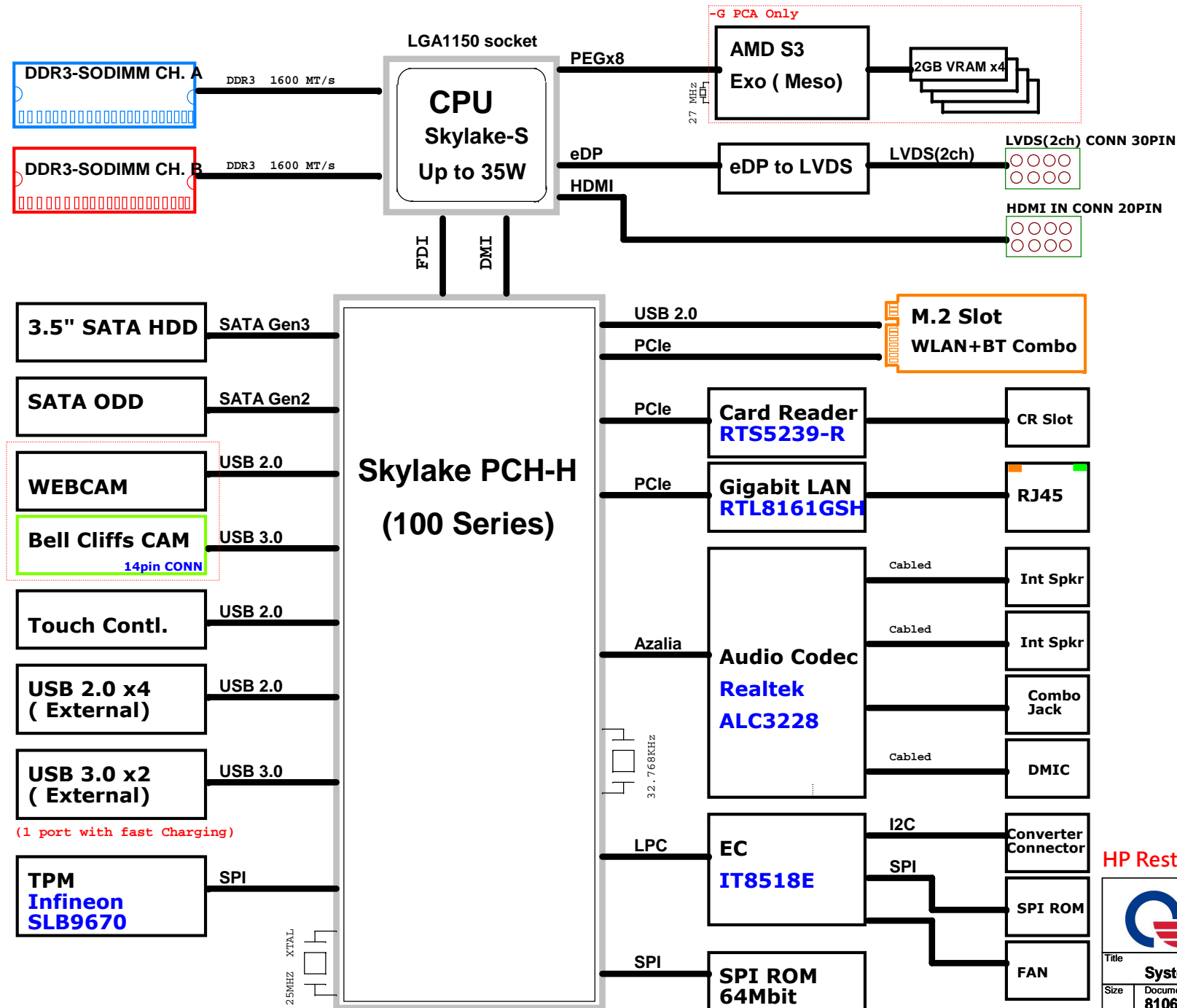



# HP Crane System Block Diagram

01



HP Restricted Secret

		<b>Quanta Computer Inc.</b>	
		<b>Project: HP-CRANE</b>	
Title			
<b>System Block Diagram</b>			
Size	Document Number <b>810606-000</b>		Rev <b>B</b>
Page Modified: Wednesday, July 29, 2015		Sheet 1 of 56	

Voltage Rails

Power Rail	Voltage	S0	S3	S4	S5	PCU	G3	Ctl Signal
+RTC_VCC	3V	ON	ON	ON	ON	ON	ON	
+VIN	19V	ON	ON	ON	ON	ON	OFF	Adaptor in
+5V_AUX	5V	ON	ON	ON	ON	ON	OFF	AUX_ON
+3.3V_AUX	3.3V	ON	ON	ON	ON	ON	OFF	3V/5V PWM IC_LD0
+5V_SUS	5V	ON	ON	ON	ON	OFF	OFF	EC_SUS_ON
+3.3V_SUS	3.3V	ON	ON	ON	ON	OFF	OFF	EC_SUS_ON
+1.8V_SUS	1.8V	ON	ON	ON	ON	OFF	OFF	EC_SUS_ON
+1.0V_SUS	1.0V	ON	ON	ON	ON	OFF	OFF	PG_+1.8V_SUS
+VCCST_VCCPLL	1.0V	ON	ON	OFF	OFF	OFF	OFF	S3_ON
+VDDQ	1.35V	ON	ON	OFF	OFF	OFF	OFF	S3_ON
SMDDR_VTERM	0.75V	ON	ON	OFF	OFF	OFF	OFF	DDR_VTT_CNTL
+5V	5V	ON	OFF	OFF	OFF	OFF	OFF	MAIN_ON1
+3.3V	3.3V	ON	OFF	OFF	OFF	OFF	OFF	MAIN_ON1
+12V	12V	ON	OFF	OFF	OFF	OFF	OFF	MAIN_ON1
+VCCIO	0.95V	ON	OFF	OFF	OFF	OFF	OFF	PG_MAIN
+VCCSA	1.05V	ON	OFF	OFF	OFF	OFF	OFF	PG_+VCCIO
+VCCGT	0.65~1.3V	ON	OFF	OFF	OFF	OFF	OFF	VR_ON
+3.3V_VGA	3.3V	ON	OFF	OFF	OFF	OFF	OFF	EN_+3.3V_VGA
+1.8V_VGA	1.8V	ON	OFF	OFF	OFF	OFF	OFF	EN_+3.3V_VGA
+0.95V_VGA	0.95V	ON	OFF	OFF	OFF	OFF	OFF	EN_+3.3V_VGA
+VGA_CORE	0.8~1.15V	ON	OFF	OFF	OFF	OFF	OFF	PG_+1.8V_VGA
+1.5V_VGA	1.5V	ON	OFF	OFF	OFF	OFF	OFF	GFX_PWR_GOOD
+VCCCORE	0.65~1.3V	ON	OFF	OFF	OFF	OFF	OFF	VR_ON

RTC Batt, PCH , EC

USB Charger

EC, Flash

PCH, USB, 3D WebCAM, Touch Panel

PCH, XDP, SPI flash ROM,NGFF LAN

PCH, XDP, NGFF LAN

PCH

CPU, PCH, XDP

DDR3, CPU DDR3 I/O

DDR3

HDD, ODD,Audio AMP,Panel VCC,FAN

PCH, Audio, Card Reader, TPM, FHD CAM

3.5" HDD

CPU

PCH, CPU

PCH

dGPU

dGPU

dCPU

dGPU

dGPU, VRAM

CPU

Schematic "Value" Definition

Intel Platform Crusher-G and Crusher-U			DB/SI/PV Stage			MP		
By Value format	Description	Auto BOM Control	UMA	Discrete Meso GPU	Discrete Exo GPU	UMA	Discrete Meso GPU	Discrete Exo GPU
XX	Install	V	V	V	V	V	V	V
*XX	Non-Install	V						
PROTO@XX	Install in Pre-production only	V	V	V	V			
MP@XX	Install in MP only	V				V	V	V
DIS@xx	Install Discrete (DGPU) only	V		V	V		V	V
UMA@xx	Install UMA	V	V			V		
M_DIS@xx	Install Discrete Meso GPU only	V		V			V	
E_DIS@xx	Install Discrete Exo GPU only	V			V			V

\*\*\*Board ID and VRAM ID by manual control

02

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Quanta Computer Inc.

Project: HP-CRANE

Title			
Power States & Value Definition			
Size	Document Number		Rev
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EMI reserved

AUD\_CPU\_BCLK C128 | | \*10p/50V/NPO 4

**Project: HP-CRANE**

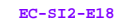
Title **CPU PEG/DISPLAY**

Size	Document Number <b>810606-000</b>
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Rev	
B	

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EC-DB-E24



+VCCST\_VCCPLL

H\_PWRGD R493 \*10k/5% 4

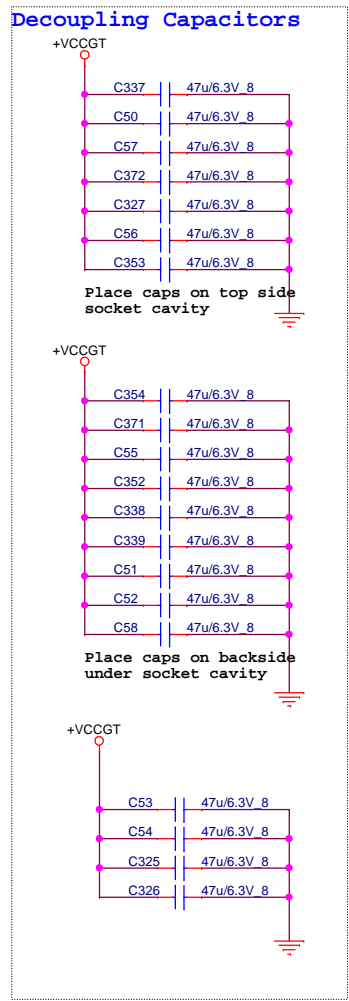
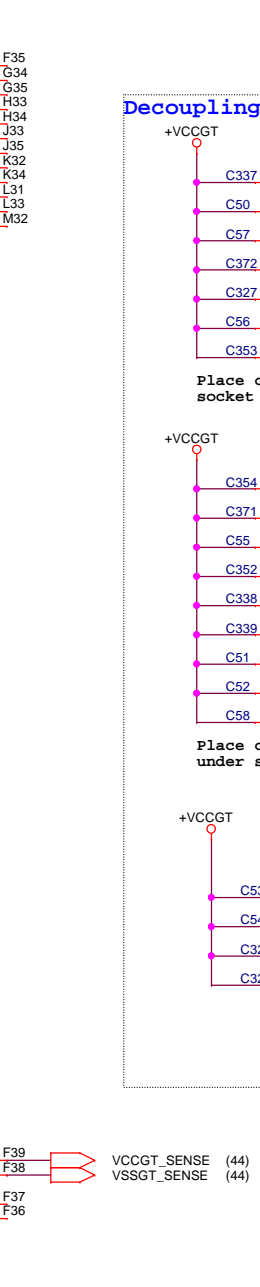
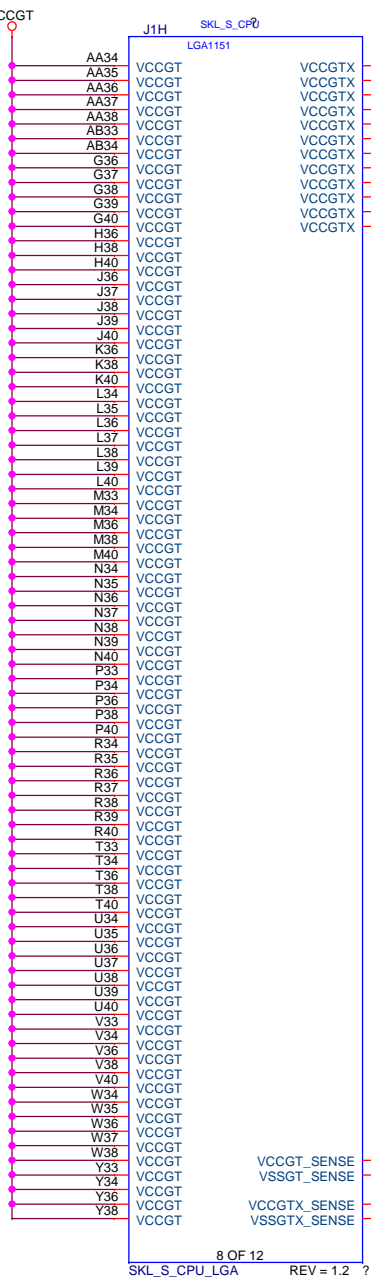
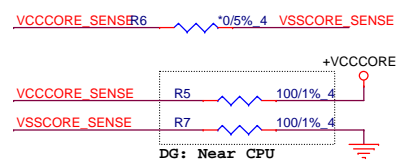
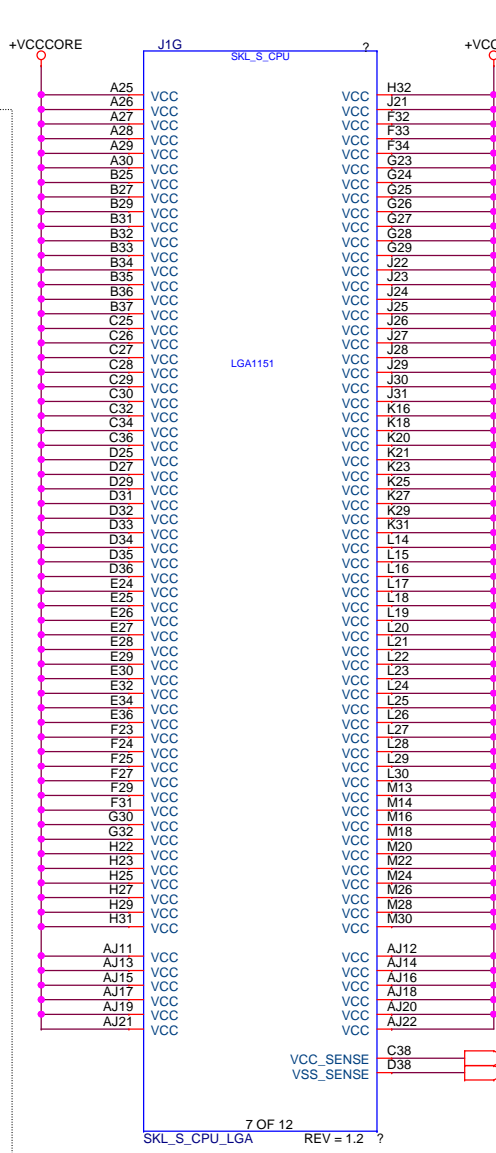
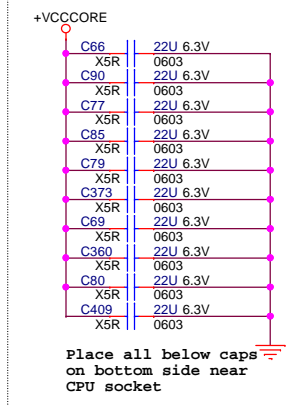
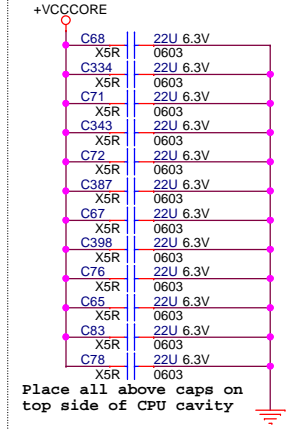
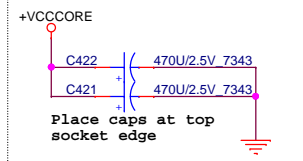
**Project: HP-CRANE**

Size	Document Number <b>810606-000</b>
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+VCCCPRE:  
Icc ( max ) : 66A  
Icc ( PS2 ) : 35A

### Decoupling Capacitors



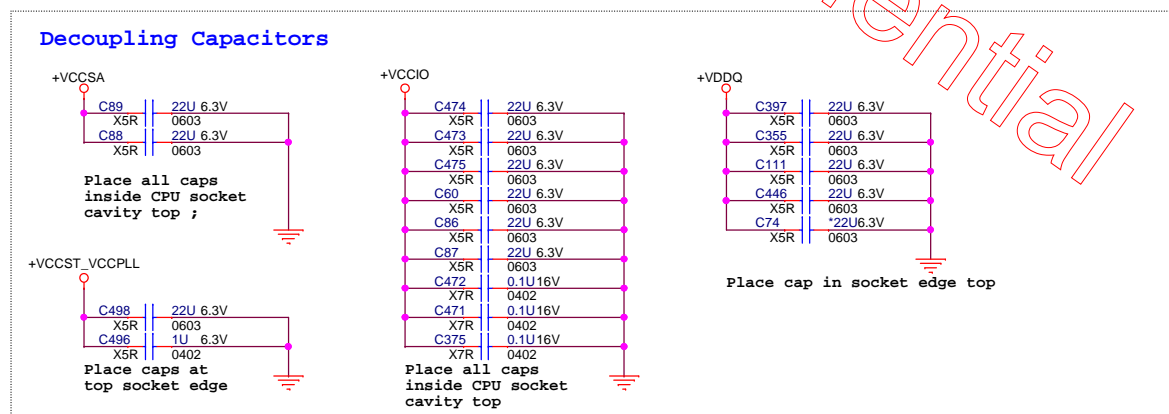
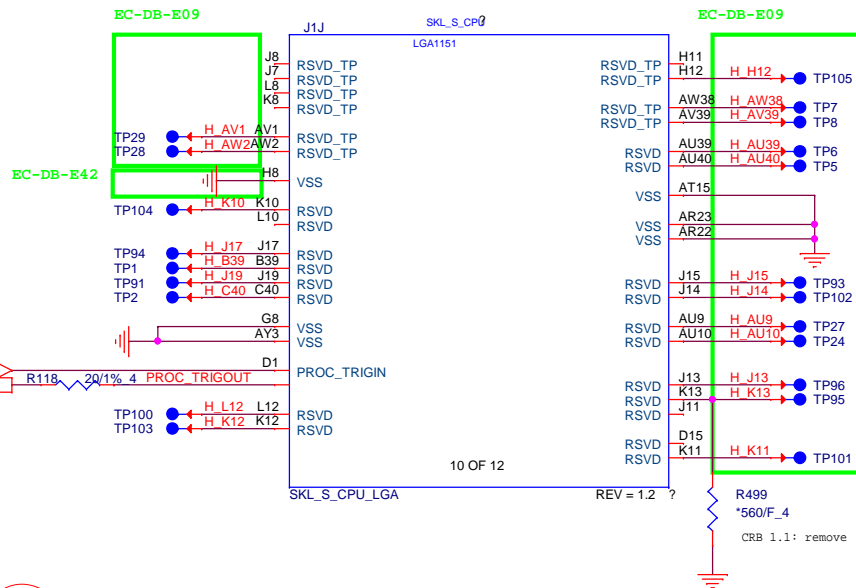
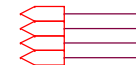
HP Restricted Secret



