P141-A03, NV31/NV34/NV18B
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

A01

X00: Fixed pin swap on parallel ROM A12 & A13
- Added charge pump for SC2612
- Added resitstors to swap GPIO for DACB loadtest
- Added resitstors for I2C on internal Video IN connector

X01: Updated variant information for new Sbom structure

A02

X00: Added sw adjust for NVVDD
- Exchanged TMDSIOVDD regulator to lower the voltage drop
- Changed TMDSPLLVDD regulator bypass to A3V3
- Addrd 1k series resistor in DACB load detection circuit

A03

X00: Removed GPIO5 from NVVDD adjust
- Fixed values for DAC Rset resitors
- Removed Sync Buffer bypass
- Removed 2nd voltage selection fet
- Changed to new internal video connector
- Added snubber to NVVDD and FBVDD regulator

8912 version 00B base on P141-A03 Modify.
1.Remove Page 13 MiniDim and Add AV-out connector.
2.Change all R,C,L parts to MSI footprint.

602-10141-0000-000 Base Schematic

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MS-8912 base on P141-A03 modify
Size: Custom | Document Number: TOP PAGE | Rev: 00B
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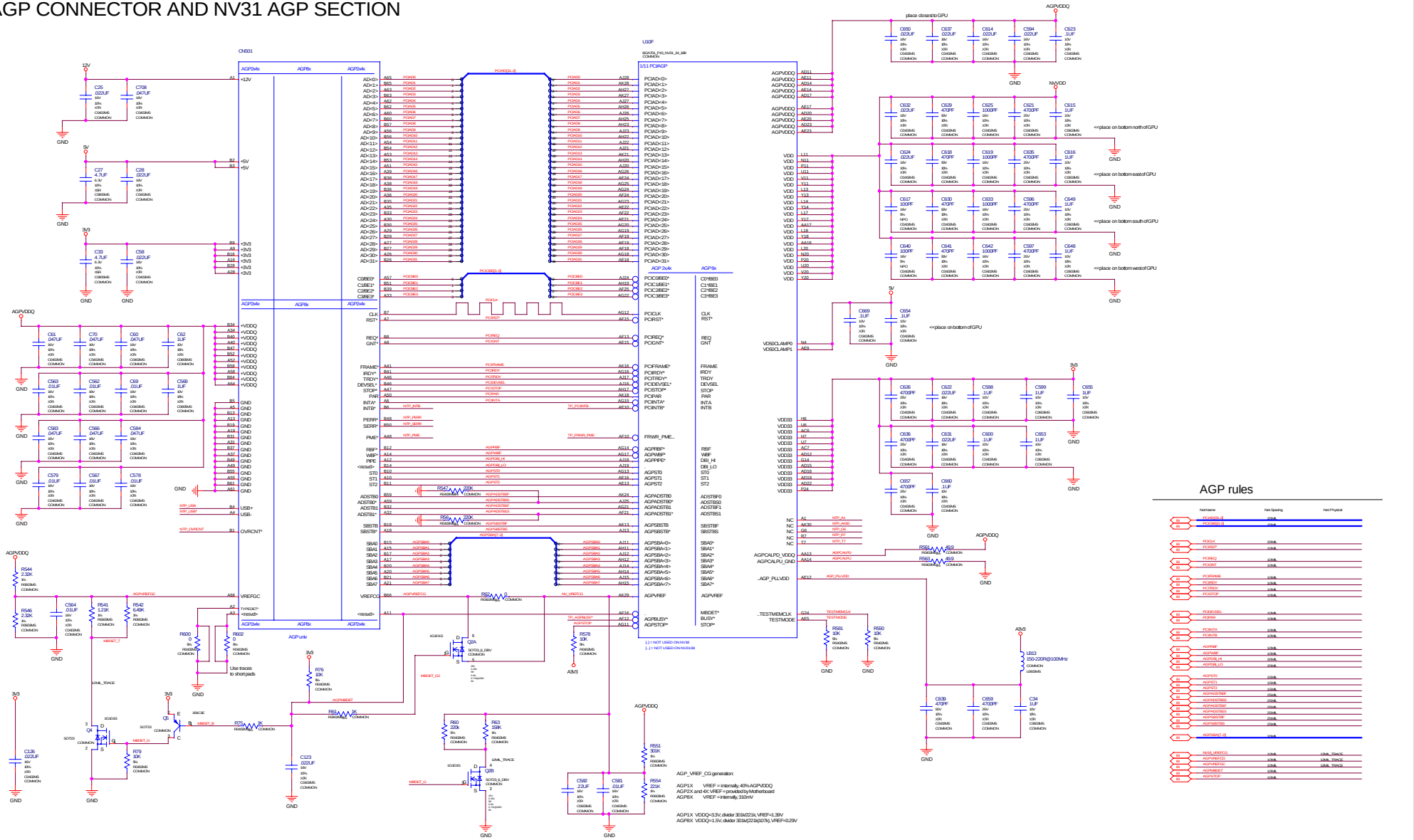
AGP CONNECTOR AND NV31 AGP SECTION



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MS-8912 base on P141-A03 modify			
Size	Document Number		Rev
Custom	AGP CONNECTOR AND NV31 AGP SECTION		00B
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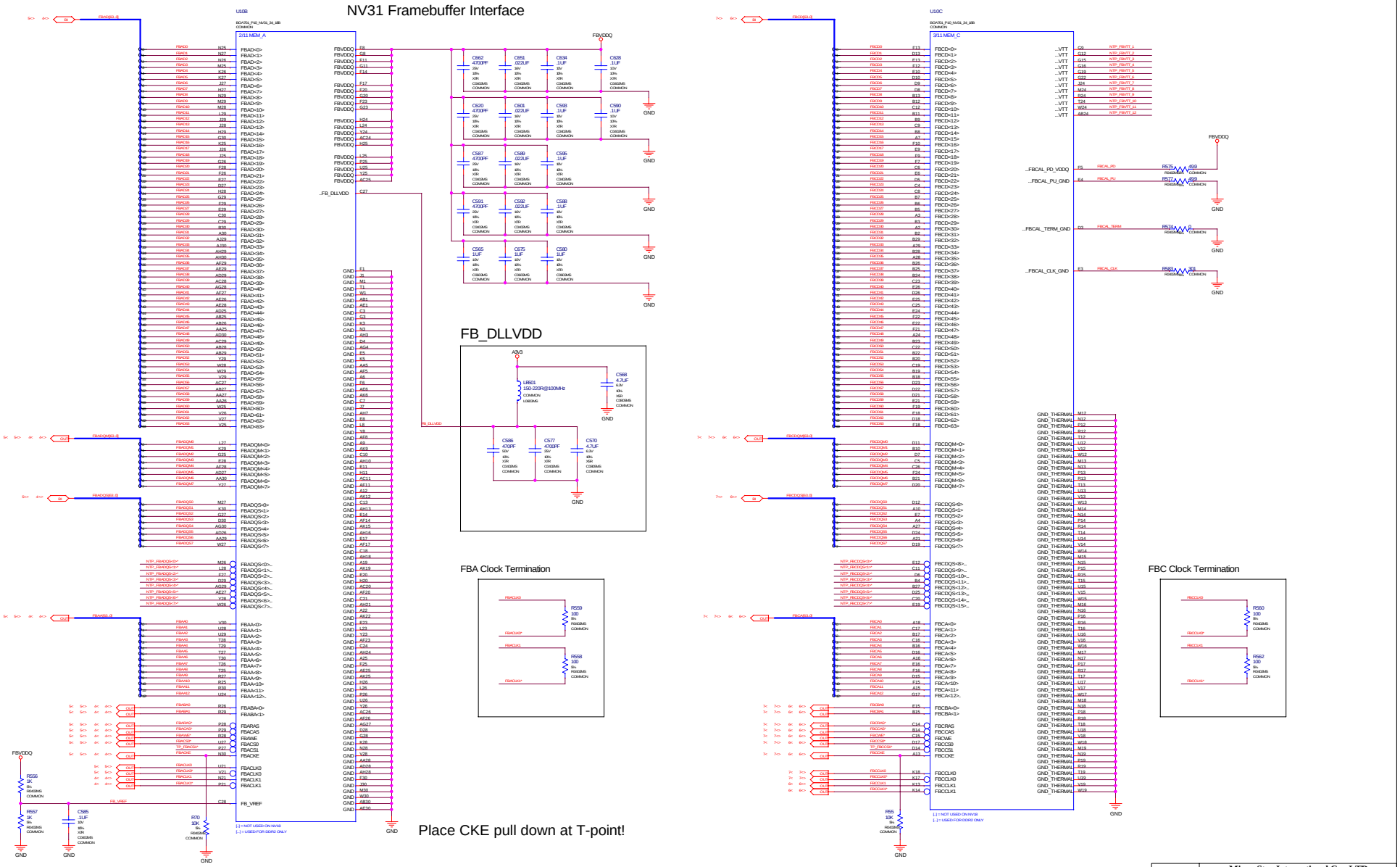
NV31 Framebuffer Interface



