

28-P152, DUAL DAC/TMDS, 128MB 4MX32 BGA DDR, VIVO, GOGGLES, AGP8X

28-P152: Based on P83-A02

Replaced NV25 with NV28.  
Use AGP8X section, DVO and DVOB series terminations from P151.  
Corrected GPU partition E (some power and gnd pins were missing.)  
Removed DVO power regulators from P-ROM page.  
Changed Serial Rom power pin to 3.3V  
Removed parallel ROM and added SST45VF010 as an alternate.  
Updated compensation circuit for SC2602.  
Added HIP6012CB as an NVVDD alternate switcher to SC2602.  
Added a PU on ROMCS and deleted PUS on WP and HOLD.  
Rearranged PS sheets; they look too busy.  
Added ISL6225 memory PS.  
Added SST45VF strap support  
Removed bypass resistors for CLC input rail filters (3.3V and 12V)  
Added SC2672--ALT to ISL6225

Changes Made After Design Review:

Added PD on DVOBCLK\_IN  
Removed C14-C17--left over from P151.  
Replaced 3 pin RGB integrated filters with 0603 inductors.  
Added an X element near svideo.  
Added PD on GPIO1 (for VGA SKU).  
Fixed Power Good error:  
- Renamed PWRGD\_MEM & PWRGD\_SC1102 to NVVDD\_PWRGD.  
- Renamed PWRGD\_SC1175 to FB\_PWRGD  
Incorporated some feedbacks from PS Vendors (more to come):  
- Deleted PU duplication (R1269)  
- Merged PVCC and SC\_BST to become SW12V  
- Deleted D615.  
-Removed SC2672.  
-Used CAPS\_SMD\_7343H38\_1812 in place of SMD\_SANYO\_CAP footprint for C1662, C1645 and C1653.  
-Corrected L814 symbol error.  
- Added RGB stub breaker resistors near long VGA filters.  
- Added 0.22uF 0603 pkg to AGPVREFCG, tracking NV18 bringup.  
-Deleted C1617 and C1618--no room.  
-Changed C1622 to 0603 pkg.  
-Isolated Gate Drive Resistors (R1032, R1033) to the FET--Each chip has its own gate drive resistors for better routing.  
-Added ISL6525 as an alternate to HIP6012. There are only 2 pins different.

Second Design Review:

1-Removed mutichip straps STRAP\_MULTICHIP\_AGP\_DEV--Deleted R982 and R983  
2-Removed mutichip straps STRAP\_MULTICHIP\_IO\_DEV--Deleted R984 and R985  
3-Consolidated 1uF caps: Changed C22, C23, C706, C1242 and C1639 to 0603 (from 0805).  
4-Consolidated 33R resistors: Changed R1000, R1107 and R1108 to 0402 pkg (from 0603).  
5-Provided the ability to disable AGP PWR GOOD: Added OR R1306.  
6-Clamped GPIO1 to 3.3V: Changed FCCDDCPWRVGA on D611.2 and D600.2 to 3.3VDD1  
7-Removed PU R1294 from Serial ROM WP pin and connected to 3.3V directly.  
8-Set RAM\_CFG to 0100b for 4Mx32 DDR DQS per byte.  
9-Merged CAPS\_SMD\_7343H38\_1812 with CAPS\_SMD\_8\_0-10\_0\_SANYO to become caps\_smd\_ale-d80d100\_D7343\_1812 footprint (C1658, C1263 and C1268 don't need to support 1812). This change would allow us to use ceramic caps for NVVDD, FBVDD and VTT rails.  
10-Changed NVVDD PWGD inverting input to the comparator to be referenced at 1.3V from 12V rail (moved R1268.1 to 12V).  
11-Merged netname FBVDDQ with FBVDD to become FBVDD. Historically we connected these 2 nets together and Orcad chose FBVDD.

"FAB STOP" CHANGES TO TRACK P151 Bringup:

- 1- Corrected Q901 PCB Footprint.
- 2- Changed AGPCALPD pullup resistors to VDDQ for pad calibration to 56.2R 1%.
- 3- Changed AGPCALPU pulldown resistors to GND for pad calibration to 49.9R 1%.

