



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)

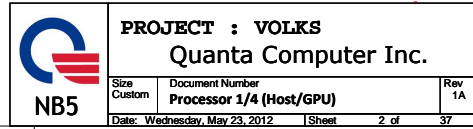
Ricktek RT8223P
System Power (+3VPCU/+5VPCU/
+3VS5/+5VS5)

**NCP6132/NCP5911/RT8240P/
TPS51462RGER**
Processor Power (+VCC_CORE/
+1.05_VTT/+VCCSA)

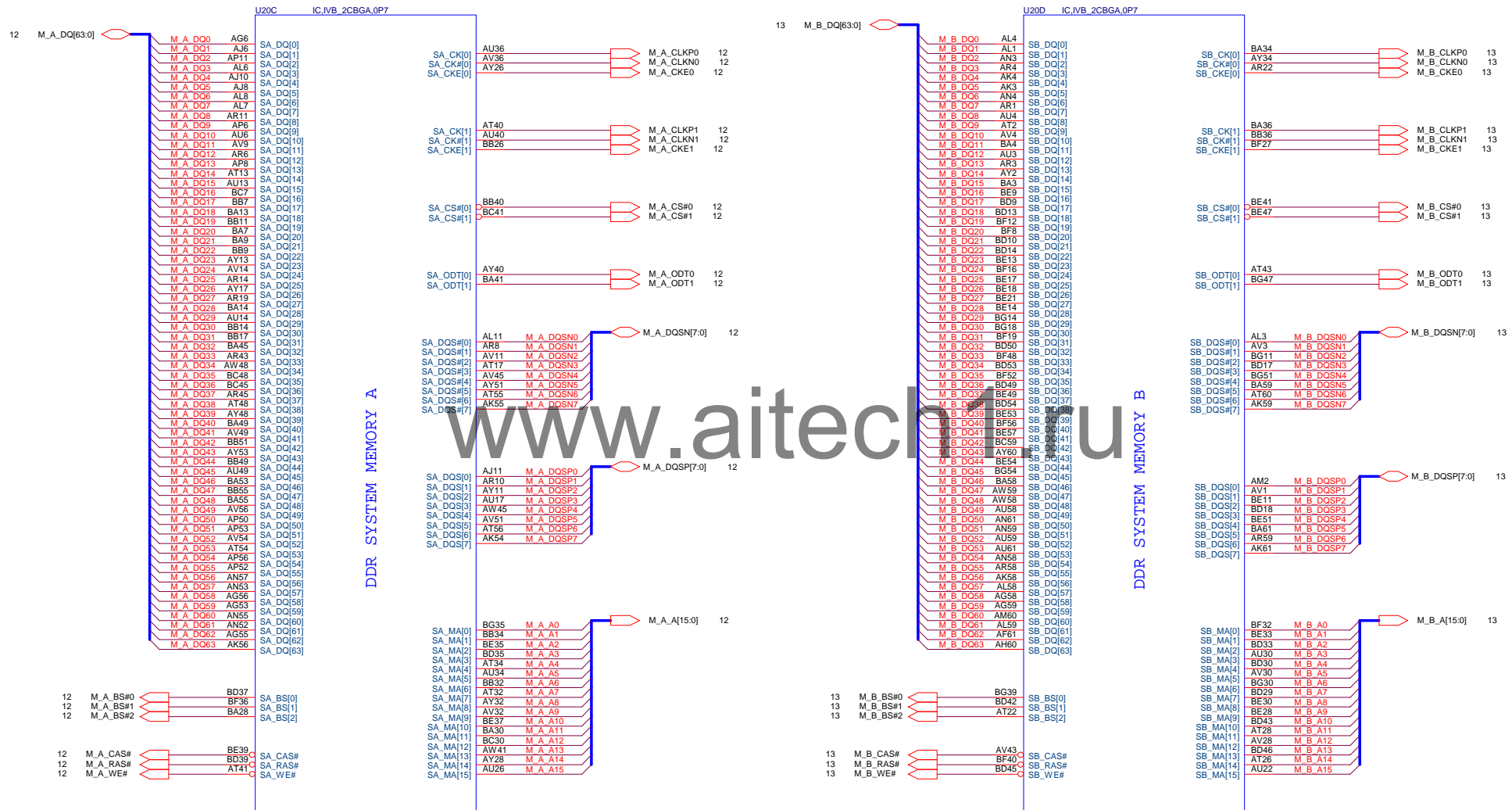
SLG55448V
System Discharge Power
(+1.5V/+3V/+5V)

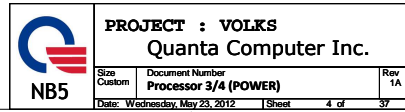
Richtek RT8207
System Memory Power (+1.5VSUS/
+0.75V DDR VTT)

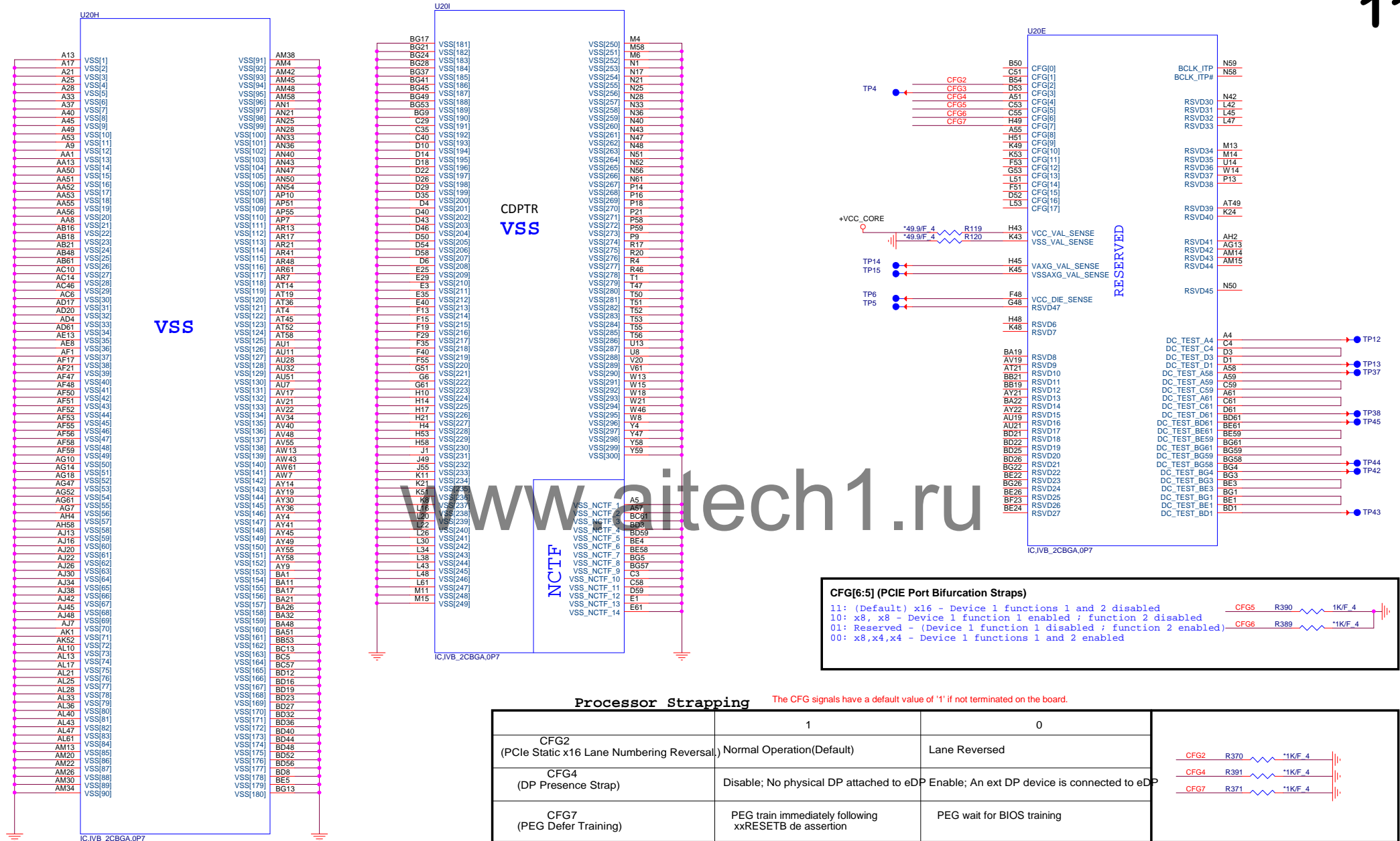
NCP3218G
GPU core power(+VGACORE)

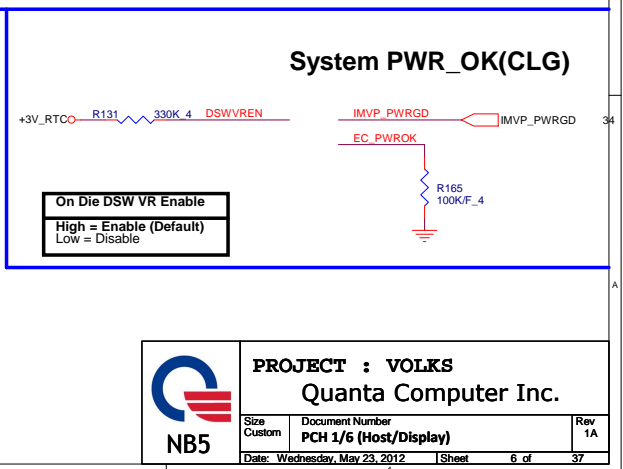


Ivy Bridge Processor (DDR3)

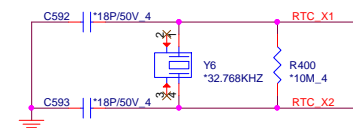






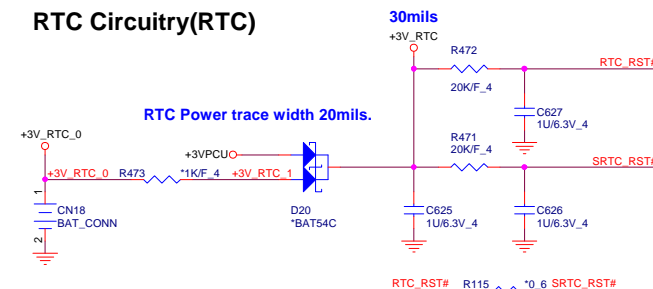


07

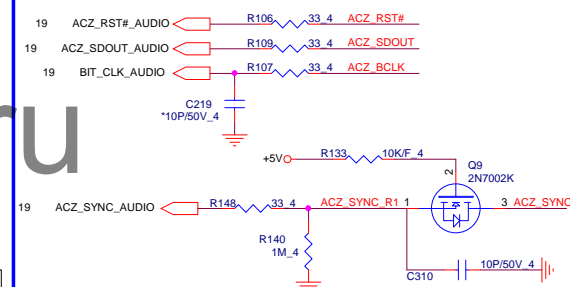


no stuff If use green Clock

RTC Circuitry(RTC)

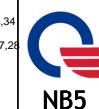
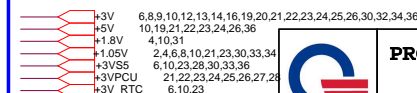
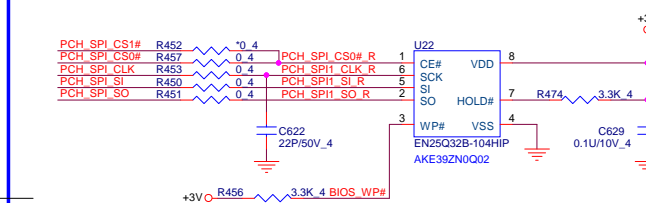


HDA Bus(CLG)



☐ 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



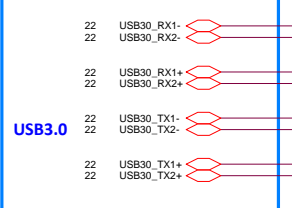
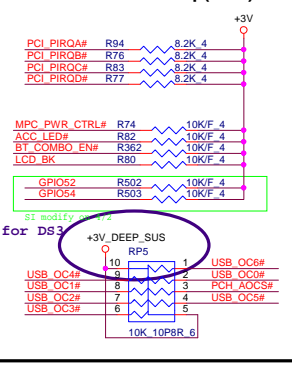
PROJECT : VOLKS
Quanta Computer Inc.

Size Custom	Document Number PCH 2/6 (HDA/RTC/SATA/SPI)	Rev 1A
Date: Wednesday, May 23, 2012	Sheet 7 of 37	

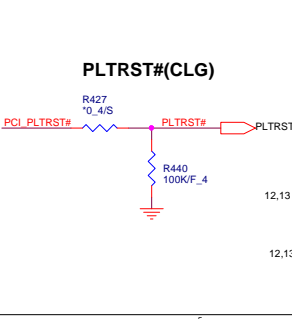
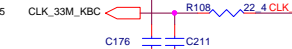
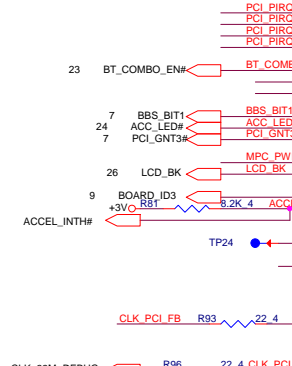
PCH Strap Table

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	<table border="1"><thead><tr><th>GNT1#</th><th>GNT0#</th><th>Boot Location</th></tr></thead><tbody><tr><td>0</td><td>0</td><td>SPI LPC</td></tr></tbody></table>	GNT1#	GNT0#	Boot Location	0	0	SPI LPC	
GNT1#	GNT0#	Boot Location								
0	0	SPI LPC								
GPIO19 <div>Different from Calpella</div>	Boot BIOS Selection 0 [bit-0]	PWROK								
GNT2# / GPIO53	ESl 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							
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 <div>Different from Calpella</div>	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							

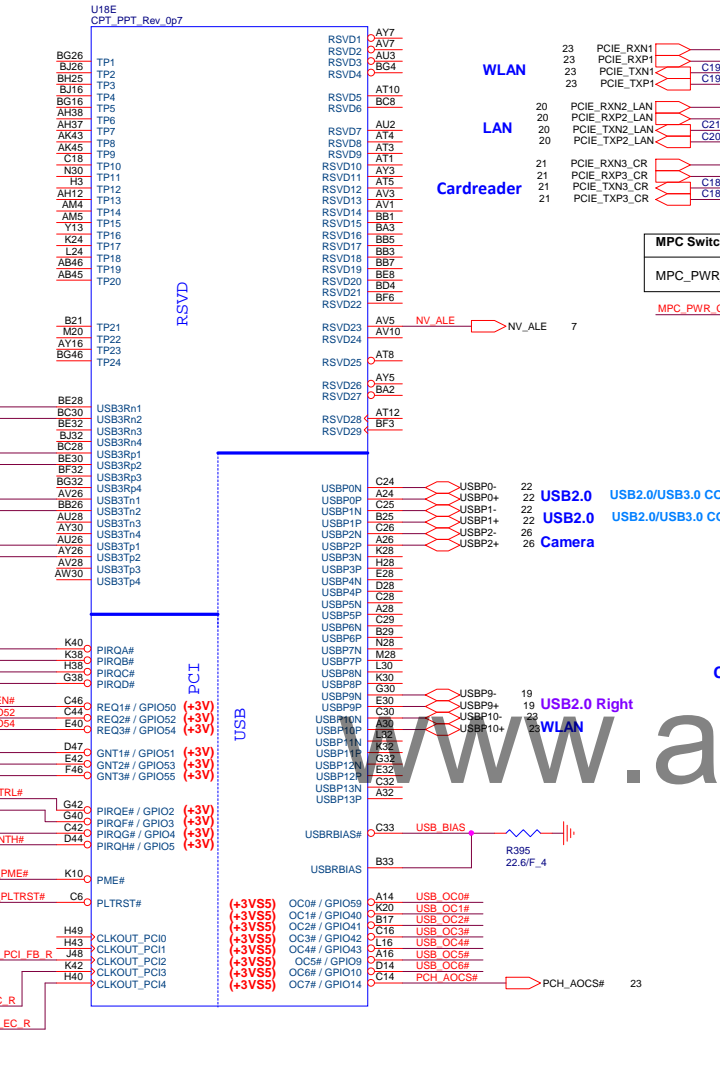
PCI/USBOC# Pull-up(CLG)



