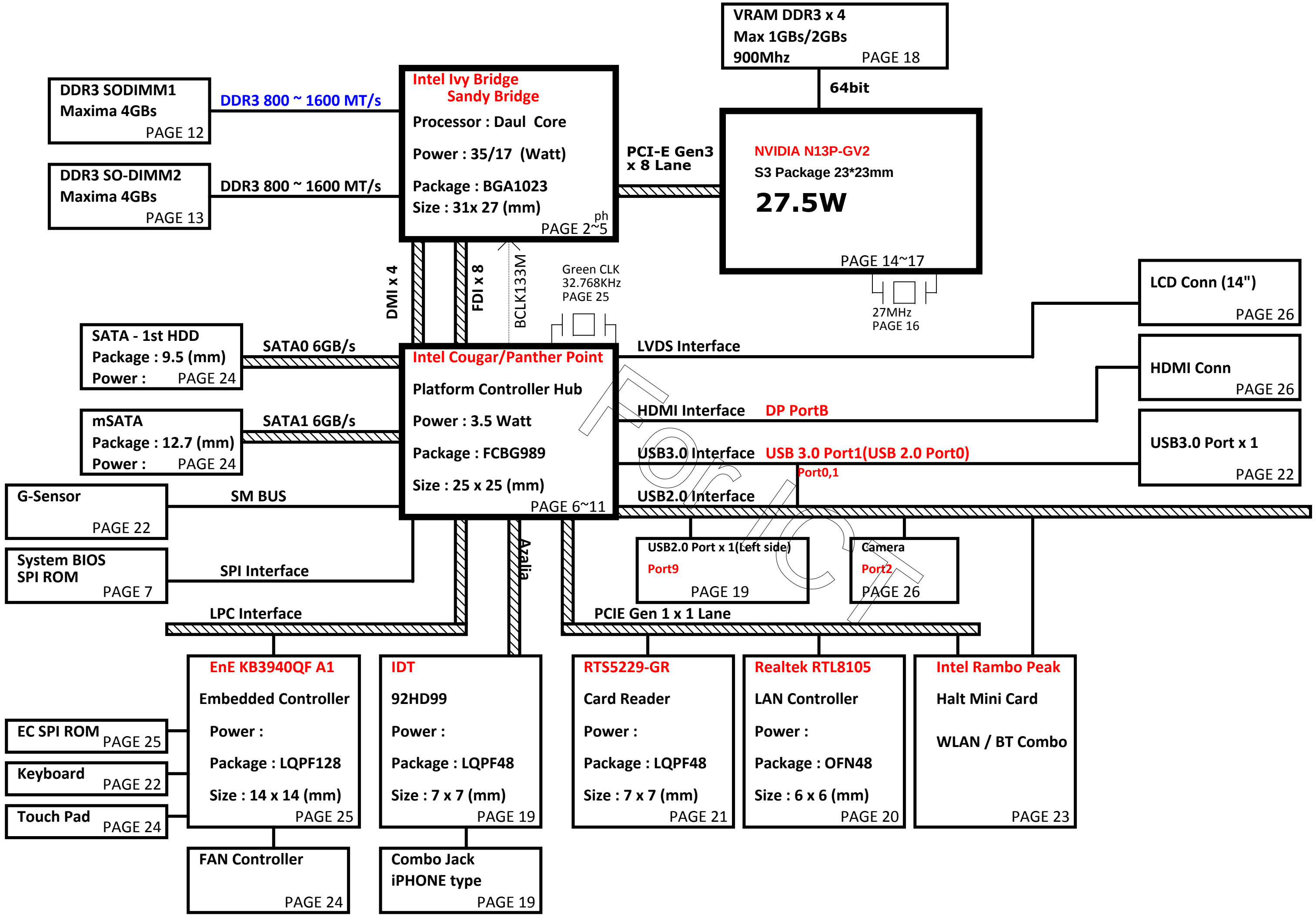
Volks DIS/UMA (14"/15.6") Ultra/Slim
Intel Chief River Platform Block Diagram



PCB 6L STACK UP

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

Power Source

- BQ24738 — System Charge Power (+BATCHG)
- Ricktek RT8223P — System Power (+3VPCU/+5VPCU/+3VS5/+5VS5)
- NCP6132/NCP5911/RT8240P/TPS51462RGER — Processor Power (+VCC_CORE/+1.05_VTT/+VCCSA)
- SLG55448V — System Discharge Power (+1.5V/+3V/+5V)
- Richtek RT8207 — System Memory Power (+1.5VSUS/+0.75V_DDR_VTT)
- NCP3218G — GPU core power(+VGACORE)

NB5

PROJECT : VOLKS
Quanta Computer Inc.

Size	Document Number	Rev
Custom	Block Diagram	1A

Date: Thursday, June 07, 2012 Sheet 1 of 37

Ivy Bridge Processor (DMI,PEG,FDI)

02

PEG_COMP connect to PIN G3&G4 W:4mils/S:15mils/L: 500mils.
PEG_COMP connect to PIN G1 W:12mils/S:15mils/L: 500mils.

U20A

DMI
Intel(R) FDI
PCI EXPRESS - GRAPHICS
eDP

IC,IVB_2CBGA,0P7

U20B

MISC
THERMAL
PWR MANAGEMENT
CLOCKS
DDR3 MISC
JTAG & BPM

IC,IVB_2CBGA,0P7

PEG x8

CPU RESET#

DDR3 DRAM RESET

for DS3

PV modify on 5/24

SM_DRAMPWROK
Processor Input.

Intel DG request

Placement close to EC.

SI modify on 4/2

SM_RCOMP[0] W:20mils/S:20mils/L: 500mils,
SM_RCOMP[1] W:20mils/S:20mils/L: 500mils,
SM_RCOMP[2] W:15mils/S:20mils/L: 500mils,

CPU XDP

Processor pull-up (CPD)

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

For iFDIM Trigger Point

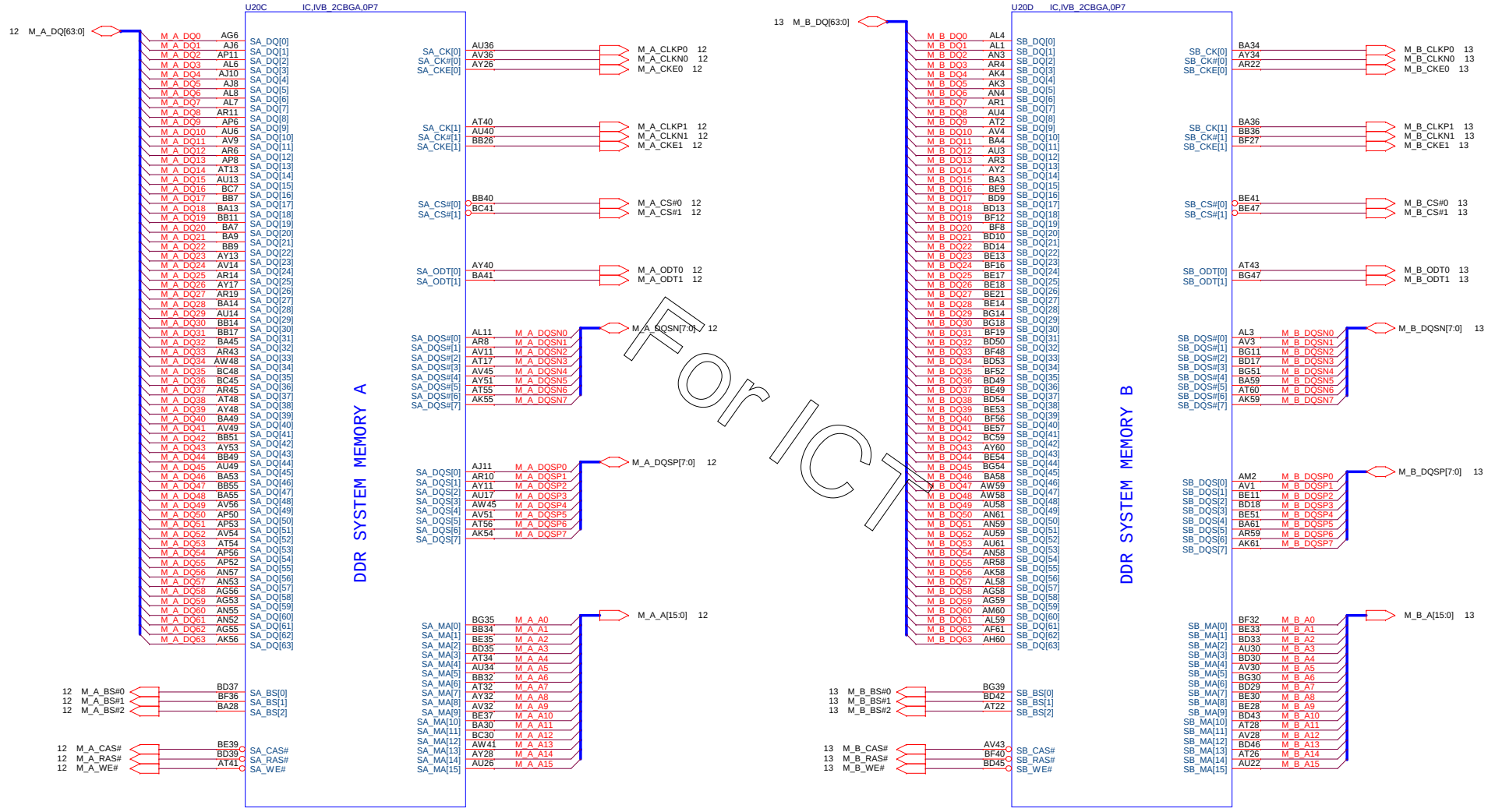
Connect a Test Point on BPM# 6 signal, very close to processor.

Connect a Test Point on BPM# 7 signal, very close to processor.

PROJECT :	VOLKS
	Quanta Computer Inc.
Size: Custom	Document Number: Processor 1/4 (Host/GPU)
Rev: 1A	
Date: Thursday, June 07, 2012	Sheet 2 of 37

NB5

Ivy Bridge Processor (DDR3)



NB5

PROJECT : VOLKS

Quanta Computer Inc.

Size	Document Number	Rev
Custom	Processor 2/5 (DDR3 I/F)	1A
Date: Thursday, June 07, 2012	Sheet 3 of 37	

POWER

U20F — IC,IVB_2CBGA,0P7

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

+VCC_CORE

330uFx3pcs bulk BOT
22uFx14pcs cavity_BOT
2.2uFx16pcs BGA TOP

IVB:8.5A

330uFx2pcs bulk BOT
22uFx10pcs cavity_BOT
2.2uFx13pcs BGA TOP

+1.05V

VCCIO_SEL — H_VTTVID1 30 — R178 *1K/F_4

VCCPQE[1] VCCPQE[2] — +1.05V — C300 1U/6.3V_4

VIDALERT# VIDSCLK VIDSOUT — H_CPU_SVIDALRT# VR_SVID_CLK VR_SVID_DATA

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

VCC_SENSE VSS_SENSE — R381 100/F_4 +VCC_CORE — VCC_SENSE 34 VSS_SENSE 34

VCCIO_SENSE VSS_SENSE_VCCIO — R380 100/F_4 R180 10/F_4 +1.05V — VCCP_SENSE 30 VSSP_SENSE 30 — R179 10/F_4

R close to CPU

H_CPU_SVIDALRT# R394 43_4 R378 75/F_4 +1.05V — VR_SVID_ALERT# 34
VR_SVID_DATA — VR_SVID_DATA 34
VR_SVID_CLK R377 130/F_4 +1.05V — VR_SVID_CLK 34

+VCC_GFX

330uFx2pcs bulk BOT
22uFx12pcs cavity_BOT
1uFx12pcs BGA TOP

GRAPHICS | SENSE LINES | 1.8V RAIL | SA RAIL | VCCSA VID lines

IVB: 1.5A

330uF x1, 10uF_8 x1, 1uF_4 x2

IVB: 6A

330uFx1, 10uFx4

Zo impedance: 27.4ohm

Zo impedance: 27.4ohm

Q11 AON7410 — MAIN — C620 *470P/50V_4 — R462 220_8 — Q32 2N7002K — MAIN_ONG 2,36

CPU VDDQ

POWER

U20G — IC,IVB_2CBGA,0P7

VREF | DDR3 - 1.5V RAILS | QUIET RAILS | SENSE LINES

SM_VREF — C619 0.1U/10V_4 — R454 1K/F_4 — R449 1K/F_4 — Q31 2N7002K — R455 3.3K/F_4 — MAIND 36 — C621 470P/50V_4 — DDR_VTTREF 12,13,31

SA_DIMM_VREFDQ SB_DIMM_VREFDQ — BE7 SMDDR_VREF_DQ0_M3 BG7 SMDDR_VREF_DQ1_M3 — 20mils width

+VDDR_REF_CPU and DDR_VTTREF must use 10mils width

IVB: 5A

CPU center

CRB: 1uf*1

VCCDQ[1] VCCDQ[2] — C314 1U/6.3V_4

VDDQ_SENSE VSS_SENSE_VDDQ — TP28 TP27

VCCSA_SENSE — R127 *100/F_4 +VCCSA — VCCSA_SENSE 29

Zo:55 ohm

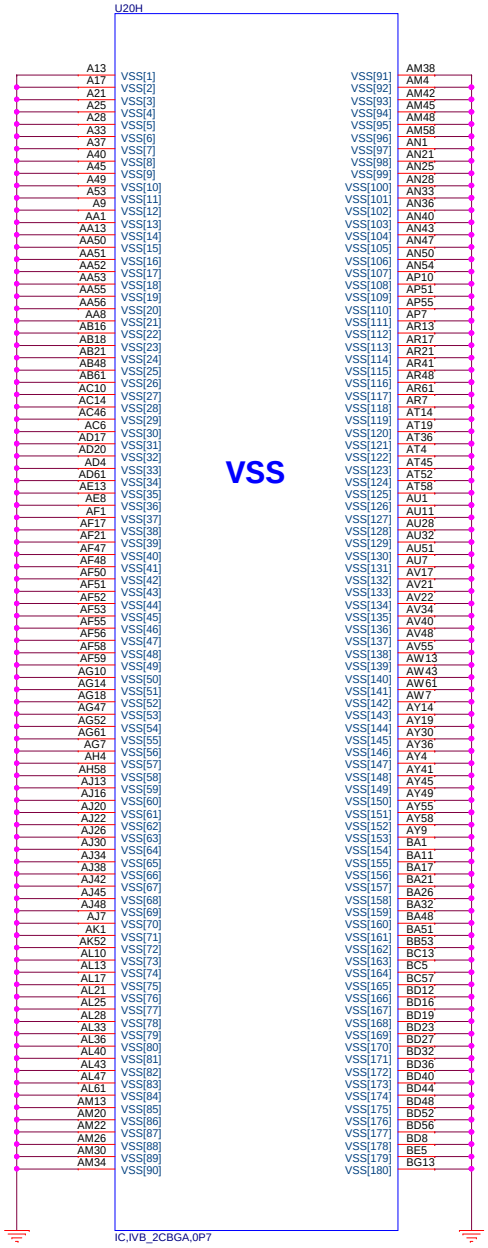
VCCSA_VID[0] VCCSA_VID[1] — D48 VCCSA_SEL0 D49 VCCSA_SEL — R392 1K/F_4 R372 1K/F_4 — VCCSA_SEL0 29 — VCCSA_SEL 29

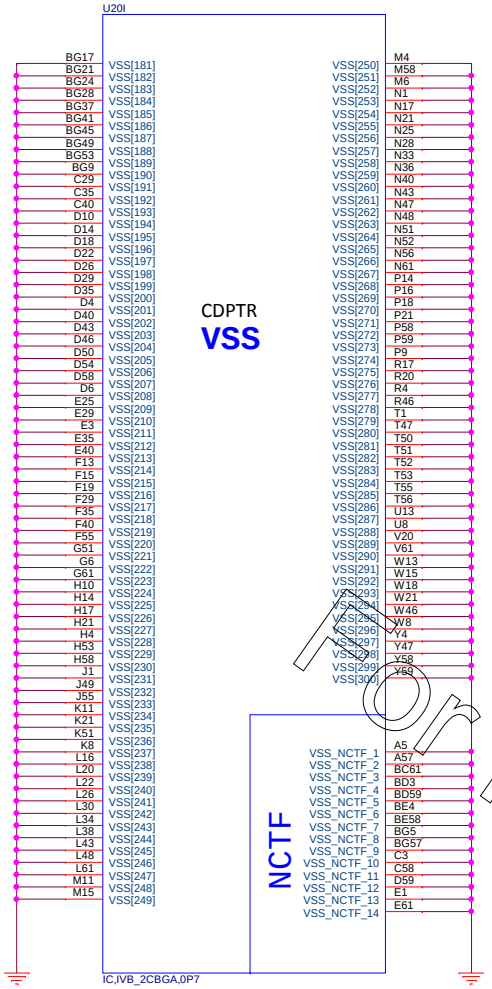
SMDDR_VREF_DQ0_M3 — R445 *1K/F_4 — SMDDR_VREF_DQ0_M3 12

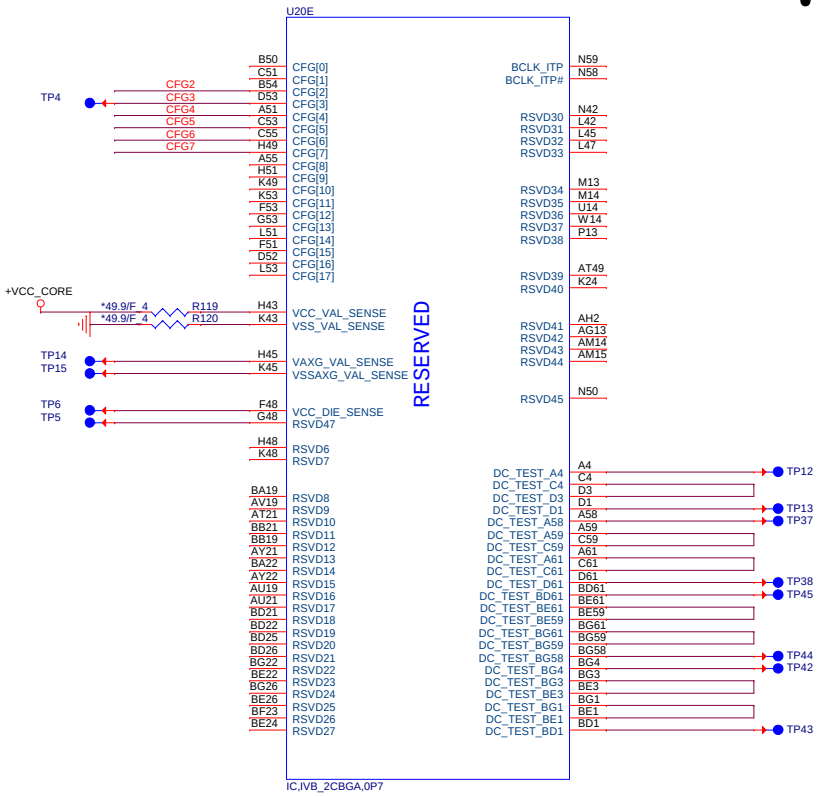
SMDDR_VREF_DQ1_M3 — R446 *1K/F_4 — SMDDR_VREF_DQ1_M3 13

CAD Note: +VDDR_REF_CPU should have 10 mil trace width

NB5	PROJECT : VOLKS Quanta Computer Inc.	
Size: Custom	Document Number: Processor 3/4 (POWER)	Rev: 1A
Date: Thursday, June 07, 2012	Sheet 4 of 37	

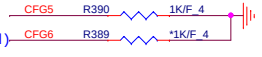






CFG[6:5] (PCIE Port Bifurcation Straps)

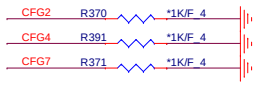
11: (Default) x16 - Device 1 functions 1 and 2 disabled
10: x8, x8 - Device 1 function 1 enabled ; function 2 disabled
01: Reserved - (Device 1 function 1 disabled ; function 2 enabled)
00: x8,x4,x4 - Device 1 functions 1 and 2 enabled



Processor Strapping

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

	1	0
CFG2 (PCIe Static x16 Lane Numbering Reversal)	Normal Operation(Default)	Lane Reversed
CFG4 (DP Presence Strap)	Disable; No physical DP attached to eDP	Enable; An ext DP device is connected to eDP
CFG7 (PEG Defer Training)	PEG train immediately following xxRESETB de assertion	PEG wait for BIOS training

