PG110-A00

GP108 64Bit GDDR5 X32
HDMI/DP + DVI-D/DP

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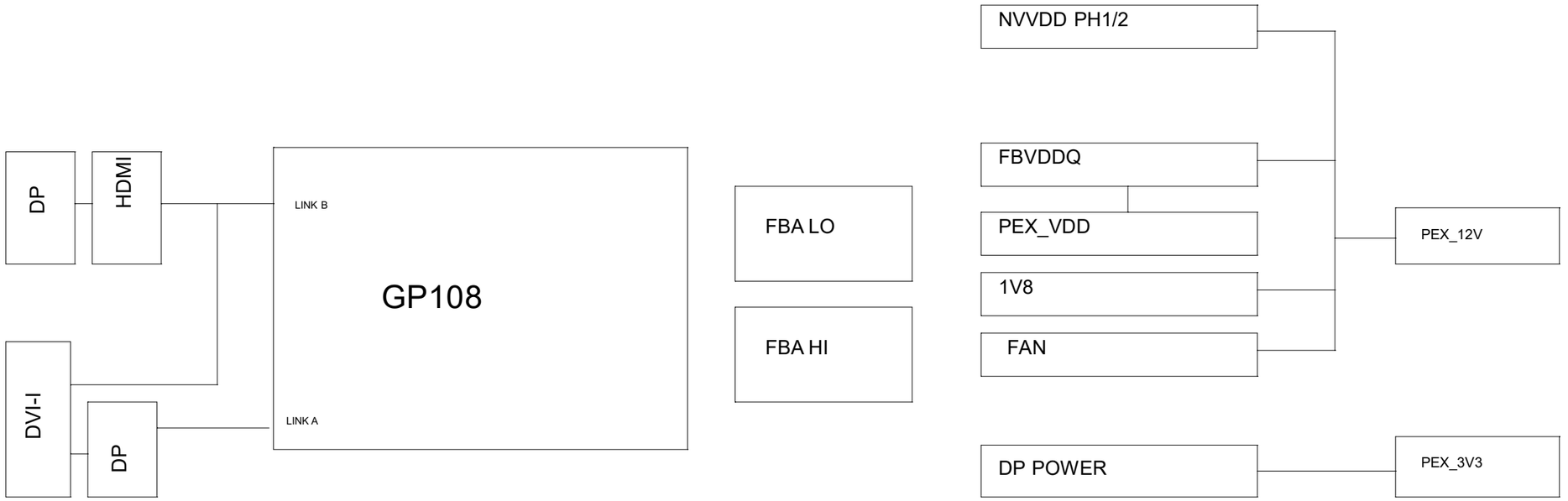
Block Diagram



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PCI Express

CN1
NONPHY-X16
CON_X16
@electro_mechanic.con_pci_express(sym_1):page3_i2
NO STUFF

PLACE DECOUPLING CAPS NEAR PCI-E CONN FINGERS

12V_PEX
C91 10uF 16V 10% X6S 0805 NO STUFF
C93 10uF 16V 10% X6S 0805 NO STUFF
C695 1uF 16V 10% X7R 0603 COMMON
C83 0.1uF 16V 10% X7R 0402 COMMON
5A
B1 +12V
B2 +12V
A2 +12V
A3 +12V
B3 +12V/RSVD
1A
B8 +3V3
A9 +3V3
A10 +3V3
B10 +3V3AUX
3V3_PEX
C678 10uF 16V 10% X6S 0805 NO STUFF
C96 1uF 16V 10% X7R 0603 COMMON
C682 0.1uF 16V 10% X7R 0402 COMMON
PEX_PRSNT*
A1 PRSNT1
PEX_B12
B12 RSVD
B4 GND
A4 GND
B7 GND
A12 GND
B13 GND
A15 GND
B16 GND
B18 GND
A18 GND
POWER_BRAKE*
OUT
12
R94 0ohm 0402 0.05W 5% NO STUFF
R97 0ohm 0402 0.05W 5% NO STUFF
PEX_B30
B30 RSVD
END OF X1
A20 GND
B22 GND
A24 GND
B26 GND
A28 GND
B29 GND
A31 GND
B32 GND
END OF X4
12V_PEX
nv_cap
C94 1uF 16V 20% X6S 0603W COMMON
C90 1uF 16V 20% X6S 0603W COMMON
CO-LAY WITH 0805 CAP
A34 GND
B36 GND
A38 GND
B40 GND
A42 GND
B44 GND
A46 GND
B47 GND
B49 GND
A49 GND
END OF X8
B81 PRSNT2
A51 GND
B53 GND
A54 GND
B56 GND
A58 GND
B60 GND
A62 GND
B64 GND
A66 GND
B68 GND
A70 GND
B72 GND
A74 GND
B76 GND
A78 GND
B80 GND
A82 GND
END OF X16

TRST* JTAG1 B9 PEX_TRST*
TCLK JTAG2 A5 PEX_TCLK
TDI JTAG3 A6 PEX_TDI
TDO JTAG4 B7 PEX_TDO
TMS JTAG5 A8 PEX_TMS
R136 0ohm 0402 0.05W COMMON
R133 0ohm 0402 0.05W NO STUFF JTAG_TRST* IN
R134 0ohm 0402 0.05W NO STUFF JTAG_TCLK IN
R132 0ohm 0402 0.05W NO STUFF JTAG_TDI IN
R135 0ohm 0402 0.05W NO STUFF JTAG_TDO OUT
R131 0ohm 0402 0.05W NO STUFF JTAG_TMS IN
12

3V3_PEX
R88 100k 5% 0402 NO STUFF
R89 100k 5% 0402 NO STUFF
SMCLK B5 PEX_SMCLK 12 OUT
SMDAT B6 PEX_SMDAT 12 BI

1V8
C677 0.1uF 16V 10% X7R 0402 COMMON
U502
@logic:u_and_2in(sym_1):page3_i64
SC70-5 COMMON
R541 100k 5% 0402 COMMON
PERST A11 PEX_RST*
R1144 0ohm 0402 0.05W NO STUFF

	NET	DIFFPAIR	NV_NETCLASS			
REFCLK	A13 PEX_REFCLK	PEX_REFCLK	PEXGEN3_SIGNALS			
REFCLK	A14 PEX_REFCLK*	PEX_REFCLK	PEXGEN3_SIGNALS			
PERP0	A16 PEX_TX0	PEX_TX0	PEXGEN3_SIGNALS	C676 0.22uF 0402 16V COMMON	PEX_TX0	AC9 PEX_TX0
PERN0	A17 PEX_TX0*	PEX_TX0	PEXGEN3_SIGNALS	C675 0.22uF 0402 16V COMMON	PEX_TX0*	AB9 PEX_TX0
PETP0	B14 PEX_RX0	PEX_RX0	PEXGEN3_SIGNALS			AG6 PEX_RX0
PETN0	B15 PEX_RX0*	PEX_RX0	PEXGEN3_SIGNALS			AG7 PEX_RX0
PERP1	A21 PEX_TX1	PEX_TX1	PEXGEN3_SIGNALS	C674 0.22uF 0402 16V COMMON	PEX_TX1	AB10 PEX_TX1
PERN1	A22 PEX_TX1*	PEX_TX1	PEXGEN3_SIGNALS	C673 0.22uF 0402 16V COMMON	PEX_TX1*	AC10 PEX_TX1
PETP1	B19 PEX_RX1	PEX_RX1	PEXGEN3_SIGNALS			AF7 PEX_RX1
PETN1	B20 PEX_RX1*	PEX_RX1	PEXGEN3_SIGNALS			AE7 PEX_RX1
PERP2	A25 PEX_TX2	PEX_TX2	PEXGEN3_SIGNALS	C672 0.22uF 0402 16V COMMON	PEX_TX2	AD11 PEX_TX2
PERN2	A26 PEX_TX2*	PEX_TX2	PEXGEN3_SIGNALS	C671 0.22uF 0402 16V COMMON	PEX_TX2*	AC11 PEX_TX2
PETP2	B23 PEX_RX2	PEX_RX2	PEXGEN3_SIGNALS			AE9 PEX_RX2
PETN2	B24 PEX_RX2*	PEX_RX2	PEXGEN3_SIGNALS			AF9 PEX_RX2
PERP3	A29 PEX_TX3	PEX_TX3	PEXGEN3_SIGNALS	C663 0.22uF 0402 16V COMMON	PEX_TX3	AC12 PEX_TX3
PERN3	A30 PEX_TX3*	PEX_TX3	PEXGEN3_SIGNALS	C662 0.22uF 0402 16V COMMON	PEX_TX3*	AB12 PEX_TX3
PETP3	B27 PEX_RX3	PEX_RX3	PEXGEN3_SIGNALS			AG9 PEX_RX3
PETN3	B28 PEX_RX3*	PEX_RX3	PEXGEN3_SIGNALS			AG10 PEX_RX3
PERP4	A35 SNN_PEX_TX4				SNN_PEX_TX4	AB13 PEX_TX4
PERN4	A36 SNN_PEX_TX4*				SNN_PEX_TX4*	AC13 PEX_TX4
PETP4	B33 SNN_PEX_RX4				SNN_PEX_RX4	AF10 PEX_RX4
PETN4	B34 SNN_PEX_RX4*				SNN_PEX_RX4*	AE10 PEX_RX4
PERP5	A39 SNN_PEX_TX5				SNN_PEX_TX5	AD14 PEX_TX5
PERN5	A40 SNN_PEX_TX5*				SNN_PEX_TX5*	AC14 PEX_TX5
PETP5	B37 SNN_PEX_RX5				SNN_PEX_RX5	AE12 PEX_RX5
PETN5	B38 SNN_PEX_RX5*				SNN_PEX_RX5*	AF12 PEX_RX5
PERP6	A43 SNN_PEX_TX6				SNN_PEX_TX6	AC15 PEX_TX6
PERN6	A44 SNN_PEX_TX6*				SNN_PEX_TX6*	AB15 PEX_TX6
PETP6	B41 SNN_PEX_RX6				SNN_PEX_RX6	AG12 PEX_RX6
PETN6	B42 SNN_PEX_RX6*				SNN_PEX_RX6*	AG13 PEX_RX6
PERP7	A47 SNN_PEX_TX7				SNN_PEX_TX7	AB16 PEX_TX7
PERN7	A48 SNN_PEX_TX7*				SNN_PEX_TX7*	AC16 PEX_TX7
PETP7	B45 SNN_PEX_RX7				SNN_PEX_RX7	AF13 PEX_RX7
PETN7	B46 SNN_PEX_RX7*				SNN_PEX_RX7*	AE13 PEX_RX7
PERP8	A52 SNN_PEX_TX8				SNN_PEX_TX8	AD17 PEX_TX8
PERN8	A53 SNN_PEX_TX8*				SNN_PEX_TX8*	AC17 PEX_TX8
PETP8	B50 SNN_PEX_RX8				SNN_PEX_RX8	AE15 PEX_RX8
PETN8	B51 SNN_PEX_RX8*				SNN_PEX_RX8*	AF15 PEX_RX8
PERP9	A56 SNN_PEX_TX9				SNN_PEX_TX9	AC18 PEX_TX9
PERN9	A57 SNN_PEX_TX9*				SNN_PEX_TX9*	AB18 PEX_TX9
PETP9	B54 SNN_PEX_RX9				SNN_PEX_RX9	AG15 PEX_RX9
PETN9	B55 SNN_PEX_RX9*				SNN_PEX_RX9*	AG16 PEX_RX9
PERP10	A60 SNN_PEX_TX10				SNN_PEX_TX10	AB19 PEX_TX10
PERN10	A61 SNN_PEX_TX10*				SNN_PEX_TX10*	AC19 PEX_TX10
PETP10	B58 SNN_PEX_RX10				SNN_PEX_RX10	AF16 PEX_RX10
PETN10	B59 SNN_PEX_RX10*				SNN_PEX_RX10*	AE16 PEX_RX10
PERP11	A64 SNN_PEX_TX11				SNN_PEX_TX11	AD20 PEX_TX11
PERN11	A65 SNN_PEX_TX11*				SNN_PEX_TX11*	AC20 PEX_TX11
PETP11	B62 SNN_PEX_RX11				SNN_PEX_RX11	AE18 PEX_RX11
PETN11	B63 SNN_PEX_RX11*				SNN_PEX_RX11*	AF18 PEX_RX11
PERP12	A68 SNN_PEX_TX12				SNN_PEX_TX12	AC21 PEX_TX12
PERN12	A69 SNN_PEX_TX12*				SNN_PEX_TX12*	AB21 PEX_TX12
PETP12	B66 SNN_PEX_RX12				SNN_PEX_RX12	AG18 PEX_RX12
PETN12	B67 SNN_PEX_RX12*				SNN_PEX_RX12*	AG19 PEX_RX12
PERP13	A72 SNN_PEX_TX13				SNN_PEX_TX13	AD23 PEX_TX13
PERN13	A73 SNN_PEX_TX13*				SNN_PEX_TX13*	AE23 PEX_TX13
PETP13	B70 SNN_PEX_RX13				SNN_PEX_RX13	AF19 PEX_RX13
PETN13	B71 SNN_PEX_RX13*				SNN_PEX_RX13*	AE19 PEX_RX13
PERP14	A76 SNN_PEX_TX14				SNN_PEX_TX14	AF24 PEX_TX14
PERN14	A77 SNN_PEX_TX14*				SNN_PEX_TX14*	AE24 PEX_TX14
PETP14	B74 SNN_PEX_RX14				SNN_PEX_RX14	AE21 PEX_RX14
PETN14	B75 SNN_PEX_RX14*				SNN_PEX_RX14*	AF21 PEX_RX14
PERP15	A80 SNN_PEX_TX15				SNN_PEX_TX15	AG24 PEX_TX15
PERN15	A81 SNN_PEX_TX15*				SNN_PEX_TX15*	AG25 PEX_TX15
PETP15	B78 SNN_PEX_RX15				SNN_PEX_RX15	AG21 PEX_RX15
PETN15	B79 SNN_PEX_RX15*				SNN_PEX_RX15*	AG22 PEX_RX15

