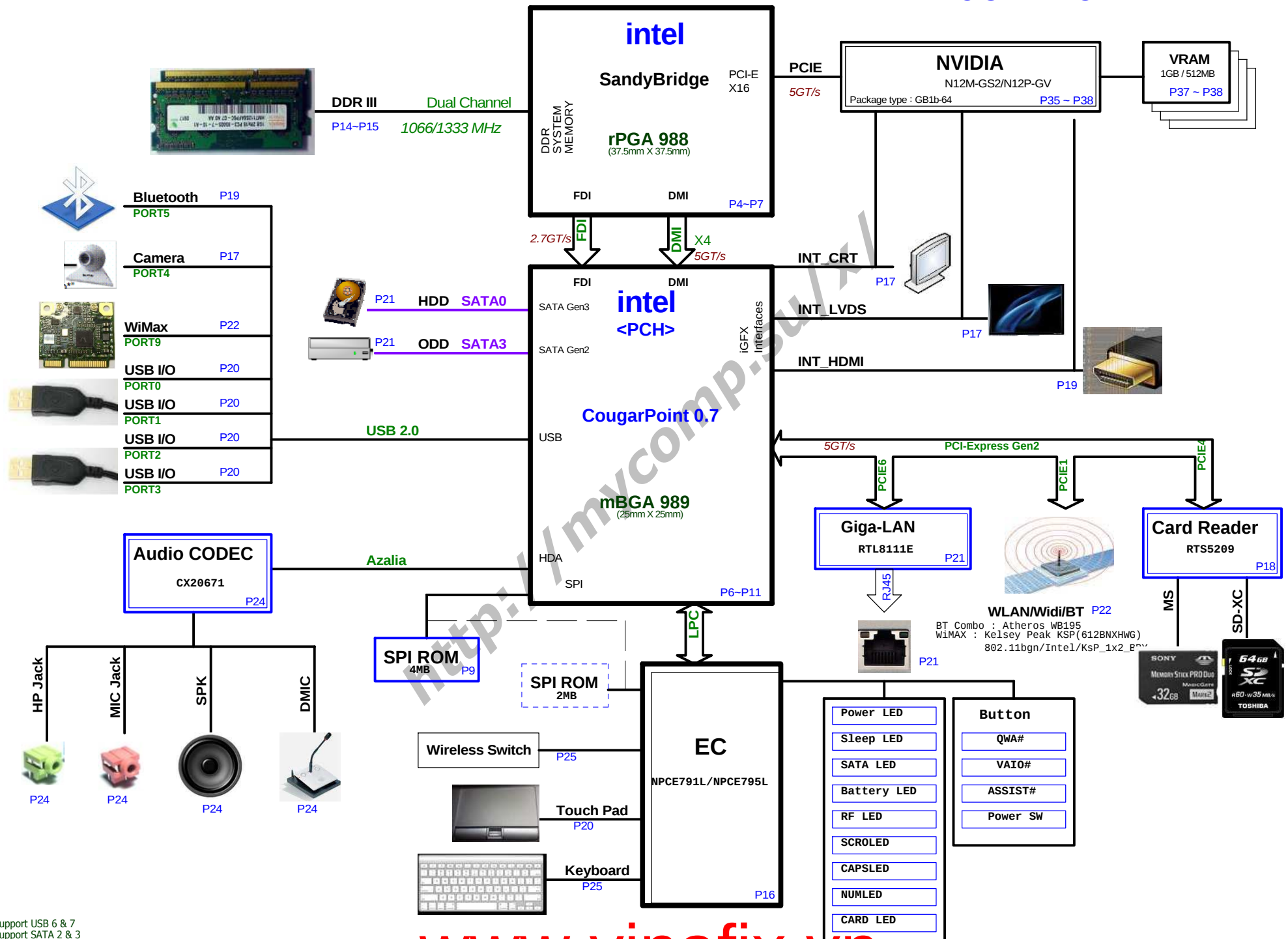


* : No mount
 E@ : For DIS GFX only
 I@ : For INT GFX only

http://mycomp.su/xl

Page	Title of schematic page	Rev.	Date
01	Page List	1A	
02	Block Diagram	1A	
03	Change List	1A	
04	SNB 1/4(HOST&PCIE)	1A	
05	SNB 2/4(DDR3 I/F)	1A	
06	SNB 3/4(POWER)	1A	
07	SNB 4/4(GND/Strap)	1A	
08	PCH 1/6(DMI/FDI/VIDEO)	1A	
09	PCH 2/6(SATA/RTC/HDA/LPC)	1A	
10	PCH 3/6(PCIE/USB/CLK/NV)	1A	
11	PCH 4/6(GPIO/CPU/STRAP)	1A	
12	PCH 5/6(POWER)	1A	
13	PCH 6/6 (GND)	1A	
14	DDR3 DIMM-0-STD	1A	
15	DDR3 DIMM-1-STD	1A	
16	WPCE791L & FLASH	1A	
17	CRT/LVDS/CAMERA	1A	
18	CARD READER(RTS5209)	1A	
19	HDMI Conn/BT/THERMAL	1A	
20	USB/TP/FAN	1A	
21	LAN (RTL8111E)	1A	
22	WLAN/HOLE	1A	
23	HDD/ODD/EMI	1A	
24	Audio CX20671	1A	
25	LED/RF/KB/PS	1A	
26	POWER +VCC_CORE (ISL95831)	1A	
27	POWER 3VPCU&5VPCU(PM6686)	1A	
28	POWER 1.5VSUS/VTT_MEM	1A	
29	POWER +1.05V(UP6128A) -15A	1A	
30	POWER +0.85V(APE8858) -6A	1A	
31	POWER VGA_CORE(OZ8111) - -15A	1A	
32	POWER VCC1.8/Thermal	1A	
33	POWER(ADAPTER IN / CONN)	1A	
34	POWER CHARGER (ISL88731C)	1A	
35	NVIDIA GS2-64 PCIE&PW 1/4	1A	
36	NVIDIA GS2-64 TMDS&DAC 2/4	1A	
37	NVIDIA GS2-64 VRAM 3/4	1A	
38	NVIDIA GS2-64 VRAM 4/4	1A	
39	IO PORT LIST	1A	

HK1 BLOCK DIAGRAM



Change List from PVT to MP

HK1_MB_SCH_PVT_001

P19-- R345 change to 48.7K.
Reason : Change thermal sensor temperature to 55 degree.
Possible Risk: No.

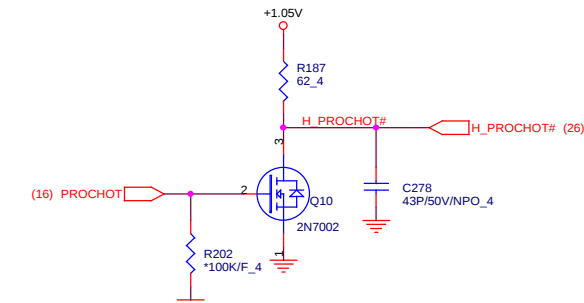
P19-- R208 change to 27.4K for UMA.
Reason : Change thermal sensor temperature to 82 degree.
Possible Risk: No.

HK1_MB_SCH_PVT_002

P16-- KR27 change value from 10K to 4.7K.
P33-- PD7 change value from uClamp3301D to CDS0D323-T03C.
Reason : for Battery ESD protect.
Possible Risk: No.

http://mycomp.su/xl

www.vinafix.vn



0.22uF AC coupling Caps for PCIe GEN1/2/3

0.1uF/10V/X5R 4

+3V

C380

U7
74AHC1G09

(8,16,26,28,30,31,32) ALL_SYS_PWRGD

(8) PM_DRAM_PWRGD

+1.5V

R157
200F_4

R158

130F_4

PM_DRAM_PWRGD R

R159

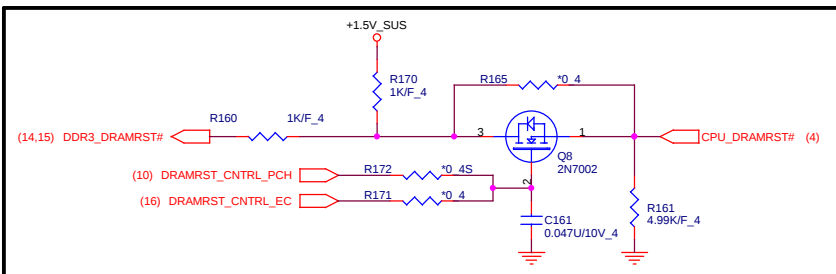
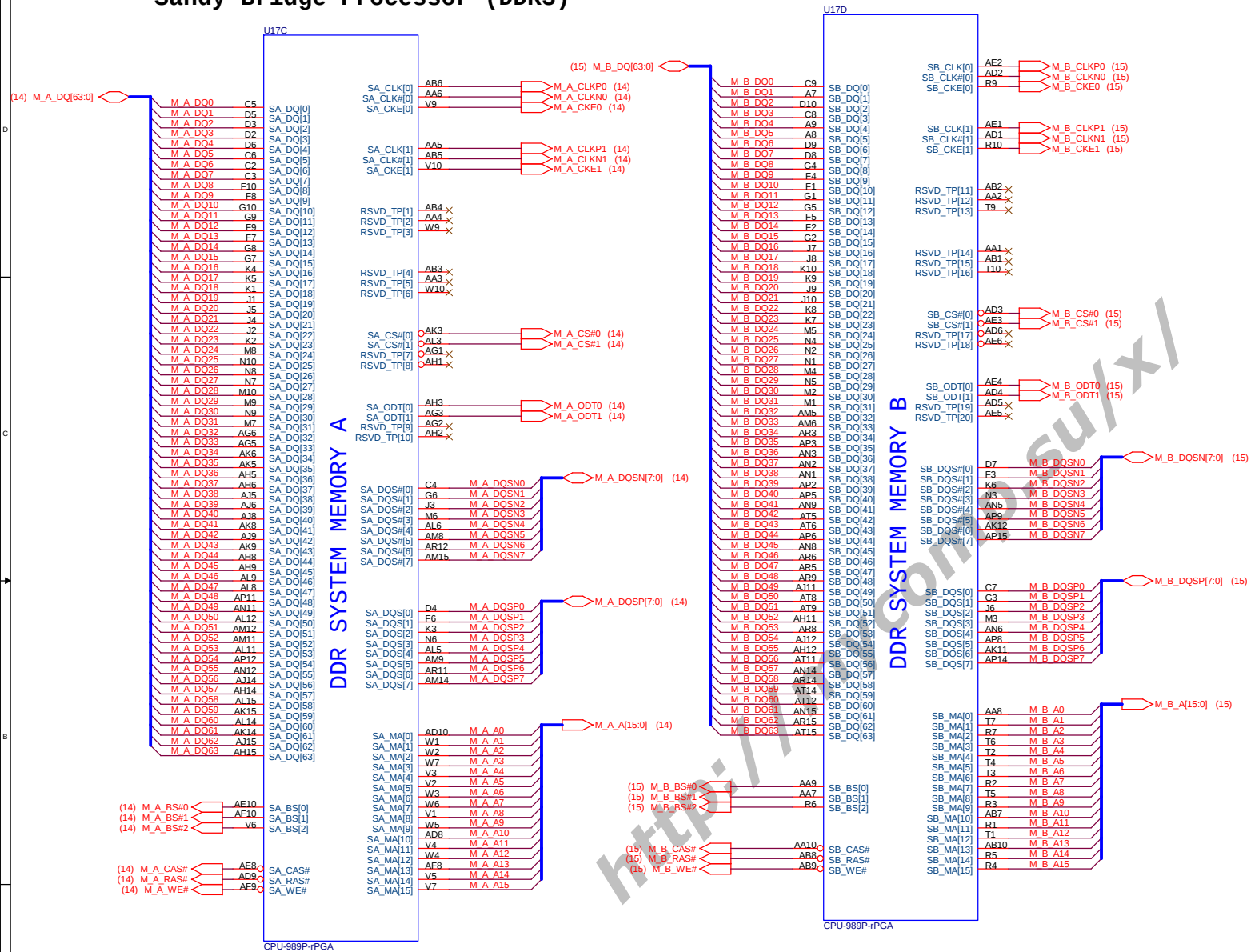
*39

Q7
*2N7002

MAING (27,28,31,32)

Sandy Bridge Processor (DDR3)

05



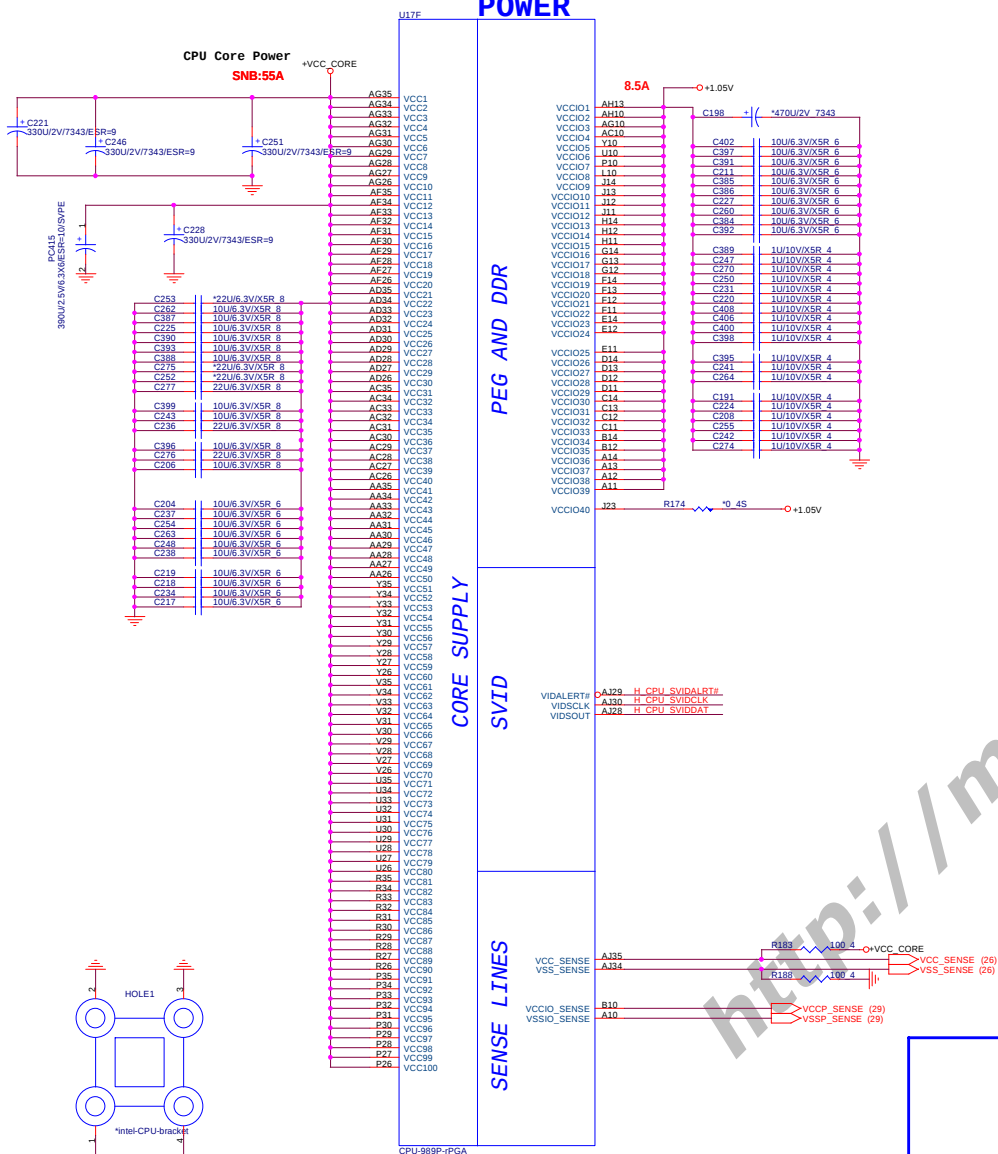
		Quanta Computer Inc. PROJECT :Huron River
Size	Document Number	Rev
	Sandy Bridge 2/4	1A
Date:	Sunday, April 03, 2011	Sheet 5 of 39

1. Level 1 Environment-related Substances Should Never be Used.
 2. Recycled Resin and Coated Wire should be procured from Green Partners.