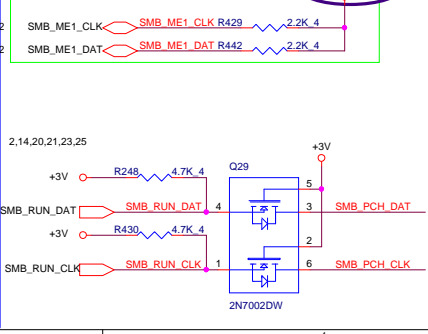
20111130 Modify USB3.0 for HM70



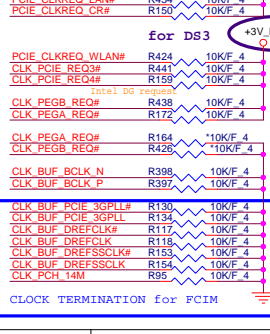
Cougar Point-M/Panther Point (PCI,USB,NVRAM)



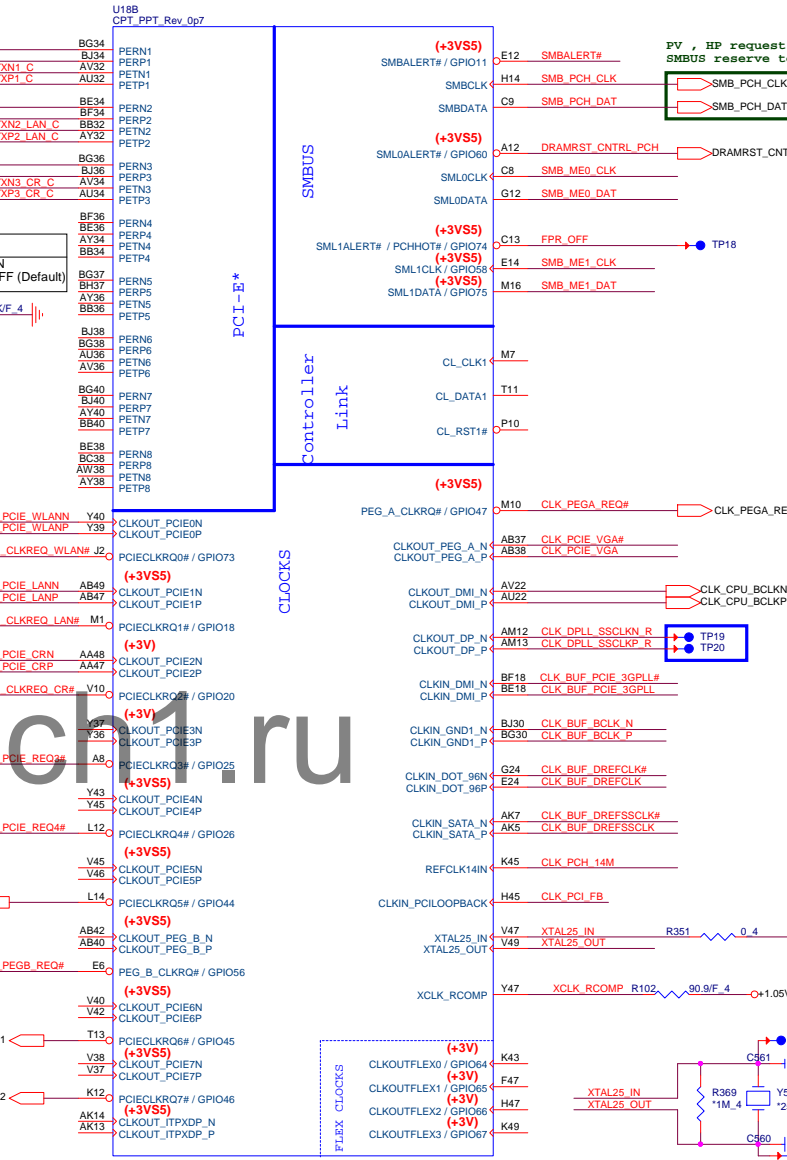
SMBus/Pull-up(CLG)



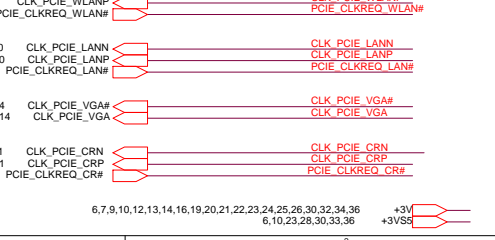
CLK/Strap Pin(CLG)



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



PCI-E Clock

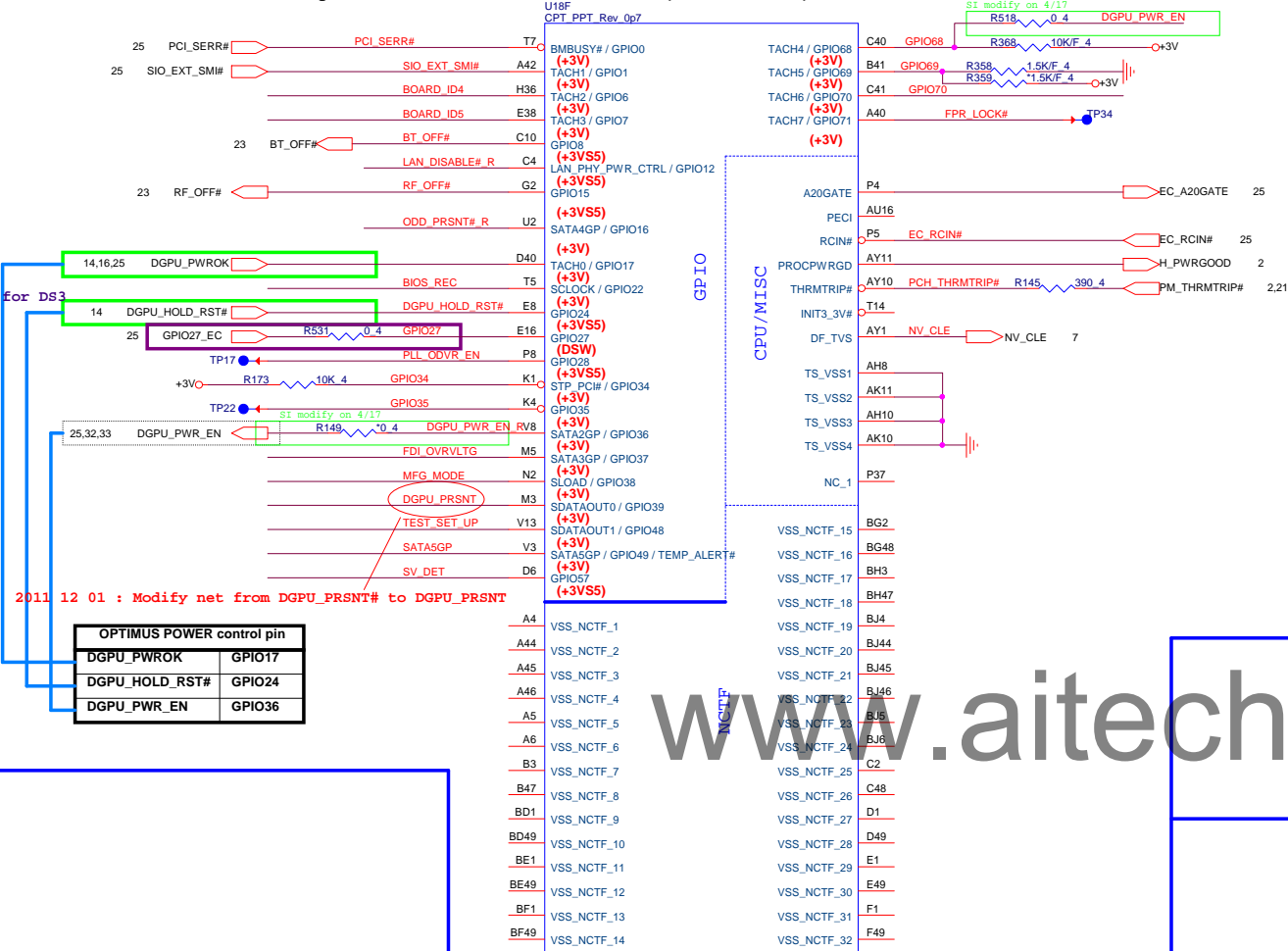


PROJECT : VOLKS
Quanta Computer Inc.

Size Custom Document Number PCH 3/6 (Clock/PCI/USB) Rev 1A

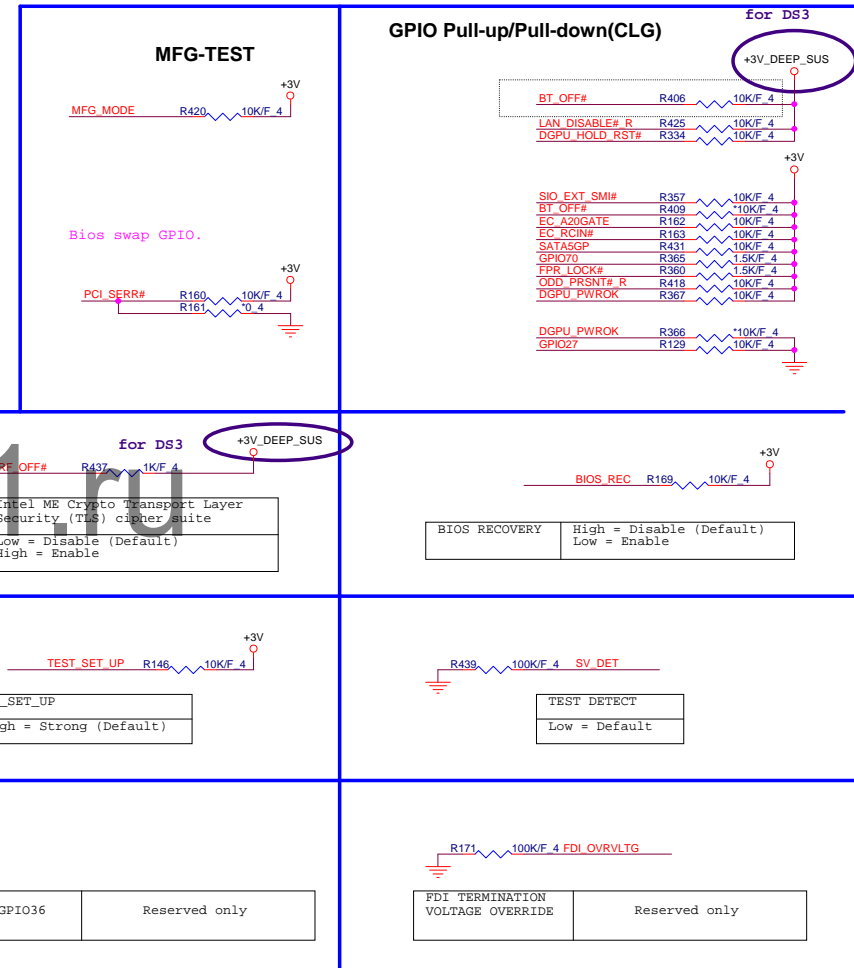
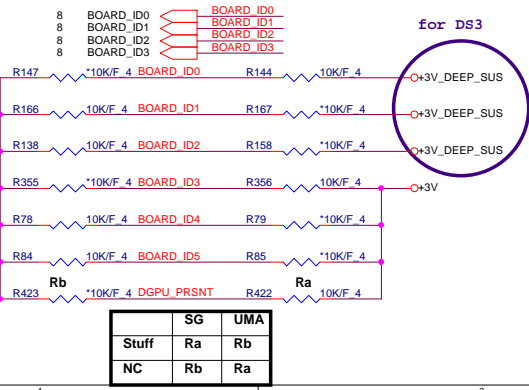
Date: Wednesday, May 23, 2012 Sheet 8 of 37