12V_PEX
C84 1uF 16V 10% X7R 0603 COMMON
C86 1uF 16V 10% X7R 0603 COMMON
0.400
C693 1uF 16V 10% X7R 0603 COMMON
C694 1uF 16V 10% X7R 0603 COMMON
3V3_PEX
C684 1uF 6.3V 10% X6S 0402 COMMON
C681 1uF 6.3V 10% X6S 0402 COMMON
0.400
C679 1uF 16V 10% X7R 0603 NO STUFF
C683 1uF 16V 10% X7R 0603 NO STUFF

G1A
@digital:u_gpu_gb2c_64(sym_1):page3_i108
BGA555
COMMON
1/14 PCI_EXPRESS
PEX_RST_BUF* AC7 PEX_RST
SNN_GPU_PEX_CLKREQ* AC6 PEX_CLKREQ
NV_NETCLASS NET
AE8 PEX_REFCLK
AD8 PEX_REFCLK
PEX LANES 15 - 4 ARE DEFEATURED

PEX_DVDD AA22
PEX_DVDD AB23
PEX_DVDD AC24
PEX_DVDD AD25
PEX_DVDD AE26
PEX_DVDD AE27
C549 1uF 6.3V 10% X6S 0402 COMMON
C605 1uF 6.3V 10% X6S 0402 COMMON
PLACE UNDER GPU
C148 4.7uF 6.3V 20% X6S 0603 COMMON
C149 4.7uF 6.3V 20% X6S 0603 COMMON
PLACE NEAR GPU
135mA
C569 22uF 4V 20% X6S 0603W NO STUFF
C567 22uF 4V 20% X6S 0603W NO STUFF
C543 22uF 4V 20% X6S 0603W NO STUFF
CO-LAYOUT 0805 AND 0603
C542 10uF 6.3V 10% X6S 0805 COMMON
C568 10uF 6.3V 10% X6S 0805 COMMON
C570 22uF 6.3V 20% X6S 0805 NO STUFF
MIDWAY BETWEEN GPU AND PS
PEX_VDD

PEX_HVDD AA10
PEX_HVDD AA12
PEX_HVDD AA13
PEX_HVDD AA16
PEX_HVDD AA18
PEX_HVDD AA19
PEX_HVDD AA20
PEX_HVDD AA21
PEX_HVDD AB22
PEX_HVDD AC23
PEX_HVDD AD24
PEX_HVDD AE25
PEX_HVDD AF26
PEX_HVDD AF27
C581 1uF 6.3V 10% X6S 0402 COMMON
C577 1uF 6.3V 10% X6S 0402 COMMON
PLACE UNDER GPU
C588 1uF 6.3V 10% X6S 0402 COMMON
C583 1uF 6.3V 10% X6S 0402 COMMON
C565 4.7uF 6.3V 20% X6S 0603 COMMON
C612 4.7uF 6.3V 20% X6S 0603 COMMON
PLACE NEAR GPU
188mA
1V8
C609 10uF 6.3V 10% X6S 0805 COMMON
C629 10uF 6.3V 10% X6S 0805 COMMON
C626 22uF 6.3V 20% X6S 0805 COMMON
MIDWAY BETWEEN GPU AND PS
CO-LAYOUT 0805 AND 0603
C610 22uF 4V 20% X6S 0603W NO STUFF
C627 22uF 4V 20% X6S 0603W NO STUFF
C628 22uF 4V 20% X6S 0603W NO STUFF

PEX_PLL_HVDD AA8
PEX_PLL_HVDD AA9
1V8
35mA
C600 0.1uF 16V 10% X7R 0402 COMMON
PLACE UNDER GPU

PEX_TERMP AF25 PEX_TERMP
R514 2.49k 0402 1% COMMON
50OHM_NETCLASS1

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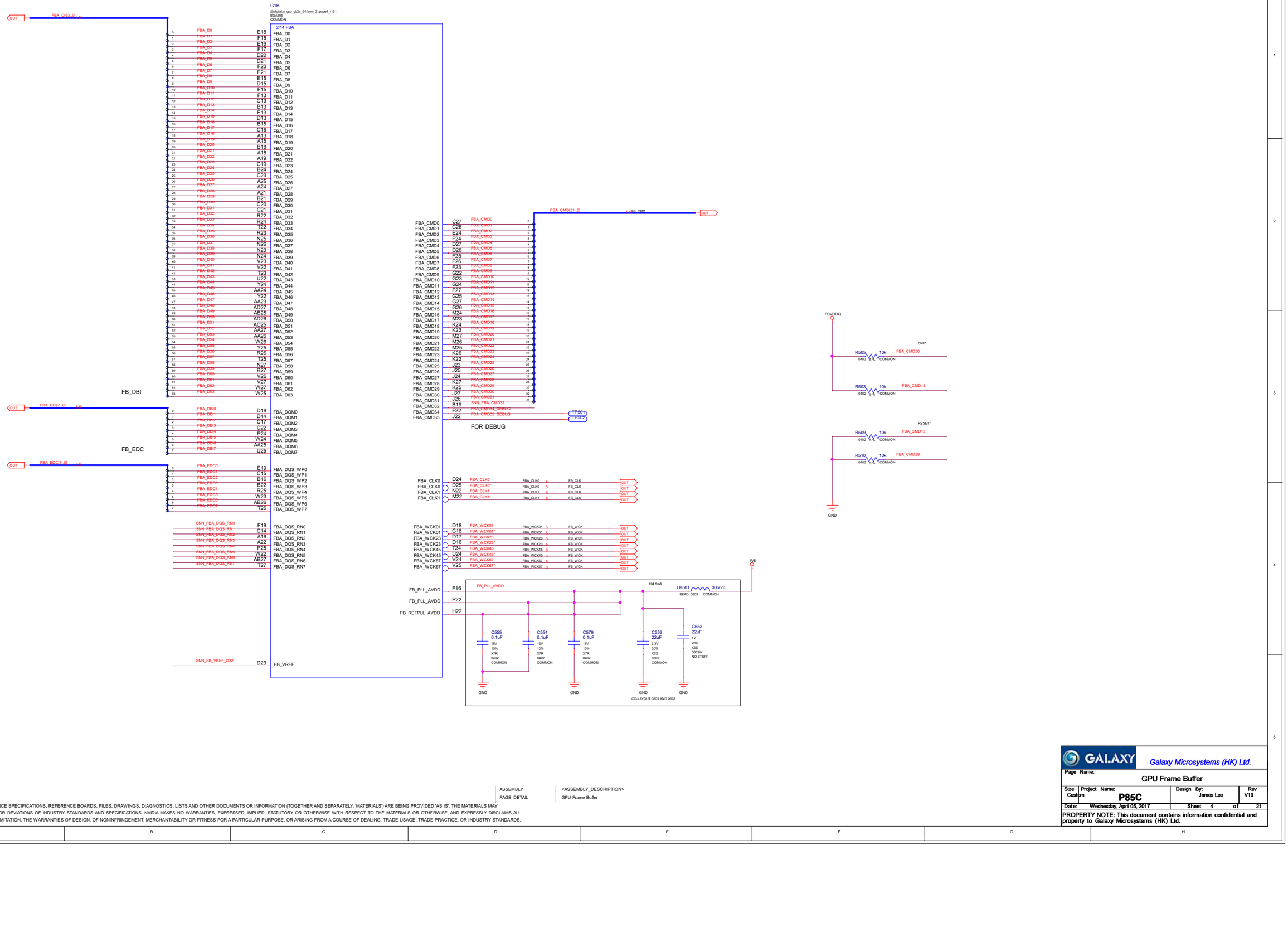
GPU Frame Buffer