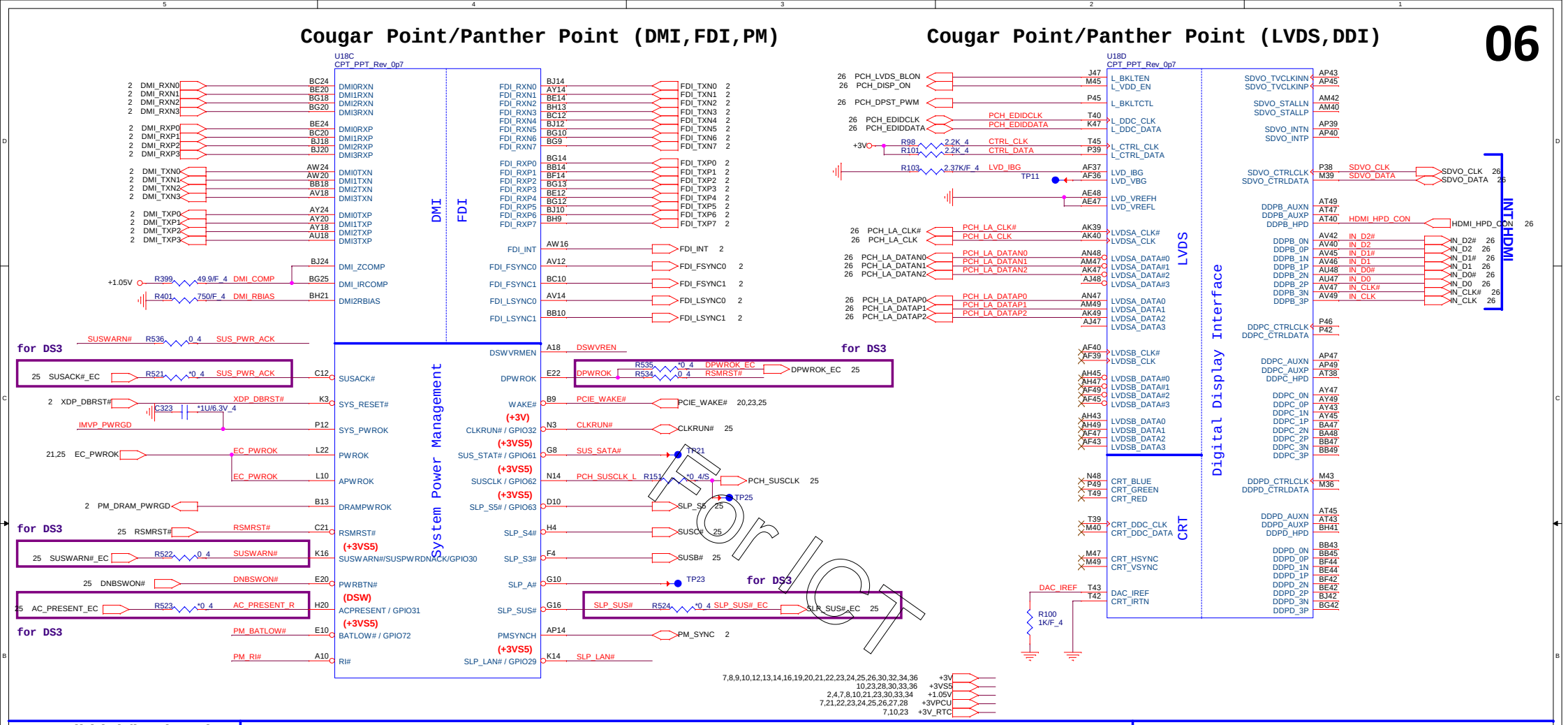


NB5	PROJECT : VOLKS Quanta Computer Inc.	
	Size: Custom	Document Number: Processor 4/4 (RSV,Ground) Rev: 1A
	Date: Thursday, June 07, 2012	Sheet 5 of 37

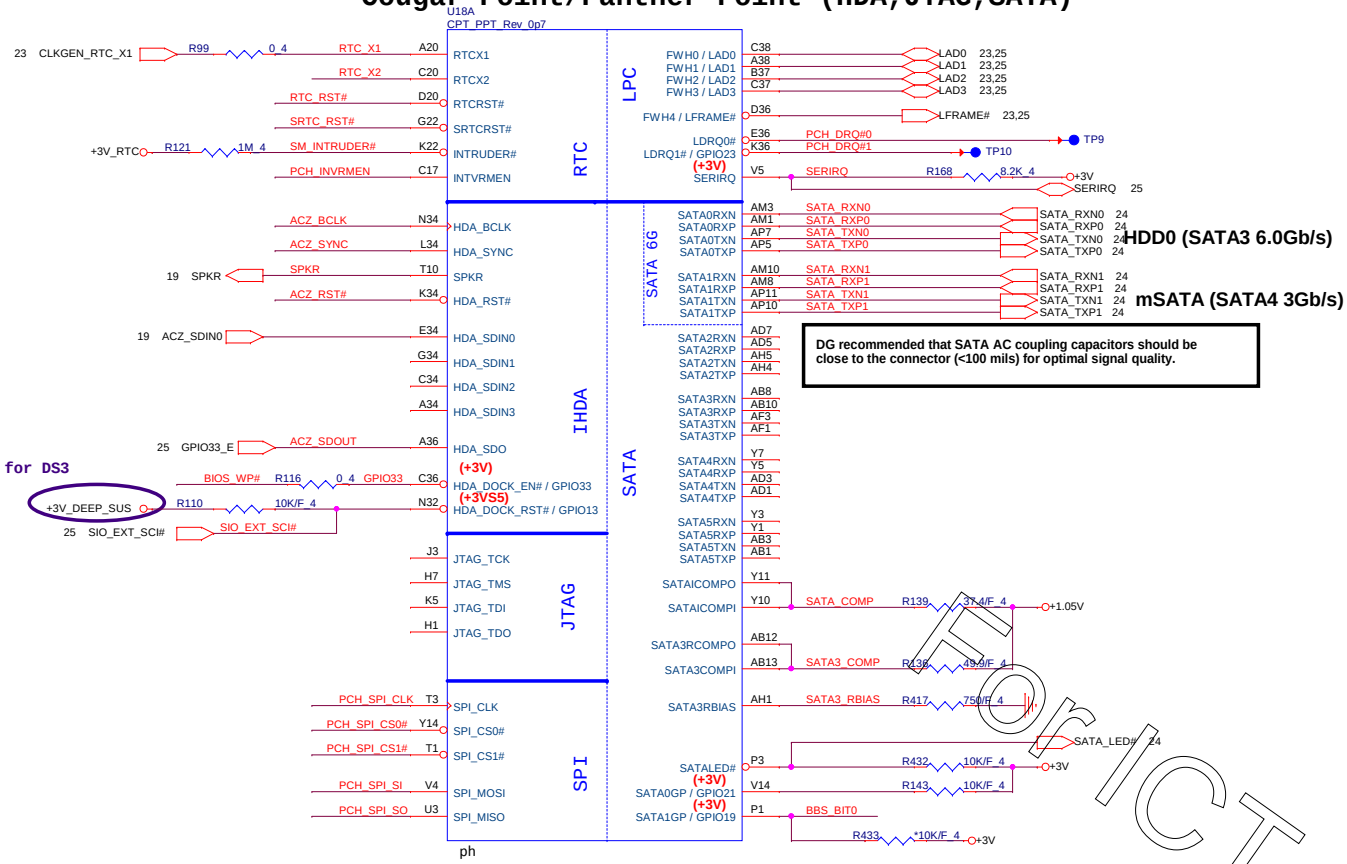
Cougar Point/Panther Point (DMI,FDI,PM)

Cougar Point/Panther Point (LVDS,DDI)

06



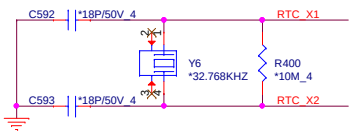
Cougar Point/Panther Point (HDA,JTAG,SATA)



PCH Strap Table

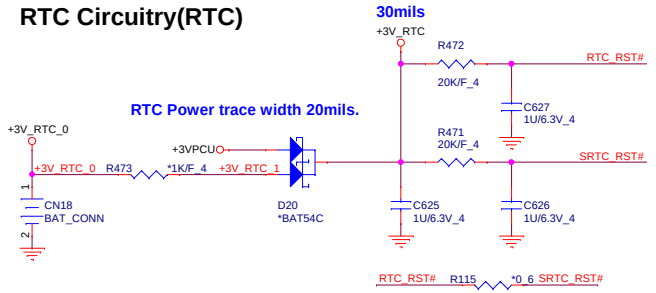
Pin Name	Strap description	Sampled	Configuration	Circuit
SPKR	No reboot mode setting	PWROK	0 = Default (weak pull-down 20K) 1 = Setting to No-Reboot mode	
GNT3# / GPIO55	Top-Block Swap Override	PWROK	0 = "top-block swap" mode 1 = Default (weak pull-up 20K)	
INTVRMEN	Integrated 1.05V VRM enable	ALWAYS	Should be always pull-up	
HDA_DOCK_EN#/GPIO33	Flash Descriptor Security Only for Interposer	PWROK	0 = Override 1 = Default (weak pull-up 20K)	
GNT1# / GPIO51	Boot BIOS Selection 1 [bit-1]	PWROK	GNT1# 1 0 / GNT0# 1 0 / Boot Location SPI LPC	[Need external pull-down for LPC BIOS] Default weak pull-up on GNT0/1#
GPIO19 Different from Calpella	Boot BIOS Selection 0 [bit-0]	PWROK		
GNT2# / GPIO53	ESI strap (Server only)	PWROK	Should not be pull-down (weak pull-up 20K)	USE GPIO PIN
NV_ALE	Intel Anti-Theft HDD protection Only for Interposer	PWROK	0 = Disable (Internal pull-down 20kohm)	
NV_CLE	DMI Termination voltage	PWROK	weak pull-down 20kohm	
HDA_SYNC	On-Die PLL VR Voltage Select	RSMRST	0 = Support by 1.8V (weak pull-down) 1 = Support by 1.5V	for DS3
HDA_SDO	Flash Descriptor Security	PWROK	0 = Override 1 = Default (weak pull-up 20K)	
GPIO8	Integrated Clock Chip Enable	RSMRST#	Should be pull-down (weak pull-up 20K)	
GPIO28 Different from Calpella	On-die PLL Voltage Regulator	RSMRST#	0 = Disable 1 = Enable (Default)	
SPI_MOSI	iTPM function Disable	APWROK	0 = Default (weak pull-down 20K) 1 = Enable	

RTC Clock 32.768KHz

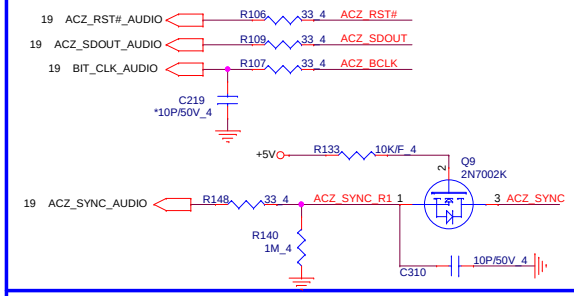


no stuff If use green Clock

RTC Circuitry(RTC)

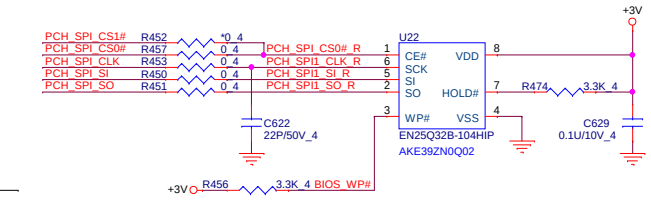


HDA Bus(CLG)



PCH SPI ROM(CLG)

Vender	Size	P/N
EON	4MB	AKE39ZN0Q02 (EN25Q32B-104HIP)
MX	4MB	AKE39FP0Z02 (MX25L3206EM2I-12G)
AMIC	4MB	AKE39F-0800 (A25LQ32AM-F/Q)
Socket		DFHS08FS023



+3V 6,8,9,10,12,13,14,16,19,20,21,22,23,24,25,26,30,32,34,36
+5V 10,19,21,22,23,24,26,36
+1.8V 4,10,31
+1.05V 2,4,6,8,10,21,23,30,33,34
+3VS5 6,10,23,28,30,33,36
+3VPCU 21,22,23,24,25,26,27,28
+3V_RTC 6,10,23

NB5

PROJECT : VOLKS
Quanta Computer Inc.

Size	Document Number	Rev
Custom	PCH 2/6 (HDA/RTC/SATA/SPI)	1A
Date: Thursday, June 07, 2012	Sheet 7 of 37	

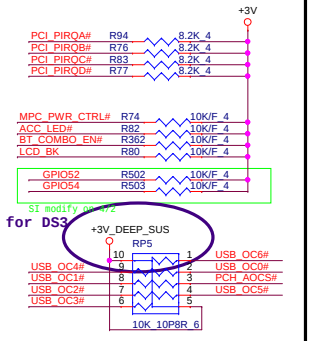
07

Cougar Point-M/Panther Point (PCI,USB,NVRAM)

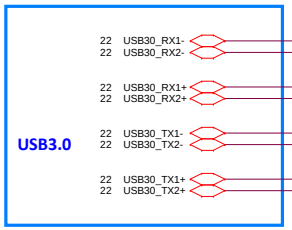
Cougar Point-M/Panther Point (PCI-E,SMBUS,CLK)

08

PCI/USBOC# Pull-up(CLG)

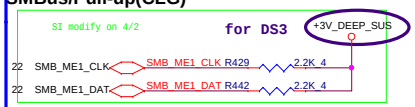


USB3.0

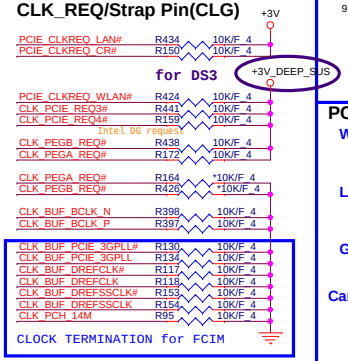


20111130 Modify USB3.0 for HM70

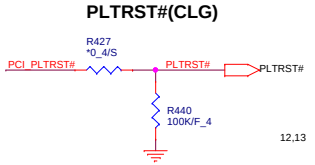
SMBus/Pull-up(CLG)

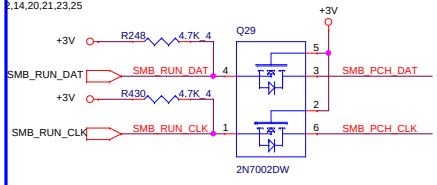


CLK_REQ/Strap Pin(CLG)

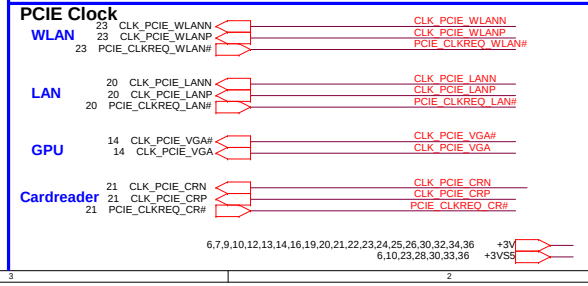


PLTRST#(CLG)

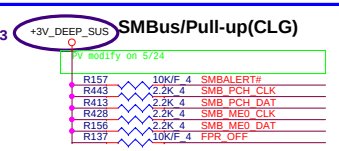




PCIE Clock



SMBus/Pull-up(CLG)



PV , HP request Image sensor
SMBUS reserve to PCH

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

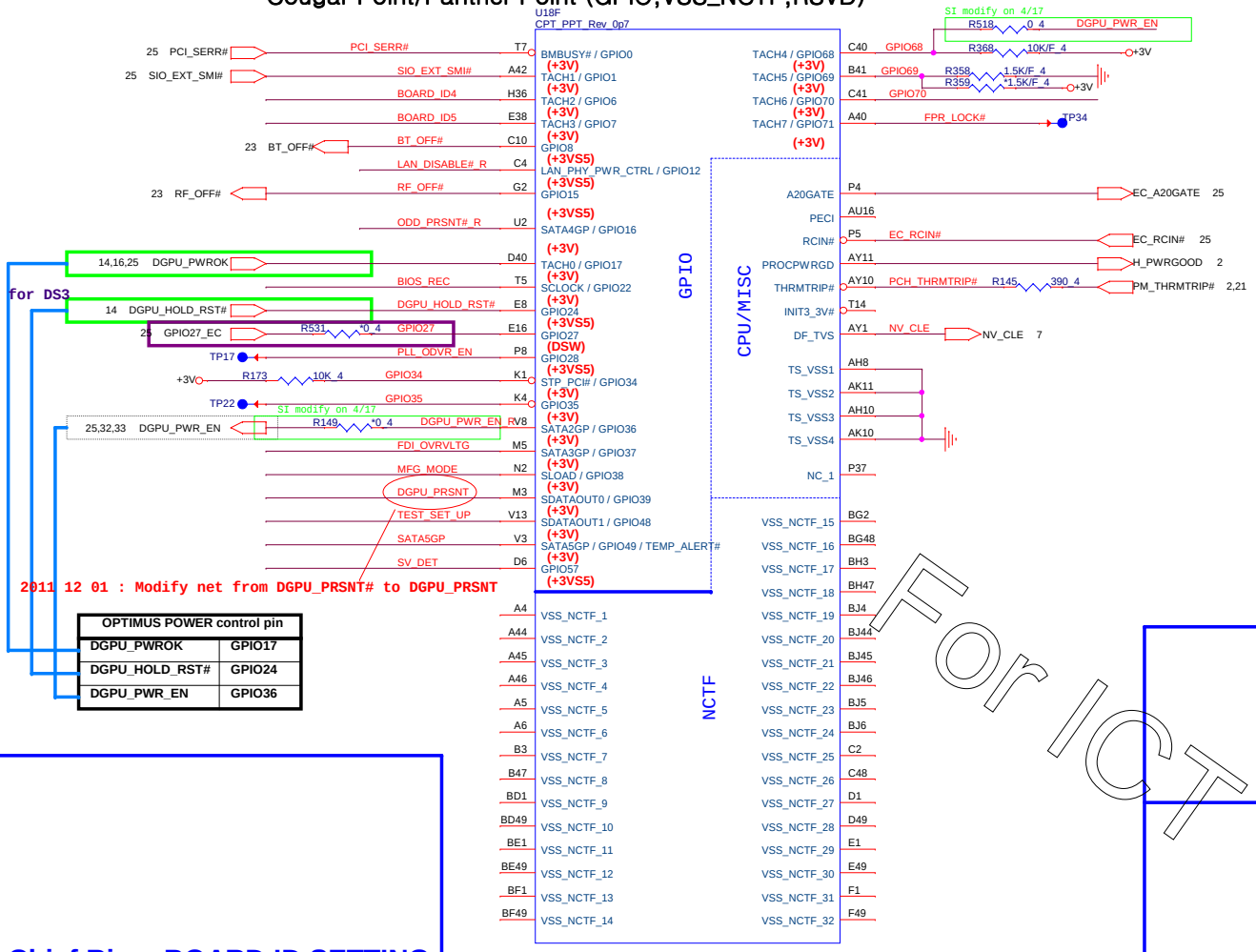
MPC_PWR_CTRL# R75 *1K/F_4

PROJECT : VOLKS		
Quanta Computer Inc.		
Size: Custom	Document Number: PCH 3/6 (Clock/PCI/PCIE/USB)	Rev: 1A
Date: Thursday, June 07, 2012	Sheet: 8 of 37	

NB5

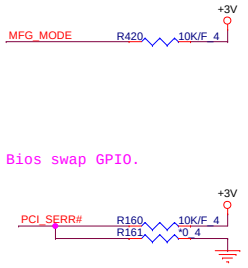
Cougar Point/Panther Point (GPIO,VSS_NCTF,RSVD)

09



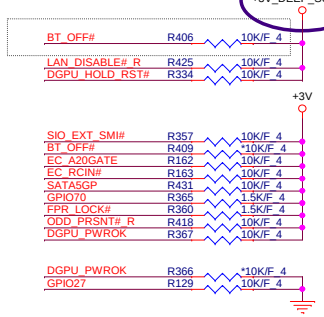
OPTIMUS POWER control pin	
DGPU_PWROK	GPIO17
DGPU_HOLD_RST#	GPIO24
DGPU_PWR_EN	GPIO36

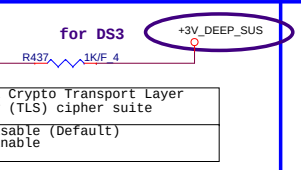
MFG-TEST



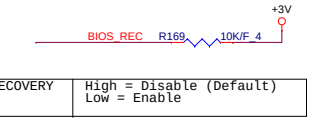
GPIO Pull-up/Pull-down(CLG)

for DS3

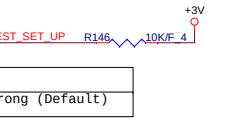




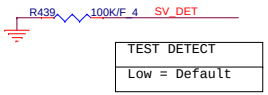
Intel ME Crypto Transport Layer Security (TLS) cipher suite
Low = Disable (Default) High = Enable



BIOS RECOVERY	High = Disable (Default) Low = Enable



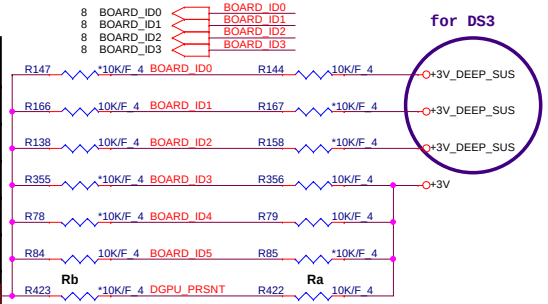
SV_SET_UP
High = Strong (Default)



TEST DETECT
Low = Default

Chief River BOARD ID SETTING

Model	BOARD_ID5	BOARD_ID4 14": 0 15": 1	BOARD_ID3 HM70: 0 HM77: 1	BOARD_ID2	BOARD_ID1 1G: 0 2G: 1	BOARD_ID0 UMA: 0 DIS: 1
U33 UMA	0	0	0	0	0	0
U33 DIS 128*16 VRAM	0	0	0	0	0	1
U33 DIS 256X16 VRAM	0	0	0	0	1	1
	0	0	0	1	1	1
U33 HM77	0	0	1	X	X	X
U33 HM70	0	0	0	X	X	X



	SG	UMA
Stuff	Ra	Rb
NC	Rb	Ra

SATA2GP/GPIO36	Reserved only

FDI TERMINATION VOLTAGE OVERRIDE	Reserved only

6,7,8,10,12,13,14,16,19,20,21,22,23,24,25,26,30,32,34,36 +3V
6,10,23,28,30,33,36 +3VS5

NB5

PROJECT : VOLKS

Quanta Computer Inc.

