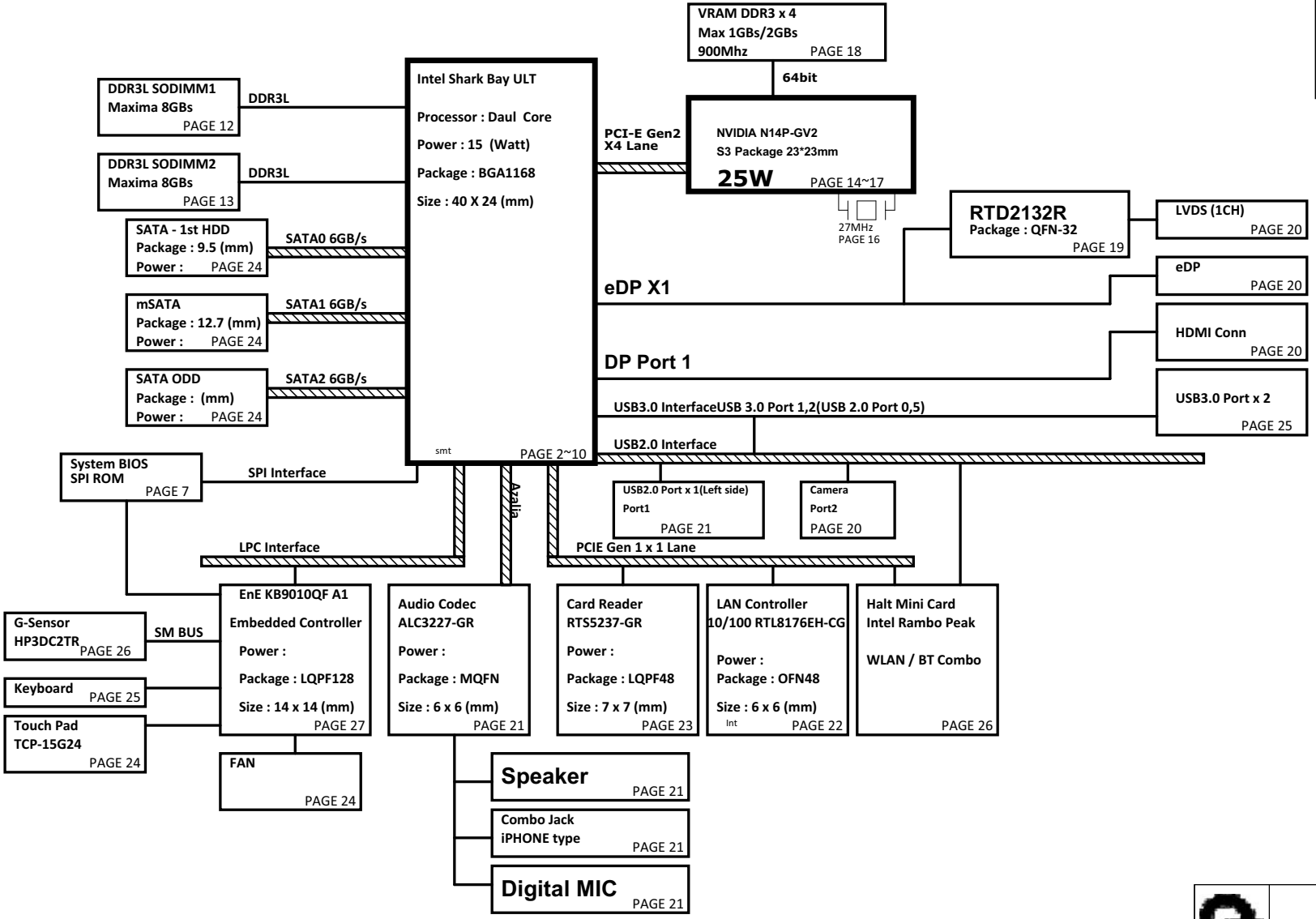
U82 DIS (14"/15.6") Ultra/Slim
Intel Shark Bay ULT Platform Block Diagram

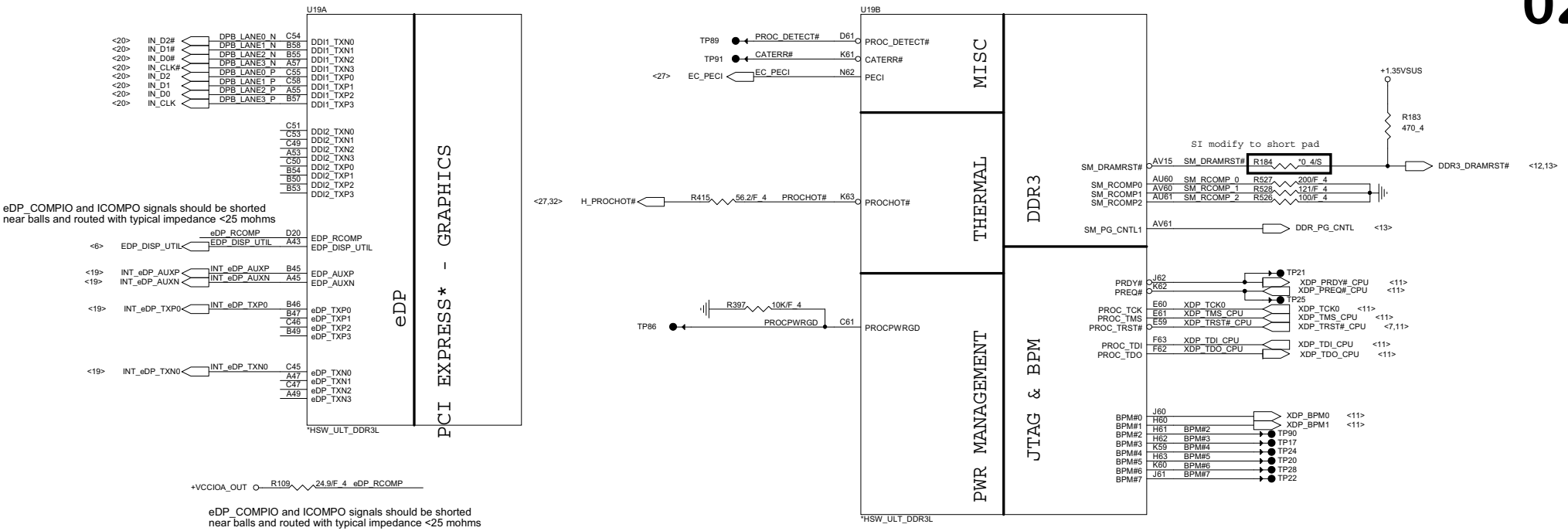
PCB 6L STACK UP

LAYER 1 : TOP
LAYER 2 : SGND
LAYER 3 : IN1(High)
LAYER 4 : IN2(Low)
LAYER 5 : SVCC
LAYER 6 : BOT



PROJECT :U82
Quanta Computer Inc.

Size	Document Number	Rev
Custom	Block Diagram	1A
Date: Monday, May 06, 2013	Sheet 1 of 40	



eDP_COMPIO and ICOMPO signals should be shorted
near balls and routed with typical impedance <25 mohms

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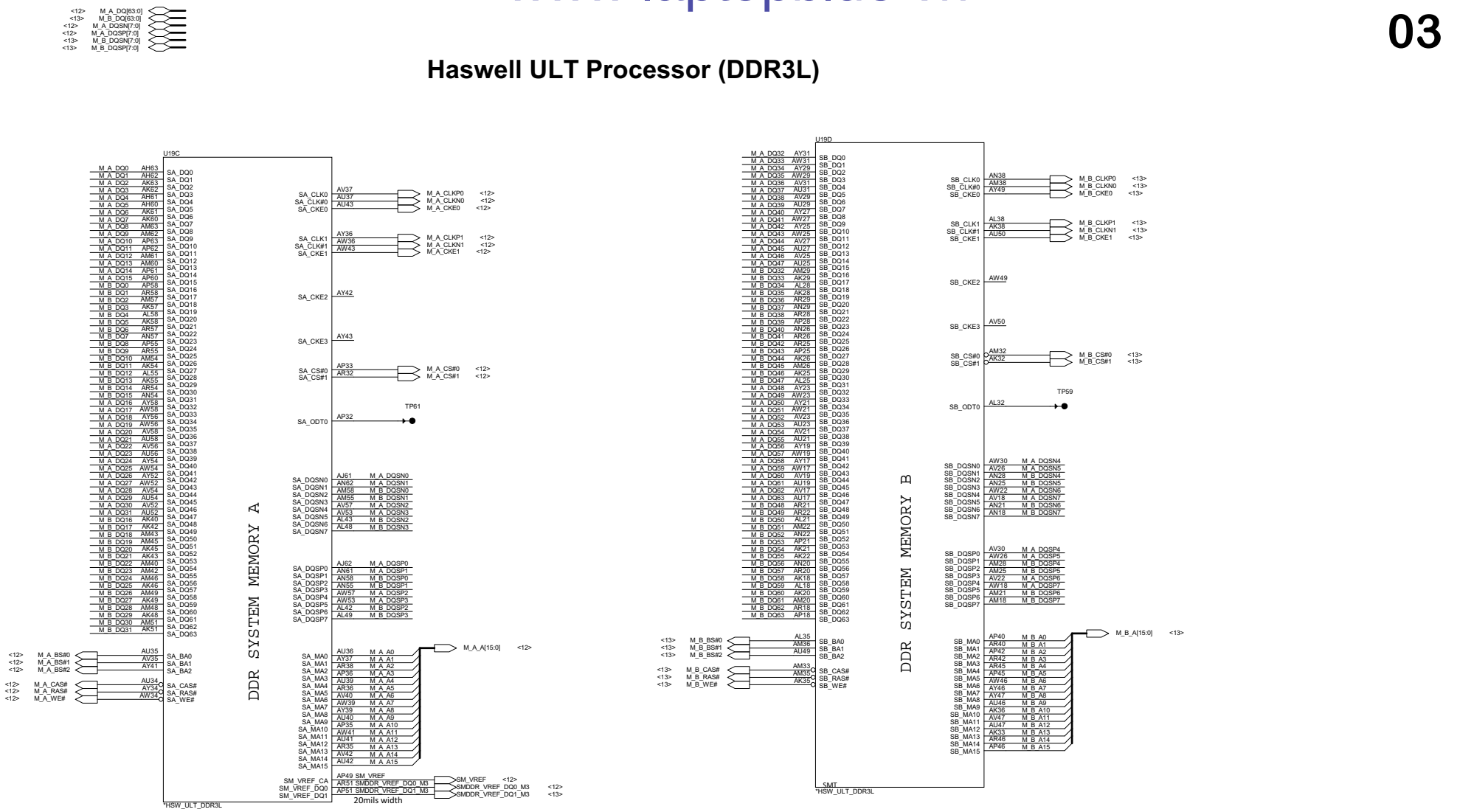
Quanta Computer Inc.		
Size: Custom	Document Number: ULT 1/9(eDP/DDI)	Rev: 1A
Date: Friday, April 26, 2013	Sheet: 2 of 40	

Haswell ULT Processor (DDR3L)



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Quanta Computer Inc.	
Size: Custom	Document Number: ULT 2/9 (DDR3 I/F)
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POWER

32A
+VCC_CORE

1.4A
+1.35VSUS

U19F

HSW ULT POWER

*HSW_ULT_DDR3L

Close to CPU

Direct tie to CPU VCC/VSS-Ball

CFG0-19 need Reserve TP

U19E

RESERVED

*HSW_ULT_DDR3L

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

SVID ALERT

SVID CLK

SVID DATA

Place PU resistor close to VR

IO Thrm Protect

For 65 degree, 1.8v limit, (SW)

For 75 degree, 1.2v limit, (HW)

SI modify to short pad

100- ±1% pull-up to VCC near processor.

Processor Strapping

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

	1	0	Circuit
CFG3 (Physcial Debug Enable) DFX Privacy	Disable:	Enable: Set DFX Enable in DFX interface MSR	CFG3 R452 *1K_4
CFG4 (DP Presence Strap)	Disable; No physical DP attached to eDP	Enable; An ext DP device is connected to eDP	CFG4 R143 1K_4

+VCCIOA_OUT <2>
+VCCIO_OUT <6>
+1.5V <10,21,24,26,30>
+1.35VSUS <2,12,13,24,31>
+1.05V <7,10,11,26,27,30,33,35>
+VCC_CORE <32>

PROJECT :U82
Quanta Computer Inc.

Size	Document Number	Rev
Custom	04 -- ULT 3/9 (POWER-1)	1A
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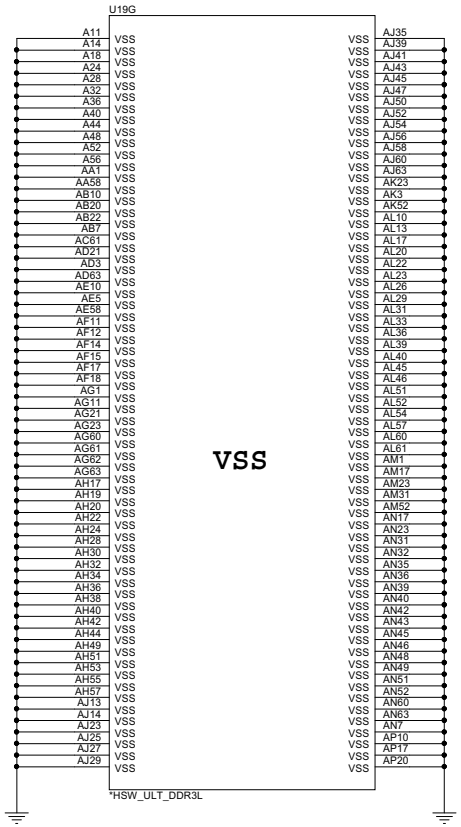

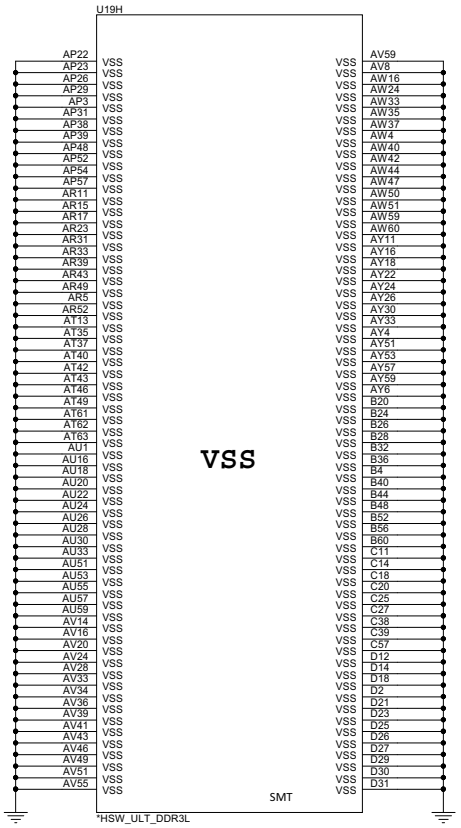

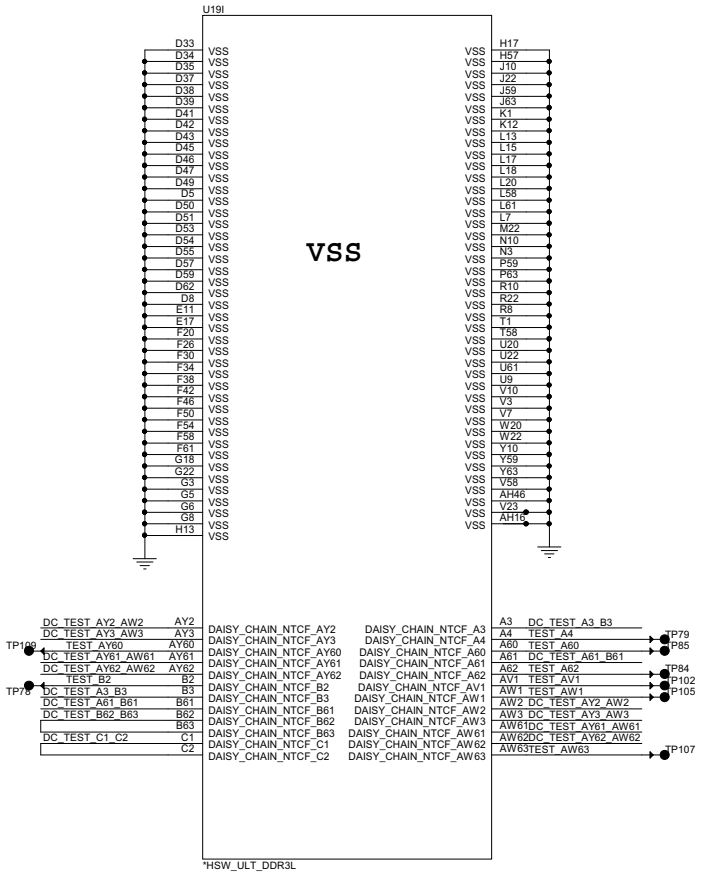

PROJECT :U82
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Size	Document Number	Rev
Custom	ULT 4/9 (RSV,GND)	1A
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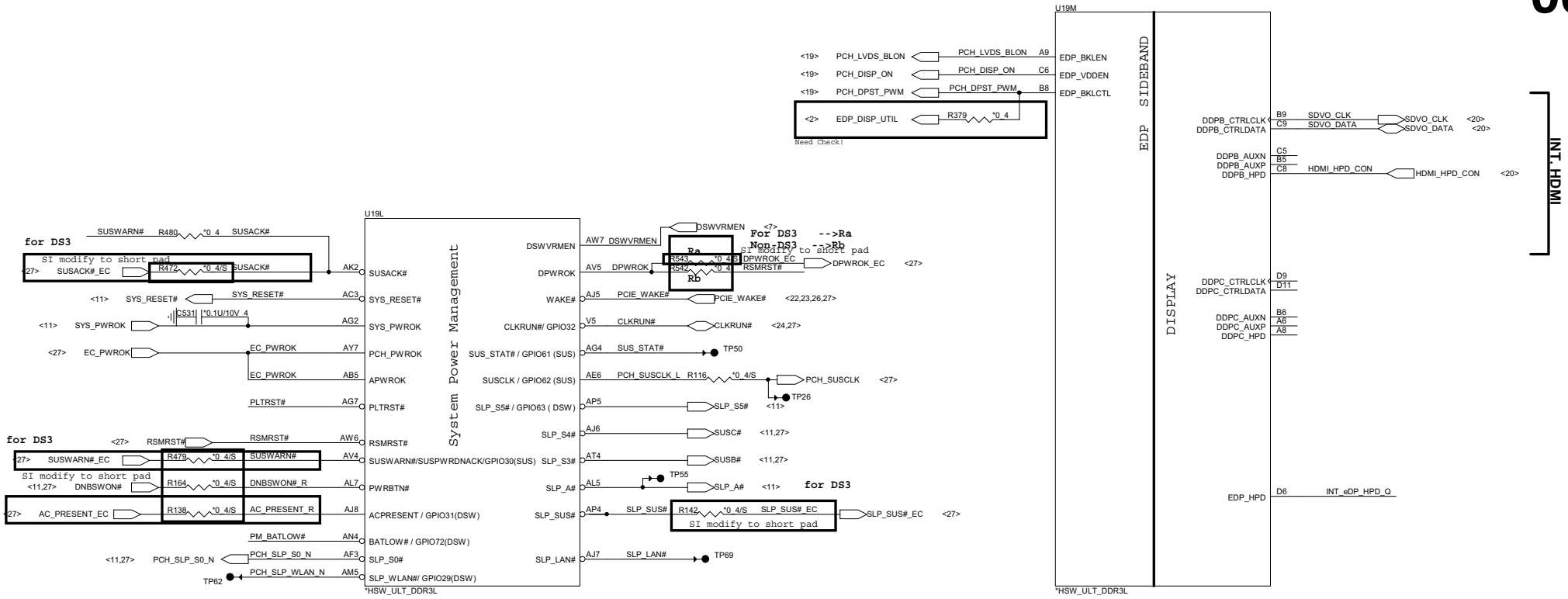
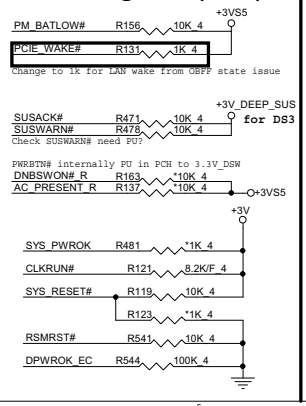
Lynx Point-LP Platform Controller Hub (LVDS,DDI)

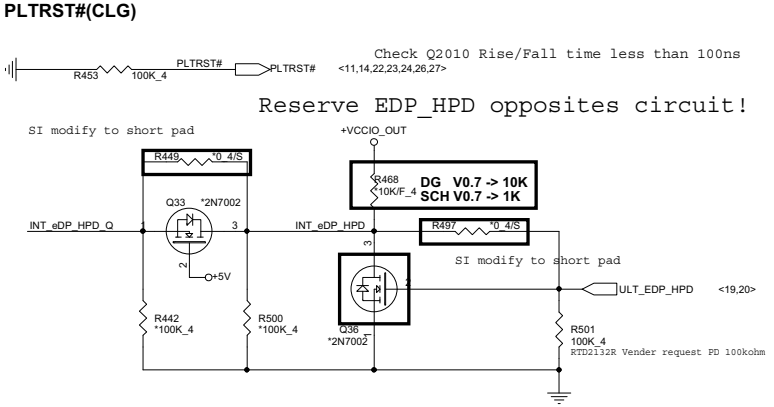
06



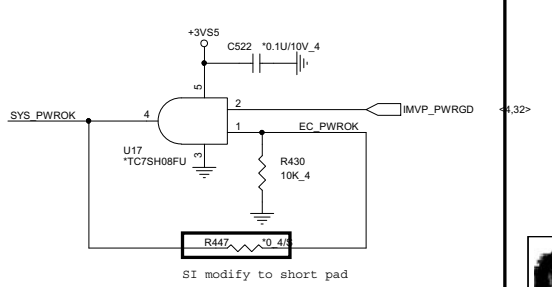
PCH Pull-high/low(CLG)



PLTRST#(CLG)



System PWR_OK(CLG)



<7,8,9,10,11,12,13,14,15,16,17,19,20,21,22,23,24,25,26,27,32,33,34>
<9,10,11,24,26,29,30,33,35>
+3V
+3VS5

PROJECT :U82
Quanta Computer Inc.

