

N91D Power Schematic EC Tracking Record DB to SI version

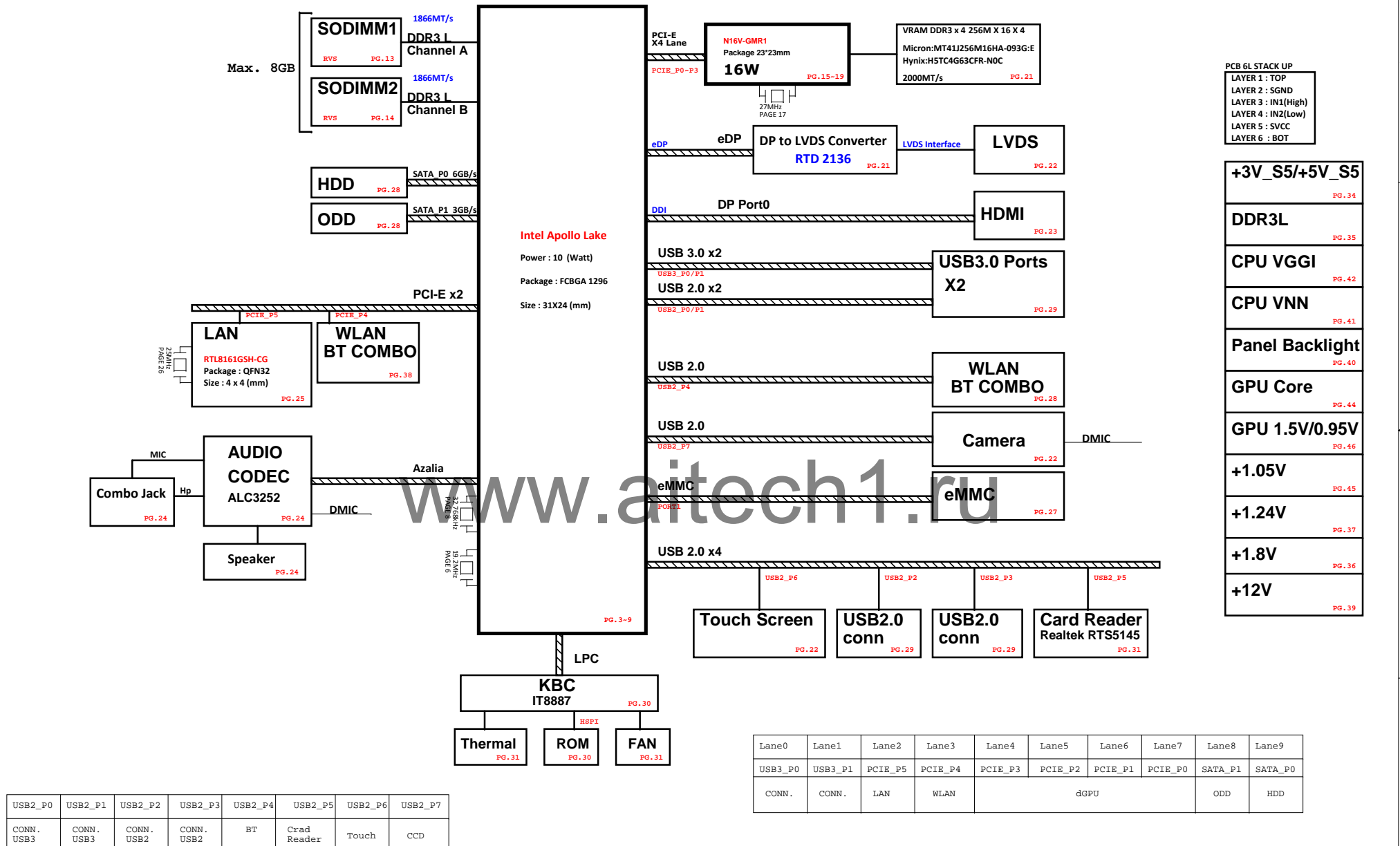
EC #	Page	Description	Part Affected
EC-SI-P01	34~45	Change default open to default short	PJP1~PJP14
EC-SI-P02	41	Change IMON setting	PR220
EC-SI-P03	41	Adjust current response	PR214 、 PR39 、 PR40
EC-SI-P04	42	Change IMON setting	PR114
EC-SI-P05	42	Adjust current response	PR127 、 PR128
EC-SI-P06	42	Adjust Frequency	PR304 、 PR149
EC-SI-P07	42	Adjust load line	PR142

www.aitech1.ru

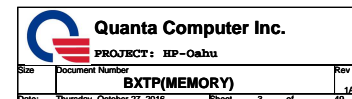
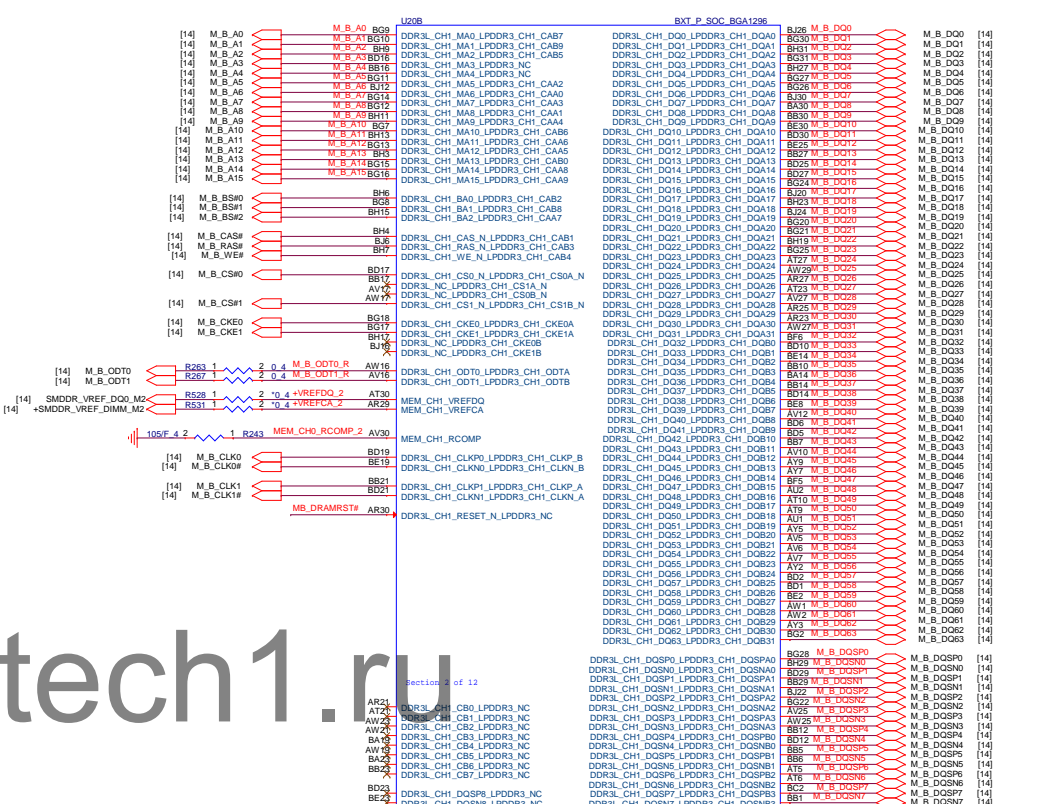
Title		
<Title>		
Size	Document Number	Rev
Custom<Doc>		<Rev Code>
Date:	Thursday, October 27, 2016	Sheet 1 of 1

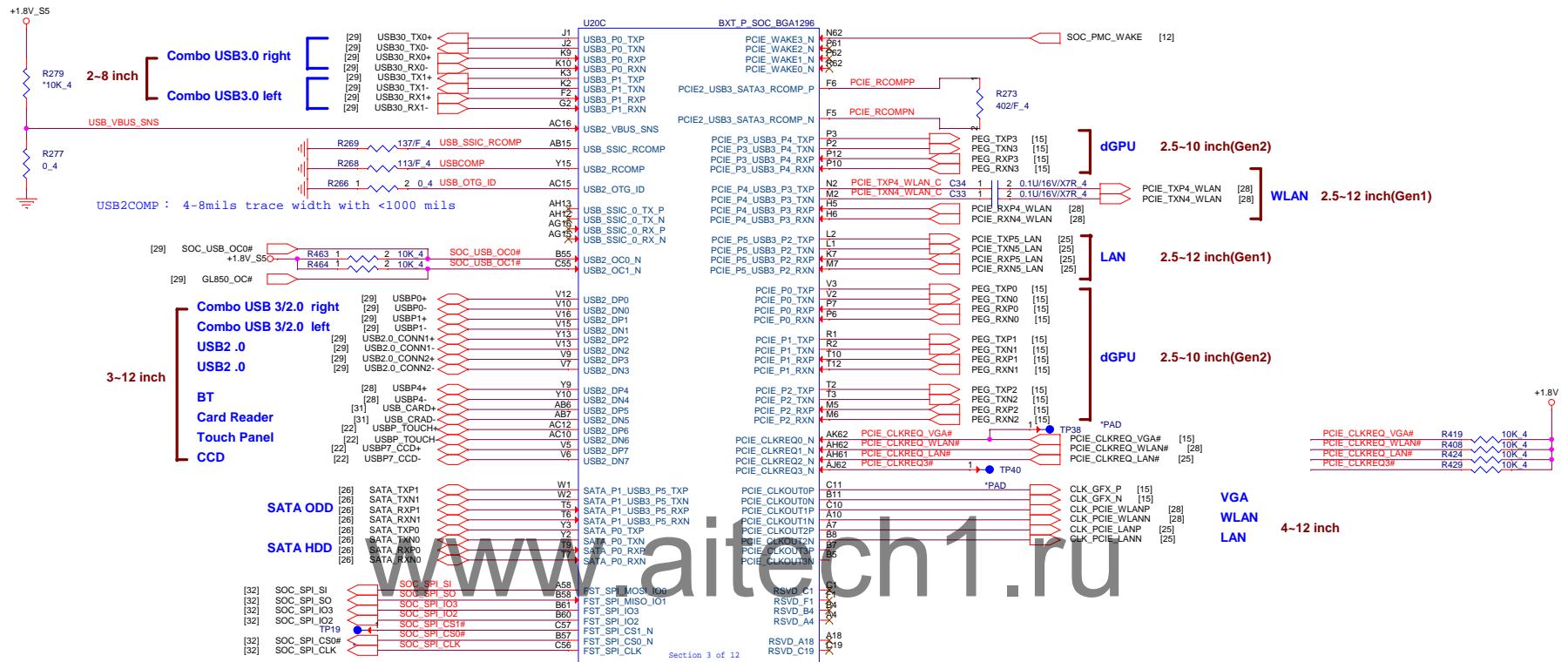
Oahu Intel Apollo Lake Platform Block Diagram

2



HP Restricted Secret





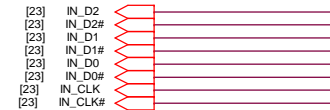
Apollolake (DISPLAY,eDP)

[4,6,7,8,10,11,12,20,30,32,36,37,42,43]
[4,6,7,23,25,27,28,31,43]
[7,12,13,14,15,16,17,18,20,21,22,23,25,26,27,29,30,31,35,37,38,43,44,45]

+1.8V_S5
+1.8V
+3V

05

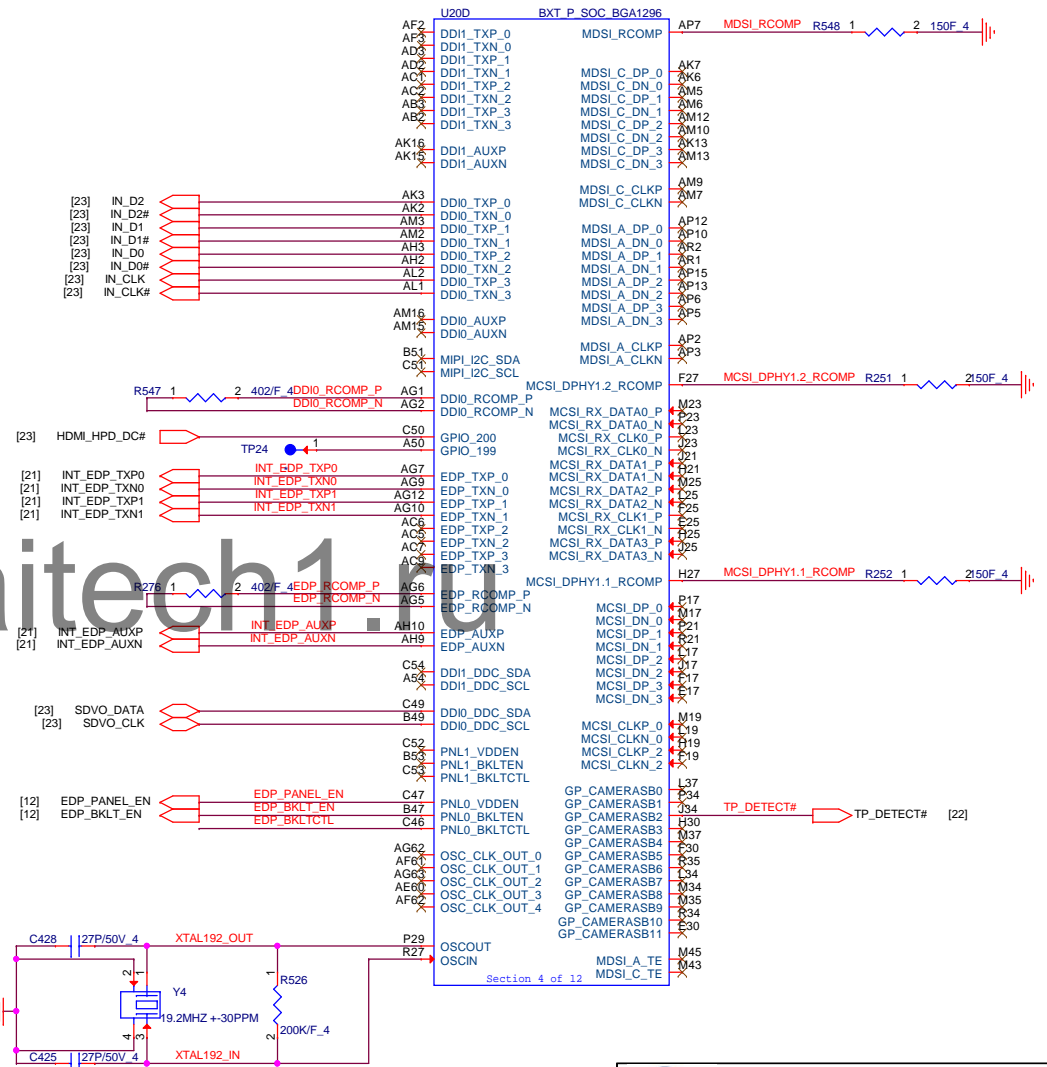
Max 7.5 inch HDMI



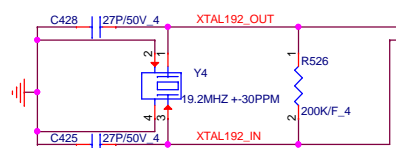
DDIO_HP
DDH_HP

eDP Panel

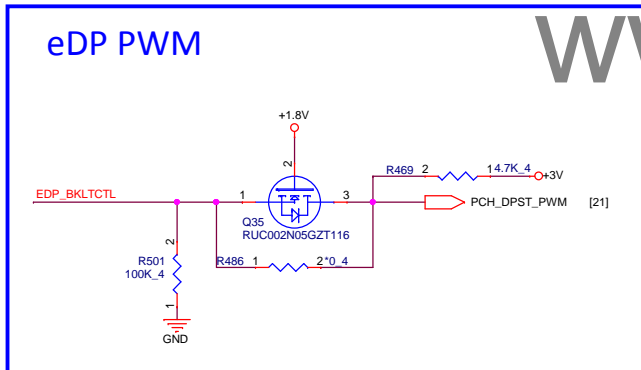
<10000 mil

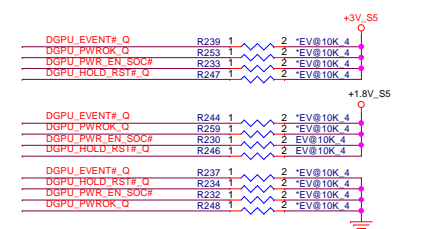
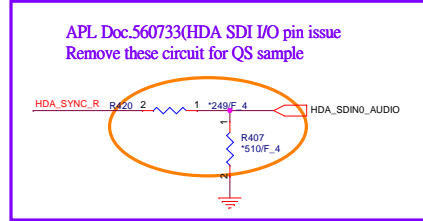
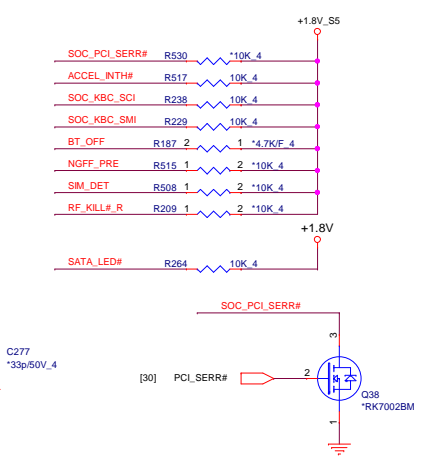
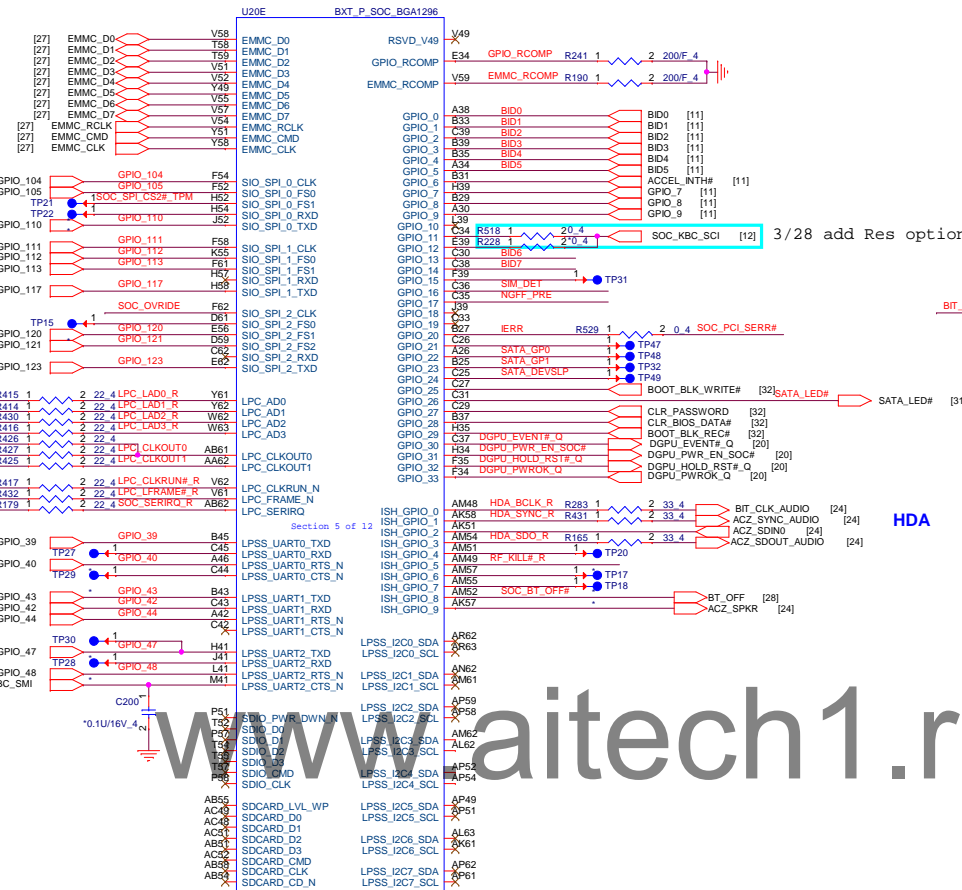


<1000 mil



eDP PWM





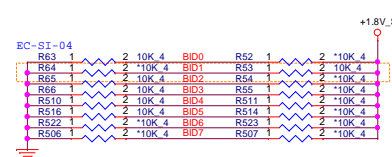
BOARD ID SETTING

Model	Board ID (Default = 00)	
	BOARD_ID0	BOARD_ID1
All EVT	0	0
All DVT	0	1
PVT1	1	0
PVT2+	1	1
MVB,A	0	0
1st Major ECN	0	1
2nd Major ECN	1	0
3rd Major ECN	1	1

Board ID (Default = 00)		
eMMC	BOARD_ID2	BOARD_ID3
W/O	0	0
Hynix	0	1
Samsung	1	0
Reserved	1	1

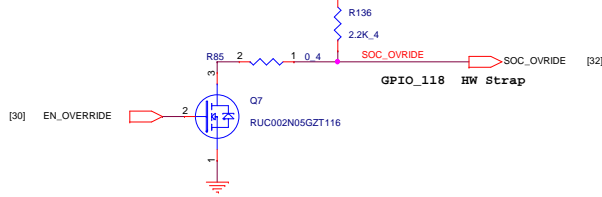
Board ID (Default = 00)		
VRAM	BOARD_ID4	BOARD_ID5
UMA	0	0
Hynix	0	1
Mircon	1	0
Samsung	1	1

BOARD ID SETTING



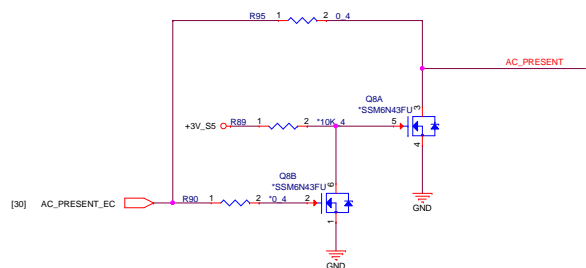
Override

Flash Descriptor Override (SOC_OVRIDE)
 0 = Normal Override(Normal operation)
 1 = Override

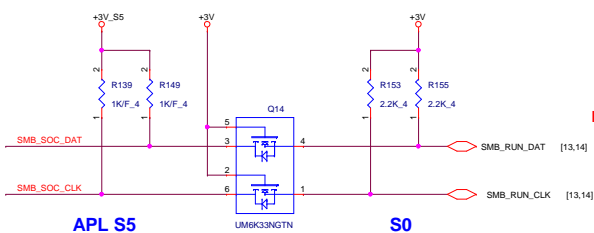




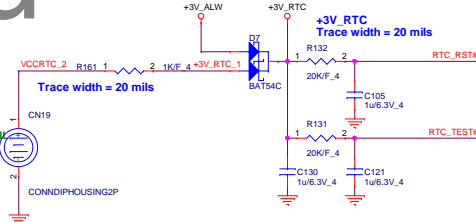
AC_PRESENT



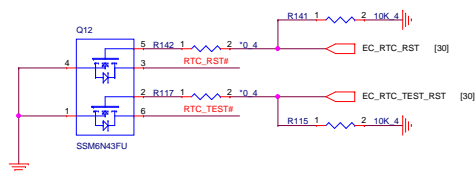
SMBus



RTC Circuitry (RTC)



EC reset RTC



BOT side cap

TOP side cap

•VNN Output Decoupling Recommendations

1uFx3	0402	BOT, inside socket cavity
22uFx4	0603	TOP, inside socket cavity

•VDD2_1P24_GLM Output Decoupling Recommendations

1uFx4	0402	TOP1 / BOT*3, inside socket cavity
22uFx1	0603	TOP, inside socket cavity

•VDD2_1P24_DSI Output Decoupling Recommendations

1uFx2	0402	TOP1 / BOT*1, inside socket cavity
22uFx1	0603	TOP, inside socket cavity

•VDD2_1P24_AUD_ISH_PLL Output Decoupling Recommendations

1uFx2	0402	TOP1 / BOT*1, inside socket cavity
22uFx1	0603	TOP, inside socket cavity

•VDD2_1P24_MPHY Output Decoupling Recommendations

1uFx3	0402	TOP1 / BOT*2, inside socket cavity
22uFx1	0603	TOP, inside socket cavity

•VCCRAM_1P05_IO_3PHASEIO Output Decoupling Recommendations

1uFx4	0402	TOP2 / BOT*2, inside socket cavity
22uFx1	0603	TOP, inside socket cavity

