AK24 BIOCK DIAGRAM

01

Memory single channel

CPU
Yonah/Celeron
u-FCPGA 479PIN
PAGE 3,4

CPU Thermal Sensor PAGE 3

NB Thermal Sensor PAGE 5

FSB 533 MHZ

Battery → DC/DC & Charge PAGE 35

DC In → DC/DC & Charge PAGE 35

NB
ATI RC415MD
PAGE 5~9

SO-DIMM NORMAL PAGE 11

SO-DIMM NORMAL PAGE 11

DDR II CHANNEL
533 MHZ

CRT DDC2B → CRT PAGE 10 1x D-SUB 15-Pin

1x LVDS → LCD PAGE 08 1x SXGA+

PCI-E Interface → MINI PCI-E PAGE 24

4X PCI-E

SATA HDD PAGE 28

SATA<PORT0>

SB
ATI
SB600
PAGE 13~17

ODD PAGE 28

PATA 66/100MHz

USB 3x connector PAGE 30

USBX3<PORT0-2>

PCI BUS 33MHZ → CARDBUS R5C847 PAGE 18,19 → PC Card 1x type-I/II PAGE 19

CARDBUS → Media card PAGE 20

SPI ROM 1MB FLASH PAGE 26

PCU ITE 8512 PAGE 26

PCI BUS 33MHZ → 10/100BASE-T Realtek RTL8100CL PAGE 29 → RJ-45 PAGE 29

Azalia → HD_ AUDIO ALC262 Rev C2 PAGE 21

HD_ AUDIO → MAX4411 PAGE 22 → MIC-In Jack PAGE 23

HD_ AUDIO → MAX4411 PAGE 22 → HP-Out Jack PAGE 23

HD_ AUDIO → AMP MAX9710 PAGE 22 → Int. Speaker PAGE 22

Azalia → HD_MDC PAGE 25 → RJ-11 PAGE 25

QUANTA COMPUTER

Title	BLOCK DIAGRAM	
Size B	Document Number AK24 Main Board	Rev B
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1. PAGE LIST

2. PCI Description :

IDSEL	CHIP
AD24	LAN (RTL8100CL)
AD26	CardBus (R5C847)
AD28	

PCIINT	CHIP
IRQA	LAN(RTL8100CL)
IRQB	CardBus
IRQC	CardBus
IRQD	CardBus
IRQE	
IRQF	

BUSMASTER

REQ	CHIP
REQ0 / GNT0	LAN(RTL8100CL)
REQ1 / GNT1	CardBus R5C847
REQ2 / GNT2	
REQ3 / GNT3	
REQ4 / GNT4	

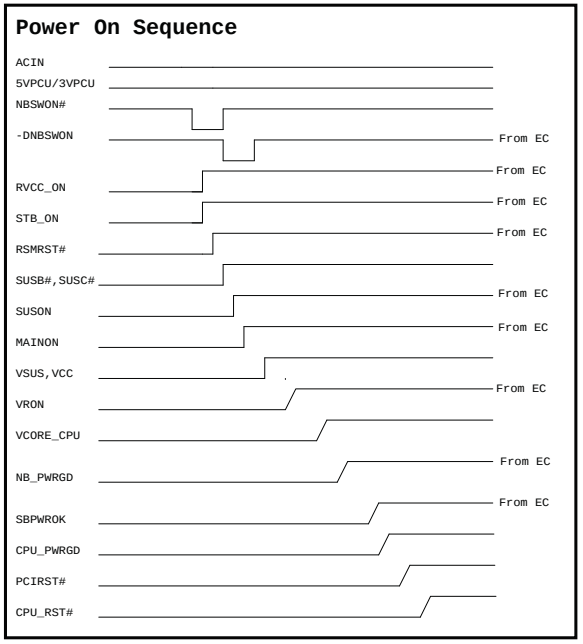
3. PCI_E Description :

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

4.Power Rails

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
VCC1.5	MAINON	ON	ON	ON	OFF	OFF	OFF
VCC1.8	MAINON	ON	ON	ON	OFF	OFF	OFF
VCC3.3	MAINON	ON	ON	ON	OFF	OFF	OFF
VCC5	MAINON	ON	ON	ON	OFF	OFF	OFF
+1.2VALW	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.POWER ON SEQUENCE



02

QUANTA COMPUTER

Title: PAGE LIST

Size: C | Document Number: AK24 Main Board | Rev: B

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Thermal Control

U20A — ADDR GROUP 0 / CONTROL / XDP/ITP SIGNALS / THERM / H_CLK / RESERVED — PZ47903-2741-01

U20B — DATA GRP 0 / DATA GRP 1 / DATA GRP 2 / DATA GRP 3 / MISC — PZ47903-2741-01

U19 — GMT781-1

Layout note: 0.5" max for GTLREF

For IMVP6

PP

NEEDED FOR SB460 ONLY

SB460 NEED ONLY

PA_IXP600AD13

For SB600 pull-up resistor R124 is not needed

VCCP	5,8,16
VCC5	16,19,24,26,30
VCC3	5,11,14,15,16,17,18,19,20,21,26,33

QUANTA COMPUTER

Title: CPU (Yonah / Merom) -1

Size: Custom | Document Number: AK24 Main Board | Rev: B

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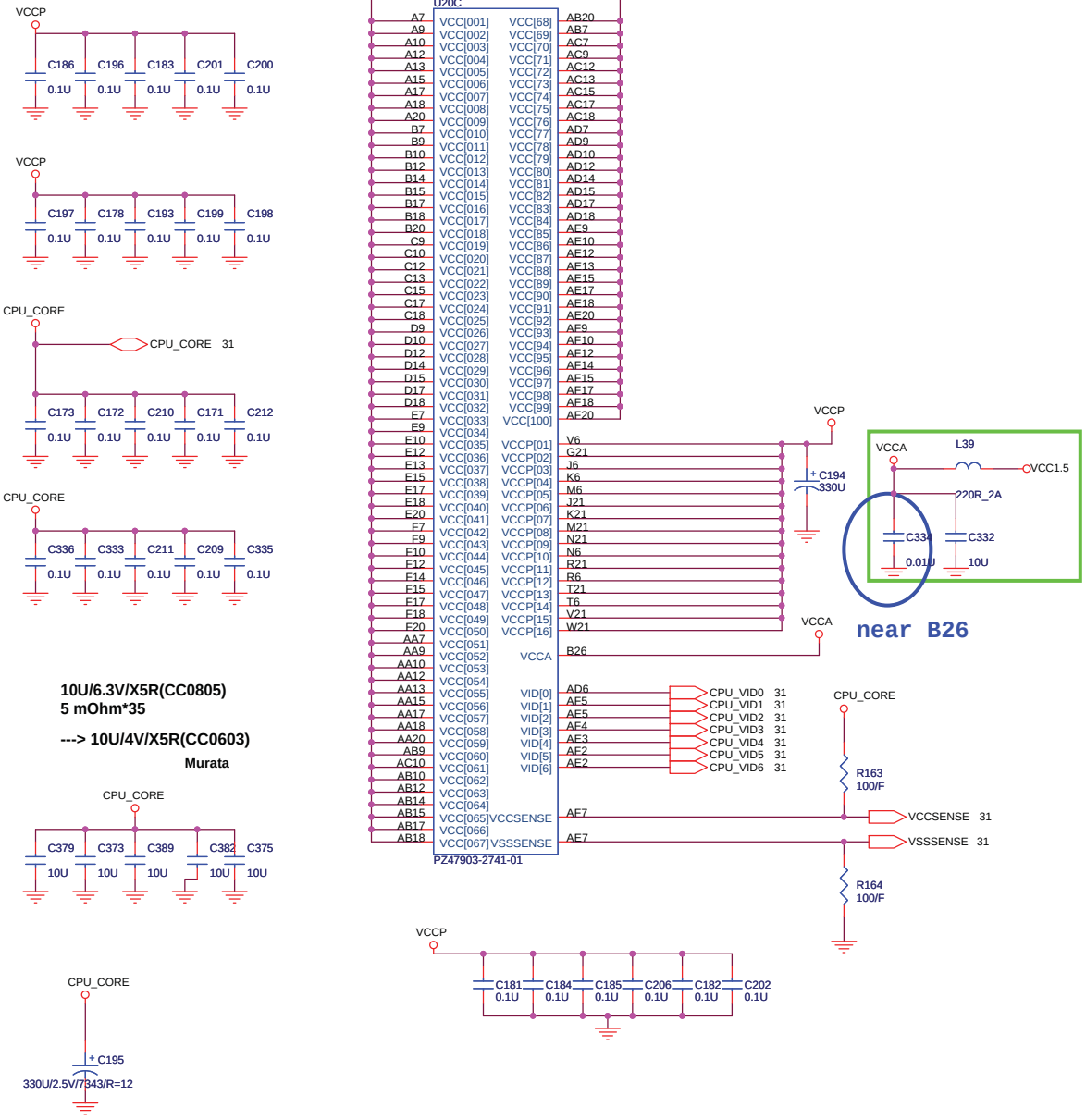

QUANTA COMPUTER

Title: DOTHAN CPU (POWER/NC)-2

Size	Document Number	Rev
B	AK24 Main Board	B

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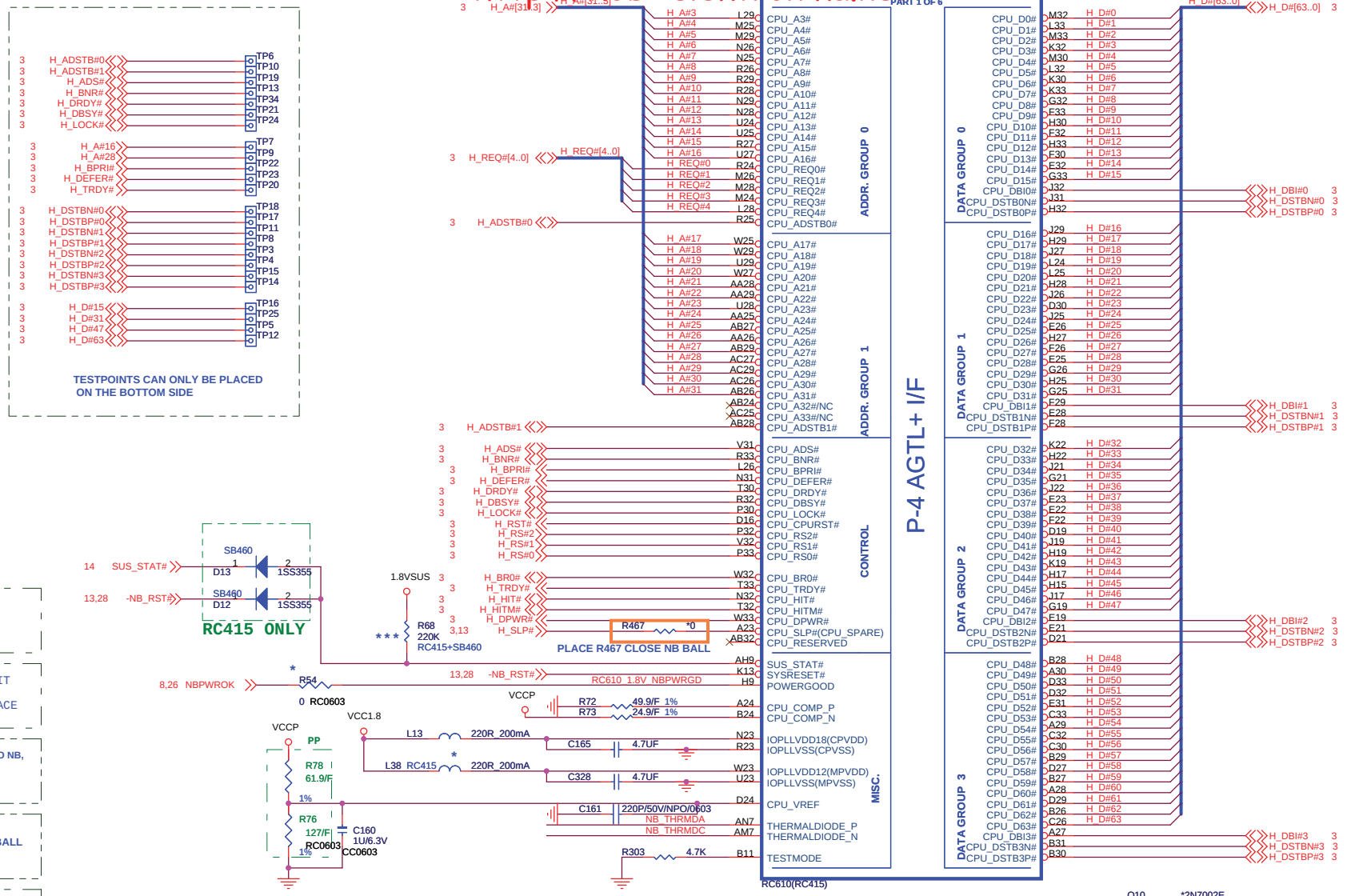

TESTMODE	NB MODE
LOW	NORMAL MODE
HIGH	TEST MODE

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

Note:
* Stuff only for RC415
** Stuff only for RC610
*** Stuff only for RC415 and SB460

Title	RC415-AGTL+I/F
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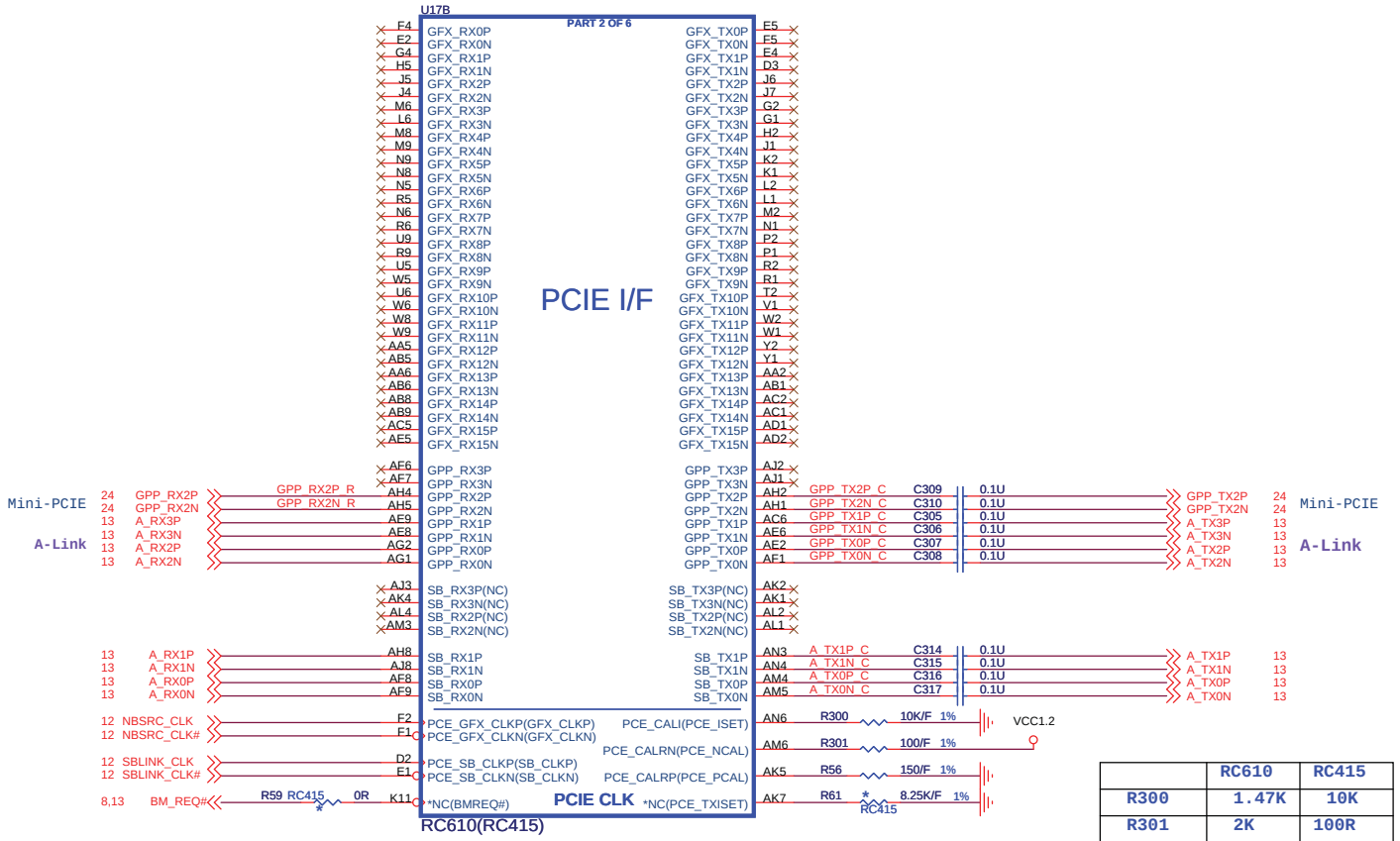
QUANTA COMPUTER