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

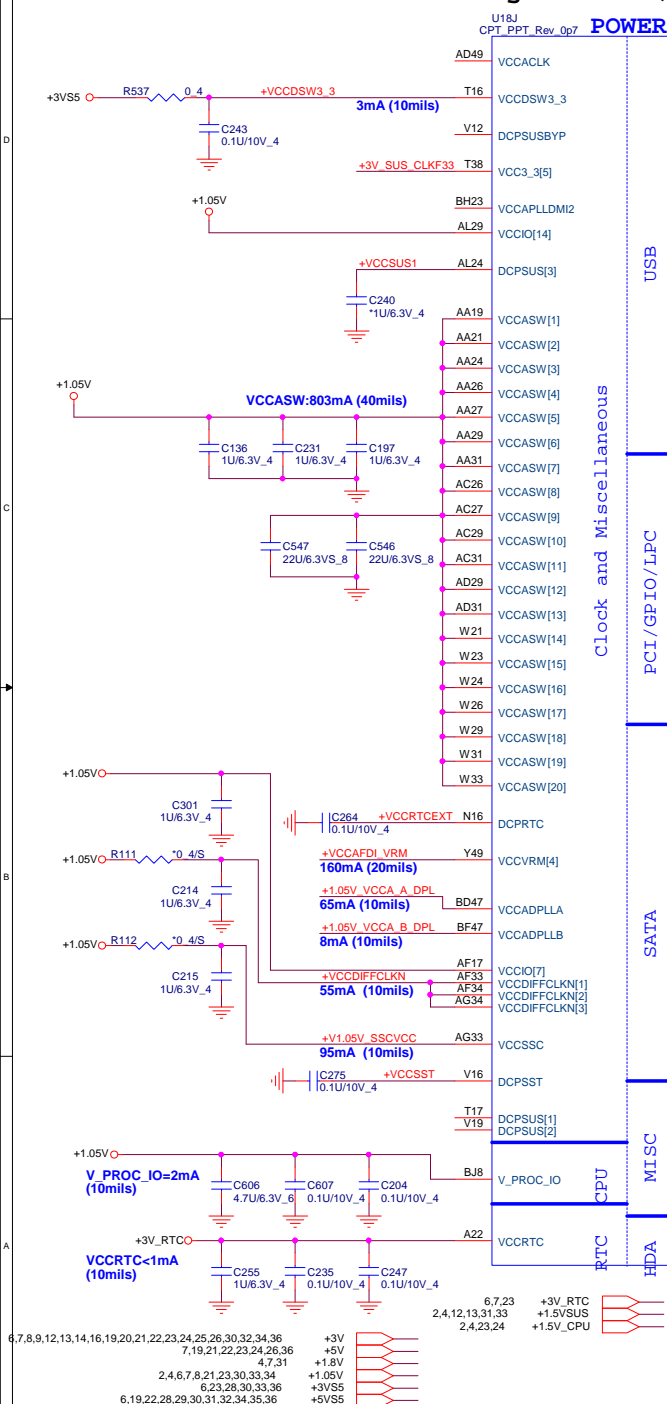


Chief River BOARD ID SETTING

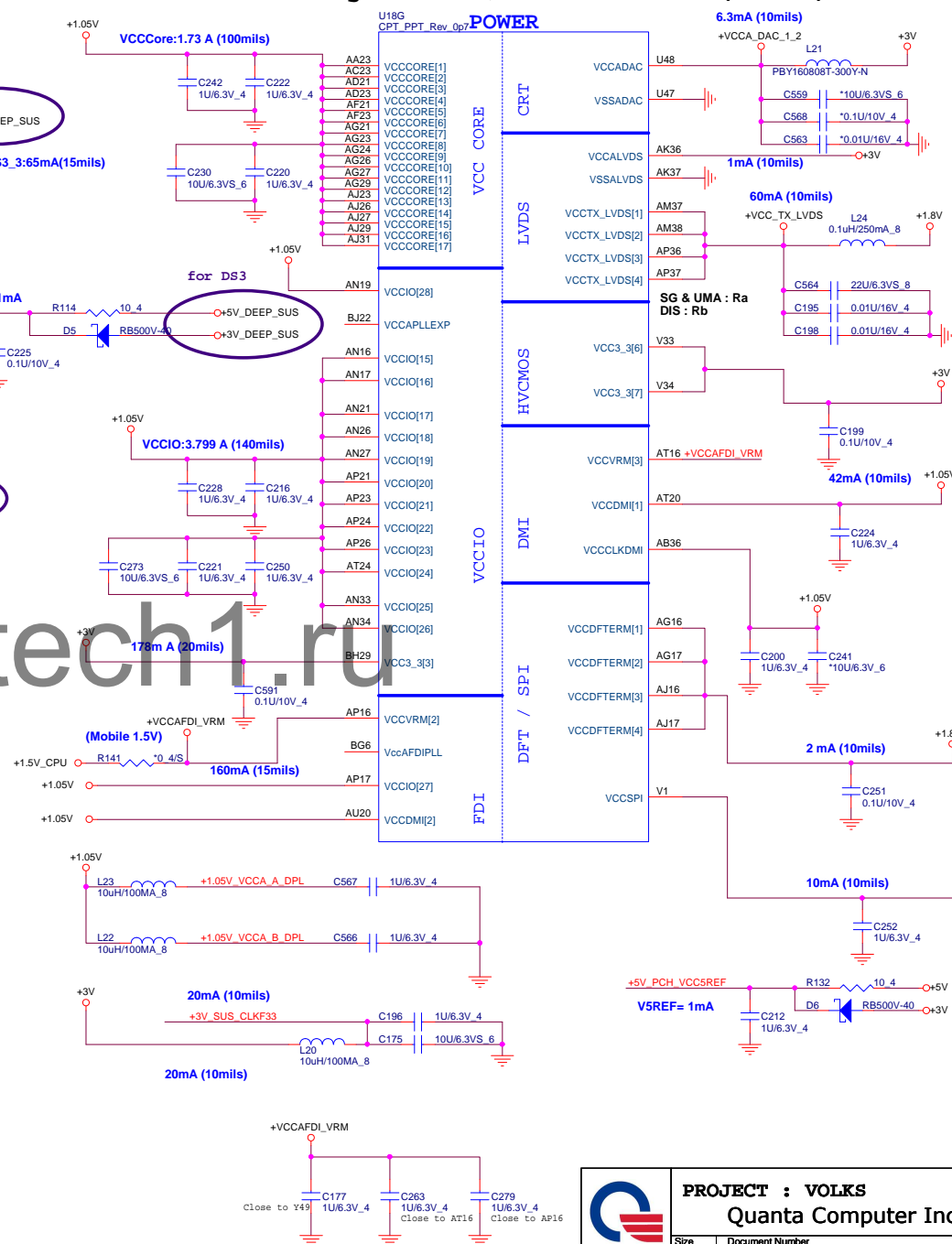
Model	BOARD_ID5	BOARD_ID4	BOARD_ID3	BOARD_ID2	BOARD_ID1	BOARD_ID0
U33 UMA	0	0	0	0	0	0
U33 DIS 128*16 VRAM	0	0	0	0	0	1
U33 DIS 256*16 VRAM	0	0	0	0	1	1
	0	0	0	1	1	1
U33 HM77	0	0	1	X	X	X
U33 HM70	0	0	0	X	X	X



Cougar Point/Panther Point (POWER)



Cougar Point/Panther Point (POWER)



Cougar Point/Panther Point (GND)

U18I CPT_PPT_Rev_0p7		
AY4	VSS[159]	H46
AY42	VSS[160]	K18
AY46	VSS[161]	K26
AY8	VSS[162]	K39
B11	VSS[163]	K46
B15	VSS[164]	L18
B19	VSS[165]	L2
B23	VSS[166]	L20
B27	VSS[167]	L26
B31	VSS[168]	L28
B35	VSS[169]	L36
B39	VSS[170]	L48
B7	VSS[171]	M12
F45	VSS[172]	P16
BB12	VSS[173]	M18
BB16	VSS[174]	M22
BB20	VSS[175]	M24
BB22	VSS[176]	M30
BB24	VSS[177]	M32
BB28	VSS[178]	M34
BB30	VSS[179]	M38
BB38	VSS[180]	M4
BB4	VSS[181]	M42
BB46	VSS[182]	M46
BC14	VSS[183]	M8
BC18	VSS[184]	N18
BC2	VSS[185]	P30
BC22	VSS[186]	N47
BC26	VSS[187]	P11
BC32	VSS[188]	P18
BC34	VSS[189]	T33
BC36	VSS[190]	P40
BC40	VSS[191]	P43
BC42	VSS[192]	P47
BC48	VSS[193]	P7
BD46	VSS[194]	R2
BD5	VSS[195]	R48
BE22	VSS[196]	T12
BE26	VSS[197]	T31
BE40	VSS[198]	T37
BF10	VSS[199]	T4
BF12	VSS[200]	W34
BF16	VSS[201]	T46
BF20	VSS[202]	V31
BF22	VSS[203]	V36
BF24	VSS[204]	V38
BF26	VSS[205]	V39
BF28	VSS[206]	V47
BD3	VSS[207]	W17
BF30	VSS[208]	W19
BF38	VSS[209]	W2
BF40	VSS[210]	W27
BF8	VSS[211]	W48
BG17	VSS[212]	Y12
BG21	VSS[213]	Y38
BG33	VSS[214]	Y4
BG44	VSS[215]	Y42
BG8	VSS[216]	Y46
BH11	VSS[217]	Y8
BH15	VSS[218]	BG29
BH17	VSS[219]	N24
BH19	VSS[220]	AJ3
H10	VSS[221]	AD47
BH27	VSS[222]	B43
BH31	VSS[223]	BE10
BH33	VSS[224]	BG41
BH35	VSS[225]	G14
BH39	VSS[226]	H16
BH43	VSS[227]	BG22
BH7	VSS[228]	BG24
D3	VSS[229]	C25
D12	VSS[230]	AP13
D16	VSS[231]	M14
D18	VSS[232]	AP1
D22	VSS[233]	BE16
D24	VSS[234]	BC16
D26	VSS[235]	BG28
D30	VSS[236]	BJ28
D32	VSS[237]	
D34	VSS[238]	
D38	VSS[239]	
D42	VSS[240]	
D8	VSS[241]	
E18	VSS[242]	
E26	VSS[243]	
G18	VSS[244]	
G20	VSS[245]	
G26	VSS[246]	
G28	VSS[247]	
G36	VSS[248]	
G48	VSS[249]	
H12	VSS[250]	
H18	VSS[251]	
H22	VSS[252]	
H24	VSS[253]	
H26	VSS[254]	
H30	VSS[255]	
H32	VSS[256]	
H34	VSS[257]	
F3	VSS[258]	

Cougar Point/Panther Point (GND)

U18H CPT_PPT_Rev_0p7		
HS	VSS[0]	
AA17	VSS[1]	AK38
AA2	VSS[2]	AK4
AA3	VSS[3]	VSS[80]
AA33	VSS[4]	VSS[81]
AA34	VSS[5]	VSS[82]
AB11	VSS[6]	VSS[83]
AB14	VSS[7]	VSS[84]
AB39	VSS[8]	VSS[85]
AB4	VSS[9]	VSS[86]
AB43	VSS[10]	VSS[87]
AB5	VSS[11]	VSS[88]
AB7	VSS[12]	VSS[89]
AC19	VSS[13]	VSS[90]
AC2	VSS[14]	VSS[91]
AC21	VSS[15]	VSS[92]
AC24	VSS[16]	VSS[93]
AC33	VSS[17]	VSS[94]
AC34	VSS[18]	VSS[95]
AC48	VSS[19]	VSS[96]
AD10	VSS[20]	VSS[97]
AD11	VSS[21]	VSS[98]
AD12	VSS[22]	VSS[99]
AD13	VSS[23]	VSS[100]
AD19	VSS[24]	VSS[101]
AD24	VSS[25]	VSS[102]
AD26	VSS[26]	VSS[103]
AD27	VSS[27]	VSS[104]
AD33	VSS[28]	VSS[105]
AD34	VSS[29]	VSS[106]
AD36	VSS[30]	VSS[107]
AD37	VSS[31]	VSS[108]
AD38	VSS[32]	VSS[109]
AD39	VSS[33]	VSS[110]
AD4	VSS[34]	VSS[111]
AD40	VSS[35]	VSS[112]
AD42	VSS[36]	VSS[113]
AD43	VSS[37]	VSS[114]
AD45	VSS[38]	VSS[115]
AD46	VSS[39]	VSS[116]
AD8	VSS[40]	VSS[117]
AE2	VSS[41]	VSS[118]
AE3	VSS[42]	VSS[119]
AF10	VSS[43]	VSS[120]
AF12	VSS[44]	VSS[121]
AD14	VSS[45]	VSS[122]
AD16	VSS[46]	VSS[123]
AF16	VSS[47]	VSS[124]
AF19	VSS[48]	VSS[125]
AF24	VSS[49]	VSS[126]
AF28	VSS[50]	VSS[127]
AF29	VSS[51]	VSS[128]
AF31	VSS[52]	VSS[129]
AF38	VSS[53]	VSS[130]
AF4	VSS[54]	VSS[131]
AF42	VSS[55]	VSS[132]
AF46	VSS[56]	VSS[133]
AF5	VSS[57]	VSS[134]
AF7	VSS[58]	VSS[135]
AF8	VSS[59]	VSS[136]
AG19	VSS[60]	VSS[137]
AG2	VSS[61]	VSS[138]
AG31	VSS[62]	VSS[139]
AG48	VSS[63]	VSS[140]
AH11	VSS[64]	VSS[141]
AH3	VSS[65]	VSS[142]
AH36	VSS[66]	VSS[143]
AH39	VSS[67]	VSS[144]
AH40	VSS[68]	VSS[145]
AH42	VSS[69]	VSS[146]
AH46	VSS[70]	VSS[147]
AH7	VSS[71]	VSS[148]
AJ19	VSS[72]	VSS[149]
AJ21	VSS[73]	VSS[150]
AJ24	VSS[74]	VSS[151]
AJ33	VSS[75]	VSS[152]
AJ34	VSS[76]	VSS[153]
AK12	VSS[77]	VSS[154]
AK3	VSS[78]	VSS[155]
	VSS[79]	VSS[156]
		VSS[157]
		VSS[158]

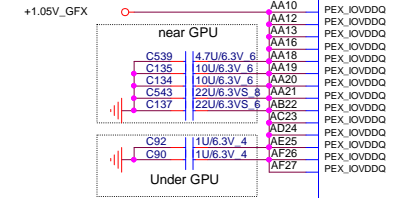




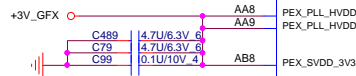
PROJECT : VOLKS		
Quanta Computer Inc.		
Size Custom	Document Number System Memory 2/2 (9.2H)	Rev 1A

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

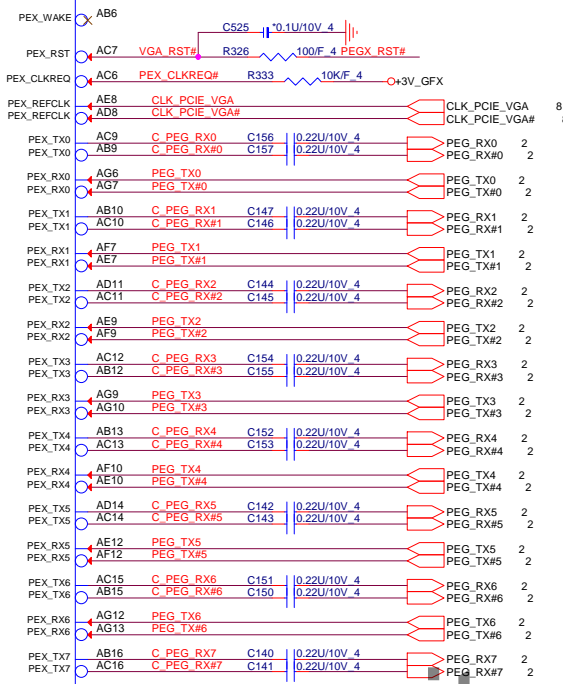
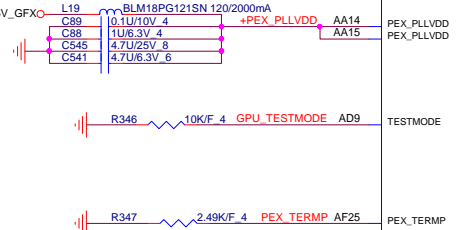
PEX_IOVDD + PEX_IOVDDQ = 1.042A



