V133-10

P729: G96, DDR2 MEMORY 32MX16/16MX16

SKU	VARIANT	NVPN	ASSEMBLY
B	BASE	600-10729-xxxx-000	BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL
1	SKU0000	600-10729-0000-000	G96-300-A1, 550/500MHz, 512MB 32Mx16 DDR2 BGA84 DVI-DL+VGA+HDTV
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14	<UNDEFINED>	<UNDEFINED>	<UNDEFINED>
15	<UNDEFINED>	<UNDEFINED>	<UNDEFINED>

REV HISTORY

Modify Power Sequencing

02/25

PAGE 14.EDIT NET
R562 : I2CD_SCL_R to I2CC_SCL_R
R563 : I2CD_SDA_R to I2CC_SDA_R
R172,R173 Pull high 5V

PAGE 19.change footprint
C87 footprint 0805 to 1206

PAGE 11.Remove R130
HDMI gate pull down

02/26

PAGE 2.Change 3V3_PEX to 3V3_AUX

03/03

PAGE 11.Add commond chock
L21,L22,L23,L24

PAGE 18.Change AZ7805 footprint to TO263

03/04

PAGE 13.Remove SLI CN1 circuit
Change MIOB_VDD to 3V3_PEX

PAGE 16.Change pullhigh to 3V3_PEX

PAGE 19.Change C29 to 1500uF
Add CAP C24 C37 1500uF
Add CAP C60 C63 1500uF
Change Chock L10,L11 footprint

03/04

PAGE 18.Change 1V8 circuit

Remove
C96,C156,C157,C158,C159,C160,C161,C162,C163
Q30,R152,R153,R154,R155,R156,R157

03/07

PAGE 14.Add BAV99 D21,D22,D23,D24,D25,D26
PAGE 20.Change NVVDD circuit
Remove R517 R11-0101T12-C52

03/12

PAGE 14.Add 2pin Fan control
PAGE 18.Change DDC_5V circuit

03/13

PAGE 14.Remove J6
PAGE 15.Remove J8

ASSEMBLY	BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL
PAGE DETAIL	P729 Overview

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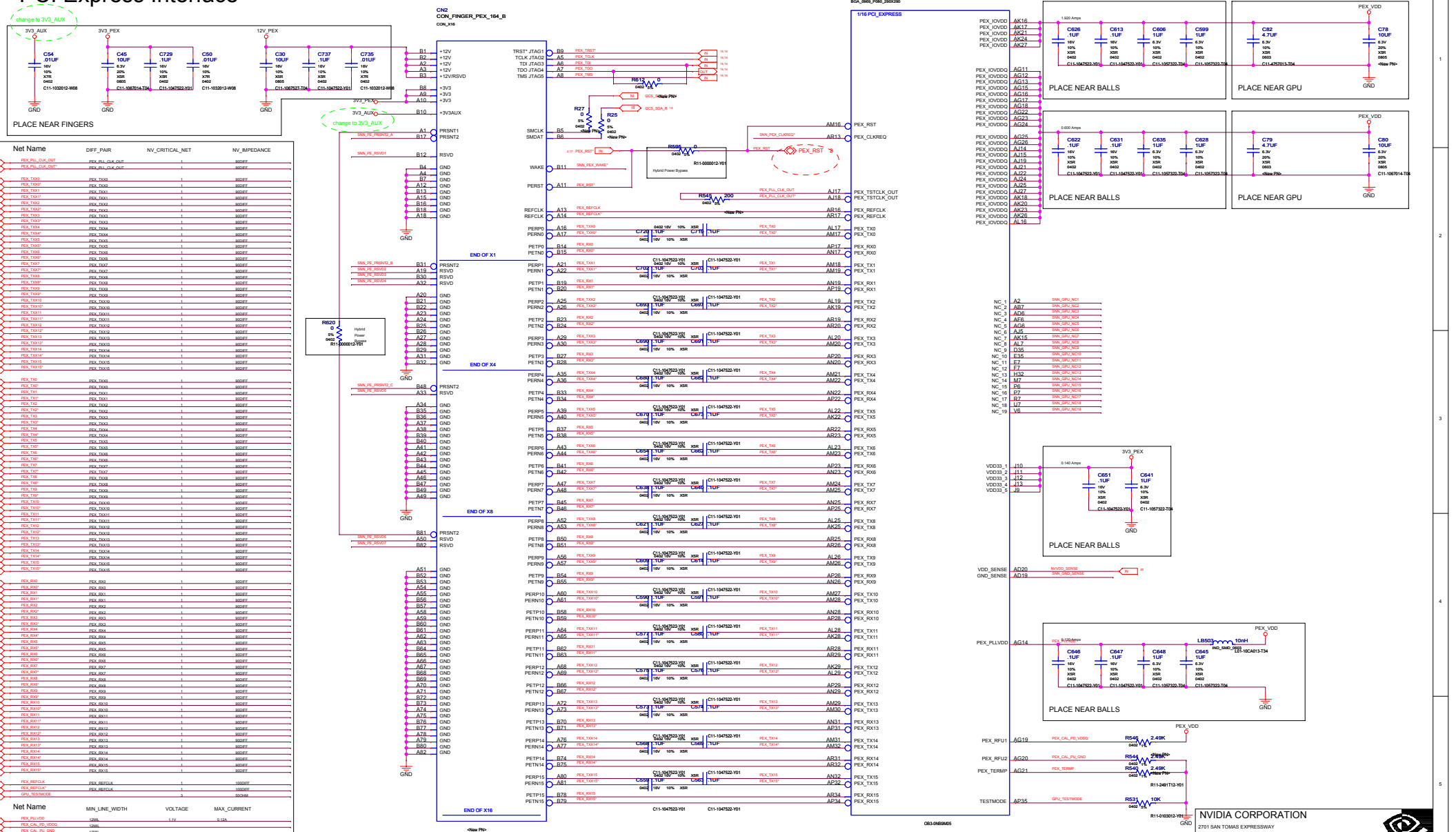
PCI Express Interface



Net Name

Net Name	DIFF_PAIR	NV_CRITICAL_NET	NV_IMPEDANCE
PEX_PLL_CLK_OUT	PEX_PLL_CLK_OUT	1	90DIFF
PEX_PLL_CLK_OUT*	PEX_PLL_CLK_OUT	1	90DIFF
PEX_TX00	PEX_TX00	1	90DIFF
PEX_TX00*	PEX_TX00	1	90DIFF
PEX_TX01	PEX_TX01	1	90DIFF
PEX_TX01*	PEX_TX01	1	90DIFF
PEX_TX02	PEX_TX02	1	90DIFF
PEX_TX02*	PEX_TX02	1	90DIFF
PEX_TX03	PEX_TX03	1	90DIFF
PEX_TX03*	PEX_TX03	1	90DIFF
PEX_TX04	PEX_TX04	1	90DIFF
PEX_TX04*	PEX_TX04	1	90DIFF
PEX_TX05	PEX_TX05	1	90DIFF
PEX_TX05*	PEX_TX05	1	90DIFF
PEX_TX06	PEX_TX06	1	90DIFF
PEX_TX06*	PEX_TX06	1	90DIFF
PEX_TX07	PEX_TX07	1	90DIFF
PEX_TX07*	PEX_TX07	1	90DIFF
PEX_TX08	PEX_TX08	1	90DIFF
PEX_TX08*	PEX_TX08	1	90DIFF
PEX_TX09	PEX_TX09	1	90DIFF
PEX_TX09*	PEX_TX09	1	90DIFF
PEX_TX10	PEX_TX10	1	90DIFF
PEX_TX10*	PEX_TX10	1	90DIFF
PEX_TX11	PEX_TX11	1	90DIFF
PEX_TX11*	PEX_TX11	1	90DIFF
PEX_TX12	PEX_TX12	1	90DIFF
PEX_TX12*	PEX_TX12	1	90DIFF
PEX_TX13	PEX_TX13	1	90DIFF
PEX_TX13*	PEX_TX13	1	90DIFF
PEX_TX14	PEX_TX14	1	90DIFF
PEX_TX14*	PEX_TX14	1	90DIFF
PEX_TX15	PEX_TX15	1	90DIFF
PEX_TX15*	PEX_TX15	1	90DIFF
PEX_TX0	PEX_TX00	1	90DIFF
PEX_TX0*	PEX_TX00	1	90DIFF
PEX_TX1	PEX_TX01	1	90DIFF
PEX_TX1*	PEX_TX01	1	90DIFF
PEX_TX2	PEX_TX02	1	90DIFF
PEX_TX2*	PEX_TX02	1	90DIFF
PEX_TX3	PEX_TX03	1	90DIFF
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PEX_TX4	PEX_TX04	1	90DIFF
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PEX_TX5	PEX_TX05	1	90DIFF
PEX_TX5*	PEX_TX05	1	90DIFF
PEX_TX6	PEX_TX06	1	90DIFF
PEX_TX6*	PEX_TX06	1	90DIFF
PEX_TX7	PEX_TX07	1	90DIFF
PEX_TX7*	PEX_TX07	1	90DIFF
PEX_TX8	PEX_TX08	1	90DIFF
PEX_TX8*	PEX_TX08	1	90DIFF
PEX_TX9	PEX_TX09	1	90DIFF
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PEX_TX10	PEX_TX10	1	90DIFF
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PEX_TX11	PEX_TX11	1	90DIFF
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PEX_RX14	PEX_RX14	1	90DIFF
PEX_RX14*	PEX_RX14	1	90DIFF
PEX_RX15	PEX_RX15	1	90DIFF
PEX_RX15*	PEX_RX15	1	90DIFF
PEX_REFCLK	PEX_REFCLK	1	100DIFF
PEX_REFCLK*	PEX_REFCLK	1	100DIFF
GPU_TESTMODE		1	50OHM