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MS-8912 base on P141-A03 modify
Size: Custom | Document Number: NV31 Framebuffer Interface | Rev: 0.0B
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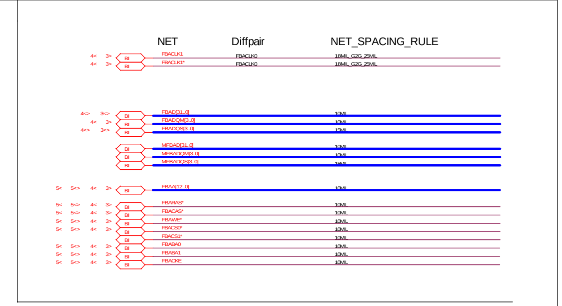
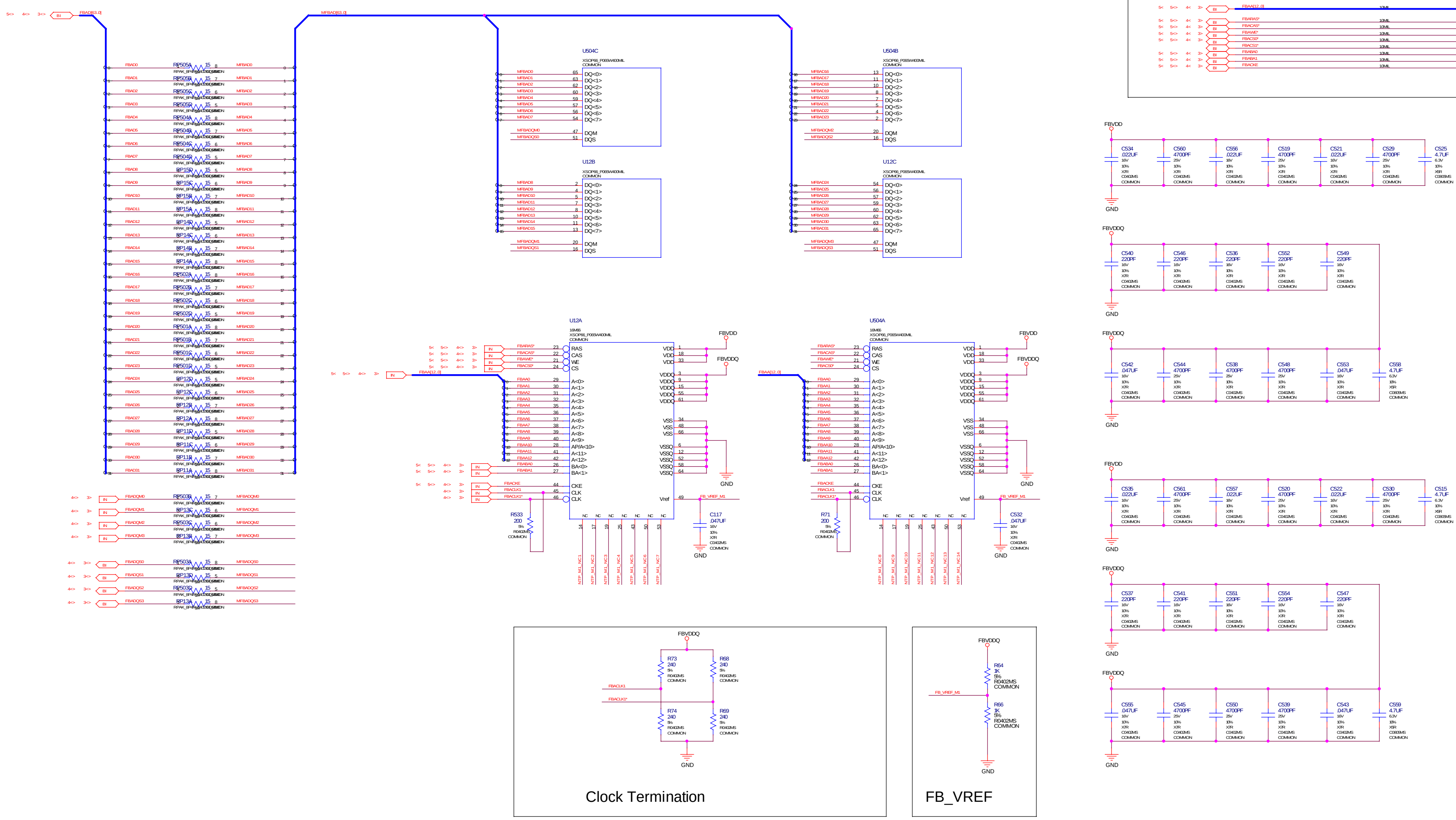
MEMORY 8(16)Mx16DDR Partition A , Bits 0..31

PLACE ALL DISCRETE COMPONENTS AS NEAR AS POSSIBLE TO MEMORY!





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MS-8912 base on P141-A03 modify	
Size: Custom	Document Number: MEMORY 8(16)Mx16DDR Partition A , Bits 0..31	Rev: 00B
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MEMORY 8(16)Mx16DDR Partition A , Bits 32..63

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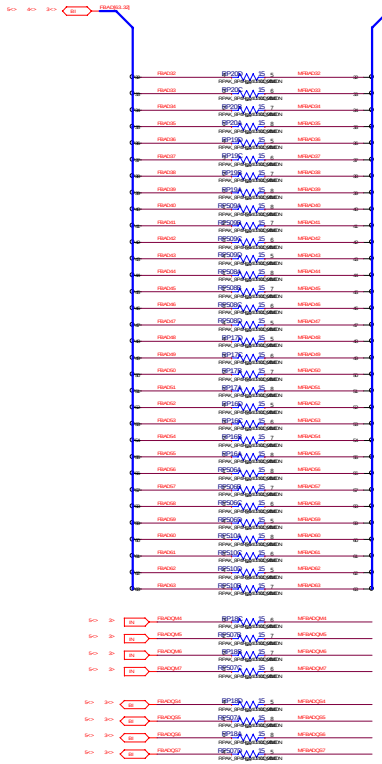