•VCCDDQ Output Decoupling Recommendations

1uFx2	0402	BOT, inside socket cavity
22uFx8	0603	TOP, inside socket cavity

•VCC_VCCIO Output Decoupling Recommendations

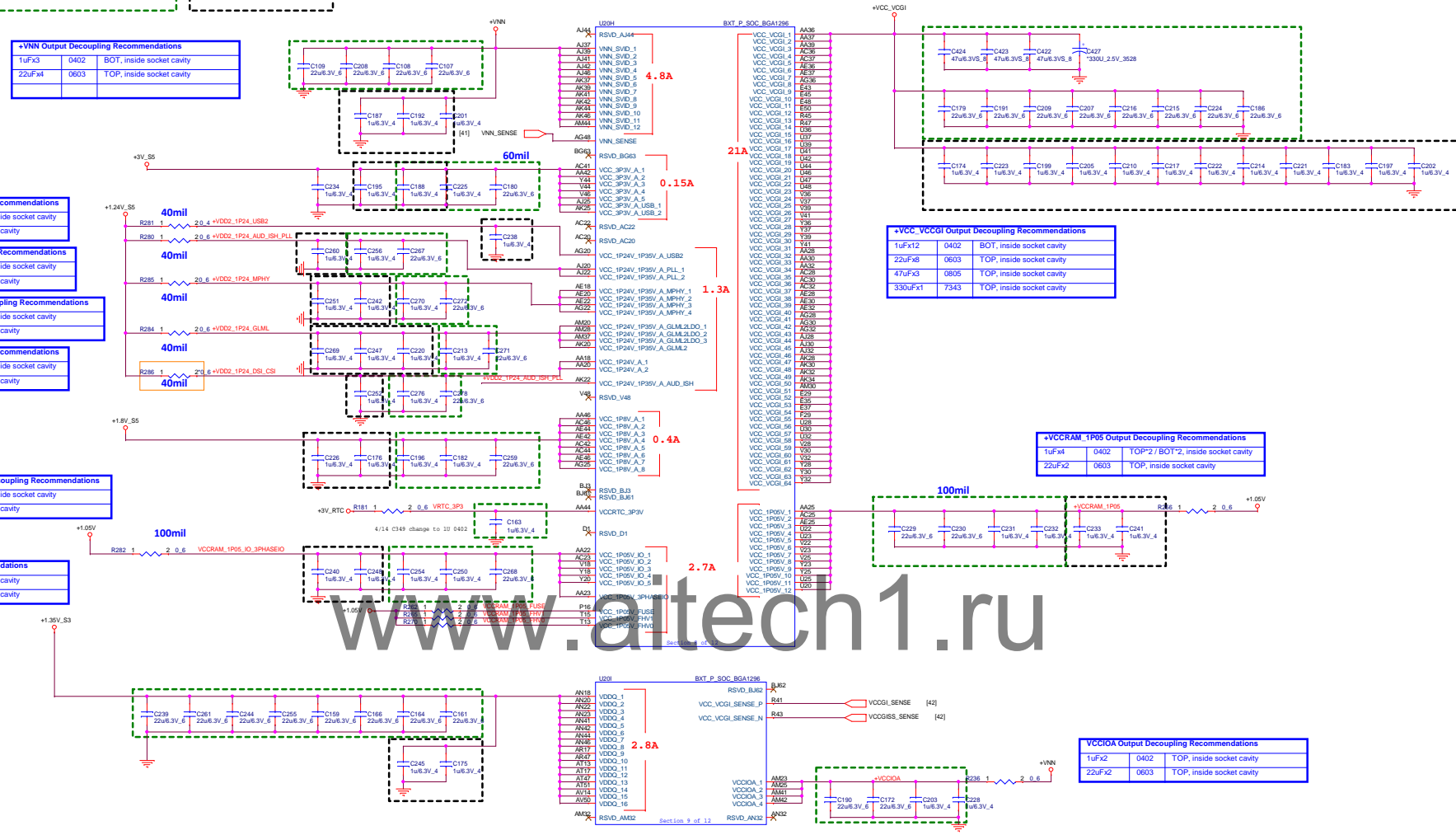
1uFx12	0402	BOT, inside socket cavity
22uFx8	0603	TOP, inside socket cavity
47uFx3	0805	TOP, inside socket cavity
330uFx1	7343	TOP, inside socket cavity

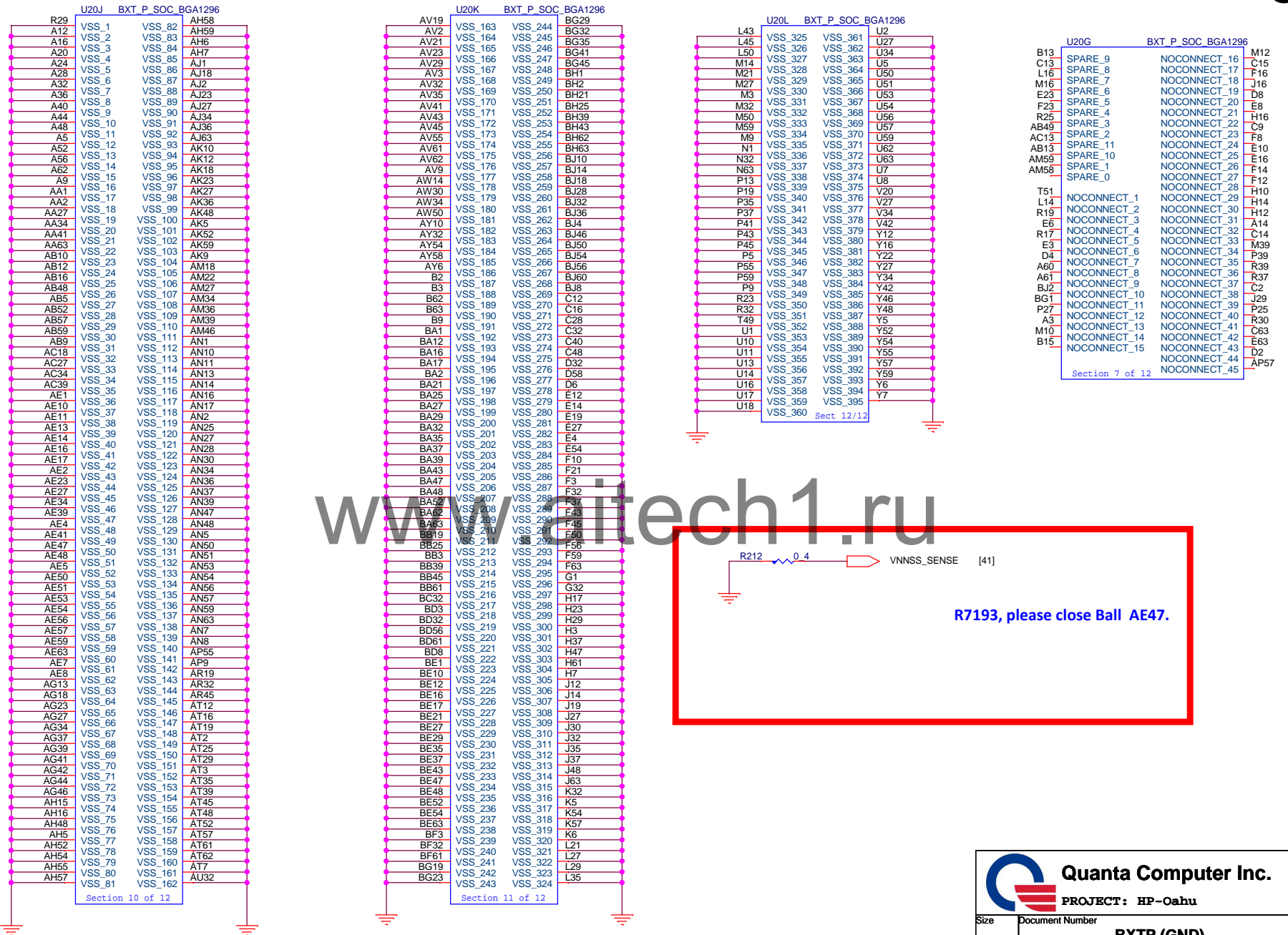
•VCCRAM_1P05 Output Decoupling Recommendations

1uFx4	0402	TOP2 / BOT*2, inside socket cavity
22uFx2	0603	TOP, inside socket cavity

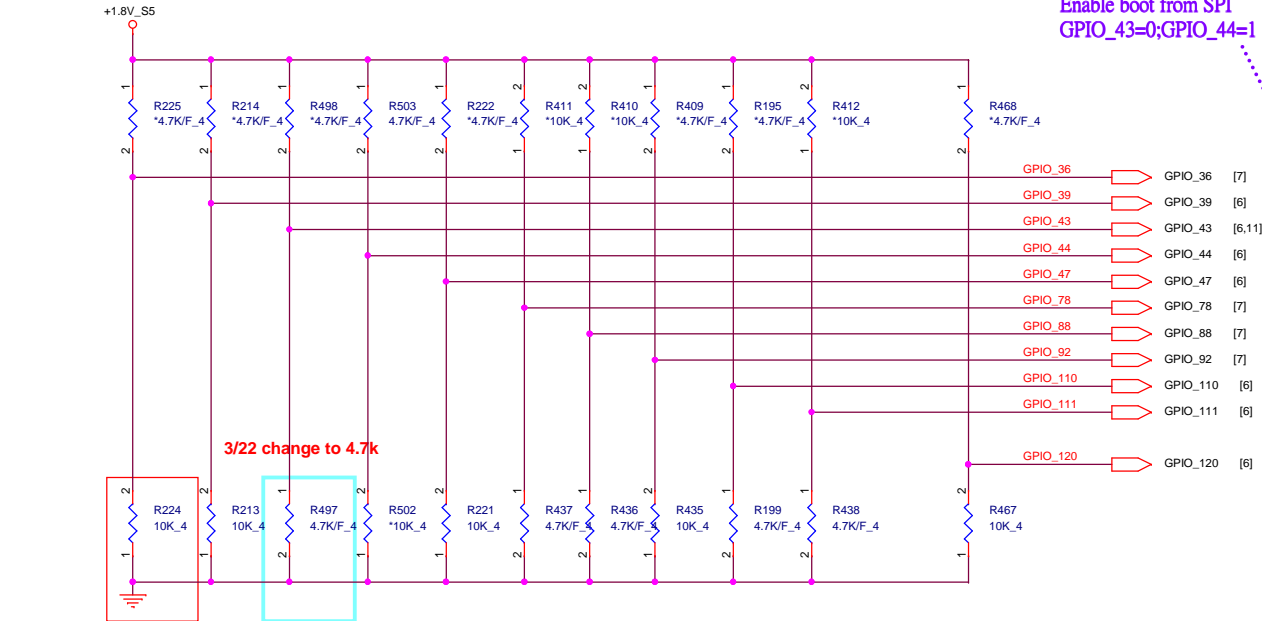
•VCCIOA Output Decoupling Recommendations

1uFx2	0402	TOP, inside socket cavity
22uFx2	0603	TOP, inside socket cavity





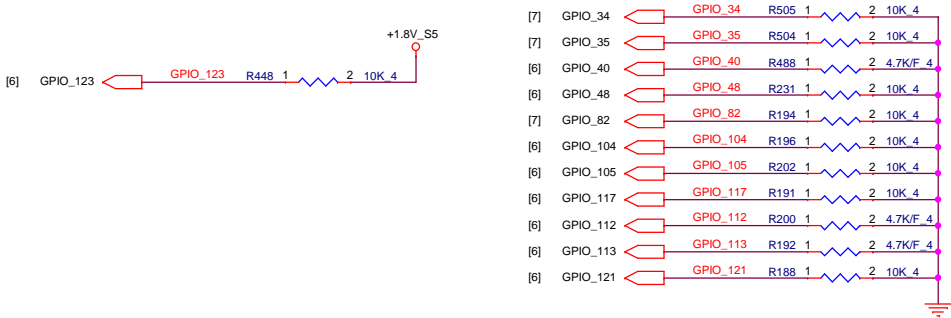
Folllow APL WoW36 :
Enable boot from SPI
GPIO_43=0;GPIO_44=1



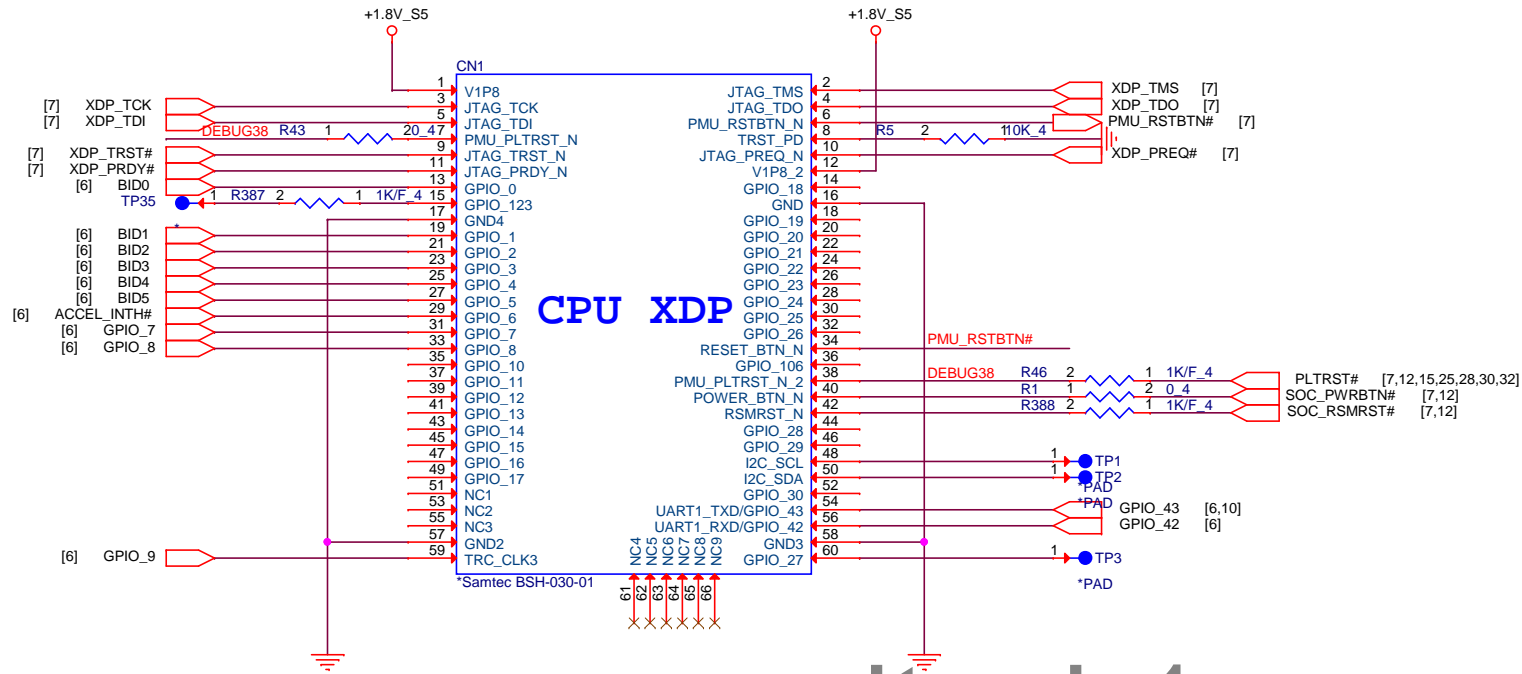
This rail must be 1.24V for A0 step.
Starting B-step, this rail can be 1.24V or 1.35V

Hardware Strap	Strap Description	Value
GPIO_36	VCC_1P24V_1P35V_A voltage select 0 = 1.24V 1 = 1.35V	0
GPIO_39	Enable CSE(TXE3.0) ROM Bypass 0 = Disable bypass 1 = Enable Bypass	0
GPIO_43	Allow eMMC as a boot source 0 = Disable 1 = Enable	0
GPIO_44	Allow SPI as a boot source 0 = Disable 1 = Enable	1
GPIO_47	Force DNX FW Load 0 = Do not force 1 = Force	0
GPIO_78	SMBus 1.8V/3.3V mode select 0=buffers set to 3.3V 1=buffers set to 1.8V	0
GPIO_88	PMU 1.8V/3.3V mode select 0=buffers set to 3.3V mode 1=buffers set to 1.8V mode	0
GPIO_92	SMBus No Re-Boot 0 = Disable (default) 1 = Enable	0
GPIO_110	LPC 1.8V/3.3V mode select 0=buffers set to 3.3V mode 1=buffers set to 1.8V mode	0
GPIO_111	Boot BIOS Strap 0 = Boot from SPI 1 = Do not boot from SPI	0
GPIO_120	Top swap override 0 = Disable 1 = Enable	0

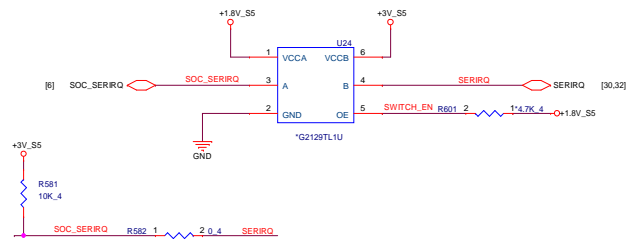
www.aitech1.ru



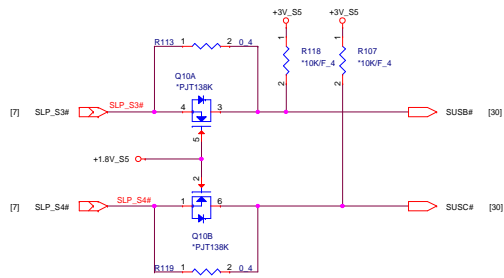
Please ensure that this strap is pulled LOW when RSM_RST_N de-asserts for normal platform operation.
GPIO_40/GPIO_48/GPIO_104/GPIO_105/GPIO_112/GPIO_113/GPIO_117/GPIO_121 PD
GPIO_106/GPIO_123 PU



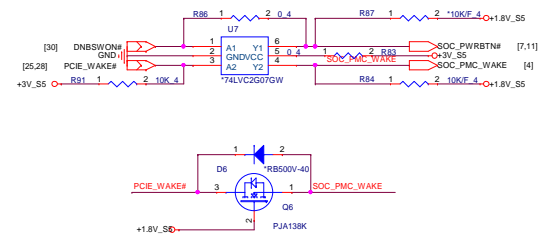
www.aitech1.ru



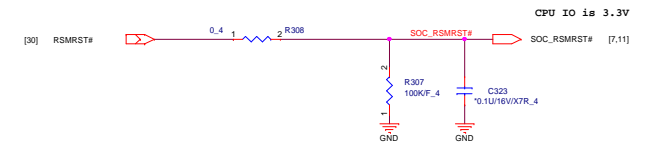
SUSB/C#



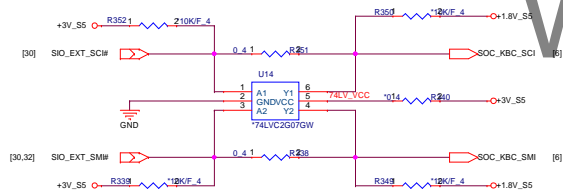
PWRBTN#/PCIE_WAKE#



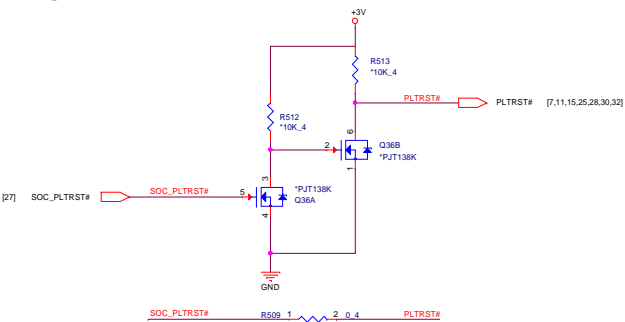
RSMRST#



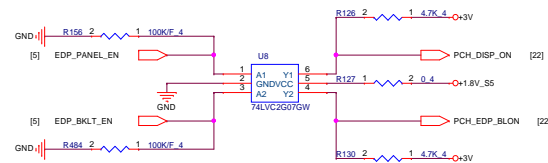
SCI#/SMI#



PLTRST#



Disp ON/BL ON(OK)

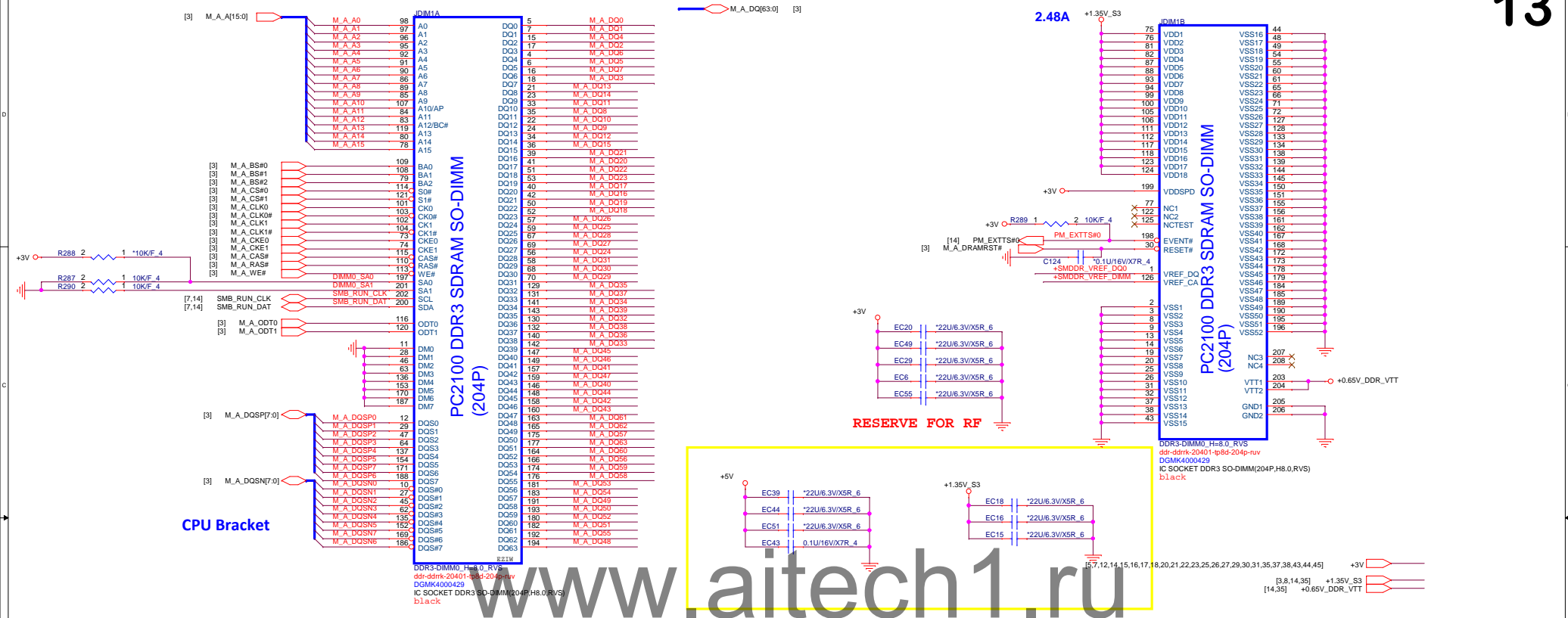


[5,7,13,14,15,16,17,18,20,21,22,23,25,26,27,29,30,31,35,37,38,43,44,45]
[4,5,6,7,8,10,11,20,30,32,36,37,42,43]
[6,7,8,20,22,25,28,30,32,33,34,36,37,38,41,42,43,45]

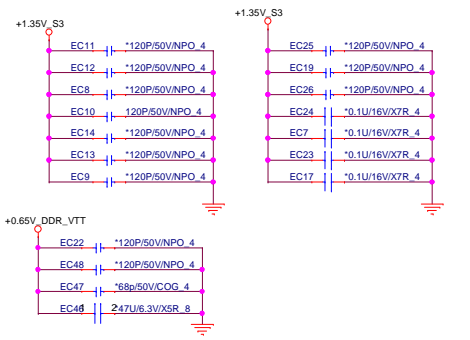
+3V
+1.8V_S5
+3V_S5

HP Restricted Secret

Quanta Computer Inc.	
PROJECT: HP-Oahu	
Size	Document Number
Level shift/Thermistor	
Date: Thursday, October 27, 2016	Sheet 12 of 49

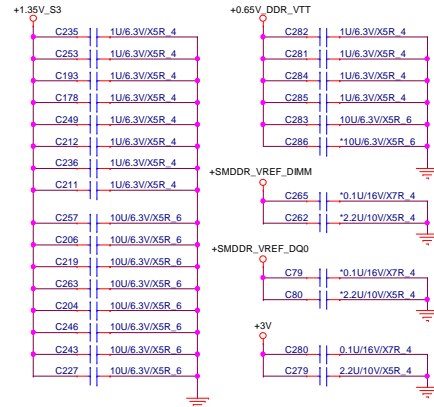


For EMI RESERVE

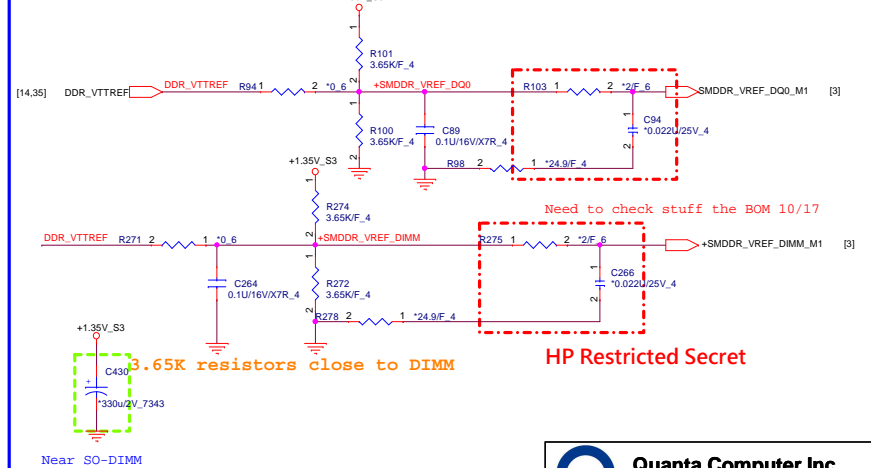


Place these Caps near So-Dimm0.