Net Name

Net Name	MIN_LINE_WIDTH	VOLTAGE	MAX_CURRENT
PEX_PLLVDD	12MIL	1.1V	0.12A
PEX_CAL_PD_VDDQ	12MIL		
PEX_CAL_PU_GND	12MIL		
PEX_TERMP	12MIL		

ASSEMBLY	BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL
PAGE DETAIL	PCI Express Interface

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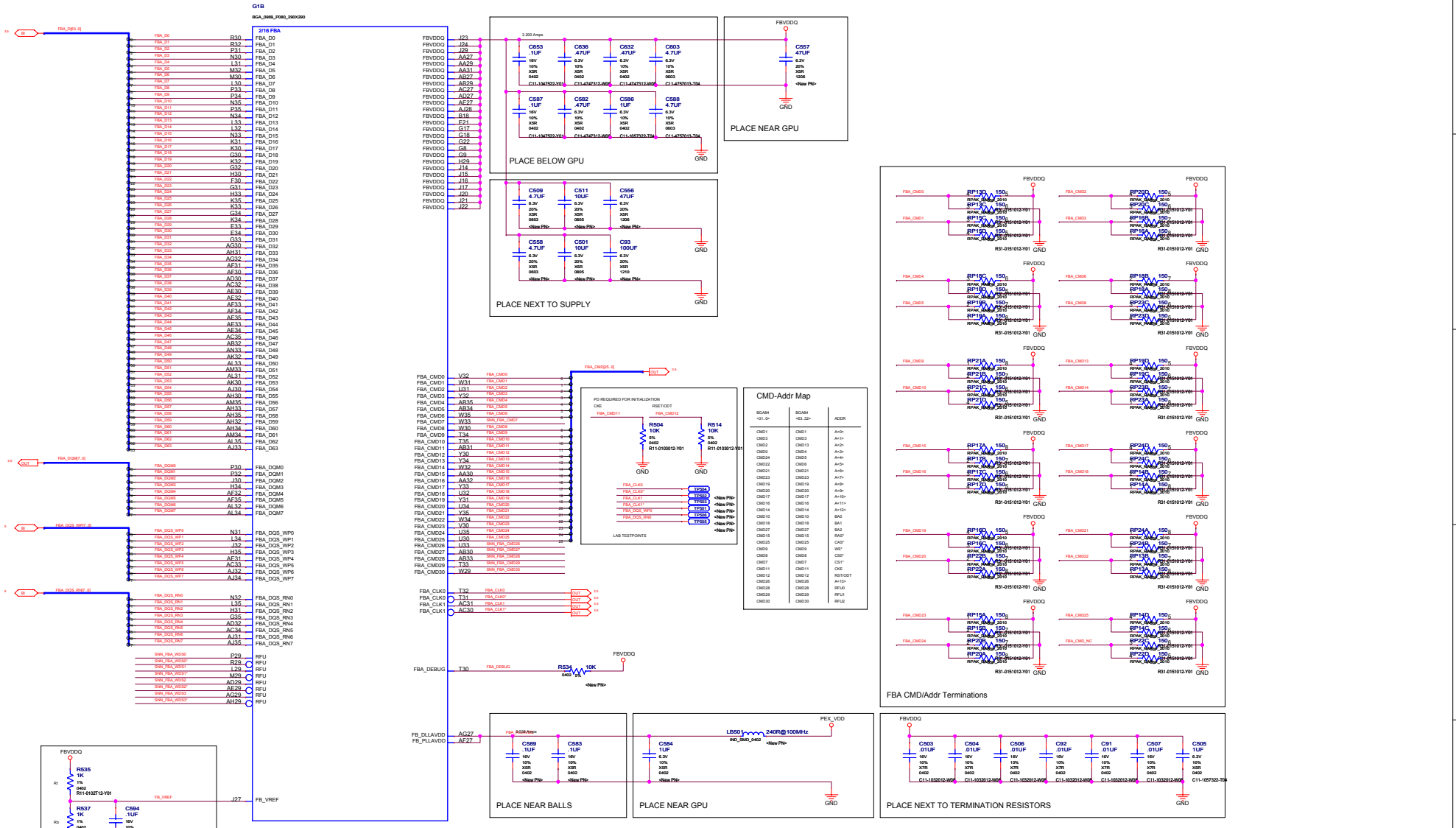
Partition A Frame Buffer Interface



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PAGE DETAIL	Partition A Frame Buffer Interface

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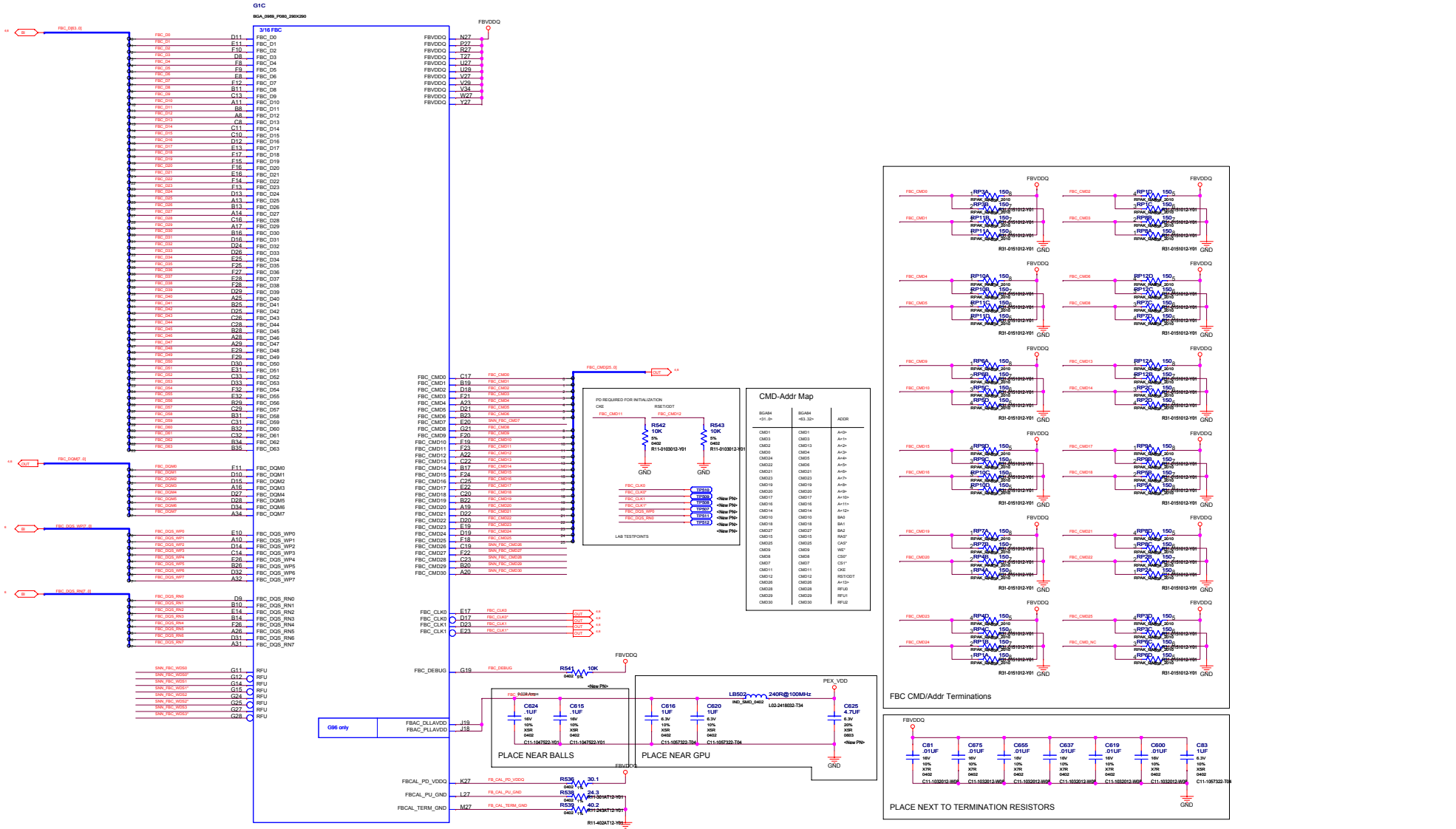
Partition C Frame Buffer Interface