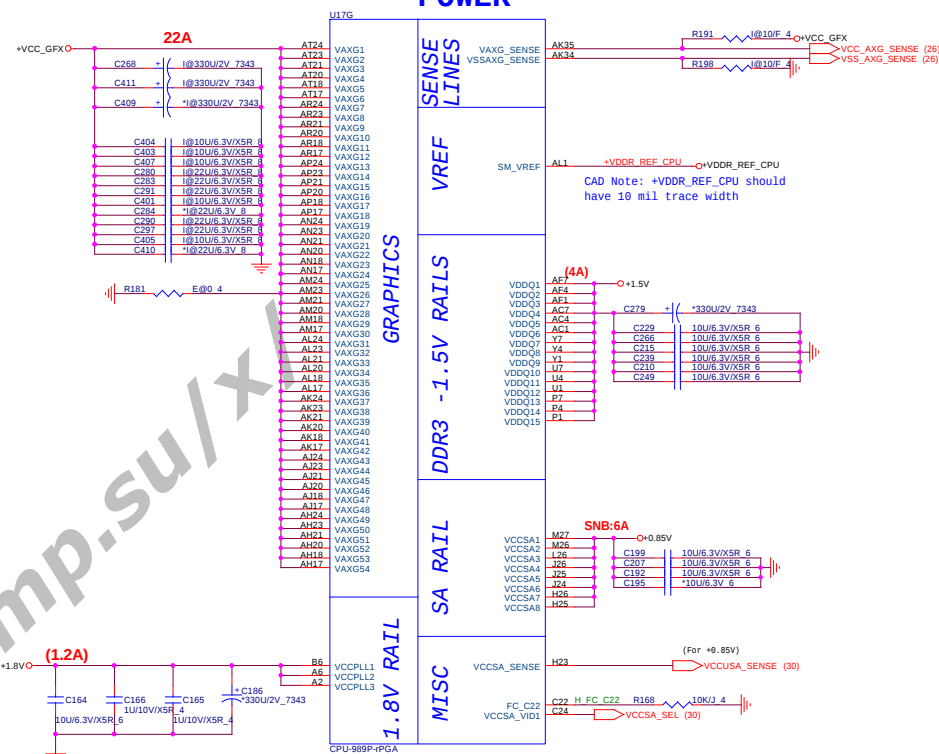
www.vinafix.vn

Sandy Bridge Processor (GRAPHIC POWER)

POWER



POWER



Layout note: need routing together and ALERT needs to be between CLK and DATA

SVID CLK

0.05V

- Place PU resistor close to CPU

SVID DATA

0.05V

- Place PU resistor close to CPU

SVID ALERT



Quanta Computer Inc.

PROJECT :Huron River

Sandy Bridge 3/4

Size	Document Number	Re
	Sandy Bridge 3/4	

rs. Date: Monday, February 21, 2011 Sheet 6 of 39



The CFG signals have a default value of '1' if not terminated on the board



CFG[6:5] (PCIe Port Bifurcation Straps)

11: (Default) x16 - X16 PEG interface

10: PEG x8 x8 bifurcation enabled/disabled

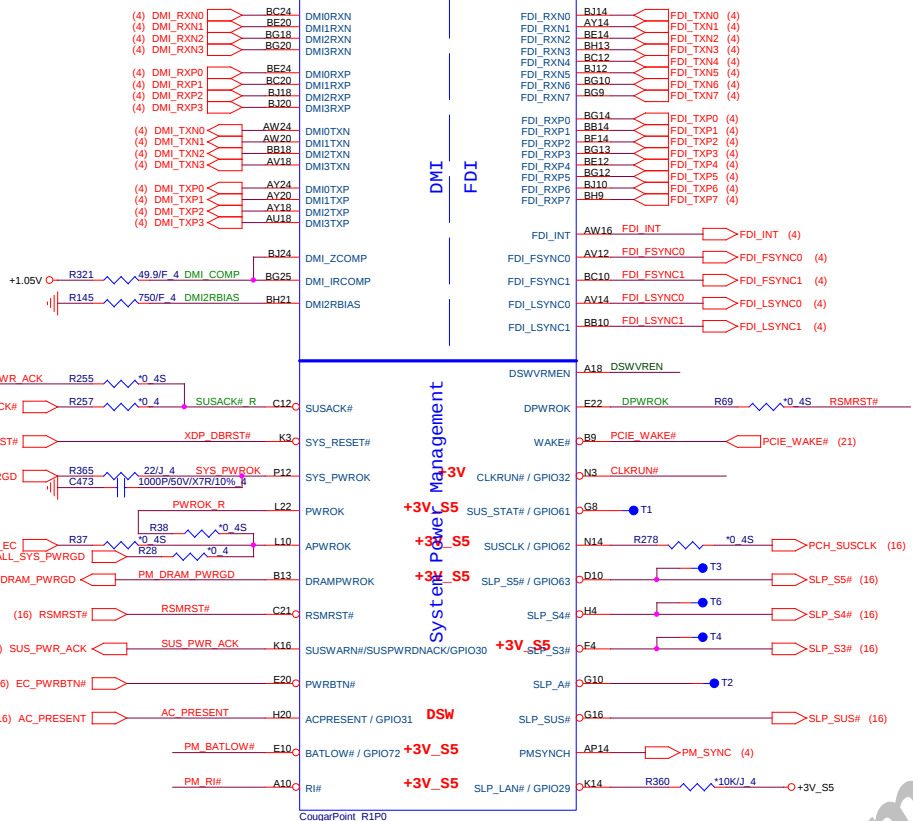
01: Reserved - (Device 1 function 1 disabled ; function 2 enabled)

00: x8,x4,x4 - Device 1 functions 1 and 2 enabled

www.vinafix.vn

Cougar Point (DMI, FDI, PM)

U16C



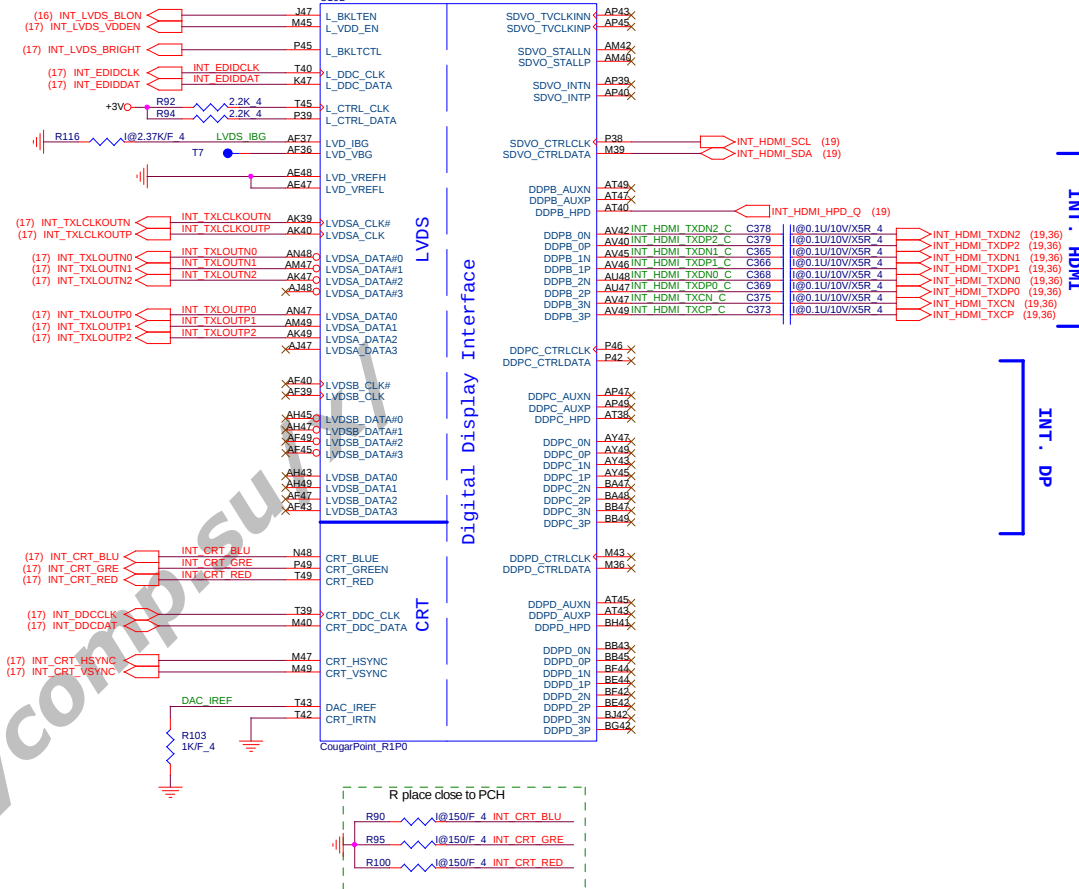
Cougar Point (LVDS, DDI)

+3V0

R54 2.2K 4

INT_EDIDCLK

INT_EDIDDAT

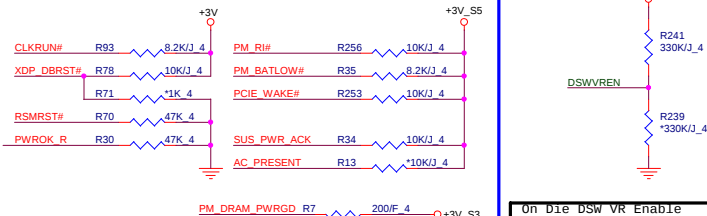


08

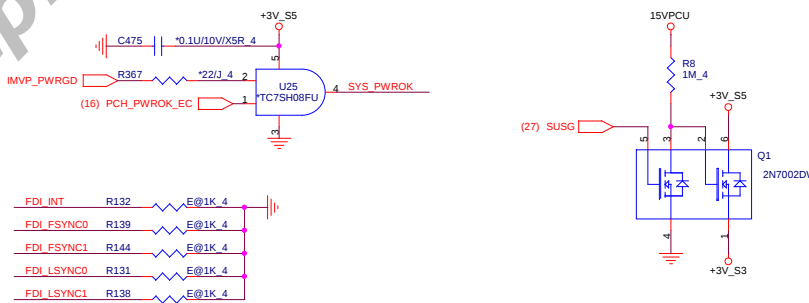
INT_HDMI

INT_DP

PCH Pull-high/low(CLG)



On Die DSW VR Enable
High = Enable (Default)
Low = Disable



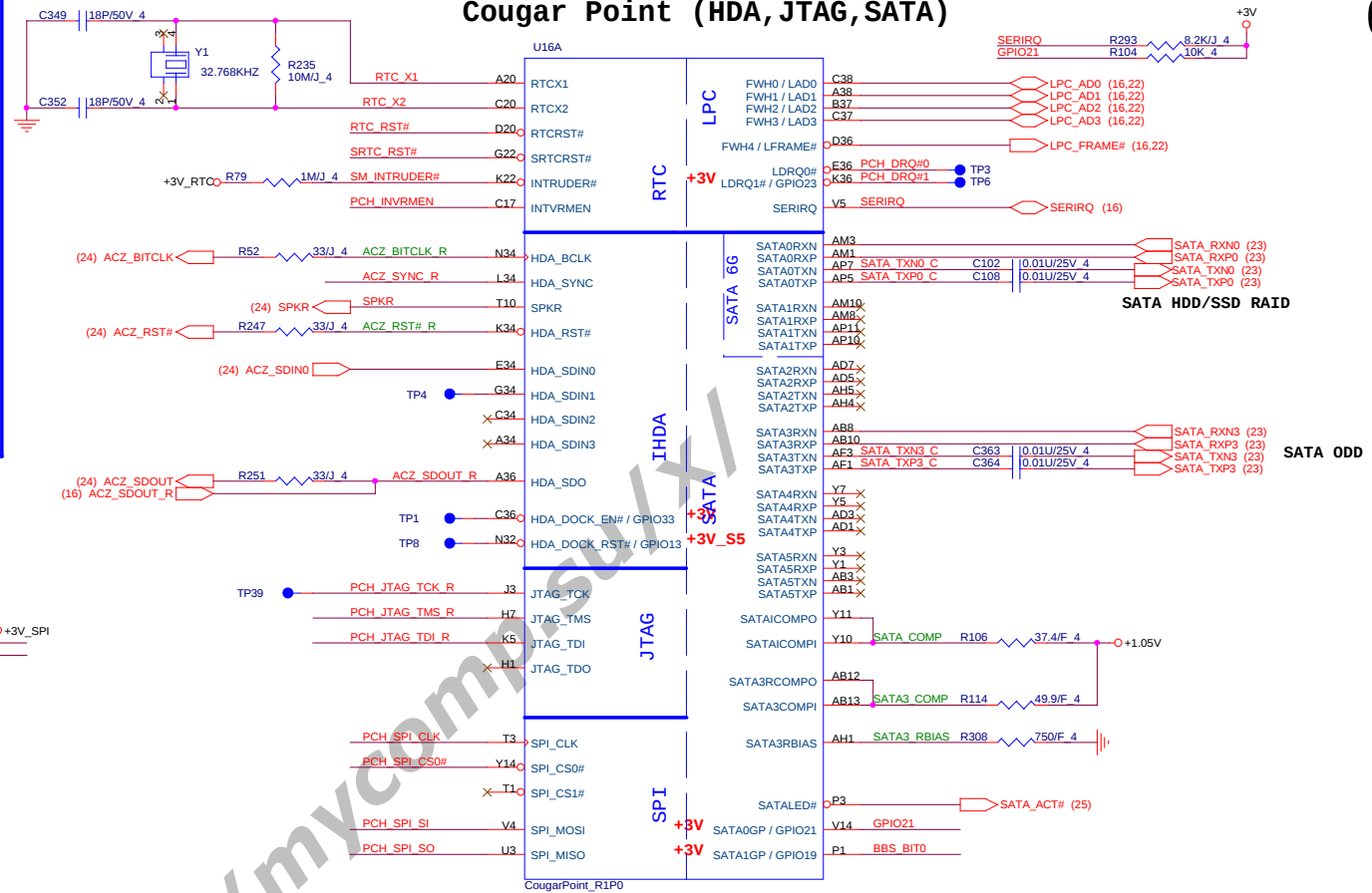
1. Level 1 Environment-related Substances Should Never be Used.
2. Recycled Resin and Coated Wire should be procured from Green Partners.

Quanta Computer Inc.
PROJECT :Huron River

Size	Document Number	Rev
	Cougar Point 1/6	1A

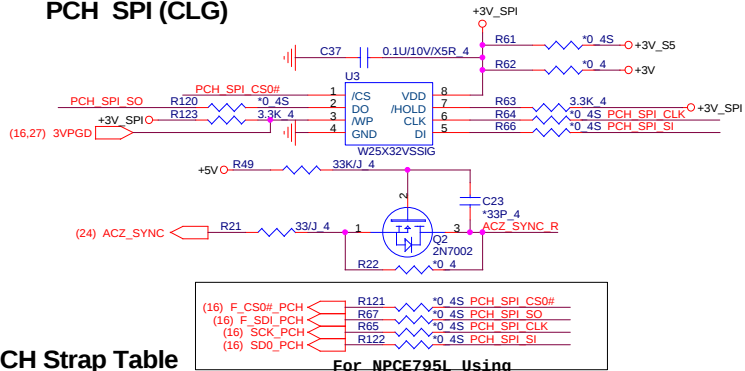
Date: Sunday, April 03, 2011 Sheet 8 of 39

Cougar Point (HDA, JTAG, SATA)



MX25L3205DM2I-12G: AKE39FP0Z00
W25X32VSSIG: AKE39ZP0N00

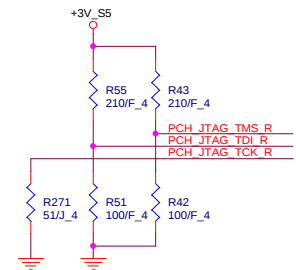
PCH SPI (CLG)



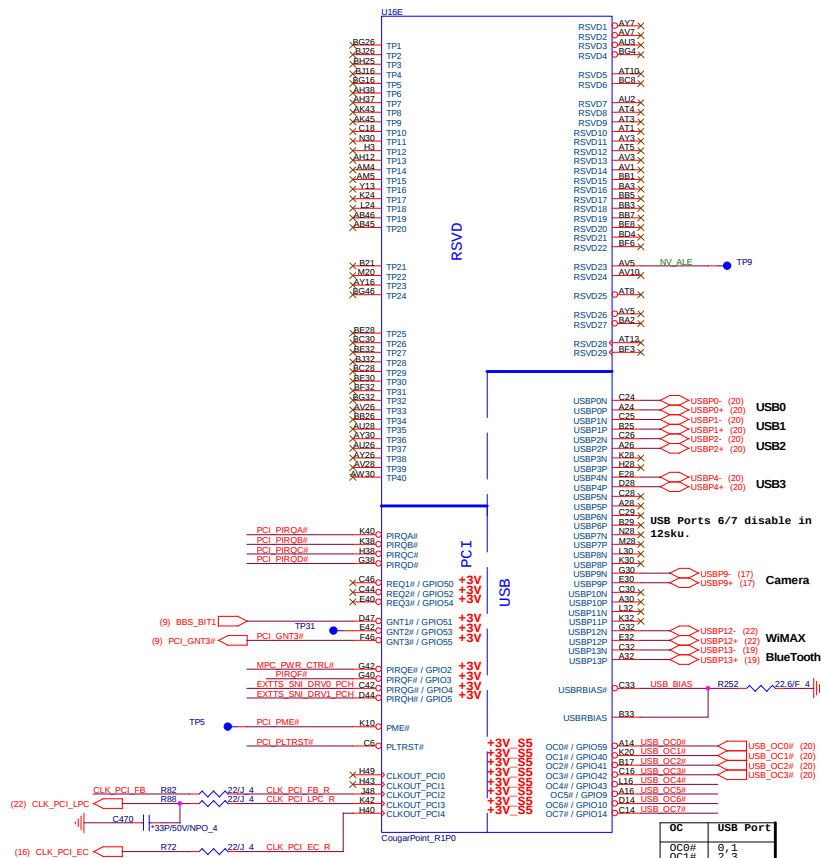
Pin Name	Strap description	Sampled	Configuration	HK1/HK2 note
SPKR	No reboot mode setting	PWROK	0 = Default (weak pull-down 20K) 1 = Setting to No-Reboot mode	
GNT3# / GPIO55	Top-Block Swap Override	PWROK	0 = "top-block swap" mode 1 = Default (weak pull-up 20K)	
INTVRMEN	Integrated 1.05V VRM enable	ALWAYS	Should be always pull-up	
GNT1# / GPIO51	Boot BIOS Selection 1 [bit-1]	PWROK	Default weak pull-up on GNT0/1# [Need external pull-down for LPC BIOS]	
GPIO19	Boot BIOS Selection 0 [bit-0]	PWROK		
HDA_SDO	Flash Descriptor Security	PWROK	0 = Default (weak pull-down 20K) 1 = Enabled	
DF_TVS	DMI/FDI Termination voltage	PWROK	0 = Set to Vss 1 = Set to Vcc (weak pull-down 20K)	
GPIO28	On-die PLL Voltage Regulator	RSMRST#	0 = Disable 1 = Enable (Default)	
HDA_SYNC	On-Die PLL VR Voltage Select	RSMRST	0 = Support by 1.8V (weak pull-down) 1 = Support by 1.5V	