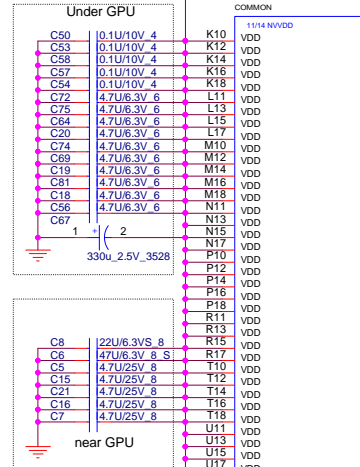
PEX_PLL_HVDD +
PEX_SVDD_3V3 = 143mA



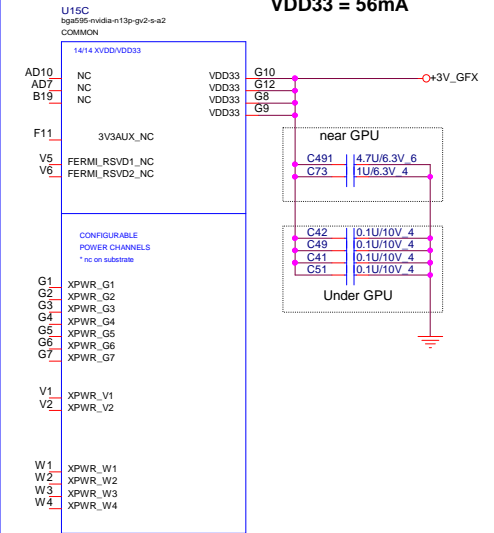
PEX_PLLVDD = 130mA



NVDD = 32.22 ~ 26.66 A



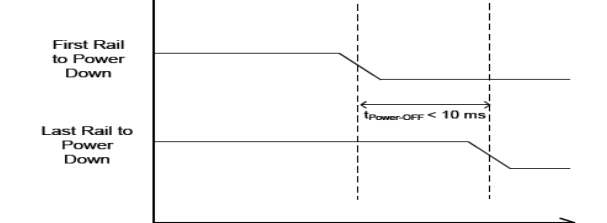
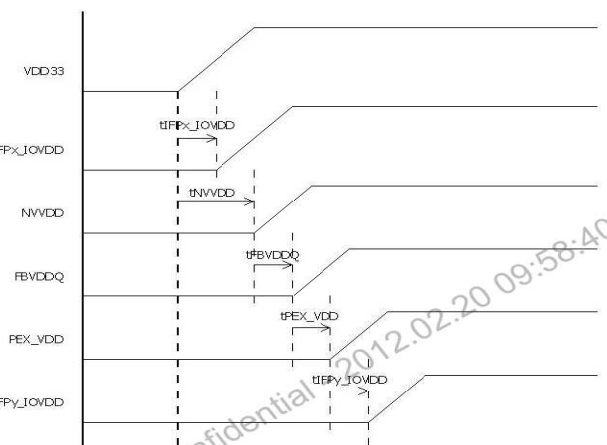
VDD33 = 56mA

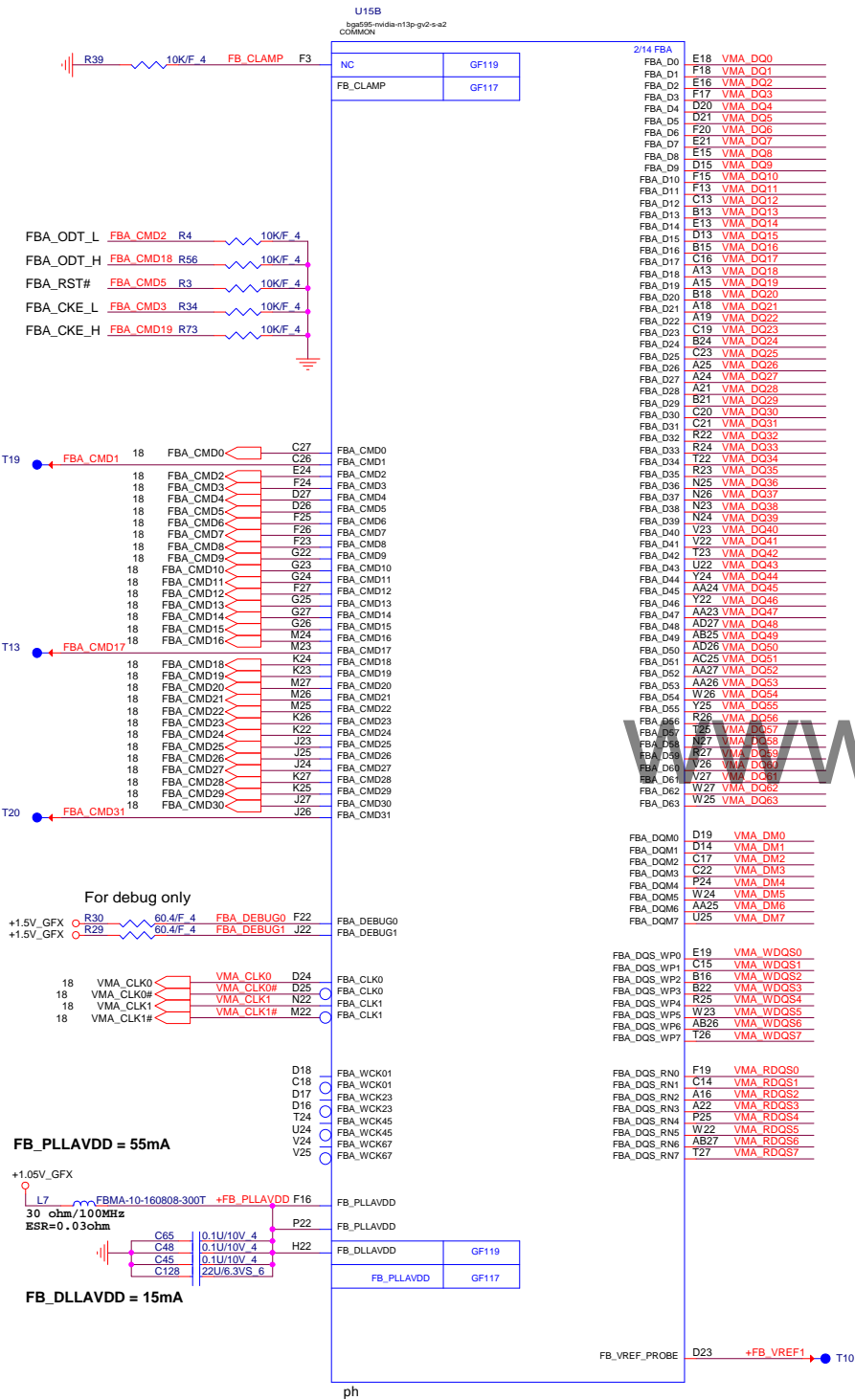


www.aitech1.ru

power up sequence

power down sequence





FBVDDQ + FBVDD = 3.116A

U15D

bga095-midm-n13p-g2-s-a2

COMMON

U15F

13/14 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

B26 FBVDDQ

C25 FBVDDQ

E23 FBVDDQ

E26 FBVDDQ

F14 FBVDDQ

F21 FBVDDQ

G13 FBVDDQ

G14 FBVDDQ

G15 FBVDDQ

G16 FBVDDQ

G18 FBVDDQ

G19 FBVDDQ

G20 FBVDDQ

G21 FBVDDQ

H26 FBVDDQ

H26 FBVDDQ

J21 FBVDDQ

K21 FBVDDQ

L22 FBVDDQ

L24 FBVDDQ

L26 FBVDDQ

M21 FBVDDQ

N21 FBVDDQ

R21 FBVDDQ

Y21 FBVDDQ

V21 FBVDDQ

W21 FBVDDQ

bga095-midm-n13p-g2-s-a2

COMMON

U15F

13/14 GND

A2 GND

AB17 GND

AB20 GND

AB24 GND

AC2 GND

AC22 GND

AC26 GND

AC5 GND

AC8 GND

AD12 GND

AD13 GND

AD15 GND

AD16 GND

AD18 GND

AD19 GND

AD21 GND

AD22 GND

AE11 GND

AE14 GND

AE17 GND

AE20 GND

AE11 GND

AF1 GND

AF11 GND

AF14 GND

AF17 GND

AF20 GND

AF23 GND

AF5 GND

AF8 GND

AG2 GND

AG26 GND

AB14 GND

B1 GND

B14 GND

B17 GND

B20 GND

B23 GND

B27 GND

B5 GND

B8 GND

E11 GND

E14 GND

E17 GND

E2 GND

E20 GND

E22 GND

E25 GND

E5 GND

E8 GND

H2 GND

H23 GND

H25 GND

H5 GND

K11 GND

K13 GND

K15 GND

K17 GND

L10 GND

L12 GND

L14 GND

L16 GND

L18 GND

L2 GND

L23 GND

L25 GND

L5 GND

M11 GND

AA7 GND

AB7 GND

M13 GND

M15 GND

M17 GND

N10 GND

N12 GND

N14 GND

N16 GND

N18 GND

N11 GND

P13 GND

P15 GND

P17 GND

P2 GND

P23 GND

P26 GND

P5 GND

R10 GND

R12 GND

R14 GND

R16 GND

R18 GND

T11 GND

T13 GND

T15 GND

T17 GND

U10 GND

U12 GND

U14 GND

U16 GND

U18 GND

U2 GND

U23 GND

U26 GND

U5 GND

V11 GND

V13 GND

V15 GND

V17 GND

Y2 GND

Y23 GND

Y26 GND

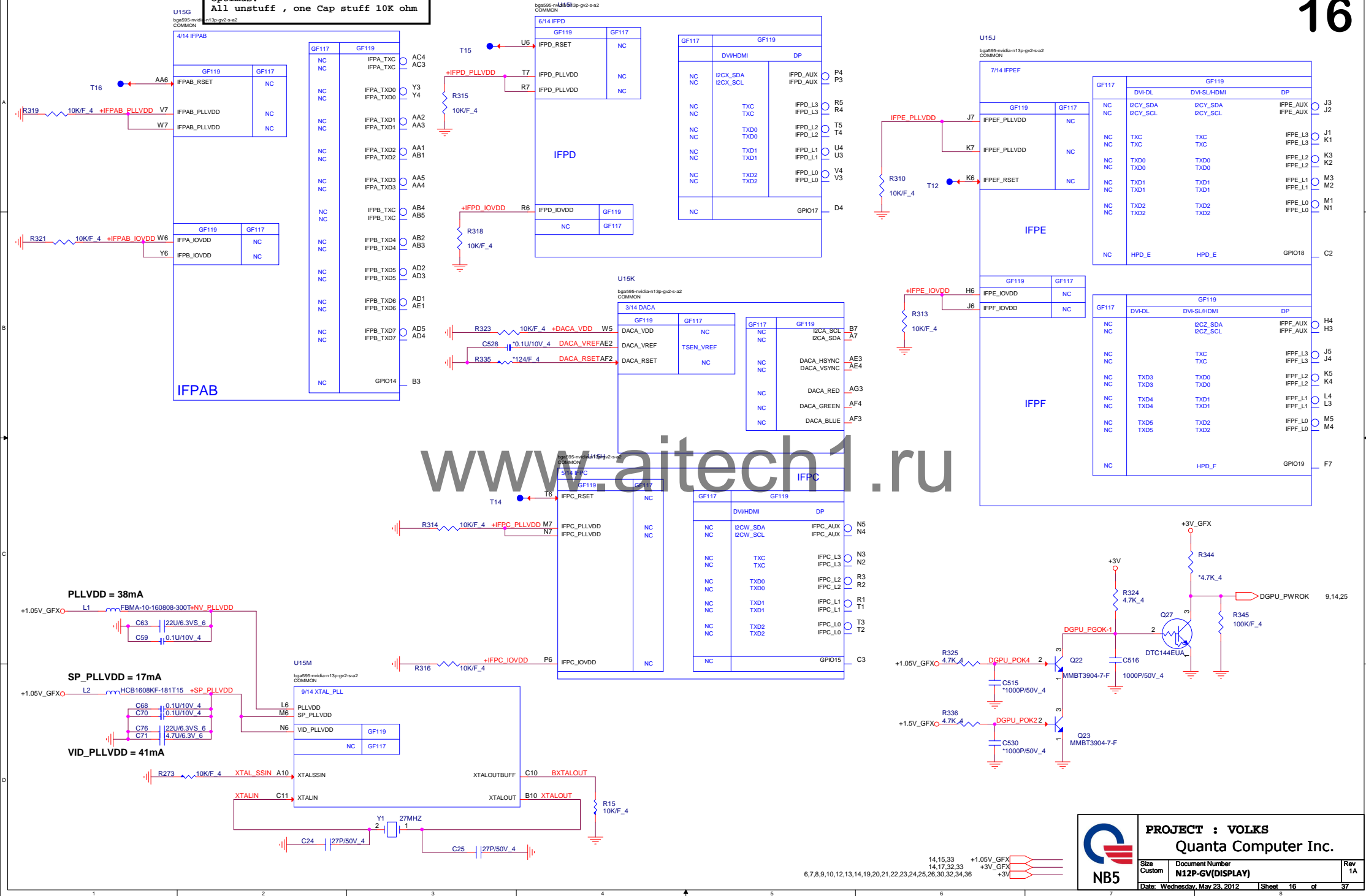
Y5 GND



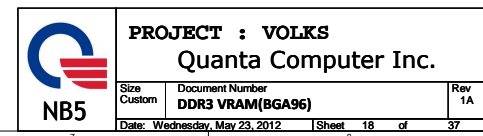
PROJECT : VOLKS
Quanta Computer Inc.

Size	Document Number	Rev
Custom	N11M-GE2(MEMORY/GND)	1A
Date: Wednesday, May 23, 2012	Sheet 15 of 37	

Optimus:
All unstuff , one Cap stuff 10K ohm



18



Close to CODEC
SPK trace width
Speaker 4 ohm: 40mils

Check layout
mount location

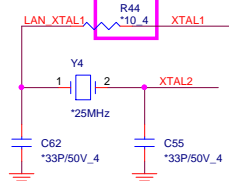
Close to CONNECTOR



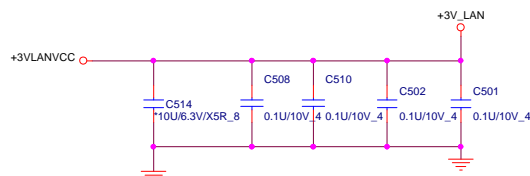
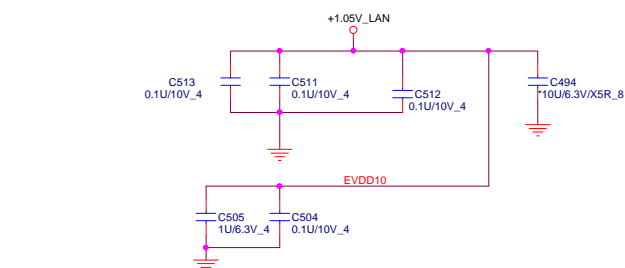
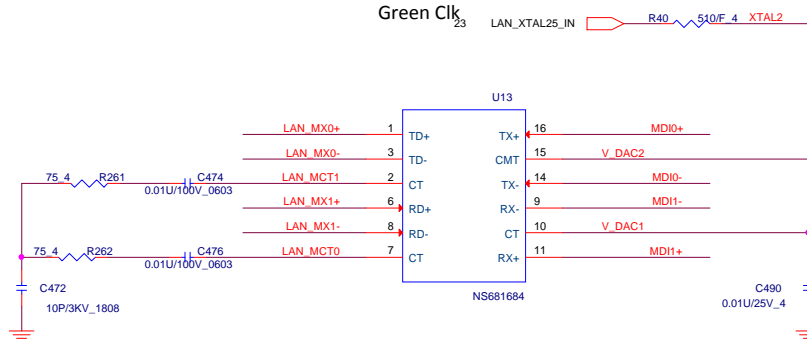
PROJECT : VOLKS
Quanta Computer Inc.

