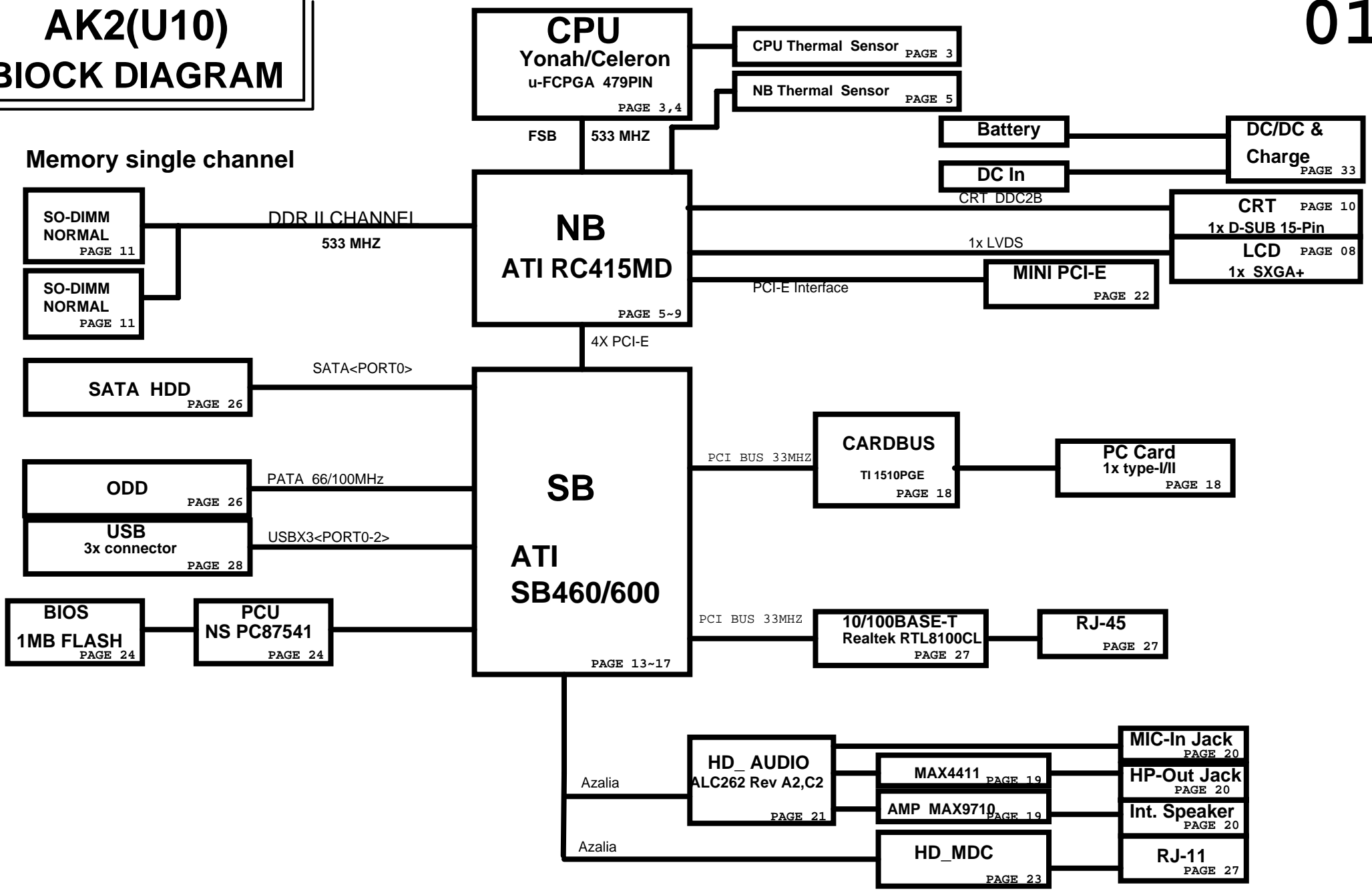


AK2(U10) BLOCK DIAGRAM

Memory single channel



QUANTA COMPUTER

Title: **BLOCK DIAGRAM**

Size B	Document Number	Rev 1A
	AK2(U10) Main Board	
Date: Wednesday, November 29, 2006	Sheet 1 of 37	

4. Power rails

POWER RAIL	VOLTAGE SIGNAL	S0	S1	S2	S3	S4	S5
CPU_CORE	VRON	ON	ON	ON	OFF	OFF	OFF
VCC_NB	VRON	ON	ON	ON	OFF	OFF	OFF
+VTT_DDR	MAINON	ON	ON	ON	OFF	OFF	OFF
VCCP	MAINON	ON	ON	ON	OFF	OFF	OFF
VCCCORE	VRON	ON	ON	ON	OFF	OFF	OFF
RVCC3	RVCCON	ON	ON	ON	ON	ON	OFF
+VCC1.2	MAINON	ON	ON	ON	OFF	OFF	OFF
+1.5V	MAINON	ON	ON	ON	OFF	OFF	OFF
+VCC1.8	MAINON	ON	ON	ON	OFF	OFF	OFF
+3.3V	MAINON	ON	ON	ON	OFF	OFF	OFF
+5V	MAINON	ON	ON	ON	OFF	OFF	OFF
+1.8VALW	STB_ON	ON	ON	ON	ON	ON	ON
+3.3VALW	STB_ON	ON	ON	ON	ON	ON	ON
+1.8VSUS	SUSON	ON	ON	ON	ON	OFF	OFF
+3VSUS	SUSON	ON	ON	ON	ON	OFF	OFF
+5VSUS	SUSON	ON	ON	ON	ON	OFF	OFF
+3VPCU	VIN	ON	ON	ON	ON	ON	ON
+5VPCU	VIN	ON	ON	ON	ON	ON	ON

1. PAGE LIST

- 01--BLOCK DIAGRAM
- 02--PAGE LIST
- 03--Yonah CPU (HOST BUS)-1
- 04--Yonah CPU (POWER/NC)-2
- 05--RC415MD-AGTL+ I/F 1/5
- 06--RC415MD-PCIE LINK I/F 2/5
- 07--RC415MD-DDR2 I/F 3/5
- 08--RC415MD-VIDEO & STRAPS 4/5
- 09--RC415MD-POWER 5/5
- 10--CRT PORT
- 11--DDRII SODIMM X2 and Terms
- 12--EXT CLK GEM
- 13--SB460-PCIE/PCI/CPU/LPC -1
- 14--SB460-ACPI/GPIO/USB/AC97 -2
- 15--SB460-SATA/IDE/HWM/SPI -3
- 16--SB460-POWER & DECOUPLING -4
- 17--SB460-STRAPS -5
- 18--TI1510 CARD BUS
- 19--AUDIO AMP
- 20--BUZZER & AUDIO/BOARD
- 21--HD_ALC262
- 22--MINI PCI-E
- 23--HD_MDC
- 24--PCU-97551 & BIOS
- 25--INT.KB &TP CONN
- 26--SATA(HDD),PATA(ODD) CONNECT
- 27--LAN (RTL8100CL)
- 28--USB PORT
- 29--CPU CORE(MAX8736)
- 30--3V/5V MAX8744
- 31--VCCP/VCC1.2/VCC1.5
- 32--1.8VSUS/DDRVTM
- 33--Battery Charger
- 34--BATTERY CONNECTOR
- 35--VGA POWER
- 36--DISCHARGE
- 37--CHANGE LIST

2. PCI Description :

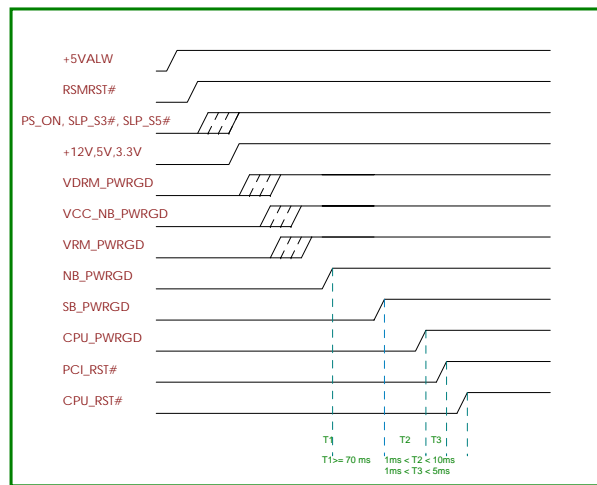
IDSEL	CHIP	PCIINT	CHIP
AD24	LAN (RTL8100CL)	IRQA	LAN (RTL8100CL)
AD26	CardBus (TI1510)	IRQB	CardBus
AD28		IRQC	CardBus
		IRQD	
		IRQE	
		IRQF	

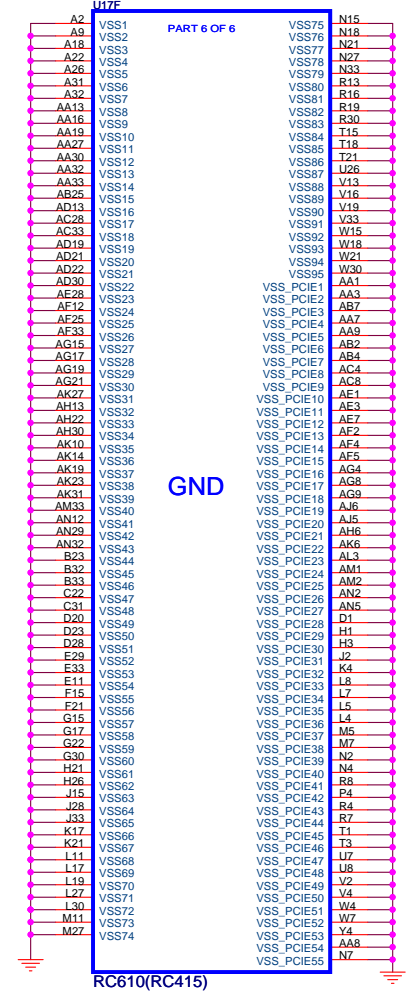
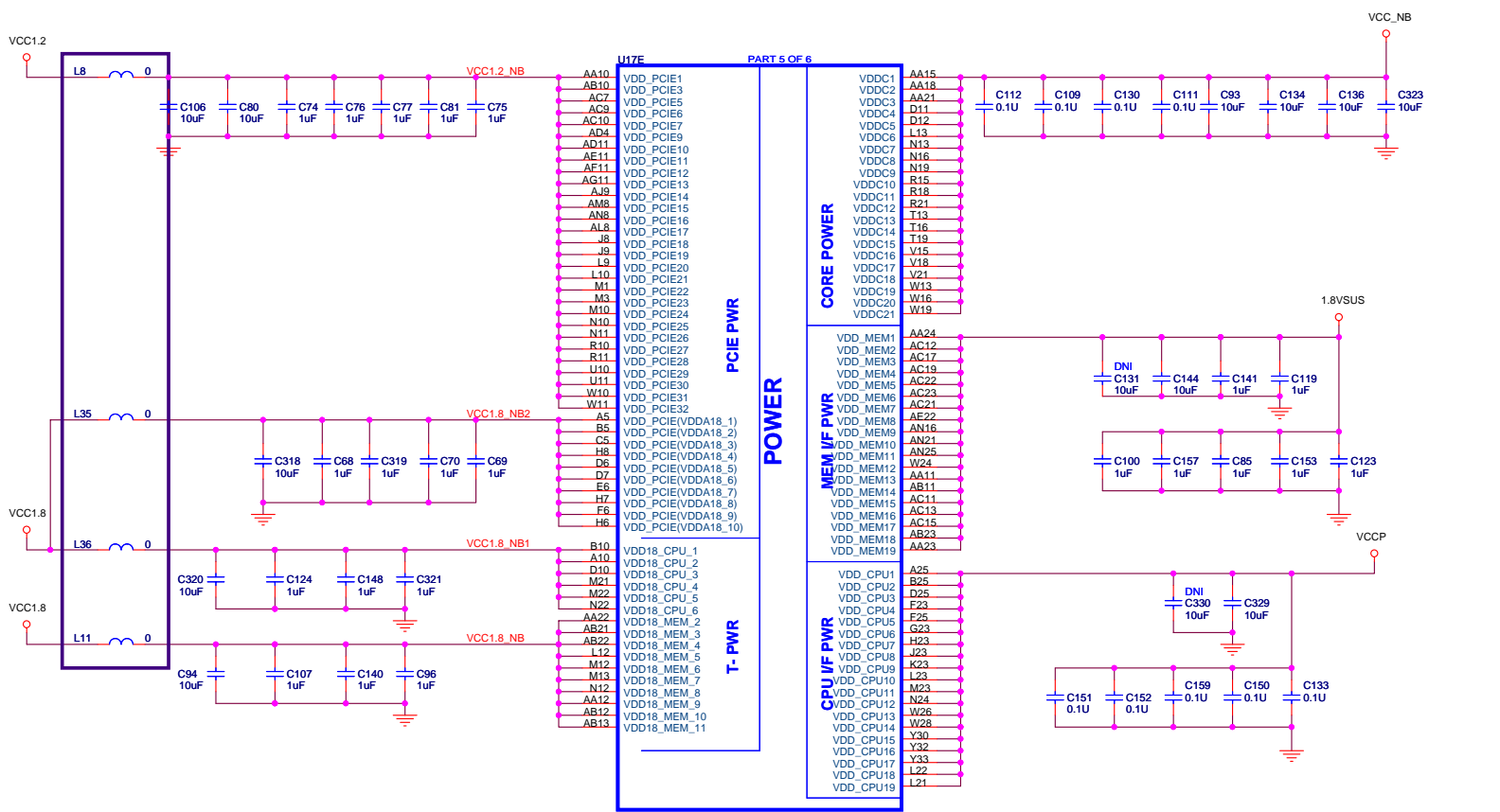
BUSMASTER	CHIP
REQ0 / GNT0	LAN(RTL8100CL)
REQ1 / GNT1	CardBus TI1510
REQ2 / GNT2	
REQ3 / GNT3	
REQ4 / GNT4	

3. PCI_E Description :

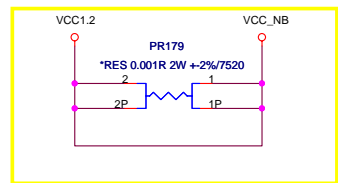
CHIP
Port 0,1 A-LINK
Port 2 Mini-PCIE (Wireless card)

5. ALBACORE POWER UP SEQUENCE





Note:
 * Stuff only for RC415
 ** Stuff only for RC610



THE CAPS HAVE TO BE PLACED UNDER NB. ALL CAPS' GND USE COPPER FLOOD TOGETHER, AND POWER ALSO LIKE THIS WAY.

