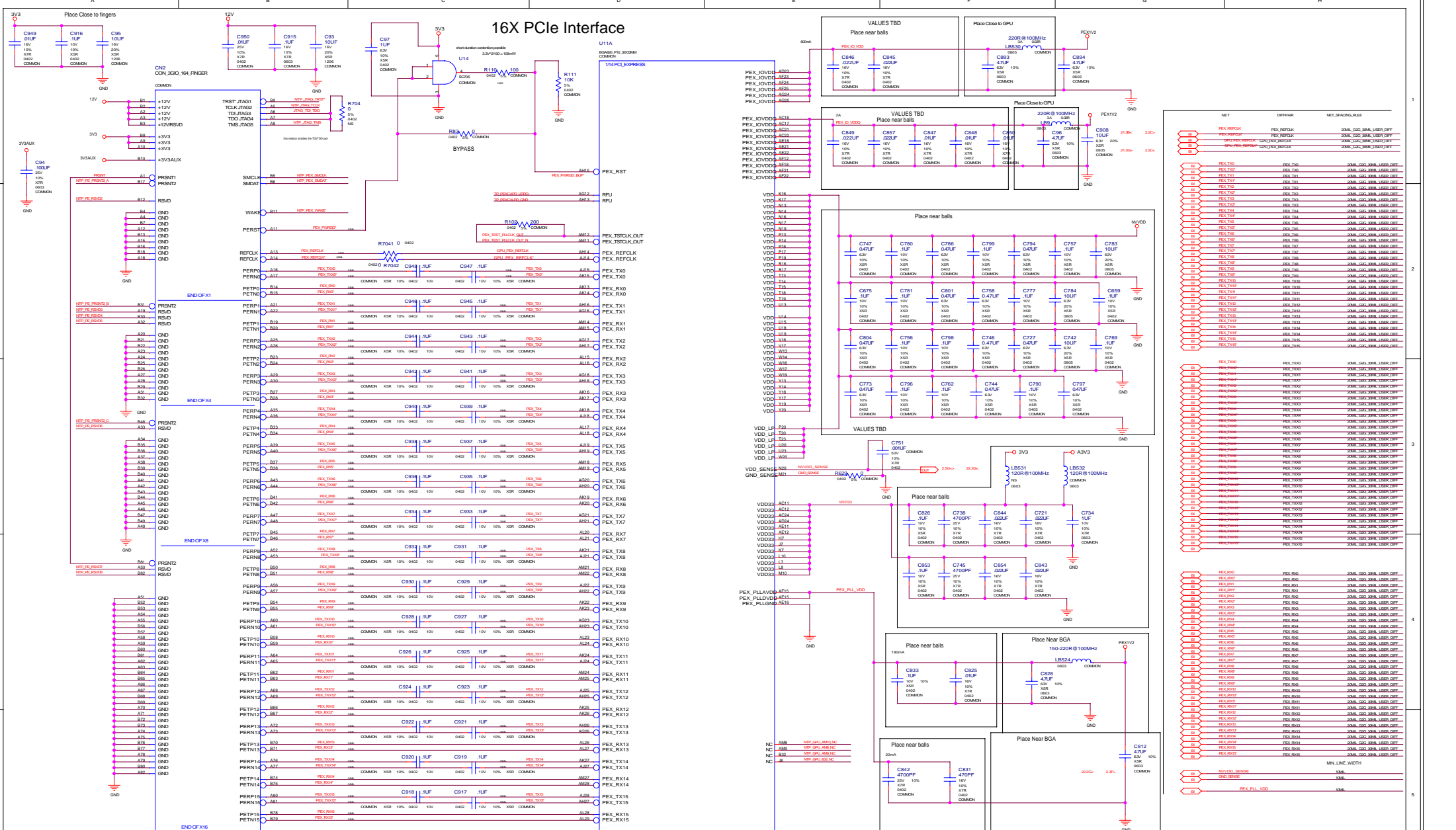


P216-A02 DESIGN -- NV43, 128 MB DDR3, VGA, DVI-I, SD/HDTV, VIVO

PAGE SUMMARY:

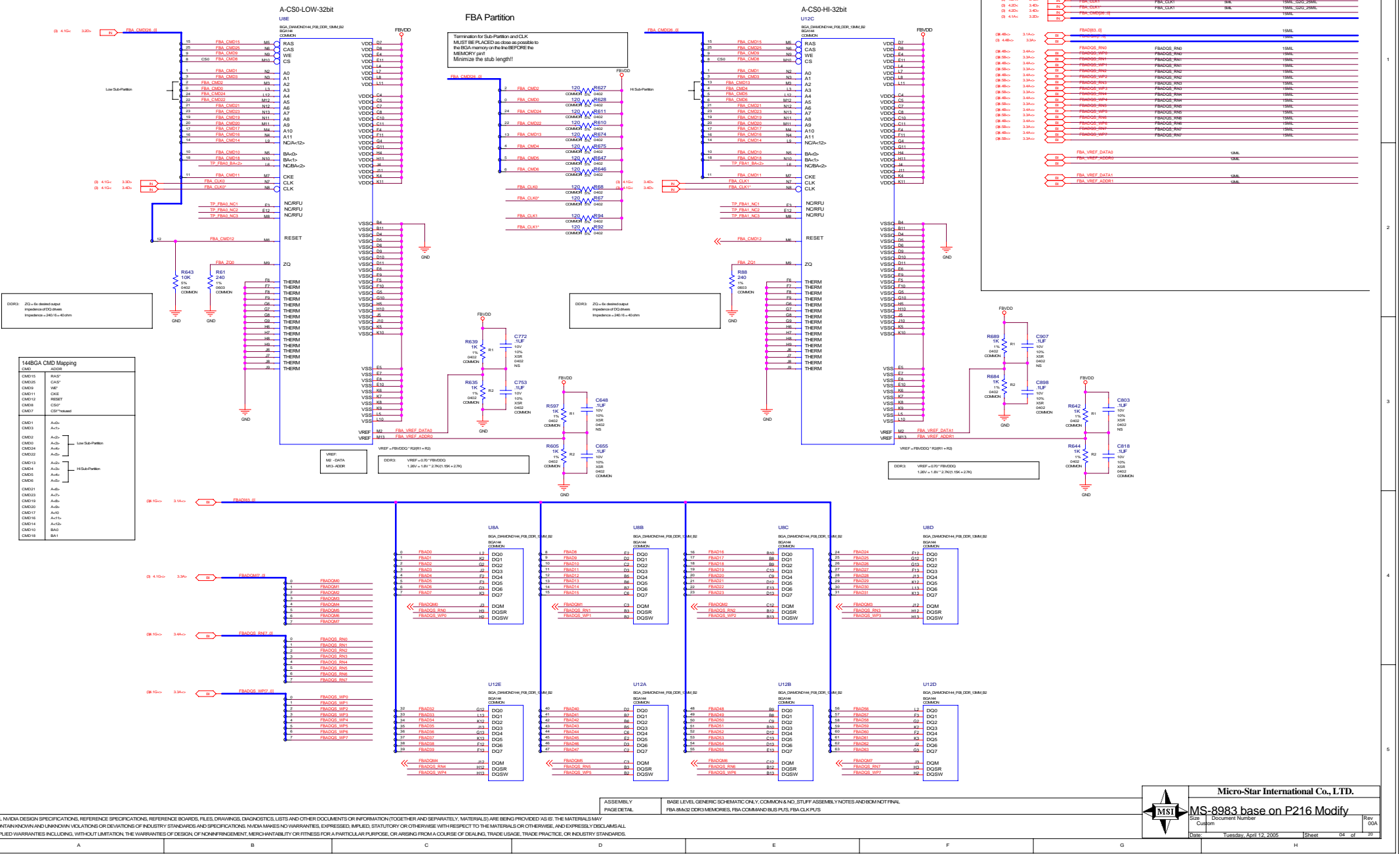
NO.	VARIANT	MPN	ASSEMBLY
0	BASE	602-10216-base-000	BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO. STUFF ASSEMBLY NOTES AND SOME NOT FINAL
1	000	602-10216-0000-200	NV43-U 500500MHZ 128MB DDR3 8MX32 DV+VGA+HDTVOUT
2	001	602-10216-0001-200	NV43-U 500500MHZ 128MB DDR3 8MX32 DV+VGA+HDTVOUT
3	002	602-10216-0002-200	NV43-U 500500MHZ 128MB DDR3 8MX32 DV+VGA+HDTVOUT
4	003	602-10216-0003-200	NV43-U 400400MHZ 128MB DDR3 8MX32 DV+VGA+HDTVOUT
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6	<UNDEFINED>	<UNDEFINED>	<UNDEFINED>
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X01