**Quanta Computer Inc.**  
**Project: HP-CRANE**

Title <b>CPU POWER</b>		
Size	Document Number <b>810606-000</b>	Rev <b>B</b>
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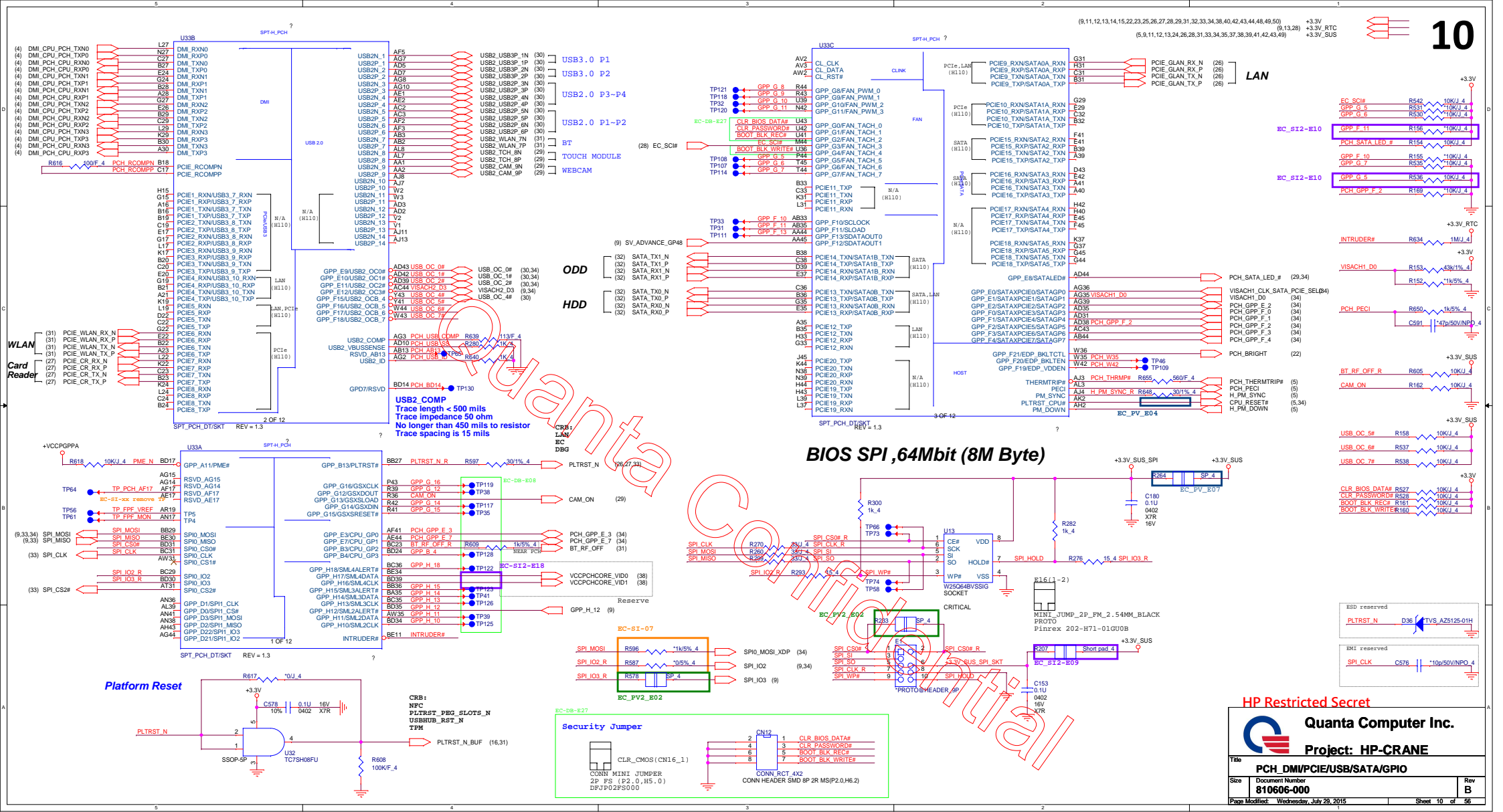
**Project: HP-CRANE**

Page Modified: Wednesday, July 29, 2015		Sheet 7 of 56	
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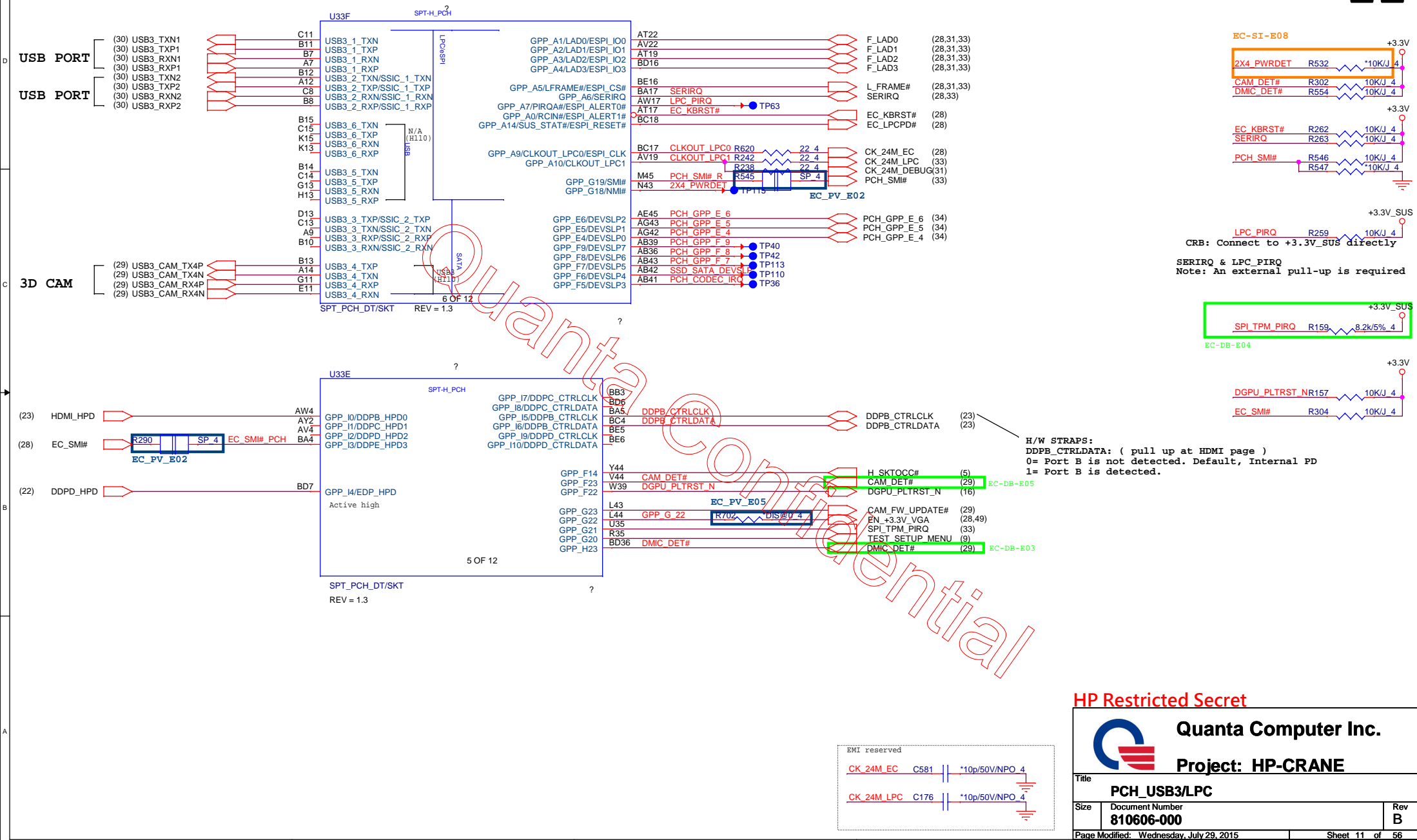






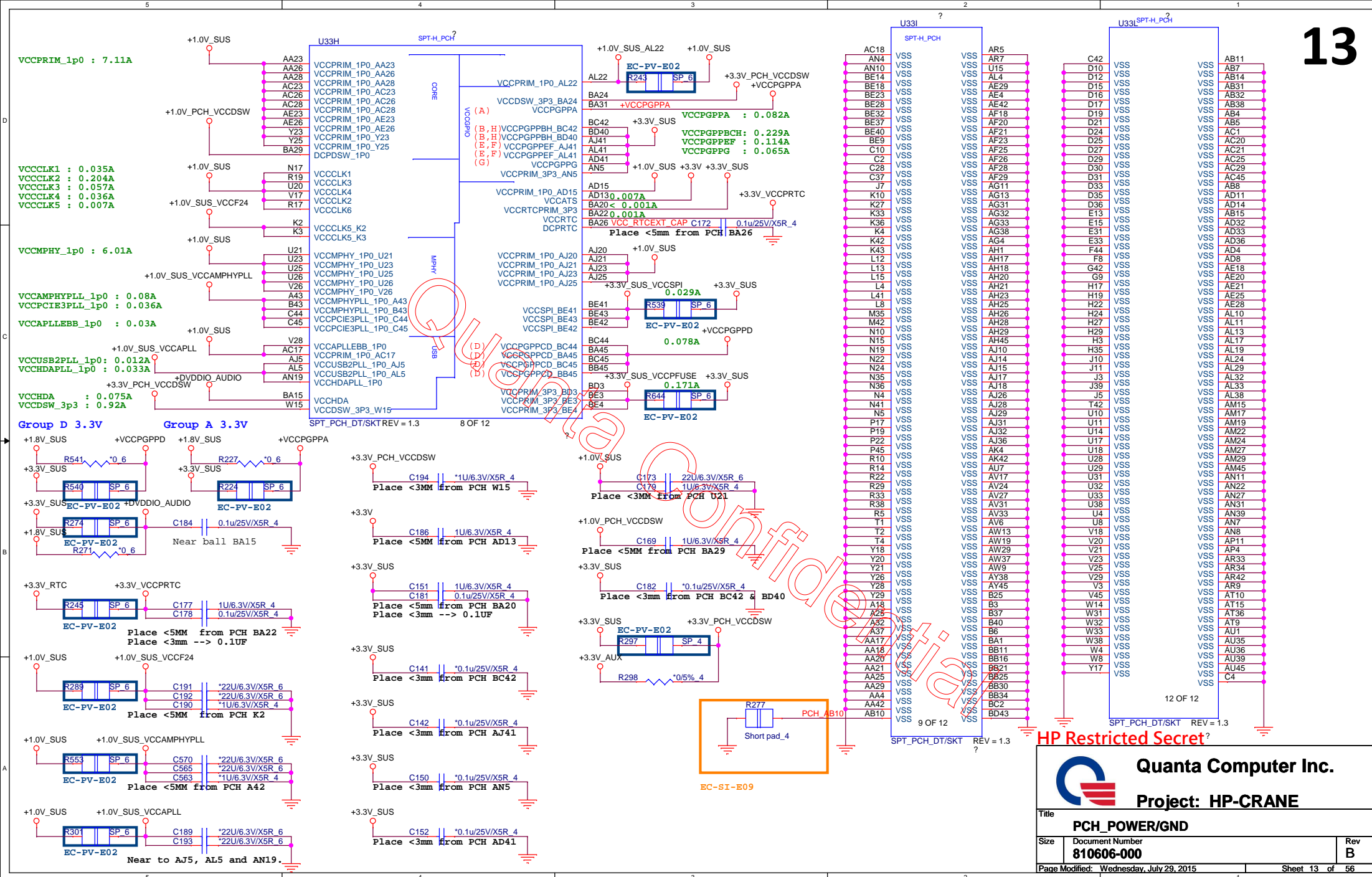
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(5,9,10,12,13,24,26,28,31,33,34,35,37,38,39,41,42,43,49)

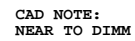
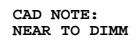
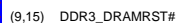
+3.3V  
+3.3V\_SUS



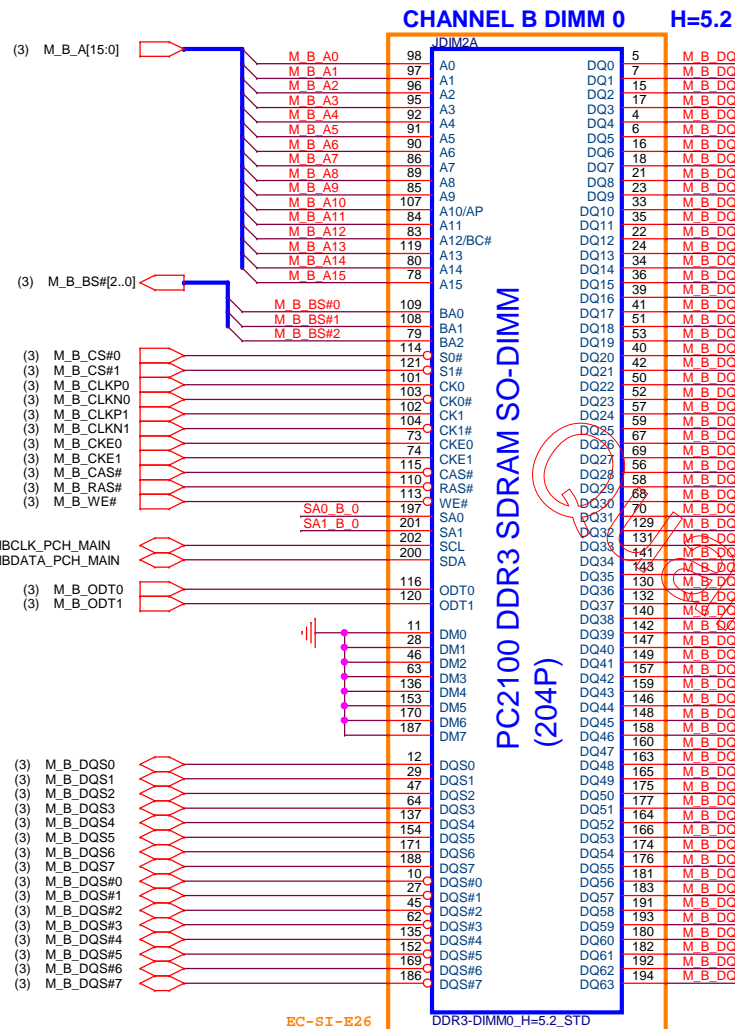












M\_B\_DQ[0..63] (3)

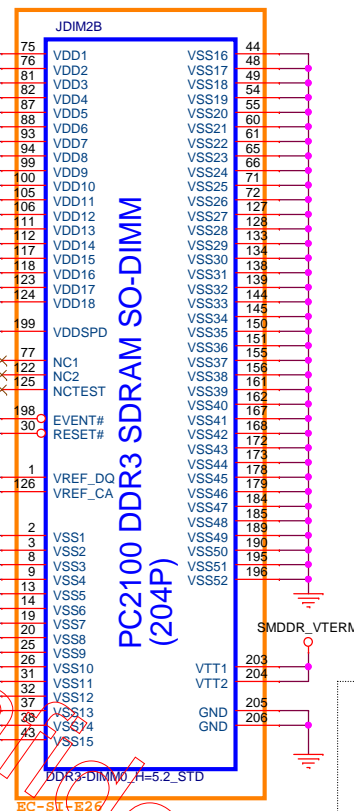
EC-DB-E11  
SWAP Memory dimm data bus

TP106 DIMM EVENT# B

(9,14) DDR3\_DRAMRST#

DIMM\_DQ\_R\_VREF\_B

DIMM\_CA\_VREF\_B



BK: CRB--> NO BOTH

M\_B\_CLKP0 R463 \*100KR 4 M\_B\_CLKN0

M\_B\_CLKP1 R464 \*100KR 4 M\_B\_CLKN1

DDR3\_DRAMRST#

C291 100p/50V\_4

+3.3V

R518 \*4.7KR\_4

R521 4.7KR\_4

R517 10k/5%\_4

R522 \*0R\_4

SA1 B 0

SA0 B 0

SPD SA0 0

SPD SA1 1

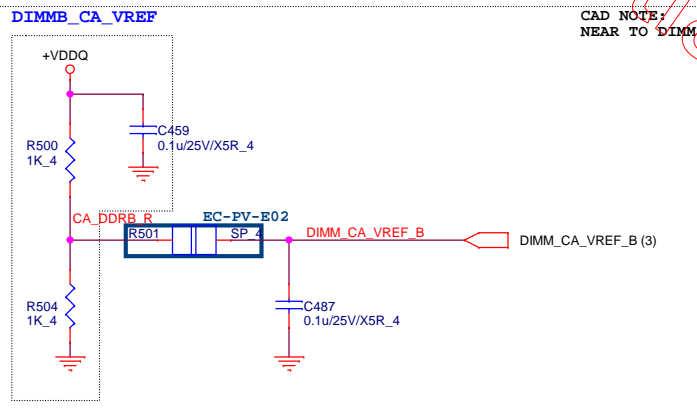
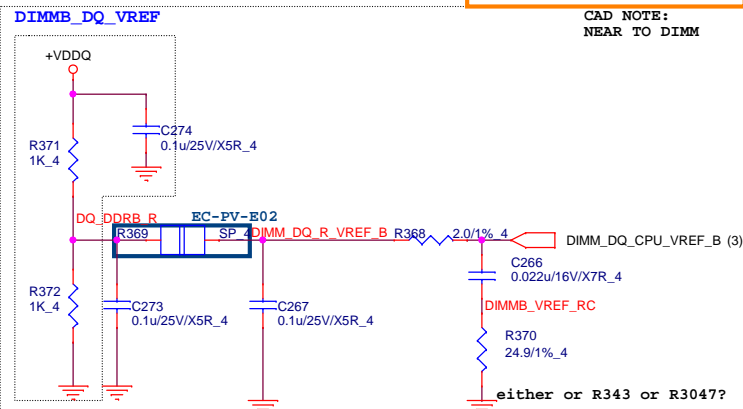
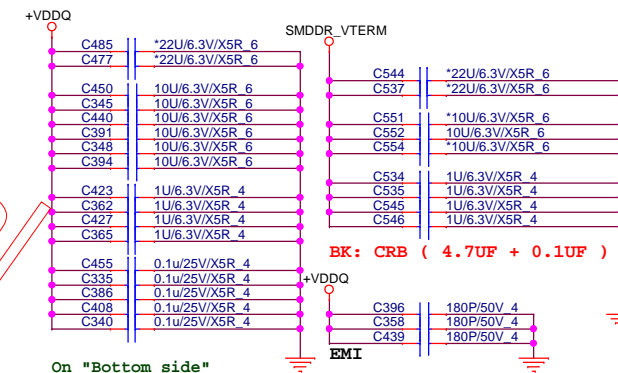
+3.3V