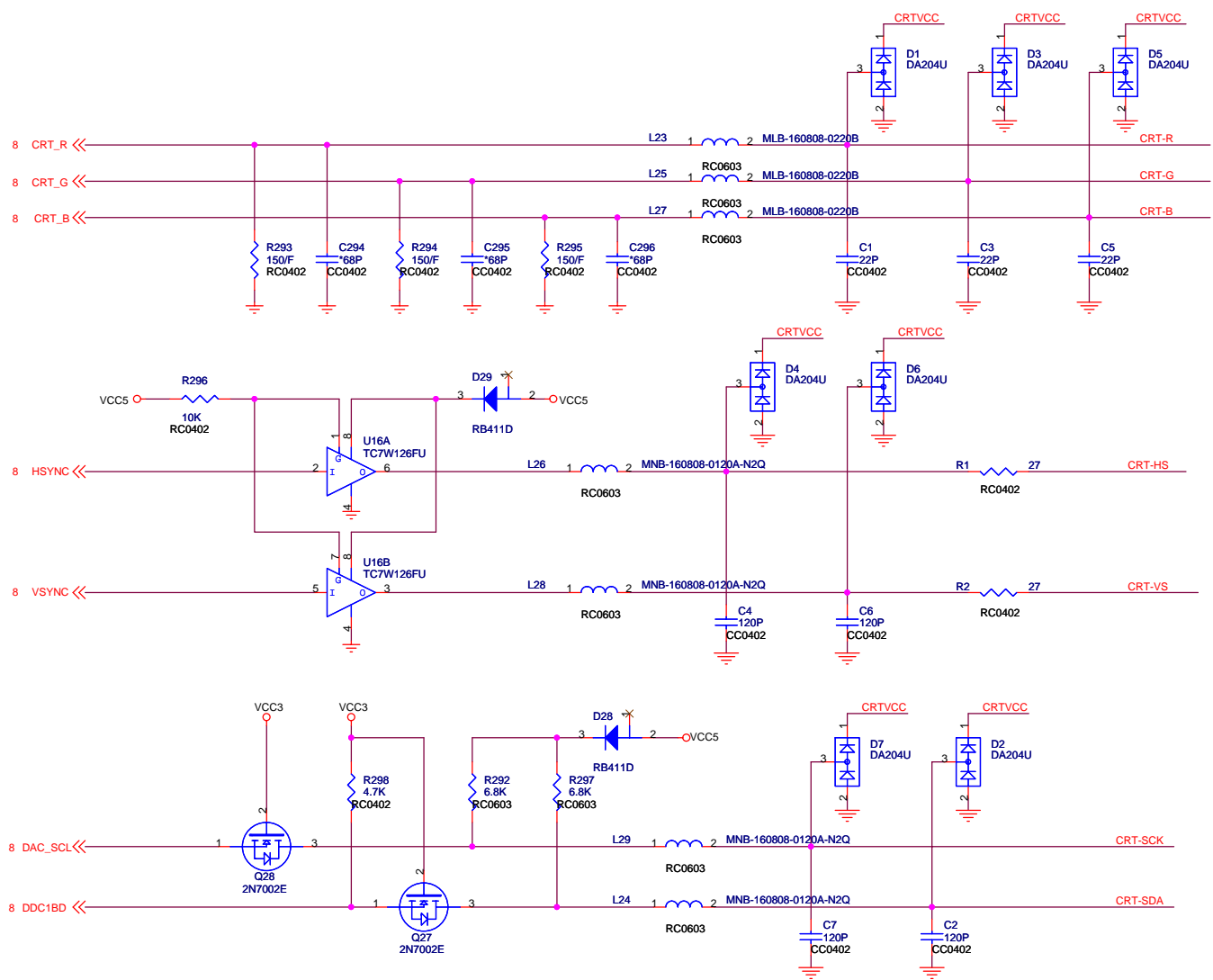
- VCC1.8 5,8,11,15,32,36
- VCC1.2 6,22,31,35,36
- 1.8VSUS 5,7,11,16,22,31,32,36
- VCCP 3,4,5,8,12,16,31
- VCC_NB 6,22,31,35,36

QUANTA COMPUTER

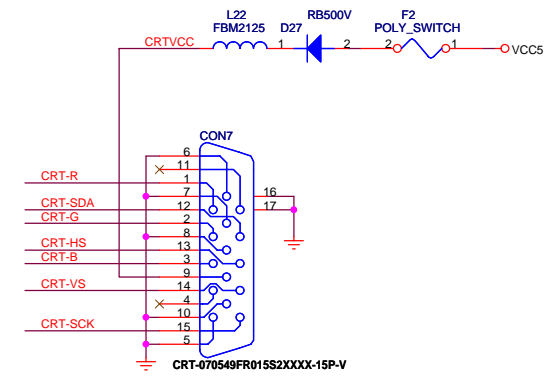
Title: **RC415-POWER**

Size	Document Number	Rev
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Date: Wednesday, November 29, 2006 Sheet 9 of 37

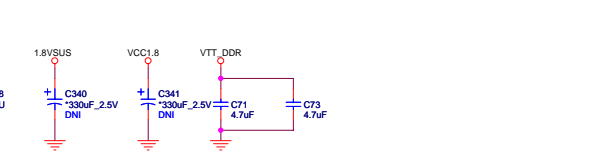
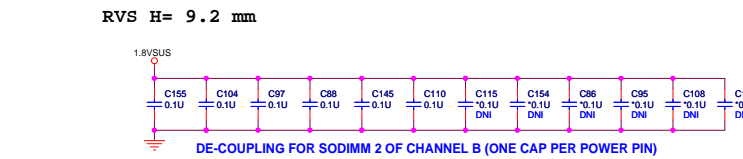
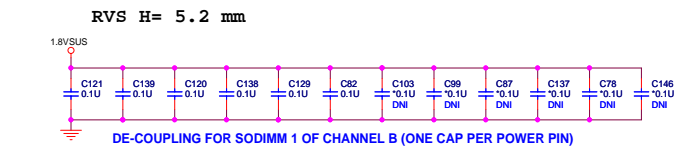
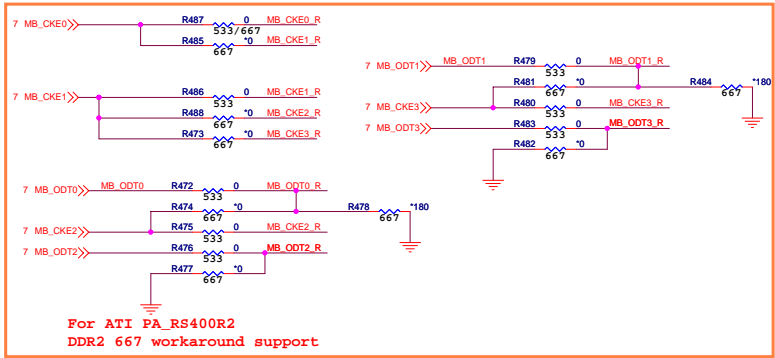
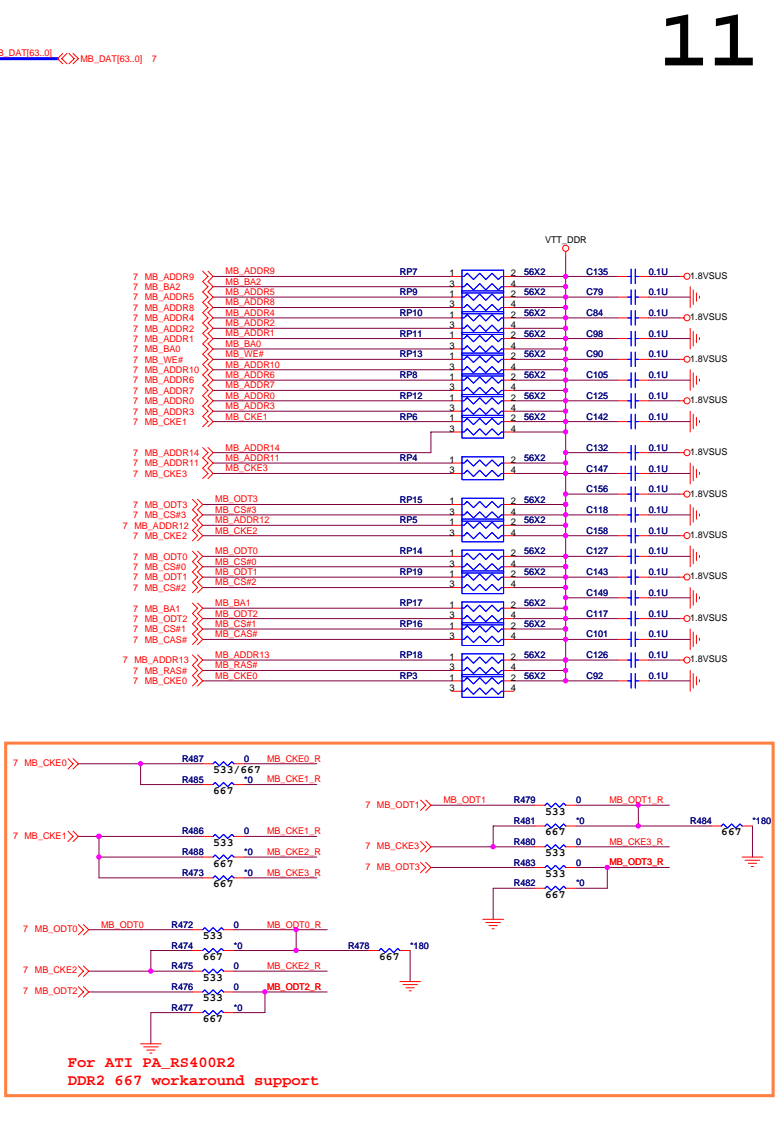
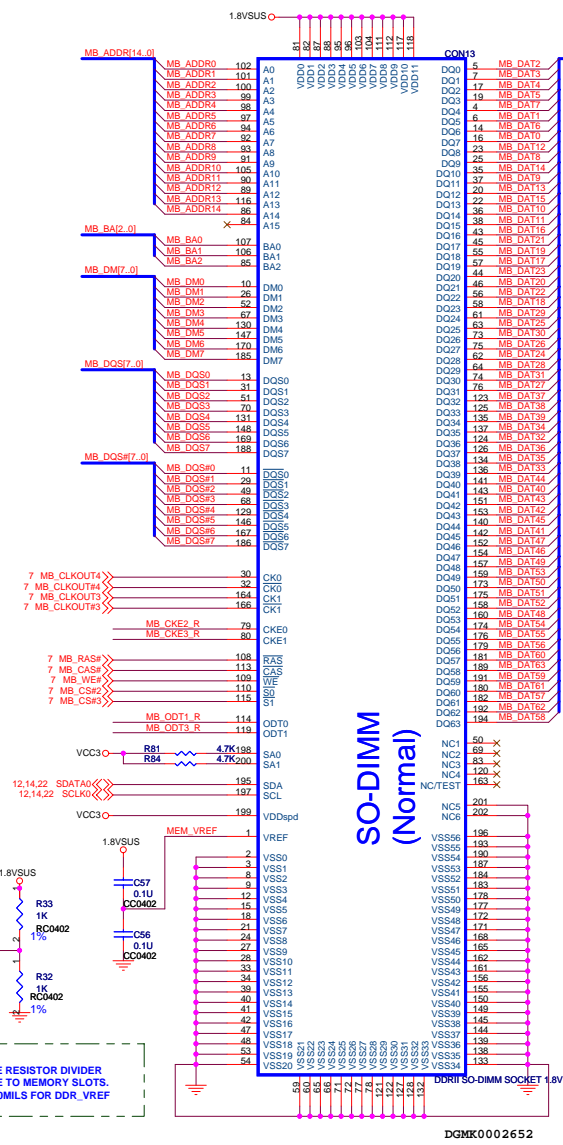
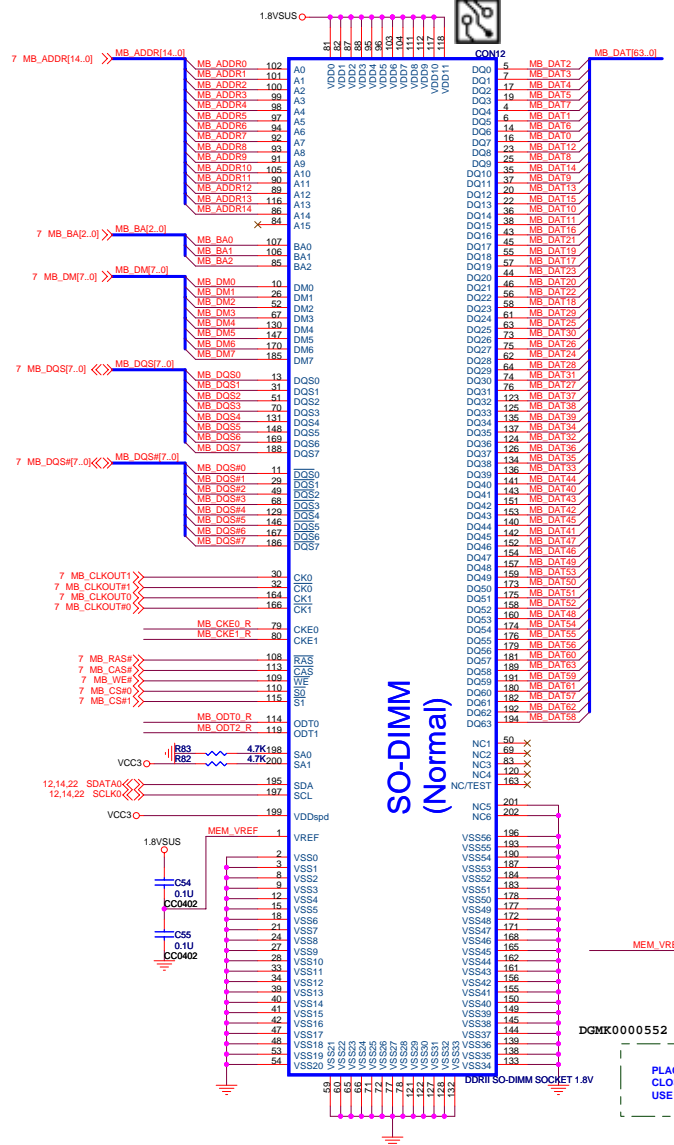


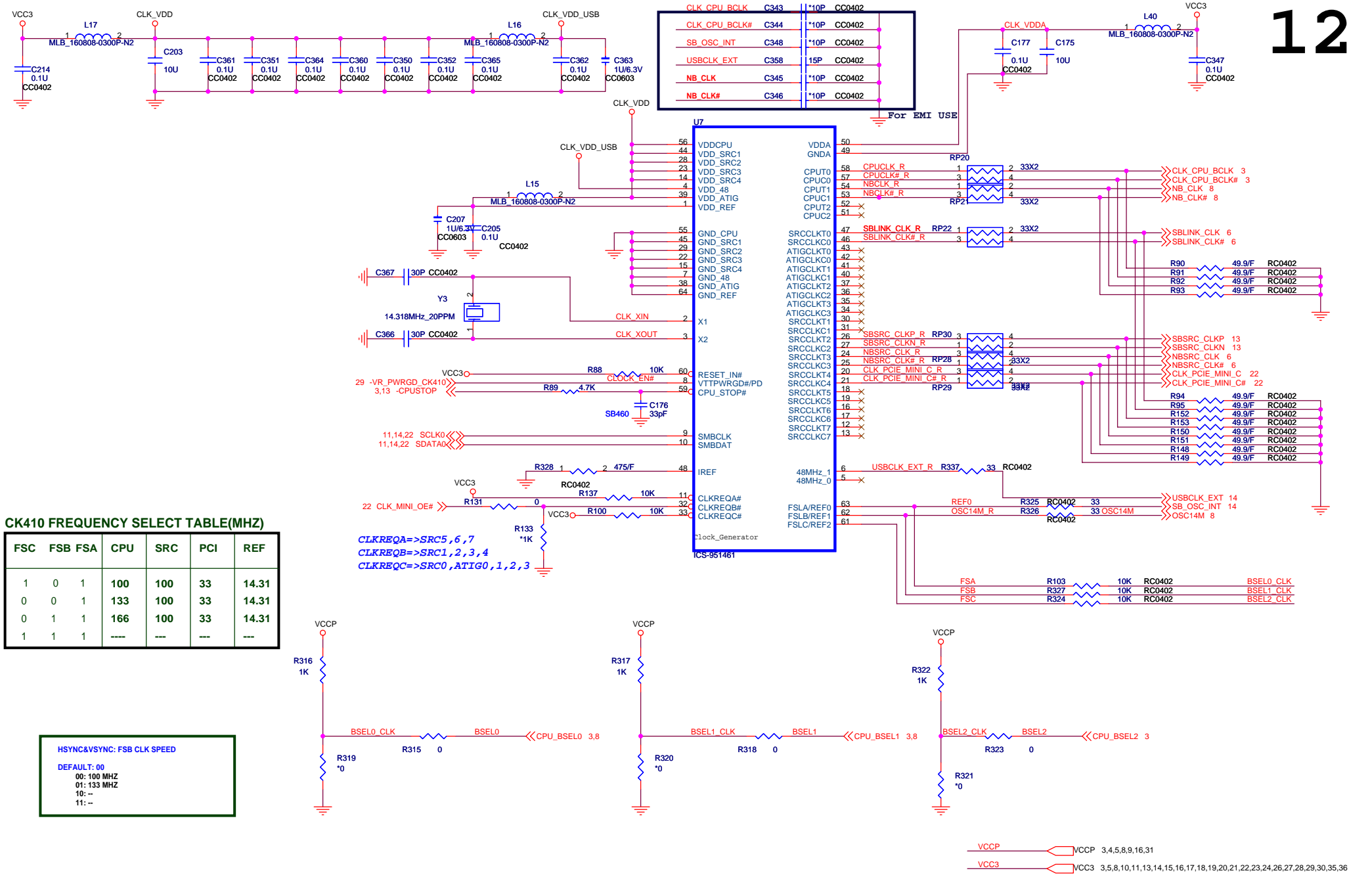
CRT CONNECTOR



- VCC5 3,8,16,18,19,20,21,22,23,24,25,26,30,36
- VCC3 3,5,8,11,12,13,14,15,16,17,18,19,20,21,22,23,24,26,27,28,29,30,35,36

