

Block Diagram

PCB STACK UP 6L

LAYER 1 : TOP
LAYER 2 : SGND
LAYER 3 : IN1
LAYER 4 : IN2
LAYER 5 : VCC
LAYER 6 : BOT

Intel Processor
Sandy Bridge

ULV 17Watt
31*24mm
BGA 1023P

PAGE 3-6

DDR3 1333MT/s (Single Channel B)

DDR3 SO-DIMM-1
STD

4GB Max. Page 16

Channel A

DDR3 on board

Page 13-14

DMI*4

FDI

32.768KHz
BCLK133M
DMI100M
DPI20M

USB 2.0

SYSTEM POWER
+3VS5/+5VS5(RT8223)
PAGE 29

DDR 3
+0.75V_DDR_VTT/+1.5VSUS(RT8207)
PAGE 32

CPU CORE (RT8165BGQW)
PAGE 30

SYSTEM CHARGER (OZ8681)
PAGE 34

1.05V(RT8240BZ)
1.8V(G5173)
PAGE 33

Dis-charge (SLG55448VTR)
+3VSUS/+3V/+5V/+1.5V/+3VLAVCC
PAGE 35

VCCSA (RT8241EZ)
PAGE 31

11.6" LED Panel
Page 18

CRT Connector
Page 17

HDMI Connector
Page 19

SATA

2.5"HDD/SSD
Page 25

Accelerometer
Sensor
Page 25

Touch Pad
Page 27

Keyboard
Page 27

BIOS
SPI Flash
Page 28

ENC KBC
ENE3930 A2
Page 28

LPC

SPI

HDA

Cougar Point
Platform Controller Hub

- FCBGA package
- Package size: 25 mm x 25 mm
- Ball Count: 989
- Ball pitch: 0.6 mm

PAGE 7-12

AUDIO CODEC
92HD87BX
Page 20

Int SPK
Page 20

Digital MIC
Page 20

MIC JACK
Page 20

HP JACK
Page 20

Amplifier
Beats
Page 20

3, 5, 9

USB2.0
Port x3
Page 22

0

Card Reader
Page 22

2

BT / WLAN
Page 23

1

WWAN
Page 24

8

Webcam
Page 18

Card Reader
Socket
Page 17

SIM Card Socket
Page 24

PCI-Express

X1

LAN
RTL8111E
Page 21

X1

WLAN
Page 21

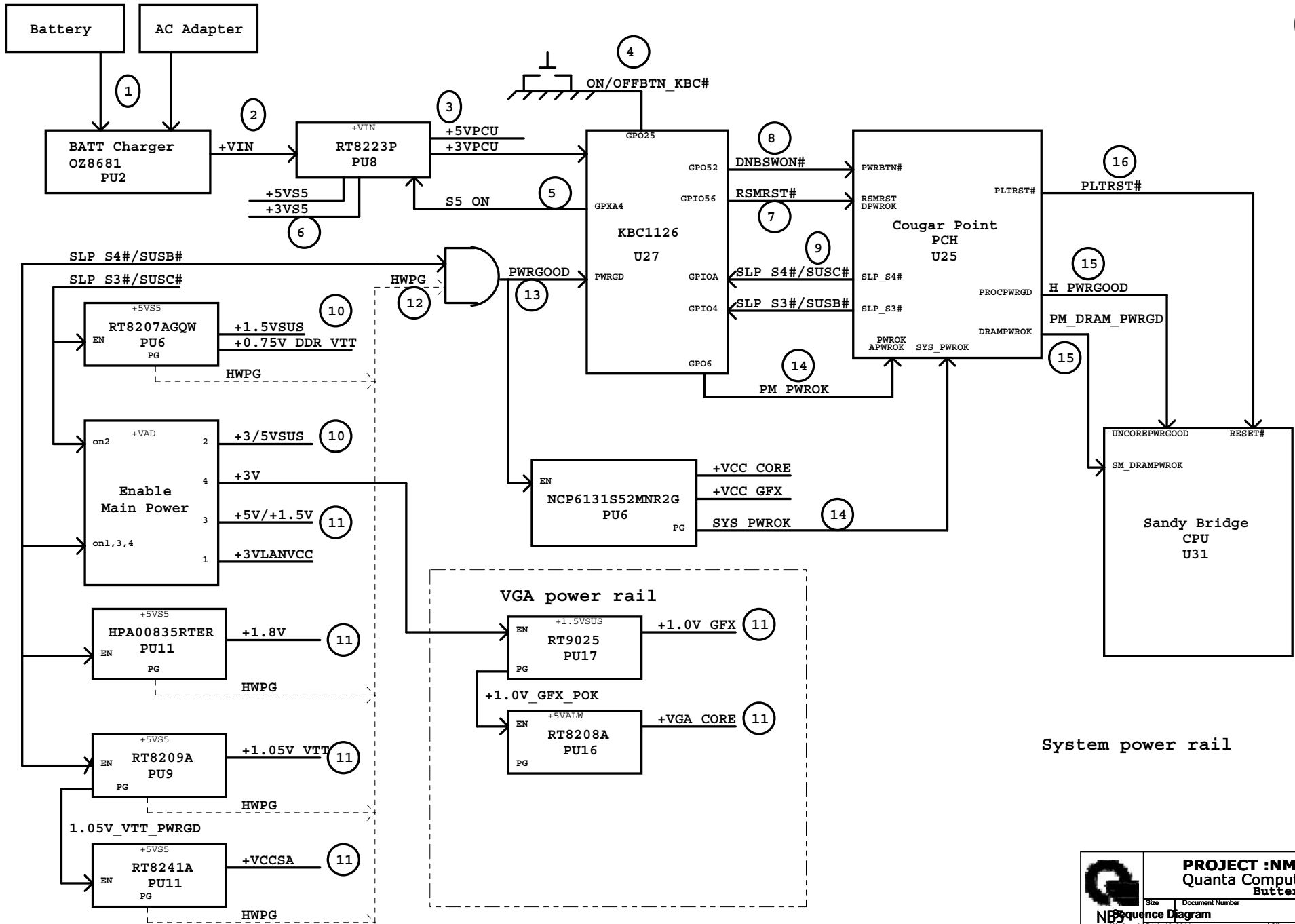
25MHz

RJ 45
Page 21



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Size	Document Number	Rev
	Block Diagram	1A
Date:	Wednesday, July 13, 2011	Sheet 1 of 36



Sandy Bridge Processor (CLK,MISC,JTAG)

03



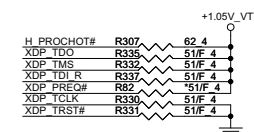
PEG ICOMPI and RCOMPO signals

should be routed within 500 mils typical
impedance = 42 mohms REC. ICOMBO

signals should be routed within 500 mils

typical Impedance = 14.5 mohms

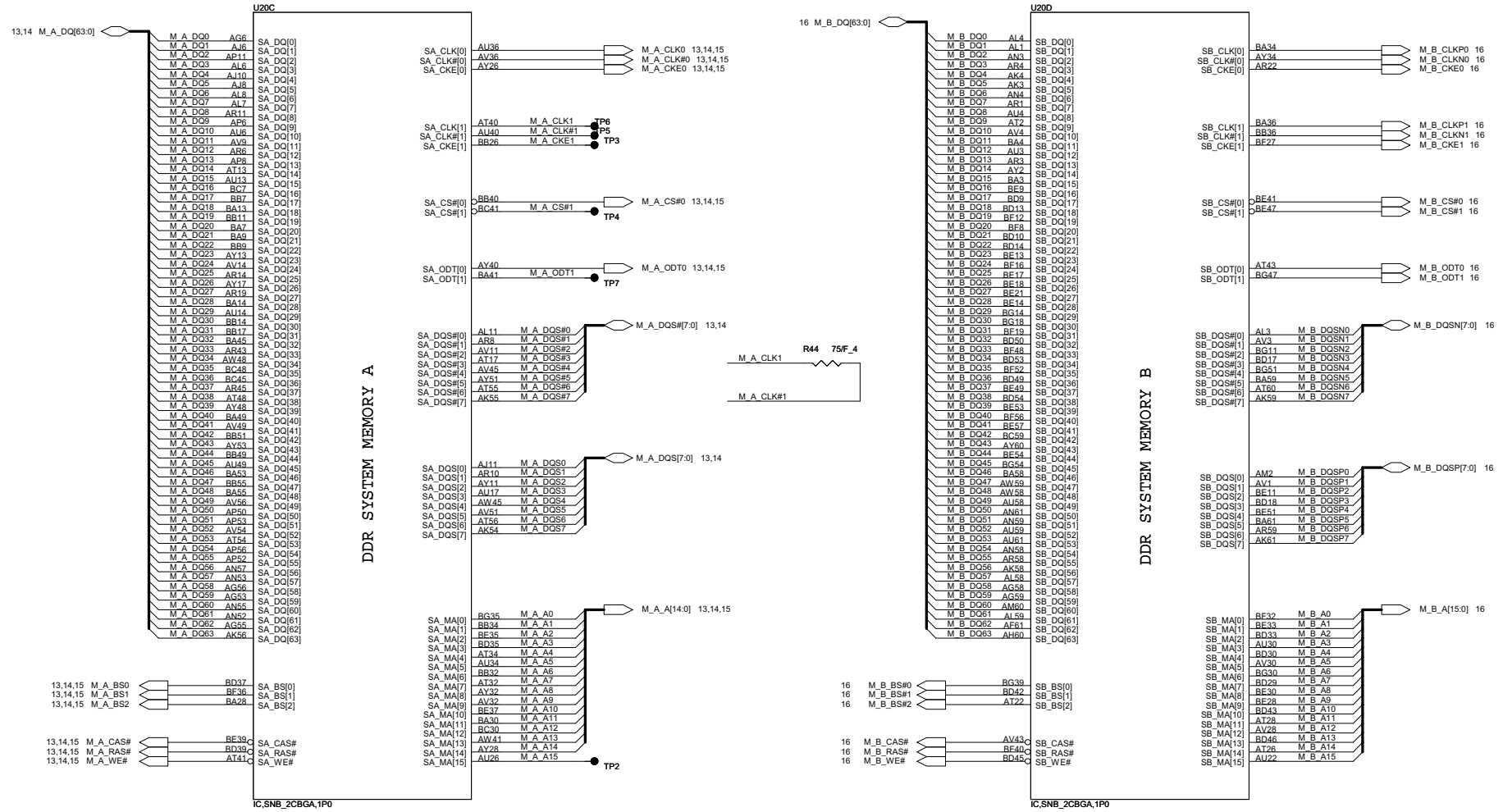
Processor pull-up (CPU)	
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PROJECT :NM2
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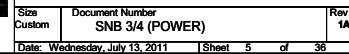
Size Custom	Document Number SNB 1/4 (PCIE&DMI&FDI)	R
Date: Wednesday, July 13, 2011	Sheet 3 of 36	

Sandy Bridge Processor (DDR3)



Sandy Bridge Processor (GRAPHIC POWER)

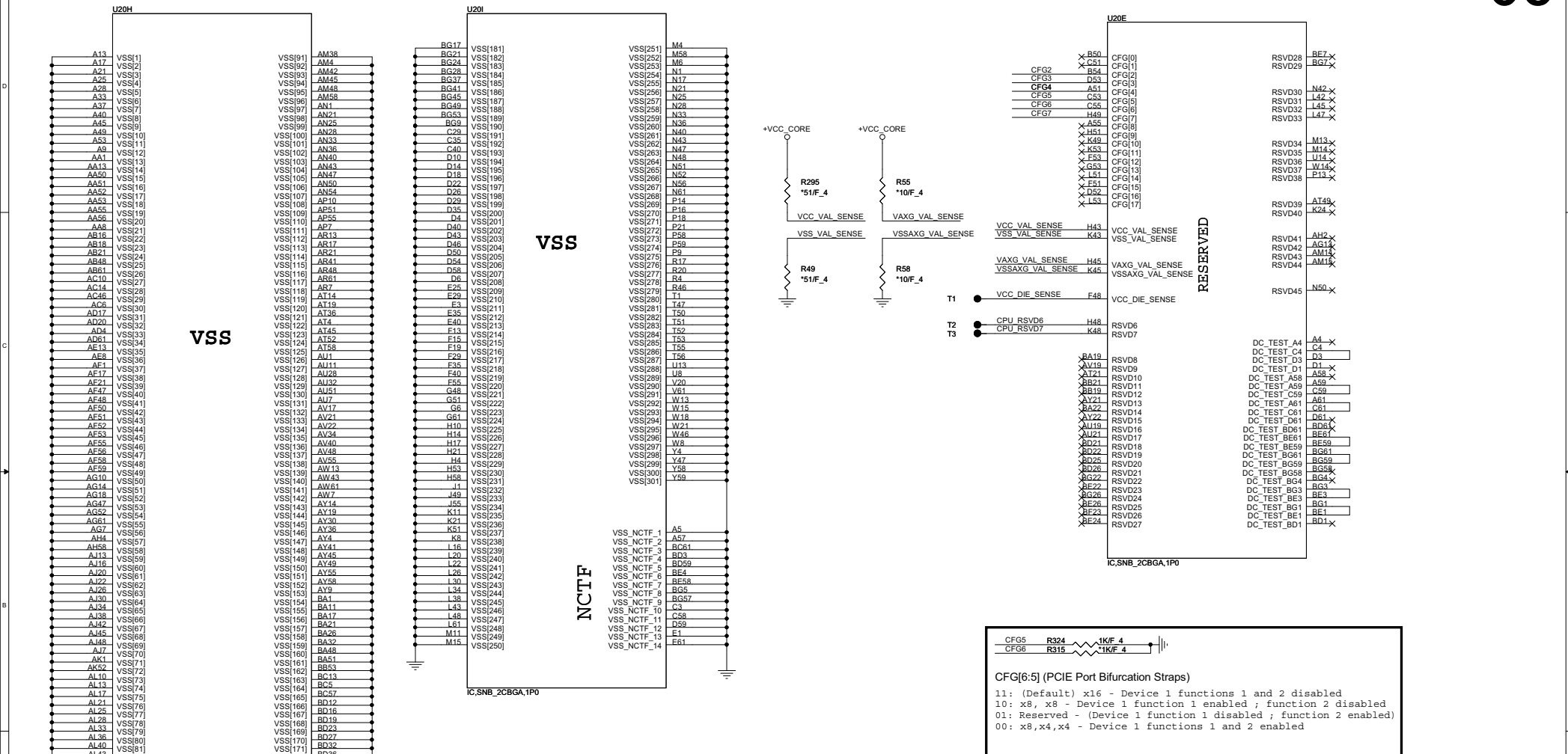
CAD Note: +VDDR_REF_CPU should have 10 mil trace width