For NPCE795L Using

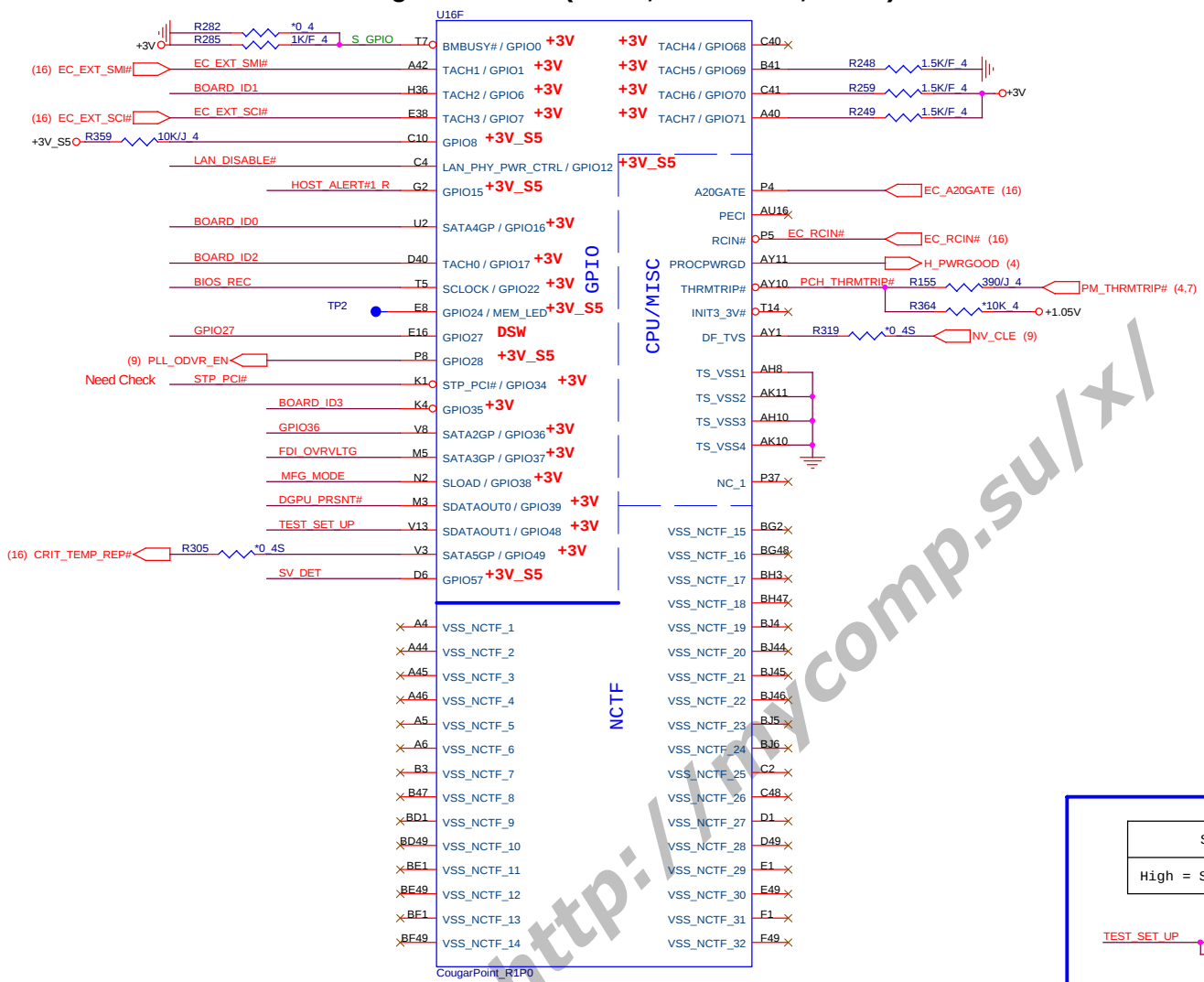
PCH JTAG Debug (CLG)



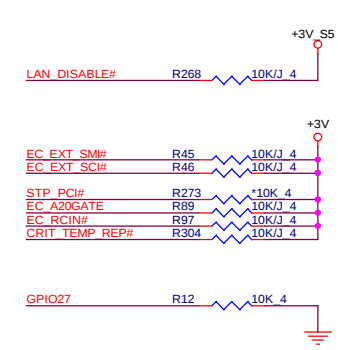
Cougar Point-M (PCI, USB, NVRAM)



Cougar Point (GPIO, VSS_NCTF, RSVD)



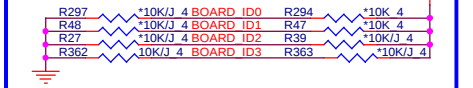
GPIO Pull-up/Pull-down(CLG)



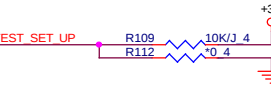
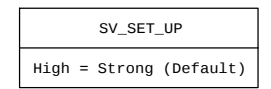
Board ID0 (N12M/N12P)	N12M	N12P
R294	Stuff	No Stuff
R297	No Stuff	Stuff

Board ID1 (VRAM Vendor)	Samaung	Hynix
R47	Stuff	No Stuff
R48	No Stuff	Stuff

Board ID2 (VRAM 1G/512M)	1G	512M
R39	Stuff	No Stuff
R27	No Stuff	Stuff



PCBA SKU	Discrete	UMA
R277	Stuff	No Stuff
R275	No Stuff	Stuff



Intel ME Crypto Transport Layer Security (TLS) cipher suite
Low = Disable (Default)
High = Enable

MFG - TEST

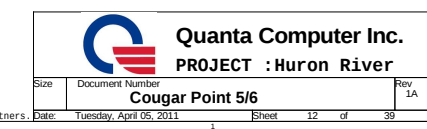


FDI TERMINATION VOLTAGE OVERRIDE
LOW - Tx, Rx terminated to same voltage

DMI TERMINATION VOLTAGE OVERRIDE
Low = Tx, Rx terminated to same voltage (DC Coupling Mode) (DEFAULT)

BIOS RECOVERY
High = Disable (Default)
Low = Enable

Quanta Computer Inc.
PROJECT : Huron River





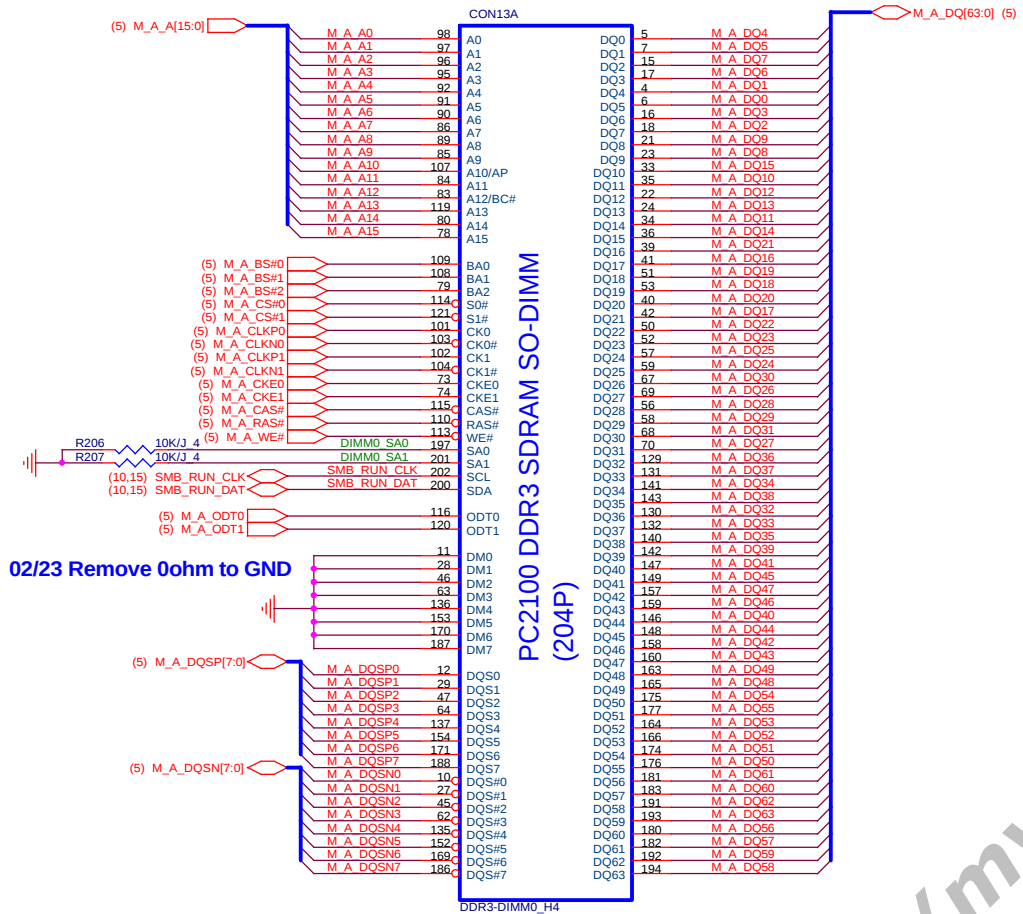
Quanta Computer Inc.
PROJECT : Huron River

Size	Document Number	Rev
	Cougar Point 6/6	1A

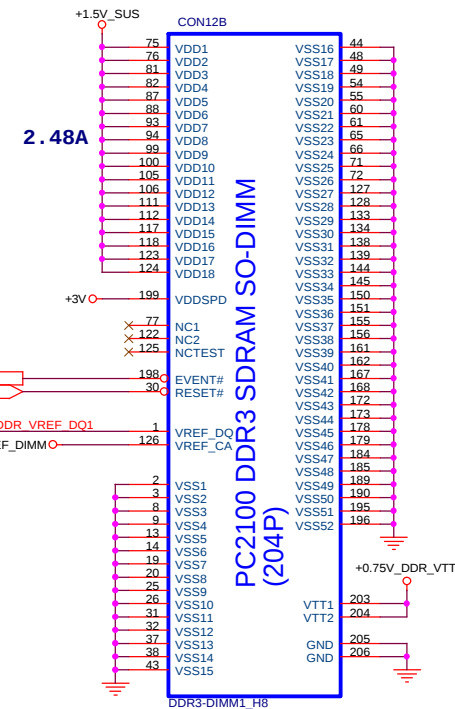
Level 1 Environment-related Substances Should Never be Used.

2 Recycled Resin and Coated Wire should be procured from Green Partners.

Date: Monday, February 21, 2011 Sheet 13 of 39

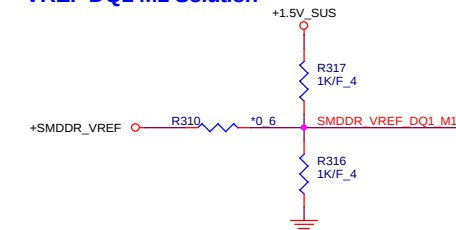


15

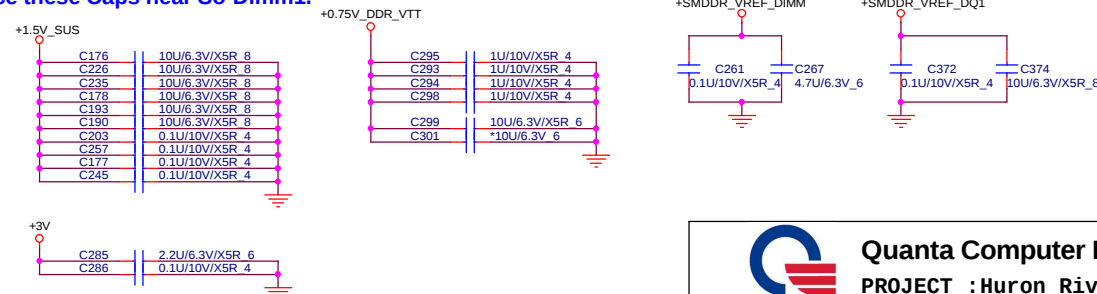


RUV Type

VREF DQ1 M1 Solution



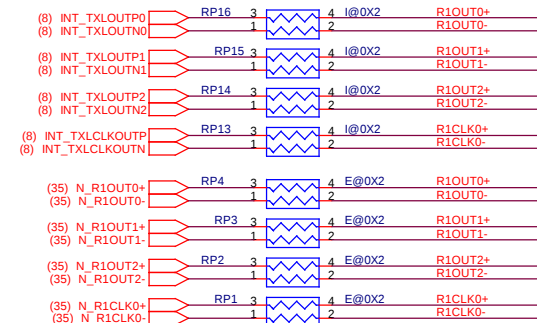
Place these Caps near So-Dimm1.



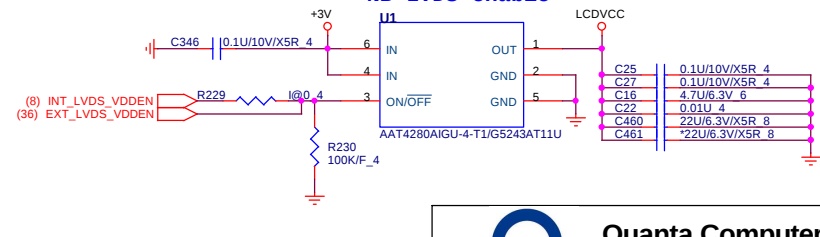
Quanta Computer Inc.
PROJECT :Huron River

Size	Document Number	Rev
	DDRIII SO-DIMM-1	1A
Date:	Tuesday, April 05, 2011	Sheet 15 of 39

USB Camera Power



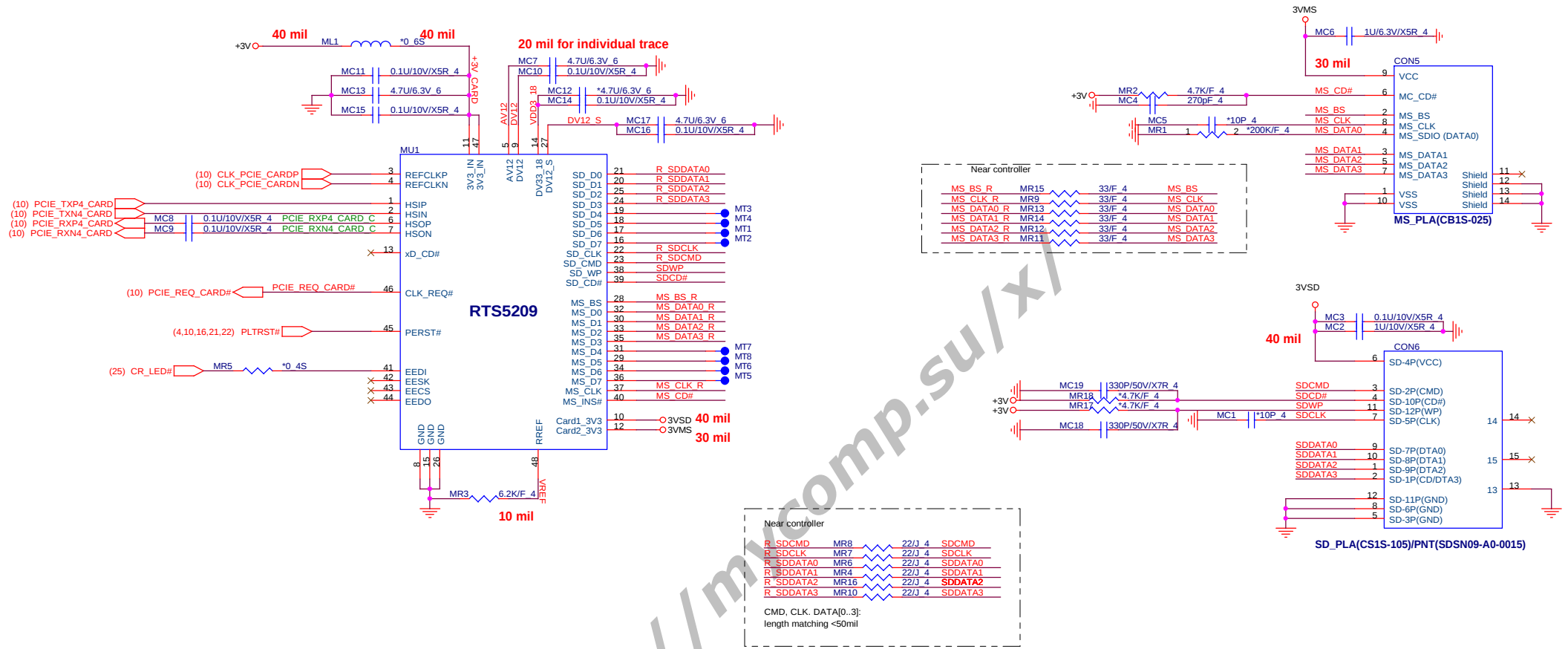
NB LVDS enable

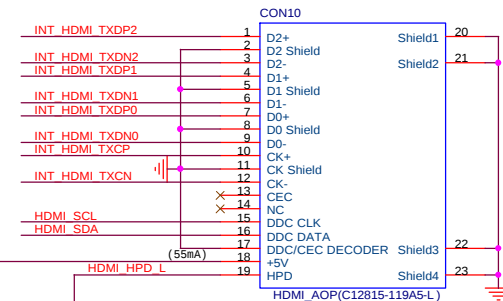
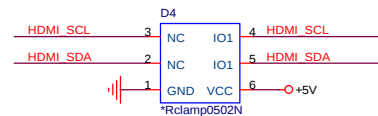
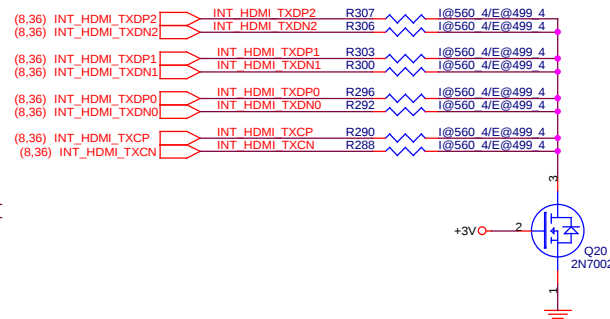
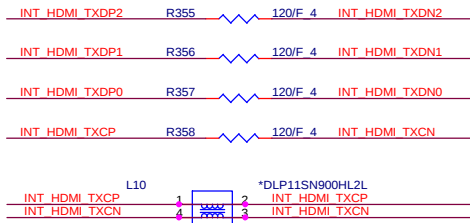


