P216-A02 DESIGN -- NV43, 128 MB DDR3, VGA, DVI-I, SD/HDTV, VIVO

PAGE SUMMARY:

20050203 Verson 10

Adding BJT into 1155 VID4 to solve always pull low issue.
ATS2G GPIO contorller reset pin set to 3v3.
Adding OVT &SMI# Func. with F75387
Remove FAN JU1(12V only)
Solve Cap dummy issue with 3 pin
Adding EMI Fucn. into south DVI
Change GPIO to GPU & Memory -2005-0214

SKU	VARIANT	NVPN	ASSEMBLY
B	BASE	600-10216-base-sch	BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL
1	000	602-10216-0000-200	NV43-U 500/500MHz 128MB DDR3 8MX32 DVI+VGA+HDTVOUT
2	001	602-10216-0001-200	NV43-U 500/500MHZ 128MB DDR3 8MX32 DVI+VGA+HD/VIVO
3	002	602-10216-0002-200	NV43-U 350/350MHZ 128MB DDR3 8MX32 DVI+VGA+HDTVOUT
4	003	602-10216-0003-200	NV43-U 400/400MHZ 128MB DDR3 8MX32 DVI+VGA+HDTVOUT
5	<UNDEFINED>	<UNDEFINED>	<UNDEFINED>
6	<UNDEFINED>	<UNDEFINED>	<UNDEFINED>
7	<UNDEFINED>	<UNDEFINED>	<UNDEFINED>
8	<UNDEFINED>	<UNDEFINED>	<UNDEFINED>
9	<UNDEFINED>	<UNDEFINED>	<UNDEFINED>
10	<UNDEFINED>	<UNDEFINED>	<UNDEFINED>
11	<UNDEFINED>	<UNDEFINED>	<UNDEFINED>
12	<UNDEFINED>	<UNDEFINED>	<UNDEFINED>
13	<UNDEFINED>	<UNDEFINED>	<UNDEFINED>
14	<UNDEFINED>	<UNDEFINED>	<UNDEFINED>
15	<UNDEFINED>	<UNDEFINED>	<UNDEFINED>

ASSEMBLY	BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL
PAGE DETAIL	TABLE OF CONTENTS & REVISION HISTORY

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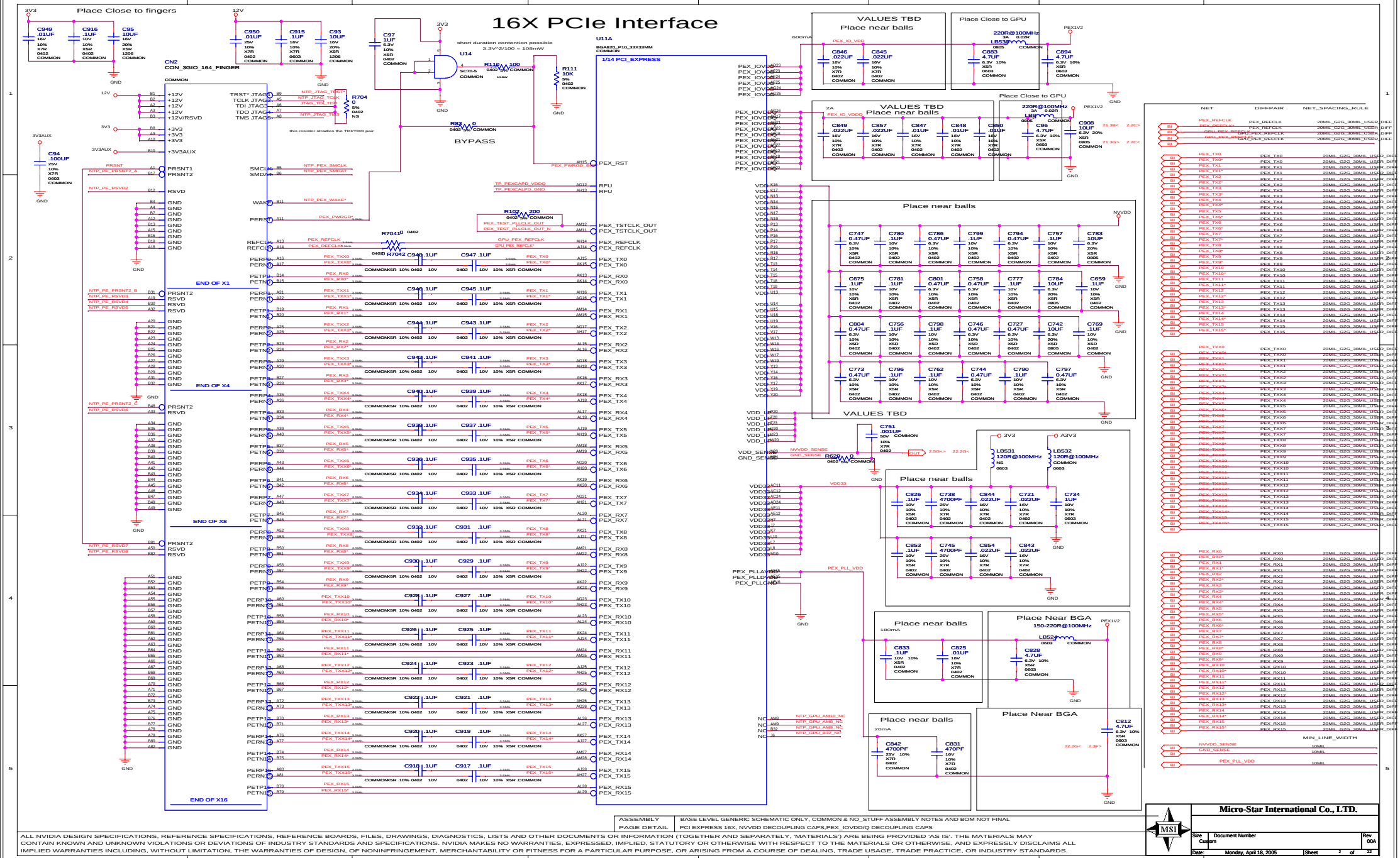
16X PCIe Interface



ASSEMBLY	BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL
PAGE DETAIL	PCI EXPRESS 16X, NVVDD DECOUPLING CAPS,PEX_IOVDD/Q DECOUPLING CAPS

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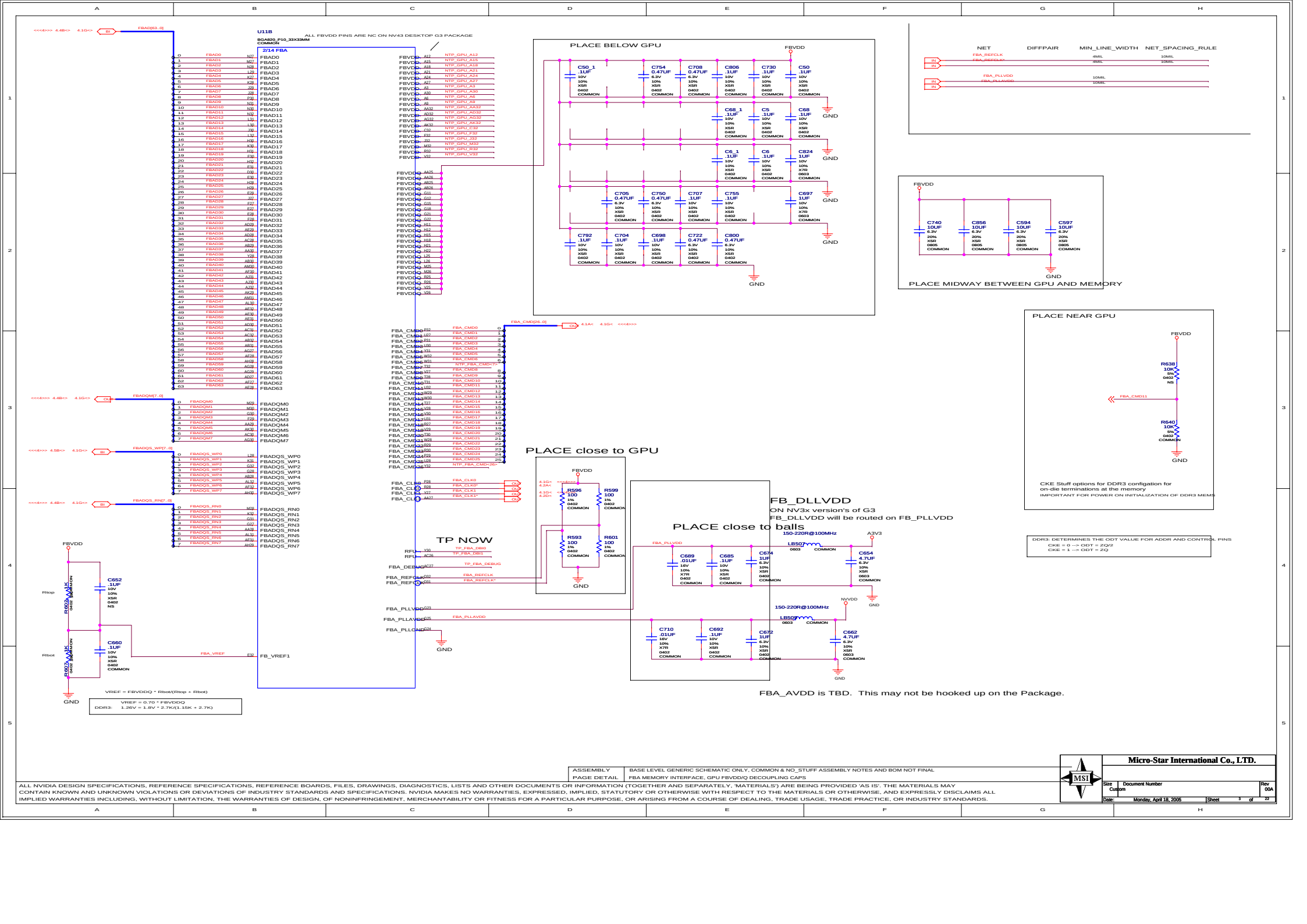

ASSEMBLY	BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL
PAGE DETAIL	FBA MEMORY INTERFACE, GPU FBVDD/Q DECOUPLING CAPS

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5 FrameBuffer: Partition A 8Mx32 BGA144 DDR3

FBA Partition

Termination for Sub-Partition and CLK
MUST BE PLACED as close as possible to the BGA memory on the line BEFORE the MEMORY pin!!
Minimize the stub length!!