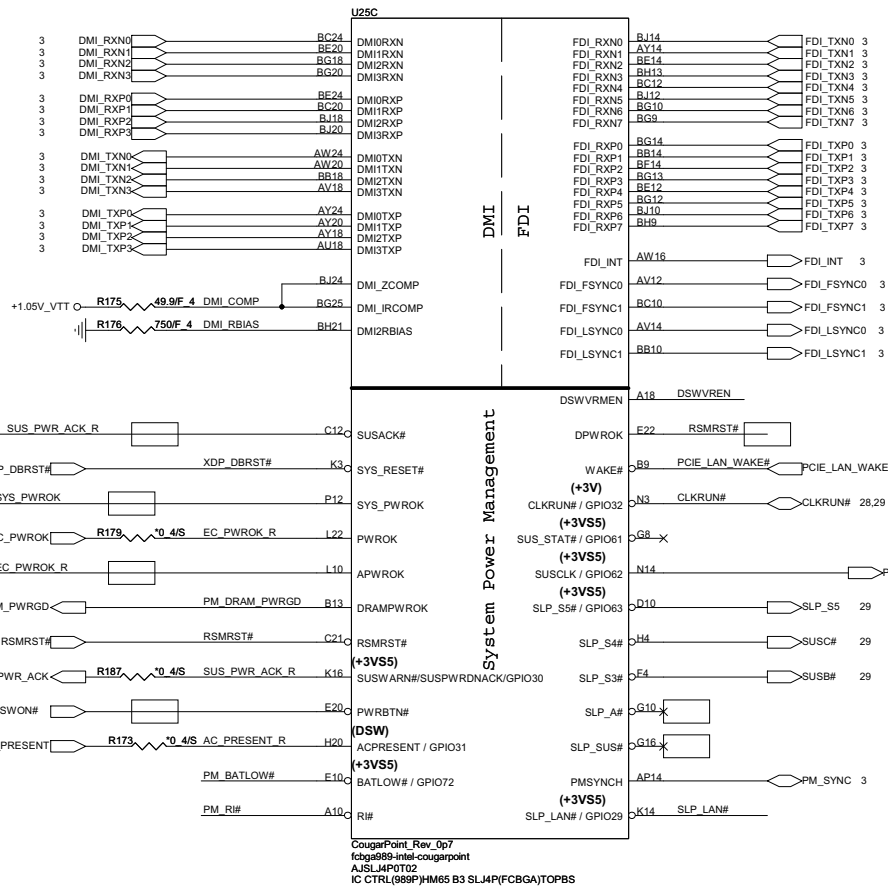
Sandy Bridge Processor (GND)

Sandy Bridge Processor (RESERVED, CFG)

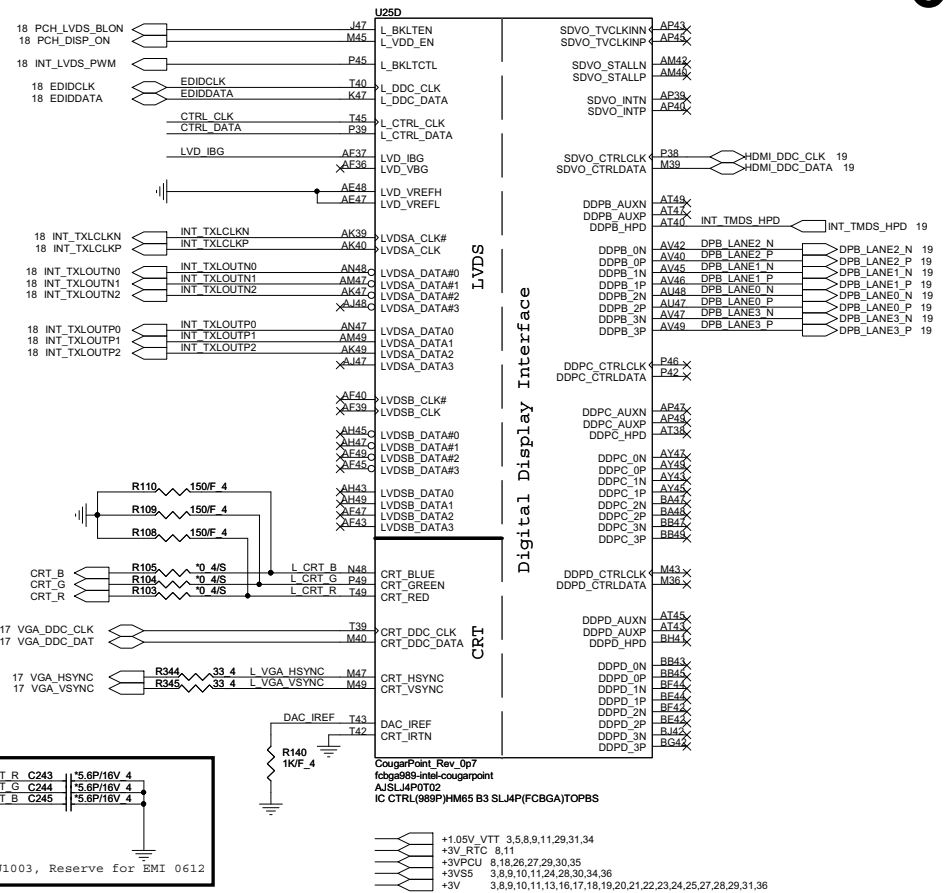
06



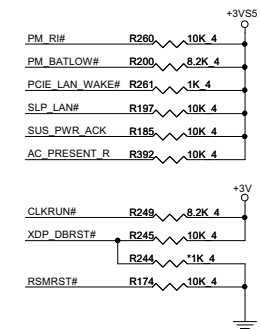
Cougar Point (DMI, FDI, PM)



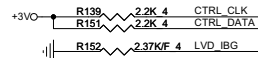
Cougar Point (LVDS,DDI)



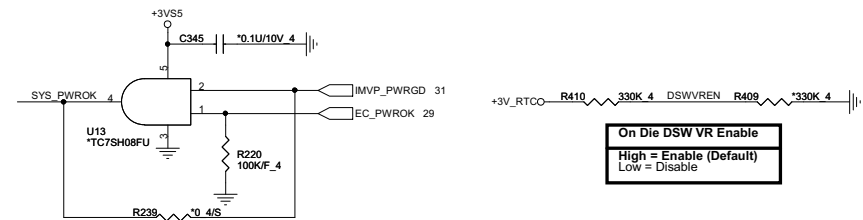
PCH Pull-high/low(CLG)



**INT LVDS & CRT disable
(DIS only remove)**



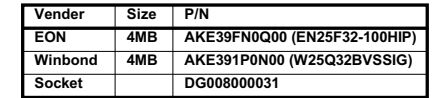
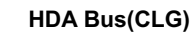
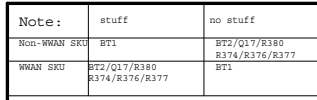
System PWR_OK(CLG)



PROJECT :NM2
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Size Custom	Document Number PCH 1/6 (DMI/FDI/VIDEO)	Rev 1A
Date: Wednesday, July 13, 2011	Sheet 7 of 36	

08

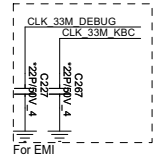


Size Custom	Document Number PCH 2/6 (SATA/HDA/SPI)	Rev 1A
Date: Wednesday, July 13, 2011	Sheet 8 of 36	

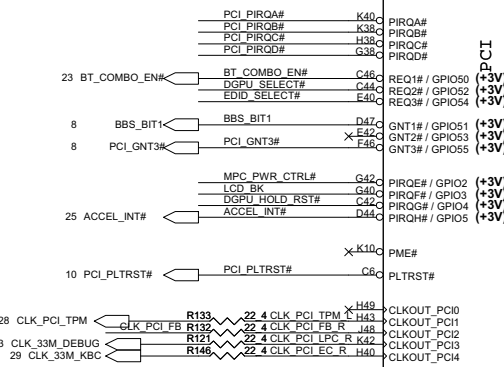
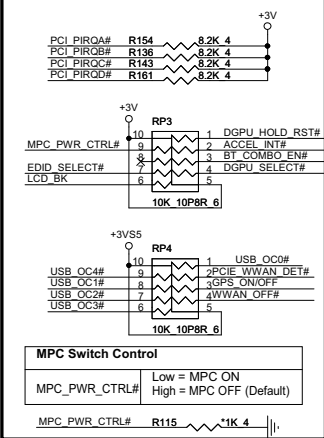
Pin Name	Strap description	Sampled	Configuration	Circuit						
SPKR Different from Calpella	No reboot mode setting	PWROK	0 = Default (weak pull-down 20K) 1 = Setting to No-Reboot mode							
GNT3# / GPIO55	Top-Block Swap Override	PWROK	0 = "top-block swap" mode 1 = Default (weak pull-up 20K)							
INTVRMEN	Integrated 1.05V VRM enable	ALWAYS	Should be always pull-up							
HDA_DOCK_EN#/GPIO33	Flash Descriptor Security Only for Interposer	PWROK	0 = Override 1 = Default (weak pull-up 20K)							
GNT1# / GPIO51	Boot BIOS Selection 1 [bit-1]	PWROK	<table border="1"><thead><tr><th>GNT1#</th><th>GNT0#</th><th>Boot Location</th></tr></thead><tbody><tr><td>1</td><td>0</td><td>SPI LPC</td></tr></tbody></table>	GNT1#	GNT0#	Boot Location	1	0	SPI LPC	<p>[Need external pull-down for LPC BIOS] Default weak pull-up on GNT0/1#</p>
GNT1#	GNT0#	Boot Location								
1	0	SPI LPC								
GPIO19 Different from Calpella	Boot BIOS Selection 0 [bit-0]	PWROK								
GNT2# / GPIO53	ESI strap (Server only)	PWROK	Should not be pull-down (weak pull-up 20K)	USE GPIO PIN						
NV_ALE	Intel Anti-Theft HDD protection Only for Interposer	PWROK	0 = Disable (Internal pull-down 20kohm)							
NV_CLE	DMI Termination voltage	PWROK	weak pull-down 20kohm							
HDA_SYNC	On-Die PLL VR Voltage Select	RSMRST	0 = Support by 1.8V (weak pull-down) 1 = Support by 1.5V							
HDA_SDO	Flash Descriptor Security	PWROK	0 = Override 1 = Default (weak pull-up 20K)							
GPIO8	Integrated Clock Chip Enable	RSMRST#	Should be pull-down (weak pull-up 20K)							
GPIO28 Different from Calpella	On-die PLL Voltage Regulator	RSMRST#	0 = Disable 1 = Enable (Default)							
SPI_MOSI	iTPM function Disable	APWROK	0 = Default (weak pull-down 20K) 1 = Enable							

Cougar Point-M (PCI,USB,NVRAM)

Cougar Point-M (PCI-E,SMBUS,CLK)

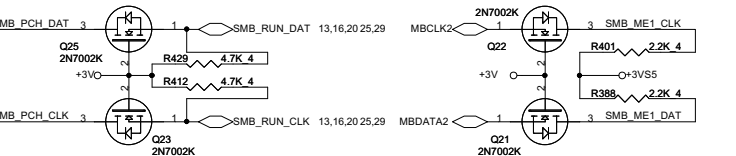


PCI/USBOC# Pull-up(CLG)

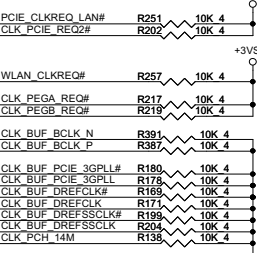


CougarPoint_Rev_0p7
fcbg989-intel-cougarpoint
AJSJL4POT02
IC CTRL(989P/JHM65 B3 SLJ4P(FCBGA)TOPBS

SMBus/Pull-up(CLG)



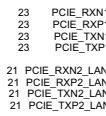
CLK_REQ/Strap Pin(CLG)



