TABLE OF CONTENTS

AMD - Personal Connectivity Solutions

PROJECT: NX DB1500
SCHEMATIC PART NUMBER: 720M000017
SCHEMATIC REVISION: 1.2
PRELIMINARY REVISION: Monday, July 12, 2004

AMD - Personal Connectivity Solutions
9500 Arboretum Blvd.
AUSTIN, TX 78759

SHEET: COVER SHEET

DATE: Monday, July 12, 2004 REV: 1.2

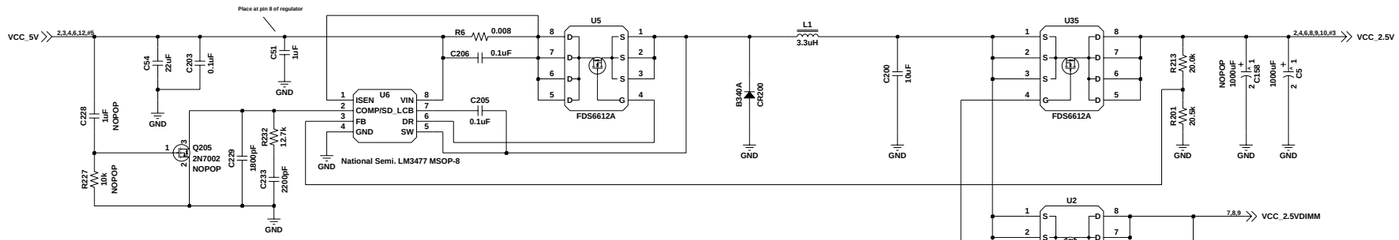
SHEET NUMBER: 1 OF 20

DOCUMENT NUMBER: 720M000017

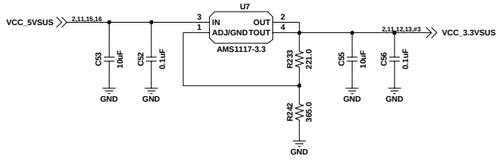
TITLE: NX DB1500

SYSTEM POWER

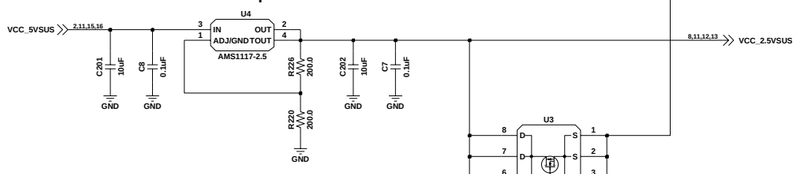
2.5V (4A) supply for DDR, NB & SB

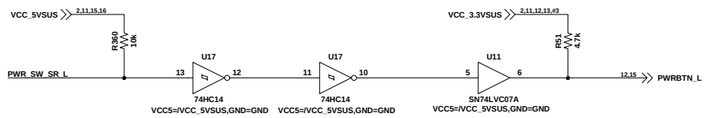


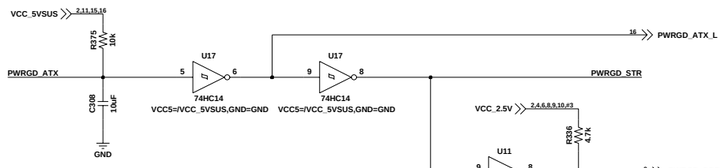
3.3V Suspend

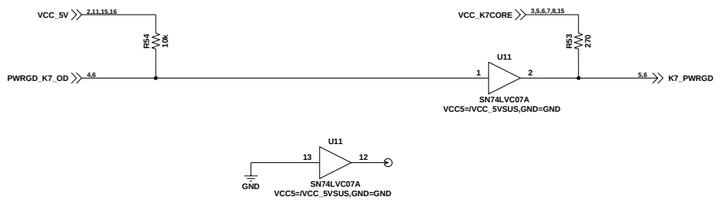


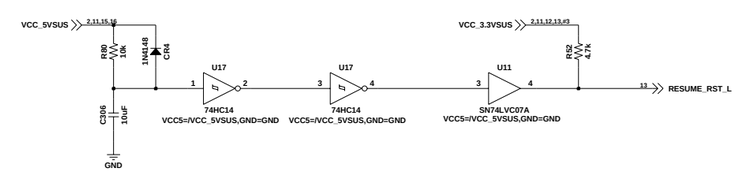
2.5V Suspend



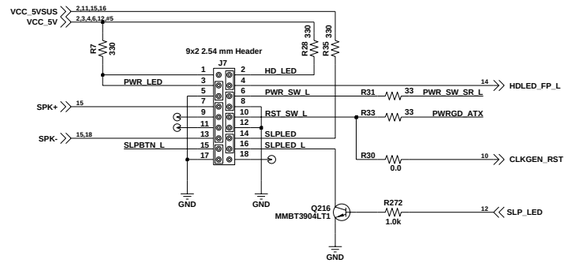


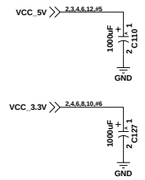


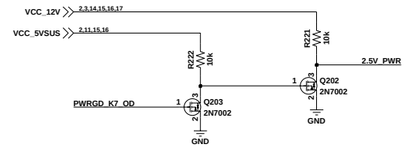


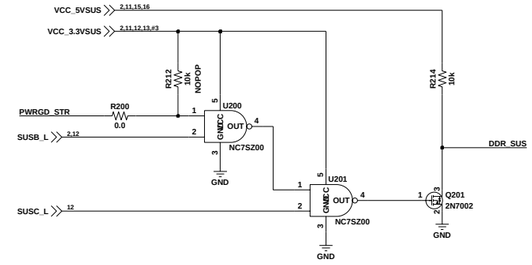


Front Panel

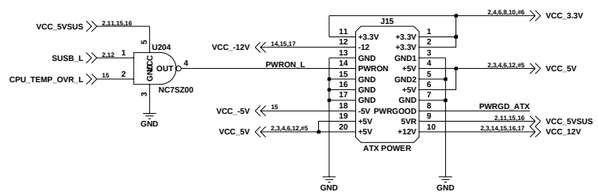


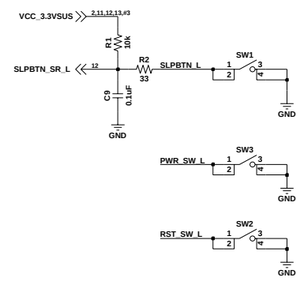


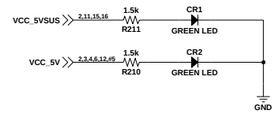




ATX Power Connector







AMD - Personal Connectivity Solutions
9500 Arboretum Blvd.
AUSTIN, TX 78759

SHEET: SYSTEM POWER

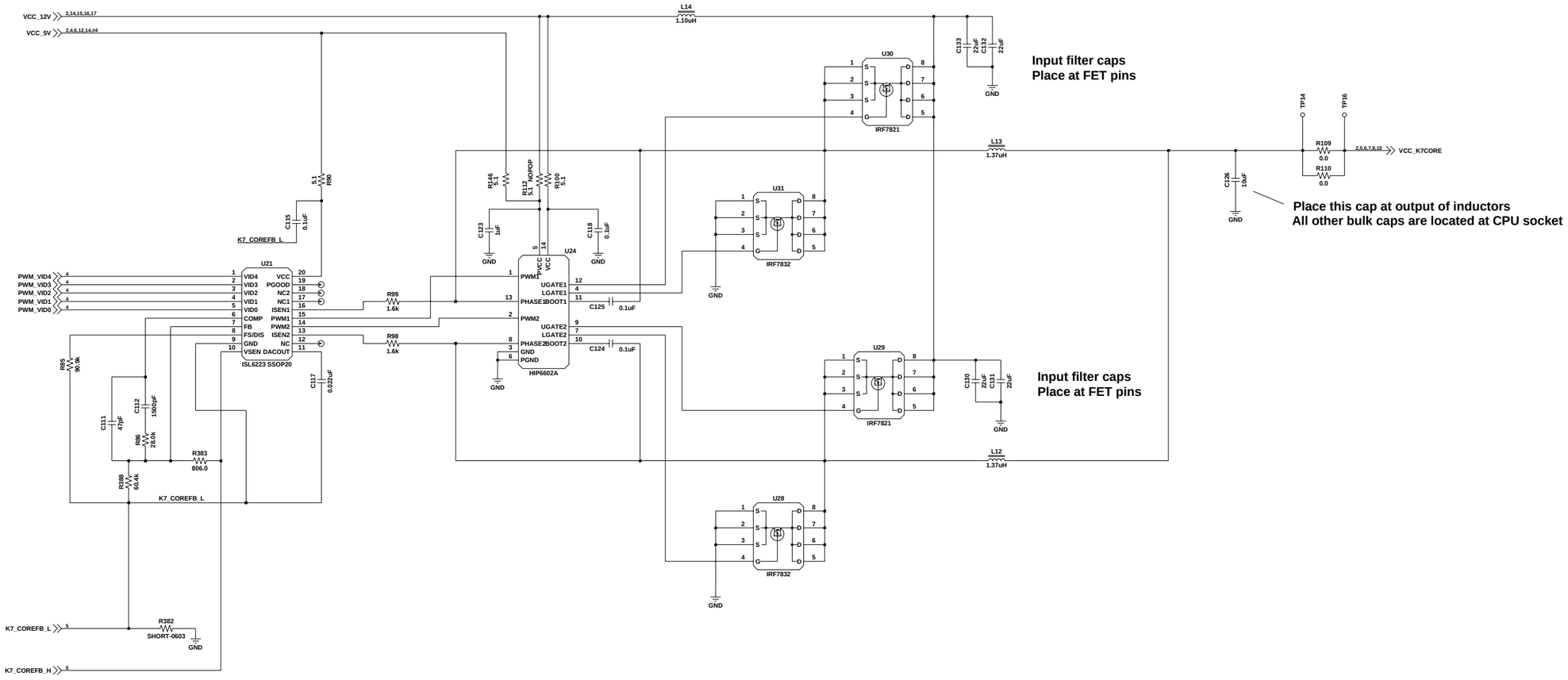
DATE: Monday, July 12, 2004 REV: 1.2

SHEET NUMBER: 2 OF 20

DOCUMENT NUMBER: 720M000017

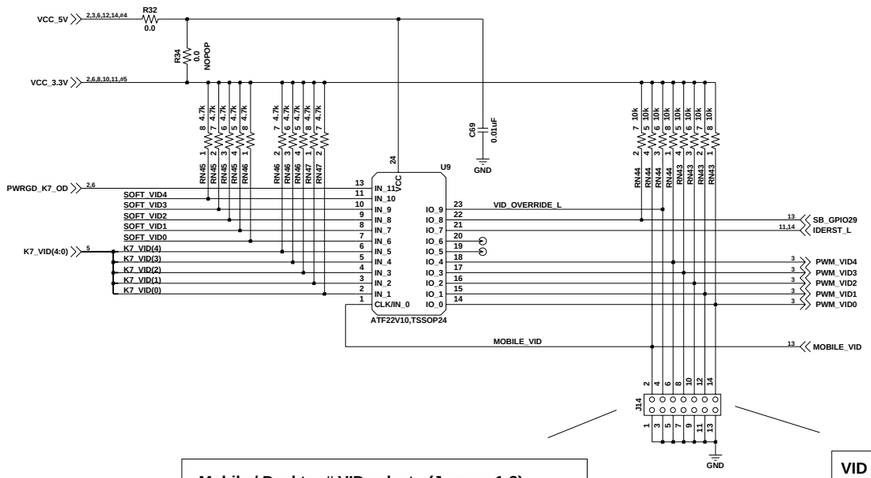
TITLE: NX DB1500

CPU PWR SUPPLY



AMD - Personal Connectivity Solutions 9500 Arboretum Blvd. AUSTIN, TX 78759	CONFIDENTIAL AND PROPRIETARY TO ADVANCED MICRO DEVICES INC.
SHEET: CPU PWR SUPPLY	
DATE: Monday, July 12, 2004 — REV: 1.2	
SHEET NUMBER: 3 OF 20	TITLE: NX DB1500
DOCUMENT NUMBER: 720M000017	

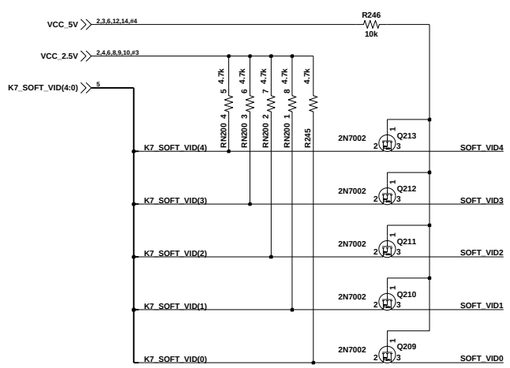
CPU VID & FID CONTROL

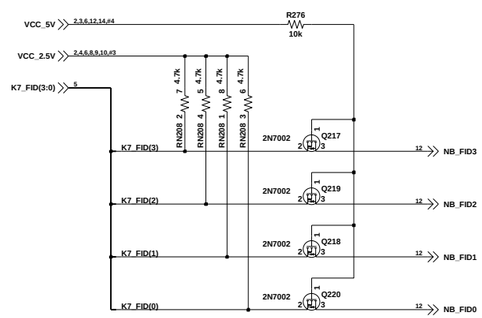


Mobile / Desktop# VID select: (Jumper 1-2)	
Open (1)	Mobile Processor Installed - Do not translate VID codes! - "Power Good" signal (active high) will switch output to SOFTVIDs
Short (0)	Desktop Processor Installed - Translate VID codes to mobile VRM!