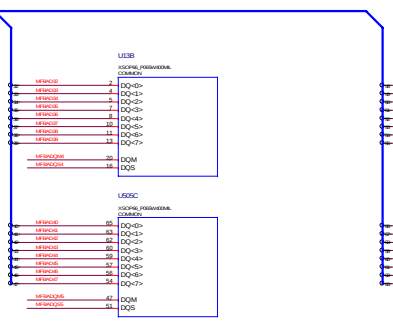

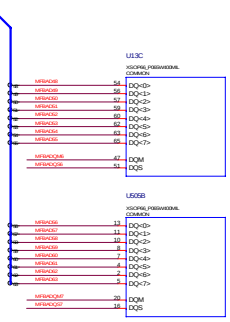

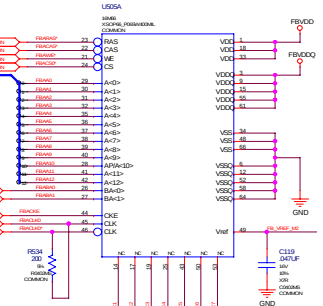

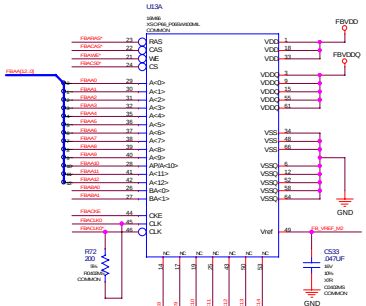

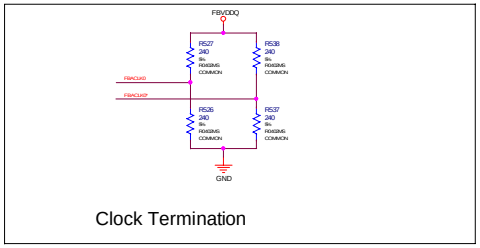

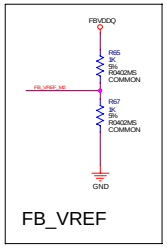

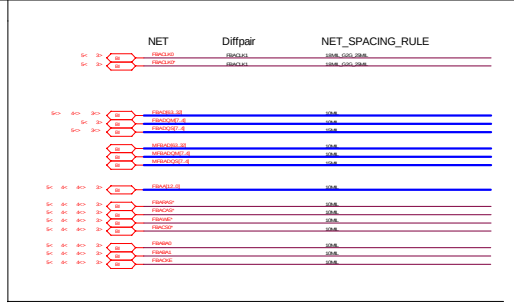

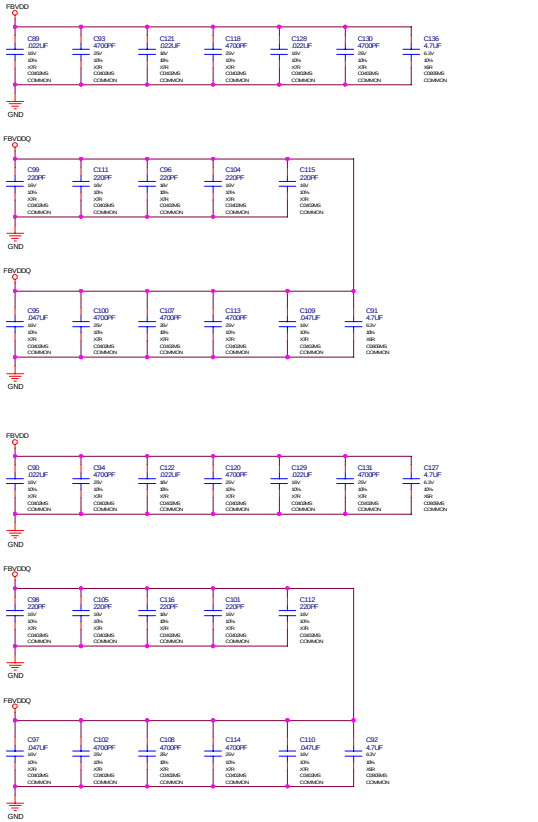

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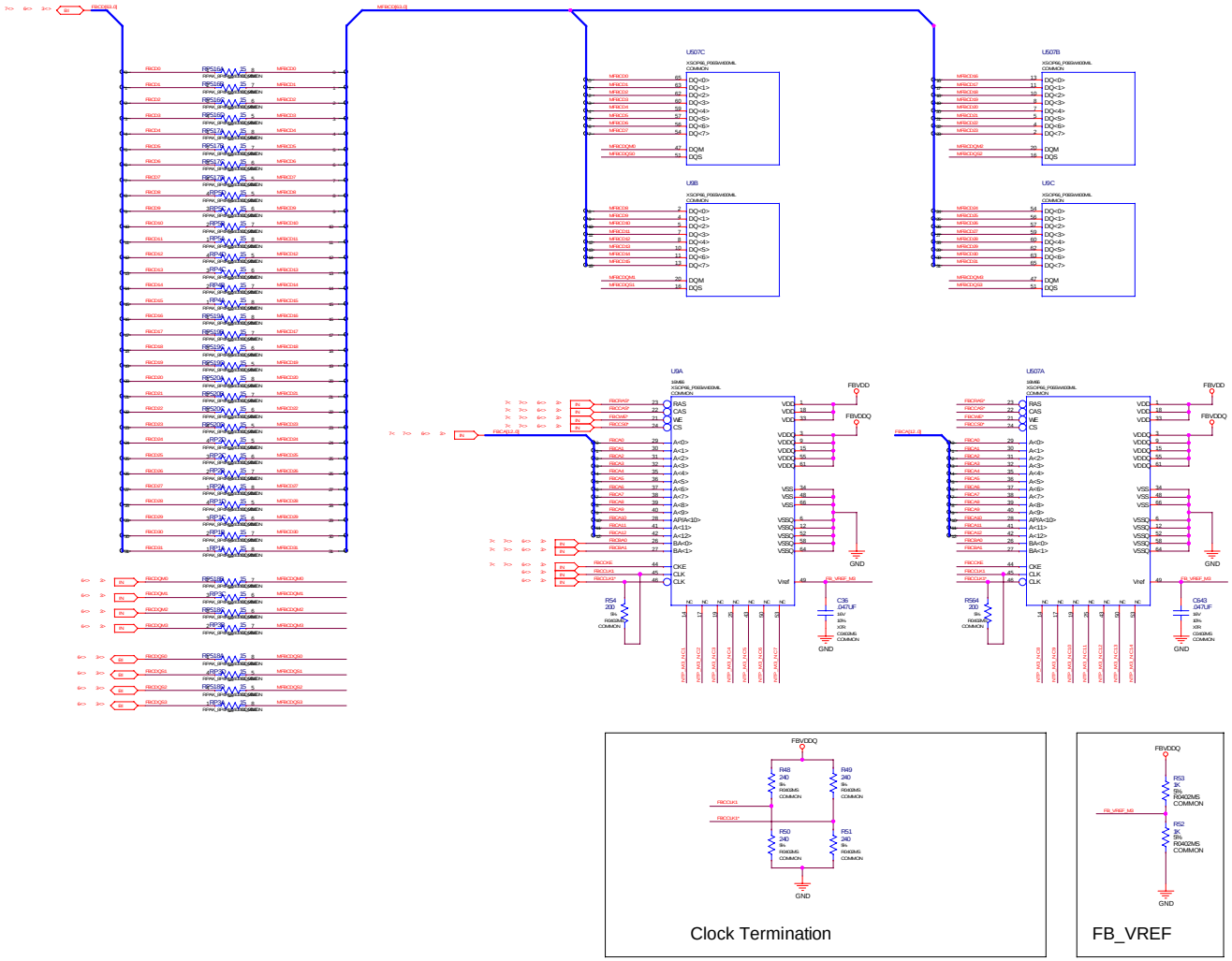
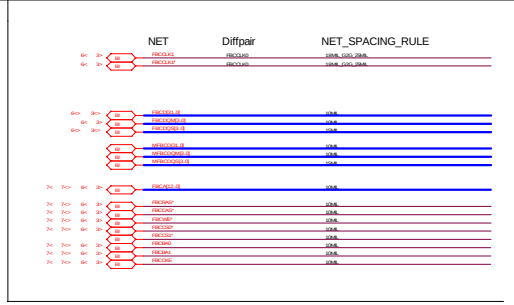
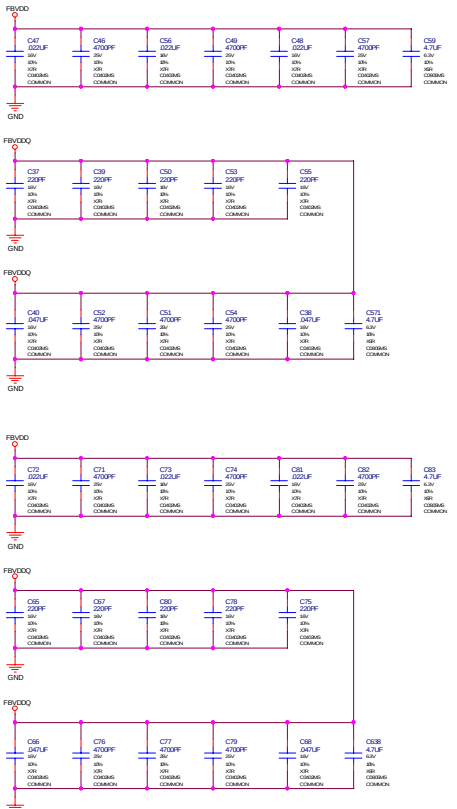
MEMORY 8(16)Mx16DDR Partition C , Bits 0..31

PLACE ALL DISCRETE COMPONENTS AS NEAR AS POSSIBLE TO MEMORY!







Clock Termination

FB_VREF

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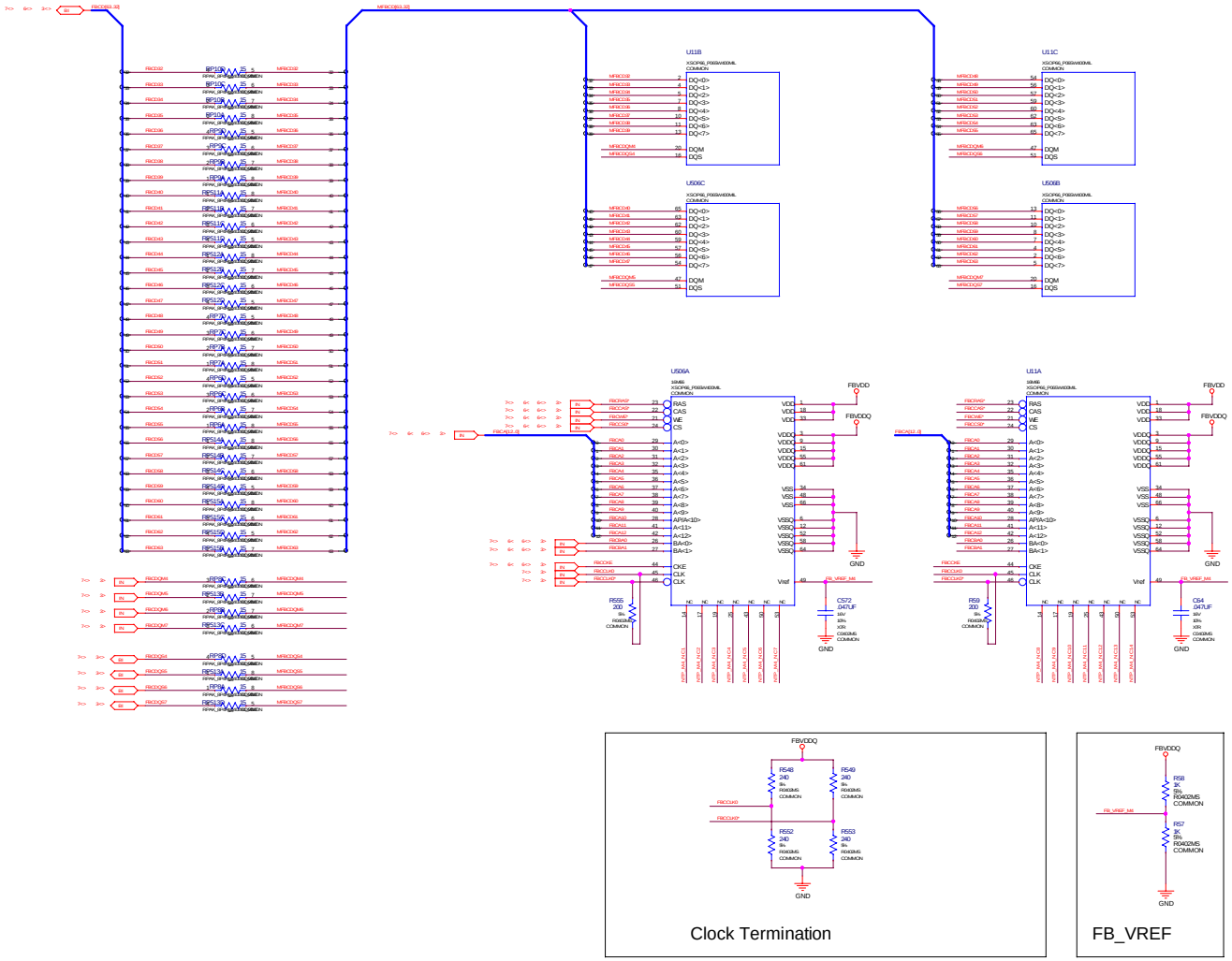
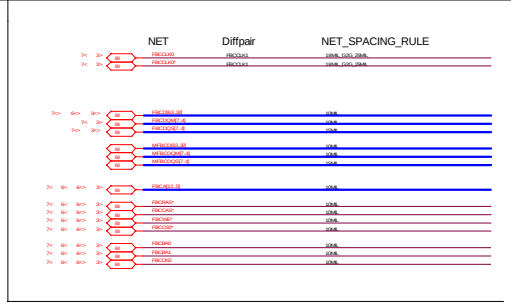
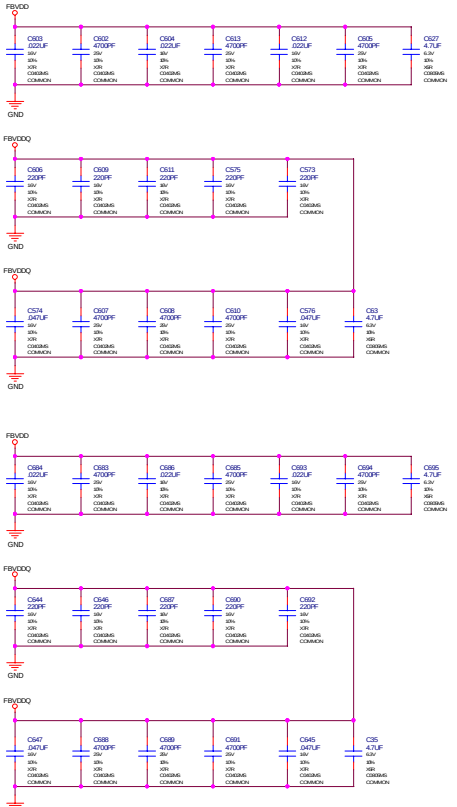
MEMORY 8(16)Mx16DDR Partition C , Bits 32..63