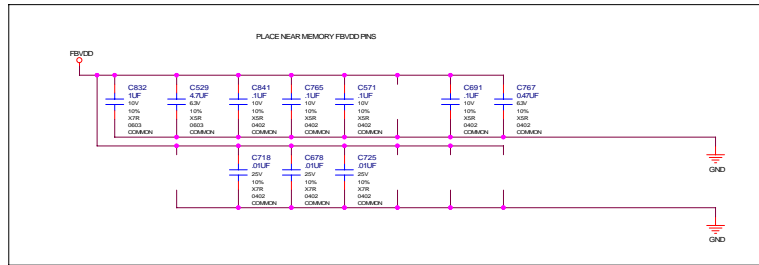
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5 FrameBuffer: Partition A 8Mx32 BGA144 DDR3

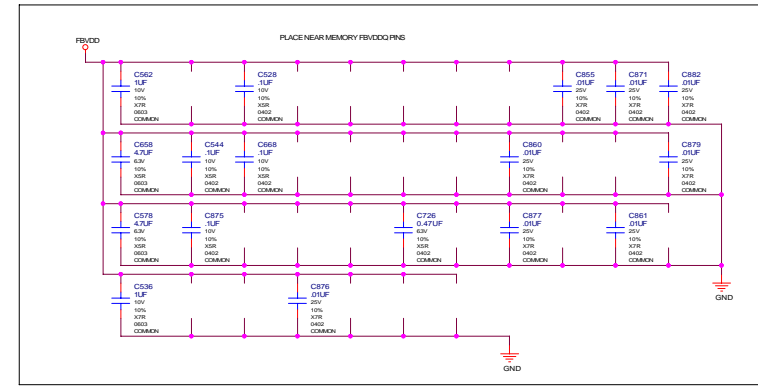
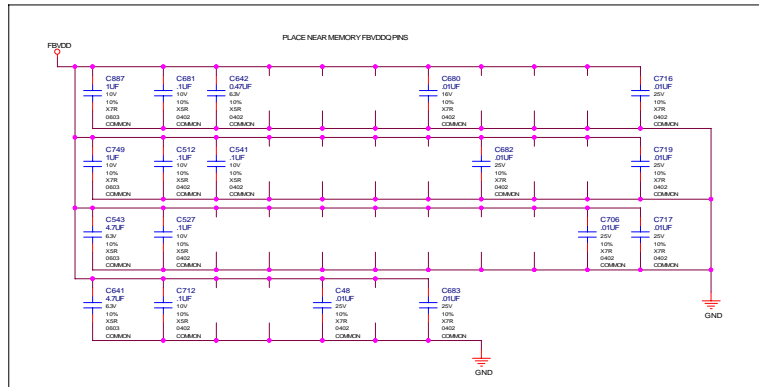
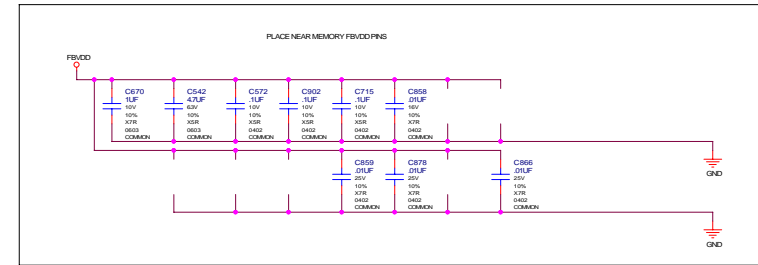


FRAME BUFFER: PARTITION A DECOUPLING

Decoupling for FBA 0..31



Decoupling for FBA 32..63



ALL NVIDIA DESIGN SPECIFICATIONS, REFERENCE SPECIFICATIONS, REFERENCE BOARDS, FILES, DRAWINGS, DIAGNOSTIC LISTS AND OTHER DOCUMENTS (TOGETHER AND SEPARATELY, "MATERIALS") ARE BEING PROVIDED AS IS. THE MATERIALS MAY CONTAIN ERRORS AND APPROXIMATIONS OR DEVIATIONS OF INDUSTRY STANDARDS AND SPECIFICATIONS. NVIDIA MAKES NO WARRANTIES, EXPRESSED, IMPLIED, STATUTORY OR OTHERWISE WITH RESPECT TO THE MATERIALS, AND EXPRESSLY DISCLAIMS ALL IMPLIED WARRANTIES INCLUDING, WITHOUT LIMITATION, THE WARRANTIES OF DESIGN, OF NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, OR ARISING FROM A COURSE OF DEALING, TRADE USAGE, TRADE PRACTICE, OR INDUSTRY STANDARDS.