VID Manual Override	Jumper 3-4	Jumper 5-6	Jumper 7-8	Jumper 9-10	Jumper 11-12	Jumper 13-14
Normal Operation (PAL will output VID codes)	Open	Open	Open	Open	Open	Open
Manual VID Override - PAL ouputs are HI-Z - Populate VID Jumpers to set CPU voltage	Short	X	X	X	X	X

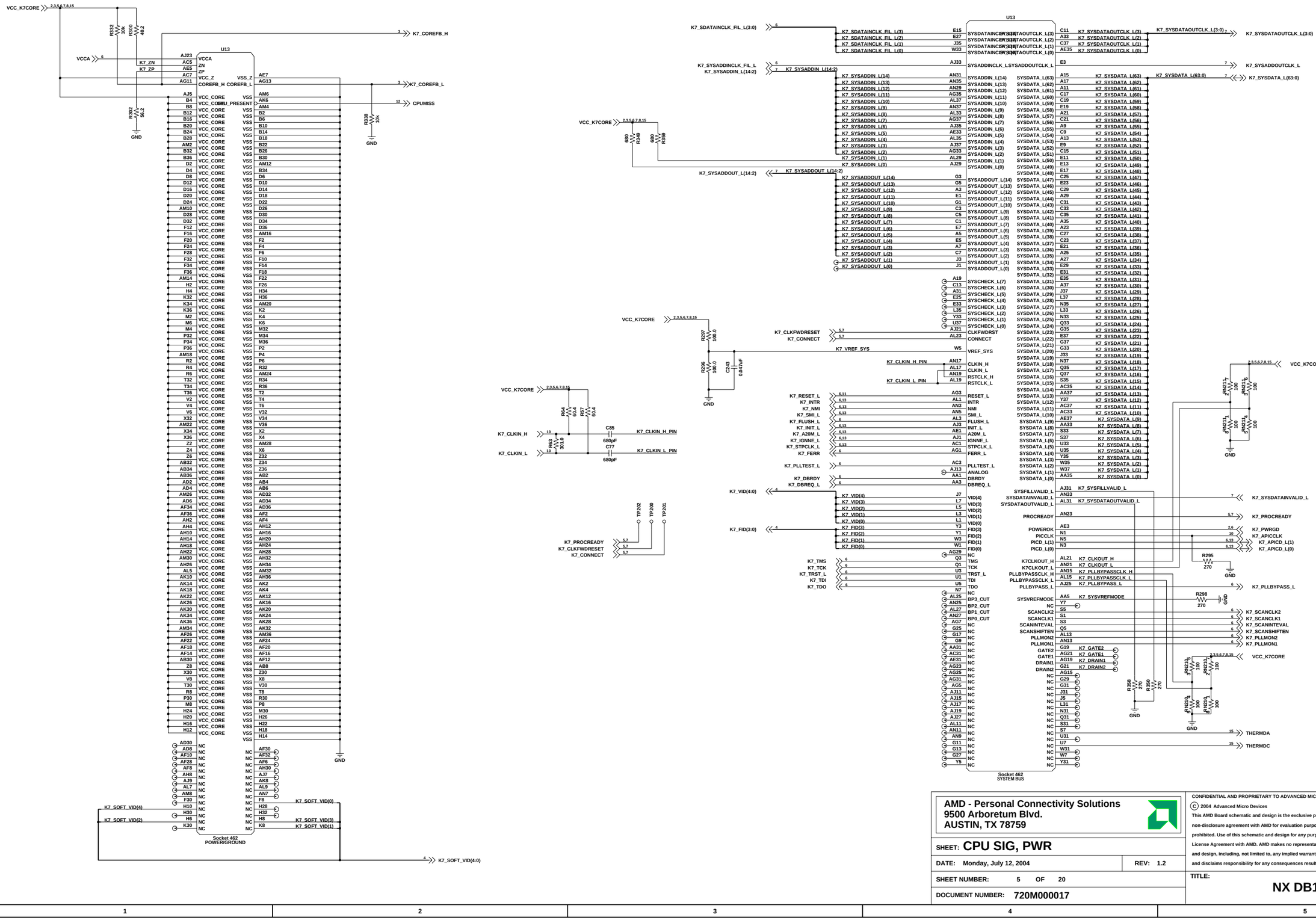
PWM_VID(4:0)	CPU Voltage
00000	2.000
00001	1.950
00010	1.900
00011	1.850
00100	1.800
00101	1.750
00110	1.700
00111	1.650
01000	1.600
01001	1.550
01010	1.500
01011	1.450
01100	1.400
01101	1.350
01110	1.300
01111	Shutdown
10000	1.275
10001	1.250
10010	1.225
10011	1.200
10100	1.175
10101	1.150
10110	1.125
10111	1.100
11000	1.075
11001	1.050
11010	1.025
11011	1.000
11100	0.975
11101	0.950
11110	0.925
11111	





AMD - Personal Connectivity Solutions 9500 Arboretum Blvd. AUSTIN, TX 78759	
SHEET: CPU VID & FID CONTROL	
DATE: Monday, July 12, 2004	REV: 1.2
SHEET NUMBER: 4 OF 20	
DOCUMENT NUMBER: 720M000017	

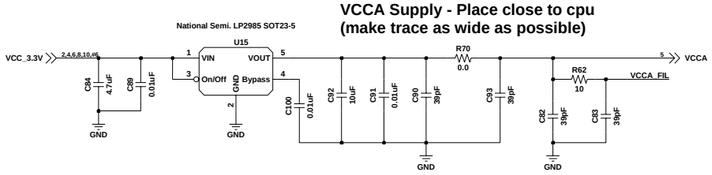
TITLE: **NX DB1500**



AMD - Personal Connectivity Solutions **9500 Arboretum Blvd.** **AUSTIN, TX 78759**	CONFIDENTIAL AND PROPRIETARY TO ADVANCED MICRO DEVICES INC. © 2004 Advanced Micro Devices This AMD Board schematic and design is the exclusive property of AMD, and is provided only to entities under a non-disclosure agreement with AMD for evaluation purposes. Further distribution or disclosure is strictly prohibited. Use of this schematic and design for any purpose other than evaluation requires a Board Technology License Agreement with AMD. AMD makes no representations or warranties of any kind regarding this schematic and design, including, not limited to, any implied warranty of merchantibility or fitness for a particular purpose, and disclaims responsibility for any consequences resulting from use of the information included herein.
SHEET: **CPU SIG, PWR**	
DATE: **Monday, July 12, 2004** REV: **1.2**	
SHEET NUMBER: **5** OF **20**	TITLE: **NX DB1500**
DOCUMENT NUMBER: **720M000017**	

CPU MISC

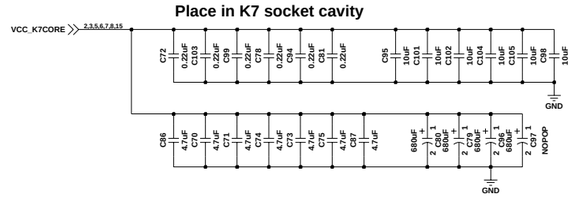
VCCA Supply - Place close to cpu (make trace as wide as possible)



Notes: 39pf values are for processors of 1.6GHz or less. If higher, use 22pF

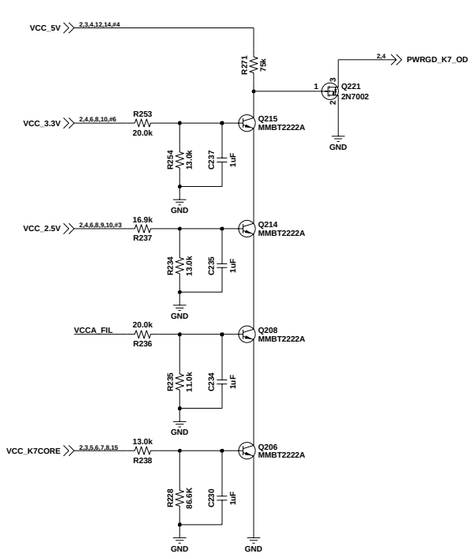
This supply will support up to a 3GHz PLL

Place in K7 socket cavity

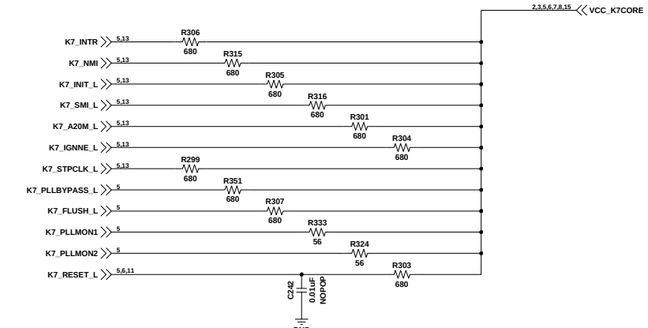


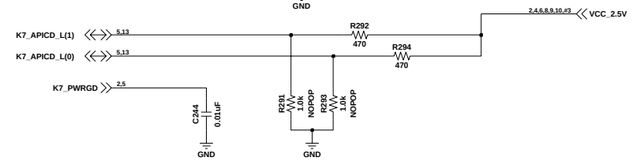
If all caps will not fit in cavity, distribute extras (excluding 680uF) to the bottom side of the processor

