# V207-10

# P672: GT215-128bit, 32Mx32 GDDR5

## DL-DVI, VGA, HDMI



**V207 20 pcb change list**

Page 2：Add EC1802 for 12V input



| sku | VARIANT | NVPN | ASSEMBLY |
|---|---|---|---|
| B | BASE | 600-10672-base-100 | BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL |
| 1 | SKU0001 | 600-10672-0001-100 | GT215-450, 550/1375MHz 512MB 32Mx16 BGA170 1800MHz GDDR5 DVI-I/VGA/HDMI |
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| ASSEMBLY | BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL |
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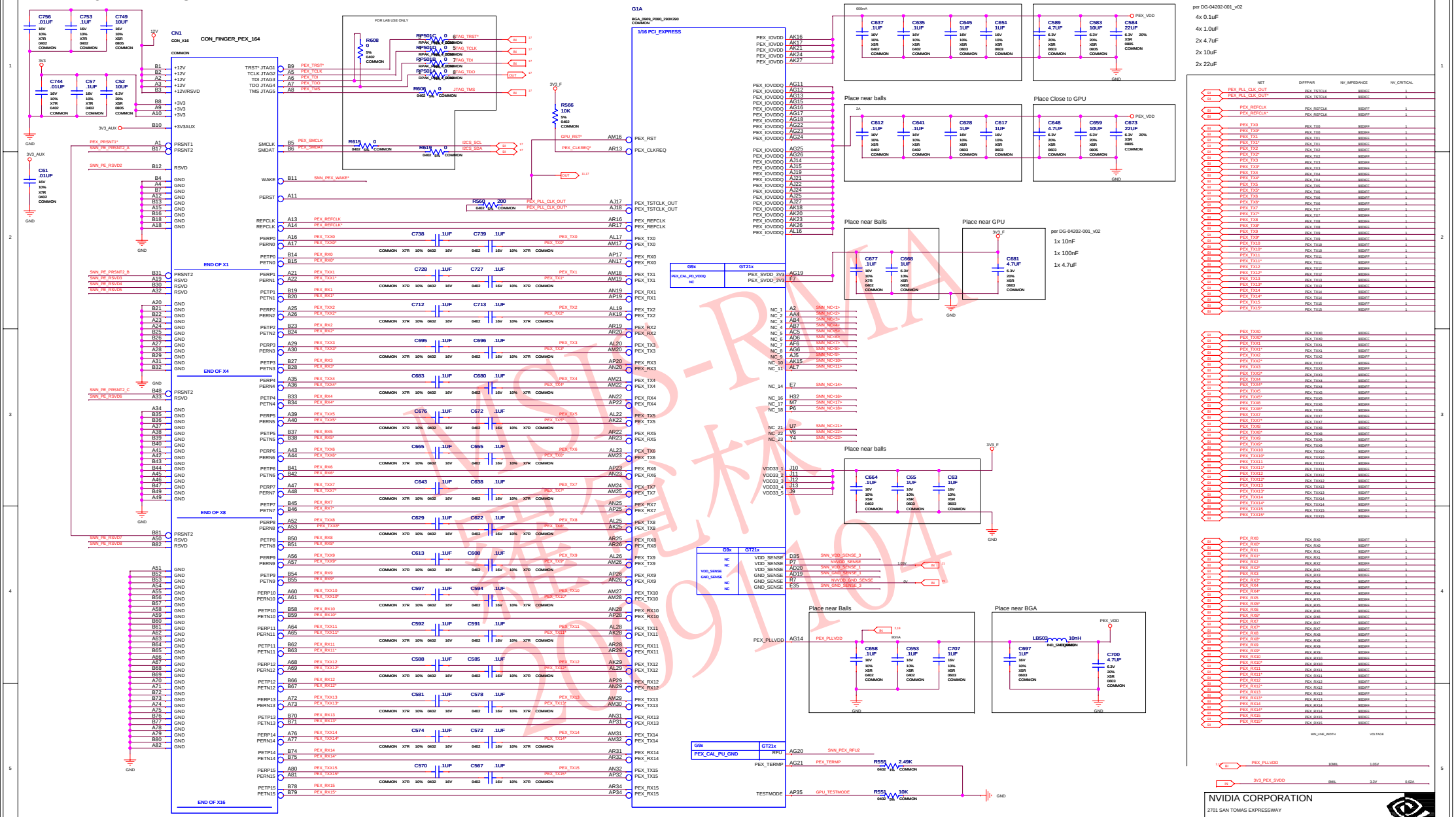
# PEX x16 INTERFACE






| | |
|---|---|
| ASSEMBLY | BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL |
| PAGE DETAIL | PCI EXPRESS INTERFACE, PEX_VDD DECOUPLING CAPS |

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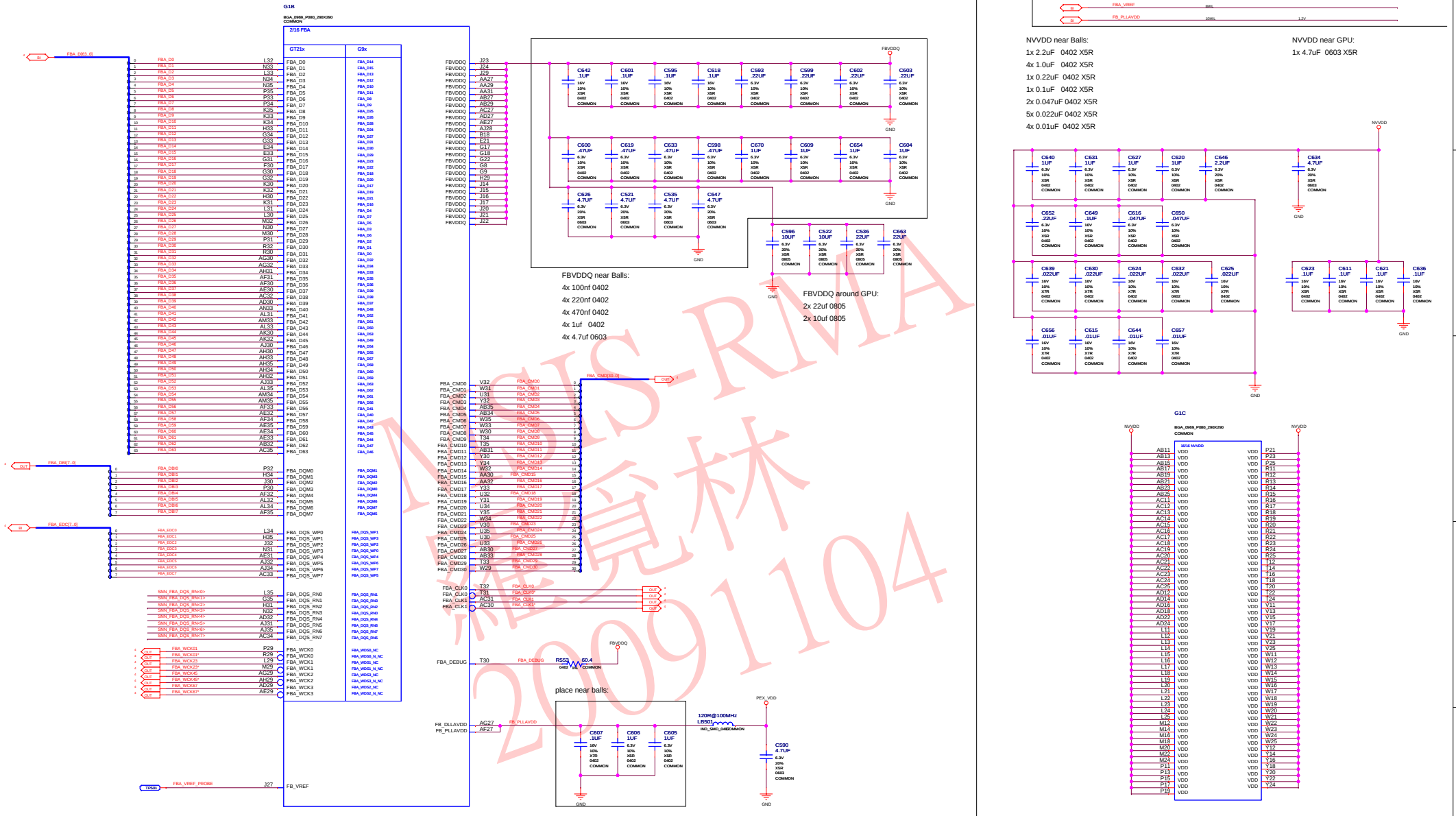
# MEMORY Partition A - GPU, FBVDD/Q & NVVDD DECOUPLING






| | |
|---|---|
| ASSEMBLY | BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL |
| PAGE DETAIL | FBA MEMORY INTERFACE, GPU NVVDD & FBVDDQ DECOUPLING CAPS |



