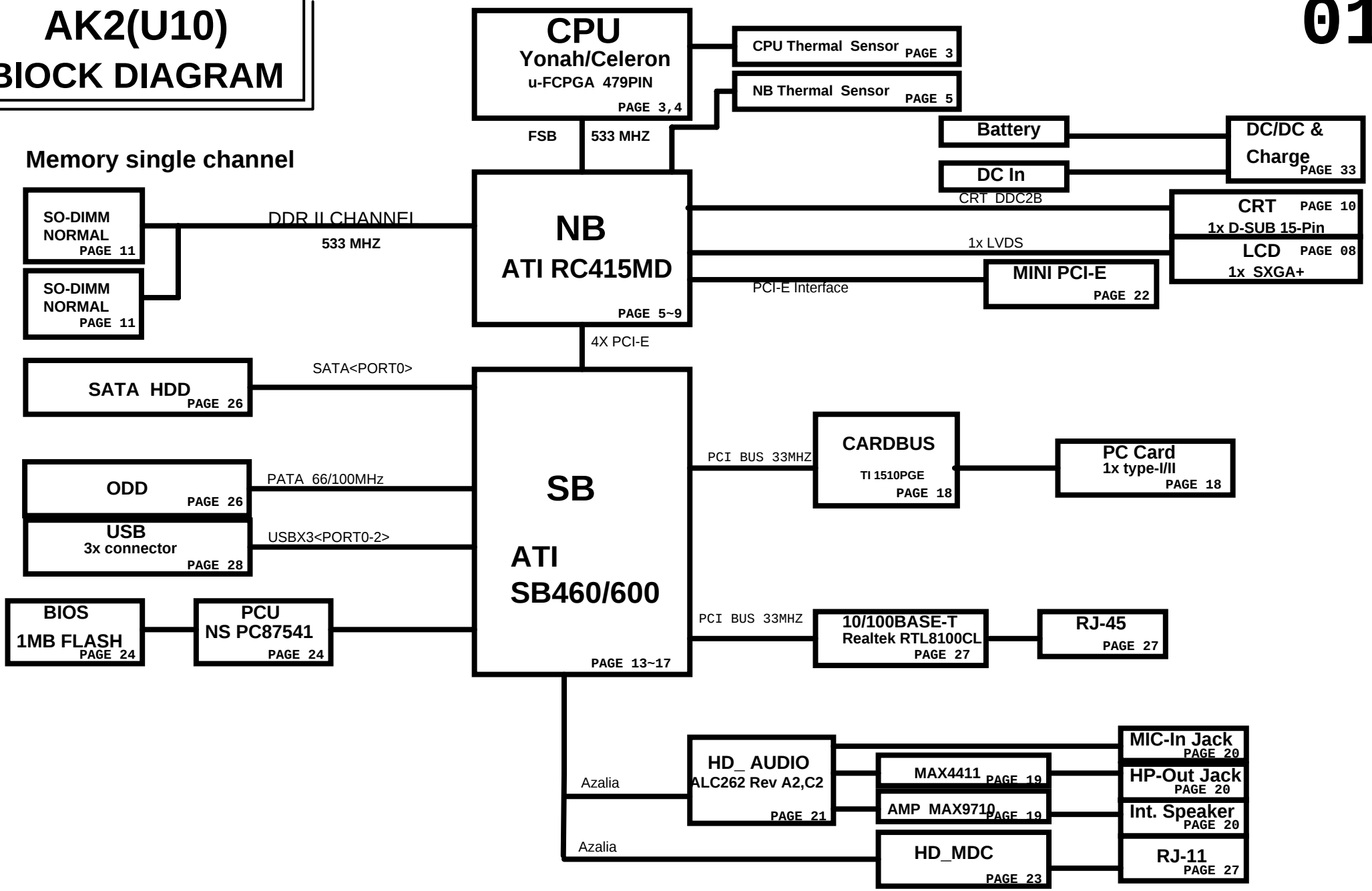


AK2(U10) BLOCK DIAGRAM

Memory single channel



1. PAGE LIST

01--BLOCK DIAGRAM	31-- VCCP/VCC1.2/VCC1.5
02--PAGE LIST	32--1.8VSUS/DDRTERM
03--Yonah CPU (HOST BUS)-1	33--Battery Charger
04--Yonah CPU (POWER/NC)-2	34-- BATTERY CONNECTOR
05--RC415MD-AGTL+ I/F 1/5	35-- VGA POWER
06--RC415MD-PCIE LINK I/F 2/5	36--DISCHARGE
07--RC415MD-DDR2 I/F 3/5	37--CHANGE LIST
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	

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

3. PCI_E Description :

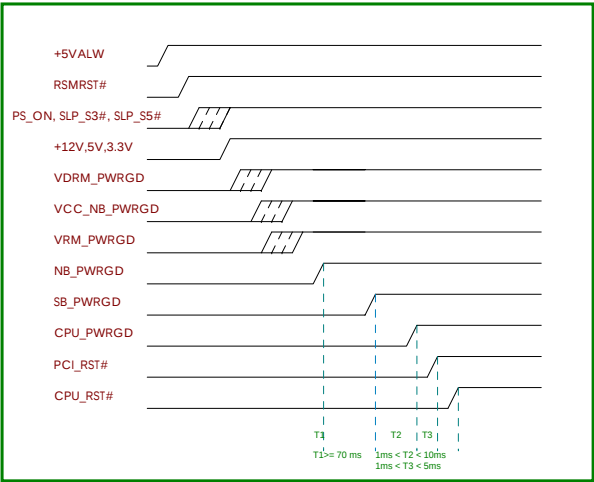
CHIP
Port 0,1 A-LINK
Port 2 Mini-PCIE (Wireless card)

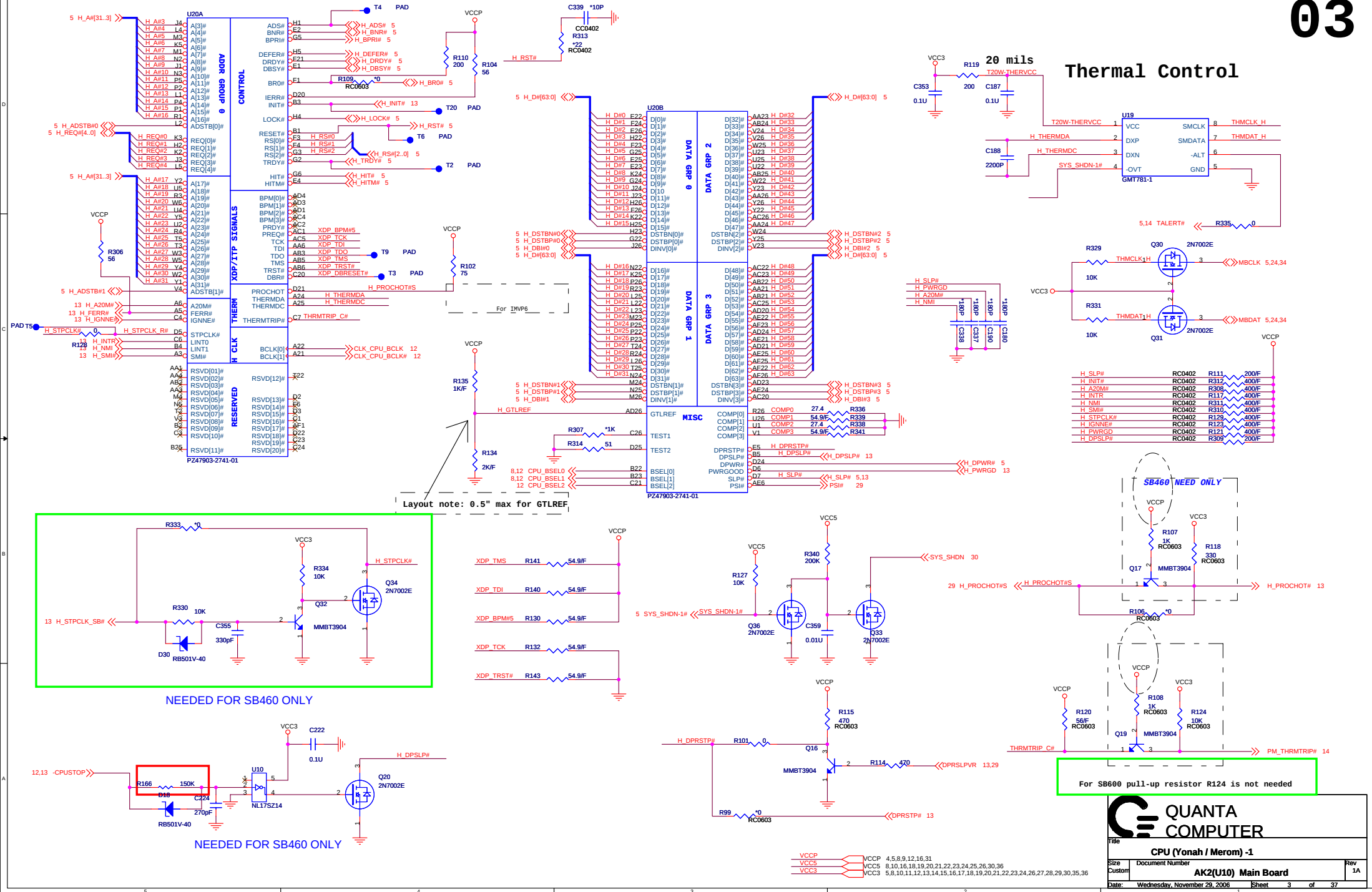
4.Power rails

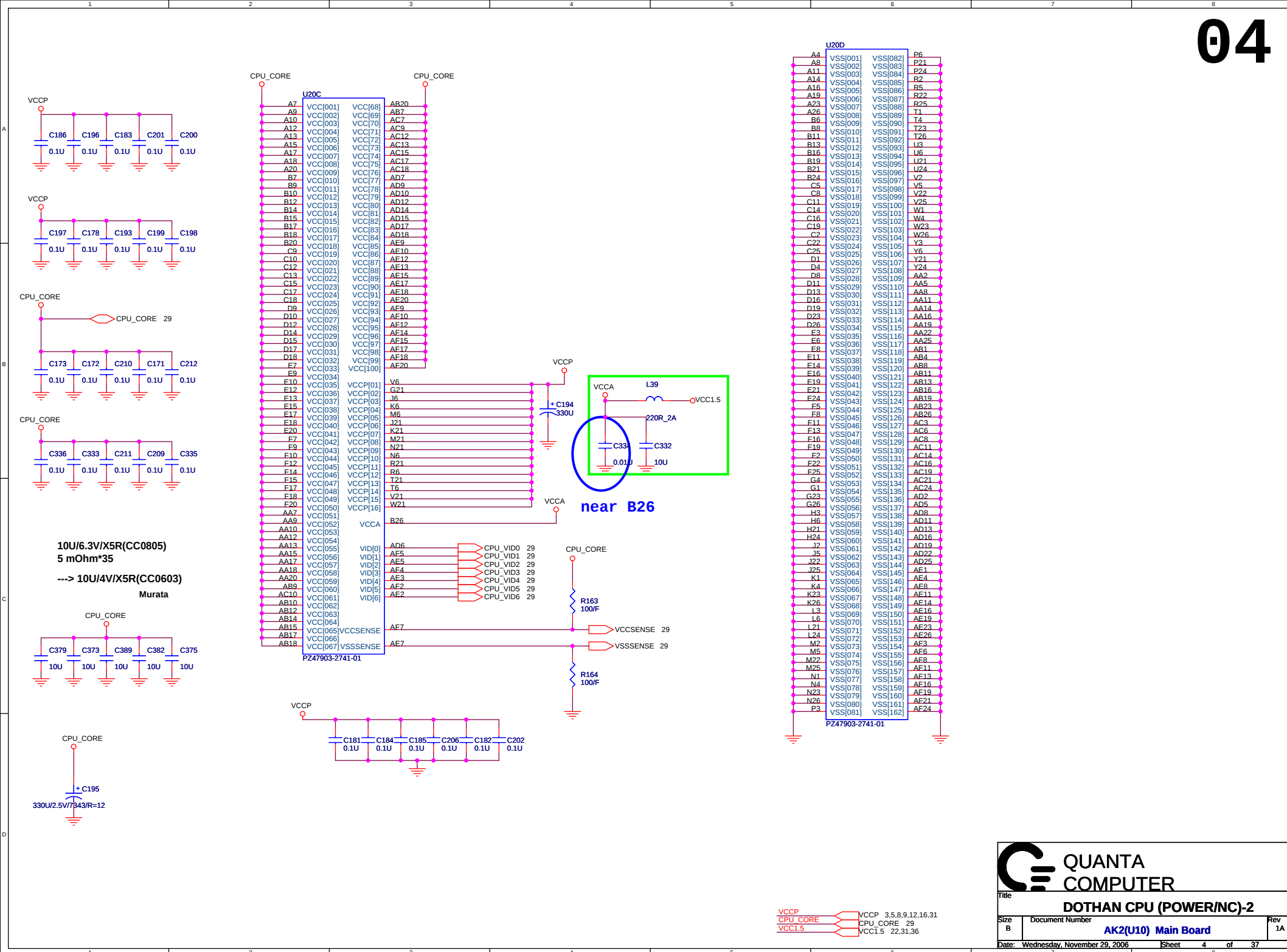
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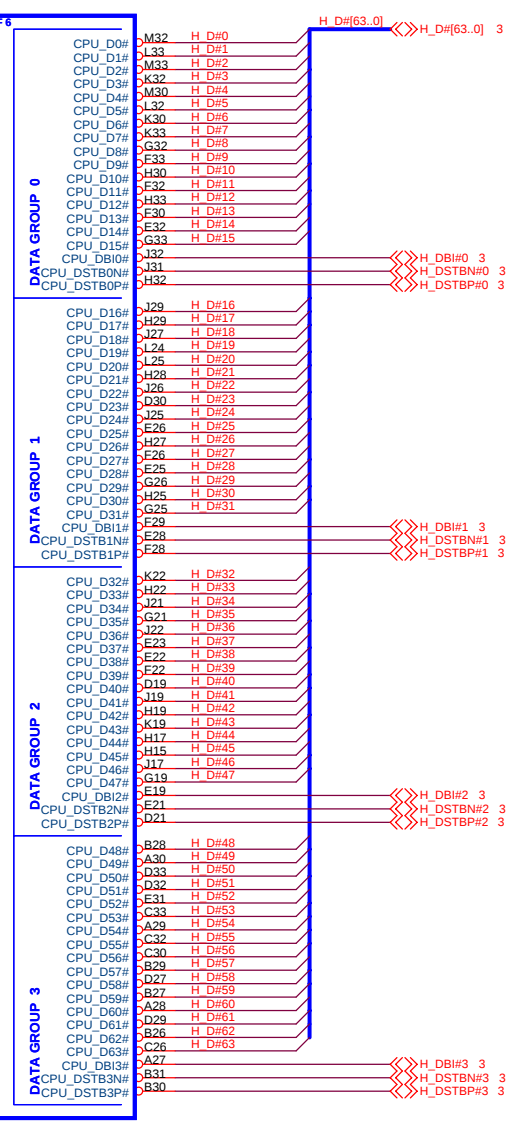
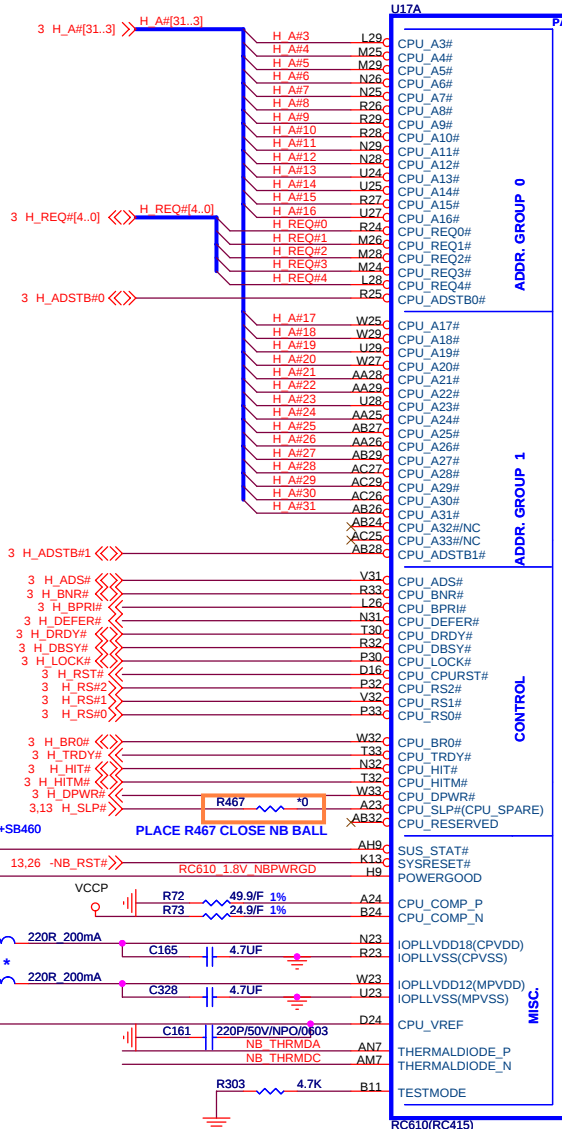
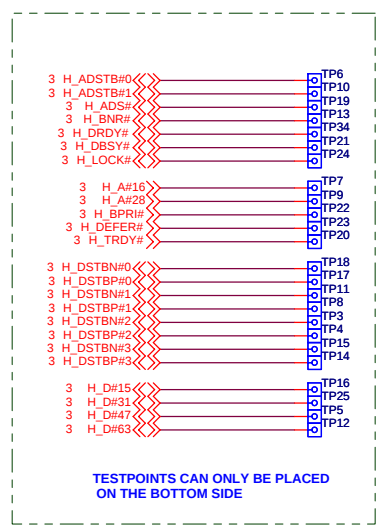
POWER RAIL	VOLTAGE SIGNAL	S0	S1	S2	S3	S4	S5
CPU_CORE	VRON	ON	ON	ON	OFF	OFF	OFF
VCC_NB	VRON	ON	ON	ON	OFF	OFF	OFF
+VTT_DDR	MAINON	ON	ON	ON	OFF	OFF	OFF
VCCP	MAINON	ON	ON	ON	OFF	OFF	OFF
VCCCORE	VRON	ON	ON	ON	OFF	OFF	OFF
RVCC3	RVCCON	ON	ON	ON	ON	ON	OFF
+VCC1.2	MAINON	ON	ON	ON	OFF	OFF	OFF
+1.5V	MAINON	ON	ON	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