CPU Power Good Detect

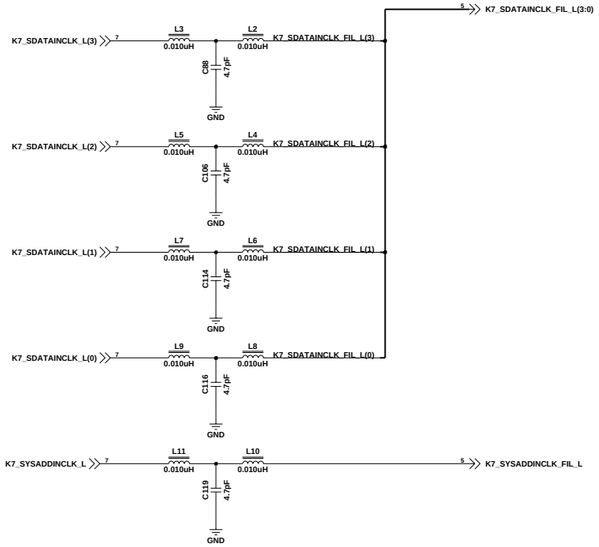


K7 Signals

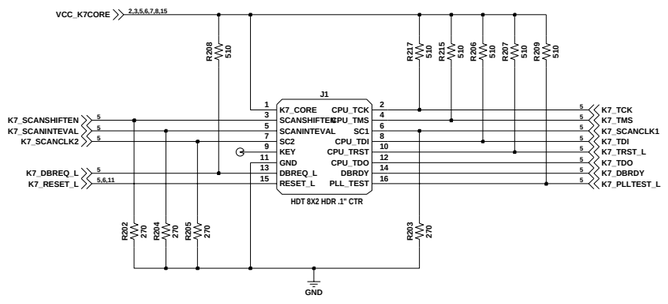


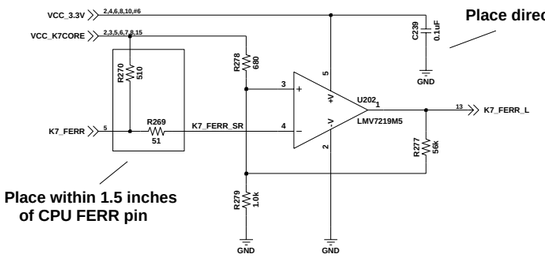


NB SIDE / CPU SIDE



CPU JTAG Port





AMD - Personal Connectivity Solutions
9500 Arboretum Blvd.
AUSTIN, TX 78759

SHEET: CPU MISC

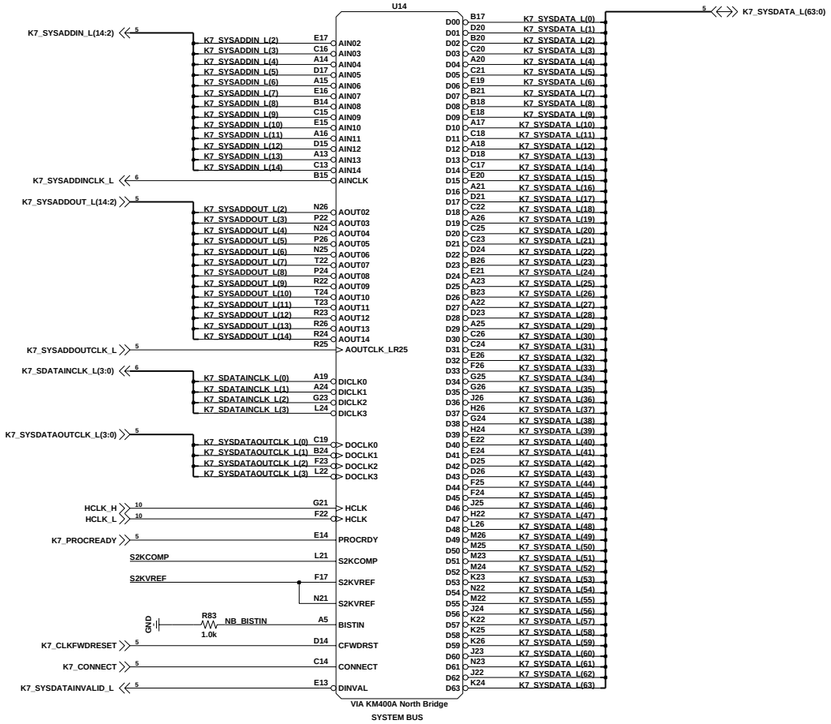
DATE: Monday, July 12, 2004 REV: 1.2

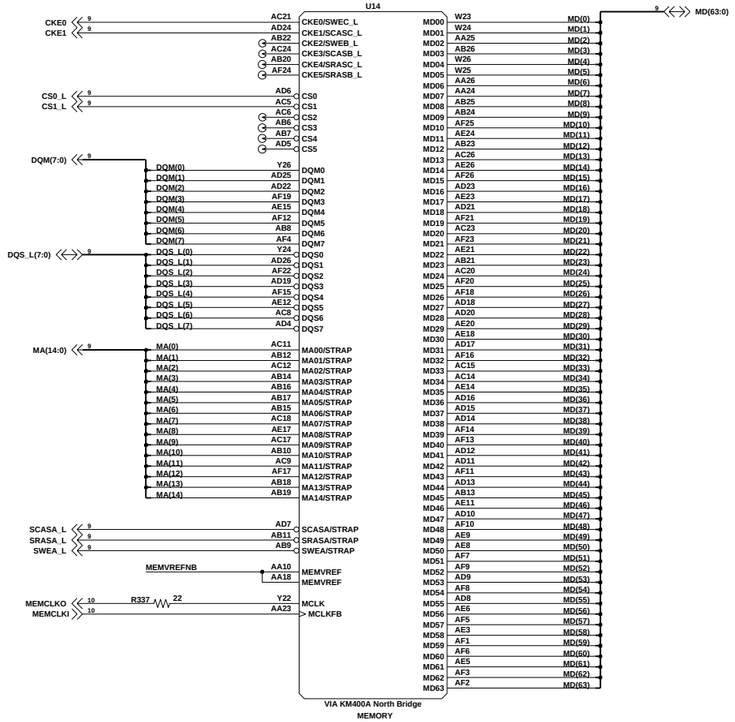
SHEET NUMBER: 6 OF 20

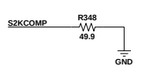
DOCUMENT NUMBER: 720M000017

TITLE: NX DB1500

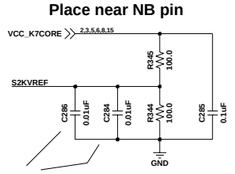
KM400A NORTH BRIDGE PART 1





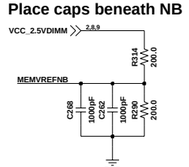


Place near NB pin



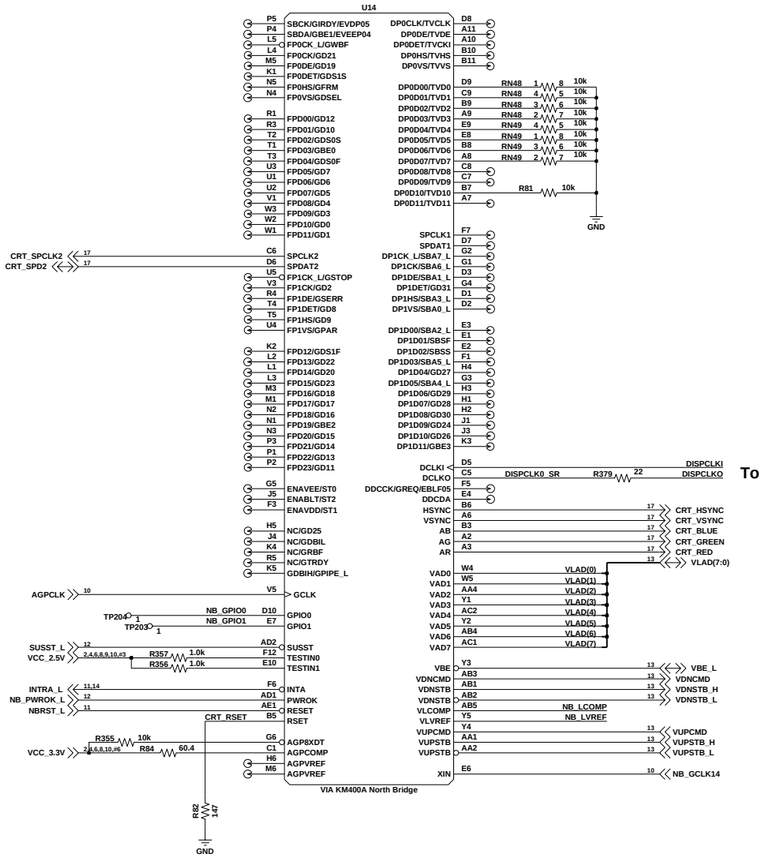
Place caps beneath NB

Place caps beneath NB

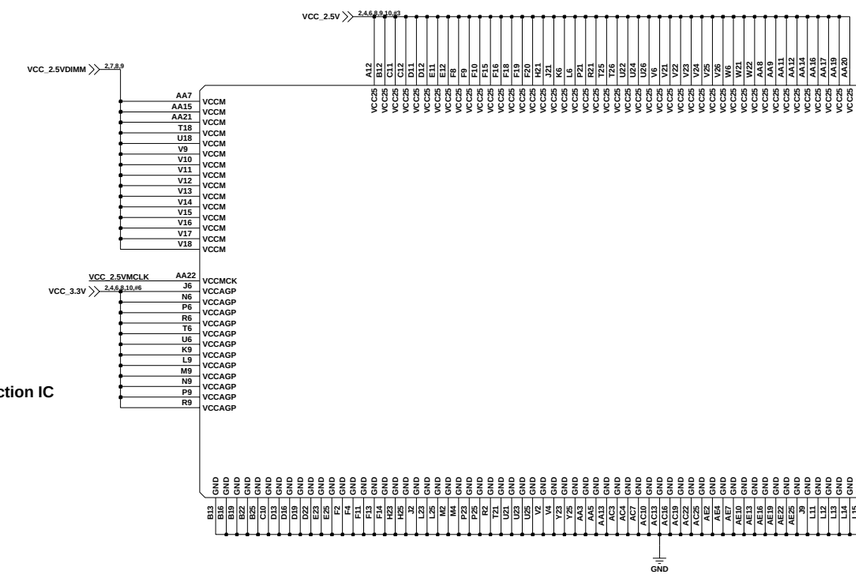


AMD - Personal Connectivity Solutions 9500 Arboretum Blvd. AUSTIN, TX 78759	CONFIDENTIAL AND PROPRIETARY TO ADVANCED MICRO DEVICES INC. © 2004 Advanced Micro Devices This AMD Board schematic and design is the exclusive property of AMD, and is provided only to entities under a non-disclosure agreement with AMD for evaluation purposes. Further distribution or disclosure is strictly prohibited. Use of this schematic and design for any purpose other than evaluation requires a Board Technology License Agreement with AMD. AMD makes no representations or warranties of any kind regarding this schematic and design, including, not limited to, any implied warranty of merchantibility or fitness for a particular purpose, and disclaims responsibility for any consequences resulting from use of the information included herein.
SHEET: KM400A NORTH BRIDGE PART 1	
DATE: Monday, July 12, 2004 REV: 1.2	
SHEET NUMBER: 7 OF 20	TITLE: NX DB1500
DOCUMENT NUMBER: 720M000017	

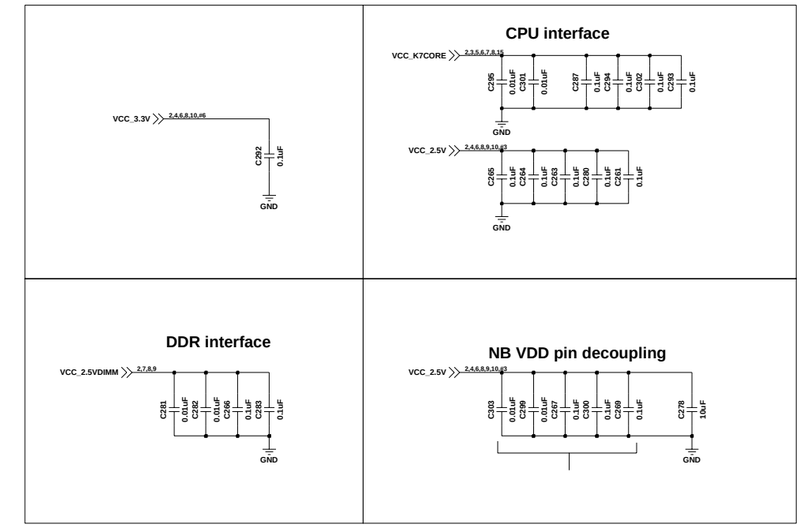
KM4OOA NORTH BRIDGE PART 2



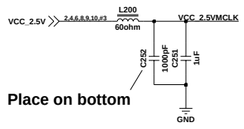
To EMI reduction IC



Place caps under NorthBridge

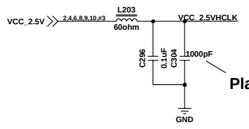


Power for MCLK circuit
Place near pin



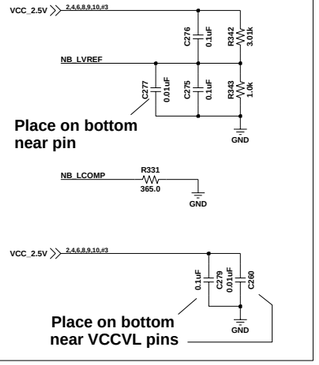
Place on bottom

Power for HCLK circuit
Place near pin

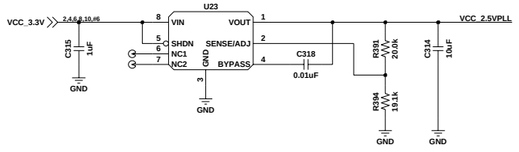


Place on bottom

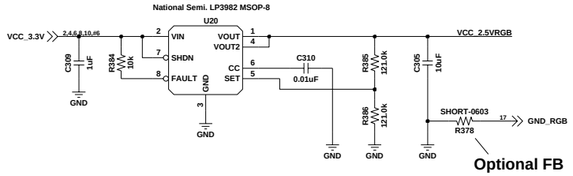
VLINK BUS CONFIG



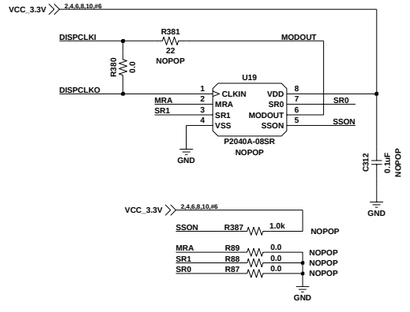
LT1763
Linear Tech. LT1763 LDO Reg.