Title		
CRT/TV OUT PORT		
Size	Document Number	Rev
B	AK2(U10) Main Board	1A
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CK410 FREQUENCY SELECT TABLE(MHZ)

FSC	FSB	FSA	CPU	SRC	PCI	REF
1	0	1	100	100	33	14.31
0	0	1	133	100	33	14.31
0	1	1	166	100	33	14.31
1	1	1	----	---	---	---

HSYNC&VSYNC: FSB CLK SPEED
 DEFAULT: 00
 00: 100 MHZ
 01: 133 MHZ
 10: --
 11: --

QUANTA COMPUTER

Title: **EXT CLK GEN& RS400M-STRAPS**

Size B Document Number: **AK2(U10) Main Board** Rev 1A

Date: Wednesday, November 29, 2006 Sheet 12 of 37

A link SB transmission side AC coupling
SB460 is 0.01uF
SB600 is 0.1uF

PLACE THESE PCIE AC DECOUPLING CAPS CLOSE TO THE U22

Resistor R5181 should be 0 ohm when SB600 populated.
The alternate combination of R5177/R5179/R5181 should be used for SB460. They are 150R/150R/4.12K

FOR SB600 VCC_SB = 1.2V
FOR SB460 VCC_SB = 1.8V

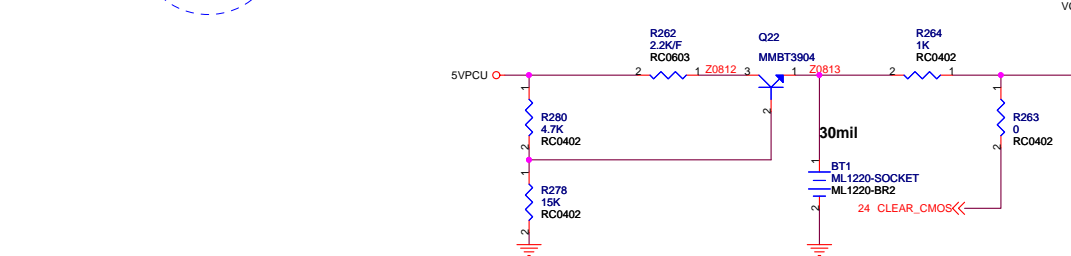
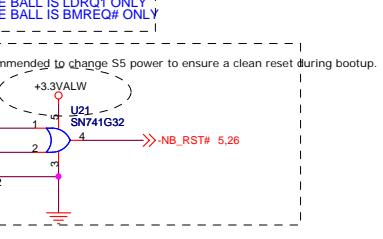
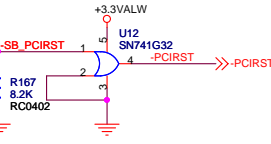
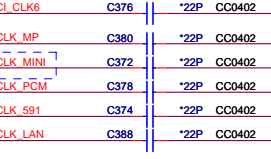
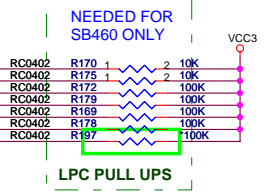
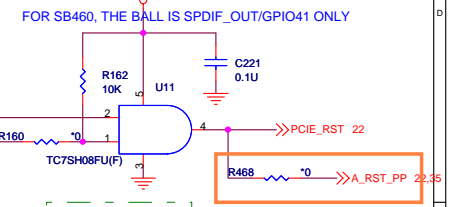
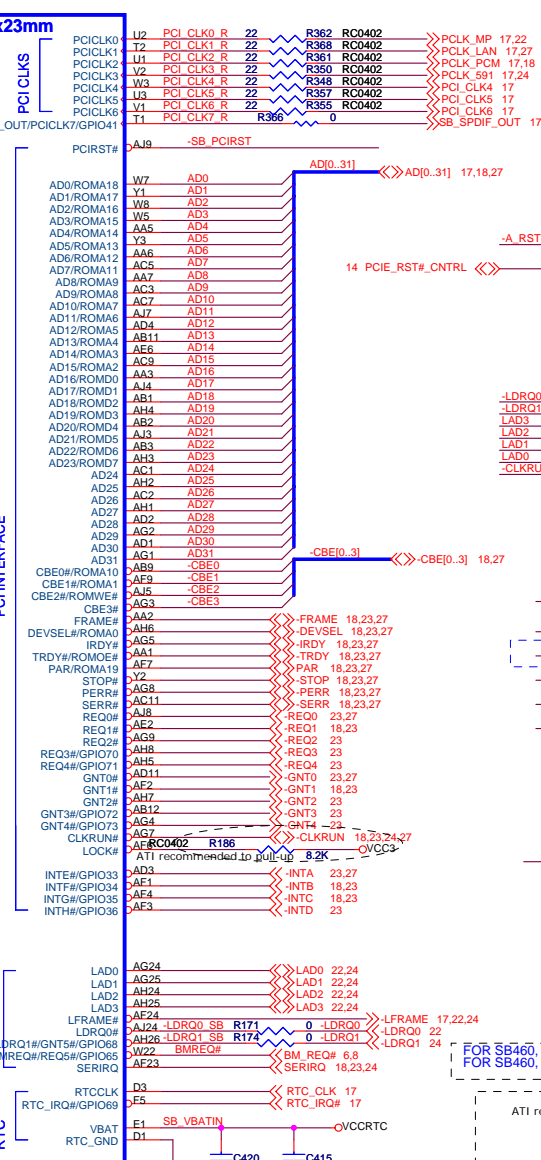
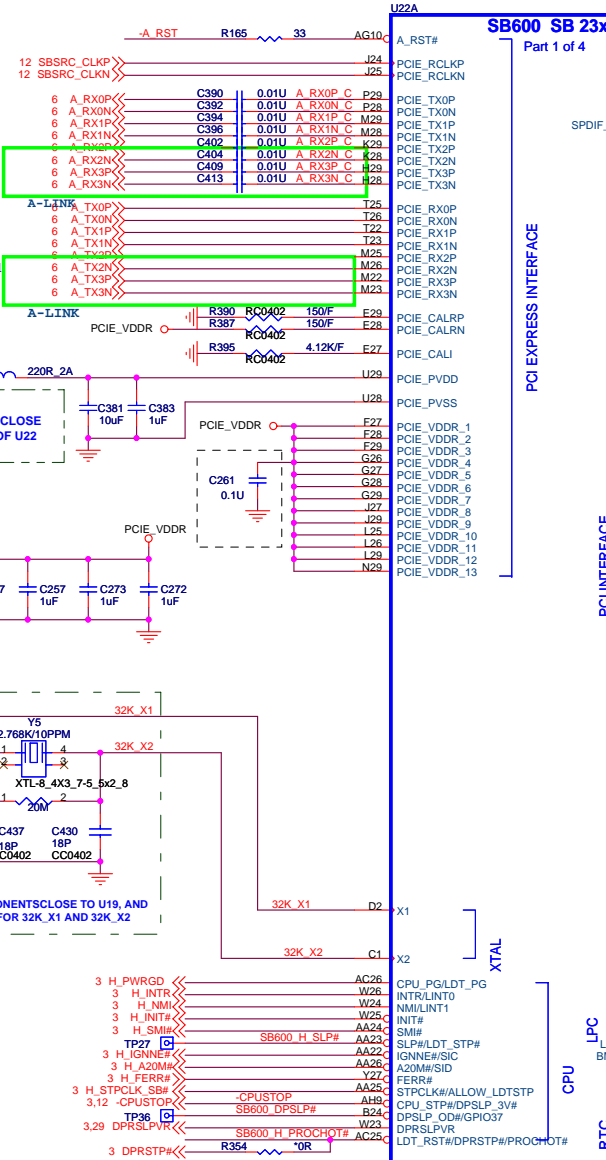
C381 AND C383 CLOSE THE BALL U29 OF U22

PLACE THESE COMPONENTS CLOSE TO U19, AND USE GROUND GUILD FOR 32K_X1 AND 32K_X2

NEEDED FOR SB460 ONLY

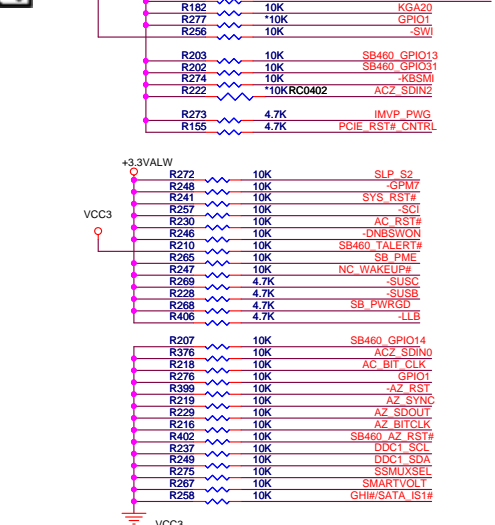
NEEDED FOR SB460 ONLY

NEEDED FOR SB460 ONLY



QUANTA COMPUTER logo and title block containing document information: Title SB460-PCIE/PCI/CPU/LPC -1, Document Number AK2(U10) Main Board, Date Wednesday, November 29, 2006, Sheet 13 of 37.

NEEDED FOR SB460 ONLY



NEEDED FOR SB460 ONLY

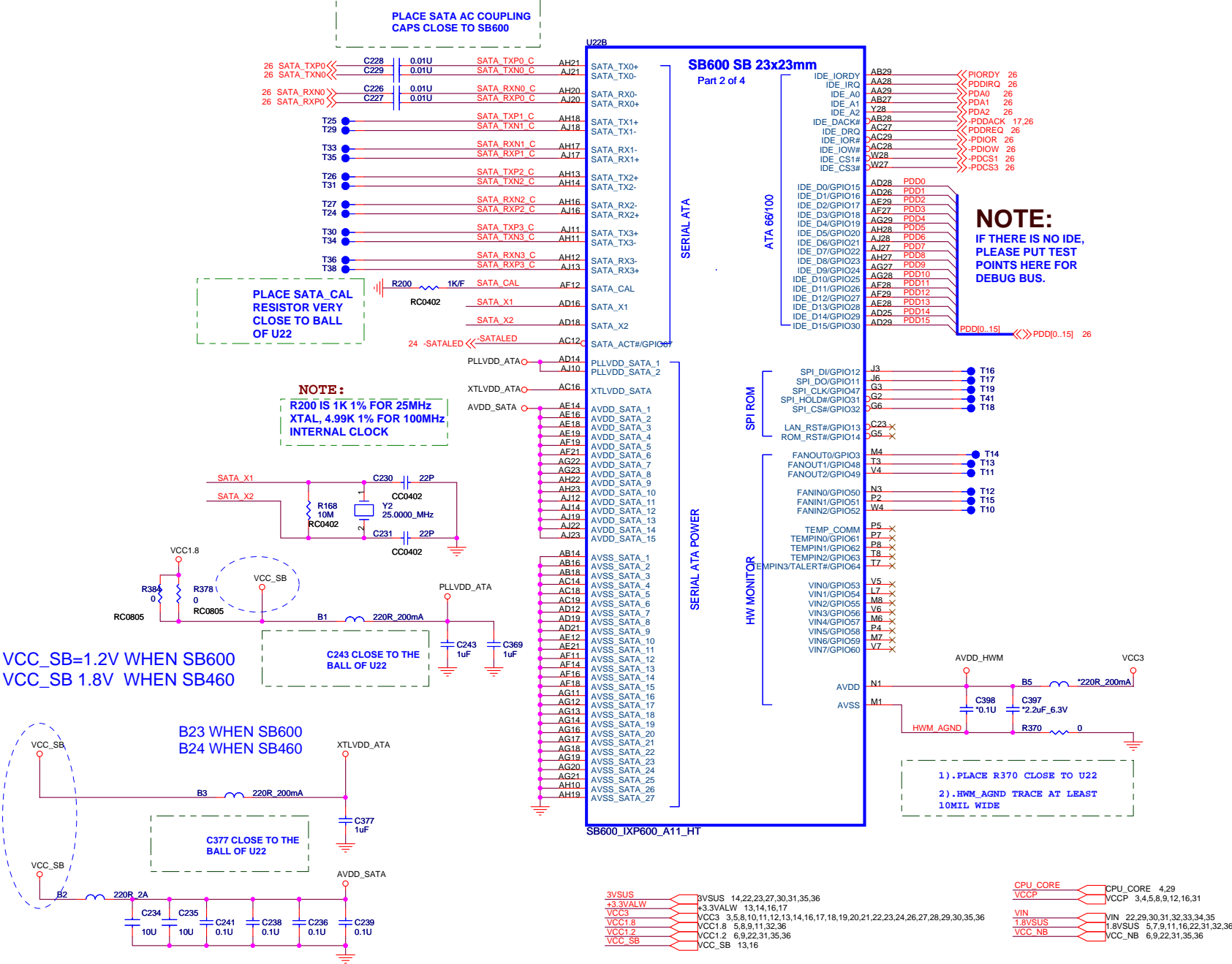


NEEDED FOR SB460 ONLY




NEEDED FOR SB460 ONLY





3VSUS	8VSUS	14,22,23,27,30,31,35,36	CPU CORE	CPU_CORE	4,29
+3.3VALW	+3.3VALW	13,14,16,17	VCCP	VCCP	3,4,5,8,9,12,16,31
VCC3	VCC3	3,5,8,10,11,12,13,14,16,17,18,19,20,21,22,23,24,26,27,28,29,30,35,36	VIN	VIN	22,29,30,31,32,33,34,35
VCC1.8	VCC1.8	5,8,9,11,32,36	1.8VSUS	1.8VSUS	5,7,9,11,16,22,31,32,36
VCC1.2	VCC1.2	6,9,22,31,35,36	VCC_NB	VCC_NB	6,9,22,31,35,36
VCC_SB	VCC_SB	13,16			

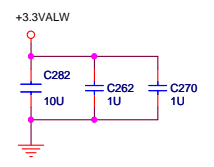
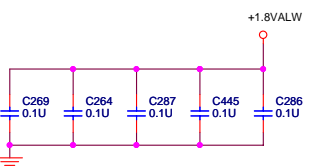
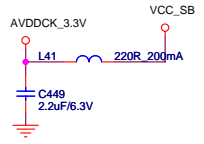
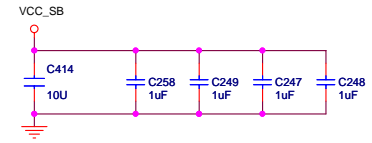
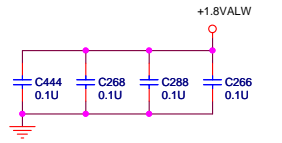
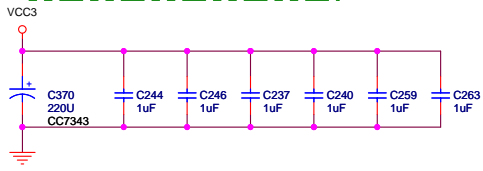


QUANTA COMPUTER

SB460-SATA/IDE/HWM/SPI -3		
Title	SB460-SATA/IDE/HWM/SPI -3	Rev
Size	Document Number	1A
Date:	AK2(U10) Main Board	Sheet
Wednesday, November 29, 2006	15	of 37

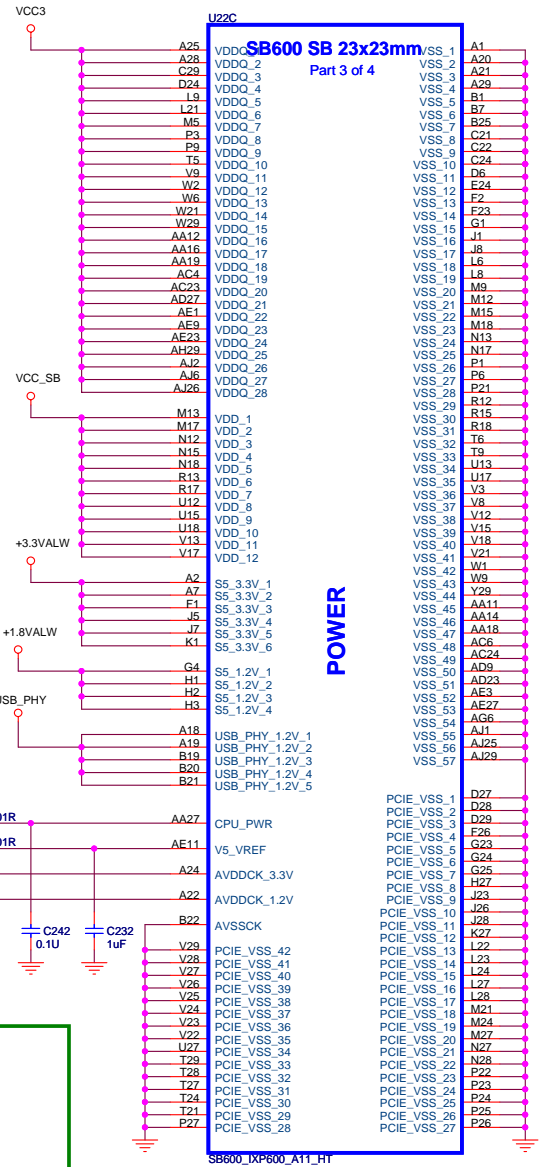
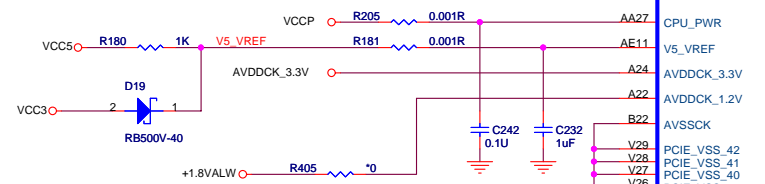
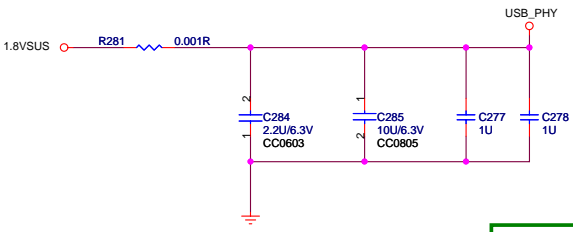
hexainf@htbmail.com

PLACE ALL THE DECOUPLING CAPS ON THIS SHEET CLOSE TO SB AS POSSIBLE.