Quanta Computer Inc.
PROJECT :Huron River

CRT/LVDS

Rev	1A
-----	----





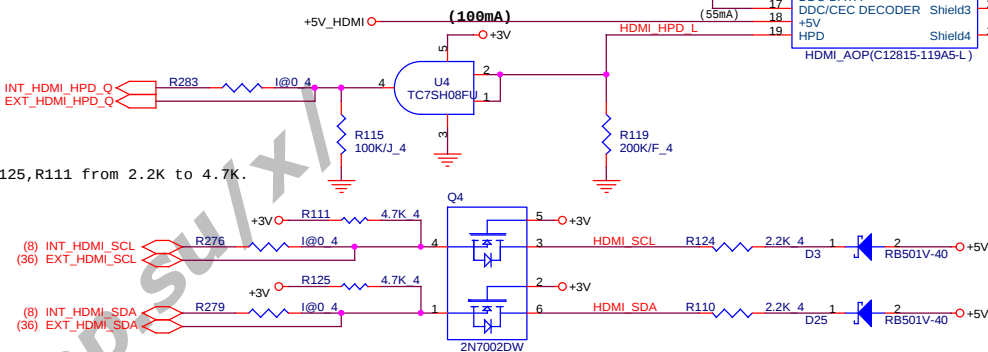
DIS SKU

Location of IC	Temp	R-Set	Parts in BOM	Max	Min
Near CPU sensor temp	73	R208=34.59K	34.8K	73.2	72.2
Near GFX sensor temp	73	R146=34.59K	34.8K	73.2	72.2
Near AUDIO sensor temp	55	R345=48.58K	48.7K	55.5	54.2

UMA SKU

Location of IC	Temp	R-Set	Parts in BOM	Max	Min
Near CPU sensor temp	82	R208=27.89K	27.4K	83.1	82.2
Near AUDIO sensor temp	55	R345=48.58K	48.7K	55.5	54.2

1/18 Change R125, R111 from 2.2K to 4.7K.



H/W Thermal Protect

Beside HDD

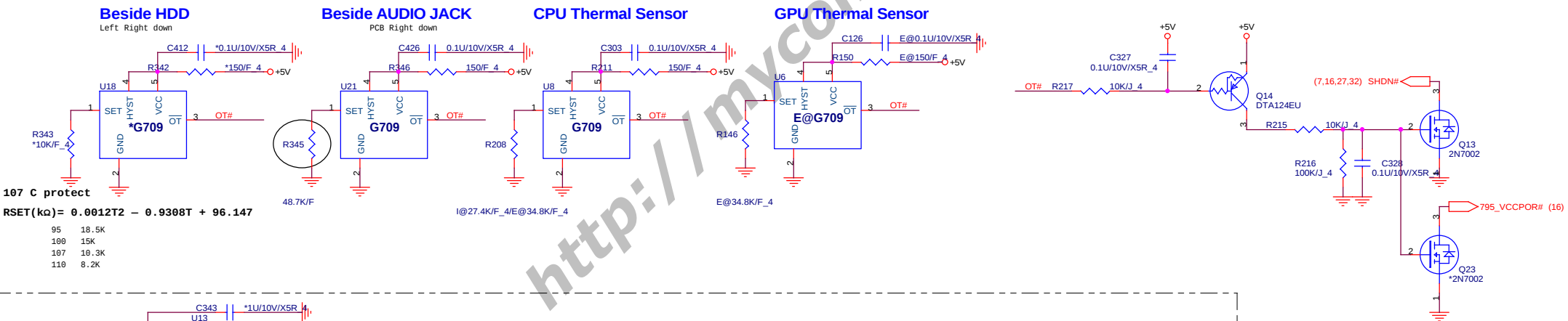
Left Right down

Beside AUDIO JACK

PCB Right down

CPU Thermal Sensor

GPU Thermal Sensor

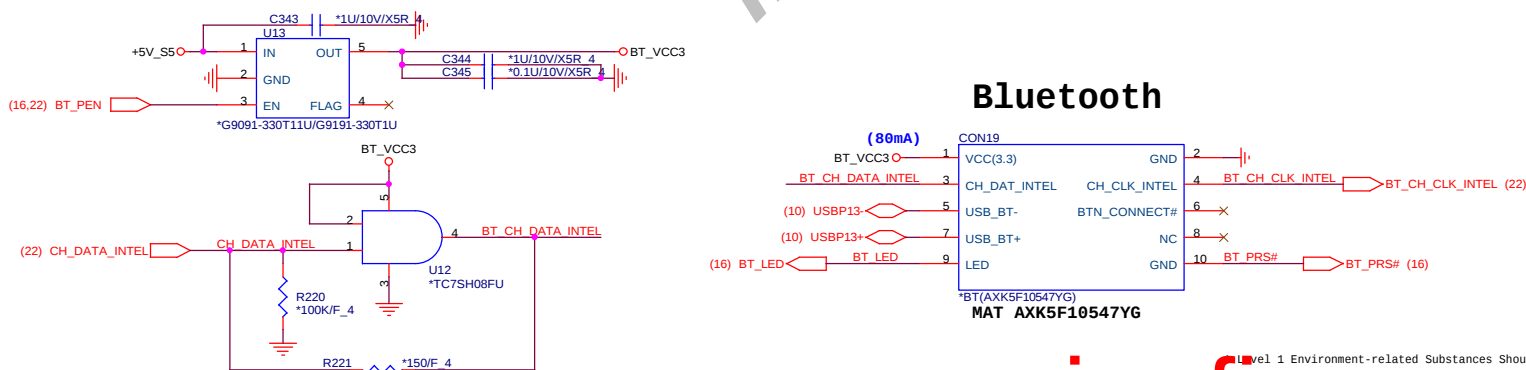


107 C protect

$$RSET(k\Omega) = 0.0012T2 - 0.9308T + 96.147$$

95	18.5K
100	15K
107	10.3K
110	8.2K

Bluetooth



Quanta Computer Inc.
PROJECT : Huron River

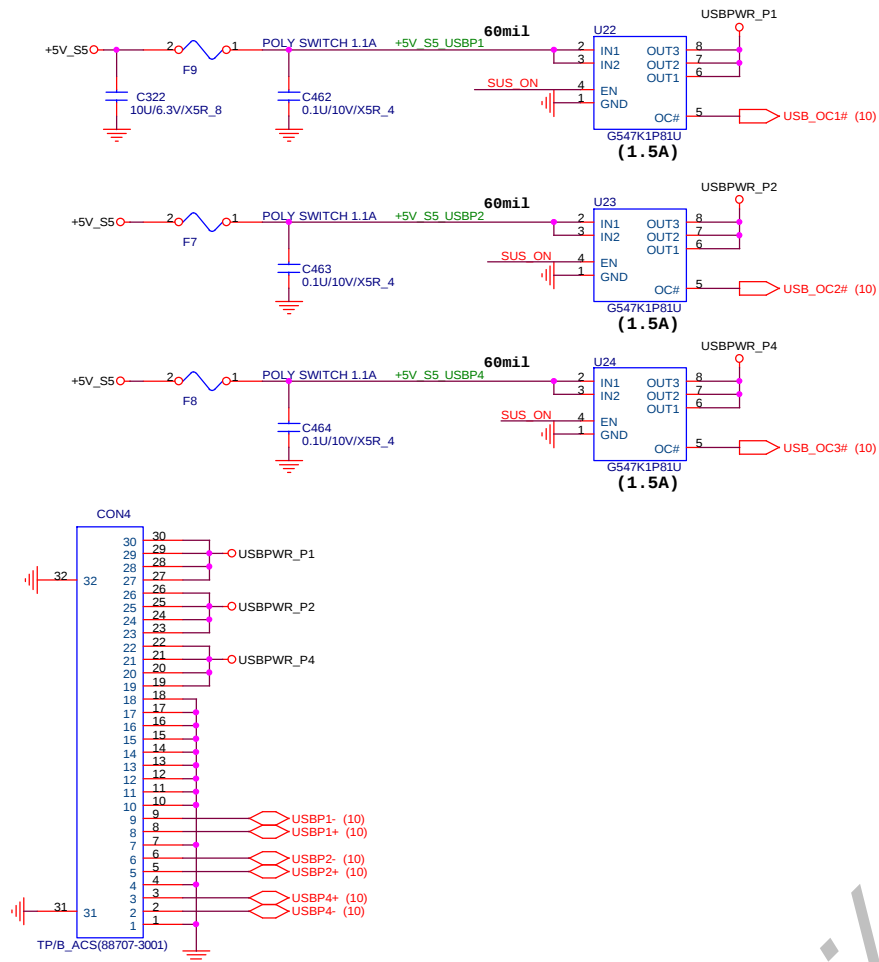
Size	Document Number	Rev
	HDMI/Bluetooth/Thermal IC	3A

Level 1 Environment-related Substances Should Never be Used.

Recycled Resin and Coated Vias should be procured from Green Partners.

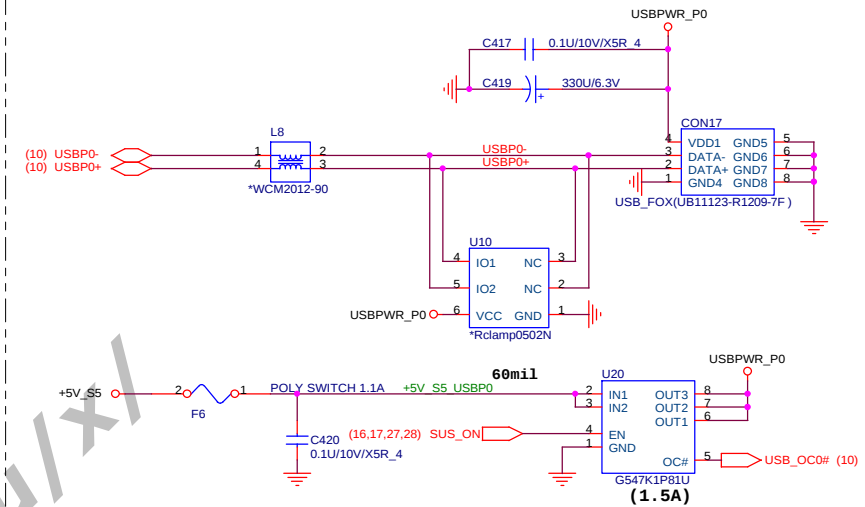
Date: Wednesday, April 06, 2011 Sheet 19 of 39

MB to USB board



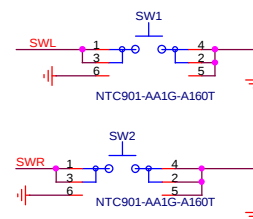
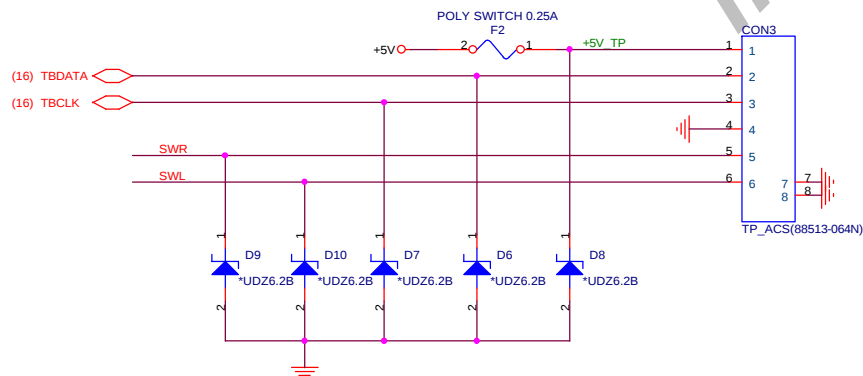
USB PORT 0

20

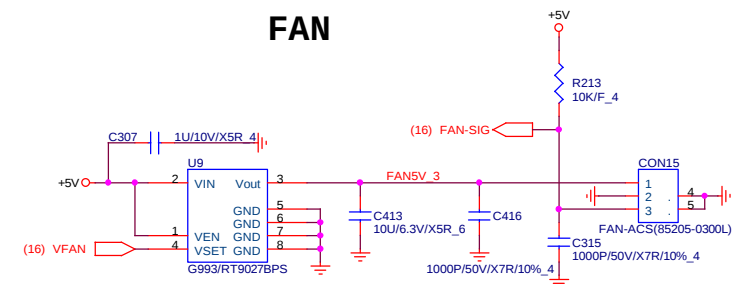


T/P Board to T/P

9/13 change F2 P/N from 0.12A to 0.25A



FAN



Quanta Computer Inc.
PROJECT : Huron River

Size	Document Number	Rev
	USB/TP/FAN	1A

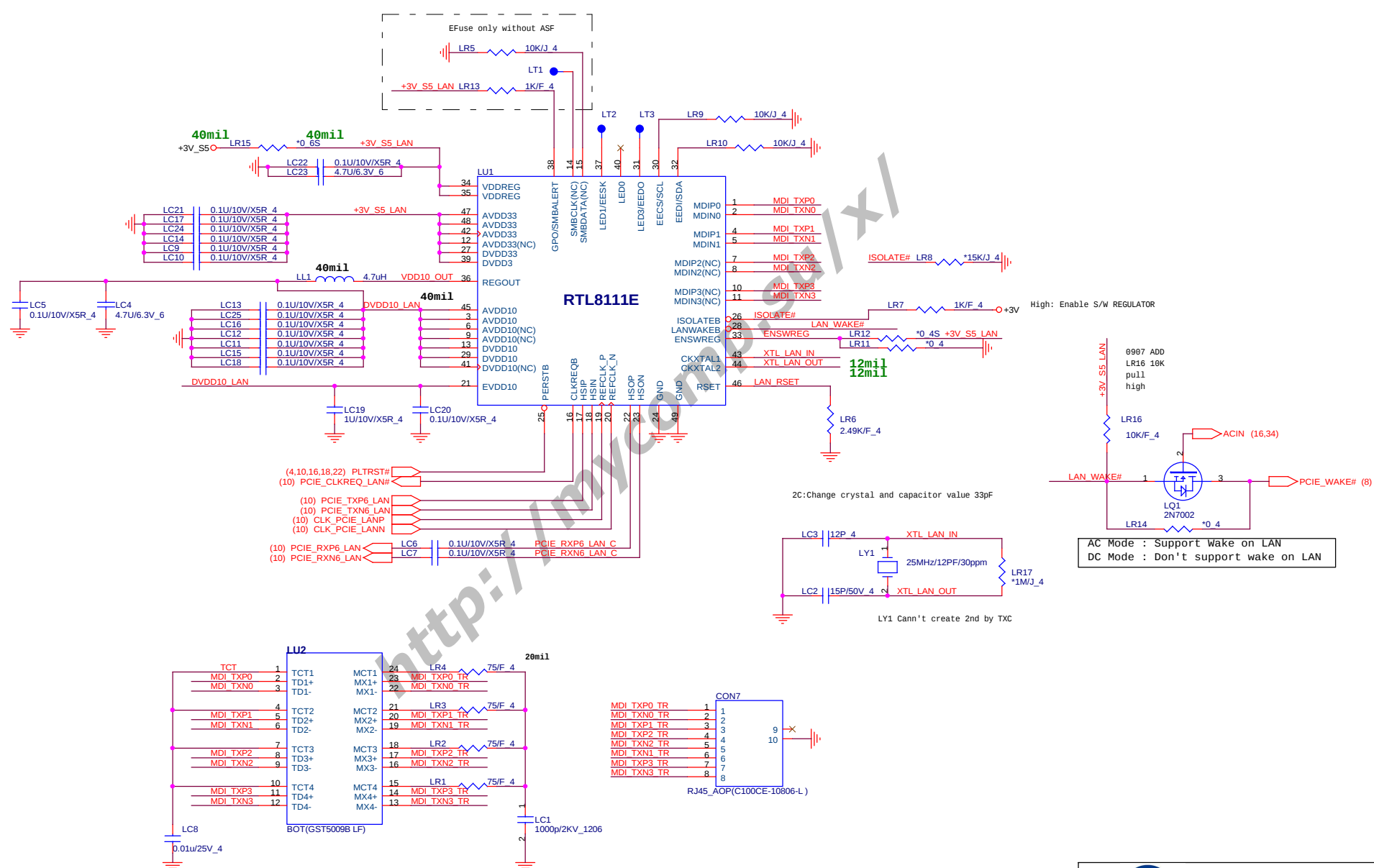
Level 1 Environment-related Substances Should Never be Used.

