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Molokai

Braswell CPU (TDP 6.5W) SoC

Project Information

Phase: DVT

POWER PLANE	VOLTAGE	CONTROL SIGNAL	Power States ACTIVE IN
+VIN	+19V		Always
VCCRTC	+1.5V		Always
+3V	+3.3V	MAIN_ON1	S0
+3V_S5	+3.3V	S5_LOAD_CODE	S0~S5
+3V_ALW	+3.3V	AC/DC Insert enable	Always (LDO)
+5V	+5V	MAIN_ON	S0
+5V_S5	+5V	S5_ON	S0~S5
+5V_ALW	+5V	AC/DC Insert enable	Always (LDO)
+3V_WLAN_P	+3.3V	WLAN_ON	S0~S5
+3V_LAN	+3.3V	LAN_PWR_ON	S0~S5
+1.35V_S3	+1.35V	S3_ON	S0~S3
+1.05V_S5	+2.5V	S5_ON	S0~S5
+1.8V_S5	+1.8V	S5_ON	S0~S5
+1.8V	+1.8V	MAIN_ON	S0
+VNN	+1.05V	S5_ON	S0~S5
+VGG	~	MAIN_ON	S0
CPU_CORE	~	VGG_PWRGD	S0
+1.8V_ALW	+1.8V	S5_ON	S0~S5
+1.15V_S5	+1.15V	S5_ON	S0~S5
+1.24V_S5	+1.24V	S5_ON	S0~S5
+0.65V_DDR_VTT	+0.675V	S3_ON	S3
+3V_S5_PRIME	+1V	S5_ON	S0~S5
+1.5V	+1.5V	MAIN_ON	S0

BOARD ID SETTING

Model	Board ID (Default = 00) BOARD_ID7	BOARD_ID6
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

eMMC	eMMC ID (Default = 00) BOARD_ID5	BOARD_ID4
W/O	0	0
Hynix	0	1
Samsung	1	0
Reserved	1	1

VRAM	VRAM ID (Default = 00) BOARD_ID3	BOARD_ID2	BOARD_ID1	BOARD_ID0
UMA	0	0		
Hynix	0	1		
Mircon	1	0		
Reserved	1	1		

Schematic "Value" Definition

Molokai INTEL Platform		DB/SI/PV Stage				MP		
By Value format	Description	Auto BOM Control	Molokai	Lanai-U	Lanai-UE	Molokai	Lanai-U	Lanai-UE
XX	Install	V	V	V	V	V	V	V
*XX	Non-Install	V						
EV@XX	Install dGPU device	V	V			V		
SATA@XX	Install SATA device	V	V	V		V	V	
EMMC@XX	Install EMMC	V			V			V
PROTO@XX	Install in pre-production only	V	V	V	V			
MP@XX	Install in MP only	V				V	V	V

***Board ID by manual control

Molokai -2G : *

Molokai -UE : **

PCB AND SILKSCREEN COLOR		
Program Phase	Color of PCB	Silkscreen
EVT	RED	YELLOW
DVT	LIGHT BLUE	YELLOW
PVT/MVB / PRODUCTION	GREEN	WHITE

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PROJECT: HP-Molokai

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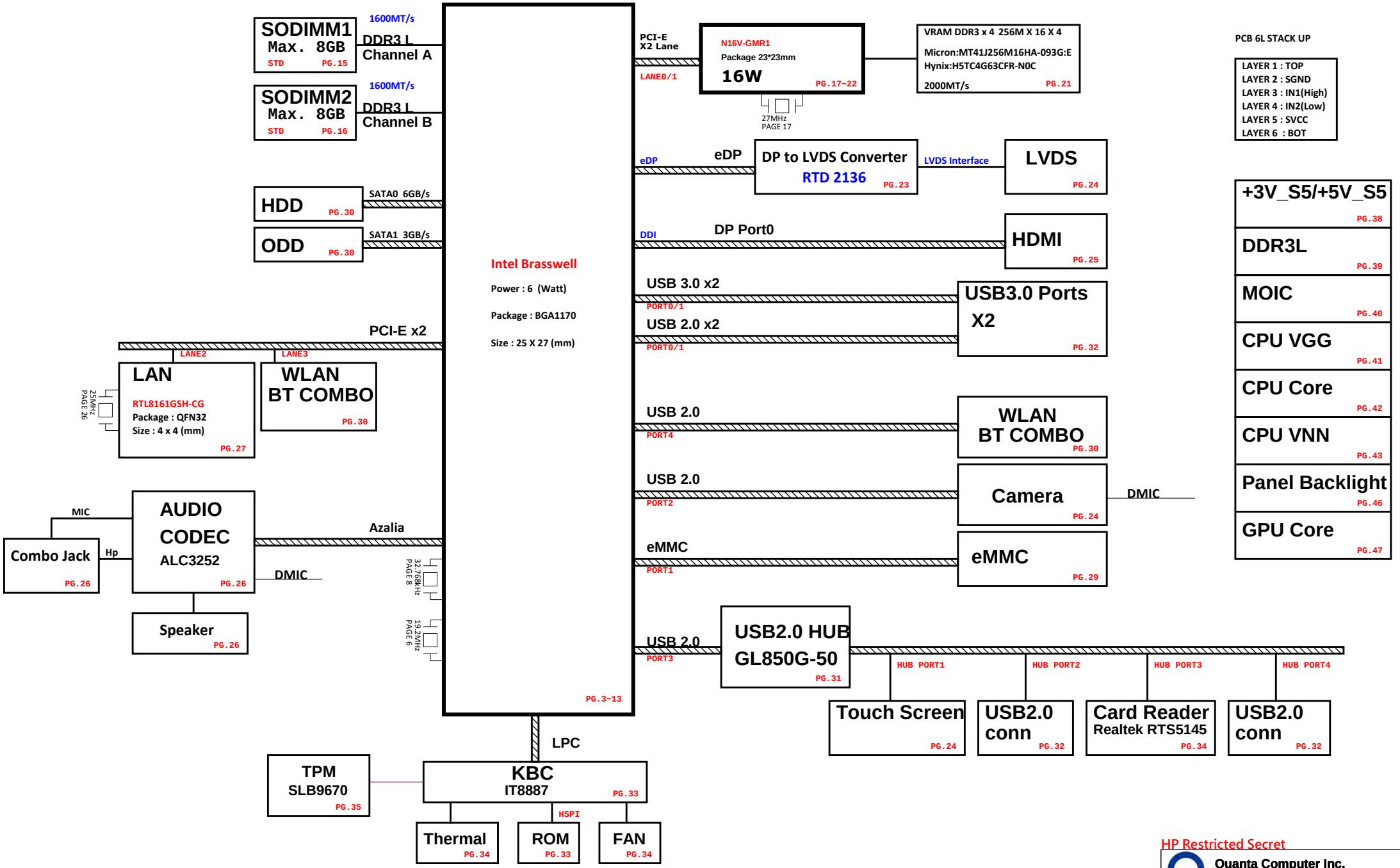
Molokai Intel Brasswell-M Platform Block Diagram



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PROJECT: HP-Molokai

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Custom	BLOCK DIAGRAM	1A

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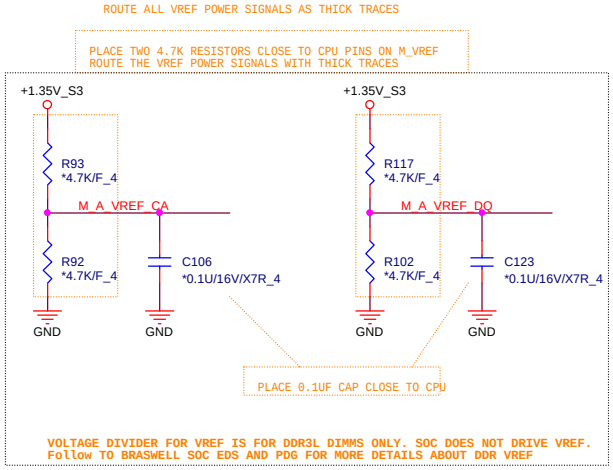
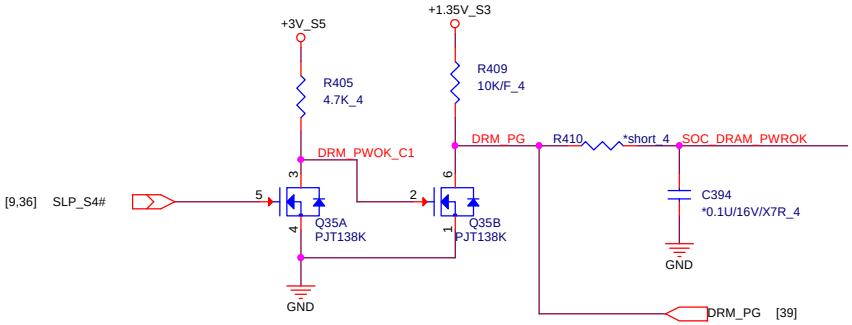
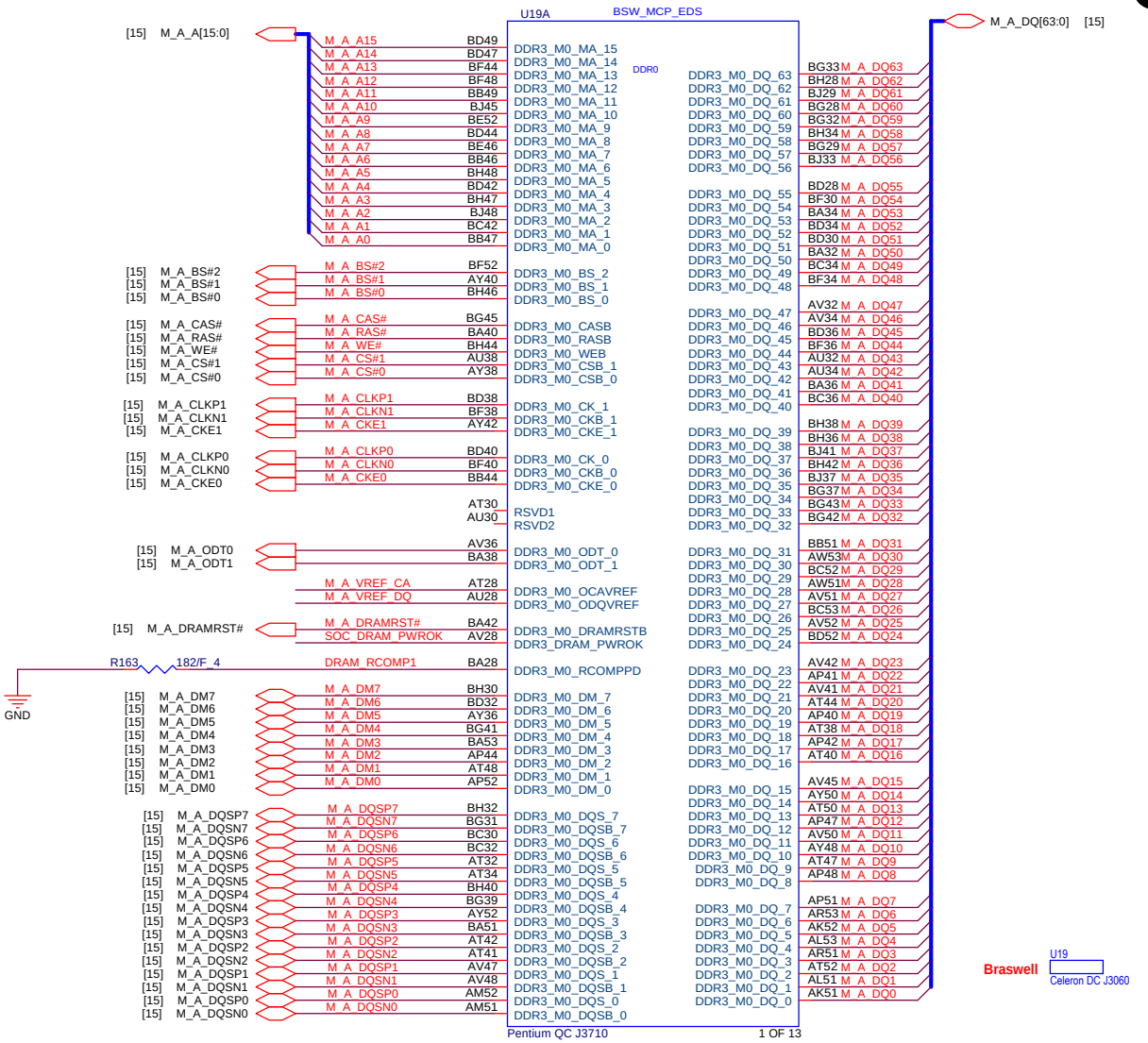
Channel 0	Channel 1	SoC Supported Memory Operation Speed
1333 MHz	X	1066 MHz
1600 MHz	X	1600 MHz
1333 MHz	1333 MHz	1066 MHz
1600 MHz	1600 MHz	1600 MHz

Channel 0 need to
be populated first for the platform to power on



VREF signals are not used for DDR3L designs.





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Size	Document Number	Rev
Custom	Braswell (DDRA)	1A
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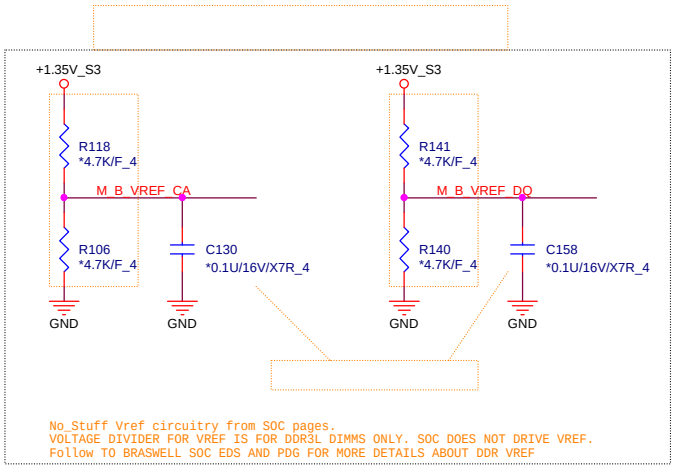
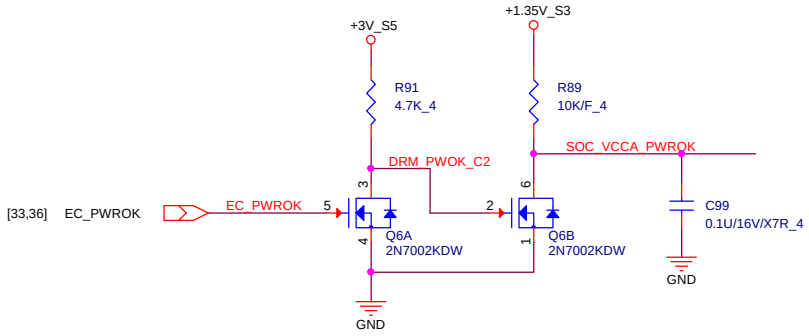
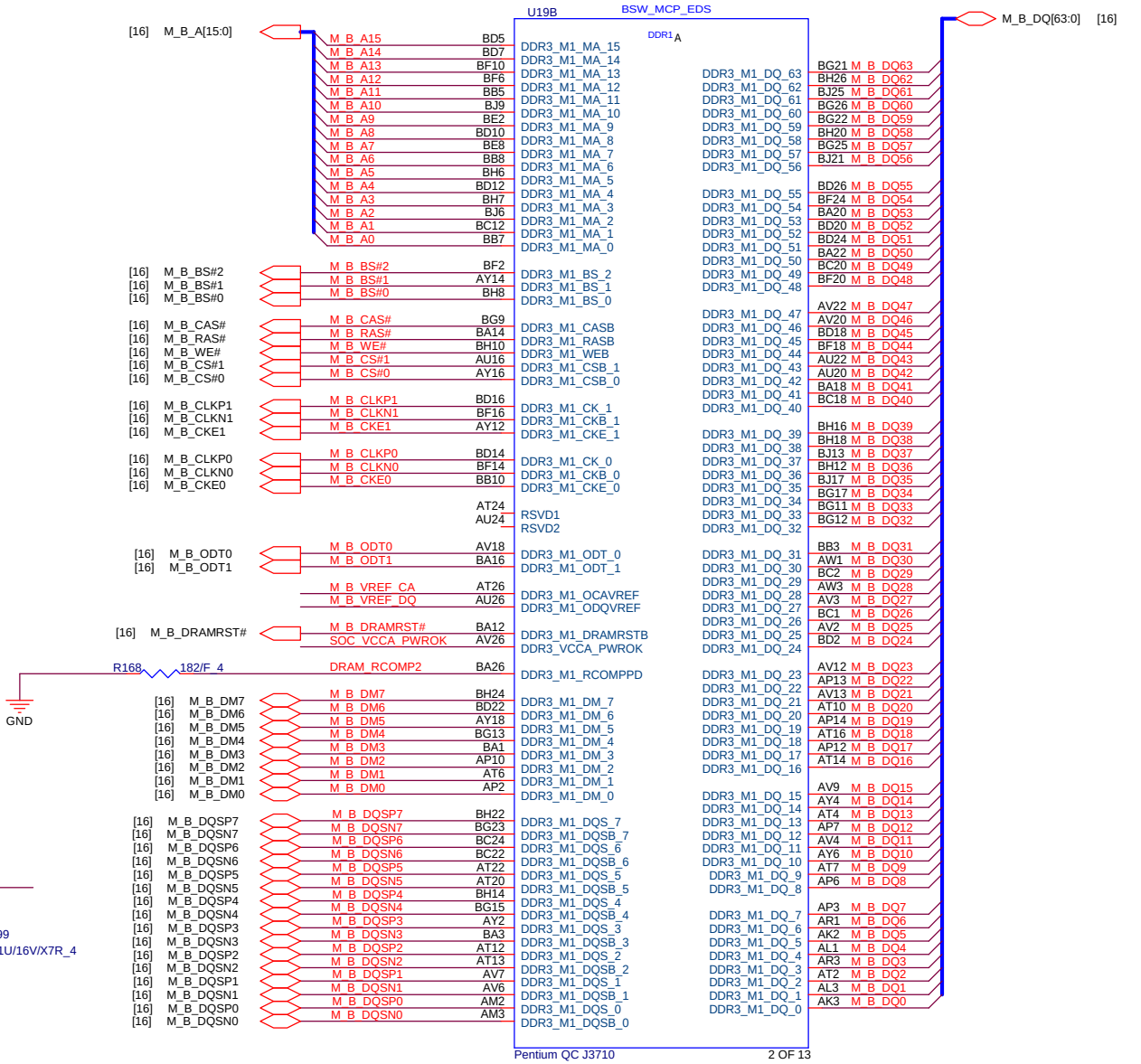


VREF signals are not used for DDR3L designs.





[3,11,15,16,39] +1.35V_S3
[3,5,6,11,14,22,24,27,30,31,32,33,35,36,37,38,40,41,42,43,44,48] +3V_S5

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Custom	Braswell (DDRB)	1A
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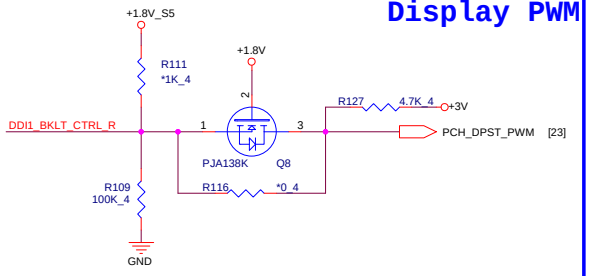
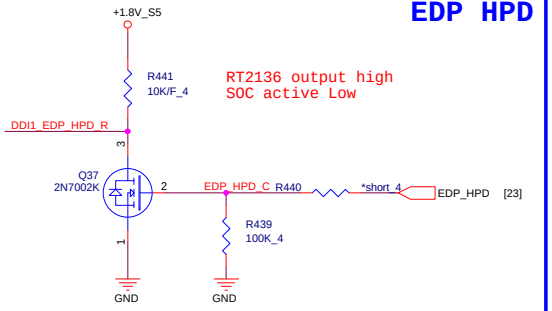
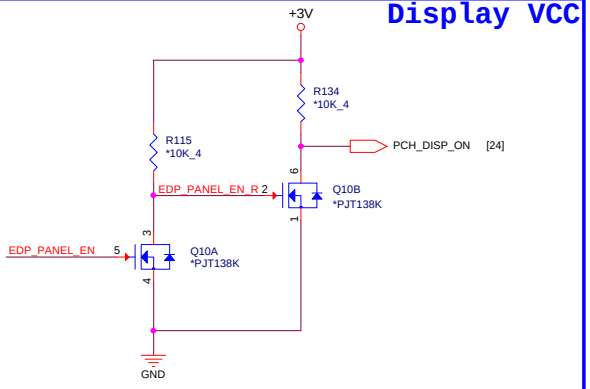
Display PWM



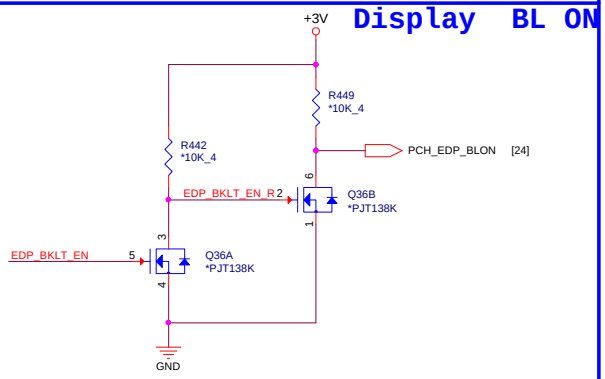
EDP HPD



Display VCC

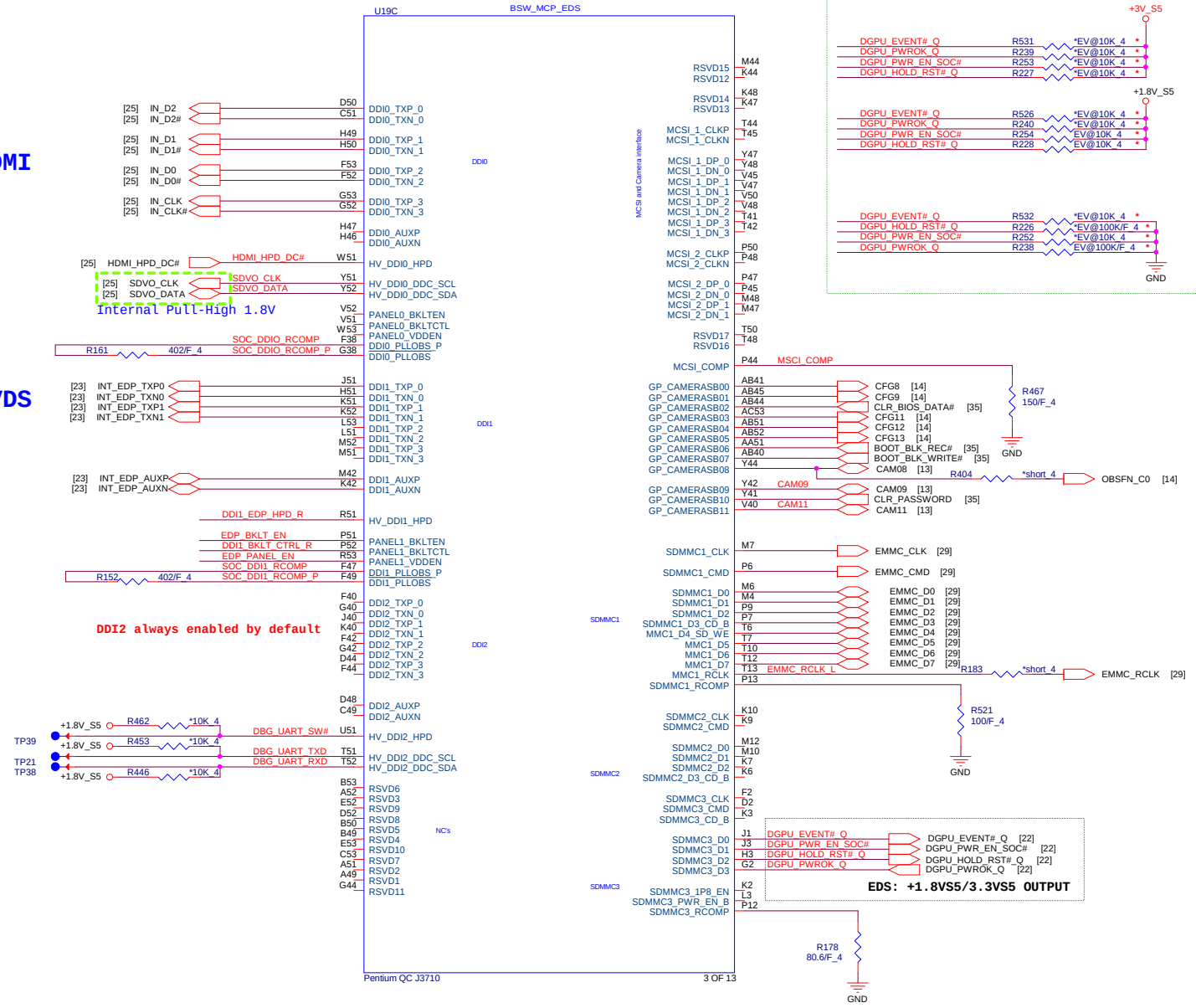


Display BL ON



HDMI

LVDS



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Size	Document Number	Rev
Custom	Braswell (Display)	1A
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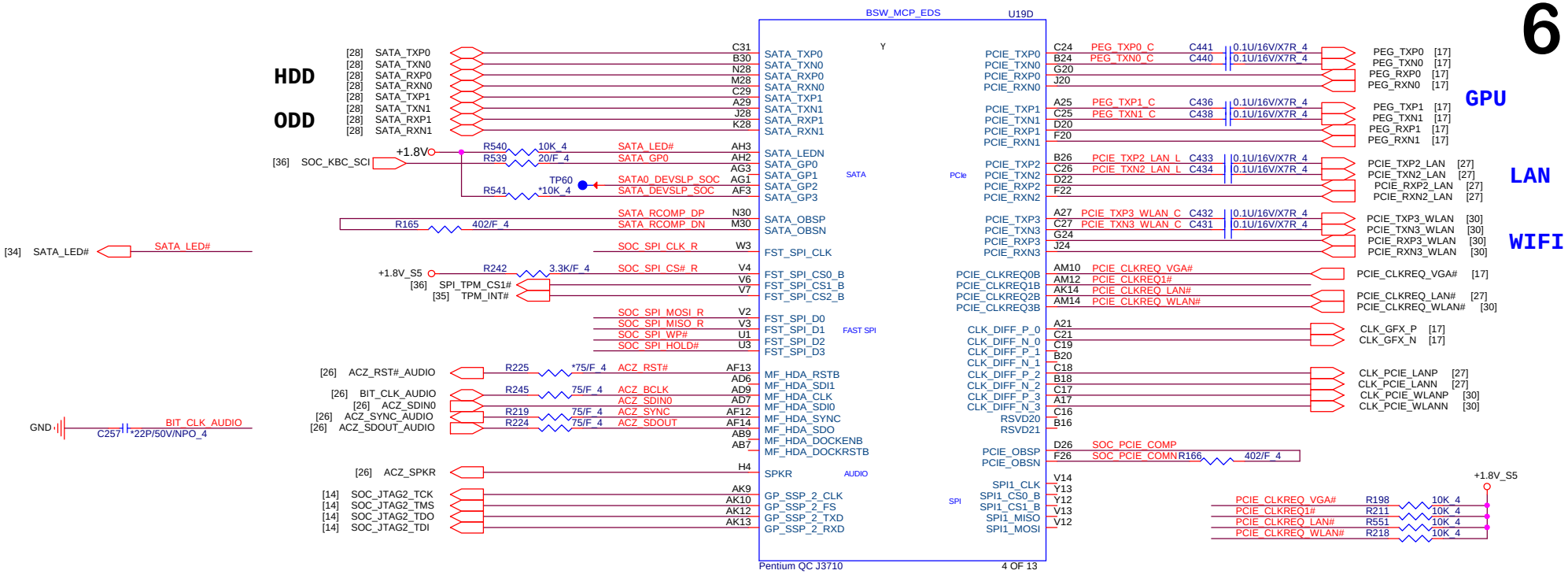
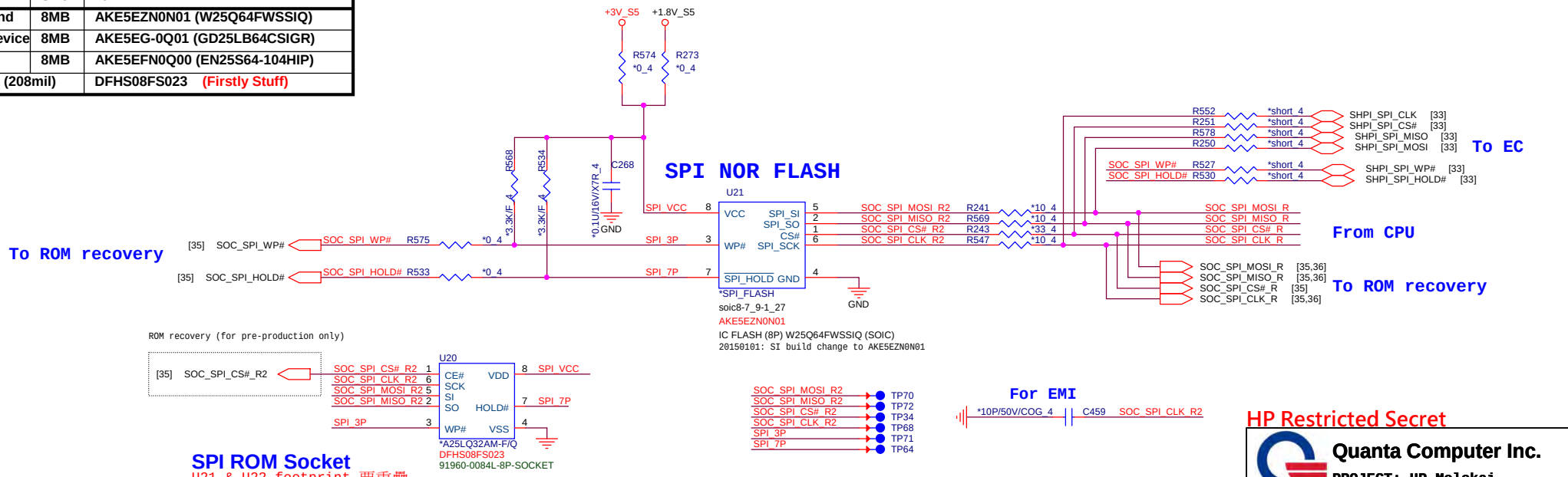


Vender	Size	P/N
Winbond	8MB	AKE5EZN0N01 (W25Q64FWSSIQ)
GigaDevice	8MB	AKE5EG-0Q01 (GD25LB64CSIGR)
EON	8MB	AKE5EFN0Q00 (EN25S64-104HIP)
Socket (208mil)	DFHS08FS023	(Firstly Stuff)



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Size	Document Number	Rev
Custom	Braswell (SP/PC/SA/AU)	1A
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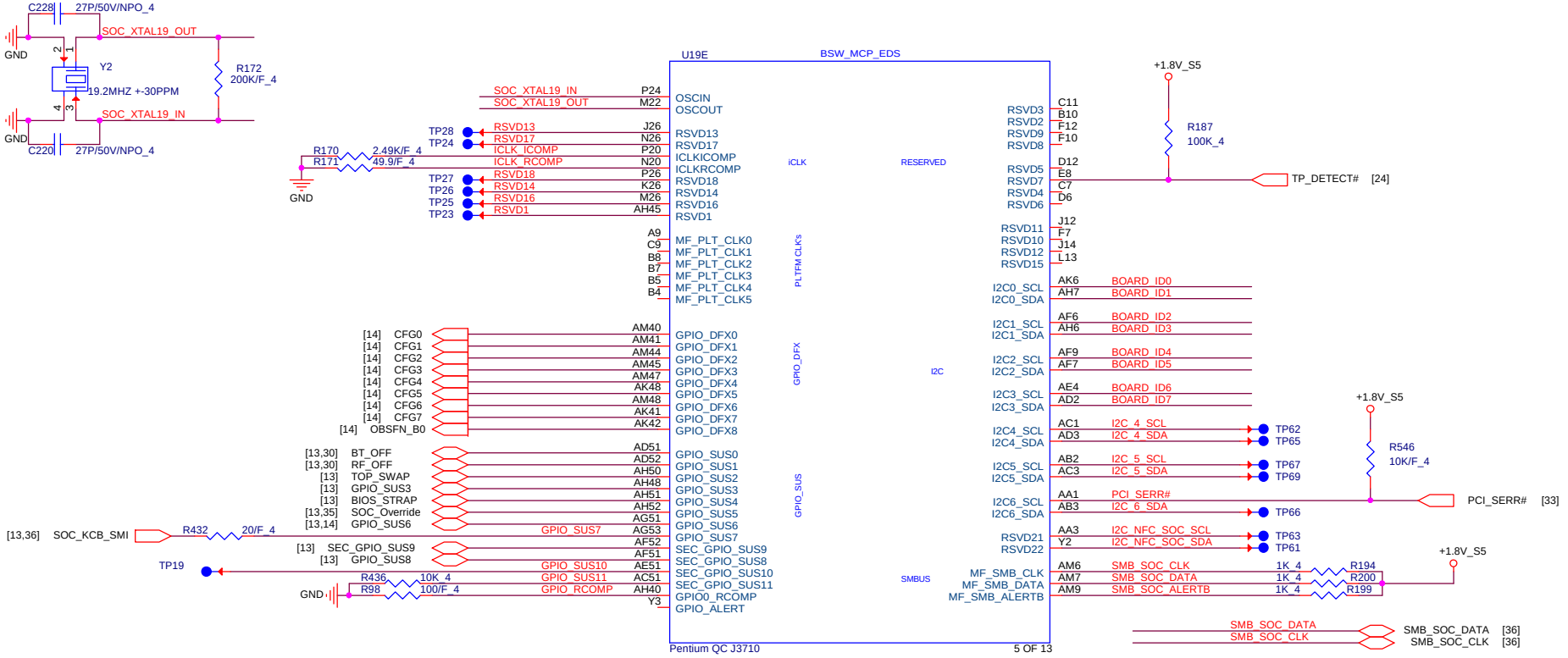
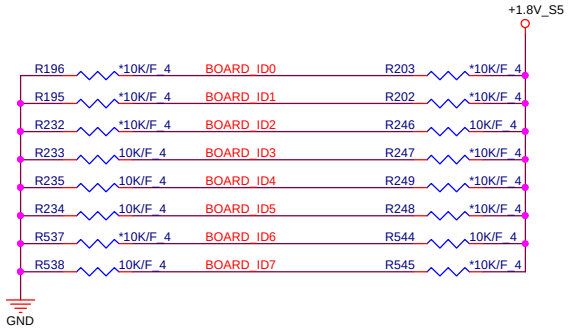