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

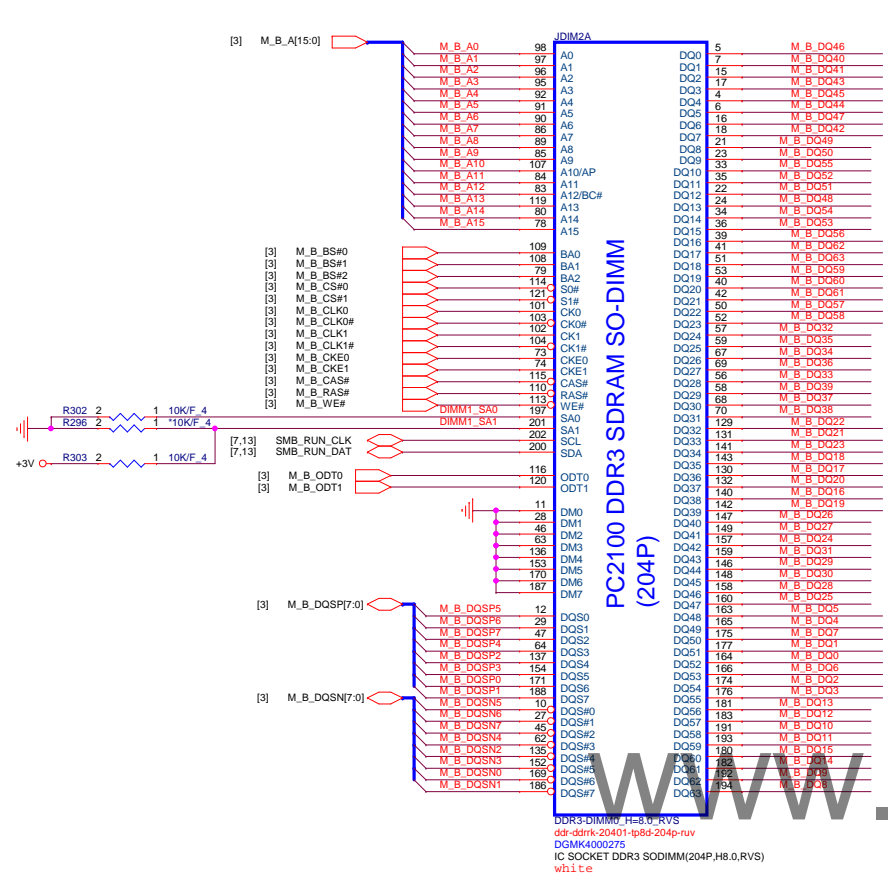


VREF DQ0 M1 Solution

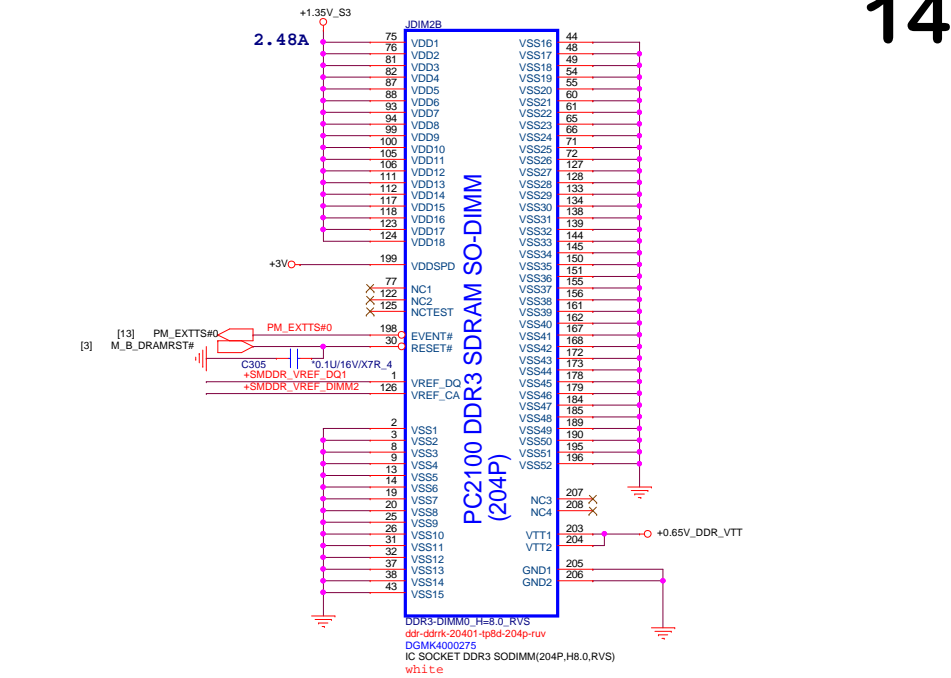


Quanta Computer Inc.
PROJECT: HP-Oahu

Size: Custom
 Document Number: DDR3L DIMM0-RVS(8.0H)
 Date: Thursday, October 27, 2016
 Sheet: 13 of 49
 Rev: 2A

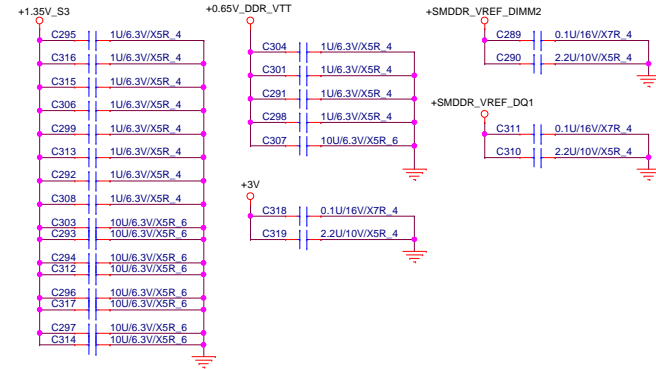


M_B_DQ[63:0] [3]

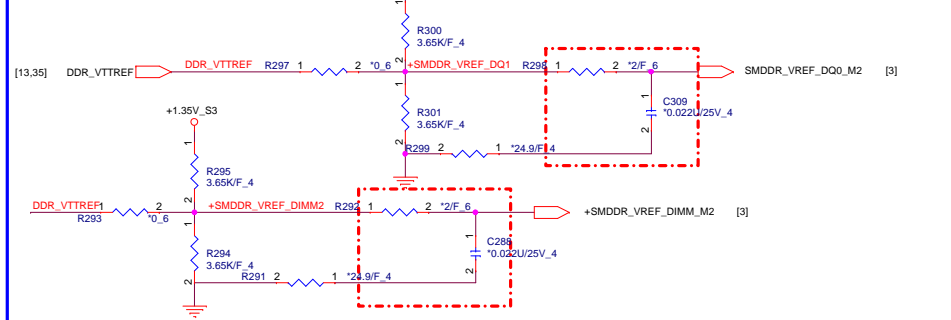


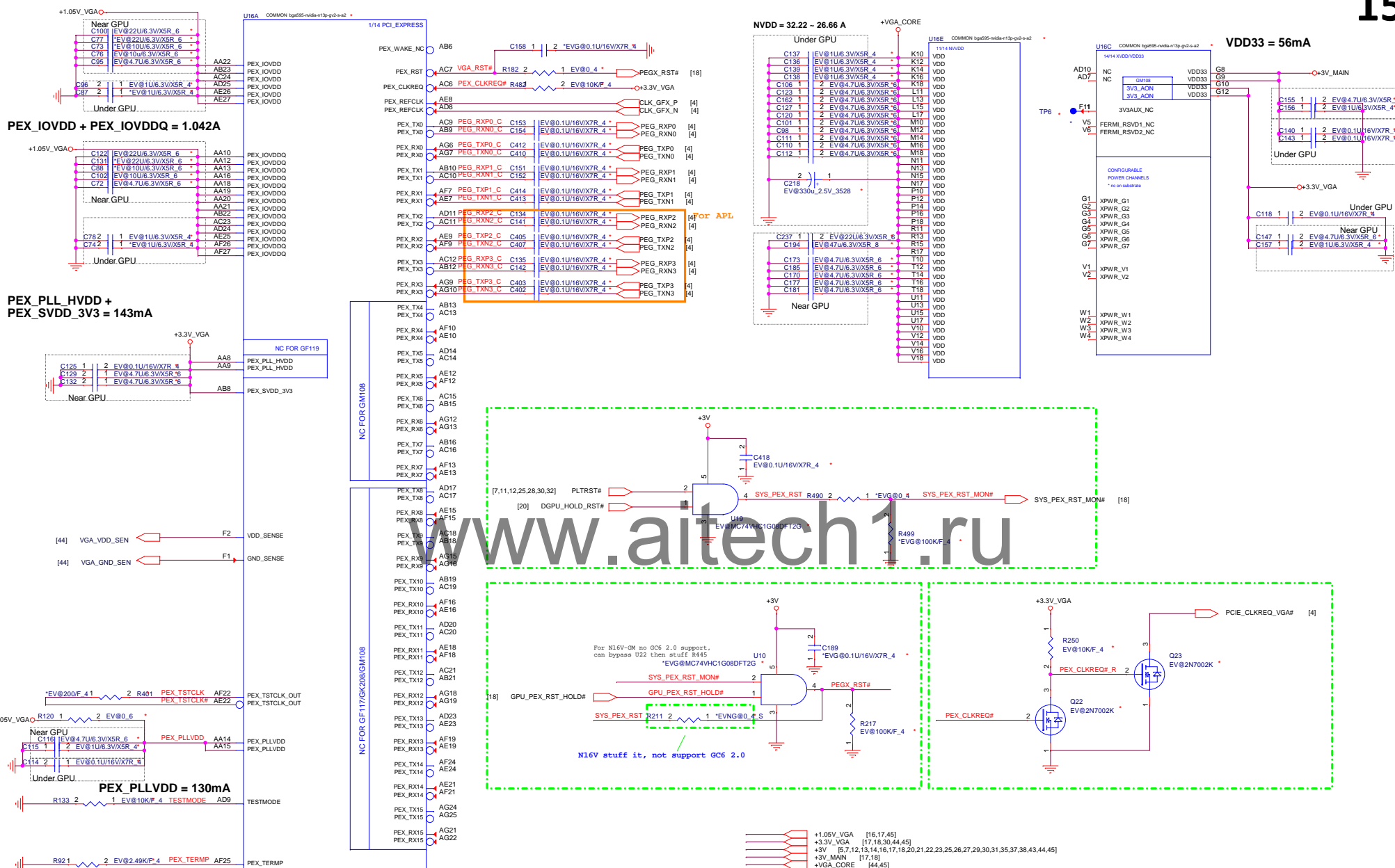
www.aitech1.ru

Place these Caps near So-Dimm1.
1uF/10uF 4pcs on each side of connector



VREF DQ1 M1 Solution





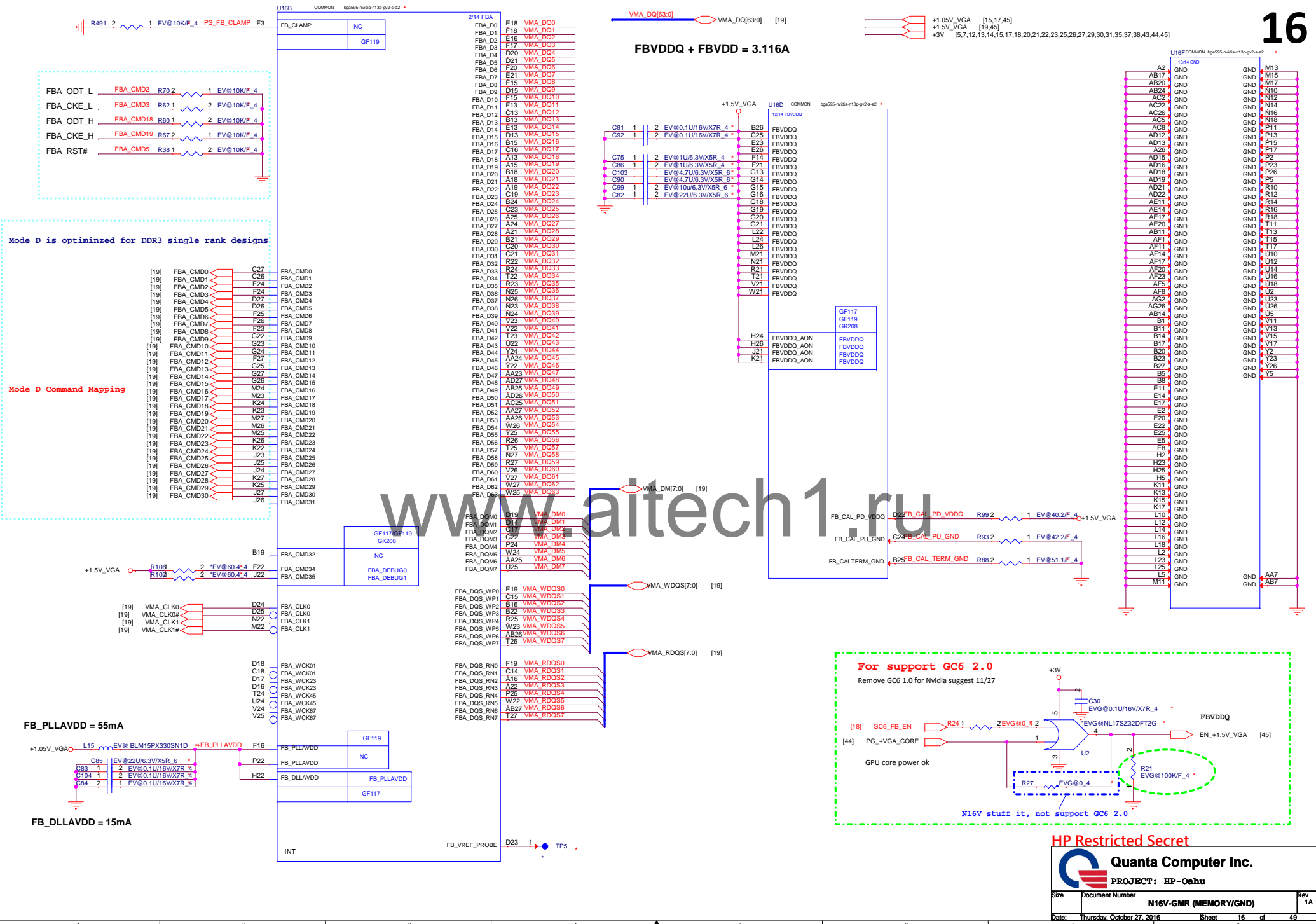
HP Restricted Secret

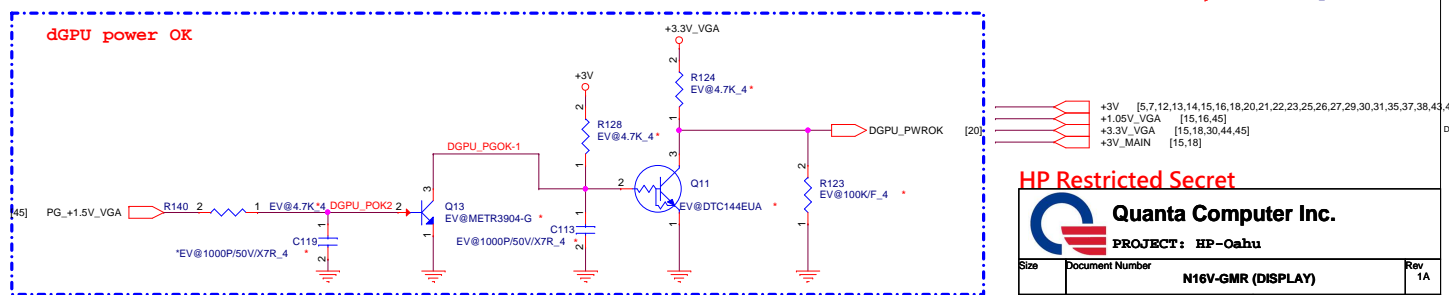
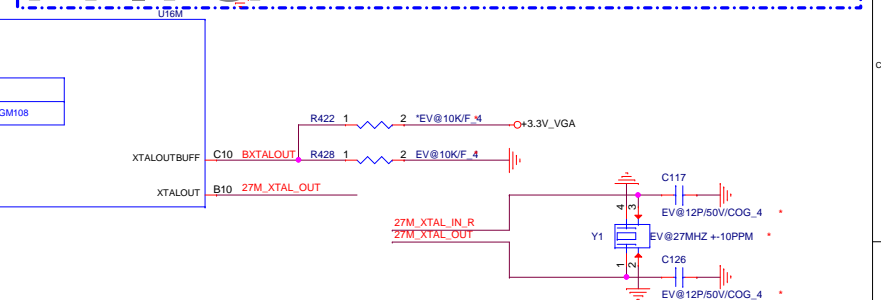


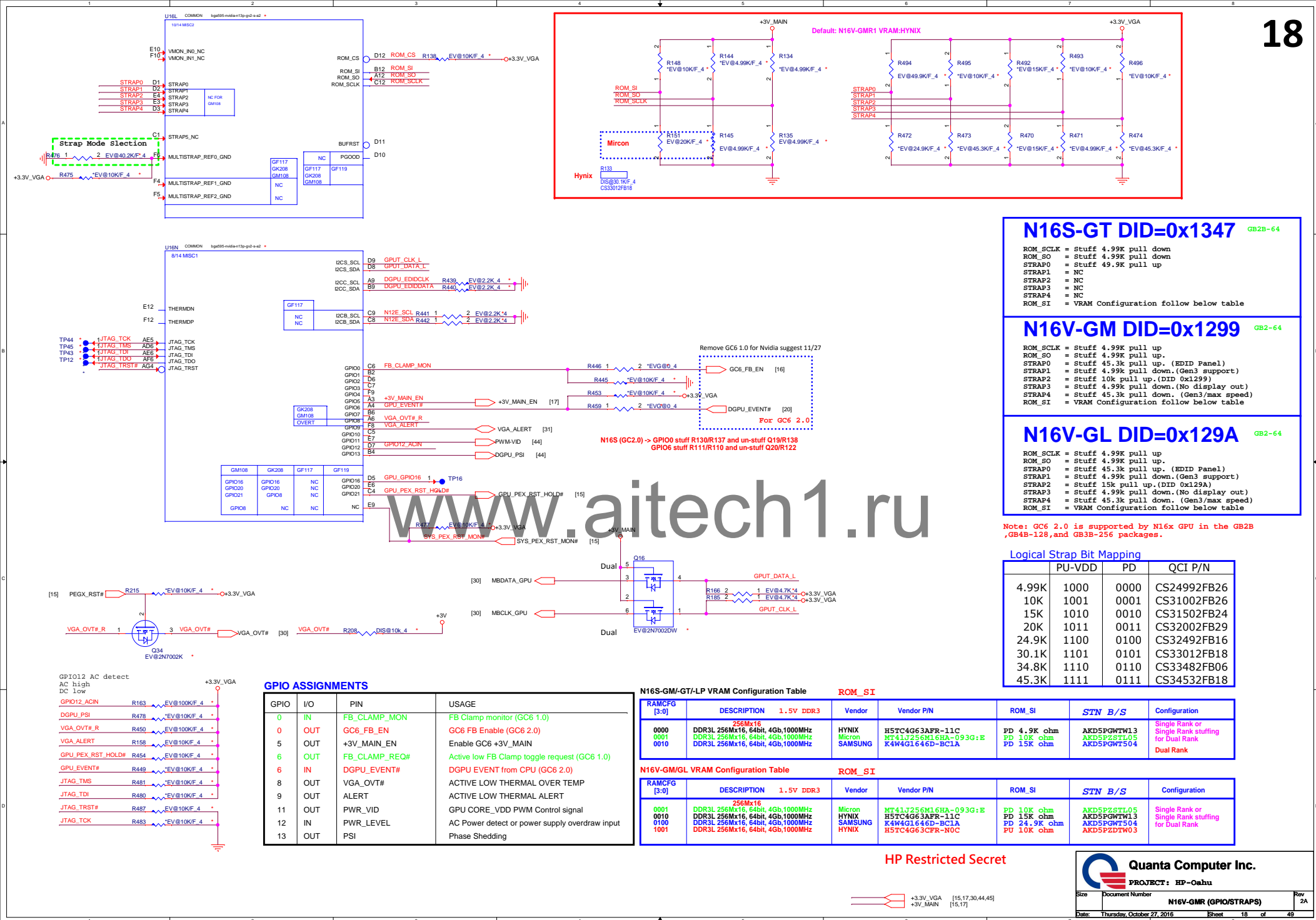
Quanta Computer Inc.