CLOSE TO NB (U200) < 0.5 INCH
NO STUBBING



	RC610	RC415
R300	1.47K	10K
R301	2K	100R
R56	562R	150R

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

VCC1.2 → VCC1.2 15,24

QUANTA COMPUTER

Title	RC415-PCIE I/F	
Size: Custom	Document Number: AK24 Main Board	Rev: B
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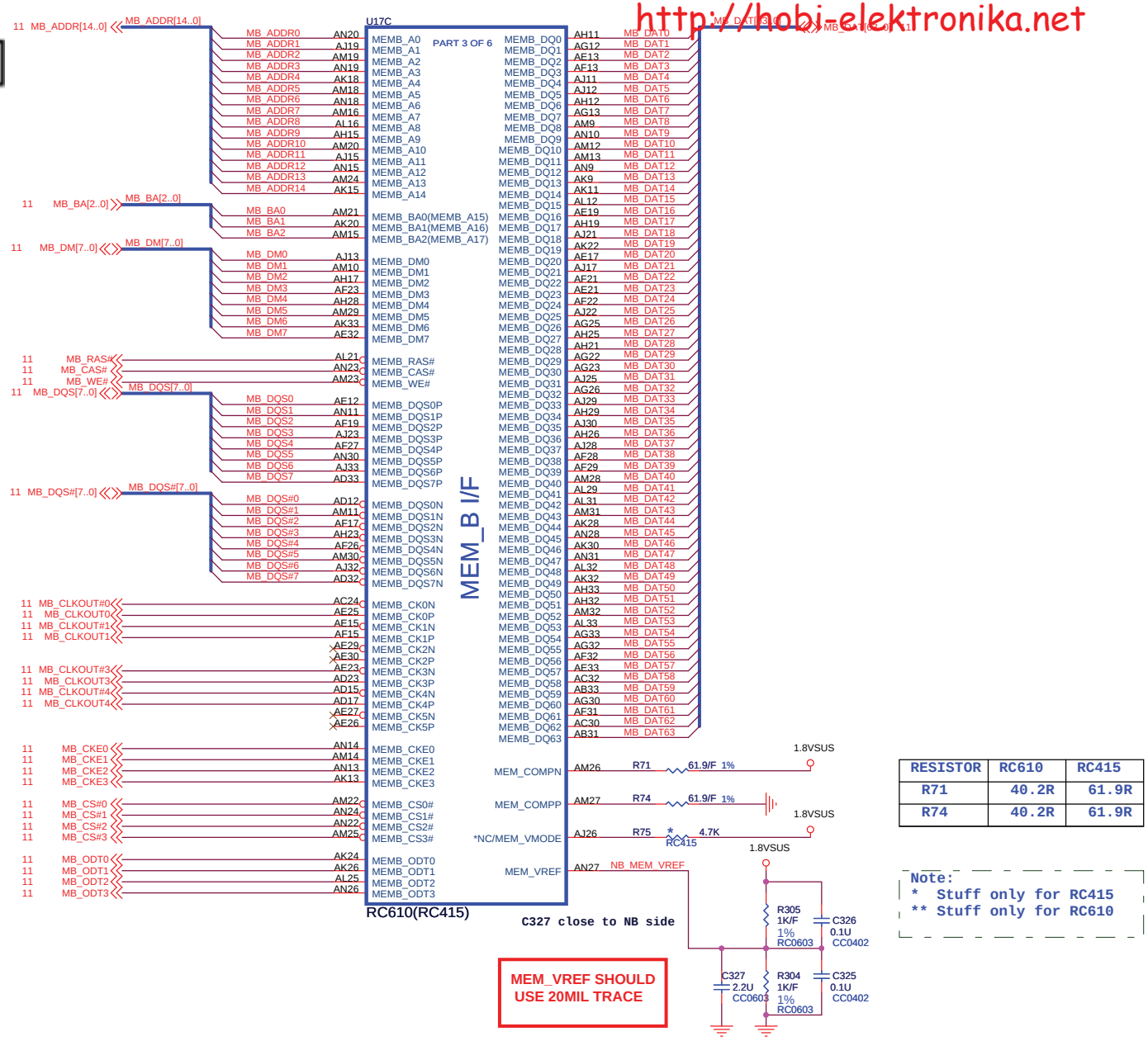

RC610(RC415)

C327 close to NB side

MEM_VREF SHOULD USE 20MIL TRACE

RESISTOR	RC610	RC415
R71	40.2R	61.9R
R74	40.2R	61.9R

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

1.8VSUS 1.8VSUS 5,11,24,33

QUANTA COMPUTER

Title: RC415-DDR2 I/F

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EVERY PLL POWER AND GND BALL SHOULD HAVE DEDICATE VIA

PLACE C324 CLOSE TO NB, AND CONNECT PLLVSS TO GND PLANE DIRECTLY

PLACE R55,R60 AND R57 CLOSE TO NB

PLACE R45,R46 AND R44 CLOSE TO NB

U17D PART 4 OF 8

RC610(RC415)

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

RC610 STRAPS RC415 STRAPS

PANEL VCC CONTROL

87216-300X-30P-LDV

LCD_CON30

VIN	24,32
VCC1.2	15,24
VCC1.8	5
VCC5	16,19,24,26,30
VCC3	5,11,14,15,16,17,18,19,20,21,26,33

QUANTA COMPUTER

Title: RC415-VIDEO I/F,CLOCK,STRAPS

Size: Custom | Document Number: AK24 Main Board | Rev: B

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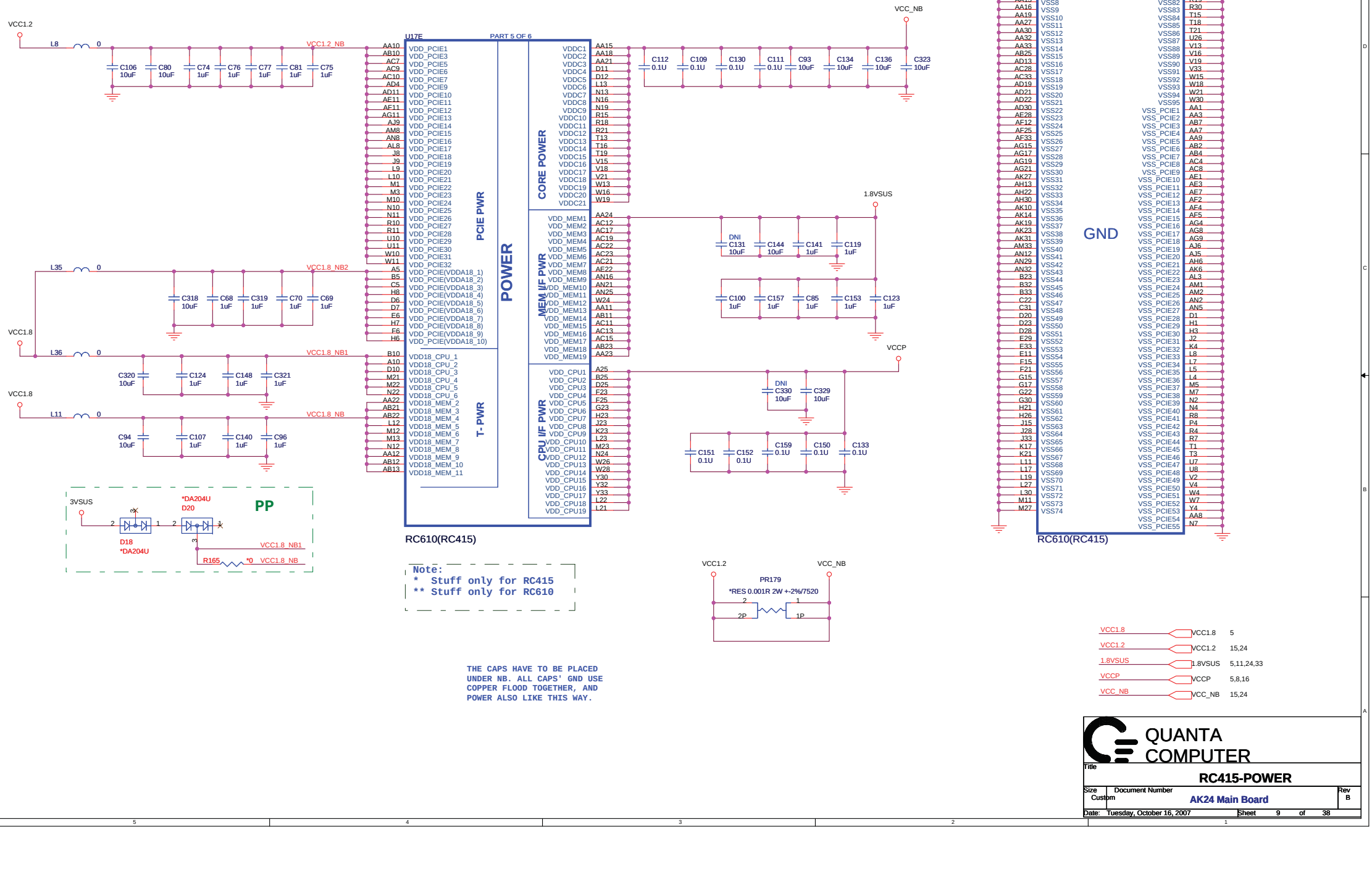

QUANTA COMPUTER

Title	RC415-POWER	
Size: Custom	Document Number: AK24 Main Board	Rev: B
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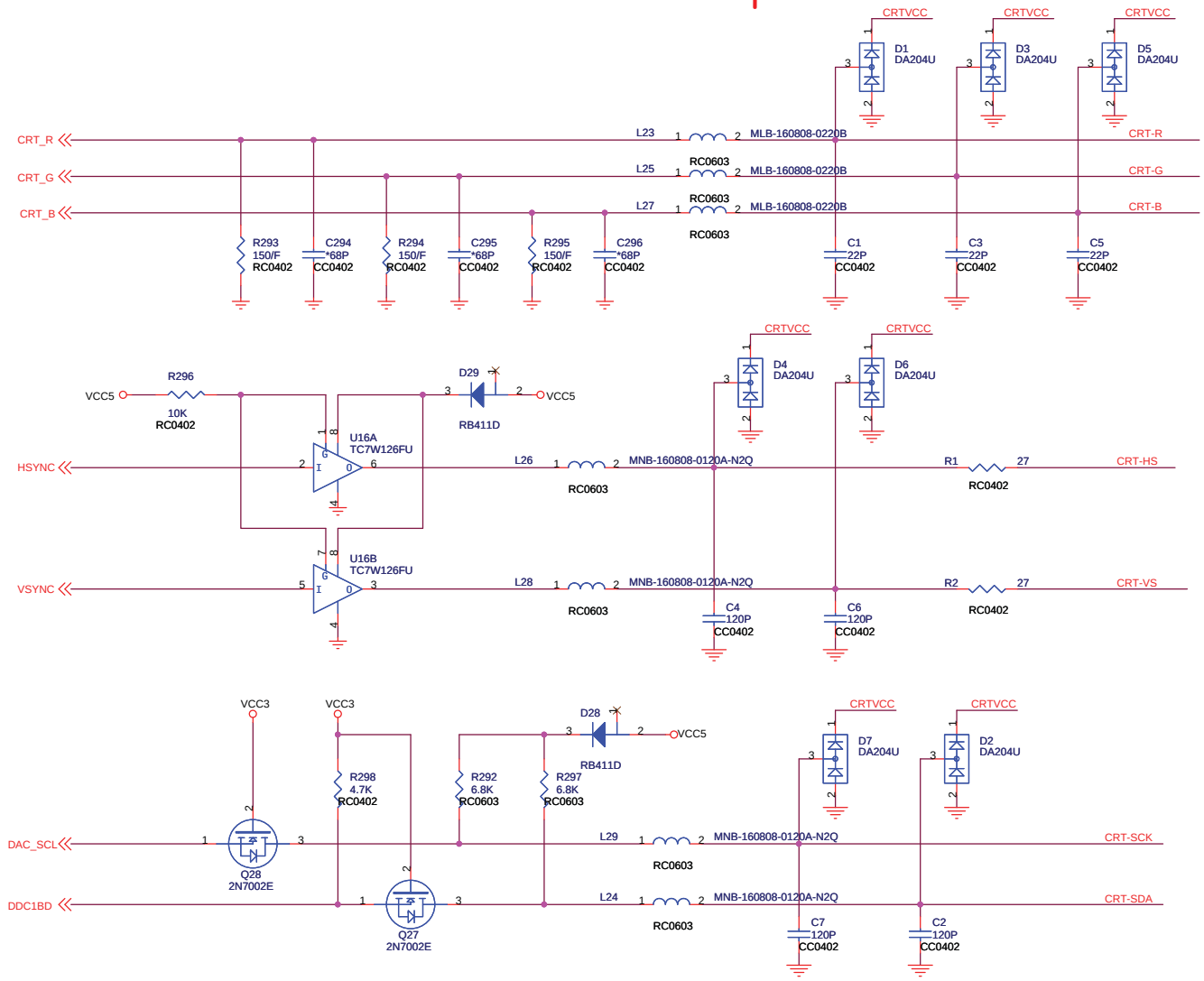
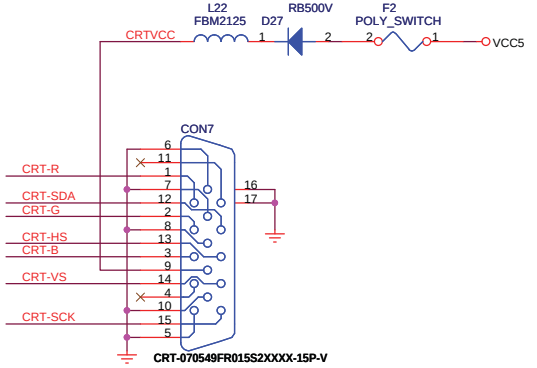
CRT CONNECTOR





VCC5	VCC5	16,19,24,26,30
VCC3	VCC3	5,11,14,15,16,17,18,19,20,21,26,33

QUANTA COMPUTER

Title	CRT/TV OUT PORT	
Size B	Document Number AK24 Main Board	Rev B
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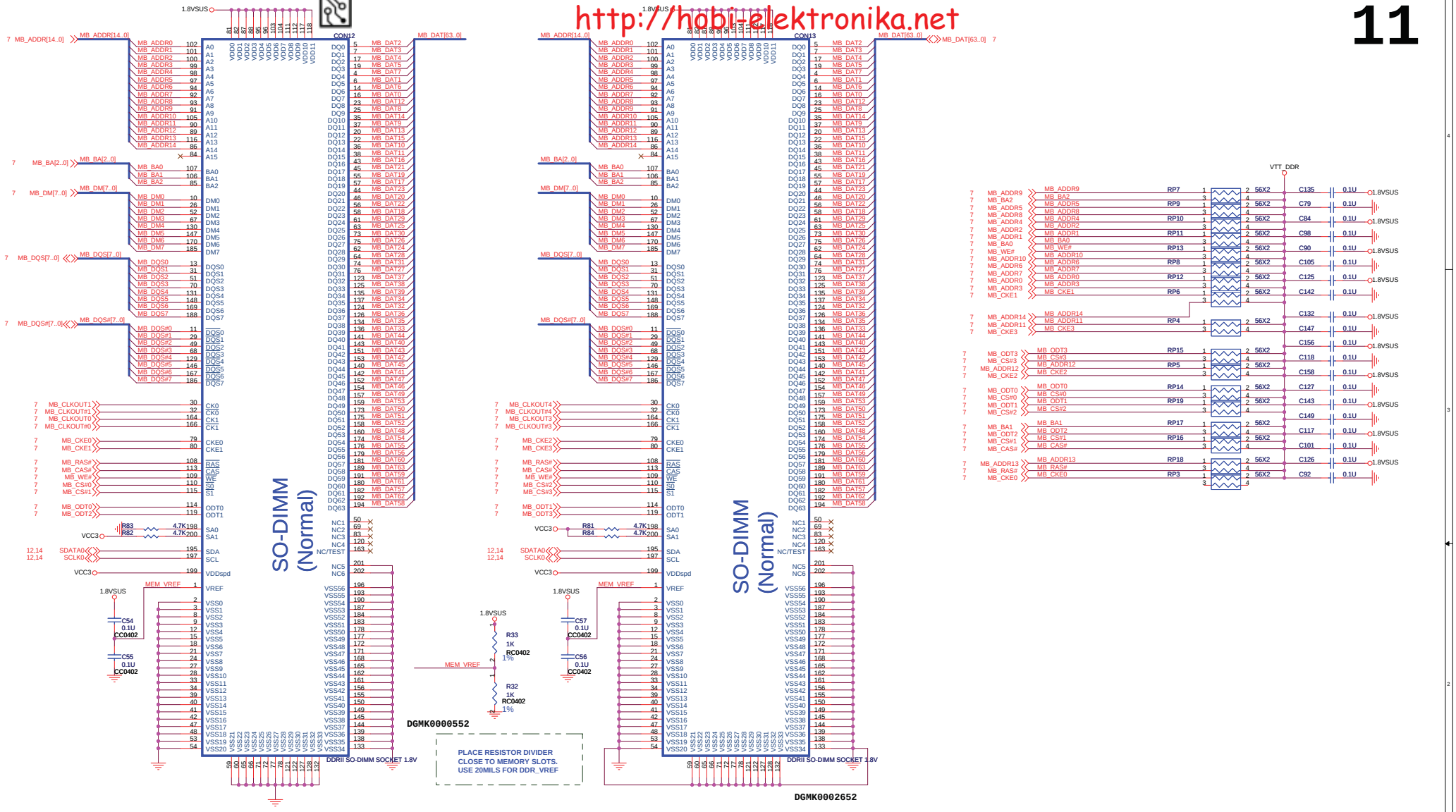
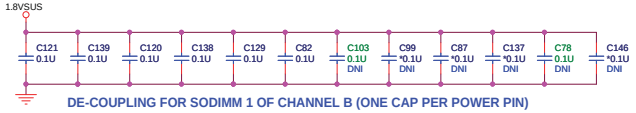
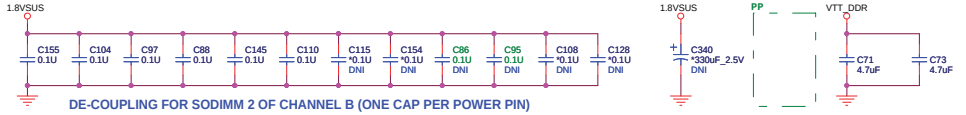