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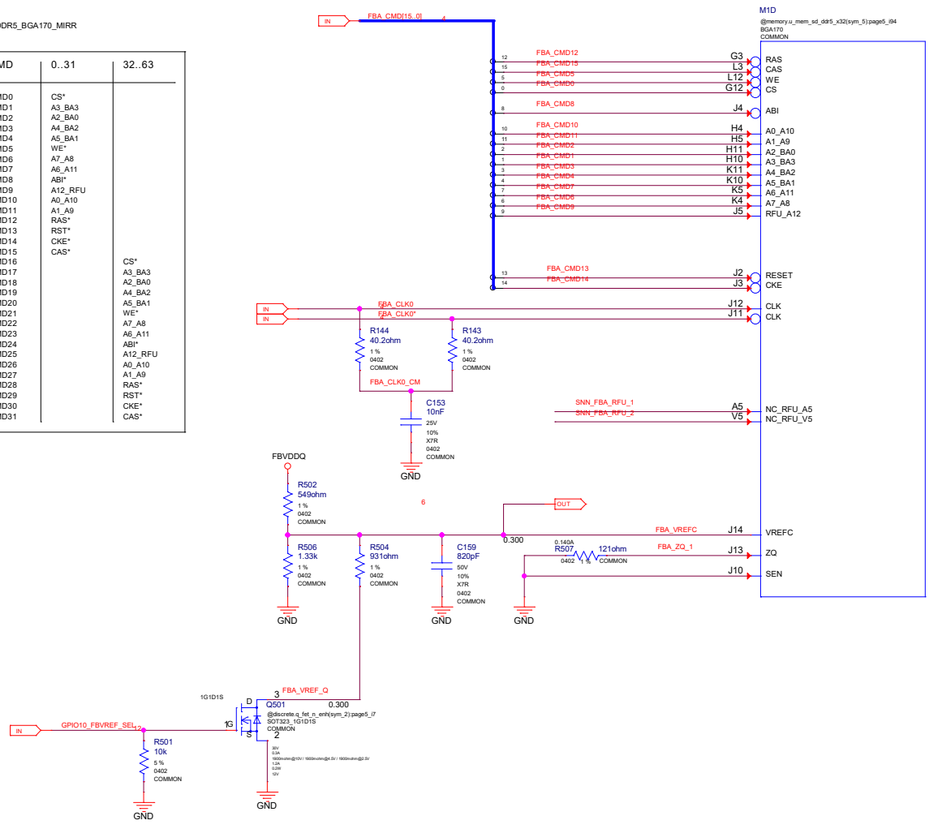
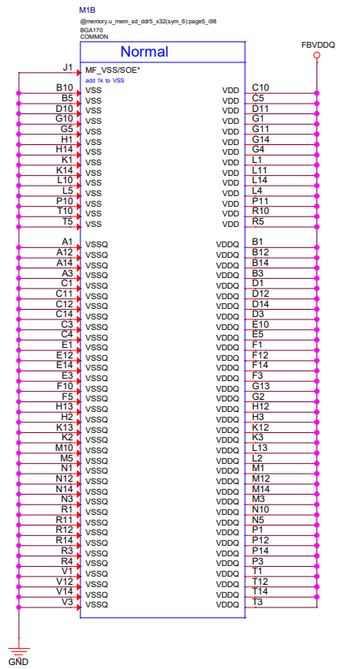
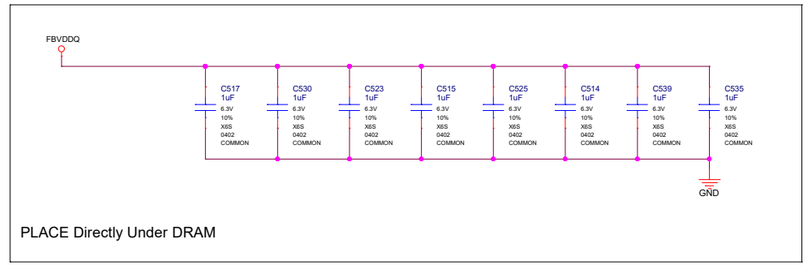
FBA bits 31..00

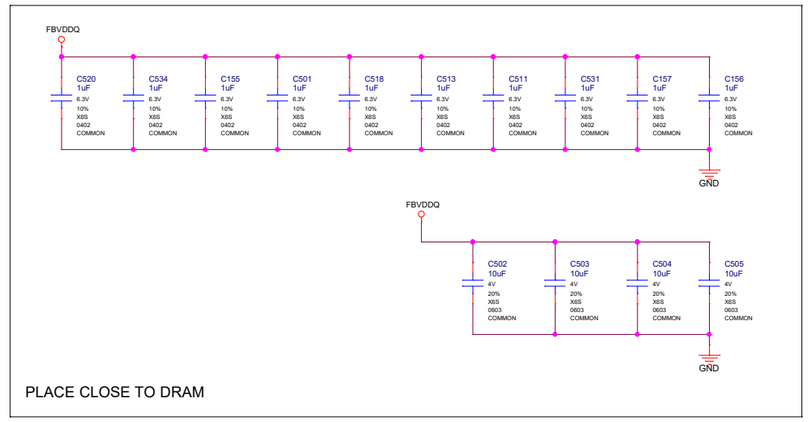
GDDR5_BGA170_MIRR

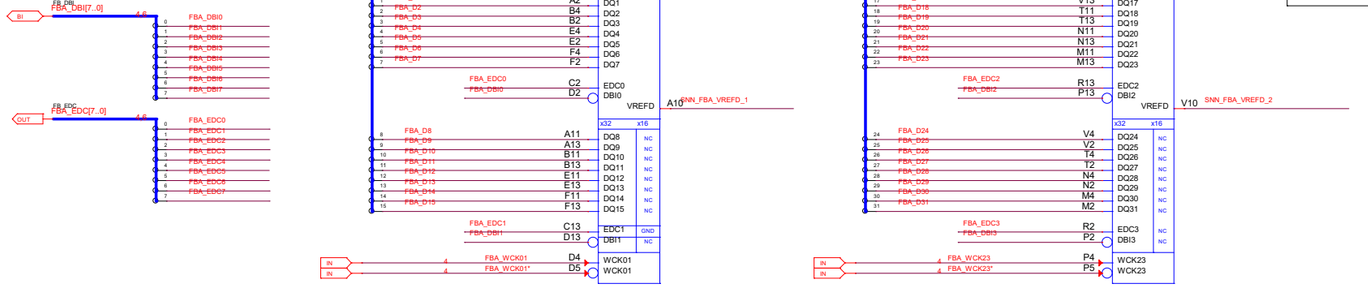
CMD	0..31	32..63
CMD0	CS*	
CMD1	A3_BA3	
CMD2	A2_BA0	
CMD3	A4_BA2	
CMD4	A5_BA1	
CMD5	WE*	
CMD6	A7_A8	
CMD7	A6_A11	
CMD8	ABI*	
CMD9	A12_RFU	
CMD10	A0_A10	
CMD11	A1_A9	
CMD12	RAS*	
CMD13	RST*	
CMD14	CKE*	
CMD15	CAS*	
CMD16		CS*
CMD17		A3_BA3
CMD18		A2_BA0
CMD19		A4_BA2
CMD20		A5_BA1
CMD21		WE*
CMD22		A7_A8
CMD23		A6_A11
CMD24		ABI*
CMD25		A12_RFU
CMD26		A0_A10
CMD27		A1_A9
CMD28		RAS*
CMD29		RST*
CMD30		CKE*
CMD31		CAS*











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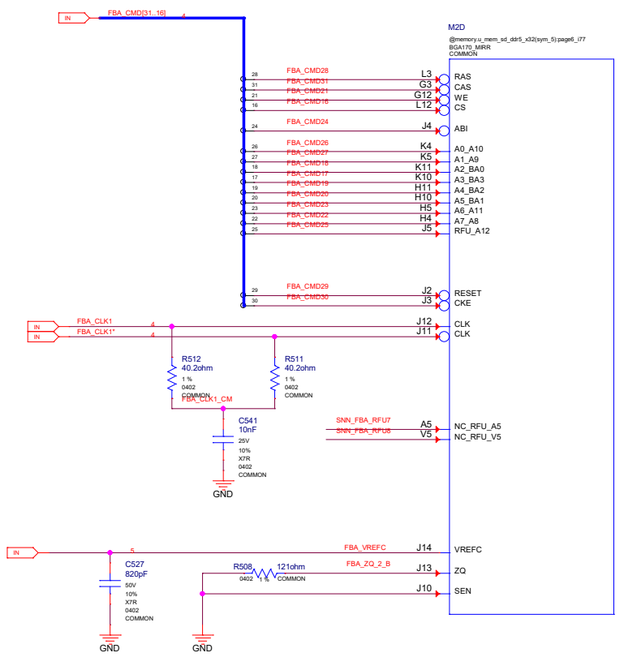
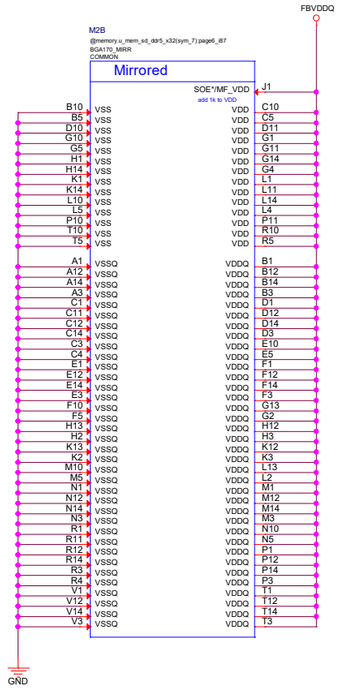
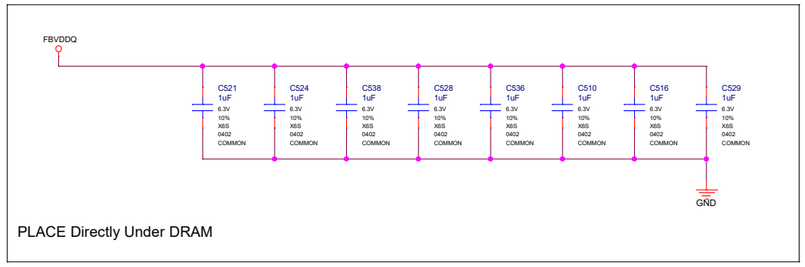
FBA bits 63..32

GDDR5_BGA170_MIRR

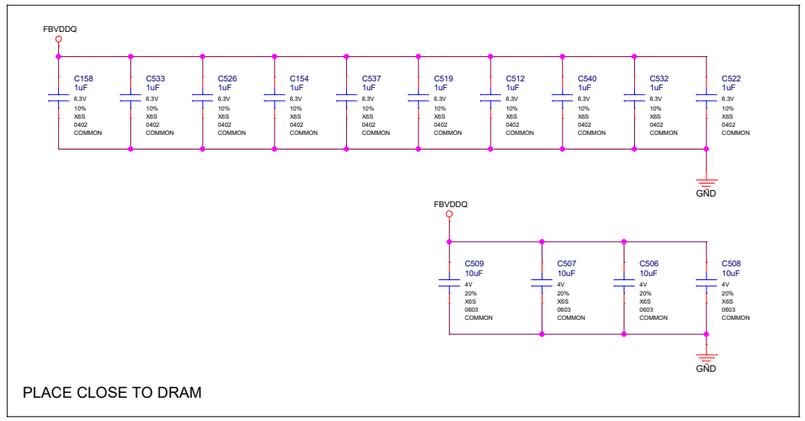
CMD	0..31	32..63
CMD0	CS*	
CMD1	A3_BA3	
CMD2	A2_BA0	
CMD3	A4_BA2	
CMD4	A5_BA1	
CMD5	WE*	
CMD6	A7_A8	
CMD7	A6_A11	
CMD8	ABI*	
CMD9	A12_RFU	
CMD10	A0_A10	
CMD11	A1_A9	
CMD12	RAS*	
CMD13	RST*	
CMD14	CKE*	
CMD15	CAS*	
CMD16		CS*
CMD17		A3_BA3
CMD18		A2_BA0
CMD19		A4_BA2
CMD20		A5_BA1
CMD21		WE*
CMD22		A7_A8
CMD23		A6_A11
CMD24		ABI*
CMD25		A12_RFU
CMD26		A0_A10
CMD27		A1_A9
CMD28		RAS*
CMD29		RST*
CMD30		CKE*
CMD31		CAS*