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

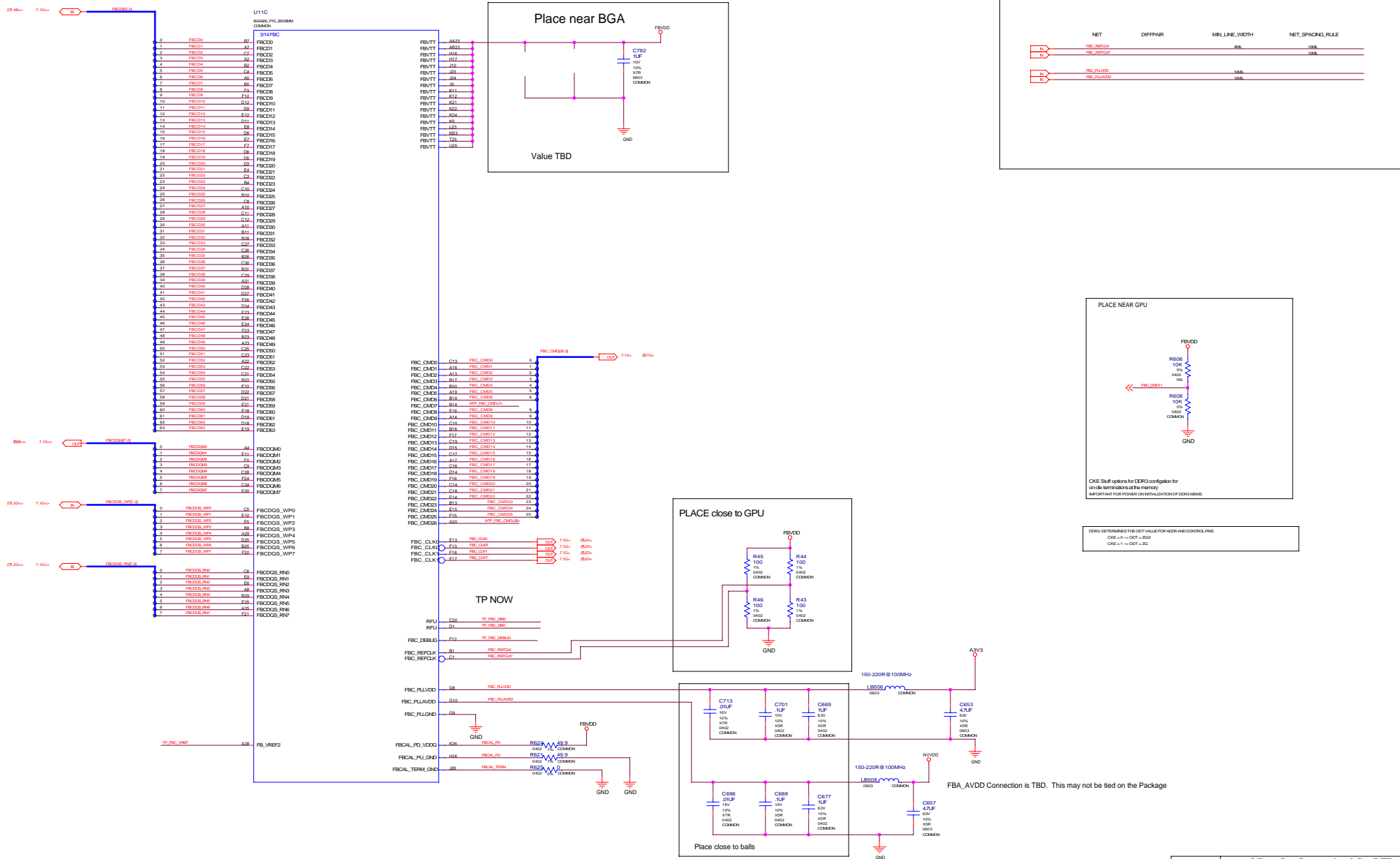


Micro-Star International Co., LTD.

