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09	HSW PCH(PCIE/USB)	1A	
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32	POWER CHARGER (ISL88731C)	1A	
33	POWER VGA_CORE/1.0(RT8812A)	1A	
34	POWER VGE1CORE/ANT8802X	1A	
35	NVIDIA N14 GB2-64 PCIE 1/4	1A	
36	NVIDIA N14 GB2-64 TMD5 2/4	1A	
37	NVIDIA N14 GB2-64 VRAM 3/4	1A	
38	NVIDIA N14 GB2-64 VRAM 4/4	1A	
39	AUDIO Woofer	1A	

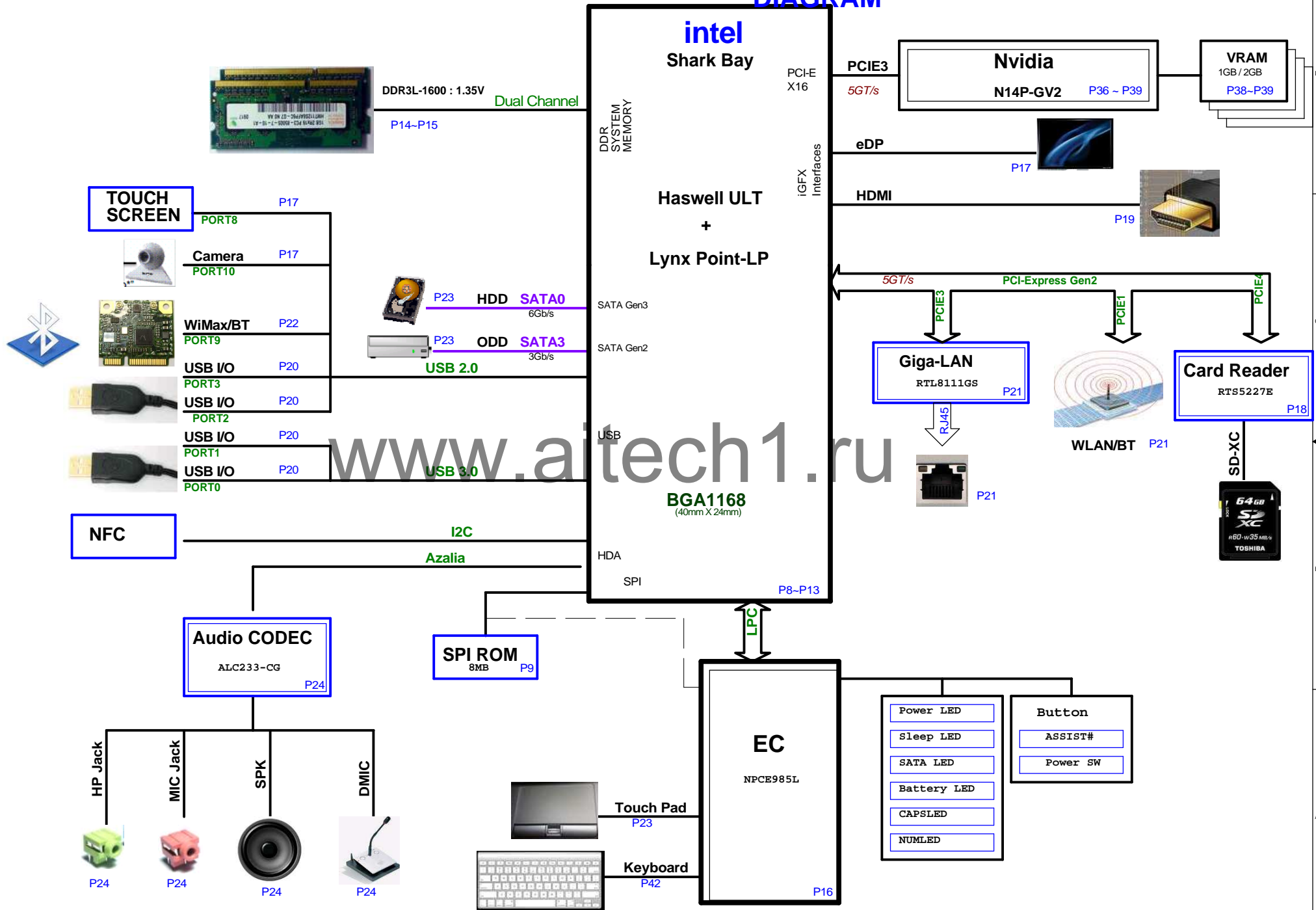
Page	Title of schematic page	Rev.	Date
40	IO PORT LIST	1A	
		1A	
		1A	
		1A	

* : No mount
L@ : For LVDS output
D@ : For eDP output
E@ : For DIS GFX
I@ : For UMA

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HKC Haswell ULT BLOCK DIAGRAM

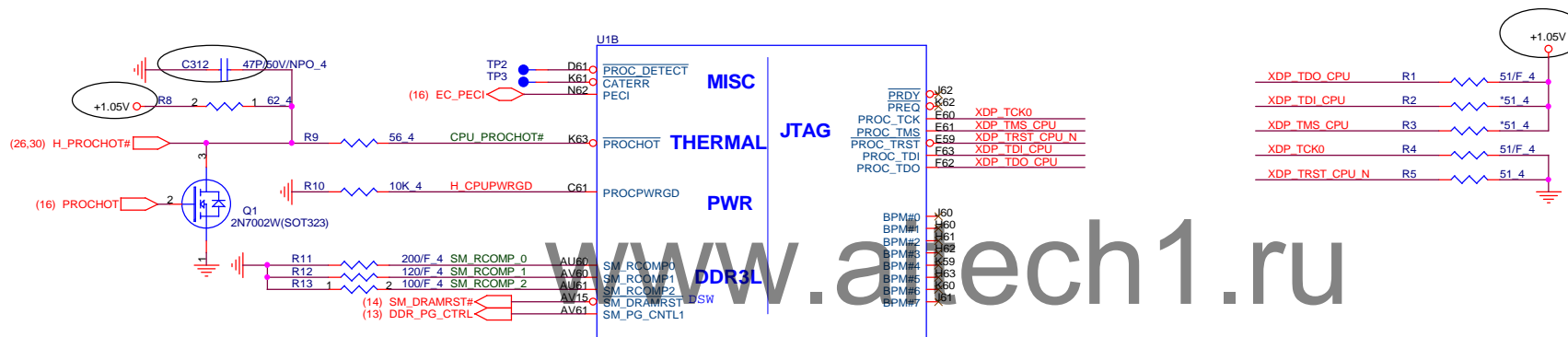
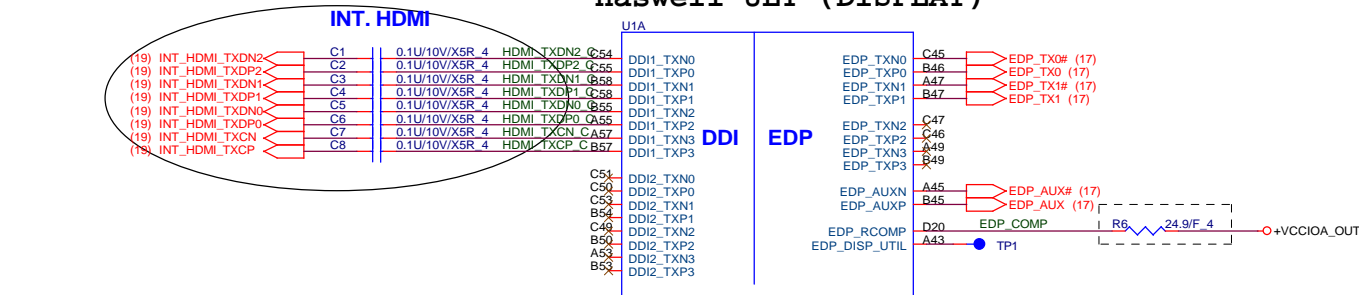
02



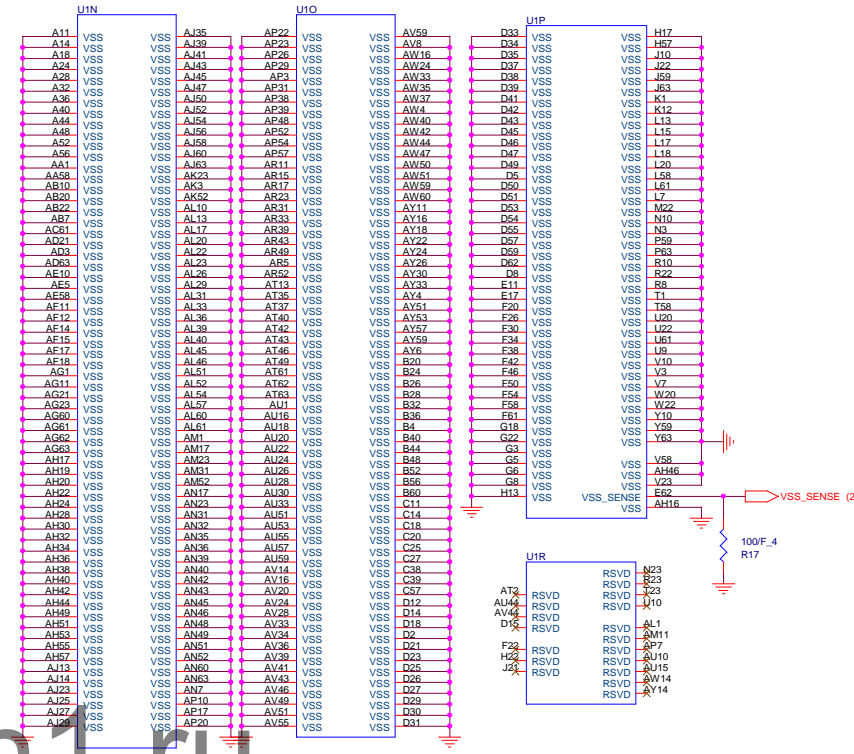
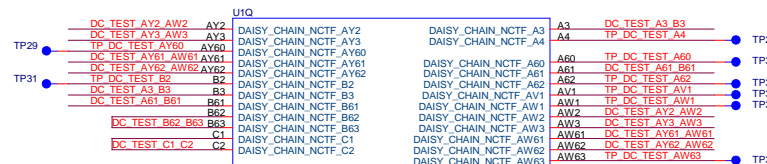
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Haswell ULT (DISPLAY)

4

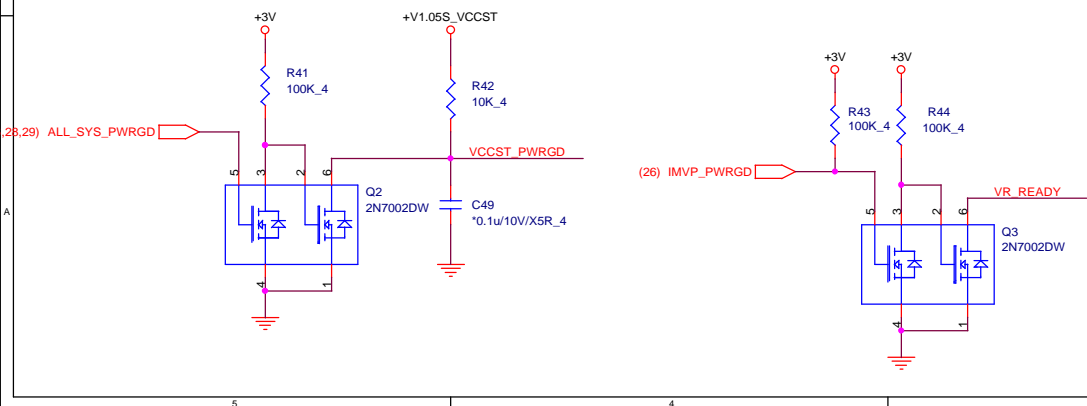
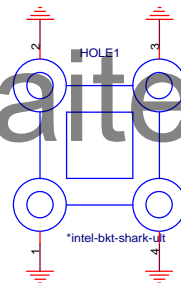
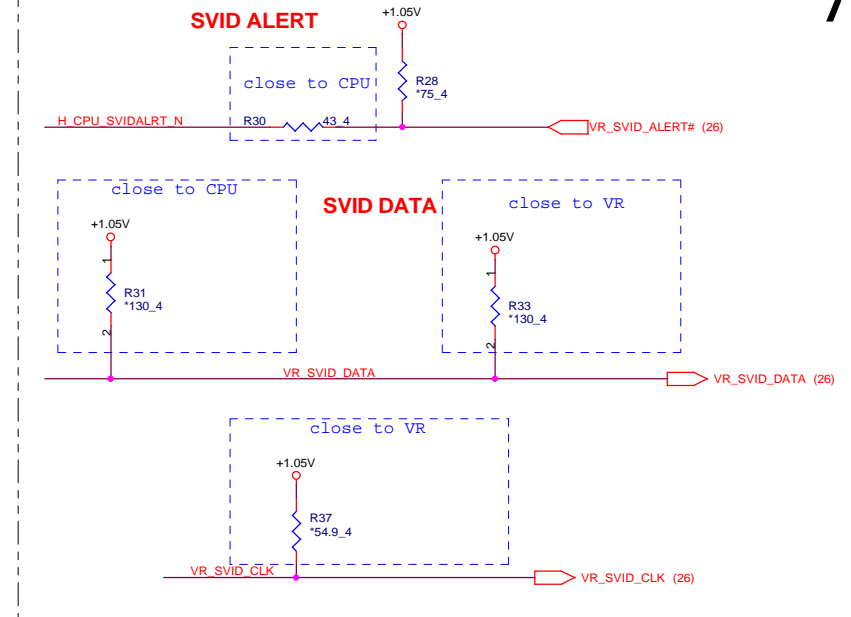
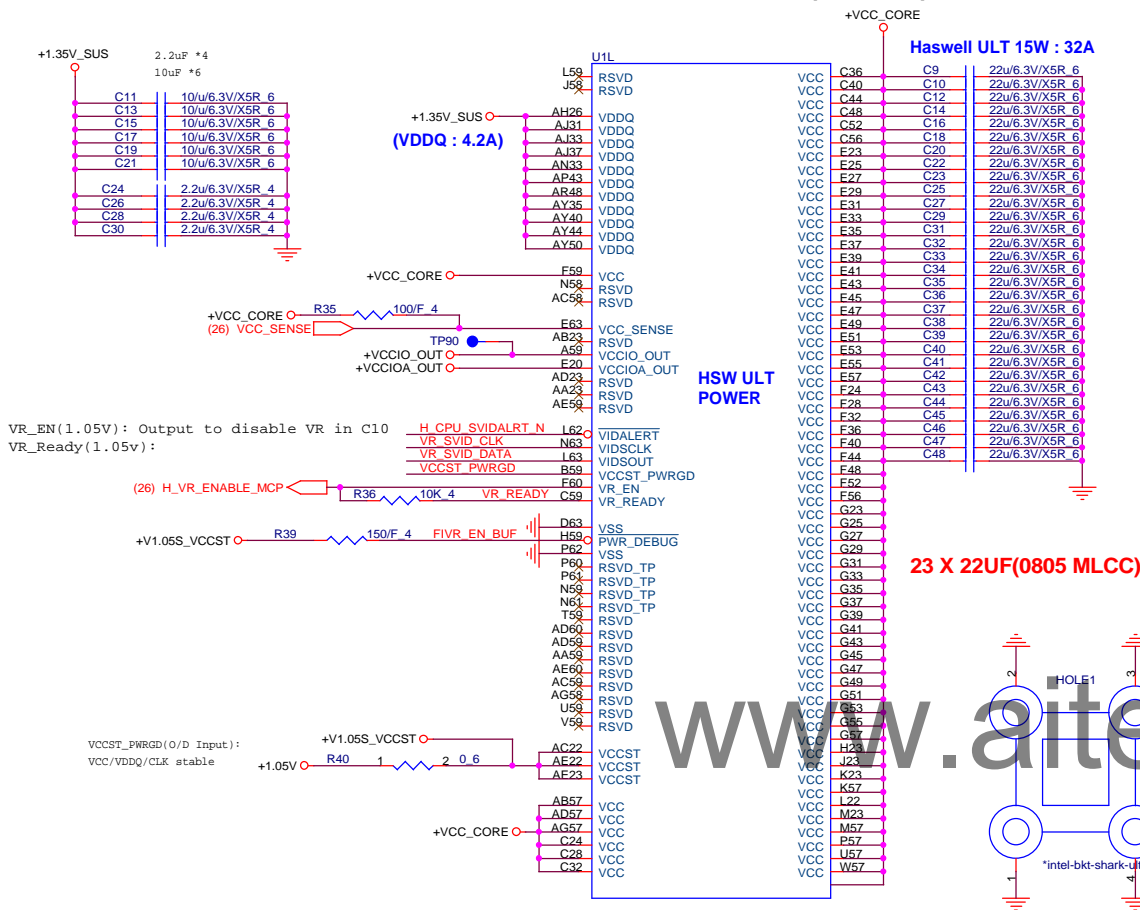


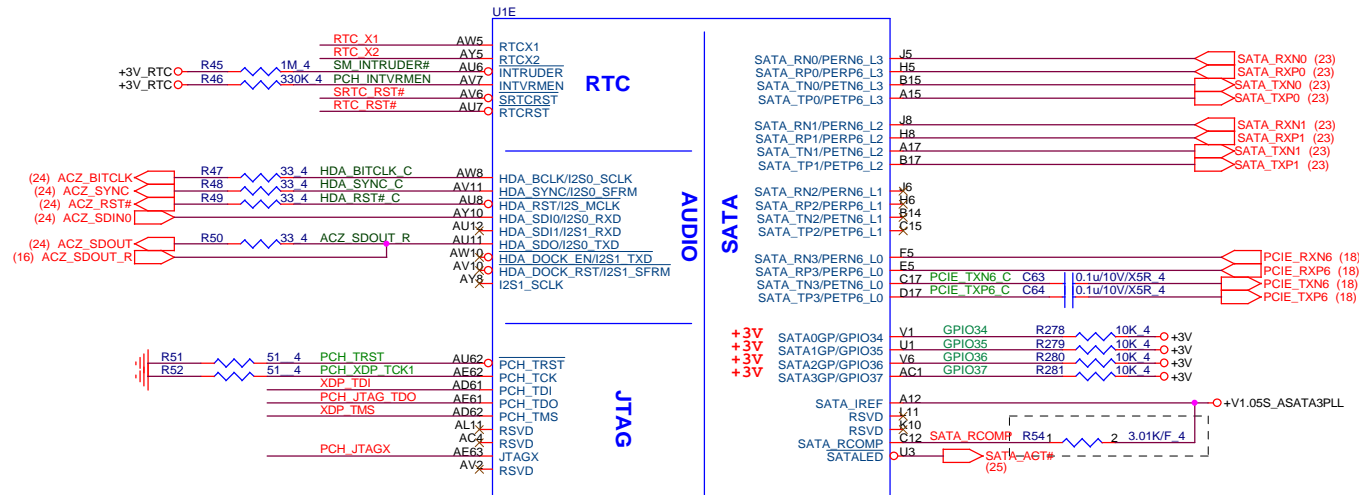
HSW ULT (GND)

[illegible]