Size	Document Number	Rev
Custom	PCH 4/6 (GPIO)	1A
Date: Thursday, June 07, 2012	Sheet 9 of 37	

Cougar Point/Panther Point (POWER)

Cougar Point/Panther Point (POWER)

U18J CPT_PPT_Rev_0p7 POWER

U18G CPT_PPT_Rev_0p7 POWER

Clock and Miscellaneous | USB | PCI/GPIO/LPC | SATA | MISC | CPU | RTC | HDA

VCC CORE | LVDS | HVCMOS | DMI | VCCIO | DFT / SPI | FDI | CRT

VCCCore:1.73 A (100mils)

VCCIO:3.799 A (140mils)

VCCSUS3_3:65mA(15mils)

VCC5REFSUS=1mA

for DS3

3mA (10mils)

VCCASW:803mA (40mils)

119mA (15mils)

266mA (20mils)

70mA

350mA

30mA

1.01A (60mils)

10mA (10mils)

1mA (10mils)

178m A (20mils)

(Mobile 1.5V)

160mA (15mils)

20mA (10mils)

6.3mA (10mils)

60mA (10mils)

SG & UMA : Ra
DIS : Rb

42mA (10mils)

2 mA (10mils)

160mA (20mils)

65mA (10mils)

8mA (10mils)

55mA (10mils)

95mA (10mils)

V_PROC_IO=2mA (10mils)

VCCRTC<1mA (10mils)

V5REF= 1mA

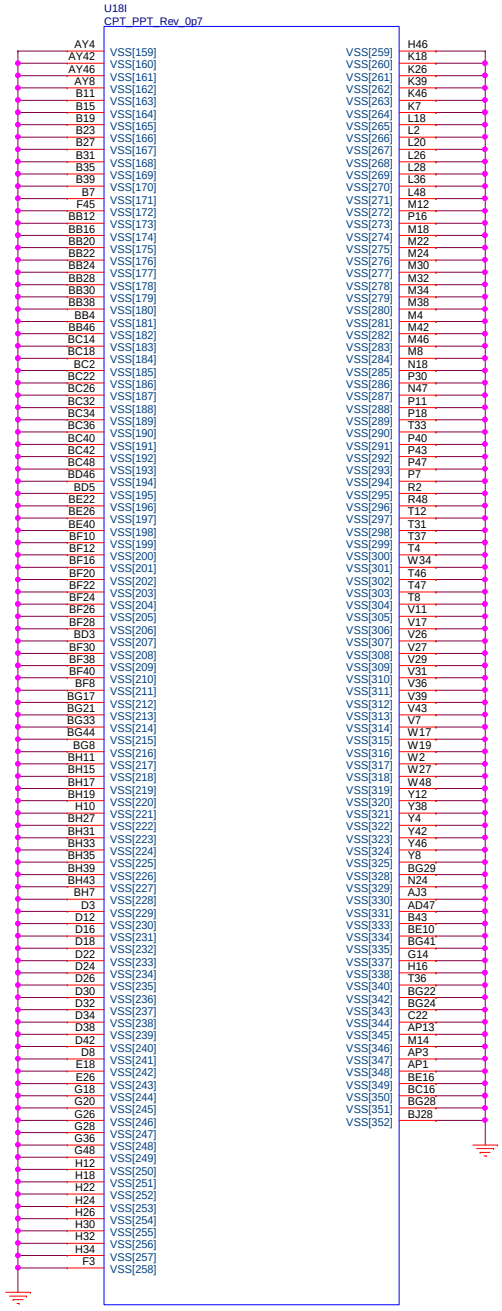
Close to Y49

Close to AT16

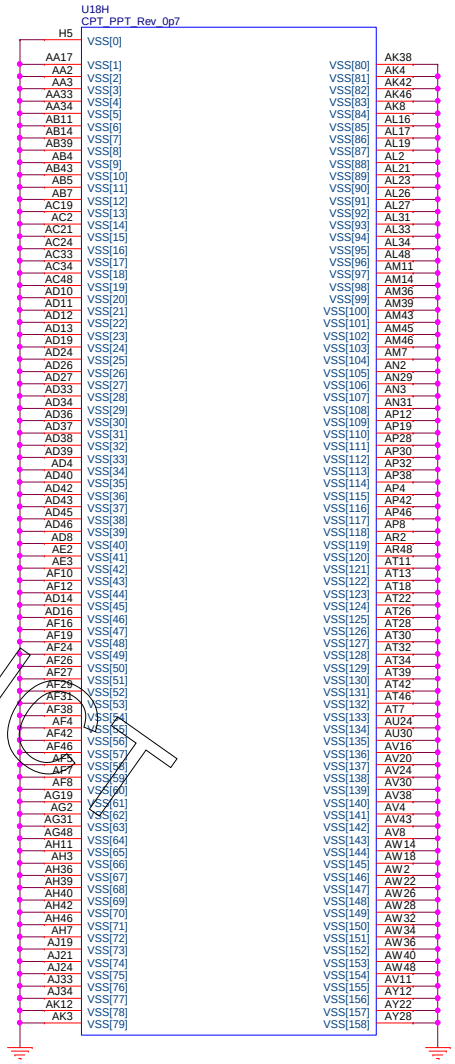
Close to AP16

PROJECT : VOLKS	
Quanta Computer Inc.	
NB5	Size: Custom; Document Number: PCH 5/6 (Power); Rev: 1A
Date: Thursday, June 07, 2012	Sheet 10of 37

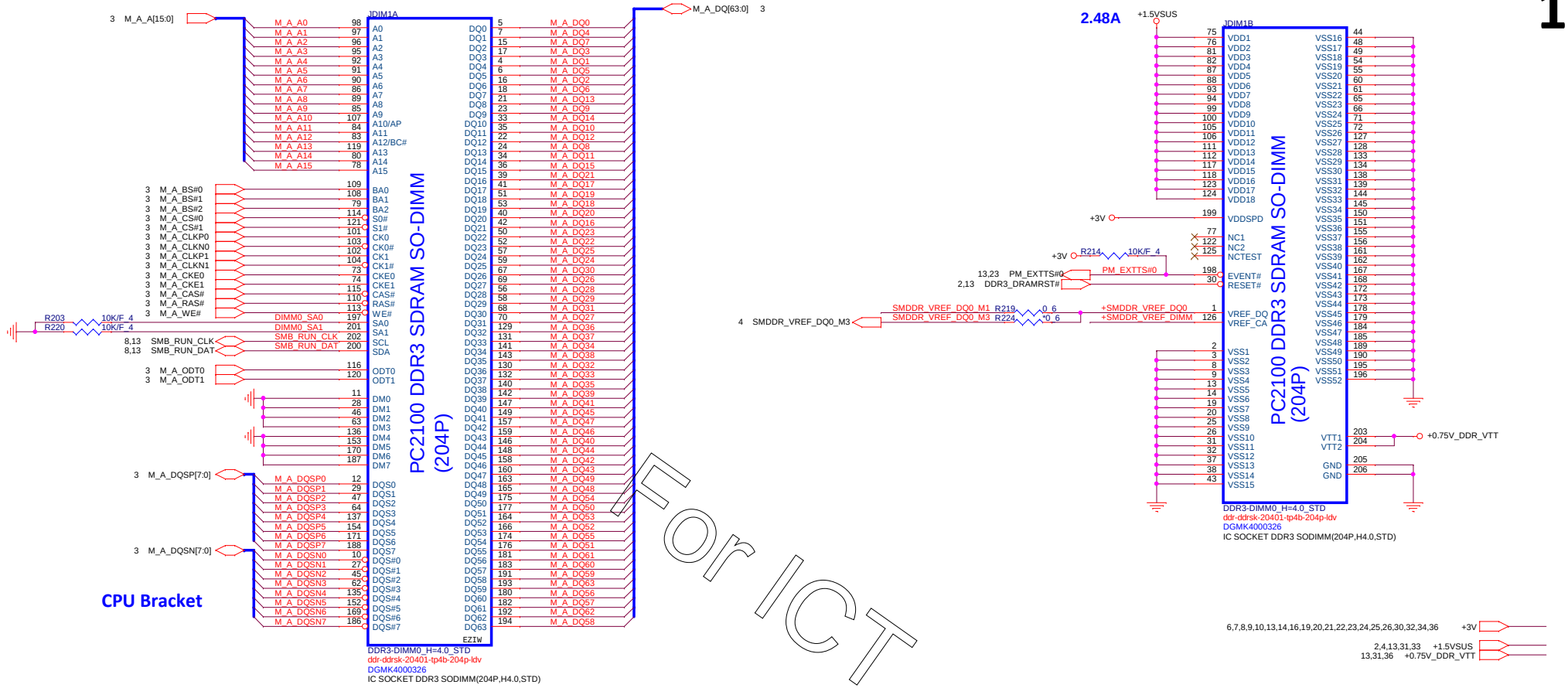
Cougar Point/Panther Point (GND)



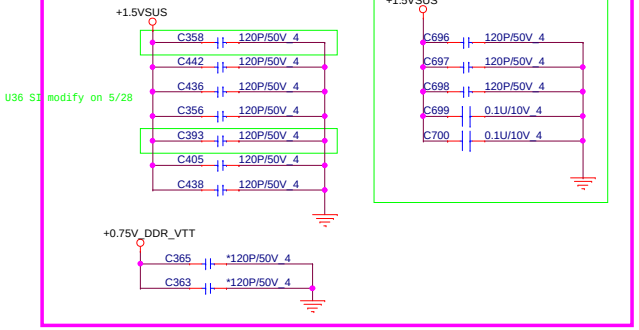
Cougar Point/Panther Point (GND)



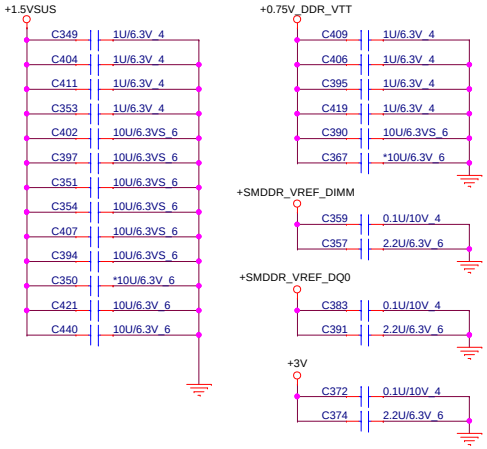
NB5	PROJECT : VOLKS Quanta Computer Inc.	
Size: Custom	Document Number: PCH 6/6 (Ground)	Rev: 1A
Date: Thursday, June 07, 2012	Sheet: 11of	37



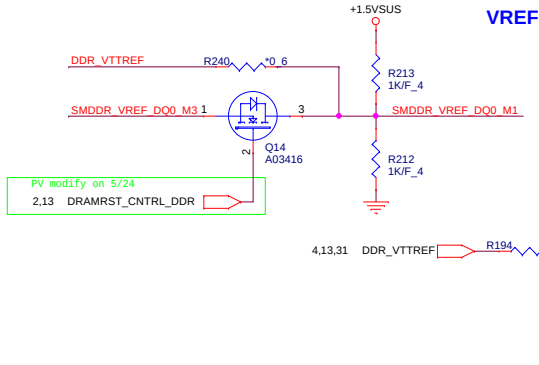
For EMI RESERVE 8/30



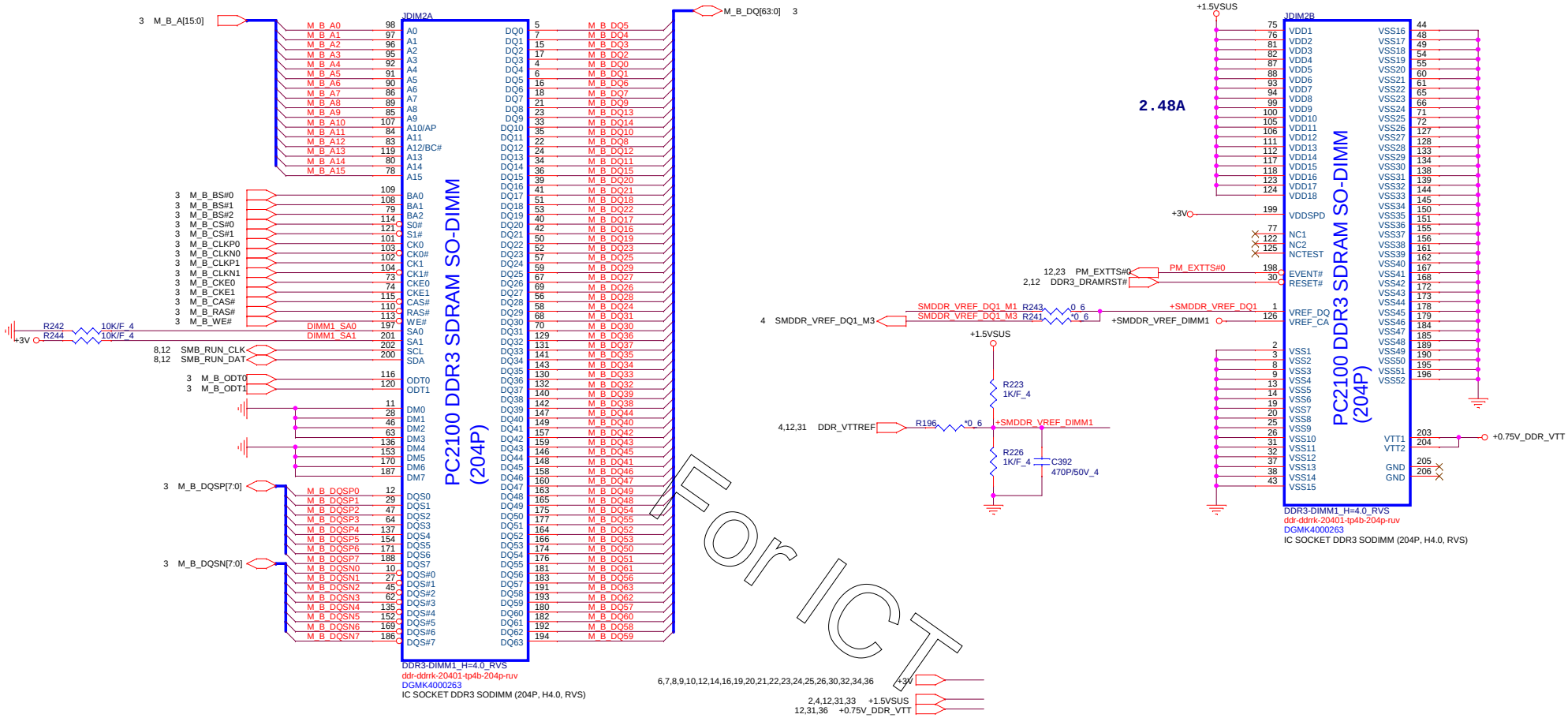
Place these Caps near So-Dimm0.



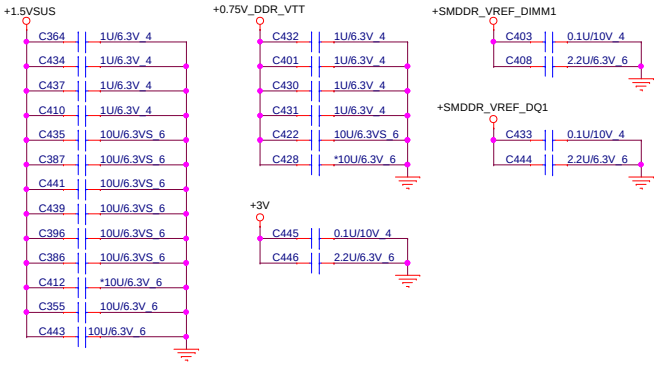
VREF DQ0 M1 Solution



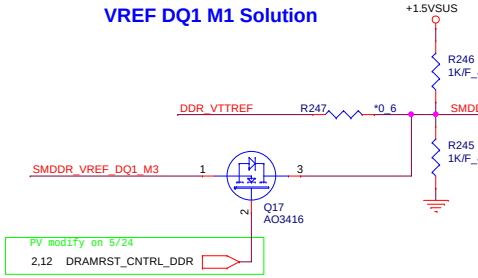
NB5	PROJECT : VOLKS Quanta Computer Inc.	
Size: Custom	Document Number: System Memory 1/2 (5.2H)	Rev: 1A
Date: Thursday, June 07, 2012	Sheet: 12of	37



Place these Caps near So-Dimm1.



VREF DQ1 M1 Solution



NB5	PROJECT : VOLKS Quanta Computer Inc.	
Size: Custom	Document Number: System Memory 2/2 (9.2H)	Rev: 1A
Date: Thursday, June 07, 2012	Sheet: 13of	37

N13P-GV2-S-A2 (GB2-64)
Max point NVCLK = 937.5 , MCLK = 900
TDP point NVCLK = 800 , MCLK = 900

