

18P112, NV18, 4Mx32DDR, 64MB, DVI-I, Video OUT, VGA

Page Overview

- 1 18P112 OVERVIEW
- 2 NV18 AGP Section and AGP connector
- 3 NV18 FRAMEBUFFER Interface
- 4 MEMORY 64MB, 4Mx32DDR Bits 0..63
- 5 MEMORY 64MB, 4Mx32DDR Bits 64..127
- 6 NV18 STRAPPING, I/O Interface
 - BIOS, FAN CONTROL, THERMAL SENSOR
- 7 NV18 DACA, DACB output, SYNC amplifier
 - PLL Section
- 8 DACB MULTIPLEXER
- 9 PRIMARY DISPLAY Filter and Connector
- 10 SECONDARY DISPLAY Filter and Connector
- 11 NV18 INTERNAL TMDS Power and Output
 - TMDS Backdrive circuit
- 12 PRIMARY DISPLAY DVI-I option
 - Hotplug detection and Connector
- 13 VIDEO CAPTURE Philips 7114 I/O
- 14 VIDEO IN/OUT, Filter and Connector
- 15 VIDEO INTERNAL Input
 - Filter and Connector
- 16 1394 TEXAS TSB41AB2, PowerRails,
 - I/O, Internal and external connector
- 17 POWER SUPPLY
 - NVVDD, MEM_VDD, A3V3, TMDS3V3, TMDSPLL
- 18 MECHANICS

HISTORY:

A00

X00: INITIAL VERSION
 X01: Removed MBDET circuit bypass resistor
 STRAP resistors, stuffing options set
 STRAP resistors, USER strap :=0
 DACB RSET modification resistor 1%=>5%
 SYNC amplifier, bypass resistors removed
 DACB RGB filter, bypass capacitors set to NO STUFF
 DVI-HPD signal, voltage divisor 10k/15k set near DVI
 24MHZ signal to 1394, changed stuffing option to disable trace
 VIDEO in connector internal, added A3V3 decoupling caps.
 DVCLKOUT signal, series termination added
 PD input 1394, stuffing option of series resistor set to NO STUFF
 LDOs, calculation information added
 LDO for TMDSPLL, changed resistor values to create 3V3
 LDO for TMDSPLL, complex bypass resistors simplified.
 1394 POWERCLASS, SVSENSE signal renamed to EXTsense and generated from 12VEXT
 ADDED OFFPAGE SYMBOLS, OPTICAL IMPROVEMENTS

A01

X00: Replaced NV18 symbol_9. Pin changes Thermal sensor
 Changed TMDS constraints to 10MIL_G2G_30MIL
 Changed THERM, THERMX constraints to 10MIL_G2G_10MIL
 Added SST45VF BIOS type with necessary strap resistors.
 Added Pullup on ROMCSx
 Replaced backdrive diode TMDS3V3 by SCHOTTKY type with 1A
 Added bypass resistors to Sync Amplifier
 Changed GND pin usage on internal 1394 connector
 Added compensation to FBVDD regulator
 Added supply rail from 3V3 for switching regulator to solve 3V3 shutdown
 Added alternative circuit to solve switch reg. 3V3 shutdown
 Added hex jack screws as symbols
 Added cap for CG_VREF on AGP
 Added bypass resistors for primary inductor of switch regulator
 Added pulldown for 7114 TRST Jtag signal

A02

X00: Changed AGPVREF(CG rule to 12mil tracewidth
 Page2: changed AGPVREF(CG generation for BX mode
 Page5: Added series resistor in FRWR_PME_
 X01: Page6: Changed description for strap resistors

602-50112-0300-000 for SKU 801-50112-0300-000

ALL NVIDIA DESIGN SPECIFICATIONS, REFERENCE BOARDS, FILES, DRAWINGS, DIAGNOSTICS, LISTS AND OTHER DOCUMENTS (TOGETHER AND SEPARATELY, 'MATERIALS') ARE BEING PROVIDED 'AS IS'.
 NVIDIA MAKES NO WARRANTIES, EXPRESSED, IMPLIED, STATUTORY OR OTHERWISE WITH RESPECT TO THE MATERIALS, AND EXPRESSLY DISCLAIMS ALL IMPLIED WARRANTIES OF NONINFRINGEMENT, MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

ID	p112_design	PAGE	1 OF 22
NAME	602-50112-0300-000	DATE	JUG-15 2002
DETAIL			NVIDIA CORPORATION 2701 SAN TOMAS EXPRESSWAY SANTA CLARA, CA 95051, USA 

A

B

C

D

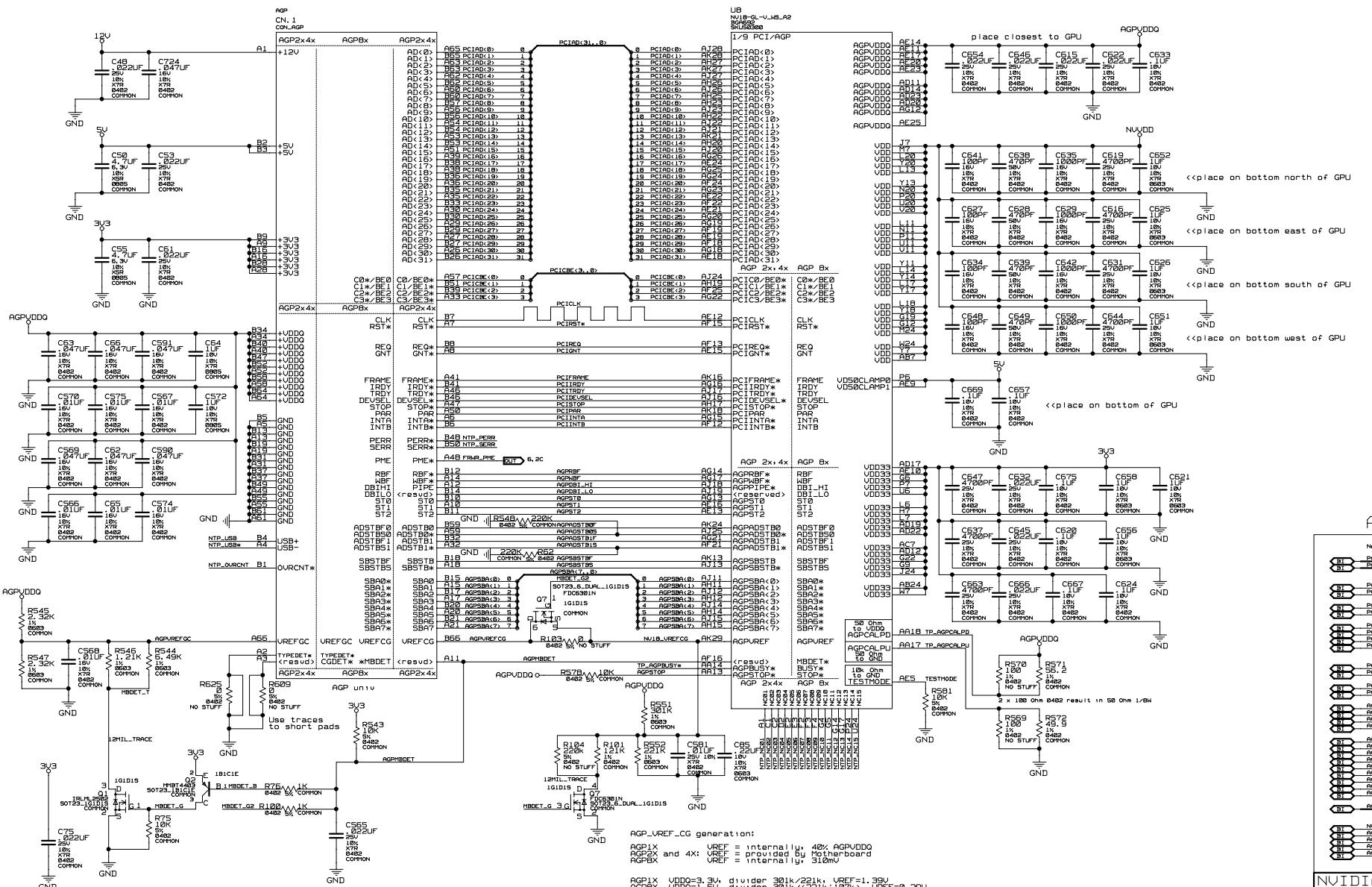
E

F

G

H

NV18 AGP SECTION AND AGP CONNECTOR



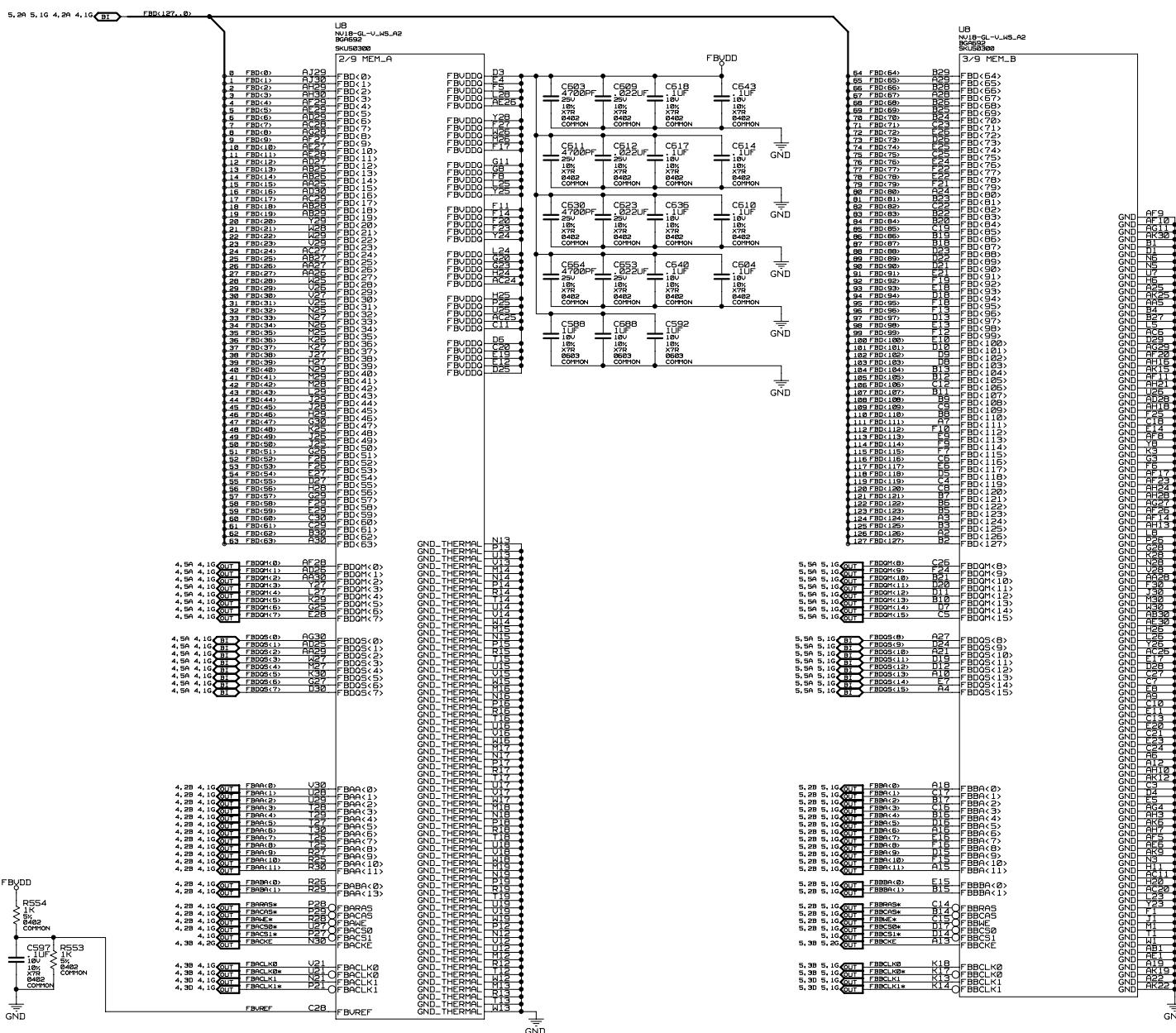
NVIDIA CORPORATION
2701 SAN TOMAS EXPRESSWAY
SANTA CLARA, CA 95050, USA

ALL NUDIA DESIGN SPECIFICATIONS, REFERENCE BOARDS, FILES, DRAWINGS, DIAGNOSTICS, LISTS AND OTHER DOCUMENTS (TOGETHER AND SEPARATELY, "MATERIALS"), ARE BEING PROVIDED "AS IS" WITHOUT WARRANTY OR GUARANTEE. EXCEPT AS EXPRESSLY PROVIDED IN THE AGREEMENT, NUDIA IS NOT LIABLE FOR ANY DAMAGES, WHETHER DIRECT, INDIRECT, SPECIAL, INCIDENTAL, CONSEQUENTIAL, PUNITIVE, EXEMPLARY, OR OTHERWISE, ARISING OUT OF THE USE OF THE MATERIALS.

