

P561: G98, DDR2 MEMORY 32MX16/16Mx16/64MX16

V116-30

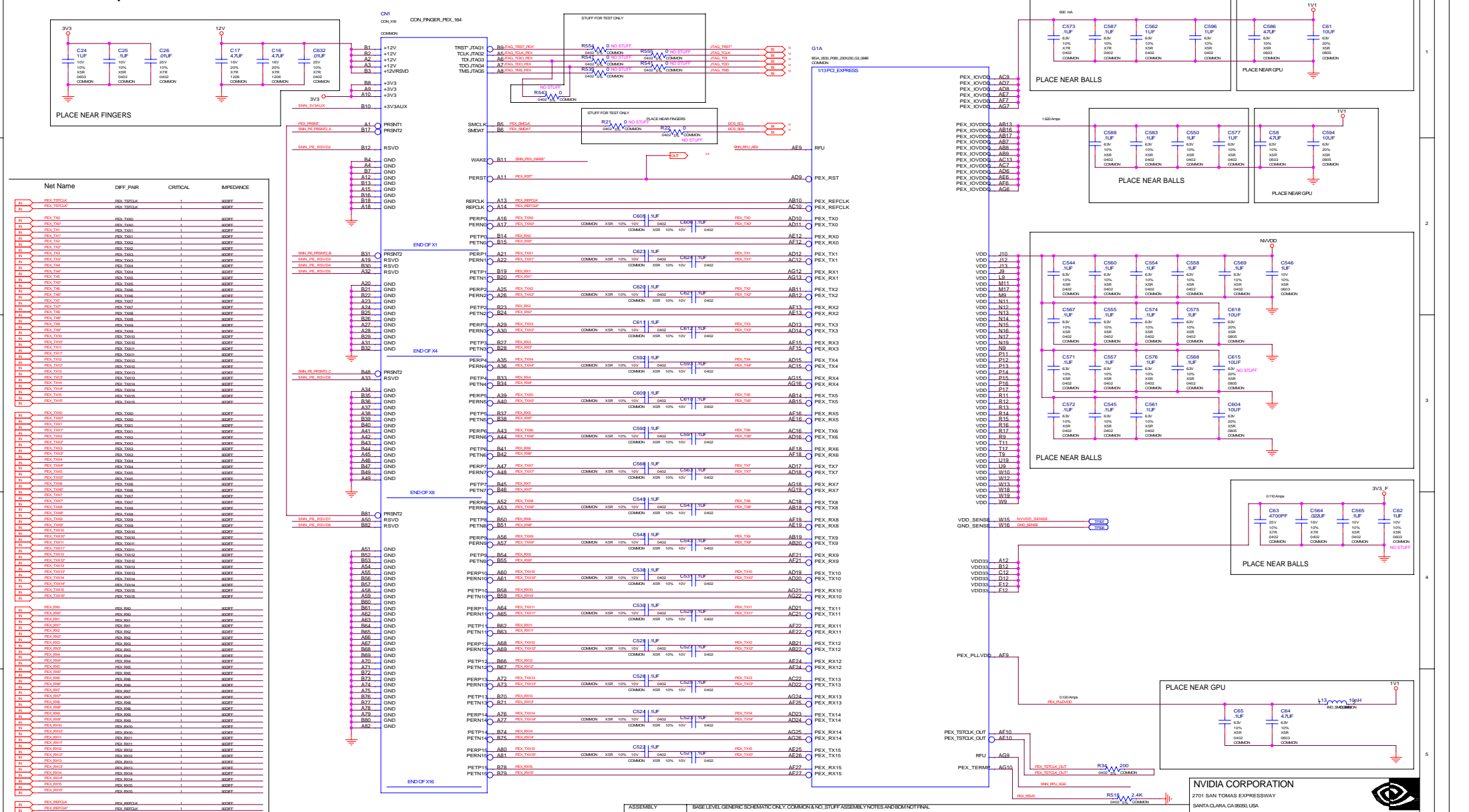
- Page 1: P561 Overview
- Page 2: PCI Express Interface
- Page 3: Frame Buffer Interface
- Page 4: Memory 1st Bank 0..31
- Page 5: Memory 1st Bank 32..63
- Page 6: DACA, Slim DB15 Connector
- Page 7: DACC,2x6 Header
- Page 8: VIDEO CONNECTORS: MiniDIN
- Page 9: TMDS Interface
- Page 10: HDAUDIO, IFPE, HDMI
- Page 11: Straps, Mechanical Parts
- Page 12: XTAL, GPIO, BIOS, FAN, JTAG, HDCP, SPDIF
- Page 13: Power Supply I: NVVDD, PLLVDD
- Page 14: Power Supply II: F3V3, 5V, DDC5V, FBVDDQ
- Page 15: Basenet Report
- Page 16: Cref Part

REV HISTORY


History 10		
96/09/27	page 08	add AV_OUT
	page 13	change Q1, Q2 to TO252
	page 14	add FBVDDQ-LDO block, change U2 footprint
96/09/28	page 07	change J4 footprint
	page 12	add J7 (co-lay J6)
	page 13	add R572 for RT9259A, R570 footprint change to 0805, change L11, C11, C12, C31 footprint
96/10/01	page 14	remove PWM block
		add D20, D21, C211, C212, C213, C214
	page 14	add R210, R211
96/10/02	page 09	change L15 footprint as CHK4417C_3R3S01, change C35 footprint
	page 12	add R75~R88, R63~R69, L15~L21 for DVI (EMI_solution)
96/10/02	page 12	add FAN Control Function
96/10/03	page 09	and netname (Between common Choke and DVI connector)
96/10/05	page 12	cnage Y501 (4 pin to 2 pin)
History 20		
96/10/03	page 14	remove FBVDDQ-LDO block, add FBVDDQ-PWM function
96/10/05	page 12	change L15 footprint as CHK4417C_3R3S01, change C35 footprint
96/10/09	page 11	cahnge Y501 (4pin to 2 pin)
		add FM1~~ FM6 for Fiducial Point
		add U301~~U306 for EMI
	page 13	add C309 for EMI
96/10/10	page 14	add C301~~C308, C310~~C312 for EMI
	page 13	add L30
96/10/11	page 13	remove L10
-----		
96/10/16	Page 10 :	Add HDMI solution .
add J8 , Q11,Q12 , L31~L38 , D11~D14 , C110~C123 , C131~C138 , R201~R208 , R211~R219 , R331~R338 .		