2 Recycled Resin and Coated Wire should be procured from Green Partners.

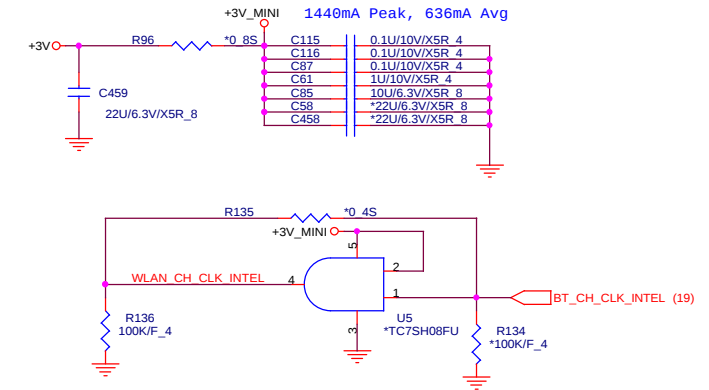
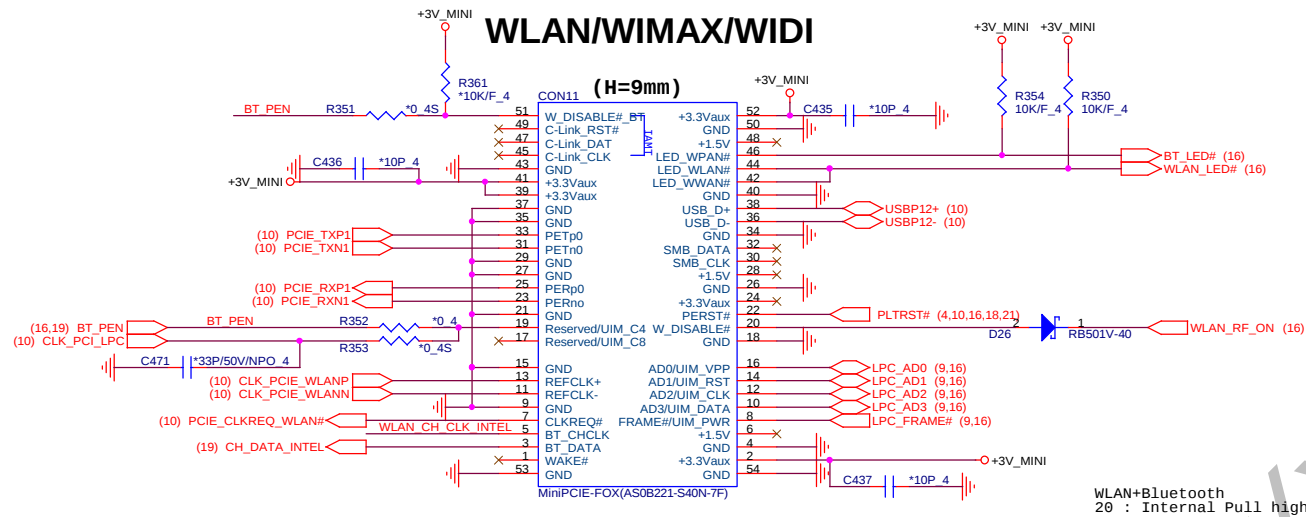
Date: Monday, February 21, 2011

Sheet 20 of 39

www.vinafix.vn

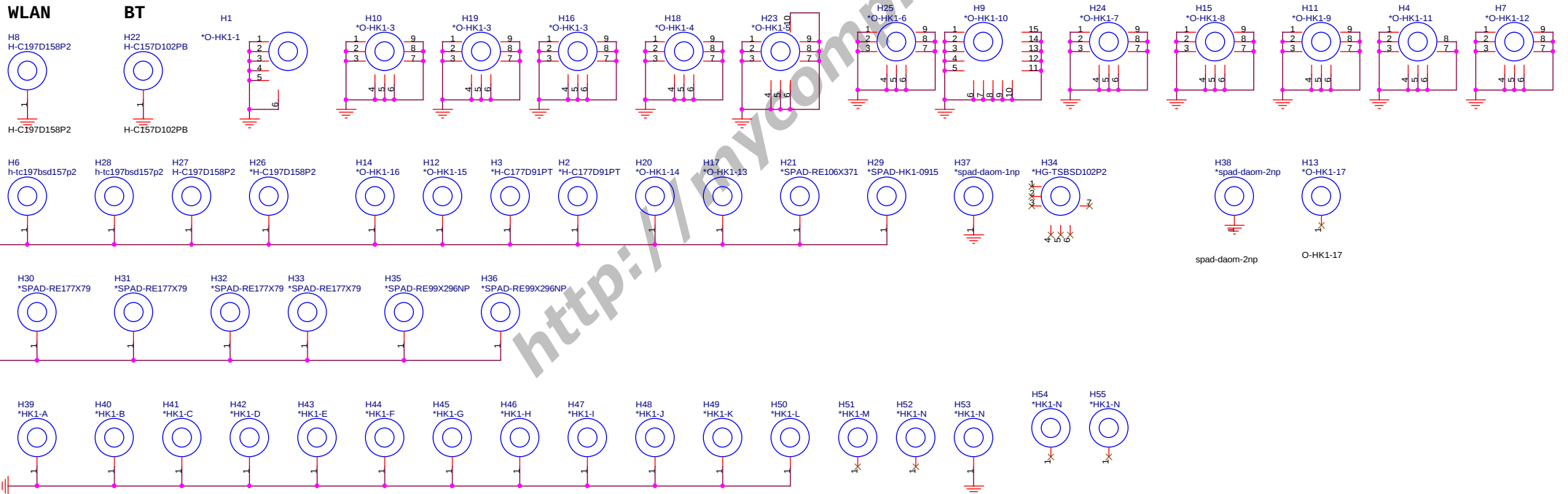


WLAN/WIMAX/WIDI



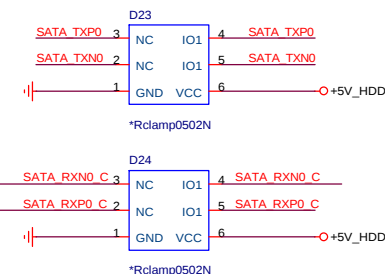
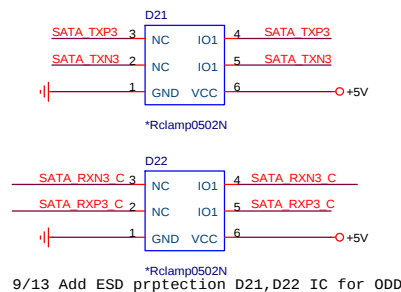
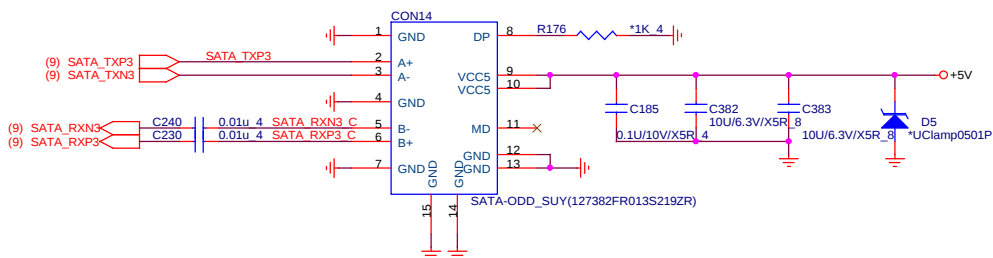
WLAN+Bluetooth
20 : Internal Pull high 25K ~ 58K

HOLE

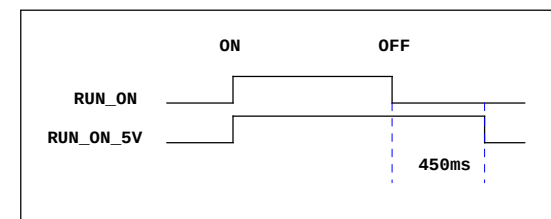
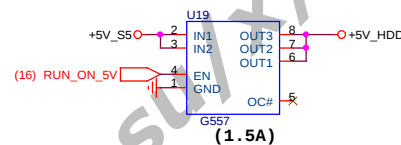
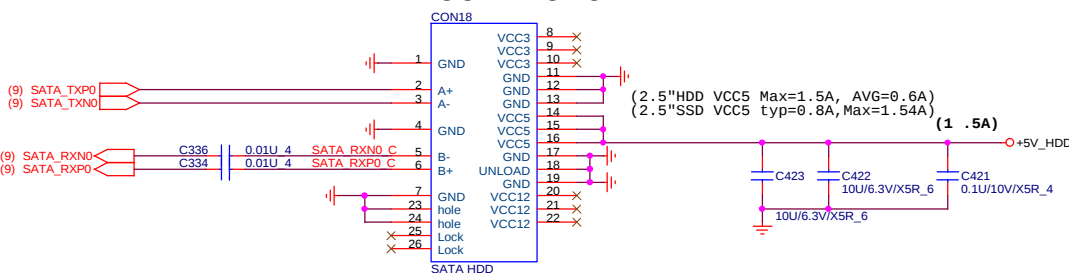


ODD CONNECTOR

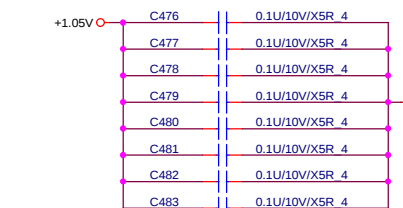
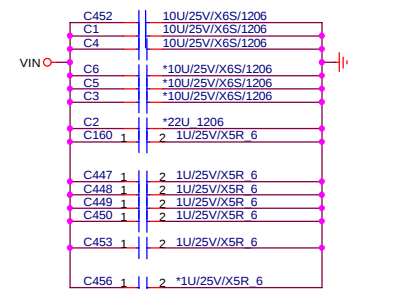
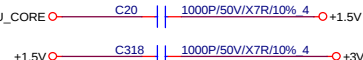
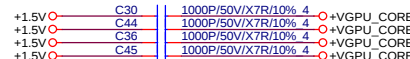
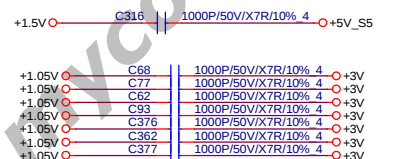
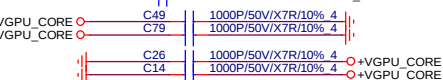
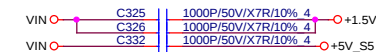
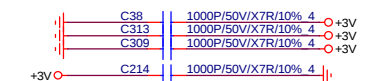
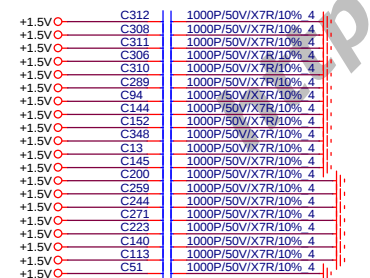
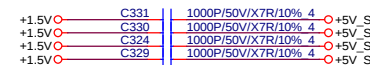
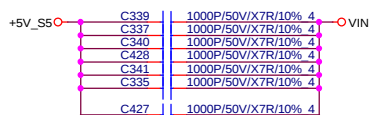
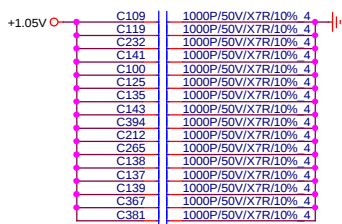
8/18 Change HDD 2nd source connector patt number



HDD CONNECTOR

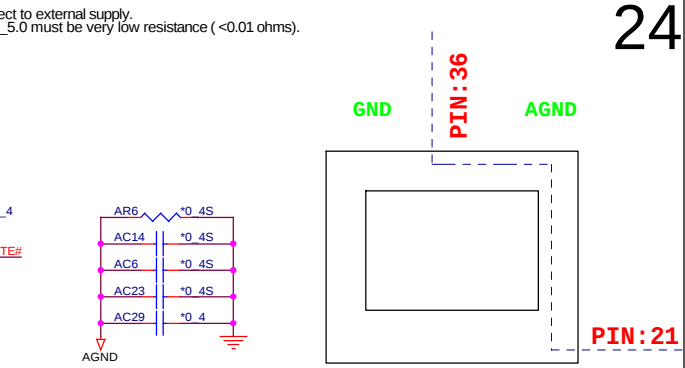
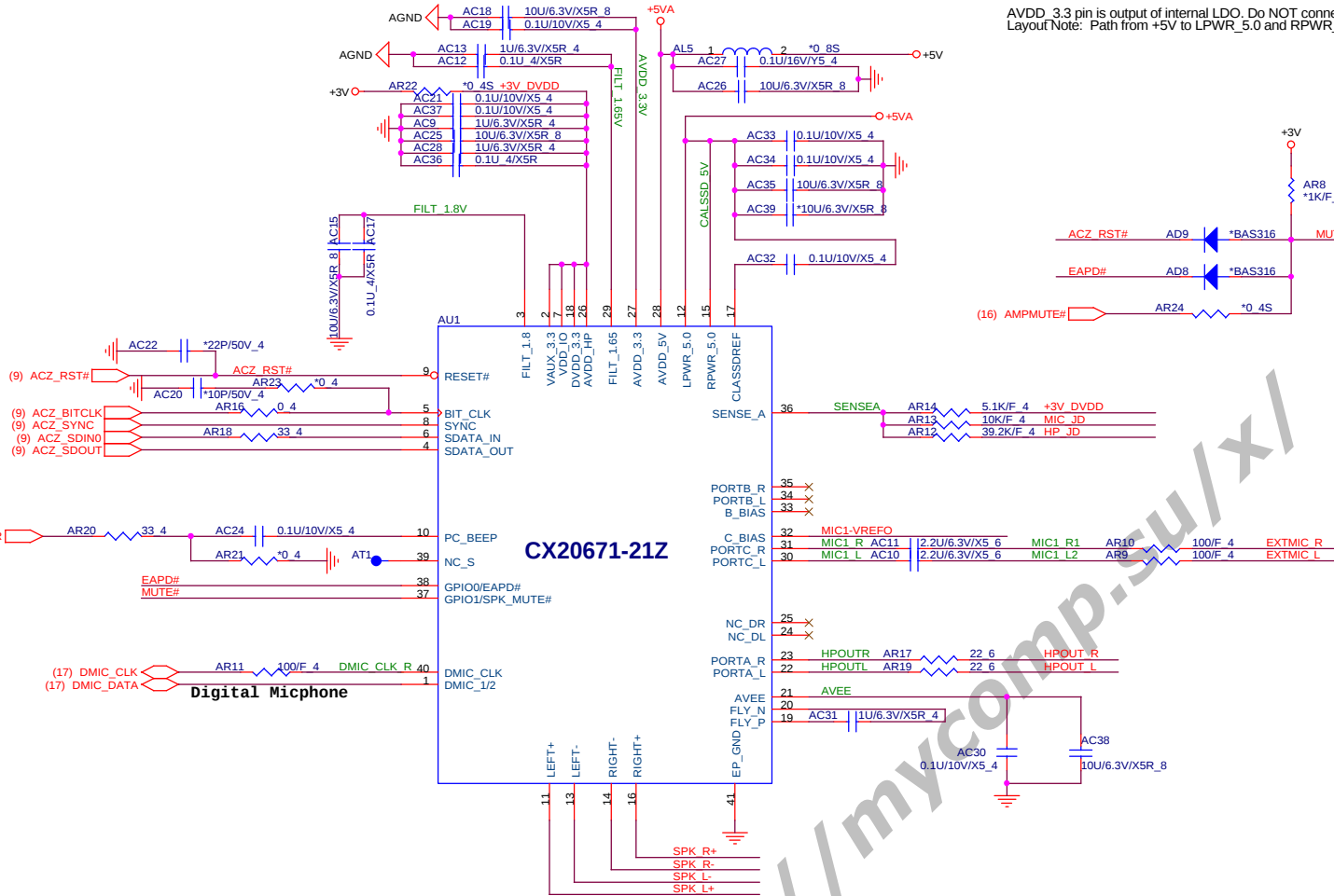


