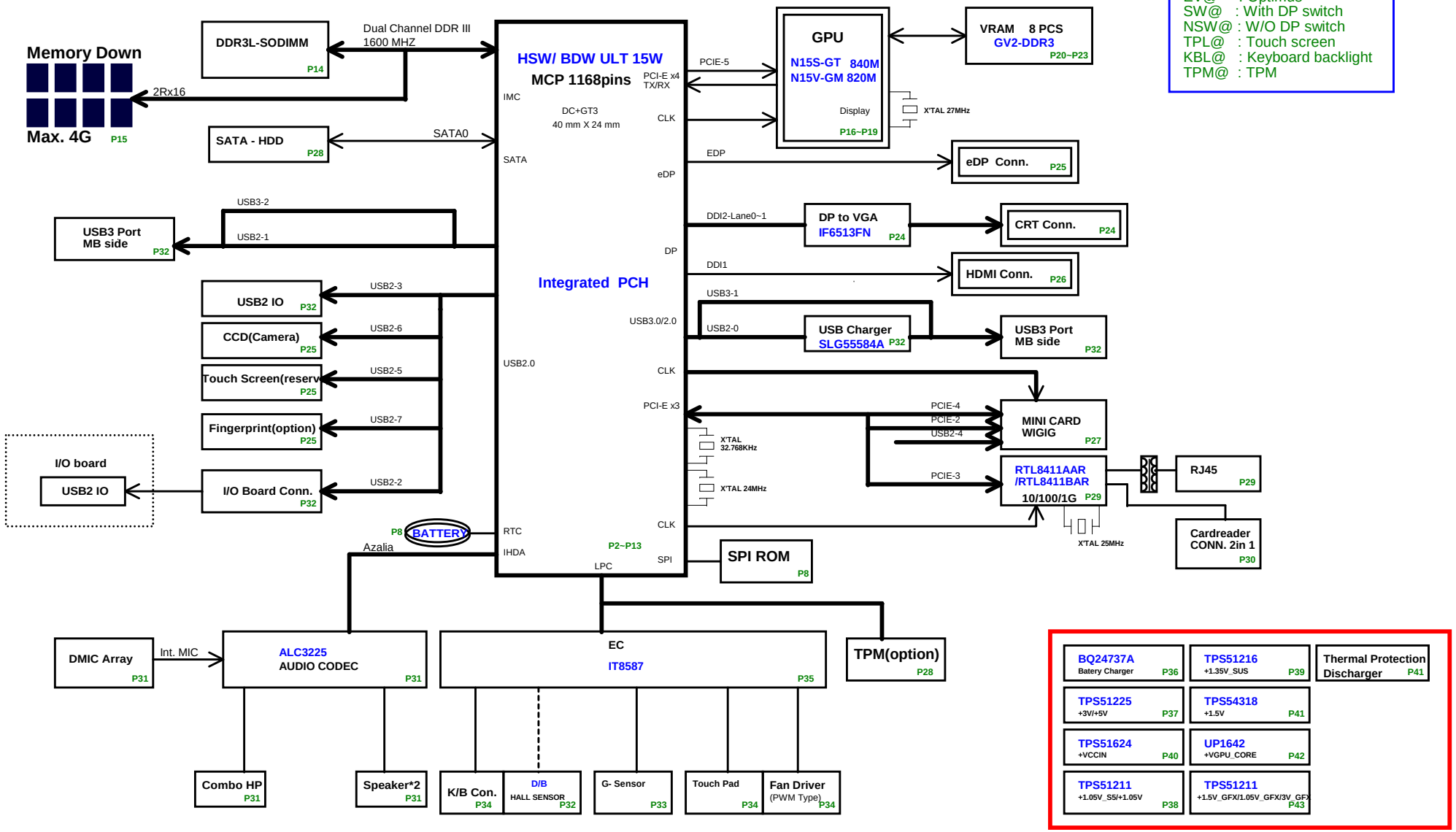
Z8C_GDDR3 SHB ULT SYSTEM BLOCK DIAGRAM

01

BOM

IV@ : iGPU
EV@ : Optimus
SW@ : With DP switch
NSW@ : W/O DP switch
TPL@ : Touch screen
KBL@ : Keyboard backlight
TPM@ : TPM



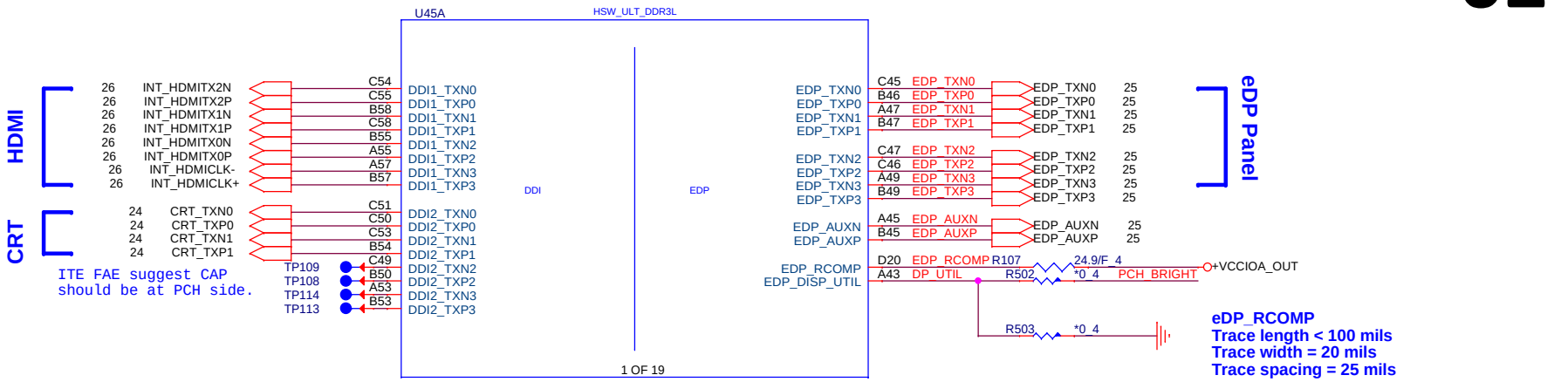
BQ24737A Batery Charger P36	TPS51216 +1.35V_SUS P39	Thermal Protection Discharger P41
TPS51225 +3V/+5V P37	TPS54318 +1.5V P41	
TPS51624 +VCCIN P40	UP1642 +VGPU_CORE P42	
TPS51211 +1.05V_S5/+1.05V P38	TPS51211 +1.5V_GFX/1.05V_GFX/3V_GFX P43	

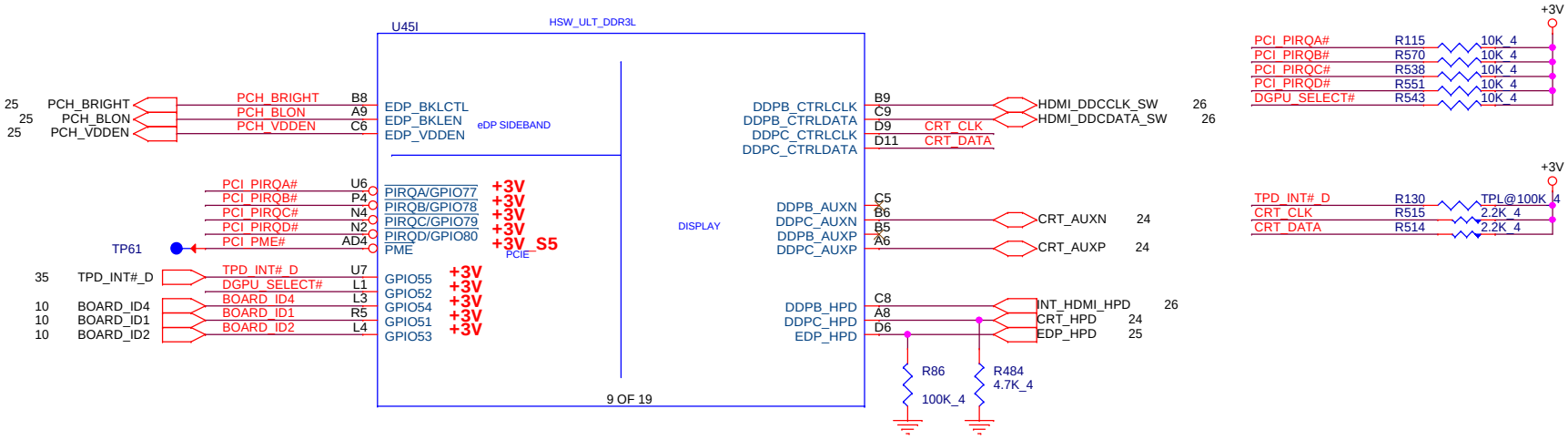
www.schematic-x.blogspot.com

Quanta Computer Inc.
PROJECT : Z8C
Block Diagram
Size | Document Number | Rev 3A
Date: Saturday, November 15, 2014 Sheet 1 of 48

Haswell ULT (DISPLAY,eDP)

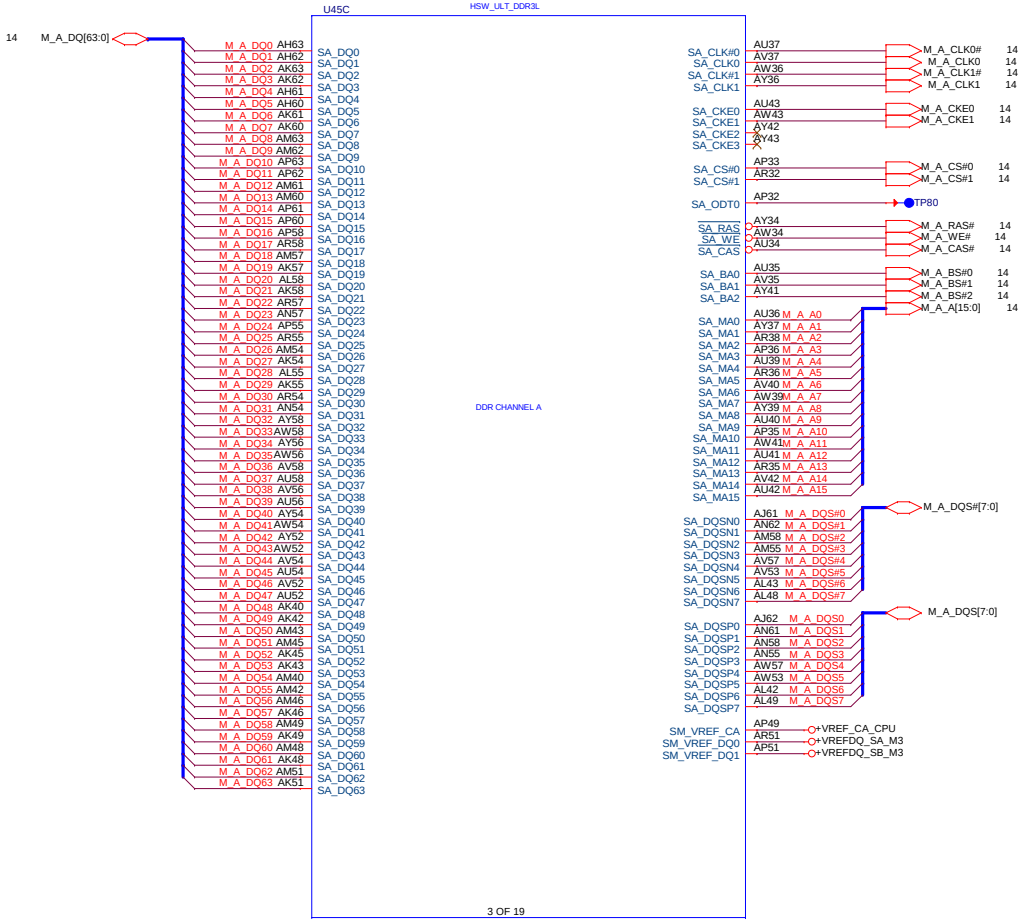
02



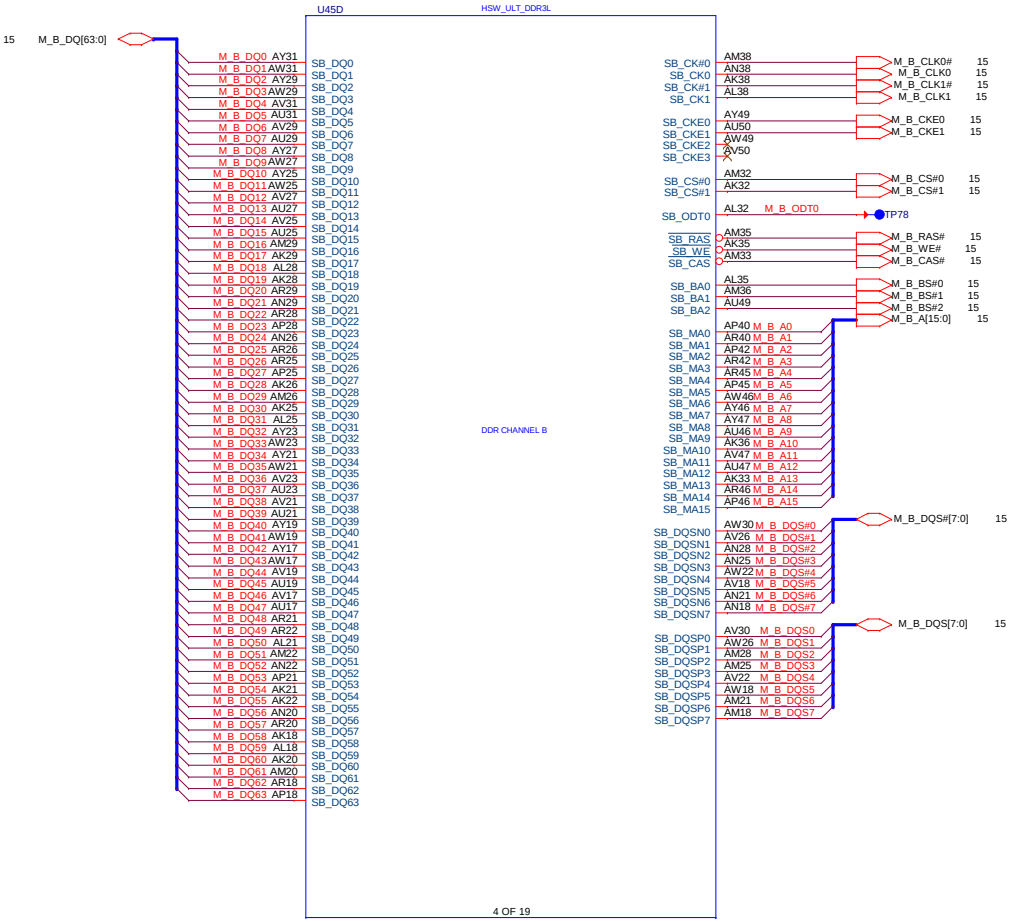


Quanta Computer Inc.			
PROJECT : Z8C			
Size	Document Number: Haswell 3/5 (DDI/eDP)		Rev 3A
Date: Saturday, November 15, 2014	Sheet 2 of 48		

Haswell ULT (DDR3L)



Haswell Processor (DDR3)



03

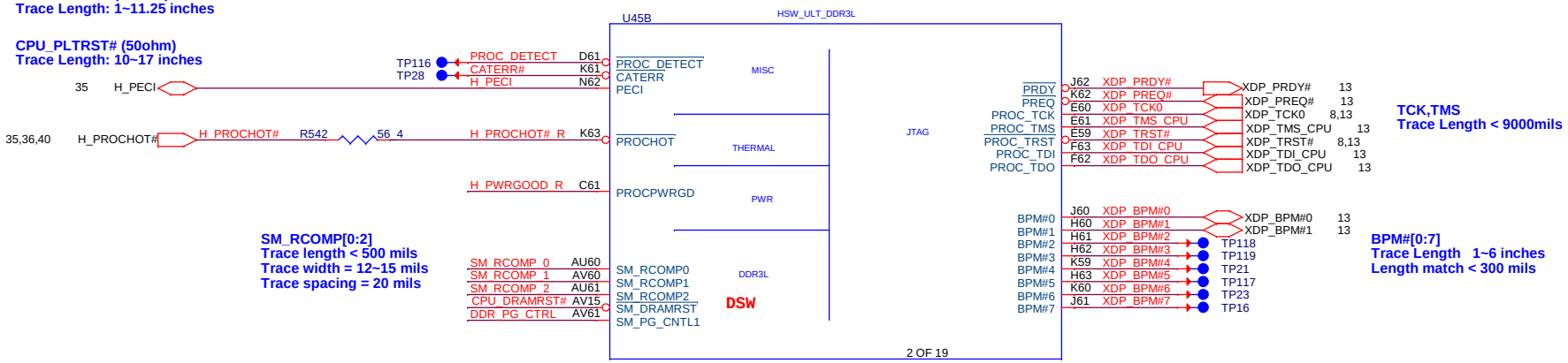
Quanta Computer Inc.			
PROJECT : Z8C			
Size	Document Number		Rev
	Haswell 2/5 (DDR3 I/F)		3A
Date: Saturday, November 15, 2014		Sheet 3 of 48	

Haswell ULT (SIDEBAND)

H_PECI (50ohm)
Route on microstrip only
Spacing >18 mils
Trace Length: 0.4~6.125 iches

H_PWRGOOD (50ohm)
Trace Length: 1~11.25 inches

CPU_PLTRST# (50ohm)
Trace Length: 10~17 inches

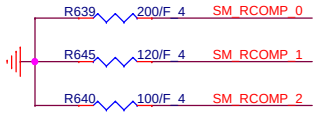


TCK,TMS
Trace Length < 9000mils

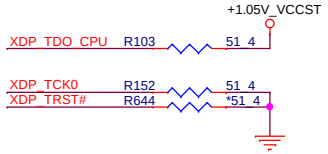
SM_RCOMP[0:2]
Trace length < 500 mils
Trace width = 12~15 mils
Trace spacing = 20 mils

BPM#[0:7]
Trace Length 1~6 inches
Length match < 300 mils

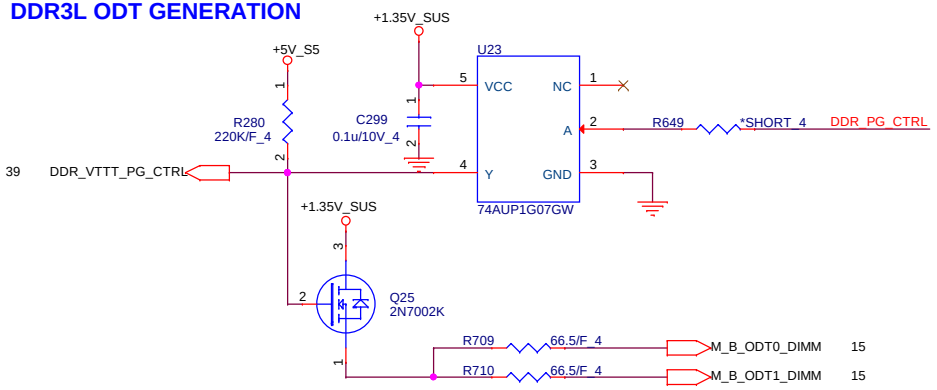
DRAM COMP



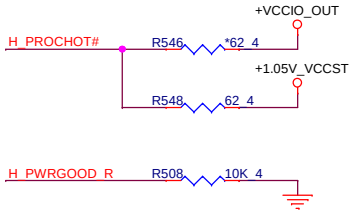
XDP PU/PD



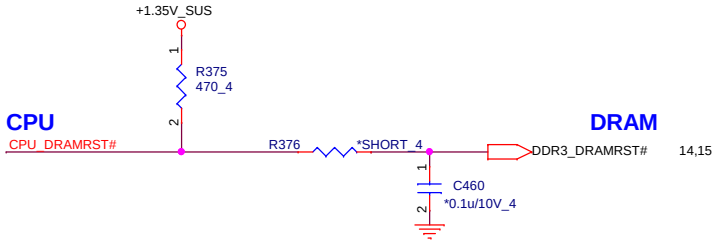
DDR3L ODT GENERATION



PU/PD of CPU



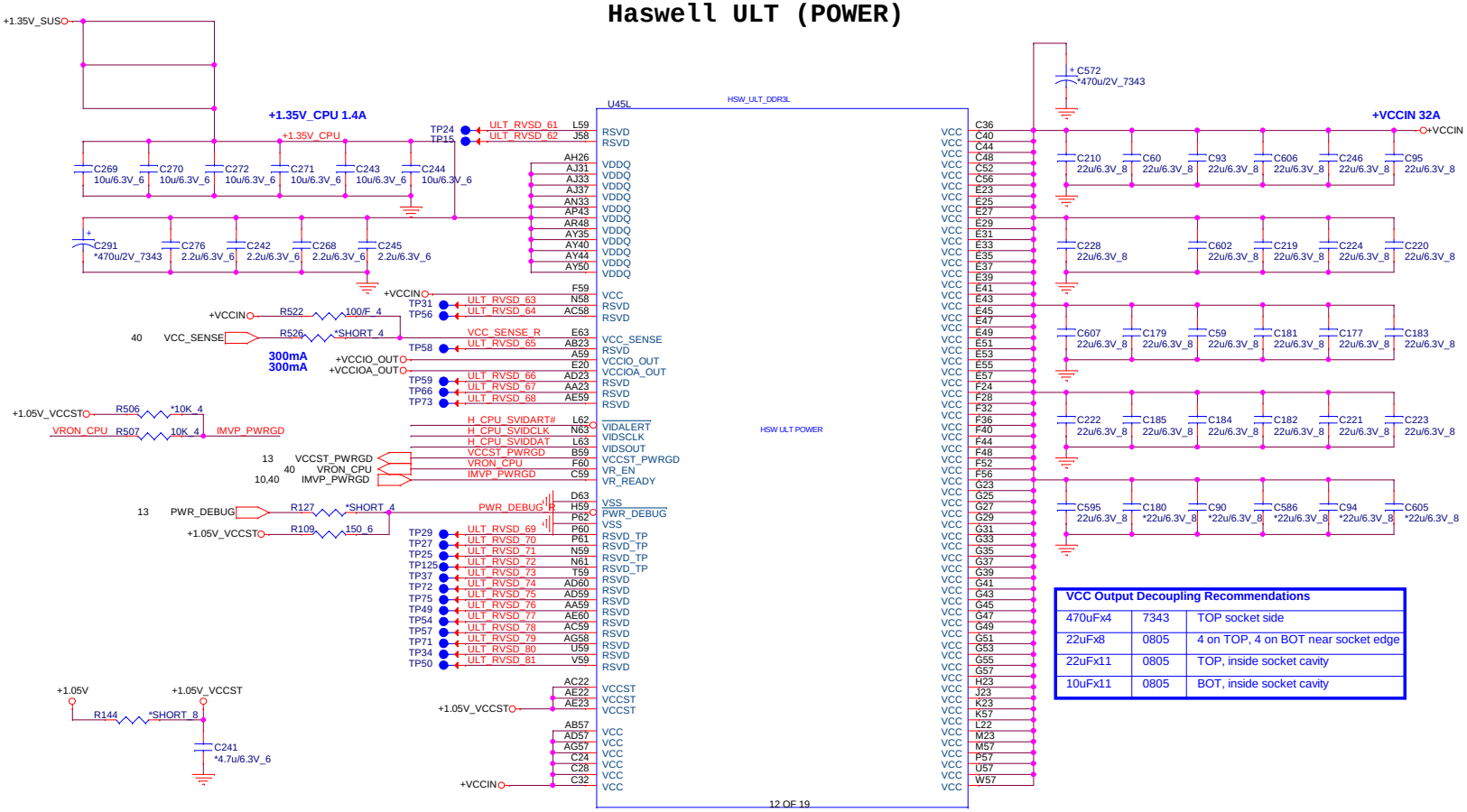
DRAMRST



Quanta Computer Inc.		
PROJECT : Z8C		
Size	Document Number: Haswell 1/5 (PEG/DMI/FDI)	Rev: 3A
Date: Saturday, November 15, 2014	Sheet 4 of 48	

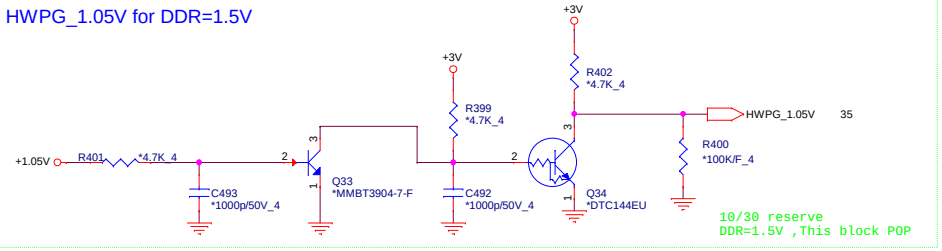
Haswell ULT (POWER)

VDDQ Output Decoupling Recommendations		
330uFx2	7343	BOT socket side
22uFx11	0805	5 onTOP, 6 on BOT inside socket cavity
10uFx10	0805	5 onTOP, 5 on BOT inside socket cavity



VCC Output Decoupling Recommendations		
470uFx4	7343	TOP socket side
22uFx8	0805	4 on TOP, 4 on BOT near socket edge
22uFx11	0805	TOP, inside socket cavity
10uFx11	0805	BOT, inside socket cavity

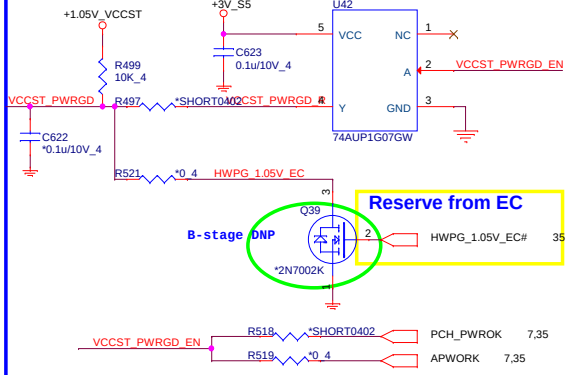
HWPG_1.05V for DDR=1.5V

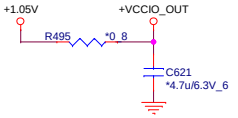


VCCST PWRGD

CRB is via +1.05V PG

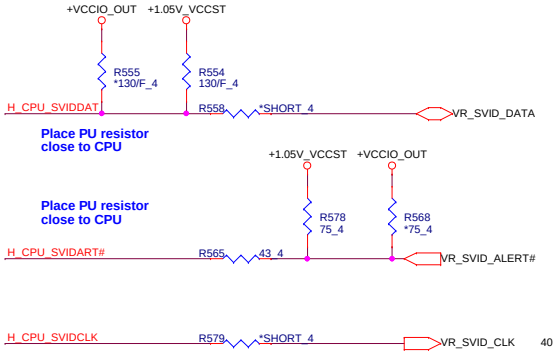
05





SVID

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



Quanta Computer Inc.