REV	VARIANT	MPN	ASSEMBLY
0	BASE	600-10561-xxxx-100	BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO. STUFF ASSEMBLY NOTES AND BOM NOT FINAL
1	SKU0000	600-10561-0000-100	P561: G98-300, 64 BIT DDR2 16Mx16 MEMORY, VGA+DVI+HDMI
2	SKU0001	600-10561-0001-100	P561: G98-300, 64 BIT DDR2 32Mx16 MEMORY, VGA+DVI+HDMI
3	SKU0997	600-10561-0997-100	P561: G98-300, 64 BIT DDR2 32Mx16 MEMORY, VGA+DVI+HDMI
4	SKU0997	600-10561-0997-200	P561: G98-300, 64 BIT DDR2 32Mx16 MEMORY, VGA+DVI+HDMI
5	SKU0001	600-10561-0001-200	P561: G98-300, 64 BIT DDR2 32Mx16 MEMORY, VGA+DVI+HDMI
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>

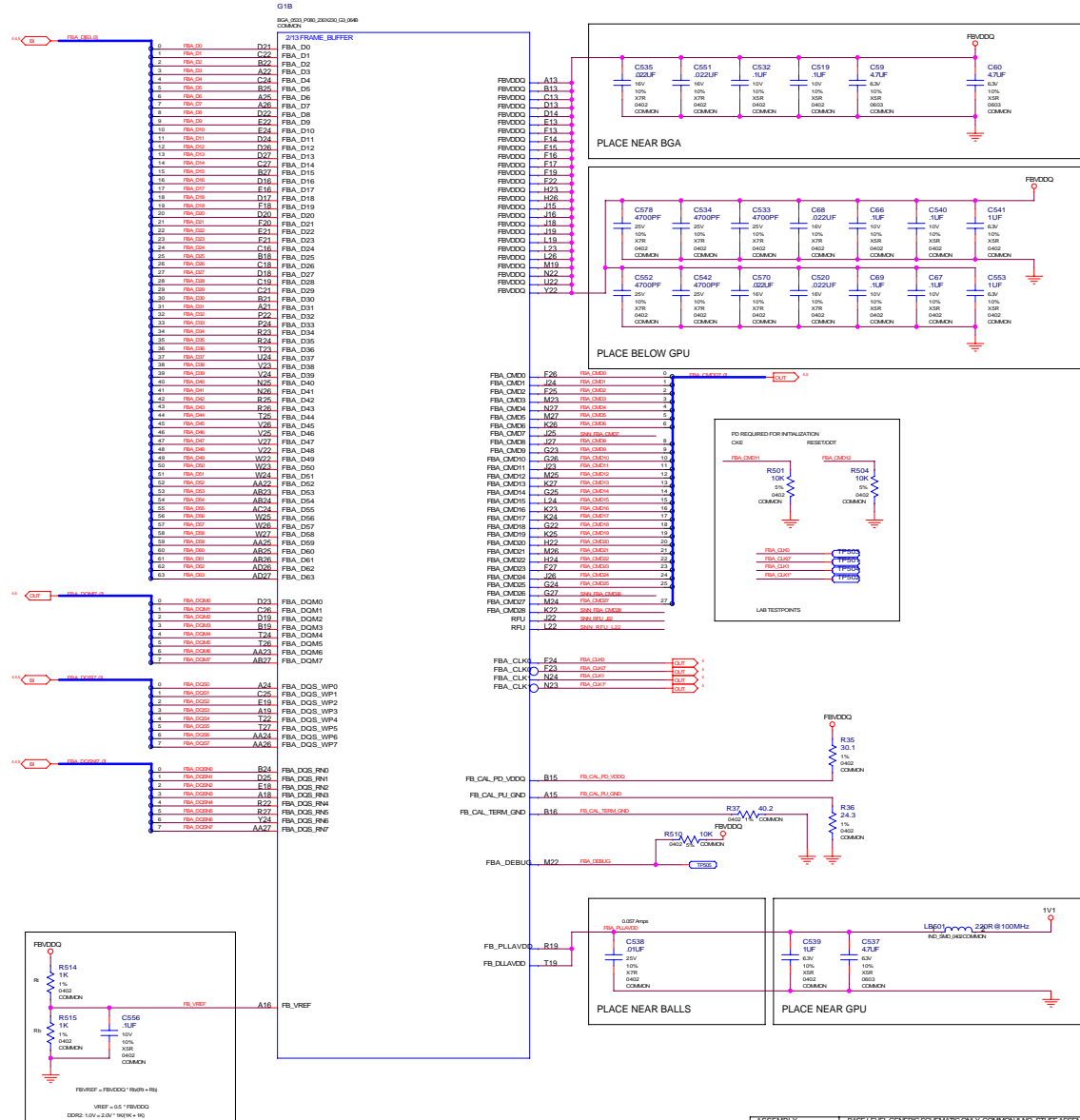
## PCI Express Interface



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 NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, OR ARISING FROM A COURSE OF DEALING, TRADE USAGE, TRADE PRACTICE, OR INDUSTRY STANDARDS.