NVIDIA MAKES NO WARRANTIES, EXPRESSED, IMPLIED, STATUTORY OR OTHERWISE WITH RESPECT TO THE MATERIALS, AND EXPRESSLY DISCLAIMS ALL IMPLIED WARRANTIES OF NONINFRINGEMENT, MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

ID p112_design PAGE 2 OF 22
NAME 602-50112-0300-000 DATE AUG-16 2002

NV18 FRAMEBUFFER INTERFACE AND DECOUPLING



ALL NVIDIA DESIGN SPECIFICATIONS, REFERENCE BOARDS, FILES, DRAWINGS, DIAGNOSTICS, LISTS AND OTHER DOCUMENTS (TOGETHER AND SEPARATELY, 'MATERIALS') ARE BEING PROVIDED 'AS IS'.

NVIDIA MAKES NO WARRANTIES, EXPRESSED, IMPLIED, STATUTORY OR OTHERWISE WITH RESPECT TO THE MATERIALS, AND EXPRESSLY DISCLAIMS ALL IMPLIED WARRANTIES OF NONINFRINGEMENT, MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

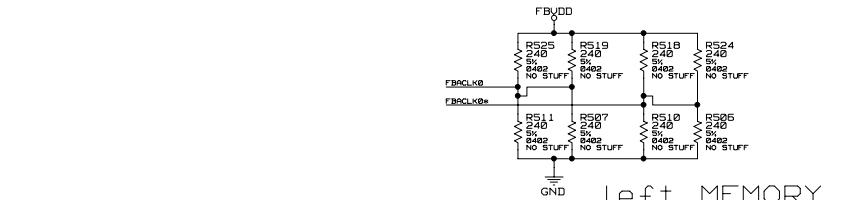
NVIDIA CORPORATION
2701 SAN TOMAS EXPRESSWAY
SANTA CLARA, CA 95051, USA
DETAIL NV18 Framebuffer Interface

ID p112_design PAGE 3 of 22

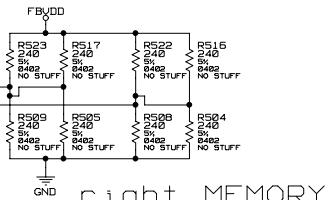
NAME 502-S0112-0300-000 DATE AUG-16 2002

MEMORY 64MB, 4Mx32DDR bits 0..63

PLACE ALL DISCRETE COMPONENTS AS NEAR AS POSSIBLE TO MEMORY



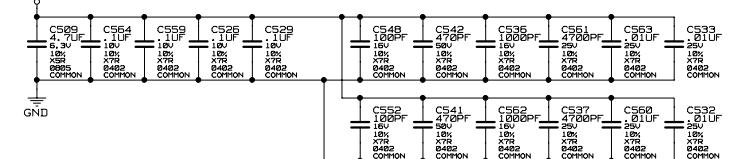
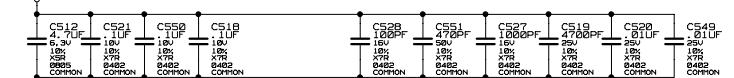
Left MEMORY



right MEMORY

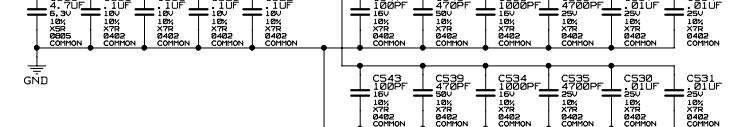
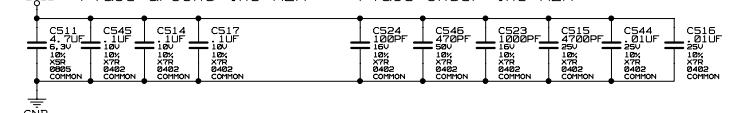
Decoupling for left MEMORY

~~FBYDD~~ Place around the MEM Place under the MEM



Decoupling for right MEMORY

FBYDD Place around the MFM Place under the MFM



PLACE NEAR MEMORY

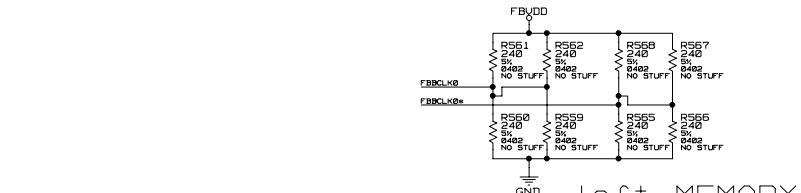
ALL NVIDIA DESIGN SPECIFICATIONS, REFERENCE BOARDS, FILES, DRAWINGS, DIAGNOSTICS, LISTS AND OTHER DOCUMENTS (TOGETHER AND SEPARATELY, 'MATERIALS') ARE BEING PROVIDED 'AS IS'.

NVIDIA MAKES NO WARRANTIES, EXPRESSED, IMPLIED, STATUTORY OR OTHERWISE WITH RESPECT TO THE MATERIALS, AND EXPRESSLY DISCLAIMS ALL IMPLIED WARRANTIES OF NONINFRINGEMENT, MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

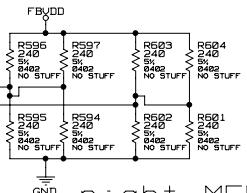
NVIDIA CORPORATION
2701 SAN TOMAS EXPRESSWAY
SANTA CLARA, CA 95051, USA
DETAIL MEMORY 64MB, 4Mx32DDR Bits 0..63

MEMORY 64MB, 4Mx32DDR, bits 64..127

PLACE ALL DISCRETE COMPONENTS AS NEAR AS POSSIBLE TO MEMORY



left MEMORY

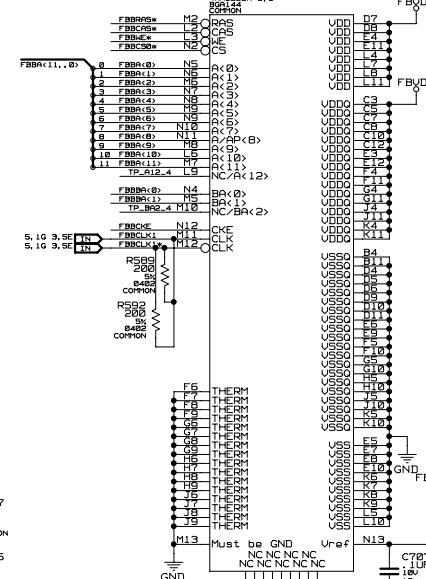
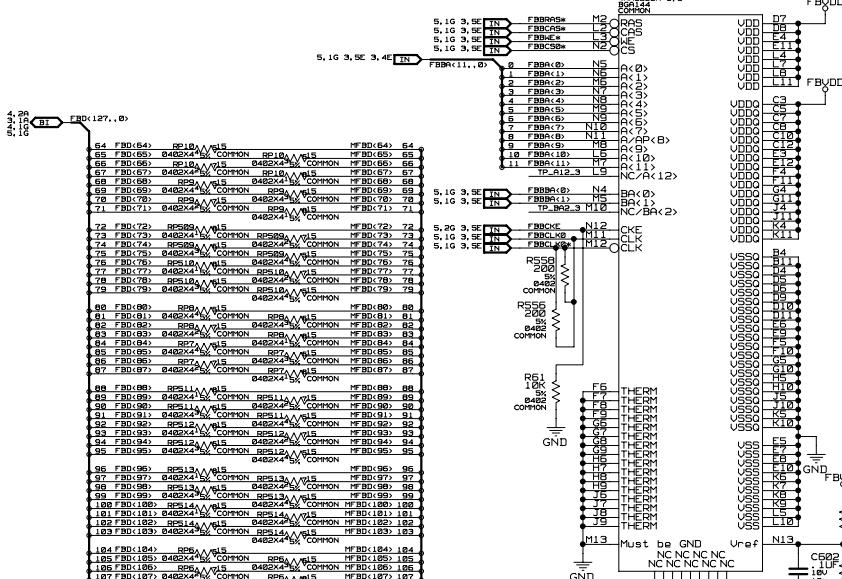


right MEMORY

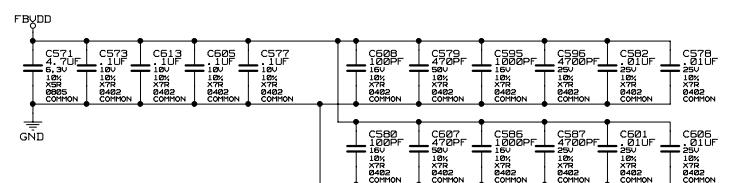
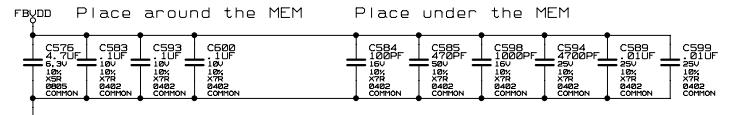
NET	Diffpair	NET_SPACING_RULE
FBNCLK0	FBNCLK0	20mil G2G .30mil
FBNCLK0*	FBNCLK0*	20mil G2G .30mil
FBNCLK1	FBNCLK1	20mil G2G .30mil
FBNCLK1*	FBNCLK1*	20mil G2G .30mil
FBNCLK2	FBNCLK2	20mil G2G .30mil
FBNCLK3	FBNCLK3	20mil G2G .30mil
FBNCLK4	FBNCLK4	20mil G2G .30mil
FBNCLK5	FBNCLK5	20mil G2G .30mil
FBNCLK6	FBNCLK6	20mil G2G .30mil

5.3B 3.5E	FBNCLK0	12mil
5.3B 3.5E	FBNCLK0*	12mil
5.3D 3.5E	FBNCLK1	12mil
5.3D 3.5E	FBNCLK1*	12mil
5.2A 4.2A 3.1P	FBNCLK2	12mil
5.5A 3.4C	FBNCLK3	12mil
5.2B 3.5E	FBNCLK4	12mil
5.2B 3.5E	FBNCLK5	12mil
5.2B 3.5E	FBNCLK6	12mil

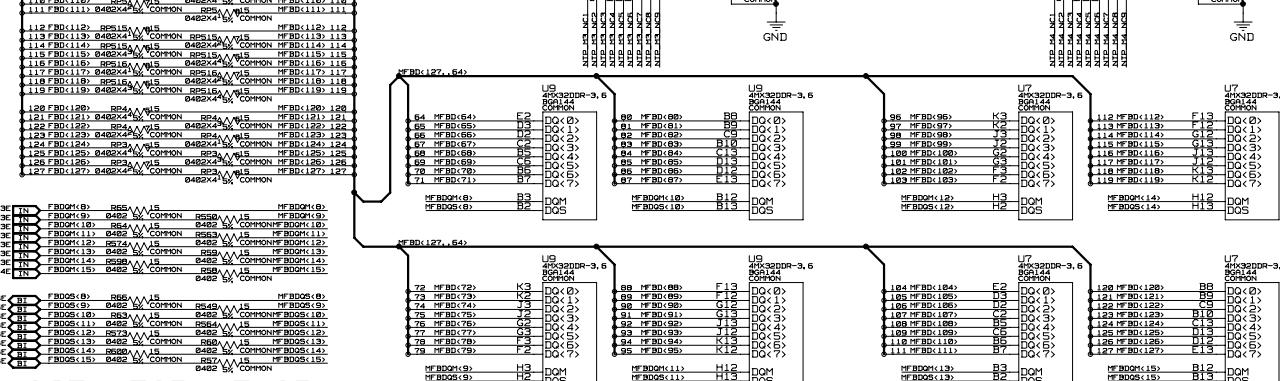
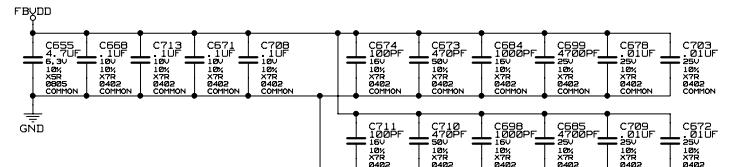
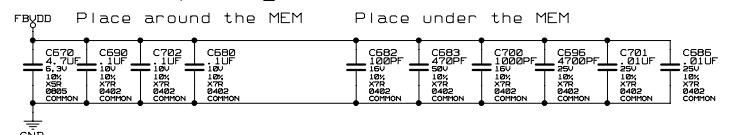
5.2B 3.5E	FBNCLK0	12mil
5.2B 3.5E	FBNCLK0*	12mil
5.2B 3.5E	FBNCLK1	12mil
5.2B 3.5E	FBNCLK1*	12mil
5.2B 3.5E	FBNCLK2	12mil
5.2B 3.5E	FBNCLK3	12mil
5.2B 3.5E	FBNCLK4	12mil
5.2B 3.5E	FBNCLK5	12mil
5.2B 3.5E	FBNCLK6	12mil