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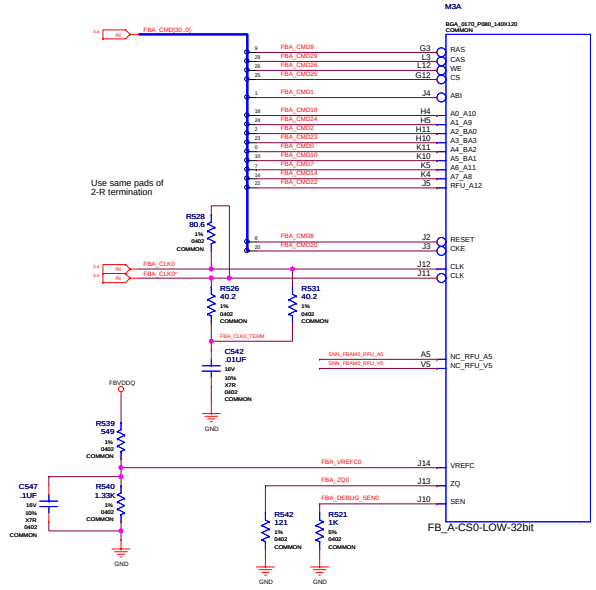
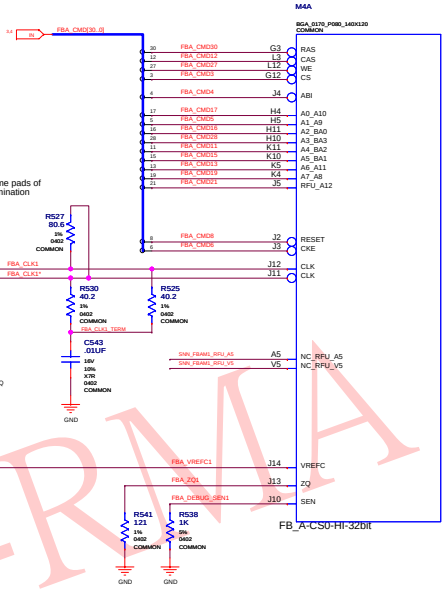
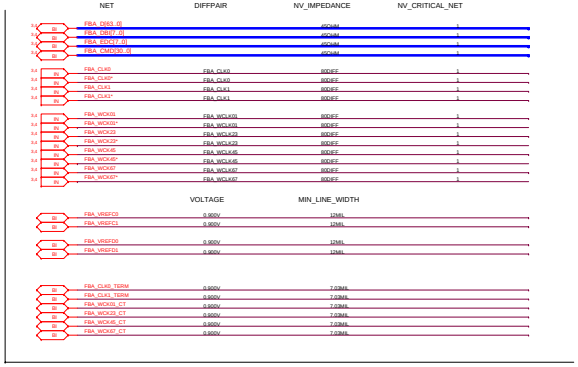
# MEMORY Partition A

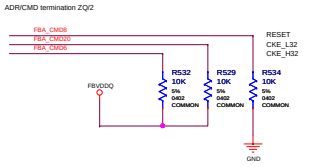



GT21x CMD MAP

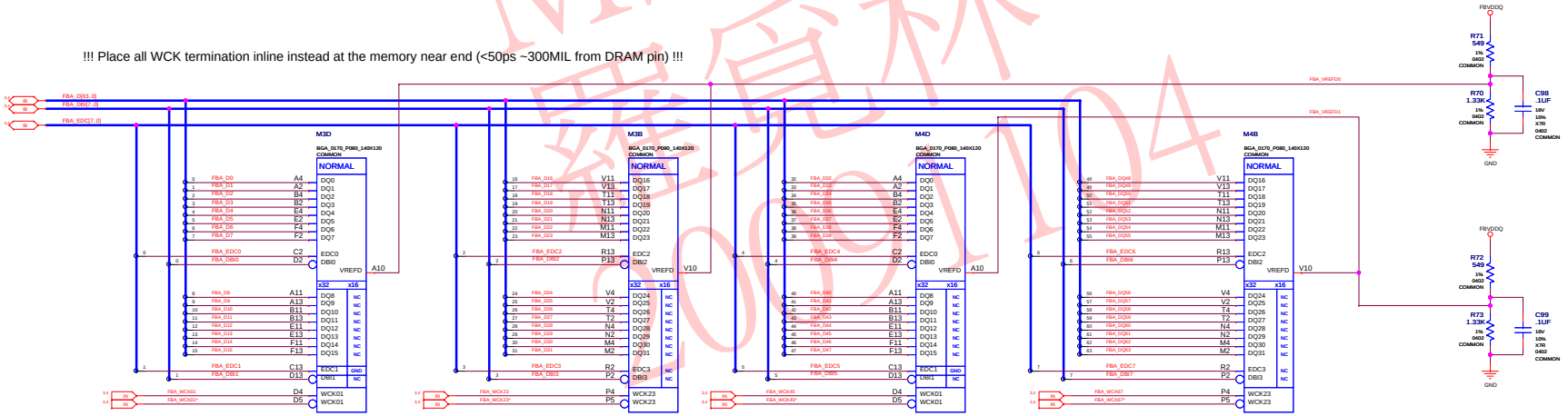
| | 0..31 | 32..63 |
|---|---|---|
| CMD0 | A4_BA2 | |
| CMD1 | ABI* | |
| CMD2 | A3_BA0 | |
| CMD3 | | CS* |
| CMD4 | | ABI* |
| CMD5 | | A1_A9 |
| CMD6 | | CKE* |
| CMD7 | A6_A11 | |
| CMD8 | RST* | RST* |
| CMD9 | RAS* | |
| CMD10 | A5_BA1 | |
| CMD11 | | A4_BA2 |
| CMD12 | | CAS* |
| CMD13 | | A6_A11 |
| CMD14 | A7_A8 | |
| CMD15 | | A5_BA1 |
| CMD16 | | A2_BA0 |
| CMD17 | | A0_A10 |
| CMD18 | A0_A10 | |
| CMD19 | | A7_A8 |
| CMD20 | CKE* | |
| CMD21 | | A12_RFU |
| CMD22 | A12_RFU | |
| CMD23 | A3_BA3 | |
| CMD24 | A1_A9 | |
| CMD25 | CS* | |
| CMD26 | WE* | |
| CMD27 | | WE* |
| CMD28 | | A3_BA3 |
| CMD29 | CAS* | |
| CMD30 | | RAS* |




!!! Place all WCK termination inline instead at the memory near end (<50ps ~300MIL from DRAM pin) !!!






| | |
|---|---|
| ASSEMBLY | BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL |
| PAGE DETAIL | FBA 32Mx32 GDDR5 MEMORIES, FBA CLK TERMS |



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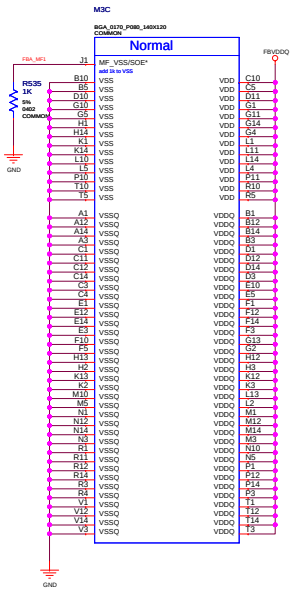
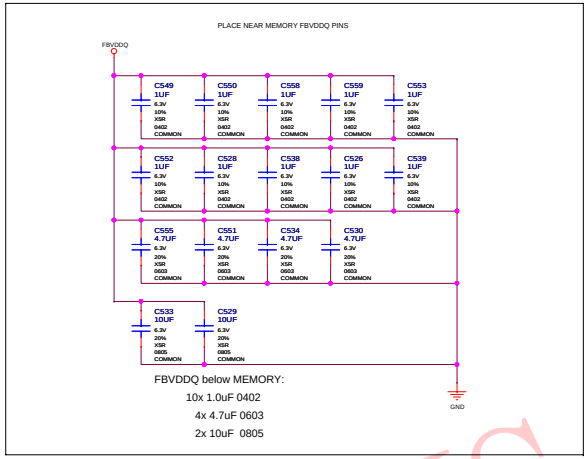
# MEMORY Partition A - Decoupling




## Decoupling for FBA 0..31



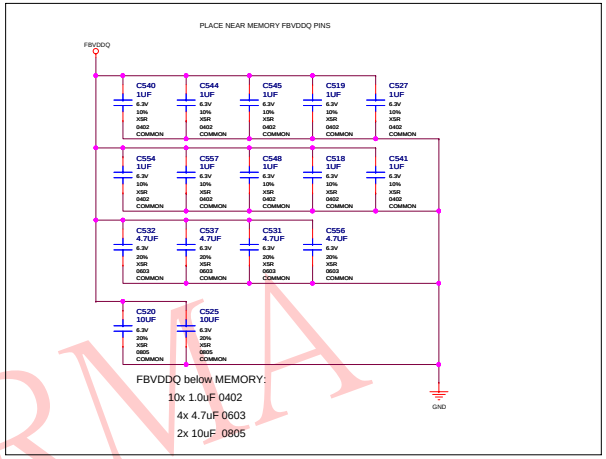

FBVDDQ below MEMORY:

10x 1.0uF 0402

4x 4.7uF 0603

2x 10uF 0805

## Decoupling for FBA 32..63

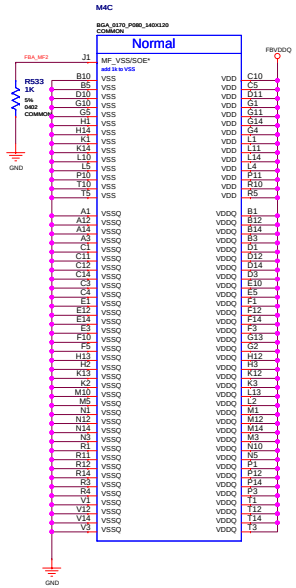



FBVDDQ below MEMORY:

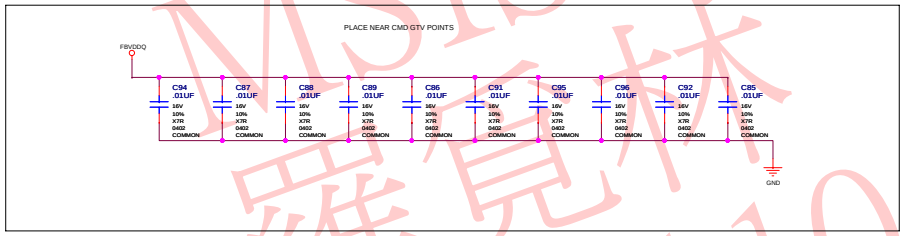
10x 1.0uF 0402

4x 4.7uF 0603

2x 10uF 0805




## Return path coupling GND/FBVDDQ for FBA






| | |
|---|---|
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| PAGE DETAIL | FBA MEMORY FBVDDQ DECOUPLING CAPS |



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# MEMORY Partition C - GPU






| | |
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| PAGE DETAIL | FBC MEMORY INTERFACE |