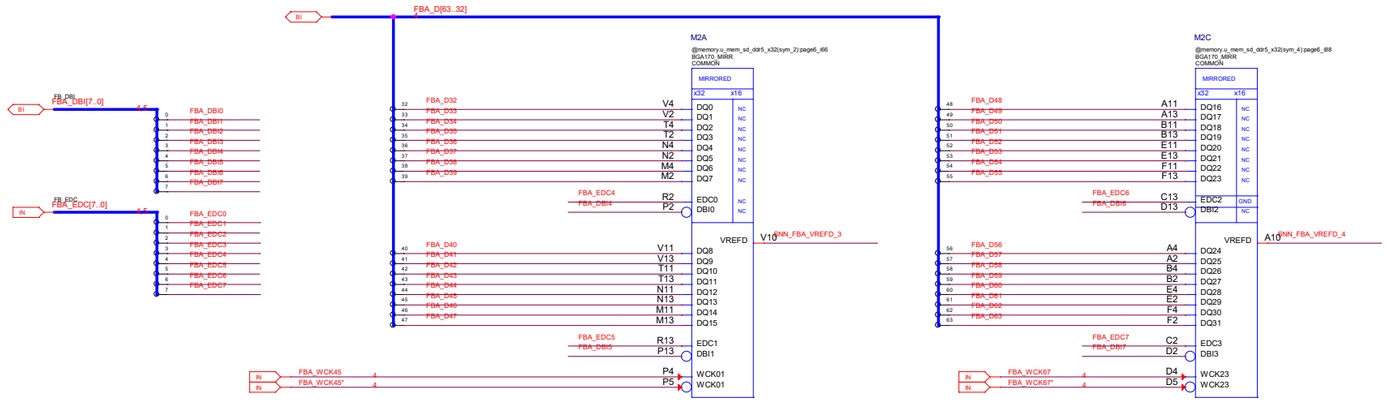




PLACE Directly Under DRAM



PLACE CLOSE TO DRAM



PLACE Around DRAM

ASSEMBLY	<ASSEMBLY_DESCRIPTION>
PAGE DETAIL	FBA bits 63..32

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Page Name: FBA bits 31..00			
Size: Custom	Project Name: P85C	Design By: James Lee	Rev: V10
Date: Wednesday, April 05, 2017		Sheet 6 of 21	

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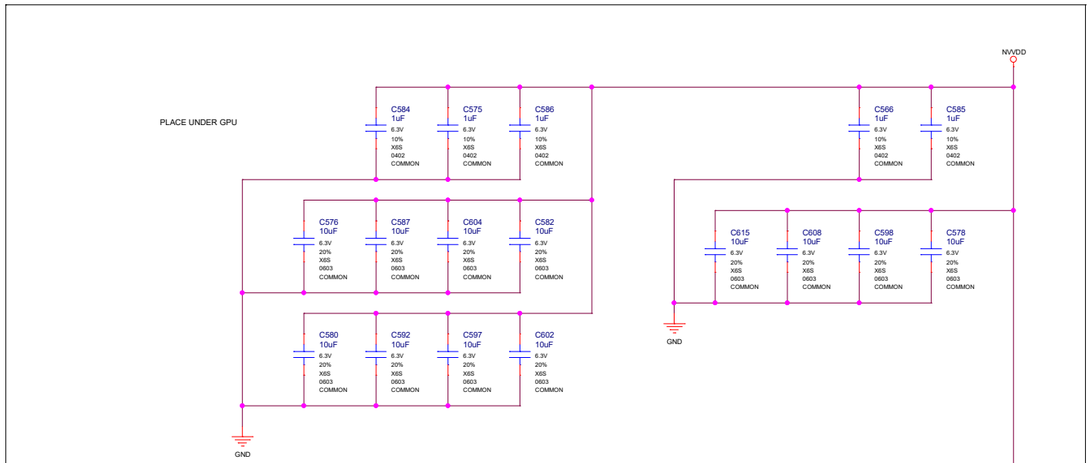
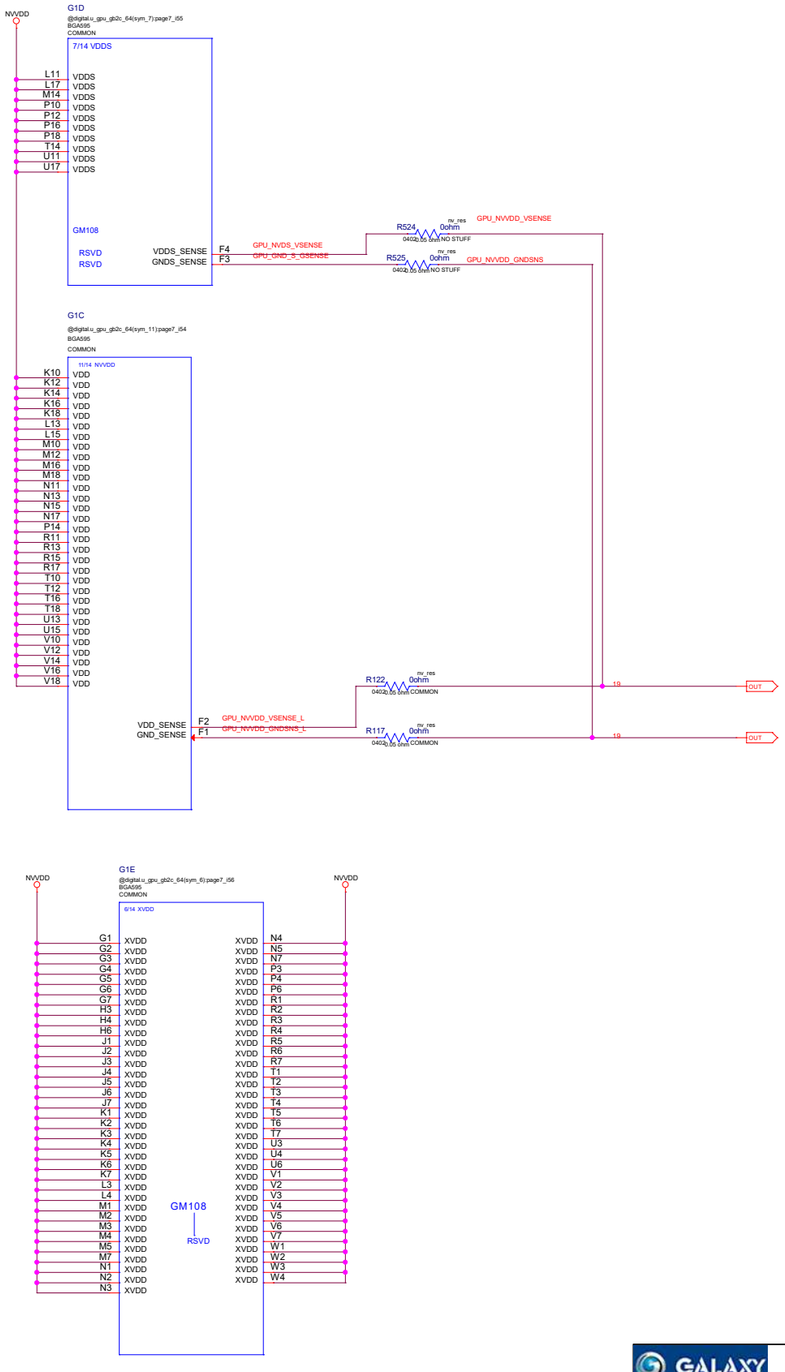
NVVVD Decoupling

PLACE UNDER GPU



PLACE NEAR GPU

CO-Layout 0603 and 0805



ASSEMBLY	<ASSEMBLY_DESCRIPTION>
PAGE DETAIL	NVVVD Decoupling

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GALAXY Galaxy Microsystems (HK) Ltd.

Page Name: NVVVD Decoupling

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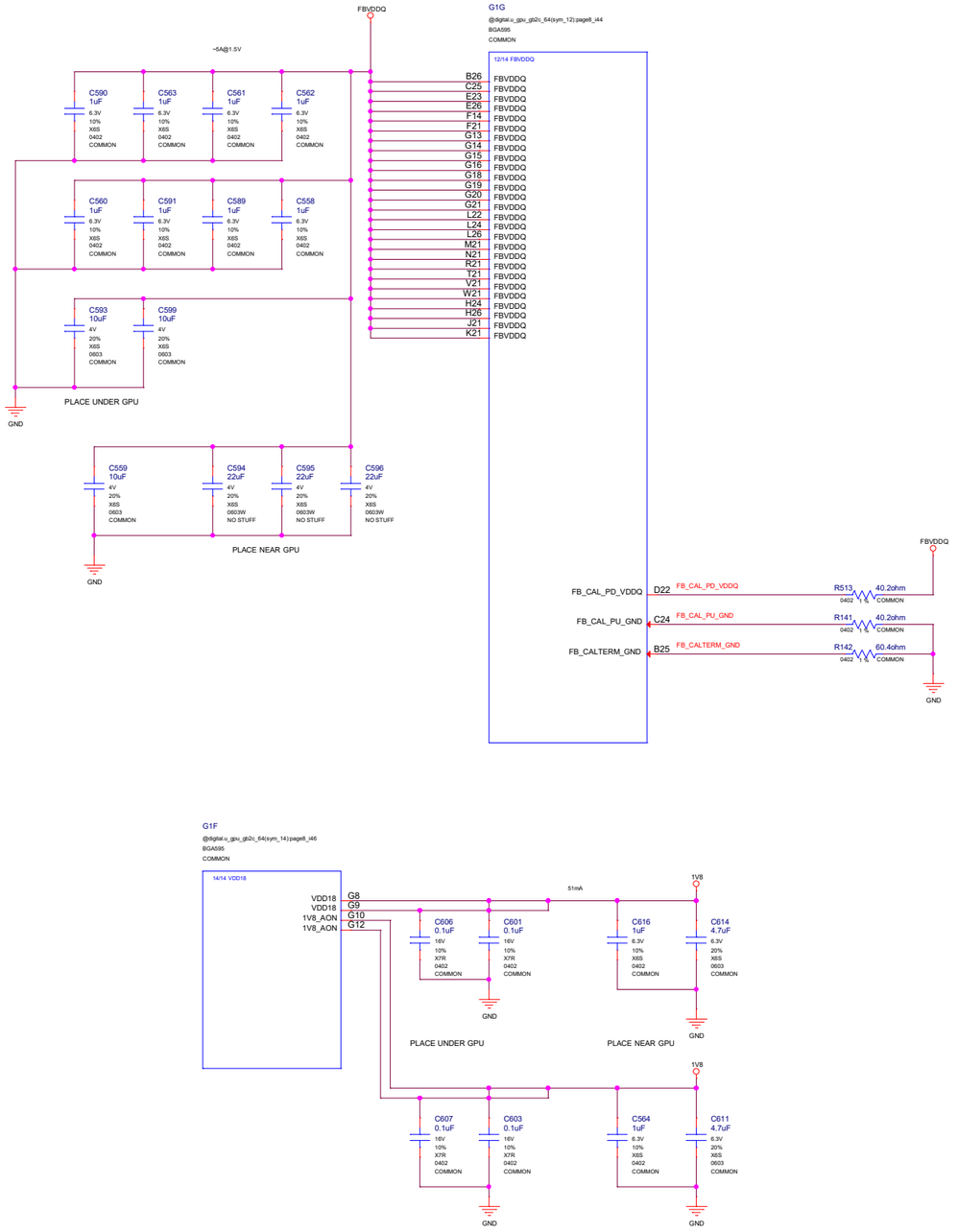
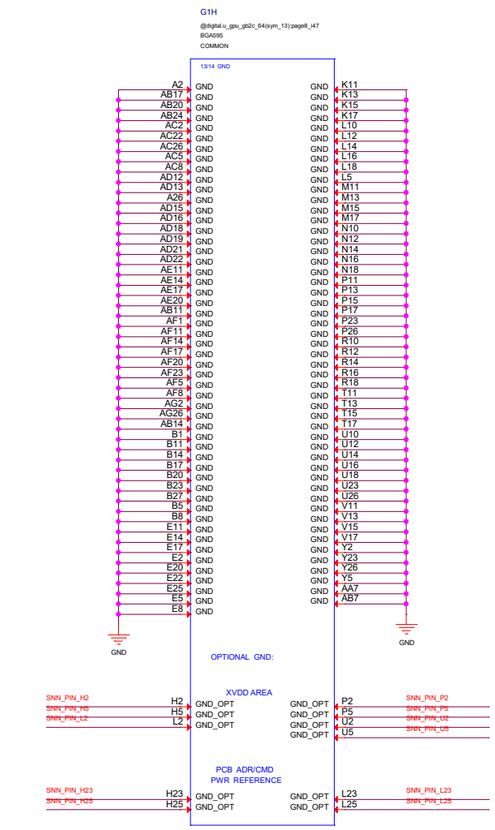
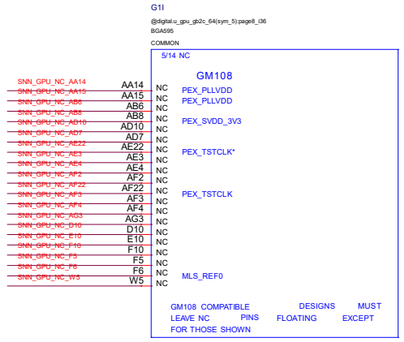
FBVDDQ and 1V8 Decoupling