CLOCK TERMINATION for PCIM

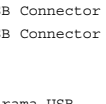
WLAN

LAN

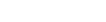


WLAN

LAN



GPS_ON/OFF



BOARD_ID0



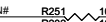
BOARD_ID1



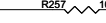
BOARD_ID2



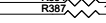
CLK_PCH_ITPN



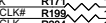
CLK_PCH_ITTP



CLK_PCH_14M



CLK_PCH_22K



CLK_PCH_48



CLK_PCH_100



CLK_PCH_200



CLK_PCH_400

CLK_PCH_800

CLK_PCH_1600

CLK_PCH_3200

CLK_PCH_6400

CLK_PCH_12800

CLK_PCH_25600

CLK_PCH_51200

CLK_PCH_102400

CLK_PCH_204800

CLK_PCH_409600

CLK_PCH_819200

CLK_PCH_1638400

CLK_PCH_3276800

CLK_PCH_6553600

CLK_PCH_13107200

CLK_PCH_26214400

CLK_PCH_52428800

CLK_PCH_104857600

CLK_PCH_209715200

CLK_PCH_419430400

CLK_PCH_838860800

CLK_PCH_1677721600

CLK_PCH_3355443200

CLK_PCH_6710886400

CLK_PCH_13421772800

CLK_PCH_26843545600

CLK_PCH_53687091200

CLK_PCH_107374182400

CLK_PCH_214748364800

CLK_PCH_429496729600

CLK_PCH_858993459200

CLK_PCH_1717986918400

CLK_PCH_3435973836800

CLK_PCH_6871947673600

CLK_PCH_13743895347200

CLK_PCH_27487790694400

CLK_PCH_54975581388800

CLK_PCH_109951162777600

CLK_PCH_219902325555200

CLK_PCH_439804651110400

CLK_PCH_879609302220800

CLK_PCH_1759218604416000

CLK_PCH_3518437208832000

CLK_PCH_7036874417664000

CLK_PCH_14073748835328000

CLK_PCH_28147497670656000

CLK_PCH_56294995341312000

CLK_PCH_112589990682624000

CLK_PCH_225179981365248000

CLK_PCH_450359962730496000

CLK_PCH_900719925460992000

CLK_PCH_1801439850921984000

CLK_PCH_3602879701843968000

CLK_PCH_7205759403687936000

CLK_PCH_14411518807375872000

CLK_PCH_28823037614751744000

CLK_PCH_57646075229503488000

CLK_PCH_115292150459006976000

CLK_PCH_230584300918013952000

CLK_PCH_461168601836027904000

CLK_PCH_922337203672055808000

CLK_PCH_18446744073441116160000

CLK_PCH_36893488146882232320000

CLK_PCH_73786976293764464640000

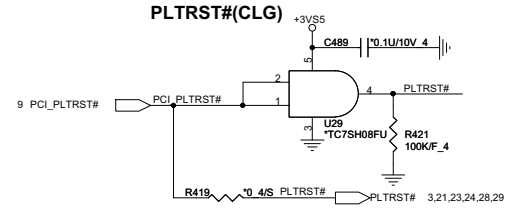
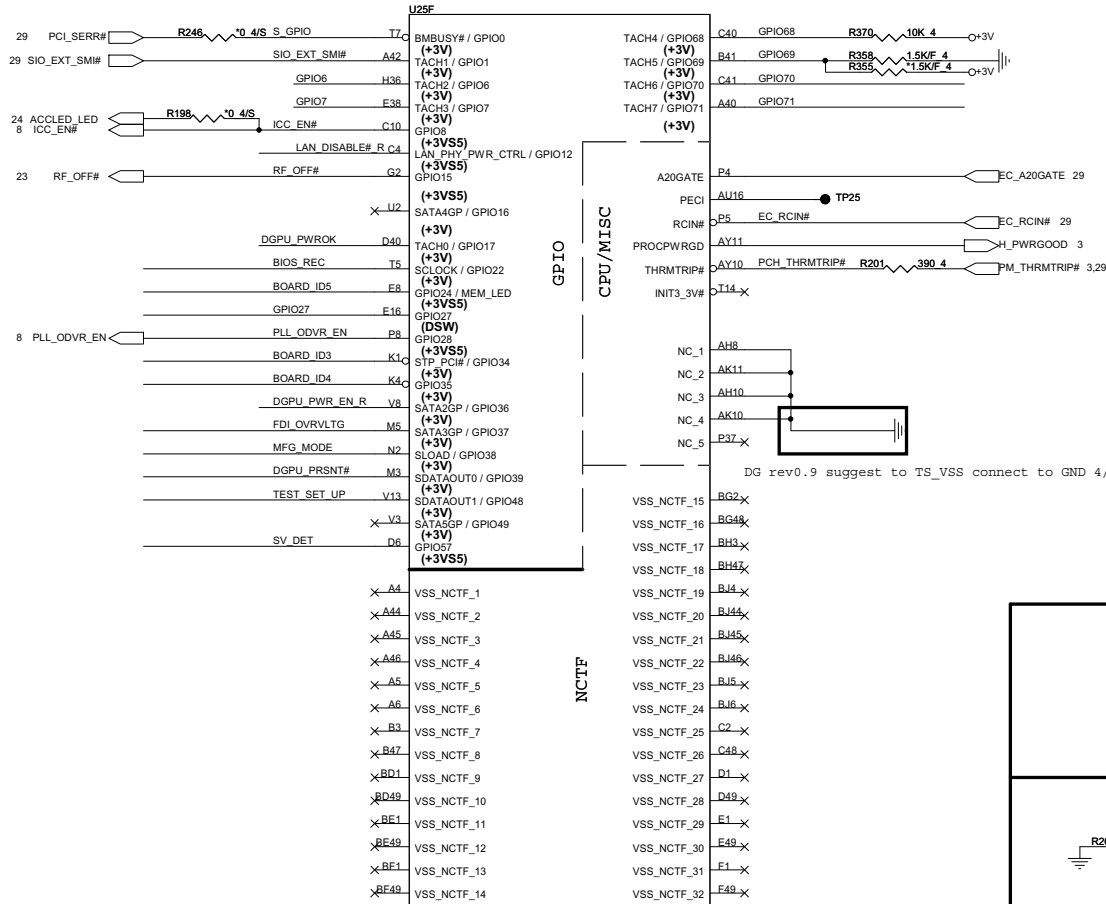
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CLK_PCH_295147905175057858560000

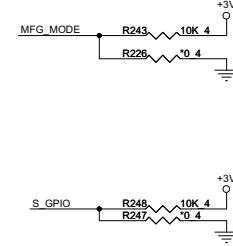
CLK_PCH_5902958103501157171200000

CLK_PCH_11805916207002314342400000

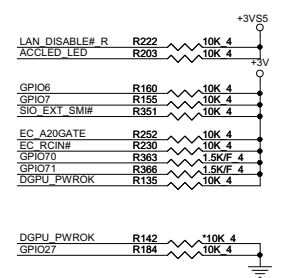
Cougar Point (GPIO,VSS_NCTF,RSVD)



MFG-TEST



GPIO Pull-up/Pull-down (CLG)



RF_OFF# R236 1K/F 4

Intel ME Crypto Transport Layer Security (TLS) cipher suite

Low = Disable (Default)

High = Enable

BIOS REC R215 10 4

BIOS RECOVERY

High = Disable (Default)

Low = Enable

TEST_SET_UP R209 10 4

SV_SET_UP

High = Strong (Default)

SV_DET R221 10K 4

TEST DETECT

Low = Default

DGPU_PWR_EN R R210 200K/F 4

DMI TERMINATION VOLTAGE OVERRIDE

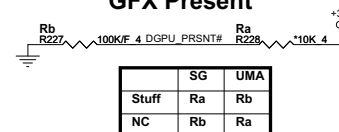
Low = Tx, Rx terminated to same voltage (DC Coupling Mode) (DEFAULT)

FDI_OVRVLGT R253 1K 4

FDI TERMINATION VOLTAGE OVERRIDE

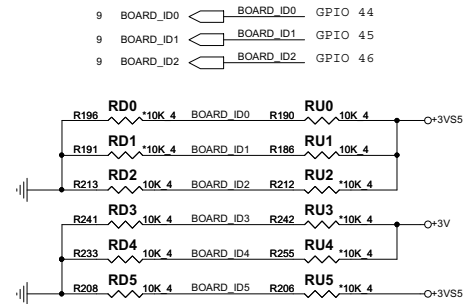
LOW - Tx, Rx terminated to same voltage

GFX Present



BOARD ID SETTING

BOARD ID SETTING	0	1
BOARD_ID0 GPIO 44	Micron	Hynix
BOARD_ID1 GPIO 45	non-beats	beats
BOARD_ID2 GPIO 46	on- board RAM	non-on board ram
BOARD_ID3 GPIO 34	RESERVE	RESERVE
BOARD_ID4 GPIO 35	RESERVE	RESERVE
BOARD_ID5 GPIO 24	RESERVE	RESERVE

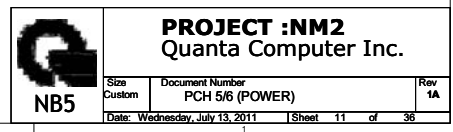


PROJECT :NM2
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Size Custom	Document Number PCH 4/B (GPIO/MISC)	Rev 1A
Date: Wednesday, July 13, 2011	Sheet 10 of 36	

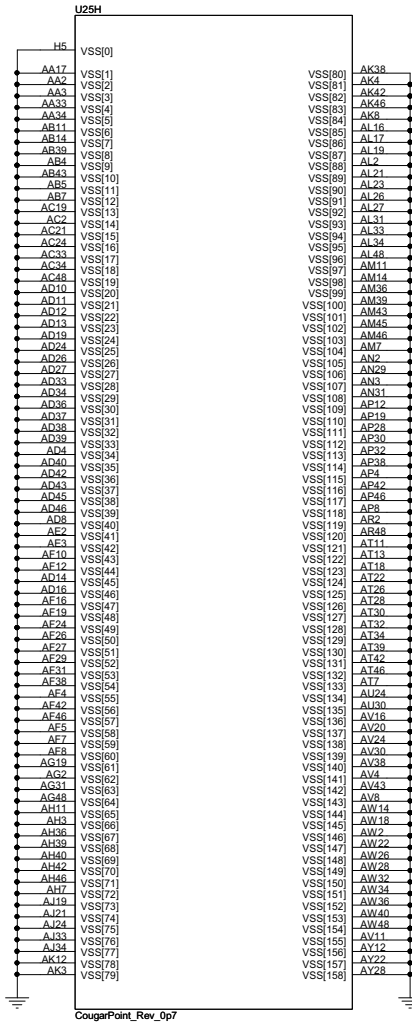
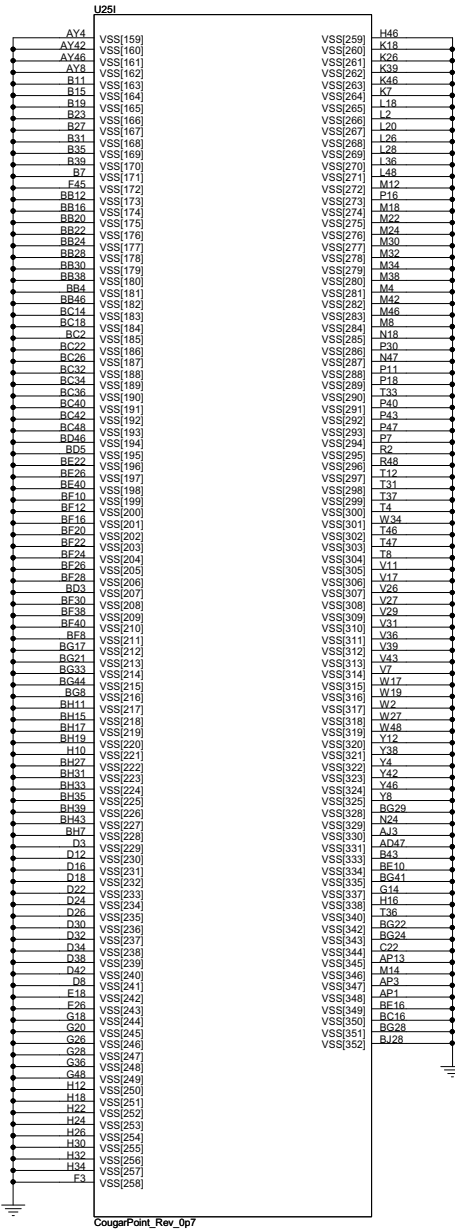
COUGAR POINT (POWER)

11



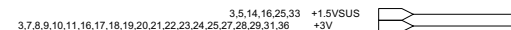
IBEX PEAK-M (GND)

IBEX PEAK-M (GND)

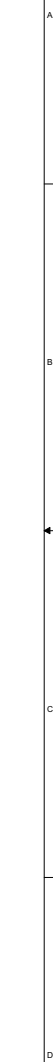
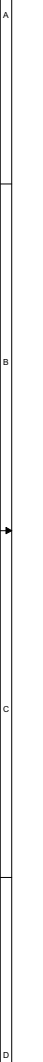


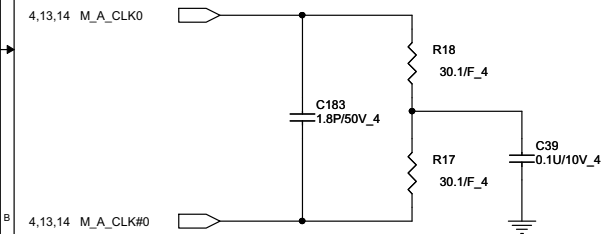
PROJECT :NM2
Quanta Computer Inc.