C540 0.1u/25V/X5R 4

C541 0.1u/25V/X5R 4

Close to PIN199 OF DIMM

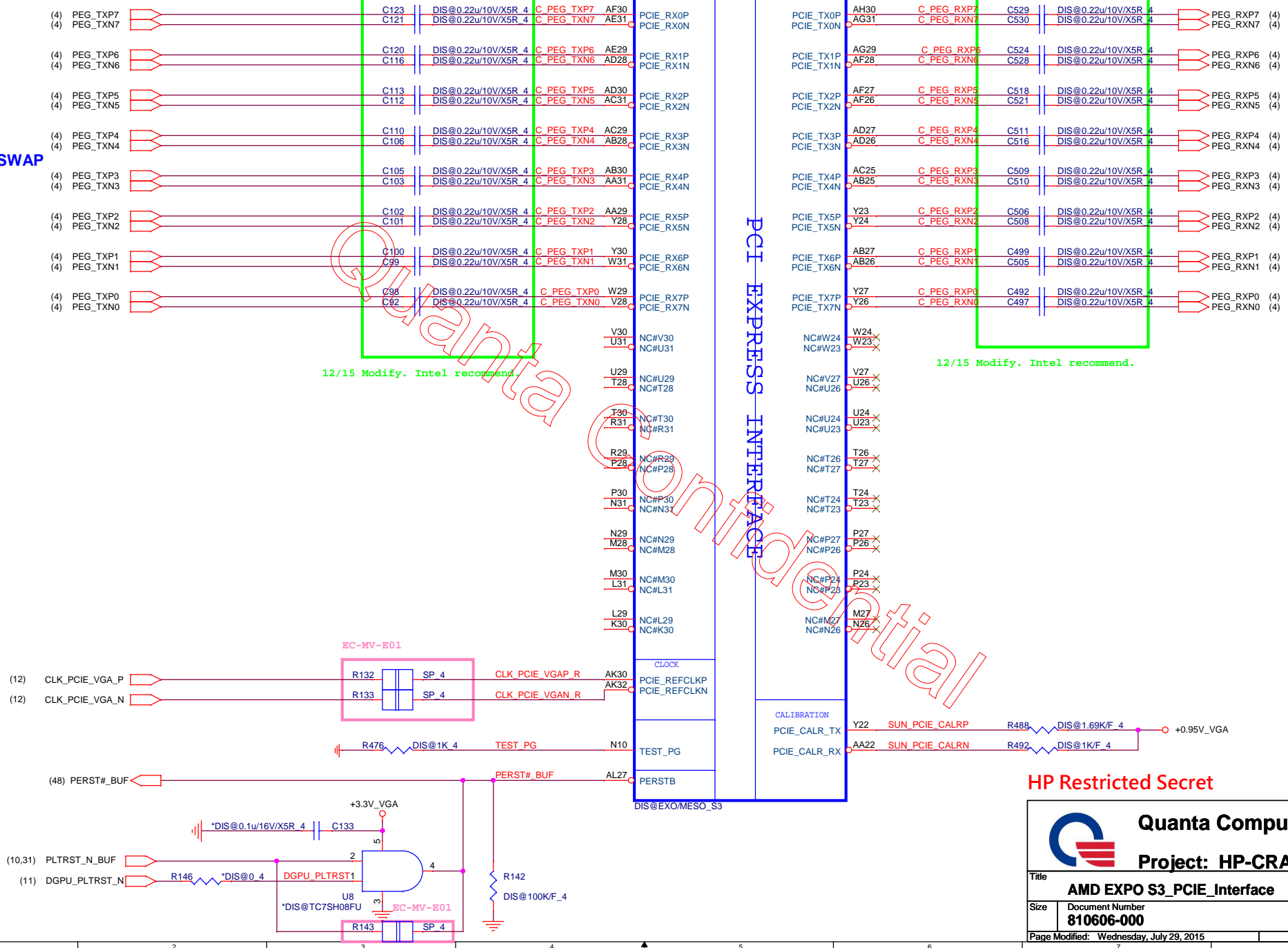
Place these Caps near CHB So-Dimm0.



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LANE SWAP

LANE SWAP



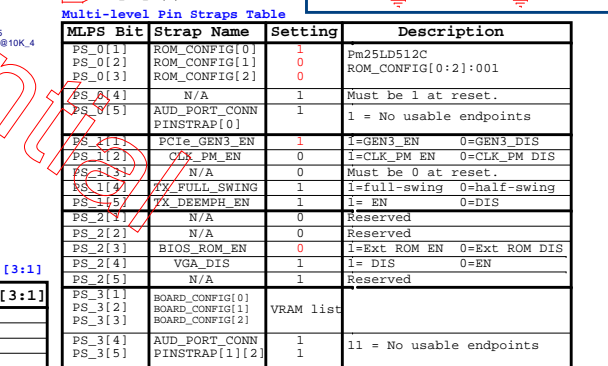
HP Restricted Secret



Quanta Computer Inc.

Project: HP-CRANE

Title			AMD EXPO S3_PCIE_Interface
Size	Document Number	Rev	
	810606-000	B	
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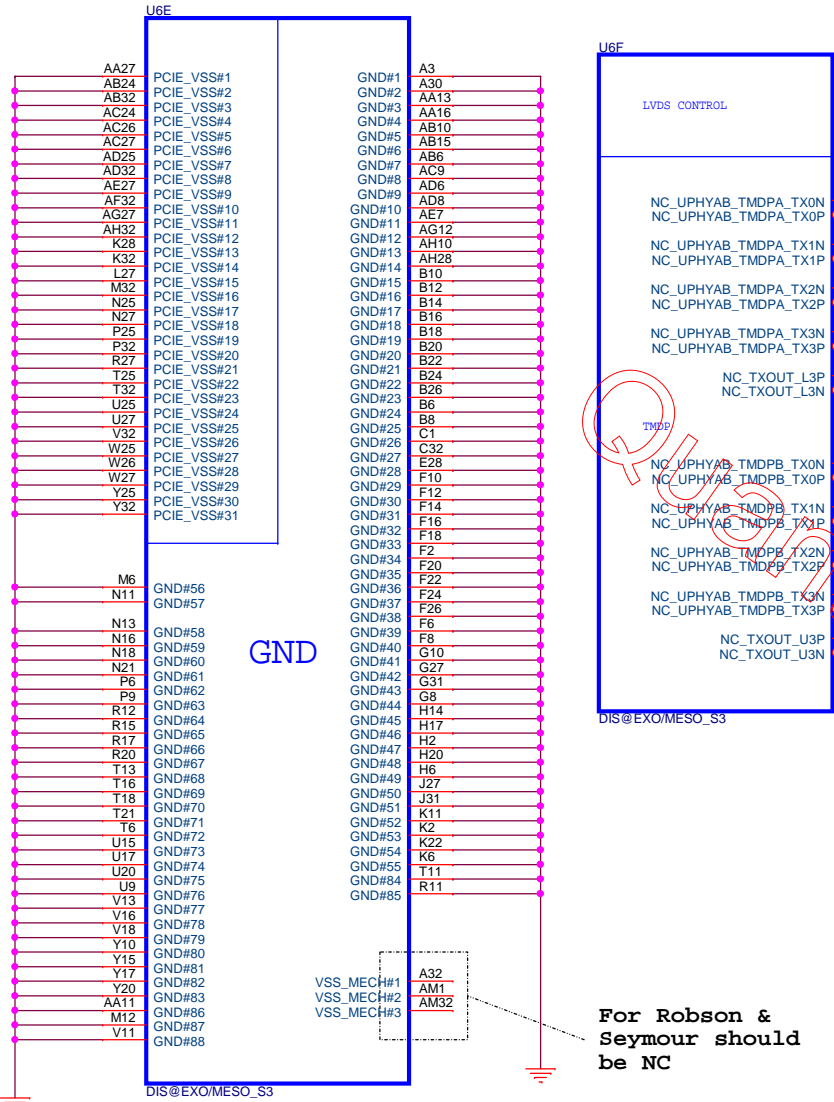
PS_3[3:1]	Vendor	Type	Vendor P/N	R128	R123
000	Micron	256Mx16 *4, 1000Mhz	MT41J256M16HA-093G:E	NC	4.75
001	Hynix	256Mx16 *4, 1000Mhz	H5TC4G63CFR-NOC	8.45K	2K
010	Micron	512Mx16 *4, 1000Mhz	MT41J512M16HA-093G:E	4.75K	2K

Cap Value(nF)	Bits [5:4]
680	00
82	01
10	10
NC	11

4.75K	NC	111
-------	----	-----

Note: 0402 1% resistors are required

For AMD tuning  
timing purpose




CONFIGURATION STRAPS-- SEE EACH DATABOOK FOR STRAP DETAILS			RECOMMENDED SETTINGS 0= DO NOT INSTALL RESISTOR 1 = INSTALL 3K RESISTOR X = DESIGN DEPENDANT NA = NOT APPLICABLE
ALLOW FOR PULLUP PADS FOR THESE STRAPS AND IF THESE GPIOs ARE USED, THEY MUST NOT CONFLICT DURING RESET			
STRAPS	PIN	DESCRIPTION OF DEFAULT SETTINGS	
TX_PWRS_ENB	GPIO0	PCIE FULL TX OUTPUT SWING	0
TX_DEEMPH_EN	GPIO1	PCIE TRANSMITTER DE-EMPHASIS ENABLED	X
RSVD	GPIO2	RESERVED	0
RSVD	GPIO8	RESERVED	0
BIF_VGA DIS	GPIO9	VGA ENABLED	0
RSVD	GPIO21	RESERVED	0
BIOS_ROM_EN	GPIO_22_ROMCSB	ENABLE EXTERNAL BIOS ROM	0
ROMIDCFG(2:0)	GPIO[13:11]	SERIAL ROM TYPE OR MEMORY APERTURE SIZE SELECT	0 0 1
VIP_DEVICE_STRAP_ENA	V2SYNC	IGNORE VIP DEVICE STRAPS (Removed on Seymour/Whistler)	0
RSVD	H2SYNC	RESERVED	0
AUD[1]	HSYNC	SEE DATABOOK FOR DETAIL	0
AUD[0]	VSYNC	SEE DATABOOK FOR DETAIL	0
RSVD	GENERICC	RESERVED	0

NOTE1: AMD RESERVED CONFIGURATION STRAPS				
ALLOW FOR PULLUP PADS FOR THESE STRAPS BUT DO NOT INSTALL RESISTOR. IF THESE GPIOs ARE USED, THEY MUST KEEP "LOW" AND NOT CONFLICT DURING RESET.				
GPIO21	H2SYNC	GENERICC	GPIO8	GPIO2



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Quanta Computer Inc.

Project: HP-CRANE

Title

AMD EXO PRO S3\_GND/LVDS/Strap

Size

Document Number

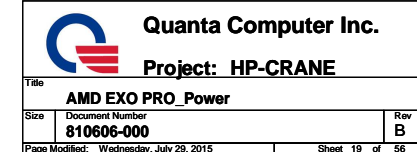
810606-000

Rev

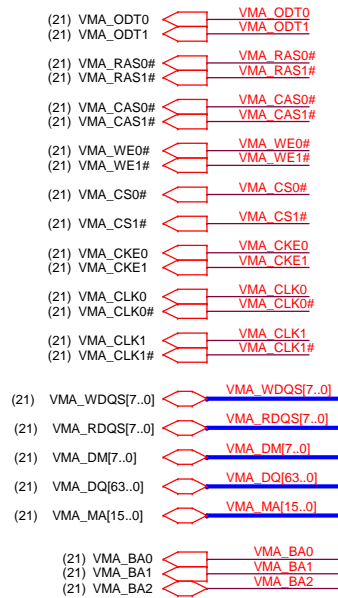
B

Page Modified: Wednesday, July 29, 2015

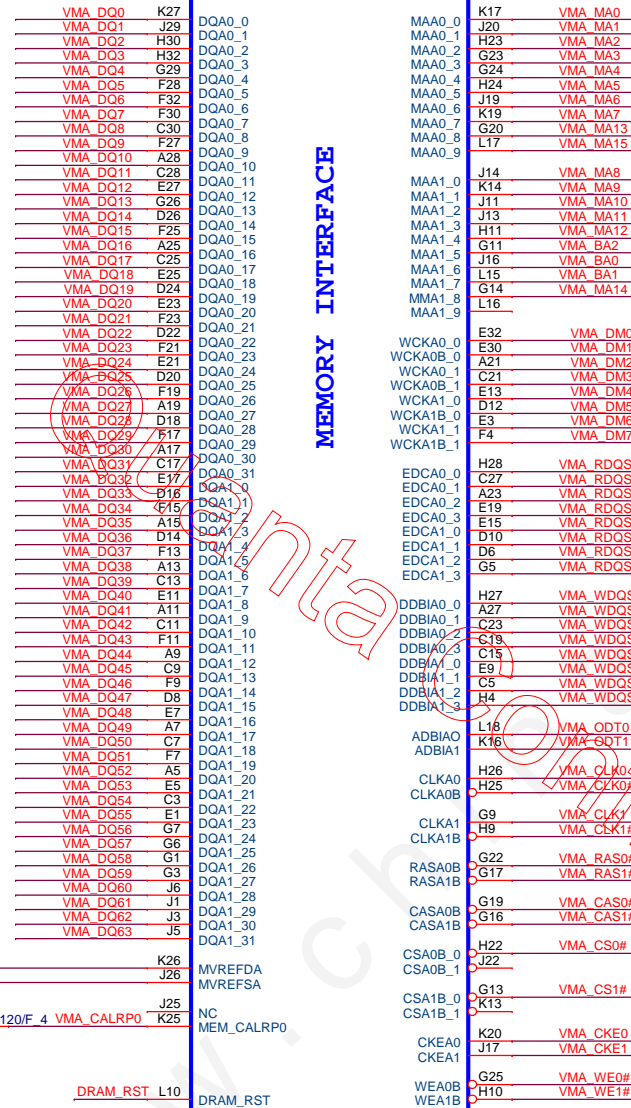
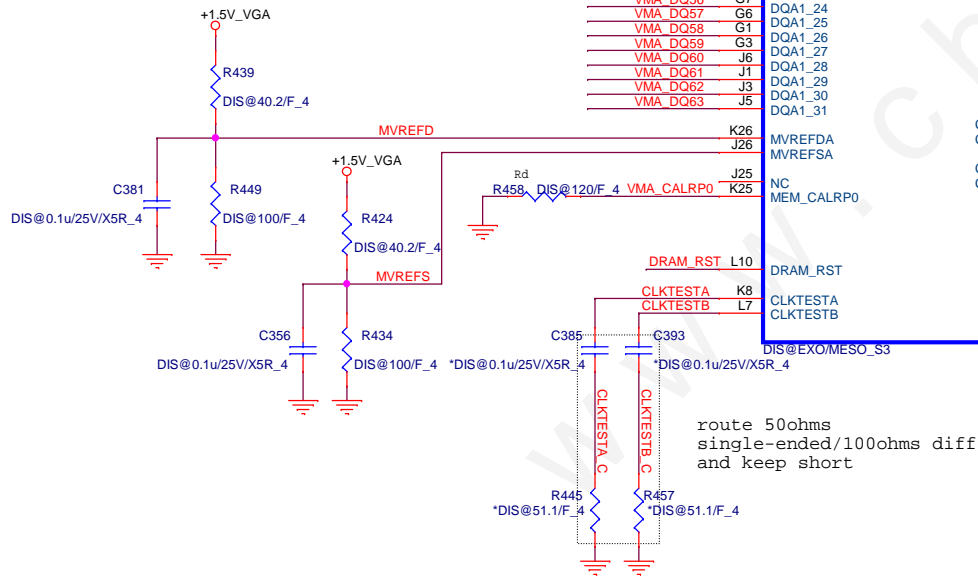
Sheet 18 of 56



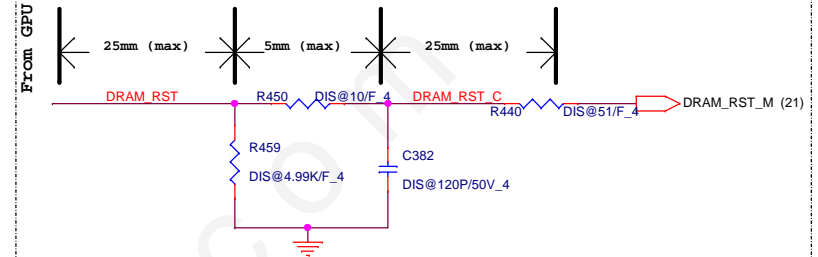




support 1Gbit  
VRAM ( 64M X 16 )



# MEMORY INTERFACE



Place all these components very close to GPU (Within 25mm) and keep all component close to each Other (within 5mm) except Rser2

This basic topology should be used for DRAM\_RST for DDR3/GDDR5. These Capacitors and Resistor values are an example only. The Series R and || Cap values will depend on the DRAM load and will have to be calculated for different Memory ,DRAM Load and board to pass Reset Signal Spec.

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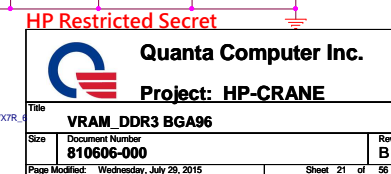


Quanta Computer Inc.