	1	0	
CFG0 EAR-STALL/NOT STALL RESET SEQUENCE AFTER PCU PLL IS LOCKED	(DEFAULT) NORMAL OPERATION; NO STALL	STALL	
CFG1 PCH/ PCH LESS MODE SELECTION	(DEFAULT) NORMAL OPERATION	PCH-LESS MODE	
CFG3 PHYSICAL_DEBUG_ENABLED (DFX PRIVACY)	DISABLED	ENABLED SET DFX ENABLED BIT IN DEBUG INTERFACE MSR	
CFG4 DISPLAY PORT PRESENCE STRAP	DISABLED NO PHYSICAL DISPLAY PORT ATTACHED TO EMBEDDED DISPLAY PORT	ENABLED; NOA WILL BE AVAILABLE REGARDLESS OF THE LOCKING OF THE UNIT	
CFG 8 ALLOW THE USE OF NOA ON LOCKED UNITS	DISABLED(DEFAULT); IN THIS CASE, NOA WILL BE DISABLED IN LOCKED UNITS AND ENABLED IN UN-LOCKED UNITS	ENABLED AN EXTERNAL DISPLAY PORT DEVICE IS CONNECTED TO THE EMBEDDED DISPLAY PORT	
CFG9 NO SVID PROTOCOL CAPABLE VR CONNECTED	VRS SUPPORTING SVID PROTOCOL ARE PRESENT	NO VR SUPPORTING SVID IS PRESENT. THE CHIP WILL NOT GENERATE (OR RESPOND TO) SVID ACTIVITY	
CFG10 SAFE MODE BOOT	POWER FEATURES ACTIVATED DURING RESET	POWER FEATURES (ESPECIALLY CLOCK GATINE ARE NOT ACTIVATED	

Haswell ULT MCP(POWER)

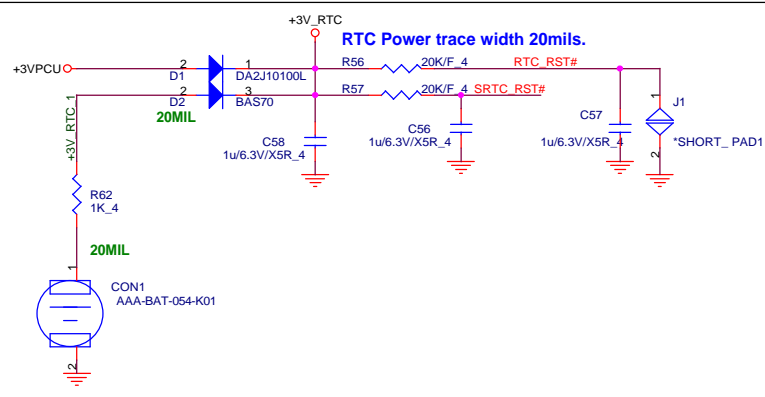
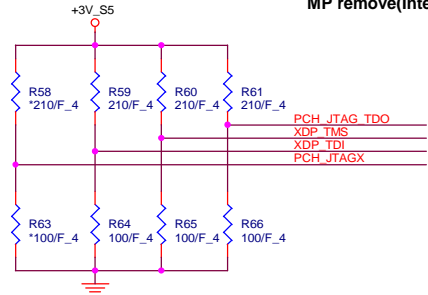




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PCH JTAG Debug (CLG)

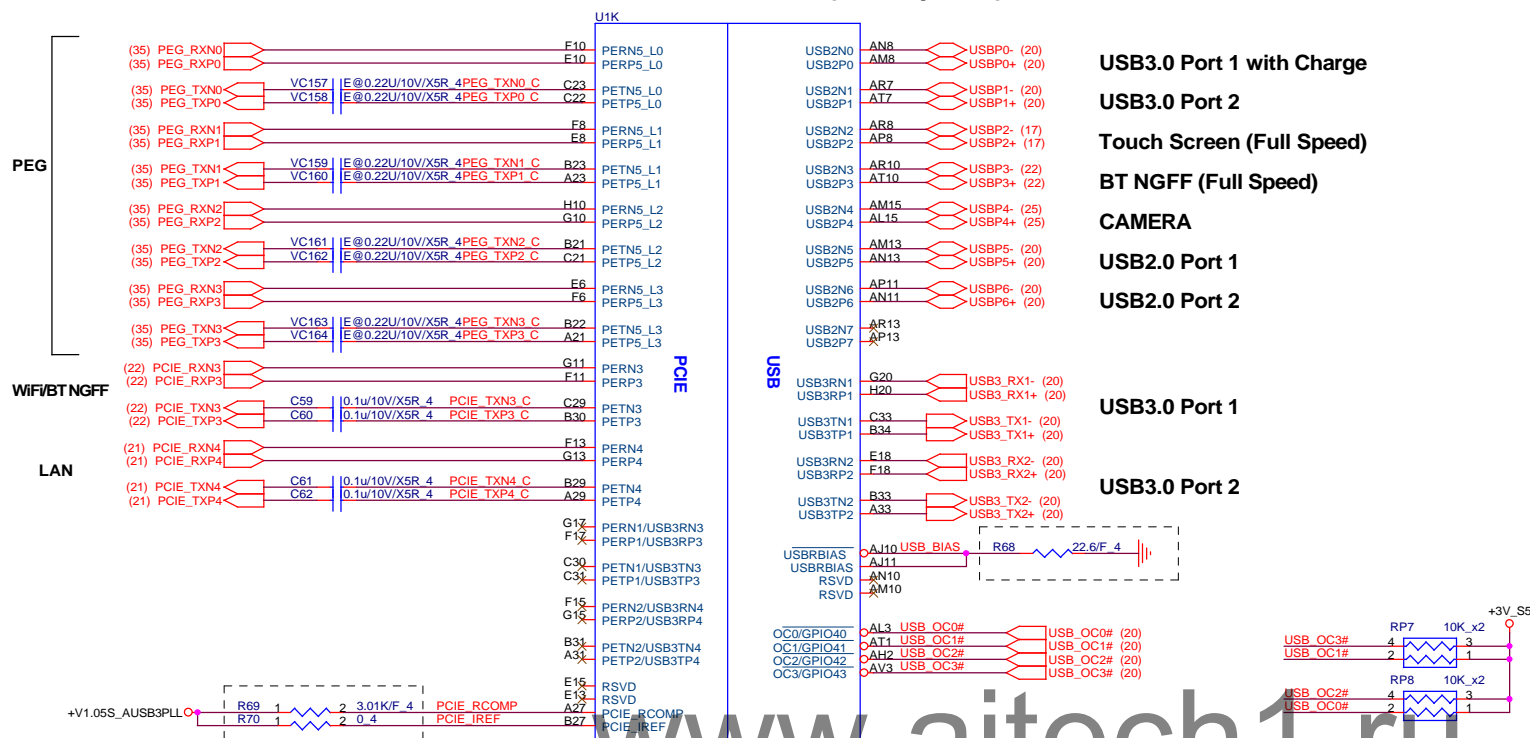
MP remove(Intel)



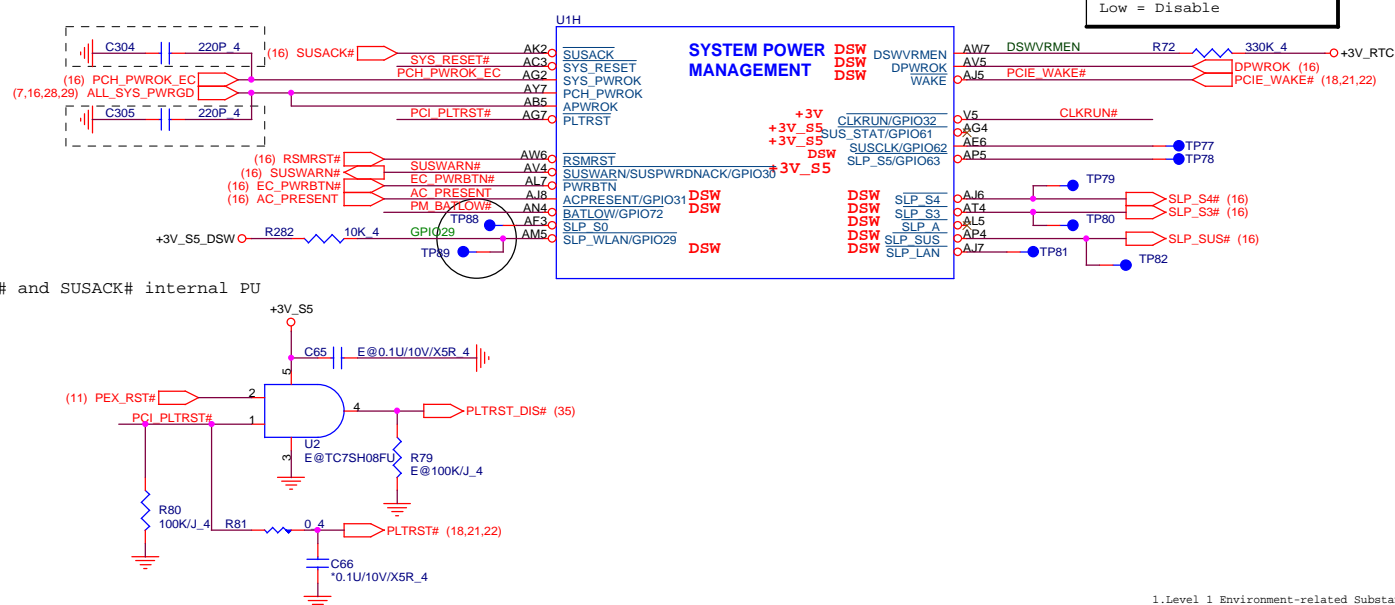
PCH Strap Table

Pin Name	Strap description	Sampled	Configuration	note
SPKR	No reboot mode setting	PWROK	0 = Default (weak pull-down 20K) 1 = Setting to No-Reboot mode	+3V — R67 — *1K — SPCR (11,24)
HDA_SDO	Flash Descriptor Security Override / Intel ME Debug	PWROK	0 = Security Effect (Int PD) 1 = Can be Override	
INTVRMEN	Mode Integrated 1.05V VRM enable	ALWAYS	Should be always pull-up	

Haswell ULT (PCIe,USB)

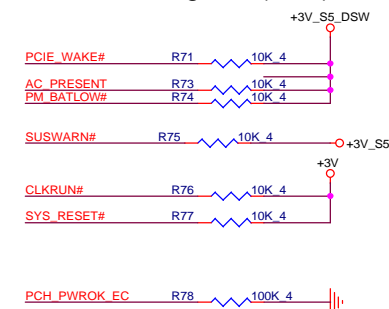


Haswell ULT (SYSTEM POWER MANAGEMENT)



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

PCH Pull-high/low(CLG)



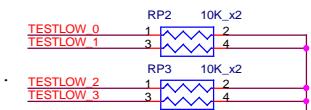
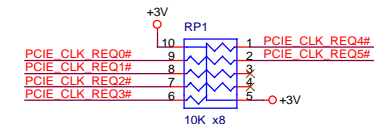
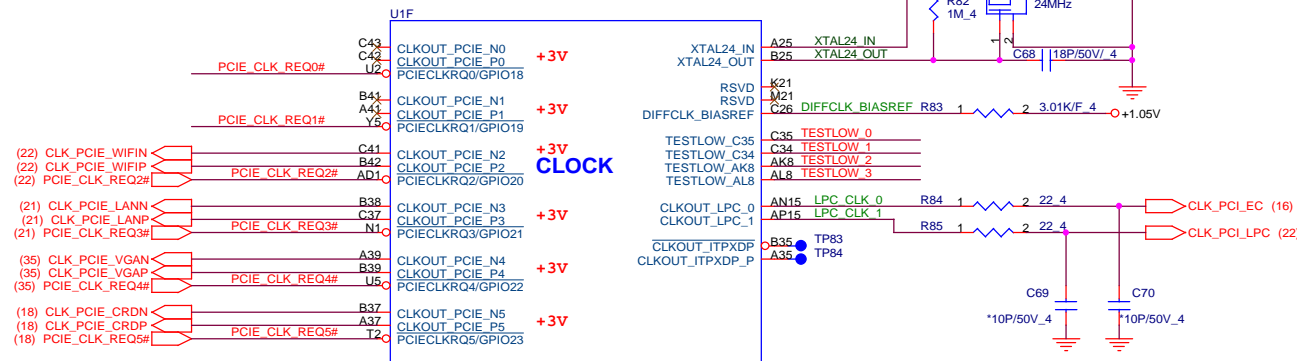
Haswell ULT (CLK)

WiFi/BT(NGFF)

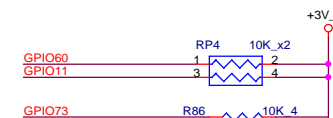
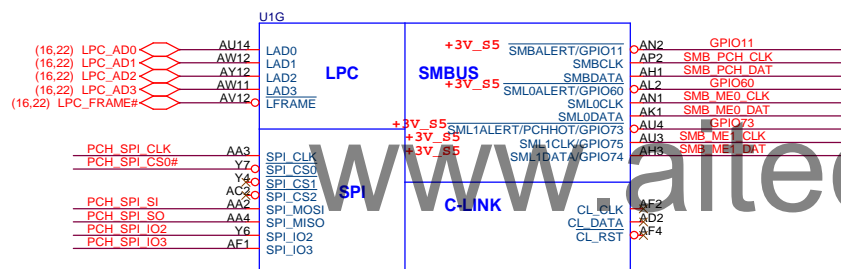
LAN

GFX

Card Reader



Do not short
the testlow pins together.

**Haswell ULT (LPC/SPI/SMB/CLINK)**

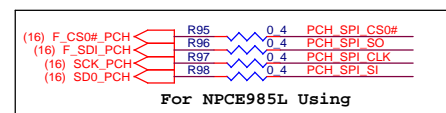
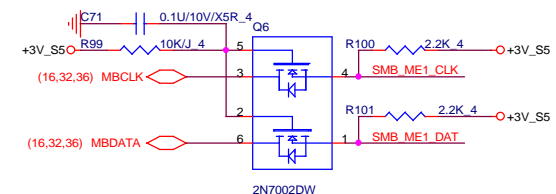
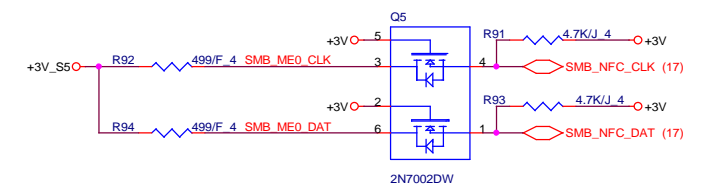
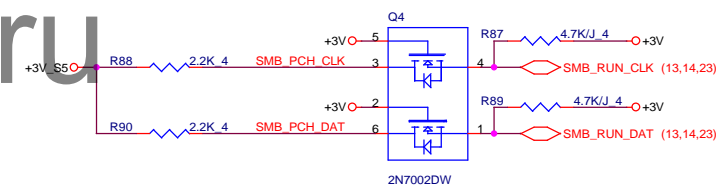
SPD

NFC

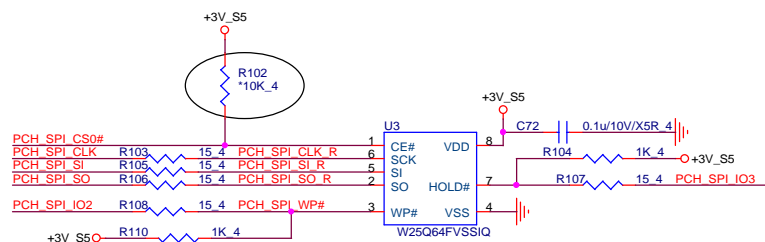
EC

1

SMBus/Pull-up(CLG)



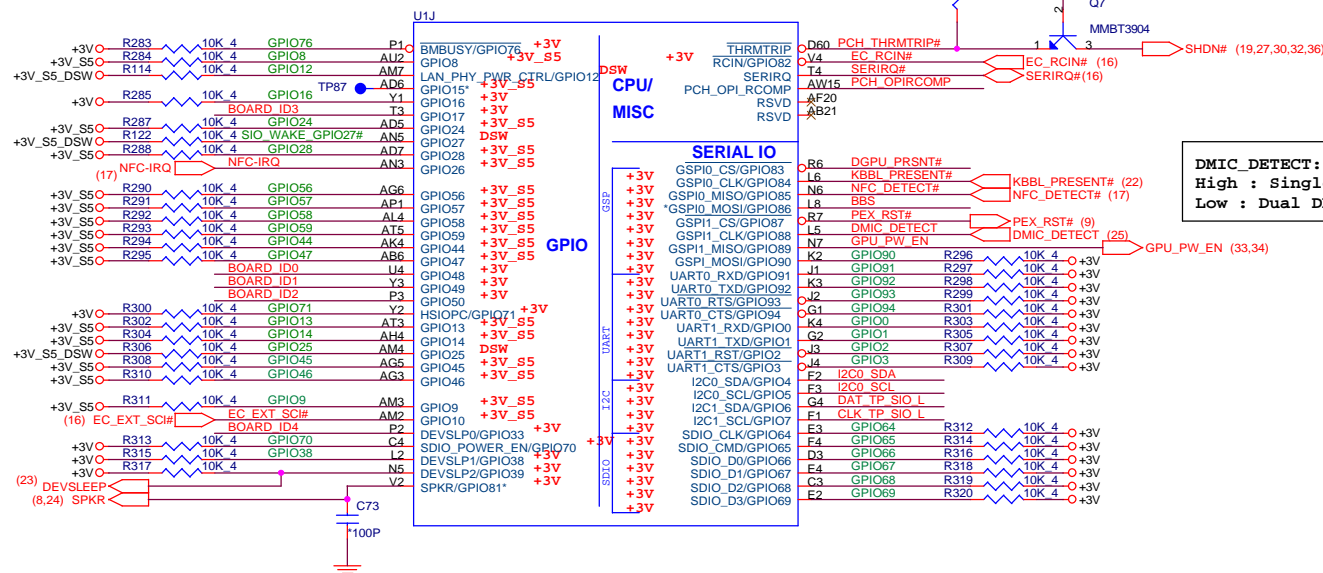
SPI FLASH



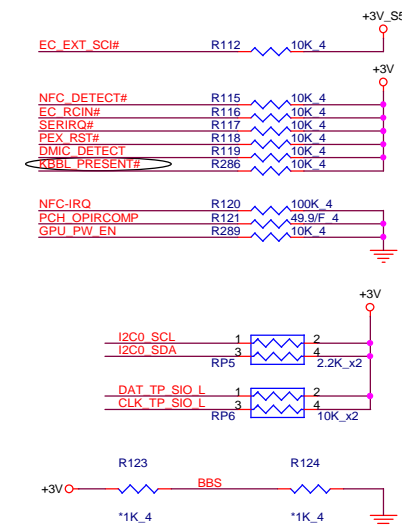
Hasswell ULT(GPIO,LPIO,MISC)

GPI027

With Intel LAN:
Connect to LANWAKE# pin on the LAN
Without Intel LAN:
Used to wake event from DSx



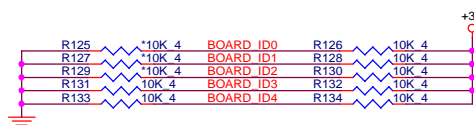
GPIO Pull-up/Pull-down(CLG)



```
DMIC_DETECT:
High : Single DMIC
Low  : Dual DMIC
```

25) GPU_PW_EN (33,34)


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GPIO86	
PU	LPC
PD	SPI (Default IPD)

No Reboot Strap(GPIO81)	
NC	Default
PU	EN

TLS CONFIDENTIALITY STRAP(GPIO15)	
NC	Default
PU	EN

 <div> Quanta Computer Inc. PROJECT : HKC </div>		
Size	Document Number	HSW PCH(GPIO/MISC) Revision

	0	1
Board ID0	CaspiSHAL-CaspiSHB1 HKC/HKD	SuperiorSHAL-SuperiorSHB1 GD9/GDA
Board ID1	HKC1/GD9 14"	HKD-GDA 15"