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ASSEMBLY	<ASSEMBLY_DESCRIPTION>
PAGE DETAIL	FBVDDQ and 1V8 Decoupling

Galaxy Microsystems (HK) Ltd.

Page Name: FBVDDQ and 1V8 Decoupling			
Size: Custom	Project Name: P85C	Design By: James Lee	Rev: V10
Date: Wednesday, April 05, 2017		Sheet 8 of 21	

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IFPAB DL DVI-D

ASSEMBLY <ASSEMBLY_DESCRIPTION>
PAGE DETAIL IFPAB DL-DVI

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BOM R

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Page Name: IFPAB DL-DVI

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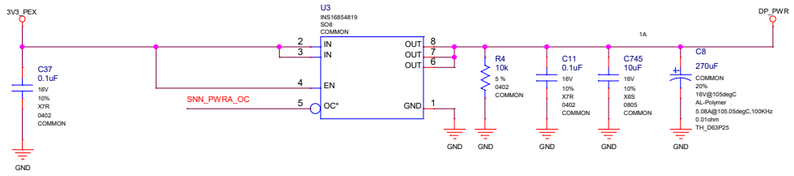
IFPA DP



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ASSEMBLY	<ASSEMBLY_DESCRIPTION>
PAGE DETAIL	IFPA DP

Galaxy Microsystems (HK) Ltd.

Page Name: IFPA DP

Size	Project Name:	Design By:	Rev
Custom	P85C	James Lee	V10

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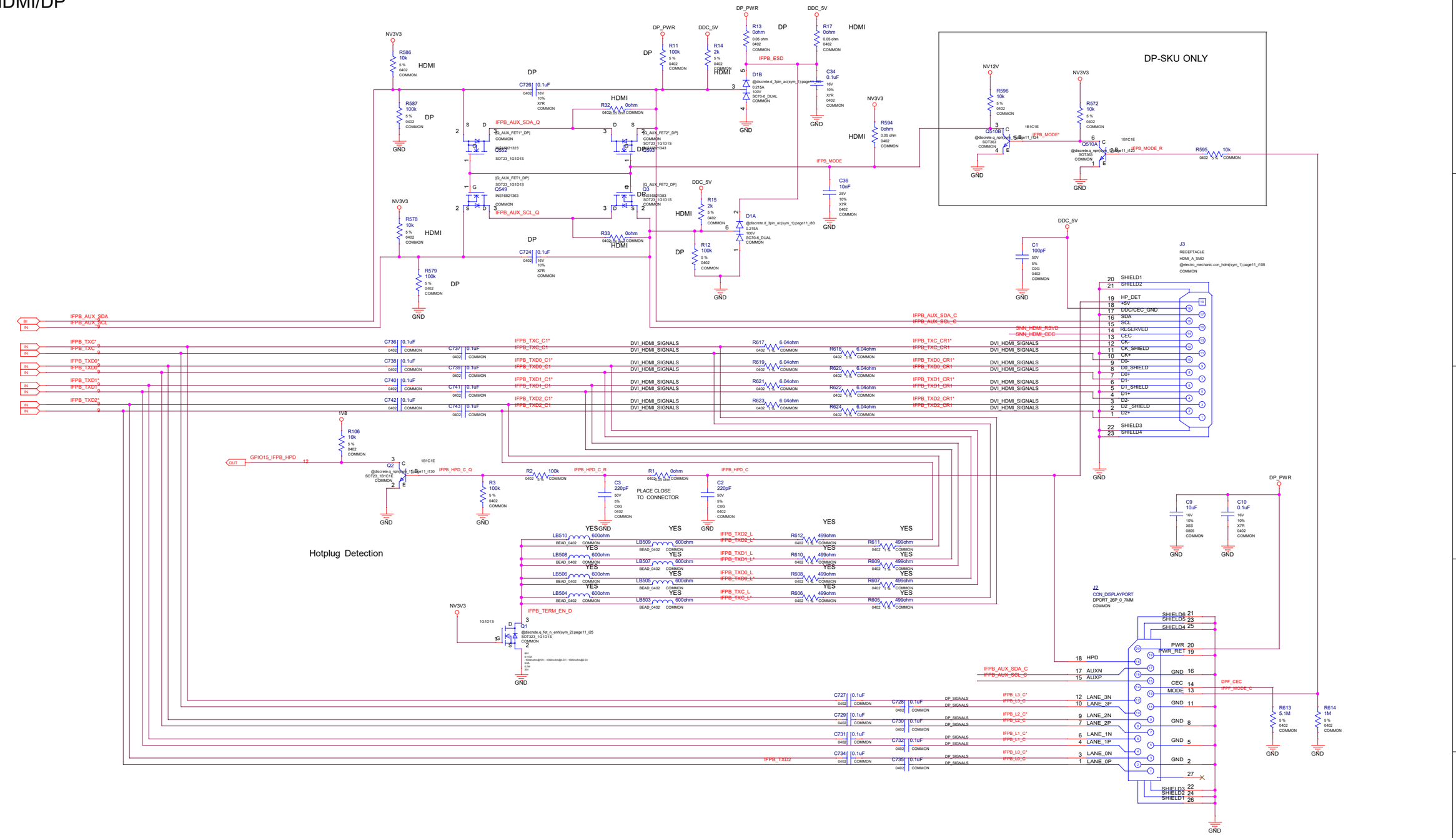
IFPB HDMI/DP



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PAGE DETAIL	IFPB DP/HDMI

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Page Name:	IFPB DP_HDMI	
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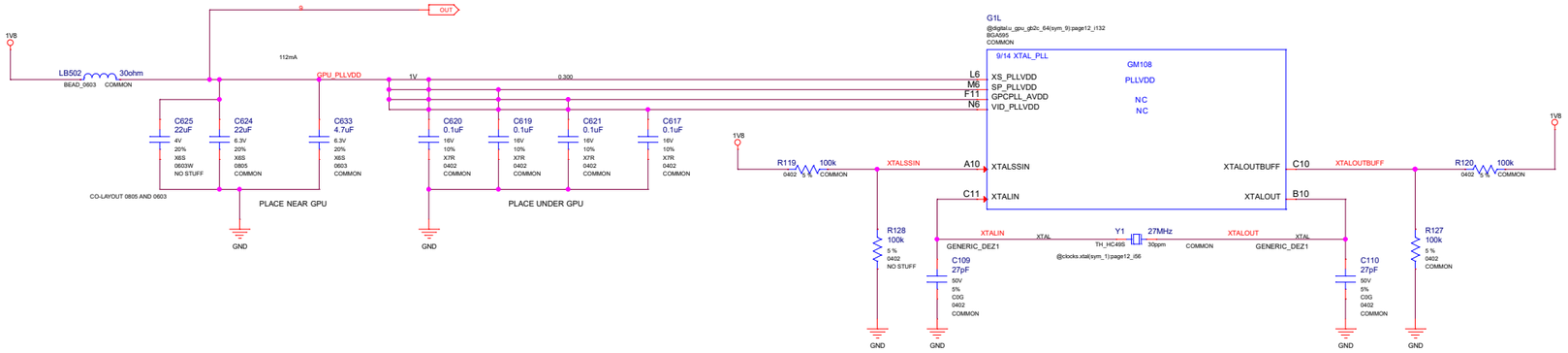
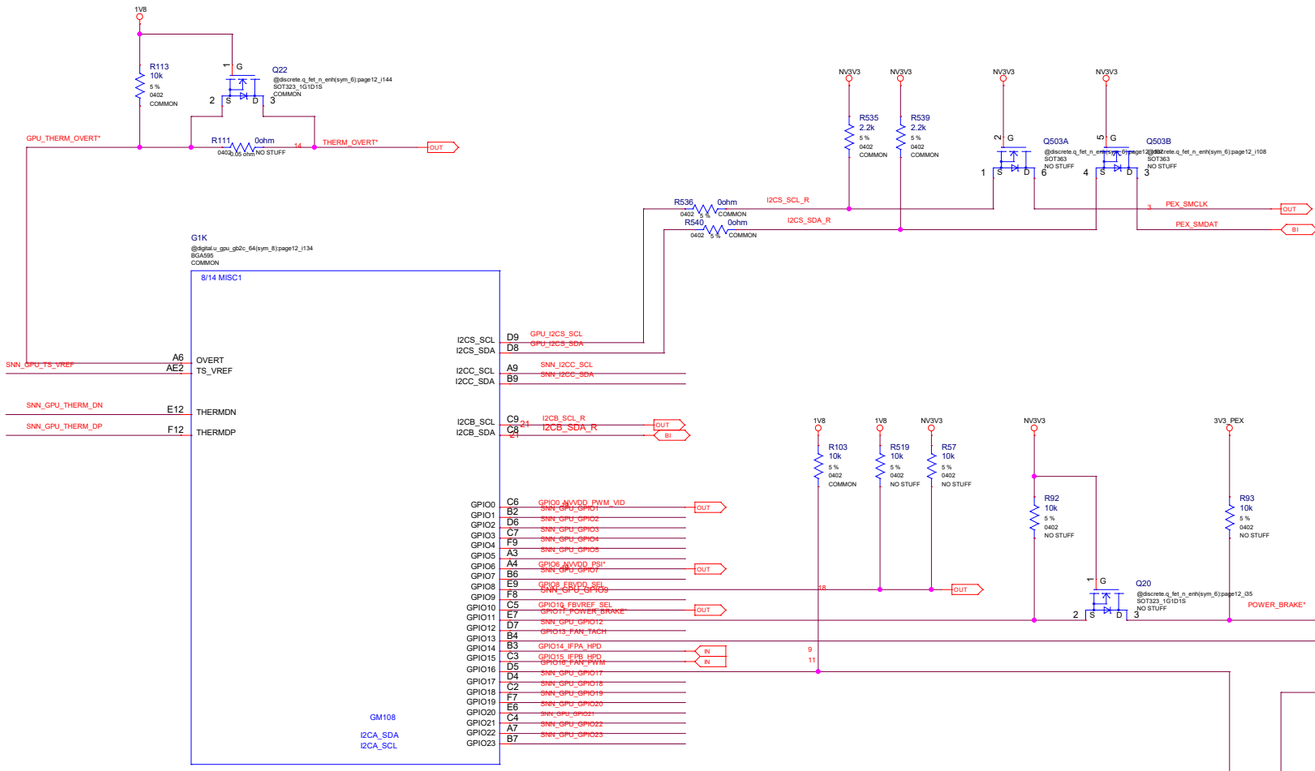
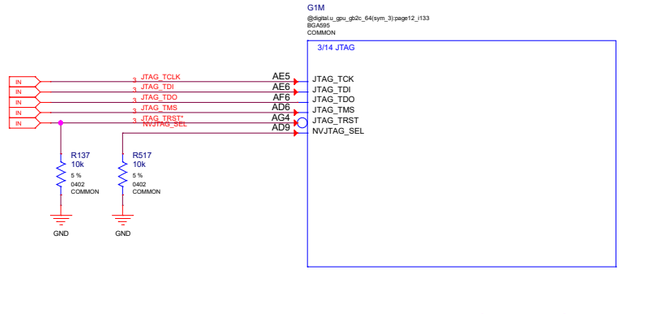
JTAG,GPIO&XTAL