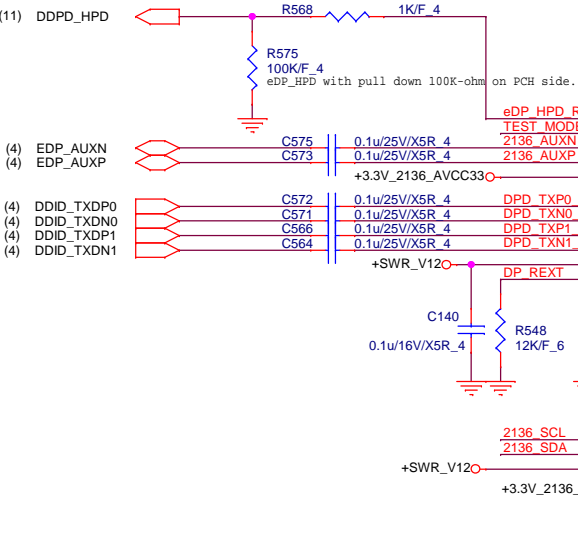
Project: HP-CRANE

Title			AMD EXO RPO S3_MEM_Interface
Size	Document Number	Rev	
	810606-000	B	
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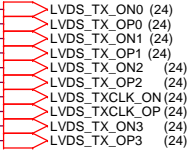




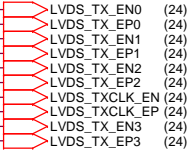
DP input signals



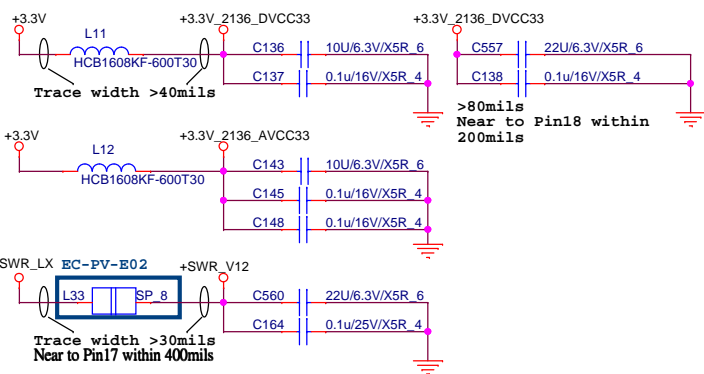
ODD\_CH



EVEN\_CH



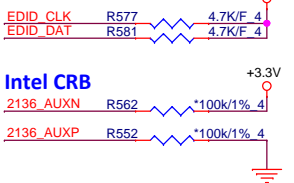
RTD2136N Power



SWR MODE /LDO MODE

L9	2.2-uH	0 Ohm
SWR	Connect	NC
LDO	NC	Connect

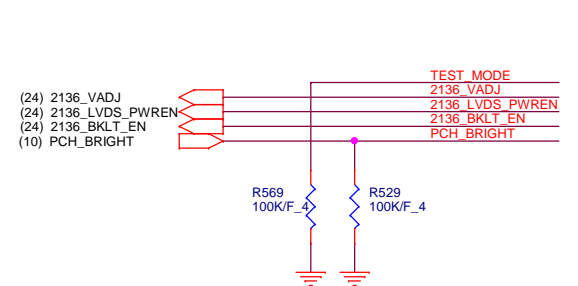
EDID



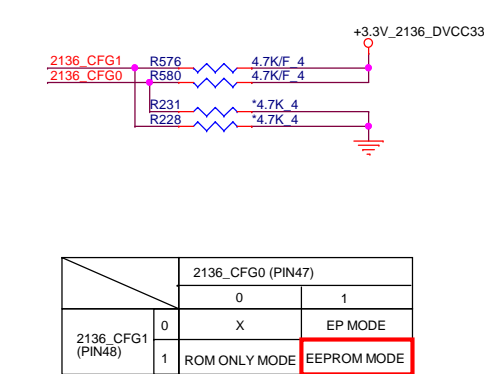
Intel CRB



GPIO & TESTING signals

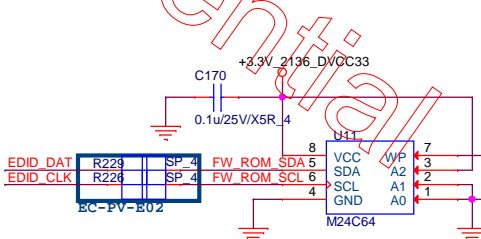


Mode select



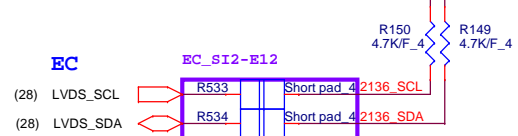
		2136_CFG0 (PIN47)	
		0	1
2136_CFG1 (PIN48)	0	X	EP MODE
	1	ROM ONLY MODE	EEPROM MODE

EEPROM



- 1- EEPROM with a size 8K-Byte
- 2- EEPROM device should be 2-byte addressing device
- 3- Slave address should configure as 0xA8

In System Programing slave address=0xA8



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**Quanta Computer Inc.**  
**Project: HP-CRANE**

Title  
**eDP-LVDS\_RTD2136N**

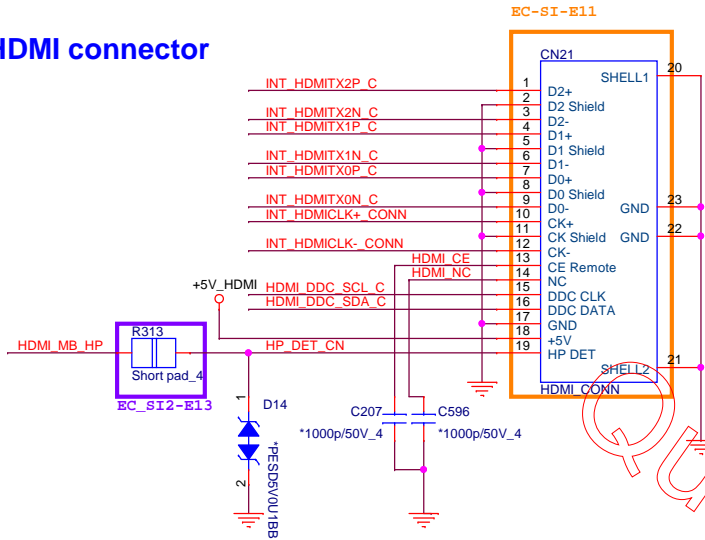
Size  
Document Number  
**810606-000**

Rev  
**B**

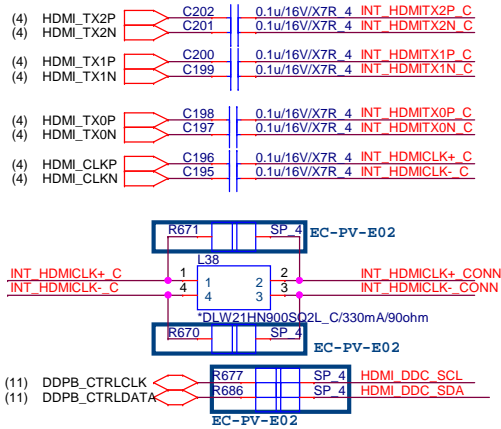
Page Modified: Wednesday, July 29, 2015

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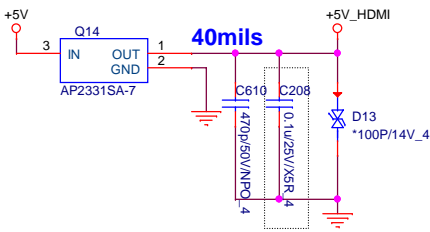
HDMI connector



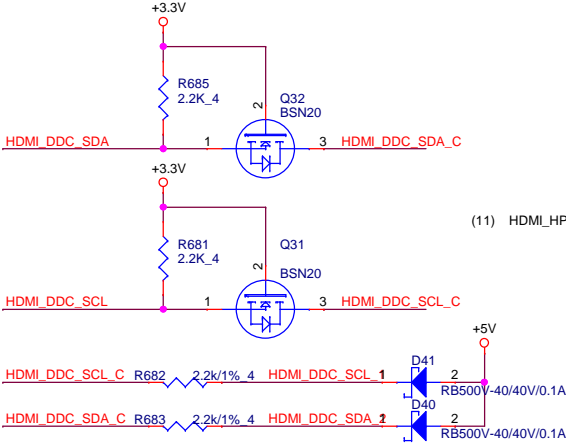
HDMI INTERFACE



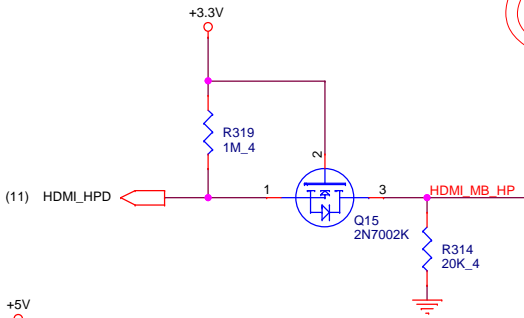
HDMI POWER SUPPLY



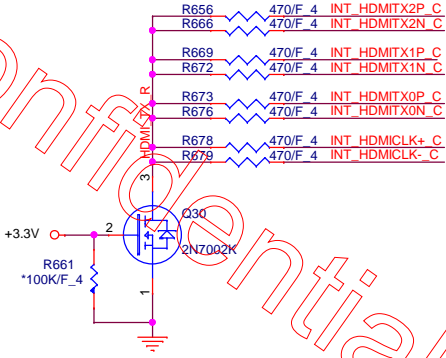
HDMI DDC



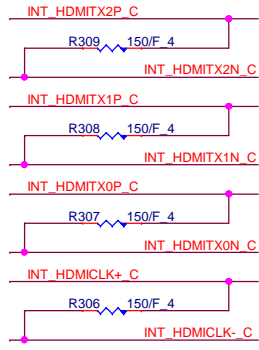
HDMI-detect



HDMI LEVEL SHIFT

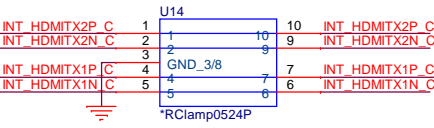
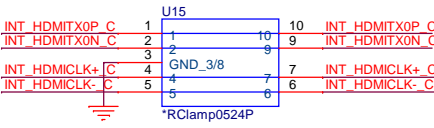
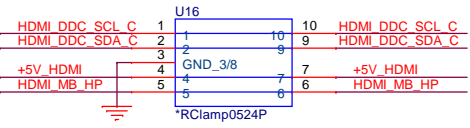


HDMI EMI (EMC)




ESD reserve for HDMI

Layout Notes:  
Place decoupling CAPs close to Connector



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**Quanta Computer Inc.**  
**Project: HP-CRANE**

Title  
**HDMI**

Size  
Document Number  
**810606-000**

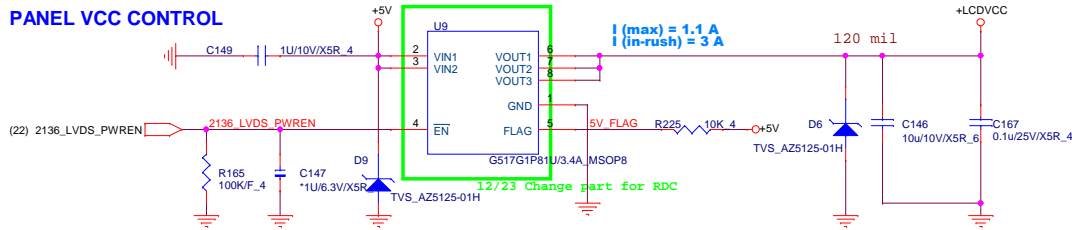
Rev  
**B**

Page Modified: Wednesday, July 29, 2015  
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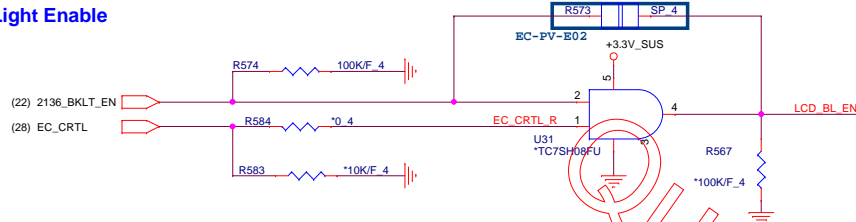
# LED PANEL

24

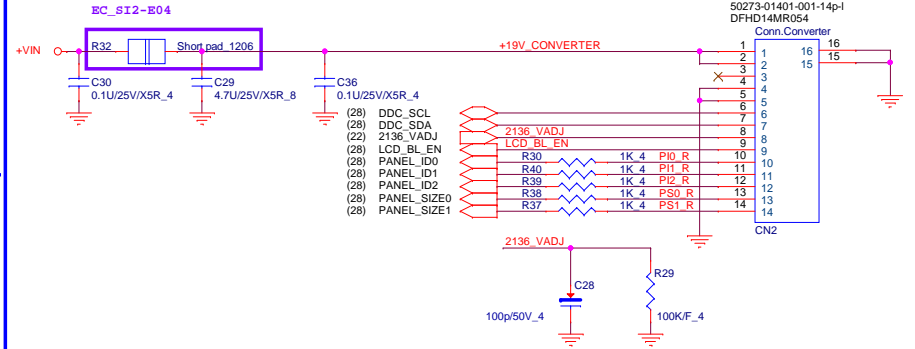
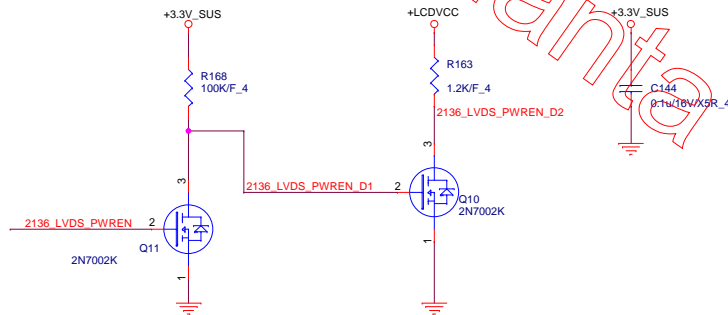
## PANEL VCC CONTROL



## BackLight Enable



## LCDVCC Discharge Circuit



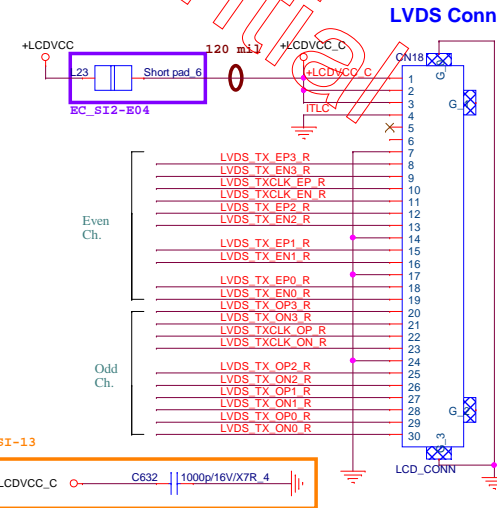
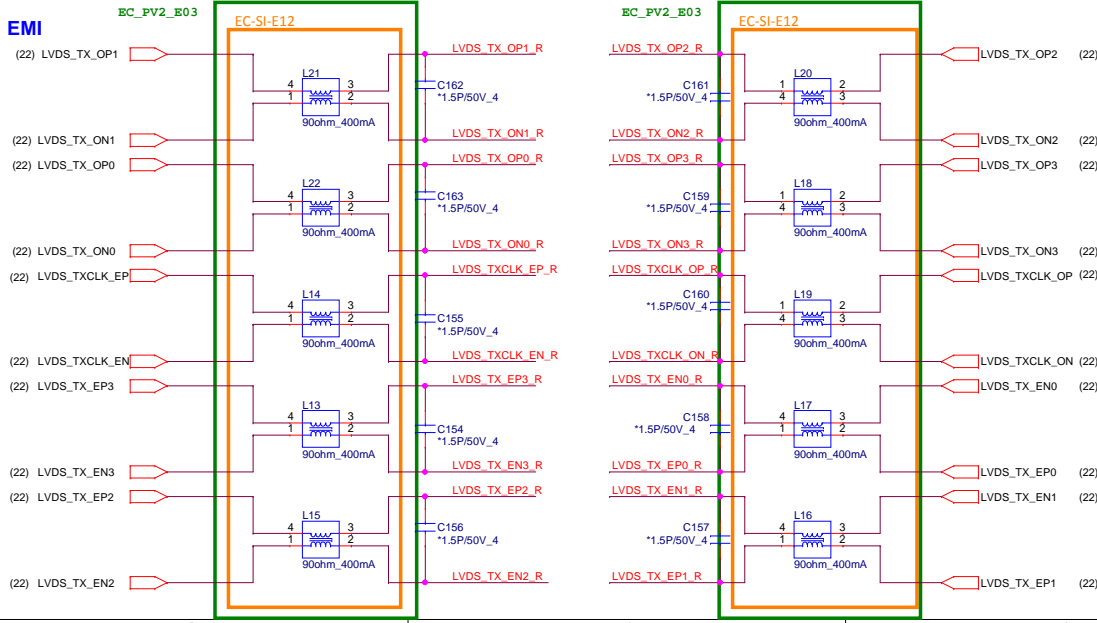
## PANEL\_Size Table

PANEL_Size[1:0]	Size
10	23"
11	21.5"
01	27"

## PANEL\_ID Table

PANEL_ID[2:0]	Panel model
000	Reserve
001	SDC LTM215HL01_H02
010	SDC LTM230HL08 LTM215HL01_H01
011	Reserve
100	LGD LM230WF3 LM215WF3
101	Reserve
110	Reserve
111	No Connect