VDD33 = 56mA

NVDD = 32.22 ~ 26.66 A

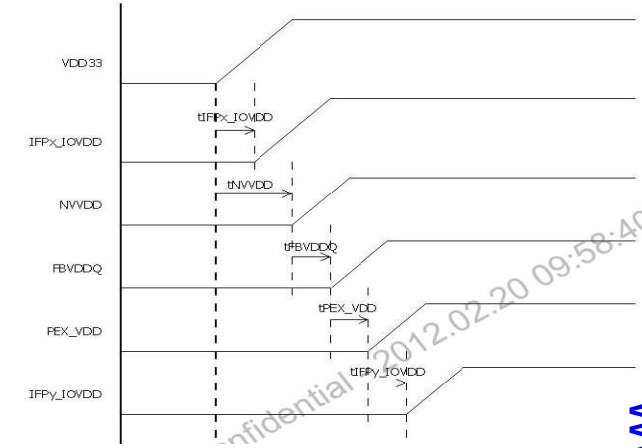
PEX_IOVDD + PEX_IOVDDQ = 1.042A

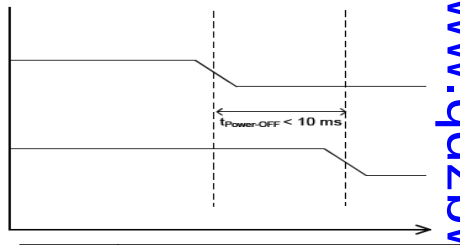
PEX_PLL_HVDD + PEX_SVDD_3V3 = 143mA

PEX_PLLVDD = 130mA

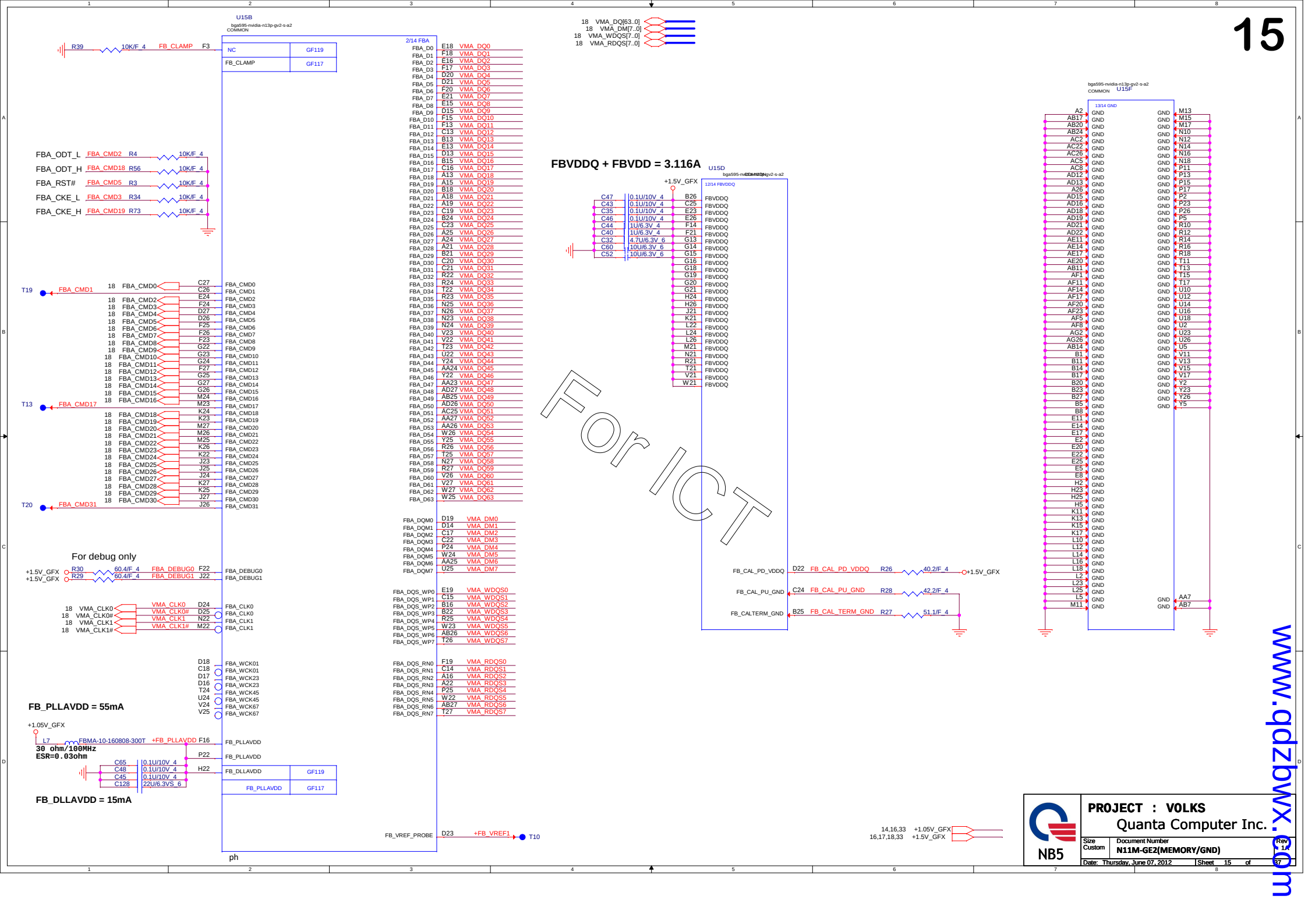
power up sequence

power down sequence

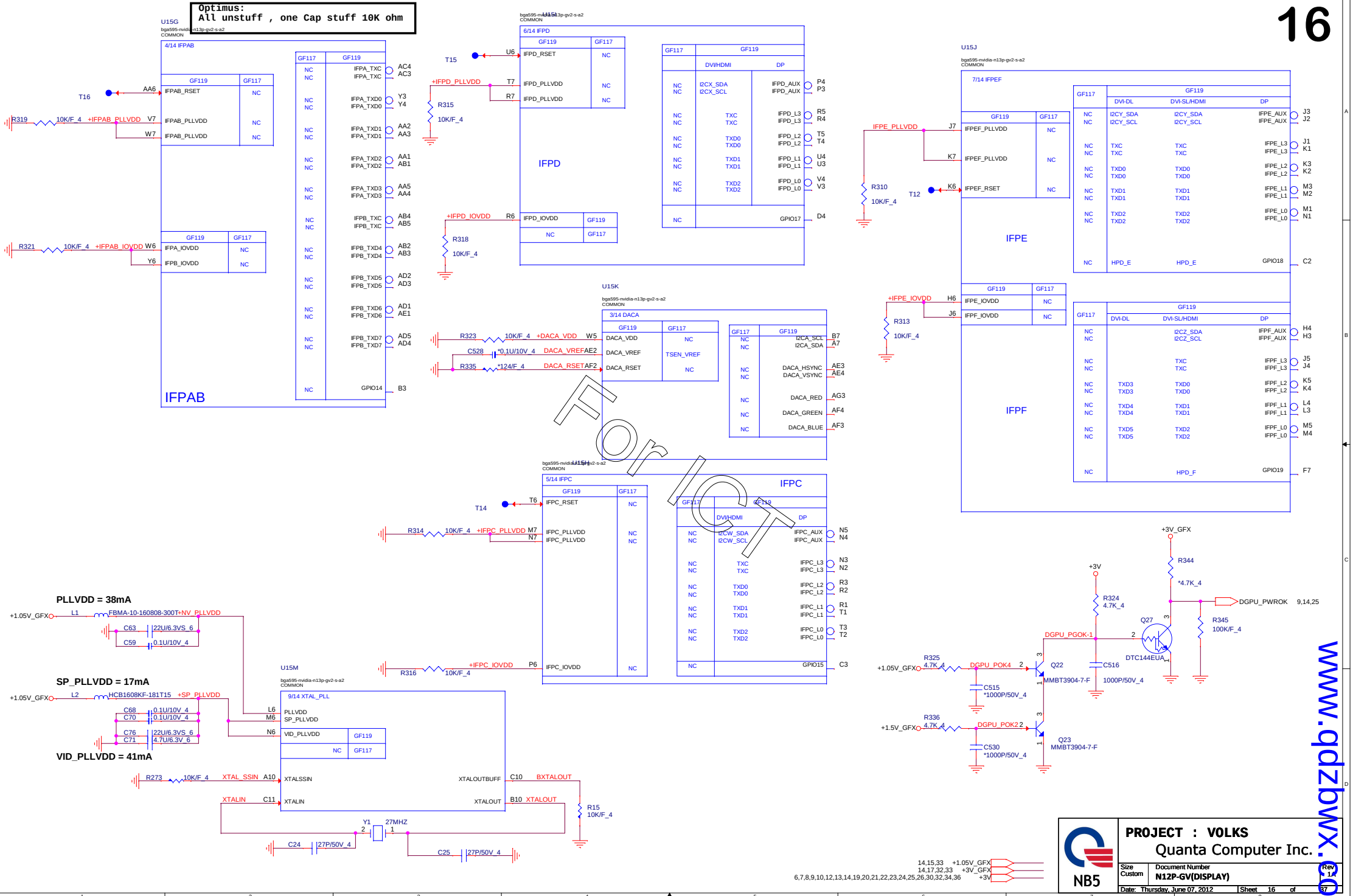




PROJECT : VOLKS
Quanta Computer Inc.
NB5
Size: Custom | Document Number: N13P-GV2(PCIE/F) | Rev: 1A
Date: Thursday, June 07, 2012 | Sheet 14 of 37

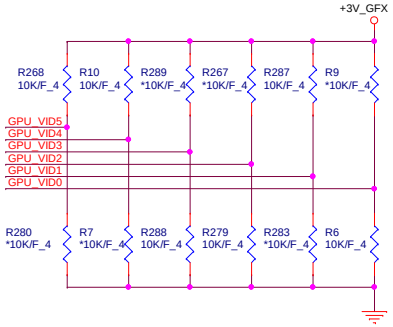

U15B
bga595-nvidia-n13p-gv2-s-a2
COMMON
2/14 FBA
R39 10K/F_4 FB_CLAMP F3
NC GF119
FB_CLAMP GF117
FBA_ODT_L FBA_CMD2 R4 10K/F_4
FBA_ODT_H FBA_CMD18 R56 10K/F_4
FBA_RST# FBA_CMD5 R3 10K/F_4
FBA_CKE_L FBA_CMD3 R34 10K/F_4
FBA_CKE_H FBA_CMD19 R73 10K/F_4
T19 FBA_CMD1
T13 FBA_CMD17
T20 FBA_CMD31
For debug only
+1.5V_GFX R30 60.4/F_4 FBA_DEBUG0 F22
+1.5V_GFX R29 60.4/F_4 FBA_DEBUG1 J22
18 VMA_CLK0
18 VMA_CLK0#
18 VMA_CLK1
18 VMA_CLK1#
FB_PLLAVDD = 55mA
+1.05V_GFX
L7 FBMA-10-160808-300T +FB_PLLAVDD F16
30 ohm/100MHz
ESR=0.03ohm
C65 0.1U/10V_4
C48 0.1U/10V_4
C45 0.1U/10V_4
C128 22U/6.3VS_6
FB_DLLAVDD = 15mA
FB_DLLAVDD GF119
FB_PLLAVDD GF117
ph
18 VMA_DQ[63..0]
18 VMA_DM[7..0]
18 VMA_WDQS[7..0]
18 VMA_RDQS[7..0]
FBVDDQ + FBVDD = 3.116A
U15D
12/14 FBVDDQ
+1.5V_GFX
C47 0.1U/10V_4
C43 0.1U/10V_4
C35 0.1U/10V_4
C46 0.1U/10V_4
C44 1U/6.3V_4
C40 1U/6.3V_4
C32 4.7U/6.3V_6
C60 10U/6.3V_6
C52 10U/6.3V_6
FB_CAL_PD_VDDQ D22 FB_CAL_PD_VDDQ R26 40.2/F_4 +1.5V_GFX
FB_CAL_PU_GND C24 FB_CAL_PU_GND R28 42.2/F_4
FB_CALTERM_GND B25 FB_CAL_TERM_GND R27 51.1/F_4
U15F
13/14 GND
14,16,33 +1.05V_GFX
16,17,18,33 +1.5V_GFX
FB_VREF_PROBE D23 +FB_VREF1 T10
For Ict
PROJECT : VOLKS
Quanta Computer Inc.
NB5
Size Custom
Document Number N11M-GE2(MEMORY/GND)
Rev 1A
Date: Thursday, June 07, 2012
Sheet 15 of 37
www.qdzbwx.com

Optimus:
All unstuff , one Cap stuff 10K ohm

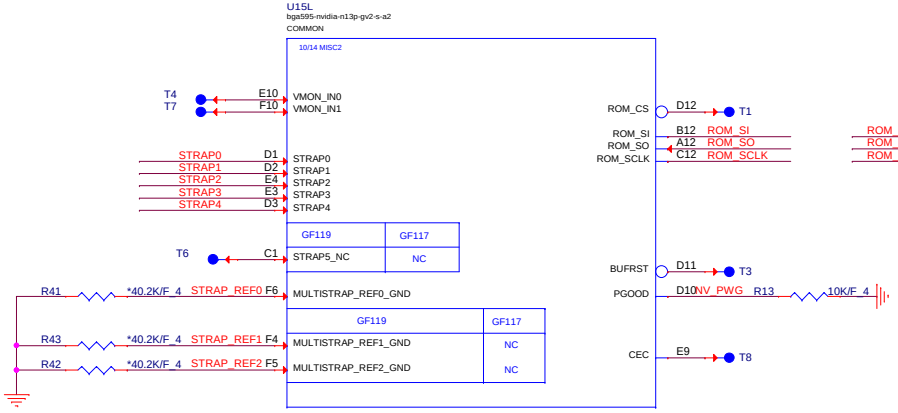


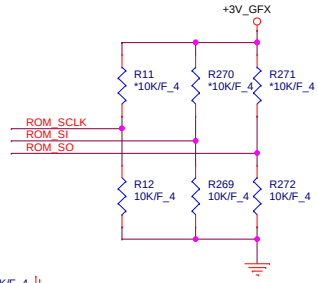
PROJECT :	VOLKS
	Quanta Computer Inc.
Size: Custom	Document Number: N12P-GV(DISPLAY) Rev: 1A
Date: Thursday, June 07, 2012	Sheet 16 of 37

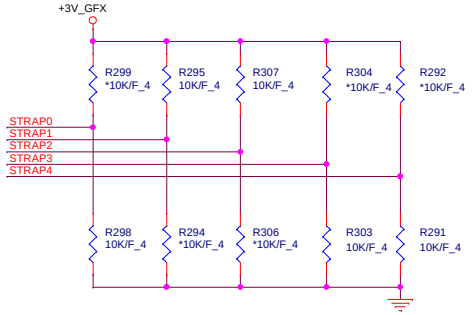
NB5



N13P-GV2 NVDD HW BOOT Voltage = 0.875V
VID = 0110010





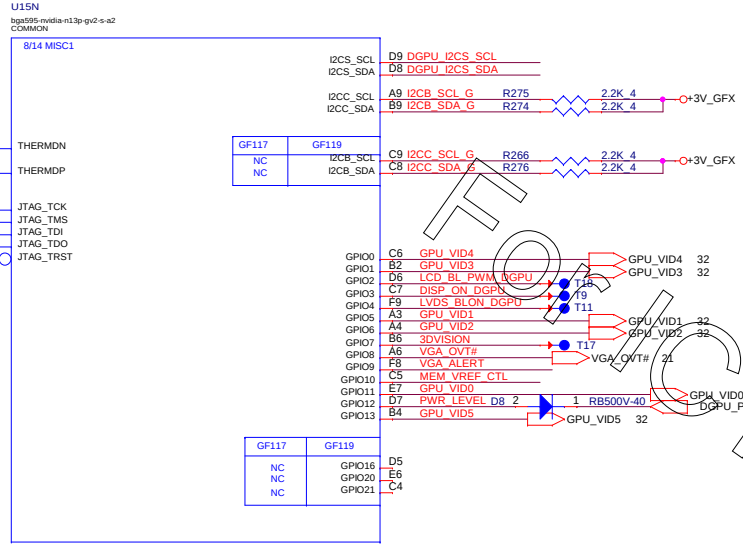


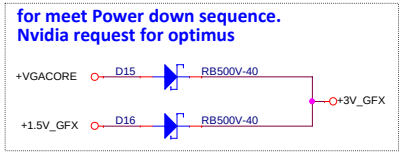
Binary Strap Mode Mapping

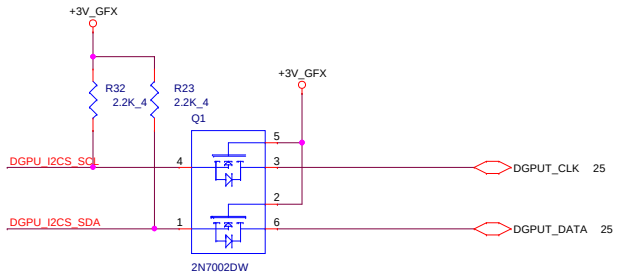
Strap Pin name	Strap Mapping	Resistance	Polarity
ROM_SCLK	SMB_ALT_ADDR	10Kohm	Pull-down to GND
ROM_SI	SUB_VENDOR	10Kohm	Pull-UP to 3V3 if VBIOS ROM Exists Pull-down to GND if no VBIO ROM
ROM_SO	VGA_DEVICE	10Kohm	Pull-down to GND (no dispaly)
STRAP0	RAMCFG[0]	10Kohm	USER defined
STRAP1	RAMCFG1]	10Kohm	USER defined
STRAP2	RAMCFG[2]	10Kohm	USER defined
STRAP3	RAMCFG[3]	10Kohm	USER defined
STRAP4	PCIE_MAX_SPEED	10Kohm	Pull-down to GND

VRAM Configuration Table

RAMCFG [3:0]	DESCRIPTION	Vendor	Vendor P/N	QBCON P/N	HP P/N
	(MP)	Reserved			
0011	DDR3 256Mx16x4, 64bit, 2Gb,900MHz	Hynix	H5TQ4G63MFR-11C	AKD5PGWTW00	AKD5PGWTW01
0101	DDR3 256Mx16x4, 64bit, 2Gb,900MHz	Micron	MT41K256M16HA-107G:E	AKD5PGSTL01	AKD5PGSTL02
1100	DDR3 128Mx16x4, 64bit, 1Gb,900MHz	Hynix	H5TQ2G63DFR-11C	AKD5MGWTW12	AKD5MGWTW13
0101	DDR3 128Mx16x4, 64bit, 1Gb,900MHz	Samsung	K4W2G1646C-HC11	AKD5MGWT513	AKD5MGWT508
	(OOC)				
0001	DDR3 256Mx16x4, 64bit, 2Gb,900MHz	Samsung	K4W4G1646B-HC11	AKD5MGWT518	AKD5MGWT517
0100	DDR3 256Mx16x4, 64bit, 2Gb,900MHz	Hynix	H5TQ4G63AFR-11C	applying	applying
1011	DDR3 128Mx16x4, 64bit, 1Gb,900MHz	Samsung	K4W2G1646E-BC11	AKD5MGGT521	AKD5MGGT522

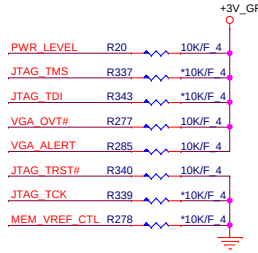






GB2-64 and GB4-128 GPIO Desdription

GPIO pin Name	Normal Function	I/O	Functional Description	Recommended Default Pull-up or Pull-down
GPIO0	GPU_VID4	O	GPU Core VDD VID4	Strap to boot NVVDD
GPIO1	GPU_VID3	O	GPU Core VDD VID3	Strap to boot NVVDD
GPIO2	LCD_BL_PWM	O	Panel Backlight PWM Brightness Control	100 K pull-down
GPIO3	LCD_VCC or PSI	O	Panel Power Enable or Phase Shedding	LCD_VCC: 100k pull-down PSI: 10k pull-up or pull-down; stuff as needed to disable phase shedding by default
GPIO4	LCD_BLEN	O	Panel Backlight Enable	100 K pull-down
GPIO5	GPU_VID1	O	GPU Core VDD VID1	Strap to boot NVVDD
GPIO6	GPU_VID2	O	GPU Core VDD VID2	Strap to boot NVVDD
GPIO7	3DVision	O	3D Vision Left/Right signal	100 K pull-down
GPIO8	OVERT	I/O	Active Low Thermal Catastrophic Over Temperature	100 K pull-up
GPIO9	ALERT	I/O	Active Low Thermal Alert	100 K pull-up
GPIO10	MEM_VREF_CTL	O	Memory VREF Control	100 K pull-down
GPIO11	GPU_VID0	O	GPU Core VDD VID0	Strap to boot NVVDD
GPIO12	PWR_LEVEL	I	AC power detect or power supply overdraw input	100 K pull-up
GPIO13	GPU_VID5	O	GPU Core VDD VID5	Strap to boot NVVDD
GPIO14	HPD_AB	I	Hot Plug Detect for IFPAB	See Figure 76
GPIO15	HPD_C	I	Hot Plug Detect for IFPC	See Figure 76
GPIO16	PSI or MEM_VDD_CTL	O	Phase Shedding or Memory VDD VID	PSI: 10k pull-up or pull-down; stuff as needed to disable phase shedding by default MEM_VDD_CTL: Strap to boot FBVDD/Q
GPIO17	HPD_D	I	Hot Plug Detect for IFPD	See Figure 76
GPIO18	HPD_E	I	Hot Plug Detect for IFPE	See Figure 76
GPIO19	HPD_F	I	Hot Plug Detect for IFPF	See Figure 76
GPIO20	Reserved			
GPIO21	Reserved			



14,16,32,33 +3V_GFX

NB5

PROJECT : VOLKS
Quanta Computer Inc.

Size	Document Number	Rev
Custom	N12P-GV(GPIO/STRAPS)	1A

Date: Thursday, June 07, 2012 Sheet 17 of 37

CHANNEL A: 256MB/512MB DDR3

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

U1 — 96-BALL SDRAM DDR3 VRAM _DDR3 (ph)
U14 — 96-BALL SDRAM DDR3 VRAM _DDR3
U3 — 96-BALL SDRAM DDR3 VRAM _DDR3
U17 — 96-BALL SDRAM DDR3 VRAM _DDR3

R33 240/F_4
R265 240/F_4
R72 240/F_4
R330 240/F_4
R5 162/F_4 VMA_CLK0#
R301 1.33K/F_4
R305 1.33K/F_4
R263 1.33K/F_4
R264 1.33K/F_4
R328 1.33K/F_4
R329 1.33K/F_4
R350 1.33K/F_4
R349 1.33K/F_4
R71 162/F_4 VMA_CLK1#
C481 0.1U/10V_4
C498 0.1U/10V_4
C520 0.1U/10V_4
C552 0.1U/10V_4

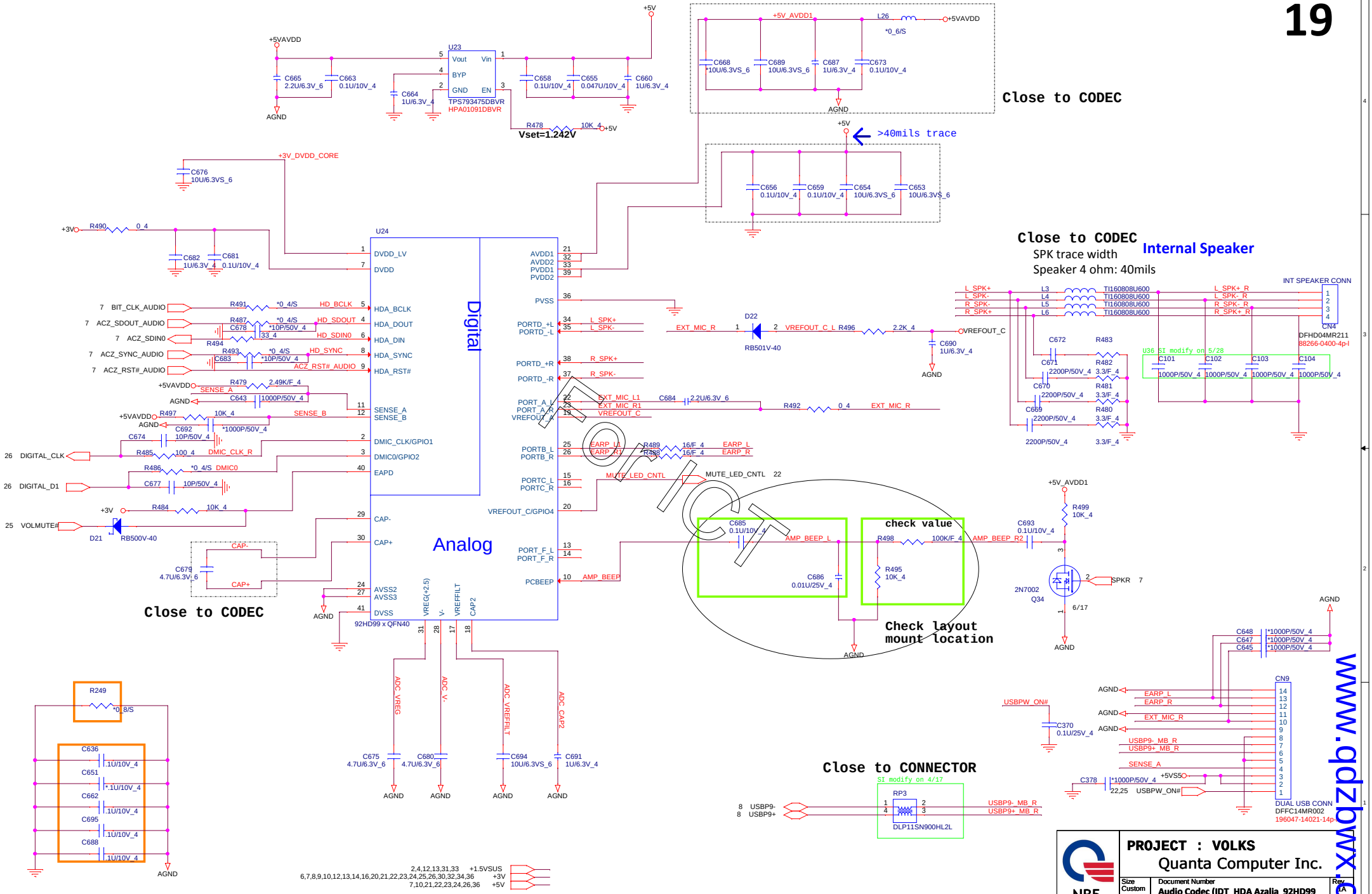
Left
Right

15,16,17,33 +1.5V_GFX

NB5

PROJECT : VOLKS
Quanta Computer Inc.

