P690: GT218, DDR3 MEMORY 64MX16/32MX16

Page 1: P690 Overview

Page 2: PCI Express Interface

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Page 11: Thermal Protection, IFP_IOVDD, Straps

Page 12: Power Supply I: FBVDD/Q, PEX_VDD, 5V, 3V3_F

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V183 2.0 pcb change list

Page 2：Add EC1802 for 12V_PEX use , G1.E15 pin NC

Page 3：Add R72

Page 5：ESD diose move to close connector side

Page 7：Add EMI suggestion

Page 8：Add HDMI function

Page 8：G1.H6 pin connector to GND

Page 9：G1.P6 D7 pin connector to GND

Page 10：Del JTAG、I2C SCH, U503 pin 3 connector to ROM_VCC

Page 12：Change FBVDDQ PWM sch , Add C99 for 3V3_PEX

Page 12：Change PEX_VDD、5V

Page 13：Change NVVDD PWM sch

Page 13：Del PEX_PLL sch

V183 2.3 pcb change list

Page 8：HDMI change to Link C

V183 5.0 pcb change list

Page 5：Del Slim type VGA connector

Page 6：Del Fly cable VGA connector

Page 7：Del DVI-I connector , Add DMS59 connector

Page 8：Del HDMI connector

SKU	VARIANT	NVPN	ASSEMBLY
B	BASE	600-10690-BASE-000	BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL
1	SKU0000	600-10690-0000-000	GT218-300, 550/1375/800, 512MB/64bit, 64Mx16 DDR3, DVI-DL+DP+VGA, DT
2	<UNDEFINED>	<UNDEFINED>	<UNDEFINED>
3	<UNDEFINED>	<UNDEFINED>	<UNDEFINED>
4	<UNDEFINED>	<UNDEFINED>	<UNDEFINED>
5	<UNDEFINED>	<UNDEFINED>	<UNDEFINED>
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ASSEMBLY	BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL
PAGE DETAIL	P690 Overview

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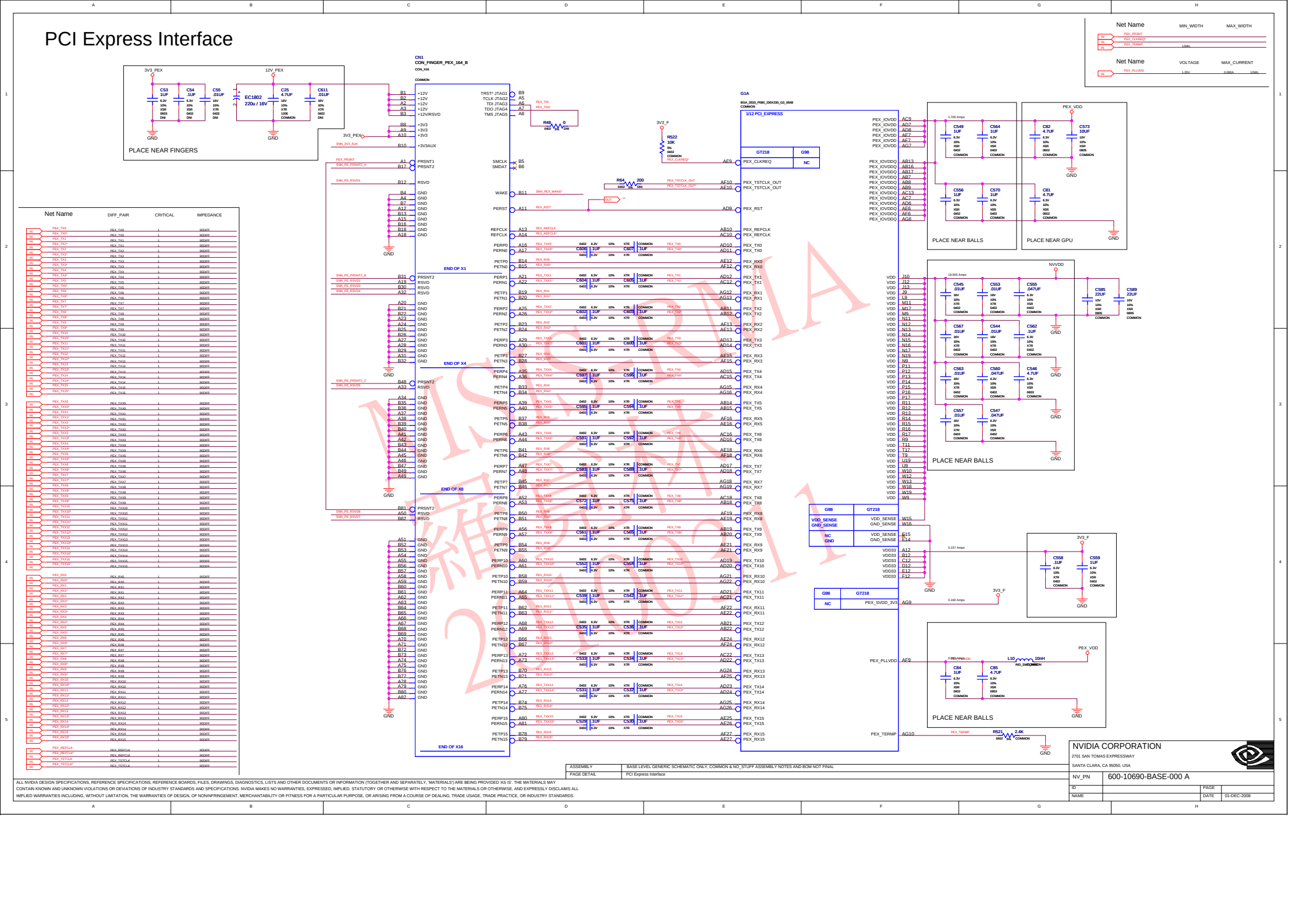
NV_PN	600-10690-BASE-000 A		
ID		PAGE	
NAME		DATE	01-DEC-2008

PCI Express Interface



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

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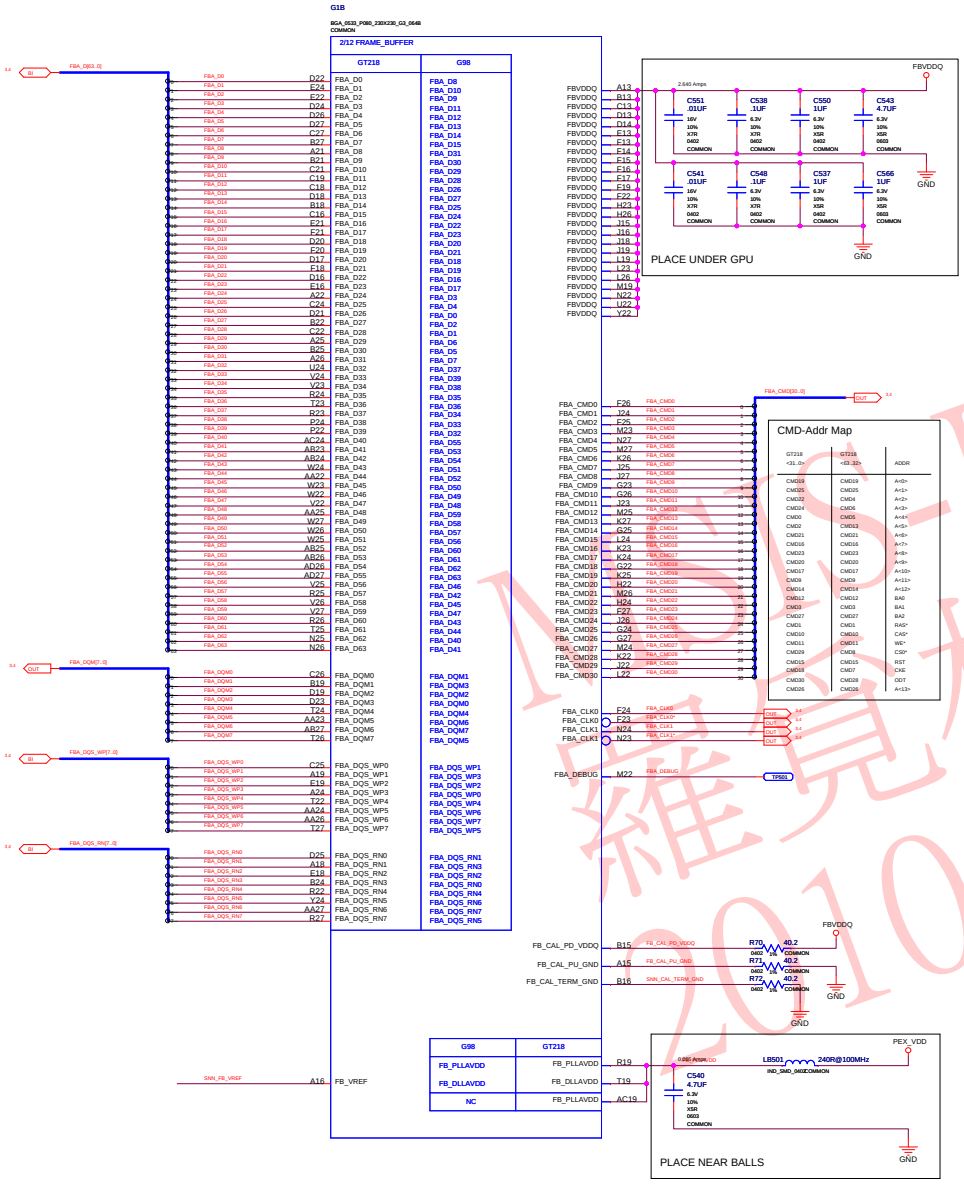
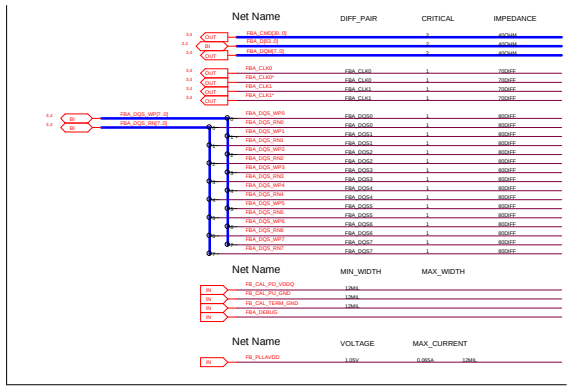
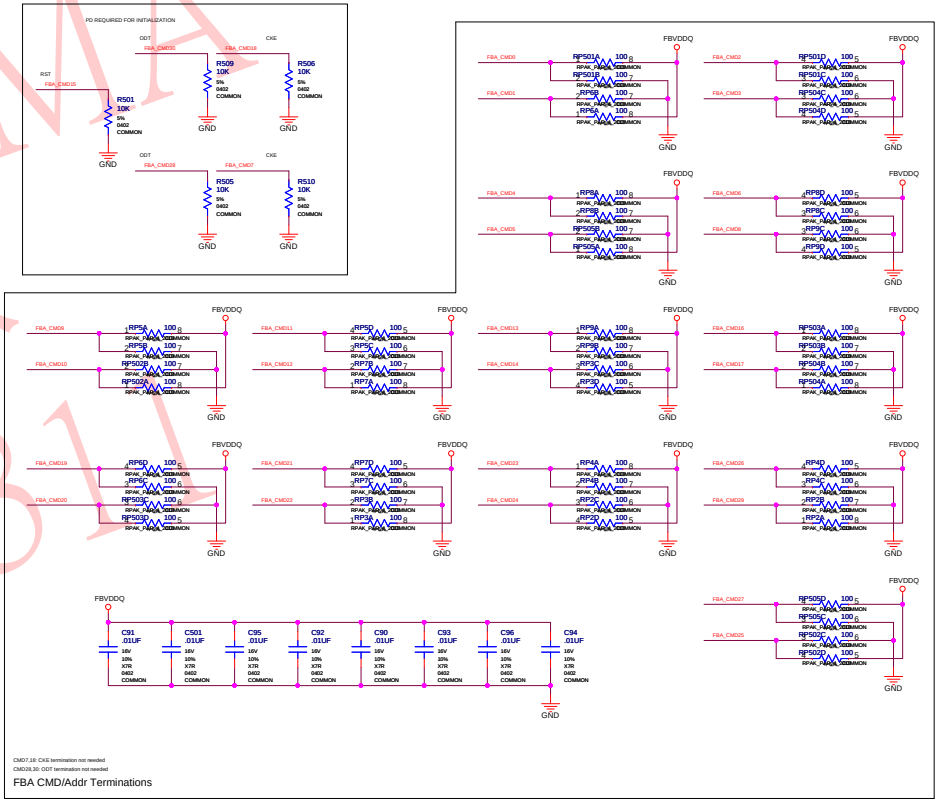
NV_PN	600-10690-BASE-000 A		
ID		PAGE	
NAME		DATE	01-DEC-2008