RVS H= 5.2 mm



DE-COUPLING FOR SODIMM 1 OF CHANNEL B (ONE CAP PER POWER PIN)

RVS H= 9.2 mm



DE-COUPLING FOR SODIMM 2 OF CHANNEL B (ONE CAP PER POWER PIN)

QUANTA COMPUTER			
Title: DDR SODIMMX2 and Terms			
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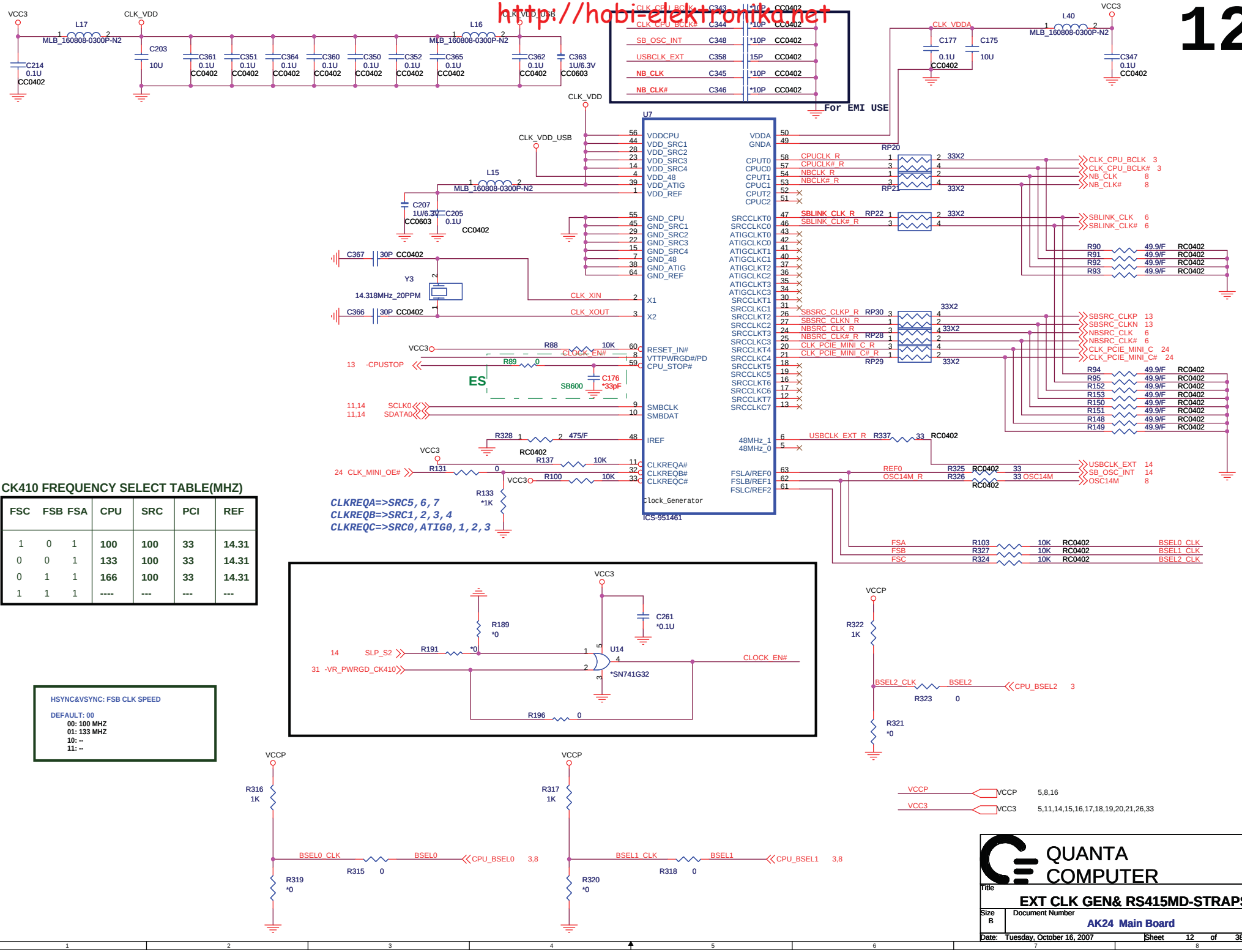

CK410 FREQUENCY SELECT TABLE(MHZ)

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& RS415MD-STRAPS

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SB600 SB 23x23mm
Part 1 of 4

PCI_CLK0:LAN
PCI_CLK1:EC
PCI_CLK2:CardBus
PCI_CLK3:Debug Card

PLACE THESE PCIE AC DECOUPLING CAPS CLOSE TO THE U600

IRT

C608 AND C609 CLOSE THE BALL U29 OF U600

PA_SB600AT4 for AK24 PP

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

FOR SB460, THE BALL IS SPDIF_OUT/GPIO41 ONLY

For R5C847,R360 and R363 are mounted;
For R5C804,R360 and R363 are unmounted;
Place R360 and R363 close to SB600.

ES

SB600 IXP600 A12 HT

PP: Revised PCIE_PVDD Power Sequence (reserved)

PCIE_PVDD_SB discharge

PA_IXP600AD13

Title	SB600-PCIE/PCI/CPU/LPC -1
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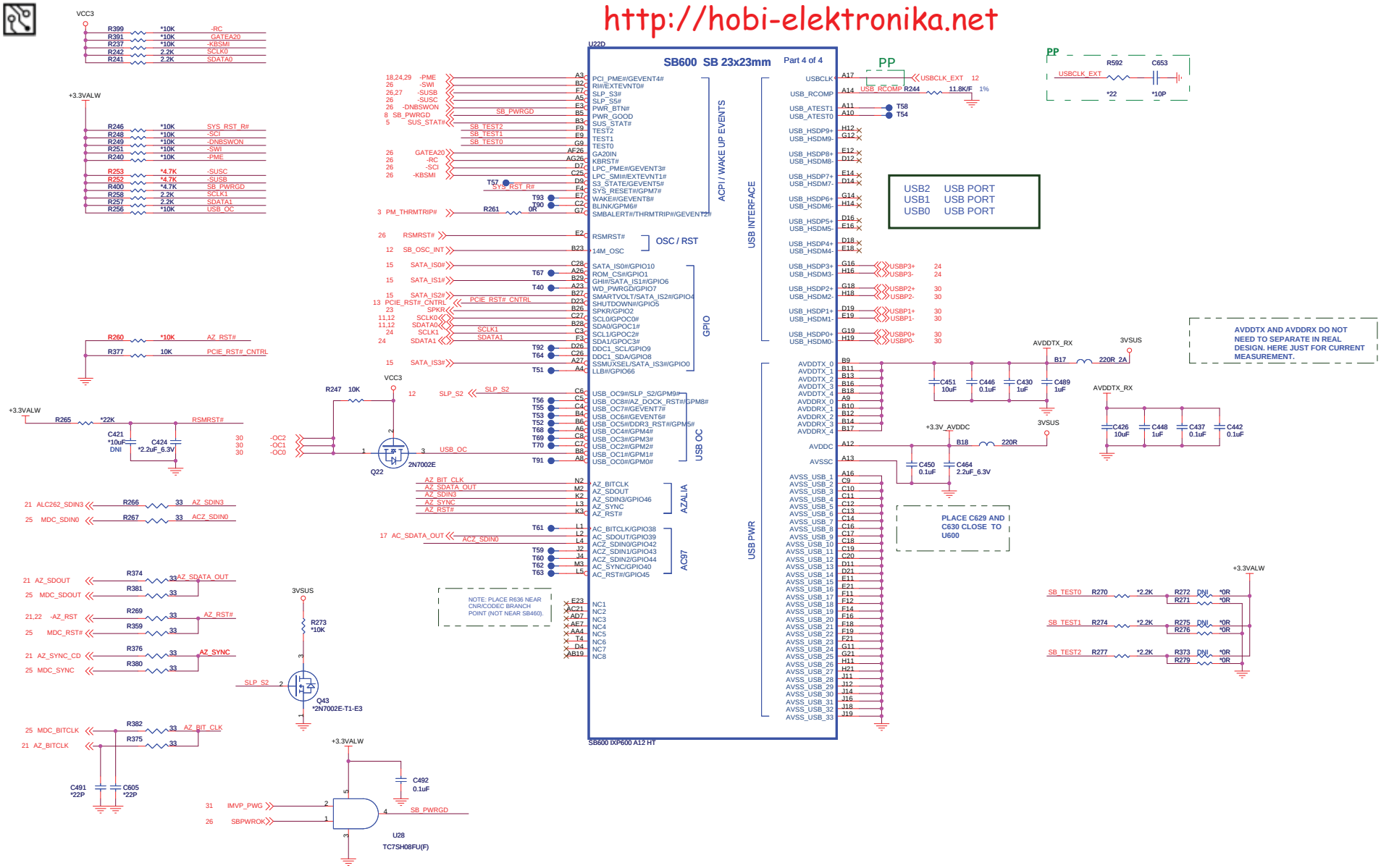
QUANTA COMPUTER



Title	SB600-ACPI/GPIO/USB/AC97 -2
Size	C
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QUANTA COMPUTER

NOTE: J600&J601 ARE SMT. J602&J603 ARE THT.

R370 *10K
R401 *10K
R384 *10K
R402 *10K
R404 *10K
R406 *10K
R492 *10K
R497 *10K
SATA_IS0# 14
SATA_IS1# 14
SATA_IS2# 14
SATA_IS3# 14

PLACE SATA AC COUPLING CAPS CLOSE TO SB600

U22B

SB600 SB 23x23mm
Part 2 of 4

SERIAL ATA
SATA_TX0+ AH21
SATA_TX0- AJ21
SATA_RX0- AH20
SATA_RX0+ AJ20
SATA_TX1+ AH18
SATA_TX1- AJ18
SATA_RX1- AH17
SATA_RX1+ AJ17
SATA_TX2+ AH13
SATA_TX2- AH14
SATA_RX2- AH16
SATA_RX2+ AJ16
SATA_TX3+ AJ11
SATA_TX3- AH11
SATA_RX3- AH12
SATA_RX3+ AJ13
SATA_CAL AF12
SATA_X1 AD16
SATA_X2 AD18
SATA_ACT#/GPIO67 AC12

28 SATA_TXP0 C564 .01uF SATA_TX0+
28 SATA_TXN0 C398 .01uF SATA_TX0-
28 SATA_RXN0 C566 .01uF SATA_RX0-
28 SATA_RXP0 C572 .01uF SATA_RX0+
T29 T30
T31 T33
T38 T34
T35 T36
T87 T86
T41 T88
R407 1K 1% SATA_CAL
SATA_X1
SATA_X2
26 -SATALED

ATA 66/100
IDE_IORDY AB29 PIORDY 28
IDE_IRQ AA28 PDDIRQ 28
IDE_A0 AA29 PDA0 28
IDE_A1 AB27 PDA1 28
IDE_A2 Y28 PDA2 28
IDE_DACK# AB28 -PDDACK 28
IDE_DRQ AC27 PDDREQ 28
IDE_IOR# AC29 -PDIOR 28
IDE_IOW# AC28 -PDIOW 28
IDE_CS1# W28 -PDCS1 28
IDE_CS3# W27 -PDCS3 28

IDE_D0/GPIO15 AD28 IDE_D0
IDE_D1/GPIO16 AD26 IDE_D1
IDE_D2/GPIO17 AE29 IDE_D2
IDE_D3/GPIO18 AE27 IDE_D3
IDE_D4/GPIO19 AG29 IDE_D4
IDE_D5/GPIO20 AH28 IDE_D5
IDE_D6/GPIO21 AJ28 IDE_D6
IDE_D7/GPIO22 AJ27 IDE_D7
IDE_D8/GPIO23 AH27 IDE_D8
IDE_D9/GPIO24 AG27 IDE_D9
IDE_D10/GPIO25 AG28 IDE_D10
IDE_D11/GPIO26 AF28 IDE_D11
IDE_D12/GPIO27 AF29 IDE_D12
IDE_D13/GPIO28 AE28 IDE_D13
IDE_D14/GPIO29 AD25 IDE_D14
IDE_D15/GPIO30 AD29 IDE_D15
IDE_D[0..15] PDD[0..15] 28

NOTE:
IF THERE IS NO IDE, PLEASE PUT TEST POINTS HERE FOR DEBUG BUS.

PP

16M SST P/N:AKE28FP0K07
8M Winbond P/N:AKE3GFP0N08

SPI ROM
SPI_DI/GPIO12 J3
SPI_DO/GPIO11 J6
SPI_CLK/GPIO47 G3
SPI_HOLD#/GPIO31 G2
SPI_CS#/GPIO32 G6
LAN_RST#/GPIO13 C23 T82
ROM_RST#/GPIO14 G5 T81

HW MONITOR
FANOUT0/GPIO3 M4 VGA_MODE
FANOUT1/GPIO48 T3 MEM_TYPE
FANOUT2/GPIO49 V4 T76
FANIN0/GPIO50 N3 T79
FANIN1/GPIO51 P2 T78
FANIN2/GPIO52 W4 T77
TEMP_COMM P5 T83
TEMPIN0/GPIO61 P7 T80
TEMPIN1/GPIO62 P8 T84
TEMPIN2/GPIO63 T8 T85
TEMPIN3/TALERT#/GPIO64 T7 R491 0R TALERT# 3,5
VIN0/GPIO53 V5 T89
VIN1/GPIO54 L7 T66
VIN2/GPIO55 M8 T65
VIN3/GPIO56 V6 T71
VIN4/GPIO57 M6 T74
VIN5/GPIO58 P4 T73
VIN6/GPIO59 M7 T72
VIN7/GPIO60 V7 T75

SERIAL ATA POWER
PLLVDD_ATA AD14 PLLVDD_SATA_1
AJ10 PLLVDD_SATA_2
XTLVDD_ATA AC16 XTLVDD_SATA
AVDD_SATA AE14 AVDD_SATA_1
AE16 AVDD_SATA_2
AE18 AVDD_SATA_3
AE19 AVDD_SATA_4
AF19 AVDD_SATA_5
AF21 AVDD_SATA_6
AG22 AVDD_SATA_7
AG23 AVDD_SATA_8
AH22 AVDD_SATA_9
AH23 AVDD_SATA_10
AJ12 AVDD_SATA_11
AJ14 AVDD_SATA_12
AJ19 AVDD_SATA_13
AJ22 AVDD_SATA_14
AJ23 AVDD_SATA_15
AB14 AVSS_SATA_1
AB16 AVSS_SATA_2
AB18 AVSS_SATA_3
AC14 AVSS_SATA_4
AC18 AVSS_SATA_5
AC19 AVSS_SATA_6
AD12 AVSS_SATA_7
AD19 AVSS_SATA_8
AD21 AVSS_SATA_9
AE12 AVSS_SATA_10
AE21 AVSS_SATA_11
AF11 AVSS_SATA_12
AF14 AVSS_SATA_13
AF16 AVSS_SATA_14
AF18 AVSS_SATA_15
AG11 AVSS_SATA_16
AG12 AVSS_SATA_17
AG13 AVSS_SATA_18
AG14 AVSS_SATA_19
AG16 AVSS_SATA_20
AG17 AVSS_SATA_21
AG18 AVSS_SATA_22
AG19 AVSS_SATA_23
AG20 AVSS_SATA_24
AG21 AVSS_SATA_25
AH10 AVSS_SATA_26
AH19 AVSS_SATA_27

SB600 IXP600 A12 HT

SATA_X1 C377 10pF CC0402
SATA_X2 R378 10M RC0402 Y6 25.0000_MHz C369 10pF CC0402
PA_IXP600AD13

C649 CLOSE TO THE BALL OF U600

VCC3 B20 220R XTLVDD_ATA C574 1uF
VCC1.2 R499 0 R498 0 RC0805
VCC_SB B23 220R_2A
VCC_SB B21 220R PLLVDD_ATA C397 1uF C498 *1uF DNI
C650 CLOSE TO THE BALL OF U600
AVDD_SATA C568 22uF C565 0.1uF C569 0.1uF C571 1uF C495 1uF

AVDD_HWM
VCC3 B22 220R_200mA
AVDD N1
AVSS M1
C573 0.1uF C570 2.2uF_6.3V
HWM_AGND R496 0R

1).PLACE R671 CLOSE TO U600
2).HWM_AGND TRACE AT LEAST 10MIL WIDE

NOTE:
ALL HWM VALUES ARE TBD

NOTE: ROUTE TEMP_COMM AS A 10MIL TRACE

VCC3
RC0402 *10K R511 MEM_TYPE RC0402 *10K R510
Low:EMBEDDED
High:DISCRETE

VCC3
RC0402 *10K R509 VGA_MODE RC0402 *10K R508
Low:EMBEDDED
High:DISCRETE

QUANTA COMPUTER

Title	SB600-SATA/IDE/HWM/SPI -3	
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PLACE ALL THE DECOUPLING CAPS ON THIS SHEET CLOSE TO SB AS POSSIBLE.