Size	Document Number	Rev
Custom	ULT 5/9(Power Manger)	1A
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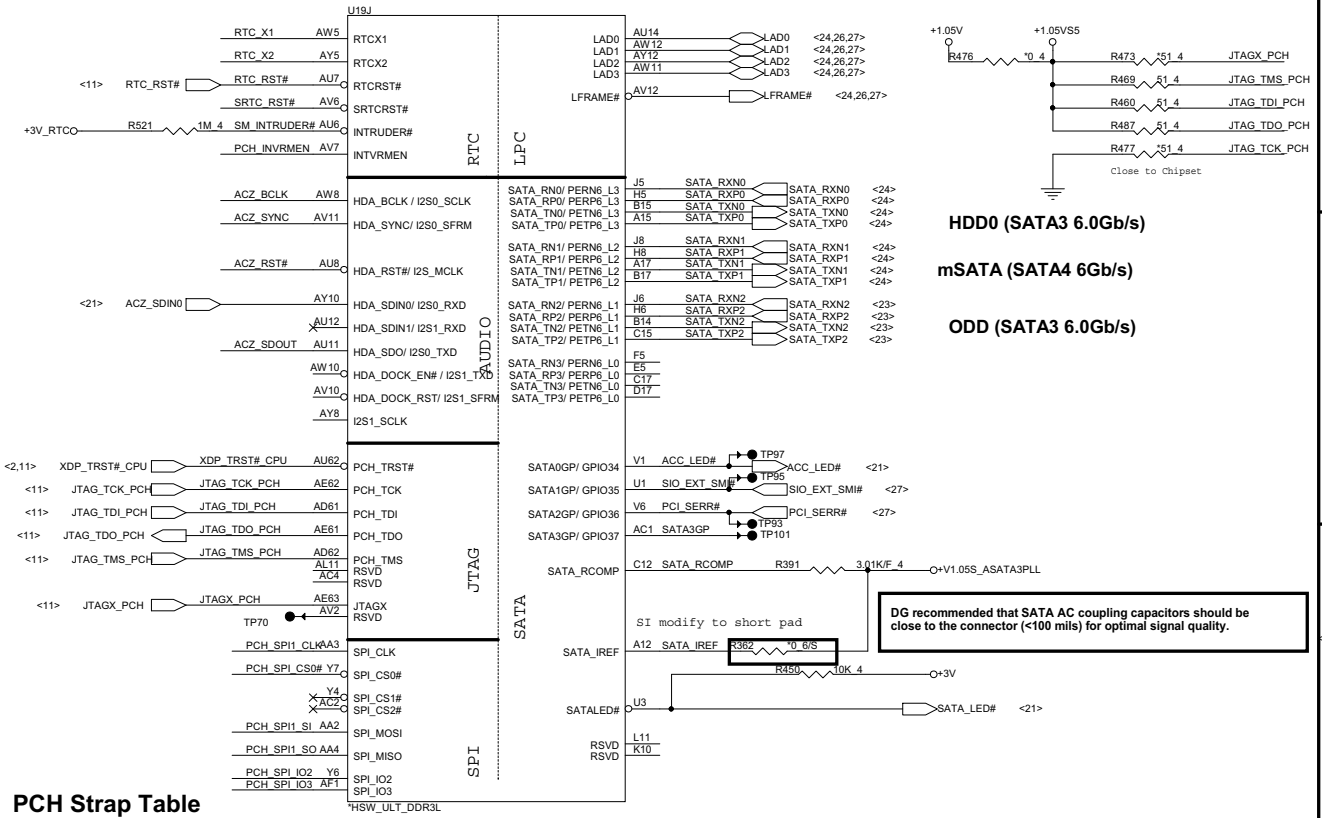
Lynx Point-LP Platform Controller Hub (HDA,JTAG,SATA)



HDD0 (SATA3 6.0Gb/s)

mSATA (SATA4 6Gb/s)

ODD (SATA3 6.0Gb/s)

DG recommended that SATA AC coupling capacitors should be close to the connector (<100 mils) for optimal signal quality.

PCH Strap Table

Pin Name	Strap description	Sampled	Configuration	Circuit
SPKR	No reboot mode setting	PWROK	0 = Default (weak pull-down 20K) 1 = Setting to No-Reboot mode	
SDIO_D0 /GPIO66	Top-Block Swap	PWROK	0 = "top-block swap" mode 1 = Default (weak pull-up 20K)	
INTVRMEN	Integrated 1.05V VRM enable	ALWAYS	Should be always pull-up	
HDA_SDO /I2S0_TXD	Flash Descriptor Security Only for Interposer	PWROK	0 = Default (weak pull-down 20K) 1 = Can be Overridden	
GSPI0_MOSI /GPIO86	Boot BIOS Selection	PWROK	GNT0# 1 = LPC; GNT0# 0 = SPI(Default)	
GPIO15	TLS Confidentiality	PWROK	0 = ME Crypto Transport Layer Security cipher suite with no confidentiality(Default) 1 = Intel ME Crypto TLS cipher suite with confidentiality	
DSWVRMEN	Deep Sx Well On-Die Voltage Regulator Enable	ALWAYS	Should be always pull-up	

RTC Clock 32.768KHz

07

SI modify to short pad

no stuff If use green Clock

RTC Circuitry(RTC)

30mils

RTC Power trace width 20mils.

Uninstall for Green-CLK

HDA Bus(CLG)

GPIO Pull UP

PCH SPI ROM(CLG)

Vender	Size	P/N
MXIC	8MB	AKE3EZN0Z00 (MX25L6473EM2I-10G)
Winbond	8MB	AKE3EFP0N07 (W25Q64FVSSIQ)
GigaDevice	8MB	AKE3EGN0Q01 (GD25B64BSIGR)
Socket		DFHS08FS023

SI modify to short pad

TP66-71 need place to TOP

R457/R453/R450/R451/R546/R548 close to U15 pin

SI modify

PROJECT :U82
Quanta Computer Inc.

Size	Document Number	Rev
Custom	ULT 6/9(SATA/HDA)	1A

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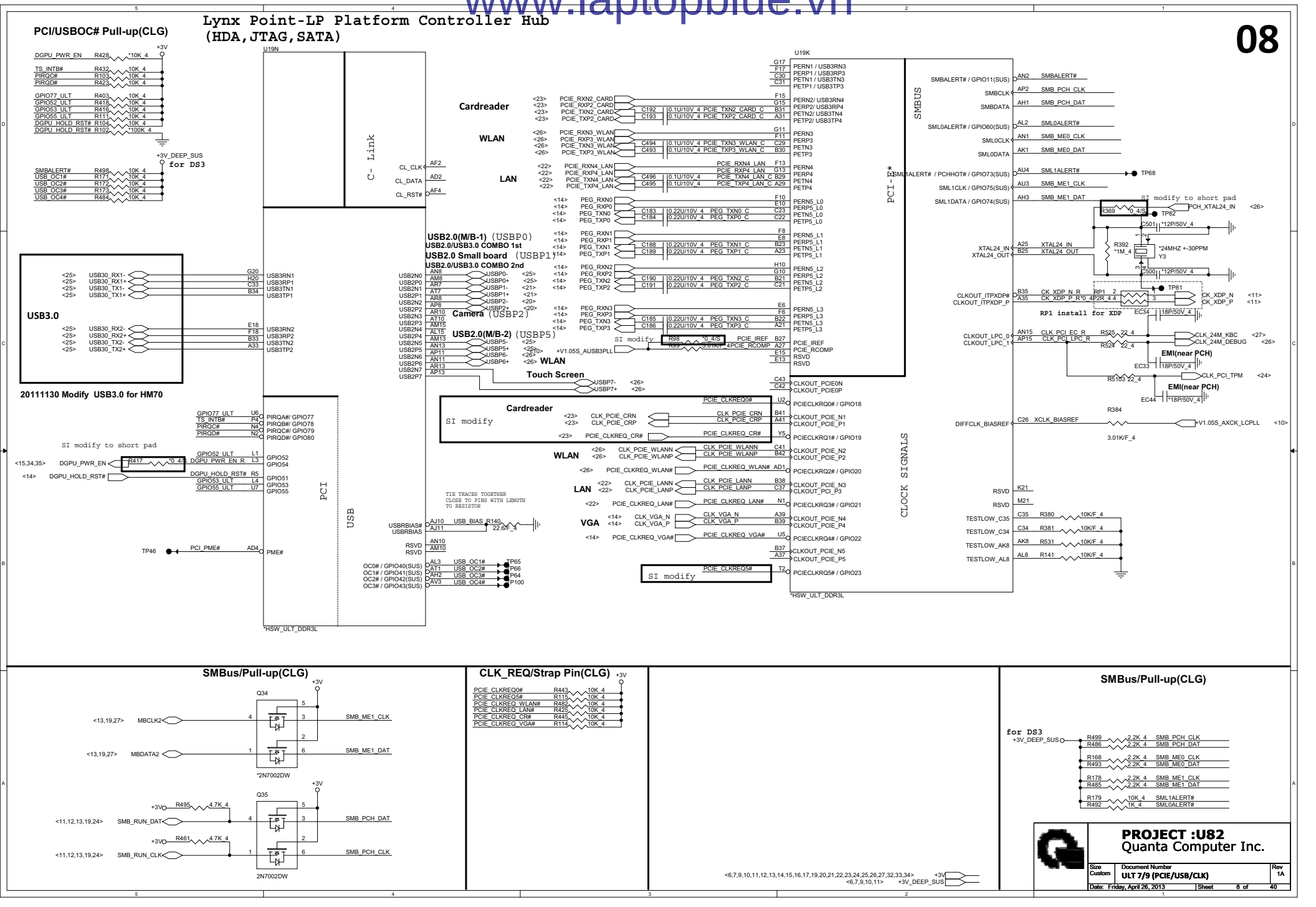
Lynx Point-LP Platform Controller Hub (HDA,JTAG,SATA)



SMBus/Pull-up(CLG)

CLK_REQ/Strap Pin(CLG)

SMBus/Pull-up(CLG)

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Quanta Computer Inc.

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Custom	ULT 7/9 (PCIE/USB/CLK)	1A
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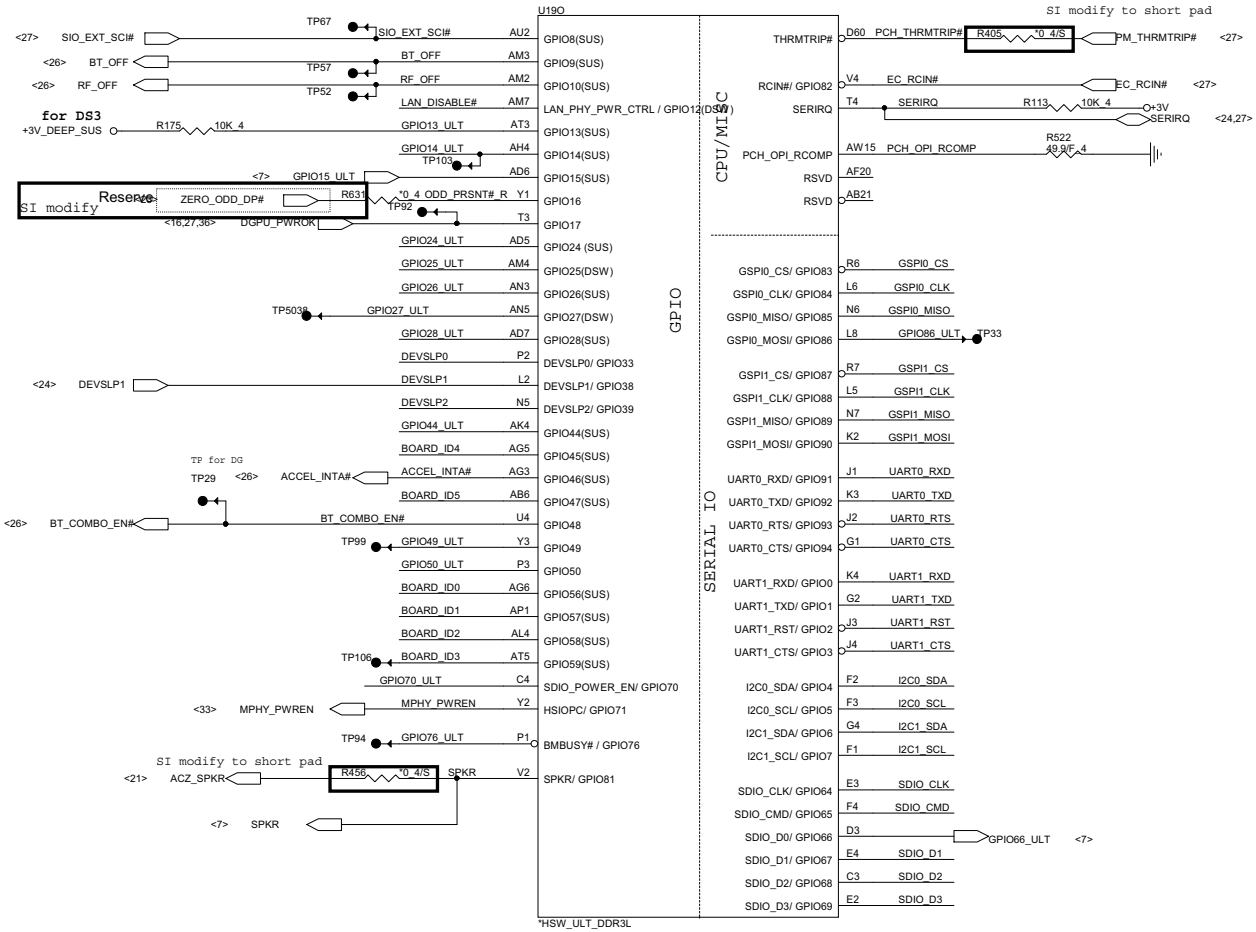
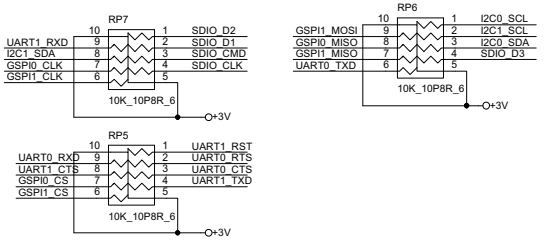
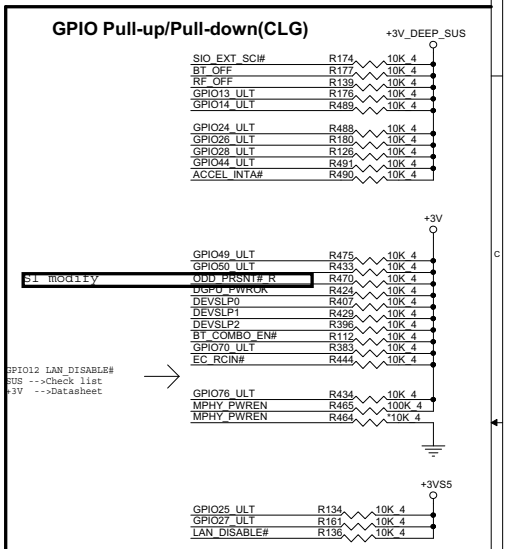
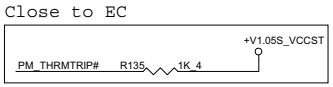
Lynx Point-LP Platform Controller Hub (HDA,JTAG,SATA) Haswell (GPIO)

09

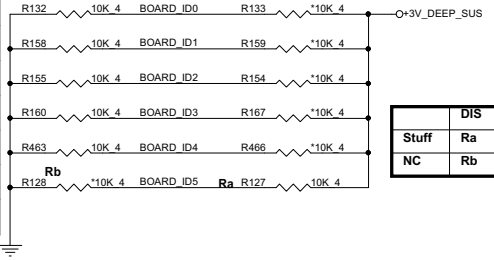








Model	BOARD_ID5 UMA: 0 DIS: 1	BOARD_ID4 14": 0 15": 1	BOARD_ID3	BOARD_ID2	BOARD_ID1	BOARD_ID0
U83 DIS-14	1	0	0	0	0	0
U83 UMA-15	0	1	0	0	0	0
	0	0	0	0	0	0
	0	0	0	0	0	0
	0	0	0	0	0	0
	0	0	0	0	0	0



	DIS	UMA
Stuff	Ra	Rb
NC	Rb	Ra

<6,7,8,10,11,12,13,14,15,16,17,19,20,21,22,23,24,25,26,27,32,33,34> +3V
<6,10,11,24,26,29,30,33,35> +3VS5

PROJECT :U82
Quanta Computer Inc.

Size	Document Number	Rev
Custom	ULT 8/9 (GPIO/MISC)	1A
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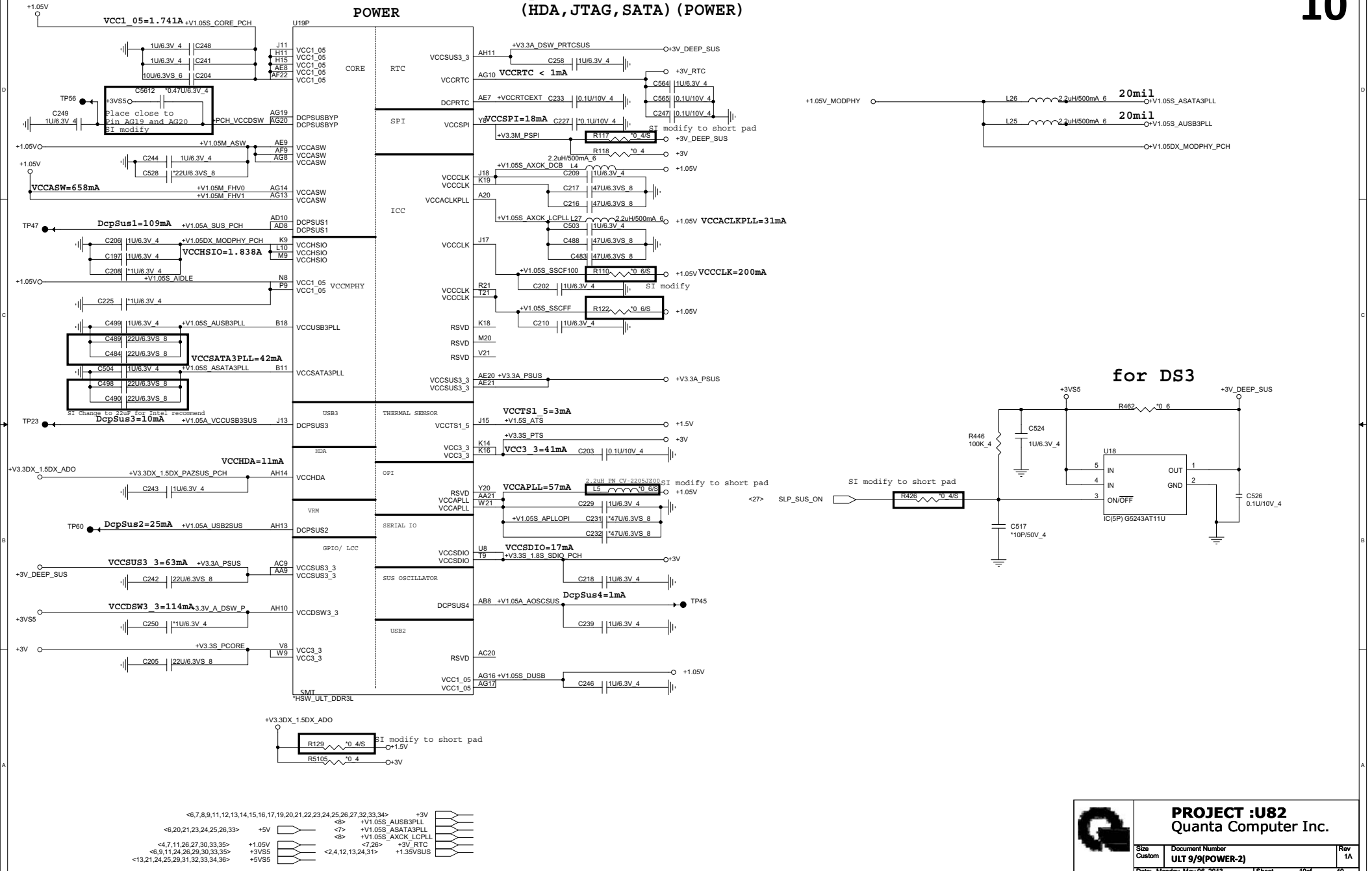
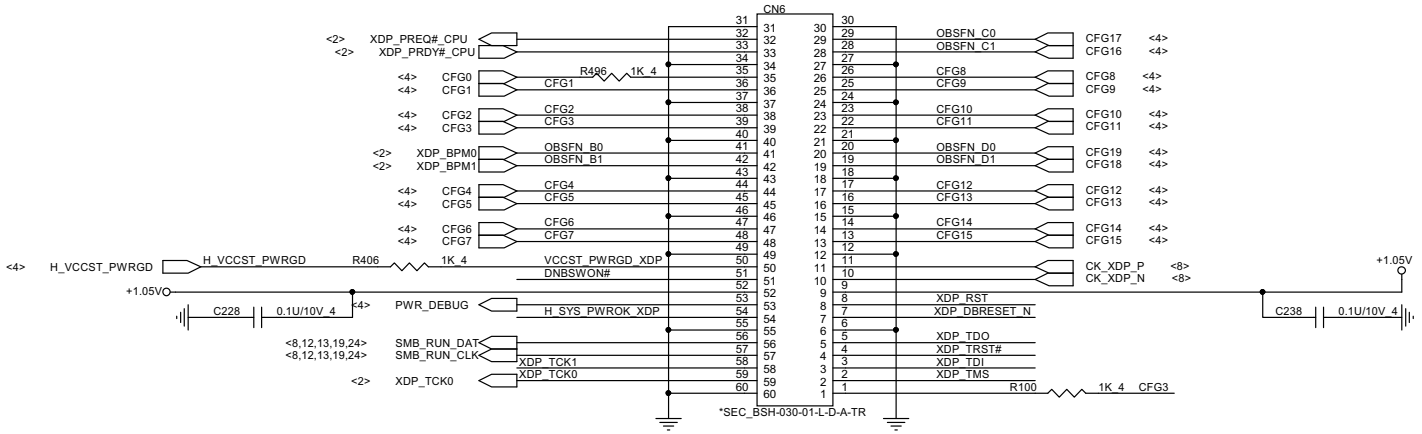
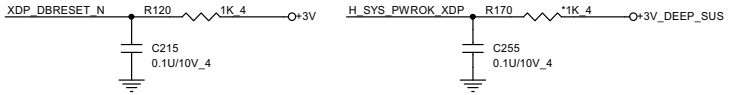
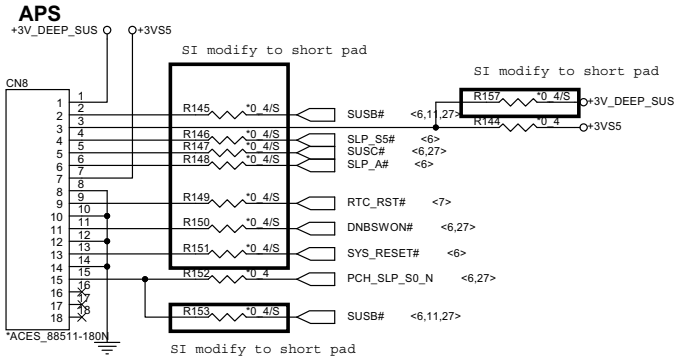
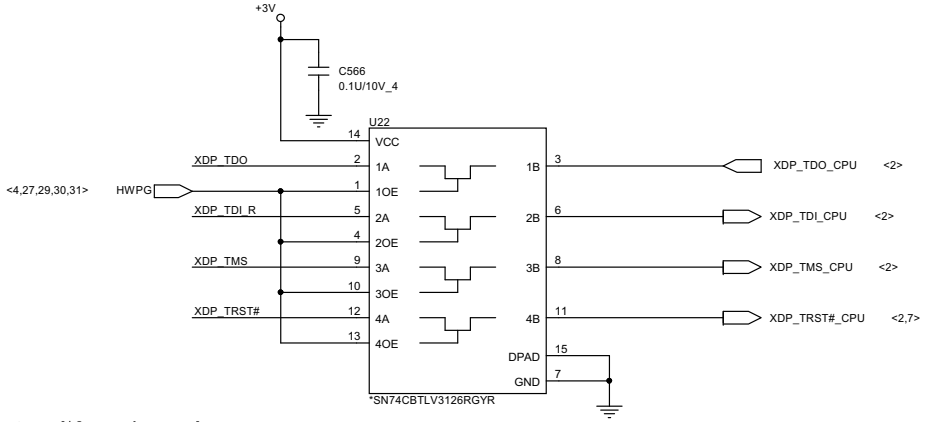
Lynx Point-LP Platform Controller Hub (HDA,JTAG,SATA)(POWER)

