P727-A01: G96, GB1-128, GDDR3, DL-DVI, DL-DVI/VGA, SD/HDTV

# V129-122

PAGE SUMMARY:



## REV 1.2 HISTORY

04/01

PAGE 12.Remove J1 Slim-DSUB connector

PAGE 15.Add R761 and R762 to reserve pull down DP AUX
Change F503 and F504 footprint to 1812 size
Remove DP J8 Pin25,Pin26

PAGE 18.Change U514~U517 to EM1~EM6

PAGE 19.Add 2pin Fan control circuit

PAGE 23.Add C120,C149 10uF 1206 footprint to reserve PEX_VDD power

04/08

PAGE 22. Add R92 0805 0ohm Resistor for 3V3 bypass to 2V5 power

## REV 1.21 HISTORY

06/04

PAGE 20.Add R774 10K pull down resistor for HDA issue

## REV 1.22 HISTORY

07/16

PAGE 22. Reverse Diode at 5V regulator input side to prevent Leakage to 12V

PAGE 22. Reverse CAP SOLID for A2V5



| sku | VARIANT | NVPN | ASSEMBLY |
|---|---|---|---|
| B | BASE | 600-10727-base-sch | BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL |
| 1 | SKU0000 | 600-10727-0000-100 | G96-400, 625/800MHz 256MB 16Mx32 GDDR3, DVI DVI HDTV-Out |
| 2 | SKU0001 | 600-10727-0001-100 | G96-300, 550/800MHz 256MB 16Mx32 GDDR3, DVI DVI HDTV-Out |
| 3 | SKU0002 | 600-10727-0002-100 | G96-300, 550/800Mhz 256MB 16Mx32 GDDR3, DVI DVI |
| 4 | <UNDEFINED> | <UNDEFINED> | <UNDEFINED> |
| 5 | <UNDEFINED> | <UNDEFINED> | <UNDEFINED> |
| 6 | <UNDEFINED> | <UNDEFINED> | <UNDEFINED> |
| 7 | <UNDEFINED> | <UNDEFINED> | <UNDEFINED> |
| 8 | <UNDEFINED> | <UNDEFINED> | <UNDEFINED> |
| 9 | <UNDEFINED> | <UNDEFINED> | <UNDEFINED> |
| 10 | <UNDEFINED> | <UNDEFINED> | <UNDEFINED> |
| 11 | <UNDEFINED> | <UNDEFINED> | <UNDEFINED> |
| 12 | <UNDEFINED> | <UNDEFINED> | <UNDEFINED> |
| 13 | <UNDEFINED> | <UNDEFINED> | <UNDEFINED> |
| 14 | <UNDEFINED> | <UNDEFINED> | <UNDEFINED> |
| 15 | <UNDEFINED> | <UNDEFINED> | <UNDEFINED> |

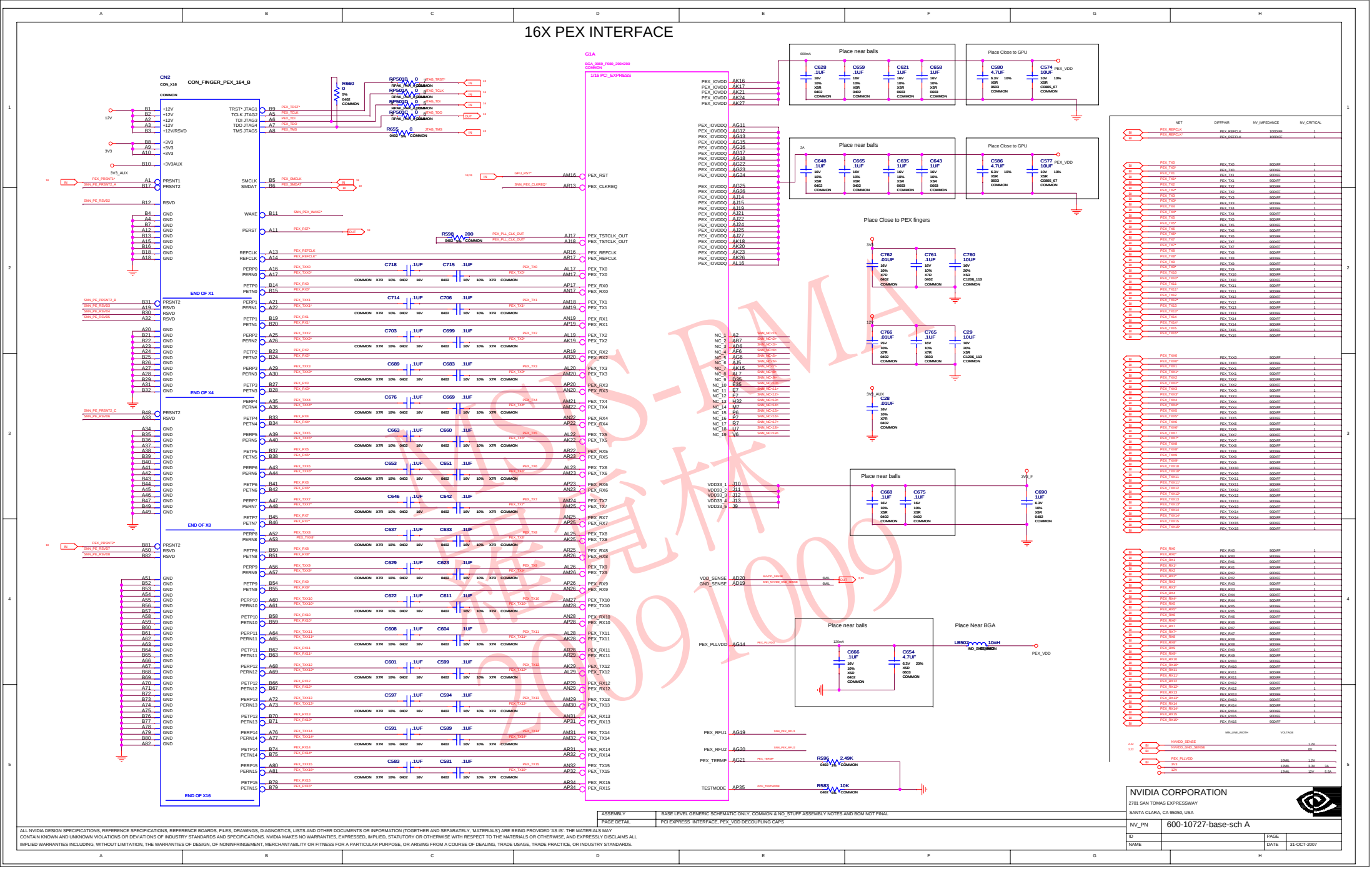
| | |
|---|---|
| ASSEMBLY | BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL |
| PAGE DETAIL | TABLE OF CONTENTS |




NVIDIA CORPORATION
2701 SAN TOMAS EXPRESSWAY
SANTA CLARA, CA 95050, USA


| | | | |
|---|---|---|---|
| NV_PN | 600-10727-base-sch A | | |
| ID | | PAGE | |
| NAME | | DATE | 31-OCT-2007 |

# 16X PEX INTERFACE

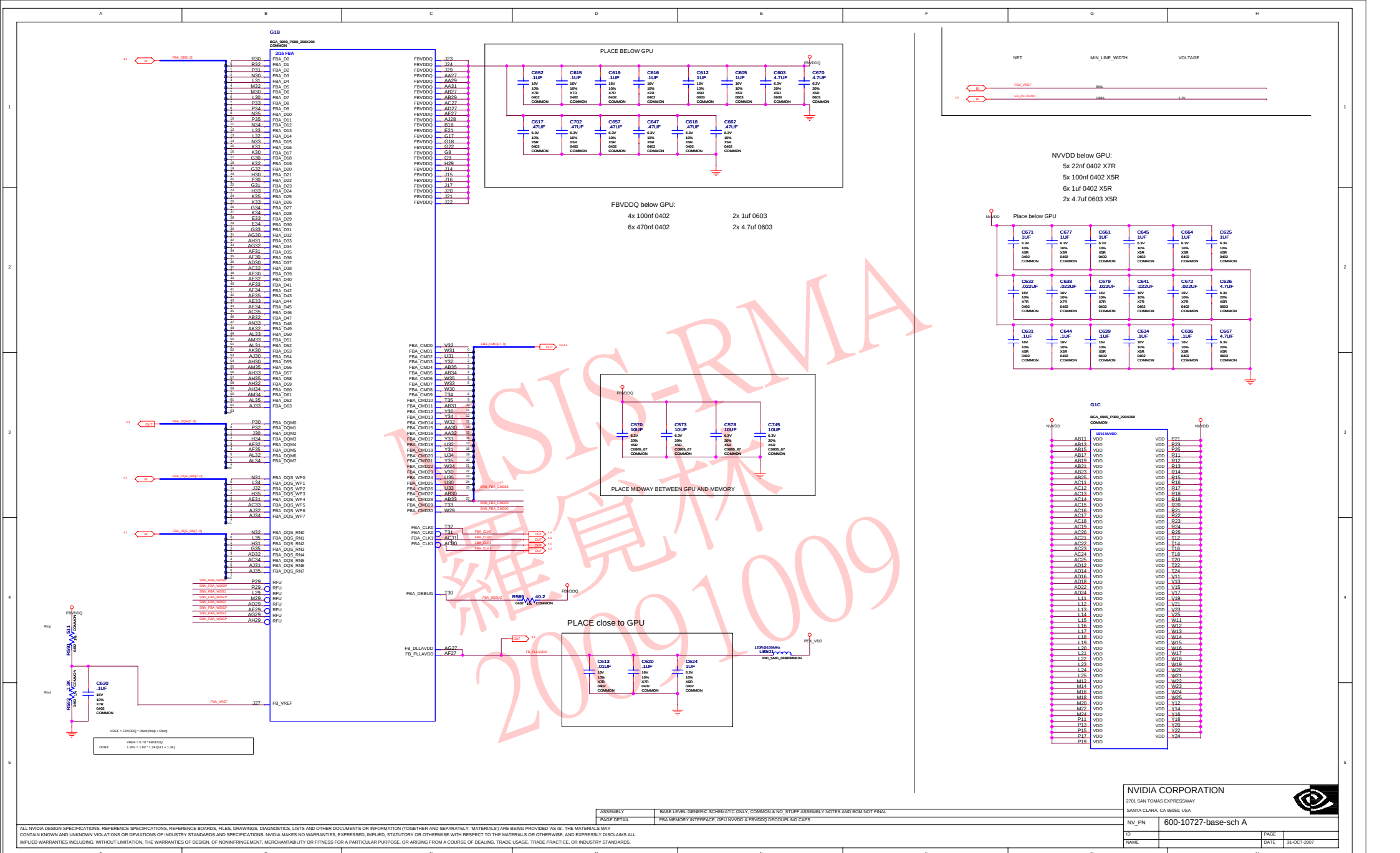





| | |
|---|---|
| ASSEMBLY | BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL |
| PAGE DETAIL | PCI EXPRESS INTERFACE, PEX_VDD DECOUPLING CAPS |

NVIDIA CORPORATION
2701 SAN TOMAS EXPRESSWAY
SANTA CLARA, CA 95050, USA

| | | | |
|---|---|---|---|
| NV_PN | 600-10727-base-sch A | | |
| ID | | PAGE | |
| NAME | | DATE | 31-OCT-2007 |