## EMI



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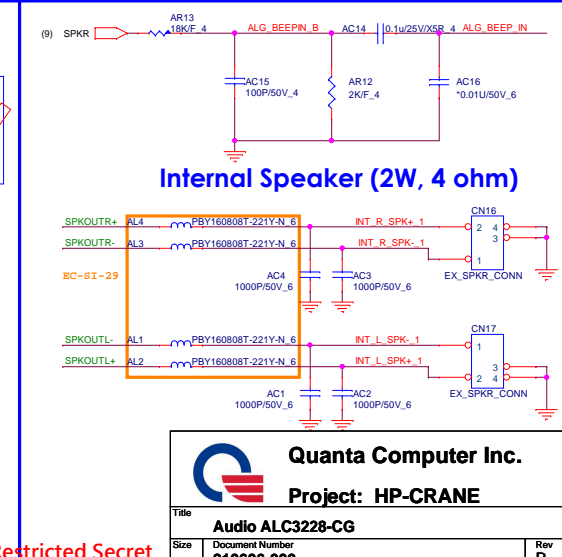
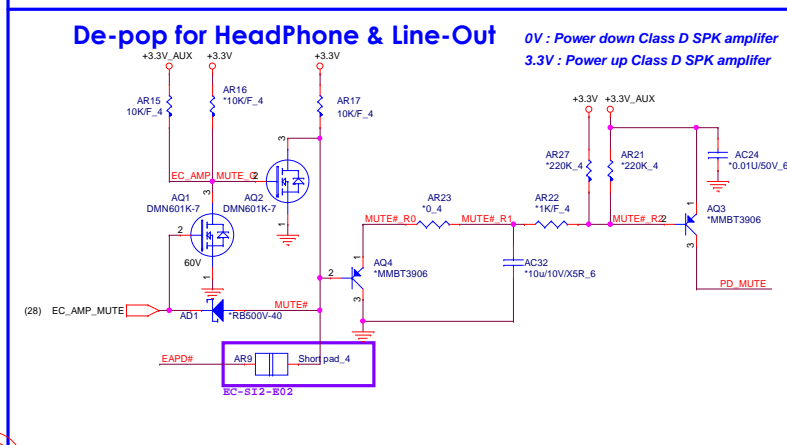
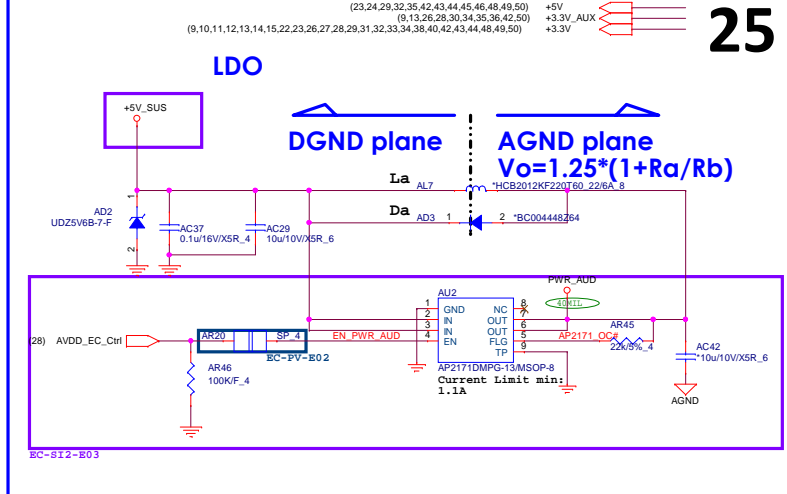
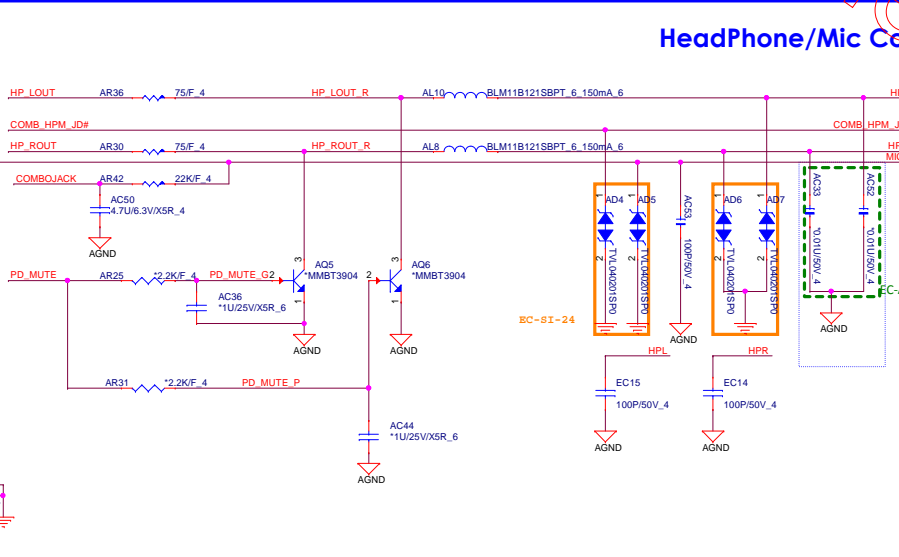
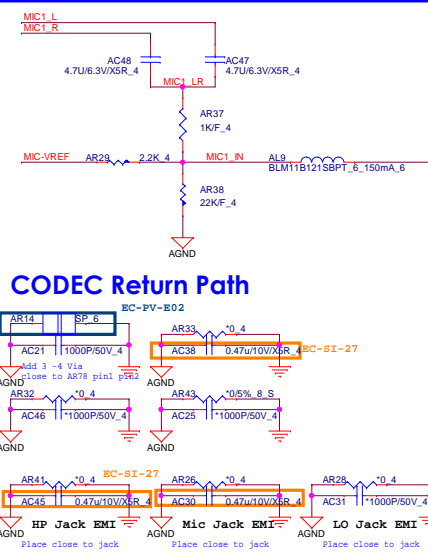
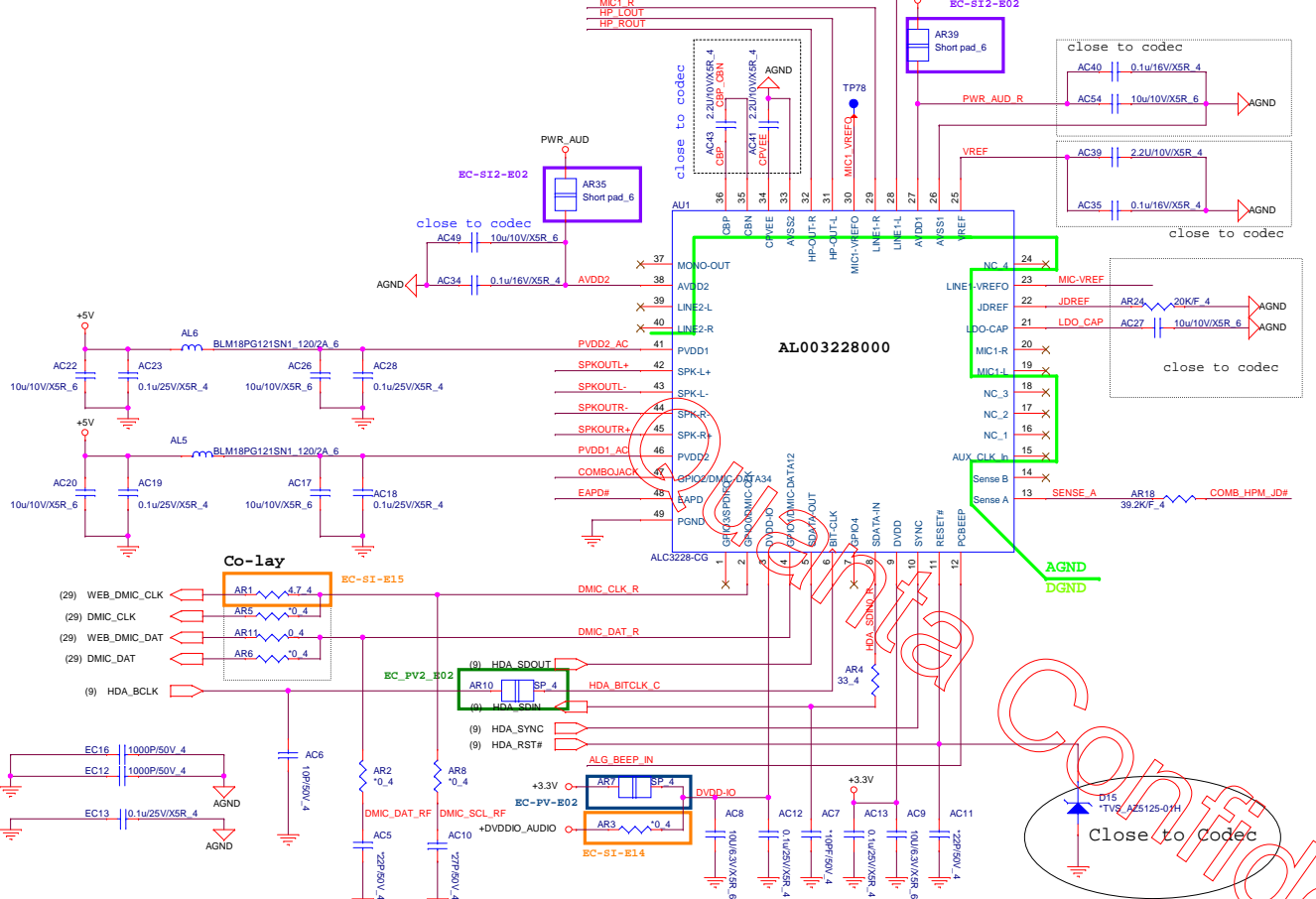


Quanta Computer Inc.

Project: HP-CRANE

Title	Panel (Control).LVDS-Conn.	Rev	B
Size	Document Number		
	810606-000		
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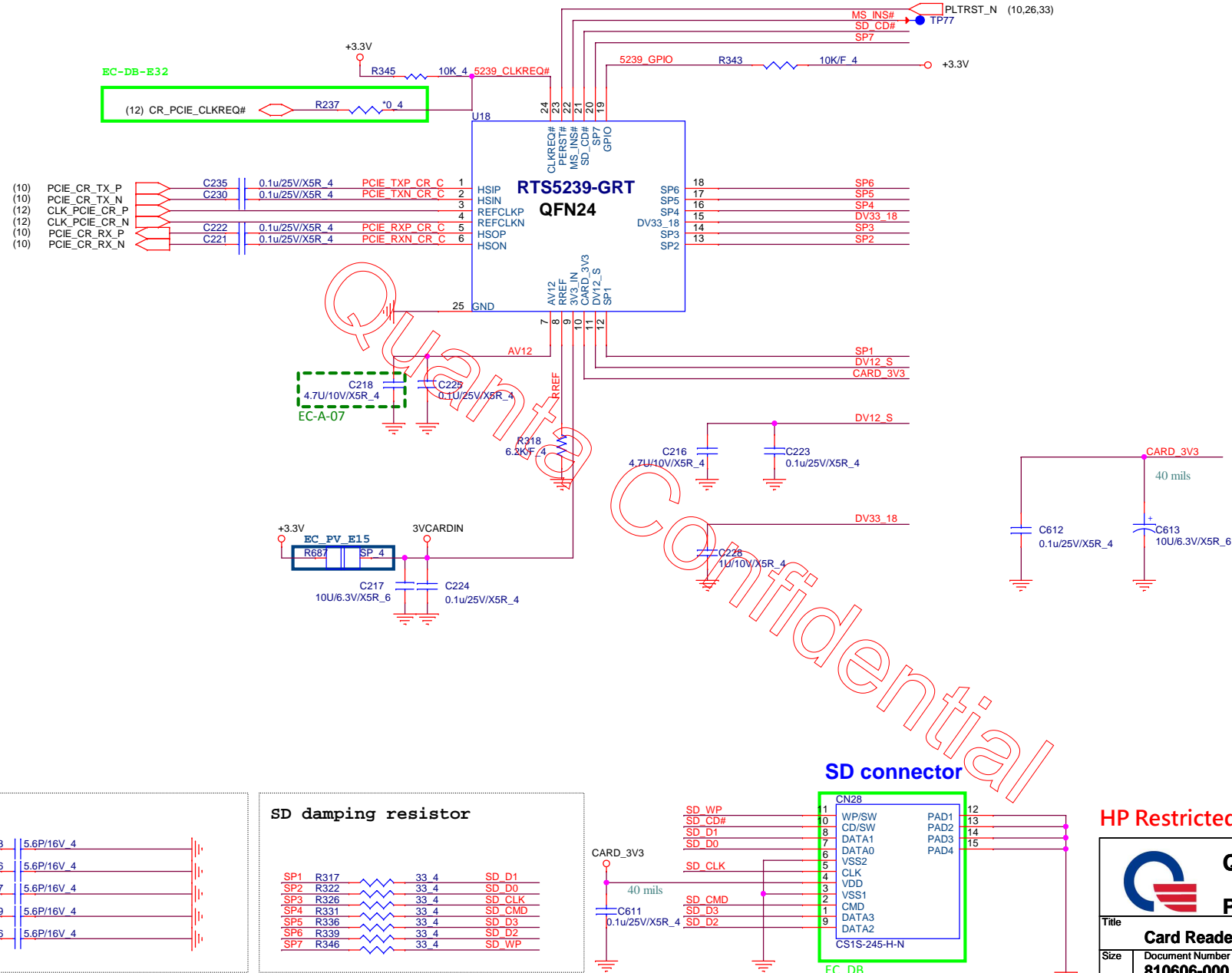
Audio Codec ALC3228

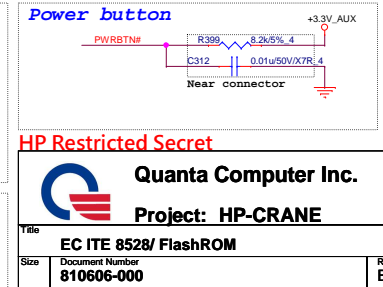
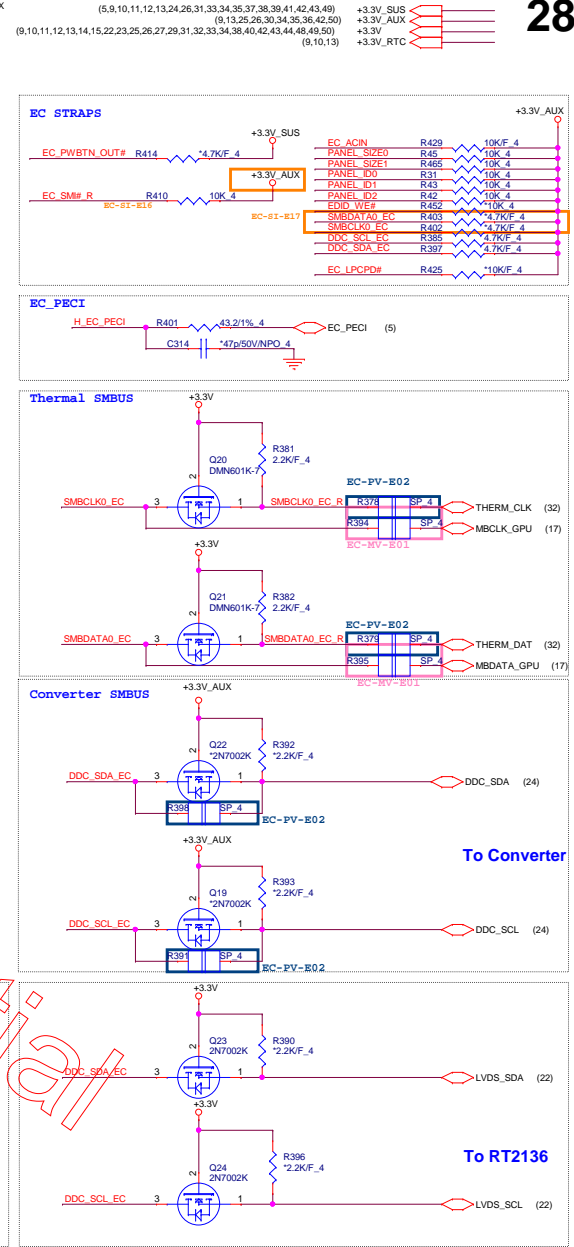


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## 3D CAM



Normal = 0.135A  
Design = 0.3A



3D CAM Module	
#	Description
1	GND
2	USB3_TX-
3	USB3_TX+
4	GND
5	USB3_RX-
6	USB3_RX+
7	GND
8	FW_UPDATE
9	5V +/- 5%
10	5V +/- 5%

## Touch Panel




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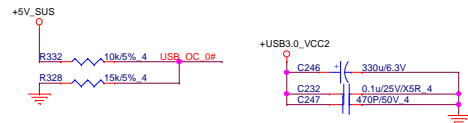
The diagram shows the pinout for the U40 USB3 CAM connector. It is a 10-pin connector with the following connections:

Pin	Signal	Pin	Signal
1	USB3_CAM_RX4N	10	USB3_CAM_RX4N
2	USB3_CAM_RX4P	9	USB3_CAM_RX4P
3		8	
4	USB3_CAM_TX4N C	7	USB3_CAM_TX4N
5	USB3_CAM_TX4P C	6	USB3_CAM_TX4P

Additional labels in the diagram include: U40, GND\_3/8, and a ground symbol connected to pins 1, 2, 3, 4, and 5.

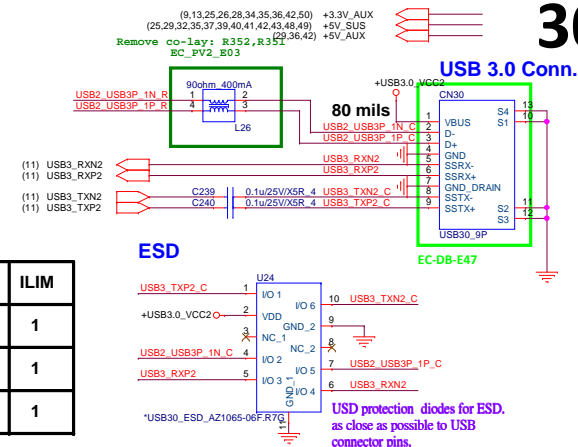
 <div> <div>Quanta Computer Inc.</div> <div>Project: HP-CRANE</div> </div>	
Title	
eDP-LVDS_RTD2136N	
Size	Document Number <b>810606-000</b>
	Rev B
Page Modified: Wednesday, July 29, 2015	Sheet 29 of 56

30

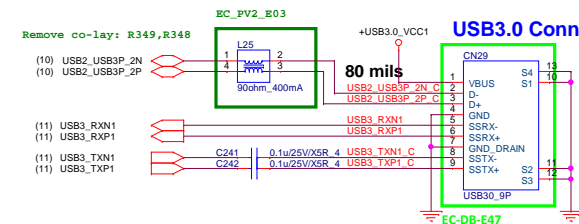
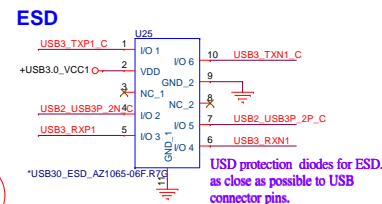
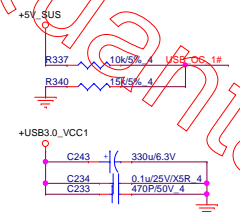


SDP : Standard Downstream Port (11) US  
 CDP : Charging downstream port (11) US  
 DCP : Dedicated Charging Port  
 Enable/Disable : setting by BIOS

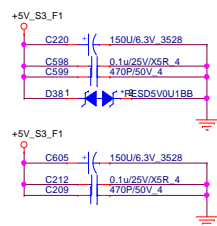
POWER STATE	TPS2546 CHARGING MODE	CTRL1	CTRL2	CTRL3	ILIM
S0	CDP LOAD DETECTION WITH ILIM_LO +60MA THRESHOLDS OR IF A BC1.2 PRIMARY DETECTION OCCURS	1	1	1	1
S3	AUTO MODE, LOAD DETECTION WITH POWER WAKE THRESHOLDS	0	1	1	1
S4/S5	AUTO MODE, KEYBOARD/ MOUSE WAKE-UP, LOAD DETECTION WITH ILIM_LO +60MA THRESHOLDS	0	0	1	1



### USB3.0 Power Switch



### USB3.0 Power Switch

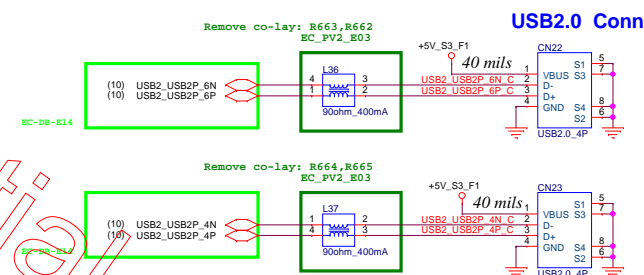


**ESD**

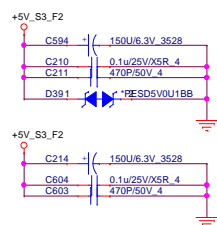
U36	1	10	10
USB2_USB2P_4P C	1	10	10
USB2_USB2P_4N C	2	9	9
USB2_USB2P_6N C	3	7	7
USB2_USB2P_6P C	5	6	6

TAZ1045-04F

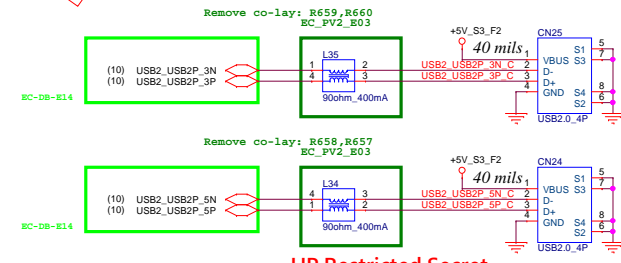
**ESD protection diodes for ESD,**  
as close as possible to USB connector pins.