VCC3
C591 220U/6.3V CC7343
C470 1uF
C441 1uF
C582 1uF
C439 1uF
C576 1uF
C600 1uF

+1.2VALW
C577 0.1uF
C601 0.1uF
C575 0.1uF
C414 0.1uF

VCC_SB
B24 220R
AVDDCK_1.2V
C599 2.2uF_6.3V

VCC_SB
C579 2.2uF_6.3V
C444 1uF
C370 1uF
C584 1uF
C459 1uF

+1.2USB_PHY
C445 1uF
C602 1uF DNI
C578 1uF
C580 1uF
C431 1uF

VCC3
B25 220R
AVDDCK_3.3V
C585 2.2uF_6.3V

+3.3VALW
+1.2USB_PHY
U24
VIN ADJ GND VEN VO
G961
R405 *0
R422 1K RC0402
26,34,37 SUSON
C588 1U/6.3V CC0603
C590 *0.1U CC0402
R398 0 RC0402
C589 1U/6.3V CC0603
R396 2K/F RC0402

1.2V R413=0 R414=2K
Vo=1.2*(R1+R2)/R2

U22C
SB600 SB 23x23mm
Part 3 of 4
POWER
VDDQ_1 ... VDDQ_28
VDD_1 ... VDD_12
SS_3.3V_1 ... SS_3.3V_6
SS_1.2V_1 ... SS_1.2V_4
USB_PHY_1.2V_1 ... USB_PHY_1.2V_5
CPU_PWR
V5_VREF
AVDDCK_3.3V
AVDDCK_1.2V
AVSSCK
PCIE_VSS_1 ... PCIE_VSS_42
VSS_1 ... VSS_57
SB600 IXP600 A12 HT

+3.3VALW
C597 22uF
C598 1uF
C596 1uF

+1.2VALW
+1.2USB_PHY

VCC5
R393 1K
V5_VREF
D19
RB500V-40
VCC3

VCCP
R385 0.001R
R389 0.001R
AVDDCK_3.3V
AVDDCK_1.2V
C583 0.1uF DNI
C457 0.1uF DNI
C581 0.1uF
C449 1uF

3VPCU
Q44
AAT4280IGU-1-T1
IN IN ON/OFF OUT GND GND
C595 0.1U
26 STB_ON
+3.3VALW
C586 1U/6.3V CC0603
C587 10U/6.3V CC0805

3VPCU
+3.3VALW
R632 100K/J/0603
Q39 2N7002E
R155 33
26 STB_ON
Q83
DTC144EUEUA-7-F

+3.3VALW
+1.2VALW
ES
U27
VIN ADJ GND VEN VO
G961
R502 0
R503 *1K RC0402
C592 1U/6.3V CC0603
C594 0.1U CC0402
R501 0 RC0402
C593 1U/6.3V CC0603
R500 2K/F RC0402
26 STB_ON

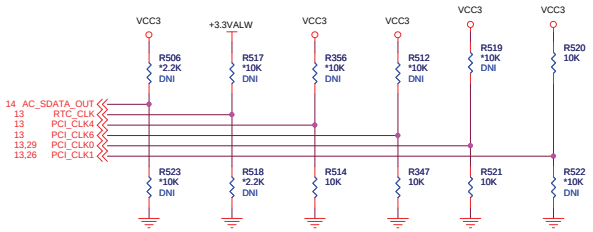
VCC_SB=1.2V WHEN SB600 1.2V R413=0 R414=2K
1.8V R413=1K R414=2K
Vo=1.2*(R1+R2)/R2

QUANTA COMPUTER

Title	SB600-POWER & DECOUPLING -4	
Size C	Document Number AK24 Main Board	Rev B
Date: Tuesday, October 16, 2007	Sheet 16 of 38	

REQUIRED STRAPS

SB600 HAS AN INTERNAL PD FOR AC_SDATA_OUT
SB600 HAS AN INTERNAL PU FOR RTC_CLK

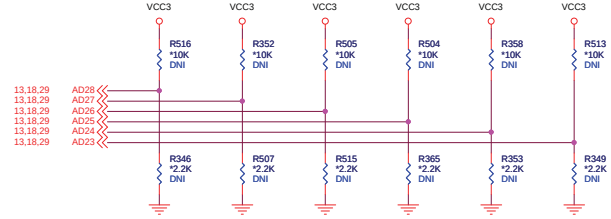


SB600 Internal PD 10K

	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 DEFAULT L, L = FWH ROM
PULL LOW	IGNORE DEBUG STRAPS DEFAULT	EXT. RTC (PD on X1, apply 32KHz to RTC_CLK)	USE EXT. 48MHZ DEFAULT	CPU IF=P4 DEFAULT	

DEBUG STRAPS

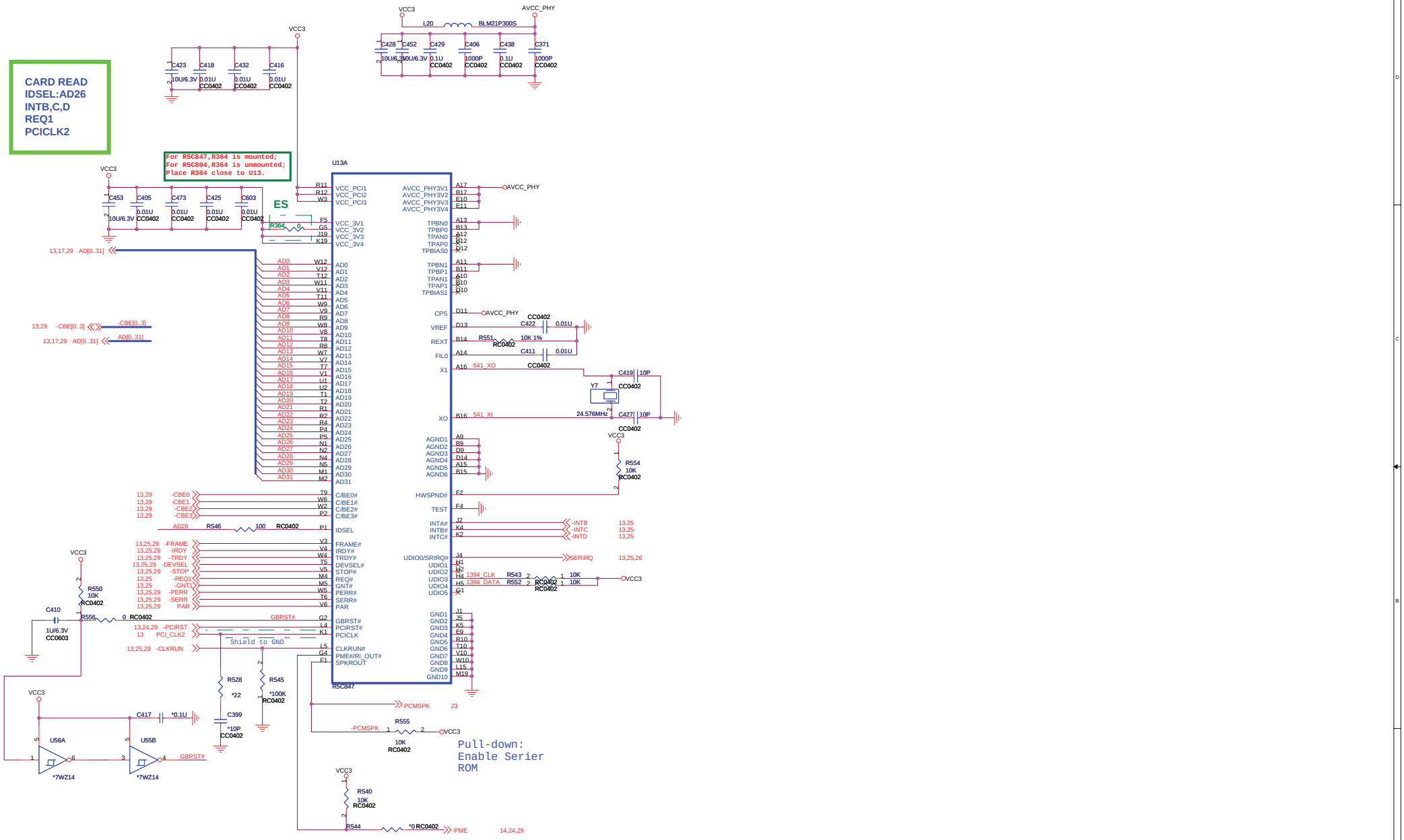
SB600 HAS 15K INTERNAL PU FOR PCI_AD[28:23]



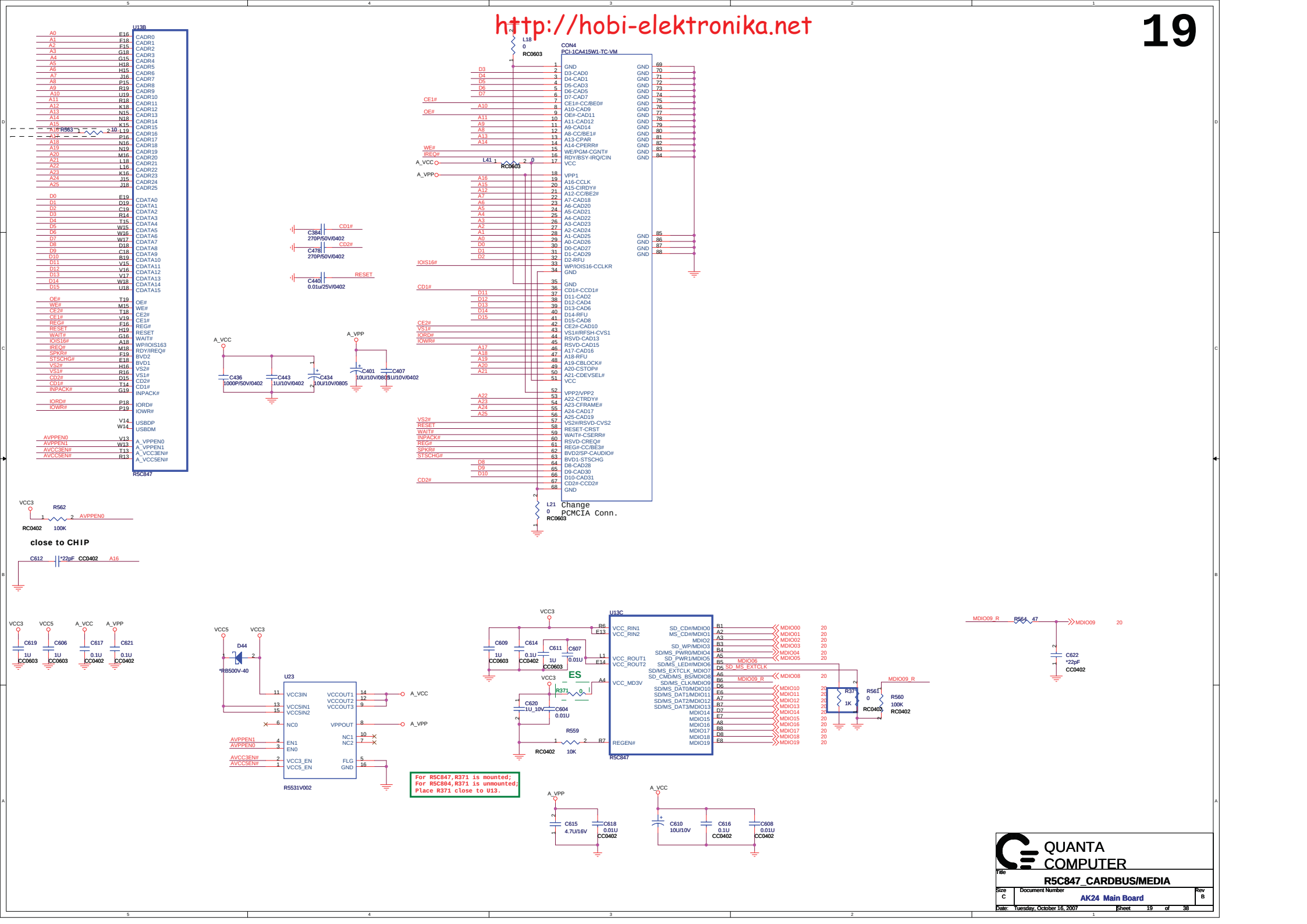
	PCI_AD28	PCI_AD27	PCI_AD26	PCI_AD25	PCI_AD24	PCI_AD23
PULL HIGH	USE LONG RESET DEFAULT	USE PCI PLL DEFAULT	USE ACPI BCLK DEFAULT	USE IDE PLL DEFAULT	USE DEFAULT PCIE STRAPS DEFAULT	BOOTFAILTIMER DISABLED DEFAULT
PULL LOW	USE SHORT RESET	BYPASS PCI PLL	BYPASS ACPI BCLK	BYPASS IDE PLL	USE EEPROM PCIE STRAPS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

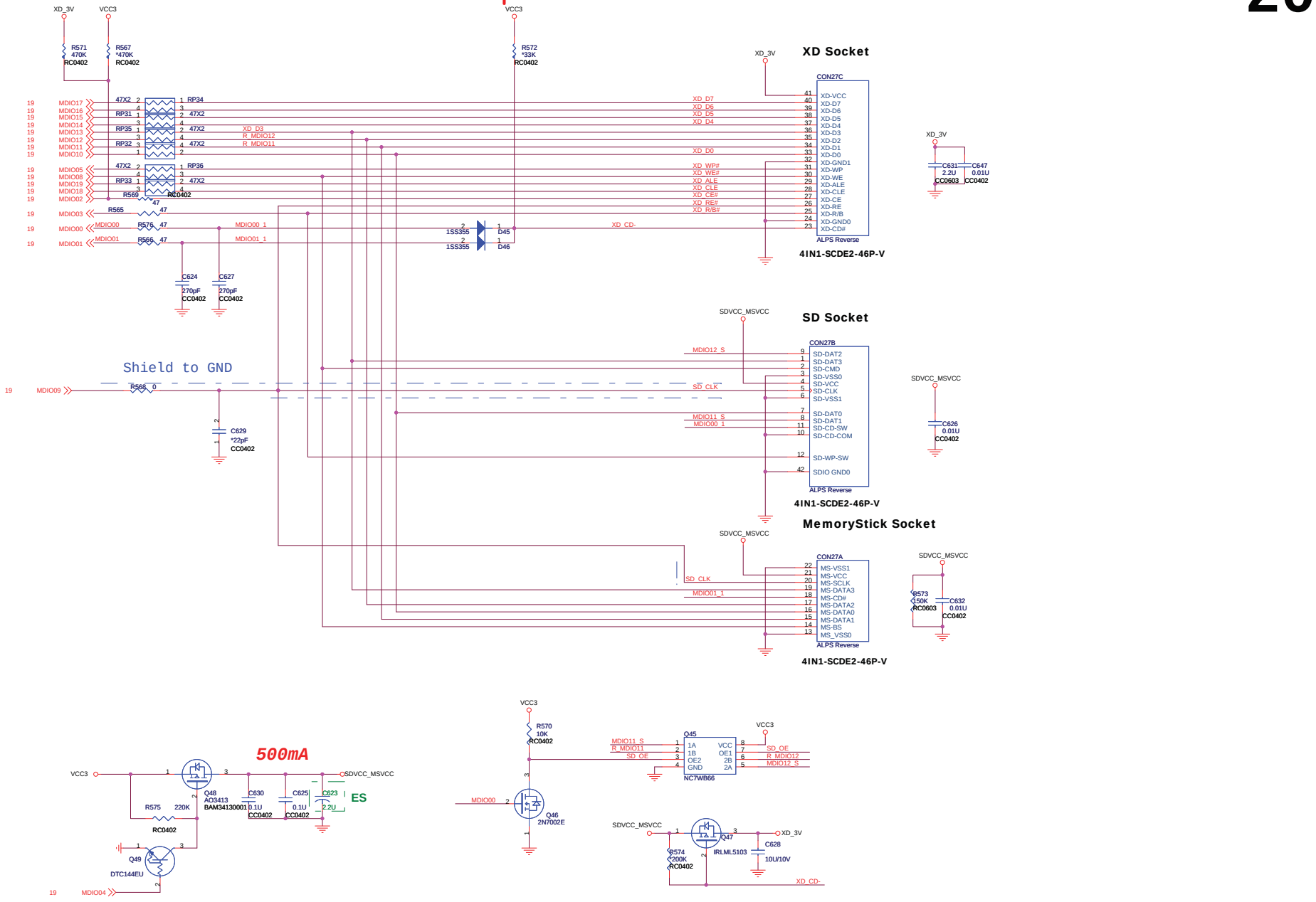
QUANTA COMPUTER

Title	SB600-STRAPS -5	
Size C	Document Number AK24 Main Board	Rev B
Date: Tuesday, October 16, 2007	Sheet 17 of 38	