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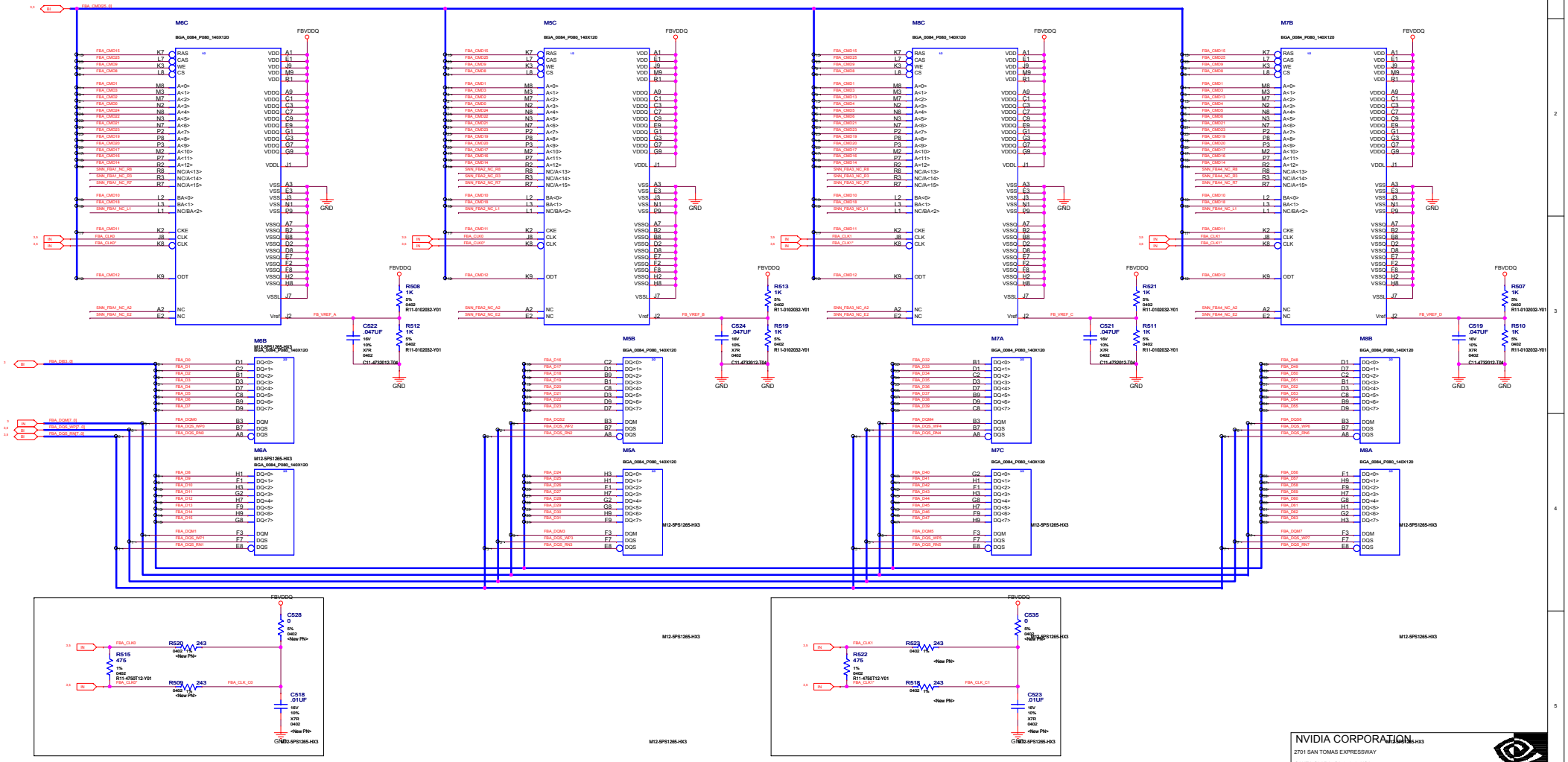
PAGE DETAIL	Partition C Frame Buffer Interface

Partition A Memories



ASSEMBLY	BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL
PAGE DETAIL	Partition A Memories

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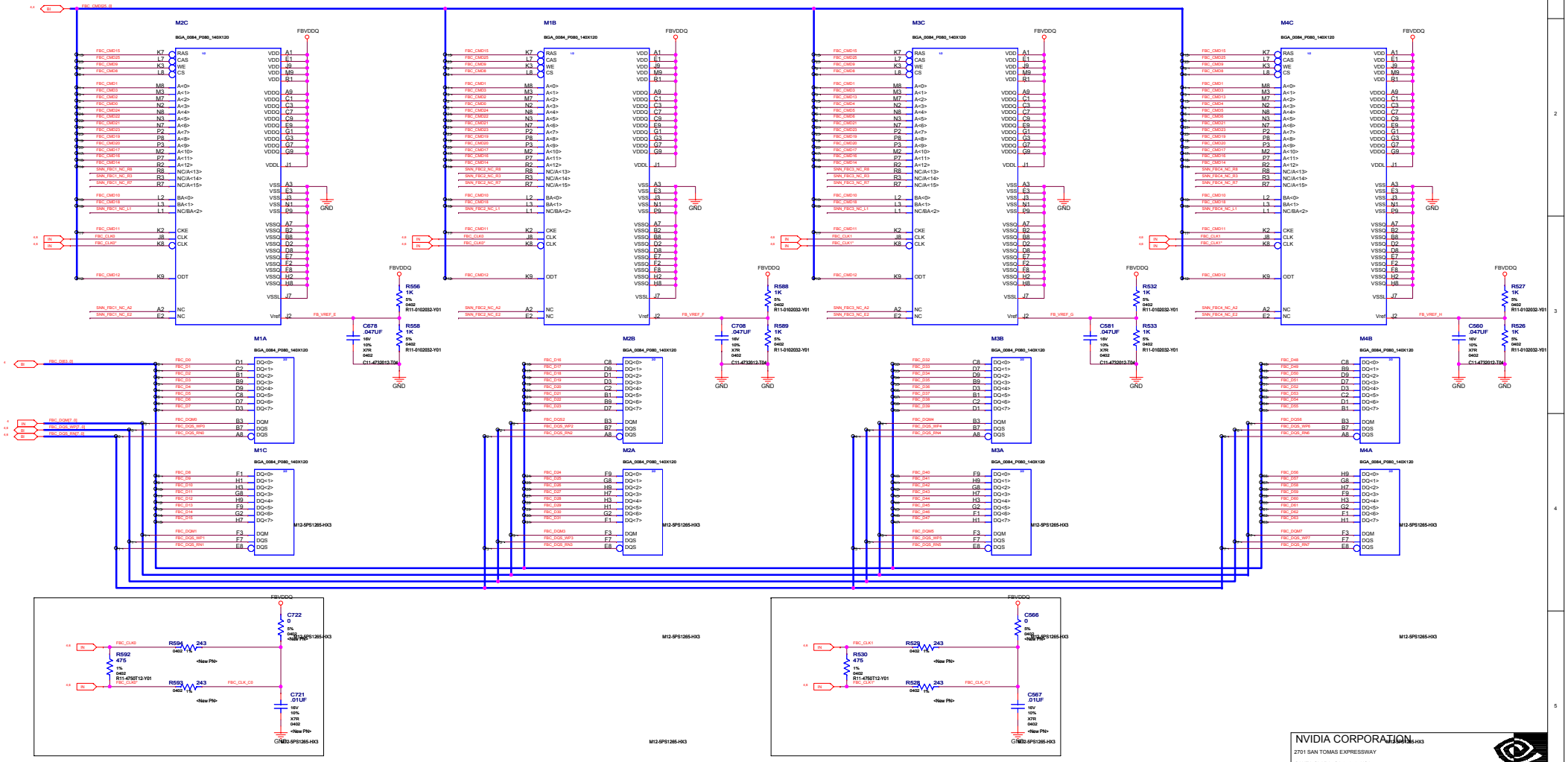
Partition C Memories



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PAGE DETAIL	Partition C Memories

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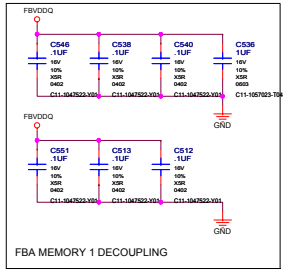
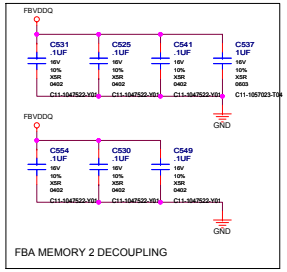
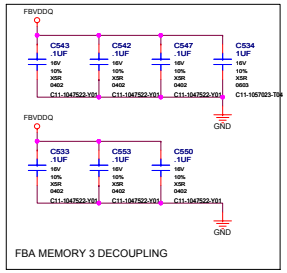
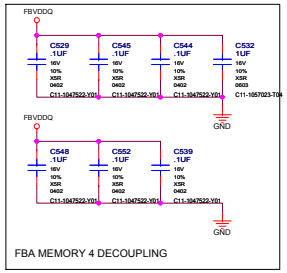
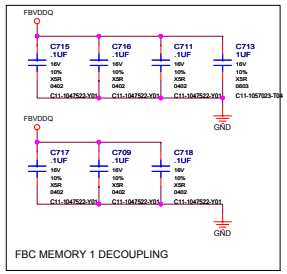
Decoupling Caps