PLACE ALL DISCRETE COMPONENTS AS NEAR AS POSSIBLE TO MEMORY!







Clock Termination

FB_VREF

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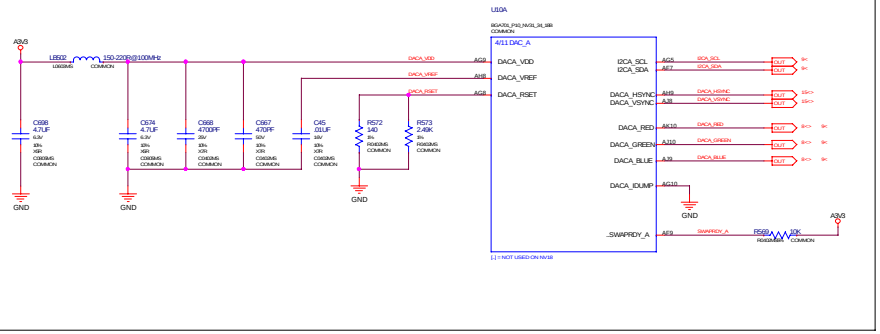
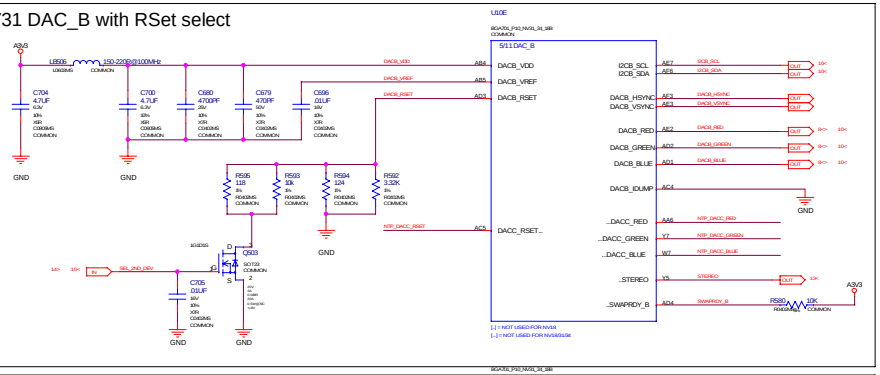
NV31 DAC_A, DAC_B, PLL, SYNC Buffer