<b>NVIDIA CORPORATION</b> 2701 SAN TOMAS EXPRESSWAY SANTA CLARA, CA 95050, USA			
NV_PN	600-10561-xxxx-100 D		
ID		PAGE	
NAME		DATE	31-AUG-2007

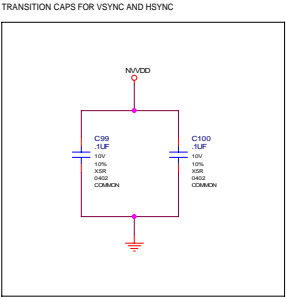
# Frame Buffer Interface



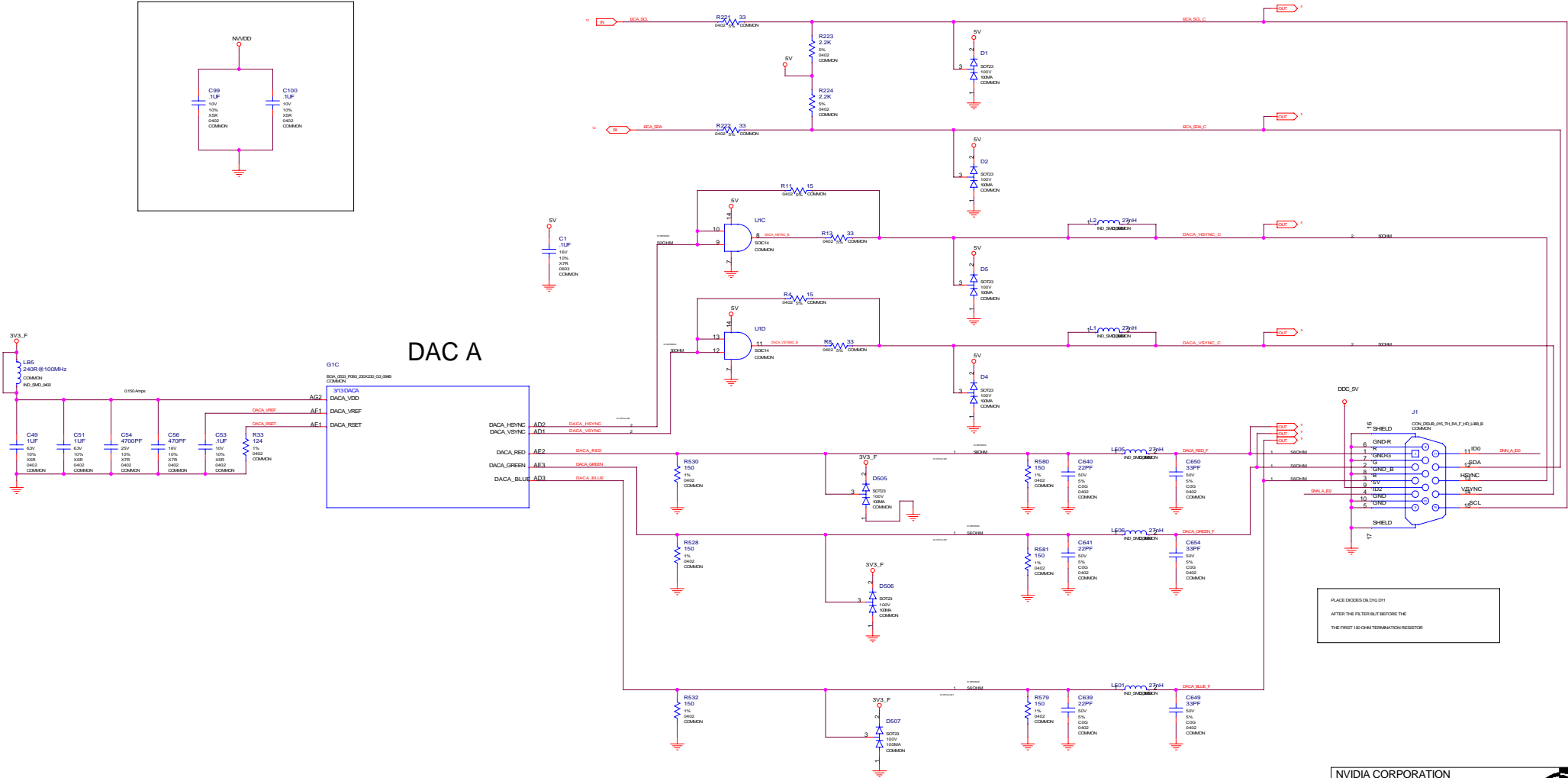




DACA, Slim DB15 Connector



DAC A



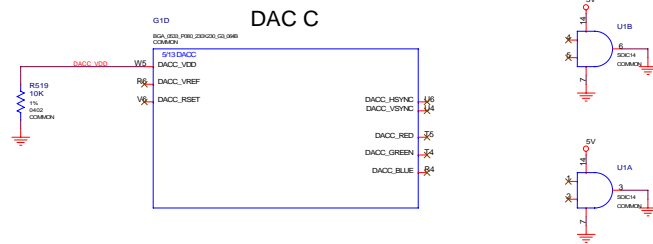
PLACE DIODES D4/D5/D6  
AFTER THE FILTER BUT BEFORE THE  
FIRST 150 OHM TERMINATION RESISTOR

ALL NVIDIA DESIGN SPECIFICATIONS, REFERENCE SPECIFICATIONS, REFERENCE BOARDS, FILES, DRAWINGS, DIAGNOSTICS, LISTS AND OTHER DOCUMENTS (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 NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, OR ARISING FROM A COURSE OF DEALING, TRADE USAGE, TRADE PRACTICE OR INDUSTRY STANDARDS.