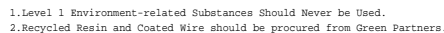
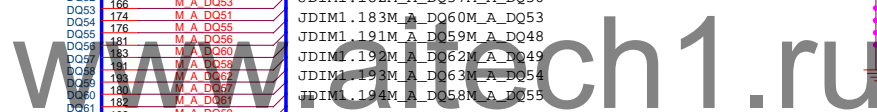
PCBA SKU	Discrete	UMA
R277(Pull High)	Stuff	No Stuff
R275(Pull Low)	No Stuff	Stuff



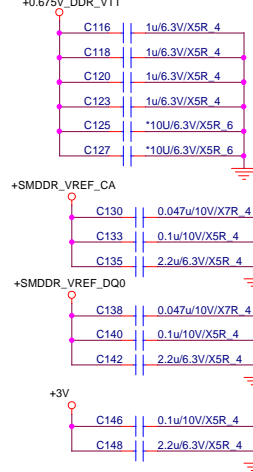
HSW PCH(Power)

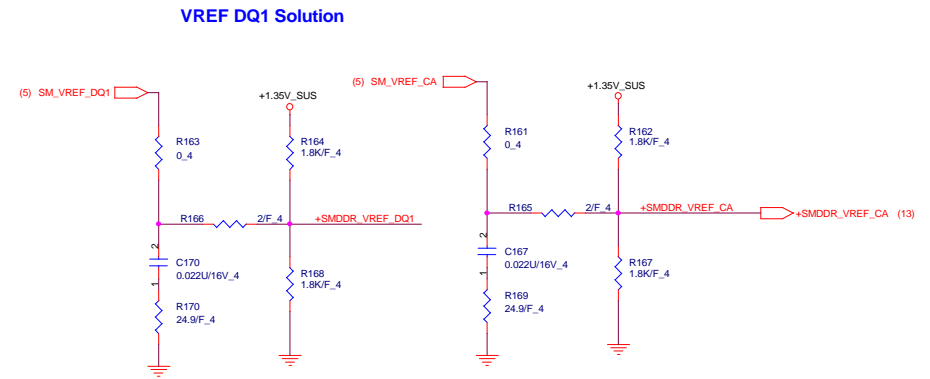
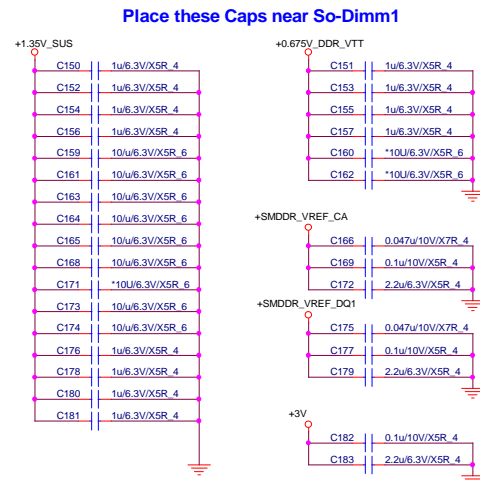
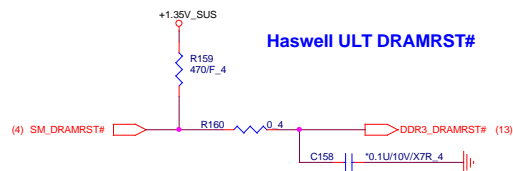
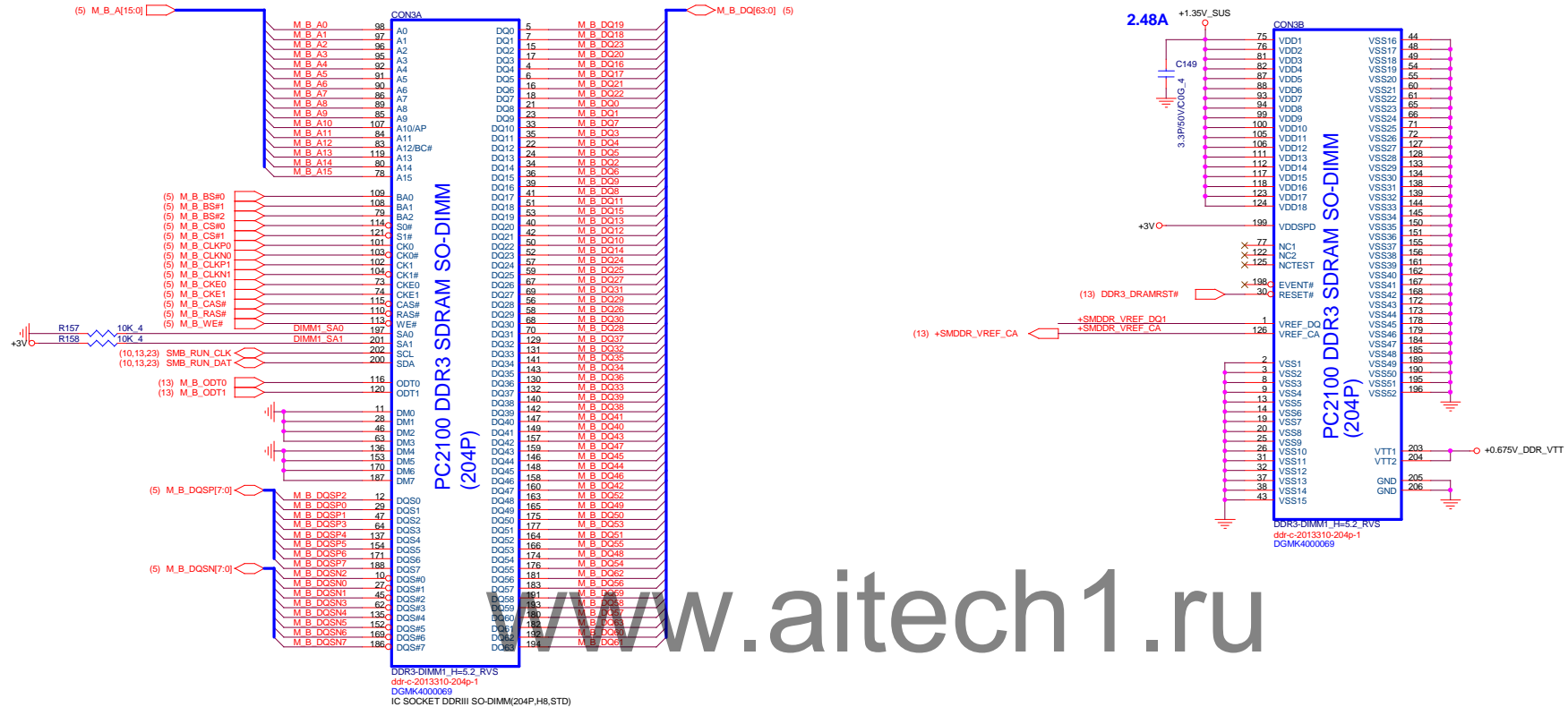
Sheet 12 of 40

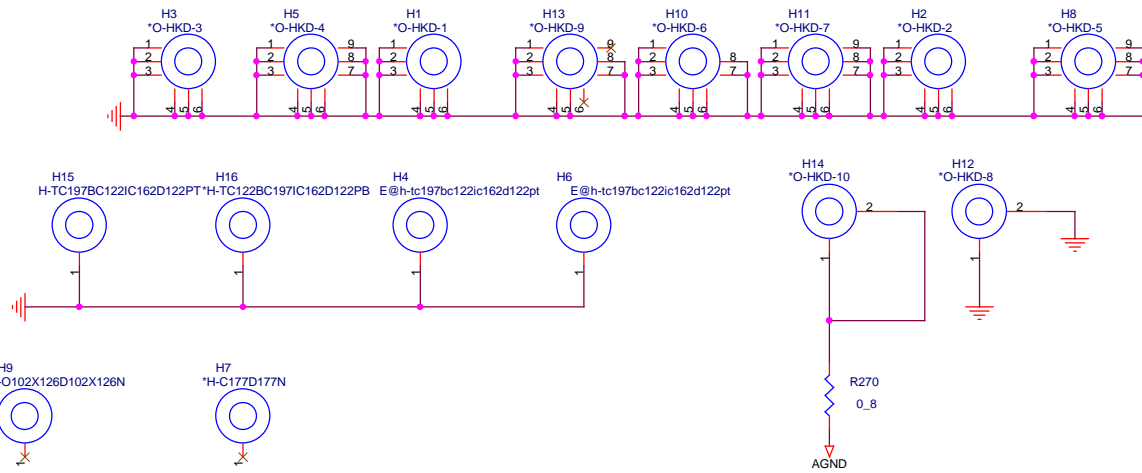
Sheet 12 of 40



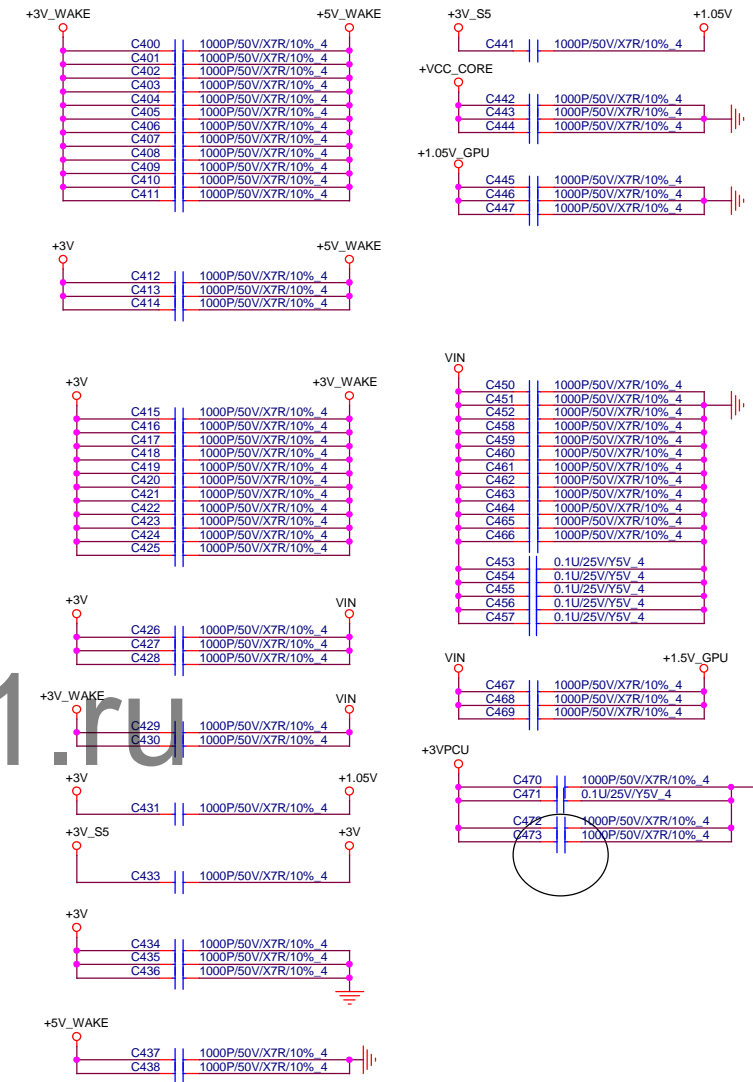
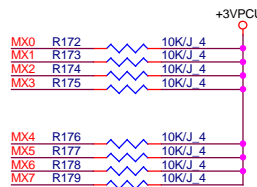
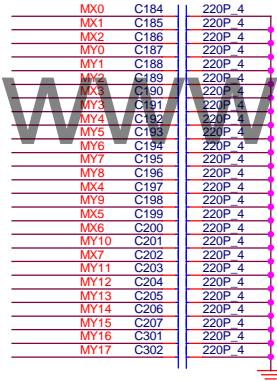
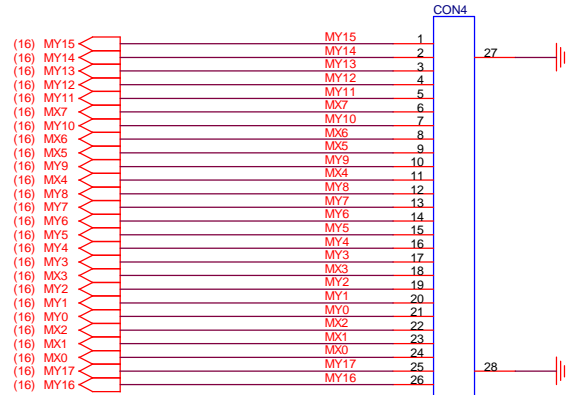
-0.675V DDB VTT








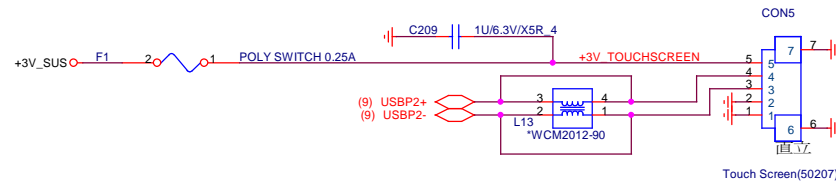
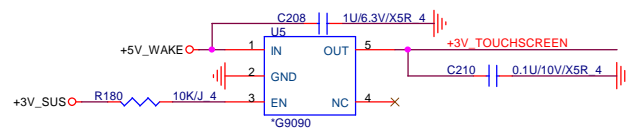
KEY BOARD Connector



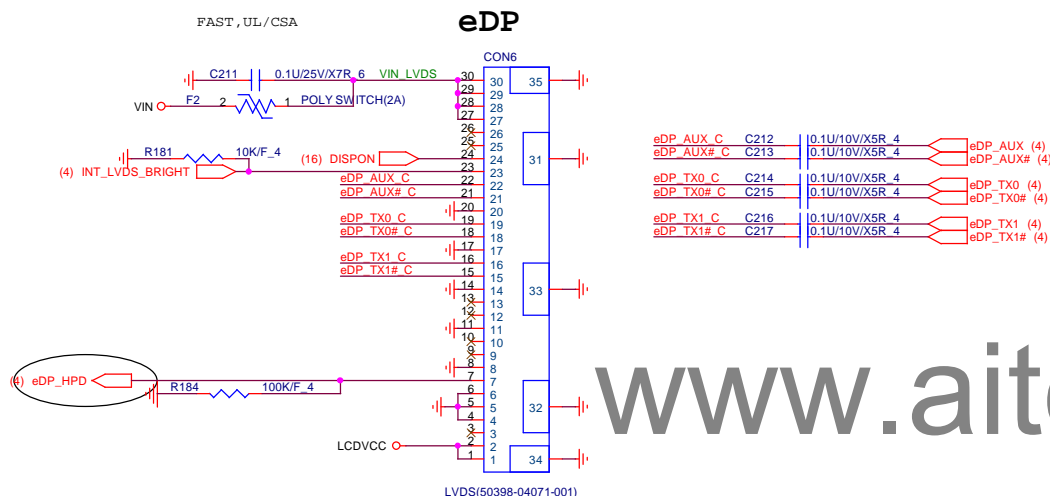
1. Level 1 Environment-related Substances Should Never be Used.
2. Recycled Resin and Coated Wire should be procured from Green Partners.

 Quanta Computer Inc. PROJECT :HKC		Size	Document Number	Rev
				1A
Date:	Tuesday, February 05, 2013	Sheet	15	of 40

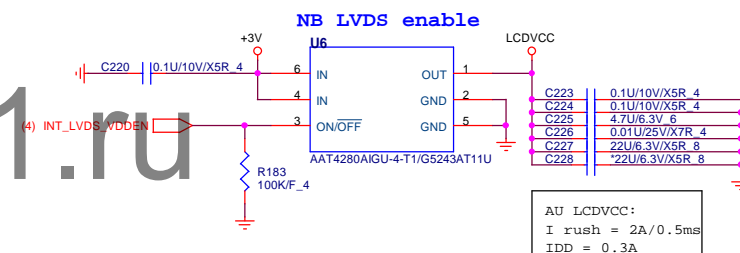
Touch Screen



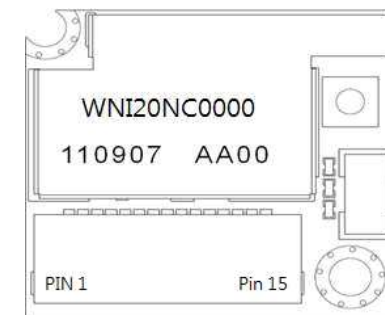
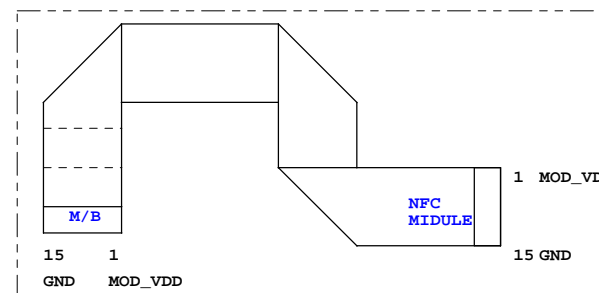
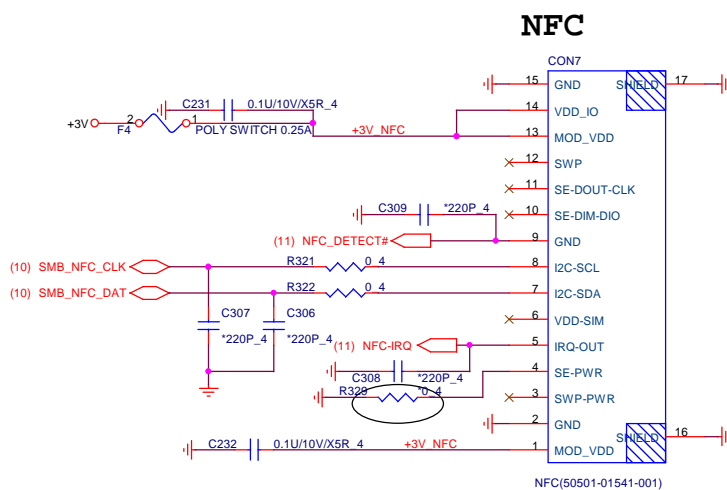
NFC module :
Vender : Samsung SNC-i20
Power consumption : Max. 160mW/48mA
Power Ripple +/- 50mV



Camera HD specification
Voltage: Max. 3.6V
Current : Max. 200mA
OCP: 200mA ~ 300mA