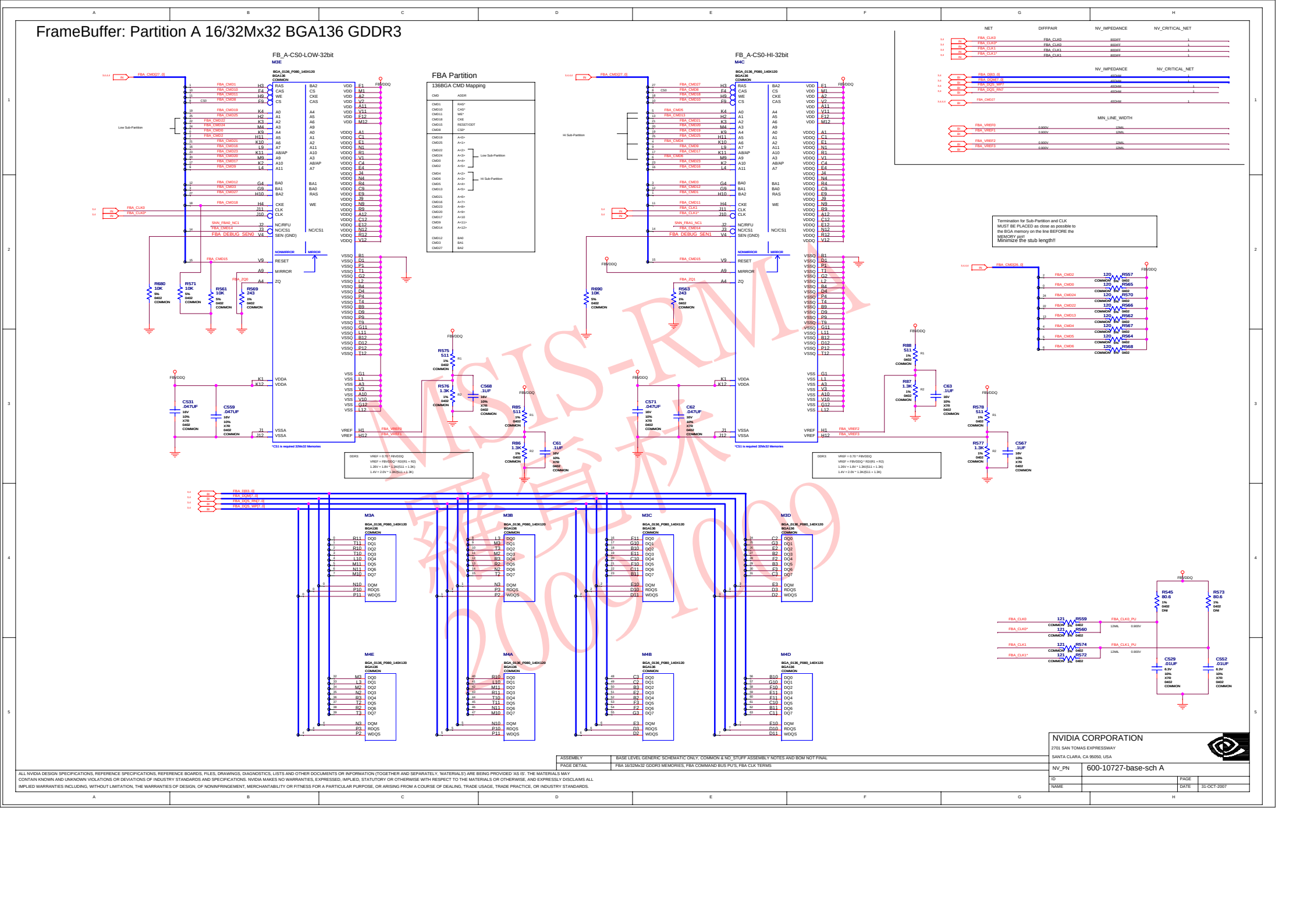

| | |
|---|---|
| ASSEMBLY | BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL |
| PAGE DETAIL | FBA MEMORY INTERFACE, GPU NVVDD & FBVDDQ DECOUPLING CAPS |



NVIDIA CORPORATION
2701 SAN TOMAS EXPRESSWAY
SANTA CLARA, CA 95050, USA

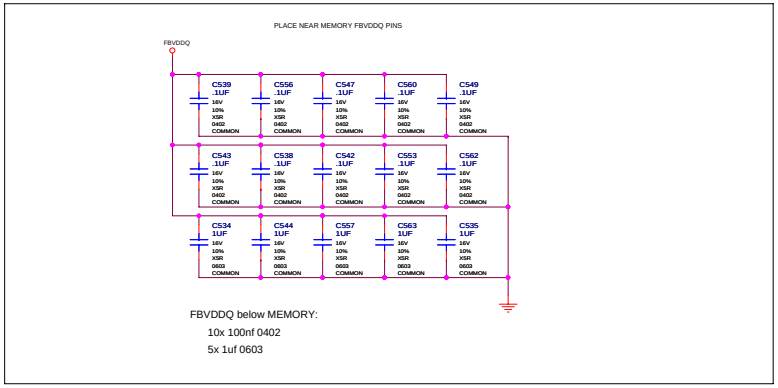
| | |
|---|---|
| NV_PN | 600-10727-base-sch A |
| ID | |
| NAME | |
| PAGE | |
| DATE | 31-OCT-2007 |

# FrameBuffer: Partition A 16/32Mx32 BGA136 GDDR3

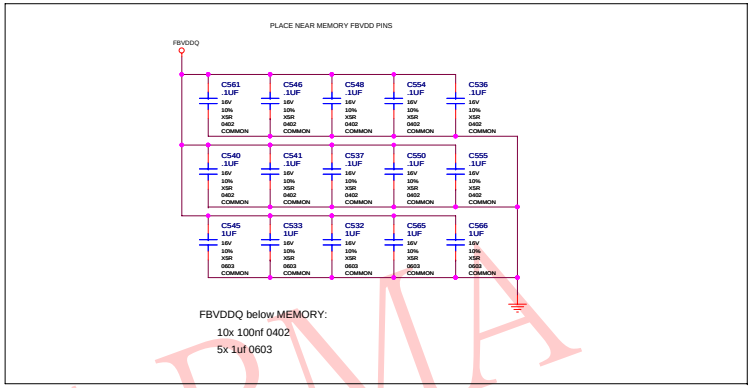


# FRAME BUFFER: PARTITION A DECOUPLING

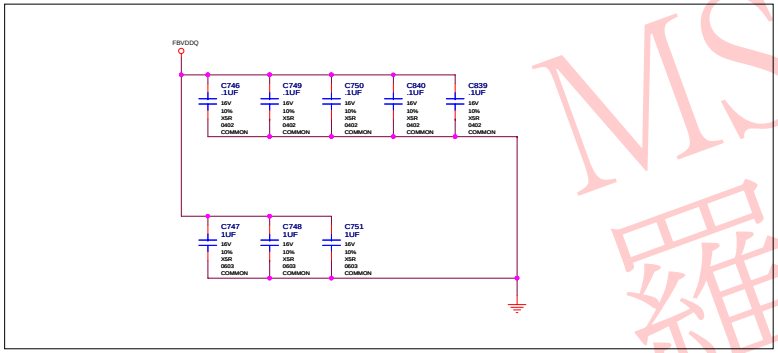
## Decoupling for FBA 0..31



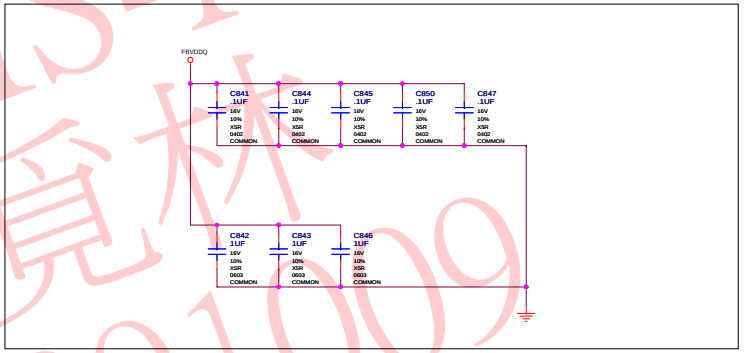

## Decoupling for FBA 32..63



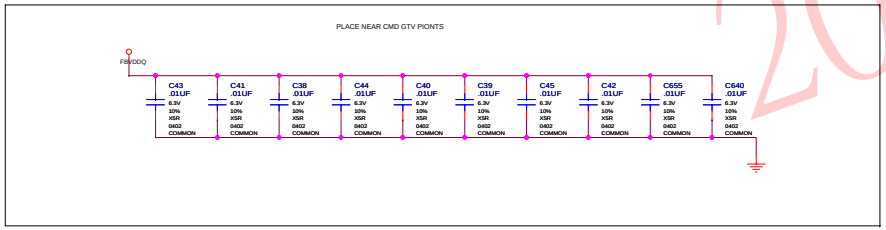

## Decoupling for FBA A1 0..31




## Decoupling for FBA A1 0..31




## Return path coupling GND/FBVDDQ for FBA



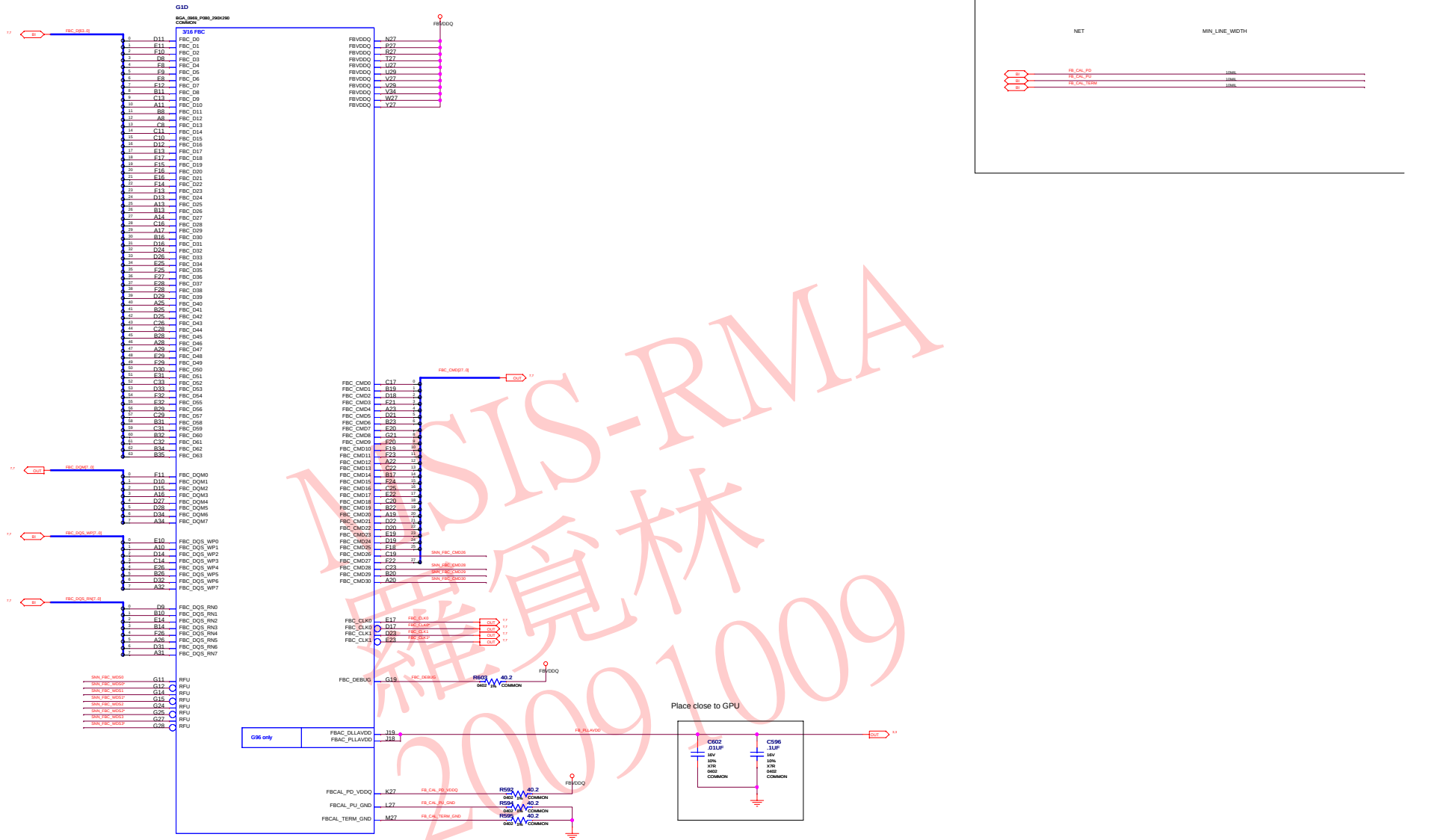



| | |
|---|---|
| ASSEMBLY | BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL |
| PAGE DETAIL | FBA MEMORY FBVDDQ DECOUPLING CAPS |



NVIDIA CORPORATION
2701 SAN TOMAS EXPRESSWAY
SANTA CLARA, CA 95050, USA

| | | | |
|---|---|---|---|
| NV_PN | 600-10727-base-sch A | | |
| ID | | PAGE | |
| NAME | | DATE | 31-OCT-2007 |





