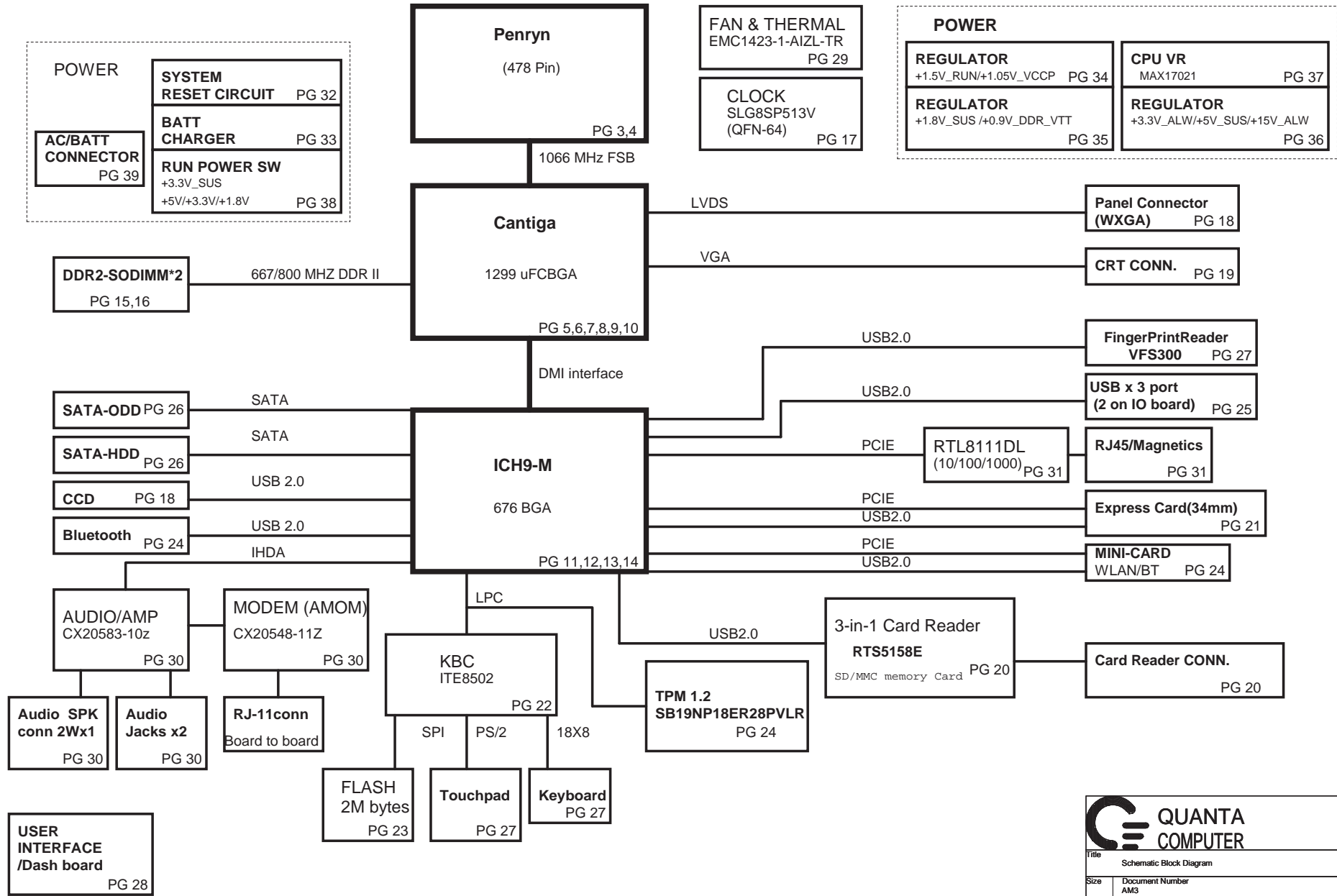




MB PCB

# 12.1" AM3 Low Rider Block Diagram

VER : C3A



**QUANTA COMPUTER**

Title: Schematic Block Diagram

Size: Document Number AM3 Rev 1A


Date: Wednesday, March 25, 2009 Sheet 1 of 45


### Table of Contents

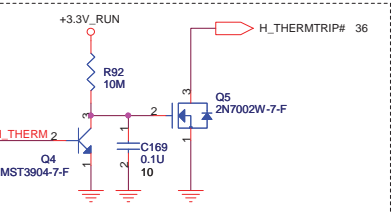
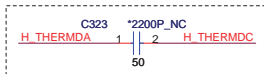
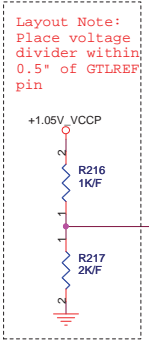
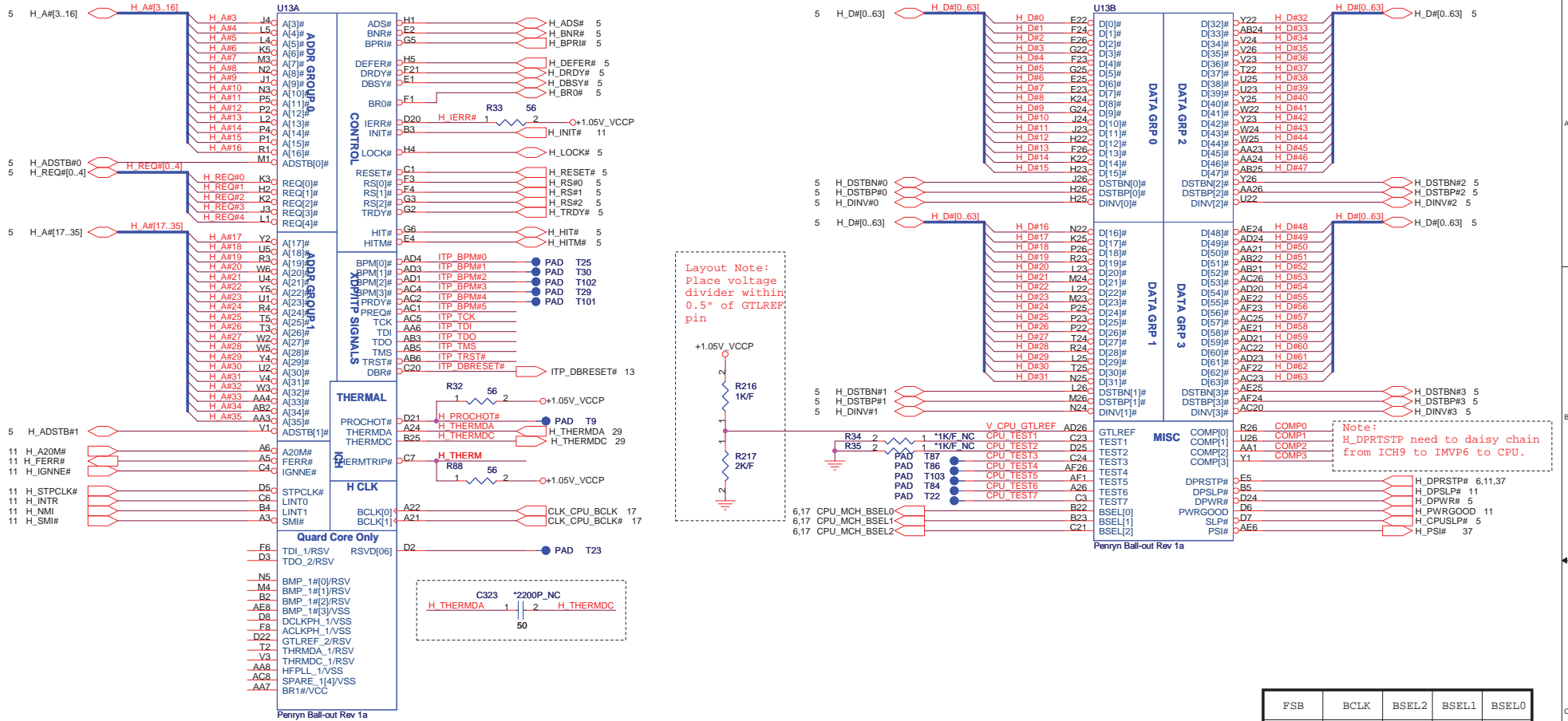
PAGE	DESCRIPTION
1	Schematic Block Diagram
2	Front Page
3-4	Penryn
5-10	Cantiga
11-14	ICH9M
15-16	DDRII SO-DIMM(200P)
17	Clock Generator
18	LCD Conn.
19	CRT Conn
20	RTS5158
21	Express card
22	SIO (ITE8502)
23	FLASH/RTC/TPM
24	Mini Card / BT
25	USB
26	SATA Conn HDD and ODD
27	TP / KEYBOARD / FP
28	SWITCH /LED
29	FAN & Thermal
30	Audio CODEC(CX20583)/Phone Jack/Modem
31	LAN / TRANSFORM
32	System Reset Circuit
33	Battery Selector & Charger
34	1.05VCCP / 1.5V RUJN
35	DDR2_1.8VSUS, 0.9V
36	MAX17020 (+5V/+3V ALW)
37	MAX17021 V_CORE
38	RUN Power Switch
39	DCIN,Batt
40	PAD& SCREW
41	EMI CAP
42	SMBUS BLOCK
43	Power Block Dianram

### Power States

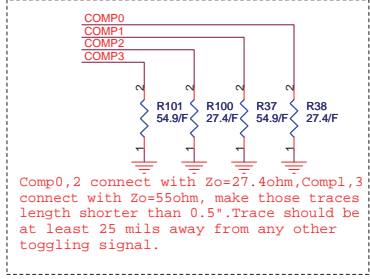
POWER PLANE	VOLTAGE	PAGE	DESCRIPTION	CONTROL SIGNAL	ACTIVE IN
+PWR_SRC	10V~+19V	4,26,32,34,46,48,49,51,52,56	MAIN POWER		S0-S5
+RTC_CELL	+3.0V~+3.3V	11,14,31,32	RTC		S0-S5
+3.3V_ALW	+3.3V	3,31,32,34,36,37,38,44,46,49,52,53,54	8051 POWER	ALWON	S0-S5
+15V_ALW	+15V	26,36,37,52,53	LARGE POWER	+5V_ALW	S0-S5
+3.3V_LAN	+3.3V	42,43	LAN POWER	AUX_ON	
+5V_SUS	+5V	14,38,51,53	SLP_S5# CTRLD POWER	SUS_ON	
+3.3V_SUS	+3.3V	3,11,12,13,14,26,30,37,38,43,48,49,51,53	SLP_S5# CTRLD POWER	3.3V_SUS_ON	
+1.8V_SUS	+1.8V	6,8,9,15,48,49,53	SODIMM POWER	DDR_ON	
+0.9V_DDR_VTT	+0.9V	16,49,53	SODIMM POWER	0.9V_DDR_VTT_ON	
+5V_RUN	+5V	14,18,27,36,37,38,39,40,41,53	SLP_S3# CTRLD POWER	RUN_ON	
+3.3V_RUN	+3.3V	14,18,27,36,37,38,39,40,41,53	SLP_S3# CTRLD POWER	3.3V_RUN_ON	
+1.5V_RUN	+1.5V	4,9,14,30,33,34,48,53,56	CALISTOGA/ICH8 POWER	1.5V_RUN_ON	
+1.05V_VCCP	+1.05V	3,4,5,6,8,9,11,14,48,56	CPU/CALISTOGA/ICH8 POWER	1.05V_RUN_ON	
+VCC_CORE	+0.7V~+1.77V	4,51,56	CPU CORE POWER	IMVP_VR_ON	
+LCDVCC	+3.3V	26	LCD Power	LCDVCC_TST_EN & ENVDD	
+PBATT	+10V~+17V		MAIN BATTERY	CHG_PBATT	
+SBATT	+10V~+17V		SECOND BATTERY	CHG_SBATT	

GND PLANE	PAGE	DESCRIPTION
 GND	ALL	

		<b>QUANTA COMPUTER</b>
Title Index & Power Status		
Size AMS	Document Number AMS	Rev 1A
Date: Wednesday, March 25, 2009		Sheet 2 of 45



FSB	BCLK	BSEL2	BSEL1	BSEL0
667	166	0	1	1
800	200	0	1	0
1066	266	0	0	0



Signal	Resistor Value	Connect To	Resistor Placement
TDI	150 ohm +/- 5%	VTT	Within 2.0" of the ITP
TMS	39 ohm +/- 5%	VTT	Within 2.0" of the ITP
TRST#	680 ohm +/- 5%	GND	Within 2.0" of the ITP
TCK	27 ohm +/- 5%	GND	Within 2.0" of the ITP
TDO	Open	VTT	Within 2.0" of the ITP
ITP_EN	R268 Depop	+3VRUN	Close to CK410M Pin8

**Populate ITP700Flex for bringup**

Change ITP\_DBRESET# design circuit No2 1/5

ITP\_DBRESET# R36 1 2 150 → +3.3V\_RUN

ITP\_BPM#5 R96 54.9F → +1.05V\_VCC

ITP\_TDO R98 54.9F

ITP\_TMS R97 54.9F

ITP\_TDI R99 54.9F

ITP\_TCK R94 54.9F

ITP\_TRST# R95 54.9F

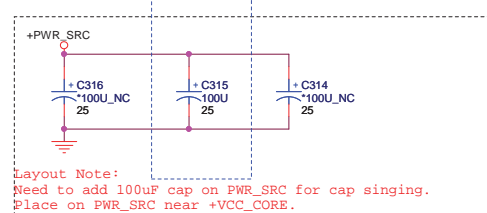
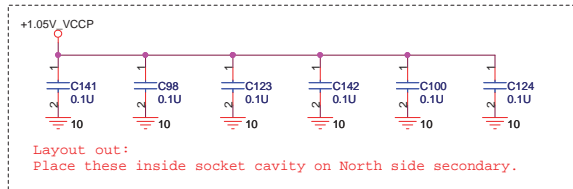
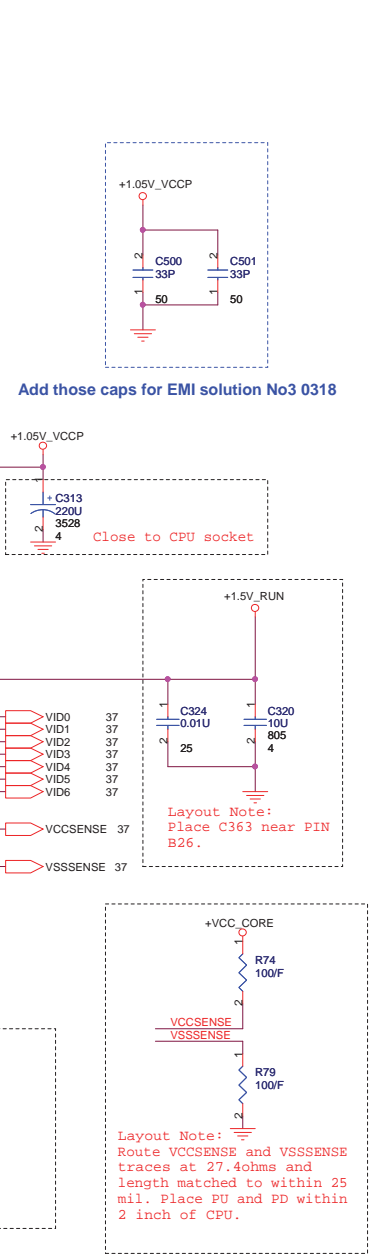
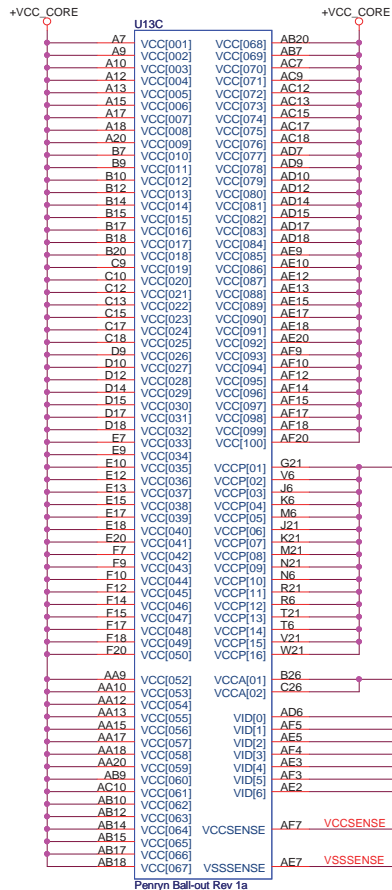
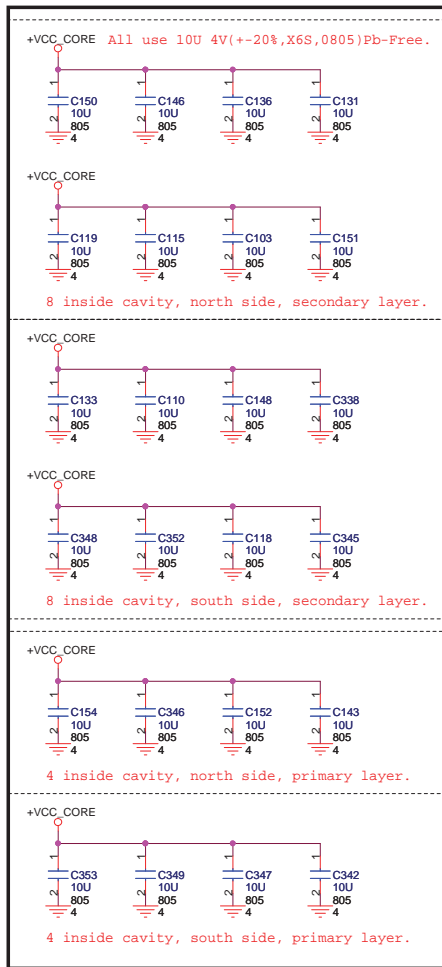
Layout Note: Place R92-R97 close to CPU

**QUANTA COMPUTER**

Title: Penryn Processor (HOST BUS)

Size: Document Number AM3 Rev 1A

Date: Wednesday, March 25, 2009 Sheet 3 of 45



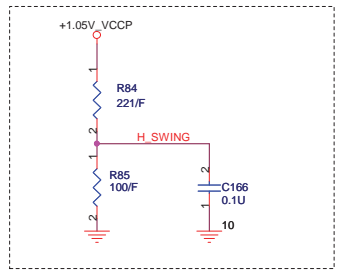
Add C315 for Acoustic No1 0220

**QUANTA COMPUTER**

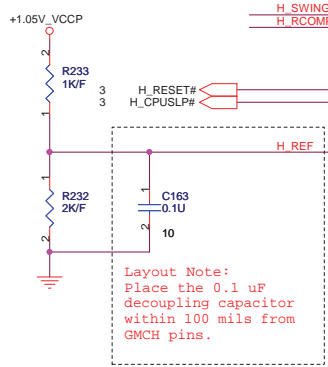
Title: Penryn Processor (POWER)

Size	Document Number	Rev
	AM3	1A

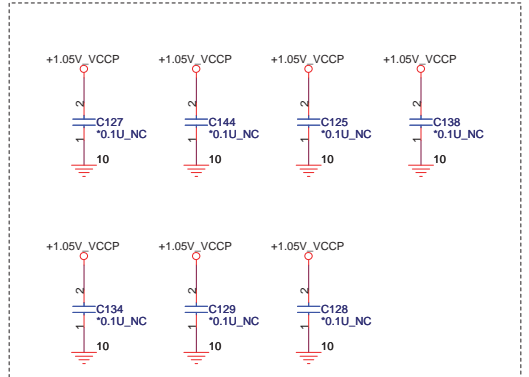
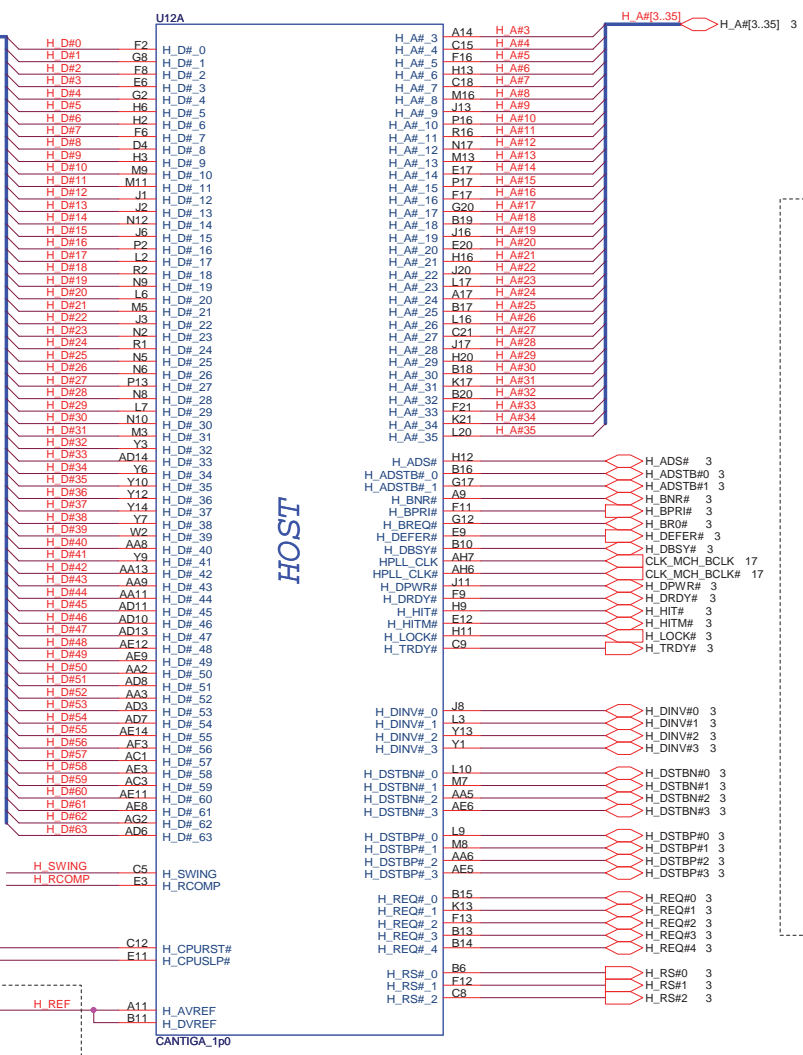
Date: Wednesday, March 25, 2009 Sheet 4 of 45