### USB3.0 Power Switch



The schematic diagram illustrates the electrical connection between a USB2 to RS485 module and a USB connector. A 5V\_SUS supply is connected to a network of resistors (R680, R684) and capacitors (C680, C684) leading to a USB connector (J35). The USB connector pins are connected to an RS485 module (AZ1045-04F) via a ribbon cable. The RS485 module has pins for USB2\_0, USB2\_1, USB2\_2, USB2\_3, GND, and USB2\_4, which are connected to the module's internal pins 10, 9, 8, 7, 6, and 5 respectively.



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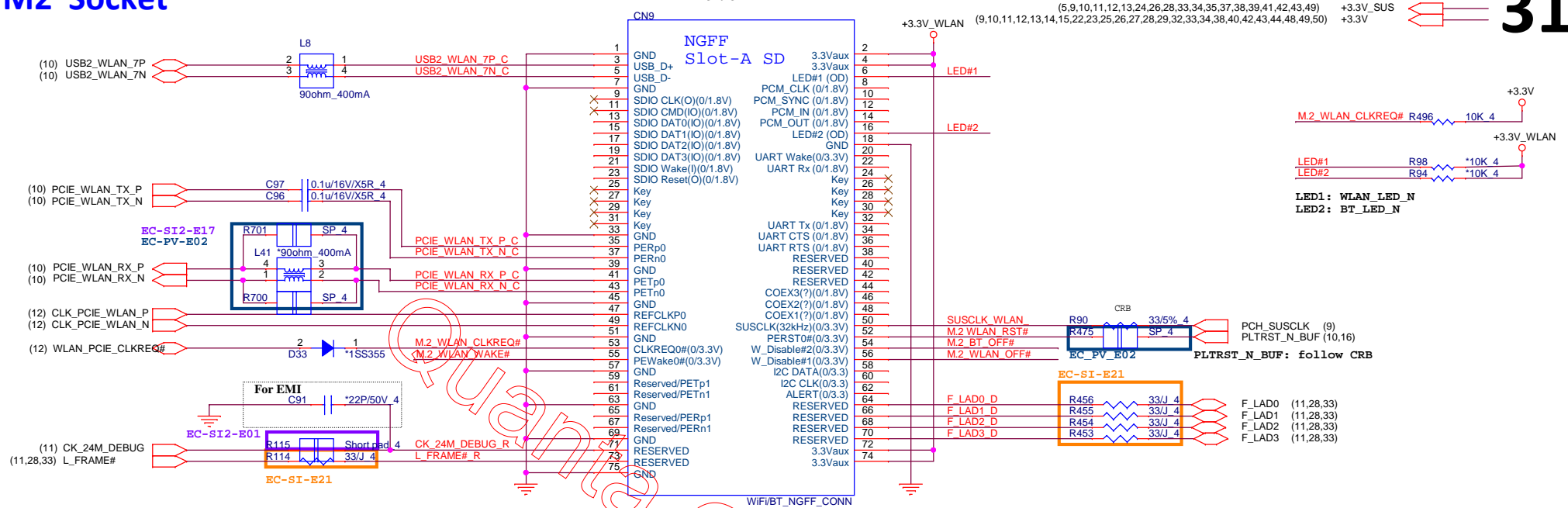
**Project: HP-CRANE**

Title			USB2.0/USB3.0 Conn		
Size	Document Number				Rev
	810606-000				B
Page Modified: Wednesday, July 29, 2015			Sheet 30 of 56		

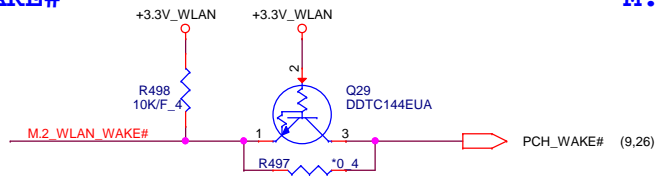
## NGFF M2 Socket

H=9.0

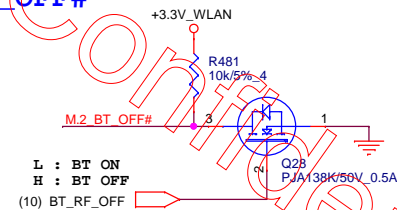
# 31



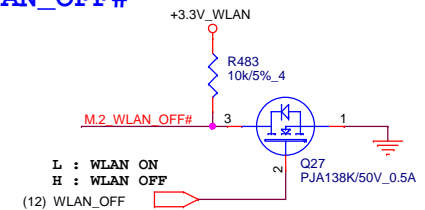
## M.2 WLAN WAKE#



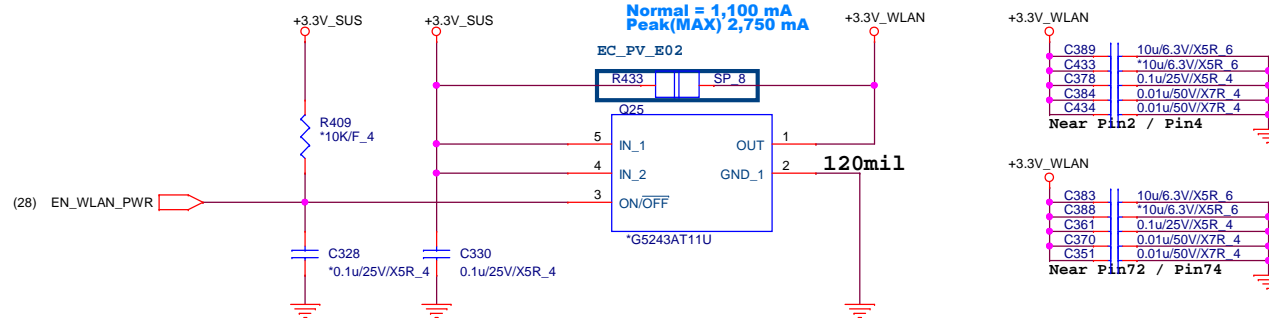
M.2\_BT\_OFF#



## M.2\_WLAN\_OFF#



## NGFF M2\_power(S5)



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**Quanta Computer Inc.**

**Project: HP-CRANE**

Title	NGFF M.2 WLAN
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Size	Document Number <b>810606-000</b>
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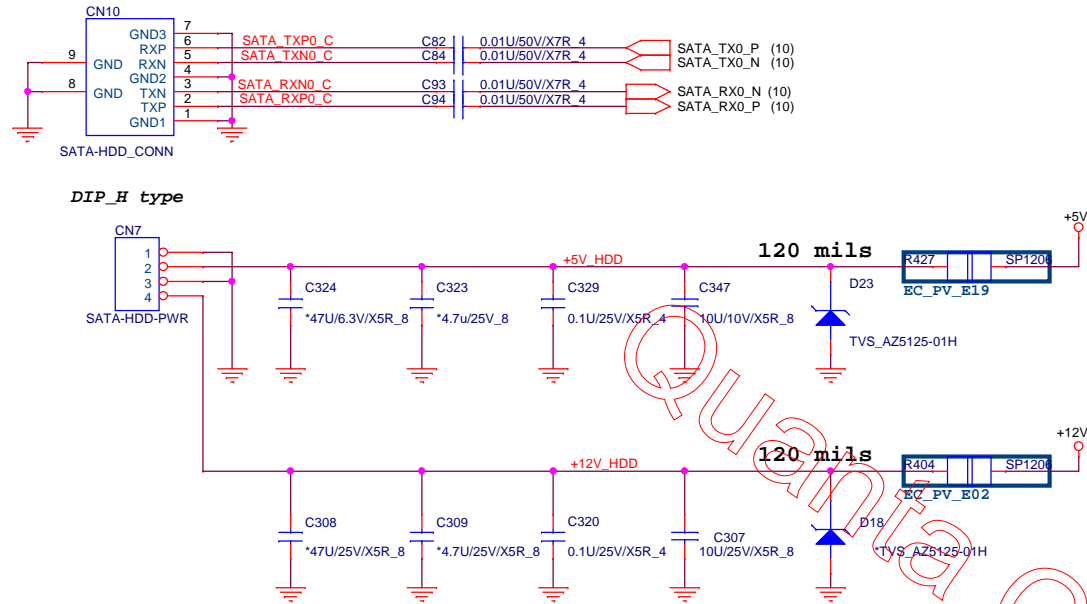
Rev  
B

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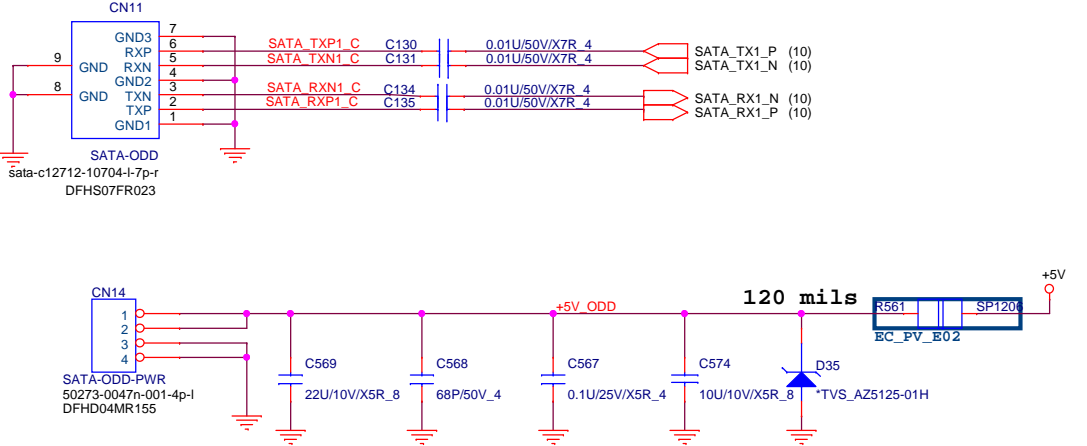
SATA HDD

HDD SATA Conn.

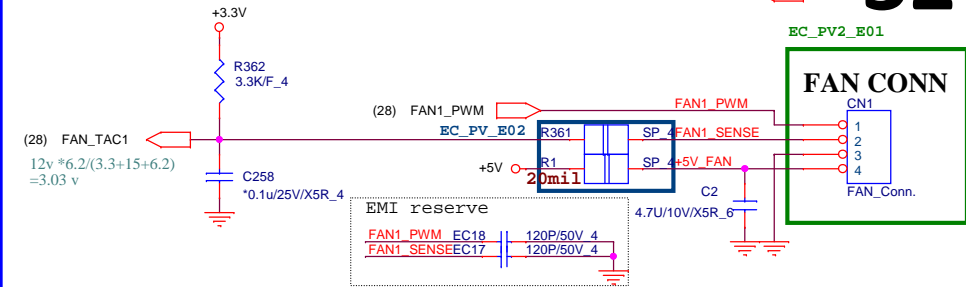


SATA ODD

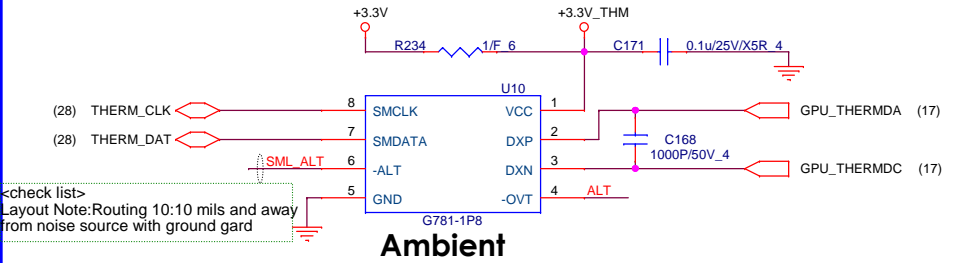
ODD SATA Conn.



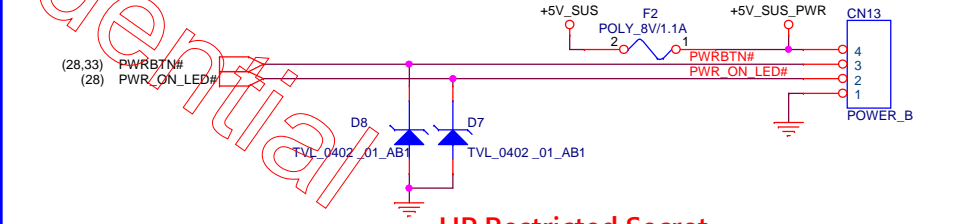
SYSTEM FAN



THERMAL SENSOR



Power Button.



EC-SI-E19

EMI reserve

5V\_SUS

EC6

220P/50V 4

PWRBTN#

EC5

220P/50V 4

PWR\_ON\_LED#

EC4

220P/50V 4

Quanta Computer Inc.

Project: HP-CRANE

Title

FAN/HDD/ODD/HDD CONN.

Size

Document Number

810606-000

Rev

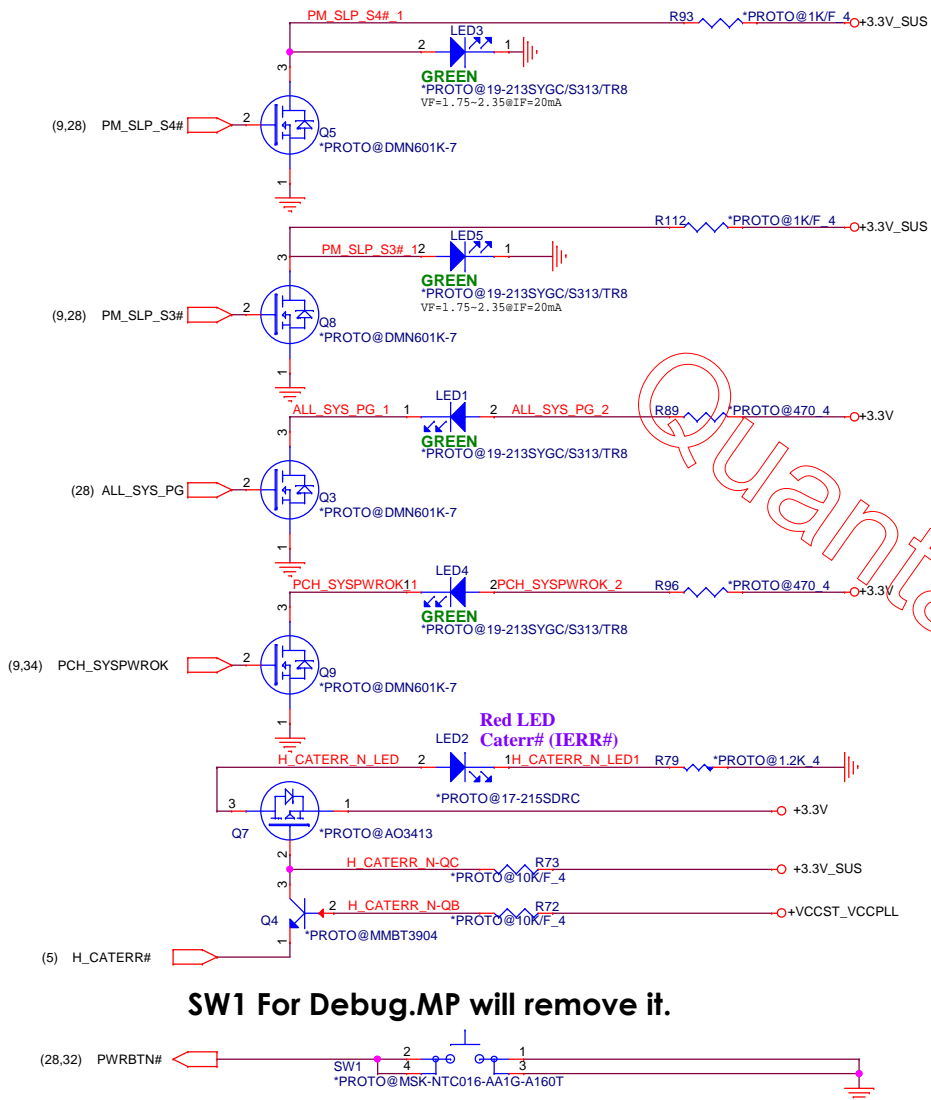
B

Page Modified: Wednesday, July 29, 2015

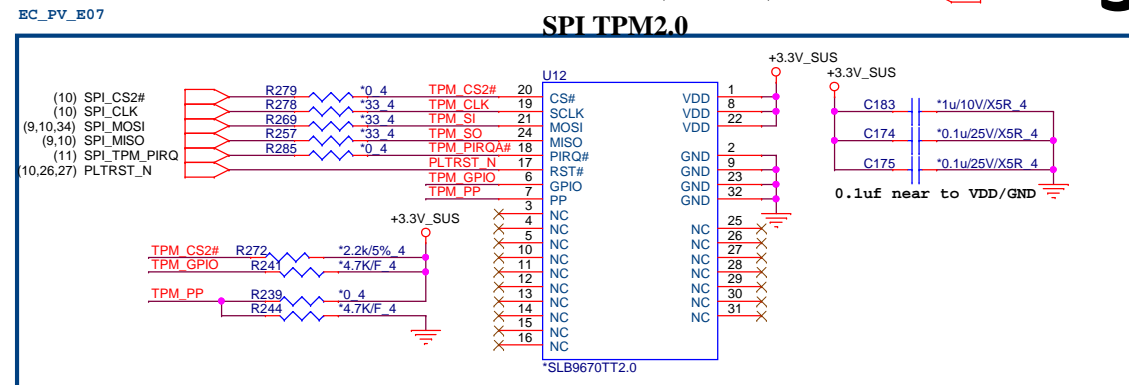
Sheet 32 of 56



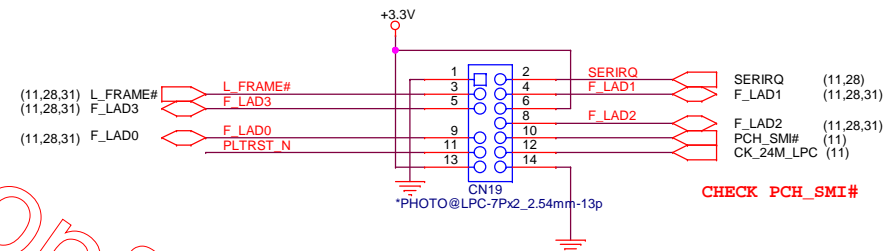
## TPM2.0



**SW1 For Debug.MP will remove it.**



## LPC HEADER



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**Quanta Computer Inc.****Project: HP-CRANE**