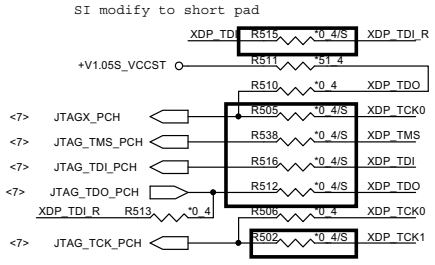


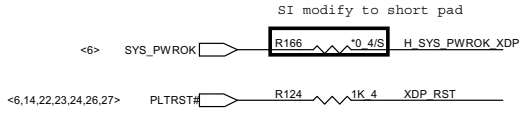












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Quanta Computer Inc.
ULT

Size	Document Number	Rev
	HSW XDP & APS	1A

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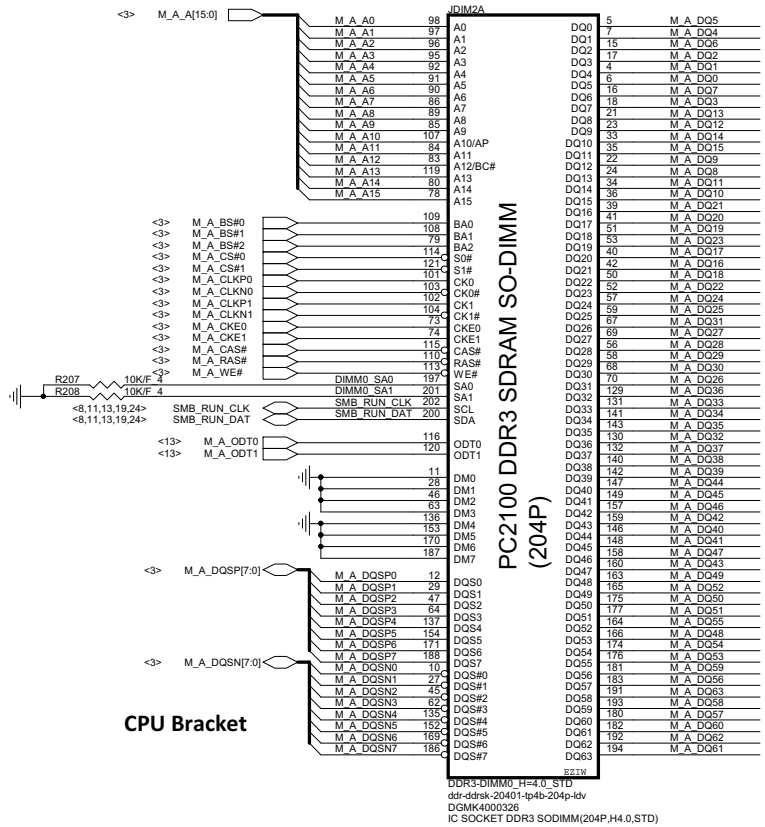
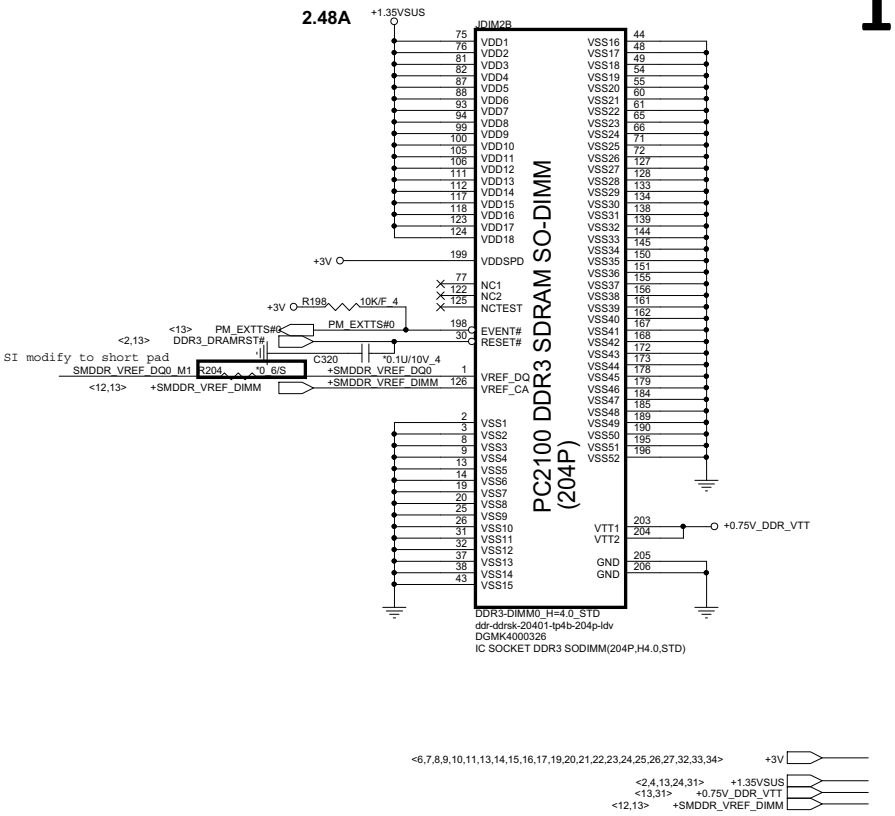
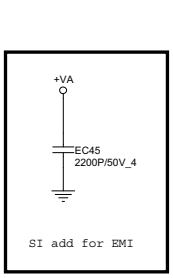
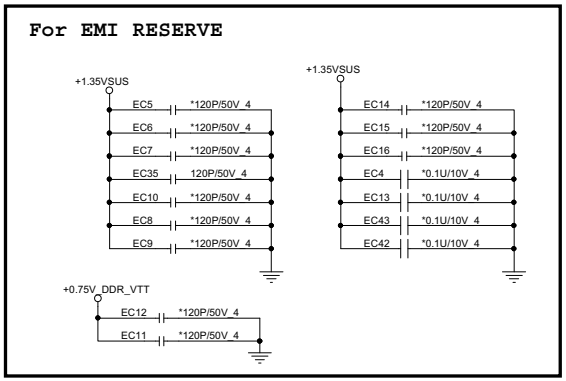
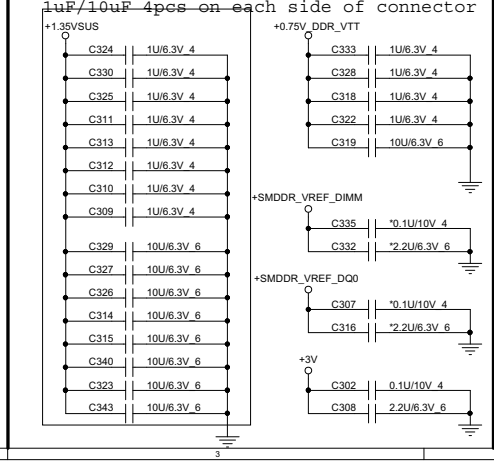
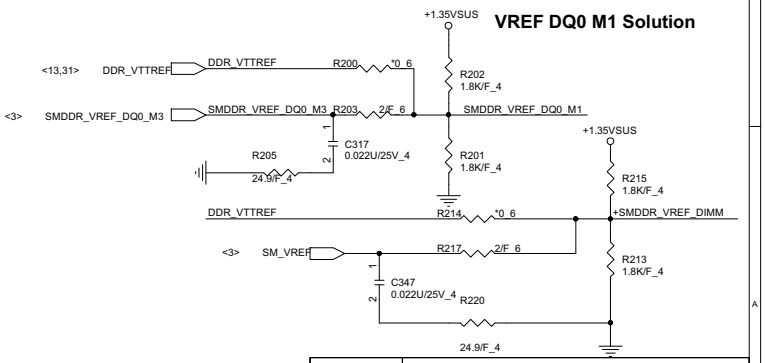


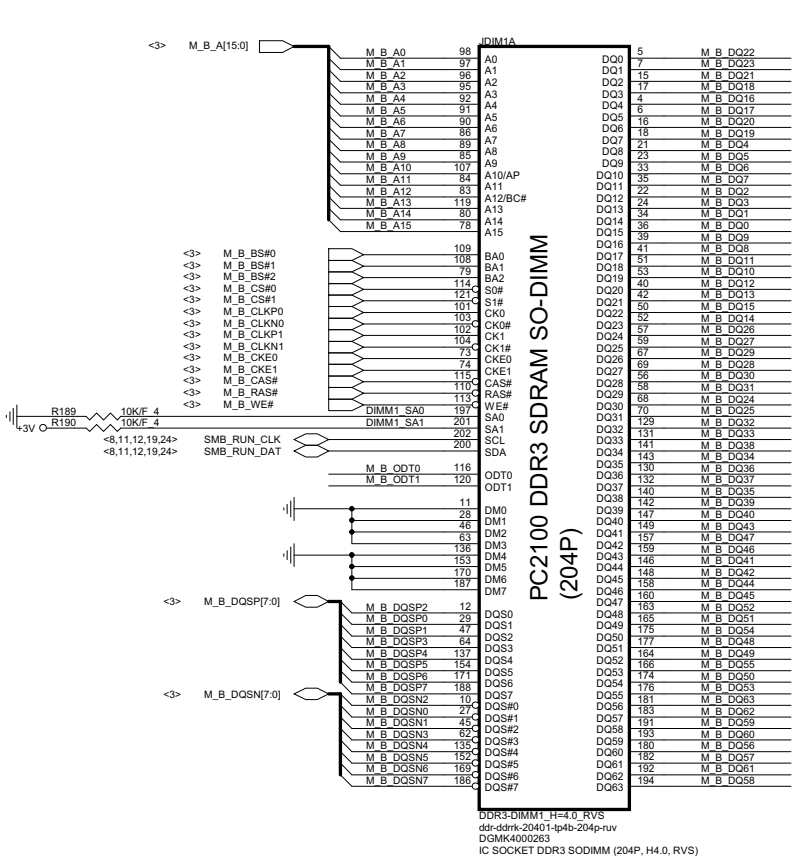


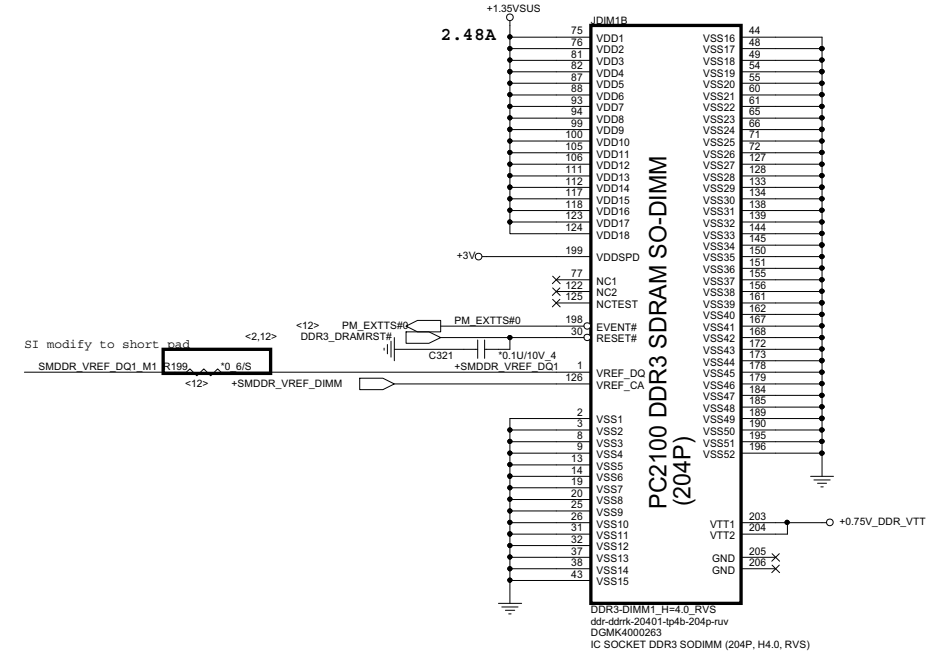




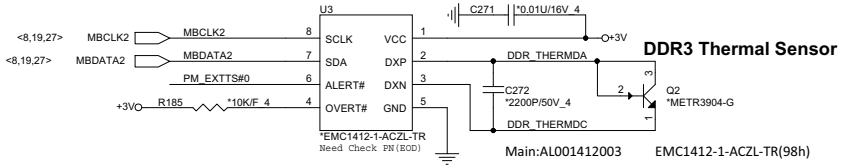








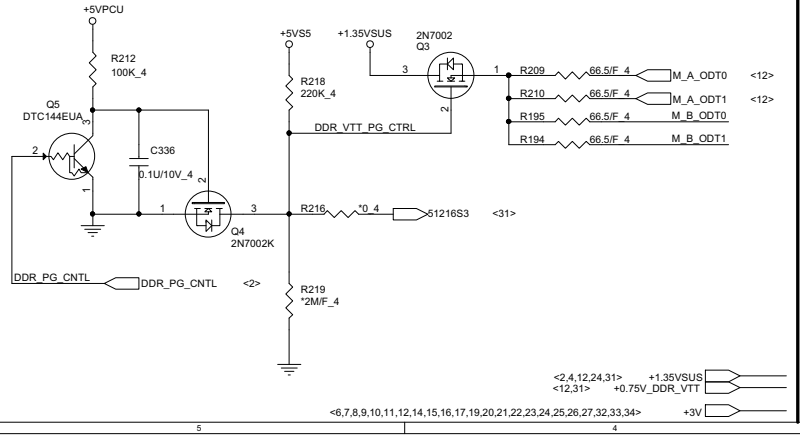
Local Thermal Sensor



DDR3 Thermal Sensor

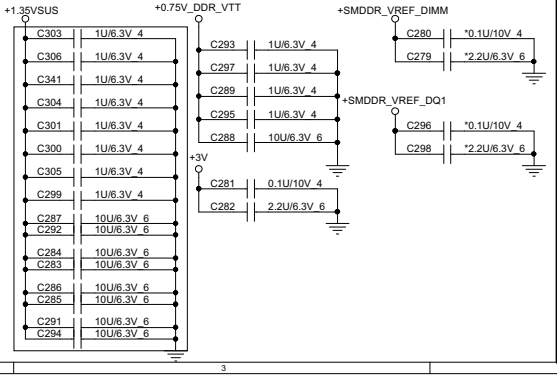
Main:AL001412003 EMC1412-1-ACZL-TR(98h)

2nd:AL000431014 TMP431ADGKR(98h)

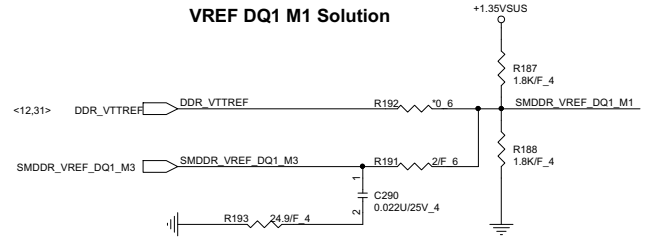


Place these Caps near So-Dimm1.

1uF/10uF 4pcs on each side of connector



VREF DQ1 M1 Solution



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Quanta Computer Inc.

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Custom	DDR3 DIMM1-RVS(4.0H)	1A
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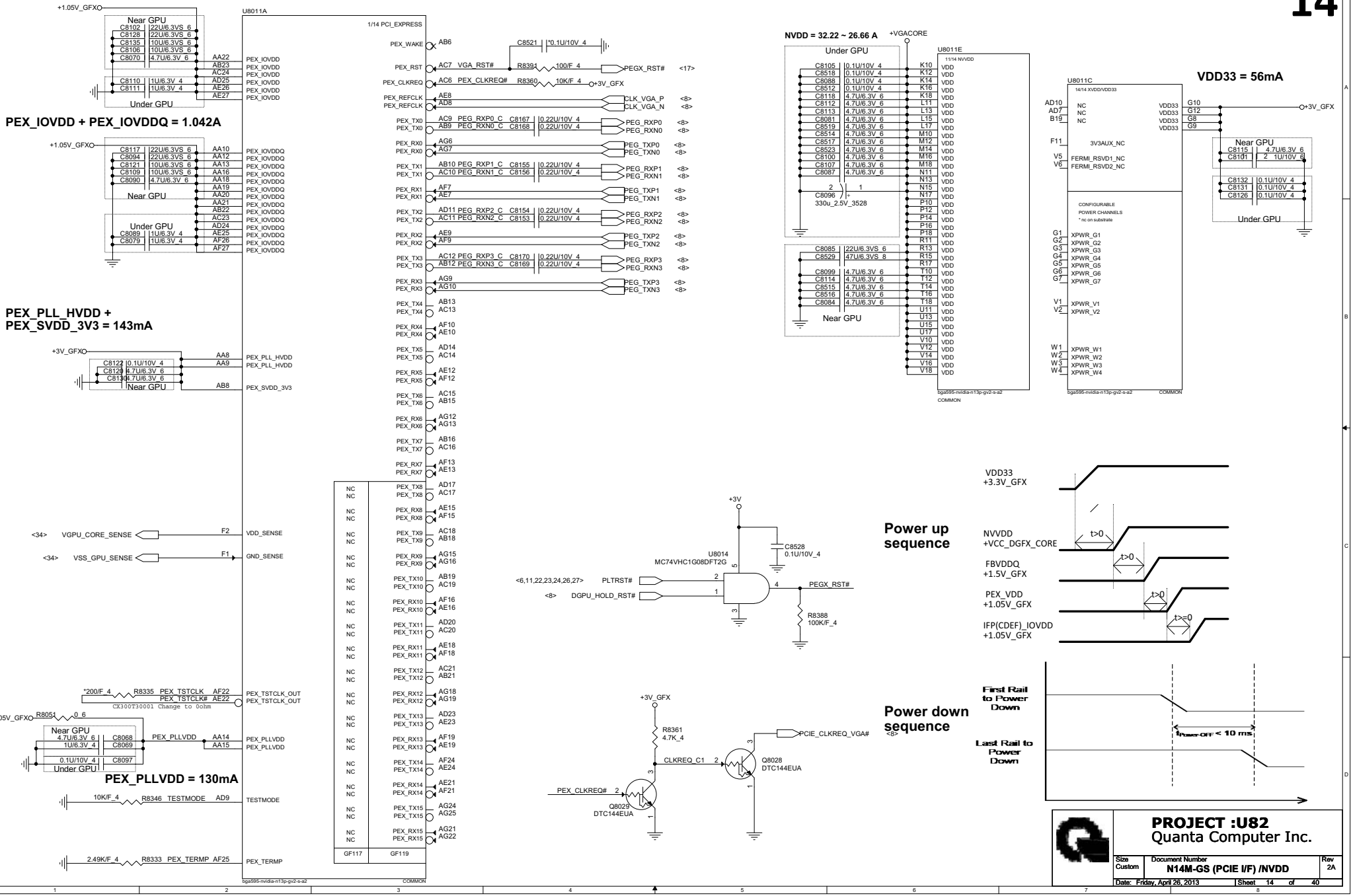