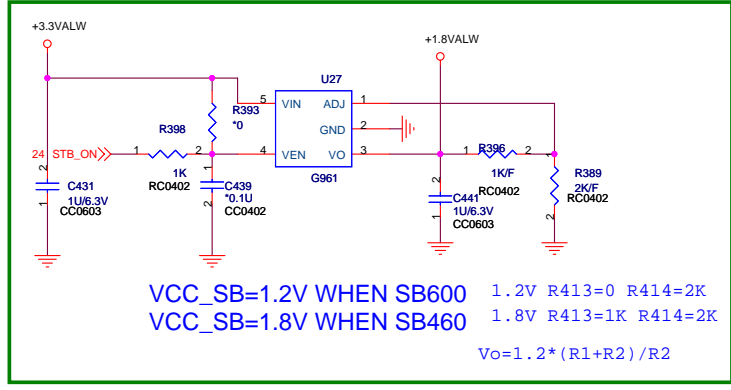
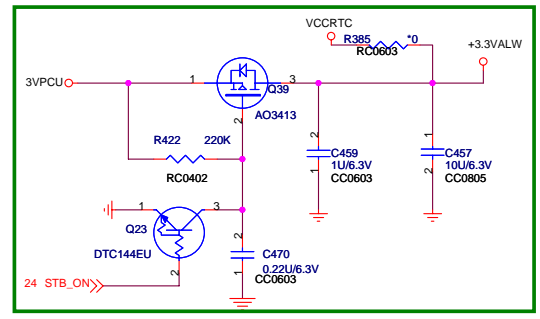
VCC_SB=1.2V WHEN SB600
VCC_SB=1.8V WHEN SB460

VCC_SB=1.2V WHEN SB600
VCC_SB=1.8V WHEN SB460



POWER

- 3VPCU 14,22,24,25,29,30,32,34
- +3.3VALW 13,14,17
- VCC3 3,5,8,10,11,12,13,14,15,17,18,19,20,21,22,23,24,26,27,28,29,30,31,32,33,36
- VCC5 3,8,10,18,19,20,21,22,23,24,25,26,30,36
- VCC_SB 13,15



VCC_SB=1.2V WHEN SB600 1.2V R413=0 R414=2K
VCC_SB=1.8V WHEN SB460 1.8V R413=1K R414=2K
 $V_o = 1.2 * (R1 + R2) / R2$

QUANTA COMPUTER

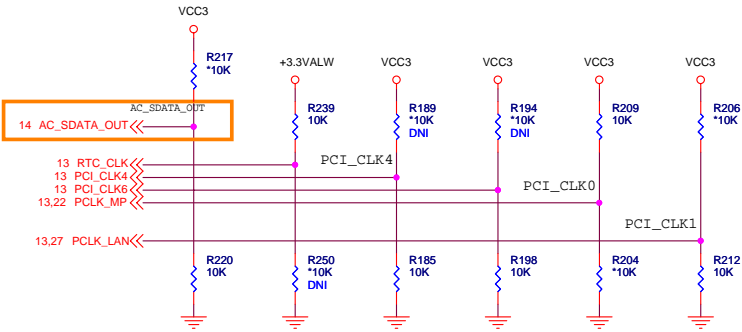
Title: **SB460-POWER & DECOUPLING -4**

Size: Custom Document Number: **AK2(U10) Main Board** Rev: 1A

Date: Wednesday, November 29, 2006 Sheet: 16 of 37

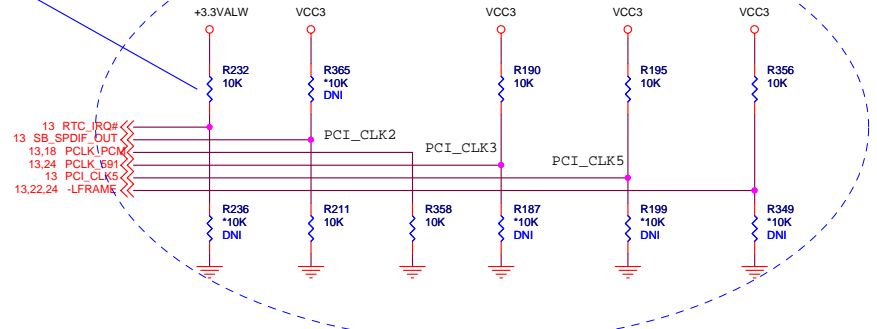
REQUIRED STRAPS

SB600 HAS 15K INTERNAL PU FOR AC_SDATA_OUT&RTC_CLK



NOTE: R232 PU RESISTOR FOR RTC_IRQ# IS REQUIRED FOR SB600 TO KEEP THE INPUT FROM FLOATING.

NEEDED FOR SB460 ONLY

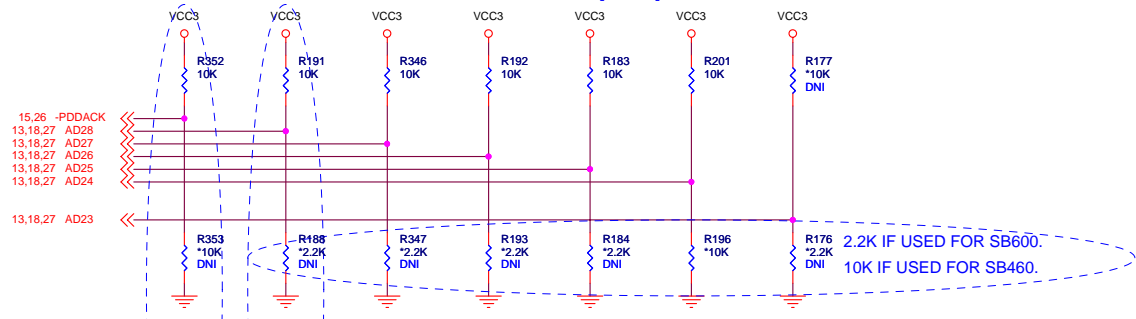


		SB600				SB460	
		AC_SDOUT	RTC_CLK	PCI_CLK4	PCI_CLK6	PCI_CLK0	PCI_CLK1
PULL HIGH	USE DEBUG STRAPS	INTERNAL RTC DEFAULT	USE INT. PLL48	CPU IF=K8	ROM TYPE: H, H = PCI ROM H, L = SPI ROM L, H = LPC ROM L, L = FWH ROM	ROM TYPE: H, H = PCI ROM H, L = LPC I ROM L, L = FWH ROM	DEFAULT
	IGNORE DEBUG STRAPS DEFAULT	EXTERNAL RTC	USE EXT. 48MHZ DEFAULT	CPU IF=P4 DEFAULT	DEFAULT	NOTE: FOR SB460, PCICLK[8:7] ARE CONNECTED TO SUBSTRATE BALLS PCICLK[1:0]	DEFAULT
PULL LOW	USE LONG RESET DEFAULT	USE SHORT RESET DEFAULT	USE PCI PLL DEFAULT	USE ACPI BCLK DEFAULT	USE IDE PLL DEFAULT	USE DEFAULT PCIE STRAPS DEFAULT	BOOTFAILTIMER DISABLED DEFAULT
	USE SHORT RESET DEFAULT	USE LONG RESET DEFAULT	BYPASS PCI PLL	BYPASS ACPI BCLK	BYPASS IDE PLL	USE EEPROM PCIE STRAPS	BOOTFAILTIMER ENABLED

	ACPWRON	SPDIF_OUT	PCI_CLK2	PCI_CLK3	PCI_CLK5	LFRAME#
PULL HIGH	MANUAL PWR ON DEFAULT	SIO 24MHz	XTAL MODE NOT SUPPORTED	USB PHY POWERDOWN DISABLE DEFAULT	Auto detection Alink PCIE lanes DEFAULT	ENABLE THERMTRIP# DEFAULT
PULL LOW	AUTO PWR ON	SIO 48MHz DEFAULT	48MHZ OSC MODE DEFAULT	USB PHY POWERDOWN ENABLE	2-lane PCIE	DISABLE THERMTRIP#

DEBUG STRAPS

SB600 HAS 15K INTERNAL PU FOR PCI_AD[28:23]



OVERLAP COMMON PADS WHERE POSSIBLE FOR DUAL-OP RESISTORS.


	IDE_DACK#	PCI_AD28	PCI_AD27	PCI_AD26	PCI_AD25	PCI_AD24	PCI_AD23
PULL HIGH	USE LONG RESET DEFAULT	USE LONG RESET DEFAULT	USE PCI PLL DEFAULT	USE ACPI BCLK DEFAULT	USE IDE PLL DEFAULT	USE DEFAULT PCIE STRAPS DEFAULT	BOOTFAILTIMER DISABLED DEFAULT
PULL LOW	USE SHORT RESET DEFAULT	USE LONG RESET DEFAULT	BYPASS PCI PLL	BYPASS ACPI BCLK	BYPASS IDE PLL	USE EEPROM PCIE STRAPS	BOOTFAILTIMER ENABLED

NEEDED FOR SB460 ONLY

NEEDED FOR SB600 ONLY

NOTE: FOR SB460, PCI_AD23 IS RESERVED





QUANTA COMPUTER

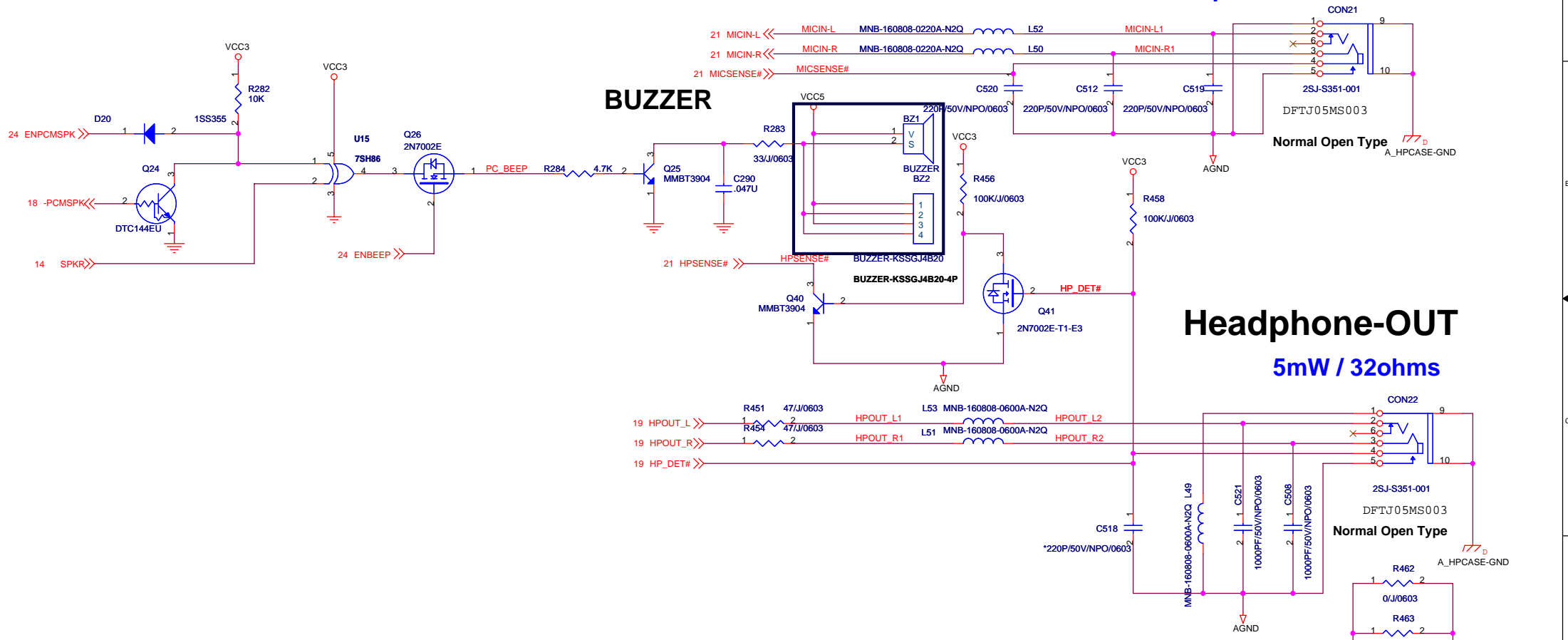
SB600-STRAPS -5	
Title	Rev 1A
Size	Document Number
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Custom AK2(U10) Main Board