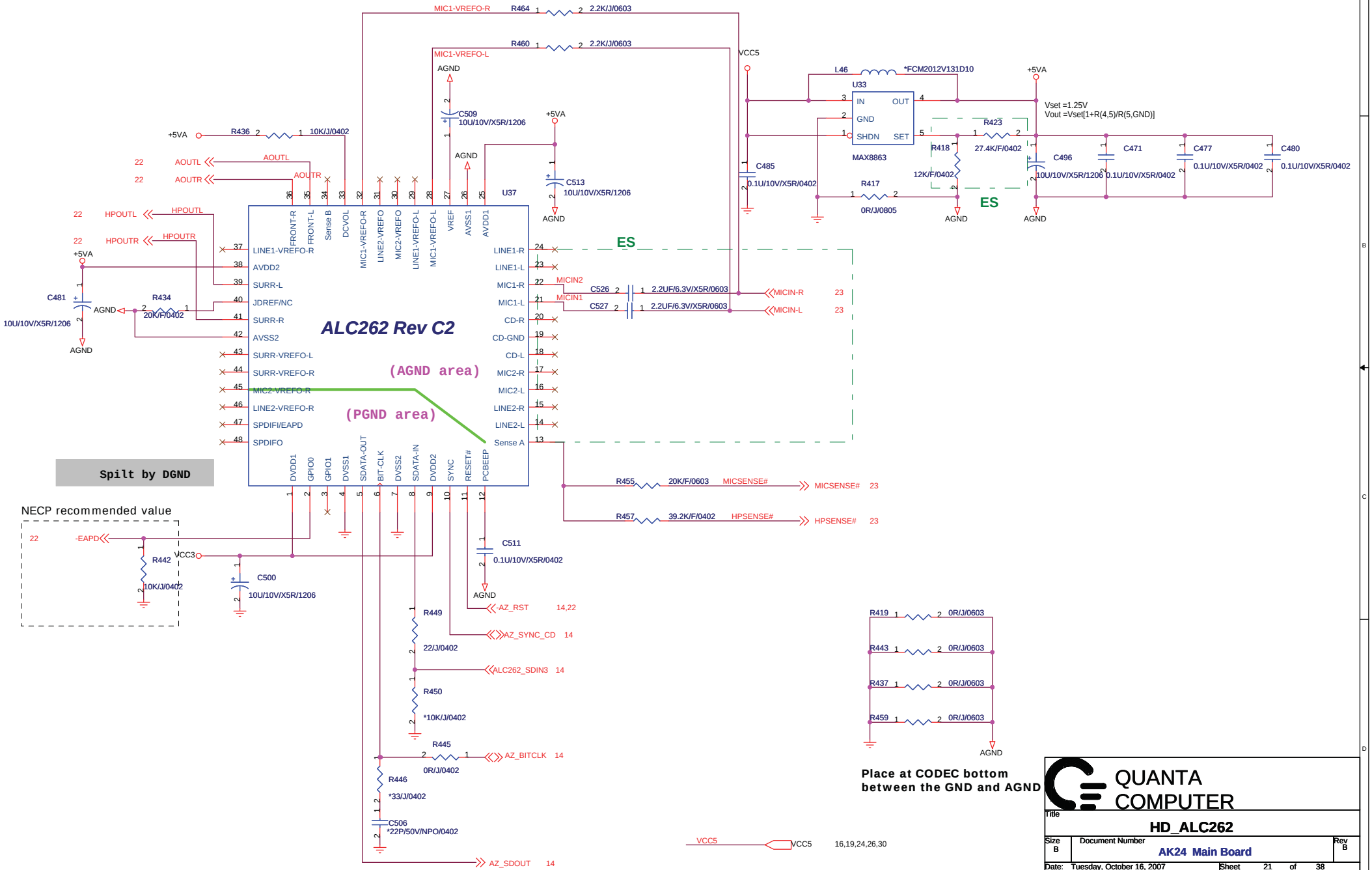


QUANTA COMPUTER			
Title	R5C847_ PCI		
Size C	Document Number AK24 Main Board		Rev B
Date: Tuesday, October 16, 2007	Sheet 18 of 38		





QUANTA COMPUTER			
Title: SD_MS_XD SLOT			
Size: C	Document Number: AK24 Main Board		Rev: B
Date: Tuesday, October 16, 2007	Sheet 20 of 38		



Title	HD_ALC262
Size	B
Document Number	AK24 Main Board
Rev	B
Date:	Tuesday, October 16, 2007
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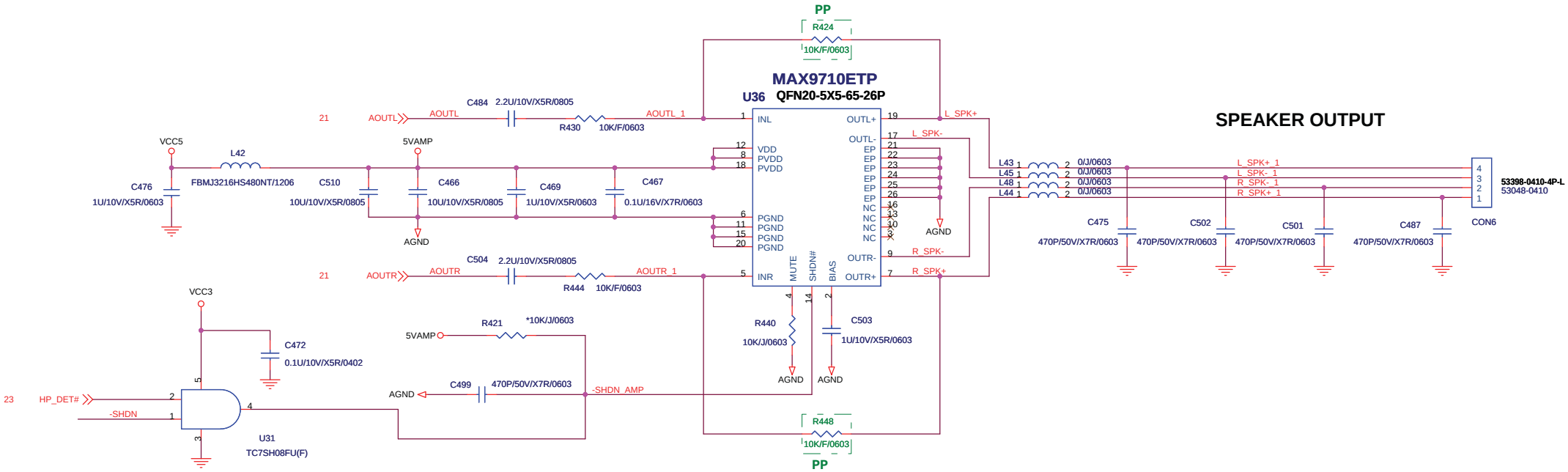
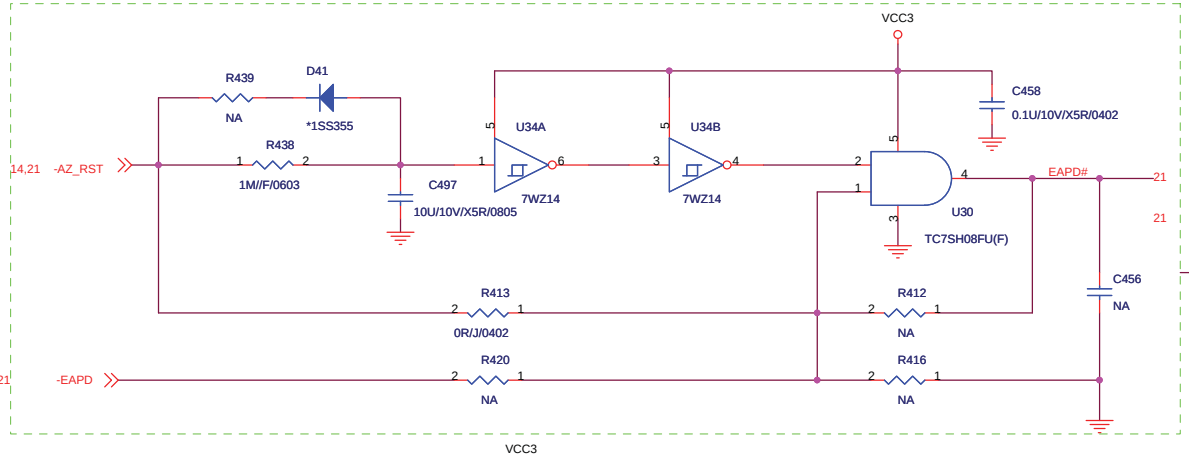
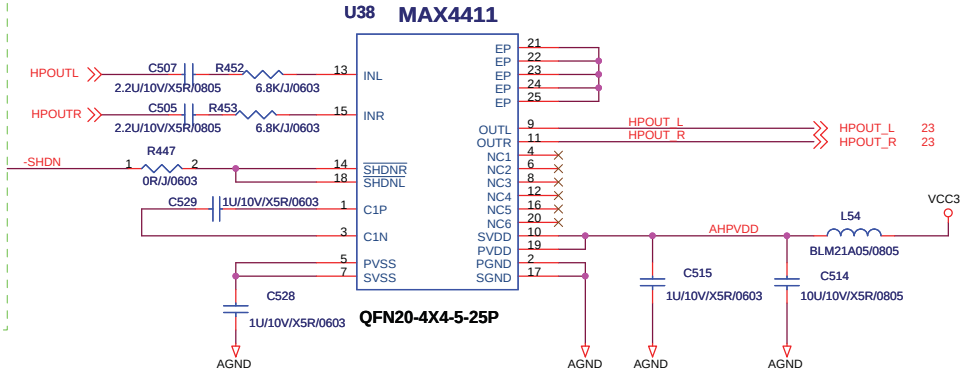
AUDIO AMPLIFIER

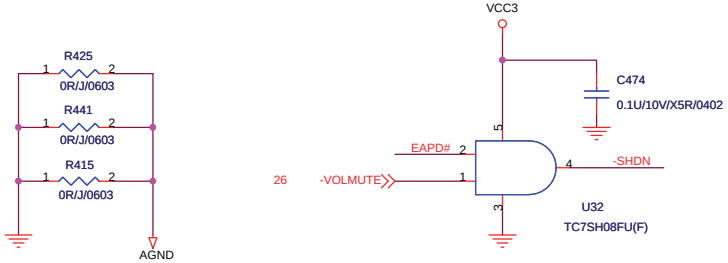


NECP recommend EAPD Control circuit for Vista



H.P AMPLIFIER





VCC3	VCC3	5,11,14,15,16,17,18,19,20,21,26,33
VCC5	VCC5	16,19,24,26,30

QUANTA COMPUTER

Title	Audio Board	
Size: Custom	Document Number: AK24 Main Board	Rev: B
Date: Tuesday, October 16, 2007	Sheet 22 of 38	

MIC-IN

Max. 100mVrms input for Mic-IN

ES

21 MICIN-L — MICIN-L — GMLB-160808-0600A-N8 — L52 — MICIN-L1
21 MICIN-R — MICIN-R — GMLB-160808-0600A-N8 — L50 — MICIN-R1
21 MICSENSE# — MICSENSE#

C520 220P/50V/NPO/0603
C512 220P/50V/NPO/0603
C519 220P/50V/NPO/0603

CON21
2SJ-S351-001
DFTJ06FR013
Normal Open Type
A_HPCASE-GND

AGND

BUZZER

VCC3
R282 10K
U15 7SH86
Q26 2N7002E
Q24 DTC144EU
18 -PCMSPK
14 SPKR
26 ENBEEP
PC_BEEP — R284 4.7K — Q25 MMBT3904
C290 0.47U
R283 33/J/0603
VCC5
BZ1 BUZZER BZ2
VCC3 — R456 100K/J/0603
R458 100K/J/0603
21 HPSENSE# — HPSENSE#
*BUZZER-KSSGJ4B20
BUZZER-KSSGJ4B20-4P
Q40 MMBT3904
Q41 2N7002E-T1-E3
HP_DET#

Headphone-OUT

5mW / 32ohms

ES

22 HPOUT_L — R451 47/J/0603 — HPOUT_L1 — L53 GMLB-160808-0600A-N8 — HPOUT_L2
22 HPOUT_R — R454 47/J/0603 — HPOUT_R1 — L51 GMLB-160808-0600A-N8 — HPOUT_R2
22 HP_DET#

CON22
2SJ-S351-001
DFTJ06FR013
Normal Open Type
A_HPCASE-GND

C518 *220P/50V/NPO/0603
C521 1000PF/50V/NPO/0603
C508 1000PF/50V/NPO/0603

ES
AGND

R462 0/J/0603
R463 0/J/0603
AGND
A_HPCASE-GND

VCC3	VCC3	5,11,14,15,16,17,18,19,20,21,26,33
5VPCU	5VPCU	8
VCC5	VCC5	16,19,24,26,30

QUANTA COMPUTER

Title: BUZZER & AUDIO/BOARD

Size	Document Number	Rev
Custom	AK24 Main Board	B

Date: Tuesday, October 16, 2007 Sheet 23 of 38

Mini PCI-E Card

PCI-Express TX and RX direct to connector

IRT

IRT

For HK/CH model D43 is Green, D42 is N/A
For JP model, D43 is Amber D42 is Green

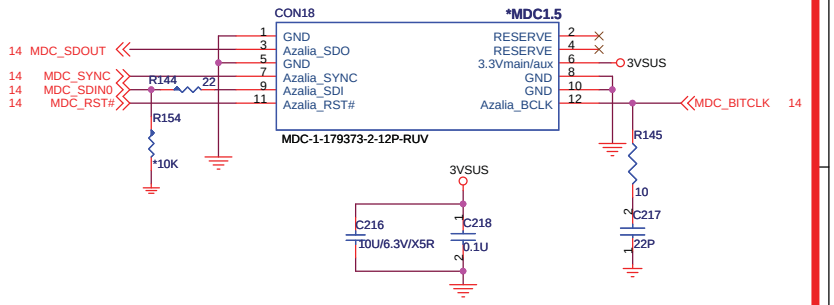
For EMI Bypass Capacitor

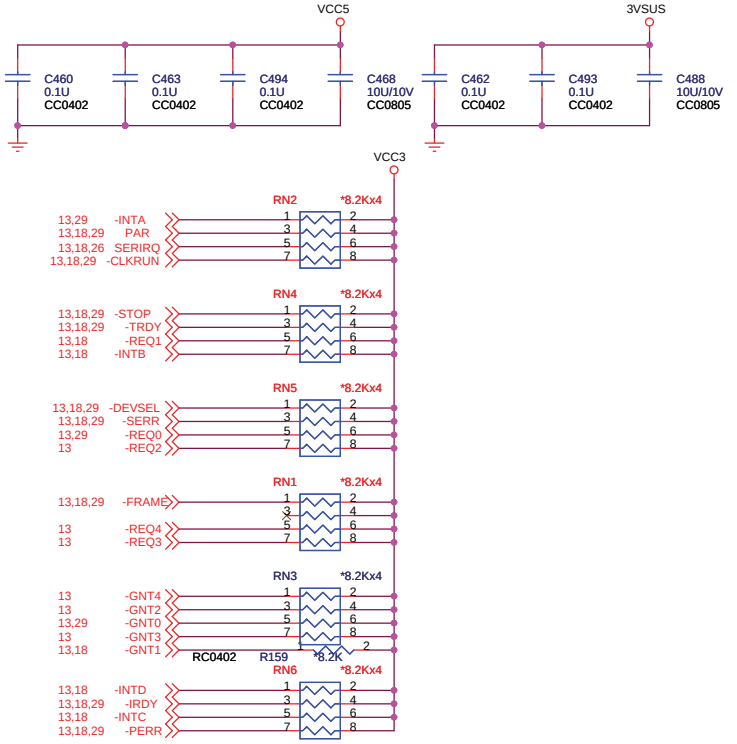
Title	Mini PCI-E Card
Size	Custom
Document Number	AK24 Main Board
Rev	B
Date:	Tuesday, October 16, 2007
Sheet	24 of 38

QUANTA COMPUTER

For JP model don't have HD_MDC

HD_MDC





VCC3	VCC3	5,11,14,15,16,17,18,19,20,21,26,33
3VSUS	3VSUS	9,14,29
VCC5	VCC5	16,19,24,26,30

QUANTA COMPUTER

Title	HD_MDC	
Size B	Document Number AK24 Main Board	Rev B
Date: Tuesday, October 16, 2007	Sheet 25 of 38	

IT8512

Layout Note:
Place all capacitors close to IT8512.