AU LCDVCC:
I rush = 2A/0.5ms
IDD = 0.3A



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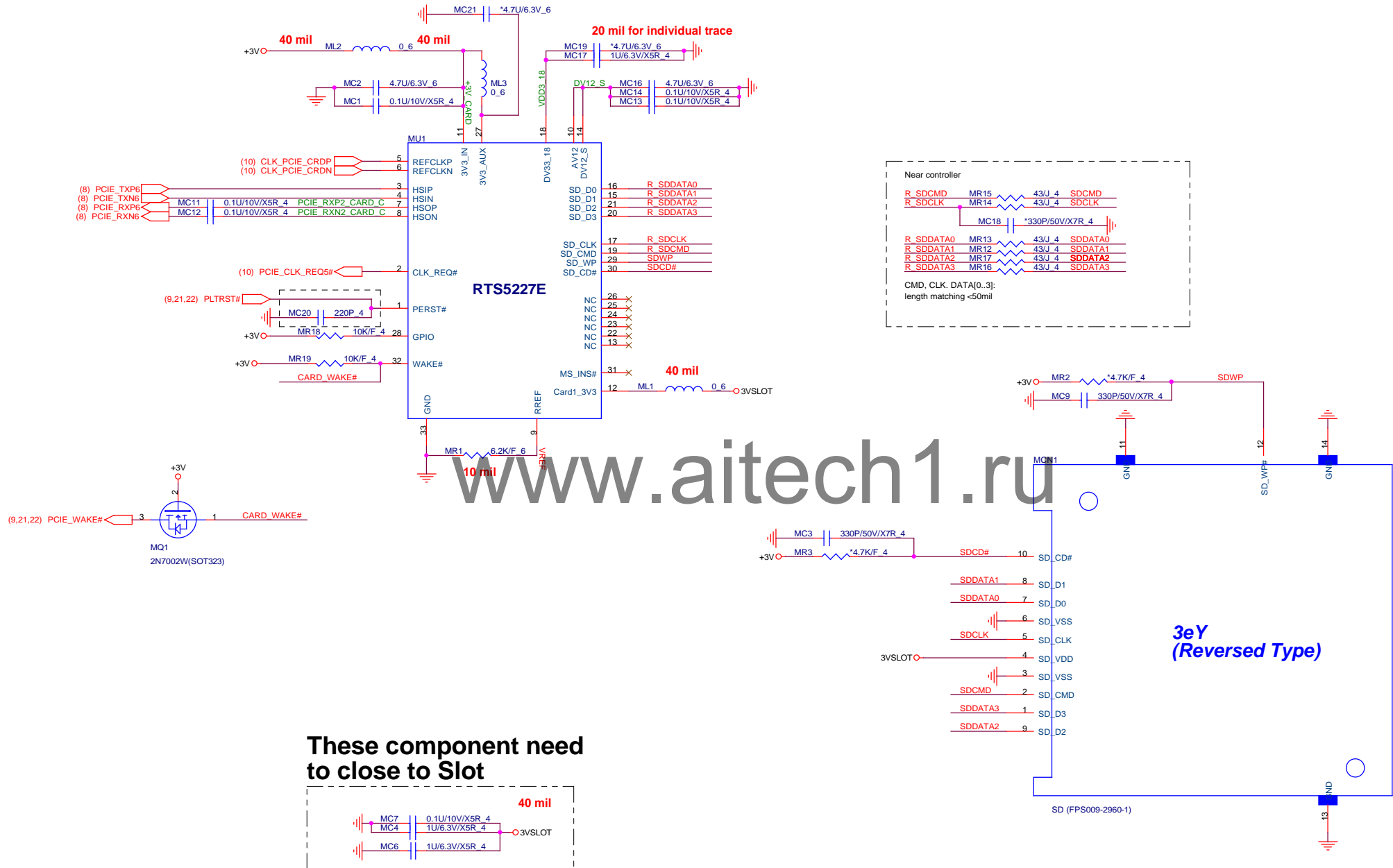
PROJECT :HKC

CRT/LVDS

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

Date: Monday, February 04, 2013 Sheet 17 of 40



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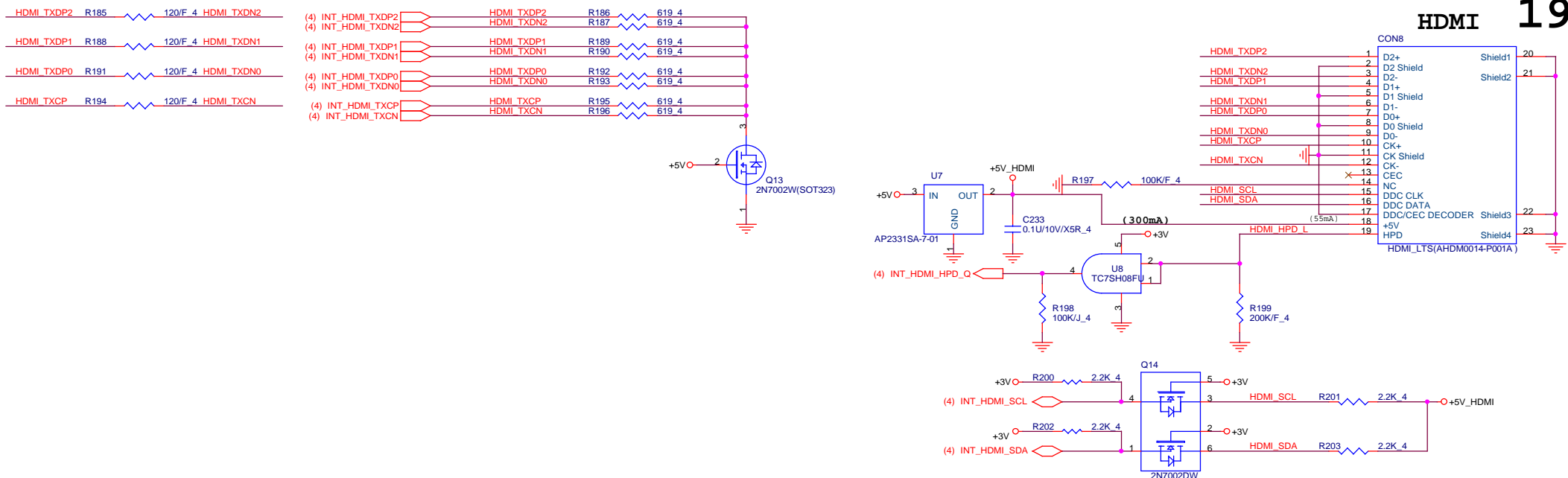
PROJECT : HKC

Size Document Number **CARD** Rev 1A

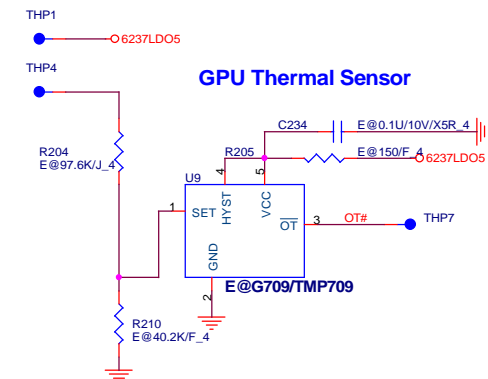
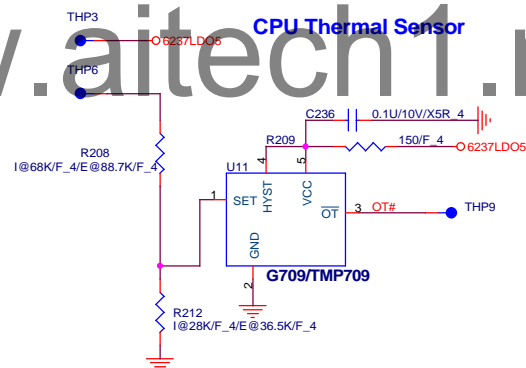
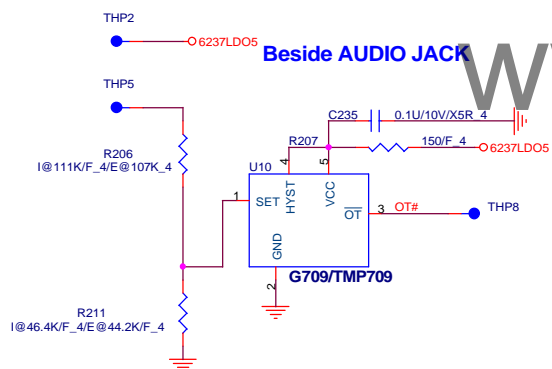
1. Level 1 Environment-related Substances Should Never be Used.

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

Date: Thursday, January 24, 2013 Sheet 18 of 40



H/W Thermal Protect



$$RSET(kQ) = 0.0012T^2 - 0.9308T + 96.147$$

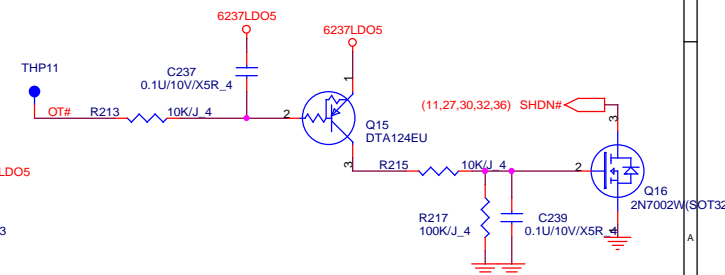
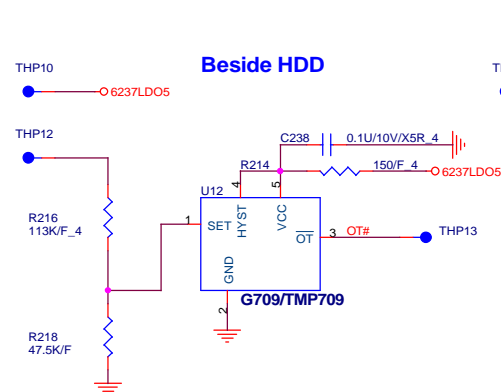
95	18.5K
100	15K
107	10.3K
110	8.2K

DIS SKU

Location of IC	Temp	R-Set	Parts in BOM	Max	Min
Near CPU sensor temp	70	R208=36.87K	36.5K	71	70
Near GFX sensor temp	65	R146=40.72K	40.2K	66.3	65.1
Near AUDIO sensor temp	60	R345=44.62K	44.2K	61.2	60

UMA SKU

Location of IC	Temp	R-Set	Parts in BOM	Max	Min
Near CPU sensor temp	81	R208=28.63K	28K	82.3	81.4
Near AUDIO sensor temp	58	R345=46.2K	46.4K	58.4	57.1



Quanta Computer Inc.

PROJECT : HKC

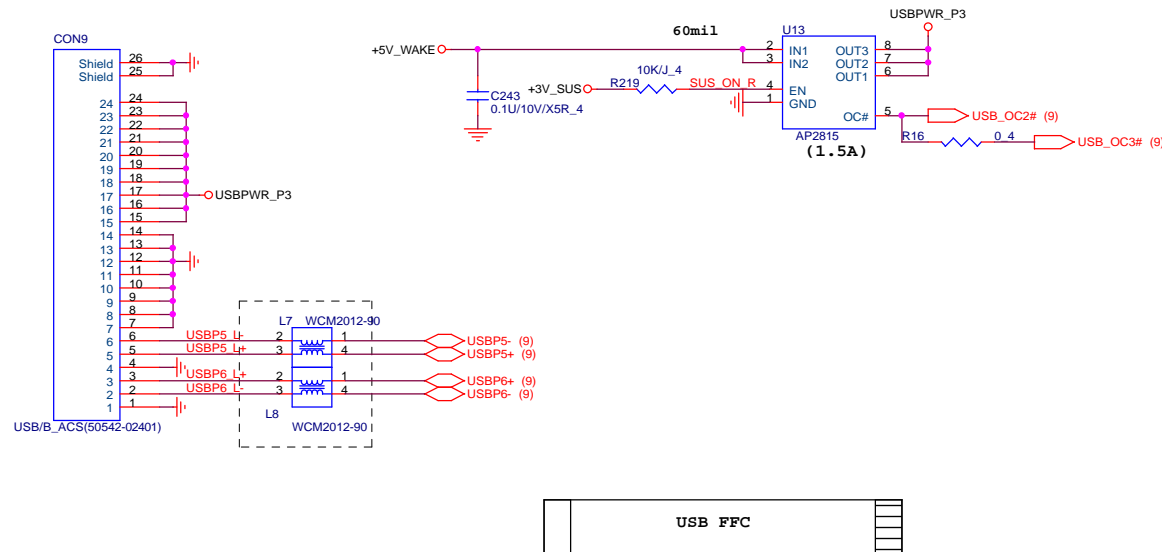
Size	Document Number	Rev
	HDMI/Thermal IC	1A

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

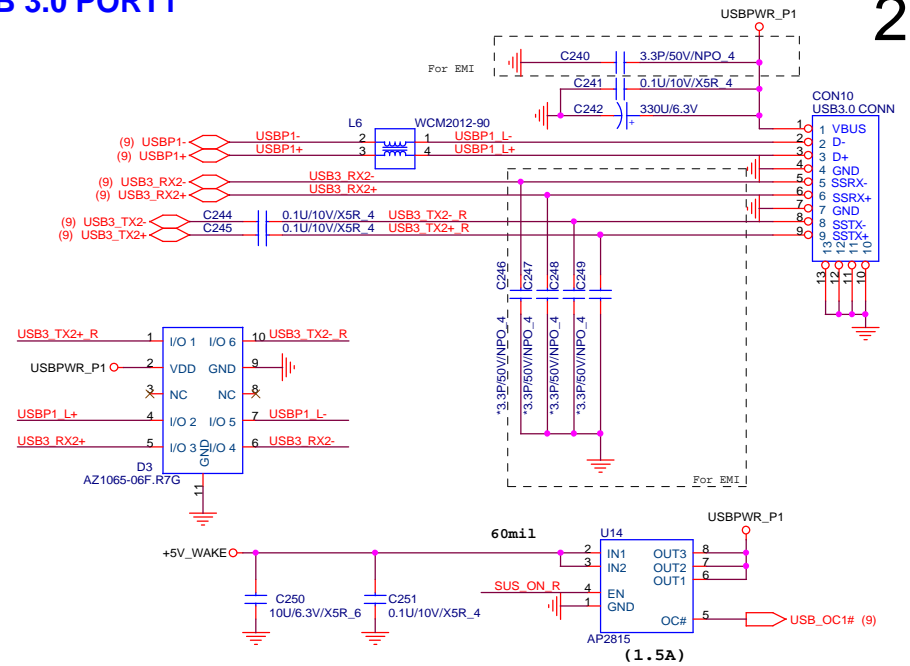
2. Recycled Resin and Coated Wire should be procured from Green Partners

Date: Thursday, January 31, 2013 Sheet 19 of 40

MB to USB board



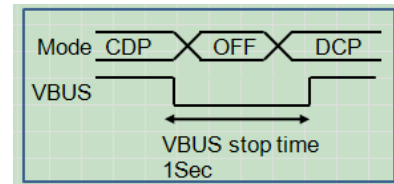
USB 3.0 PORT1



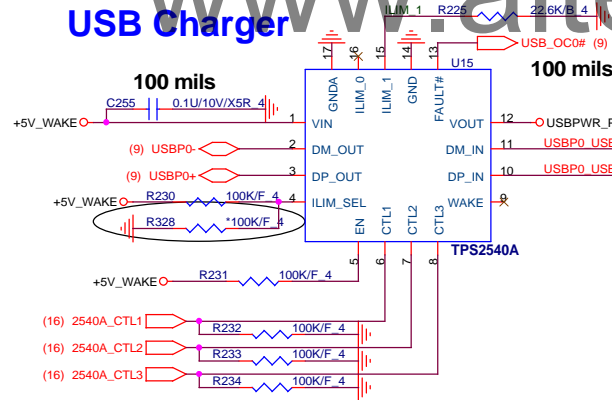
20

	TPS2540A	TPS2543
ILIM_SEL	Pin15	Pin16
High	V	V
Low	V	V

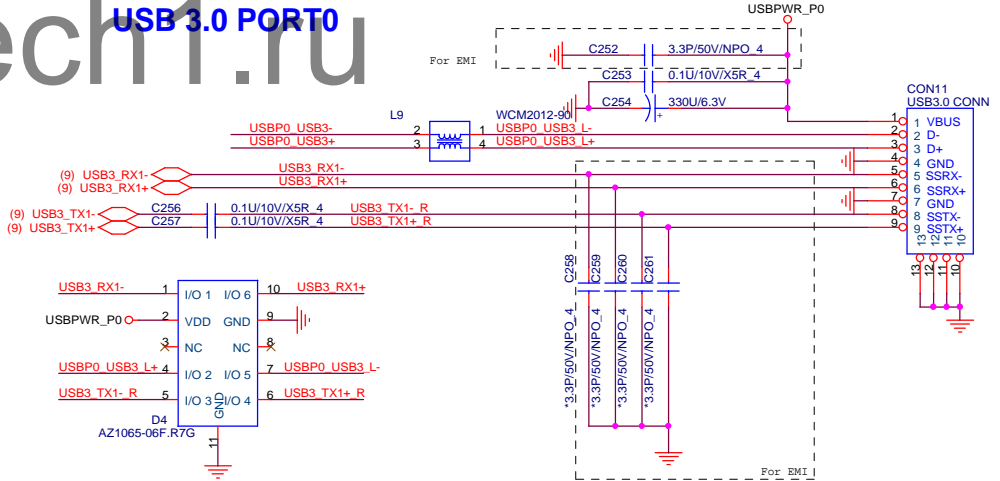
SDP : Standard Downstream Port
CDP : Charging downstream port
DCP : Dedicated Charging Port
Enable/Disable : setting by BIOS



USB Charger



USB 3.0 PORT0

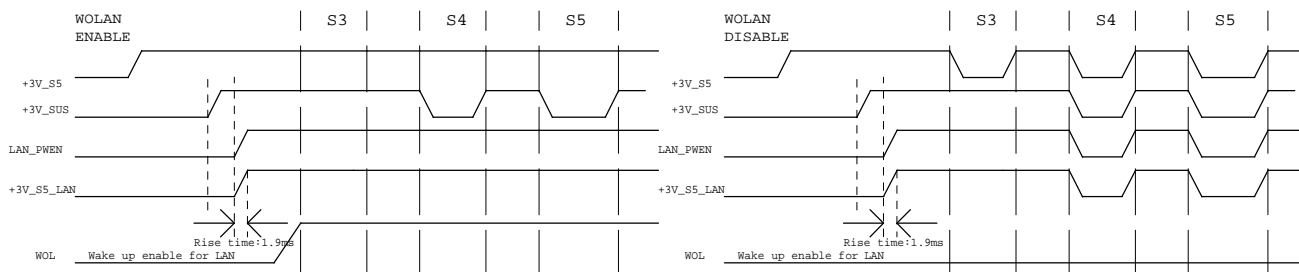
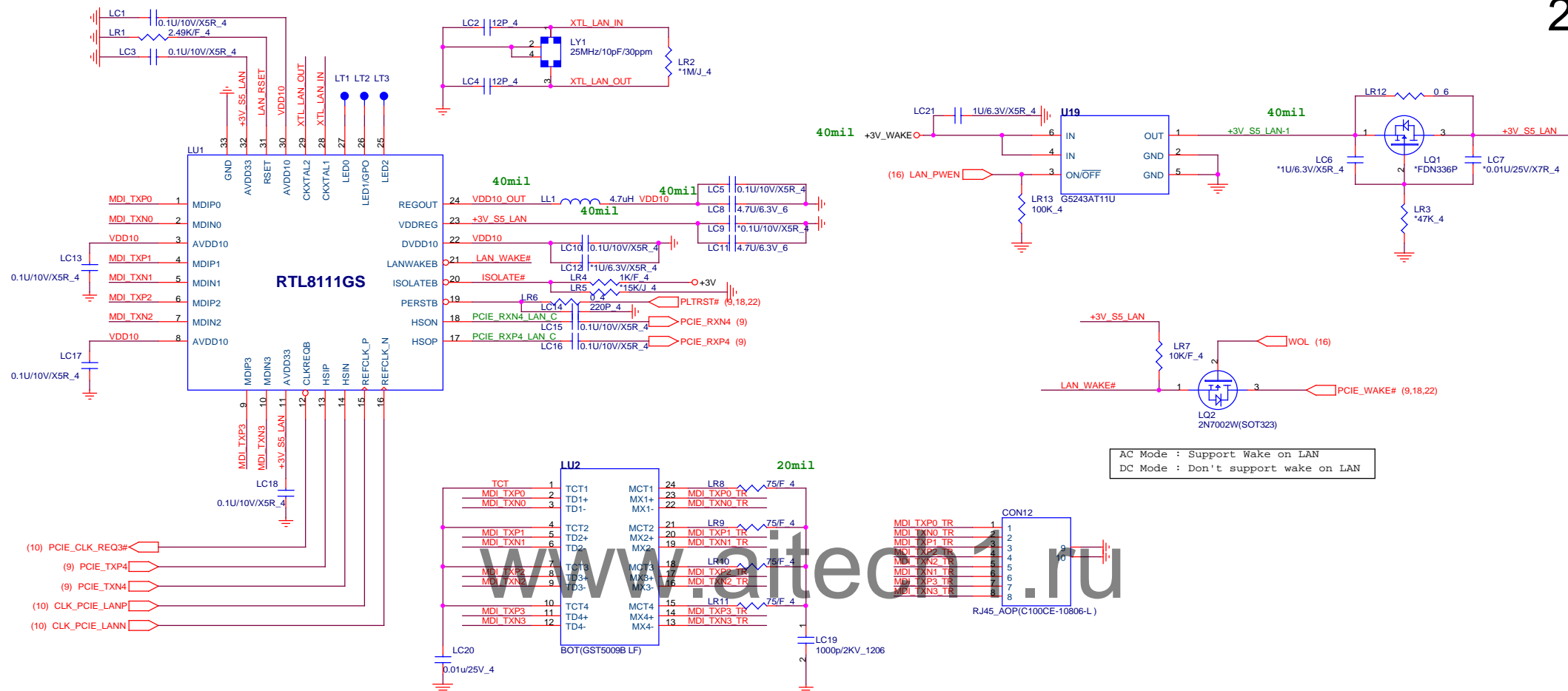