Decoupling for left MEMORY



Decoupling for left MEMORY



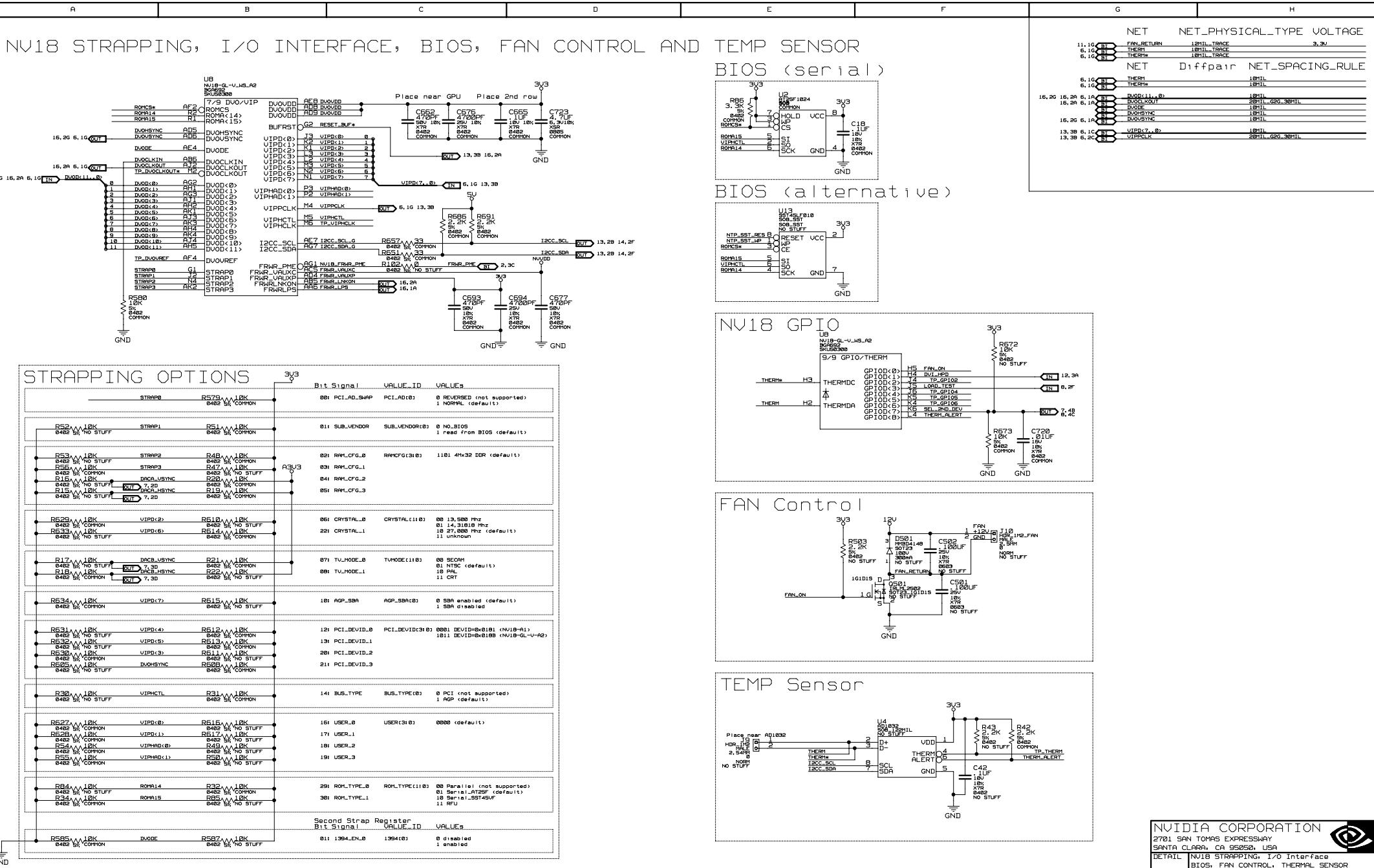
PLACE NEAR MEMORY

ALL NUDIA DESIGN SPECIFICATIONS, REFERENCE BOARDS, FILES, DRAWINGS, DIAGNOSTICS, LISTS AND OTHER DOCUMENTS (TOGETHER AND SEPARATELY, 'MATERIALS') ARE BEING PROVIDED 'AS IS'.

NUDIA MAKES NO WARRANTIES, EXPRESSED, IMPLIED, STATUTORY OR OTHERWISE WITH RESPECT TO THE MATERIALS, AND EXPRESSLY DISCLAIMS ALL IMPLIED WARRANTIES OF NONINFRINGEMENT, MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

ID: p112_design PAGE: 5 of 22

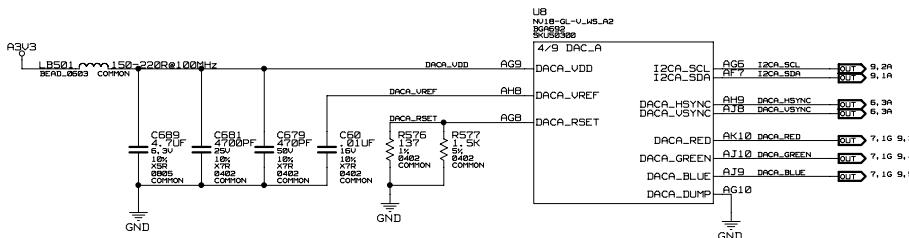
NAME: 502-50112-0300-000 DATE: AUG-16 2002



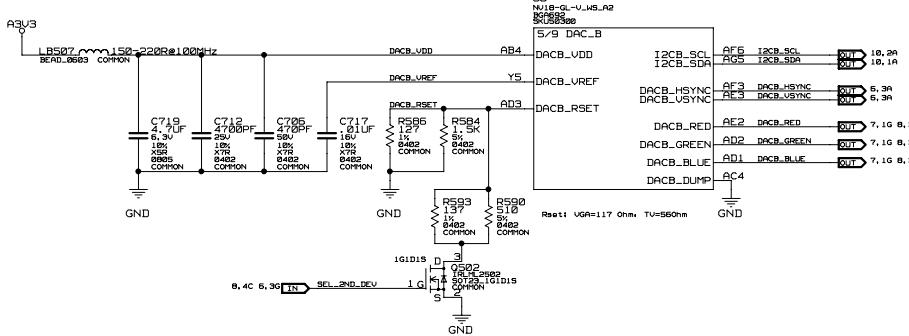
ALL NVIDIA DESIGN SPECIFICATIONS, REFERENCE BOARDS, FILES, DRAWINGS, DIAGNOSTICS, LISTS AND OTHER DOCUMENTS (TOGETHER AND SEPARATELY, "MATERIALS") ARE BEING PROVIDED "AS IS". NVIDIA MAKES NO WARRANTIES, EXPRESSED, IMPLIED, STATUTORY OR OTHERWISE WITH RESPECT TO THE MATERIALS, AND EXPRESSLY DISCLAIMS ALL IMPLIED WARRANTIES OF NONINFRINGEMENT, MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

NV18 DAC_A, DAC_B, PLL, SYNC AMPL

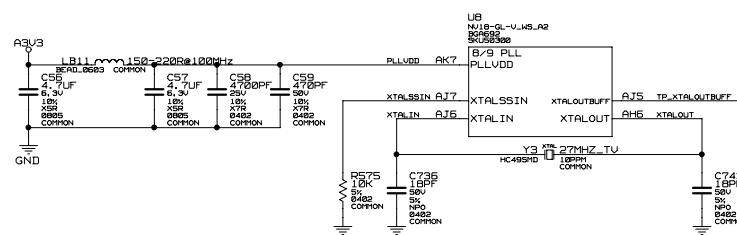
NV18 DAC_A



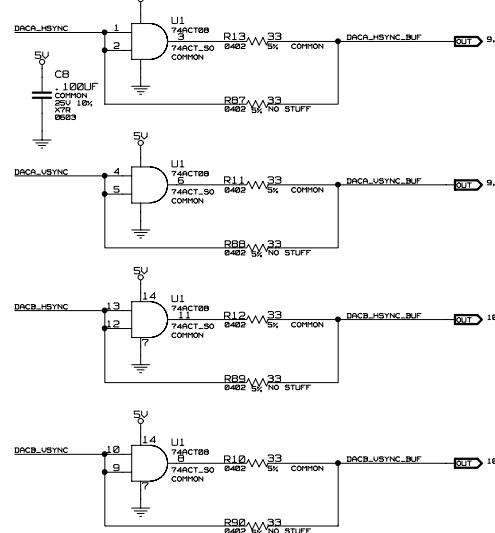
NV18 DAC_B with RSet select



NV18 PLL



SYNC Amplifier



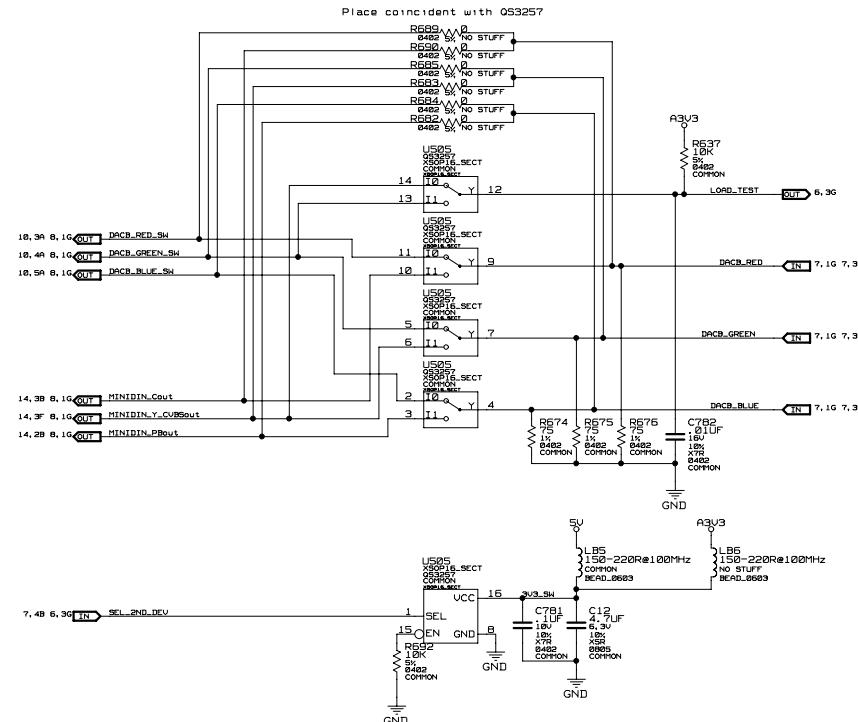
ALL NVIDIA DESIGN SPECIFICATIONS, REFERENCE BOARDS, FILES, DRAWINGS, DIAGNOSTICS, LISTS AND OTHER DOCUMENTS (TOGETHER AND SEPARATELY, 'MATERIALS') ARE BEING PROVIDED 'AS IS'. NVIDIA MAKES NO WARRANTIES, EXPRESSED, IMPLIED, STATUTORY OR OTHERWISE WITH RESPECT TO THE MATERIALS, AND EXPRESSLY DISCLAIMS ALL IMPLIED WARRANTIES OF NONINFRINGEMENT, MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

NVIDIA CORPORATION
2701 SAN TOMAS EXPRESSWAY
SANTA CLARA, CA 95051, USA
DETAIL NV18 DAC_A, DAC_B output, SYNC amplifier
PLL Section

ID p112_design PAGE 7 of 22
NAME 502-50112-0300-000 DATE 10/16/2002

DACB SWITCH BETWEEN VGA OUT AND TV OUT

	NET	Diffpair	NET_SPACING_RULE
10, 36	8, 2C	BLI	DPCB_GGD_30H
10, 44	8, 2C	BLI	DPCB_GREEN_SW
10, 59	8, 3C	BLI	DPCB_BLUE_SW
14, 3B	8, 3C	BLI	MINIDIN_Cout
14, 3F	8, 3C	BLI	MINIDIN_Y_CVBSout