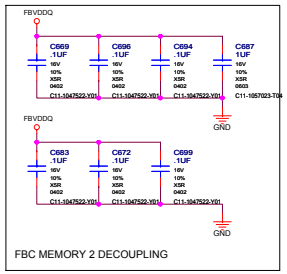


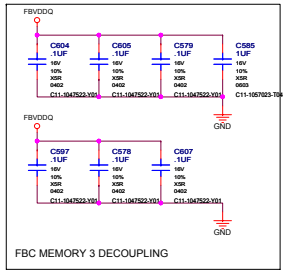


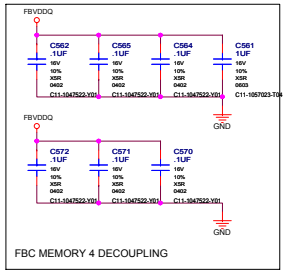


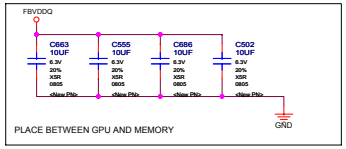


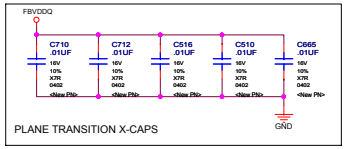


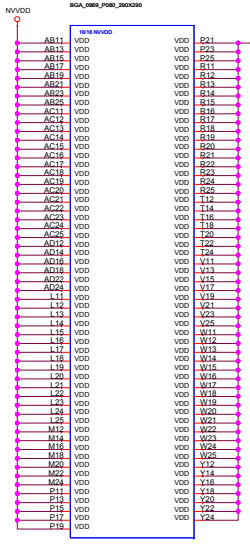


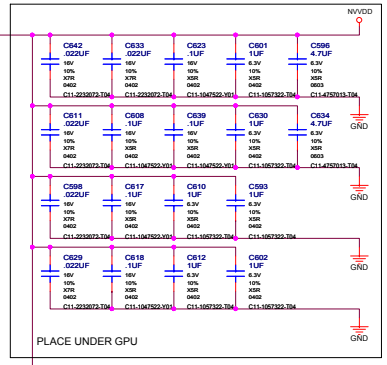


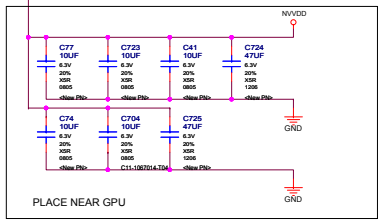


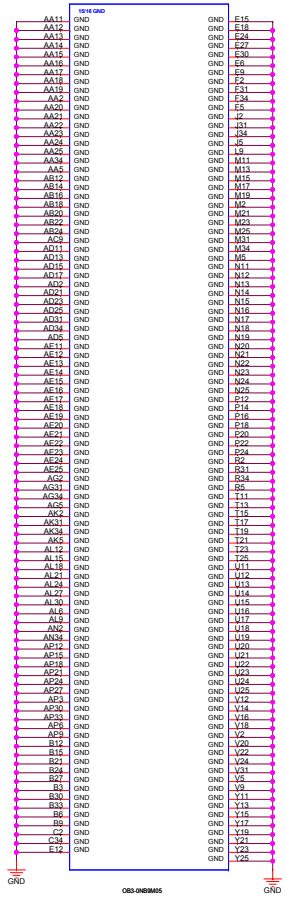












ASSEMBLY	BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL
PAGE DETAIL	Decoupling Caps

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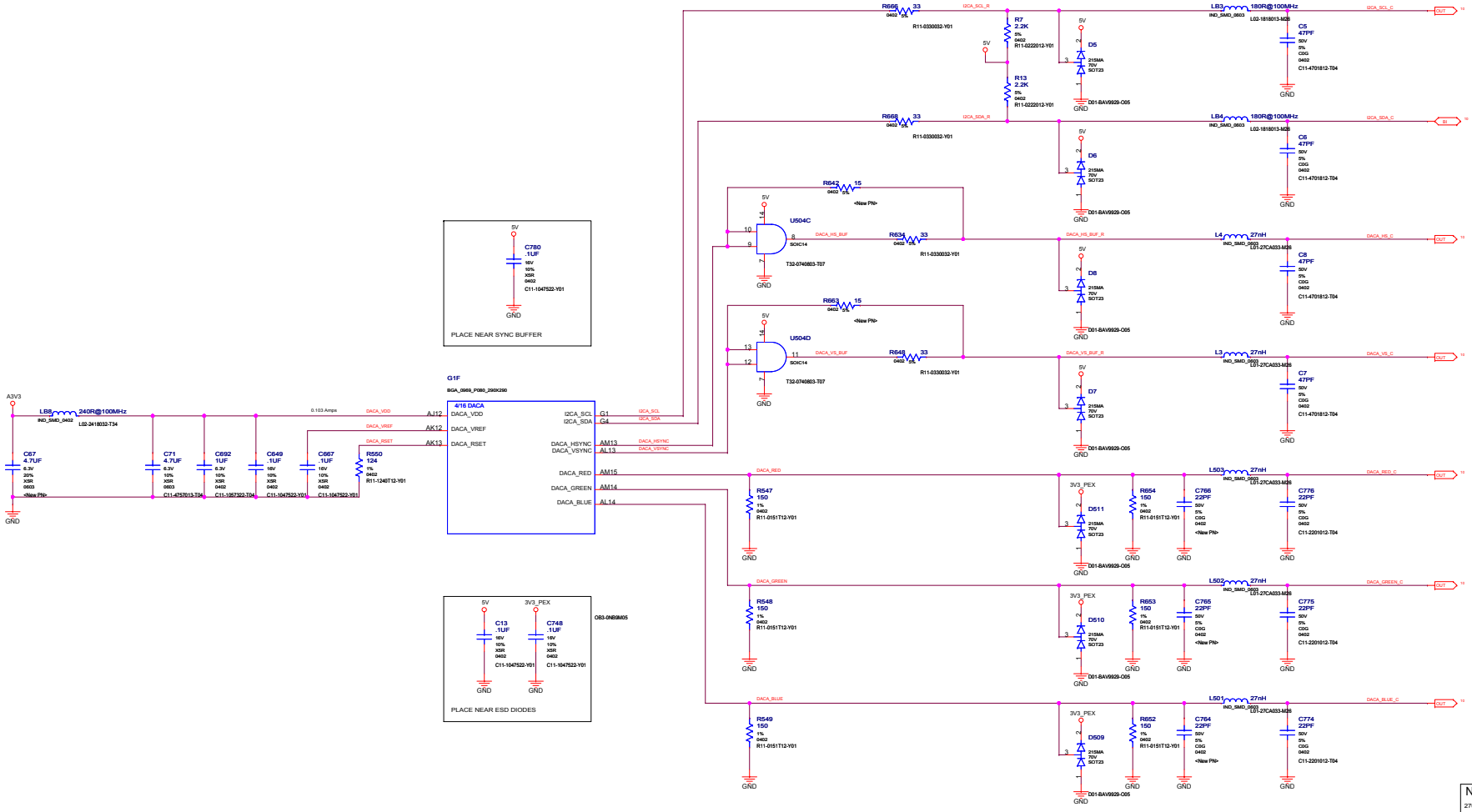
DACA



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PAGE DETAIL	DACA

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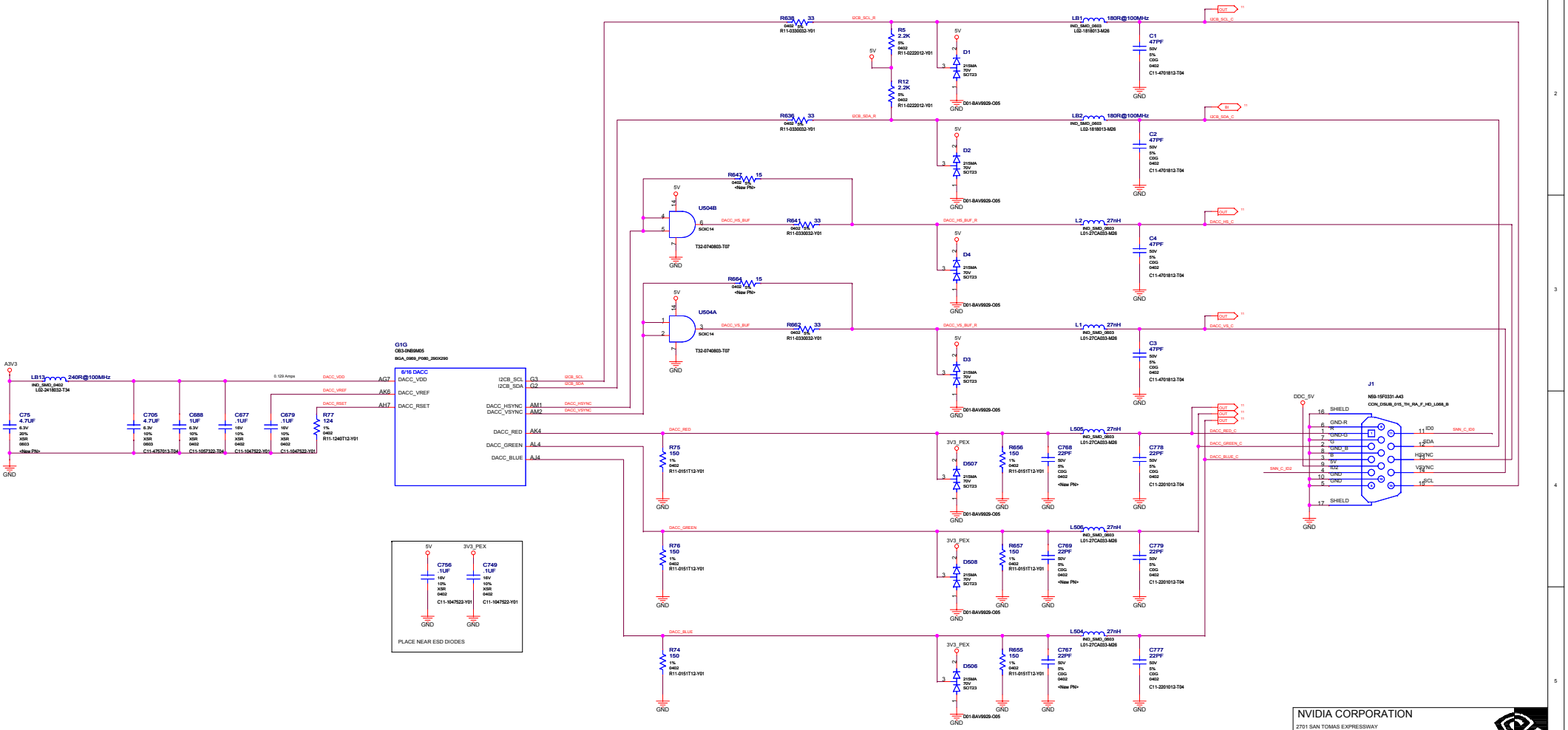
DACC, Slim DB15 Connector



ASSEMBLY	BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL
PAGE DETAIL	DACC, Slim DB15 Connector