CTL_1	CTL_2	CTL_3	TPS 2540A/2543 Truth Table
0	0	0	OUT discharge, power switch OFF
0	X	1	DCP, Auto-detect (S3/S4/S5, 1.5A)
X	1	0	SDP, USB2.0 mode (S0, 0.5A)
1	0	0	DCP, BC SPEC1.2 only (S3/Deep standby/S4/S5, 1.5A)
1	0	1	DCP, Divider mode only (S3/S4/S5, 1.5A)
1	1	1	CDP (S0, 1.5A)

System State	USB Battery Charging Setting	
	Disable	Enable
S0	Disable C(1 2 3)	Enable C(1 2 3)
S3	SDP (X 1 0)	CDP (1 1 1)
DS3	SDP (X 1 0)	DCP BC (1 0 0)
S4	Charger OFF (0 0 0)	DCP BC (1 0 0)
S5	Charger OFF (0 0 0)	DCP BC (1 0 0)

ILIM_SEL	(I LIMIT(A)= 48000/R)
HI	I_LIM_1
LO	I_LIM_0

Quanta Computer Inc.
PROJECT : HKC
USB/USB Charger
Size Document Number
Date: Thursday, January 31, 2013 Sheet 20 of 40
Rev 1A



BIOS Setup	WOLAN DISABLE		WOLAN ENABLE	
	LAN_PWEN	WOL	LAN_PWEN	WOL
S3	H	H	H	H
S4	L	L	H	H
S5	L	L	H	H



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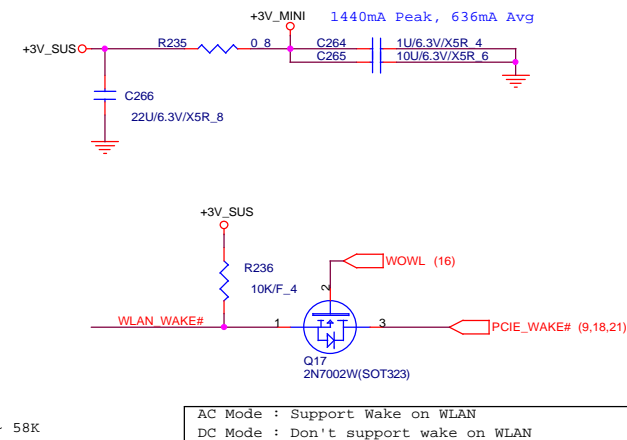
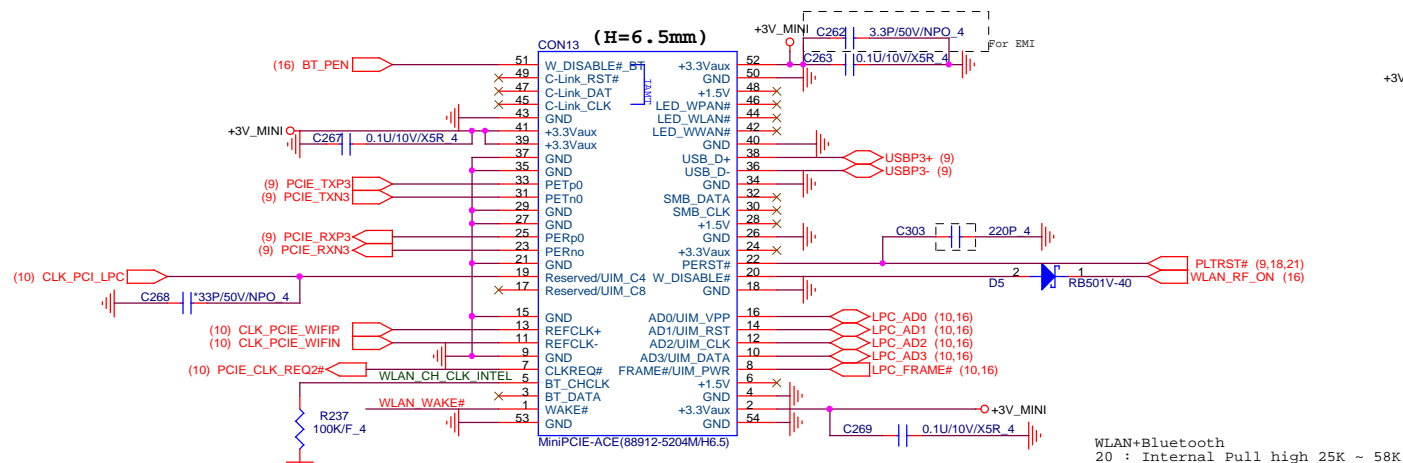
PROJECT : HKC

Size	Document Number	Date	Sheet	of	Rev
	Giga LAN RTL8111GS	Friday, January 25, 2013	21	40	1A

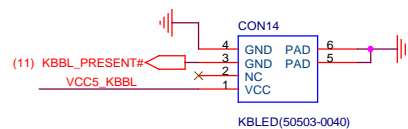
1. Level 1 Environment-related Substances Should Never be Used.

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

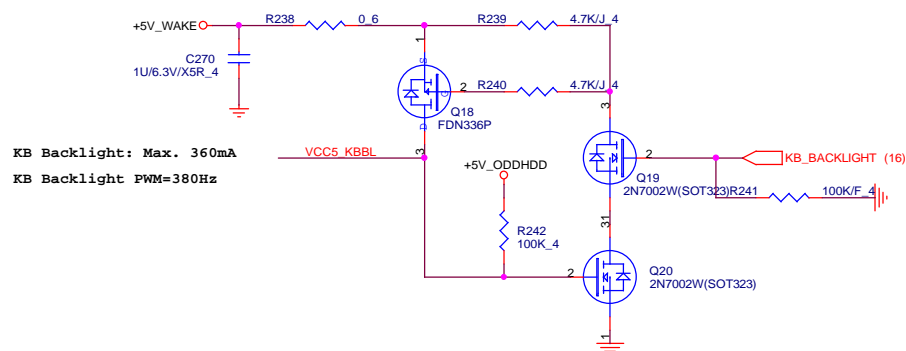
WLAN/WIMAX/WIDI



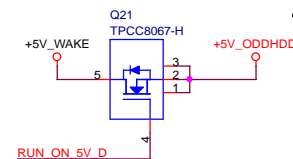
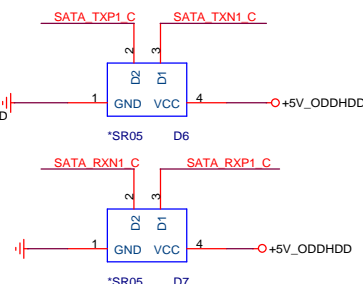
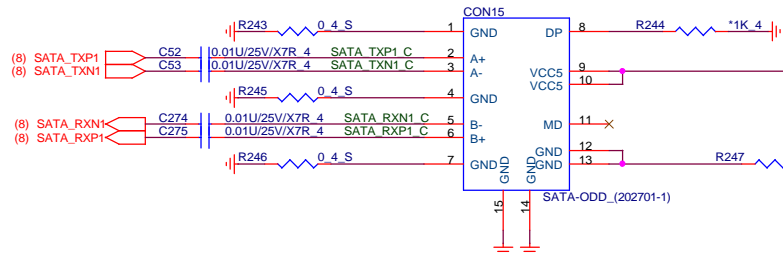
KB BACKLIGHT



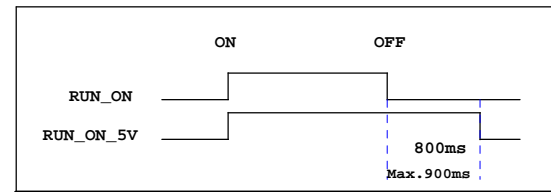
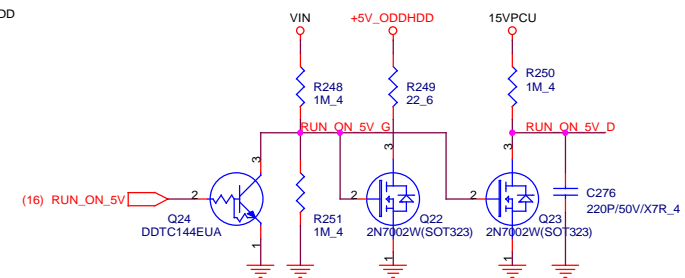
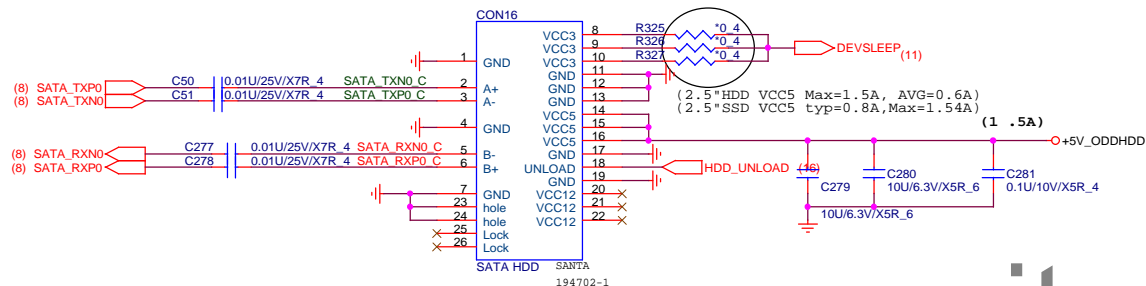
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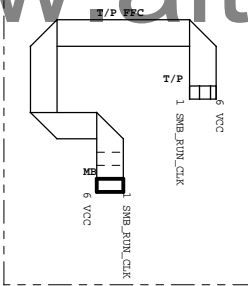
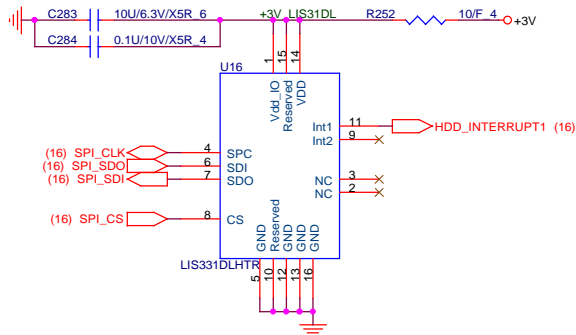
ODD CONNECTOR



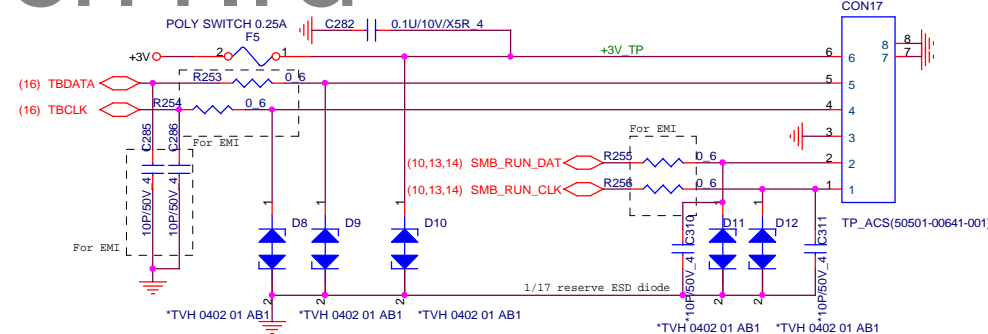
HDD CONNECTOR



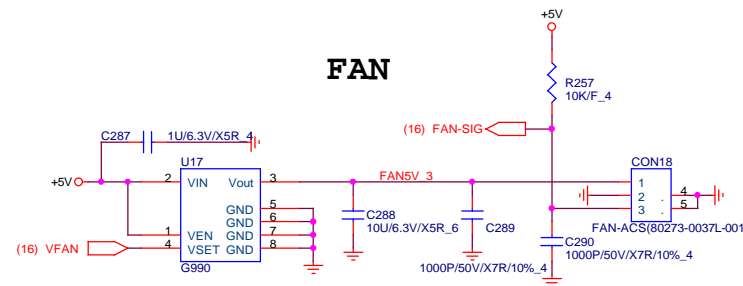
HDD PROTECT SPI INTERFACE



T/P Board to T/P



FAN



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HDD/ODD/TP/FAN

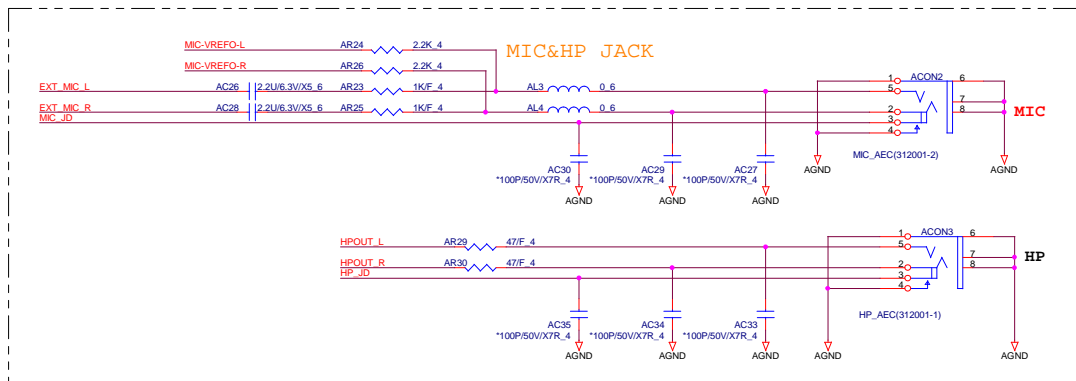
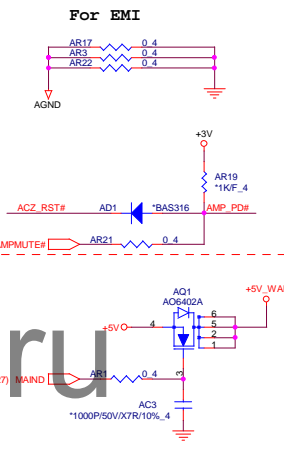
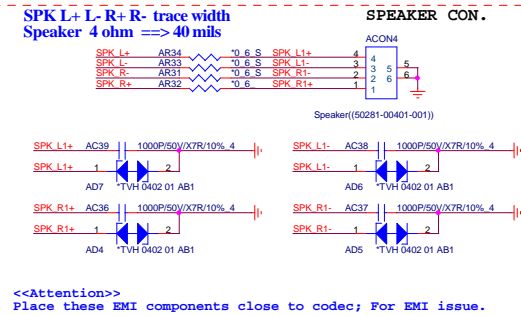
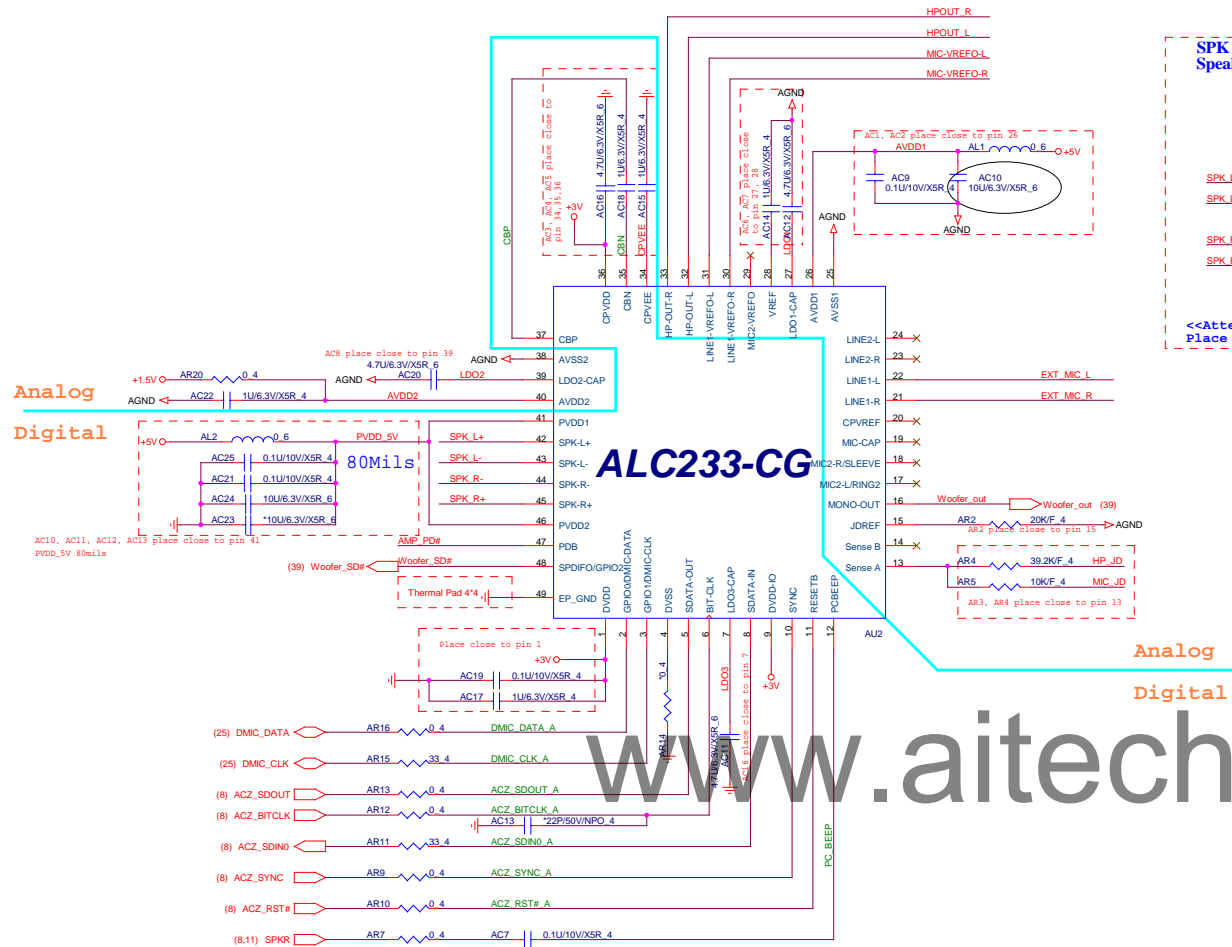
Rev	1A
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1.Level 1 Environment-related Substances Should Never be Used.

