31P141, NV31, 4(8,16)Mx16, 64(128,256)MB, VIDEO IN/OUT, DVI-I, VGA

Page Overview

HISTORY:

A00

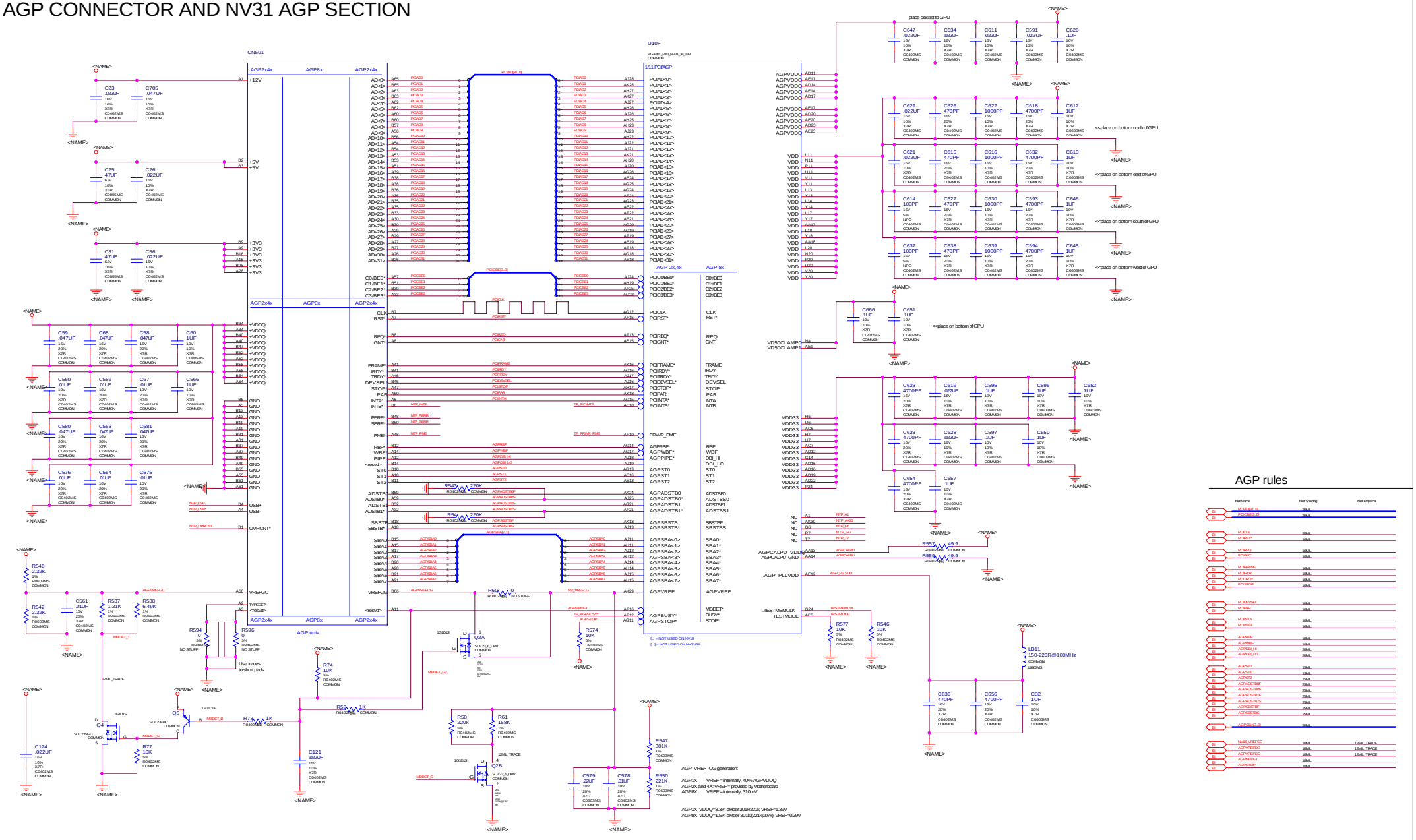
X00: INITIAL VERSION

X01: First Review
- Replaced series resistors in sync lines with 33ohms
- Moved clamping diodes next to GPU
- Added parallel caps to EMI filter DACB
- Removed not needed strap on SAA7114
- Connected RESET and WP of SST ROM to ROMVCC
- Added parallel ROM and Strapps
- Added FBVDD regulator
- Added STEREO glasses circuit
- Removed Decoupling CAPs on VIP VDD, covered by Caps on page 2
- Added ROM_VCC for cleaner planes
- Changed used TMDS lines of IFPA and IFPB to TP from NTP
- Changed Resistor for AGP Vref circuit to 158k

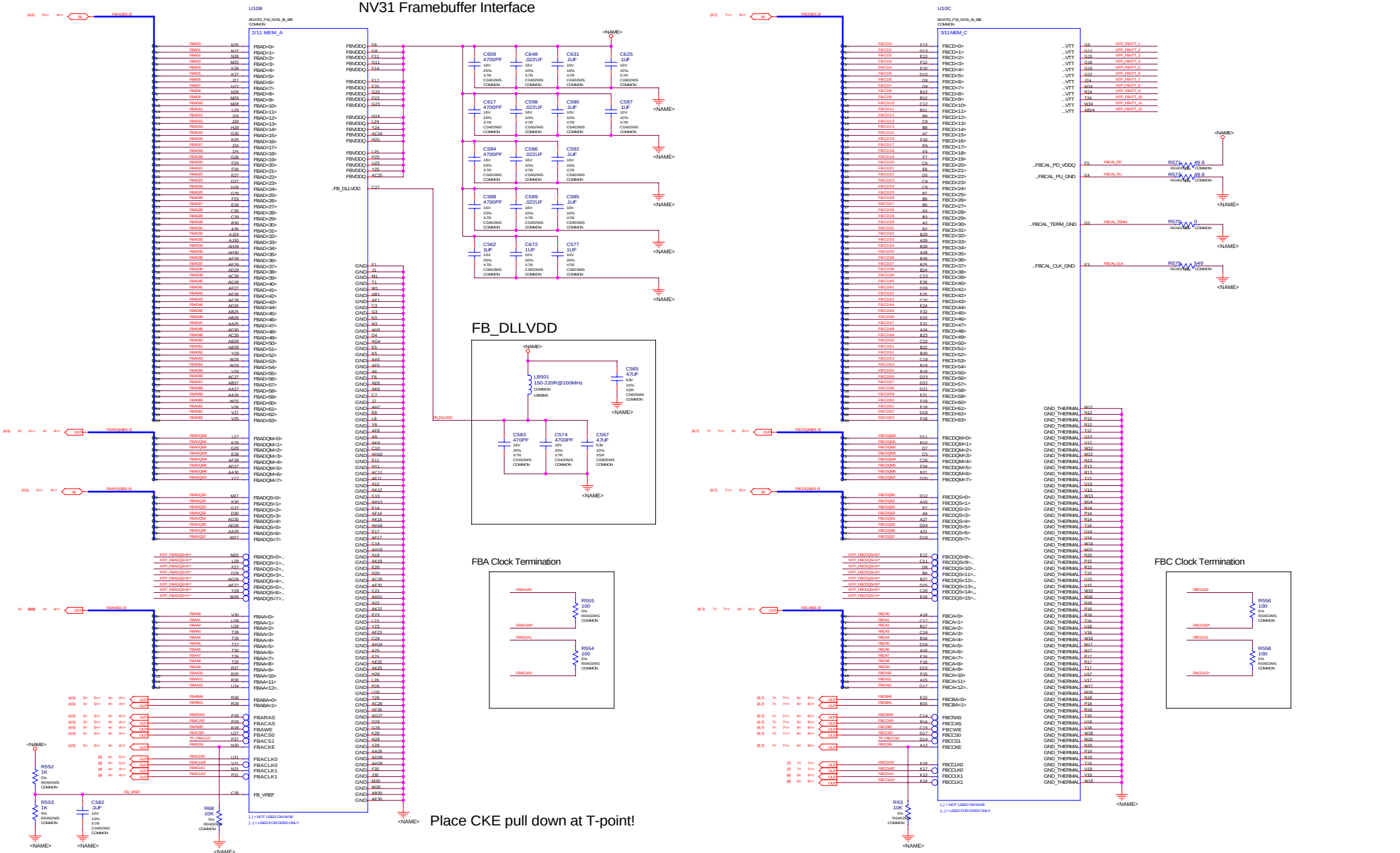
X02: Final Review
- Added clock termination resistors
- Added net name for FBCALxxx
- Added cap on filter input for FB_DLLVDD, DACA_VDD & DACB_VDD
- Changed netnames for SAA7114 NTPs to NTP_xxx
- Added 1uF cap parallel to fan connector
- Changed all xxCALxx resistors to 50 Ohms
- Changed all FBxDQS*<x> to NTP_FBxDQS*<x> with NO_TEST property