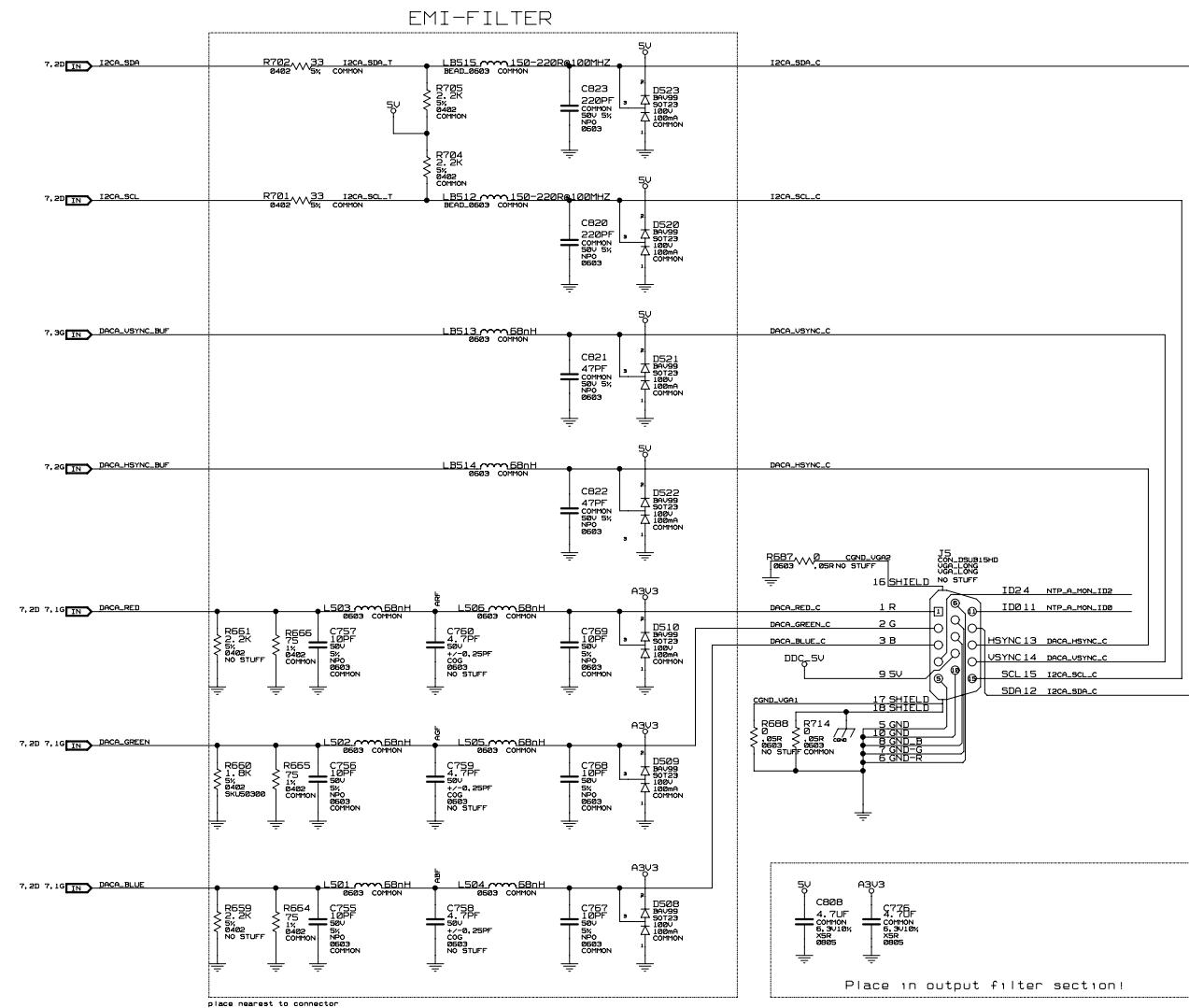


ALL NUDITIN DESIGN SPECIFICATIONS, REFERENCE BOARDS, FILES, DRAWINGS, DIAGNOSTICS, LISTS AND OTHER DOCUMENTS (TOGETHER AND SEPARATELY, "MATERIALS"), ARE BEING PROVIDED "AS IS", NUDITIN MAKES NO WARRANTIES, EXPRESSED, IMPLIED, STATUTORY OR OTHERWISE, WITH RESPECT TO THE MATERIALS, AND EXPRESSLY DISCLAIMS ALL IMPLIED WARRANTIES OF NONINFRINGEMENT, MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

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

ID p112_design PAGE 8 OF 22
 NAME 602-50112-0300-000 DATE AUG-16 2002

DACA output



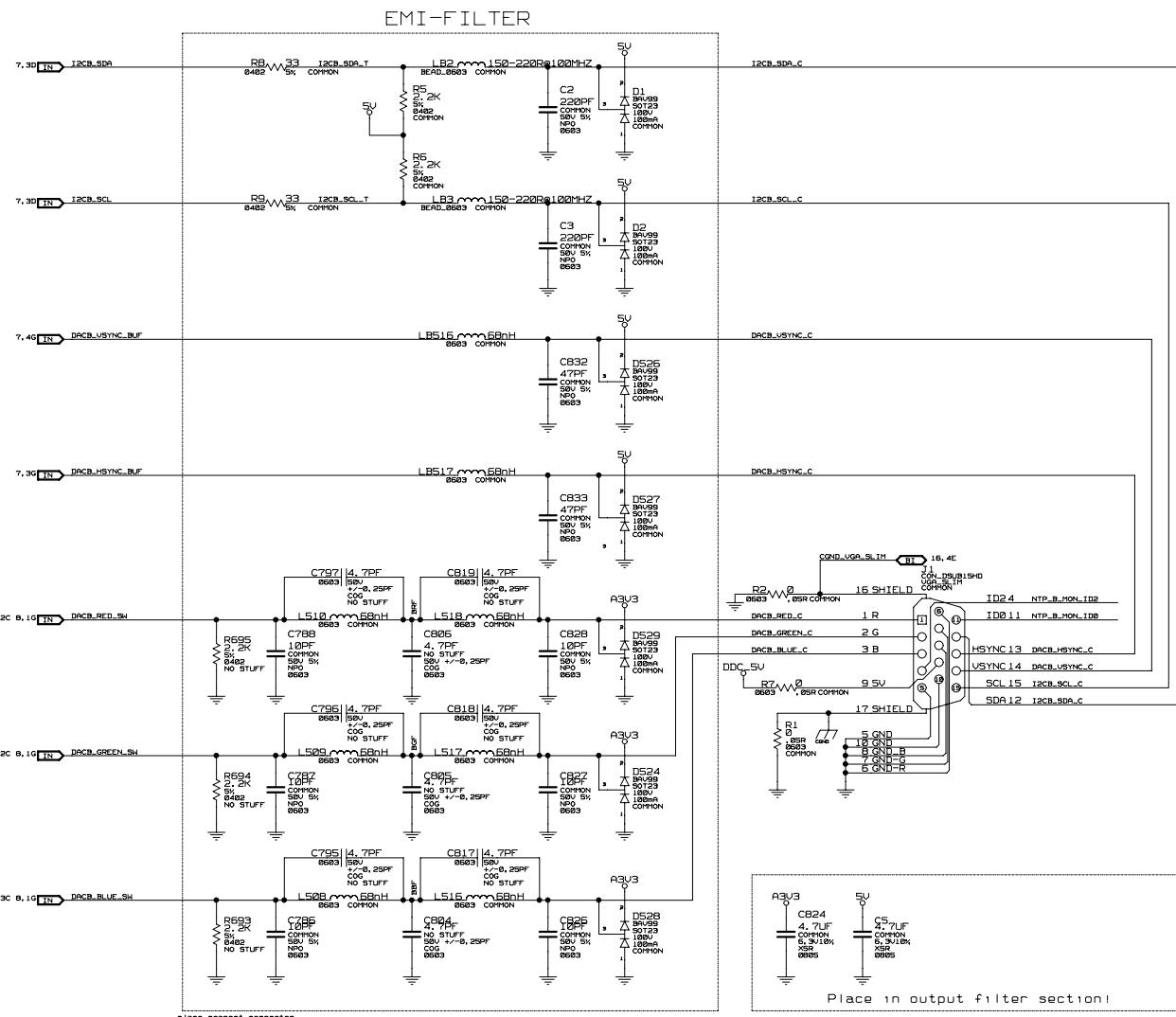
NET	Diffpair	NET_SPACING_RULE
RPF		20HIL_G2G_30HIL
RGF		20HIL_G2G_30HIL
BRF		20HIL_G2G_30HIL
DACA_RED_C		20HIL_G2G_30HIL
DACA_GREEN_C		20HIL_G2G_30HIL
DACA_BLUE_C		20HIL_G2G_30HIL



ALL NVIDIA DESIGN SPECIFICATIONS, REFERENCE BOARDS, FILES, DRAWINGS, DIAGNOSTICS, LISTS AND OTHER DOCUMENTS (TOGETHER AND SEPARATELY, 'MATERIALS') ARE BEING PROVIDED 'AS IS'. NVIDIA MAKES NO WARRANTIES, EXPRESSED, IMPLIED, STATUTORY OR OTHERWISE WITH RESPECT TO THE MATERIALS, AND EXPRESSLY DISCLAIMS ALL IMPLIED WARRANTIES OF NONINFRINGEMENT, MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

ID	p112_design	PAGE	9 of 22
NAME	b02-S0112-0300-000	DATE	MUG-16 2002

DACB output



NET	Diffpair	NET_SPACING_RULE
REF	REF	20HIL_G2G_30HIL
REF	REF	20HIL_G2G_30HIL
OUT	DACB_RED_C	20HIL_G2G_30HIL
OUT	DACB_GREEN_C	20HIL_G2G_30HIL
OUT	DACB_BLUE_C	20HIL_G2G_30HIL

NVIDIA CORPORATION
2701 SAN TOMAS EXPRESSWAY
SANTA CLARA, CA 95051, USA
DETAIL SECONDARY DISPLAY Filter and Connector

ALL NVIDIA DESIGN SPECIFICATIONS, REFERENCE BOARDS, FILES, DRAWINGS, DIAGNOSTICS, LISTS AND OTHER DOCUMENTS (TOGETHER AND SEPARATELY, 'MATERIALS') ARE BEING PROVIDED 'AS IS'.
NVIDIA MAKES NO WARRANTIES, EXPRESSED, IMPLIED, STATUTORY OR OTHERWISE WITH RESPECT TO THE MATERIALS, AND EXPRESSLY DISCLAIMS ALL IMPLIED WARRANTIES OF NONINFRINGEMENT, MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