ASSEMBLY	BOARD LEVEL GENERIC SCHEMATIC ONLY; COMMON & NO-STUFF ASSEMBLY NOTES AND BOARD NOTYAL
PAGE/DETAIL	DACA, Slim DB15 Connector

NVIDIA CORPORATION	
2701 SAN TOMAS EXPRESSWAY	
SANTA CLARA, CA 95050, USA	
NV_PN	600-10561-xxxx-100 D
ID	PAGE
NAME	DATE 31-AUG-2007

## DAC C,2x6 Header



ASSEMBLY	BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL
PAGE DETAIL	DACC 2x6 Header

ALL MEDIA DESIGN SPECIFICATIONS, REFERENCE SPECIFICATIONS, PERFORMANCE BOARDS, FILES, DRAWINGS, DIAGNOSTICS, LOGS 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. MEDIA 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 NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, OR ARISING FROM A COURSE OF DEALING, TRADE USAGE, TRADE PRACTICE, OR INDUSTRY STANDARDS.

NVIDIA CORPORATION

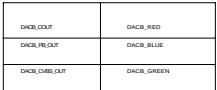
2701 SAN TOMAS EXPRESSWAY  
SANTA CLARA, CA 95050, USA




NV_PN	600-10561-xxxx-100 D
-------	----------------------

ID	PAGE
NAME	DATE 31-AUG-2007

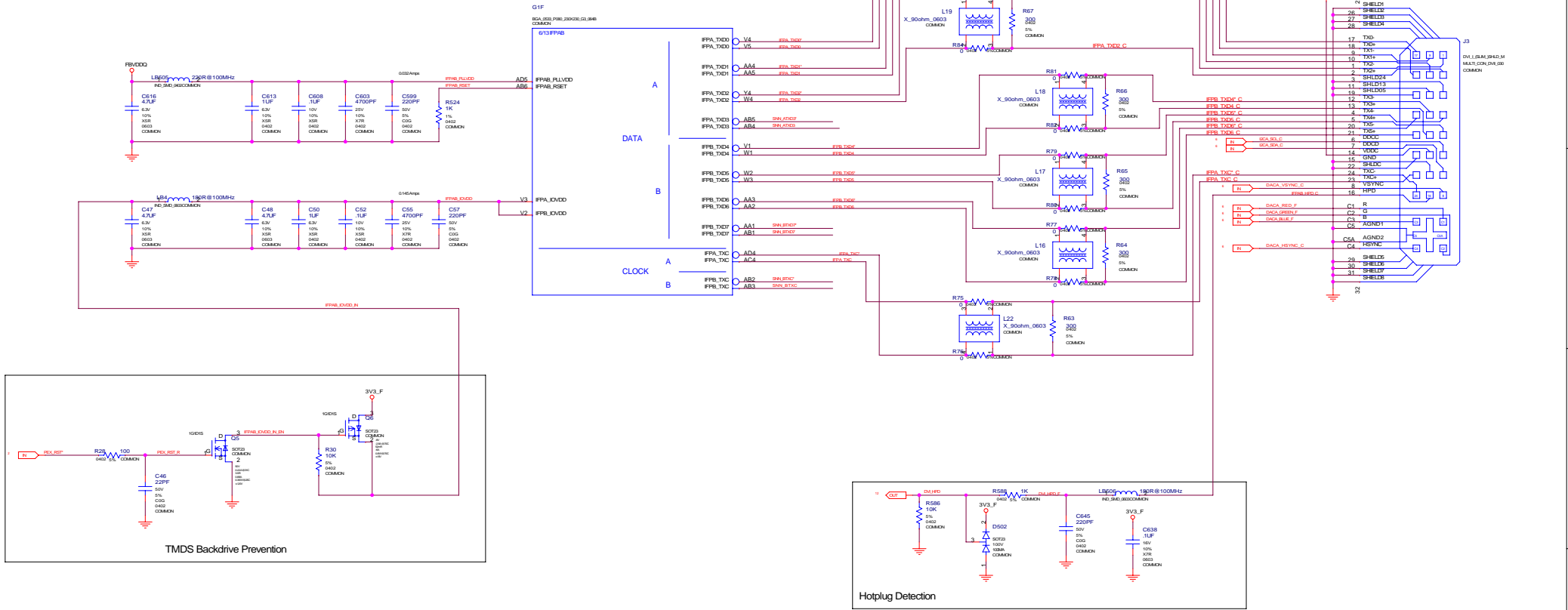
## A



NVIDIA CORPORATION			
2701 SAN TOMAS EXPRESSWAY			
SANTA CLARA, CA 95050, USA			
NV_PN	600-10561-xxxx-100 D		
ID		PAGE	
NAME		DATE	31-AUG-2007



TMDS Interface



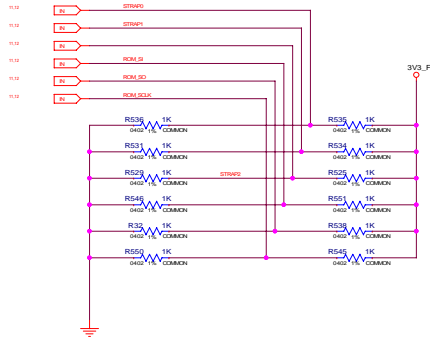
ALL NVIDIA DESIGN SPECIFICATIONS, REFERENCE SPECIFICATIONS, REFERENCE BOARDS, FILES, DRAWINGS, DIAGNOSTICS, LISTS AND OTHER DOCUMENTS (TOGETHER AND SEPARATELY, MATERIALS) ARE BEING PROVIDED AS IS. THE MATERIALS MAY CONTAIN KNOWN AND UNKNOWN VIOLATIONS OR DEVIATIONS OF INDUSTRY STANDARDS AND SPECIFICATIONS. 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 NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, OR ARISING FROM A COURSE OF DEALING, TRADE USAGE, TRADE PRACTICE, OR INDUSTRY STANDARDS.

ASSEMBLY: BOARD LEVEL GENERIC SCHEMATIC ONLY; COMMON & NO\_STUFF ASSEMBLY NOTES AND BOARD NOT FINAL  
PAGE DETAIL: TMDS Interface



## Straps, Mechanical Parts

## MULTI LEVEL STRAPS



Each strap pin represents a 4 bit value  
Pullup or Pulldown configures the MSB  
Resistor Value determines the 3 LSBs  
Resistor range is  $R \cdot n$   
where n is 0-9 and R is 5K ohm.

