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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	DDR3L MEMORY DOWN(1RX8)	1A	
15	DDR3 DIMM-1-STD(5.2H)	1A	
16	NPCE985E & FLASH	1A	
17	LVDS/TS/NFC	1A	
18	CARD READER(RTS5209)	1A	
19	HDMI/THERMAL	1A	
20	USB	1A	
21	LAN RTL8111GS	1A	
22	WLAN/KB-BL	1A	
23	HDD/ODD/GSENSOR/TP/FAN	1A	
24	AUDIO(ALC233-CG)	1A	
25	LED/PS	1A	
26	POWER +VCC_CORE (ISL95837)	1A	
27	POWER 3VPCU&RVCC5(TPS51427)	1A	
28	POWER 1.35VSUS/VTT_MEM	1A	
29	POWER +1.05V(G5602R41U)-15A	1A	
30	POWER VCCSA/VCCIO	1A	
31	POWER VCC1.8/Thermal	1A	
32	POWER(BAT IN / ADA IN/ UL)	1A	
33	POWER CHARGER (ISL88731C)	1A	
34	POWER VGA_CORE/1.0(RT8812A)	1A	
35	POWER VCC1.5_VRAM/1.05V	1A	
36	NVIDIA N14 GB2-64 PCIE 1/4	1A	
37	NVIDIA N14 GB2-64 TMDS 2/4	1A	
38	NVIDIA N14 GB2-64 VRAM 3/4	1A	
39	NVIDIA N14 GB2-64 VRAM 4/4	1A	

Page	Title of schematic page	Rev.	Date
40	HOLE/EMI/KB	1A	
41	IO PORT LIST	1A	

1

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

Chief River ULV BLOCK DIAGRAM

Memory Down(Channel A)

X8 X8 X8 X8
X8 X8 X8 X8

DDR3L : 1.35V

Dual Channel

P14~P15

DDR3L : 1.35V
DDR3 : 1.5V

SO-DIMM(Channel B)

intel
Ivy Bridge
PCI-E X16
DDR SYSTEM MEMORY
BGA1023
(31mm X 24mm)
FDI
DMI
P4~P7

PCIE3
5GT/s

Nvidia
N14M-LP
P36 ~ P39

VRAM
1GB / 2GB
P38~P39

X8
2.7GT/s
FDI

DMI
X4
5GT/s

intel
<PCH>
Panther Point
SATA Gen3
SATA Gen2
USB
HDA
SPI
iGFX Interfaces
mBGA 989
(25mm X 25mm)
P8~P13

TOUCH SCREEN
PORT8

Camera P17
PORT10

WiMax/BT P21
PORT12

USB I/O P20
PORT3

USB I/O P20
PORT2

USB I/O P20
PORT1

USB I/O P20
PORT0

USB 2.0
USB 3.0

P21 HDD SATA0 6Gb/s

P21 ODD SATA3 3Gb/s

LVDS/eDP
P17

HDMI
P19

5GT/s
PCI-Express Gen2
PCIE6
PCIE1
PCIE4

Giga-LAN
RTL8111GS
P21

RJ45
P21

WLAN/BT P21

Card Reader
RTS5209
P18

SD-XC

NFC
I2C

Azalia

Audio CODEC
ALC233-CG
P24

Combo Jack
SPK
DMIC
P24
P24
P24

SPI ROM
8MB
P9

LPC

EC
NPCE985L
P16

Touch Pad
P20

Keyboard
P25

Power LED
Sleep LED
SATA LED
Battery LED
CAPSLED
NUMLED

Button
ASSIST#
Power SW
Battery Detach

Change List

GD56_MB_SCH_EVT_001

Quanta Computer Inc.
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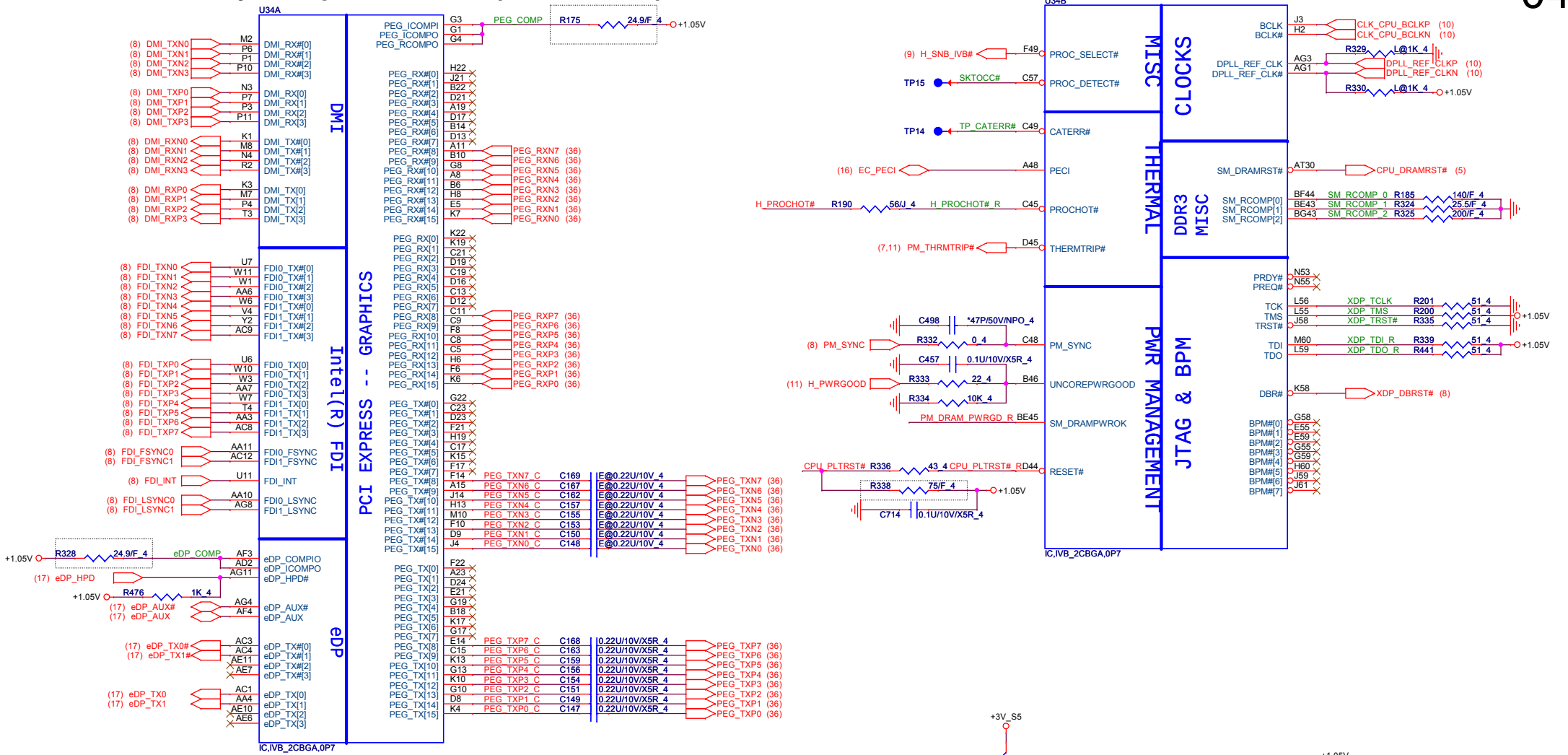
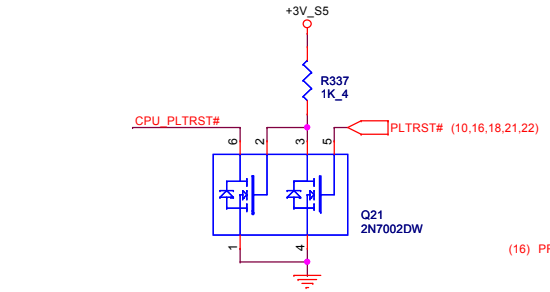
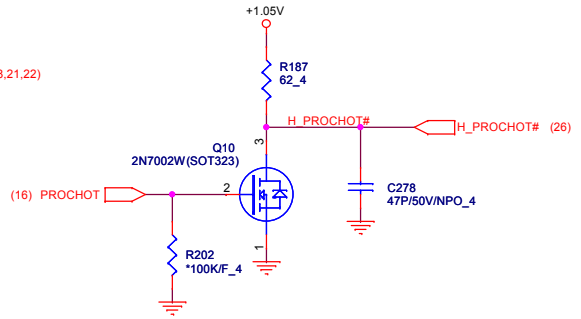
Ivy Bridge Processor (DMI,PEG,FDI)

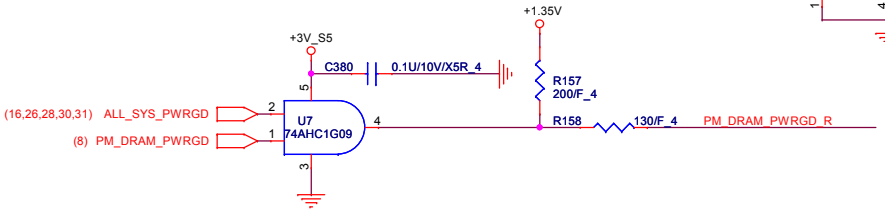
Ivy Bridge Processor (CLK,MISC,JTAG)

04









SNB_IVB#:
- It is NC when using Sandy Bridge.(1.05V)
- For next generation processor it will be grounded in package.(1.0V)

FDI Disabling (Discrete Only)

-FDI_FSYNC (J18/J17/J19/H17) can gang all these 4 signals together and tie them with only one 1K resistor to GND (DG V0.5 Ch2.2.9).
- FDI_INT connect to GND with 1K ohm.

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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PROJECT : GD5

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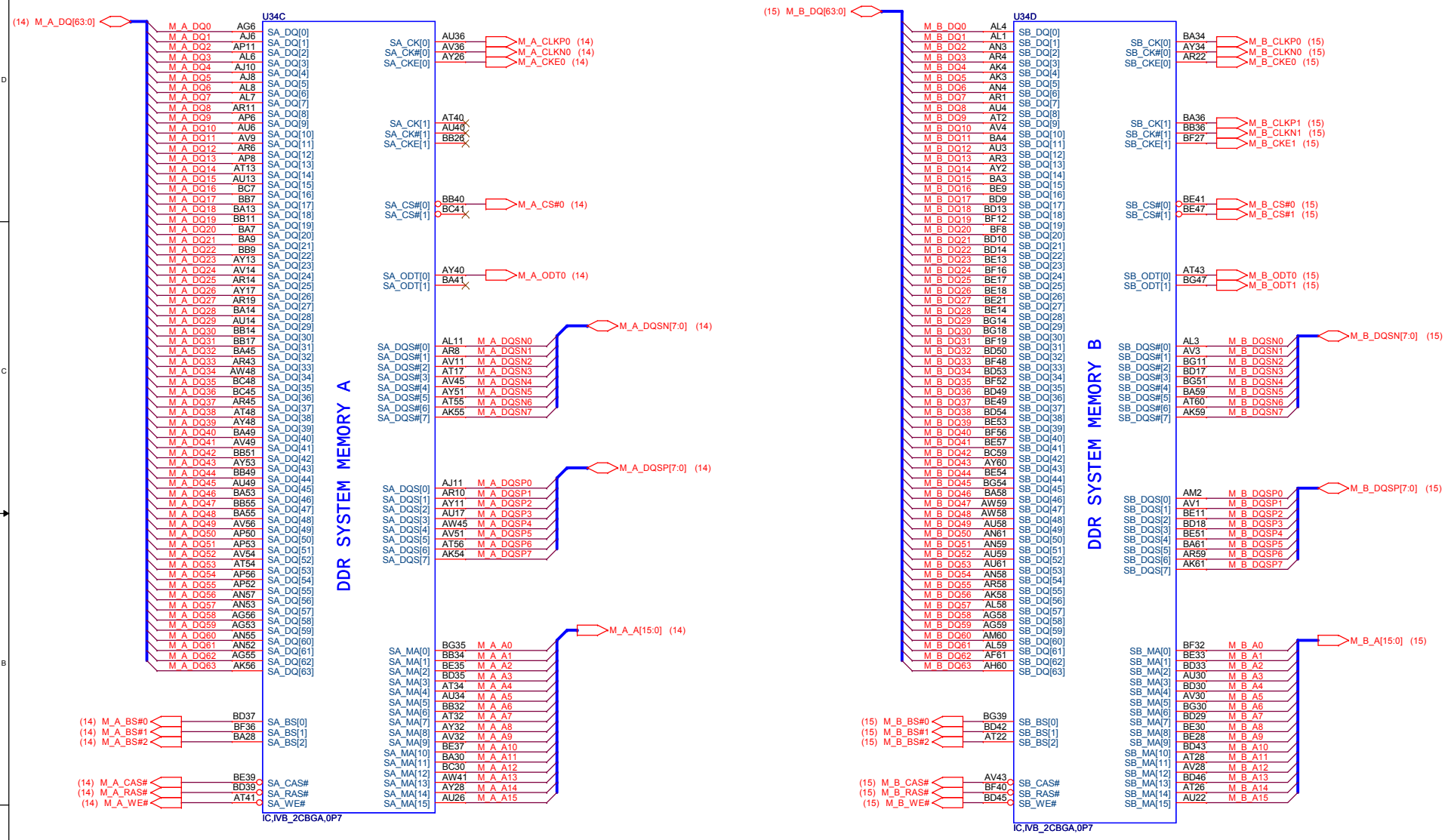
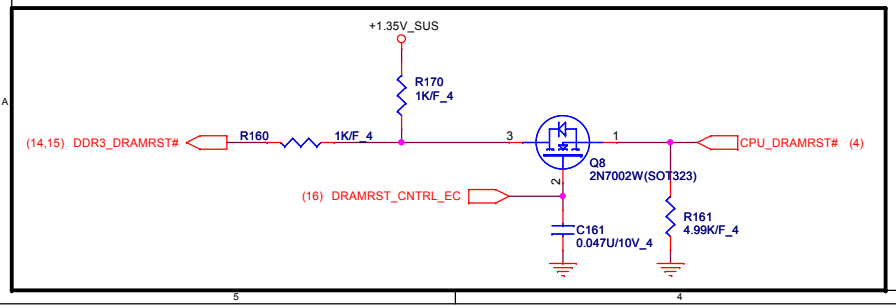
	SNB/IVB 1/4	1A
Date: Thursday, October 25, 2012	Sheet 4 of 41	

Ivy Bridge Processor (DDR3)





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Quanta Computer Inc.
PROJECT : GD5

Size	Document Number	Rev
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Ivy Bridge Processor (POWER)

Ivy Bridge Processor (GRAPHIC POWER)

POWER

CPU Core Power
(33A)

Intel request
2.2uF x16
22uF x12
330uF x4 9mohm

+VCC_CORE

U34F

CORE SUPPLY
PEG IO AND DDR IO
QUIET RAILS
SVID
SENSE LINES

IC,IVB_2CBGA,0P7

+1.05V

(7.1A)

Intel request
10uF x10
1uF x26

C1 *330U/2.5V/3528/ESR=9_NEO

VCCIO_SEL: BC22 R468 10K_4 +3V

VCCPQE[1] VCCPQE[2] AM25 AN22 0.4A +1.05V C716 1U/6.3V/X5R_4

VIDALERT# A44 H_CPU_SVIDALRT#
VIDSCLK B43 H_CPU_SVIDCLK
VIDSOUT C44 H_CPU_SVIDDAT

VCC_SENSE F43 R183 100/F_4 +VCC_CORE → VCC_SENSE (26)
VSS_SENSE G43 R188 100/F_4 → VSS_SENSE (26)

VCCIO_SENSE AN16 R436 10/F_4 +1.05V → VCCP_SENSE (29)
VSS_SENSE_VCCIO AN17 R437 10/F_4 → VSSP_SENSE (29)

VCCIO50 W16
VCCIO51 W17 +1.05V_VCCIO5 R467 0_4 +1.05V

HOLE1
*Intel-CPU-bracket

POWER

+VCC_GFX (25A)

Intel request
22uF x12 PDC: 10ux8
1uF x15
330uF x2

U34G

VREF
GRAPHICS DDR3 - 1.5V RAILS
QUIET RAILS
SENSE LINES
1.8V RAIL
SA RAIL
VCCSA VID lines

SM_VREF AY43 R341 1K/F_4 +1.35V (Trace=10mil) +VDDR_REF_CPU
R340 1K/F_4 C499 0.1U/10V/X5R_4
SA_DIMM_VREFDQ BE7
SB_DIMM_VREFDQ BG7

(4.75A) +1.35V

Intel request
10uF x8
1uF x10

+VCC_GFX R191 100/F_4 (26) VCC_AXG_SENSE (26) VSS_AXG_SENSE R198 100/F_4

+1.8V (0.93A)

+VCCSA (4.5A)

Intel request
10uF x5
1uF x5

IC,IVB_2CBGA,0P7

(0.6A) +1.35V C715 1U/6.3V/X5R_4

HR/CR: HR(VID1 only) CR(VID0&VID1)

VCCIO_SEL:
Sandy is High = 1.05V
Ivy is Low = 1.0V

Layout note: need routing together and ALERT need between CLK and DATA

SVID CLK
+1.05V
Close to VR
R218 54.9/F_4
H_CPU_SVIDCLK R189 0_4 VR_SVID_CLK (26)
(50 ohm)

Place PU resistor close to CPU

SVID DATA
+1.05V
R184 130/F_4
Close to VR
R347 130/F_4
H_CPU_SVIDDAT R186 0_4 VR_SVID_DATA (26)
(50 ohm)

Place PU resistor close to CPU

SVID ALERT
+1.05V
R195 75/F_4
H_CPU_SVIDALRT# R192 43_4 R197 0_4 VR_SVID_ALERT# (26)
(50 ohm)

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PROJECT : GD5

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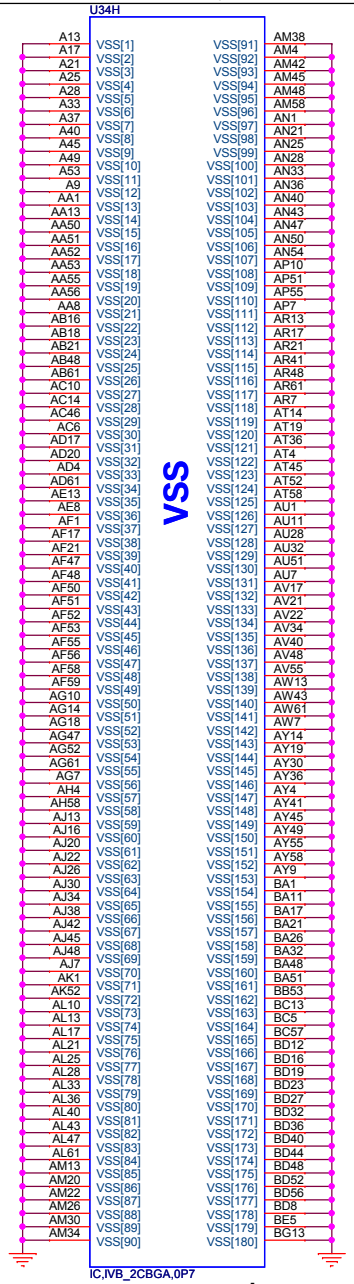
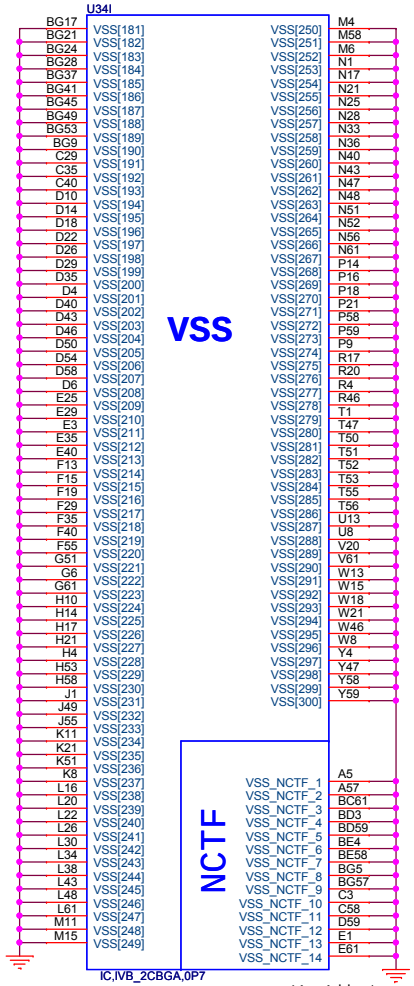
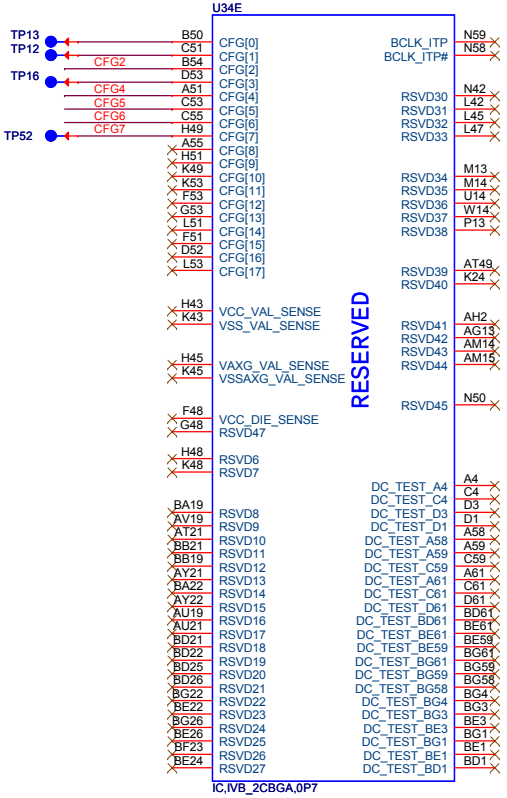
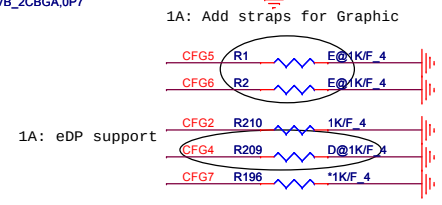
Ivy Bridge Processor (GND)

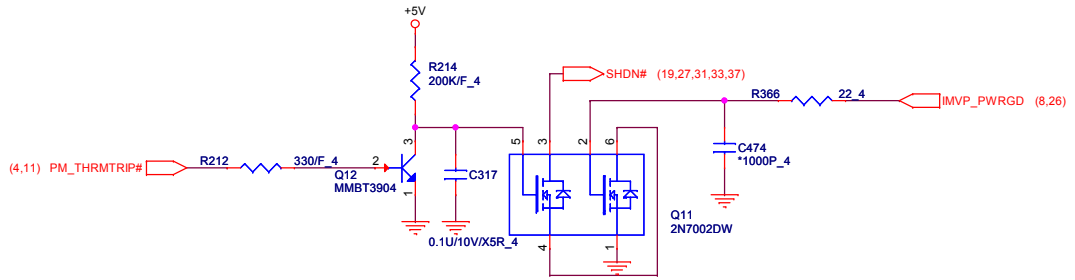




Ivy Bridge Processor (RESERVED, CFG)







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

Processor Strapping

	1	0
CFG2 (PEG Static Lane Reversal)	Normal Operation	**Lane Reversed**
CFG4 (DP Presence Strap)	**Disable; No physical DP attached to eDP**	Enable; An ext DP device is connected to eDP
CFG7 (PEG Defer Training)	**PEG train immediately following xxRESETB de assertion**	PEG wait for BIOS training

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

11: (Default) x16 - X16 PEG interface
10: PEG x8 x8 bifurcation enableddisabled
01: Reserved - (Device 1 function 1 disabled ; function 2 enabled)
00: x8,x4,x4 - Device 1 functions 1 and 2 enabled