(For PLL Power)

Layout Note:
net "3VPCU" and "RTC_VCC"
minimum trace width 12mils.

Note 1 : Since all GPIO belong to VSTBY power domain, and there are some special considerations below:
(1) If it is output to external VCC derived power domain circuit, this signal should be isolated by a diode such as KBRST# and GA20.
(2) If it is input from external VCC derived power domain circuit, this external circuit must consider not to float the GPIO input.

Note 2 :
(1) Each input pin should be driven or pulled.
(2) Each output-drain output pin should be pulled.

SMBUS

Pull Up for Low Active Pin

ES

Layout Note:
Place R471,R498,R534 within 500 mils from SPI Flash.Place R567 within 500mils from R534; R520 within 500mils from R498 and R570 within 500mils from R471.

8Mbit , SPI

16M SST P/N:AKE28FP0K07
8M Winbond P/N:AKE3GFP0N08

Layout Note:
32.768kHz clock lines:
a. If possible, please avoid using any through-hole.
b. Please make the trace length short, and the trace width wide enough.
c. The spacing to the closest neighbor should be wide enough.

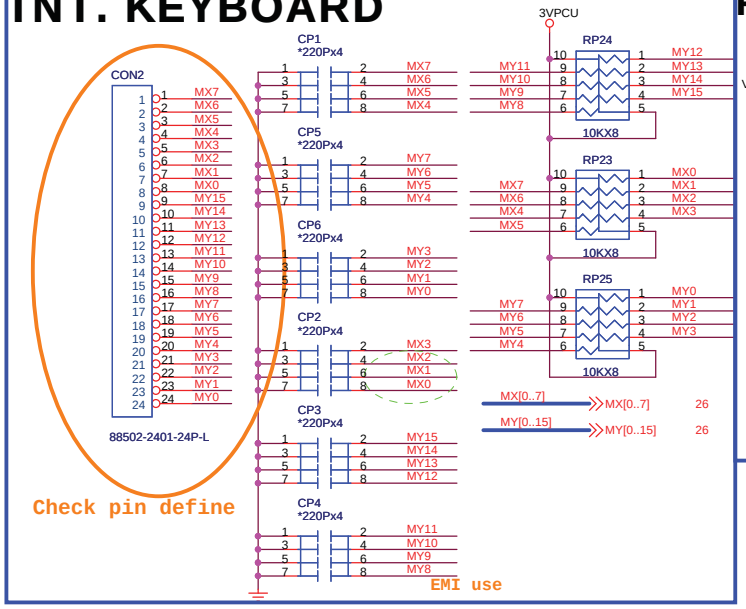
Please reserve this connector
for serial debug port & KBS download usage.

NECP re-assign Jumper

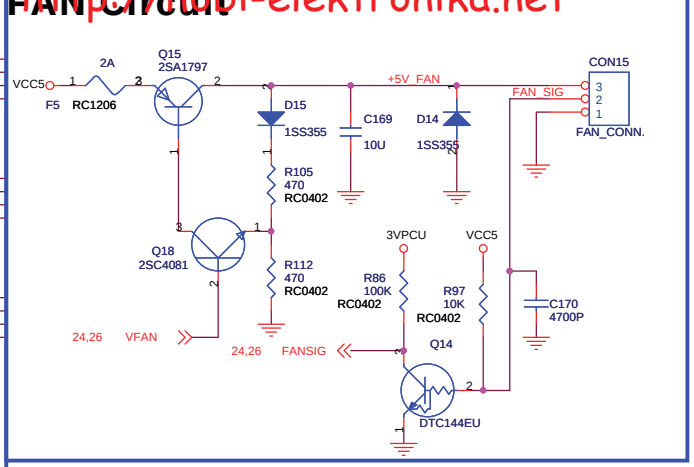
IT8512 U26
AJ085120F01

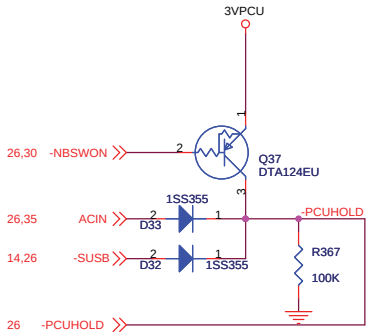
QUANTA COMPUTER			
Title: IT8512 & BIOS			
Size: C	Document Number: AK24 Main Board		Rev: B
Date: Tuesday, October 16, 2007		Sheet 26 of 38	

INT. KEYBOARD

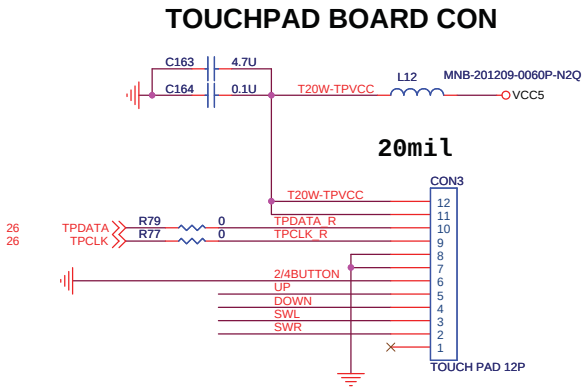


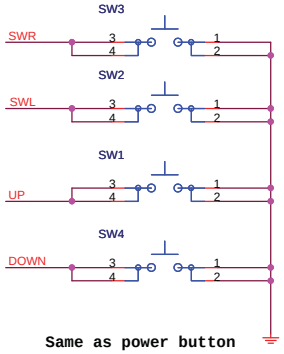
FAN Circuit

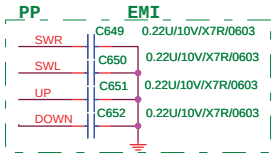




TOUCHPAD BOARD CON







3VPCU — 3VPCU 16,24,26,32,34

VCC5 — VCC5 16,19,24,26,30

QUANTA COMPUTER

Title	INT.KB &TP CONN	
Size: Custom	Document Number: AK24 Main Board	Rev: B
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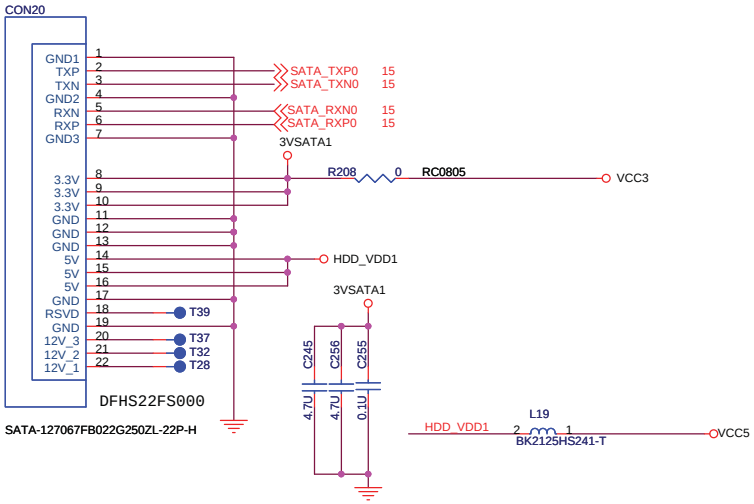
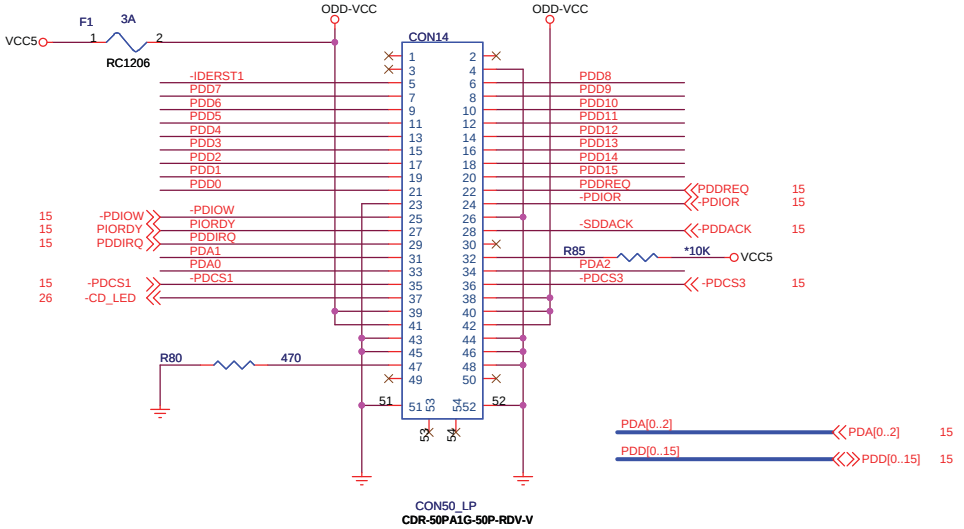
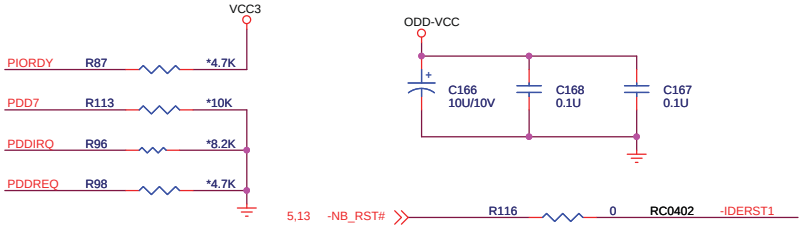
SATA_TOP(MASTER)

ODD Connector







VCC3 VCC3 5,11,14,15,16,17,18,19,20,21,26,33

VCC5 VCC5 16,19,24,26,30

QUANTA COMPUTER

Title	SATA(HDD),PATA(ODD) CONNECT	
Size B	Document Number AK24 Main Board	Rev B
Date: Tuesday, October 16, 2007	Sheet 28 of 38	

LAN Controller
IDSEL:AD24
INTA,
REQ0,GNT0
PCI_CLK0

U1
RTL8100CL
PQFP128A_0.5MM

U3
AT93C46

U2
NS681686

CON10
RJ45

CON8
*RJ11

CON9
*HEADER 2(MODEM)

For JP model don't have CON8 and CON9

Y1
25MHz/20pF/20ppm

LP1
*DLP31SN121SL2

LP2
*DLP31SN121SL2

Q1
*2SB1188

Q2
2SB1197K

Q3
PDTC144EU

Q4
*2SB1188

Q5
*2SB1197K

D8
1SS355

Title	LAN--RTL8100CL
Size	Custom
Document Number	AK24 Main Board
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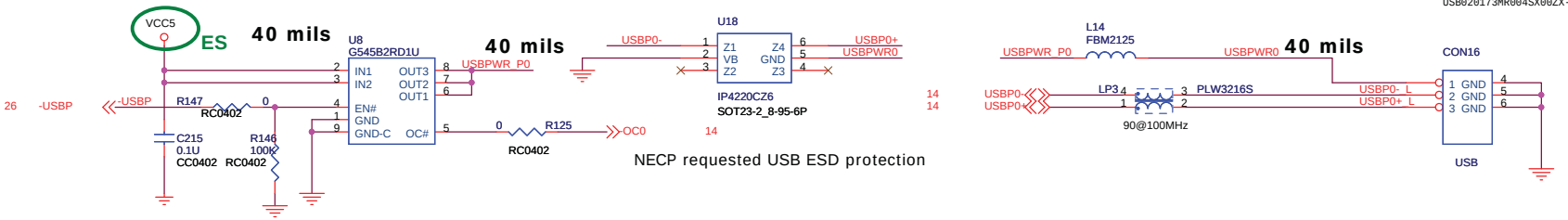
Date	Tuesday, October 16, 2007
Sheet	29 of 38