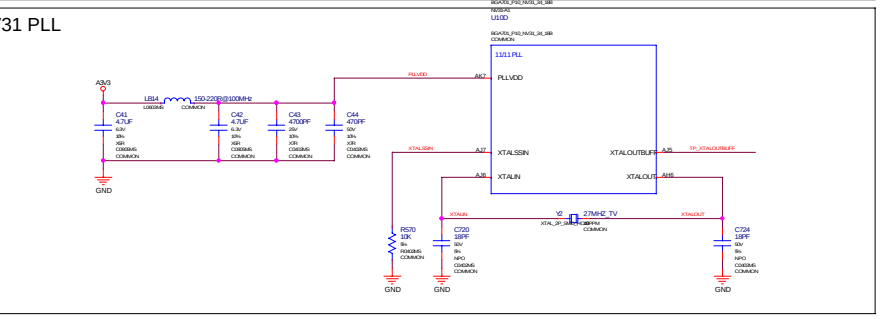
NV31 DAC_A



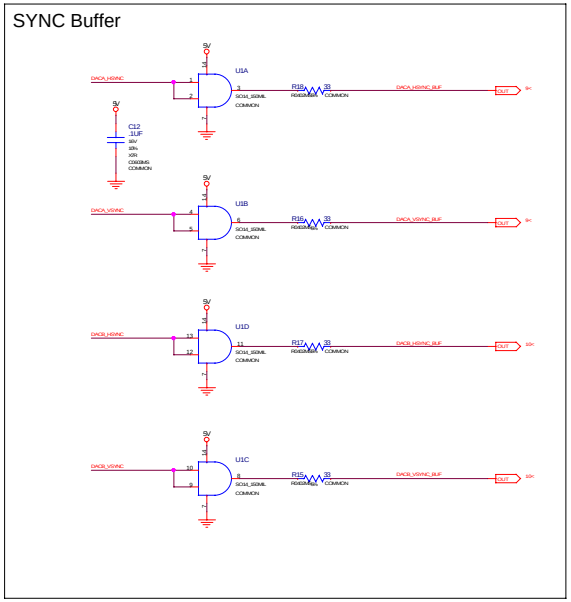
NV31 DAC_B with RSet select

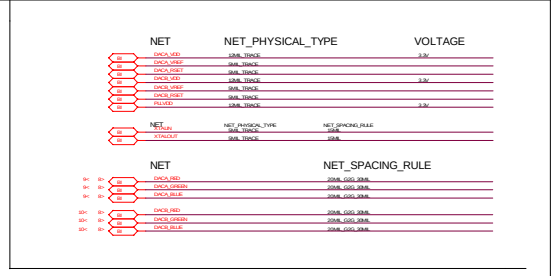


NV31 PLL



SYNC Buffer





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MS-8912 base on P141-A03 modify			
Size	Document Number		Rev
Custom	NV31 DAC_A, DAC_B, PLL, SYNC Buffer		00B
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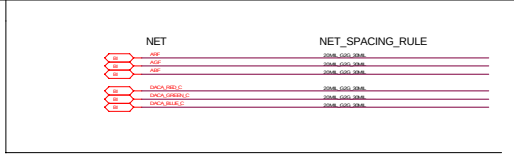
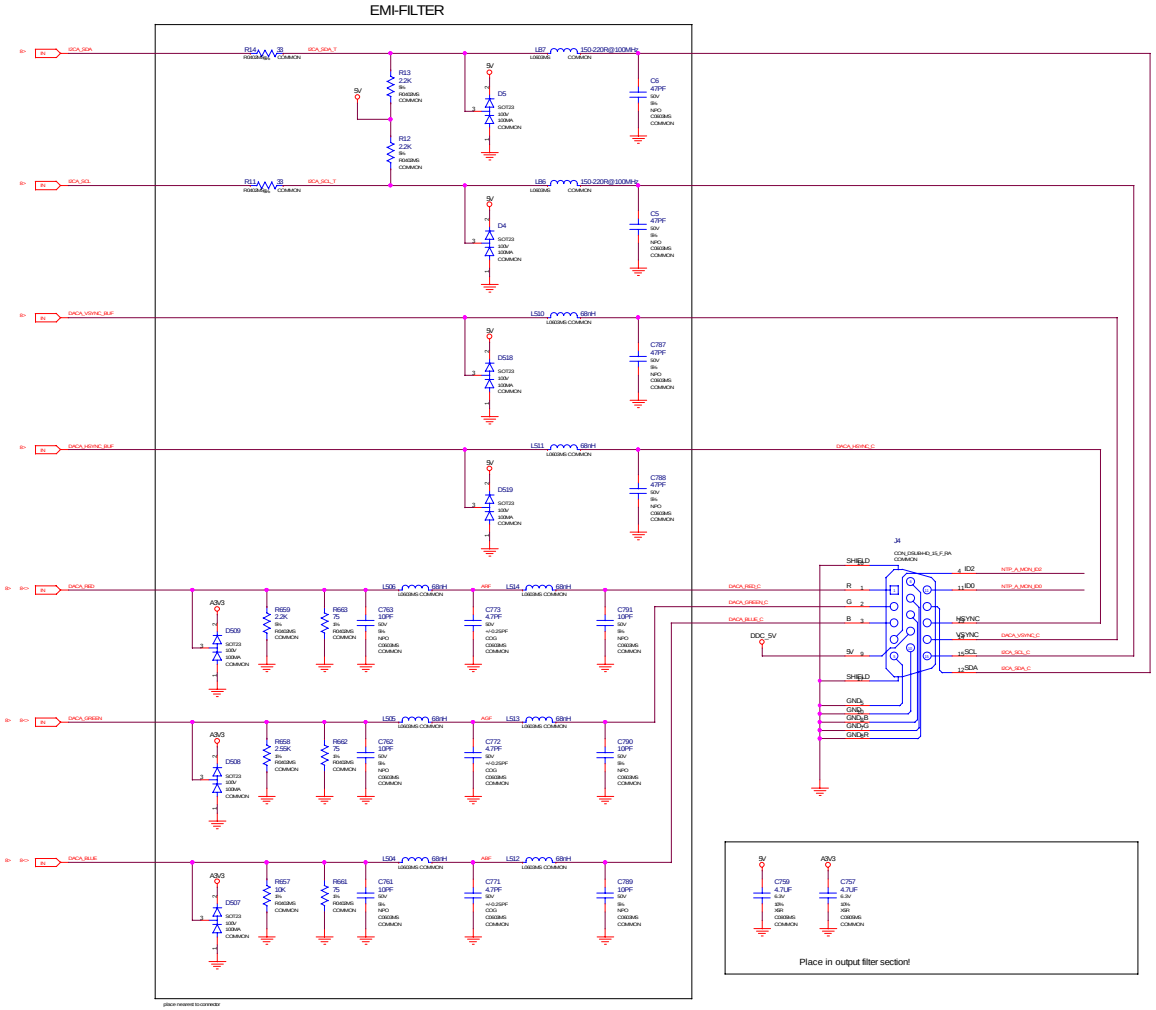
Primary Display (DACA), DB15 only!





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!

Micro-Star International Co., LTD.			
MS-8912 base on P141-A03 modify			
Size	Document Number		Rev
Custom	Primary Display (DACA), DB15 only!		00B
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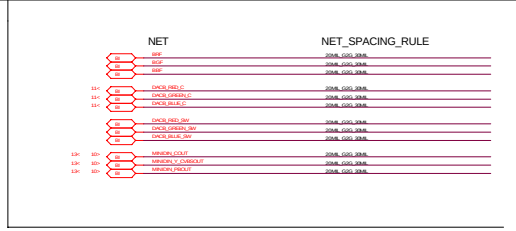
Secondary Display (DACB), SILM DB15 optional DVI-I

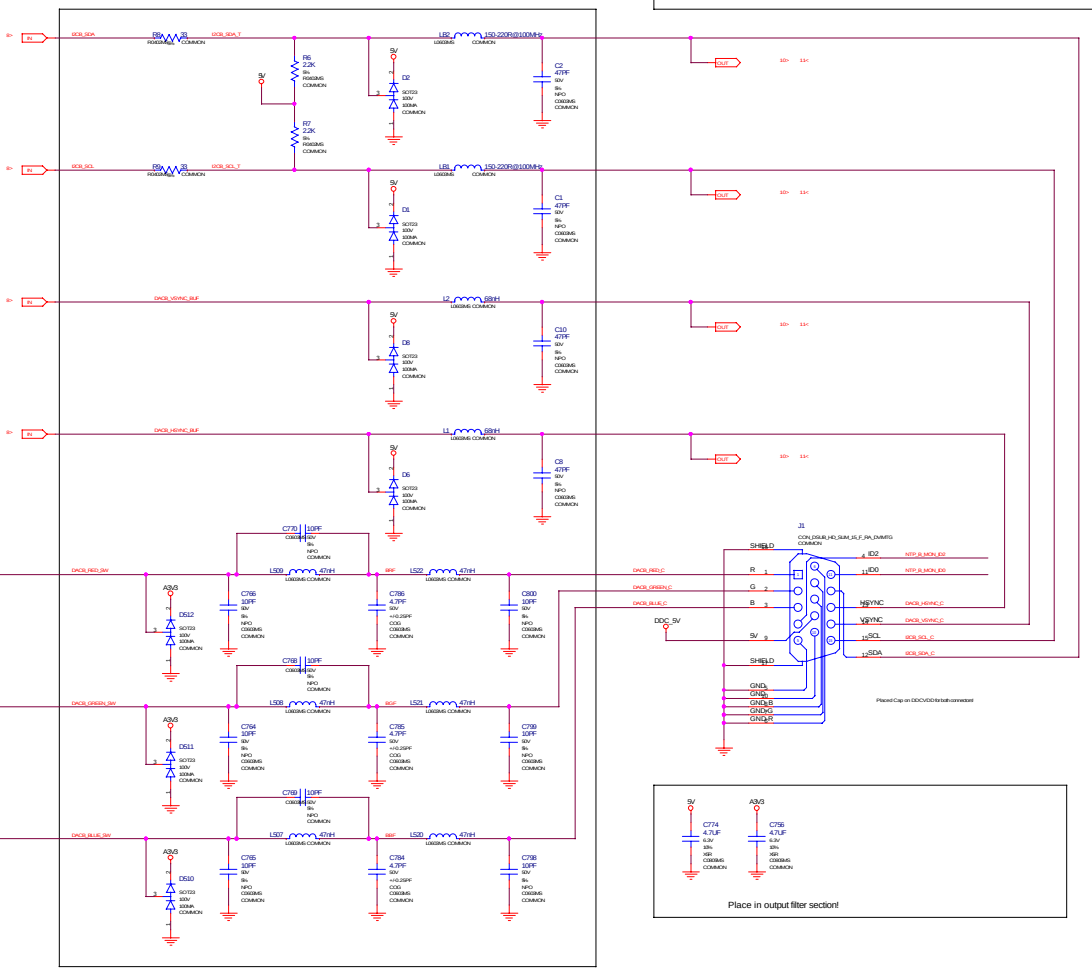
Place all filter components on the side nearest to the reference GND plane!

Route all signals only on layers referenced to GND!

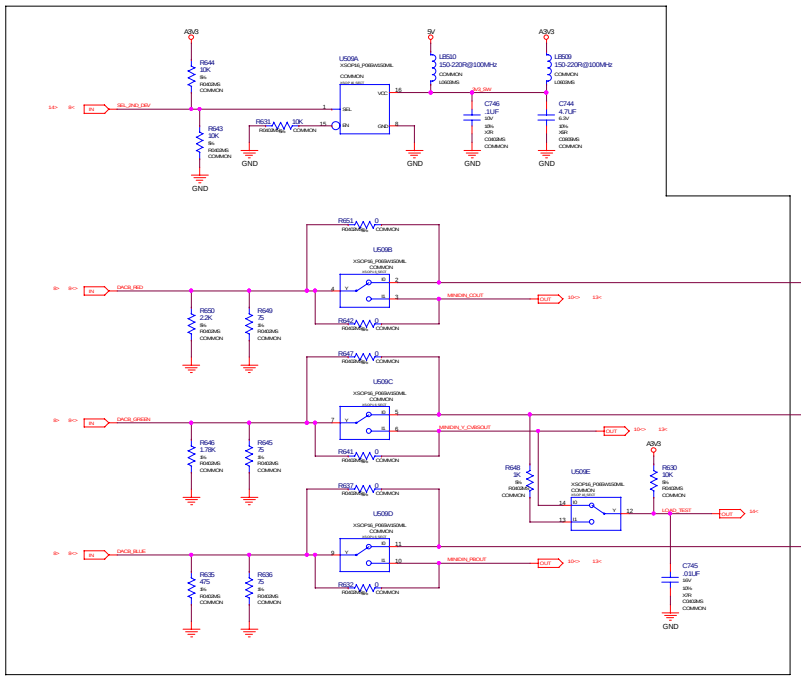
Don't split the reference GND plane beneath a RGB signal!