Frame Buffer Interface







NV_PN	600-10690-BASE-000 A
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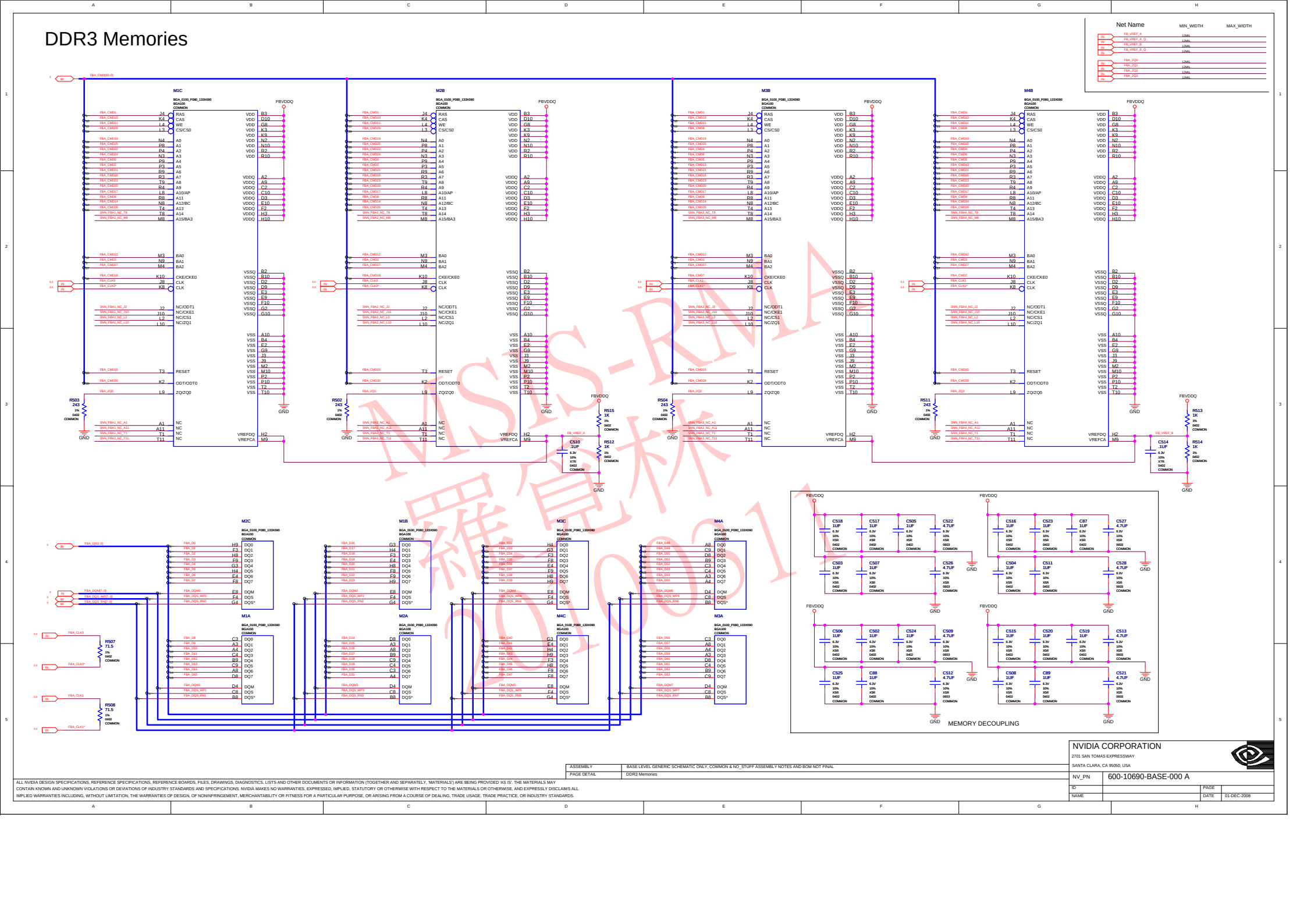
PAGE	
NAME	
DATE	01-DEC-2008
ASSEMBLY	BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL
PAGE DETAIL	Frame Buffer Interface

DDR3 Memories



Net Name	MIN_WIDTH	MAX_WIDTH
FB_VREF_A	12MIL	
FB_VREF_A_Q	12MIL	
FB_VREF_B	12MIL	
FB_VREF_B_Q	12MIL	
FBA_ZQ0	12MIL	
FBA_ZQ1	12MIL	
FBA_ZQ2	12MIL	
FBA_ZQ3	12MIL	

ASSEMBLY	BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL
PAGE DETAIL	DDR3 Memories

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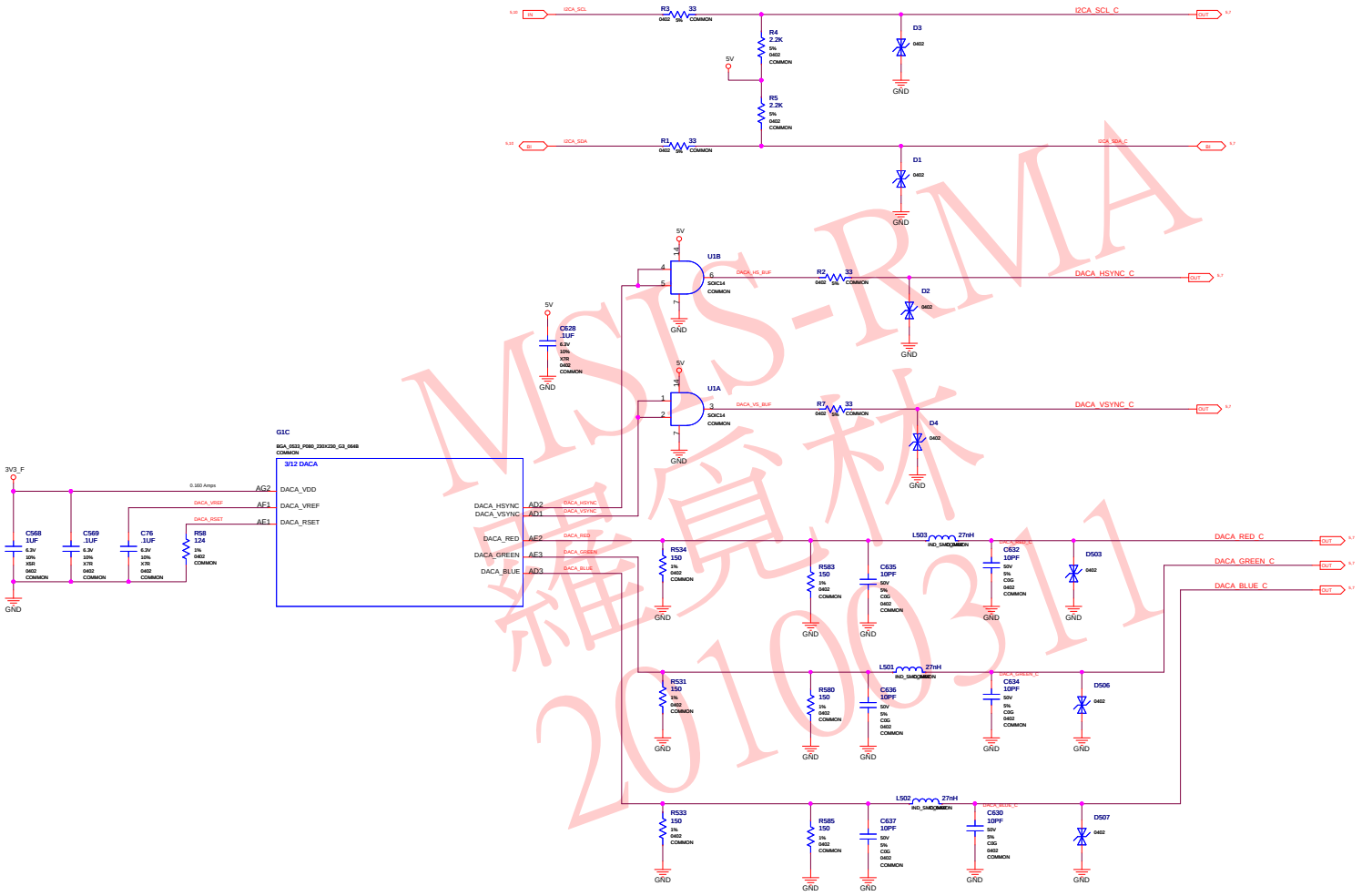
NV_PN	600-10690-BASE-000 A		
ID		PAGE	
NAME		DATE	01-DEC-2008