A-CS0-LOW-32bit

U8E — BGA_DIAMOND144_P08_DDR_13MM_B2 — BGA144 — COMMON

Low Sub-Partition

A-CS0-HI-32bit

U12C — BGA_DIAMOND144_P08_DDR_13MM_B2 — BGA144 — COMMON

Hi Sub-Partition

DDR3ZQ = 6x desired output impedence of DQ drivers
Impedence = 240 / 6 = 40 ohm

VREF:
M2 - DATA
M13 - ADDR

DDR3: VREF = 0.70 * FBVDDQ
1.26V = 1.8V * 2.7K/(1.15K + 2.7K)

VREF = FBVDDQ * R2/(R1 + R2)

144BGA CMD Mapping

CMD	ADDR
CMD15	RAS*
CMD25	CAS*
CMD9	WE*
CMD11	CKE
CMD12	RESET
CMD8	CS0*
CMD7	CS1**notused
CMD1	A<0>
CMD3	A<1>
CMD2	A<2>
CMD0	A<3> (Low Sub-Partition)
CMD24	A<4>
CMD22	A<5>
CMD13	A<2>
CMD4	A<3> (Hi Sub-Partition)
CMD5	A<4>
CMD6	A<5>
CMD21	A<6>
CMD23	A<7>
CMD19	A<8>
CMD20	A<9>
CMD17	A<10
CMD16	A<11>
CMD14	A<12>
CMD10	BA0
CMD18	BA1

NET	DIFFPAIR	MIN_LINE_WIDTH	SPACING
FBA_CLK0	FBA_CLK0	5MIL	15MIL_G2G_25MIL
FBA_CLK0*	FBA_CLK0	5MIL	15MIL_G2G_25MIL
FBA_CLK1	FBA_CLK1	5MIL	15MIL_G2G_25MIL
FBA_CLK1*	FBA_CLK1	5MIL	15MIL_G2G_25MIL
FBA_CMD[26..0]			15MIL
FBAD[63..0]			15MIL
FBADQM[7..0]			15MIL
FBADQS_RN0	FBADQS_RN0		15MIL
FBADQS_WP0	FBADQS_RN0		15MIL
FBADQS_RN1	FBADQS_RN1		15MIL
FBADQS_WP1	FBADQS_RN1		15MIL
FBADQS_RN2	FBADQS_RN2		15MIL
FBADQS_WP2	FBADQS_RN2		15MIL
FBADQS_RN3	FBADQS_RN3		15MIL
FBADQS_WP3	FBADQS_RN3		15MIL
FBADQS_RN4	FBADQS_RN4		15MIL
FBADQS_WP4	FBADQS_RN4		15MIL
FBADQS_RN5	FBADQS_RN5		15MIL
FBADQS_WP5	FBADQS_RN5		15MIL
FBADQS_RN6	FBADQS_RN6		15MIL
FBADQS_WP6	FBADQS_RN6		15MIL
FBADQS_RN7	FBADQS_RN7		15MIL
FBADQS_WP7	FBADQS_RN7		15MIL
FBA_VREF_DATA0			12MIL
FBA_VREF_ADDR0			12MIL
FBA_VREF_DATA1			12MIL
FBA_VREF_ADDR1			12MIL

ASSEMBLY	BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL
PAGE DETAIL	FBA 8Mx32 DDR3 MEMORIES, FBA COMMAND BUS PU'S, FBA CLK PU'S

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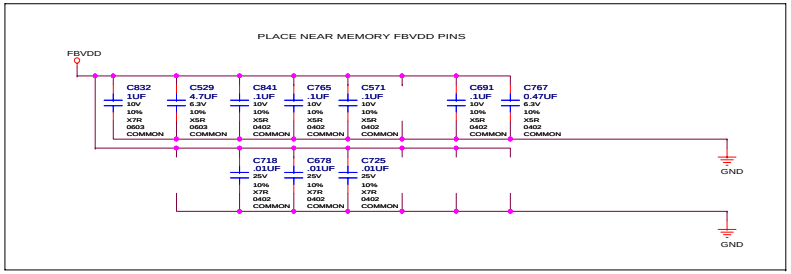
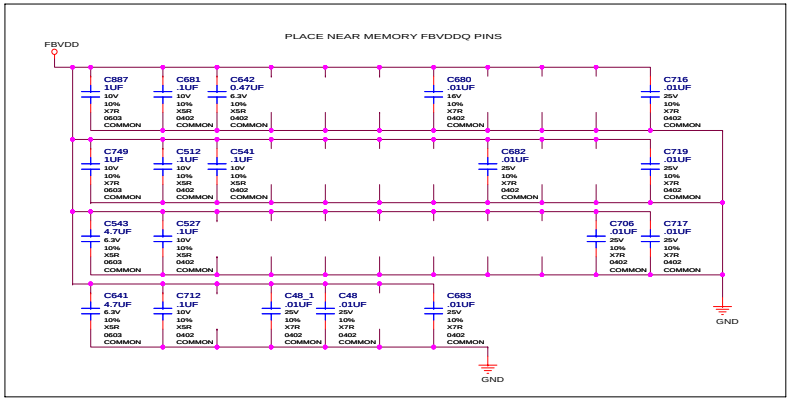
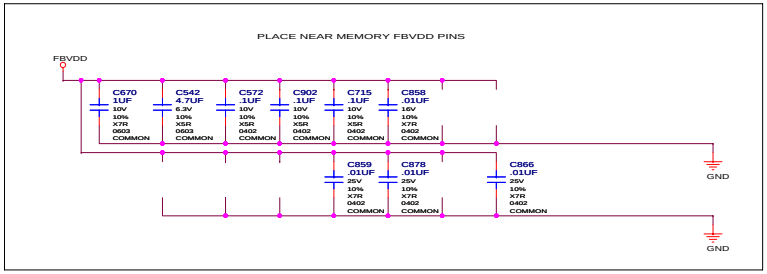
FRAME BUFFER: PARTITION A DECOUPLING

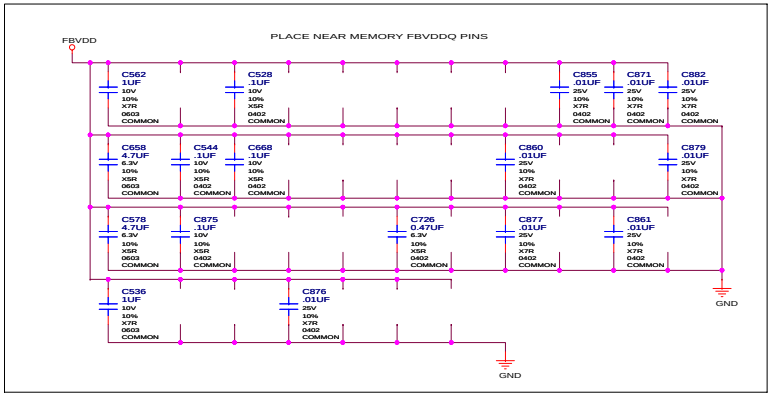
Decoupling for FBA 0..31





Decoupling for FBA 32..63





ASSEMBLY	BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL
PAGE DETAIL	FBA MEMORY FBVDD/Q DECOUPLING CAPS

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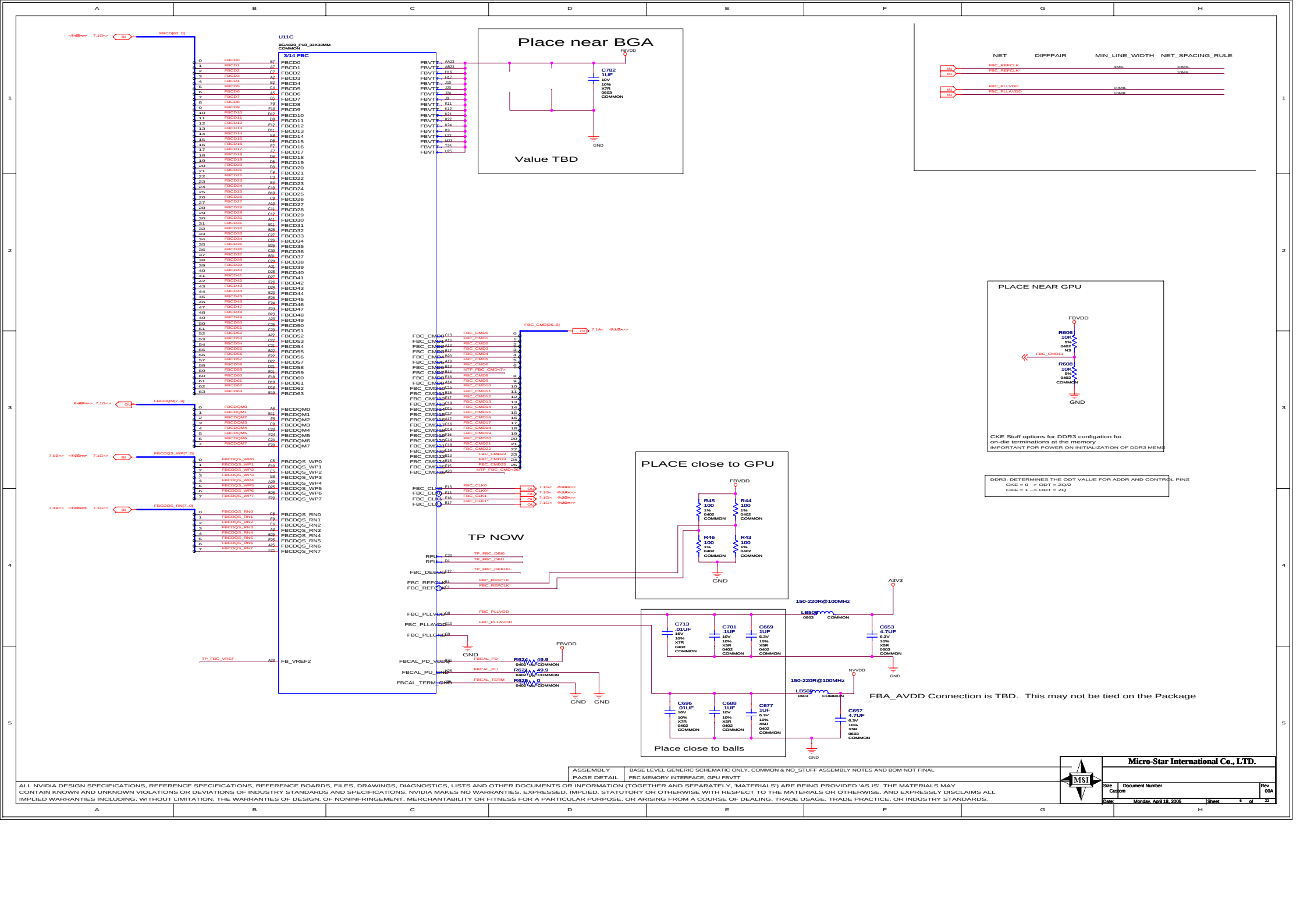