5.ALBACORE POWER UP SEQUENCE









H_RST# need to fork out from NB

PLACE GTLREF CIRCUIT CLOSE TO NB, USE 10/10 WIDTH/SPACE

PLACE C165,C328 CLOSE TO NB, AND CONNECT IOPLLVS TO GND DIRECTLY

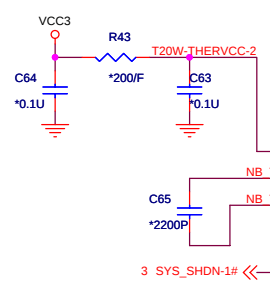
PLACE C161 CLOSE NB BALL

ROUTE THRMDC AND THRMDC TRACES AS DIFF PAIRS TO SIO AND SB

Note:

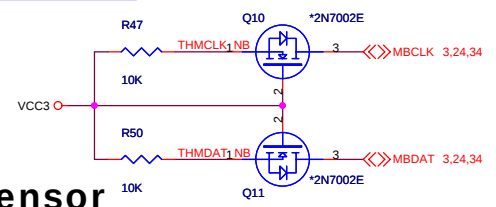
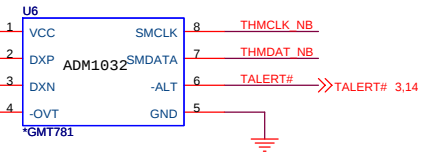
- * Stuff only for RC415
- ** Stuff only for RC610
- *** Stuff only for RC415 and SB460

RC610/RC415	RC610	RC415
R72	53.6R	49.9R
R73	21R	24.9R



TESTMODE	NB MODE
LOW	NORMAL MODE
HIGH	TEST MODE

NB Thermal Sensor



QUANTA COMPUTER

Title

RC415-AGTL+I/F

Size

Custom

Document Number

AK2(U10) Main Board

Date

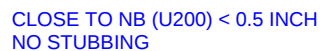
Wednesday, November 29, 2006

Sheet

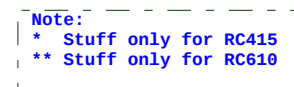
5 of 37

Rev

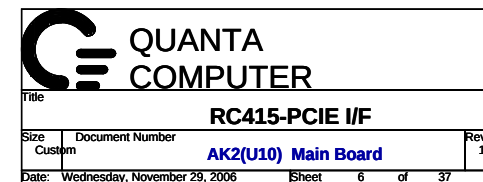
1A

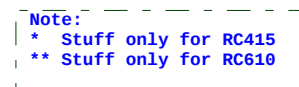


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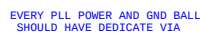


VCC1.2 VCC1.2 9,22,31,35,36

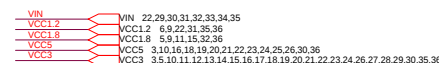
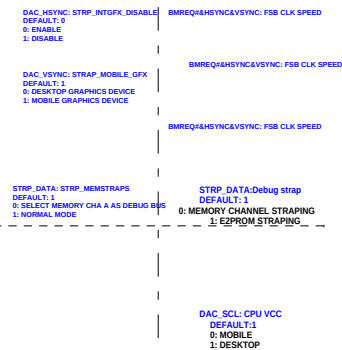
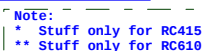




 QUANTA COMPUTER			
Title			
RC415-DDR2 I/F			
Size	Document Number		Rev
Custom	AK2(U10) Main Board		1.
Date:	Wednesday, November 29, 2006	Sheet	7 of 37



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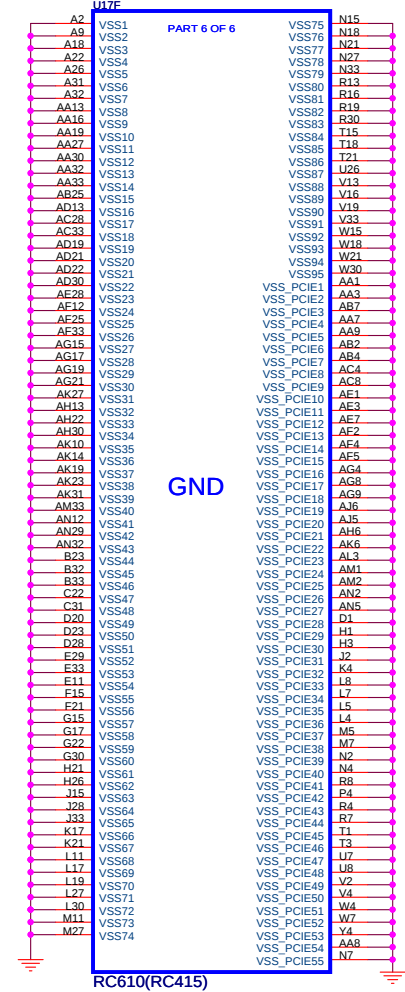
QUANTA
COMPUTER

RC415-VIDEO I/F,CLOCK,STRAPS

Size	Document Number
Custom	AK2(U10) Main Board

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Date: Wednesday, November 29, 2006 Sheet 8 of 37



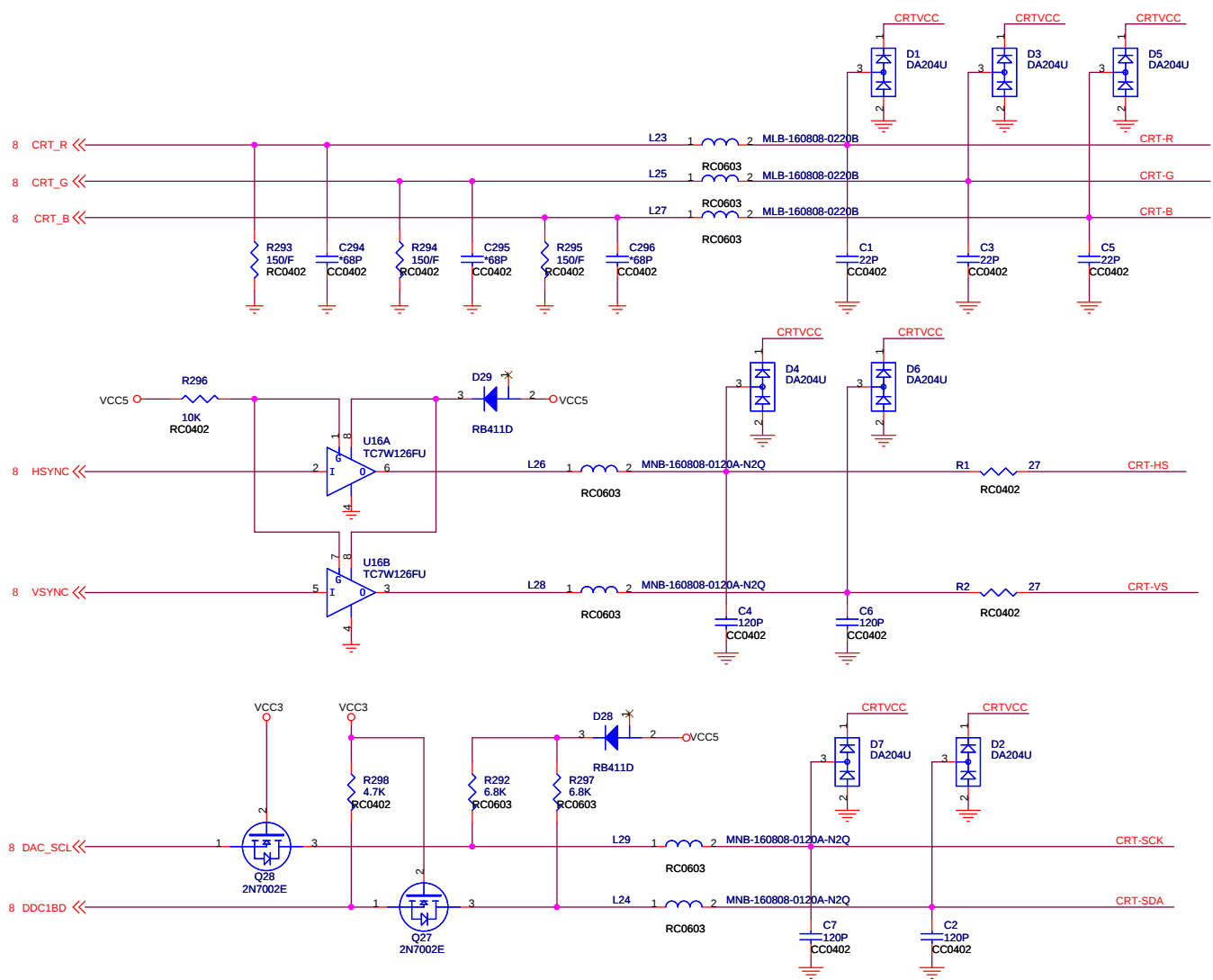
PR179
*RES 0.001R 2W +-2%/7520

2P 1P

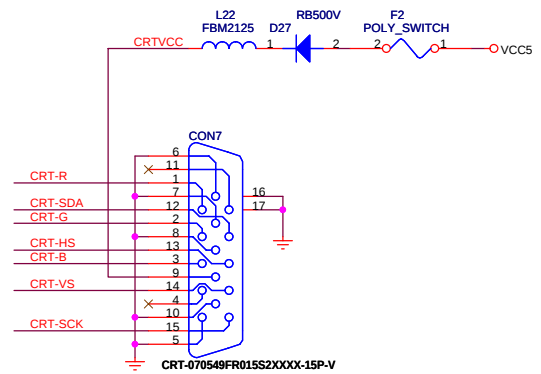
VCC1.2 VCC_NB

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

 QUANTA COMPUTER				
Title				
RC415-POWER				
Size	Document Number			Rev
Custom	AK2(U10) Main Board			1A
Date:	Wednesday, November 29, 2006	Sheet	9 of 37	



CRT CONNECTOR



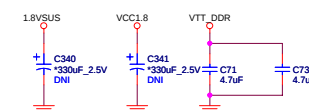
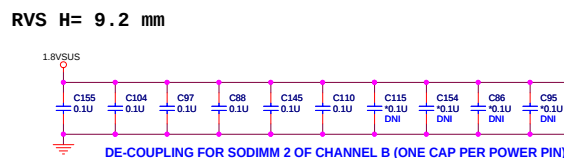
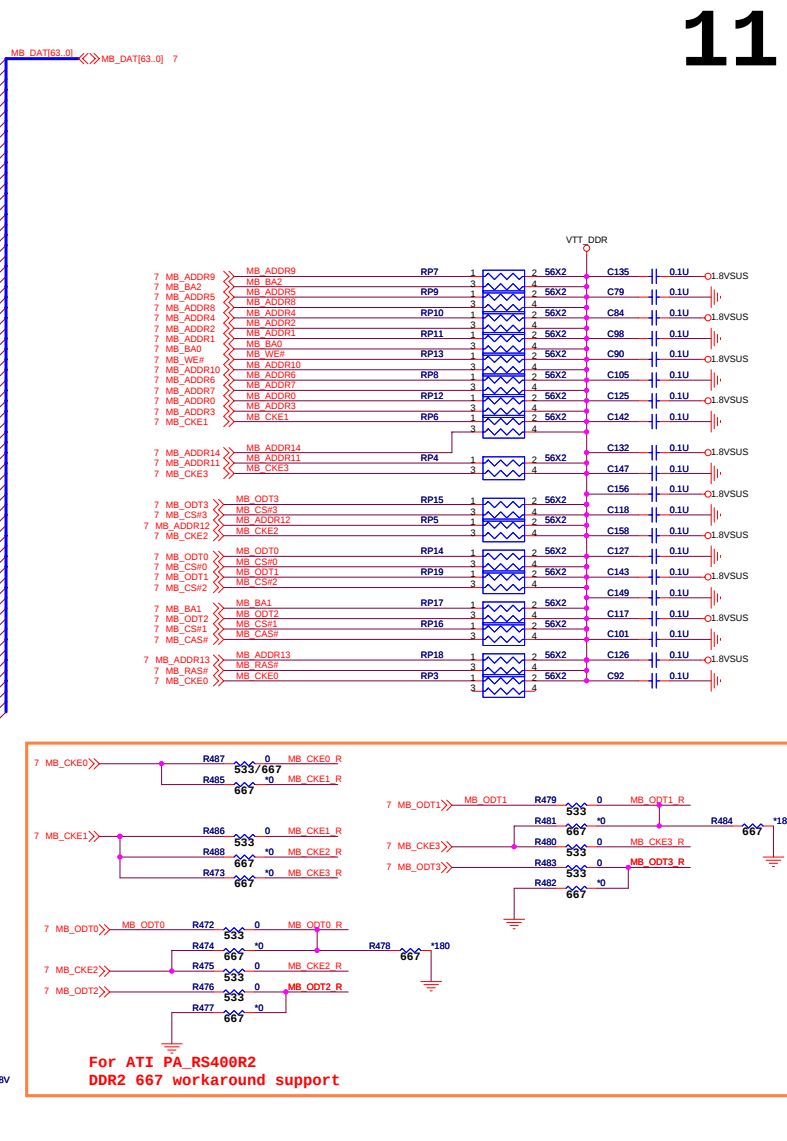
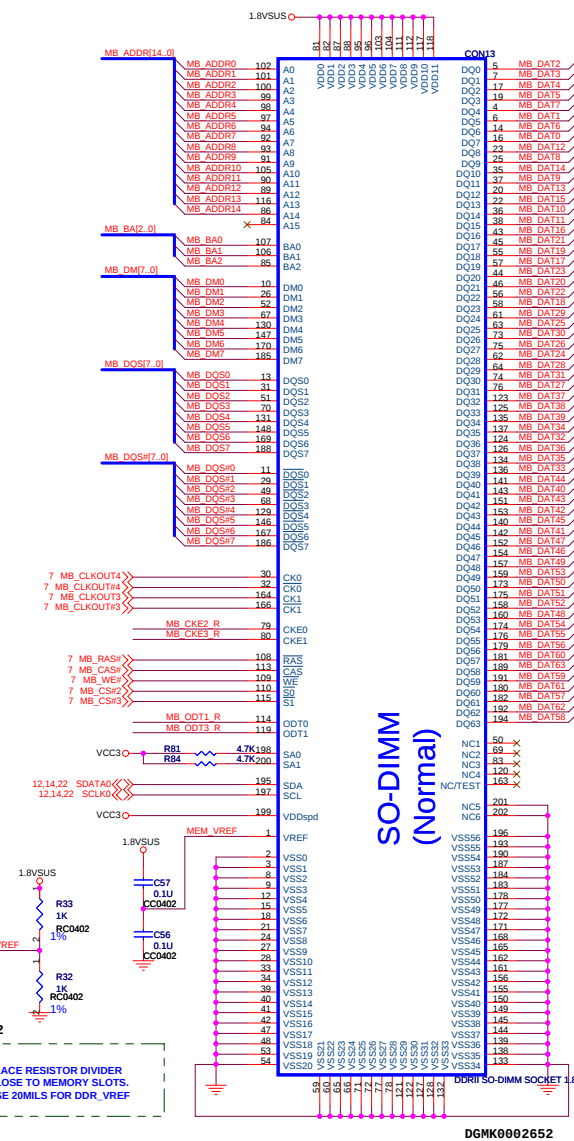
VCC5 3,8,16,18,19,20,21,22,23,24,25,26,30,36
VCC3 3,5,8,11,12,13,14,15,16,17,18,19,20,21,22,23,24,26,27,28,29,30,35,36