Size Custom	Document Number Audio Codec (IDT_HDA Azalia 92HD99	Rev 1A
Date: Wednesday, May 23, 2012	Sheet 19 of	37

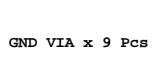
For EMI 0 ~ 22 ohm



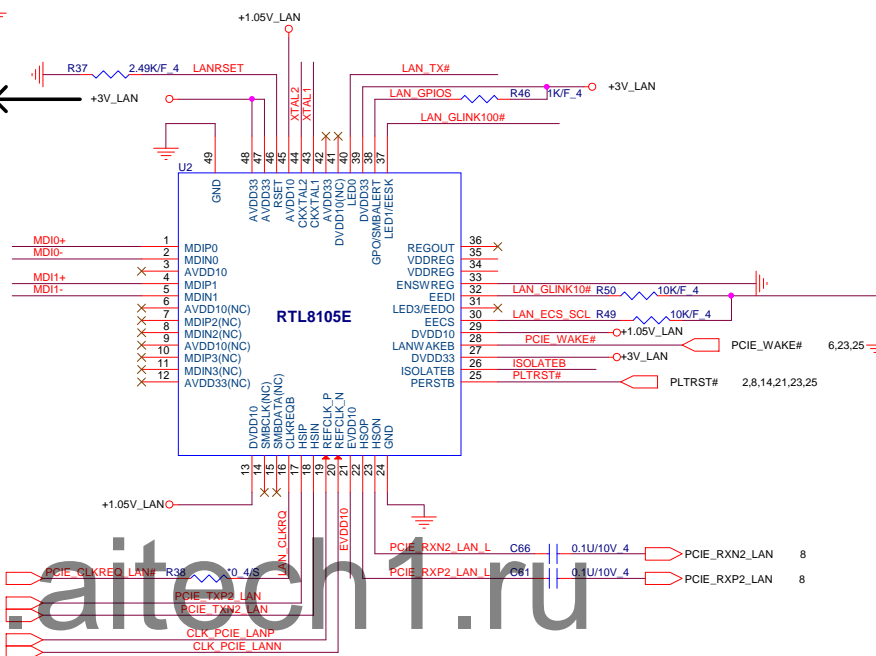
Green Clk



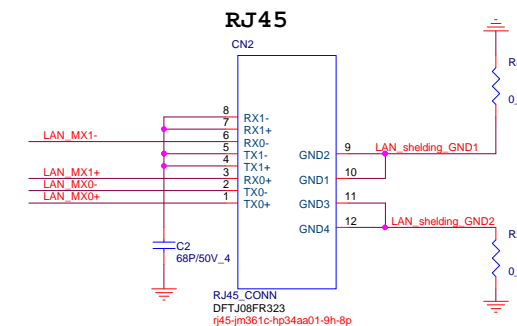
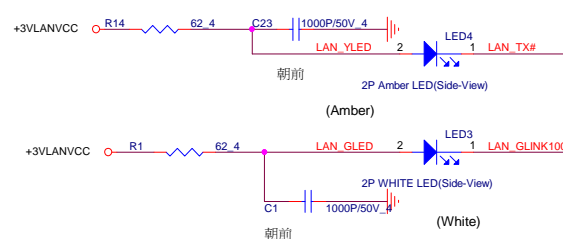
GND VIA x 9 Pcs



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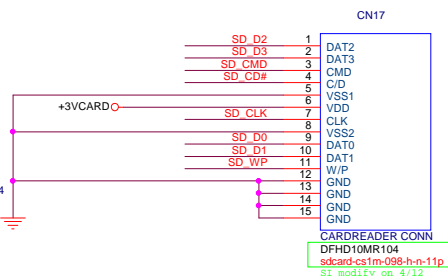
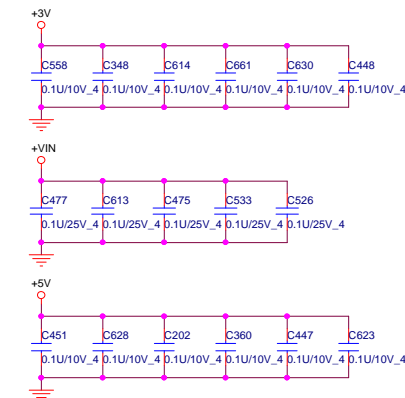
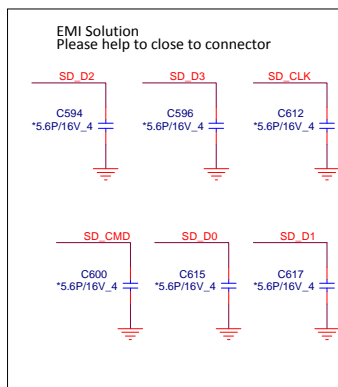
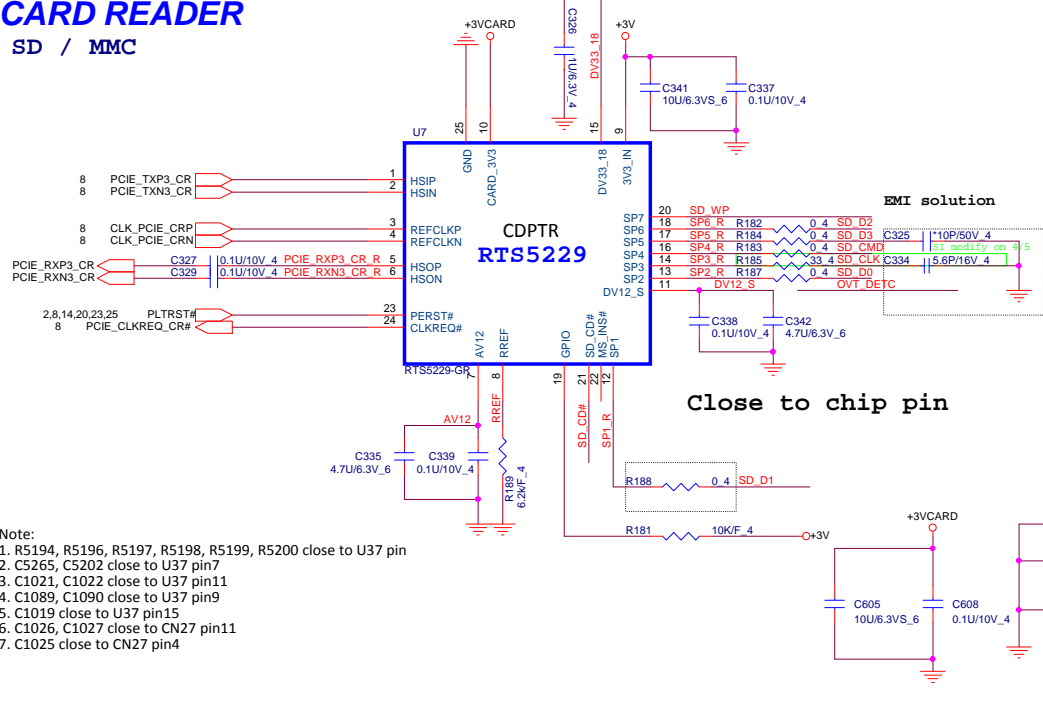
if ISOLATEB pin
pull-low, the LAN
chip will not drive
it's PCI-E outputs
(excluding
PCIE_WAKE# pin)



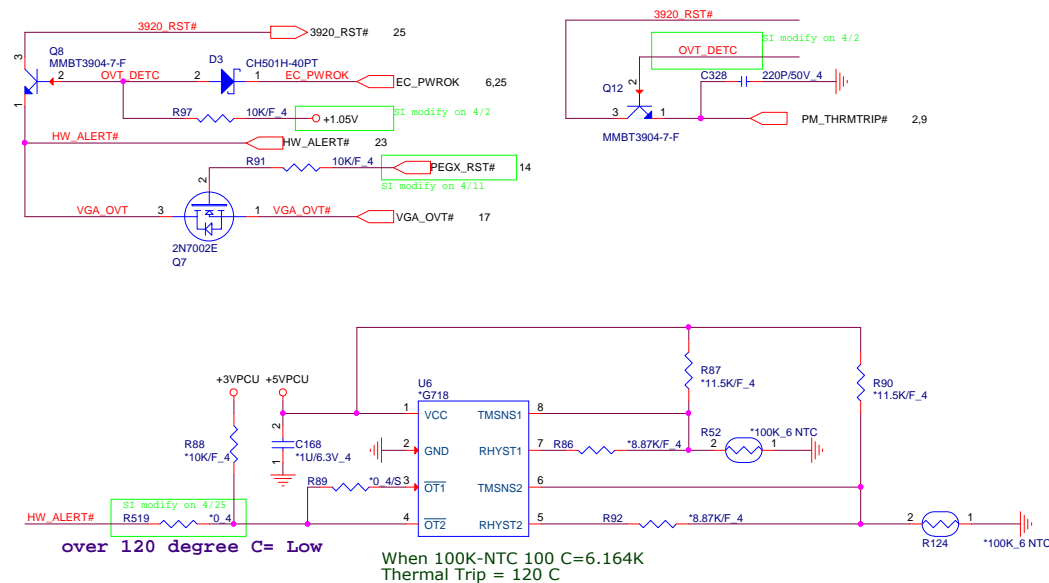
NB5	PROJECT : VOLKS		
	Quanta Computer Inc.		
Size	Document Number	Rev	
Custom	LAN RTL8105/RJ45	1A	
Date: Wednesday, May 23, 2012	Sheet	20of	37

CARD READER

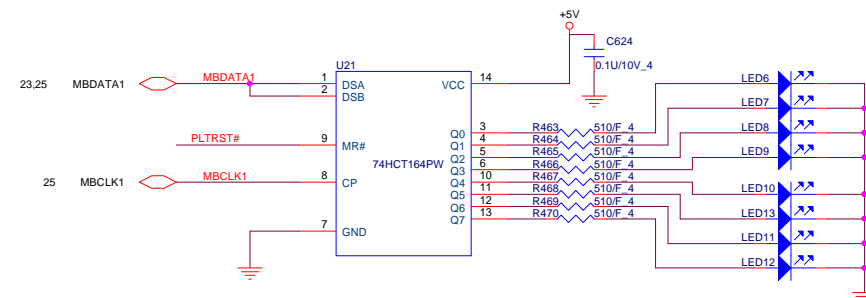
SD / MMC

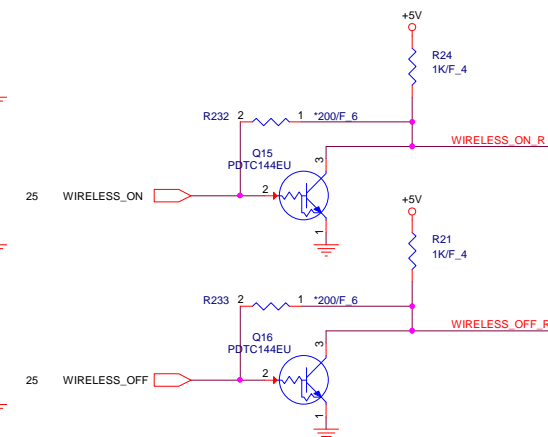
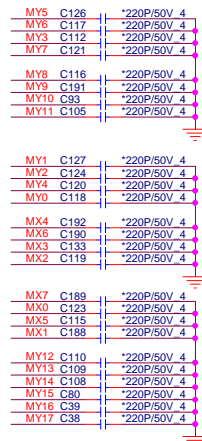
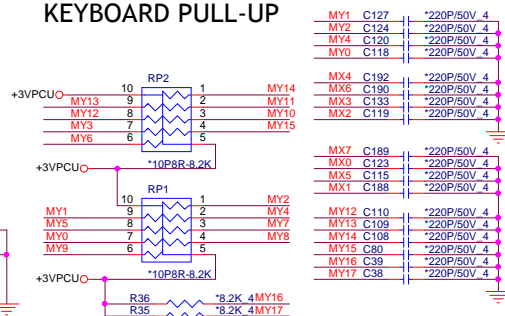


Thermal HW protect

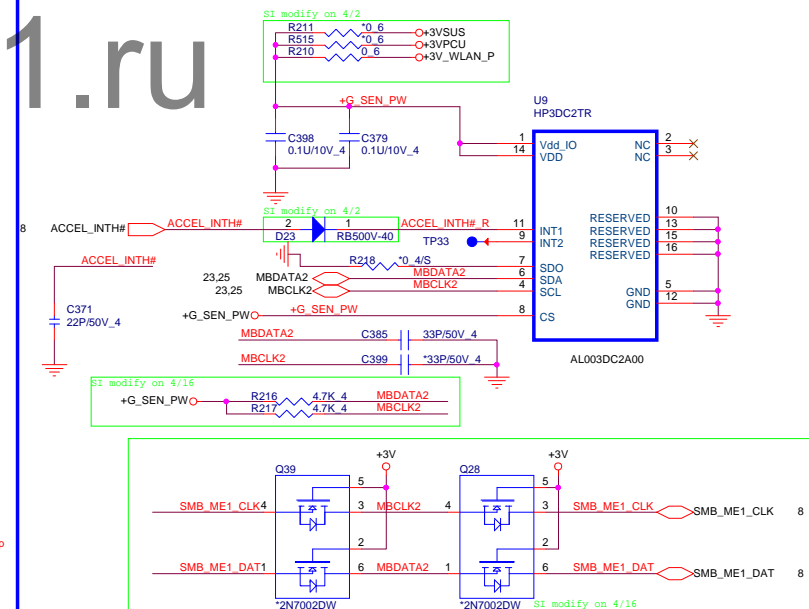
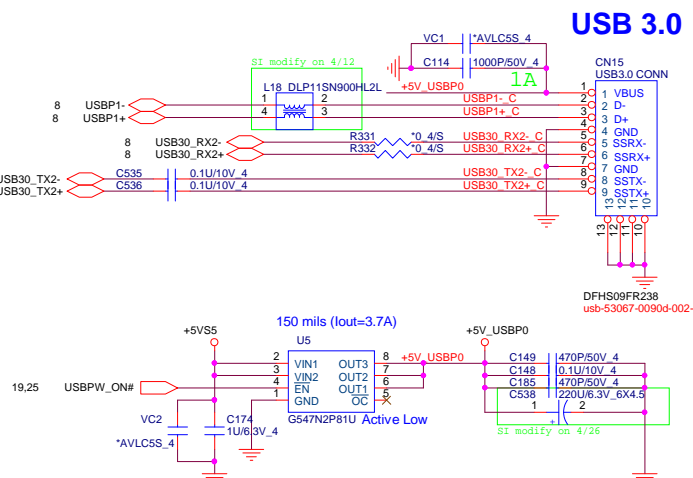
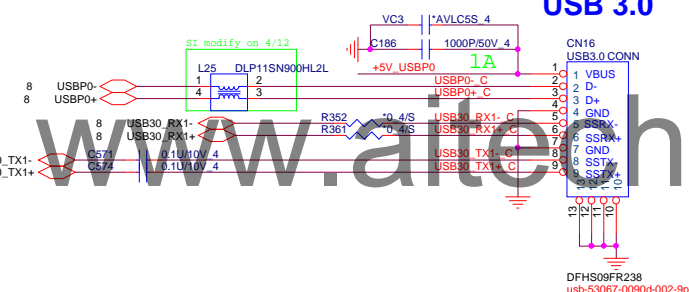