LP3982
National Semi. LP3982 MSOP-8



Display clock spread spectrum
Place close to NB

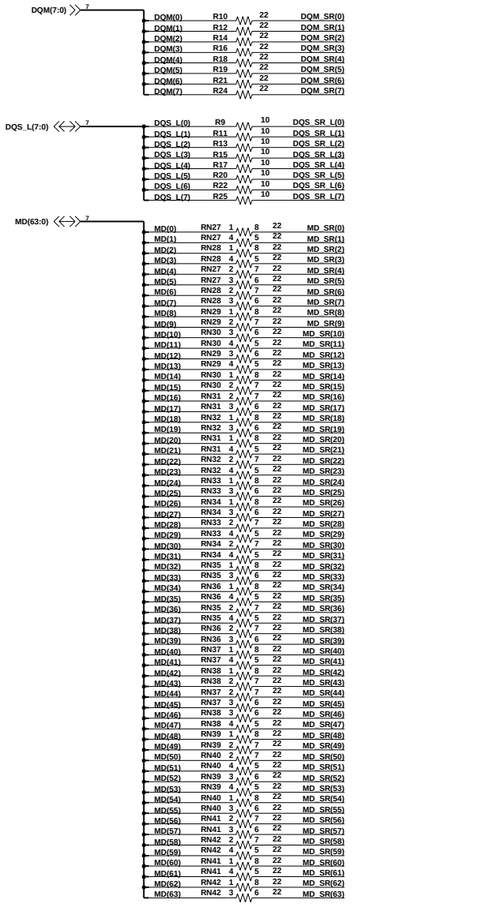


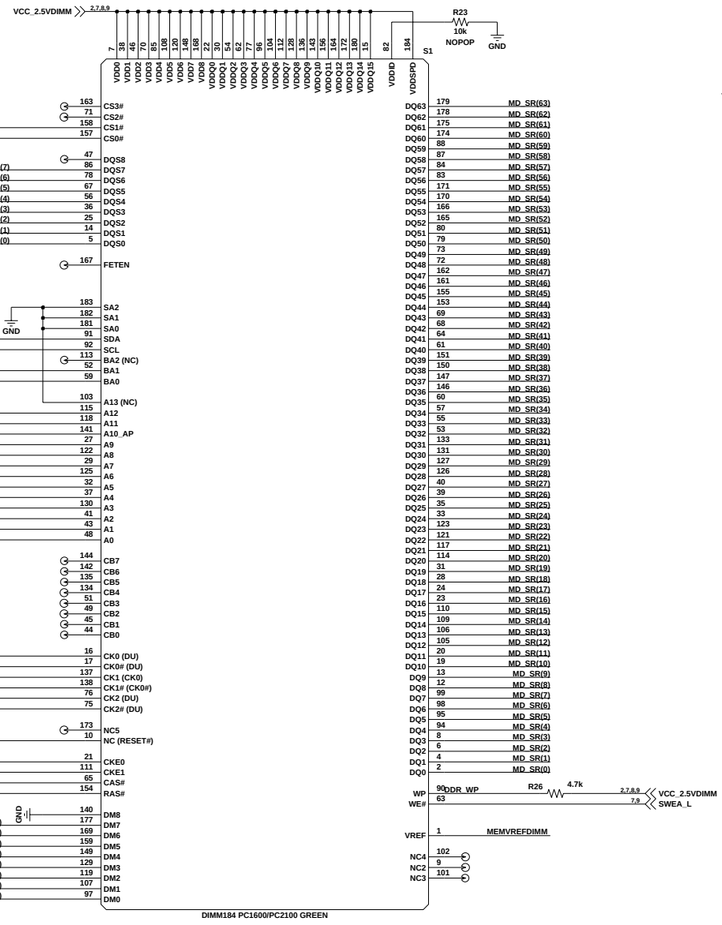
AMD - Personal Connectivity Solutions
9500 Arboretum Blvd.
AUSTIN, TX 78759

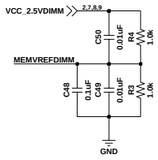
SHEET: KM4OOA NORTH BRIDGE PART 2	
DATE: Monday, July 12, 2004	REV: 1.2
SHEET NUMBER: 8 OF 20	
DOCUMENT NUMBER: 720M000017	
TITLE: NX DB1500	

DDR MEMORY

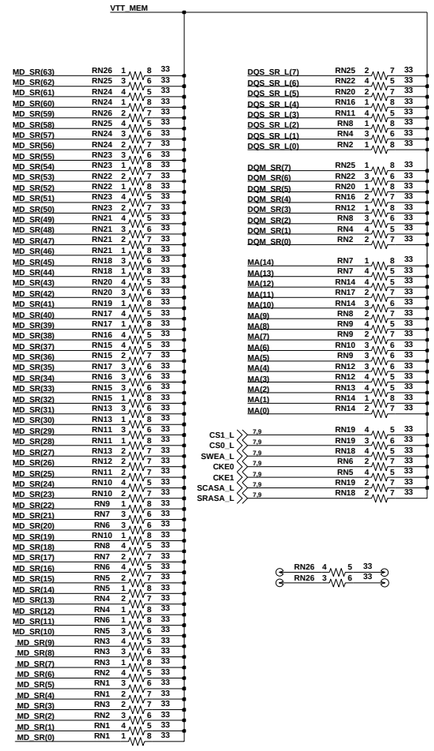
DDR DAMPING RESISTORS
PLACE CLOSE TO DIMM1

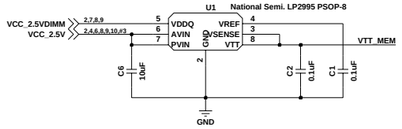


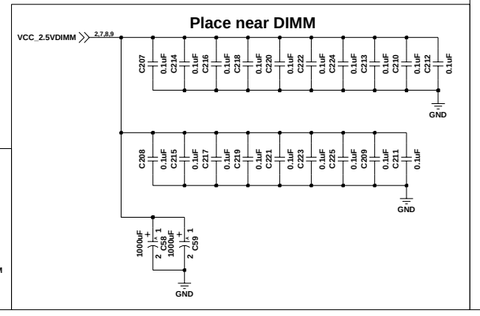


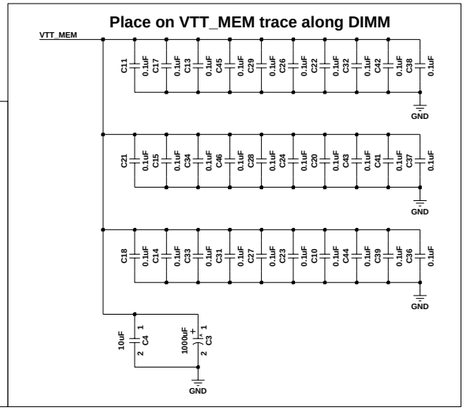


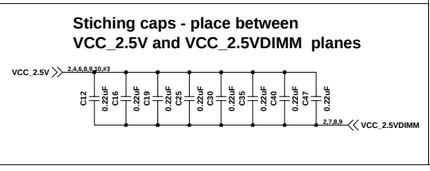
DDR END TERMINATION





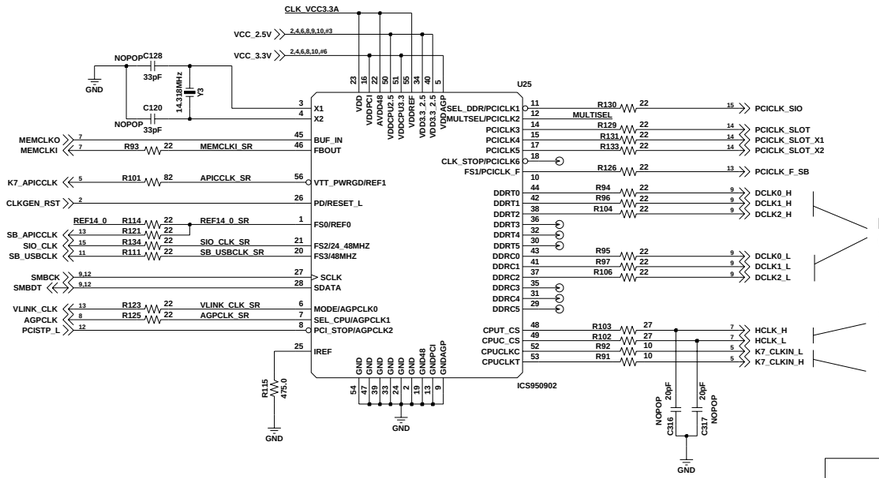






AMD - Personal Connectivity Solutions 9500 Arboretum Blvd. AUSTIN, TX 78759	
SHEET: DDR MEMORY	
DATE: Monday, July 12, 2004	REV: 1.2
SHEET NUMBER: 9 OF 20	
DOCUMENT NUMBER: 720M000017	TITLE: NX DB1500

CLOCK GENERATORS



Lenth match nets REF14_0, K7_APICCLK and SB_APIC_CLK to +-100mils

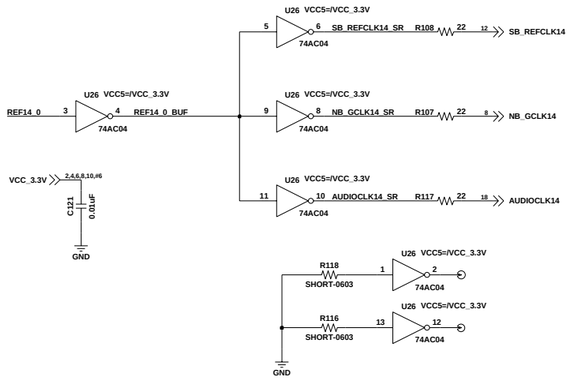
Lenth match nets AGPCLK and VLINK_CLK to +-100mils

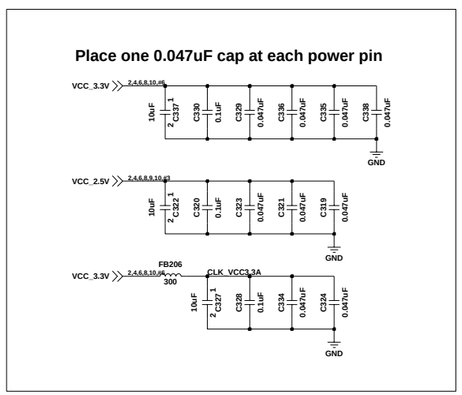
Route at Zdiff = 70 ohms (Zo ~ 35 ohms)

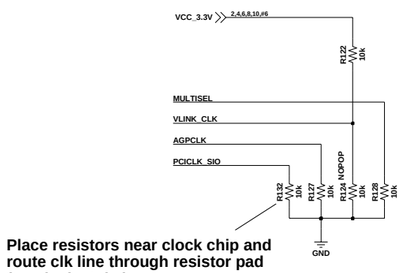
5 mil trace, 5 mil spacing length match to 50 mils

Route with 5 mil spacing & length match to 50 mils

Route HCLK pair 1 inch longer than CLKIN pair





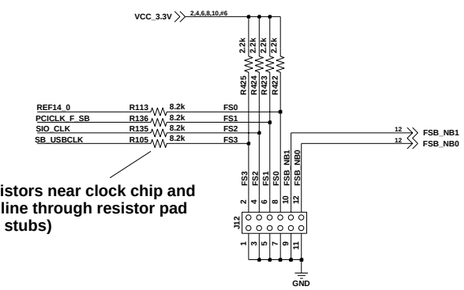


Place resistors near clock chip and route clk line through resistor pad (no clock stubs)

VLINK_CLK (Mode Select)
0: Mobile (activates stop clk inputs)
1: Desktop

MULTSEL
Sets current multiplier for CPU outputs in conjuction with R_iref - see datasheet

CPU Front Side Bus Config



Place resistors near clock chip and route clk line through resistor pad (no clock stubs)

Frequency table for ICS950902 (MHz)

FS(3:0)	CPU	AGP	PCI
0000	160.00	80.00	40.00
0001	164.00	82.00	41.00
* 0010	166.66	66.60	33.30
0011	170.00	68.00	34.00
0100	175.00	70.00	35.00
0101	180.00	72.00	36.00
0110	185.00	74.00	37.00
0111	190.00	76.00	38.00
1000	66.80	66.80	33.40
1001	100.90	67.27	33.63
1010	133.60	66.80	33.40
1011	200.40	66.80	33.40
1100	66.60	66.60	32.30
* 1101	100.00	66.60	33.30
* 1110	200.00	66.60	33.30
* 1111	133.30	66.60	33.30