DAC A Slim VGA



Net Name	CRITICAL	IMPEDANCE
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_HS_BUF	2	50OHM
DACA_VS_BUF	2	50OHM
DACA_HSYNC_C	2	50OHM
DACA_VSYNC_C	2	50OHM

Net Name	MIN_WIDTH	MAX_WIDTH
I2CA_SCL		
I2CA_SDA		
I2CA_SCL_C		
I2CA_SDA_C		

Net Name	VOLTAGE	MAX_CURRENT
DACA_VREF	1.2V	12MIL
DACA_RSET		12MIL

ASSEMBLY	BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL
PAGE DETAIL	DAC A Slim VGA

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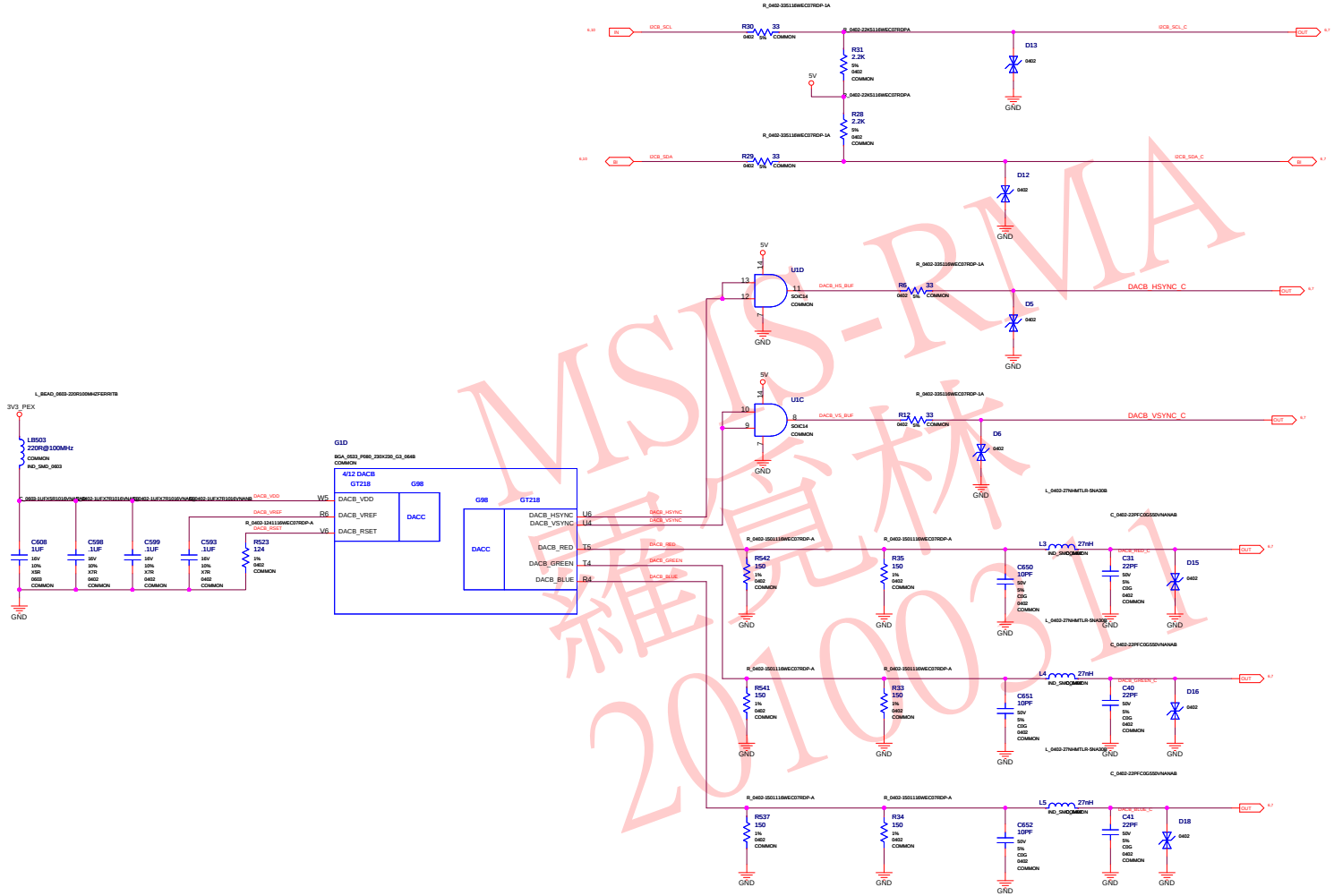
NV_PN	600-10690-BASE-000 A		
ID		PAGE	
NAME		DATE	01-DEC-2008

DAC B VGA Header



Net Name	CRITICAL	IMPEDANCE
DACB_RED	1	50OHM
DACB_GREEN	1	50OHM
DACB_BLUE	1	50OHM
DACB_RED_C	1	50OHM
DACB_GREEN_C	1	50OHM
DACB_BLUE_C	1	50OHM
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

Net Name	MIN_WIDTH	MAX_WIDTH
I2CB_SCL		
I2CB_SDA		
I2CB_SCL_C		
I2CB_SDA_C		

Net Name	VOLTAGE	MAX_CURRENT
DACB_VREF	1.2V	12MIL
DACB_RSET		12MIL

ASSEMBLY	BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL
PAGE DETAIL	DAC B VGA Header

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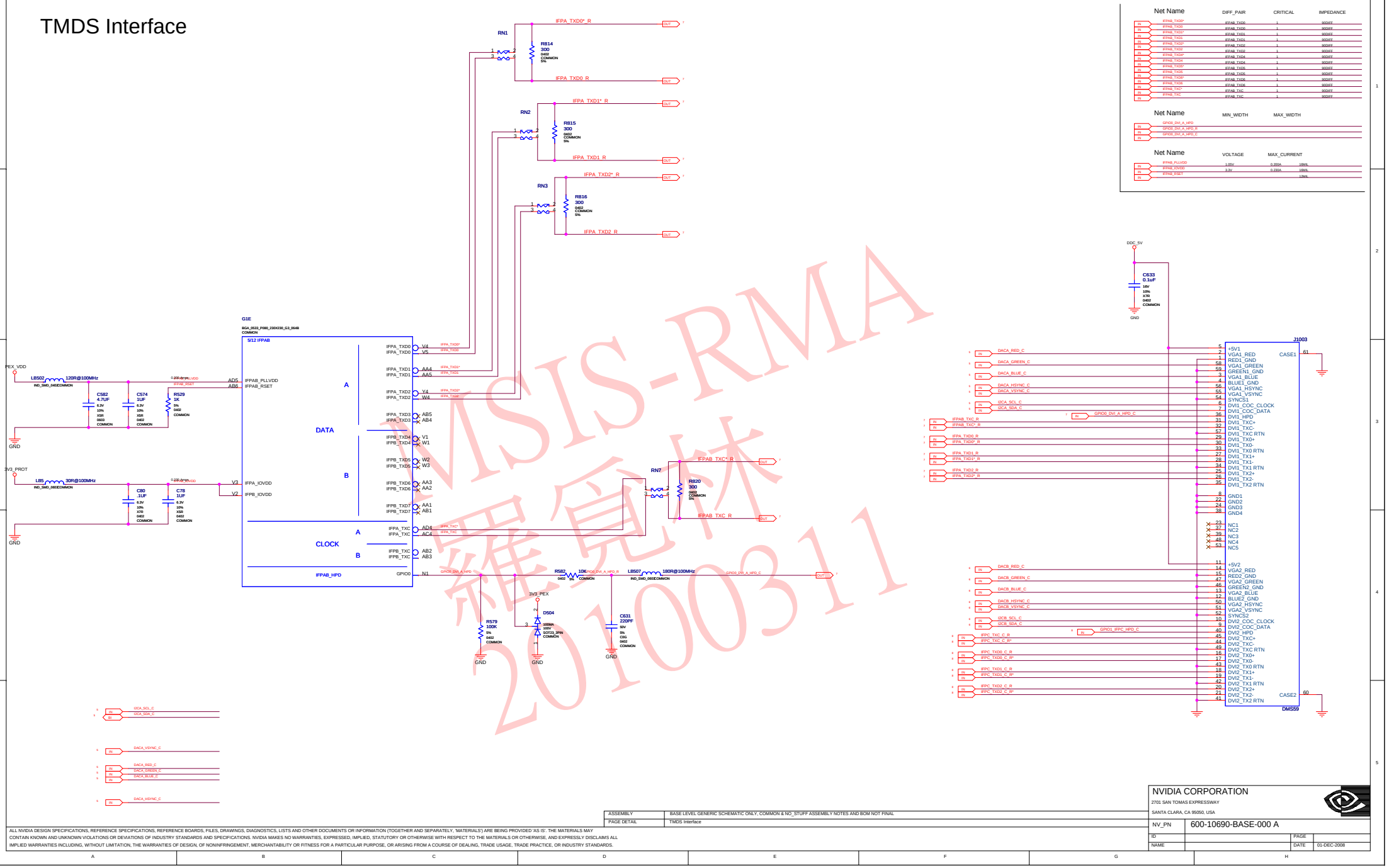
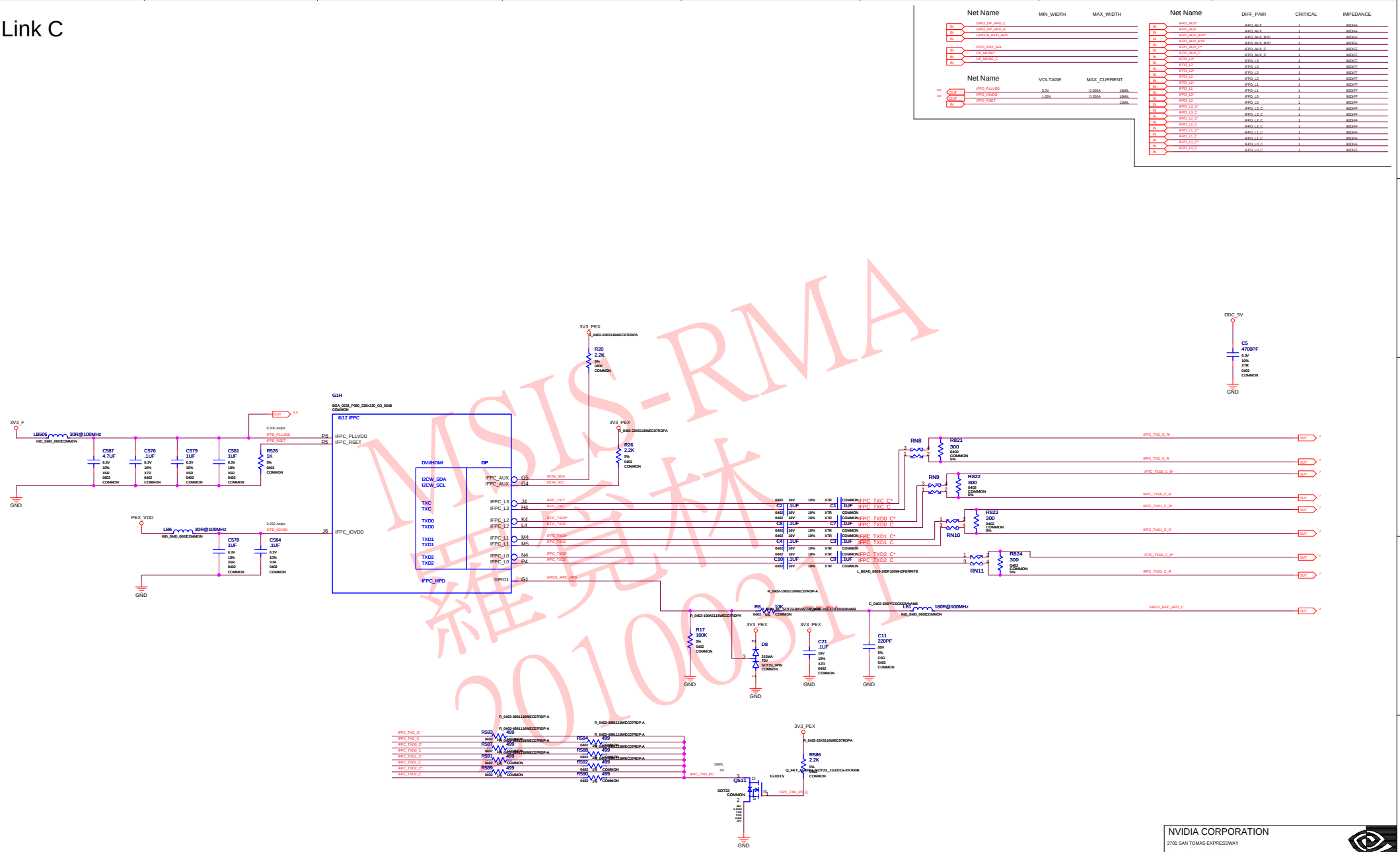
NV_PN	600-10690-BASE-000 A		
ID		PAGE	
NAME		DATE	01-DEC-2008