ASSEMBLY	BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL
PAGE DETAIL	FBC MEMORY INTERFACE, GPU FBVTT

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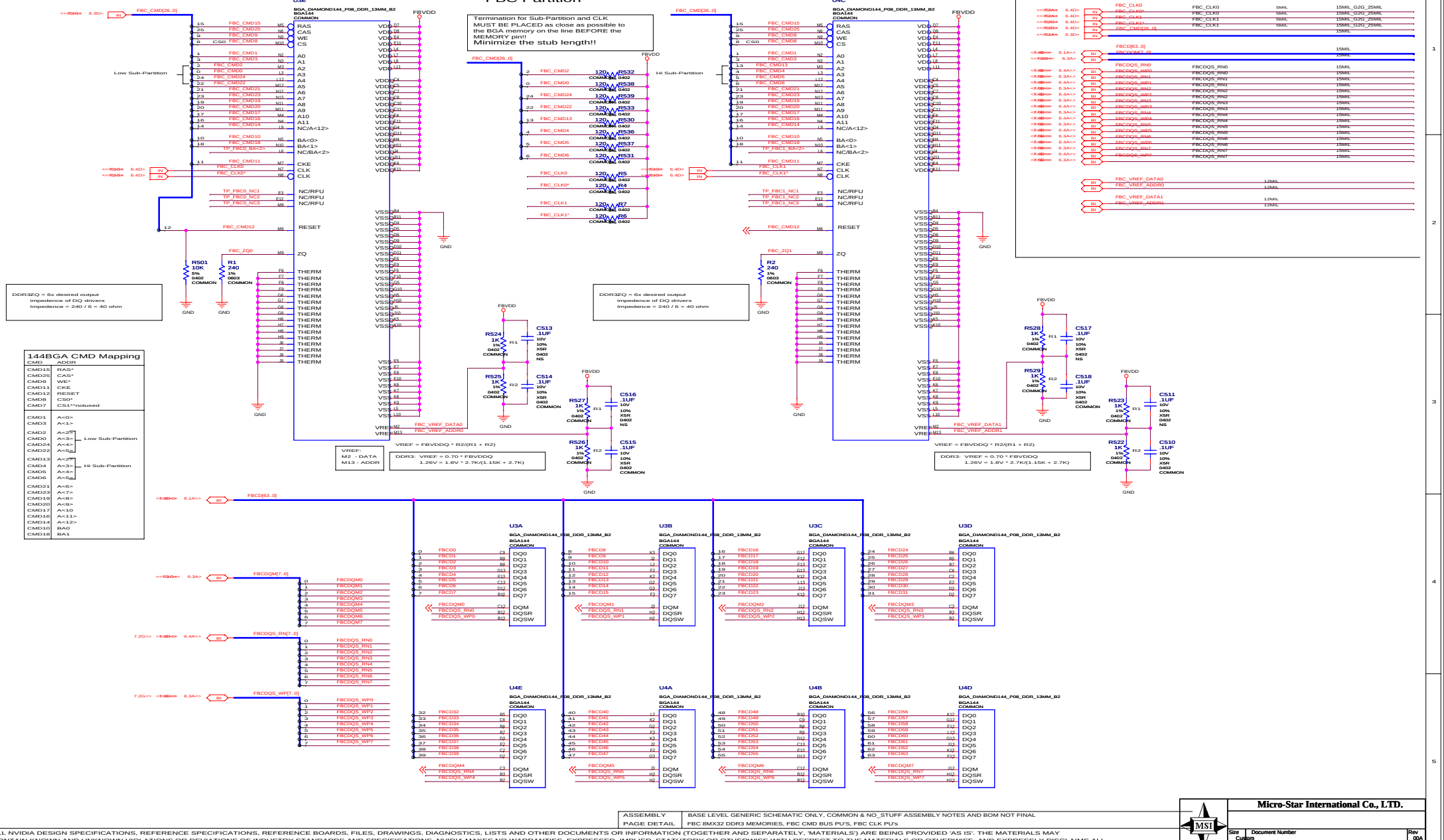
FRAMEBUFFER: PARTITION C 8Mx32 BGA144 DDR3



ASSEMBLY	BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL
PAGE DETAIL	FBC 8MX32 DDR3 MEMORIES, FBC CMD BUS PU'S, FBC CLK PU's

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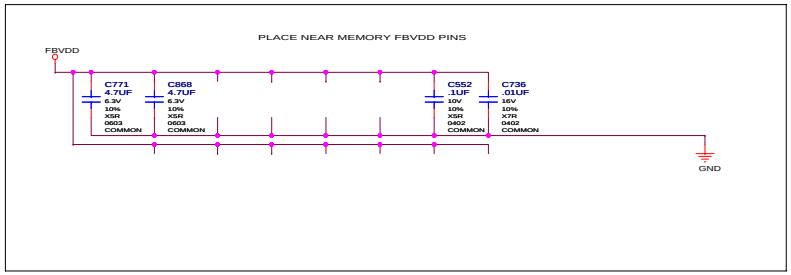
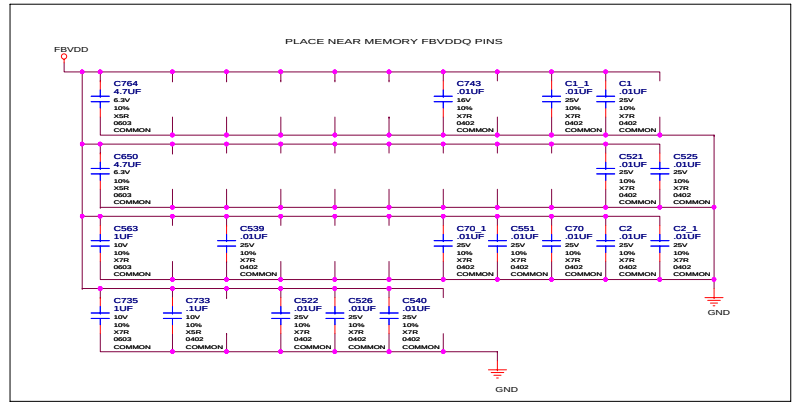
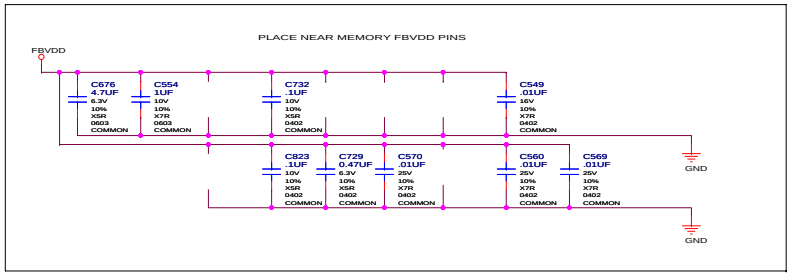
FRAMEBUFFER: PARTITION C DECOUPLING

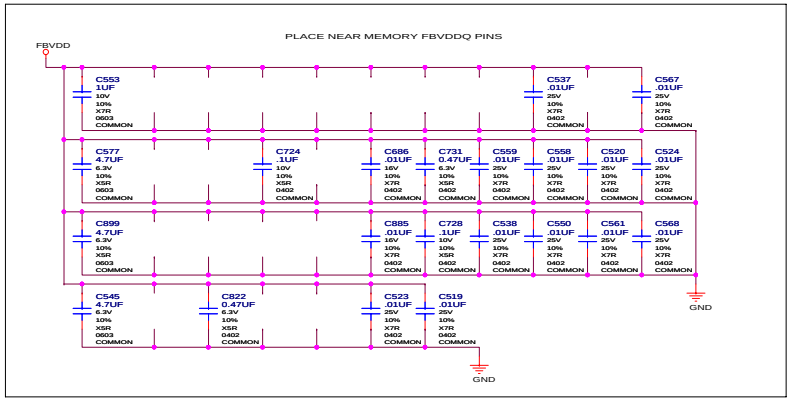
Decoupling for FBC 0..31

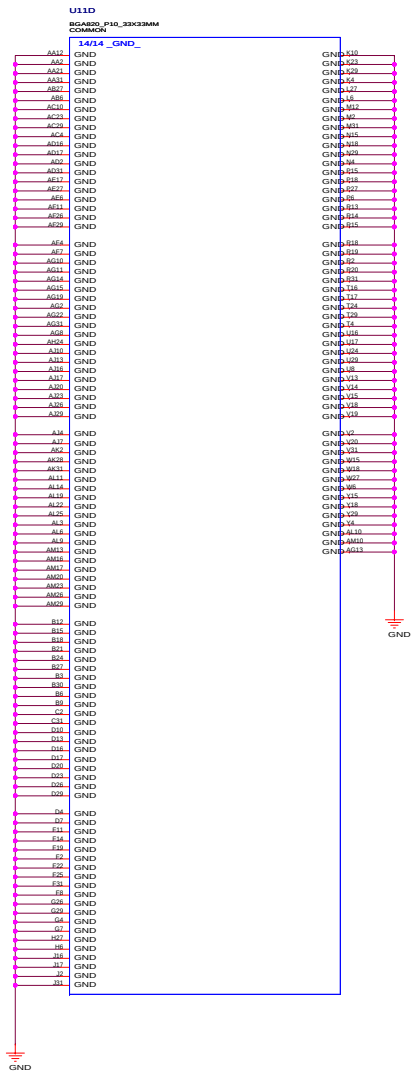




Decoupling for FBC 32..63







ASSEMBLY	BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL
PAGE DETAIL	FBC MEMORY FBVDD/Q DECOUPLING CAPS, GPU GND CONNECTIONS

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Primary Display (DACA), Slim DB15

DACA RGB-FILTER

NET_NAME	NET_SPACING_RULE	IMPEDANCE	MIN_LINE_WIDTH
DACA_VDD			12MIL
DACA_VREF			12MIL
DACA_RSET			12MIL
DACA_RED	20MIL	U11.AH11-R101.1.37.50 ohm:2 %	
DACA_GREEN	20MIL	U11.AJ12-R104.1.37.50 ohm:2 %	
DACA_BLUE	20MIL	U11.AH12-R98.1.37.50 ohm:2 %	
DACA_R_F	20MIL	L15.2-L16.1:75.00 ohm:2 %	
DACA_G_F	20MIL	L17.2-L18.1:75.00 ohm:2 %	
DACA_B_F	20MIL	L13.2-L14.1:75.00 ohm:2 %	
DACA_RED_C	20MIL	L16.2-J8.1:75.00 ohm:2 %	
DACA_GREEN_C	20MIL	L18.2-J8.2:75.00 ohm:2 %	
DACA_BLUE_C	20MIL	L14.2-J8.3:75.00 ohm:2 %	
DDC_5V			12MIL

Route DAC RGB with ~37.5ohm Impedence

NO STUFF 2.2K ON RGB FOR BRINGUP

PLACE NEAR SYNC BUFFER

FOR ESD DIODES

Place in output filter section!

SOUTH

ASSEMBLY	BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL
PAGE DETAIL	DACA FILTERS, DACA SYNC BUFFERS & DB15 SOUTH

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Secondary Display (DACC), Slim DB15

DACC RGB-FILTER

NET_NAME	NET_SPACING_RULE	IMPEDANCE	MIN_LINE_WIDTH
DACC_VDD			12MIL
DACC_VREF			12MIL
DACC_RSET			12MIL
DACC_RED	20MIL	U11.AE6.R59.1.37.50 ohm.2 %	
DACC_GREEN	20MIL	U11.AG6.R70.1.37.50 ohm.2 %	
DACC_BLUE	20MIL	U11.AE5.R50.1.37.50 ohm.2 %	
DACBC_R_F	20MIL	L10.2.L9.1.75.00 ohm.2 %	
DACBC_G_F	20MIL	L12.2.L11.1.75.00 ohm.2 %	
DACBC_B_F	20MIL	L8.2.L7.1.75.00 ohm.2 %	
DACC_RED_C	20MIL	L9.2.36.1.75.00 ohm.2 %	
DACC_GREEN_C	20MIL	L11.2.36.2.75.00 ohm.2 %	
DACC_BLUE_C	20MIL	L7.2.36.2.75.00 ohm.2 %	

Place 0ohm Resistor Incident with Common Mode Choke

MIDDLE

FOR ESD DIODES

Place in output filter section!