Size Custom	Document Number PCH 616 (GND)	Rev 1A
Date: Wednesday, July 13, 2011	Sheet 12 of 36	



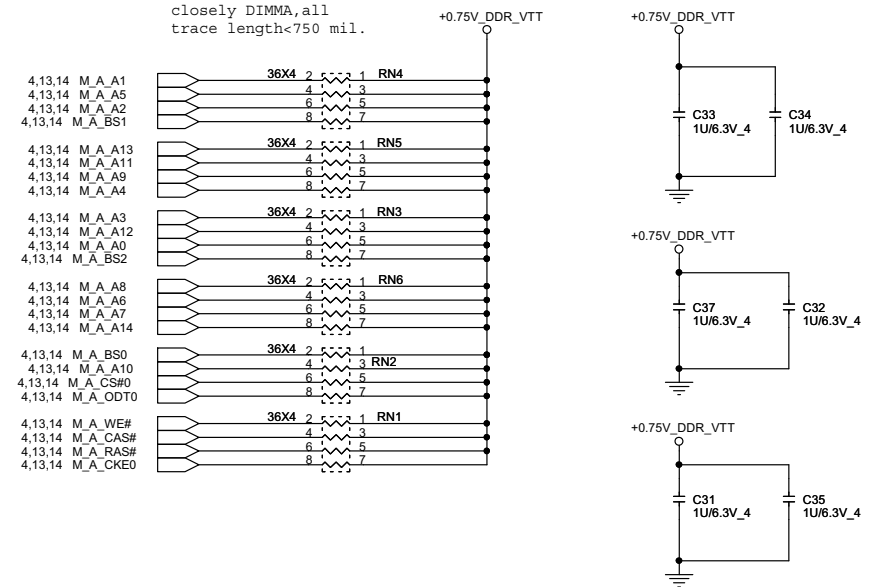
Size Custom	Document Number DDR3 (A) On Board_A,1Rank	Rev 1A
Date: Wednesday, July 13, 2011		Sheet 13 of 36





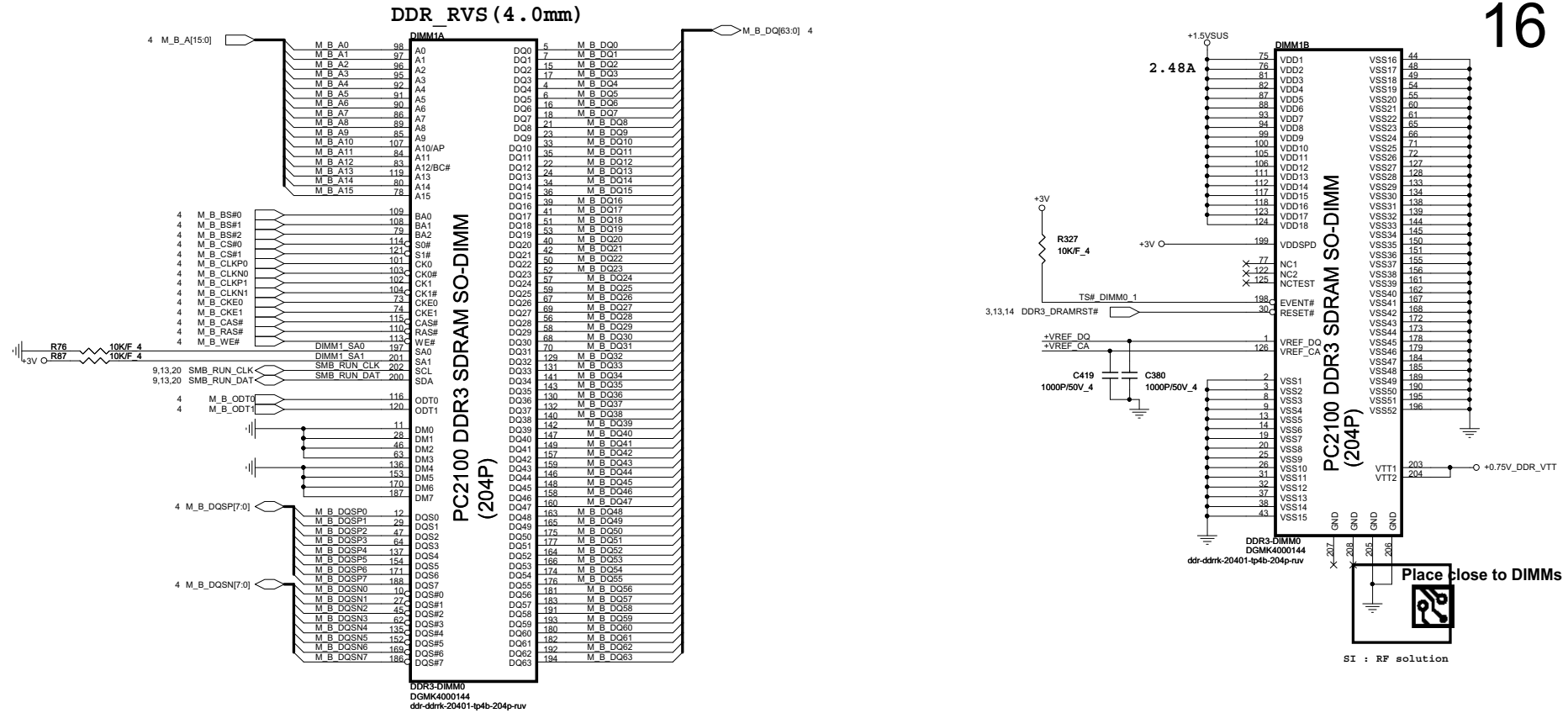
DDR3 TERMINATION FOR MEMORY DOWN

Please these resistor
closely DIMMA,all
trace length<750 mil.



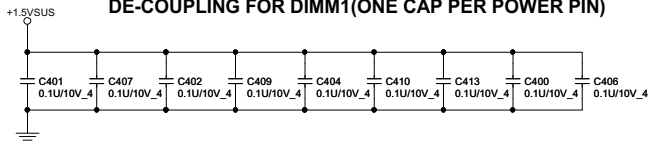
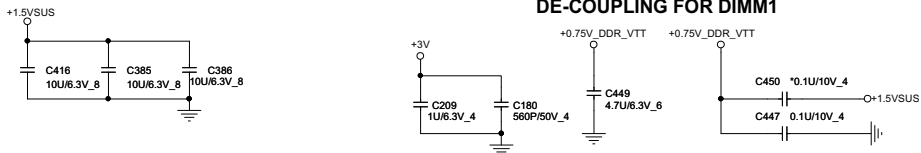
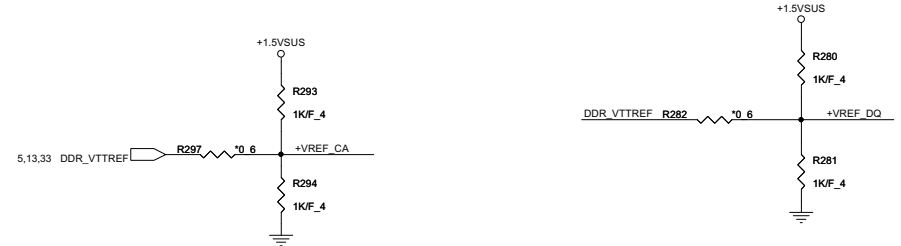
PROJECT :NM2
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Size	Document Number	Rev
B	DDR3 TERMINATION	1A
Date: Wednesday, July 13, 2011 Sheet 15 of 36		



Place these Caps near So-Dimm1.

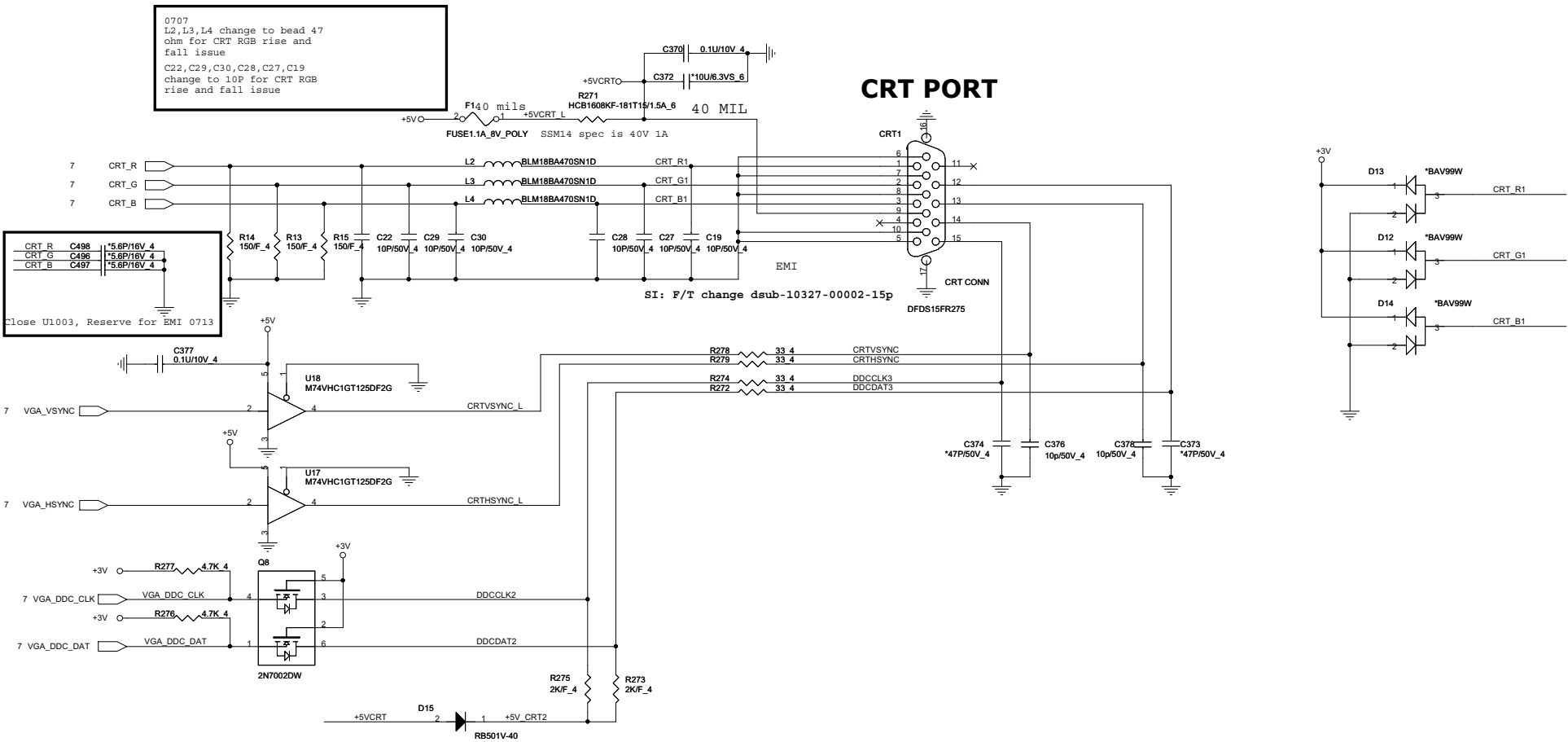
No Vias Between the Trace of PIN to CAP.

Place these Caps near So-Dimm1.**DE-COUPLING FOR DIMM1(ONE CAP PER POWER PIN)****DE-COUPLING FOR DIMM1****VREF DQ0 M1 Solution**

PROJECT :NM2
Quanta Computer Inc.

Size	Document Number	Rev
	DDRIII SODIMM-1 (STD)	1A
Date:	Wednesday, July 13, 2011	Sheet 16 of 36

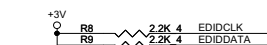
3,7,8,9,10,11,13,16,18,19,20,21,22,23,24,25,27,28,29,31,36 +3V
8,11,19,20,25,27,36 +5V



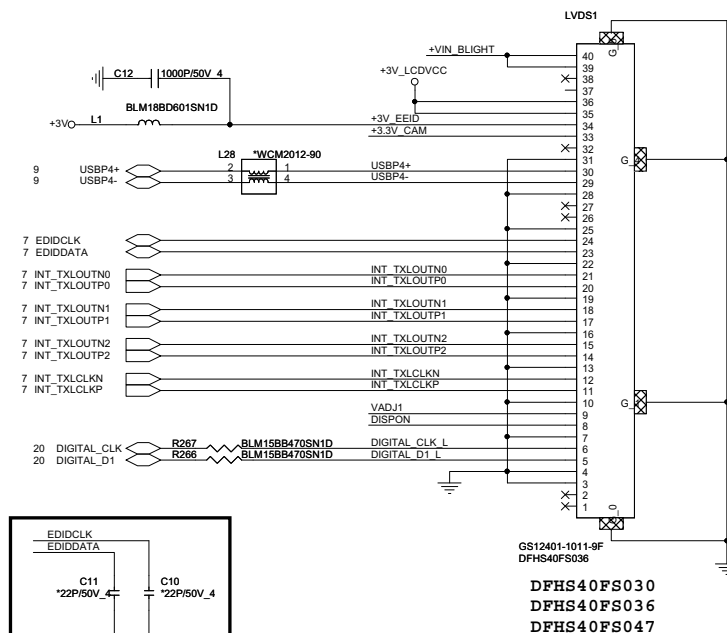
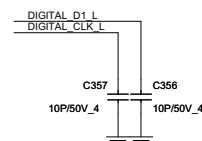
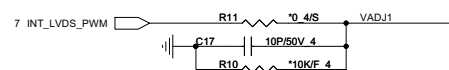
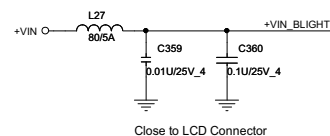
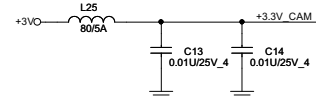
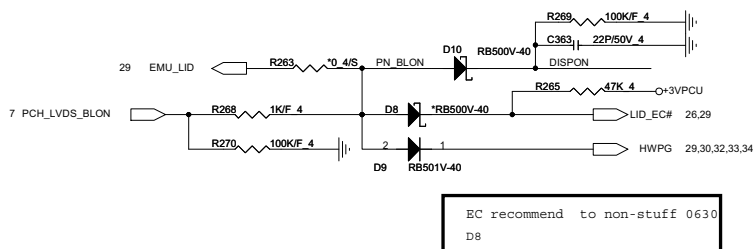
PROJECT :NM2
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Size	Document Number	Rev
1A	CRT Connector	1A
Date: Wednesday, July 13, 2011	Sheet	17 of 36

