P60, GeFORCE2 MX 200, 4MX16 SDR, 32MB, RGB, TV, AGP4X

PCI DEVICE ID 0X0=0X111 FOR NV11.

STRAPS: AGP4X, SIDEBAND DIS, FAST WRITE DIS, AGP BIOS, NORMAL PCIAD, 14.318MHZ

TV out will be stuffed on both PCB sides!

Stuffing Options	Meaning
1 BT	stuff Brooktree BT868/869 TV encoder
2 CX	stuff Conexant CX25870/871 TV encoder
3 CH	stuff Crontel CH7007 TV encoder
4 NO_TV	no TV, just a bracket without TV cutout
5 NV_BOTTOM	stuff caps on bottom side under GPU
6 RGB_PROT	RGB protection diodes

PAGE OVERVIEW
1 top (this) page
2 NVXX host
3 AGP I/O
4 NVXX DAC
5 DAC I/O
6 NVXX FBA/FBB
7 FBA DDR 4Mx32
8 ROM & straps
9 TV encoder
10 power supply
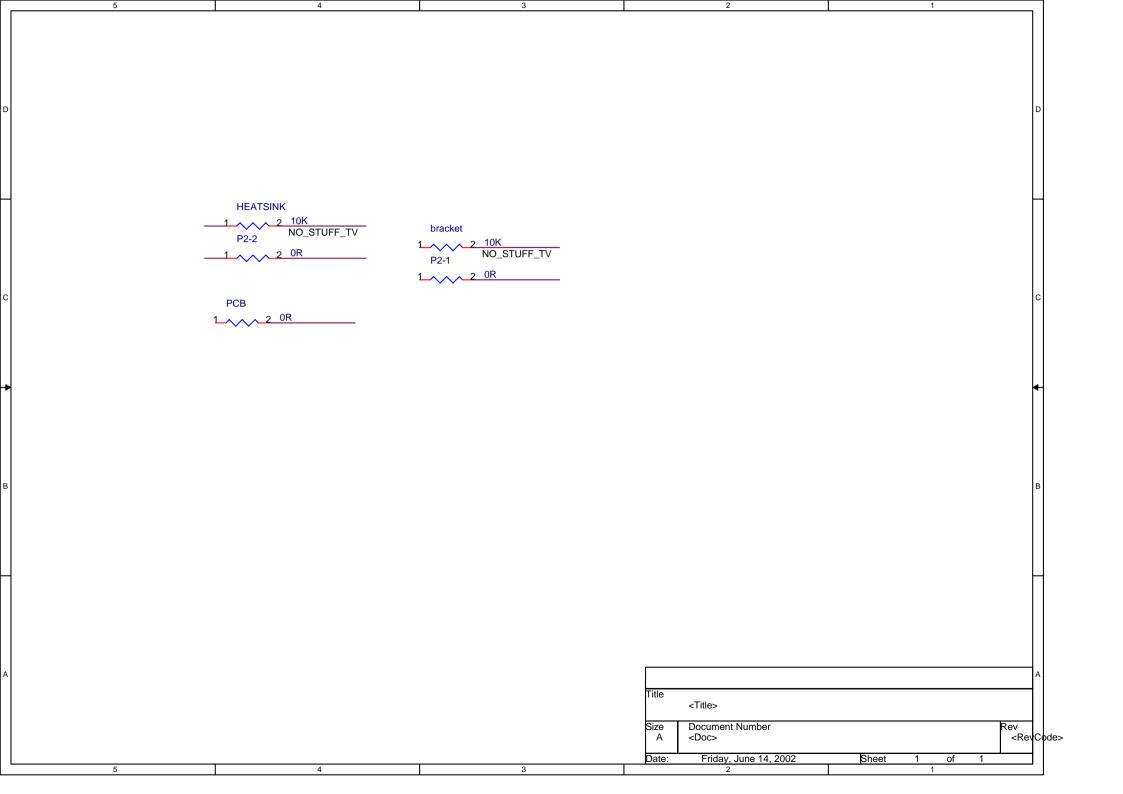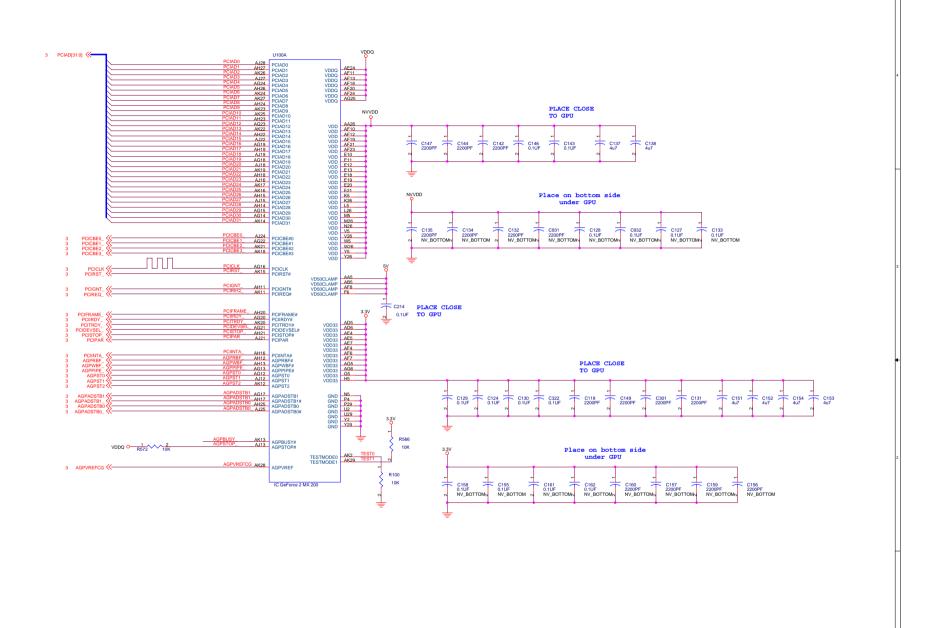
HISTORY:

X00
    Based on P43-A01
    Initial

X01
    Changed CLK and DQS termination options

X02
    Added alternative caps for power supply
    Changed cap packages (cost reduction)
    Connected U700.67 to VAA3.3V (CX-fix)

X03
    Moved some strapping to the bottom side
    Updated some PCB symbols

X04
    Deleted extra components of the AGP bus

X05
    Added note for DQS feedback.