ASSEMBLY	BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL
PAGE DETAIL	DACC FILTERS, DACC SYNC BUFFERS & DB15 MID

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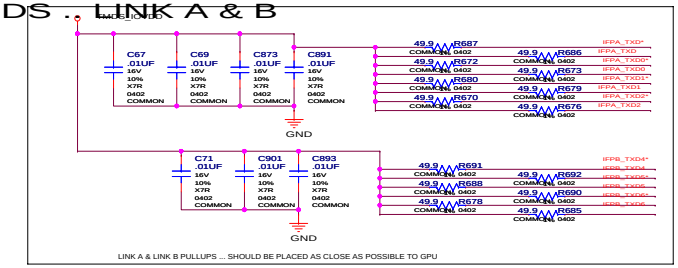
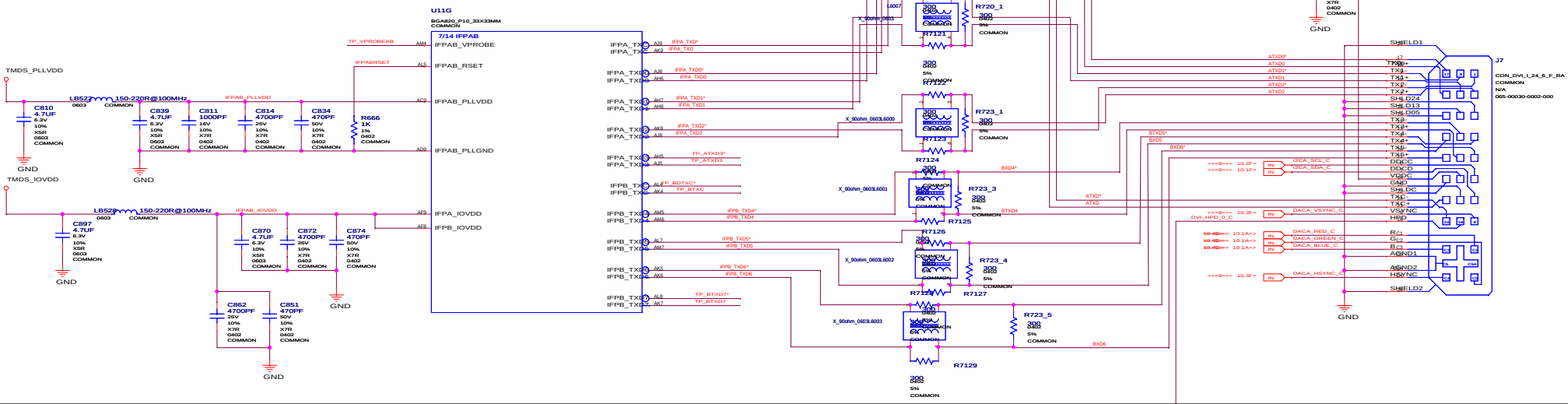
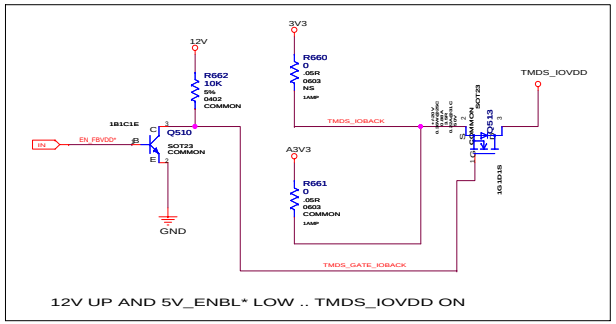
INTERNAL TMDS .. LINK A & B



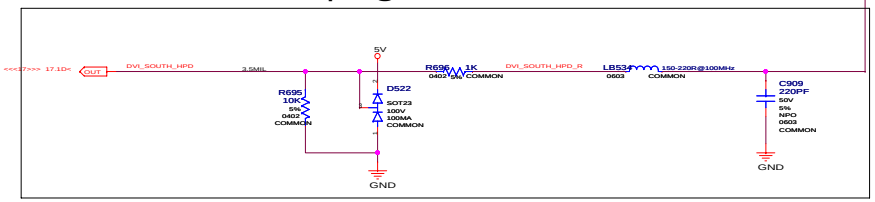
NOTE: GPU HAS ON DIE PULL UPS ON TMDS LINES .. EXTERNAL PULLUPS ADDED (FOR CYA) IN CASE ON-DIE CURRENT DRAW IS EXCESSIVE



TMDS_IOVDD BACKDRIVE PREVENTION



Hotplug Detection



NETNAME	MIN_LINE_WIDTH	VOLTAGE
TMDS_PLLVDD	12MIL	3.3V
IFPAB_PLLVDD	12MIL	3.3V
TMDS_IOVDD	12MIL	3.3V
IFPAB_IOVDD	12MIL	3.3V
IFPABRSET	12MIL	
TMDS_IOBACK	12MIL	

ASSEMBLY	BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL
PAGE DETAIL	TMDS LINK A/B & PU's, TMDS IO BACKDRIVE PREVENTION,DVI CONNECTOR SOUTH

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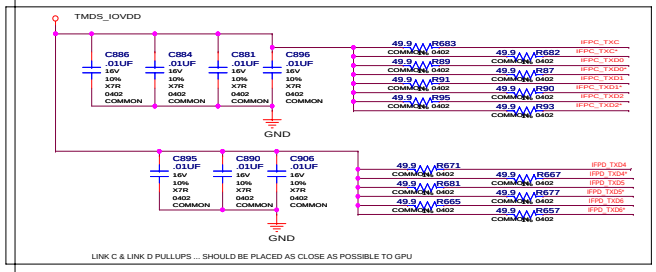
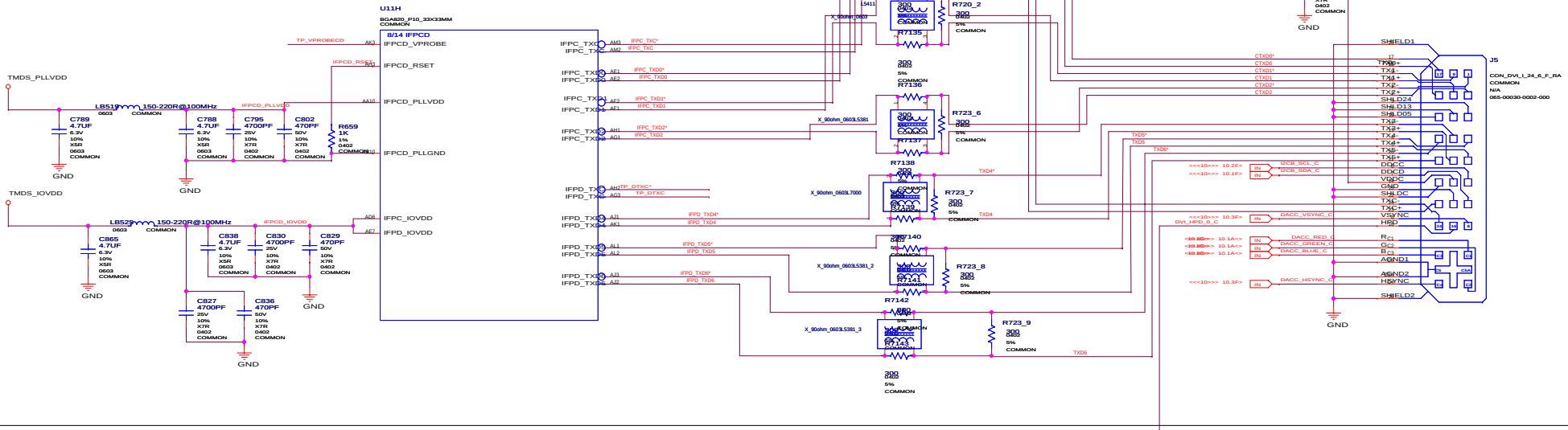
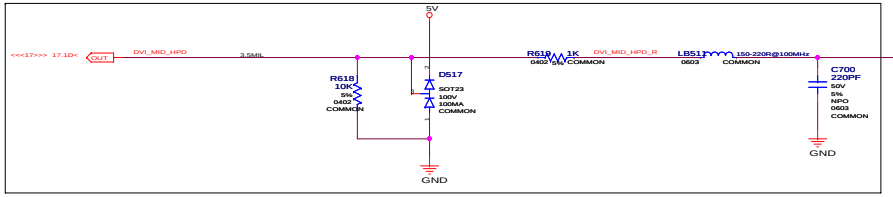
INTERNAL TMDS .. LINK C & D