**Layout Note:**  
H\_RCOMP trace should be 10-mil wide with 20-mil spacing.



**Layout Note:**  
Place the 0.1 uF decoupling capacitor within 100 mils from GMCH pins.



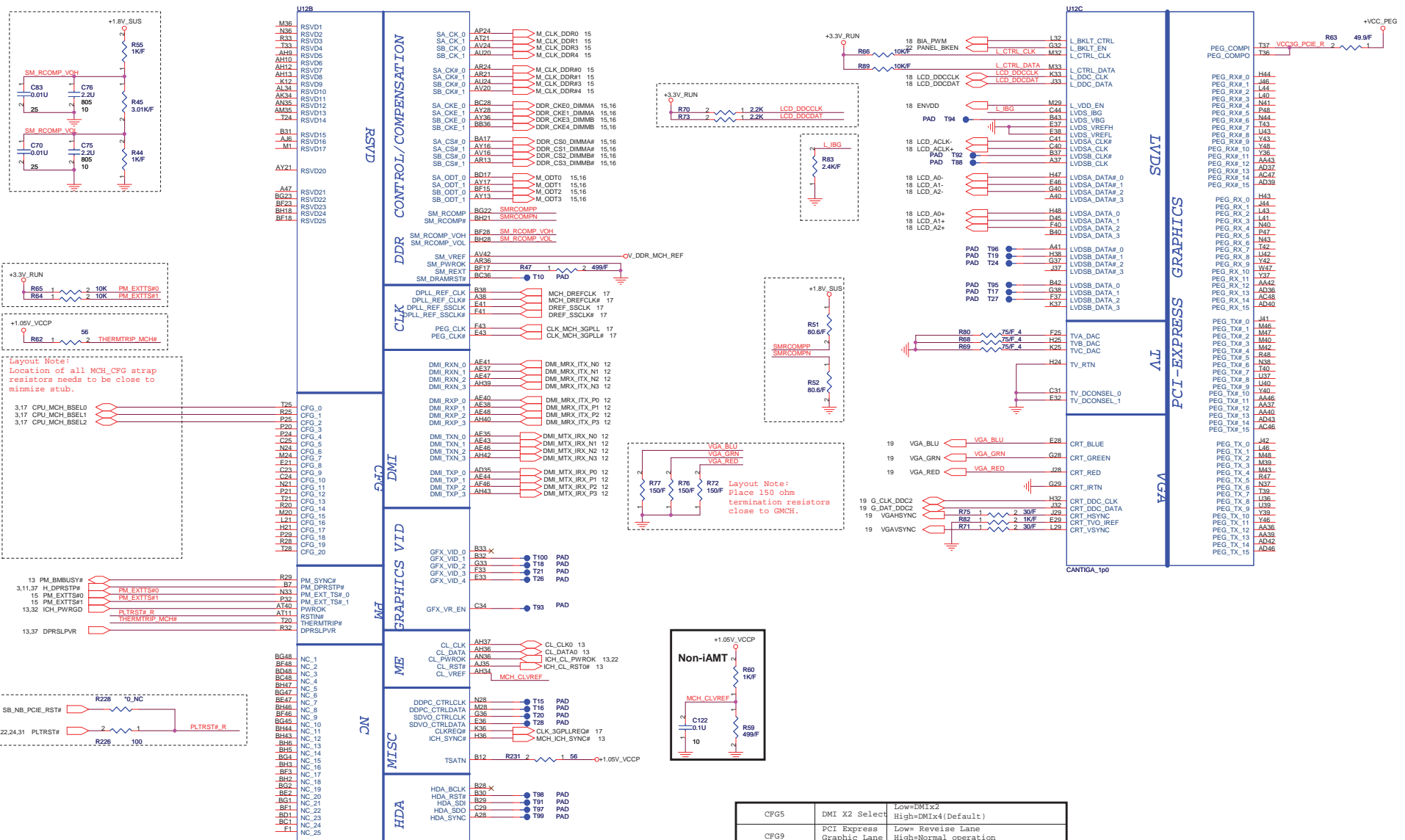
**Layout Note:**  
These 7 caps should be near below pin.  
1. should be near AB1,AB2,AC2,Y3  
2. should be near AD2,AE2,AG3,AE3  
3. should be near AC5,AC6,AD7,AC7,AC9,AD9,AD11,AC11,AD12,AD13,AC14  
4. should be near E2,F3,H2,H3,G4,H5,G7,H7  
5. should be near M6,L7,K9,M7,N8,N9,M10,M11,N12,P13  
6. should be near H13,J13,L13,M14,L16,K16,J17,H17  
7. should be near E13,G17,F16,C15,B14,C11,B11,A11,B12

**QUANTA COMPUTER**

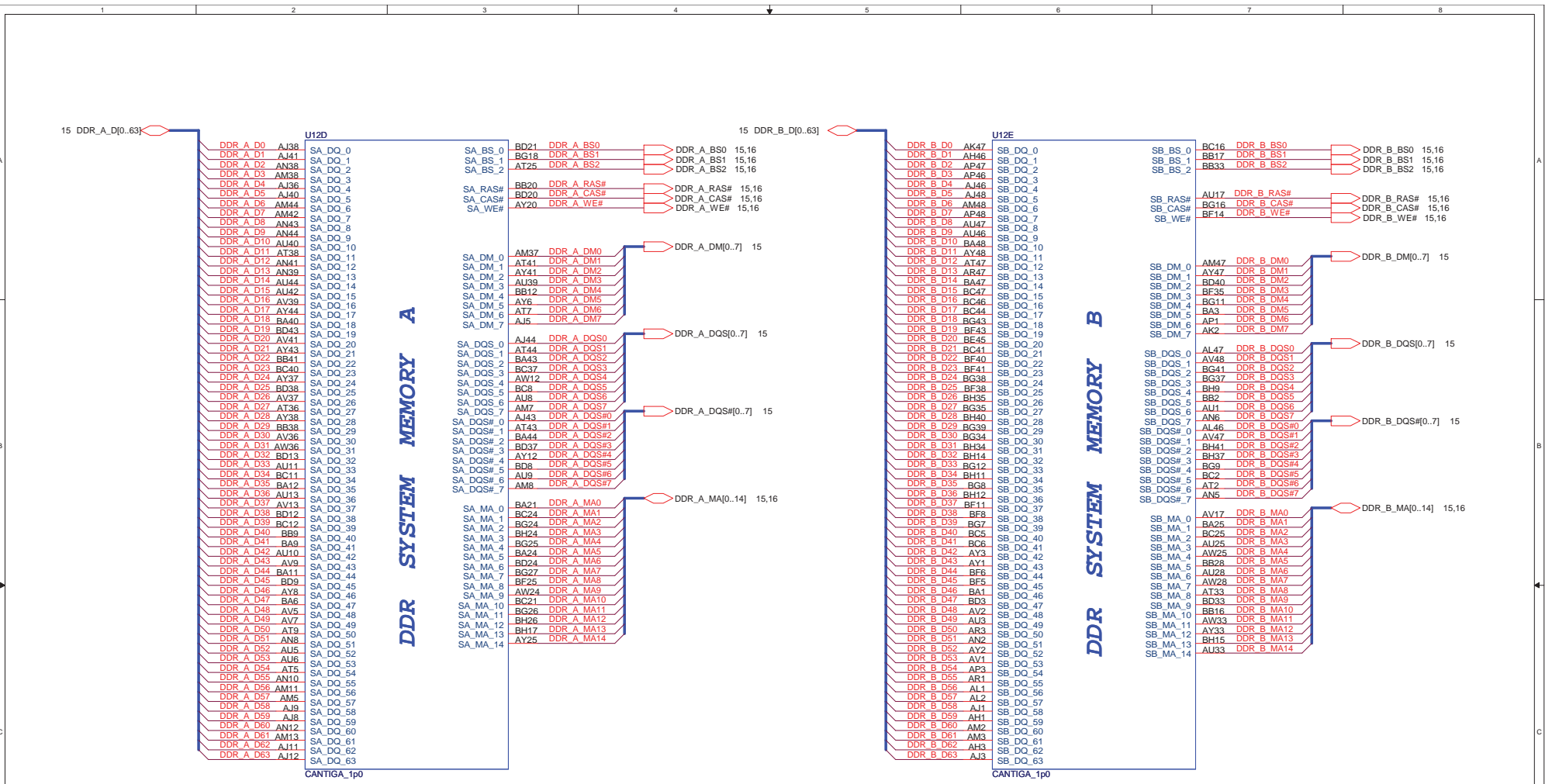
Title: Cantiga (HOST)

Size	Document Number	Rev
	AMS	1A

Date: Wednesday, March 25, 2009 Sheet 5 of 45



CFG5	DMI X2 Select	Low=DMIx2 High=DMIx4(Default)
CFG9	PCI Express Graphic Lane	Low= Reverse Lane High=Normal operation
CFG16	FSB Dynamic ODT	Low=Dynamic ODT Disable High=Dynamic ODT Enable(default).
CFG19	DMI Lane Reversal	Low=Normal(default). High=Lane Reversed
CFG20	SDVO/PCIE Concurrent Operation	Low=Only SDVO or PCIEx1 is operational (default) High=SDVO and PCIEx1 are operating simultaneously via PEG port
SDVO_CTRL_DATA	SDVO Present	Low=No SDVO Device Present (default) High=SDVO Device Present

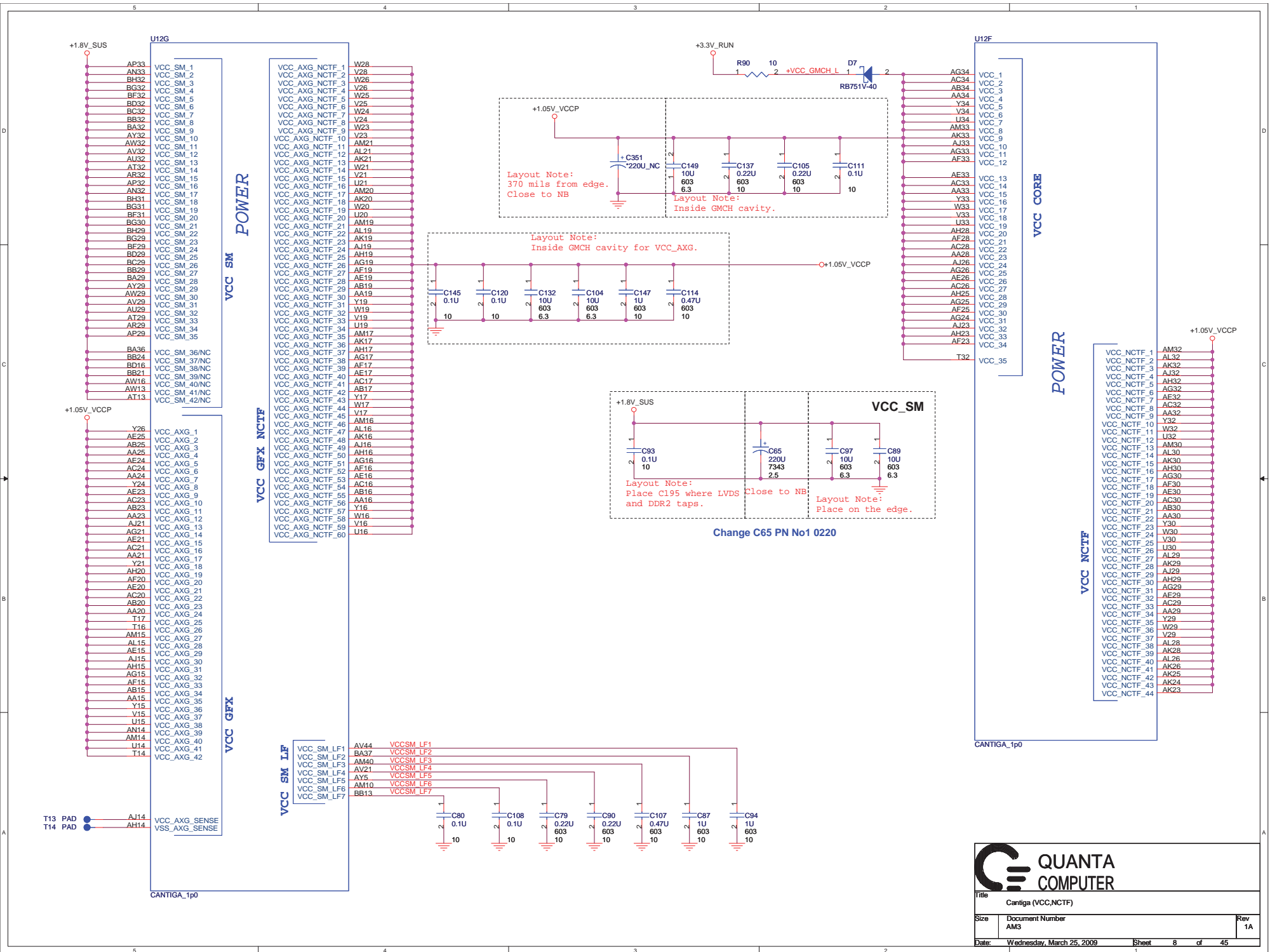


**QUANTA COMPUTER**

Title: Cantiga (DDR2)

Size	Document Number	Rev
	AM3	1A

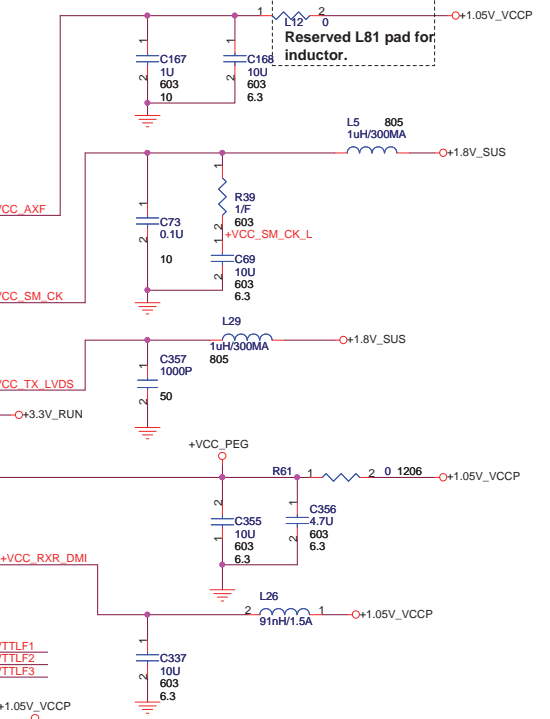
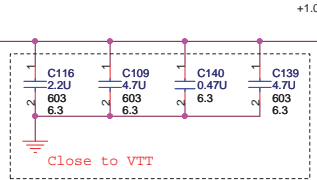
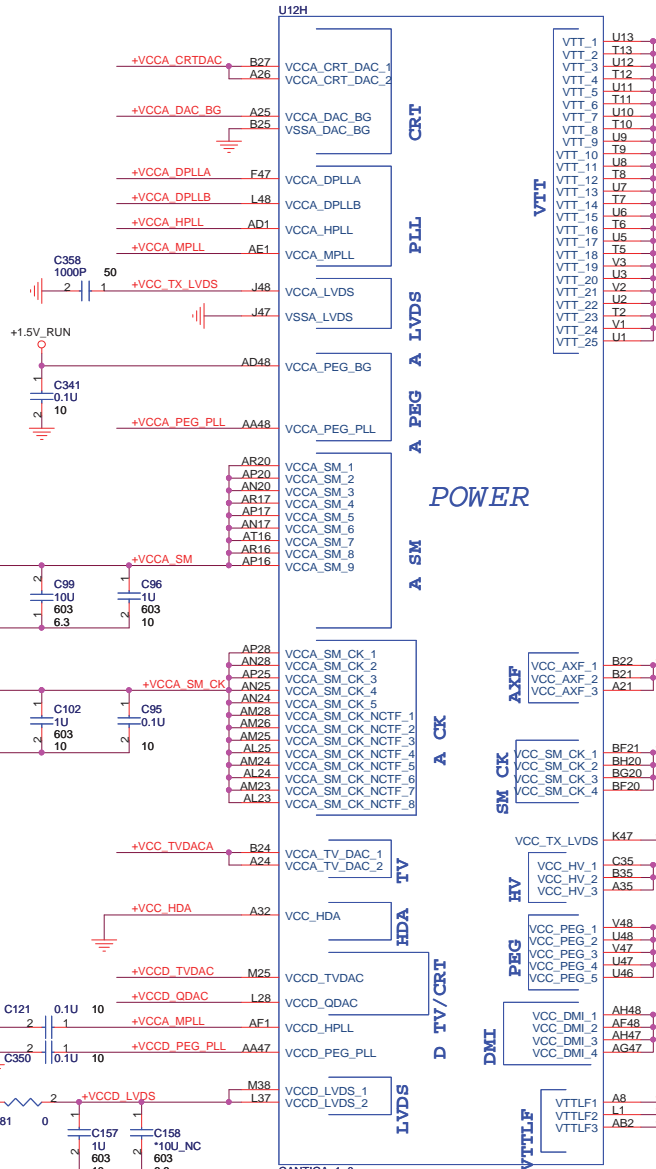
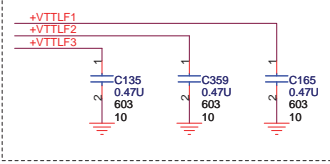
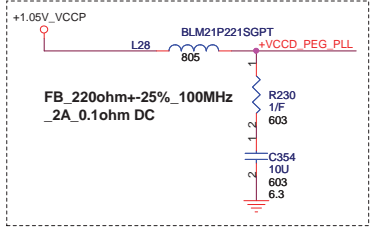
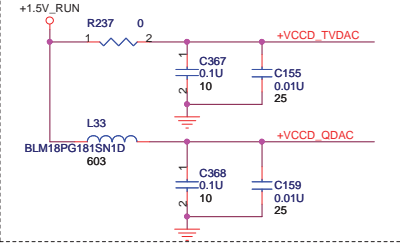
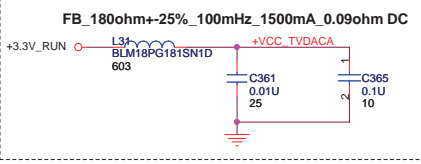
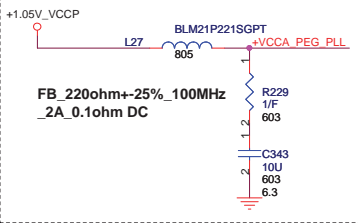
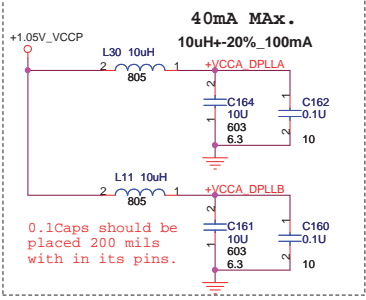
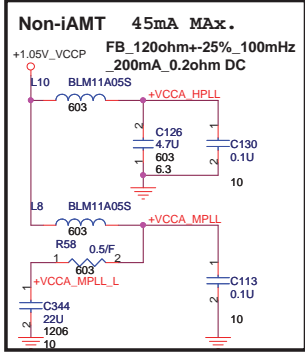
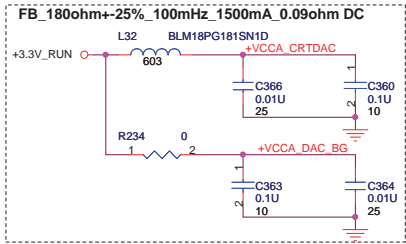
Date: Wednesday, March 25, 2009 Sheet 7 of 45



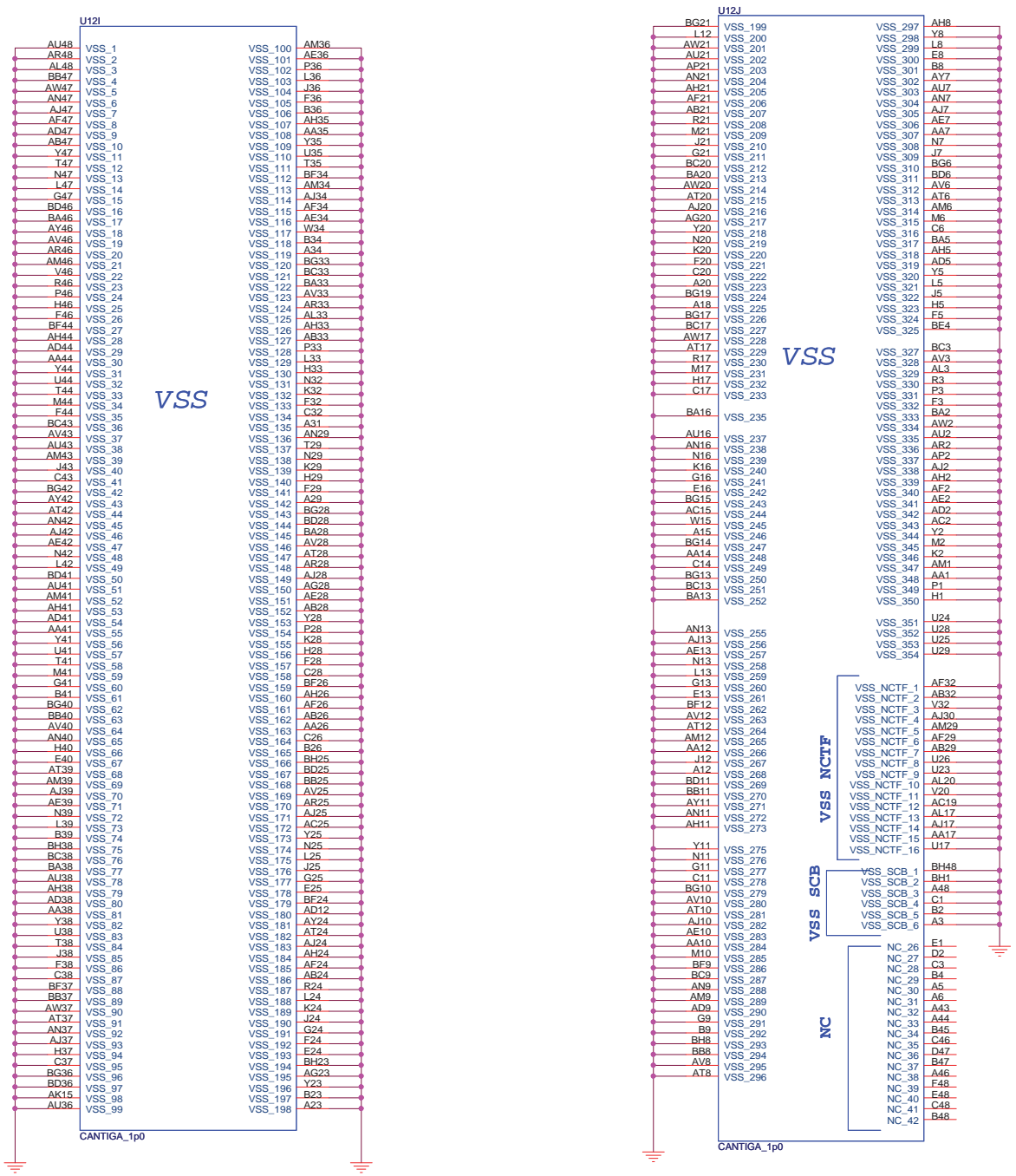
<http://laptop-motherboard-schematic.blogspot.com/>