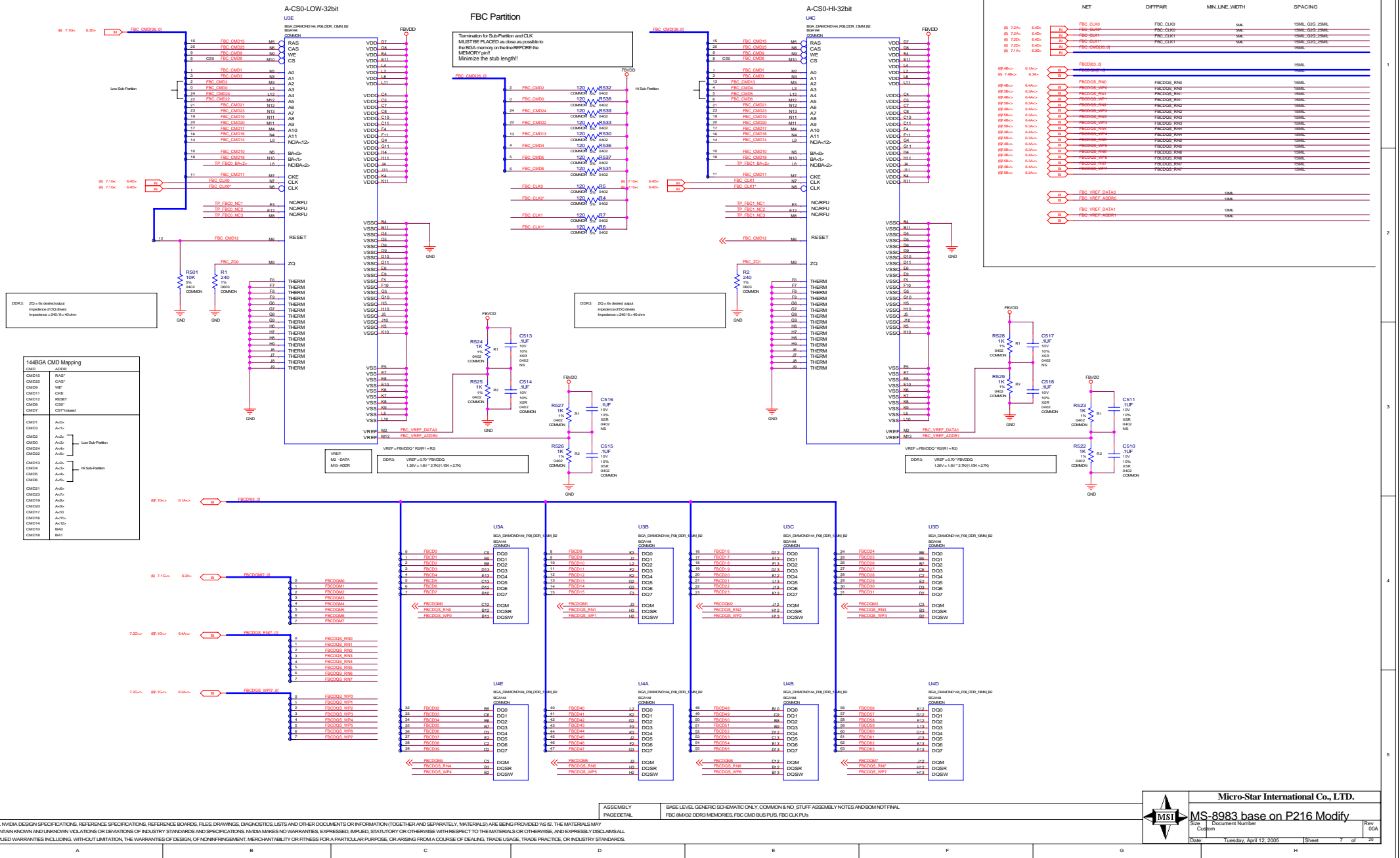
MS-8983 base on P216 Modify

Size: 10.0mm x 10.0mm x 1.0mm

Date: Tuesday, April 12, 2005 Sheet 5 of 20

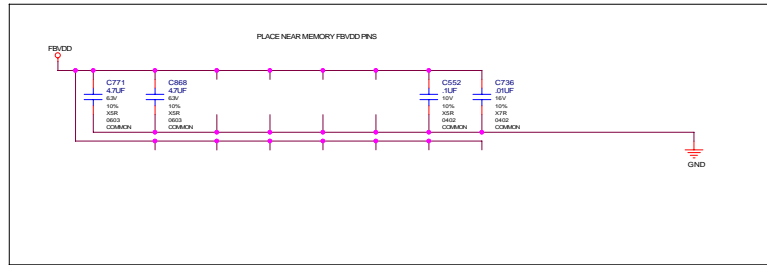


FRAMEBUFFER: PARTITION C 8Mx32 BGA144 DDR3

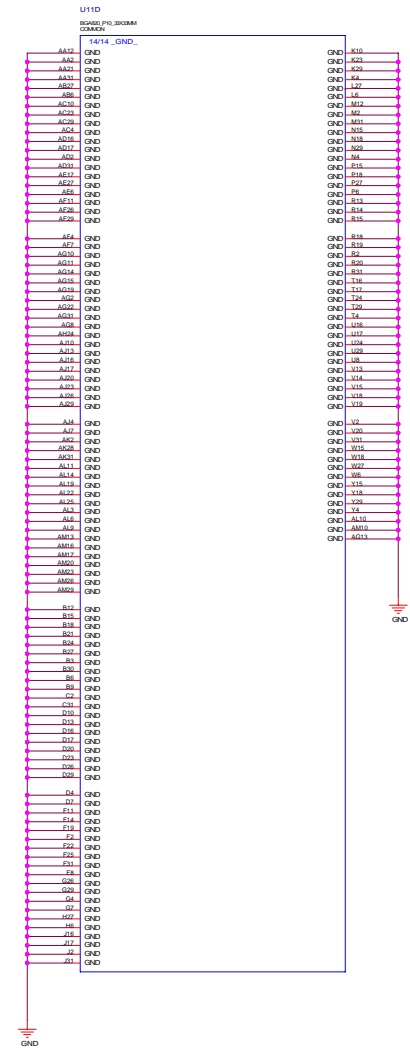
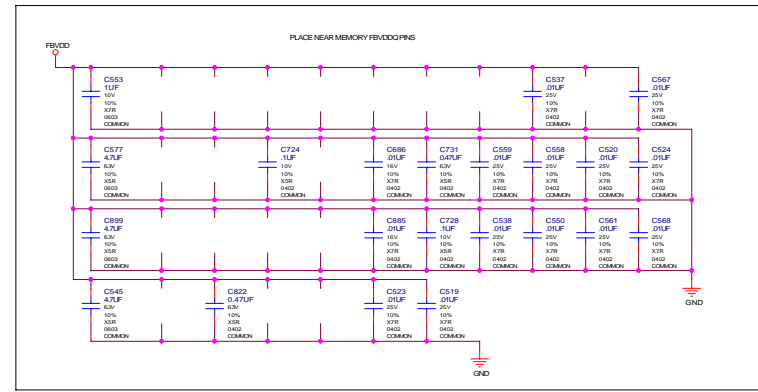
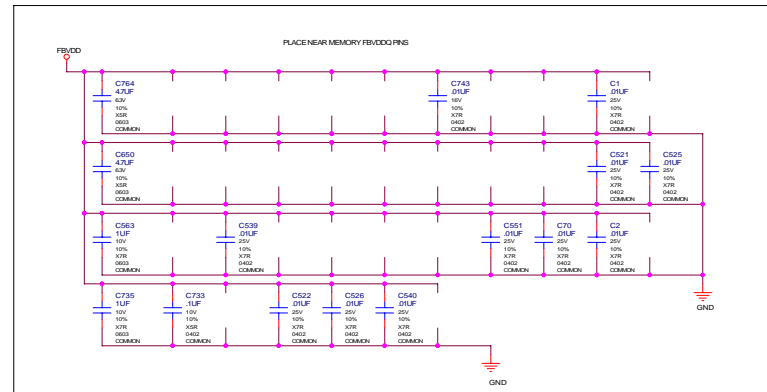
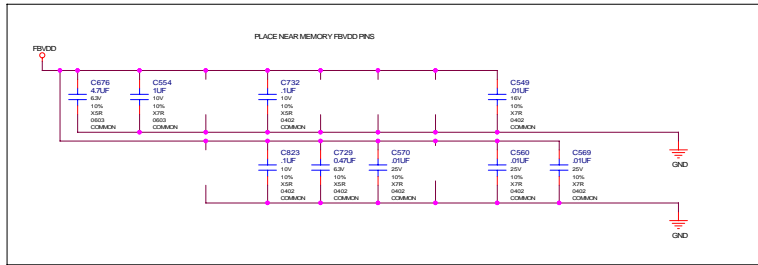


FRAMEBUFFER: PARTITION C DECOUPLING

Decoupling for FBC 0..31



Decoupling for FBC 32..63



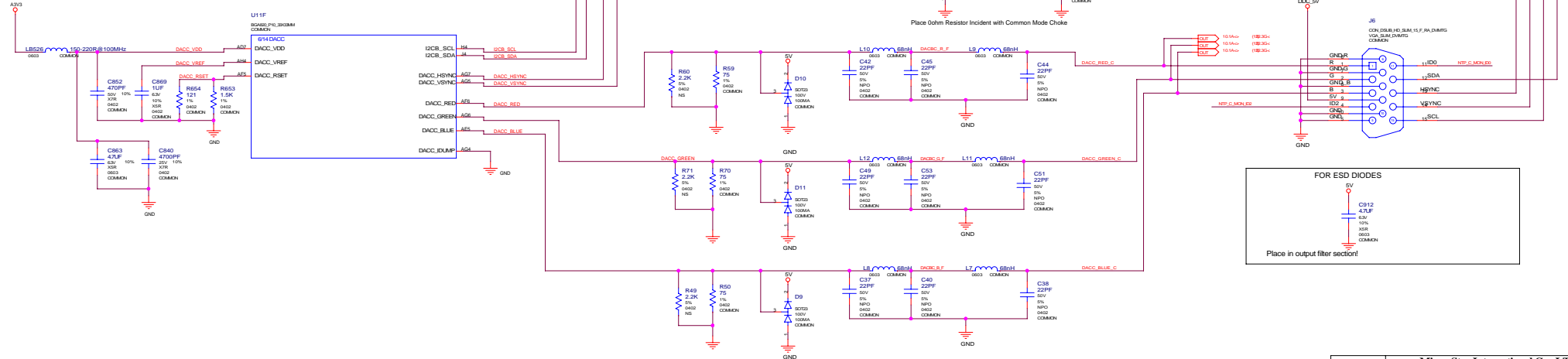
DE
DE
DE
DE
DE

DACA RGB-FILTER

Rev	00A
-----	-----

(D)	DA00_RED_C	23.8L	18.2/17.75/0.0mm2%
(D)	DA00_GREEN_C	23.8L	18.2/17.75/0.0mm2%
(D)	DA00_BLUE_C	23.8L	17.2/16.75/0.0mm2%

DACCC RGB-FILTER



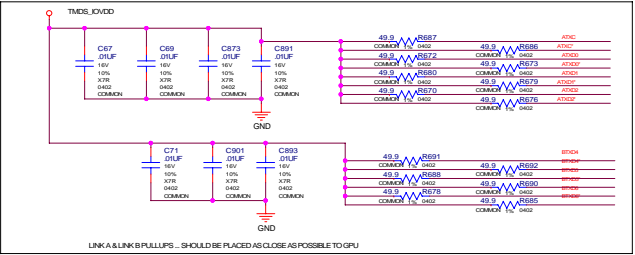
FOR ESD DIODES

5V
C912
4.7uF
10%
XSR
COMMON

Place in output filter section!

INTERNAL TMDS .. LINK A & B

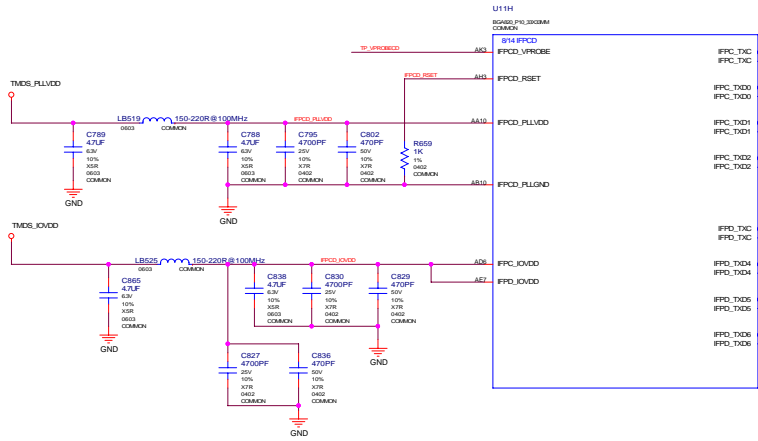
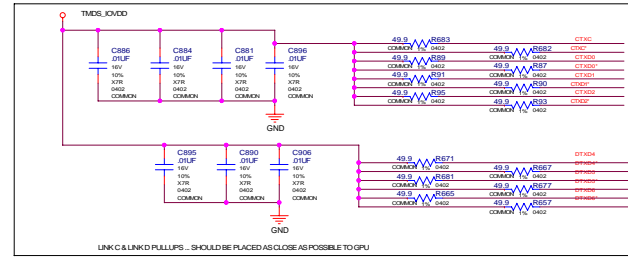
NOTE: GPU HAS ON DIE PULL UPS ON TMDS LINES .. EXTERNAL PULLUPS ADDED (FOR C/A) IN CASE ON DIE CURRENT DRAW IS EXCESSIVE