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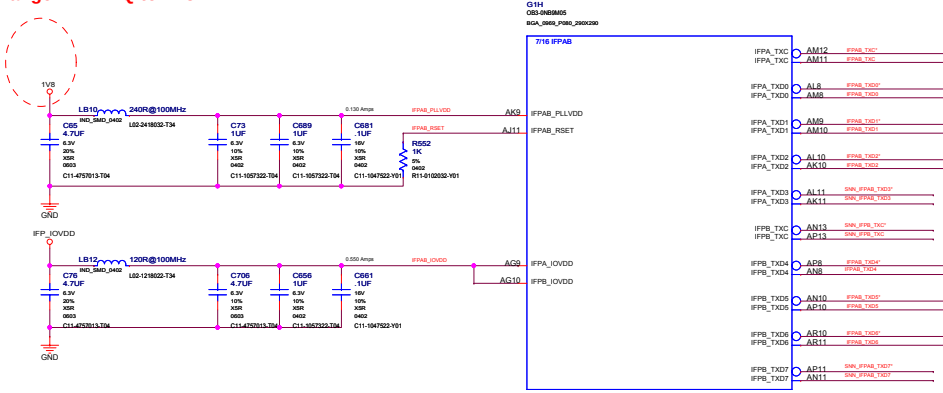
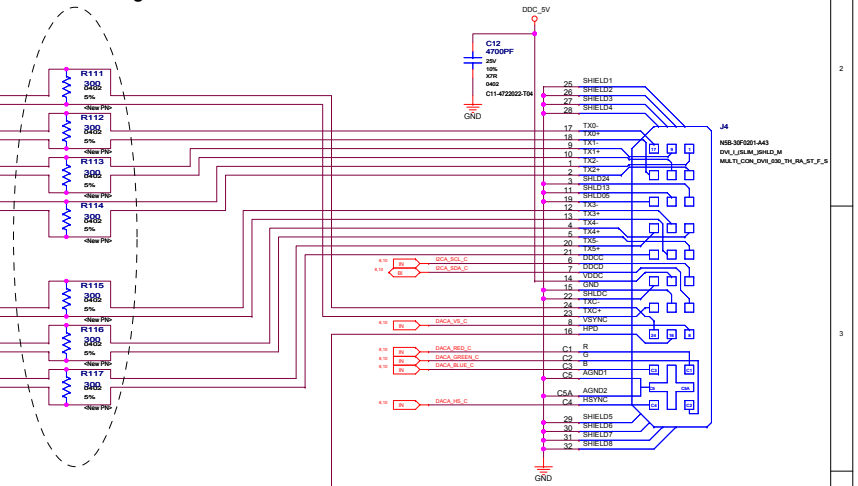
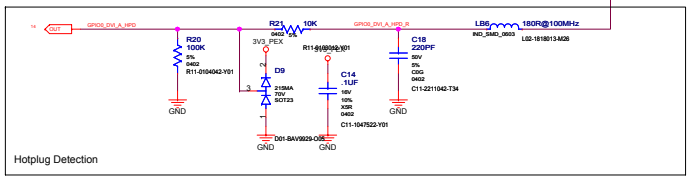
Internal TMDS .. Link A & B

change FBVDDQ to 1V8



add EMI bridge





ASSEMBLY	BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL
PAGE DETAIL	Internal TMDS .. Link A & B

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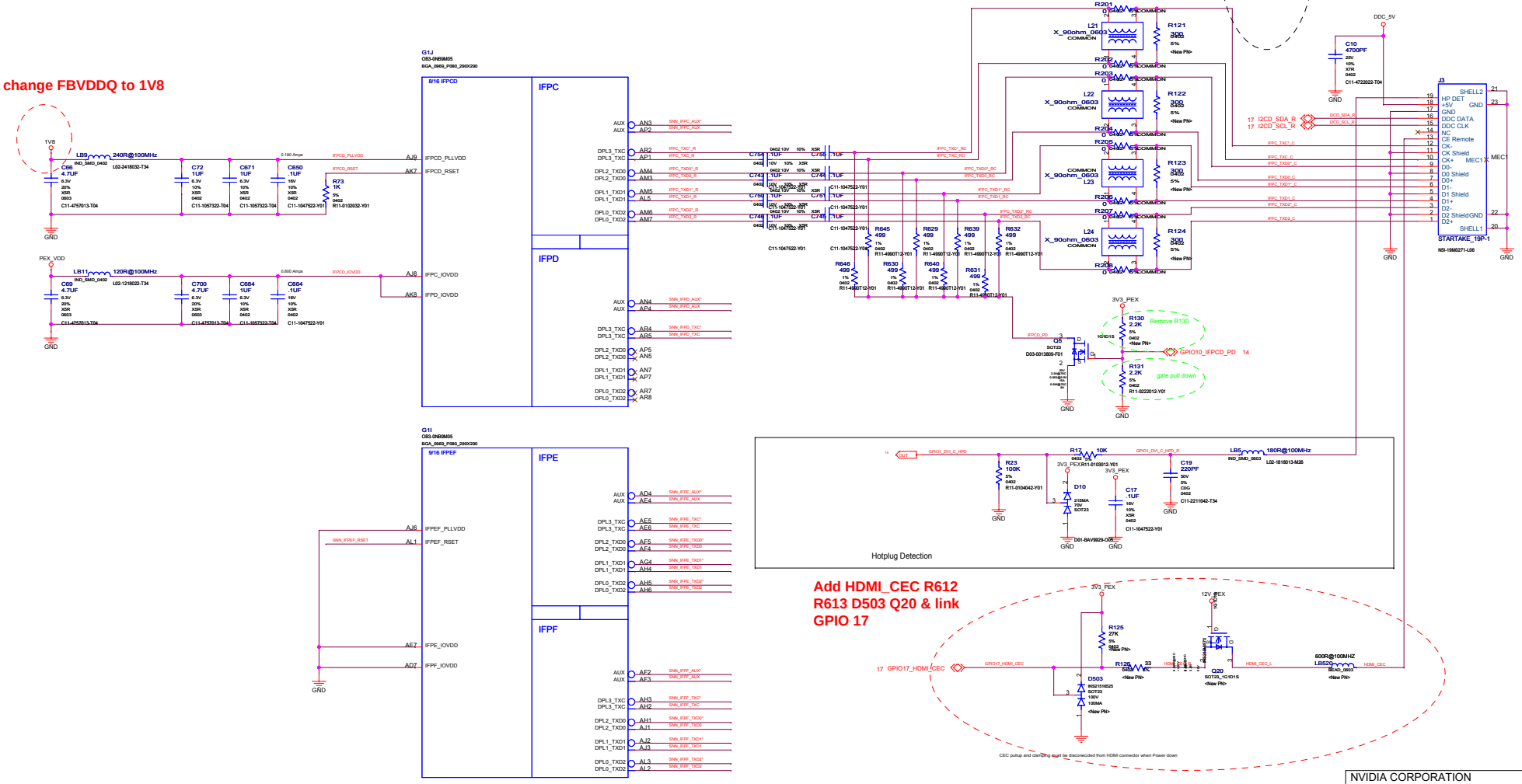
Internal TMDS .. Link C & D

add EMI bridge

Change DVI to HDMI

change FBVDDQ to 1V8



ASSEMBLY	BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL
PAGE DETAIL	Internal TMDS .. Link C & D

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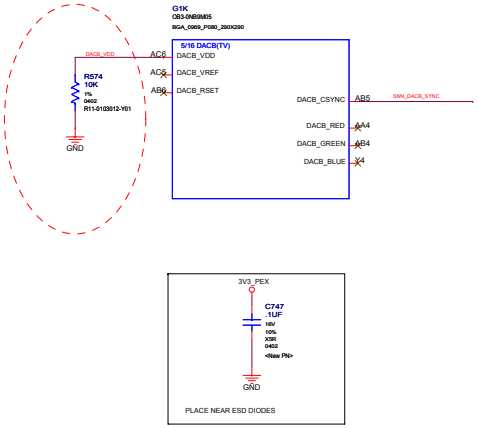
DACB, MINIDIN Connector

Change R574 to 10K



Remove TV-OUT

ASSEMBLY	BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL
PAGE DETAIL	DACB, MINIDIN Connector