X06
    C818 changed from 3.3V to 5V decoupling in RGB section (see page 5).

X07
    Updated pin-/function swaps

X08
    added cap for TVCLK from CH to NV11

X09
    deleted unplaceable decoupling caps C140, C141, C150

A00
    no chages, just release ...

{Item}\t{Quantity}\t{Reference}\t{Source Package}\t{Value}\t{Assembly}\t{PN}
{Assembly}{Source Package} {Value}{PN}{AVL1}{AVL2}{AVL3}{AVL4}{AVL5}

602-10060-0000-X04

NVIDIA Corporation
3535 Monroe St
Santa Clara, CA 95051, USA

P60, GeFORCE2 MX 200, 4MX16 SDR, 32MB, RGB, TV, AGP4X

Size	CAGE Code	DWG NO	Rev
B			

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HEATSINK

1 —/\/\/— 2 10K
P2-2   NO_STUFF_TV

1 —/\/\/— 2 0R

bracket

1 —/\/\/— 2 10K
P2-1   NO_STUFF_TV

1 —/\/\/— 2 0R

PCB

1 —/\/\/— 2 0R

Title	
	<Title>

Size	Document Number	Rev
A	<Doc>	<RevCode>

| Date: | Friday, June 14, 2002 | Sheet | 1 | of | 1 |

1a. NVXX HOST

U100A — IC GeForce 2 MX 200

PCIAD[31:0]

Signal	Pin
PCIAD0	AJ28
PCIAD1	AH27
PCIAD2	AK26
PCIAD3	AJ27
PCIAD4	AG24
PCIAD5	AH26
PCIAD6	AK24
PCIAD7	AK27
PCIAD8	AH24
PCIAD9	AK23
PCIAD10	AK25
PCIAD11	AH23
PCIAD12	AG23
PCIAD13	AK22
PCIAD14	AH22
PCIAD15	AJ22
PCIAD16	AG19
PCIAD17	AH19
PCIAD18	AJ19
PCIAD19	AG18
PCIAD20	AJ18
PCIAD21	AK19
PCIAD22	AH18
PCIAD23	AJ16
PCIAD24	AK17
PCIAD25	AK16
PCIAD26	AH15
PCIAD27	AJ15
PCIAD28	AH14
PCIAD29	AG15
PCIAD30	AG14
PCIAD31	AK14

PCICBE0_ AJ24 — PCICBE#0
PCICBE1_ AG22 — PCICBE#1
PCICBE2_ AK21 — PCICBE#2
PCICBE3_ AK18 — PCICBE#3

PCICLK AG16 — PCICLK
PCIRST_ AK15 — PCIRST#

PCIGNT_ AH11 — PCIGNT#
PCIREQ_ AK11 — PCIREQ#

PCIFRAME_ AH20 — PCIFRAME#
PCIIRDY_ AG20 — PCIIRDY#
PCITRDY_ AK20 — PCITRDY#
PCIDEVSEL_ AG21 — PCIDEVSEL#
PCISTOP_ AH21 — PCISTOP#
PCIPAR AJ21 — PCIPAR

PCIINTA_ AH16 — PCIINTA#
AGPRBF_ AH12 — AGPRBF#
AGPWBF_ AH13 — AGPWBF#
AGPPIPE_ AG13 — AGPPIPE#
AGPST0 AG12 — AGPST0
AGPST1 AJ12 — AGPST1
AGPST2 AK12 — AGPST2

AGPADSTB1 AG17 — AGPADSTB1
AGPADSTB1_ AH17 — AGPADSTB1#
AGPADSTB0 AH25 — AGPADSTB0
AGPADSTB0_ AJ25 — AGPADSTB0#

AGPBUSY_ AK13 — AGPBUSY#
AGPSTOP_ AJ13 — AGPSTOP#

AGPVREFCG AK28 — AGPVREF

TESTMODE0 AK2 — TEST0
TESTMODE1 AK29 — TEST1

VDDQ: AE24, AF11, AF13, AF18, AF20, AF24, AG25

NVVDD (VDD): AA26, AF10, AF12, AF19, AF21, AF23, E10, E11, E12, E13, E18, E19, E20, E21, K5, K26, L5, L26, M5, M26, N26, V5, V26, W5, W26, Y5, Y26

VD50CLAMP: AA5, AB5, AF8, F6

VDD33: AD5, AD6, AE4, AE5, AE7, AF4, AF6, AF7, AG5, AG6, G5, H5

GND: N5, P4, P29, U2, U29, Y2, Y29

PLACE CLOSE TO GPU

NVVDD — C147 2200PF, C144 2200PF, C142 2200PF, C146 0.1UF, C143 0.1UF, C137 4u7, C138 4u7

Place on bottom side under GPU

NVVDD — C135 2200PF NV_BOTTOM, C134 2200PF NV_BOTTOM, C132 2200PF NV_BOTTOM, C931 2200PF NV_BOTTOM, C128 0.1UF NV_BOTTOM, C932 0.1UF NV_BOTTOM, C127 0.1UF NV_BOTTOM, C133 0.1UF NV_BOTTOM