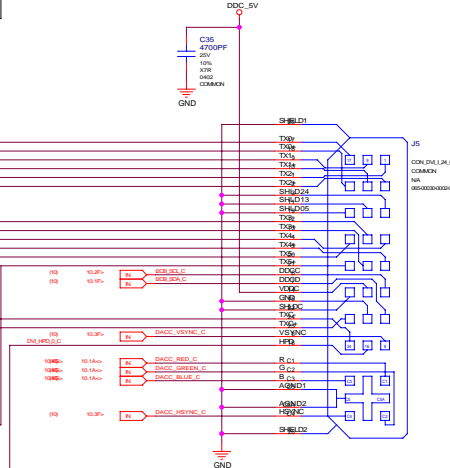
LINK A & LINK B PULLUPS .. SHOULD BE PLACED AS CLOSE AS POSSIBLE TO GPU

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ATX02	ATX02	20.0	20.0
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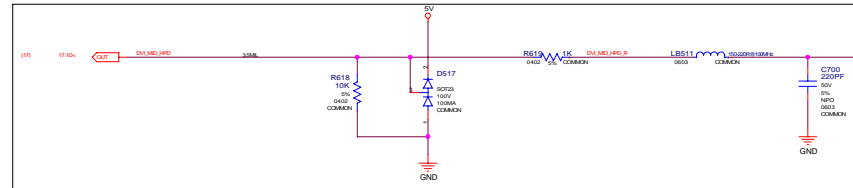
INTERNAL TMD5 .. LINK C & D



NETNAME	DIFF PARAM NAME	MIN LINE WIDTH	SPACING RULE
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IFPC_TNC	CTNC2	3.0M	2.0M
IFPC_TNC	CTNC3	3.0M	2.0M
IFPC_TNC	CTNC4	3.0M	2.0M
IFPC_TNC	CTNC5	3.0M	2.0M
IFPC_TNC	CTNC6	3.0M	2.0M
IFPC_TNC	CTNC7	3.0M	2.0M
IFPC_TNC	CTNC8	3.0M	2.0M
IFPC_TNC	CTNC9	3.0M	2.0M
IFPC_TNC	CTNC10	3.0M	2.0M
IFPC_TNC	CTNC11	3.0M	2.0M
IFPC_TNC	CTNC12	3.0M	2.0M
IFPC_TNC	CTNC13	3.0M	2.0M
IFPC_TNC	CTNC14	3.0M	2.0M
IFPC_TNC	CTNC15	3.0M	2.0M
IFPC_TNC	CTNC16	3.0M	2.0M
IFPC_TNC	CTNC17	3.0M	2.0M
IFPC_TNC	CTNC18	3.0M	2.0M
IFPC_TNC	CTNC19	3.0M	2.0M
IFPC_TNC	CTNC20	3.0M	2.0M
IFPC_TNC	CTNC21	3.0M	2.0M
IFPC_TNC	CTNC22	3.0M	2.0M
IFPC_TNC	CTNC23	3.0M	2.0M
IFPC_TNC	CTNC24	3.0M	2.0M
IFPC_TNC	CTNC25	3.0M	2.0M
IFPC_TNC	CTNC26	3.0M	2.0M
IFPC_TNC	CTNC27	3.0M	2.0M
IFPC_TNC	CTNC28	3.0M	2.0M
IFPC_TNC	CTNC29	3.0M	2.0M
IFPC_TNC	CTNC30	3.0M	2.0M
IFPC_TNC	CTNC31	3.0M	2.0M
IFPC_TNC	CTNC32	3.0M	2.0M
IFPC_TNC	CTNC33	3.0M	2.0M
IFPC_TNC	CTNC34	3.0M	2.0M
IFPC_TNC	CTNC35	3.0M	2.0M
IFPC_TNC	CTNC36	3.0M	2.0M
IFPC_TNC	CTNC37	3.0M	2.0M
IFPC_TNC	CTNC38	3.0M	2.0M
IFPC_TNC	CTNC39	3.0M	2.0M
IFPC_TNC	CTNC40	3.0M	2.0M
IFPC_TNC	CTNC41	3.0M	2.0M
IFPC_TNC	CTNC42	3.0M	2.0M
IFPC_TNC	CTNC43	3.0M	2.0M
IFPC_TNC	CTNC44	3.0M	2.0M
IFPC_TNC	CTNC45	3.0M	2.0M
IFPC_TNC	CTNC46	3.0M	2.0M
IFPC_TNC	CTNC47	3.0M	2.0M
IFPC_TNC	CTNC48	3.0M	2.0M
IFPC_TNC	CTNC49	3.0M	2.0M
IFPC_TNC	CTNC50	3.0M	2.0M
IFPC_TNC	CTNC51	3.0M	2.0M
IFPC_TNC	CTNC52	3.0M	2.0M
IFPC_TNC	CTNC53	3.0M	2.0M
IFPC_TNC	CTNC54	3.0M	2.0M
IFPC_TNC	CTNC55	3.0M	2.0M
IFPC_TNC	CTNC56	3.0M	2.0M
IFPC_TNC	CTNC57	3.0M	2.0M
IFPC_TNC	CTNC58	3.0M	2.0M
IFPC_TNC	CTNC59	3.0M	2.0M
IFPC_TNC	CTNC60	3.0M	2.0M
IFPC_TNC	CTNC61	3.0M	2.0M
IFPC_TNC	CTNC62	3.0M	2.0M
IFPC_TNC	CTNC63	3.0M	2.0M
IFPC_TNC	CTNC64	3.0M	2.0M
IFPC_TNC	CTNC65	3.0M	2.0M
IFPC_TNC	CTNC66	3.0M	2.0M
IFPC_TNC	CTNC67	3.0M	2.0M
IFPC_TNC	CTNC68	3.0M	2.0M
IFPC_TNC	CTNC69	3.0M	2.0M
IFPC_TNC	CTNC70	3.0M	2.0M
IFPC_TNC	CTNC71	3.0M	2.0M
IFPC_TNC	CTNC72	3.0M	2.0M
IFPC_TNC	CTNC73	3.0M	2.0M
IFPC_TNC	CTNC74	3.0M	2.0M
IFPC_TNC	CTNC75	3.0M	2.0M
IFPC_TNC	CTNC76	3.0M	2.0M
IFPC_TNC	CTNC77	3.0M	2.0M
IFPC_TNC	CTNC78	3.0M	2.0M
IFPC_TNC	CTNC79	3.0M	2.0M
IFPC_TNC	CTNC80	3.0M	2.0M
IFPC_TNC	CTNC81	3.0M	2.0M
IFPC_TNC	CTNC82	3.0M	2.0M
IFPC_TNC	CTNC83	3.0M	2.0M
IFPC_TNC	CTNC84	3.0M	2.0M
IFPC_TNC	CTNC85	3.0M	2.0M
IFPC_TNC	CTNC86	3.0M	2.0M
IFPC_TNC	CTNC87	3.0M	2.0M
IFPC_TNC	CTNC88	3.0M	2.0M
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IFPC_TNC	CTNC91	3.0M	2.0M
IFPC_TNC	CTNC92	3.0M	2.0M
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IFPC_TNC	CTNC94	3.0M	2.0M
IFPC_TNC	CTNC95	3.0M	2.0M
IFPC_TNC	CTNC96	3.0M	2.0M
IFPC_TNC	CTNC97	3.0M	2.0M
IFPC_TNC	CTNC98	3.0M	2.0M
IFPC_TNC	CTNC99	3.0M	2.0M
IFPC_TNC	CTNC100	3.0M	2.0M