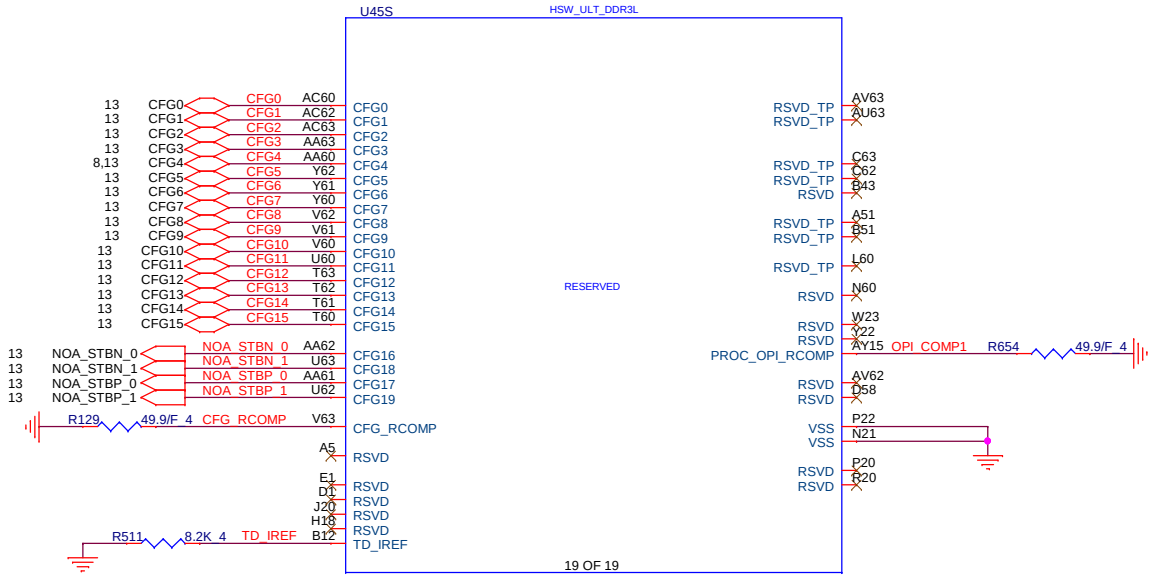
PROJECT : Z8C

Size	Document Number	Rev
	Haswell 4/5 (POWER)	3A

Date: Saturday, November 15, 2014 Sheet 5 of 48

Haswell ULT (CFG,RSVD)

06



Processor Strapping

	1	0	
CFG0 EAR-STALL/NOT STALL RESET SEQUENCE AFTER PCU PLL IS LOCKED	**(DEFAULT) NORMAL OPERATION; NO STALL**	STALL	CFG0 R153 *1K_4
CFG1 PCH/ PCH LESS MODE SELECTION	**(DEFAULT) NORMAL OPERATION**	PCH-LESS MODE	CFG1 R136 *1K_4
CFG3 PHYSICAL_DEBUG_ENABLED (DFX PRIVACY)	**DISABLED NO PHYSICAL DISPLAY PORT ATTACHED TO EMBEDDED DISPLAY PORT**	ENABLED AN EXTERNAL DISPLAY PORT DEVICE IS CONNECTED TO THE EMBEDDED DISPLAY PORT	CFG3 R142 *1K_4
CFG 8 ALLOW THE USE OF NOA ON LOCKED UNITS	**DISABLED(DEFAULT); IN THIS CASE, NOA WILL BE DISABLED IN LOCKED UNITS AND ENABLED IN UN-LOCKED UNITS**	ENABLED; NOA WILL BE AVAILABLE REGARDLESS OF THE LOCKING OF THE UNIT	CFG8 R125 *1K_4
CFG9 NO SVID PROTOCOL CAPABLE VR CONNECTED	**VRS SUPPORTING SVID PROTOCOL ARE PRESENT**	NO VR SUPPORTING SVID IS PRESENT. THE CHIP WILL NOT GENERATE (OR RESPOND TO) SVID ACTIVITY	CFG9 R126 *1K_4
CFG10 SAFE MODE BOOT	**POWER FEATURES ACTIVATED DURING RESET**	POWER FEATURES (ESPECIALLY CLOCK GATINE ARE NOT ACTIVATED	CFG10 R135 *1K_4

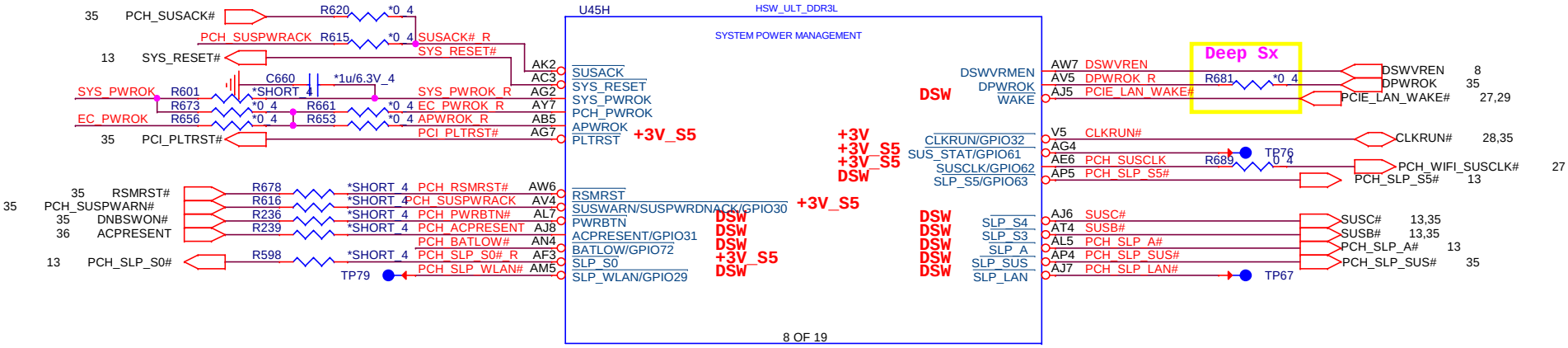
Quanta Computer Inc.
PROJECT : Z8C

Size	Document Number	Rev
	Haswell 5/5 (CFG/GND)	3A

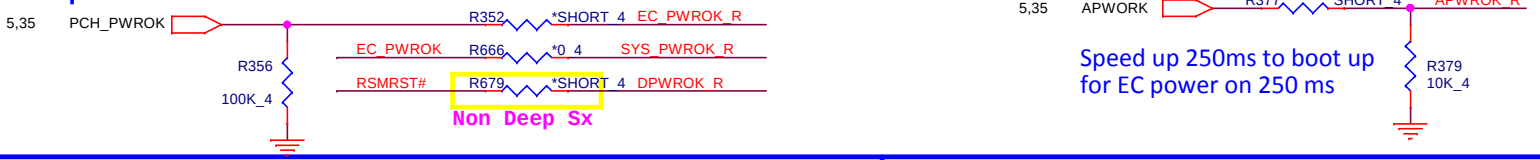
Date: Saturday, November 15, 2014 Sheet 6 of 48

Haswell ULT PCH (PM)

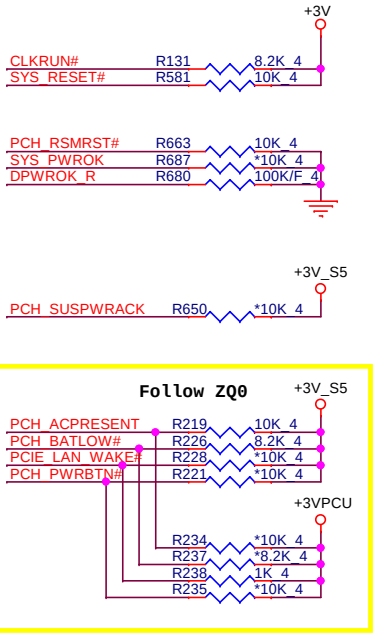
07



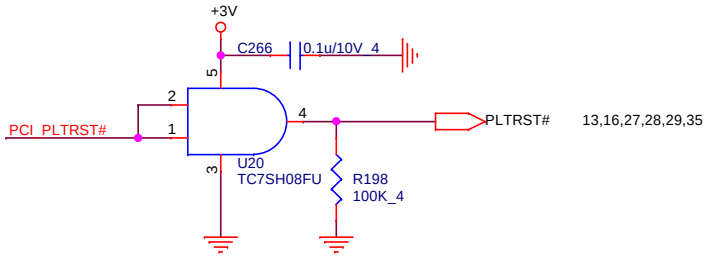
Power Sequence



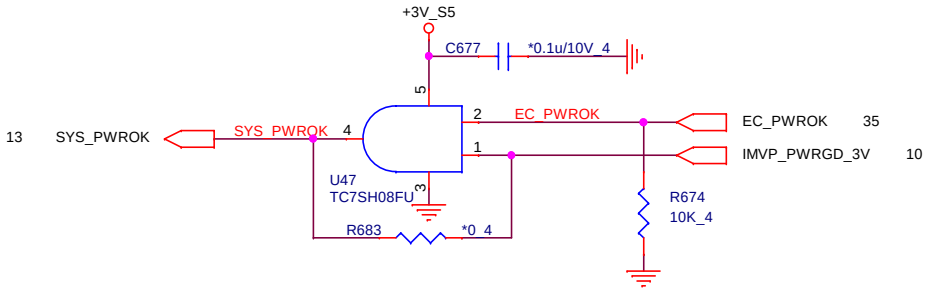
PCH PM PU/PD



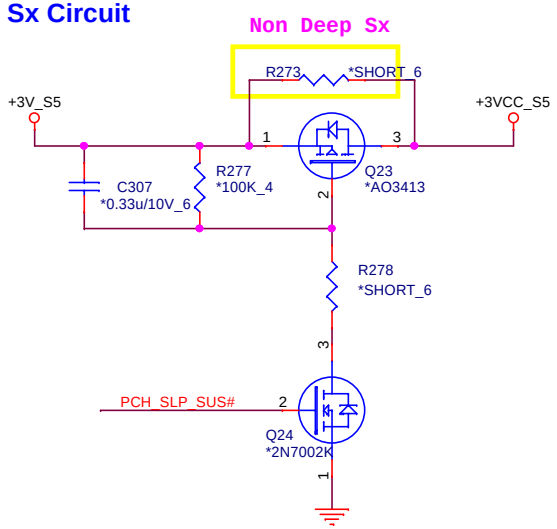
PLTRST# Buffer



SYSPWOK



Deep Sx Circuit



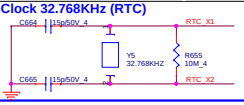
Quanta Computer Inc.		
PROJECT : Z8C		
Size	Document Number: LPT 1/6 (DMI/FDI/VGA)	Rev: 3A
Date: Saturday, November 15, 2014	Sheet 7 of 48	

Haswell ULT PCH (RTC/HDA/SATA/SPI)

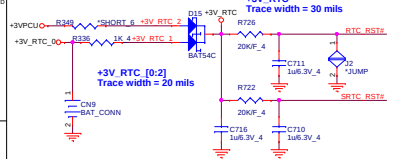
Haswell ULT PCH(LPC,SPI,SMBUS,C-LINK,THERMAL)

08

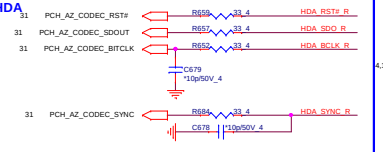
RTC Clock 32.768KHz (RTC)



RTC Circuitry (RTC)



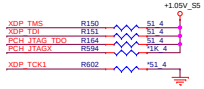
HDA

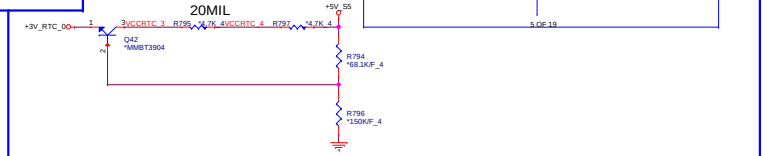


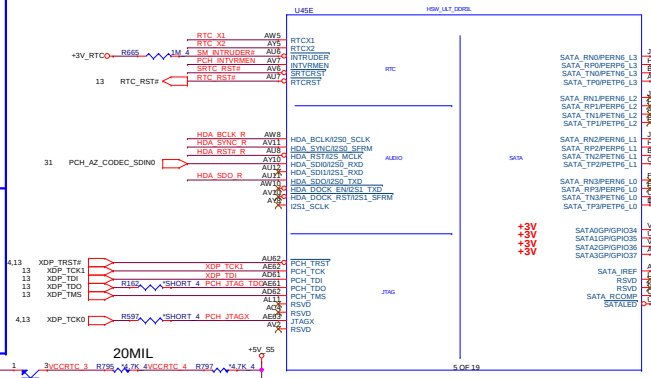
PCH JTAG

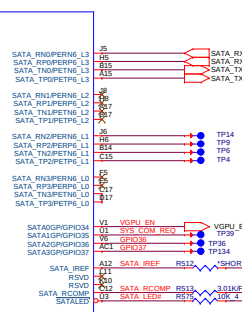
JTAG_TCK,JTAG_TMS
Trace Length < 9000mils

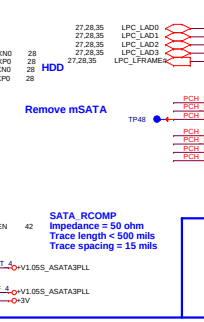
MP remove(Intel)





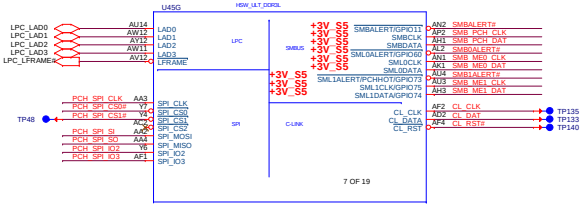


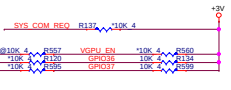




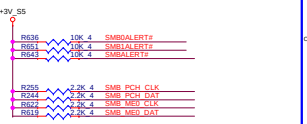
SATA_RCOMP
Impedance = 50 ohm
Trace length < 500 mils
Trace spacing = 15 mils

Remove mSATA

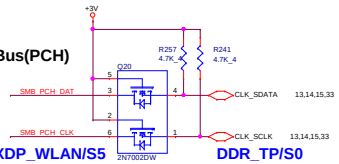




SMBus



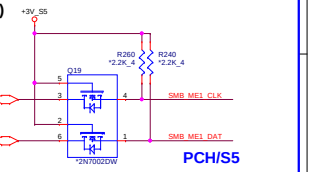
SMBus(PCH)



PCH_XDP_WLAN/S5

DDR_TP/S0

SMBus(EC)

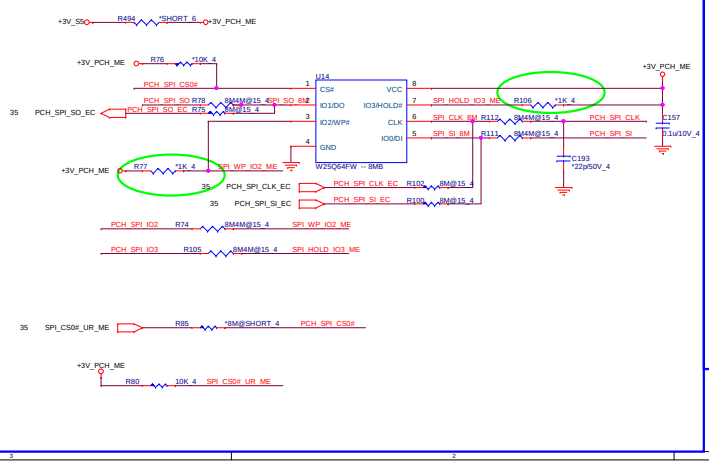


EC/S5

PCH/S5

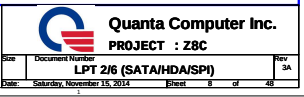
PCH Quad SPI ROM

(Default for WIN8)

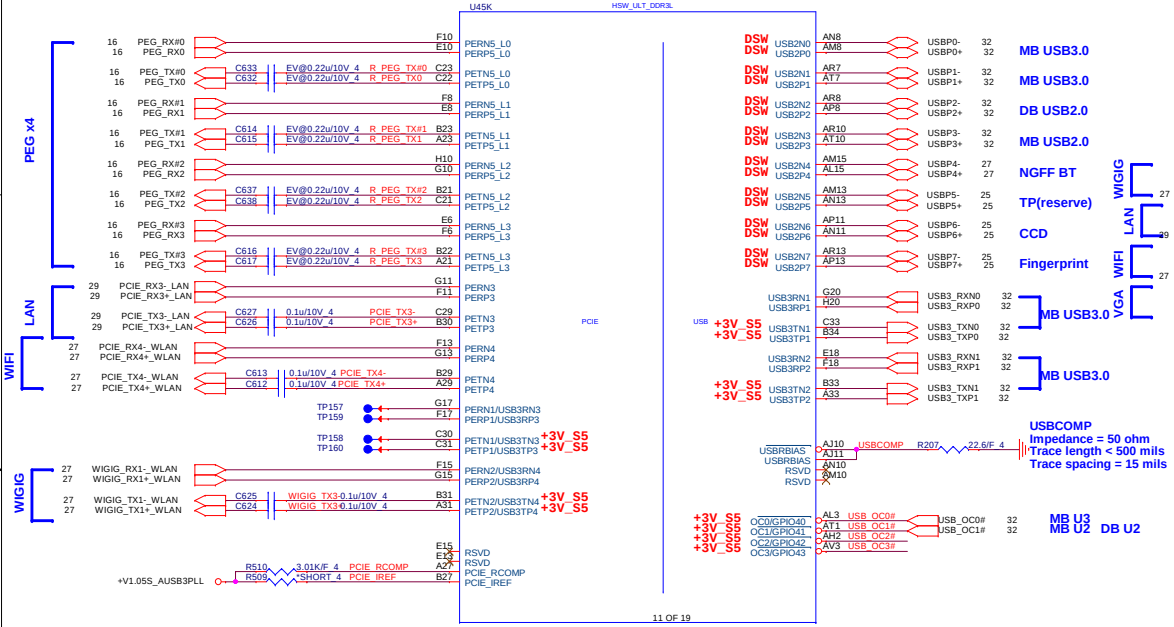


ULT Strapping Table

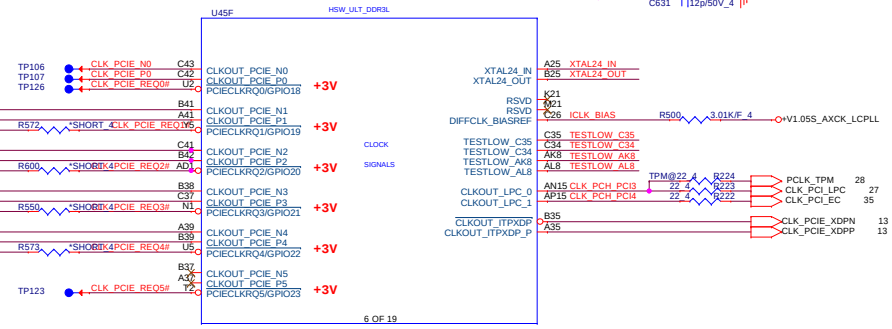
Pin Name	Strap description	Sampled	Configuration	note
GPIO81(SPKR)	No reboot on TCO Timer expiration	PWROK	**0 = Default enable (iPD 20K)** 1 =Disable No-Reboot mode	+3V R589 *1K_4 SPKR — SPKR 10,31
HDA_SDO	Flash Descriptor Security Override / Intel ME Debug Mode	PWROK	**0 = Default can program ME (iPD 20K)** 1 =can't program ME	HDA_SDO_R R658 *SHORT_4 ME_WR# 35
INTVRMEN	Integrated 1.05V VRM enable	ALWAYS	**1=Should be always pull-up**	+3V_RTC R675 330K_4 PCH_INTVRMEN R660 *330K_4
GPIO66	Top-Block Swap override		**0 = Default disable (iPD 20K)** 1 = Enable TBS function	10 GPIO66 +3V R517 *1K_4 GPIO66 R516 *1K_4
GPIO86	Boot BIOS Strap Bit		**0 = Default SPI (iPD 20K)** 1 =LPC	10 GPIO86 +3V R99 *1K_4 GPIO86 R93 *1K_4
GPIO15	TLS(Transport layer security)		**0 = Default enable w/o confidentiality(iPD 20K)** 1 =Default enable with confidentiality	10 GPIO15 +3V_S5 R146 8.2K_4 GPIO15 R140 *1K_4
CFG4	DP presence strap		**0 = Enable an external display port is connected to the eDP** 1 =disable	6,13 CFG4 CFG4 R143 1K_4
DSWVREN	Deep Sx well on die VR enable		**1=Should be always pull-up**	7 DSWVREN +3V_RTC R677 330K_4 DSWVREN R662 *330K_4



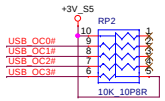
Haswell ULT PCH (PCIE,USB3.0,USB2.0)

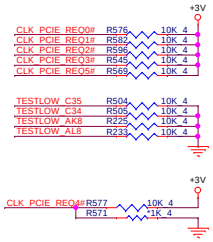


Haswell ULT PCH (CLOCK)



USB Overcurrent



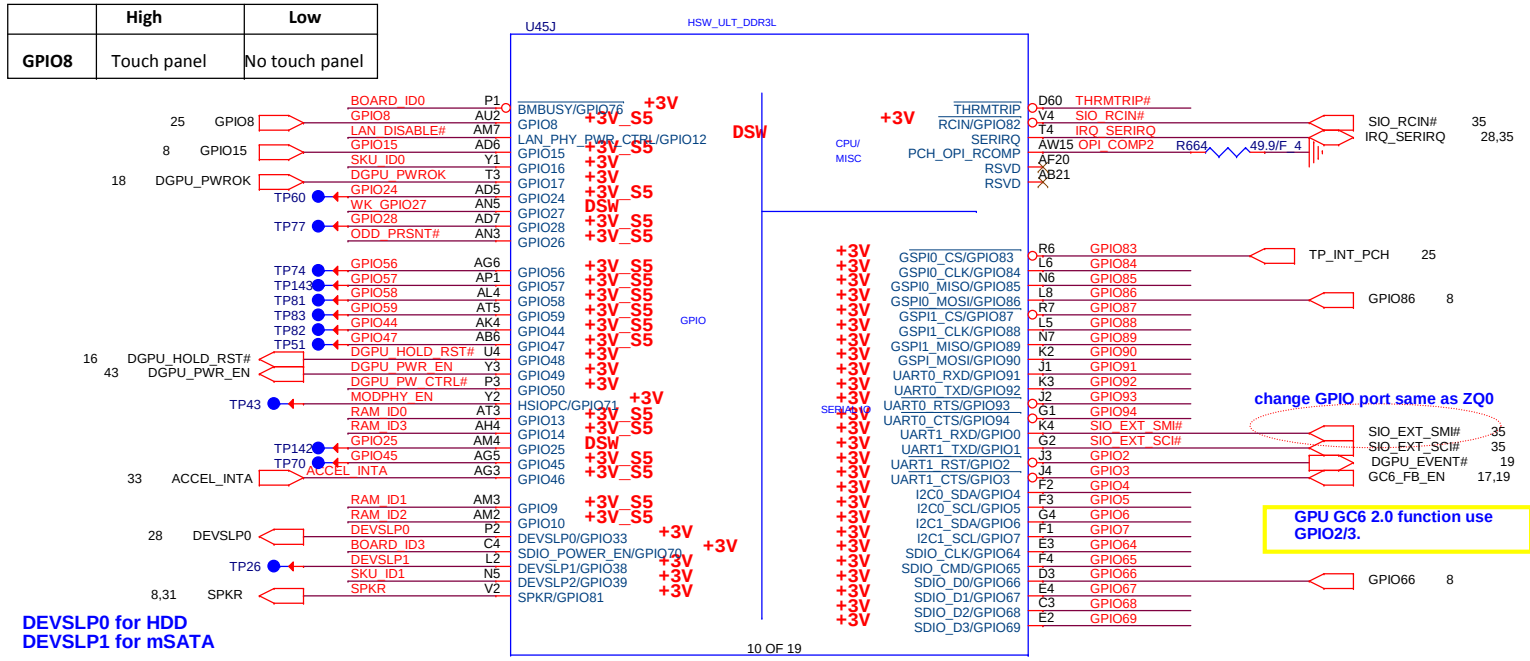


09

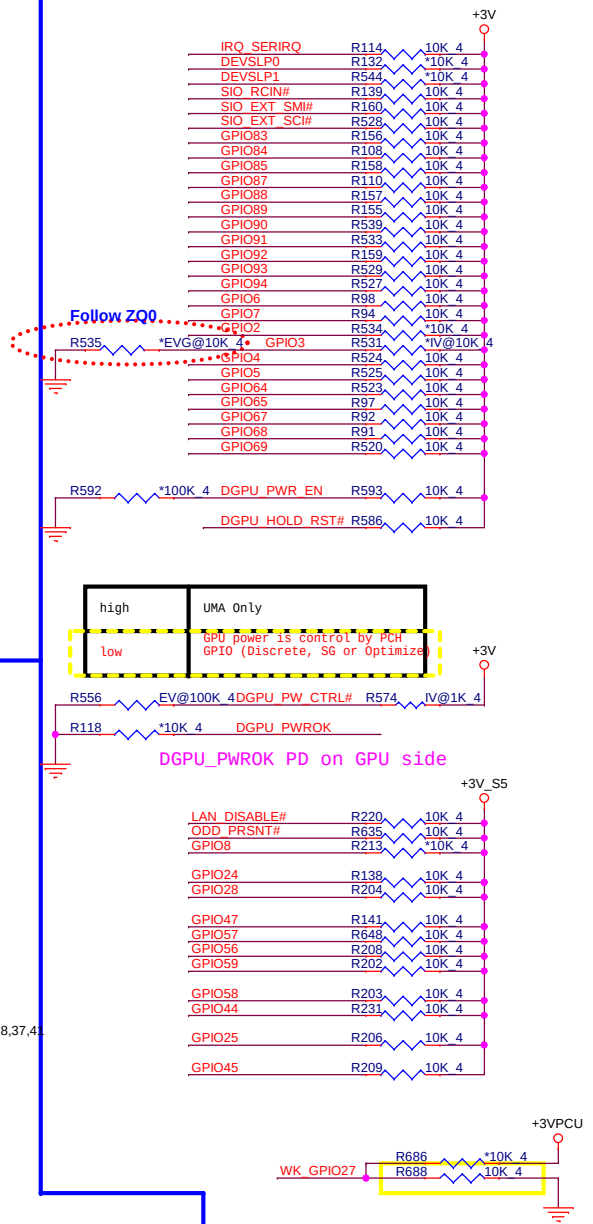
Quanta Computer Inc.		
PROJECT : Z8C		
Size	Document Number	Rev
	LPT 3/6 (PCIE/USB/CLK)	3A
Date: Saturday, November 15, 2014	Sheet 9 of 48	

Haswell ULT PCH (GPIO,CPU/MISC,NCTF)

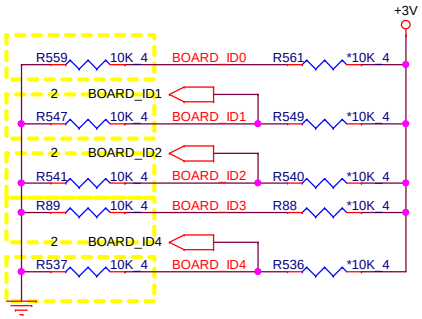
	High	Low
GPIO8	Touch panel	No touch panel



PCH GPIO PU/PD

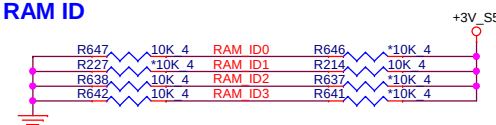


Board ID



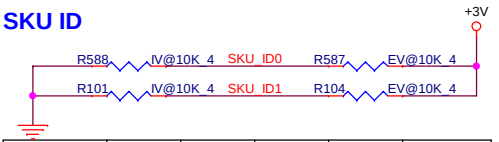
	Low	High
BOARD_ID0	N15S-GT Dual Rank	N15S_GT Single Rank
BOARD_ID1	Enable on board memory	Disable on board memory
BOARD_ID2	Pin8 of SYNAPTICS and ELAN are NC pin. BIOS maybe will use EEPROM detection. Default is pull high.	
BOARD_ID3	Reserved (Default)	Reserved
BOARD_ID4	Reserved (Default)	Reserved

RAM ID



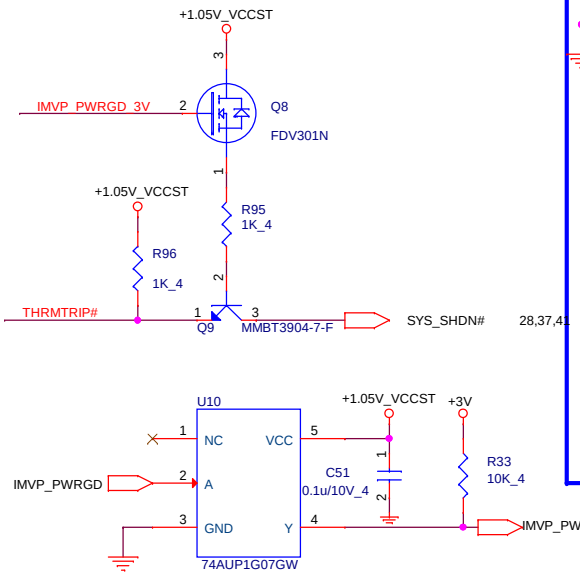
Vender	RAM_ID	Q PN	Mfr. PN	Freq.	
Hynix	0000	AKD5JGETW04	H5TC4G63AFR-PRBA	1600MHz	
Hynix	0001	AKD5JGETW04	H5TC4G63AFR-PBA	1600MHz	2G
Kingston	0010	AKD5PZSTP02	D2516EC4BXGGB	1600MHz	4G
Hynix	0011	AKD5JGETW04	H5TC4G63AFR-PBA	1600MHz	4G
MICRON	0100	AKD5JGSTL08	MT41K256M16HA-125	1600MHz	

SKU ID



	SKU_ID1	SKU_ID0	VGA H/W Signal	Setup Menu	
UMA Only	0	0	UMA	Hidden	UMA boot
dGPU Only	0	1	GPU	Hidden	GPU boot
Switchable (Mux)	1	0	UMA+GPU	dGPU/SG	UMA boot
Optimize (Muxless)	1	1	UMA	UMA/SG	UMA boot

CPU thermal trip



GPIO27 : If not used then use 8.2-kΩ to 10-kΩ pull-down to GND.

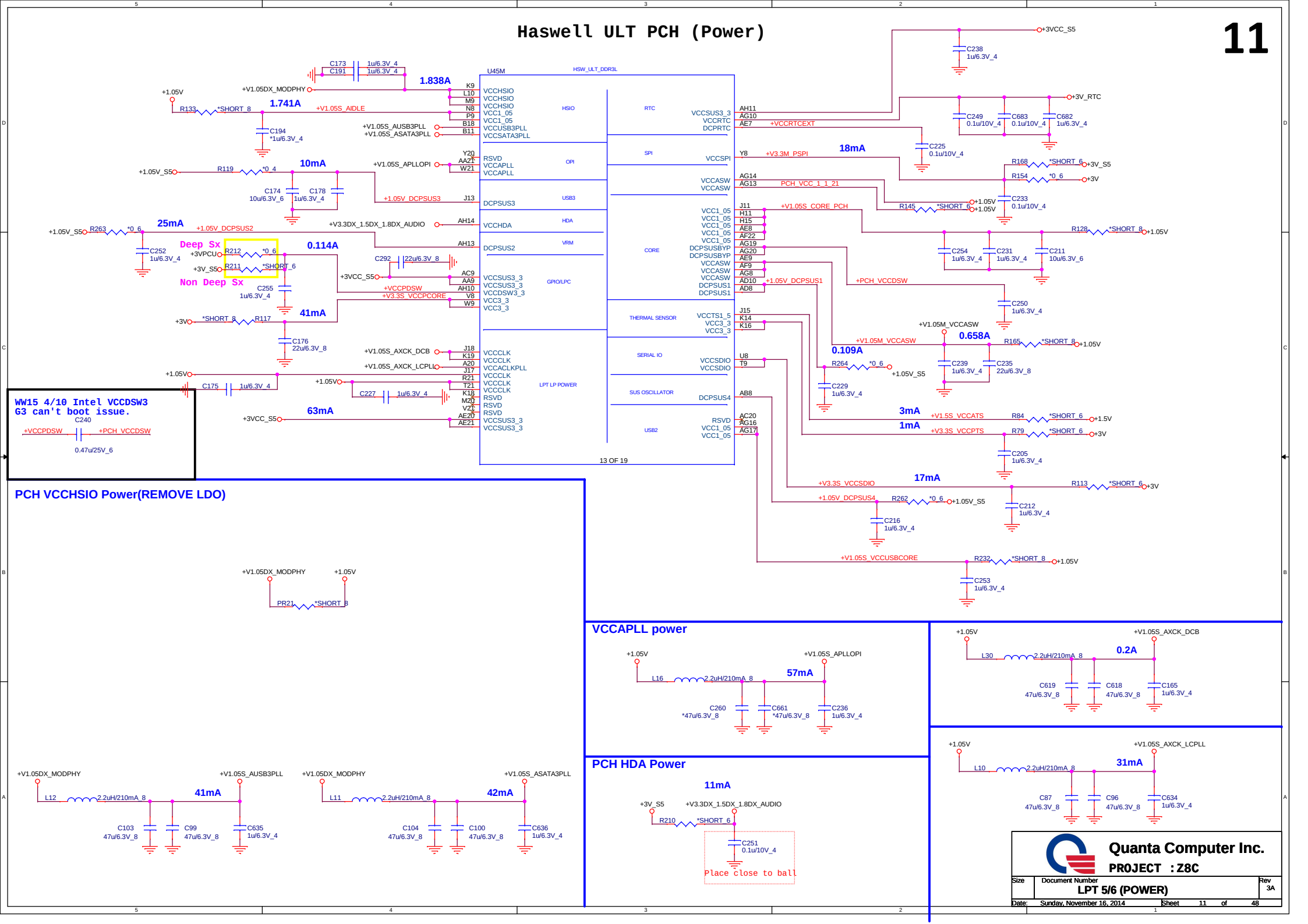
Quanta Computer Inc.