QUANTA COMPUTER

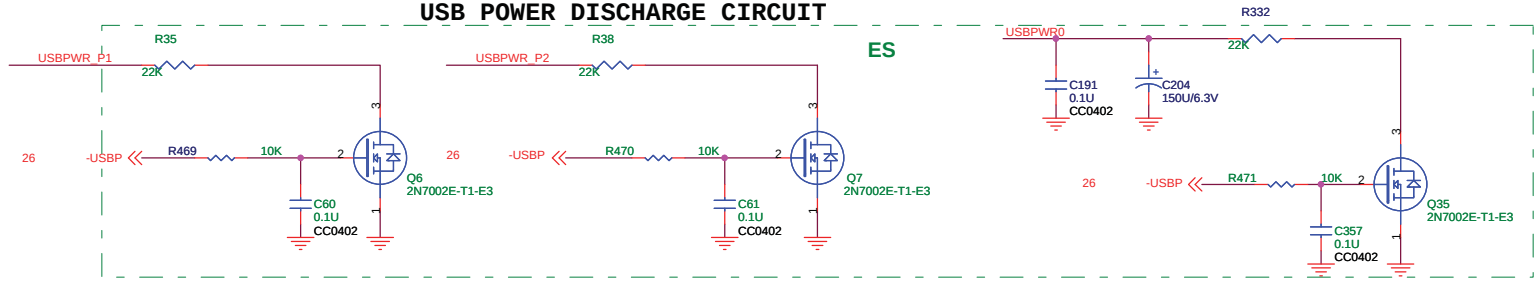
USB Power and Over current

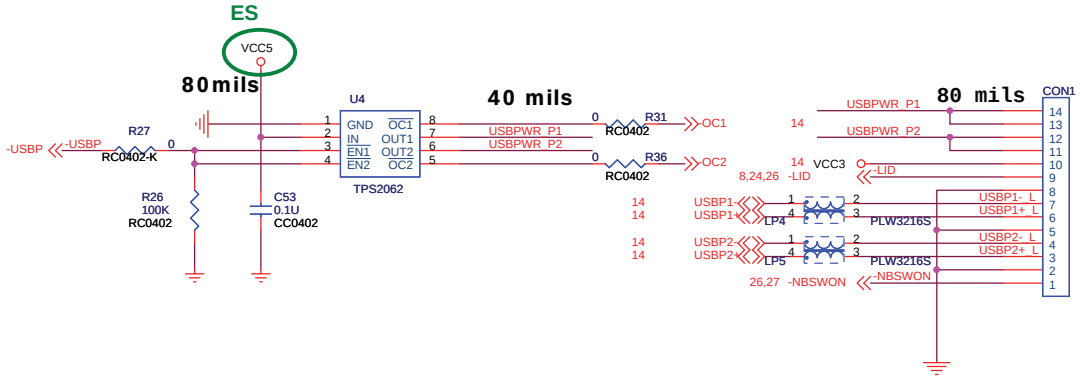
USB Connector

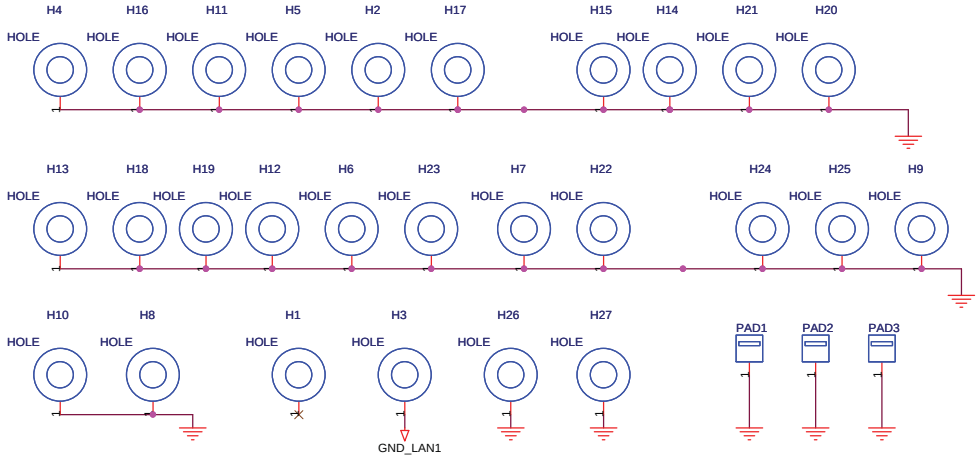
USB020173MR004SX00ZX-RVS-4P-H



USB POWER DISCHARGE CIRCUIT







VCC3 — VCC3 5,11,14,15,16,17,18,19,20,21,26,33

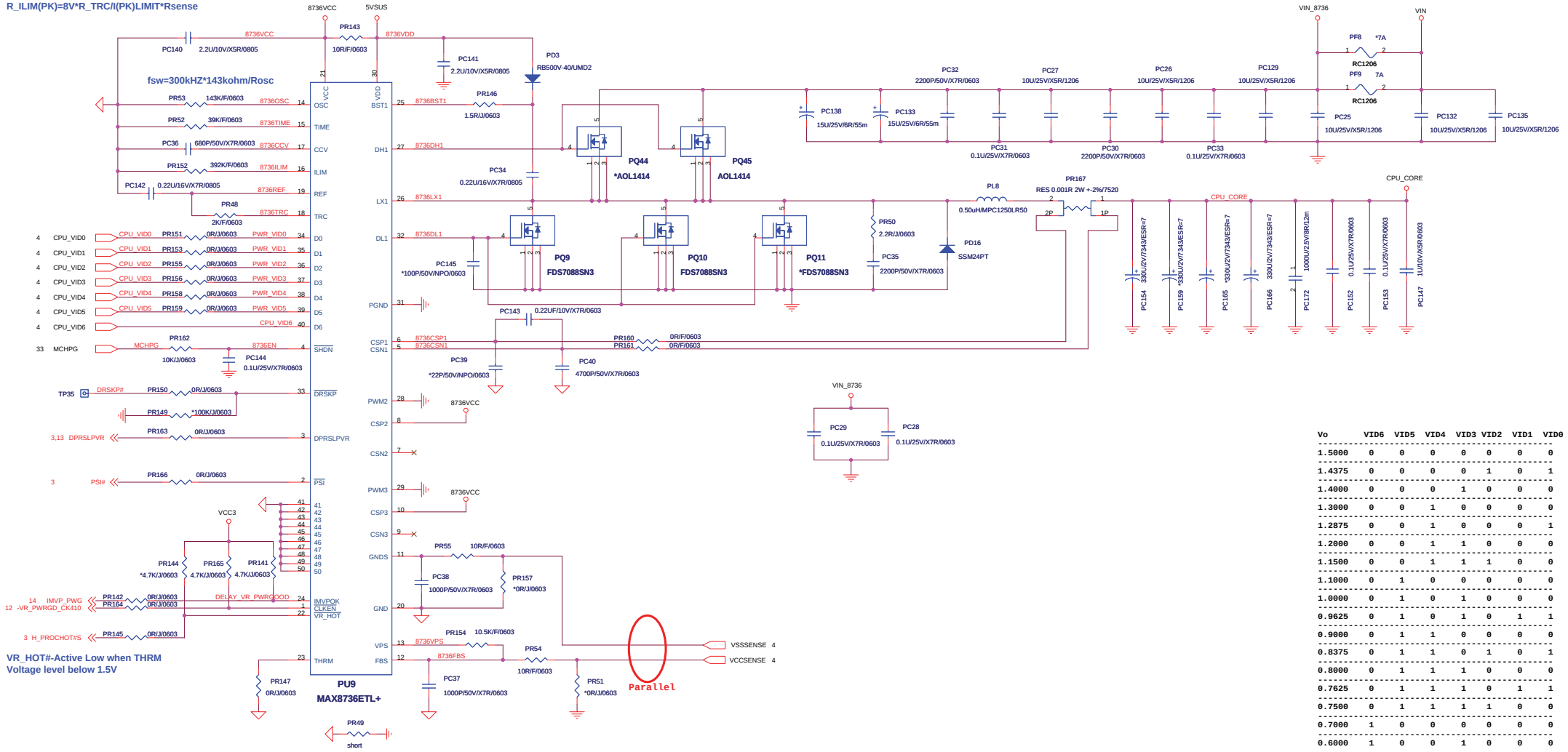
5VSUS — 5VSUS 24,31

QUANTA COMPUTER

Title	USB PORT/USB board conn	
Size: Custom	Document Number: AK24 Main Board	Rev: B
Date: Tuesday, October 16, 2007	Sheet 30 of 38	

dV_Target/dt=12.5mV/us*71.5kohm/R_TIME

R_ILIM(PK)=8V*R_TRC/I(PK)LIMIT*Rsense



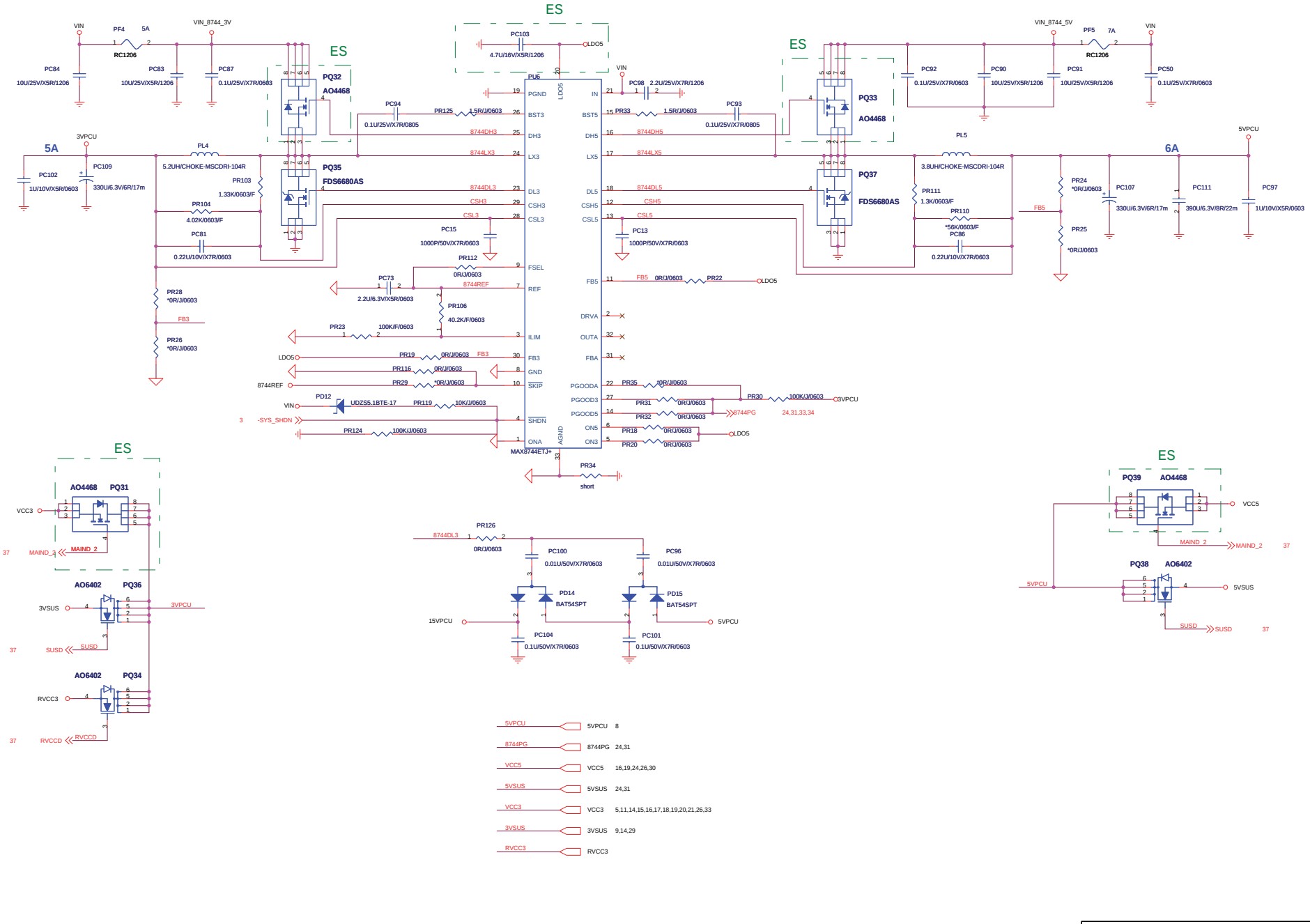
VR_HOT#-Active Low when THRM
Voltage level below 1.5V

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

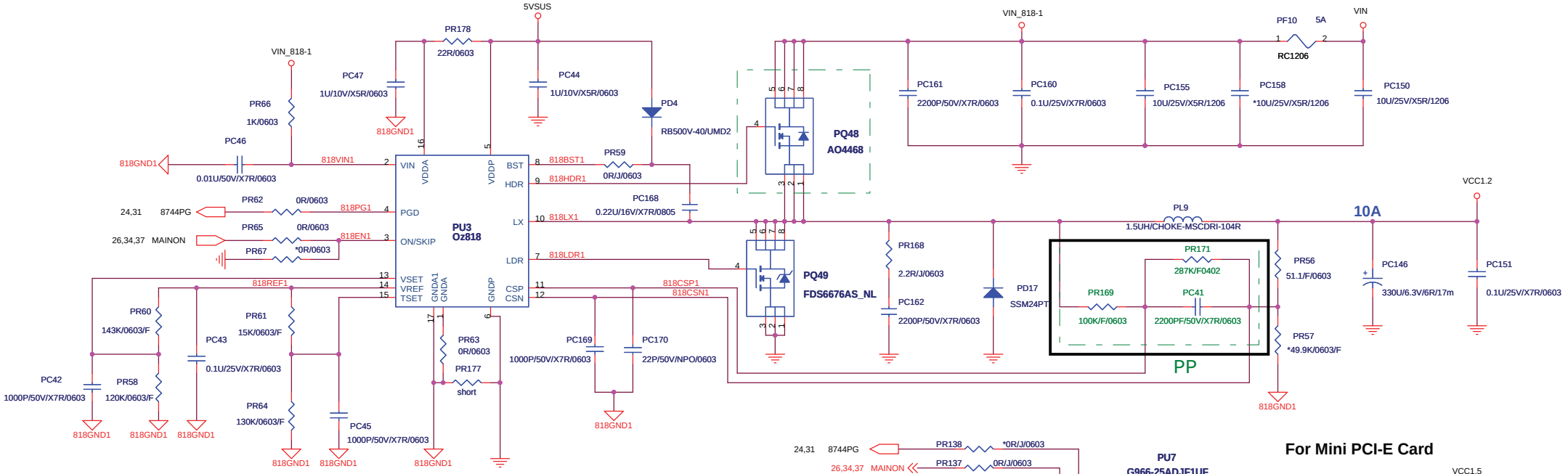
Title	CPU CORE (MAX8736)	
Size: Custom	Document Number: AK24 Main Board	Rev: B
Date: Tuesday, October 16, 2007	Sheet 31 of 38	

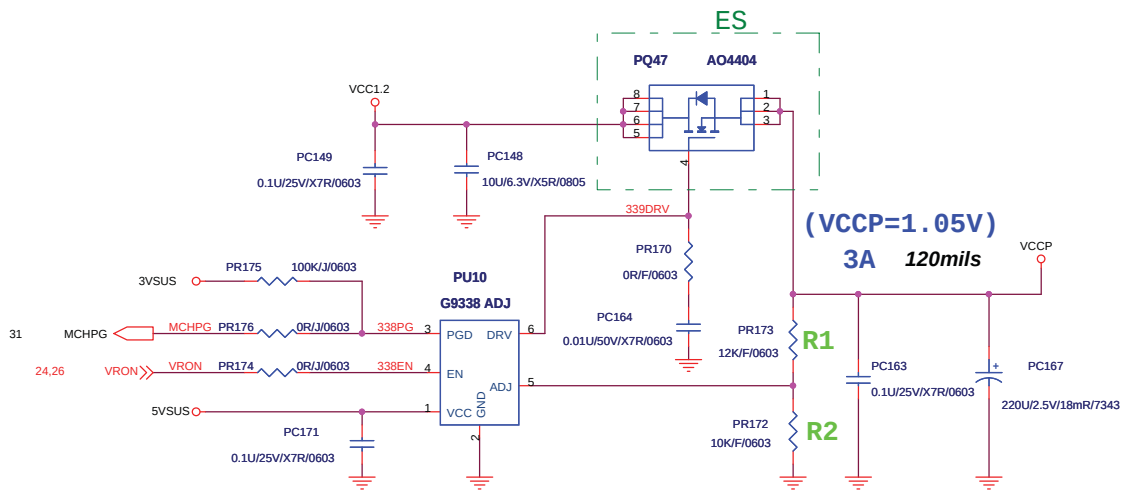
DC/DC 3.3V&5V POWER

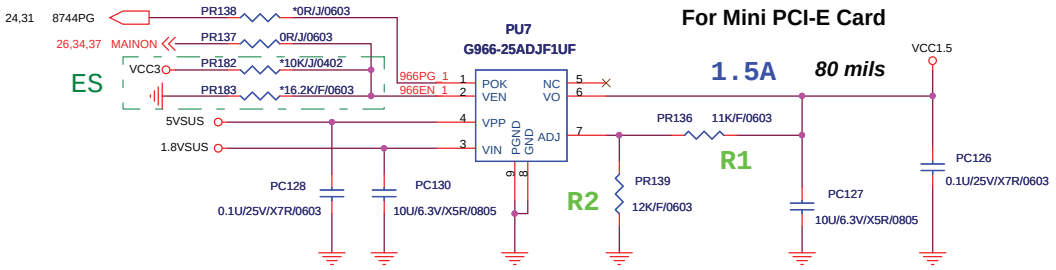


Quanta Computer	
Title	DC/DC 3V&5V
Size: Custom	Document Number: AK24 Main Board
Rev: B	
Date: Tuesday, October 16, 2007	Sheet 32 of 38

VCCP/VCC1.2 / VCC1.5







Vo=0.5*(1+R1/R2)

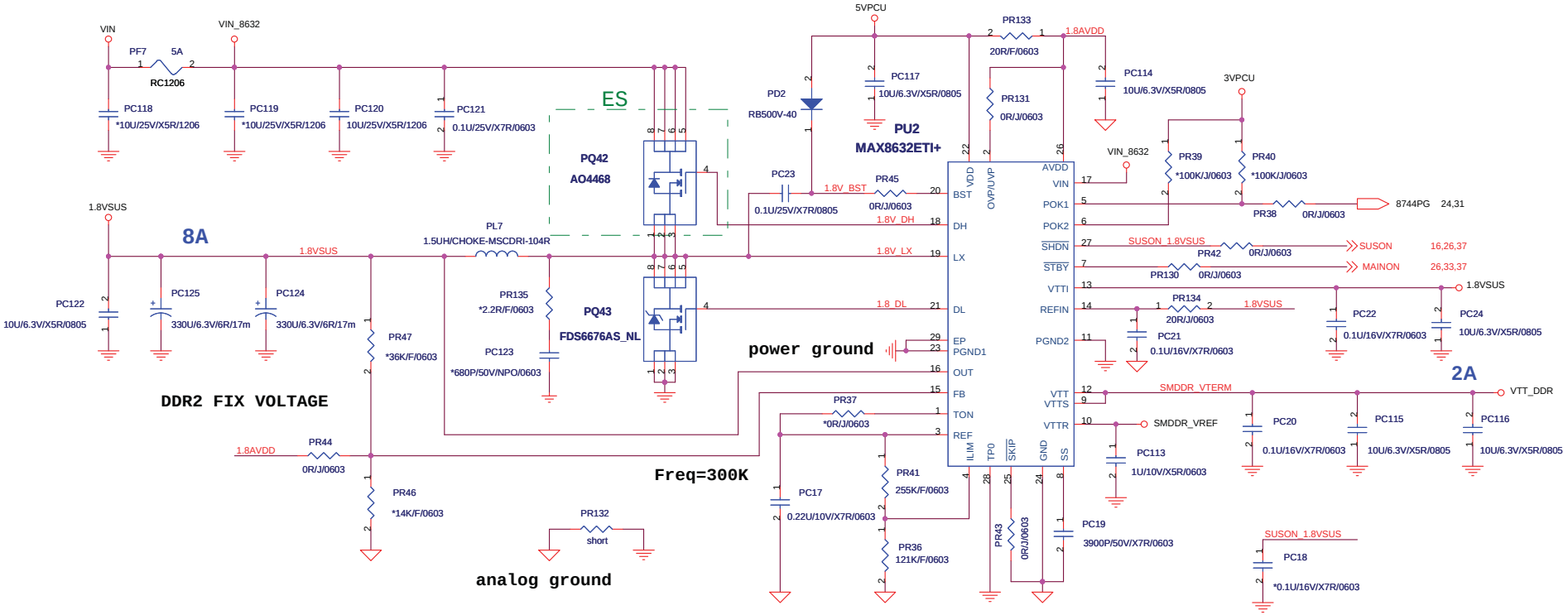
24,32 VIN — VIN
24,31 5VSUS — 5VSUS
9,14,29 3VSUS — 3VSUS
31 MCHPG — MCHPG

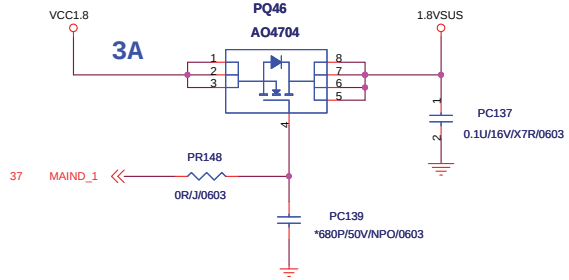
VCC1.2 — VCC1.2 15,24
VCC1.5 — VCC1.5 37
VCCP — VCCP 5,8,16