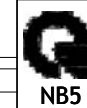
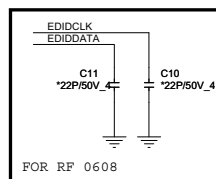
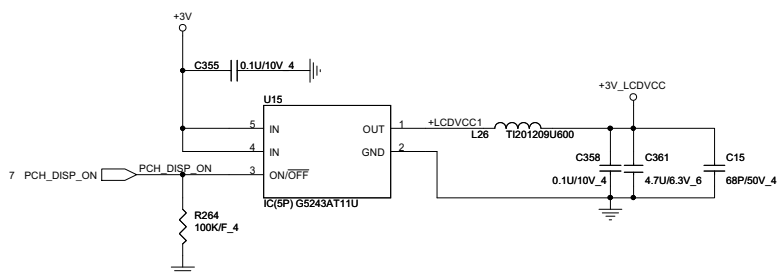
LED Panel(LDS)

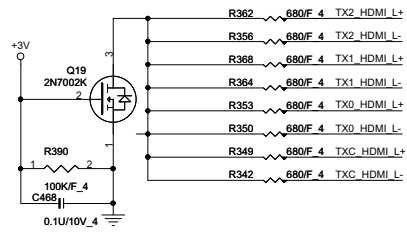


Backlight Control(LDS)

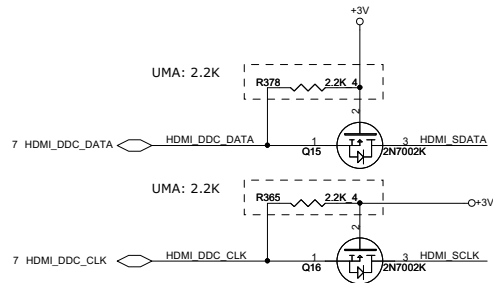
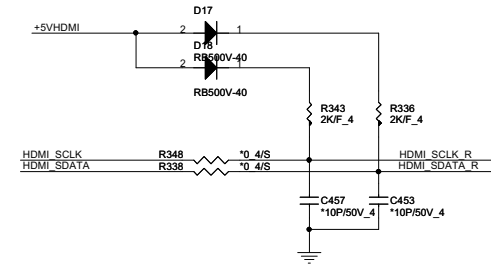
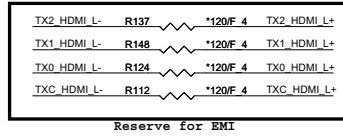


LCD POWER SWITCH

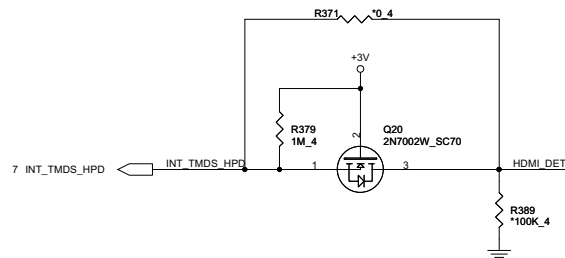




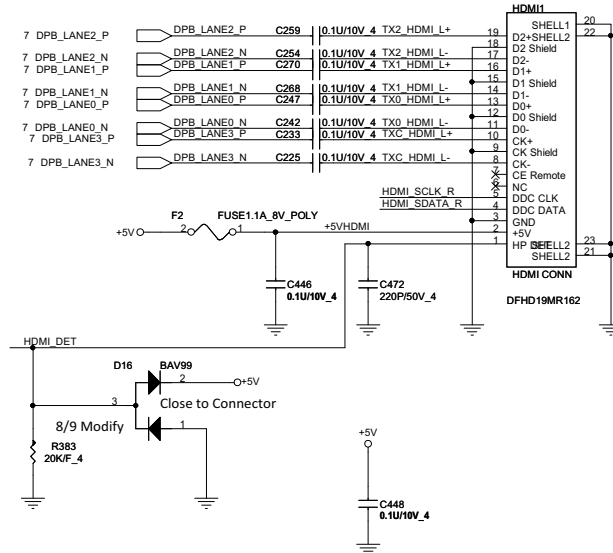
Close HDMI5



INT HDMI Detect Function



INT. HDMI



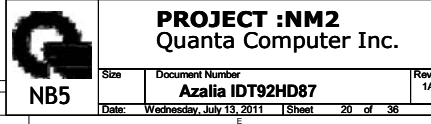
3,7,8,9,10,11,13,16,17,18,20,21,22,23,24,25,27,28,29,31,36
8,11,17,20,25,27,36

+3V
+5V



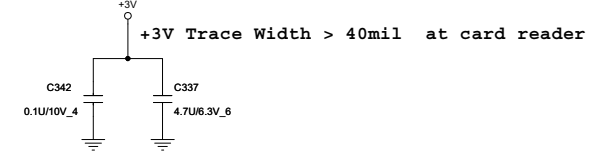
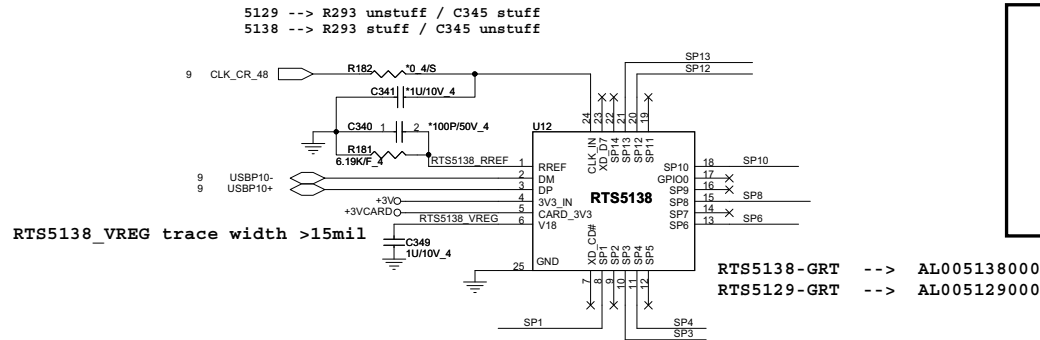
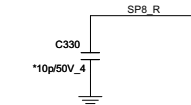
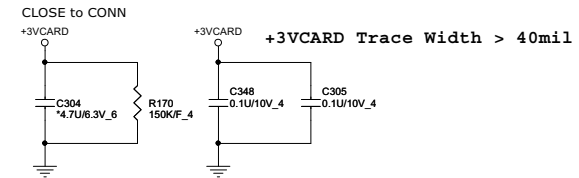
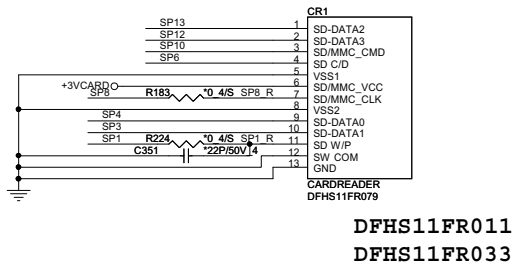
PROJECT :NM2
Quanta Computer Inc.

Size	Document Number	Rev
1A	HDMI Connector	1A
Date: Wednesday, July 13, 2011		Sheet 19 of 36



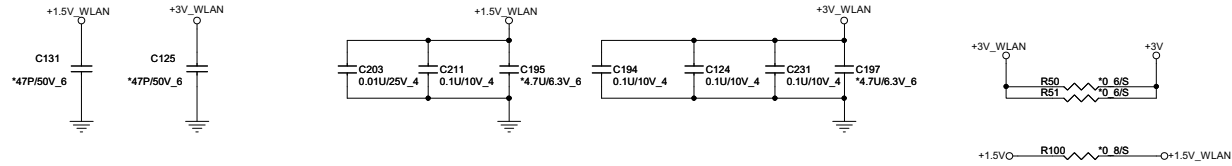
Share Pin

SP1	XD CDW	SD WP	MS CLK
SP2	XD RDV	SD D1	MS INS#
SP3	XD RRE#	SD D0	MS D7
SP4	XD CE#	SD D7	MS D3
SP5	XD ALE	SD D6	MS D6
SP6	XD WE#	SD D5	MS D0
SP7	XD WP	SD D4	MS D4
SP8	XD D0	SD D3	MS D1
SP9	XD D1	SD D2	MS D5
SP10	XD D2	SD D1	MS BS
SP11	XD D3	SD D0	
SP12	XD D4	SD D7	
SP13	XD D5	SD D6	
SP14	XD D6	SD D5	
	XD D7		

SD / MMC
CARD READER

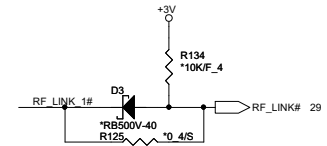
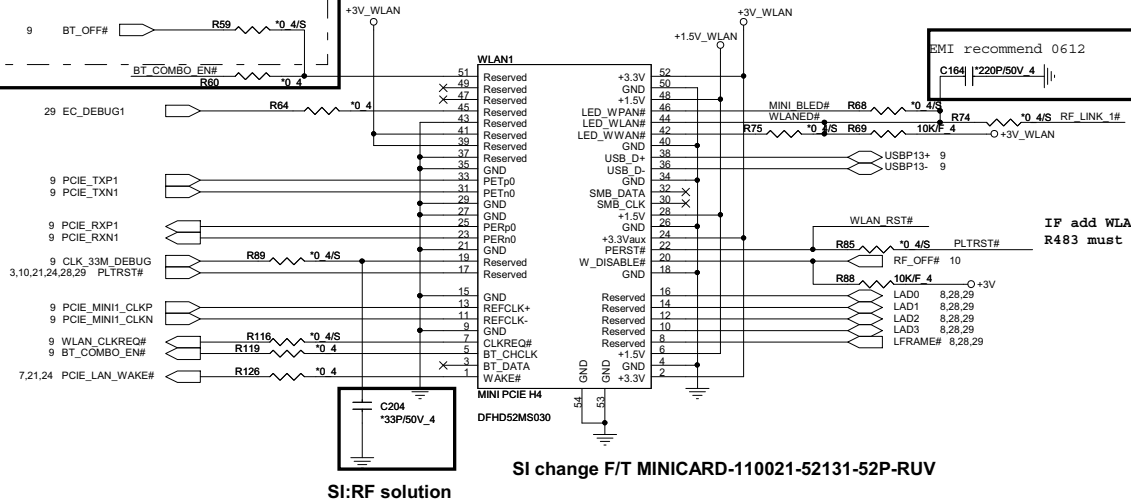
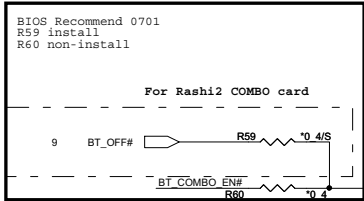
PROJECT :NM2
Quanta Computer Inc.