Hotplug Detection



NETNAME	MIN_LINE_WIDTH	VOLTAGE
IFPCD_RSET	12MIL	
IFPCD_PLLVDD	12MIL	3.3V
IFPCD_IOVDD	12MIL	3.3V

ASSEMBLY	BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL
PAGE DETAIL	TMDS LINK C/D & PU's,DVI CONNECTOR MID

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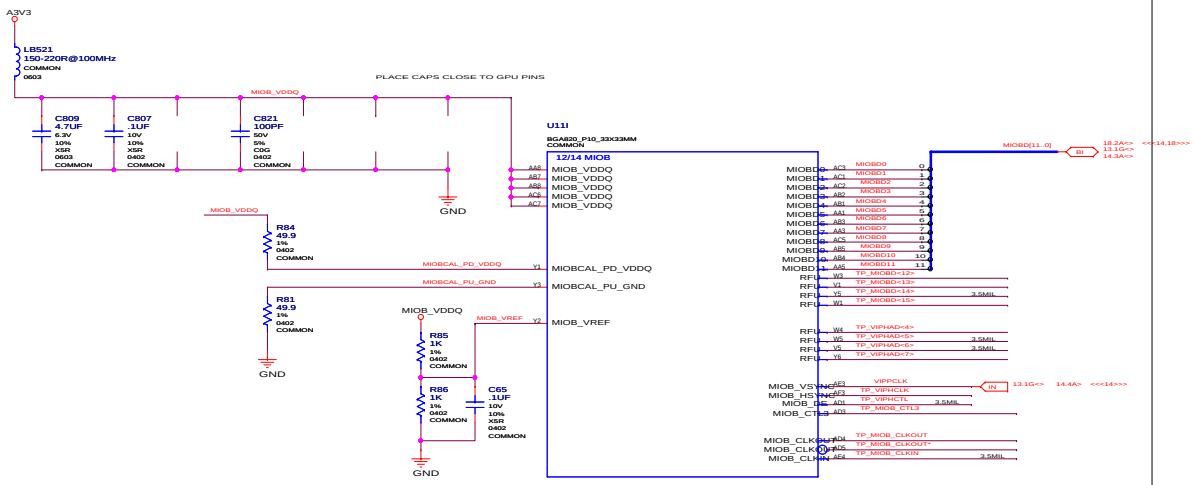
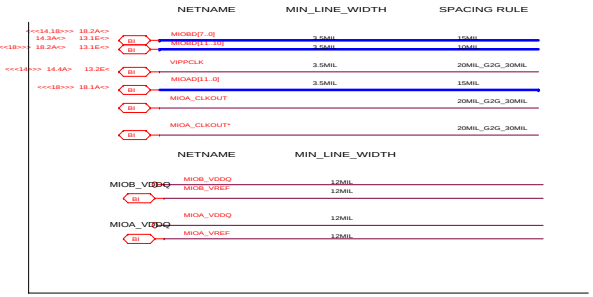
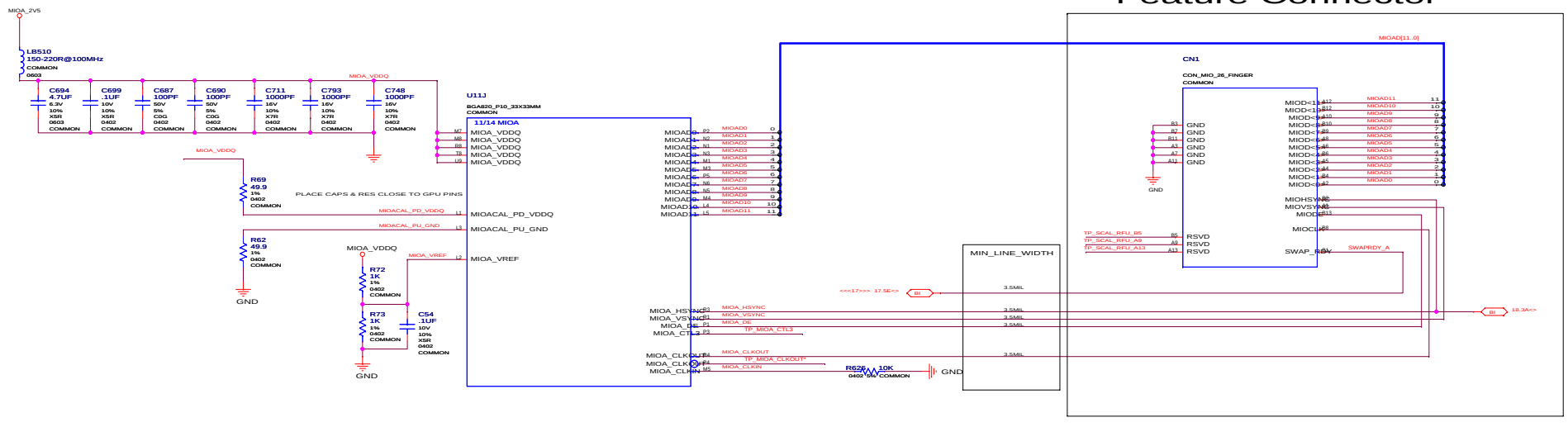
G3 VIP/MIOB





G3 MIOA



Feature Connector

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

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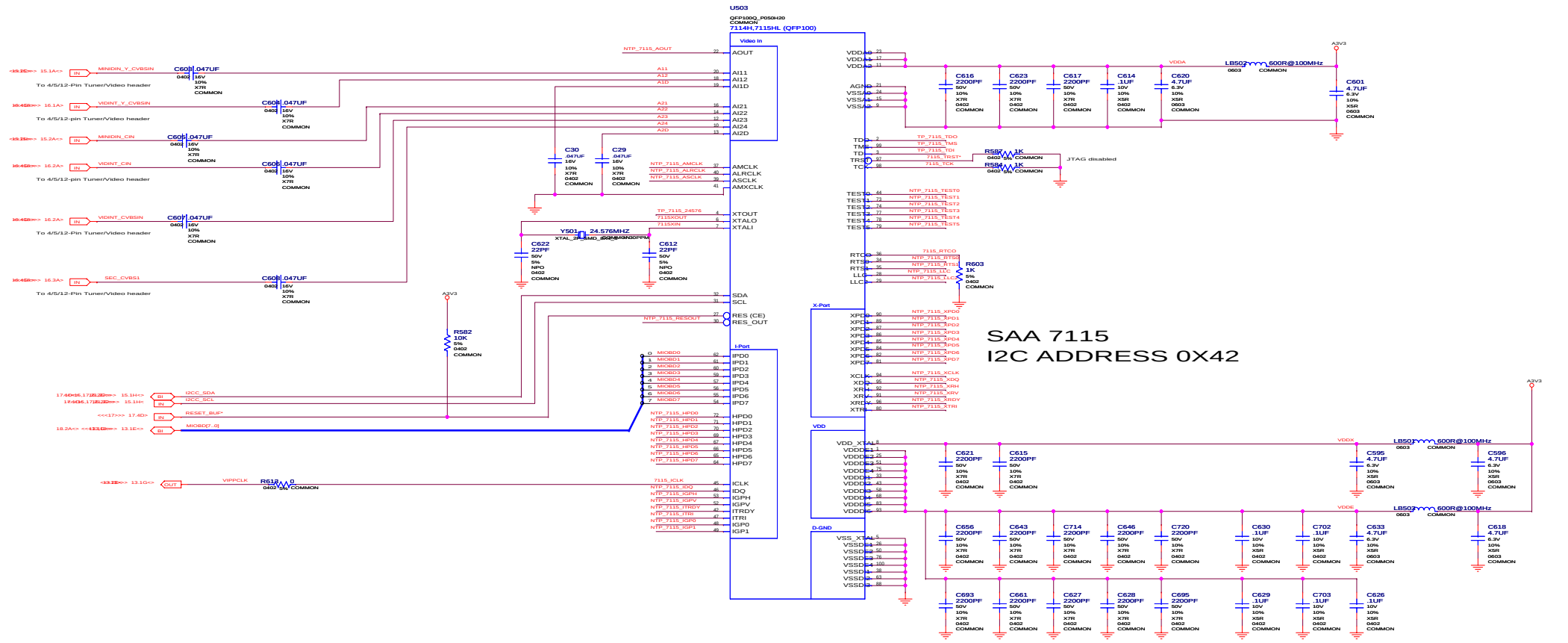
PHILIPS VIDEO CAPTURE



NETNAME MIN_LINE_WIDTH

VDDA 12MIL
VDDX 12MIL
VDDE 12MIL

ASSEMBLY	BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL
PAGE DETAIL	PHILIPS SAA7115 VIDEO DECODER

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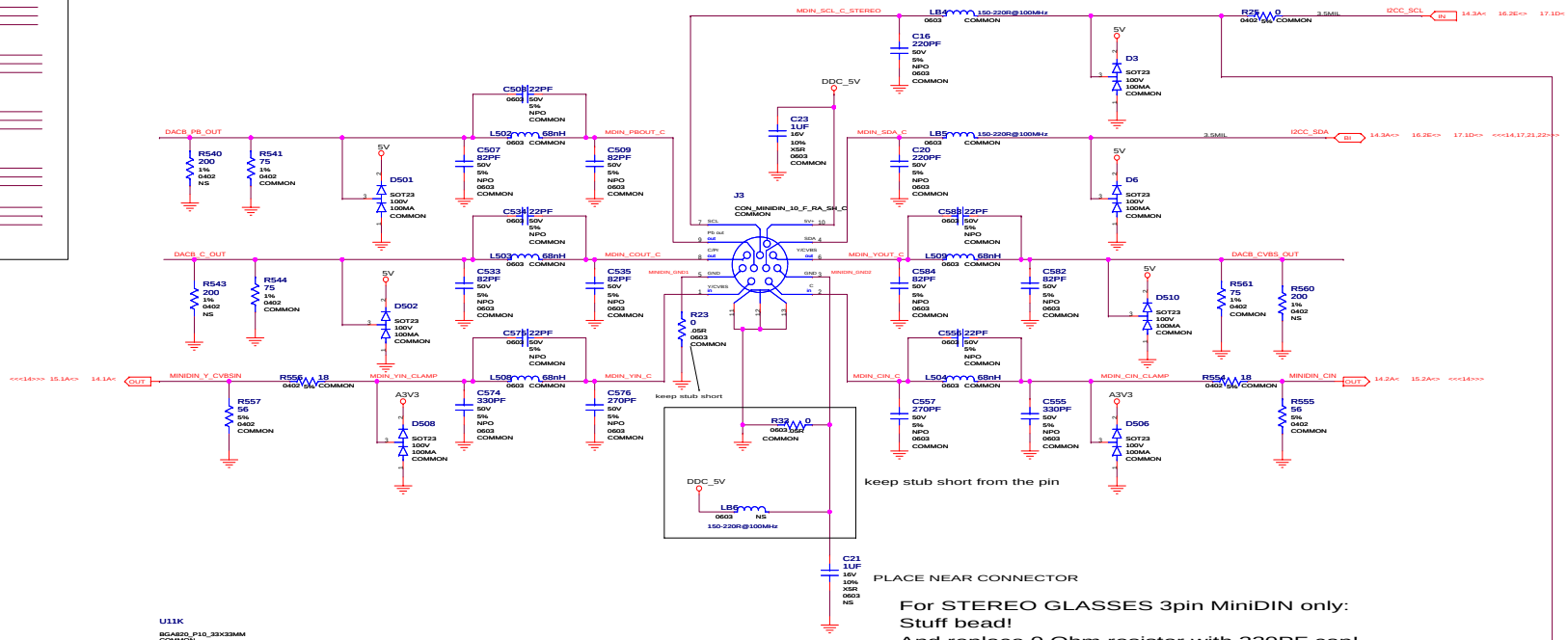
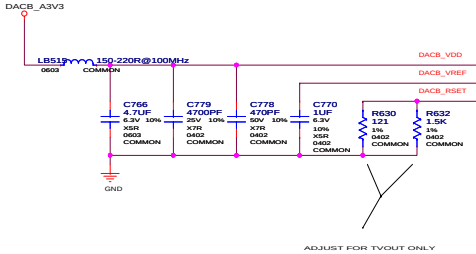
DACB .. MiniDIN VIDEO IN/OUT CONNECTOR /STEREO GLASSES

NET_NAME	MIN_LINE_WIDTH	IMPEDANCE	NET_SPACING_RULE
DACB_C_OUT		U11.R6;RS44 1.37.50 ohm 2 %	20MIL
DACB_CVBS_OUT		U11.T5;RS61 1.37.50 ohm 2 %	20MIL
DACB_PB_OUT		U11.T6;RS41 1.37.50 ohm 2 %	20MIL
MDIN_PBOUT_C			20MIL
MDIN_COUT_C			20MIL
MDIN_YOUT_C			20MIL
MINIDIN_Y_CVBSIN			20MIL
MDIN_YIN_C			20MIL
MDIN_YIN_CLAMP			20MIL
MDIN_CIN_C			20MIL
MINIDIN_CIN			20MIL
MDIN_CIN_CLAMP			20MIL
DACB_VDD	12MIL		
DACB_VREF	12MIL		
DACB_RSET	12MIL		

FILTER NOTES:

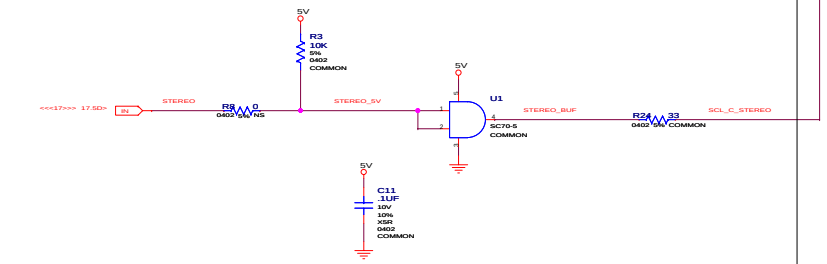
SD: USE L=1.8UH
HD: USE L=?