## STRAPS

- ```

1 SUB VENDOR = 1 (ROM PRESENT)
   = 0 (NO ROM PRESENT)

2 DEVICE ID FOR G81-64 = 0x002E
   A) PG_DEV_ID = 0_3_0 (LSB = 0x00)
   B) PG_DEV_ID_EXT = 0_3_0 (MSB = 0)

3 XGR_PACFG_0_LUT_ACRQ_0_0 = 0x00

4 TMMODEQ_0_0 = 0x00

5 RAMCFG_0_0 = 0x00 18MBits DQSG 64 BIT EUDATA
   = 0x00 18MBits DQSG 64 BIT SAMPLING, MICRON
   = 0x00 18MBits DQSG 64 BIT INTX
   = 0x01 18MBits DQSG 64 BIT INTX
   = 0x02 18MBits DQSG 64 BIT INTX
   = 0x03 18MBits DQSG 64 BIT INTX
   = 0x04 18MBits DQSG 64 BIT SAMPLING
   = 0x05 18MBits DQSG 64 BIT INTX
   = 0x11 18MBits DQSG 64 BIT INTX

6 USERP_0_0 = 0x000

```

| Resistor Value | Multiplier | Tactile VCC | Tactile Ground |
|----------------|------------|-------------|----------------|
| 240ohms        | Y          | 1000        | 0000           |
| 600ohms        | Y          | 1001        | 0001           |
| 1200ohms       | Y          | 1010        | 0010           |
| 2400ohms       | Y          | 1011        | 0011           |
| 4800ohms       | Y          | 1100        | 0100           |
| 9600ohms       | Y          | 1101        | 0101           |
| 19200ohms      | Y          | 1110        | 0110           |
| 28400ohms      | Y          | 1111        | 0111           |
| 2 KOhms?       | N          | xxxx        | xxxx           |

| MULTI LEVEL MODE |                                                           |
|------------------|-----------------------------------------------------------|
| SIGNAL           | FUNCTION                                                  |
| STRAP_PU_GND1    | USEPUL-2                                                  |
| STRAP_PU_GND2    | 3GO_PADCFG_LUT_A0PUL-2                                    |
| STRAP_PU_GND3    | POI_DEVCFG-2                                              |
| ROM1_SCLK        | POI_DEVCFG_277_SCLK_VENDEX_SLOTT_CLK_CFG_PU_PU_EN_TERRA10 |
| ROM1_CS          | RANCFG-2                                                  |
| ROM1_SD          | NCKA_277_TWANDREQ-2                                       |

| BRIDGE/STAFF/NAME |                          | STRAF_CAL_PUL_GNDN (R05)=NO STUFF<br>STRAF_CAL_PUL_GNDN (R05)=NO STUFF |
|-------------------|--------------------------|------------------------------------------------------------------------|
| SERIAL            | FUNCTION                 |                                                                        |
| STRAF01           | SOIL PRODIGE (LUT, ACRO) |                                                                        |
| STRAF02           | SOIL PRODIGE (LUT, ACRO) |                                                                        |
| STRAF03           | SOIL PRODIGE (LUT, ACRO) |                                                                        |
| ROMA_S01L         | SOIL PRODIGE (LUT, ACRO) |                                                                        |
| ROMA_S1           | SUB-VENDOR               |                                                                        |
| ROMA_S0           | ROMA_ZPT                 |                                                                        |

| PRODUCTION/BINARY MODE |             | STRAP_CAL_PU_GND1 (R55) = NO STUFF<br>STRAP_CAL_PU_GND1 (R51) = OK |
|------------------------|-------------|--------------------------------------------------------------------|
| SIGNAL                 | FUNCTION    |                                                                    |
| STRAP1                 | RANKFGR1    |                                                                    |
| STRAP2                 | RANKFGR2    |                                                                    |
| STRAP3                 | RANKFGR3    |                                                                    |
| ROM_SAR                | PG1_DEV001E |                                                                    |
| ROM_B                  | PG1_DEV001E |                                                                    |
| ROM_S0                 | ROM_ZPT     |                                                                    |

STRAP SETTINGS FOR HYNIX 32Mx16 DDR2 500MHz ( MULTI LEVEL) R511= 40K, R512=40K

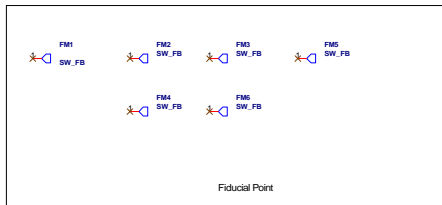
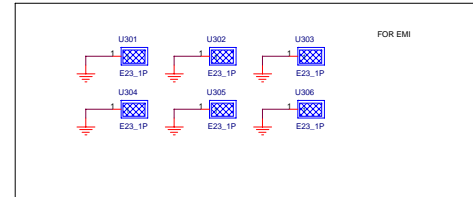
| 303_F | GND      | FUNCTION(s) | FUNCTION                                                      |
|-------|----------|-------------|---------------------------------------------------------------|
| 25K   | 5K       | STRM_W1     | USERP_11                                                      |
|       | 5K       | STRM_W2     | SIGM_PACFG_LUT_A0B_01                                         |
|       | 25K      | STRM_W3     | DCI_DECODE_1                                                  |
|       | 10K, 25K | ROM_SCLK    | PCI_DECODE_SCLK_S0B1, MENDOR_SLOT_03K_CPGI_F0R_P4L_01, T0R0B0 |
|       | 45K      | ROM_01      | RAMCFG_01                                                     |
|       |          | ROM_00      | K0LA_077, TVM0000_01                                          |