TMDS Interface



Link C



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

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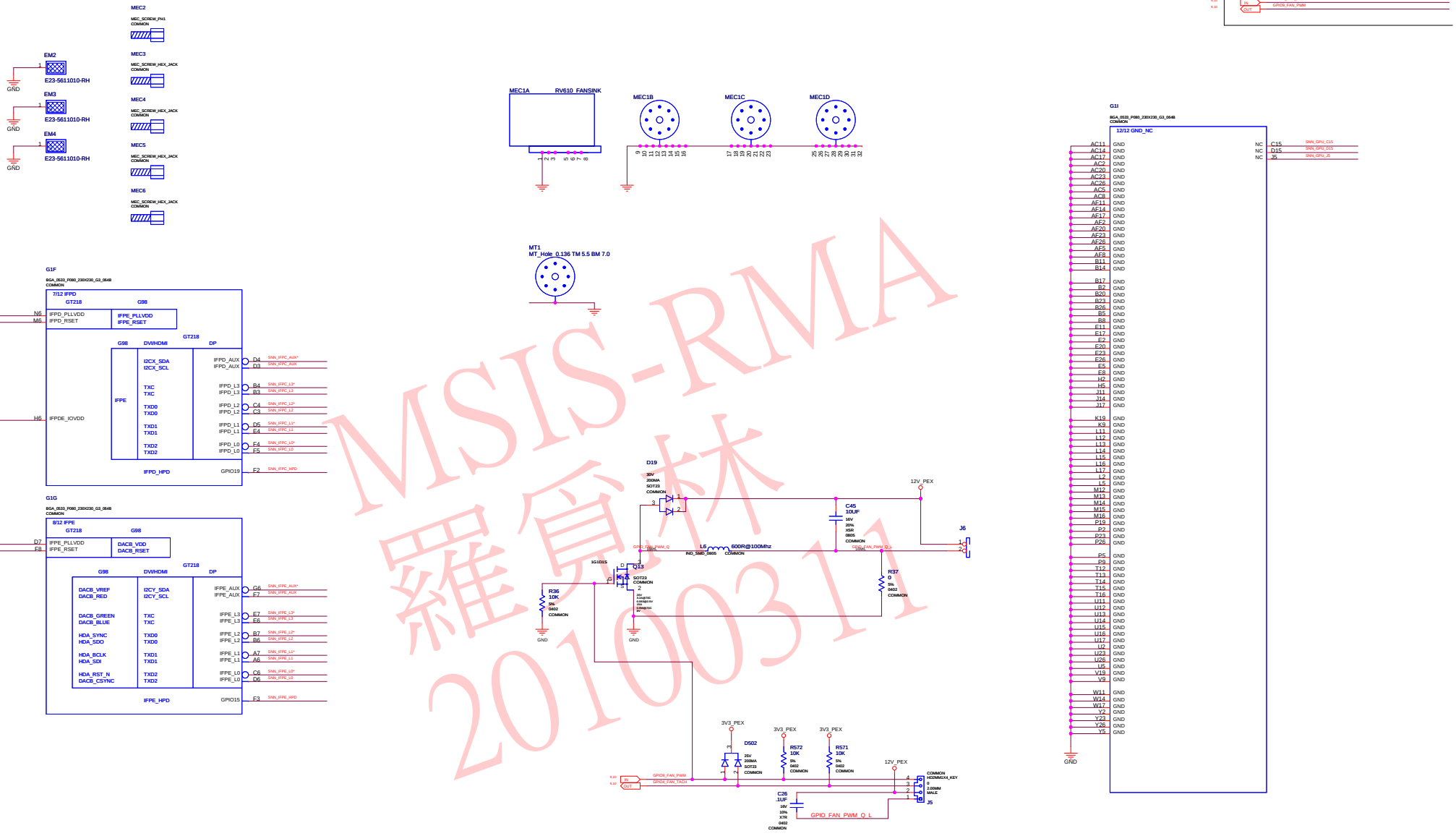
NV_PN	600-10690-BASE-000 A		
ID		PAGE	
NAME		DATE	01-DEC-2008

IFPC, IFPE Interface, Fan, Mechanical



ASSEMBLY	BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL
PAGE DETAIL	IFPC, IFPE Interface, Fan, Mechanical

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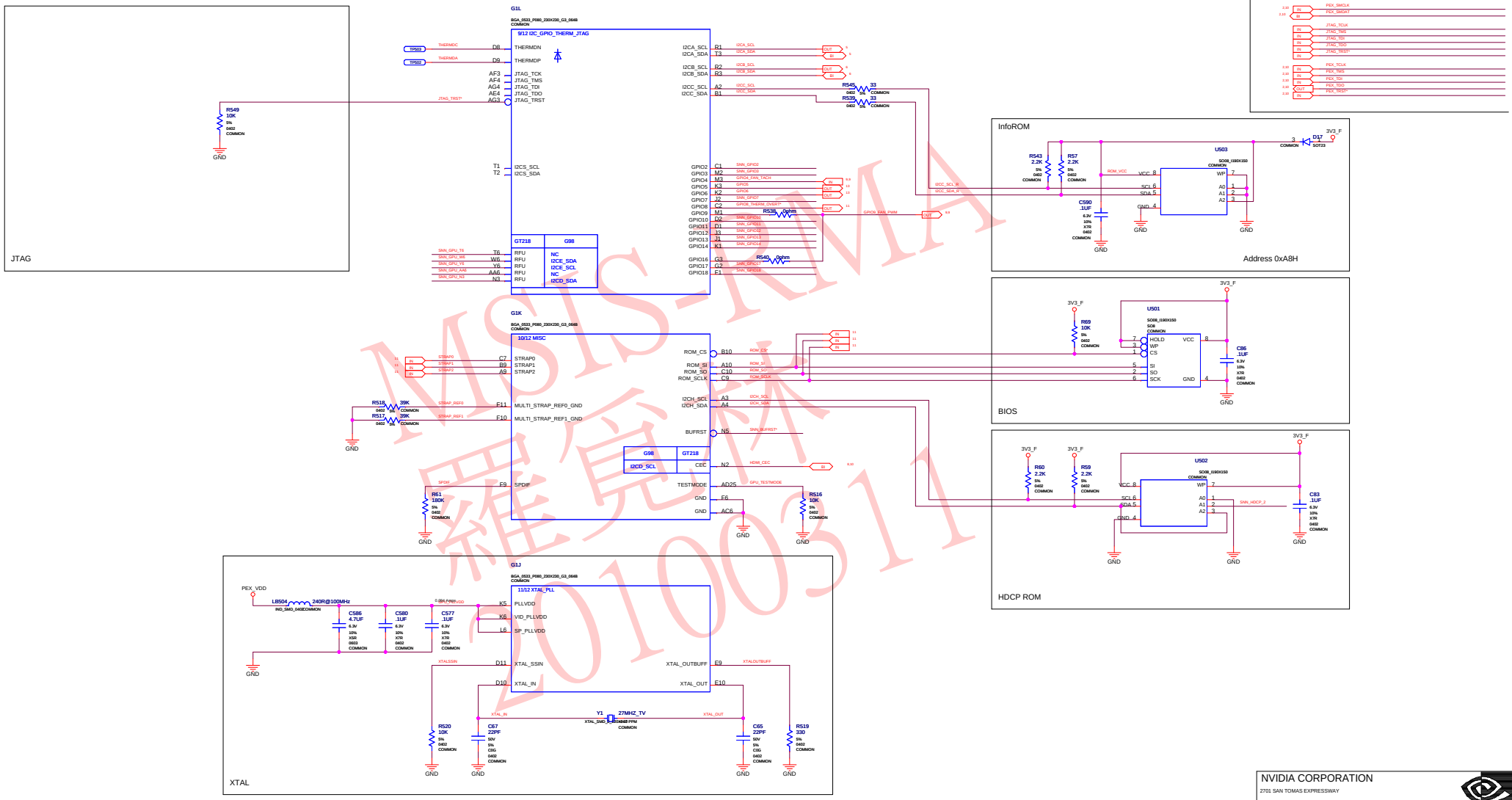
NV_PN	600-10690-BASE-000 A		
ID		PAGE	
NAME		DATE	01-DEC-2008