602-10141-0000-000 Base Schematic

AGP CONNECTOR AND NV31 AGP SECTION



NV31 Framebuffer Interface



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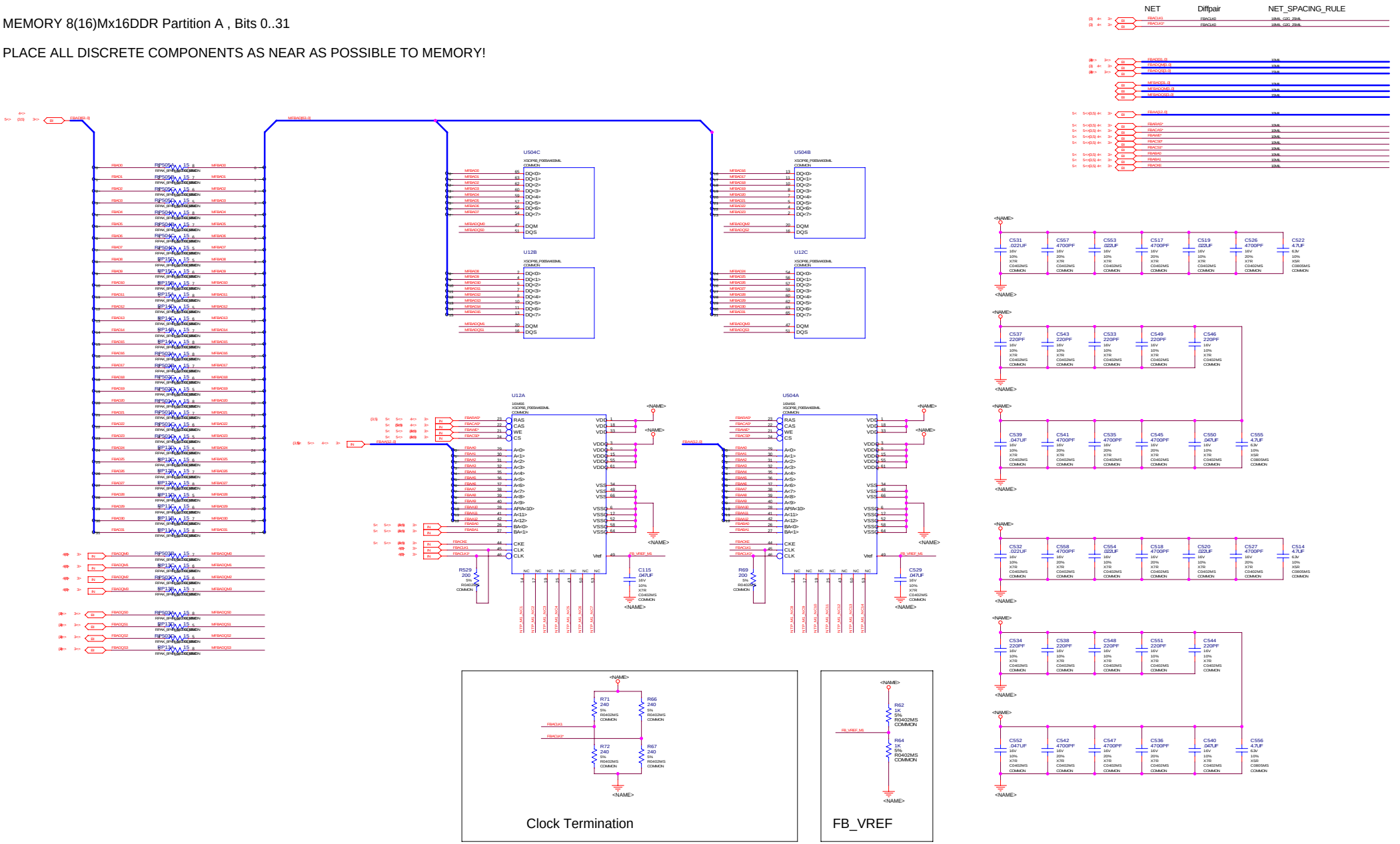
Size: Custom | Document Number: NV31 Framebuffer Interface | Rev: 00A

Date: Friday, January 17, 2003 | Sheet 3 of 17

MEMORY 8(16)Mx16DDR Partition A , Bits 0..31

PLACE ALL DISCRETE COMPONENTS AS NEAR AS POSSIBLE TO MEMORY!



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MS-8912 base on P141 modify		
Size: Custom	Document Number: MEMORY 8(16)Mx16DDR Partition A , Bits 0..31	Rev: 00A
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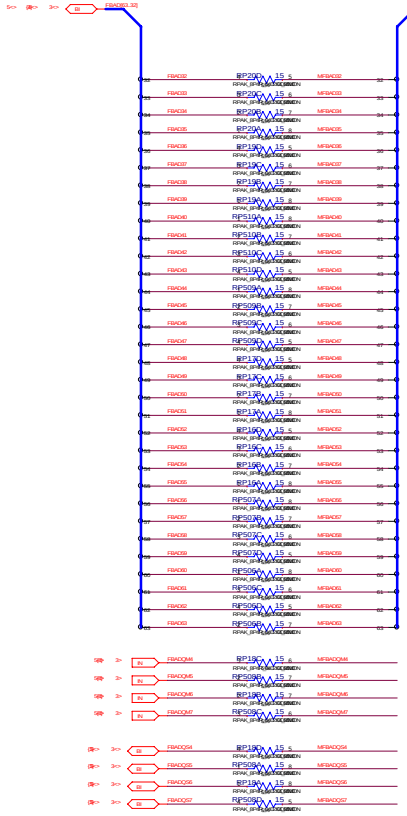
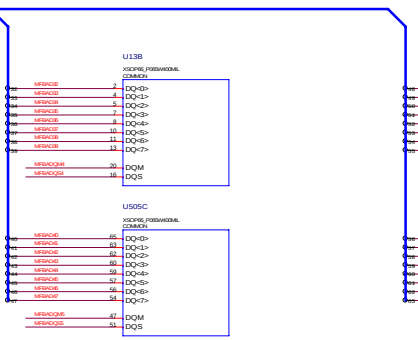
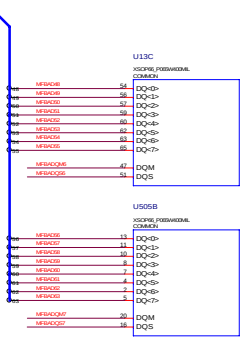
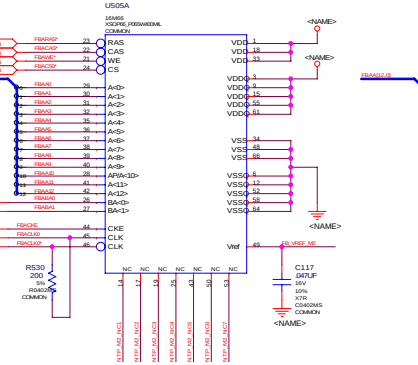
MEMORY 8(16)Mx16DDR Partition A , Bits 32..63

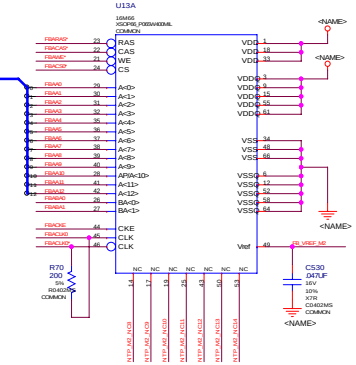
PLACE ALL DISCRETE COMPONENTS AS NEAR AS POSSIBLE TO MEMORY!