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Quanta Computer Inc.
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	SNB/IVB 4/4	1A
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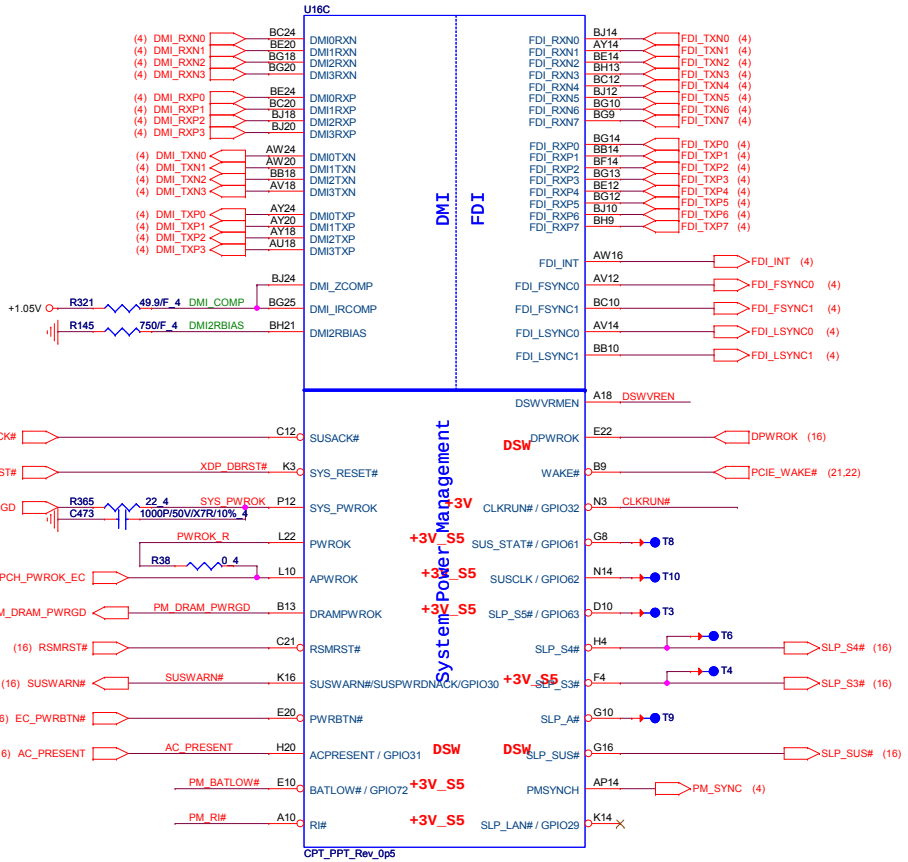
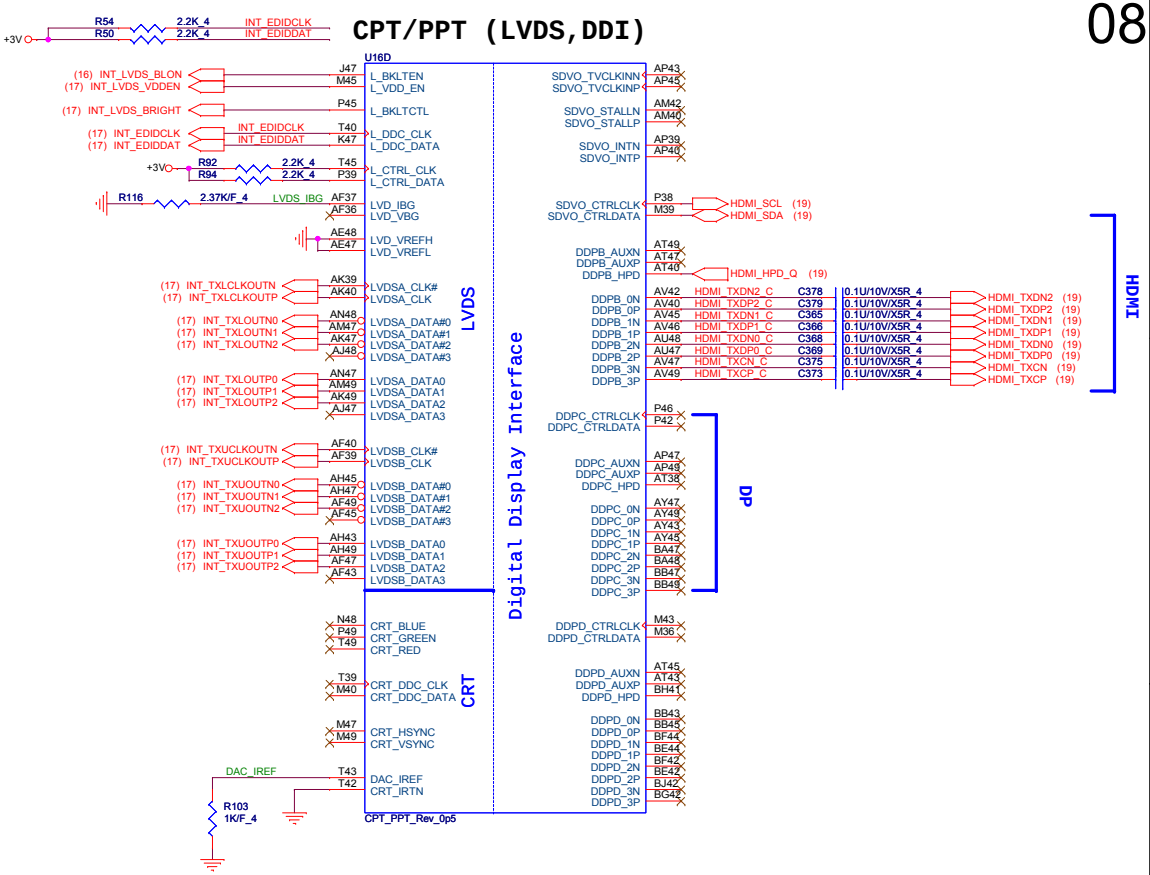
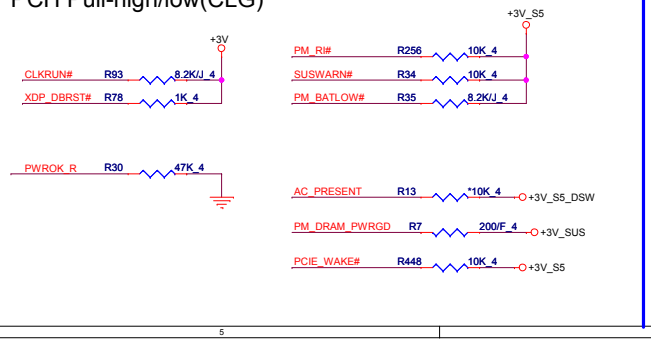
CPT/PPT (DMI,FDI,PM)

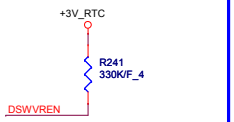


CPT/PPT (LVDS,DDI)



PCH Pull-high/low(CLG)





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

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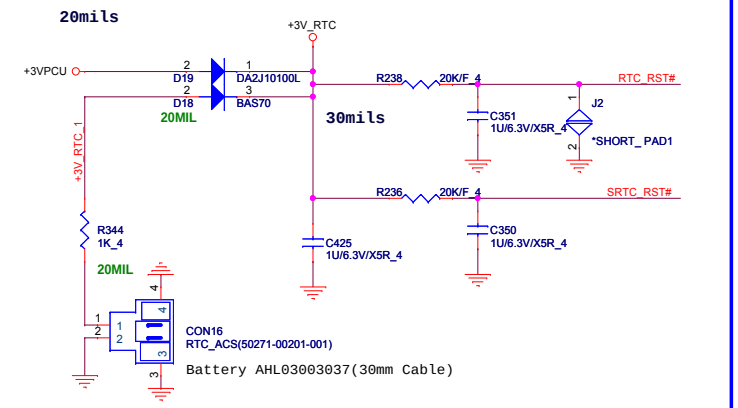
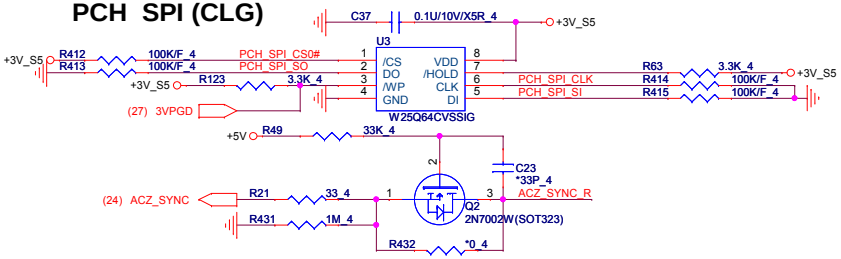
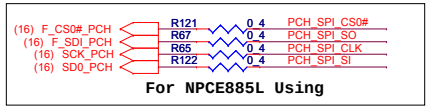
RTC Circuitry(RTC)



MX25L3205DM2I-12G: AKE39FP0Z00
W25X32VSSIG: AKE39ZP0N00

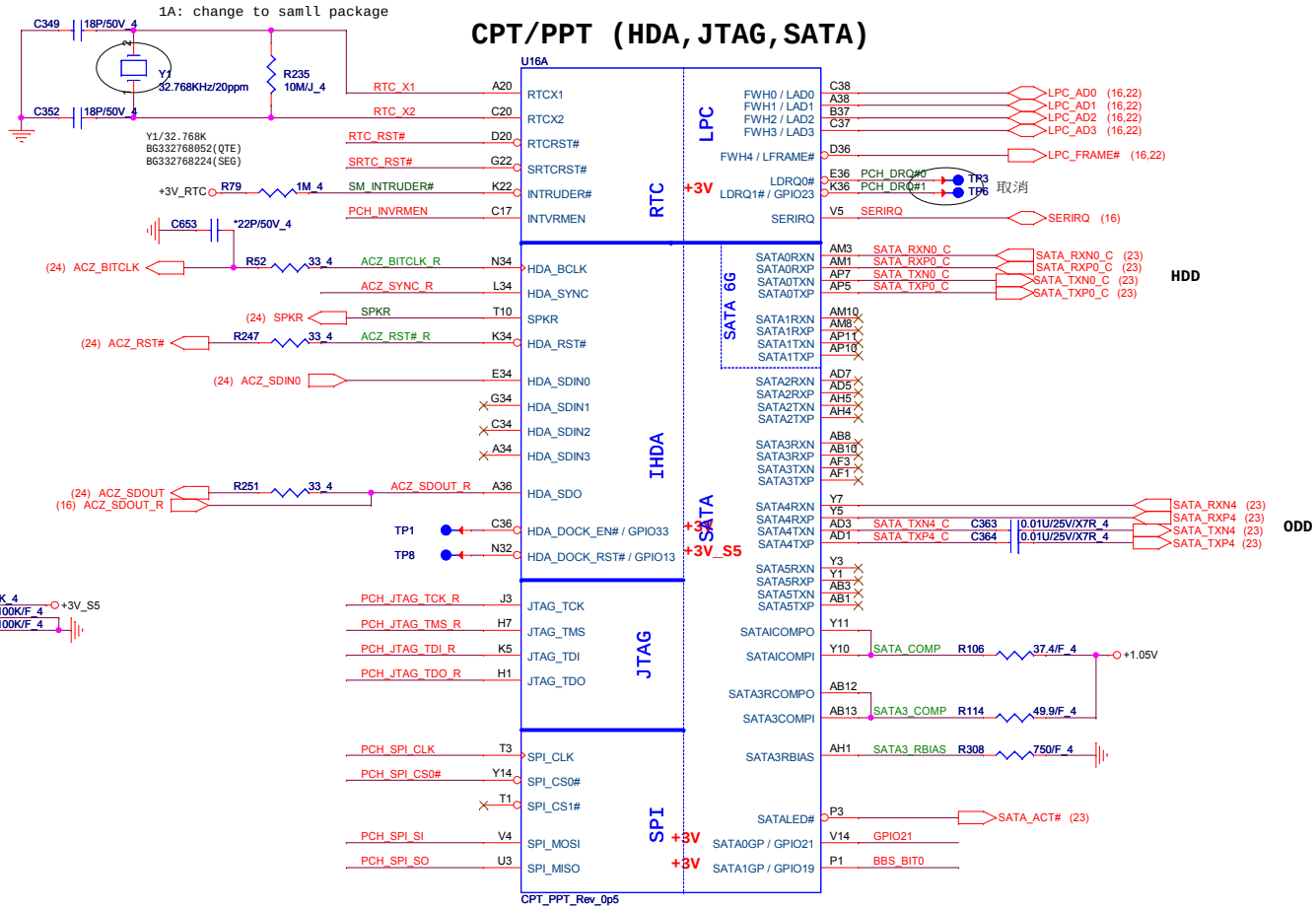
PCH SPI (CLG)





CPT/PPT (HDA,JTAG,SATA)

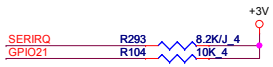
1A: change to samll package



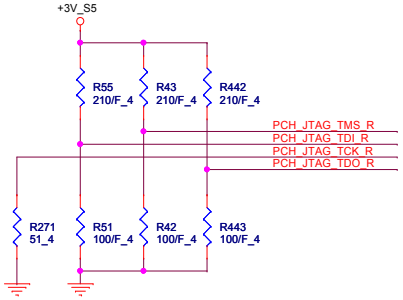
PCH Strap Table

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	SPKR
PCI_GNT3# / GPIO55	Top-Block Swap Override	PWROK	0 = "top-block swap" mode **1 = Default (weak pull-up 20K)**	TP53 PCI_GNT3# (10)
INTVRMEN	Integrated 1.05V VRM enable	ALWAYS	**Should be always pull-up**	+3V_RTC R242 330K/F_4 PCH_INVRMEN
GNT1# / GPIO51	Boot BIOS Selection 1 [bit-1]	PWROK	GNT1# / GNT0# / Boot Location: 1 / 1 / **SPI** *; 0 / 0 / LPC	**Default weak pull-up on GNT0/1#** **[Need external pull-down for LPC BIOS]**
GPIO19	Boot BIOS Selection 0 [bit-0]	PWROK		TP47 BBS_BIT1 (10) TP43 BBS_BIT0
HDA_SDO	Flash Descriptor Security	PWROK	0 = Default (weak pull-down 20K) 1 = Enabled	**ACZ_SDOUT_R**
DF_TVS	DMI/FDI Termination voltage	PWROK	0 = Set to Vss for Ivy Bridge 1 = Set to Vcc for Sandy Bridge (weak pull-down 20K)	R140 2.2K_4 +1.8V R320 1K_4 NV_CLE (11) H_SNB_IVB# (4)
GPIO28	On-die PLL Voltage Regulator	RSMRST#	0 = Disable 1 = Enable (Default)	TP44 PLL_ODVR_EN (11)
HDA_SYNC	On-Die PLL VR Voltage Select	RSMRST	0 = Support by 1.8V (weak pull-down) 1 = Support by 1.5V	+3V_S5 R29 1K_4 ACZ_SYNC_R

HR/CR: PROCSEL#



PCH JTAG Debug (CLG)



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 : GD5

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	CPT/PPT 2/6	1A
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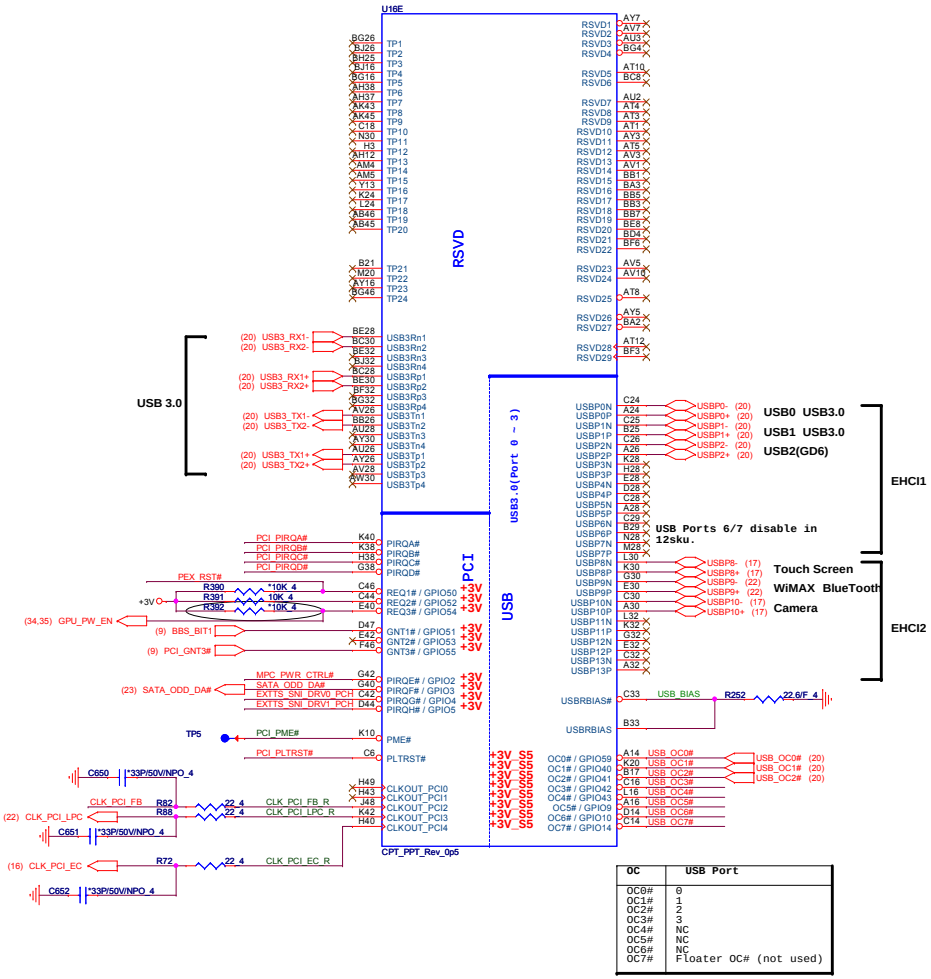
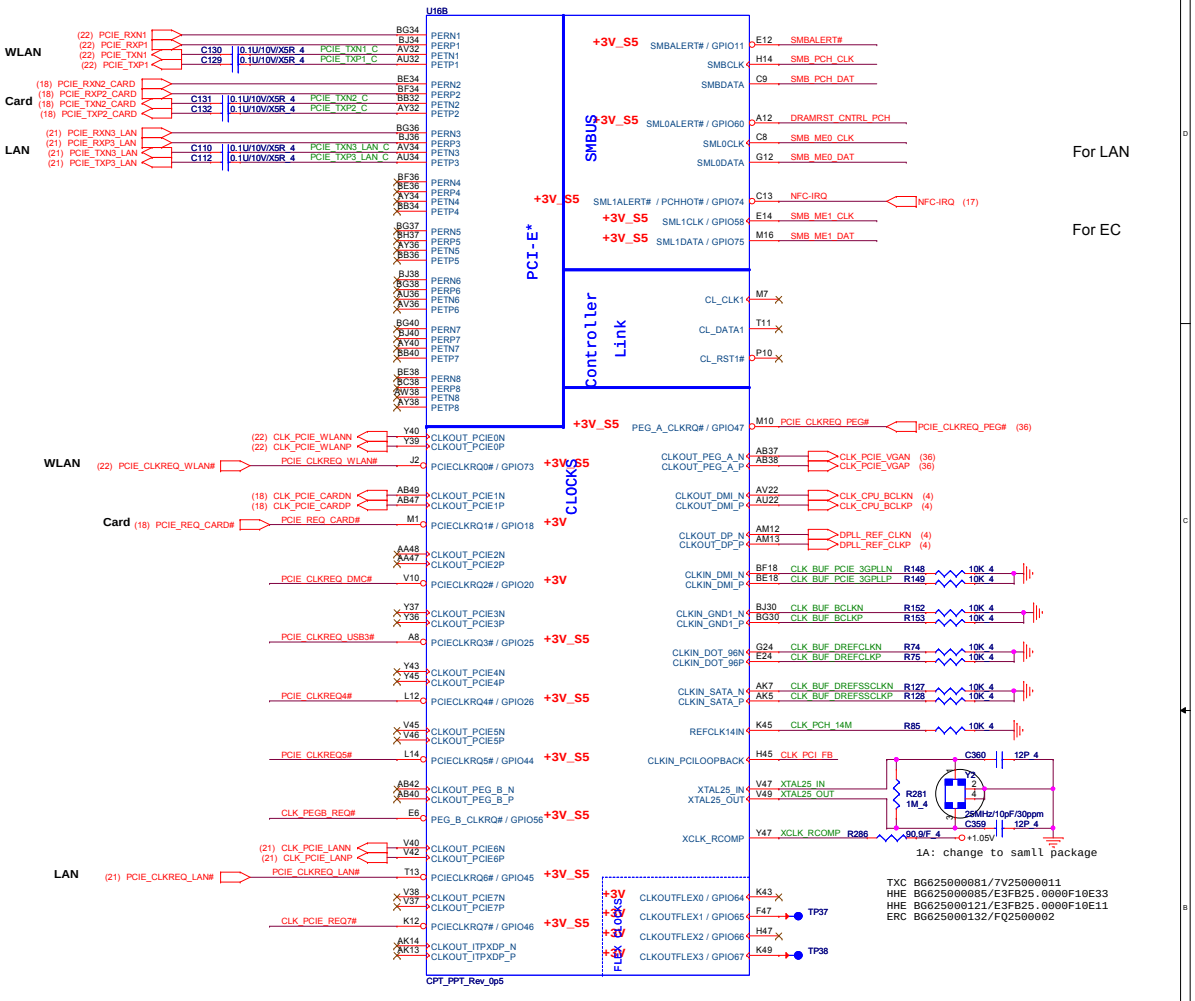
CPT/PPT (PCI,USB,NVRAM)



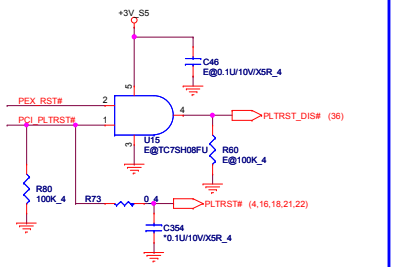
OC	USB Port
OC0#	0
OC1#	1
OC2#	2
OC3#	3
OC4#	NC
OC5#	NC
OC6#	NC
OC7#	Floater OC# (not used)

CPT/PPT (PCI-E,SMBUS,CLK)

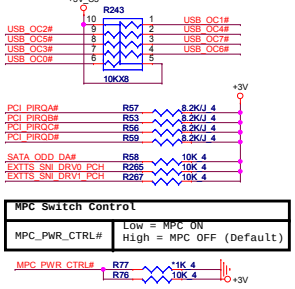


TXC BG625000081/7V25000011
HHE BG625000085/E3FB25.0000F10E33
HHE BG625000121/E3FB25.0000F10E11
ERC BG625000132/FQ2500002

PLTRST#(CLG)

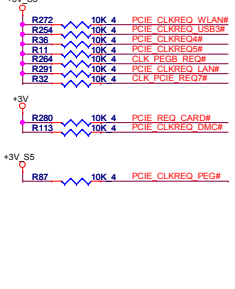


PCI/USBOC# Pull-up(CLG)

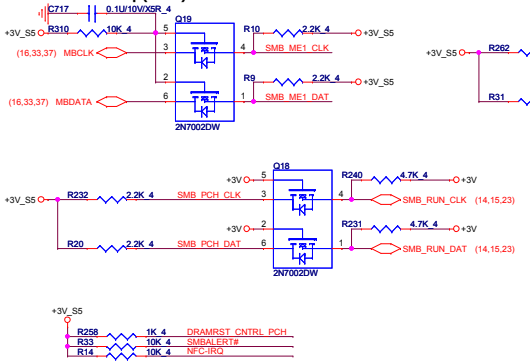


MPC Switch Control	
MPC_PWR_CTRL#	Low = MPC ON High = MPC OFF (Default)

CLK_REQ/Strap Pin(CLG)



SMBus/Pull-up(CLG)



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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PROJECT : GD5