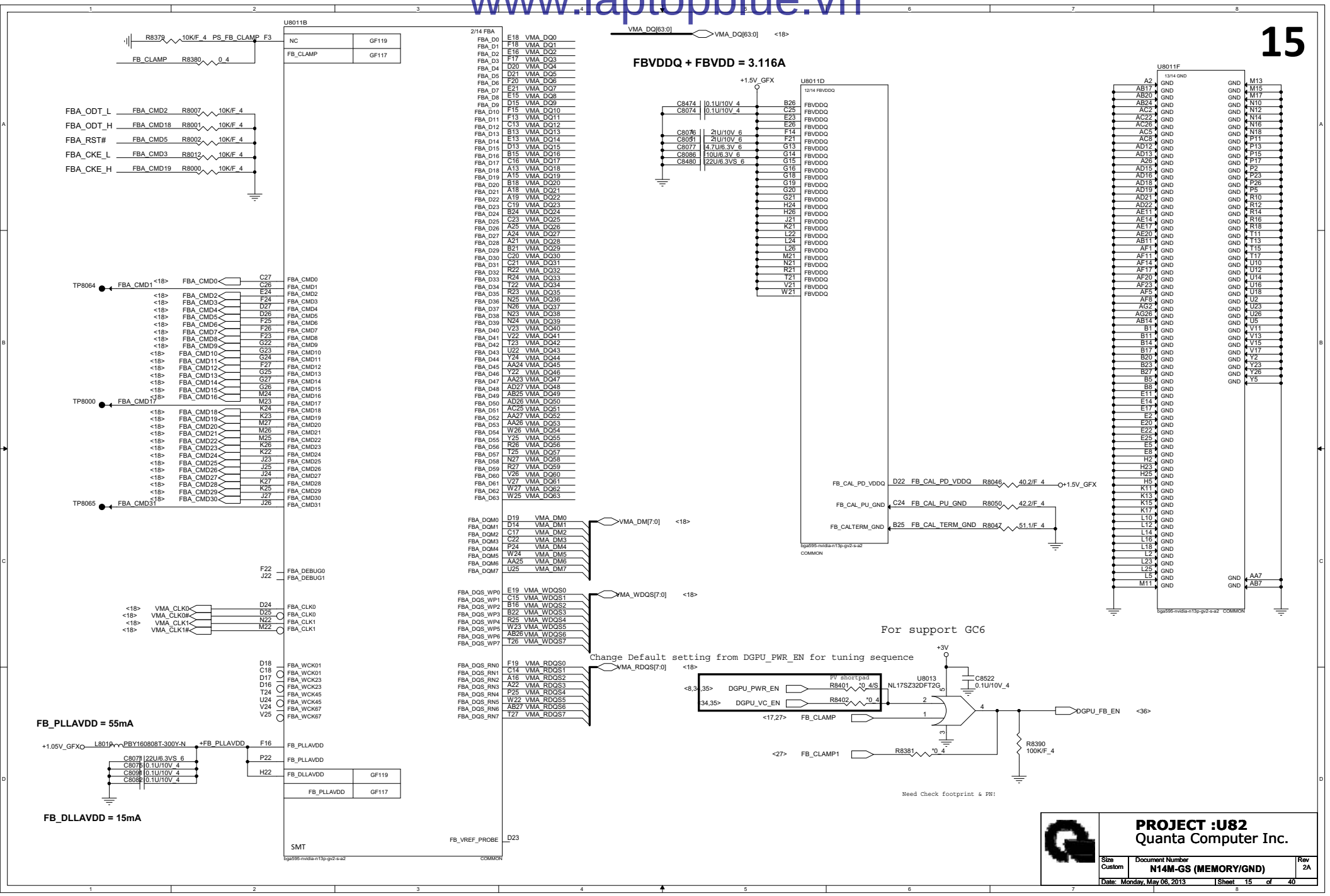

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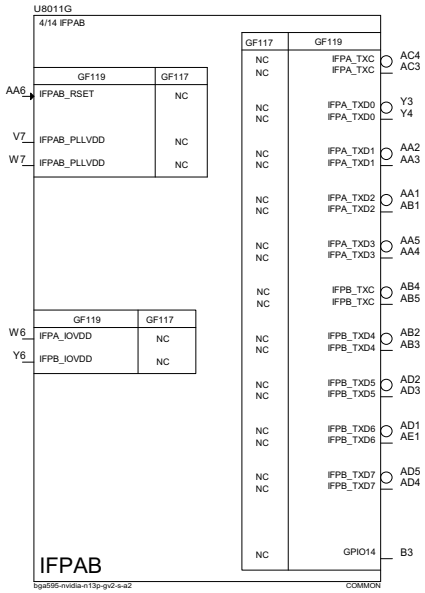
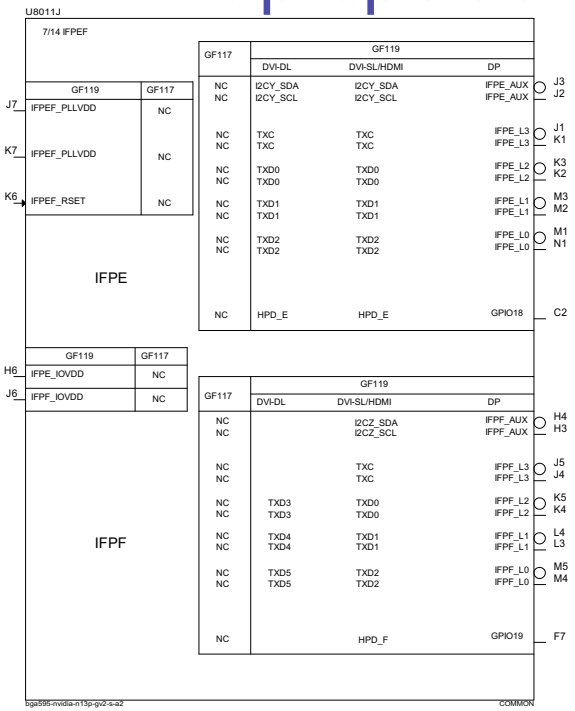
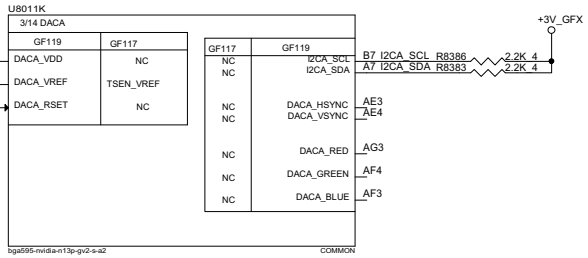
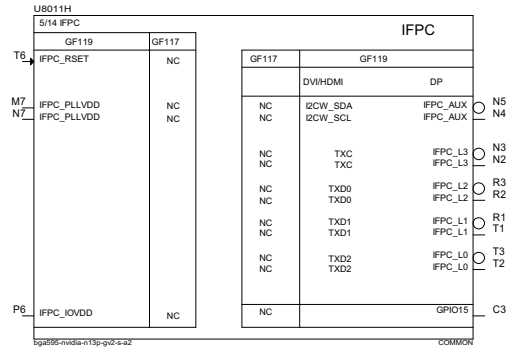
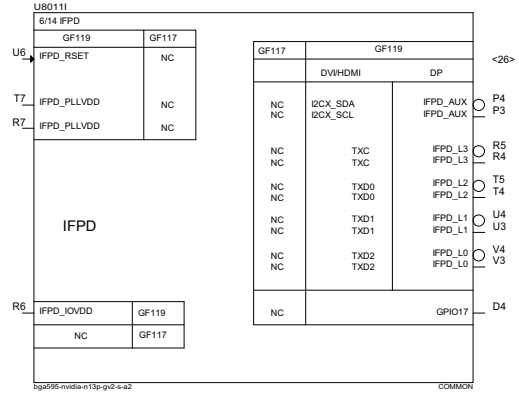
Quanta Computer Inc.	
Size: Custom	Document Number: N14M-GS (MEMORY/GND)
Rev:	2A
Date: Monday, May 06, 2013	Sheet 15 of 40



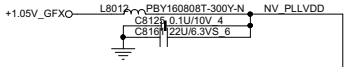




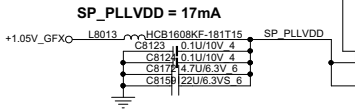




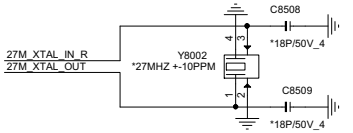
PLLVDD = 38mA

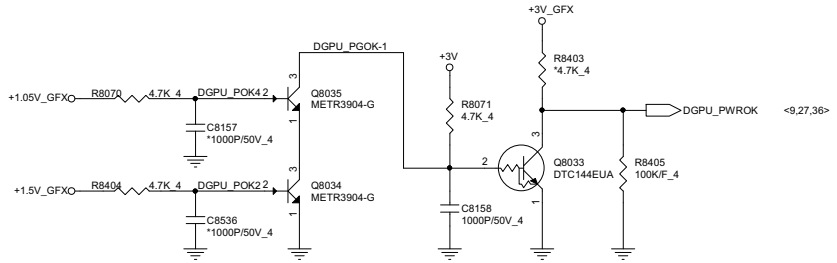


SP_PLLVDD = 17mA



VID_PLLVDD = 41mA





PROJECT :U82
Quanta Computer Inc.

Size	Document Number	Rev
Custom	N14M-GS (DISPLAY)	2A

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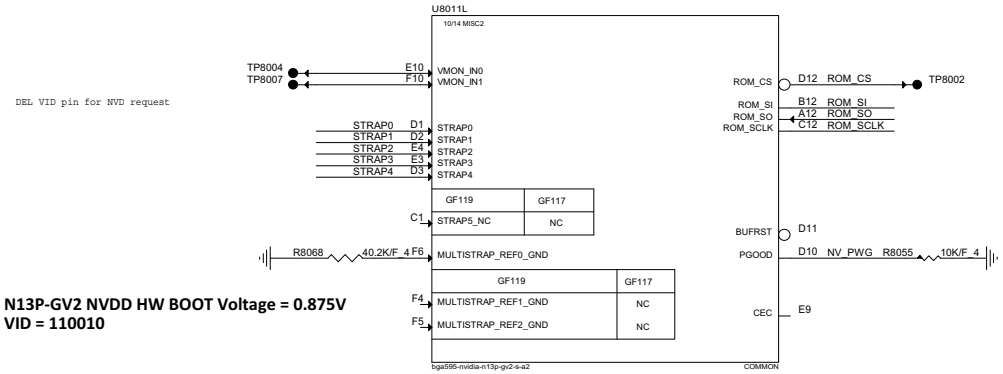
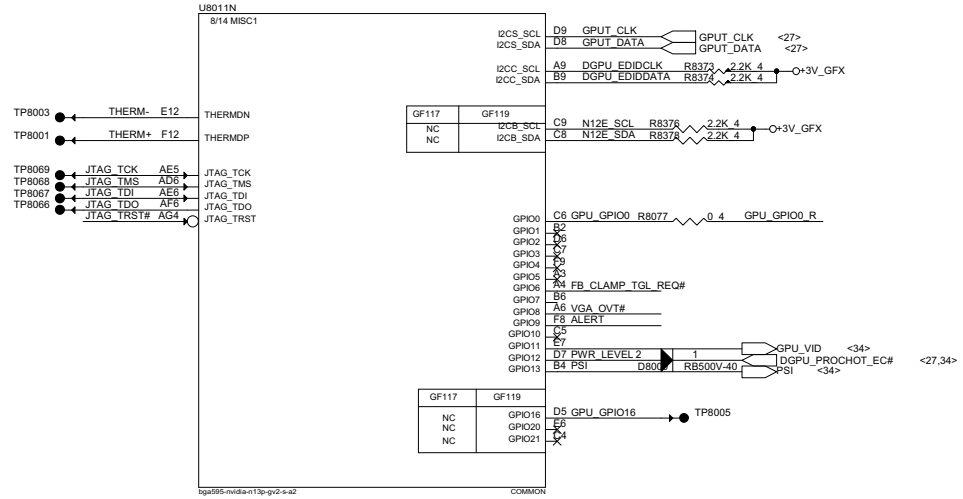
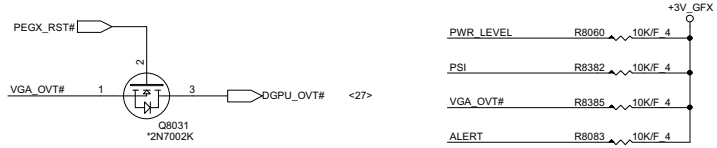
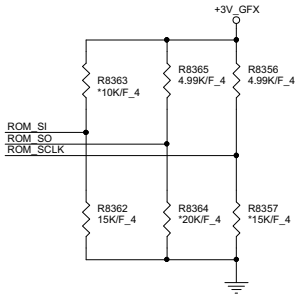
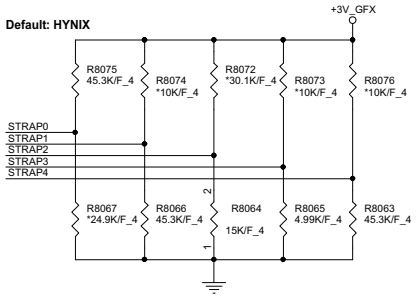


N13P-GV2 NVDD HW BOOT Voltage = 0.875V
VID = 110010

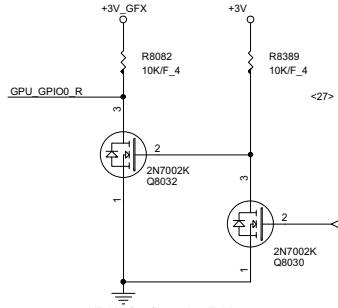


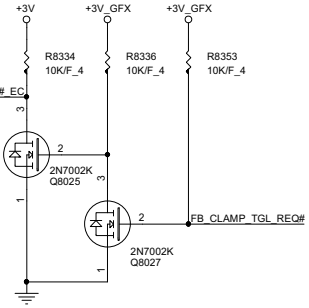






4.99k	CS24992FB26
10k	CS31002FB26
15k	CS31502FB24
20k	CS32002FB29
24.9k	CS32492FB16
30.1k	CS33012FB18
34.8k	CS33482FB22
45.3k	CS34532FB18





VRAM Configuration Table

RAMCFG [3:0]	DESCRIPTION	Vendor	Vendor P/N	QCI P/N	
0000		...			
0000	DDR3 128Mx16x4, 64bit, 2Gb,900MHz	Micron	MT41J128M16JT-107G:K	AKD5MGSTL06	AKD5MGSTL08
0110	DDR3 128Mx16x4, 64bit, 2Gb,900MHz	HYNIX	H5TQ2G63DFR-11C	AKD5MGWTW16	AKD5MGWTW13
0111	DDR3 128Mx16x4, 64bit, 2Gb,900MHz	SAMSUNG	K4W2G1646E-BC11	AKD5MGGT520	AKD5MGGT522

GPIO ASSIGNMENTS

GPIO	I/O	PIN	USAGE
0	IN	FB_CLAMP_MON	FB Clamp monitor
1	OUT	MEM_VDD_CTL	Memory VDD VID
2	OUT	LCD_BL_PWM	Panel Backlight PWM
3	OUT	LCD_VCC	PANEL POWER ENABLE
4	OUT	LCD_BLEN	PANEL BACKLIGHT ENABLE
5	OUT	Reserved	--
6	OUT	FB_CLAMP_TGL_REQ	Active low FB Clamp toggle request
7	OUT	3D VISION	3D VISION LEFT/RIGHT signal
8	I/O	OVERT	ACTIVE LOW THERMAL OVER TEMP
9	I/O	ALERT	ACTIVE LOW THERMAL ALERT
10	OUT	MEM VREF_CTL	MEMMORY VREF CONTROL
11	OUT	PWR_VID	GPU CORE_VDD PWM Control signal
12	IN	PWR_LEVEL	AC Power detect or power supply overdraw input
13	OUT	PSI	Phase Shedding

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Quanta Computer Inc.

Size	Document Number	Rev
Custom	N14M-GS (GPIO/STRAPS)	2A

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CHANNEL A: 256MB/512MB DDR3

HYU 256Mx16, PN : AKD5PGWTW08---AKD5PGWTW07
HYU 128Mx16, PN : AKD5MZDTW03---AKD5MZDTW02

QBC TOP B/S
SAM 256Mx16, PN : AKD5PZDT501---AKD5PZDT500
SAM 128Mx16, PN : AKD5MGGT535---AKD5MGGT534

<15> VMA_DQ[63..0]
<15> VMA_DM[7..0]
<15> VMA_WDQS[7..0]
<15> VMA_RDQS[7..0]

VRAM8001 — VRAM _DDR3_HYNIX_256MX16
VRAM8003 — VRAM _DDR3_HYNIX_256MX16
VRAM8000 — VRAM _DDR3_HYNIX_256MX16
VRAM8002 — VRAM _DDR3_HYNIX_256MX16

Should be 240 Ohms +-1% — R8022 243/F_4
Should be 240 Ohms +-1% — R8028 243/F_4
Should be 240 Ohms +-1% — R8019 243/F_4
Should be 240 Ohms +-1% — R8326 243/F_4

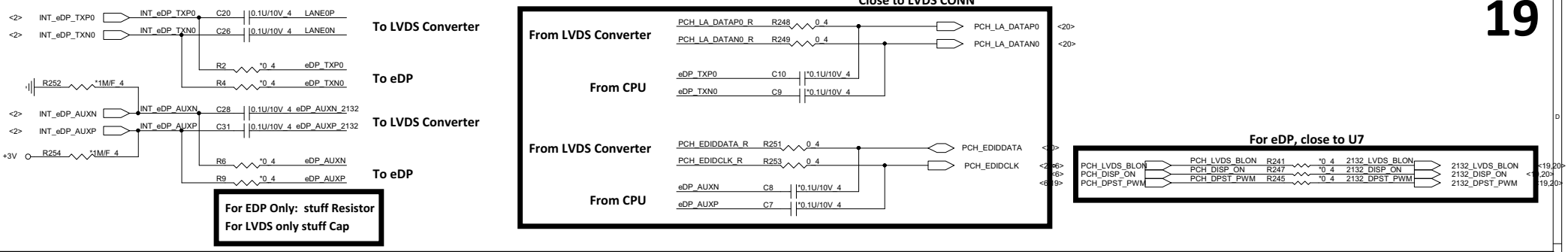
VMA_CLK0 — R8027 160/F_4 — VMA_CLK0#
VMA_CLK1 — R8031 160/F_4 — VMA_CLK1#

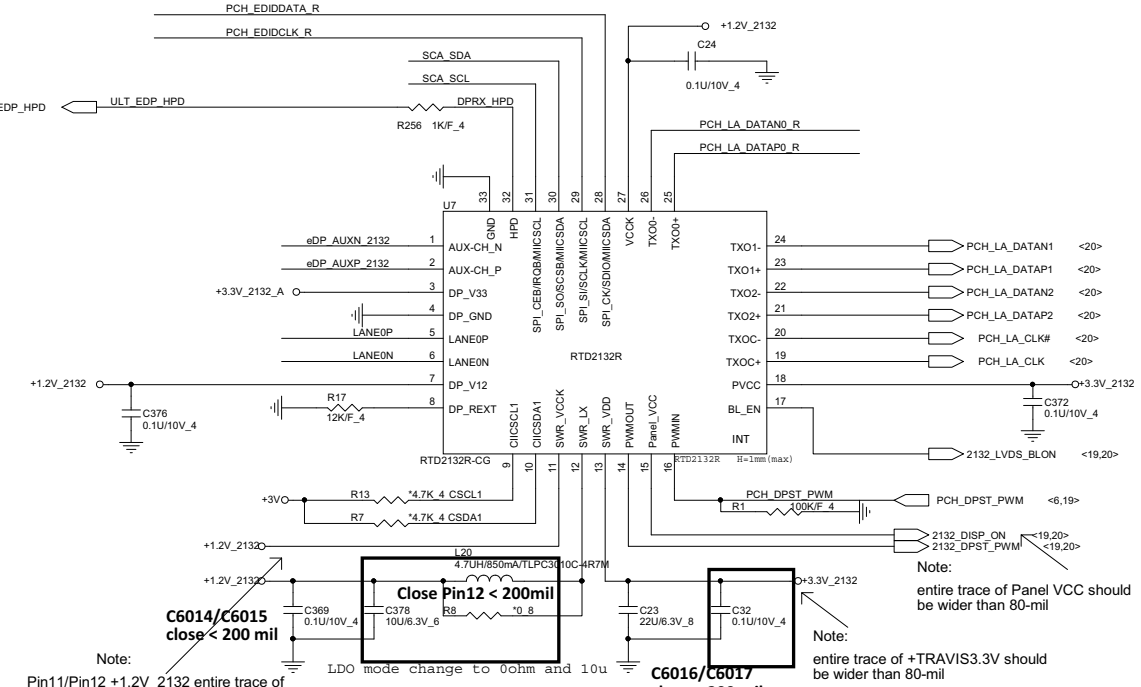
+1.5V_GFX
R8329 1.33K/F_4 — VREFC_VMA1 — R8327 1.33K/F_4 — C8475 0.1U/10V_4
R8036 1.33K/F_4 — VREFD_VMA1 — R8035 1.33K/F_4 — C8044 0.1U/10V_4
R8003 1.33K/F_4 — VREFC_VMA3 — R8005 1.33K/F_4 — C8028 0.1U/10V_4
R8041 1.33K/F_4 — VREFD_VMA3 — R8038 1.33K/F_4 — C8046 0.1U/10V_4

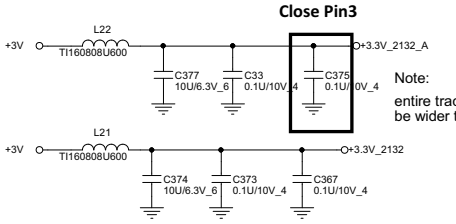
C8052 1U/6.3V_4
C8010 1U/6.3V_4
C8482 1U/6.3V_4
C8485 1U/6.3V_4
C8468 10U/6.3V_6
C8479 1U/6.3V_4
C8049 1U/6.3V_4
C8462 1U/6.3V_4
C8476 1U/6.3V_4
C8030 1U/6.3V_4
C8007 10U/6.3V_6
C8478 1U/6.3V_4
C8020 1U/6.3V_4
C8486 1U/6.3V_4
C8464 1U/6.3V_4
C8473 1U/6.3V_4
C8011 1U/6.3V_4
C8043 1U/6.3V_4
C8009 10U/6.3V_6
C8466 10U/6.3V_6
C8471 0.1U/10V_4
C8487 0.1U/10V_4
C8465 0.1U/10V_4
C8463 0.1U/10V_4
C8027 0.1U/10V_4
C8467 10U/6.3V_6
C8008 10U/6.3V_6
C8031 0.1U/10V_4
C8470 0.1U/10V_4
C8056 0.1U/10V_4

PROJECT :U82
Quanta Computer Inc.