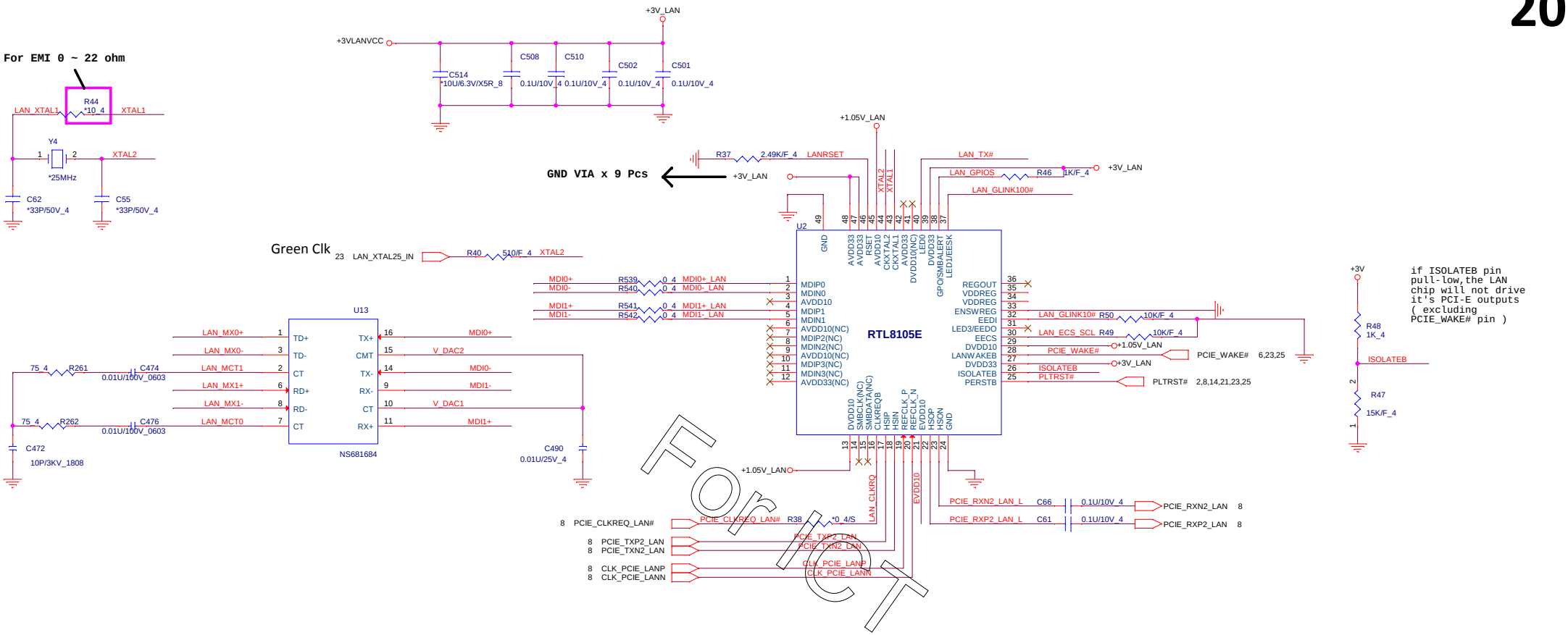
Size: Custom | Document Number: DDR3 VRAM(BGA96) | Rev: 1A
Date: Thursday, June 07, 2012 | Sheet 18 of 37

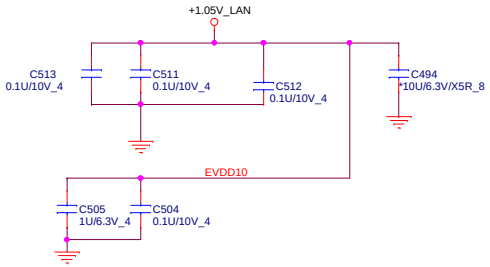


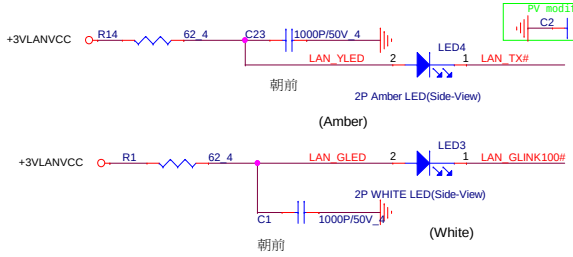
For EMI 0 ~ 22 ohm

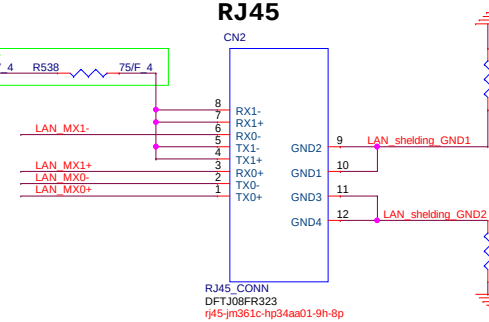
GND VIA x 9 Pcs

Green Clk



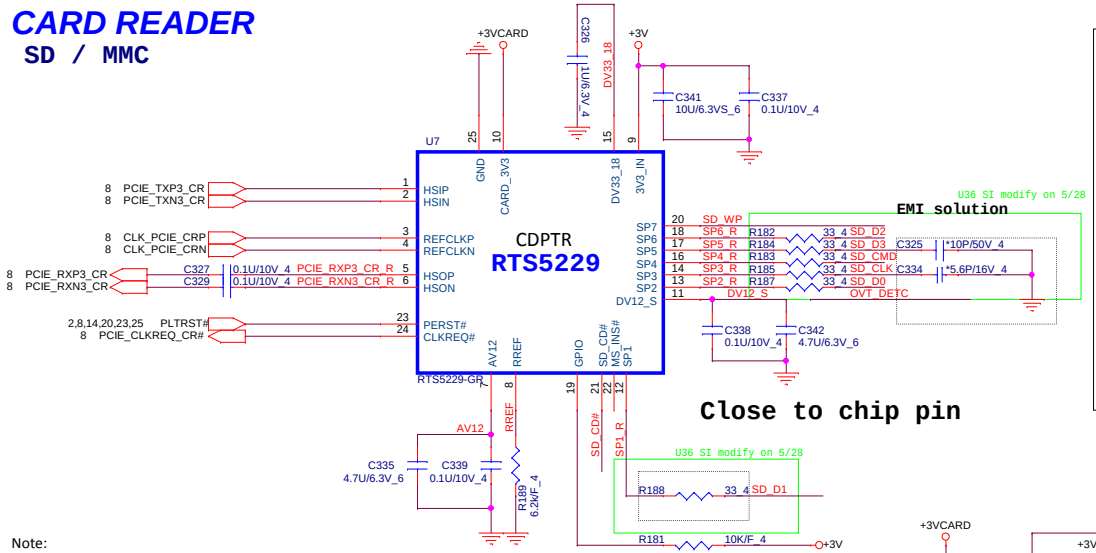


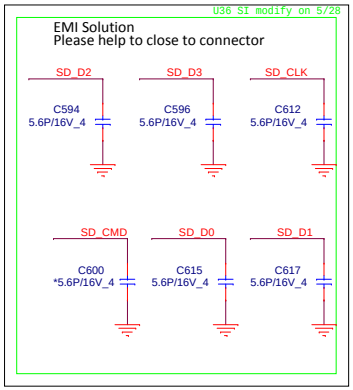


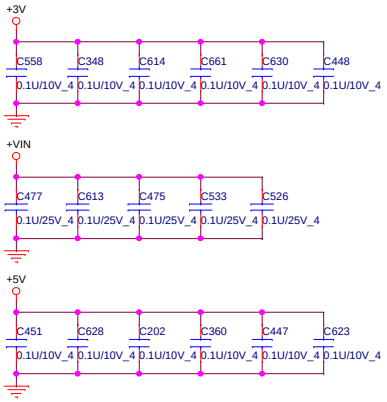


NB5	PROJECT : VOLKS Quanta Computer Inc.	
Size: Custom	Document Number: LAN RTL8105/RJ45	Rev: 1A
Date: Thursday, June 07, 2012	Sheet: 20of	37

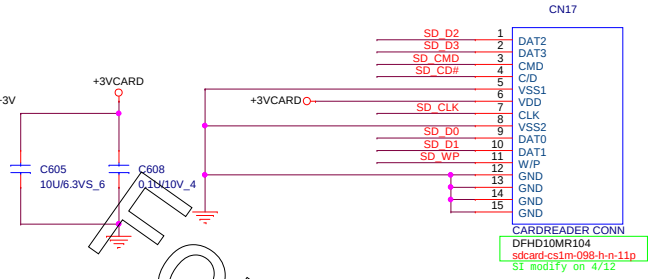
CARD READER
SD / MMC



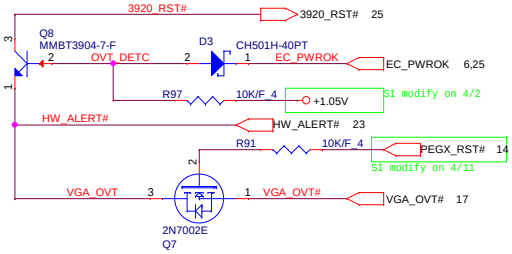


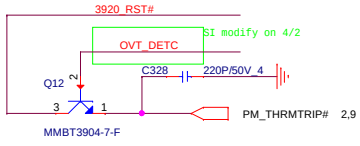


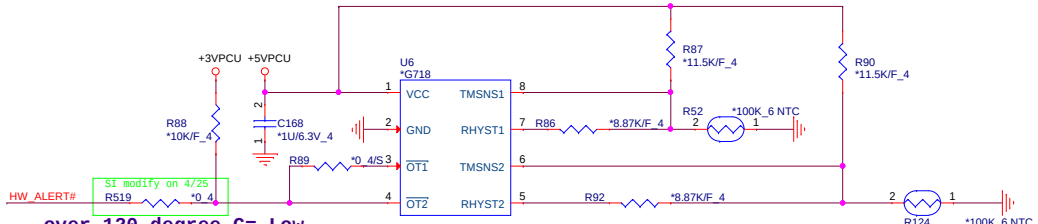
Note:
1. R5194, R5196, R5197, R5198, R5199, R5200 close to U37 pin
2. C5265, C5202 close to U37 pin7
3. C1021, C1022 close to U37 pin11
4. C1089, C1090 close to U37 pin9
5. C1019 close to U37 pin15
6. C1026, C1027 close to CN27 pin11
7. C1025 close to CN27 pin4



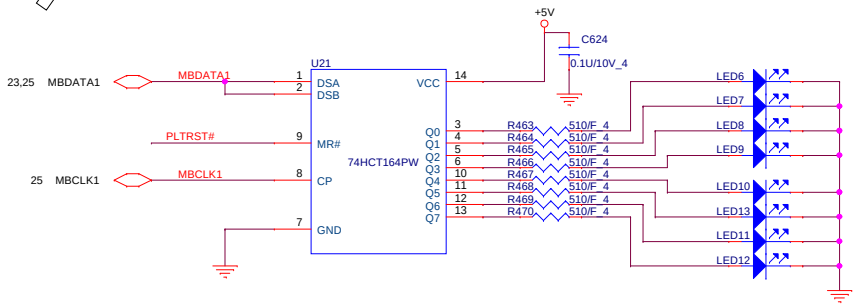
Thermal HW protect







80 port

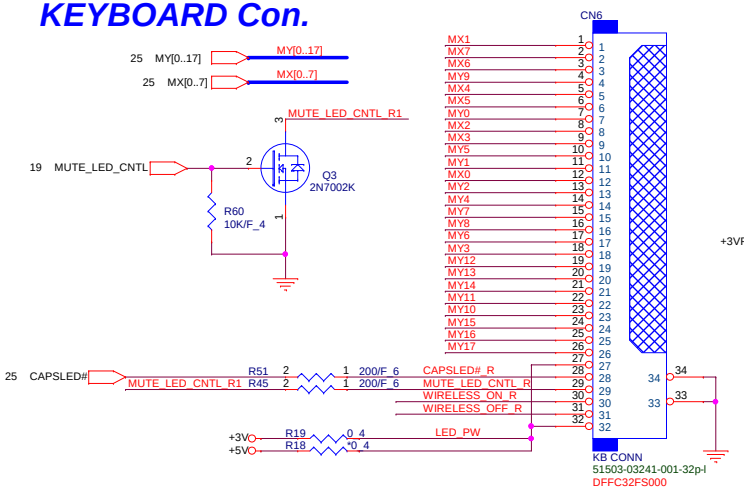


NB5

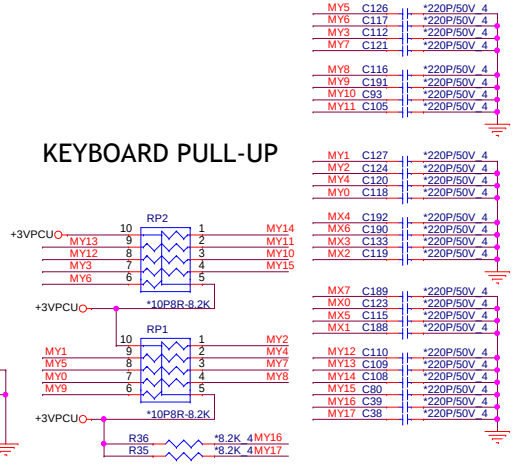
PROJECT : VOLKS
Quanta Computer Inc.

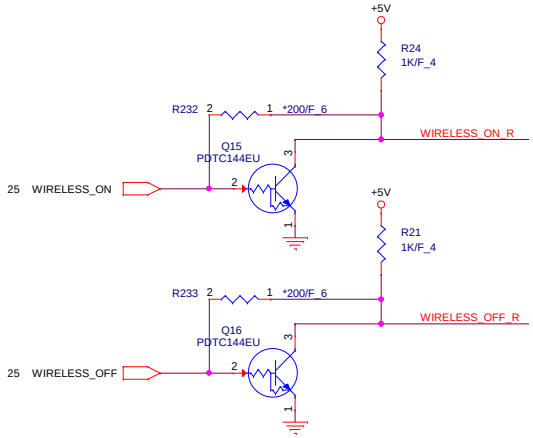
Size	Document Number	Rev
Custom	Card Reader control (RTS5229-GR)	1A
Date: Thursday, June 07, 2012	Sheet 21of 37	

KEYBOARD Con.

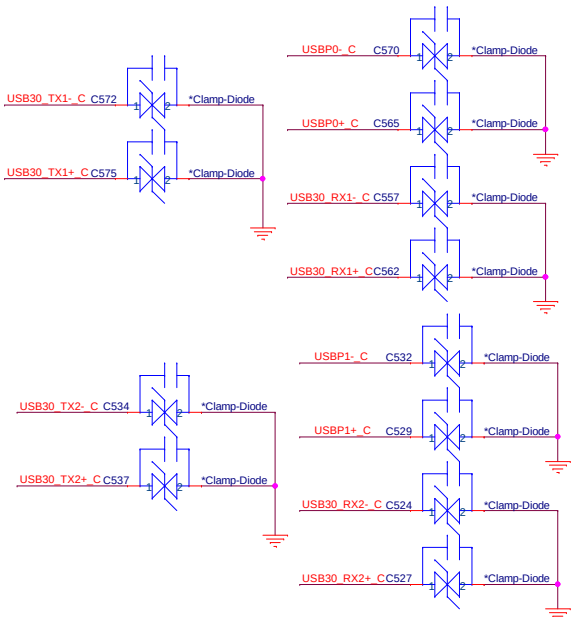


KEYBOARD PULL-UP

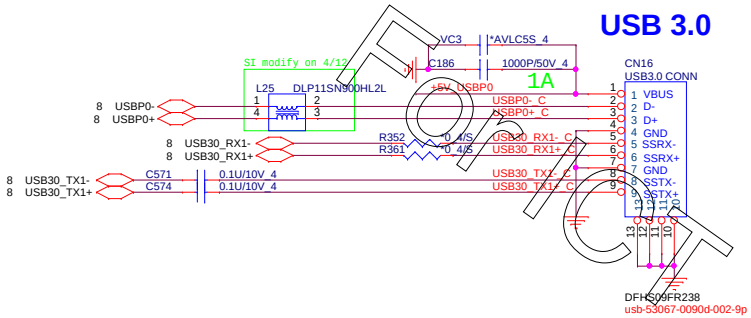




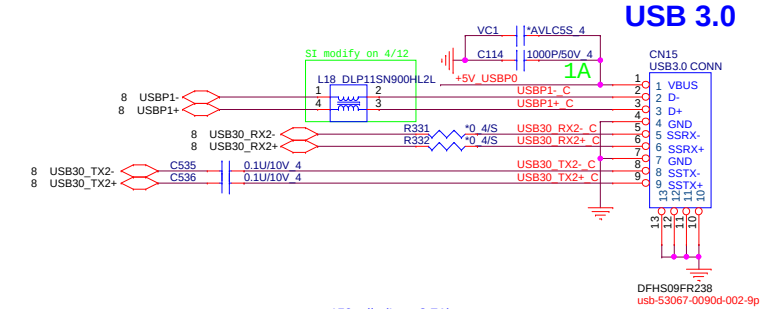
USB 2.0/3.0 Combo

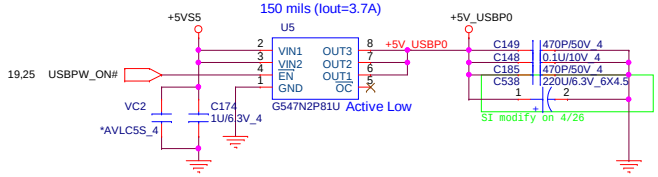


USB 3.0

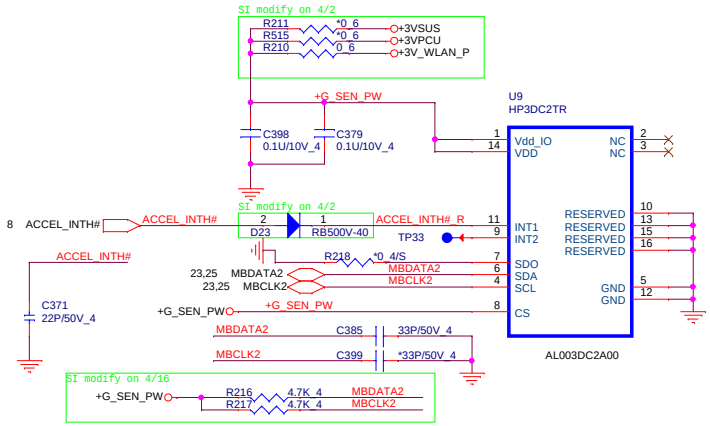


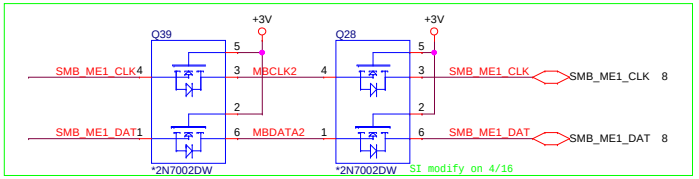
USB 3.0





Accelerometer Sensor

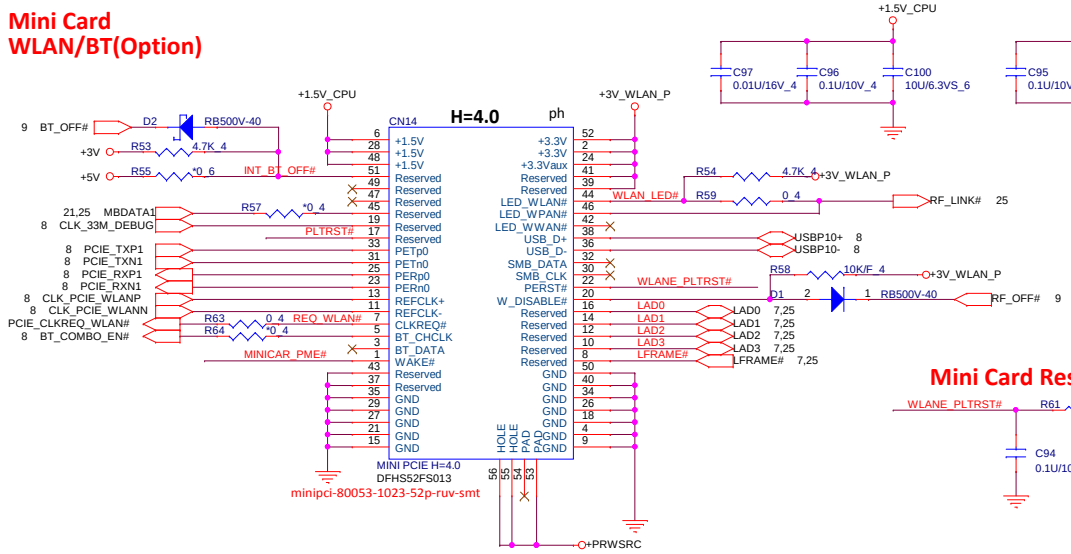


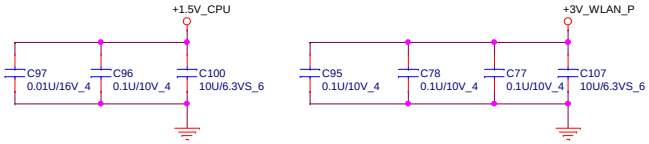


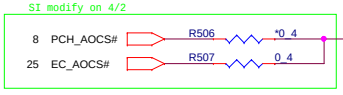
6,19,28,29,30,31,32,34,35,36 +5VS5
7,21,23,24,25,26,27,28 +3VPCU