BOARD ID SETTING

Model	Board ID (Default = 00) BOARD_ID7	BOARD_ID6
EC-SI-03		
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

eMMC	Board ID (Default = 00) BOARD_ID5	BOARD_ID4
W/O	0	0
Hynix	0	1
Samsung	1	0
Reserved	1	1

VRAM	Board ID (Default = 00) BOARD_ID3	BOARD_ID2	BOARD_ID1	BOARD_ID0
UMA	0	0		
Hynix	0	1		
Mircon	1	0		
Reserved	1	1		



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Size	Document Number	Rev
Custom	Braswell (I2C/GPIO/CLK)	2A
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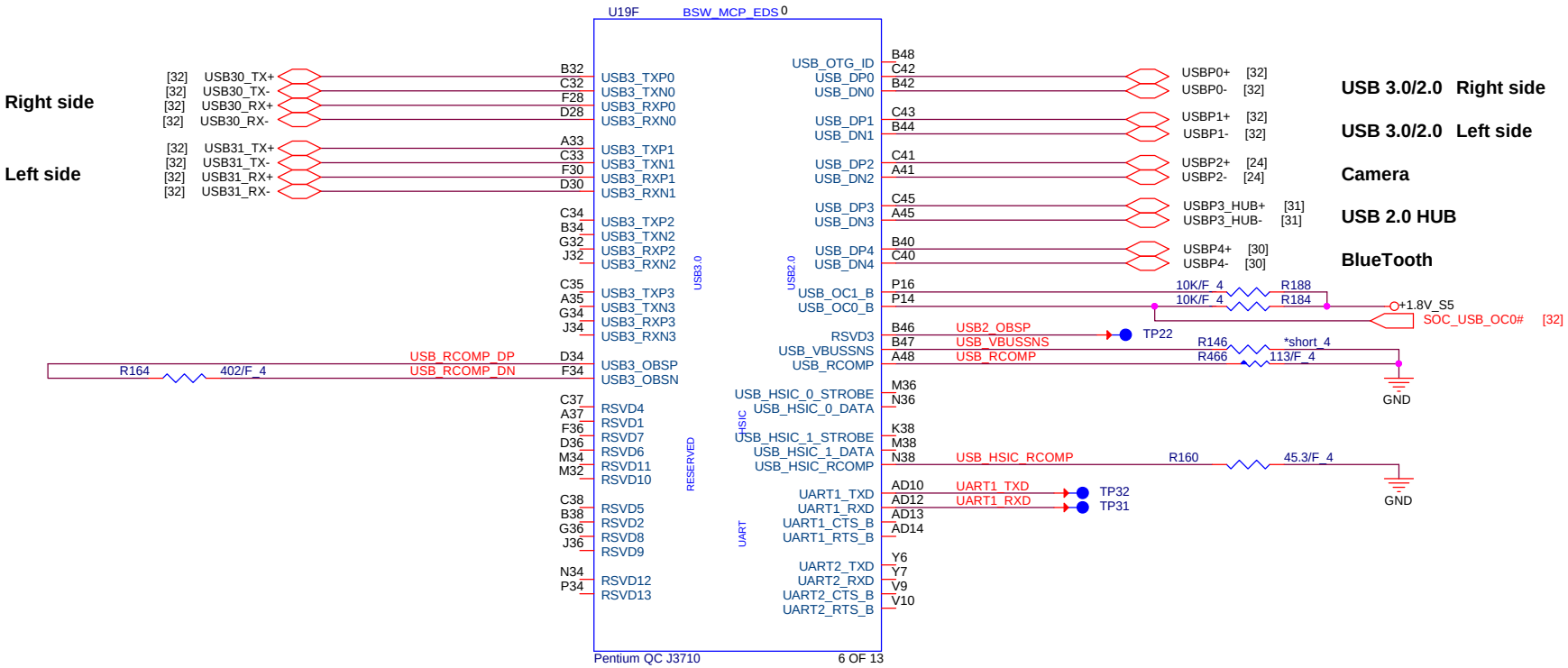

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PROJECT: HP-Molokai

Size	Document Number	Rev
Custom	Braswell (USB/URAT)	1A
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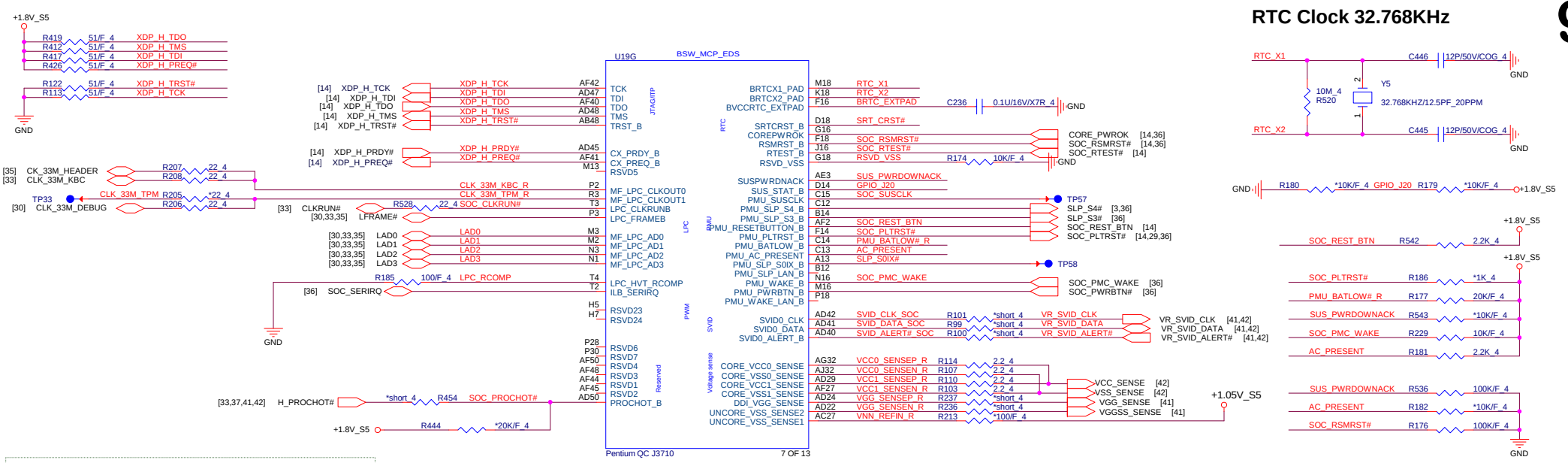
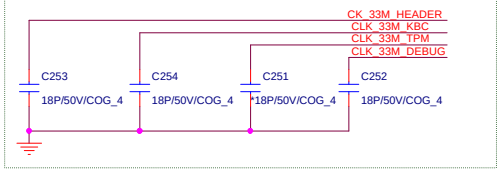
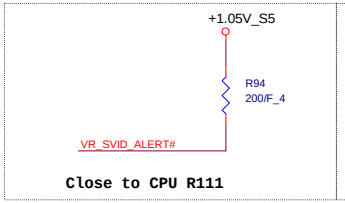
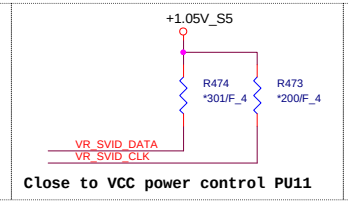
RTC Clock 32.768KHz

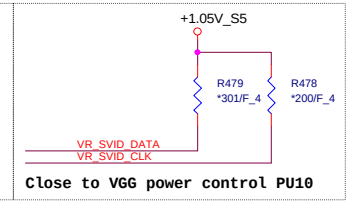


EMI

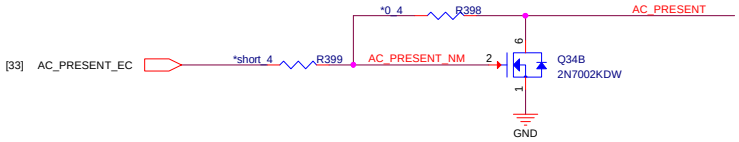






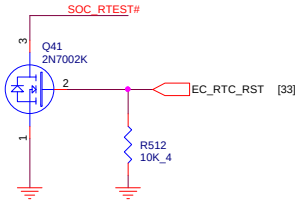


AC Present: This input pin indicates when the platform is plugged into AC power.

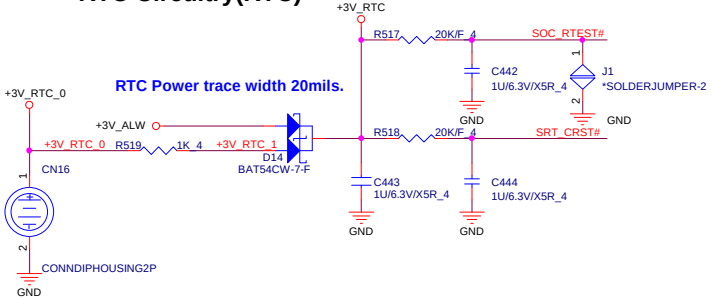


RTC Circuitry(RTC)

30mils



RTC Power trace width 20mils.



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Custom	Braswell (RTC/LPC/PMU)	1A

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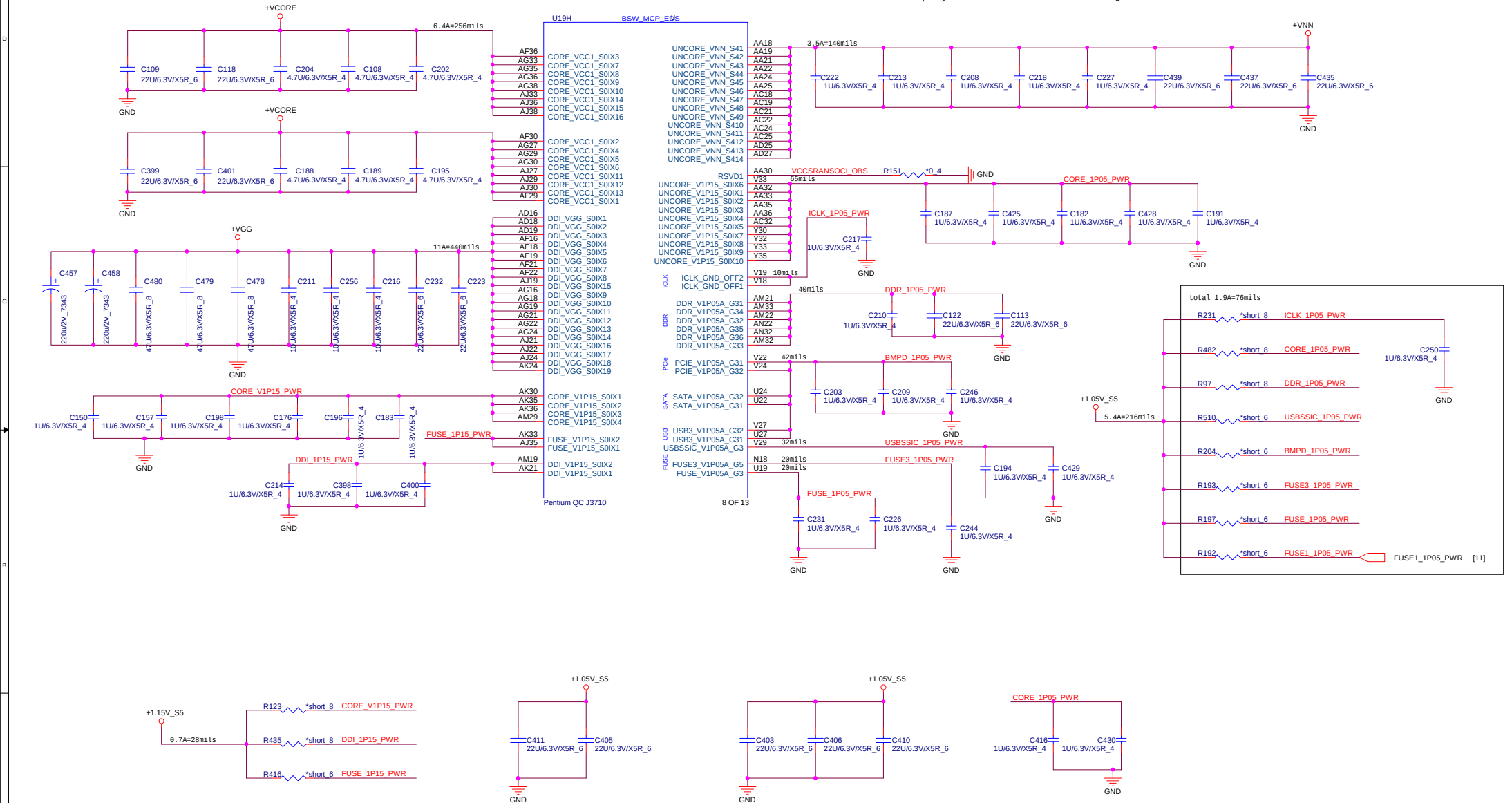
VNN can optionally be merged with V1P05A
if display resolution is 2560 x1600 @ 60Hz or lower.



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Size	Document Number	Rev
Custom	Braswell (Power 1)	1A

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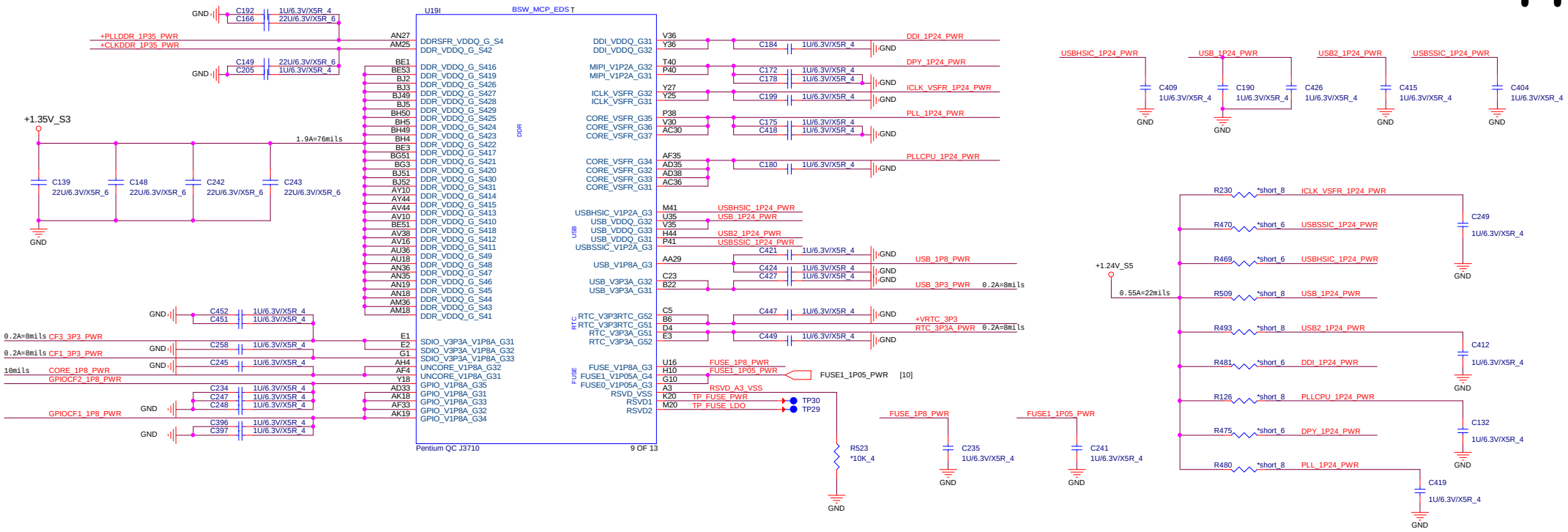

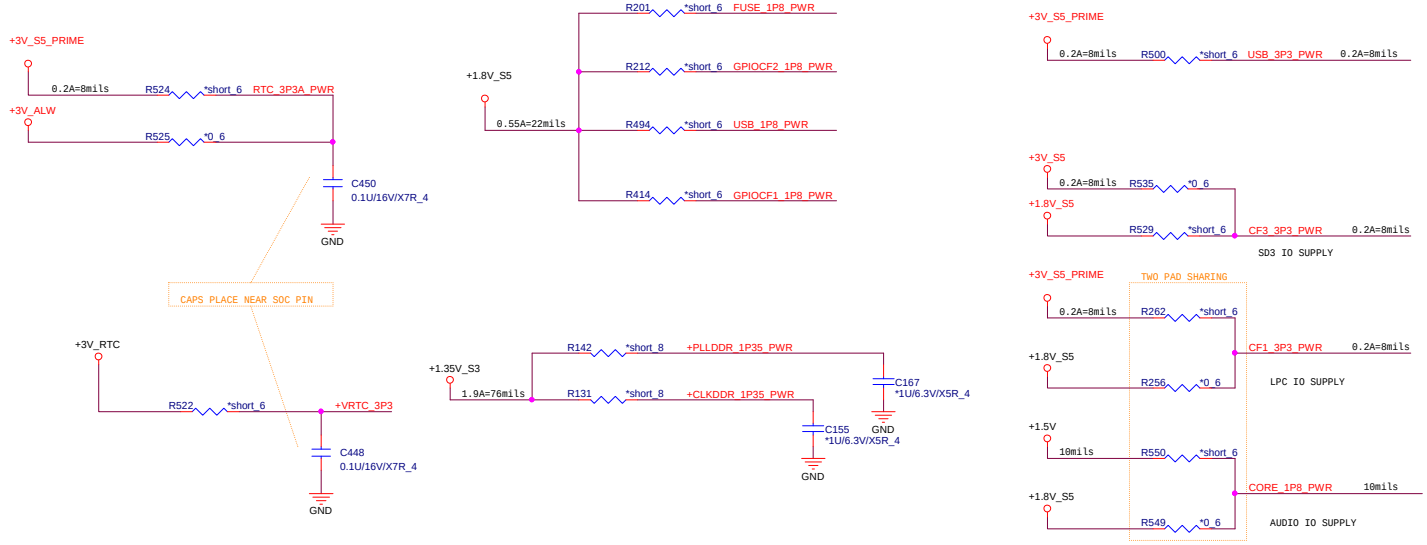

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Size	Document Number	Rev
Custom	Braswell (Power 2)	1A

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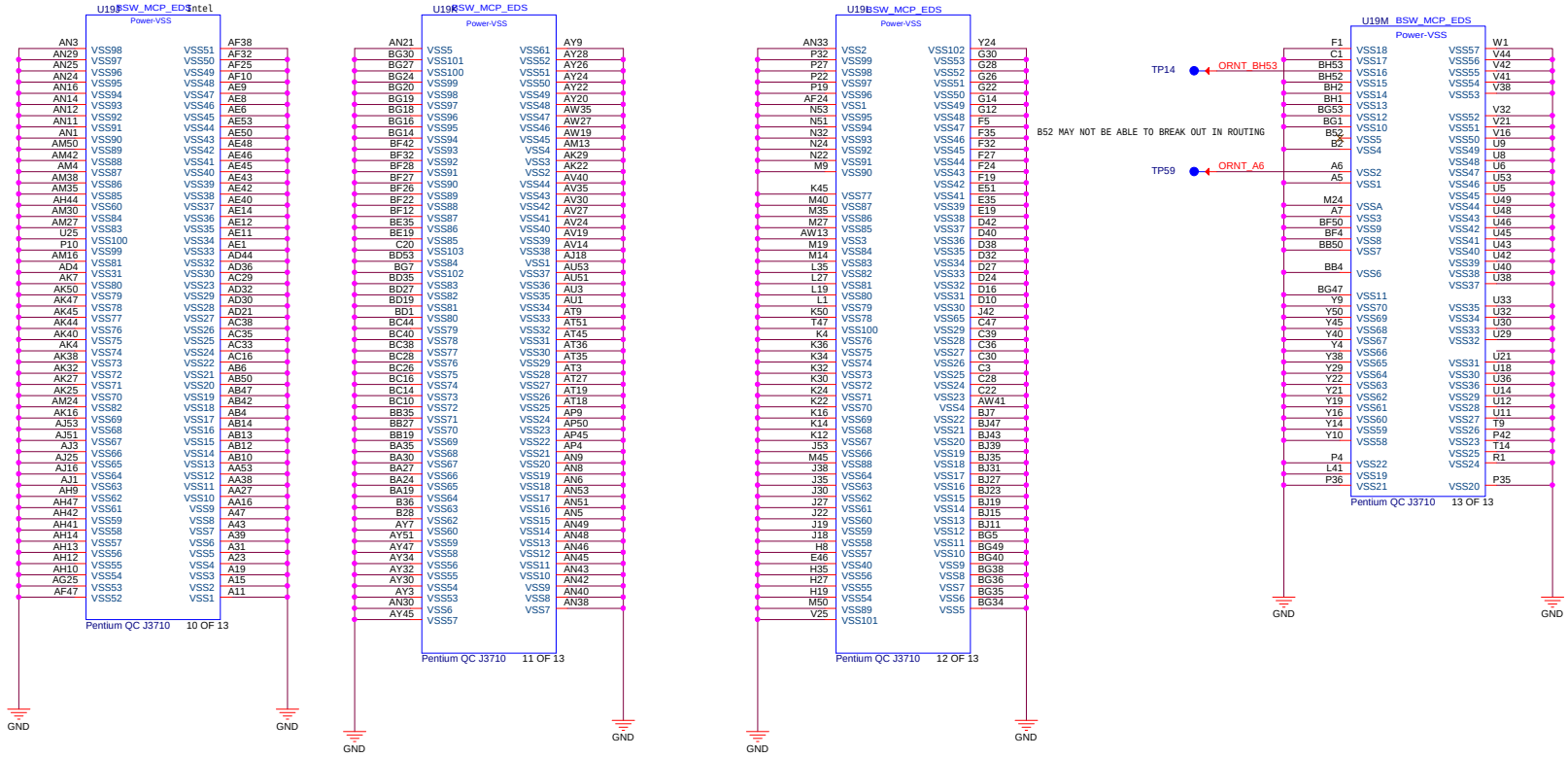

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Size	Document Number	Rev
Custom	Braswell (GND)	1A

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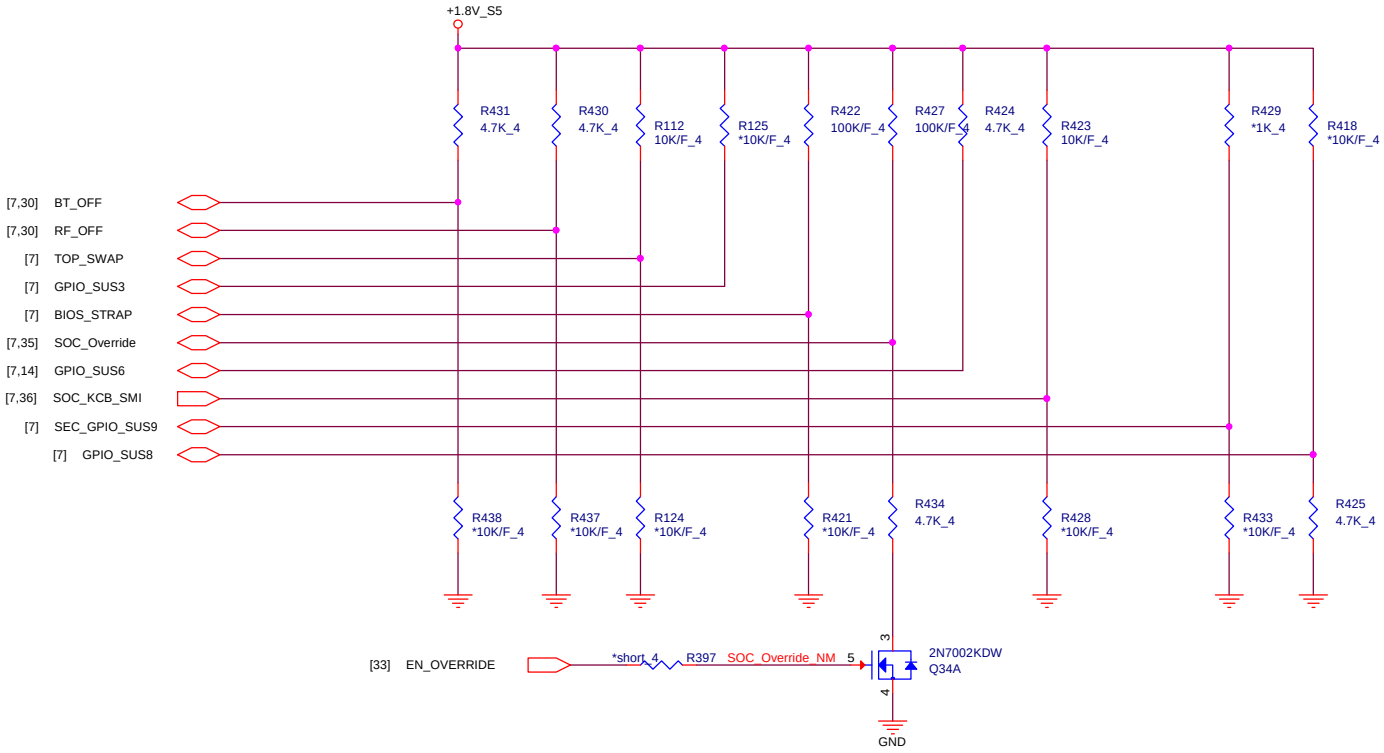

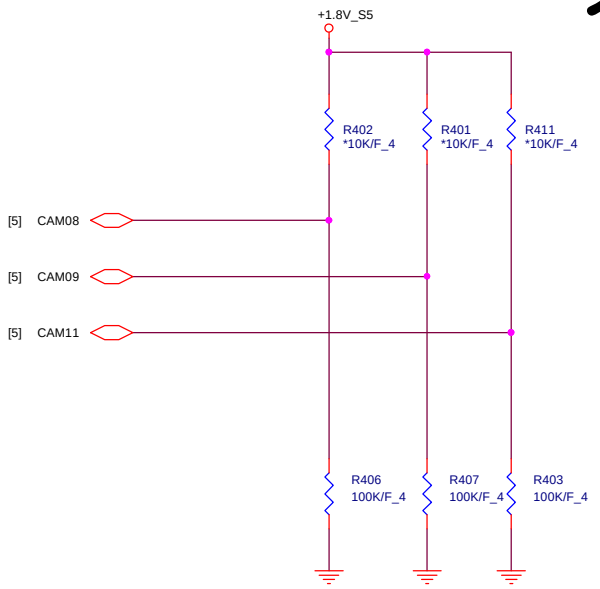

	CAM08	CAM09	CAM11
PULL HIGH	ICLK Xtal OSC Bypass	CCU SUS RO Bypass	RTC OSC Bypass
PULL LOW	ICLK Xtal OSC No Bypass DEFAULT	CCU SUS RO No Bypass DEFAULT	RTC OSC No Bypass DEFAULT

REQUIRED STRAPS

	GPIO_SUS0	GPIO_SUS1	TOP_SWAP	GPIO_SUS3	BIOS_STRAP	SOC_Override	GPIO_SUS6	SOC_KCB_SMI	GPIO_SUS8
PULL HIGH	DDI0 detected DEFAULT	DDI1 detected DEFAULT	Normal Operation DEFAULT	Reserve 10 KΩ PU DEFAULT	SPI DEFAULT	Normal Operation DEFAULT 20150209 PV change	10 KΩ PU to 1.8V DEFAULT	Reserve 10 KΩ PU DEFAULT	Supply is 1.35V
PULL LOW	DDI0 not detected	DDI1 not detected	Change Boot Loader address		LPC	Override			Supply is 1.25V DEFAULT

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Custom	Braswell (Strap)	1A
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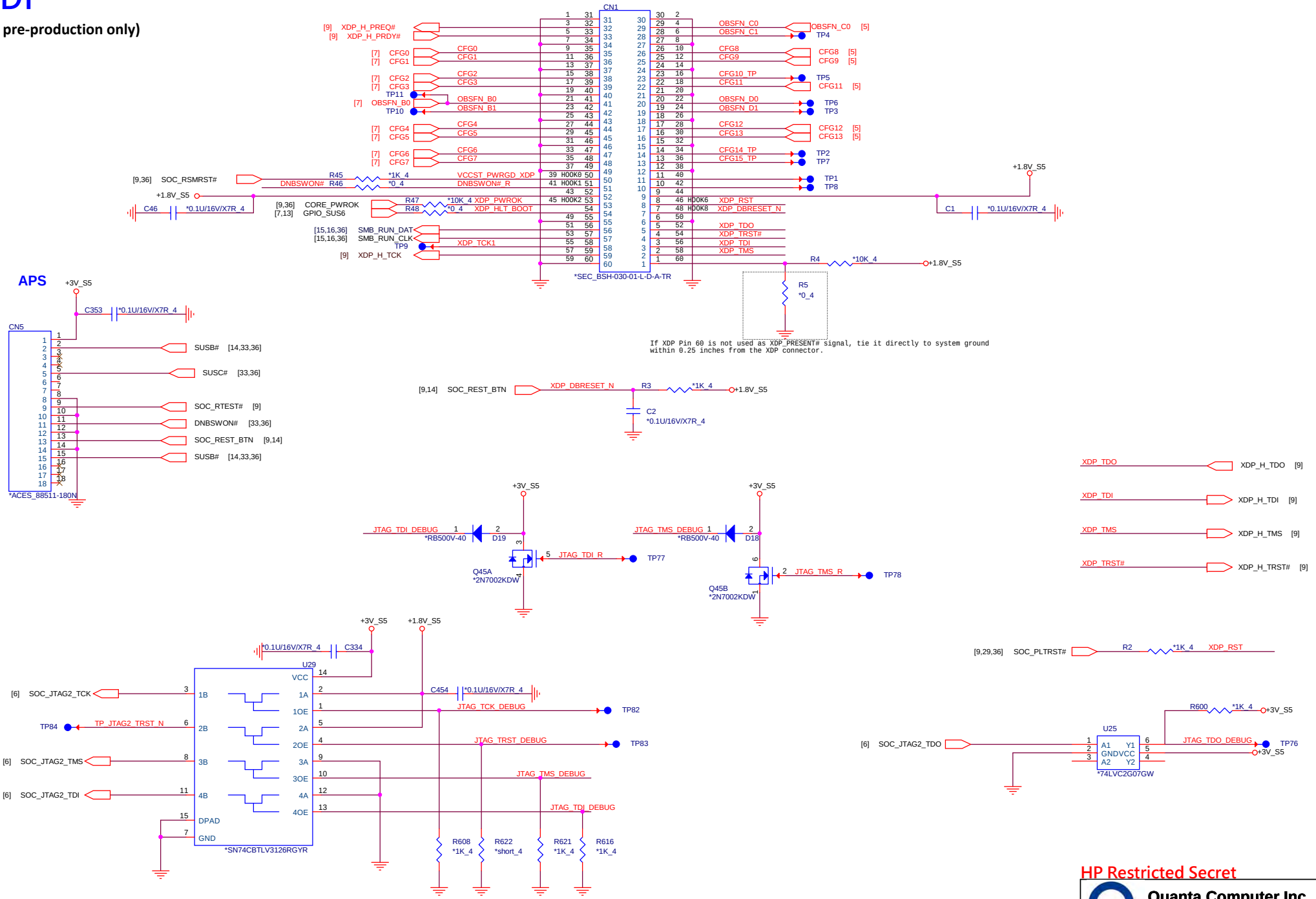
XDP

(for pre-production only)