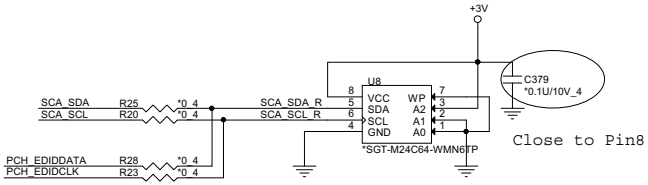
Size	Document Number	Rev
Custom	DGPU Memory (DDR3)	2A
Date: Friday, April 26, 2013	Sheet 18 of 40	







SCA_SCL pull high => EEPROM mode
SCA_SDA pull low = > EEPROM Free mode



RTD2132S => R25, R20
RTD2132R => R28, R23

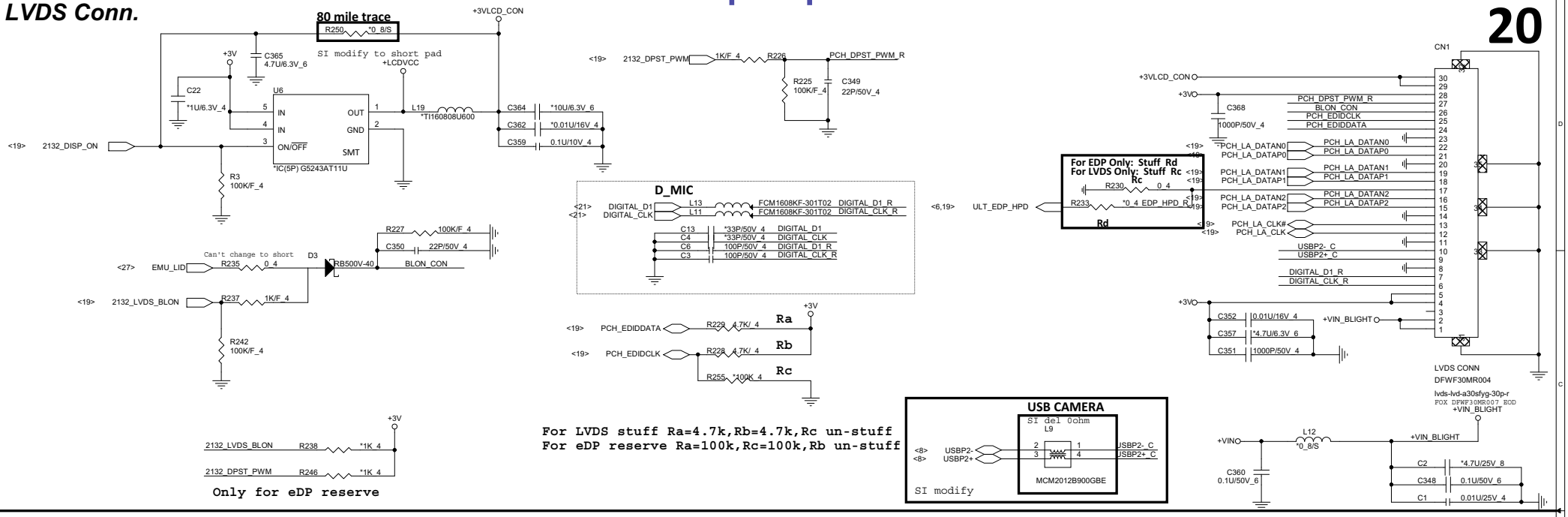
		MODE_CFG0(PIN30)	
		0	1
MODE_CFG1(PIN31)	0	X	EP MODE
	1	ROM ONLY MODE	EEPROM MODE

PROJECT :U82
Quanta Computer Inc.

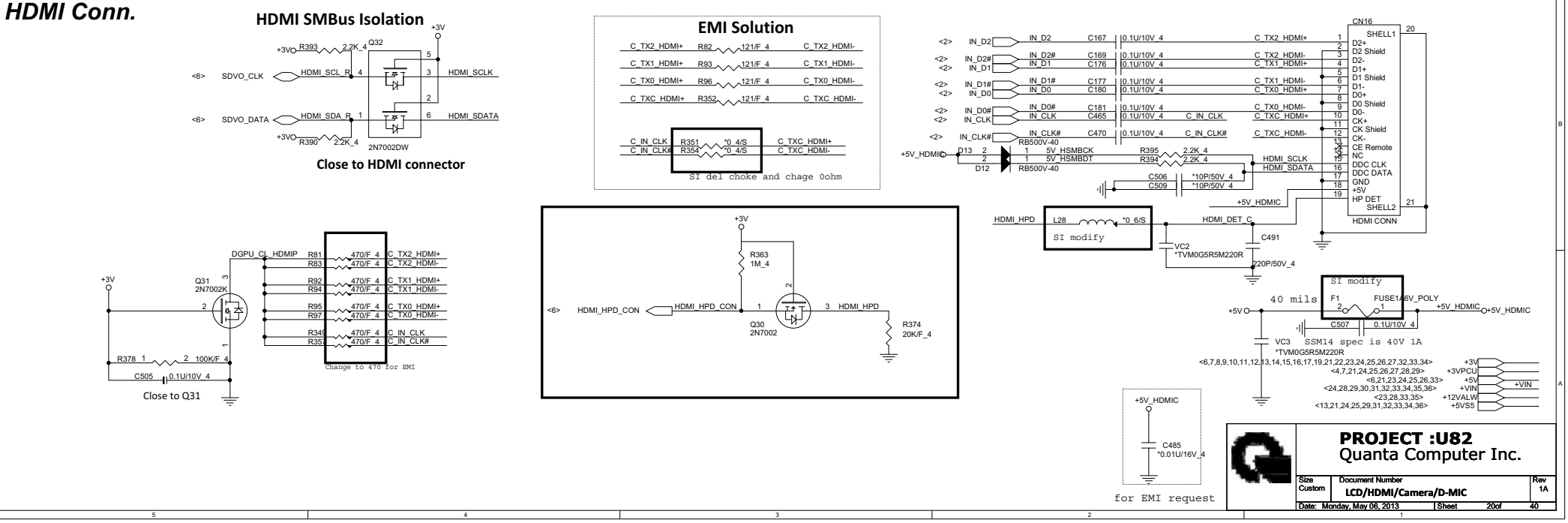
Size	Document Number	Rev
Custom	LVDS converter RTD2132R	1A

Date: Friday, April 26, 2013 Sheet 19 of 40

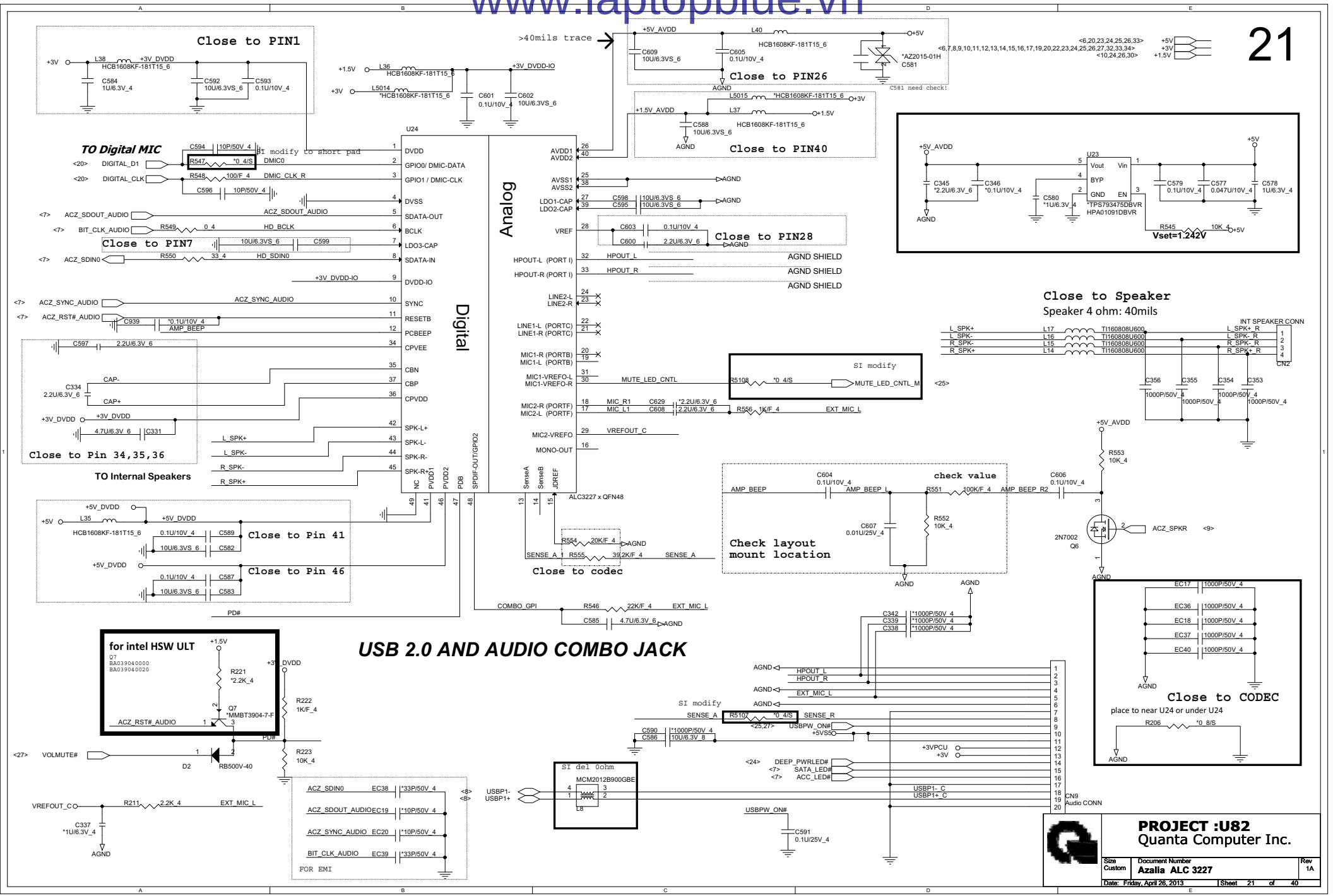
LVDS Conn.

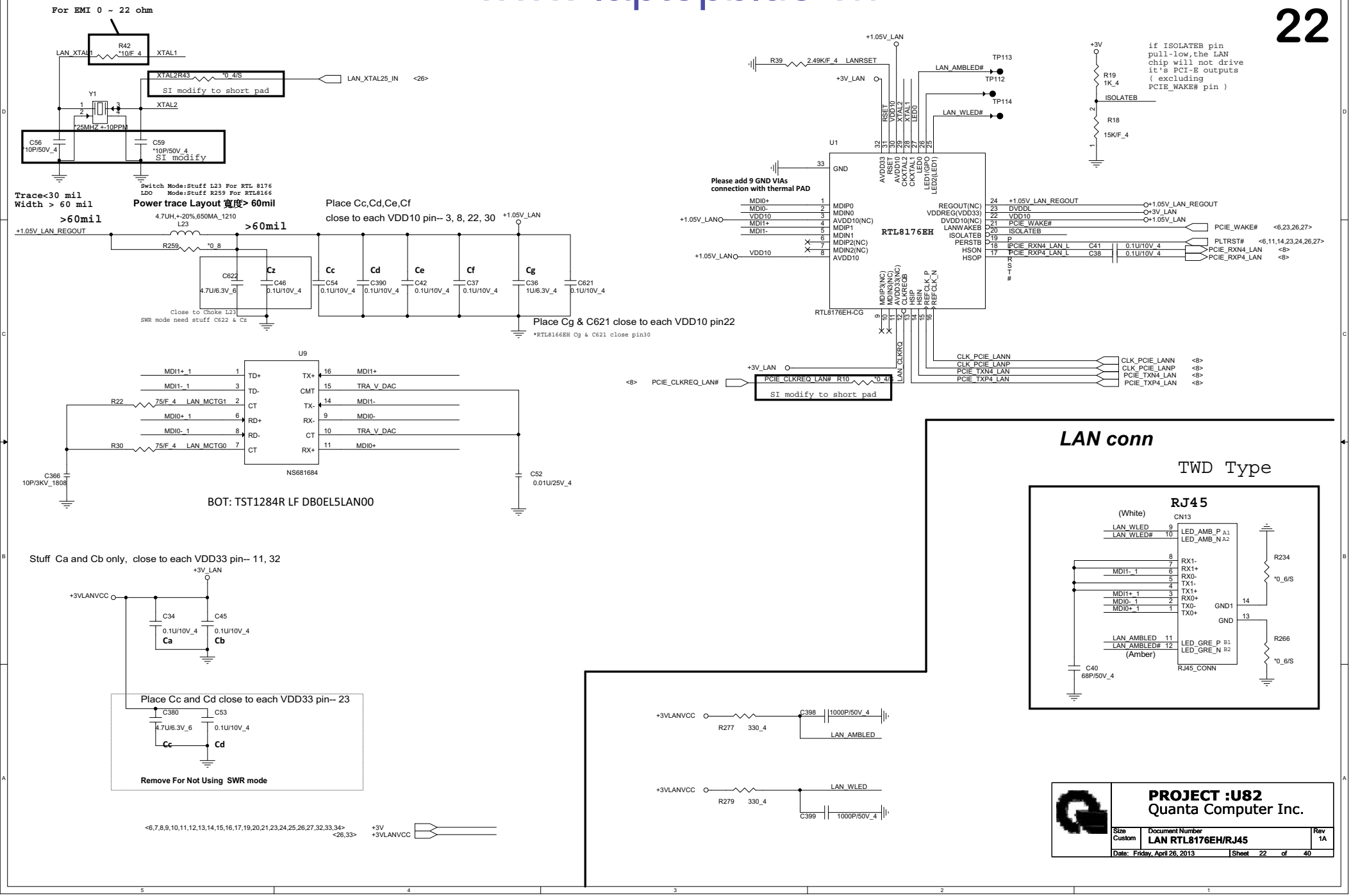


HDMI Conn.



PROJECT :U82 Quanta Computer Inc.		
Size: Custom	Document Number: LCD/HDMI/Camera/D-MIC	Rev: 1A
Date: Monday, May 06, 2013	Sheet: 20of 40	





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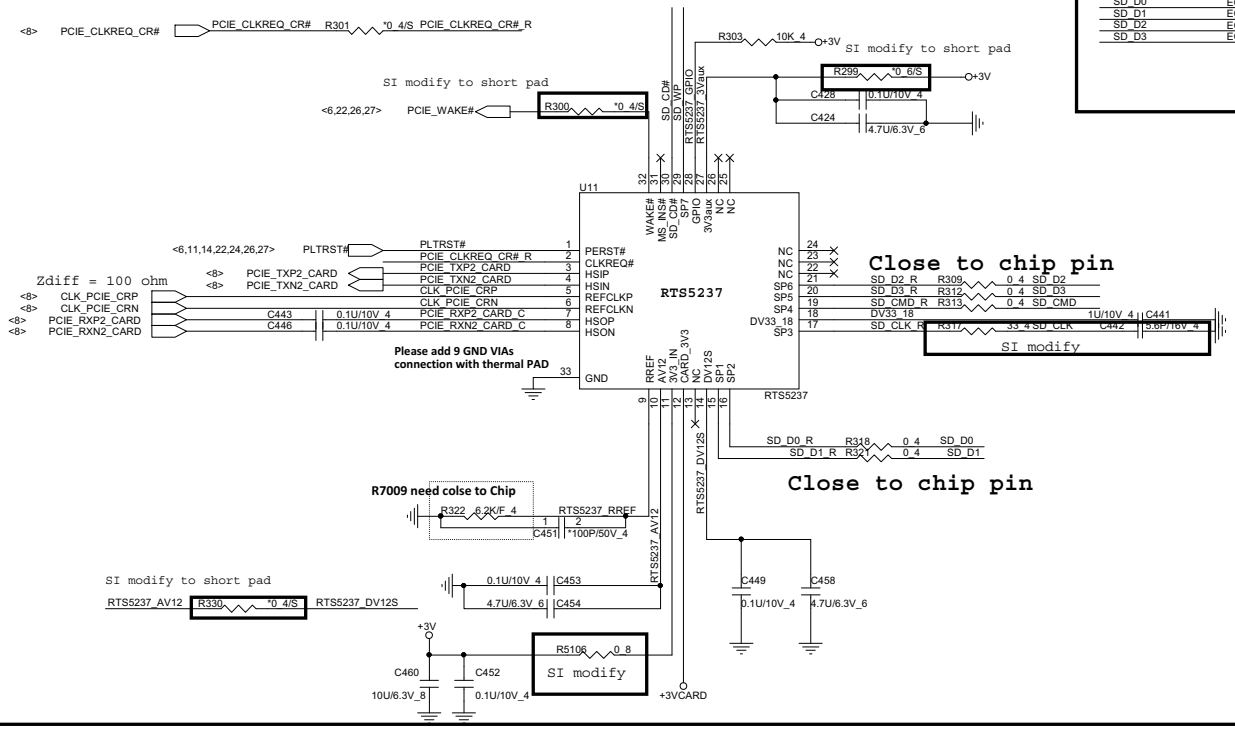
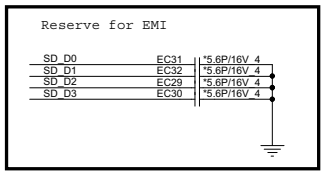
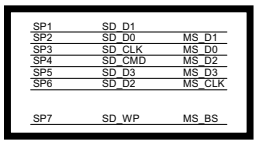
Quanta Computer Inc.	
Size: Custom	Document Number: LAN RTL8176EH/RJ45
Rev: 1A	
Date: Friday, April 26, 2013	Sheet 22 of 40







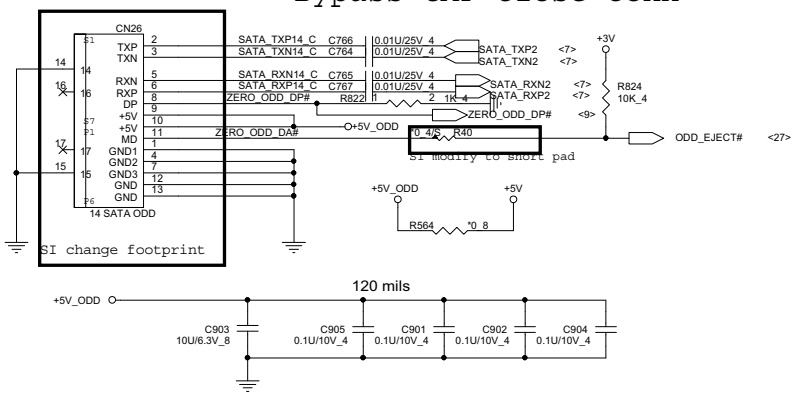
Share Pin

SD / MMC

SATA ODD CONNECTOR

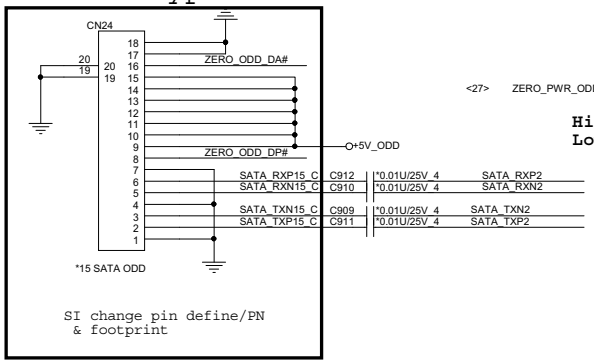
14" SATA ODD

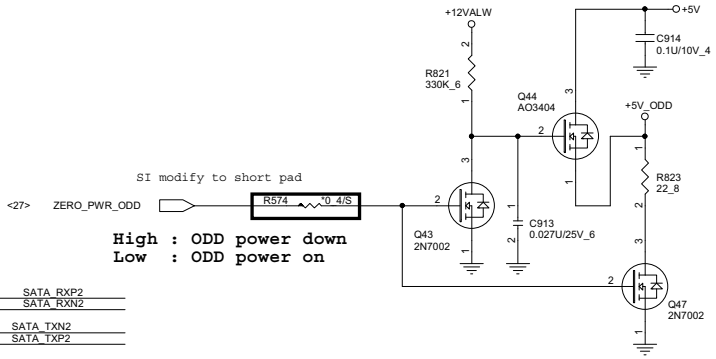
Bypass CAP close conn



15" SATA ODD

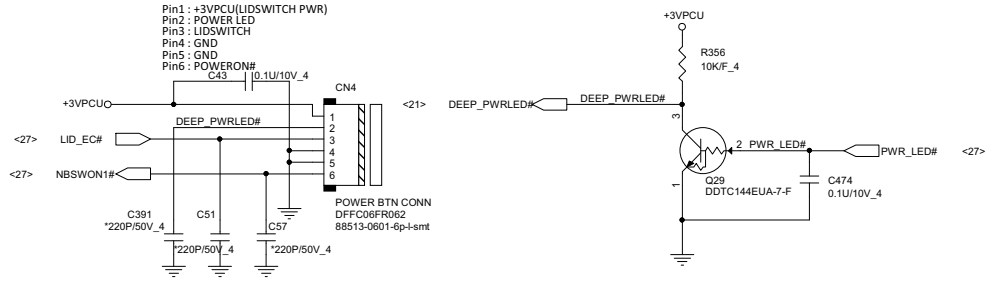
New Type



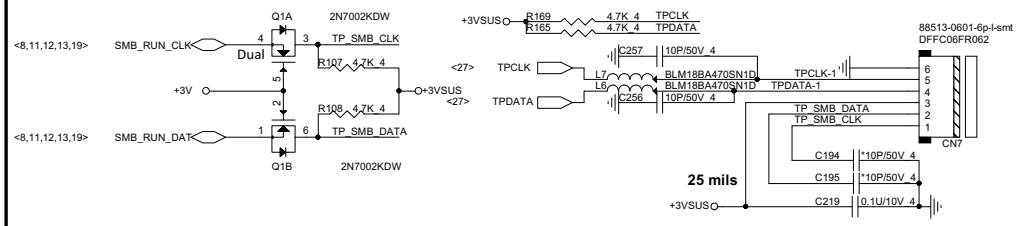


PROJECT :U82 Quanta Computer Inc.			
Size: Custom	Document Number: CR RTS5237 & CR SOCKET		Rev: 1A
Date: Friday, May 03, 2013	Sheet 23 of 40		