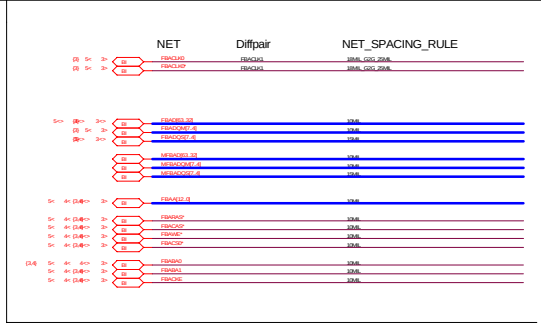


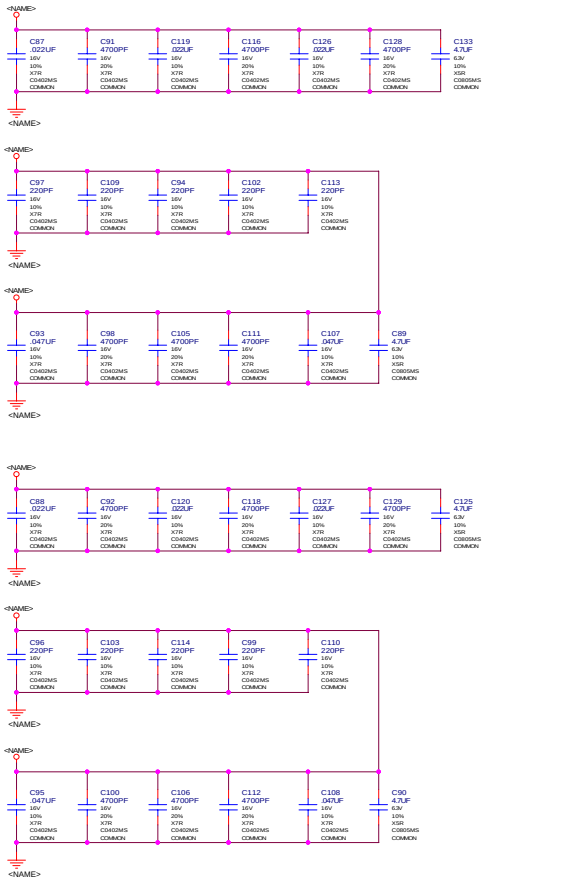


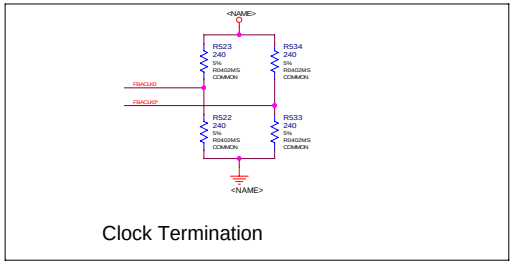


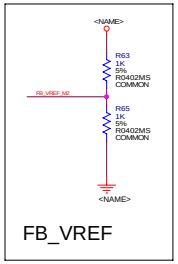












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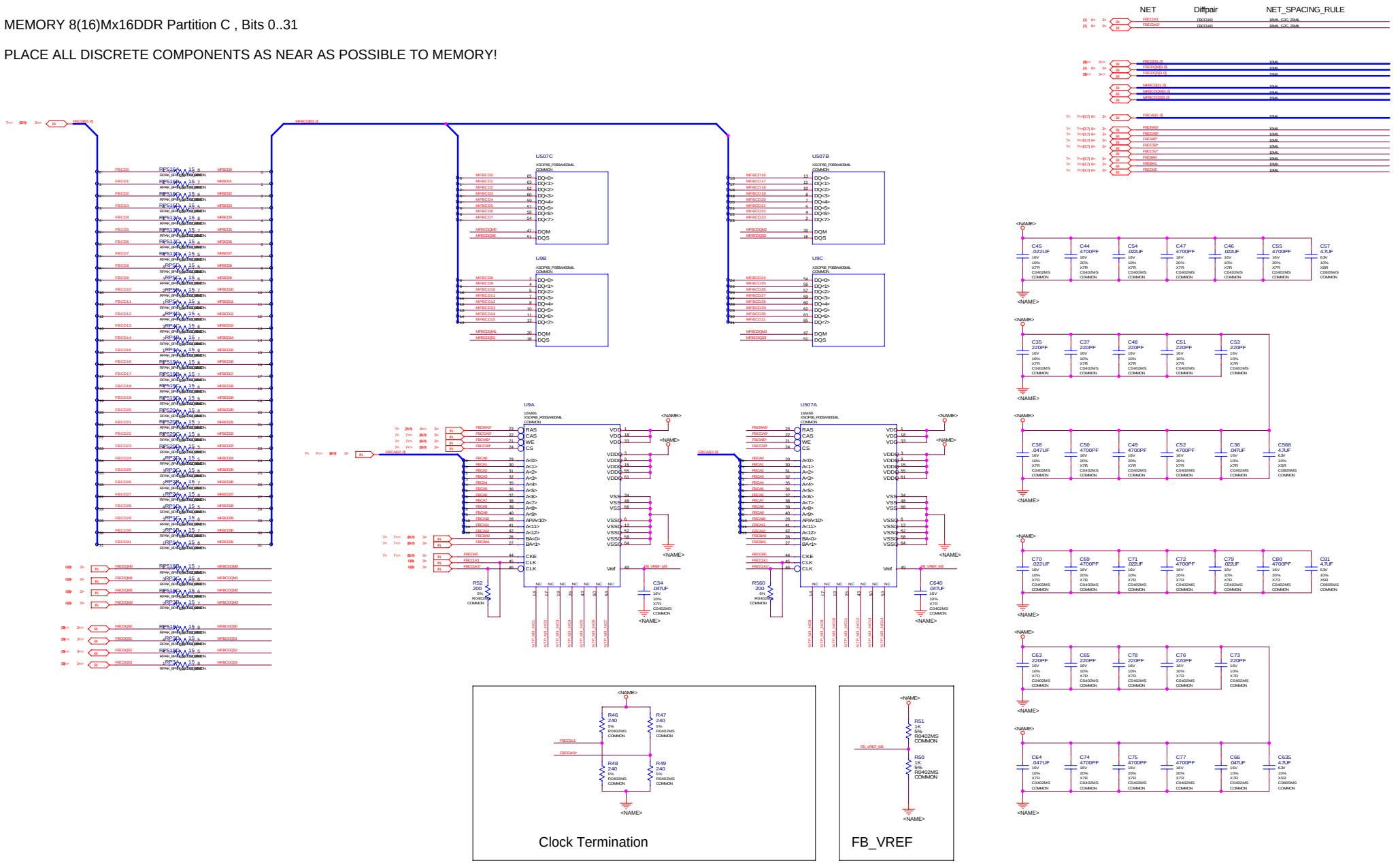
MEMORY 8(16)Mx16DDR Partition C , Bits 0..31

PLACE ALL DISCRETE COMPONENTS AS NEAR AS POSSIBLE TO MEMORY!



Micro-Star International Co., LTD.		
MS-8912 base on P141 modify		
Size: Custom	Document Number: MEMORY 8(16)Mx16DDR Partition C , Bits 0..31	Rev: 00A
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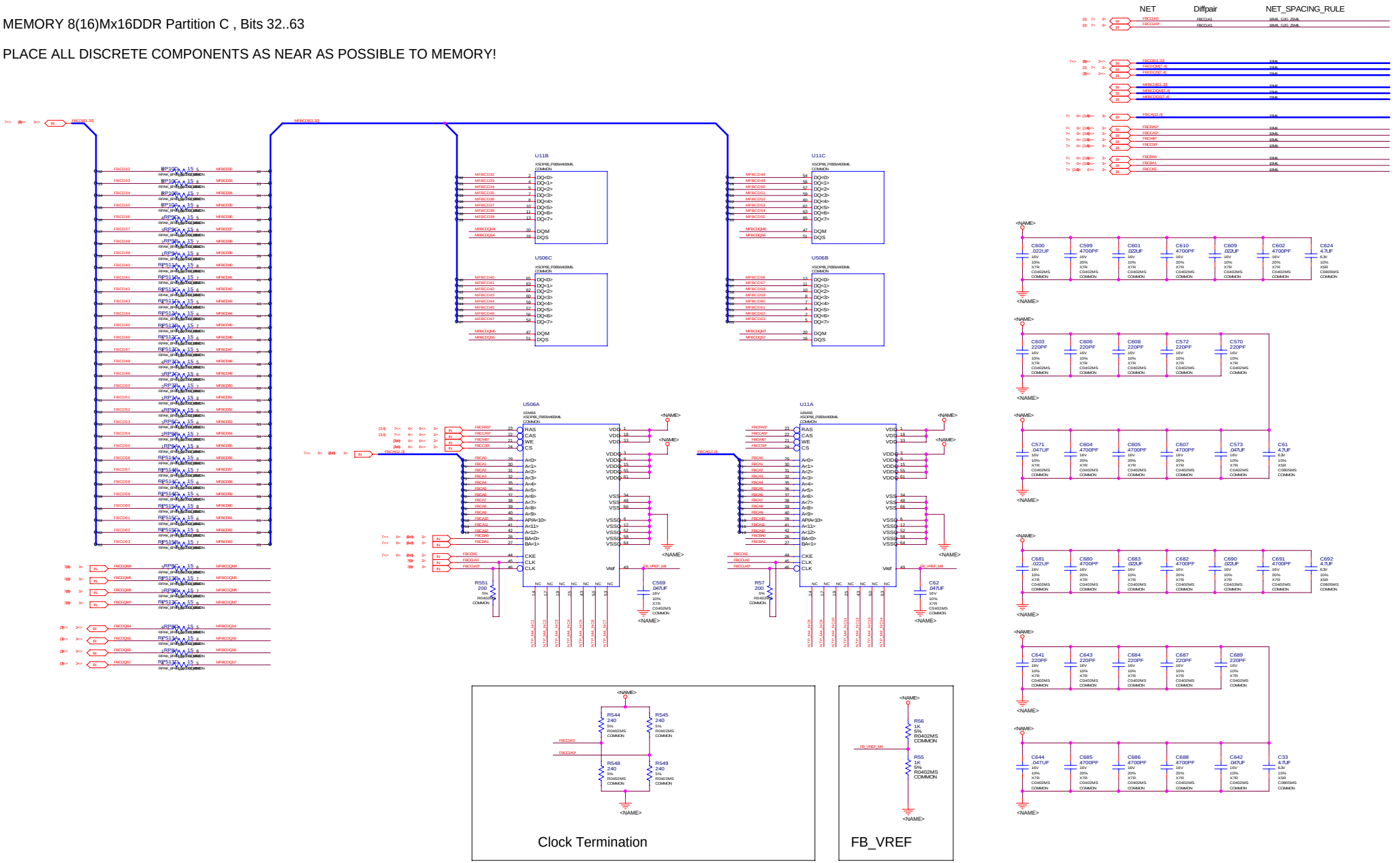
MEMORY 8(16)Mx16DDR Partition C , Bits 32..63

PLACE ALL DISCRETE COMPONENTS AS NEAR AS POSSIBLE TO MEMORY!