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Size: Custom	Document Number: BSW XDP	Rev: 1A
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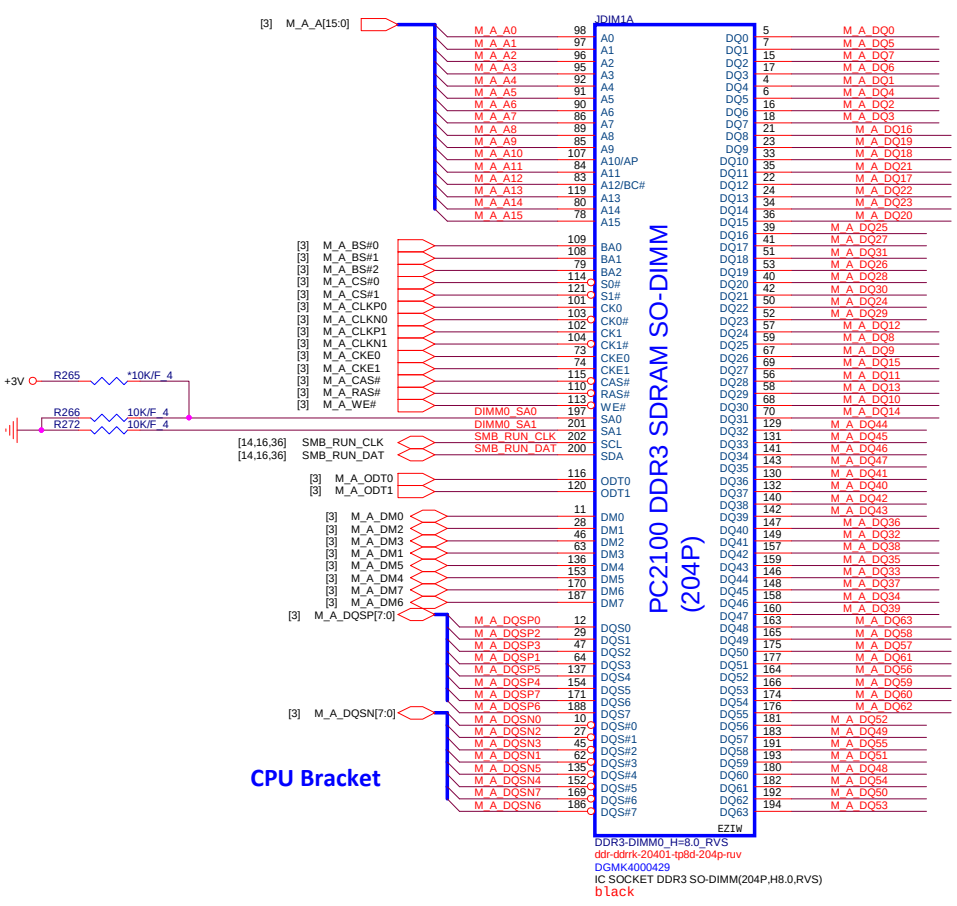

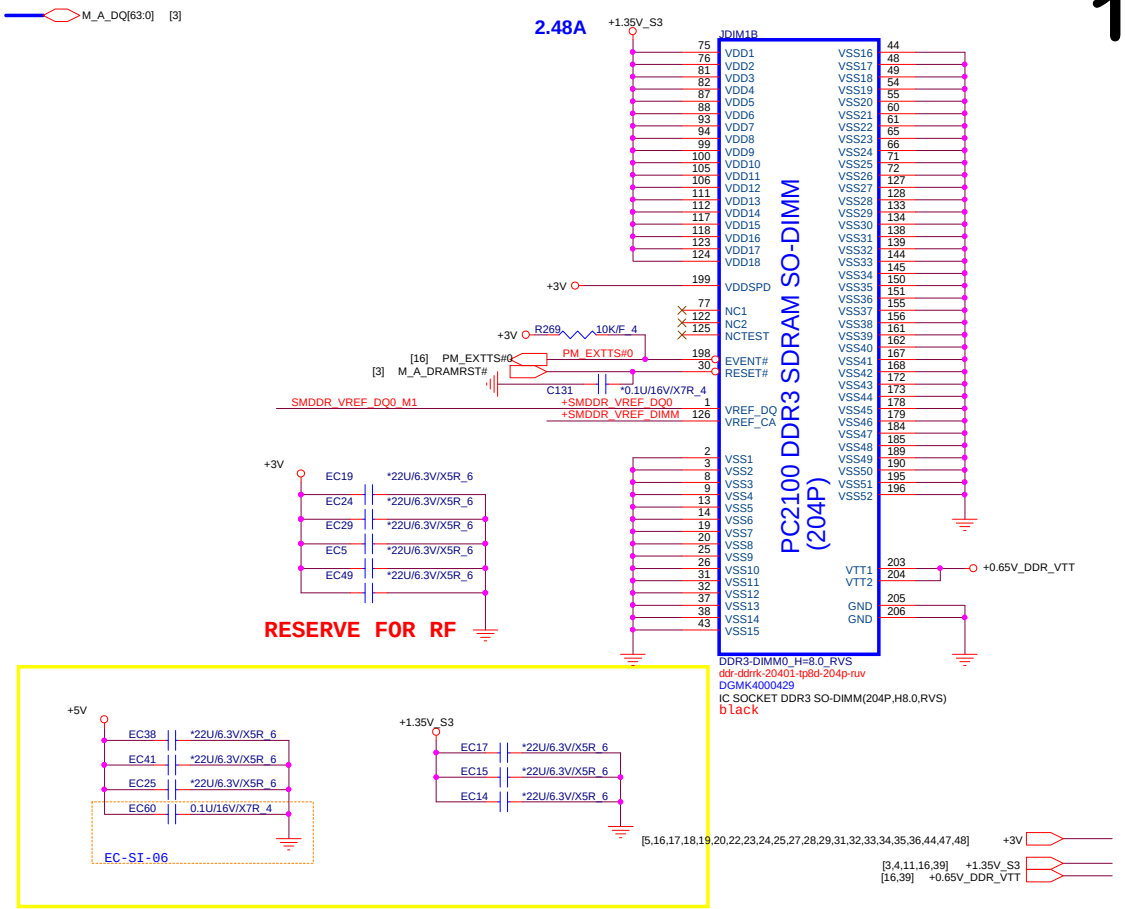

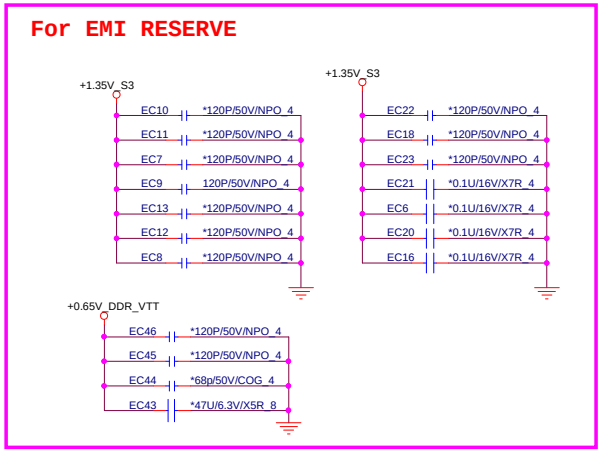

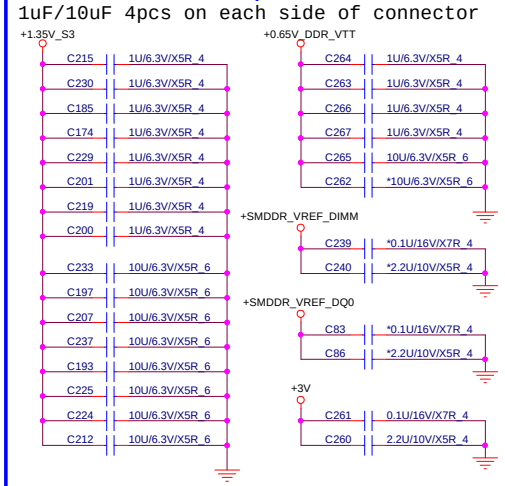

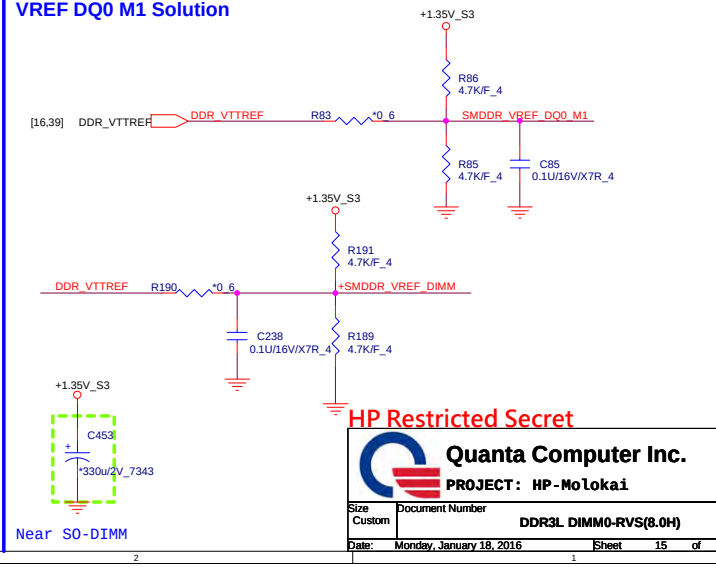

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PROJECT: HP-Molokai

Size	Document Number	Rev
Custom	DDR3L DIMM0-RVS(8.0H)	2A
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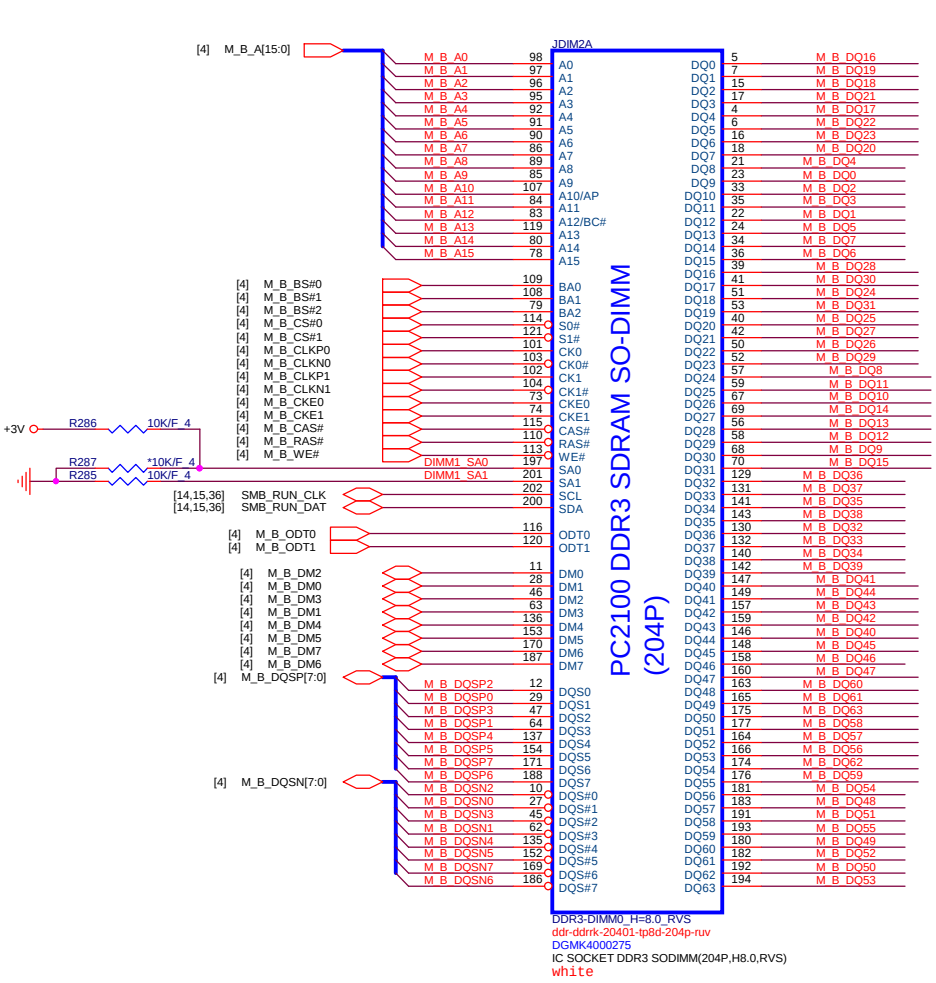
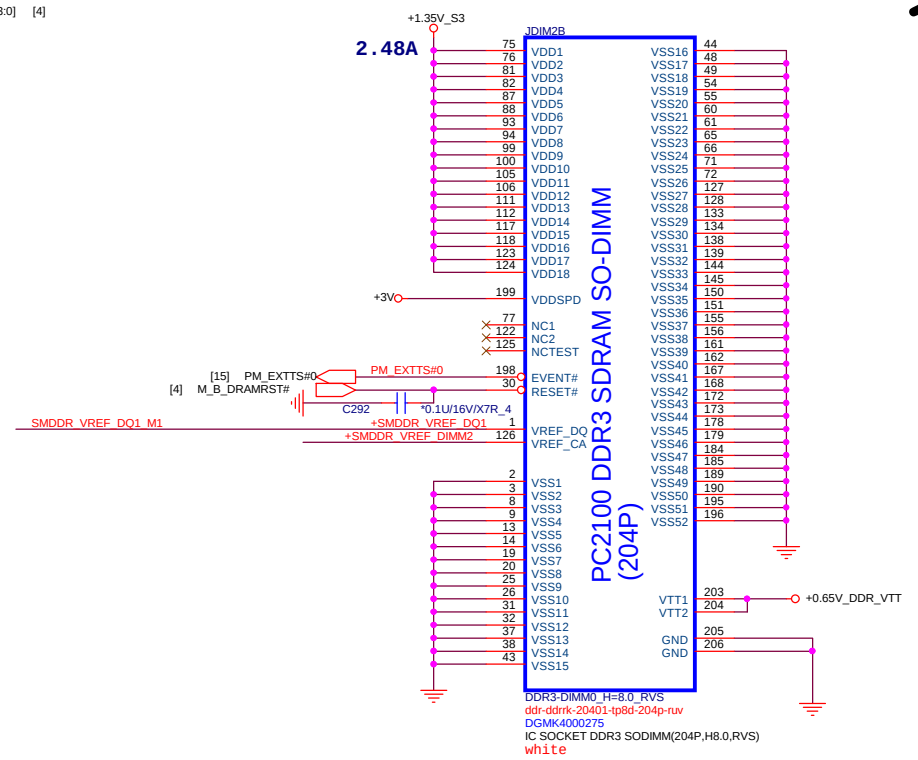
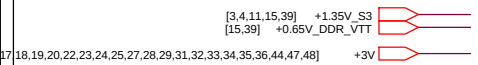
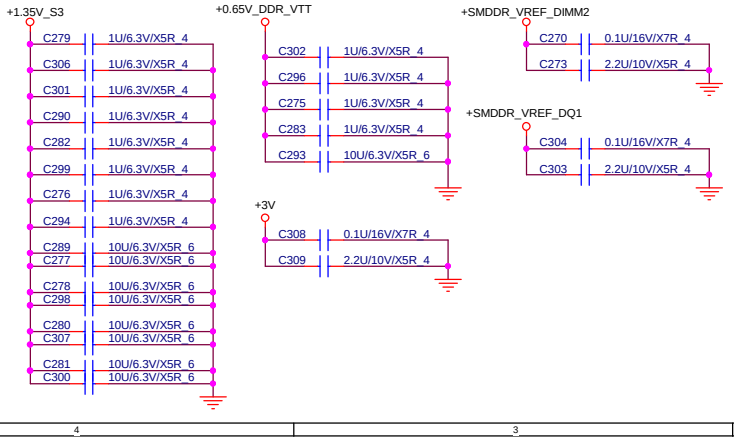




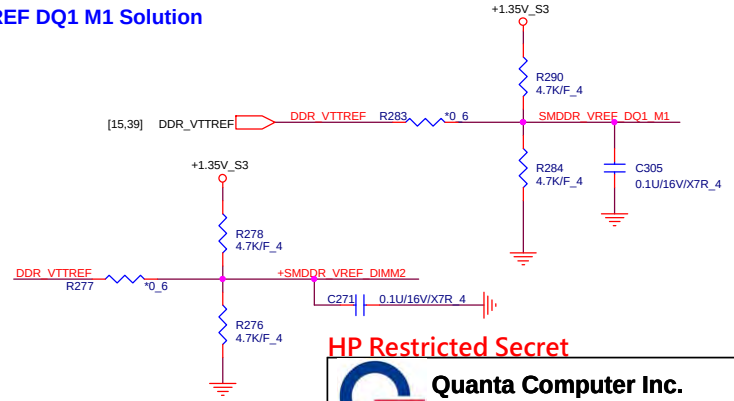


Place these Caps near So-Dimm1.

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



VREF DQ1 M1 Solution



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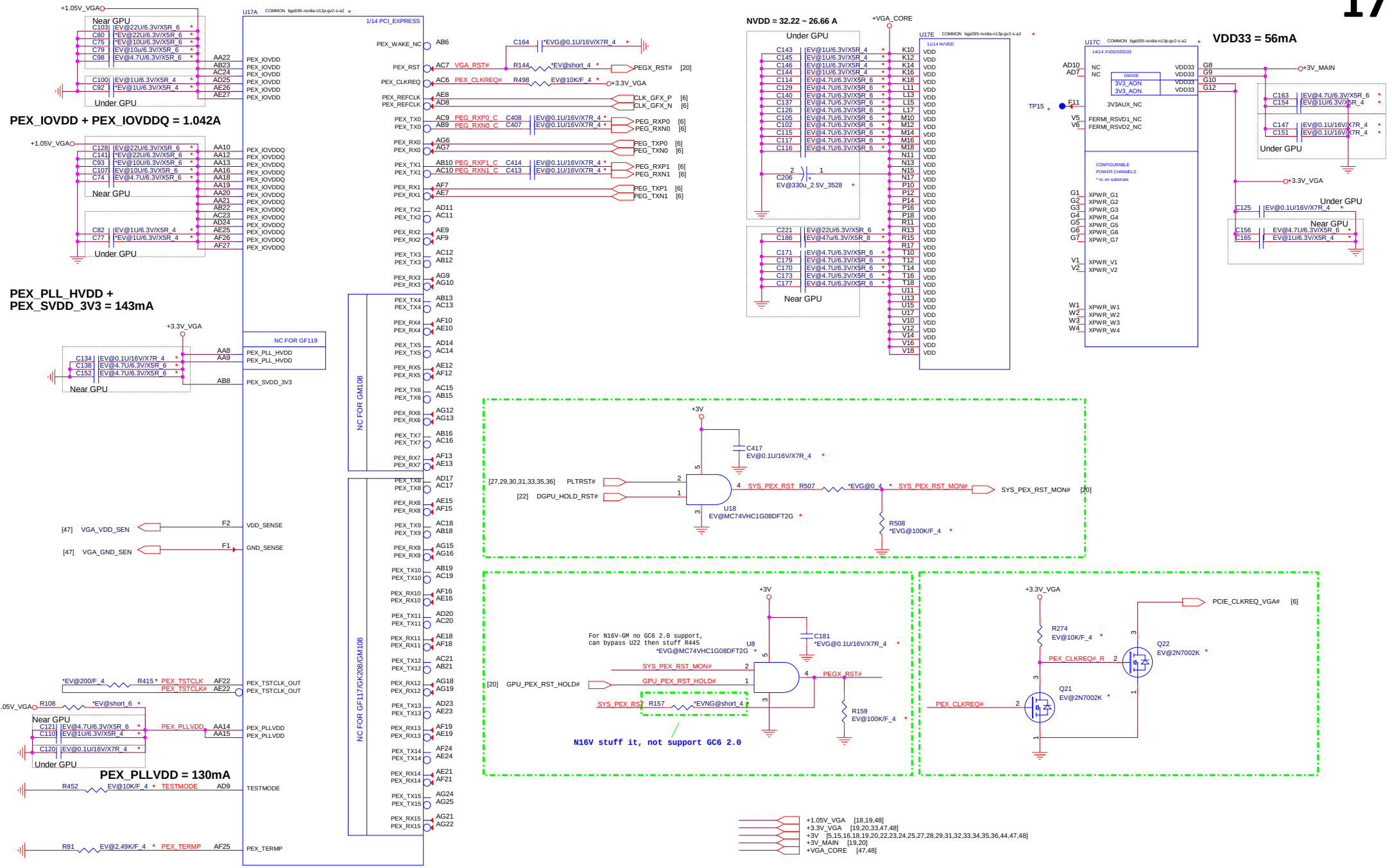
Quanta Computer Inc.

PROJECT: HP-Molokai

Size	Document Number	Rev
Custom	DDR3L DIMM1-RVS(8.0H)	1A
Date: Monday, January 18, 2016	Sheet 16 of 54	



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Quanta Computer Inc.		
PROJECT: HP-Molokai		
Size	Document Number: N16V-GMR (PCIE I/F) /NVDD	Rev: 1A
Date: Monday, January 18, 2016	Sheet 17 of 54	

FBVDDQ + FBVDD = 3.116A

Mode D is optimized for DDR3 single rank designs

Mode D Command Mapping

FB_PLLAVDD = 55mA

FB_DLLAVDD = 15mA

For support GC6 2.0

Remove GC6 1.0 for Nvidia suggest 11/27

GPU core power ok

N16V stuff it, not support GC6 2.0

HP Restricted Secret

Quanta Computer Inc.

PROJECT: HP-Molokai

Size	Document Number	Rev
	N16V-GMR (MEMORY/GND)	1A

Date: Monday, January 18, 2016 Sheet 18 of 54

U17G COMMON bga595-nvidia-n13p-gv2-s-a2
4/14 IFPAB
IFPAB
IFPA_RSET AA6
IFPAB_PLLVDD V7
IFPAB_PLLVDD W7
IFPA_IOVDD W6
IFPB_IOVDD Y6
IFPA_TXC AC4 AC3
IFPA_TXD0 Y3 Y4
IFPA_TXD1 AA2 AA3
IFPA_TXD2 AA1 AB1
IFPA_TXD3 AA5 AA4
IFPB_TXC AB4 AB5
IFPB_TXD4 AB2 AB3
IFPB_TXD5 AD2 AD3
IFPB_TXD6 AD1 AE1
IFPB_TXD7 AD5 AD4
GF117 NC GPIO14 B3
NC FOR GF117/GM108
TP46 TP45 TP56 TP50

U17J COMMON bga595-nvidia-n13p-gv2-s-a2
7/14 IFPEF
IFPE
IFPF
IFPEF_PLLVDD J7
IFPEF_PLLVDD K7
IFPEF_RSET K6
IFPE_IOVDD H6
IFPF_IOVDD J6
TP49 TP43 TP18 TP41
GF119/GK208
DVI-DL DVI-SL/HDMI DP
I2CY_SDA I2CY_SCL IFPE_AUX J3 J2
TXC TXC IFPE_L3 J1 K1
TXD0 TXD0 IFPE_L2 K3 K2
TXD1 TXD1 IFPE_L1 M3 M2
TXD2 TXD2 IFPE_L0 M1 N1
NC FOR GK208
HPD_E HPD_E GPIO18 C2
NC FOR GF117
I2CZ_SDA I2CZ_SCL IFPF_AUX H4 H3
TXC TXC IFPF_L3 J5 J4
TXD3 TXD0 IFPF_L2 K5 K4
TXD4 TXD1 IFPF_L1 L4 L3
TXD5 TXD2 IFPF_L0 M5 M4
HPD_F GPIO19 F7
NC FOR GF117/GM108
NC FOR GF117/GK208/GM108

U17K COMMON bga595-nvidia-n13p-gv2-s-a2
3/14 DACA
DACA_VDD W5
DACA_VREF AE2
DACA_RSET AF2
GF117/GM108 NC TSEN_VREF NC
GF117 GM108/GK208
I2CA_SCL B7 I2CA_SCL R459 EV@2.2K_4 EV@2.2K_4
I2CA_SDA A7 I2CA_SDA R458 EV@2.2K_4 EV@2.2K_4
DACA_HSYNC AE3
DACA_VSYNC AE4
DACA_RED AG3
DACA_GREEN AF4
DACA_BLUE AF3
GM108 GF117 GK208
TP54 TP52

U17H COMMON bga595-nvidia-n13p-gv2-s-a2
5/14 IFPC
IFPC
IFPC_RSET T6
IFPC_PLLVDD M7
IFPC_PLLVDD N7
IFPC_IOVDD P6
GF119/GK208
DVI/HDMI DP
I2CW_SDA I2CW_SCL IFPC_AUX N5 N4
TXC TXC IFPC_L3 N3 N2
TXD0 TXD0 IFPC_L2 R3 R2
TXD1 TXD1 IFPC_L1 R1 T1
TXD2 TXD2 IFPC_L0 T3 T2
GF117 NC GPIO15 C3
NC FOR GF117/GM108
TP44 TP16 TP42

U17I COMMON bga595-nvidia-n13p-gv2-s-a2
6/14 IFPD
IFPD
IFPD_RSET U6
IFPD_PLLVDD T7
IFPD_PLLVDD R7
IFPD_IOVDD R6
GF119/GK208
DVI/HDMI DP
I2CX_SDA I2CX_SCL IFPD_AUX P4 P3
TXC TXC IFPD_L3 R5 R4
TXD0 TXD0 IFPD_L2 T5 T4
TXD1 TXD1 IFPD_L1 U4 U3
TXD2 TXD2 IFPD_L0 V4 V3
GF117 NC GPIO17 D4
NC FOR GF117/GM108
TP47 TP40 TP48

GC6 Power control
3V GPU MAIN POWER

+3.3V_VGA
R156 *EVG@10K_4
R148 *EVG@10K_4
R150 *EVG@200K_4
C169 *EVG@0.022U/25V/X7R_4
R149 *EVNG@short_8
60mil
Q14 *EVG@AO3413
C168 *EVG@0.022U/25V/X7R_4
+3V_MAIN
[20] +3V_MAIN_EN
Q15 *EVG@2N7002K
N16V stuff it, not support GC6 2.0

+1.05V_GFX and GPU core power EN

+3V
R147 EV@1.5K/F_4
R138 EV@4.7K_4
PG_+3.3V_MAIN [47,48]
Q13
R143 *EV@100K/F_4
+3V_MAIN
R135 EV@4.7K_4
C160 *EV@1000p/50V/X7R_4
Q11 EV@METR3904-G
C142 EV@1000p/50V/X7R_4
EV@DTC144EU

PLLVDD = 38mA
+1.05V_VGA
L20 EV@BLM15PX330SN1D
NV_PLLVDD
C159 EV@0.1U/16V/X7R_4
C420 EV@22U/6.3V/X5R_6

SP_PLLVDD = 17mA
L19 EV@HCB1005KF-181T15(180,1500MA)
SP_PLLVDD
C153 EV@0.1U/16V/X7R_4
C161 EV@0.1U/16V/X7R_4
C422 EV@10U/10V/X5R_6
C423 EV@47U/6.3V/X5R_8

VID_PLLVDD = 41mA
R447 EV@10K/F_4
XTAL_SSIN

U17M COMMON bga595-nvidia-n13p-gv2-s-a2
9/14 XTAL_PLL
PLLVDD SP_PLLVDD L6 M6
VID_PLLVDD N6
GF119/GK208 GF117/GM108
XTALSSIN A10
XTALIN C11
XTALOUTBUFF C10 BXTALOUT
XTALOUT B10 27M_XTAL_OUT
27M_XTAL_IN_R
R448 *EV@10K/F_4
R443 EV@10K/F_4
+3.3V_VGA
C124 EV@12P/50V/COG_4
Y1 EV@27MHZ +-10PPM
C135 EV@12P/50V/COG_4

dGPU power OK

+3V
R95 EV@4.7K_4*
R105 EV@4.7K_4*
DGPU_PGOK-1
DGPU_PWROK [22]
[48] PG_+1.5V_VGA
R130 EV@4.7K_4
DGPU_POK2
Q9 EV@METR3904-G
Q7 EV@DTC144EUA
C119 EV@1000P/50V/X7R_4
C127 *EV@1000P/50V/X7R_4
R96 EV@100K/F_4

+3V [5,15,16,17,18,20,22,23,24,25,27,28,29,31,32,33,34,35,36,44,47,48]
+1.05V_VGA [17,18,48]
+3.3V_VGA [17,20,33,47,48]
+3V_MAIN [17,20]

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Quanta Computer Inc.
PROJECT: HP-Molokai
Size | Document Number: N16V-GMR (DISPLAY) | Rev 1A
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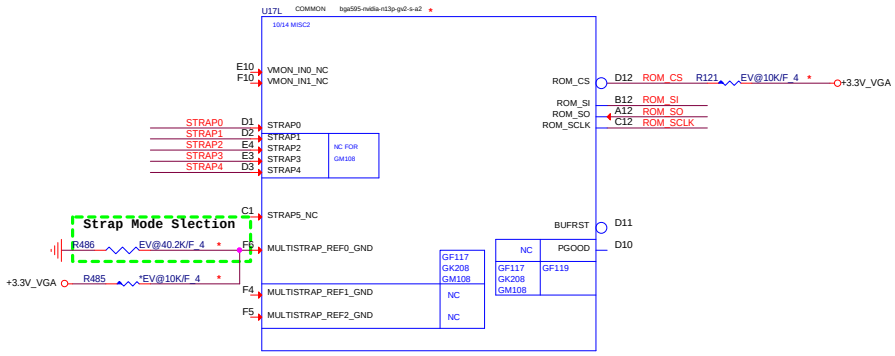

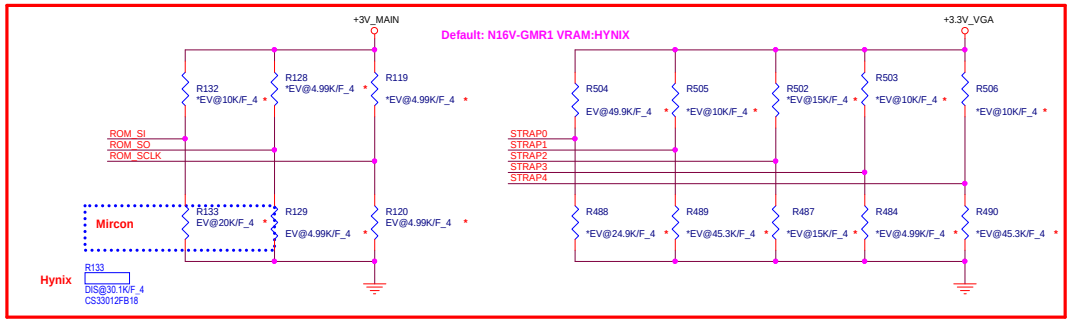

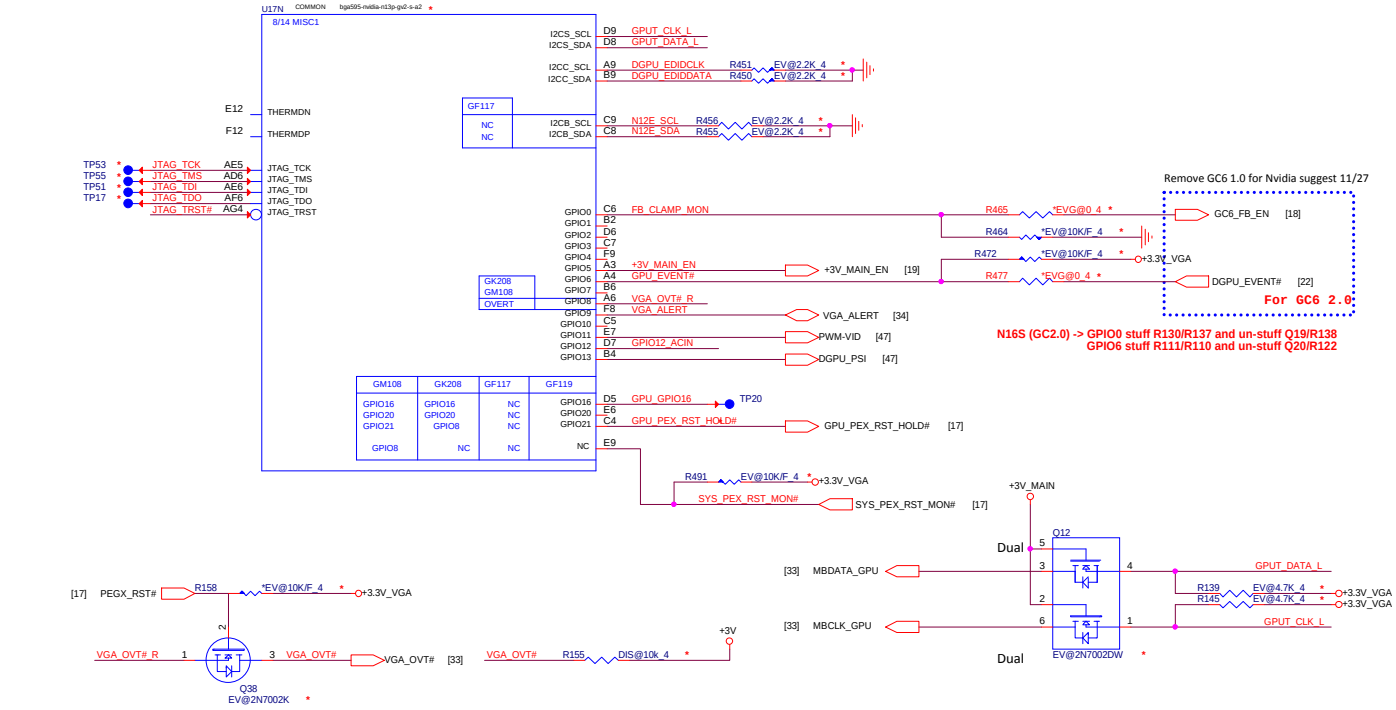

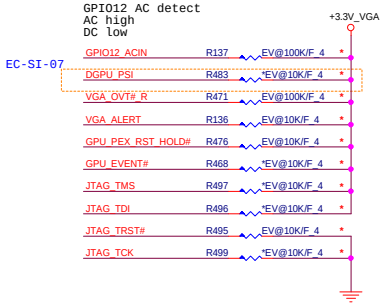

GPIO ASSIGNMENTS

GPIO	I/O	PIN	USAGE
0	IN	FB_CLAMP_MON	FB Clamp monitor (GC6 1.0)
0	OUT	GC6_FB_EN	GC6 FB Enable (GC6 2.0)
5	OUT	+3V_MAIN_EN	Enable GC6 +3V_MAIN
6	OUT	FB_CLAMP_REQ#	Active low FB Clamp toggle request (GC6 1.0)
6	IN	DGPU_EVENT#	DGPU EVENT from CPU (GC6 2.0)
8	OUT	VGA_OVT#	ACTIVE LOW THERMAL OVER TEMP
9	OUT	ALERT	ACTIVE LOW THERMAL ALERT
11	OUT	PWR_VID	GPU CORE_VDD PWM Control signal
12	IN	PWR_LEVEL	AC Power detect or power supply overdraw input
13	OUT	PSI	Phase Shedding

N16S-GT DID=0x1347 GB2B-64

```
ROM_SCLK = Stuff 4.99K pull down
ROM_SO   = Stuff 4.99K pull down
STRAP0   = Stuff 49.9K pull up
STRAP1   = NC
STRAP2   = NC
STRAP3   = NC
STRAP4   = NC
ROM_SI   = VRAM Configuration follow below table
```

N16V-GM DID=0x1299 GB2-64

```
ROM_SCLK = Stuff 4.99K pull up
ROM_SO   = Stuff 4.99K pull up.
STRAP0   = Stuff 45.3k pull up. (EDID Panel)
STRAP1   = Stuff 4.99k pull down.(Gen3 support)
STRAP2   = Stuff 10k pull up.(DID 0x1299)
STRAP3   = Stuff 4.99k pull down.(No display out)
STRAP4   = Stuff 45.3k pull down. (Gen3/max speed)
ROM_SI   = VRAM Configuration follow below table
```

N16V-GL DID=0x129A GB2-64

```
ROM_SCLK = Stuff 4.99K pull up
ROM_SO   = Stuff 4.99K pull up.
STRAP0   = Stuff 45.3k pull up. (EDID Panel)
STRAP1   = Stuff 4.99k pull down.(Gen3 support)
STRAP2   = Stuff 15k pull up.(DID 0x129A)
STRAP3   = Stuff 4.99k pull down.(No display out)
STRAP4   = Stuff 45.3k pull down. (Gen3/max speed)
ROM_SI   = VRAM Configuration follow below table
```

Note: GC6 2.0 is supported by N16x GPU in the GB2B ,GB4B-128,and GB3B-256 packages.