Size Document Number Rev
RTS5129/5138/Card Reader 1A
Date: Wednesday, July 13, 2011 Sheet 22 of 36

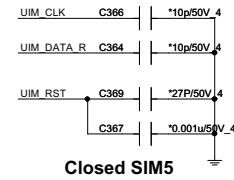
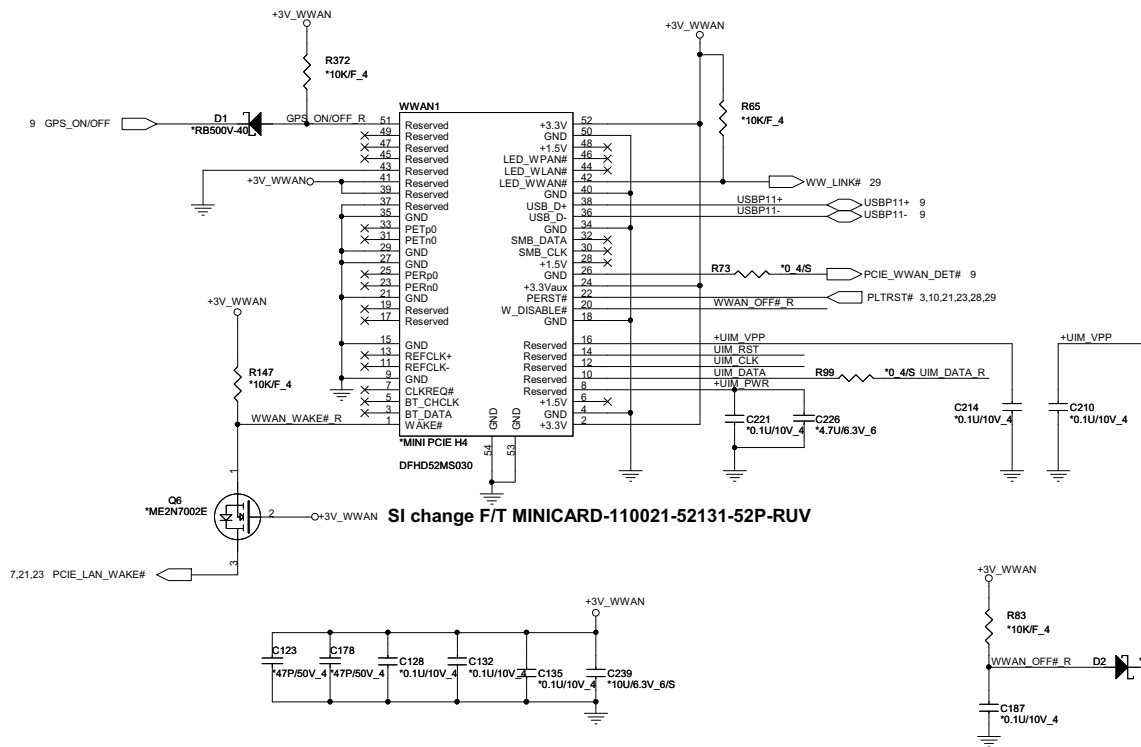


Mini PCI-E Card 1 Half Mini PCI-E WLAN

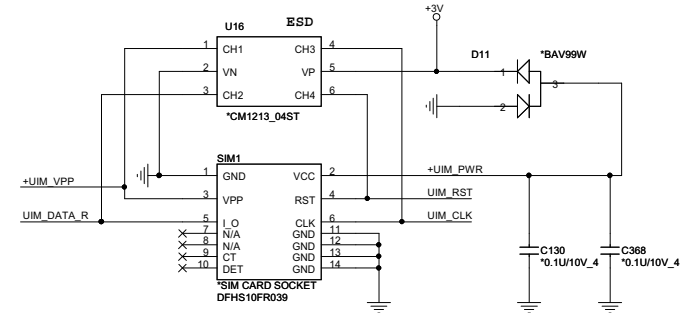
The value of the capacitor is suggest by Siemens HQ expert.
For against 900MHz RF interference. The value of capacitor is 27pF.
For against 1800MHz RF interference. The value of capacitor is 10pF.
1nF/10nF value capacitor use for against ESD purpose.



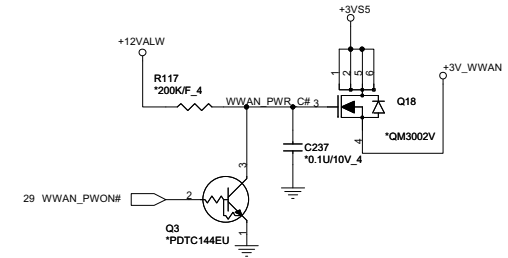
Full mini PCIE for WWAN Mini PCI-E Card 2



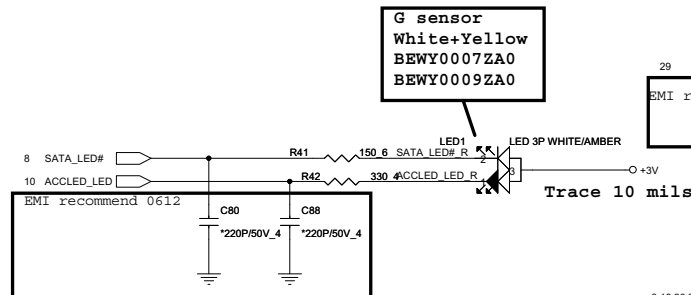
SIM CARD SIGNALS ROUTE PARALLEL



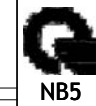
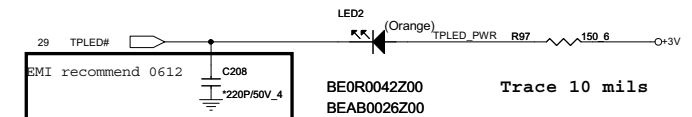
SIM CARD



SATA/G sensor LED



Touchpad LED



PROJECT :NM2
Quanta Computer Inc.

Size Document Number
Mini PCIE(WWAN)/LED/LID
Date: Wednesday, July 13, 2011 Sheet 24 of 36

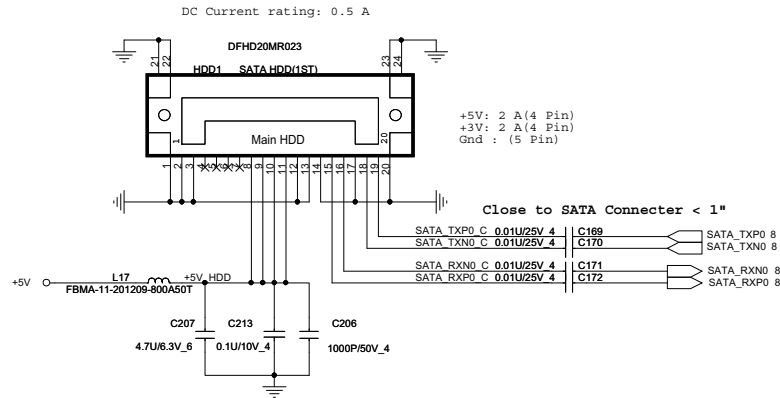
8,18,26,27,29,30,35
3,7,8,9,10,11,13,16,17,18,19,20,21,22,23,25,27,28,29,31,36

+3VPCU
+3V

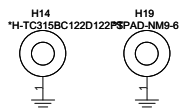
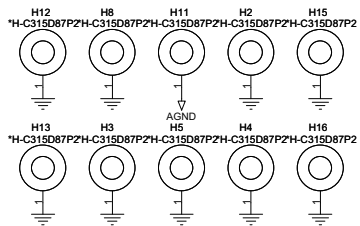
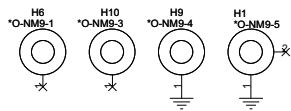
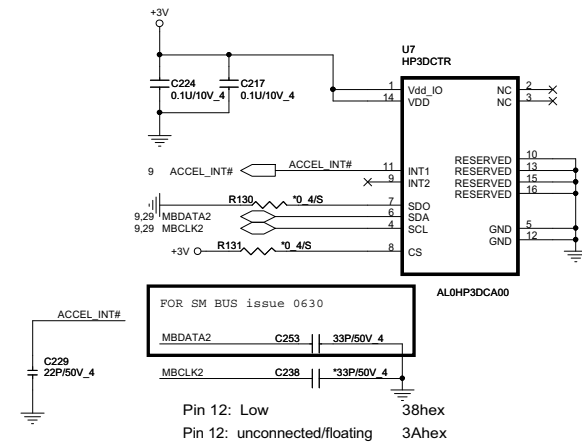
NB5

Rev
1A

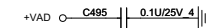
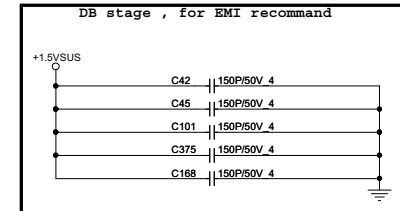
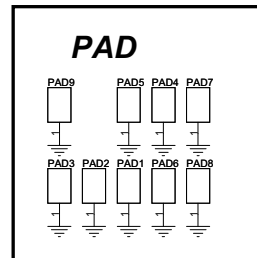
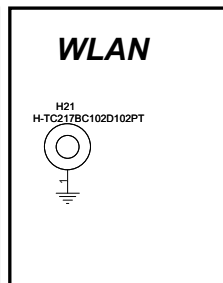
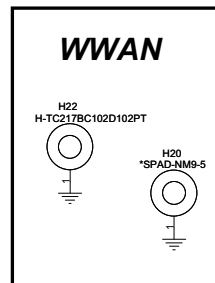
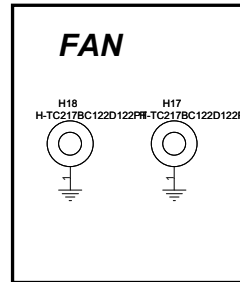
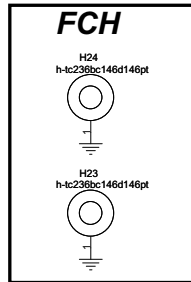
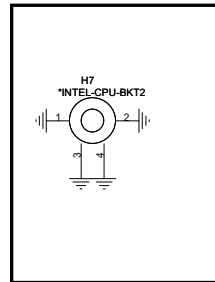
2.5" SATA HDD OR SSD(TOSHIBA)



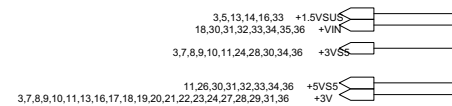
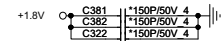
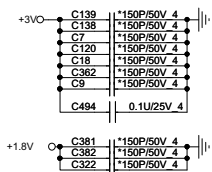
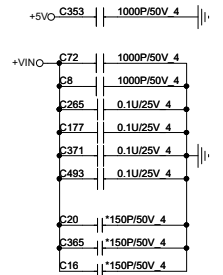
Accelerometer Sensor



SI:del H33

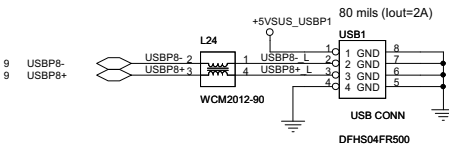
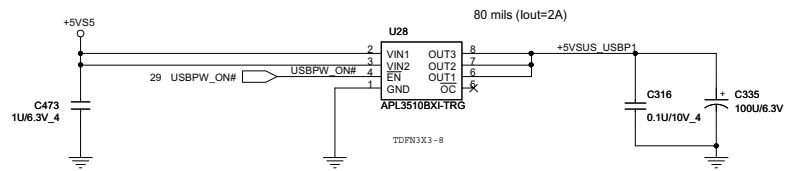
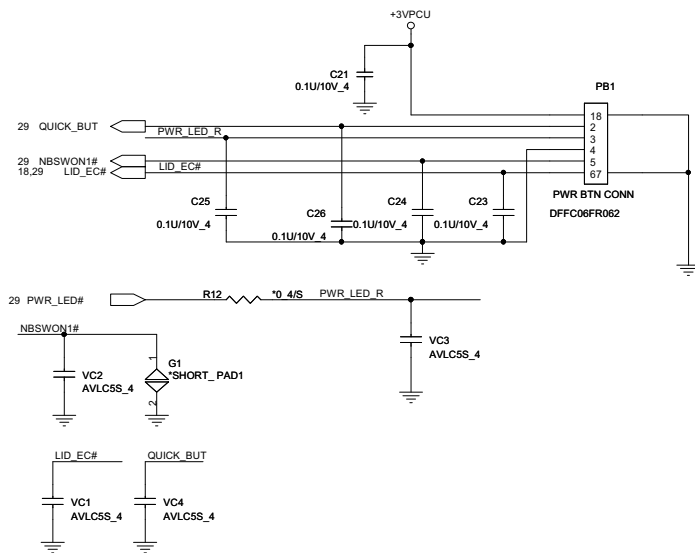


PRE- PV stage , for RF recommend

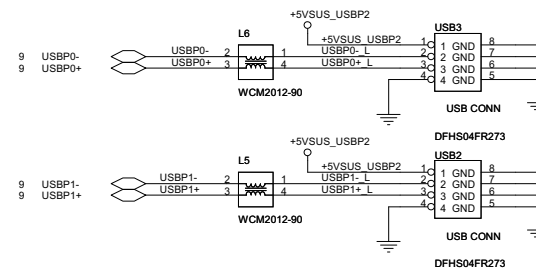
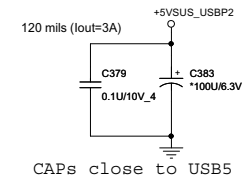
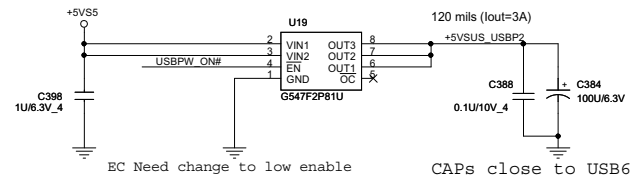
PROJECT :NM2
Quanta Computer Inc.

Size	Document Number	Rev
	HDD/Hole/G Sensor/RF	1A
Date: Wednesday, July 13, 2011	Sheet 25 of 36	

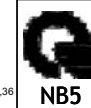
1x Left side USB port supports Keyed USB.