**QUANTA  
COMPUTER**  
 Title Cantiga (VCC,NCTF)  
 Size Document Number AM3 Rev 1A  
 Date: Wednesday, March 25, 2009 Sheet 8 of 45



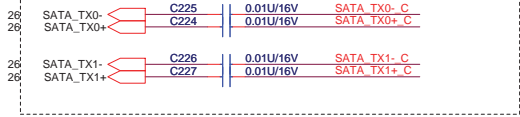
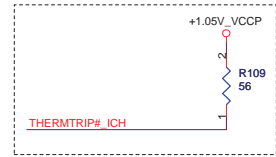
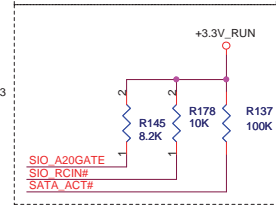
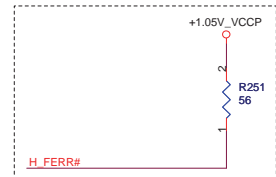
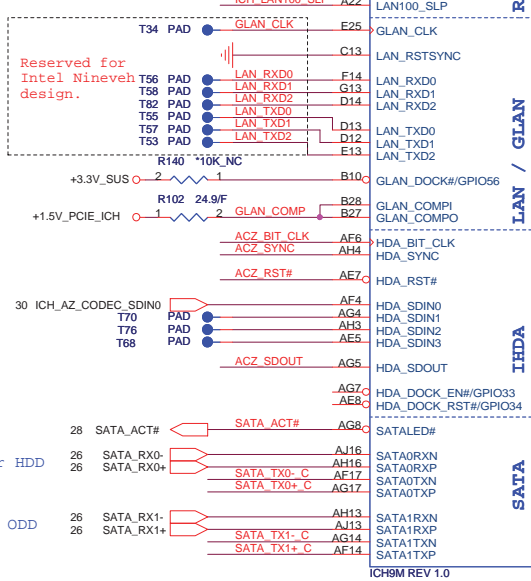
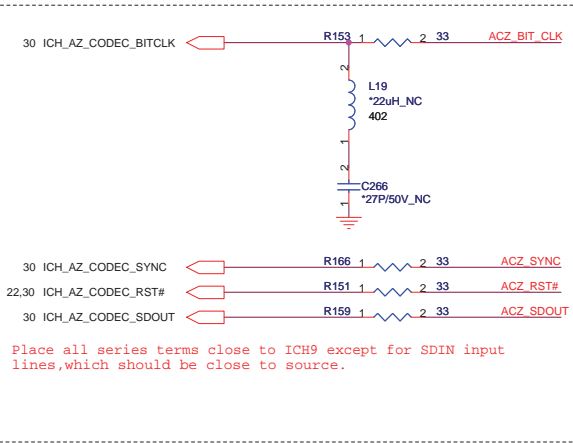
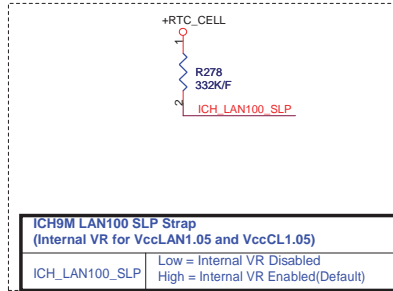
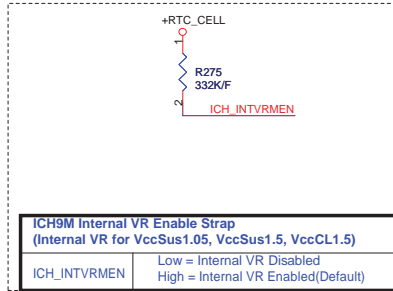
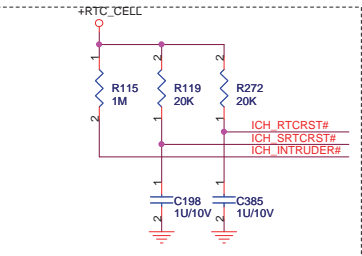
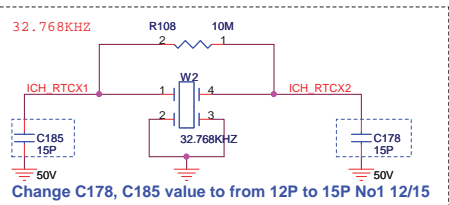


Title: Cantiga (POWER)  
Size: Document Number: AM3, Rev: 1A  
Date: Wednesday, March 25, 2009, Sheet: 9 of 45



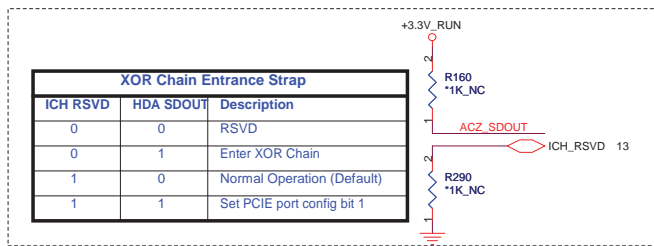
**QUANTA  
COMPUTER**

Title Cantiga (VSS)		
Size AMS	Document Number AMS	Rev 1A
Date Wednesday, March 25, 2009	Sheet 10	of 45



Master HDD

SATA ODD

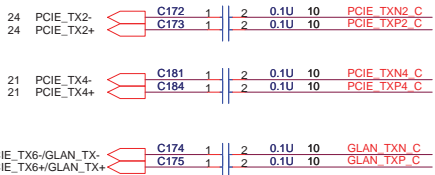


Place within 500mils of ICH9 ball



Title		
ICH9-M (CPU,SATA,LPC,LAN,CODEC)		
Size	Document Number	Rev
AM3		1A
Date:	Wednesday, March 25, 2009	Sheet 11 of 45

Place TX DC blocking caps close ICH9.



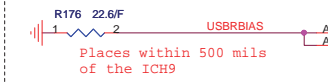
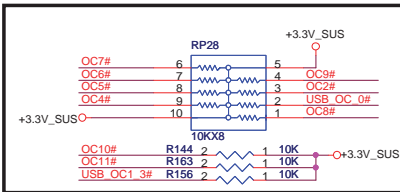
MiniWWAN

Express Card

Giga Bit LOM

Boot BIOS Strap			
	GNT0#	SPI_CS1#	
LPC	11	No stuff	No stuff
PCI	10	No stuff	Stuff
SPI	01	Stuff	No stuff

Update USB OC circuit No24 11/17



USB

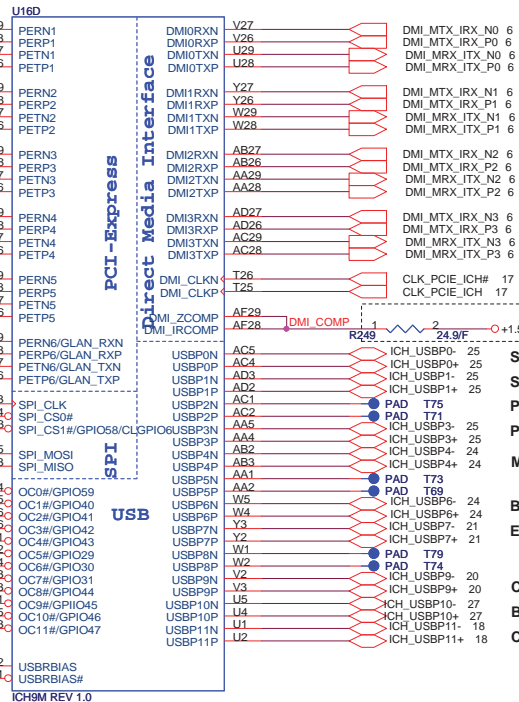
Bluetooth

Express Card

Card reader

Biometric

Camera



PCI-Express

SPI

USB

USB

USB

USB

USB

USB

USB

USB

USB

USB

USB

USB

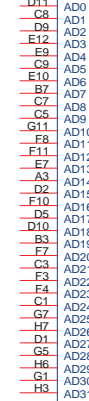
USB

USB

USB

USB

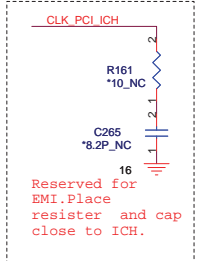
U16B



Interrupt I/F

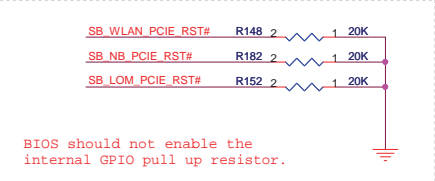
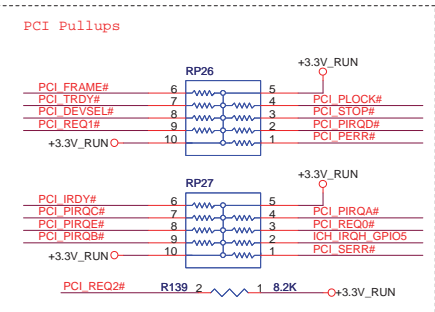
ICH9M REV 1.0

Add SB\_LOM\_PCIE\_RST# No25 11/18



A16 away override strap.	
SB_NB_PCIE_RST#	Low = A16 swap override enabled. High = Default.

- Side pair Top / left
- Side pair bottom / right
- Pair 1 top / left
- Pair 1 bottom / right
- Mini Card (WLAN)
- Bluetooth
- Express Card
- Card reader
- Biometric
- Camera



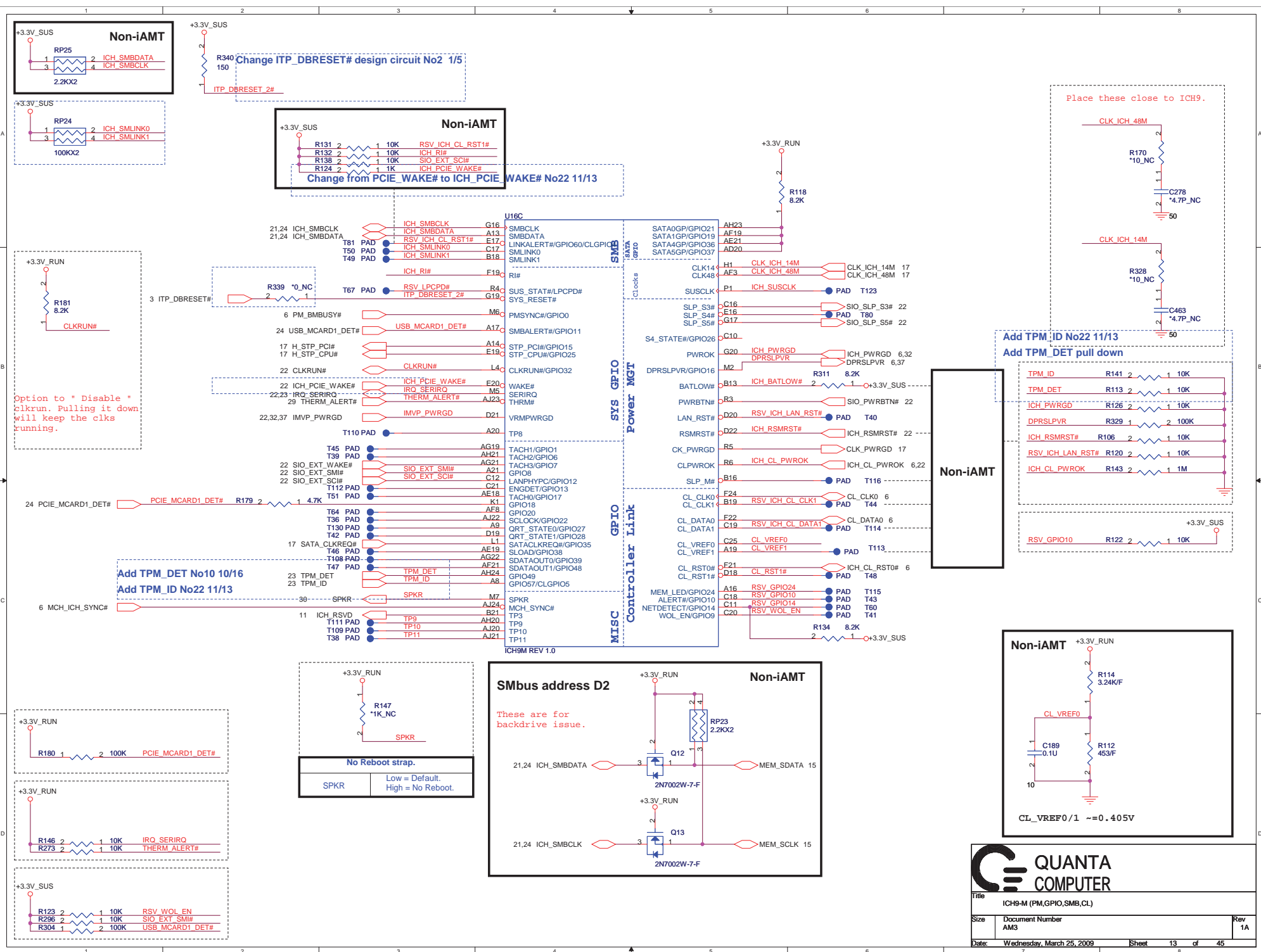
BIOS should not enable the internal GPIO pull up resistor.

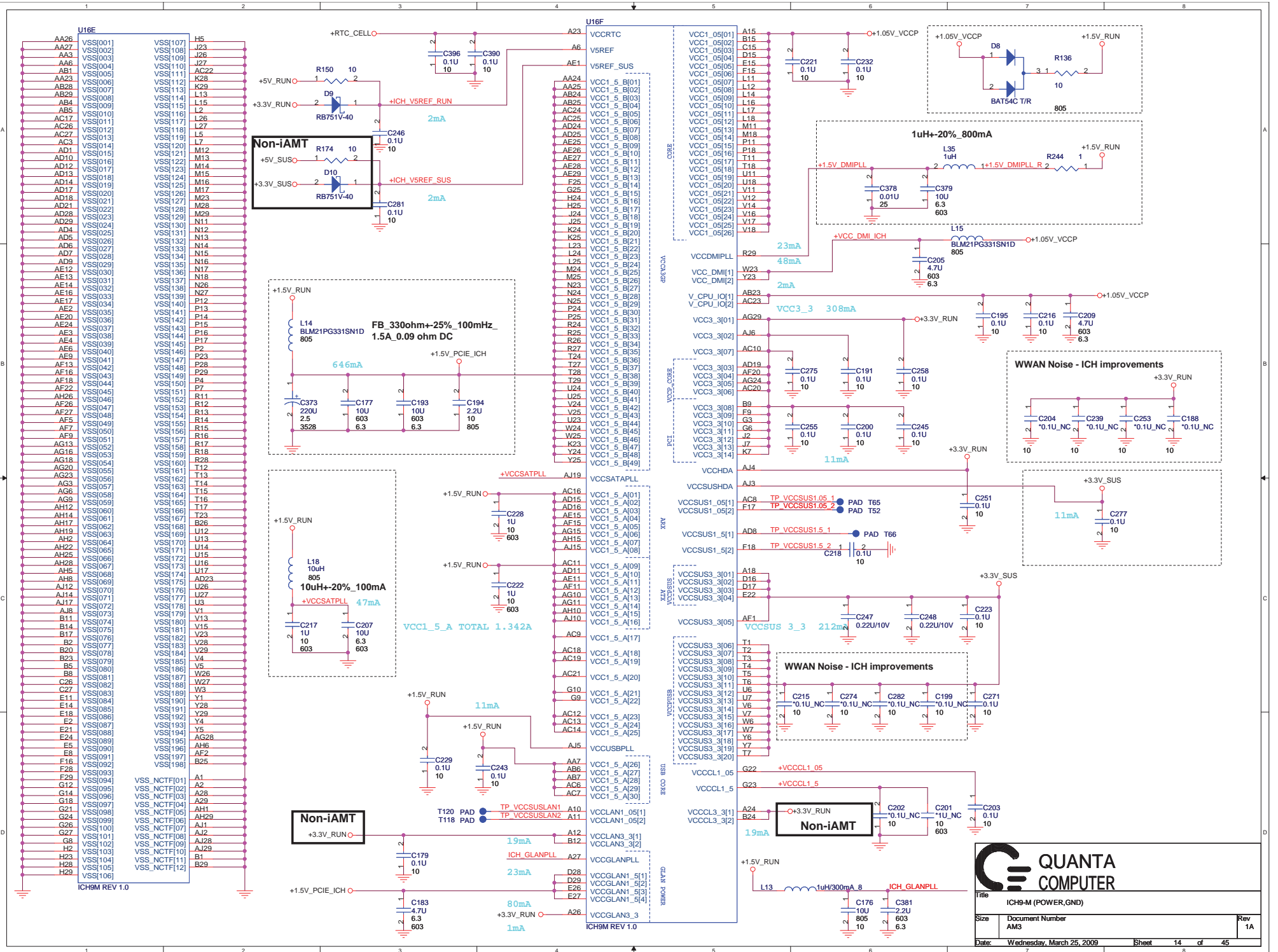
**QUANTA COMPUTER**

Title: ICH9-M (USB,DMI,PCIE,PCI)

Size: Document Number AM3 Rev 1A

Date: Wednesday, March 25, 2009 Sheet 12 of 45





**QUANTA COMPUTER**

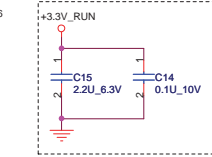
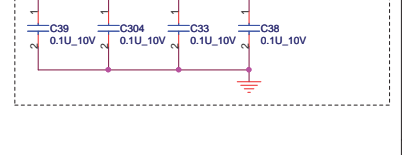
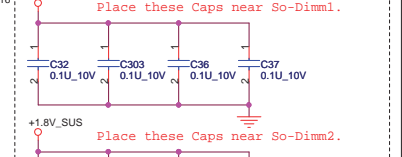
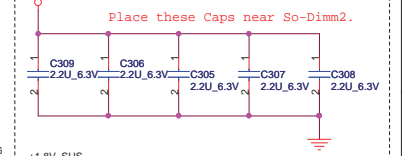
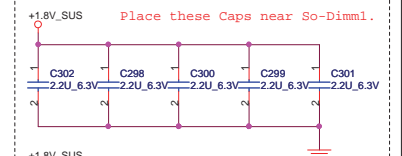
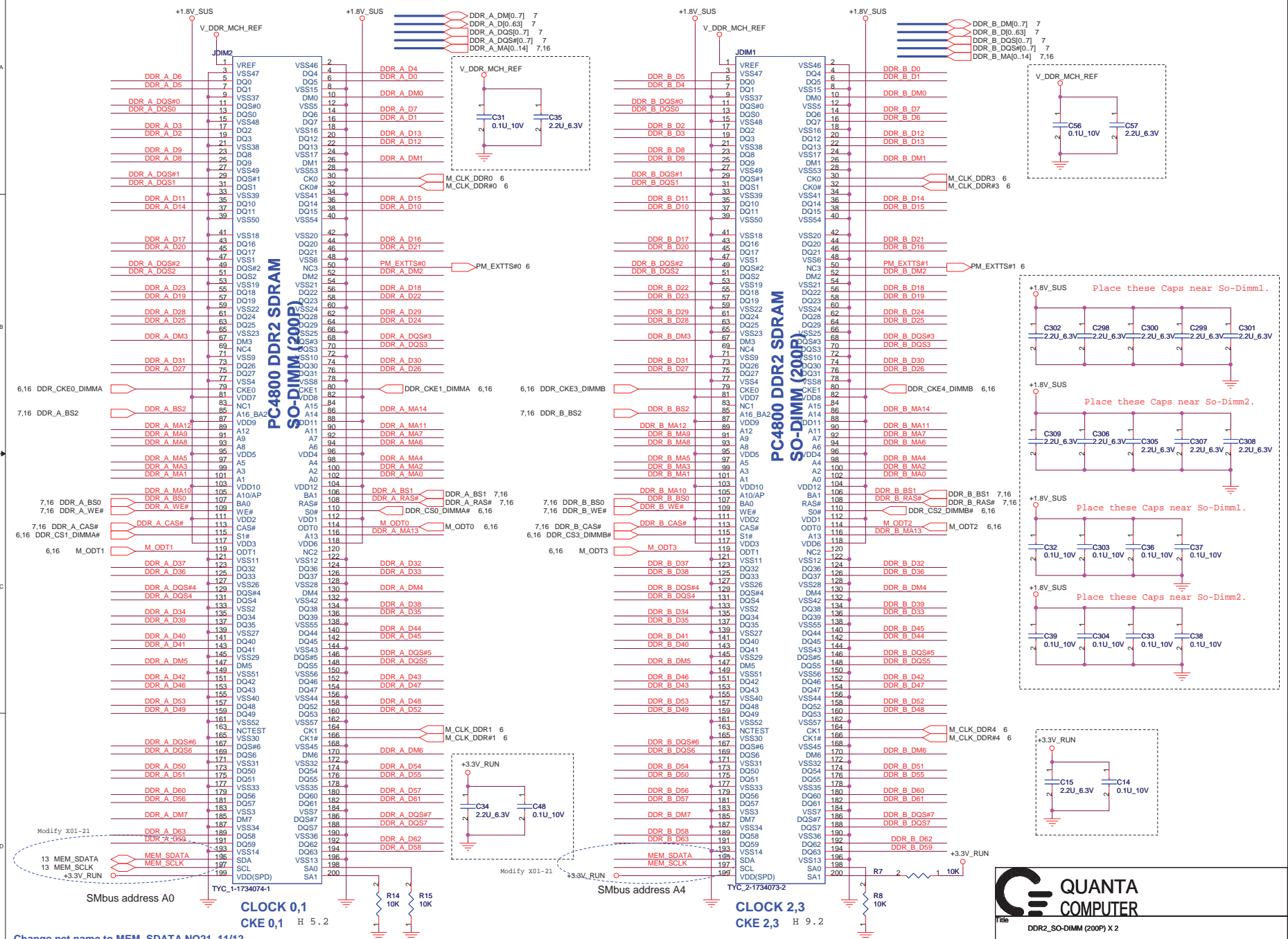
Size	Document Number	Rev
AMS	AMS	1A