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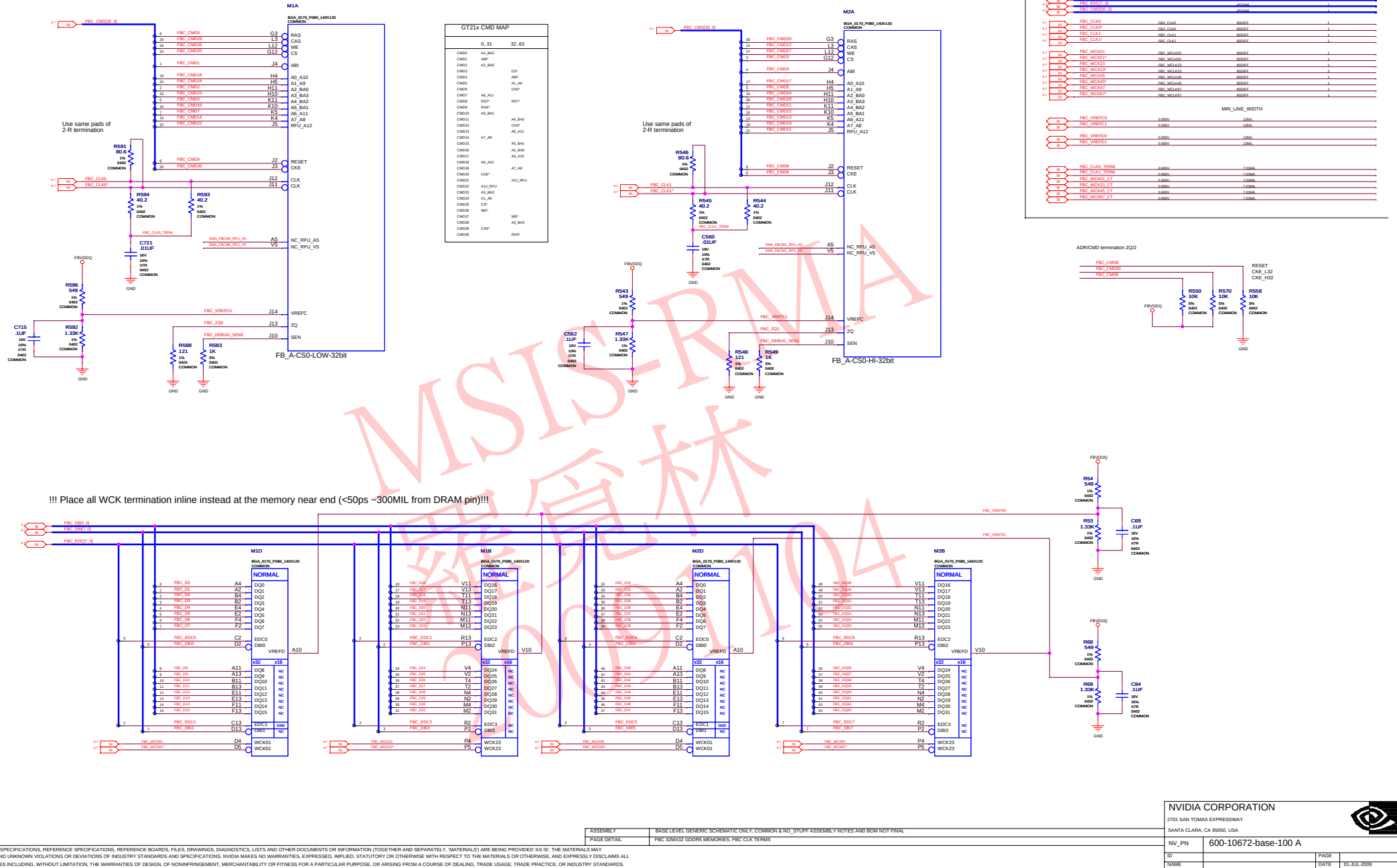
# MEMORY Partition C






| | |
|---|---|
| ASSEMBLY | BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL |
| PAGE DETAIL | FBC 32MX32 GDDR5 MEMORIES, FBC CLK TERMS |



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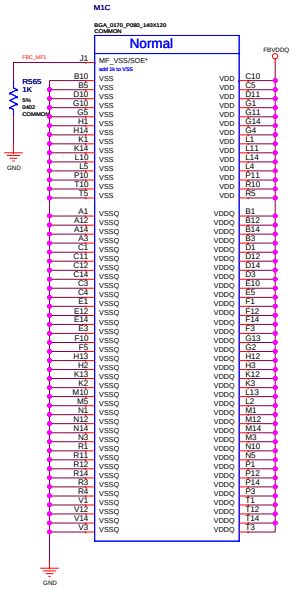
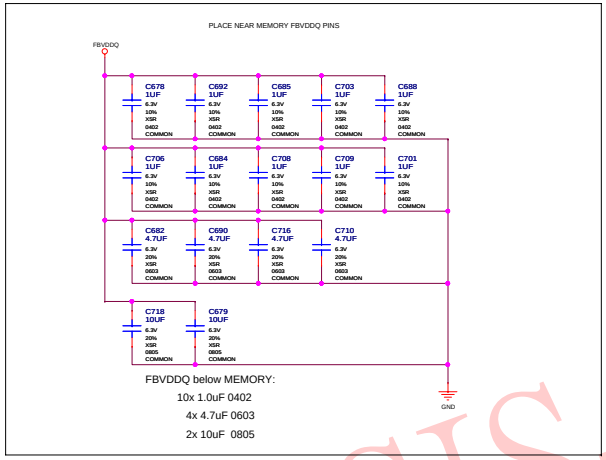
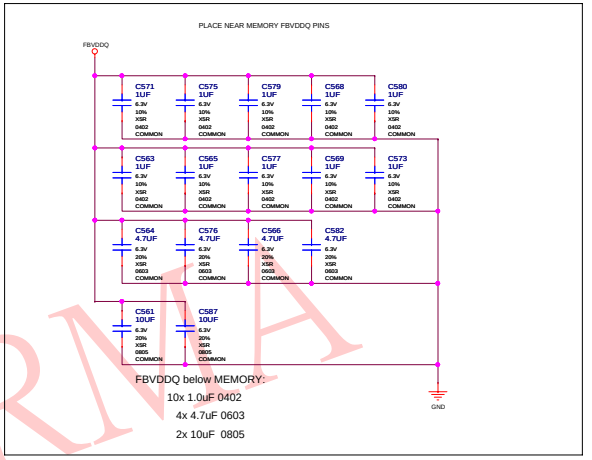
# MEMORY PARTITION C DECOUPLING

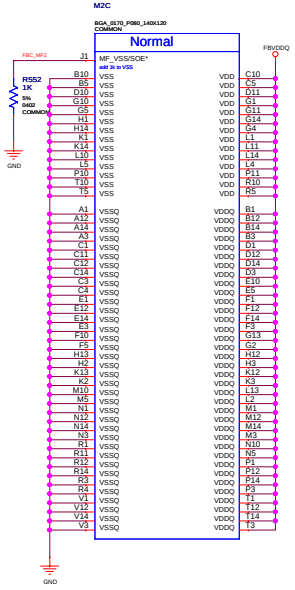



## Decoupling for FBC 0..31

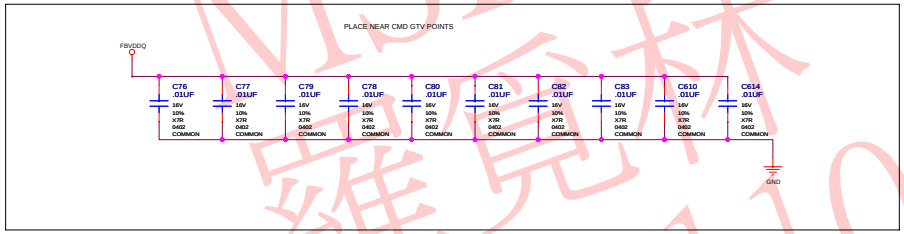



## Decoupling for FBC 32..63




## Return path coupling GND/FBVDDQ for FBC






| | |
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| ASSEMBLY | BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL |
| PAGE DETAIL | FBC MEMORY FBVDDQ DECOUPLING CAPS |