PROJECT: HP-Oahu

Size	Document Number	Rev
	N16V-GMR (PCIE V/F) NVDD	1A
Date	Thursday, October 27, 2016	Sheet 15 of 49





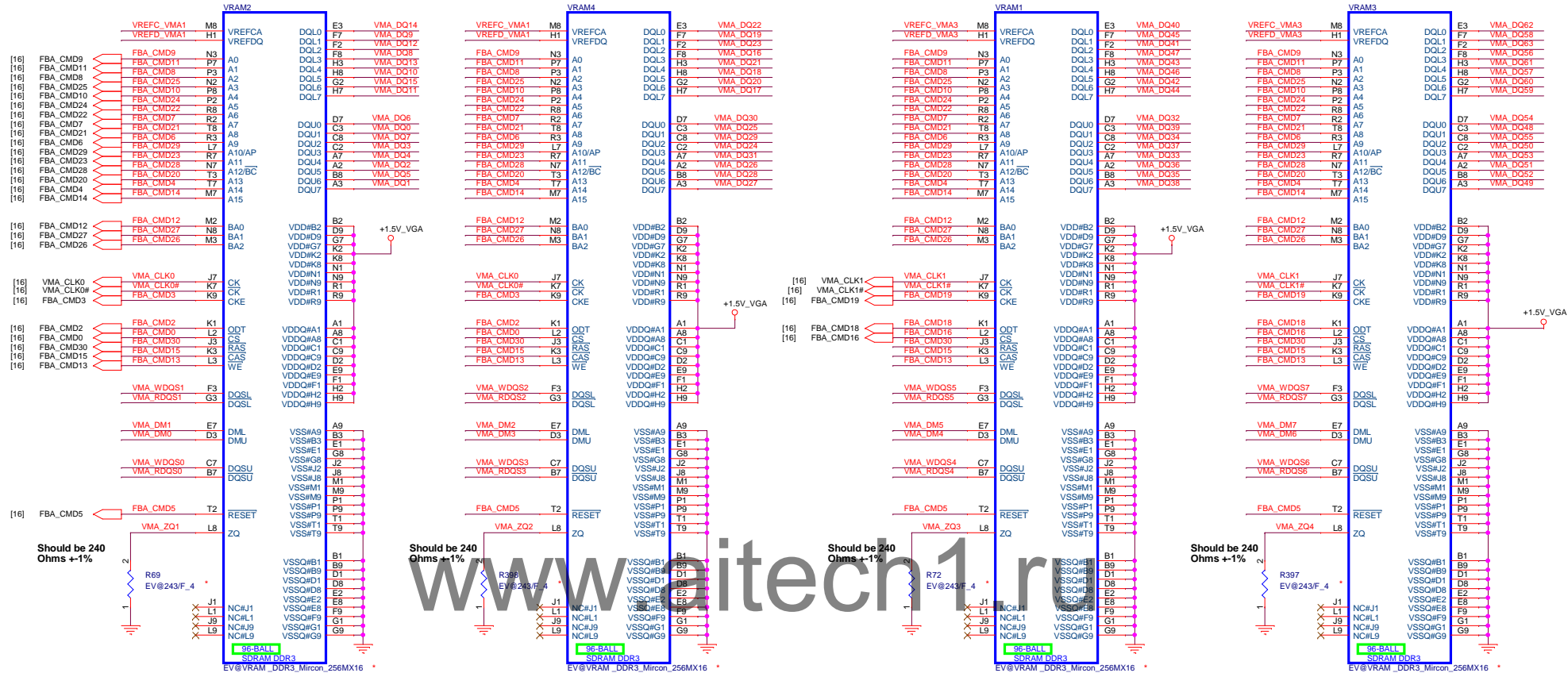
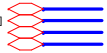


CHANNEL A: 2048MB DDR3X16

+1.05V_VGA
+1.5V_VGA [16,15,17,45]

HYU 256Mx16, H57C4G63AFR-11C STN B/S PN : AKD5PGWTW13
MIC 256Mx16, MT41J256M16A-093G:E STN B/S PN : AKD5P2STL05
SAM 256Mx16, K4W4G1646D-BC1A STN B/S PN : AKD5PGWT504

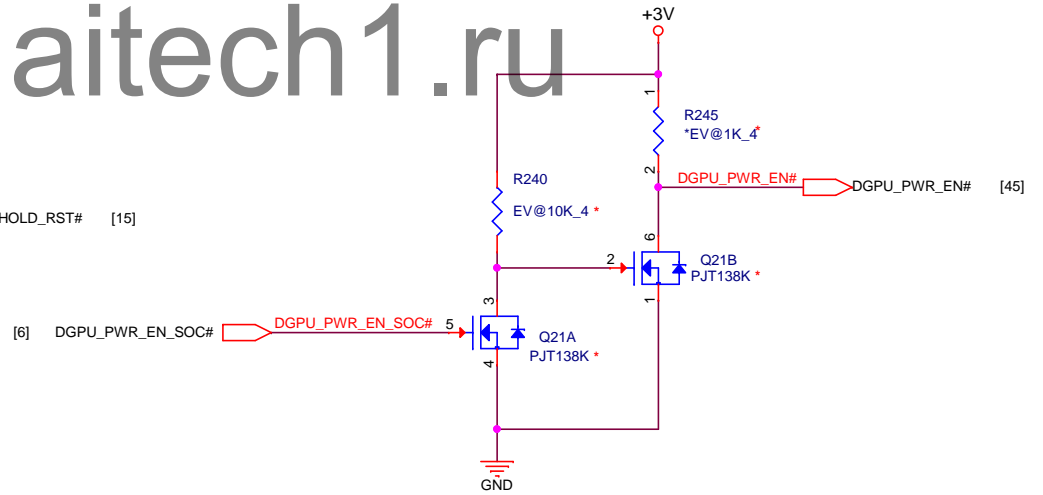
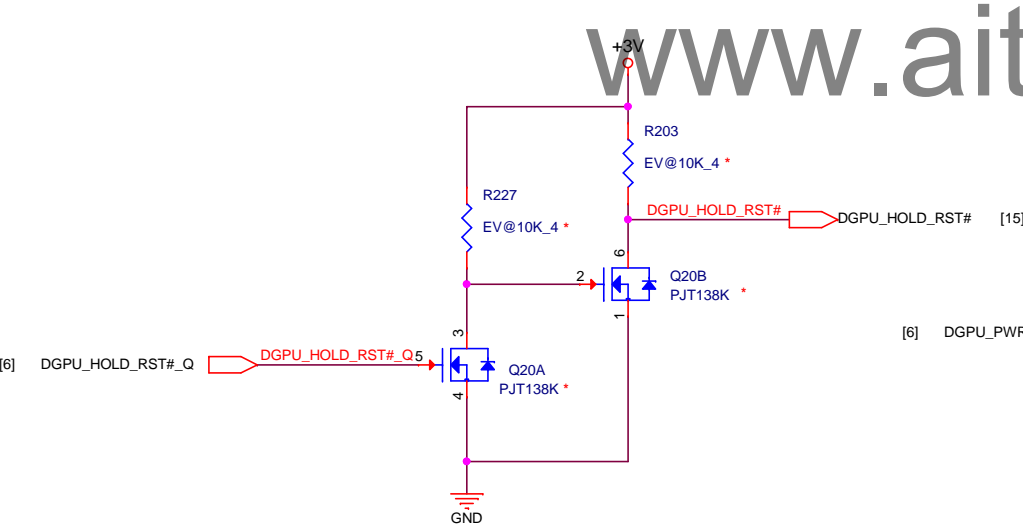
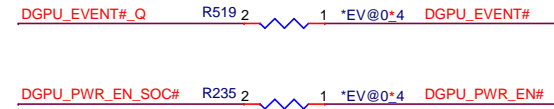
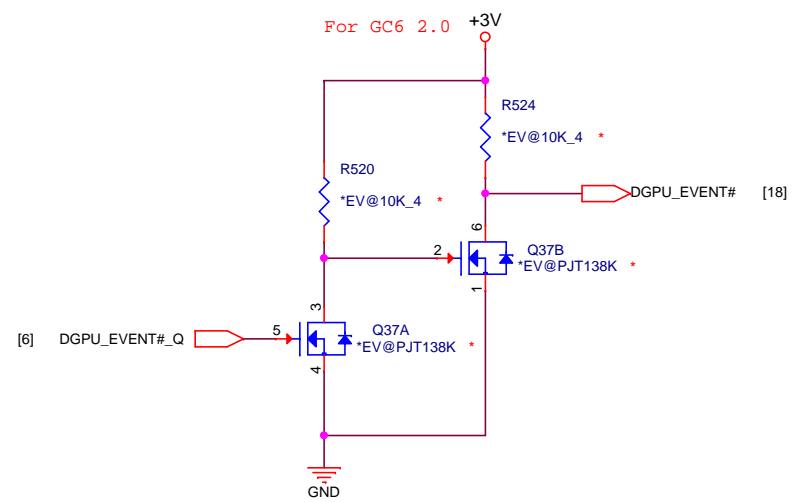
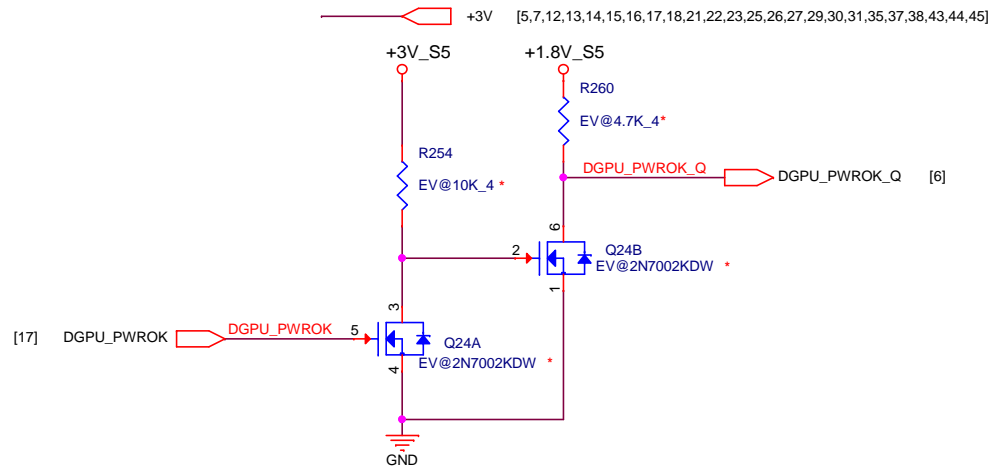
[16] VMA_DQ[63..0]
[16] VMA_DM[7..0]
[16] VMA_WDQS[7..0]



162.1k ohm
CS11622FB07 RES CHIP 162 1/16W +-1%(0402)
CS11622FB15 RES CHIP 162 1/16W +-1%(0402)


Fermi : Change to 160 ohm
1 : CS11602JB00 ,RES CHIP 160 1/16W +-5%(0402)
2 : CS11622FB07 ,RES CHIP 162 1/16W +-1%(0402)

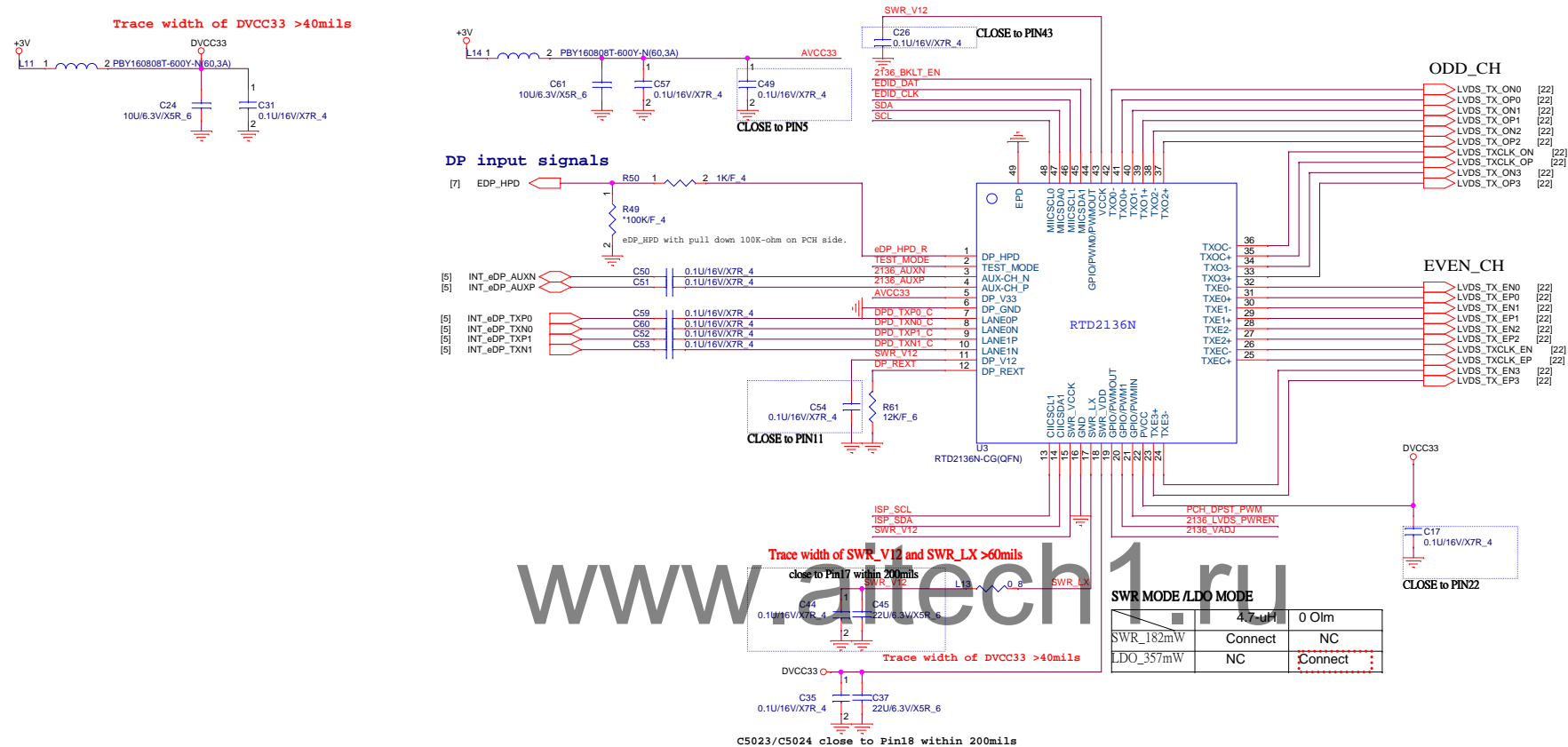
HP Restricted Secret

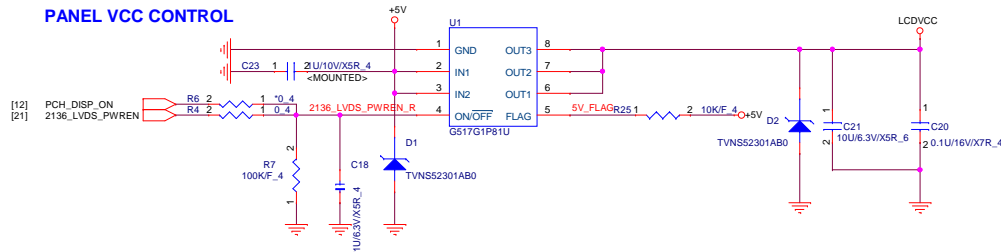


www.aitech1.ru

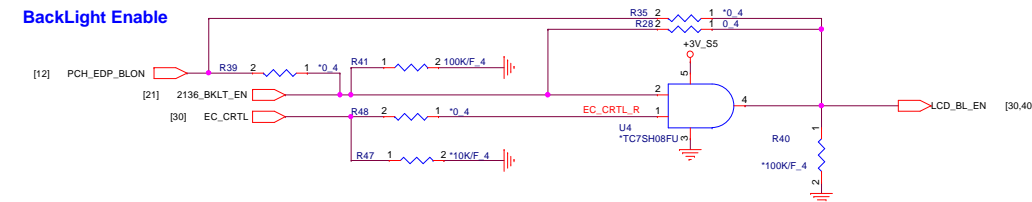
HP Restricted Secret

 Quanta Computer Inc. PROJECT: HP-Oahu		Size	Document Number	Rev
			dGPU Level Shift	1A
Date:	Thursday, October 27, 2016	Sheet	20	of 49

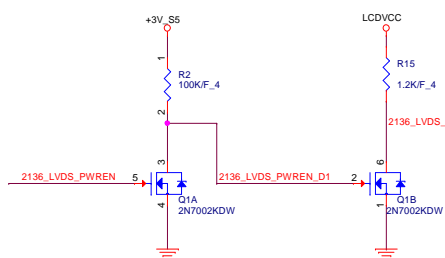




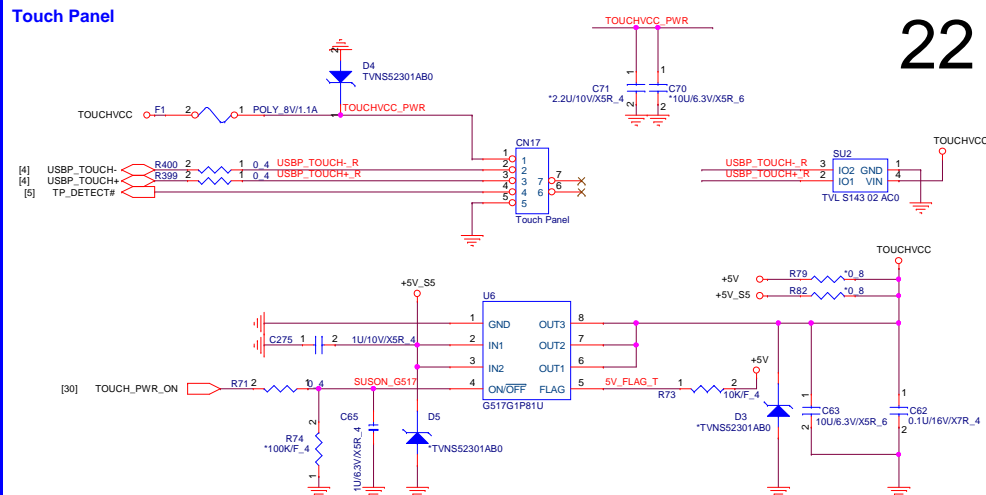
BackLight Enable



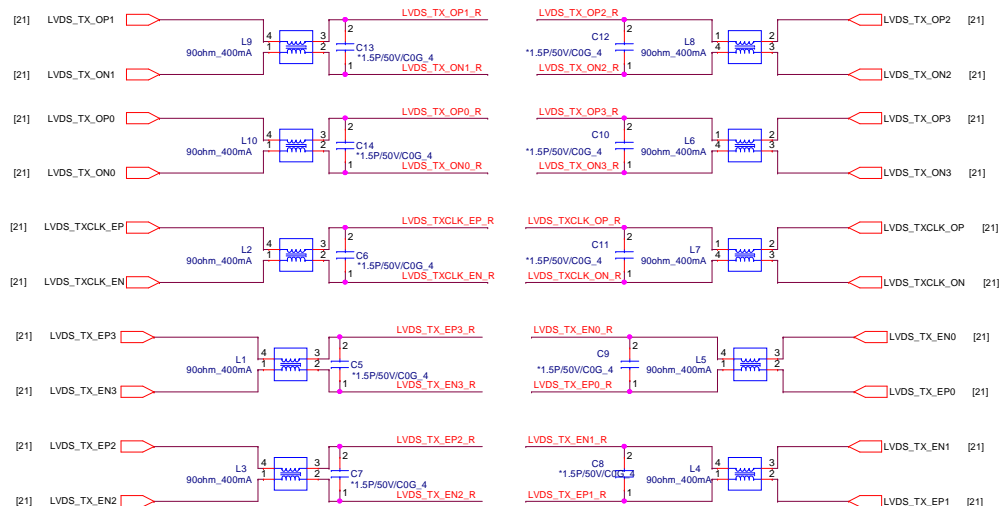
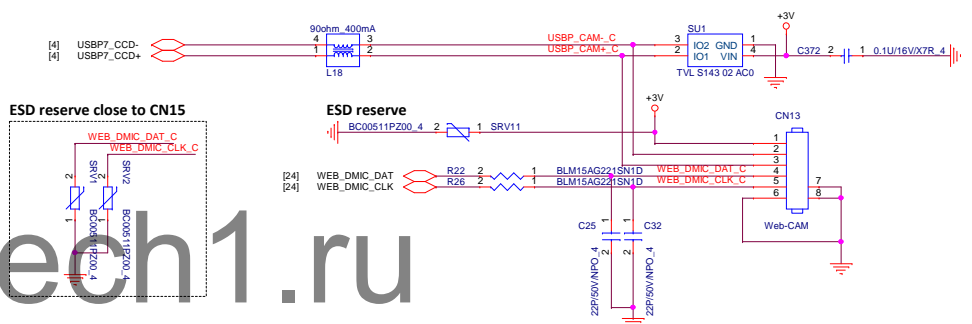
LCDVCC Discharge Circuit



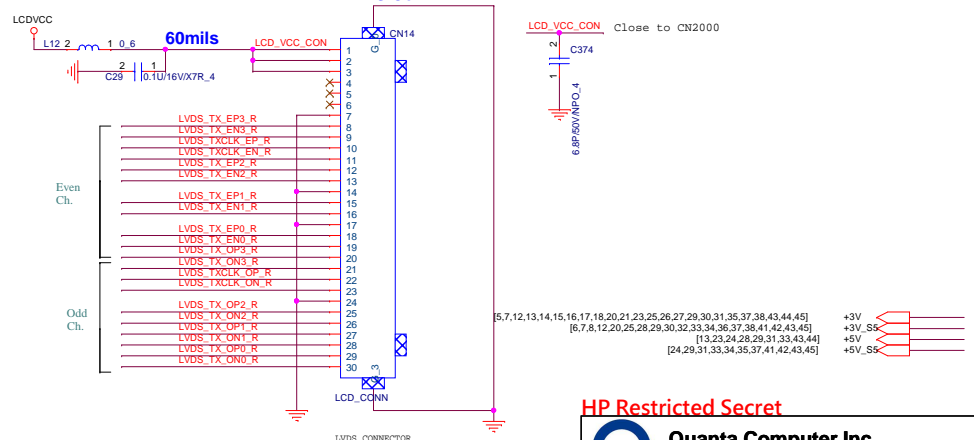
Touch Panel



CCD CONN



LVDS Conn



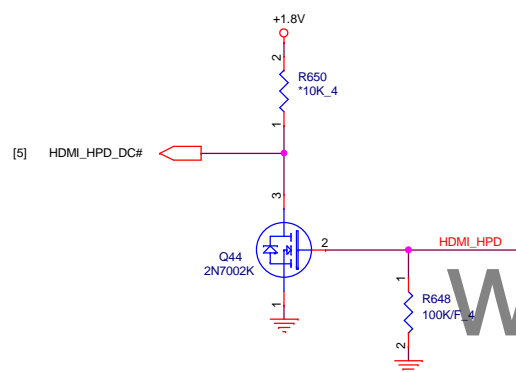
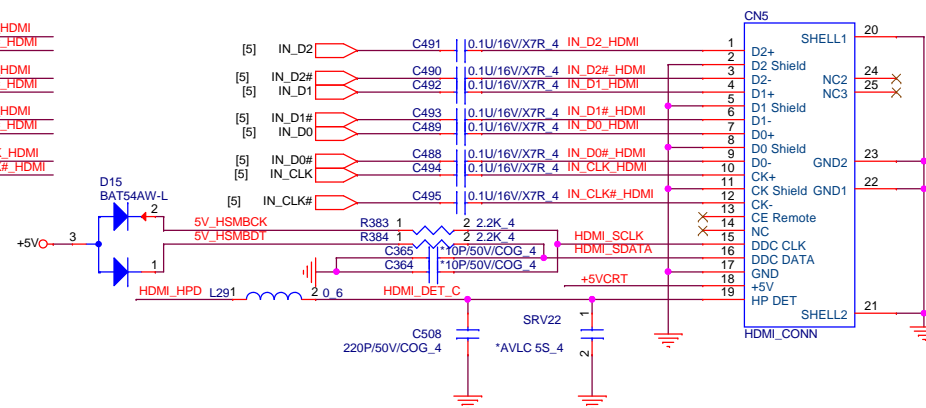
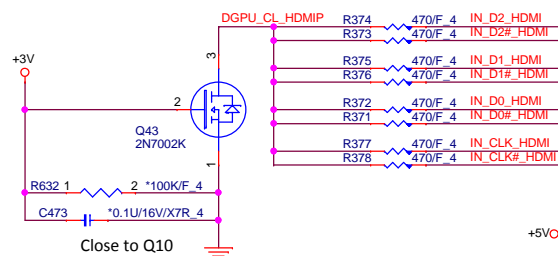
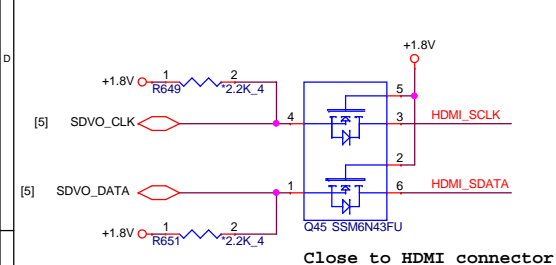
HP Restricted Secret



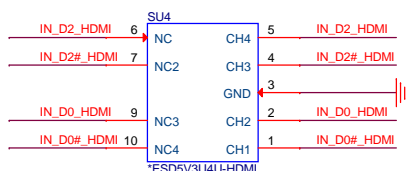
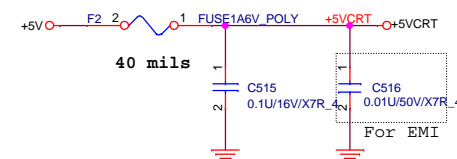
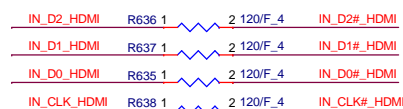
PROJECT: HP-Oahu