Micro-Star International Co., LTD.			
MS-8912 base on P141 modify			
Size: Custom	Document Number: MEMORY 8(16)Mx16DDR Partition C , Bits 32..63		Rev: 00A
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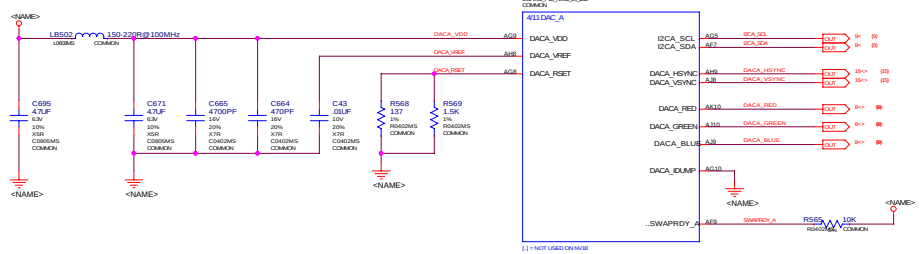
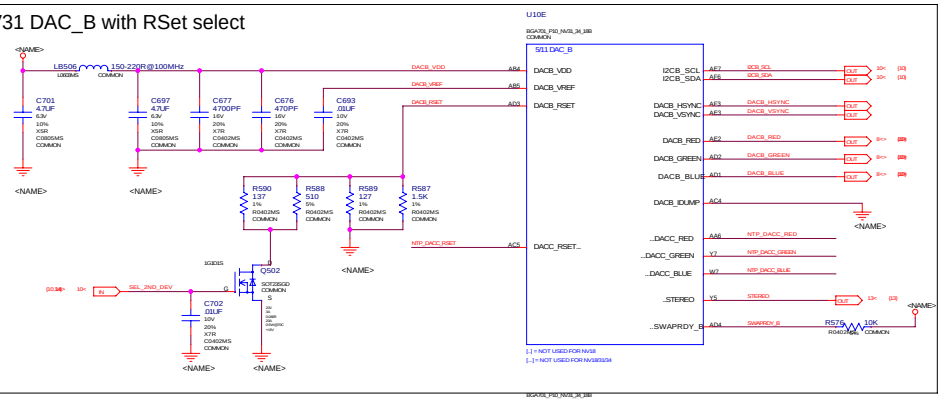
NV31 DAC_A, DAC_B, PLL, SYNC Buffer

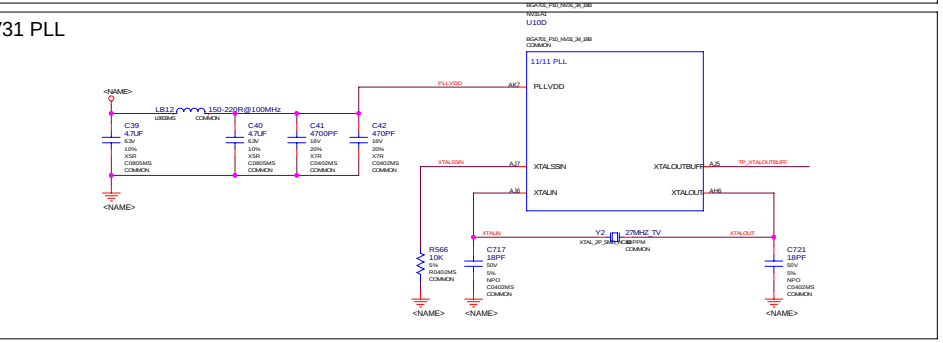
NV31 DAC_A



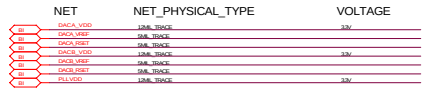
NV31 DAC_B with RSet select



NV31 PLL



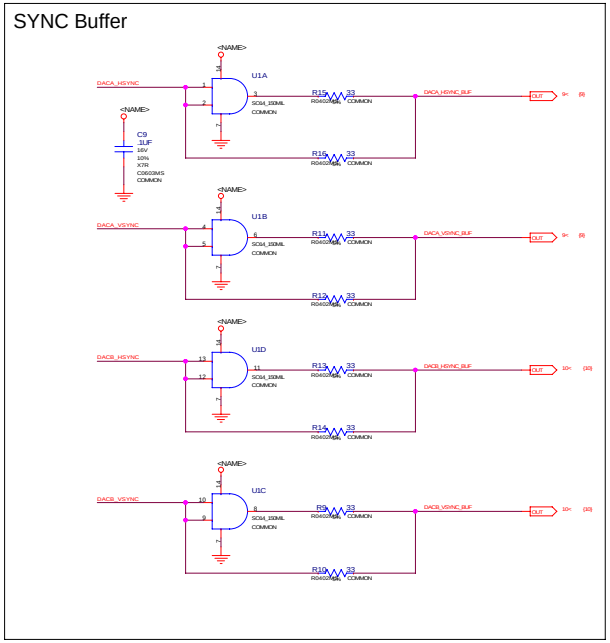
NET / NET_PHYSICAL_TYPE / VOLTAGE



NET / NET_PHYSICAL_TYPE / NET_SPACING_RULE

NET / NET_SPACING_RULE

SYNC Buffer



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MS-8912 base on P141 modify			
Size: Custom	Document Number: NV31 DAC_A, DAC_B, PLL, SYNC Buffer		Rev: 00A
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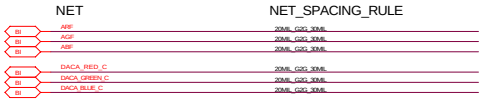
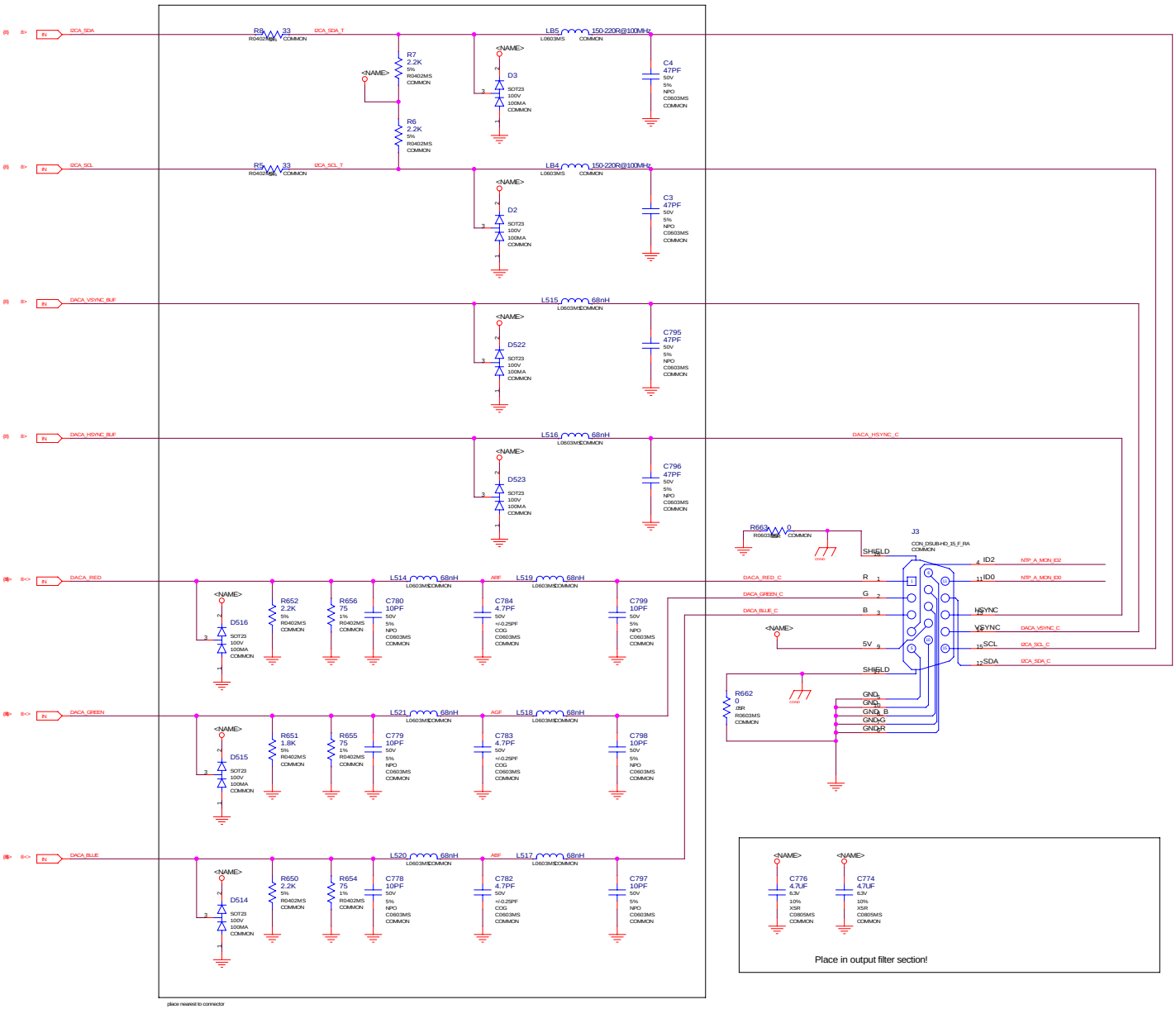
Primary Display (DACA), DB15 only!



EMI-FILTER



Place all filter components on the side nearest to the reference GND plane!

Route all signals only on layers referenced to GND!

Don't split the reference GND plane beneath a RGB signal!

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MS-8912 base on P141 modify		
Size: C	Document Number: Primary Display (DACA), DB15 only!	Rev: 00A
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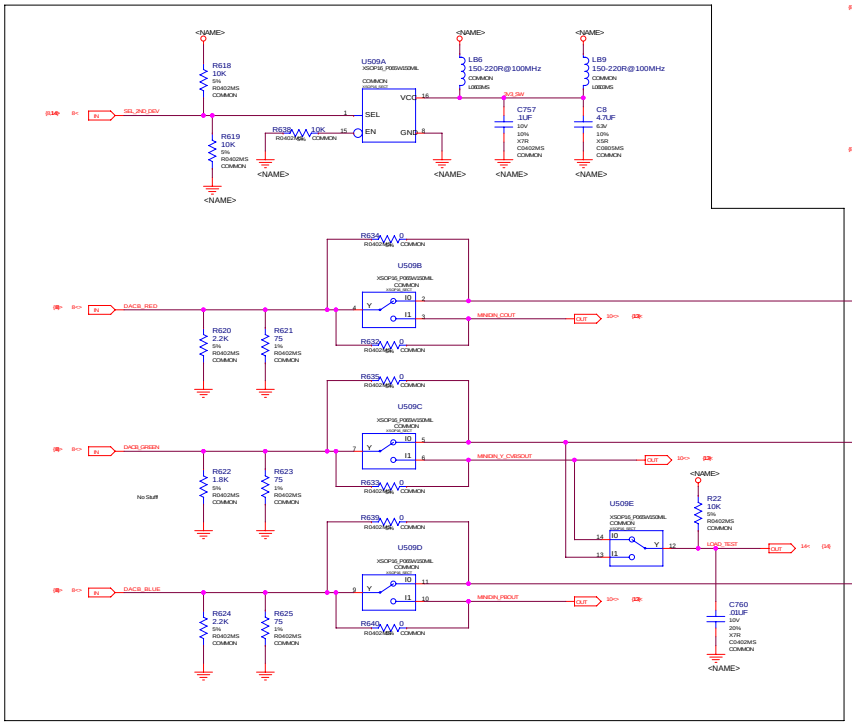
Secondary Display (DACB), long DB15 optional DVI-I

Place all filter components on the side nearest to the reference GND plane!