STRAP SETTINGS FOR HYNIX 32Mx16 DDR2 500MHz ( BRINGUP BINARY) R511= NO STUFF, R512=NO STUFF

| IO/F | GRD | FUNCTION | FUNCTION             |
|------|-----|----------|----------------------|
| SK   | SK  | STRWPE   | SGR_PWDGSI[1,17_ADR] |
| SK   | SK  | STRWPE   | SGR_PWDGSI[1,17_ADR] |
| SK   | SK  | STRWPE   | SGR_PWDGSI[1,17_ADR] |
| SK   | SK  | ROM_SGR  | SGR_PWDGSI[1,17_ADR] |
|      |     | ROM_SR   | SLEWINDOR            |
| SK   |     | ROM_SCD  | KXK_ZTT              |

STRAP SETTINGS FOR HYNIX 32Mx16 DDR2 500MHZ ( PRODUCTION BINARY) R511= 40K, R512= NO STUFF

| IO/F | GND | FRSIGNAL | FUNCTION     |
|------|-----|----------|--------------|
| SK   |     | STRWPE   | RAMCFR0      |
| SK   |     | STRWPE   | RAMCFR1      |
| SK   |     | STRWPE   | RAMCFR2      |
|      | SK  | K2M_K2M  | PCI_DEV000   |
|      | SK  | K0M_0    | PCI_DEV0_007 |
| SK   |     | K0M_0    | K2M_077      |



**MEC2**  
HSA\_GPU\_TM01-IUP\_T\_AL\_1\_V1  
COMMON

**COOLING SOLUTION**  
No connected mounting pins

MEC1

HSP\_GPU\_HISTOGRAMS  
COMMON

## COOLING SOLUTION

MEC7

MEC\_SCREW\_PHS  
COMMON



**MEC5**  
MEC\_SCREW\_HEX JACK  
COMMON

MEC6  
MEC\_SORDN\_HDX\_JACK  
COMMON

MEC3  
MEC\_SCREW\_HEX JACK  
COMMON

MEC4  
MEC\_SCREW\_HEX JACK

NVIDIA CORPORATION

2701 SAN TOMAS EXPRESSWAY  
SANTA CLARA, CA 95050, USA

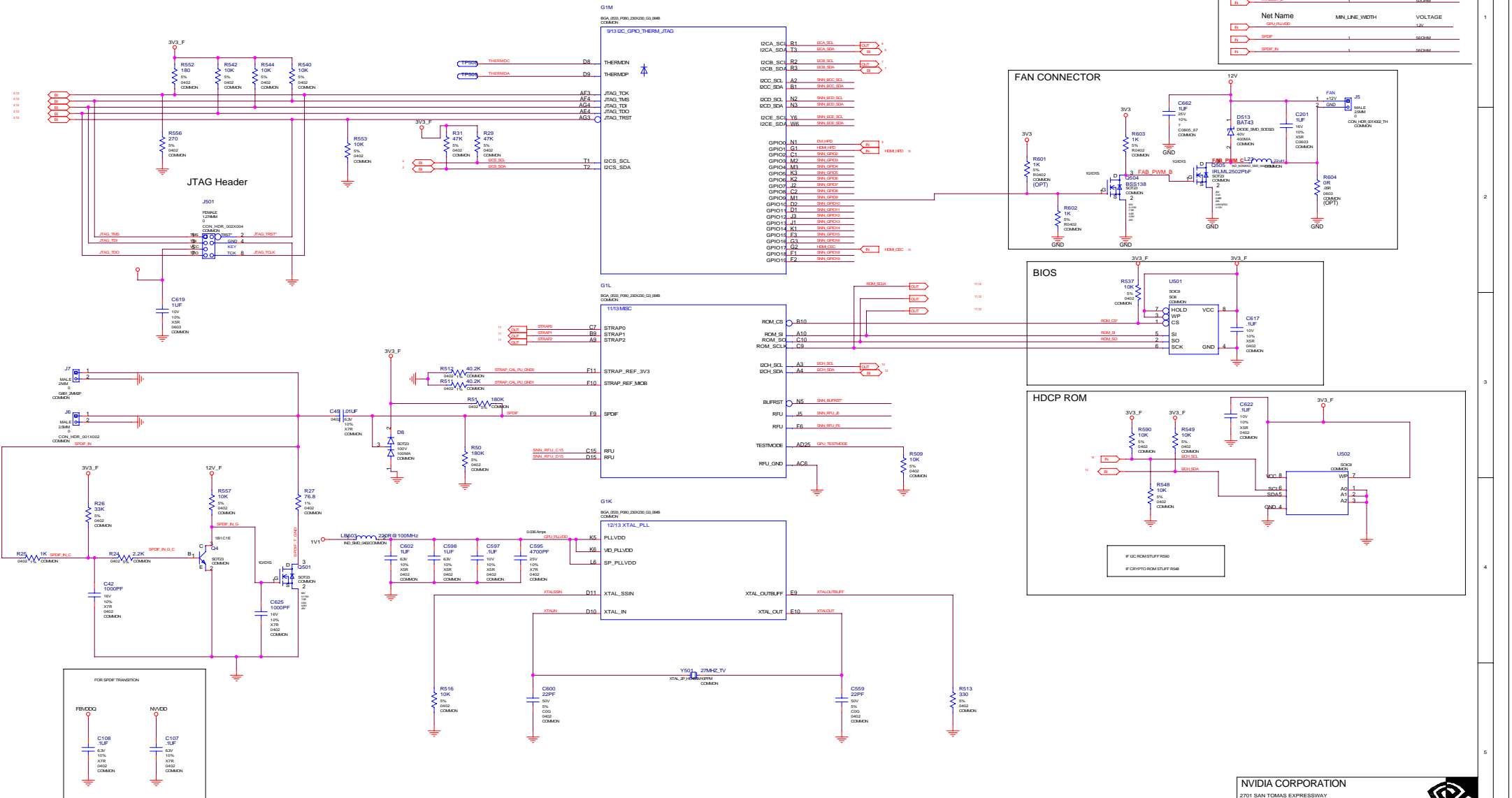


|       |                      |
|-------|----------------------|
| NV_PN | 600-10561-xxxx-100 D |
|-------|----------------------|

|      |  |      |             |
|------|--|------|-------------|
| ID   |  | PAGE |             |
| NAME |  | DATE | 31-AUG-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 UNKNOWN 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 NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, OR ARISING FROM A COURSE OF DEALING, TRADE USAGE, TRADE PRACTICE, OR INDUSTRY STANDARDS.