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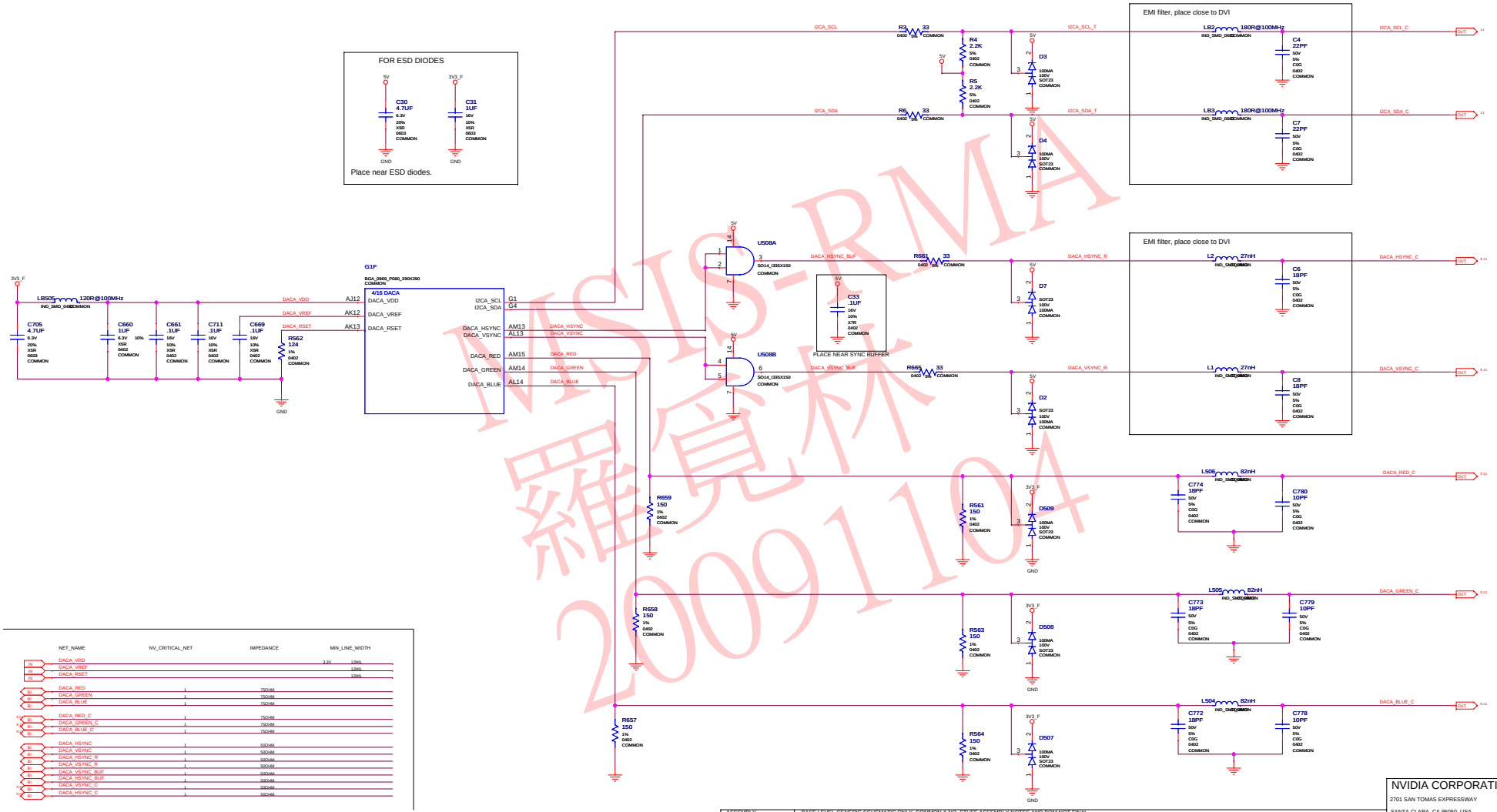
# Primary Display (DACA), DVI-I (South)

## DACA FILTER




| NET_NAME | NV_CRITICAL_NET | IMPEDANCE | MIN_LINE_WIDTH |
|---|---|---|---|
| DACA_VDD | | 3.3V | 12MIL |
| DACA_VREF | | | 12MIL |
| DACA_RSET | | | 12MIL |
| DACA_RED | 1 | 75OHM | |
| DACA_GREEN | 1 | 75OHM | |
| DACA_BLUE | 1 | 75OHM | |
| DACA_RED_C | 1 | 75OHM | |
| DACA_GREEN_C | 1 | 75OHM | |
| DACA_BLUE_C | 1 | 75OHM | |
| DACA_HSYNC | 1 | 50OHM | |
| DACA_VSYNC | 1 | 50OHM | |
| DACA_HSYNC_R | 1 | 50OHM | |
| DACA_VSYNC_R | 1 | 50OHM | |
| DACA_VSYNC_BUF | 1 | 50OHM | |
| DACA_HSYNC_BUF | 1 | 50OHM | |
| DACA_VSYNC_C | 1 | 50OHM | |
| DACA_HSYNC_C | 1 | 50OHM | |

| | |
|---|---|
| ASSEMBLY | BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL |
| PAGE DETAIL | DACA (PRIMARY DVI-I) |

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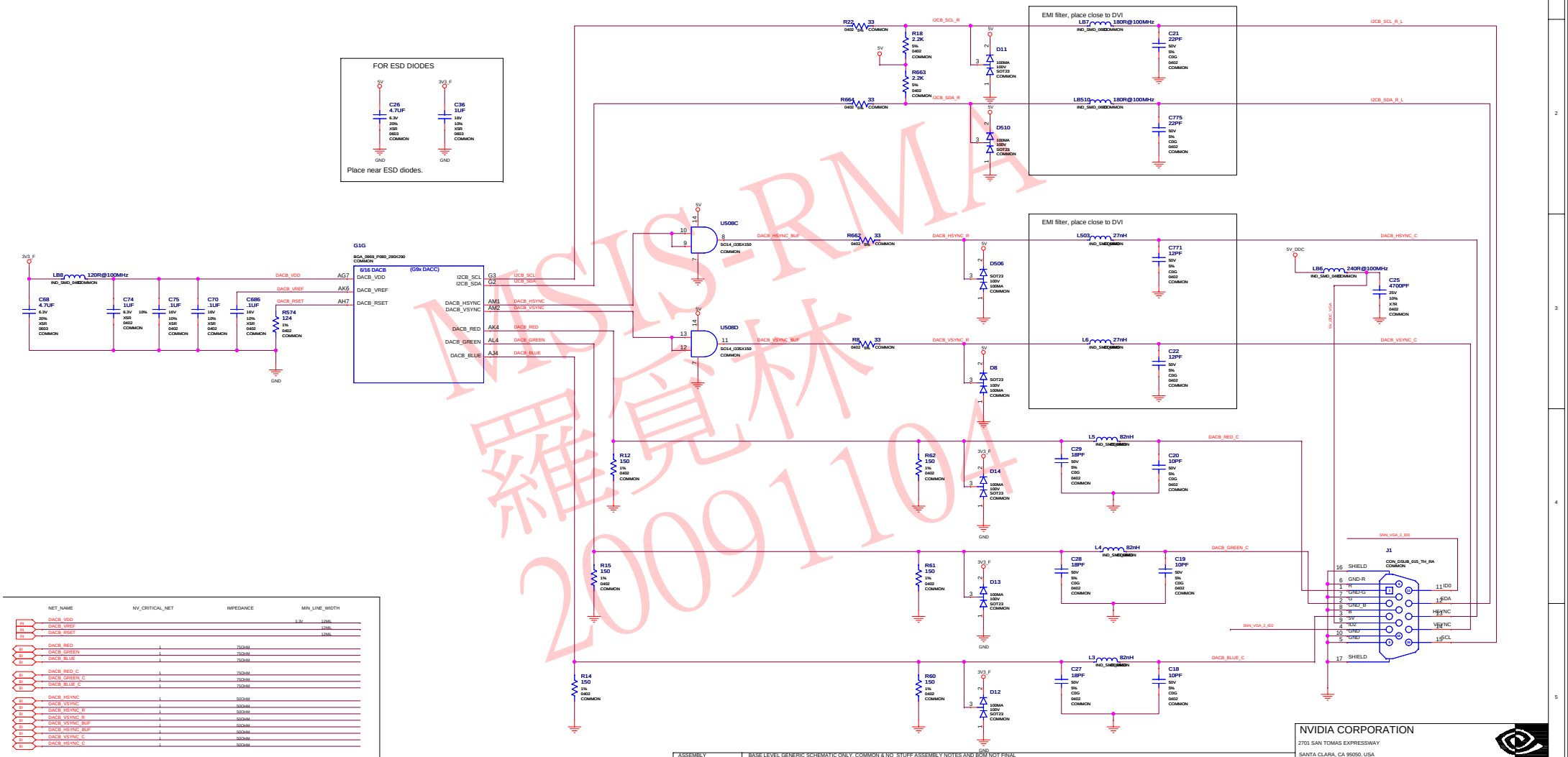
# Secondary Display (DACB), VGA (Mid)

## DACB FILTER






| NET_NAME | NV_CRITICAL_NET | IMPEDANCE | MIN_LINE_WIDTH |
|---|---|---|---|
| DACB_VDD | | 3.3V | 12MIL |
| DACB_VREF | | | 12MIL |
| DACB_RSET | | | 12MIL |
| DACB_RED | 1 | 75OHM | |
| DACB_GREEN | 1 | 75OHM | |
| DACB_BLUE | 1 | 75OHM | |
| DACB_RED_C | 1 | 75OHM | |
| DACB_GREEN_C | 1 | 75OHM | |
| DACB_BLUE_C | 1 | 75OHM | |
| DACB_HSYNC | 1 | 50OHM | |
| DACB_VSYNC | 1 | 50OHM | |
| DACB_HSYNC_R | 1 | 50OHM | |
| DACB_VSYNC_R | 1 | 50OHM | |
| DACB_VSYNC_BUF | 1 | 50OHM | |
| DACB_HSYNC_BUF | 1 | 50OHM | |
| DACB_VSYNC_C | 1 | 50OHM | |
| DACB_HSYNC_C | 1 | 50OHM | |

| | |
|---|---|
| ASSEMBLY | BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL |
| PAGE DETAIL | DACB (SECONDARY VGA) |