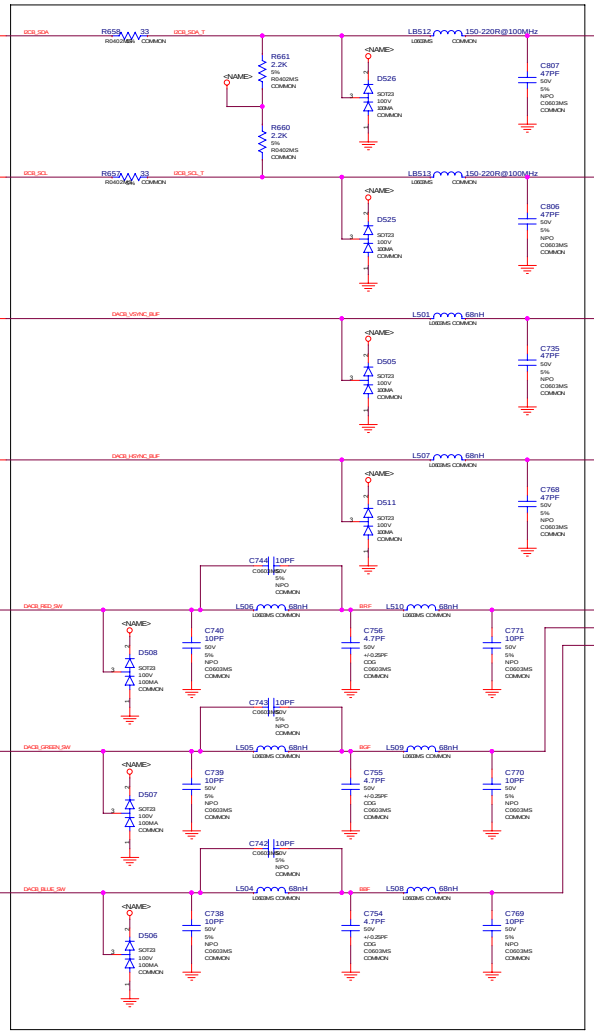
Route all signals only on layers referenced to GND!

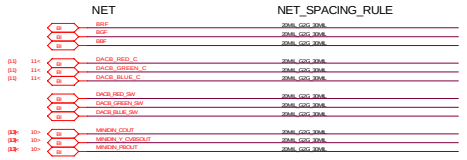
Don't split the reference GND plane beneath a RGB signal!

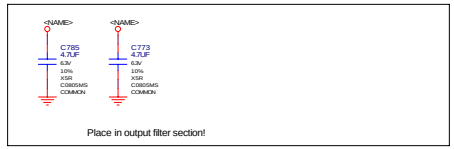
DACB Multiplexer



EMI-FILTER







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MS-8912 base on P141 modify			
Size: Custom	Document Number: Secondary Display (DACB), long DB15 optional DVI-I		Rev: 00A
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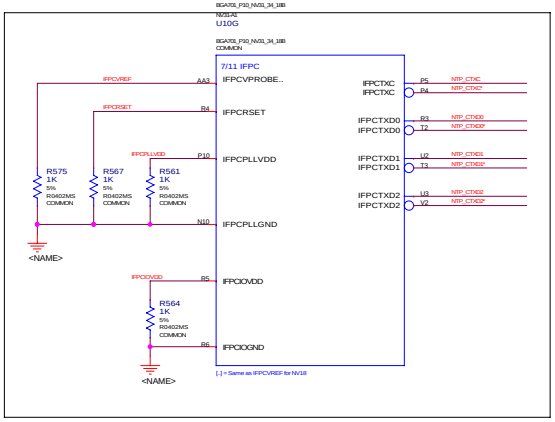
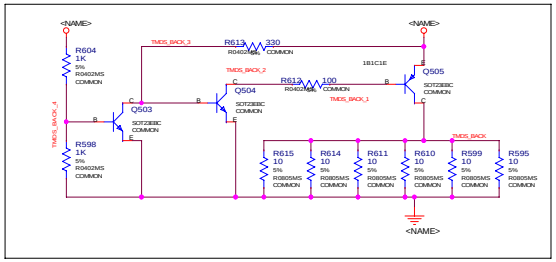
INTERNAL DUAL LINK TMDS POWER AND DECOUPLING

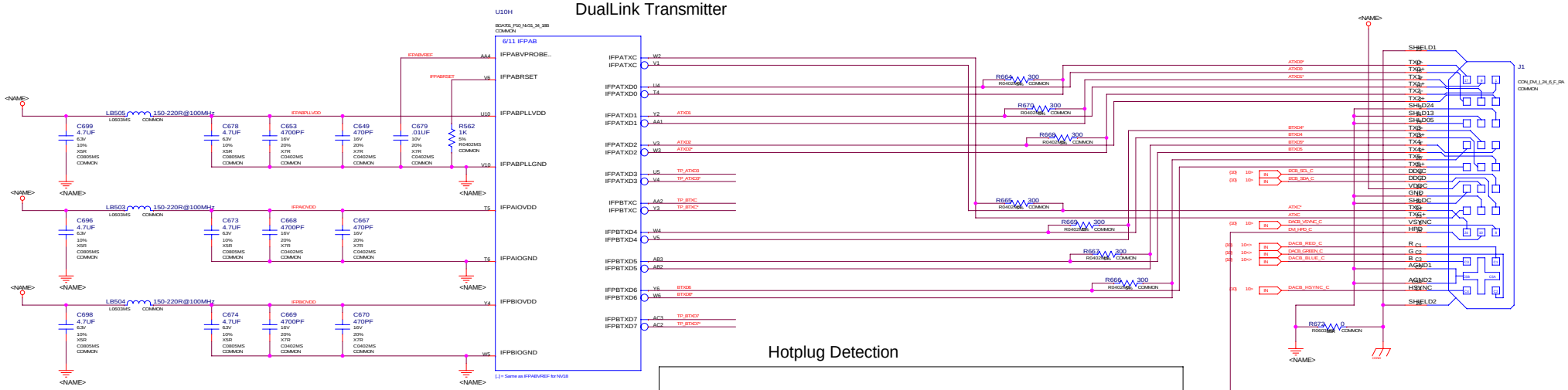
Unused Transmitter



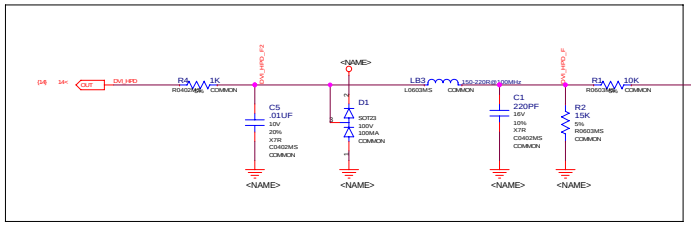
TMDS backdrive prevention



DualLink Transmitter



Hotplug Detection



NET	NET_PHYSICAL_TYPE	VOLTAGE
IFPABVREF	12MIL TRACE	3.3V
IFPABPLLVDD	12MIL TRACE	3.3V
IFPACVDD	12MIL TRACE	3.3V
IFPBCVDD	12MIL TRACE	3.3V
IFPCVREF	12MIL TRACE	3.3V
IFPCPLLVDD	12MIL TRACE	3.3V
IFPCCVDD	12MIL TRACE	3.3V
FAN_RETURN	12MIL TRACE	3.3V
TMDS_BACK	12MIL TRACE	3.3V

NET	Diffpair	NET_SPACING_RULE
ATXD0	ATXD0	20MIL GAL 30MIL
ATXD0#	ATXD0	20MIL GAL 30MIL
ATXD1	ATXD1	20MIL GAL 30MIL
ATXD1#	ATXD1	20MIL GAL 30MIL
ATXD2	ATXD2	20MIL GAL 30MIL
ATXD2#	ATXD2	20MIL GAL 30MIL
ATXC	ATXC	20MIL GAL 30MIL
ATXC#	ATXC	20MIL GAL 30MIL
BTXD4	BTXD4	20MIL GAL 30MIL
BTXD4#	BTXD4	20MIL GAL 30MIL
BTXD5	BTXD5	20MIL GAL 30MIL
BTXD5#	BTXD5	20MIL GAL 30MIL
BTXD6	BTXD6	20MIL GAL 30MIL
BTXD6#	BTXD6	20MIL GAL 30MIL