Logical Strap Bit Mapping

	PU-VDD	PD	QCI P/N
4.99K	1000	0000	CS24992FB26
10K	1001	0001	CS31002FB26
15K	1010	0010	CS31502FB24
20K	1011	0011	CS32002FB29
24.9K	1100	0100	CS32492FB16
30.1K	1101	0101	CS33012FB18
34.8K	1110	0110	CS33482FB06
45.3K	1111	0111	CS34532FB18

N16S-GM/-GT/-LP VRAM Configuration Table — ROM_SI

RAMCFG [3:0]	DESCRIPTION 1.5V DDR3	Vendor	Vendor P/N	ROM_SI	STN B/S	Configuration
	256Mx16					
0000	DDR3L 256Mx16, 64bit, 4Gb,1000MHz	HYNIX	H5TC4G63AFR-11C	PD 4.9K ohm	AKD5PGWTW13	Single Rank or Single Rank stuffing for Dual Rank
0001	DDR3L 256Mx16, 64bit, 4Gb,1000MHz	Micron	MT41J256M16HA-093G:E	PD 10K ohm	AKD5PZSTL05	
0010	DDR3L 256Mx16, 64bit, 4Gb,1000MHz	SAMSUNG	K4W4G1646D-BC1A	PD 15K ohm	AKD5PGWT504	Dual Rank

N16V-GM/GL VRAM Configuration Table — ROM_SI

RAMCFG [3:0]	DESCRIPTION 1.5V DDR3	Vendor	Vendor P/N	ROM_SI	STN B/S	Configuration
	256Mx16					
0001	DDR3L 256Mx16, 64bit, 4Gb,1000MHz	Micron	MT41J256M16HA-093G:E	PD 10K ohm	AKD5PZSTL05	Single Rank or Single Rank stuffing for Dual Rank
0010	DDR3L 256Mx16, 64bit, 4Gb,1000MHz	HYNIX	H5TC4G63AFR-11C	PD 15K ohm	AKD5PGWTW13	
0100	DDR3L 256Mx16, 64bit, 4Gb,1000MHz	SAMSUNG	K4W4G1646D-BC1A	PD 24.9K ohm	AKD5PGWT504	
1001	DDR3L 256Mx16, 64bit, 4Gb,1000MHz	HYNIX	H5TC4G63CFR-N0C	PU 10K ohm	AKD5PZDTW03	Dual Rank

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+3.3V_VGA [17,19,33,47,48]
+3V_MAIN [17,19]

Quanta Computer Inc.
PROJECT: HP-Molokai

Size	Document Number	Rev
	N16V-GMR (GPIO/STRAPS)	2A
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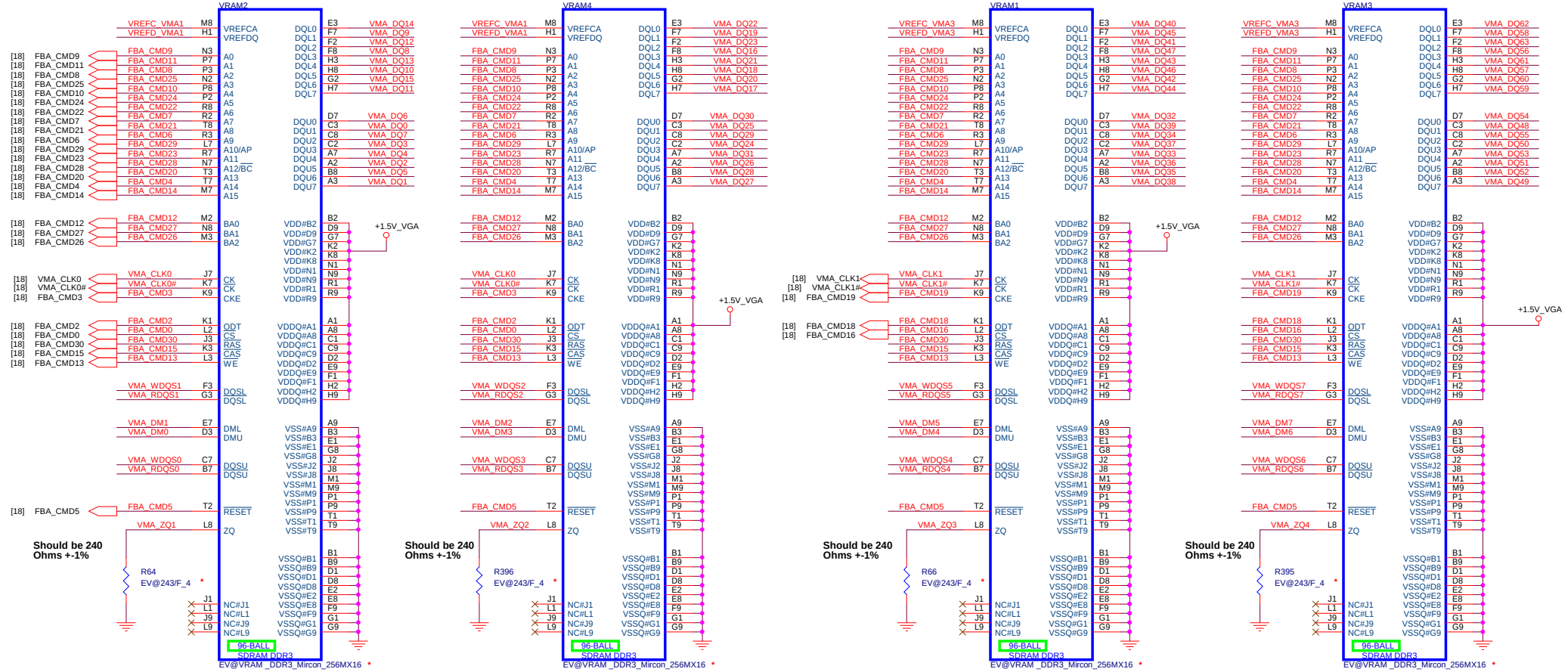
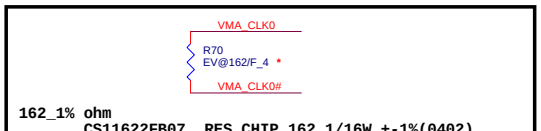
HYU 256Mx16, H5TC4G63AFR-11C STN B/S PN : AKD5PGWTW13
MIC 256Mx16, MT41J256M16HA-093G:E STN B/S PN : AKD5PZSTL05
SAM 256Mx16, K4W4G1646D-BC1A STN B/S PN : AKD5PGWT504

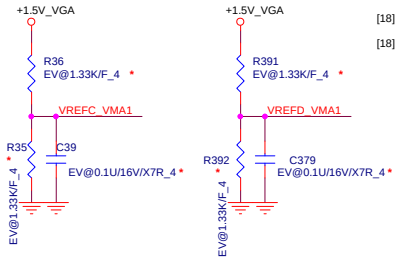
CHANNEL A: 2048MB DDR3X16

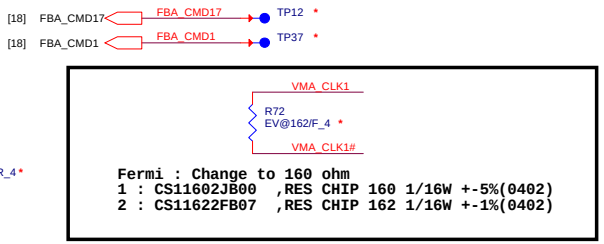
[18] VMA_DQ[63..0]
[18] VMA_DM[7..0]
[18] VMA_WDQS[7..0]
[18] VMA_RDQS[7..0]

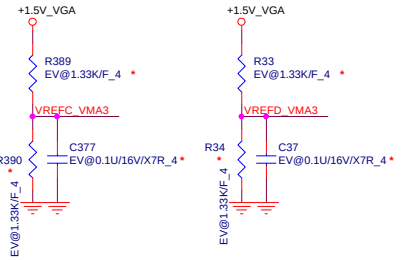
+1.05V_VGA [17,18,19,48]
+1.5V_VGA [18,48]

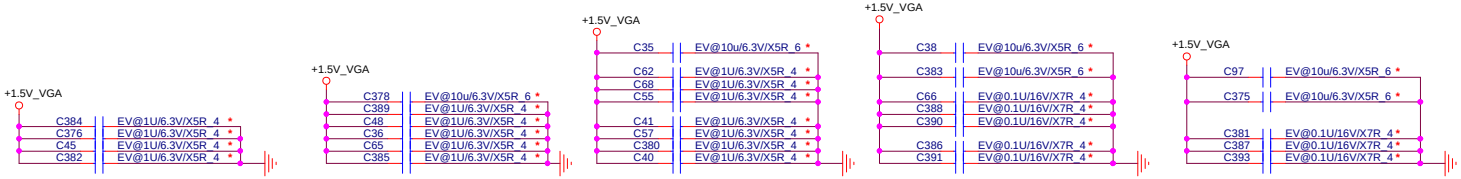












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Quanta Computer Inc.
PROJECT: HP-Molokai

Size	Document Number	Rev
	N16V-GMR DDR3 VRAM(BGA96)	1A
Date: Monday, January 18, 2016	Sheet 21 of 54	

+3V [5,15,16,17,18,19,20,23,24,25,27,28,29,31,32,33,34,35,36,44,47,48]

+3V_S5

+1.8V_S5

R255
EV@10K_4 *

R264
EV@10K_4 *

DGPU_PWROK_Q

DGPU_PWROK_Q [5]

Q19B
EV@2N7002KDW *

[19] DGPU_PWROK

DGPU_PWROK

Q19A
EV@2N7002KDW *

GND

For GC6 2.0

+3V

R516
*EV@10K_4 *

R515
*EV@10K_4 *

DGPU_EVENT# [20]

Q40B
*EV@PJT138K *

[5] DGPU_EVENT#_Q

Q40A
*EV@PJT138K *

GND

DGPU_PWROK R257 *EV@0_4 * DGPU_PWROK_Q

DGPU_HOLD_RST#_Q R154 *EV@0_4 * DGPU_HOLD_RST#

DGPU_EVENT#_Q R514 *EV@0_4 * DGPU_EVENT#

DGPU_PWR_EN_SOC# R223 *EV@0_4 * DGPU_PWR_EN#

+3V

R153
EV@10K_4 *

R162
EV@10K_4 *

DGPU_HOLD_RST# [17]

Q16B
PJT138K *

[5] DGPU_HOLD_RST#_Q

DGPU_HOLD_RST#_Q

Q16A
PJT138K *

GND

+3V

R217
EV@1K_4 *

R244
EV@10K_4 *

DGPU_PWR_EN# [48]

Q18B
PJT138K *

[5] DGPU_PWR_EN_SOC#

DGPU_PWR_EN_SOC#

Q18A
PJT138K *

GND

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Quanta Computer Inc.

PROJECT: HP-Molokai

Size	Document Number	Rev
	dGPU Level Shift	1A
Date: Monday, January 18, 2016	Sheet 22 of 54	

eDP to LVDS (RTD2136N-CG)

[5,15,16,17,18,19,20,22,24,25,27,28,29,31,32,33,34,35,36,44,47,48] +3V

Trace width of DVCC33 >40mils

+3V — L12 PBY160808T-600Y-N(60,3A) — DVCC33
C32 10U/6.3V/X5R_6
C34 0.1U/16V/X7R_4

+3V — L14 PBY160808T-600Y-N(60,3A) — AVCC33
C60 10U/6.3V/X5R_6
C56 0.1U/16V/X7R_4
C49 0.1U/16V/X7R_4 CLOSE to PIN5

SWR_V12
C27 0.1U/16V/X7R_4 CLOSE to PIN43

2136_BKLT_EN
EDID_DAT
EDID_CLK
SDA
SCL

DP input signals

[5] EDP_HPD — R55 1K/F_4
R54 *100K/F_4
eDP_HPD with pull down 100K-ohm on PCH side.

[5] INT_eDP_AUXN — C50 0.1U/16V/X7R_4
[5] INT_eDP_AUXP — C51 0.1U/16V/X7R_4

[5] INT_eDP_TXP0 — C58 0.1U/16V/X7R_4
[5] INT_eDP_TXN0 — C59 0.1U/16V/X7R_4
[5] INT_eDP_TXP1 — C52 0.1U/16V/X7R_4
[5] INT_eDP_TXN1 — C53 0.1U/16V/X7R_4

C54 0.1U/16V/X7R_4
R60 12K/F_6
CLOSE to PIN11

U3 RTD2136N-CG(QFN)

1	eDP_HPD_R	DP_HPD	
2	TEST_MODE	TEST_MODE	
3	2136_AUXN	AUX-CH_N	
4	2136_AUXP	AUX-CH_P	
5	AVCC33	DP_V33	
6		DP_GND	
7	DPD_TXP0_C	LANE0P	
8	DPD_TXN0_C	LANE0N	
9	DPD_TXP1_C	LANE1P	
10	DPD_TXN1_C	LANE1N	
11	SWR_V12	DP_V12	
12	DP_REXT	DP_REXT	
13		CIICSCL1	
14		CIICSDA1	
15		SWR_VCCK	
16		GND	
17		SWR_LX	
18		SWR_VDD	
19		GPIO/PWMOUT	
20		GPIO/PWM1	
21		GPIO/PWMIN	
22		PVCC	
23		TXE3+	
24		TXE3-	
48		EPD	
47		MIICSCL0	
46		MIICSDA0	
45		MIICSCL1	
44		MIICSDA1	
43		GPIO/PWM0/PWM0OUT	
42		VCCK	
41		TXO0-	
40		TXO0+	
39		TXO1-	
38		TXO1+	
37		TXO2-	
36		TXO2+	
35		TXOC-	
34		TXOC+	
33		TXO3-	
32		TXO3+	
31		TXE0-	
30		TXE0+	
29		TXE1-	
28		TXE1+	
27		TXE2-	
26		TXE2+	
25		TXEC-	
		TXEC+	

RTD2136N

ODD_CH
LVDS_TX_ON0 [24]
LVDS_TX_OP0 [24]
LVDS_TX_ON1 [24]
LVDS_TX_OP1 [24]
LVDS_TX_ON2 [24]
LVDS_TX_OP2 [24]
LVDS_TXCLK_ON [24]
LVDS_TXCLK_OP [24]
LVDS_TX_ON3 [24]
LVDS_TX_OP3 [24]

EVEN_CH
LVDS_TX_EN0 [24]
LVDS_TX_EP0 [24]
LVDS_TX_EN1 [24]
LVDS_TX_EP1 [24]
LVDS_TX_EN2 [24]
LVDS_TX_EP2 [24]
LVDS_TXCLK_EN [24]
LVDS_TXCLK_EP [24]
LVDS_TX_EN3 [24]
LVDS_TX_EP3 [24]

ISP_SCL
ISP_SDA
SWR_V12
PCH_DPST_PWM
2136_LVDS_PWREN
2136_VADJ

DVCC33
C23 0.1U/16V/X7R_4
CLOSE to PIN22

Trace width of SWR_V12 and SWR_LX >60mils
close to Pin17 within 200mils
SWR_V12 — L13 *short_8 — SWR_LX
C42 0.1U/16V/X7R_4
C43 22U/6.3V/X5R_6

Trace width of DVCC33 >40mils
DVCC33
C33 0.1U/16V/X7R_4
C25 22U/6.3V/X5R_6

C5023/C5024 close to Pin18 within 200mils

SWR MODE /LDO MODE

	4.7-uH	0 Olm
SWR_182mW	Connect	NC
LDO_357mW	NC	Connect

GPIO & TESTing signals

TEST_MODE
[46] 2136_VADJ — 2136_VADJ
[24] 2136_LVDS_PWREN — 2136_LVDS_PWREN
[24] 2136_BKLT_EN — 2136_BKLT_EN
[5] PCH_DPST_PWM — PCH_DPST_PWM
R56 100K/F_4
R18 100K/F_4

2136_VADJ
C29 100P/50V/NPO_4
R26 100K/F_4

In System Programing

slave address=0xA8

DVCC33 DVCC33
R58 4.7K/F_4
R50 4.7K/F_4
[33] LVDS_SCL — R57 *short_4ISP_SCL
[33] LVDS_SDA — R49 *short_4ISP_SDA

RTD2136N: Mode Selestion		MODE_CFG0 (PIN47)	
		0	1
MODE_CFG1(PIN48)	0	X	EP MODE
	1	ROM ONLY MODE	EEPROM MODE

Program EEPROM (F/W.EDID)

slave address=0xA8

DVCC33 DVCC33
R19 *4.7K/F_4
R16 4.7K/F_4
SCL SDA
MODE_CFG1(PIN48) MODE_CFG0 (PIN47)

DVCC33
C26 *0.1U/16V/X7R_4
Pin_45 EDID_DAT R23 *short_4FW_ROM_SDA
Pin_46 EDID_CLK R22 *short_4FW_ROM_SCL
U5 *M24C64 (VCC WP SCL A2 SDA A1 GND A0)

The Program EEPROM must be 2 byte addressing device

DDC

DVCC33 DVCC33
R38 4.7K/F_4
R31 *4.7K/F_4
Pin_46 EDID_CLK EDID_DAT
Pin_45
R39 *4.7K/F_4
R32 4.7K/F_4
SCL
R44 4.7K/F_4

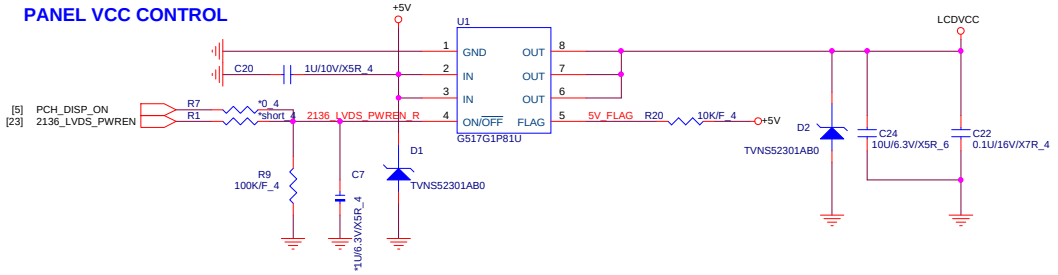
Reserve pull down for EPMODE

HP Restricted Secret

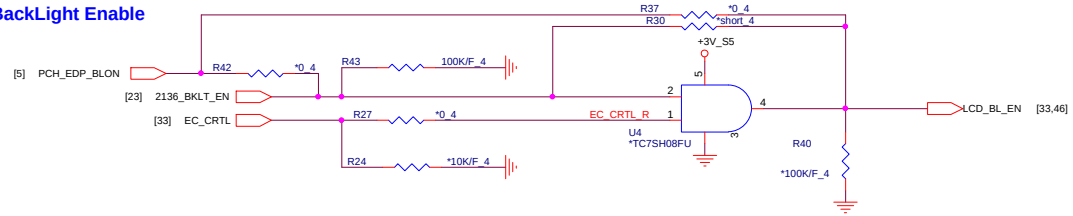
Quanta Computer Inc.
PROJECT: HP-Molokai

Size	Document Number	Rev
Custom	LVDS converter RTD2136	1A
Date: Monday, January 18, 2016	Sheet 23 of 54	

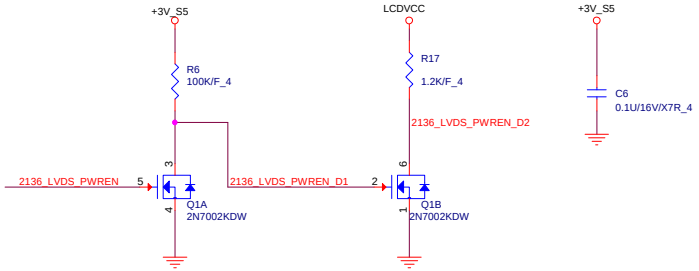
PANEL VCC CONTROL



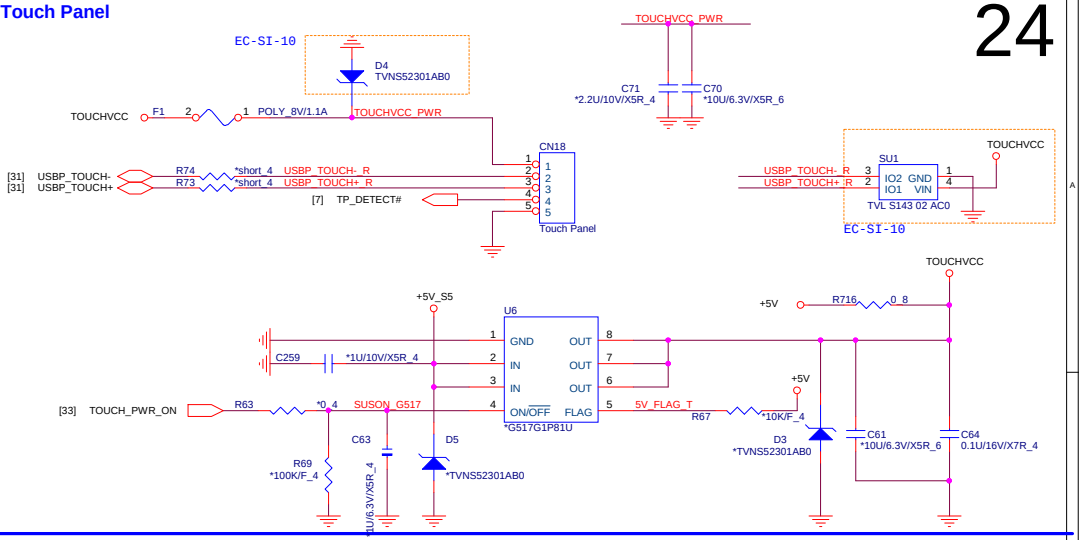
BackLight Enable



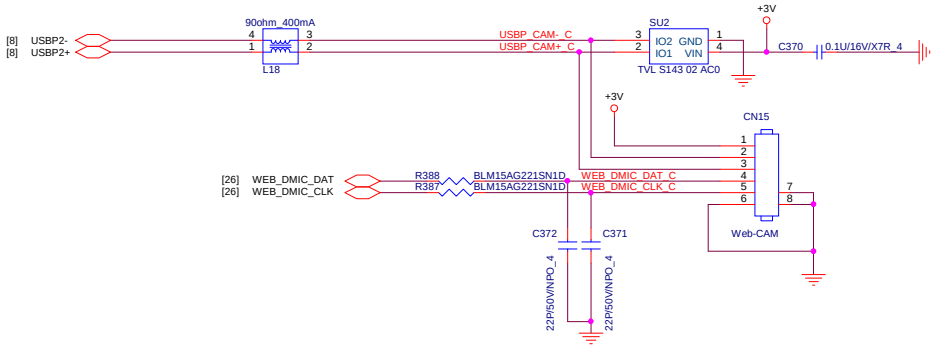
LCDVCC Discharge Circuit

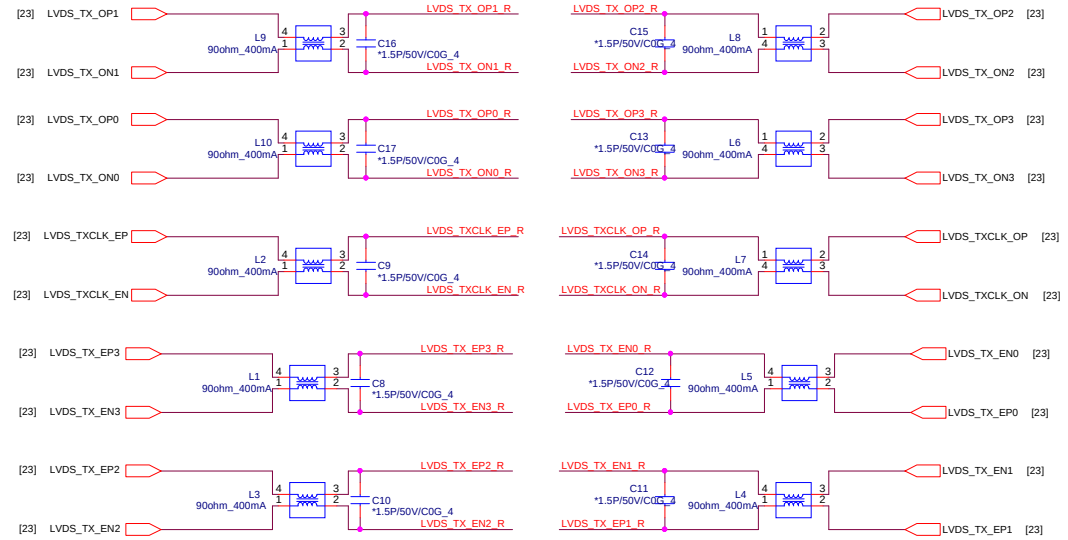


Touch Panel

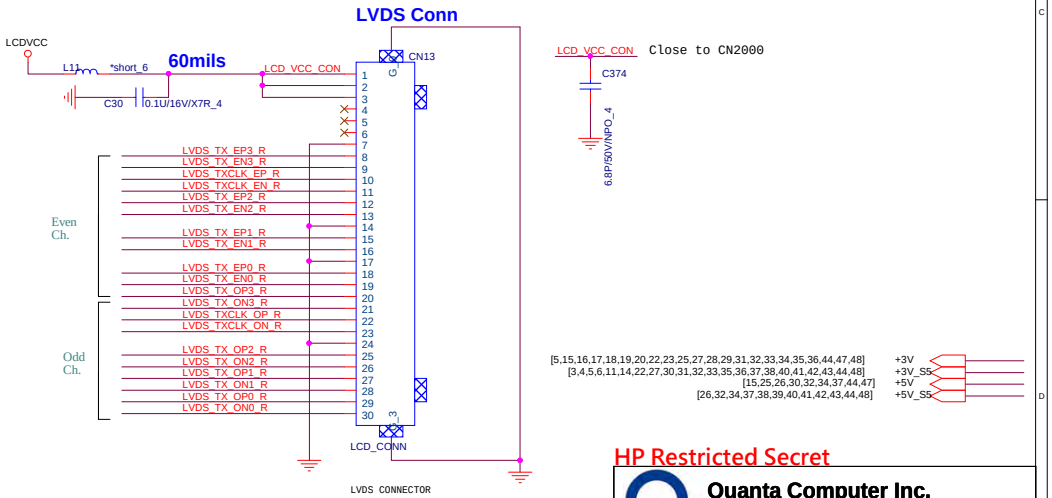


CCD CONN





LVDS Conn



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Quanta Computer Inc.

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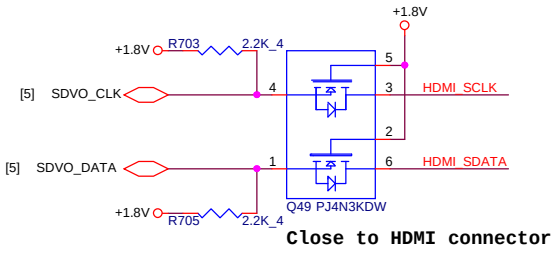
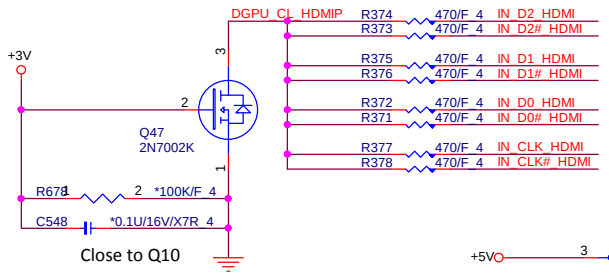
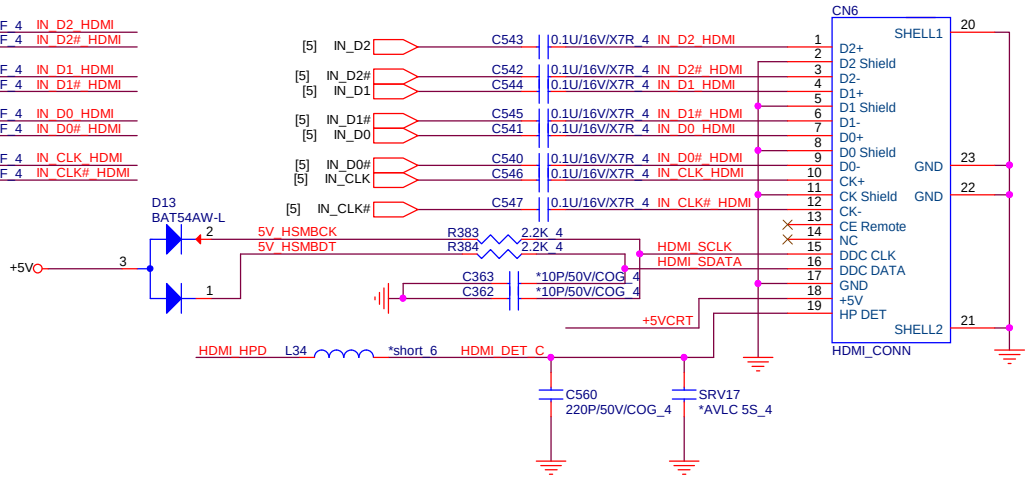
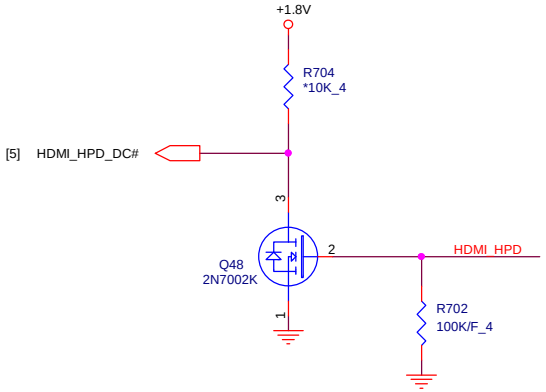
HDMI CONN

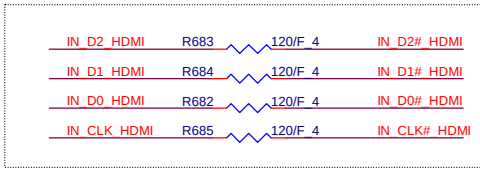


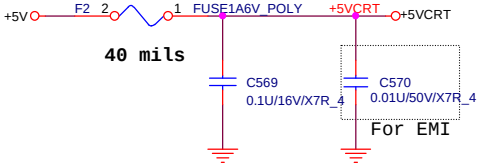




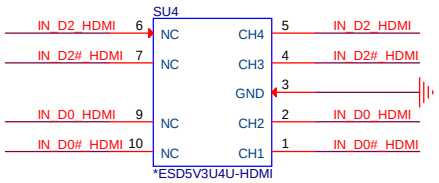


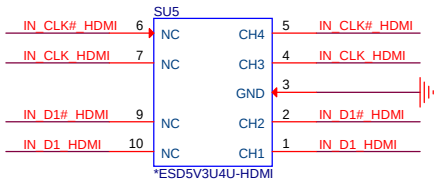
For EMI

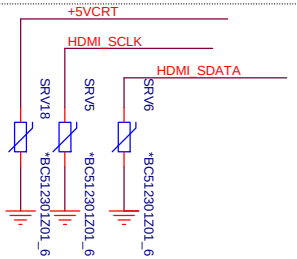




For ESD







Layout note:Place close to HDMI Conn

[5,6,27,29,30,34,36,40] +1.8V
[5,15,16,17,18,19,20,22,23,24,27,28,29,31,32,33,34,35,36,44,47,48] +3V
[15,24,26,30,32,34,37,44,47] +5V

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Quanta Computer Inc.