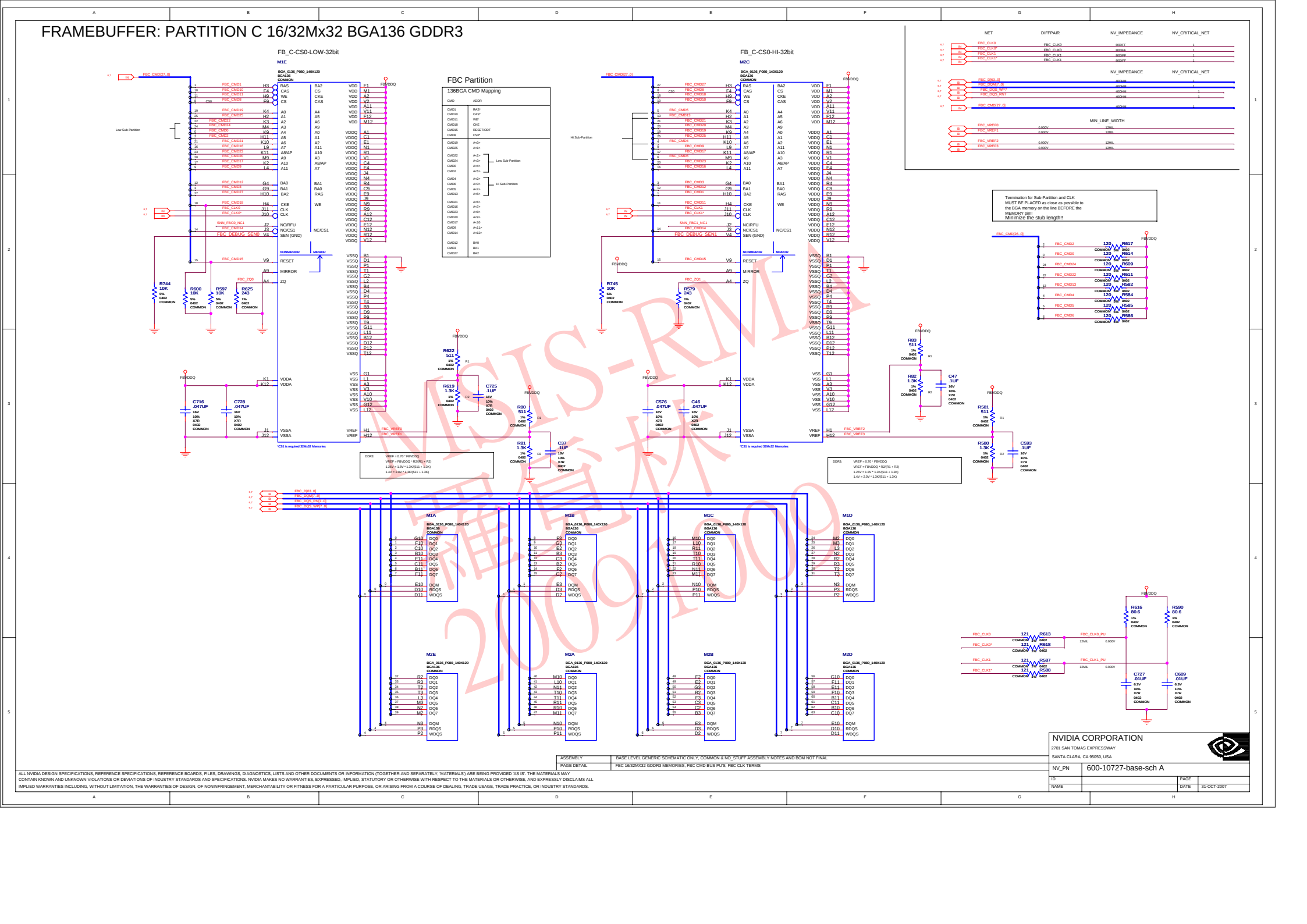

| | |
|---|---|
| ASSEMBLY | BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL |
| PAGE DETAIL | FBC MEMORY INTERFACE |



NVIDIA CORPORATION
2701 SAN TOMAS EXPRESSWAY
SANTA CLARA, CA 95050, USA

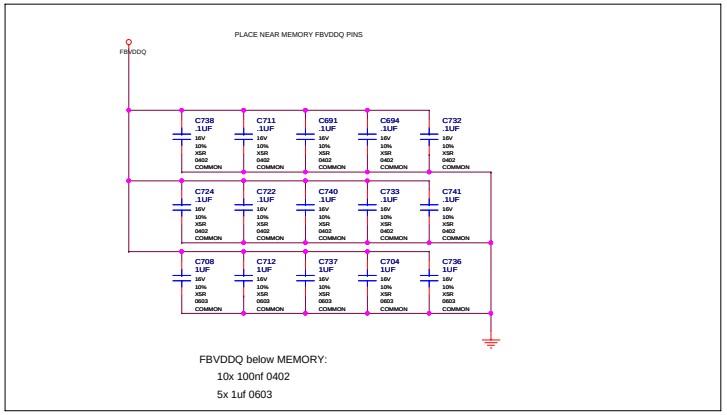
| | | | |
|---|---|---|---|
| NV_PN | 600-10727-base-sch A | | |
| ID | | PAGE | |
| NAME | | DATE | 31-OCT-2007 |

# FRAMEBUFFER: PARTITION C 16/32Mx32 BGA136 GDDR3

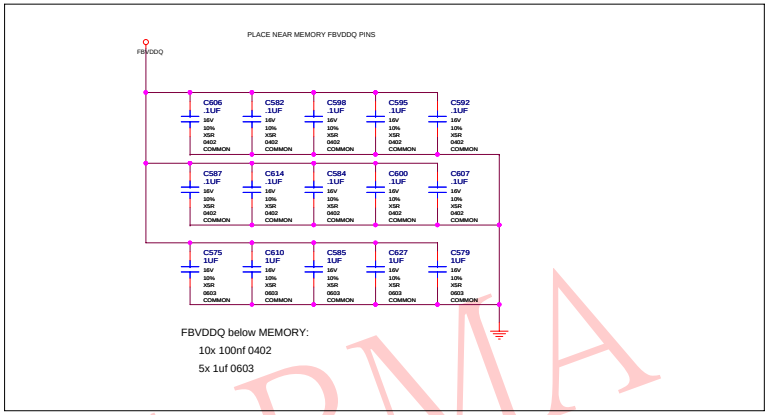


# FRAMEBUFFER: PARTITION C DECOUPLING

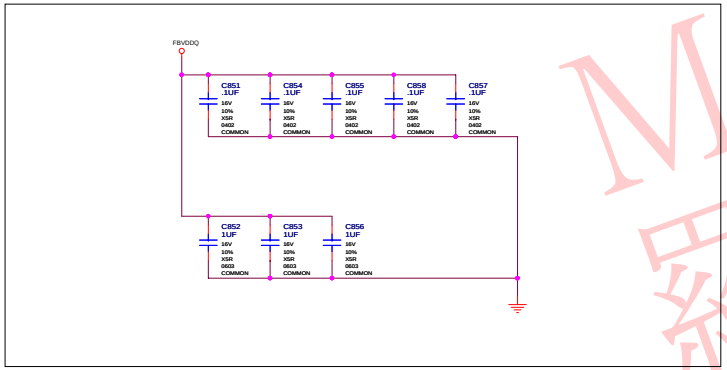
## Decoupling for FBC 0..31



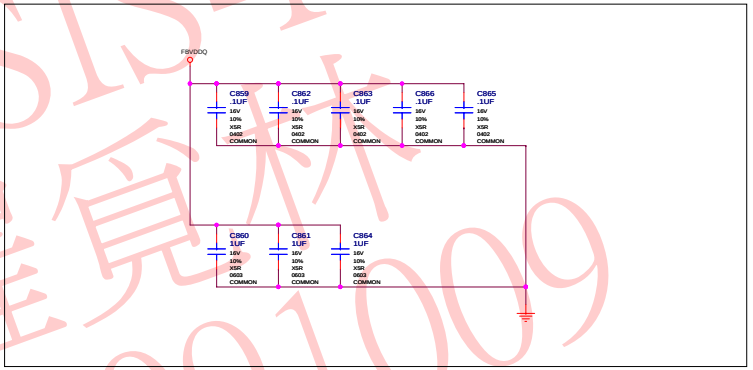

## Decoupling for FBC 32..63



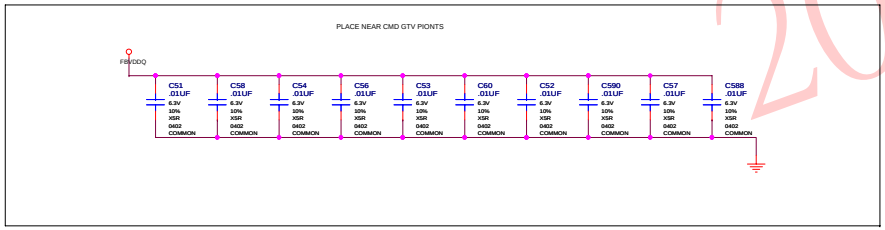

## Decoupling for FBC C1 0..31

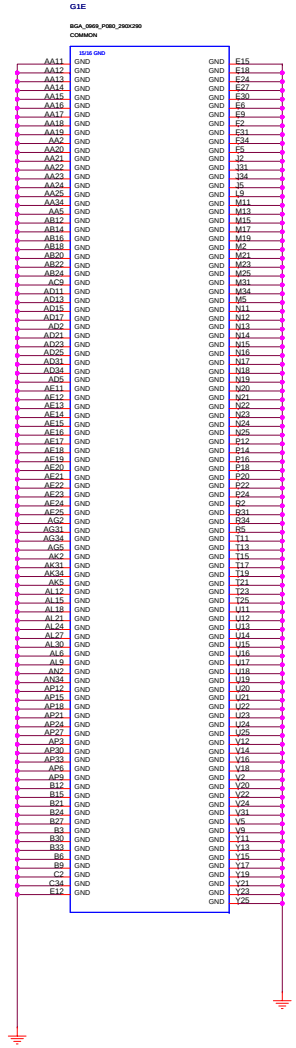



## Decoupling for FBC C1 32..63




## Return path coupling GND/FBVDDQ for FBC






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



NVIDIA CORPORATION
2701 SAN TOMAS EXPRESSWAY
SANTA CLARA, CA 95050, USA

| | | | |
|---|---|---|---|
| NV_PN | 600-10727-base-sch A | | |
| ID | | PAGE | |
| NAME | | DATE | 31-OCT-2007 |

# Primary Display (DACA), DVI-I

## DACA RGB-FILTER

| NET_NAME | NV_CRITICAL_NET | IMPEDANCE | MIN_LINE_WIDTH |
|---|---|---|---|
| DAC_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_GND_CMC | | | 0V 12MIL |
| DACA_RED_CMC | 1 | 75OHM | |
| DACA_GREEN_CMC | 1 | 75OHM | |
| DACA_BLUE_CMC | 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 | |

EMI filter, place close to DVI

EMI filter, place close to DVI

PLACE NEAR SYNC BUFFER

Route DAC RGB with ~37.5ohm impedence

Place Ohm-Resistor Incident with Common Mode Choke

MIDDLE

FOR ESD DIODES

Place near ESD diodes.



| | |
|---|---|
| ASSEMBLY | BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL |
| PAGE DETAIL | DACA FILTERS, DACA SYNC BUFFERS & DB15 SOUTH |



NVIDIA CORPORATION
2701 SAN TOMAS EXPRESSWAY
SANTA CLARA, CA 95050, USA

| | | | |
|---|---|---|---|
| NV_PN | 600-10727-base-sch A | | |
| ID | | PAGE | |
| NAME | | DATE | 31-OCT-2007 |

# Secondary Display (DACC), Slim DB15

## DACC RGB-FILTER

| NET_NAME | NV_CRITICAL_NET | IMPEDANCE | MIN_LINE_WIDTH |
|---|---|---|---|
| DACC_VREF | | | 12MIL |
| DACC_RSET | | | 12MIL |
| DACC_RED | 1 | 75OHM | |
| DACC_GREEN | 1 | 75OHM | |
| DACC_BLUE | 1 | 75OHM | |
| DACC_RED_C | 1 | 75OHM | |
| DACC_GREEN_C | 1 | 75OHM | |
| DACC_BLUE_C | 1 | 75OHM | |
| DACC_GND_CMC | 0V | | 12MIL |
| DACC_RED_CMC | 1 | 75OHM | |
| DACC_GREEN_CMC | 1 | 75OHM | |
| DACC_BLUE_CMC | 1 | 75OHM | |
| DACC_HSYNC | 1 | 50OHM | |
| DACC_VSYNC | 1 | 50OHM | |
| DACC_VSYNC_R | 1 | 50OHM | |
| DACC_HSYNC_R | 1 | 50OHM | |
| DACC_VSYNC_BUF | 1 | 50OHM | |
| DACC_HSYNC_BUF | 1 | 50OHM | |
| DACC_VSYNC_C | 1 | 50OHM | |
| DACC_HSYNC_C | 1 | 50OHM | |

FOR ESD DIODES

C771 1UF 16V 10% X5R 0603 COMMON

C19 1UF 16V 10% X5R 0603 COMMON

Place near ESD diodes.