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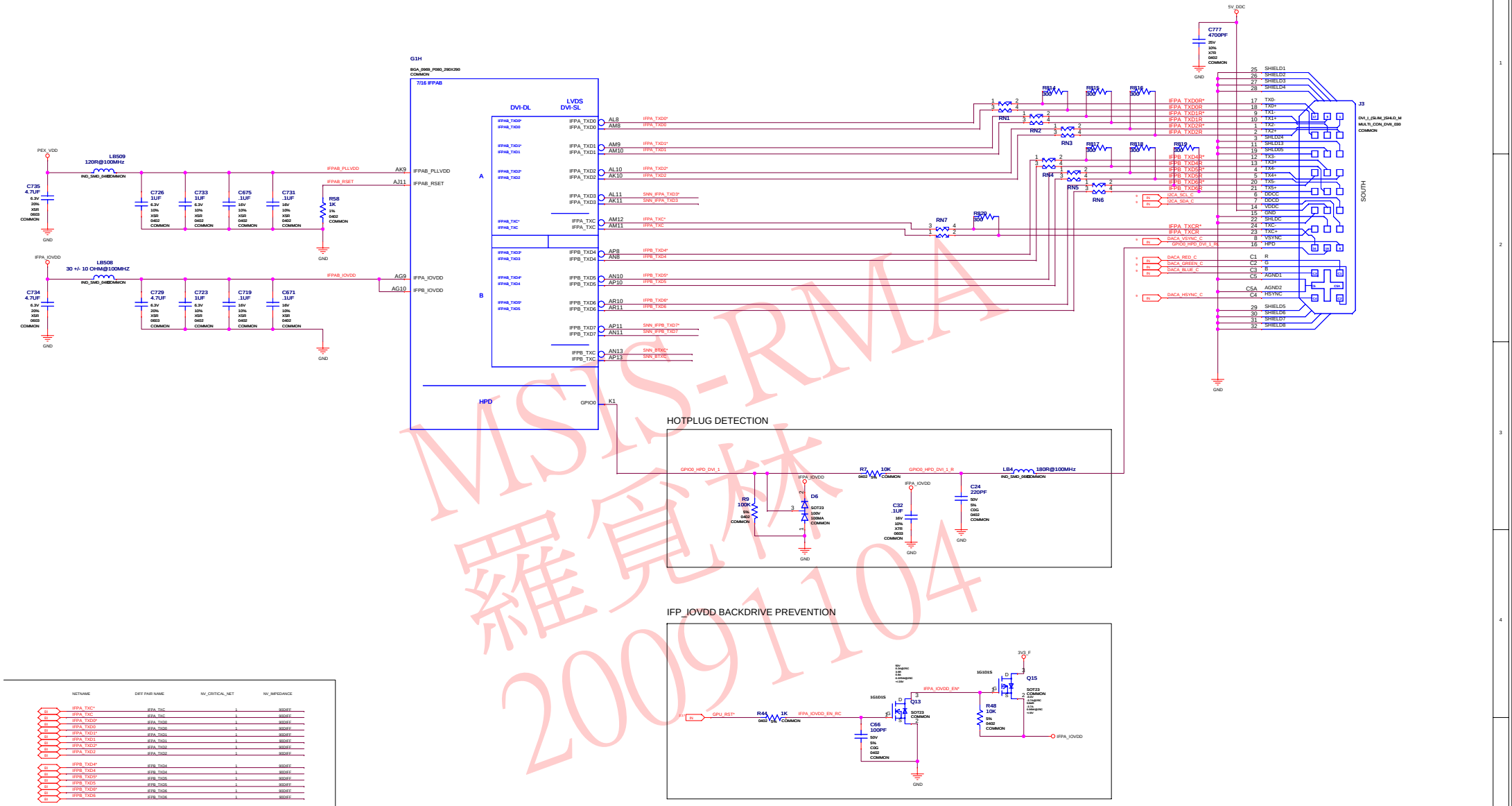
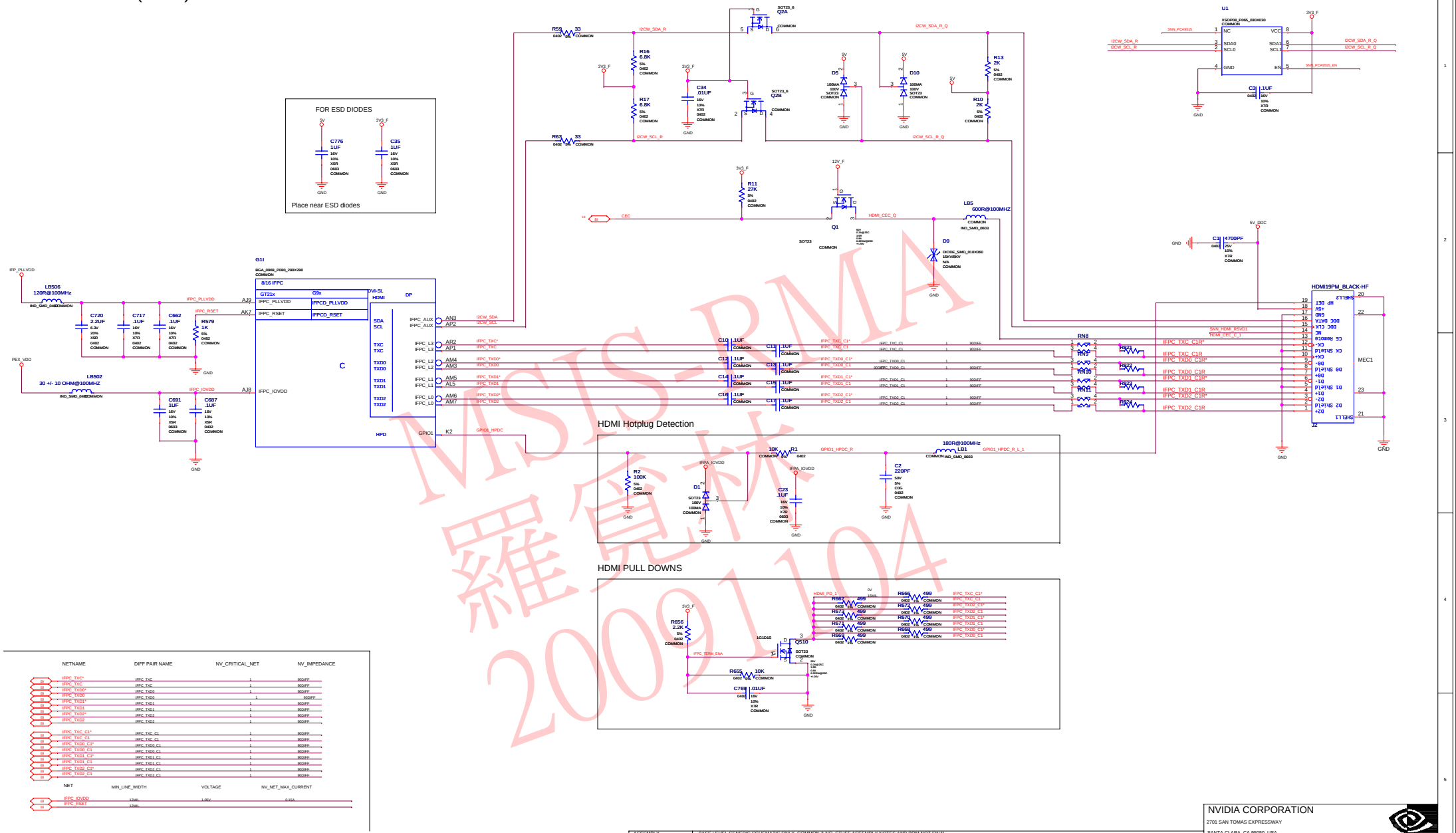
# LINK A/B: TMDS, Primary DVI-I DL (South)



# LINK C: HDMI (North)






| | |
|---|---|
| ASSEMBLY | BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL |
| PAGE DETAIL | LINK C: HDMI (NORTH) |



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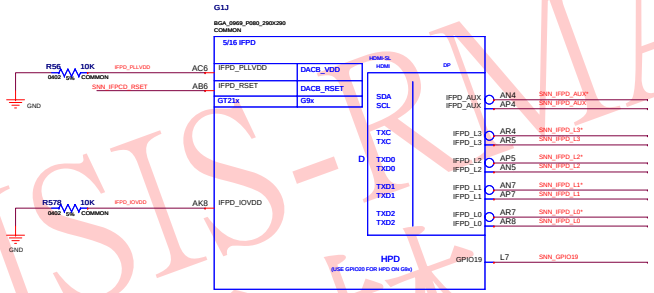
LINK D: UNUSED






| | |
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| ASSEMBLY | BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL |
| PAGE DETAIL | LINK D (UNUSED) |



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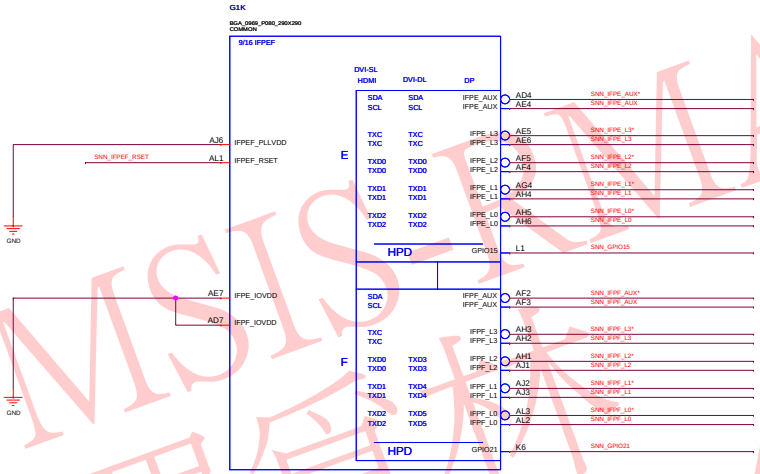
# LINK E/F: (UNUSED)