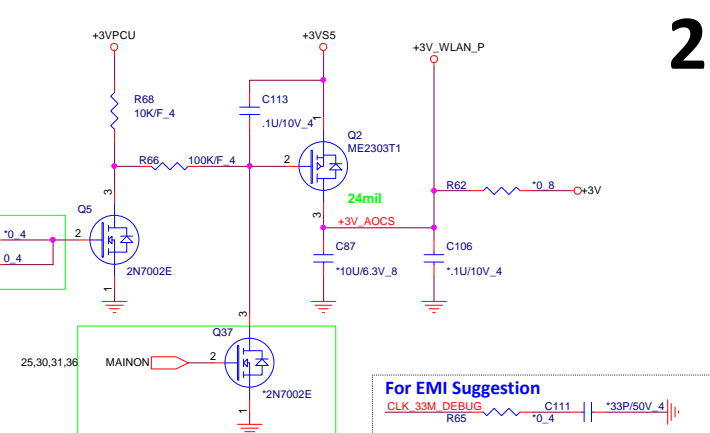
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USB 3.0

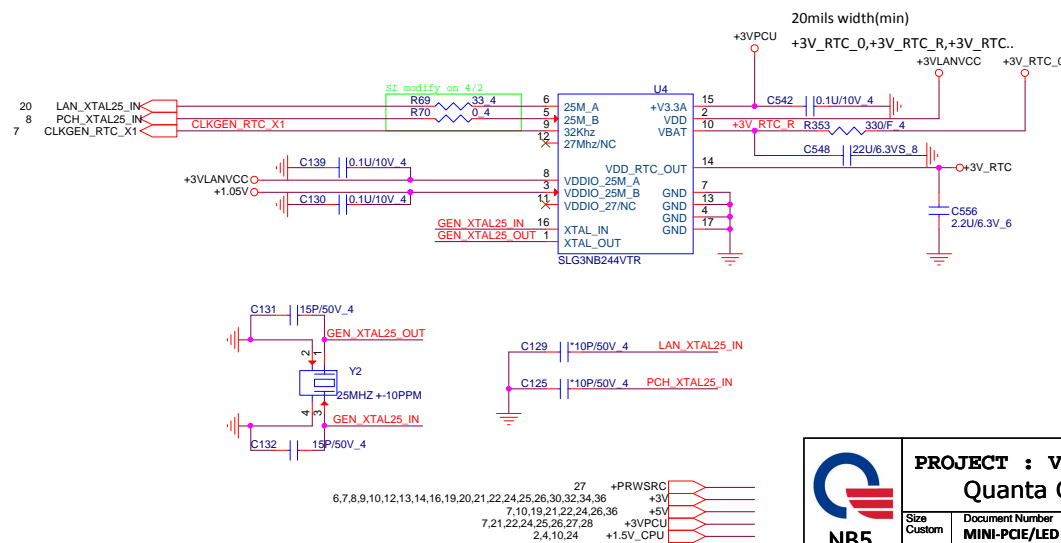




GPU Thermal Sensor

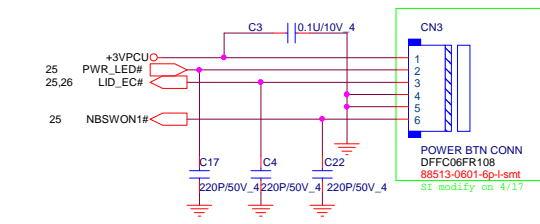


Green CLK Circuitry

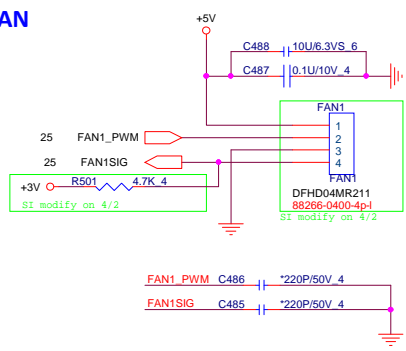


Power Button Connector

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



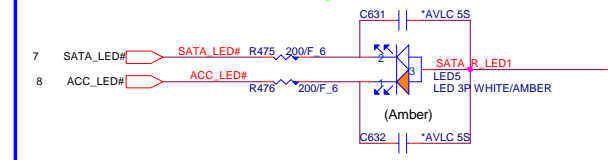
FAN



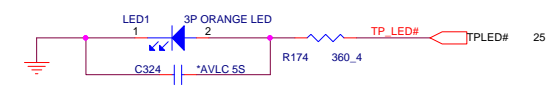
PWR LED



SATA LED

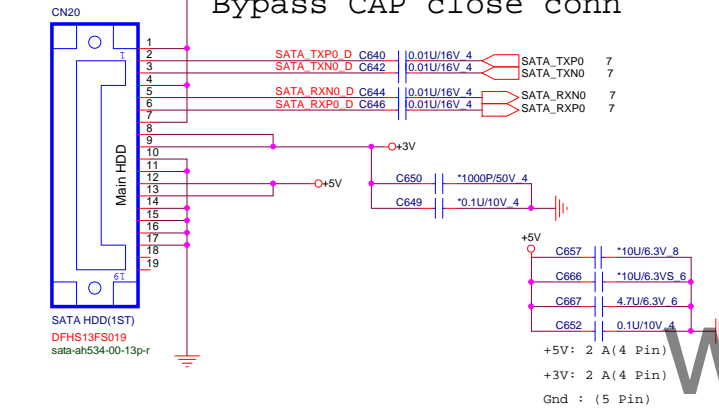


14" TP LED

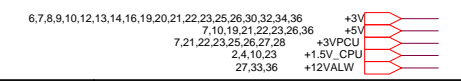
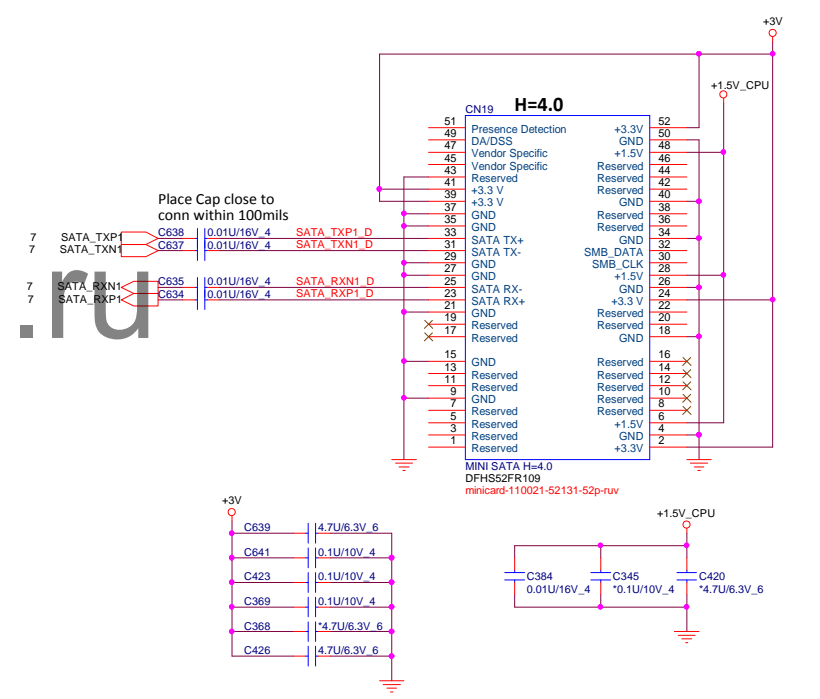


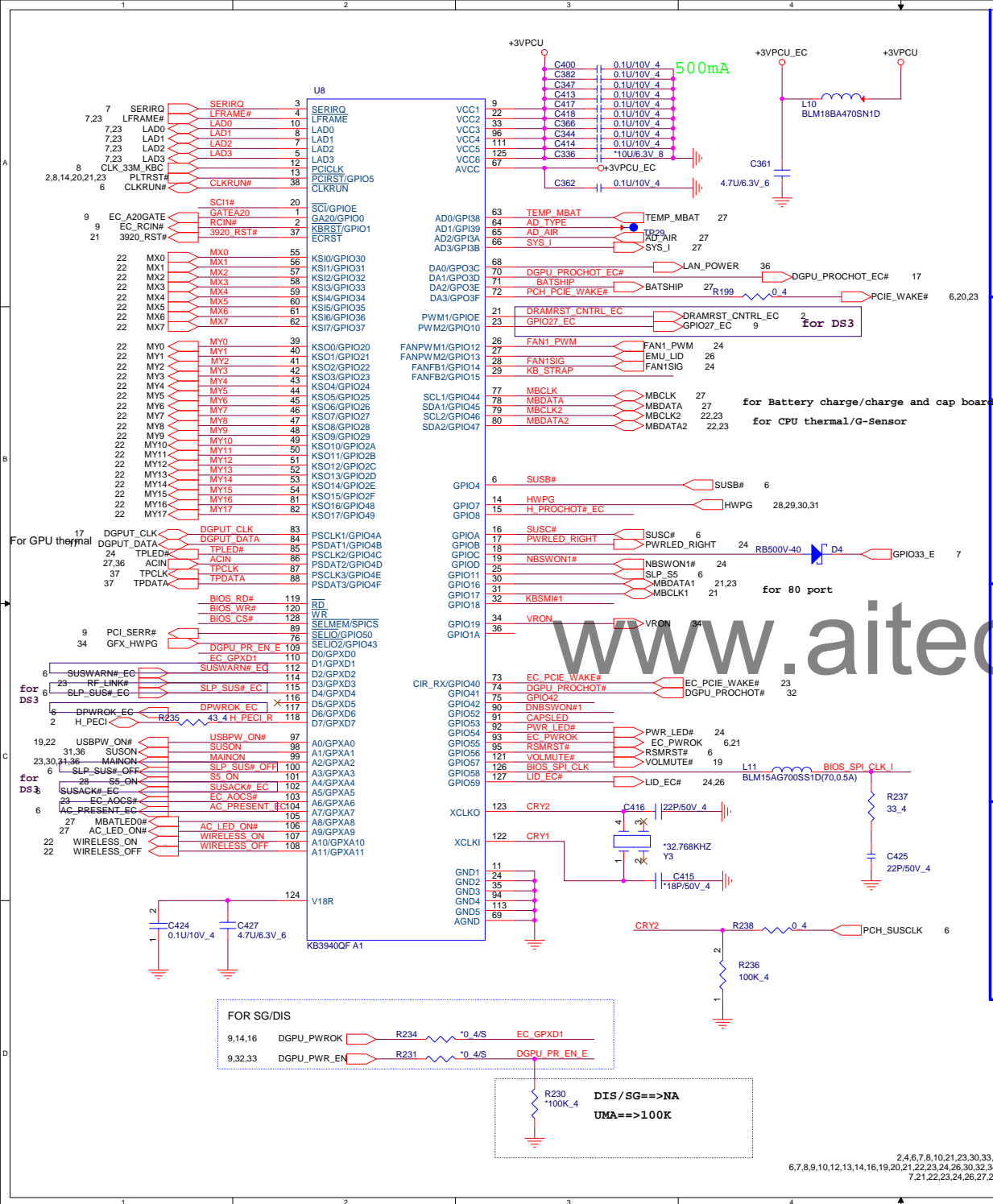
SATA HDD Connector(Cable type)

Bypass CAP close conn

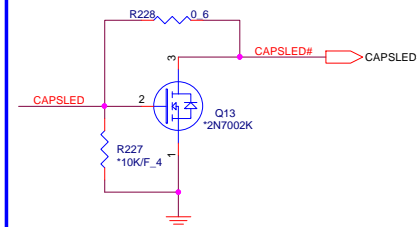


Mini PCI-E Card 2- Full size mSATA

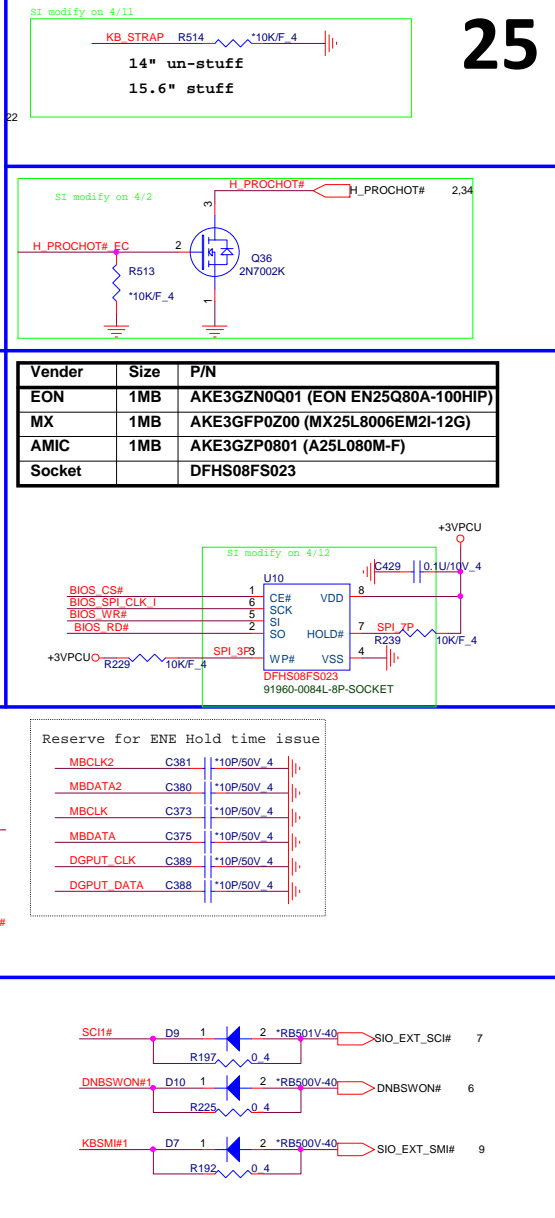
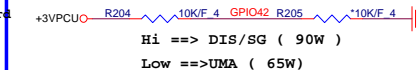