*** Typical Settings**

Frequency table for KM400 / KM400A NB

FSB_NB(1:0)	
00	100MHz
01	133MHz
10	166MHz
11	200MHz #

 # KM400A ONLY

Key 0 = Jumper ON
1 = Jumper OFF

AMD - Personal Connectivity Solutions
9500 Arboretum Blvd.
AUSTIN, TX 78759

SHEET: CLOCK GENERATORS

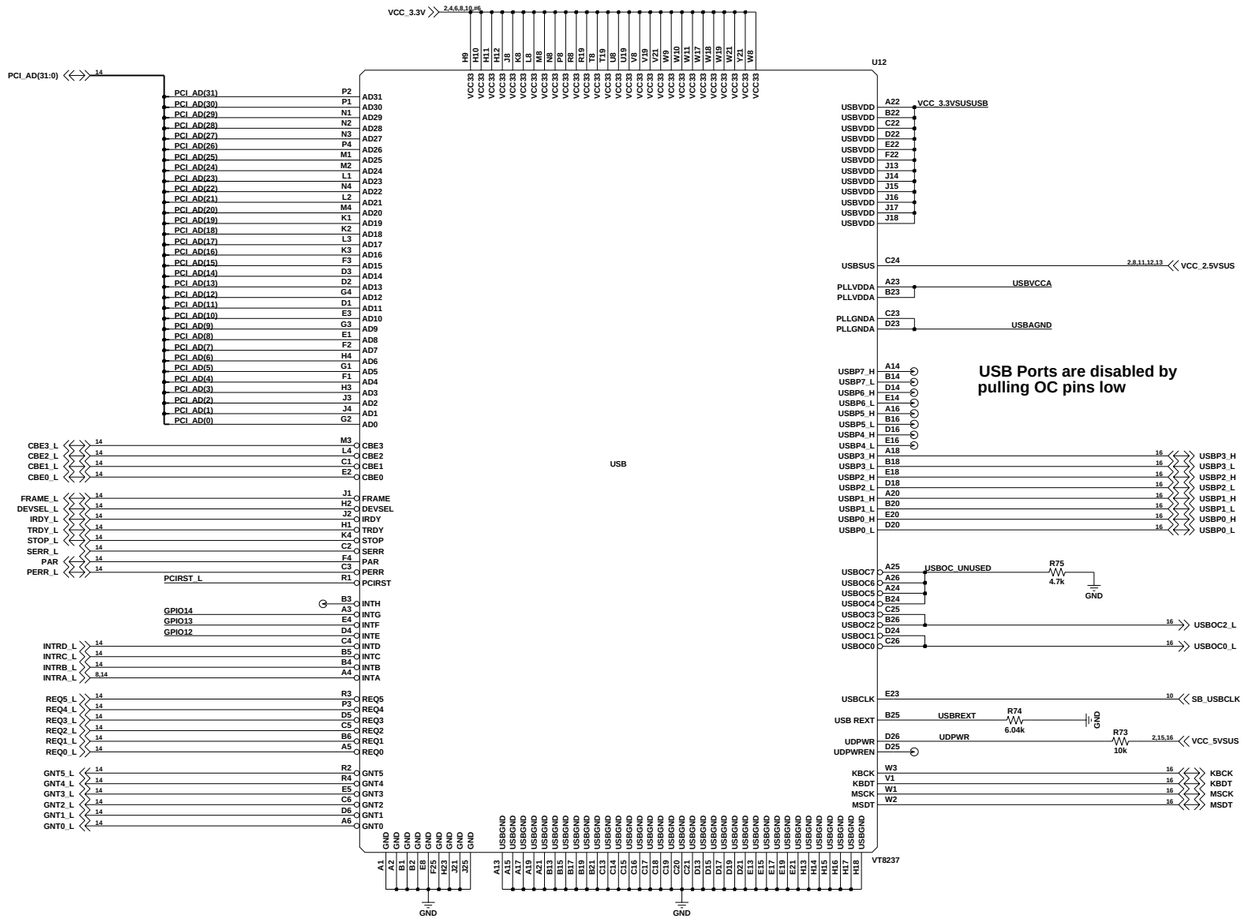
DATE: Monday, July 12, 2004 REV: 1.2

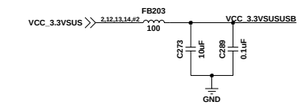
SHEET NUMBER: 10 OF 20

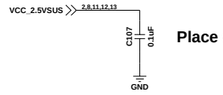
DOCUMENT NUMBER: 720M000017

TITLE: NX DB1500

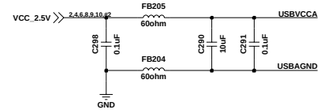
SOUTH BRIDGE PART 1

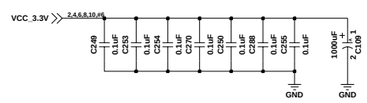


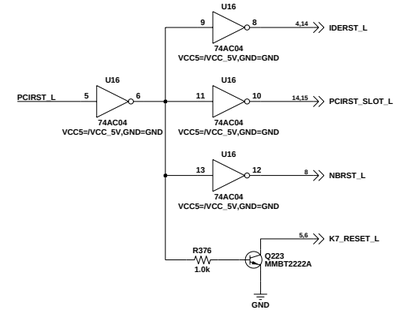


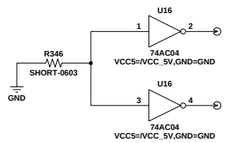


Place close to pin C24

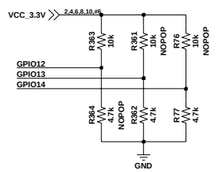




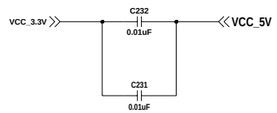




Board Rev ID pins

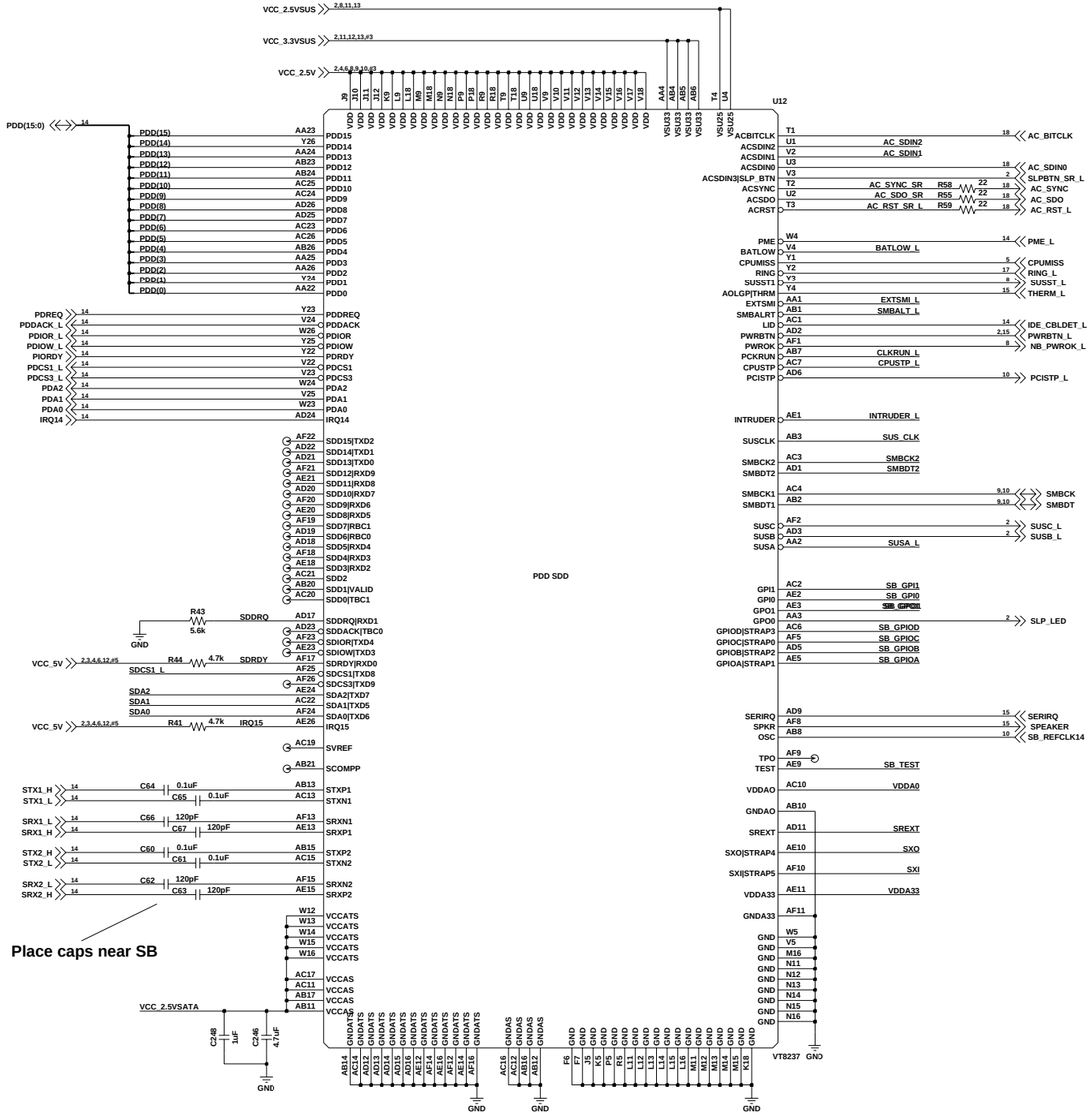


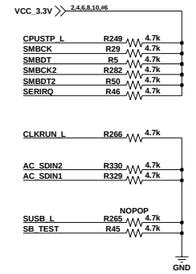
Stitching Capacitors for USB pair



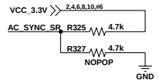
AMD - Personal Connectivity Solutions 9500 Arboretum Blvd. AUSTIN, TX 78759	
SHEET: SOUTH BRIDGE PART 1	
DATE: Monday, July 12, 2004	REV: 1.2
SHEET NUMBER: 11 OF 20	TITLE: NX DB1500
DOCUMENT NUMBER: 720M000017	

SOUTH BRIDGE PART 2

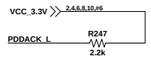




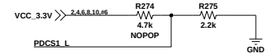
LPC FWH command:
0/1 Enable/Disable



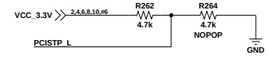
SATA external PHY
0/1 Enable/Disable

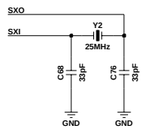


SATA master/slave mode
0/1 Enable/Disable

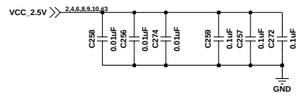


100MHz Vlink Clock
0/1 Enable/Disable

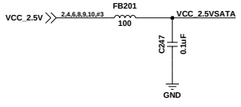




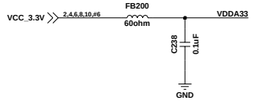
Place under or near SB



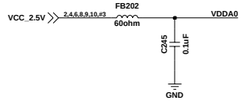
Place between pins
VCCAS & GNDATS

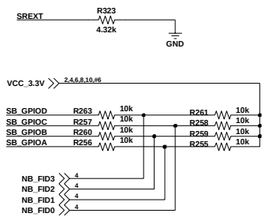


Place between pins
VDDA33 & GNDA33



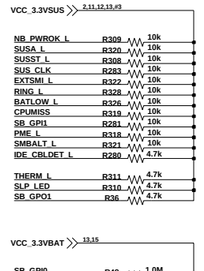
Place between pins
VDDA0 & GNDA0

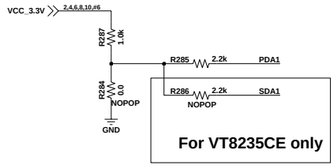




1/0 Enable/disable LPC ROM

For VT8235CE only

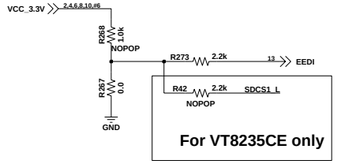




Strapping information select:

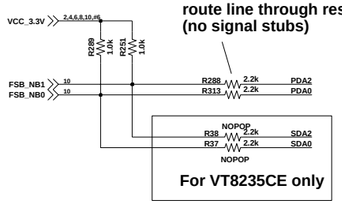
VT8237	VT8235CE
PDA1	SDA1

0 - From hardware strapping (default)
1 - From boot ROM



EEPROM Select:

VT8237 SEEDI	VT8235CE SDCS1_L	
0	1	Enable (default)
1	0	Disable



Place resistors near SB and route line through resistor pad (no signal stubs)