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| ASSEMBLY | BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL |
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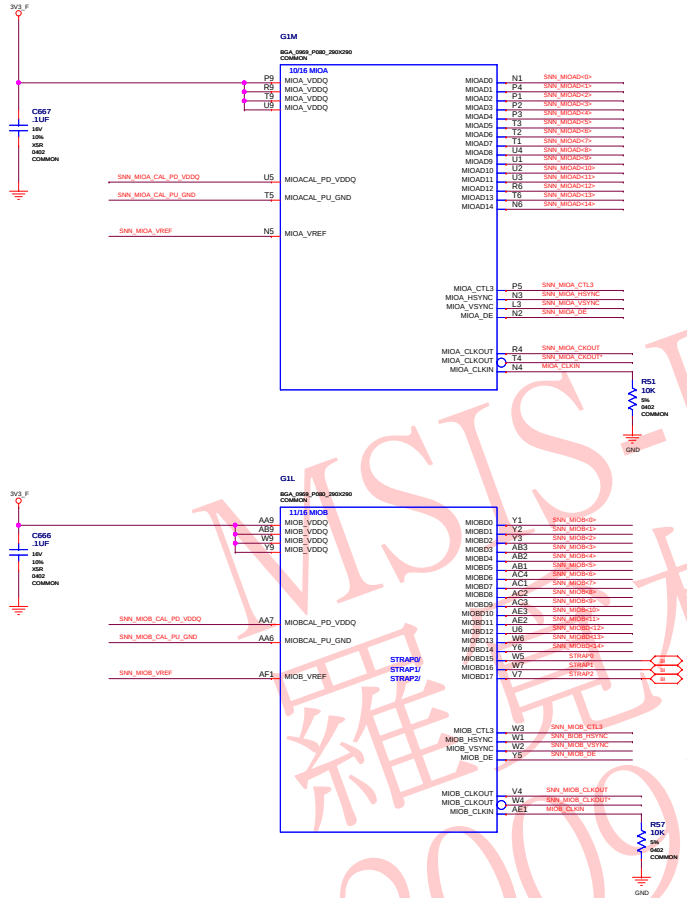
# MIOA/B UNUSED



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|---|---|
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| PAGE DETAIL | MIOA & MIOB (UNUSED) |



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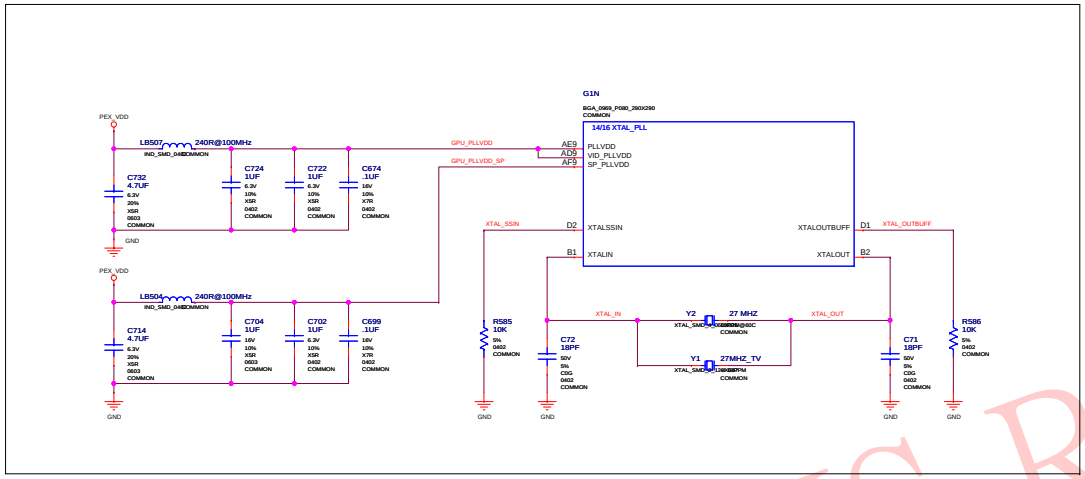
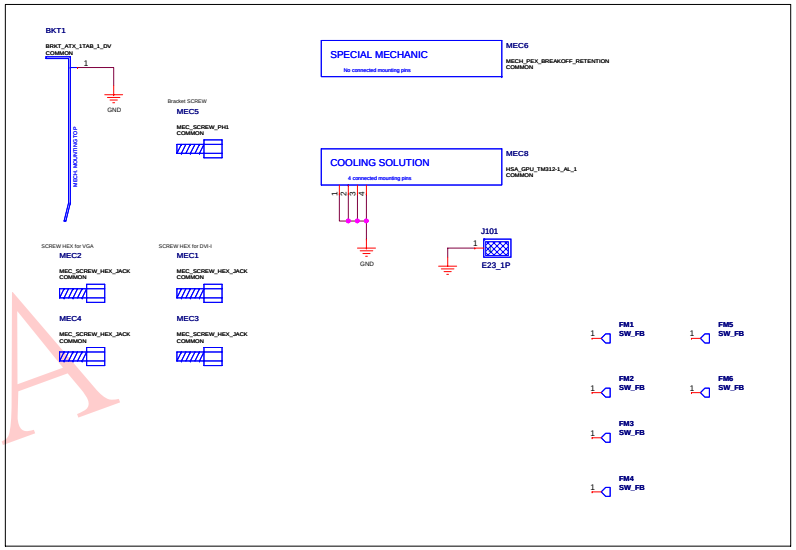
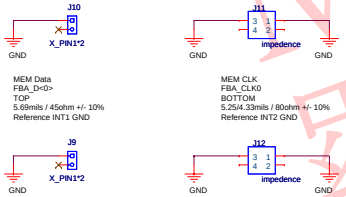
# XTAL, MECHANICALS

## XTAL/GPU_PLLVDD




## MECHANICALS & THERMALS

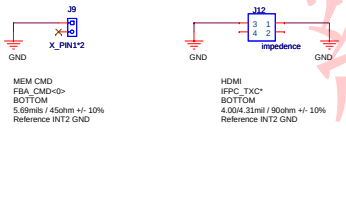



MEM Data
FBA_D<0>
TOP
5.69mils / 45ohm +/- 10%
Reference INT1 GND



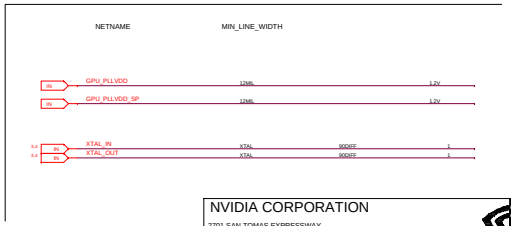

MEM CLK
FBA_CLK0
BOTTOM
5.25/4.33mils / 80ohm +/- 10%
Reference INT2 GND




MEM CMD
FBA_CMD<0>
BOTTOM
5.69mils / 45ohm +/- 10%
Reference INT2 GND




HDMI
IFPC_TXC*
BOTTOM
4.00/4.31mil / 90ohm +/- 10%
Reference INT2 GND



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|---|---|
| ASSEMBLY | BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL |
| PAGE DETAIL | XTAL, MECHANICALS, THERMALS |



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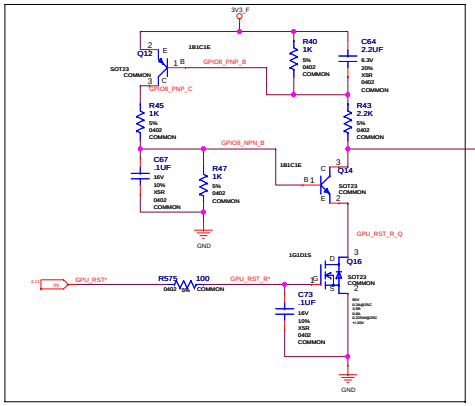
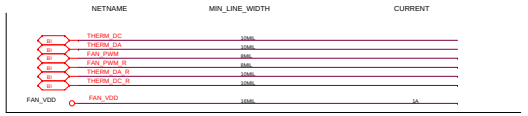
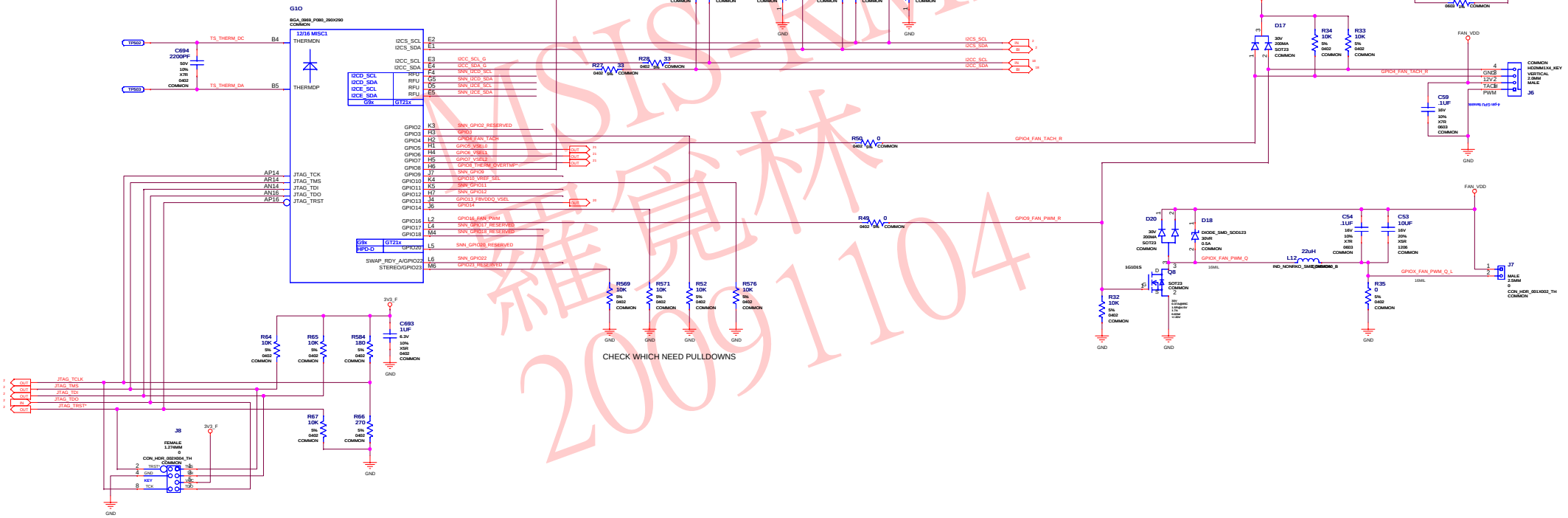
# THERM ALERT, FAN CONTROL, GPIO & JTAG