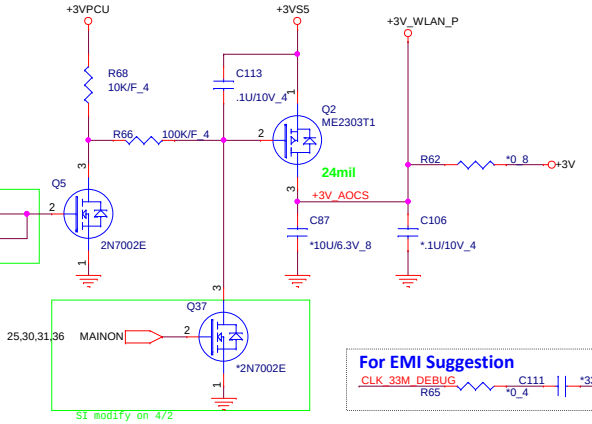
NB5	PROJECT : VOLKS Quanta Computer Inc.	
Size: Custom	Document Number: USB 3.0/KB/Green CLK	Rev: 1A
Date: Thursday, June 07, 2012	Sheet: 22of	37

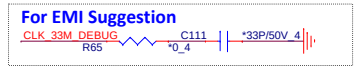
Mini Card WLAN/BT(Option)



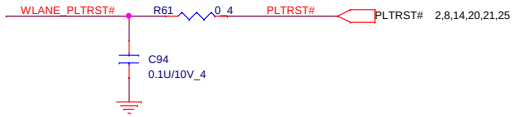




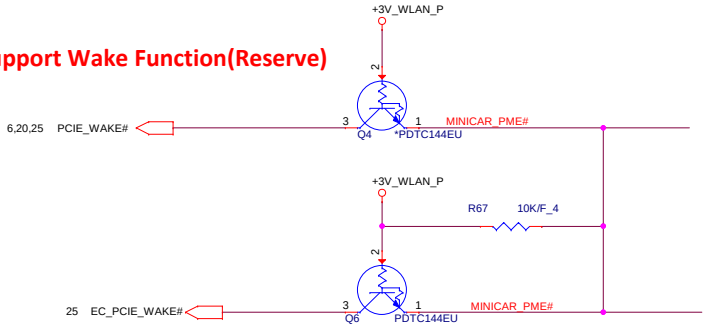




Mini Card Reset

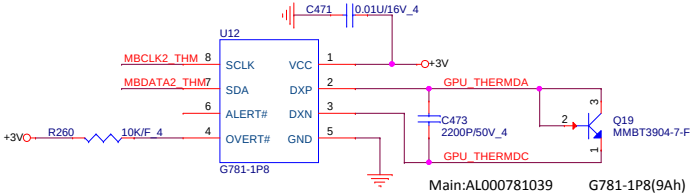


Support Wake Function(Reserve)



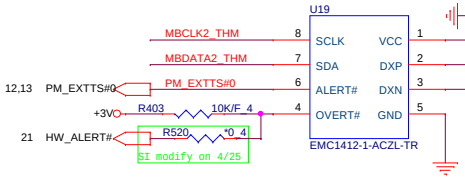
Local Thermal Sensor

GPU Thermal Sensor

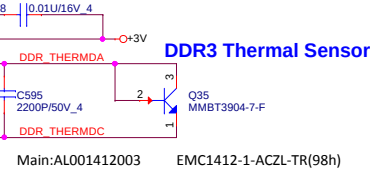


Main:AL000781039 G781-1P8(9Ah)
2nd:AL001412005 EMC1412-2-ACZL-TR(9Ah)

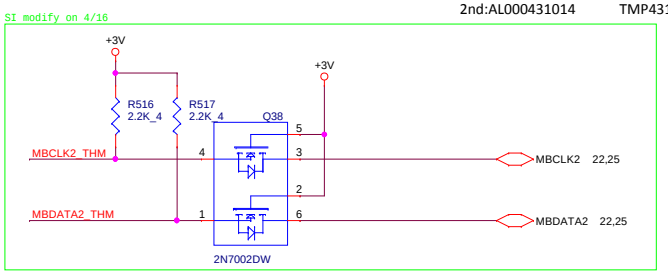
CPU Thermal Sensor



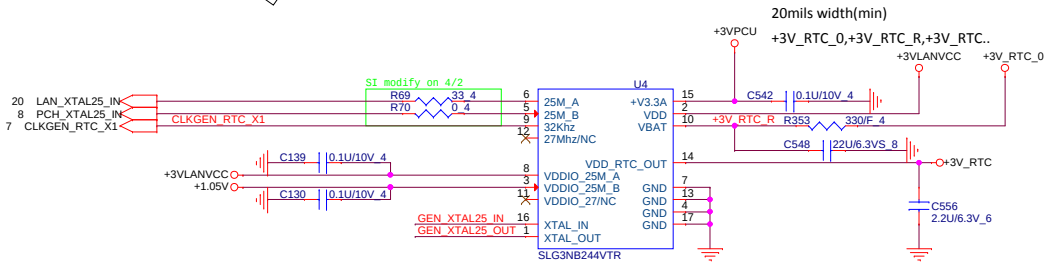
DDR3 Thermal Sensor

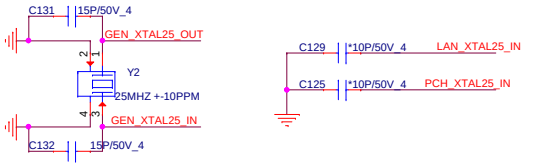


Main:AL001412003 EMC1412-1-ACZL-TR(98h)
2nd:AL000431014 TMP431ADGKR(98h)



Green CLK Circuitry





27 +PRWSRC
6,7,8,9,10,12,13,14,16,19,20,21,22,24,25,26,30,32,34,36 +3V
7,10,19,21,22,24,26,36 +5V
7,21,22,24,25,26,27,28 +3VPCU
2,4,10,24 +1.5V_CPU

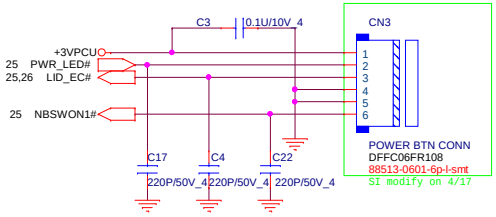
NB5

PROJECT : VOLKS
Quanta Computer Inc.

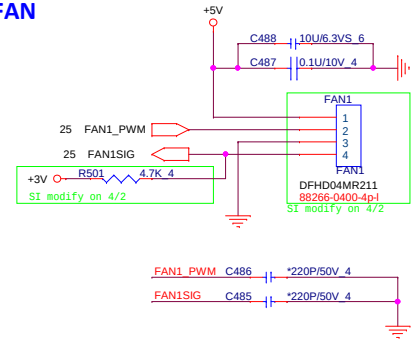
Size	Document Number	Rev
Custom	MINI-PCIE/LED	1A
Date: Thursday, June 07, 2012	Sheet 23of 37	

Power Botton Connector

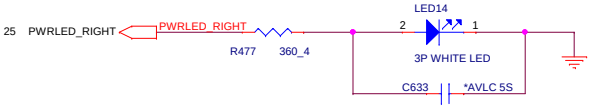
Pin1 : +3VPCU(LIDSWITCH PWR)
Pin2 : POWER LED
Pin3 : LIDSWITCH
Pin4 : GND
Pin5 : GND
Pin6 : POWERON#



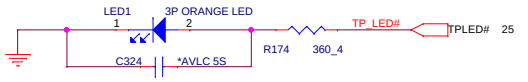
FAN



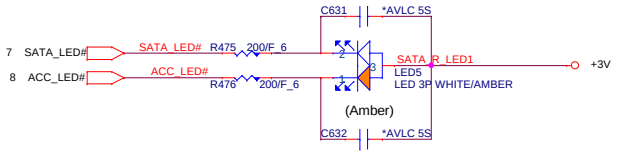
PWR LED



14" TP LED

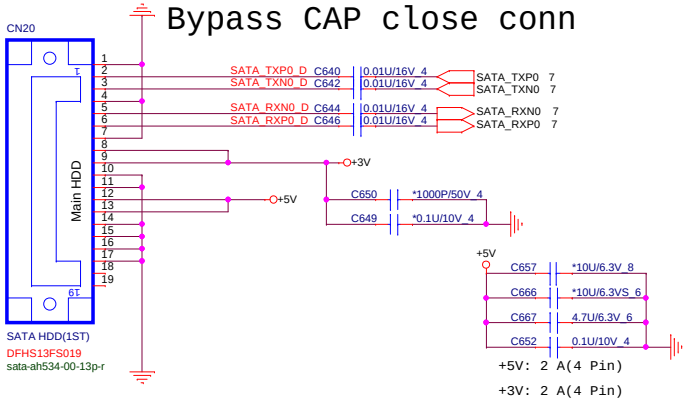


SATA LED



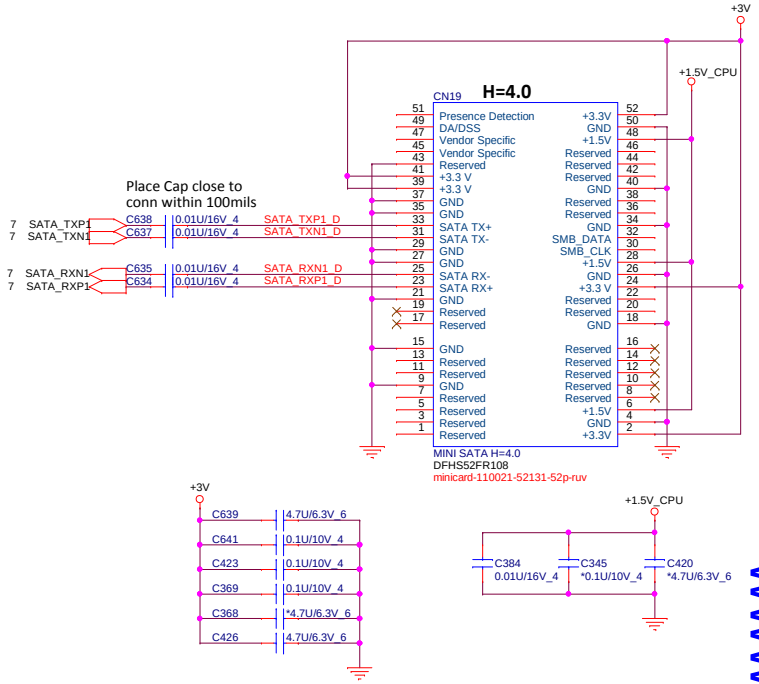
SATA HDD Connector(Cable type)

Bypass CAP close conn



+5V: 2 A(4 Pin)
+3V: 2 A(4 Pin)
Gnd : (5 Pin)

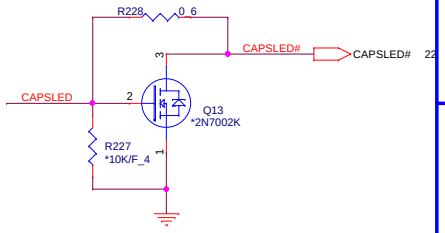
Mini PCI-E Card 2- Full size mSATA



6,7,8,9,10,12,13,14,16,19,20,21,22,23,25,26,30,32,34,36 +3V
7,10,19,21,22,23,26,36 +5V
7,21,22,23,25,26,27,28 +3VPCU
2,4,10,23 +1.5V_CPU
27,33,36 +12VALW

NB5	PROJECT : VOLKS Quanta Computer Inc.	
Size: Custom	Document Number: SATA HDD/ODD/MSATA CONN	Rev: 1A
Date: Thursday, June 07, 2012	Sheet: 24of	37

Cap LED



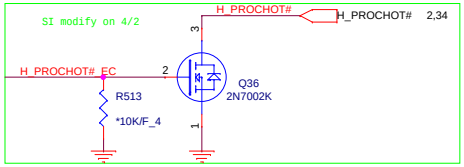
SI modify on 4/11

KB_STRAP R514 *10K/F_4

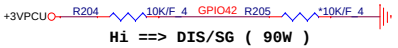
14" un-stuff

15.6" stuff

SI modify on 4/2



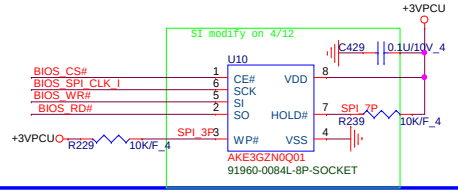
Adapter select for EC

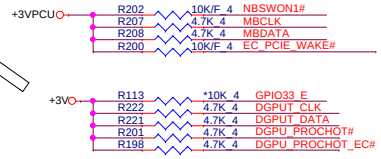


Hi ==> DIS/SG (90W)

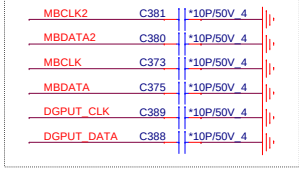
Low ==>UMA (65W)

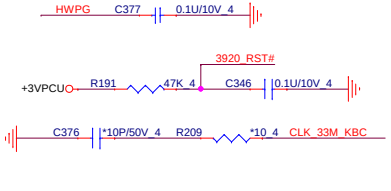
Vender	Size	P/N
EON	1MB	AKE3GZN0Q01 (EON EN25Q80A-100HIP)
MX	1MB	AKE3GFP0Z00 (MX25L8006EM2I-12G)
AMIC	1MB	AKE3GZP0801 (A25L080M-F)
Socket		DFHS08FS023

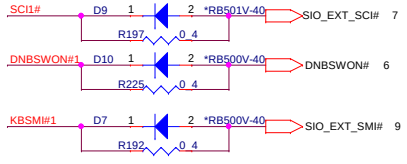


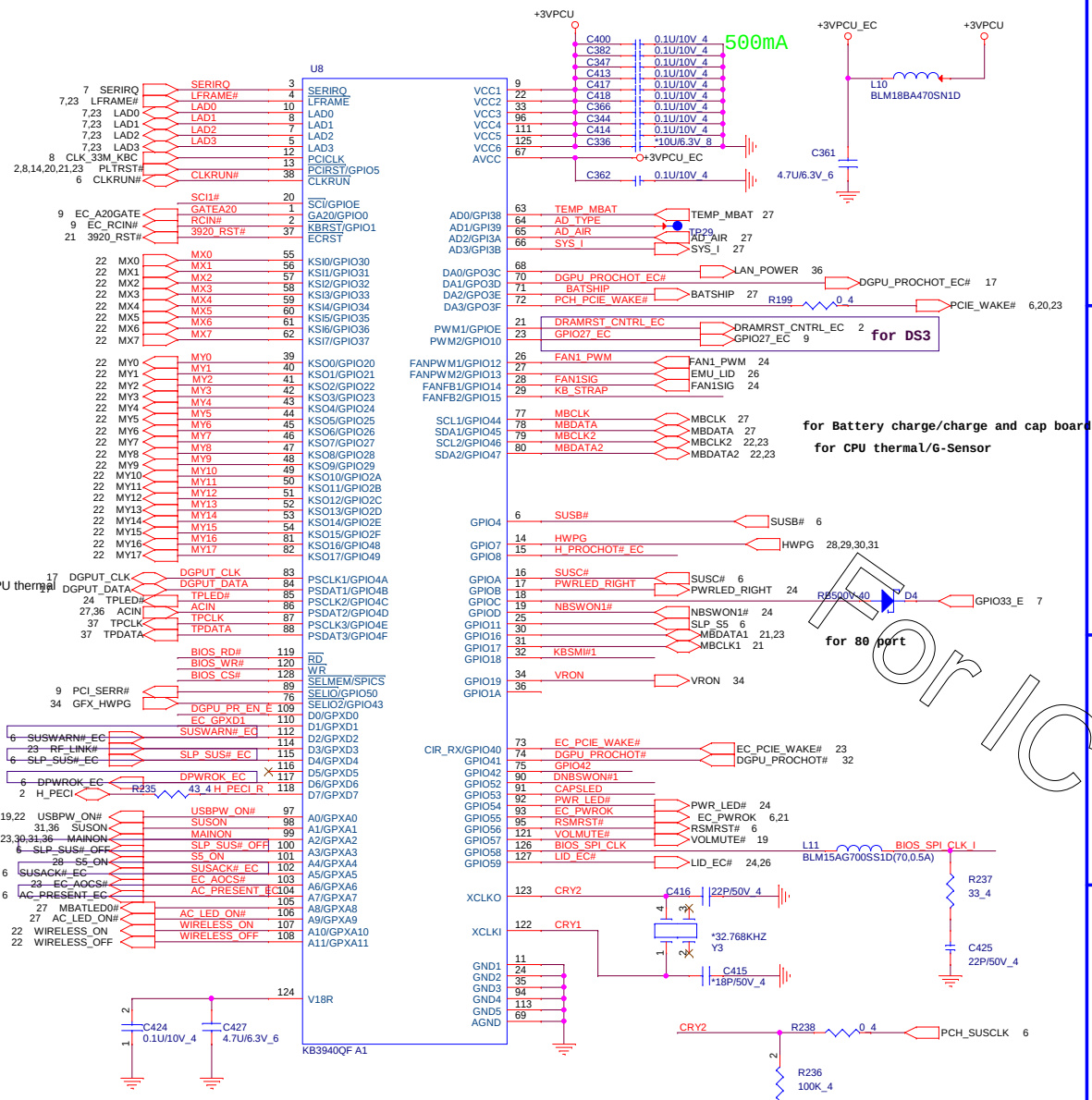


Reserve for ENE Hold time issue









NB5

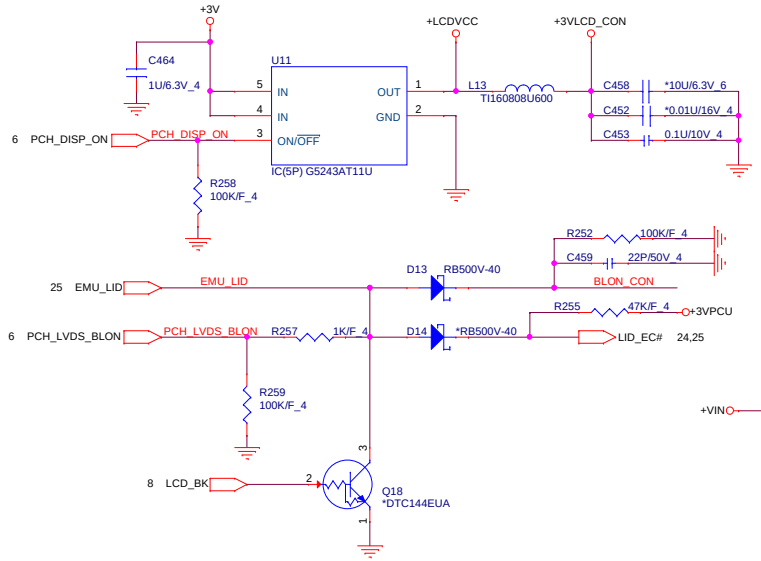
PROJECT : VOLKS

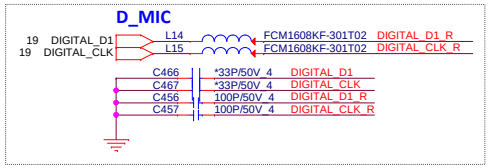
Quanta Computer Inc.

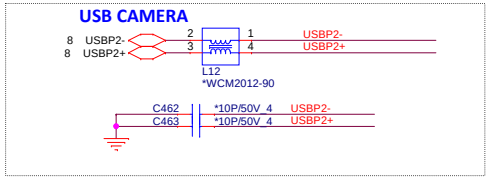
Size	Document Number	Rev
Custom	EC (KB3940 A1)/ROM	1A

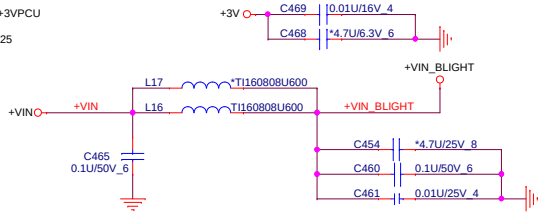
Date: Thursday, June 07, 2012 Sheet 25 of 37

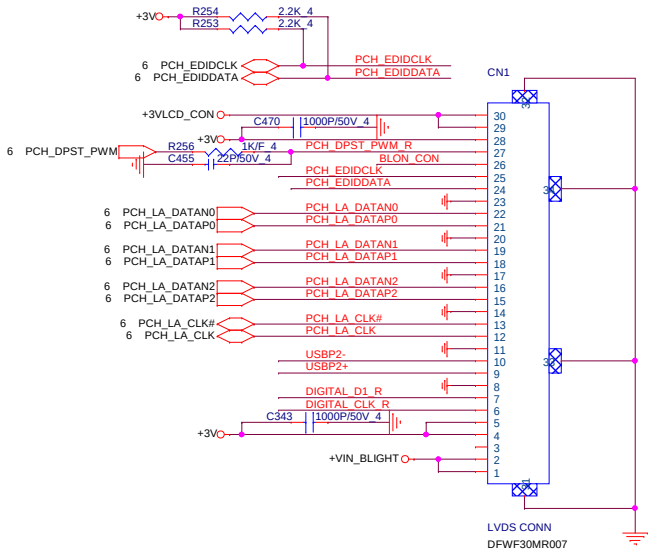
LVDS Conn.





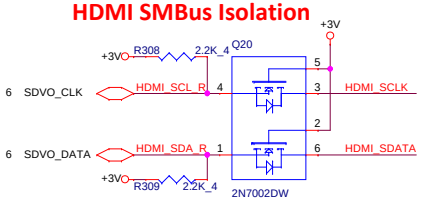






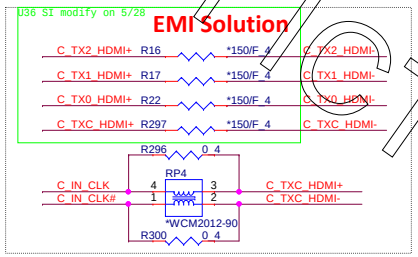
HDMI Conn.