For Right 2xUSB Ports PWR



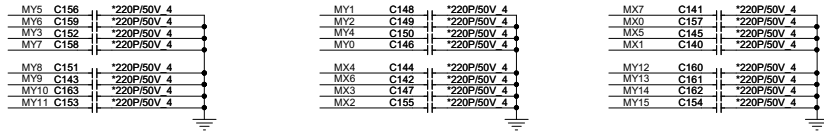
8,18,27,29,30,35
3,7,8,9,10,11,13,16,17,18,19,20,21,22,23,24,25,27,28,29,31,36



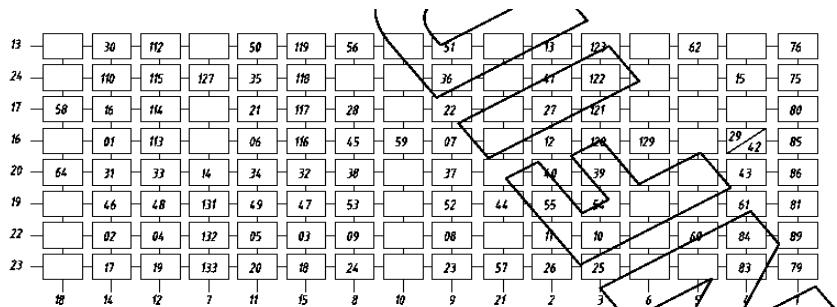
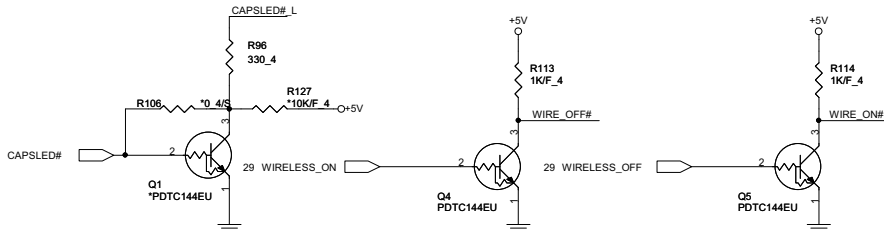
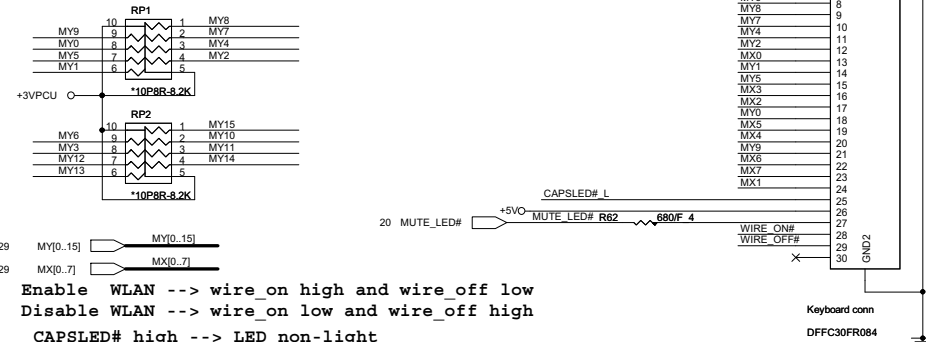
PROJECT :NM2
Quanta Computer Inc.

Size Document Number Rev
Power Board/USB 1A
Date: Wednesday, July 13, 2011 Sheet 26 of 36

Keyboard (KBC)

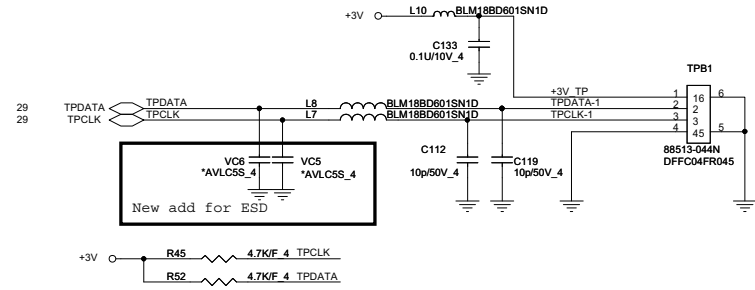


KEYBOARD PULL-UP

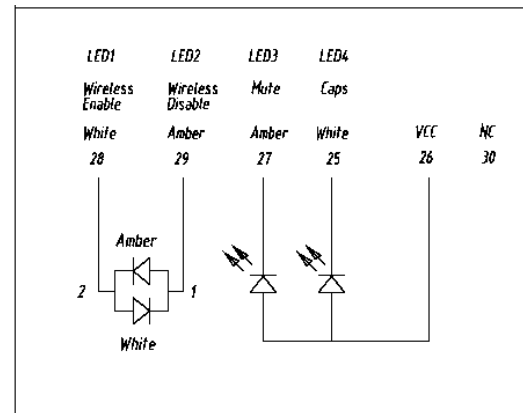
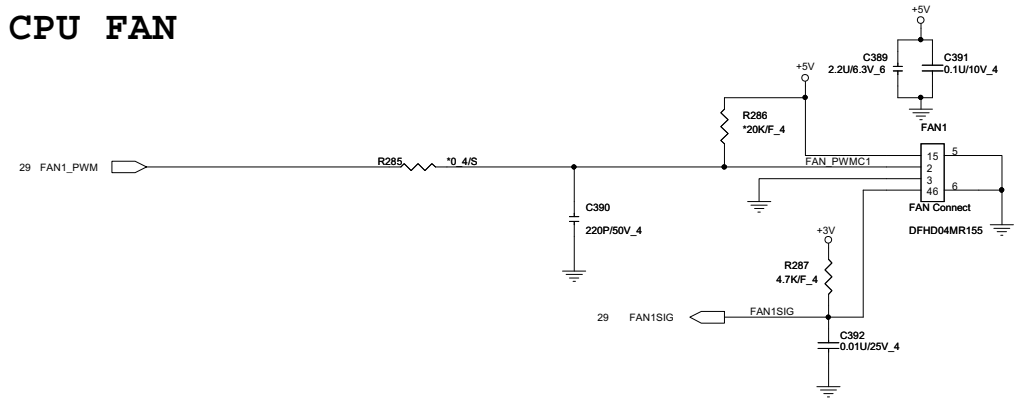


US MATRIX

TOUCH PAD CONN



CPU FAN



PROJECT :NM2
Quanta Computer Inc.

Size	Document Number	Rev
	KB/TP/CPU FAN	1A
Date:	Wednesday, July 13, 2011	Sheet 27 of 36

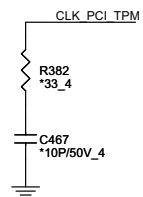
Charge LED

3 pins

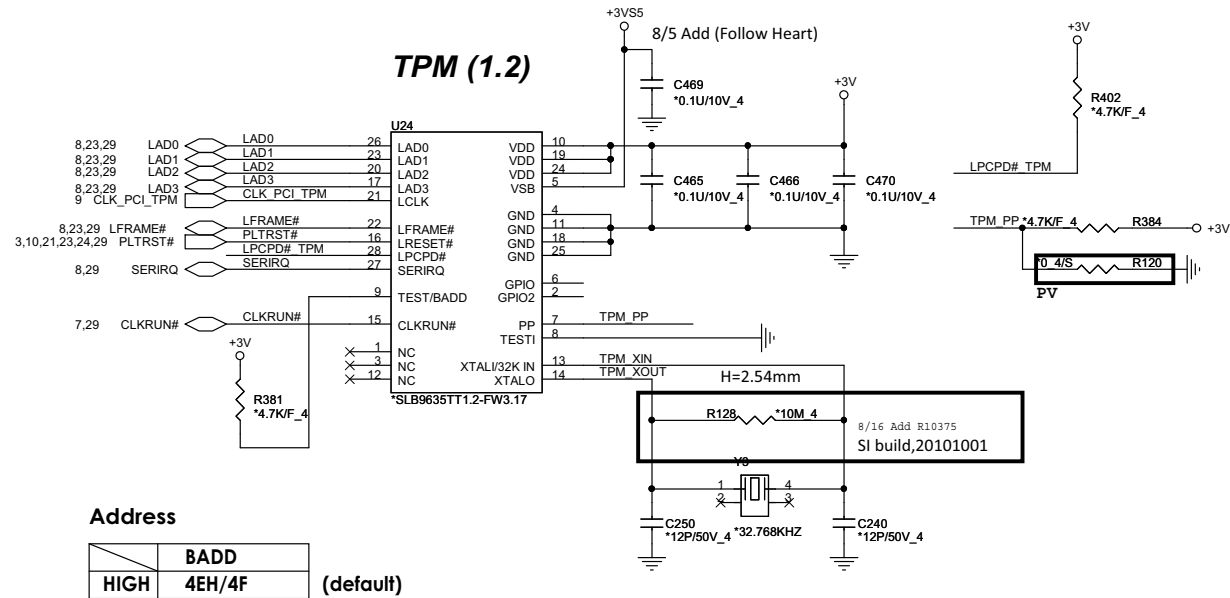
Pin 32

Pin 1

SI Build, 20101021

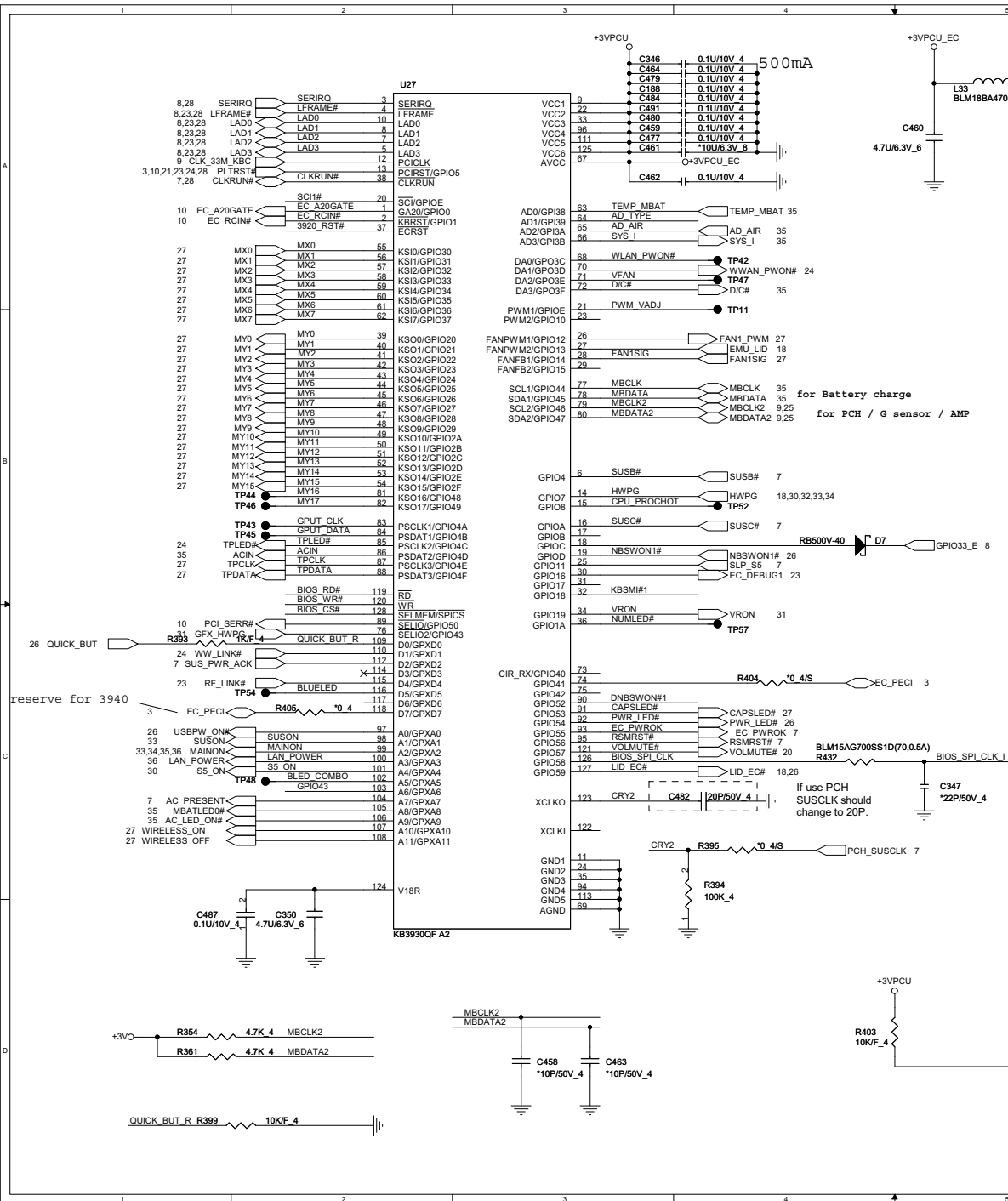


FOR EMI

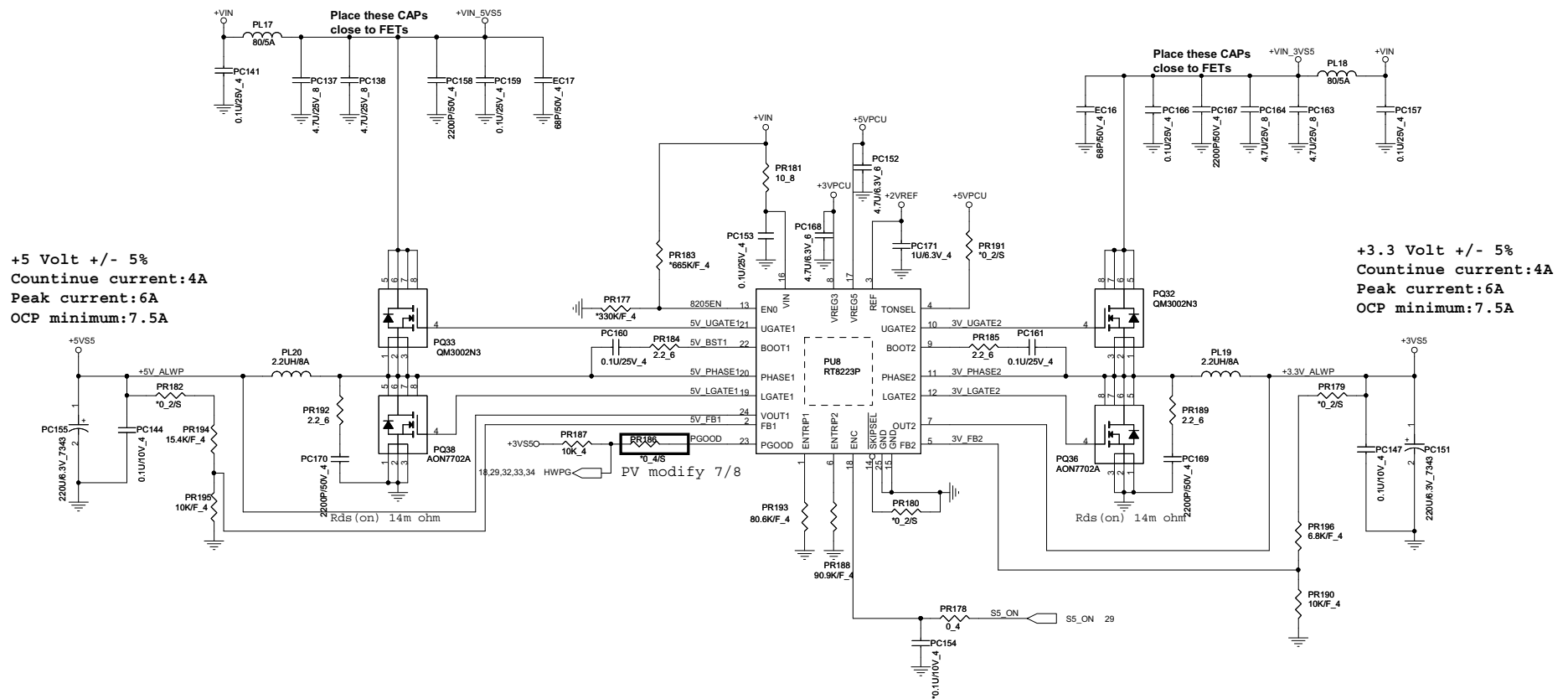


PROJECT : F11
Quanta Computer Inc.