CPU clock frequency:

VT8237	VT8235CE
PDA2, PDA0	SDA2, SDA0

(Jumpers on clock sheet)

AMD - Personal Connectivity Solutions
9500 Arboretum Blvd.
AUSTIN, TX 78759

SHEET: SOUTH BRIDGE PART 2

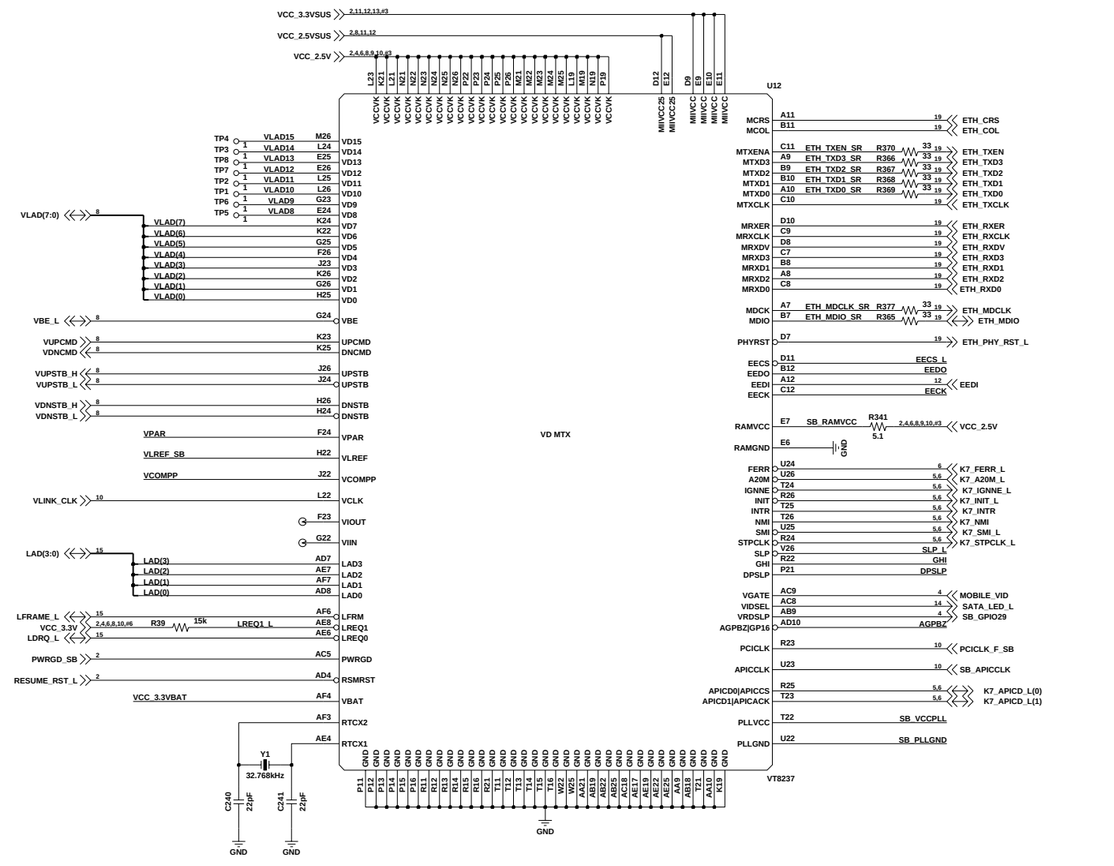
DATE: Monday, July 12, 2004 REV: 1.2

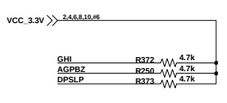
SHEET NUMBER: 12 OF 20

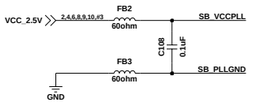
DOCUMENT NUMBER: 720M000017

TITLE: NX DB1500

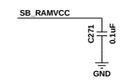
SOUTH BRIDGE PART 3

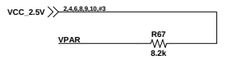


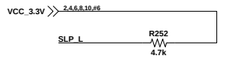


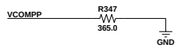


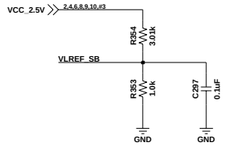
Place near RAMVCC pin

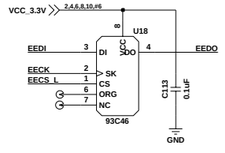








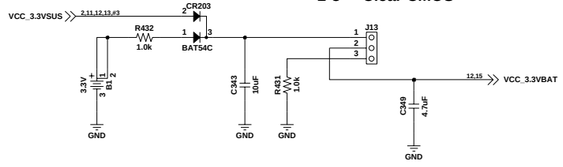




CMOS JUMPER

1-2 Normal Operation

2-3 Clear CMOS



AMD - Personal Connectivity Solutions
9500 Arboretum Blvd.
AUSTIN, TX 78759

SHEET: SOUTH BRIDGE PART 3

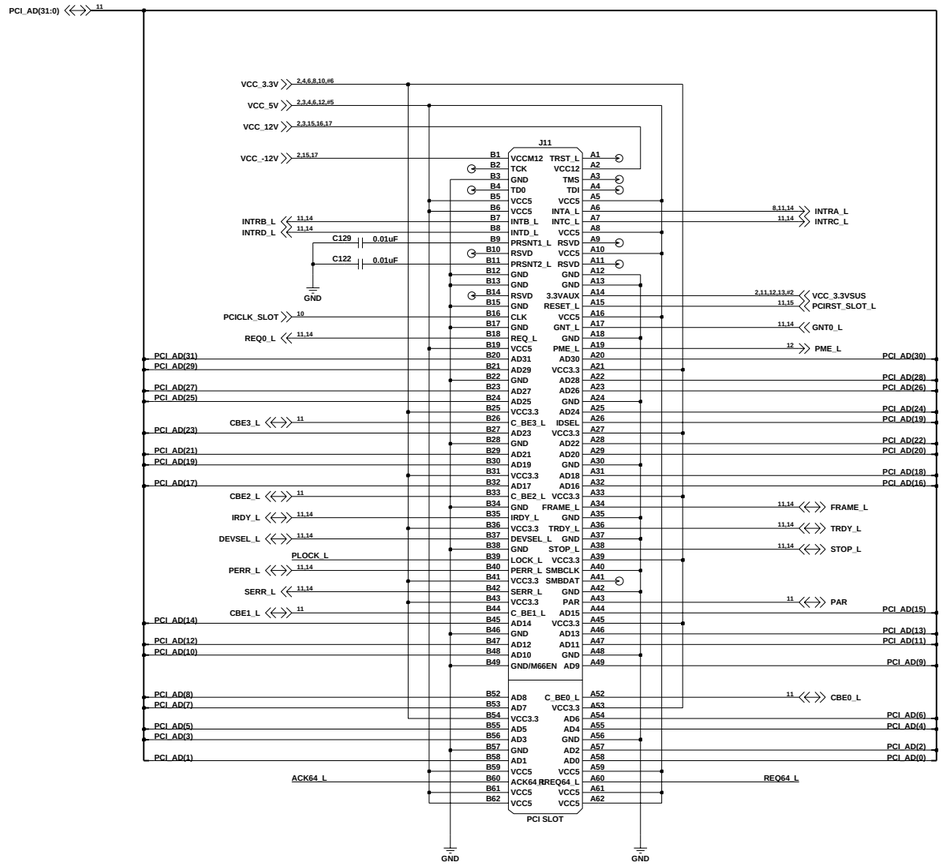
DATE: Monday, July 12, 2004 REV: 1.2

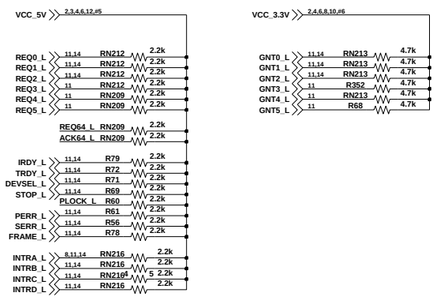
SHEET NUMBER: 13 OF 20

DOCUMENT NUMBER: 720M000017

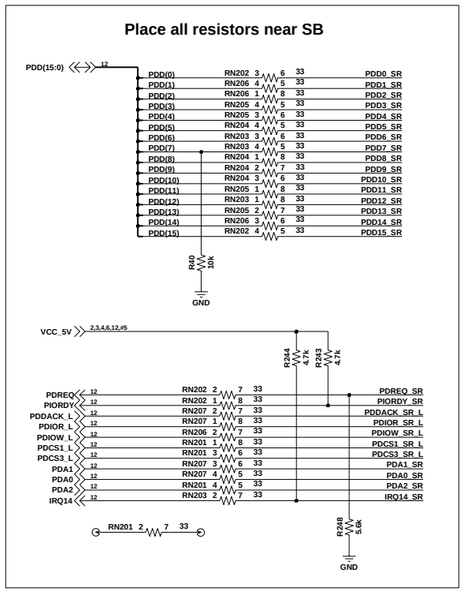
TITLE: NX DB1500

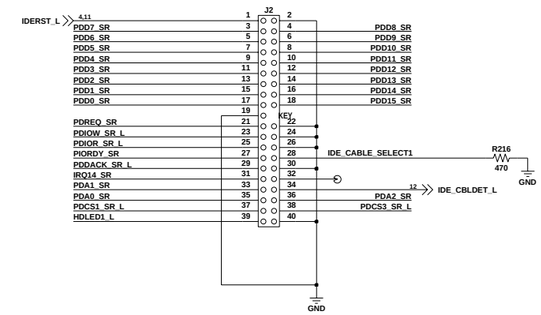
PCI SLOT & IDE CONNECTORS

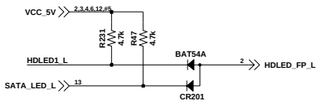




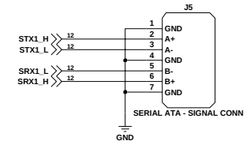
Primary IDE

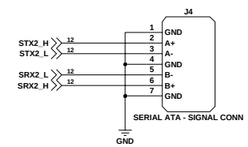




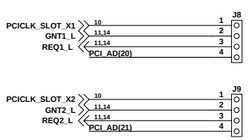


SATA





PCI extension headers



AMD - Personal Connectivity Solutions
9500 Arboretum Blvd.
AUSTIN, TX 78759

SHEET: PCI SLOT & IDE CONNECTORS

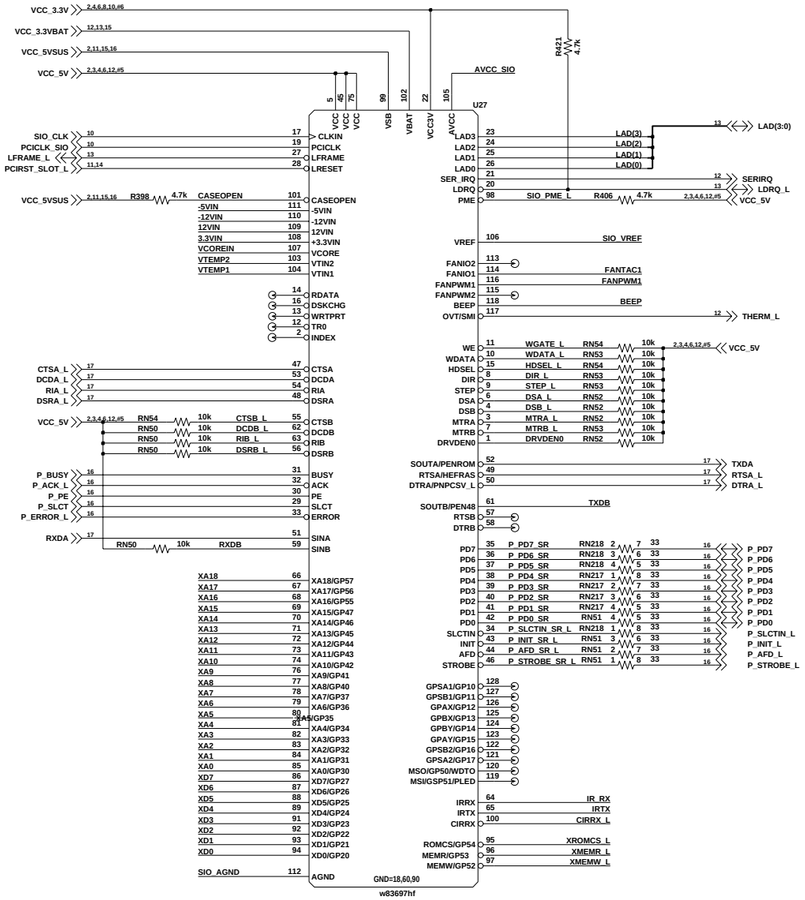
DATE: Monday, July 12, 2004 REV: 1.2

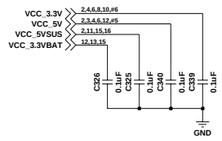
SHEET NUMBER: 14 OF 20

DOCUMENT NUMBER: 720M000017

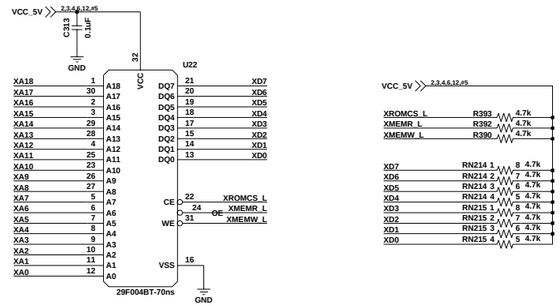
TITLE: NX DB1500

SUPER I/O, ROM & FANS

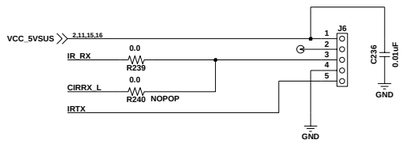




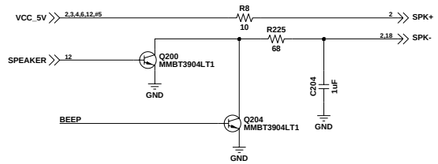
FLASH



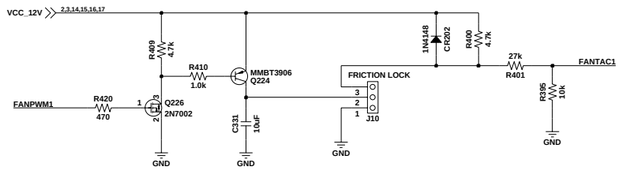
IR / CIR



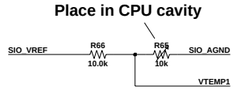
SPEAKER



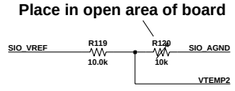
CPU FAN

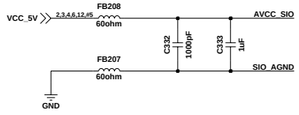


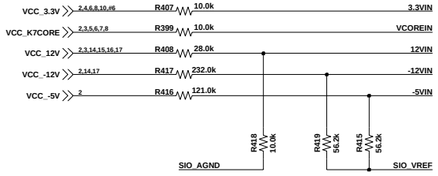
Place in CPU cavity



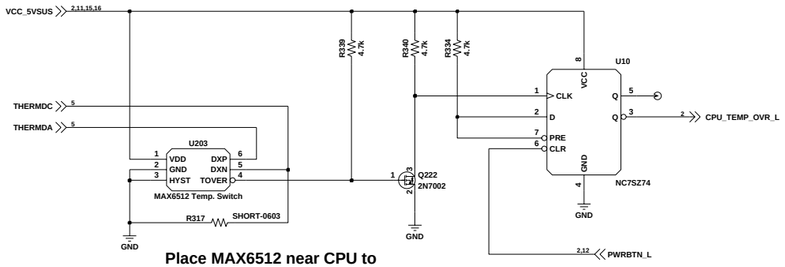
Place in open area of board







CPU thermal shutdown



Place MAX6512 near CPU to shorten thermal diode traces

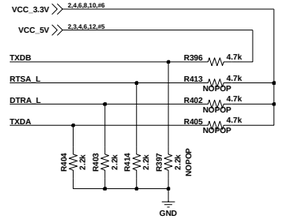
SUPER IO STRAPPING

RTSA_L: Base address select
0: 2Eh/2Fh
1: 4Eh/4Fh

DTRA_L: PNPCSV Selection
0: Default Value
1: No default value

TXDA: ROM I/F Selection
0: Enable flash ROM
1: Disable flash ROM

TXDB: Clock input selection
0: 24MHz
1: 48MHz



AMD - Personal Connectivity Solutions
9500 Arboretum Blvd.
AUSTIN, TX 78759

SHEET: SUPER I/O, ROM & FANS

DATE: Monday, July 12, 2004 REV: 1.2

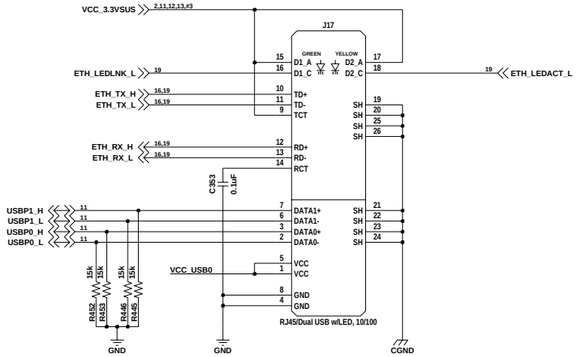
SHEET NUMBER: 15 OF 20

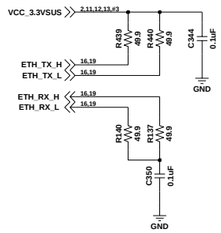
DOCUMENT NUMBER: 720M000017

TITLE: NX DB1500

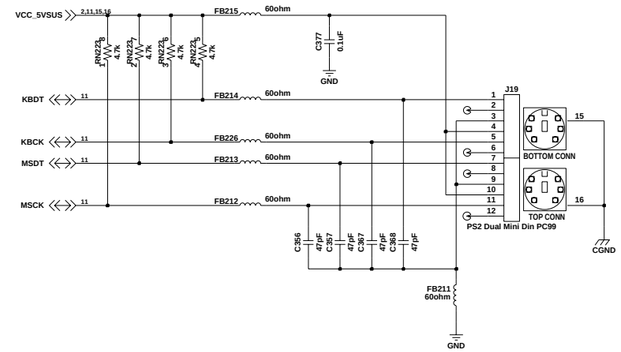
USB, MOUSE, KB CONNECTORS

LAN, USB 1 & 2