EMI-FILTER



DACB Multiplexer



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MS-8912 base on P141-A03 modify		
Size: Custom	Document Number: Secondary Display (DACB), SILM DB15 optional DVI-I	Rev: 0DB
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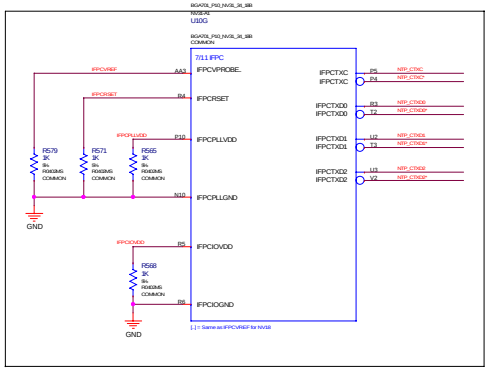
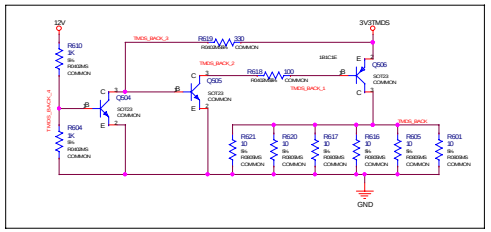
INTERNAL DUAL LINK TMDS POWER AND DECOUPLING

Unused Transmitter

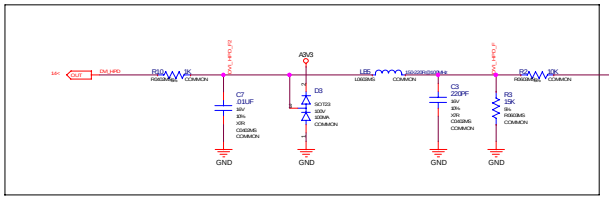


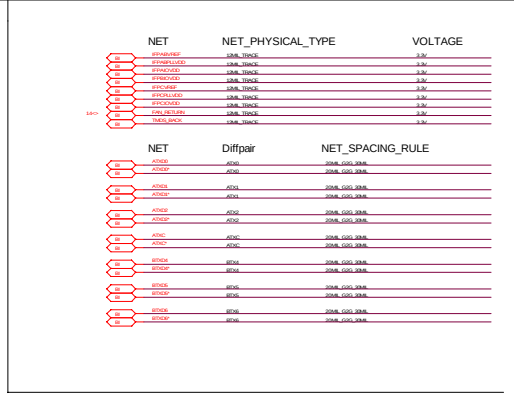
TMDS backdrive prevention



DualLink Transmitter

Hotplug Detection





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MS-8912 base on P141-A03 modify		
Size: Custom	Document Number: INTERNAL DUAL LINK TMDS POWER AND DECOUPLING	Rev: 00B
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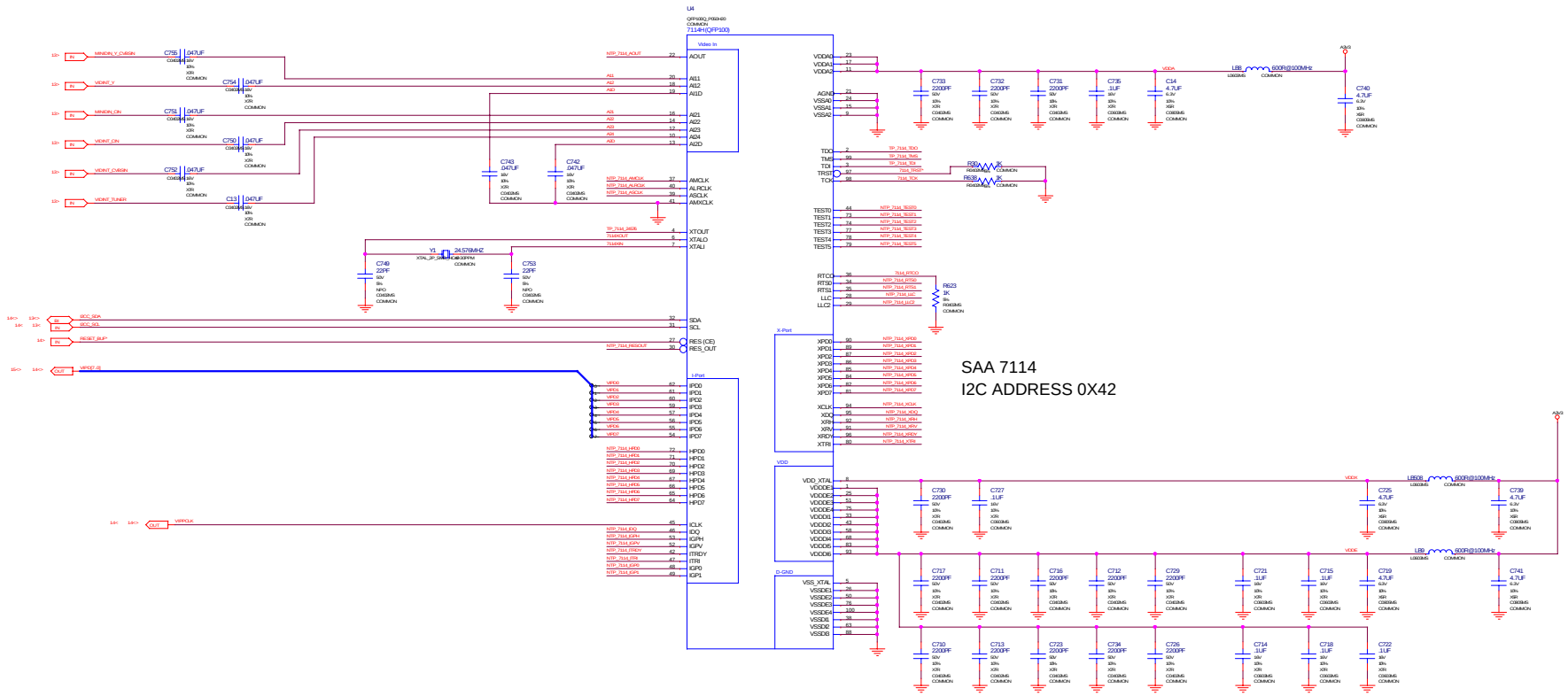

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MS-8912 base on P141-A03 modify			
Size: Custom	Document Number: VIDEO CAPTURE		Rev: 008
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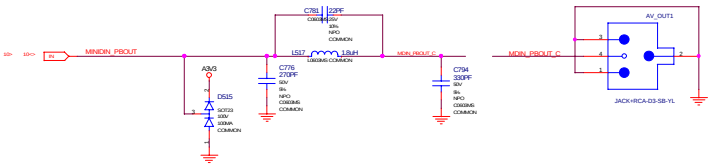
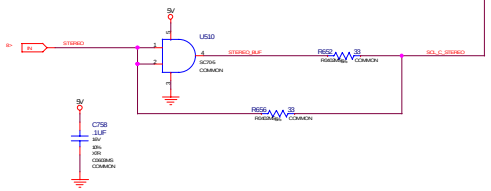
VIDEO IN/OUT CONNECTOR /STEREO GLASSES

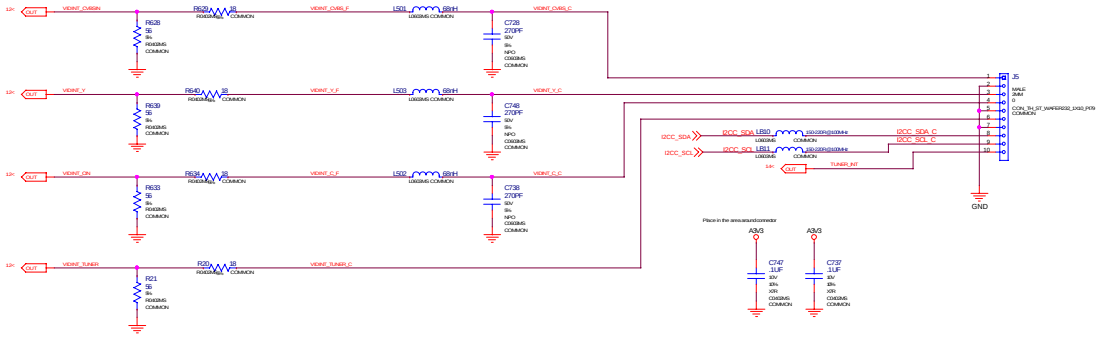


STEREO GLASSES BUFFER

Place close to MiniDIN connector!



INTERNAL VIDEO IN CONNECTOR



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MS-8912 base on P141-A03 modify		
Size: Custom	Document Number: MiniDIN VIDEO IN/OUT CONNECTOR /STEREO GLASSES	Rev: 00B
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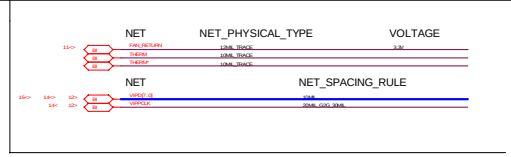
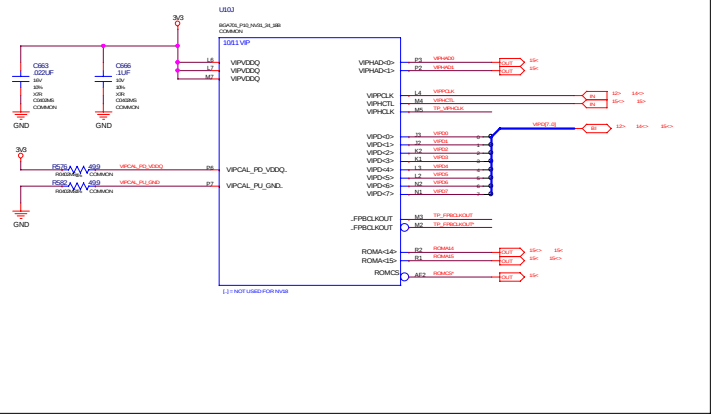
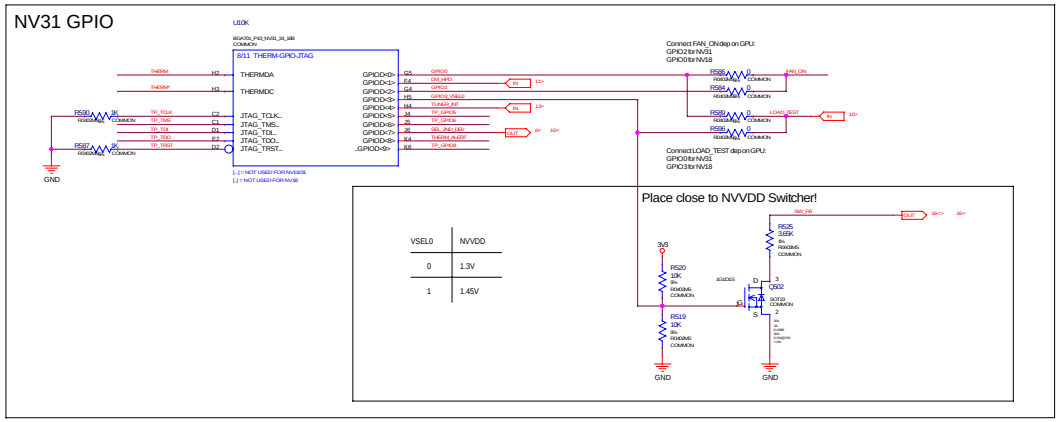
NV31 DVO, VIP AND GPIO SECTION, FAN CONTROL AND TEMP SENSOR