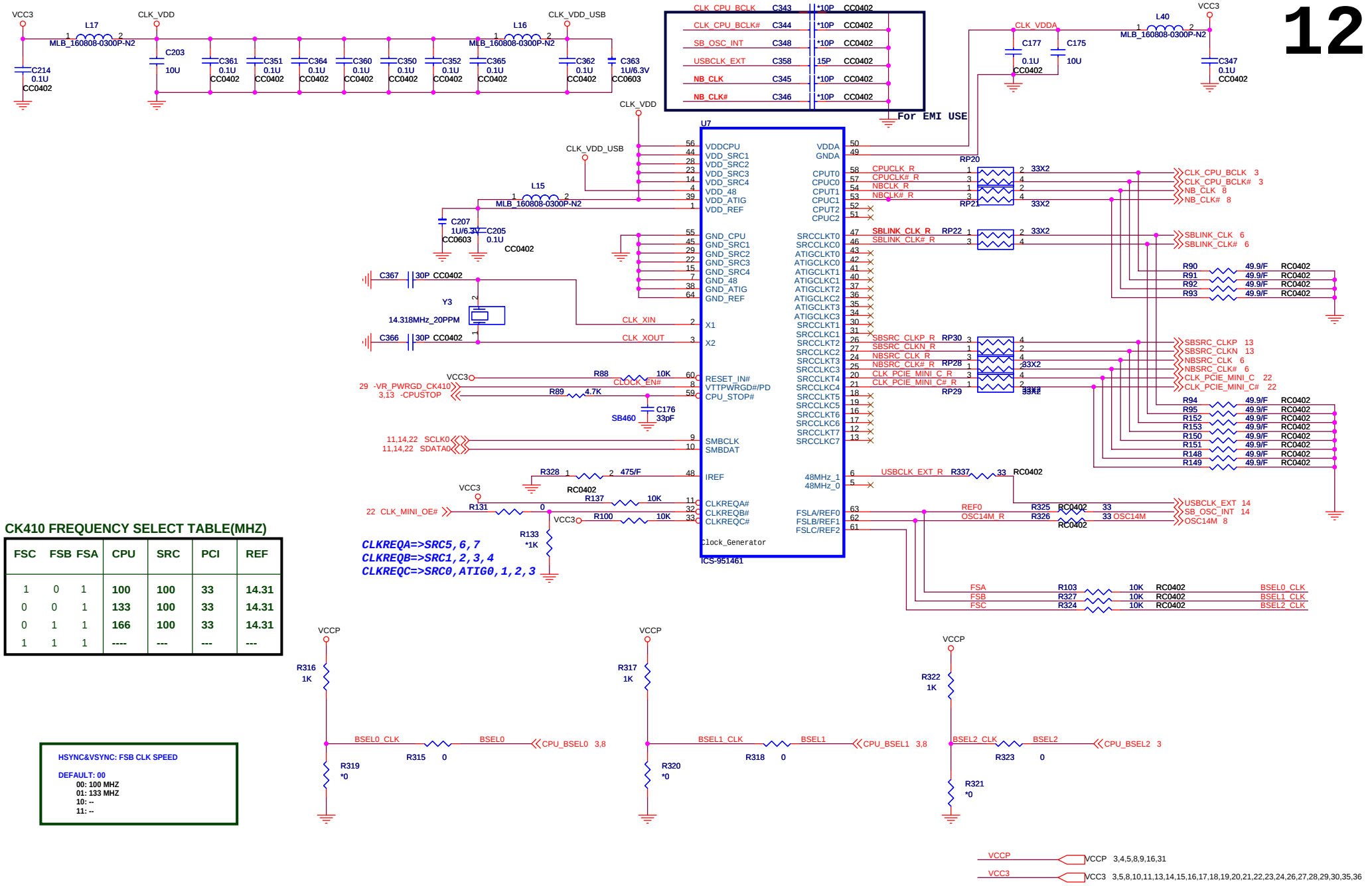


QUANTA

COMPUTER

Title CRT/TV OUT PORT		
Size B	Document Number AK2(U10) Main Board	Rev 1A
Date: Wednesday, November 29, 2006	Sheet	10 of 37





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: --

SB460 is 0.01uf
SB600 is 0.1uf

PLACE THESE PCIE AC DECOUPLING CAPS CLOSE TO THE U22

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

C381 AND C383 CLOS
THE BALL U29 OF U22

PLACE THESE COMPONENTS CLOSE TO U19, AND

NEEDED FOR

NEEDED FOR
SB460 ONLY

NEEDED FOR
SB460 ONLY

FOR SB460, THE BALL IS LDRQ1 ONLY
FOR SB460, THE BALL IS BMREQ# ONLY

ATI recommended to change S5 power to ensure a clean reset during bootup.

NEEDED FOR
SB460 ONLY

SB600 SB 23x23mm Part 4 of 4

ACPI / WAKE UP EVENTS

USB INTERFACE

USB PWR

USB OC

GPIO

OSC / RST

BALLS(C6 AND C5) ARE FOR SB600 ONLY (NC FOR SB460)

NEEDED FOR
SB460 ONLYNEEDED FOR
SB460 ONLY

SB460 ONLY

TEST POINT TP602 FOR
SB460_FANOUT0NEEDED FOR
SB460 ONLYUSB3 MINI-PCIE
USB2 USB2
USB1 USB1
USB0 USB0AVDDTX AND AVDDR3 DO NOT
NEED TO SEPARATE IN REAL
DESIGN. HERE JUST FOR CURRENT
MEASUREMENT.PLACE C446 AND
C448 CLOSE TO
U22

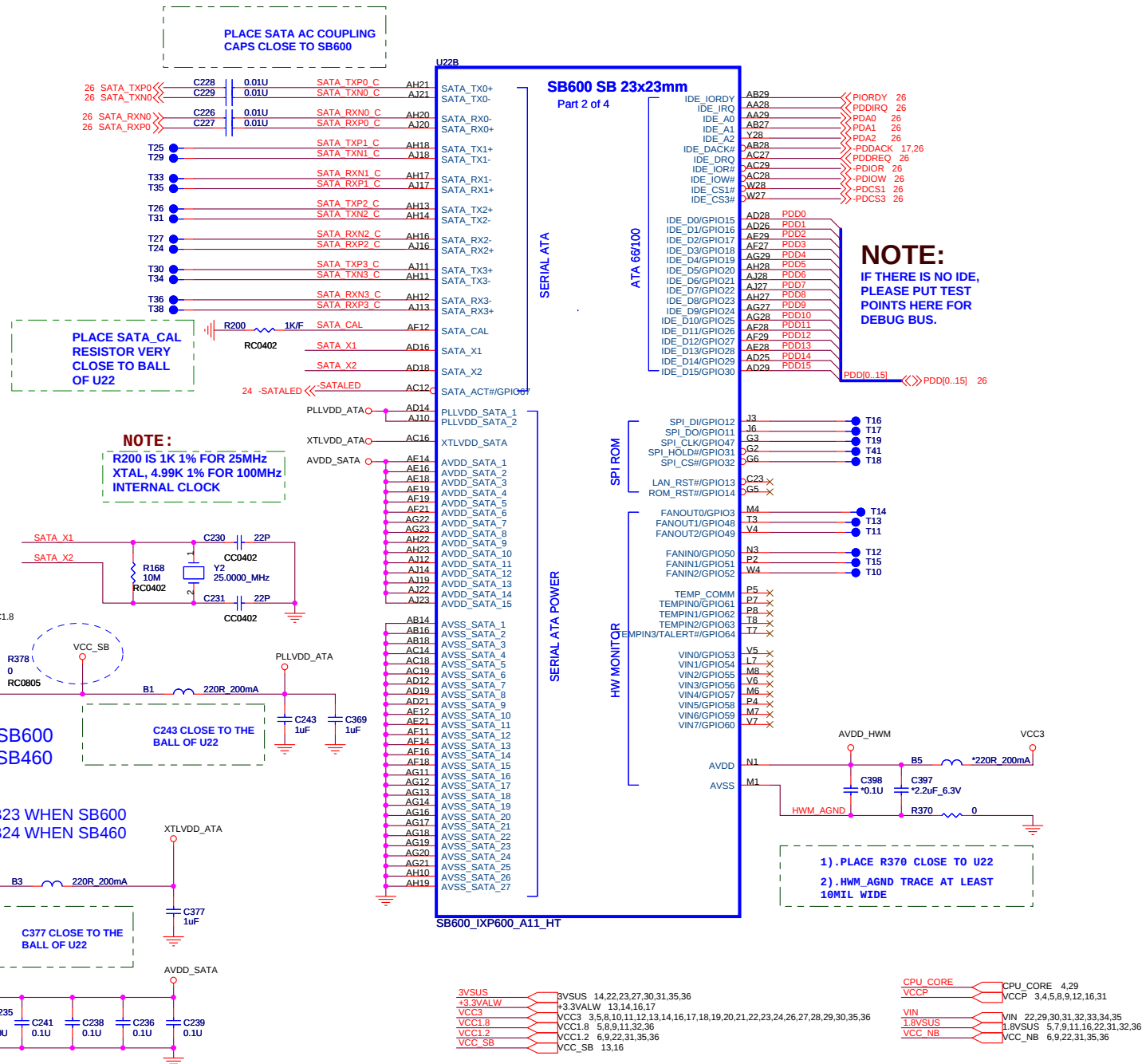
SB600 ONLY

QUANTA
COMPUTER

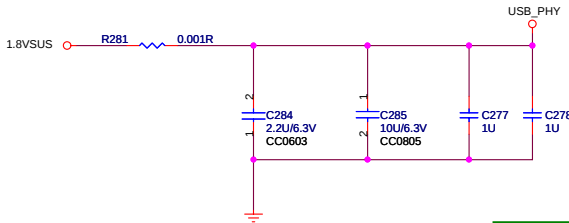
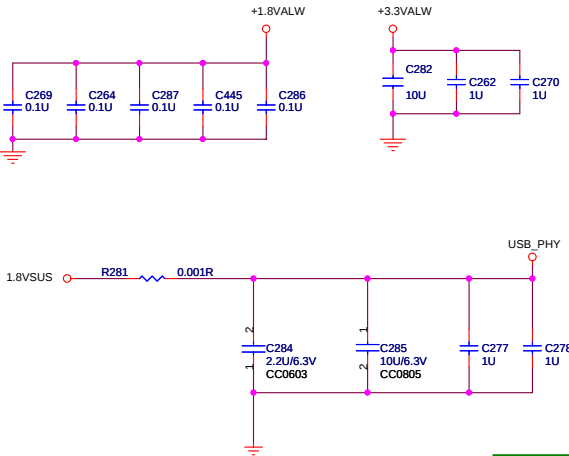
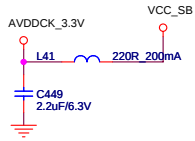
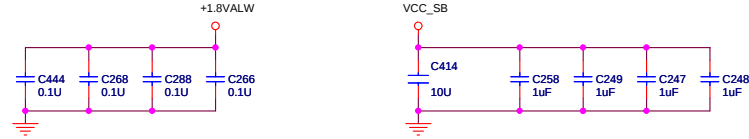
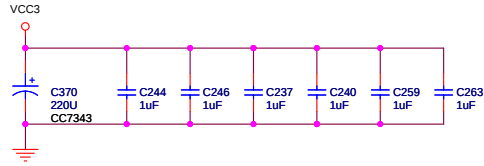
SB460-ACPI/GPIO/USB/AC97 -2

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

Date: Wednesday, November 29, 2006 Sheet 14 of 37

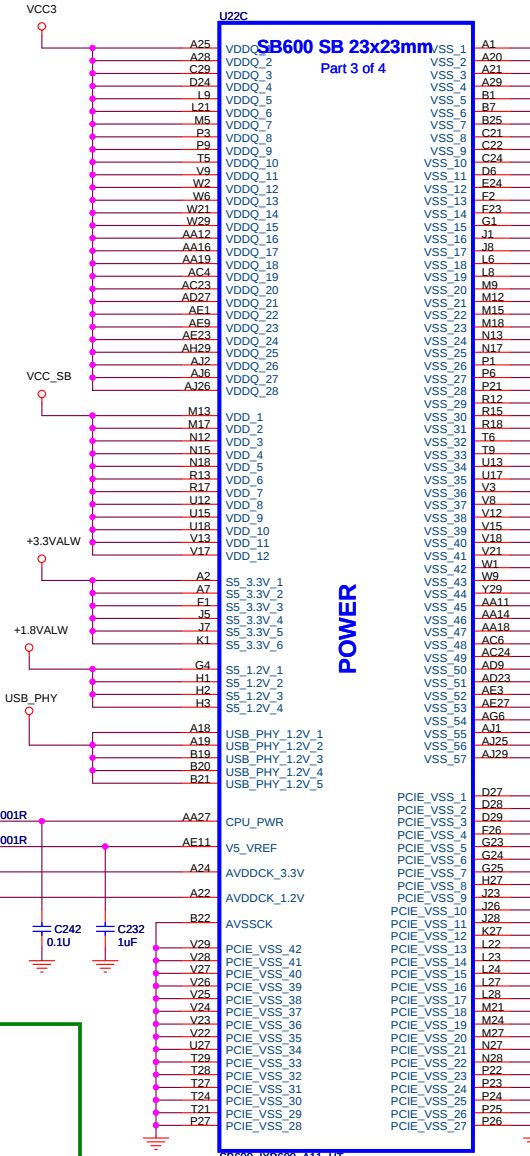
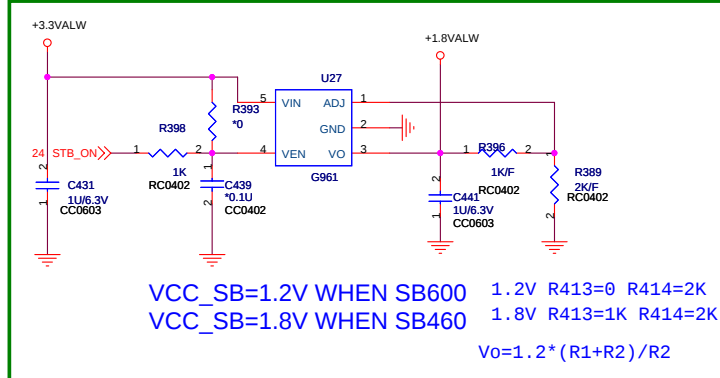
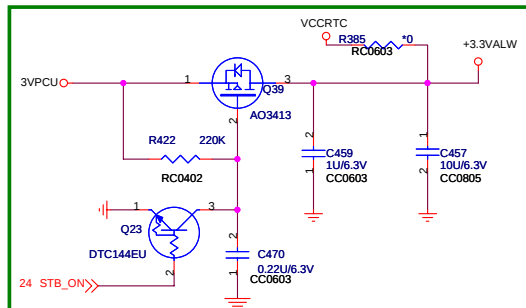
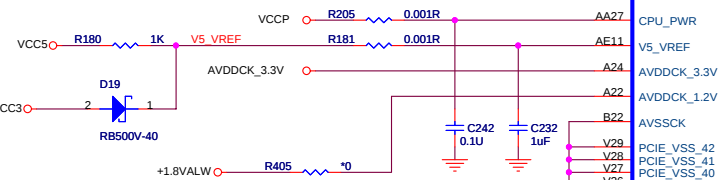


PLACE ALL THE DECOUPLING CAPS ON THIS SHEET CLOSE TO SB AS POSSIBLE.



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

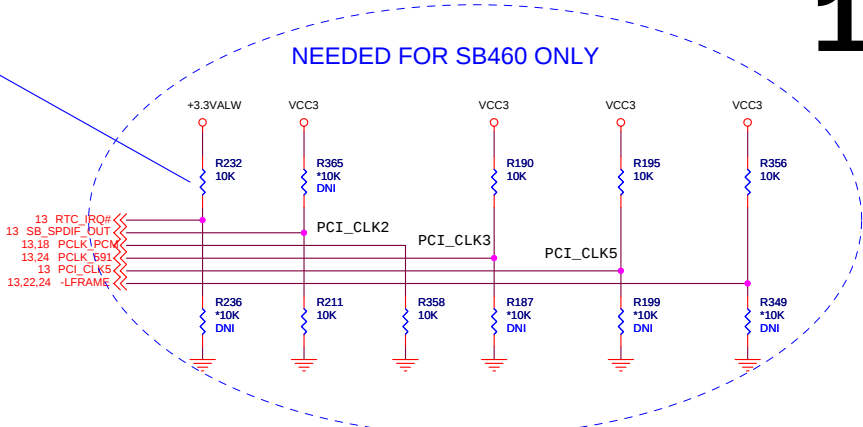
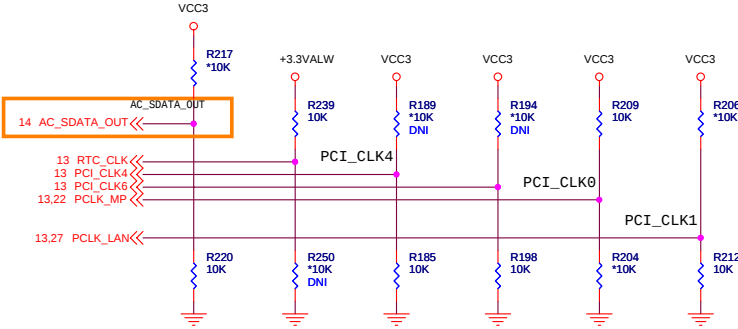
3VPCU 14,22,24,25,29,30,32,34
+3.3VALW 13,14,17
VCC3 3,5,8,10,11,12,13,14,15,17,18,19,20,21,22,23,24,26,27,28,29,30,31,32,33,34,35,36,37,38,39,40,41,42,43,44,45,46,47,48,49,50,51,52,53,54,55,56,57,58,59,60,61,62,63,64,65,66,67,68,69,70,71,72,73,74,75,76,77,78,79,80,81,82,83,84,85,86,87,88,89,90,91,92,93,94,95,96,97,98,99,100
VCC5 3,8,10,18,19,20,21,22,23,24,25,26,30,36
VCC_SB 13,15



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.