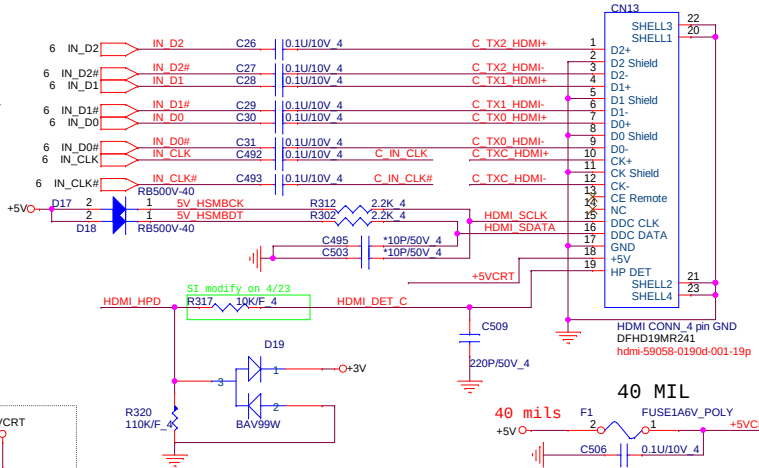
HDMI SMBus Isolation

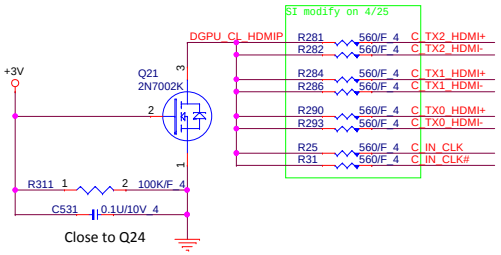


Close to HDMI connector

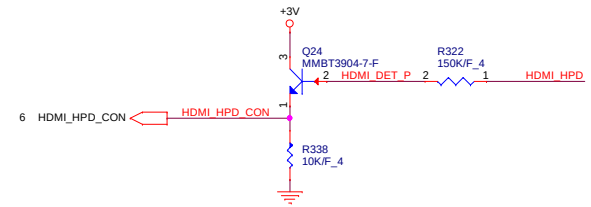
EMI Solution

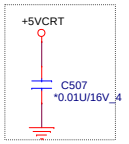




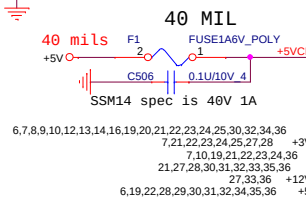


Close to Q24





for EMI request



NB5

PROJECT : VOLKS

Quanta Computer Inc.

Size	Document Number	Rev
Custom	LCD Connector (LVDS)	1A
Date: Thursday, June 07, 2012	Sheet 26of 37	

DC_JACK
90W

Do Not add test pad on BATDIS_G signal

Place this ZVS close to Diode away +VIN

PV modify 0605

PV modify 0607

To PWR LED

Place this ZVS close to Far-Far away +VIN

Place this cap close to EC

Place this cap close to EC

Place this cap close to EC

ACDET=13V

MIN. BATV=7.2V

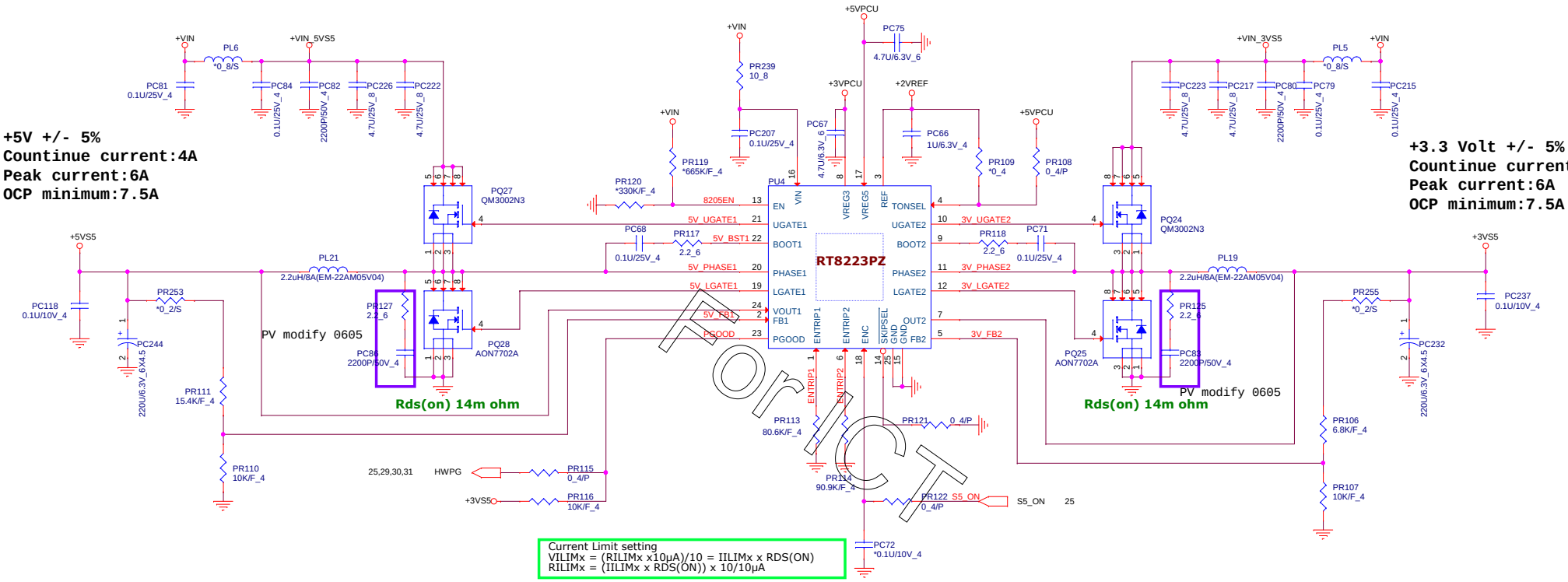
PU1 BQ24738

PROJECT : VOLKS
Quanta Computer Inc.
NB5
Size: Custom | Document Number: Charger (OZ8681) | Rev: 1A
Date: Thursday, June 07, 2012 | Sheet 27 of 37

DC/DC +3V_ALW/+5V_ALW/+5V_ALW2 /+15V_ALW

+5V +/- 5%
Countinue current:4A
Peak current:6A
OCP minimum:7.5A

+3.3 Volt +/- 5%
Countinue current:4A
Peak current:6A
OCP minimum:7.5A



NB5

PROJECT : VOLKS
Quanta Computer Inc.

Size	Document Number	Rev
Custom	3/5VS5 (RT8223P)	A4
Date: Thursday, June 07, 2012	Sheet 28 of 37	

TPS51462RGER/AL051462000

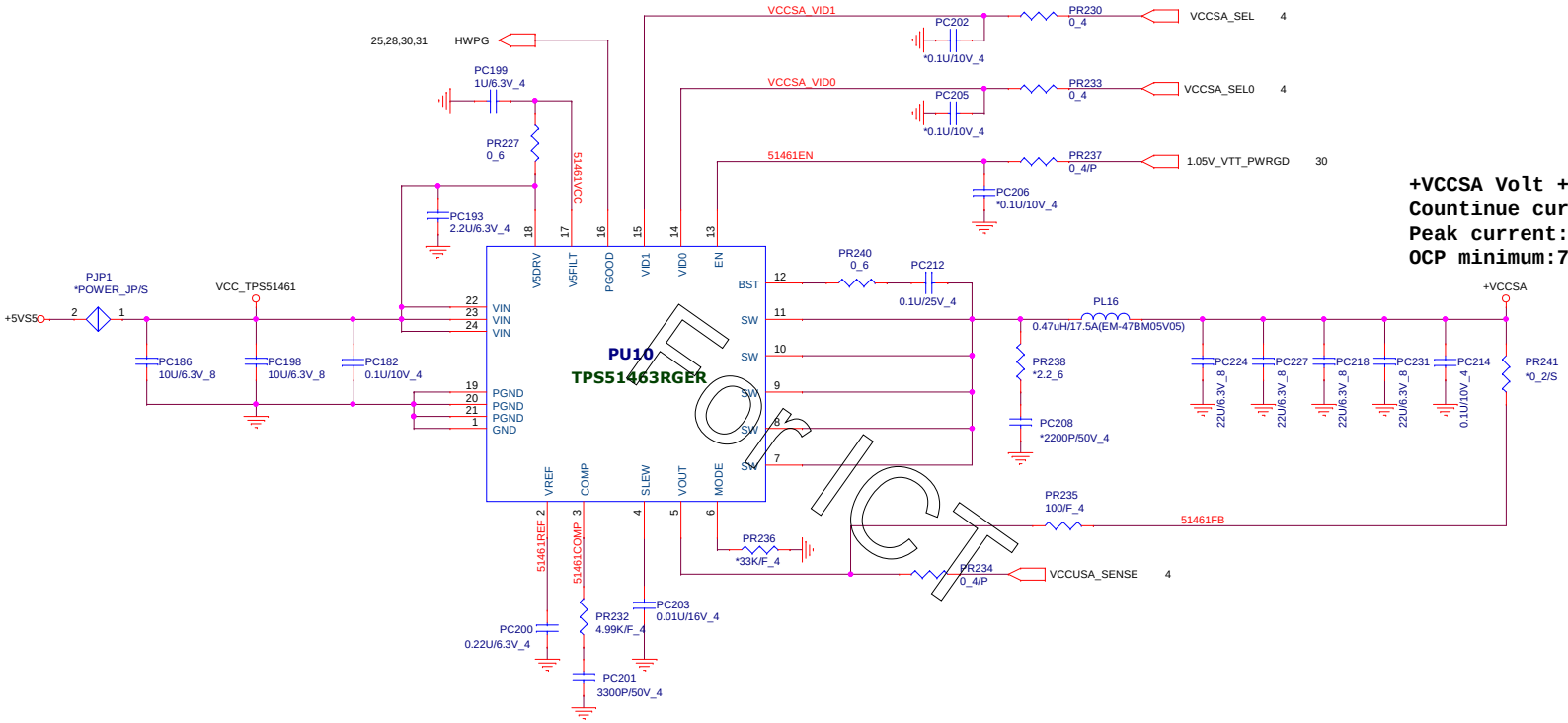
For CPU SV system agent voltage slew rate of 0.5 -10 mV/µs

SEL0	SEL1	+VCCSA
0	0	0.9V
0	1	0.8V
1	0	0.725V
1	1	0.675V

TPS51463RGER/AL051463000

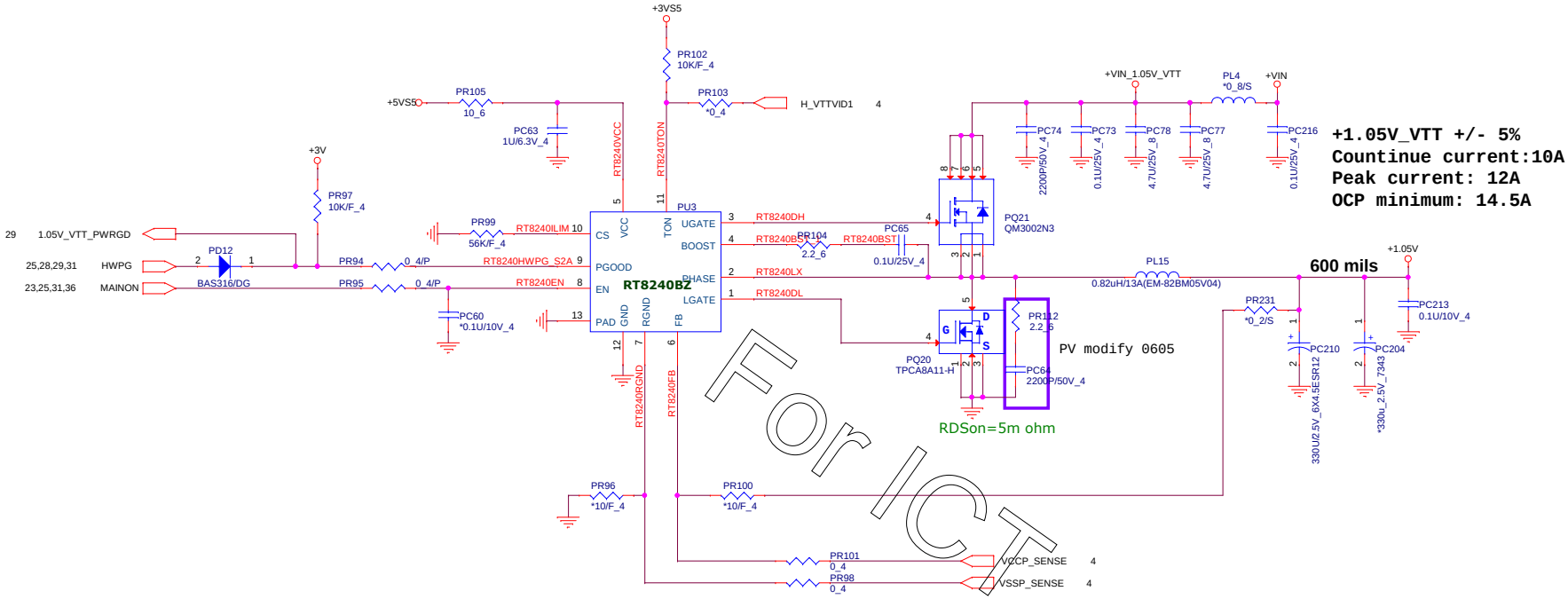
For CPU ULV system agent voltage slew rate of 0.5 -10 mV/µs

SEL0	SEL1	+VCCSA
0	0	0.9V
0	1	0.85V
1	0	0.775V
1	1	0.75V

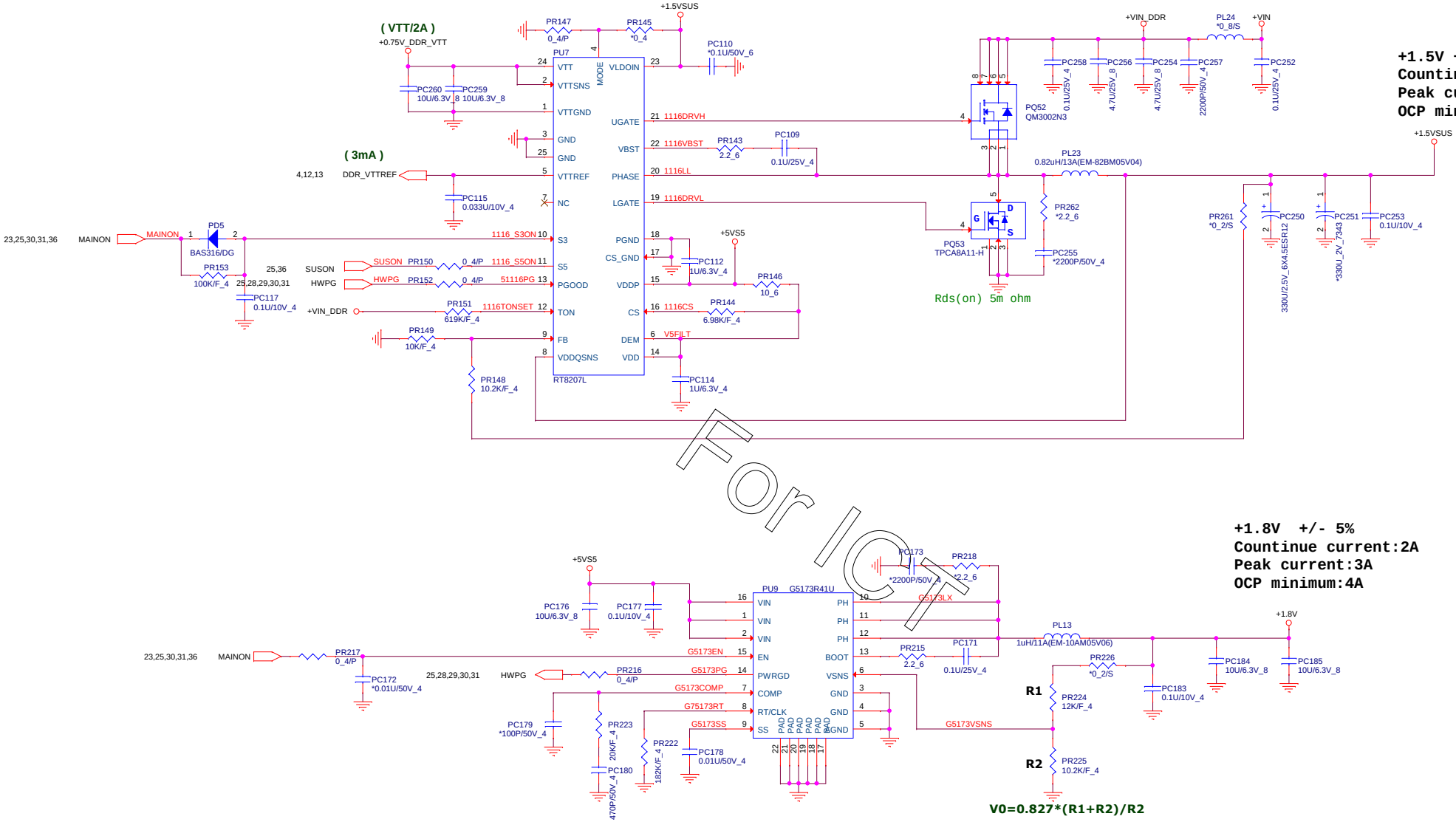


+VCCSA Volt +/- 5%
Countinue current:4A
Peak current:6A
OCP minimum:7A

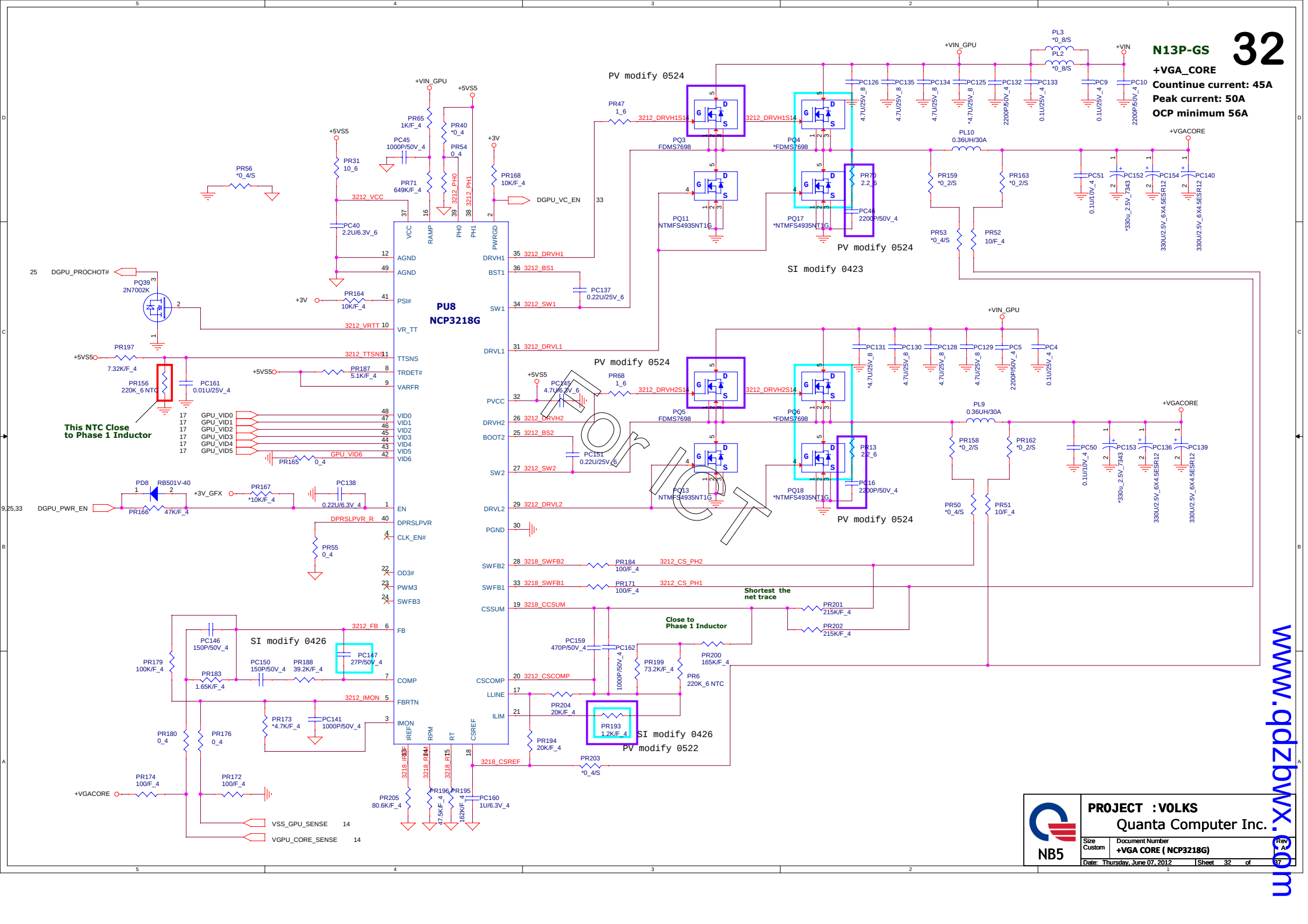
NB5	PROJECT : VOLKS Quanta Computer Inc.	
Size: Custom	Document Number: +VCCSA (TPS51462RGER)	Rev: A*
Date: Thursday, June 07, 2012	Sheet: 29of	37