U508D QSOP16 COMMON

U508B QSOP16 COMMON

R712 33 0402 COMMON

R701 33 0402 COMMON

R699 33 0402 COMMON

R697 33 0402 COMMON

R711 2.2K 5% 0402 COMMON

R706 2.2K 5% 0402 COMMON

D525 SOT23 100V 100mA COMMON

D526 SOT23 100V 100mA COMMON

EMI filter, place close to DVI

LB512 180R@100MHz IND_SMD_0603 COMMON

LB511 180R@100MHz IND_SMD_0603 COMMON

C787 22PF 50V 5% C0G 0402 COMMON

C786 22PF 50V 5% C0G 0402 COMMON

U507B SOIC14 COMMON

U507A SOIC14 COMMON

R685 33 0402 COMMON

R692 33 0402 COMMON

D513 SOT23 100V 100mA COMMON

D514 SOT23 100V 100mA COMMON

L501 27nH IND_SMD_0603 COMMON

L502 27nH IND_SMD_0603 COMMON

C788 47PF 50V 5% C0G 0603 COMMON

C789 47PF 50V 5% C0G 0603 COMMON

MIDDLE

G1G BGA_096B_P080_290X290 COMMON

6/16 DACC

DACC_VDD AG7

DACC_VREF AK6

DACC_RSET AH7

I2CB_SCL G3

I2CB_SDA G2

DACC_HSYNC AM1

DACC_VSYNC AM2

DACC_RED AK4

DACC_GREEN AL4

DACC_BLUE AJ4

C710 470PF 50V X7R 0402 COMMON

C726 4700PF 25V X7R 0402 COMMON

C709 1UF 16V X5R 0402 COMMON

R615 124 1% 0402 COMMON

Place 0ohm Resistor Incident with Common Mode Choke

R76 150 1% 0402 COMMON

R77 150 1% 0402 COMMON

R75 150 1% 0402 COMMON

D2 3V3_F 215MA 75V SOT23 COMMON

D3 3V3_F 215MA 75V SOT23 COMMON

D1 3V3_F 215MA 75V SOT23 COMMON

R14 150 1% 0402 COMMON

R15 150 1% 0402 COMMON

R13 150 1% 0402 COMMON

C11 22PF 50V 5% C0G 0402 COMMON

C12 22PF 50V 5% C0G 0402 COMMON

C10 22PF 50V 5% C0G 0402 COMMON

L8 27nH IND_SMD_0603 COMMON

L9 27nH IND_SMD_0603 COMMON

L7 27nH IND_SMD_0603 COMMON

C7 22PF 50V 5% C0G 0402 COMMON

C8 22PF 50V 5% C0G 0402 COMMON

C6 22PF 50V 5% C0G 0402 COMMON

R10 0 0402 COMMON

R9 0 0402 COMMON

R12 0 0402 COMMON

R11 0 0402 COMMON

R8 0 0402 COMMON

R7 0 0402 COMMON

L5 360R@100mhz IND_NONRKO_SMD_0603 COMMON N/A

L6 360R@100mhz IND_NONRKO_SMD_0603 COMMON N/A

L4 360R@100mhz IND_NONRKO_SMD_0603 COMMON N/A



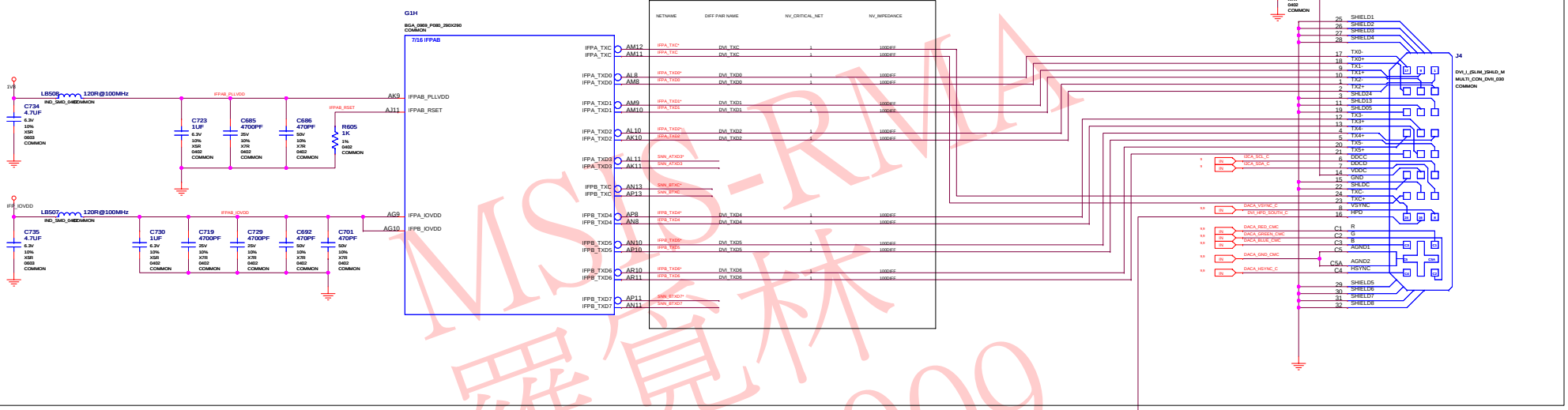
| | |
|---|---|
| ASSEMBLY | BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL |
| PAGE DETAIL | DACC FILTERS, DACC SYNC BUFFERS & DB15 MID |



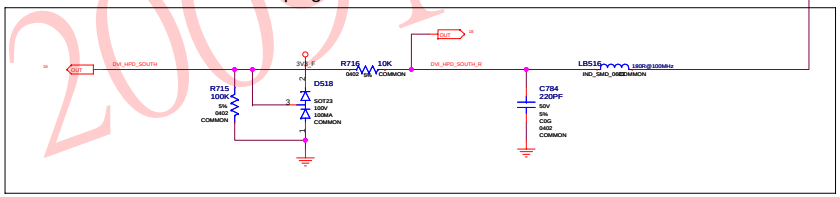
NVIDIA CORPORATION
2701 SAN TOMAS EXPRESSWAY
SANTA CLARA, CA 95050, USA

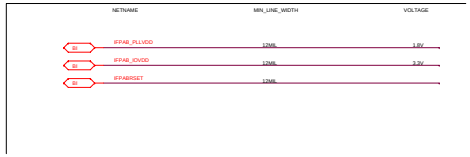
| | | | |
|---|---|---|---|
| NV_PN | 600-10727-base-sch A | | |
| ID | | PAGE | |
| NAME | | DATE | 31-OCT-2007 |

# TMDS LINK: A & B




## Hotplug Detection





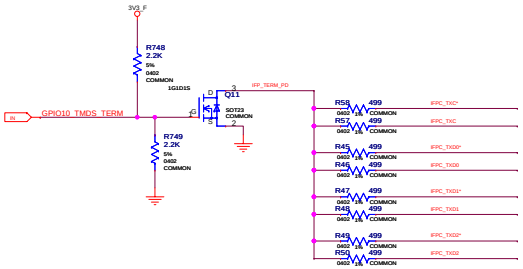

| | |
|---|---|
| ASSEMBLY | BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL |
| PAGE DETAIL | TMDS LINK A/B, DVI CONNECTOR SOUTH |

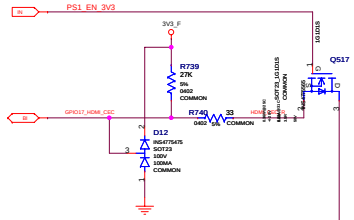


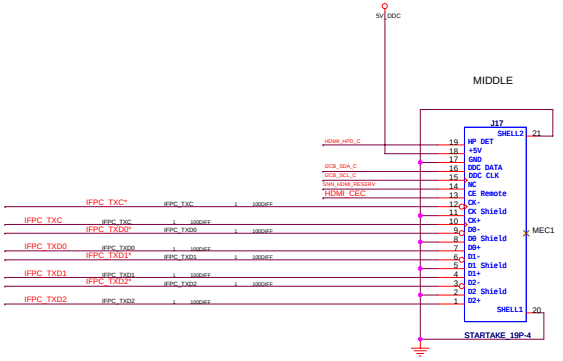
NVIDIA CORPORATION
2701 SAN TOMAS EXPRESSWAY
SANTA CLARA, CA 95050, USA

| | | | |
|---|---|---|---|
| NV_PN | 600-10727-base-sch A | | |
| ID | | PAGE | |
| NAME | | DATE | 31-OCT-2007 |

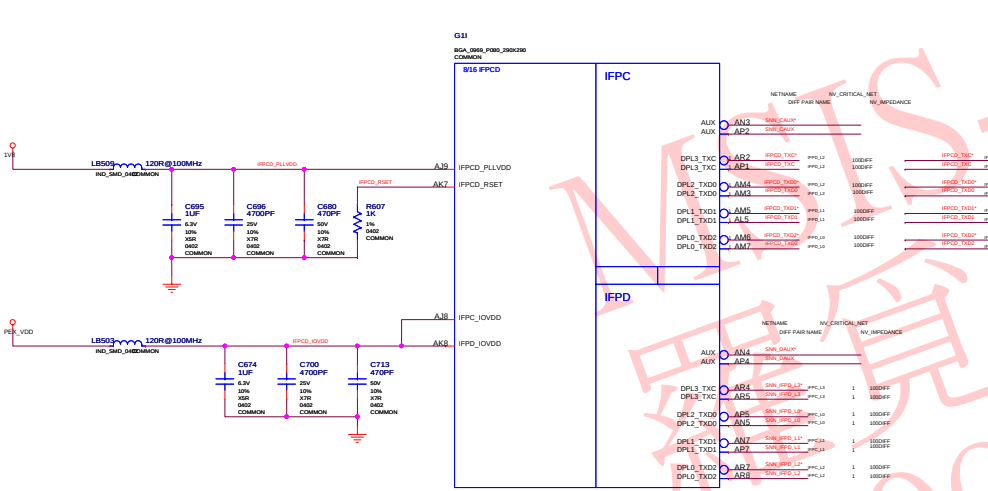
# TMDS LINK: C & D



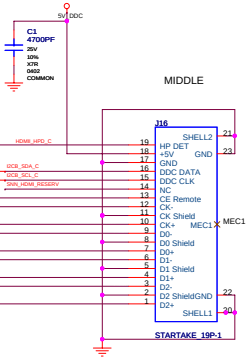



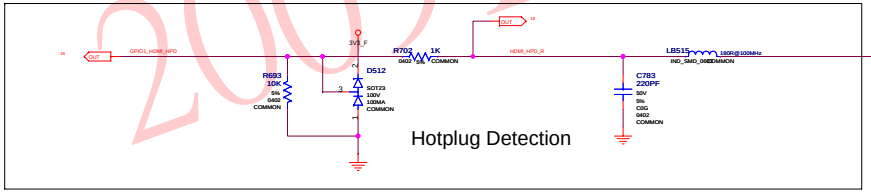

# TMDS C : HDMI

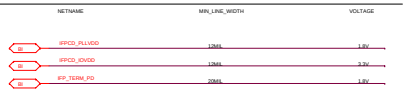










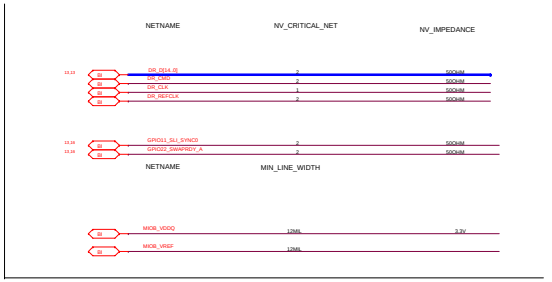

| | |
|---|---|
| ASSEMBLY | BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL |
| PAGE DETAIL | TMDS LINK C/D, AC COUPLING, PD's, DVI CONNECTOR MID |

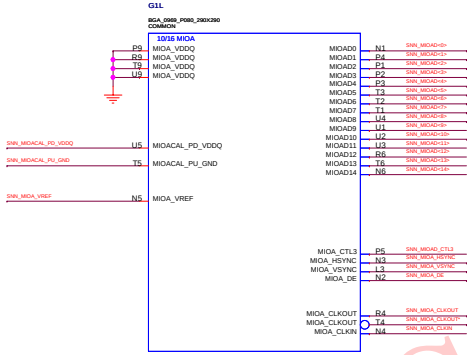


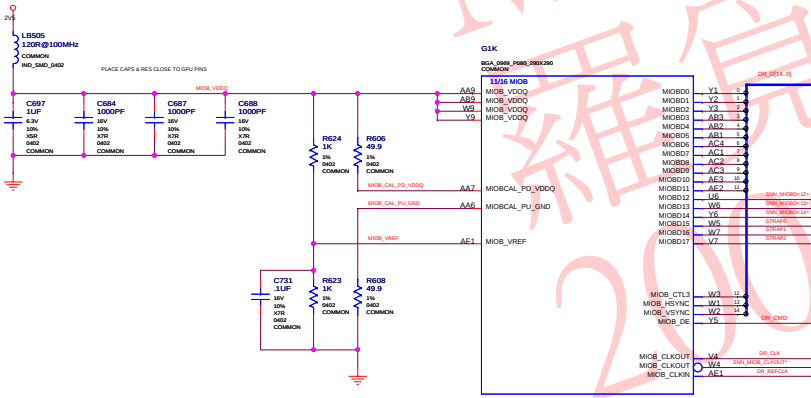
NVIDIA CORPORATION
2701 SAN TOMAS EXPRESSWAY
SANTA CLARA, CA 95050, USA

| | | | |
|---|---|---|---|
| NV_PN | 600-10727-base-sch A | | |
| ID | | PAGE | |
| NAME | | DATE | 31-OCT-2007 |