ID: p112_design
PAGE: 10 OF 22
NAME: 502-50112-0300-000
DATE: AUG-15 2002

A

B

C

D

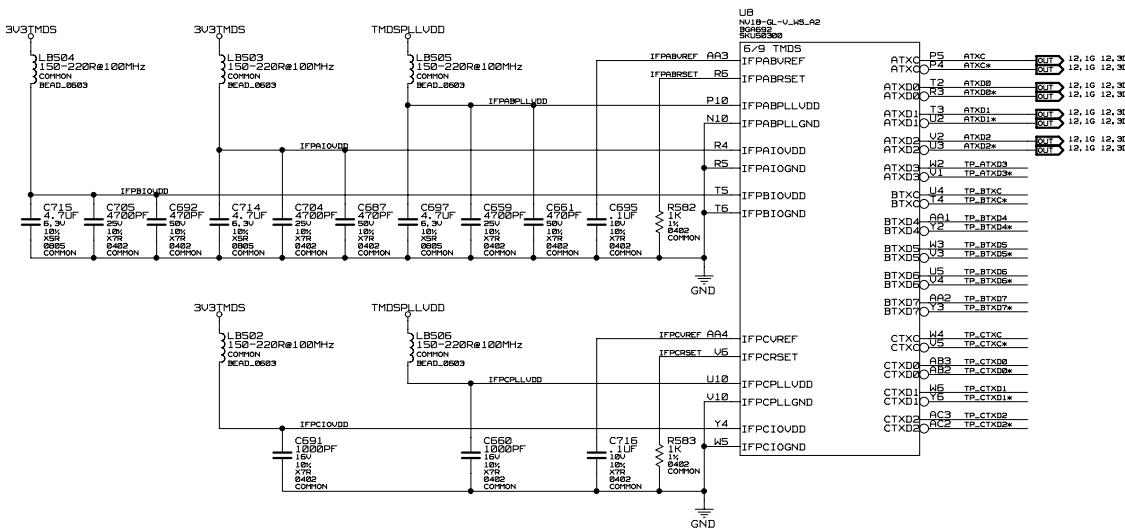
E

F

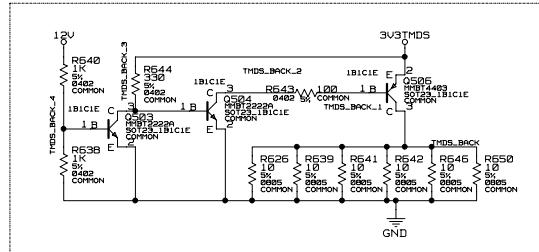
G

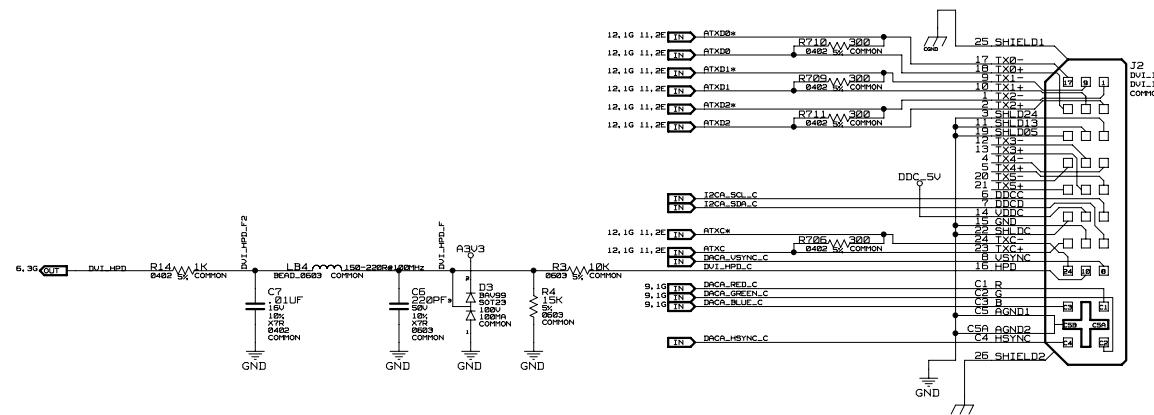
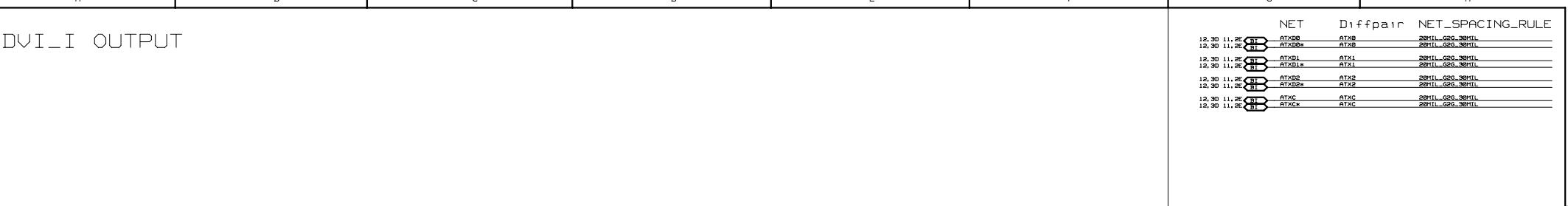
H

INTERNAL TMDS POWER AND DECOUPLING



TMDS backdrive prevention



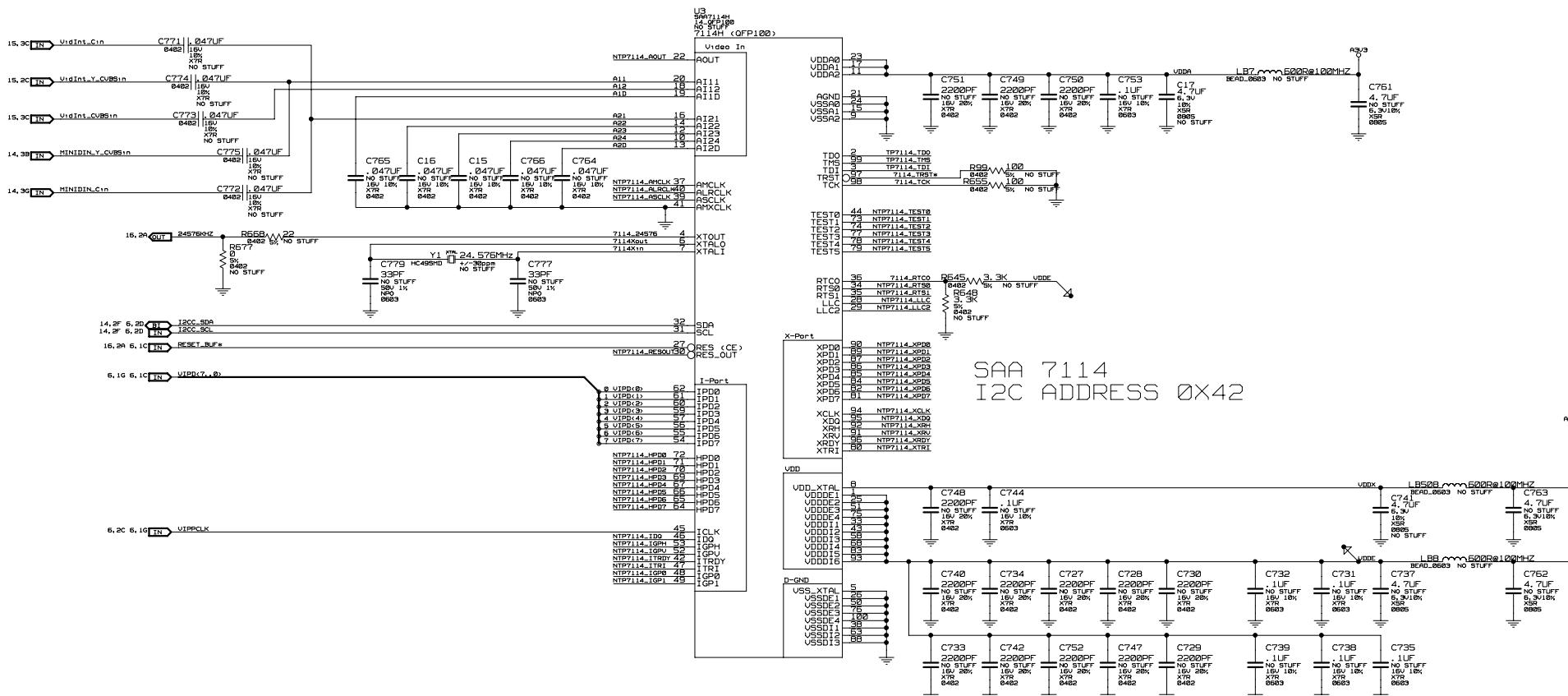


ALL NUVIA DESIGN SPECIFICATIONS, REFERENCE BOARDS, FILES, OR DRAWINGS, DIAGNOSTICS, LISTS AND OTHER DOCUMENTS (TOGETHER AND SEPARATELY, "MATERIALS") ARE BEING PROVIDED "AS IS", ALL NUVIDA MAKES NO WARRANTIES, EXPRESSED, IMPLIED, STATUTORY OR OTHERWISE, WITH RESPECT TO THE MATERIALS, AND EXPRESSLY DISCLAIMS ALL IMPLIED WARRANTIES OF NONINFRINGEMENT, MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

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

ID	p112_design	PAGE	12 OF 22
NAME	602-50112-0300-000	DATE	AUG-16 2002

VIDEO CAPTURE

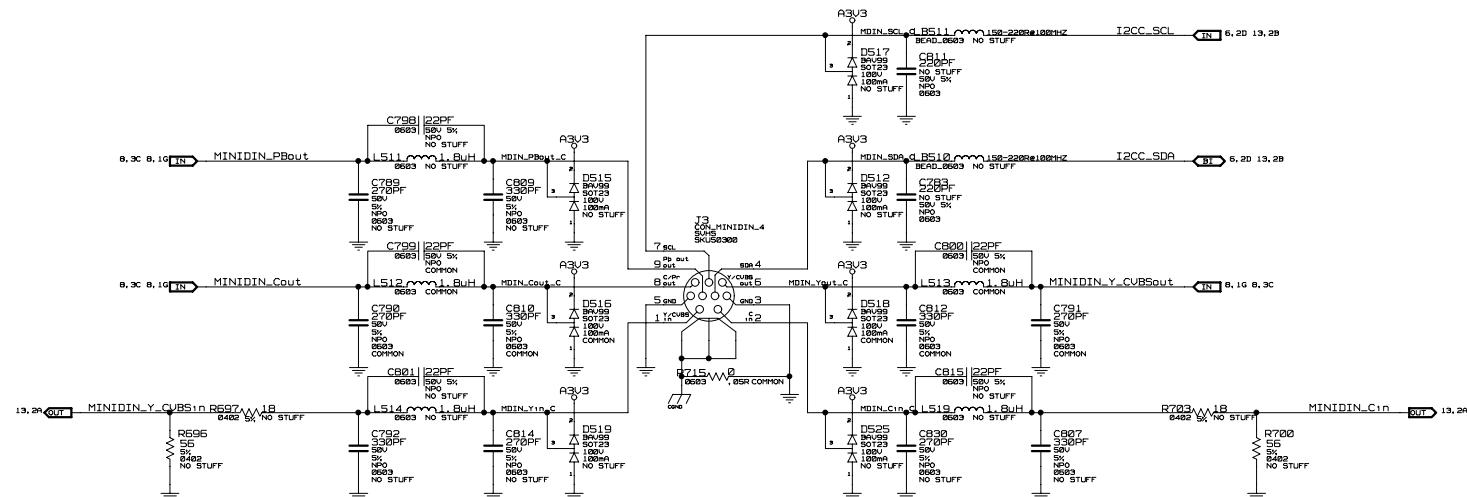


NVIDIA CORPORATION
2701 SAN TOMAS EXPRESSWAY
SANTA CLARA, CA 95051, USA
DETAIL VIDEO CAPTURE Philips 7114 I/O

ALL NVIDIA DESIGN SPECIFICATIONS, REFERENCE BOARDS, FILES, DRAWINGS, DIAGNOSTICS, LISTS AND OTHER DOCUMENTS (TOGETHER AND SEPARATELY, "MATERIALS") ARE BEING PROVIDED "AS IS". NVIDIA MAKES NO WARRANTIES, EXPRESSED, IMPLIED, STATUTORY OR OTHERWISE WITH RESPECT TO THE MATERIALS, AND EXPRESSLY DISCLAIMS ALL IMPLIED WARRANTIES, INCLUDING MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

ID p112_design PAGE 13 OF 22
NAME 602-50112-0300-000 DATE AUG-16 2002

VIDEO IN/OUT CONNECTOR

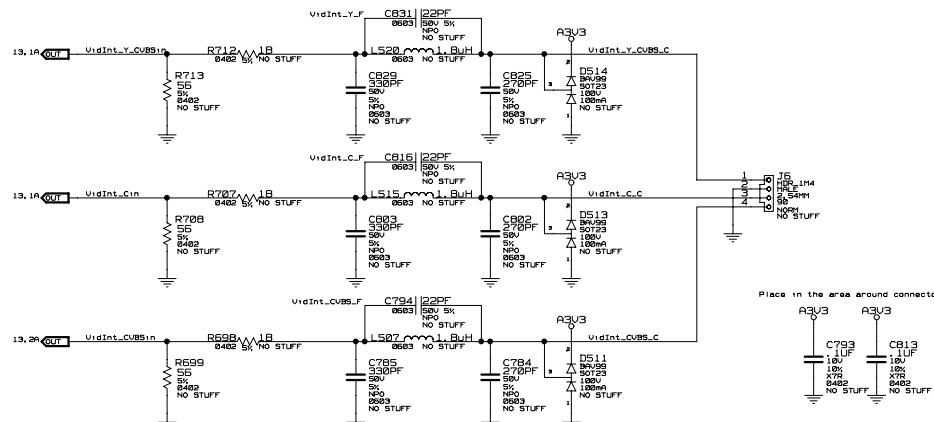


ALL NVIDIA DESIGN SPECIFICATIONS, REFERENCE BOARDS, FILES, DRAWINGS, DIAGNOSTICS, LISTS AND OTHER DOCUMENTS (TOGETHER AND SEPARATELY, 'MATERIALS') ARE BEING PROVIDED 'AS IS'.
NVIDIA MAKES NO WARRANTIES, EXPRESSED, IMPLIED, STATUTORY OR OTHERWISE WITH RESPECT TO THE MATERIALS, AND EXPRESSLY DISCLAIMS ALL IMPLIED WARRANTIES OF NONINFRINGEMENT, MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