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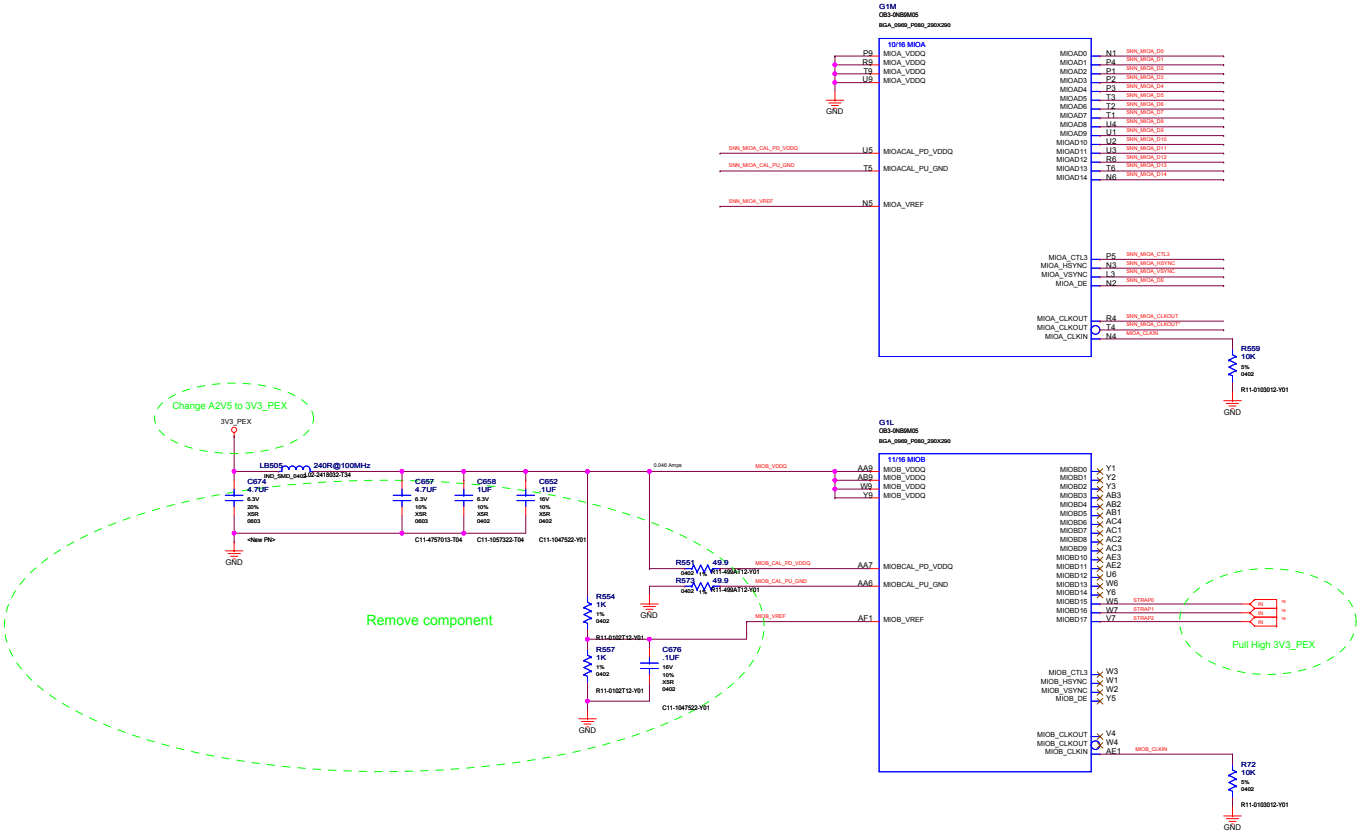
MIOA, MIOB Interface



ASSEMBLY	BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL
PAGE DETAIL	MIOA, MIOB Interface

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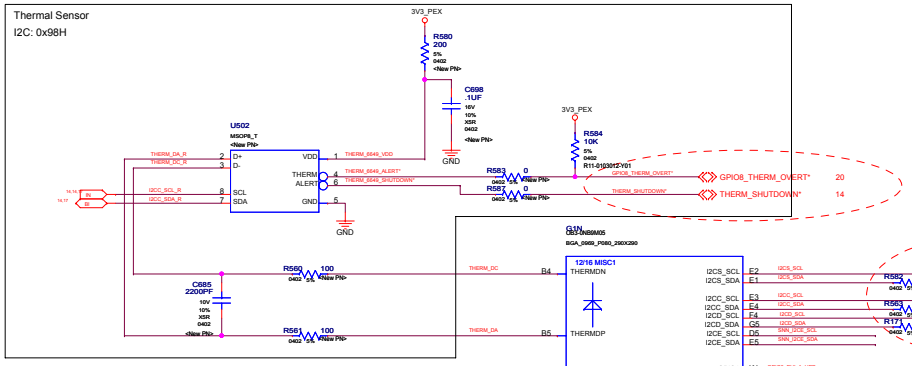
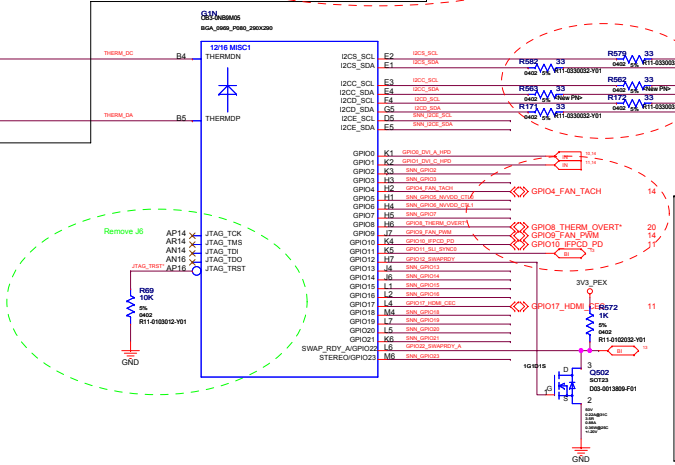
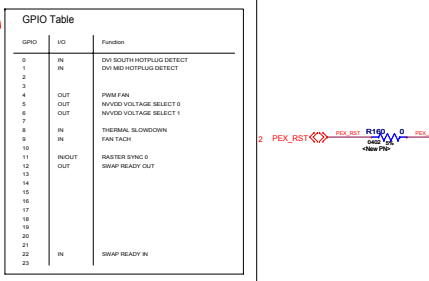
Thermal Sensors, GPIOs, XTAL, JTAG, Fan



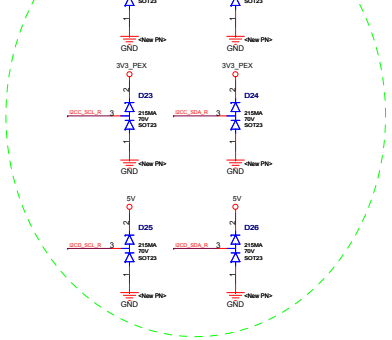




Add R171 R172 R173 R174
I2CD_SCL & I2CD_SDA

GPIO Table

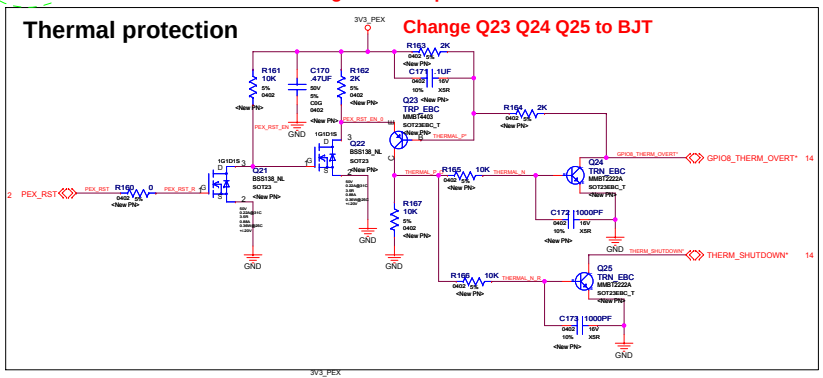
GPIO	I/O	Function
0	IN	DVI SOUTH HOTPLUG DETECT
1	IN	DVI MID HOTPLUG DETECT
2		
3		
4	OUT	PWM FAN
5	OUT	NVVDD VOLTAGE SELECT 0
6	OUT	NVVDD VOLTAGE SELECT 1
7		
8	IN	THERMAL SLOWDOWN
9	IN	FAN TACH
10		
11	IN/OUT	RASTER SYNC 0
12	OUT	SWAP READY OUT
13		
14		
15		
16		
17		
18		
19		
20		
21		
22	IN	SWAP READY IN
23		