PROJECT : Z8C

Size	Document Number	Rev
	LPT 4/6 (GPIO/MISC)	3A

Date: Saturday, November 15, 2014 Sheet 10 of 48

Haswell ULT PCH (Power)



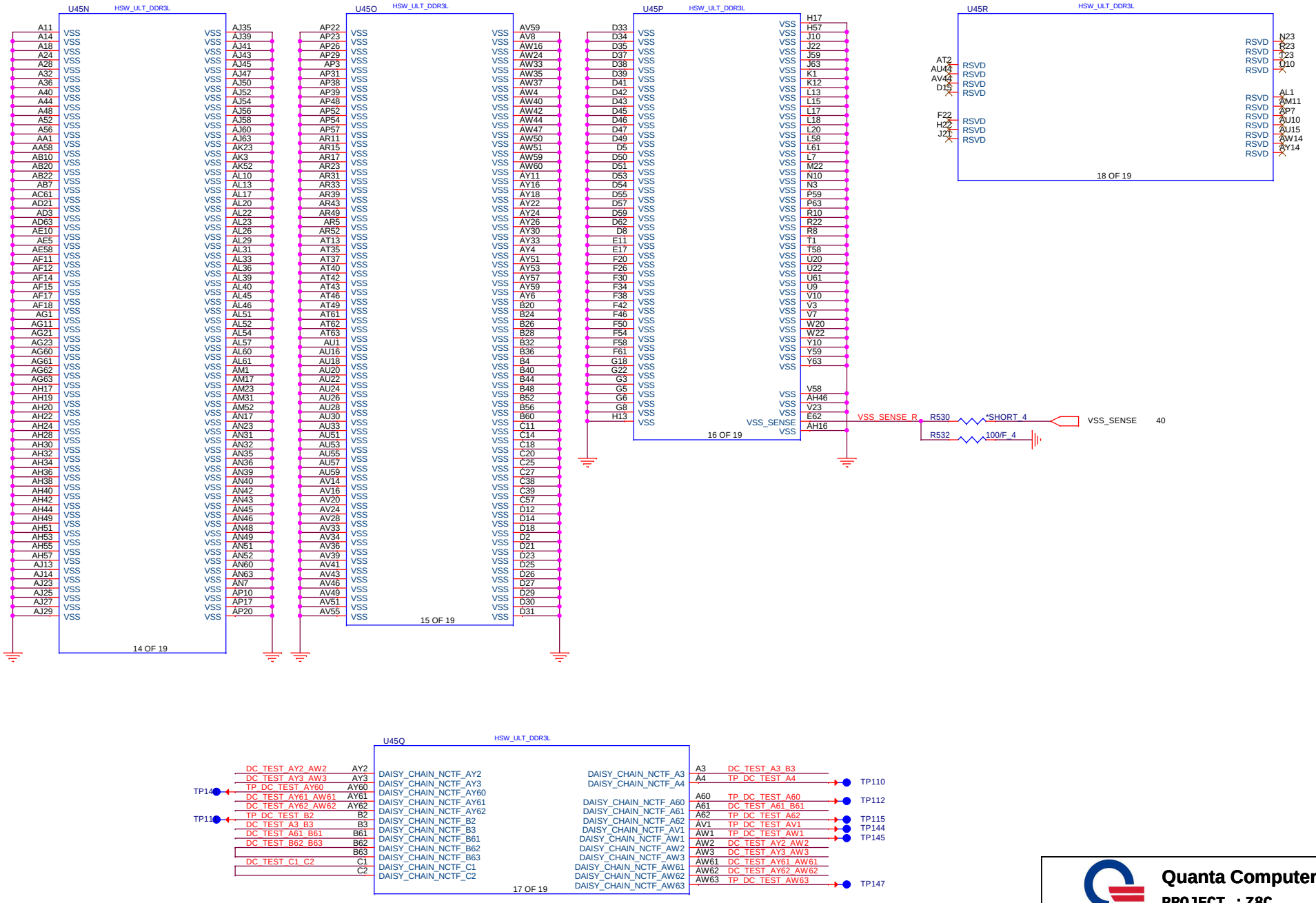
Quanta Computer Inc.

PROJECT : Z8C

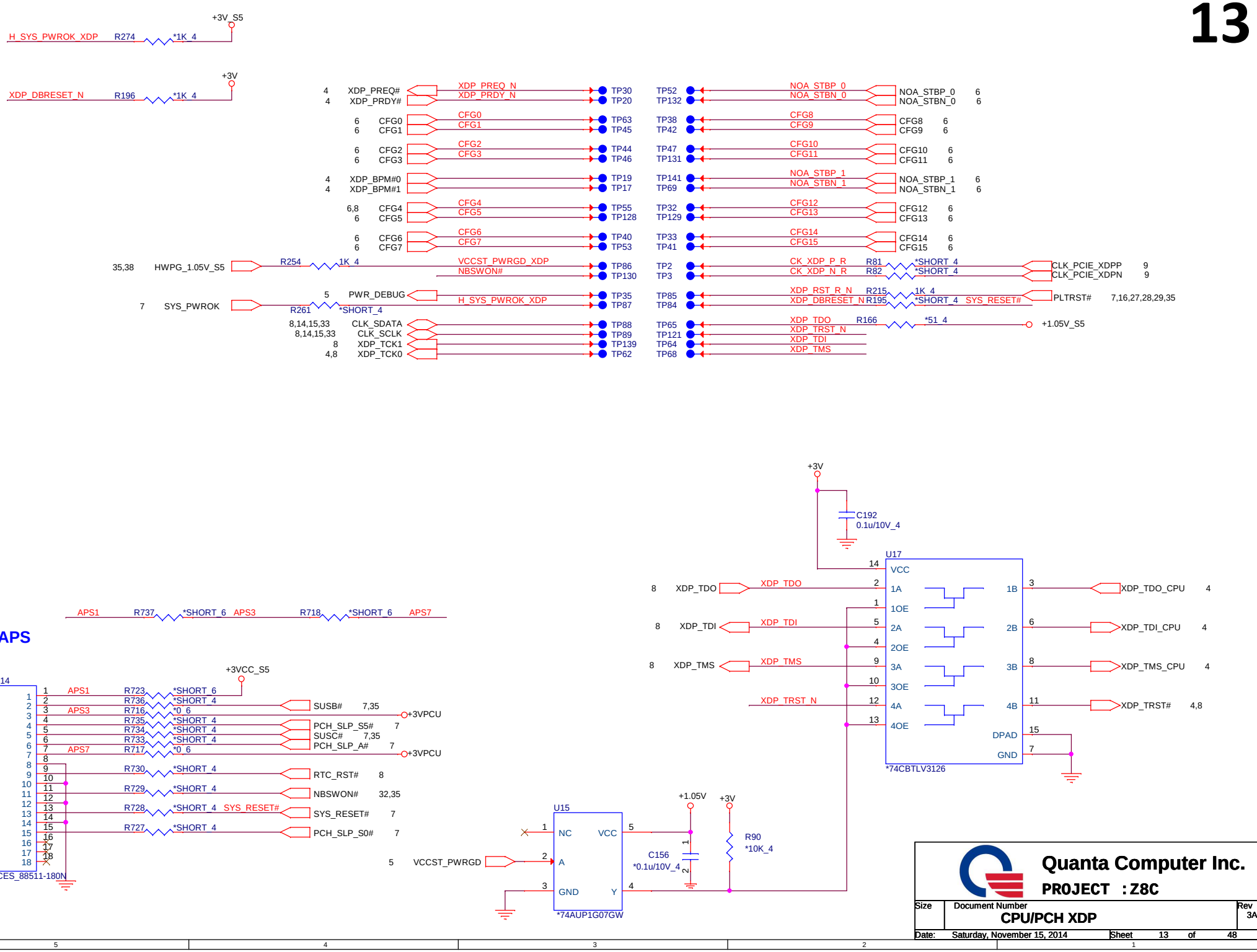
Size	Document Number	Rev
	LPT 5/6 (POWER)	3A

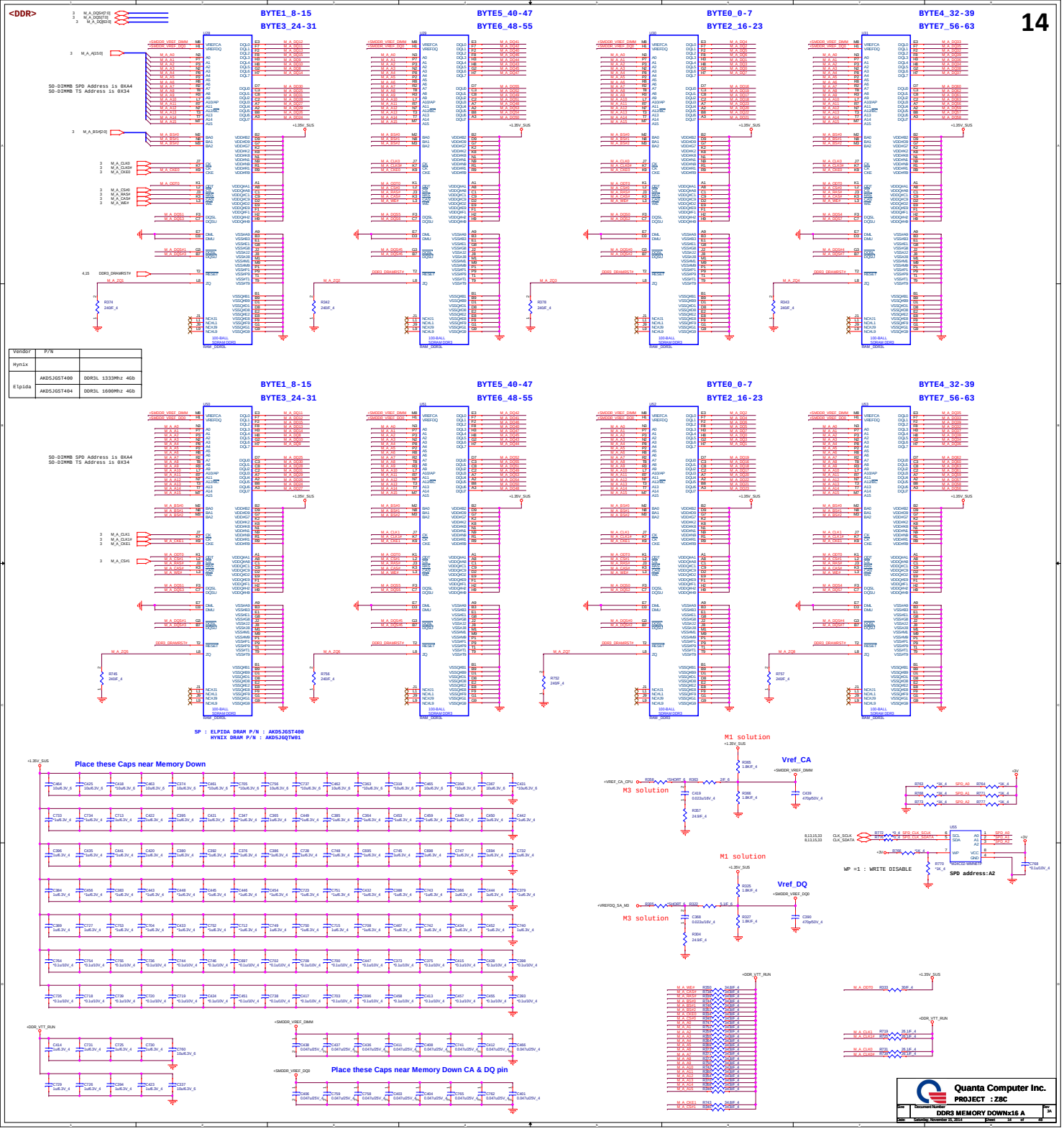
Date: Sunday, November 16, 2014 Sheet 11 of 48

Haswell ULT (GND)

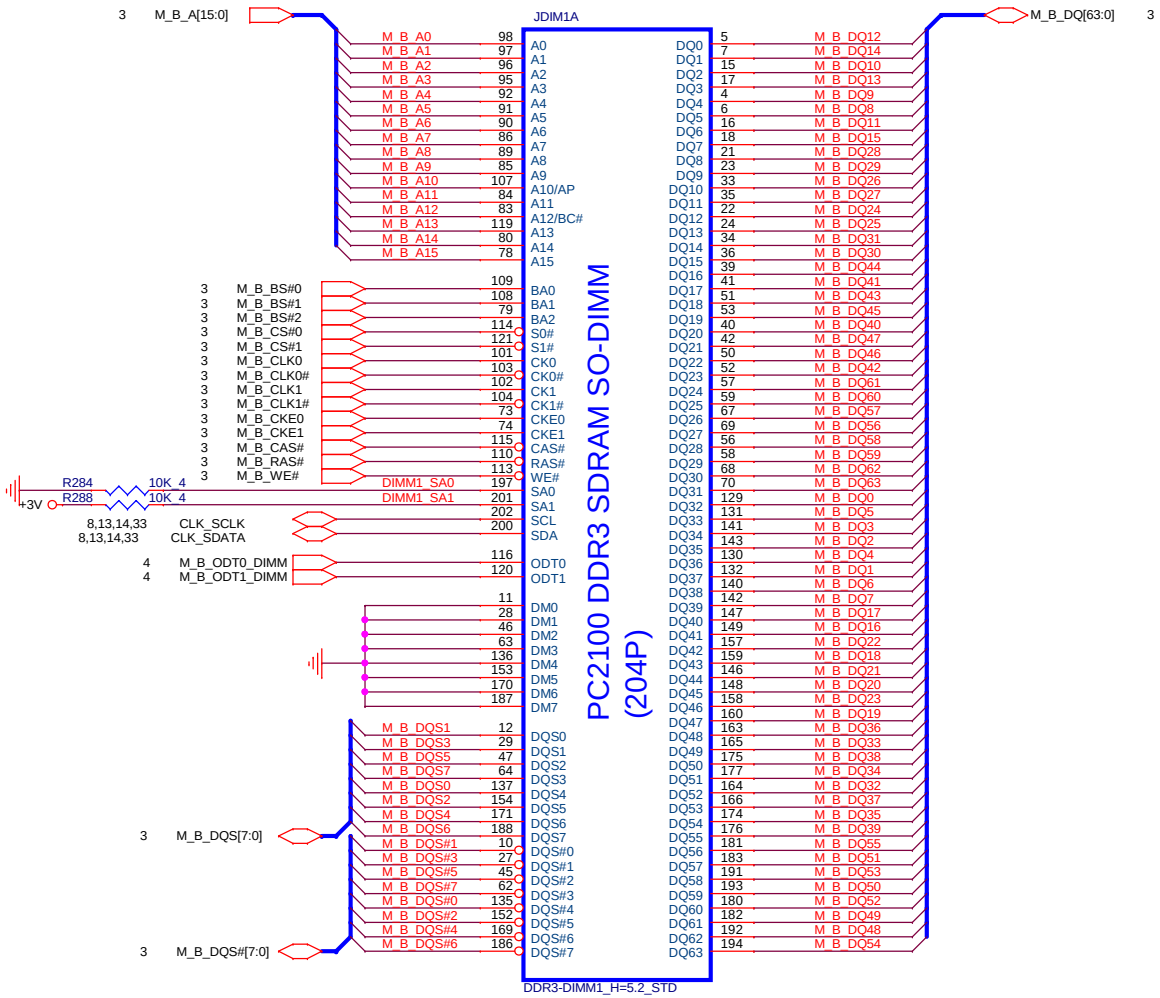


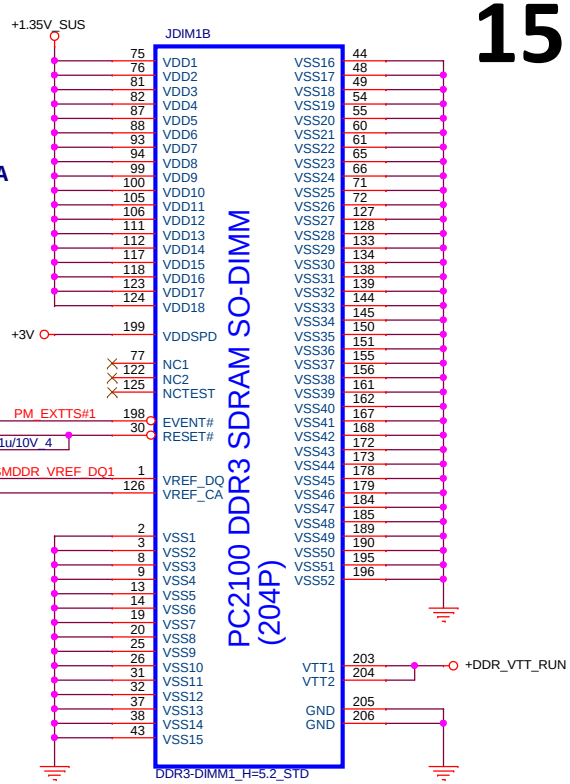
Quanta Computer Inc.			
PROJECT : Z8C			
Size	Document Number		Rev
	LPT 6/6 (GND)		3A
Date: Saturday, November 15, 2014	Sheet 12 of 48		

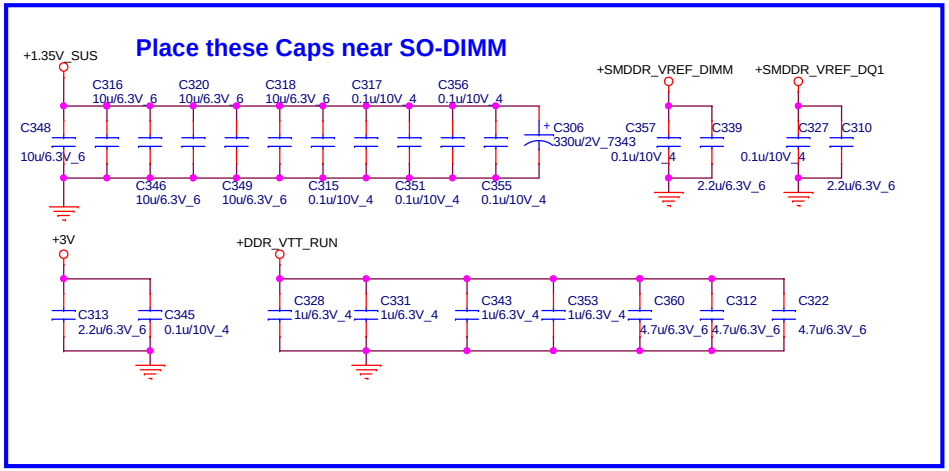

+3V_S5
H_SYS_PWROK_XDP R274 *1K_4
+3V
XDP_DBRESET_N R196 *1K_4
4 XDP_PREQ# XDP_PREQ_N TP30
4 XDP_PRDY# XDP_PRDY_N TP20
6 CFG0 CFG0 TP63
6 CFG1 CFG1 TP45
6 CFG2 CFG2 TP44
6 CFG3 CFG3 TP46
4 XDP_BPM#0 TP19
4 XDP_BPM#1 TP17
6,8 CFG4 CFG4 TP55
6 CFG5 CFG5 TP128
6 CFG6 CFG6 TP40
6 CFG7 CFG7 TP53
35,38 HWPG_1.05V_S5 R254 1K_4 VCCST_PWRGD_XDP TP86
NBSWON# TP130
5 PWR_DEBUG TP35
7 SYS_PWROK H_SYS_PWROK_XDP TP87
R261 *SHORT_4
8,14,15,33 CLK_SDATA TP88
8,14,15,33 CLK_SCLK TP89
8 XDP_TCK1 TP139
4,8 XDP_TCK0 TP62
TP52 NOA_STBP_0 NOA_STBP_0 6
TP132 NOA_STBN_0 NOA_STBN_0 6
TP38 CFG8 CFG8 6
TP42 CFG9 CFG9 6
TP47 CFG10 CFG10 6
TP131 CFG11 CFG11 6
TP141 NOA_STBP_1 NOA_STBP_1 6
TP69 NOA_STBN_1 NOA_STBN_1 6
TP32 CFG12 CFG12 6
TP129 CFG13 CFG13 6
TP33 CFG14 CFG14 6
TP41 CFG15 CFG15 6
TP2 CK_XDP_P_R R81 *SHORT_4 CLK_PCIE_XDPP 9
TP3 CK_XDP_N_R R82 *SHORT_4 CLK_PCIE_XDPN 9
TP85 XDP_RST_R_N R215 1K_4
TP84 XDP_DBRESET_N R195 *SHORT_4 SYS_RESET# PLTRST# 7,16,27,28,29,35
TP65 XDP_TDO R166 *51_4 +1.05V_S5
TP121 XDP_TRST_N
TP64 XDP_TDI
TP68 XDP_TMS
APS1 R737 *SHORT_6 APS3 R718 *SHORT_6 APS7
APS
CN14
+3VCC_S5
APS1 R723 *SHORT_6
R736 *SHORT_4 SUSB# 7,35
APS3 R716 *0_6 +3VPCU
R735 *SHORT_4
R734 *SHORT_4 PCH_SLP_S5# 7
R733 *SHORT_4 SUSC# 7,35
APS7 R717 *0_6 PCH_SLP_A# 7
+3VPCU
R730 *SHORT_4 RTC_RST# 8
R729 *SHORT_4 NBSWON# 32,35
R728 *SHORT_4 SYS_RESET# SYS_RESET# 7
R727 *SHORT_4 PCH_SLP_S0# 7
*ACES_88511-180N
5 VCCST_PWRGD
U15
NC VCC
A
GND Y
*74AUP1G07GW
+1.05V
+3V
C156 *0.1u/10V_4
R90 *10K_4
+3V
C192 0.1u/10V_4
U17
VCC
8 XDP_TDO XDP_TDO 1A 1B XDP_TDO_CPU 4
1OE
8 XDP_TDI XDP_TDI 2A 2B XDP_TDI_CPU 4
2OE
8 XDP_TMS XDP_TMS 3A 3B XDP_TMS_CPU 4
3OE
XDP_TRST_N 4A 4B XDP_TRST# 4,8
4OE
DPAD
GND
*74CBTLV3126
Quanta Computer Inc.
PROJECT : Z8C
Size
Document Number
CPU/PCH XDP
Rev 3A
Date: Saturday, November 15, 2014
Sheet 13 of 48

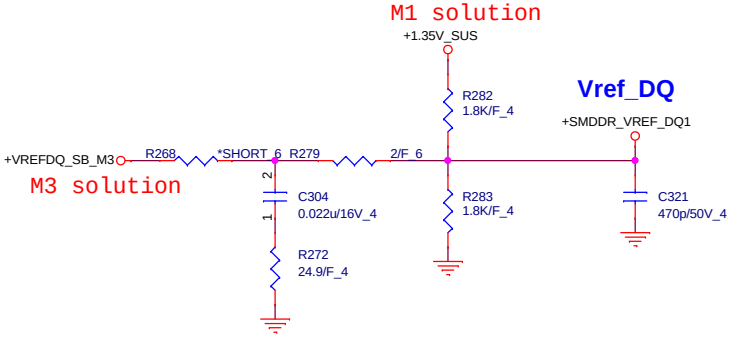


Vendor	P/N	
Hynix		
Elpida	AKD5JGST400	DDR3L 1333Mhz 4Gb
	AKD5JGST404	DDR3L 1600Mhz 4Gb

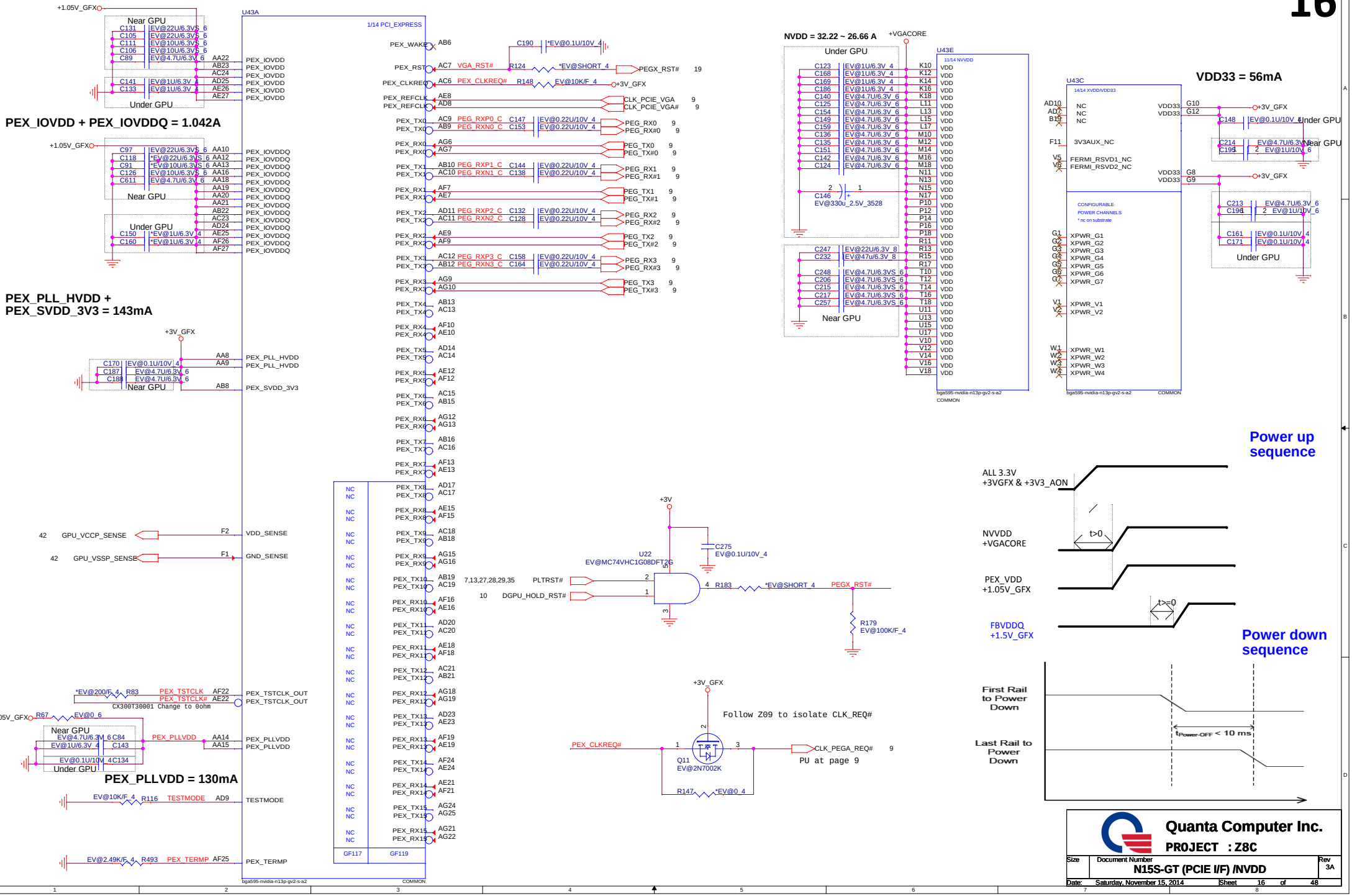


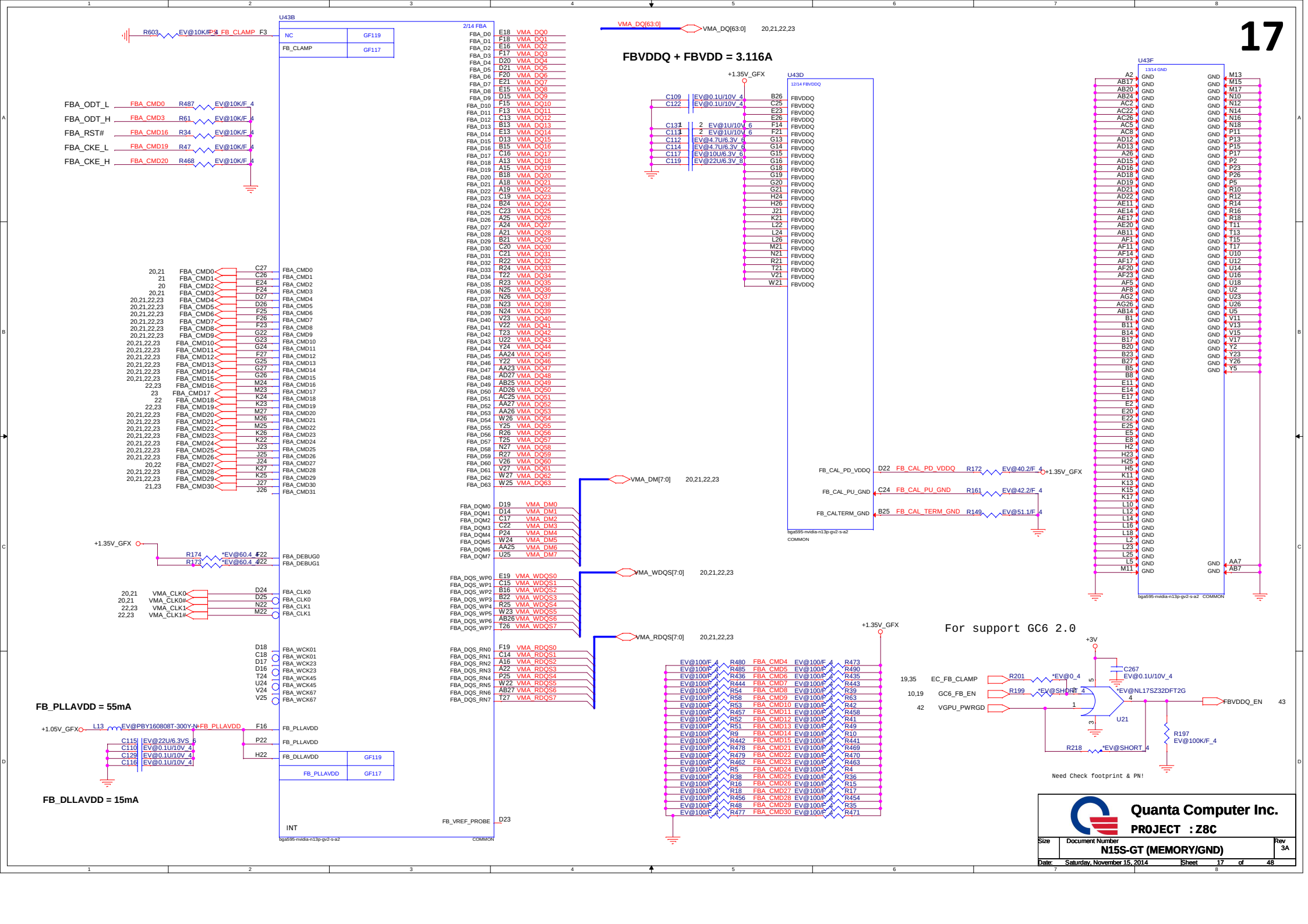






Quanta Computer Inc.			
PROJECT : Z8C			
Size	Document Number		Rev
	DDRIII SO-DIMM-1		3A
Date:	Saturday, November 15, 2014	Sheet 15 of 48	