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Revision A01:

- 1- Added AGP VREFCG Circuit.
- 2- Added common mode chokes on RGB signals for both DACs.
- 3- Updated AGP Constraints based on NV28 pkg measurement.
- 4- Made Common Mode filters available to long VGA.

Revision A02:

- 1- Added circuit to fix AGP current violation.

CHANGES AFTER X-RELEASE:

- ECO6753: Populate R1348 (was NO\_STUFF)
- ECO6784: Adjusted RSET Values: R927=105R; R207=110R
- ECO6989: Incorporated changes to pass EMI prescan.  
Updated various properties and added some more notes.
- ECO7119: Incorporated changes to pass EMI final scan.

ECO7152: P-RELEASE.

- ECO7284: Corrected PN discrepancies (R1310, C1680-C1683, C1677-C1679).

COMMON -- ALL  
NO\_STUFF - NOT STUFFED  
PRI\_VGA - Primary VGA Support  
PRI\_DVI - Primary DVI-D (Digital) Support  
PRI\_DVI\_I - Primary DVI-I (Digital & Analog) Support  
SEC\_DVI\_I - Secondary DVI-I (Digital & Analog) Support  
PRI\_PROT - Primary DVI-VGA protection diodes.  
SEC\_PROT - Secondary DVI-I protection diodes  
MEM128 - 128MB EXTENDED MEMORY

STEREO - USED FOR STEREO GOGGLES  
STEREOSYNC1 - USED FOR STEREO GOGGLES  
STEREOSYNC2 - USED FOR STEREO GOGGLES  
STEREOSYNCS - USED FOR STEREO SYNC BUFFERS  
SAA5 - PHILIPS ENCODER/DECODER SAA7109  
SAA2 - PHILIPS ENCODER SAA7102  
CX - CONEXANT ENCODER CX2581


PS Switchers:  
SC1565 - USED TO REGULATE 3.3VL FROM 3.3V - LINEAR  
ISL6225 - USED TO REGULATE FBVDD and VTT from 12V.  
SC1102/ISL6525CB - USED TO REGULATE NVVDD FROM 3.3V - SWITCHER

VGA-TV-DVI - Used for Primary VGA / TV / Secondary DVI  
VGA-DVI - Used for Primary VGA / Secondary DVI only  
VGA-TV - Used for Primary VGA / TV  
VGA - Used for Primary VGA only  
DVI-TV-DVI - Used for Primary DVI / TV / Secondary DVI  
DVI-DVI - Used for Primary DVI / Secondary DVI only  
DVI-TV - Used for Primary DVI / TV  
DVI - Used for Secondary DVI  
PASSIVE\_HS - Used for Passive heat sink  
FAN\_HS - Used for Fan heat Sink  
SOCKET - PARTS REMOVED WHEN USING A SOCKET