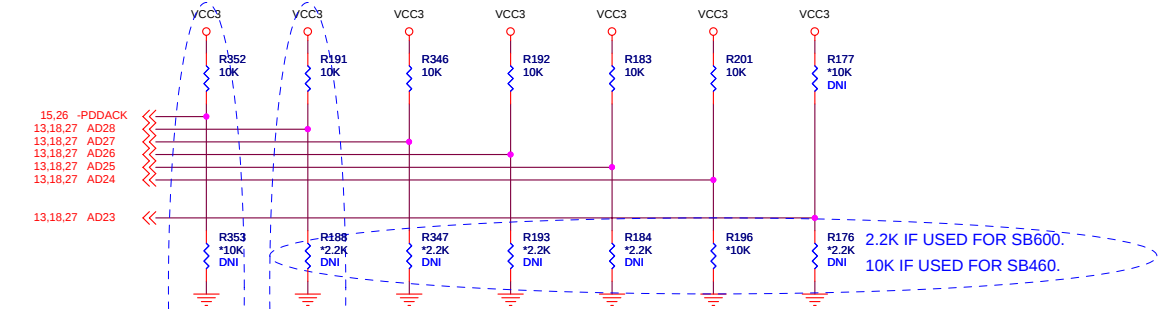


	SB600				SB460	
	AC_SDOUT	RTC_CLK	PCI_CLK4	PCI_CLK6	PCI_CLK0	PCI_CLK1
PULL HIGH	USE DEBUG STRAPS	INTERNAL RTC	USE INT. PLL48	CPU IF=K8	ROM TYPE: H, H = PCI ROM H, L = SPI ROM L, H = LPC ROM L, L = FWH ROM	ROM TYPE: H, H = PCI ROM H, L = LPC I ROM L, H = LPC II ROM L, L = FWH ROM
PULL LOW	IGNORE DEBUG STRAPS	EXTERNAL RTC	USE EXT. 48MHZ	CPU IF=P4	DEFAULT	NOTE: FOR SB460, PCICLK[8:7] ARE CONNECTED TO SUBSTRATE BALLS PCICLK[1:0]

	ACPWRON	SPDIF_OUT	PCI_CLK2	PCI_CLK3	PCI_CLK5	LFRAME#
PULL HIGH	MANUAL PWR ON	SIO 24MHz	XTAL MODE	USB PHY POWERDOWN DISABLE	Auto detection ALink PCIE lanes	ENABLE THERMTRIP#
PULL LOW	AUTO PWR ON	SIO 48MHz	48MHZ OSC MODE	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	USE LONG RESET	USE PCI PLL	USE ACPI BCLK	USE IDE PLL	USE DEFAULT PCIE STRAPS	BOOTFAILTIMER DISABLED
PULL LOW	USE SHORT RESET	USE SHORT RESET	BYPASS PCI PLL	BYPASS ACPI BCLK	BYPASS IDE PLL	USE EEPROM PCIE STRAPS	BOOTFAILTIMER ENABLED

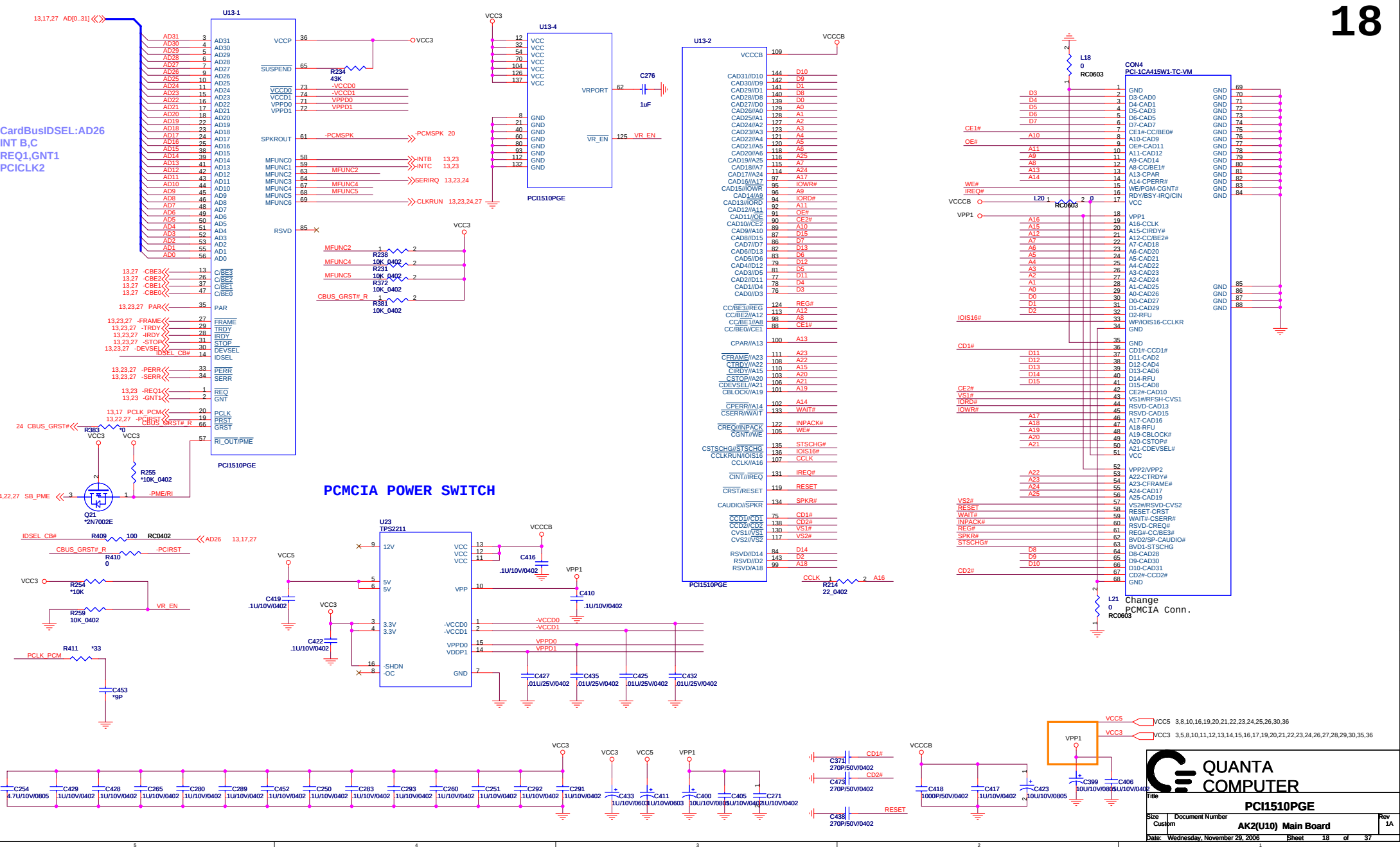
NEEDED FOR SB460 ONLY

NEEDED FOR SB600 ONLY

NOTE: FOR SB460, PCI_AD23 IS RESERVED

+3.3VALW VCC3

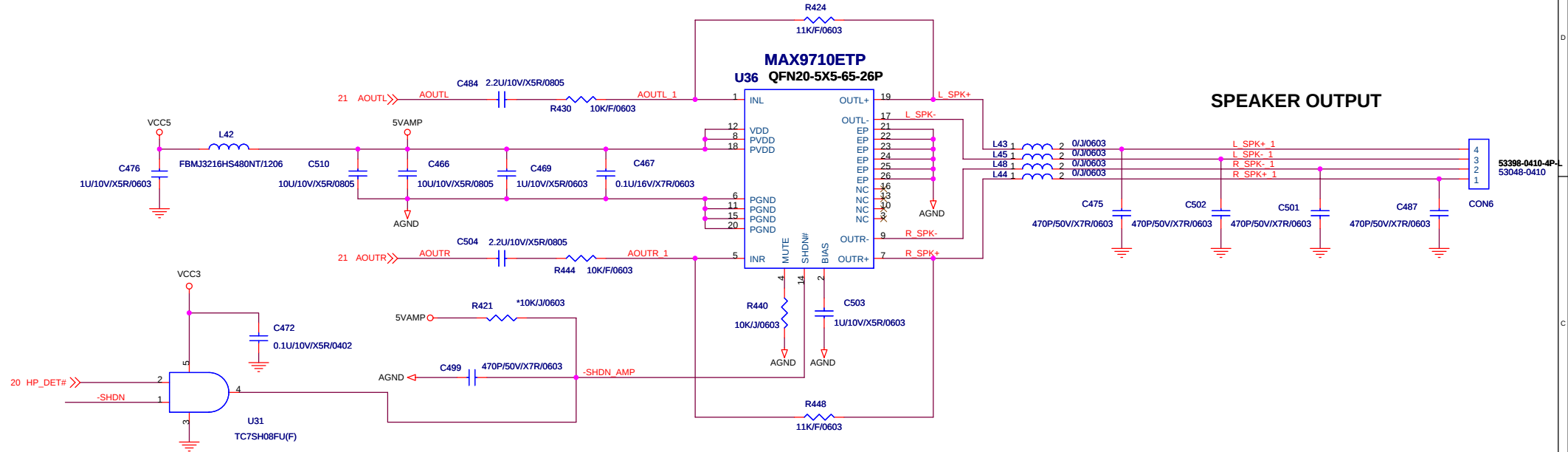
CardBusIDSEL:AD26
INT B,C
REQ1,GNT1
PCICLK2



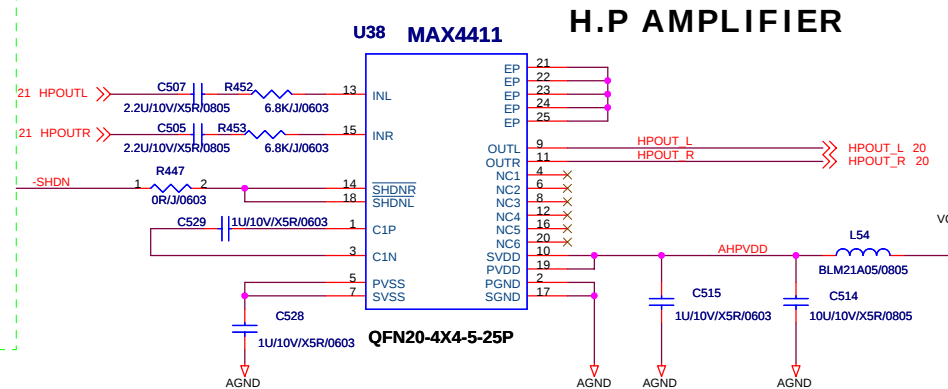
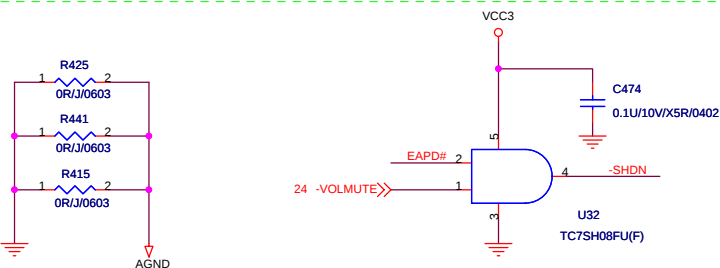
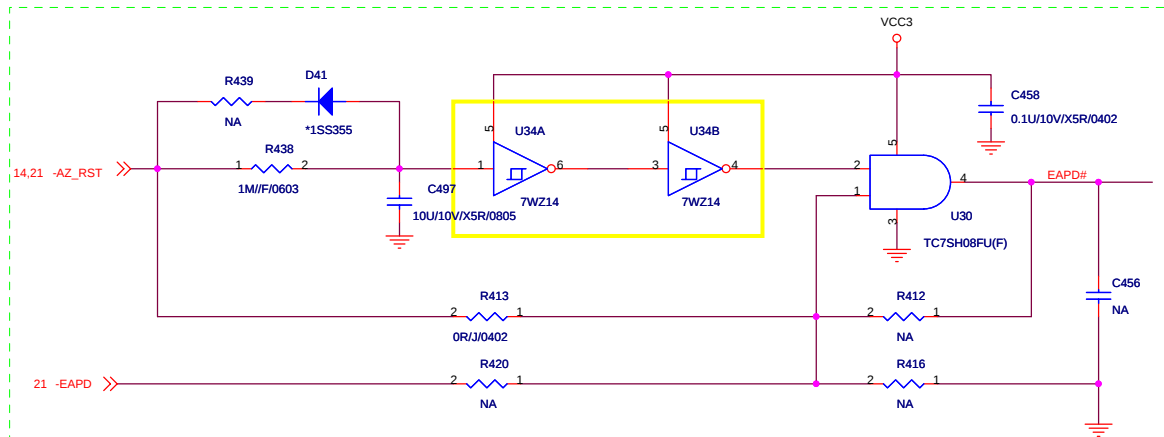


**QUANTA
COMPUTER**

PCI1510PGE			
Size	Document Number	AK2(U10) Main Board	Rev 1A
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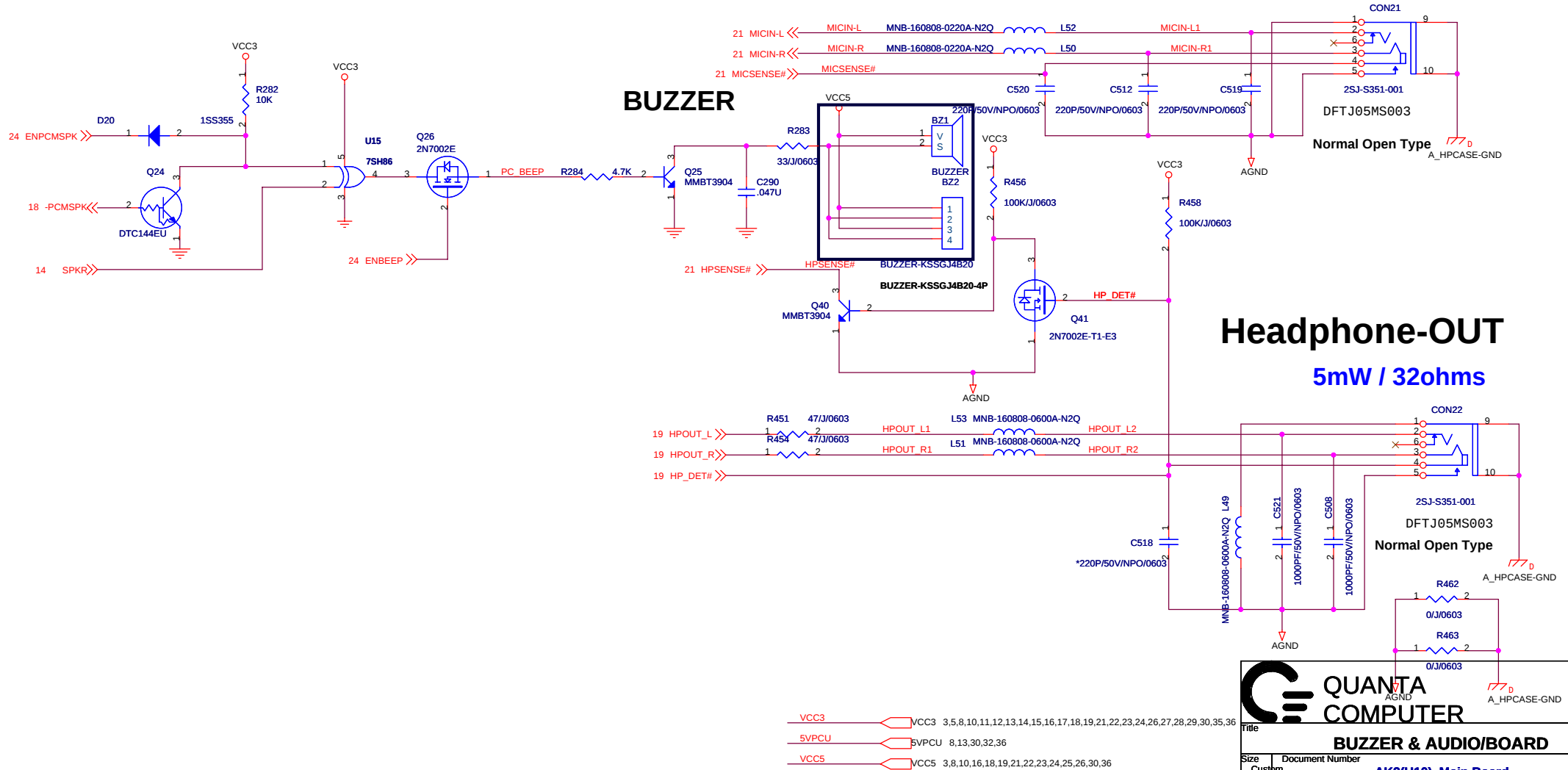