PEX_IOVDD + PEX_IOVDDQ = 1.042A
PEX_PLL_HVDD +
PEX_SVDD_3V3 = 143mA
PEX_PLLVDD = 130mA
NVDD = 32.22 ~ 26.66 A
VDD33 = 56mA
U43A
1/14 PCI_EXPRESS
U43E
U43C
Near GPU
Under GPU
+1.05V_GFX
+3V_GFX
+VGACORE
+3V
PEX_IOVDD
PEX_IOVDDQ
PEX_PLL_HVDD
PEX_SVDD_3V3
PEX_PLLVDD
PEX_TERMP
PEX_TSTCLK_OUT
TESTMODE
VDD_SENSE
GND_SENSE
GPU_VCCP_SENSE
GPU_VSSP_SENSE
PEX_WAKE#
PEX_RST#
PEX_CLKREQ#
PEGX_RST#
CLK_PCIE_VGA
CLK_PCIE_VGA#
CLK_PEGA_REQ#
PLTRST#
DGPU_HOLD_REQ#
Follow Z09 to isolate CLK_REQ#
PU at page 9
CX300T30001 Change to 0ohm
Power up sequence
Power down sequence
ALL 3.3V
+3VGFX & +3V3_AON
NVVDD
+VGACORE
PEX_VDD
+1.05V_GFX
FBVDDQ
+1.5V_GFX
First Rail to Power Down
Last Rail to Power Down
tPower_OFF < 10 ms
t>0
t>=0
Quanta Computer Inc.
PROJECT : Z8C
Size
Document Number
N15S-GT (PCIE I/F) /NVDD
Rev
3A
Date: Saturday, November 15, 2014
Sheet 16 of 48



Quanta Computer Inc.	
PROJECT : Z8C	
Size	Document Number: N15S-GT (MEMORY/GND) — Rev: 3A
Date: Saturday, November 15, 2014	Sheet 17 of 48

U43G
4/14 IFPAB
IFPAB
bga595-nvidia-n13p-gv2-s-a2
COMMON

U43J
7/14 IFPEF
IFPE
IFPF
bga595-nvidia-n13p-gv2-s-a2
COMMON

U43K
3/14 DACA
bga595-nvidia-n13p-gv2-s-a2
COMMON

U43H
5/14 IFPC
IFPC
bga595-nvidia-n13p-gv2-s-a2
COMMON

U43I
6/14 IFPD
IFPD
bga595-nvidia-n13p-gv2-s-a2
COMMON

U43M
9/14 XTAL_PLL
bga595-nvidia-n13p-gv2-s-a2
COMMON

+3V_GFX
+3V
R70 EV@1.5K/F_4
R64 EV@4.7K_4
R66 *EV@100K/F_4
3V_MAIN_PWGD
3V_MAIN_PWGD 42,43
R71 EV@4.7K_4
C85 *EV@1000p/50V_4
Q6 EV@MMBT3904-7-F
C70 EV@1000p/50V_4
Q5 EV@DTC144EU
+1.05V_GFX and GPU core power EN

PLLVDD = 38mA
+1.05V_GFX
L15 EV@PBY160808T-300Y-N
NV_PLLVDD
C167 EV@0.1U/10V_4
C234 EV@22U/6.3VS_6

SP_PLLVDD = 17mA
L14 EV@HCB1005KF-181T15(180,1500MA)
SP_PLLVDD
C166 EV@0.1U/10V_4
C227 EV@0.1U/10V_4
C230 EV@4.7U/6.3V_6
C218 EV@22U/6.3VS_6

VID_PLLVDD = 41mA
R634 EV@10K/F_4
XTAL_SSIN
27M_XTAL_IN_R
XTALSSIN
XTALIN
XTALOUTBUFF
XTALOUT
C10 BXTALOUT
R613 EV@10K/F_4
B10 27M_XTAL_OUT

DB-->SI change 10/25
Use G-CLK

27M_XTAL_IN_R
27M_XTAL_OUT
Y4 EV@27MHZ +-10PPM
C656 EV@10P/50V_4
C658 EV@10P/50V_4

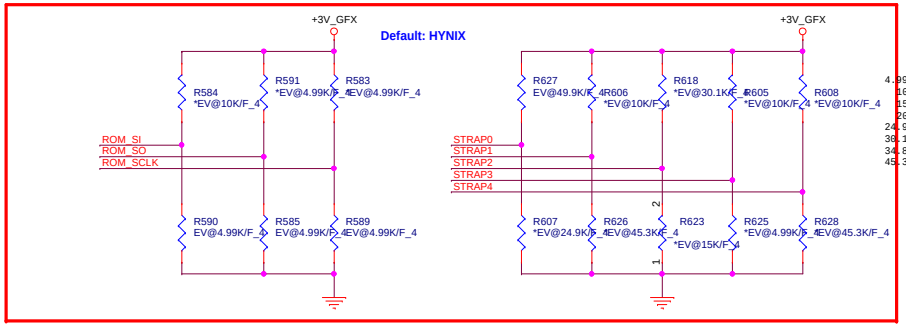
DB-->SI change 10/25
Use G-CLK

DGPU_PGOK-1
+3V
+3V_GFX
R65 EV@4.7K_4
R59 EV@4.7K_4
DGPU_PWROK 10
Q7 EV@DTC144EUA
R69 EV@100K/F_4
43 HWPG_1.5VGFX
R56 EV@4.7K_4
DGPU_POK2
Q4 EV@METR3904-G
C63 *EV@1000P/50V_4
C77 EV@1000P/50V_4

Quanta Computer Inc.
PROJECT : Z8C

Size	Document Number	Rev
	N15S-GT (DISPLAY)	3A

Date: Saturday, November 15, 2014 Sheet 18 of 48



19

N15S-GT only ROM_SI

Hynix should be 0x0, R590 4.99K 1%

Samsung Should be 0x2, R590 15K 1%

N15V-GM strap0~3

Hynix should be 0x4, R590 24.9K 1%

U43L
10/14 MISC2

TP13 TP18 E10 F10 VMON_IN0 VMON_IN1

STRAP0 D1 STRAP1 D2 STRAP2 E4 STRAP3 E3 STRAP4 D3

GF119	GF117
STRAP5_NC	NC

C1

R604 EV@40.2K/F_4 F6 MULTISTRAP_REF0_GND

GF119	GF117
MULTISTRAP_REF1_GND	NC
MULTISTRAP_REF2_GND	NC

F4 F5

ROM_CS D12 ROM_CS R171 EV@10K/F_4 +3V_GFX
ROM_SI B12 ROM_SI
ROM_SO A12 ROM_SO
ROM_SCLK C12 ROM_SCLK
BUFRST D11
PGOOD D10
CEC E9 SYS_PEX_RST_MON# TP22
R170 *EV@10K/F_4 +3V_GFX

bga595-nvidia-n13p-gv2-s-a2 COMMON

U43N
8/14 MISC1

I2CS_SCL D9 GPUT_CLK_L
I2CS_SDA D8 GPUT_DATA_L
I2CC_SCL A9 DGPU_EDIDCLK R614 EV@2.2K_4
I2CC_SDA B9 DGPU_EDIDDATA R633 EV@2.2K_4
I2CB_SCL C9 N12E_SCL R632 EV@2.2K_4
I2CB_SDA C8 N12E_SDA R612 EV@2.2K_4

GF117	GF119
NC	I2CB_SCL
NC	I2CB_SDA

TP11 THERM- E12 THERMDN
TP10 THERM+ F12 THERMDP

TP124 JTAG_TCK AE5 JTAG_TCK
TP127 JTAG_TMS AD6 JTAG_TMS
TP122 JTAG_TDI AE6 JTAG_TDI
TP120 JTAG_TDO AF6 JTAG_TDO
JTAG_TRST# AG4 JTAG_TRST

GPIO0 B3 FB_CLAMP_MON
GPIO1 B2
GPIO2 D6
GPIO3 C7
GPIO4 C9
GPIO5 A3 +3V_MAIN_EN
GPIO6 A4 GPU_EVENT#
GPIO7 B6
OVERT A6 VGA_OVT#
GPIO9 F8 ALERT
GPIO10 C5
GPIO11 E7
GPIO12 D7 GPIO12_ACIN
GPIO13 B4

VGPU_PWMVID 42
VGPU_PSI 42

GF117	GF119
NC	GPIO16
NC	GPIO20
NC	GPIO21

D5 GPU_GPIO16 TP136
E6
C4 GPU_PEX_RST_HOLD# TP137

bga595-nvidia-n13p-gv2-s-a2 COMMON

Dual Q12 EV@2N7002DW

8,35 2ND_MBDATA 2ND_MBDATA GPUT_DATA_L
R176 EV@4.7K_4 +3V_GFX
R175 EV@4.7K_4 +3V_GFX
8,35 2ND_MBCLK 2ND_MBCLK GPUT_CLK_L

R181 *EV@SHORT_4
Q14 *EVG@2N7002K
R184 *EVG@0_4
R189 *EVG@0_4
R177 EV@10K/F_4
R178 *EV@0_4
R182 *EV@10K/F_4
Q13 *EVG@2N7002K
R167 *EVG@0_4
R163 EV@0_4
R186 *EV@10K/F_4

EC_FB_CLAMP 17,35
GC6_FB_EN 10,17
FB_CLAMP_REQ# 35
DGPU_EVENT# 10
TP138

16 PEGX_RST#
VGA_OVT# Q15 EV@2N7002K dGPU_OTP# 35

GPIO12_ACIN Q10 EV@2N7002K dGPU_OPP# 35
dGPU_OPP# = EC control
GPIO12 AC detect
AC high
DC low

GPIO12_ACIN R169 EV@10K/F_4
VGPU_PSI R629 *EV@10K/F_4
VGA_OVT# R185 EV@10K/F_4
ALERT R624 EV@10K/F_4
GPU_PEX_RST_HOLD# R609 *EV@10K/F_4
GPU_EVENT# R630 *EV@10K/F_4
+3V_MAIN_EN R610 *EV@10K/F_4
JTAG_TMS R566 *EV@10K/F_4
JTAG_TDI R552 *EV@10K/F_4
JTAG_TRST# R553 EV@10K/F_4
JTAG_TCK R567 *EV@10K/F_4

ROM_SI

Logical Strap Bit Mapping

	PU-VDD	PD
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

VRAM Configuration Table ROM_SI

RAMCFG [3:0]	DESCRIPTION	Vendor	Vendor P/N	QCI P/N	QBC	TOP B/S
0000	...	...	...		...	...
0100	DDR3L 256Mx16, 64bit, 4Gb,900MHz	Micron	MT41J256M16HA-093G:E		AKD5PZSTL01	AKD5PZSTL00
0011	DDR3L 256Mx16, 64bit, 4Gb,900MHz	HYNIX	H5TC4G63AFR-11C	AKD5PGWT500	AKD5PGWTW08	AKD5PGWTW07
0101	DDR3L 256Mx16, 64bit, 4Gb,900MHz	SAMSUNG	K4W4G1646D-BC1A		AKD5PGWT501	AKD5PGWT502

GPIO ASSIGNMENTS

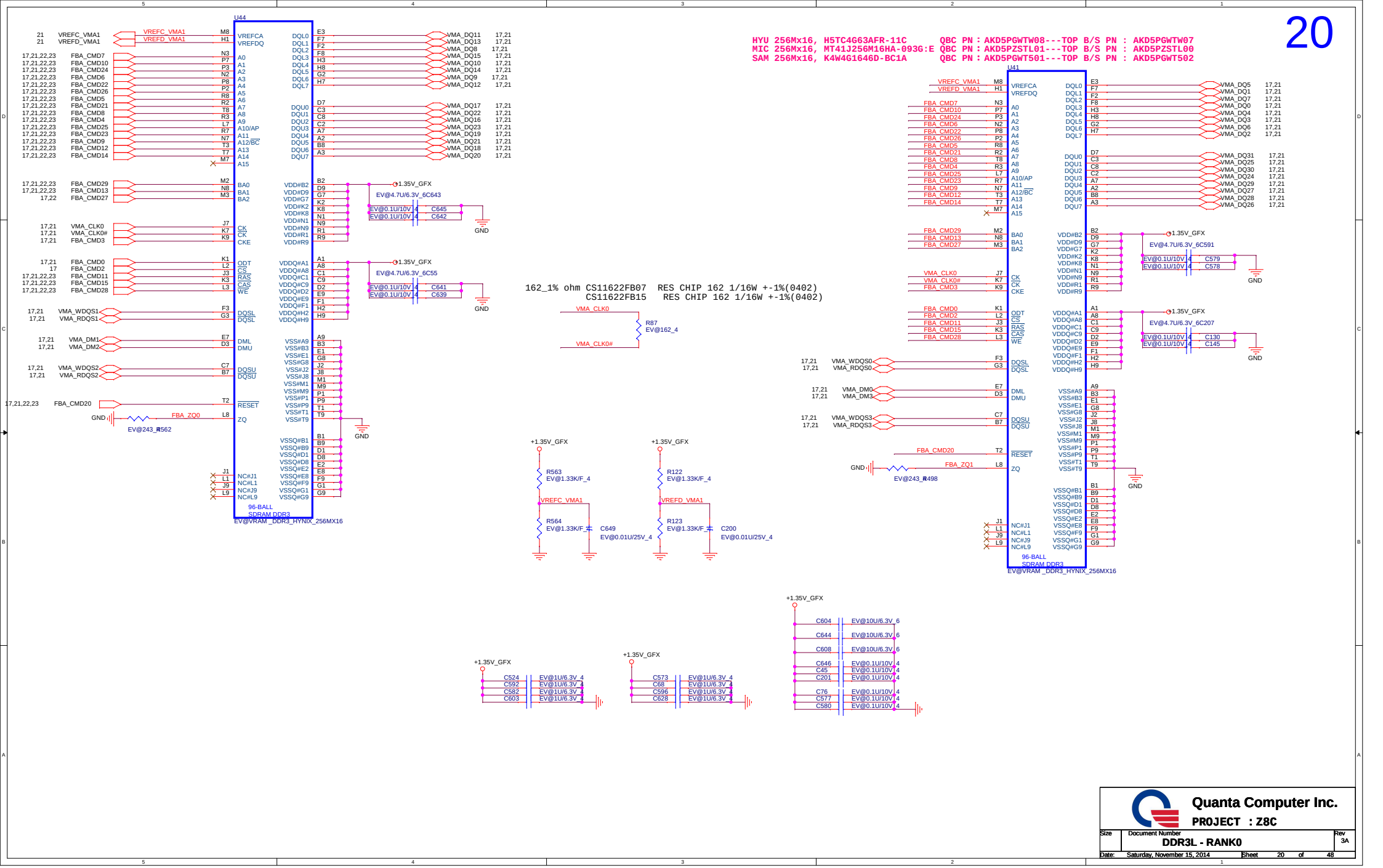
GPIO	I/O	PIN	USAGE
0	IN	FB_CLAMP_MON	FB Clamp monitor
1	OUT	MEM_VDD_CTL	Memory VDD VID
2	OUT	LCD_BL_PWM	Panel Backlight PWM
3	OUT	LCD_VCC	PANEL POWER ENABLE
4	OUT	LCD_BLEN	PANEL BACKLIGHT ENABLE
5	OUT	Reserved	--
6	OUT	FB_CLAMP_TGL_REQ	Active low FB Clamp toggle request
7	OUT	3D VISION	3D VISION LEFT/RIGHT 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

Quanta Computer Inc.
PROJECT : Z8C

Size	Document Number	Rev
	N15S-GT (GPIO/STRAPS)	3A
Date: Saturday, November 15, 2014	Sheet 19 of 48	

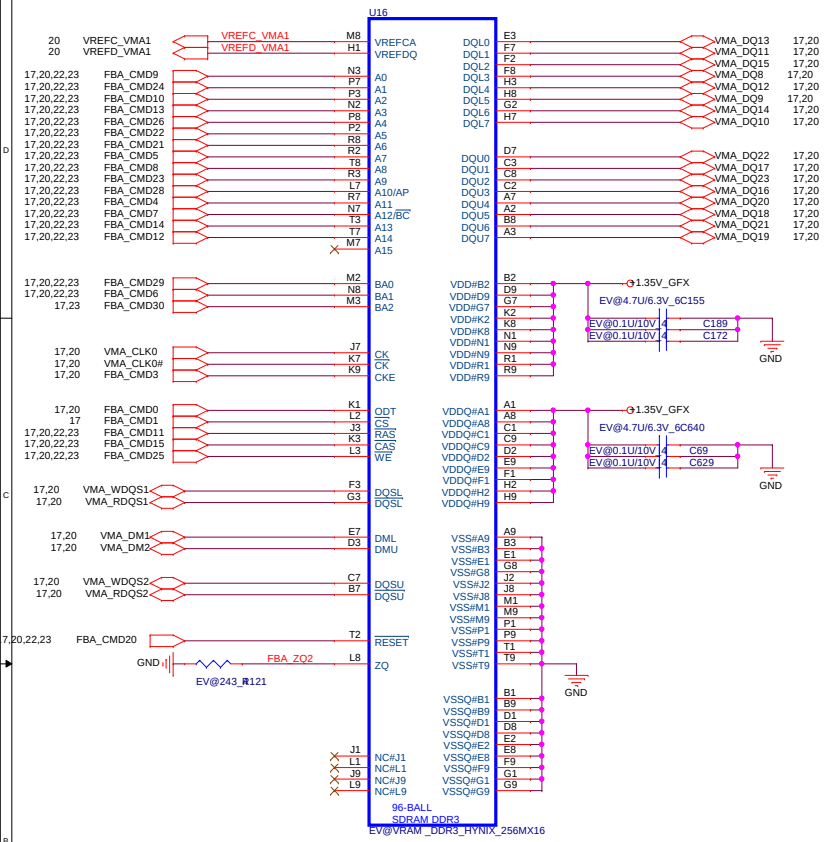
HYU 256Mx16, H5TC4G63AFR-11C QBC PN : AKD5PGWTW08---TOP B/S PN : AKD5PGWTW07
MIC 256Mx16, MT41J256M16HA-093G:E QBC PN : AKD5PZSTL01---TOP B/S PN : AKD5PZSTL00
SAM 256Mx16, K4W4G1646D-BC1A QBC PN : AKD5PGWT501---TOP B/S PN : AKD5PGWT502

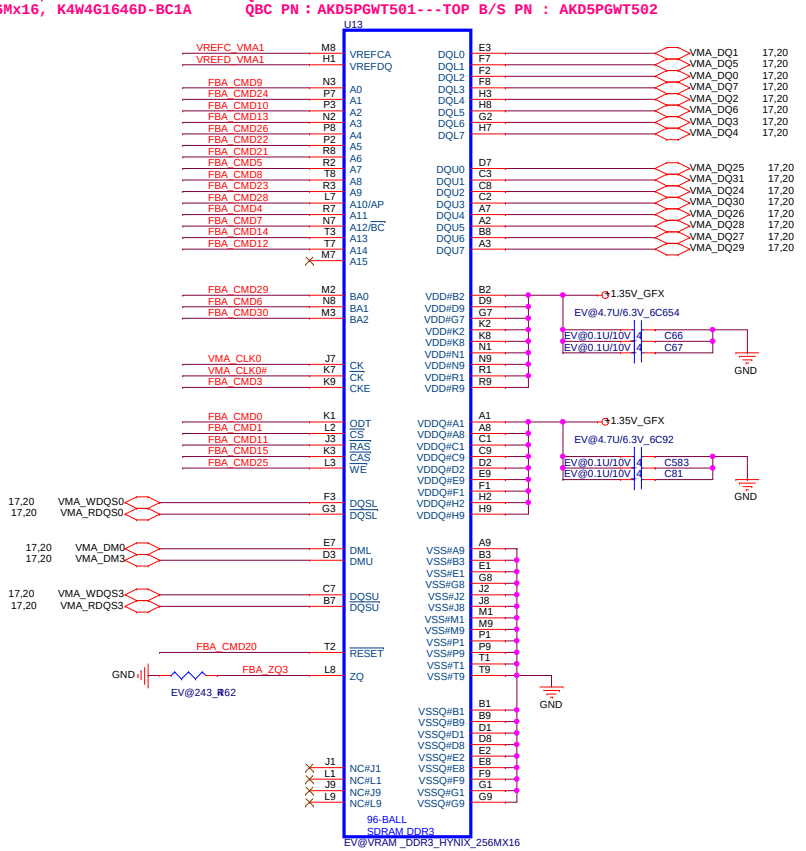
162_1% ohm CS11622FB07 RES CHIP 162 1/16W +-1%(0402)
CS11622FB15 RES CHIP 162 1/16W +-1%(0402)

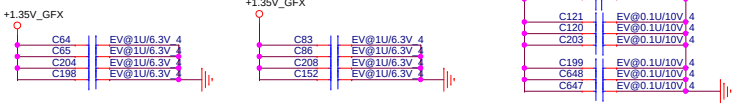


Quanta Computer Inc.	
PROJECT : Z8C	
Size	Document Number: DDR3L - RANK0 — Rev: 3A
Date: Saturday, November 15, 2014	Sheet 20 of 48

HYU 256Mx16, H5TC4G63AFR-11C QBC PN : AKD5PGWTW08---TOP B/S PN : AKD5PGWTW07
MIC 256Mx16, MT41J256M16HA-093G:E QBC PN : AKD5PZSTL01---TOP B/S PN : AKD5PZSTL00
SAM 256Mx16, K4W4G1646D-BC1A QBC PN : AKD5PGWT501---TOP B/S PN : AKD5PGWT502





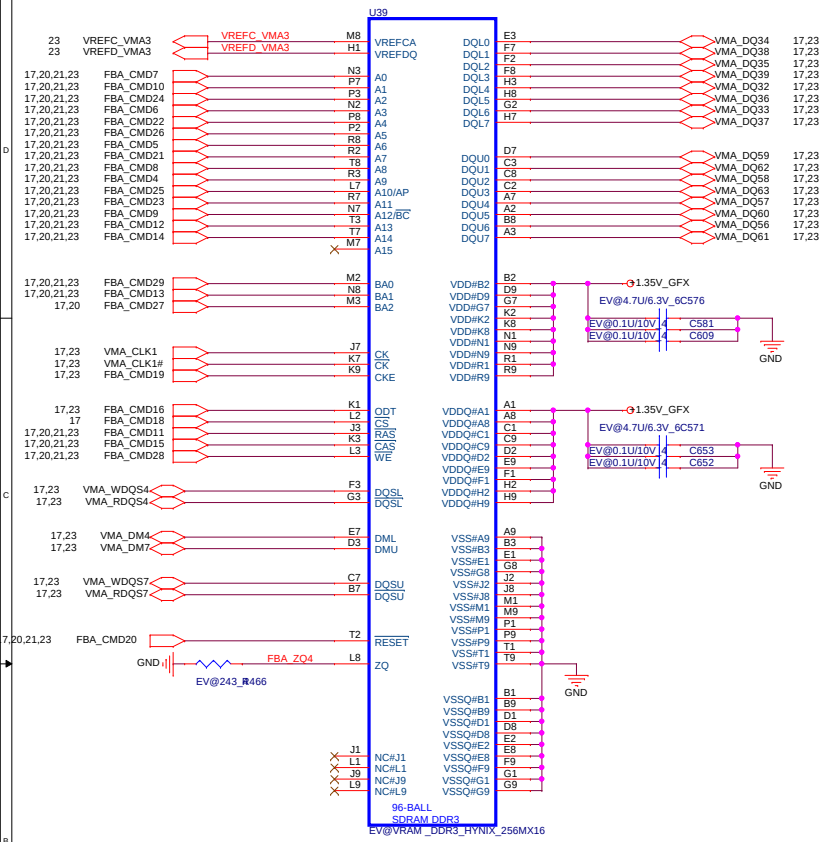


Quanta Computer Inc.
PROJECT : Z8C

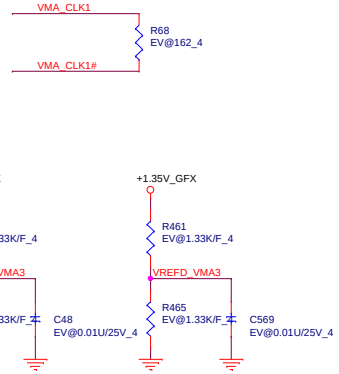
Size	Document Number	Rev
	DDR3L - RANK0	3A

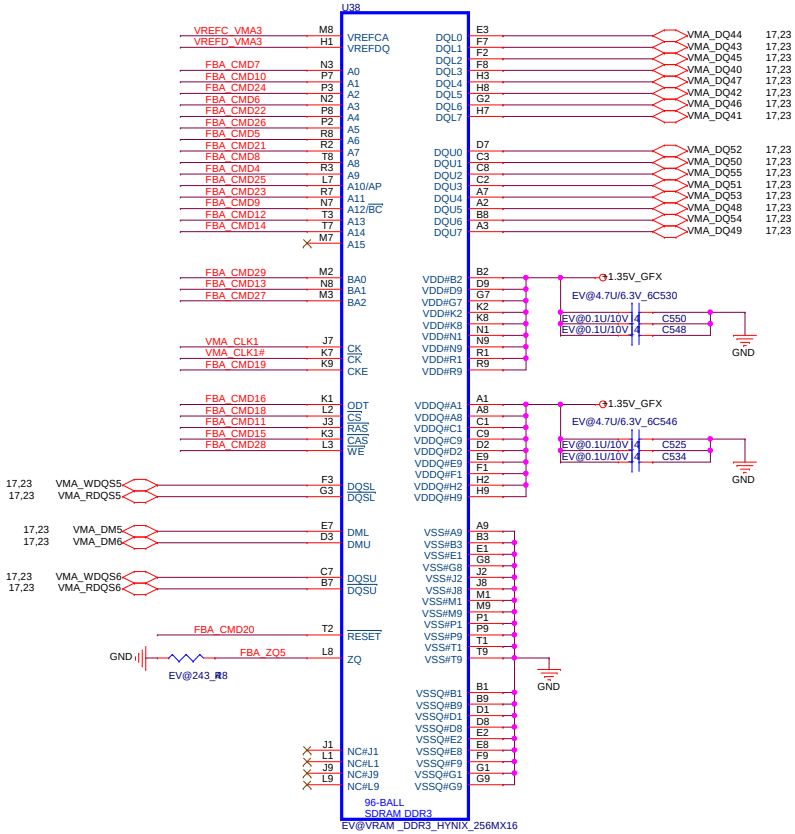
Date: Saturday, November 15, 2014 Sheet 21 of 48

HYU 256Mx16, H5TC4G63AFR-11C QBC PN : AKD5PGWTW08---TOP B/S PN : AKD5PGWTW07
MIC 256Mx16, MT41J256M16HA-093G:E QBC PN : AKD5PZSTL01---TOP B/S PN : AKD5PZSTL00
SAM 256Mx16, K4W4G1646D-BC1A QBC PN : AKD5PGWT501---TOP B/S PN : AKD5PGWT502

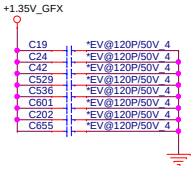


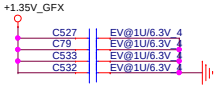
162_1% ohm CS11622FB07 RES CHIP 162 1/16W +-1%(0402)
CS11622FB15 RES CHIP 162 1/16W +-1%(0402)

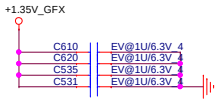


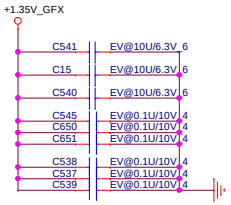


FOR EMI Request







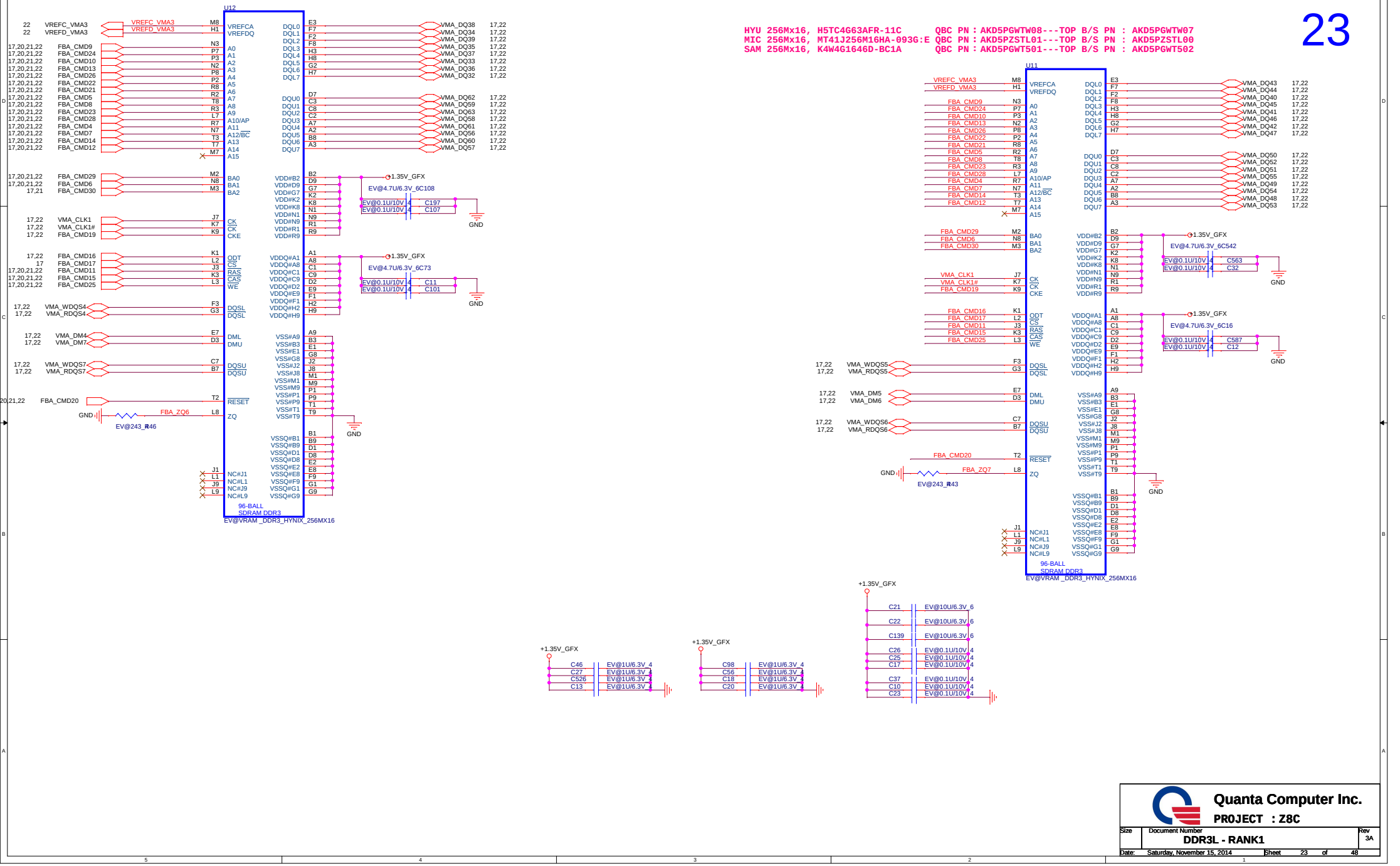


Quanta Computer Inc.
PROJECT : Z8C

Size	Document Number	Rev
	DDR3L - RANK0	3A

Date: Saturday, November 15, 2014 Sheet 22 of 48

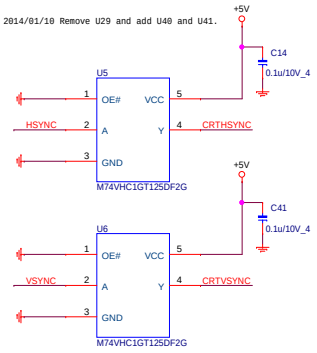
HYU 256Mx16, H5TC4G63AFR-11C QBC PN : AKD5PGWTW08---TOP B/S PN : AKD5PGWTW07
MIC 256Mx16, MT41J256M16HA-093G:E QBC PN : AKD5PZSTL01---TOP B/S PN : AKD5PZSTL00
SAM 256Mx16, K4W4G1646D-BC1A QBC PN : AKD5PGWT501---TOP B/S PN : AKD5PGWT502

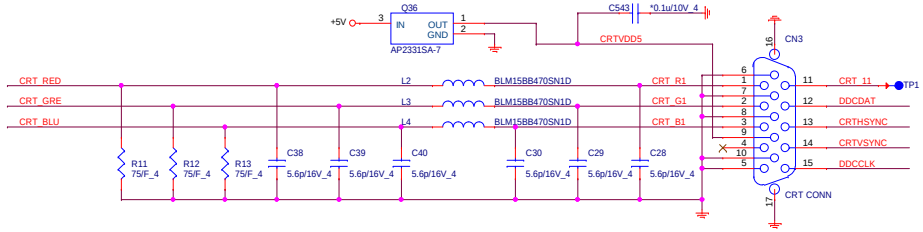


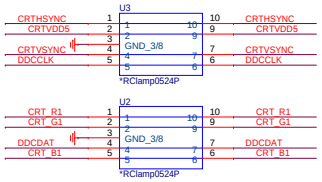
Quanta Computer Inc.	
PROJECT : Z8C	
Size	Document Number: DDR3L - RANK1 — Rev: 3A
Date: Saturday, November 15, 2014	Sheet 23 of 48

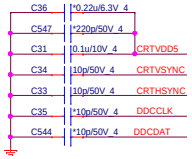
CRT

1C-1 2014/01/10 Remove U29 and add U40 and U41.