hexainf@htbmail.com

MIC-IN

Max. 100mVrms input for Mic-IN



Headphone-OUT

5mW / 32ohms

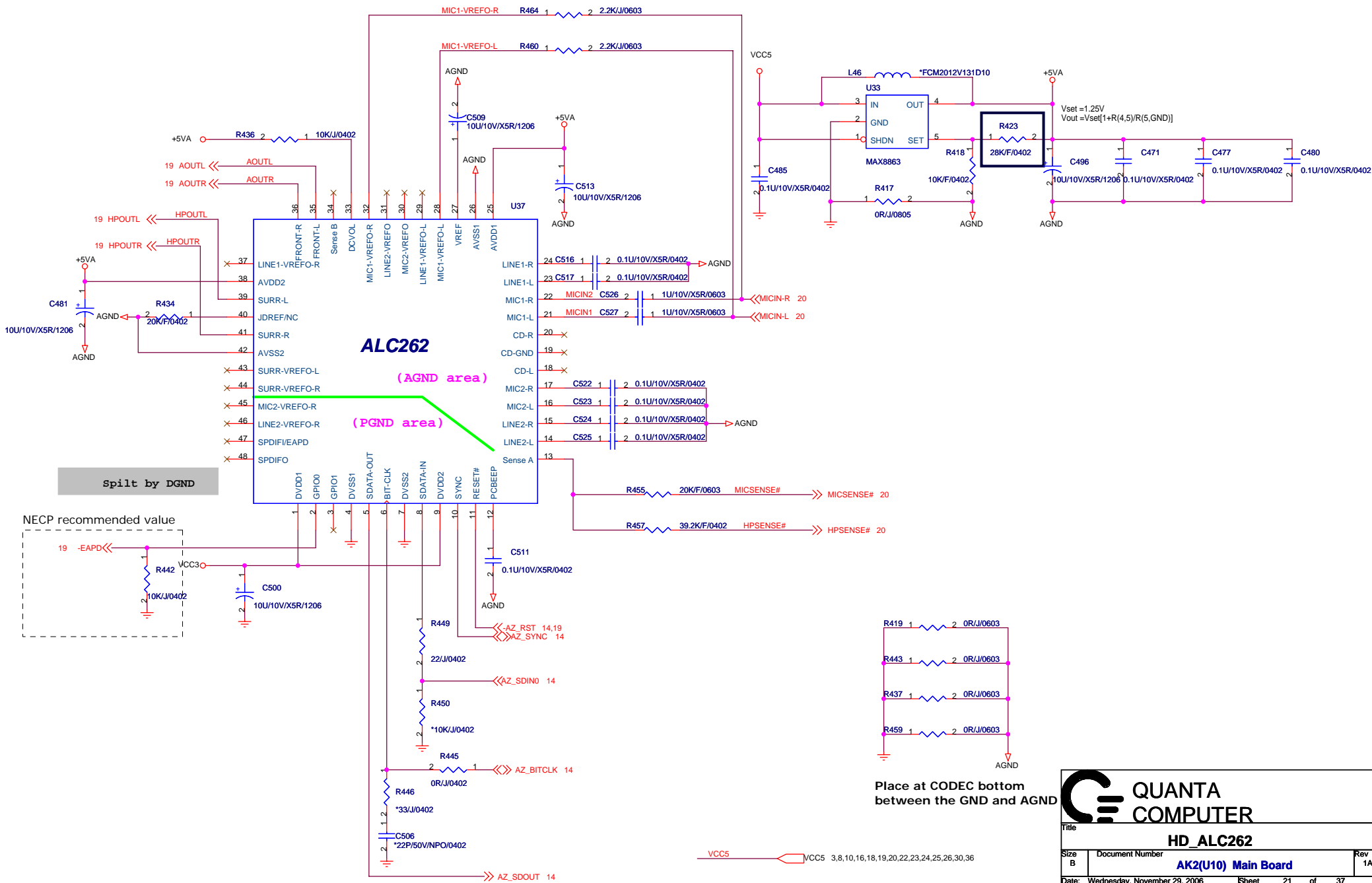
- VCC3 3,5,8,10,11,12,13,14,15,16,17,18,19,21,22,23,24,26,27,28,29,30,35,36
- 5VPCU 8,13,30,32,36
- VCC5 3,8,10,16,18,19,21,22,23,24,25,26,30,36

QUANTA COMPUTER

Title
Buzzer & Audio/BOARD

Size	Document Number	Rev
Custom	AK2(U10) Main Board	1A

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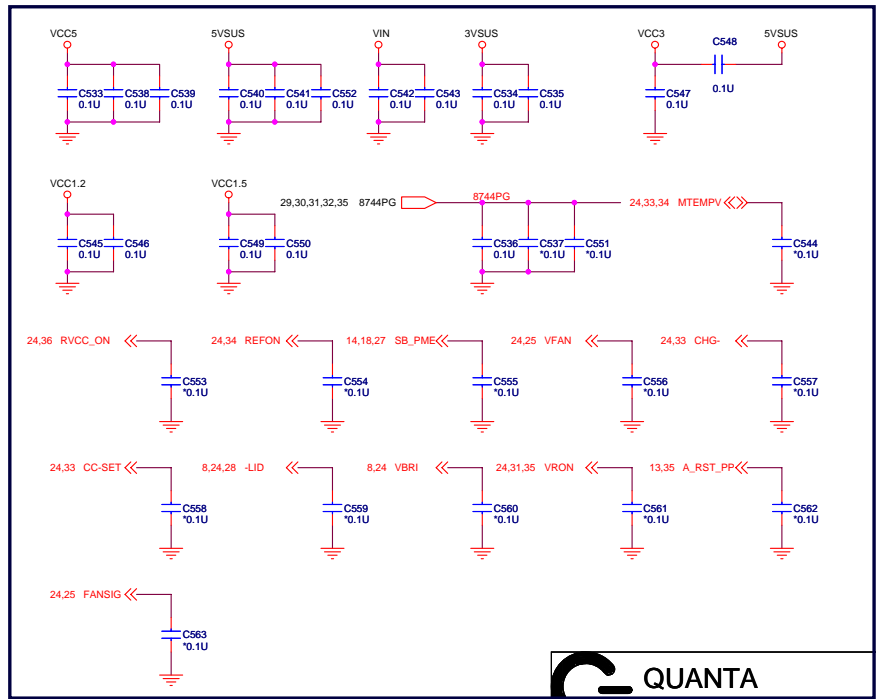
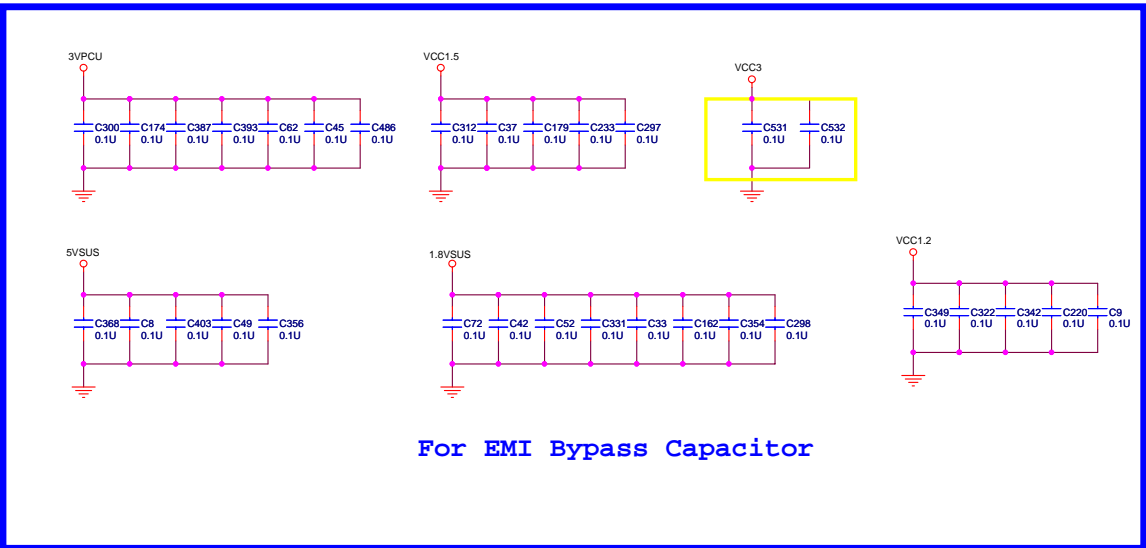
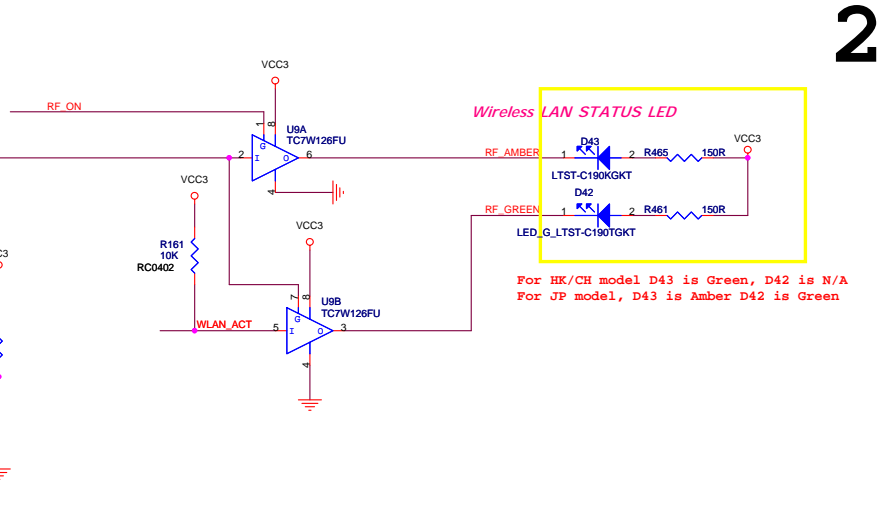
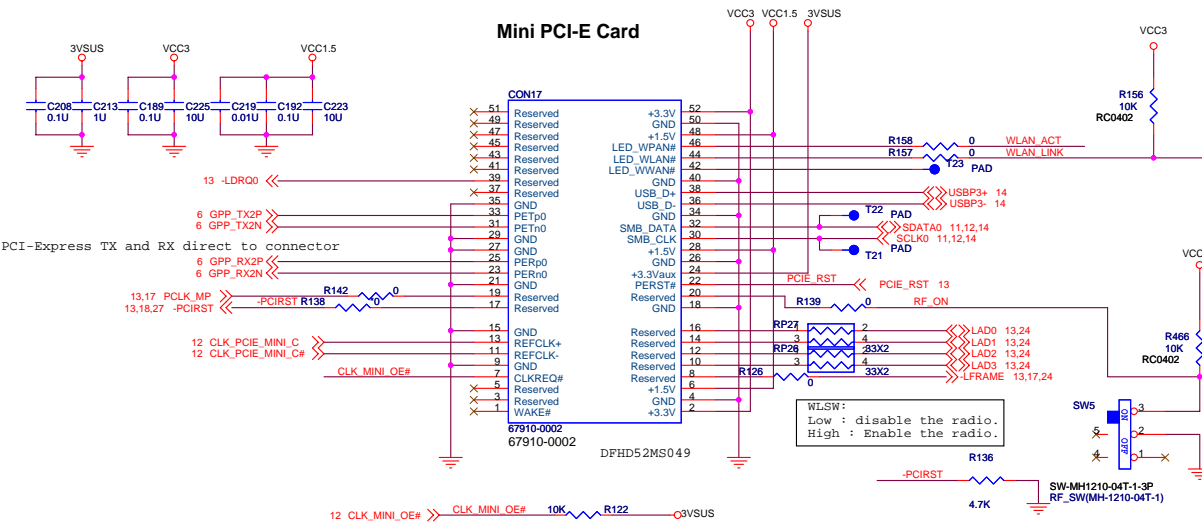
QUANTA COMPUTER

Title: **HD_ALC262**

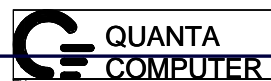
Size B: Document Number **AK2(U10) Main Board** Rev 1A

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Mini PCI-E Card

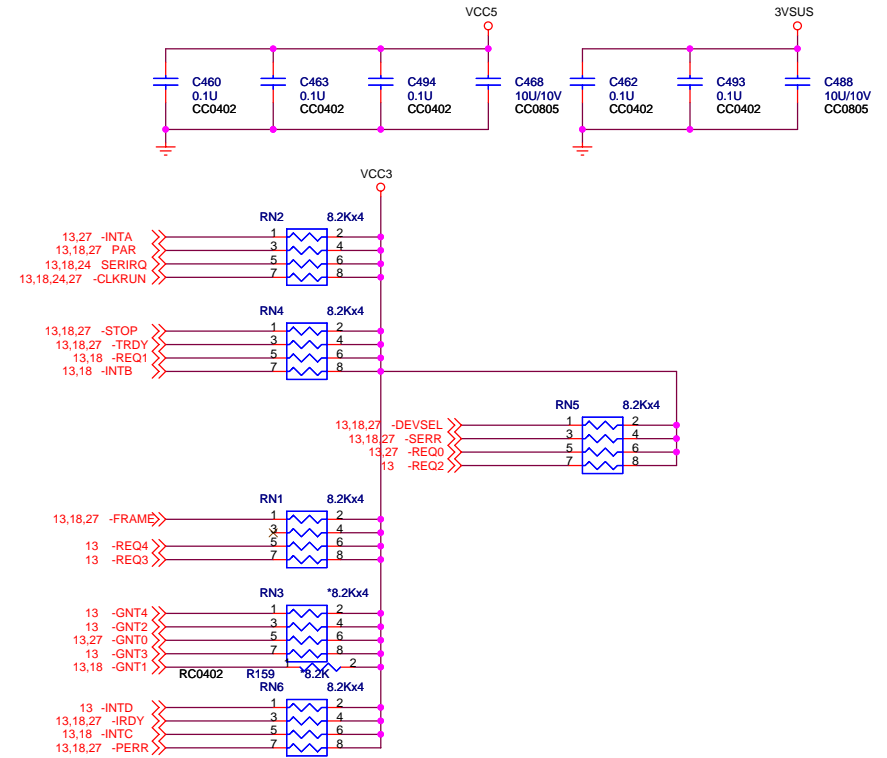
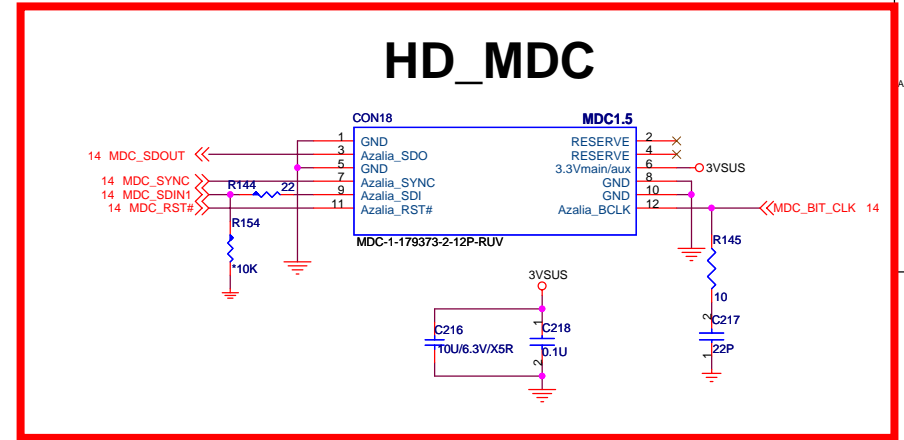


- VCC3 3,5,8,10,11,12,13,14,15,16,17,18,19,20,21,23,24,26,27,28,29,30,35,36
- 3VSUS 14,23,27,30,31,35,36
- VCC1.5 VCC1.5 4,31,36



Mini PCI-E Card			Rev 1A
Size Custom	Document Number	AK2(U10) Main Board	
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For JP model don't have HD_MDC



VCC3	3,5,8,10,11,12,13,14,15,16,17,18,19,20,21,22,24,26,27,28,29,30,35,36
3VSUS	14,22,27,30,31,35,36
VCC5	3,8,10,16,18,19,20,21,22,24,25,26,30,36

**QUANTA
COMPUTER**

Title: **MINI PCI & HD_MDC**

Size B	Document Number AK2(U10) Main Board	Rev 1A
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Date: Wednesday, November 29, 2006 Sheet 23 of 37