XTAL, ROM, SPDIF, JTAG



Net Name	CRITICAL	IMPEDANCE
XTALOUTBUFF	1	50OHM
XTAL_OUT	1	50OHM
XTAL_IN	1	50OHM
XTALSSIN	1	50OHM

Net Name	VOLTAGE	MAX_CURRENT
GPU_PLLVDD	1.05V	0.08A

Net Name	MIN_WIDTH	MAX_WIDTH

Net Name	MIN_WIDTH	MAX_WIDTH
ROM_CS*		
GPU_TESTMODE		
SPDIF		
I2CC_SCL		
I2CC_SDA		
I2CC_SCL_R		
I2CC_SDA_R		
I2CH_SCL		
I2CH_SDA		
I2CS_SCL		
I2CS_SDA		
STRAP_REF0		
STRAP_REF1		
THERMDC	12MIL	
THERMDA	12MIL	
PEX_SMCLK		
PEX_SMDAT		
JTAG_TCLK		
JTAG_TMS		
JTAG_TDI		
JTAG_TDO		
JTAG_TRST*		
PEX_TCLK		
PEX_TMS		
PEX_TDI		
PEX_TDO		
PEX_TRST*		

ASSEMBLY	BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL
PAGE DETAIL	XTAL, ROM, SPDIF, JTAG

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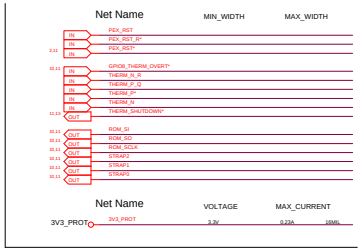
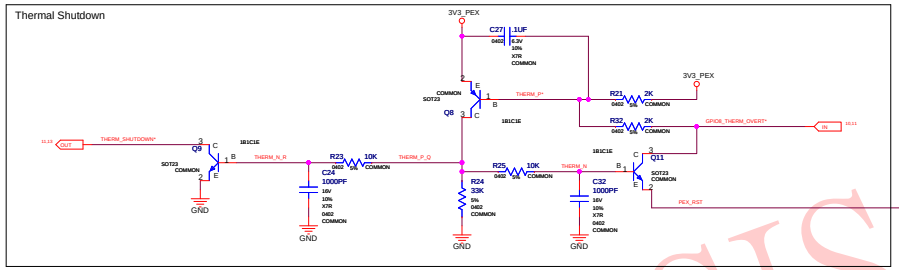
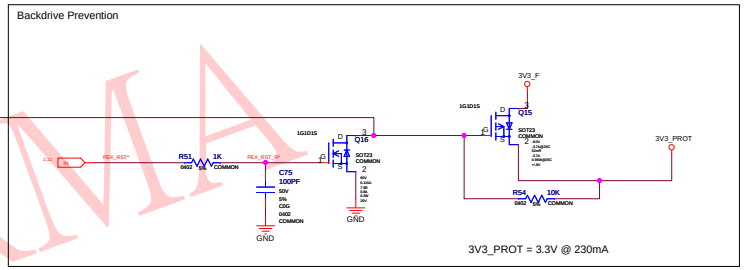
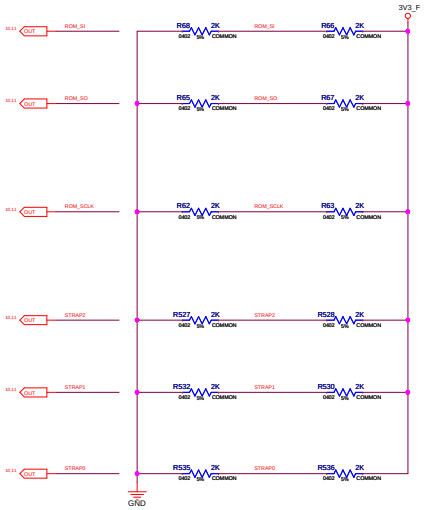
NV_PN	600-10690-BASE-000 A		
ID		PAGE	
NAME		DATE	01-DEC-2008

Thermal Protection, IFP_IOVDD, Straps









GT218 Straps MLS Mode

Bit	Signal	Values	
03:	RAMCFG[3]	0000	Elpida
		0001	Samsung, Micron
02:	RAMCFG[2]	0010	Qimonda
		0011	Hynix
01:	RAMCFG[1]	0100	Nanya
00:	RAMCFG[0]		
03:	XCLK_417	0	277 (Default)
02:	FB[0]	0	256M (Default)
01:	SMB_ALT_ADDR	0	0x4C
		1	0x6C
00:	VGA_DEVICE	0	Class code 302
		1	Class code 300
03:	PCI_DEVID_EXT	0	GT218-300-A1
02:	SUB_VENDOR	0	No BIOS
		1	BIOS
01:	SLOT_CLK_CFG	0	Disable
		1	Enable
00:	PEX_PLL_EN_TERM100	0	Disable
		1	Enable
03:	PCI_DEVID[3]	0000	GT218-300-A1
02:	PCI_DEVID[2]		
01:	PCI_DEVID[1]		
00:	PCI_DEVID[0]		
03:	3GIO_PADCFG_LUT_ADR[3]	0000	DSKTOP_DEFAULT
		0001	MOBILE_DEFAULT
02:	3GIO_PADCFG_LUT_ADR[2]	0010	MOBILE_NTHRS_LLAMP
		0011	MOBILE_NTHRS_LAMP
01:	3GIO_PADCFG_LUT_ADR[1]	0100	MOBILE_NTHRS_HAMP
00:	3GIO_PADCFG_LUT_ADR[0]	0101	MOBILE_NTHRS_HHAMP
		0110	MOBILE_NTHRS_HHHAMP
		0111	MOBILE_HTHRS_LLAMP
		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
03:	USER[3]	0000	Default
02:	USER[2]		
01:	USER[1]		
00:	USER[0]		

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
40K 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
40K to VCC	1111

GT218 Straps BU Mode

Bit	Signal	Values	
	PCI_DEVID_EXT	0	GT218-300-A1
	XCLK_417	0	277 (Default)
	3GIO_PADCFG_LUT_ADR[3]	0000	DSKTOP_DEFAULT
		0001	MOBILE_DEFAULT
	3GIO_PADCFG_LUT_ADR[2]	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[1]		
	3GIO_PADCFG_LUT_ADR[0]		

GT218 Straps PM Mode

Bit	Signal	Values	
	PCI_DEVID_EXT	0	GT218-300-A1
	XCLK_417	0	277/277 OR 417/417
	PCI_DEVID[3]	0	GT218-300-A1
	RAMCFG[3]	0000	Elpida
		0001	Samsung, Micron
	RAMCFG[2]	0010	Qimonda
		0011	Hynix
		0100	Nanya
	RAMCFG[1]		
	RAMCFG[0]		

Mode	REF0/REF1
MLS	Stuff
BU	No stuff
PM	Stuff one

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

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ID		PAGE	
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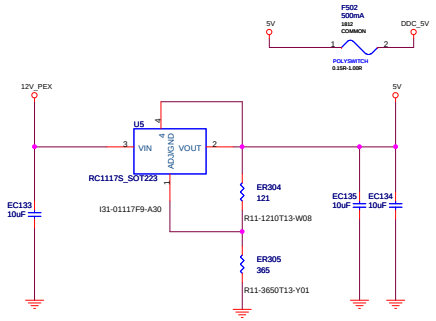
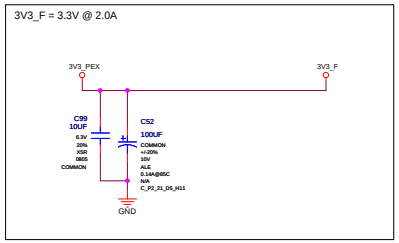
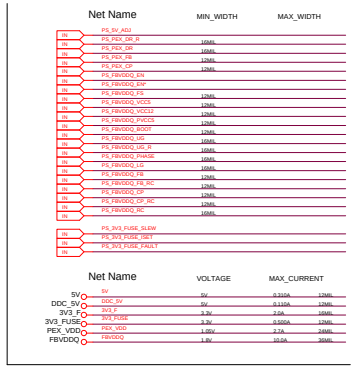
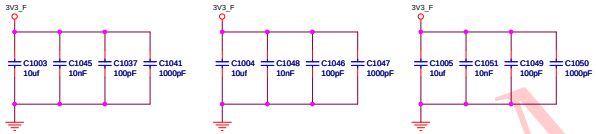
Power Supply I: FBVDD/Q, PEX_VDD, 5V, 3V3_F

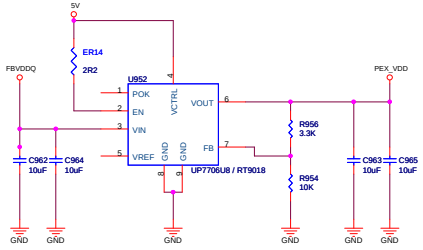


Vout=1.25V* [1+(ER305/ER304)]