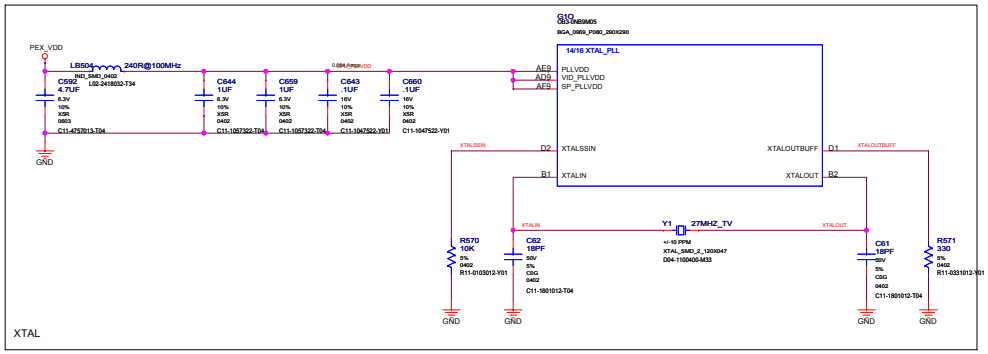


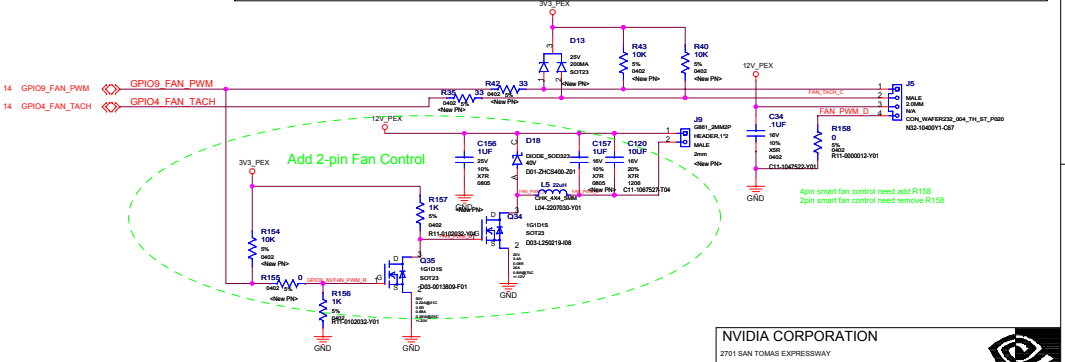
change Thermal protection

Thermal protection

Change Q23 Q24 Q25 to BJT







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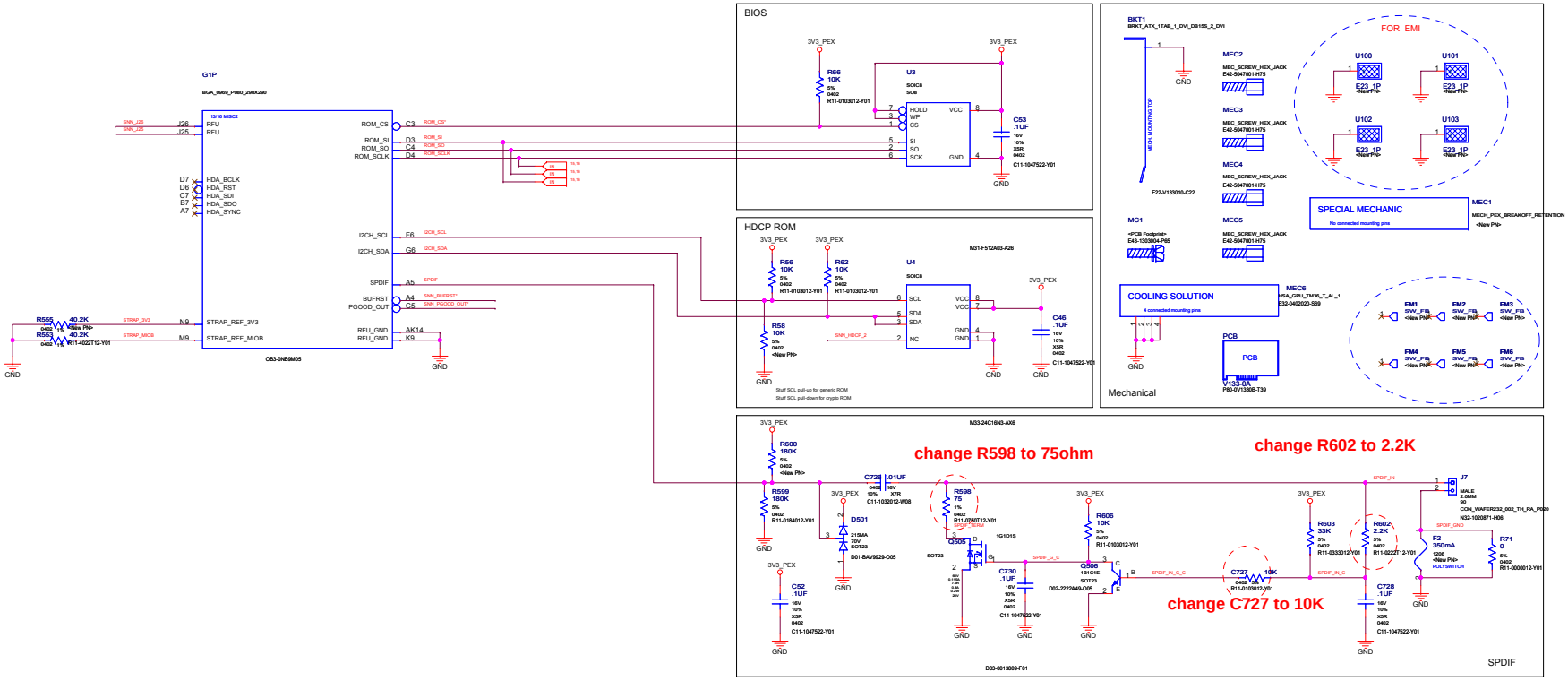
ASSEMBLY	BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL
PAGE DETAIL	Thermal Sensors, GPIOs, XTAL, JTAG, Fan

BIOS, HDCP, SPDIF, HDA, Mechanical



ASSEMBLY	BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL
PAGE DETAIL	BIOS, HDCP, SPDIF, HDA, Mechanical

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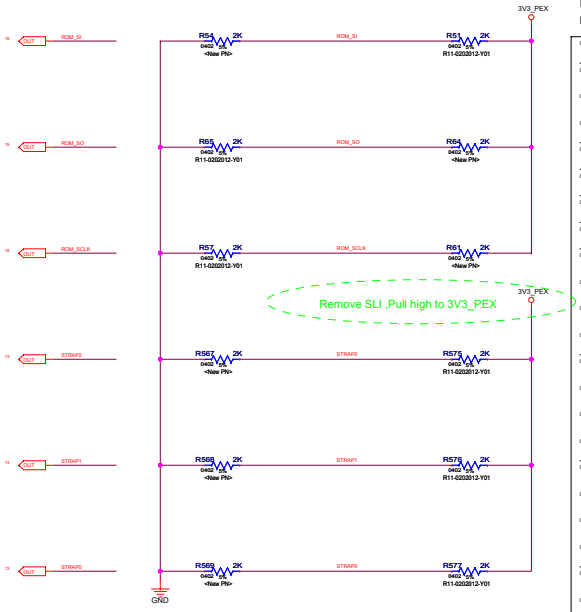
Straps



G94 Straps
Multilevel Mode

Bit	Signal	Values
03:	XCLK_277	0 DISABLED 1 ENABLED
02:	TVMODE[2]	000 NTSC_M 001 NTSC_J 010 PAL_M 011 PAL_N 100 PAL_CN 101 PAL_SIGGHI 110 RESERVED0 111 RESERVED1
01:	TVMODE[1]	
00:	TVMODE[0]	
03:	PCI_DEVID_EXT	1 G96-300-A1
02:	SUB_VENDOR	0 NO BIOS 1 BIOS
01:	SLOT_CLK_CFG	0 DISABLE 1 ENABLE
00:	PEX_PLL_EN_TERM100	0 DIS 1 EN
03:	RAMCFG[3]	0000 32Mx16/16Mx16 DDR2 128-bit Elpida 0001 16Mx16 DDR2 128-bit Samsung, Micron 0010 16Mx16 DDR2 128-bit Qimonda 0011 16Mx16 DDR2 128-bit Hynix 0100 32Mx16/16Mx16 DDR2 128-bit Nanya 0101 32Mx16 DDR2 128-bit Samsung 0110 32Mx16 DDR2 128-bit Qimonda 0111 32Mx16 DDR2 128-bit Hynix 1000 32Mx16/16Mx16 DDR2 64-bit Elpida 1001 16Mx16 DDR2 64-bit Samsung, Micron 1010 16Mx16 DDR2 64-bit Qimonda 1011 16Mx16 DDR2 64-bit Hynix 1100 32Mx16/16Mx16 DDR2 64-bit Nanya 1101 32Mx16 DDR2 64-bit Samsung 1110 32Mx16 DDR2 64-bit Qimonda 1111 32Mx16 DDR2 64-bit Hynix
02:	RAMCFG[2]	
01:	RAMCFG[1]	
00:	RAMCFG[0]	
03:	PCI_DEVID[3]	0001 G96-300-A1
02:	PCI_DEVID[2]	
01:	PCI_DEVID[1]	
00:	PCI_DEVID[0]	
03:	3GIO_PADCFG_LUG_ADR[3]	0000 DSKTOP_DEFAULT 0001 MOBILE_DEFAULT 0010 MOBILE_NTHRS_LLAMP 0011 MOBILE_NTHRS_LAMP 0100 MOBILE_NTHRS_HAMP 0101 MOBILE_NTHRS_HHAMP 0110 MOBILE_NTHRS_HHHAMP 0111 MOBILE_NTHRS_HHHHAMP 1000 DSKTOP_HTHRS 1001 MOBILE_HTHRS_NAMP 1010 MOBILE_HTHRS_LLAMP 1011 MOBILE_HTHRS_LAMP 1100 MOBILE_HTHRS_HAMP 1101 MOBILE_HTHRS_HHAMP 1110 MOBILE_HTHRS_HHHAMP 1111 MOBILE_HTHRS_HHHHAMP
02:	3GIO_PADCFG_LUG_ADR[2]	
01:	3GIO_PADCFG_LUG_ADR[1]	
00:	3GIO_PADCFG_LUG_ADR[0]	
03:	USER[3]	0000 DEFAULT
02:	USER[2]	
01:	USER[1]	
00:	USER[0]	

0111 32Mx16 DDR2 128-bit Hynix

Multilevel Straps

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

G94 Straps
Binary-Bringup Mode

Bit	Signal	Values
	SUB_VENDOR	0 NO BIOS 1 BIOS
	SLOT_CLK_CFG	0 DISABLE 1 ENABLE
	3GIO_PADCFG_LUT_ADR[3]	0000 DSKTOP_DEFAULT 0001 MOBILE_DEFAULT 0010 MOBILE_NTHRS_LLAMP 0011 MOBILE_NTHRS_LAMP 0100 MOBILE_NTHRS_HAMP 0101 MOBILE_NTHRS_HHAMP 0110 MOBILE_NTHRS_HHHAMP 0111 MOBILE_NTHRS_HHHHAMP 1000 DSKTOP_HTHRS 1001 MOBILE_HTHRS_NAMP 1010 MOBILE_HTHRS_LLAMP 1011 MOBILE_HTHRS_LAMP 1100 MOBILE_HTHRS_HAMP 1101 MOBILE_HTHRS_HHAMP 1110 MOBILE_HTHRS_HHHAMP 1111 MOBILE_HTHRS_HHHHAMP
	3GIO_PADCFG_LUT_ADR[2]	
	3GIO_PADCFG_LUT_ADR[1]	
	3GIO_PADCFG_LUT_ADR[0]	