Title	
-------	--

## Debug /LPC Header/TPM

Size

Document Number
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Rev
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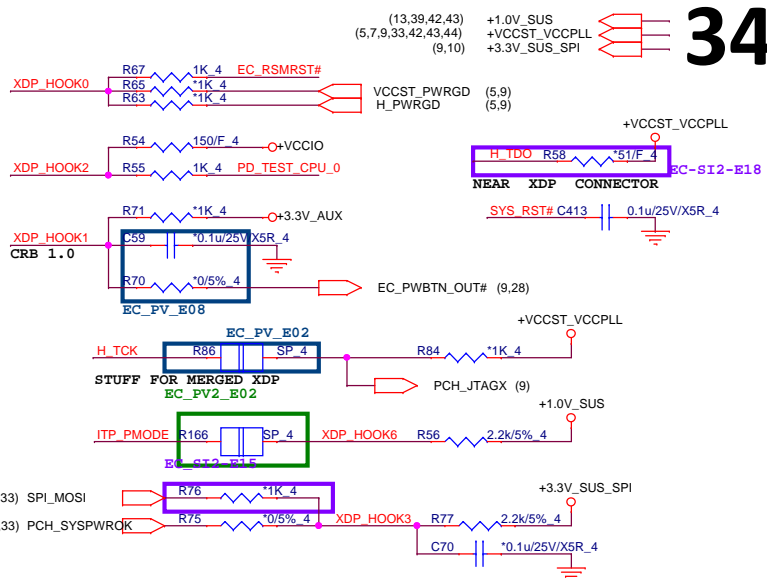
810606-000

**B**

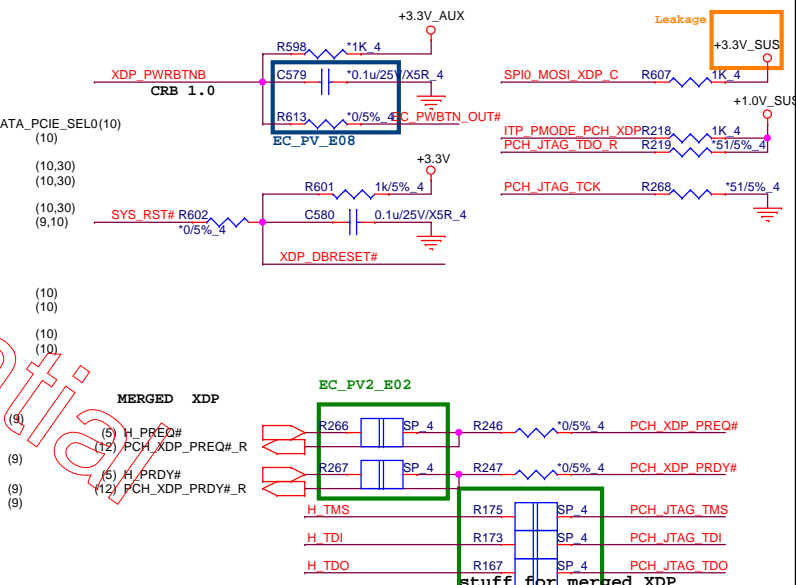
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## 34



stuff for no merged XDP

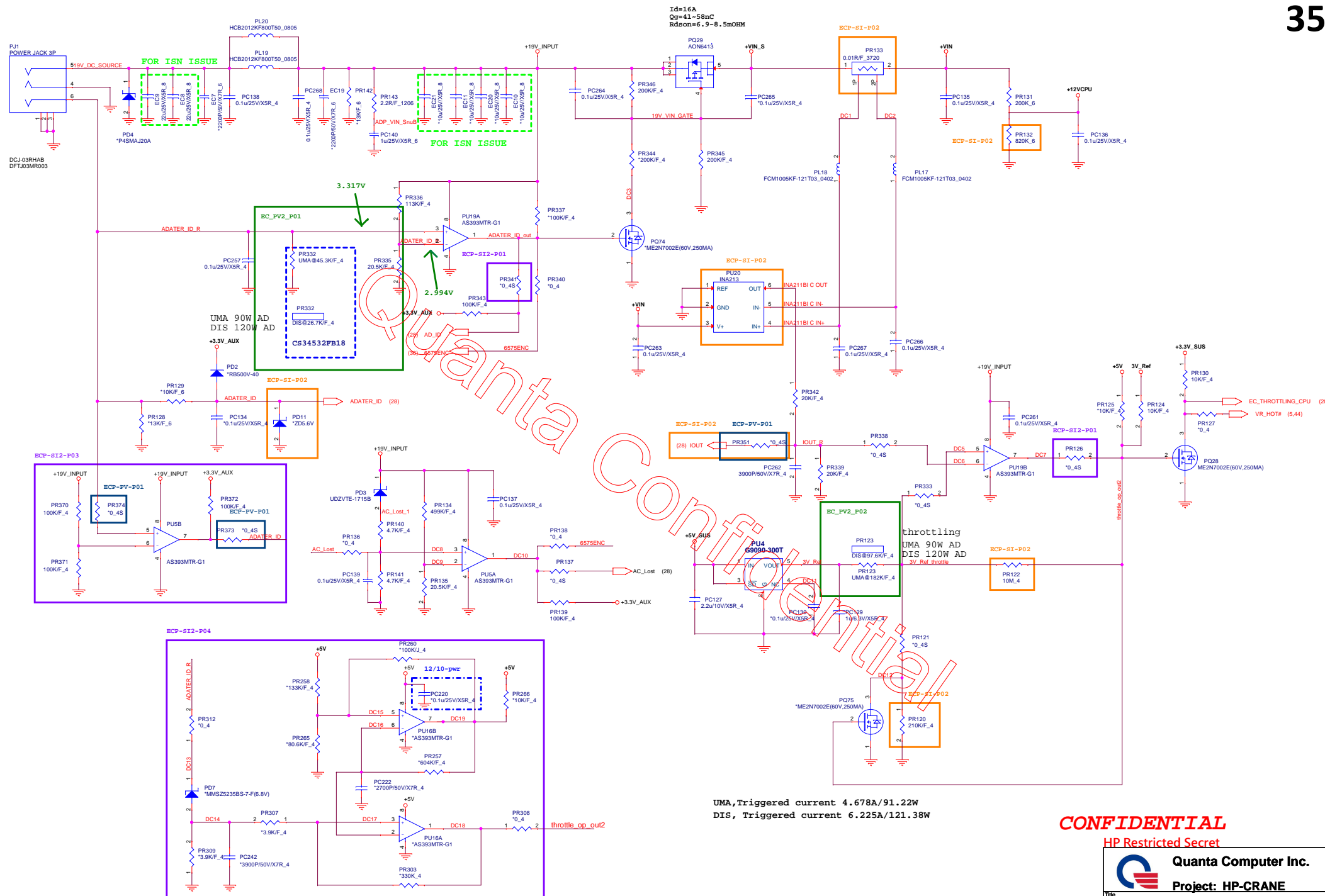


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**Project: HP-CRANE**

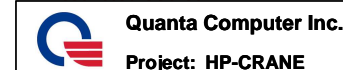
Modified: Wednesday

56



CONFIDENTIAL

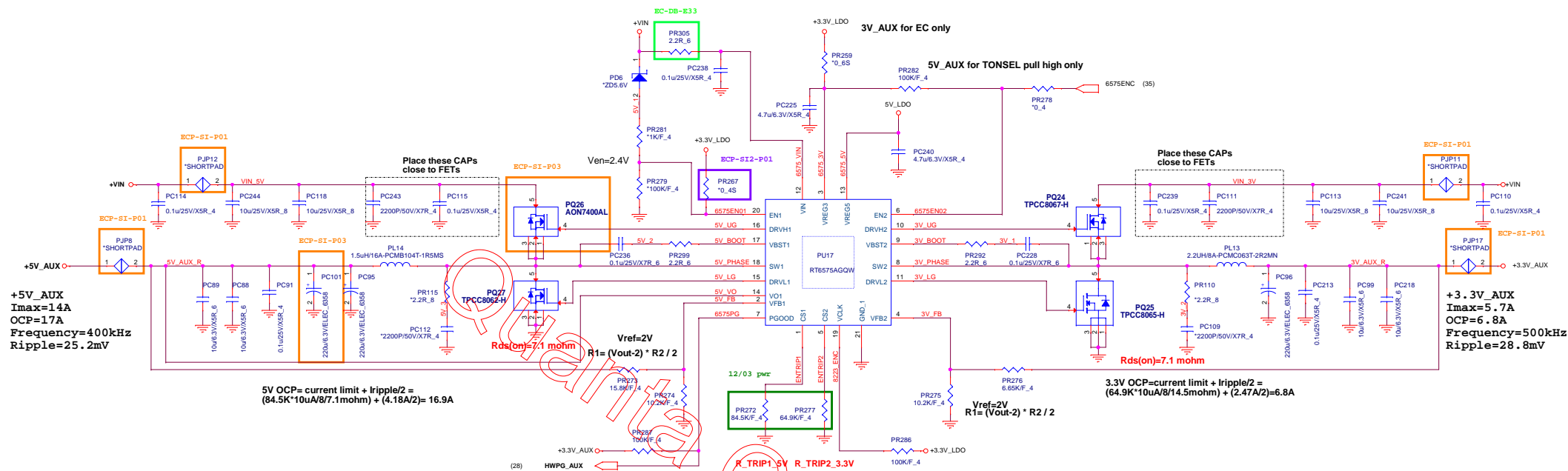
HP Restricted Secret



Project: HP-CRANE

Title	DC-IN	Rev	A
Size	Document Number	810606-000	
Page Modified:	Wednesday, July 29, 2015	Sheet	35 of 64

CONFIDENTIAL

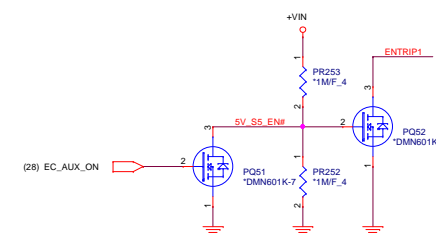


### L/S Mosfet parameter

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



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**Quanta Computer Inc.**

**Project: HP-CRANE**

Title	3V_AUX/5V_AUX(RT6575AGQW
-------	--------------------------

Size	Document Number
	810606-000

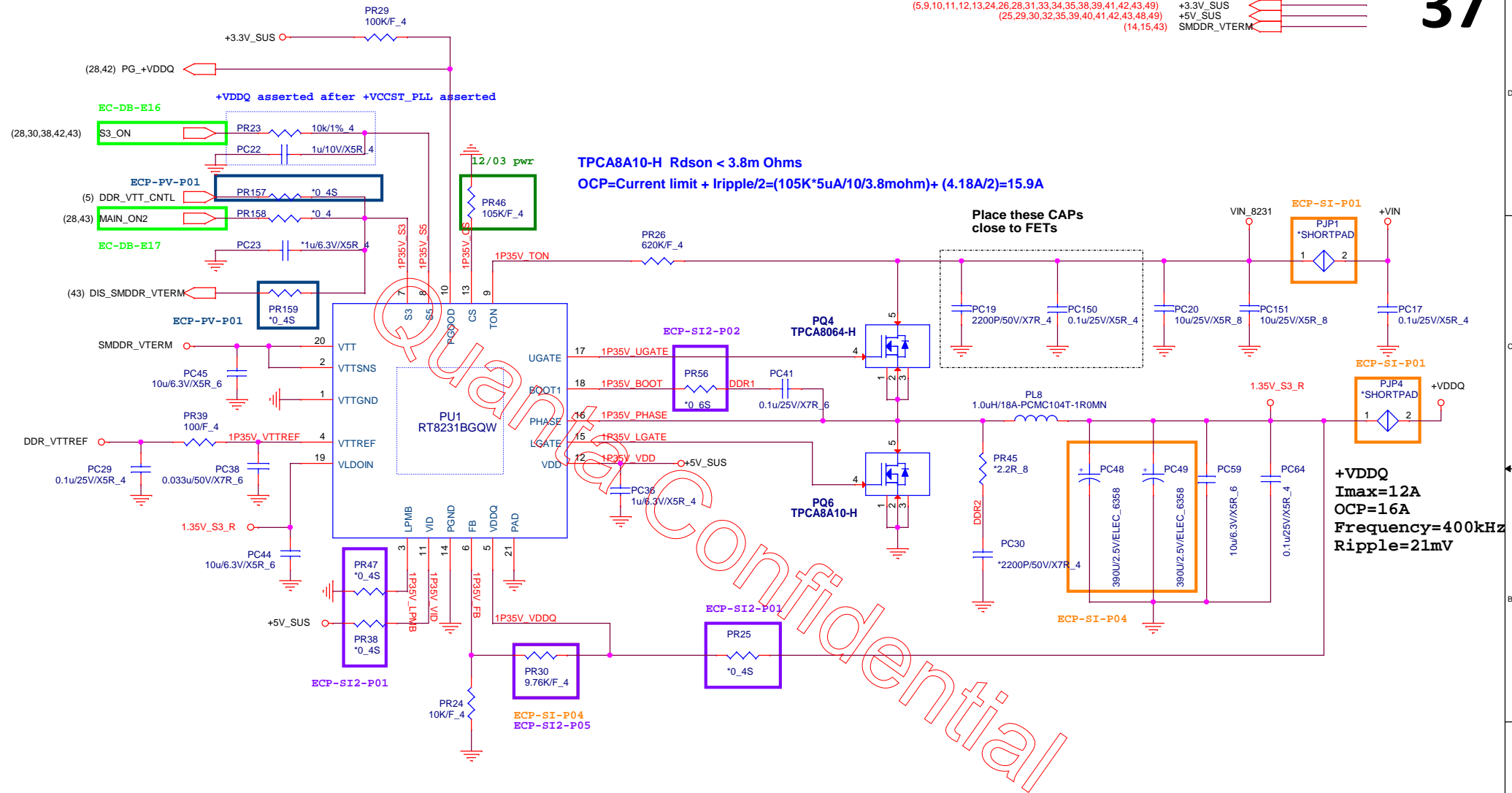
Page Modified: Wednesday, July 29, 2015

	Rev A
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(24,35,36,38,39,40,42,43,45,46,47,48,49,50)  
 (7,9,14,15,42,43,49,50)  
 (5,9,10,11,12,13,24,26,28,31,33,34,35,38,39,41,42,43,49)  
 (25,29,30,32,35,39,40,41,42,43,48,49)  
 (14,15,43)

+VIN  
 +VDDQ  
 +3.3V\_SUS  
 +5V\_SUS  
 SMDDR\_VTERM



**Quanta Computer Inc.**

**Project: HP-CRANE**

Title  
**+VDDQ /SMDDR\_VTERM (RT8231BGQW)**

Size  
 Document Number  
**810606-000**

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**A**

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**Quanta Computer Inc.****Project: HP-CRANE**