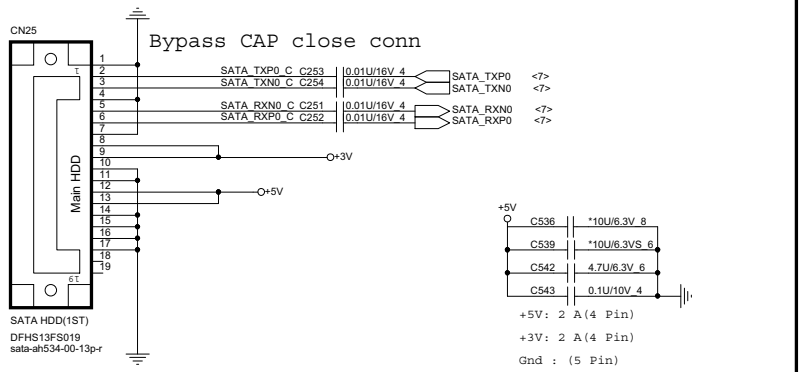
Power Botton Connector



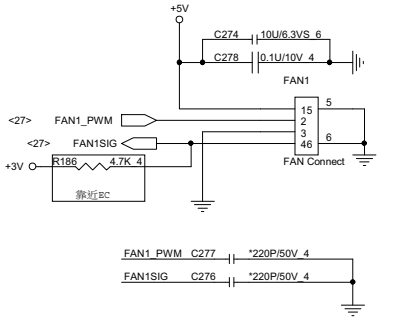
Touch Pad Connector



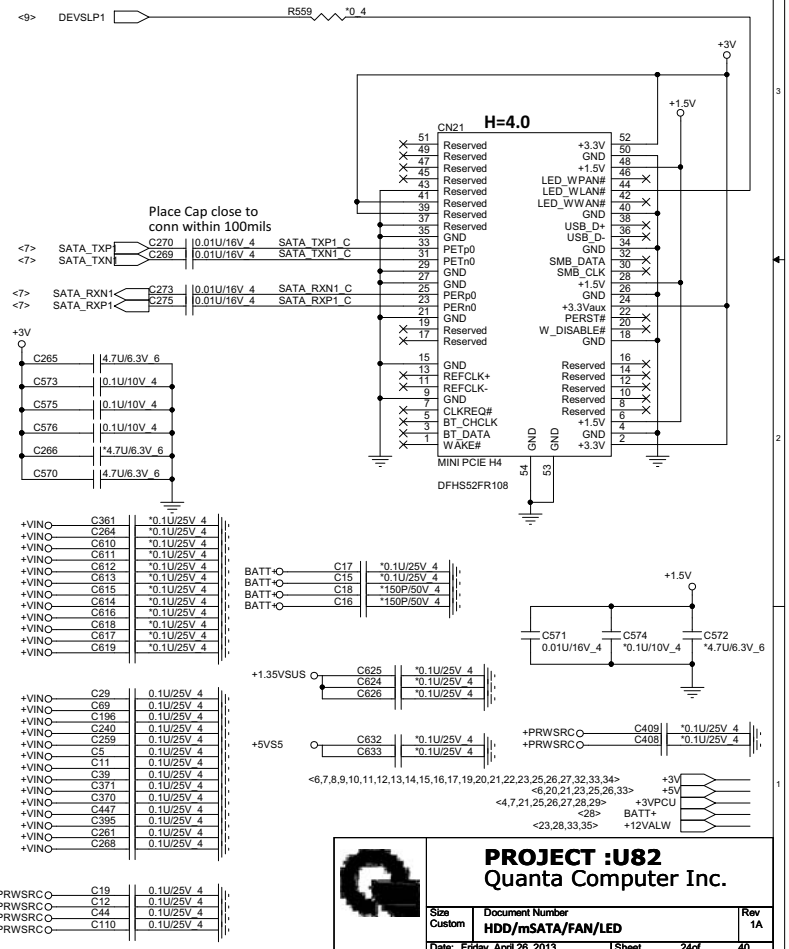
SATA HDD Connector(Cable type)



FAN



Mini PCI-E Card 2- Full size mSATA

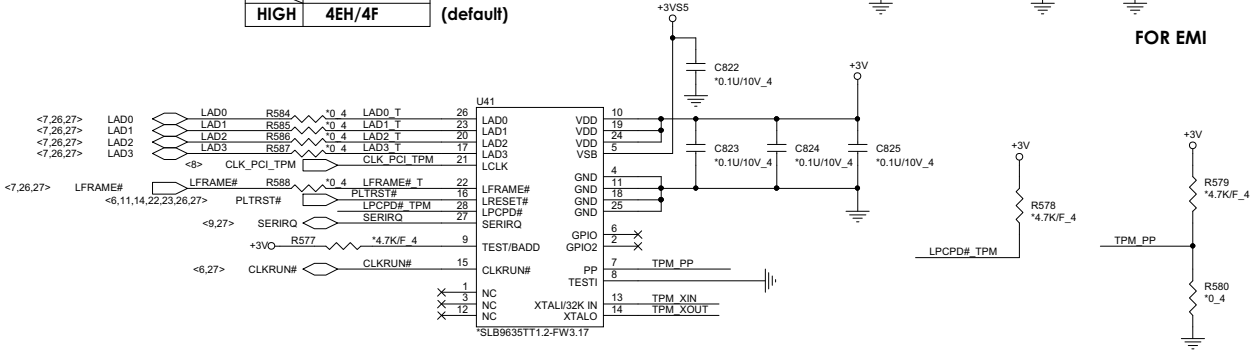


TPM (1.2)

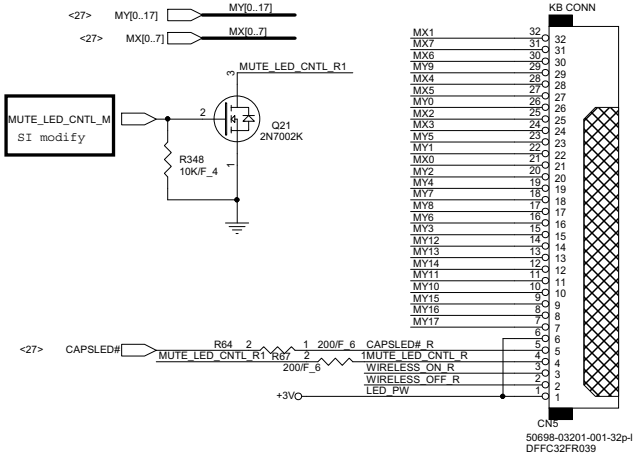
Address

	BADD
HIGH	4EH/4F

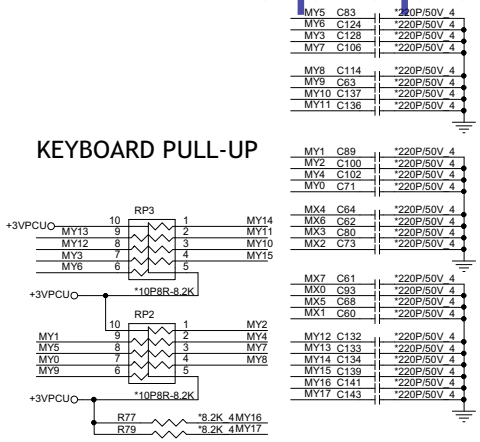
(default)

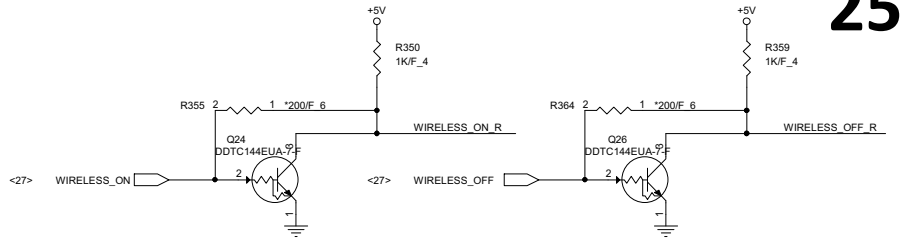


KEYBOARD Con.



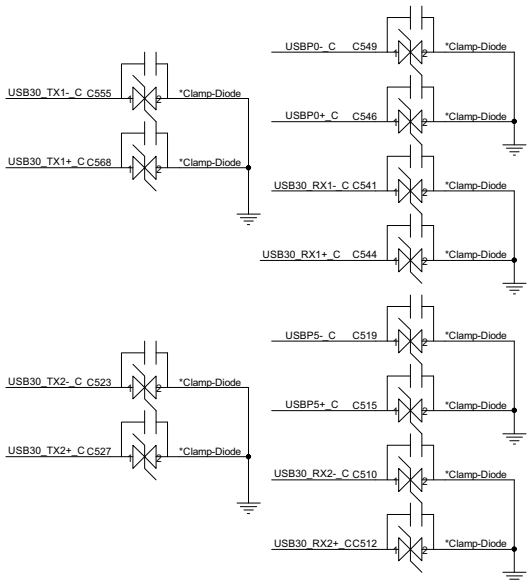
KEYBOARD PULL-UP

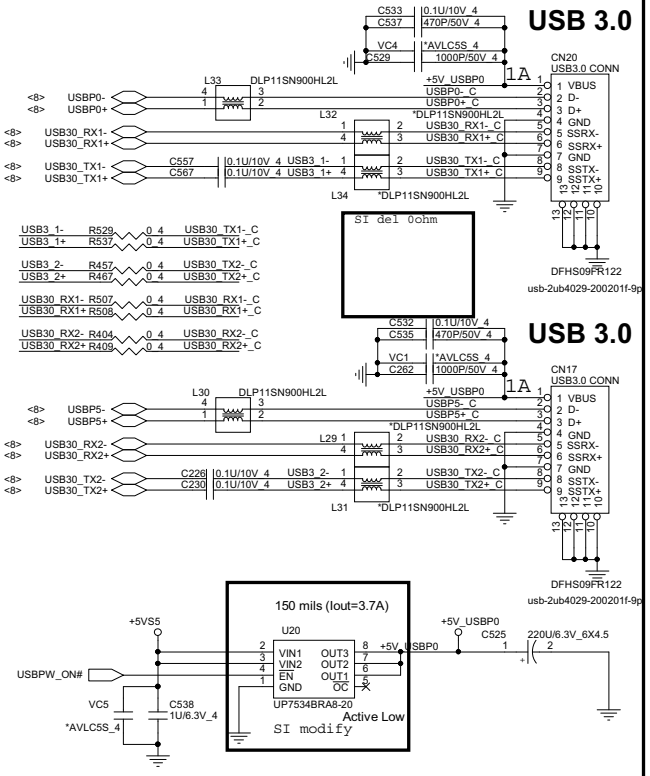




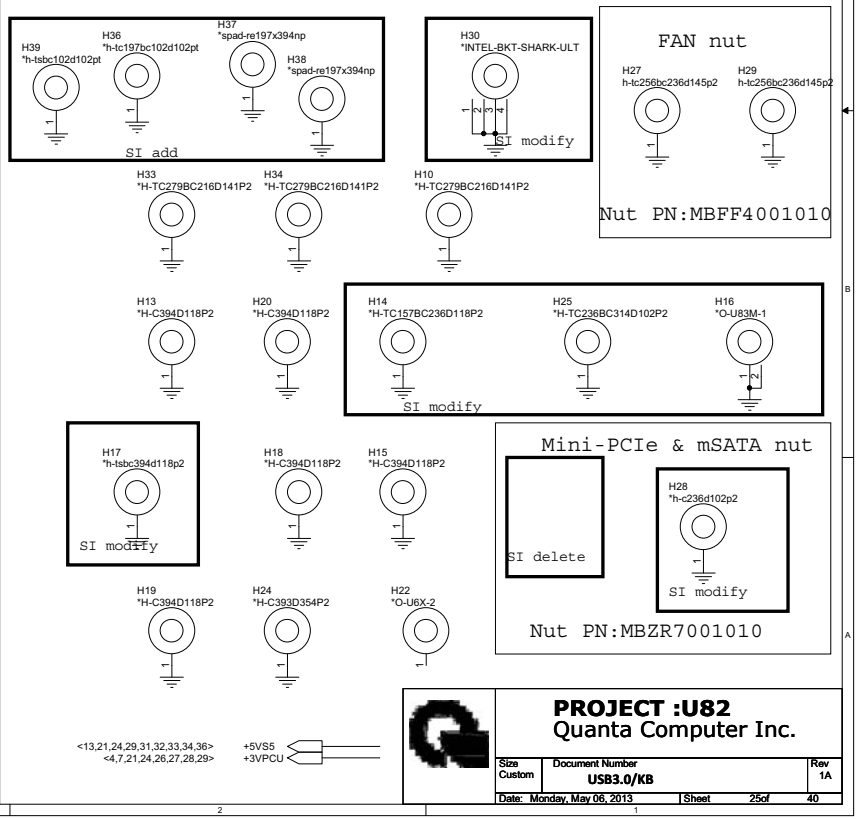
R6X Type

USB 2.0/3.0 Combo





Hole



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Quanta Computer Inc.

Size	Document Number	Rev
Custom	USB3.0/KB	1A
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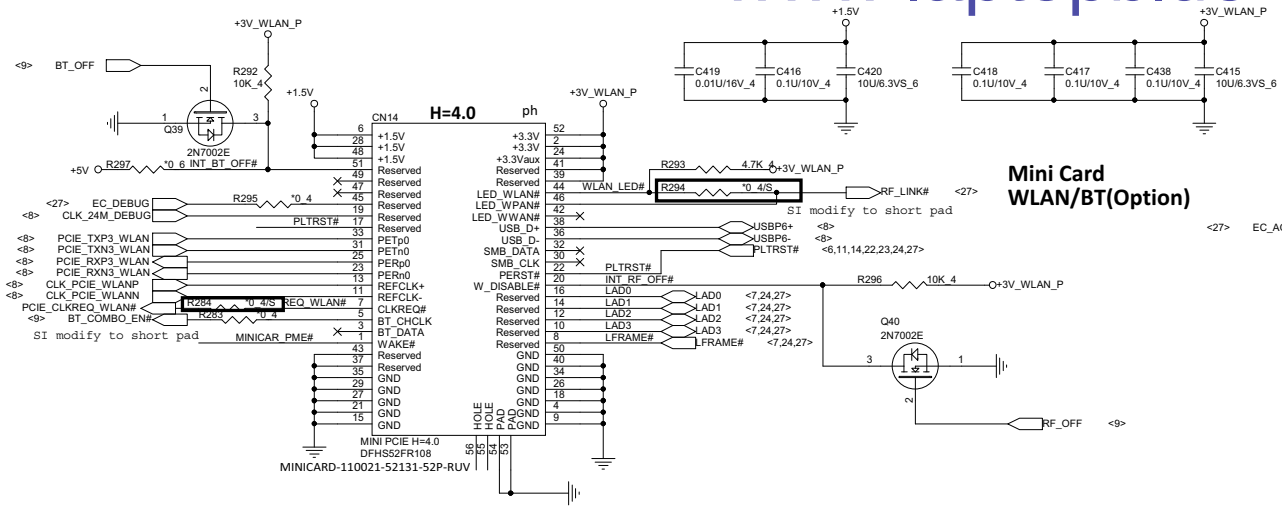
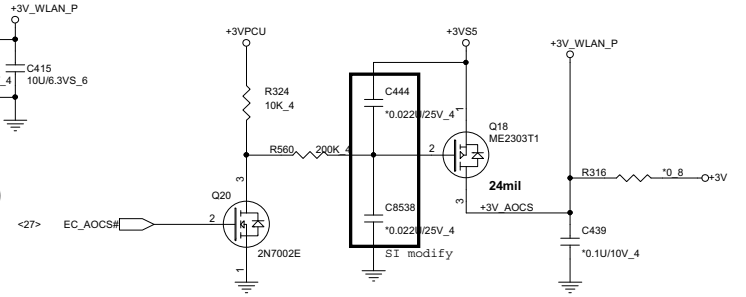
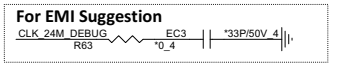
Mini Card WLAN/BT(Option)

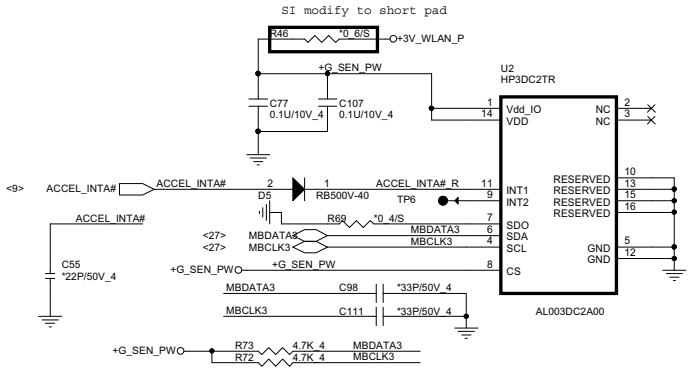




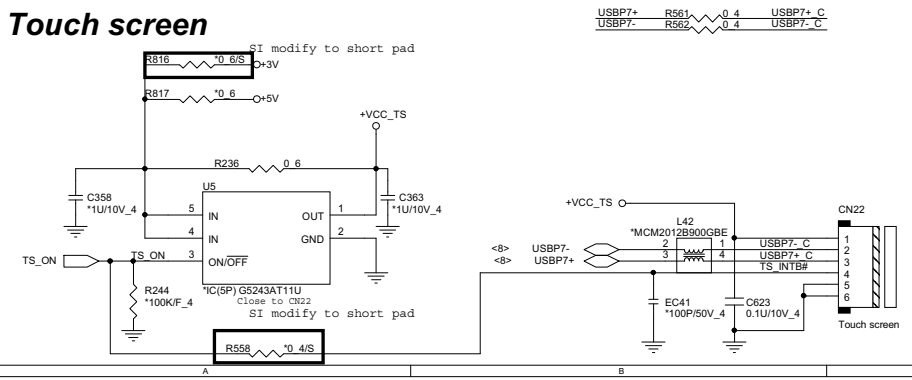
For EMI Suggestion



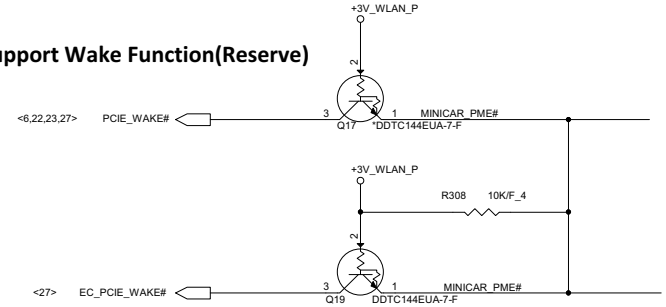
Accelerometer Sensor



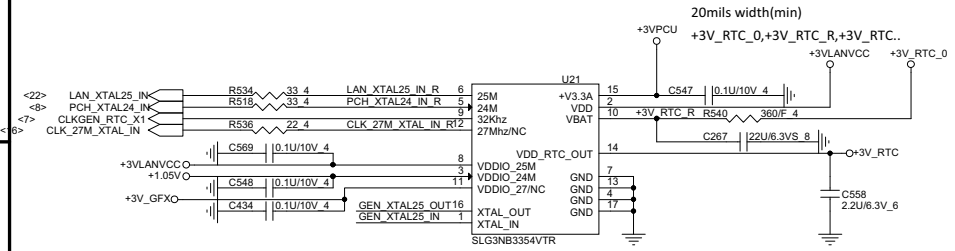
Touch screen



Support Wake Function(Reserve)



Green CLK Circuitry



	P/N	R536	C434
UMA	AL003355000	N/A	N/A
DIS	AL003354001	Install	Install

PROJECT :U82
Quanta Computer Inc.