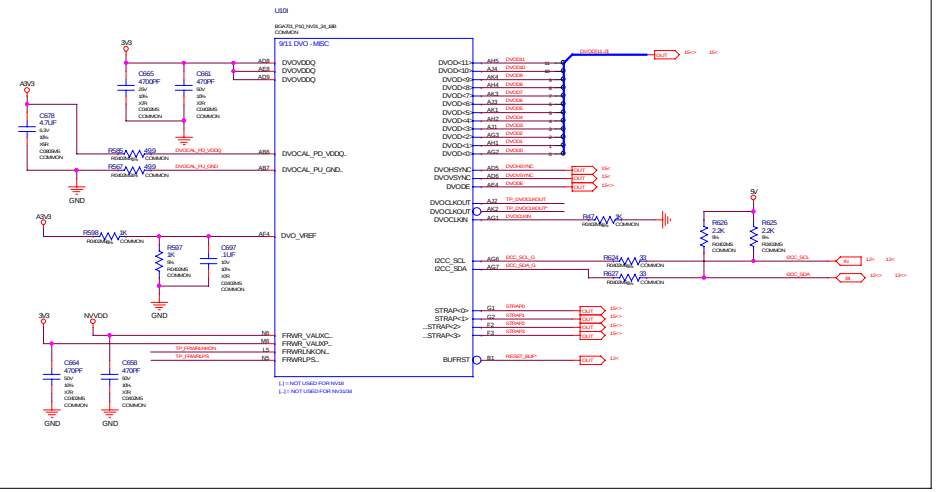
NV31 VIP



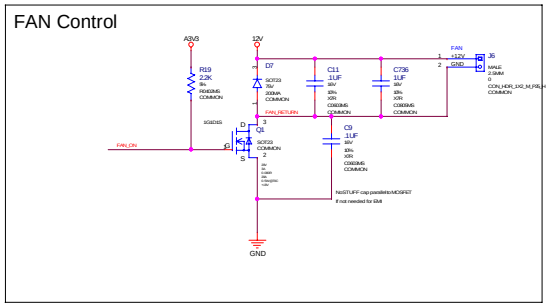
NV31 GPIO



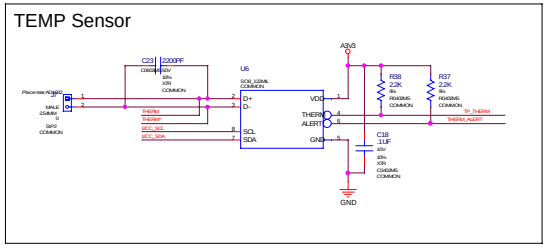
NV31 DVO



FAN Control



TEMP Sensor



	Micro-Star International Co., LTD.		
	MS-8912 base on P141-A03 modify		
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Custom	NV31 DVO, VIP AND GPIO SECTION, FAN CONTROL AND TEMP SENSOR		0DB
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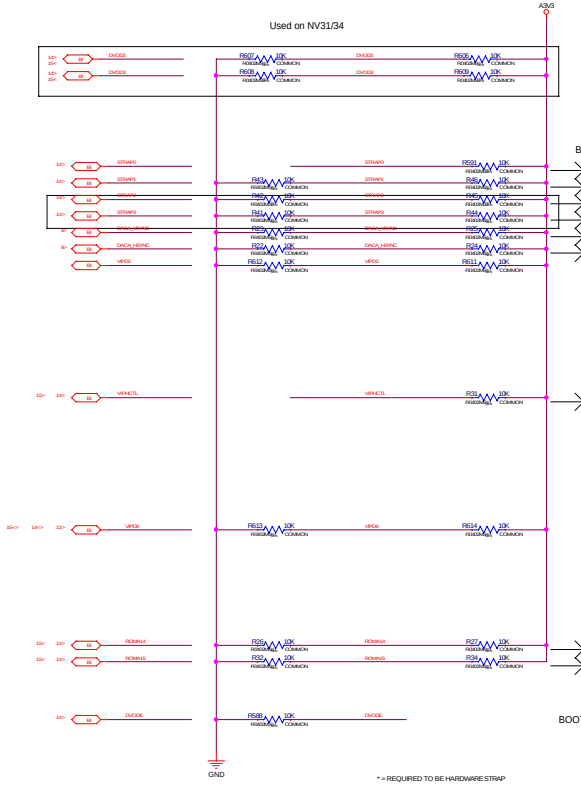
NV31 BIOS STRAPPING

AND MASK
1 -> HARDWARE STRAP
0 -> BIOS STRAP

OR MASK
1 -> DESIRED=1 ANDMASK=0

Used on NV31/34



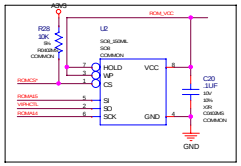
SKU#	0000			0001			0002			0003		
BOOT_0_STRAP_0	DESIRED	AND MASK	OR MASK	DESIRED	AND MASK	OR MASK	DESIRED	AND MASK	OR MASK	DESIRED	AND MASK	OR MASK
* 00: PCI_AD_SWAP	1	1	0	1	1	0	1	1	0	1	1	0
* 01: SUB_VENDOR	1	1	0	1	1	0	1	1	0	1	1	0
02: RAM_CFG_0	1	1	0	1	1	0	1	1	0	1	1	0
03: RAM_CFG_1	1	1	0	1	1	0	1	1	0	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: AGPrate	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_ID	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_1.5B_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_SNFR_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

600-61641-0000
600-61641-0001
600-61641-0002

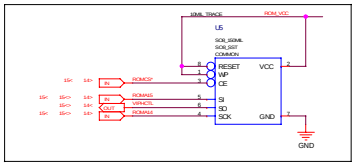
600-61641-0003

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

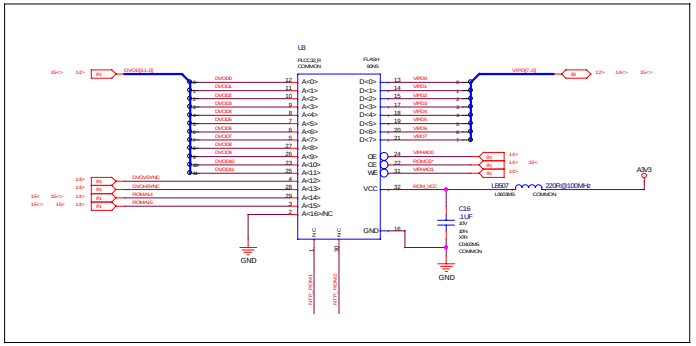
BIOS (serial)



BIOS (serial alternative)



BIOS (parallel alternative)



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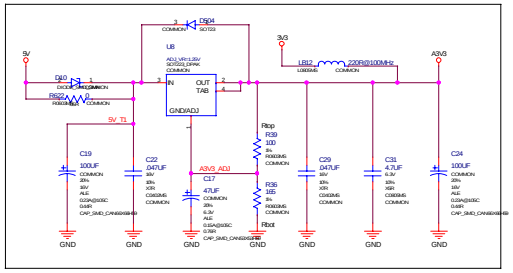
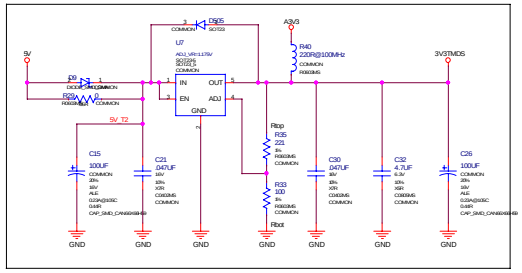
POWER SUPPLY

ANALOG 3V3



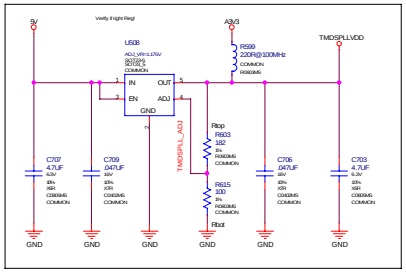
Vout = VRef * (1+Rbot/Rtop)
3.31V = 1.25V * (1+(165/100))