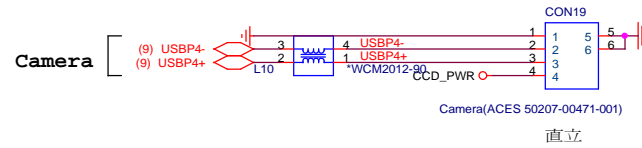
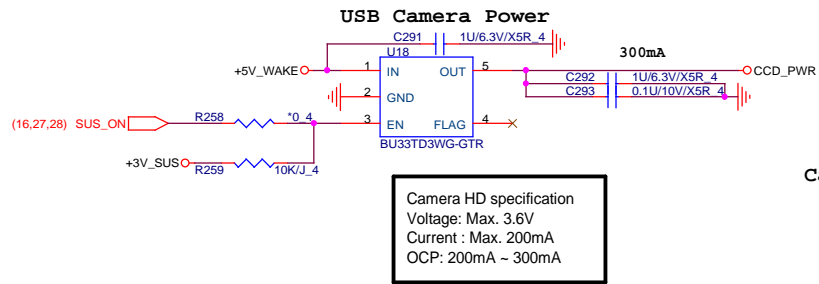
2. Recycled Resin and Coated Wire should be procured from Green Partners

Date: Thursday, January 31, 2013 Sheet 23 of 40

Date: Thursday, January 31, 2013 Sheet 23 of 40



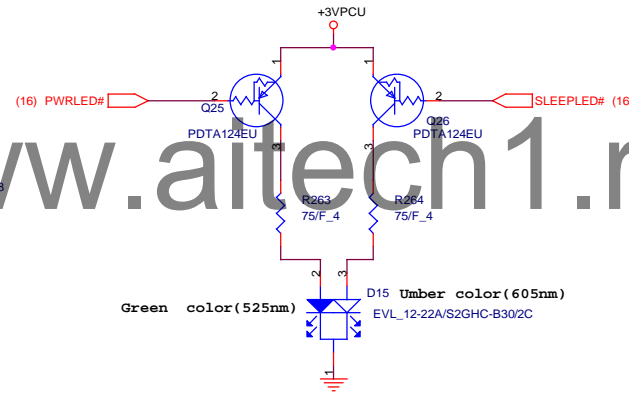
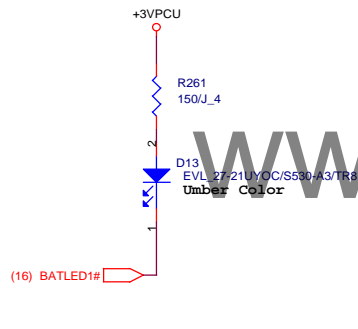
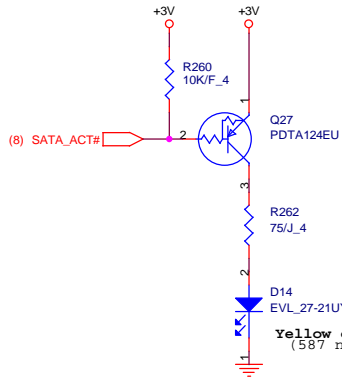
Camera



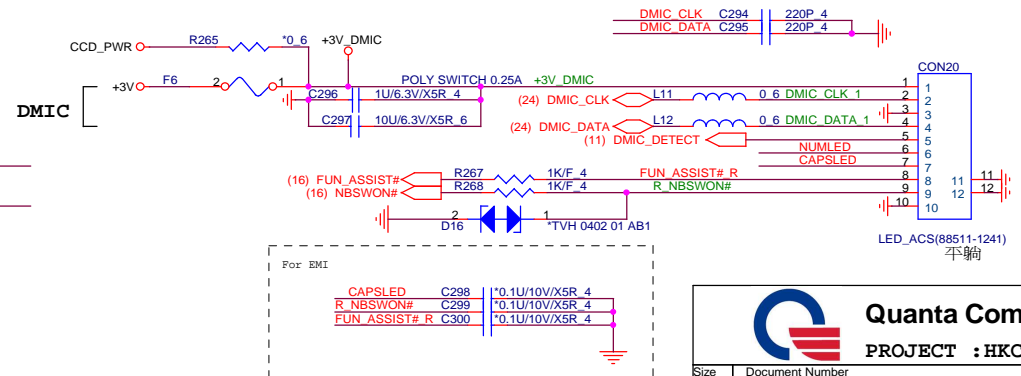
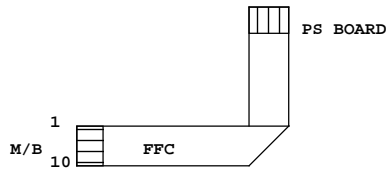
SATA LED

BATTERY LED

Power/Sleep LED



Power SW Board Connector

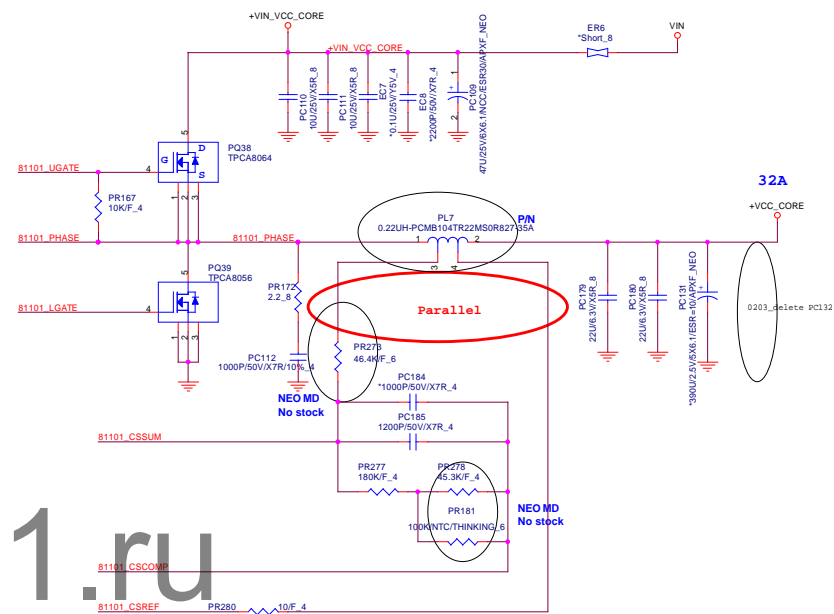


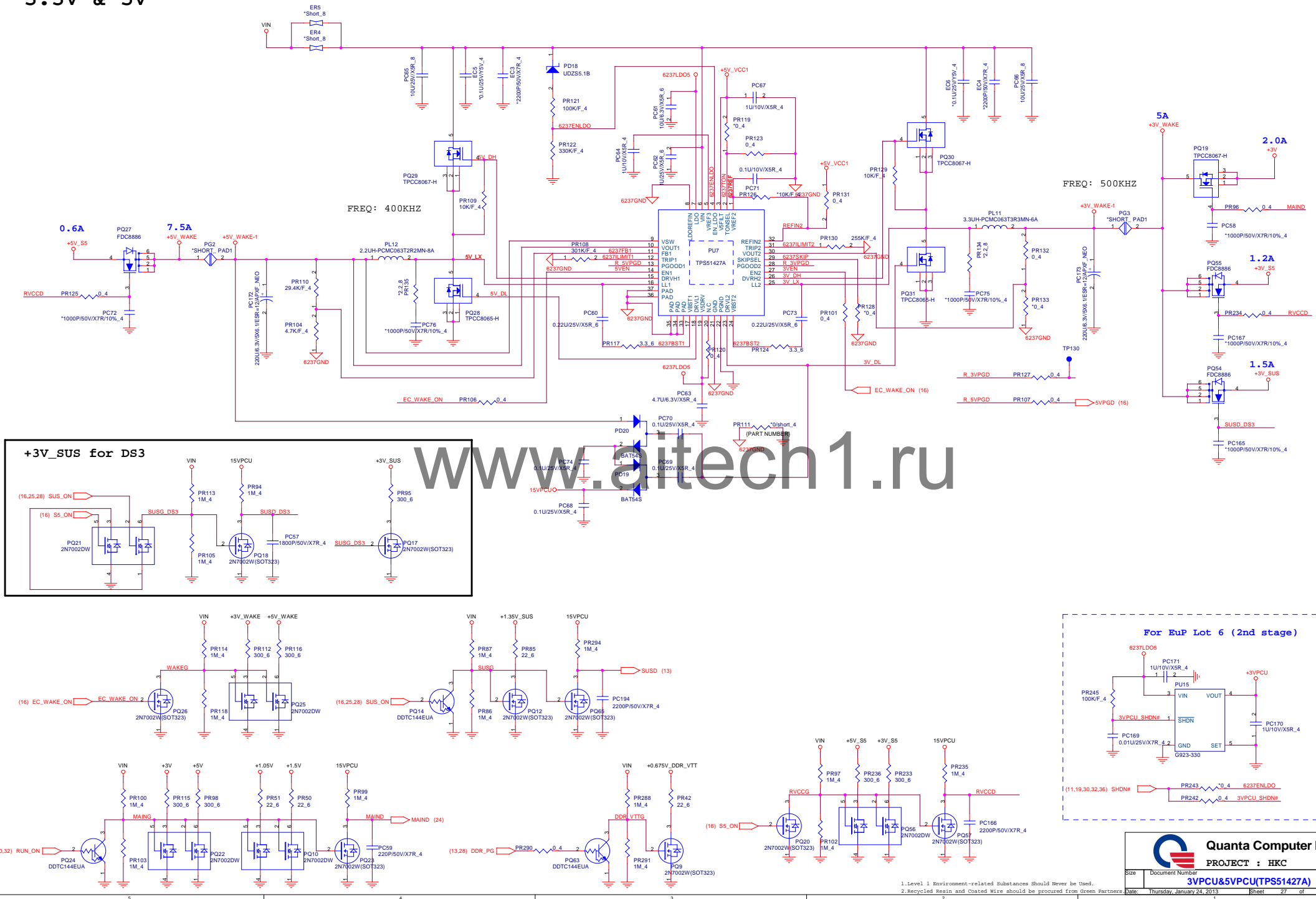
Quanta Computer Inc.

PROJECT : HKC

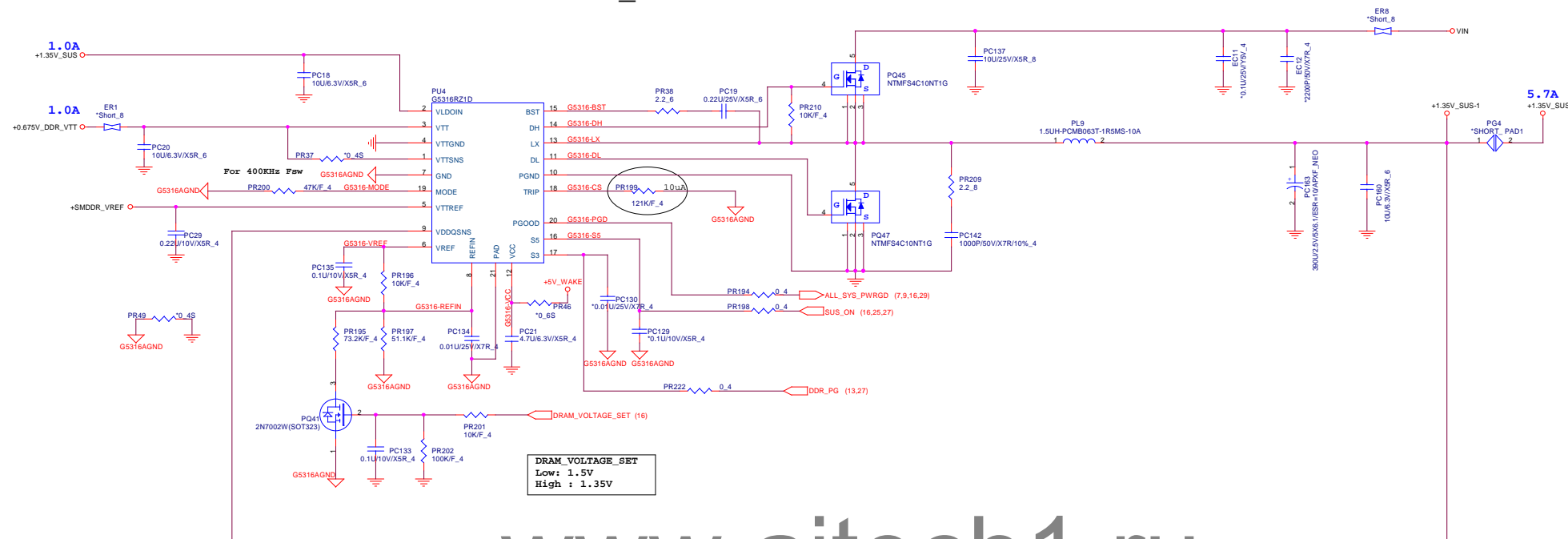
Size	Document Number	Rev
	LED/RF/KB/PS	1A
Date:	Thursday, January 24, 2013	Sheet 25 of 40

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





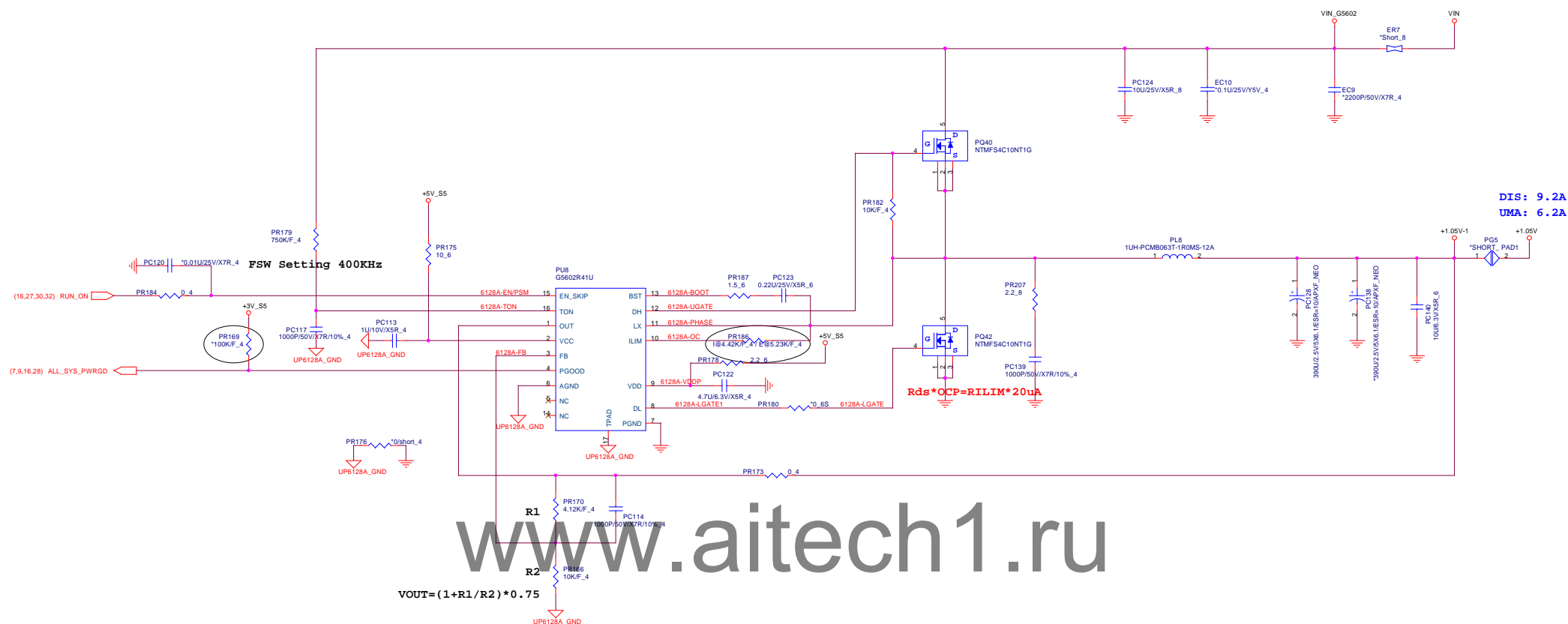
1.5VSUS & VTT_MEM



MODE	Resistor on Mode	Fsw	Discharge Mode
3	200Kohm	400KHz	Tracking discharge
2	100Kohm	300KHz	
1	68Kohm	300KHz	Non-tracking discharge
0	47Kohm	400KHz	

STATE	S3	S5	1.5VSUS	VTTREF	VTT
S0	1	1	On	On	On
S3	0	1	On	On	Off/High Z
S4/S5	0	0	Off	Off	Off

+1.05V



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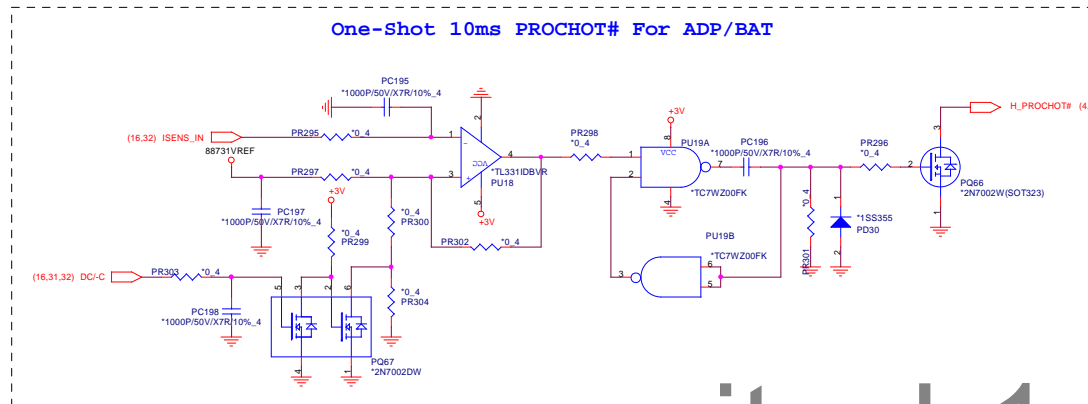
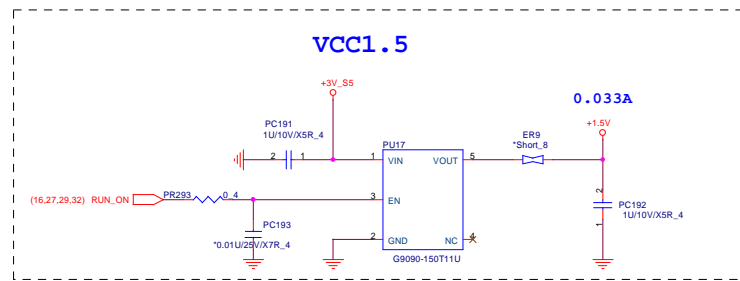


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PROJECT : HKC

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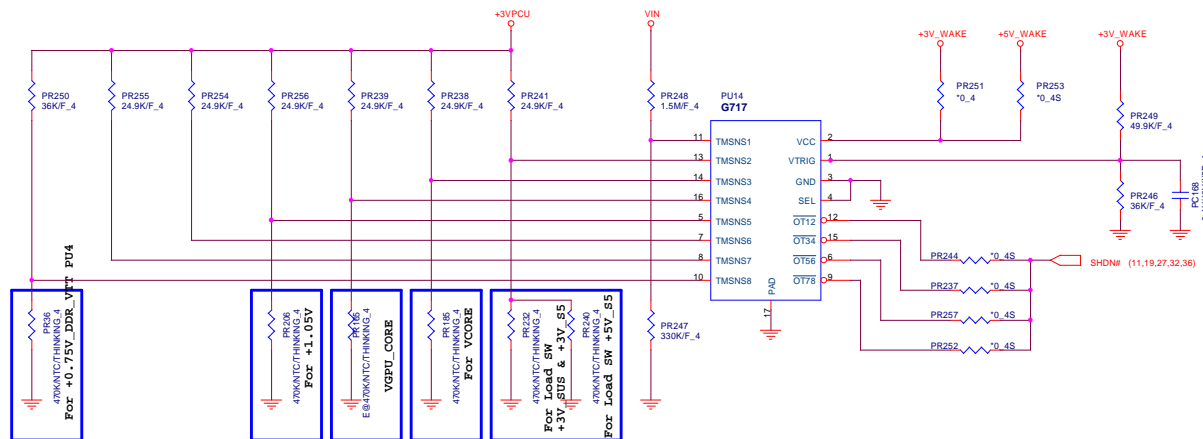
1. Level 1 Environment-related Substances Should Never be Used.
2. Recycled Resin and Coated Wire should be procured from Green Partners.