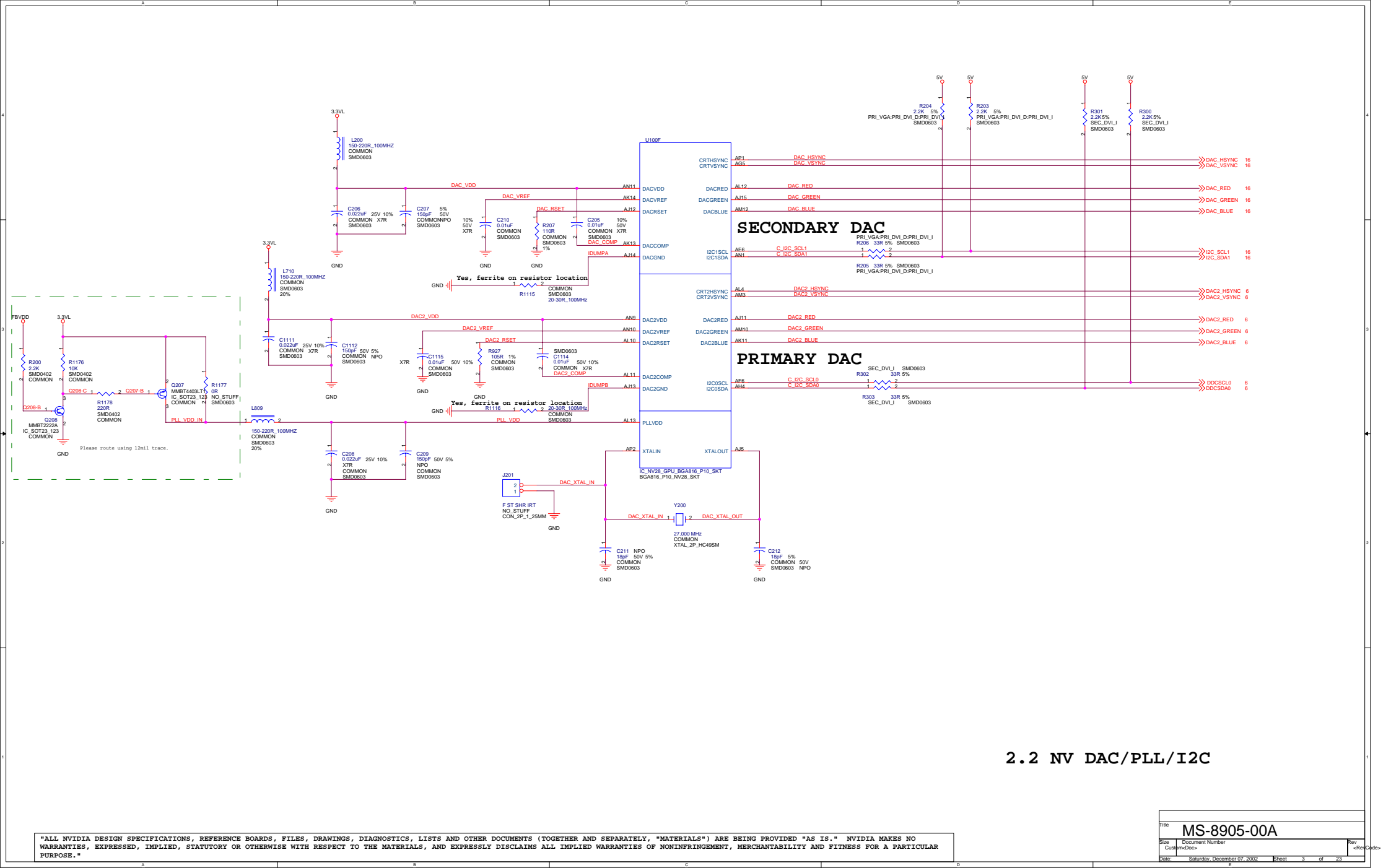
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NV28, 4MX32 BGA DDR 64/128MB, RGB, DVI-I, TV-DOWN, AGP4X

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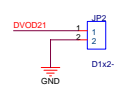


## 2.3 NV DECOUPLING

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14,15,18 DVOD[23:0] >> DVOD[23:0]  
 15 DVOD[23:0] >> DVOD[23:0]  
 14,15,18 VIP\_VID[15:0] >> VIP\_VID[15:0]



### 3.0 NV STRAP

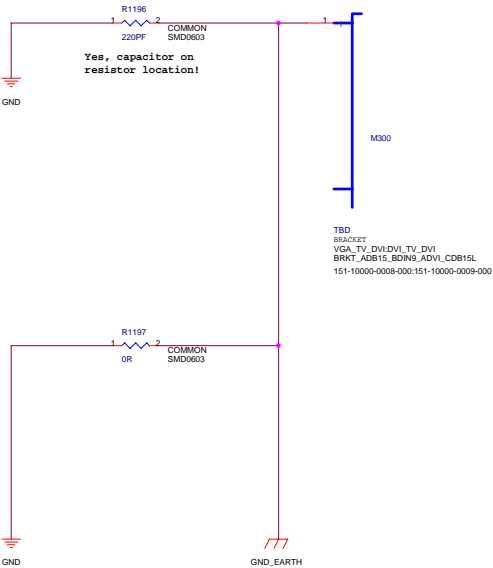
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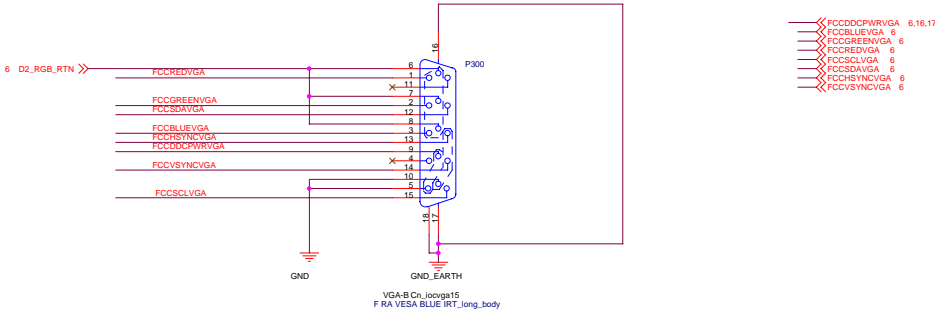