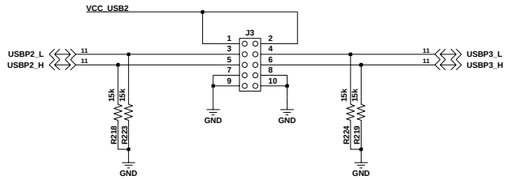


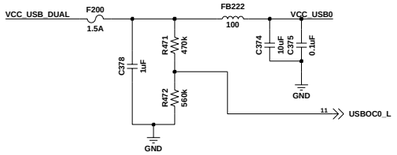


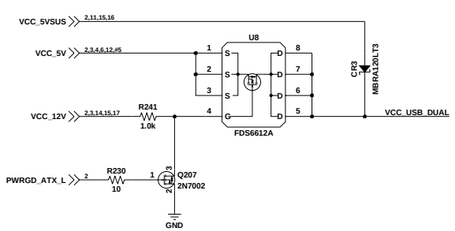
KEY/MOUSE

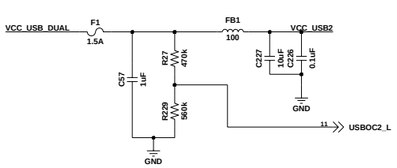


USB 3 & 4

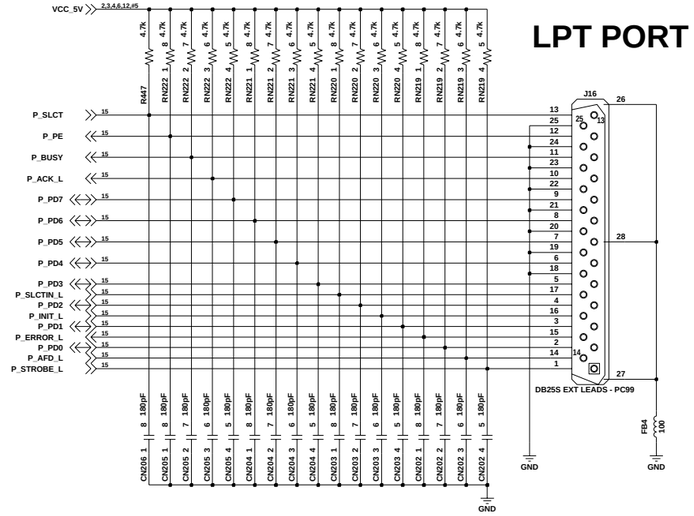








LPT PORT



AMD - Personal Connectivity Solutions
9500 Arboretum Blvd.
AUSTIN, TX 78759

SHEET: USB, MOUSE, KB, CONNECTORS

DATE: Monday, July 12, 2004 REV: 1.2

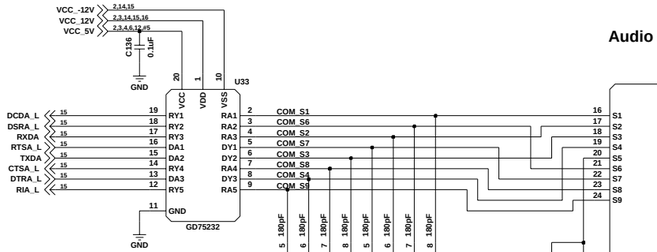
SHEET NUMBER: 16 OF 20

DOCUMENT NUMBER: 720M000017

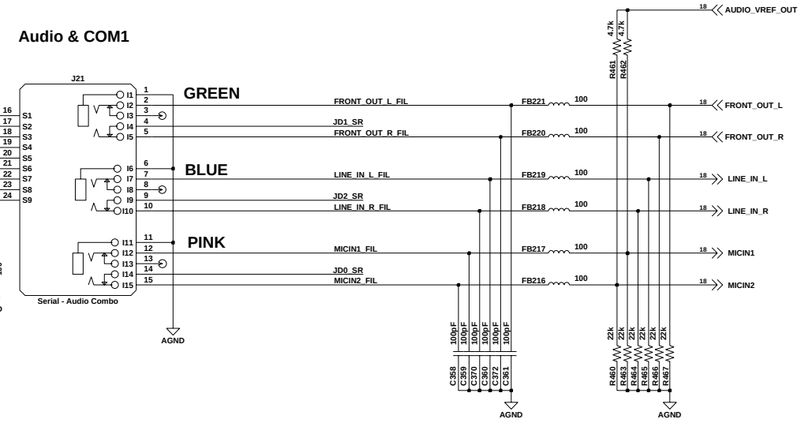
TITLE: NX DB1500

COM, AUDIO & VGA PORTS

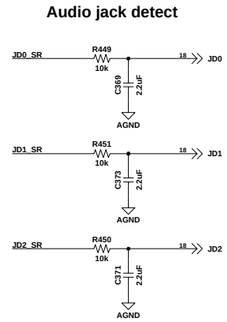
RS232 Transceiver



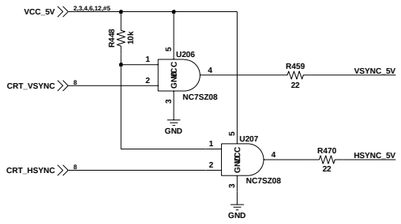
Audio & COM1



Audio jack detect

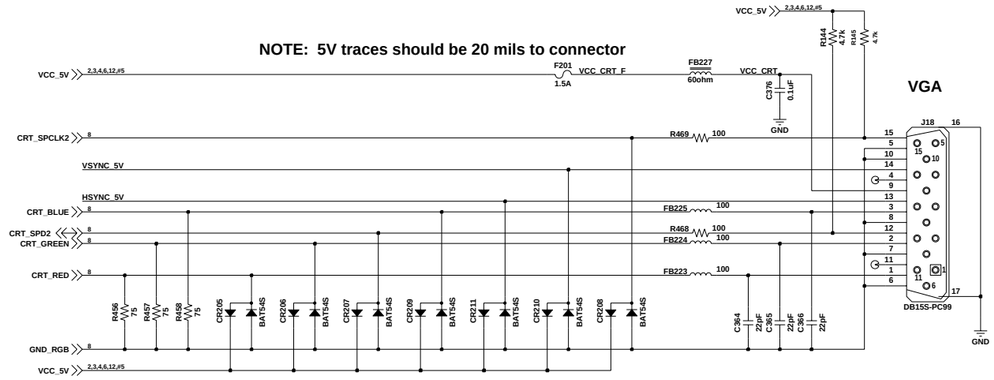


5V Level conversion for synch pulses

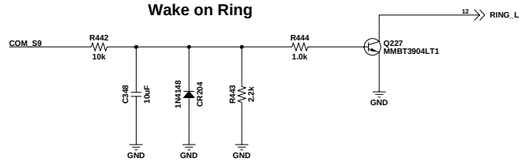


NOTE: 5V traces should be 20 mils to connector

VGA



Wake on Ring



AMD - Personal Connectivity Solutions
9500 Arboretum Blvd.
AUSTIN, TX 78759

SHEET: COM, AUDIO & VGA PORTS

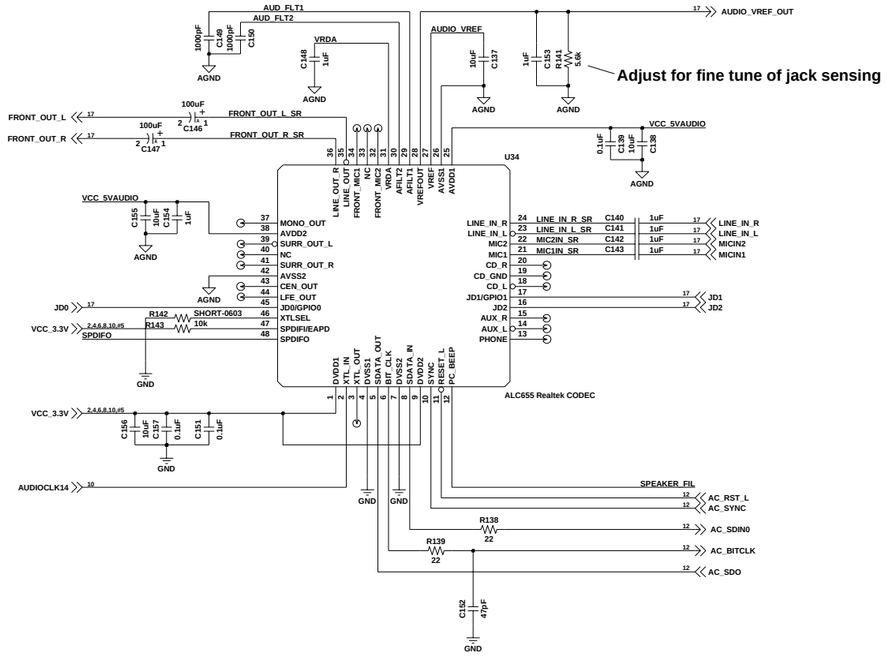
DATE: Monday, July 12, 2004 | REV: 1.2

SHEET NUMBER: 17 OF 20

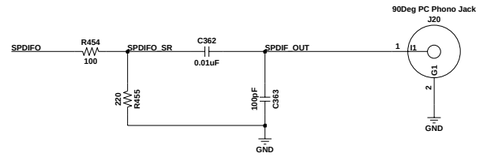
DOCUMENT NUMBER: 720M000017

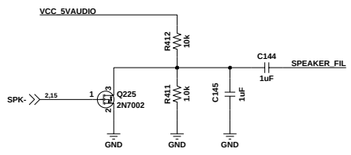
TITLE: NX DB1500

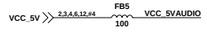
AC’97 AUDIO CODEC



S/PDIF DIGITAL AUDIO OUT







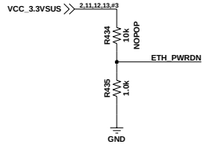
Connect at one point under or near codec

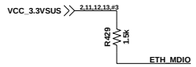
AMD - Personal Connectivity Solutions 9500 Arboretum Blvd. AUSTIN, TX 78759	
SHEET: AC’97 AUDIO CODEC	
DATE: Monday, July 12, 2004	REV: 1.2
SHEET NUMBER: 18 OF 20	
DOCUMENT NUMBER: 720M000017	

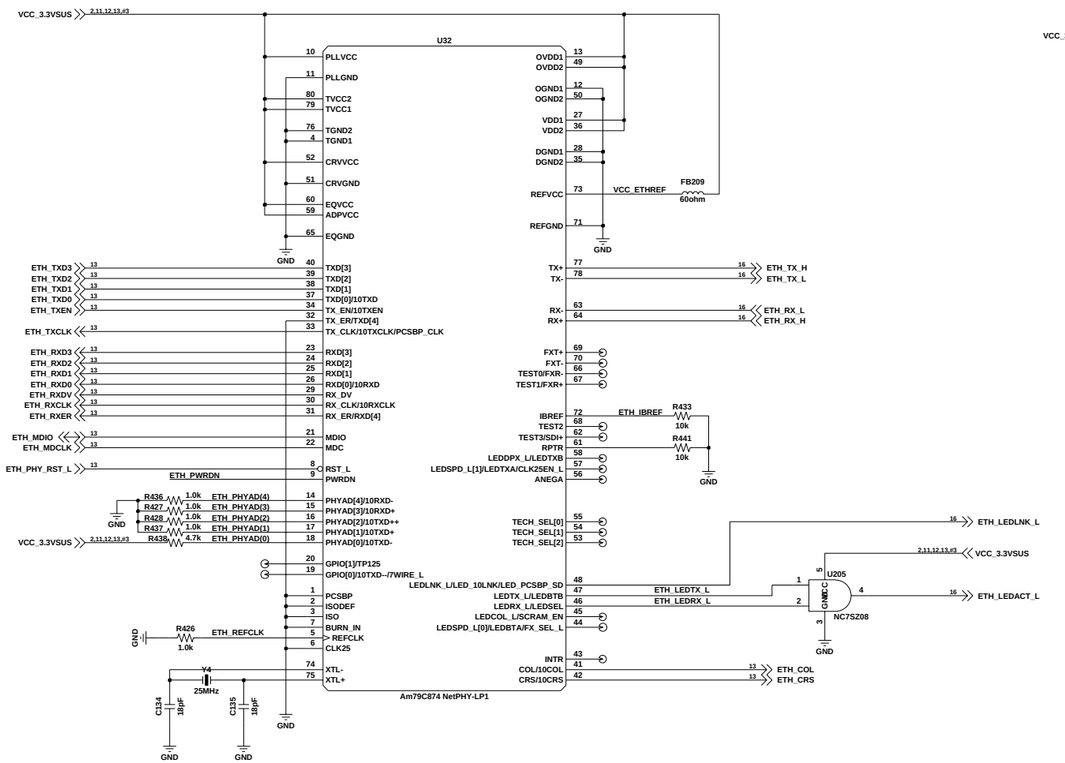
TITLE: **NX DB1500**

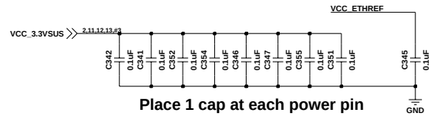
LAN (10/100 ETHERNET)

Ethernet is always on for WOL







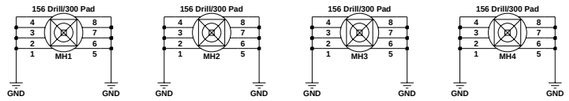


Place 1 cap at each power pin

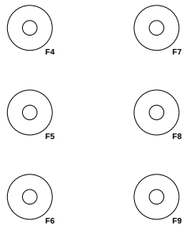
AMD - Personal Connectivity Solutions 9500 Arboretum Blvd. AUSTIN, TX 78759	CONFIDENTIAL AND PROPRIETARY TO ADVANCED MICRO DEVICES INC. © 2004 Advanced Micro Devices This AMD Board schematic and design is the exclusive property of AMD, and is provided only to entities under a non-disclosure agreement with AMD for evaluation purposes. Further distribution or disclosure is strictly prohibited. Use of this schematic and design for any purpose other than evaluation requires a Board Technology License Agreement with AMD. AMD makes no representations or warranties of any kind regarding this schematic and design, including, not limited to, any implied warranty of merchantibility or fitness for a particular purpose, and disclaims responsibility for any consequences resulting from use of the information included herein.
SHEET: LAN (10/100 ETHERNET)	
DATE: Monday, July 12, 2004 REV: 1.2	
SHEET NUMBER: 19 OF 20	TITLE: NX DB1500
DOCUMENT NUMBER: 720M000017	

MISC

Mount Holes



FIDUCIALS



Revision Changes From Rev 1.0

Item	Location	Description
1. ATX Front Panel Header (J7)	Sheet 2	Changed pin assignment on symbol