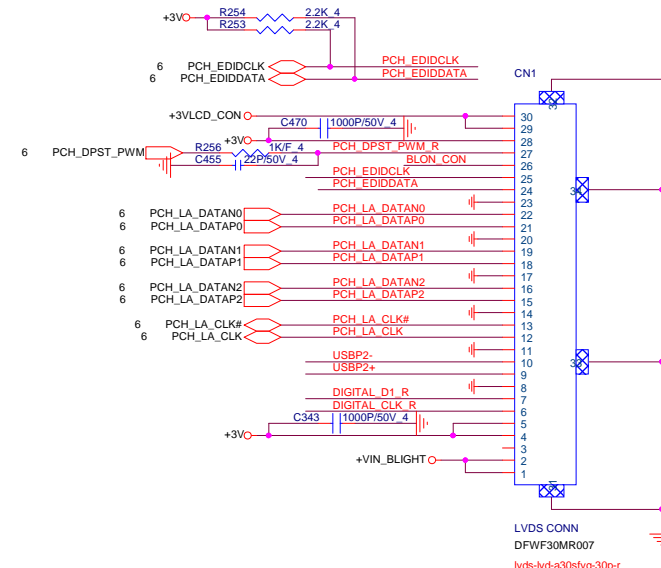
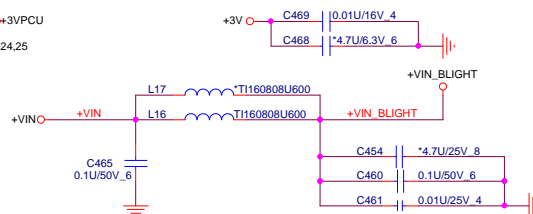
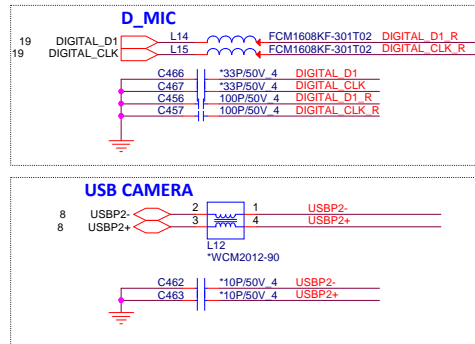
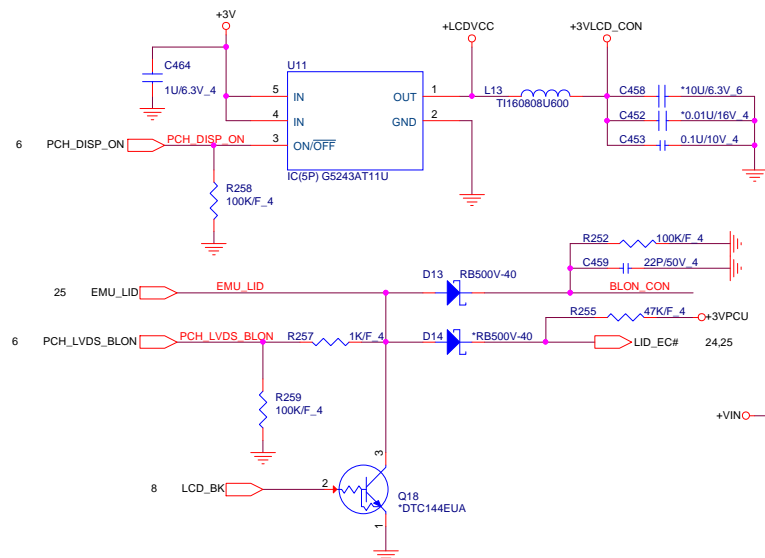
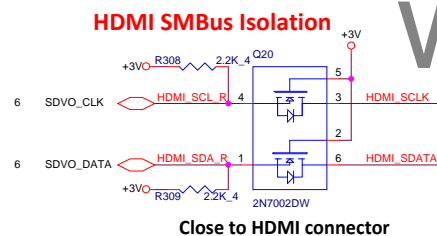


Cap LED

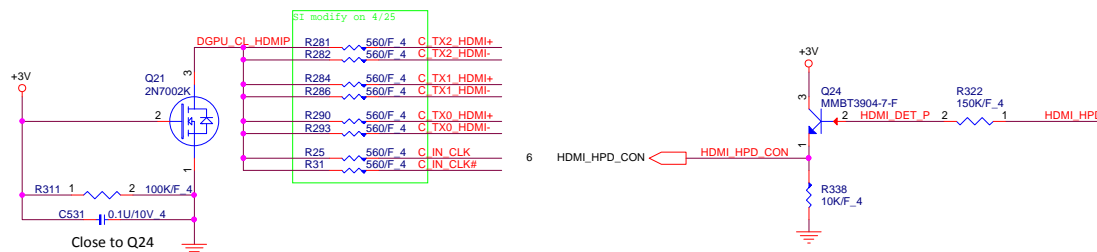


Adapter select for EC

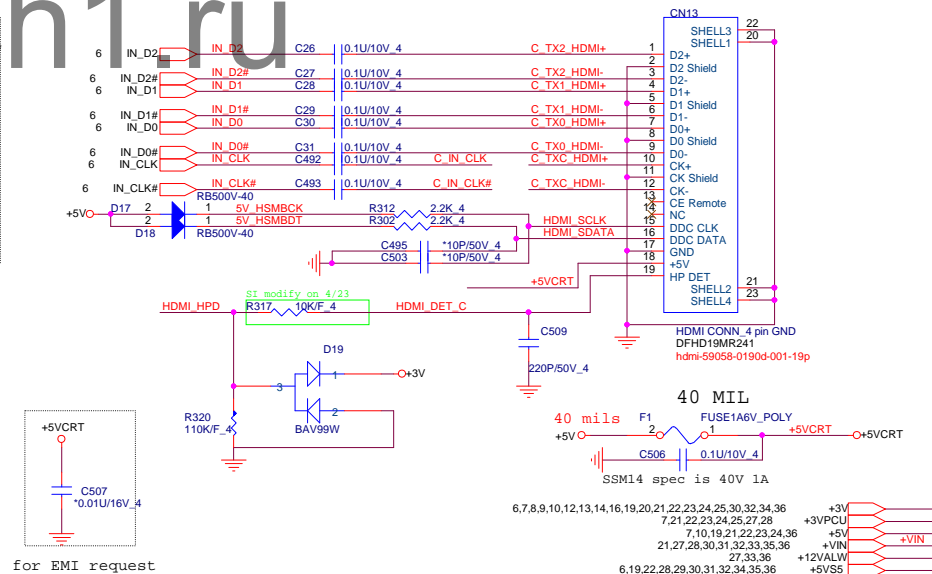
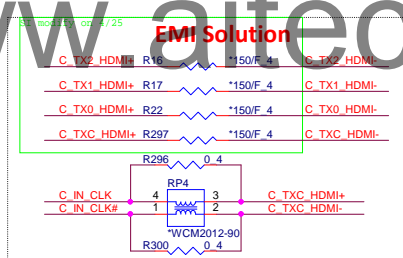


**HDMI Conn.**

Close to HDMI connector



Close to Q24



for EMI request

CN10	P/N
14"	DFAD08MR036
15"	DFAD08MR035

DC JACK
90W

Do Not add test pad on BATDIS_G signal

Place this ZVS close to
Diode away +VINPlace this ZVS close to
Far-Far away +VINPlace this cap
close to ECPlace this cap
close to ECPlace this cap
close to EC

+VH28 36
+3VPCU 7,21,22,23,24,25,26,28



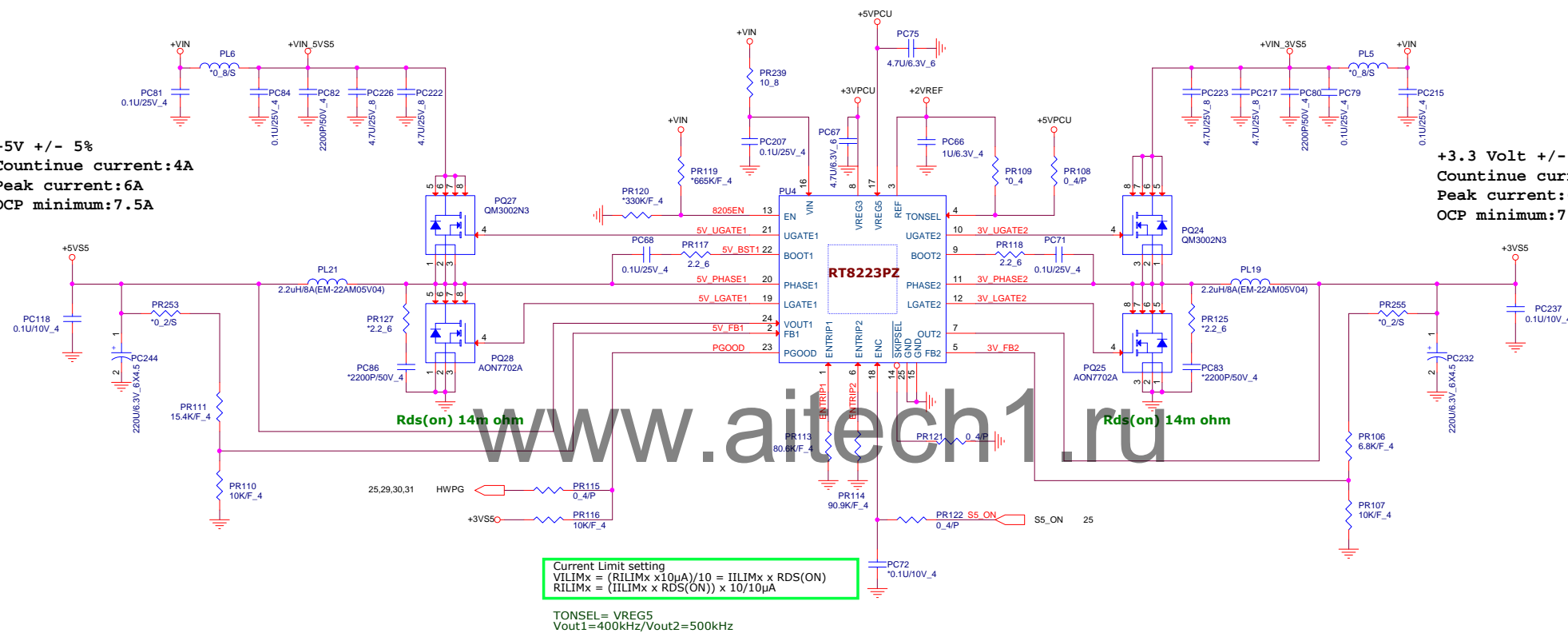
PROJECT :VOLKS
Quanta Computer Inc.

Size	Document Number	Rev
Custom	Charger (028681)	A
Date: Wednesday, May 23, 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

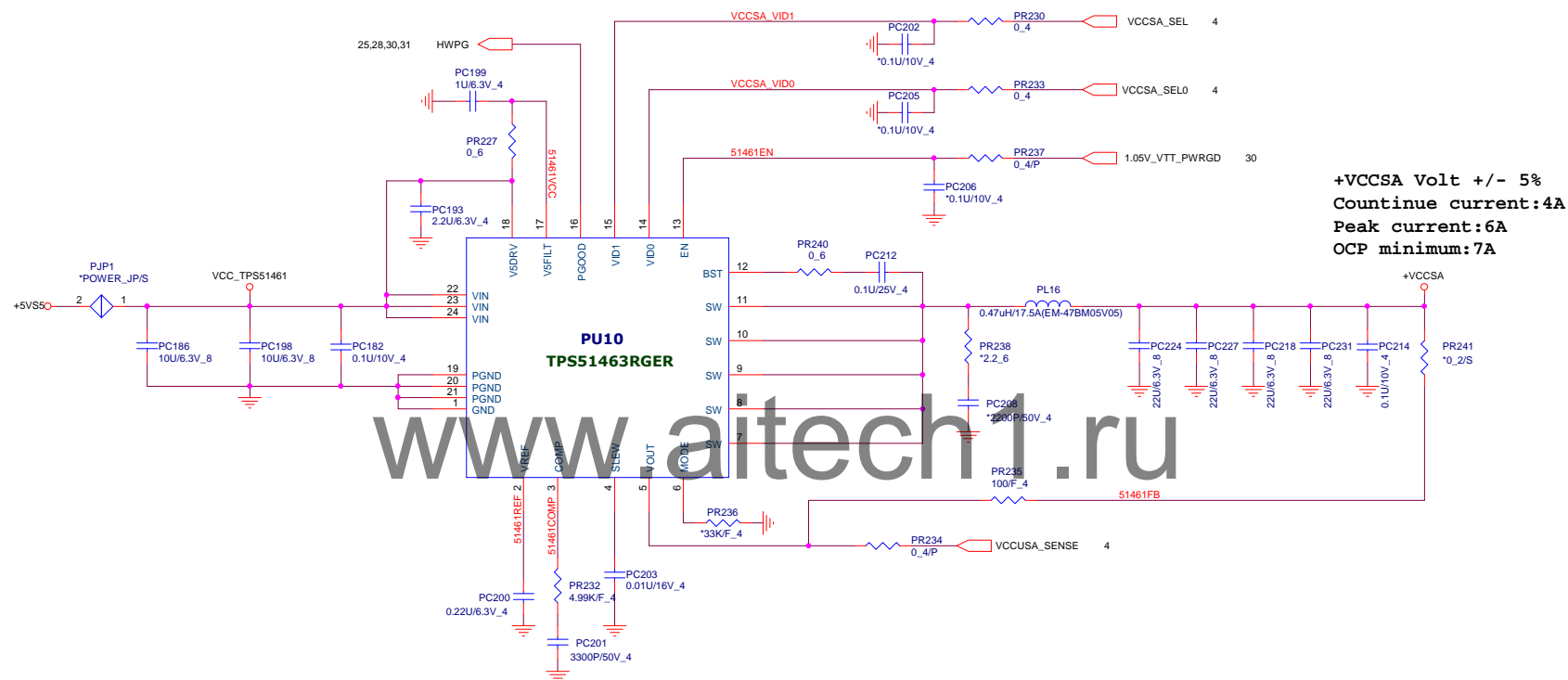


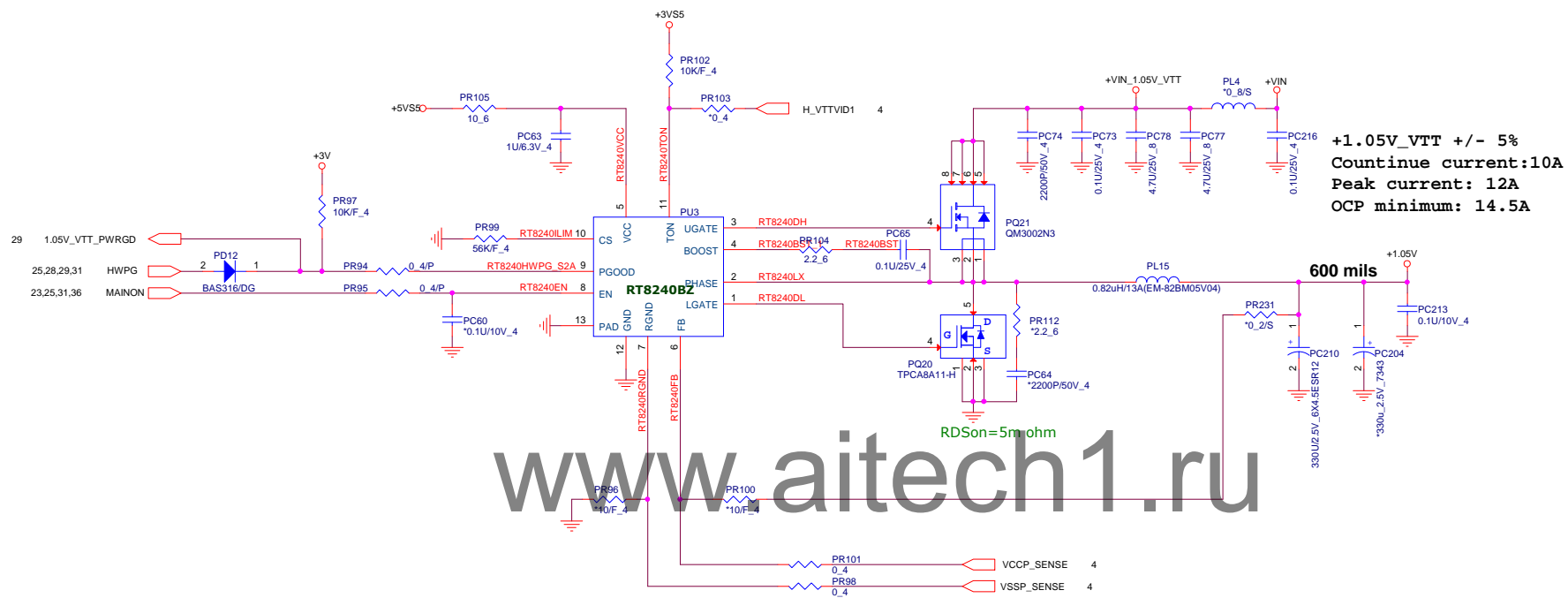
TPS51462RGER/AL051462000For CPU SV system agent
voltage slew rate of 0.5 -10 mV/ μ s