Date: Wednesday, March 25, 2009 Sheet 14 of 45

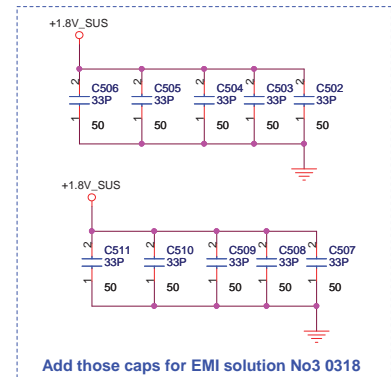
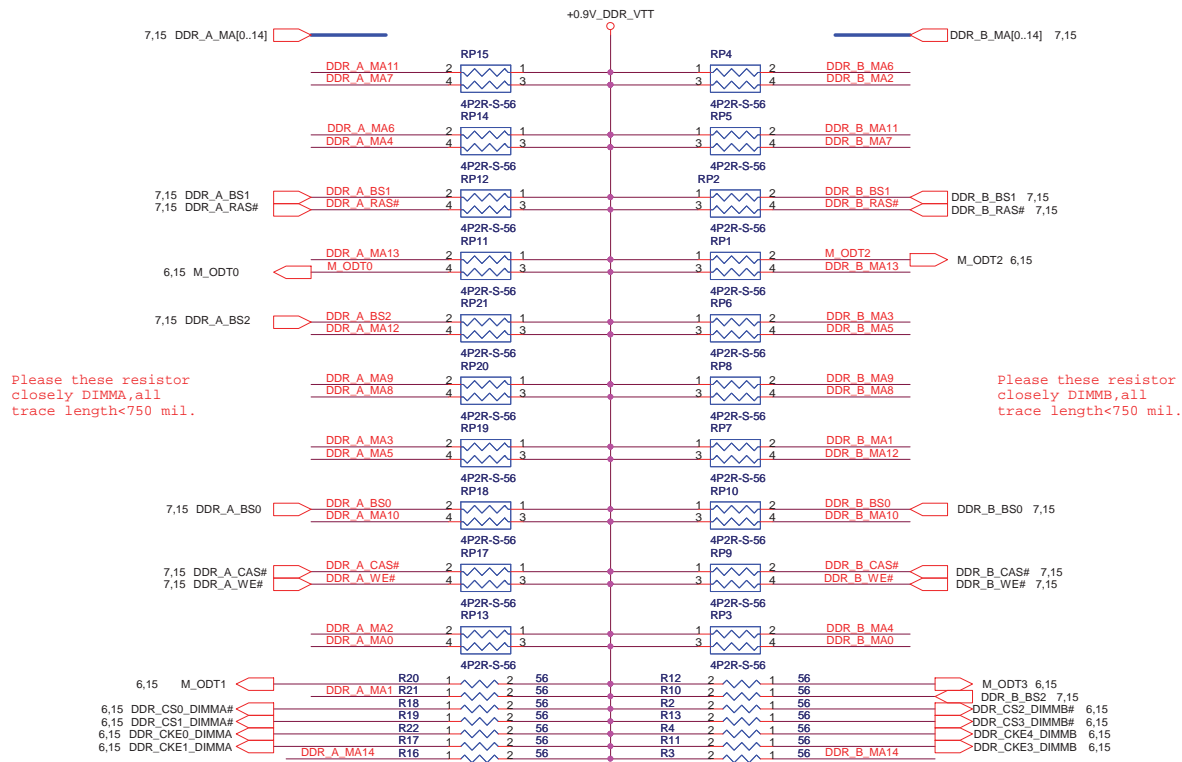
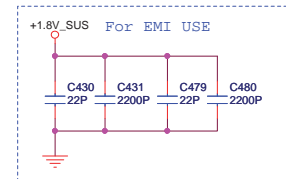
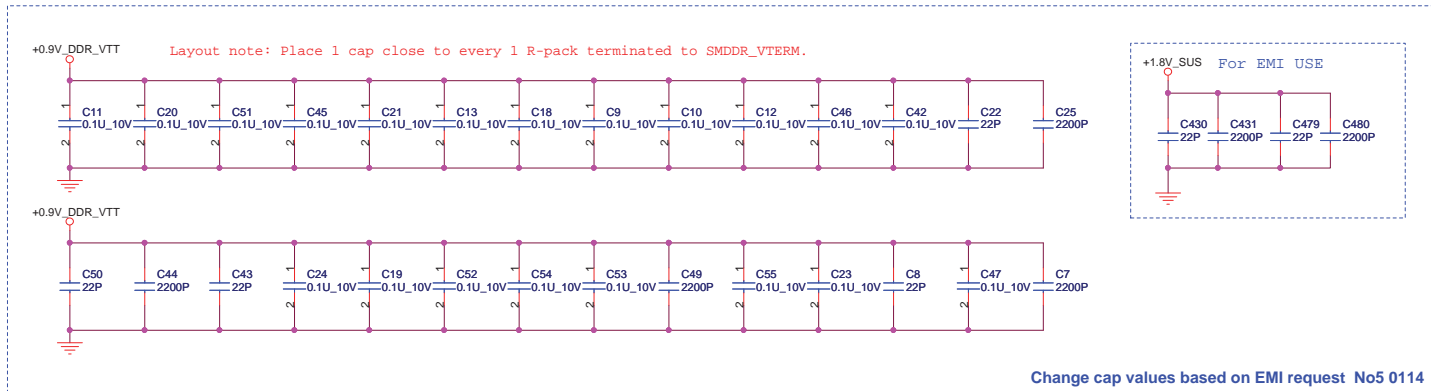
MASTER

RFQ PN =DGMK0005619 and DGMK0005601

SLAVE



		<b>File</b> DDR2_SO-DIMM (200P) X 2	
		<b>Size</b> AM3	<b>Document Number</b> Rev 1A
<b>Date</b> Wednesday, March 25, 2009		<b>Sheet</b> 15 of 45	<b>Page</b> 8



**QUANTA COMPUTER**

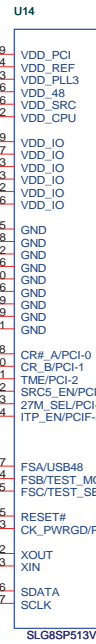
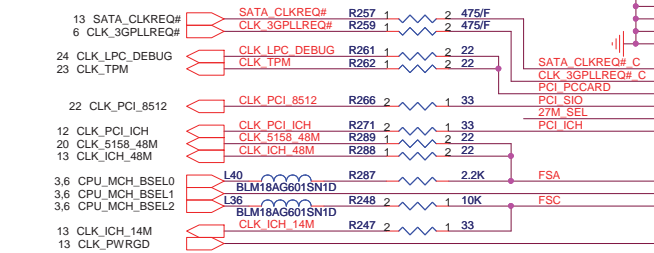
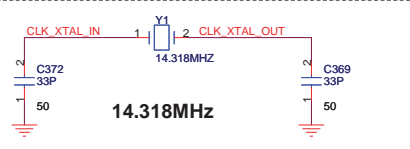
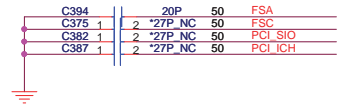
Title: DDR2 RES. ARRAY

Size	Document Number	Rev
	AM3	1A

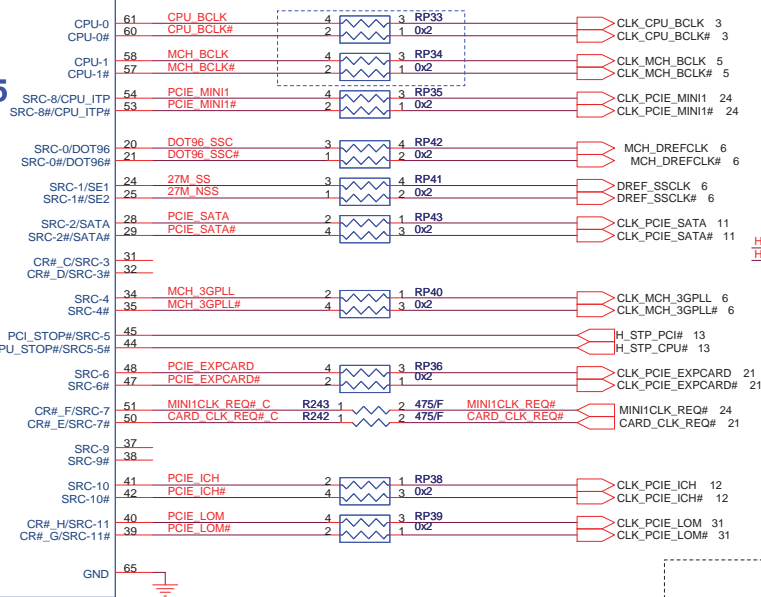
Date: Wednesday, March 25, 2009 Sheet 16 of 45



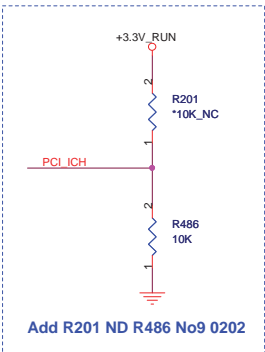
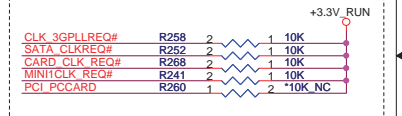
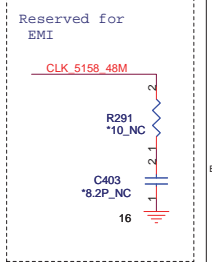
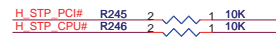
**Add capacitor pads for improving WWAN.**



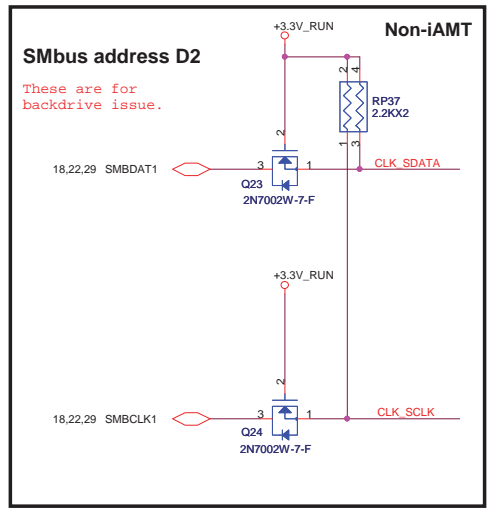
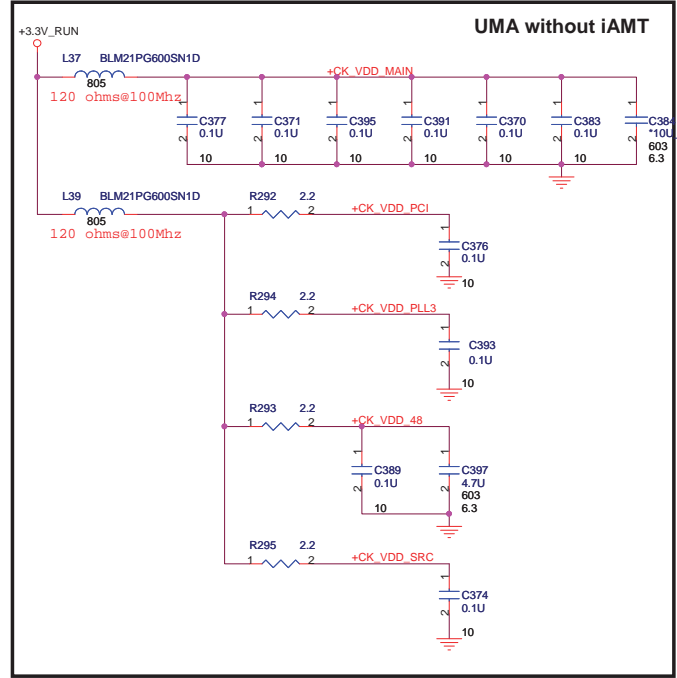
**CK505 QFN64**



Change resistor values based on EMI request No5 0114  
Change resistor values based on EMI request No6 0119



Add R201 ND R486 No9 0202

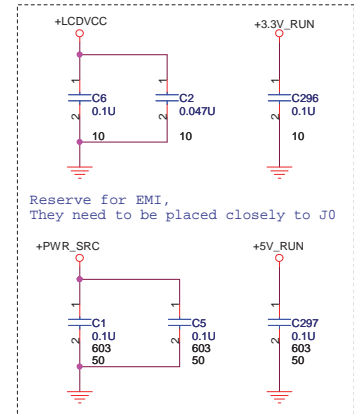
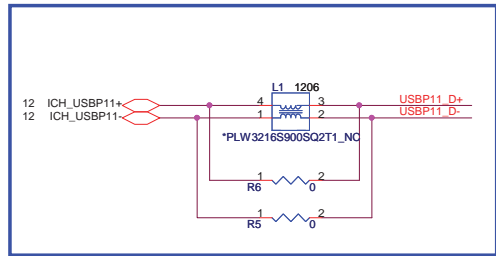
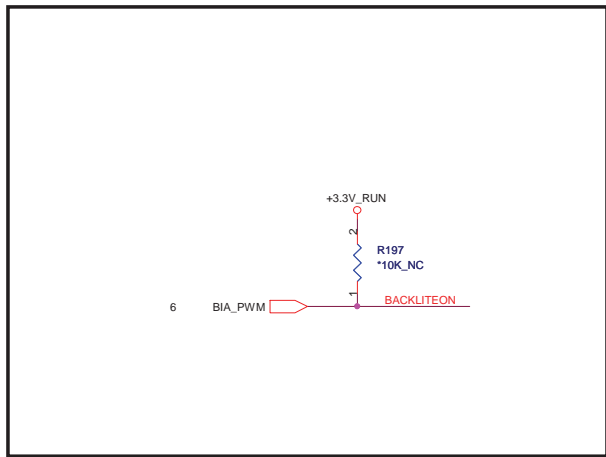
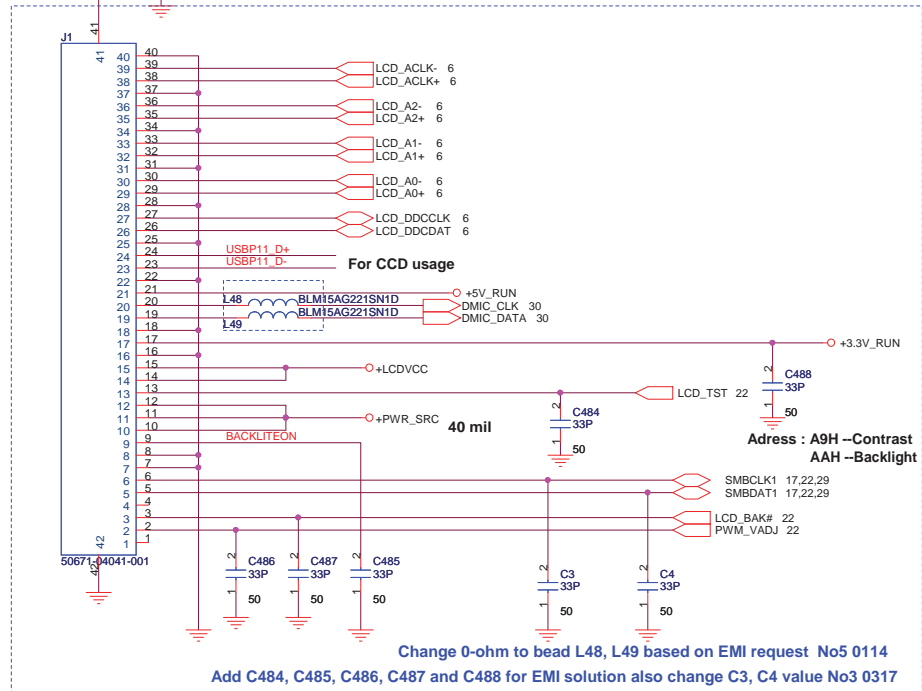
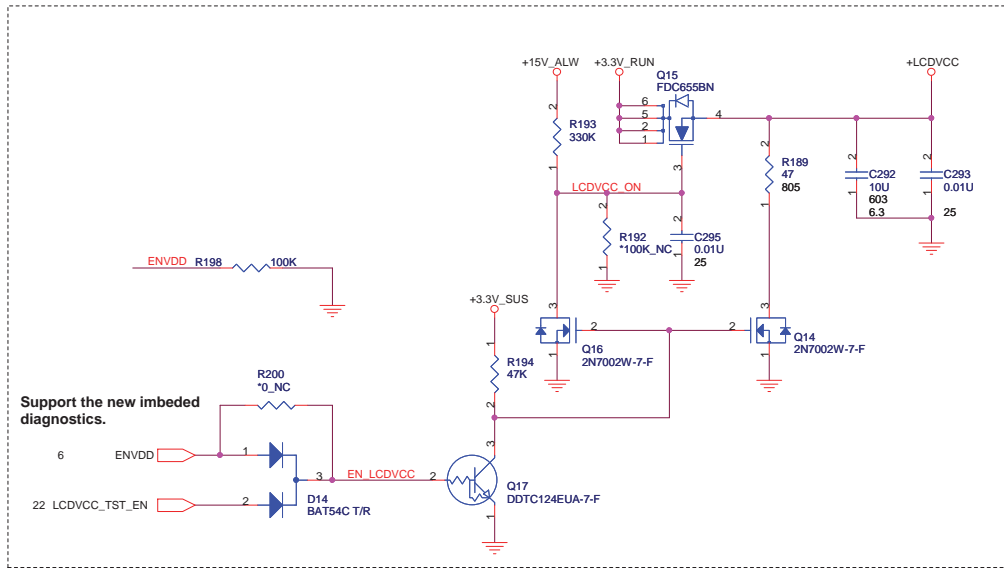


SMBus address D2  
These are for backdrive issue.

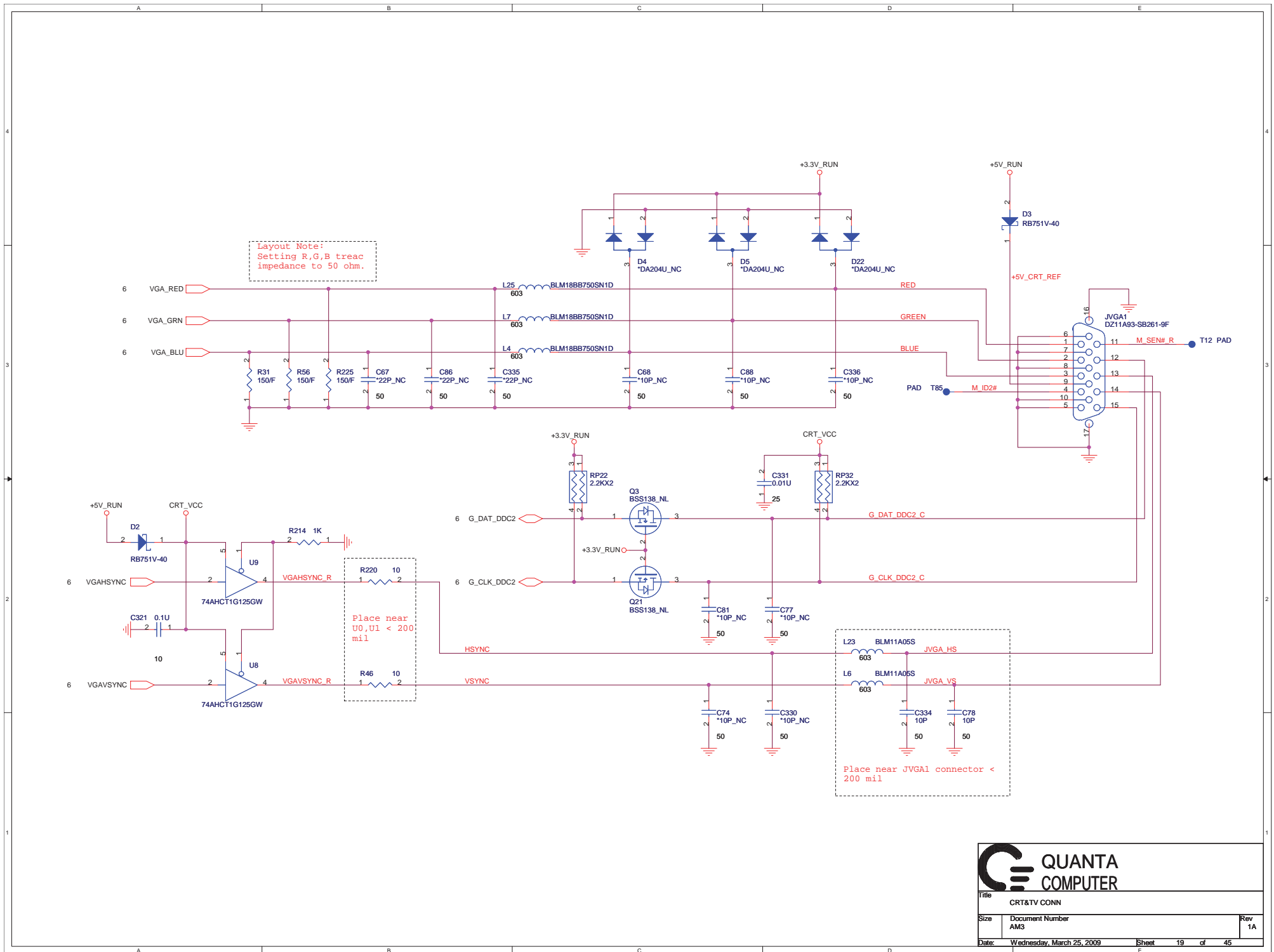
FSC	FSB	FSA	CPU	SRC	PCI
1	0	1	100	100	33
0	0	1	133	100	33
0	1	1	166	100	33
0	1	0	200	100	33
0	0	0	266	100	33
1	0	0	333	100	33
1	1	0	400	100	33
1	1	1	RSVD	100	33