STEREO GLASSES BUFFER

Place close to MiniDIN connector!



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

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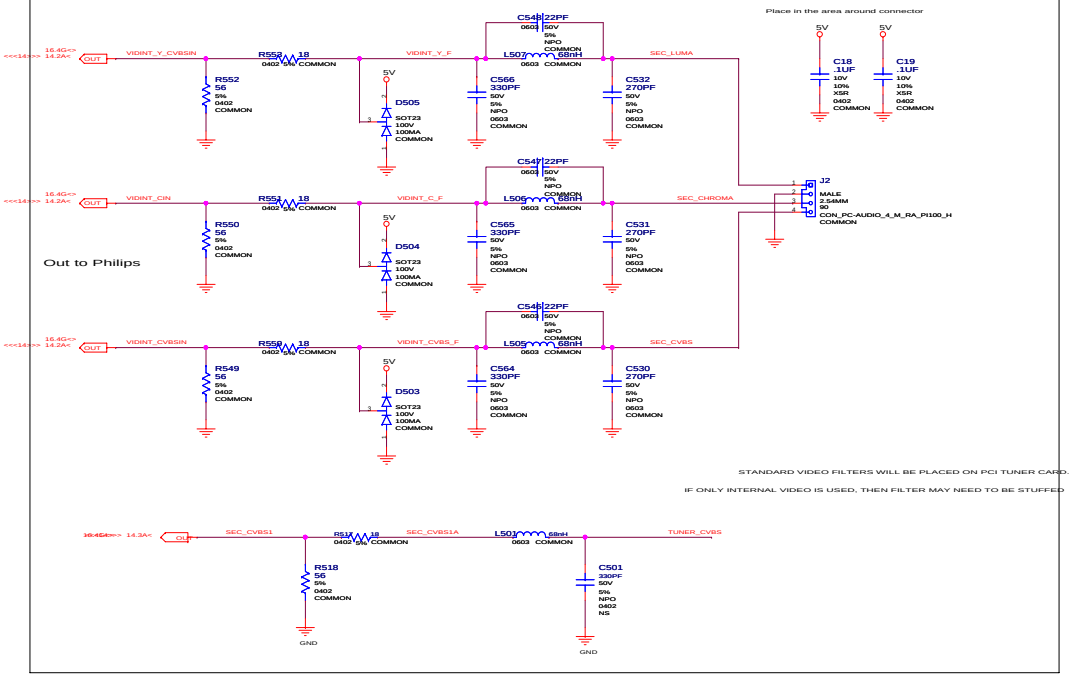
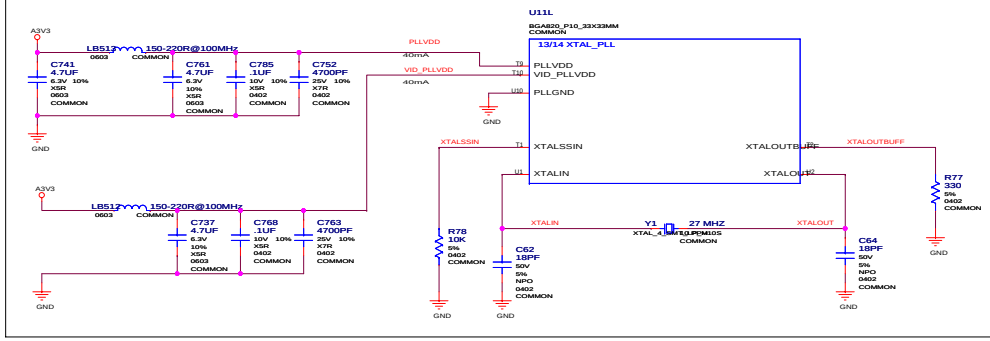
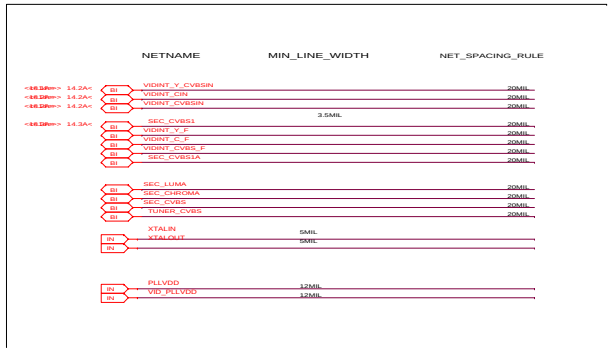
4-Pin Video In, 12-pin Video In connectors

EXTERNAL 4-PIN VIDEO IN CONNECTOR



XTAL/PLLVDD





ASSEMBLY	BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL
PAGE DETAIL	4-PIN & 12-PIN VIDEO HEADERS, XTAL

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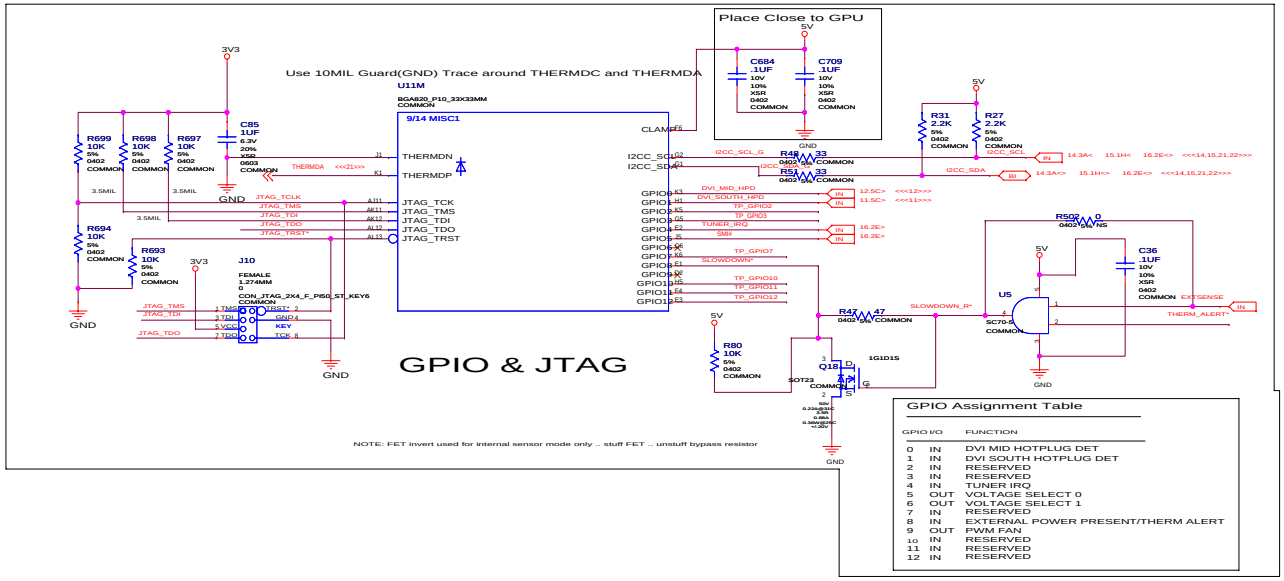

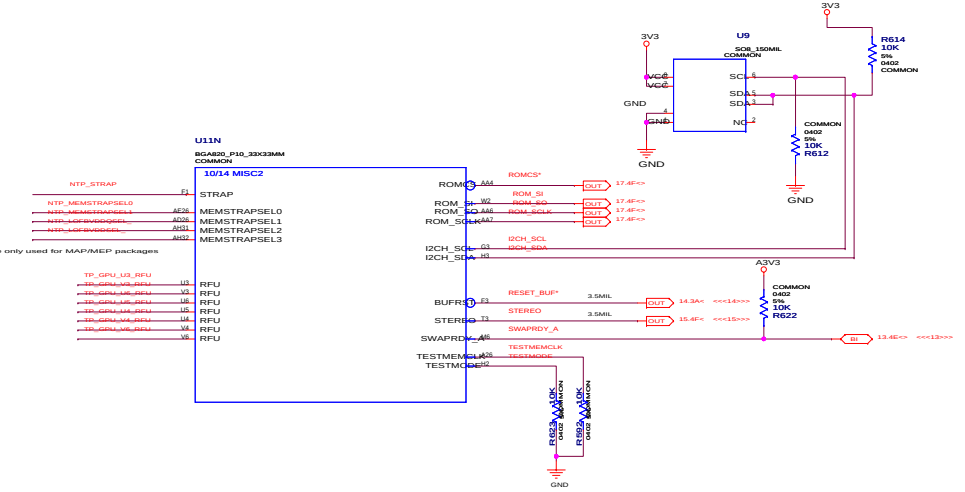

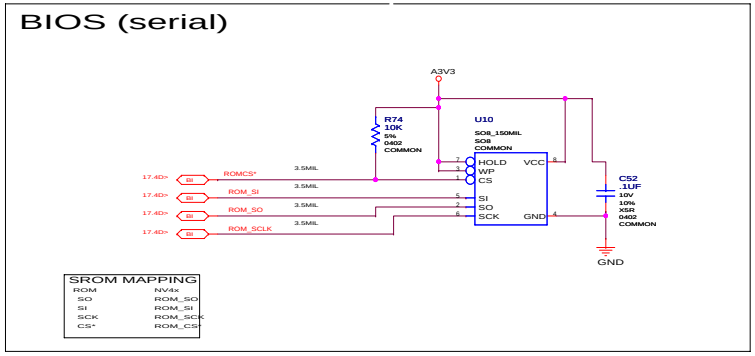

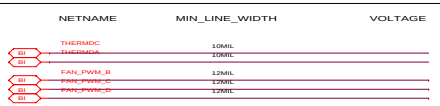

ASSEMBLY	BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL
PAGE DETAIL	JTAG, BIOS ROM, HDCP ROM, FAN CONTROL, TEMP SENSOR & GPIO's