Size	Document Number	Rev
	CPT/PPT 3/6	1A

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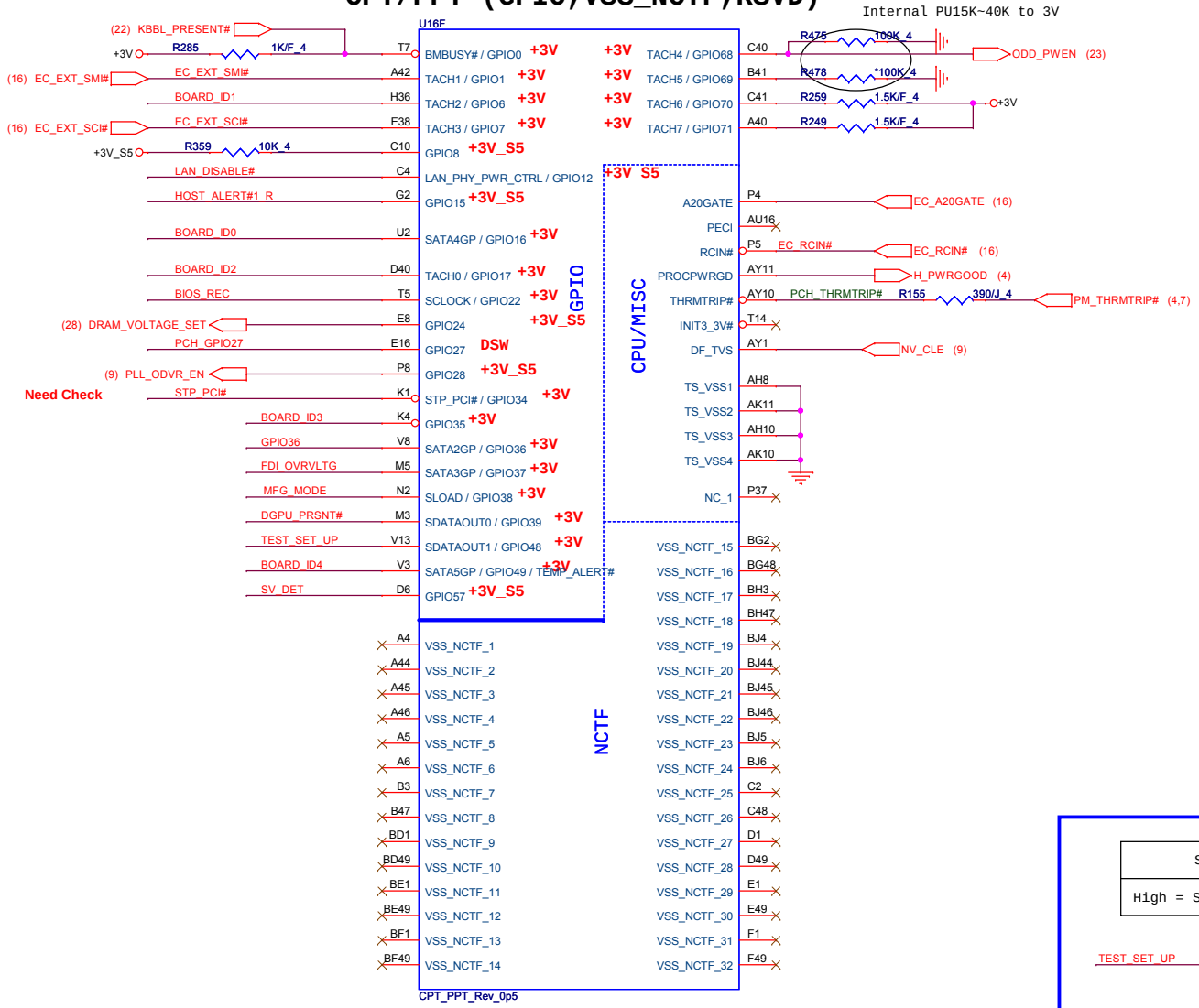
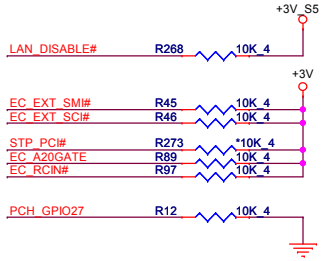
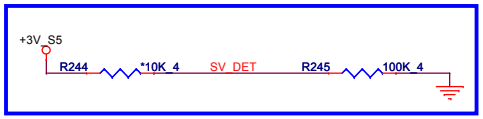
CPT/PPT (GPIO,VSS_NCTF,RSVD)



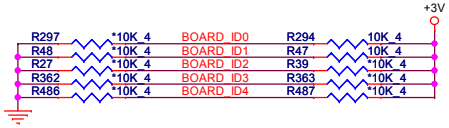
GPIO Pull-up/Pull-down(CLG)



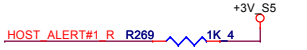


	0	1
Board ID0	CaspiCRA1/CRB1 HK8/9	SuperiorCRA1/CRB1 GD5/6
Board ID1	14"	15"

	Board ID2	Board ID3	Board ID4
SAM 2G	0	0	1
SAM 4G	0	1	0
HYN 2G	0	1	1
HYN 4G	1	0	0
ELP 2G	1	0	1
ELP 4G	1	1	0

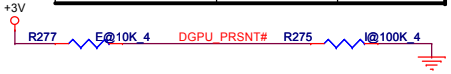


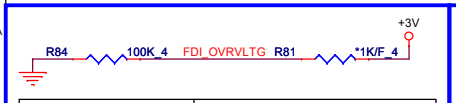
SV_SET_UP
High = Strong (Default)



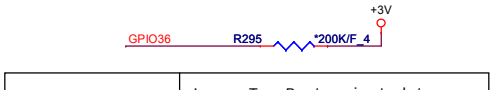
Intel ME Crypto Transport Layer Security (TLS) cipher suite
Low = Disable (Default)
High = Enable

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

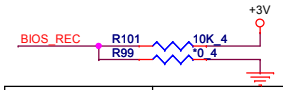




FDI TERMINATION VOLTAGE OVERRIDE	LOW - Tx, Rx terminated to same voltage



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



BIOS RECOVERY	High = Disable (Default) Low = Enable

MFG-TEST

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 : GD5

Size	Document Number	Rev
	CPT/PPT 4/6	1A
Date: Thursday, October 25, 2012	Sheet 11 of 41	

CPT/PPT (POWER)

POWER

VccCORE =1.3 A(60mils)

1A: CRT Disable

1mA(8mils)

1mA(8mils)

60mA(10mils)

1B: C114 change to 0603 at DVT stage.

(VccIO =2.925A (140mils))

VCCVRM: 1.8V (Destop)
1.5V (Mobile)

VCCDMI = 42mA(10mils)

VCCCLKDMI = 20mA(8mils)

VCCPNAND = 190 mA(15mils)

VCCSPI = 20mA(8mils)

VccASW =1.01 A(60mils)

VCCDSW3_3= 3mA

65mA(10mils)

8mA(8mils)

VCCDIFFCLKN= 55mA(10mils)

VCCSSC= 95mA(10mils)

1mA(8mils)

VCCRTC<1mA(8mils)

VCCSUS3_3 = 119mA(15mils)

VCC5REFSUS=1mA

V5REF= 1mA

VCCSUS3_3 = 119mA(15mils)

VCCPCORE = 28mA(10mils)

VCCVRM= 114mA(15mils)

VCCME = 1.01A(60mils)

VCCSUSHDA= 10mA(8mils)

DEEP STANDBY

1A: Modify FP

1.Level 1 Environment-related Substances Should Never be Used.
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Quanta Computer Inc.
PROJECT : GD5

Size	Document Number	Rev
	CPT/PPT 5/6	1B

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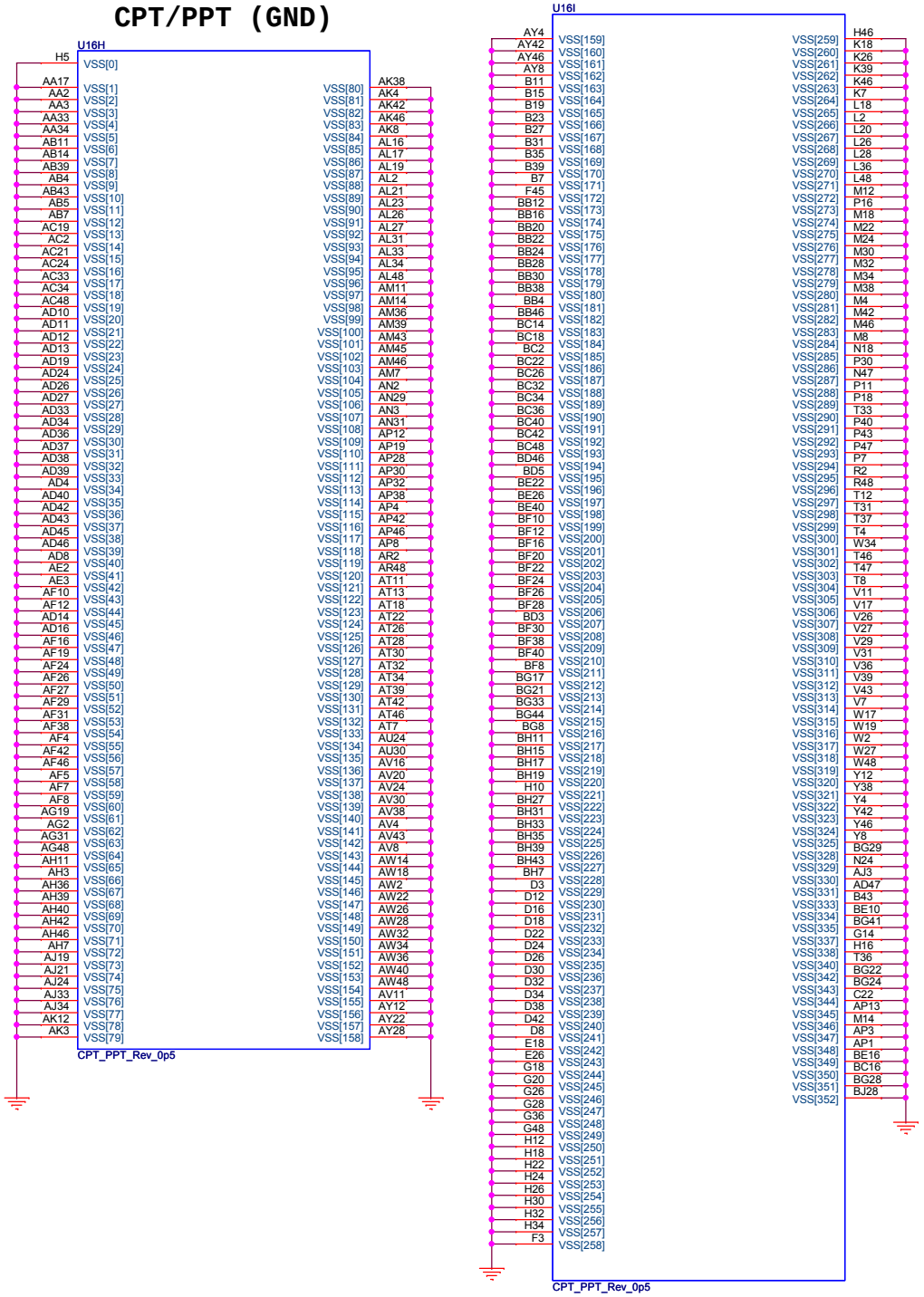
CPT/PPT (GND)



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

Quanta Computer Inc.
PROJECT : GD5

Size	Document Number	Rev
	CPT/PPT 6/6	1A
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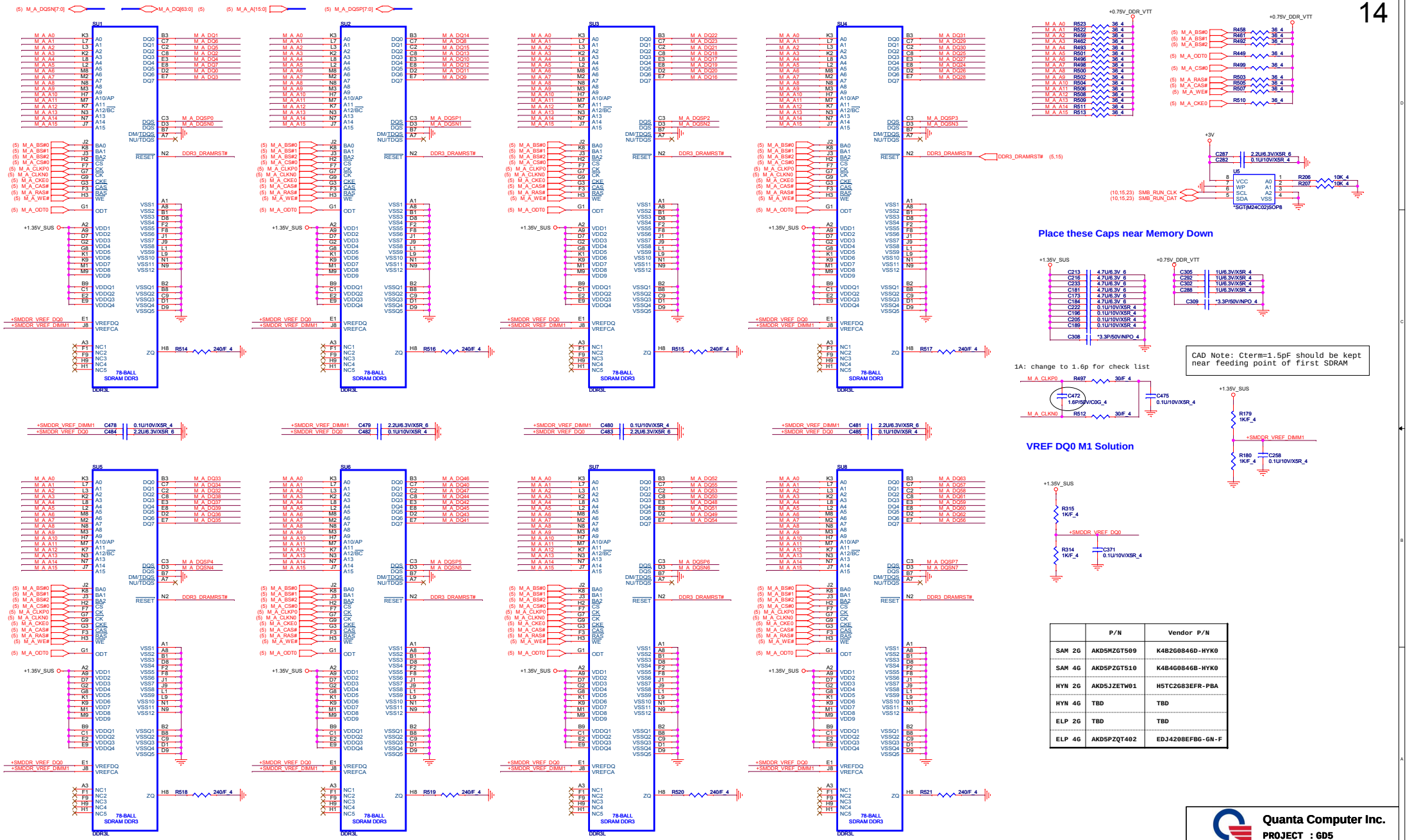

	P/N	Vendor P/N
SAM 2G	AKD5MZGT509	K4B2G0846D-HYK0
SAM 4G	AKD5PZGT510	K4B4G0846B-HYK0
HYN 2G	AKD5JZETW01	H5TC2G83EFR-PBA
HYN 4G	TBD	TBD
ELP 2G	TBD	TBD
ELP 4G	AKD5PZQT402	EDJ4208EFBG-GN-F

Quanta Computer Inc.
PROJECT : GD5

Size	Document Number	Rev
	DDR3L MEMORY DOWN	1A
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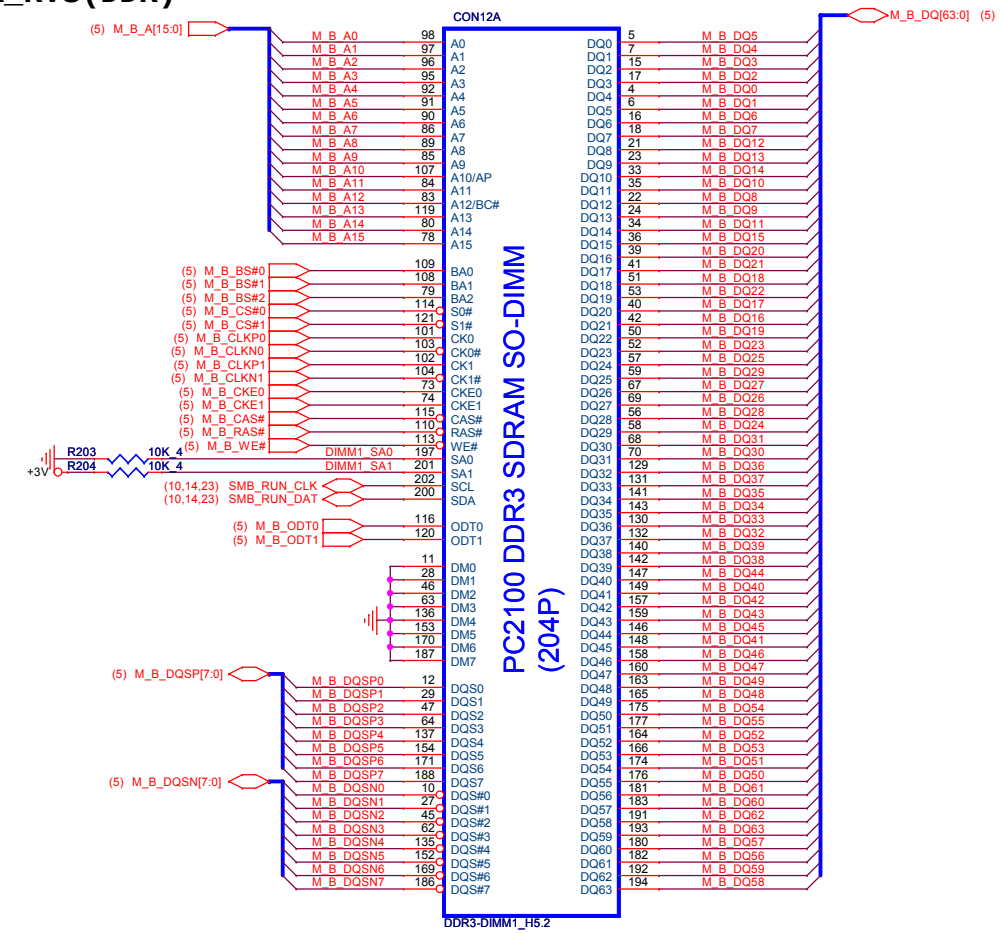
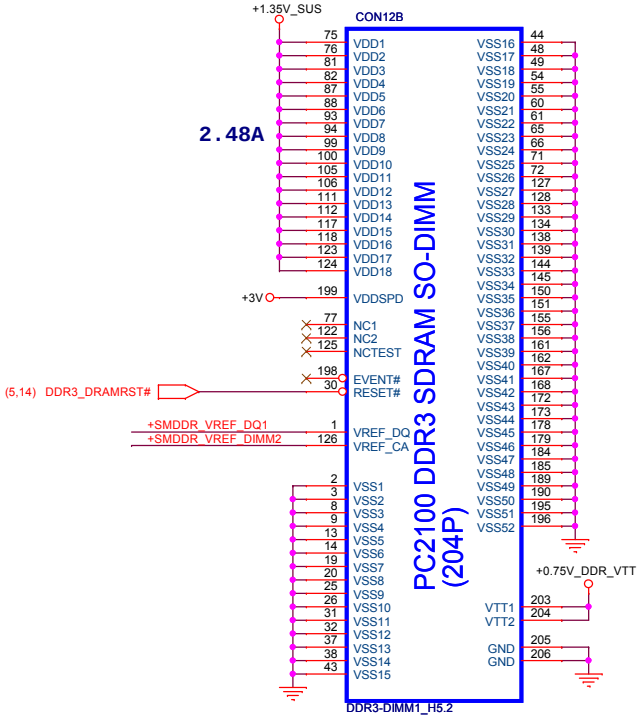
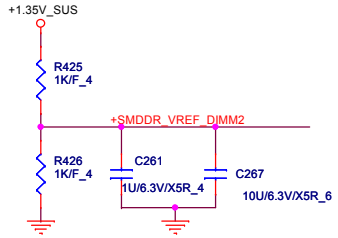
DDR_RVS(DDR)



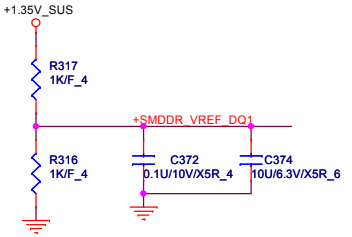
RUV Type



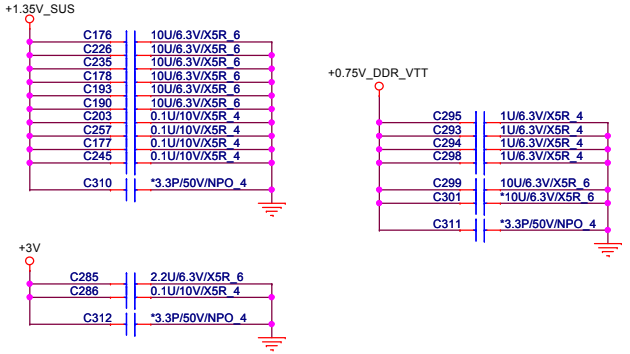
RUV Type



VREF DQ1 M1 Solution



Place these Caps near So-Dimm1.



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Quanta Computer Inc.
PROJECT : GD5

Size	Document Number	Rev
	DDRIII SO-DIMM-1	1A
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** Straping Pin,Can not pull low.
Note the input leakage current to the strap pins must be less than 10uA.