EMI



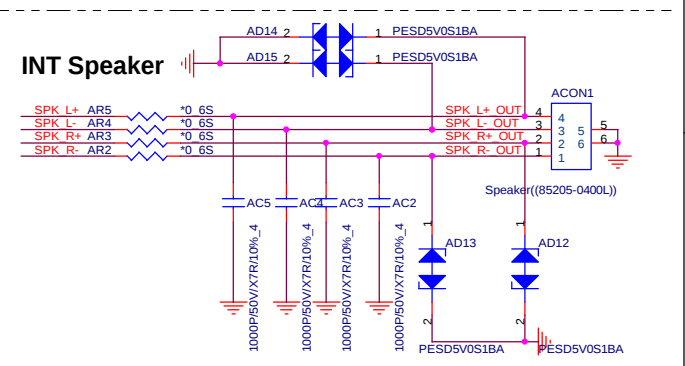
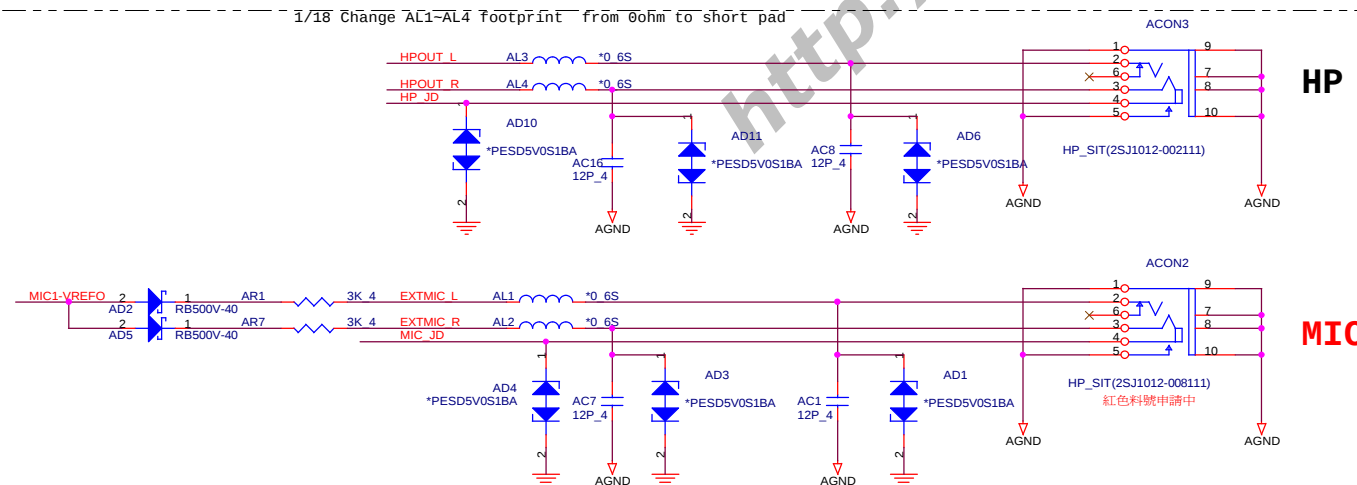
Quanta Computer Inc.
PROJECT : Huron River

Size	Document Number	Rev
	HDD/ODD	1A
Monday, February 21, 2011	Sheet 23 of 39	

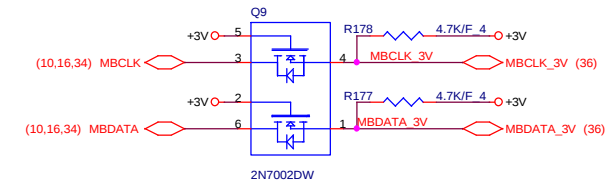
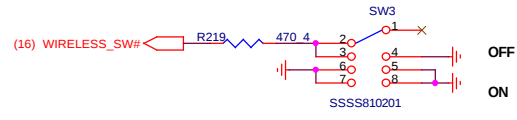


1/18 Change AL1,AL2,AL3,AL4 from 0ohm to short pad.

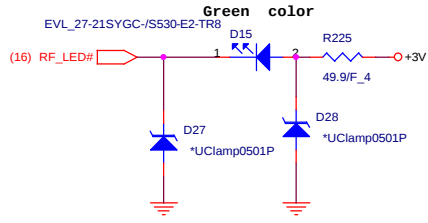
1/18 Change AL1~AL4 footprint from 0ohm to short pad



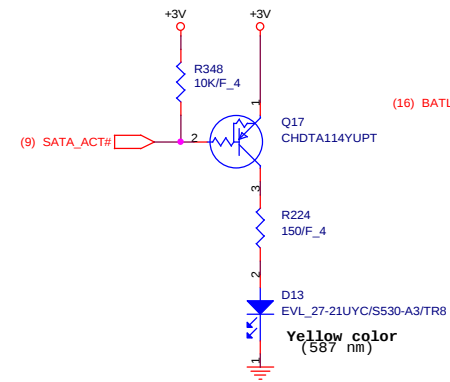
WIRELESS/Bluetooth SWITCH



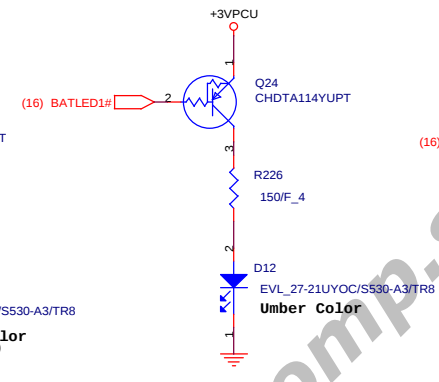
RF LED



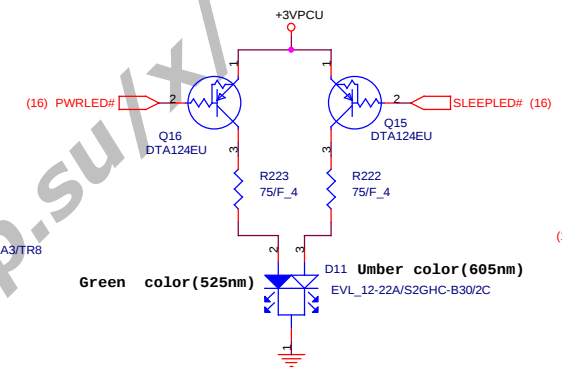
SATA LED



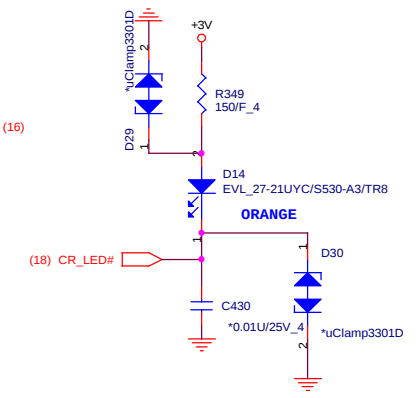
BATTERY LED



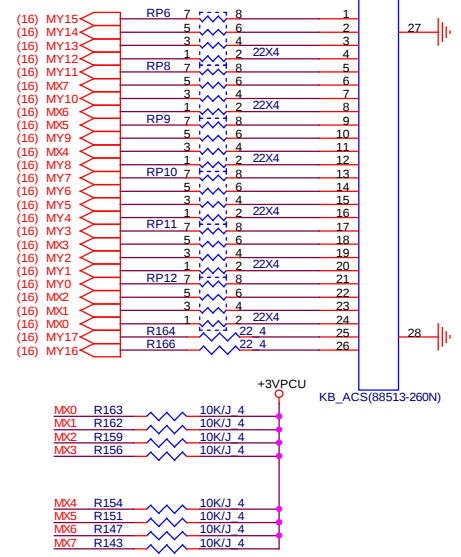
Power/Sleep LED



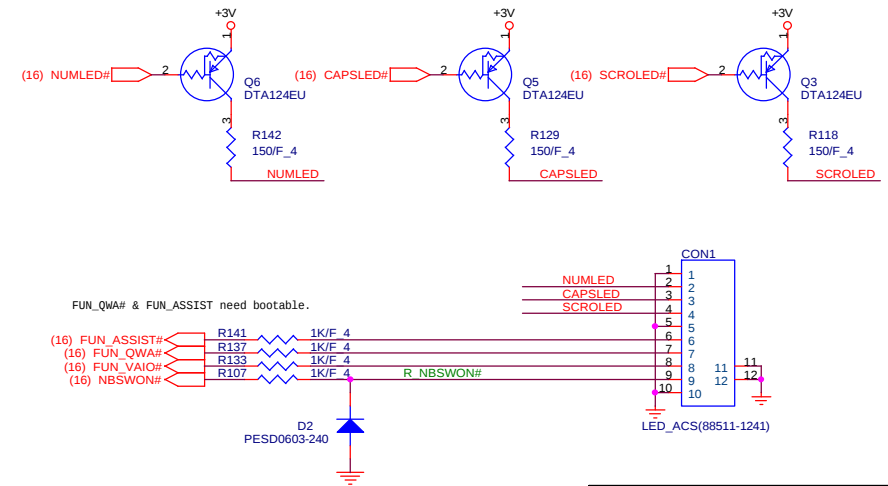
CARD LED



KEY BOARD Connector



Power SW Board Connector



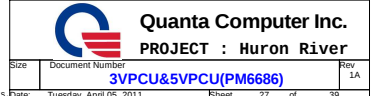
Quanta Computer Inc.
PROJECT : Huron River

Size	Document Number	Rev
	LED/RF/KB/PS	1A

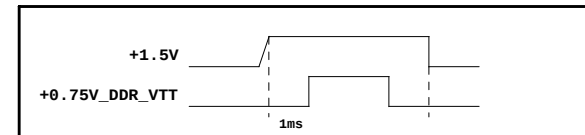
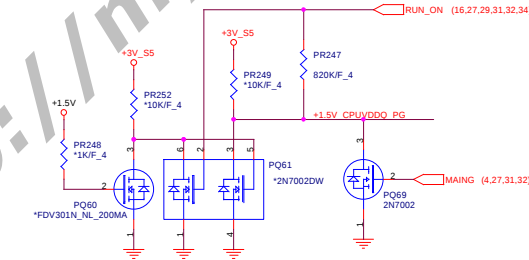
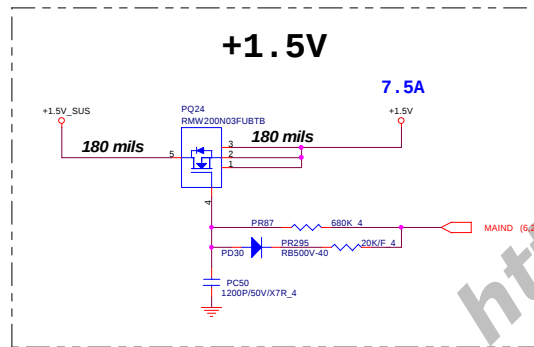
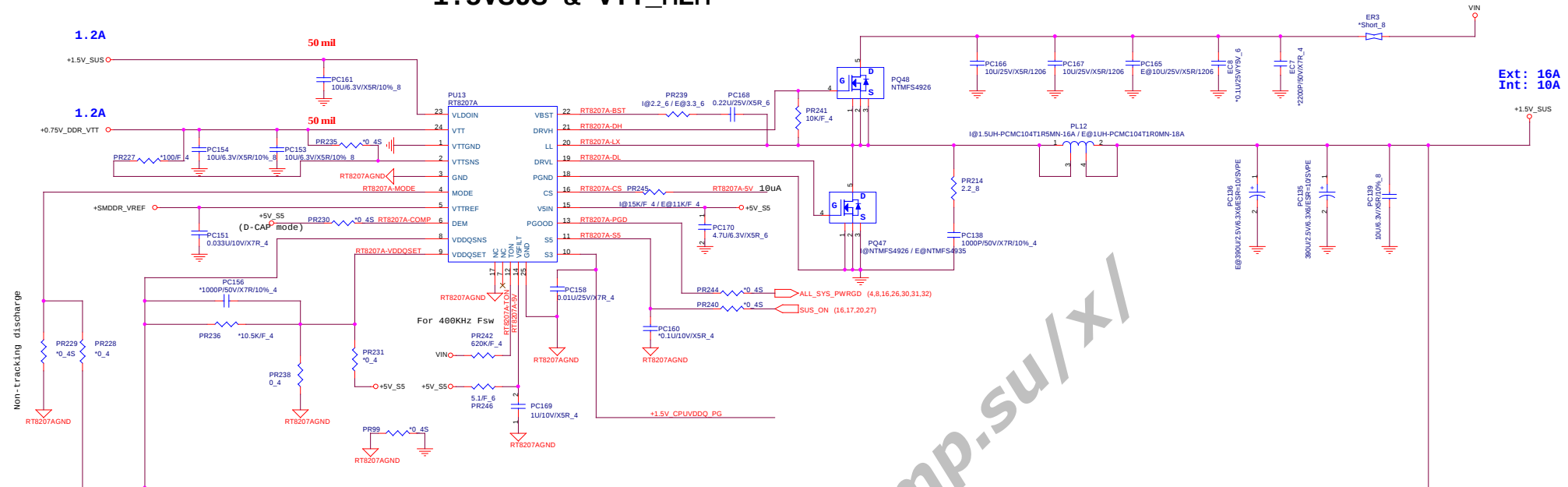
Level 1 Environment-related Substances Should Never be Used.
Recycled Resin and Coated Vials should be procured from Green Partners.

Date: Wednesday, April 06, 2011 Sheet 25 of 39





1.5VSUS & VTT_MEM

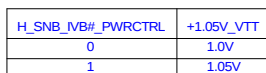


MODE	DISCHARGE MODE
+5V	No discharge
+1.5V	Tracking discharge
GND	Non-tracking discharge

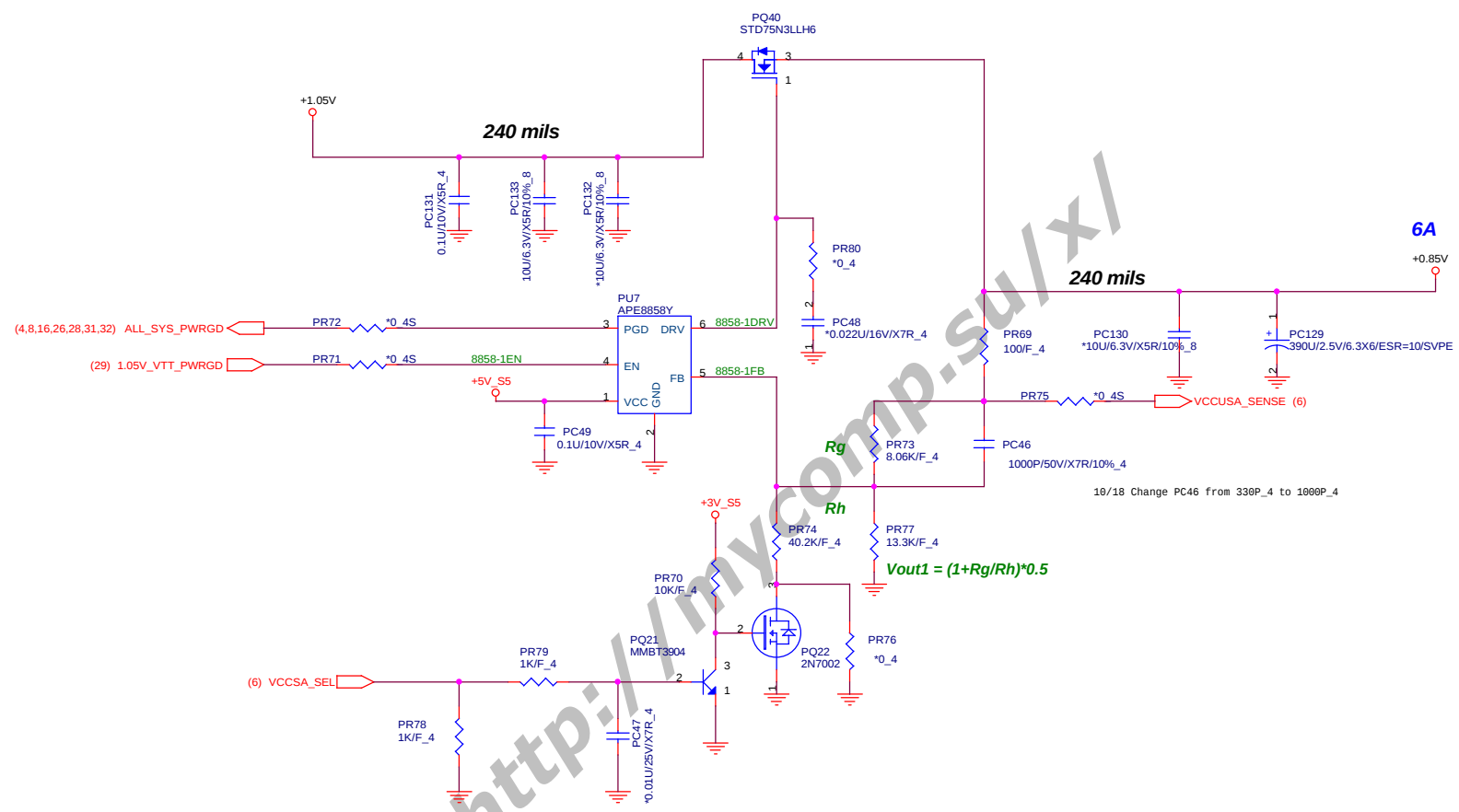
VDDQSET	VDDQ(V)	VTTREF & VTT	NOTE
GND	1.5 Fixed	VDDQSNS/2	DDR3
5V	1.8 Fixed	VDDQSNS/2	DDR2
FB-Resistor	Adjustable	VDDQSNS/2	1.5V<VDDQ<3V

VTT = VTTREF = VDDQSNS/2 = 0.75V

STATE	S3	S5	1.5VSUS	VTTREF	VTT
S0	1	1	on	on	on
S3	0	1	on	on	off
S4/S5	0	0	off	off	off



+0.85V



VID 0	VCCSA_SEL	+0.85V
0	0	0.9V
0	1	0.8V
1	0	0.75V
1	1	0.65V

$$V_{out} = 2.75 * (R_2 / (R_1 + R_2))$$

N12P-GV

External VGA_CORE Voltage Setting:

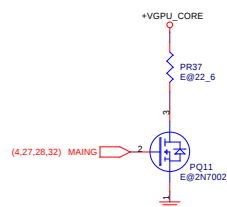
GFX_CORE_CNTRL1	GFX_CORE_CNTRL0	VGA_CORE	
0	0	1.025V	PR176=64.9K/F_4
0	1	1.00V	PR181=0_4
1	0	0.85V	PR180=16.9K/F_4
1	1	0.85V	PR39=3.24K/F_4

N12M-GS2

External VGA_CORE Voltage Setting:

GFX_CORE_CNTRL1	GFX_CORE_CNTRL0	VGA_CORE	
0	0	1.025V	PR176=66.5K/F.4
0	1	1.00V	PR181=0.4
1	0	0.875V	PR190=15.4K/F.4
1	1	0.875V	PR39=3.09K/F.4

Dis-charge



UMA GFX DISABLE



(0.1A) +3V

(2A) +1.05V

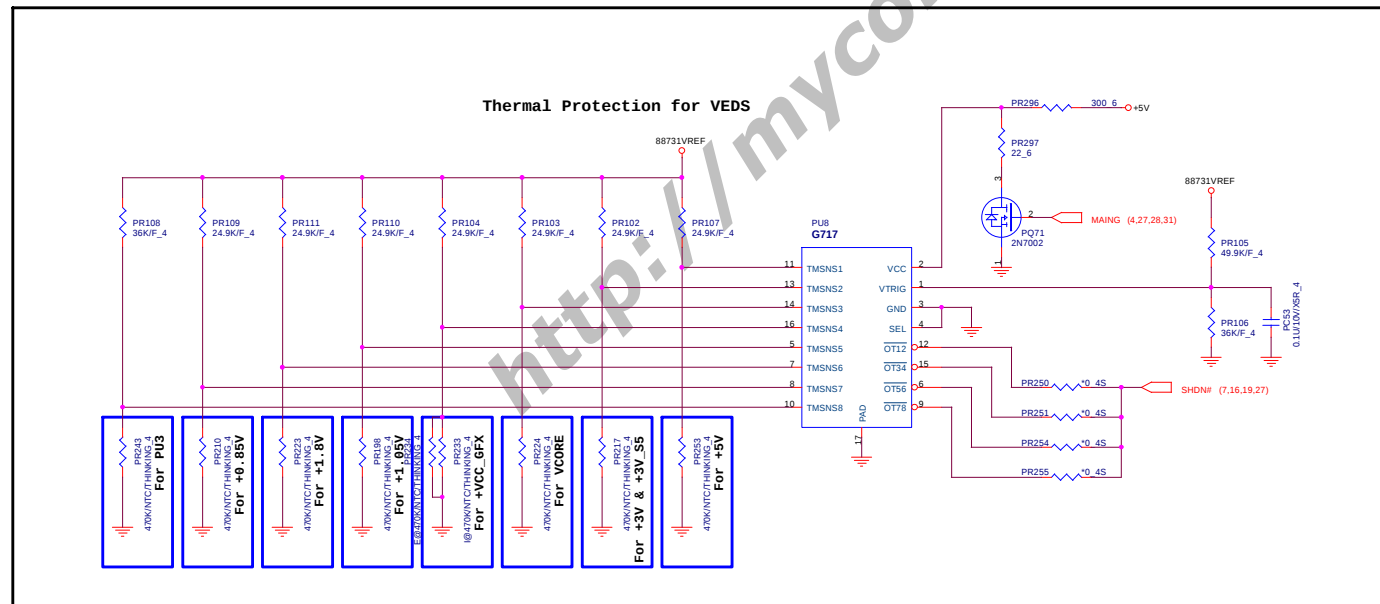
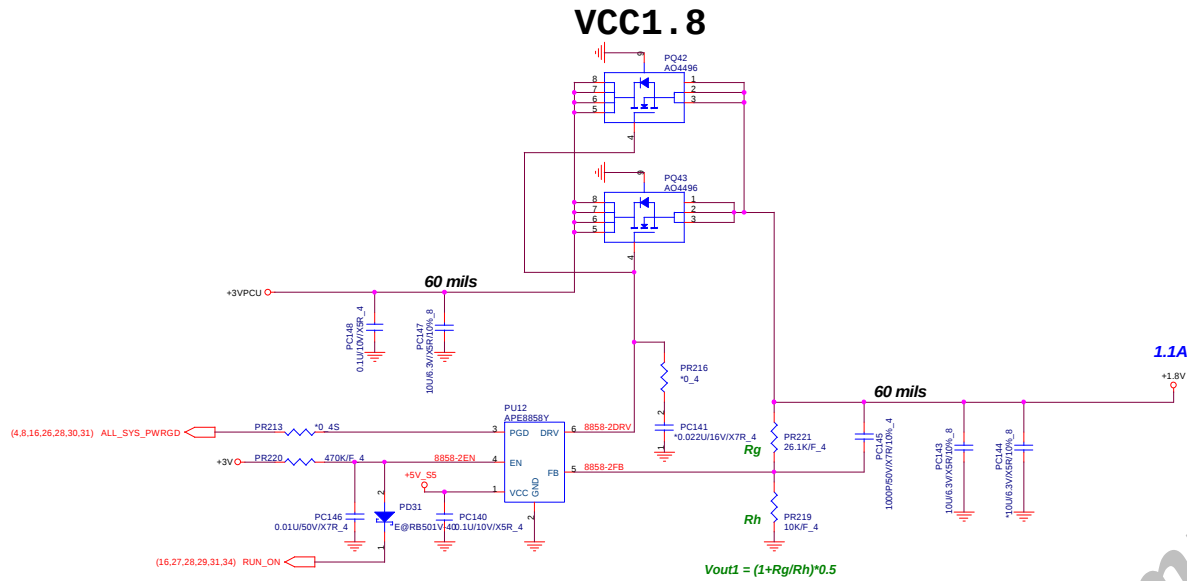
(6A) **+1.5V**



Quanta Computer Inc.
PROJECT : Huron River

Size	Document Number	Re
	VGA_CORE(OZ8111)-15A	

1.Level 1 Environment-related Substances Should Never be Used.		VGA_CORE(OZ8111)-15A	
2.Recycled Resin and Coated Wire should be procured from Green Partners.		Date: Tuesday, April 05, 2011	Sheet 31 of 39

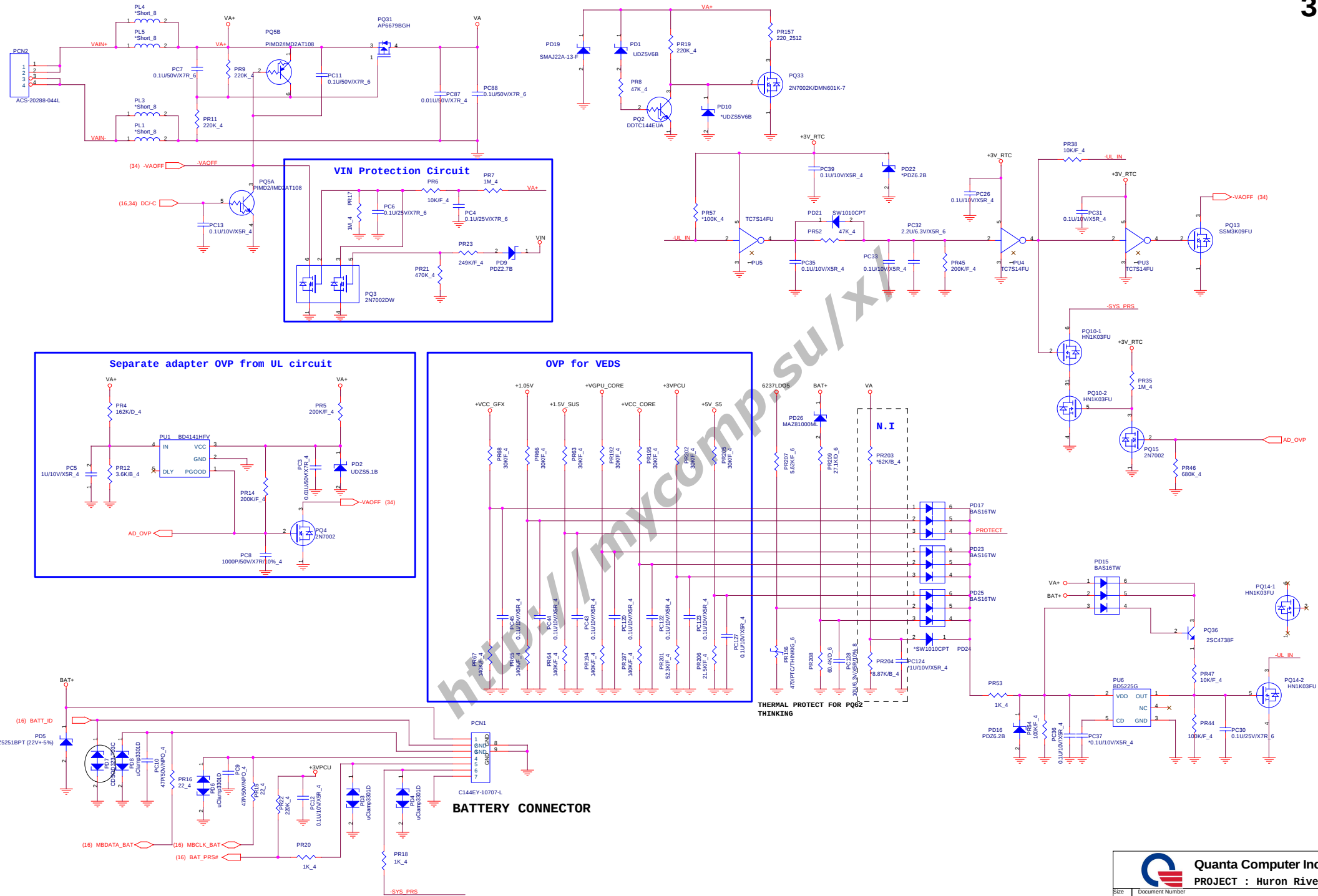


Quanta Computer Inc.
PROJECT : Huron River

Size Document Number
VCC1.8
Rev 1A

1. Level 1 Environment-related Substances Should Never be Used.
2. Recycled Resin and Coated Wire should be procured from Green Partners.

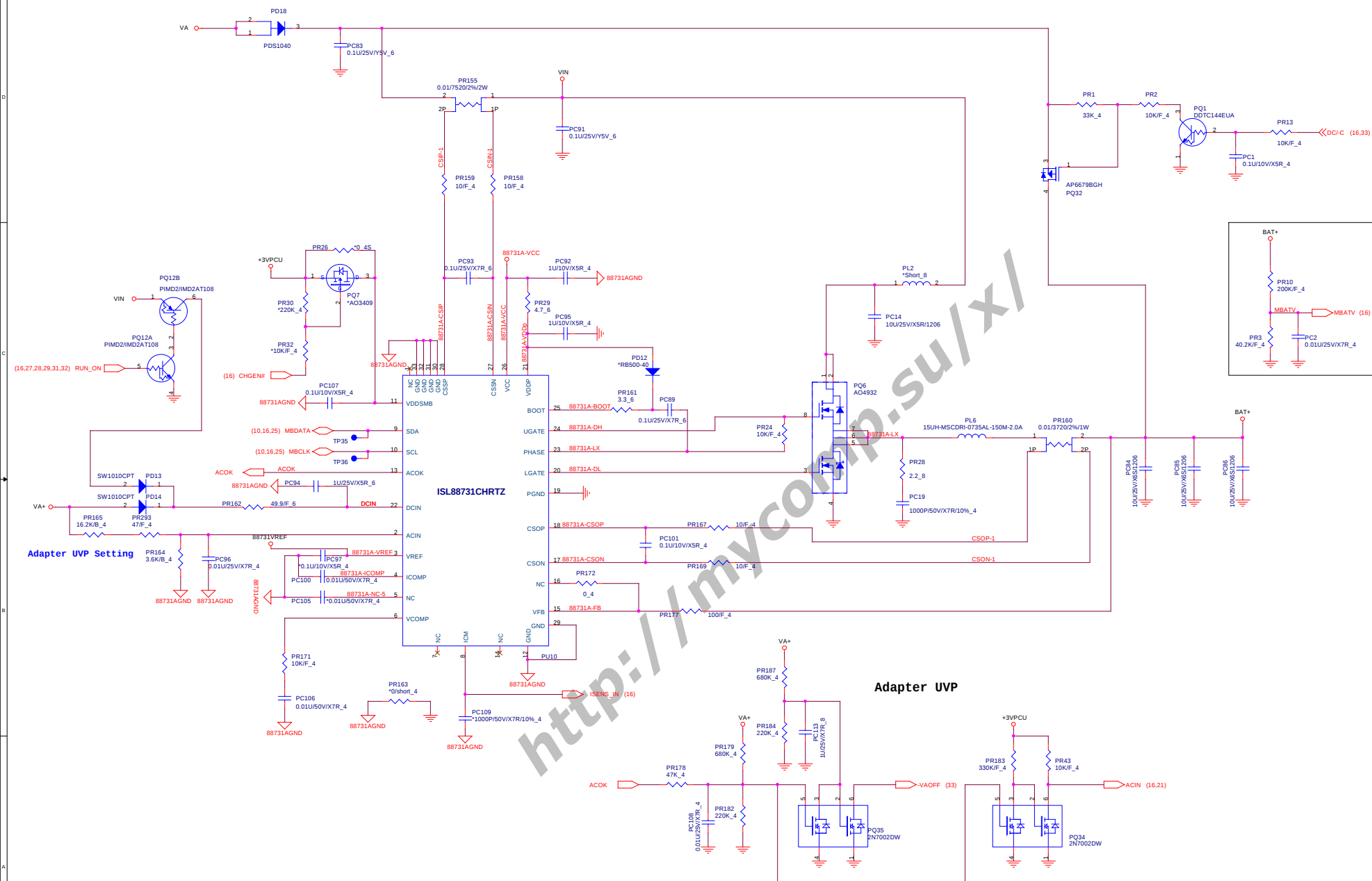
Date: Tuesday, April 05, 2011 Sheet 32 of 39

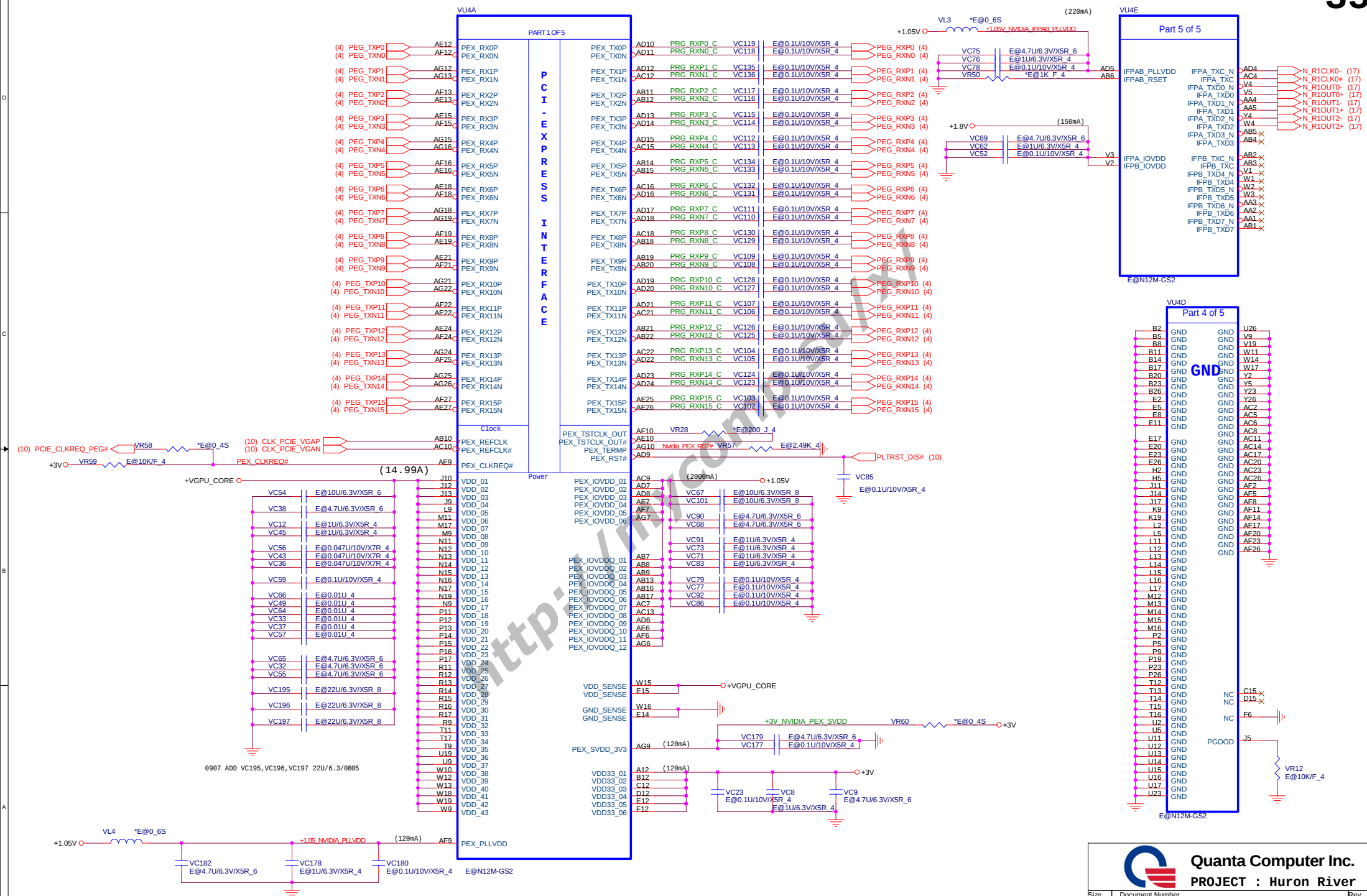


Quanta Computer Inc.
PROJECT : Huron River

Size Document Number
BAT INADA INUL
Rev 1A

1. Level 1 Environment-related Substances Should Never be Used.
2. Recycled Resin and Coated Wire should be procured from Green Partners.
Date: Sunday, April 03, 2011 Sheet 33 of 39