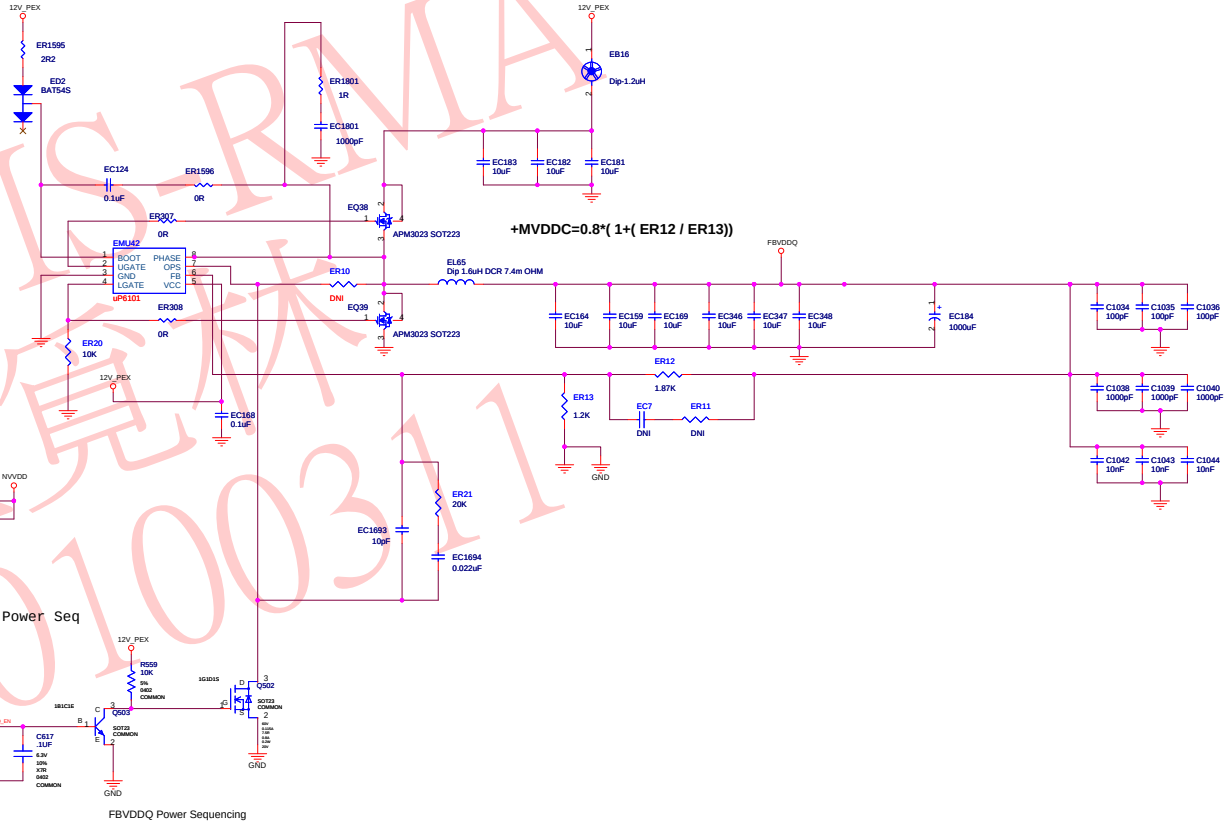








Vout=0.8V * (1+ R995 / R954)



+MVDDC=0.8*(1+(ER12 / ER13))

PEX_VDD = 1.05V @ 2.7A

Memory Power Seq

FBVDDQ Power Sequencing

ASSEMBLY	BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL
PAGE DETAIL	Power Supply I: FBVDD/Q, PEX_VDD, 5V, 3V3_F

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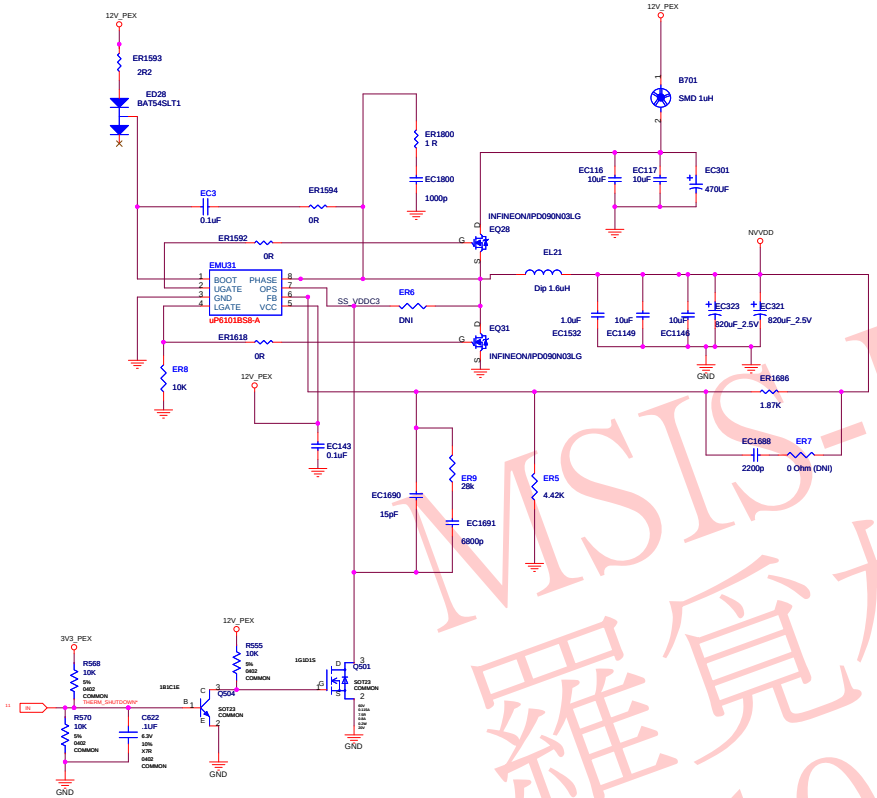
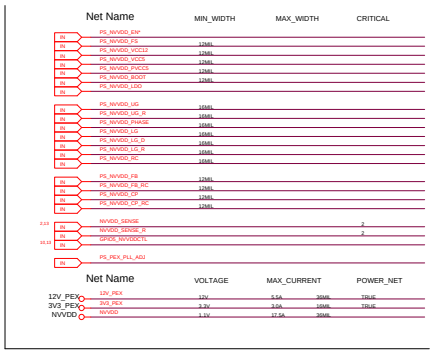
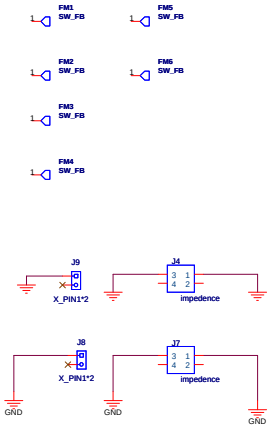
NV_PN	600-10690-BASE-000 A		
ID		PAGE	
NAME		DATE	01-DEC-2008

Power Supply II: PLLVDD, NVVDD







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

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NV_PN	600-10690-BASE-000 A		
ID		PAGE	
NAME		DATE	01-DEC-2008

Title: Basenet Report
Design: design
Date: Dec 1 21:48:15 2008

Base nets and synonyms for
design_lib.DESIGN(@design_lib.design(sch
_1))
Base Signal Location([Zone][dir])

3V3_F 12.2H
3V3_FUSE 12.2H
3V3_PEX 13.2G
3V3_PROT 11.1H
5V 12.2H
12V_PEX 13.2G
DACA_BLUE 5.1G< 5.4C
DACA_BLUE_C 5.1G> 5.4F> 7.3F<
DACA_GREEN 5.1G< 5.4C
DACA_GREEN_C 5.1G> 5.4F> 7.3F<
DACA_HSYNC 5.1G< 5.4C
DACA_HSYNC_C 5.1G> 5.3F> 7.4F<
DACA_HS_BUF 5.1G< 5.3D
DACA_RED 5.1G< 5.4C
DACA_RED_C 5.1G> 5.4F> 7.3F<
DACA_RSET 5.2G< 5.4B
DACA_VREF 5.2G< 5.4B
DACA_VSYNC 5.1G< 5.4C
DACA_VSYNC_C 5.1G> 5.3F> 7.3F<
DACA_VS_BUF 5.1G< 5.3D
DACB_BLUE 6.1G< 6.4C
DACB_BLUE_C 6.1G< 6.5E
DACB_GREEN 6.1G< 6.4C
DACB_GREEN_C 6.1G< 6.4E
DACB_HSYNC 6.1G< 6.4C
DACB_HSYNC_C 6.1G< 6.3E
DACB_HS_BUF 6.1G< 6.3D
DACB_RED 6.1G< 6.4C
DACB_RED_C 6.1G< 6.4E
DACB_RSET 6.2G< 6.4B
DACB_VREF 6.2G< 6.4B
DACB_VSYNC 6.1G< 6.4C
DACB_VSYNC_C 6.1G< 6.3E
DACB_VS_BUF 6.1G< 6.3D
DDC_5V 12.2H
DP_MODE* 8.1F< 8.2F
DP_MODE_C 8.1F< 8.3G
FBA_CLK0 3.1G> 3.4D> 4.2A< 4.2B< 4.4A<
FBA_CLK0* 3.1G> 3.4D> 4.2A< 4.2B< 4.5A<
FBA_CLK1 3.1G> 3.4D> 4.2D< 4.2F< 4.5A<
FBA_CLK1* 3.1G> 3.4D> 4.2D< 4.2F< 4.5A<
FBA_CMD<0> 3.2C 3.2G 4.1A 4.1C
FBA_CMD<30..0> 3.1G> 3.2D> 4.1A<>
FBA_CMD<1> 3.2C 3.2G 4.1A 4.1C 4.1E 4.1F
FBA_CMD<2> 3.2C 3.2H 4.1A 4.1C
FBA_CMD<3> 3.2C 3.2H 4.2A 4.2C 4.2E 4.2F
FBA_CMD<4> 3.2C 3.3G 4.1E 4.1F
FBA_CMD<5> 3.3C 3.3G 4.1E 4.1F
FBA_CMD<6> 3.3C 3.3H 4.1E 4.1F
FBA_CMD<7> 3.3C 3.3F 4.2E 4.2F
FBA_CMD<8> 3.3C 3.3H 4.1E 4.1F
FBA_CMD<9> 3.3C 3.3E 4.2A 4.2C 4.2E 4.2F
FBA_CMD<10> 3.3C 3.3E 4.1A 4.1C 4.1E 4.1F
FBA_CMD<11> 3.3C 3.3F 4.1A 4.1C 4.1E 4.1F
FBA_CMD<12> 3.3C 3.3F 4.2A 4.2C 4.2E 4.2F
FBA_CMD<13> 3.3C 3.3G 4.1E 4.1F
FBA_CMD<14> 3.3C 3.3G 4.2A 4.2C 4.2E 4.2F
FBA_CMD<15> 3.2E 3.3C 4.3A 4.3C 4.3E 4.3F
FBA_CMD<16> 3.3C 3.3H 4.2A 4.2C 4.2E 4.2F
FBA_CMD<17> 3.3C 3.3H 4.2A 4.2C 4.2E 4.2F
FBA_CMD<18> 3.2F 3.3C 4.2A 4.2C
FBA_CMD<19> 3.3C 3.4E 4.1A 4.1C 4.1E 4.1F
FBA_CMD<20> 3.3C 3.4E 4.2A 4.2C 4.2E 4.2F
FBA_CMD<21> 3.3C 3.4F 4.2A 4.2C 4.2E 4.2F
FBA_CMD<22> 3.3C 3.4F 4.1A 4.1C
FBA_CMD<23> 3.3C 3.4G 4.2A 4.2C 4.2E 4.2F
FBA_CMD<24> 3.3C 3.4G 4.1A 4.1C
FBA_CMD<25> 3.3C 3.4H 4.1A 4.1C 4.1E 4.1F