ID	p112_design	PAGE	14 OF 22
NAME	502-50112-0300-000	DATE	MUG-16 2002

A B C D E F G H

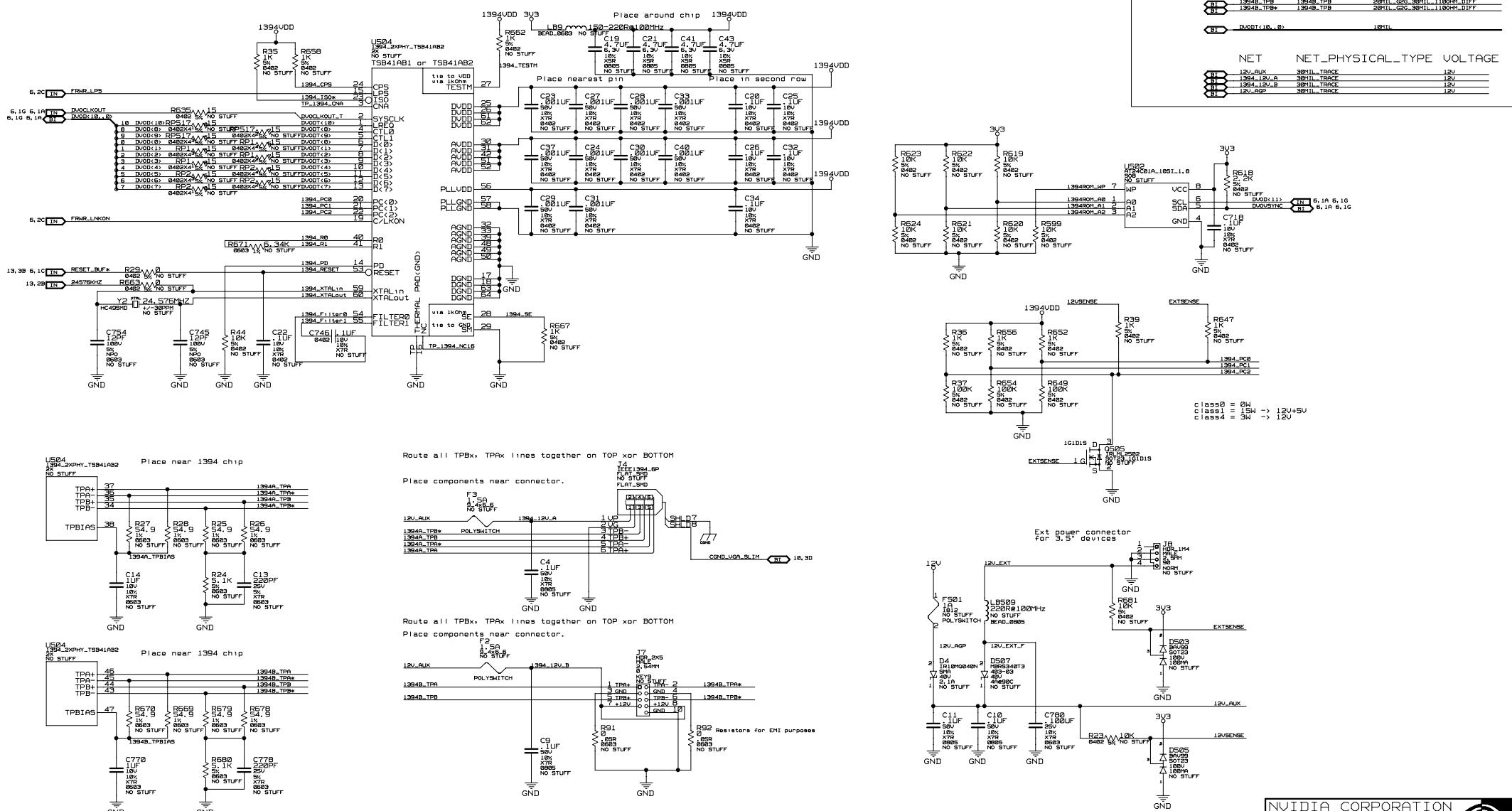
INTERNAL VIDEO CAPTURE CONNECTOR



Place in the area around connector

A3V3 A3V3
 C793 CB13
 1UF 1UF
 10V 10V
 10K 10K
 X7R X7R
 0402 0402
 NO STUFF NO STUFF

1394 INTERFACE AND CONNECTORS



ALL NVIDIA DESIGN SPECIFICATIONS, REFERENCE BOARDS, FILES, DRAWINGS, DIAGNOSTICS, LISTS AND OTHER DOCUMENTS (TOGETHER AND SEPARATELY, 'MATERIALS') ARE BEING PROVIDED 'AS IS'.

NVIDIA MAKES NO WARRANTIES, EXPRESSED, IMPLIED, STATUTORY OR OTHERWISE WITH RESPECT TO THE MATERIALS, AND EXPRESSLY DISCLAIMS ALL IMPLIED WARRANTIES OF NONINFRINGEMENT, MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

NVIDIA CORPORATION
2701 SAN TOMAS EXPRESSWAY
SANTA CLARA, CA 95051, USA
DETAIL 1394 TEXAS TSB41AB2, PowerRails,

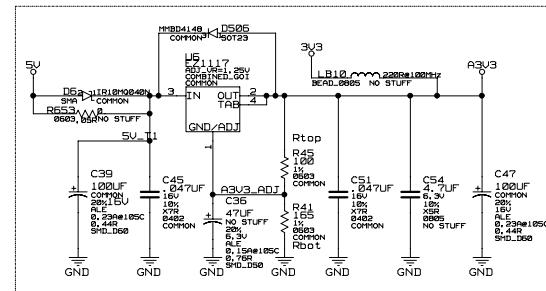

I/O, Internal and external connector
ID p112_design PAGE 16 OF 22

NAME 602-50112-0300-000 DATE AUG-16 2002

NAME 602-50112-0300-000 DATE AUG-16 2002

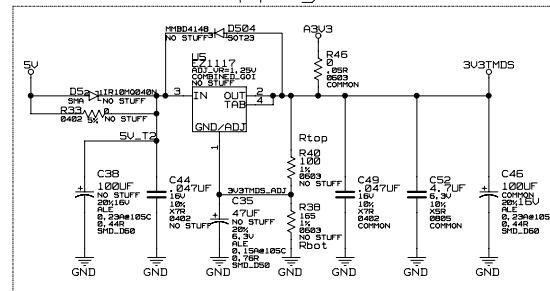
POWER SUPPLY

ANALOG 3V3



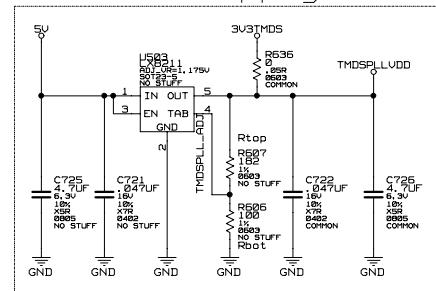
$$V_{out} = V_{Ref} * (1 + R_{bot}/R_{top})$$

$$3.31V = 1.25V * (1 + (165/100))$$



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

$$3.31V = 1.25V * (1 + (165/100))$$

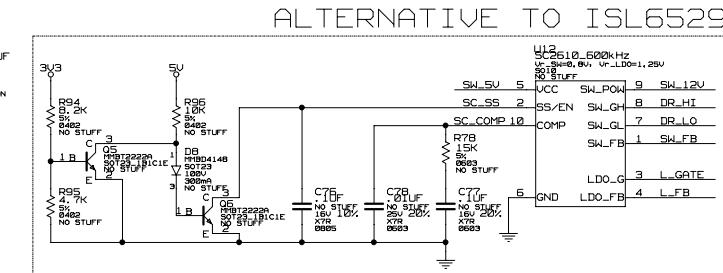
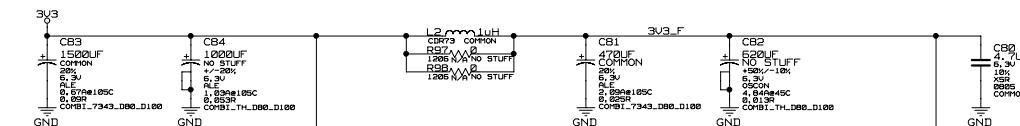


$$V_{out} = V_{Ref} * (1 + R_{top}/R_{bot})$$

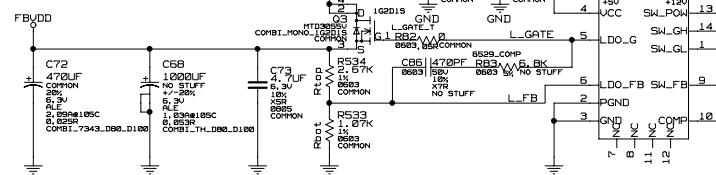
$$3.31V = 1.175V * (1 + (100/182))$$

		NET	NET_PHYSICAL_TYPE	VOLTAGE
3U3_VDDC_O	3_U3_VDDC	3_U3_VDDC	12HIL_TRACE	3.3V
	3_U3_VDDC_10NS	3_U3_VDDC_10NS	12HIL_TRACE	3.3V
	3_U3_VDDC_10NS_D	3_U3_VDDC_10NS_D	12HIL_TRACE	3.3V
	3_U3_VDDC_FWDUD	3_U3_VDDC_FWDUD	12HIL_TRACE	1.85V
	3_U3_VDDC_FWDDN	3_U3_VDDC_FWDDN	12HIL_TRACE	1.85V
	3_U3_VDDC_FWDDN_D	3_U3_VDDC_FWDDN_D	12HIL_TRACE	1.85V
	3_U3_VDDC_FWDDN_P	3_U3_VDDC_FWDDN_P	12HIL_TRACE	1.85V
	3_U3_VDDC_FWDDN_P_D	3_U3_VDDC_FWDDN_P_D	12HIL_TRACE	1.85V
	3_U3_VDDC_FWDDN_P_P	3_U3_VDDC_FWDDN_P_P	12HIL_TRACE	1.85V
	3_U3_VDDC_FWDDN_P_P_D	3_U3_VDDC_FWDDN_P_P_D	12HIL_TRACE	1.85V
DDC_SV_O	DDC_SV	DDC_SV	12HIL_TRACE	SV
	DDC_SV_12V	DDC_SV_12V	12HIL_TRACE	12V
	DDC_SV_5V	DDC_SV_5V	12HIL_TRACE	5V
	DDC_HI	DDC_HI	12HIL_TRACE	
	DDC_L0	DDC_L0	12HIL_TRACE	
	DDC_FW	DDC_FW	12HIL_TRACE	
	DDC_COND	DDC_COND	12HIL_TRACE	
	DDC_BI	DDC_BI	12HIL_TRACE	
	DDC_BI_JHU	DDC_BI_JHU	12HIL_TRACE	
	3_STANDS_AJU	3_STANDS_AJU	12HIL_TRACE	
MDSPLLVDDC_O	MDSPLLVDDC	MDSPLLVDDC	THDSPLL_AJU	1.85V
	MDSPLLVDDC	MDSPLLVDDC	THDSPLL_AJU_D	1.85V
				3.3V