5V — C214 0.1UF

3.3V

PLACE CLOSE TO GPU

C129 0.1UF, C124 0.1UF, C130 0.1UF, C322 0.1UF, C118 2200PF, C149 2200PF, C301 2200PF, C131 2200PF, C151 4u7, C152 4u7, C154 4u7, C153 4u7

Place on bottom side under GPU

C158 0.1UF NV_BOTTOM, C155 0.1UF NV_BOTTOM, C161 0.1UF NV_BOTTOM, C162 0.1UF NV_BOTTOM, C160 2200PF NV_BOTTOM, C157 2200PF NV_BOTTOM, C159 2200PF NV_BOTTOM, C156 2200PF NV_BOTTOM

R566 10K
R100 10K
VDDQ — R572 10K

5V

C104 4u7   C108 0.1UF

VDDQ

C113 0.1UF   C117 0.1UF   C110 0.01UF   C111 0.01UF   C112 0.022UF   C114 0.022UF

3.3V

C115 4u7   C116 0.022UF

In all cases each capacitor should be low
ESR/ESL and placed as close as possible to
the respective rail connector pin(s).

B2 5V
B3 5V

B34 VDDQ
B40 VDDQ
B47 VDDQ
B52 VDDQ
B58 VDDQ
B64 VDDQ
A34 VDDQ
A40 VDDQ
A52 VDDQ
A58 VDDQ
A64 VDDQ

B9 3.3V
B16 3.3V
B28 3.3V
A9 3.3V
A16 3.3V
A28 3.3V

A2 TYPEDET#   TYPEDET_
B14 SPARE
A48 SPARE
B1 OVERCNT#

R108 100R

A3 RESERVED
A11 RESERVED

B6 INTB#
B48 PERR#
B50 SERR#

B4 USB+
A4 USB-

B5   GND
B13 GND
B19 GND
B31 GND
B37 GND
B49 GND
B55 GND
B61 GND
A5   GND
A13 GND
A19 GND
A31 GND
A37 GND
A49 GND
A55 GND
A61 GND

B42 3.3Vaux/KEY
B45 3.3V/KEY
B44 RSVD/KEY
B43 GND/KEY

1.5V KEY

VDDQ

C122 470pF
R111 1.5K
AGPVREF1
R113 75R

AGPVREFGC

R114 75R

R116 1.5K
AGPVREF2
C126 470pF

B24 KEY/3.3Vaux
B22 KEY/RSVD
B25 KEY/3.3V
B23 KEY/GND

3.3V KEY

A66 RSVD/Vrefgc

(GOLD FINGERS AND PCB PER FAB DWG)

AD0   A65
AD1   B65
AD2   A63
AD3   B63
AD4   A62
AD5   B62
AD6   A60
AD7   B60
AD8   B57
AD9   A56
AD10 B56
AD11 A54
AD12 B54
AD13 A53
AD14 B53
AD15 A51
AD16 A39
AD17 B38
AD18 A38
AD19 B36
AD20 A36
AD21 B35
AD22 A35
AD23 B33
AD24 A30
AD25 B30
AD26 A29
AD27 B29
AD28 A27
AD29 B27
AD30 A26
AD31 B26

PCIAD0
PCIAD1
PCIAD2
PCIAD3
PCIAD4
PCIAD5
PCIAD6
PCIAD7
PCIAD8
PCIAD9
PCIAD10
PCIAD11
PCIAD12
PCIAD13
PCIAD14
PCIAD15
PCIAD16
PCIAD17
PCIAD18
PCIAD19
PCIAD20
PCIAD21
PCIAD22
PCIAD23
PCIAD24
PCIAD25
PCIAD26
PCIAD27
PCIAD28
PCIAD29
PCIAD30
PCIAD31

PCIAD[31:0] 2

C/BE0# A57   PCICBE0_   PCICBE0_ 2
C/BE1# B51   PCICBE1_   PCICBE1_ 2
C/BE2# B39   PCICBE2_   PCICBE2_ 2
C/BE3# B1   PCICBE3_   PCICBE3_ 2

CLK B7   PCICLK   PCICLK 2
RST# A7   PCIRST_ PCIRST_ 2

GNT# A8   PCIGNT_   PCIGNT_ 2
REQ# B8   PCIREQ_   PCIREQ_ 2

FRAME#   A41   PCIFRAME_   PCIFRAME_ 2
IRDY#   B41   PCIIRDY_   PCIIRDY_ 2
TRDY#   A46   PCITRDY_   PCITRDY_ 2
DEVSEL# B46   PCIDEVSEL_ PCIDEVSEL_ 2
STOP#   A47   PCISTOP_   PCISTOP_ 2
PAR   A50   PCIPAR   PCIPAR 2

INTA# A6   PCIINTA_   PCIINTA_ 2
RBF#   B12   AGPRBF_   AGPRBF_ 2
WBF#   A14   AGPWBF_   AGPWBF_ 2
PIPE# A12   AGPPIPE_   AGPPIPE_ 2
ST0   B10   AGPST0   AGPST0 2
ST1   A10   AGPST1   AGPST1 2
ST2   B11   AGPST2   AGPST2 2

ADSTB1   B32   AGPADSTB1   AGPADSTB1 2
ADSTB1# A32   AGPADSTB1_   AGPADSTB1_ 2
ADSTB0   B59   AGPADSTB0   AGPADSTB0 2
ADSTB0# A59   AGPADSTB0_   AGPADSTB0_ 2
SBSTB   B18
SBSTB#   A18
SBA0   B15
SBA1   A15
SBA2   B17
SBA3   A17
SBA4   B20
SBA5   A20
SBA6   B21
SBA7   A21