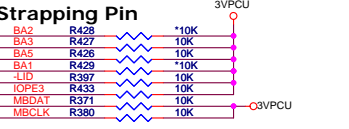
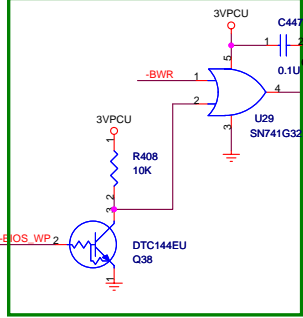
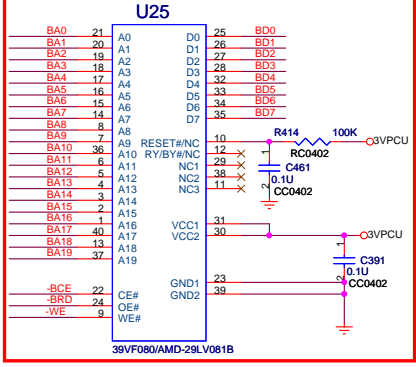
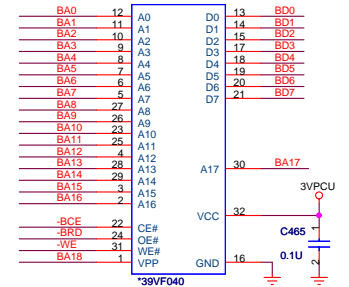
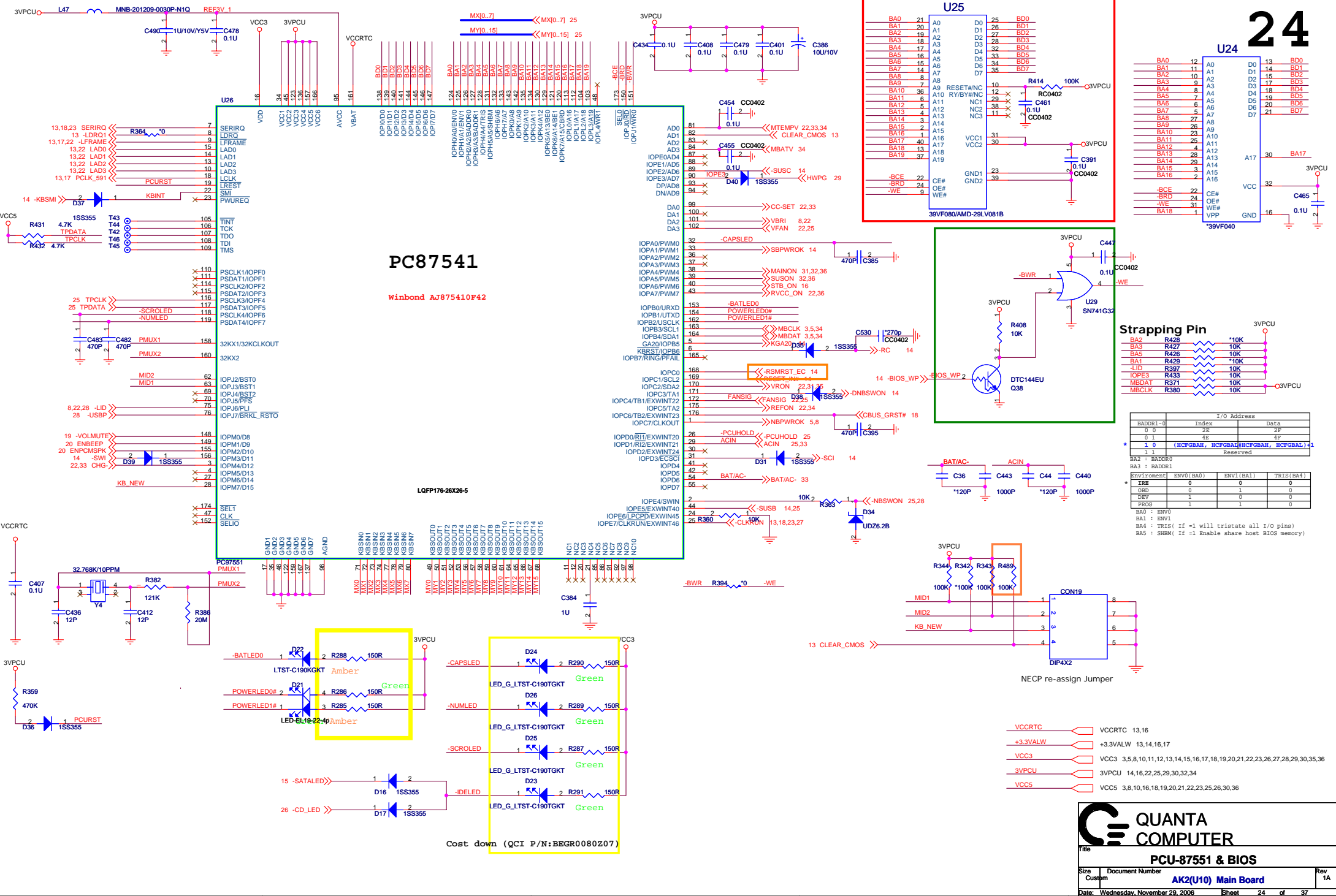
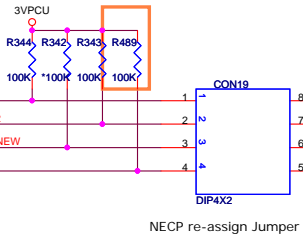
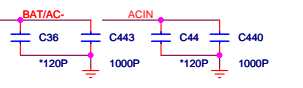


Table with I/O Address, Index, and Data columns. Includes entries for BADDR1-0, BADDR2, BADDR3, and Environment variables (ENV0-ENV4).



- Legend for power pins: VCCRTC, +3.3VALW, VCC3, 3VPCU, VCC5.

PC87541

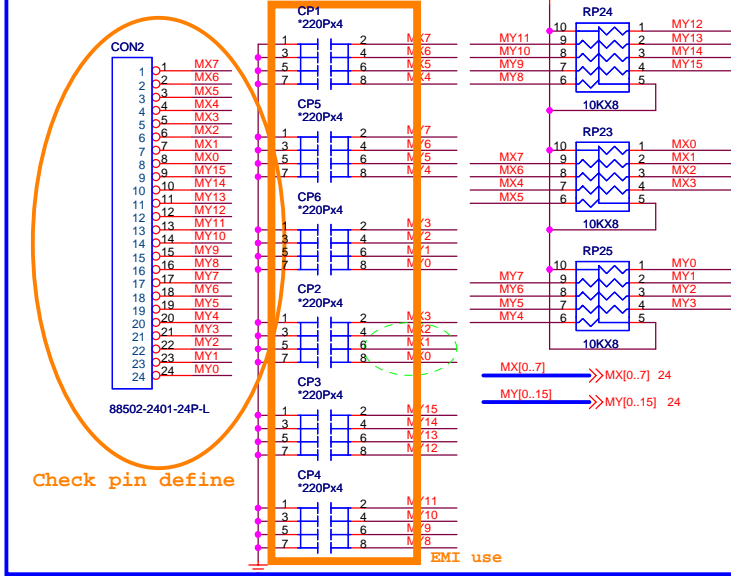
Winbond AJ785410F42

LQFP176-26X26-5

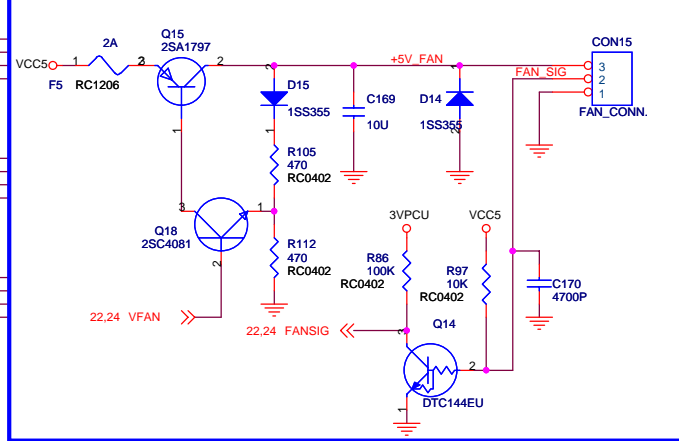
Cost down (QCI P/N: BEGR0080Z07)

QUANTA COMPUTER logo and product information: PCU-87551 & BIOS, AK2(U10) Main Board, Rev 1A, Date: Wednesday, November 29, 2006, Sheet 24 of 37.

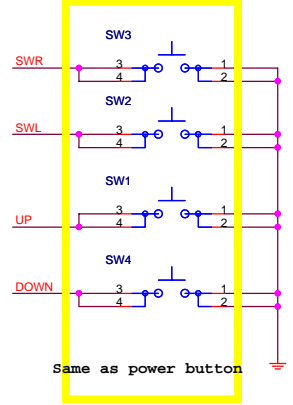
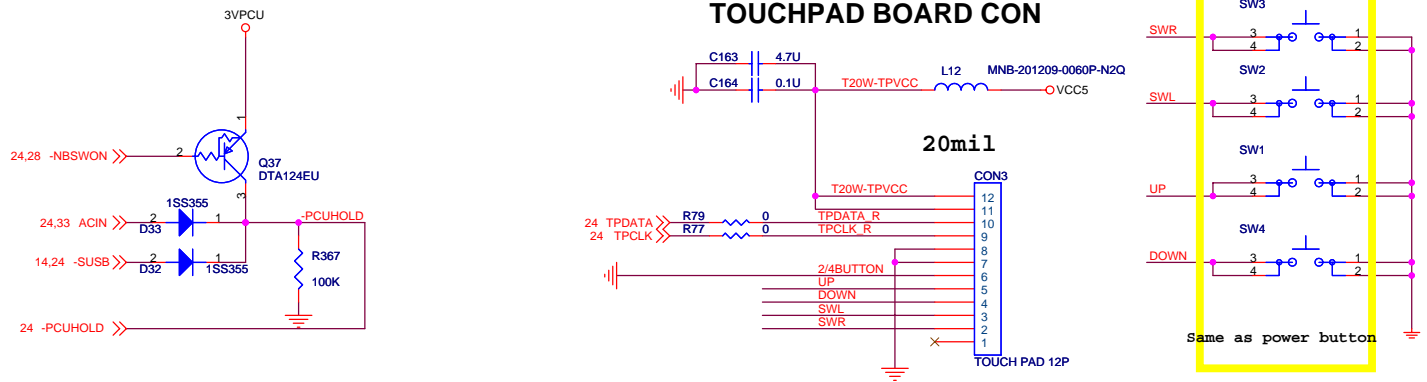
INT. KEYBOARD



FAN Circuit



TOUCHPAD BOARD CON



3VPCU 3VPCU 14,16,22,24,29,30,32,34

VCC5 VCC5 3,8,10,16,18,19,20,21,22,23,24,26,30,36

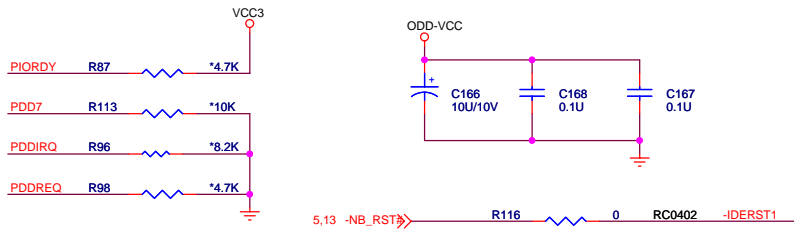
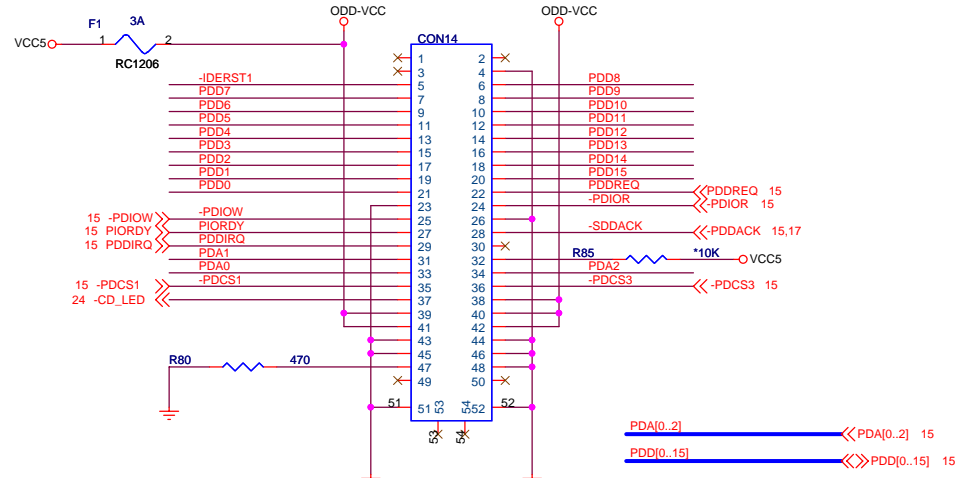
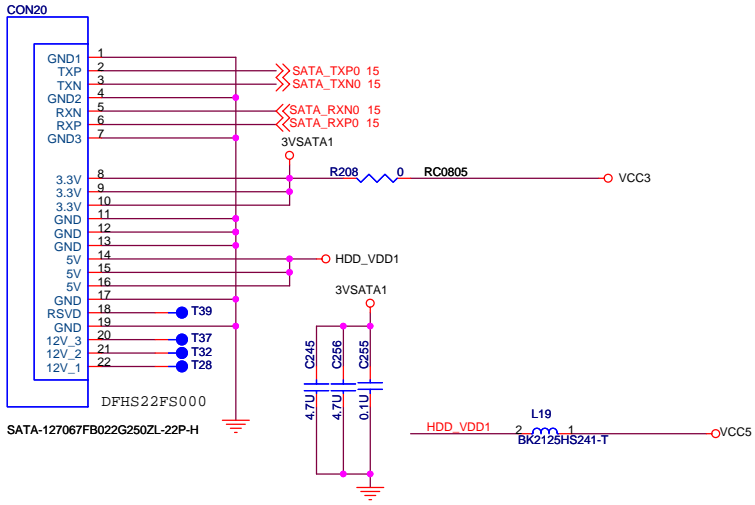
QUANTA COMPUTER