Components to connect  
digital and chassis GND.



VGA-TV-DVI - Used for Primary VGA / TV / Secondary DVI  
DVI-TV-DVI - Used for Primary DVI / TV / Secondary DVI

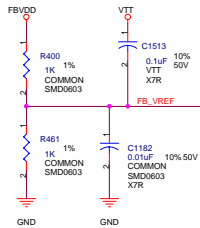


### PRIMARY DAC-LONG VGA

### 3.2 VGA CON, BRACKET

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U1000			
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FBD_DATA1	B19	FBD_DATA1	C33
FBD_DATA2	E19	FBD_DATA2	E31
FBD_DATA3	C18	FBD_DATA3	E31
FBD_DATA4	C17	FBD_DATA4	E31
FBD_DATA5	C17	FBD_DATA5	E31
FBD_DATA6	D17	FBD_DATA6	E30
FBD_DATA7	E17	FBD_DATA7	E30
FBD_DATA8	E17	FBD_DATA8	E30
FBD_DATA9	B16	FBD_DATA9	C31
FBD_DATA10	C16	FBD_DATA10	D30
FBD_DATA11	D16	FBD_DATA11	E29
FBD_DATA12	B15	FBD_DATA12	A32
FBD_DATA13	C15	FBD_DATA13	D29
FBD_DATA14	D15	FBD_DATA14	D28
FBD_DATA15	B14	FBD_DATA15	E28
FBD_DATA16	B13	FBD_DATA16	E28
FBD_DATA17	D13	FBD_DATA17	E27