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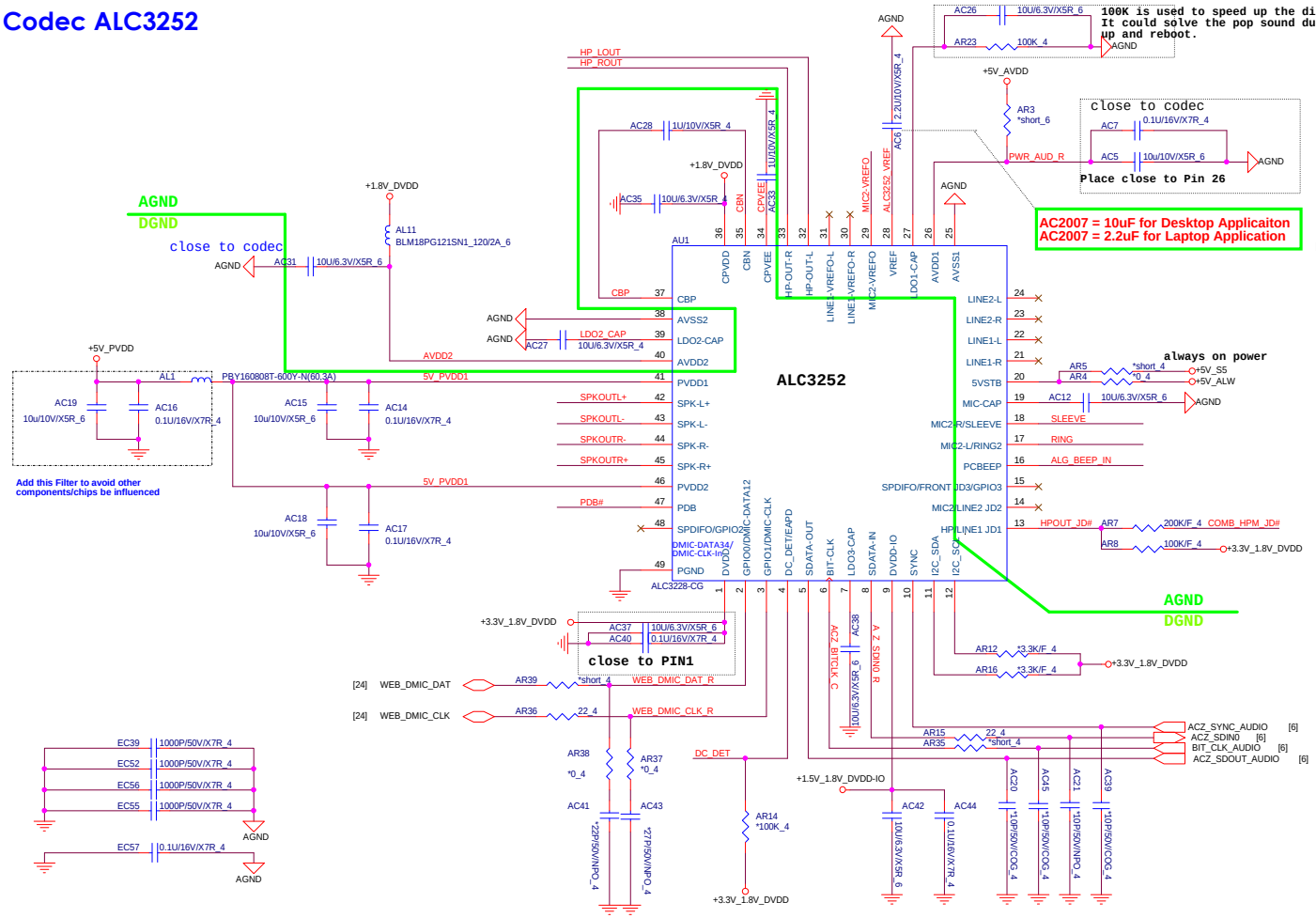
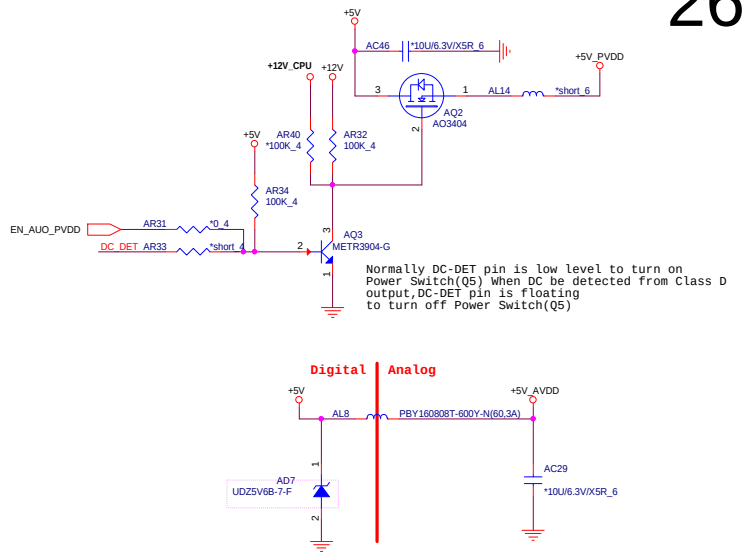
Codec ALC3252

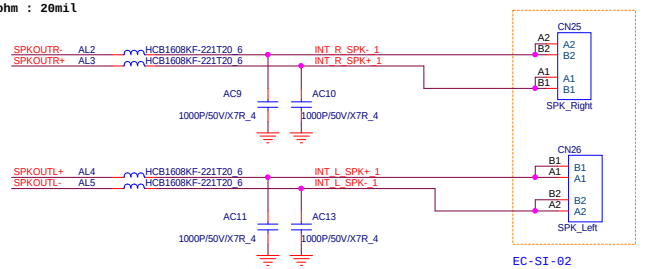


CODEC 5V POWER

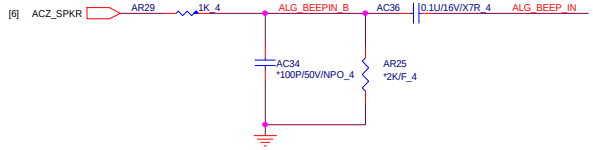


Internal Speaker (2W, 4 ohm)

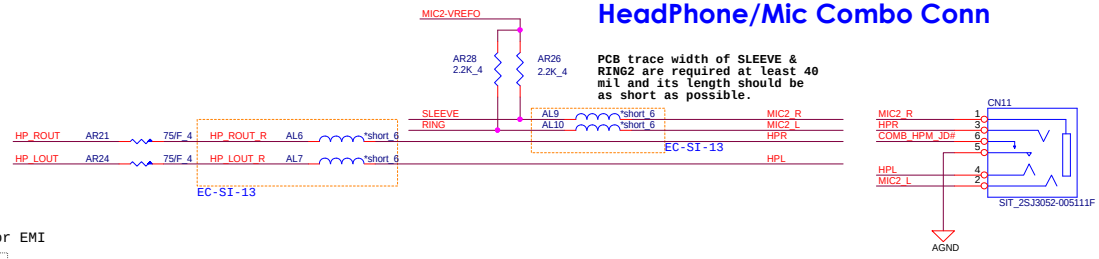
Trace width for SPK-L+/SPK-L-/SPK-R+/SPK-RSpeaker 4 ohm : 40mil
Speaker 8 ohm : 20mil



PC BEEP



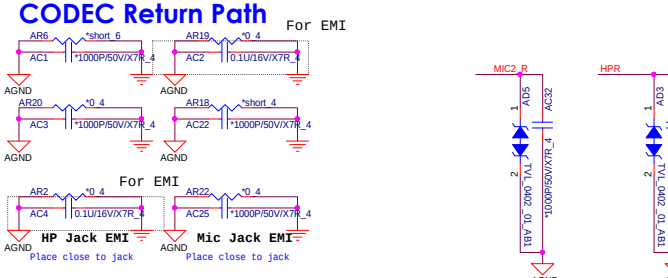
HeadPhone/Mic Combo Conn

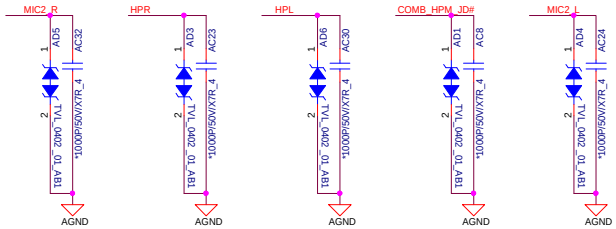


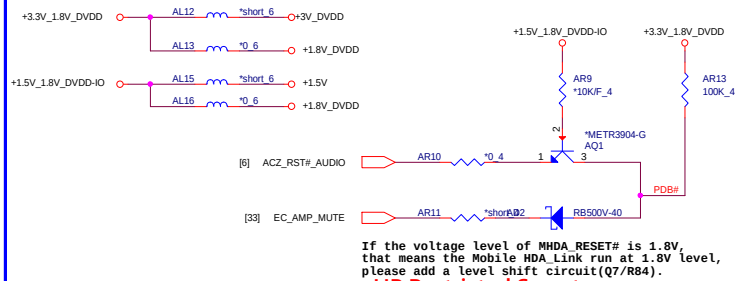
Normal Open

HP-JD attached to HP left channel for reduce plug-in "bo" noise

CODEC Return Path







HP Restricted Secret

[15,24,25,30,32,34,37,44,47] +5V
[3] +3V
[9,11,33,38] +3V_ALW
[11,40] +1.5V
[37,48] +12V_CPU

Quanta Computer Inc.

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Custom	Audio Codec(ALC3252)	2A
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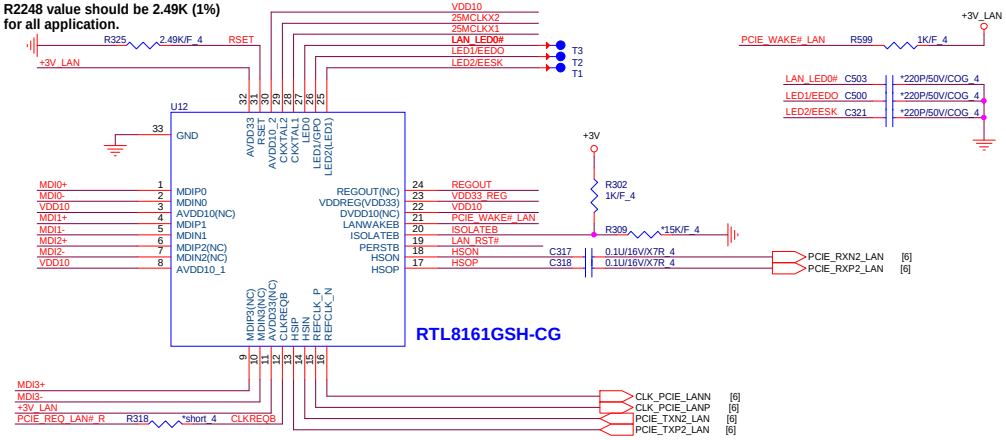
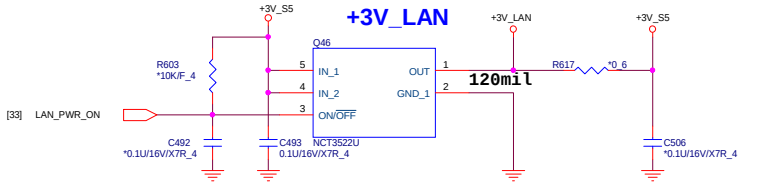
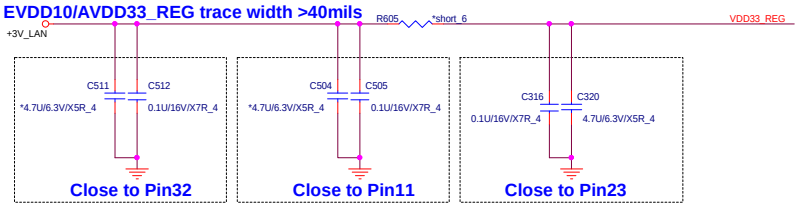
R2248 value should be 2.49K (1%)
for all application.

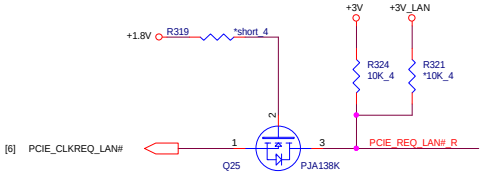


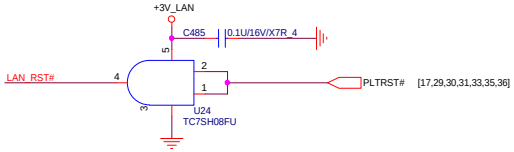
+3V_LAN



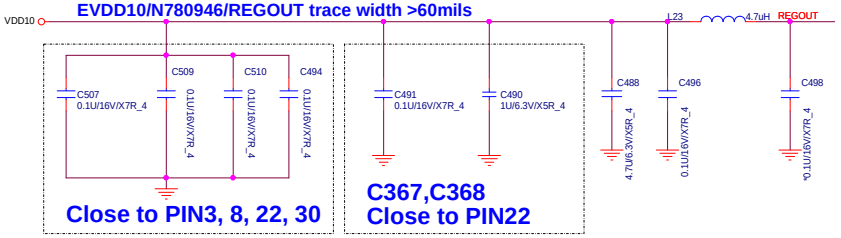
EVDD10/AVDD33_REG trace width >40mils



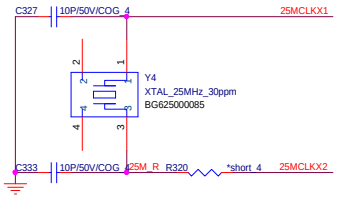


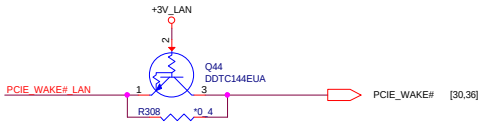


EVDD10/N780946/REGOUT trace width >60mils

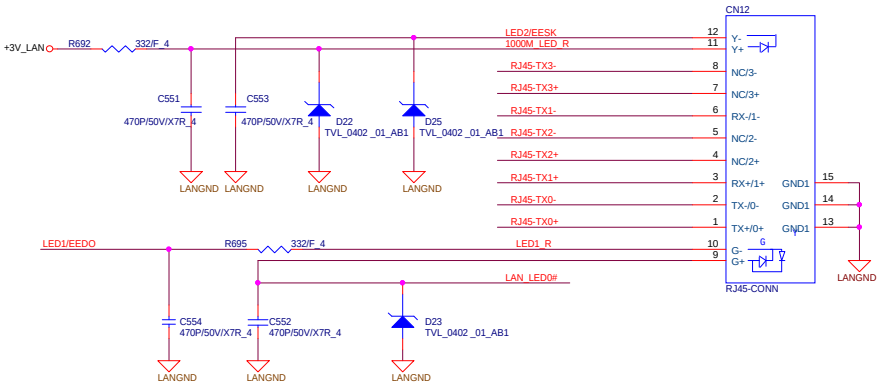


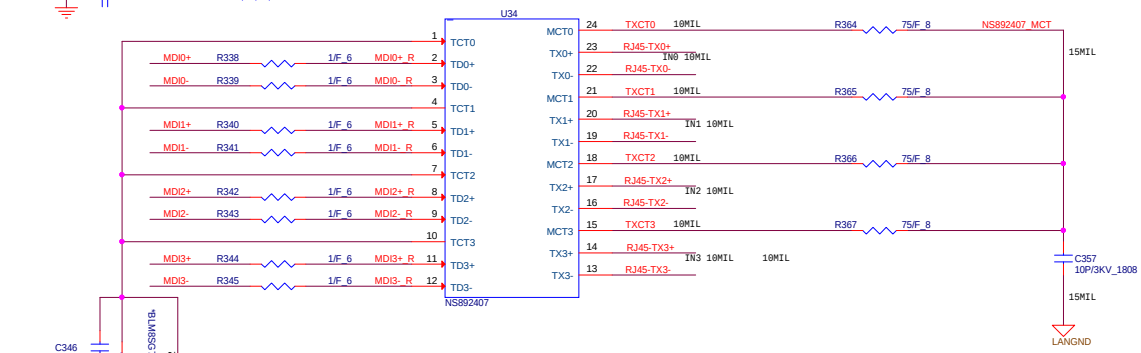
X'tal 25MHz

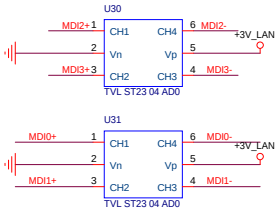


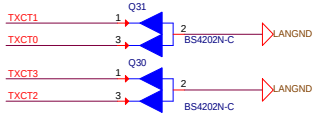


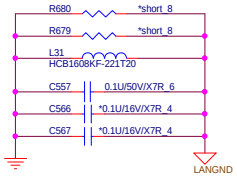
LAN Conn











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Quanta Computer Inc.
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[5,15,16,17,18,19,20,22,23,24,25,27,29,31,32,33,34,35,36,44,47,48] +3V

HDD REDRIVER

C521,C523,C525,C527 CLOSE TO RE-DRIVER IC

[6] SATA_TXP0 — C527 R352 *SATA@0.01U/50V/X7R_4 *SATA@0_4 — SATA_TX0_P_RE — SATA_TX0_P_CON [30]
[6] SATA_TXN0 — C525 R351 *SATA@0.01U/50V/X7R_4 *SATA@0_4 — SATA_TX0_N_RE — SATA_TX0_N_CON [30]
[6] SATA_RXN0 — C523 R346 *SATA@0.01U/50V/X7R_4 *SATA@0_4 — SATA_RX0_N_RE — SATA_RX0_N_CON [30]
[6] SATA_RXP0 — C521 R337 *SATA@0.01U/50V/X7R_4 *SATA@0_4 — SATA_RX0_P_RE — SATA_RX0_P_CON [30]

3 PAD DESIGN

+3V — R644 *SATA@0_4 — +3V_HDD_REDRIVER

+3V_HDD_REDRIVER

C534 *SATA@4.7U/6.3V/X5R_4
C532 *SATA@0.1U/16V/X7R_4
C518 *SATA@4.7U/6.3V/X5R_4
C519 *SATA@0.1U/16V/X7R_4

U33 *SATA@PS8527BTQFN20GTR2-A2

6, 16	VCC	REXT	10 U21_REXT R657 *SATA@4.99K/F_4
HDD_A_EQ1 18	A_EQ1	B_EQ2	17 HDD_B_EQ2
HDD_A_EQ2 19	A_EQ2	B_EQ1	20 HDD_B_EQ1
SATA_TX0_P_RE 1	IN0P	OUT0P	15 SATA_TXP0+_R [30]
SATA_TX0_N_RE 2	IN0M	OUT0M	14 SATA_TXN0-_R [30]
SATA_RX0_N_RE 4	OUT1N	IN1N	12 SATA_RXN0-_R [30]
SATA_RX0_P_RE 5	OUT1P	IN1P	11 SATA_RXP0+_R [30]
+3V R654 *SATA@10K/F_4 U21_EN 7	EN	GND	3, 13, 22
+3V R642 *SATA@4.7K_4 U21_A_DE 9	A_DE	EP_AGND	23, 24
R641 *SATA@4.7K_4 U21_B_DE 8	B_DE		21, 25

R655 *SATA@4.7K_4 R656 *SATA@4.7K_4

+3V

R673 R672 R674 R671 *SATA@4.7K_4
HDD_A_EQ1
HDD_A_EQ2
HDD_B_EQ2
HDD_B_EQ1
R667 R666 R668 R665 *SATA@4.7K_4

ODD REDRIVER

C531,C533,C537,C538 CLOSE TO RE-DRIVER IC

[6] SATA_TXP1 — C531 R664 *SATA@0.01U/50V/X7R_4 *SATA@short_4 — SATA_TX1_P_RE — SATA_TX1_P_CON [30]
[6] SATA_TXN1 — C533 R669 *SATA@0.01U/50V/X7R_4 *SATA@short_4 — SATA_TX1_N_RE — SATA_TX1_N_CON [30]
[6] SATA_RXN1 — C537 R670 *SATA@0.01U/50V/X7R_4 *SATA@short_4 — SATA_RX1_N_RE — SATA_RX1_N_CON [30]
[6] SATA_RXP1 — C538 R675 *SATA@0.01U/50V/X7R_4 *SATA@short_4 — SATA_RX1_P_RE — SATA_RX1_P_CON [30]

3 PAD DESIGN

+3V — R659 *SATA@0_4 — +3V_ODD_REDRIVER

+3V_ODD_REDRIVER

C529 *SATA@4.7U/6.3V/X5R_4
C528 *SATA@0.1U/16V/X7R_4
C351 *SATA@4.7U/6.3V/X5R_4
C352 *SATA@0.1U/16V/X7R_4

U35 *SATA@PS8527BTQFN20GTR2-A2

6, 16	VCC	REXT	10 U19_REXT *SATA@4.99K/F_4 R360
ODD_A_EQ1 18	A_EQ1	B_EQ2	17 ODD_B_EQ2
ODD_A_EQ2 19	A_EQ2	B_EQ1	20 ODD_B_EQ1
SATA_TX1_P_RE 1	IN0P	OUT0P	15 SATA_TXP1+_R [30]
SATA_TX1_N_RE 2	IN0M	OUT0M	14 SATA_TXN1-_R [30]
SATA_RX1_N_RE 4	OUT1N	IN1N	12 SATA_RXN1-_R [30]
SATA_RX1_P_RE 5	OUT1P	IN1P	11 SATA_RXP1+_R [30]
+3V R370 *SATA@10K/F_4 U19_EN 7	EN	GND	3, 13, 22
+3V R368 *SATA@4.7K_4 U19_A_DE 9	A_DE	EP_AGND	23, 24
R369 *SATA@4.7K_4 U19_B_DE 8	B_DE		21, 25

R362 *SATA@4.7K_4 R361 *SATA@4.7K_4

+3V

R661 R662 R660 R663 *SATA@4.7K_4
ODD_A_EQ1
ODD_A_EQ2
ODD_B_EQ2
ODD_B_EQ1
R355 R356 R354 R357 *SATA@4.7K_4

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Quanta Computer Inc.
PROJECT: HP-Molokai

Size	Document Number	Rev
Custom	SATA RE-DEIVER	1A
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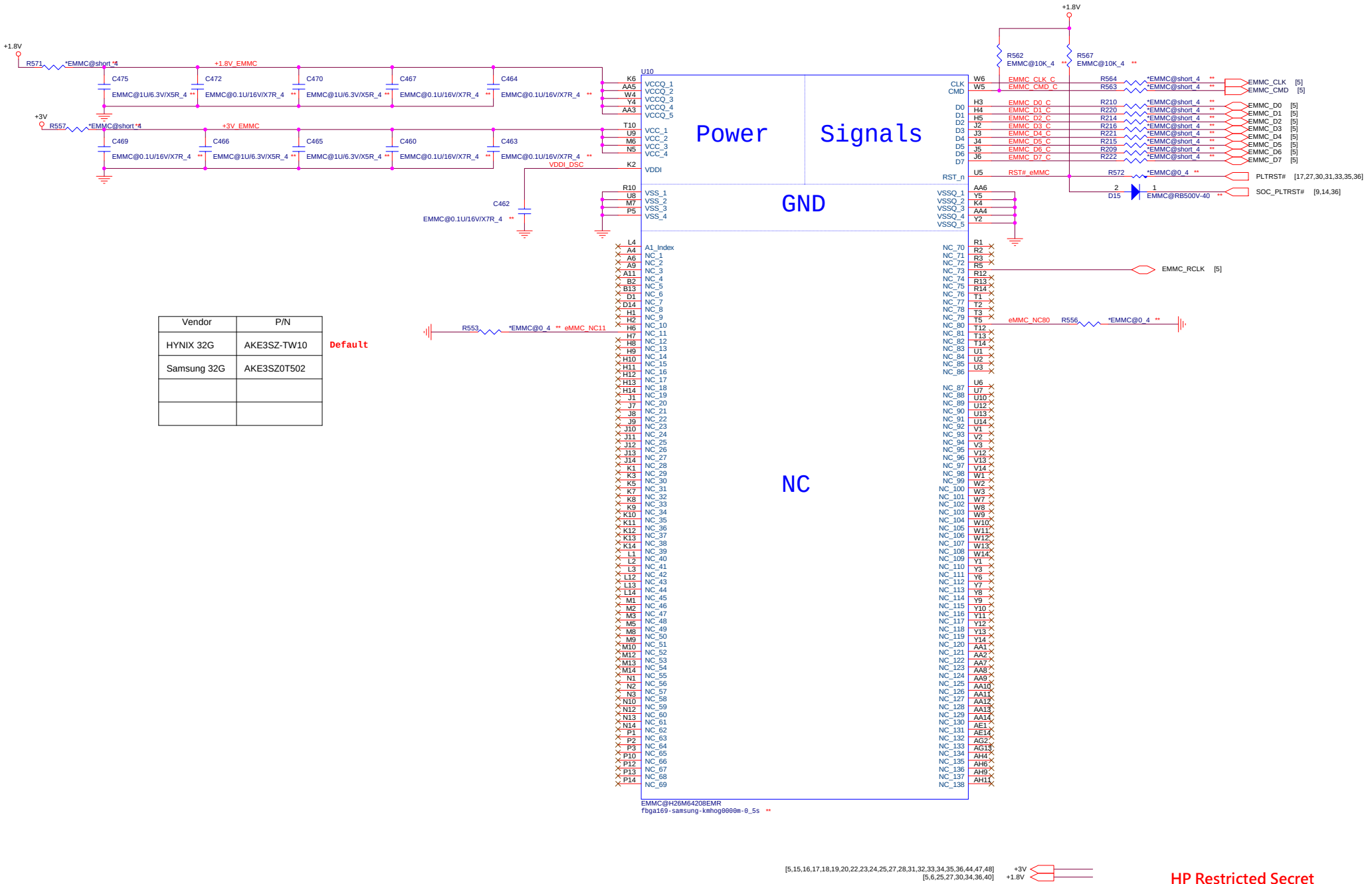
eMMC



Vendor	P/N	
HYNIX 32G	AKE3SZ-TW10	Default
Samsung 32G	AKE3SZ0T502	

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Quanta Computer Inc.

PROJECT: HP-Molokai

Size	Document Number	Rev
Custom	eMMC	1A

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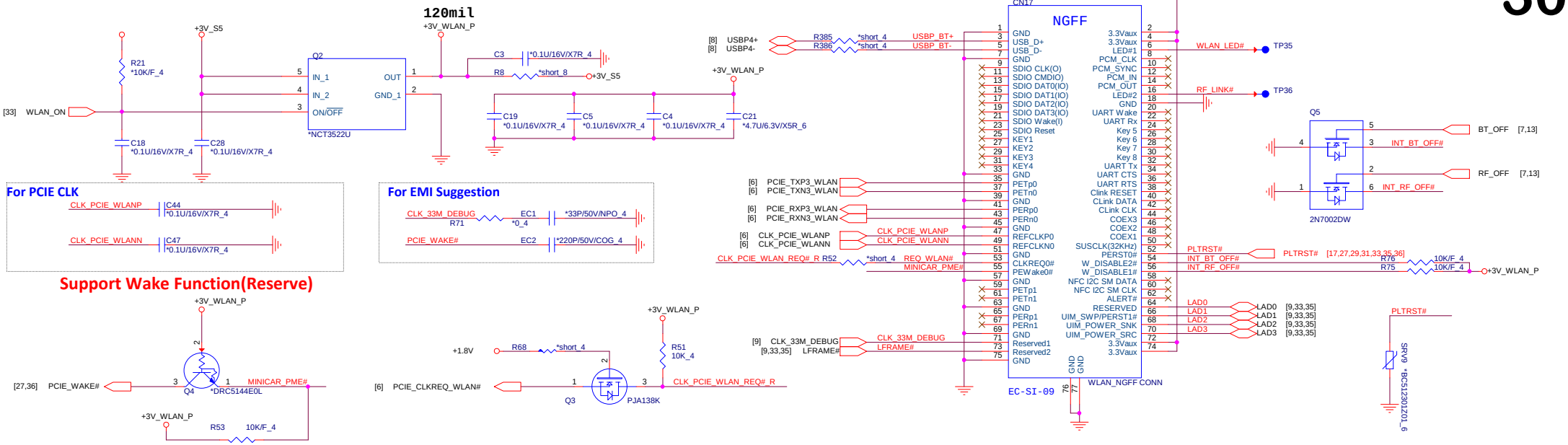
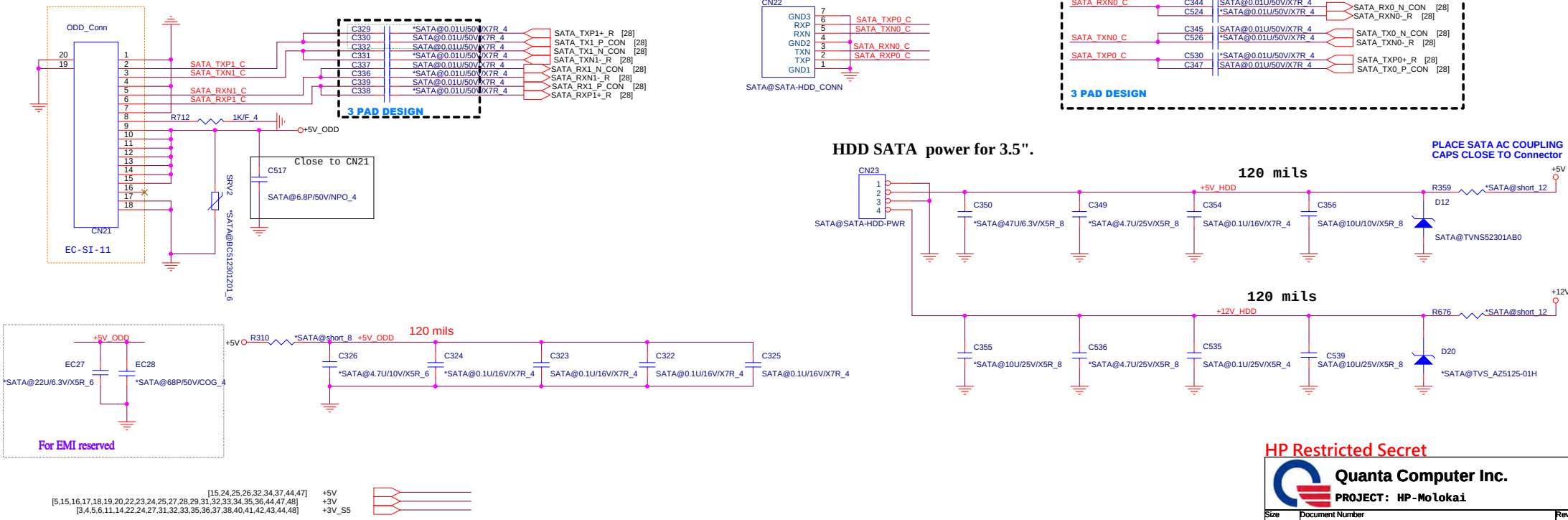
Mini Card WLAN/BT(Option) PCIe M.2_power(S5)



ODD



[15,24,25,26,32,34,37,44,47] +5V
[5,15,16,17,18,19,20,22,23,24,25,27,28,29,31,32,33,34,35,36,44,47,48] +3V
[3,4,5,6,11,14,22,24,27,31,32,33,35,36,37,38,40,41,42,43,44,48] +3V_S5