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Size: Custom	Document Number: INTERNAL DUAL LINK TMDS POWER AND DECOUPLING
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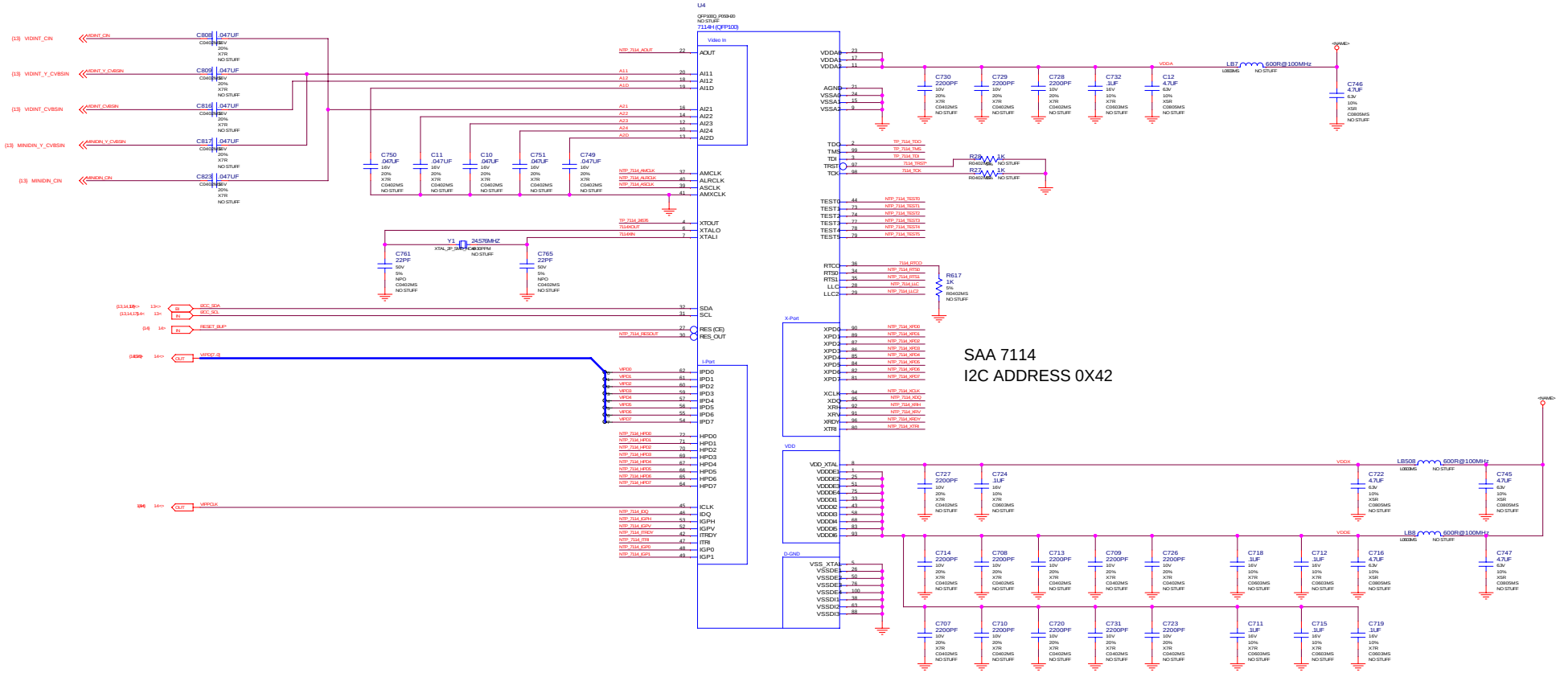
VIDEO CAPTURE



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MS-8912 base on P141 modify			
Size: Custom	Document Number: VIDEO CAPTURE		Rev: 00A
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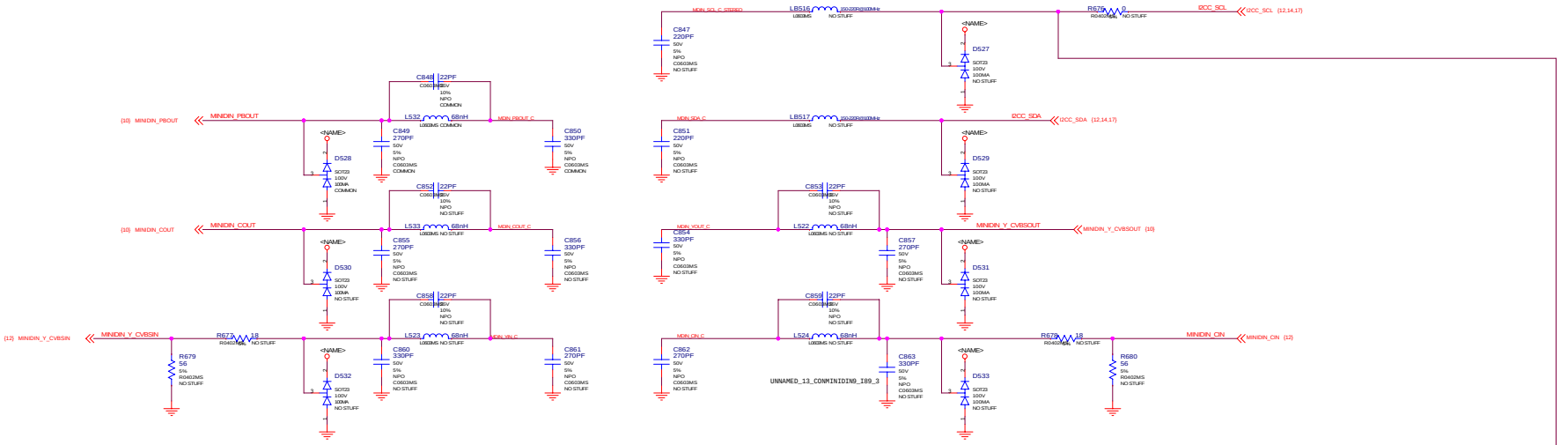
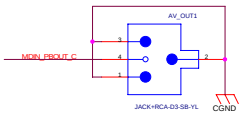
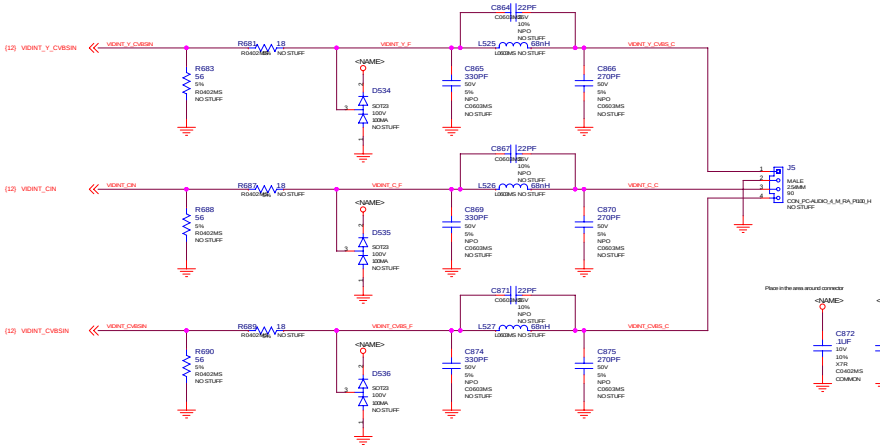
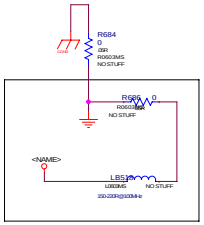
MiniDIN VIDEO IN/OUT CONNECTOR /STEREO GLASSES





INTERNAL VIDEO IN CONNECTOR

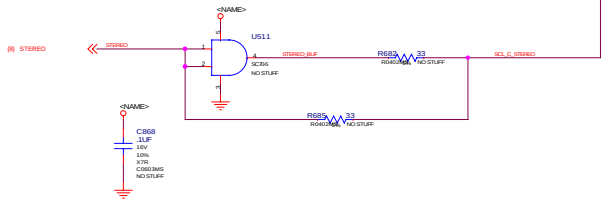




For STEREO GLASSES 3pin MiniDIN only:
Stuff bead!
And replace 0 Ohm resistor with 220PF cap!

STEREO GLASSES BUFFER

Place close to MiniDIN connector!



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MS-8912 base on P141 modify		
Size: Custom	Document Number: MiniDIN VIDEO IN/OUT CONNECTOR /STEREO GLASSES	Rev: 00A
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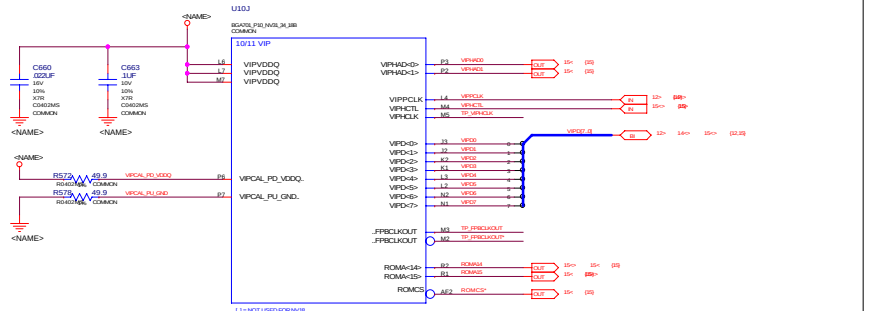
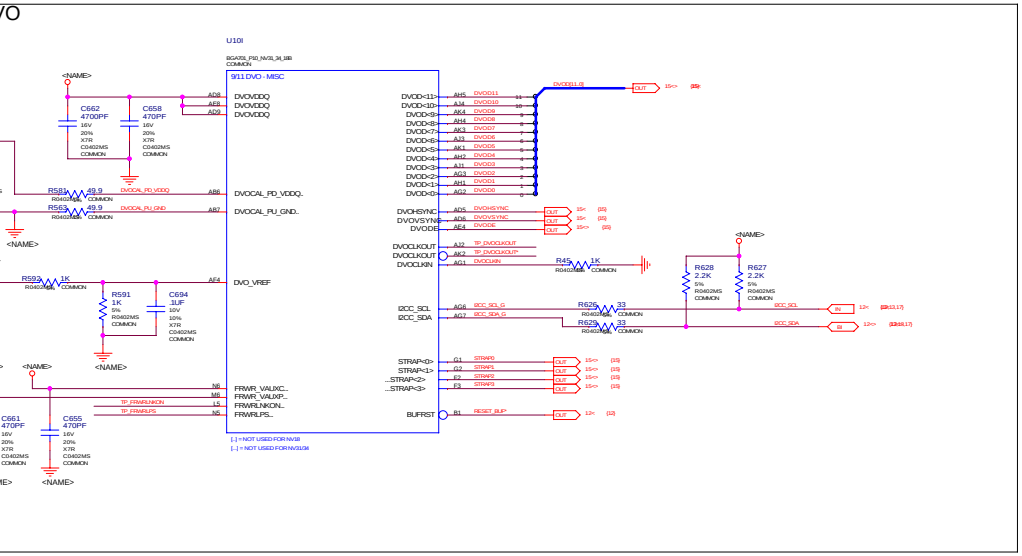
NV31 DVO, VIP AND GPIO SECTION, FAN CONTROL AND TEMP SENSOR