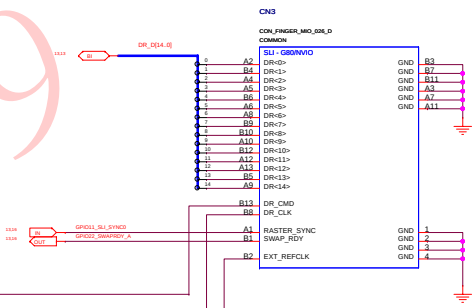
# MIOA/B SLI




## SLI Connector






| | |
|---|---|
| ASSEMBLY | BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL |
| PAGE DETAIL | MIOA & MIOB, SLI CONNECTOR |



NVIDIA CORPORATION
2701 SAN TOMAS EXPRESSWAY
SANTA CLARA, CA 95050, USA

| | | | |
|---|---|---|---|
| NV_PN | 600-10727-base-sch A | | |
| ID | | PAGE | |
| NAME | | DATE | 31-OCT-2007 |

# DACB: SD/HD VIDEO OUT CONNECTOR

| NET_NAME | MIN_LINE_WIDTH | NV_IMPEDANCE | NV_CRITICAL_NET |
|---|---|---|---|
| OUT DACB_C_OUT | | 75OHM | 1 |
| OUT DACB_CVBS_OUT | | 75OHM | 1 |
| OUT DACB_PB_OUT | | 75OHM | 1 |
| BI TV_PBOUT_C | | 75OHM | 1 |
| BI TV_COUT_C | | 75OHM | 1 |
| BI TV_YOUT_C | | 75OHM | 1 |
| IN DACB_VREF | 12MIL | | |
| IN DACB_RSET | 12MIL | | |

FOR ESD DIODES

3V3_F
C772 1UF 16V 10% X5R 0603 COMMON

Place near ESD diodes.

FILTER CIRCUIT

HDTV/SDTV
8.2pF/22pf
from codec
to DIN connector
0.56uH/1.8uH
82pF/330pF
82pF/270pF

G1M
BGA_0969_P0B0_29DX290 COMMON
S16 DACB(TV)

IN
DAC_VDD → AC6 DACB_VDD
DACB_VREF → AC5 DACB_VREF
DACB_RSET → AB6 DACB_RSET

C707 1UF 6.3V X5R 0402 COMMON
C705 4700PF 25V X7R 0402 COMMON
C720 .1UF 16V 10% X5R 0402 COMMON
R610 124 1% 0402 COMMON

DACB_CSYNC AB5 → SWN_DACB_SYNC
DACB_RED AA4 → DACB_C_OUT
DACB_GREEN AB4 → DACB_CVBS_OUT
DACB_BLUE Y4 → DACB_PB_OUT

R73 150 1% 0402 COMMON
R74 150 1% 0402 COMMON
R72 150 1% 0402 COMMON

DS17 / DS15 / DS16: 3V3_F, 215MA 70V SOT23 COMMON

R705 / R703 / R704: 150 1% 0402 COMMON

C783 / C780 / C781: 8.2PF 0603 50V +/-0.5PF NPO COMMON

L507 / L505 / L506: 0.56uH IND_0402 COMMON

C779 / C777 / C778: 82PF 50V 5% C0G 0402 COMMON

C795 / C793 / C794: 82PF 50V 5% C0G 0402 COMMON

TV_YOUT_C
TV_PBOUT_C
TV_COUT_C

J3





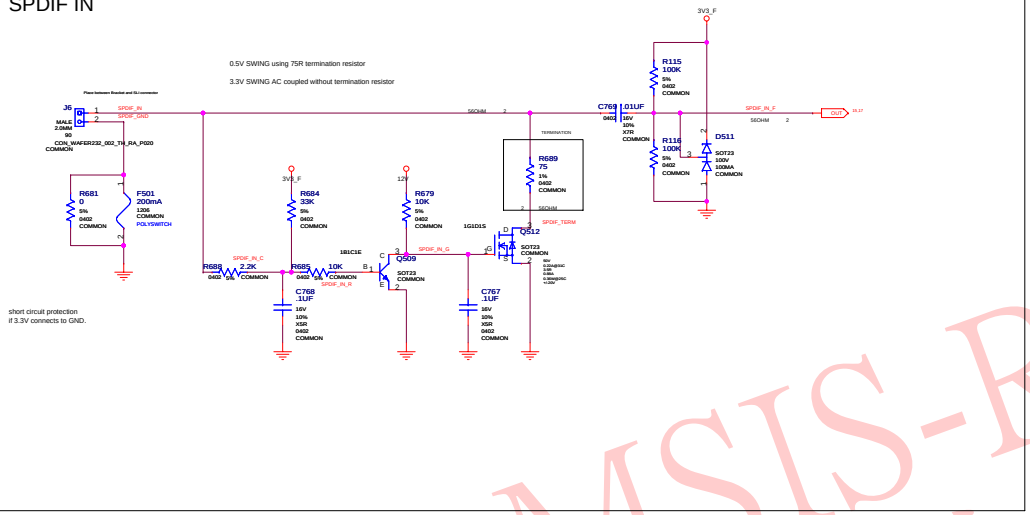
| | |
|---|---|
| ASSEMBLY | BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL |
| PAGE DETAIL | DACB FILTERS, MINIDIN CONNECTOR NORTH, SD/HD VIDEO OUTPUT CONNECTOR |

NVIDIA CORPORATION
2701 SAN TOMAS EXPRESSWAY
SANTA CLARA, CA 95050, USA

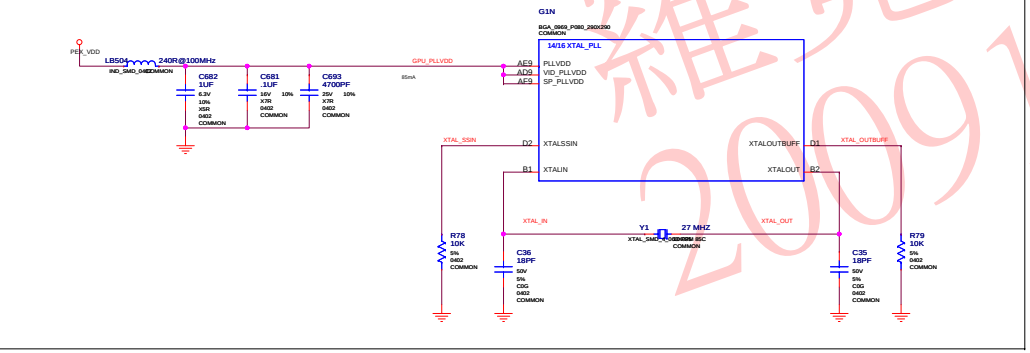
| | | | |
|---|---|---|---|
| NV_PN | 600-10727-base-sch A | | |
| ID | | PAGE | |
| NAME | | DATE | 31-OCT-2007 |

# XTAL/PLLVDD/SPDIF IN

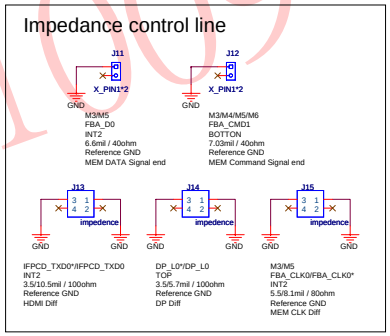
## SPDIF IN



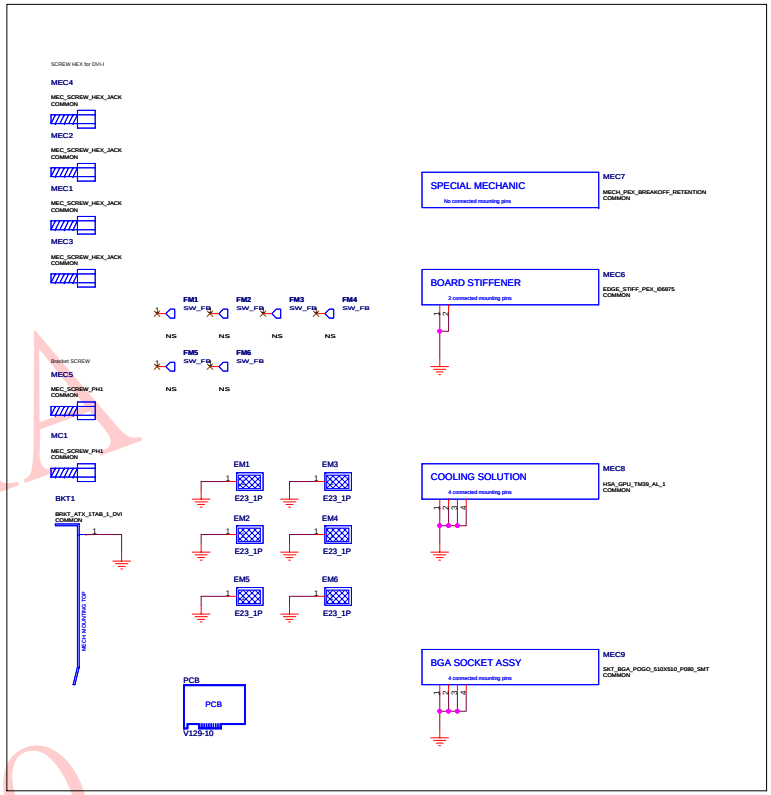

## XTAL/GPU_PLLVDD



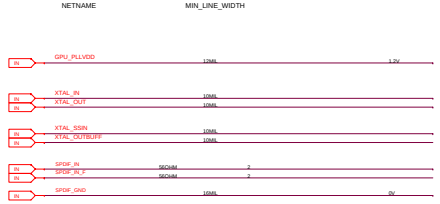

## Impedance control line




# MECHANICALS & THERMALS




NETNAME MIN_LINE_WIDTH



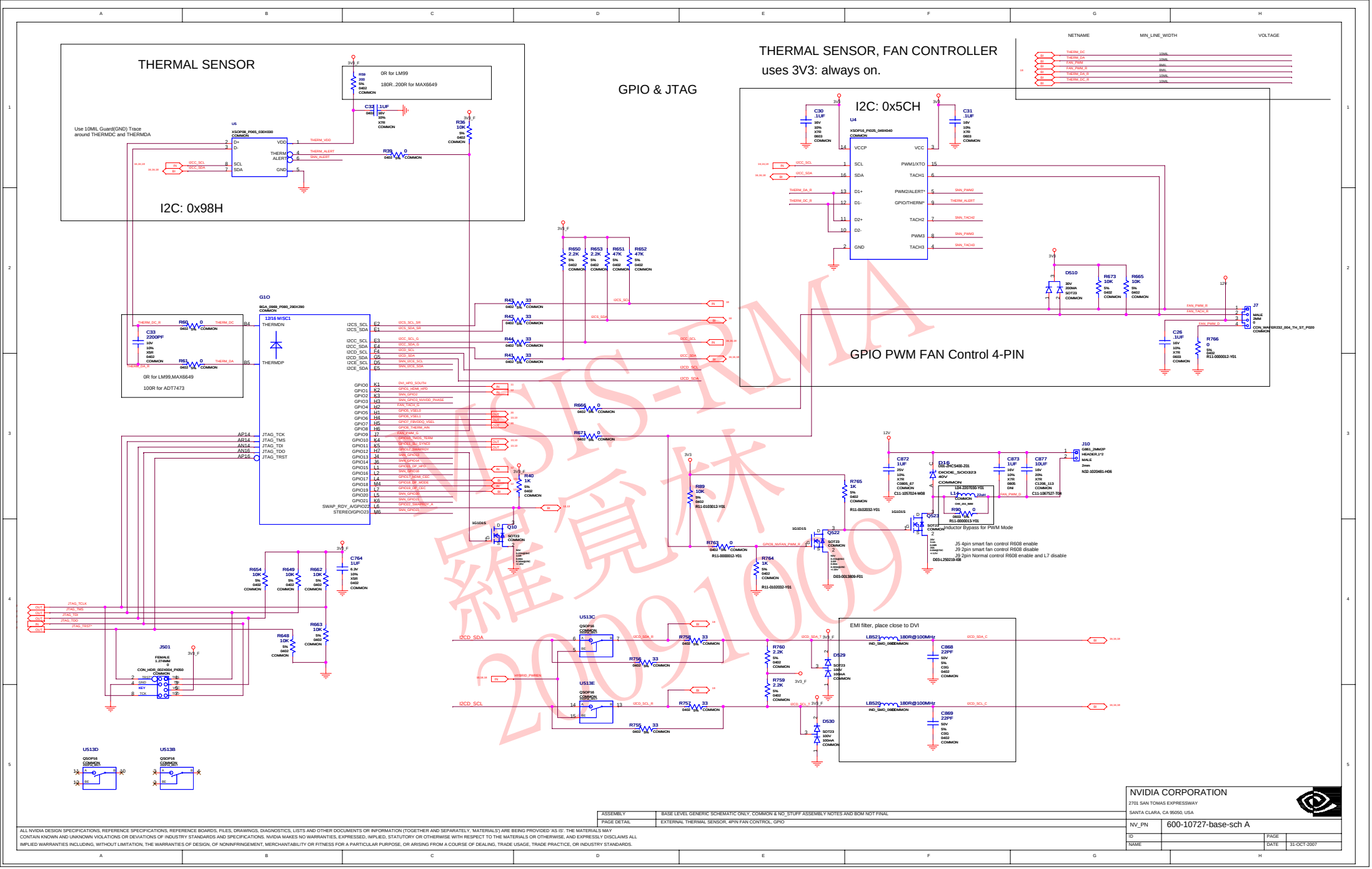



| | |
|---|---|
| ASSEMBLY | BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL |
| PAGE DETAIL | SPDIF-IN, XTAL, MECHANICALS, THERMALS |