2. C228, R227, Q205	Sheet 2	Changed C228 value to 1uF, 0603; Swap C228, R227; POP C228, R227, Q205
3. R220, R226 on AMS1117 (U4)	Sheet 2	Value Change -> R220 = 200 ohm, 1%; R226 = 200 ohm, 1%
4. R233, R242 on AMS1117 (U7)	Sheet 2	Value Change -> R233 = 221 ohm, 1%; R242 = 365 ohm, 1%
5. C158 Capacitor Addition (NOPOP)	Sheet 2	Added 1000uF Capacitor to VCC_2.5V (NOPOP)
6. CR1, CR2	Sheet 2	Changed LED Part Number (EIA0603)
7. R210, R211	Sheet 2	Value Change -> R210 &R211 = 1.5K ohm, 5%
8. R6 on FDS6612A (U5)	Sheet 2	Value Change -> R6 = 0.008 ohm, 1%
9. R146, R112 Population option	Sheet 3	POP option for HIP6602A PVCC
10. R246, R276 pull-up resistors	Sheet 4	Pull-up Resistors to VCC_5V
11. R348, S2K Compensation	Sheet 7	Value Change -> R348 = 60.4 ohm, 1%
12. LP3982 Linear Reg. (U20), C310	Sheet 8	Connect bypass capacitor (C310) on pin 6 to GND
13. R385, R386 on LP3982 (U20)	Sheet 8	Value Change -> R385 & R386 = 120k ohm, 5%
14. Board ID - R77, R362, R364	Sheet 11	Value Change -> R77(POP), R362(POP), R364(NOPOP) = 4.7k pull-down RES
15. Board ID - R363 POP	Sheet 11	Populate R363 (10k pull-up RES)
16. U18 device change	Sheet 15	Component Change -> U18 = 93c46 EEPROM, 1k
17. NC7SZ74 D-Flip Flop (U10)	Sheet 15	Connect VCC (pin 8) to VCC_5VSUS
18. J18, R144, R145	Sheet 17	Added R144, R145 -> 4.7k ohm Pull-Up Resistors
19. R374	Sheet 2	Removed R374
20. R389	Sheet 3	Removed R389
21. R341	Sheet 13	Value Change -> R341 = 5.1 ohms
22. R331, R347, R385, R386	Sheet 8, 13	Value Changes: R331, R347 -> 365.0 ohms / R385, R386 -> 121.0 kohms
23. RN45-47, RN200, RN208, R245	Sheet 4	Value Change: RN45-47, RN200, RN208, R245 -> 4.7 kohms
24. All 1uF capacitors	Mult	Changed all 1uF capacitors from 10V to 16V

South Bridge GPIO Assignments

(These are pins used as GPIOs, not as their defined function)

Pin Name (pin#)	New Name	Location	Description
GPI4 / LID_L (AC1)	IDE_CBLDET_L	Sheet 12	Active Low input to SB to detect presence of an 80 conductor IDE cable
GPO0 (AA3)	SLP_LED	Sheet 12	Active high control for system sleep LED on front panel
VGATE / GPIO8 (AC9)	MOBILE_VID	Sheet 12	Active high input to SB indicating if the VID PLD is set for mobile or desktop VIDs
VIDSEL / GPIO28 (AC8)	SATA_LED_L	Sheet 12	Active low control for serial ATA activity LED
VRDSLP / GPIO29 (AB9)	SB_GPIO29	Sheet 12	Undefined GPIO to VID PLD for future use
GPIO[14:12] (A3,E4,D4)	"	Sheet 11	Inputs to SB for board revision identification

Revision Changes From Rev 1.1

Item	Location	Description
1. R54 pull-up resistor	Sheet 2	R54 pull-up connected to VCC_5V
2. C4 value change	Sheet 2	Value Change -> C4 = 10uF, 1206 capacitor
3. U35 FET addition	Sheet 2	Added U35 FDS6612A
4. C228, R227, Q205 - NOPOP	Sheet 2	NOPOP components
5. R348, S2K Compensation	Sheet 7	Value Change -> R348 = 49.9 ohm, 1%

AMD - Personal Connectivity Solutions
9500 Arboretum Blvd.
AUSTIN, TX 78759

SHEET: MISC

DATE: Monday, July 12, 2004 REV: 1.2

SHEET NUMBER: 20 OF 20

DOCUMENT NUMBER: 720M000017

TITLE: NX DB1500