## THERM ALERT LATCH






| | |
|---|---|
| ASSEMBLY | BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL |
| PAGE DETAIL | FAN CONTROL, THERMAL ALERT, GPIO, JTAG |



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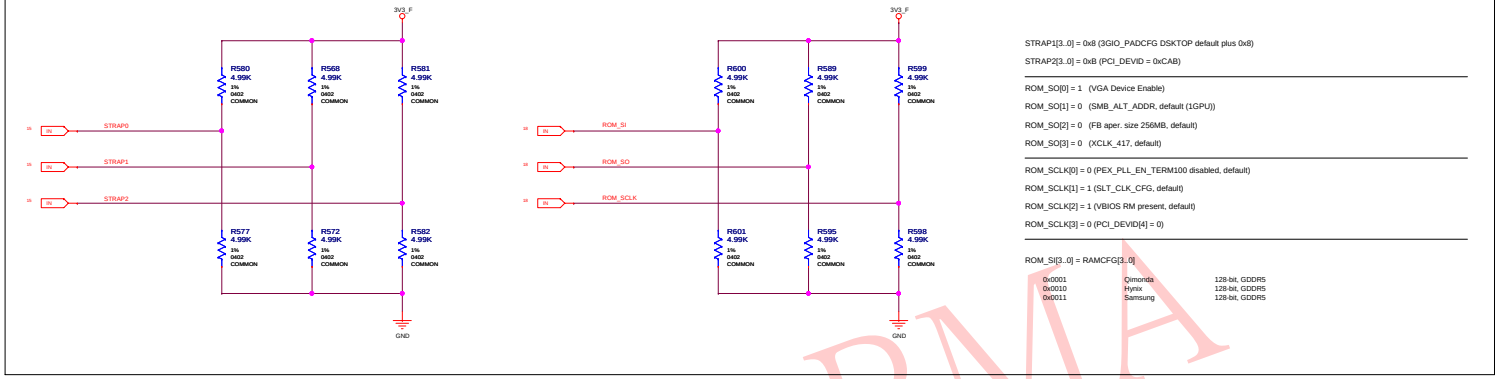
# STRAPPING, VBIOS, INFOROM

## STRAPPING OPTIONS




STRAP1[3..0] = 0x8 (3GIO_PADCFG DSKTOP default plus 0x8)

STRAP2[3..0] = 0xB (PCI_DEVID = 0xCAB)

---

ROM_SO[0] = 1 (VGA Device Enable)

ROM_SO[1] = 0 (SMB_ALT_ADDR, default (1GPU))

ROM_SO[2] = 0 (FB aper. size 256MB, default)

ROM_SO[3] = 0 (XCLK_417, default)

---

ROM_SCLK[0] = 0 (PEX_PLL_EN_TERM100 disabled, default)

ROM_SCLK[1] = 1 (SLT_CLK_CFG, default)

ROM_SCLK[2] = 1 (VBIOS RM present, default)

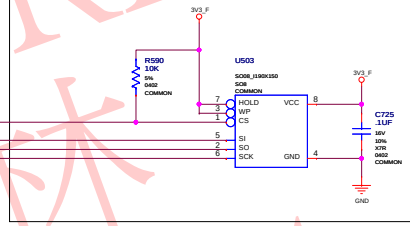
ROM_SCLK[3] = 0 (PCI_DEVID[4] = 0)

---

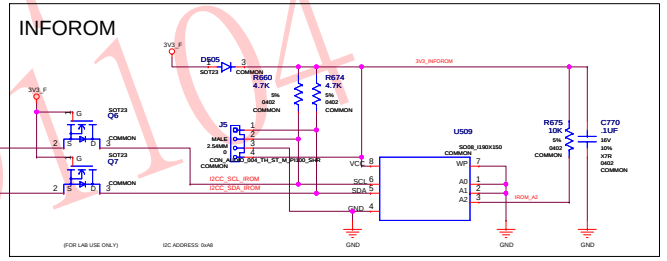
ROM_SI[3..0] = RAMCFG[3..0]

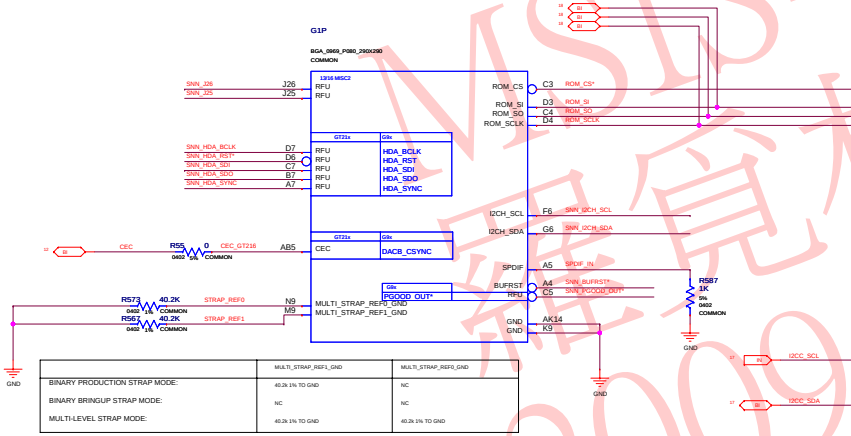
| | | |
|---|---|---|
| 0x0001 | Qimonda | 128-bit, GDDR5 |
| 0x0010 | Hynix | 128-bit, GDDR5 |
| 0x0011 | Samsung | 128-bit, GDDR5 |

## BIOS ROM(serial)




## INFOROM




| | MULTI_STRAP_REF1_GND | MULTI_STRAP_REF0_GND |
|---|---|---|
| BINARY PRODUCTION STRAP MODE: | 40.2k 1% TO GND | NC |
| BINARY BRINGUP STRAP MODE: | NC | NC |
| MULTI-LEVEL STRAP MODE: | 40.2k 1% TO GND | 40.2k 1% TO GND |



| | |
|---|---|
| ASSEMBLY | BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL |
| PAGE DETAIL | VBIOS ROM, INFOROM, STRAPPING OPTIONS |



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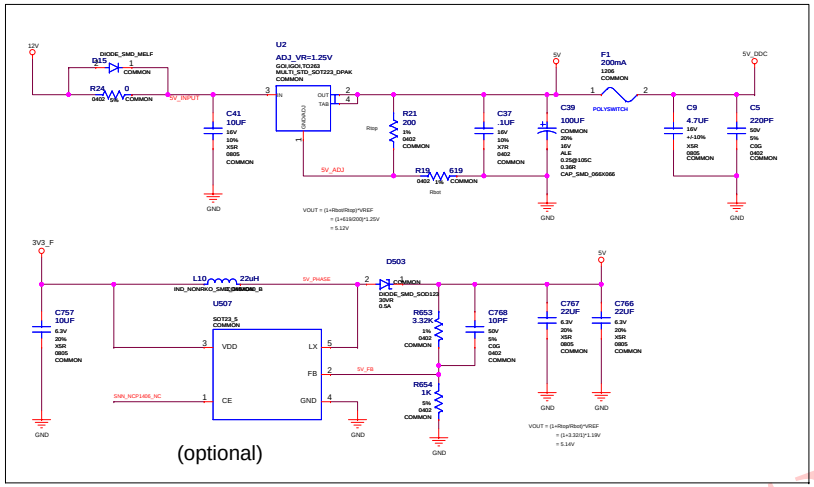
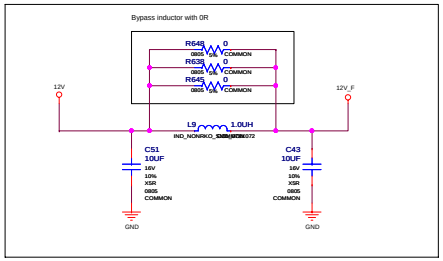
# POWER SUPPLY: 5V, 5V_DDC, 1V8, INPUT FILTER

## 5V REGULATOR

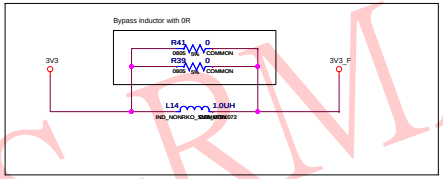



## 5V DDC

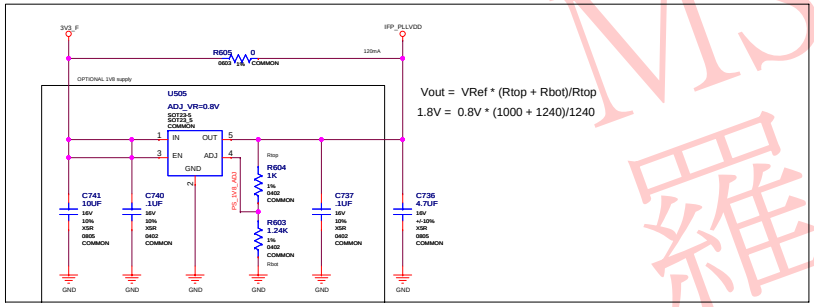
## 12V filter



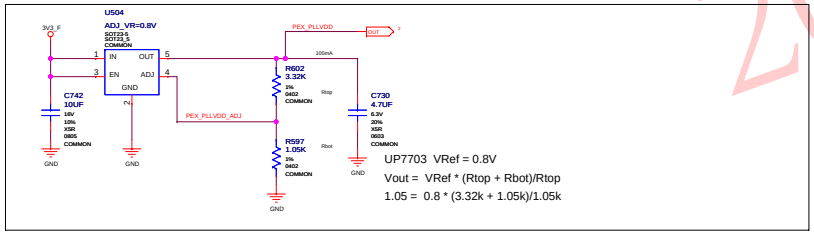

## 3.3V filter




## IFPCEF PLLVDD supply




## PEX_PLLVDD (optional)




| NETNAME | MAX_CURRENT | MIN_LINE_WIDTH | VOLTAGE |
|---|---|---|---|
| 5V_FUSED | 0.1A | 12MIL | 5V |
| 5V_INPUT | 0.2A | 12MIL | 5V |
| PS_1V8_ADJ | | 10MIL | 1.8V |
| IFPA_IOVDD | 0.3A | 12MIL | 3.2V |
| 12V | 6A | 20MIL | 12V |
| 12V_F | 6A | 20MIL | 12V |
| 3V3 | 3A | 12MIL | 3.2V |
| 3V3_F | 4A | 20MIL | 3.3V |
| 5V | 0.3A | 12MIL | 5V |
| 5V_DDC | 0.1A | 12MIL | 5V |
| GND | | 10MIL | 0V |



| | |
|---|---|
| ASSEMBLY | BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL |
| PAGE DETAIL | 5V, DDC5V, IFP PLLVDD, IFP IOVDD, 3V3 FILTER, 12V FILTER |