Date: Wednesday, January 30, 2013 Sheet 29 of 40



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Thermal Protection and Battery UVP for VEDS

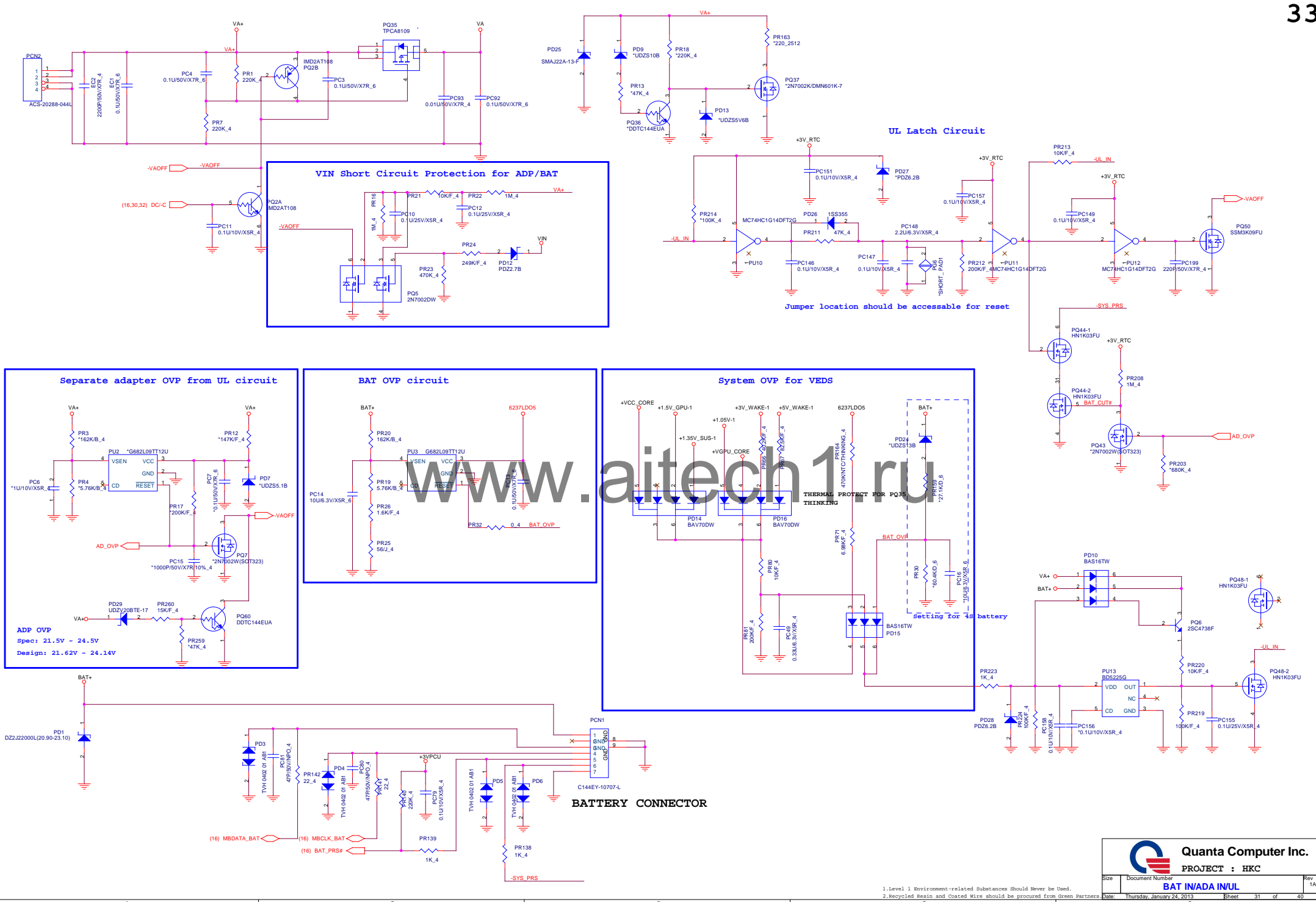


Quanta Computer Inc.
PROJECT : HKC

Size	Document Number	Rev
	VCC1.8	1A

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

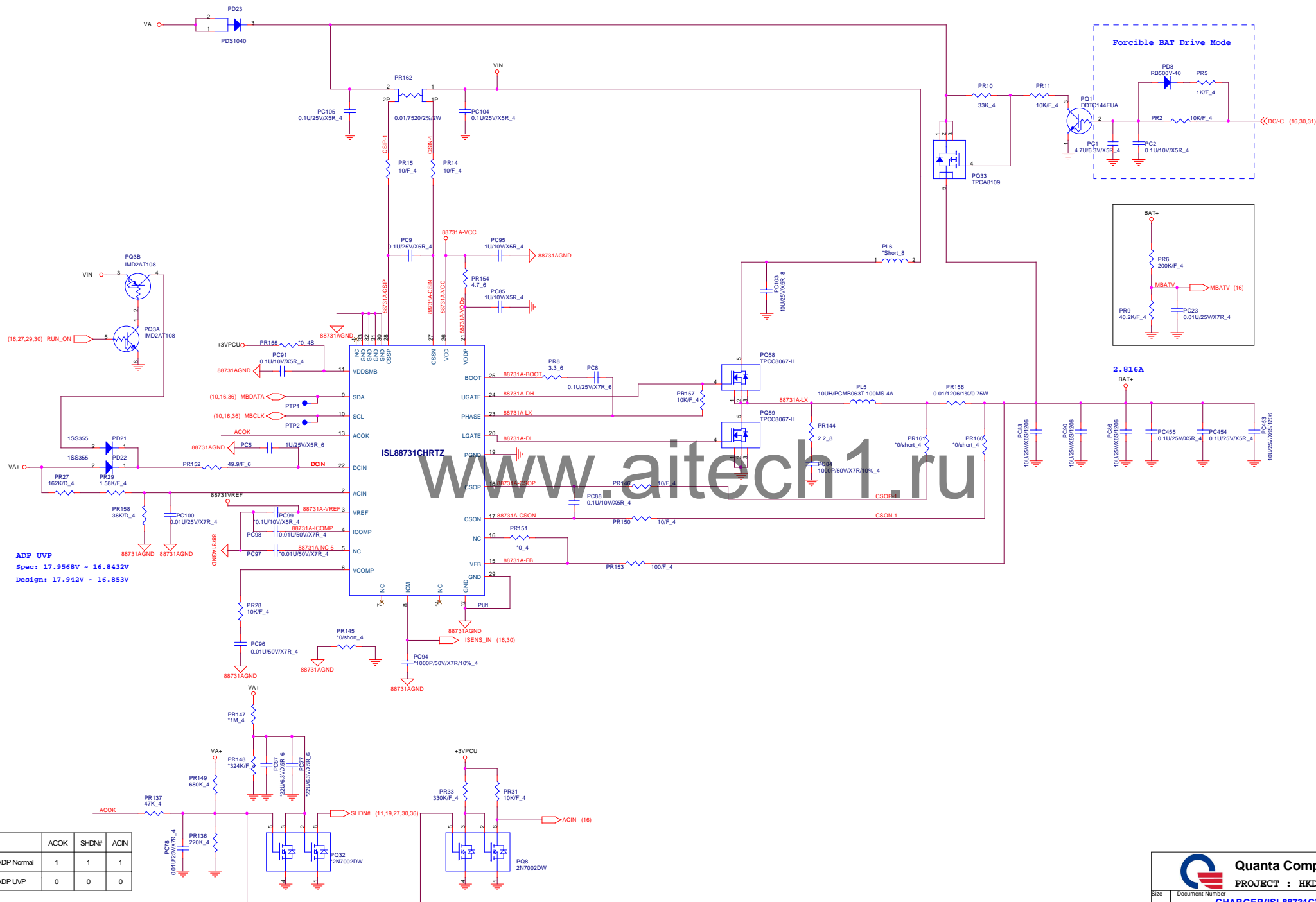
Date: Thursday, January 24, 2013 Sheet 30 of 40

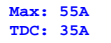


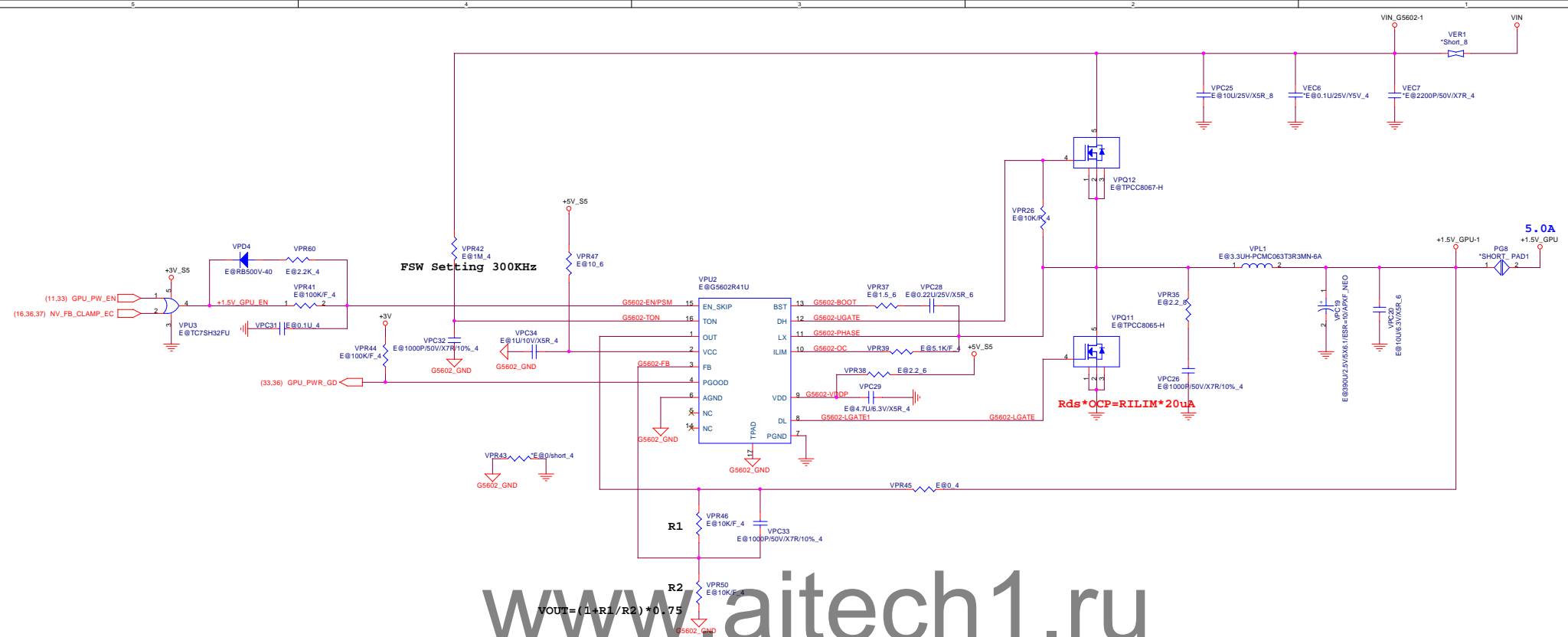
Quanta Computer Inc.
PROJECT : HKC

Size Document Number
BAT INADA INUL
Date Thursday, January 24, 2013 Sheet 31 of 40

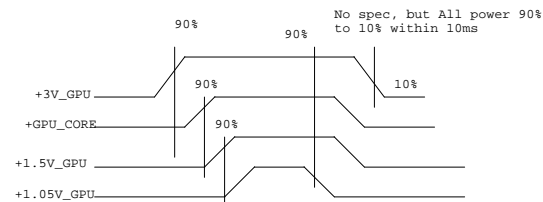
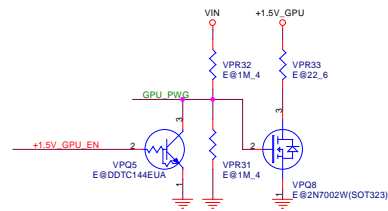
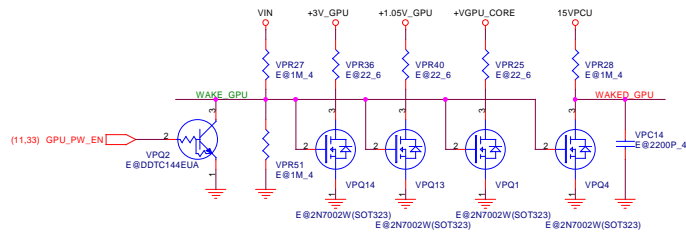
1. Level 1 Environment-related Substances Should Never be Used.
2. Recycled Resin and Coated Wire should be procured from Green Partners.







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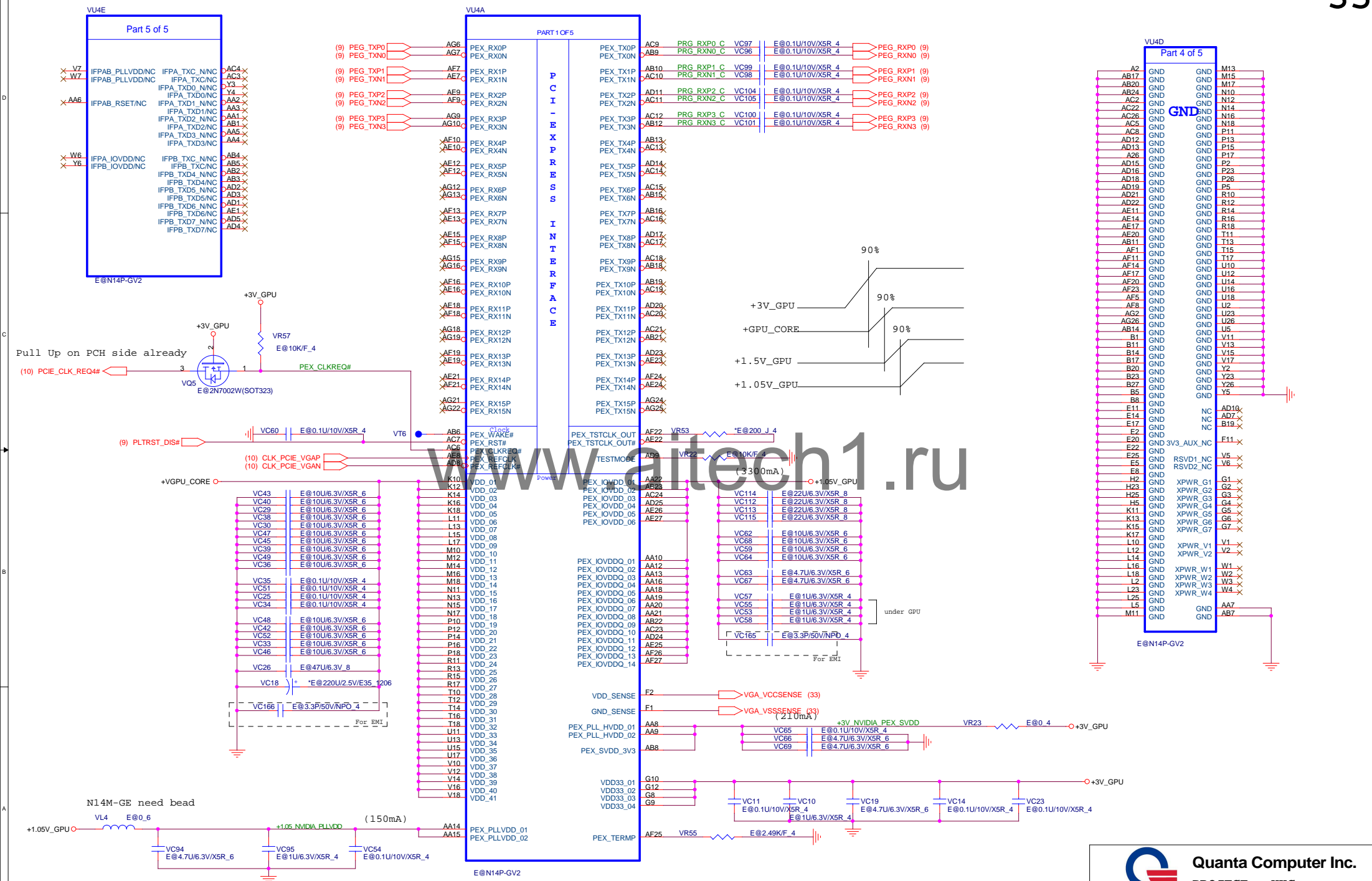


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PROJECT : HKC

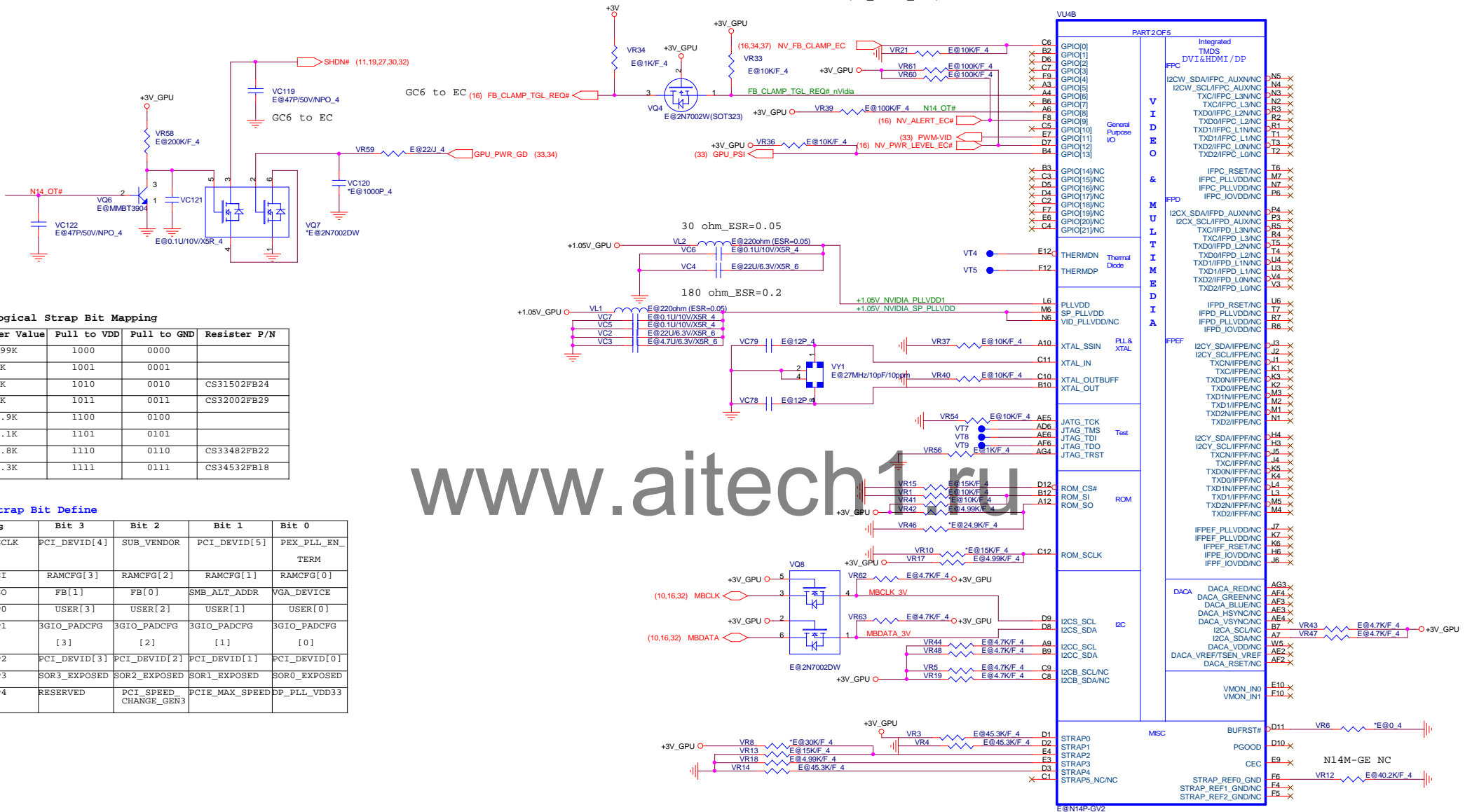
Size Document Number
1.8 GPU / 1.0 GPU
Rev 1A