Size	Document Number	Rev
B	TPM	1A
Date: Wednesday, July 13, 2011 Sheet 28 of 36		

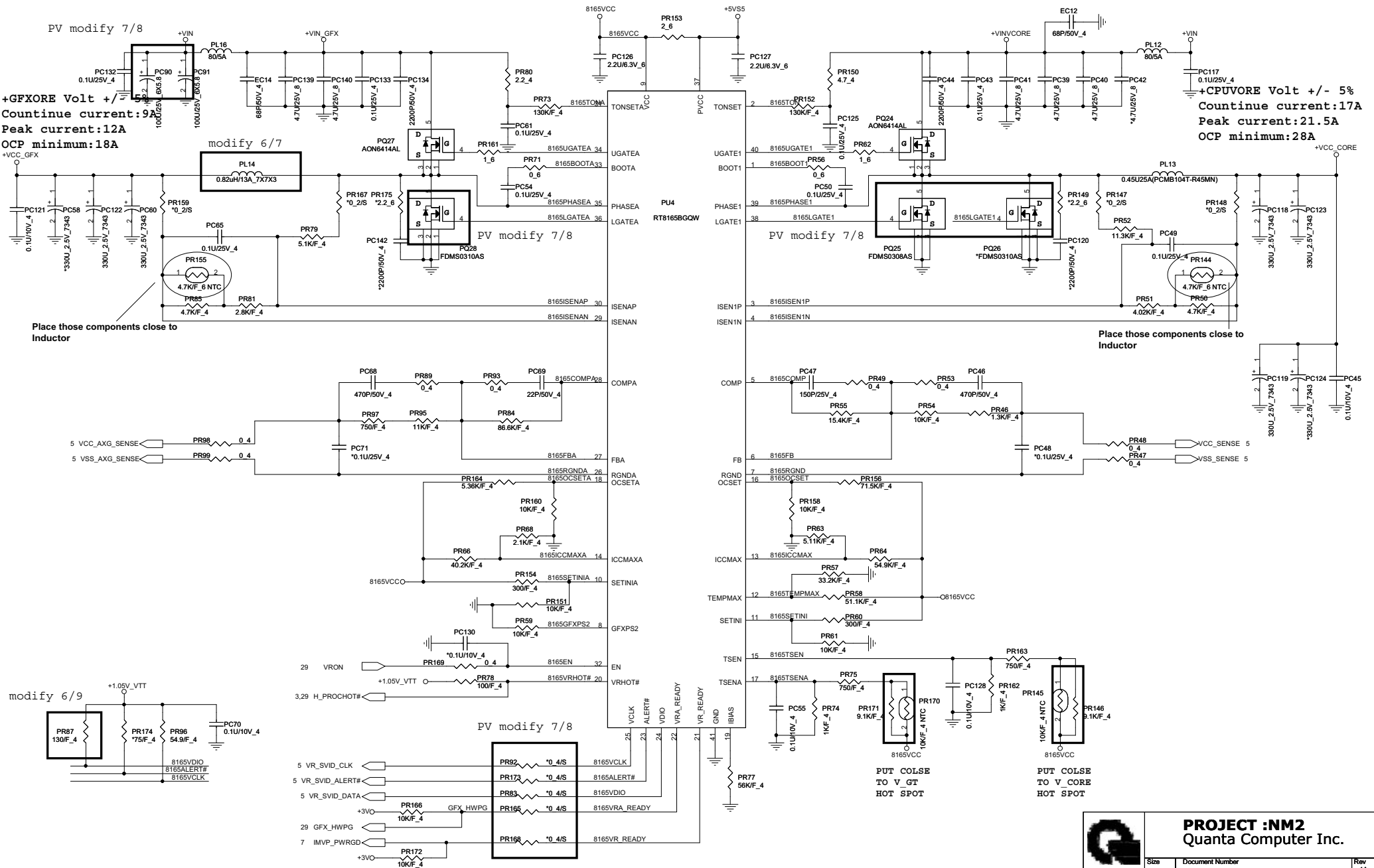


DC/DC +3VS5/+5VS5



PROJECT :NM2
Quanta Computer Inc.

Size	Document Number	Rev
	3/5VPCU(RT8223P)	1A
Date:	Wednesday, July 13, 2011	Sheet 30 of 35

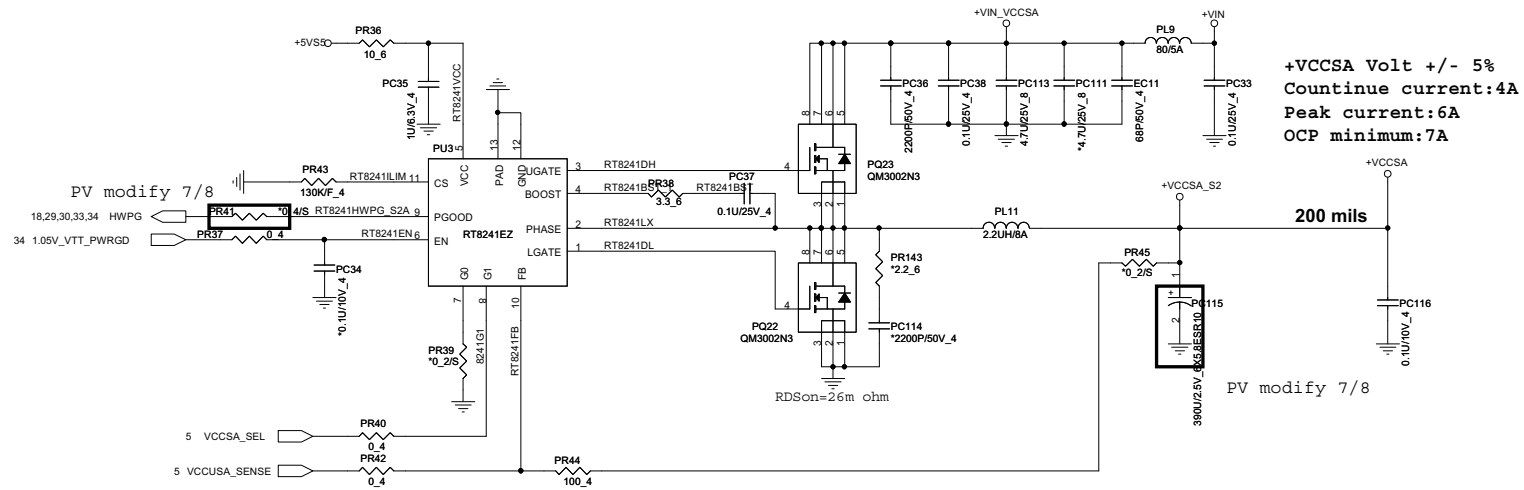


+CPUVORE Volt +/- 5%
 Countinue current:17A
 Peak current:21.5A
 OCP minimum:28A



PROJECT :NM2
 Quanta Computer Inc.

Size	Document Number	Rev
	Vcore (RT8165B)	1A
Date:	Wednesday, July 13, 2011	Sheet 31 of 35



CPU system agent
voltage slew rate of 0.5 -10 mV/ μ s

H_FC_C22	VCCSA_SEL	Vout
VID0	VID1	
0	0	0.9V
0	1	0.80V (SV-RT8241DZGQW) 0.85V (LV-RT8241EZGQW)
1	0	0.725V
1	1	0.675V

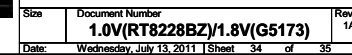
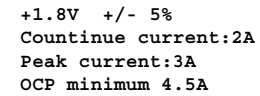
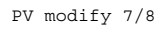


PROJECT :NM2
Quanta Computer Inc.

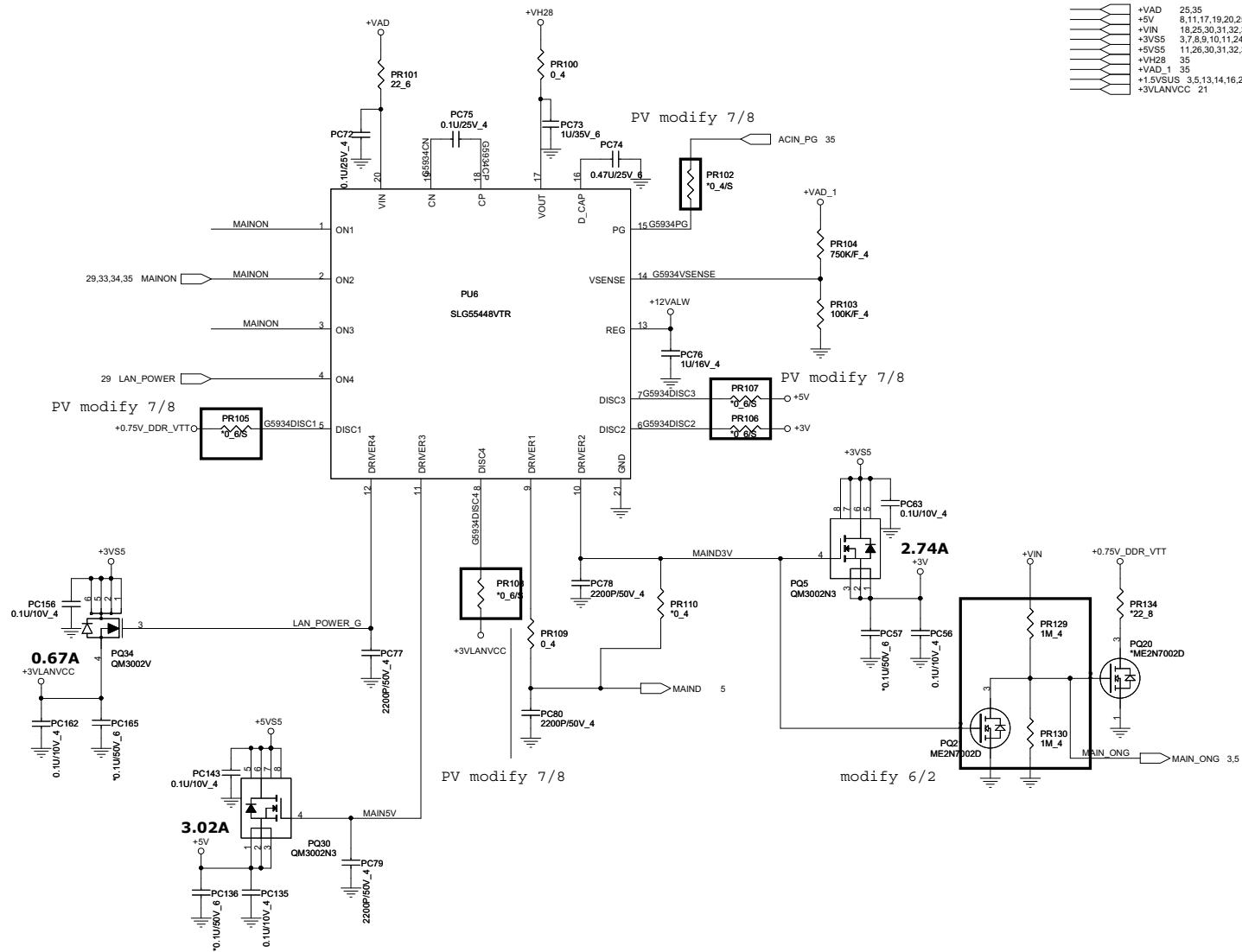
Size	Document Number	Rev
	VCCSA (RT8241EZ)	1A
Date:	Wednesday, July 13, 2011	Sheet 32 of 35



Size	Document Number DDRIII(RT8207LGQW)	Rev 1A
Date:	Wednesday, July 13, 2011	Sheet 33 of 35







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