Size	Document Number	Rev
Custom	WLAN/G-Sensor/G-CLK/TS	1A
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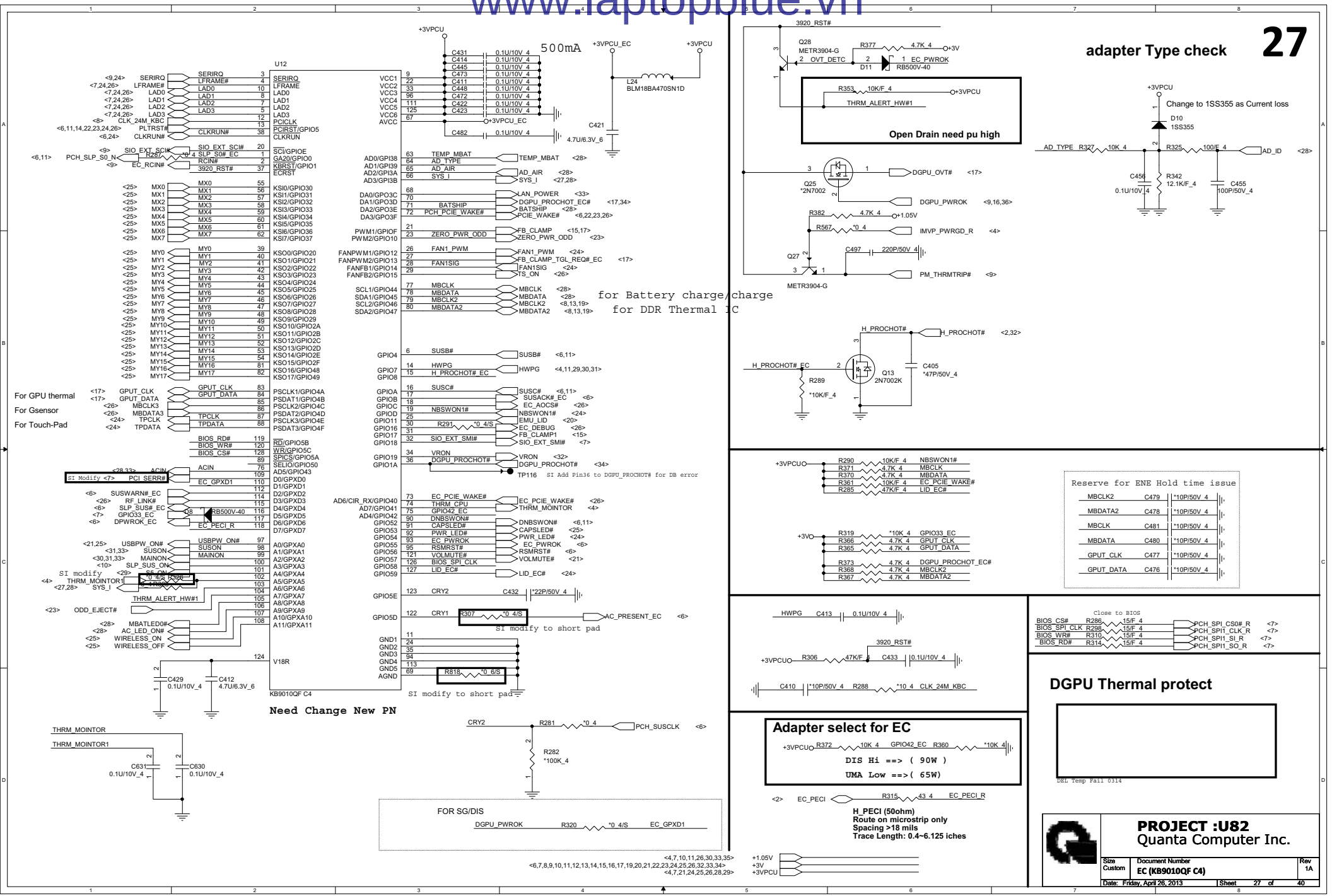

adapter Type check

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Size	Document Number	Rev
Custom	EC (KB9010QF C4)	1A
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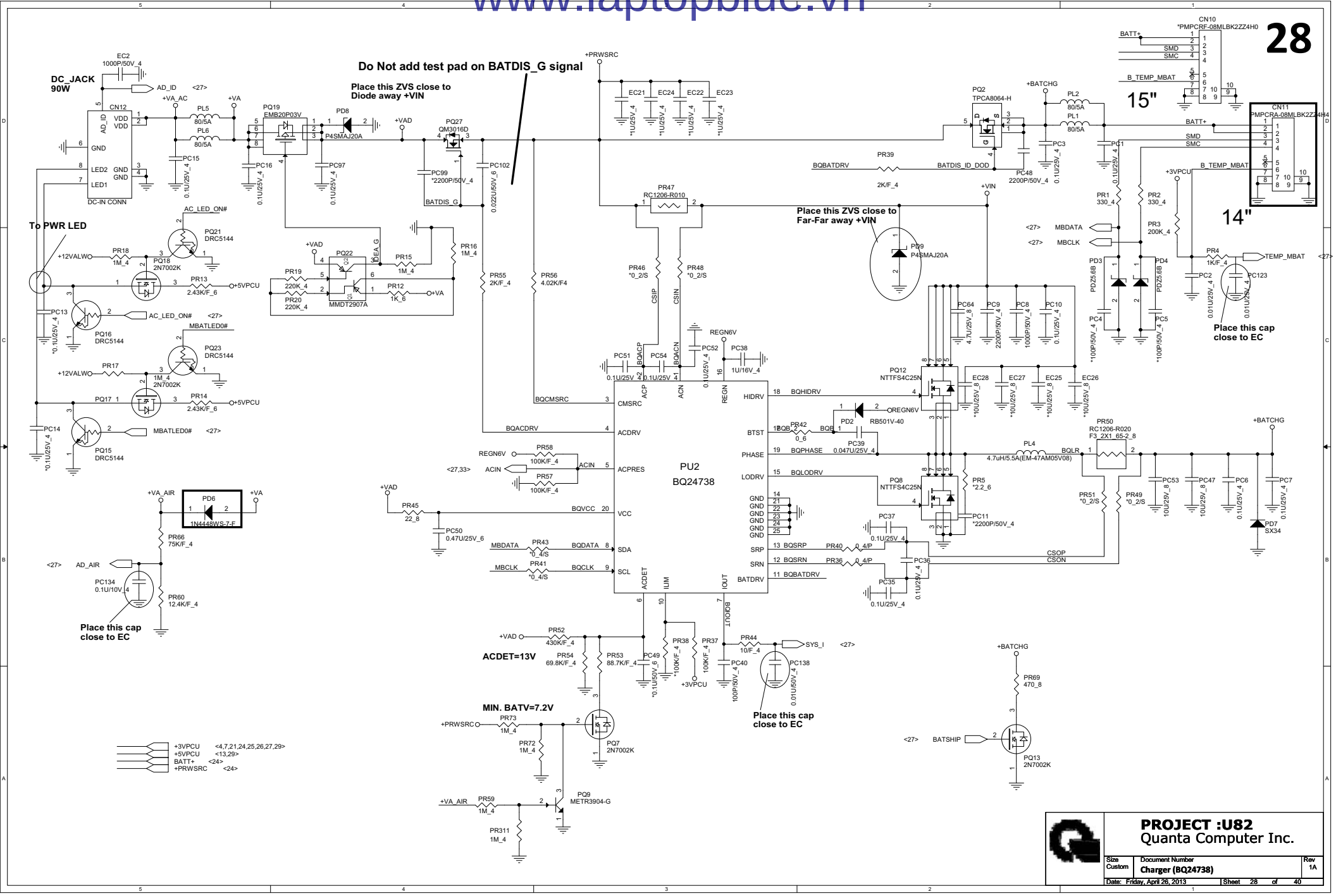

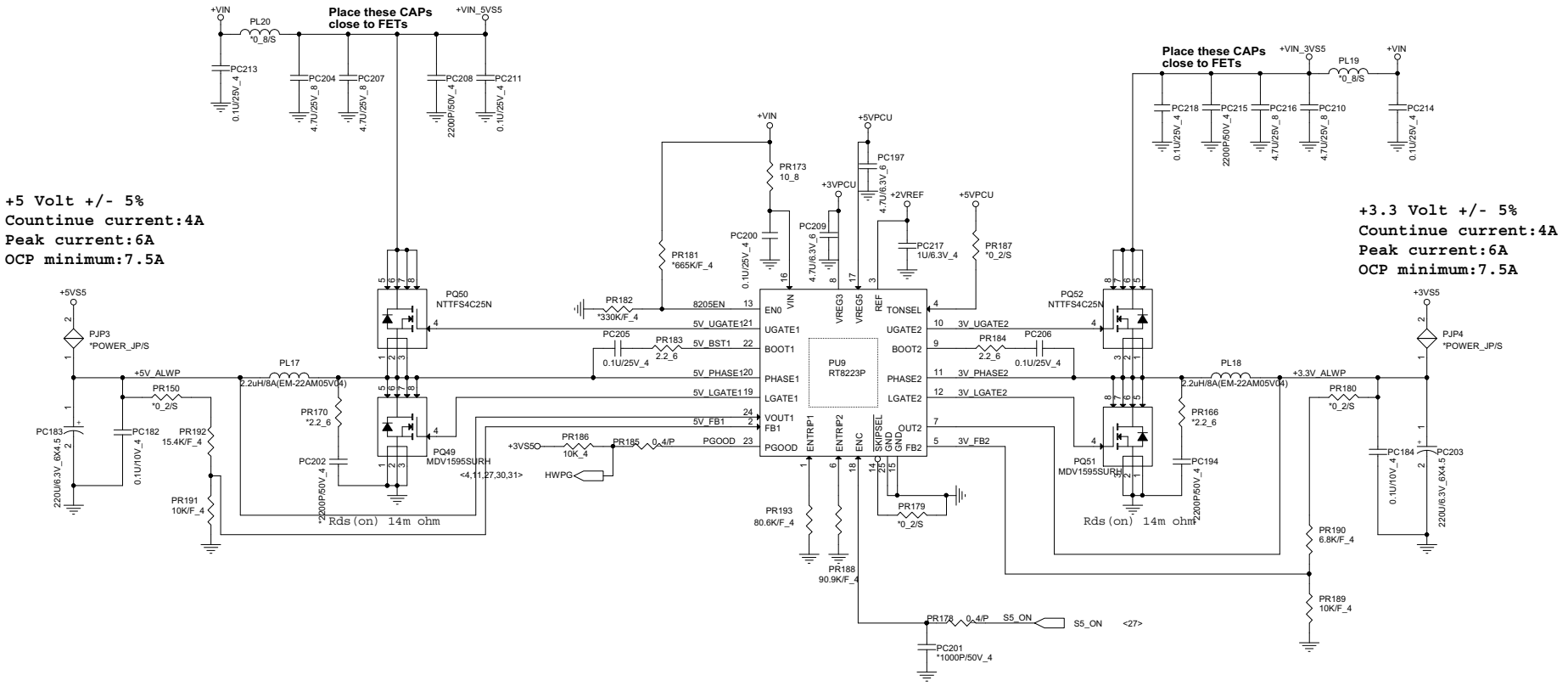

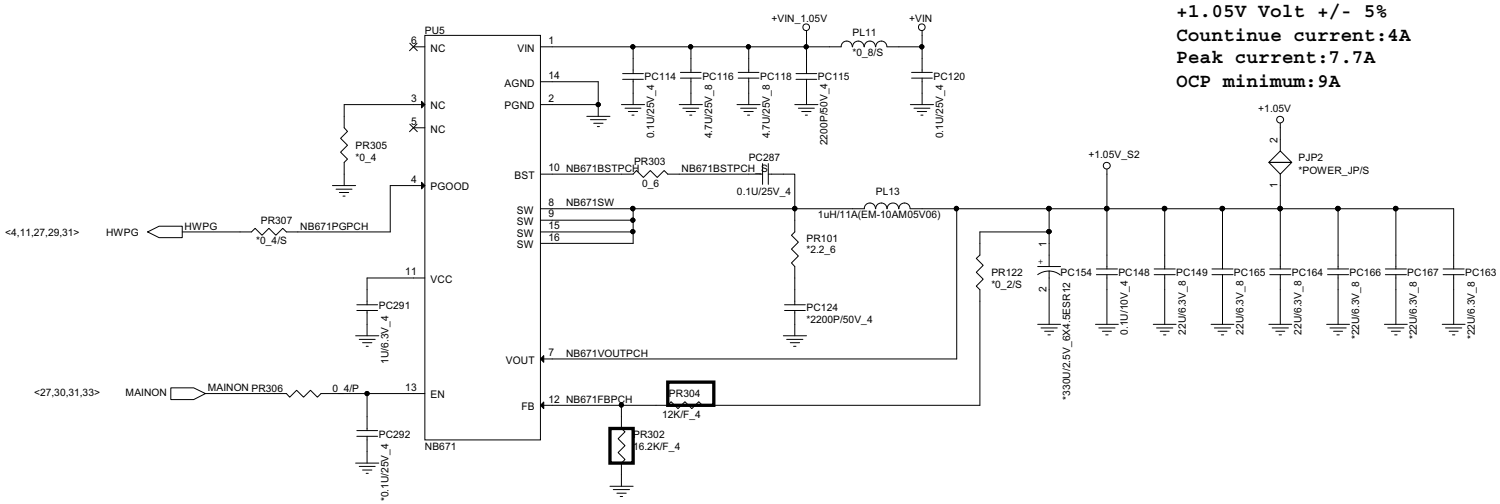

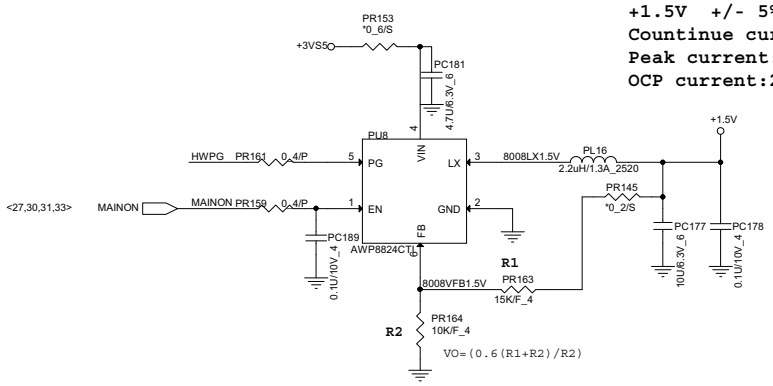

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+3VS5 <6,9,10,11,24,26,29,33,35>
+5VS5 <13,21,24,25,29,31,32,33,34,36>
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Custom	+1.05V (NB671)/1.5V	1A

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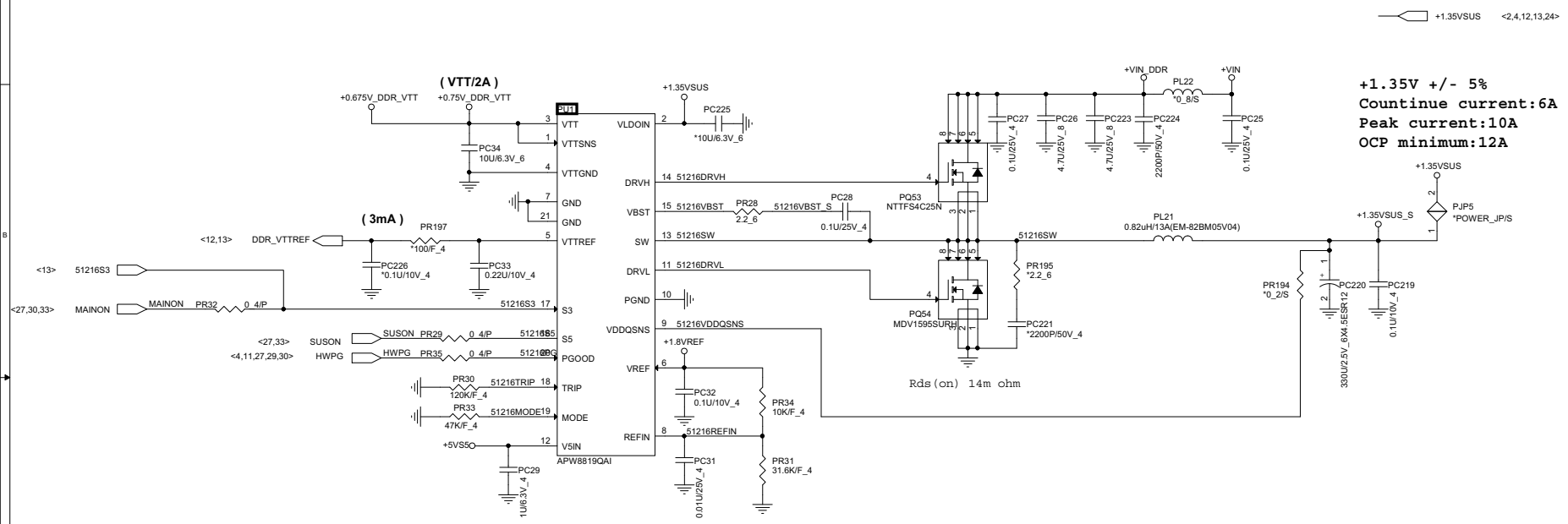

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Size	Document Number	Rev
Custom	DDR3 (APW8819)	1A

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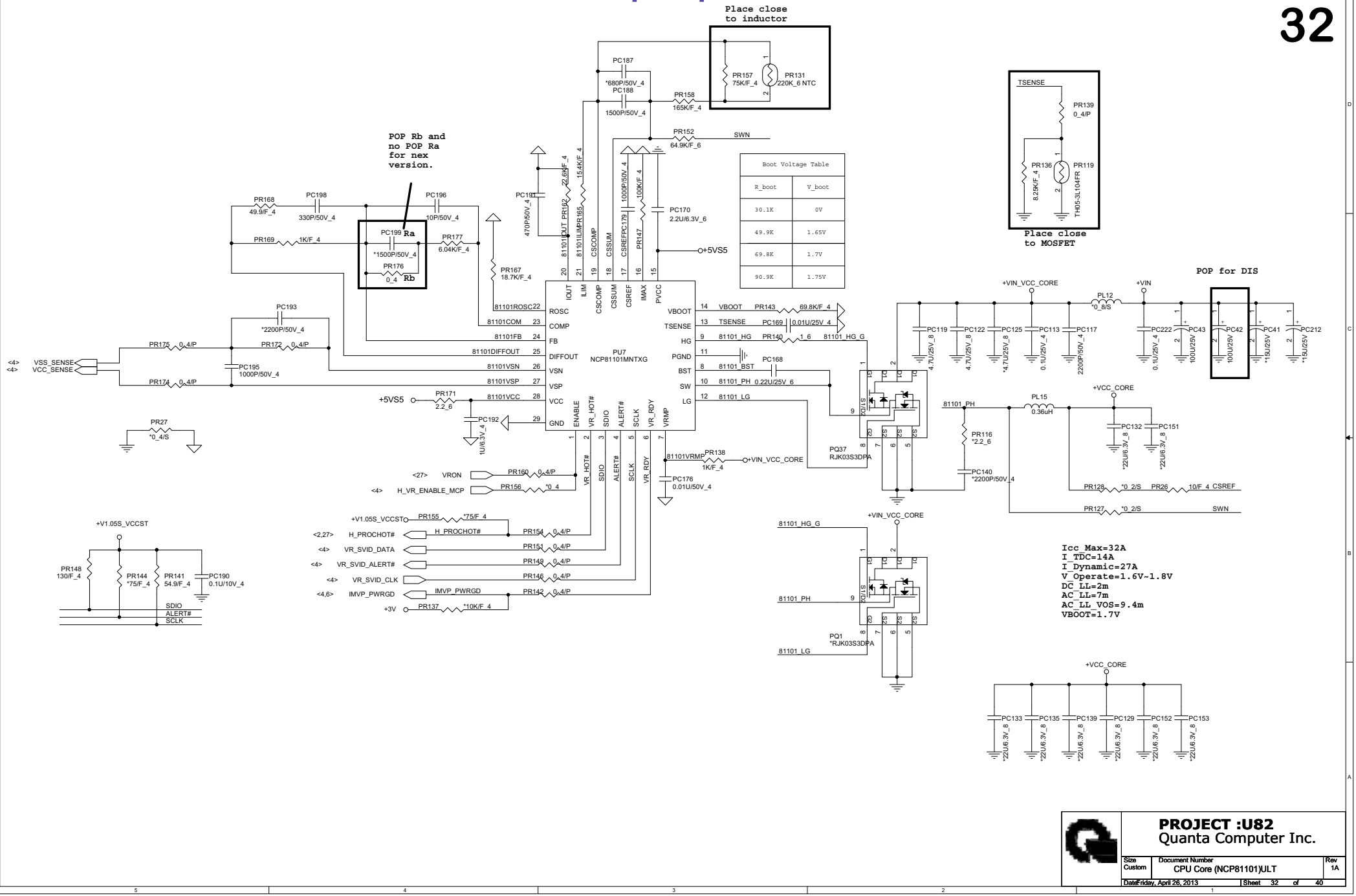