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

Date: Thursday, January 24, 2013 Sheet 34 of 40




```
For GC6 GPU Monitor
Status(FB_CLAMP_MON)
```



Register Value	Pull to VDD	Pull to GND	Register P/N
4.99K	1000	0000	
10K	1001	0001	
15K	1010	0010	CS31502FB24
20K	1011	0011	CS32002FB29
24.9K	1100	0100	
30.1K	1101	0101	
34.8K	1110	0110	CS33482FB22
45.3K	1111	0111	CS34532FB18

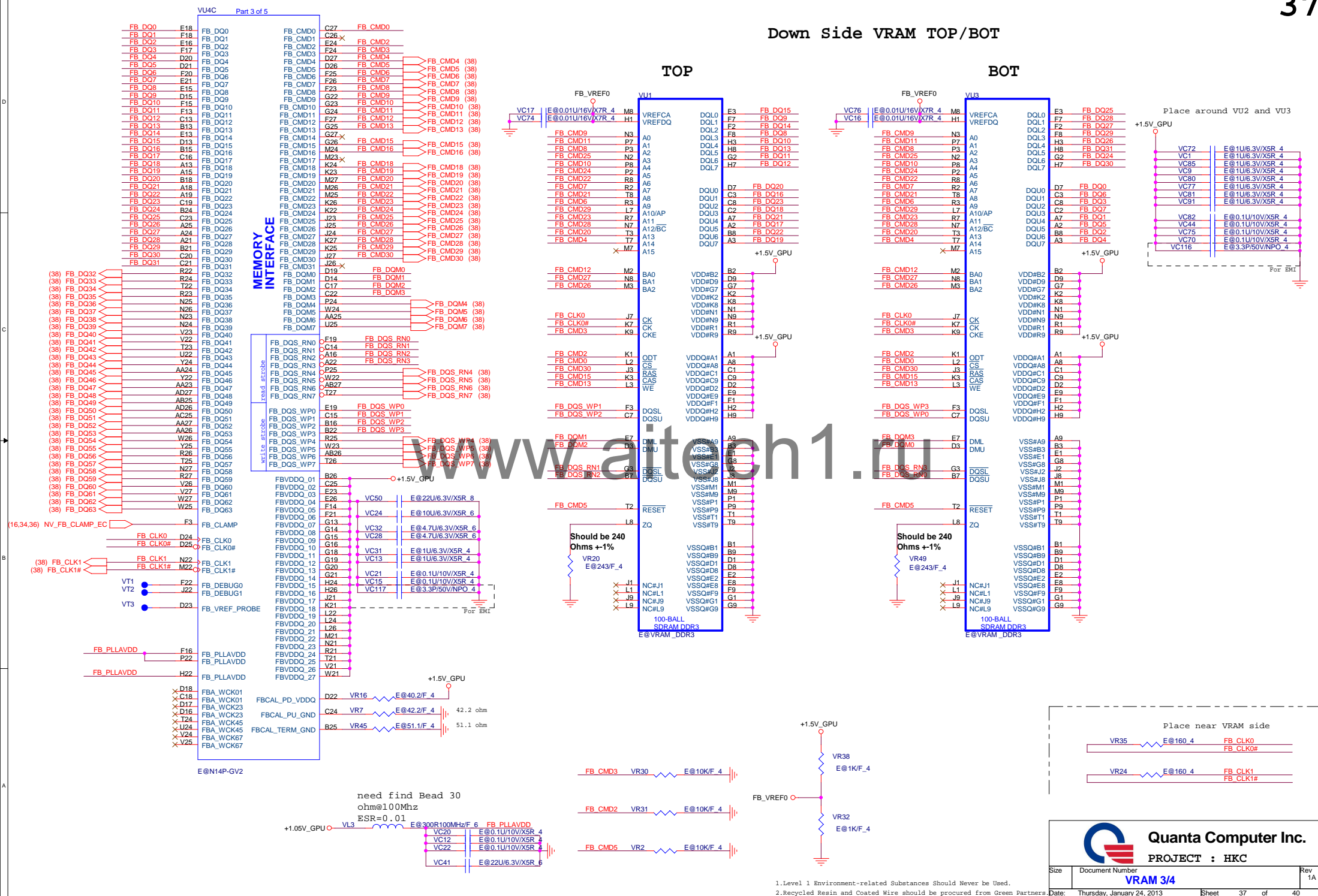
Straps	Bit 3	Bit 2	Bit 1	Bit 0
ROM_SCLK	PCI_DEVID[4]	SUB_VENDOR	PCI_DEVID[5]	PEX_PLL_EN_TERM
ROM_SI	RAMCFG[3]	RAMCFG[2]	RAMCFG[1]	RAMCFG[0]
ROM_SO	FB[1]	FB[0]	SMB_ALT_ADDR	VGA_DEVICE
STRAP0	USER[3]	USER[2]	USER[1]	USER[0]
STRAP1	3GIO_PADCFG [3]	3GIO_PADCFG [2]	3GIO_PADCFG [1]	3GIO_PADCFG [0]
STRAP2	PCI_DEVID[3]	PCI_DEVID[2]	PCI_DEVID[1]	PCI_DEVID[0]
STRAP3	SOR3_EXPOSED	SOR2_EXPOSED	SOR1_EXPOSED	SOR0_EXPOSED
STRAP4	RESERVED	PCI_SPEED_CHANGE_GEN3	PCIE_MAX_SPEED	DP_PLL_VDD33

	VRAM Capacity	VRAM Vender	ID	VR1	Mfr P/N	Quanta P/N
N14M-LP N14P-GV2	128Mx16 DDR3	Samsung	0111	PD45.3K	K4W2G1646E-BC11	AKD5MGGT525
		Hynix	0110	PD34.8K	H5TQ2G63DFR-11C	AKD5MGW7W15
	256Mx16 DDR3	Samsung	0011	PD20K	K4W4G1646B-HC11	AKD5MGW7T25
		Hynix	0010 (TBD)	PD15K	H5TC4G63AFR-11C	AKD5PGW7W10

 Quanta Computer Inc. PROJECT : HKC		
Size	Document Number Nvidia 2/4	Rev 1A
Date:	Thursday, January 24, 2013	Sheet 36 of 40

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

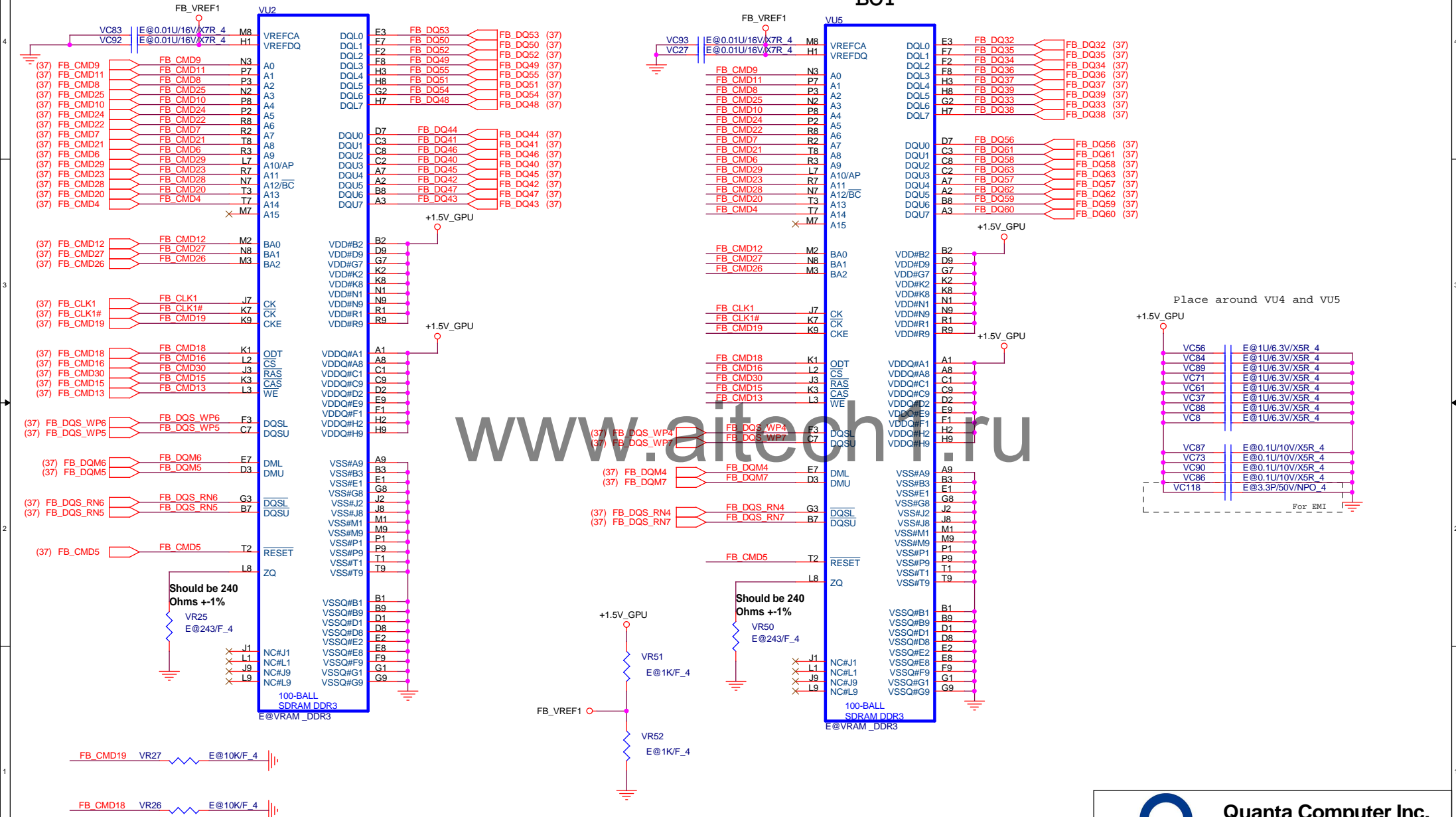
Down Side VRAM TOP/BOT



Up Side VRAM TOP/BOT

TOP

BOT



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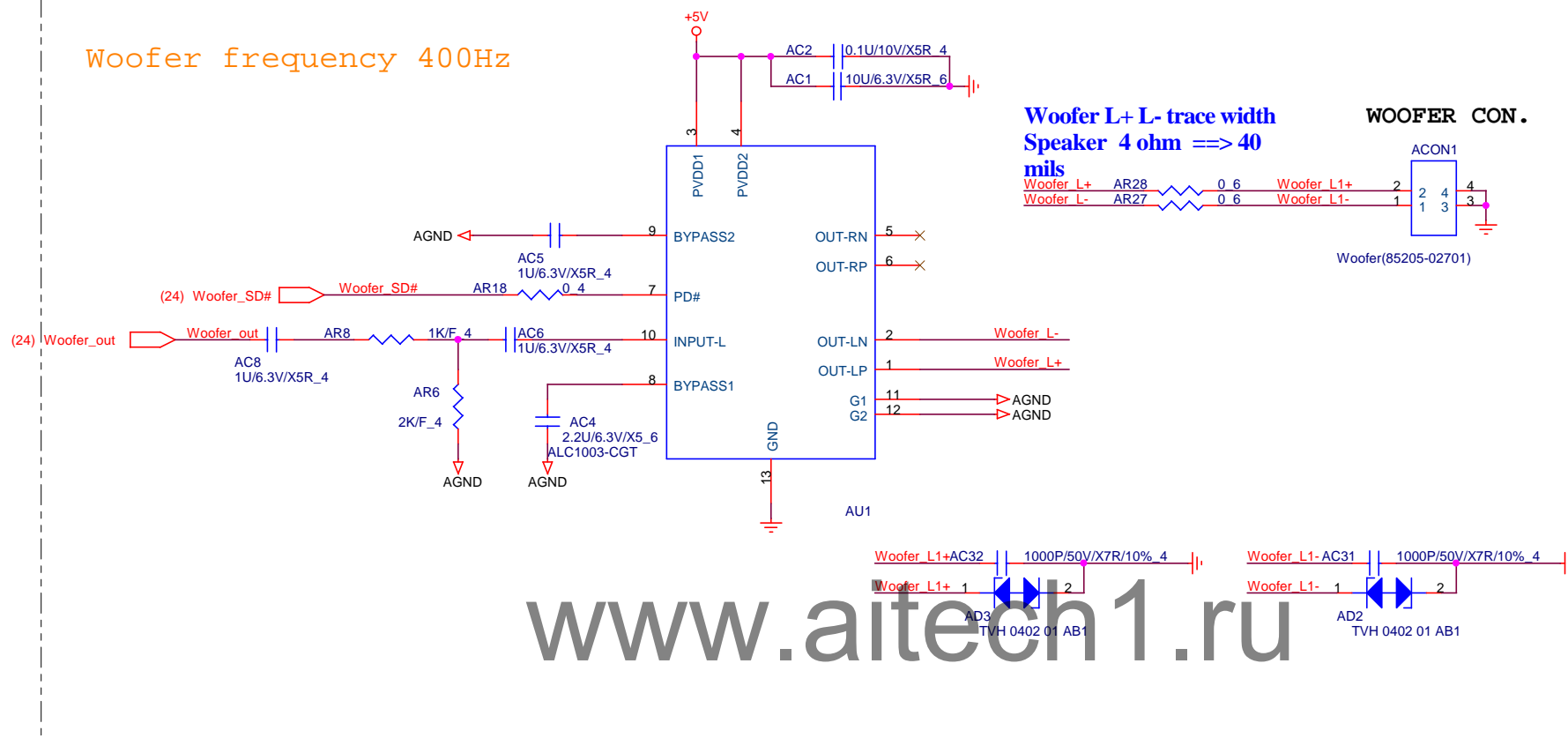
PROJECT : HKC

Size	Document Number	VRAM 4/4	Rev	1A
Date:	Thursday, January 24, 2013	Sheet	38	of 40

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

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

Woofers frequency 400Hz



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



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Size	Document Number	Rev
	Audio Codec Woofer	1A
Date:	Thursday, January 24, 2013	Sheet 39 of 40

USB PORT Architecture	
PORT 0	USB3.0
PORT 1	USN3.0
PORT 2	USN2.0
PORT 3	USB2.0
PORT 4	NFC
PORT 5	N/A
PORT 6	N/A
PORT 7	N/A
PORT 8	N/A
PORT 9	WiMax/BT
PORT 10	Camera
PORT 11	Card Reader
PORT 12	Touch Screen
PORT 13	N/A

PCIE BUS	
PORT 1	WLAN Port
PORT 2	CARD READER
PORT 3	GLAN(RTL8111G)
PORT 4	N/A
PORT 5	N/A
PORT 6	N/A
PORT 7	N/A
PORT 8	N/A

SATA BUS	
PORT 0	HDD
PORT 1	N/A
PORT 2	N/A
PORT 3	N/A
PORT 4	ODD
PORT 5	N/A

SM BUS	MBCLK/MBDATA	WRITE	READ	Function
ISL88731CHRTZ	0001 001X	0001 0010	0001 0011	Charger
Nvidia	1001 1110	-	1001 1110	Graphice
LIS331DL	0011 101X	0011 1010	0011 1011	G Sensor

SM BUS	MBCLK_BAT/MBDATA_BAT	WRITE	READ	Function
VGP-BPS35A	0001 011X	0001 0110	0001 0111	Battery

SM BUS	SMB_PCH_CLK/SMB_PCH_DAT	WRITE	READ	Function
DIMM Module0	1010 000X	1010 0000	1010 0001	DDRIII
DIMM Module 1	1010 010X	1010 0100	1010 0101	DDRIII
Synaptics	0010 110X	0010 1100	0010 1101	Click PAD

	R363(High) R362(Low)	R294(High) R297(low)
	Board ID3	Board ID0
14"/HK6	0	0
15"/HK5	0	1
17"/HK7	1	0

Board ID1 (VRAM Vendor)	Samaung(1)	Hynix(0)
R47(High)	Stuff	No Stuff
R48(Low)	No Stuff	Stuff

Board ID2		
14" 4PCS	1G	512M
15" 8PCS	1G	2G
R39(High)	Stuff	No Stuff
R27(Low)	No Stuff	Stuff

PCBA SKU	Discrete	UMA
R277(Pull High)	Stuff	No Stuff
R275(Pull Low)	No Stuff	Stuff

OS status	S0	S3	DS3	(Soft OFF)	(Soft OFF)	(Soft OFF)	(Soft OFF)	(Soft OFF)
H/W status	S0	S3	DS3	S4 (Win8 off) RTC wake Enable WOLAN Enable	S4 (Win8 off) RTC wake Disable WOLAN Disable	S5 Charge Enable	S5 Charge Disable WoL Disable	S5 WoL Enable
RUN_ON	H	L	L	L	L	L	L	L
+3V	H	L	L	L	L	L	L	L
+5V	H	L	L	L	L	L	L	L
+0.675V_DDR_VTT	H	L	L	L	L	L	L	L
+1.05V	H	L	L	L	L	L	L	L
+0.85V	H	L	L	L	L	L	L	L
+1.5V	H	L	L	L	L	L	L	L
+3V_GPU	H	L	L	L	L	L	L	L
+1.05V_GPU	H	L	L	L	L	L	L	L
+VGPU_CORE	H	L	L	L	L	L	L	L
+VCC_CORE	H	L	L	L	L	L	L	L
SUS_ON	H	H	H	L	L	L	L	L
+1.35V_SUS	H	H	H	L	L	L	L	L
S5_ON	H	H	L	H	L	L	L	H
+5V_S5	H	H	L	H	L	L	L	H
+3V_S5	H	H	L	H	L	L	L	H
EC_WAKE_ON	H	H	H	H	L	H	L	H
+3V_WAKE	H	H	H	H	L	H	L	H
+5V_WAKE	H	H	H	H	L	H	L	H
DEEP_EC_EN	H	H	H	H	L	L	L	L
+3V_S5_DSW	H	H	H	H	L	L	L	L
+3V_SUS	H	H	L	L	L	L	L	L