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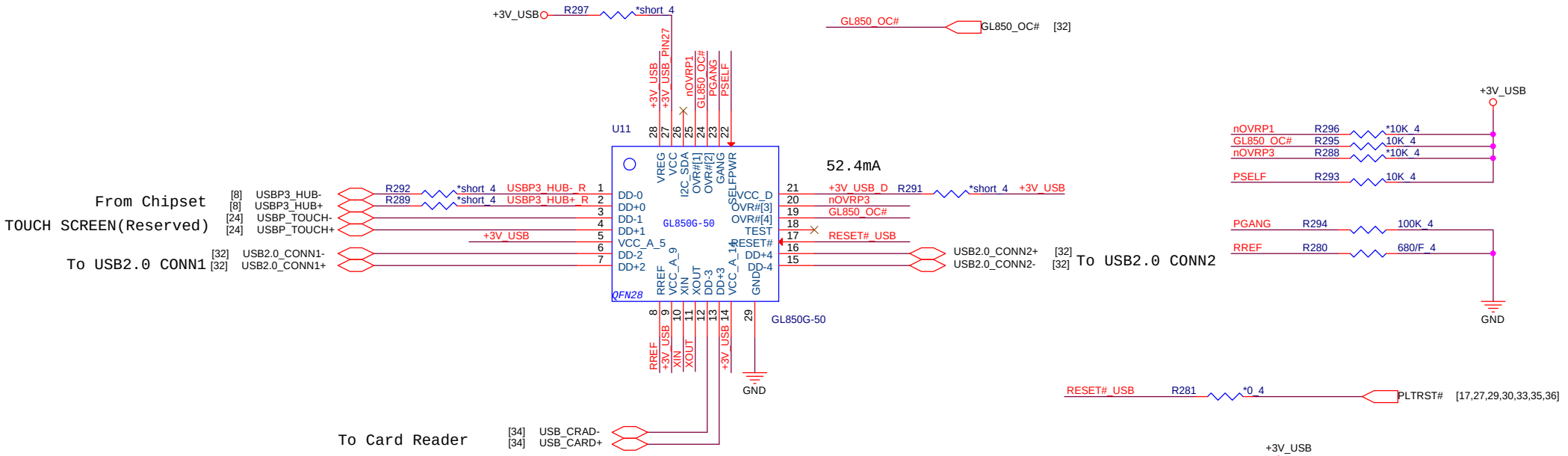
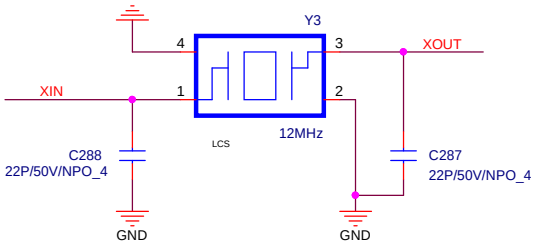
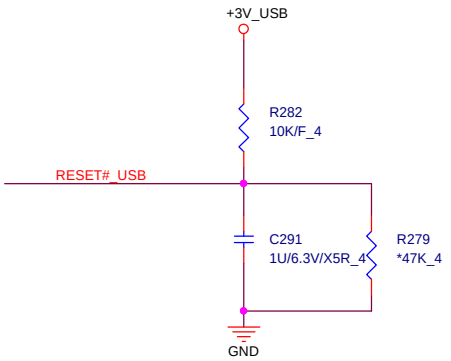
Quanta Computer Inc.
PROJECT: HP-Molokai

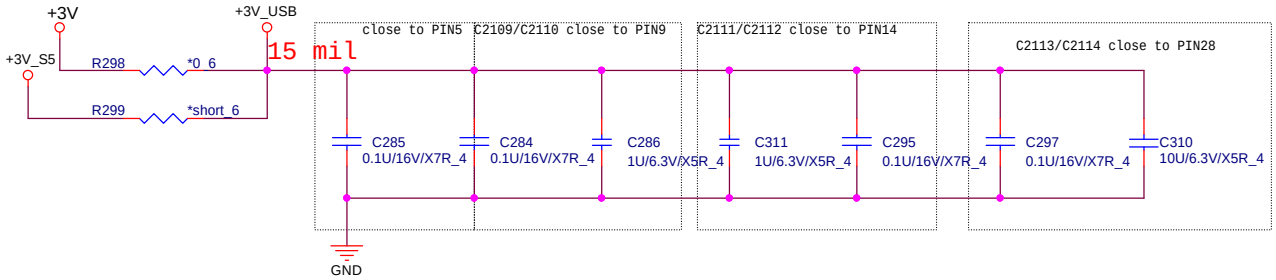
Size	Document Number	Rev
Custom	WLAN(NGFF)/HDD/ODD	2A
Date: Monday, January 18, 2016	Sheet 30 of 54	

[5,15,16,17,18,19,20,22,23,24,25,27,28,29,32,33,34,35,36,44,47,48] +3V
[3,4,5,6,11,14,22,24,27,30,32,33,35,36,37,38,40,41,42,43,44,48] +3V_S5









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Quanta Computer Inc.
PROJECT: HP-Molokai

Size	Document Number	Rev
Custom	USB20 HUB GL850G-50	1A
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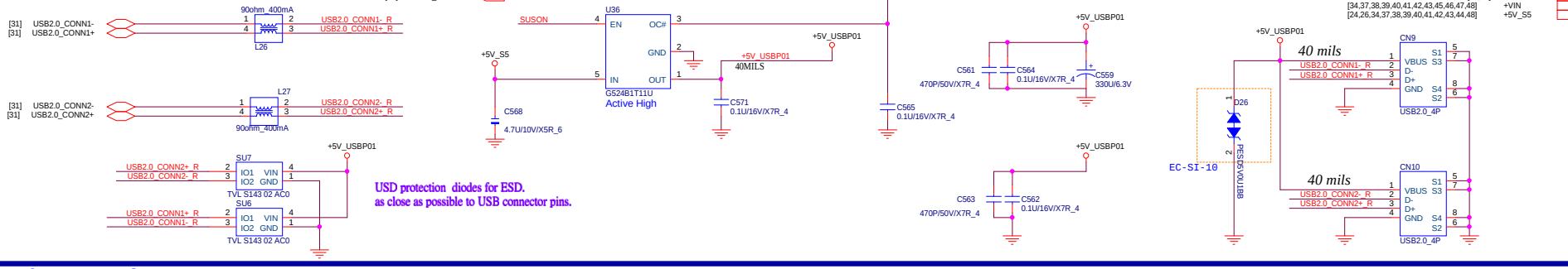
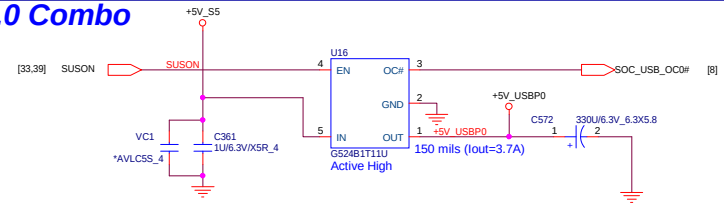
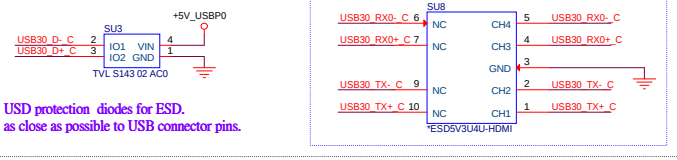
USB 2.0



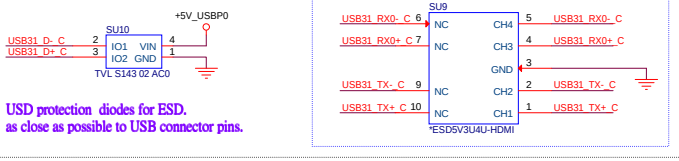
USB 2.0/3.0 Combo

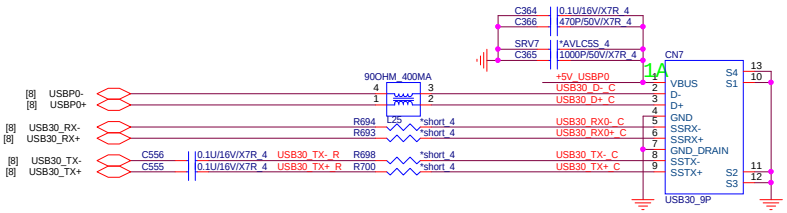


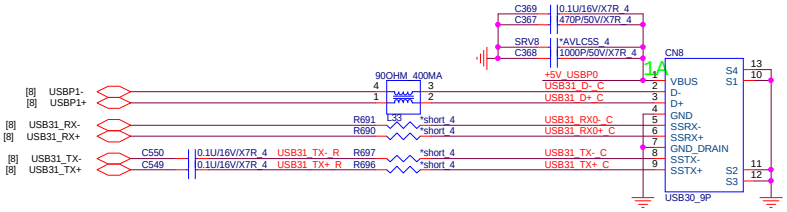
For ESD

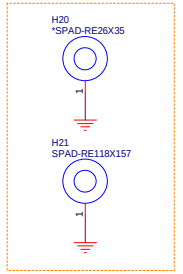


For ESD

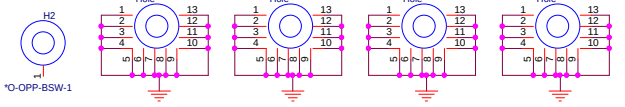




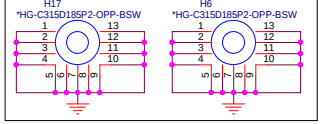




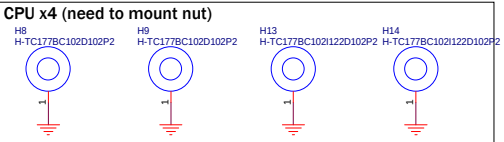
outline x5



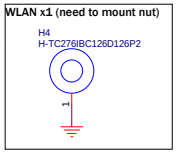
Orientation x2



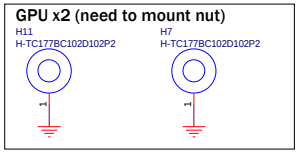
CPU x4 (need to mount nut)



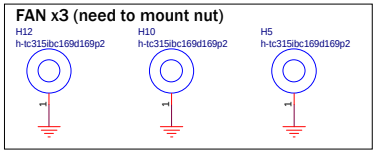
WLAN x1 (need to mount nut)



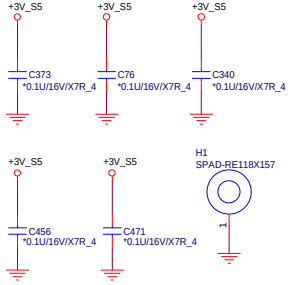
GPU x2 (need to mount nut)

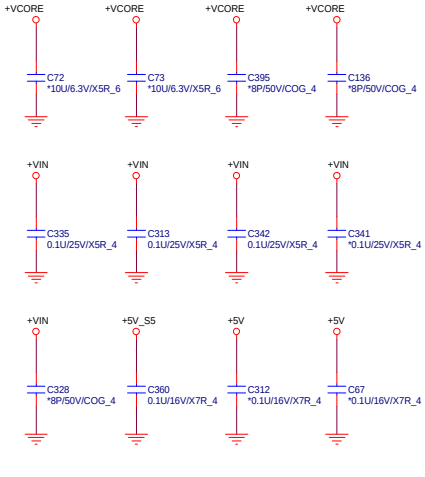


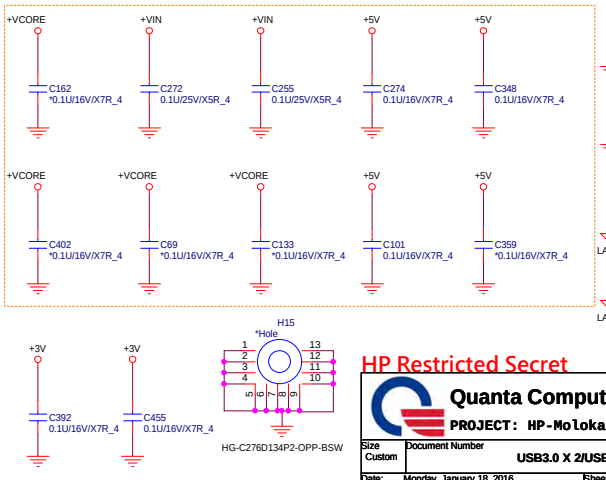
FAN x3 (need to mount nut)



HOLE/RF/EMI







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Quanta Computer Inc.

PROJECT: HP-Molokai

Size	Document Number	Rev
Custom	USB3.0 X 2/USB2.0 X 2	2A

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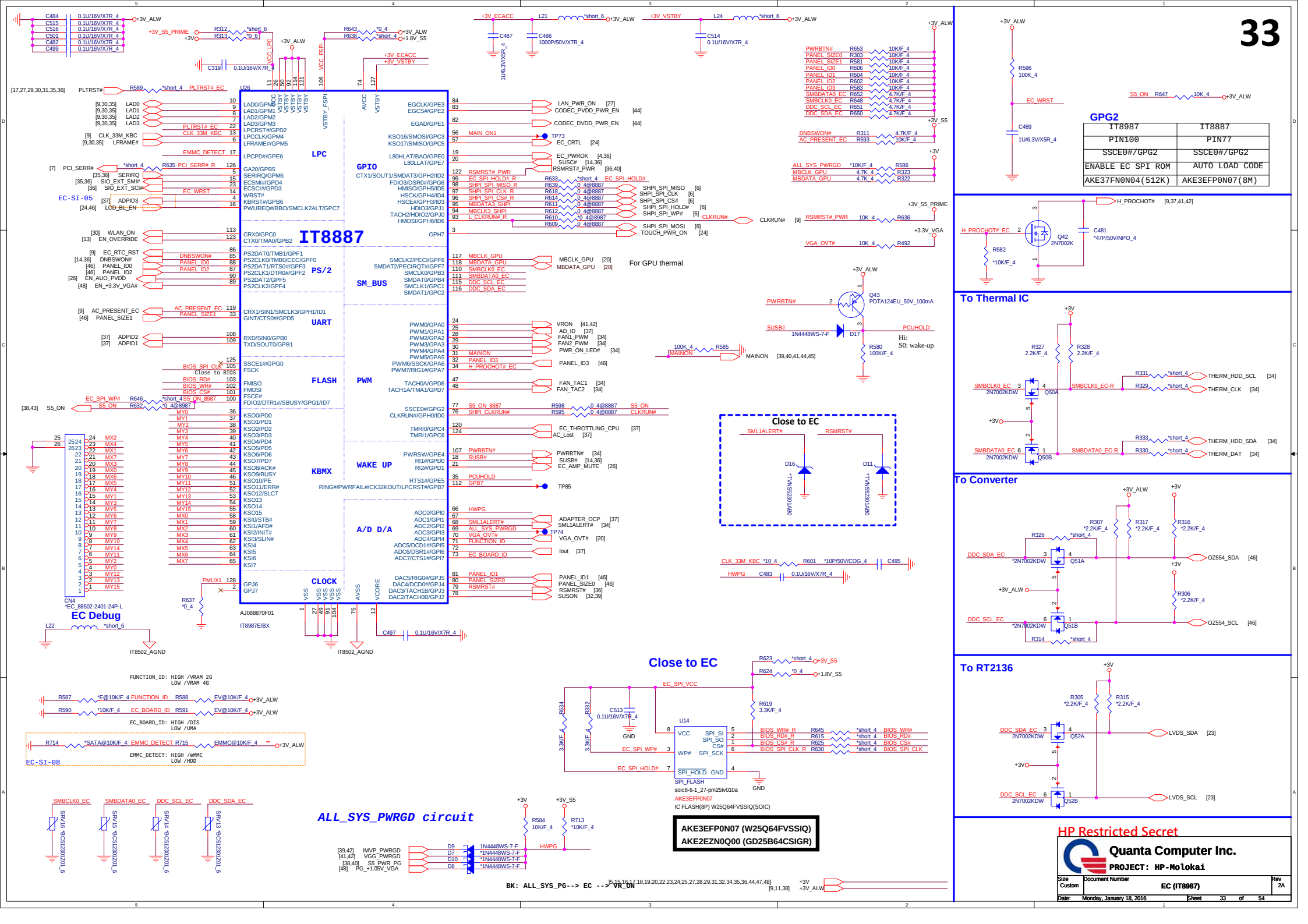
IT8887
LPC
GPIO
PS/2
SM_BUS
UART
FLASH
PWM
KBMX
WAKE UP
A/D D/A
CLOCK
EC-SI-05
EC-SI-08
EC Debug
For GPU thermal
Close to EC
Close to EC
ALL_SYS_PWRGD circuit
To Thermal IC
To Converter
To RT2136
GPG2
IT8987 | IT8887
PIN100 | PIN77
SSCE0#/GPG2 | SSCE0#/GPG2
ENABLE EC SPI ROM | AUTO LOAD CODE
AKE37FN0N04(512K) | AKE3EFP0N07(8M)
AKE3EFP0N07 (W25Q64FVSSIQ)
AKE2EZN0Q00 (GD25B64CSIGR)
IC FLASH(8P) W25Q64FVSSIQ(SOIC)
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Quanta Computer Inc.
PROJECT: HP-Molokai
EC (IT8987)
Monday, January 18, 2016
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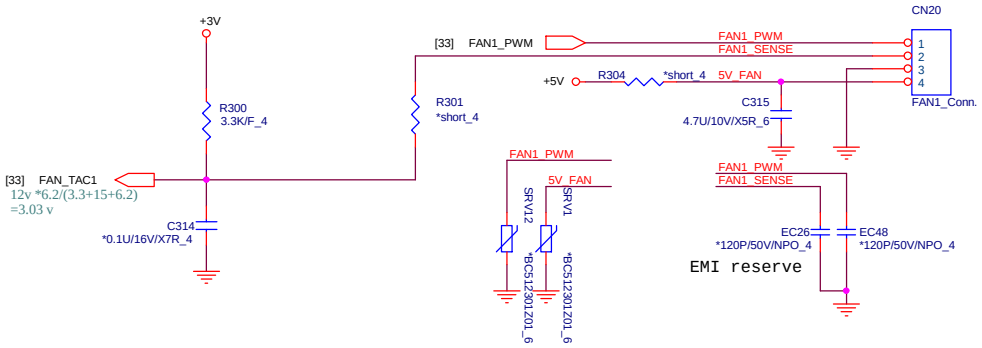
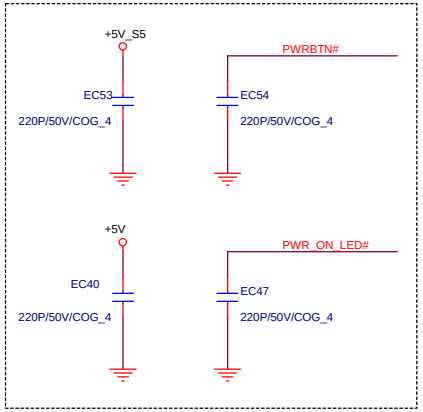
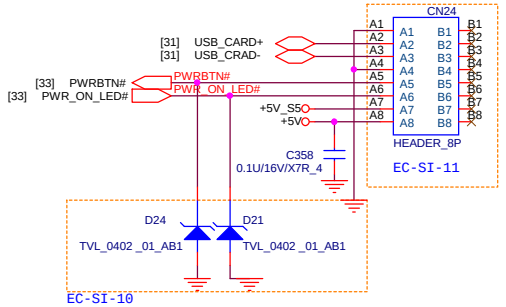
SYSTEM FAN

[5,15,16,17,18,19,20,22,23,24,25,27,28,29,31,32,33,35,36,44,47,48] +3V
[15,24,25,26,30,32,37,44,47] +5V
[24,26,32,37,38,39,40,41,42,43,44,48] +5V_S5



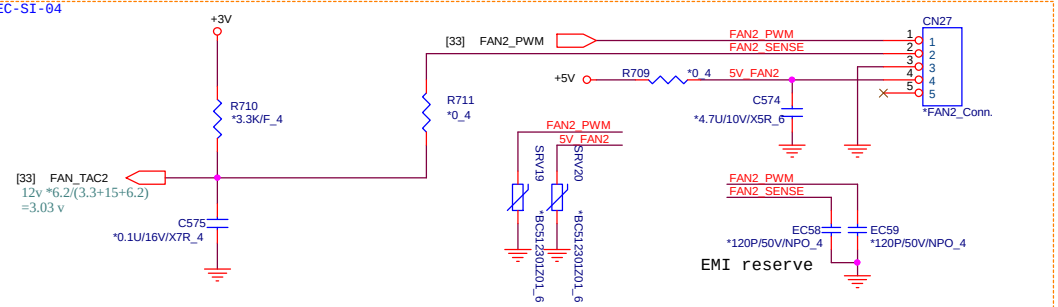
Card reader/Power button conn



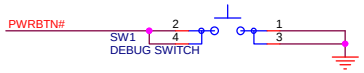


34

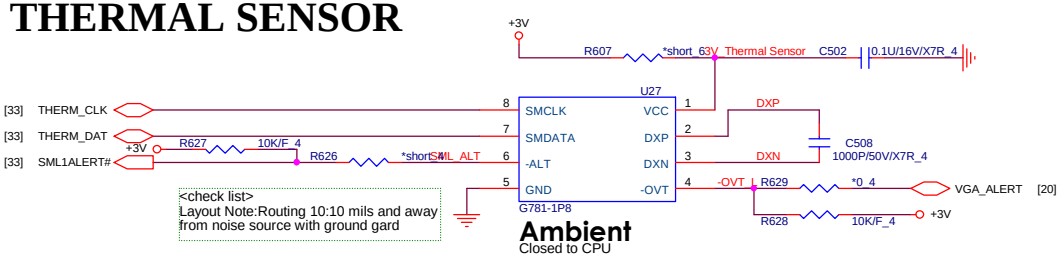
EC-SI-04



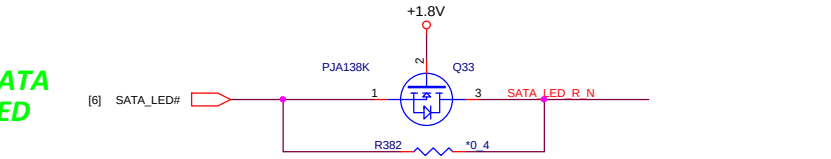
SW1 For Debug.MP will remove it.

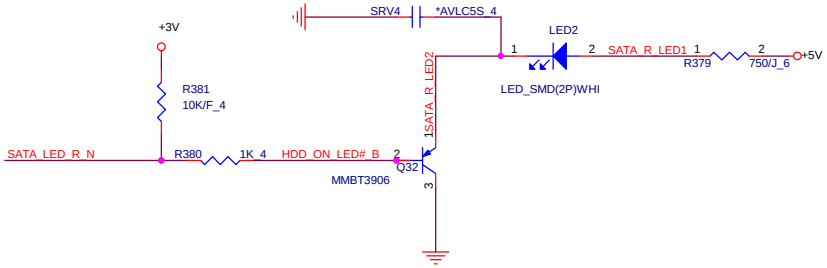


THERMAL SENSOR

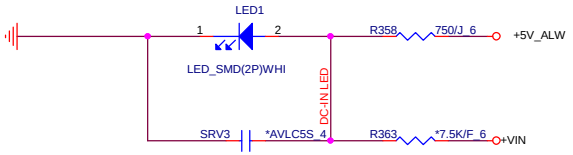


SATA LED





DC-IN LED

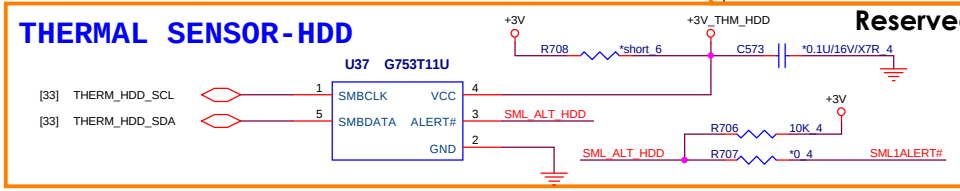


Slave Adress

A6	A5	A4	A3	A2	A1	A0
1	0	0	1	0	0	0

THERMAL SENSOR-HDD

Reserved



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Quanta Computer Inc.

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Size	Document Number	Rev
Custom	Thermal/FAN/LEDs	2A

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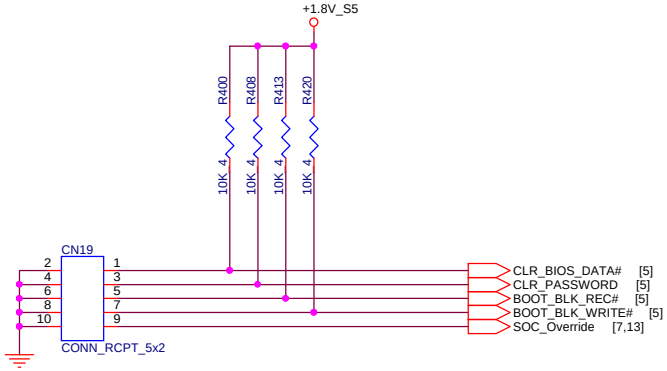
[3,4,5,6,11,14,22,24,27,30,31,32,33,36,37,38,40,41,42,43,44,48] +3V_S5
[5,6,7,8,9,11,13,14,22,33,36,40,41] +1.8V_S5
[5,15,16,17,18,19,20,22,23,24,25,27,28,29,31,32,33,34,36,44,47,48] +3V

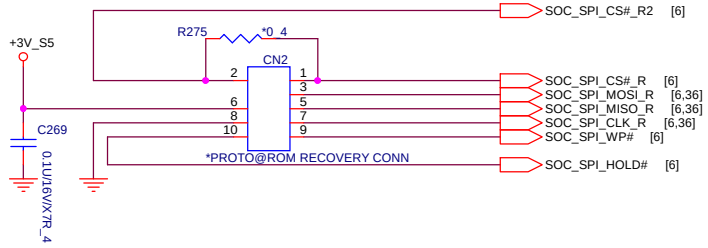
CLR_CMOS

Jumper	Pre-production	Production
BOOT_BLK_Recovery	X	X
BOOT_BLK_Enable	O	X

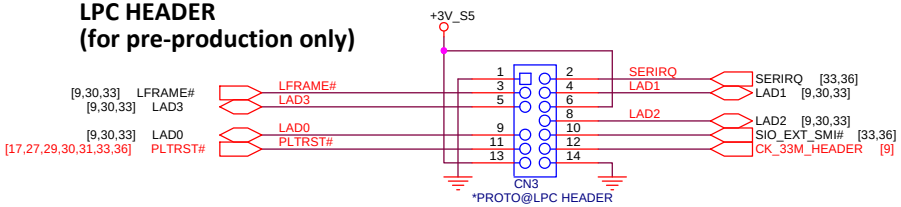
Jumper	Type
Pop	CLR_BIOS_DAT
Pop	CLR_PASSWD
Pop	BOOT_BLK_Recovery
Pop	BOOT_BLK_Enable



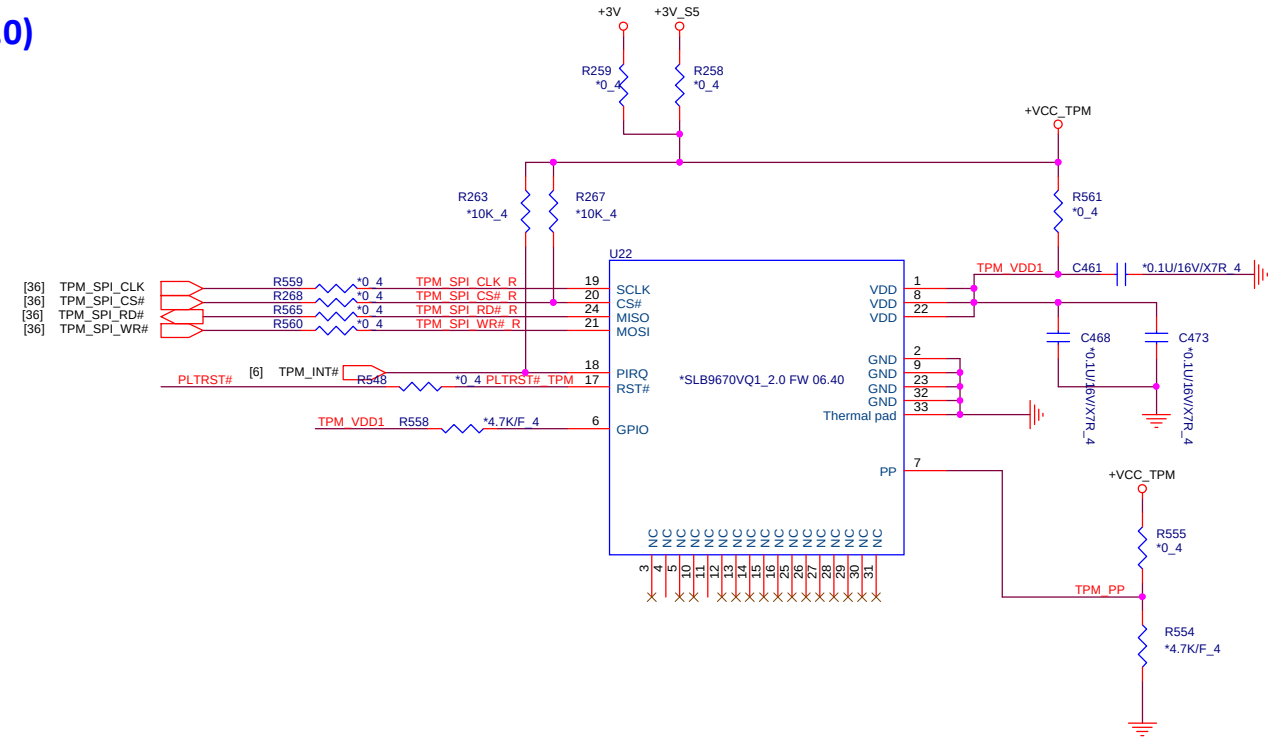
ROM recovery (for pre-production only)



LPC HEADER (for pre-production only)



TPM (1.2 or 2.0)



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Quanta Computer Inc.

PROJECT: HP-Molokai

Size	Document Number	Rev
Custom	JUMPER/LPCHeader	1A
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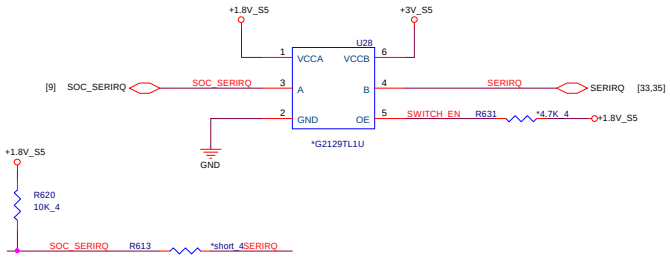
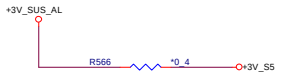
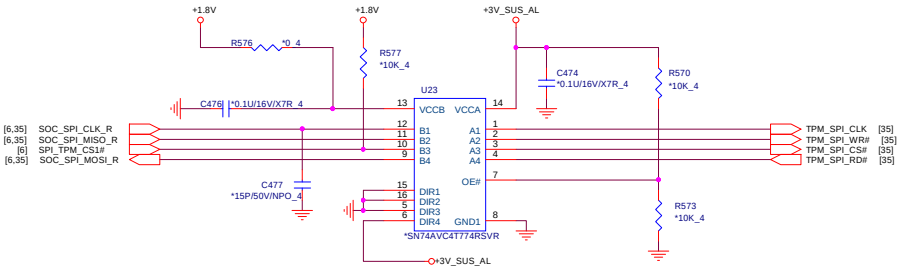
SERIRQ



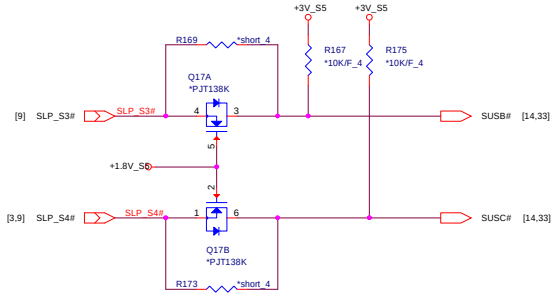
TPM level shift



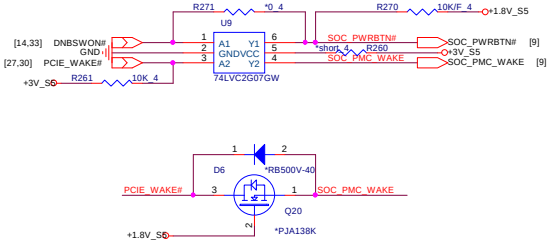
OE#	DIR	OPERATION
L	L	B TO A
L	H	A TO B
H	X	Disconnect



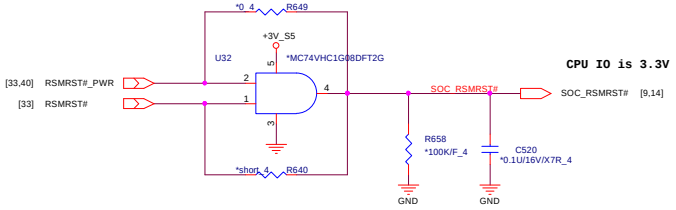
SUSB/C#



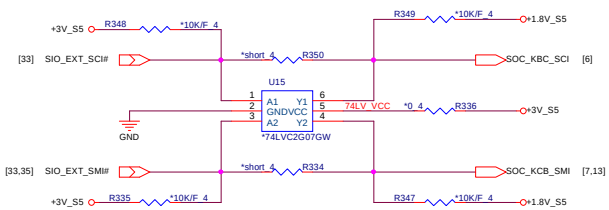
PWRBTN#/PCIE_WAKE#



RSMRST#

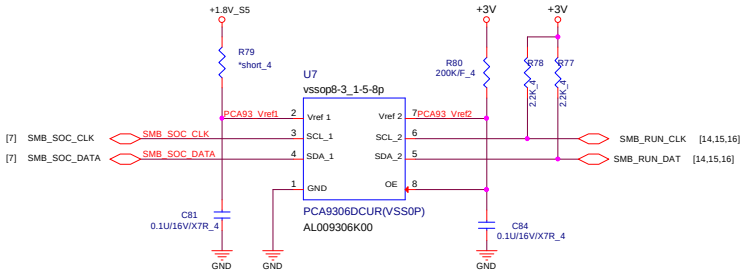


SCI#/SMI#

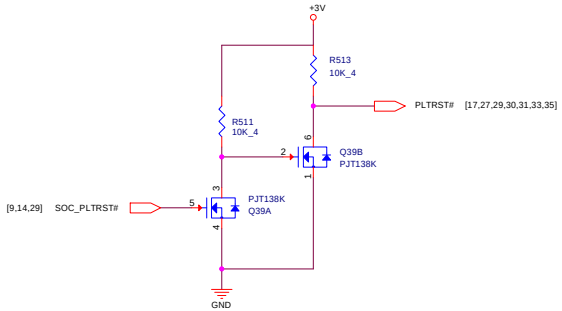


SYS PWRGD

SO-DIMM/XDP SMBUS



PLTRST#



[5,15,16,17,18,19,20,22,23,24,25,27,28,29,31,32,33,34,35,44,47,48]
[5,6,7,8,9,11,13,14,22,33,35,40,41]
[3,4,5,6,11,14,22,24,27,30,31,32,33,35,37,38,40,41,42,43,44,48]
+3V
+1.8V_S5
+3V_S5

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Quanta Computer Inc.