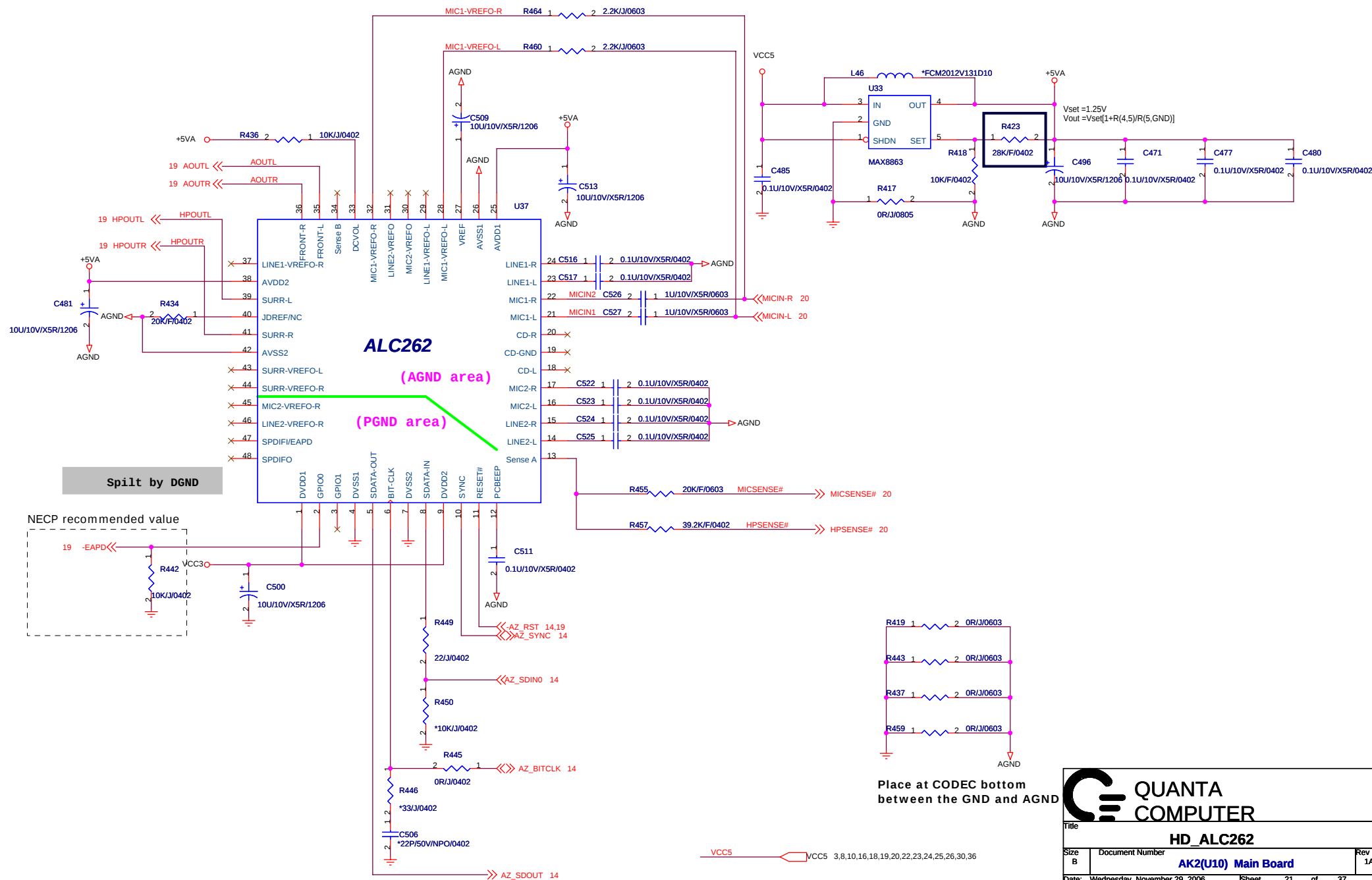
NECP recommend EAPD Control circuit for Vista

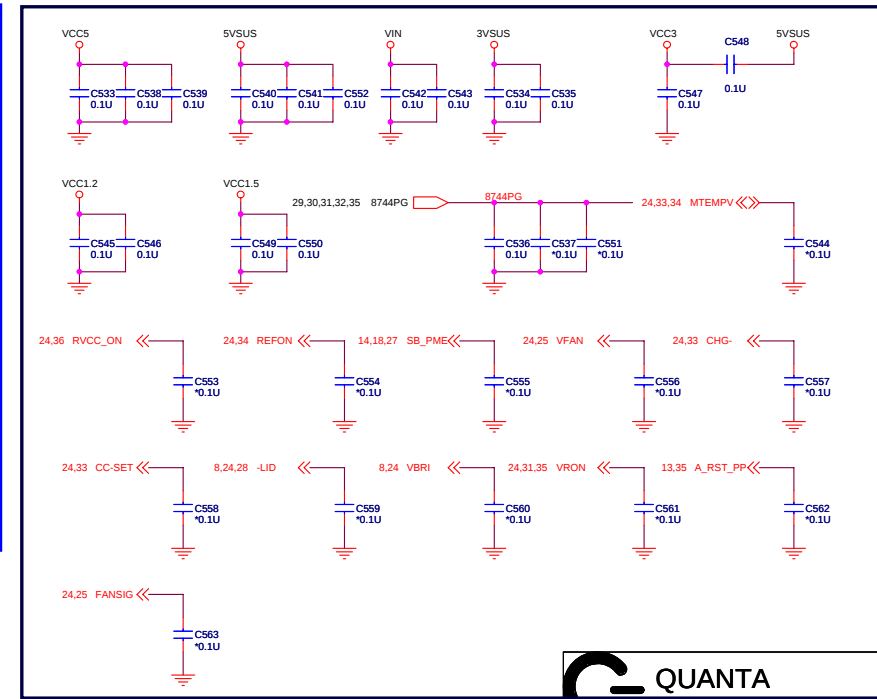
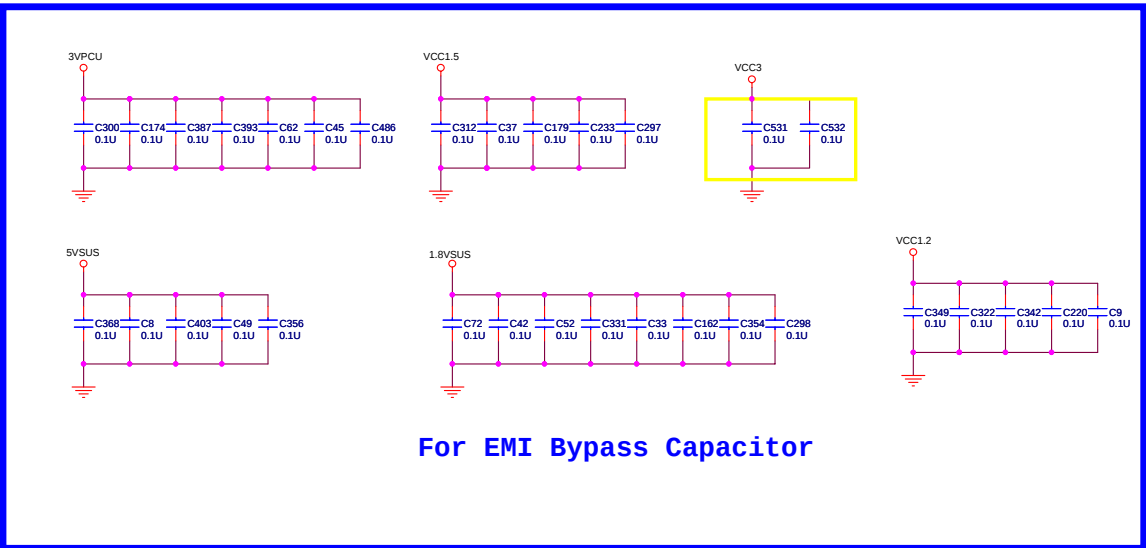
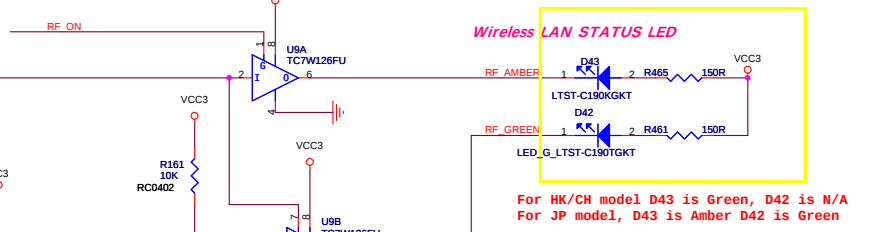
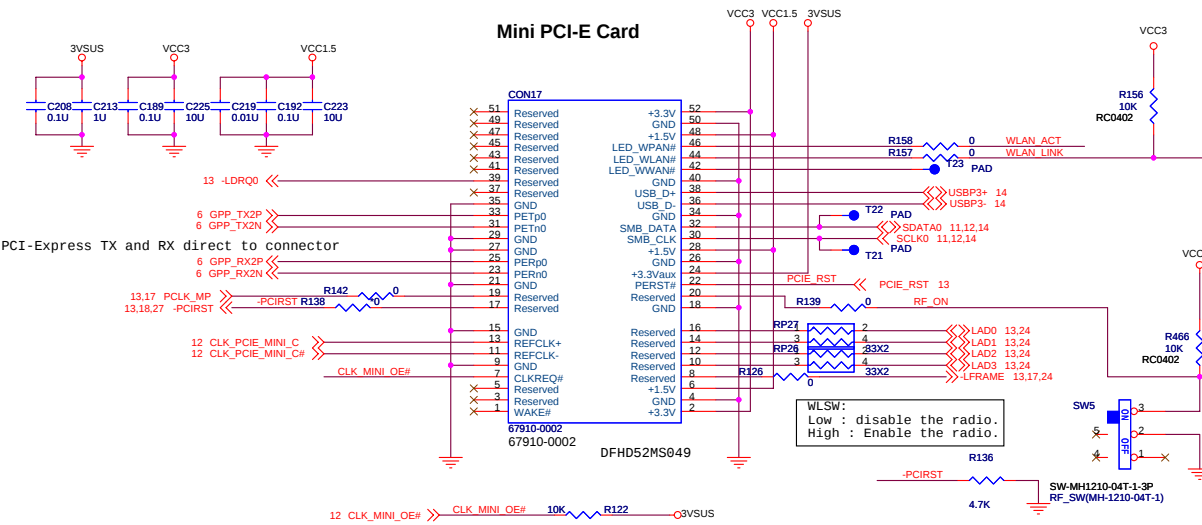


MIC-IN

Max. 100mVrms input for Mic-IN



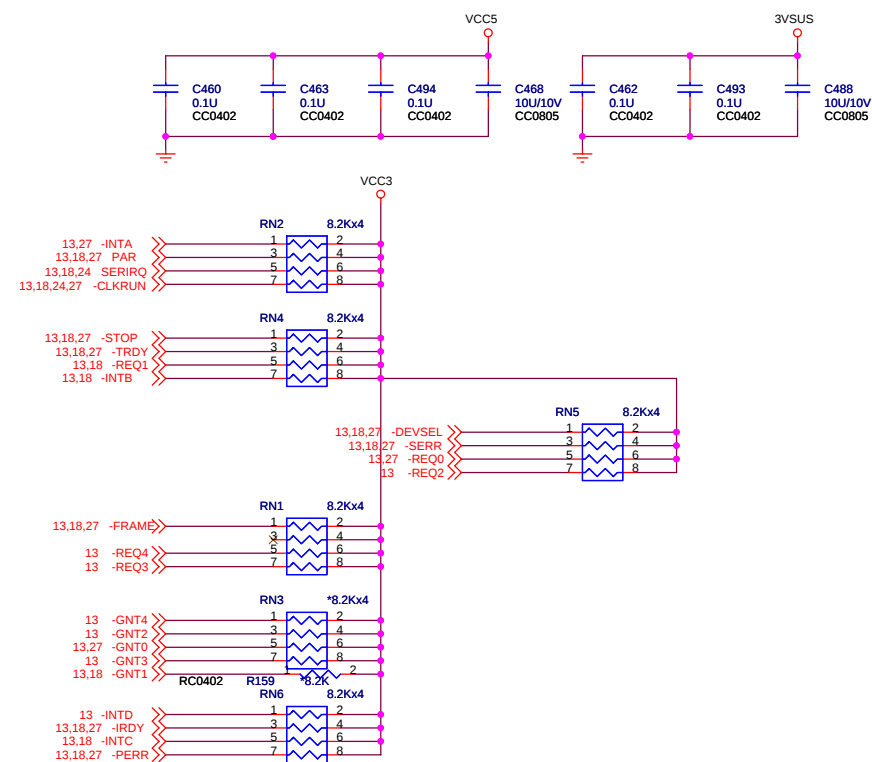
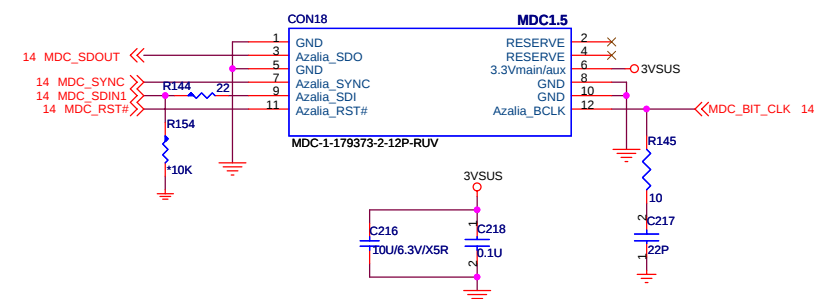




VCC3	VCC3	3.5,8,10,11,12,13,14,15,16,17,18,19,20,21,23,24,26,27,28,29,30,35,36
3VSUS	3VSUS	14,23,27,30,31,35,36
VCC1.5	VCC1.5	4,31,36