TMDS 3V3 Supply

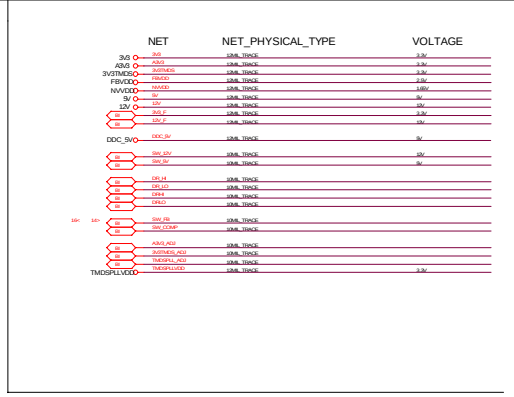


Vout = VRef * (1+Rtop/Rbot)
3.76V = 1.175V * (1+(221/100))

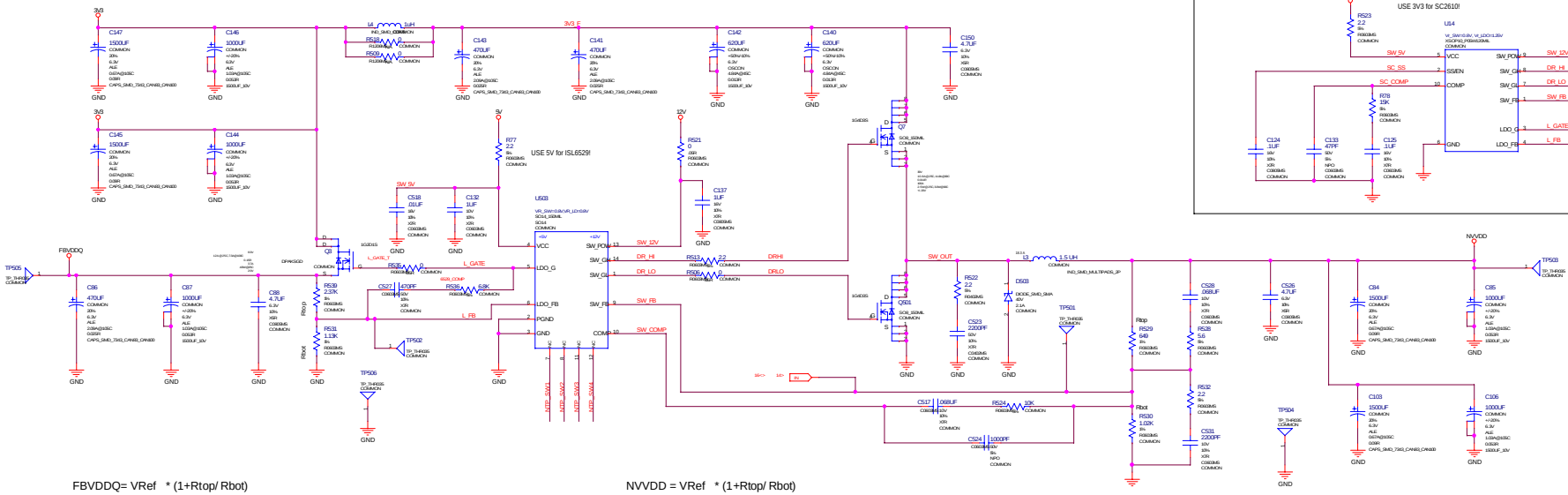
TMDS PLL Supply



Vout = VRef * (1+Rtop/Rbot)
3.31V = 1.175V * (1+(100/182))



NVVDD-SWITCHER / FBVDDQ-LDO CONTROLER ISL6529



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)

NVVDD = VRef * (1+Rtop/ Rbot)

NV18B	1.656V = 0.800V * (1+1070/1000)
NV31	1.309V = 0.800V * (1+649/1020)
NV34	1.45V = 0.800V * (1+866/1070)

See page 14 GPIO section for NVVDD Software adjustable!

ALTERNATIVE TO ISL6529

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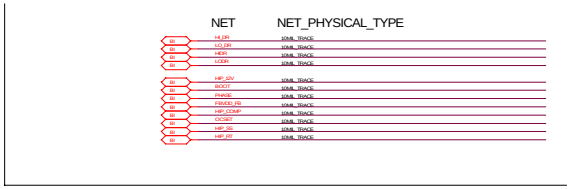
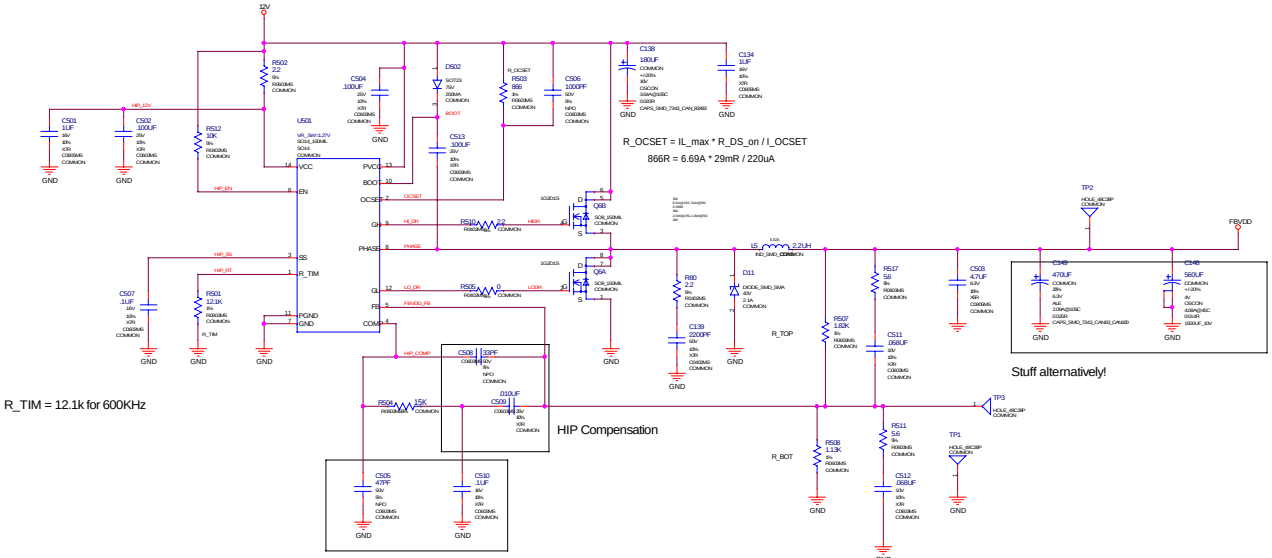
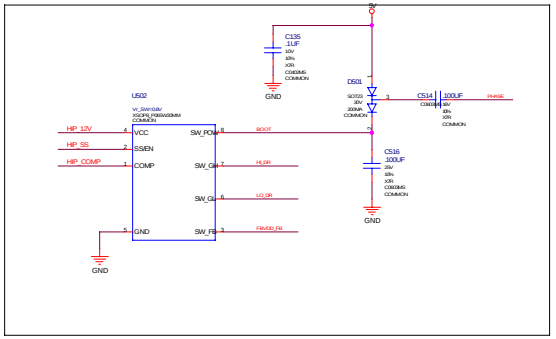
FBVDD Switcher (3.3V out of 12V Rail)

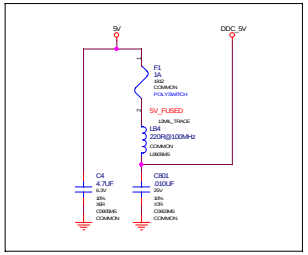




Semtech Sc2612
Stuff alternatively to ISL & HIP!



DDC 5V

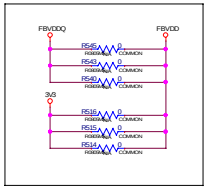


FBVDD = VRef * (1+Rtop/ Rbot)

HIP6012
3.29V = 1.270V * (1 + 1.82K / 1.13K)
2.5V = 1.270V * (1 + 1 K / 1.02k)

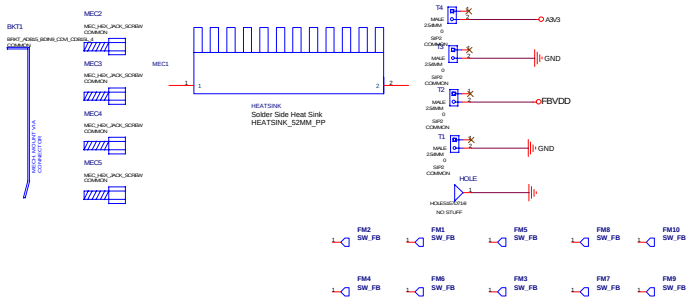
ISL6522/SC2612
3.34V = 0.8V * (1 + 3.32K / 1.07K)
2.5V = 0.8V * (1 + 2.37K / 1.02K)

Switcher Bypass



MECHANICAL COMPONENTS

BRACKET SCREWS HEATSINK



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MS-8912 base on P141-A03 modify	
Size	Document Number: FBVDD Switcher (3.3V out of 12V Rail) — Rev: 008
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