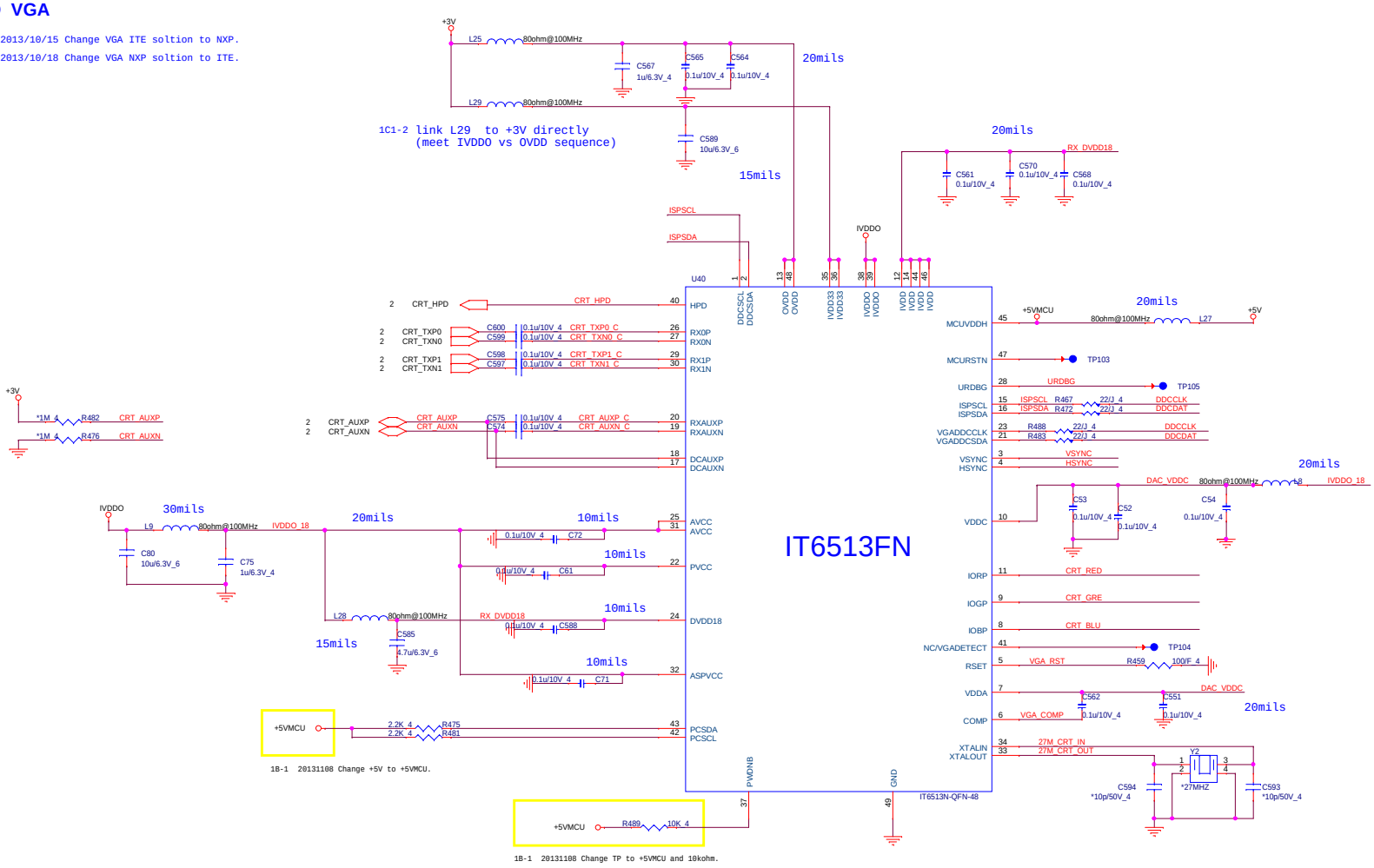


Power trace tracking

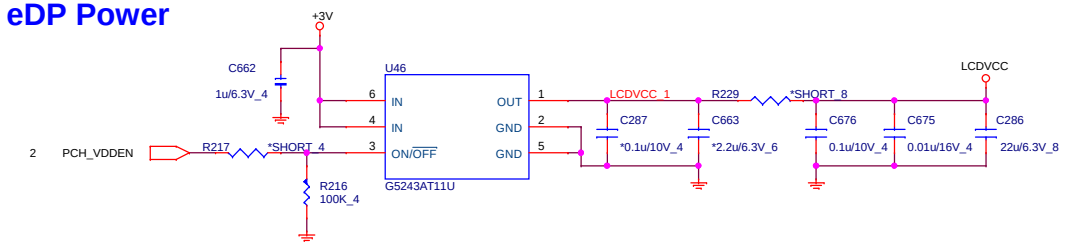
DP TO VGA

1A-1 2013/10/15 Change VGA ITE soltion to NXP.

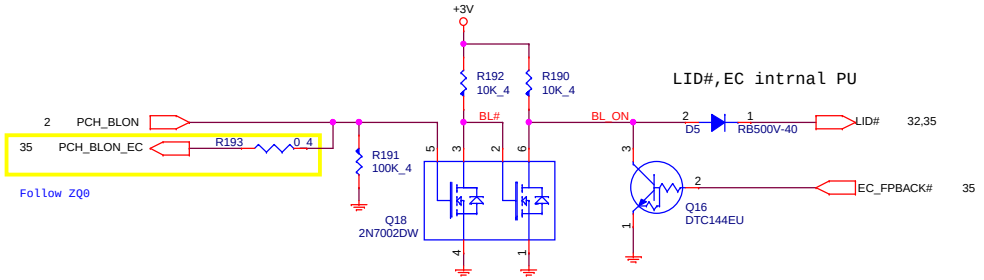
1A-5 2013/10/18 Change VGA NXP soltion to ITE.



eDP Power

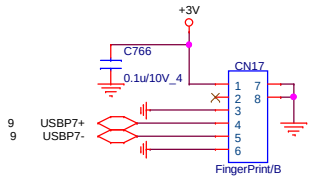


Backlight Control

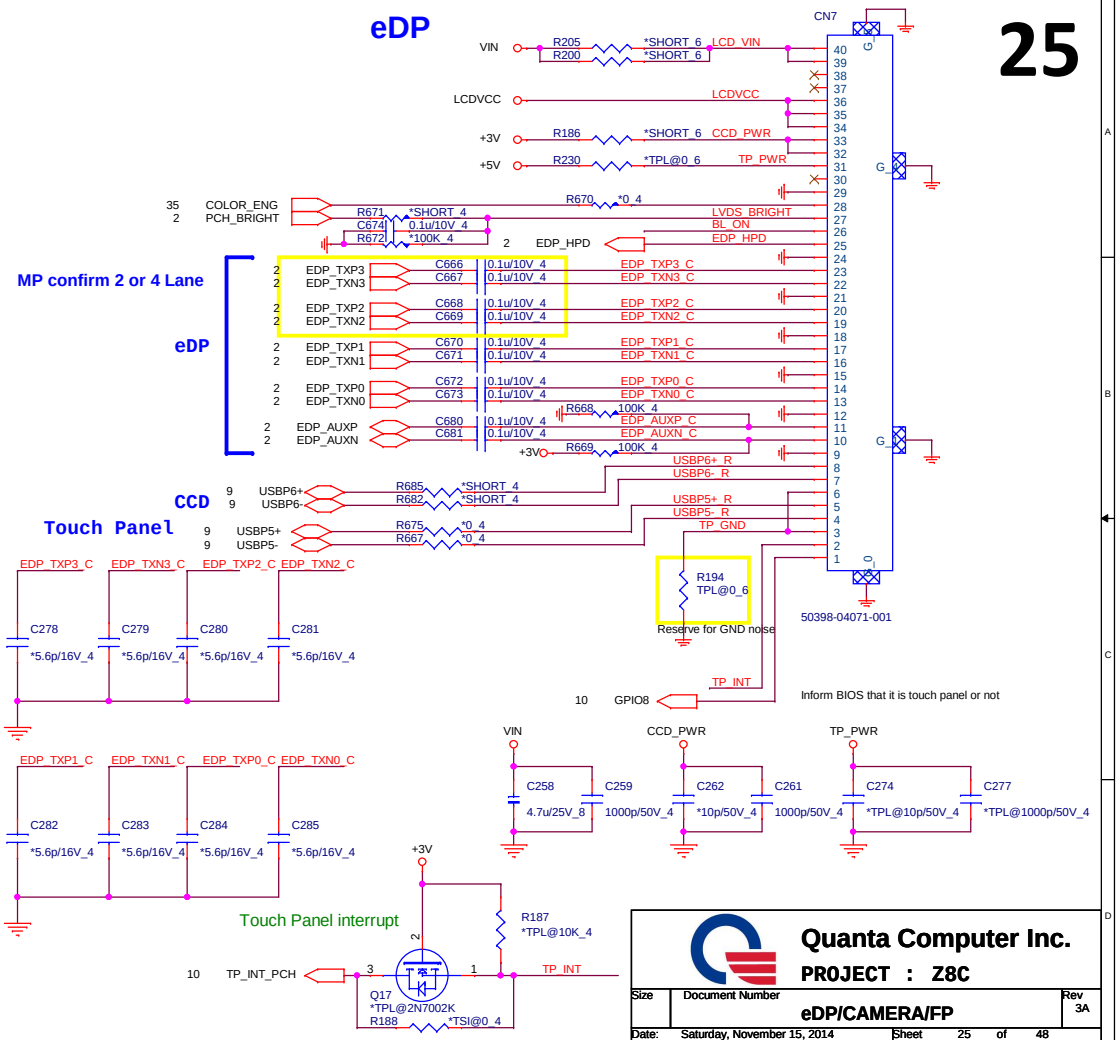


Lid Switch (HSR)(move to USB/B)

FingerPrint Conn



eDP



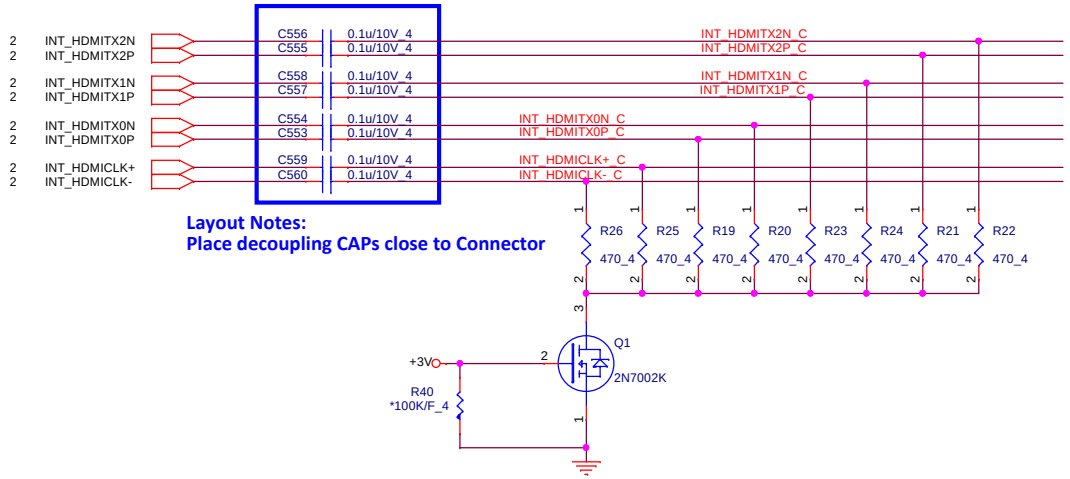
Quanta Computer Inc.

PROJECT : Z8C

Size	Document Number	Rev
	eDP/CAMERA/FP	3A

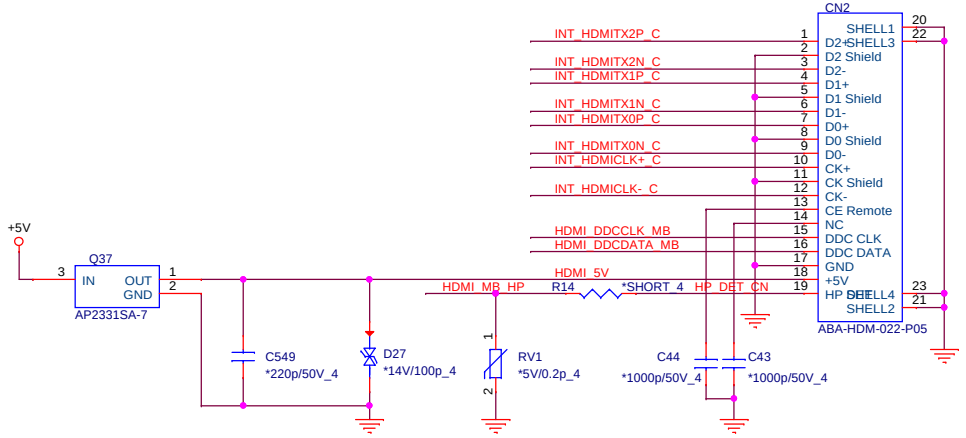
Date: Saturday, November 15, 2014 Sheet 25 of 48

HDMI Cost Reduced level shift (HDM)

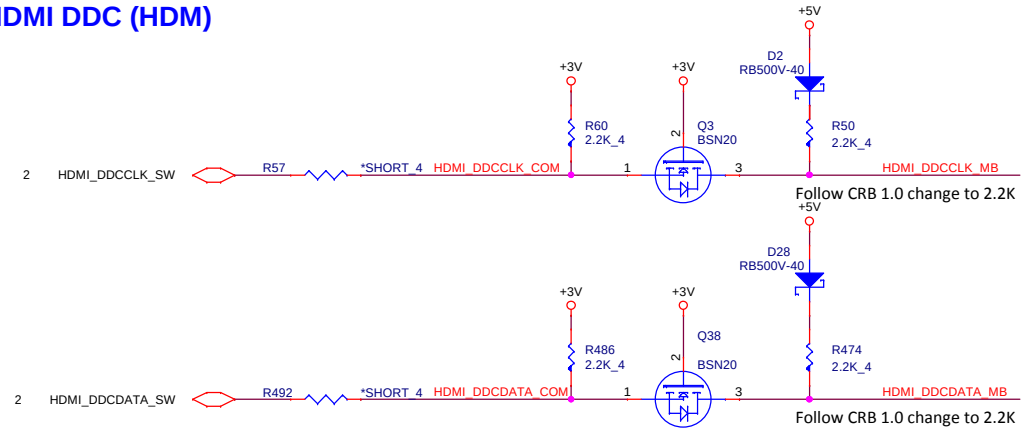


Layout Notes:
Place decoupling CAPs close to Connector

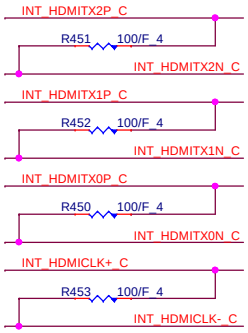
HDMI connector (HDM)



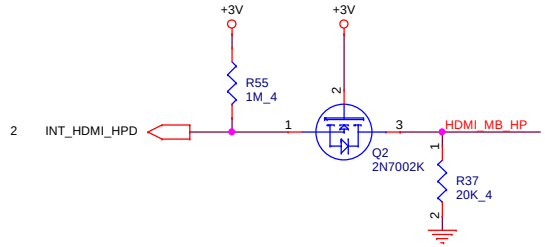
HDMI DDC (HDM)



EMI (EMC)



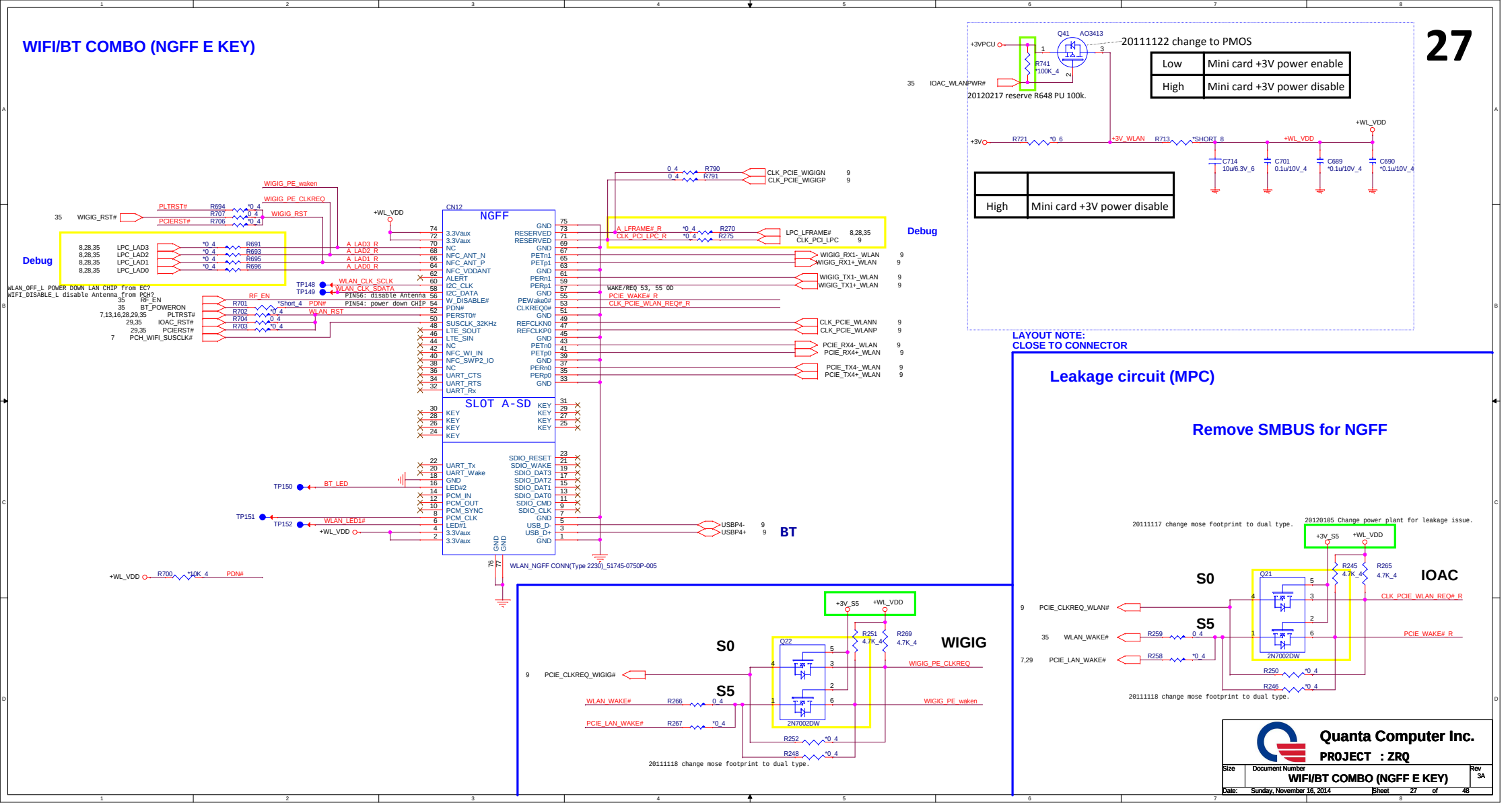
HDMI-detect (HDM)



Quanta Computer Inc.
PROJECT : Z8C

Size	Document Number	Rev
	HDMI (PS8101)	3A
Date: Saturday, November 15, 2014	Sheet 26 of 48	

WIFI/BT COMBO (NGFF E KEY)



Low	Mini card +3V power enable
High	Mini card +3V power disable

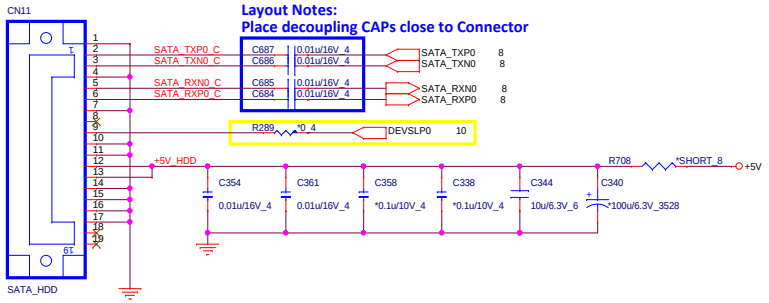
High	Mini card +3V power disable

Quanta Computer Inc.
PROJECT : ZRQ

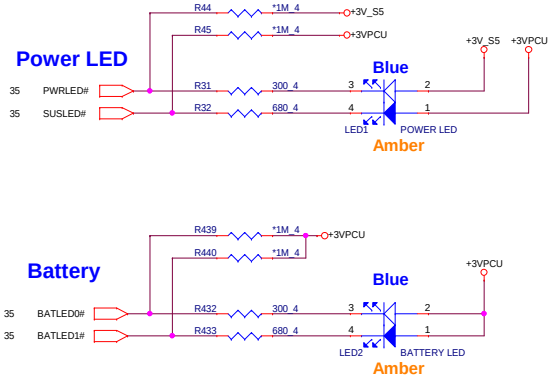
Size	Document Number	Rev
	WIFI/BT COMBO (NGFF E KEY)	3A

Date: Sunday, November 16, 2014 Sheet 27 of 48

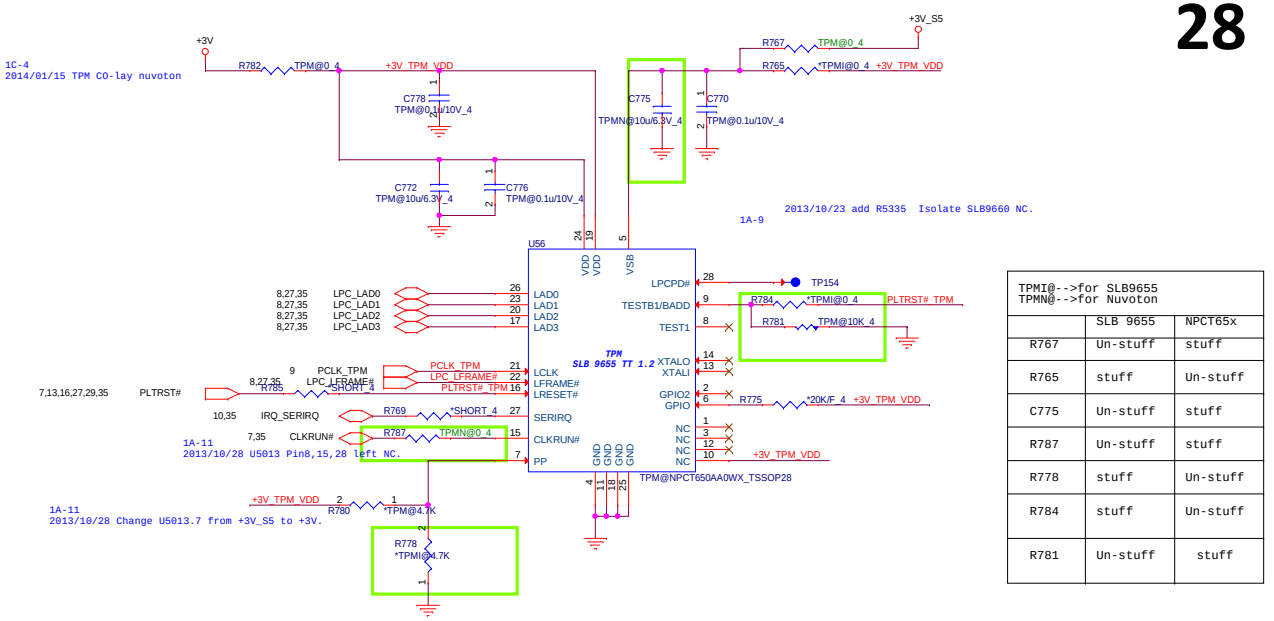
MAIN SATA HDD (HDD)



LED(UIF)

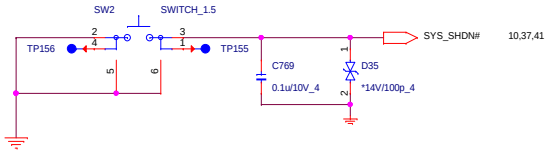


TPM



TPMI@-->for SLB9655 TPMN@-->for Nuvoton		
	SLB 9655	NPCT65x
R767	Un-stuff	stuff
R765	stuff	Un-stuff
C775	Un-stuff	stuff
R787	Un-stuff	stuff
R778	stuff	Un-stuff
R784	stuff	Un-stuff
R781	Un-stuff	stuff

3/5VPCU reset switch (CLG)

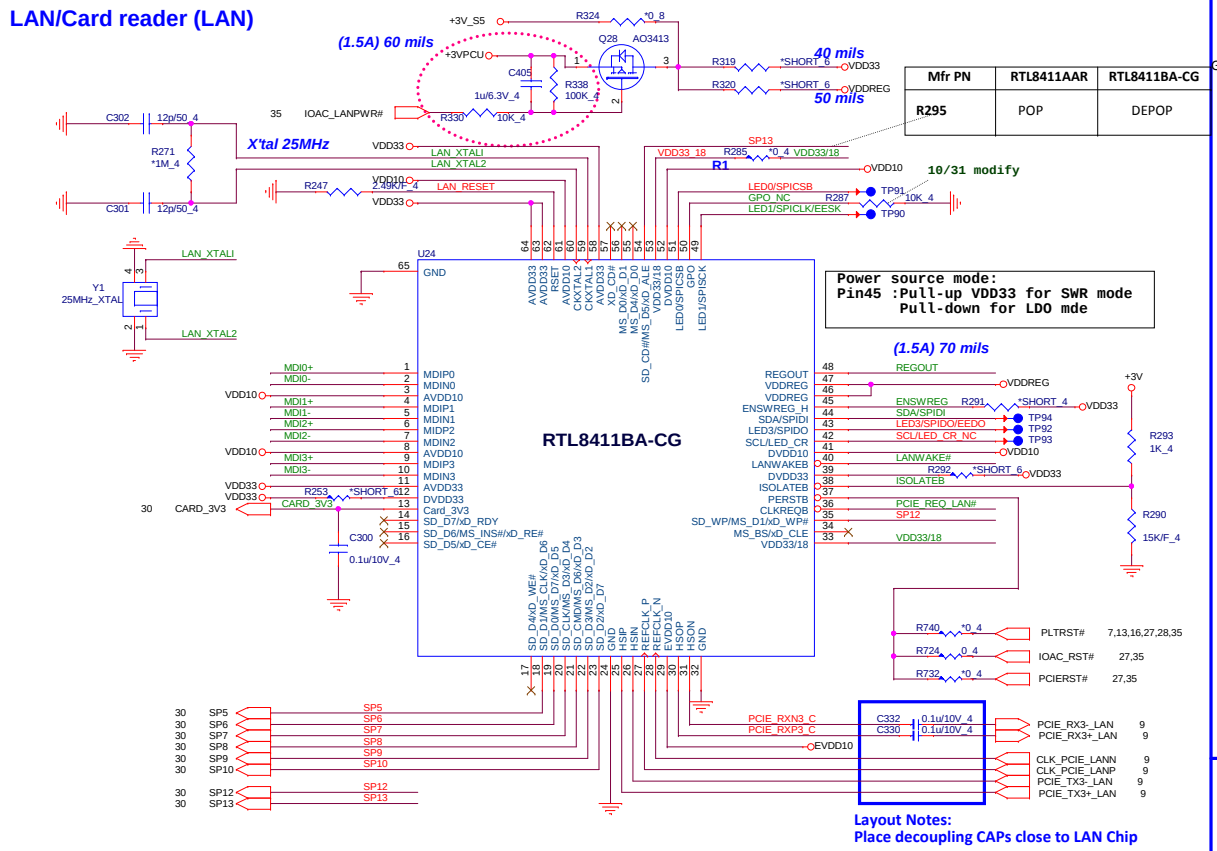


Quanta Computer Inc.
PROJECT : Z8C

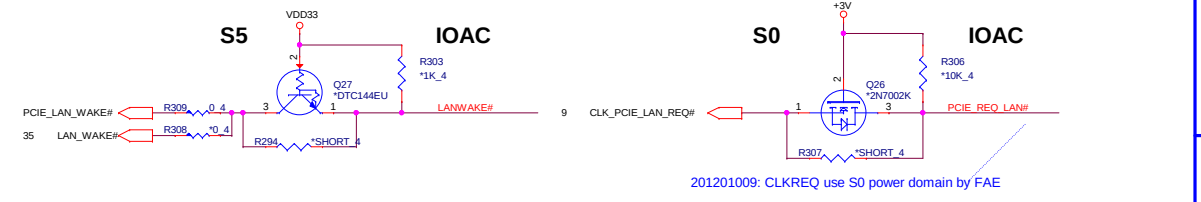
Size	Document Number	Rev
	SATA-HDD/ TPM	3A