N12P-GV

External VGA_CORE Voltage Setting:

GFX_CORE_CNTRL1	GFX_CORE_CNTRL0	VGA_CORE	
0	0	1.025V	PR176=64.9K/F_4
0	1	1.00V	PR181=0_4
1	0	0.85V	PR180=16.9K/F_4
1	1	0.85V	PR39=3.24K/F_4

N12M-GS2

External VGA_CORE Voltage Setting:

GFX_CORE_CNTRL1	GFX_CORE_CNTRL0	VGA_CORE	
0	0	1.025V	PR176=66.5K/F_4
0	1	1.00V	PR181=0_4
1	0	0.875V	PR180=15.4K/F_4
1	1	0.875V	PR39=3.09K/F_4

Logical Strap Bit Mapping

Resistor Value	Pull to VDD	Pull to GND
5K	1000	0000
10K	1001	0001
15K	1010	0010
20K	1011	0011
25K	1100	0100
30K	1101	0101
35K	1110	0110
45K	1111	0111

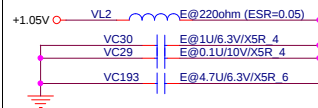
N12M Strap Bit Define

Straps	Bit 3	Bit 2	Bit 1	Bit 0
ROM_S0	FB[1]	FB[1]	SMB_ALT_ADDR	VGA_DEVICE
ROM_SCLK	PCI_DEVID[4]	SUB_VENDOR	PCI_DEVID[5]	PEX_PLL_EN_TERM
ROM_SI	RAMCFG[3]	RAMCFG[2]	RAMCFG[1]	RAMCFG[0]
STRAP2	PCI_DEVID[3]	PCI_DEVID[2]	PCI_DEVID[1]	PCI_DEVID[0]
STRAP1	3GIO_PADCFG[3]	3GIO_PADCFG[2]	3GIO_PADCFG[1]	3GIO_PADCFG[0]
STRAP0	USER[3]	USER[2]	USER[1]	USER[0]
STRAP3	SOR3_EXPOSED	SOR2_EXPOSED	SOR1_EXPOSED	SOR0_EXPOSED
STRAP4	RESERVED	RESERVED	PCIE_MAX_SPEED	DP_PLL_VDD33

for device ID

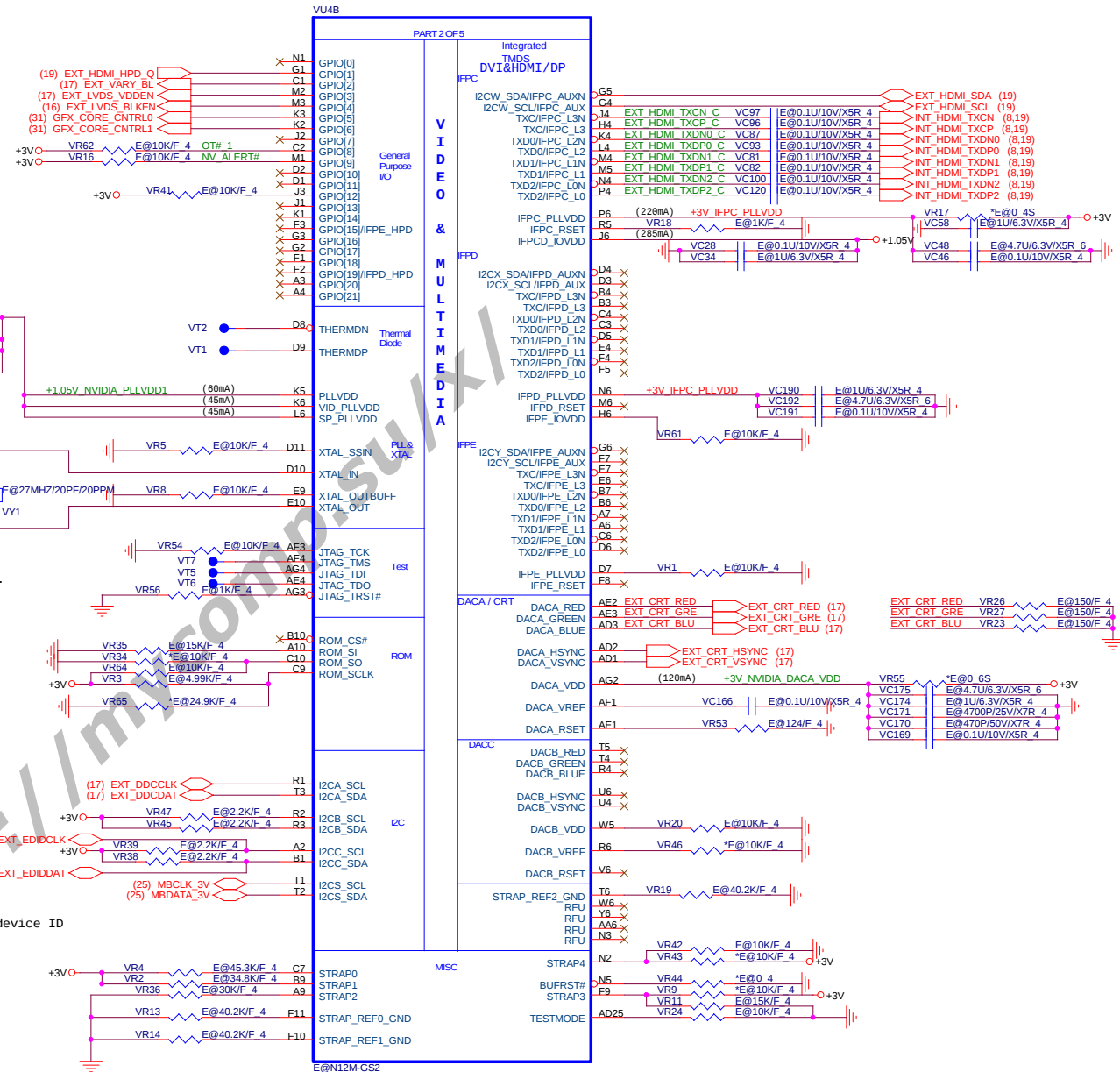
For N12P VR3 pull high 4.99K VR65 NC VR36 Pull down 4.99K

For N12M VR3 pull high 4.99K VR65 NC VR36 Pull down 30K



1/18 Change VC5, VC6 from 18P to 27P.

1/18 Change N12M and N12P device ID



	VRAM Capacity	VRAM Vender	ID	VR35	P/N	P/N
N12M	64Mx16 DDR3	Hynix	0010	PD15K	H5TQ1G63DFR-12C	
		Samsung	0011	PD20K	K4W1G1646G-BC12	
	128Mx16 DDR3	Hynix	0110	PD35K	H5TQ2G63BFR-12C	
		Samsung	0111	PD45K	K4W2G1646C-HC12	

**Quanta Computer Inc.****PROJECT : Huron River**

Size	Document Number	Rev
	Nvidia 2/4	2A

1. Level 1 Environment-related Substances Should Never be Used.

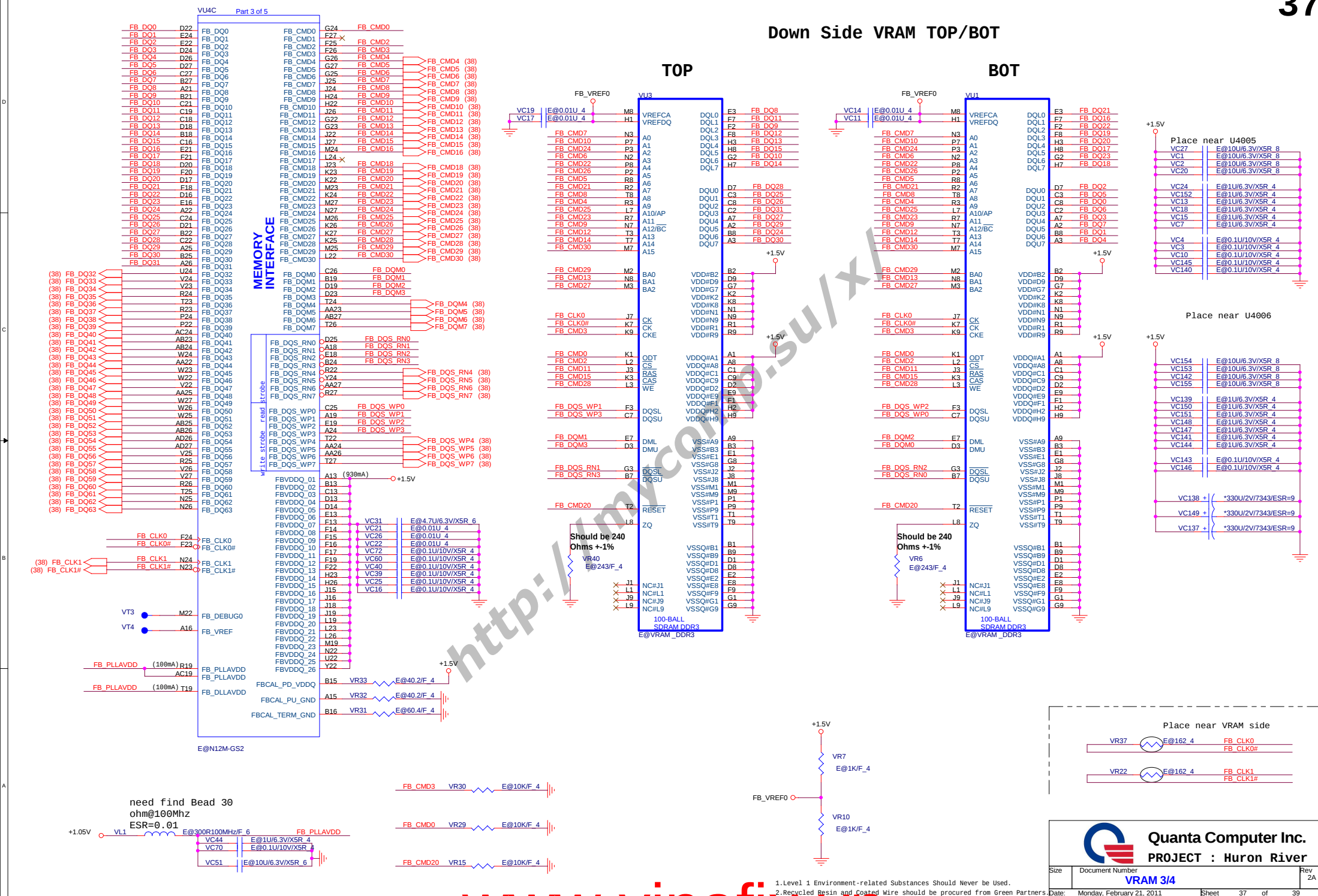
2. Recycled Resin and Coated Wire should be procured from Green Partners. Date: Tuesday, April 05, 2011

Sheet 36 of 39

Down Side VRAM TOP/BOT

TOP

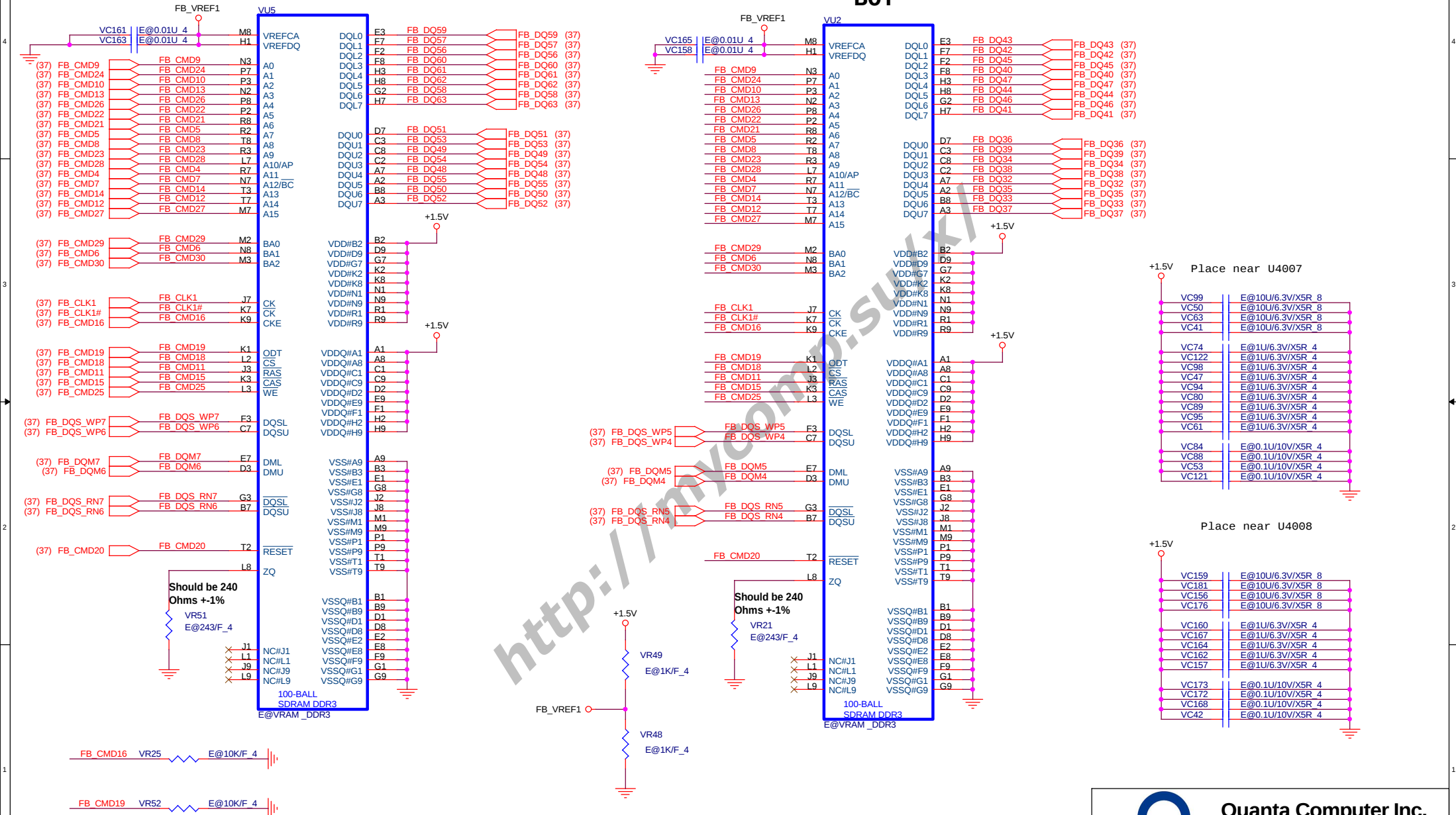
BOT



Up Side VRAM TOP/BOT

TOP

BOT



USB PORT Architecture for EVT

PORT 0	IO Port
PORT 1	IO Port
PORT 2	IO Port
PORT 3	N/A
PORT 4	IO Port
PORT 5	N/A
PORT 6	N/A
PORT 7	N/A
PORT 8	N/A
PORT 9	Camera
PORT 10	N/A
PORT 11	N/A
PORT 12	WiMax
PORT 13	BlueTooth

PCIE BUS

PORT 1	WLAN Port
PORT 2	N/A
PORT 3	N/A
PORT 4	CARD READER
PORT 5	N/A
PORT 6	GLAN(RTL8111E)
PORT 7	N/A
PORT 8	N/A

SM BUS

MBCLK/MBDATA

ISL88731CHRTZ	0001 001X
NVIDIA	1001 111X

SATA BUS

PORT 0	HDD
PORT 1	N/A
PORT 2	N/A
PORT 3	ODD
PORT 4	N/A

Board ID0 (N12M/N12P)	N12M	N12P
R294	Stuff	No Stuff
R297	No Stuff	Stuff

Board ID1 (VRAM Vendor)	Samaung	Hynix
R47	Stuff	No Stuff
R48	No Stuff	Stuff

Board ID2 (VRAM 1G/512M)	1G	512M
R39	Stuff	No Stuff
R27	No Stuff	Stuff

	DGPU_PRSENT#(GPIO39)	BOARD_ID0 (GPIO16)	BOARD_ID1 (GPIO6)	BOARD_ID2 (GPIO17)
--	----------------------	--------------------	-------------------	--------------------

UMA	0	0	0	0
N12M-GS2_SAM_512MB	1	1	1	0
N12M-GS2-SAM_1GB	1	1	1	1
N12M-GS2-HYN_512MB	1	1	0	0
N12M-GS2-HYN_1GB	1	1	0	1
N12P-GV_SAM_512MB	1	0	1	0
N12P-GV-SAM_1GB	1	0	1	1
N12P-GV-HYN_512MB	1	0	0	0
N12P-GV-HYN1_1GB	1	0	0	1