R109 220K   R110 220K

A45 3.3V/KEY
A42 RSVD/KEY
A44 RSVD/KEY
A43 GND/KEY

1.5V KEY

+12V A1

VDDQ

R112 301K

A24 KEY/RSVD
A22 KEY/RSVD
A25 KEY/3.3V
A23 KEY/GND

3.3V KEY

B66 RSVD/Vrefcg   AGPVREFCG

C125 0.1UF NO STUFF

R115 221K

AGPVREFCG 2

1b1. AGP I/O

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P60, GeFORCE2 MX 200, 4MX16 SDR, 32MB, RGB, TV, AGP4X

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Size C
CAGE Code
DWG NO
Rev
Scale
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2b. NVXX DAC

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Sheet 4 of 10

PLACE C227 CLOSE TO L211 and L212

PLACE CLOSE TO GPU

PLACE CLOSEST TO GPU

PLACE CLOSE TO GPU

PLACE CLOSE TO GPU

Use thick (non-impedance controlled) traces on XTALIN/OUT

IC GeForce 2 MX 200

Place near to RGB filter, sync buffer and clamping diodes (BAT54)!

2a. DAC I/O

Size	CAGE Code	DWG NO	Rev
C			

Scale

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Sheet 5 of 10

7 FBD[63:0]

U100B

3.3V

	AE28	FBD0		VDD25	AC26
	AD27	FBD1		VDD25	AD25
	AE30	FBD2		VDD25	AD26
	AE29	FBD3		VDD25	AE27
	AC28	FBD4		VDD25	AE27
	AC27	FBD5		VDD25	AF25

keep CFBDQS2
and CFBDQS6
as short as
possible

7 CFBAA[13:0]

7 FBDQM[7:0]

7 CFBARAS_
7 CFBACAS_
7 CFBAWE_
7 CFBACS0_
7 CFBACS1_

7 CFBACLK0
7 CFBACLK1
7 CFBACKE

CFBDQS1   R331 1   2 15R
CFBDQS5   R327 1   2 15R

8 ROMCS_

3.3V R594 1 2 FBVREF
270R

IC GeForce 2 MX 200

U100C

7 CFBBCLK0   CFBBCLK0   B13   FBBCLK0
7 CFBBCLK1   CFBBCLK1   A10   FBBCLK1

IC GeForce 2 MX 200

3a. NVXX FBA/FBB

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P60, GeFORCE2 MX 200, 4MX16 SDR, 32MB, RGB, TV, AGP4X

nVIDIA

Size C
CAGE Code
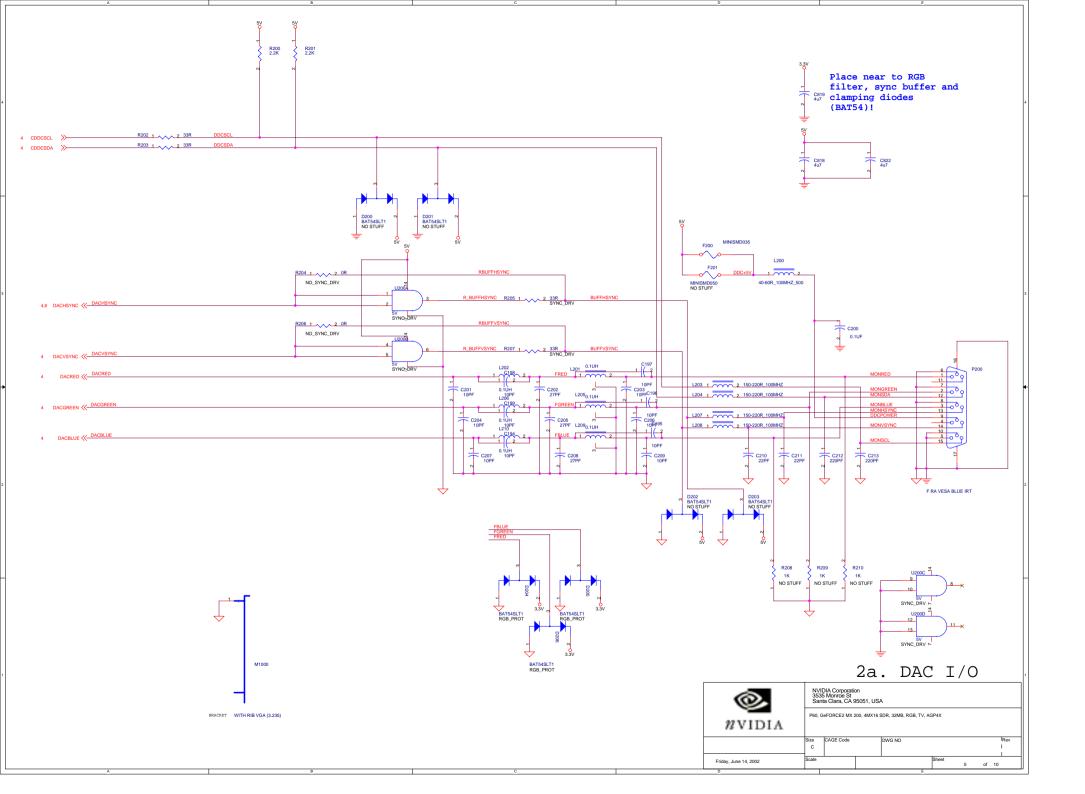DWG NO
Rev

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Scale

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FBD[63:0]