Size	Document Number
Custom	LCD CONN/CGD/TouchPanel

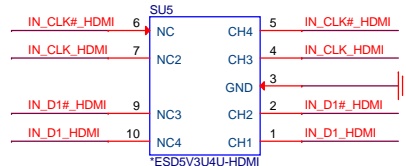
Date:	Thursday, October 27, 2016	Sheet	22	of	49
-------	----------------------------	-------	----	----	----



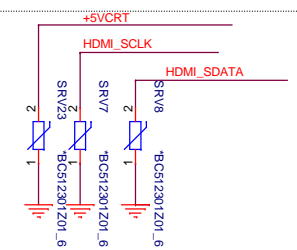
For EMI



For ESD



Layout note: Place close to HDMI Conn



[4,5,6,7,25,27,28,31,43]
[5,7,12,13,14,15,16,17,18,20,21,22,25,26,27,29,30,31,35,37,38,43,44,45]
[13,22,24,28,29,31,33,43,44]

+1.8V
+3V
+5V

HP Restricted Secret

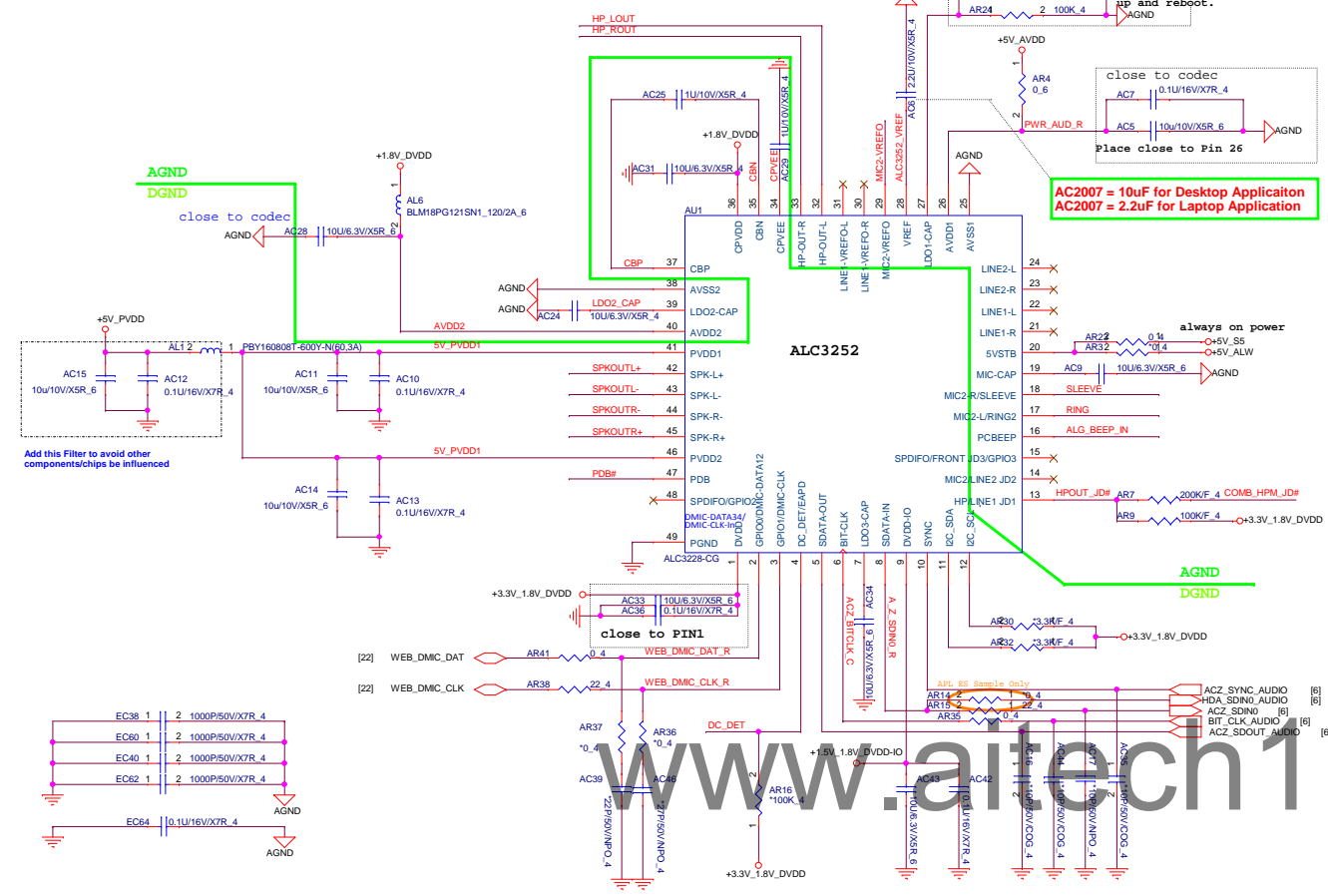


Quanta Computer Inc.

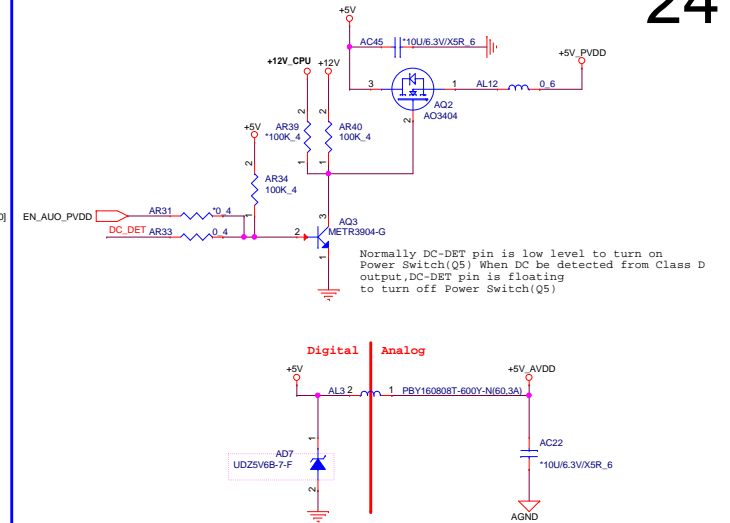
PROJECT: HP-Oahu

Size	Document Number	HDMI	Rev
Custom			1A

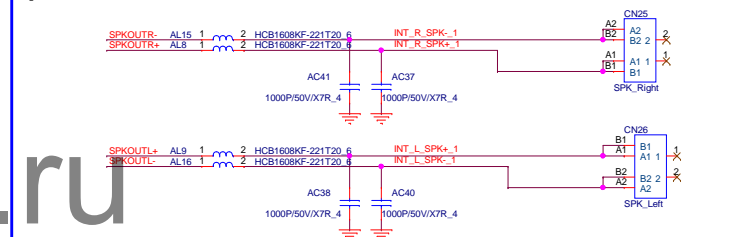
Date: Thursday, October 27, 2016 Sheet 23 of 49



CODEC 5V POWER



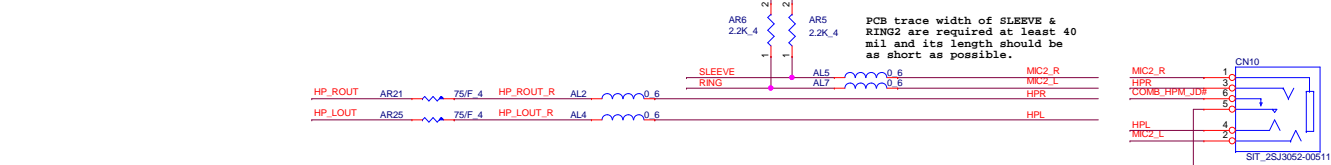
Trace width for SPK-L+/SPK-L-/SPK-R+/SPK-R-Speaker Internal Speaker (2W, 4 ohm)



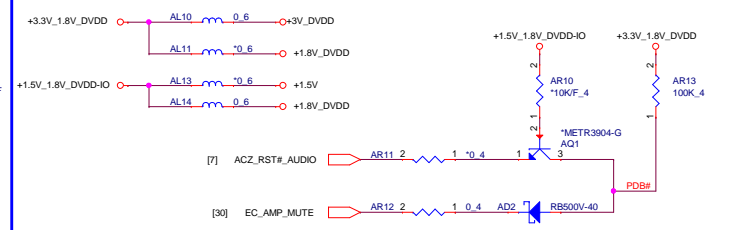
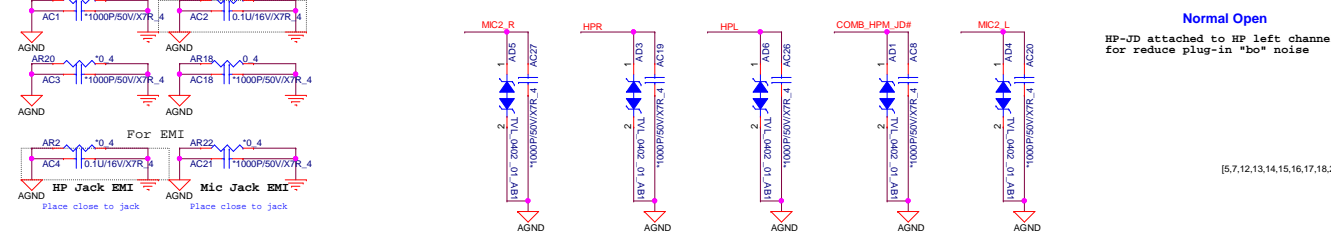
PC BEEP



HeadPhone/Mic Combo Conn



CODEC Return Path

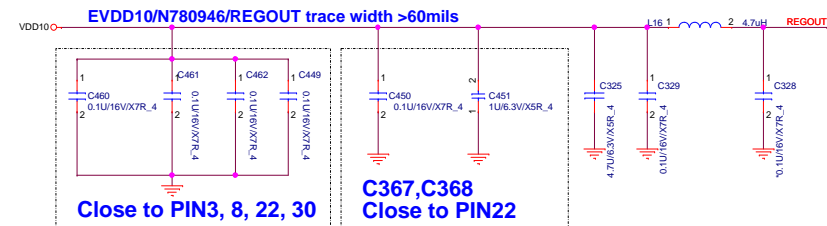
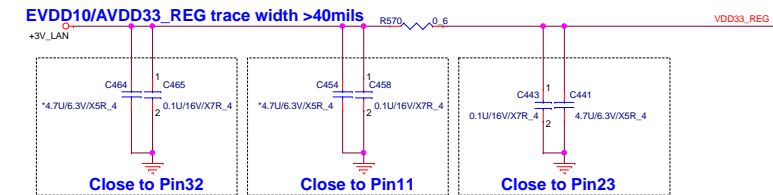
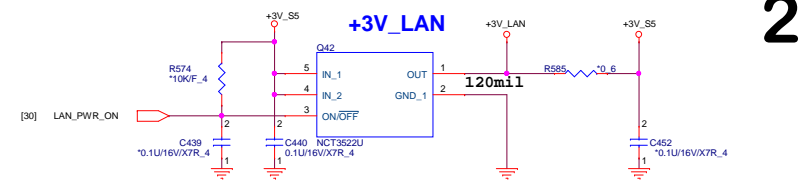
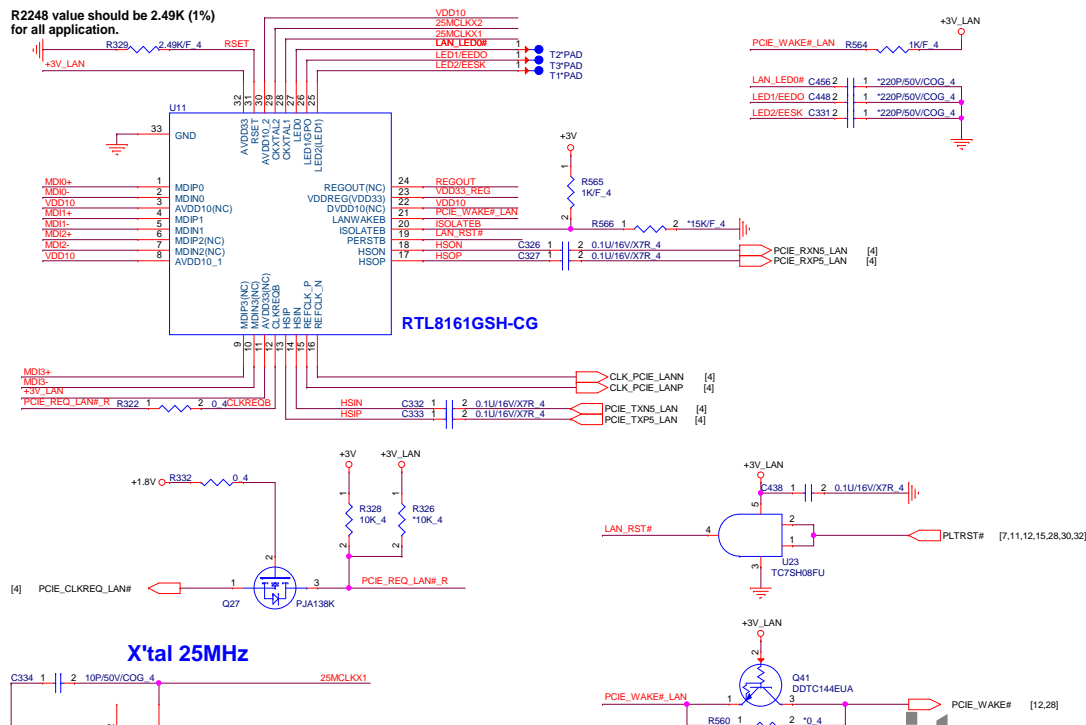


If the voltage level of MIDA_RESET# is 1.8V, that means the Mobile HDA Link run at 1.8V level, please add a level shift circuit (Q7/R84).

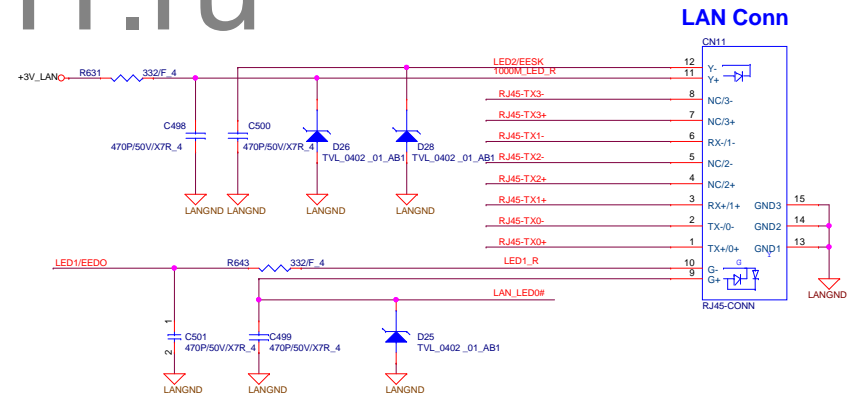
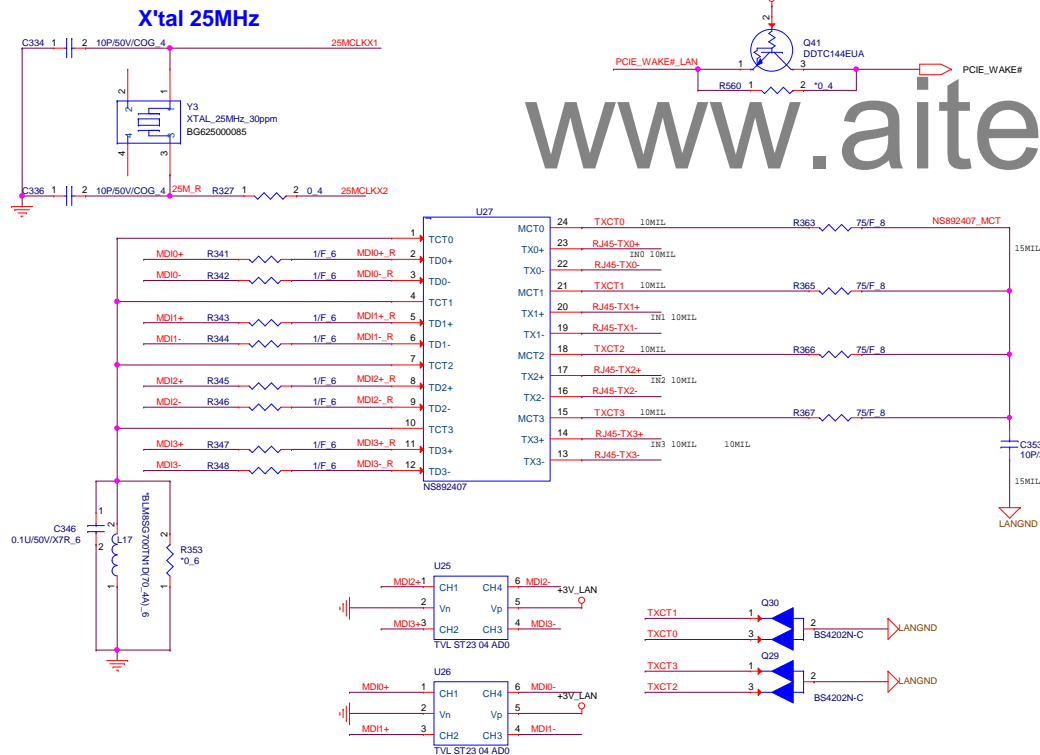
HP Restricted Secret

		PROJECT: HP-Oahu
Size	Document Number	Rev
Custom	Audio Codec(ALC3252)	2A
Date:	Thursday, October 27, 2016	Sheet 24 of 49

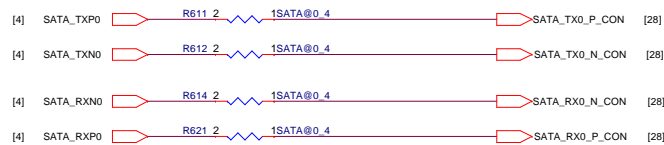
R2248 value should be 2.49K (1%)
for all application.



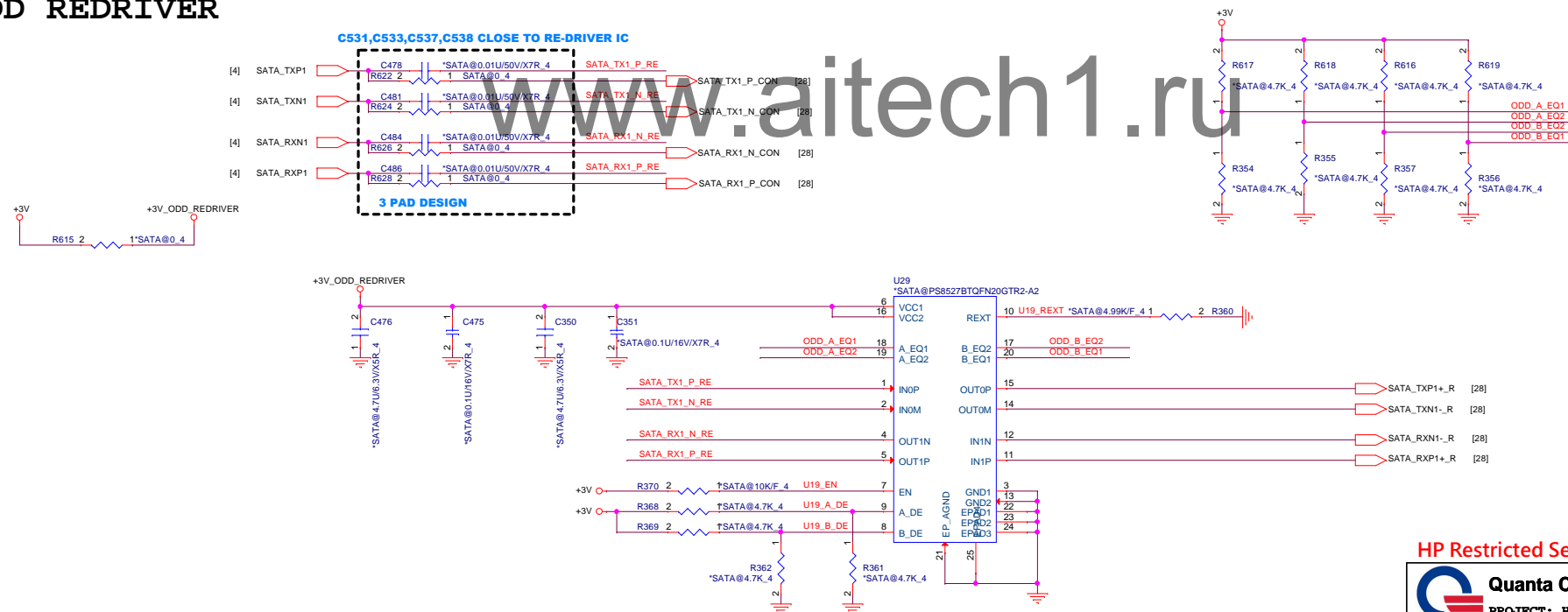
www.aitech1.ru



HP Restricted Secret



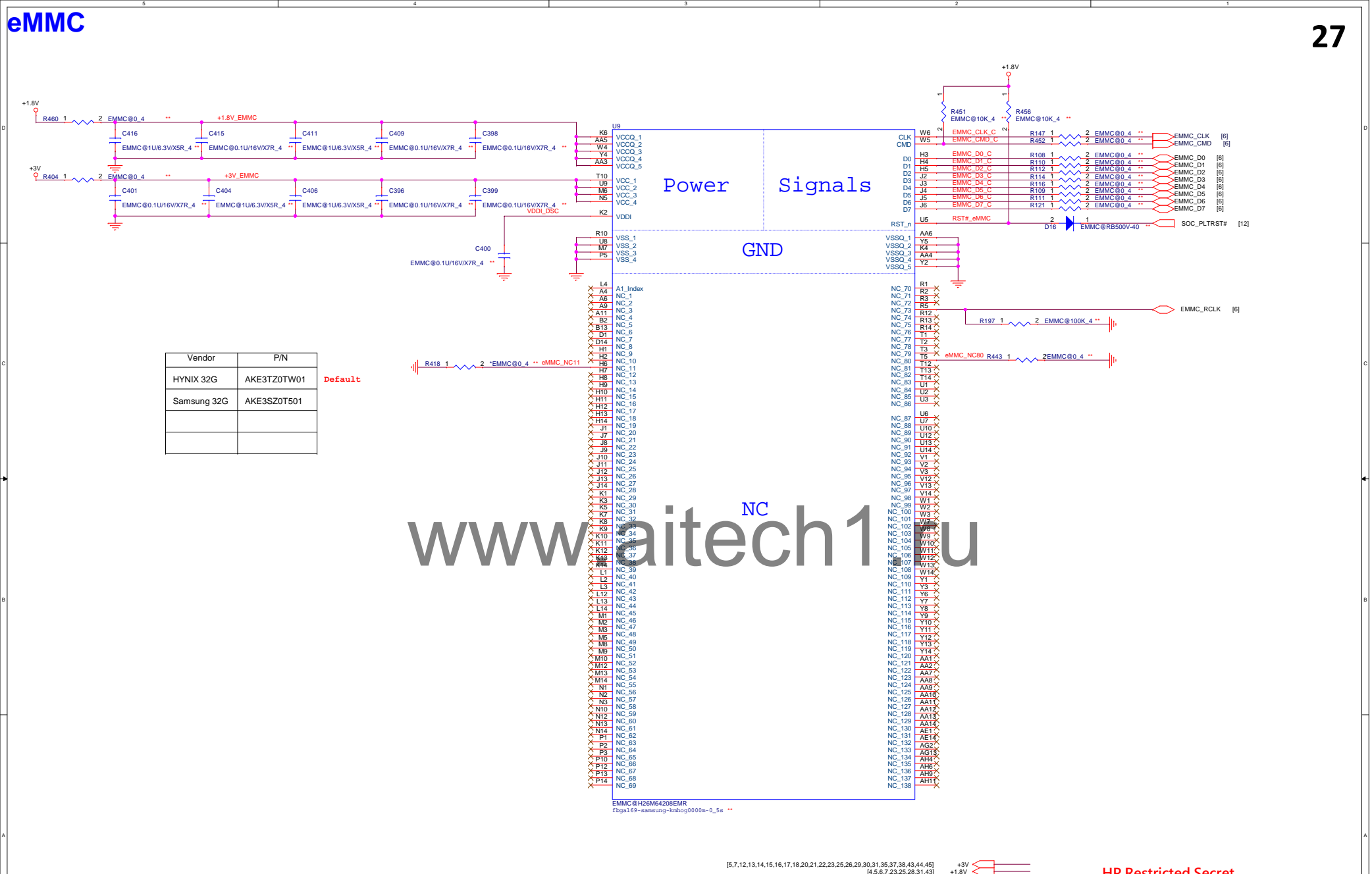
ODD REDRIVER



HP Restricted Secret

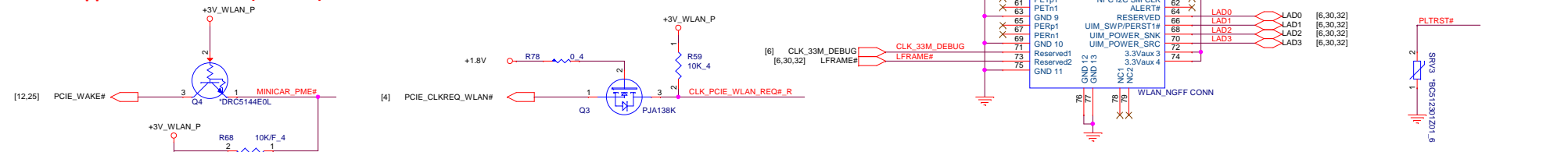
Quanta Computer Inc.
PROJECT: HP-Oahu

Size Custom Document Number SATE RE-DEIVER Rev 1A
Date: Thursday, October 27, 2016 Sheet 26 of 49