QUANTA COMPUTER

Title	VCC1.2/VCCPVCC1.5	
Size	Document Number: AK24 Main Board	Rev: B
Date: Tuesday, October 16, 2007	Sheet 33 of 38	

1.8VSUS & VTERM(DDR2)





1.8VSUS	1.8VSUS	5,11,24,33
VTT_DDR	VTT_DDR	11
VCC1.8	VCC1.8	5
VIN	VIN	24,32

3VSUS	3VSUS	9,14,29
5VPCU	5VPCU	8

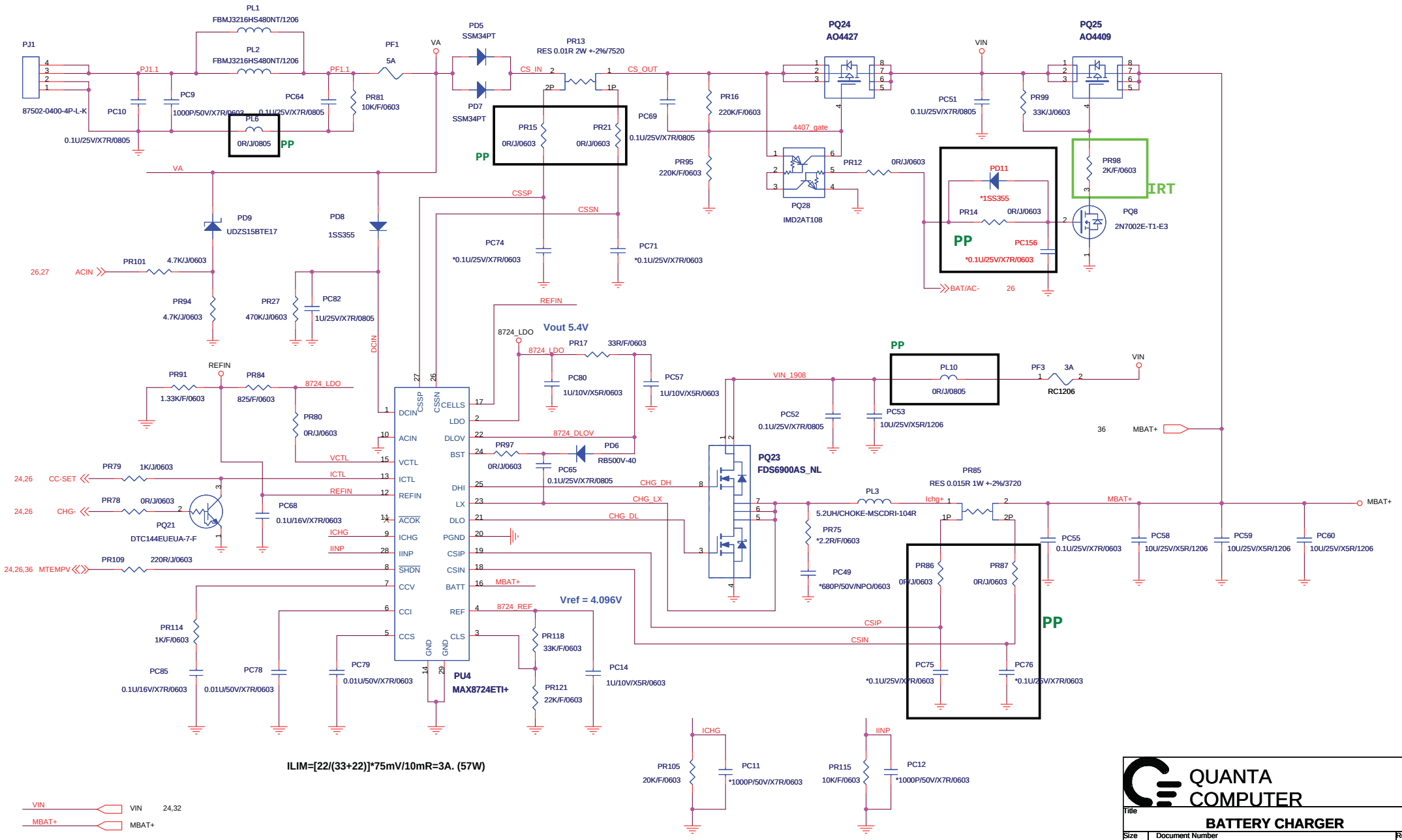
QUANTA COMPUTER

Title: 1.8VSUS / DDRVTERM

Size: Custom | Document Number: AK24 Main Board | Rev: B

Date: Tuesday, October 16, 2007 | Sheet 34 of 38

Battery Charger



Title	BATTERY CHARGER	
Size: Custom	Document Number: AK24 Main Board	Rev: B
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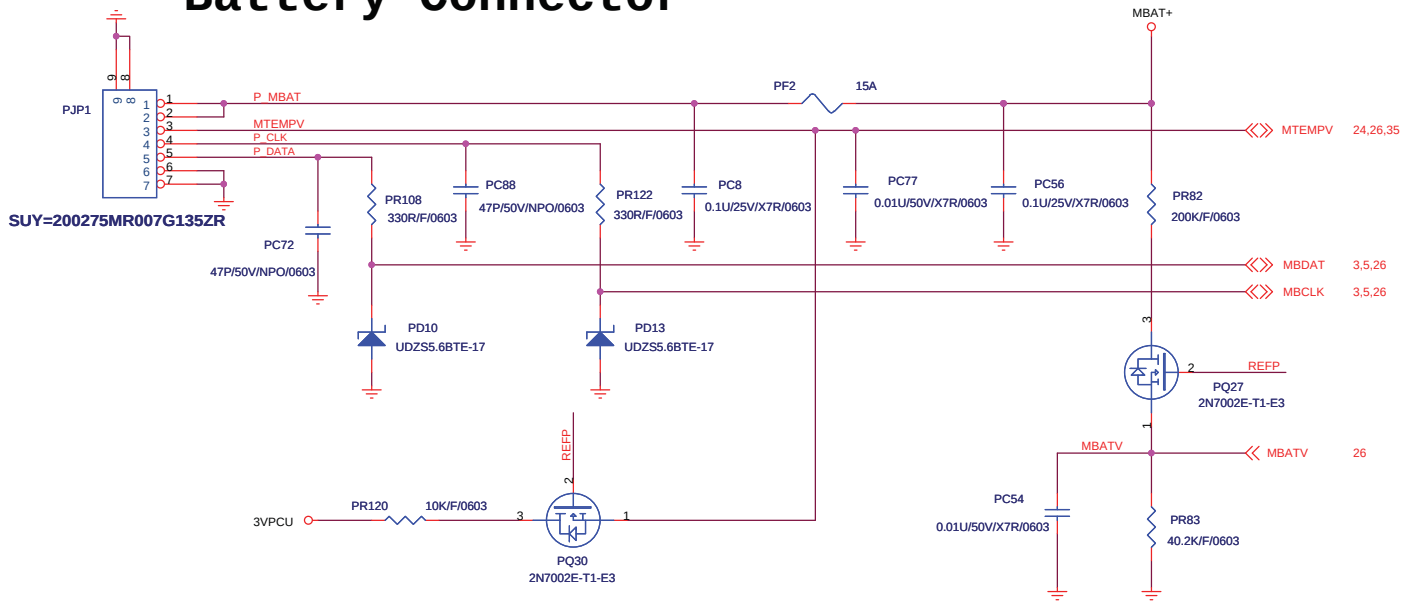
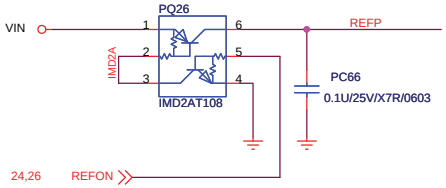
QUANTA COMPUTER

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

QUANTA COMPUTER

Title	BATTERY CONNECTOR	
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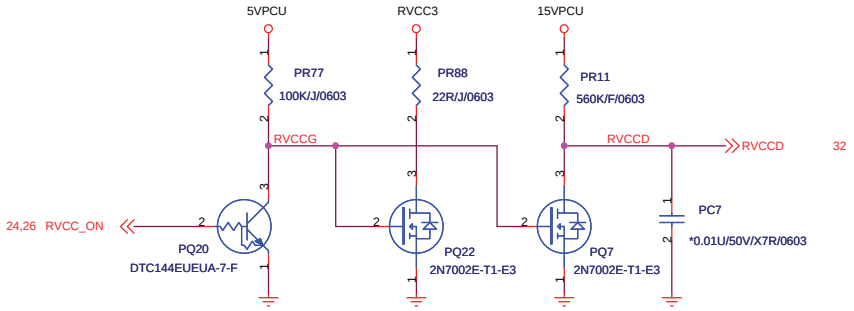
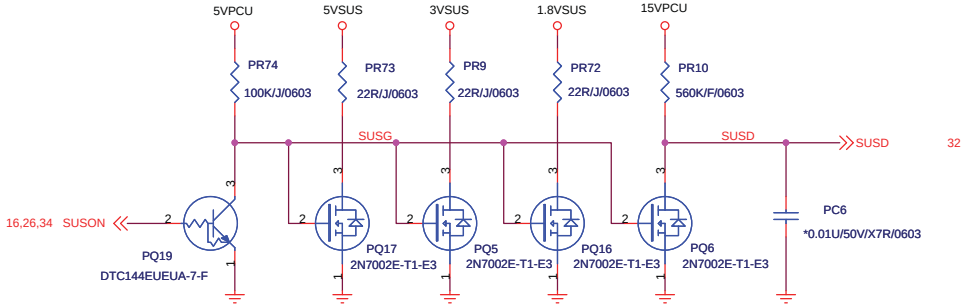
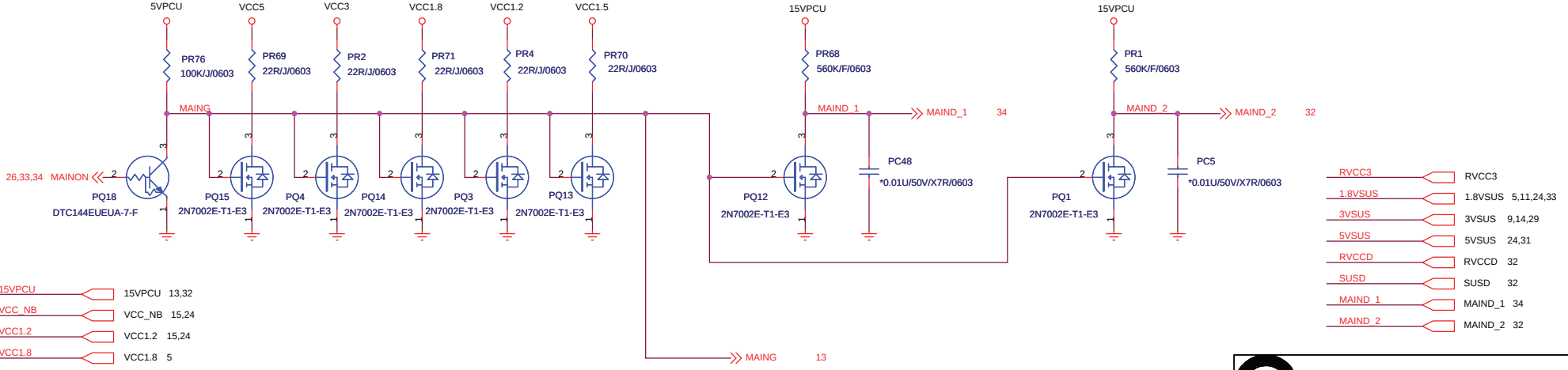
Battery Connector







15VPCU — 15VPCU 13,32
VCC_NB — VCC_NB 15,24
VCC1.2 — VCC1.2 15,24
VCC1.8 — VCC1.8 5
VCC3 — VCC3 5,11,14,15,16,17,18,19,20,21,26,33
VCC5 — VCC5 16,19,24,26,30
5VPCU — 5VPCU 8

RVCC3 — RVCC3
1.8VSUS — 1.8VSUS 5,11,24,33
3VSUS — 3VSUS 9,14,29
5VSUS — 5VSUS 24,31
RVCCD — RVCCD 32
SUSD — SUSD 32
MAIND_1 — MAIND_1 34
MAIND_2 — MAIND_2 32

QUANTA COMPUTER

Title: DISCHARGE

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《ES2 Change list(Rev 2A)
0323:
1.Change SB460 to SB600;
2.Change TI1510 to R5C847;
3.Change EC WINBOND 541 to ITE8512;
4.Remove ATI DDR2-667 workaround;

0325:
1.Remove 1394 function circuit;
2.Delete U59 Express power switch circuit;
0327:
Page 12: Change R89 from 4.7K to 0 and reserve C176 for SB600;
Page 20: Change Media Card CONN to reverse model;
Page 21: Change C526,C527 value to 2.2uF and Delete C516, C517, C522~C525 for NECP requirement;
Page 23: Change L49 to 0ohm for NECP requirement;
Page 24: Remove RF Switch and Let EC(Pin:PWM4/GPA4) control Enable/Disable function;
Page 26: Reserve 10K Pull-up resistor for -VOLMUTE;
0329:
Page 26: Add R342 for KB_NEW use;
Page 30: Change USB Power line from 5VSUS to VCC5 and Add USB Power discharge circuit for NECP requirement;
0403:
Page 16: Reserve R503,add R502 for lable no found issue;
Delete the original reserved Page 37:VGA power;
0409:
Page 13:ADD R360 and R363 for the selection of R5C847 and R5C804;
Page 18:ADD R364 for the selection of R5C847 and R5C804;
Page 19:ADD R371 for the selection of R5C847 and R5C804;
0411:
Page 21:Change the Value of R423 and R418 to 27.4K and 12K for NECP request;
0413:
Page 20:Change C623 to 2.2uF from 47uF for NECP request;
0418:
Page 33:Change PR171 from 97.6K to 51.1K,Change PC41 from 3300PF/50V/X7R/0603 to 0.01UF/50V/X7R/0603,
Change PR169 from 100K/F/0603 to 20K/F/0603,Change PQ47 from AO4468 to AO4404 for current limit setting of VCC1.2;

《ES2 to PP Change list(Rev 3A)
0511:
Page 33:Change PR171 from 51.1K to 287K,Change PR169 from 20K to 100K,Change PC41 from 0.01UF to 2200PF for current limit setting of VCC1.2;
Page 35:Add PD11 and PC156,but no mount it;
0514:
Page 14:Delete R243 for leaving more space to the trace layout;
0515:
Page 3:Delete R166,D18,C224,U10,C222,Q20 for leaving more space to add PCIE_PVDD Power Sequence Requirement circuit;
Page 13:Add and Reserve AMD PCIE_PVDD Power Sequence Requirement circuit;
Page 15:Delete R403,R468,R493,R490,U53,R494,R495,C567 for leaving more space to add PCIE_PVDD Power Sequence Requirement circuit;
0519:
Page3:Add and Reserve C222,C224,C226,C227,C228 to H_INIT#,H_IGNNE#,H_STPCLK#,H_SMI#,H_INTR signal for AMD recommendation;
Page13:Using VRON to control PCIE_PVDD Power Sequence Requirement circuit;
0521:
Page3:Change R102 to 62ohm from 75ohm for following Intel CPU Spec;
Page5:Change R76 to 127ohm from 100ohm,R78 to 61.9ohm from 51ohm for following Intel CPU Spec;
Page9:ADD RC415MD Power Up Sequence to follow VDDR3/VDDLT33/AVDD power up after VDD_MEM and VDD18 for AMD recommendation;
Page22:Change R424,R448 from 11K to 10K due to change gain of internal speaker;
0523:
Page11:Delete C341 for EMI layout suggestion;
Page24:Add Q88 and Delete D35 for WLAN LED driver schedule requirement of NECP(Reserve R158,R466,D43,R465);
Page26:Add C648 for EMI solution;
Page27:Add C649,C650,C651,C652 for EMI solution;
Page35:Add PL6,PL10,PR15,PR21,PR86,PR87 and Reserve PC75,PC76 for EMI solution;
0524:
Page14:Add and Reserve R592,C653 for EMI solution;

《PP to IRT Change list
Page13: Add R166,R167,C229 from ATI suggestion
Del B15, Add B19 from ATI suggestion
Page24: Delete R142, RP27,RP26,R126 and change to short circuit for non-necessary parts.

0904
《AK23 to AK24 Change list for AK24 PP using
Page13: A:Del reserve parts R162,R166,C221
B:Reserve R162,C229 to disable RC delay PCIE_VDDR timing
C:Change Q87 type from 2N7002 TO DTC144 to Enable EC delay PCIE_VDDR timing
D:Del B16 Add B26 from PA_SB600AT4

1012 IRT change for LCD flash issue.
Page 8:Add D31 for A_RST# signal
Page 13:Add R634 for A_RST# signal

QUANTA COMPUTER

Title: Change list

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