Hotplug Detection



NETNAME	MIN LINE WIDTH	VOLTAGE
IFPC_TNC	3.0M	3.0V
IFPC_TNC	3.0M	3.0V
IFPC_TNC	3.0M	3.0V



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MS-8983 base on P216 Modify

Size: Document Number

Custom

Date: Tuesday, April 19, 2006 Sheet 12 of 25

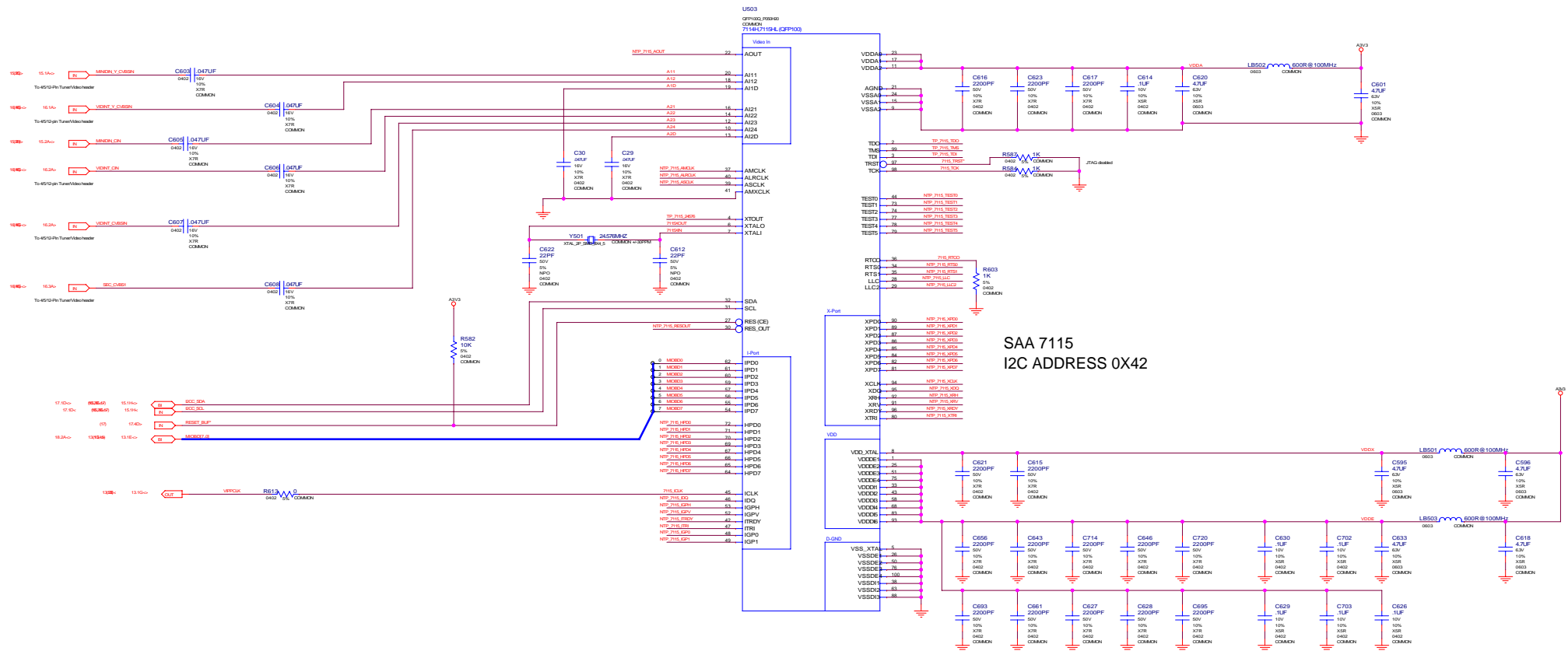
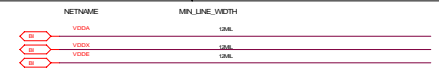
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ASSEMBLY PAGE DETAIL

BASE LEVEL GENERIC SCHEMATIC ONLY. COMMON & NO STUFF ASSEMBLY NOTES AND BOM NOT FINAL

TMD5 LINK C/D & PLUG/DET CONNECTOR MD

PHILIPS VIDEO CAPTURE



SAA 7115
I2C ADDRESS 0X42

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MS-8983 base on P216 Modify

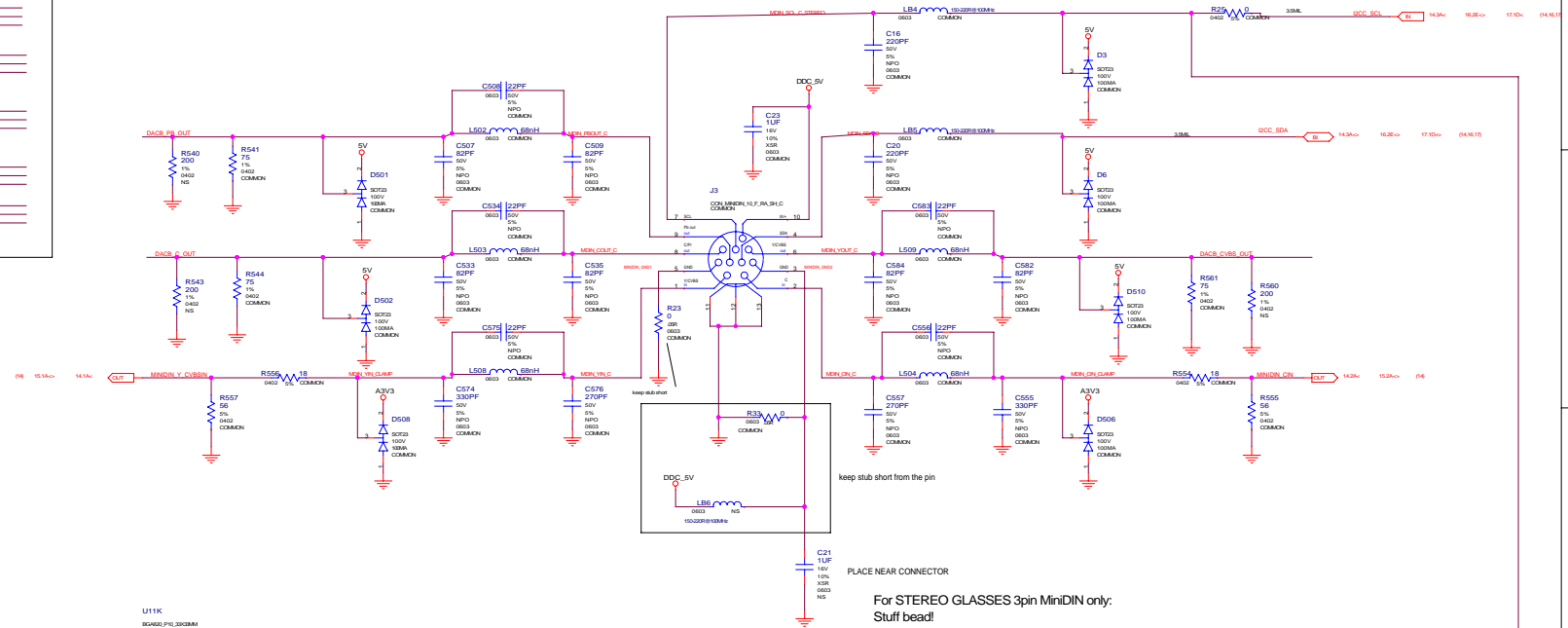
Size	Document Number	
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COA