FBD_DATA18	A6	FBD_DATA18	D23
FBD_DATA19	B6	FBD_DATA19	C23
FBD_DATA20	D6	FBD_DATA20	E22
FBD_DATA21	C7	FBD_DATA21	D22
FBD_DATA22	E6	FBD_DATA22	C22
FBD_DATA23	B5	FBD_DATA23	B22
FBD_DATA24	A4	FBD_DATA24	E21
FBD_DATA25	C6	FBD_DATA25	E21
FBD_DATA26	D7	FBD_DATA26	E21
FBD_DATA27	E7	FBD_DATA27	D21
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U1000C			
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FBB_DATA7	V31	FBB_DATA7	V31
FBB_DATA8	U34	FBB_DATA8	U34
FBB_DATA9	U31	FBB_DATA9	U31
FBB_DATA10	U32	FBB_DATA10	U32
FBB_DATA11	T33	FBB_DATA11	T33
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FBB_DATA24	E34	FBB_DATA24	E34
FBB_DATA25	D34	FBB_DATA25	D34
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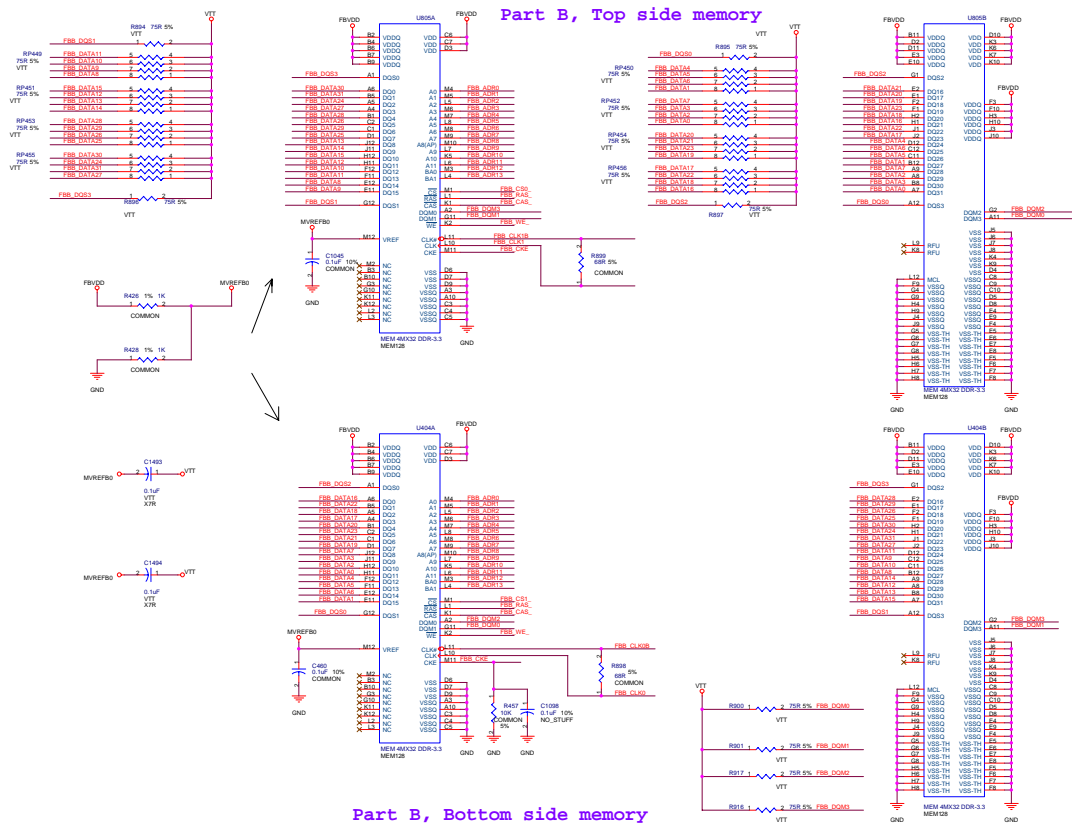
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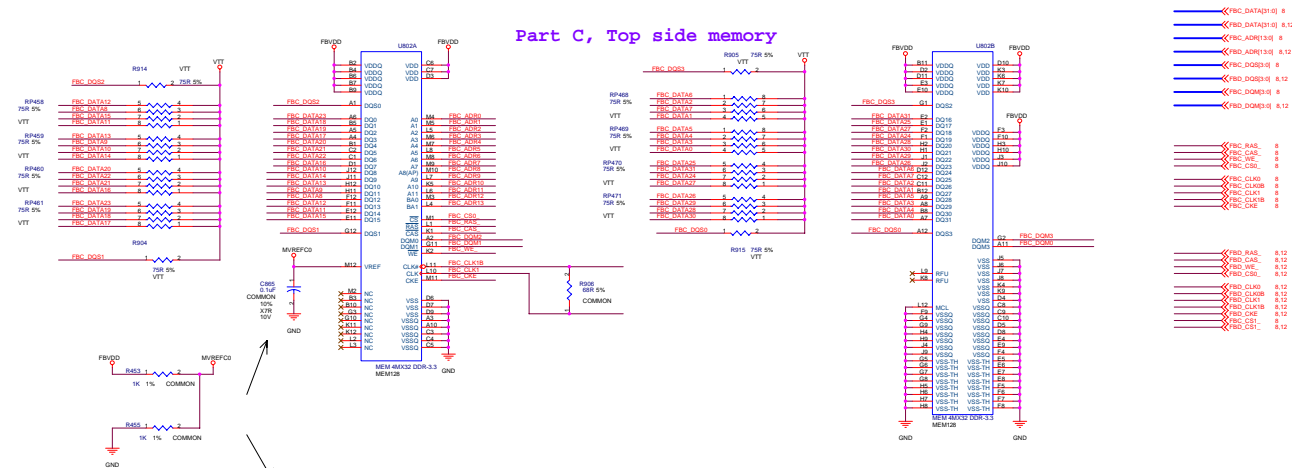