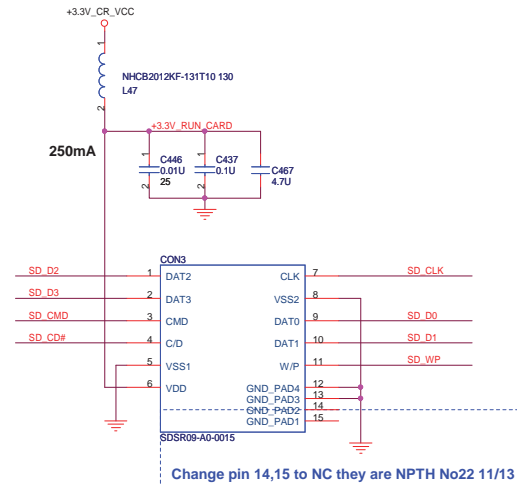
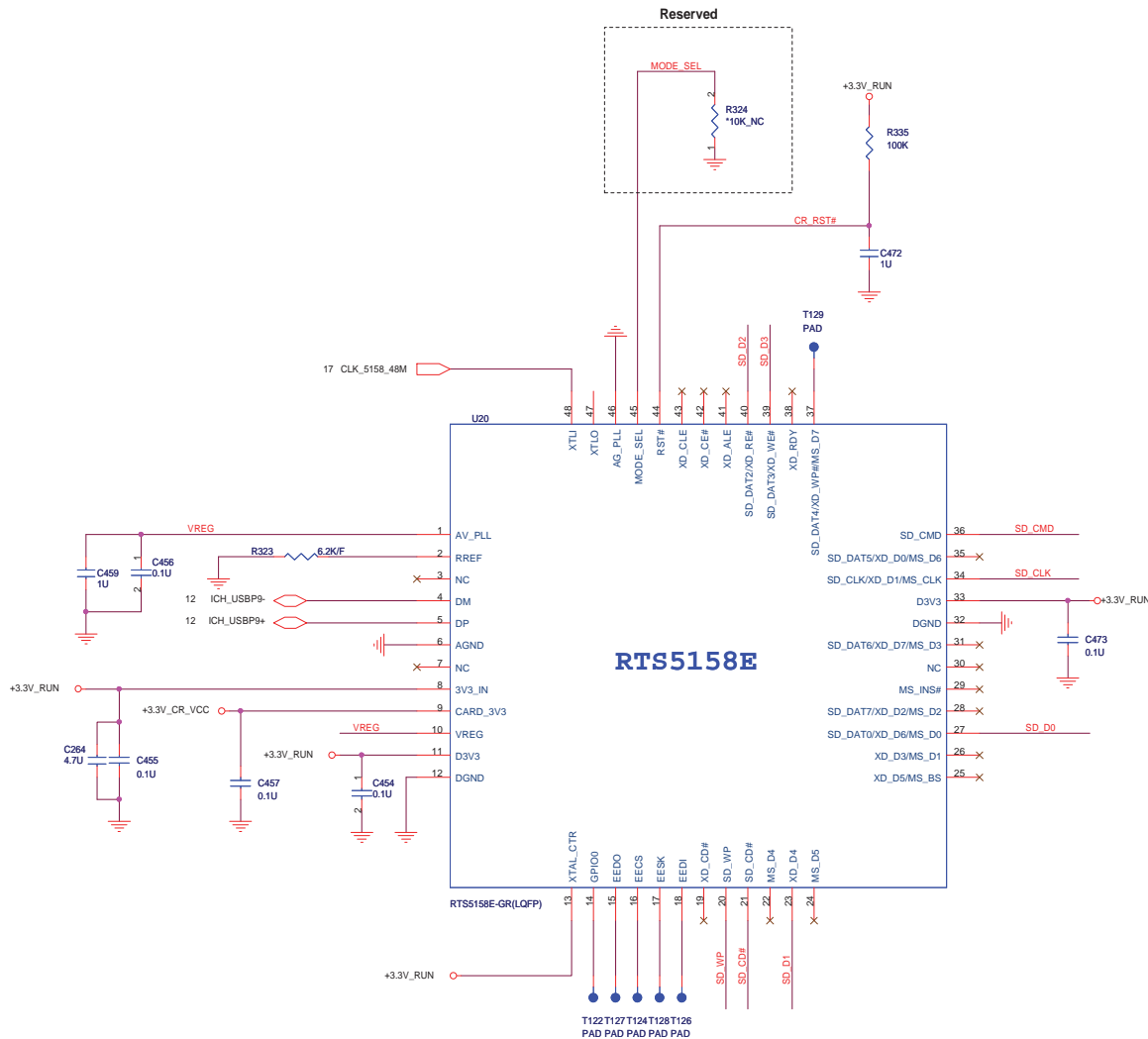
**27M\_SEL**

27M_SEL (PIN13)	PIN20	PIN21	PIN24	PIN25
0=UMA	DOT96T	DOT96C	96/100M_T	96/100M_C
1 = Disc. GRFX down	SRCT0	SRCC0	27Mout	27MSSout



			Title LCD CONN & CK-SSCD
Size	Document Number AM3	Rev	1A
Date:	Wednesday, March 25, 2009	Sheet	18 of 45

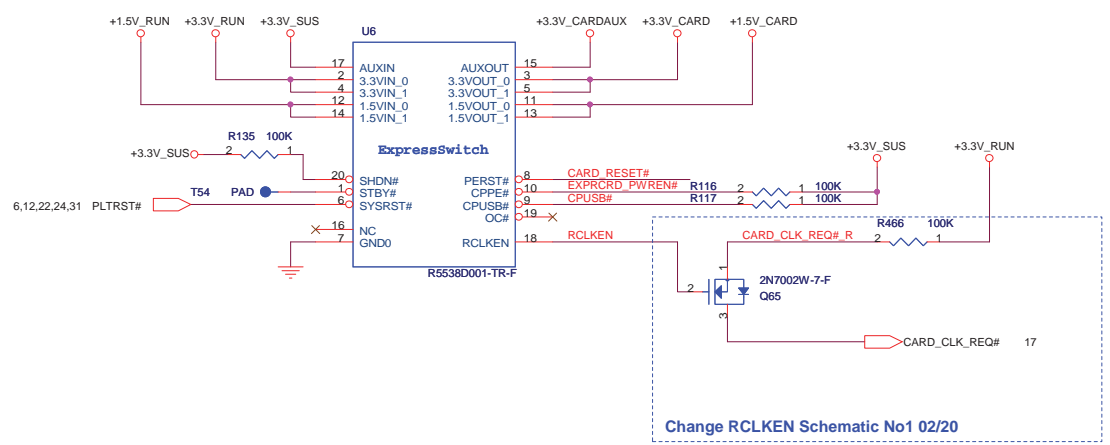
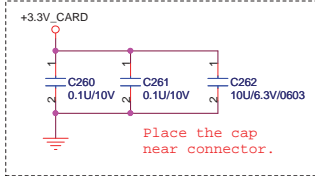
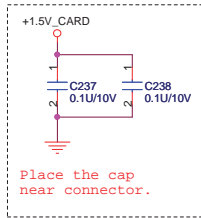
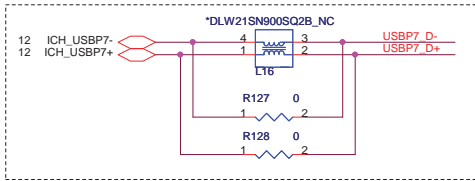




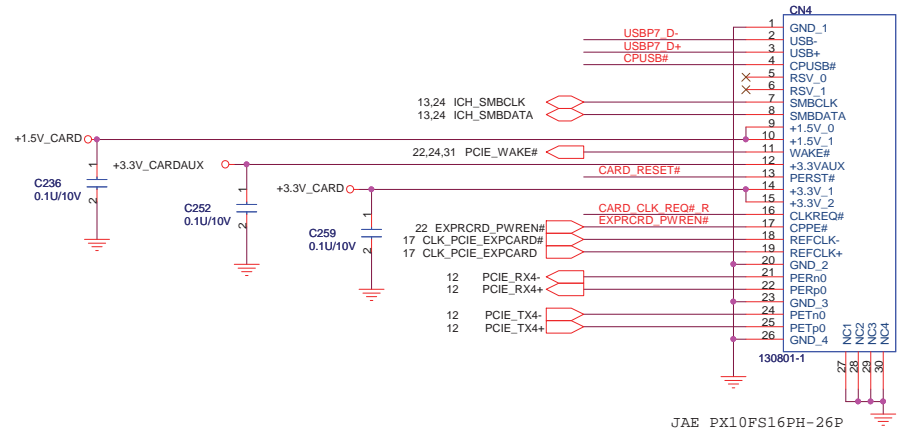
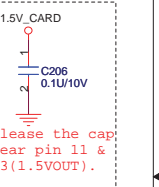
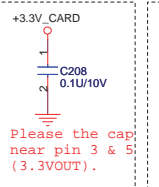
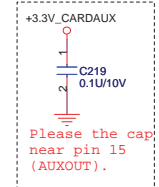
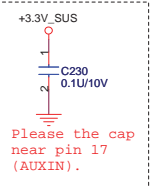
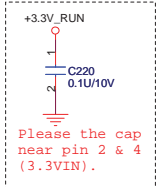
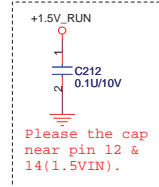
3 IN 1 CARD READER (SD/MMC/HCS memory Card)

QUANTA COMPUTER	
Title: 5 IN 1 CONTROLLER	
Size: AMS	Document Number: Rev 1A
Date: Wednesday, March 25, 2009 Sheet 20 of 45	

+1.5V\_CARD Max. 650mA, Average 500mA.  
 +3V\_CARD Max. 1300mA, Average 1000mA.

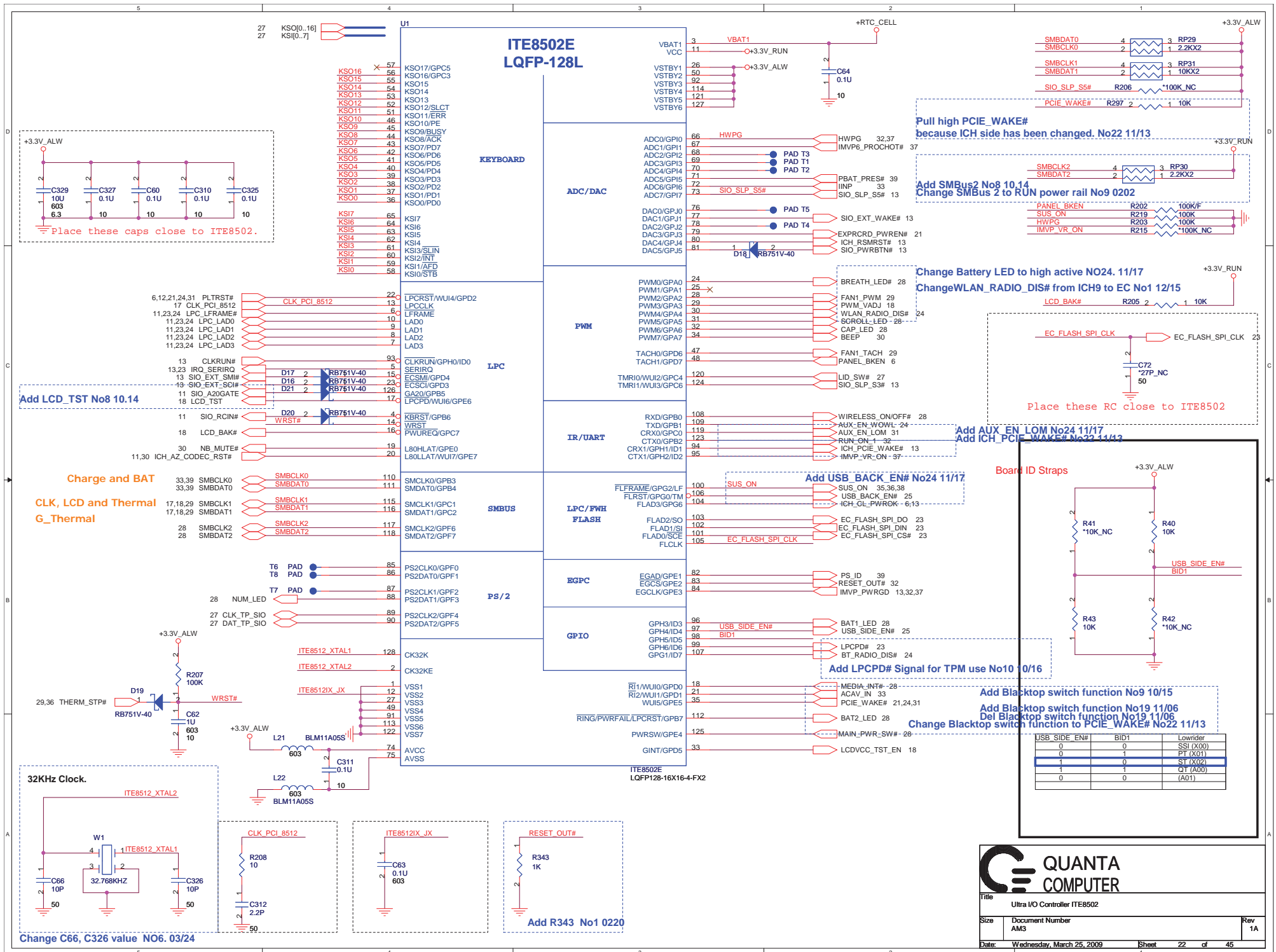


Change RCLKEN Schematic No1 02/20

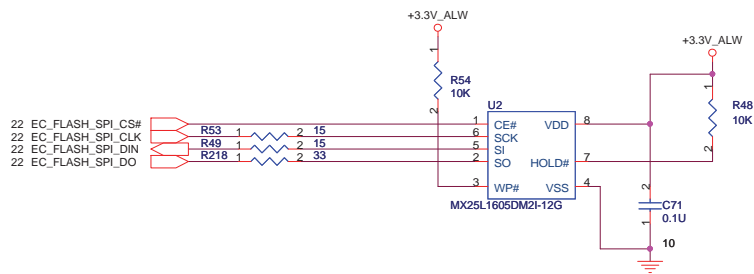


Express Card

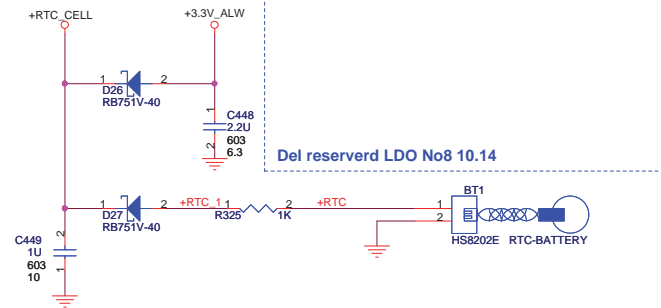
Title	blank	
Size	Document Number	Rev
	AMS	1A
Date:	Wednesday, March 25, 2009	Sheet 21 of 45



### 16Mbit (2M Byte), SPI

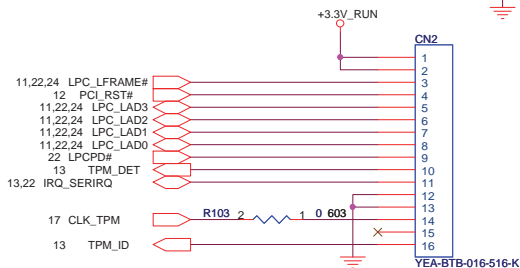
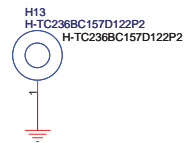


### RTC BATTERY




### TPM on MB side

Board to board conn

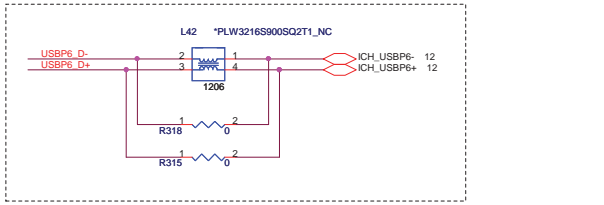
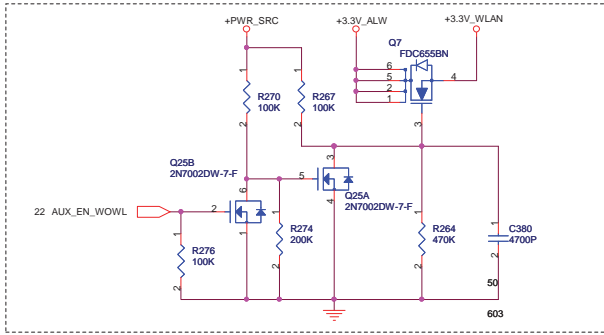
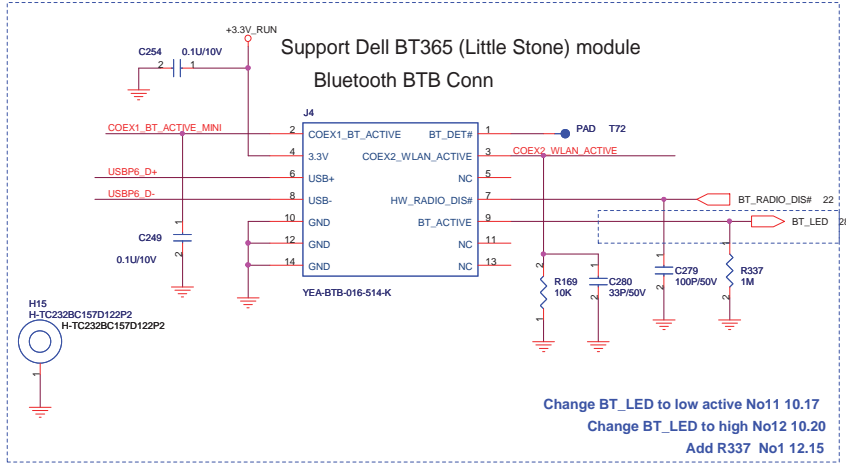
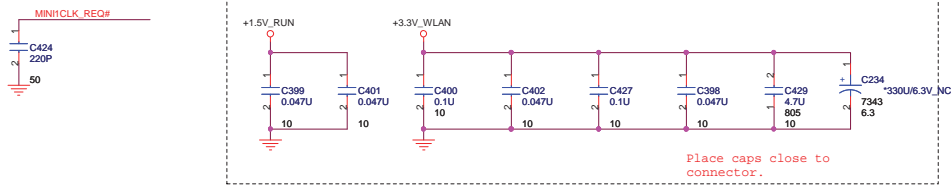
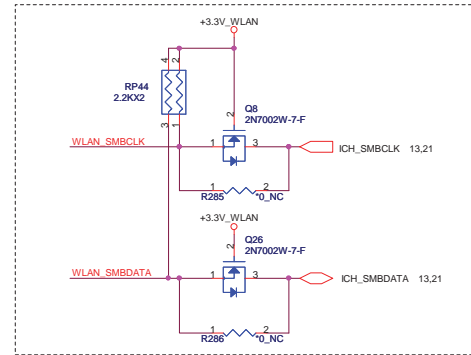
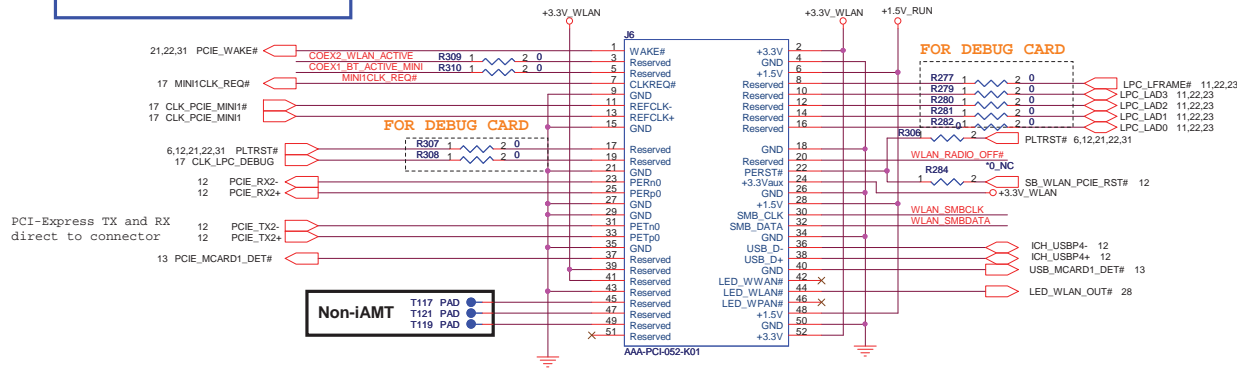


Change pin define and add TPM\_DET and LPCPD# No10 10/16  
 Add 0-ohm resistor for EMI request No16 10/29  
 Add TPM\_ID No22 11/13

 <b>QUANTA COMPUTER</b>		
Title Ultra I/O Controller ECE5028		
Size	Document Number AM3	Rev 1A
Date:	Wednesday, March 25, 2009	Sheet 23 of 45

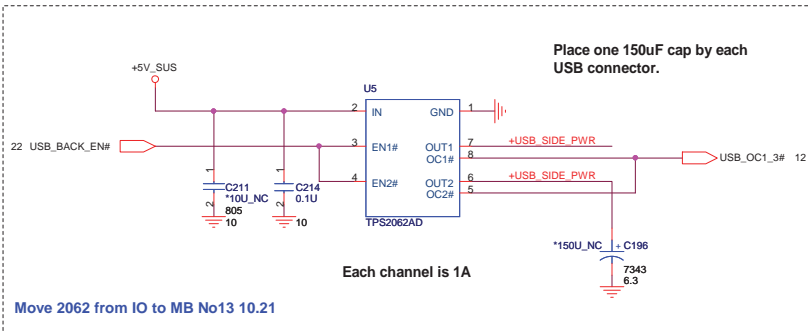
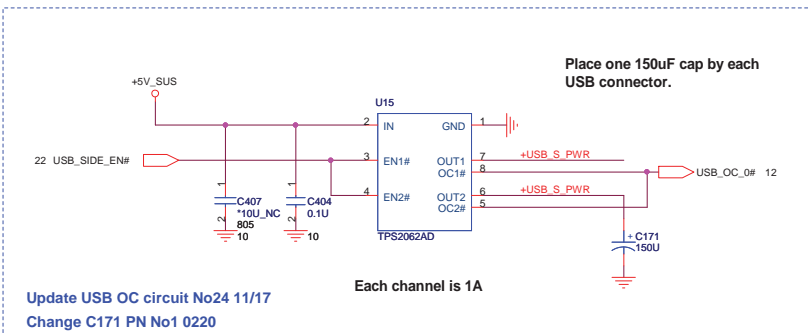
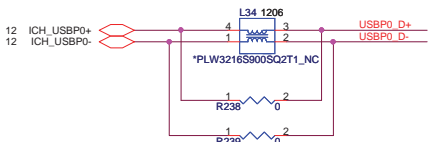
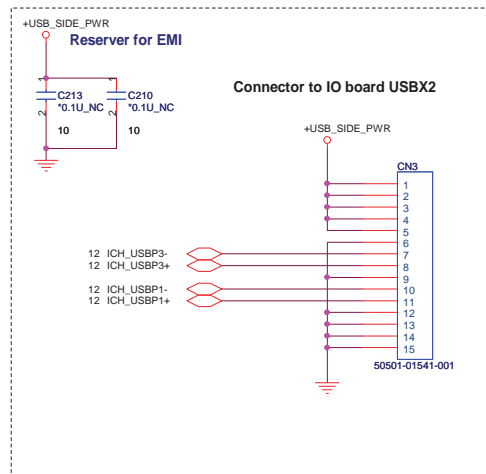
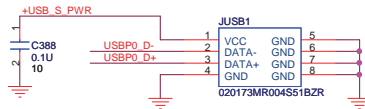
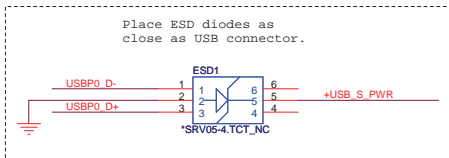


### MiniCard WLAN connector

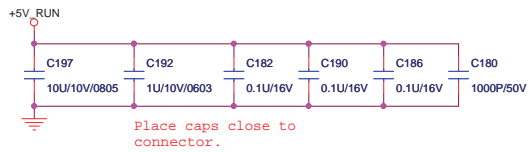
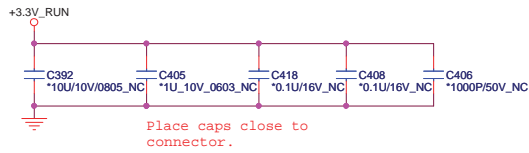
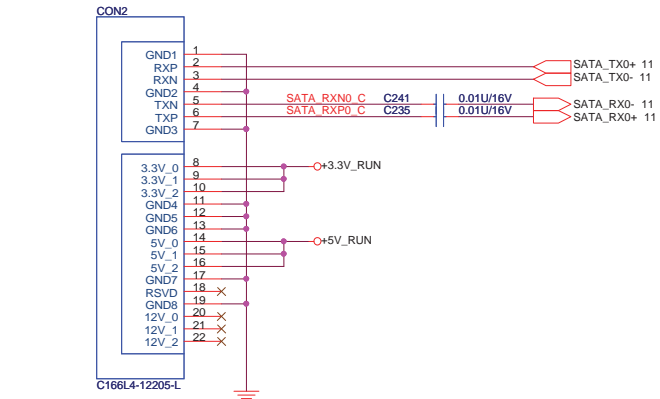


Title			
MDC CONN.			
Size	Document Number	Rev	
AM3		1A	
Date	Version	Sheet	
Wednesday, March 25, 2009		24 of 45	

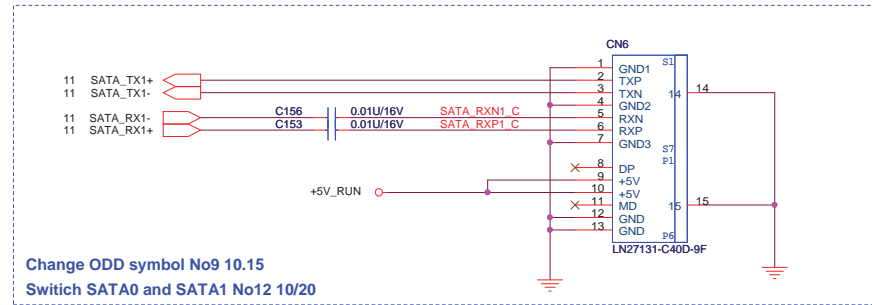




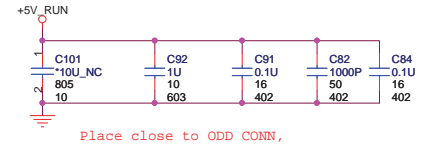
### SATA HDD Connector.