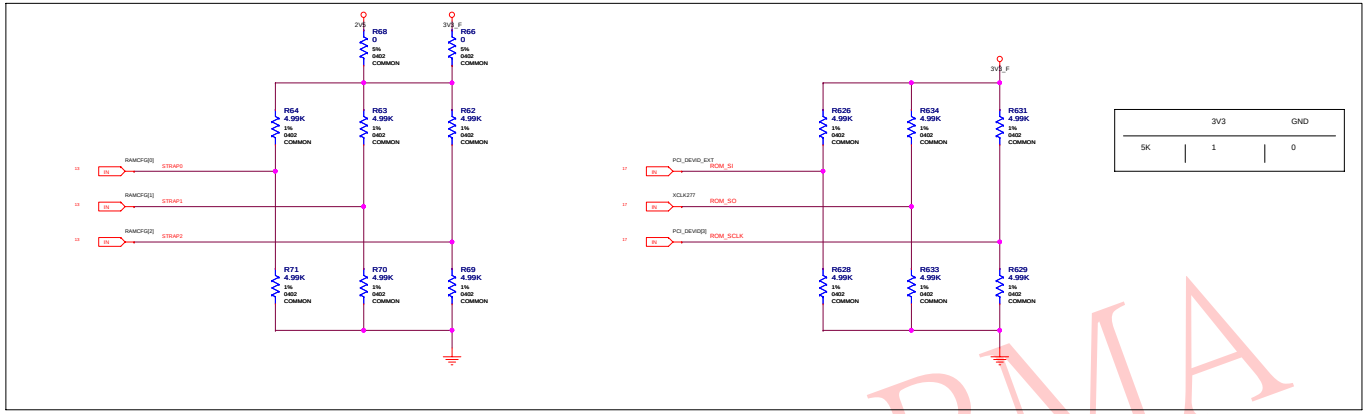
NVIDIA CORPORATION
2701 SAN TOMAS EXPRESSWAY
SANTA CLARA, CA 95050, USA

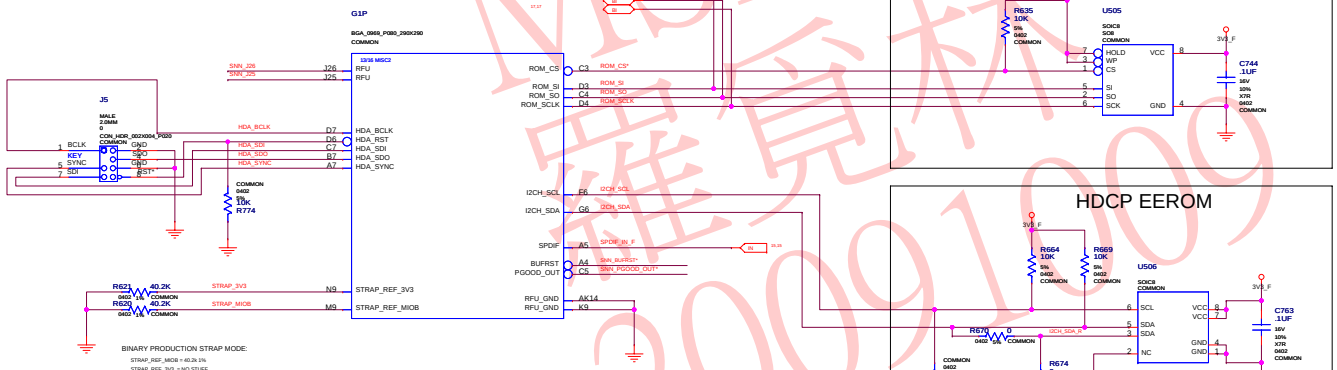
| | | | |
|---|---|---|---|
| NV_PN | 600-10727-base-sch A | | |
| ID | | PAGE | |
| NAME | | DATE | 31-OCT-2007 |


THERMAL SENSOR
I2C: 0x98H
Use 10MIL Guard(GND) Trace around THERMDC and THERMDA
0R for LM99
180R..200R for MAX6649
GPIO & JTAG
THERMAL SENSOR, FAN CONTROLLER
uses 3V3: always on.
I2C: 0x5CH
GPIO PWM FAN Control 4-PIN
0R for LM99,MAX6649
100R for ADT7473
J5 4pin smart fan control R608 enable
J9 2pin smart fan control R608 disable
J9 2pin Normal control R608 enable and L7 disable
Inductor Bypass for PWM Mode
EMI filter, place close to DVI
NETNAME
MIN_LINE_WIDTH
VOLTAGE
NVIDIA CORPORATION
2701 SAN TOMAS EXPRESSWAY
SANTA CLARA, CA 95050, USA
NV_PN
600-10727-base-sch A
ASSEMBLY
BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL
PAGE DETAIL
EXTERNAL THERMAL SENSOR, 4PIN FAN CONTROL, GPIO
ID
NAME
PAGE
DATE
31-OCT-2007
ALL NVIDIA DESIGN SPECIFICATIONS, REFERENCE SPECIFICATIONS, REFERENCE BOARDS, FILES, DRAWINGS, DIAGNOSTICS, LISTS AND OTHER DOCUMENTS OR INFORMATION (TOGETHER AND SEPARATELY, 'MATERIALS') ARE BEING PROVIDED 'AS IS'. THE MATERIALS MAY CONTAIN KNOWN AND UNKNOWN VIOLATIONS OR DEVIATIONS OF INDUSTRY STANDARDS AND SPECIFICATIONS. NVIDIA MAKES NO WARRANTIES, EXPRESSED, IMPLIED, STATUTORY OR OTHERWISE WITH RESPECT TO THE MATERIALS OR OTHERWISE, AND EXPRESSLY DISCLAIMS ALL IMPLIED WARRANTIES INCLUDING, WITHOUT LIMITATION, THE WARRANTIES OF DESIGN, OF NONINFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, OR ARISING FROM A COURSE OF DEALING, TRADE USAGE, TRADE PRACTICE, OR INDUSTRY STANDARDS.

# STRAPPING OPTIONS

Assembly: BIOS










| NET_NAME | MIN_LINE_WIDTH | NV_IMPEDANCE | NV_CRITICAL_NET |
|---|---|---|---|
| HDA_BCLK | | 55OHM | 2 |
| HDA_RST* | | 55OHM | 2 |
| HDA_SDI | | 55OHM | 2 |
| HDA_SDO | | 55OHM | 2 |
| HDA_SYNC | | 55OHM | 2 |



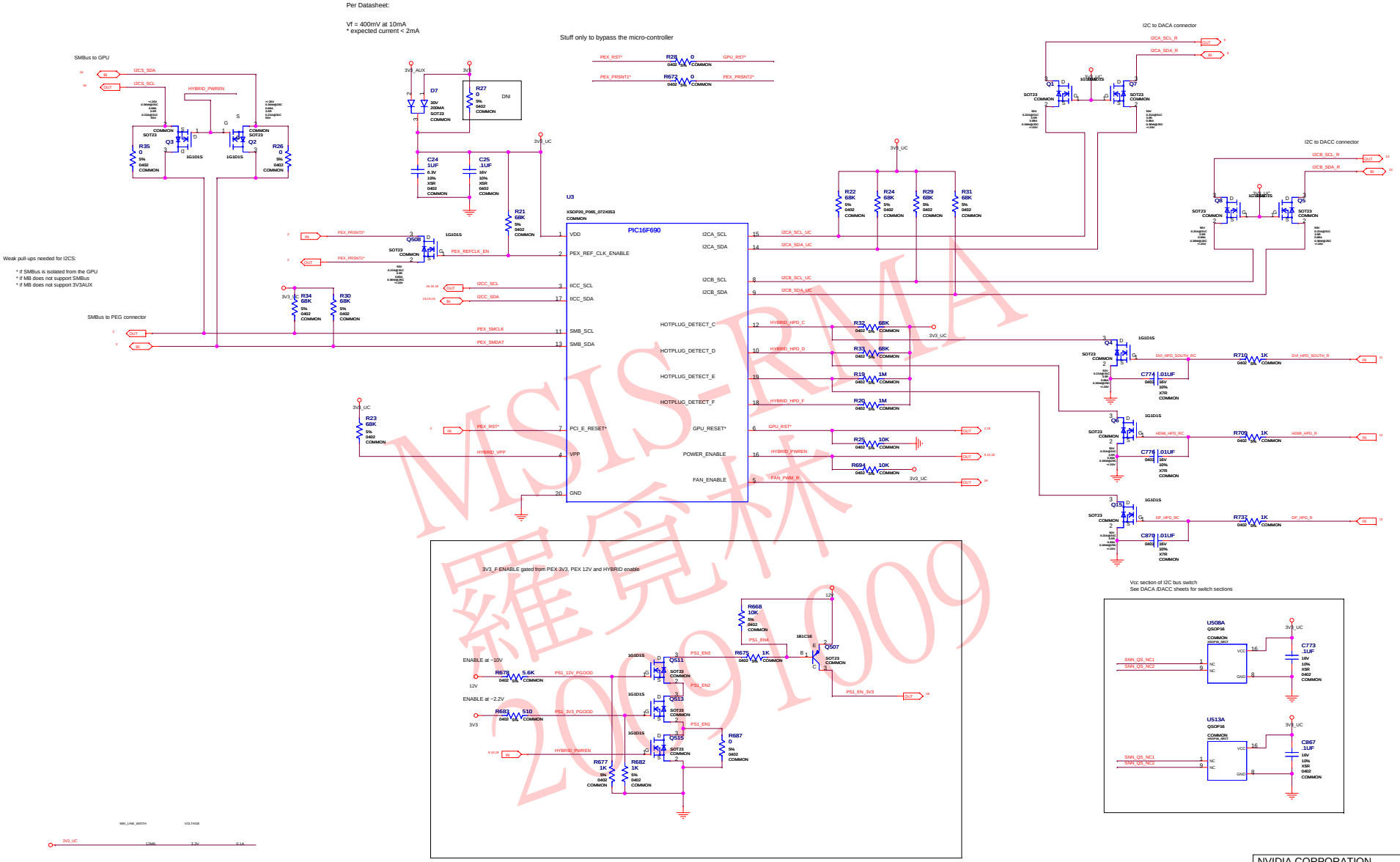


| | |
|---|---|
| ASSEMBLY | BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL |
| PAGE DETAIL | BIOS ROM, HDCP ROM, STRAPPING OPTIONS |

NVIDIA CORPORATION
2701 SAN TOMAS EXPRESSWAY
SANTA CLARA, CA 95050, USA

| | | | |
|---|---|---|---|
| NV_PN | 600-10727-base-sch A | | |
| ID | | PAGE | |
| NAME | | DATE | 31-OCT-2007 |

# HYBRID POWER






| | |
|---|---|
| ASSEMBLY | BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL |
| PAGE DETAIL | HYBRID POWER CIRCUIT |



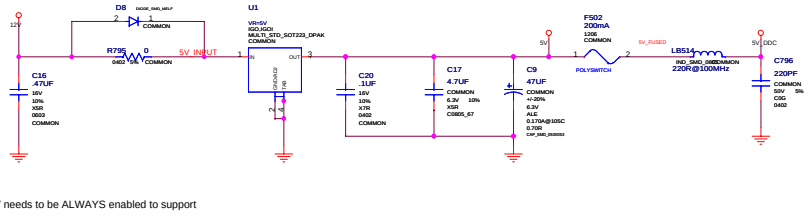
NVIDIA CORPORATION
2701 SAN TOMAS EXPRESSWAY
SANTA CLARA, CA 95050, USA

| | | | |
|---|---|---|---|
| NV_PN | 600-10727-base-sch A | | |
| ID | | PAGE | |
| NAME | | DATE | 31-OCT-2007 |

# Power Supply: 5V, 5V_DDC, TMDS, MIOA_VDDQ

| NETNAME | MAX_CURRENT | MIN_LINE_WIDTH | VOLTAGE |
|---|---|---|---|
| 5V_FUSED | 0.1A | 12MIL | 5V |
| 5V_DDC | 0.1A | 12MIL | 5V |
| 5V | 0.15A | 12MIL | 5V |
| PS_1V8_ADJ | | 10MIL | 1.8V |
| 1V8 | 0.12A | 12MIL | 1.8V |
| 2V5 | 0.3A | 12MIL | 2.5V |
| GND | | 16MIL | 0V |
| 3V3_F | 3.5A | 16MIL | 3.3V |
| 12V_F | 6A | 20MIL | 12V |

## 5V REGULATOR




5V needs to be ALWAYS enabled to support
Hybrid DDC reads !!