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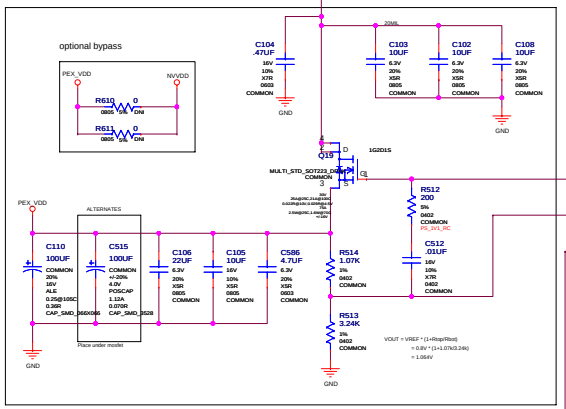
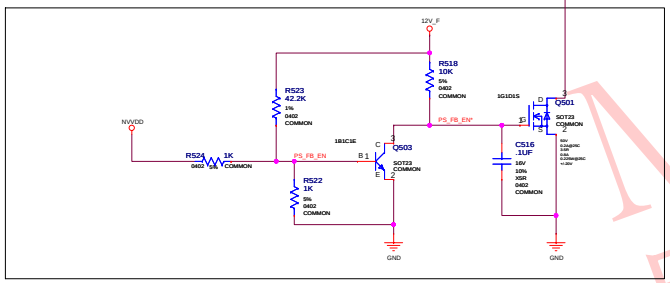
# POWER SUPPLY: FBVDDQ, PEX_VDD

FBVDDQ Power Supply 1.35-1.50V@15A

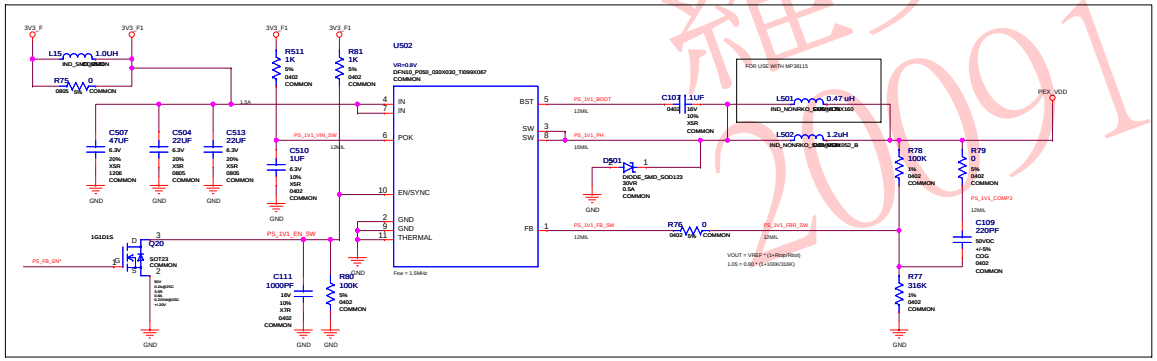
## PEXVDD LINEAR




## PEXVDD GATING




## PEXVDD SWITCHING VR




Irms = 5.3A @ 1.5V / 15A (1.0uH)

FBVDDQ = 1.5V / 15A

FBVDDQ = VREF * (1 + (Rtop / Rbot))
1.358V = 0.8V * (1 + (698 / 1K))

FBVDDQ = VREF * (1 + (Rtop / Rbot ll Rbot1))
1.548V = 0.8V * (1 + (698 / (1K ll 2.94K))

| GPIO13 | |
|---|---|
| FBVDDQ = 1.35V | 0 |
| FBVDDQ = 1.55V | 1 |

| NET | MIN_LINE_WIDTH | VOLTAGE | NV_NET_MAX_CURRENT |
|---|---|---|---|
| NVVDD | 20MIL | 1.0V | 40A |
| FBVDDQ | 20MIL | 1.5V | 15A |
| PEX_VDD | 20MIL | 1.05V | 3A |



| | |
|---|---|
| ASSEMBLY | BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL |
| PAGE DETAIL | FBVDDQ SINGLE PHASE SWITCHER, PEX_VDD LINEAR |



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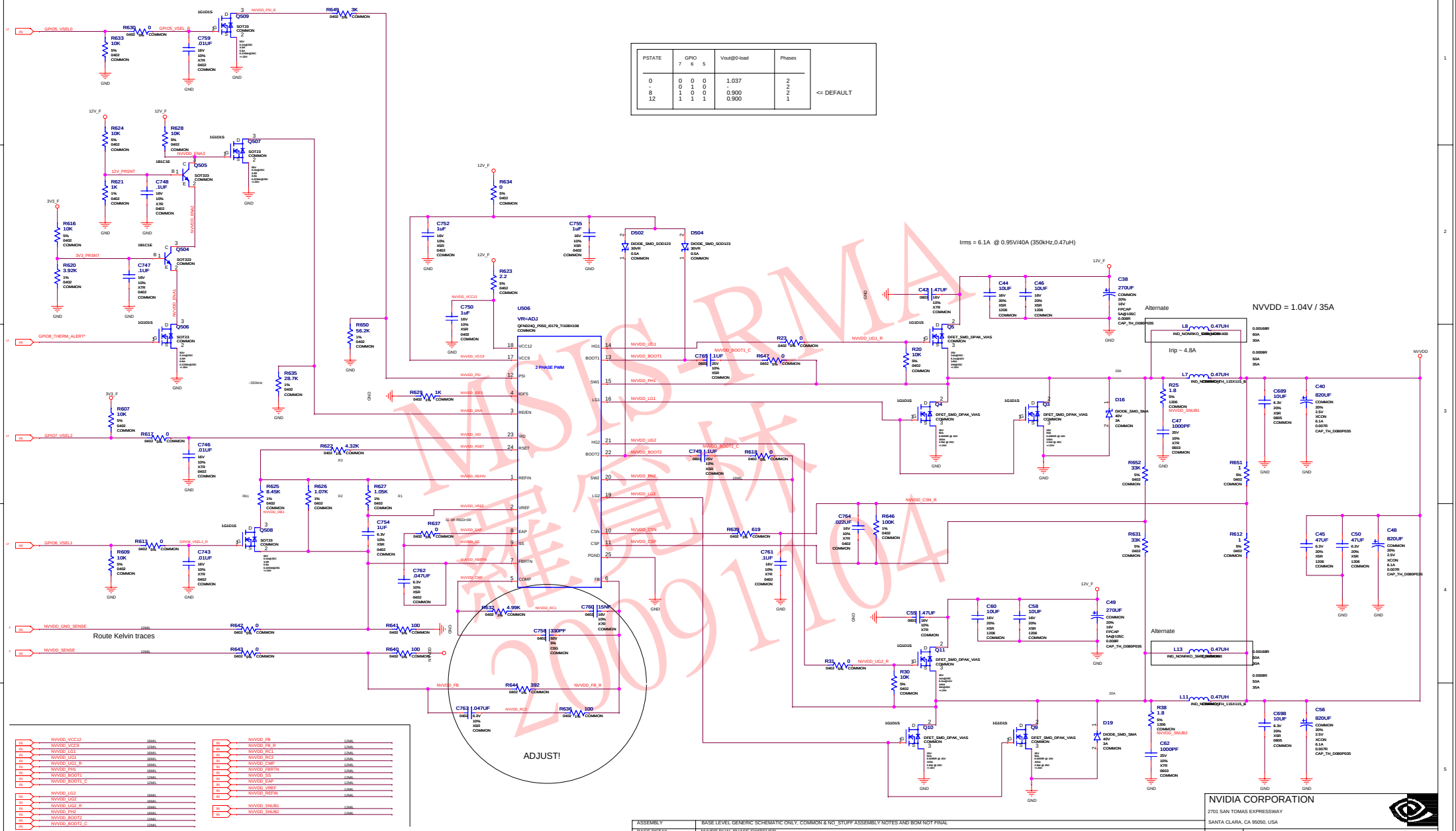
# POWER SUPPLY: NVVDD DUAL-PHASE SWITCHER

NVVDD Power Supply 35A@1.04V

| PSTATE | GPIO 7 6 5 | Vout@0-load | Phases | |
|---|---|---|---|---|
| 0 | 0 0 0 | 1.037 | 2 | |
| - | 0 1 0 | - | 2 | |
| 8 | 1 0 0 | 0.900 | 2 | |
| 12 | 1 1 1 | 0.900 | 1 | <= DEFAULT |



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|---|---|
| ASSEMBLY | BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL |
| PAGE DETAIL | NVVDD DUAL PHASE SWITCHER |




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