Since ECSCI is OD, no need for a back-drive protection diode on this signal. But note there is internal PU in chipset at default

KC16, KC17 can't mount(ME high limitation)

KU1 PC985L_0

LPC: LAD0/GPIOF1, LAD1/GPIOF2, LAD2/GPIOF3, LAD3/GPIOF4, LRESET#/GPIOF7, LCLK/GPIOF5, LFRAME#/GPIOF6, GA20/GPIO85, SERIRQ/GPIOF0, SMI#/GPIO65, ECSCI#/GPIO54, KBRST#/GPIO86

A/D: AD0/GPIO90, AD1/GPIO91, AD2/GPIO92, AD3/GPIO93, AD4/GPIO05, AD5/GPIO04, AD6/GPIO03, AD7/GPIO07/VD_IN2

D/A: DA0/GPIO94, DA1/GPIO95, DA2/GPIO96, DA3/GPIO97

PWM: A_PWM0/GPIO15, B_PWM/GPIO21, C_PWM/GPIO13, D_PWM/GPIO32, H_PWM/GPIO33/VD1_EN#, G_PWM/GPIO66, E_PWM/GPIO45, PWM/GPIO40/1_WIRE

SPI: GPIO67/N2TMS, F_SDI/F_SDIO1, F_SDIO/F_SDIO0, F_SCK, F_CS0#

K/B: KBSIN0/GPIOA0/N2TCK, KBSIN1/GPIOA1/N2TMS, KBSIN2/GPIOA2, KBSIN3/GPIOA3, KBSIN4/GPIOA4, KBSIN5/GPIOA5, KBSIN6/GPIOA6, KBSIN7/GPIOA7, KBSOUT0/GPOB0/JENK#/SOUT_CR/GPIO81/F_WP#/F_SDIO2, KBSOUT1/GPIOB1/TCK, KBSOUT2/GPIOB2/TMS, KBSOUT3/GPIOB3/TDI, KBSOUT4/GPOB4/JEN0#**, KBSOUT5/GPIOB5/TDO, KBSOUT6/GPIOB6/RDY#, KBSOUT7/GPIOB7, KBSOUT8/GPIOC0, KBSOUT9/GPOC1/SDP_VIS#, KBSOUT10/P80_CLK/GPIOC2, KBSOUT11/P80_DAT/GPIOC3, KBSOUT12/GPO64/TEST#, KBSOUT13/GP(I)O63/TRIST#, KBSOUT14/GP(I)O62/XORTR#, KBSOUT15/GPIO61/XOR_OUT, KBSOUT16/GPIO60, KBSOUT17/GPIO57

GPIO: GPIO16, GPIO30/F_WP#, GPIO36, GPIO41/F_WP#, GPIO70, GPIO71, GPIO72, GPIO24, TA1/GPIO56, TMS/GPIO43, SOUT_CR/GPIO83, TDI/GPIO44, GPIO51/N2TCK

PS/2: RDY#/GPIO52/PSDAT3, TDO/GPIO50/PSCLK3, PSDAT2/GPIO27, PSCLK2/GPIO26, PSDAT1/GPIO35, PSCLK1/GPIO37

CIR: GPIO34, TRST#/GPIO46, SIN_CR/GPIO87

PCEI: PECI, VTT, TCK/GPIO42

SMBus I/O Expansion: TA2/GPIO20/IOX_DIN_DIO, TB1/GPIO14, TB2/GPIO01, SCL1/GPIO17/N2TCK, SDA1/GPIO22/N2TMS, SCL2/GPIO73/N2TCK, SDA2/GPIO74/N2TMS, SCL3A/GPIO23/N2TCK, SDA3A/GPIO31/N2TMS, SCL4A/GPIO47/N2TCK, SDA4A/GPIO53N2TMS, GPIO00/EXTCLK/F_SDIO3

SPI_MISO/GPIO77, **SPI_MOSI/GPO76, SPI_SCK/GPIO75, SPI_CS#/GPIO02

GPIO06/IOX_DOUT, GPIO82/IOX_LDSH/VD_OUT1, GPIO84/IOX_SCLK/VD_OUT2, CLKOUT/GPIO55/IOX_DIM_DIO

VD_IN1/GPIO80, EXT_RST#, VCORF

Magnetic Lid Switch

KU4 E-CMOS: +3VPCU, IN, OUT, GND, LID#

E-CMOS :AL002618001/EC2618NLB1GR
PROLIFIC : AL003661003/PT3661-BB
BCD : AL009249000/AH9249NTR-G1

1A: Add MODEL ID

MODEL_ID: KR4 *100K_4 +3VPCU; KR5 100K_4

HK8/9 HIGH KR29 MOUNT
GD5/6 LOW KR30 MOUNT

DRAM_VOLTAGE_SET
Low: 1.5V
High : 1.35V

VCC POWER ON RESET

35001: KU2 R5G05000N753NF (PGM, RSET, VSS, VCC, GND, PIO, SDA, SCK, CNVSS)

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 : GD5

Size	Document Number	Rev
	NPCE985	1A
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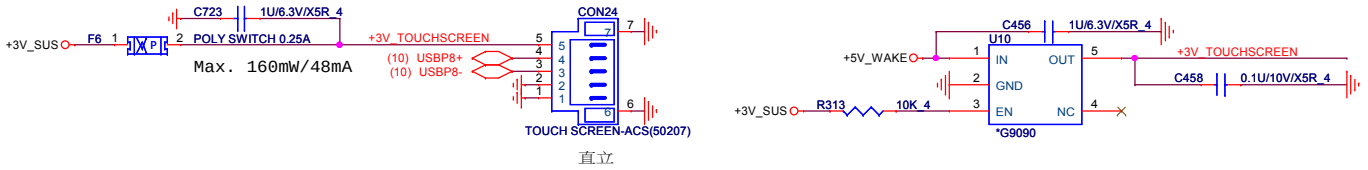
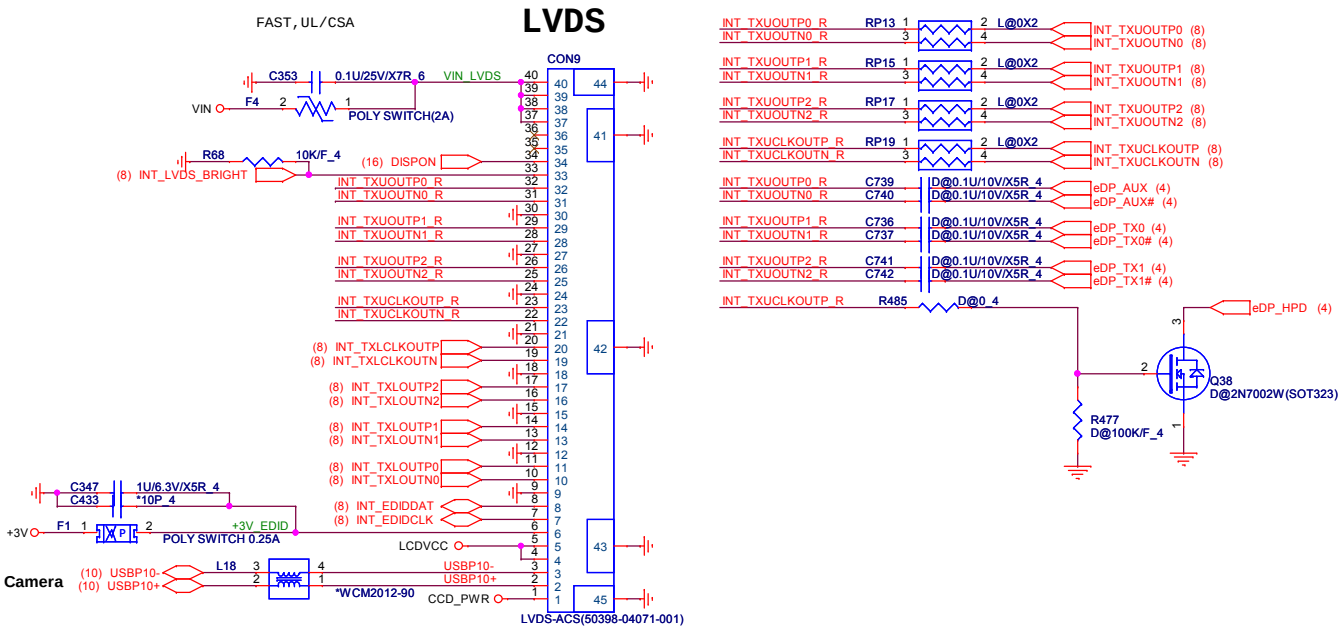
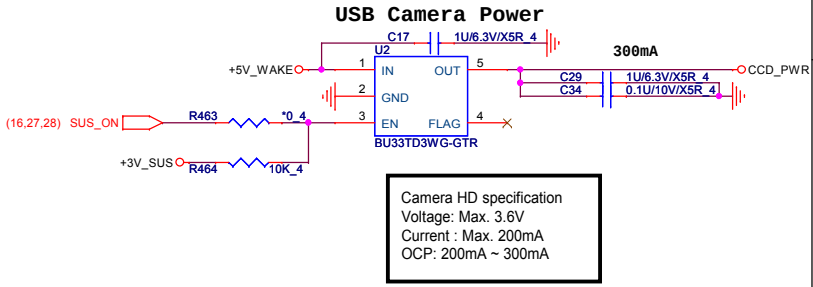
Touch Screen



LVDS

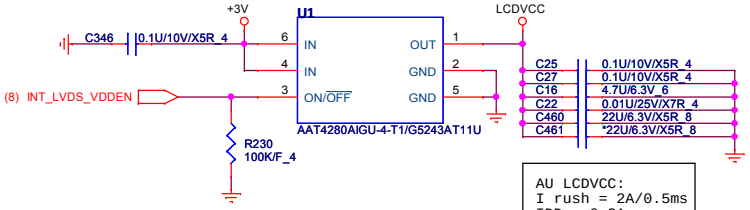


USB Camera Power



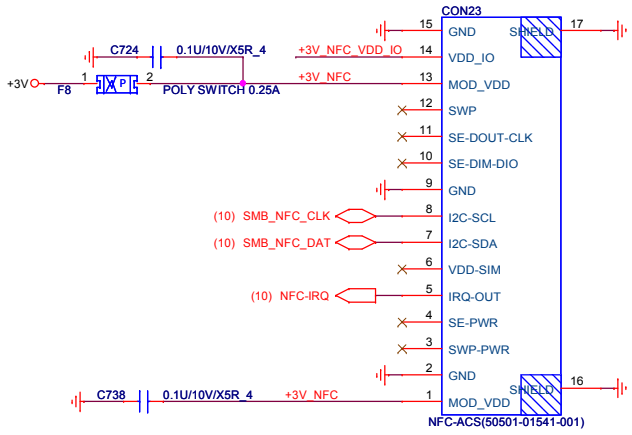
Camera HD specification
Voltage: Max. 3.6V
Current : Max. 200mA
OCP: 200mA ~ 300mA

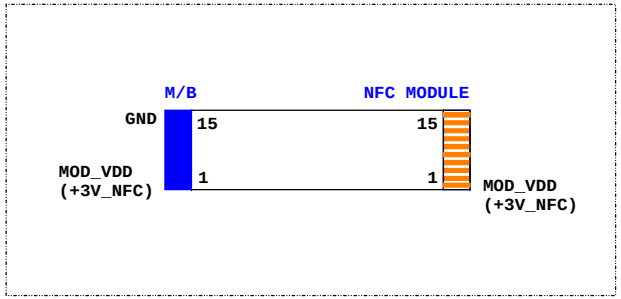
NB LVDS enable

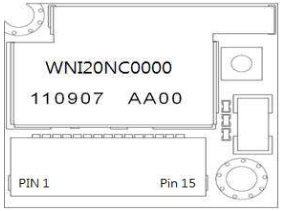


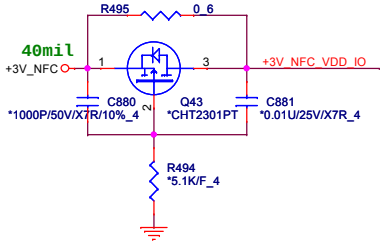
AU LCDVCC:
I rush = 2A/0.5ms
IDD = 0.3A

NFC









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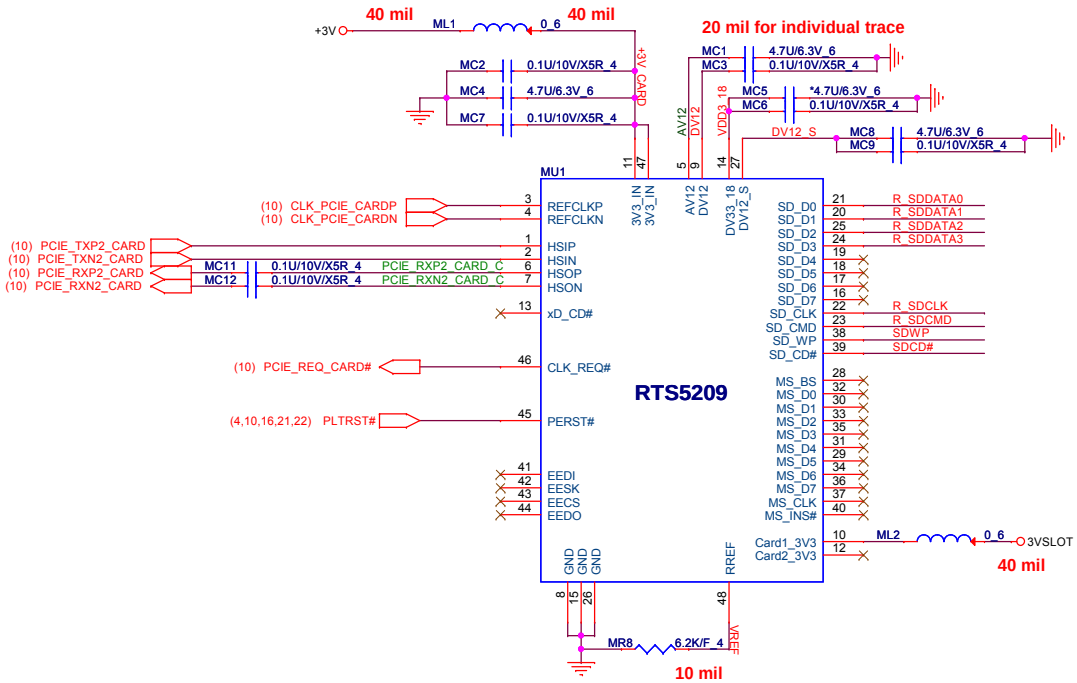
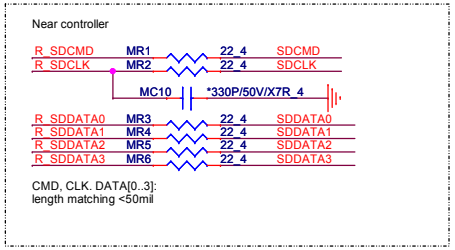
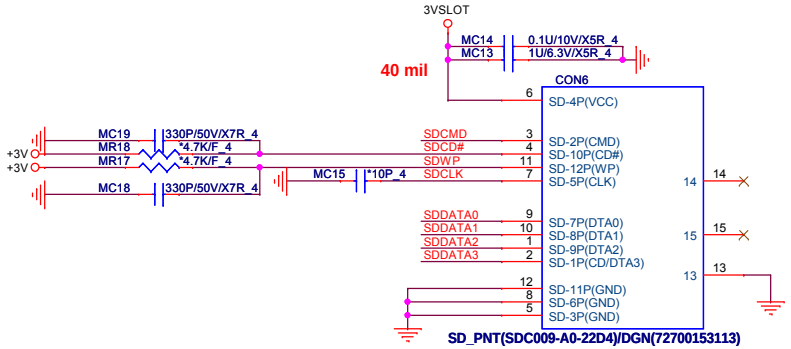
2.Recycled Resin and Coated Wire should be procured from Green Partners.

Quanta Computer Inc.
PROJECT : GD5

Size	Document Number	Rev
	NFC/TOUCH SCREEN/eDP	1A
Date: Thursday, October 25, 2012	Sheet 17 of 41	







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Quanta Computer Inc.
PROJECT : GD5

Size	Document Number	Rev
	CARD	1A
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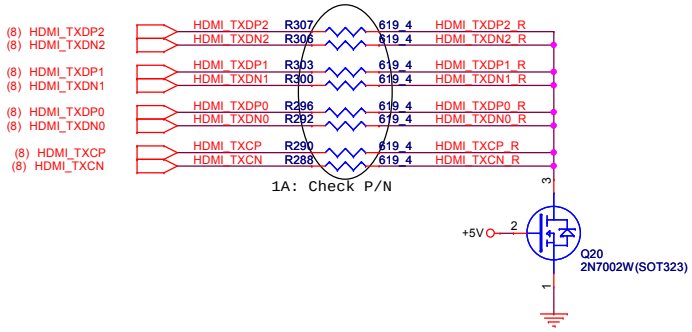
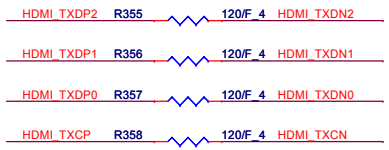
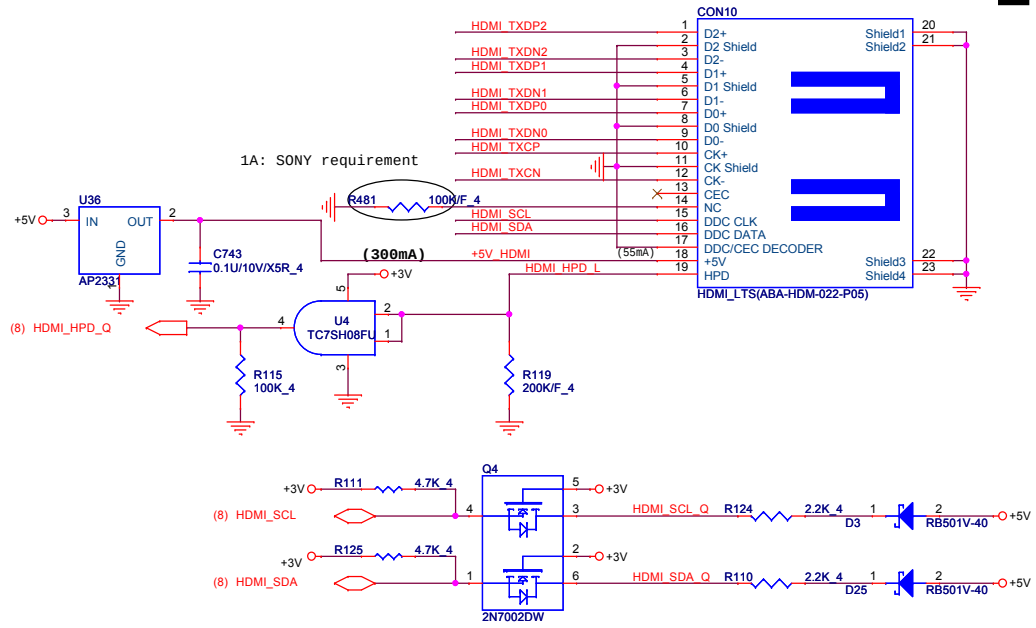
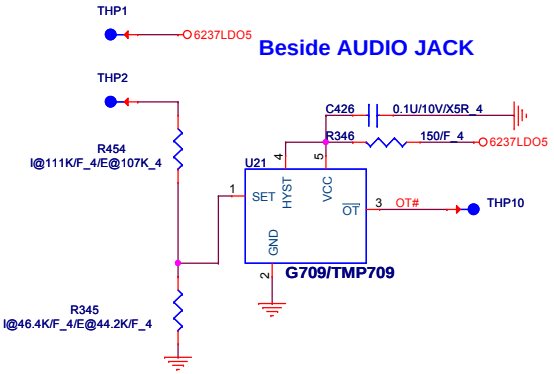
HDMI

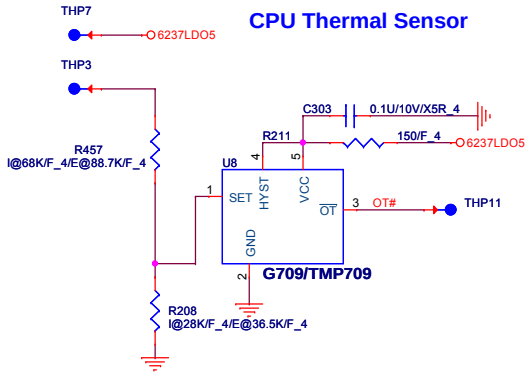


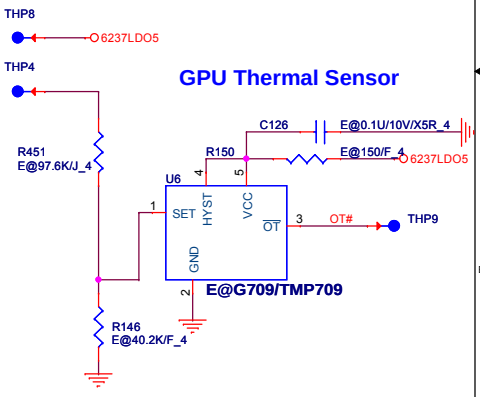




H/W Thermal Protect

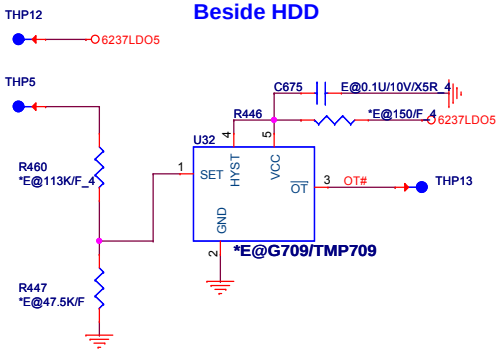


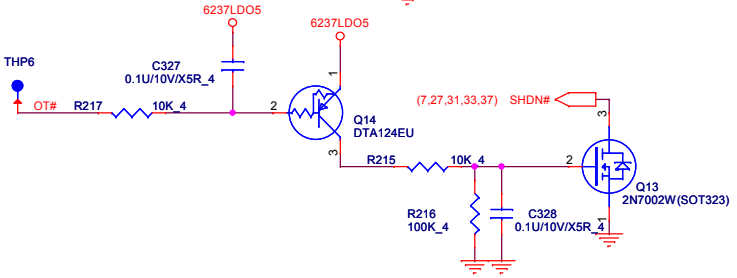




RSET(kΩ)= 0.0012T2 – 0.9308T + 96.147

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

1.Level 1 Environment-related Substances Should Never be Used.
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Quanta Computer Inc.
PROJECT : GD5

Size	Document Number	Rev
	HDMI/Thermal IC	1A
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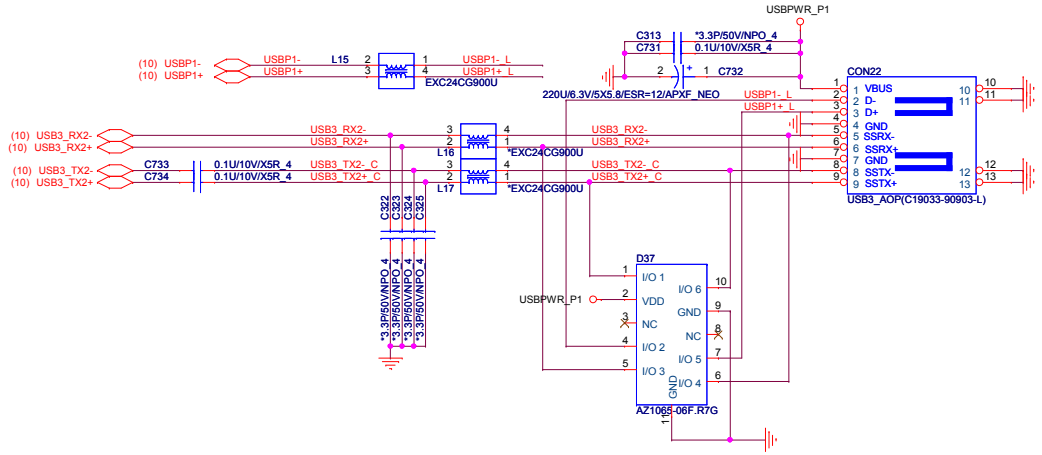
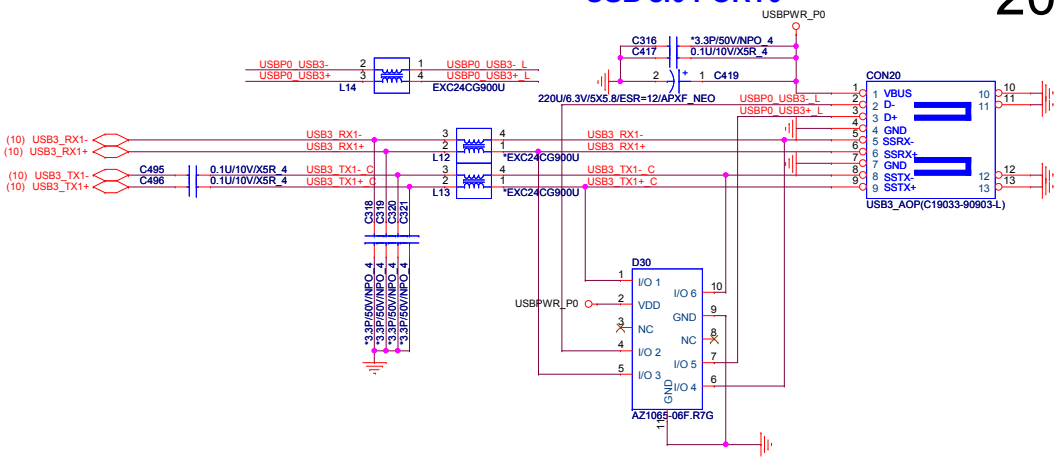
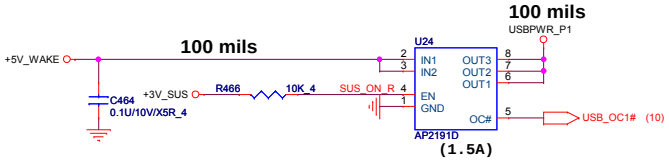
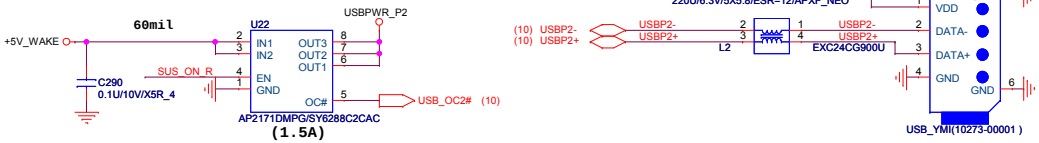