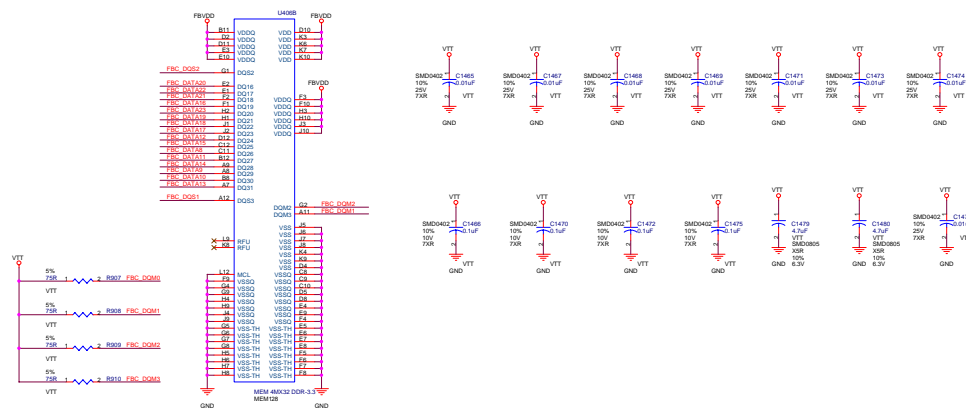
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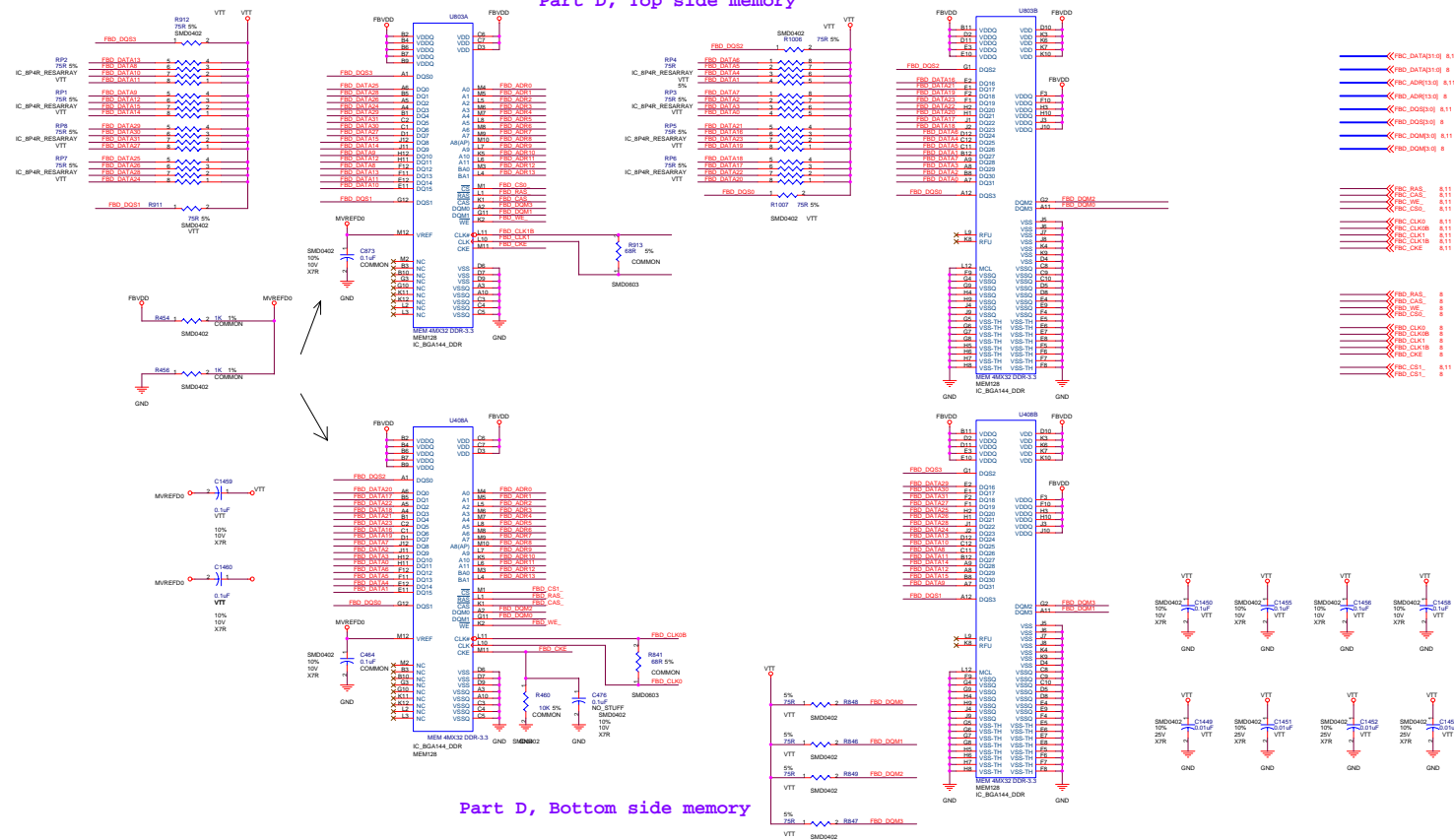