# XTAL, GPIO, BIOS, FAN, JTAG, HDCP, SPDIF

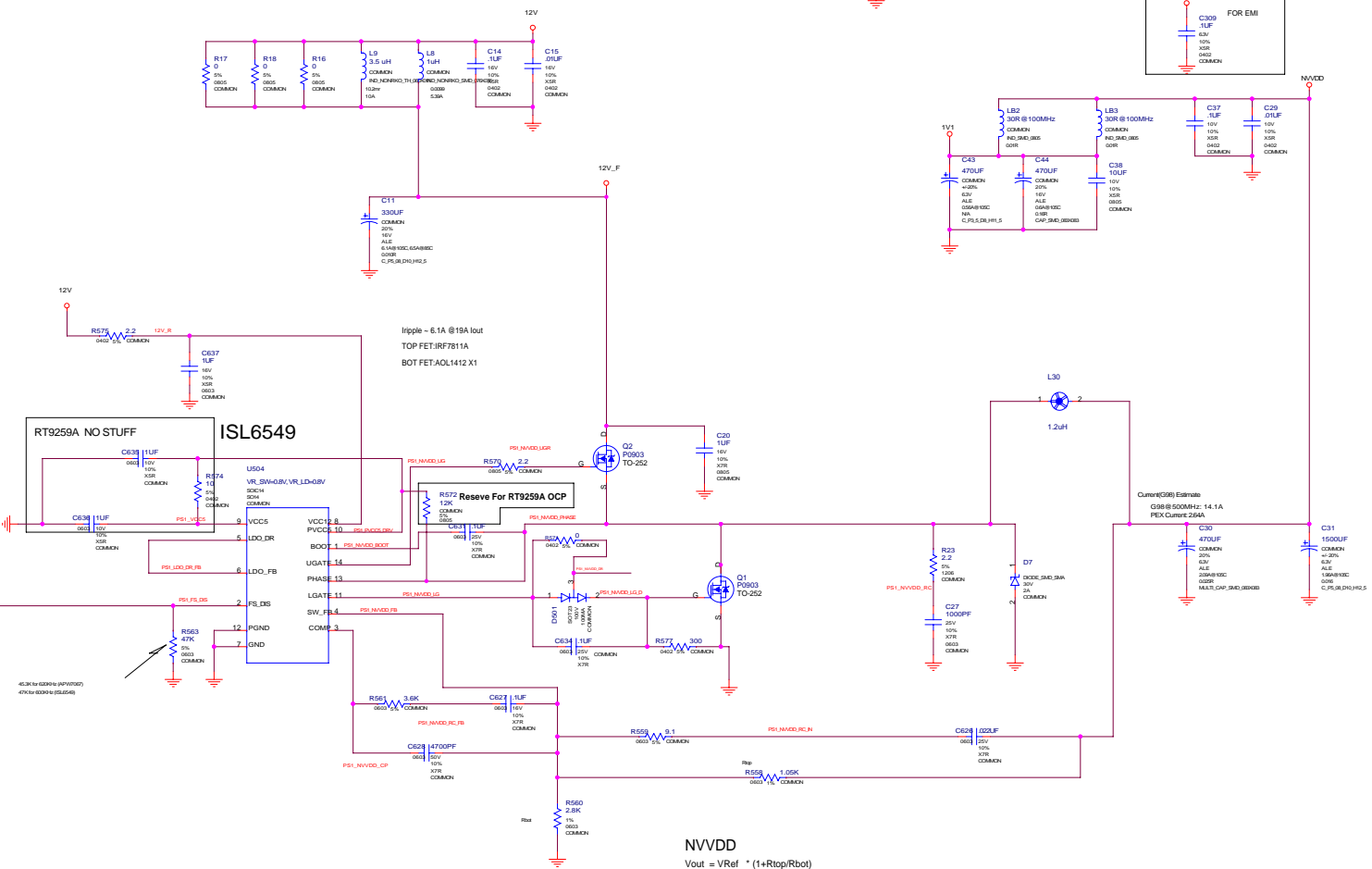
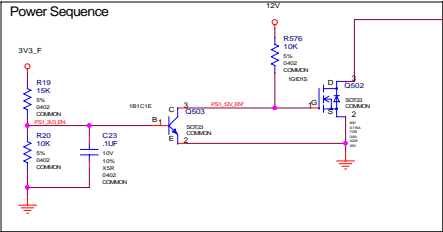


| Net Name  | CRITICAL | IMPEDANCE |
|-----------|----------|-----------|
| XTALIN    | 1        | 50OHM     |
| XTALOUT   | 1        | 50OHM     |
| XTALIN_T  | 1        | 50OHM     |
| XTALOUT_T | 1        | 50OHM     |
| XTALIN_B  | 1        | 50OHM     |
| XTALOUT_B | 1        | 50OHM     |

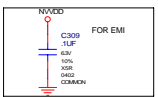
  

| Net Name    | MIN_LINE_WIDTH | VOLTAGE |
|-------------|----------------|---------|
| GPIO_PULVED | 1              | 12V     |
| SPDIF       | 1              | 50OHM   |
| SPDIF_IN    | 1              | 50OHM   |

Power Supply I: NVVDD, PLLVDD



| Net Name | LINE_WIDTH | Current | Voltage |
|----------|------------|---------|---------|
| 0V_F     | 30M        | 3A      | 0V      |
| NVVDD    | 30M        | 0.2A    | 1.1V    |
| 1V1      | 30M        | 0.2A    | 1.1V    |
| 12V      | 30M        | 4A      | 12V     |
| 0VDD     | 30M        | 0.000A  | 0V      |