U300 / U301 / U302 / U303 — SDRAM devices

3.3V

VDD / VDDQ / VSSQ / GND

PLACE CLOSE
TO GPU

FBACLK0   R321 22R   CFBACLK0   CFBACLK0
FBACLK1   R323 22R   CFBACLK1   CFBACLK1
FBBCLK0   R325 22R   CFBBCLK0   CFBBCLK0
FBBCLK1   R326 22R   CFBBCLK1   CFBBCLK1

FBDQM[7:0]

FBDQM0 / FBDQM1 / FBDQM2 / FBDQM3 / FBDQM4 / FBDQM5 / FBDQM6 / FBDQM7

PLACE CLOSE
TO GPU

CFBAA[13:0]

RP300 15R
RP305 15R
RP301 15R
RP302 15R
RP303 15R

MNR04
small arrays

R300 10K

Place close to memory

C315 0.047UF C302 0.047UF C306 0.047UF C329 0.047UF C330 0.047UF C307 0.047UF C323 0.047UF C334 0.047UF C321 0.047UF C318 0.047UF C327 0.047UF C325 0.1UF C303 0.1UF C319 0.1UF C332 0.1UF

C335 2200PF C304 2200PF C305 2200PF C326 2200PF C333 2200PF C317 2200PF C324 2200PF C320 2200PF C316 2200PF C328 2200PF C331 2200PF C312 4u7 C313 4u7 C336 4u7

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3c1 FBA DDR 4MX32 SDRAM

Size C

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CAGE Code   DWG NO   Rev

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Place on ...

... top side

... bottom side

... top side

... bottom side

... top side

... bottom side

... top side

U400

A0 12 O0 13
A1 11 O1 14
A2 10 O2 15
A3 9   O3 17
A4 8   O4 18
A5 7   O5 19
A6 6   O6 20
A7 5   O7 21
A8 27
A9 26
A10 23
A11 25
A12 4
A13 28
A14 29
A15 3
NC/A16 2
NC/A17 30

NC 1

CE 22
OE 24
WE 31

VDD 32
GND 16

3.3V
C480
0.1UF

TVED0 A0
TVED1 A1
TVED2 A2
TVED3 A3
TVED4 A4
TVED5 A5
TVED6 A6
TVED7 A7
TVED8 A8
TVED9 A9
TVED10 A10
TVED11 A11

VIPD0 O0
VIPD1 O1
VIPD2 O2
VIPD3 O3
VIPD4 O4
VIPD5 O5
VIPD6 O6
VIPD7 O7

4,9 TVED[11:0]   TVED[11:0]

VIPD[9:0] 4

VIPHAD2 4
VIPHAD3 4
VIPHAD4 4
DACHSYNC 4,5

ROMCS_ 6
VIPHAD0 4
VIPHAD1 4

4 DFPD[11:0]

3.3V

R123 1 2 10K DFPD2   R124 1 2 10K NO STUFF
DFPD[2:1] PCI_DEV_ID
PCI_DEV_ID (0x0) = 0x110

R121 1 2 10K DFPD1   R122 1 2 10K
NO STUFF

R125 1 2 10K DFPD0   R126 1 2 10K
NO STUFF
DFPD[0] STRAP_FAST_WRITES
STRAP_FAST_WRITES=0 : FAST WRITE ENABLED
STRAP_FAST_WRITES=1 : FAST WRITE DISABLED

TVED11 R142 1 2 10K
TVED[11] STRAP_HOST=1 : AGP Mode

TVED10 R140 1 2 10K
TVED[10] STRAP_AGPSBA
STRAP_AGPSBA=1 : pipelined only transfers

R137 1 2 10K TVED9   R138 1 2 10K NO STUFF
TVED[9] STRAP_AGP4X
STRAP_AGP4X=0 : AGP4X transfers enabled
STRAP_AGP4X=1 : AGP2X only

R127 1 2 10K TVED6   R128 1 2 10K
NO STUFF
TVED[6] STRAP_CRYSTAL
STRAP_CRYSTAL=1 : 14.31818MHz

R129 1 2 10K TVED5   R130 1 2 10K NO STUFF
TVED[5:2] STRAP_RAM_TYPE
0000 = 2MX32 SDR SDRAM
1010 = 4MX16 DDR SDRAM
1001 = 2Mx32 DDR SDRAM
0001 = 4MX16 SDR SDRAM

R131 1 2 10K TVED4   R132 1 2 10K NO STUFF

R133 1 2 10K TVED3   R134 1 2 10K NO STUFF

R135 1 2 10K TVED2   R136 1 2 10K
NO STUFF

TVED1 R118 1 2 10K
TVED[1] STRAP_SUB_VENDOR
STRAP_SUB_VENDOR=1 : Adaptor BIOS

TVED0 R117 1 2 10K
TVED[0] STRAP_AD_SWAP
STRAP_AD_SWAP=1 : PCIAD bus [31:0] normal

4,9 TVED[11:0]   TVED[11:0]