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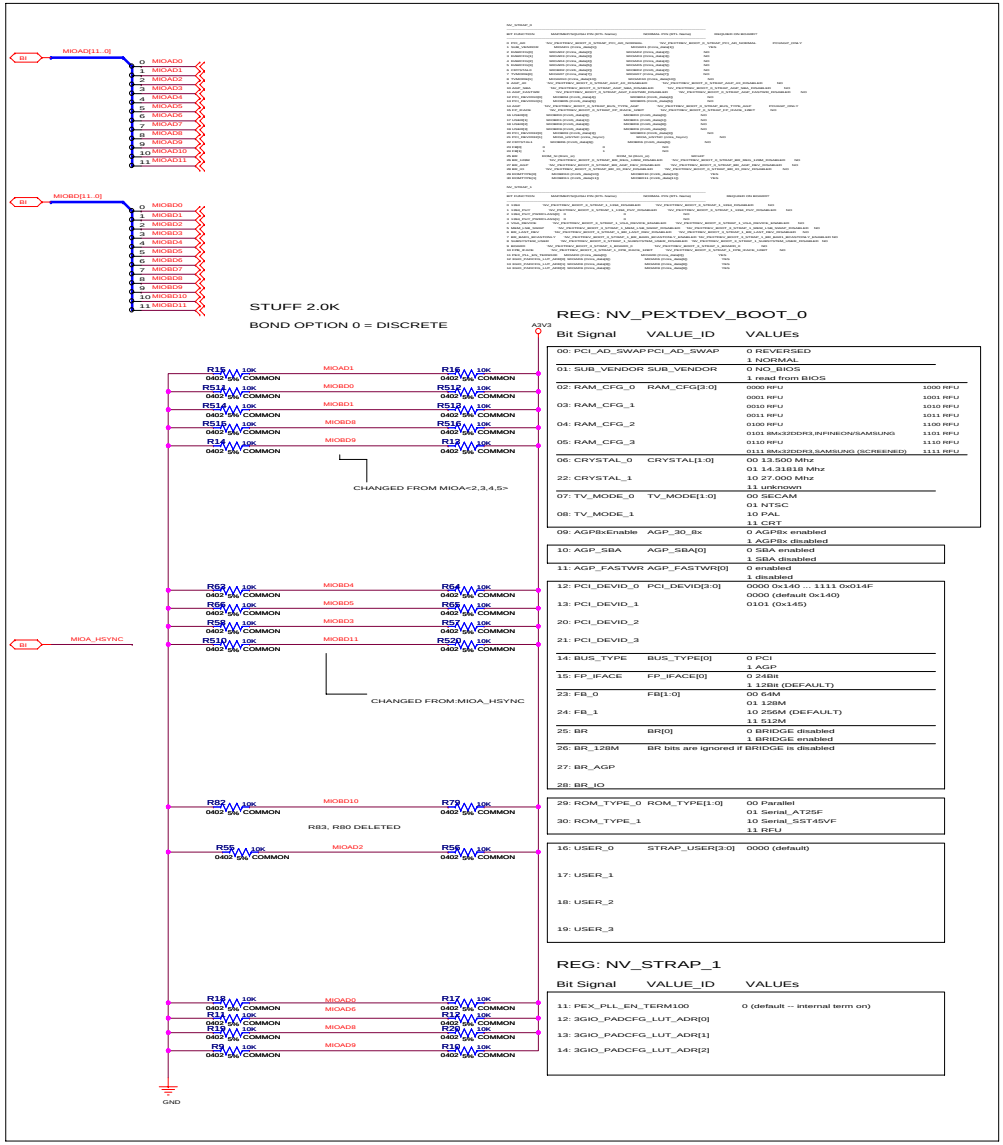
BIOS, Straps, Misc

Straps

Assembly: BIOS



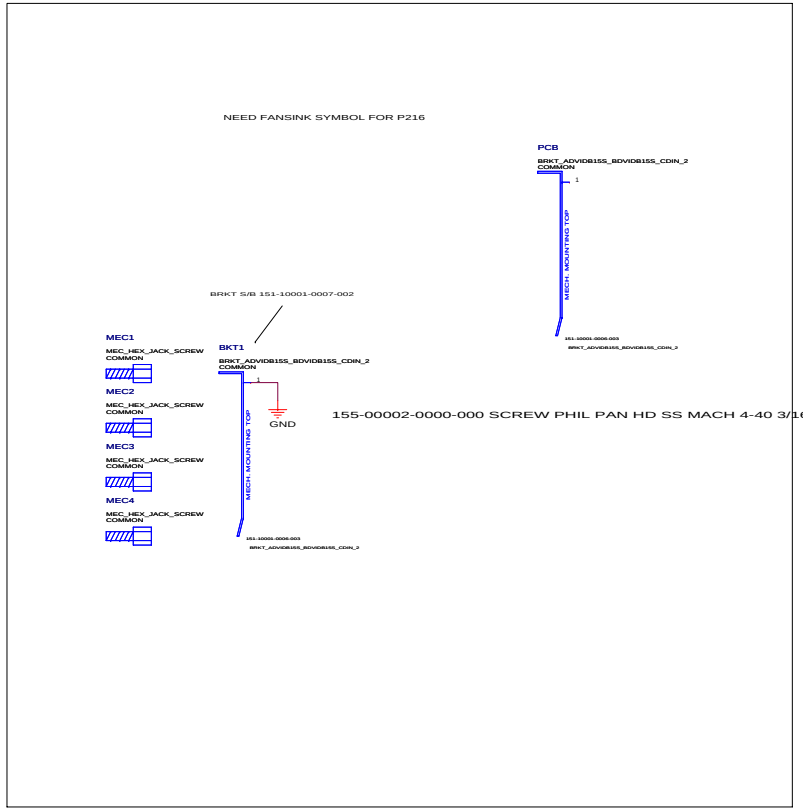
REG: NV_PEXTDEV_BOOT_0

Bit	Signal	VALUE_ID	VALUEs
00:	PCI_AD_SWAP	PCI_AD_SWAP	0 REVERSED 1 NORMAL
01:	SUB_VENDOR	SUB_VENDOR	0 NO_BIOS 1 read from BIOS
02:	RAM_CFG_0	RAM_CFG[3:0]	0000 RFU 0001 RFU 0010 RFU 0011 RFU 0100 RFU 0101 8Mx32DDR3,INFINEON/SAMSUNG 0110 RFU 0111 8Mx32DDR3,SAMSUNG (SCREENED) 1000 RFU 1001 RFU 1010 RFU 1011 RFU 1100 RFU 1101 RFU 1110 RFU 1111 RFU
03:	RAM_CFG_1		
04:	RAM_CFG_2		
05:	RAM_CFG_3		
06:	CRYSTAL_0	CRYSTAL[1:0]	00 13.500 Mhz 01 14.31818 Mhz 10 27.000 Mhz 11 unknown
22:	CRYSTAL_1		
07:	TV_MODE_0	TV_MODE[1:0]	00 SECAM 01 NTSC 10 PAL 11 CRT
08:	TV_MODE_1		
09:	AGPBxEnable	AGP_30_8x	0 AGP8x enabled 1 AGP8x disabled
10:	AGP_SBA	AGP_SBA[0]	0 SBA enabled 1 SBA disabled
11:	AGP_FASTWR	AGP_FASTWR[0]	0 enabled 1 disabled
12:	PCI_DEVID_0	PCI_DEVID[3:0]	0000 0x140 .. 1111 0x014F 0000 (default 0x140)
13:	PCI_DEVID_1		0101 (0x145)
20:	PCI_DEVID_2		
21:	PCI_DEVID_3		
14:	BUS_TYPE	BUS_TYPE[0]	0 PCI 1 AGP
15:	FP_IFACE	FP_IFACE[0]	0 24Bit 1 12Bit (DEFAULT)
23:	FB_0	FB[1:0]	00 64M 01 128M 10 256M (DEFAULT) 11 512M
24:	FB_1		
25:	BR	BR[0]	0 BRIDGE disabled 1 BRIDGE enabled
26:	BR_128M	BR bits are ignored if BRIDGE is disabled	
27:	BR_AGP		
28:	BR_IO		
29:	ROM_TYPE_0	ROM_TYPE[1:0]	00 Parallel 01 Serial_AT25F 10 Serial_SST45VF 11 RFU
30:	ROM_TYPE_1		
16:	USER_0	STRAP_USER[3:0]	0000 (default)
17:	USER_1		
18:	USER_2		
19:	USER_3		

REG: NV_STRAP_1

Bit	Signal	VALUE_ID	VALUEs
11:	PEX_PLL_EN_TERM100		0 (default -- internal term on)
12:	3GIO_PADCFG_LUT_ADR[0]		
13:	3GIO_PADCFG_LUT_ADR[1]		
14:	3GIO_PADCFG_LUT_ADR[2]		

Mechanical parts



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

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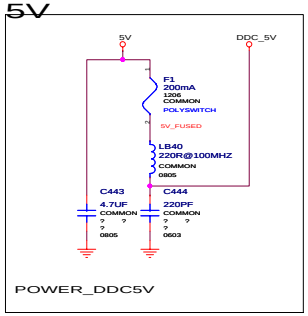
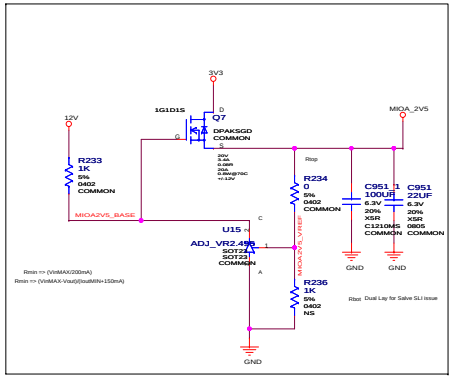
Power Supply ... /A3V3

DDC 5V



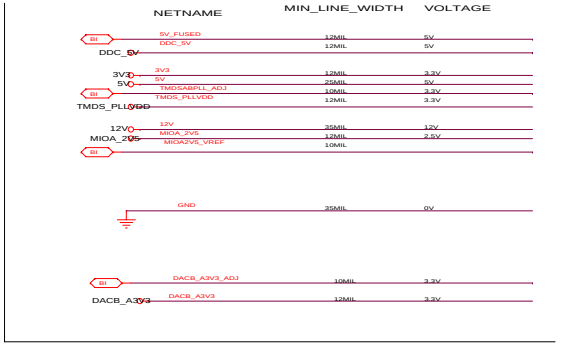
MIOA_VDDQ



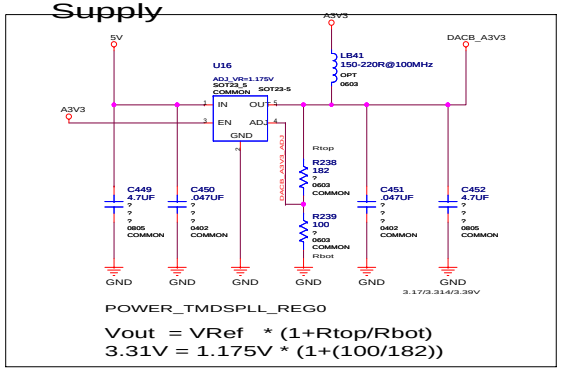
Vref = 2.5V

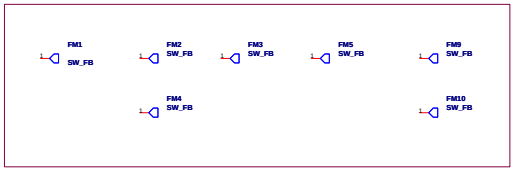
Vout = 2.495(1+Rtop/Rbot) + (Iref + Rtop)

For Vout = Vref (Rtop = 0ohm, Rbot = NO STUFF)