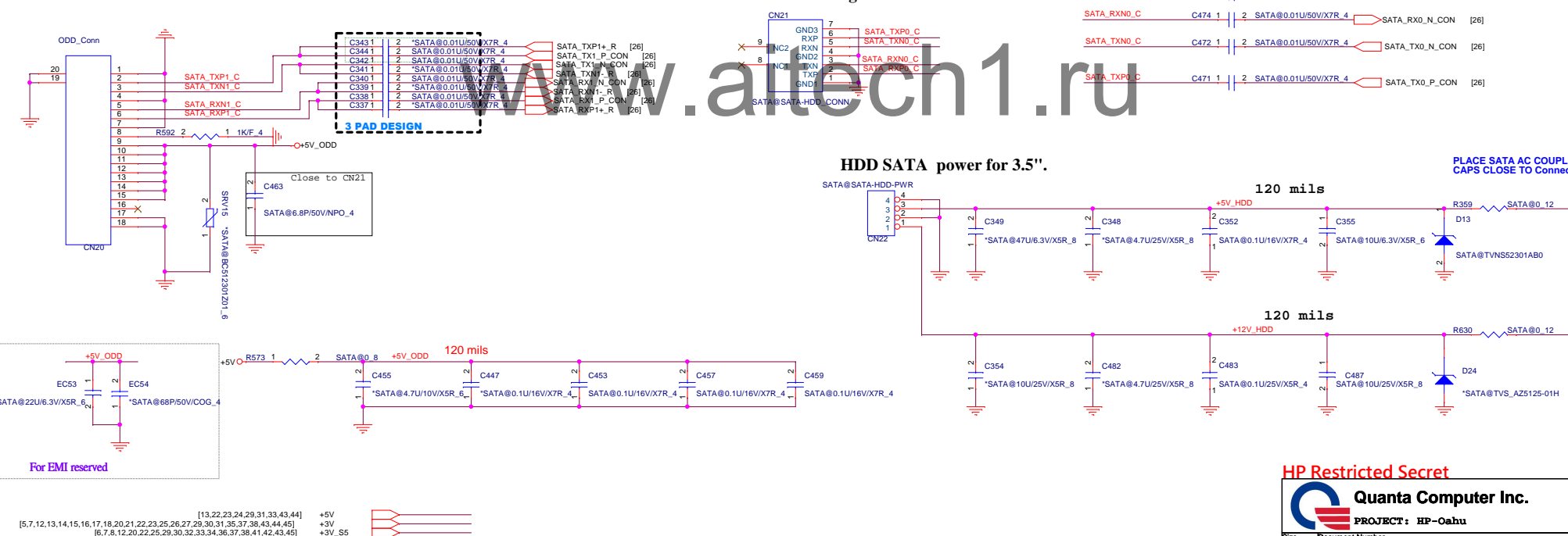




Support Wake Function(Reserve)



HDD SATA signal for 3.5".



~~HP Restricted Secret~~

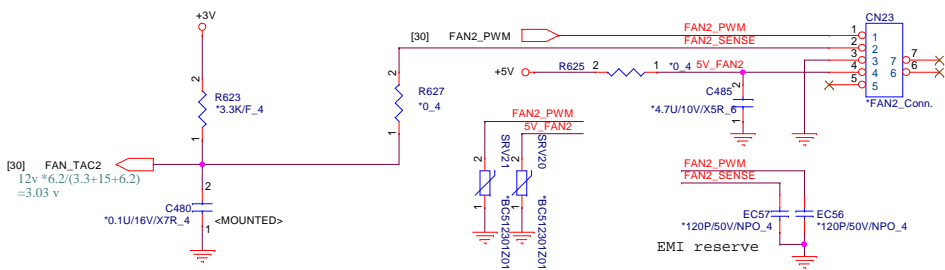
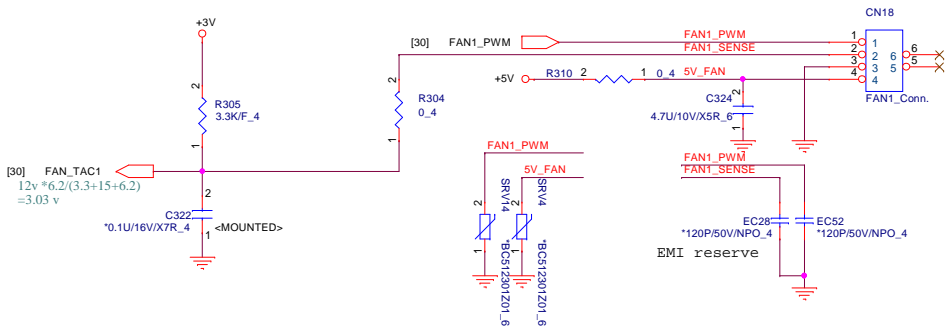

Quanta Computer Inc. PROJECT: HP-Oahu

Size	Document Number
Custom	WLAN(NGFF)/HDD/ODD

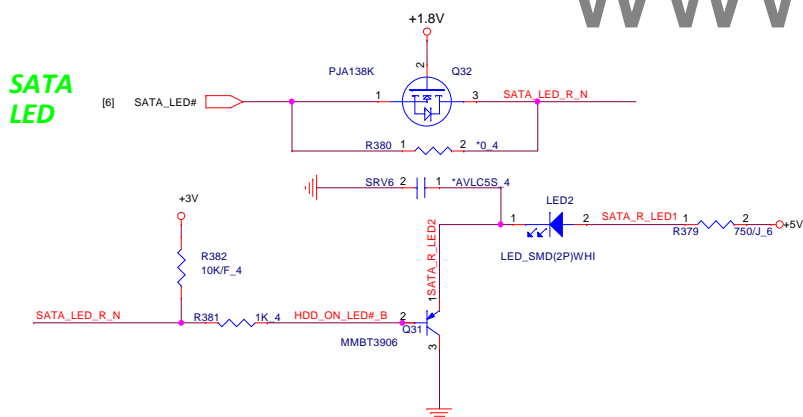
Date: Thursday, October 27, 2016 Sheet 28 of 49

	E
--	---

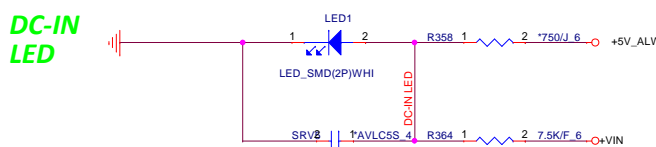
SYSTEM FAN



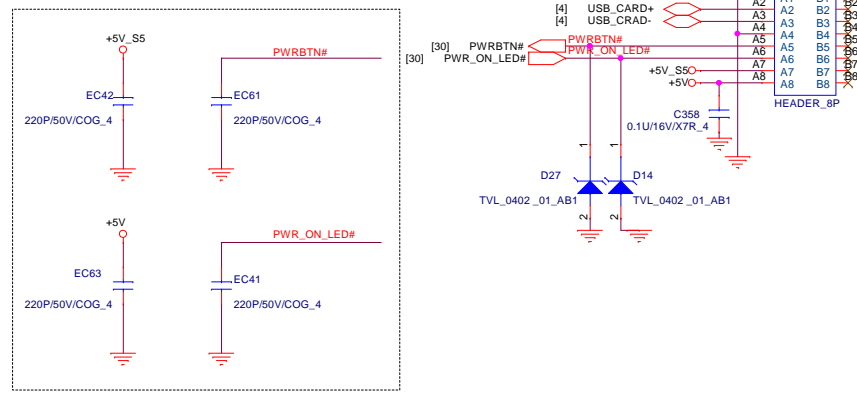
SATA LED



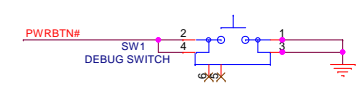
DC-IN LED



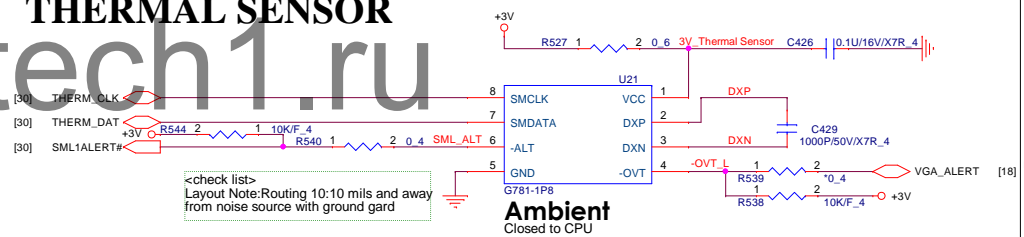
Card reader/Power button conn



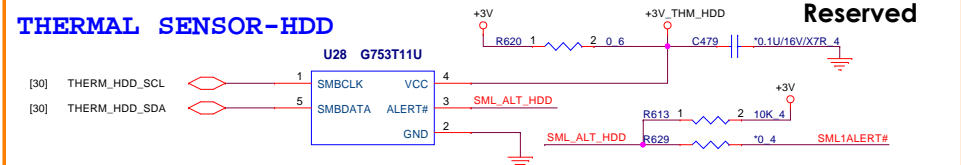
SW1 For Debug.MP will remove it.



THERMAL SENSOR



THERMAL SENSOR-HDD



HP Restricted Secret

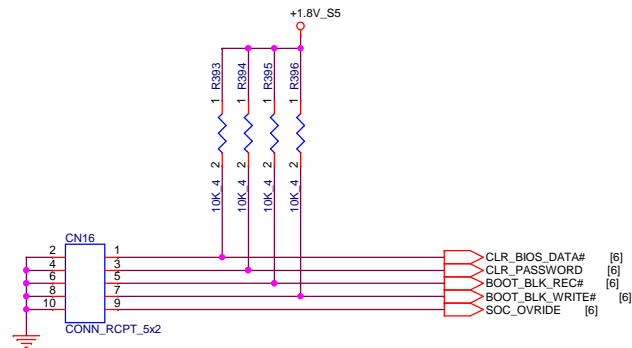
Quanta Computer Inc.
PROJECT: HP-Oahu

Size	Document Number	Thermal/FAN/LEDs	Rev
Custom			2A
Date:	Thursday, October 27, 2016	Sheet	31 of 49

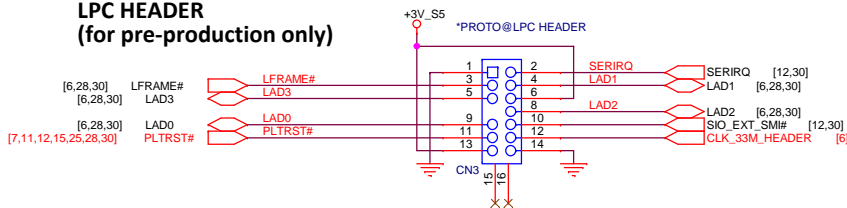
CLR_CMOS

Jumper	Pre-production	Production
BOOT_BLK_Recovery	X	X
BOOT_BLK_Enable	0	X

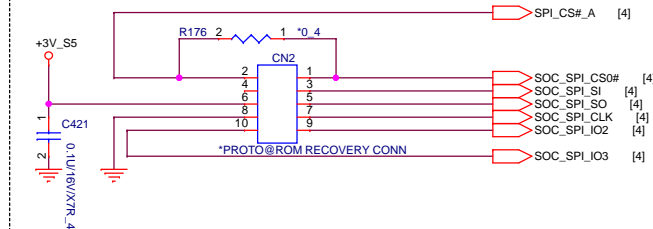
Jumper	Type
Pop CLR BIOS DAT	
Pop CLR PASSWD	
Pop BOOT_BLK_Recovery	
Pop BOOT_BLK_Enable	



LPC HEADER (for pre-production only)




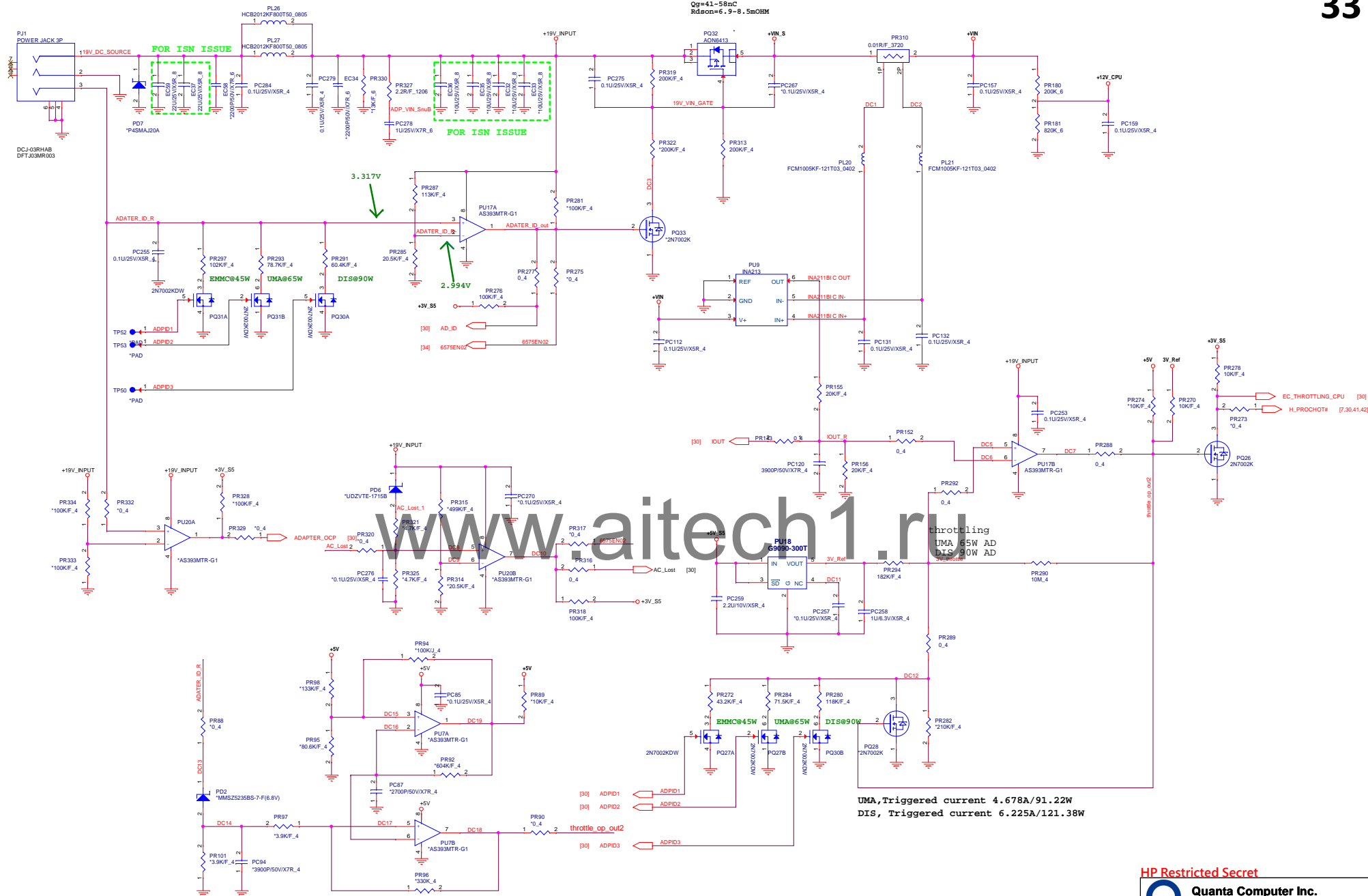
ROM recovery (for pre-production only)



www.aitech1.ru

HP Restricted Secret

 Quanta Computer Inc. PROJECT: HP-Oahu		Rev 1A
Size Custom	Document Number JUMPER/LPCHeader	
Date: Thursday, October 27, 2016	Sheet 32 of 49	



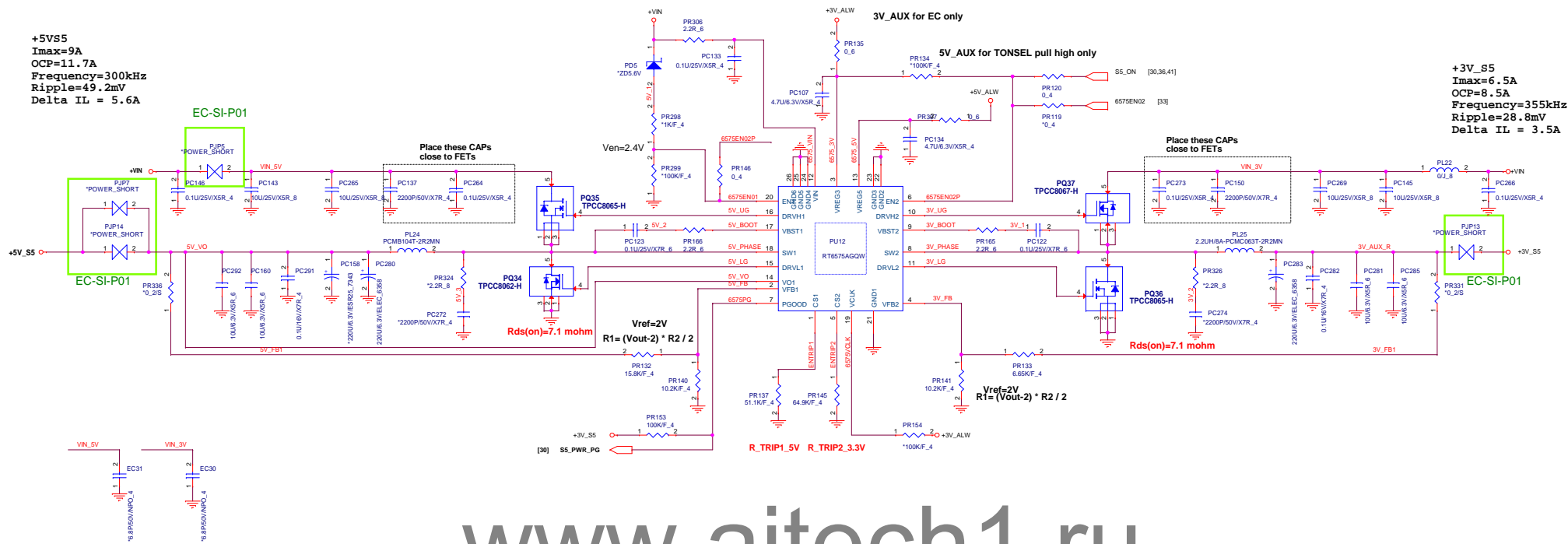
HP Restricted Secret

Quanta Computer Inc.
PROJECT: HP-Oahu

Size Custom Document Number DC-IN Rev 1A
Date: Thursday, October 27, 2016 Sheet 33 of 49

+5V_{SS}
 $I_{max}=9A$
 $OCP=11.7A$
 $Frequency=300kHz$
 $Ripple=49.2mV$
 $\Delta IL = 5.6A$

EC-SI-P01




L/S Mosfet parameter

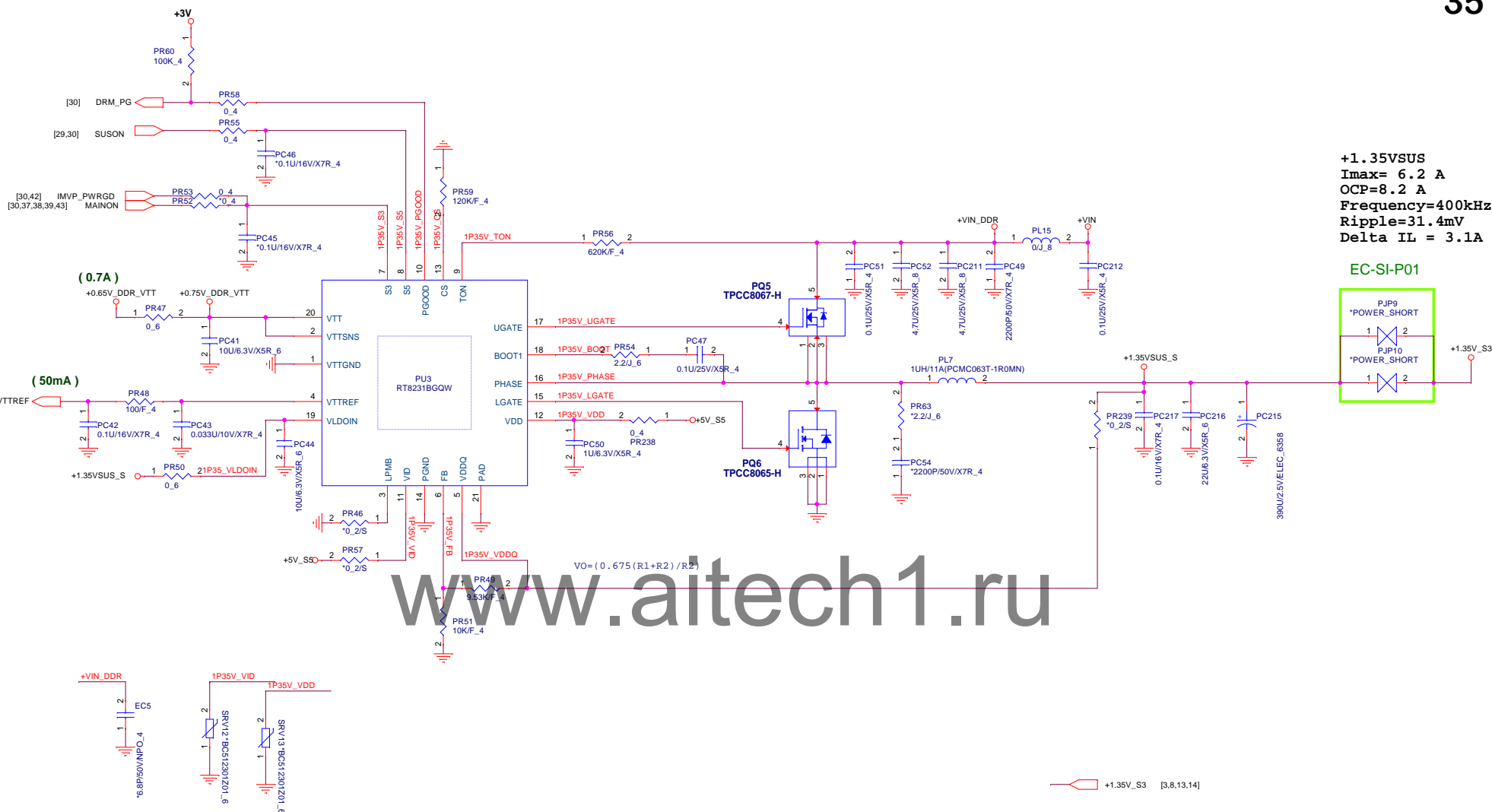
MOSFET	Package	ID (Ta=25°C)	Rds_on_max
TPCC8067-H	DFN3x3	9A	26m
TPCC8062-H	DFN3x3	27A	7.1m