4a. ROM & STRAPS

NVIDIA Corporation
3535 Monroe St
Santa Clara, CA 95051, USA

P60, GeFORCE2 MX 200, 4MX16 SDR, 32MB, RGB, TV, AGP4X

Size C
CAGE Code
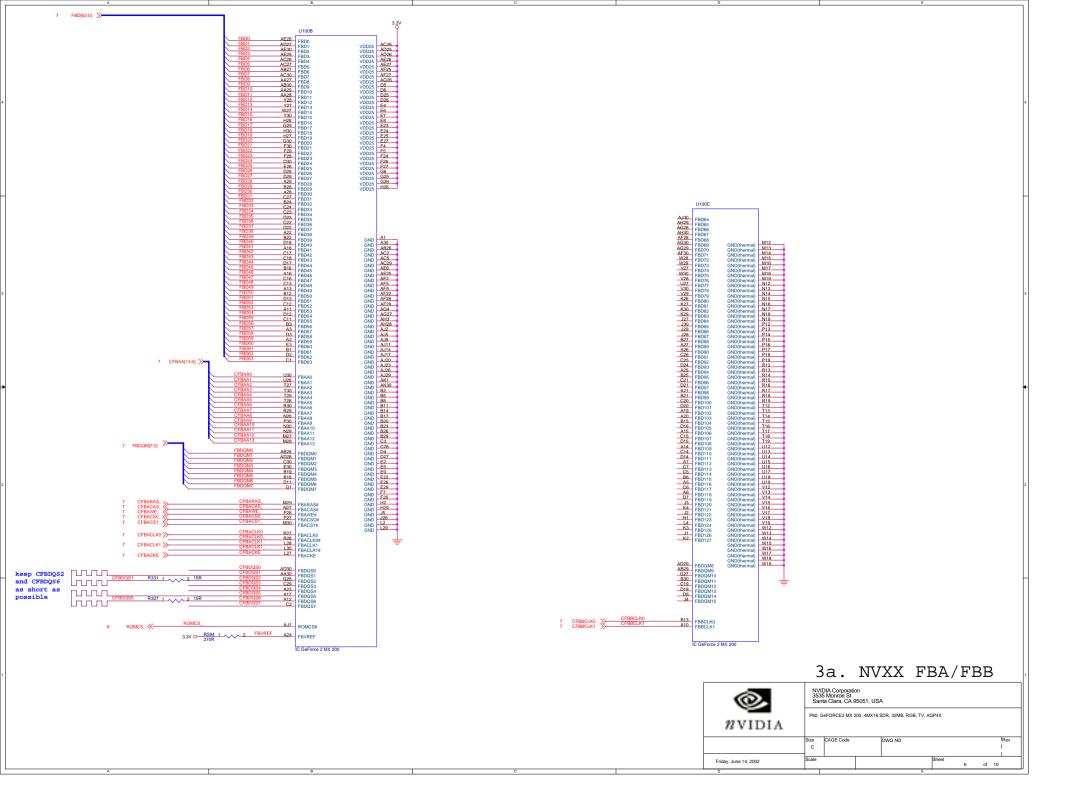