Title: INT.KB &TP CONN

Size: Custom Document Number: AK2(U10) Main Board Rev: 1A

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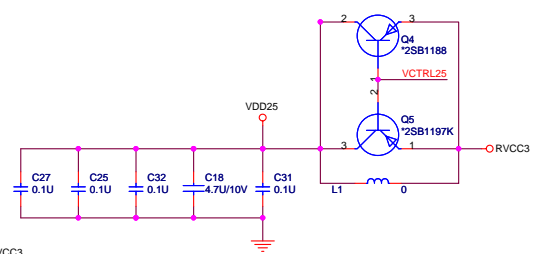
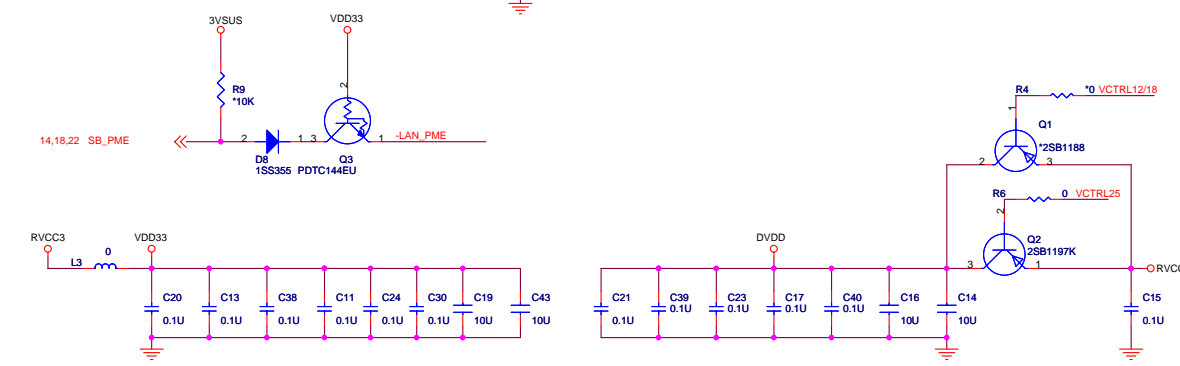
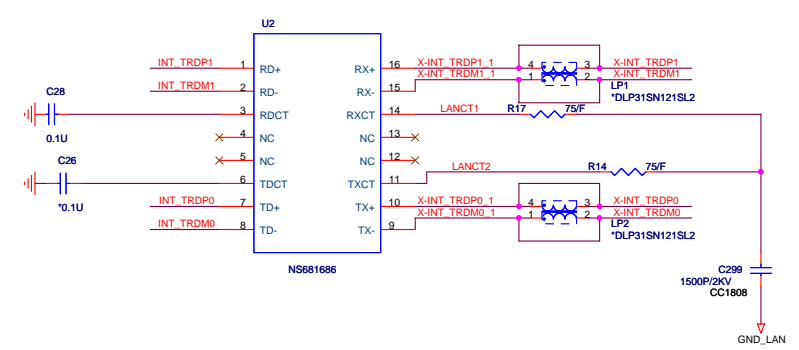
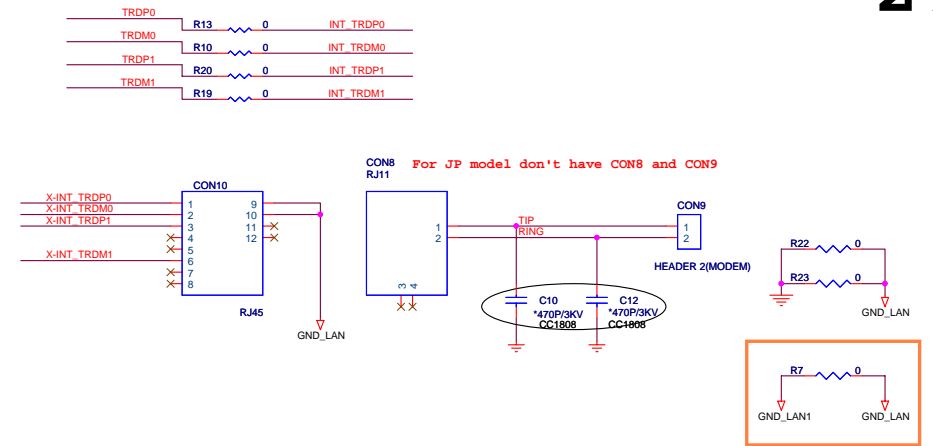
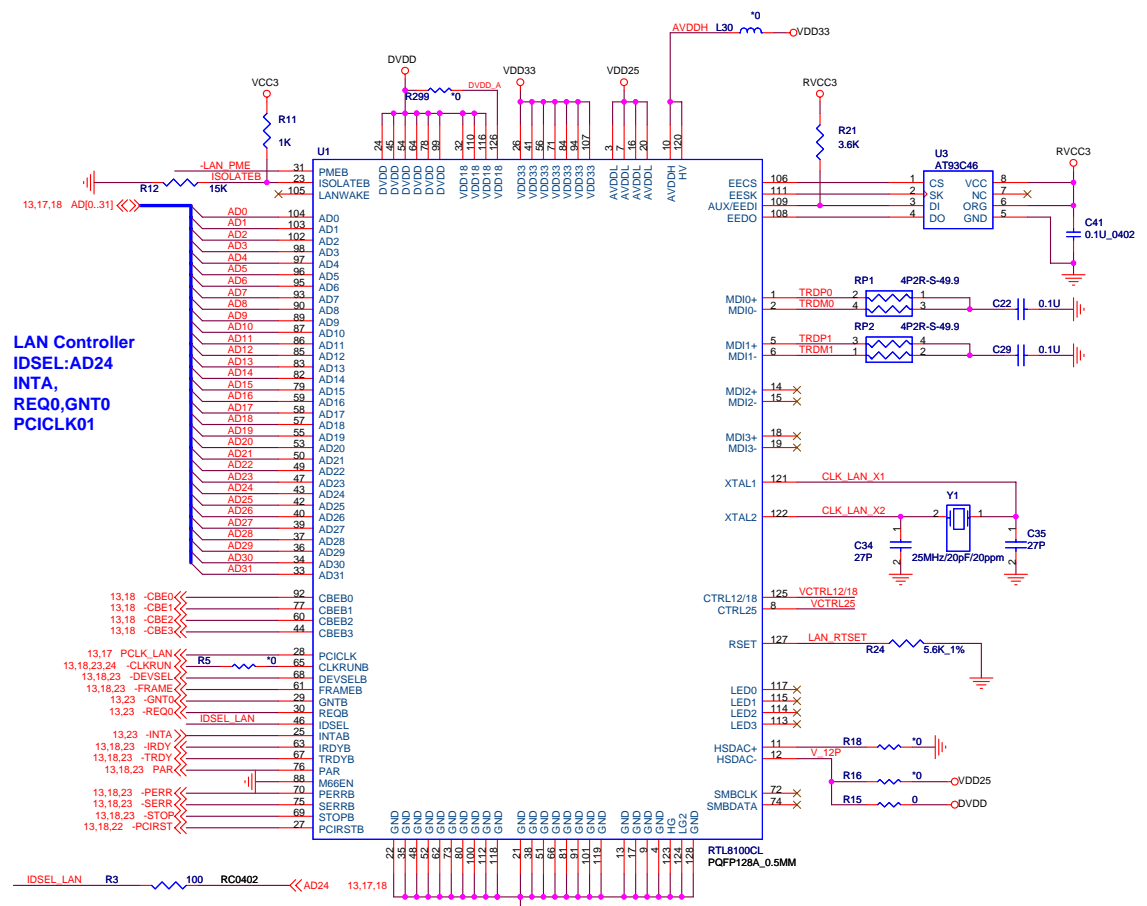
VCC3 VCC3 3,5,8,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,27,28,29,30,35,36
 VCC5 VCC5 3,8,10,16,18,19,20,21,22,23,24,25,30,36

QUANTA COMPUTER

Title: **SATA(HDD),PATA(ODD) CONNECT**

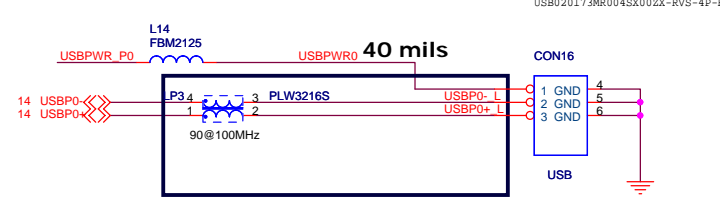
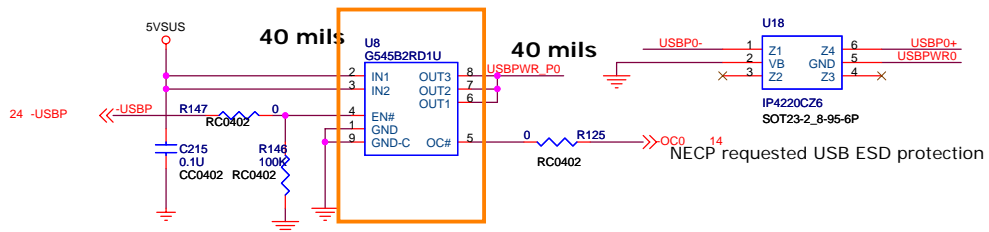
Size B Document Number: **AK2(U10) Main Board** Rev 1A

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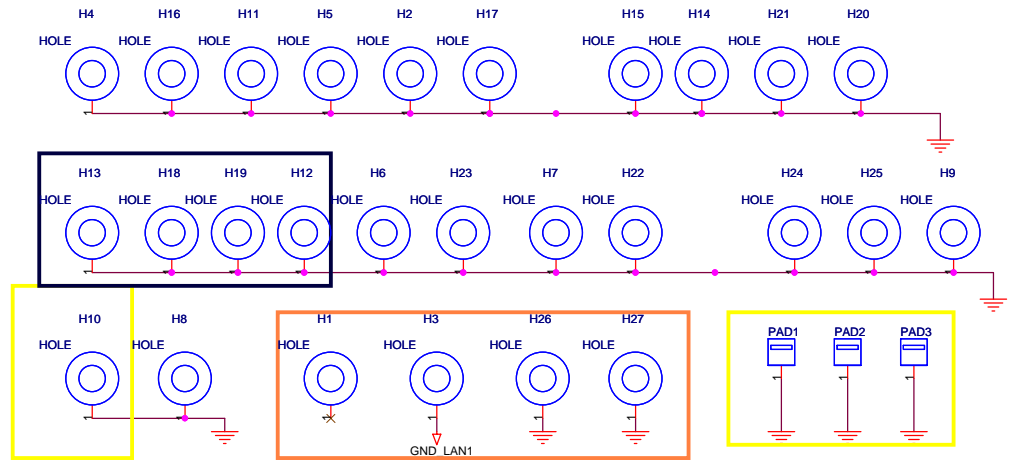
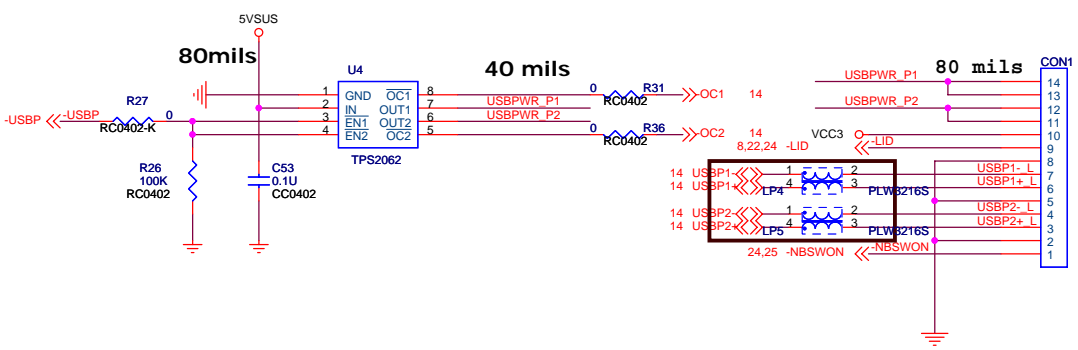
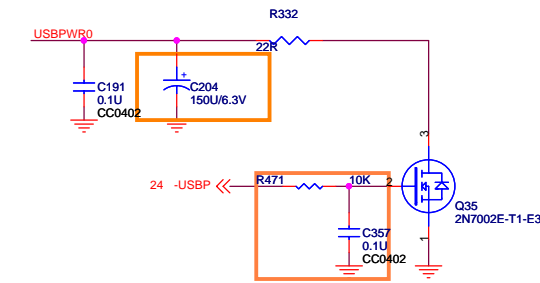
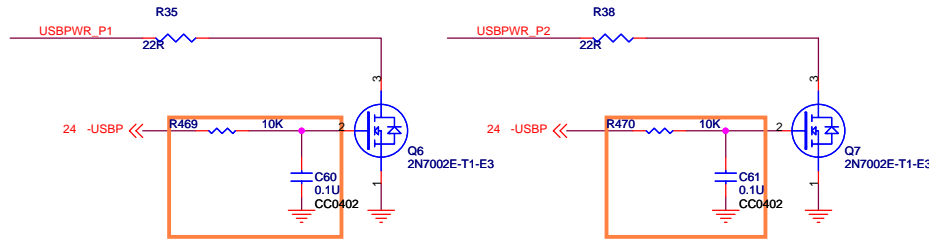


USB Power and Over current

USB Connector



USB POWER DISCHARGE CIRCUIT



- VCC3 3,5,8,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,26,27,29,30,35,36
- 5VSUS 22,29,30,31,35,36

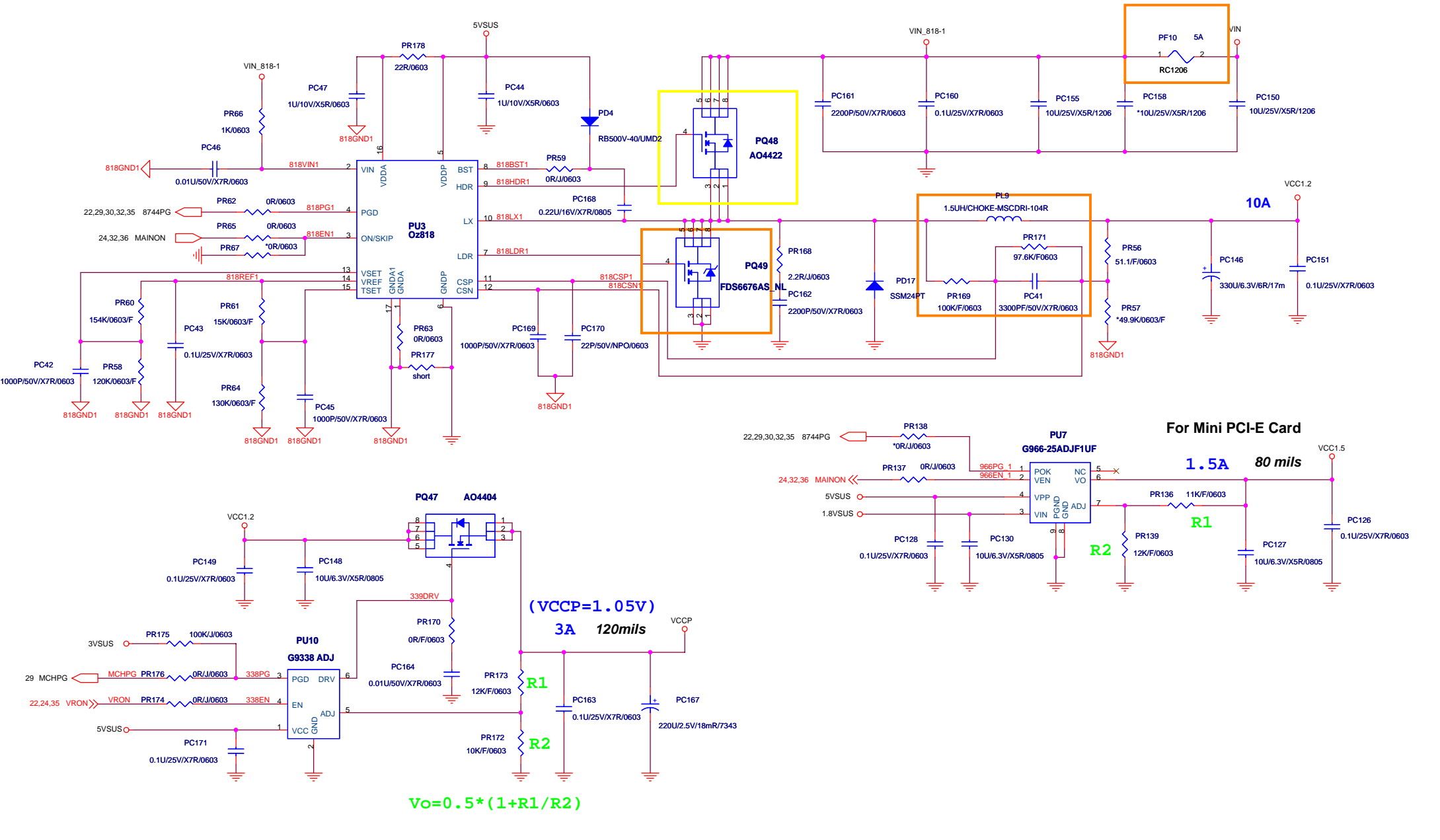
QUANTA COMPUTER

Title: **USB PORT/USB board conn**

Size: Custom Document Number: **AK2(U10) Main Board** Rev: 1A

Date: Wednesday, November 29, 2006 Sheet: 28 of 37

VCCP/VCC1.2 / VCC1.5



$V_o = 0.5 * (1 + R1/R2)$

- 22,29,30,32,33,34,35 VIN
- 22,28,29,30,35,36 5VSUS
- 14,22,23,27,30,35,36 3VSUS
- 29 MCHPG

- VCC1.2 VCC1.2 6,9,22,35,36
- VCC1.5 VCC1.5 4,22,36
- VCCP VCCP 3,4,5,8,9,12,16

**QUANTA
COMPUTER**

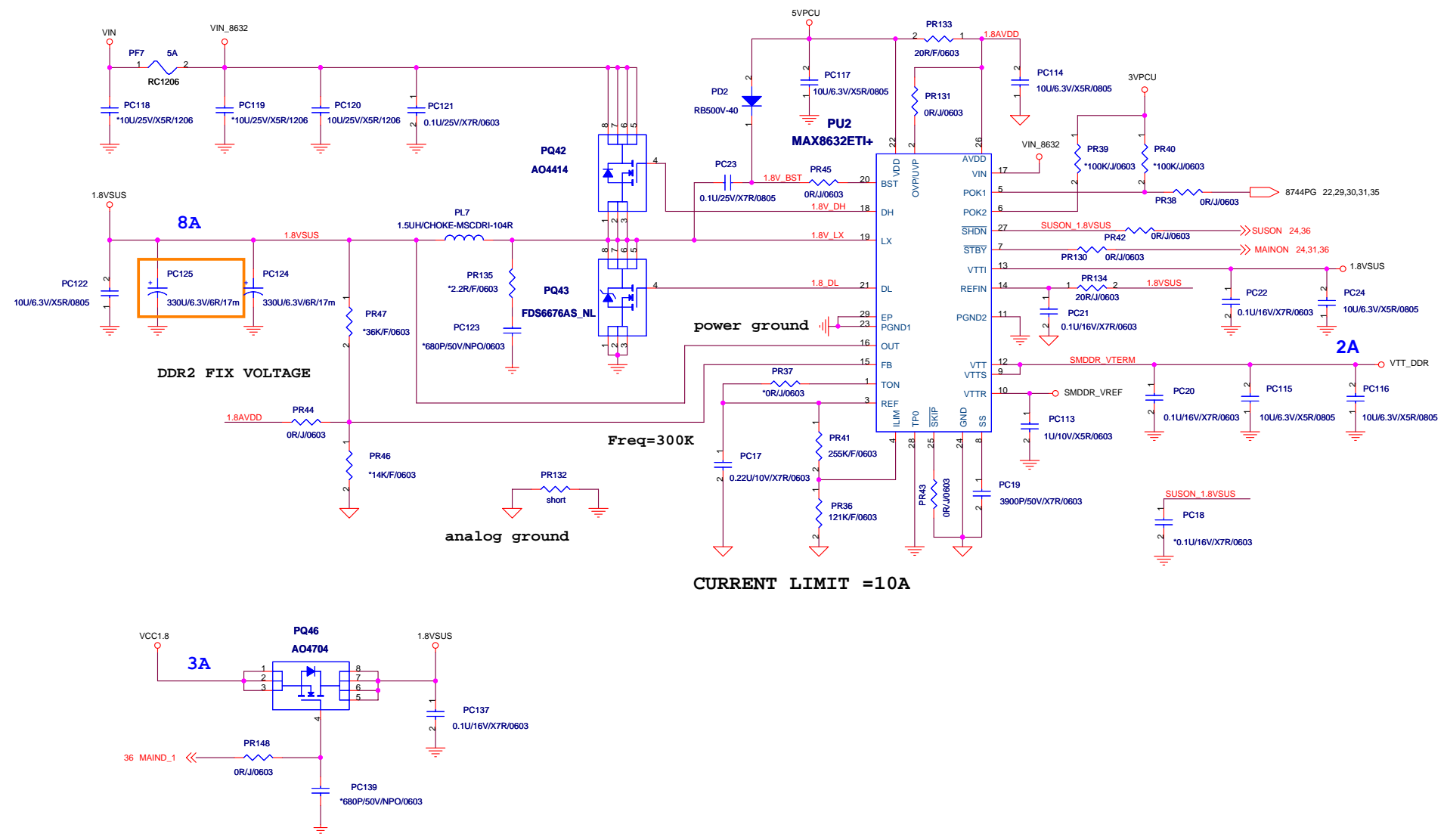
Title: **VCC1.2/VCCP/VCC1.5**

Size: Document Number **AK2(U10) Main Board** Rev 3A

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1.8VSUS & VTERM(DDR2)