### SATA ODD Connector.

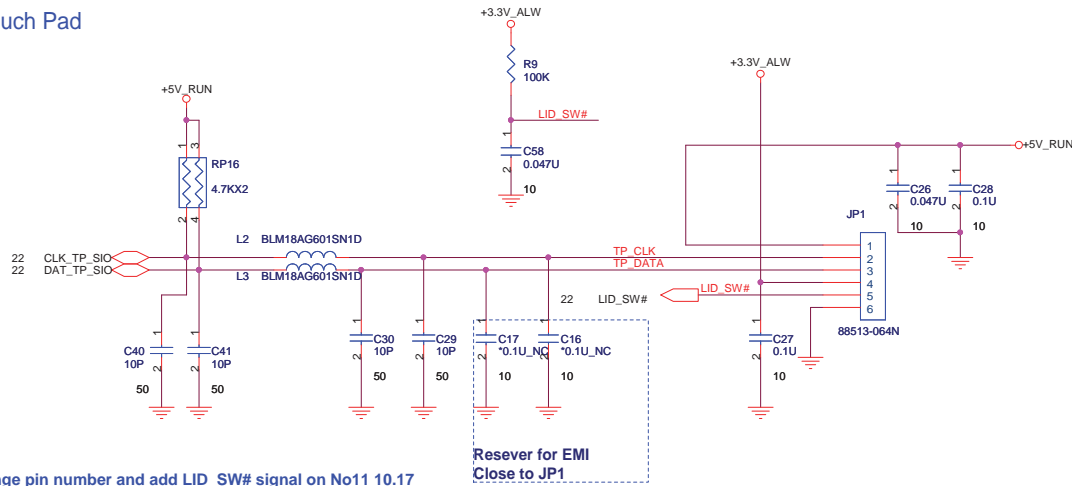


Change ODD symbol No9 10.15  
Switch SATA0 and SATA1 No12 10/20



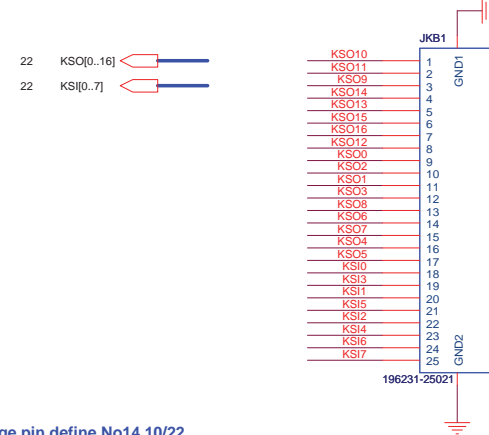
Title		
SATA (HDD&CD_ROM)		
Size	Document Number	Rev
AM3		1A
Date:	Wednesday, March 25, 2009	Sheet 26 of 45

### Touch Pad



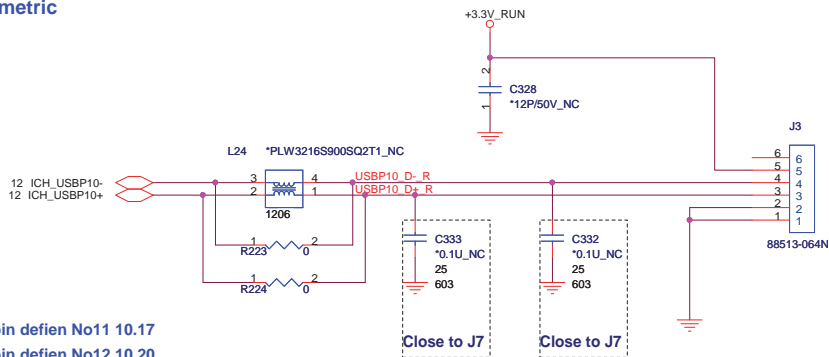
- Change pin number and add LID\_SW# signal on No11 10/17
- Change pin define No14 10/22
- Change touch pad pn and footprint No14 10/22
- Change Touch pad pin define, avoiding power and ground pin close to each other

### KEYBOARD CONNECTOR



- Change pin define No14 10/22
- Change pin define No22 11/13

### Biometric



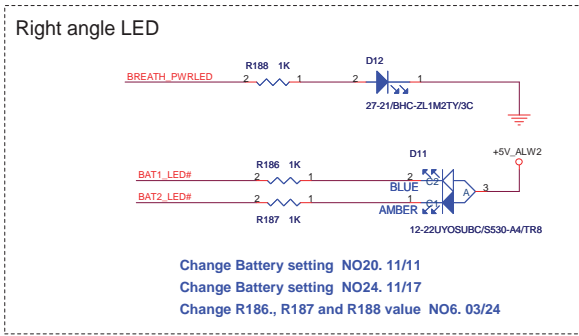
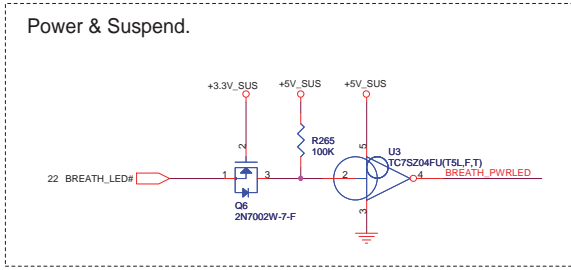
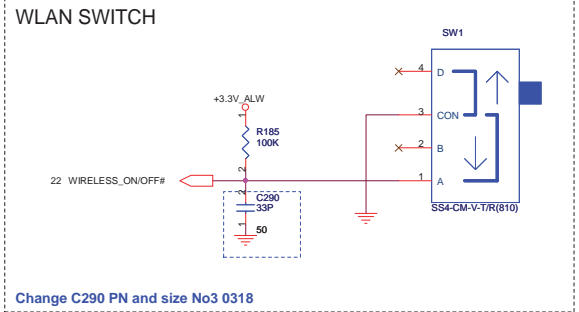
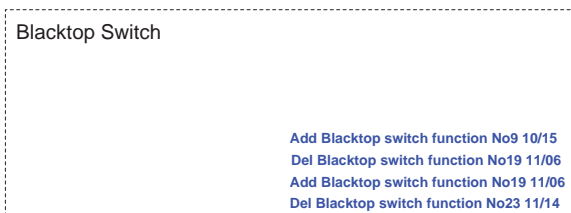
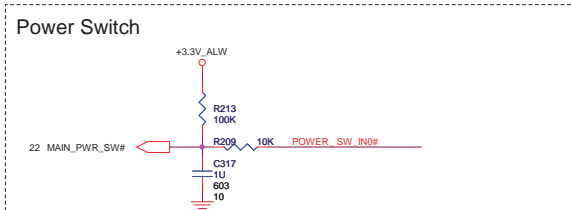
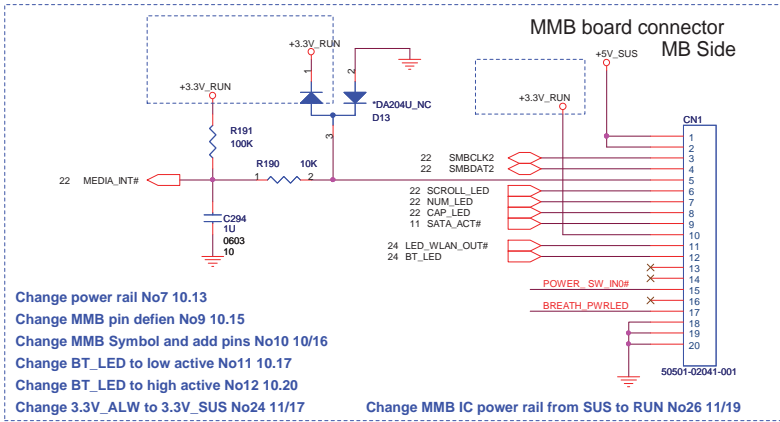
- Change pin defien No11 10.17
- Change pin defien No12 10.20
- Change touch pad pn and footprint No14 10/22
- Change FP pin define No15 10/24
- Change FP pin define No23 11/14

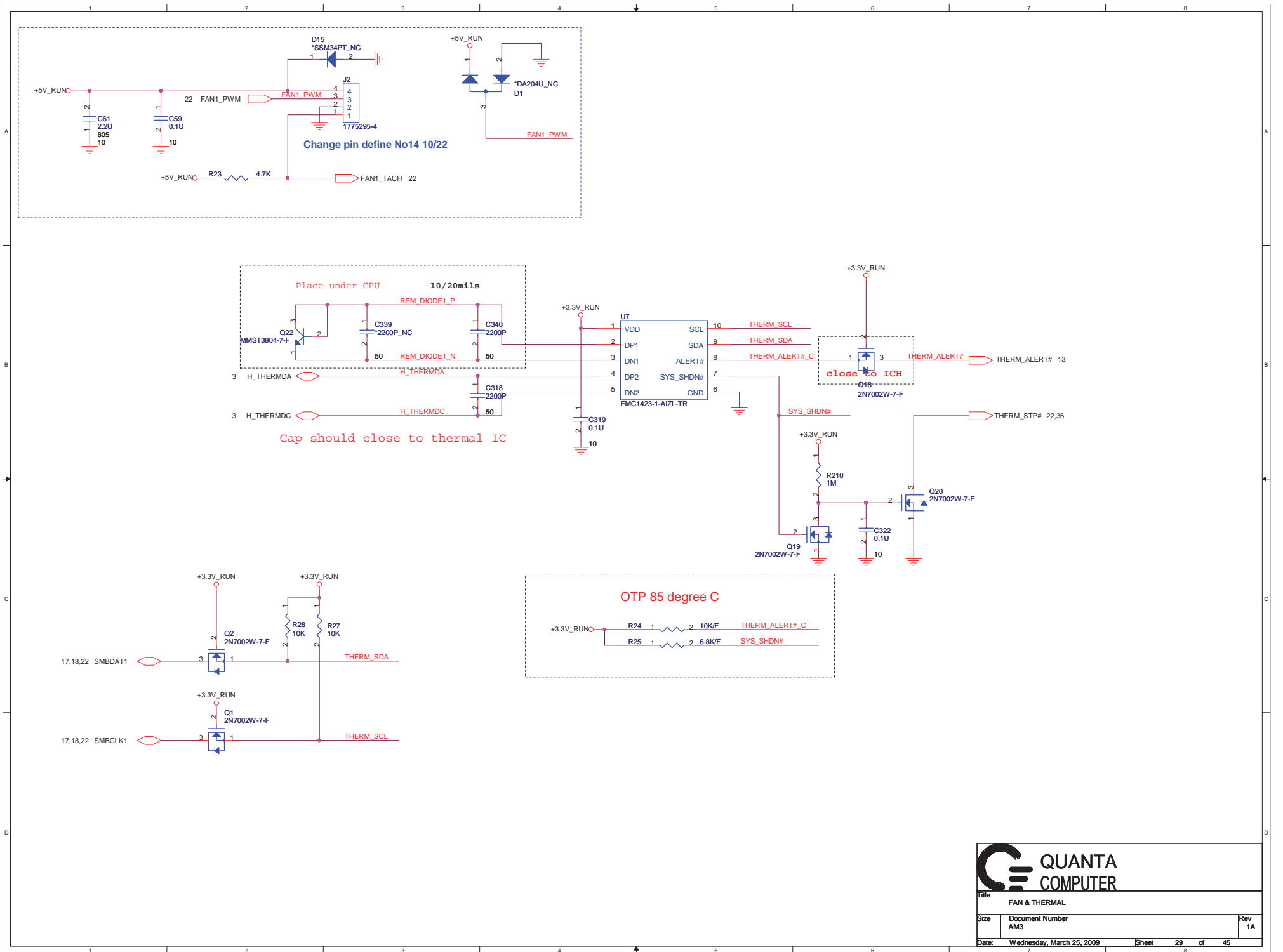
**QUANTA COMPUTER**

Title: TOUCH PAD, BULE TOOTH & FIR

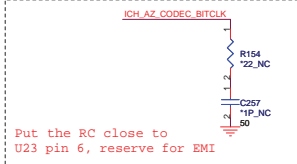
Size	Document Number	Rev
	AM3	1A

Date: Wednesday, March 25, 2009 Sheet 27 of 45



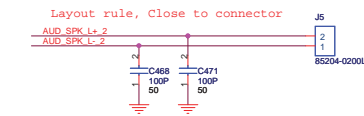


Title FAN & THERMAL		
Size	Document Number AMS	Rev 1A
Date: Wednesday, March 25, 2009	Sheet 29 of 45	



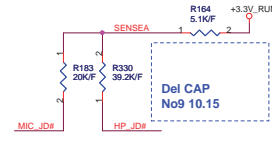
Add PC beep for system error circuit No9 10.14  
Del PC beep No9 10.15