PROJECT: HP-Molokai

Size	Document Number	Rev
Custom	Level shift	1A
Date: Monday, January 18, 2016	Sheet 36 of 54	

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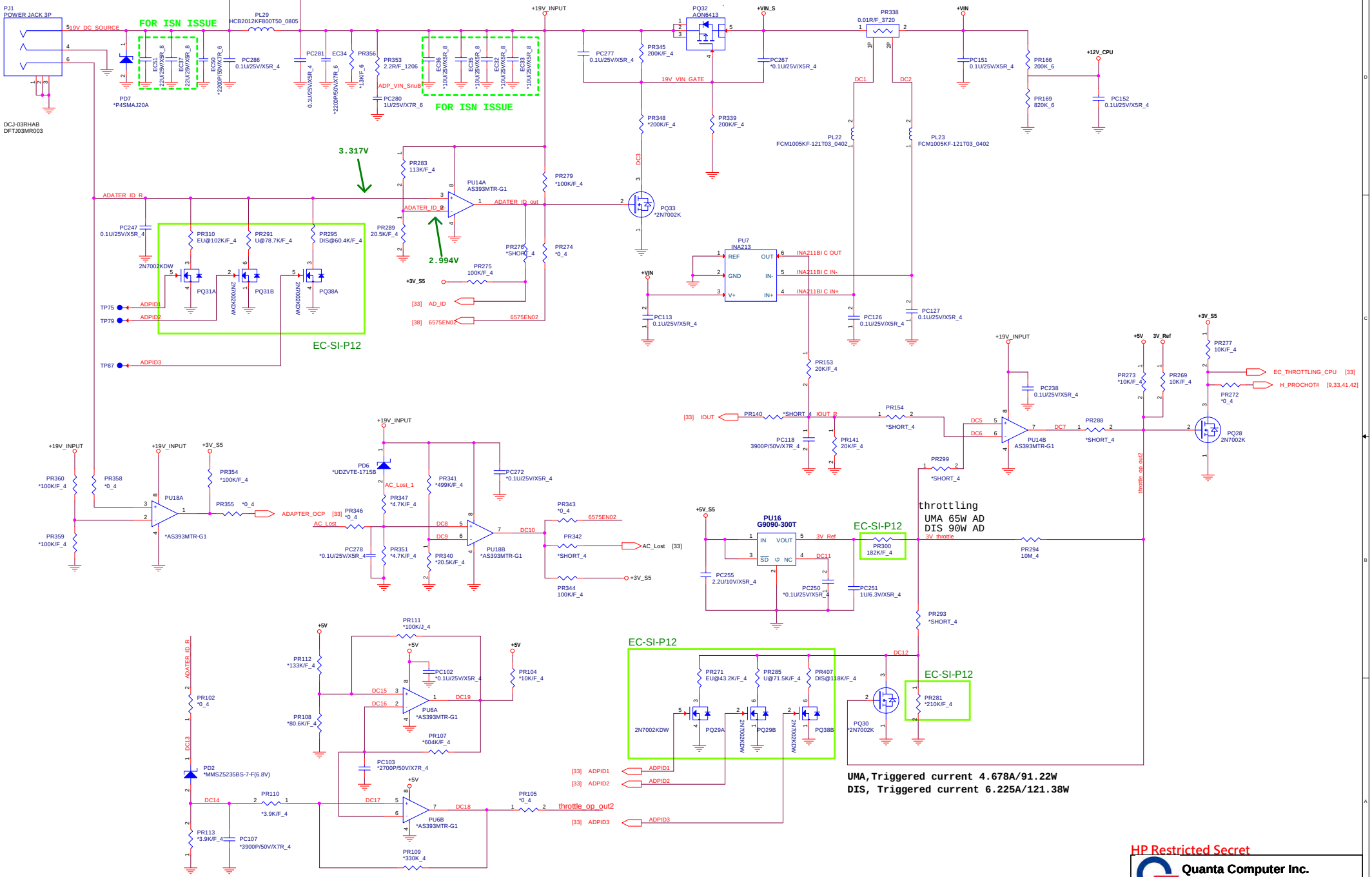
Qg=41~58nC
Rdson=6.9~8.5mOHM



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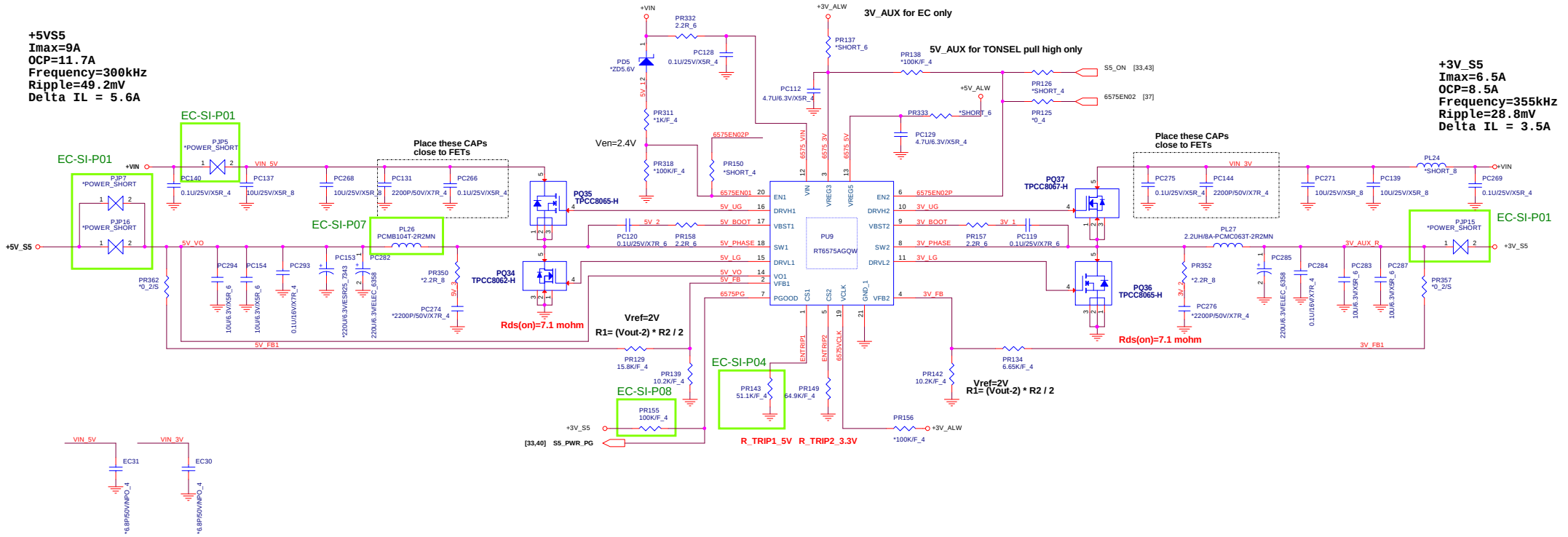
Quanta Computer Inc.
PROJECT: HP-Molokai

Size	Document Number	Rev
Custom	DC-IN	1A
Date: Monday, January 18, 2016	Sheet 37 of 54	

CONFIDENTIAL

+5VS5
Imax=9A
OCP=11.7A
Frequency=300kHz
Ripple=49.2mV
Delta IL = 5.6A

+3V_S5
Imax=6.5A
OCP=8.5A
Frequency=355kHz
Ripple=28.8mV
Delta IL = 3.5A



L/S Mosfet parameter

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

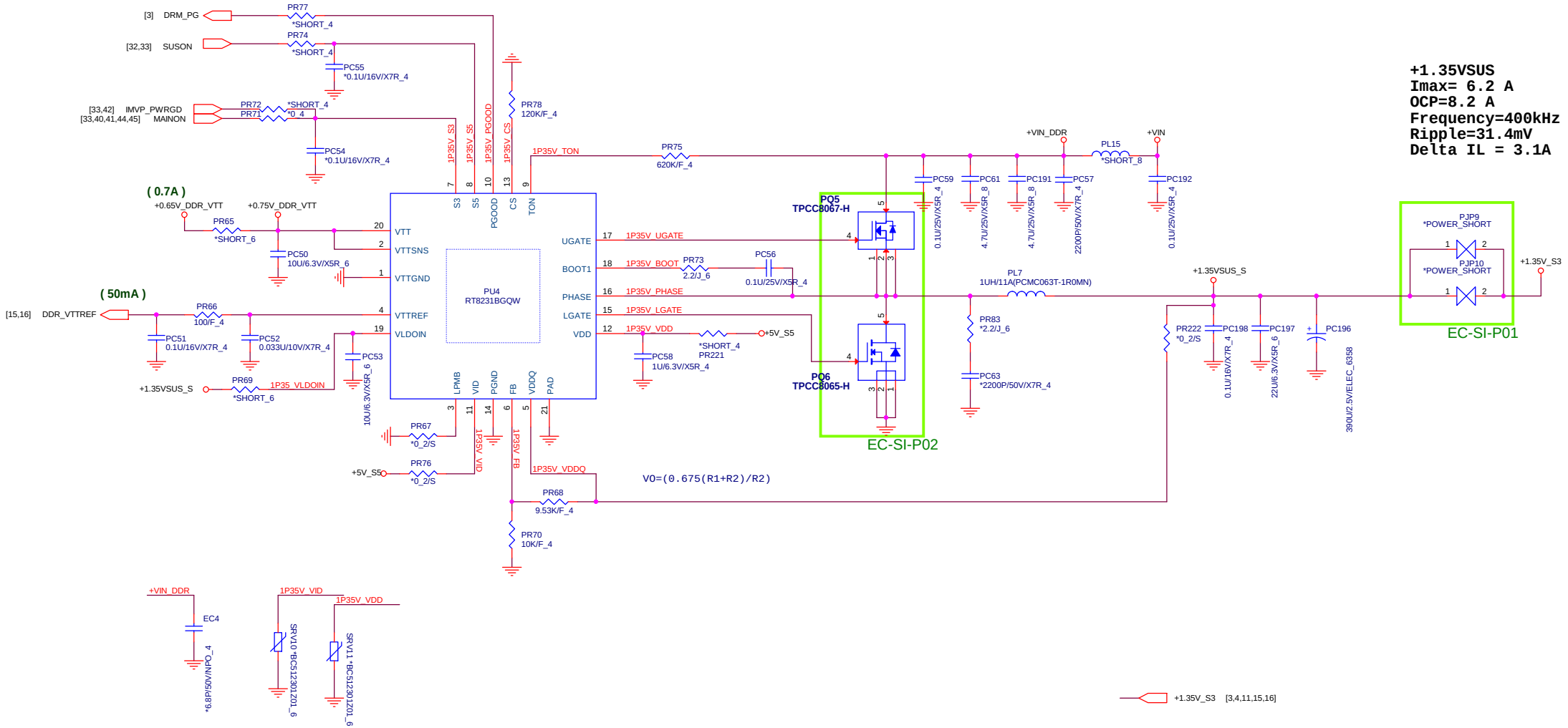
Power On sequencing

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

Quanta Computer Inc.
PROJECT: HP-Molokai

Size	Document Number	Rev
Custom	+3VS5/+5VS5(RT6575AGQW)	2A

Date: Monday, January 18, 2016 Sheet 38 of 54



HP Restricted Secret

Quanta Computer Inc.		
PROJECT: HP-Molokai		
Size: Custom	Document Number: DDR3L (RT8231B)	Rev: 2A
Date: Monday, January 18, 2016	Sheet 39 of 54	

+3V_S5 [3,4,5,6,11,14,22,24,27,30,31,32,33,35,36,37,38,41,42,43,44,48]
+1.8V_S5 [5,6,7,8,9,11,13,14,22,33,35,36,41]
+3V_S5_PRIME [11,33]
+1.5V [11,26]
+1.24V_S5 [11]
+1.15V_S5 [10]
+5V_ALW [26,34,38]
+1.05V_S5 [9,10,41,42]
+1.8V [5,6,25,27,29,30,34,36]

+1.05VS5
Imax= 2 A
OCP=6 A
Frequency=1.2MHz
Ripple=5mV
Delta IL = 1.3A

+1.8VALW
Imax= 3.1 A
OCP=6 A
Frequency=1.2MHz
Ripple=6.8mV
Delta IL = 0.68 A

Snubber

375mA, Pd:0.012W
650mA, Pd:0.025W
200mA, Pd:0.06W
550mA, Pd:0.31W
700mA, Pd:0.46W

PU5 RT5041A

Enable Signal for +1.5V LDO

EC-SI-P01
EC-SI-P09

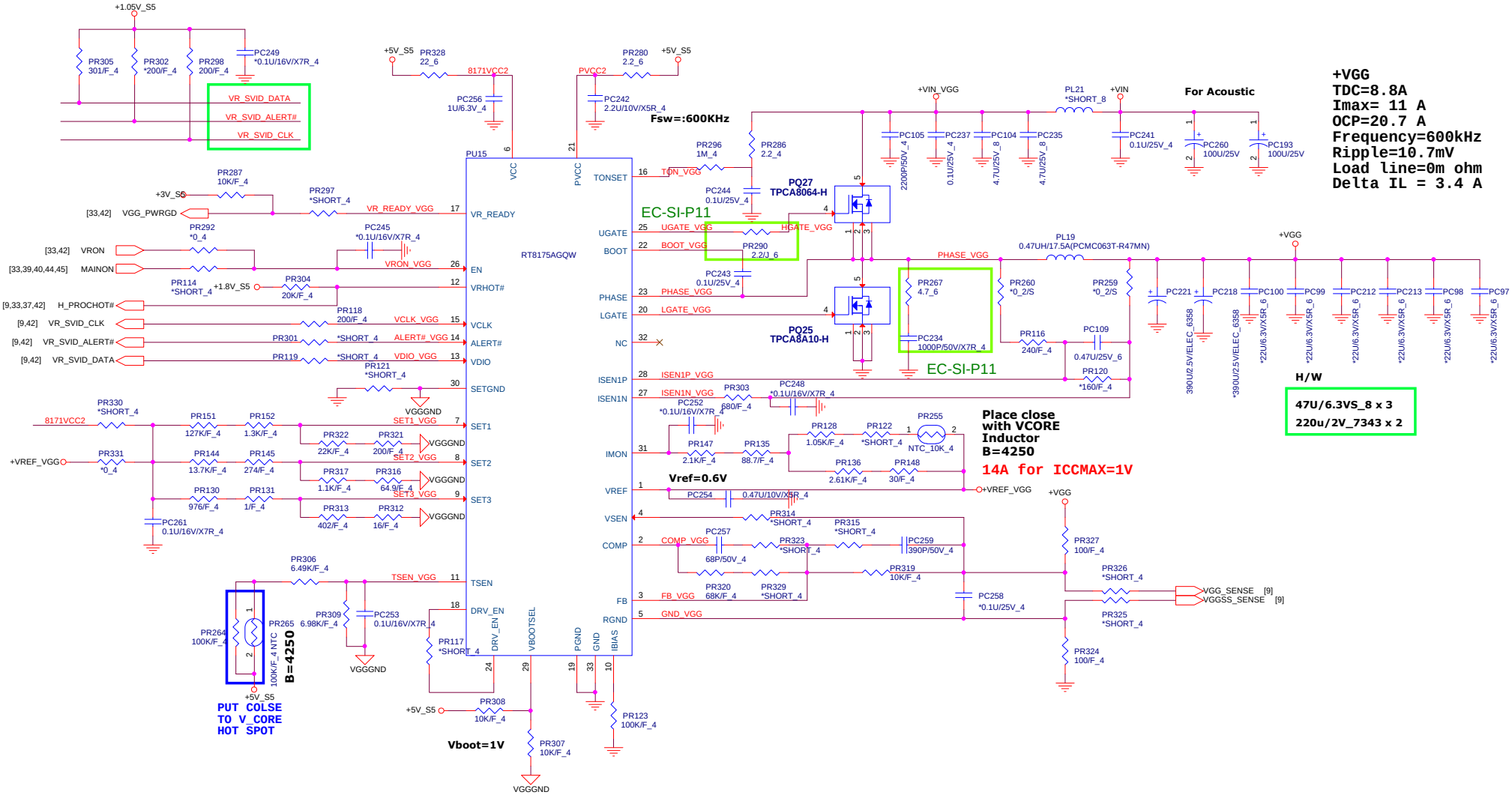
0.23A
Pd: 1.6mW
Rdson: 30m ohm

HP Restricted Secret

Quanta Computer Inc.
PROJECT: HP-Molokai

Size	Document Number	Rev
Custom	MOIC (RT5041A)	2A
Date: Monday, January 18, 2016	Sheet 40 of 54	

+3V_S5 [3,4,5,6,11,14,22,24,27,30,31,32,33,35,36,37,38,40,42,43,44,48]
+1.05V_S5 [9,10,40,42]
+5V_S5 [24,26,32,34,37,38,39,40,42,43,44,48]
+VGG [10]
+VIN [32,34,37,38,39,40,42,43,45,46,47,48]



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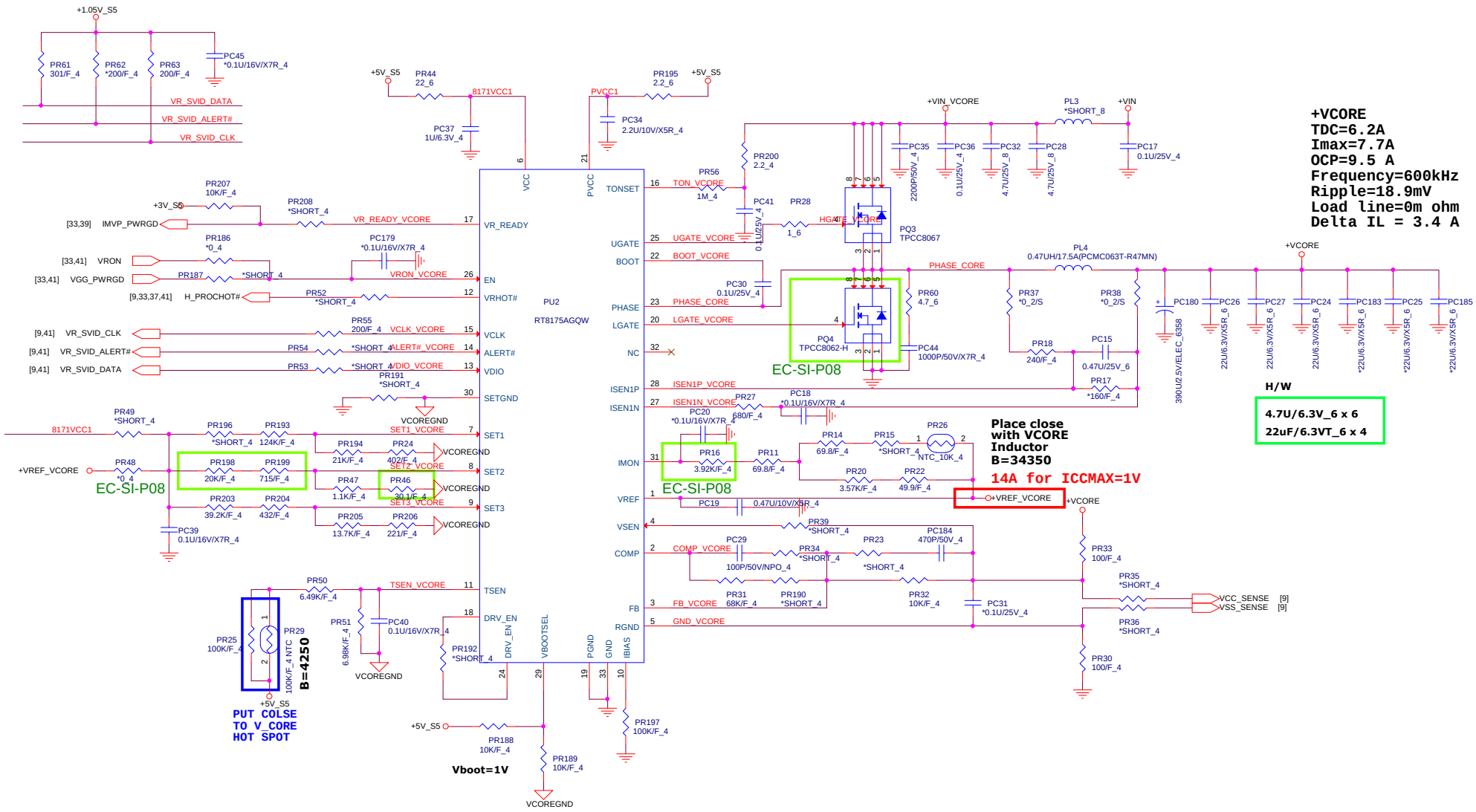
Quanta Computer Inc.
PROJECT: HP-Molokai

Size	Document Number	Rev
Custom	VGG CORE(RT8175A)	2A

Date: Monday, January 18, 2016 Sheet 41 of 54


+VCORE
TDC=6.2A
Imax=7.7A
OCP=9.5 A
Frequency=600kHz
Ripple=18.9mV
Load line=0m ohm
Delta IL = 3.4 A
H/W
4.7U/6.3V_6 x 6
22uF/6.3VT_6 x 4
Place close with VCORE Inductor B=34350
14A for ICCMAX=1V
EC-SI-P08
EC-SI-P08
EC-SI-P08
PUT COLSE TO V_CORE HOT SPOT
B=4250
Vboot=1V
RT8175AGQW
PU2
PQ3 TPCC8067
PQ4 TPCC8062-H
PL4 0.47UH/17.5A(PCMC063T-R47MN)
PL3 *SHORT_8
+1.05V_S5
+5V_S5
+VIN_VCORE
+VIN
+VCORE
+VREF_VCORE
VR_SVID_DATA
VR_SVID_ALERT#
VR_SVID_CLK
VR_READY_VCORE
VRON_VCORE
ALERT#_VCORE
VDIO_VCORE
SET1_VCORE
SET2_VCORE
SET3_VCORE
TSEN_VCORE
DRV_EN
TON_VCORE
UGATE_VCORE
BOOT_VCORE
PHASE_CORE
LGATE_VCORE
ISEN1P_VCORE
ISEN1N_VCORE
COMP_VCORE
FB_VCORE
GND_VCORE
VCC_SENSE
VSS_SENSE
VCOREGND
8171VCC1
PVCC1
HP Restricted Secret
Quanta Computer Inc.
PROJECT: HP-Molokai
Size Custom
Document Number VCC CORE(RT8175A)
Rev 2A
Date: Monday, January 18, 2016
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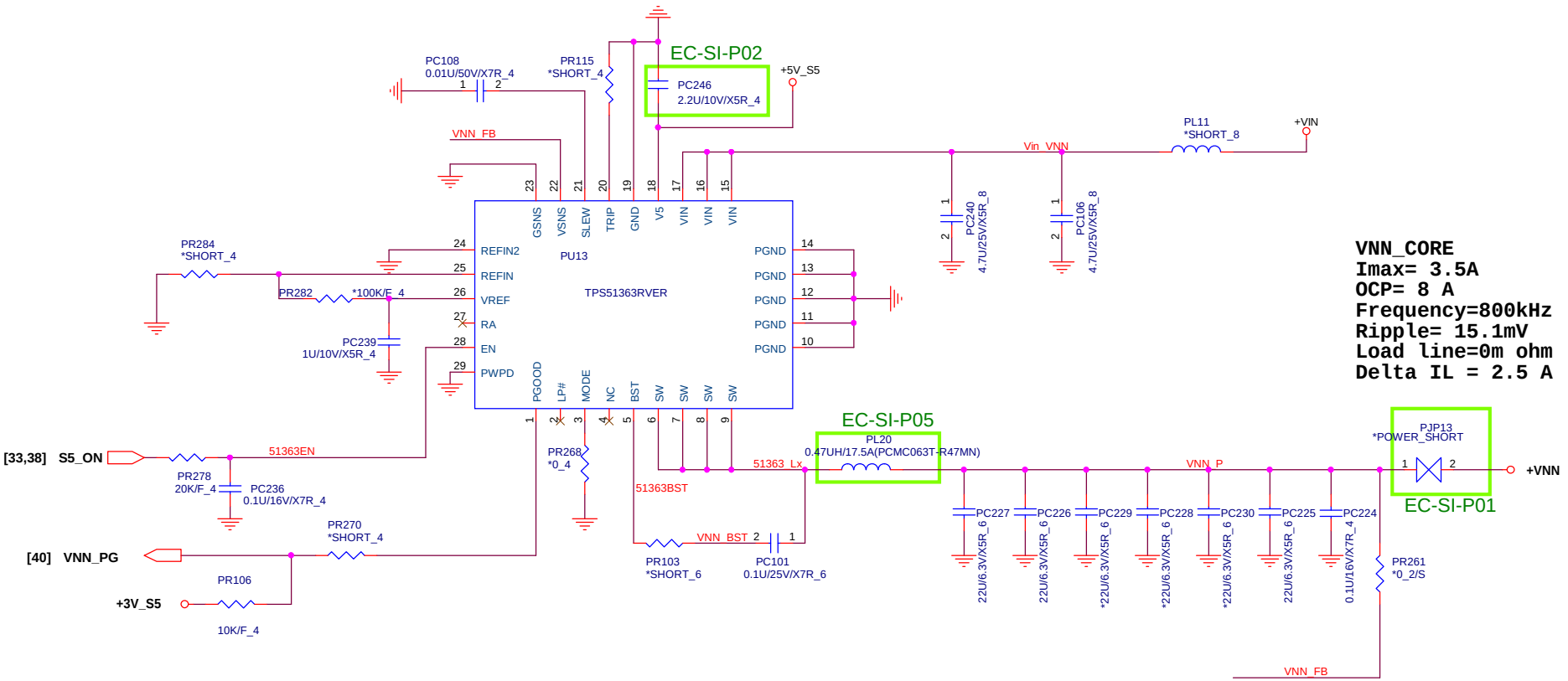


HP Restricted Secret

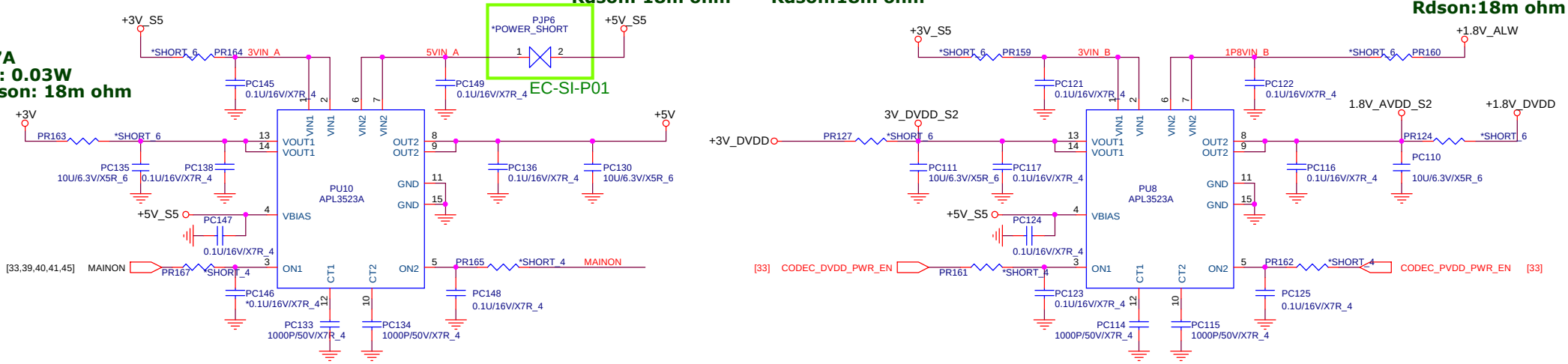
Quanta Computer Inc.		
PROJECT: HP-Molokai		
Size: B	Document Number: VNN CORE(TPS51363)	Rev: 2A
Date: Monday, January 18, 2016	Sheet 43 of 54	

1.7A
PD: 0.03W
Rdson: 18m ohm

5.62A
Pd: 0.57W
Rdson: 18m ohm

0.5A
Pd: 0.01W
Rdson:18m ohm

0.03A
Pd: 0.01W
Rdson:18m ohm



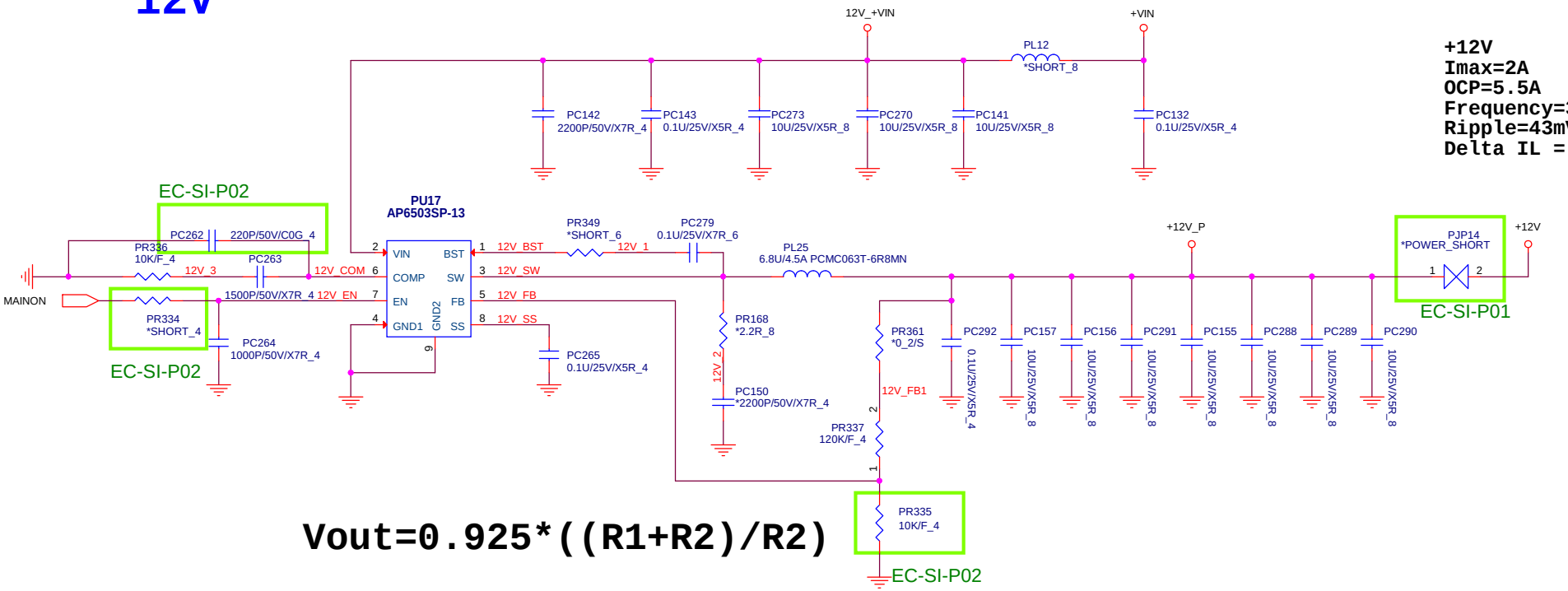
HP Restricted Secret

Quanta Computer Inc.