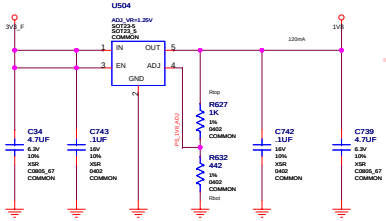
## 5V DDC

POWER_DDC5V

## 12V filter

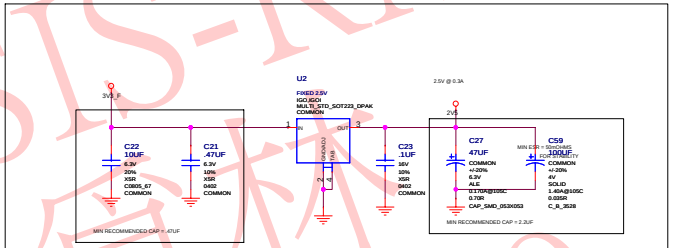



## IFP PLL Supply 1.8V

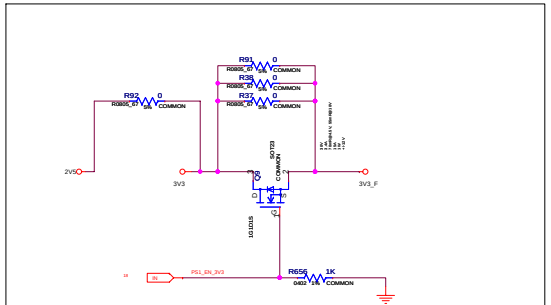



Vout = VRef * (1+(Rbot/Rtop))
1.8V = 1.25V * (1+(442/1000))

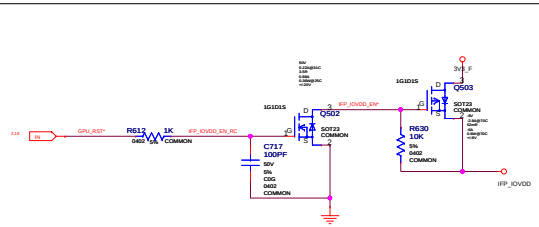
## MIO_VDD 2.5V




## 3V3 switch




## IFP_IOVDD BACKDRIVE PREVENTION






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



NVIDIA CORPORATION
2701 SAN TOMAS EXPRESSWAY
SANTA CLARA, CA 95050, USA

| | | | |
|---|---|---|---|
| NV_PN | 600-10727-base-sch A | | |
| ID | | PAGE | |
| NAME | | DATE | 31-OCT-2007 |

# POWER SUPPLY: FBVDD/Q

| NET | MIN_LINE_WIDTH | VOLTAGE | NV_NET_MAX_CURRENT |
|---|---|---|---|
| FBVDDQ | 20MIL | 2V | 10A |
| PS1_FB_BOOT | 12MIL | | |
| PS1_FB_BOOT_R | 12MIL | | |
| PS1_FB_UGATE | 12MIL | | |
| PS1_FB_UGATE_R | 12MIL | | |
| PS1_FB_PHASE | 20MIL | | 10A |
| PS1_FB_LGATE | 12MIL | | |
| PS1_FB_RC | 12MIL | | |
| PS1_FB_R1 | 12MIL | | |
| PS1_FB_SNUB | 12MIL | | |
| PS1_FB_FSET | 12MIL | | |
| PS1_FB_SVFILT | 12MIL | | |
| PS1_FB | 12MIL | | |
| PS1_FB_VD | 12MIL | | |
| FBVDDQ_FS_DIS | 12MIL | | |
| FBVDDQ_EN | 12MIL | | |

FBVDDQ: 1.2mil internal plane
500 mil wide from VRM to MEM
3inch from VRM to farthest MEM

FBVDDQ: 1.8-2.0V @ 9A

FBVDD/Q decap near VRM:
1x 47uF 1206
1x 1500uF ALE/OSCON

PEX_VDD = VREF * (1 + Rtop / Rbot)
1.099V = 0.8V * (1 + 374/1000)

110K for 300KHz
120K for 283KHz

1.896V = 0.8V * (1 + (1.37K/ 1K))
2.000V = 0.8V * (1 + (1.5K/ 1K))

FBVDDQ = VREF * (1 + (Rtop / Rbot1))
1.792V = 0.8V * (1 + (1.24K/ 1K))
1.49V = 0.8V * (1 + (1.07K/ 1.24K))

FBVDDQ = VREF * (1 + (Rtop / Rbot1/Rbot2))
2.098V = 0.8V * (1 + (1.24K/ (1K//3.24K))
1.81V = 0.8V * (1 + (1.07K/ (1.24K//2.67K))

## Power Sequence

| | GPIO7 |
|---|---|
| FBVDDQ = 1.792V / 1.49V | 0 |
| FBVDDQ = 2.098V / 1.81V | 1 |



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



NVIDIA CORPORATION
2701 SAN TOMAS EXPRESSWAY
SANTA CLARA, CA 95050, USA

| | |
|---|---|
| NV_PN | 600-10727-base-sch A |
| ID | |
| NAME | |
| PAGE | |
| DATE | 31-OCT-2007 |

# NVVDD with RT-8805 Two Phase PWM

| Net Name | LINE_WIDTH | Current | Voltage |
|---|---|---|---|
| NVVDD | 20MIL | 15A | 1.2V |
| PEX1V2 | 24MIL | 1.5A | 1.20000 |
| NVVDD_SENSE | 10MIL | 0.5A | 1.2V |
| NVVDD_SENSE_M | 10MIL | 0.5A | 1.2V |

Irms = 4.2A @ 0.9V/15A/1Ph

Irms = 5.5A @ 1.2V/35A/2Ph

L7004 Chock 1.2u

Irms=6.0A Isat=8A

Ripple Current 6.1A

Ripple Current 6.1A

Place around GPU

NVVDD near GPU:

5x 10uf 0805 X5R

2x 47uf 1206 X5R

3x 470uf ALE/OSCON

U6 RT8805

ON Semiconductor/NTD4809NT4G

ON Semiconductor/NTD4809NT4G

ON Semiconductor/NTD4806NT4G

ON Semiconductor/NTD4806NT4G

## NVVDD Power Supply

NVVDD = 0.9-1.2V @ 30-35A

NVVDD: 1.2mil internal PLANE

2inch plane width from VRM to GPU

3inch length from VRM to GPU

Power Sequence

| | GPIO6 | GPIO5 |
|---|---|---|
| NVVDD = 1.00V R7403 1.54K R7329 6.19K | 0 | 0 |
| NVVDD = 1.05V R7403 1.54K R7329 6.19K R661 24.3K | 0 | 1 |
| NVVDD = 1.10V R7403 1.54K R7329 6.19K R676 12.1K | 1 | 0 |
| NVVDD = 1.15V (Undefine) R7403 1.54K R7329 6.19K R661 24.3K R676 12.1K | 1 | 1 |

| | GPIO5 |
|---|---|
| NVVDD = 0.95V R7403 1.00K R7329 5.36K | 1 |
| NVVDD = 1.00V R7403 1.00K R7329 5.36K R661 16.2K | 0 |

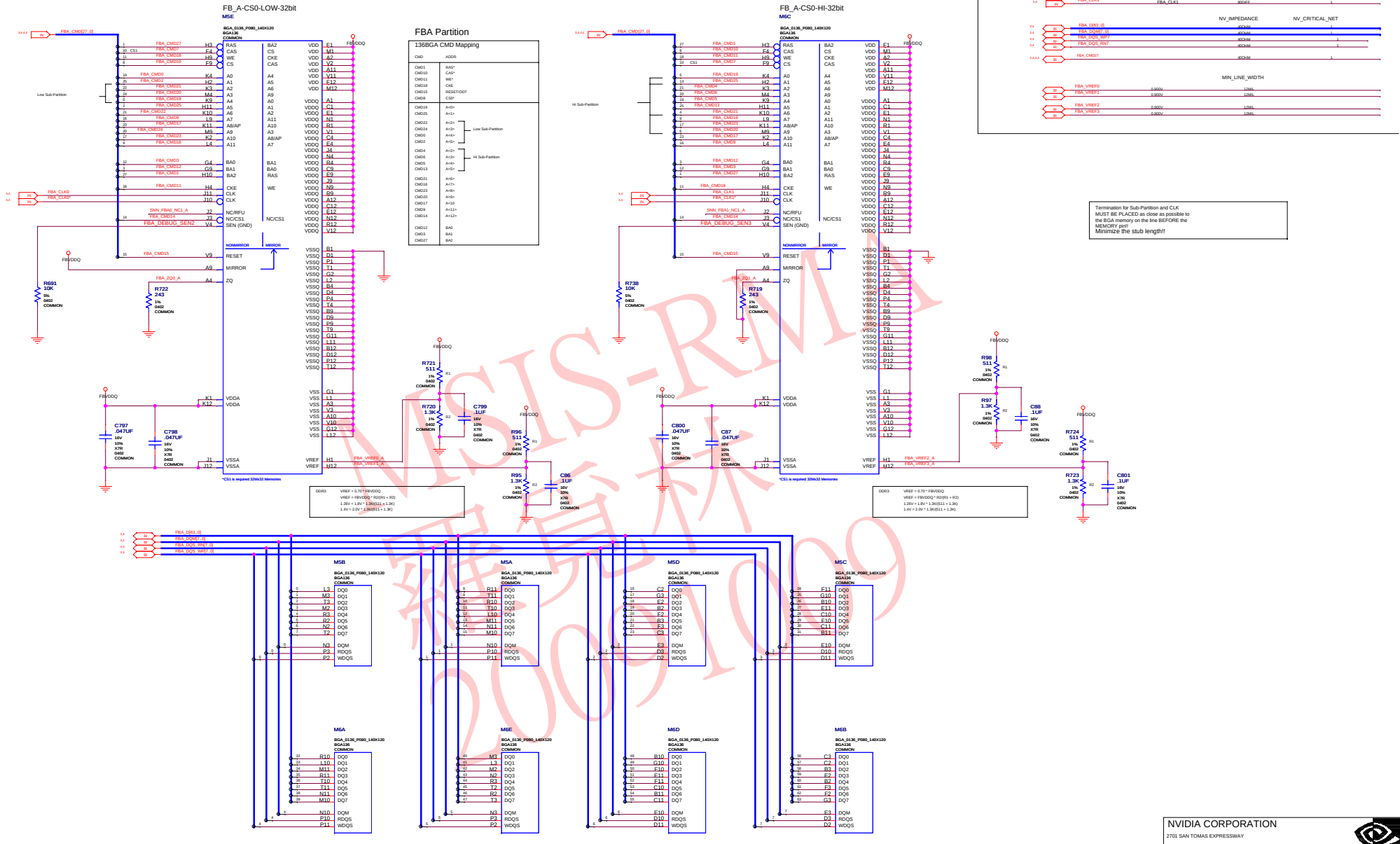


| | |
|---|---|
| ASSEMBLY | BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL |
| PAGE DETAIL | POWER SUPPLY: NVVDD DUAL PHASE SWITCHER |

NVIDIA CORPORATION
2701 SAN TOMAS EXPRESSWAY
SANTA CLARA, CA 95050, USA

| | | | |
|---|---|---|---|
| NV_PN | 600-10727-base-sch A | | |
| ID | | PAGE | |
| NAME | | DATE | 31-OCT-2007 |