NVDD-SWITCHER / FBVDD-LDO CONTROLLER ISL6529



ALTERNATIVE TO ISL6529

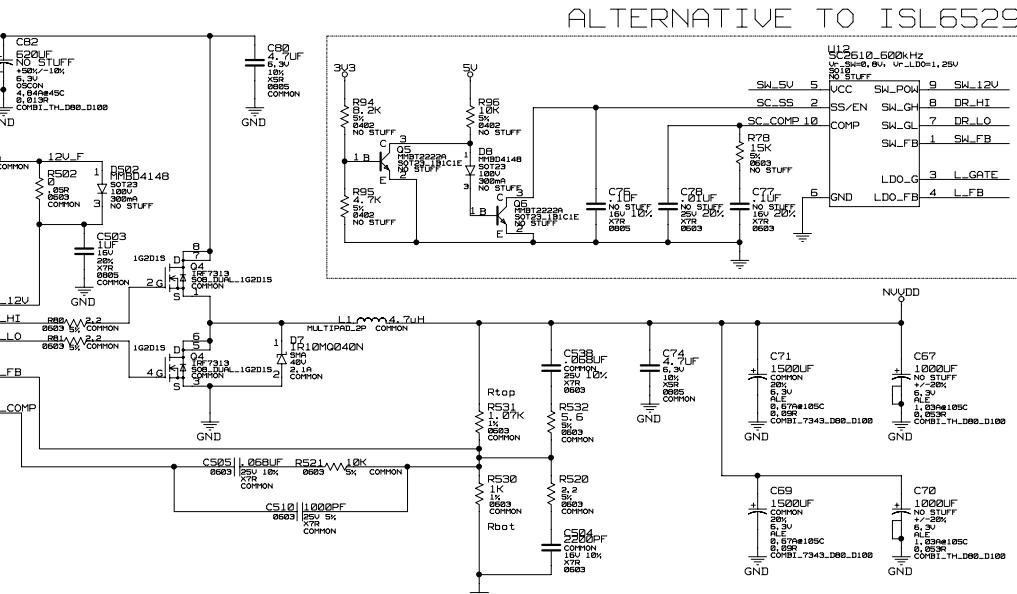


$$DD = V_{Ref} * (1 + R_{top} / R_{bot})$$

$$6L6529 \quad 2.5V = 0.800V * (1 + 2.40k / 1.13k)$$

$$C2610 \quad 2.5V = 1.250V * (1 + 100 / 100)$$

$$SL6529 \quad 2.8V = 0.800V * (1 + 2.67k / 1.07k)$$



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

$$ISL6529 \quad 1.656V = 0.800V * (1 + 1070 / 1000)$$

$$SC2610 \quad 1.656V = 0.800V * (1 + 1070 / 1000)$$

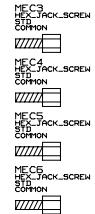
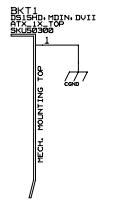
NVIDIA CORPORATION
2701 SAN TOMAS EXPRESSWAY
SANTA CLARA, CA 95051, USA

ALL NUTRITION DESIGN SPECIFICATIONS, DIFFERENCE BOARDS, FILES, DRAFTINGS, DIAGNOSTICS, LISTS AND OTHER DOCUMENTS (TOGETHER AND SEPARATELY, "MATERIALS") ARE BEING PROVIDED "AS IS".

ALL NVIDIA DESIGN SPECIFICATIONS, REFERENCE BOARD/UNIT FILES, DRAWINGS, DIAGNOSTICS, LISTS AND OTHER DOCUMENTS (TOGETHER AND SEPARATELY, "MATERIALS") ARE BEING PROVIDED "AS IS". NVIDIA MAKES NO WARRANTIES, EXPRESSED, IMPLIED, STATUTORY OR OTHERWISE WITH RESPECT TO THE MATERIALS, AND EXPRESSLY DISCLAIMS ALL IMPLIED WARRANTIES OF NONINFRINGEMENT, MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

A B C D E F G H

MECHANICS



NVIDIA CORPORATION	
2701 SAN TOMAS EXPRESSWAY SANTA CLARA, CA 95051, USA	
DETAIL	MECHANICS

ALL NVIDIA DESIGN SPECIFICATIONS, REFERENCE BOARDS, FILES, DRAWINGS, DIAGNOSTICS, LISTS AND OTHER DOCUMENTS (TOGETHER AND SEPARATELY, 'MATERIALS') ARE BEING PROVIDED 'AS IS'.
NVIDIA MAKES NO WARRANTIES, EXPRESSED, IMPLIED, STATUTORY OR OTHERWISE WITH RESPECT TO THE MATERIALS, AND EXPRESSLY DISCLAIMS ALL IMPLIED WARRANTIES OF NONINFRINGEMENT, MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

ID p112_design PAGE 18 OF 22
NAME 502-50112-0300-000 DATE 10/16/2002

A B C D E F G H

ALL NVIDIA DESIGN SPECIFICATIONS, REFERENCE BOARDS, FILES, DRAWINGS, DIAGNOSTICS, LISTS AND OTHER DOCUMENTS (TOGETHER AND SEPARATELY, 'MATERIALS') ARE BEING PROVIDED 'AS IS'.

NVIDIA MAKES NO WARRANTIES, EXPRESSED, IMPLIED, STATUTORY OR OTHERWISE, WITH RESPECT TO THE MATERIALS, AND EXPRESSLY DISCLAIMS ALL IMPLIED WARRANTIES OF NON-INFRINGEMENT, MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

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

CONTINUED...
ID p112_design PAGE 19 OF 22

NAME 602-50112-0300-000 DATE AUG-16 2002

	A	B	C	D	E	F	G	H
1								1
2	PCIEH<29> 2,4G PCIEH<30> 2,4G PCIEH<31> 2,4G PCIEC<0> 2,4G PCIEC<1..0> 2,4G PCIEC<1> 2,4G PCIEC<2> 2,4G PCIEC<3> 2,4G PCIECLK 2,4G PCIEVSEL 2,4G PCIFRAME 2,4G PCINT 2,4G PCINTA 2,4G PCINTB 2,4G PCIRDY 2,4G PCIRST 2,4G PCIRSTQ 2,4G PCIRSTx 2,4G PCISTOP 2,4G PCITIME 2,4G PILLRD 7,1G RESET_BUF* 6,1C 13,3B 16,2A SEL_2ND_DEV 6,3G 7,4B 8,4C SKL_BV 17,1G SKL_BR 17,1G SKL_CMP 17,1G SKLFB 17,1G THERM 6,1G THERM* 6,1G THDPLL_ADJ 17,1G THD_BLK 11,1G VIDINT_CIN 13,1A 15,3C VIDINT_CUBIN 13,1A 15,3C VIDINT_CVBIN 13,1A 15,3C VIDPD<0> 6,1C 6,1G 13,3B VIDPD<1..0> 6,1C 6,1G 13,3B VIDPD<1> 6,1C 6,1G 13,3B VIDPD<2> 6,1C 6,1G 13,3B VIDPD<3> 6,1C 6,1G 13,3B VIDPD<4> 6,1C 6,1G 13,3B VIDPD<5> 6,1C 6,1G 13,3B VIDPD<6> 6,1C 6,1G 13,3B VIDPD<7> 6,1C 6,2G 13,3B VIDPDLK						2	
3								3
4								4
5								5
 NVIDIA CORPORATION 2701 SAN TOMAS EXPRESSWAY SANTA CLARA, CA 95051, USA DETAIL DRAWING DETAIL CONTINUED...								
ALL NVIDIA DESIGN SPECIFICATIONS, REFERENCE BOARDS, FILES, DRAWINGS, DIAGNOSTICS, LISTS AND OTHER DOCUMENTS (TOGETHER AND SEPARATELY, 'MATERIALS') ARE BEING PROVIDED 'AS IS'. NVIDIA MAKES NO WARRANTIES, EXPRESSED, IMPLIED, STATUTORY OR OTHERWISE WITH RESPECT TO THE MATERIALS, AND EXPRESSLY DISCLAIMS ALL IMPLIED WARRANTIES OF NONINFRINGEMENT, MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.								
A	B	C	D	E	F	G	H	

ID	p112_design	PAGE	20 OF 22
NAME	502-50112-0300-000	DATE	MUG-16 2002

A	B	C	D	E	F	G	H
1	*** Part Cross-Reference for the entire design ***						1
2	BKT1 BRACKET 18,18 C1 C 17,24 C2 C 18,1C C3 C 18,2C C5 C 18,50 C6 C 12,3C C7 C 12,3B C8 C 7,2F C9 C 16,5C C10 C 16,5F C11 C 16,5F C12 C 8,4E C13 C 16,4B C14 C 16,4B C15 C 13,2C C16 C 13,2C C17 C 13,1F C18 C 5,1C C19 C 16,1D C20 C 16,1D C21 C 16,1D C22 C 16,3B C23 C 16,1C C24 C 16,2D C25 C 16,1C C26 C 16,1C C27 C 16,2D C28 C 16,10 C29 C 16,10 C30 C 16,2C C31 C 16,2D C32 C 16,2C C33 C 16,1D C34 C 16,2D C35 C 16,2D C36 C 17,2B C37 C 17,2B C38 C 17,2C C39 C 17,2B C40 C 16,20 C41 C 16,10 C42 C 16,10 C43 C 6,5F C44 C 16,1D C45 C 17,2B C46 C 17,2B C47 C 17,2B C48 C 2,1H C49 C 17,2B C50 C 2,2B C51 C 17,2B C52 C 17,2B C53 C 17,2B C54 C 17,2B C55 C 17,2B C56 C 17,2B C57 C 17,2B C58 C 17,2B C59 C 17,2B C60 C 17,2B C61 C 17,2B C62 C 17,2B C63 C 17,2B C64 C 17,2B C65 C 17,2B C66 C 17,2B C67 C 17,2B C68 C 17,2B C69 C 17,2B C70 C 17,2B C71 C 17,2B C72 C 17,2B C73 C 17,2B C74 C 17,2B C75 C 17,2B C76 C 17,2B C77 C 17,2B C78 C 17,2B C79 C 17,2B C80 C 17,2B C81 C 17,2B C82 C 17,2B C83 C 17,2B C84 C 17,2B C85 C 17,2B C86 C 17,2B C87 C 17,2B C88 C 17,2B C89 C 17,2B C90 C 17,2B C91 C 17,2B C92 C 17,2B C93 C 17,2B C94 C 17,2B C95 C 17,2B C96 C 17,2B C97 C 17,2B C98 C 17,2B C99 C 17,2B C100 C 17,2B C101 C 17,2B C102 C 17,2B C103 C 17,2B C104 C 17,2B C105 C 17,2B C106 C 17,2B C107 C 17,2B C108 C 17,2B C109 C 17,2B C110 C 17,2B C111 C 17,2B C112 C 17,2B C113 C 17,2B C114 C 17,2B C115 C 17,2B C116 C 17,2B C117 C 17,2B C118 C 17,2B C119 C 17,2B C120 C 17,2B C121 C 17,2B C122 C 17,2B C123 C 17,2B C124 C 17,2B C125 C 17,2B C126 C 17,2B C127 C 17,2B C128 C 17,2B C129 C 17,2B C130 C 17,2B C131 C 17,2B C132 C 17,2B C133 C 17,2B C134 C 17,2B C135 C 17,2B C136 C 17,2B C137 C 17,2B C138 C 17,2B C139 C 17,2B C140 C 17,2B C141 C 17,2B C142 C 17,2B C143 C 17,2B C144 C 17,2B C145 C 17,2B C146 C 17,2B C147 C 17,2B C148 C 17,2B C149 C 17,2B C150 C 17,2B C151 C 17,2B C152 C 17,2B C153 C 17,2B C154 C 17,2B C155 C 17,2B C156 C 17,2B C157 C 17,2B C158 C 17,2B C159 C 17,2B C160 C 17,2B C161 C 17,2B C162 C 17,2B C163 C 17,2B C164 C 17,2B C165 C 17,2B C166 C 17,2B C167 C 17,2B C168 C 17,2B C169 C 17,2B C170 C 17,2B C171 C 17,2B C172 C 17,2B C173 C 17,2B C174 C 17,2B C175 C 17,2B C176 C 17,2B C177 C 17,2B C178 C 17,2B C179 C 17,2B C180 C 17,2B C181 C 17,2B C182 C 17,2B C183 C 17,2B C184 C 17,2B C185 C 17,2B C186 C 17,2B C187 C 17,2B C188 C 17,2B C189 C 17,2B C190 C 17,2B C191 C 17,2B C192 C 17,2B C193 C 17,2B C194 C 17,2B C195 C 17,2B C196 C 17,2B C197 C 17,2B C198 C 17,2B C199 C 17,2B C200 C 17,2B C201 C 17,2B C202 C 17,2B C203 C 17,2B C204 C 17,2B C205 C 17,2B C206 C 17,2B C207 C 17,2B C208 C 17,2B C209 C 17,2B C210 C 17,2B C211 C 17,2B C212 C 17,2B C213 C 17,2B C214 C 17,2B C215 C 17,2B C216 C 17,2B C217 C 17,2B C218 C 17,2B C219 C 17,2B C220 C 17,2B C221 C 17,2B C222 C 17,2B C223 C 17,2B C224 C 17,2B C225 C 17,2B C226 C 17,2B C227 C 17,2B C228 C 17,2B C229 C 17,2B C230 C 17,2B C231 C 17,2B C232 C 17,2B C233 C 17,2B C234 C 17,2B C235 C 17,2B C236 C 17,2B C237 C 17,2B C238 C 17,2B C239 C 17,2B C240 C 17,2B C241 C 17,2B C242 C 17,2B C243 C 17,2B C244 C 17,2B C245 C 17,2B C246 C 17,2B C247 C 17,2B C248 C 17,2B C249 C 17,2B C250 C 17,2B C251 C 17,2B C252 C 17,2B C253 C 17,2B C254 C 17,2B						
3							3
4							4
5							5

NVIDIA CORPORATION
2701 SAN TOMAS EXPRESSWAY
SANTA CLARA, CA 95051, USA
DETAIL DRAWING DETAIL
CONTINUED...

