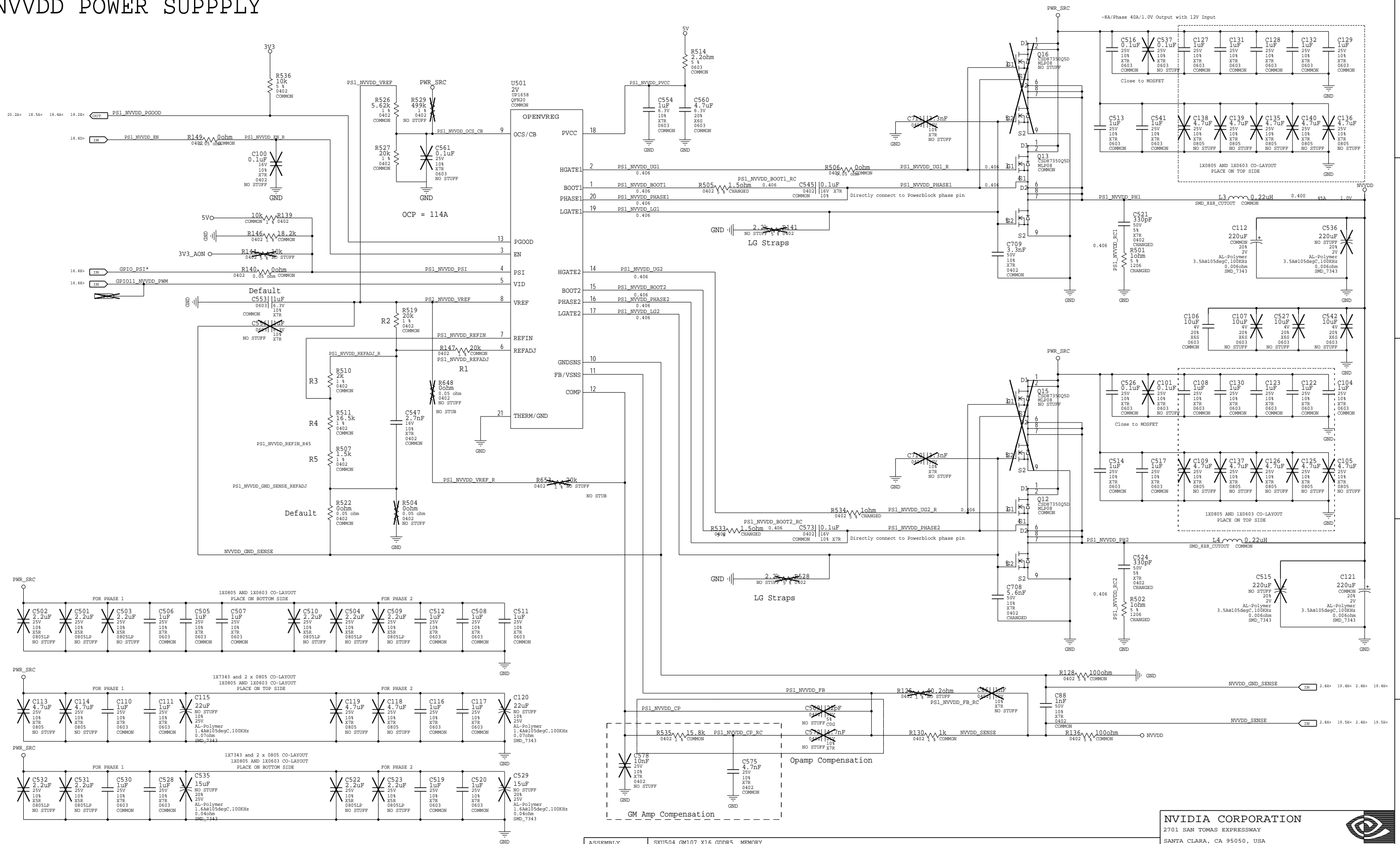
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NVVDD POWER SUPPLY

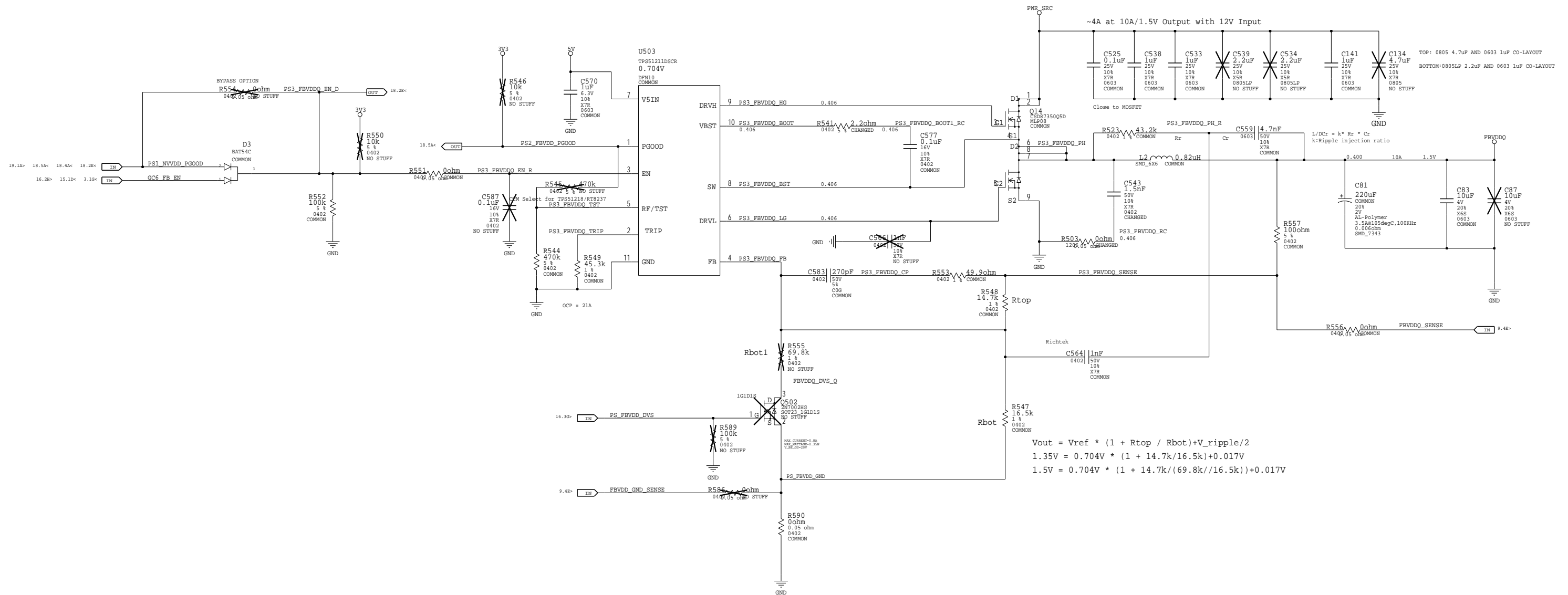


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ASSEMBLY	SKU504 GM107 X16 GDDR5 MEMORY
PAGE DETAIL	NVVDD POWER SUPPLY

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FBVDDQ POWER SUPPLY


$$\begin{aligned} V_{out} &= V_{ref} * (1 + R_{top} / R_{bot}) + V_{ripple}/2 \\ 1.35V &= 0.704V * (1 + 14.7k/16.5k) + 0.017V \\ 1.5V &= 0.704V * (1 + 14.7k/(69.8k//16.5k)) + 0.017V \end{aligned}$$

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