**Speakers conn**

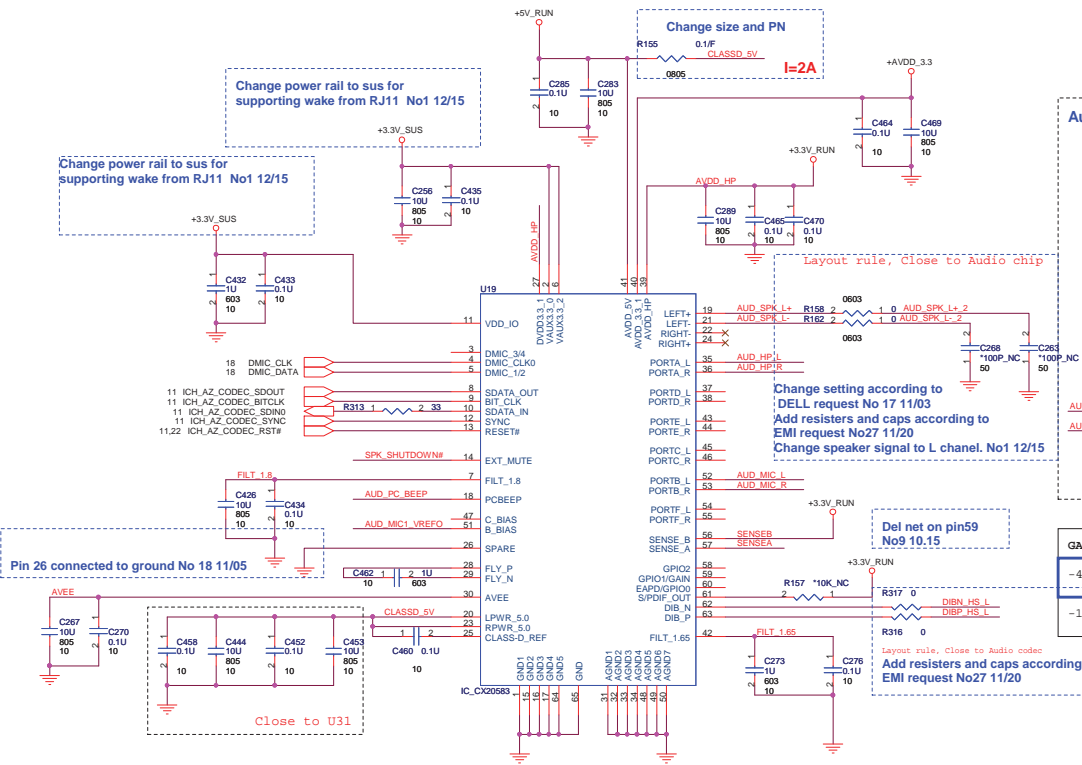


Add ESD2 for ESD concern No6 1/19  
Remove ESD2 for ESD concern No8 1/21

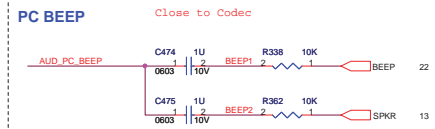
**Jack Sense**



**AUDIO CODEC**

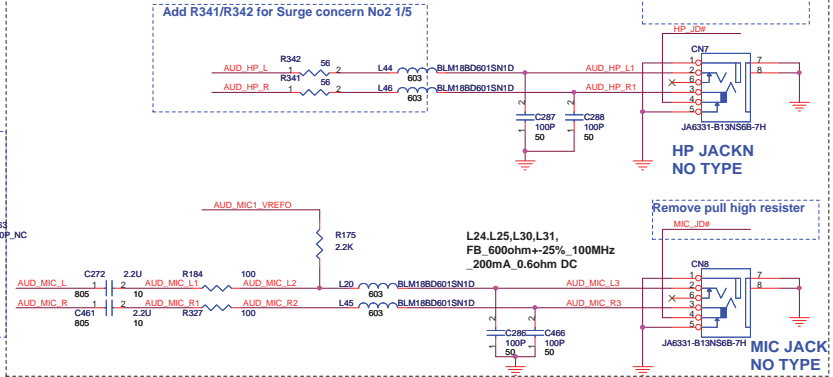


**PC BEEP**

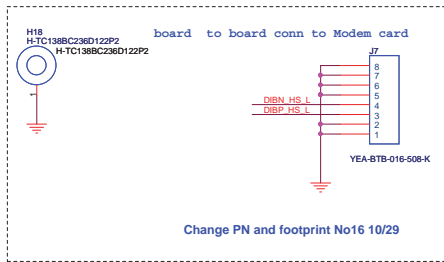


Change Beep design No1 12/15

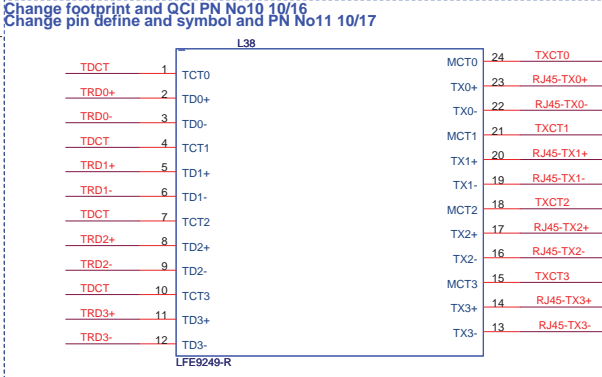
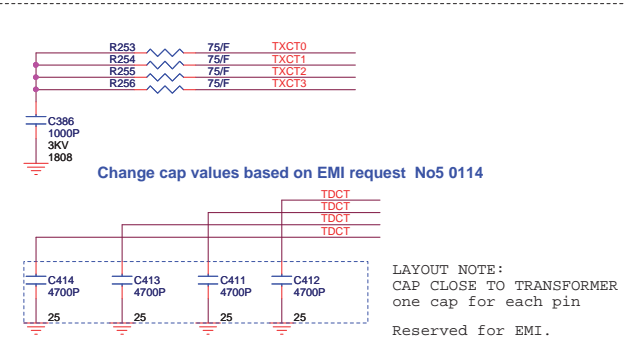
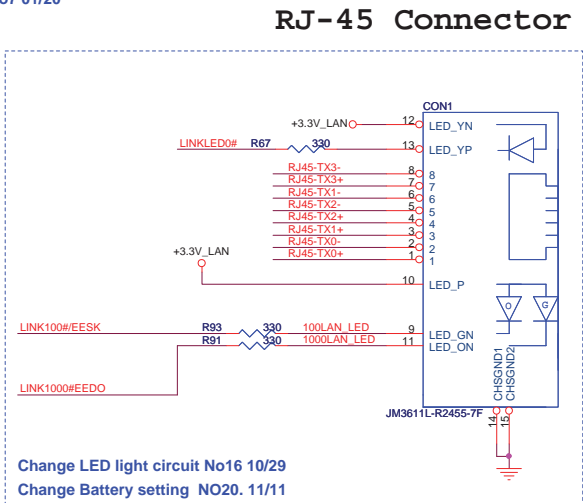
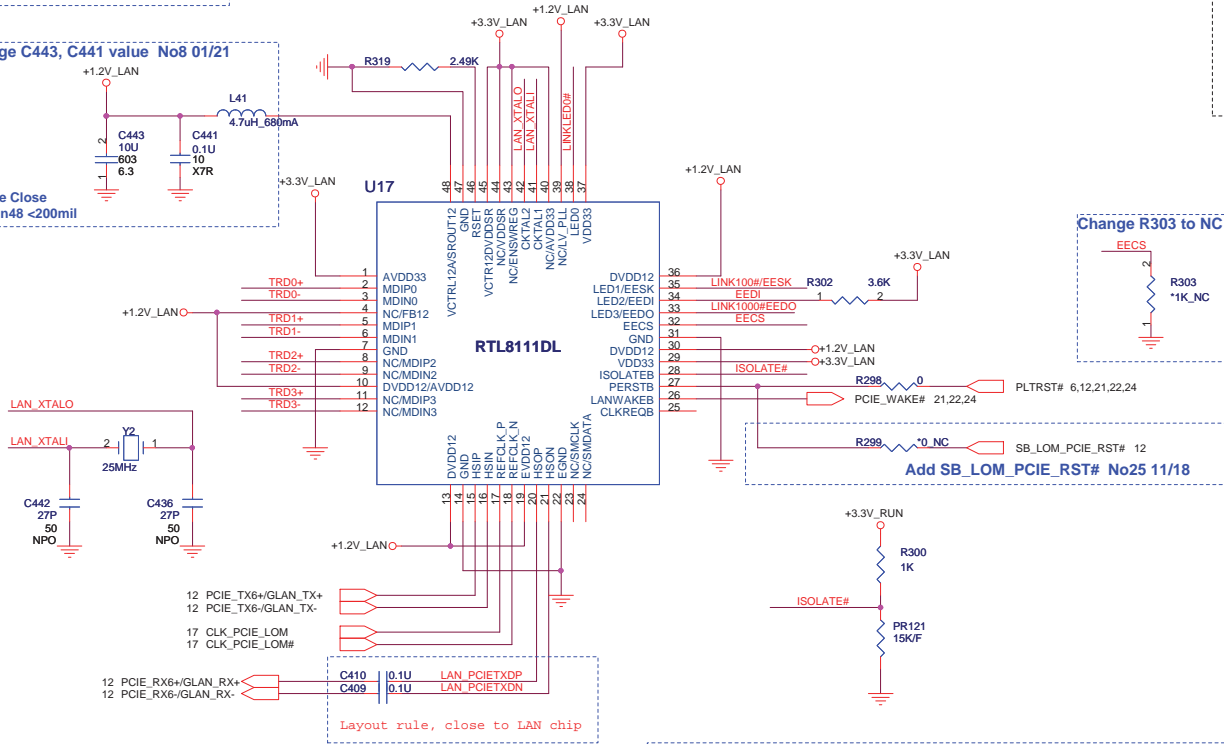
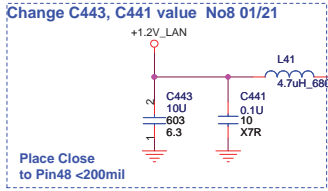
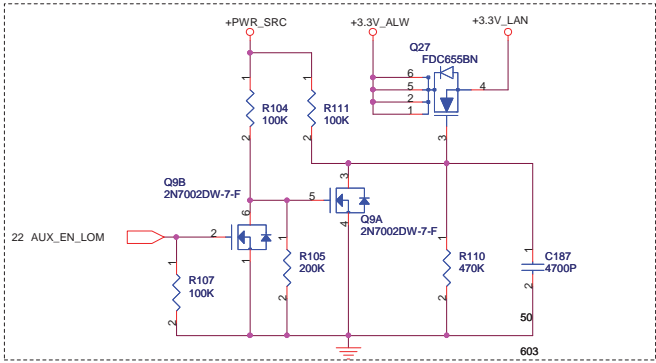
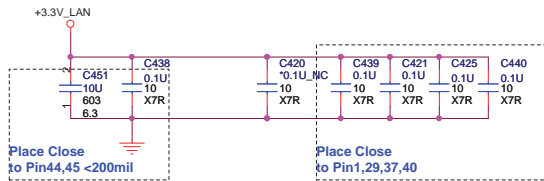
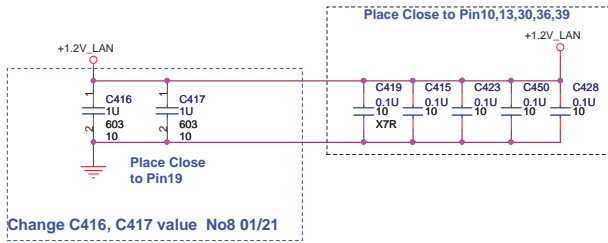
**Audio Jacks**



GAIN	R157 Pull-up
-46 dB	R10 Omit
-18 dB	R10 Populate



Change PN and footprint No16 10/29

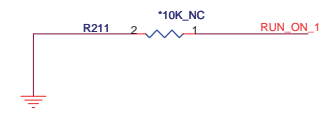
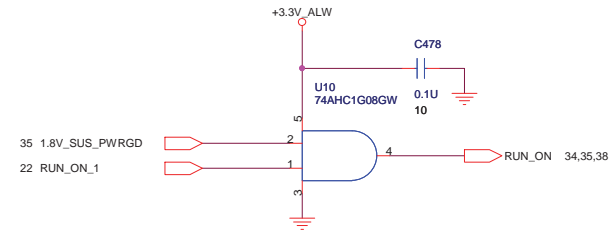
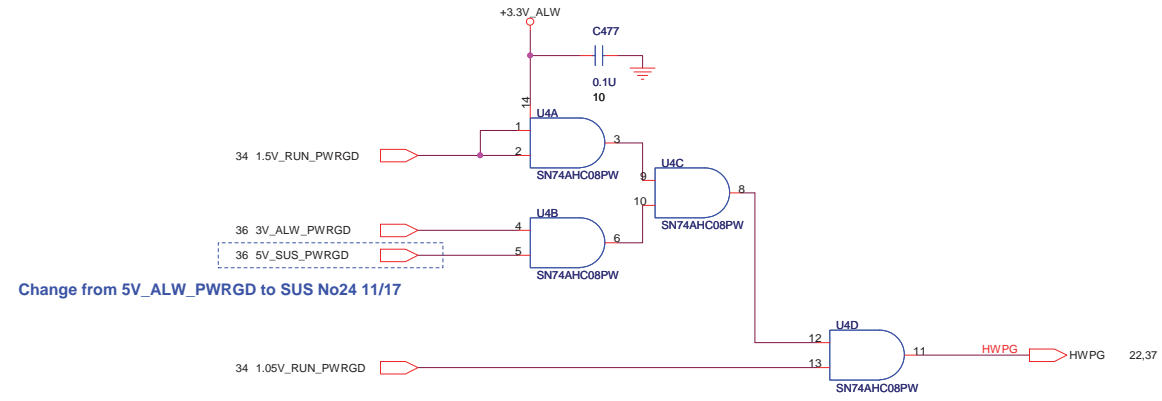
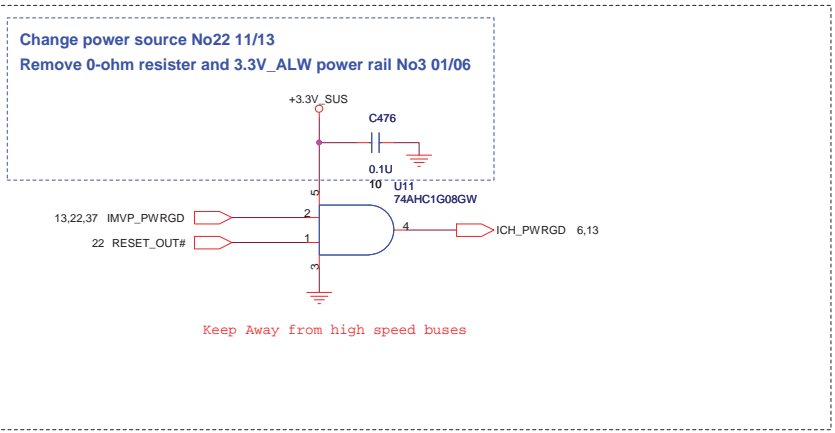


**QUANTA COMPUTER**

Title: LAN RTL8111D

Size: Document Number AM3 Rev 1A

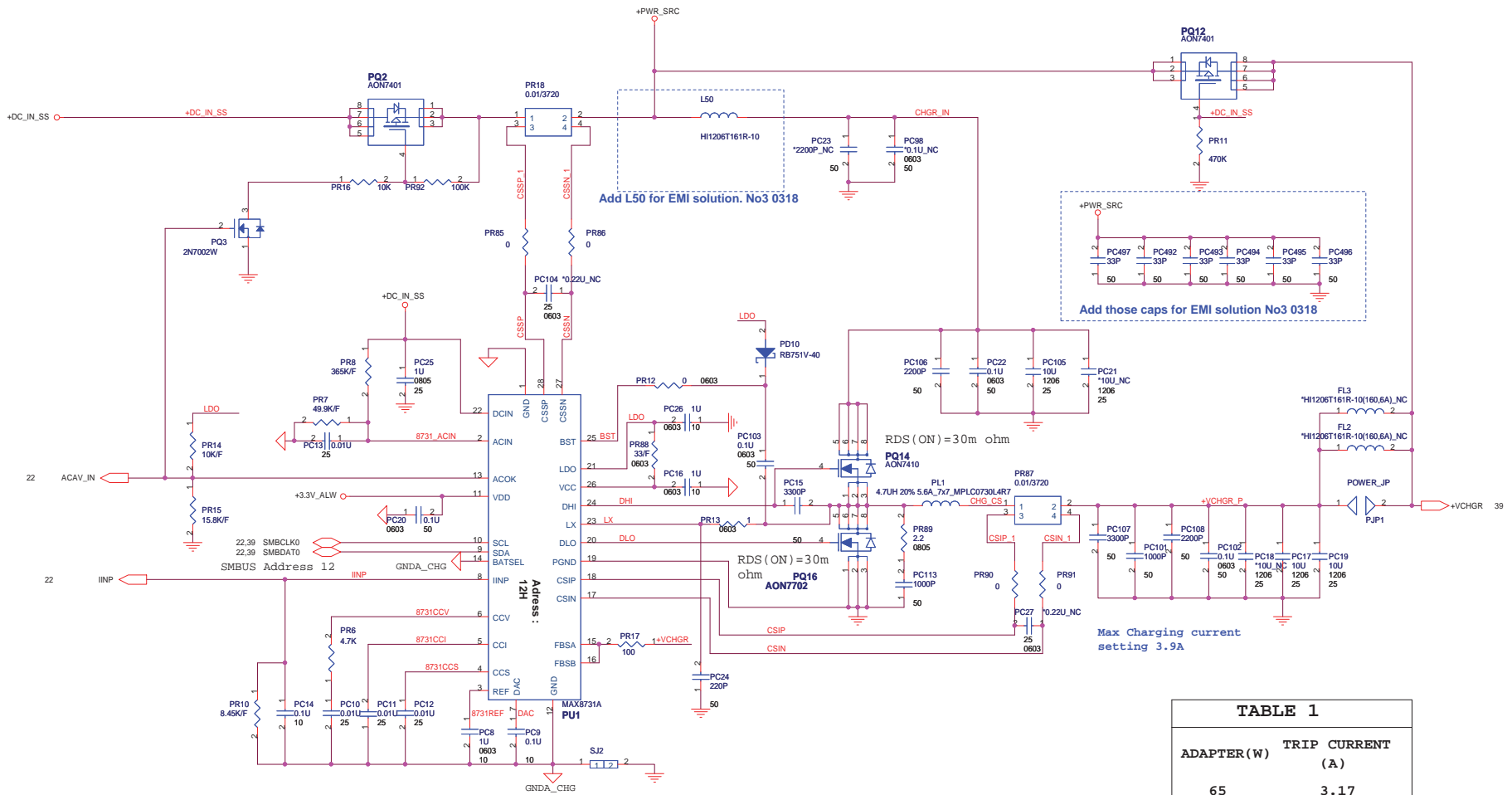
Date: Wednesday, March 25, 2009 Sheet 31 of 45



**QUANTA COMPUTER**

Title: System Reset Circuit		
Size: AMS	Document Number: AMS	Rev: 1A
Date: Wednesday, March 25, 2009	Sheet: 32 of 45	





**TABLE 1**

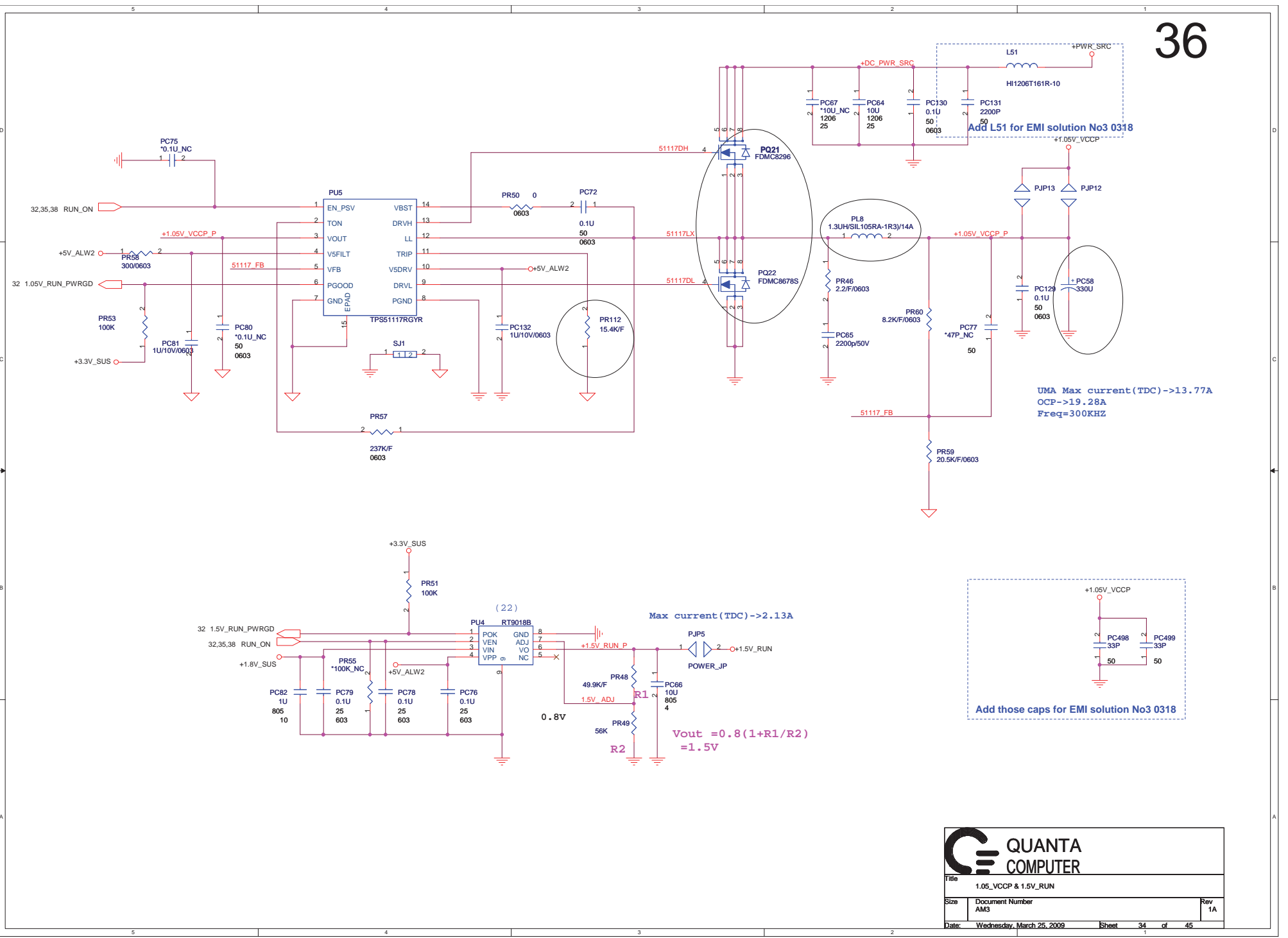
ADAPTER (W)	TRIP CURRENT (A)
65	3.17
90	4.43
130	6.43
150	7.43
200	9.75
230	(see note3)

**QUANTA COMPUTER**

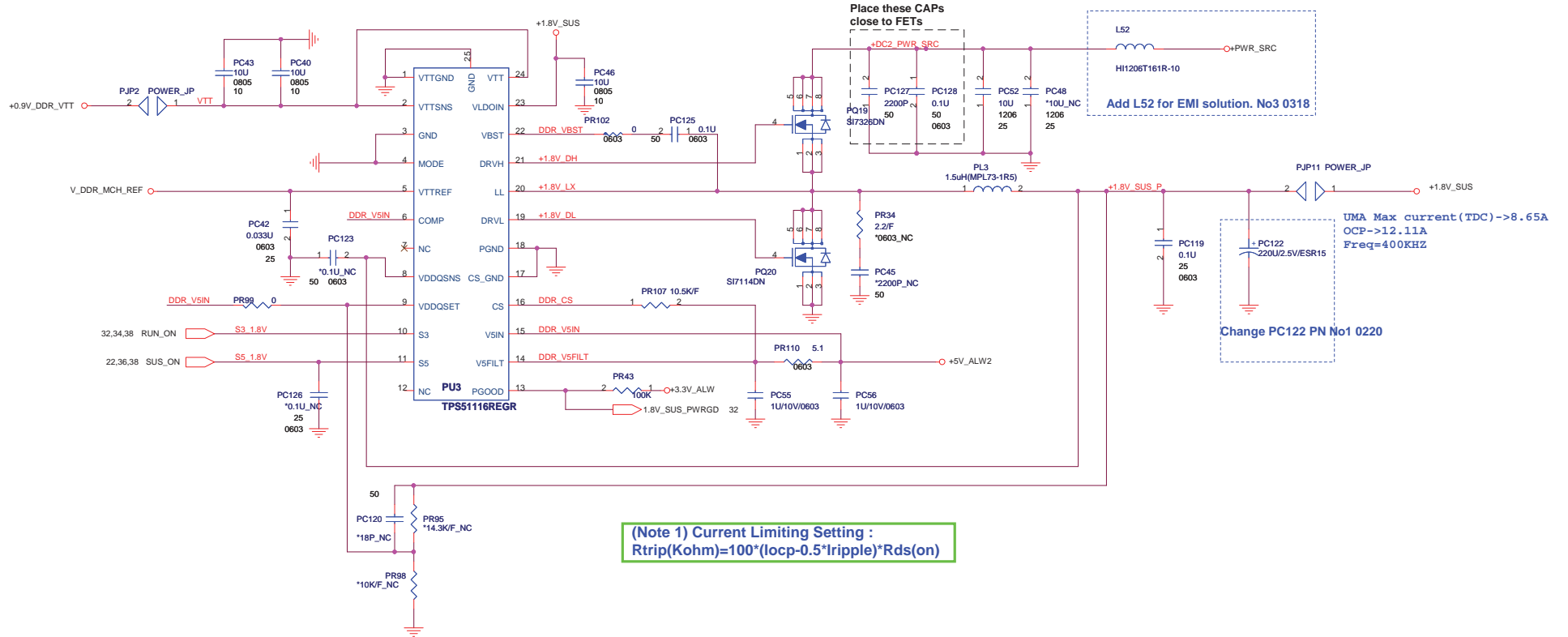
File: Charger (MAX8731A)

Size	Document Number	Rev
	AMS	1A

Date: Wednesday, March 25, 2009 Sheet 33 of 45



		<b>QUANTA COMPUTER</b>	
		Title: 1.05_VCCP & 1.5V_RUN	
Size:	Document Number: AM3	Date: Wednesday, March 25, 2009	Rev: 1A
Sheet: 34 of 45			



(Note 1) Current Limiting Setting :  
 $R_{trip}(Kohm) = 100 * (I_{ocp} - 0.5 * I_{ripple}) * R_{ds(on)}$

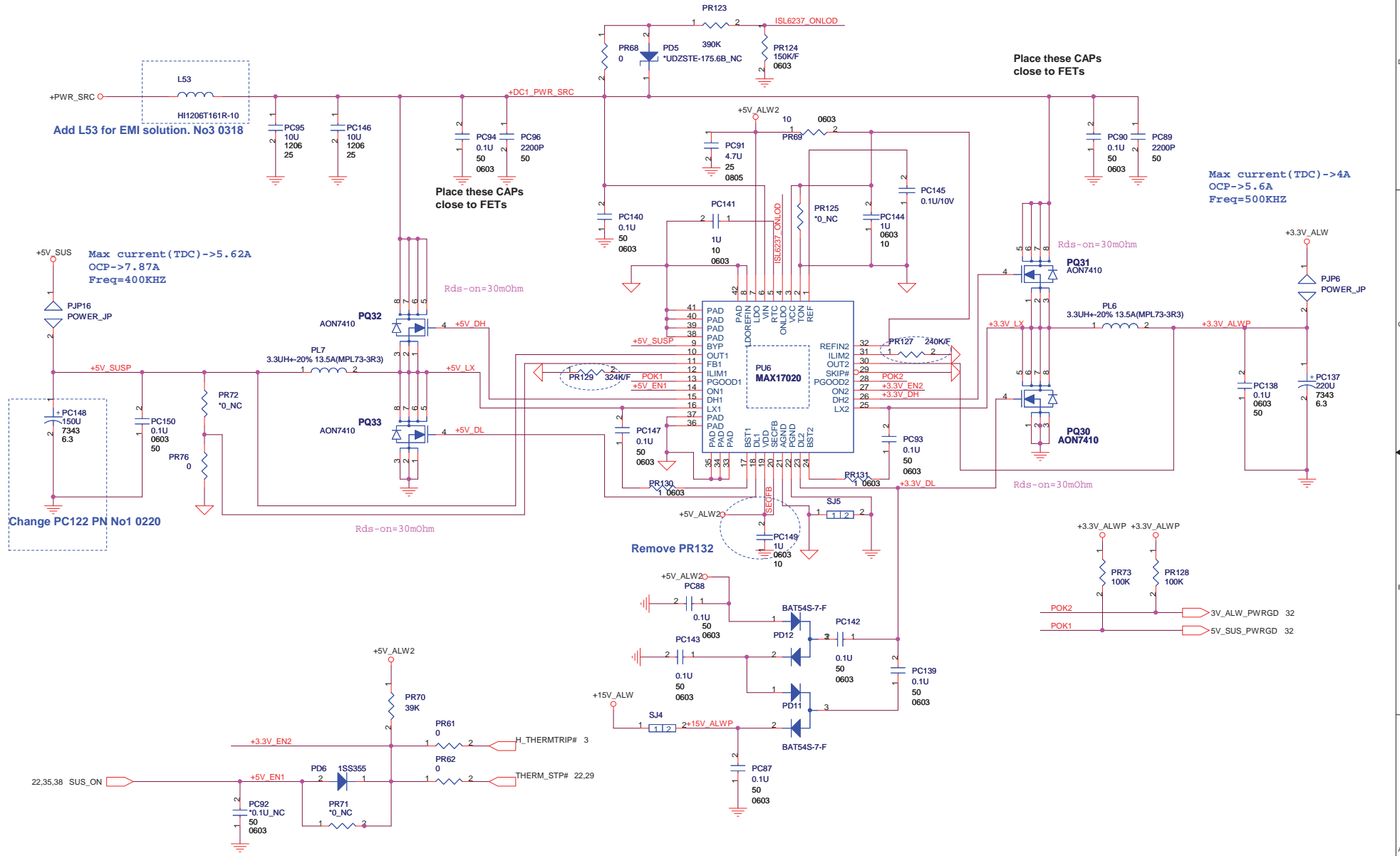
**QUANTA COMPUTER**

Title: 1.8VSUS & 0.9VTT (TPSS1116)