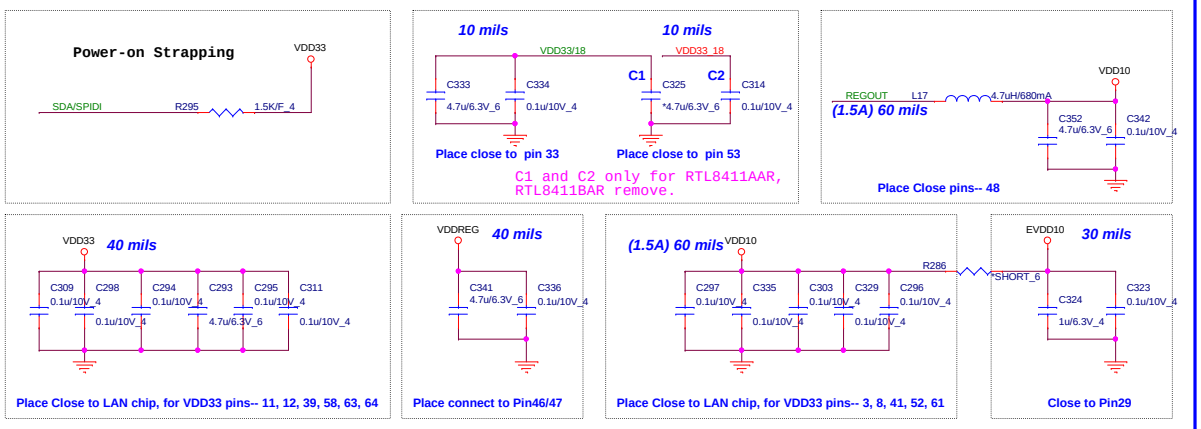
Date: Saturday, November 15, 2014 Sheet 28 of 48

LAN/Card reader (LAN)



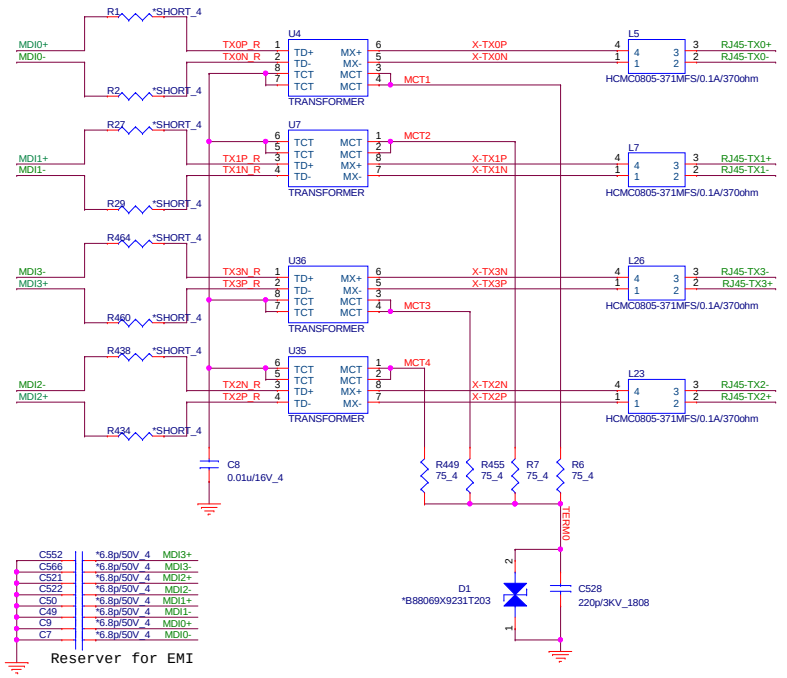
Mfr PN	RTL8411AAR	RTL8411BA-CG
R295	POP	DEPOP



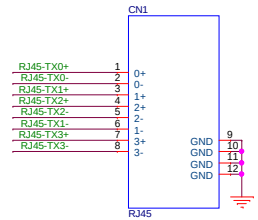


Transformer (LAN)

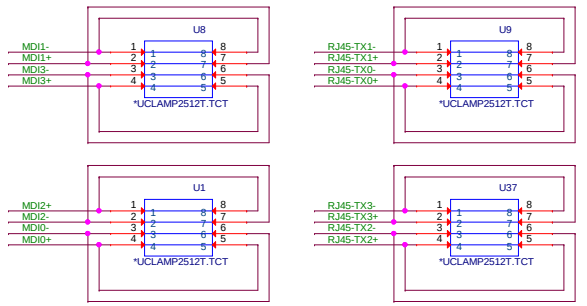
High GDDR5



RJ45 CONNECTOR (LAN)



SURGE (LAN)



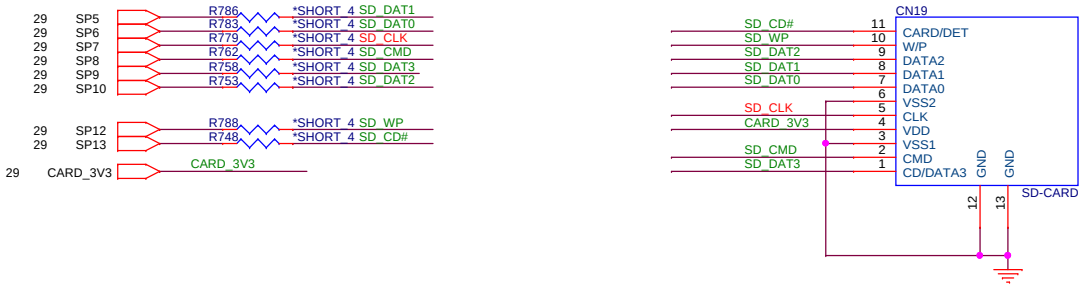
Quanta Computer Inc.

PROJECT : Z8C

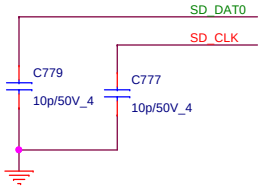
Size	Document Number	Rev
	LAN-RTL8411/CARD READER	3A

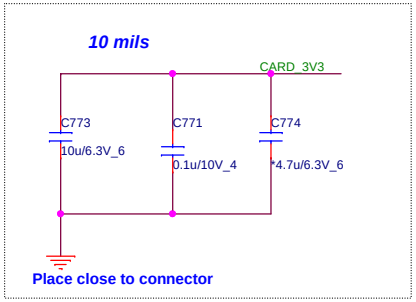
Date: Saturday, November 15, 2014 Sheet 29 of 48

SD/MMC CARD READER CONNECTOR (MMC)



EMI

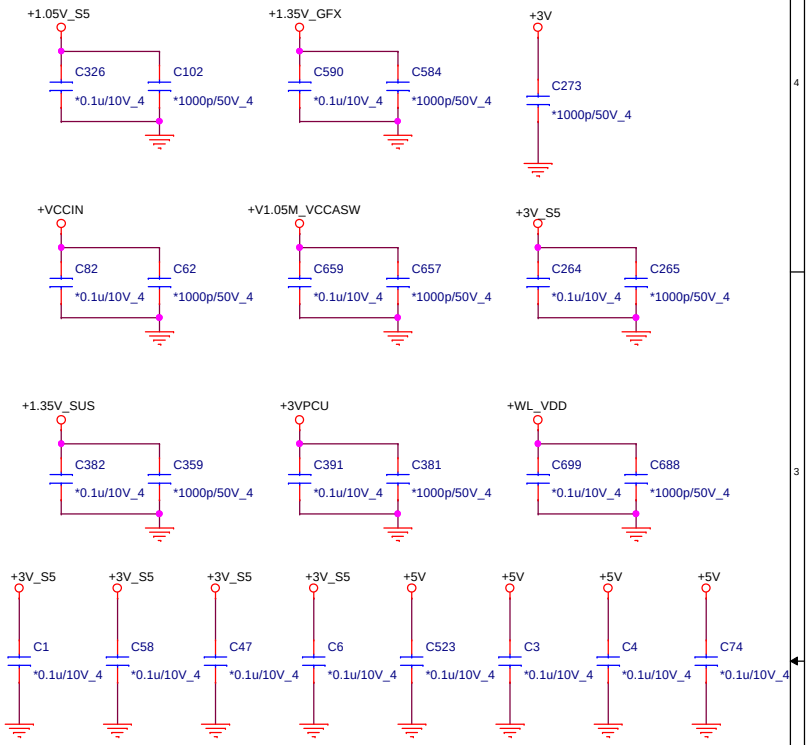


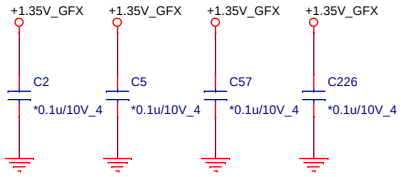


Share Pin

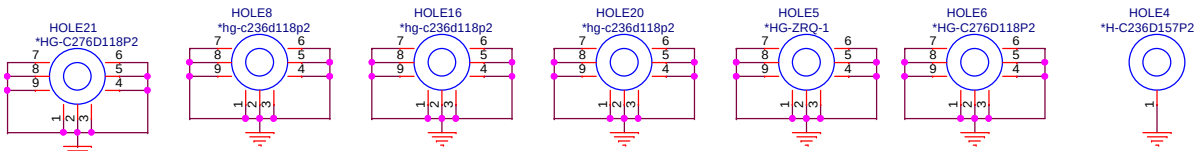
SP1	SD_D7		xD_RDY
SP2	SD_D6	MS_INS#	xD_RE#
SP3	SD_D5		xD_CE#
SP4	SD_D4		xD_WE#
SP5	SD_D1	MS_CLK	xD_D6
SP6	SD_D0	MS_D7	xD_D5
SP7	SD_CLK	MS_D3	xD_D4
SP8	SD_CMD	MS_D6	xD_D3
SP9	SD_D3	MS_D2	xD_D2
SP10	SD_D2		xD_D7
SP11		MS_BS	xD_CLE
SP12	SD_WP	MS_D1	xD_WP#
SP13	SD_CD#	MS_D5	xD_ALE
SP14		MS_D4	xD_D0
SP15		MS_D0	xD_D1
SP16			xD_CD#

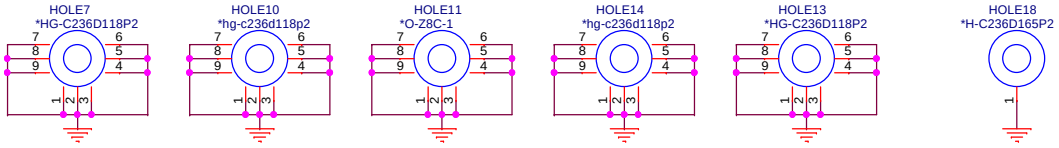
Stitching cap (EMC)

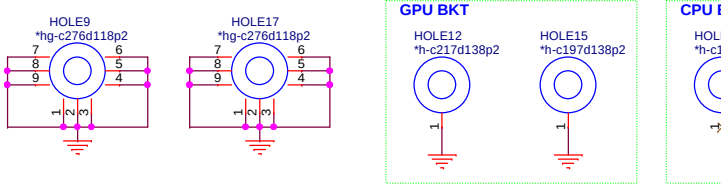




HOLE(OTH)



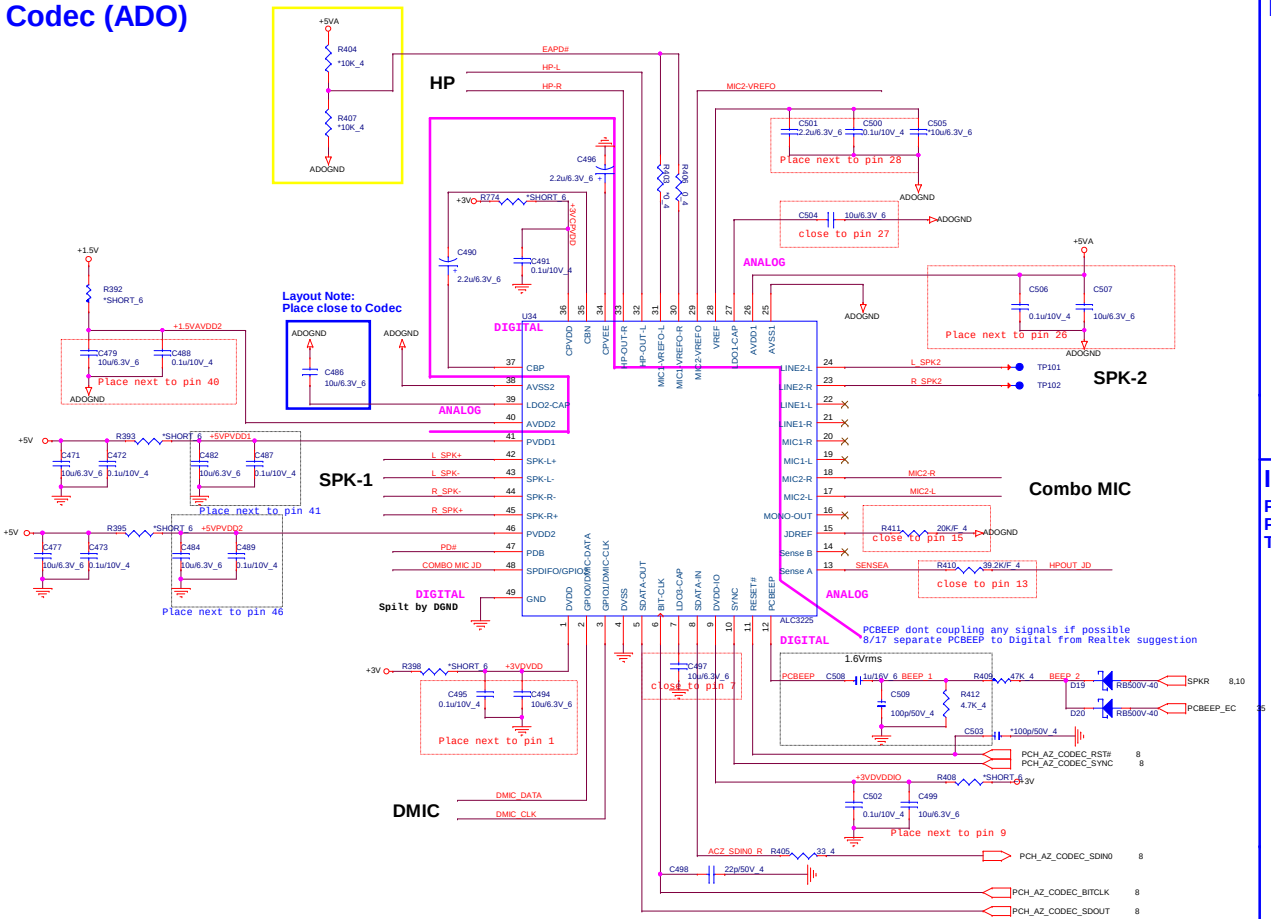




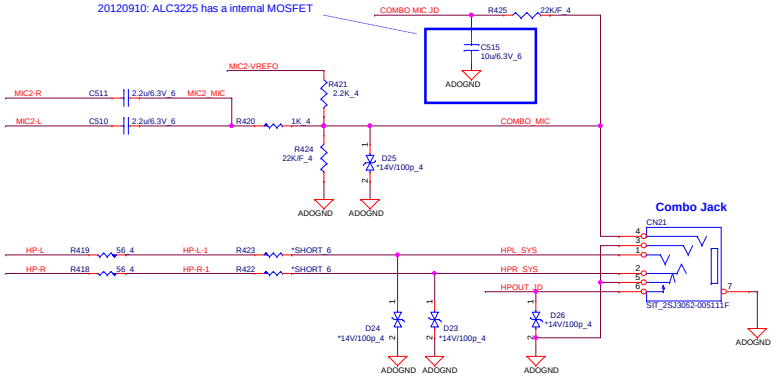
BATT Enable short pad(Remove)

Quanta Computer Inc.			
PROJECT : Z8C			
Size	Document Number		Rev
	CARD READER CONNECTOR		3A
Date: Saturday, November 15, 2014	Sheet 30 of 48		

Codec (ADO)

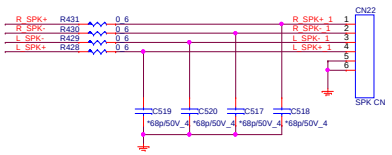


HEADPHONE/Mic combo (AMP)

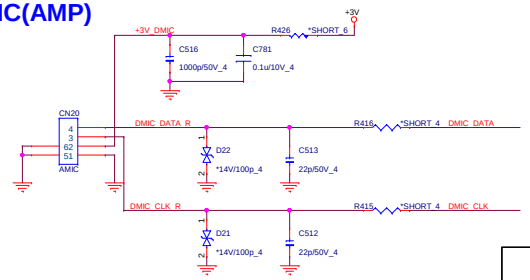


Internal Speaker (AMP) Remove

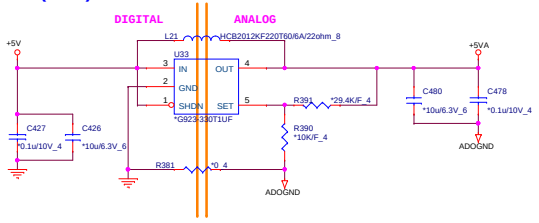
Pin1 - Pin6: DGND
Pin7 - Pin12: AGND
Thermal Pad: DGND

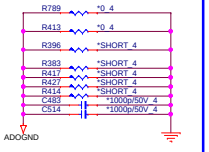


INT DMIC(AMP)

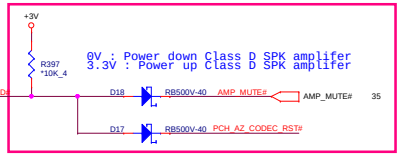


Power(ADO)





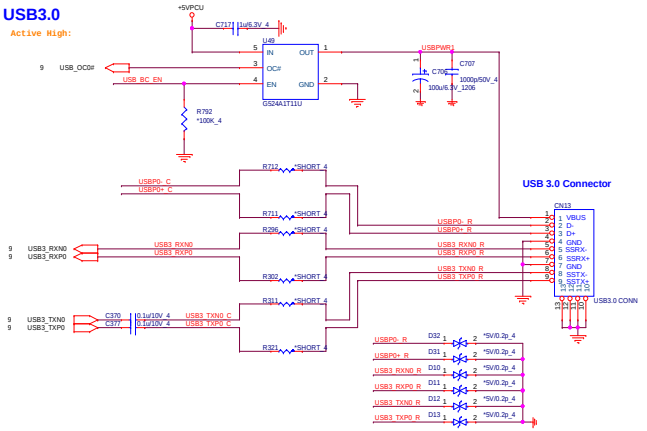
Mute(ADO)



Quanta Computer Inc.			
PROJECT : Z8C			
Size	Document Number		Rev
	REALTEK ALC3225		3A
Date: Saturday, November 15, 2014	Sheet 31 of 48		

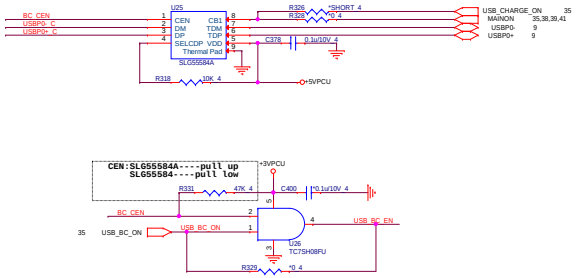
USB3.0

Active High:

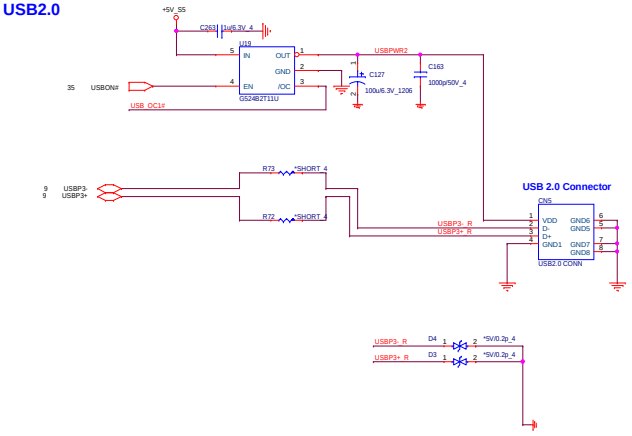


USB Charger to 3.0

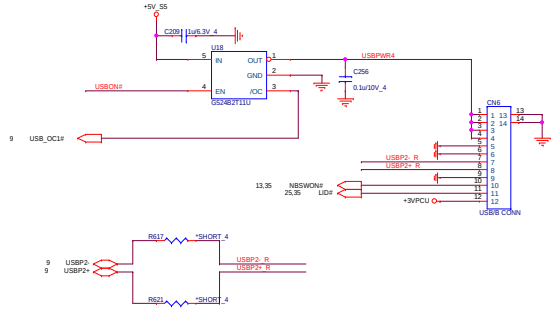
CB	SELCDP	Funcion
0	X	DCP autodetect with mouse/keyboard wakeup
1	0	S0 charging with SDP only
1	1	S0 charging with CDP or SDP only (depending on external device)

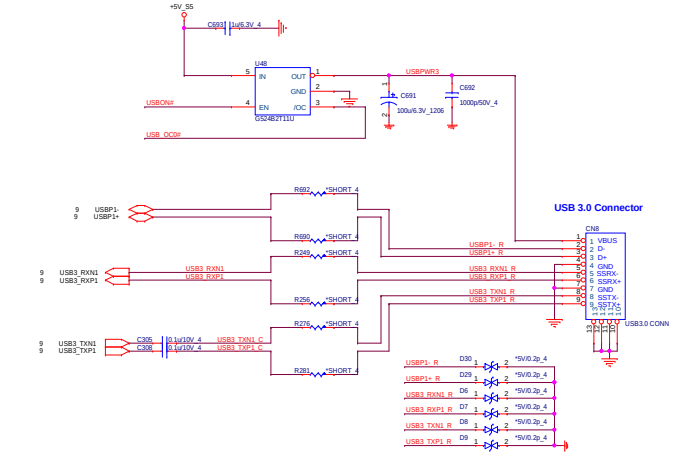


USB2.0



I/O board





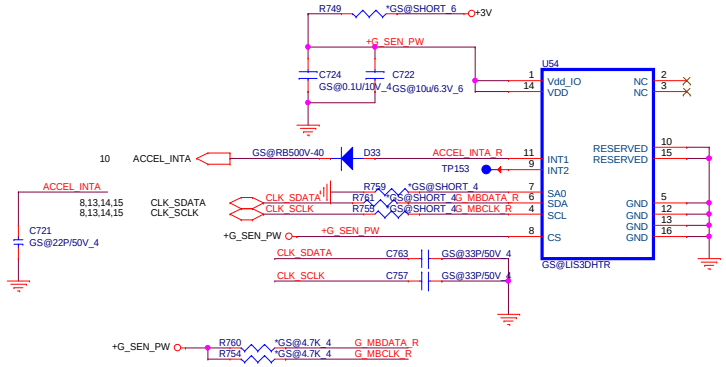
Quanta Computer Inc.

PROJECT : Z8C

Size	Document Number	Rev
	INT&EXT USB	3A
Date: Saturday, November 15, 2014	Sheet 32 of 48	

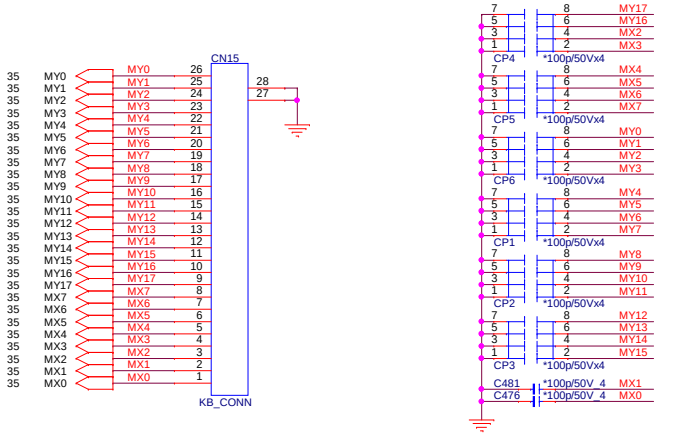
mDP USB3.0 re-driver IC(Remove)

G-sensor

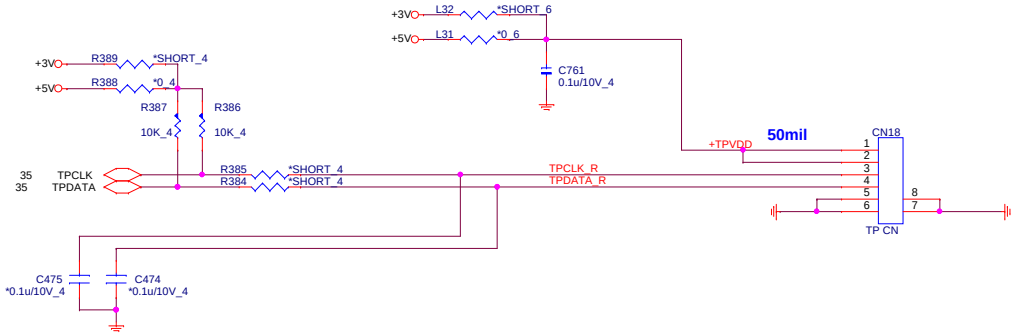


Quanta Computer Inc.		
PROJECT : Z8C		
Size	Document Number: G-Sensor	Rev: A1A
Date: Saturday, November 15, 2014	Sheet 33 of 48	

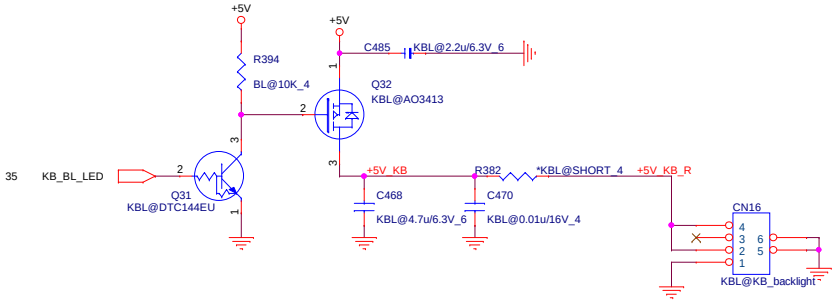
K/B (KBC)



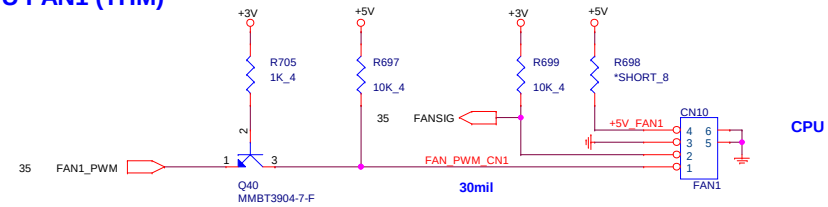
TOUCHPAD BOARD CONN (TPD)



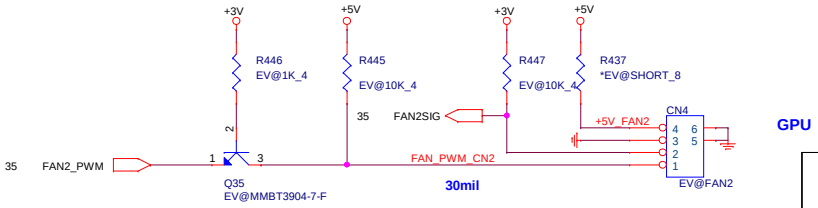
KB_BL LED (KBC)



CPU FAN1 (THM)



CPU FAN2 (THM)



Quanta Computer Inc.
PROJECT : Z8C

Size	Document Number	Rev
	KB/TP/FAN	3A

Date: Saturday, November 15, 2014 Sheet 34 of 48

EC(KBC)

+3VPCU_EC and +3V_RTC minimum trace width 12mils.