NB5	PROJECT : VOLKS Quanta Computer Inc.	
Size: Custom	Document Number: +1.05V (RT8240B)	Rev: 1A
Date: Thursday, June 07, 2012	Sheet: 30of	37



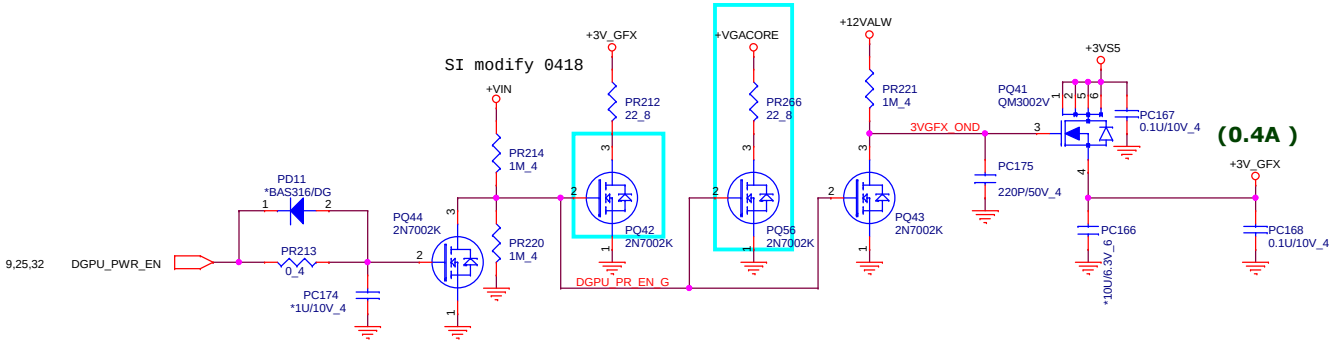
NB5	PROJECT : VOLKS Quanta Computer Inc.	
	Size: Custom Document Number: DDR3 (RT8207)	Rev: 1A
	Date: Thursday, June 07, 2012	Sheet 31 of 37

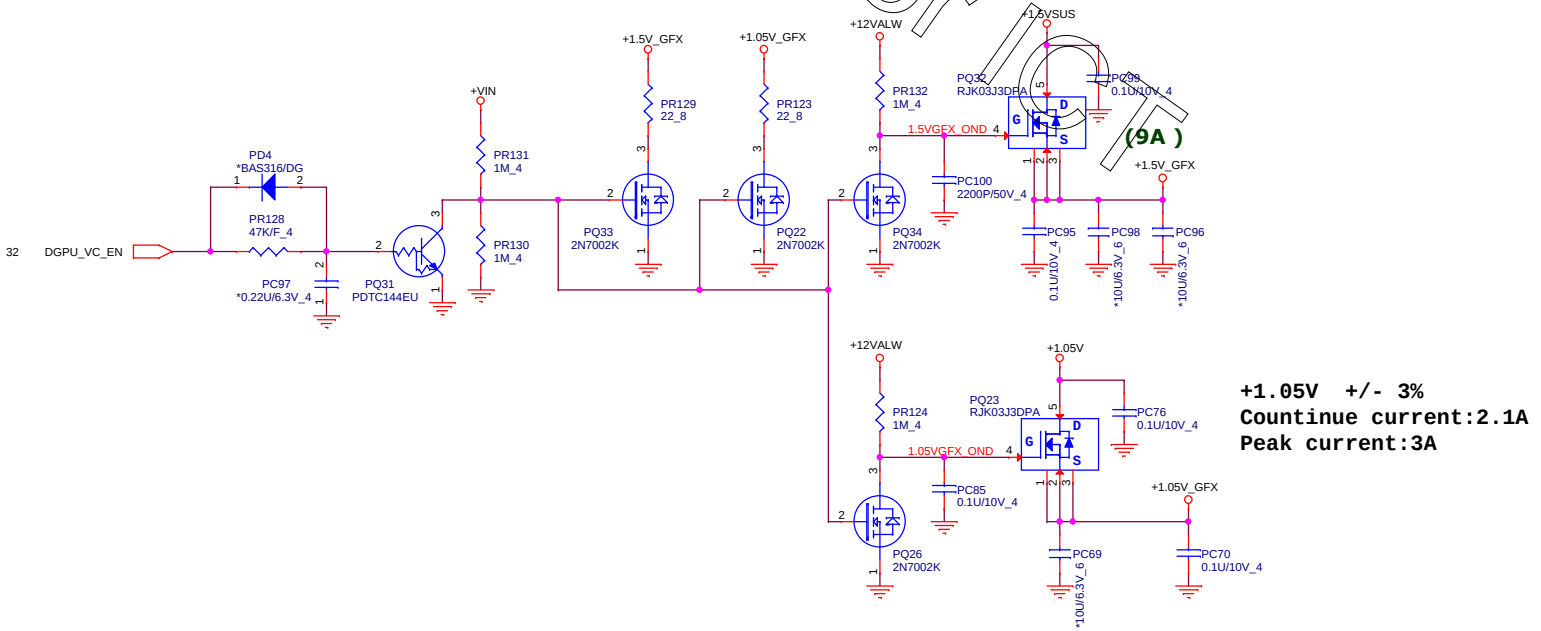

32
N13P-GS
+VGA_CORE
Countinue current: 45A
Peak current: 50A
OCP minimum 56A
PU8
NCP3218G
PV modify 0524
SI modify 0423
SI modify 0426
PV modify 0522
This NTC Close to Phase 1 Inductor
Close to Phase 1 Inductor
Shortest the net trace
PROJECT : VOLKS
Quanta Computer Inc.
NB5
+VGA CORE (NCP3218G)
Thursday, June 07, 2012
www.qdzbwx.com

VGA

2,4,12,13,31 +1.5VSUS
6,10,23,28,30,36 +3VS5
14,16,17,32 +3V_GFX
15,16,17,18 +1.5V_GFX
14,15,16 +1.05V_GFX
27,36 +12VALW
2,4,6,7,8,10,21,23,30,34 +1.05V

SI modify 0418





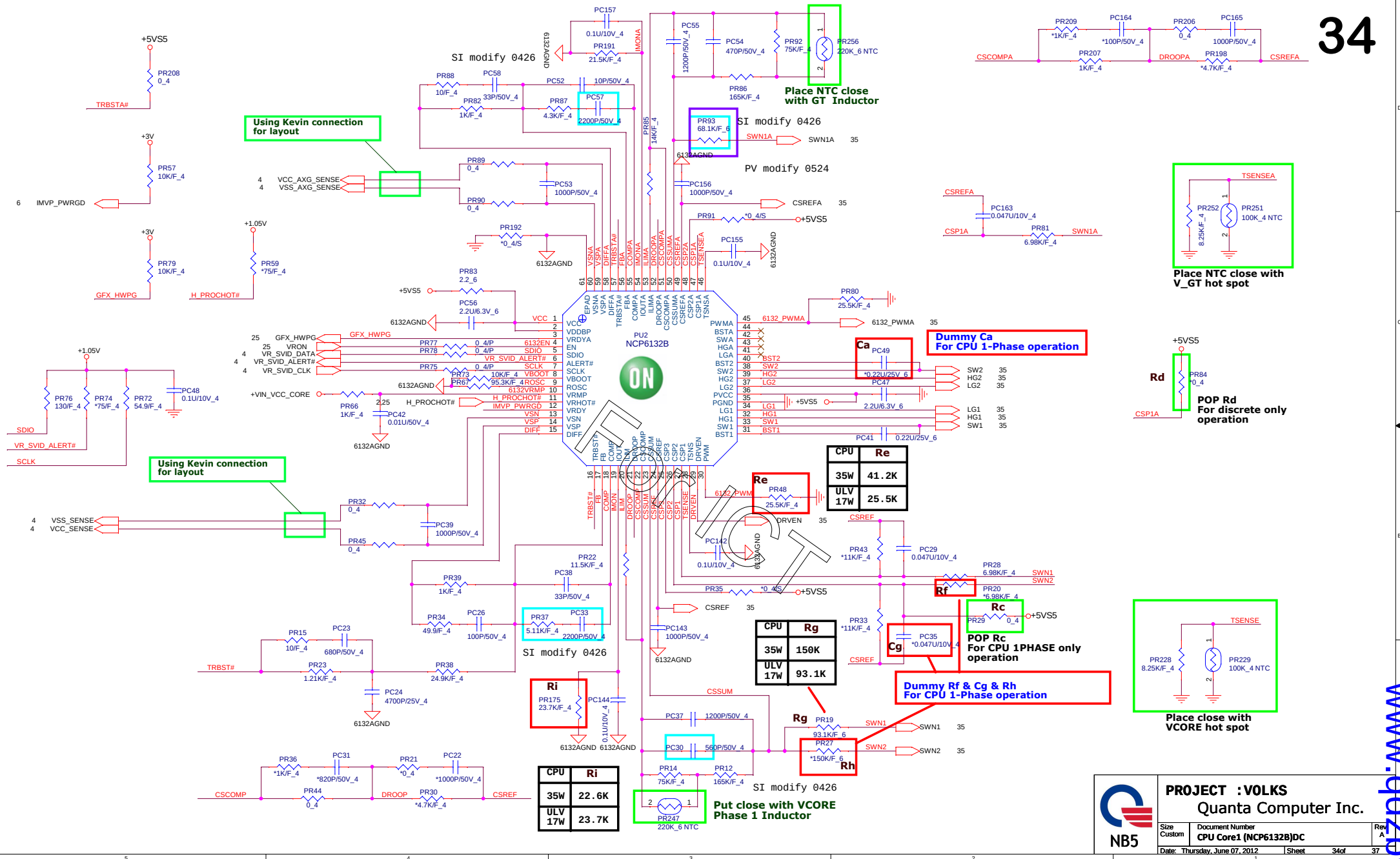
+1.05V +/- 3%
Countinue current:2.1A
Peak current:3A

NB5

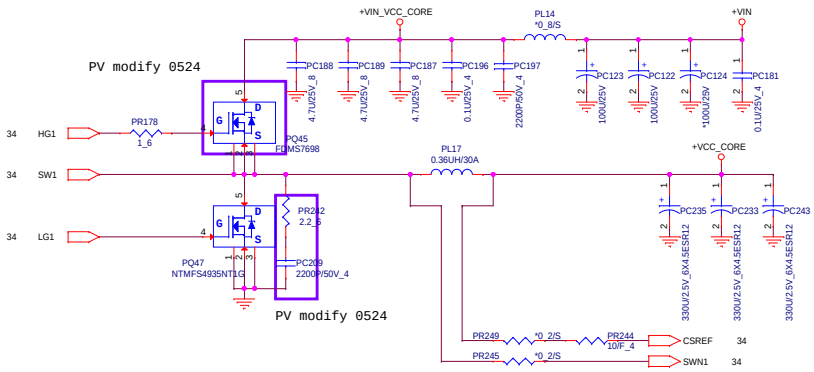
PROJECT : VOLKS
Quanta Computer Inc.

Size	Document Number	Rev
Custom	+VGA POWER	A

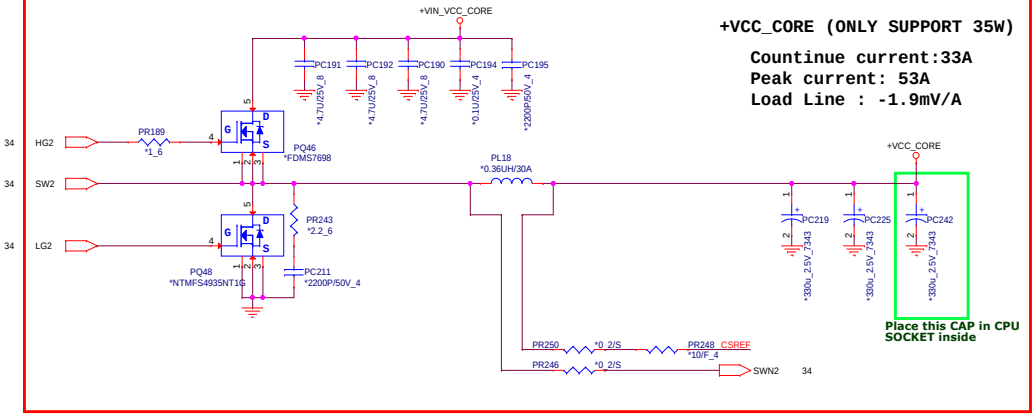
Date: Thursday, June 07, 2012 Sheet 33 of 37



PROJECT	VOLKS
	Quanta Computer Inc.
Size / Custom	Document Number: CPU Core1 (NCP6132B)DC
Rev	A
NB5	Date: Thursday, June 07, 2012 Sheet 34of 37



Dummy This Schematic
For CPU 1-Phase operation



+VCC_CORE (ONLY SUPPORT 35W)

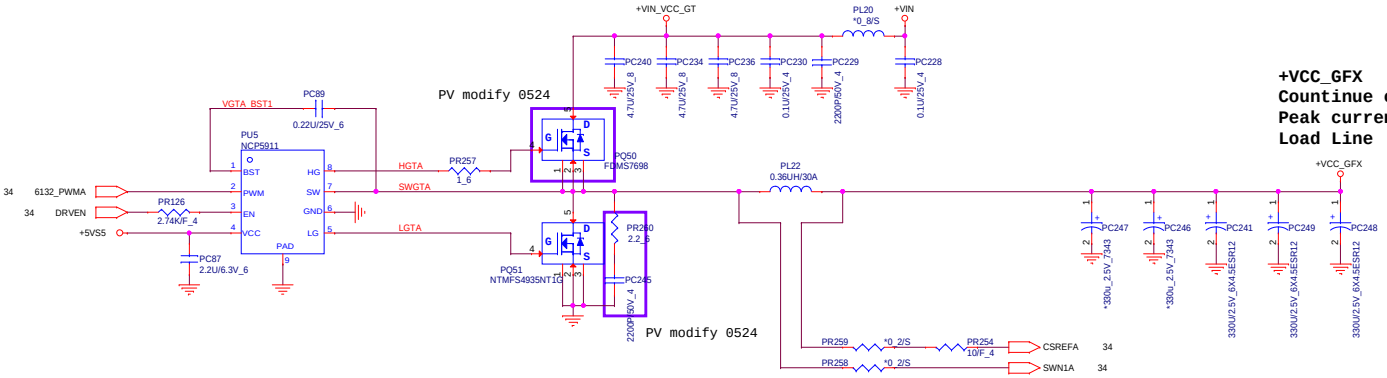
Countinue current:33A
Peak current: 53A
Load Line : -1.9mV/A

+VCC_CORE (ONLY SUPPORT 35W)

Countinue current:32A
Peak current: 53A
Load Line : -1.9mV/A

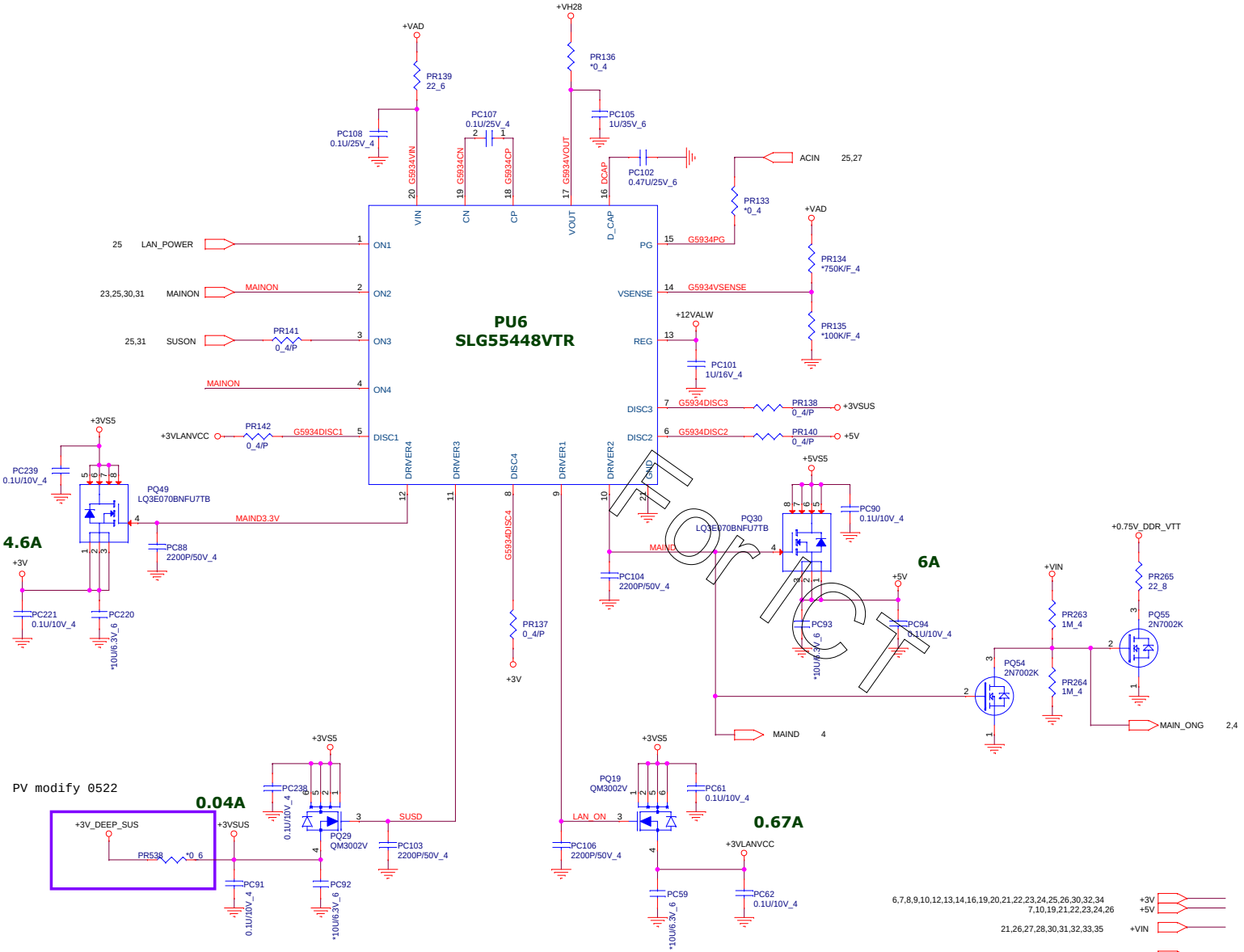
+VCC_CORE (ULV 17W)

Countinue current:16A
Peak current: 33A
Load Line : -2.9mV/A



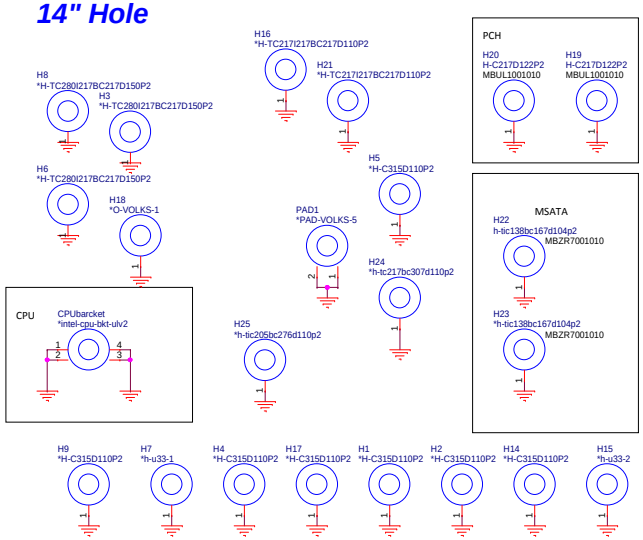
+VCC_GFX
Countinue current:21.5A
Peak current: 33A
Load Line : -3.9mV/A

NB5	PROJECT : VOLKS Quanta Computer Inc.	
Size: C	Document Number: CPU Core2 (NCP5911)DC	Rev: A
Date: Thursday, June 07, 2012	Sheet: 35of 37	

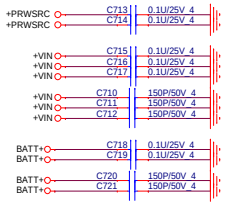


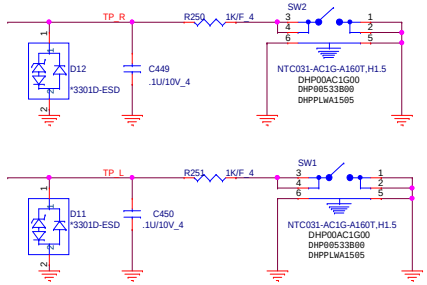
NB5	PROJECT : VOLKS Quanta Computer Inc.	
Size: Custom	Document Number: Dis-charge IC (SLG55448V)	Rev: A
Date: Thursday, June 07, 2012	Sheet 36 of 37	

14" Hole

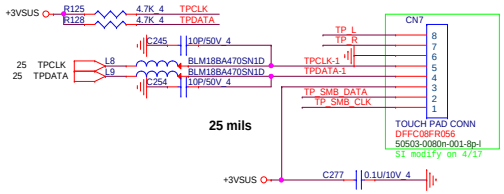


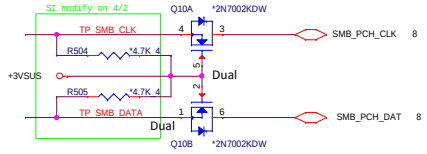
EMI CAP for 14"





Touch Pad Connector





NB5	PROJECT : VOLKS Quanta Computer Inc.	
Size C	Document Number Hole	Rev A
Date: Thursday, June 07, 2012	Sheet 37 of 37	