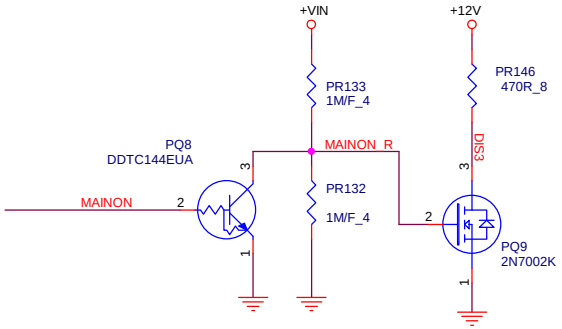
PROJECT: HP-Molokai

Size	Document Number	Rev
Custom	Load switch IC (APL3523A)	2A
Date: Monday, January 18, 2016	Sheet 44 of 54	

12V



Vout=0.925*((R1+R2)/R2)



+12V
Imax=2A
OCP=5.5A
Frequency=340kHz
Ripple=43mV
Delta IL = 2A

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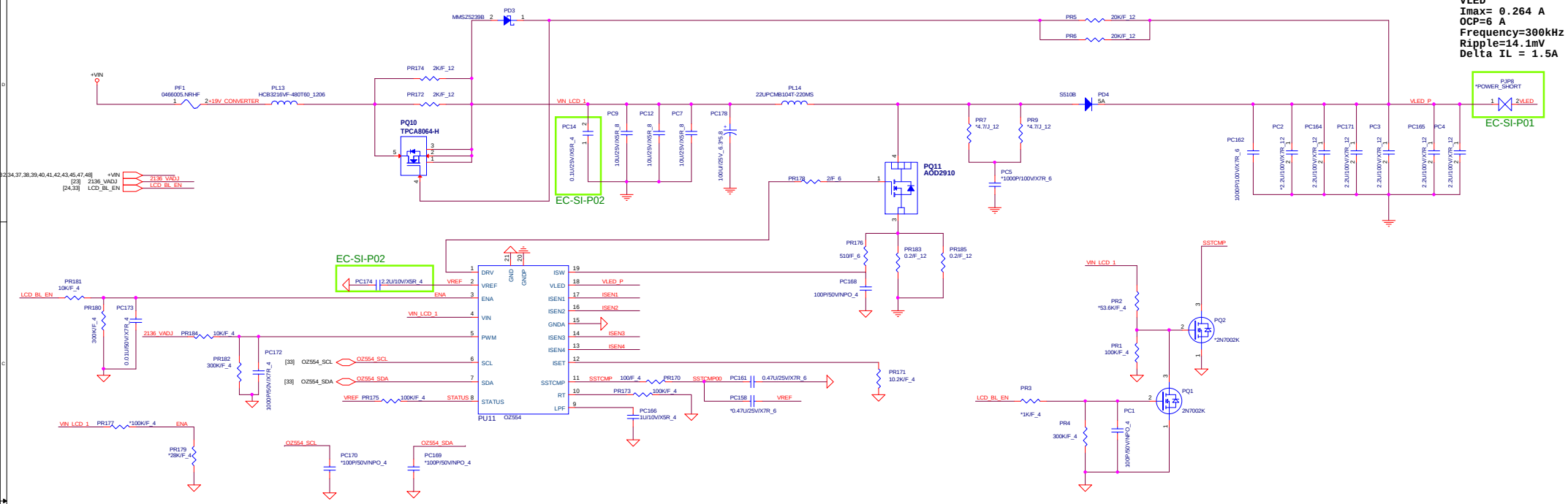
Quanta Computer Inc.		
PROJECT: HP-Molokai		
Size: B	Document Number: +12V	Rev: 2A
Date: Monday, January 18, 2016	Sheet 45 of 54	

VLED
Imax= 0.264 A
OCP=6 A
Frequency=300kHz
Ripple=14.1mV
Delta IL = 1.5A



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 M200HJJ-L20 FHD
1101	AUO M195RTN01.0 HD+
1100	LGD LM195WD1-TLA1 HD+
1010	Reserve

21.5" PANEL_ID Table

PANEL_ID[3:0]	Panel model
1111	No Connect
1110	INX M215HJK-L3B FHD eDP
1101	SDC LTM215HL01 FHD
1100	LGD LM215WF3-SLN1 FHD
1011	Reserve

23.6" /23.8" PANEL_ID Table

PANEL_ID[3:0]	Panel model
1111	No Connect
1110	INX M236HJK-L5B FHD eDP
1101	AUO M238HAN01.0 FHD
1100	LGD LM238WF1-SLE1 FHD
1011	SDC LTM238HL02 FHD
1010	Reserve

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

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Size	Document Number	Rev
Custom	OZ554	2A

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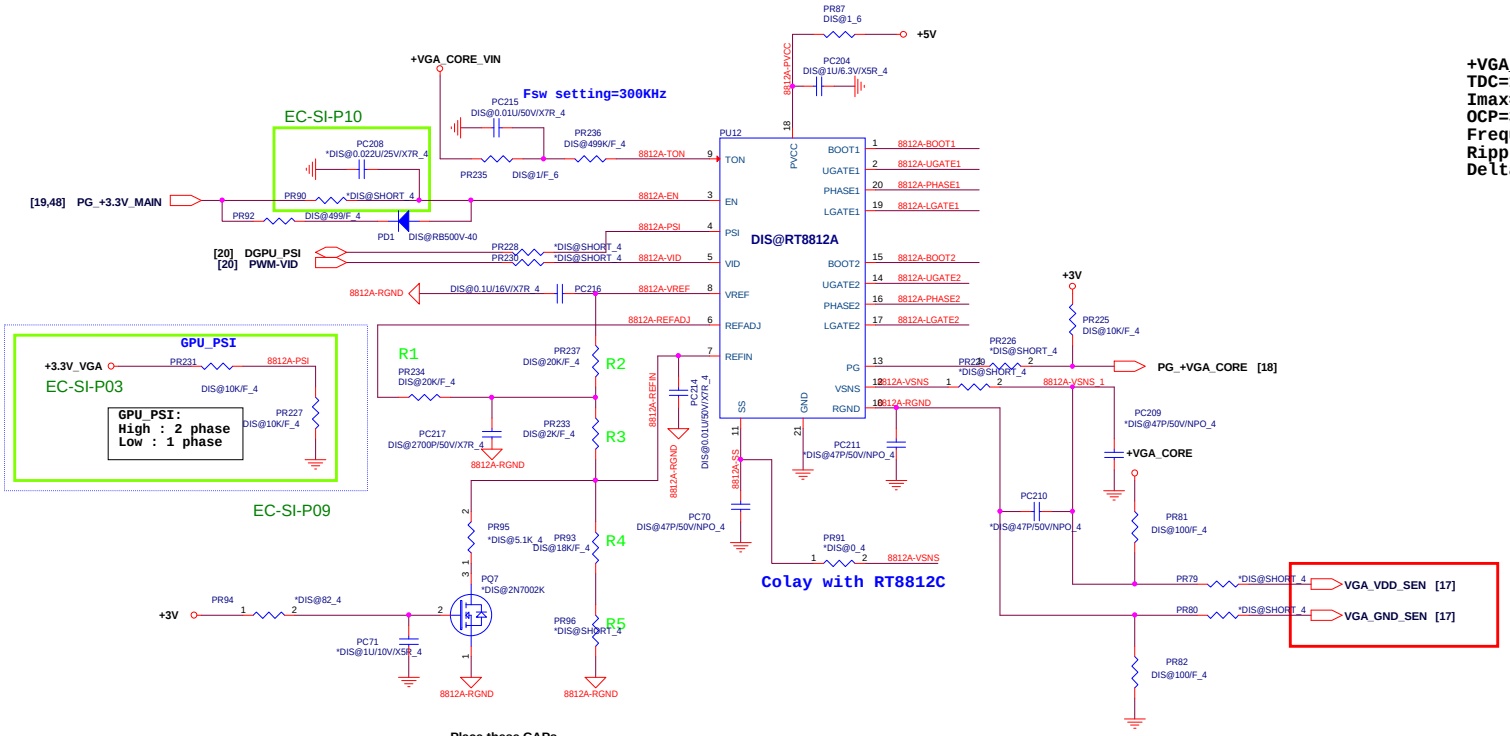
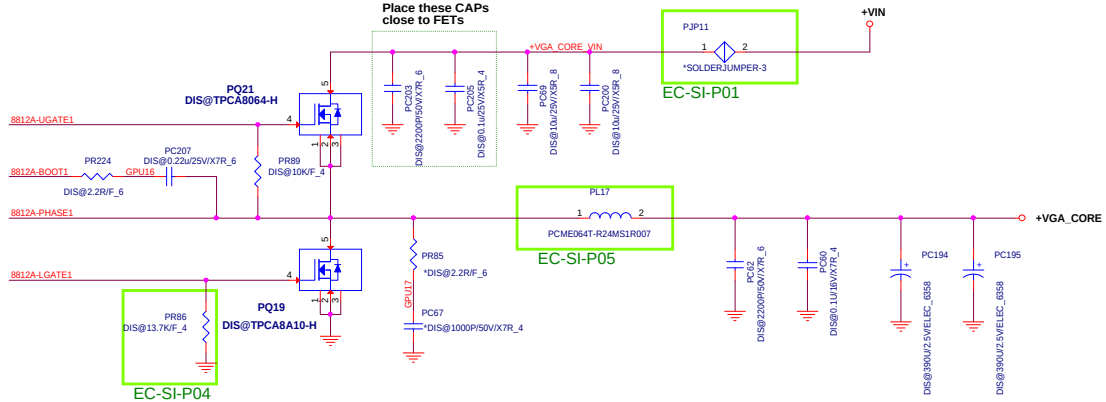
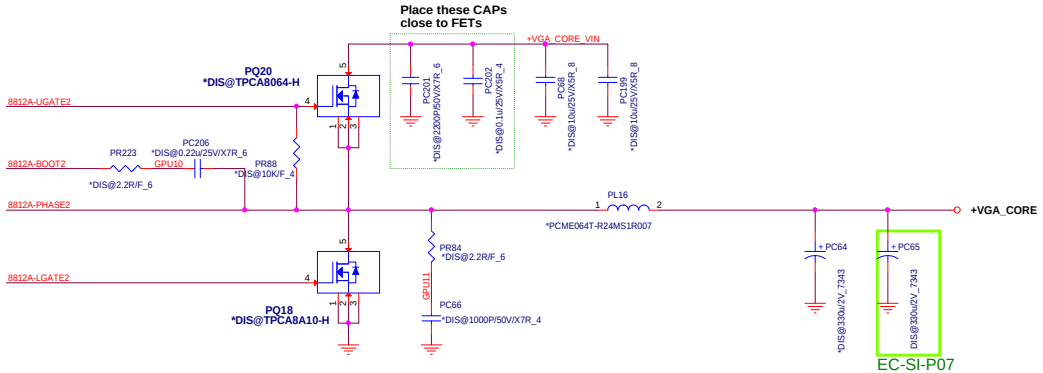
+VGA_CORE
TDC=19A
Imax=29.7A
OCP=35A
Frequency=300kHz
Ripple=36mV
Delta IL = 11.9A







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PROJECT: HP-Molokai

Size	Document Number	Rev
–	GPU_CORE (ISL62771)	2A

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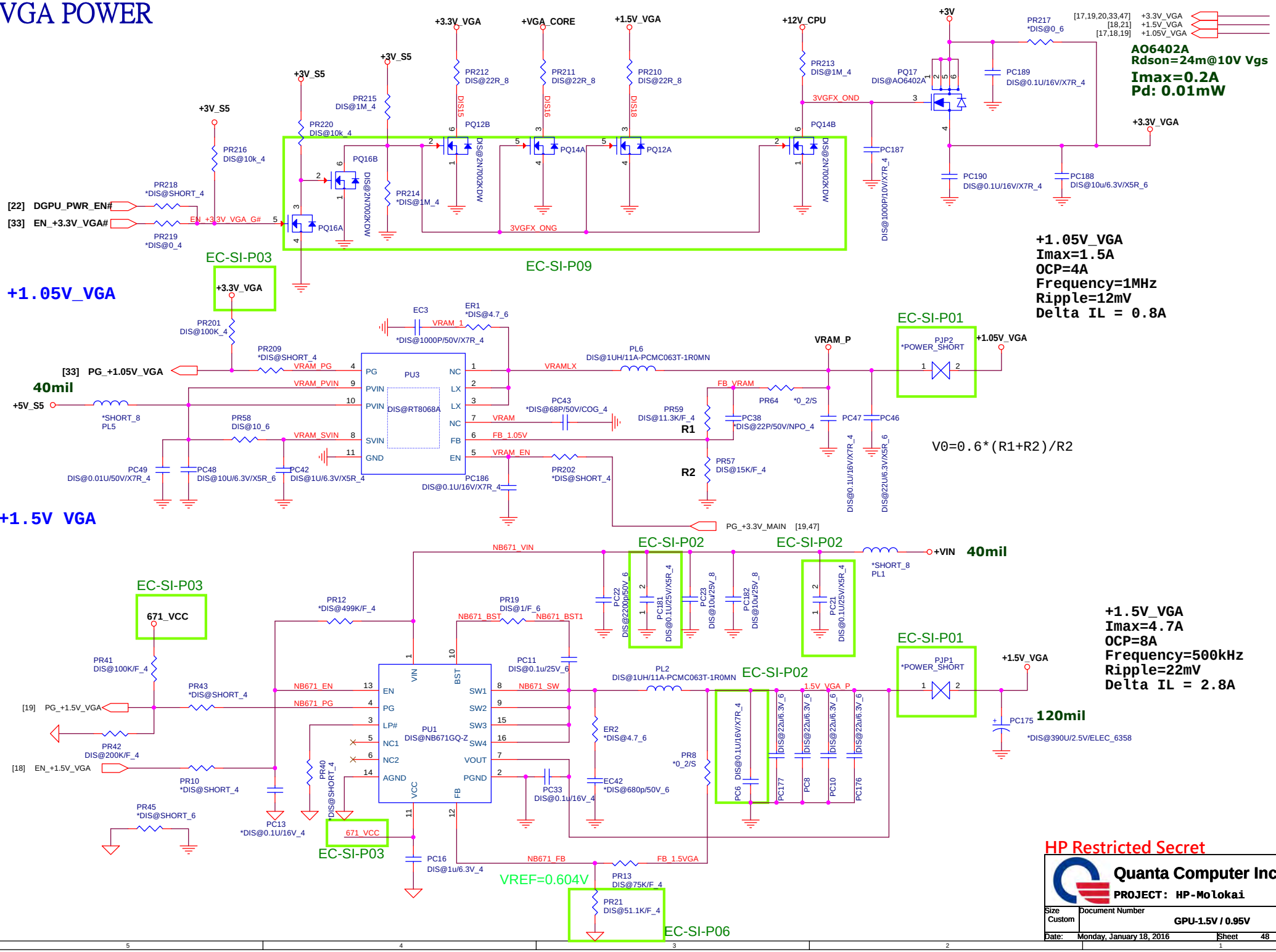
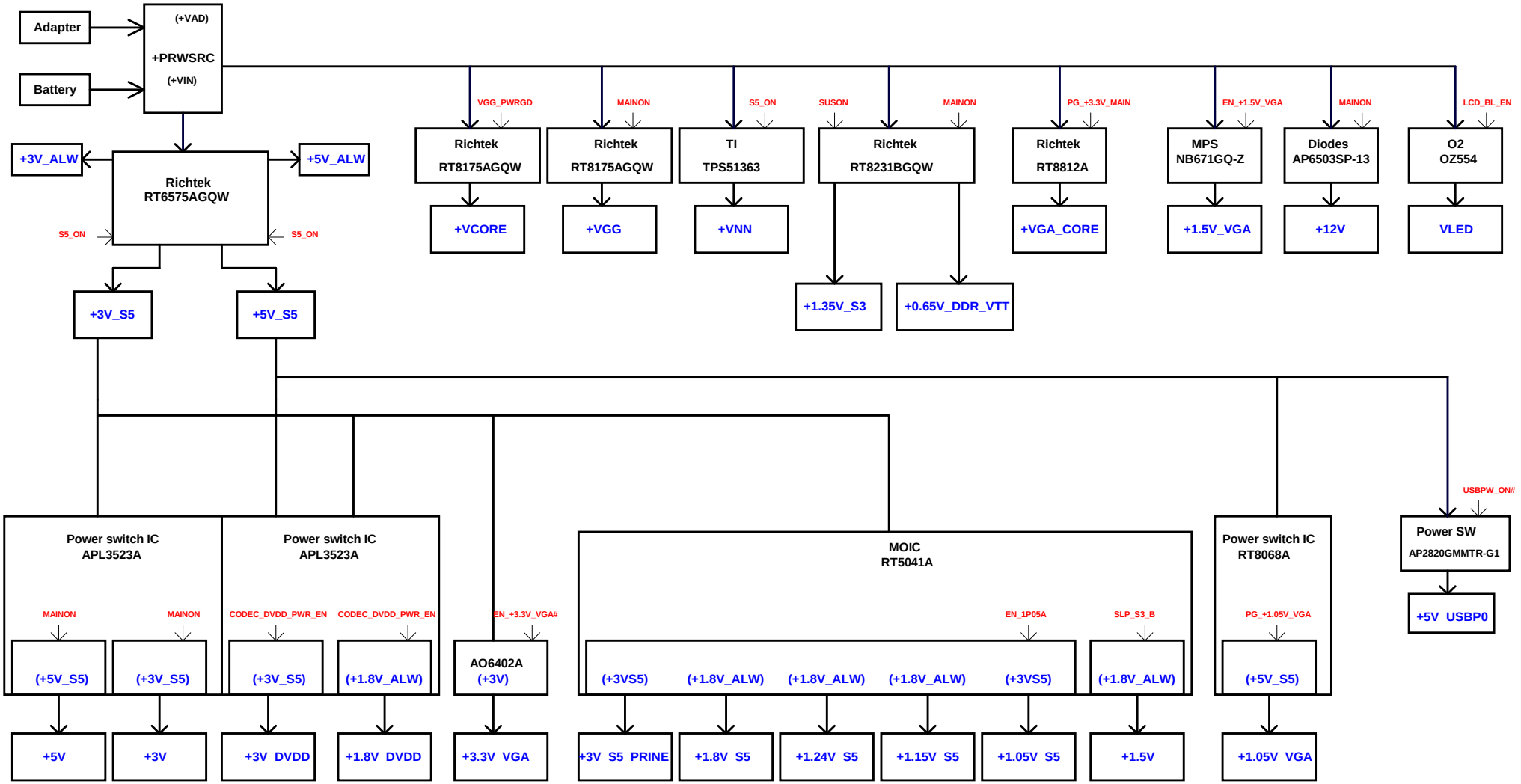
VGA POWER


+3.3V_VGA
+VGA_CORE
+1.5V_VGA
+12V_CPU
+3V
+3V_S5
AO6402A
Rdson=24m@10V Vgs
Imax=0.2A
Pd: 0.01mW
[22] DGPU_PWR_EN#
[33] EN_+3.3V_VGA#
EC-SI-P09
EC-SI-P03
+1.05V_VGA
Imax=1.5A
OCP=4A
Frequency=1MHz
Ripple=12mV
Delta IL = 0.8A
[33] PG_+1.05V_VGA
40mil
PU3
DIS@RT8068A
VRAM_P
PJP2
*POWER_SHORT
V0=0.6*(R1+R2)/R2
R1
R2
+1.5V VGA
PG_+3.3V_MAIN [19,47]
NB671_VIN
+VIN
EC-SI-P02
671_VCC
[19] PG_+1.5V_VGA
[18] EN_+1.5V_VGA
PU1
DIS@NB671GQ-Z
PJP1
120mil
*DIS@390U/2.5V/ELEC_6358
VREF=0.604V
EC-SI-P06
HP Restricted Secret
Quanta Computer Inc.
PROJECT: HP-Molokai
GPU-1.5V / 0.95V
Monday, January 18, 2016



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PROJECT: HP-Molokai

Size	Document Number	Rev
C	Power Block Diagram	1A

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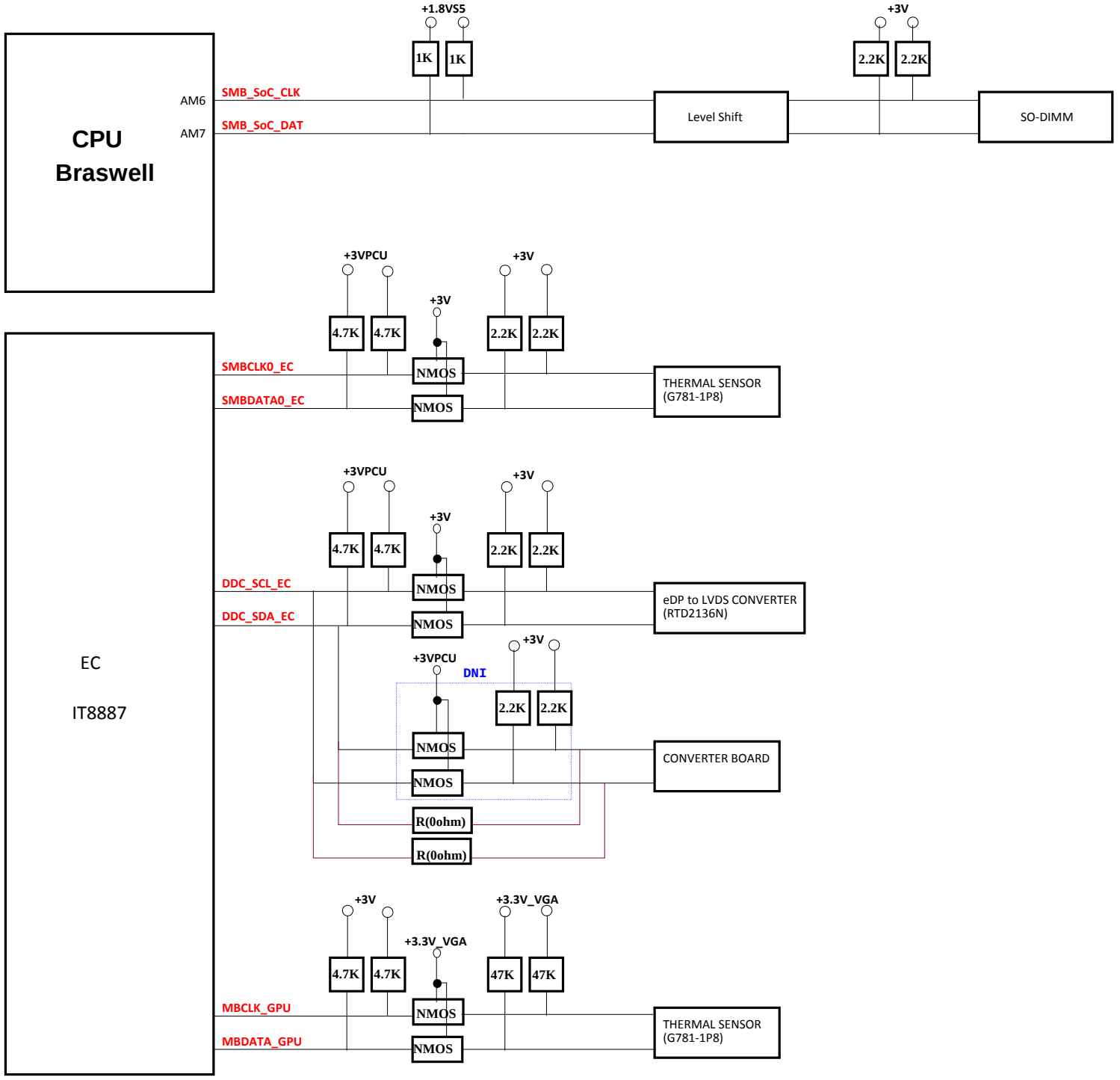

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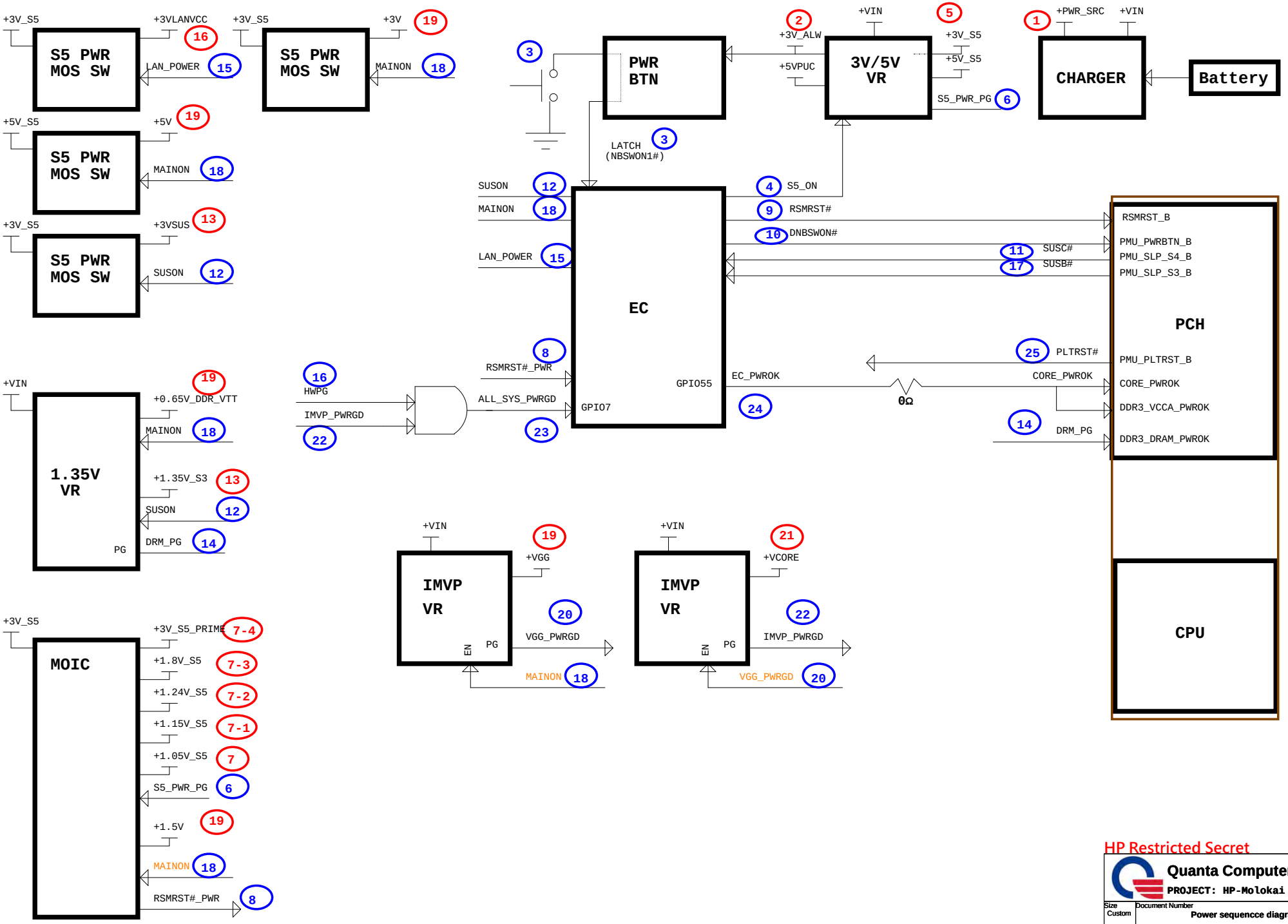
PROJECT: HP-Molokai

Size	Document Number	Rev
Custom	SMB Block diagram	1A
Date: Monday, January 18, 2016	Sheet 50 of 54	



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PROJECT: HP-Molokai

Size	Document Number	Rev
Custom	Power sequencce diagram	1A

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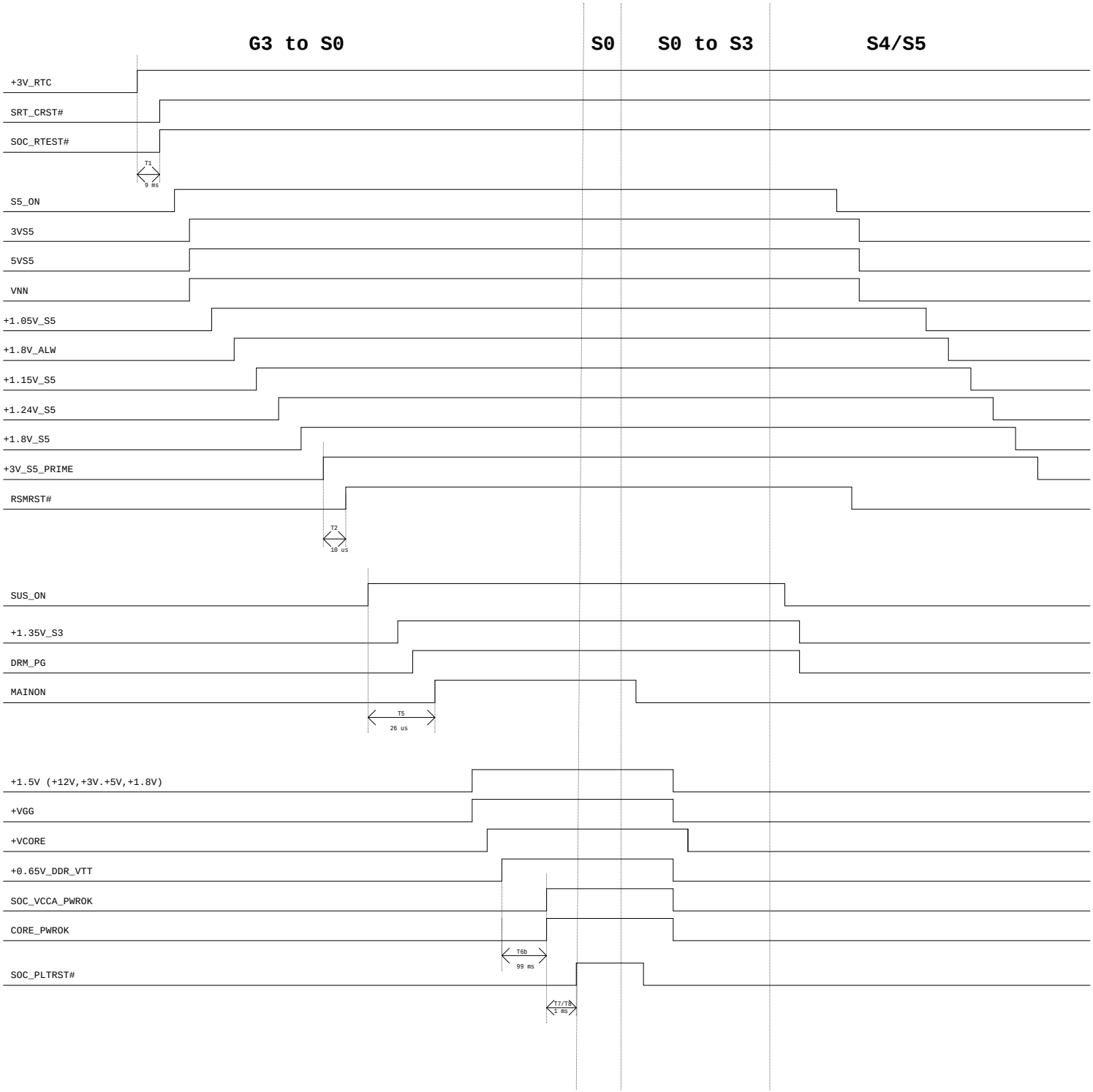
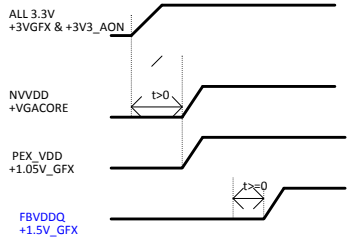
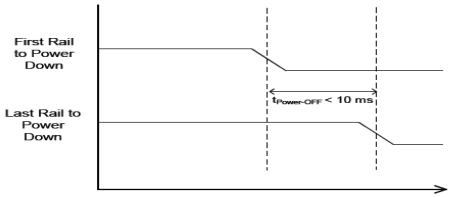


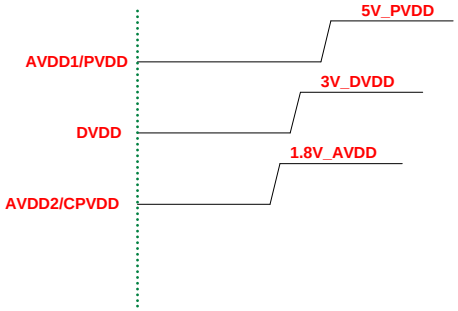
N16V Power up sequence



N16V Power down sequence



AUDIO POWER SEQUENCE



Quanta Computer Inc.
PROJECT: HP-Molokai

Size	Document Number	Rev
Custom	Power on/off sequence	1A

Date: Monday, January 18, 2016 Sheet 52 of 54

N91A EE Schematic EC Tracking Record DB to SI version

EC #	Page	Description	Part Affected
EC-SI-01	32	add GND PAD for EMI	H20,H21
EC-SI-02	26	change Audio speaker connector from 1 4pin to 2 2pin	CN25,CN26
EC-SI-03	07	change board ID for SI stage, R537 no stuff, R544 stuff	R537,R544
EC-SI-04	34	add second fan function	CN27,R709,C574,EC58,EC59,R710,R711,C575
EC-SI-05	33	add ADPID3 for smart adapter	U26.pin4,PQ38,PR295
EC-SI-06	15	add EC60 for EMI	EC60
EC-SI-07	20	remove R483 double pull high for PSI	R483
EC-SI-08	33	add EMMC_DETECTfunction for EC check sku	R714,R715
EC-SI-09	30	change CN17 footprint	CN17
EC-SI-10	24,34	change D4,SU1,D21,D24,D26 to stuff for ESD	D4,SU1,D21,D24,D26
EC-SI-11	30	Change ODD connector to 18 pin	CN21
EC-SI-12	34	Change connector to FFC type of card reader daughter board	CN24
EC-SI-12	26	change AL6/AL7/AL9/AL10 to 0 ohm for Realtek suggestion	AL6,AL7,AL9,AL10

N91A Power Schematic EC Tracking Record DB to SI version

EC #	Page	Description	Part Affected
EC-SI-P01	38~48	Change default open to default short	PJP1~PJP11, PJP13~16
EC-SI-P02	39,43,45,46,48	Downsize components	PC246, PR334, PR335, PC262, PC14, PC174, PQ5, PQ6 PC21, PC181,PC6
EC-SI-P03	47, 48	Correct connection	
EC-SI-P04	38,47	Fine tune OCP function	PR143,PR86
EC-SI-P05	43,47	Change choke for transient	PL17, PL20
EC-SI-P06	48	Fine tune offset voltage	PR21
EC-SI-P07	38, 47	Change components for ripple voltage	PL26, PC65
EC-SI-P08	42	Change components CPU 6.5W	PQ4, PR16, PR46, PR198, PR199
EC-SI-P09	40,47,48	Change components for common part using	PQ24, PR227, PR231, PQ12, PQ14, PQ16
EC-SI-P10	47	Fine tune soft start	PR90, PC208
EC-SI-P11	43	Reducing VGG Ring Voltage	PR290, PR267, PC234
EC-SI-P12	37	Add components for SMART ID function	PR281, PR300, PR295, PR291, PR310, PR271, PR285, PR407 PQ29, PQ31, PQ38