Power On sequencing

EN0	ENC	REF	VREG3	VREG5	SMPS1	SMPS2
LOW	LOW	OFF	OFF	OFF	OFF	OFF
> 2.4V	LOW	ON	ON	ON	OFF	OFF
> 2.4V	> 2.4V	ON	ON	ON	ON	ON

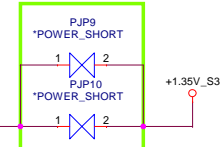
HP Restricted Secret

 Quanta Computer Inc.			
PROJECT: HP-Qabtu			
Size Custom	Document Number +3VSS+5VSS(RT8575AGQW)		Rev 2
Date: Thursday, October 27, 2016	Sheet	34 of 48	



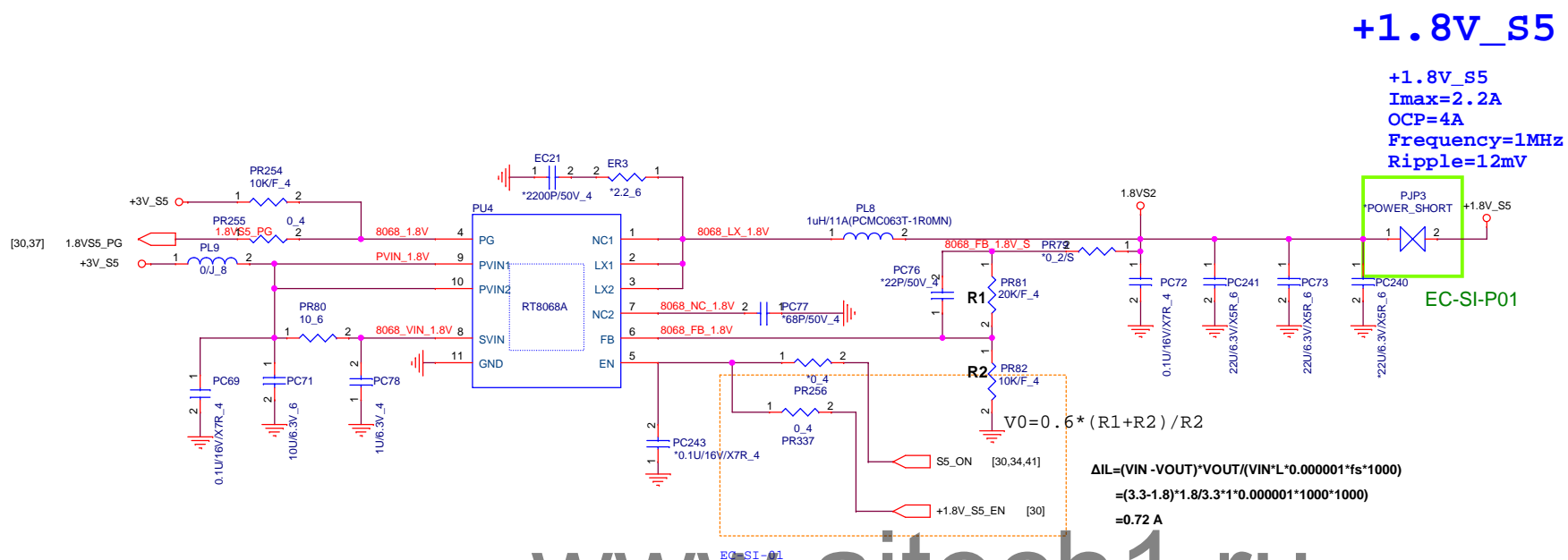
+1.35VSUS
 $I_{max} = 6.2 \text{ A}$
 $OCP = 8.2 \text{ A}$
Frequency=400kHz
Ripple=31.4mV
Delta IL = 3.1A

EC-SI-P01

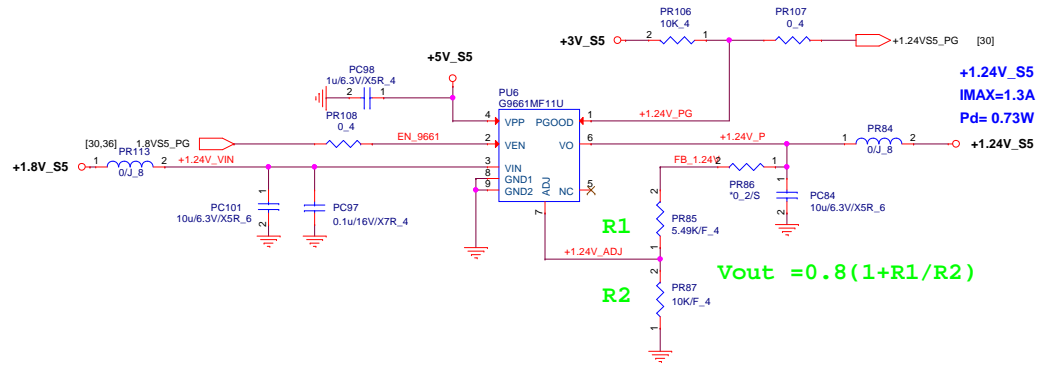
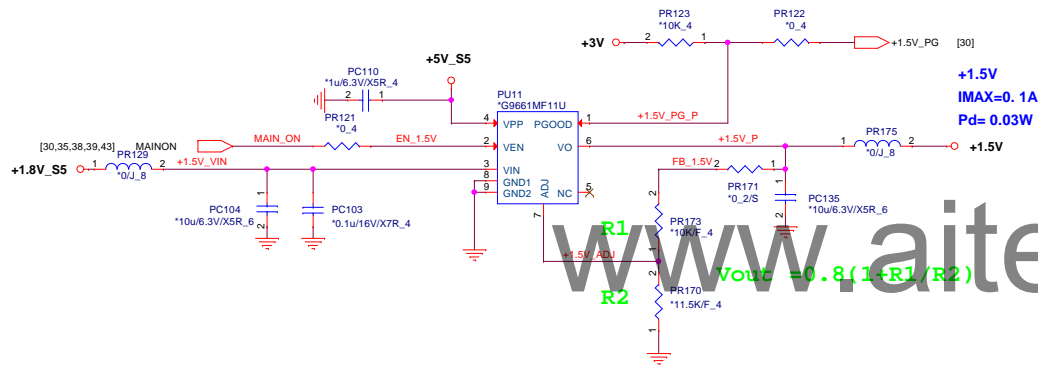


HP Restricted Secret

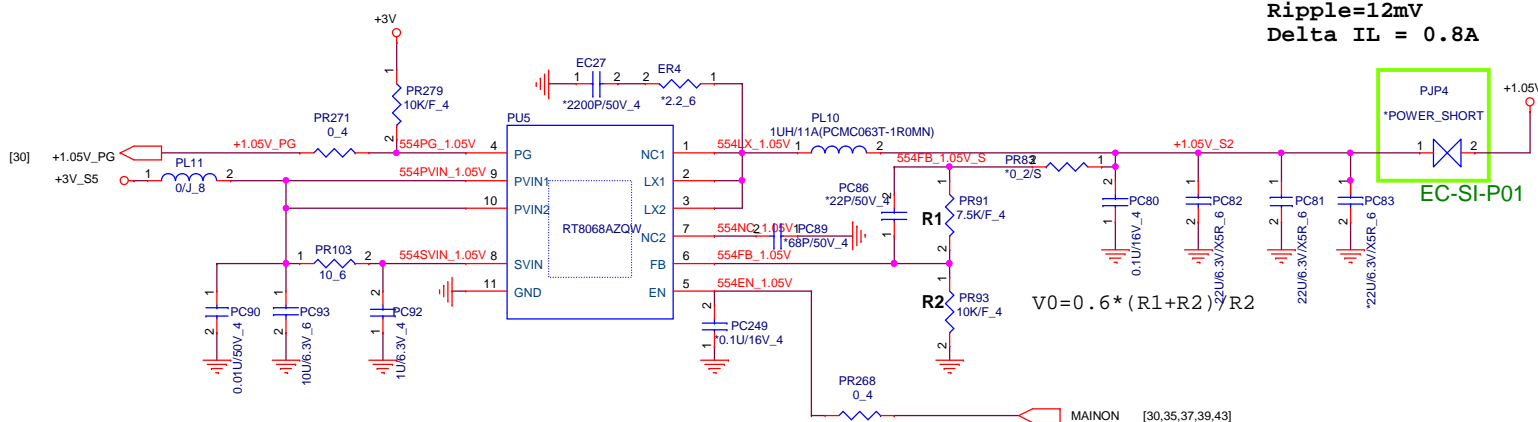
		PROJECT: HP-Oahu	
		Document Number	Rev
Size	Custom	DDR3L (RT8231B)	2A
Date:	Thursday, October 27, 2016	Sheet	35 of 49



www.aitech1.ru

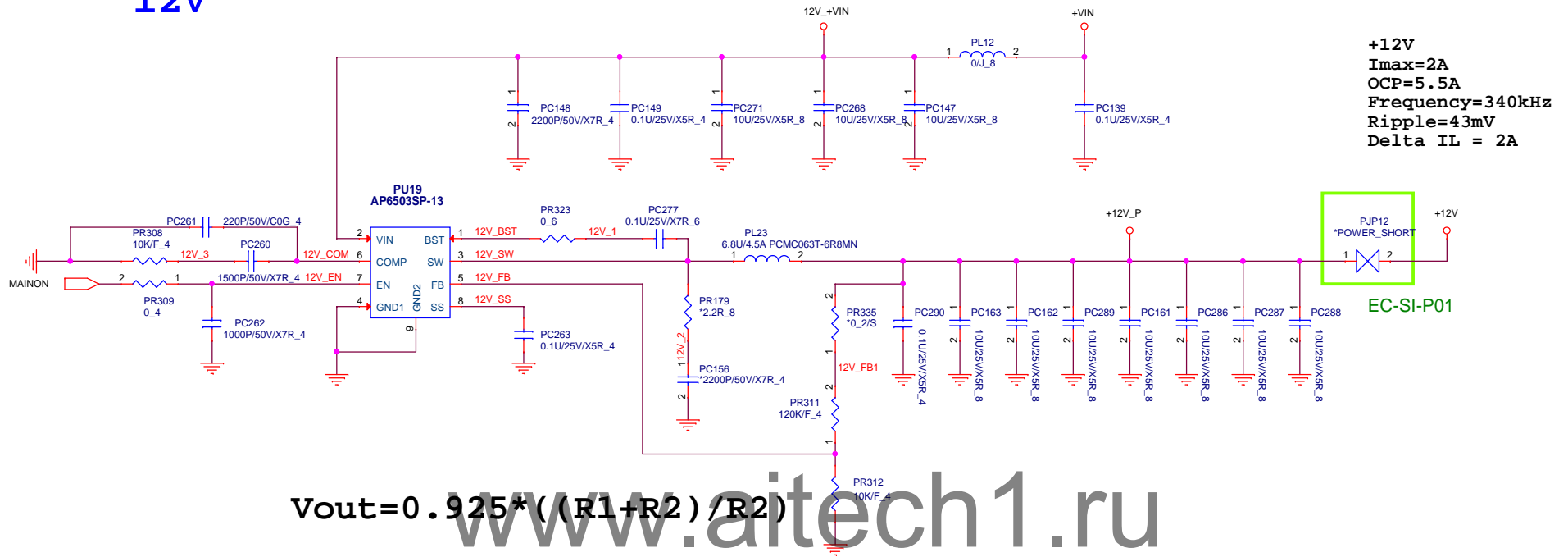
+1.24V_S5**+1.5V**

www.aitech1.ru

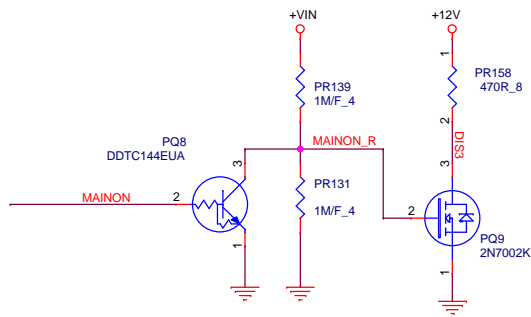


www.aitech1.ru

12V



$$V_{out} = 0.925 * ((R1 + R2) / R2)$$



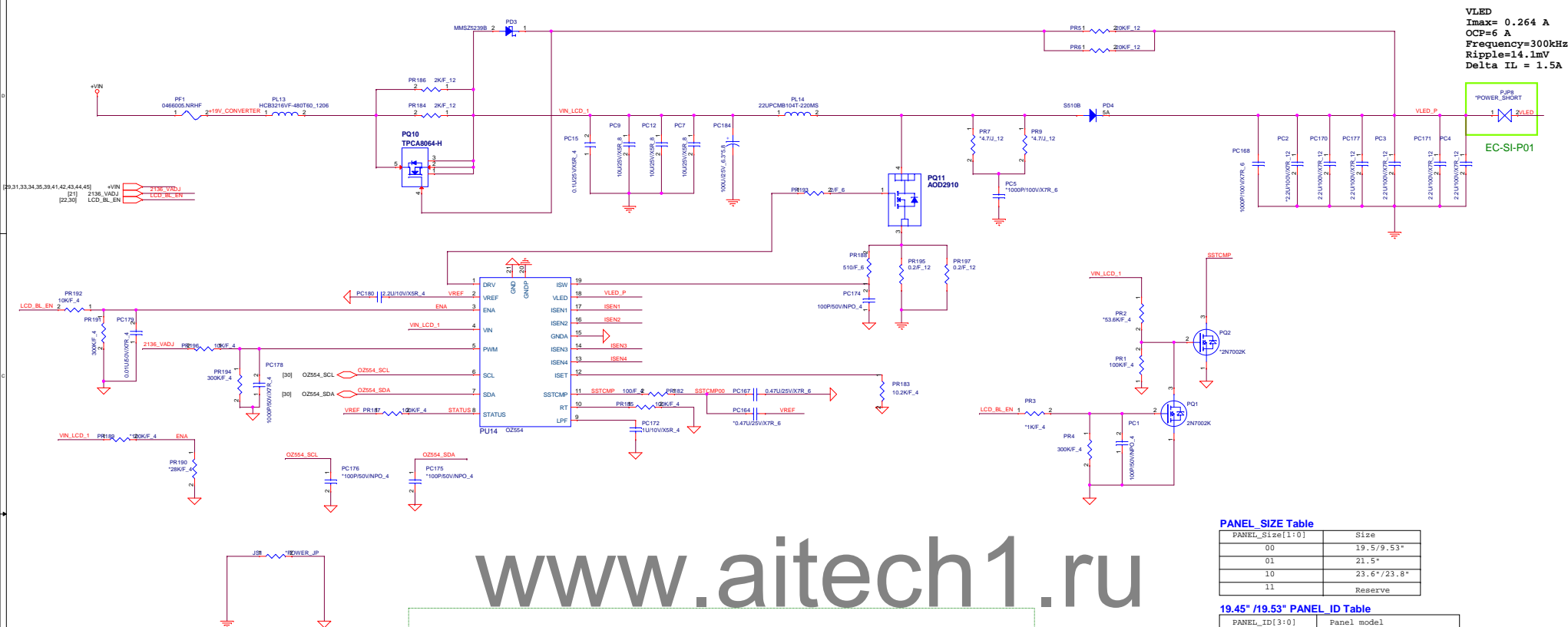
HP Restricted Secret



Quanta Computer Inc.

PROJECT: HP-Oahu

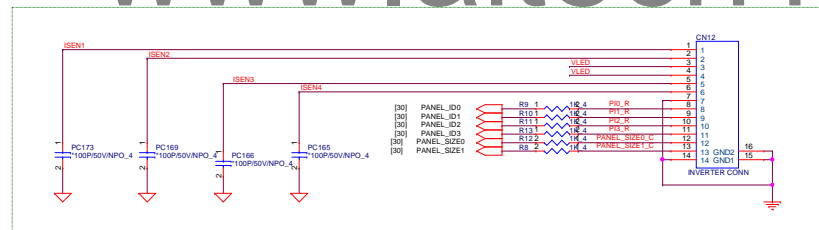
Size B	Document Number +12V	Rev 2A
Date:	Thursday, October 27, 2016	Sheet 39 of 49



VLED
I_{max} = 0.264 A
OCP = 6 A
Frequency = 300 kHz
Ripple = 14.1 mV
Delta IL = 1.5 A

PJPB
"POWER_SHORT"
EC-SI-P01

www.aitech1.ru



PANEL_SIZE Table

PANEL_Size[1:0]	Size
00	19.5"/9.53"
01	21.5"
10	23.6"/23.8"
11	Reserve

19.45" /19.53" PANEL_ID Table

PANEL_ID[3:0]	Panel model
1111	No Connect
1110	INX M195FGE-L20 CE (E57)
1101	AUD M195RTN01.0 HD+
1100	LGD M195WD1-TLA1 HD+
1011	INX M200HJ-L20 FHD
1010	LGD M195WD1-TLA3 HD+
1000	Reserve

21.5" PANEL_ID Table

PANEL_ID[3:0]	Panel model
1111	No Connect
1110	INX M215HJK-L38 FHD eDP
1101	SDC LTM215HL01 FHD
1100	LGD M215WF3-SLH1 FHD
1011	AUD M215HAN01.2
1010	LGD M215WF3-SLS1 FHD

23.6" /23.8" PANEL_ID Table

PANEL_ID[3:0]	Panel model
1111	No Connect
1110	INX M236HJK-L58 FHD eDP
1101	AUD M238HAN01.0 FHD
1100	LGD M238WF1-SLE1 FHD
1011	SDC LTM238HL02 FHD
1010	BOE M238PIM-N10
1001	LGD M238WF1-SLK1 FHD

Panel_ID[3:0] = 1111 & Panel_Size[1:0] = 11 is reserved for cabling detection by "No connection".

HP Restricted Secret

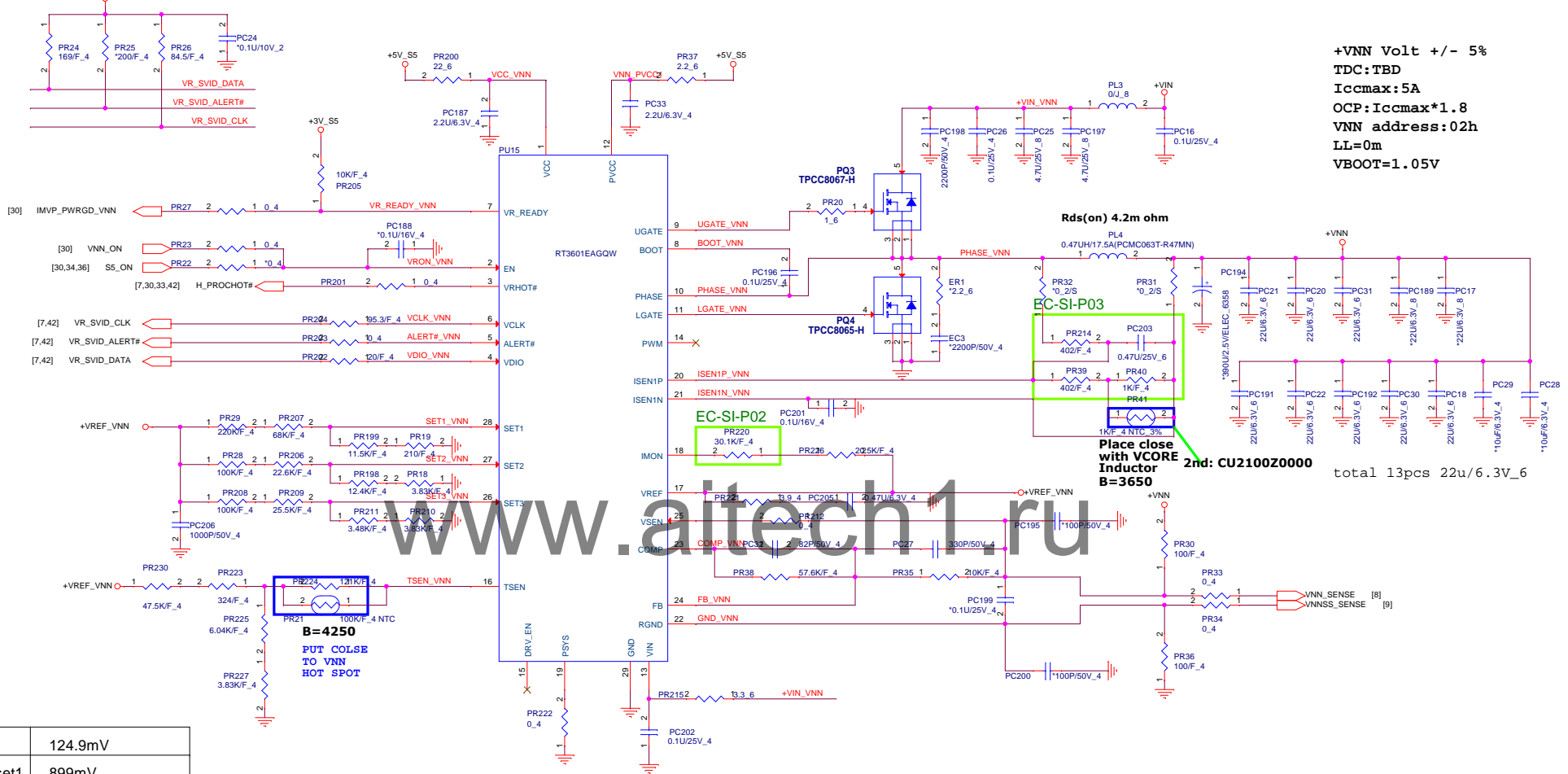
Quanta Computer Inc.
PROJECT: HP-Oahu

Doc Custom Document Number OZ554

Date: Thursday, October 27, 2016 Sheet 40 of 49

Close to CPU

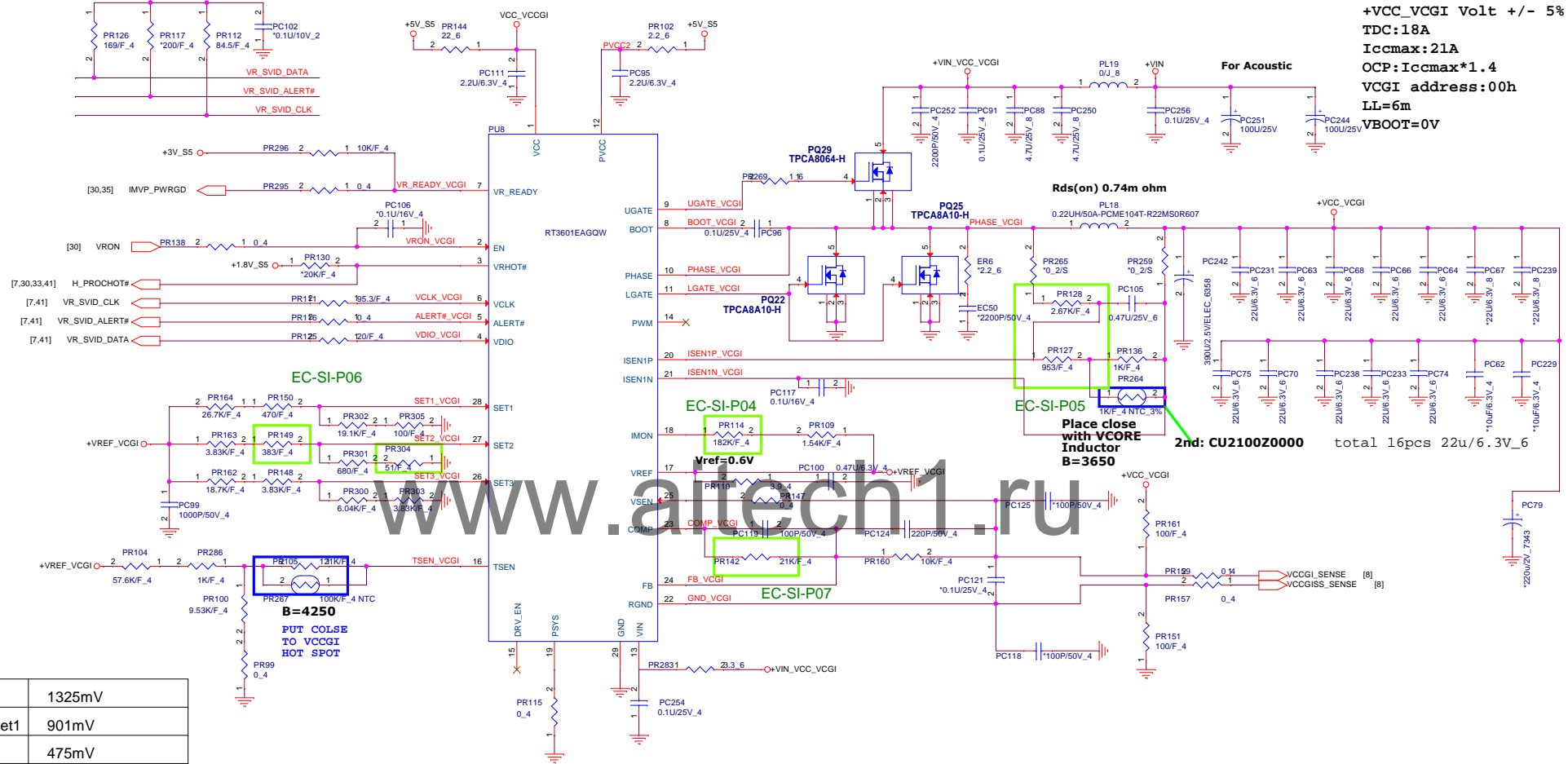
Alert: RU=68R RS=220R (EE)