ID: p112_design PAGE: 21 OF 22
NAME: 502-50112-0300-000 DATE: AUG-16 2002

ALL NVIDIA DESIGN SPECIFICATIONS, REFERENCE BOARDS, FILES, DRAWINGS, DIAGNOSTICS, LISTS AND OTHER DOCUMENTS (TOGETHER AND SEPARATELY, "MATERIALS") ARE BEING PROVIDED "AS IS".
NVIDIA MAKES NO WARRANTIES, EXPRESSED, IMPLIED, STATUTORY OR OTHERWISE WITH RESPECT TO THE MATERIALS, AND EXPRESSLY DISCLAIMS ALL IMPLIED WARRANTIES OF NONINFRINGEMENT, MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

A	B	C	D	E	F	G	H
R23 R	16, 5F	R537 R	4, 5D	R659 R	11, 3H	U12 U.SURFG.JC9516 17, 3F	
R24 R	16, 4B	R538 R	4, 5A	R660 R	5, 4C	U13 U.MEMFL.SERL.128x16 6, 2E	
R25 R	16, 4B	R539 R	4, 5B	R662 R	16, 3F	U801 U.SURFG.ISL.6029 17, 4C	
R26 R	16, 4B	R540 R	4, 5B	R663 R	17, 1A	U802 U.MEMFL.BX256 16, 2F	
R27 R	16, 4A	R541 R	4, 5B	R664 R	16, 3F	U803 U.VREG_SPIN 17, 1E	
R28 R	16, 4B	R542 R	4, 5B	R665 R	17, 1C	U804 U.VREG_SPIN 16, 1C 16, 3A 16, 4A	
R29 R	16, 2B	R543 R	2, 4B	R666 R	6, 2C	U805 U.SULANAL.3257 6, 2D 6, 3D 6, 4D	
R30 R	6, 4A	R544 R	2, 4A	R667 R	6, 1B	Y1 XTRA 13, 2C	
R31 R	6, 4B	R545 R	2, 4A	R668 R	9, 5B	Y2 XTRAL 16, 3A	
R32 R	6, 5B	R546 R	2, 4A	R669 R	9, 4B	Y3 XTRAL 7, 5C	
R33 R	17, 1C	R547 R	2, 4A	R670 R	16, 1C		
R34 R	6, 5A	R548 R	2, 4C	R671 R	16, 2B		
R35 R	16, 1B	R549 R	5, 5B	R672 R	6, 2F		
R36 R	16, 3F	R550 R	5, 5B	R673 R	6, 3C		
R37 R	16, 3F	R551 R	5, 1B	R674 R	6, 3E		
R38 R	17, 2D	R552 R	2, 4D	R675 R	6, 3E		
R39 R	16, 3F	R553 R	3, 5A	R676 R	6, 3E		
R40 R	17, 2D	R554 R	3, 5A	R677 R	17, 2B		
R41 R	17, 2B	R555 R	9, 4D	R678 R	16, 5B		
R42 R	6, 5F	R556 R	2, 3C	R679 R	16, 5B		
R43 R	6, 5F	R557 R	5, 4D	R680 R	16, 5B		
R44 R	16, 3B	R558 R	5, 3C	R681 R	10, 4F		
R45 R	17, 2B	R559 R	5, 1C	R682 R	6, 2D		
R46 R	17, 1D	R560 R	5, 1C	R683 R	6, 2D		
R47 R	6, 3B	R561 R	5, 1B	R684 R	6, 2D		
R48 R	6, 3B	R562 R	5, 1C	R685 R	6, 2D		
R49 R	6, 4B	R563 R	5, 5B	R686 R	6, 2C		
R50 R	6, 4B	R564 R	5, 5B	R687 R	9, 3D		
R51 R	6, 3B	R565 R	5, 1C	R688 R	9, 4D		
R52 R	6, 3A	R566 R	5, 1C	R689 R	6, 2D		
R53 R	6, 3A	R567 R	5, 1C	R690 R	6, 2D		
R54 R	6, 4B	R568 R	5, 1C	R691 R	6, 2C		
R55 R	6, 4B	R569 R	2, 4F	R692 R	6, 4D		
R56 R	6, 3A	R570 R	2, 4F	R693 R	16, 5B		
R57 R	5, 5B	R571 R	2, 4F	R694 R	16, 5B		
R58 R	5, 5B	R572 R	2, 4F	R695 R	16, 4B		
R59 R	5, 5B	R573 R	5, 5A	R696 R	14, 3B		
R60 R	5, 5B	R574 R	5, 5A	R697 R	14, 3C		
R61 R	5, 3C	R575 R	7, 5C	R698 R	9, 4D		
R62 R	2, 4D	R576 R	7, 2C	R699 R	6, 2D		
R63 R	5, 5B	R577 R	7, 2C	R700 R	15, 4D		
R64 R	5, 5A	R578 R	2, 4D	R701 R	14, 3G		
R65 R	5, 5A	R579 R	6, 3B	R702 R	9, 2B		
R66 R	5, 5A	R580 R	6, 2A	R703 R	9, 1B		
R67 R	5, 5A	R581 R	5, 4C	R704 R	9, 1E		
R68 R	4, 5B	R582 R	11, 3C	R705 R	9, 1B		
R69 R	4, 5B	R583 R	11, 4C	R706 R	12, 3D		
R70 R	4, 5B	R584 R	7, 3C	R707 R	15, 3D		
R71 R	4, 5A	R585 R	6, 5B	R708 R	15, 3D		
R72 R	4, 5A	R586 R	2, 3C	R709 R	12, 3D		
R73 R	4, 5A	R587 R	6, 5B	R710 R	12, 3D		
R74 R	4, 5A	R588 R	5, 4C	R711 R	12, 3D		
R75 R	4, 5A	R589 R	5, 5B	R712 R	15, 2D		
R76 R	2, 5B	R590 R	2, 3C	R713 R	15, 2D		
R77 R	17, 3C	R591 R	5, 4E	R714 R	9, 4D		
R78 R	17, 3F	R592 R	5, 3D	R715 R	10, 5D		
R79 R	4, 3C	R593 R	7, 3C	R716 R	10, 5D		
R80 R	17, 4B	R594 R	5, 1D	R717 R	10, 5D		
R81 R	17, 4D	R595 R	5, 1D	R718 R	10, 5D		
R82 R	17, 4B	R596 R	5, 1D	R719 R	10, 5D		
R83 R	17, 4B	R597 R	5, 1D	R720 R	10, 5D		
R84 R	6, 5B	R598 R	5, 1D	R721 R	10, 5D		
R85 R	6, 5B	R599 R	16, 2F	R722 R	10, 5D		
R86 R	6, 1E	R600 R	5, 5A	R723 R	10, 5D		
R87 R	7, 2F	R601 R	5, 1C	R724 R	10, 5D		
R88 R	7, 3F	R602 R	5, 1C	R725 R	10, 5D		
R89 R	7, 4F	R603 R	5, 1C	R726 R	10, 5D		
R90 R	16, 5D	R604 R	5, 1C	R727 R	10, 5D		
R91 R	16, 5D	R605 R	6, 4A	R728 R	10, 5D		
R92 R	16, 5D	R606 R	17, 2F	R729 R	10, 5D		
R93 R	17, 3B	R607 R	17, 2F	R730 R	10, 5D		
R94 R	17, 3E	R608 R	6, 4B	R731 R	10, 5D		
R95 R	17, 3E	R609 R	2, 4B	R732 R	10, 5D		
R96 R	17, 3E	R610 R	6, 3B	R733 R	10, 5D		
R97 R	17, 3B	R611 R	4, 4B	R734 R	10, 5D		
R98 R	17, 3B	R612 R	6, 4B	R735 R	10, 5D		
R99 R	13, 2E	R613 R	6, 4B	R736 R	10, 5D		
R100 R	17, 3C	R614 R	6, 4B	R737 R	10, 5D		
R101 R	4, 4E	R615 R	6, 4B	R738 R	10, 5D		
R102 R	4, 4E	R616 R	6, 4B	R739 R	10, 5D		
R103 R	4, 4E	R617 R	6, 4B	R740 R	10, 5D		
R104 R	4, 4D	R618 R	16, 2G	R741 R	10, 5D		
R105 R	4, 4E	R619 R	2, 4B	R742 R	10, 5D		
R106 R	4, 4C	R620 R	6, 2F	R743 R	10, 5D		
R107 R	4, 4C	R621 R	16, 2F	R744 R	10, 5D		
R108 R	4, 4E	R622 R	16, 2F	R745 R	10, 5D		
R109 R	4, 4D	R623 R	16, 2G	R746 R	10, 5D		
R110 R	4, 4C	R624 R	16, 2G	R747 R	10, 5D		
R111 R	4, 4E	R625 R	2, 4B	R748 R	10, 5D		
R112 R	4, 4E	R626 R	11, 3G	R749 R	10, 5D		
R113 R	4, 4E	R627 R	6, 4A	R750 R	10, 5D		
R114 R	4, 4D	R628 R	6, 4A	R751 R	10, 5D		
R115 R	4, 4D	R629 R	6, 3A	R752 R	10, 5D		
R116 R	4, 4E	R630 R	6, 4A	R753 R	10, 5D		
R117 R	4, 4D	R631 R	6, 4A	R754 R	10, 5D		
R118 R	4, 4D	R632 R	6, 4A	R755 R	10, 5D		
R119 R	4, 4C	R633 R	6, 4A	R756 R	10, 5D		
R120 R	17, 4E	R634 R	6, 4A	R757 R	10, 5D		
R121 R	17, 4D	R635 R	6, 4A	R758 R	10, 5D		
R122 R	4, 4E	R636 R	16, 2B	R759 R	10, 5D		
R123 R	4, 4E	R637 R	17, 1F	R760 R	10, 5D		
R124 R	4, 4E	R638 R	2, 4E	R761 R	10, 5D		
R125 R	4, 1B	R639 R	11, 3F	R762 R	10, 5D		
R126 R	4, 3D	R640 R	11, 3G	R763 R	10, 5D		
R127 R	4, 3D	R641 R	11, 3G	R764 R	10, 5D		
R128 R	4, 3C	R642 R	11, 3G	R765 R	10, 5D		
R129 R	4, 3C	R643 R	11, 3G	R766 R	10, 5D		
R130 R	17, 4E	R644 R	11, 3F	R767 R	10, 5D		
R131 R	17, 4E	R645 R	16, 2B	R768 R	10, 5D		
R132 R	4, 4E	R646 R	11, 3G	R769 R	10, 5D		
R133 R	17, 4B	R647 R	16, 3G	R770 R	10, 5D		
R134 R	17, 4B	R648 R	13, 2C	R771 R	10, 5D		
R135 R	4, 5A	R649 R	16, 3F	R772 R	10, 5D		

ALL NUTRITIONAL SPECIFIC DOCUMENTS, REFERENCE BOARDS, FILES, PROTOCOLS, BIOGNOSTICS, LISTS AND OTHER DOCUMENTS (TOGETHER AND SEPARATELY, "MATERIALS"), ONE BEING PRODUCED, ONE

ALL NVIDIA DESIGN SPECIFICATIONS, REFERENCE BOARDS, FILES, DRAWINGS, DIAGNOSTICS, LISTS AND OTHER DOCUMENTS (TOGETHER AND SEPARATELY, 'MATERIALS') ARE BEING PROVIDED 'AS IS'. NVIDIA MAKES NO WARRANTIES, EXPRESSED, IMPLIED, STATUTORY OR OTHERWISE WITH RESPECT TO THE MATERIALS, AND EXPRESSLY DISCLAIMS ALL IMPLIED WARRANTIES OF NONINFRINGEMENT, MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

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

DETAIL DRAWING DETAIL
CONTINUED...

CONTINUED...
ID p112_design PAGE 22 OF 22
NAME 602-50112-0300-000 DATE AUG-16 2002