Size	Document Number	Rev
AM3		1A

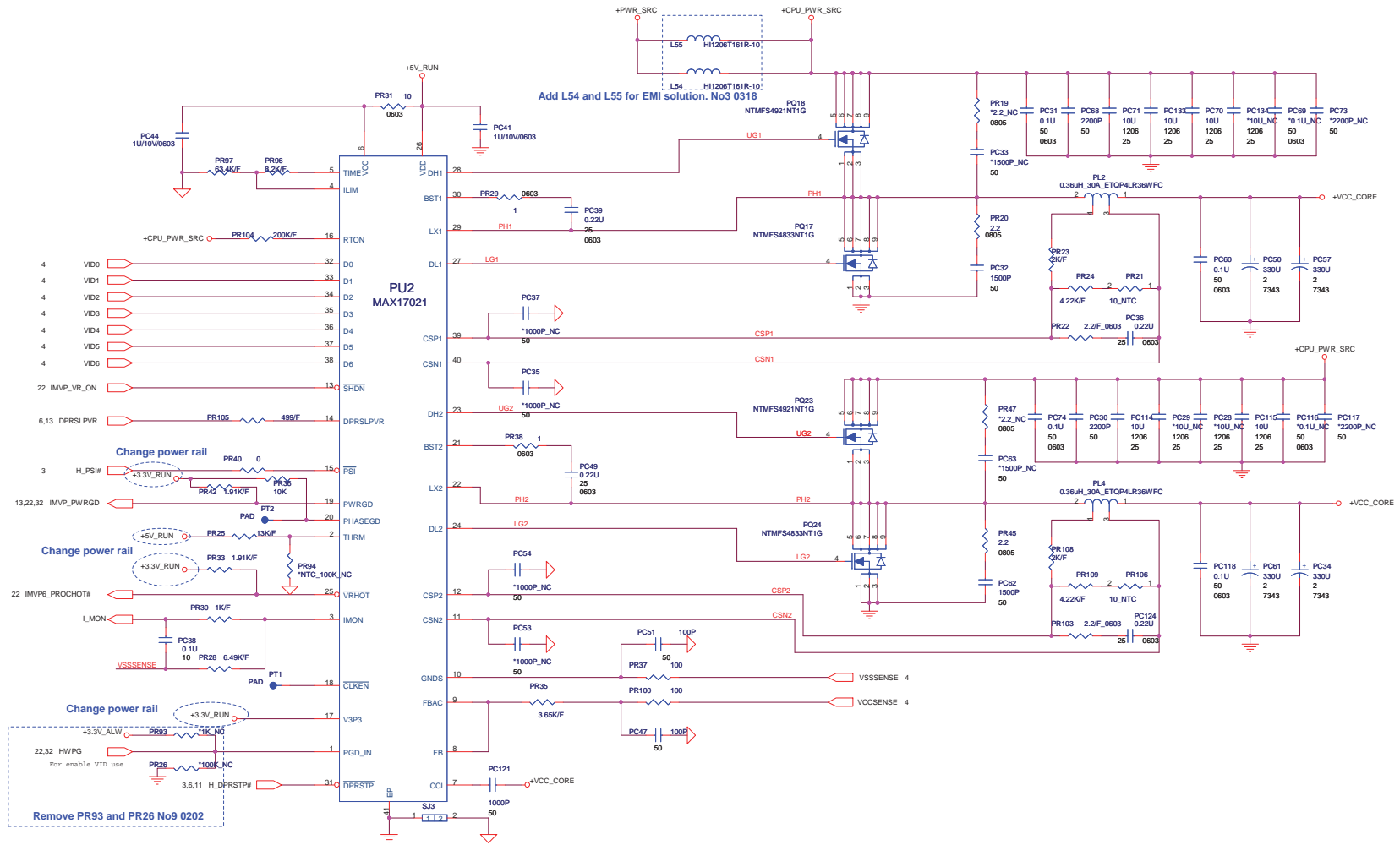
Date: Wednesday, March 25, 2009 Sheet 35 of 45

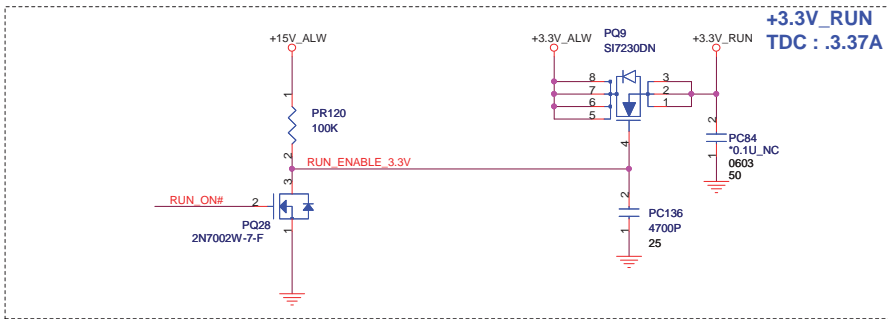
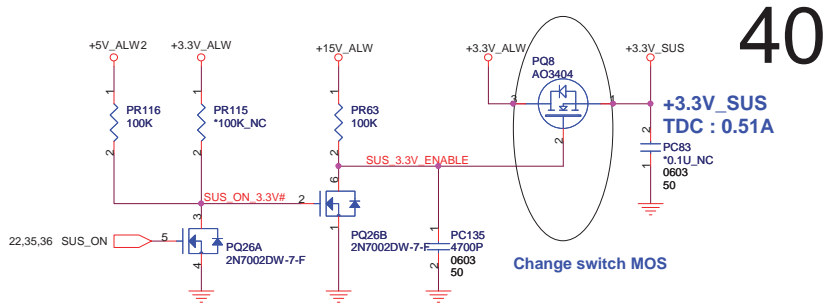
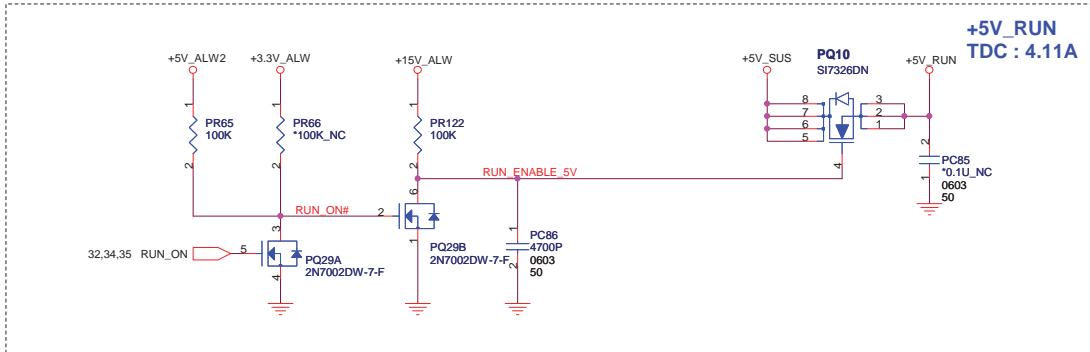
# DC/DC +3V\_ALW/+5V\_SUS/+15V\_ALW



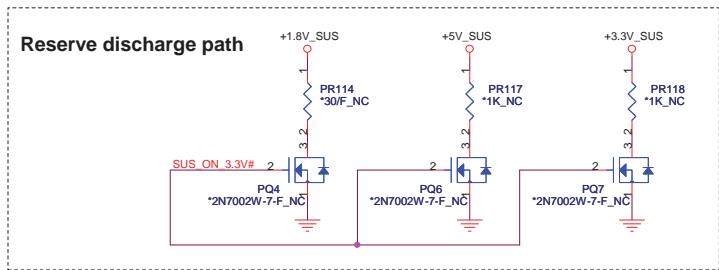
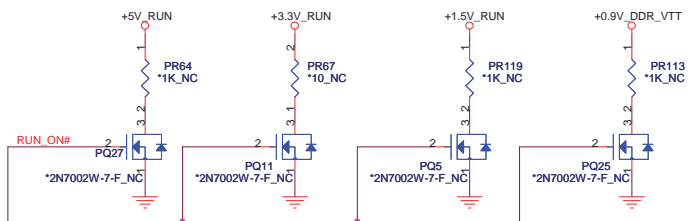
**QUANTA COMPUTER**

Title	3VALW, 5V, 3V, Power On	
Size	Document Number	Rev
	AM3	1A
Date:	Wednesday, March 25, 2009	Sheet 36 of 45





Reserve discharge path

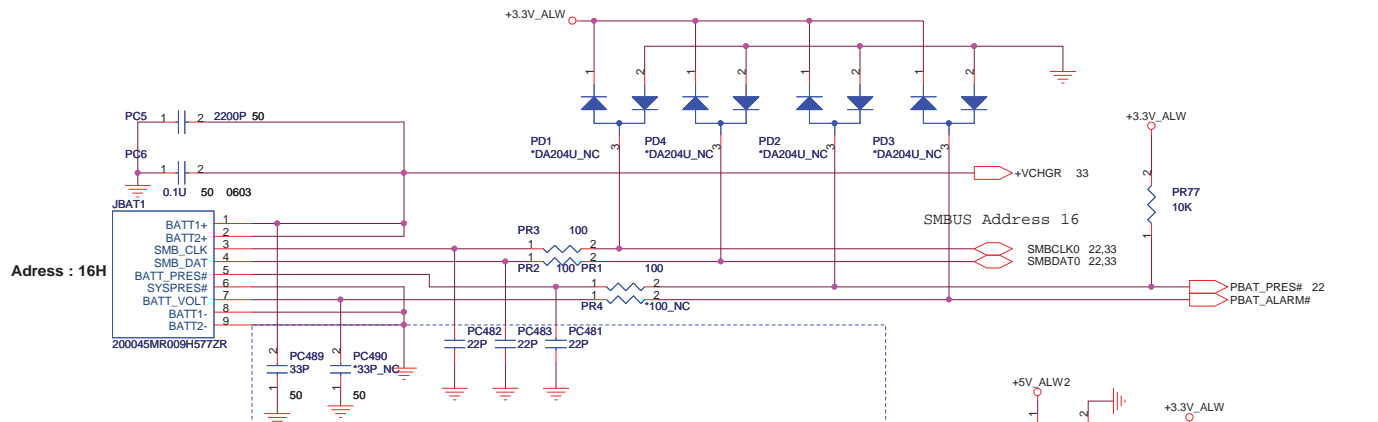


**QUANTA COMPUTER**

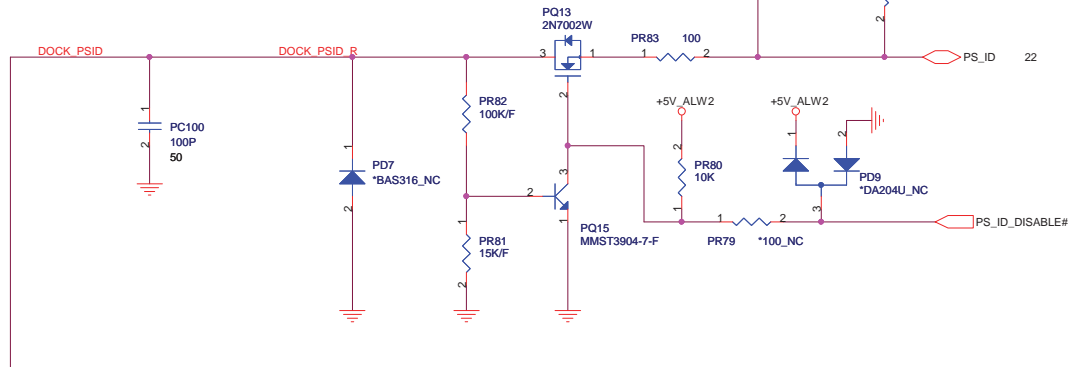
Title: RUN POWER SW

Size	Document Number	Rev
	AM3	1A

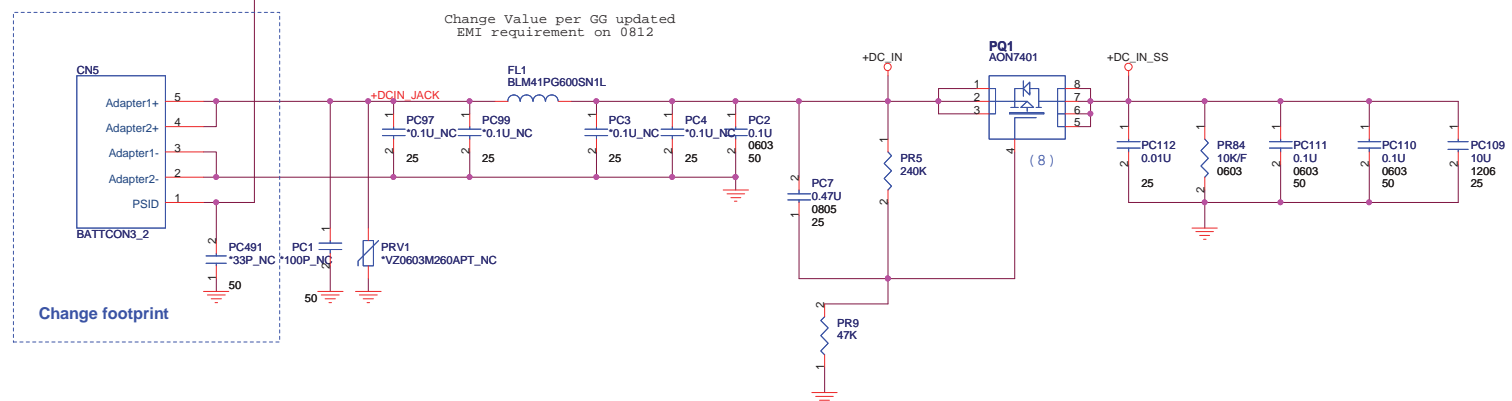
Date: Wednesday, March 25, 2009 Sheet 38 of 45



Add caps based on EMI request No5 0114  
 Add C489, C491, and C490 based on EMI request No3 0318



Change Value per GG updated  
 EMI requirement on 0812



Change footprint

**QUANTA COMPUTER**

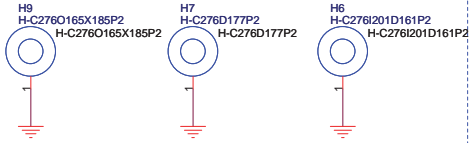
Title: DCIN,BATT CONNECTOR

Size: AM3	Document Number: AM3	Rev: 1A
-----------	----------------------	---------

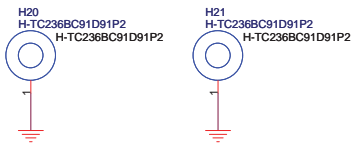
Date: Wednesday, March 25, 2009 Sheet: 39 of 45

Create hole footprints No9 10.15

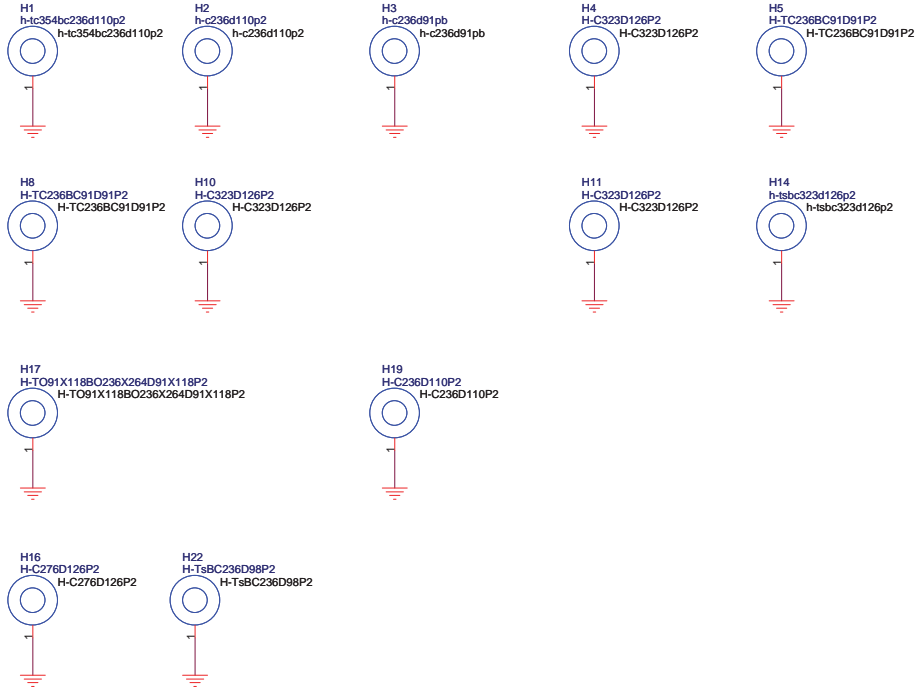
For CPU use




For ODD use



Add Screw hole No6 0119

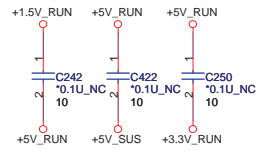


 <b>QUANTA COMPUTER</b>		
Title SCREW PAD		
Size	Document Number AM3	Rev 1A
Date: Wednesday, March 25, 2009		
Sheet 40 of 45		

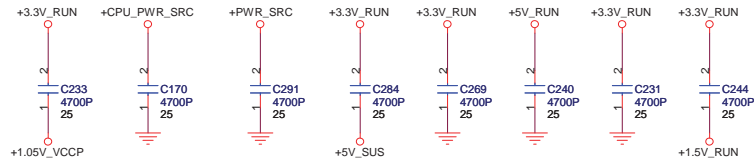



Reserved for EMI.

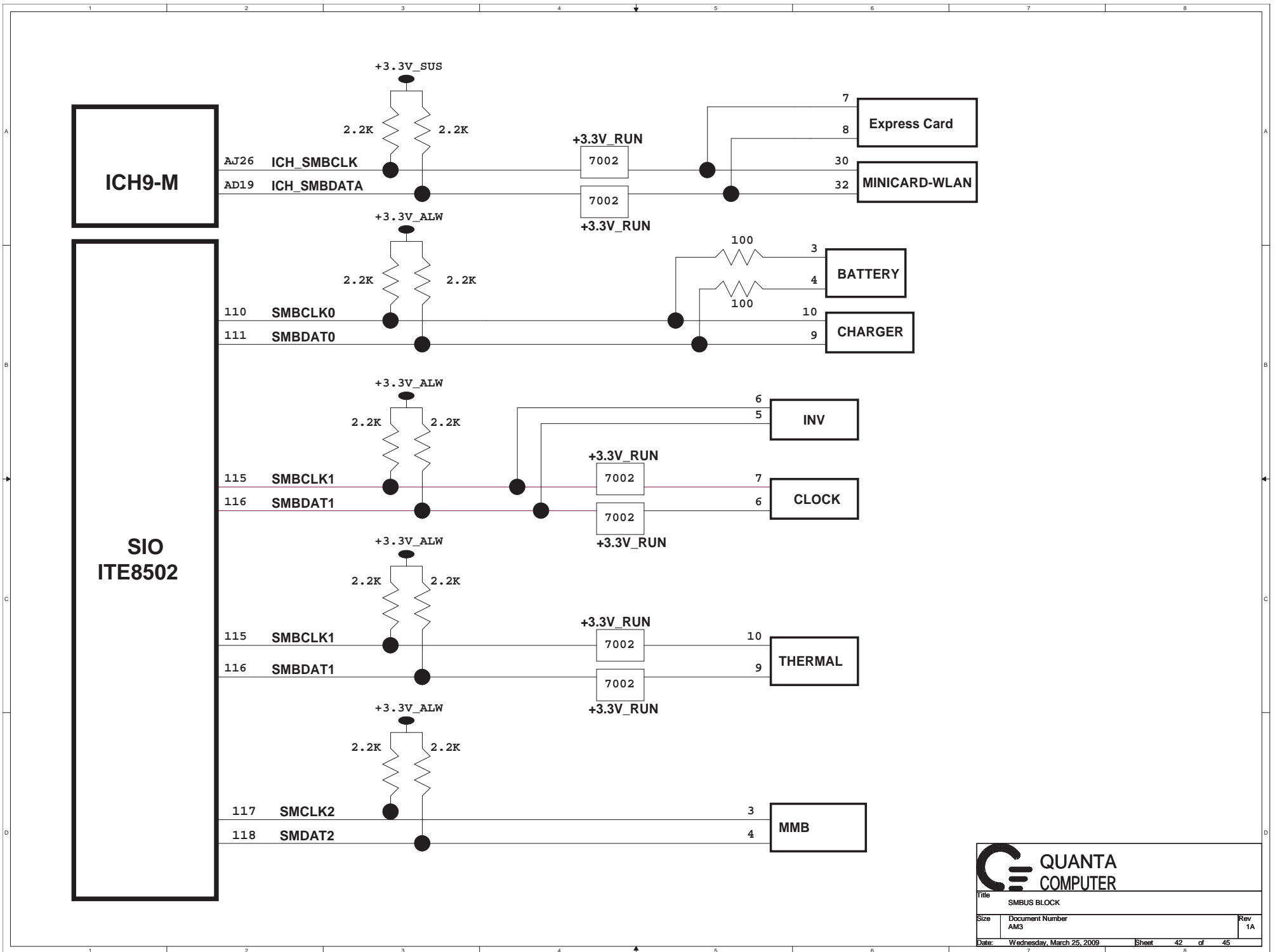
Stitching caps for PCI bus.



Stitching caps for PCI EMC.



 <b>QUANTA COMPUTER</b>		
Title: EMI CAP		
Size: AMS	Document Number: AMS	Rev: 1A
Date: Wednesday, March 25, 2009 Sheet 41 of 45		



**QUANTA COMPUTER**

Title: SMBUS BLOCK

Size	Document Number AMS	Rev 1A
Date: Wednesday, March 25, 2009	Sheet 42 of 45	