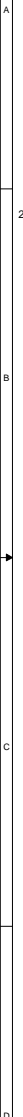
SEL0	SEL1	+VCCSA
0	0	0.9V
0	1	0.8V
1	0	0.725V
1	1	0.675V

TPS51463RGER/AL051463000For CPU ULV system agent
voltage slew rate of 0.5 -10 mV/ μ s

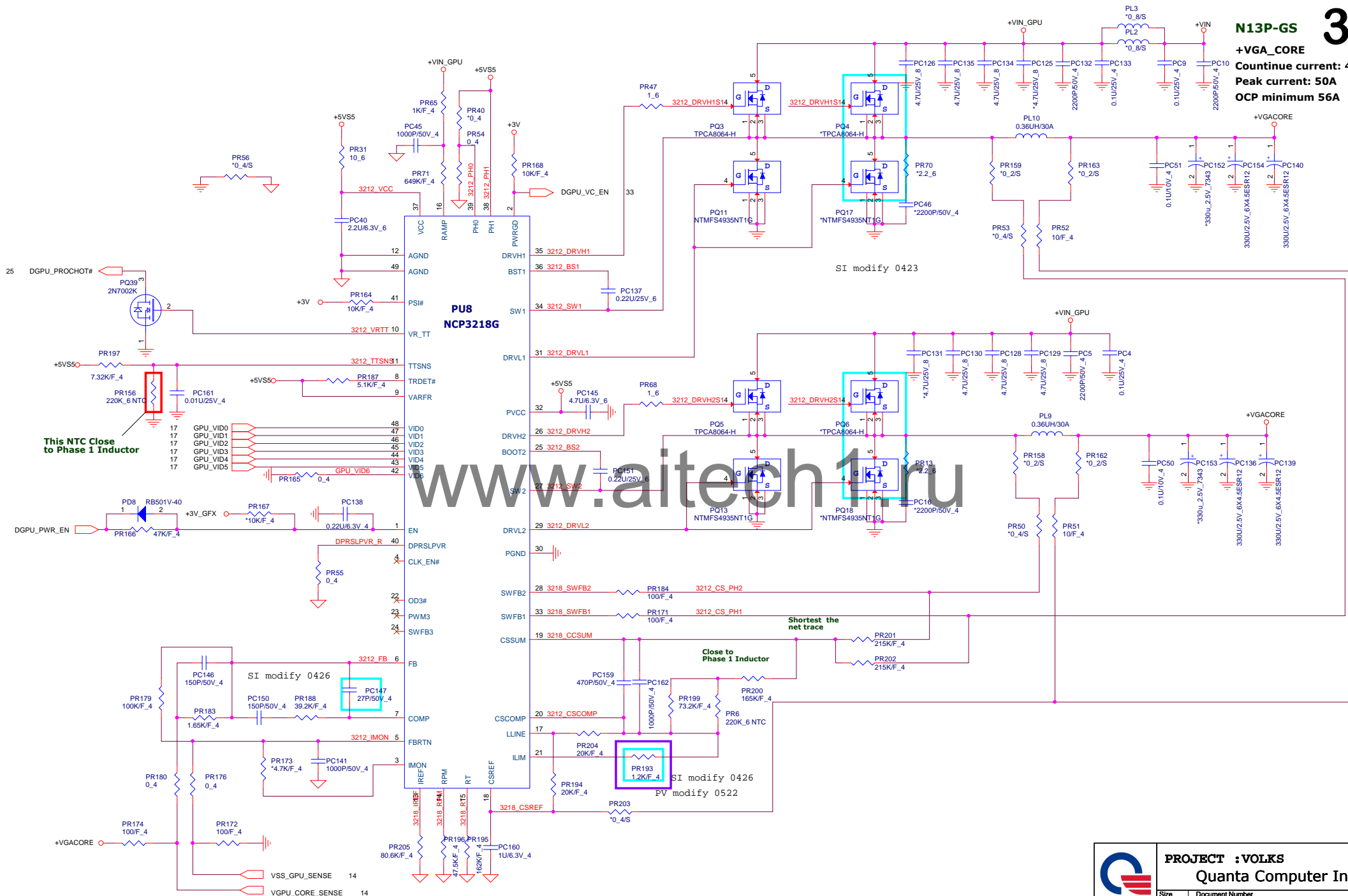
SEL0	SEL1	+VCCSA
0	0	0.9V
0	1	0.85V
1	0	0.775V
1	1	0.75V

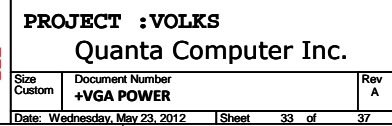


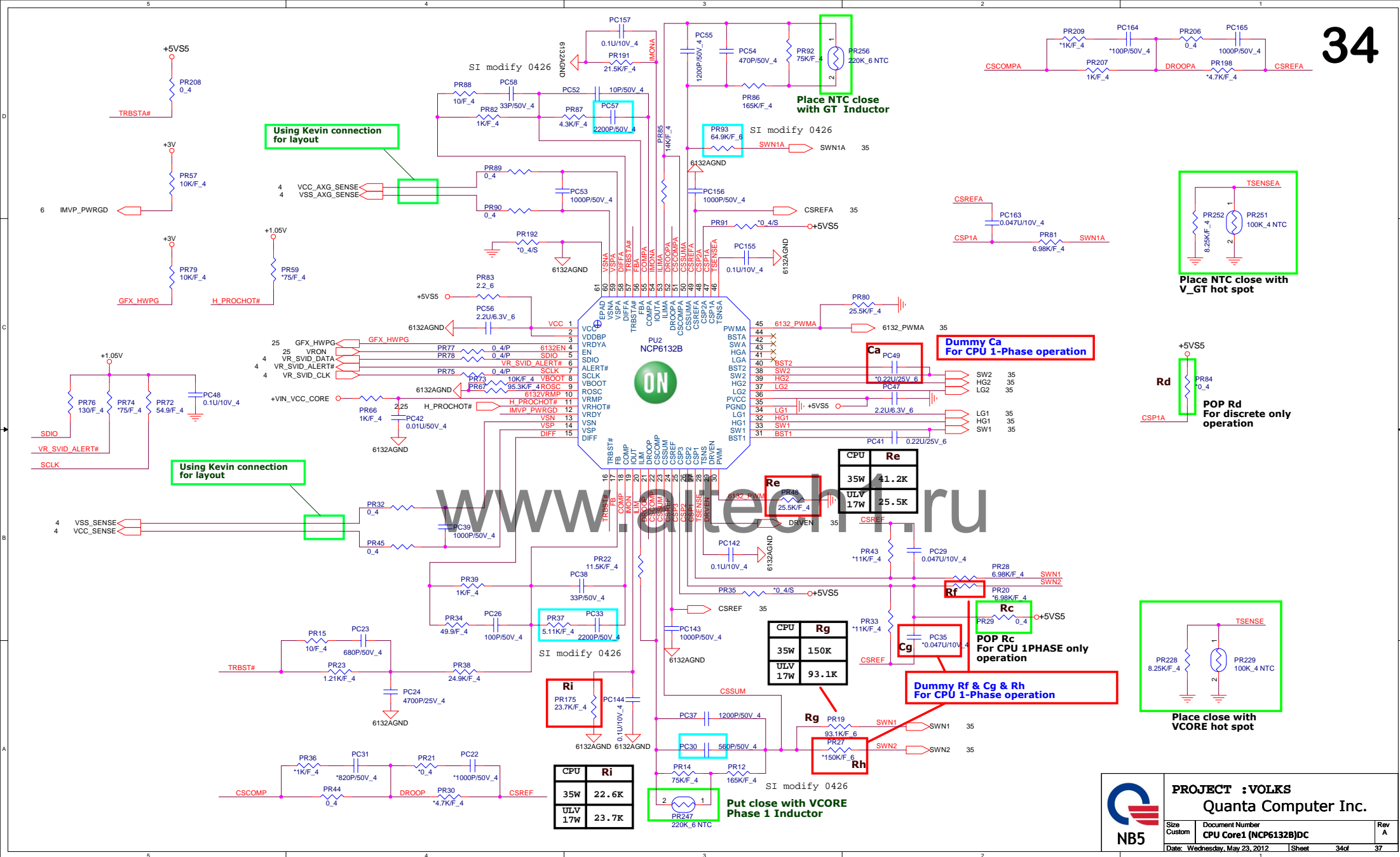




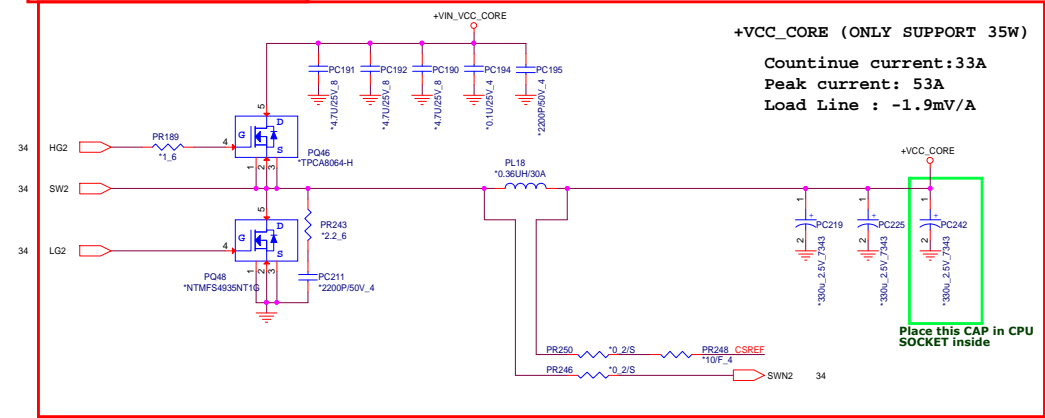
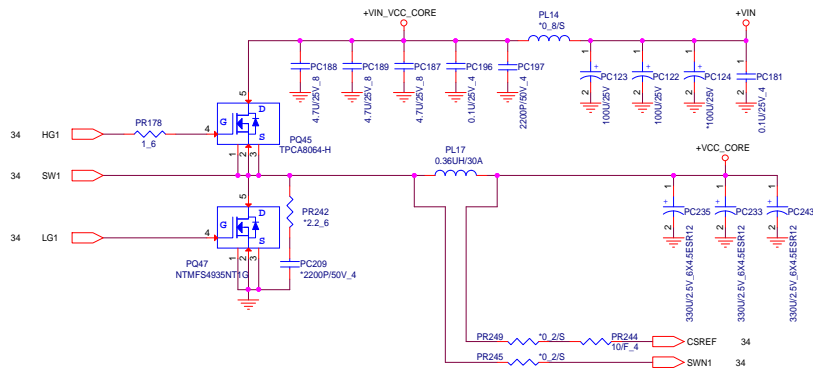
D







Dummy This Schematic
For CPU 1-Phase operation



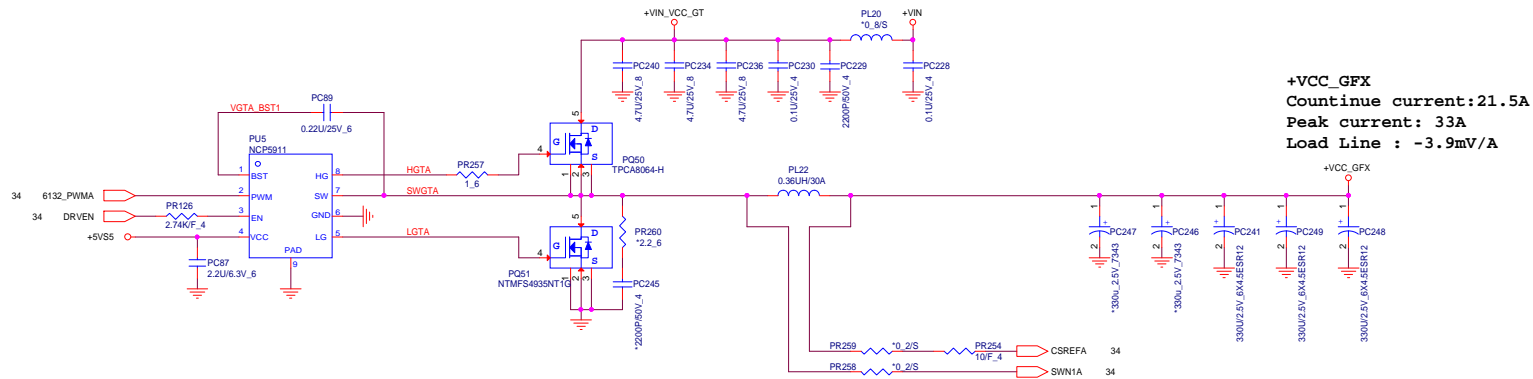
+VCC_CORE (ONLY SUPPORT 35W)

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

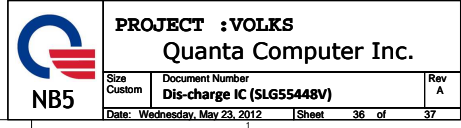
+VCC_CORE (ULV 17W)

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

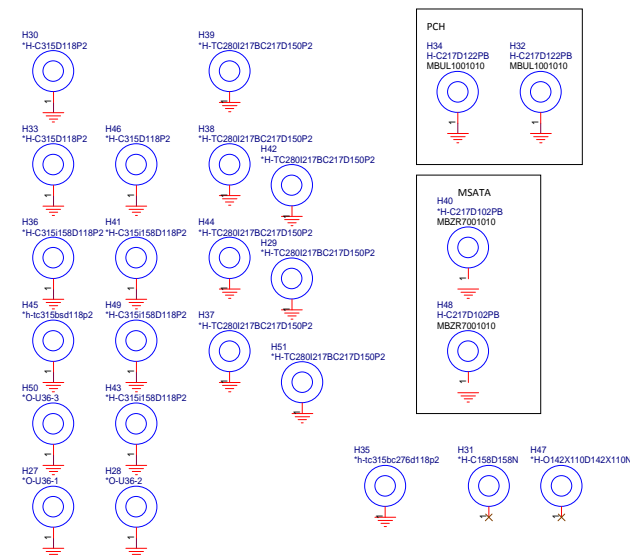
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+VCC_GFX
Countinue current:21.5A
Peak current: 33A
Load Line : -3.9mV/A



15" Hole



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Touch Pad Connector