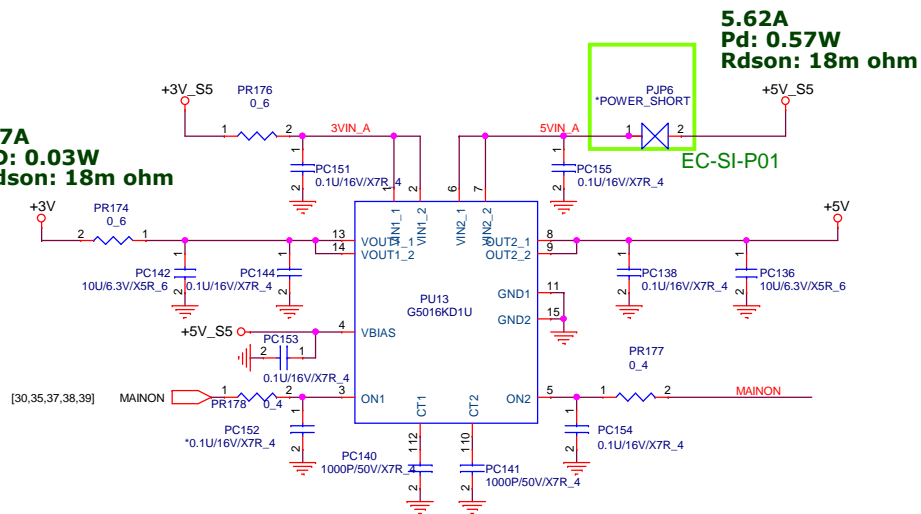
+3V_S5 [6,7,8,12,20,22,25,28,29,30,32,33,34,36,37,38,41,43,45]
 +1.05V [7,8,38,41]
 +5V_S5 [22,24,29,31,33,34,35,37,41,43,45]
 +1.8V_S5 [4,5,6,7,8,10,11,12,20,30,32,36,37,43]
 +VIN [29,31,33,34,35,39,40,41,43,44,45]

Close to CPU

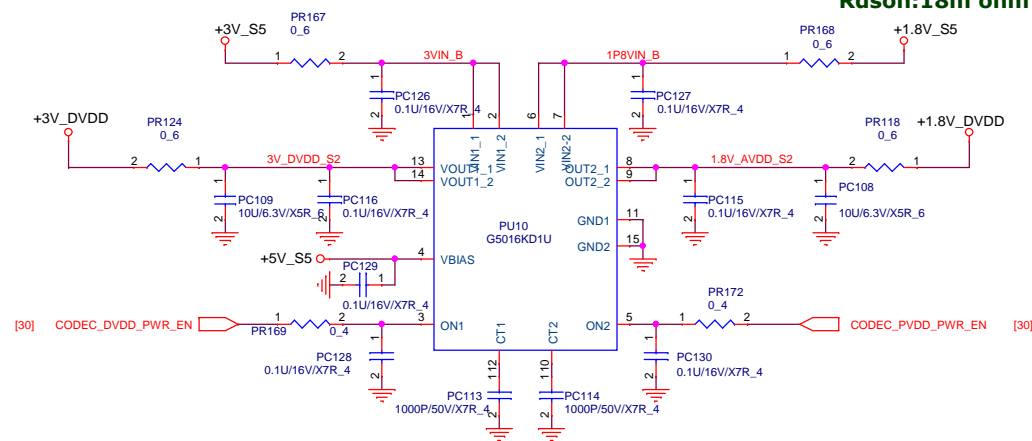
Alert: RU=68R RS=220R (EE)



1.7A
Pd: 0.03W
Rdson: 18m ohm

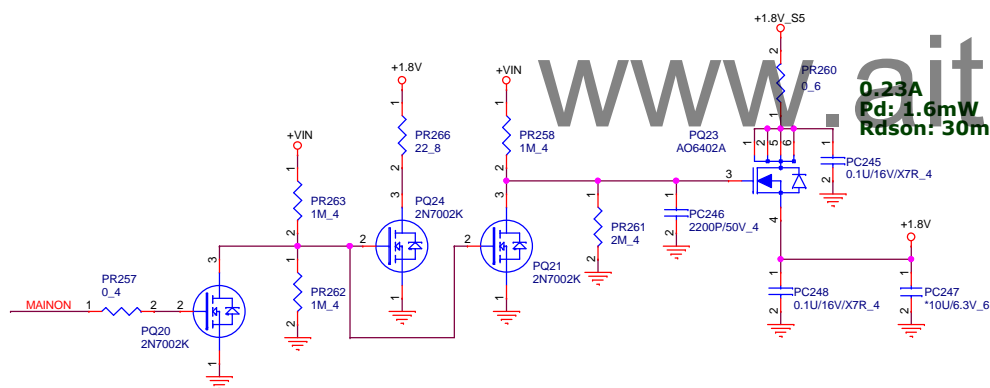


0.5A
Pd: 0.01W
Rdson: 18m ohm




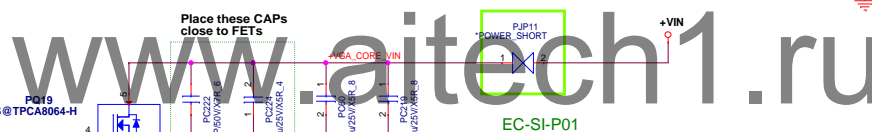
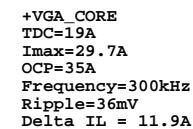
0.03A
Pd: 0.01W
Rdson: 18m ohm

0.23A
Pd: 1.6mW
Rdson: 30m ohm

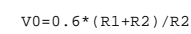


HP Restricted Secret


 Quanta Computer Inc. PROJECT: HP-Oahu		
Size Custom	Document Number Load switch IC (APL3523A)	Rev 2A
Date: Thursday, October 27, 2016	Sheet 43	of 49

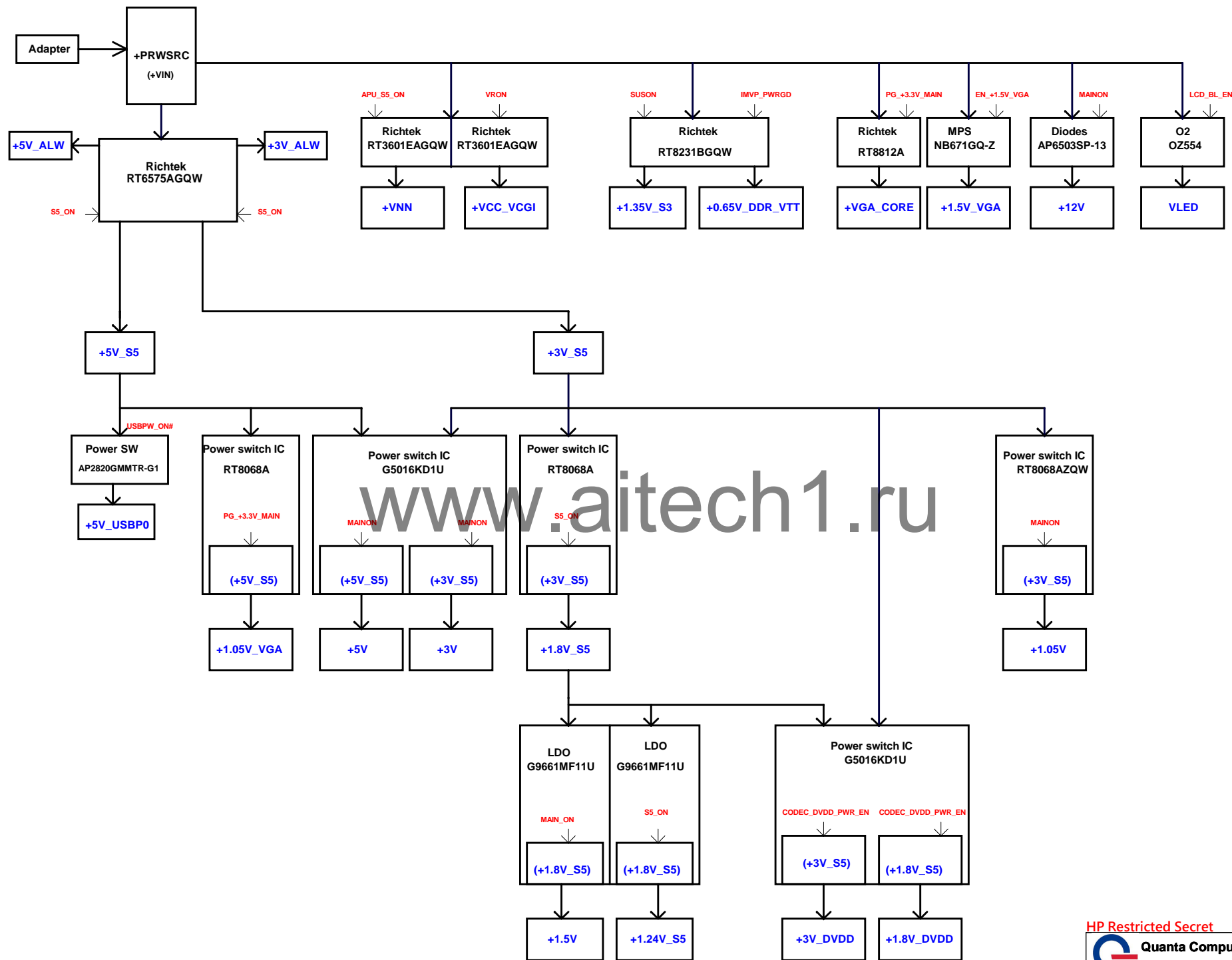


45

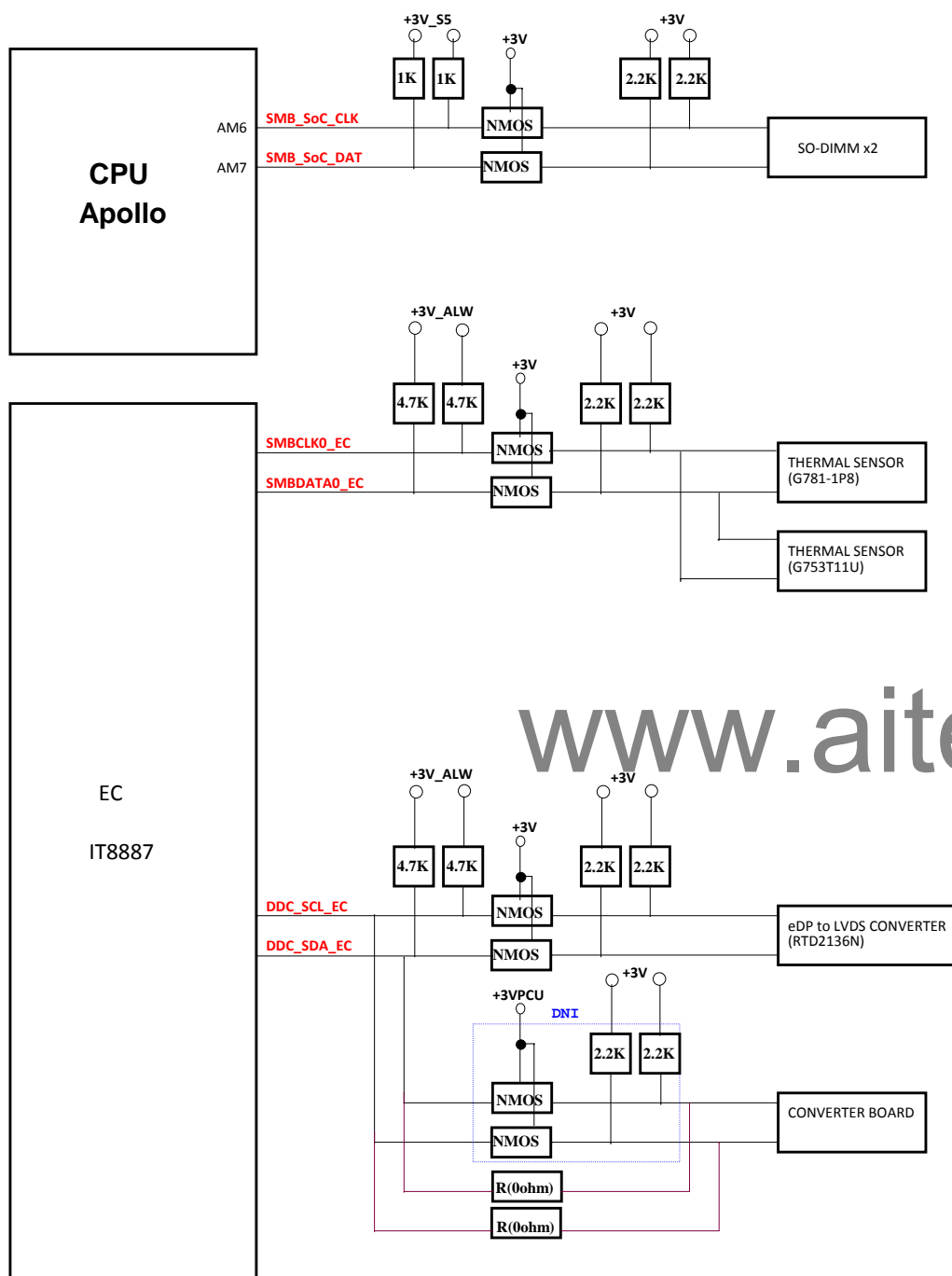


PC181 120mil

 Quanta Computer Inc. PROJECT: HP-Oahu			
Size C	Document Number	GPU-1.5V / 0.95V	Rev 2/
Date:	Thursday, October 27, 2016	Sheet	45 of 49

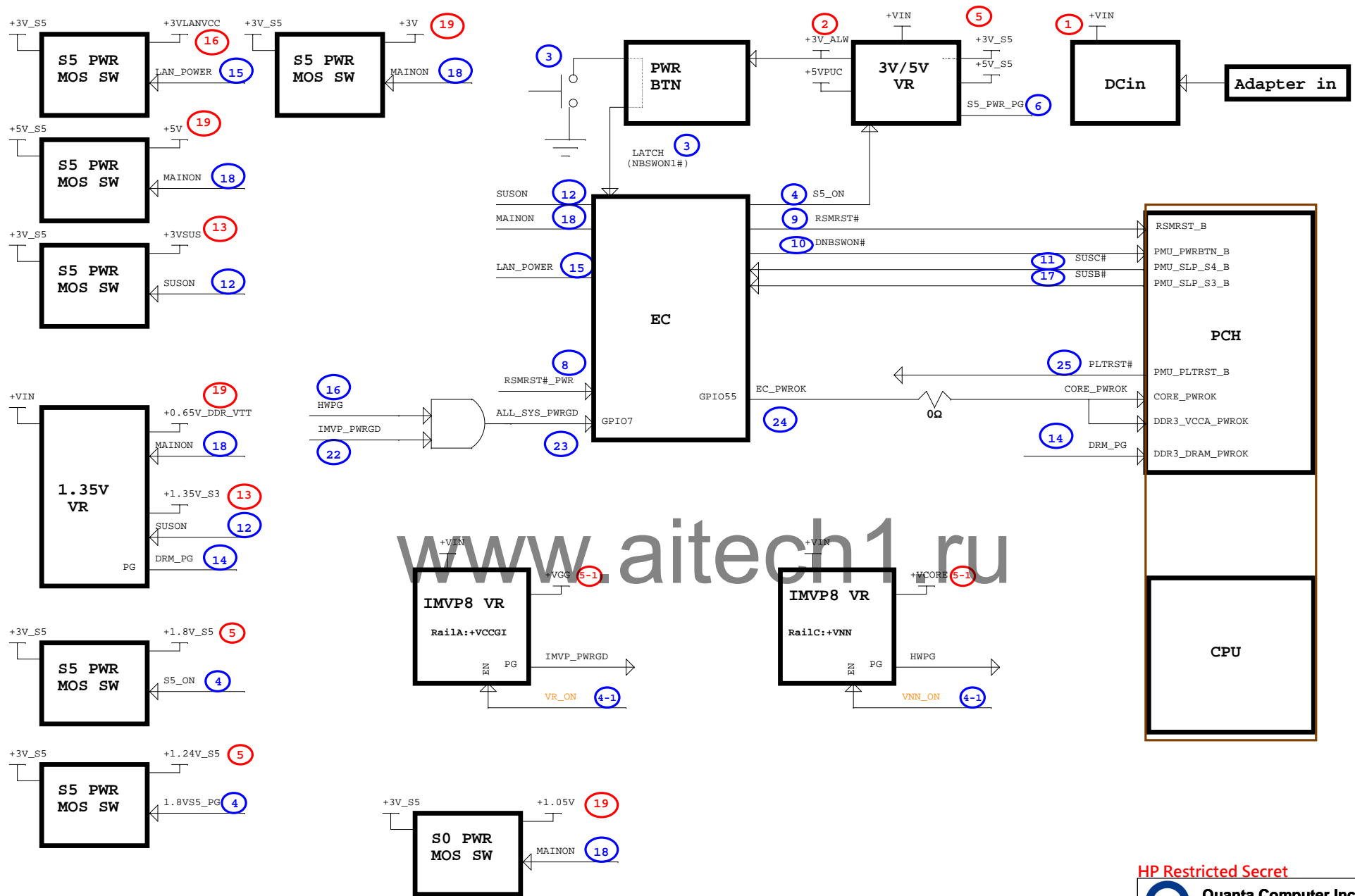


HP Restricted Secret




www.aitech1.ru

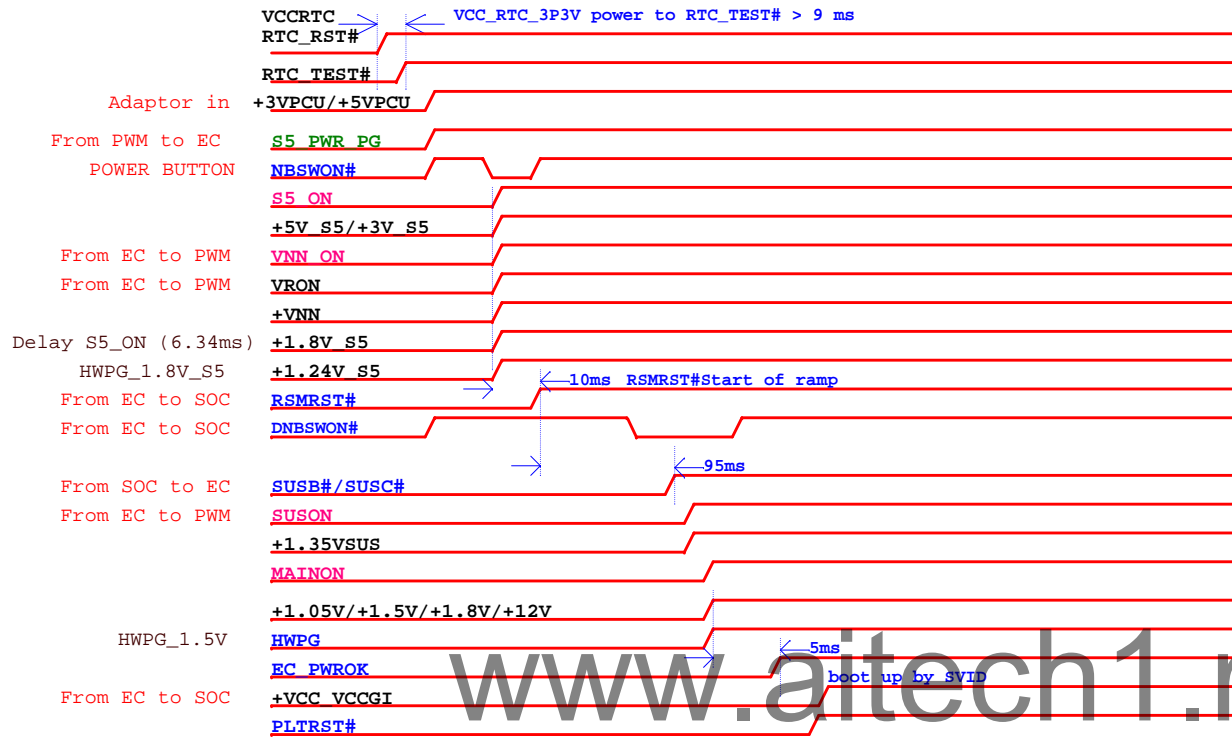
HP Restricted Secret



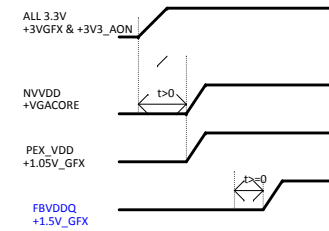
HP Restricted Secret

		Quanta Computer Inc. PROJECT: HP-Oahu	
Size Custom	Document Number	Power sequence diagram	
Date: Thursday, October 27, 2016	Sheet	48 of 49	Rev 1A

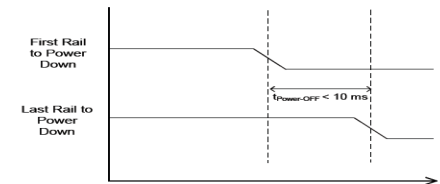
External Design Specification (EDS)
Revision 2.0



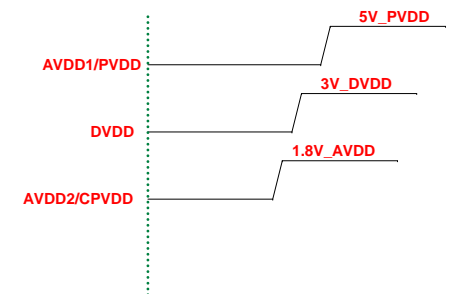
N16V Power up sequence



N16V Power down sequence



AUDIO POWER SEQUENCE



HP Restricted Secret

N91D EE Schematic EC Tracking Record DB to SI version

EC #	Page	Description	Part Affected
EC-SI-01	30,36	Add 1.8V_S5_EN to enable 1.8V_S5 for power sequence fine tune	PR337
EC-SI-02	29	Change USB2.0 footprint for SMT ME request	CN8,CN9
EC-SI-03	29	Add ESD for +-6KV (pin injection) ESD testing	SRV24,SRV25,SRV26,SRV27,SRV28,SRV29,SRV30,SRV31
EC-SI-04	6	Change Board ID for DVT	R53 stuff and R64 no stuff

N91D EE Schematic EC Tracking Record SI to PV version

EC #	Page	Description	Part Affected
EC-SI-01			
EC-SI-02			
EC-SI-03			
EC-SI-04			
EC-SI-05			
EC-SI-06			
EC-SI-07			
EC-SI-08			
EC-SI-09			
EC-SI-10			
EC-SI-11			
EC-SI-12			
EC-SI-12			

www.aitech1.ru