USB 3.0 PORT0

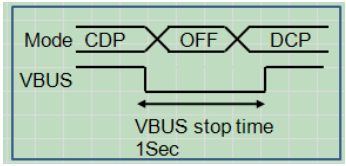




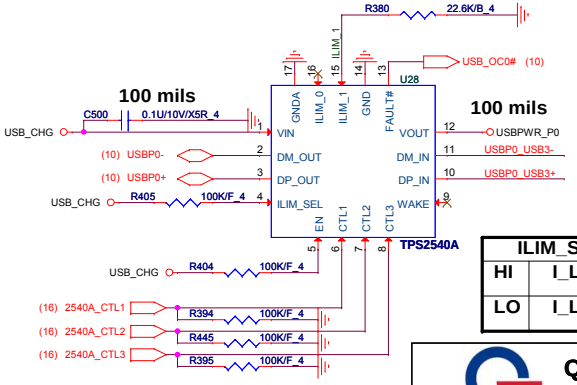
USB 2.0(GD6 Only)



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



USB Charger



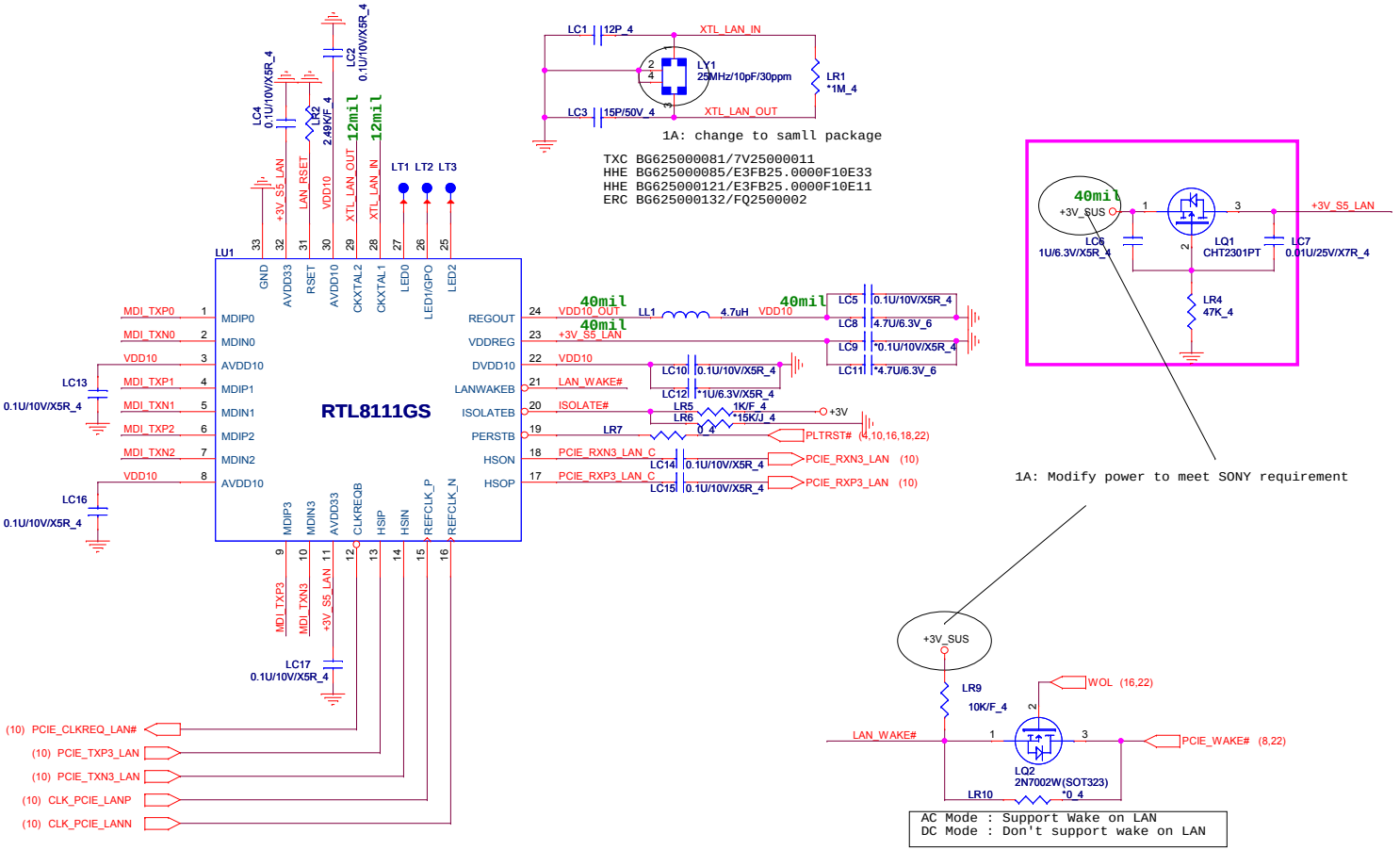
ILIM_SEL	(I LIMIT(A)= 48000/R)	
HI	I_LIM_1	
LO	I_LIM_0	48000/22.6K=2.123A

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	C(1 2 3)	Enable	C(1 2 3)
S0	SDP	(X 1 0)	CDP	(1 1 1)
S3	SDP	(X 1 0)	DCP BC	(1 0 0)
DS3	Charger OFF	(0 0 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)

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 : GD5
Size | Document Number: USB/USB Charger | Rev 1A
Date: Thursday, October 25, 2012 | Sheet 20 of 41

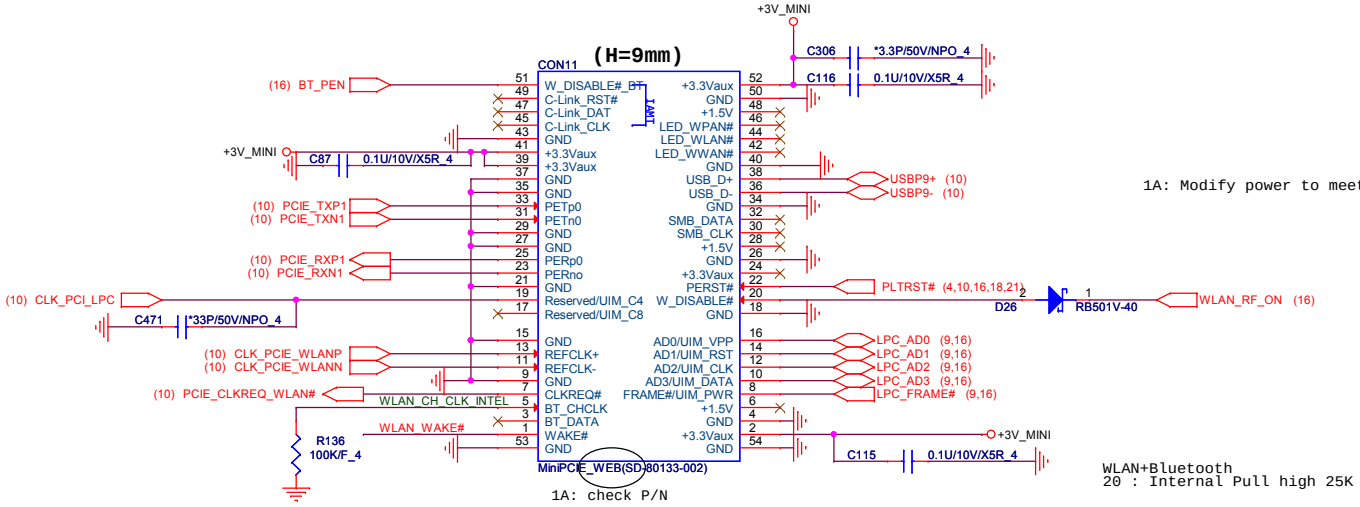


1.Level 1 Environment-related Substances Should Never be Used.
2.Recycled Resin and Coated Wire should be procured from Green Partners.

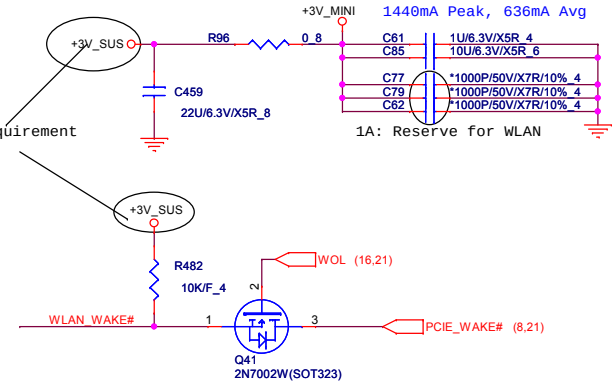
Quanta Computer Inc.
PROJECT : GD5

Size	Document Number	Rev
	Giga LAN RTL8111GS	1A
Date: Thursday, October 25, 2012	Sheet 21 of 41	

WLAN/WIMAX/WIDI



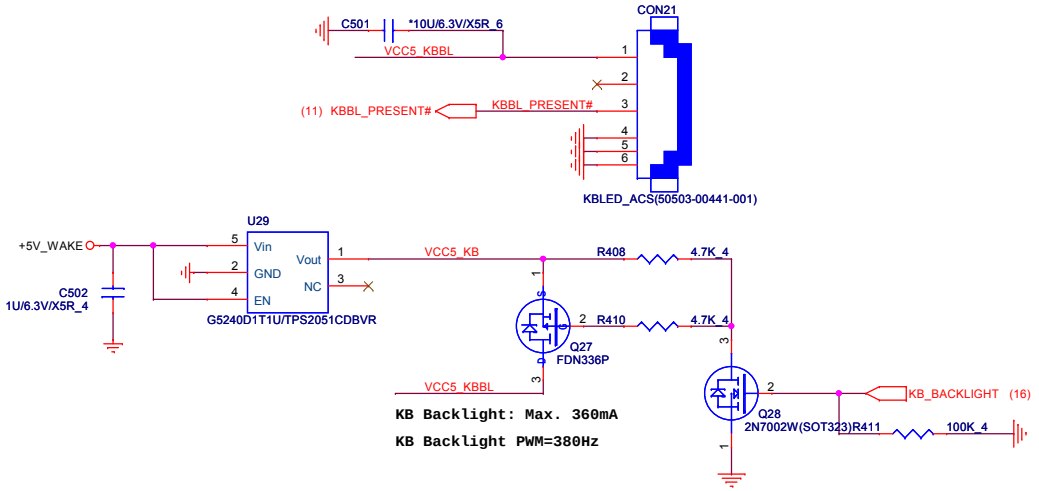
1A: Modify power to meet SONY requirement



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

AC Mode : Support Wake on WLAN
DC Mode : Don't support wake on WLAN

KB BACKLIGHT



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 : GD5

Size	Document Number	Rev
	WLAN/KB BL	1A

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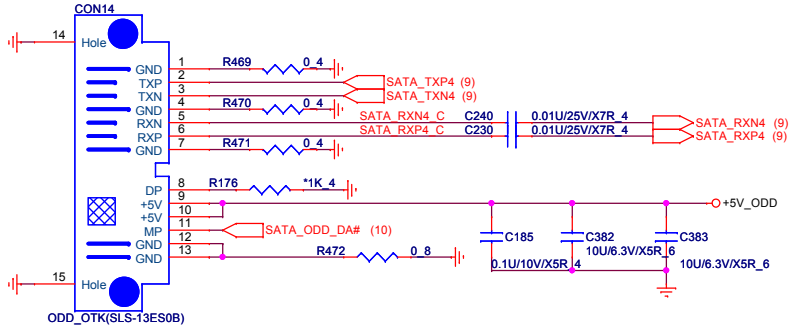
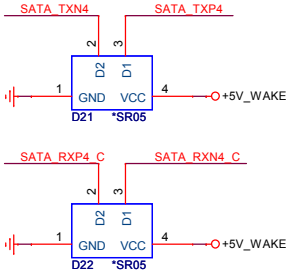
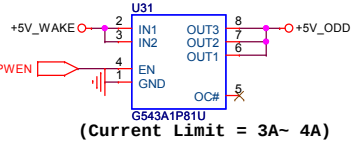
ODD CONNECTOR

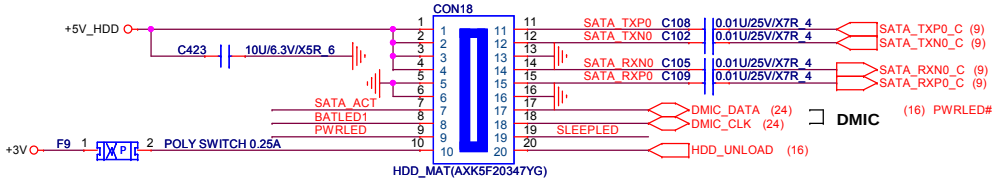






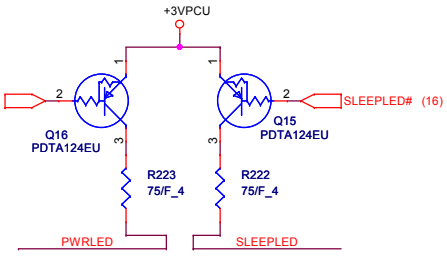
(Current Limit = 3A~ 4A)

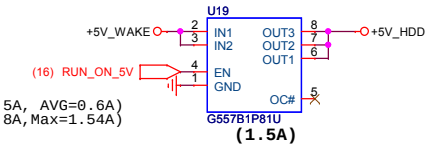
HDD BOARD CONNECTOR



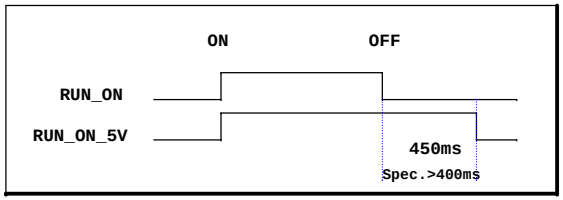
DMIC

Power/Sleep LED

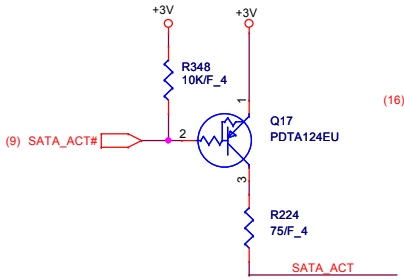




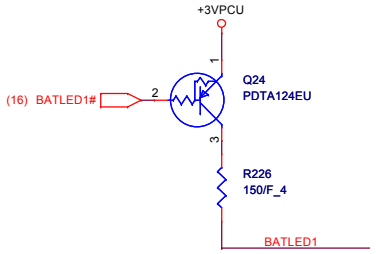
(2.5"HDD VCC5 Max=1.5A, AVG=0.6A)
(2.5"SSD VCC5 typ=0.8A,Max=1.54A)
(1.5A)

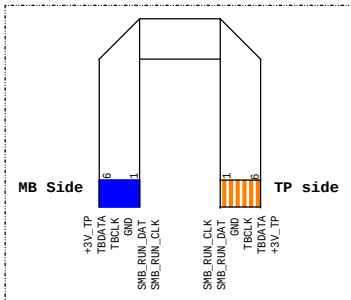


SATA LED

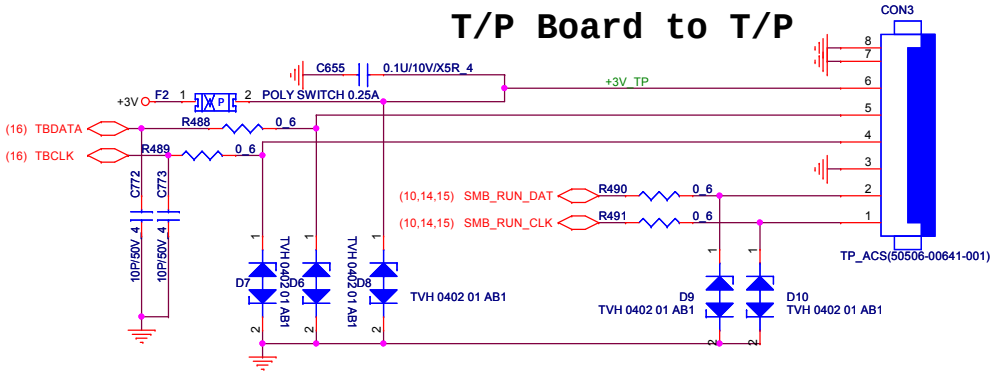


BATTERY LED

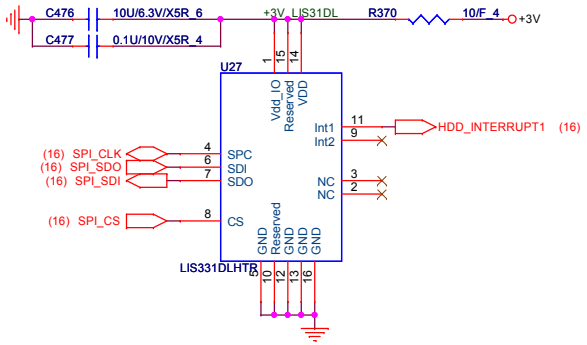




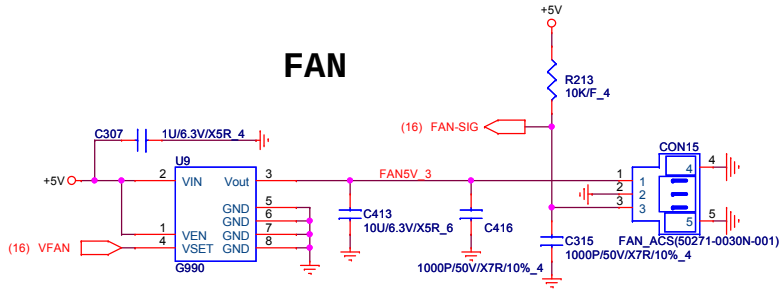
T/P Board to T/P



HDD PROTECT



FAN



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 : GD5

Size	Document Number	Rev
	HDD/ODD/TP/FAN	1A

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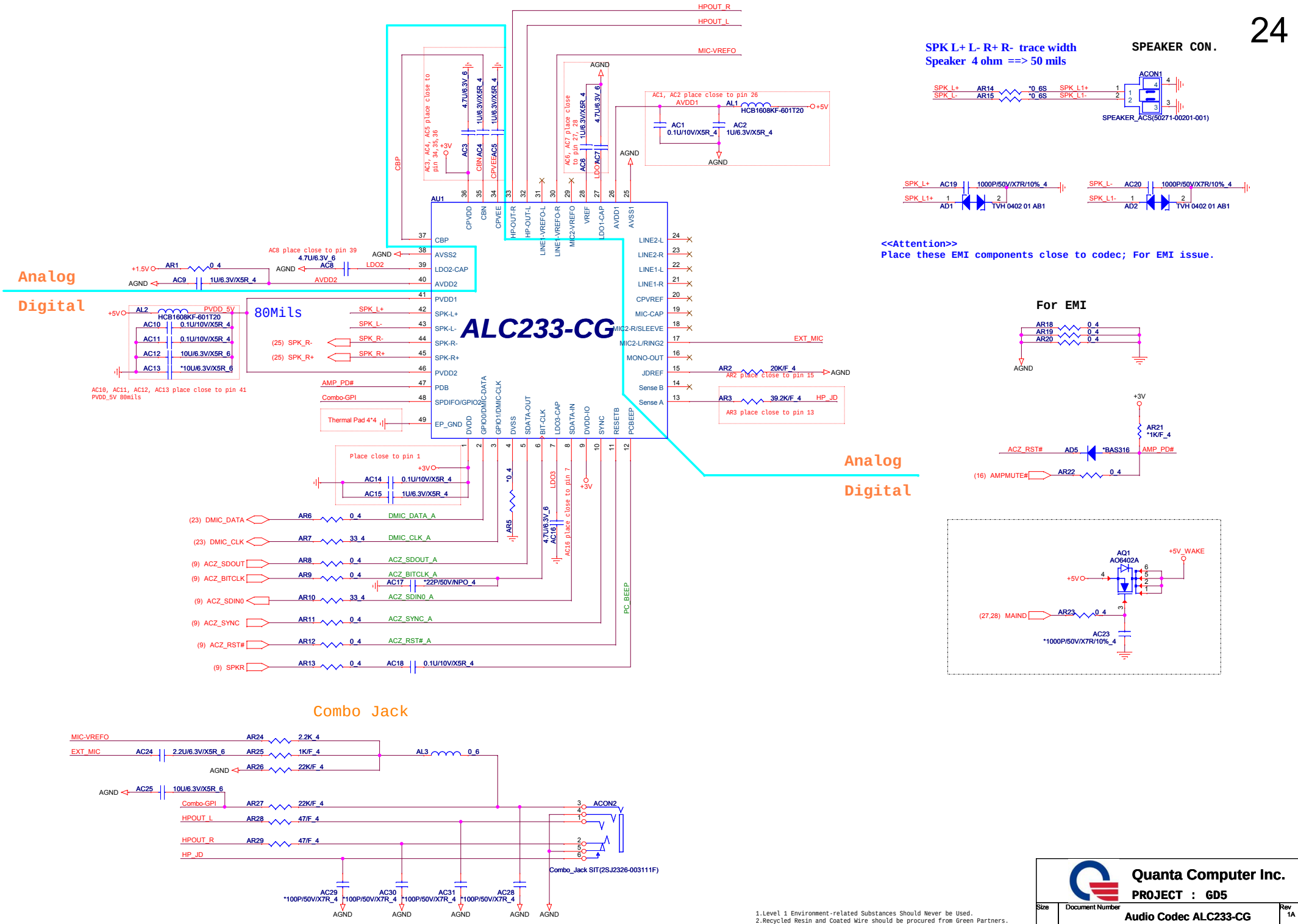

1.Level 1 Environment-related Substances Should Never be Used.
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Quanta Computer Inc.
PROJECT : GD5

Size	Document Number	Rev
	Audio Codec ALC233-CG	1A
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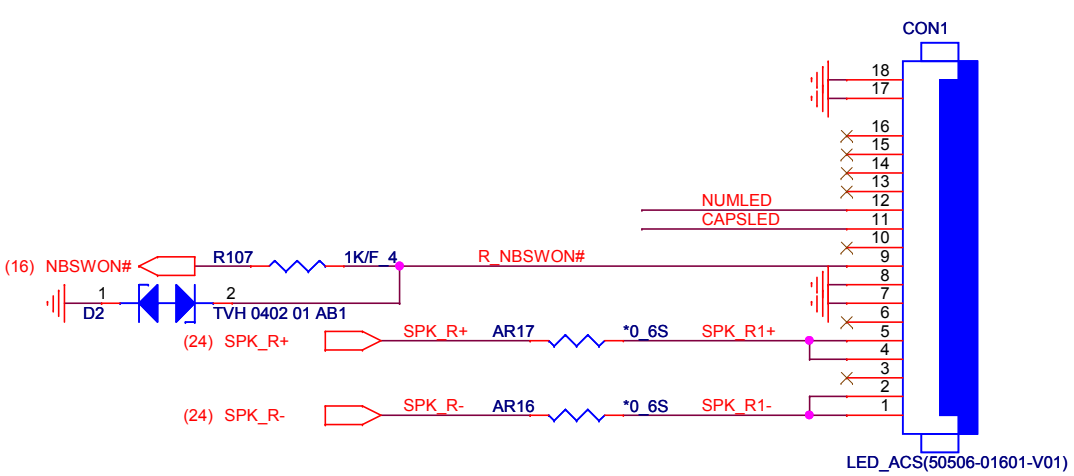
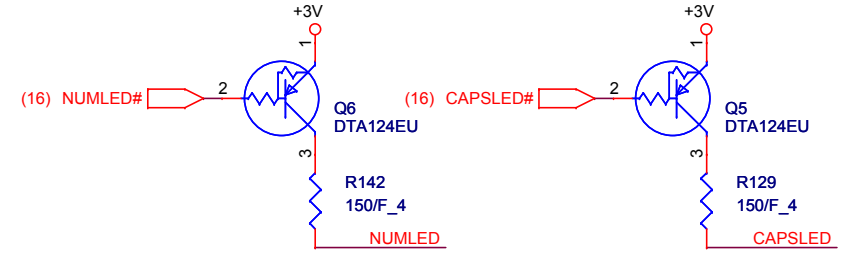
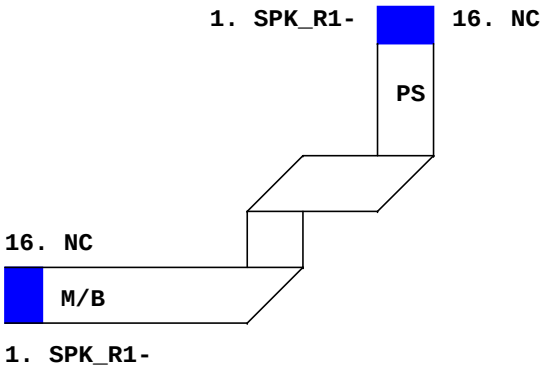
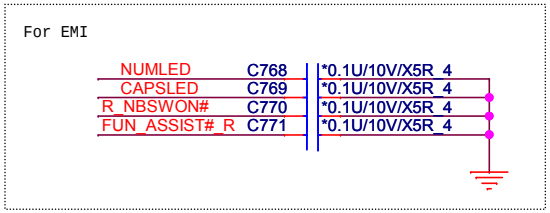
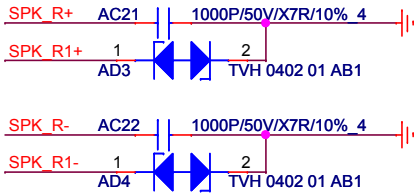
Power SW Board Connector