G94 Straps
Binary-Production Mode

Bit	Signal	Values
	SLOT_CLK_CFG	0 DISABLE 1 ENABLE
	PCI_DEVID_EXT	10 G96-300-A1
	PCI_DEVID[3]	
	RAMCFG[2]	000 32Mx16/16Mx16 DDR2 Elpida 001 16Mx16 DDR2 Samsung, Micron 010 16Mx16 DDR2 Qimonda 011 16Mx16 DDR2 Hynix 100 32Mx16/16Mx16 DDR2 Nanya 101 32Mx16 DDR2 Samsung 110 32Mx16 DDR2 Qimonda 111 32Mx16 DDR2 Hynix
	RAMCFG[1]	
	RAMCFG[0]	

ASSEMBLY	BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL
PAGE DETAIL	Straps

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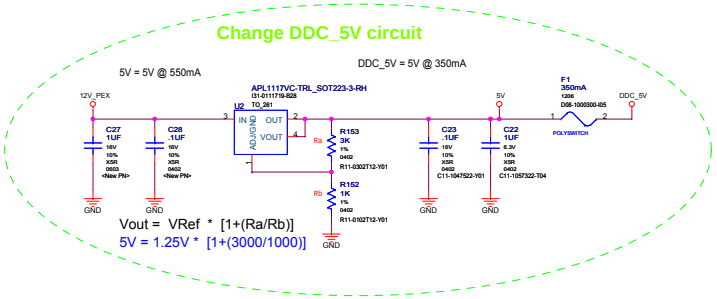
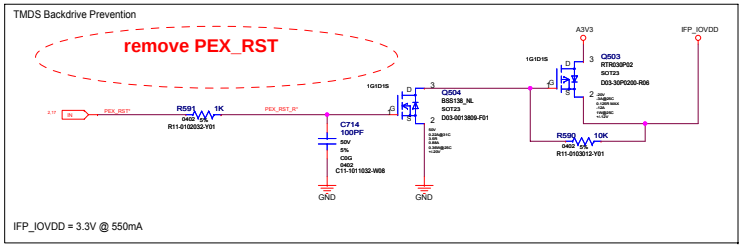
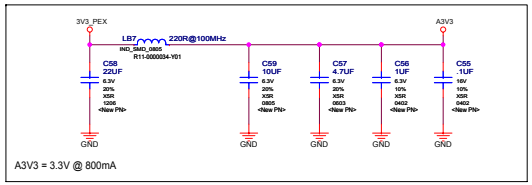
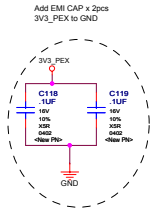
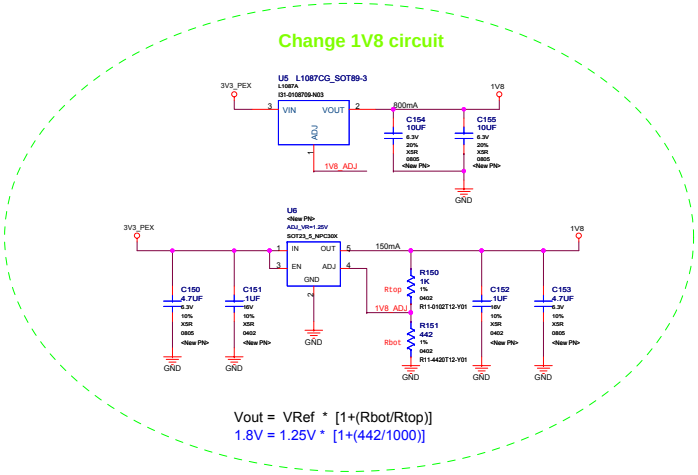
Power Supply I: 2V5, 3V3, 5V, IFP_IOVDD











ASSEMBLY	BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL
PAGE DETAIL	Power Supply I: 2V5, 3V3, 5V, IFP_IOVDD

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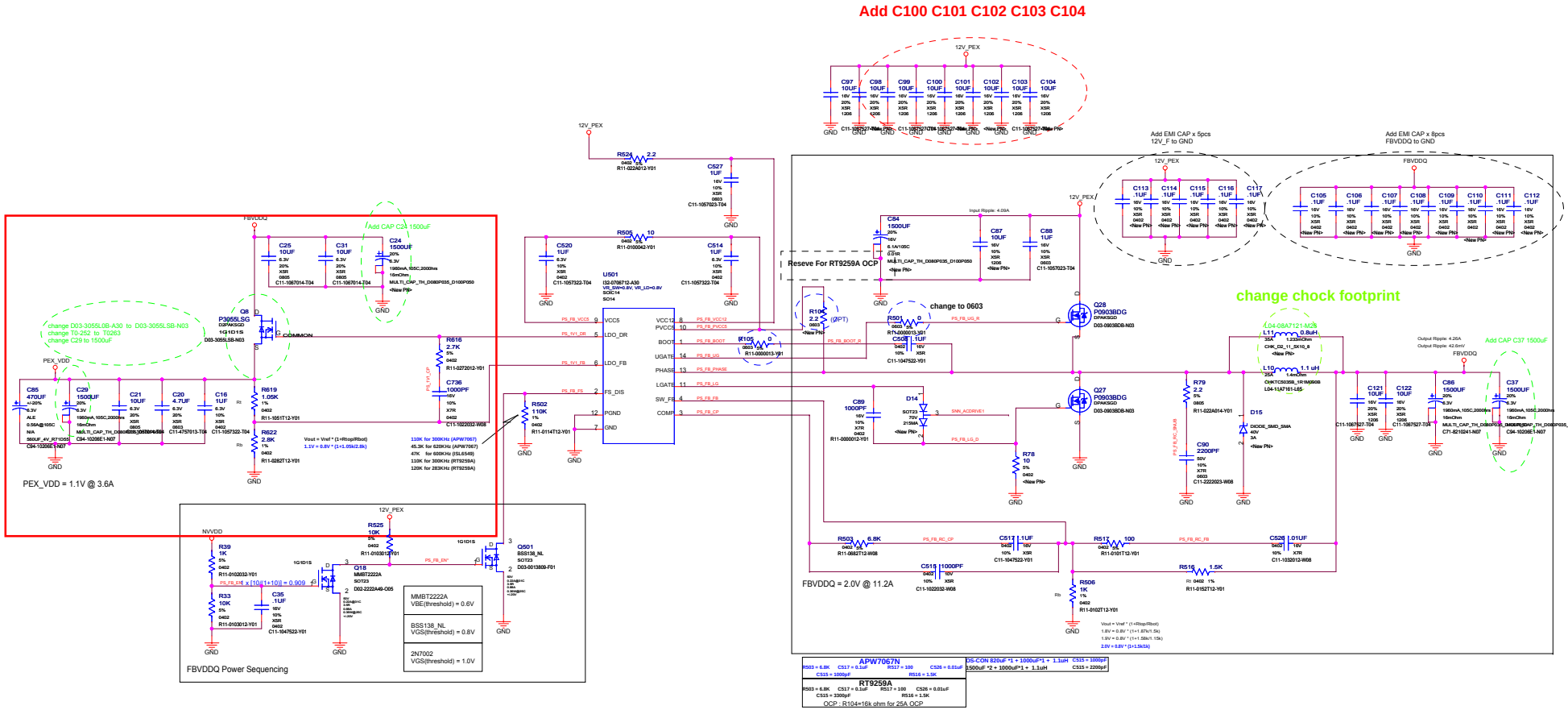
Power Supply II: FBVDDQ



ASSEMBLY	BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL
PAGE DETAIL	Power Supply II: FBVDDQ

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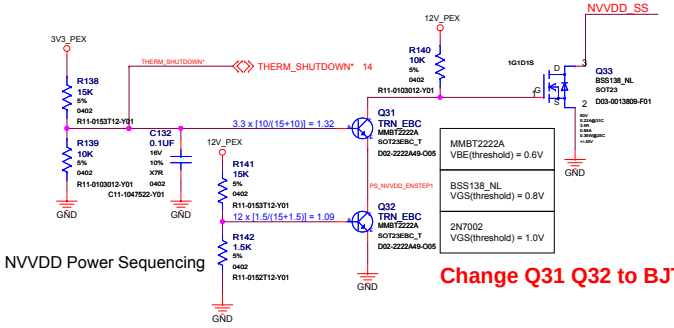
Power Supply III: NVVDD, PEX_VDD



NVVDD Power Sequencing

Change Q31 Q32 to BJT

RT9258
Switching Frequency 250KHz (R308=42K)
a.Inductance(L) : L0=0.8+20%μH(100KHz/0.25V)
b.DC Resistance(RDC) : 1.233mΩ +6%
c.Iout Max=35A
d.output CAP =1500uF 25mohm
R303 = R305 = 7.2K
R306 = R318 = 0 ohm(OCP trigger point = 60A)
C302 = C310 =0.1 uF
Compensation
C308 =NC F ; R314 = NC ohm
C306 = 33p F ; C307 = 22n F
R310 = 3k ohm ; R313 = 7K ohm

APW7088
Switching Frequency Fixed 300KHz
a.Inductance(L) : L0=0.8+20%μH(100KHz/0.25V)
b.DC Resistance(RDC) : 1.233mΩ +6%
c.Iout Max=35A
d.output CAP =1500uF 25mohm
R303 = R305 = 4.3K
R306 = R318 = 620 ohm(OCP trigger point = 60A)
C302 = C310 = 0.22uF
Compensation
C308 = 3.3nF ; R314 = 220 ohm
C306 = 1000pF ; C307 = 10nF
R310 = 4.02K ohm ; R313 = 1.78K ohm

R319 = 0 ohm C304 = N/A
R320 = 0 ohm C305 = N/A
R311 = 0 ohm
R316 = 0 ohm

VID0,VID1,VID2 Float
Vref = 0.85V
R301,R317,R308,R302,R309, R315 = N/A