12 mils

12 mils

L20 BLM11A05S/0.2A/120ohm_6

+A3VPCU

C430 0.1u/10V_4

ECAGND

+3V_RTC

C397 0.1u/10V_4

+3VPCU_ECPLL

L18 BLM11A05S/0.2A/120ohm_6

+3VPCU_EC (For PLL Power)

C369 0.1u/10V_4

R337 2.2_6

+3VPCU

C402 0.1u/10V_4

C399 0.1u/10V_4

C767 0.1u/10V_4

C372 0.1u/10V_4

C429 0.1u/10V_4

C371 0.1u/10V_4

+3VPCU_EC

+3V

R332 2.2_6

+3V_EC

C407 0.1u/10V_4

HWPG

SUSC# 7,13

SUSB# 7,13

IOAC_LANPWR# 29

R316 *SHORT_4

R317 *SHORT_4

WLAN_WAKE# 27

LAN_WAKE# 29

USB_BC_ON 32

USB_CHARGE_ON 32

CLKRUN# 7,28

TP97

U32

IT8587

IT8587E/FX

LPC

8,27,28 LPC_LAD0

8,27,28 LPC_LAD1

8,27,28 LPC_LAD2

8,27,28 LPC_LAD3

7,13,16,27,28,29 PLTRST#

9 CLK_PCI_EC

8,27,28 LPC_LFRAME#

PLTRST#

PROCHOT_EC

LPCPD#/WUI6/GPE6(Dn)

27 WIGIG_RST#

10,28 IRQ_SERIRQ

10 SIO_EXT_SMI#

10 SIO_EXT_SCI#

WRST#

10 SIO_RCIN#

5 HWPG_1.05V_EC#

GA20/GPB5(X)

SERIRQ/GPM6(X)

ECSMI#/GPD4(Up)

ECSCI#/GPD3(Up)

WRST#

KBRST#/GPB6(X)

PWUREQ#/BBO/SMCLK2ALT/GPC7(Up)/SMCLK2ALT

GPIO

EGCLK/WUI27/GPE3(Dn)

EGAD/WUI26/GPE2(Dn)

ECA0/WUI25/GPE1(Dn)

L80HLA7B/ACI/WUI24/GPE0(Dn)

L80LLA7/WUI7/GPE7(Up)

WUI42/GPH6/ID6(Dn)

WUI41/GPH5/ID5(Dn)

WUI40/GPH4/ID4(Dn)

WUI39/GPH3/ID3(Dn)

WUI38/GPH2/ID2(Dn)

CLKRUN#/WUI16/GPH0/ID0(Dn)

SM BUS

SMCLK0/GPB3(X) 110 MBCLK

SMDAT0/GPB4(X) 111 MBDATA

SMCLK1/GPC1(X) 115 2ND_MBCLK

SMDAT1/GPC2(X) 116 2ND_MBDATA

PECI/SMCLK2/WUI22/GPF6(Up) 117 EC_PECR_R R298 43_4 H_PECI 4

SMDAT2/WUI23/GPF7(Up) 118 EC_FPBACK# 25

PS/2

PS2CLK0/TMB0/CEC/GPF0(Up) 85 IOAC_RST# 27,29

PS2DAT0/TMB1/GPF1(Up) 86 LID# 25,32

PS2CLK2/WUI20/GPF4(Up) 89 TPCLK 34

PS2DAT2/WUI21/GPF5(Up) 90 TPDATA 34

MBCLK 36

MBDATA 36

2ND_MBCLK 8,19

2ND_MBDATA 8,19

PWM

PWM0/GPA0(Up) 24 PWRLED# 28

PWM1/GPA1(Up) 25 BATLED1# 28

PWM2/GPA2(Up) 28 SUSLED# 28

PWM3/GPA3(Up) 29 BATLED0# 28

PWM4/GPA4(Up) 30 APWORK 5,7

PWM5/GPA5(Up) 31 FAN2_PWM 34

SUSLED#

TACH0A/GPD6(Dn) 47 FANSIG 34

TACH1A/TMA1/GPD7(Dn) 48 FAN2SIG 34

TMRI0/WUI2/GPC4(Dn) 120 DNBSWON# 7

TMRI1/WUI3/GPC6(Dn) 124 DPWROK 7

CIR

CRX0/GPC0(Dn) 119

CTX0/TMA0/GPB2(Dn) 123

Follow ZQ9

25 PCH_BLON_EC

39 SUSON

UART port

DAC4/DCD0#/GPJ4(X)

DSR0#/GPG6(X)

GINT/CTS0#/GPD5(Up)

PS2DAT1/RTS0#/GPF3(Up)

DAC5/RIG0#/GPJ5(X)

PS2CLK1/DTR0#/GPF2(Up)

TXD/SOUT0/GPB1(Up)

RXD/SIN0/GPB0(Up)

32,38,39,41 MAINON

27 BT_POWERON

7 EC_PWROK

34 KB_BL_LED

27 IOAC_WLANPWR#

25 COLOR_ENG

36 AC_Protect

31 AMP_MUTE#

BT_POWERON

WAKE UP

PWRSW/GPE4(Up) 125 NBSWON# 13,32

RI1#/WUI0/GPD0(Up) 18 dGPU_OPP# 19

RI2#/WUI1/GPD1(Up) 21 SB_ACDC 36

RING#/PWRFAIL#/CK32KOUT/LPCRST#/GPB7(Dn) 112 RSMRST# 7

NBSWON#

dGPU_OPP#

7 PCH_SLP_SUS#

36 ACIN

36 TEMP_MBAT

TP98

31 PCBEEP_EC

36 D/C#

TP95 G_MBDATA

TP96 G_MBCLK

ADC5/DCD1#/WUI29/GPI5(X)

ADC6/DSR1#/WUI30/GPI6(X)

ADC7/CTS1#/WUI31/GPI7(X)

RTS1#/WUI5/GPE5(Dn)

PWM7/RIG1#/GPA7(Up)

DTR1#/SBUSY/GPG1/ID7(Dn)

CTX1/WUI18/SOUT1/GPH2/SMDAT3/ID2(Dn)

CRX1/WUI17/SIN1/SMCLK3/GPH1/ID1(Dn)

EXTERNAL SERIAL FLASH

8 PCH_SPI_CLK_EC

8 SPI_CS0#_UR_ME

8 PCH_SPI_SI_EC

8 PCH_SPI_SO_EC

FSCK/GPG7

FSCE#/GPG3

FMOSI/GPG4

FMISO/GPG5

A/D D/A

ADC0/GPI0(X) 66 ICMNT RF_EN 27

ADC1/GPI1(X) 67 C469 10u/6.3V_6 ECAGND ICMNT 36

ADC2/GPI2(X) 68 TPD_INT#

ADC3/GPI3(X) 69 VRON 40

ADC4/WUI28/GPI4(X) 70 FB_CLAMP_REQ# FB_CLAMP_REQ# 19

TACH2/GPJ0(X) 76 dGPU_OTP# 19

GPJ1(X) 77 EC_FB_CLAMP EC_FB_CLAMP 17,19

DAC2/TACH0B/GPJ2(X) 78 PCH_PWROK 5,7

DAC3/TACH1B/GPJ3(X) 79 USBON# 32

CLOCK

CK32KE/GPJ7 2

CK32K/GPJ6 128 R323 *0_4 PCH_SUSACK# 7 PCH_SUSPWARN# 7

KBMX

KSO0/PD0

KSO1/PD1

KSO2/PD2

KSO3/PD3

KSO4/PD4

KSO5/PD5

KSO6/PD6

KSO7/PD7

KSO8/ACK#

KSO9/BUSY

KSO10/PE

KSO11/ERR#

KSO12/SLCT

KSO13

KSO14

KSO15

KSO16/SMOSI/GPC3(Dn)

KSO17/SMISO/GPC5(Dn)

PWM6/SSCK/GPA6(Up)

SPI ENABLE

SSCE0(X)/GPG2(X)

SSCE1#/GPG0(X)

S5_ON 37,38,41

ME_WR# 8

MY16 34

MY17 34

FAN1_PWM 34

MY0 34

MY1 34

MY2 34

MY3 34

MY4 34

MY5 34

MY6 34

MY7 34

MY8 34

MY9 34

MY10 34

MY11 34

MY12 34

MY13 34

MY14 34

MY15 34

MX0 34

MX1 34

MX2 34

MX3 34

MX4 34

MX5 34

MX6 34

MX7 34

C410 0.1u/10V_4

L19 BLM11A05S/0.2A/120ohm_6

ECAGND

Please do not place any pull-up resistor on GPG0, GPG2, and GPG6 (Reserved hardware strapping).

SSCE0#

SM BUS ARRANGEMENT TABLE

SM Bus 1	Battery
SM Bus 2	PCH/VGA
SM Bus 3	N/A
SM Bus 4	

+3VPCU

S5_ON R315 10K_4

NBSWON# R310 10K_4

+3V_GFX

dGPU_OTP# R361 EV@10K_4

dGPU_OPP# R362 EV@10K_4

FB_CLAMP_REQ# R380 EV@10K_4

MAINON R347 100K_4

SUSON R312 100K_4

VRON R491 100K_4

PCH_SPI_SI_EC R314 *10K_4

PCH_SPI_SO_EC R720 *10K_4

SM BUS PU(KBC)

+3VPCU

MBCLK R301 4.7K_4

MBDATA R313 4.7K_4

+3V_S5

2ND_MBCLK R300 4.7K_4

2ND_MBDATA R299 4.7K_4

H_PROCHOT# 4,36,40

PROCHOT_EC

Q29 2N7002K

R367 100K_4

TPD_INT#

Q30 *2N7002K

TPD_INT#_D

TPD_INT#_D 2

HWPG(KBC)

DDR=1.5V, D1 DNP and D2 POP

DDR=1.35V, D1 POP and D2 DNP

+3V

R344 10K_4

D1

D2

41 HWPG_1.5V

5 HWPG_1.05V

39 HWPG_VDDR

13,38 HWPG_1.05V_S5

37 SYS_HWPG

D38 RB500V-40

D14 *RB500V-40

D36 *RB500V-40

D34 RB500V-40

D37 RB500V-40

HWPG

For test only

SW1

TP100

TP99

NBSWON#

*Power Switch

iRST

+3V

C387 *0.1u/10V_4

IOAC_RST#

PCI_PLTRST# 7

PCIERST#

PCIERST# 27,29

U27 *TC7SH08FU

R341 *100K_4

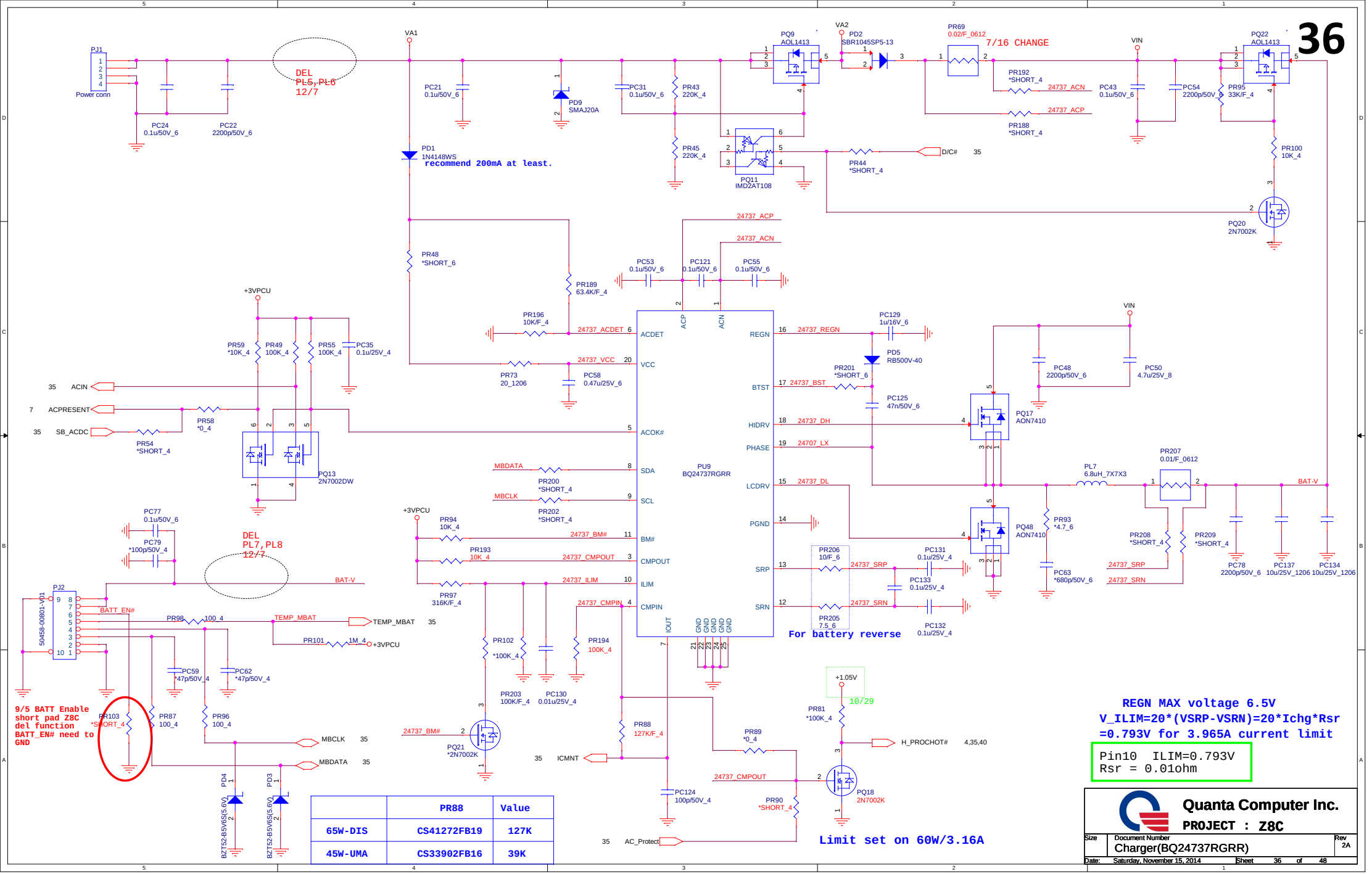
R335 *100K_4

Quanta Computer Inc.

PROJECT : Z8C

Size | Document Number: KBC IT8587 | Rev: 3A

Date: Saturday, November 15, 2014 | Sheet 35 of 48



	PR88	Value
65W-DIS	CS41272FB19	127K
45W-UMA	CS33902FB16	39K

Quanta Computer Inc.
PROJECT : Z8C

Size	Document Number	Rev
	Charger(BQ24737RGRR)	2A

Date: Saturday, November 15, 2014 Sheet 36 of 48

MAIND → MAIND 38,39,41

SYS_SHDN# → SYS_SHDN# 10,28,41

+5VPCU
5 Volt +/- 5%
TDC : 5.4A
PEAK : 7.2A
OCP : 9A
Width : 220mil

+3VPCU
3.3 Volt +/- 5%
TDC : 4.7A
PEAK : 6.2A
OCP : 7.5A
Width : 200mil

OCP:9A
L(ripple current)
=(9-5)*5/(2.2u*0.3M*9)
=3.367A
Iocp=9-(3.367/2)=7.32A
Vth=7.32A*14mOhm+1mV=103.43mV
R(Ilim)=(103.43mV*8)/10uA
=82.774K

OCP:7.5A
L(ripple current)
=(9-3.3)*3.3/(2.2u*0.355M*9)
~2.676A
Iocp=7.5-(2.676/2)=6.16A
Vth=6.16A*14mOhm+1mV=87.27mV
R(Ilim)=(87.27mV*8)/10uA
~69.81K

TDC : 1.5A
PEAK : 2A
Width : 80mil

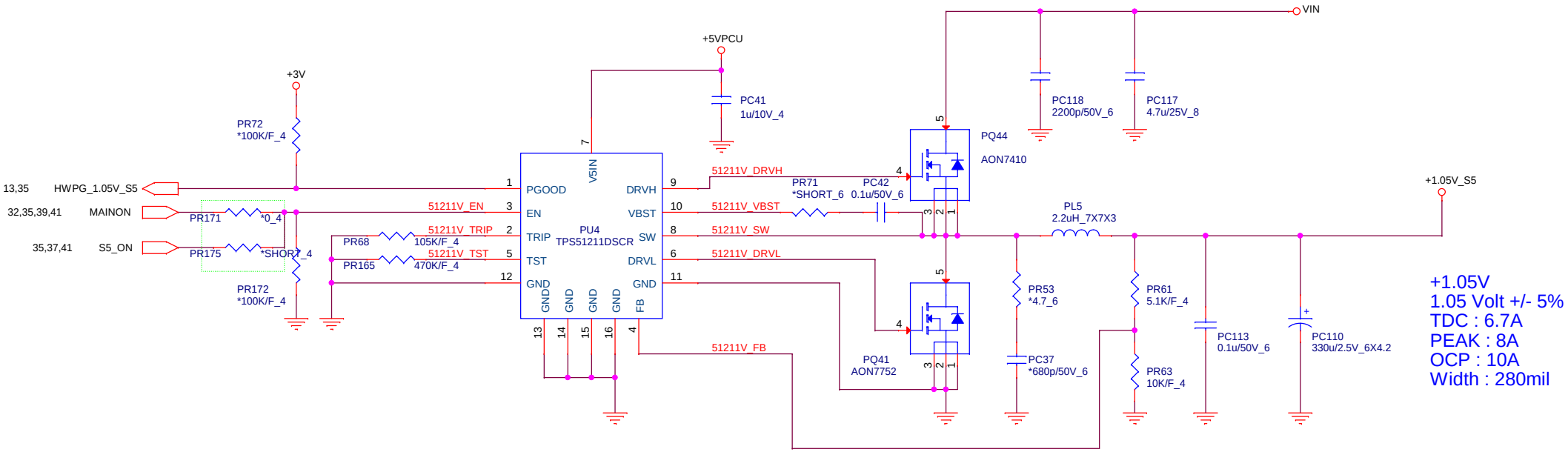
TDC : 2.4A
PEAK : 3.2A
Width : 100mil

TDC : 1.4A
PEAK : 1.8A
Width : 110mil

TDC : 1.2A
PEAK : 1.6A
Width : 60mil

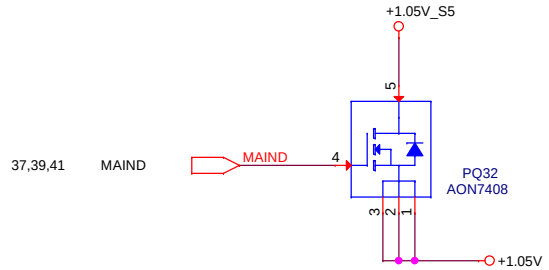
Quanta Computer Inc.
PROJECT : Z8C

Size	Document Number	Rev
	SYSTEM 5V/3V (TPS51225)	2A
Date: Saturday, November 15, 2014	Sheet 37 of 48	



+1.05V
1.05 Volt +/- 5%
TDC : 6.7A
PEAK : 8A
OCP : 10A
Width : 280mil

OCP=10A
L ripple current
=(19-1.05)*1.05/(2.2u*290k*19)
=1.555A
Vtrip=10-(1.555/2)*14mohm
=0.129V
Rlimit=0.129/10uA*8=103.293Kohm



TDC : 2.4A
PEAK : 3.2A
Width : 100mil

Quanta Computer Inc.		
PROJECT : Z8C		
Size	Document Number: +1.05V(TPS51211)	Rev: 2A
Date: Saturday, November 15, 2014	Sheet 38 of 48	

Mode	Frequency	Discharge mode
200K	400K	Tracking Discharge
100K	300K	Tracking Discharge

	S3	S5	+1.35VSUS	REF	VTT
S0	1	1	ON	ON	ON
S3 (mainon off)	0	1	ON	ON	OFF
S4/S5	0	0	OFF	OFF	OFF

OCP=10A
L ripple current
=(19-1.35)*1.35/(0.68u*400k*19)
=4.611A
Vtrip=10-(4.611/2)*2.5mohm
=0.01923V
Rlimit=0.01923/10uA*8=15.389Kohm

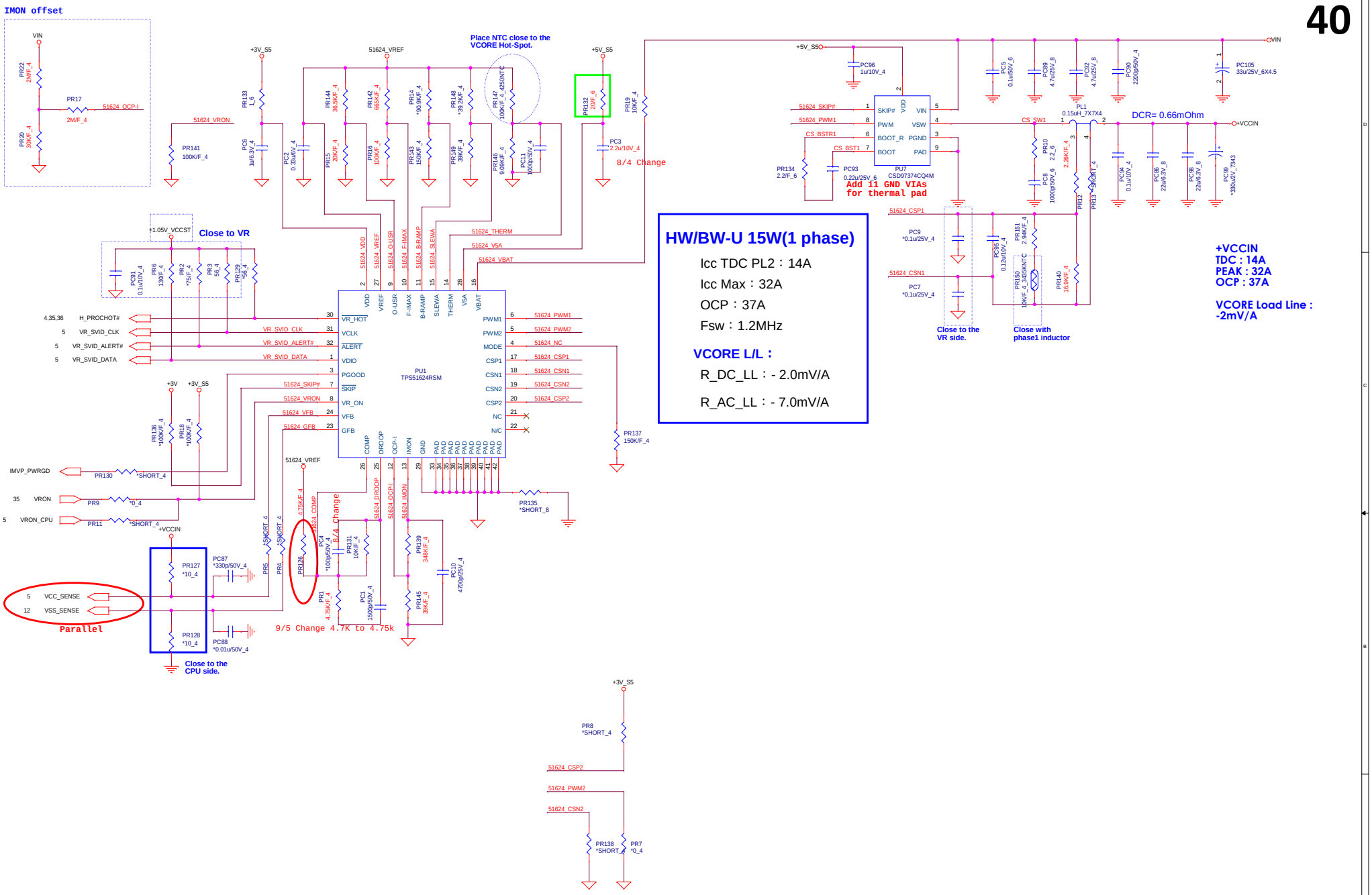
OCP=20A
L ripple current
=(19-1.5)*1.5/(0.68u*400k*19)
=5.079A
Vtrip=20-(5.079/2)*2.5mohm
=0.04365V
Rlimit=0.04365/10uA*8=34.92Kohm

DDR=1.35V
OCP=10A
PR95=15.4K/F_4
PR97=30.1K/F_4

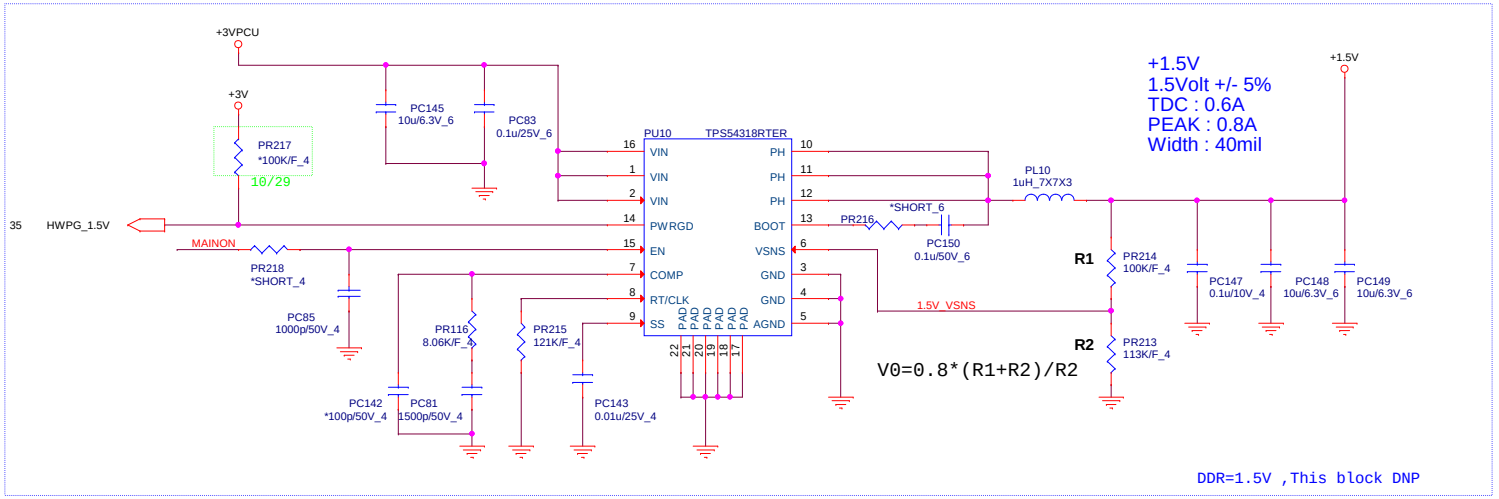
DDR=1.5V
OCP=20A
PR95=35.7K/F_4
PR97=51K/F_4

Quanta Computer Inc.
PROJECT : Z8C

Size	Document Number	Rev
	DDR 1.35V(TPS51216)	2A
Date: Saturday, November 15, 2014	Sheet 39 of 48	



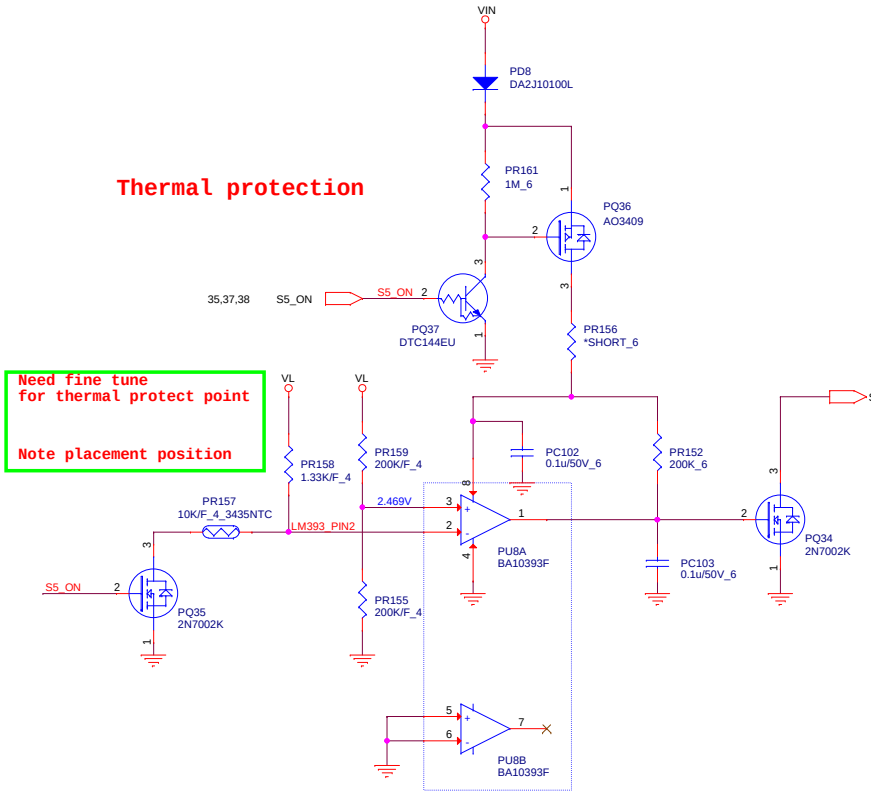
Quanta Computer Inc.	
PROJECT : Z8C	
Size	Document Number: +VCCIN(TPS51624) — Rev: 2A
Date: Saturday, November 15, 2014	Sheet 40 of 48



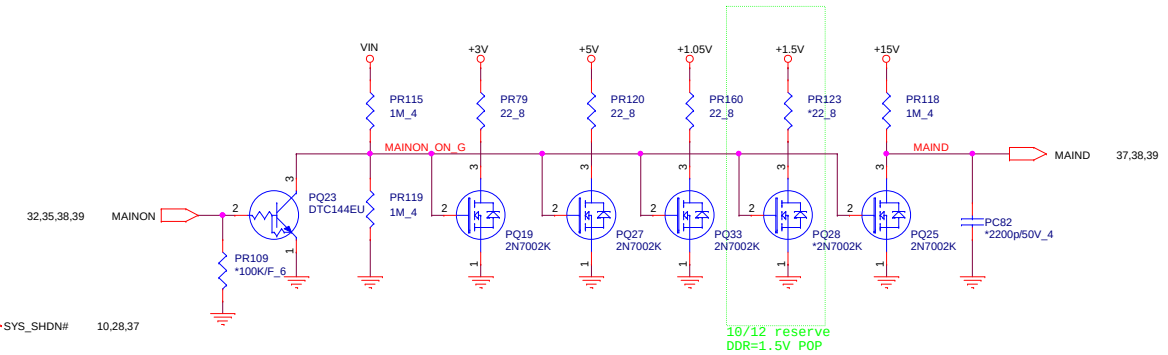
Thermal protection

Need fine tune
for thermal protect point

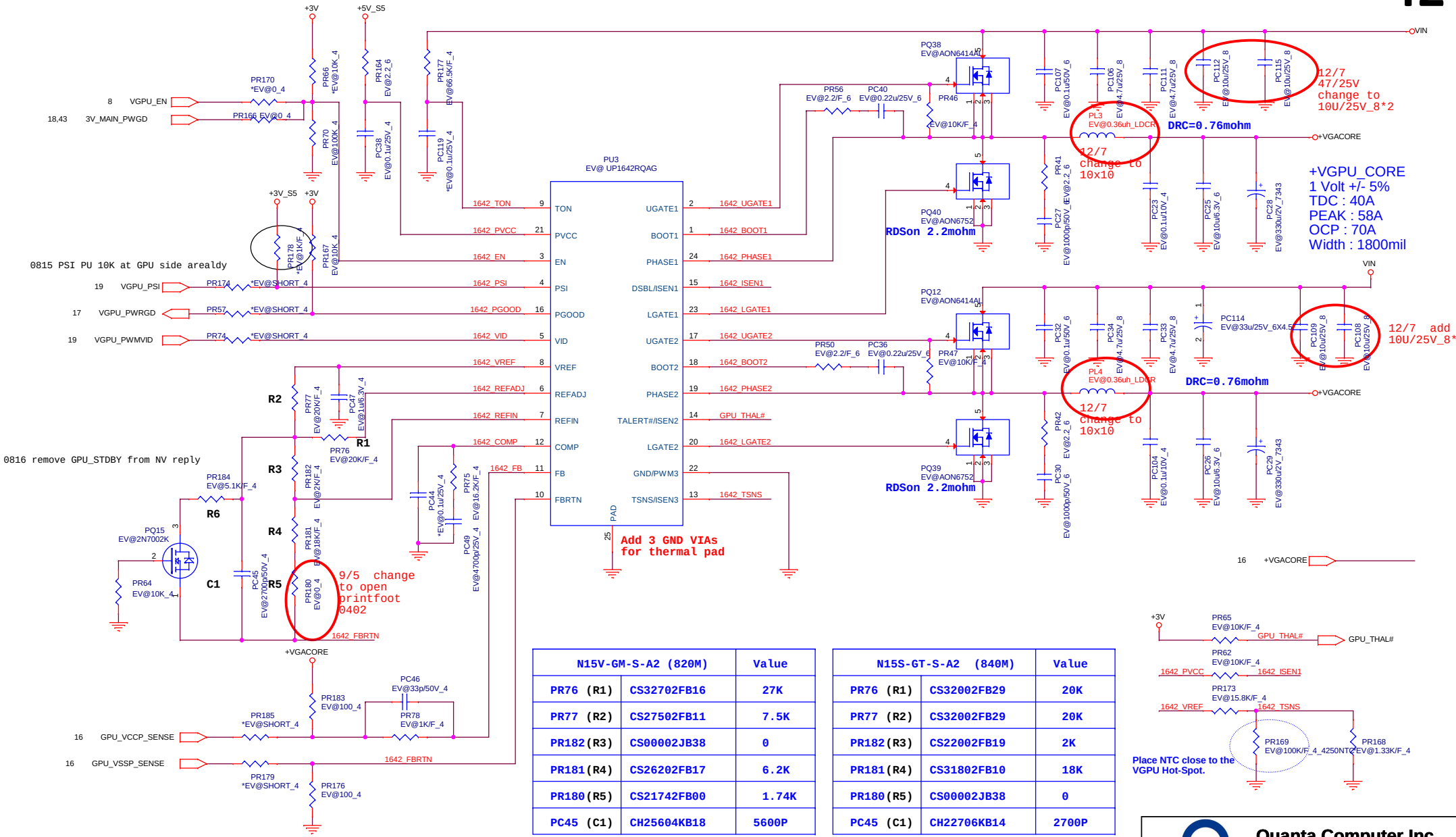
Note placement position



For EC control thermal protection (output 3.3V)