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 :GD5

Size	Document Number	Rev
	LED/PS	1A

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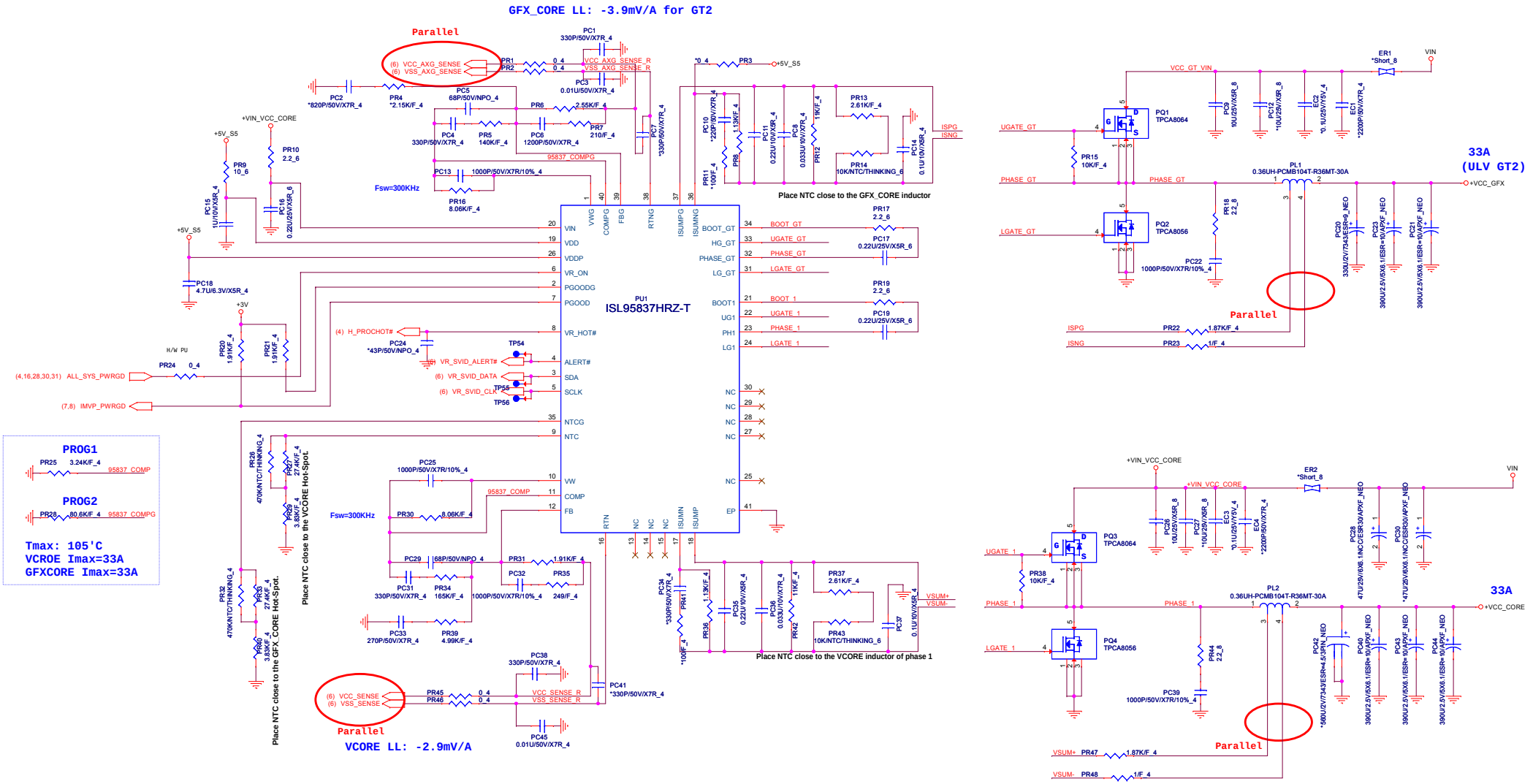

1.Level 1 Environment-related Substances Should Never be Used.
2.Recycled Resin and Coated Wire should be procured from Green Partners.

Quanta Computer Inc.
PROJECT : GD5

Size	Document Number	Rev
	+VCC_CORE (ISL95837)	ES1

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3.3V & 5V

Fsw setting=400KHz

Fsw setting=500KHz

0.6A

7.5A

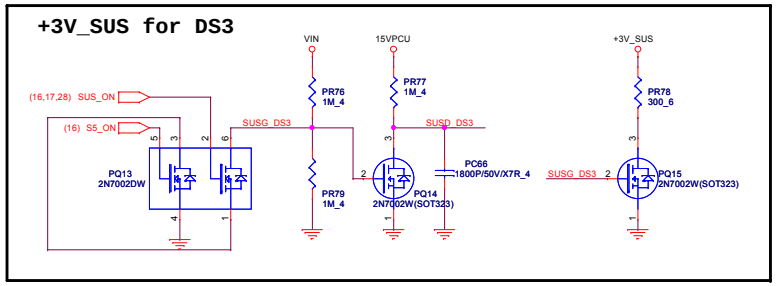
10mil

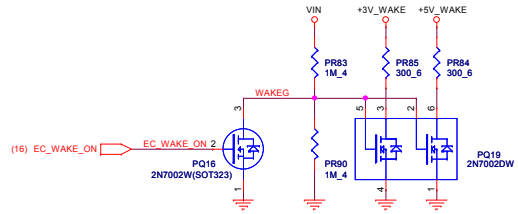
5A

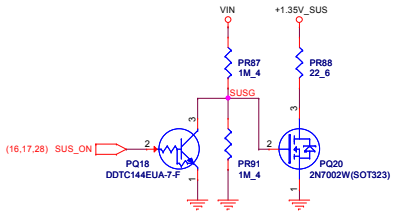
2.0A

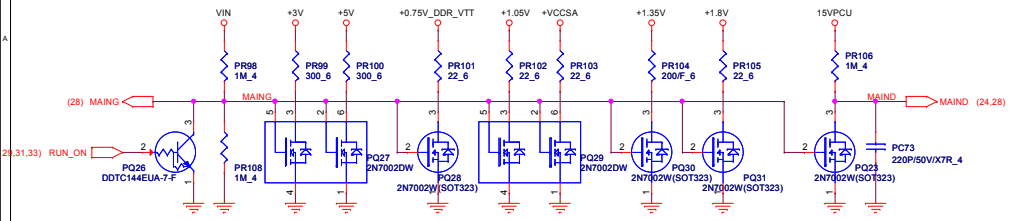
1.2A

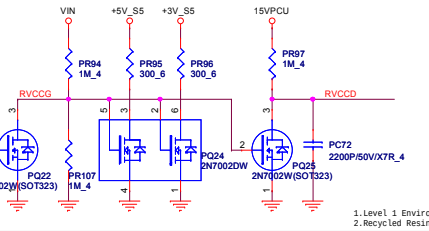
1.5A

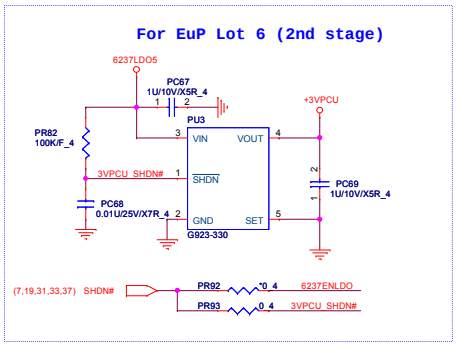












1.Level 1 Environment-related Substances Should Never be Used.
2.Recycled Resin and Coated Wire should be procured from Green Partners.

Quanta Computer Inc.
PROJECT : GD5

Size	Document Number	Rev
	3VPCU&5VPCU(TPS51427A)	1A

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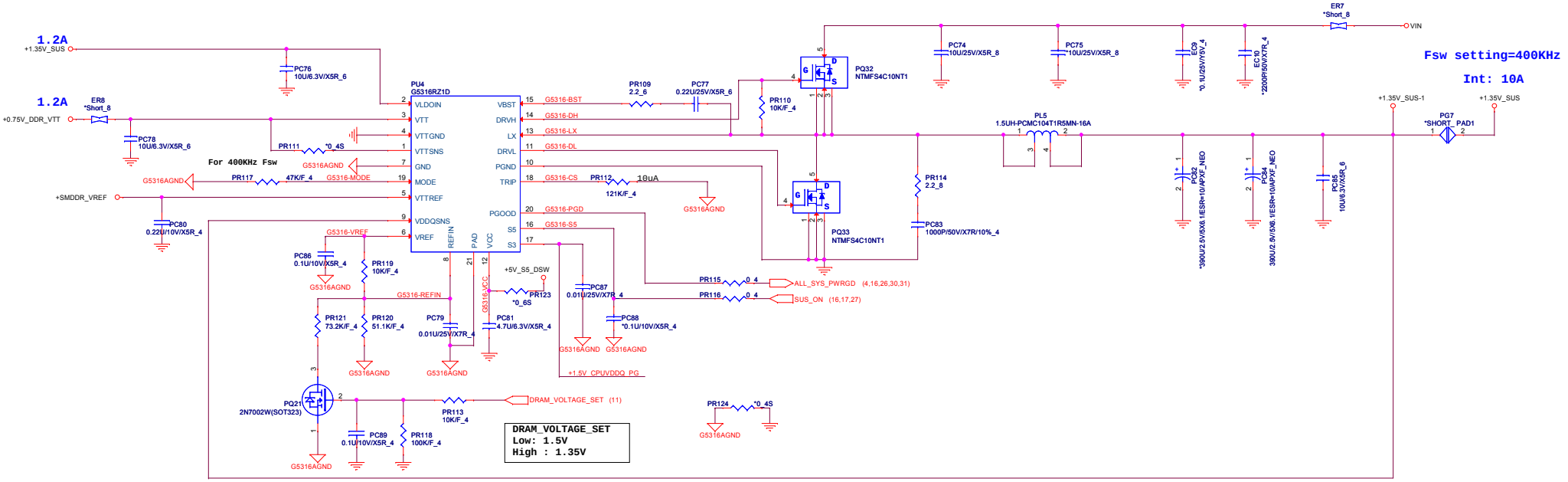
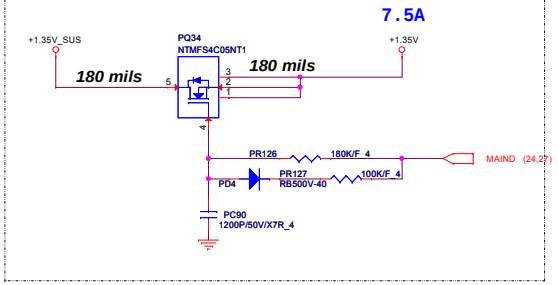
1.35VSUS & VTT_MEM

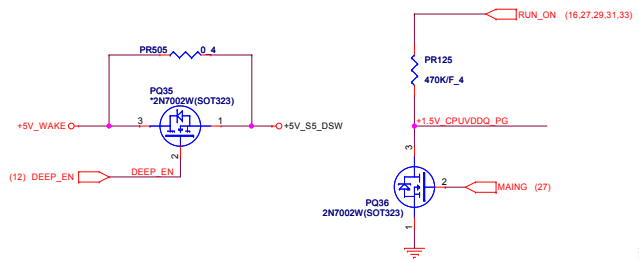


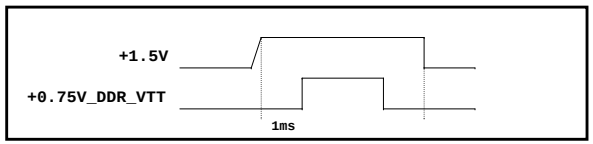
+1.35V



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.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 : GD5

Size	Document Number	Rev
	1.5VSUS/VTT_MEM	1A

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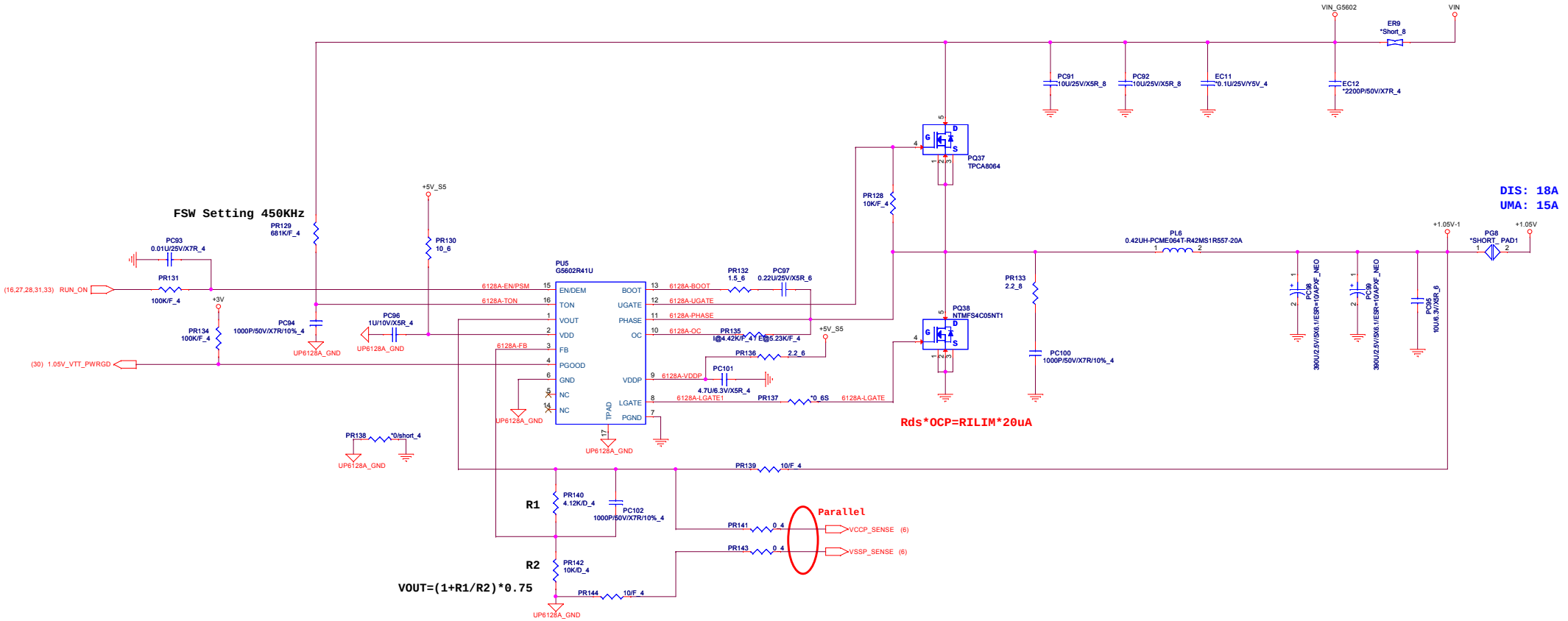
+1.05V / 15.0A



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 : GD5		
Size	Document Number	Rev
	+1.05V (UP1522RQDD)-15A	1A
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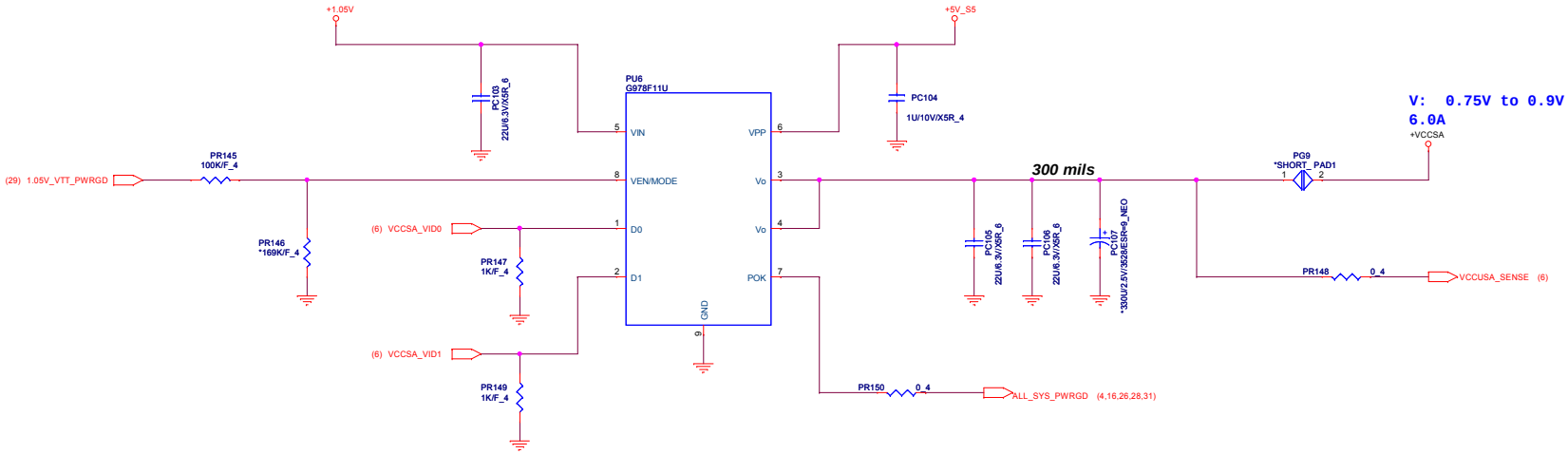
+VCCSA



For Chief River ULV

VCCSA_VID0	VCCSA_VID1	+VCCSA
0	0	0.9V
0	1	0.85V
1	0	0.775V
1	1	0.75V

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 : GD5

Size	Document Number	Rev
	VCCSA / VCCIO	1A

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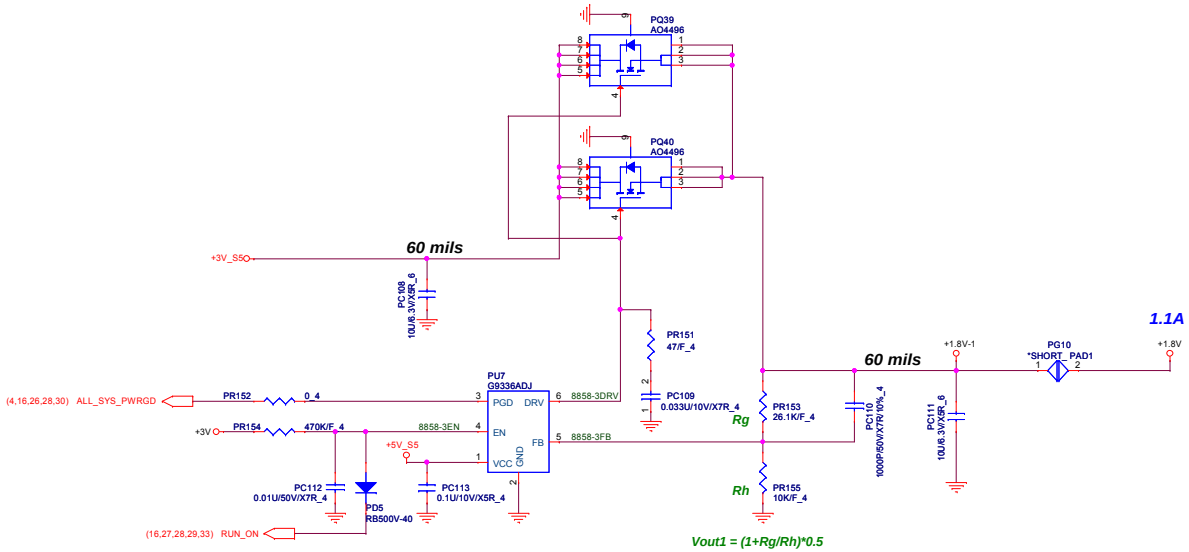
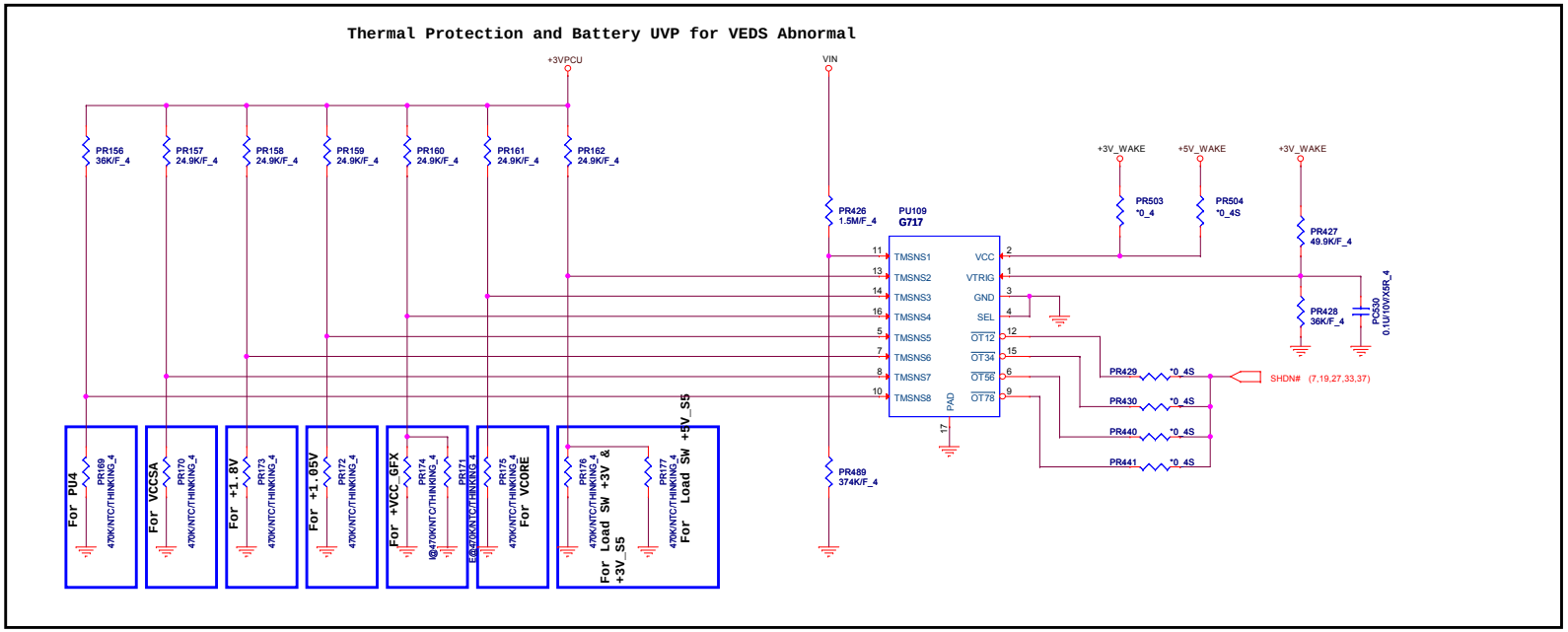
VCC1.8