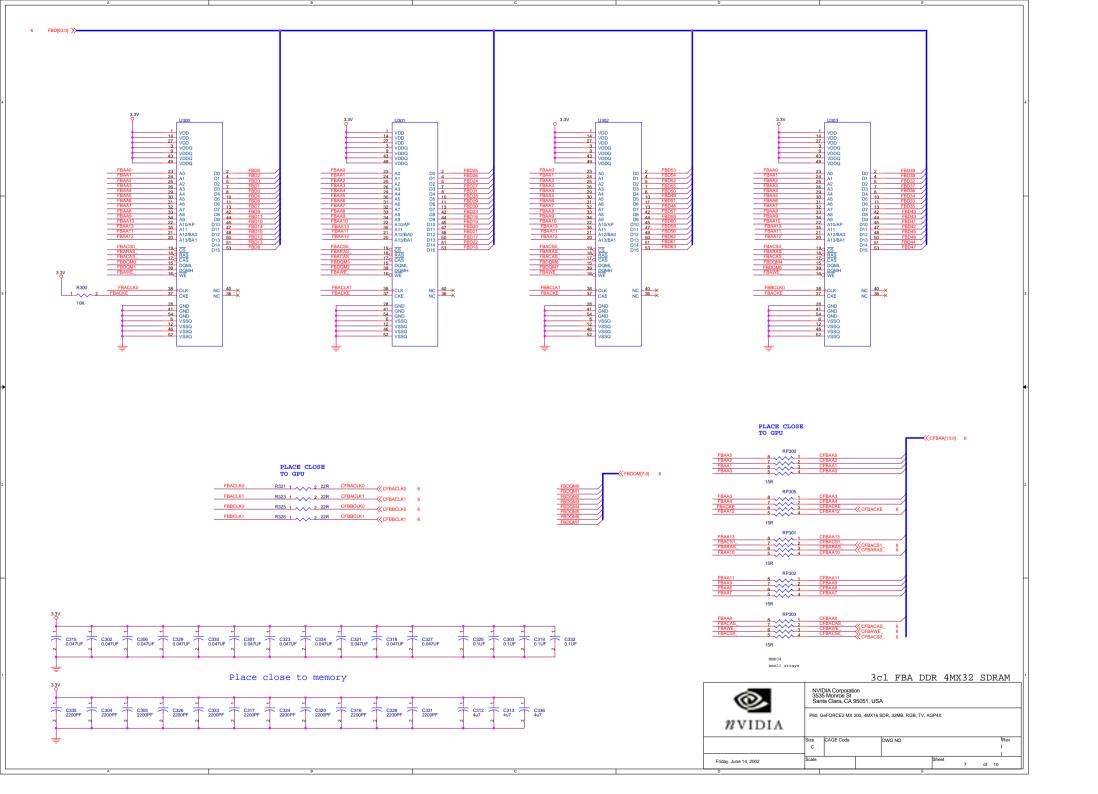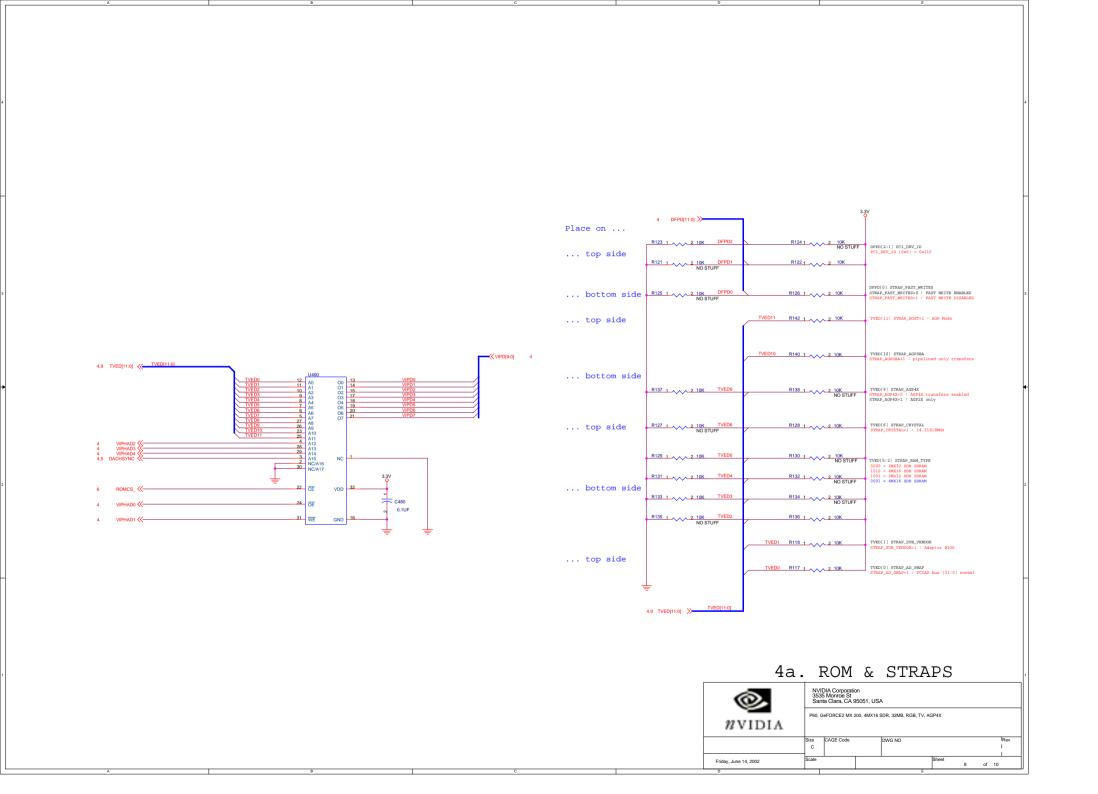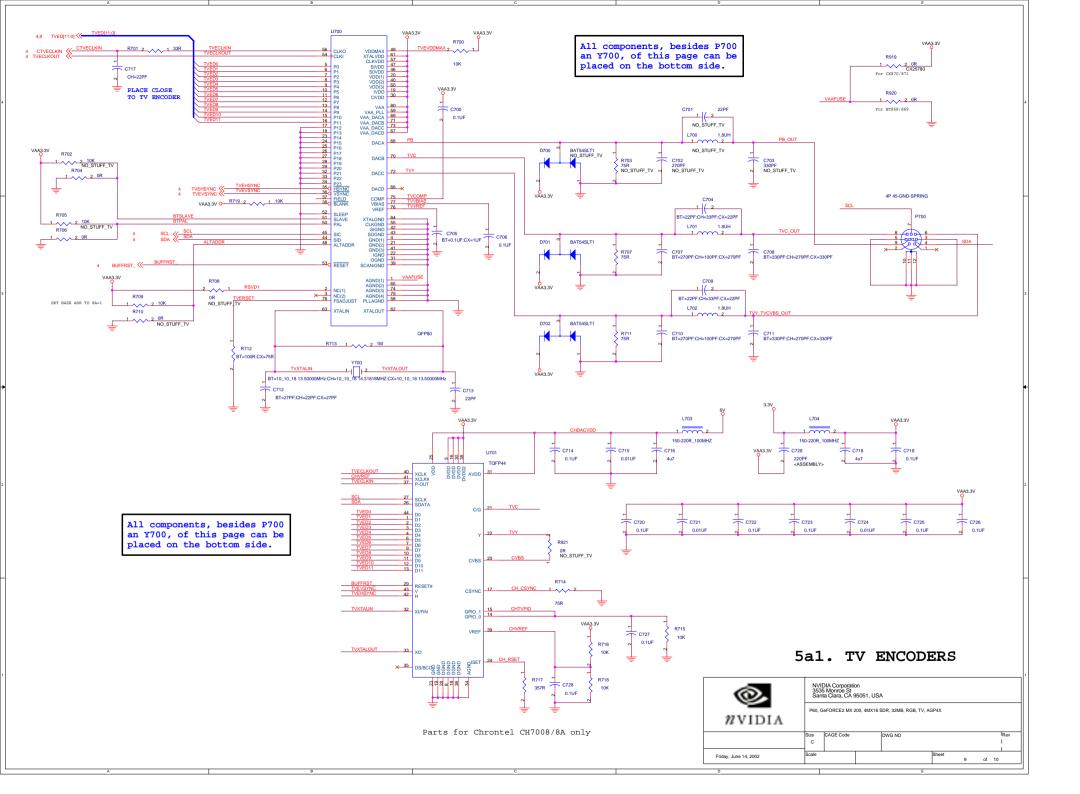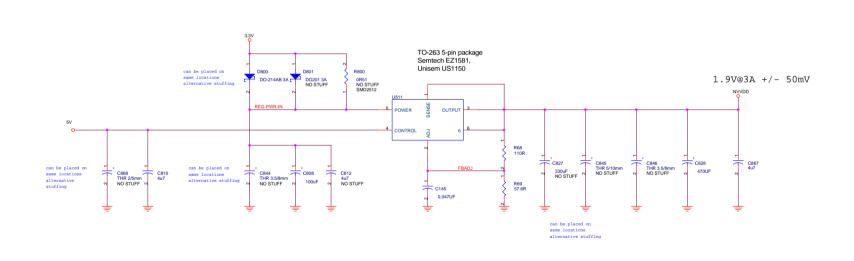DWG NO
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Scale