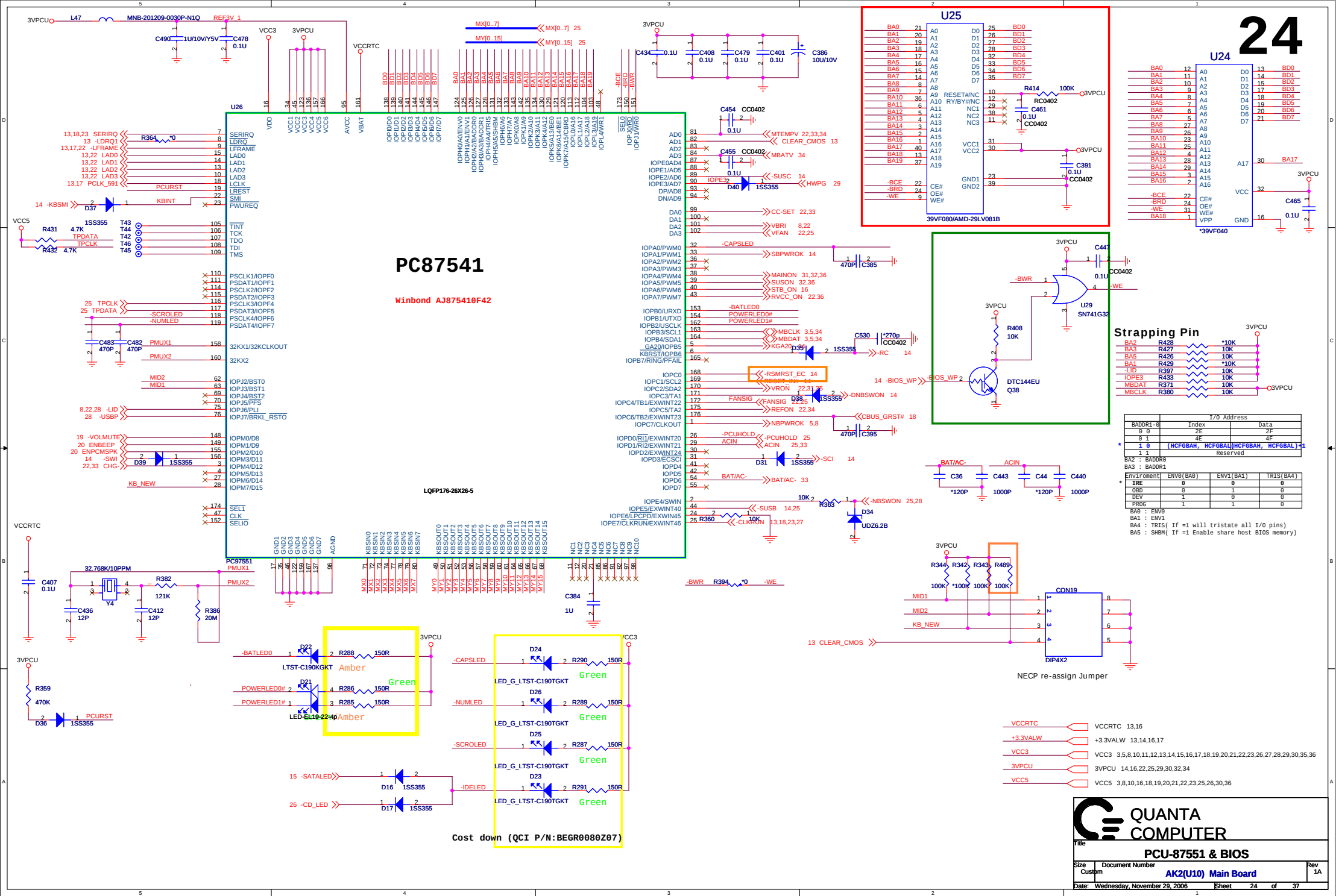
For JP model don't have HD_MDC

HD_MDC

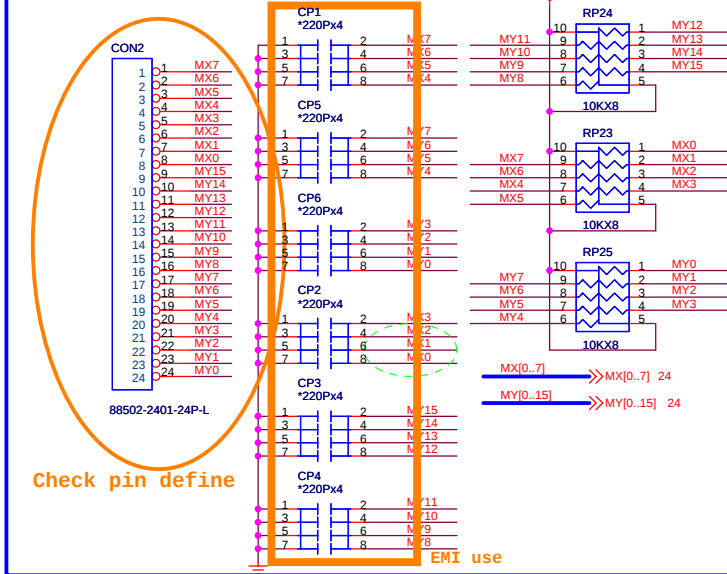


VCC3	VCC3 3,5,8,10,11,12,13,14,15,16,17,18,19,20,21,22,24,26,27,28,29,30,35,36
3VSUS	3VSUS 14,22,27,30,31,35,36
VCC5	VCC5 3,8,10,16,18,19,20,21,22,24,25,26,30,36

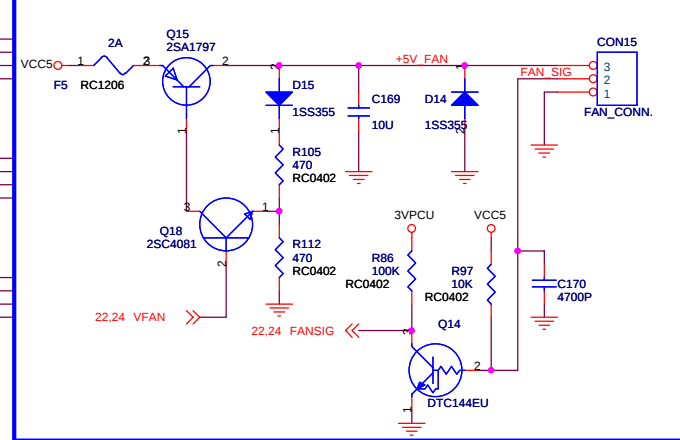
		QUANTA COMPUTER					
06	Title						
MINI PCI & HD_MDC							
Size	Document Number		AK2(U10) Main Board		Rev		
B					1.		
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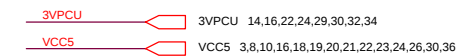
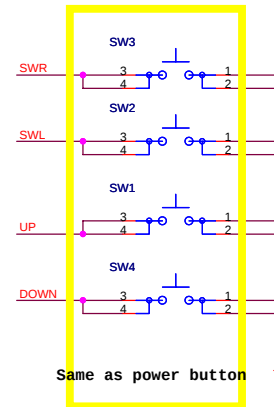
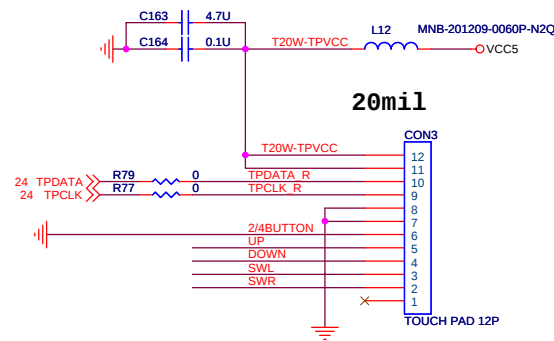
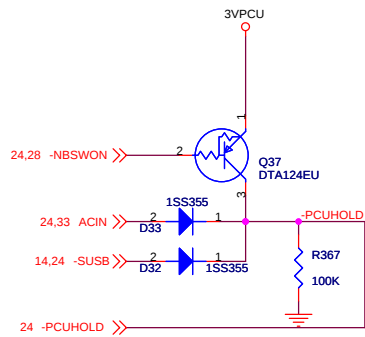
INT. KEYBOARD



FAN Circuit



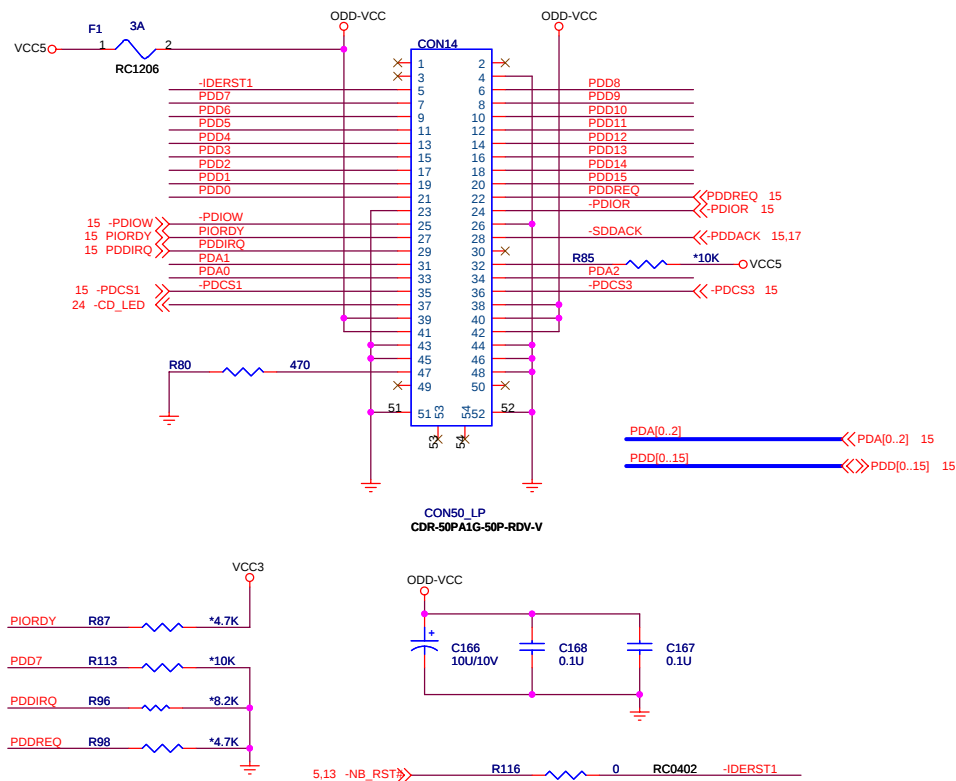
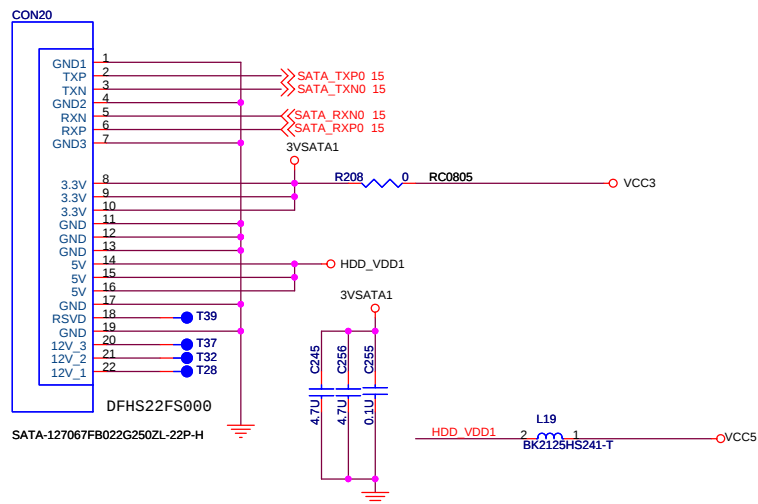
TOUCHPAD BOARD CON



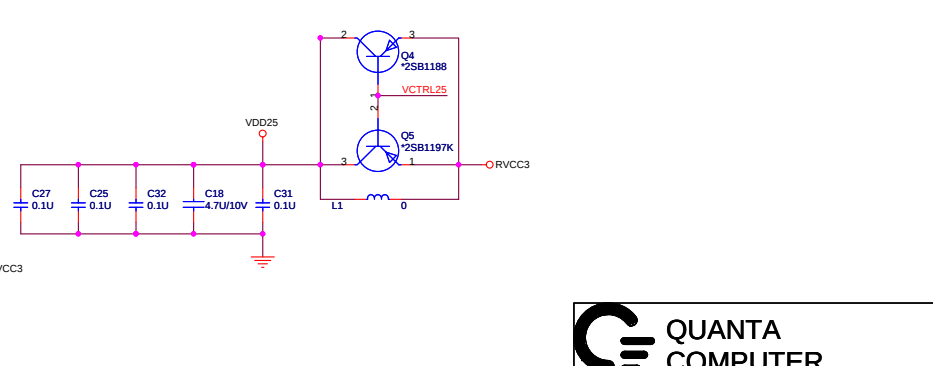
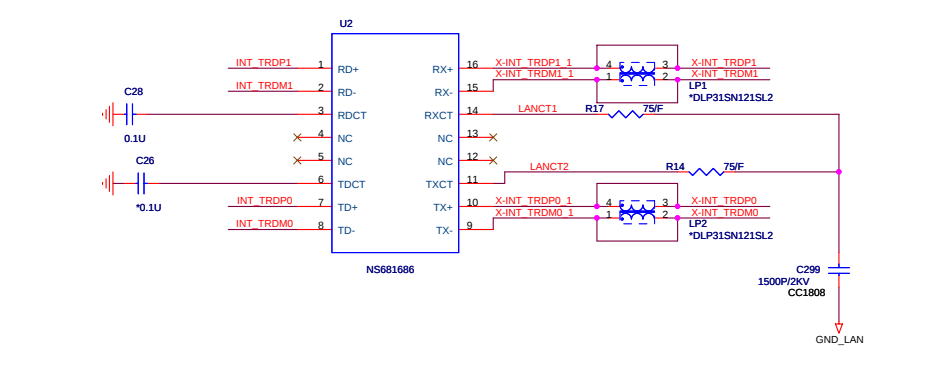
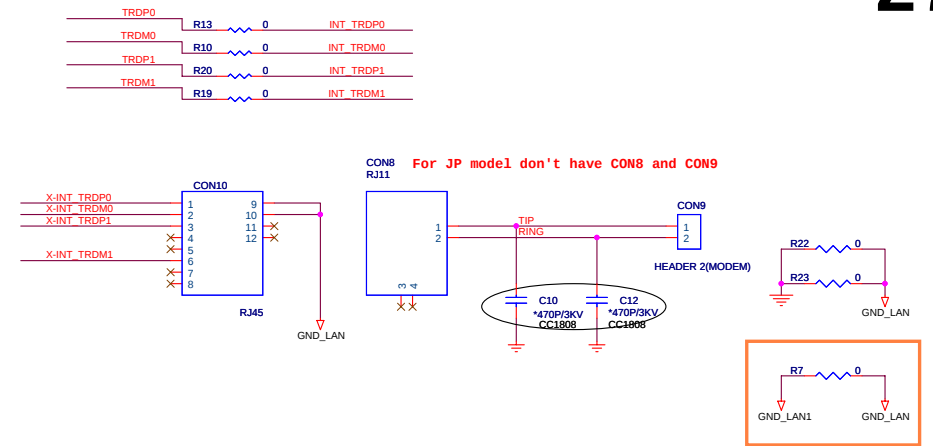
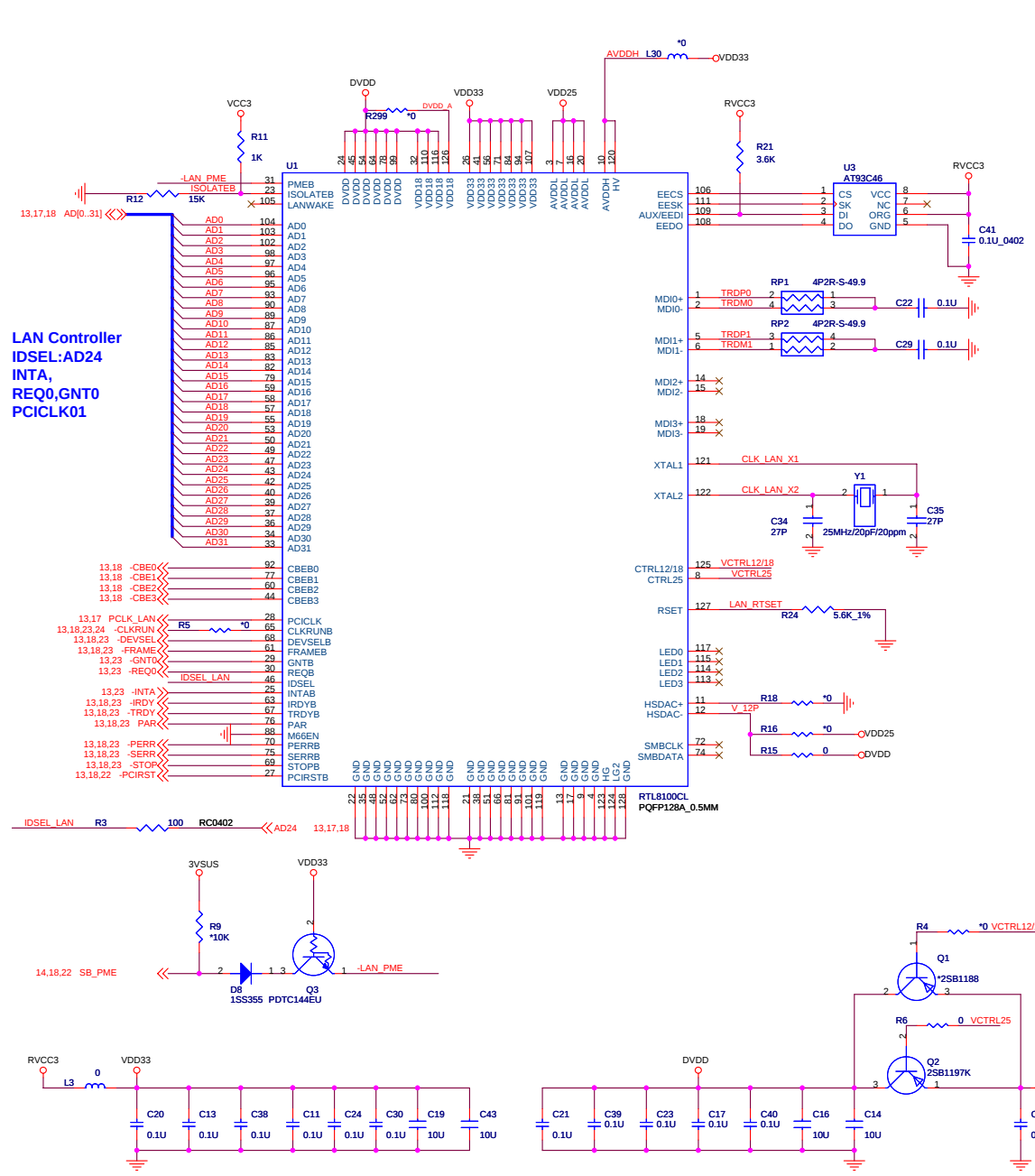
SATA_TOP(MASTER)