Quanta Computer Inc.		
PROJECT : Z8C		
Size	Document Number: +1.5V/+1.8V/Thermal protect	Rev: 2A
Date: Saturday, November 15, 2014	Sheet 41 of 48	

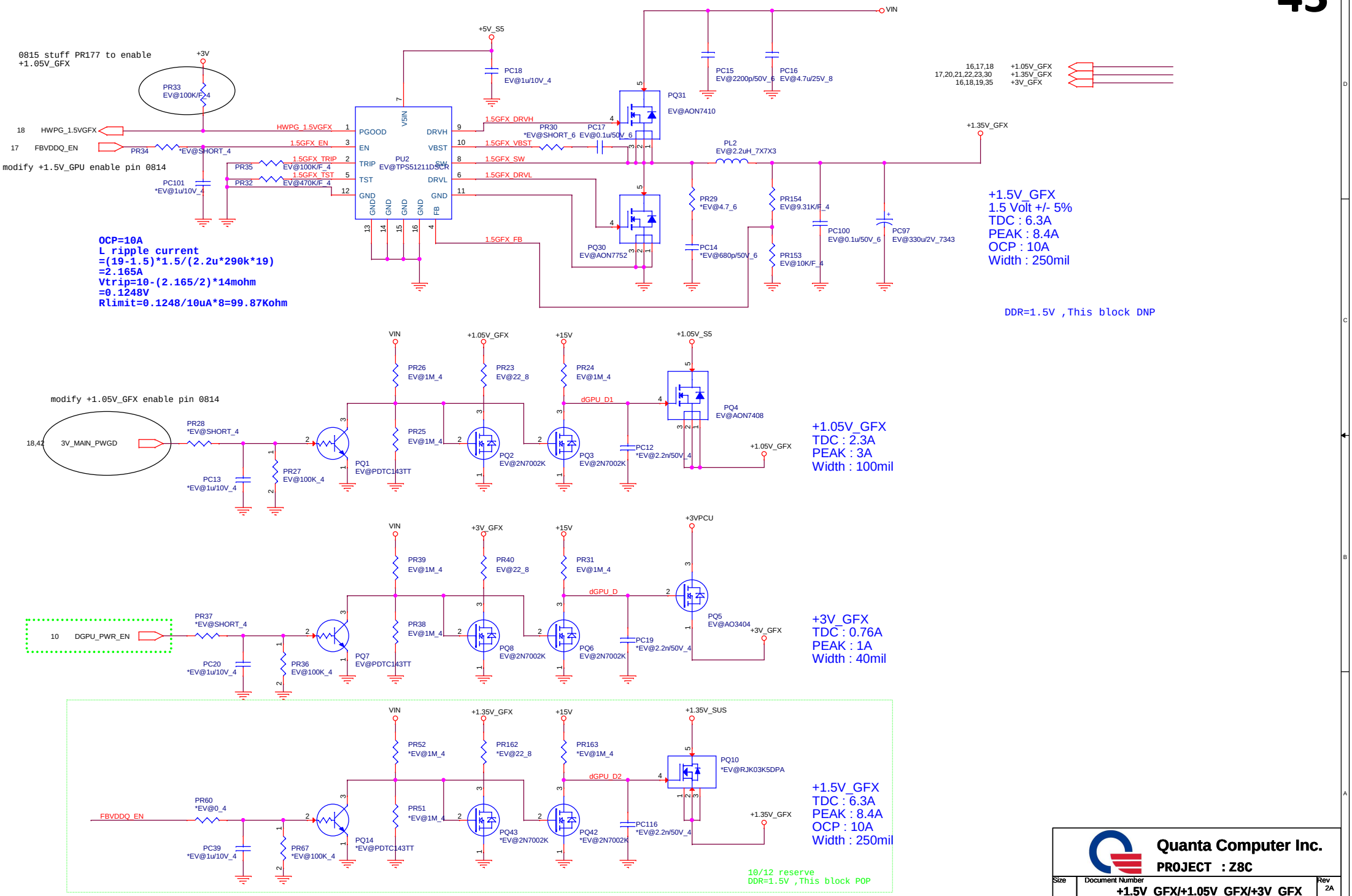


N15V-GM-S-A2 (820M)		Value
PR76 (R1)	CS32702FB16	27K
PR77 (R2)	CS27502FB11	7.5K
PR182(R3)	CS00002JB38	0
PR181(R4)	CS26202FB17	6.2K
PR180(R5)	CS21742FB00	1.74K
PC45 (C1)	CH25604KB18	5600P

N15S-GT-S-A2 (840M)		Value
PR76 (R1)	CS32002FB29	20K
PR77 (R2)	CS32002FB29	20K
PR182(R3)	CS22002FB19	2K
PR181(R4)	CS31802FB10	18K
PR180(R5)	CS00002JB38	0
PC45 (C1)	CH22706KB14	2700P

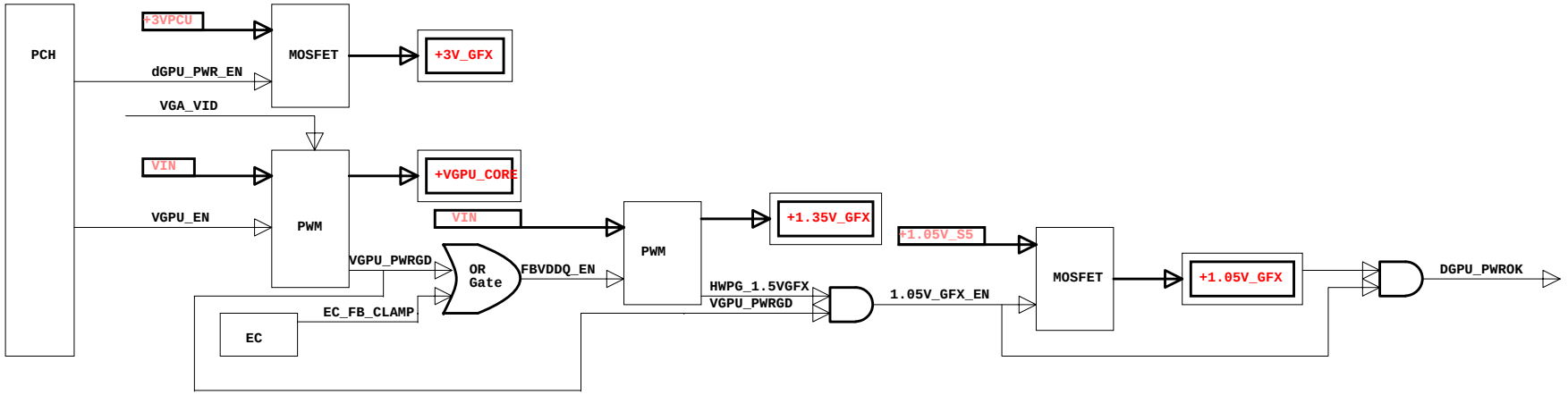
Quanta Computer Inc.
PROJECT : Z8C

Size	Document Number	Rev
	+VGPU_CORE(UP1642PQAG)	2A
Date: Saturday, November 15, 2014	Sheet 42 of 48	

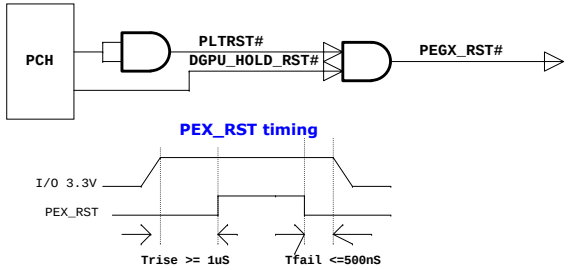


Quanta Computer Inc. PROJECT : Z8C			
Size	Document Number: +1.5V_GFX/+1.05V_GFX/+3V_GFX		Rev 2A
Date: Saturday, November 15, 2014	Sheet 43 of 48		

VGA power up sequence



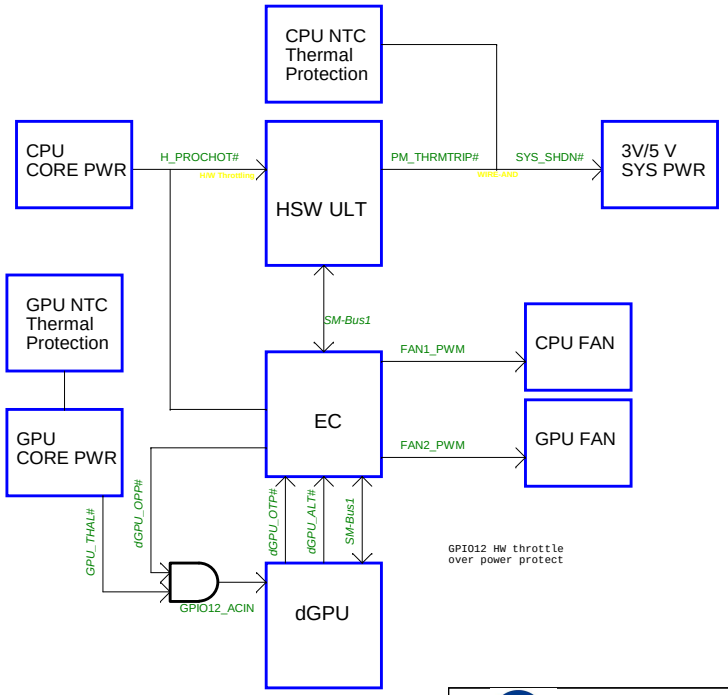
VGA Reset



Power States

POWER PLANE	VOLTAGE	DESCRIPTION	CONTROL SIGNAL	ACTIVE IN
VIN	+10V~+19V	MAIN POWER	ALWAYS	ALWAYS
+3V_RTC	+3V~+3.3V	RTC POWER	ALWAYS	ALWAYS
+3VPCU	+3.3V	EC POWER	ALWAYS	ALWAYS
+5VPCU	+5V	USB CHARGE POWER	ALWAYS	ALWAYS
+15V	+15V	CHARGE PUMP POWER	ALWAYS	ALWAYS
+3V_S5	+3.3V	LAN/BT POWER	S5_ON	S0-S5
+5V_S5	+5V	USB POWER	S5_ON	S0-S5
+5V	+5V	HDD/SPK/HDMI POWER	MAINON	S0
+3V	+3.3V	PCH/GPU/Peripheral component POWER	MAINON	S0
+1.35VSUS	+1.35V	CPU/SODIMM/MD POWER	SUSON	S0-S3
+DDR_VTT_RUN	+0.675V	SODIMM/MD Termination POWER	MAINON	S0
LCDVCC	+3.3V	LCD POWER	LVDS_VDDEN	S0
+1.5V	+1.5V	MINI CARD/NEW CARD POWER	MAINON	S0
+1.05V	+1.05V	PCH CORE VCCST POWER	MAINON	S0
+VCCIN	variation	CPU CORE POWER	VRON	S0
+VGPU_CORE	variation	External GPU POWER	VGPU_EN	S0
+3V_GFX	+3.3V	External GPU POWER	dGPU_PWR_EN	S0
+1.35V_GFX	+1.35V	External GPU POWER	FBVDDQ_EN	S0
+1.05V_GFX	+1.05V	External GPU POWER	1.05V_GFX_EN	S0

Thermal Follow Chart

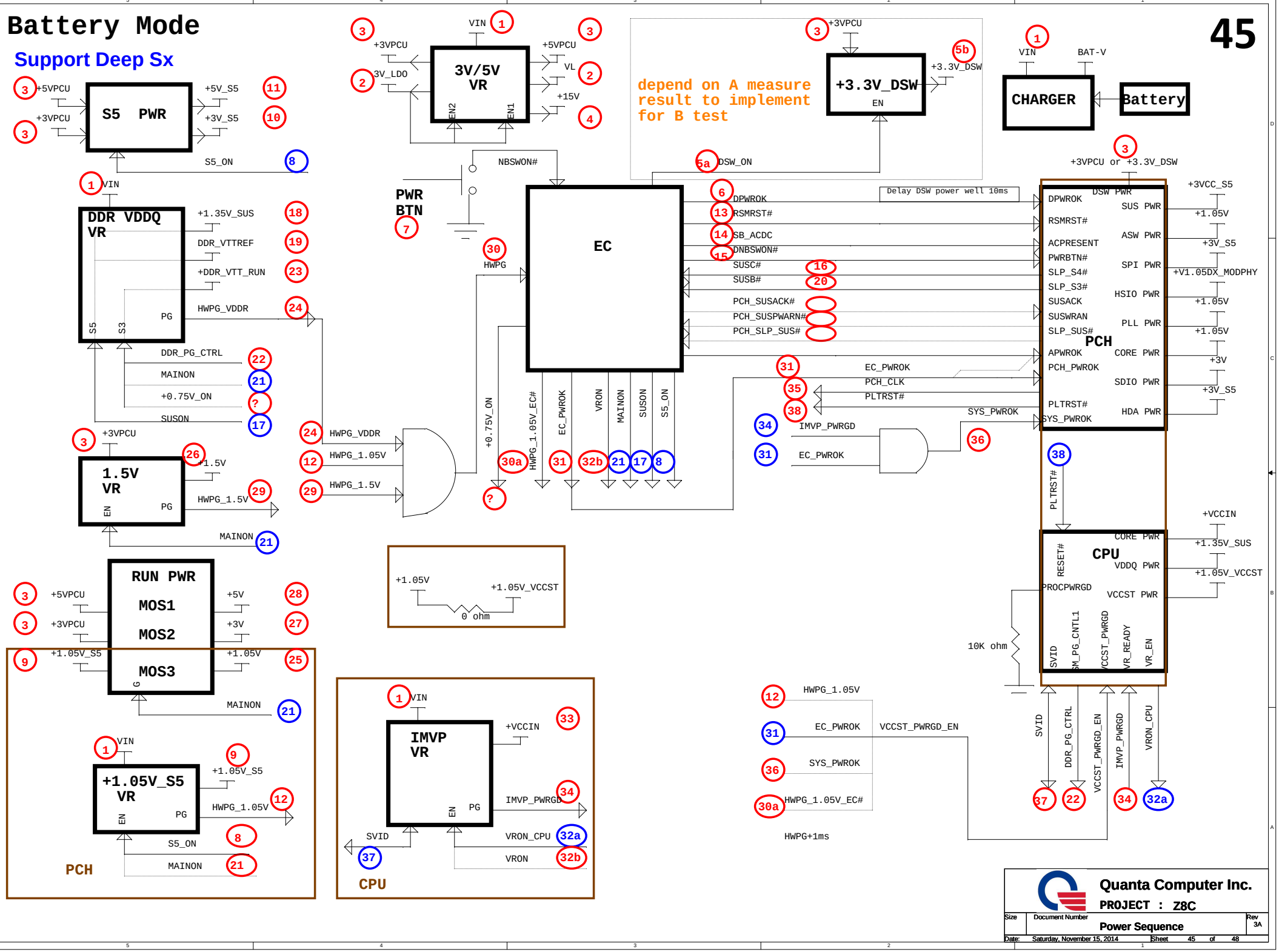


dGPU_OPP# EC notify HW throttle over power protect
dGPU_ALT# for ADPS circuit to infrom EC NV dGPU VPS Alert
dGPU_OTP# VGA thrmtrip# => inform EC over temperature protect

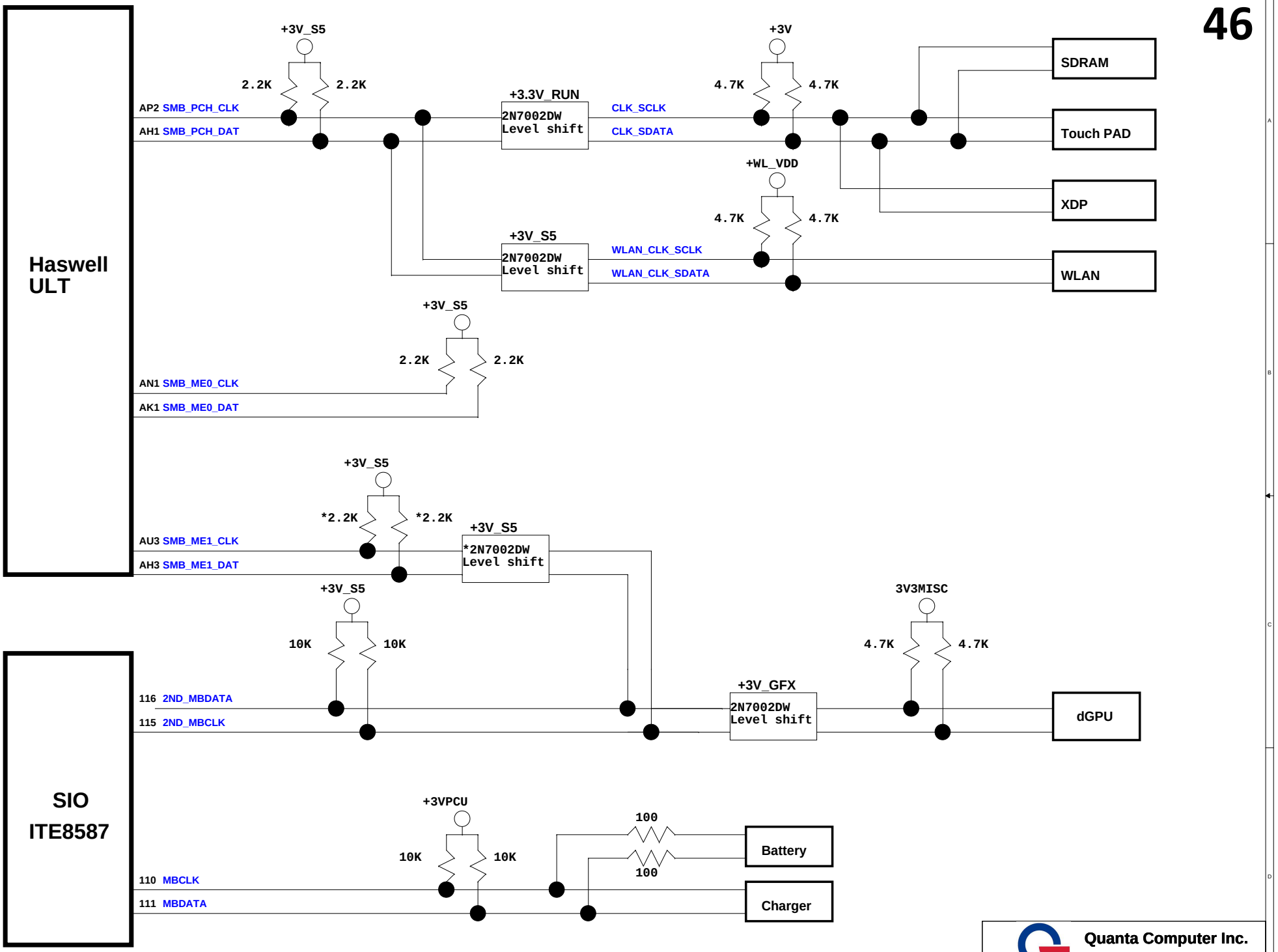
Quanta Computer Inc.
PROJECT : Z8C
Size | Document Number: PWR Status & GPU PWR CRL & THRM | Rev 3A
Date: Saturday, November 15, 2014 | Sheet 44 of 48

Battery Mode

Support Deep Sx

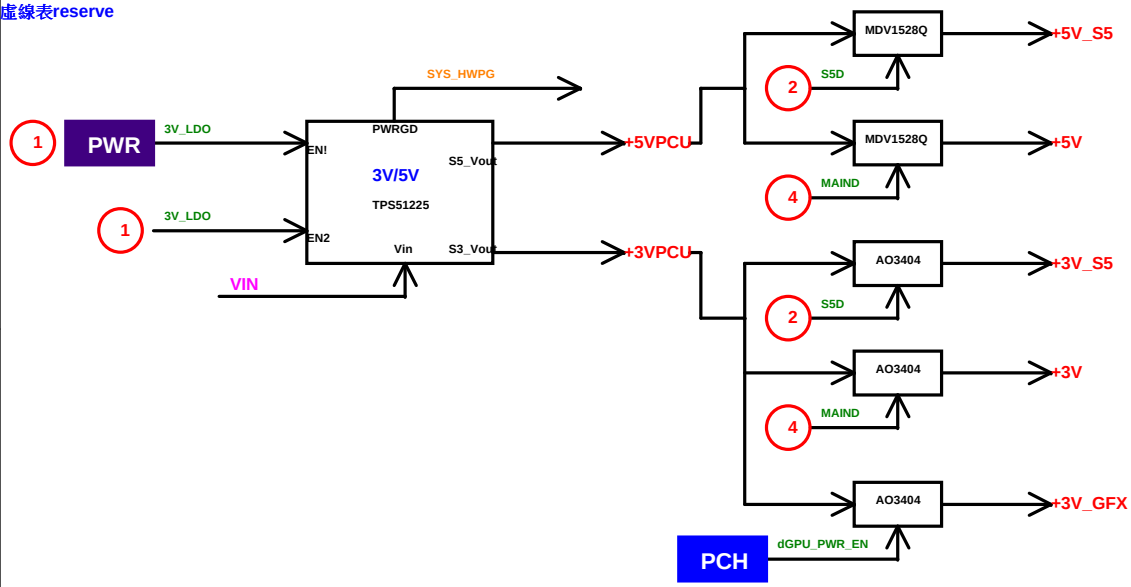


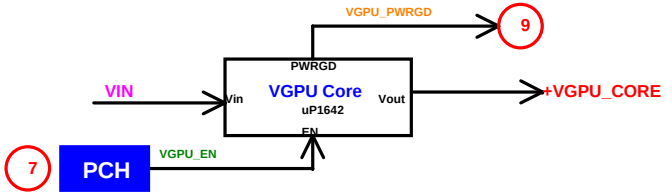
Quanta Computer Inc.	
PROJECT : Z8C	
Size	Document Number: Power Sequence
Rev	3A
Date: Saturday, November 15, 2014	Sheet 45 of 48

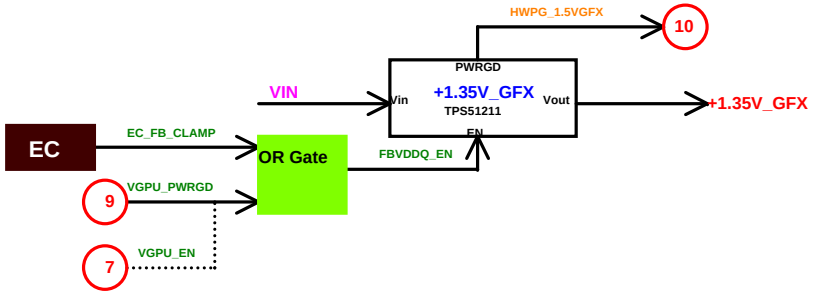


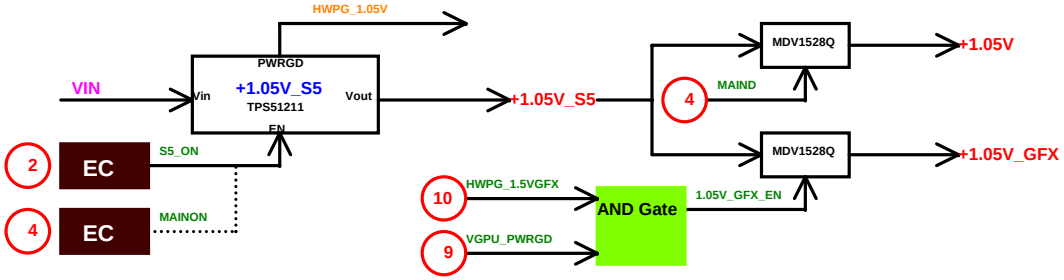
Quanta Computer Inc.
PROJECT : Z8C
Size | Document Number | Rev 3A
Block Diagram
Date: Saturday, November 15, 2014 Sheet 46 of 48

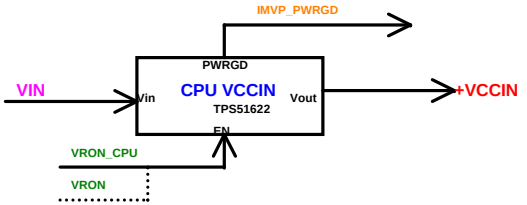
實線表defult
虛線表reserve

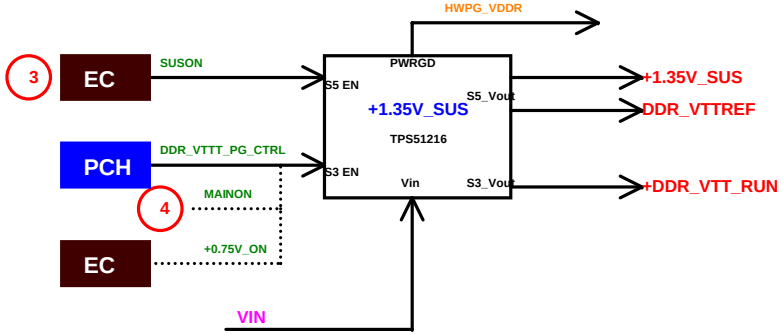


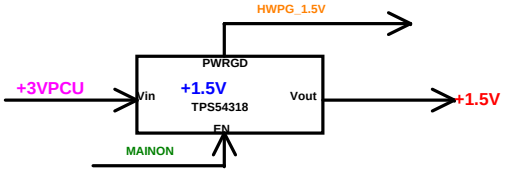












Quanta Computer Inc.
PROJECT : Z8C

Size	Document Number	Rev
	ULT PWR CONTROL	3A

Date: Saturday, November 15, 2014 Sheet 47 of 48

Model	Version	CHANGE LIST
Z8C	A	**BA42_HB** 1. Remove DP and 1 USB 2.0 , TPM Connect (reserve on board) (Page 23,27,31) 2. Add 2 USB 3.0 and CRT on MB . (Page 31) 3. Change Y7 to small size crystal. (Page 08) 4. Reserve C486 for DMIC power. (Page 30) 5. Add ODT1,CS1,CKE1.ZQ1 to supoort 512MX16. (Page 14) 6. Change USB 3.0 , TP , FP , NGFF , SPK connect. 7. Remove Lid SWSW6 and Screw Pad fo 2014 Acer spec. (Page 29) 8. Modify EC pin define to follow ZQ0. (Page 34) 9. Add GC6_FB_EN and resever DGPU_EVENT# for GC6 funtion. (Page 19,20) 10. Remove U34 EC ROM. (Page 08) 11 Chagne Z8C GPIO pin define same as. ZQ0. (Page 02~13) 12 Remove U40 LDO circuit and change to PR233. (Page 11) 13 Remove SMBUS Q66 for NGFF. (Page 26)
	B	14 Change WIGIG PCIE from port 1 to port 2. (Page 09) 15 Change CN6,CN7,CN8,CN13,CN15,CN16,CN17,JDIM1 footprint for SMT request. 16 Correct L18,L19,L20 footprint from 0603 to 0402. (Page 35) 17 Add R790,R791_0 ohm (CS00002JB38) for wigig CLK and swap USB4 D+/D-. (Page 27) 18 Change U18,U19,U48 to SOT23 type AL000524007,and U49 to SOT23 type AL000524003. (Page 32) 19 PR103 Change from 0 ohm to shorpad , PR180 from short pad to 0 ohm. (Page 36, 42) 20 PR126 change to 4.75K CS24752FB12. (Page 40) 21 pop C512,C513_22p (CH02206JB08)for DMIC EMI request. pop C486_1000p (CH21006JB10) and add C781_0.1u(CH41002KB93) for DMIC EMI request. (Page 31) 22 pop R450,R451,R452,R453_100 ohm (CS11002FB22)f or HMDI EMI request. (Page 26) 23 Change CN3 CRT Connect to DFDS15FR425 for SMT request . (Page 24) 24 Change R70 from 4.7K to 1.5K(CS21502FB14)for GPU Core not turn on issue.. (Page 18) 25 Non stuff R754,R760. (Page 33) 26 Hole19 change to MBZRQ002010. Hole12,Hole15 change to MBZRQ001010 .
	C	27 Change Q21 ,Q22,Pin 2 ,5 from +WL_VDD to +3V_S5. (Page 27) 28 Change R332 from shoart pad to 2.2 ohm. (Page 35) 29 unstuff Q39. (Page 05) 30 Cancle Colay L1, L6,L22,L24. (Page 29) 31 Short Pad 0402: R85,R377,R497,R601,R616,R679,R183,R124,R218,R181,R217,R759,R755,R761,R316,R317,R711,R712,R296,R302,R311,R321,R72,R73,R692,R690,R249,R256,R276,R281,R518 Short Pad 0603: R273,R494,R319,R320, 32 Remove J1. (Page 08) 33 Stuff KB Backlight funtion -R394,Q31,C485,C468,C470,CN16 (Page 34) 34 PR139 change from 365k(CS43652FB10) to 348k(CS43482FB16). (Page 40) 35 Unstuff RP1,it is internal pu high from EC. (Page 34) 36 Remove R714,R715. (Page 34) 37 Change PU5 from TPS51225BRUKR to TPS51225RUKR. (Page 37) 38 UnStuff R177 and R182 . (Page 19) 39 UnStuff Q30 . (Page 35) 40 Change PR154 from 11.5k to 9.31k for 1.35GFX . (Page 43)
	D	41 Short Pad 0402: R1,R2,R27,R29,R199,R294,R307,R383,R389,R396,R414,R417,R427,R434,R438,R460,R464,R769,R785 Short Pad 0603: R79,R84,R113,R145,R168,R186,R200,R205,R211,R426,R749,L32, Short Pad 0805: PR21,R117,R128,R133,R144,R165,R229,R232,R437,R698,R708,R713 42 Remove JP1,JP2,JP3

DOC NO.	PROJECT MODEL :	ZRQ	APPROVED BY:		DATE:	
	PART NUMBER:		DRAWING BY:		REVISON:	

Quanta Computer Inc.
PROJECT : Z8C
Size: Document Number: Change list-2 Rev: 3A
Date: Wednesday, November 06, 2013 Sheet 36 of 45