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

	NET_NAME	MIN_LINE_WIDTH	IMPEDANCE	NET_SPACING_RULE
	OUT1	DACB_C_OUT1	100.000544.137.50mm25%	230%
	OUT2	DACB_C_OUT2	100.000544.137.50mm25%	230%
	OUT3	DACB_PB_OUT	100.000544.137.50mm25%	230%
		MINI_PROOF_C		230%
	IS	MINI_PROOF_C		230%
	IS	MINI_PROOF_C		230%
	IS	MINI_PROOF_C		230%
14.5kV, 16.5kV		MINI_V_CUBIN		230%
	IS	MINI_V_C		230%
	IS	MINI_V_CUBIN		230%
	IS	MINI_V_CUBIN		230%
		MINI_OH_C		230%
	IS	MINI_OH_C		230%
	IS	MINI_OH_CUBIN		230%
14.5kV, 15.5kV		MINI_OH_C		230%
	IS	MINI_OH_C		230%
	IS	MINI_OH_CUBIN		230%
	IS	MINI_OH_CUBIN		230%
	IS	DACB_VDD	100%	
	IS	DACB_VDD	100%	
	IS	DACB_GND1	100%	

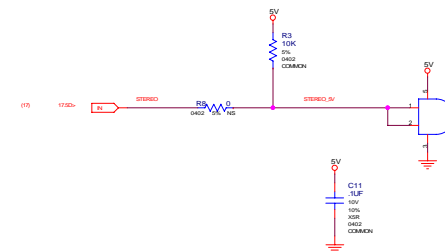
SD: USE L=1.8UH
HD: USE L=?



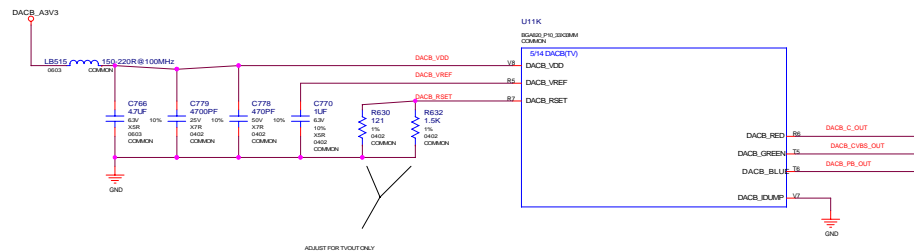
For STEREO GLASSES 3pin MiniDIN only:
Stuff bead!
And replace 0 Ohm resistor with 220PF cap

STEREO GLASSES BUFFER

Place close to MiniDIN connector!



FOR DEBUG PURPOSES ONLY .. DEFAULT IS NO STUFF



ADJUST FOR TVOUT ONLY

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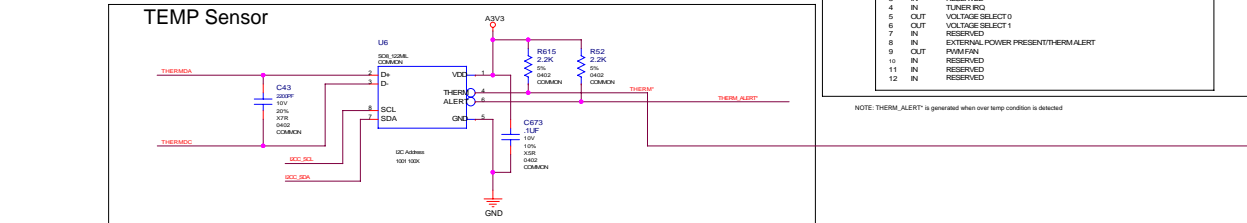
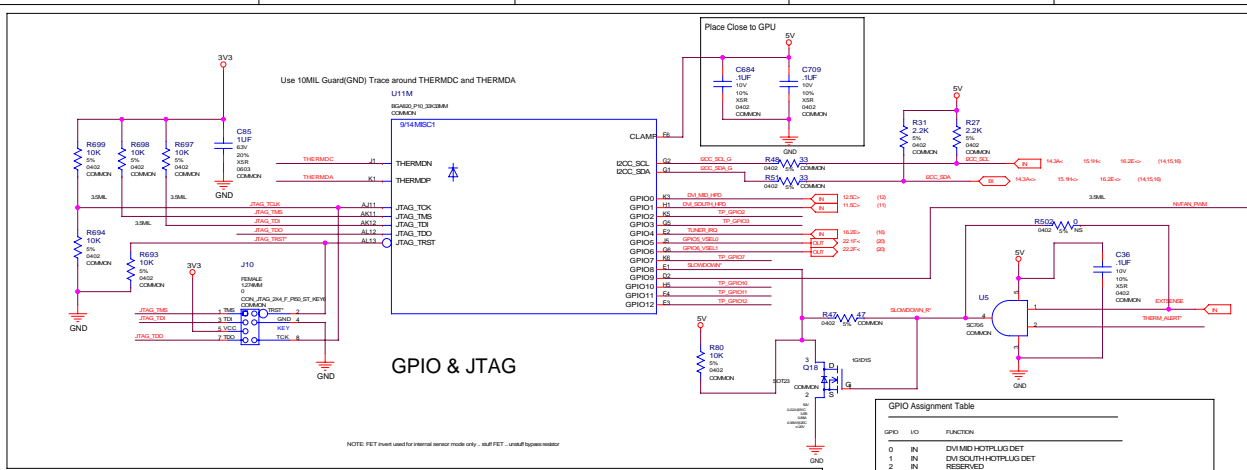
ASSEMBLY	BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL
PAGE DETAIL	DACB FILTERS, MINIDIN CONNECTOR NORTH