Smart Fan

XTALOUTBUFF	GPIO PWM %
PU	66% HIGH
MID	33% HIGH (2-PIN DEFAULT)
PD	100% HIGH







ASSEMBLY <ASSEMBLY_DESCRIPTION>
PAGE DETAIL JTAG,GPIO&XTAL

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Page Name: JTAG,GPIO&XTAL

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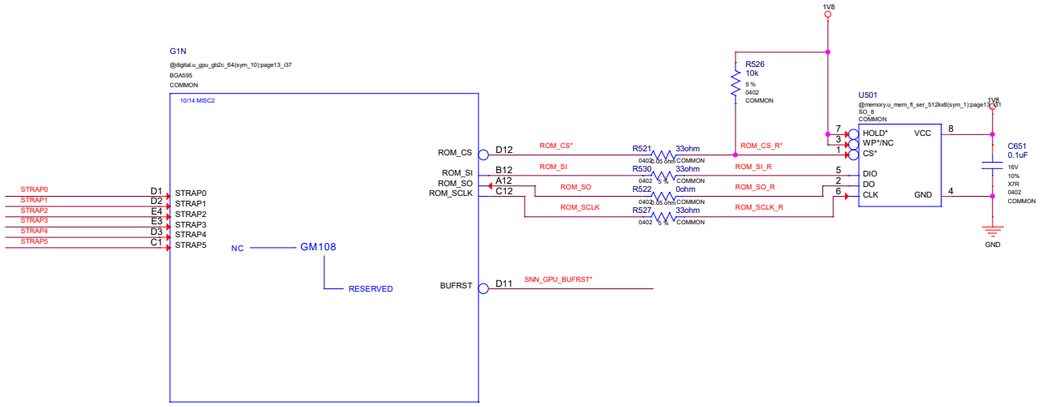
ROM & STRAPS

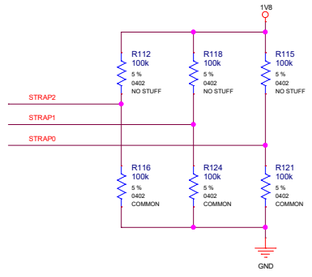
ROM_SO	ROM_SI	ROM_SCLK	SOR_EXPOSED[3:0]		1:ENABLE 0:DISABLE
L	L	L	1111	DEFAULT	SOR0/1 ENABLE
L	L	H	1110		
L	H	L	1101		
L	H	H	1100		
H	L	L	1011		
H	L	H	1010		
H	H	L	1001		
H	H	H	1000		
L	L	M	0111		
L	M	L	0110		
L	M	H	0101		
L	H	M	0100		
H	L	M	0011		
H	M	L	0010		
H	M	H	0001		
H	H	M	0000		

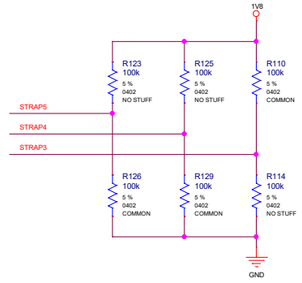
STRAP2	STRAP1	STRAP0	RAMCFG[4:0]	
L	L	L	0000	DEFAULT
L	L	H	0001	
L	H	L	0010	
L	H	H	0011	
H	H	L	0110	
H	H	H	0111	
L	L	M	1000	
L	M	L	1001	

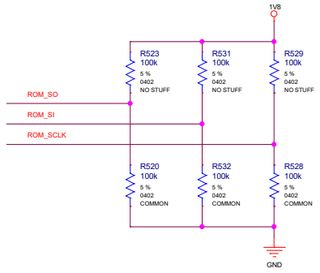
STRAP5	STRAP4	STRAP3	SMB_ALT_ADDR	DEVID_SEL	PCIE_CFG	VGA_DEVICE
M	H	H	1	1	1	1
M	H	L	1	1	1	0
M	L	H	1	1	0	1
M	L	L	1	1	0	0
L	H	M	1	0	1	1
L	M	H	1	0	1	0
L	M	L	1	0	0	1
L	L	M	1	0	0	0
H	H	H	0	1	1	1
H	H	L	0	1	1	0
H	L	H	0	1	0	1
H	L	L	0	1	0	0
L	H	H	0	0	1	1
L	H	L	0	0	1	0
L	L	H	0	0	0	1 DEFAULT
L	L	L	0	0	0	0

H=High :Tied to 1.8V
M=Middle:Tied to 0.9V
L=Low :Tied to 0V









1:SMB_ALT_ADDR ENABLE
0:SMB_ALT_ADDR DISABLE

1:DEVID_SEL REBRAND
0:DEVID_SEL ORIGNAL

1:PCIE_CFG LOW POWER
0:PCIE_CFG HIGH POWER

1:VGA_DEVICE ENABLE
0:VGA_DEVICE DISABLE

ASSEMBLY <ASSEMBLY_DESCRIPTION>
PAGE DETAIL ROM & STRAPS

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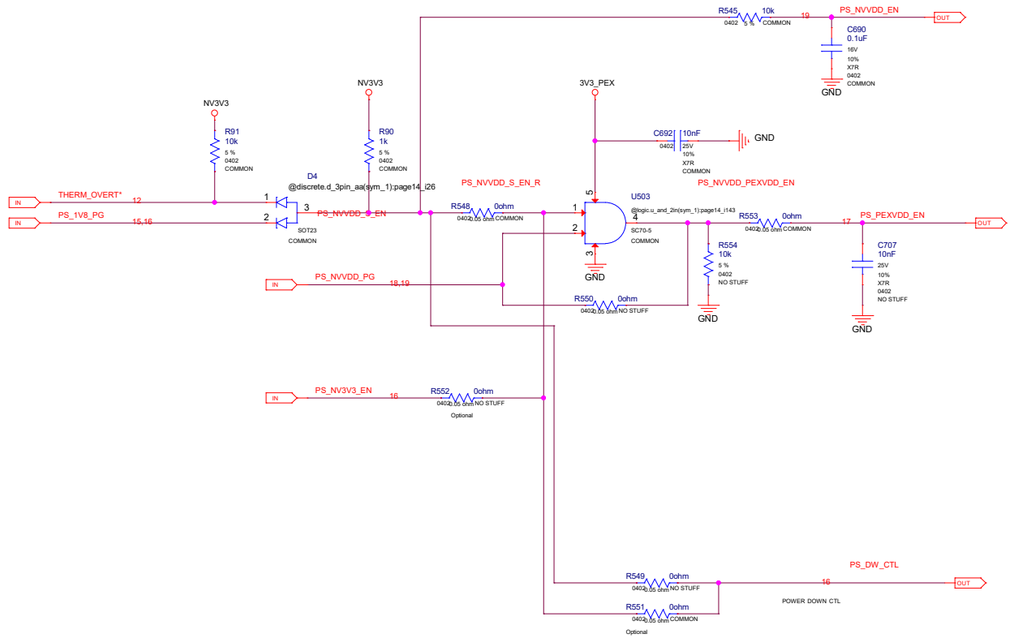
Power Sequence



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ASSEMBLY <ASSEMBLY_DESCRIPTION>
PAGE DETAIL Power Sequence