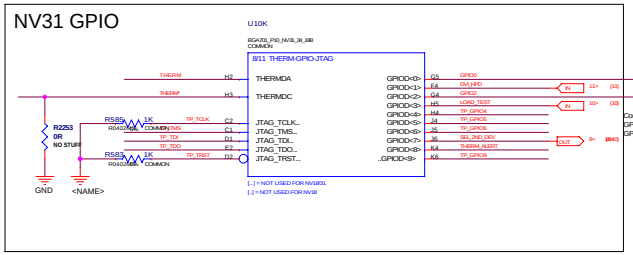
NV31 VIP



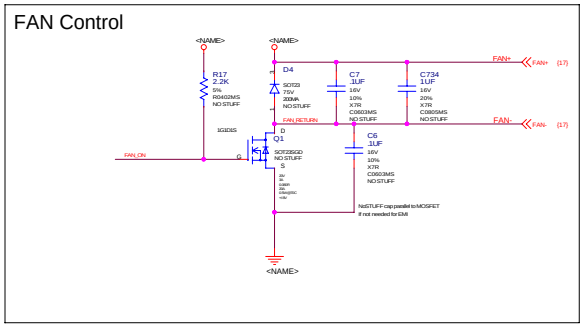
NV31 DVO



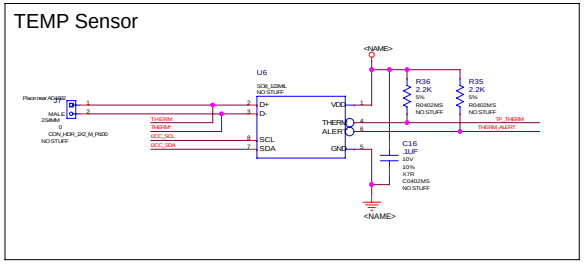
NV31 GPIO



FAN Control



TEMP Sensor



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MS-8912 base on P141 modify		
Size: Custom	Document Number: NV31 DVO,VIP AND GPIO SECTION,FAN CONTROL AND TEMP SENSOR	Rev: 00A
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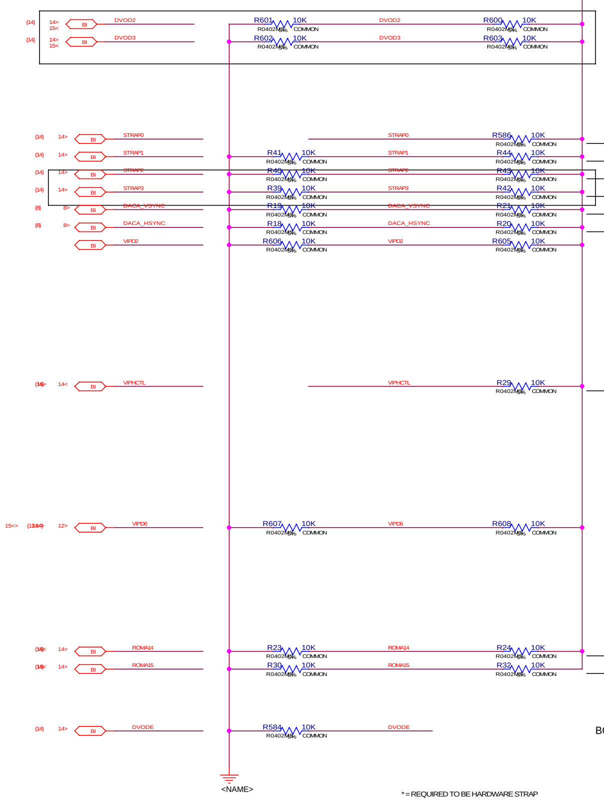
AND MASK
1 -> HARDWARE STRAP
0 -> BIOS STRAP

OR MASK
1 -> DESIRED=1 ANDMASK=0

NV31 BIOS STRAPPING

Used on NV31/34



* = REQUIRED TO BE HARDWARE STRAP

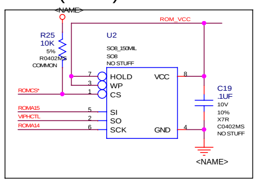
SKU#	0000			0001			0002			0003		
BOOT_0_STRAP_0	DESIRED	AND MASK	OR MASK	DESIRED	AND MASK	OR MASK	DESIRED	AND MASK	OR MASK	DESIRED	AND MASK	OR MASK
* 00: PCI_AD_SWAP	1	1	0	1	1	0	1	1	0	1	1	0
* 01: SUB_VENDOR	1	1	0	1	1	0	1	1	0	1	1	0
02: RAM_CFG_0	1	1	0	1	1	0	1	1	0	1	1	0
03: RAM_CFG_1	1	1	0	1	1	0	1	1	0	1	1	0
04: RAM_CFG_2	0	1	0	0	1	0	0	1	0	0	1	0
05: RAM_CFG_3	0	1	0	0	1	0	0	1	0	0	1	0
06: CRYSTAL_0	0	1	0	0	1	0	0	1	0	0	1	0
07: TV_MODE_0	1	0	1	1	0	1	1	0	1	1	0	1
08: TV_MODE_1	0	0	0	0	0	0	0	0	0	0	0	0
09: AGP4x/8x	0	0	0	0	0	0	0	0	0	0	0	0
10: AGP_SBA	0	0	0	0	0	0	0	0	0	0	0	0
11: AGP_FASTWR	0	0	0	0	0	0	0	0	0	0	0	0
12: PCI_DEVID_0	0	0	0	0	0	0	0	0	0	1	0	0
13: PCI_DEVID_1	1	0	1	1	0	1	1	0	1	0	0	1
* 14: BUS_TYPE	1	1	0	1	1	0	1	1	0	1	1	0
15: FP_IFACE	1	0	1	1	0	1	1	0	1	1	0	1
16: USER_0	0	0	0	0	0	0	0	0	0	0	0	0
17: USER_1	0	0	0	0	0	0	0	0	0	0	0	0
18: USER_2	0	0	0	0	0	0	0	0	0	0	0	0
19: USER_3	0	0	0	0	0	0	0	0	0	0	0	0
20: PCI_DEVID_2	0	0	0	0	0	0	0	0	0	0	0	0
21: PCI_DEVID_3	0	0	0	0	0	0	0	0	0	0	0	0
22: CRYSTAL_1	1	1	0	1	1	0	1	1	0	1	1	0
23: FB_0	0	0	0	0	0	0	0	0	0	0	0	0
24: FB_1	0	0	0	0	0	0	0	0	0	0	0	0
25: BR	0	0	0	0	0	0	0	0	0	0	0	0
26: BR_128M	0	0	0	0	0	0	0	0	0	0	0	0
27: BR_AGP	0	0	0	0	0	0	0	0	0	0	0	0
28: BR_IO	0	0	0	0	0	0	0	0	0	0	0	0
* 29: ROM_TYPE_0	1	1	0	1	1	0	1	1	0	1	1	0
* 30: ROM_TYPE_1	0	1	0	0	1	0	0	1	0	0	1	0
31: STRAP_0_OVERWRITE	0	0	0	0	0	0	0	0	0	0	0	0
BOOT_3_STRAP_1												
0: 1394	0	0	0	0	0	0	0	0	0	0	0	0
1: 1394_PHY	0	0	0	0	0	0	0	0	0	0	0	0
2: 1394_PHY_PWRCLASS[0]	0	0	0	0	0	0	0	0	0	0	0	0
3: 1394_PHY_PWRCLASS[1]	0	0	0	0	0	0	0	0	0	0	0	0
4: VGA_DEVICE	1	0	1	1	0	1	1	0	1	1	0	1
5: MEM_LSB_SWAP	0	0	0	0	0	0	0	0	0	0	0	0
6: BR_LAST_DEV	0	0	0	0	0	0	0	0	0	0	0	0
7: BR_BAR1_BCASTONLY	0	0	0	0	0	0	0	0	0	0	0	0
31: STRAP_1_OVERWRITE	0	0	0	0	0	0	0	0	0	0	0	0

600-10141-0000
600-10141-0001
600-10141-0002

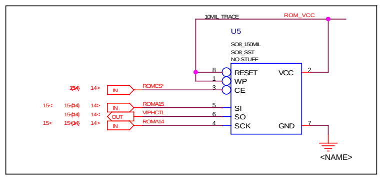
600-10141-0003

NV Register Description	NV Address	BIOS Address	Data SKU#0000-0002	Data SKU#0003
BOOT_0_STRAP_0	0x00101000		0x2040E08F	0x2040C08F
BOOT_1_STRAP_0_ANDMASK	0x00101004	0x58	0x6040407F	0x6040407F
BOOT_2_STRAP_0_ORMASK	0x00101008	0x5C	0x00008080	0x00008080
BOOT_3_STRAP_1	0x0010100C		0x00000010	0x00000010
BOOT_4_STRAP_1_ANDMASK	0x00101010	0x60	0x00000000	0x00000000
BOOT_5_STRAP_1_ORMASK	0x00101014	0x64	0x00000010	0x00000010