NVVDD

$V_{out} = V_{Ref} \cdot (1 + R_{top}/R_{bot})$

$1.1V = 0.8V \cdot (1 + (1.05K/2.8K)) \quad (ISL6549)$

$1.15V = 0.8V \cdot (1 + (1.02K/2.32K)) \quad (ISL6549)$

NVIDIA CORPORATION

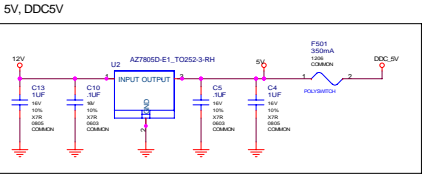
2701 SAN TOMAS EXPRESSWAY

SANTA CLARA, CA 95050, USA

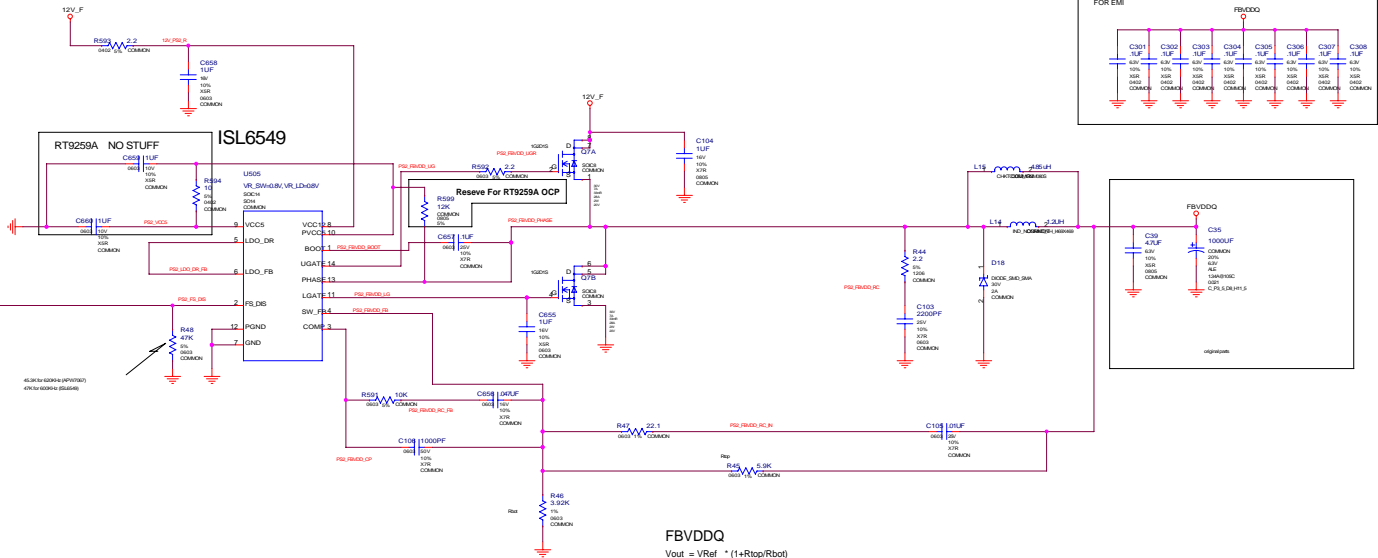
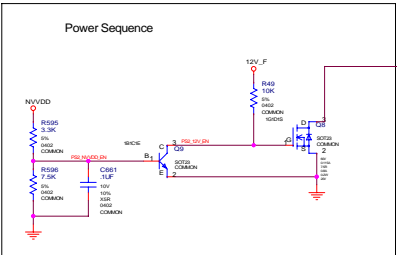
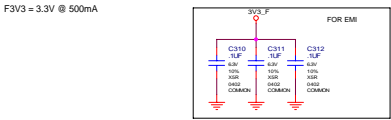
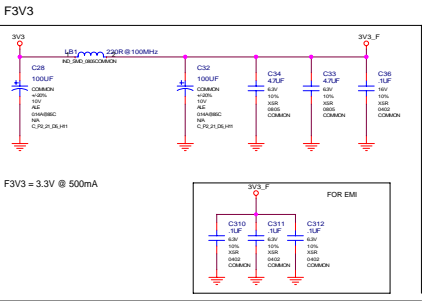
|       |                      |      |             |
|-------|----------------------|------|-------------|
| NV_PN | 600-10561-xxxx-100 D |      |             |
| ID    |                      | PAGE |             |
| NAME  |                      | DATE | 31-AUG-2007 |

ALL NVIDIA DESIGN SPECIFICATIONS, REFERENCE BOARDS, FILES, DRAWINGS, DIAGNOSTICS, LISTS AND OTHER DOCUMENTS (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 NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, OR ARISING FROM A COURSE OF DEALING, TRADE USAGE, TRADE PRACTICE, OR INDUSTRY STANDARDS.

Power Supply II: 5V, DDC5V, F3V3, FBVDDQ



| Net Name | MIN_LENGTH | CURRENT | VOLTAGE |
|----------|------------|---------|---------|
| 5V       | 100M       | 100MA   | 5V      |
| DDC5V    | 100M       | 100MA   | 5V      |
| 5V_F     | 100M       | 100MA   | 5V      |
| DDC5V_F  | 100M       | 100MA   | 5V      |



FBVDDQ

$$V_{out} = V_{Ref} * (1 + R_{top}/R_{bot})$$

1.800V = 0.8V \* (1 + (5.9K/4.7K)) (ISL6549)  
2.000V = 0.8V \* (1 + (5.9K/3.92K)) (ISL6549)  
2.156V = 0.8V \* (1 + (5.9K/3.4K)) (ISL6549)

[illegible]