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Page Name: Power Sequence

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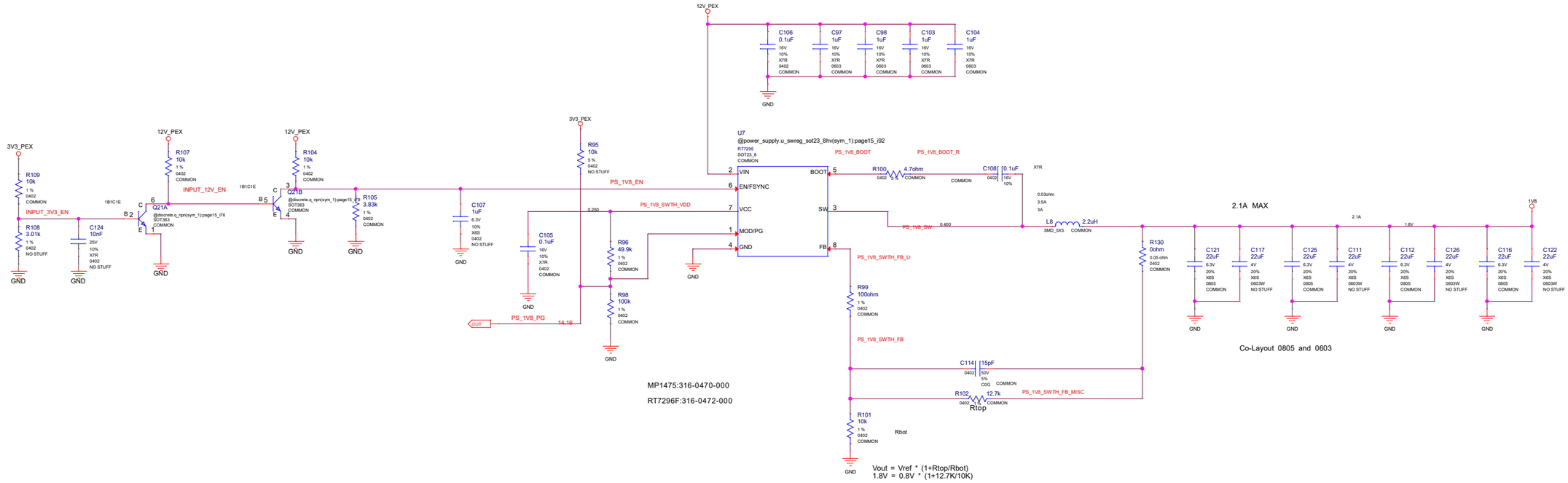
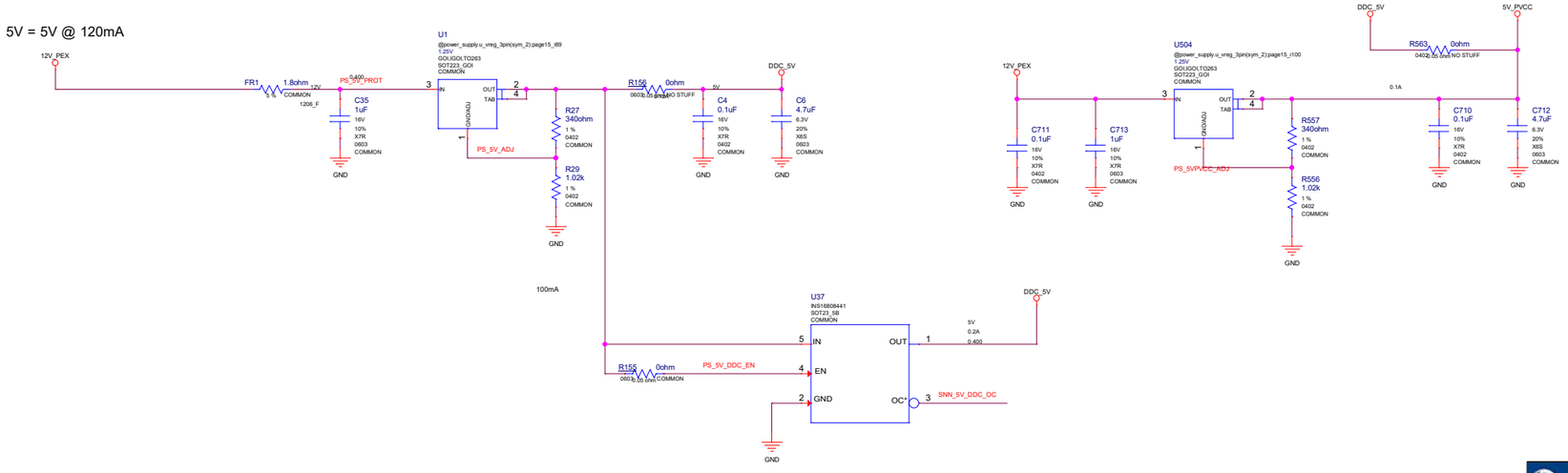
POWER:1V8 & 5V



5V = 5V @ 120mA



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ASSEMBLY	<ASSEMBLY_DESCRIPTION>
PAGE DETAIL	POWER:1V8 & 5V

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Page Name: POWER:1V8 & 5V			
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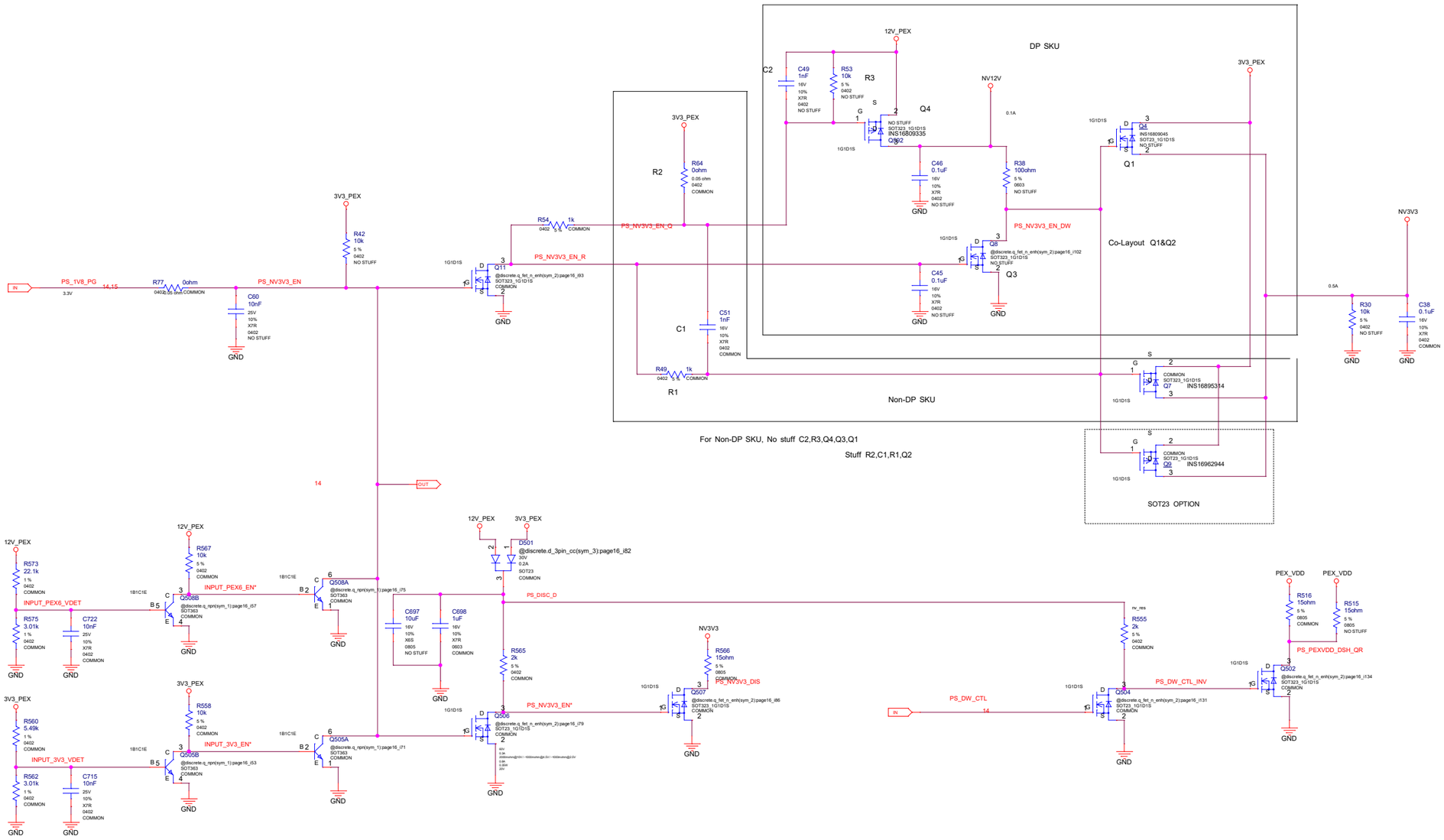
POWER: NV3V3, NV12V



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PAGE DETAIL POWER: NV3V3, NV12V

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Page Name: POWER: NV3V3, NV12V			
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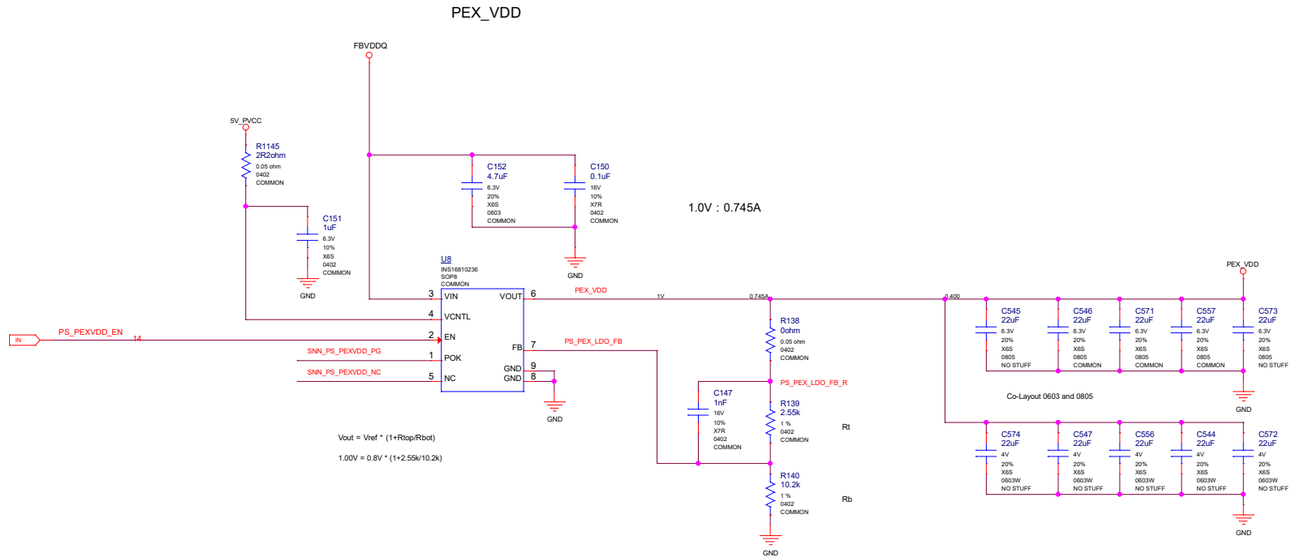

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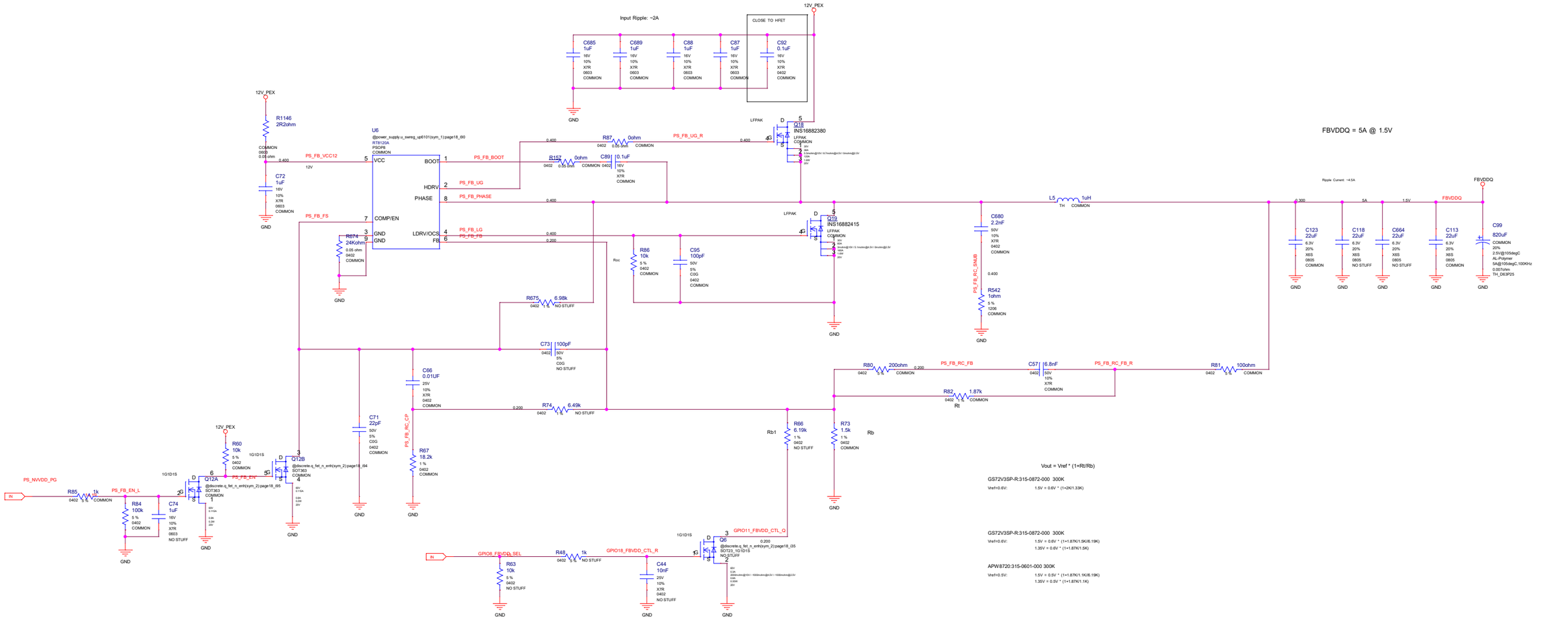