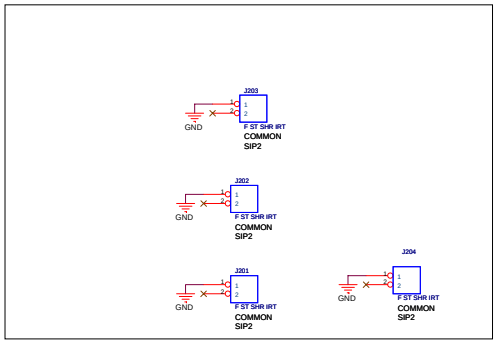


DACB Supply





Fiducial Point



Test point

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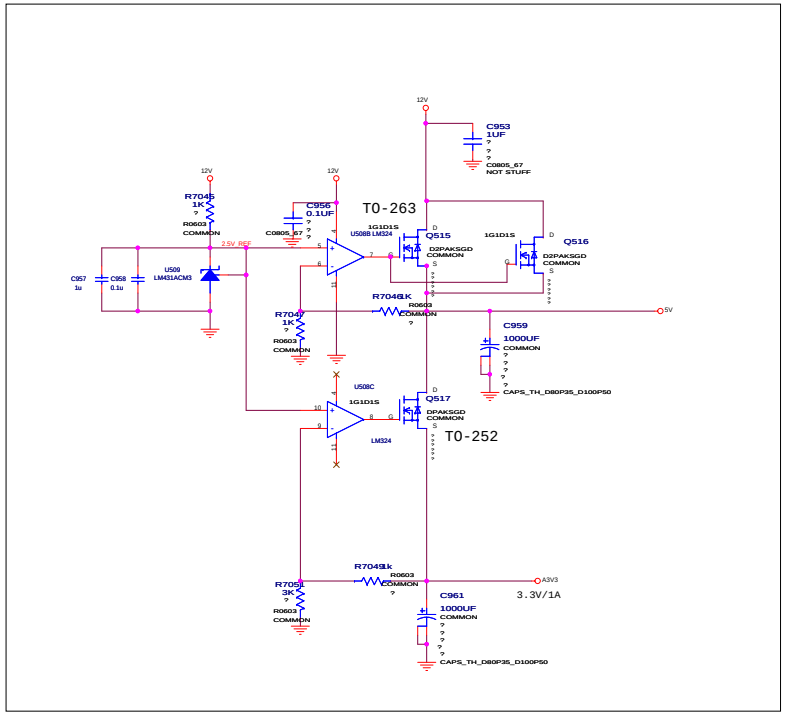
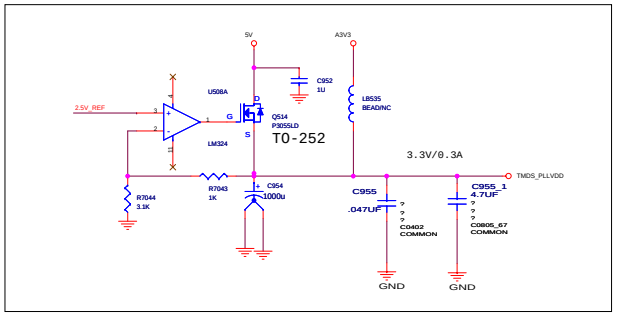
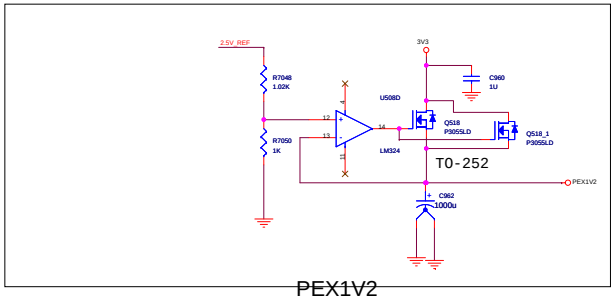


5V & A3V3



TMDS AB/CD PLL Supply



PEX1V2

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

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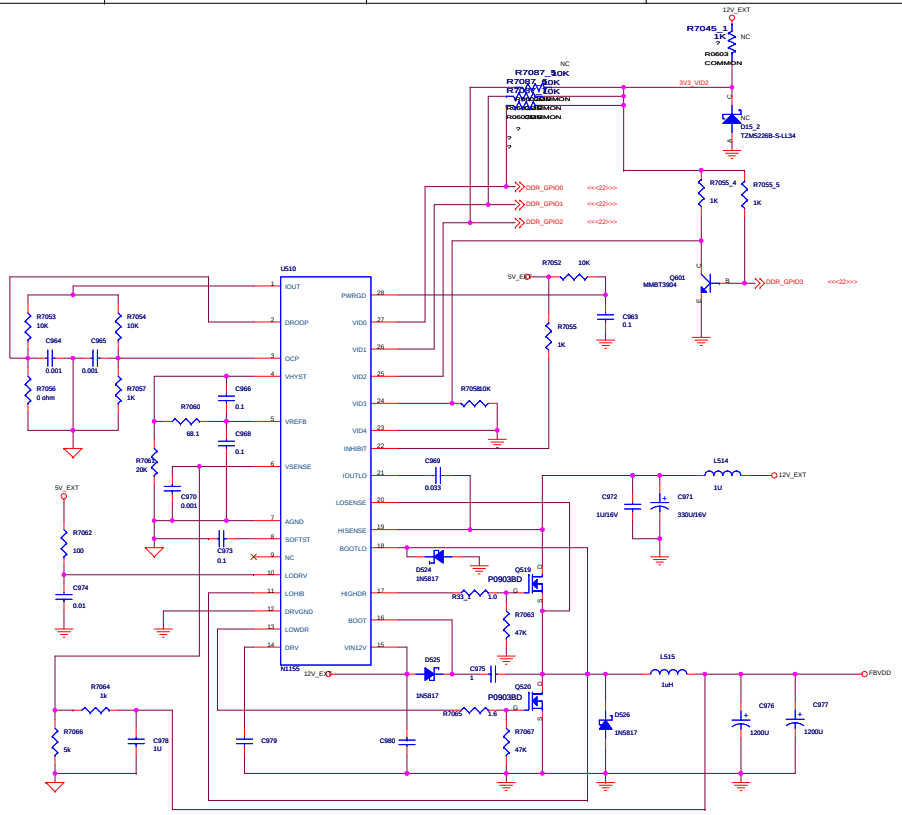
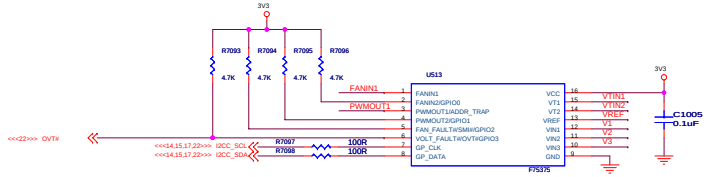
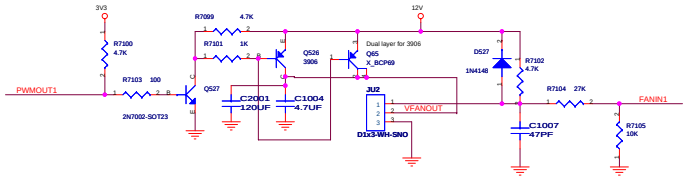


H/W MONITOR



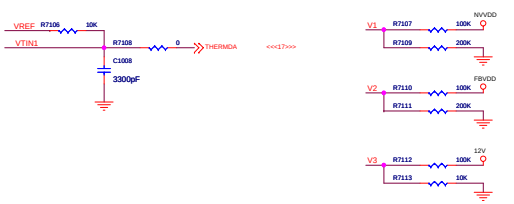
VOLTAGE SENSORING CIRCUIT



SMART FAN

TEMPERATURE SENSORING CIRCUIT

VOLTAGE SENSORING CIRCUIT



ASSEMBLY	BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL
PAGE DETAIL	PHILIPS SAA7115 VIDEO DECODER

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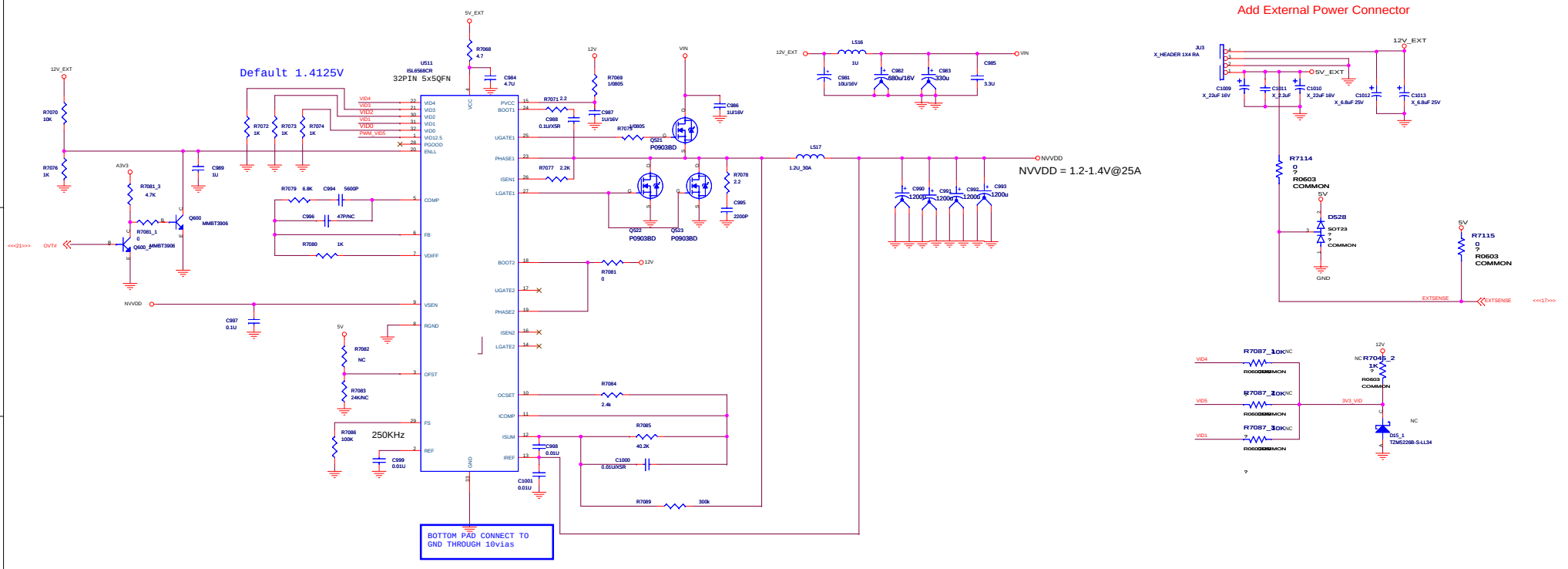

ISL6568CR -- VRM 10

VID4	VID3	VID2	VID1	VID0	VID12.5	VDC(V)
1	0	1	1	0	0	1.3125
1	0	0	0	1	1	1.325
1	0	1	0	1	1	1.375
1	0	1	0	0	1	1.35
1	0	1	0	0	0	1.3625
1	0	0	1	1	1	1.375
1	0	0	1	1	0	1.3875
1	0	0	1	0	1	1.4
1	0	0	1	0	1	1.4125
1	0	0	0	1	1	1.425
1	0	0	0	1	0	1.4375
1	0	0	0	0	1	1.45
1	0	0	0	0	1	1.4625
0	1	1	1	1	1	1.475
0	1	1	1	1	0	1.4875
0	1	1	1	1	1	1.5

ASSEMBLY	BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL
PAGE DETAIL	PHILIPS SAA7115 VIDEO DECODER

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