FBA_CMD<26> 3.3C 3.4H 4.2A 4.2C 4.2E 4.2F
FBA_CMD<27> 3.3C 3.4H 4.2A 4.2C 4.2E 4.2F
FBA_CMD<28> 3.3C 3.3E 4.3E 4.3F
FBA_CMD<29> 3.3C 3.4H 4.1A 4.1C
FBA_CMD<30> 3.2E 3.3C 4.3A 4.3C
FBA_D<0> 3.1B 4.4B
FBA_D<63..0> 3.1A<> 3.1G<> 4.4A<>
FBA_D<1> 3.1B 4.4B
FBA_D<2> 3.1B 4.4B
FBA_D<3> 3.1B 4.4B
FBA_D<4> 3.1B 4.4B
FBA_D<5> 3.1B 4.4B
FBA_D<6> 3.1B 4.4B
FBA_D<7> 3.1B 4.4B
FBA_D<8> 3.1B 4.4B
FBA_D<9> 3.1B 4.5B
FBA_D<10> 3.1B 4.5B
FBA_D<11> 3.2B 4.5B
FBA_D<12> 3.2B 4.5B
FBA_D<13> 3.2B 4.5B
FBA_D<14> 3.2B 4.5B
FBA_D<15> 3.2B 4.5B
FBA_D<16> 3.2B 4.4C
FBA_D<17> 3.2B 4.4C
FBA_D<18> 3.2B 4.4C
FBA_D<19> 3.2B 4.4C
FBA_D<20> 3.2B 4.4C
FBA_D<21> 3.2B 4.4C
FBA_D<22> 3.2B 4.4C
FBA_D<23> 3.2B 4.4C
FBA_D<24> 3.2B 4.4C
FBA_D<25> 3.2B 4.5C
FBA_D<26> 3.2B 4.5C
FBA_D<27> 3.2B 4.5C
FBA_D<28> 3.2B 4.5C
FBA_D<29> 3.2B 4.5C
FBA_D<30> 3.2B 4.5C
FBA_D<31> 3.2B 4.5C
FBA_D<32> 3.2B 4.4D
FBA_D<33> 3.2B 4.4D
FBA_D<34> 3.2B 4.4D
FBA_D<35> 3.2B 4.4D
FBA_D<36> 3.2B 4.4D
FBA_D<37> 3.2B 4.4D
FBA_D<38> 3.2B 4.4D
FBA_D<39> 3.2B 4.4D
FBA_D<40> 3.2B 4.4D
FBA_D<41> 3.2B 4.5D
FBA_D<42> 3.2B 4.5D
FBA_D<43> 3.2B 4.5D
FBA_D<44> 3.2B 4.5D
FBA_D<45> 3.2B 4.5D
FBA_D<46> 3.2B 4.5D
FBA_D<47> 3.2B 4.5D
FBA_D<48> 3.2B 4.4E
FBA_D<49> 3.2B 4.4E
FBA_D<50> 3.2B 4.4E
FBA_D<51> 3.2B 4.4E
FBA_D<52> 3.2B 4.4E
FBA_D<53> 3.2B 4.4E
FBA_D<54> 3.2B 4.4E
FBA_D<55> 3.2B 4.4E
FBA_D<56> 3.2B 4.4E
FBA_D<57> 3.2B 4.5E
FBA_D<58> 3.2B 4.5E
FBA_D<59> 3.2B 4.5E
FBA_D<60> 3.2B 4.5E
FBA_D<61> 3.2B 4.5E
FBA_D<62> 3.2B 4.5E
FBA_D<63> 3.2B 4.5E
FBA_DEBUG 3.2G< 3.4C
FBA_DQM<0> 3.3B 4.4B
FBA_DQM<7..0> 3.1G> 3.3A> 4.4A<
FBA_DQM<1> 3.3B 4.5B
FBA_DQM<2> 3.3B 4.4C
FBA_DQM<3> 3.3B 4.5C
FBA_DQM<4> 3.3B 4.4D
FBA_DQM<5> 3.4B 4.5D
FBA_DQM<6> 3.4B 4.4E
FBA_DQM<7> 3.4B 4.5E
FBA_DQS_RN<0> 3.1G 3.4B 4.4B
FBA_DQS_RN<7..0> 3.1G<> 3.4A<> 4.4A<>
FBA_DQS_RN<1> 3.1G 3.4B 4.5B
FBA_DQS_RN<2> 3.1G 3.4B 4.4C
FBA_DQS_RN<3> 3.1G 3.4B 4.5C
FBA_DQS_RN<4> 3.1G 3.4B 4.4D
FBA_DQS_RN<5> 3.1G 3.4B 4.5D
FBA_DQS_RN<6> 3.1G 3.4B 4.4E
FBA_DQS_RN<7> 3.1G 3.4B 4.5E
FBA_DQS_WP<0> 3.1G 3.4B 4.4B
FBA_DQS_WP<7..0> 3.1G<> 3.4A<> 4.4A<>
FBA_DQS_WP<1> 3.1G 3.4B 4.5B
FBA_DQS_WP<2> 3.1G 3.4B 4.4C
FBA_DQS_WP<3> 3.1G 3.4B 4.5C

FBA_DQS_WP<4> 3.1G 3.4B 4.4D
FBA_DQS_WP<5> 3.1G 3.4B 4.5D
FBA_DQS_WP<6> 3.1G 3.4B 4.4E
FBA_DQS_WP<7> 3.1G 3.4B 4.5E
FBA_ZQ0 4.1G< 4.3A
FBA_ZQ1 4.1G< 4.3C
FBA_ZQ2 4.1G< 4.3E
FBA_ZQ3 4.1G< 4.3F
FBVDDQ 12.2H
FB_CAL_PD_VDDQ 3.2G< 3.4C
FB_CAL_PU_GND 3.2G< 3.4C
FB_CAL_TERM_GND 3.2G<
FB_PLLAVDD 3.2G< 3.5C
FB_VREF_A 4.1G< 4.3D
FB_VREF_A_Q 4.1G<
FB_VREF_B 4.1G< 4.3H
FB_VREF_B_Q 4.1G<
GPIO0_DVI_A_HPD 7.1G< 7.4D
GPIO0_DVI_A_HPD_C 7.1G< 7.3F
GPIO0_DVI_A_HPD_R 7.1G< 7.4E
GPIO4_FAN_TACH 9.1G< 9.4D> 10.2E<
GPIO5_NVVDDCTL 10.2E> 13.1G< 13.5D<
GPIO5_NVVDDCTL_R 13.4E
GPIO8_THERM_OVERT* 10.2E> 11.1G< 11.2D<
GPIO9_FAN_PWM 9.1G> 9.4D< 10.2E>
GPIO19_IFPD_HPD 8.1F< 8.4D
GPIO_DP_HPD_C 8.1F< 8.4F
GPIO_DP_HPD_R 8.1F< 8.4E
GPU_PLLVDD 10.1F< 10.4C
GPU_TESTMODE 10.1G< 10.4E
I2CA_SCL 5.1G< 5.2C< 10.2E>
I2CA_SCL_C 5.1F> 5.1G> 7.3F<
I2CA_SDA 5.1G<> 5.2C<> 10.2E<>
I2CA_SDA_C 5.1G<> 5.2F<> 7.3F<>
I2CB_SCL 6.1G< 6.2C< 10.2E>
I2CB_SCL_C 6.1G< 6.2E
I2CB_SDA 6.1G<> 6.2C<> 10.2E<>
I2CB_SDA_C 6.1G< 6.2E
I2CC_SCL 10.1G< 10.2E
I2CC_SCL_R 10.1G< 10.2F
I2CC_SDA 10.1G< 10.2E
I2CC_SDA_R 10.1G< 10.2F
I2CH_SCL 10.1G< 10.3E
I2CH_SDA 10.1G< 10.3E
I2CS_SCL 10.1G< 10.2C
I2CS_SDA 10.1G< 10.2C
IFPAB_IOVDD 7.2G< 7.3C
IFPAB_PLLVDD 7.2G< 7.3C
IFPAB_RSET 7.2G< 7.3C
IFPAB_TXC 7.1G< 7.4D
IFPAB_TXC* 7.1G< 7.4D
IFPAB_TXD0 7.1G< 7.3D
IFPAB_TXD0* 7.1G< 7.3D
IFPAB_TXD1 7.1G< 7.3D
IFPAB_TXD1* 7.1G< 7.3D
IFPAB_TXD2 7.1G< 7.3D
IFPAB_TXD2* 7.1G< 7.3D
IFPAB_TXD4 7.1G< 7.3D
IFPAB_TXD4* 7.1G< 7.3D
IFPAB_TXD5 7.1G< 7.3D
IFPAB_TXD5* 7.1G< 7.3D
IFPAB_TXD6 7.1G< 7.3D
IFPAB_TXD6* 7.1G< 7.3D
IFPC_IOVDD 9.1G< 9.3B
IFPC_PLLVDD 9.1G< 9.2B
IFPD_AUX 8.1G< 8.4D
IFPD_AUX* 8.1G< 8.4D
IFPD_AUX_BYP 8.1G< 8.3D
IFPD_AUX_BYP* 8.1G< 8.2D
IFPD_AUX_C 8.1G< 8.4F
IFPD_AUX_C* 8.1G< 8.4F
IFPD_AUX_SEL 8.1F< 8.2D
IFPD_IOVDD 8.1F> 8.4C> 9.3A<
IFPD_L0 8.1G< 8.4D
IFPD_L0* 8.1G< 8.4D
IFPD_L0_C 8.1G< 8.4F
IFPD_L0_C* 8.1G< 8.4F
IFPD_L1 8.1G< 8.4D
IFPD_L1* 8.1G< 8.4D
IFPD_L1_C 8.1G< 8.4F
IFPD_L1_C* 8.1G< 8.4F
IFPD_L2 8.1G< 8.4D
IFPD_L2* 8.1G< 8.4D
IFPD_L2_C 8.1G< 8.4F
IFPD_L2_C* 8.1G< 8.4F
IFPD_L3 8.1G< 8.4D
IFPD_L3* 8.1G< 8.4D
IFPD_L3_C 8.1G< 8.4F
IFPD_L3_C* 8.1G< 8.4F
IFPD_PLLVDD 8.1F> 8.3C> 9.2A<
IFPD_RSET 8.1F< 8.4B
JTAG_TCLK 10.1G< 10.2C
JTAG_TDI 10.1G< 10.2C
JTAG_TDO 10.2C 10.2G<
JTAG_TMS 10.1G< 10.2C
JTAG_TRST* 10.2C 10.2G<