ODD Connector

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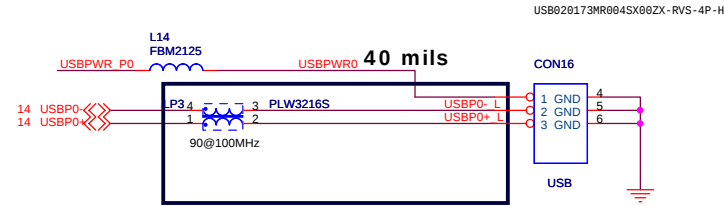
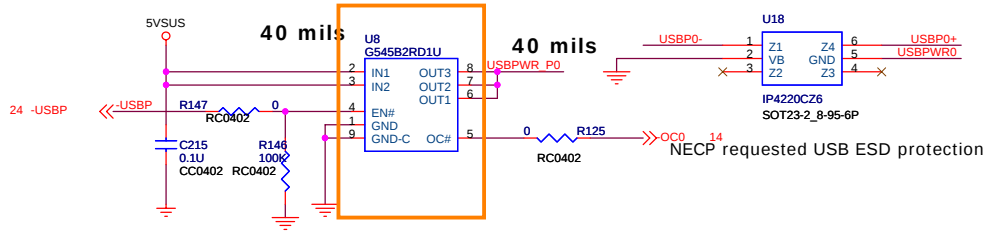
VCC3 VCC3 3,5,8,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,27,28,29,30,35,36
VCC5 VCC5 3,8,10,16,18,19,20,21,22,23,24,25,30,36



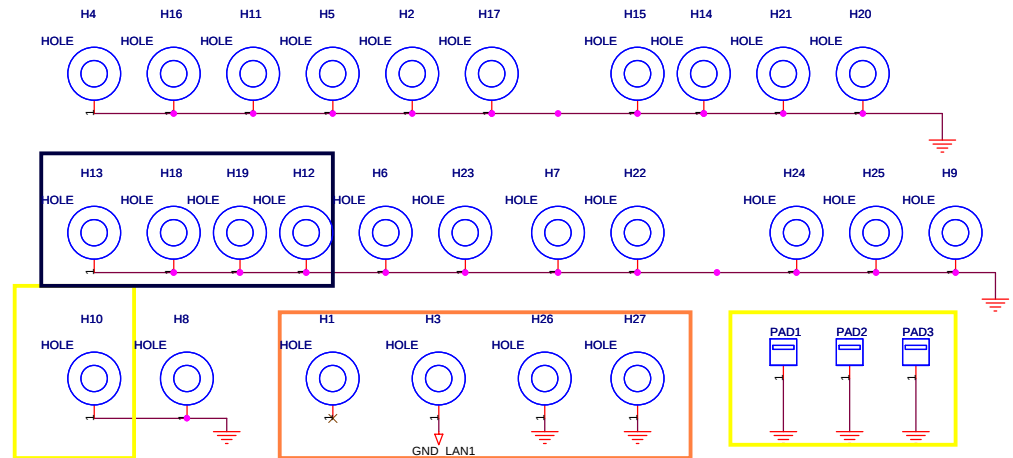
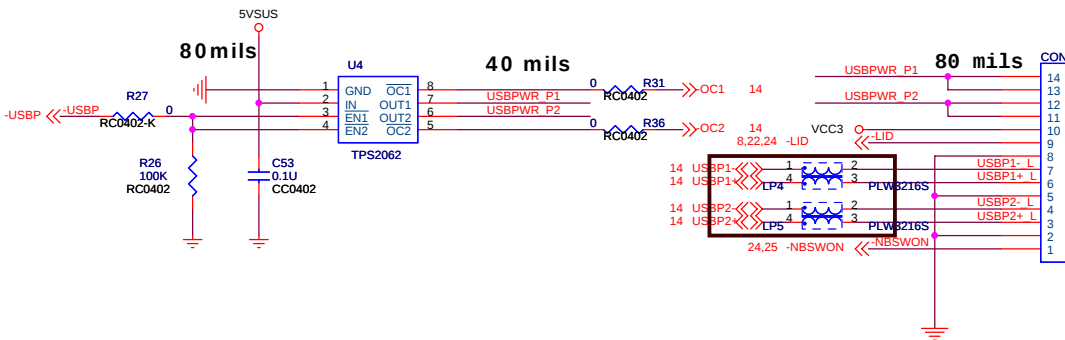
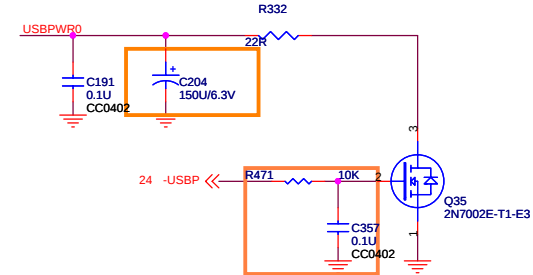
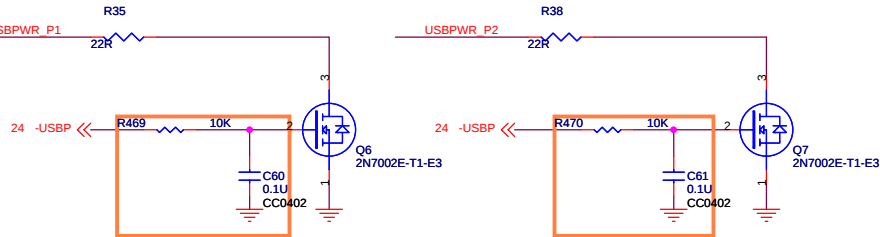
USB Power and Over current

USB Connector

28



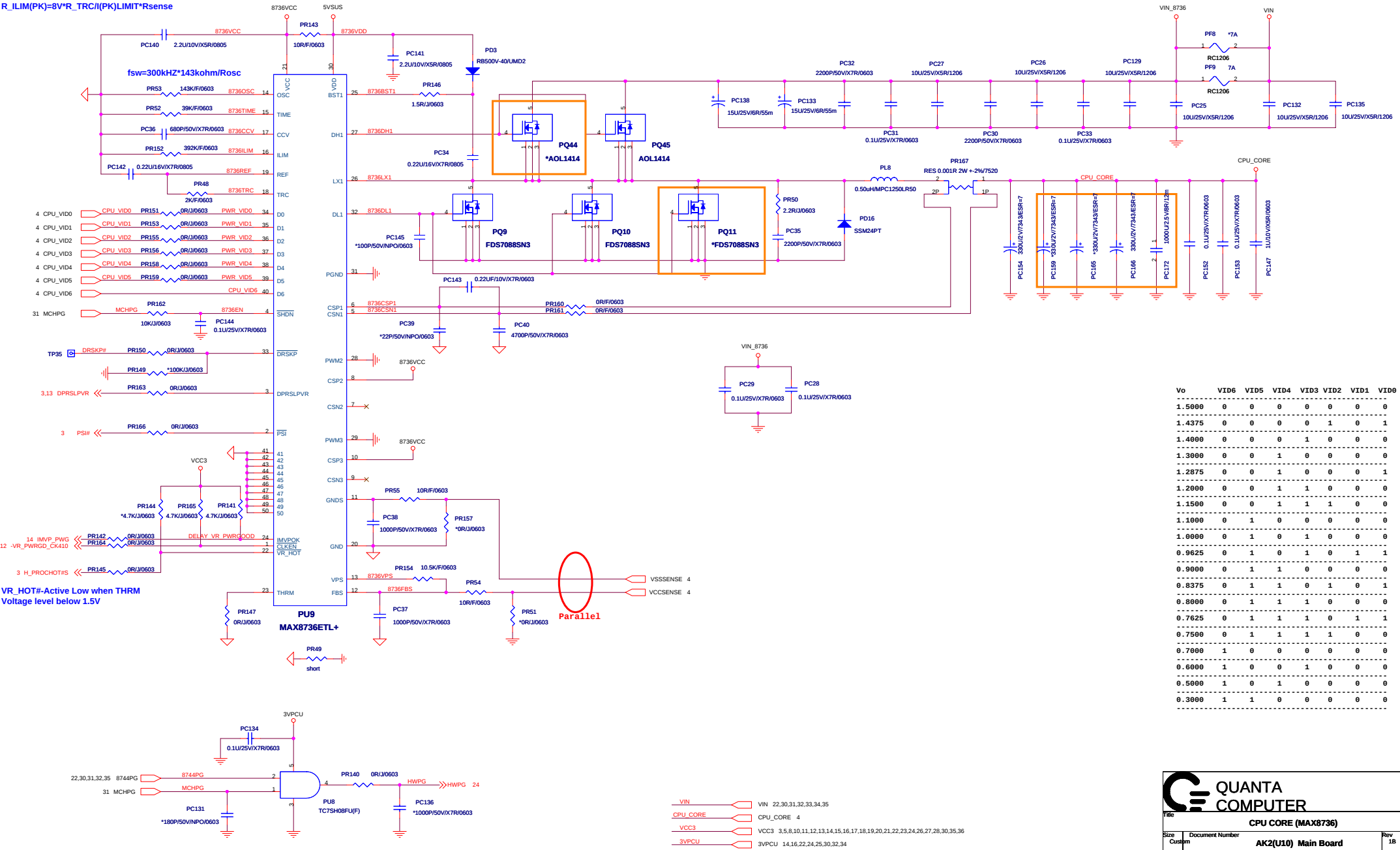
USB POWER DISCHARGE CIRCUIT



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

dV_Target/dt=12.5mV/us*71.5kohm/R_TIME
R_ILIM(PK)=8V*R_TRC/I(PK)LIMIT*Rsense



Vo	VID6	VID5	VID4	VID3	VID2	VID1	VID0
1.5000	0	0	0	0	0	0	0
1.4375	0	0	0	0	1	0	1
1.4000	0	0	0	1	0	0	0
1.3000	0	0	1	0	0	0	0
1.2875	0	0	1	0	0	0	1
1.2000	0	0	1	1	0	0	0
1.1500	0	0	1	1	1	0	0
1.1000	0	1	0	0	0	0	0
1.0000	0	1	0	1	0	0	0
0.9625	0	1	0	1	0	1	1
0.9000	0	1	1	0	0	0	0
0.8375	0	1	1	0	1	0	1
0.8000	0	1	1	1	0	0	0
0.7625	0	1	1	1	0	1	1
0.7500	0	1	1	1	1	0	0
0.7000	1	0	0	0	0	0	0
0.6000	1	0	0	1	0	0	0
0.5000	1	0	1	0	0	0	0
0.3000	1	1	0	0	0	0	0

QUANTA

COMPUTER

Part

CPU CORE (MAX8736)