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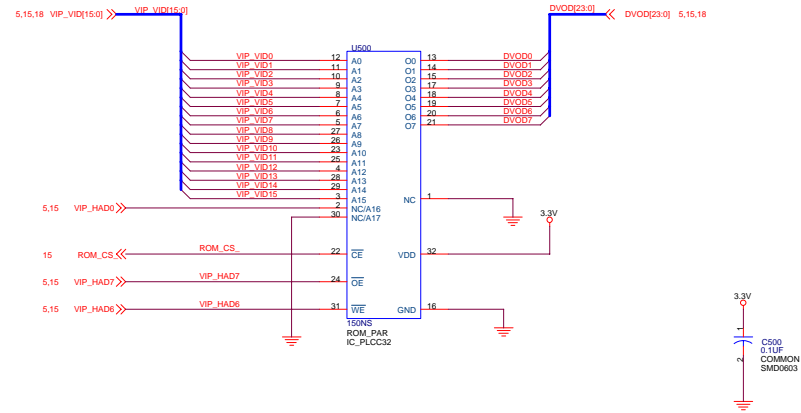
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## Part D, Bottom side memory

#### 4.5 FBD DDR 4MX32 SDRAM





5.2 S-ROM

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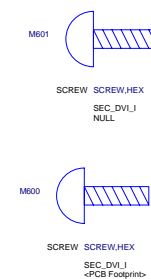
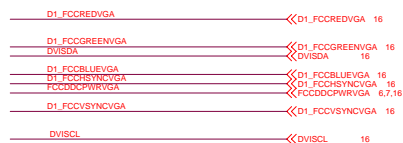