NVVDD 13.2G
NVVDD_SENSE 2.4G> 13.1G< 13.4G<
NVVDD_SENSE_R 13.1G> 13.4F
PEX_CLKREQ* 2.1E 2.1G<
PEX_PLL 13.2G
PEX_PLLVDD 2.1G< 2.5F
PEX_PRSNT 2.1C 2.1G<
PEX_REFCLK 2.2D 2.5A<
PEX_REFCLK* 2.2D 2.5A<
PEX_RST 11.1G< 11.3C
PEX_RST* 2.2D> 11.1G< 11.2E<
PEX_RST_R* 11.1G< 11.2F
PEX_RX0 2.2D 2.4A<
PEX_RX0* 2.2D 2.4A<
PEX_RX1 2.2D 2.4A<
PEX_RX1* 2.2D 2.4A<
PEX_RX2 2.2D 2.4A<
PEX_RX2* 2.3D 2.4A<
PEX_RX3 2.3D 2.4A<
PEX_RX3* 2.3D 2.4A<
PEX_RX4 2.3D 2.4A<
PEX_RX4* 2.3D 2.4A<
PEX_RX5 2.3D 2.4A<
PEX_RX5* 2.3D 2.4A<
PEX_RX6 2.3D 2.5A<
PEX_RX6* 2.3D 2.5A<
PEX_RX7 2.3D 2.5A<
PEX_RX7* 2.4D 2.5A<
PEX_RX8 2.4D 2.5A<
PEX_RX8* 2.4D 2.5A<
PEX_RX9 2.4D 2.5A<
PEX_RX9* 2.4D 2.5A<
PEX_RX10 2.4D 2.5A<
PEX_RX10* 2.4D 2.5A<
PEX_RX11 2.4D 2.5A<
PEX_RX11* 2.4D 2.5A<
PEX_RX12 2.4D 2.5A<
PEX_RX12* 2.5A< 2.5D
PEX_RX13 2.5A< 2.5D
PEX_RX13* 2.5A< 2.5D
PEX_RX14 2.5A< 2.5D
PEX_RX14* 2.5A< 2.5D
PEX_RX15 2.5A< 2.5D
PEX_RX15* 2.5A< 2.5D
PEX_SMCLK 2.1D> 10.1G< 10.3B<
PEX_SMDAT 2.2D<> 10.1G<> 10.3B<>
PEX_TCLK 2.1D> 10.2A< 10.2G<
PEX_TDI 2.1D> 10.2A< 10.2G<
PEX_TDO 2.1D< 10.2A> 10.2G>
PEX_TERMP 2.1G< 2.5F
PEX_TMS 2.1D> 10.2A< 10.2G<
PEX_TRST* 2.1D> 10.2A< 10.2G<
PEX_TSTCLK 2.5A<
PEX_TSTCLK* 2.5A<
PEX_TSTCLK_OUT 2.2E
PEX_TSTCLK_OUT* 2.2E
PEX_TX0 2.2A< 2.2E
PEX_TX0* 2.2A< 2.2E
PEX_TX1 2.2A< 2.2E
PEX_TX1* 2.2A< 2.2E
PEX_TX2 2.2A< 2.2E
PEX_TX2* 2.2A< 2.2E
PEX_TX3 2.2A< 2.3E
PEX_TX3* 2.2A< 2.3E
PEX_TX4 2.2A< 2.3E
PEX_TX4* 2.2A< 2.3E
PEX_TX5 2.2A< 2.3E
PEX_TX5* 2.2A< 2.3E
PEX_TX6 2.2A< 2.3E
PEX_TX6* 2.2A< 2.3E
PEX_TX7 2.2A< 2.3E
PEX_TX7* 2.2A< 2.3E
PEX_TX8 2.2A< 2.4E
PEX_TX8* 2.2A< 2.4E
PEX_TX9 2.3A< 2.4E
PEX_TX9* 2.3A< 2.4E
PEX_TX10 2.3A< 2.4E
PEX_TX10* 2.3A< 2.4E
PEX_TX11 2.3A< 2.4E
PEX_TX11* 2.3A< 2.4E
PEX_TX12 2.3A< 2.4E
PEX_TX12* 2.3A< 2.4E
PEX_TX13 2.3A< 2.5E
PEX_TX13* 2.3A< 2.5E
PEX_TX14 2.3A< 2.5E
PEX_TX14* 2.3A< 2.5E
PEX_TX15 2.3A< 2.5E
PEX_TX15* 2.3A< 2.5E
PEX_TXX0 2.2D 2.3A<
PEX_TXX0* 2.2D 2.3A<
PEX_TXX1 2.2D 2.3A<
PEX_TXX1* 2.2D 2.3A<
PEX_TXX2 2.2D 2.3A<
PEX_TXX2* 2.2D 2.3A<
PEX_TXX3 2.3A< 2.3D

PEX_TXX3* 2.3A< 2.3D
PEX_TXX4 2.3A< 2.3D
PEX_TXX4* 2.3A< 2.3D
PEX_TXX5 2.3A< 2.3D
PEX_TXX5* 2.3A< 2.3D
PEX_TXX6 2.3A< 2.3D
PEX_TXX6* 2.3A< 2.3D
PEX_TXX7 2.3A< 2.3D
PEX_TXX7* 2.3D 2.4A<
PEX_TXX8 2.4A< 2.4D
PEX_TXX8* 2.4A< 2.4D
PEX_TXX9 2.4A< 2.4D
PEX_TXX9* 2.4A< 2.4D
PEX_TXX10 2.4A< 2.4D
PEX_TXX10* 2.4A< 2.4D
PEX_TXX11 2.4A< 2.4D
PEX_TXX11* 2.4A< 2.4D
PEX_TXX12 2.4A< 2.4D
PEX_TXX12* 2.4A< 2.4D
PEX_TXX13 2.4A< 2.5D
PEX_TXX13* 2.4A< 2.5D
PEX_TXX14 2.4A< 2.5D
PEX_TXX14* 2.4A< 2.5D
PEX_TXX15 2.4A< 2.5D
PEX_TXX15* 2.4A< 2.5D
PEX_VDD 12.2H
PS_3V3_FUSE_FAULT 12.1G< 12.3F
PS_3V3_FUSE_ISET 12.1G< 12.3F
PS_3V3_FUSE_SLEW 12.1G< 12.3F
PS_5V_ADJ 12.1G< 12.2B
PS_FBVDDQ_BOOT 12.1G< 12.3E
PS_FBVDDQ_CP 12.1G< 12.4E
PS_FBVDDQ_CP_RC 12.1G< 12.4E
PS_FBVDDQ_EN 12.1G< 12.5C
PS_FBVDDQ_EN* 12.1G< 12.5C
PS_FBVDDQ_FB 12.1G< 12.4E
PS_FBVDDQ_FB_RC 12.1G< 12.4G
PS_FBVDDQ_FS 12.1G< 12.4D
PS_FBVDDQ_LG 12.1G< 12.4E
PS_FBVDDQ_PHASE 12.1G< 12.4E
PS_FBVDDQ_PVCCS 12.1G< 12.3E
PS_FBVDDQ_RC 12.1G< 12.4G
PS_FBVDDQ_UG 12.1G< 12.4E
PS_FBVDDQ_UG_R 12.1G< 12.3F
PS_FBVDDQ_VCC5 12.1G< 12.3D
PS_FBVDDQ_VCC12 12.1G< 12.3E
PS_NVDD_BOOT 13.1G< 13.3C
PS_NVDD_CP 13.1G< 13.3C
PS_NVDD_CP_RC 13.1G< 13.4D
PS_NVDD_EN* 13.1G< 13.4B
PS_NVDD_FB 13.1G< 13.3C
PS_NVDD_FB_RC 13.1G< 13.4F
PS_NVDD_FS 13.1G< 13.3C
PS_NVDD_LDO 13.1G< 13.3C
PS_NVDD_LG 13.1G< 13.3C
PS_NVDD_LG_D 13.1G< 13.3D
PS_NVDD_LG_R 13.1G< 13.4E
PS_NVDD_PHASE 13.1G< 13.3C
PS_NVDD_PVCCS 13.1G< 13.3C
PS_NVDD_RC 13.1G< 13.4F
PS_NVDD_UG 13.1G< 13.3C
PS_NVDD_UG_R 13.1G< 13.3E
PS_NVDD_VCC5 13.1G< 13.3C
PS_NVDD_VCC12 13.1G< 13.3C
PS_PEX_CP 12.1G< 12.4C
PS_PEX_DR 12.1G< 12.3D
PS_PEX_DR_R 12.1G< 12.3B
PS_PEX_FB 12.1G< 12.4D
PS_PEX_PLL_ADJ 13.1E 13.2G<
ROM_CS* 10.1G< 10.3E
ROM_SCLK 10.3E< 11.1G> 11.4A> 11.4B
ROM_SI 10.3E< 11.1G> 11.3A> 11.3B
ROM_SO 10.3E< 11.1G> 11.3A> 11.3B
ROM_VCC 10.2F
SNN_3V3_AUX 2.1C
SNN_AOZ_7 12.3G
SNN_A_ID0 5.4G
SNN_A_ID2 5.4F
SNN_BUFRST* 10.3E
SNN_CAL_TERM_GND 3.4C
SNN_CEC 10.4E
SNN_DP_CEC 8.4G
SNN_FBA1_NC_A1 4.3A
SNN_FBA1_NC_A11 4.3A
SNN_FBA1_NC_J2 4.2A
SNN_FBA1_NC_J10 4.2A
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