Size

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Rev

Custom

AK2(U10) Main Board

1B

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Sheet

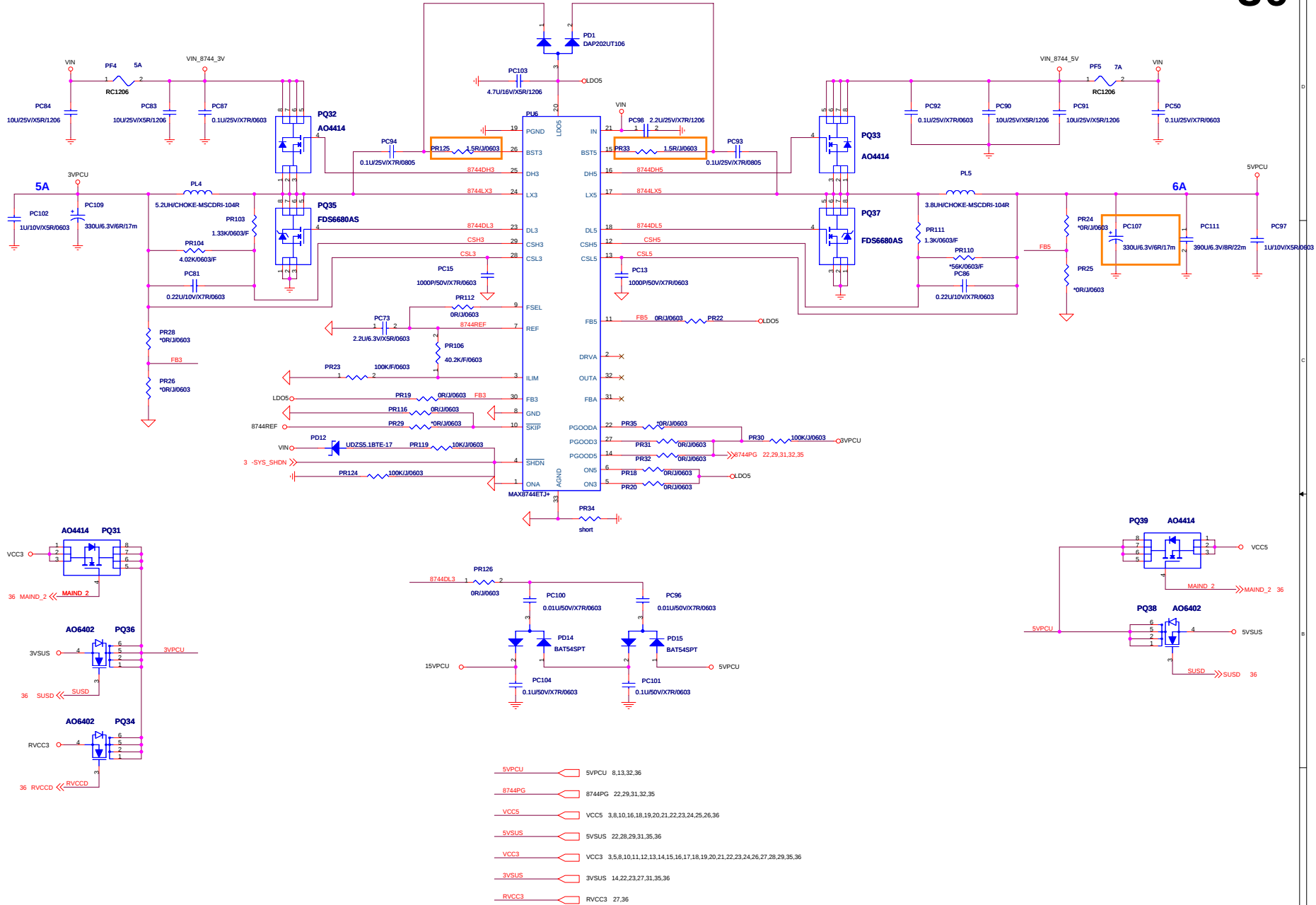
29

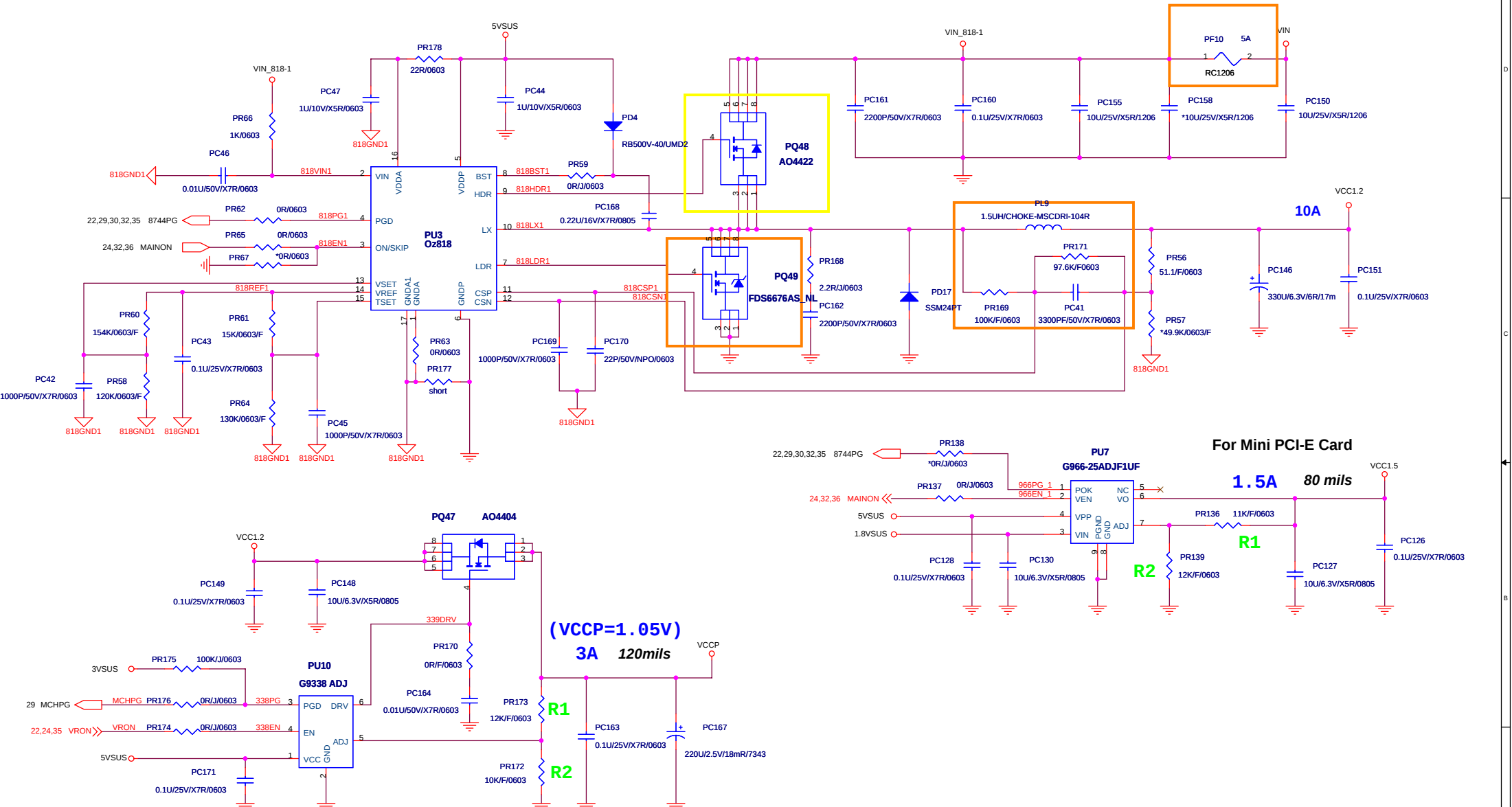
of

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DC/DC 3.3V&5V POWER

30



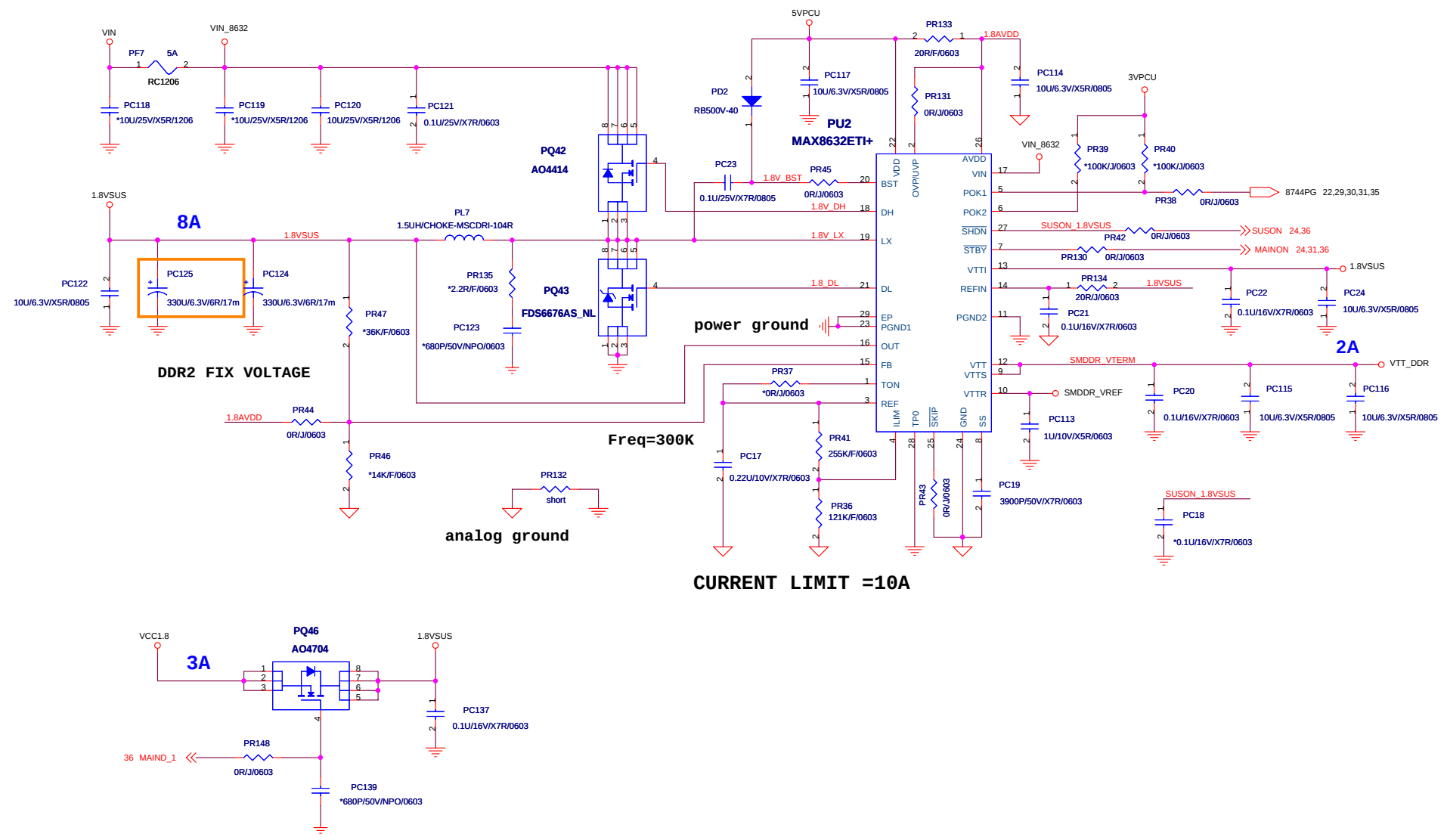


$$V_o = 0.5 * (1 + R1/R2)$$

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

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

1.8VSUS & VTERM(DDR2)



- 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



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COMPUTER

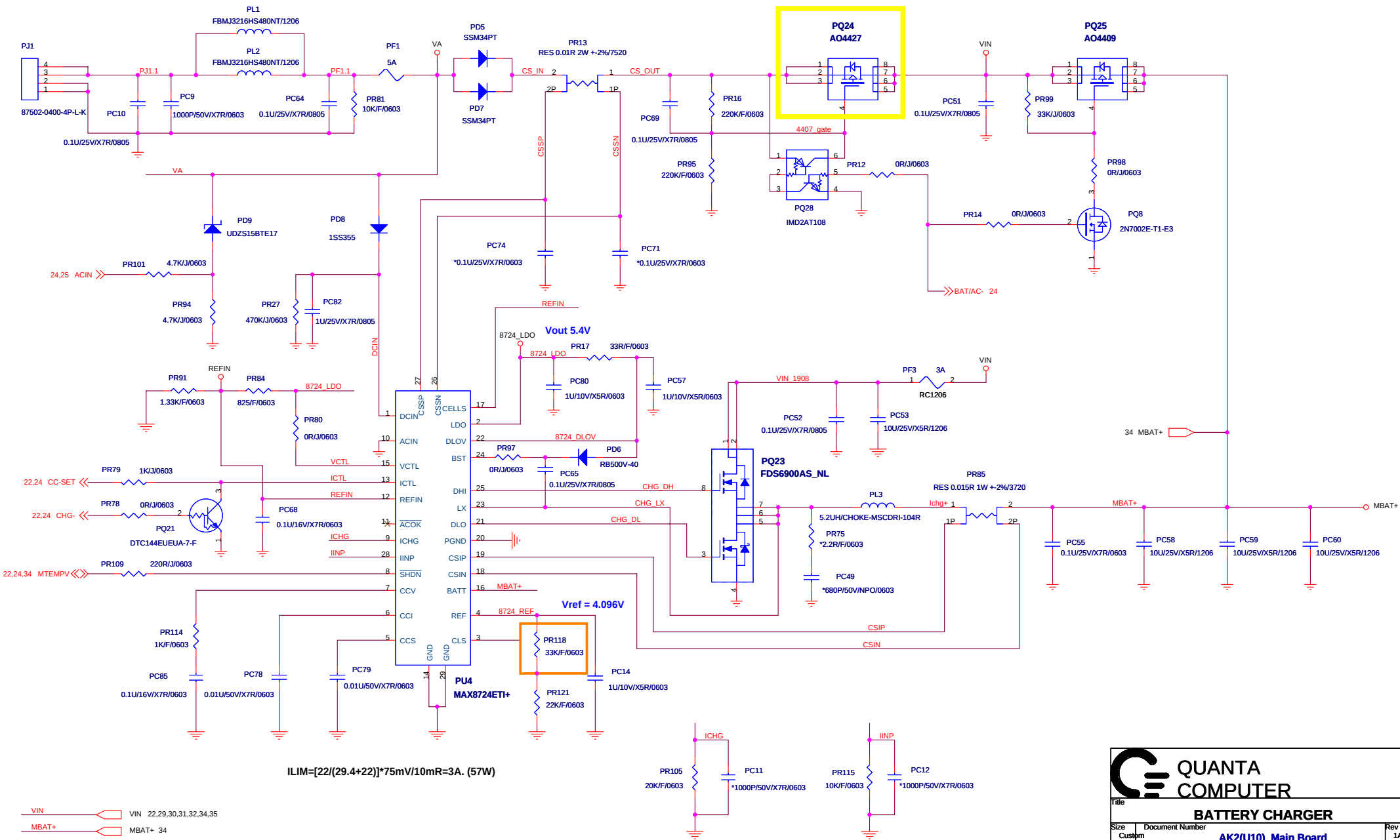
Title

1.8VSUS / DDRVTERM

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Battery Charger





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Title

BATTERY CHARGER

Size

Document Number

Rev

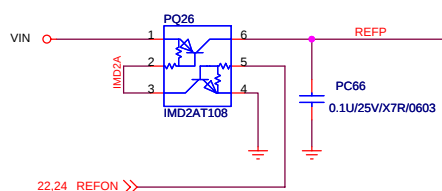
Custom

AK2(U10) Main Board

1A

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[illegible]

MTEMPV voltage :		
	System Off	System On
Battery	0V	1.6V
Adapter	3.3V	3.3V
Battery+Adapter	1.6V	1.6V

MBATV voltage :

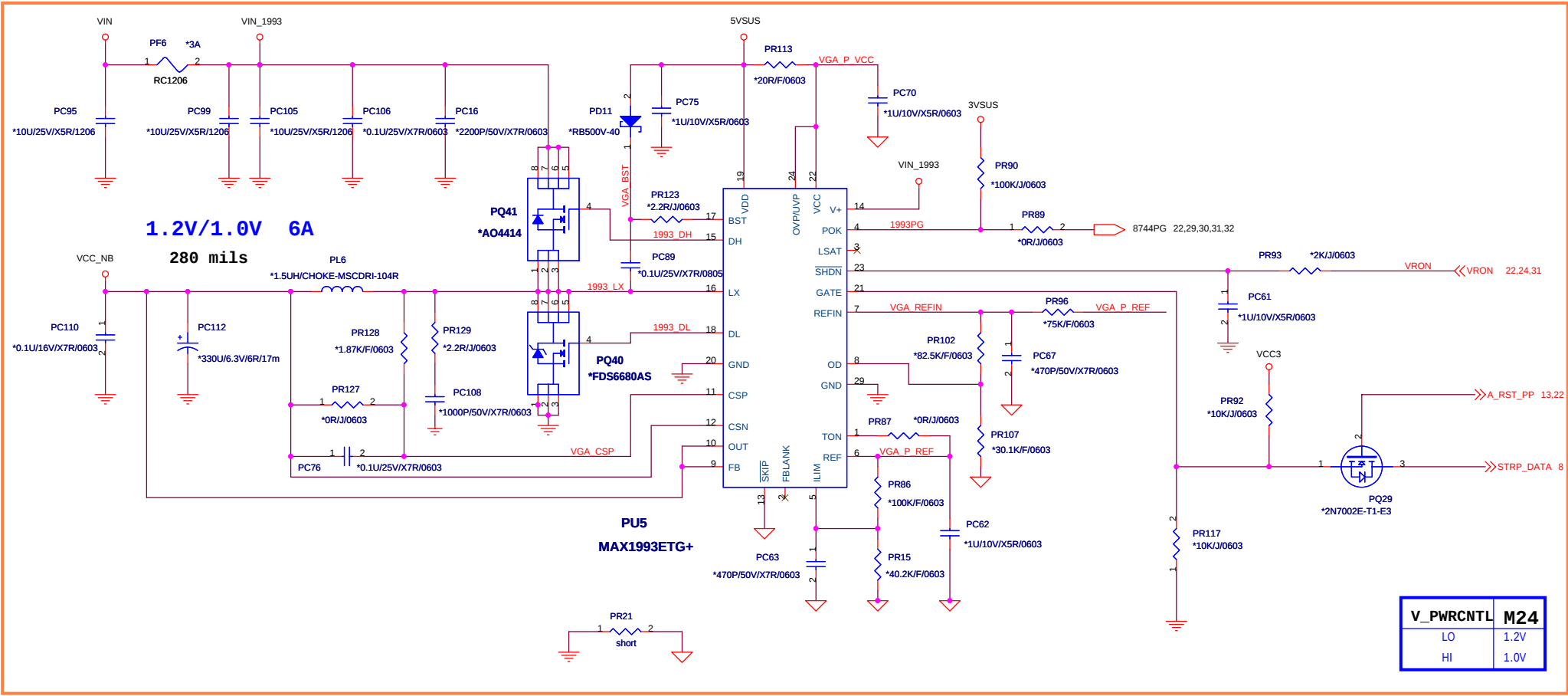
$$16.8V \cdot 40.2 / (200 + 40.2) = 2.812V$$

$$12.0V * 40.2 / (200 + 40.2) = 2.008V$$

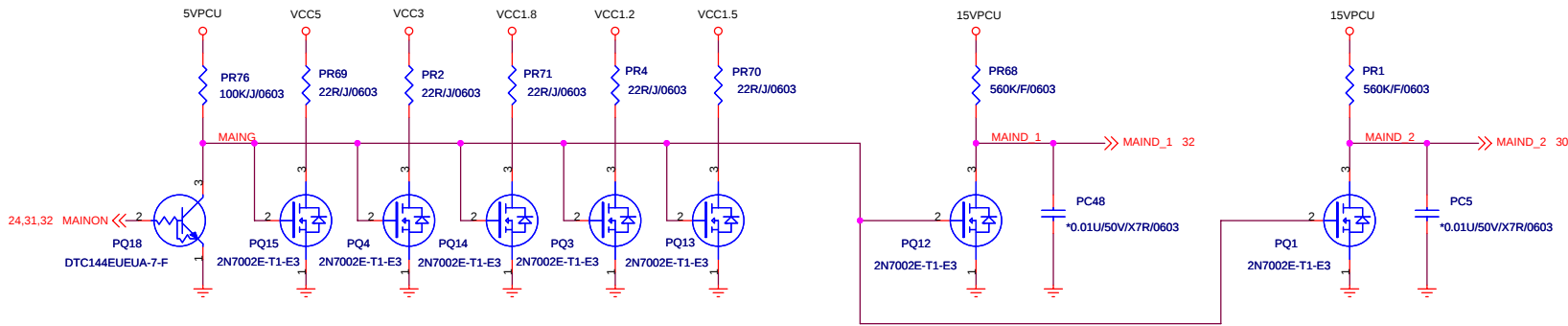
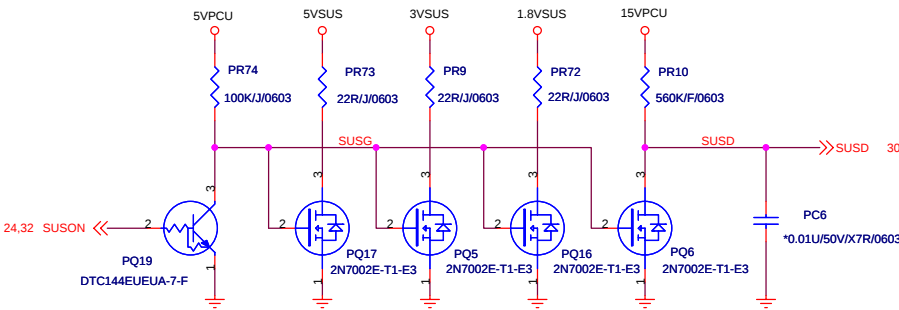
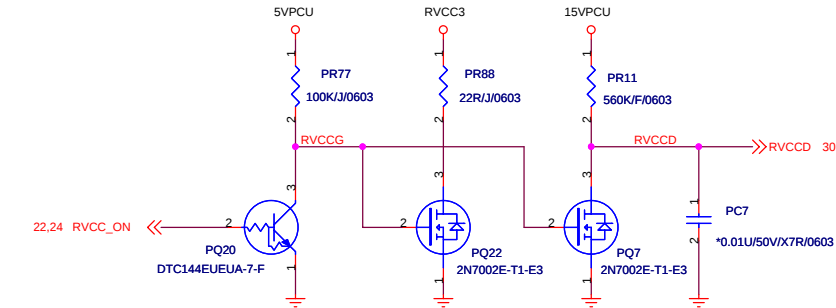
$$8.0V \cdot 40.2 / (200 + 40.2) = 1.34V$$

$$6.0V \cdot 40.2 / (200 + 40.2) = 1.004V$$

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



5VSUS 5VSUS 22,28,29,30,31,36
3VSUS 3VSUS 14,22,23,27,30,31,36
VIN VIN 22,29,30,31,32,33,34
VCC_NB VCC_NB 6,9,22,31,36



- 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 14,22,23,24,25,30,31,35
- 5VSUS 5VSUS 22,28,30,31,35
- RVCCD RVCCD 30
- SUSD SUSD 30
- MAIND_1 MAIND_1 32
- MAIND_2 MAIND_2 30



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COMPUTER

Title		
DISCHARGE		
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IRT Change list:
1.Page29: 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 PC173
7.Page21:change R423 to 28K
8.page22:Add C533-C563 for EMI