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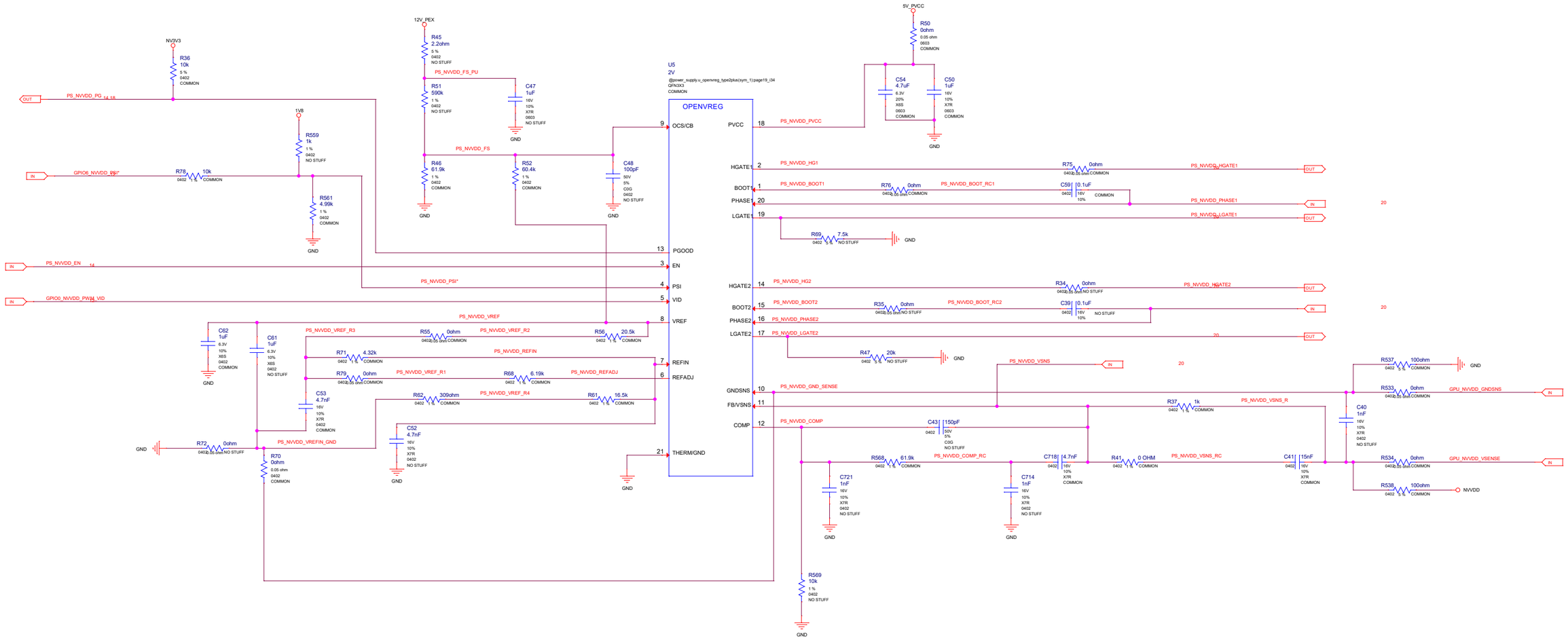

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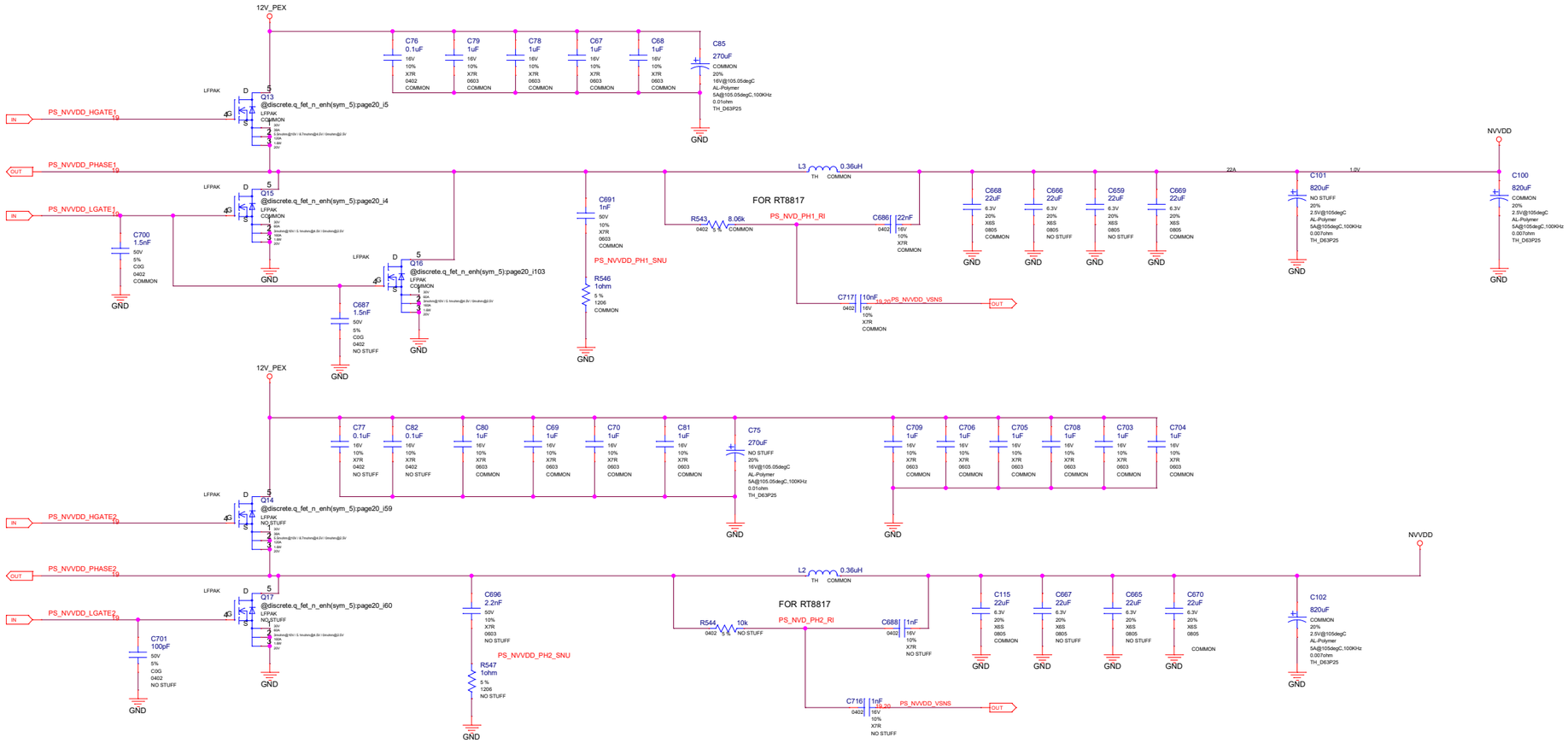

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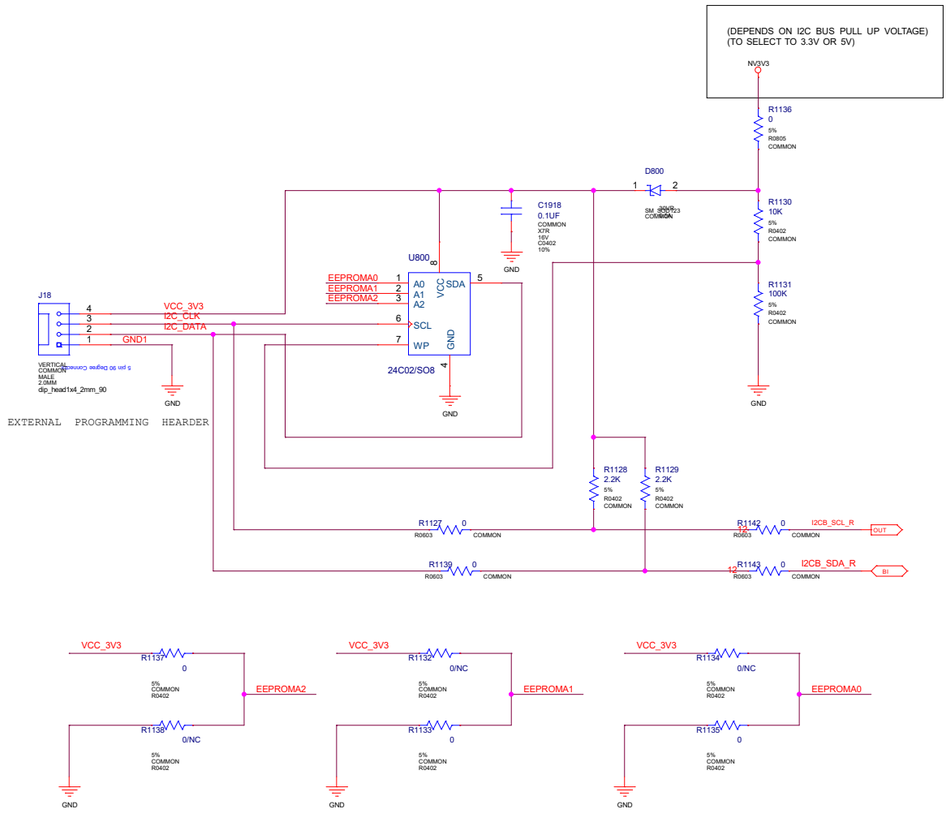

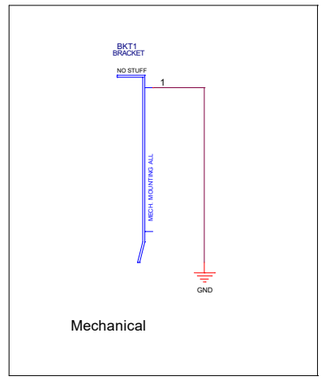

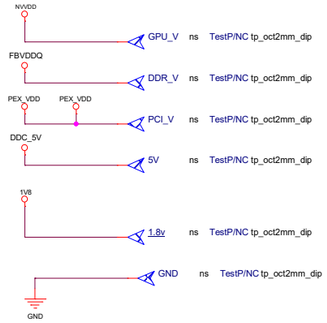

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