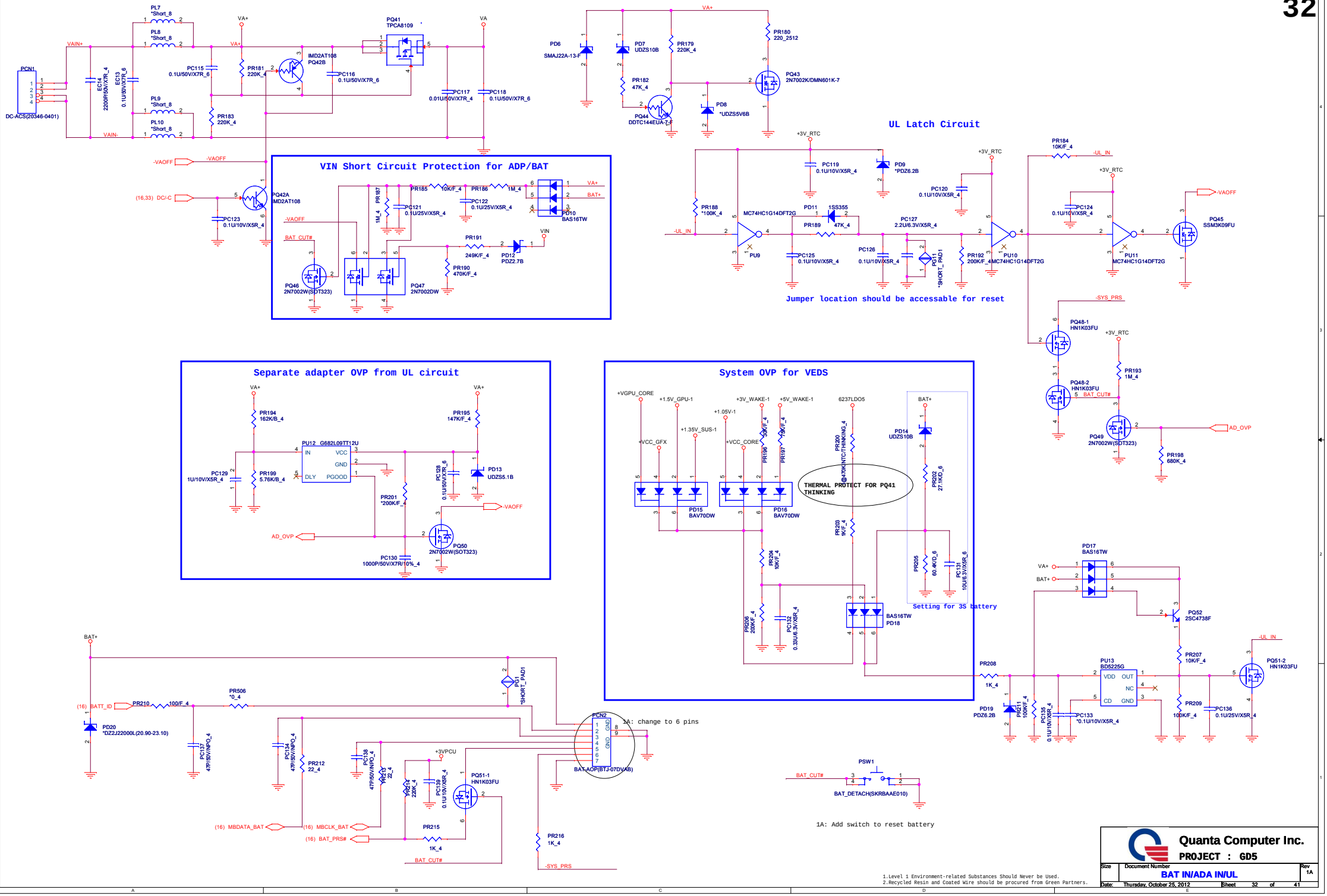


1.Level 1 Environment-related Substances Should Never be Used.
2.Recycled Resin and Coated Wire should be procured from Green Partners.

Quanta Computer Inc.
PROJECT : GD5

Size	Document Number	Rev
	VCC1.8	1A

Date: Thursday, October 25, 2012 Sheet 31 of 41


VIN Short Circuit Protection for ADP/BAT
UL Latch Circuit
Jumper location should be accessable for reset
Separate adapter OVP from UL circuit
System OVP for VEDS
THERMAL PROTECT FOR PQ41 THINKING
Setting for 3S battery
1A: change to 6 pins
1A: Add switch to reset battery
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 : GD5
BAT IN/ADA IN/UL
Size
Document Number
Rev
1A
Date: Thursday, October 25, 2012
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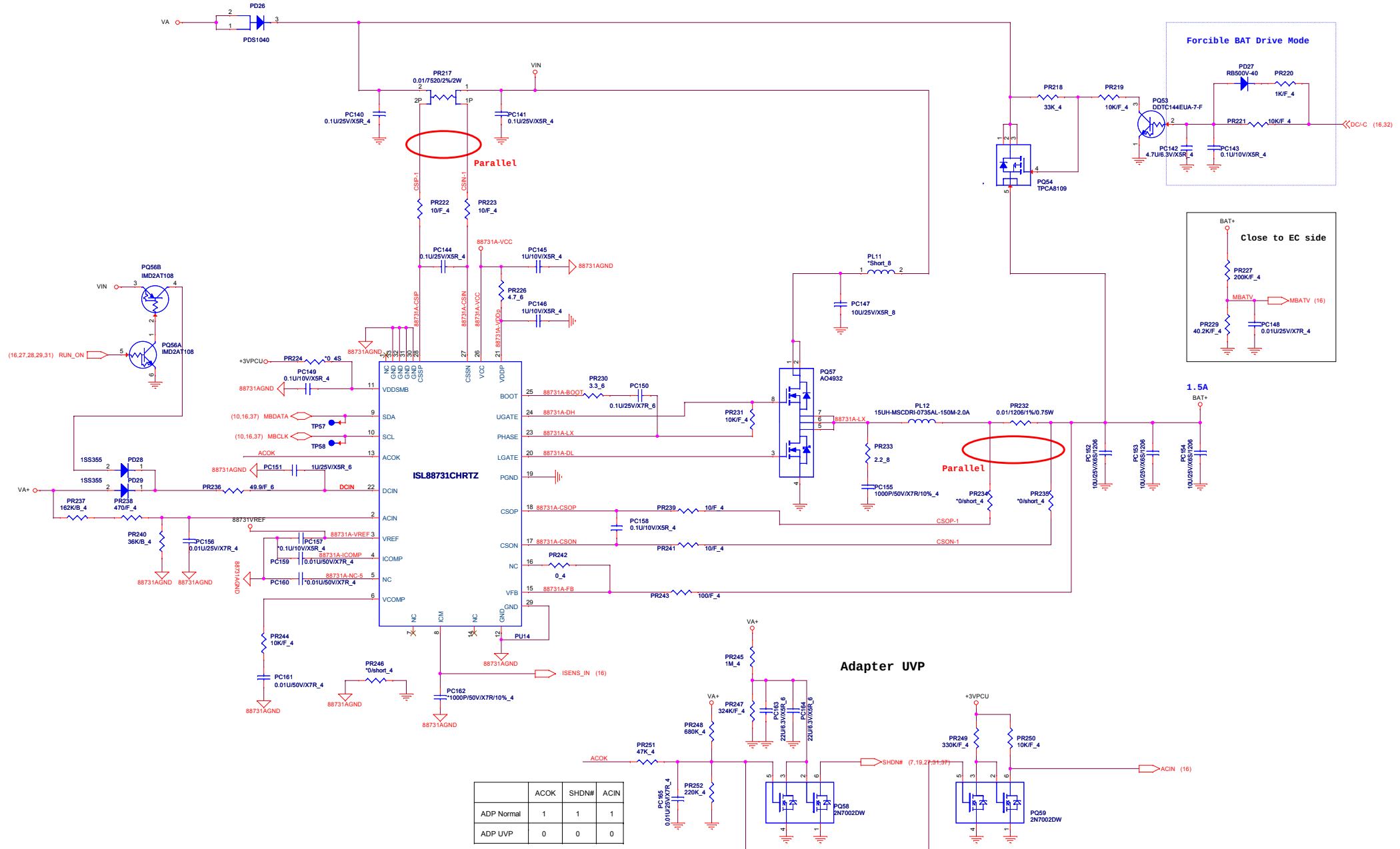

	ACOK	SHDN#	ACIN
ADP Normal	1	1	1
ADP UVP	0	0	0

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 : GD5

Size	Document Number	Rev
	CHARGER(ISL88731C)	1A

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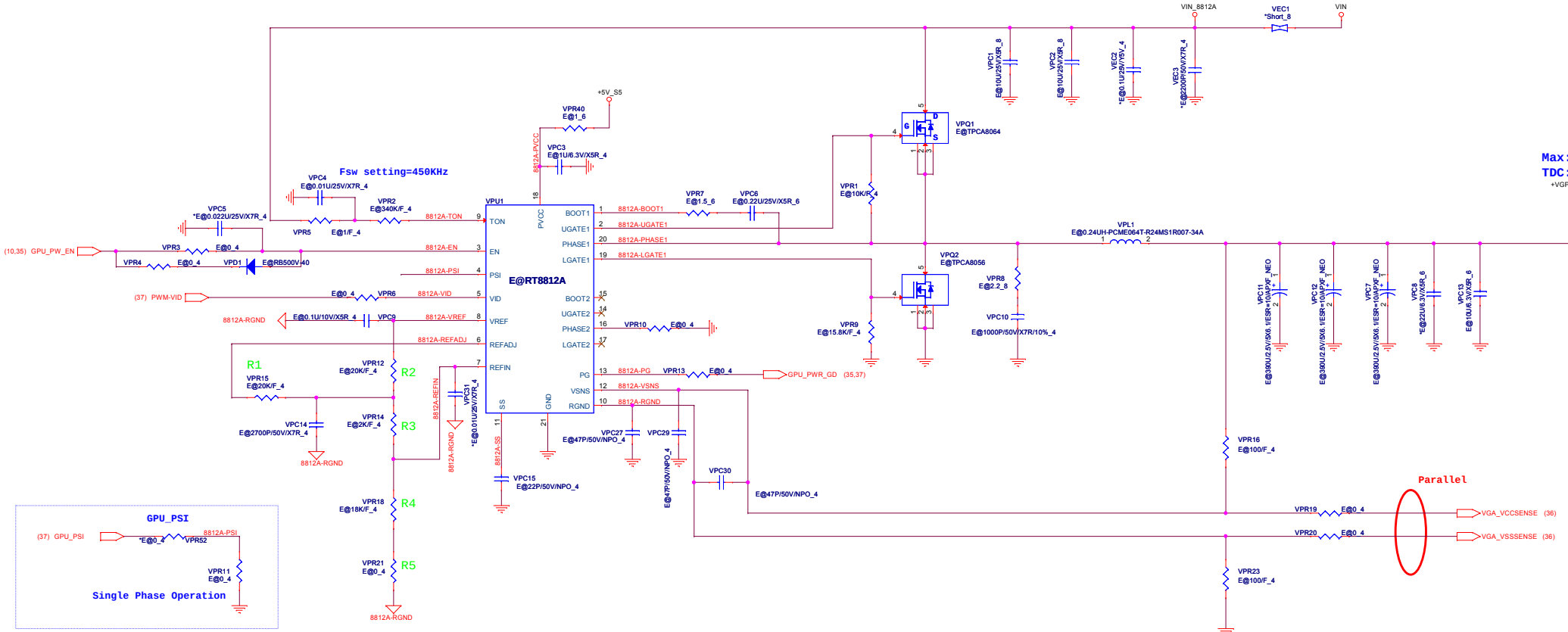
VGA-CORE



1.Level 1 Environment-related Substances Should Never be Used.
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Quanta Computer Inc.		
PROJECT : GD5		
Size	Document Number	Rev
	VGA_CORE (RT8812A)	1A
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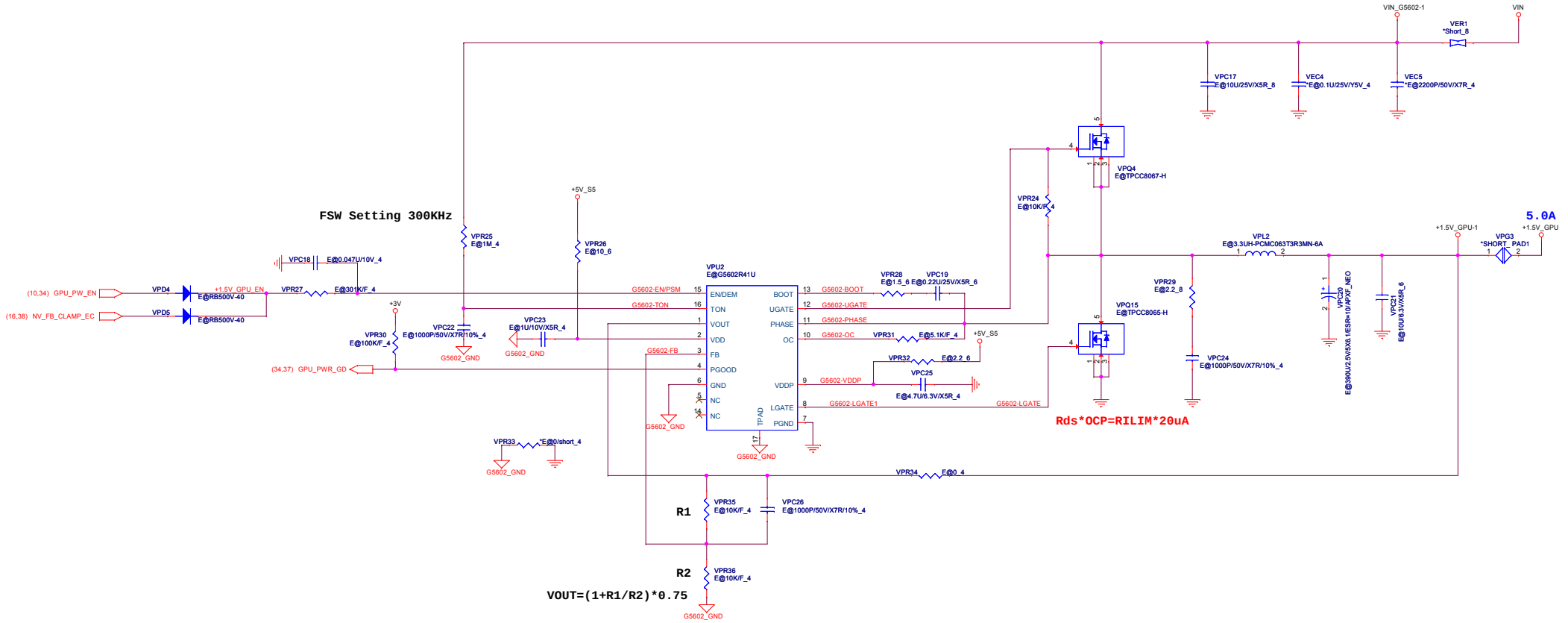

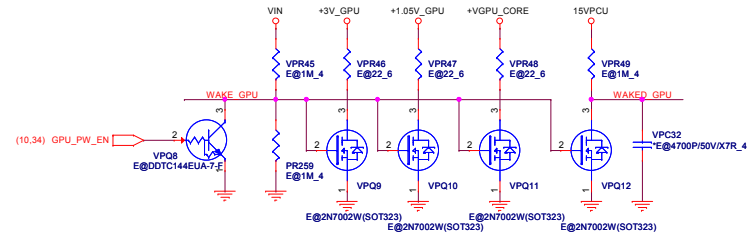

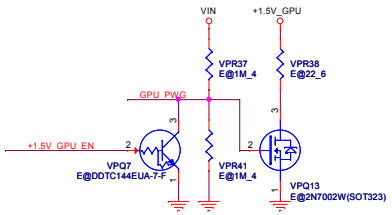

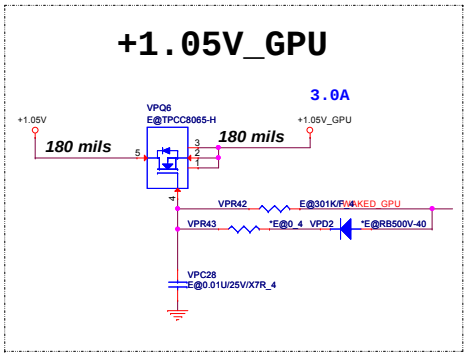

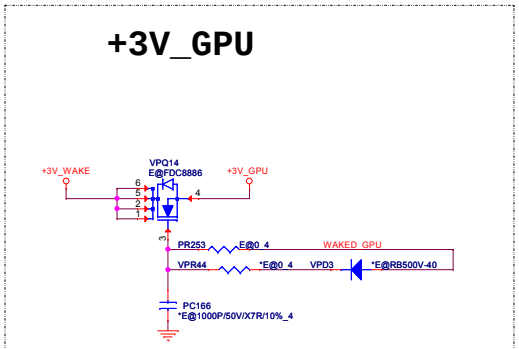

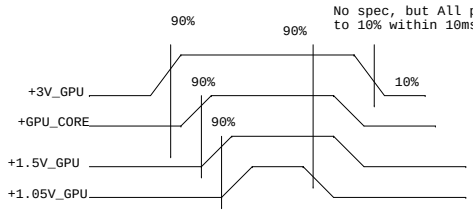

1.Level 1 Environment-related Substances Should Never be Used.
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Quanta Computer Inc.
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Size	Document Number	Rev
	1.8_GPU / 1.0_GPU	1A

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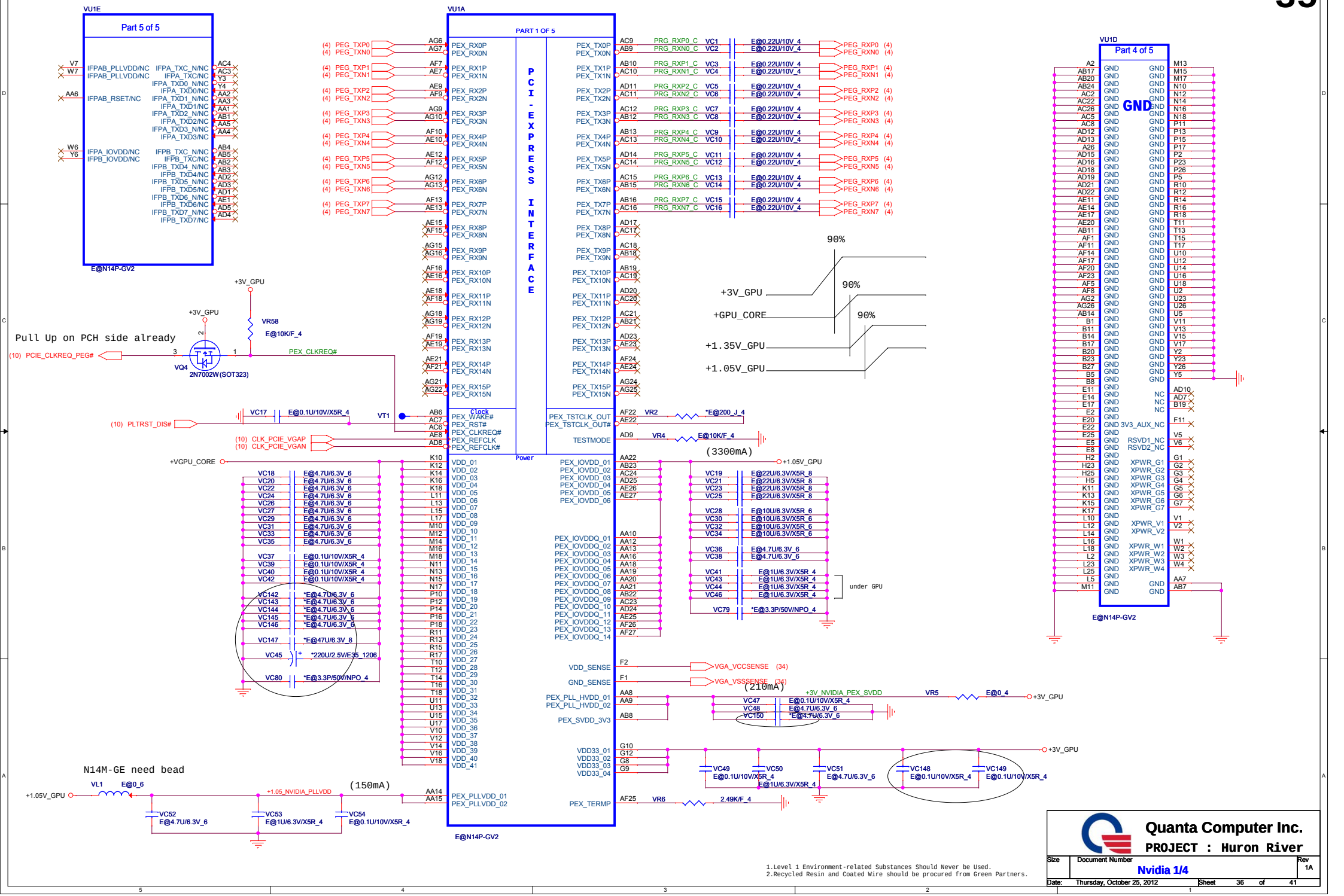
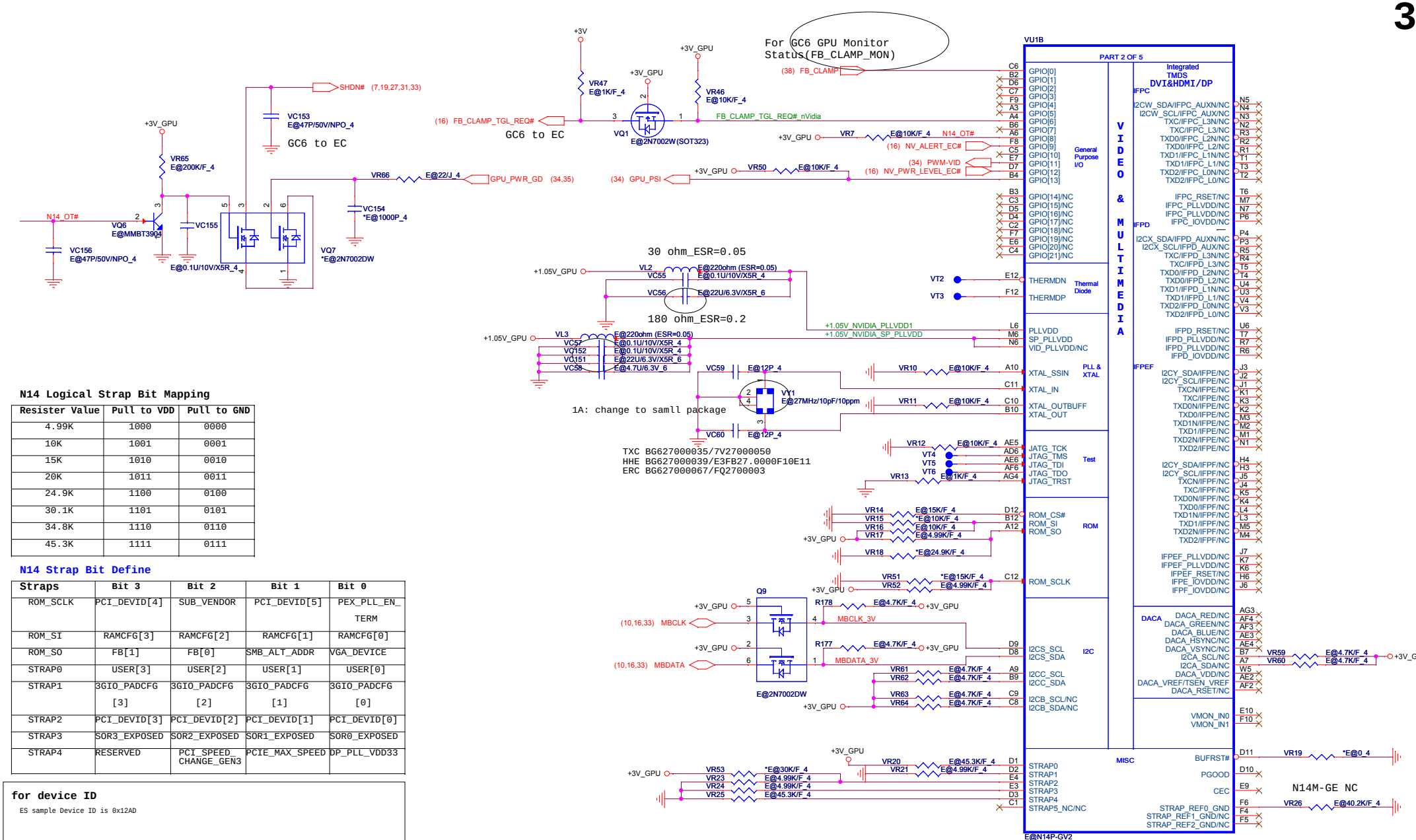

VU1E
Part 5 of 5
E@N14P-GV2
VU1A
PART 1 OF 5
PCI-EXPRESS INTERFACE
Clock
Power
E@N14P-GV2
VU1D
Part 4 of 5
GND
E@N14P-GV2
Pull Up on PCH side already
N14M-GE need bead
(3300mA)
(210mA)
(150mA)
90%
+3V_GPU
+GPU_CORE
+1.35V_GPU
+1.05V_GPU
under GPU
Quanta Computer Inc.
PROJECT : Huron River
Nvidia 1/4
Size
Document Number
Rev
1A
Date: Thursday, October 25, 2012
Sheet 36 of 41
1.Level 1 Environment-related Substances Should Never be Used.
2.Recycled Resin and Coated Wire should be procured from Green Partners.