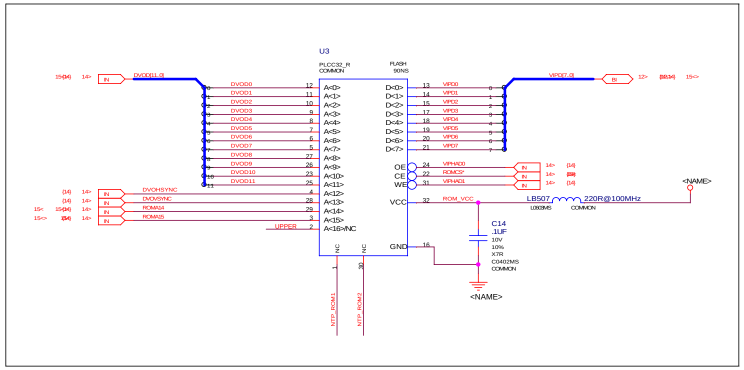
BIOS (serial)



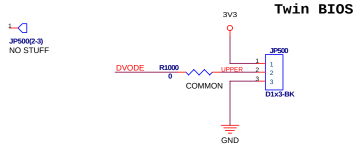
BIOS (serial alternative)



BIOS (parallel alternative)



Twin BIOS



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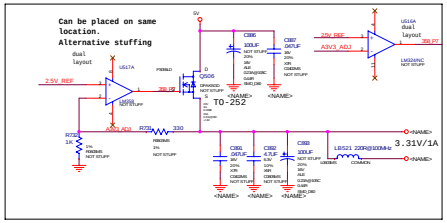
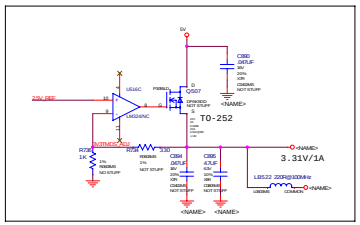
POWER SUPPLY

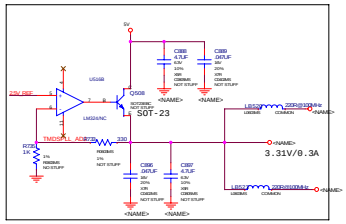
ANALOG 3V3



TMDS 3V3 Supply

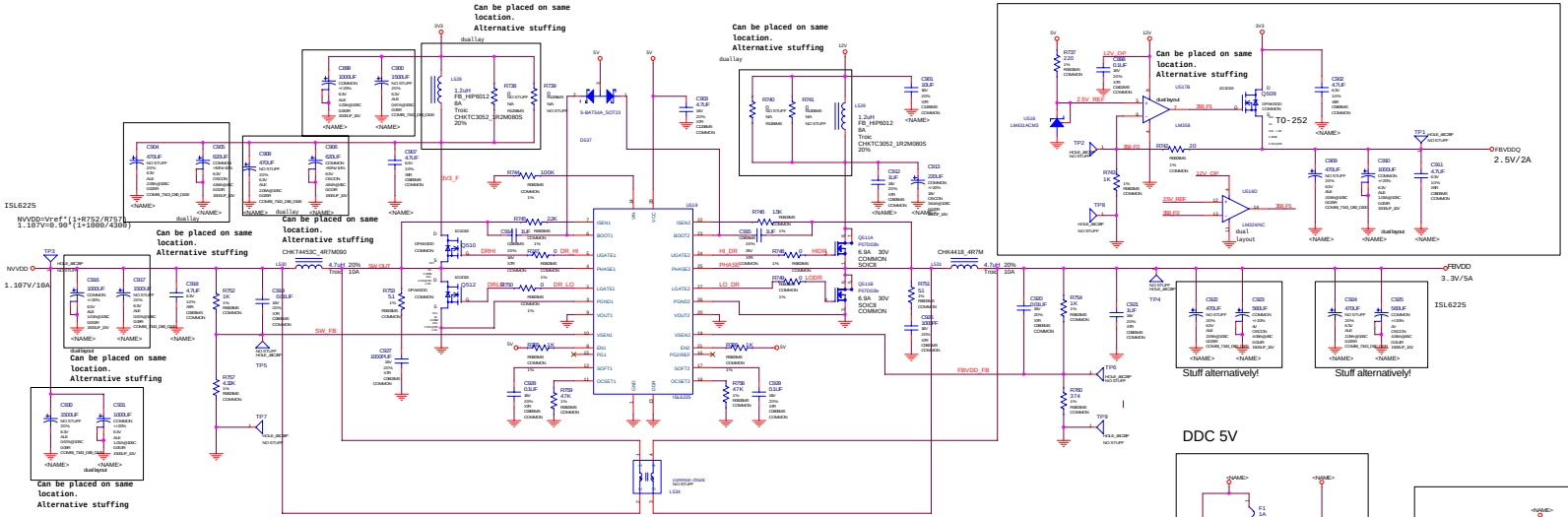


TMDS PLL Supply

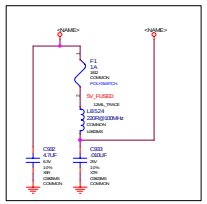


NVVDD-SWITCHER / FBVDDQ-LDO CONTROLER

Replaced ISL6529 with ISL6225.
Replaced P07D03LV with APM7312.



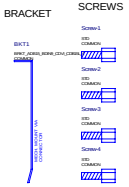
DDC 5V



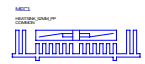
MECHANICAL COMPONENTS

BRACKET

SCREWS



HEATSINK



FBVDDQ= VRef * (1+Rtop/ Rbot)

ISL6529	2.5V = 0.800V * (1+2.37k/1.13k)
SC2610	2.5V = 1.250V * (1+1.02k/1.02k)

Vo=[0.9V*(Rtop +Rbot)] / Rbot

ISL6225	**FBVDD = [0.9V * (1K+375)] / 375 =3.3V**
NV31	**NVVDD = [0.9V * (1K+4.3K)] / 4.3K =1.109V**
NV18B	**Stand Volt need 1.656 V.**

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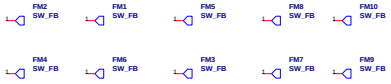
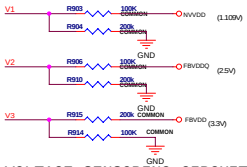
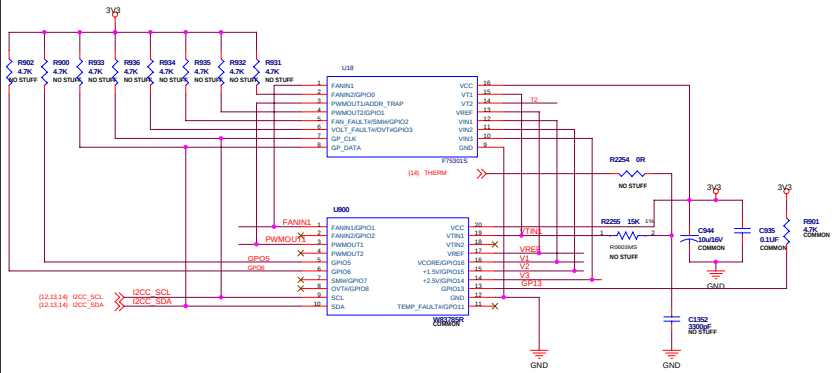
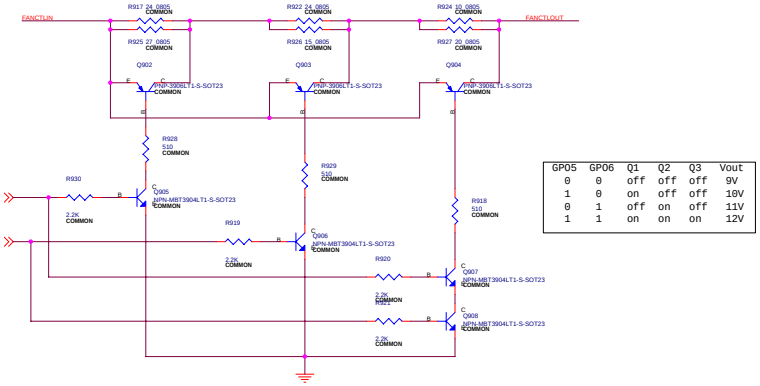
H/W Monitor Funtion





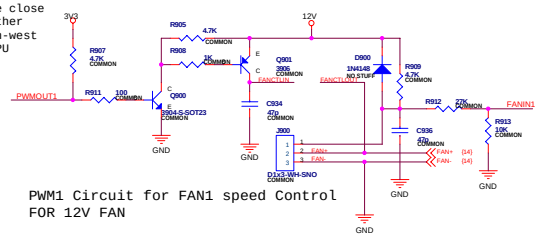
VOLTAGE SENSORING CIRCUIT



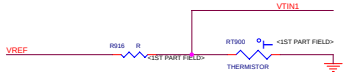


GPO5	GPO6	Q1	Q2	Q3	Vout
0	0	off	off	off	9V
1	0	on	off	off	10V
0	1	off	on	off	11V
1	1	on	on	on	12V

Place close
together
south-west
of GPU



PWM1 Circuit for FAN1 speed Control
FOR 12V FAN



TEMPERATURE SENSORING CIRCUIT

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