Sheet 8 of 10

5a1. TV ENCODERS

PLACE CLOSE TO TV ENCODER

All components, besides P700 an Y700, of this page can be placed on the bottom side.

All components, besides P700 an Y700, of this page can be placed on the bottom side.

SET BASE ADR TO 8A=1

U700 QFP80

CLKO, CLKI, P0, P1, P2, P3, P4, P5, P6, P7, P8, P9, P10, P11, P12, P13, P14, P15, P16, P17, P18, P19, P20, P21, P22, P23, HSYNC, VSYNC, FIELD, BLANK, SLEEP, SLAVE, PAL, SIC, SID, ALTADDR, RESET, NC(1), NC(2), FSADJUST, XTALIN

VDDMAX, XTALVDD, CLKVDD, SIVDD, S0VDD, VDD(1), VDD(2), VDD(3), IVDD, OVDD, VAA, VAA_PLL, VAA_DACA, VAA_DACB, VAA_DACC, VAA_DACD, PB, DACA, DACB, DACC, DACD, COMP, VBIAS, VREF, XTALGND, CLKGND, SIGND, SOGND, GND(1), GND(2), GND(3), IGND, OGND, SCAN/GND, AGND(1), AGND(2), AGND(3), AGND(4), PLLAGND, XTALOUT

TVC, TVY, TVCOMP, TVVBIAS, TVVREF

U701 TQFP44

XCLK, XCLK#, P-OUT, SCLK, SDATA, D0, D1, D2, D3, D4, D5, D6, D7, D8, D9, D10, D11, RESET#, V, H, XI/FIN, XO, DS/BCO, GND, DGND, AGND, VDD, DVDD, AVDD, C/G, Y, CVBS, CSYNC, GPIO_1, GPIO_0, VREF, ISET

TVC, TVY, CVBS, CH_CSYNC, CHTVPIO, CHVREF, CH_RSET

TVCLKOUT, CHVREF, TVECLKIN, SCL, SDA, TVED0–TVED11, BUFFRST, TVEVSYNC, TVEHSYNC, TVXTALIN, TVXTALOUT

R701 33R, C717 CH=22PF, R700 10K, R702 10K NO_STUFF_TV, R704 0R, R705 10K, R706 0R NO_STUFF_TV, R708 0R NO_STUFF_TV, R709, R710 0R NO_STUFF_TV, R712 BT=100R:CX=75R, R713 1M, R719 10K, R707 75R, R703 75R NO_STUFF_TV, R711 75R, R714 75R, R715 10K, R716 10K, R717 357R, R718 10K, R719, R921 0R NO_STUFF_TV, R919 0R, R920 0R

C700 0.1UF, C701 22PF NO_STUFF_TV, C702 270PF NO_STUFF_TV, C703 330PF NO_STUFF_TV, C704 BT=22PF:CH=33PF:CX=22PF, C705 BT=0.1UF:CX=1UF, C706 0.1UF, C707 BT=270PF:CH=100PF:CX=270PF, C708 BT=330PF:CH=270PF:CX=330PF, C709 BT=22PF:CH=33PF:CX=22PF, C710 BT=270PF:CH=100PF:CX=270PF, C711 BT=330PF:CH=270PF:CX=330PF, C712 BT=27PF:CH=22PF:CX=27PF, C713 22PF, C714 0.1UF, C715 0.01UF, C716 4u7, C718 4u7, C719 0.1UF, C727 0.1UF, C728 0.1UF, C729 220PF <ASSEMBLY>, C720 0.1UF, C721 0.01UF, C722 0.1UF, C723 0.1UF, C724 0.01UF, C725 0.1UF, C726 0.1UF

L700 1.8UH, L701 1.8UH, L702 1.8UH, L703 150-220R_100MHZ, L704 150-220R_100MHZ

D700 BAT54SLT1, D701 BAT54SLT1, D702 BAT54SLT1

Y700 BT=10_10_18 13.50000MHz:CH=10_10_18 14.31818MHz:CX=10_10_18 13.50000MHz

PB_OUT, TVC_OUT, TVY_TVCVBS_OUT, CHDACVDD, VAAFUSE

P700 4P 45-GND-SPRING, SCL, SDA

For CX870/871 (CX25780), For BT868/869

Parts for Chrontel CH7008/8A only

3.3V

can be placed on
same locatione
alternative stuffing

D800
DO-214AB 3A

D801
DO201 3A
NO STUFF

R800
0R51
NO STUFF
SMD2512

REG-PWR-IN

TO-263 5-pin package
Semtech EZ1581,
Unisem US1150

1.9V@3A +/- 50mV

NVVDD

U511
5 POWER   SENSE   OUTPUT 3

4 CONTROL ADJ   6

5V

can be placed on
same locatione
alternative
stuffing

C868
THR 2/5mm
NO STUFF

C810
4u7

can be placed on
same locatione
alternative stuffing

C844
THR 3.5/8mm
NO STUFF

C808
100uF

C812
4u7
NO STUFF

R68
110R

FBADJ

C145
0.047UF

R69
57.6R

C827
330uF
NO STUFF

C845
THR 5/10mm
NO STUFF

C846
THR 3.5/8mm
NO STUFF

C828
470UF

C867
4u7

can be placed on
same locatione
alternative stuffing

3b. power supply