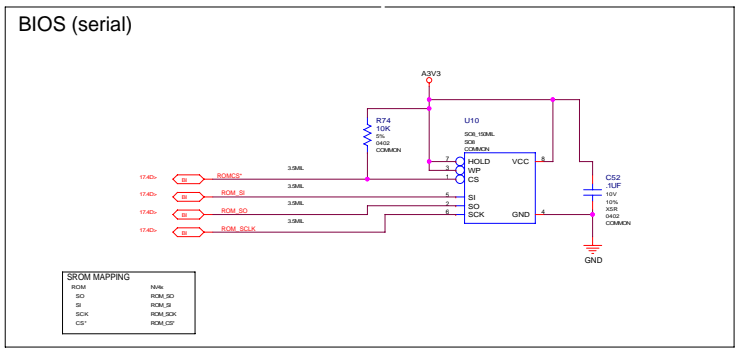
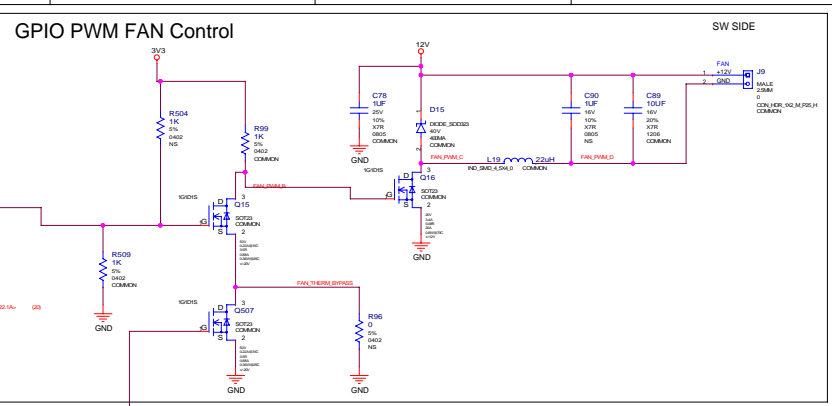
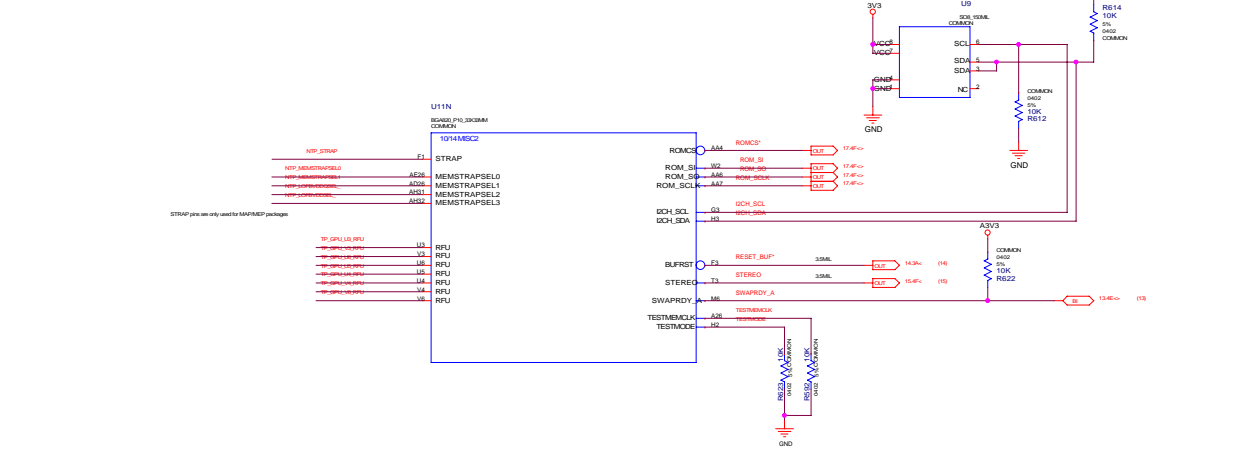
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MS-8983 base on P216 Modify

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Custom		
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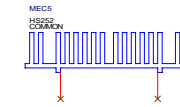
AUDIO and VIDEO signals are reserved for future GPU's. NV4x will not have support for these signals




NETNAME	MIN_LINE_WIDTH	VOLTAGE
THERMOC	10M	10M
THERMOC	10M	10M
FAN_PWM_B	10M	10M
FAN_PWM_C	10M	10M
FAN_PWM_D	10M	10M

Straps

Mechanical parts



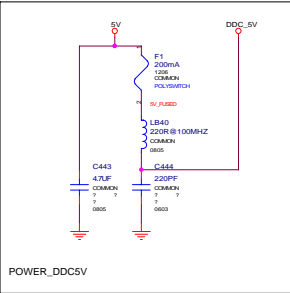
REG_NV_STRAP_1		
Bit Signal	VALUE_ID	VALUES
11: PEX_PL1_EN_TERRNO		0 (default - no termination)
10: XG0_PADCFG_LUT_ADR[9]		
9: XG0_PADCFG_LUT_ADR[8]		
14: XG0_PADCFG_LUT_ADR[3]		

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	MS-8983 base on P216 Modify		
	Size Custom	Document Number	Rev 00A
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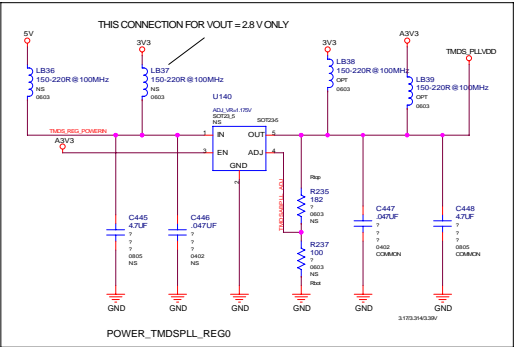
Date: Tuesday, April 12, 2005 Sheet 18 of 19

Power Supply ... TMD5/A3V3/FBVDD

DDC 5V

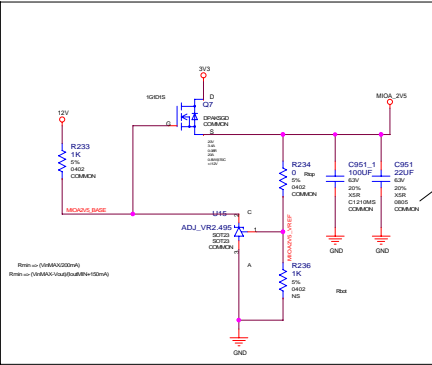


TMD5 AB/CD PLL Supply



POWER_TMDSPLL_REG0
 $V_{out} = V_{Ref} * (1 + R_{top}/R_{bot})$
 $3.31V = 1.175V * (1 + (100/182))$

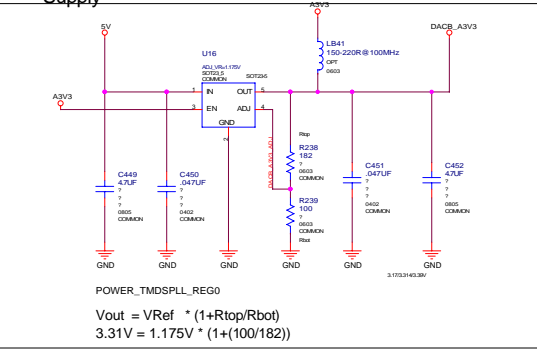
MIOA_VDDQ



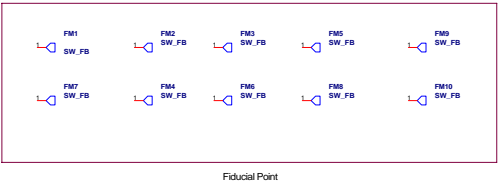
$V_{ref} = 2.5V$
 $V_{out} = 2.495(1 + R_{top}/R_{bot}) + (I_{ref} + R_{top})$
For $V_{out} = V_{ref}$ ($R_{top} = 0ohm$, $R_{bot} = NO\ STUFF$)

NETNAME	MIN_LINE_WIDTH	VOLTAGE
DDC_5V0	128	5V
DDC_5V	128	5V
3V3	128	3.3V
5V0	128	5V
TMD5_PLLVDD	128	3.3V
TMD5_PLLVDD	128	3.3V
12V	128	12V
MIOA_2V0	128	2.5V
MIOA_2V	128	2.5V
0	128	0V
0	128	0V
DACB_A3V3	128	3.3V
DACB_A3V3	128	3.3V

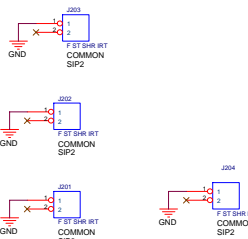
DACB Supply



POWER_TMDSPLL_REG0
 $V_{out} = V_{Ref} * (1 + R_{top}/R_{bot})$
 $3.31V = 1.175V * (1 + (100/182))$



Fiducial Point



Test point

ISL6549 for Nvidia NV4x Graphic card power ckt