# FrameBuffer: Partition A 16/32Mx32 BGA136 GDDR3





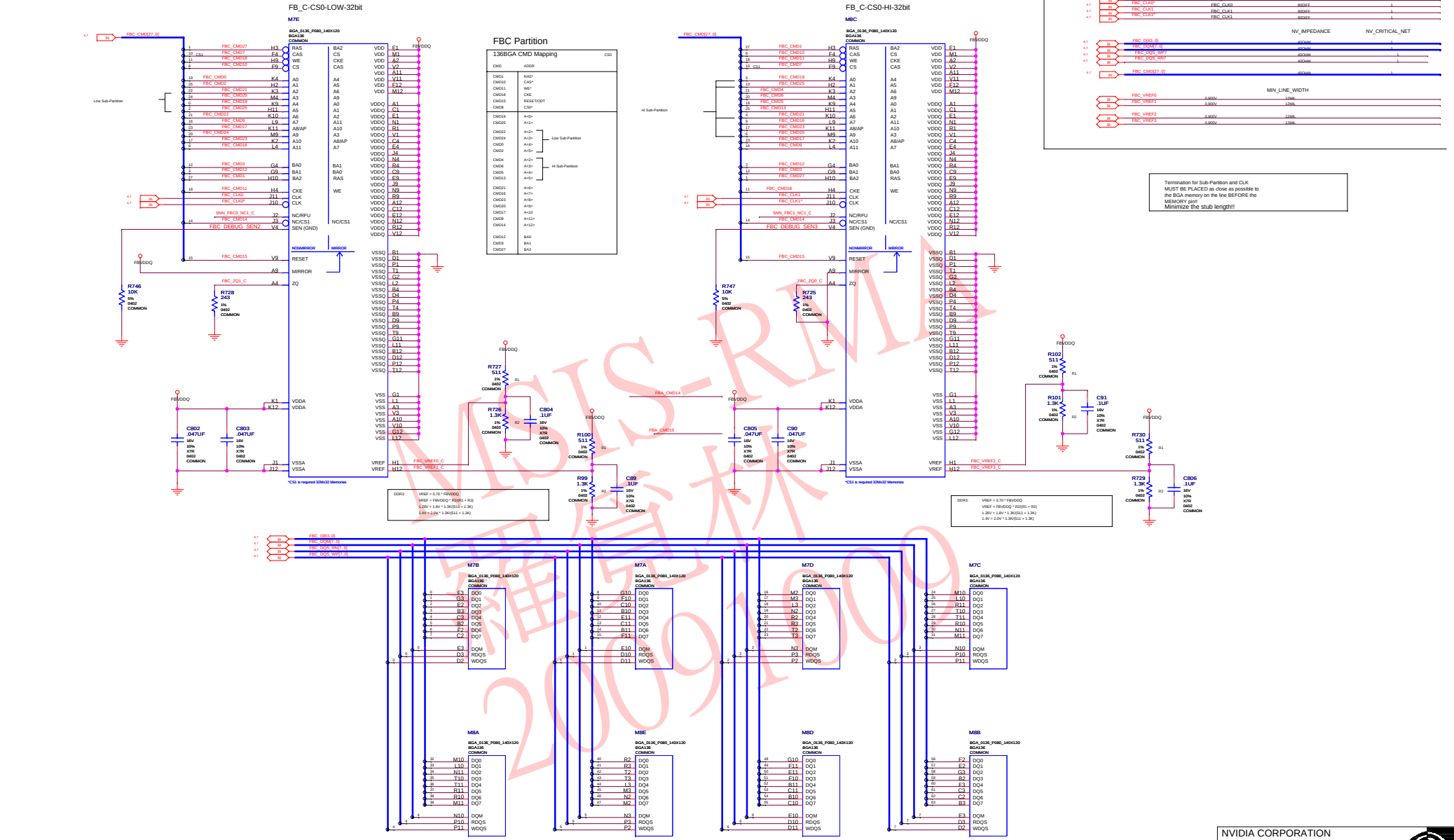

| | |
|---|---|
| ASSEMBLY | BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL |
| PAGE DETAIL | FBA 16/32Mx32 GDDR3 MEMORIES, FBA COMMAND BUS PU'S, FBA CLK TERMS |



NVIDIA CORPORATION
2701 SAN TOMAS EXPRESSWAY
SANTA CLARA, CA 95050, USA

| | |
|---|---|
| NV_PN | 600-10727-base-sch A |
| ID | |
| NAME | |
| PAGE | |
| DATE | 31-OCT-2007 |

# FRAMEBUFFER: PARTITION C 16/32Mx32 BGA136 GDDR3






| | |
|---|---|
| ASSEMBLY | BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL |
| PAGE DETAIL | FBC 16/32MX32 GDDR3 MEMORIES, FBC CMD BUS PU'S, FBC CLK TERMS |

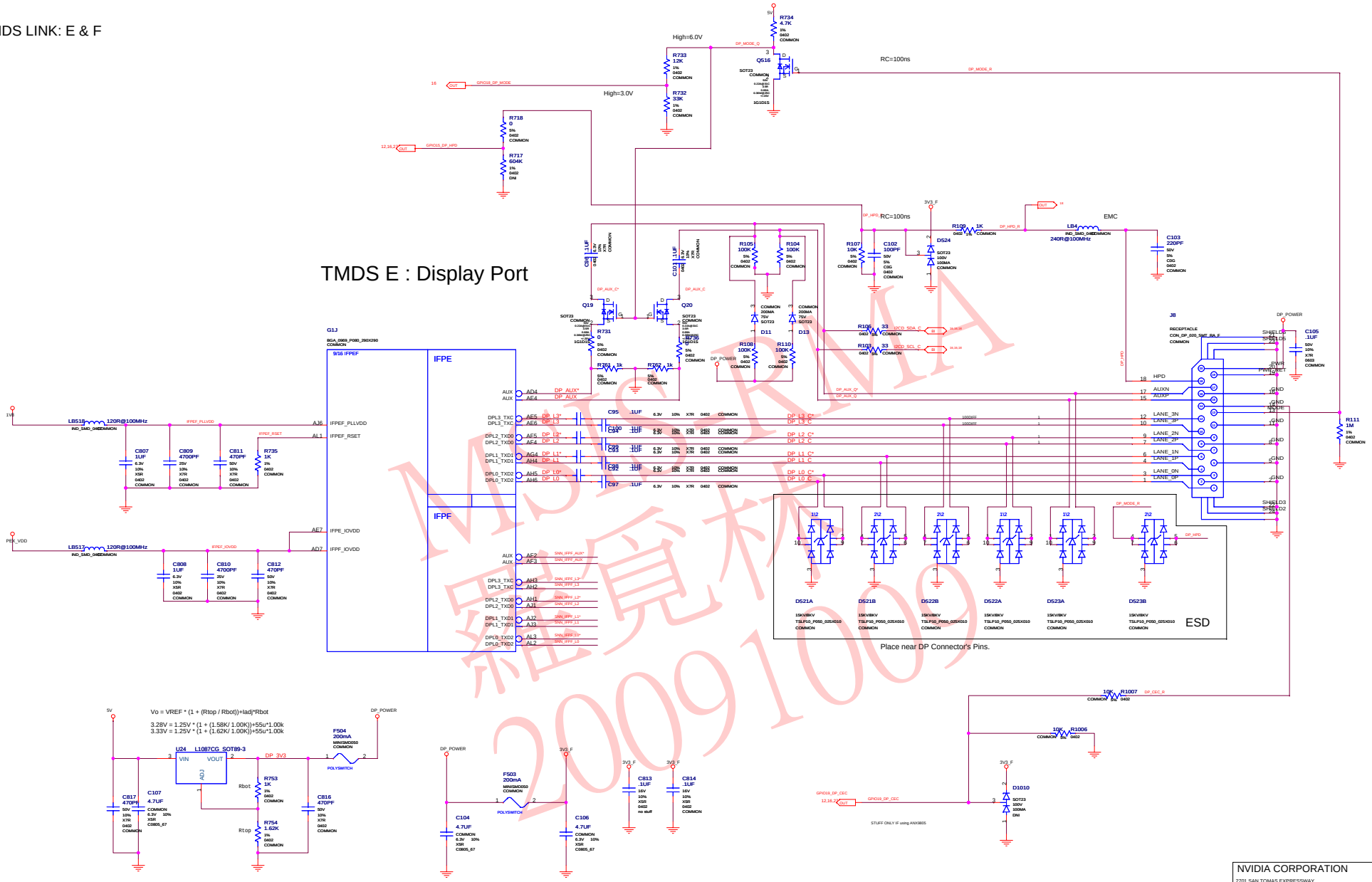


NVIDIA CORPORATION
2701 SAN TOMAS EXPRESSWAY
SANTA CLARA, CA 95050, USA

| | |
|---|---|
| NV_PN | 600-10727-base-sch A |
| ID | |
| PAGE | |
| NAME | |
| DATE | 31-OCT-2007 |

TMDS LINK: E & F

# TMDS E : Display Port





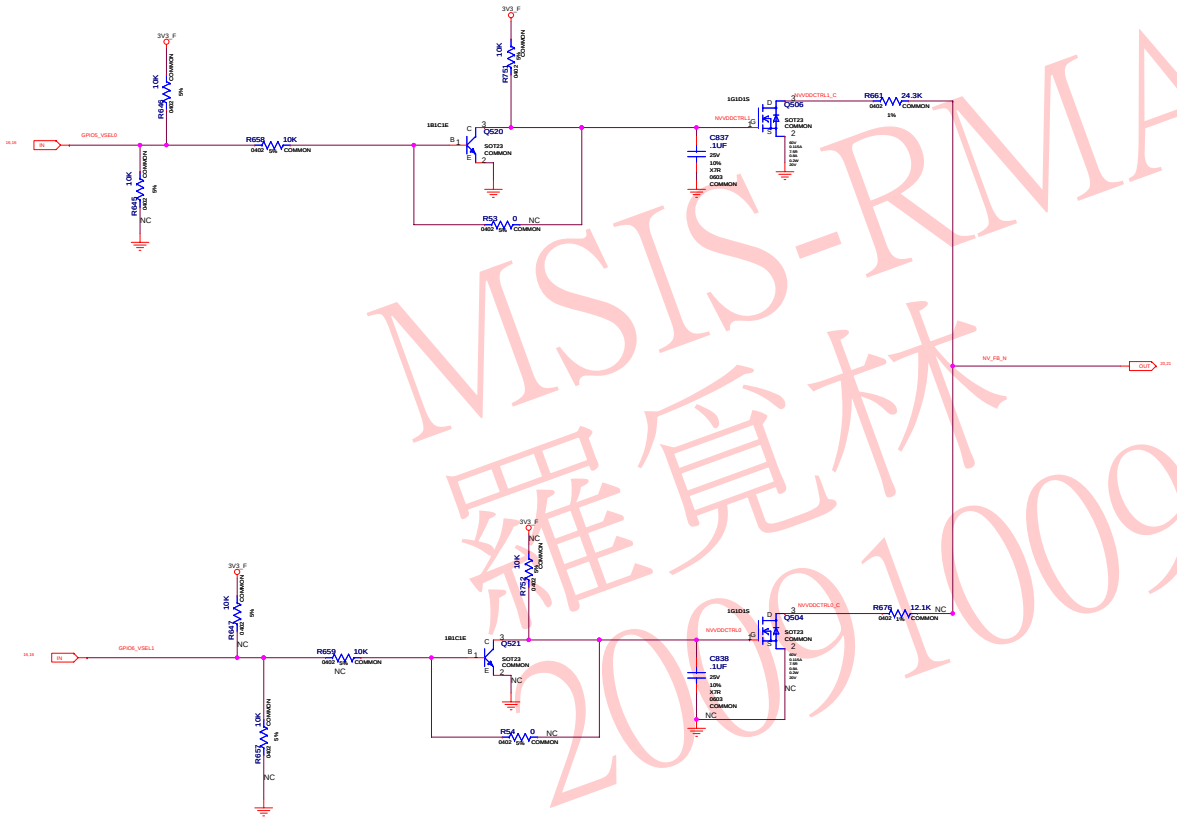

| | |
|---|---|
| ASSEMBLY | BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL |
| PAGE DETAIL | TMDS LINK C/D, AC COUPLING, PD's, DVI CONNECTOR MID |



NVIDIA CORPORATION
2701 SAN TOMAS EXPRESSWAY
SANTA CLARA, CA 95050, USA

| | |
|---|---|
| NV_PN | 600-10727-base-sch A |
| ID | |
| PAGE | |
| NAME | |
| DATE | 31-OCT-2007 |

# DYNAMIC NVVDD




Dynamic NVVDD



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



NVIDIA CORPORATION
2701 SAN TOMAS EXPRESSWAY
SANTA CLARA, CA 95050, USA

| | | | |
|---|---|---|---|
| NV_PN | 600-10727-base-sch A | | |
| ID | | PAGE | |
| NAME | | DATE | 31-OCT-2007 |