N14 Logical Strap Bit Mapping

Resister Value	Pull to VDD	Pull to GND
4.99K	1000	0000
10K	1001	0001
15K	1010	0010
20K	1011	0011
24.9K	1100	0100
30.1K	1101	0101
34.8K	1110	0110
45.3K	1111	0111

N14 Strap Bit Define

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

for device ID

ES sample Device ID is 0x12AD

	VRAM Capacity	VRAM Vender	ID	VR35	P/N	P/N
N14M-GS/LP	128Mx16 DDR3	Samsung	0111	PD45.3K	K4W2G1646E-BC1A	
		Micron	0101	PD30.1K	MT41J128M16JT-093G:K	
	256Mx16 DDR3	Samsung	0011	PD20K	K4W4G1646B-HC11	
		Micron	0001	PD10K	MT41K256M16HA-107G:E	

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Quanta Computer Inc.
PROJECT : Huron River

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	Nvidia 2/4	1A

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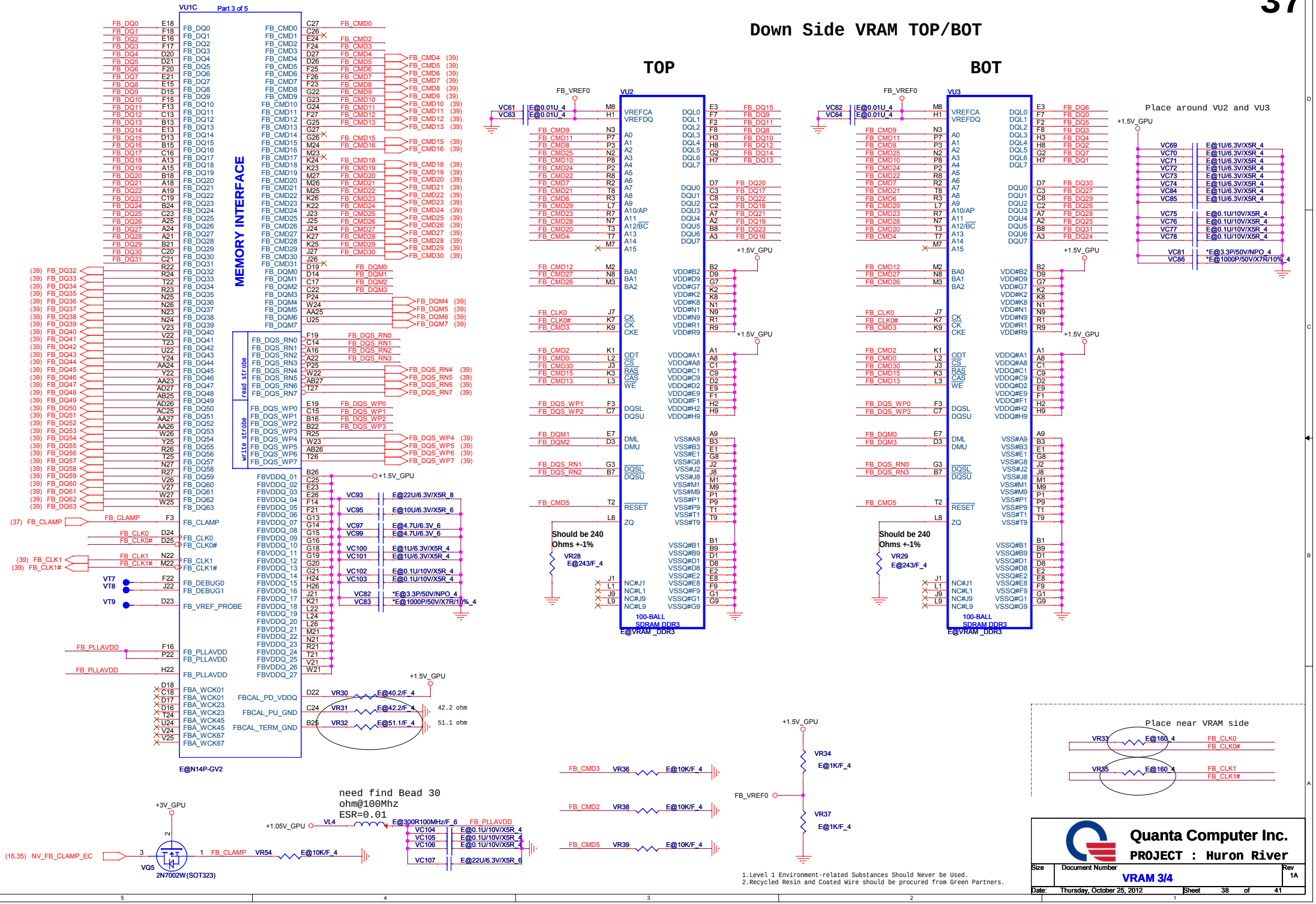
Down Side VRAM TOP/BOT



Quanta Computer Inc.
PROJECT : Huron River

Size	Document Number	Rev
	VRAM 3/4	1A

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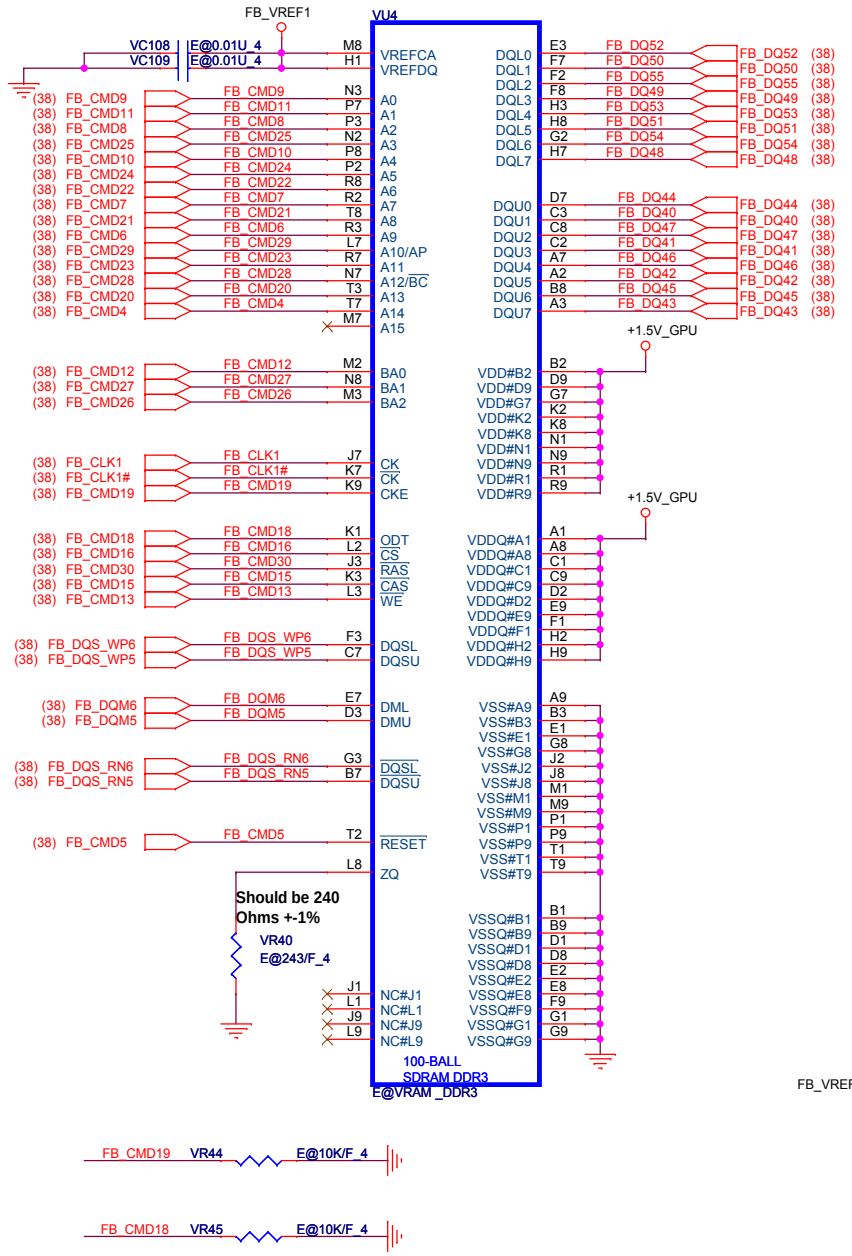
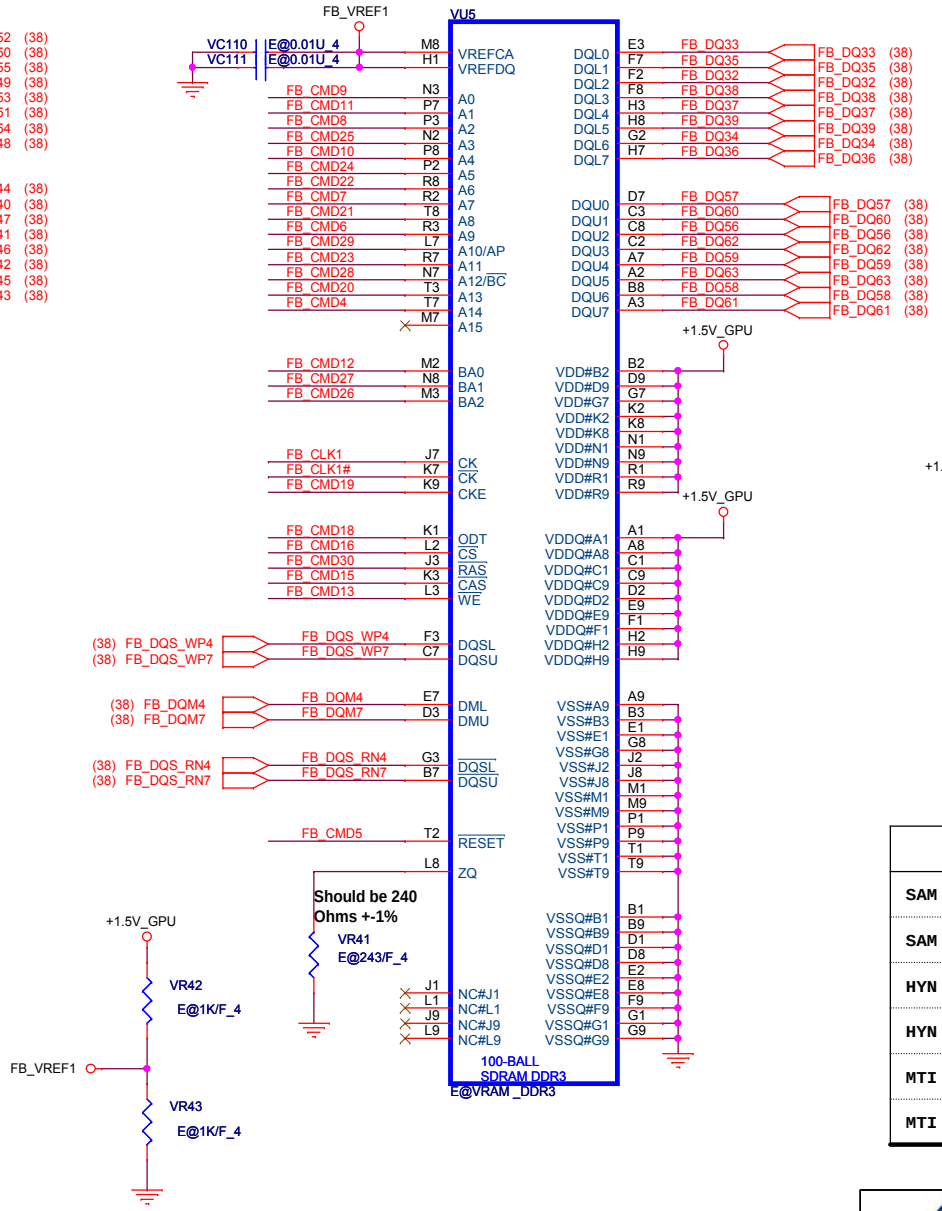
Up Side VRAM TOP/BOT

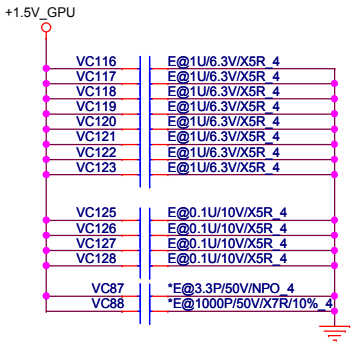
TOP



BOT



Place around VU4 and VU5



	P/N	Vendor P/N
SAM 2G	AKD5MGGT525	K4W2G1646E-BC11
SAM 4G	AKD5MGSTL14	K4W4G1646B-HC11
HYN 2G		
HYN 4G		
MTI 2G	AKD5MGWT525	MT41J128M16JT-107G:K
MTI 4G	AKD5PGSTL07	MT41K256M16HA-107G:E

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Quanta Computer Inc.
PROJECT : Huron River

Size	Document Number	Rev
	VRAM 4/4	1A

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GRAPHIC NUT

H4 H-C217D118P2

H5 H-C217D118P2

PCH NUT

H6 H-C217D118P2

WALN NUT

H1 h-tc217bc182d142p2

H2 h-tc217bc182d142p2

HDD/B NUT

H7 h-c217d146p2

H3 *H-GD5-PAD6

H9 *HG-GD5-PAD1

H10 *HG-GD5-PAD5

H11 *H-R315I139D99P2

H12 *HG-GD5-PAD2

H13 *HG-GD5-PAD3

H14 *HG-GD5-PAD4

H16 *H-C315D99P2

H23 *SPAD-RE320X700NP

H24 *H-TC236BO99X110D99X110P2

H25 *H-C236D99X110P2

H27 *H-R315X315D99P2

H28 *H-R315X315D99P2

H29 *H-R315X315D99P2

H30 *H-R315X315D99P2

H31 *H-C236D99P2

H32 *H-C276D276N

H33 *H-C276D276N

H34 *PAD-C177

H35 *PAD-C177

H36 *SPAD-RE31X181NP

H37 *SPAD-RE31X181NP

KEY BOARD Connector

CON2

(16) MY15 1
(16) MY14 2
(16) MY13 3
(16) MY12 4
(16) MY11 5
(16) MX7 6
(16) MY10 7
(16) MX6 8
(16) MX5 9
(16) MY9 10
(16) MX4 11
(16) MY8 12
(16) MY7 13
(16) MY6 14
(16) MY5 15
(16) MY4 16
(16) MY3 17
(16) MX3 18
(16) MY2 19
(16) MY1 20
(16) MY0 21
(16) MX2 22
(16) MX1 23
(16) MX0 24
(16) MY17 25
(16) MY16 26
27
28

KB_ACS(50503-02601-001)

MY15	C744	*220P_4
MY14	C745	*220P_4
MY13	C746	*220P_4
MY12	C747	*220P_4
MY11	C748	*220P_4
MX7	C749	*220P_4
MY10	C750	*220P_4
MX6	C751	*220P_4
MX5	C752	*220P_4
MY9	C753	*220P_4
MX4	C754	*220P_4
MY8	C755	*220P_4
MY7	C756	*220P_4
MY6	C757	*220P_4
MY5	C758	*220P_4
MY4	C759	*220P_4
MY3	C760	*220P_4
MX3	C761	*220P_4
MY2	C762	*220P_4
MY1	C763	*220P_4
MY0	C764	*220P_4
MX2	C765	*220P_4
MX1	C766	*220P_4
MX0	C767	*220P_4

+3VPCU

MX0	R163	10K_4
MX1	R162	10K_4
MX2	R159	10K_4
MX3	R156	10K_4
MX4	R154	10K_4
MX5	R151	10K_4
MX6	R147	10K_4
MX7	R143	10K_4

+VCC_GFX	C900	1000P/50V/X7R/10%_4 +VCC_CORE
VIN	C901	1000P/50V/X7R/10%_4 +1.05V
VIN	C902	1000P/50V/X7R/10%_4 +1.05V
VIN	C903	1000P/50V/X7R/10%_4 +1.05V
VIN	C904	1000P/50V/X7R/10%_4 +1.05V
VIN	C905	1000P/50V/X7R/10%_4 +1.05V
VIN	C906	1000P/50V/X7R/10%_4
+VCC_GFX	C907	1000P/50V/X7R/10%_4
+1.05V	C908	1000P/50V/X7R/10%_4 +VCC_CORE
VA	C909	1000P/50V/X7R/10%_4
VA	C910	1000P/50V/X7R/10%_4
VA	C911	1000P/50V/X7R/10%_4
BAT+	C921	1000P/50V/X7R/10%_4
BAT+	C922	*1000P/50V/X7R/10%_4
BAT+	C923	1000P/50V/X7R/10%_4
+1.05V	C924	1000P/50V/X7R/10%_4
+1.05V	C925	1000P/50V/X7R/10%_4
+5V	C942	1000P/50V/X7R/10%_4
+5V	C943	1000P/50V/X7R/10%_4
+5V	C944	1000P/50V/X7R/10%_4
+VGPU_CORE	C963	1000P/50V/X7R/10%_4

VIN	C912	1000P/50V/X7R/10%_4
VIN	C913	1000P/50V/X7R/10%_4
VIN	C914	1000P/50V/X7R/10%_4
VIN	C915	1000P/50V/X7R/10%_4
VIN	C916	*1000P/50V/X7R/10%_4
VIN	C917	1000P/50V/X7R/10%_4
VIN	C918	1000P/50V/X7R/10%_4
VIN	C919	1000P/50V/X7R/10%_4
VIN	C920	1000P/50V/X7R/10%_4
+VCC_GFX	C926	1000P/50V/X7R/10%_4
+VCC_GFX	C927	*1000P/50V/X7R/10%_4
+VCC_GFX	C928	1000P/50V/X7R/10%_4
+VCC_GFX	C929	*1000P/50V/X7R/10%_4
+1.05V_GPU	C930	1000P/50V/X7R/10%_4
+1.05V_GPU	C931	1000P/50V/X7R/10%_4
+VCC_CORE	C932	1000P/50V/X7R/10%_4
+VCC_CORE	C933	*1000P/50V/X7R/10%_4
+VCC_CORE	C934	1000P/50V/X7R/10%_4
+VCC_CORE	C935	*1000P/50V/X7R/10%_4
+VCC_CORE	C936	1000P/50V/X7R/10%_4
+VCC_CORE	C937	*1000P/50V/X7R/10%_4
+3V_S5	C947	1000P/50V/X7R/10%_4
+3V_S5	C948	1000P/50V/X7R/10%_4
+3V_S5	C949	1000P/50V/X7R/10%_4
+3V_S5	C950	1000P/50V/X7R/10%_4

+5V_WAKE	C938	1000P/50V/X7R/10%_4
+5V_WAKE	C939	1000P/50V/X7R/10%_4
+5V_WAKE	C940	1000P/50V/X7R/10%_4
+5V_WAKE	C941	1000P/50V/X7R/10%_4
+3V	C945	1000P/50V/X7R/10%_4
+3V	C946	1000P/50V/X7R/10%_4
+3V_SUS	C951	1000P/50V/X7R/10%_4
+3V_SUS	C952	1000P/50V/X7R/10%_4
+1.35V_SUS	C953	1000P/50V/X7R/10%_4
+1.35V_SUS	C954	1000P/50V/X7R/10%_4
+1.35V_SUS	C955	*1000P/50V/X7R/10%_4
+1.35V_SUS	C956	1000P/50V/X7R/10%_4
+1.35V_SUS	C957	*1000P/50V/X7R/10%_4
+1.35V_SUS	C958	1000P/50V/X7R/10%_4
+1.35V_SUS	C959	1000P/50V/X7R/10%_4
+1.35V_SUS	C960	1000P/50V/X7R/10%_4
+1.35V_SUS	C961	1000P/50V/X7R/10%_4
+1.35V_SUS	C962	1000P/50V/X7R/10%_4
BAT+	C966	1000P/50V/X7R/10%_4
BAT+	C967	1000P/50V/X7R/10%_4

VIN	C964	1000P/50V/X7R/10%_4 BAT+
VIN	C965	1000P/50V/X7R/10%_4 BAT+

	Quanta P/N	Vendor P/N	Foot Print
14"	DFFC24FS002	88483-2441-FN	88483-2441-fn-24p-rdv_ab
15"	DFFC26FR039	50503-02601-001	88513-2641-26p-l-smt

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 : GD5

Size	Document Number	Rev
	HOLE/EMI/KB	1A
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USB PORT Architecture	
PORT 0	USB3.0
PORT 1	USN2.0
PORT 2	USN2.0
PORT 3	USB2.0
PORT 4	N/A
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	N/A
PORT 12	N/A
PORT 13	N/A

PCIE BUS	
PORT 1	WLAN Port
PORT 2	CARD READER
PORT 3	GLAN(RTL8111E)
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
AMD Thames	0100 0001	-	0100 0001	Graphice
LIS331DL	0011 101X	0011 1010	0011 1011	G Sensor

SM BUS	MBCLK_BAT/MBDATA_BAT	WRITE	READ	Function
VGP-BPS26	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

	S0	S3	DS3	S4	S5 (Charger Enable)	S5 (Charger Disable)
RUN_ON	H	L	L	L	L	L
+3V	H	L	L	L	L	L
+5V	H	L	L	L	L	L
+0.75V_DDR_VTT	H	L	L	L	L	L
+1.05V	H	L	L	L	L	L
+0.85V	H	L	L	L	L	L
+1.5V	H	L	L	L	L	L
+1.8V	H	L	L	L	L	L
+1.8V_GPU	H	L	L	L	L	L
+1.0V_GPU	H	L	L	L	L	L
+VGPU_CORE	H	L	L	L	L	L
+VCC_GFX	H	L	L	L	L	L
+VCC_CORE	H	L	L	L	L	L
SUS_ON	H	H	H	L	L	L
+1.5V_SUS	H	H	H	L	L	L
S5_ON	H	H	L	H	L	L
+5V_S5	H	H	L	H	L	L
+3V_S5	H	H	L	H	L	L
EC_WAKE_ON	H	H	H	H	H	L
+3V_WAKE	H	H	H	H	H	L
+5V_WAKE	H	H	H	H	H	L
DEEP_EC_EN	H	H	H	H	L	L
+3V_S5_DSW	H	H	H	H	L	L
+3V_SUS	H	H	L	L	L	Lw