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Size	Document Number	Rev
Custom	CPU Core (NCP81101)ULT	1A
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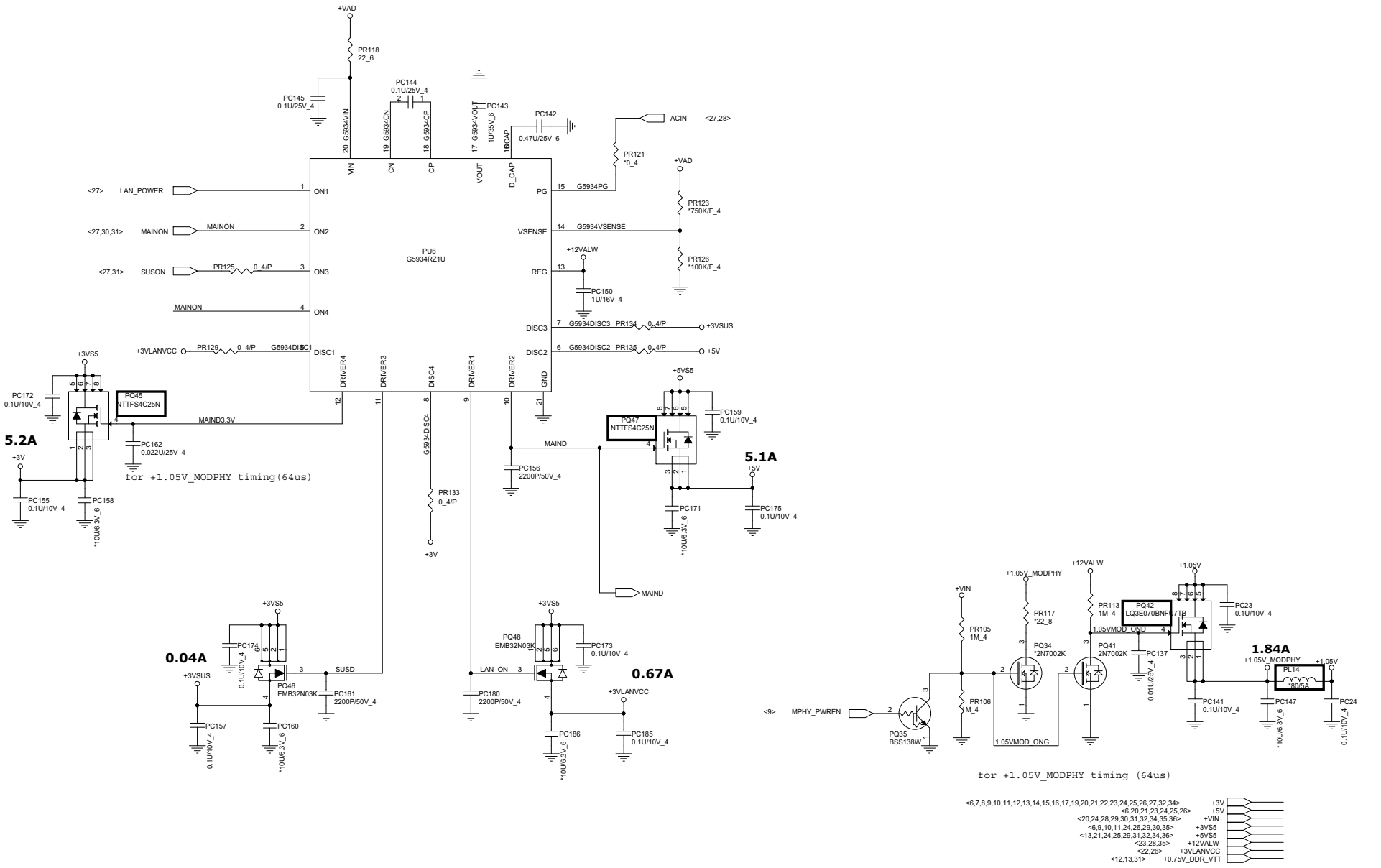

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Size	Document Number	Rev
Custom	Dis-charge IC (SLG55448)	1A
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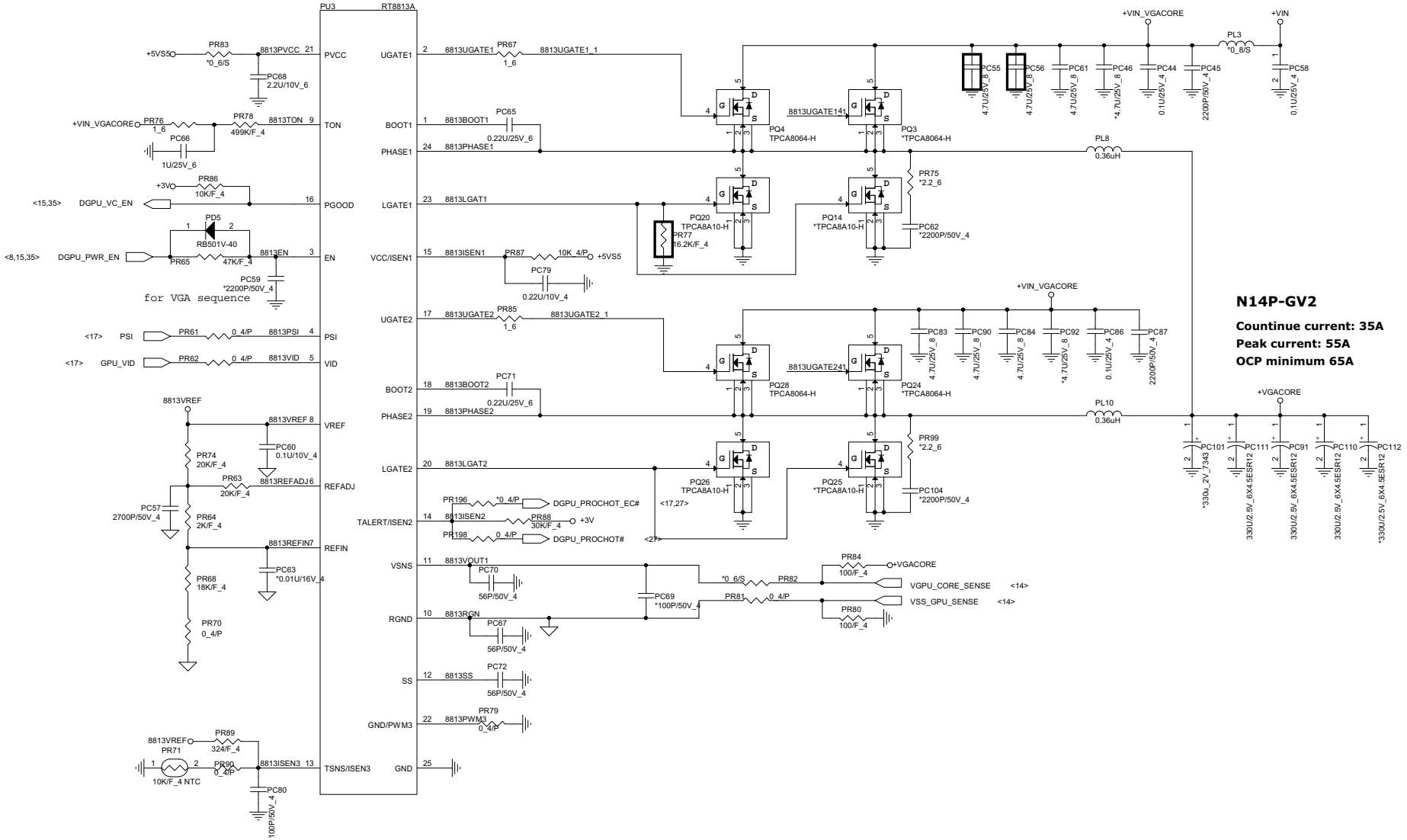
VGA Core



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Size: Custom	Document Number: +VGACORE (RT8813A)		Rev: 1A
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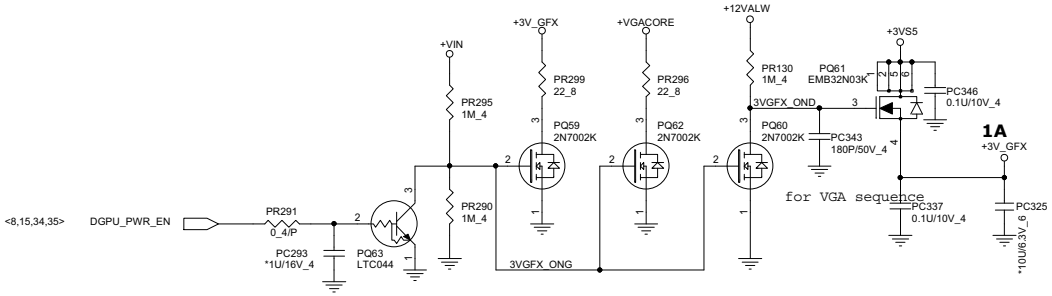

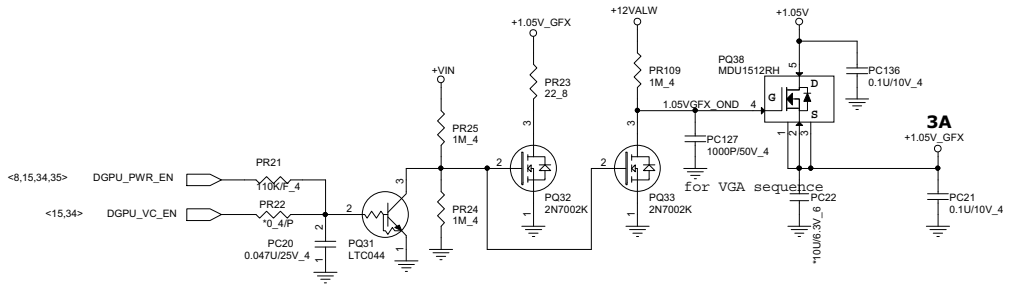

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Size	Document Number	Rev
Custom	1.05V_VGA/3V_VGA	1A
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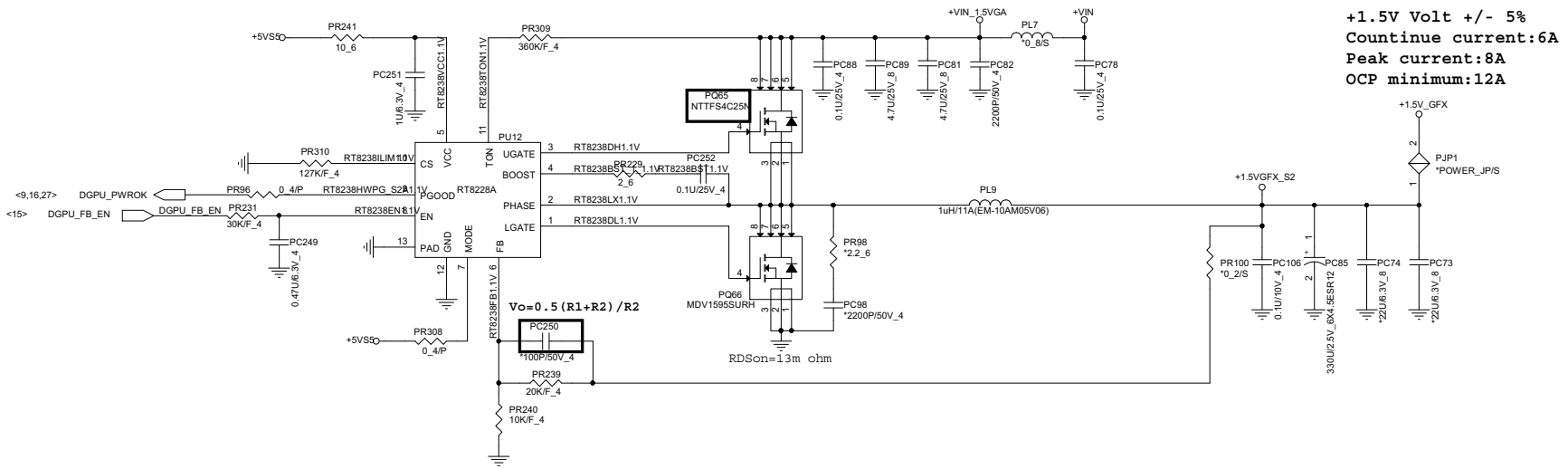

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Size	Document Number	Rev
Custom	+1.5V_VGA(RT8228)	1A

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USB3.0	Port Assignment	Power control pin
PORT1	USB2.0/USB3.0 COMBO 1st	USBPW_ON#(from EC)
PORT2	USB2.0/USB3.0 COMBO 2nd	USBPW_ON#(from EC)
PORT3	NC	N/A
PORT4	NC	N/A

USB2.0	Port Assignment	Power control pin
PORT0	USB2.0/USB3.0 COMBO 1st	USBPW_ON#(from EC)
PORT1	USB2.0/USB3.0 COMBO 2nd	USBPW_ON#(from EC)
PORT2	Camera	N/A
PORT3	NC	N/A
PORT4	NC	N/A
PORT5	Left side USB daughter B	USBPW_ON#(from EC)
PORT6	WLAN	N/A
PORT7	Touch Screen 15" used	TS_ON(from EC)

SATA Master	Port Assignment	Power control pin
SATA0	HDD	N/A
SATA1	mSATA	N/A
SATA2	NC	N/A
SATA3/PCIE	Card reader	N/A

PCIE	Port Assignment	Control pin
PCIE 5_L0	PEG0	
PCIE 5_L1	PEG1	
PCIE 5_L2	PEG2	
PCIE 5_L3	PEG3	
PCIE 1	NC	
PCIE 2	NC	
PCIE 3	WLAN	
PCIE 4	LAN	

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		1A

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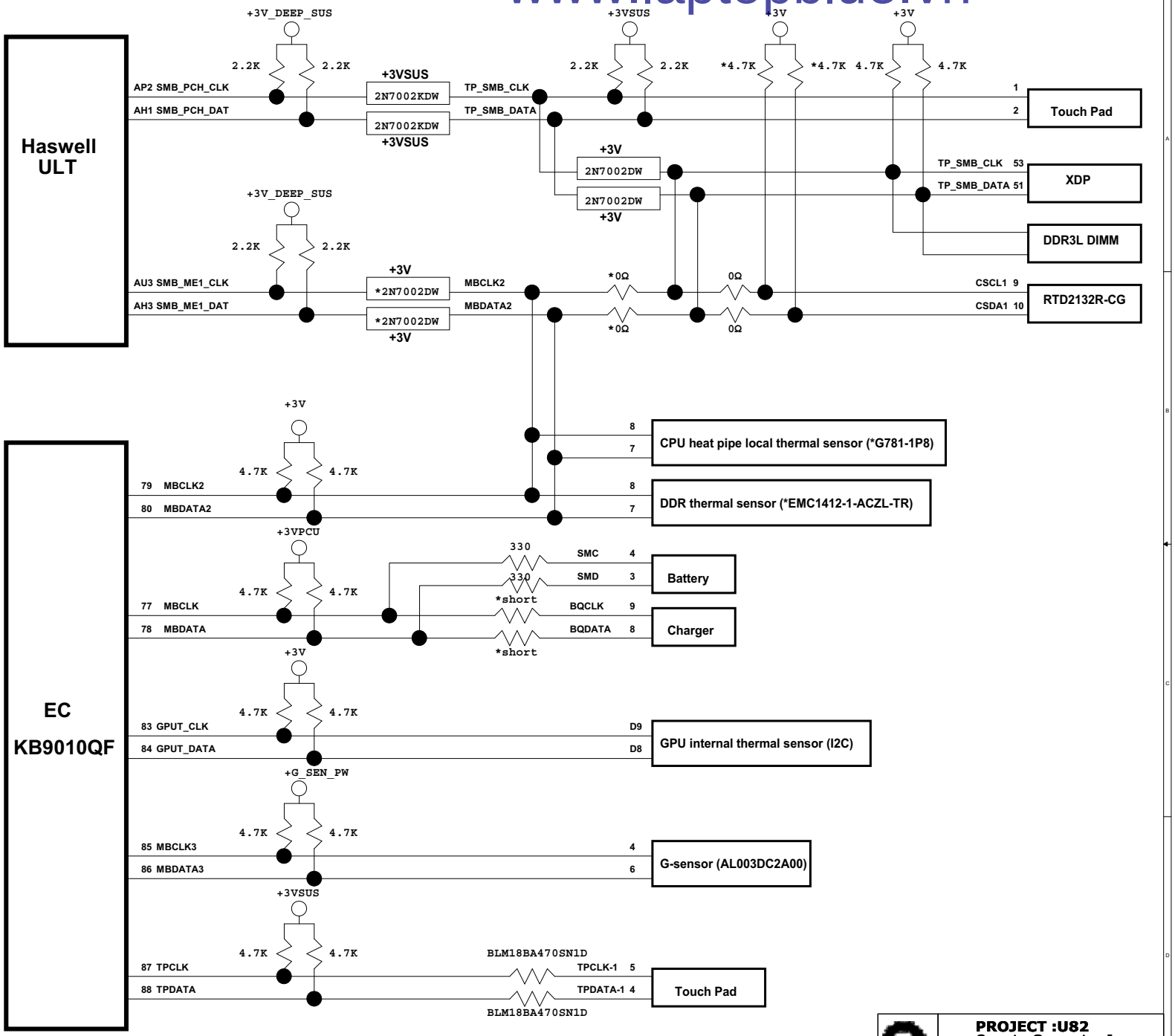

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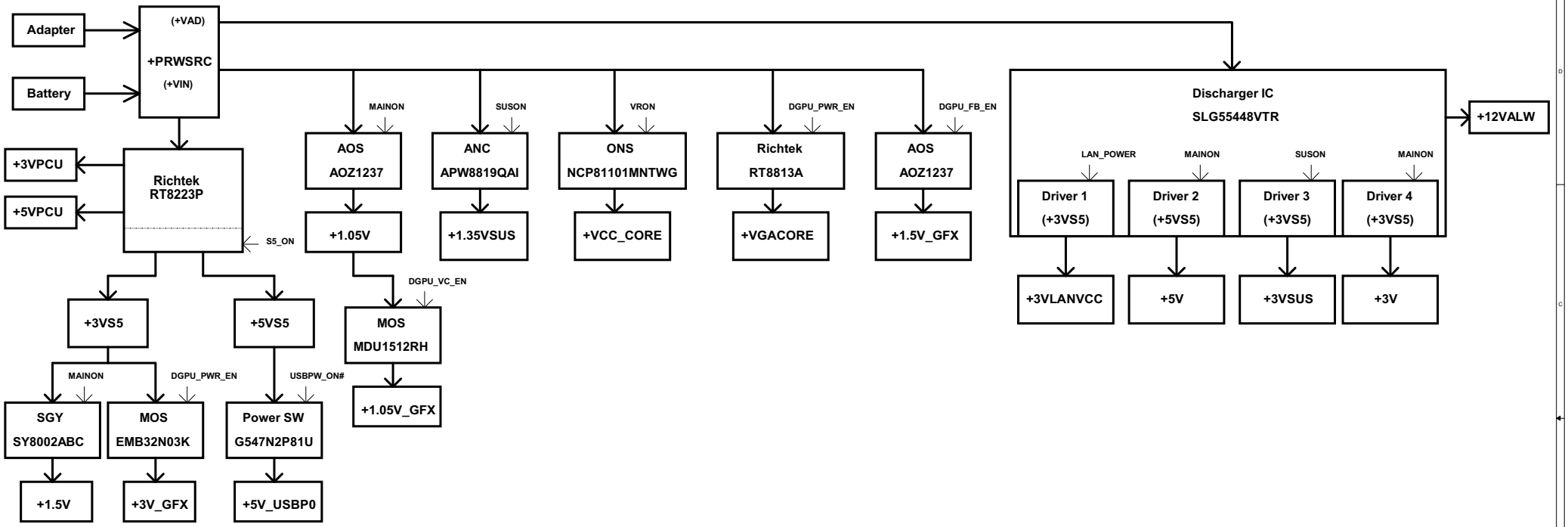

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Size	Document Number	Rev
	Power Block Diagram	1A

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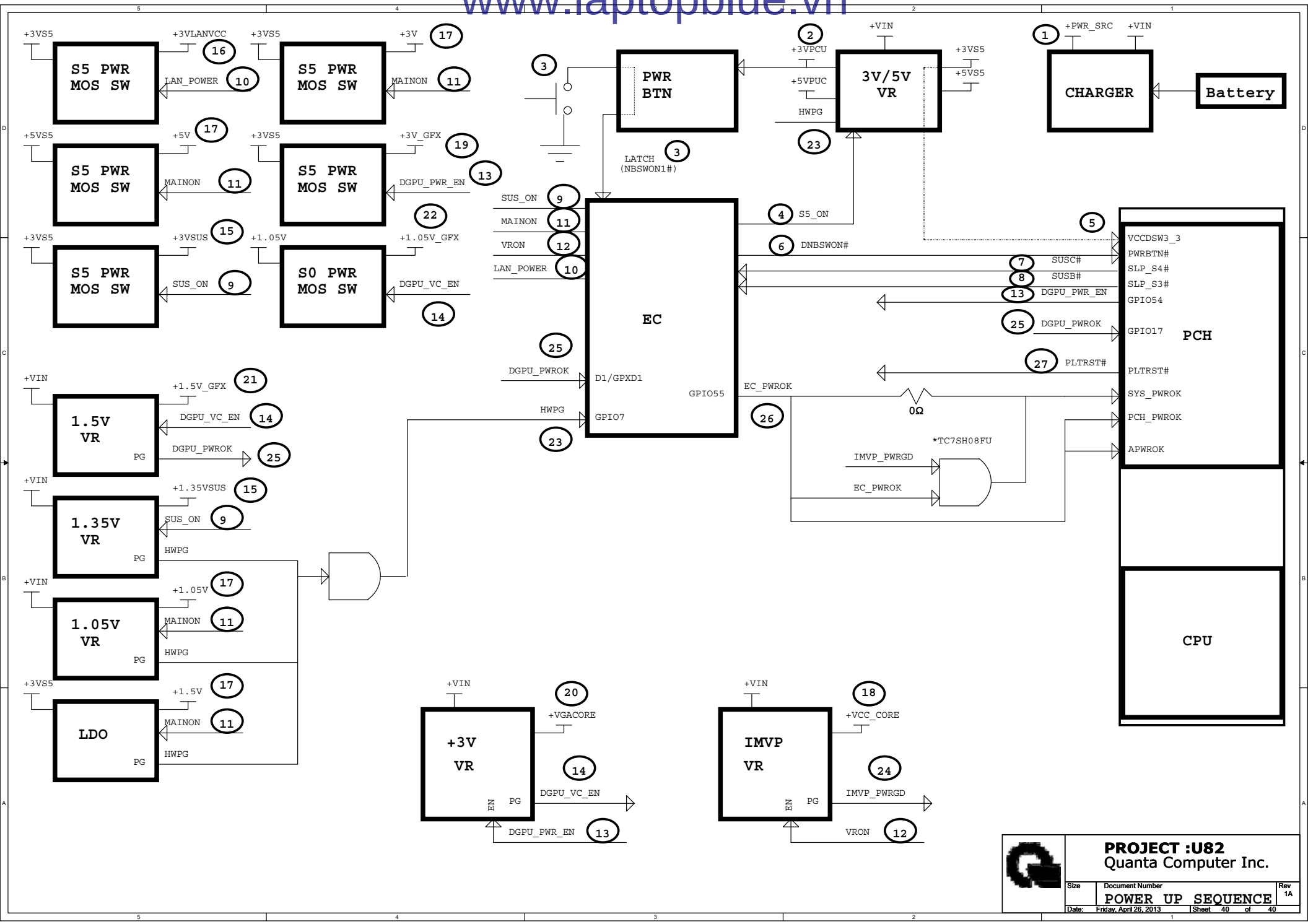

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	POWER UP SEQUENCE	1A
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