DDR2 FIX VOLTAGE

power ground

analog ground

CURRENT LIMIT =10A

- 1.8VSUS → 1.8VSUS 5,7,9,11,16,22,31,36
- VTT_DDR → VTT_DDR 11
- VCC1.8 → VCC1.8 5,8,9,11,15,36
- VIN → VIN 22,29,30,31,33,34,35

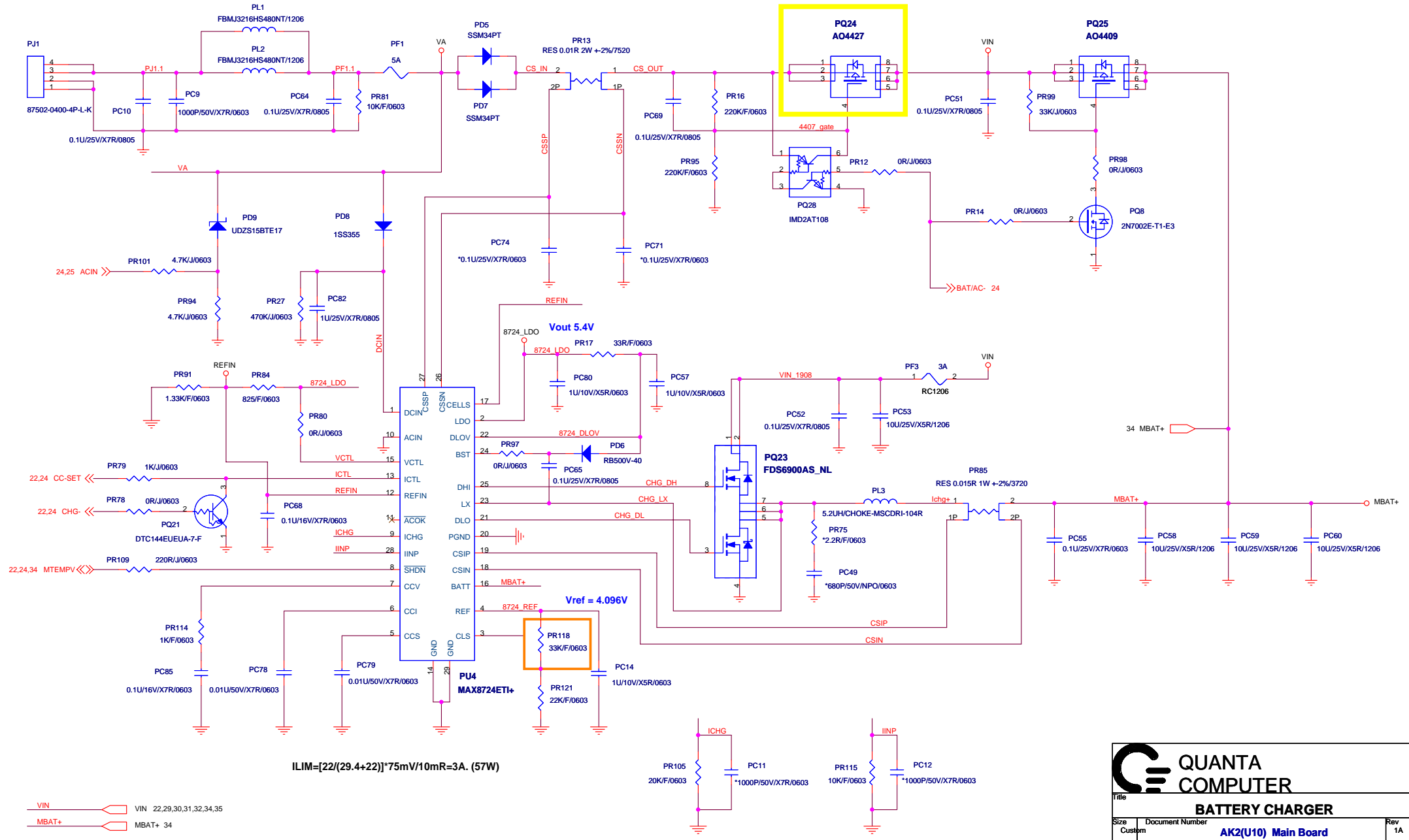
- 3VSUS → 3VSUS 14,22,23,27,30,31,35,36
- 5VPCU → 5VPCU 8,13,30,36

QUANTA COMPUTER

Title: **1.8VSUS / DDRVTERM**

Size: Custom	Document Number: AK2(U10) Main Board	Rev: 1A
Date: Wednesday, November 29, 2006		Sheet 32 of 37

Battery Charger



QUANTA COMPUTER

Title: **BATTERY CHARGER**

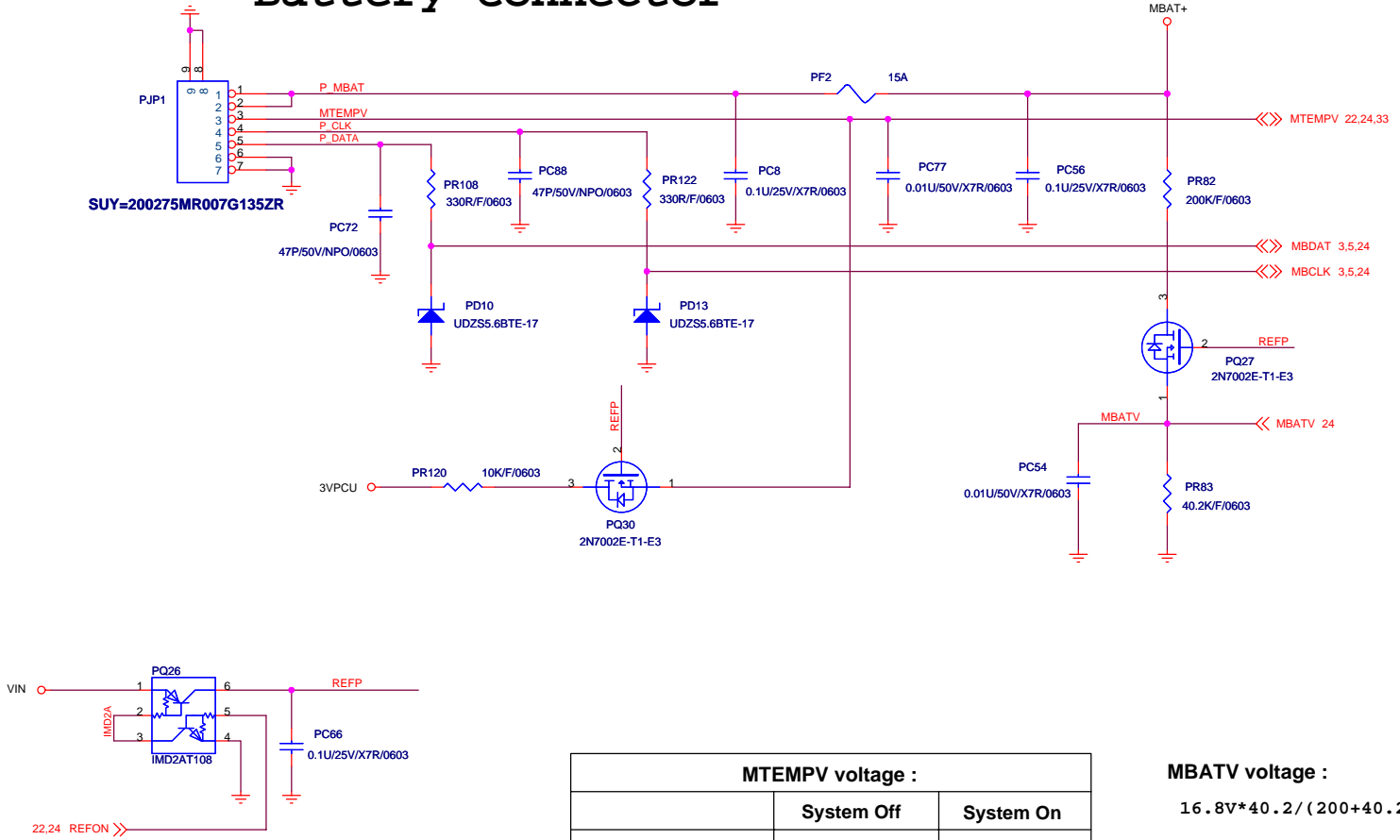
Size: Custom Document Number: **AK2(U10) Main Board** Rev: 1A

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Battery Connector

Battery Connector



MTEMPV voltage :

	System Off	System On
Battery	0V	1.6V
Adapter	3.3V	3.3V
Battery+Adapter	1.6V	1.6V

MBATV voltage :

$16.8V * 40.2 / (200 + 40.2) = 2.812V$
 $12.0V * 40.2 / (200 + 40.2) = 2.008V$
 $8.0V * 40.2 / (200 + 40.2) = 1.34V$
 $6.0V * 40.2 / (200 + 40.2) = 1.004V$

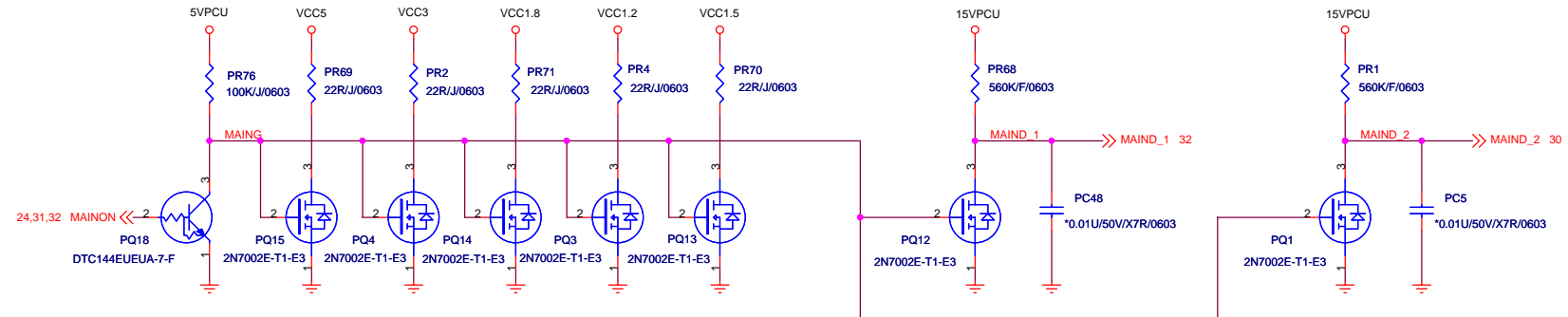
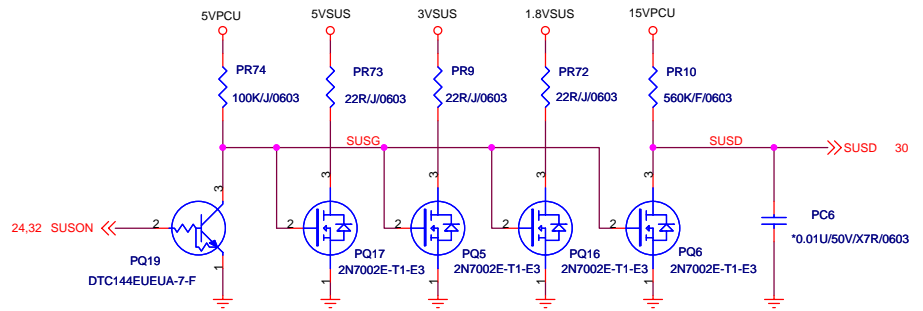
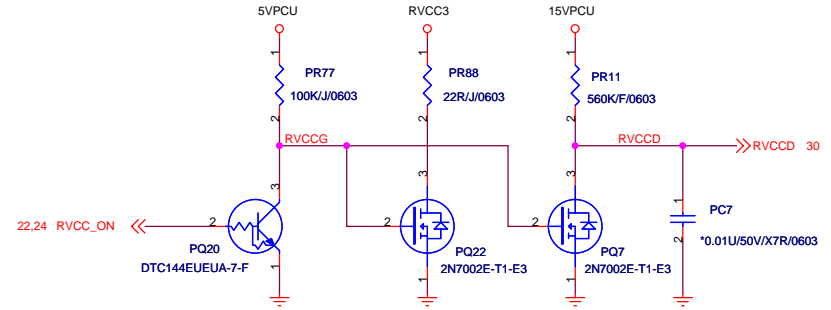
- 3VPCU ——— 3VPCU 14,16,22,24,25,29,30,32
- VIN ——— VIN 22,29,30,31,32,33,35
- MBAT+ ——— MBAT+ 33

**QUANTA
COMPUTER**

Title: **BATTERY CONNECTOR**

Size: Custom	Document Number: AK2(U10) Main Board	Rev: 1A
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Battery Connector



- 15VPCU 15VPCU 30
- VCC_NB VCC_NB 6,9,22,31,35
- VCC1.2 VCC1.2 6,9,22,31,35
- VCC1.8 VCC1.8 5,8,9,11,15,32
- VCC3 VCC3 3,5,8,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,26,27,28,29,30,35
- VCC5 VCC5 3,8,10,16,18,19,20,21,22,23,24,25,26,30
- 5VPCU 5VPCU 8,13,30,32

- RVCC3 RVCC3 27,30
- 1.8VSUS 1.8VSUS 5,7,9,11,16,22,31,32
- 3VSUS 3VSUS 14,22,23,24,25,26,27,28,29,30,31,35
- 5VSUS 5VSUS 22,28,29,30,31,35
- RVCCD RVCCD 30
- SUSD SUSD 30
- MAIND_1 MAIND_1 32
- MAIND_2 MAIND_2 30


**QUANTA
COMPUTER**

Title: **DISCHARGE**

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- IRT Change list:
1. Page20: add BZ2
 2. Page23: del MINI-PCI circuit
 3. Page28: Q6, Q7, Q35 footprint update (change to 2N7002 footprint) SMT request
 4. Page28: USB circuit modify
 5. Page28: H12, H13, H18, H19 change footprint.
 6. Page8: Add PCI173
 7. Page21: change R423 to 28K
 8. page22: Add C533-C563 for EMI

			QUANTA COMPUTER
Title			Change list
Size	Document Number	Rev	
C	AK2(U10) Main Board	1A	
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