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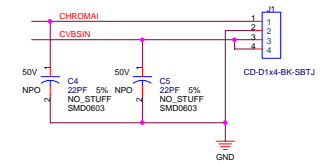
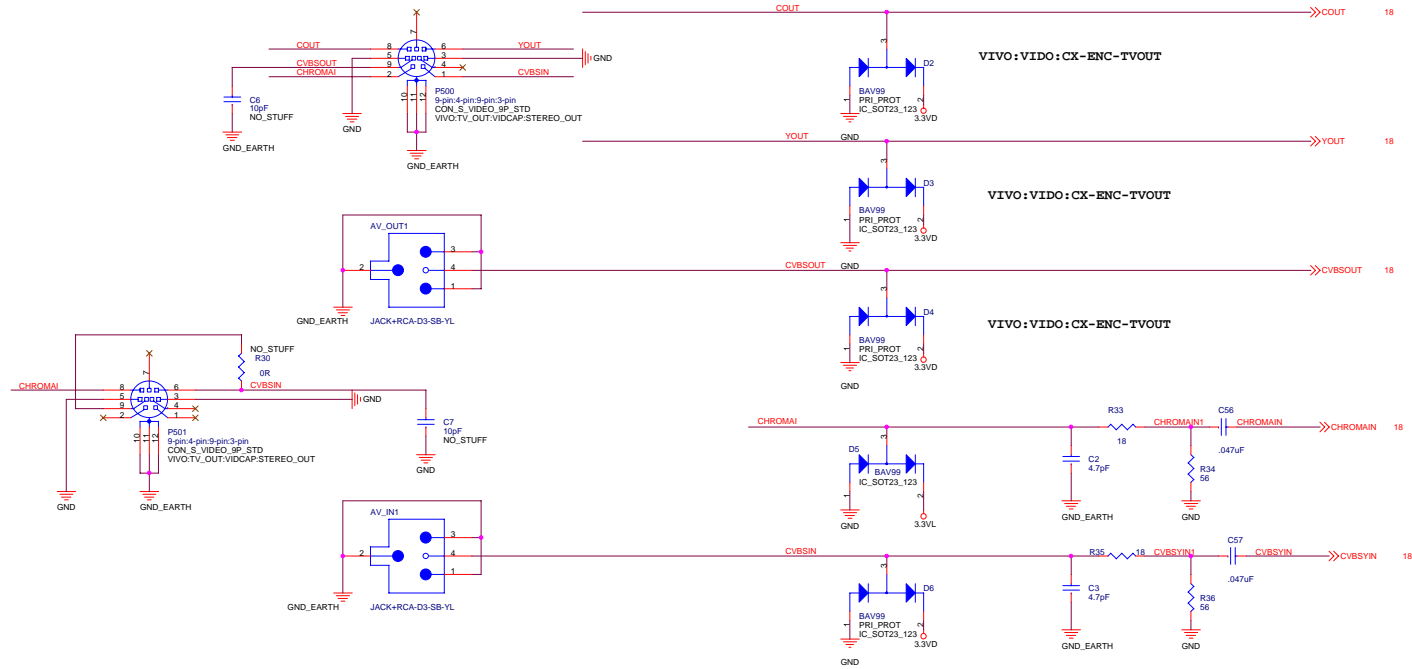
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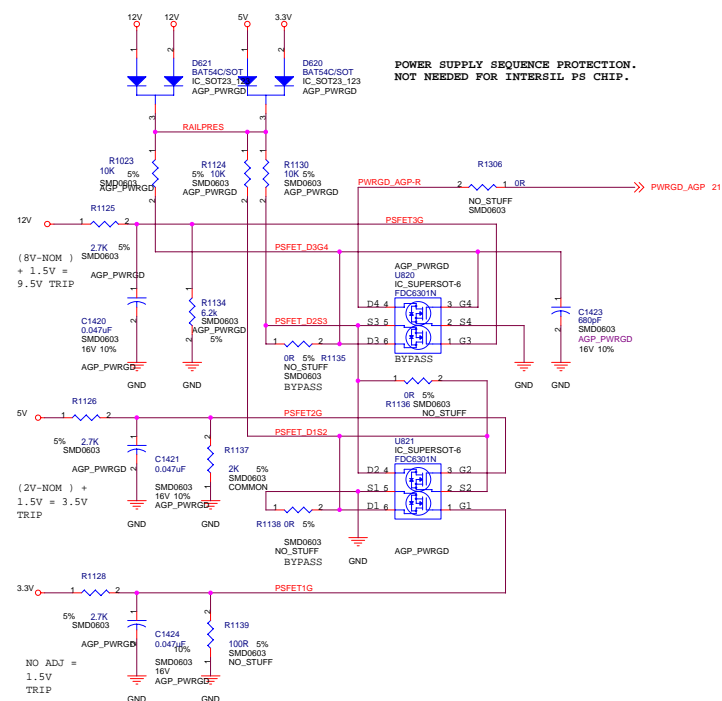
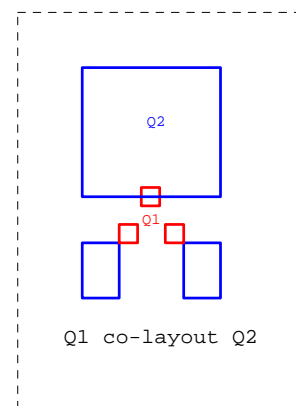
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## 5V TO 3.3V/0.5A POWER CKT



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