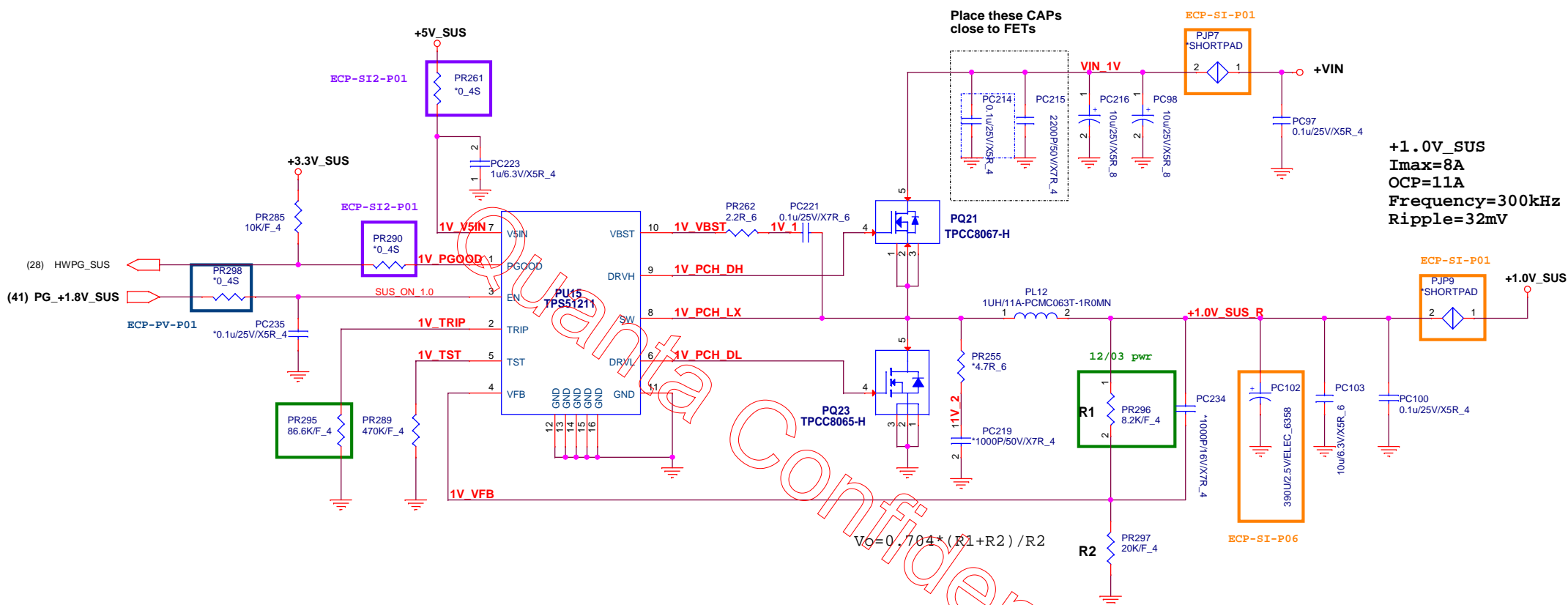
Title	<b>+1.0V_SUS(TPS51211)</b>
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Size	Document Number <b>810606-000</b>
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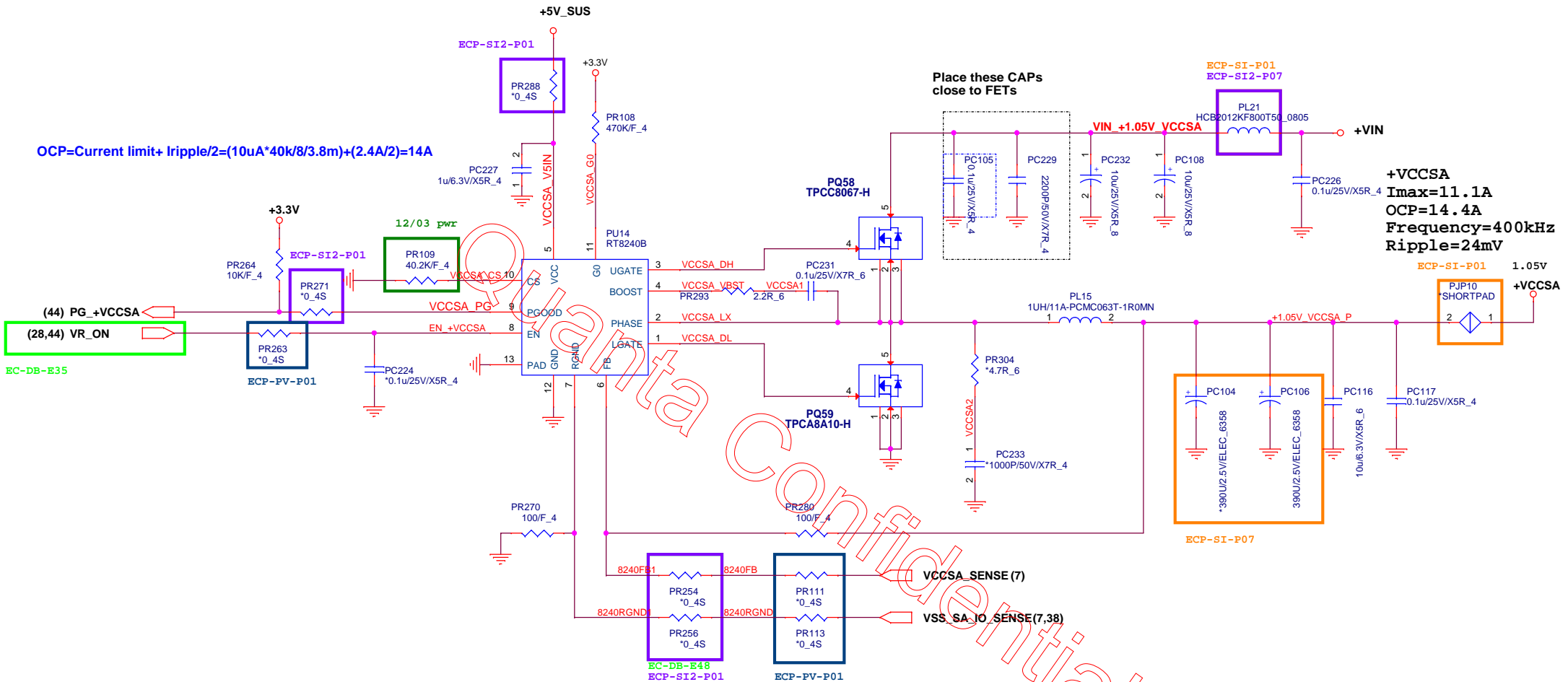
Rev  
A

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$$OCP = \text{Current limit} + I_{\text{ripple}}/2 = (10\mu A * 40k/8/3.8m) + (2.4A/2) = 14A$$



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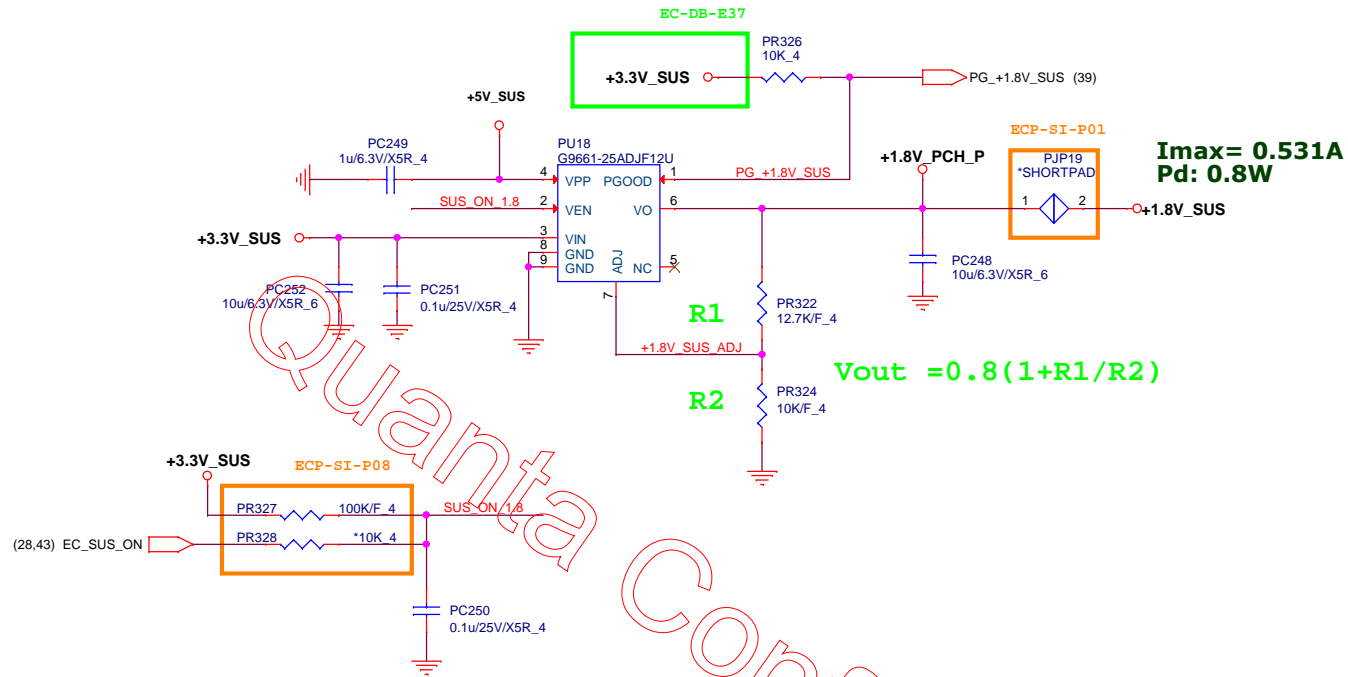


Quanta Computer Inc.

Project: HP-CRANE

Title <b>+VCCSA(RT8240B)</b>		
Size	Document Number <b>810606-000</b>	Rev <b>A</b>
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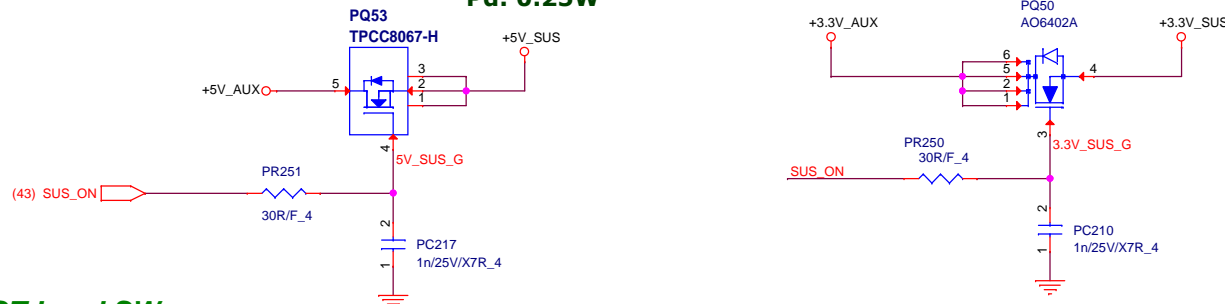


Quanta Computer Inc.

Project: HP-CRANE

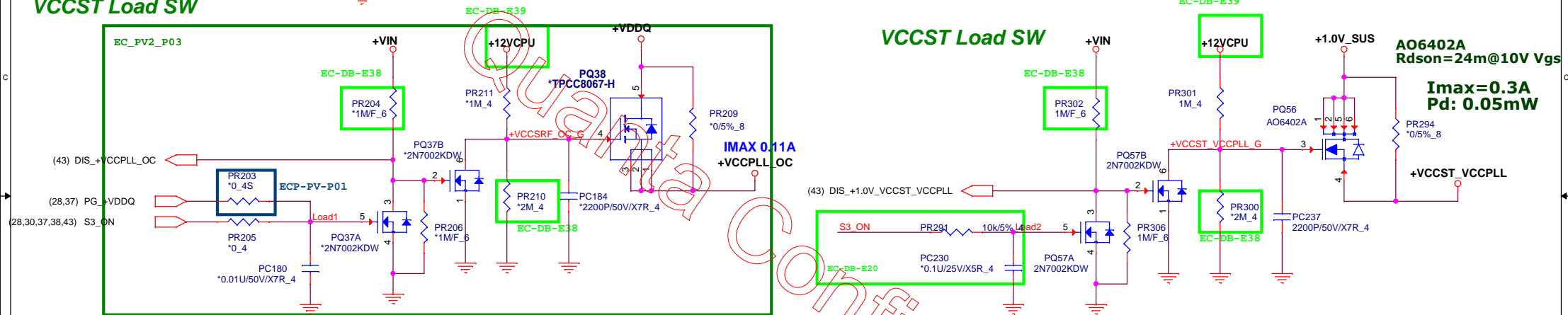
Title		
<b>+1.8V_SUS (G9661)</b>		
Size	Document Number	Rev
	<b>810606-000</b>	<b>A</b>
Page Modified: Wednesday, July 29, 2015		
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## SUS ON Load SW

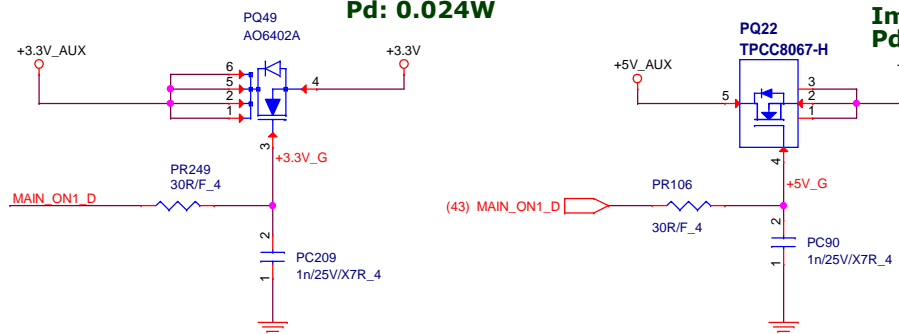
TPCC8067-H  
Rdson=20m@10V VgsImax=3.8A  
Pd: 0.25WAO6402A  
Rdson=24m@10V VgsImax=3.26A  
Pd: 0.255W

## VCCST Load SW

## VCCST Load SW



## MAIN ON\_1 Load SW

AO6402A  
Rdson=24m@10V VgsImax=1A  
Pd: 0.024WTPCC8067-H  
Rdson=20m@10V VgsImax=8A  
Pd: 1.28W

## Mosfet parameter

Mosfet	Package	ID(Ta=25C)	Rds_on_max	Vgs_max
ME3424D-G	TSOP-6	5.0A/6.7A	42m	+/- 20V
TPCC8067-H	3x3	9A	26m	+/- 20V
TPCA8064-H	SO-8	20A	7.9m	+/- 20V

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Quanta Computer Inc.

Project: HP-CRANE

Title

Load Switch

Size

Document Number

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Rev

A

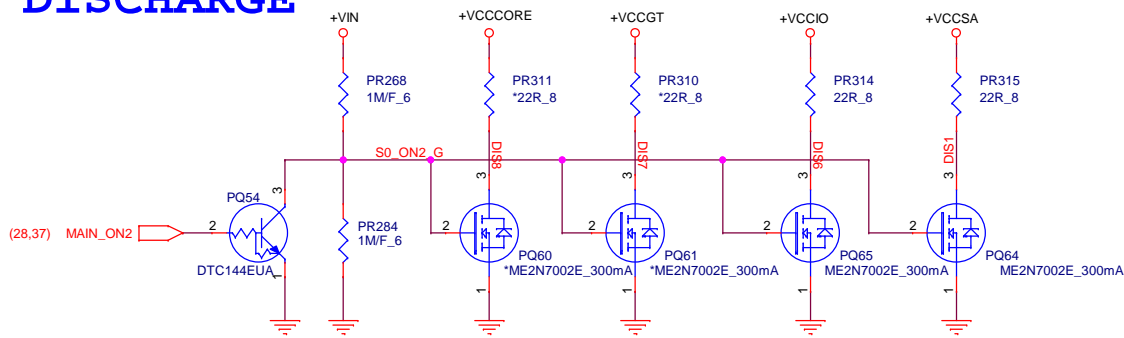
Page Modified: Wednesday, July 29, 2015

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# DISCHARGE

43

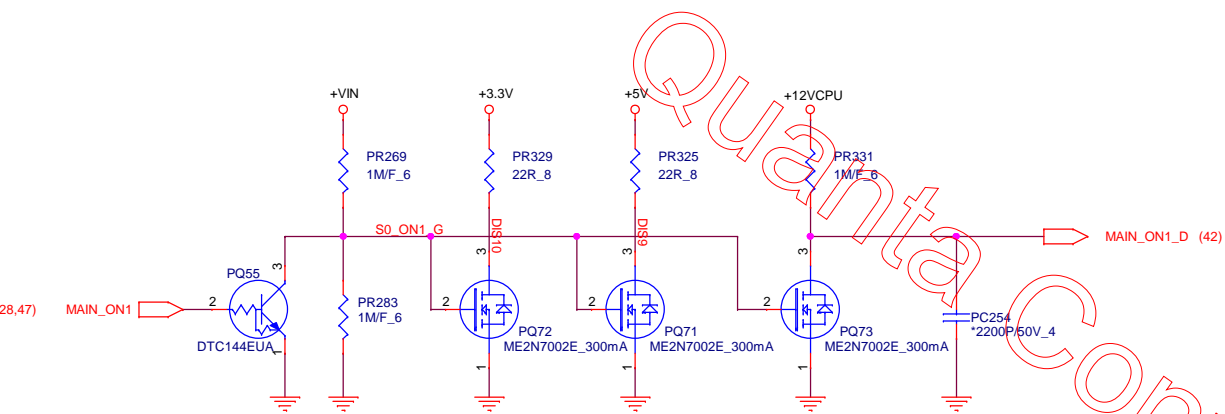


EC-DB-E21

(37) DIS\_SMDR\_VTERM

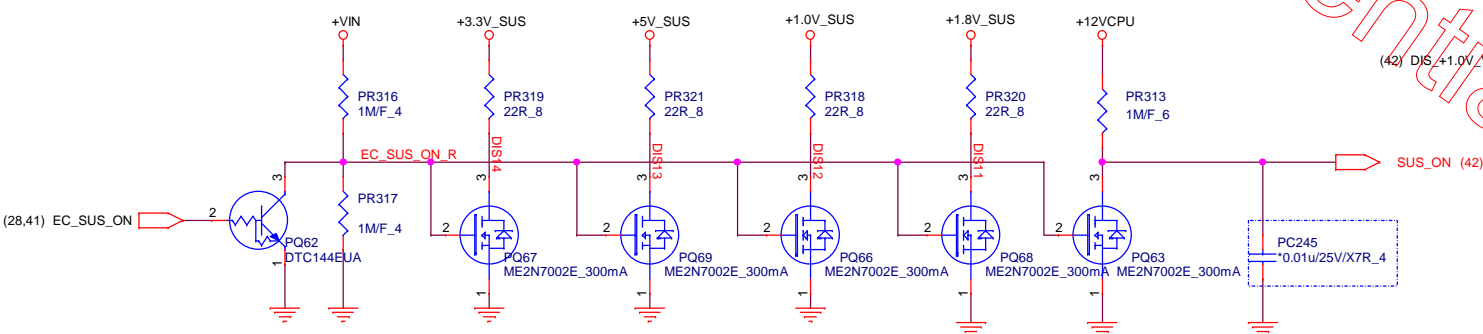
EC-DB-E21

(28,30,37,38,42) S3\_ON



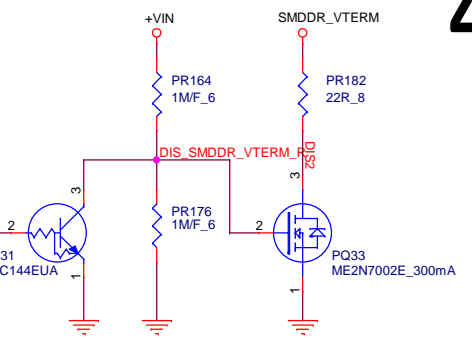
EC-DB-E21

(28,30,37,38,42) S3\_ON



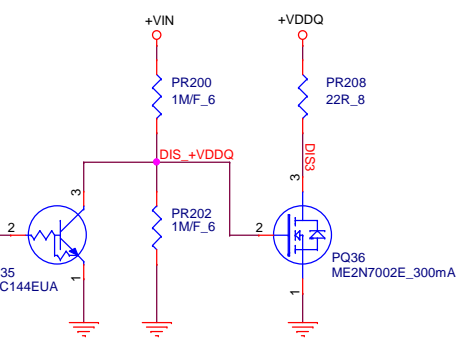
EC-DB-E21

(42) DIS\_+1.0V\_VCCST\_VCCPLL



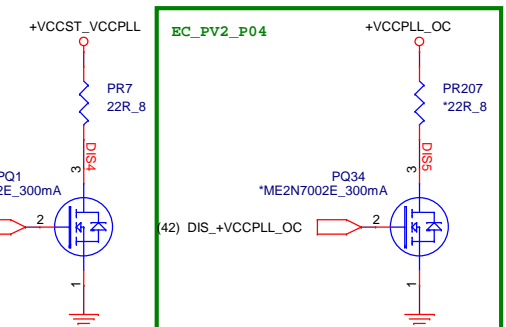
EC-DB-E21

(28,30,37,38,42) S3\_ON



EC-DB-E21


(28,30,37,38,42) S3\_ON



EC-DB-E21

(42) DIS\_+1.0V\_VCCST\_VCCPLL

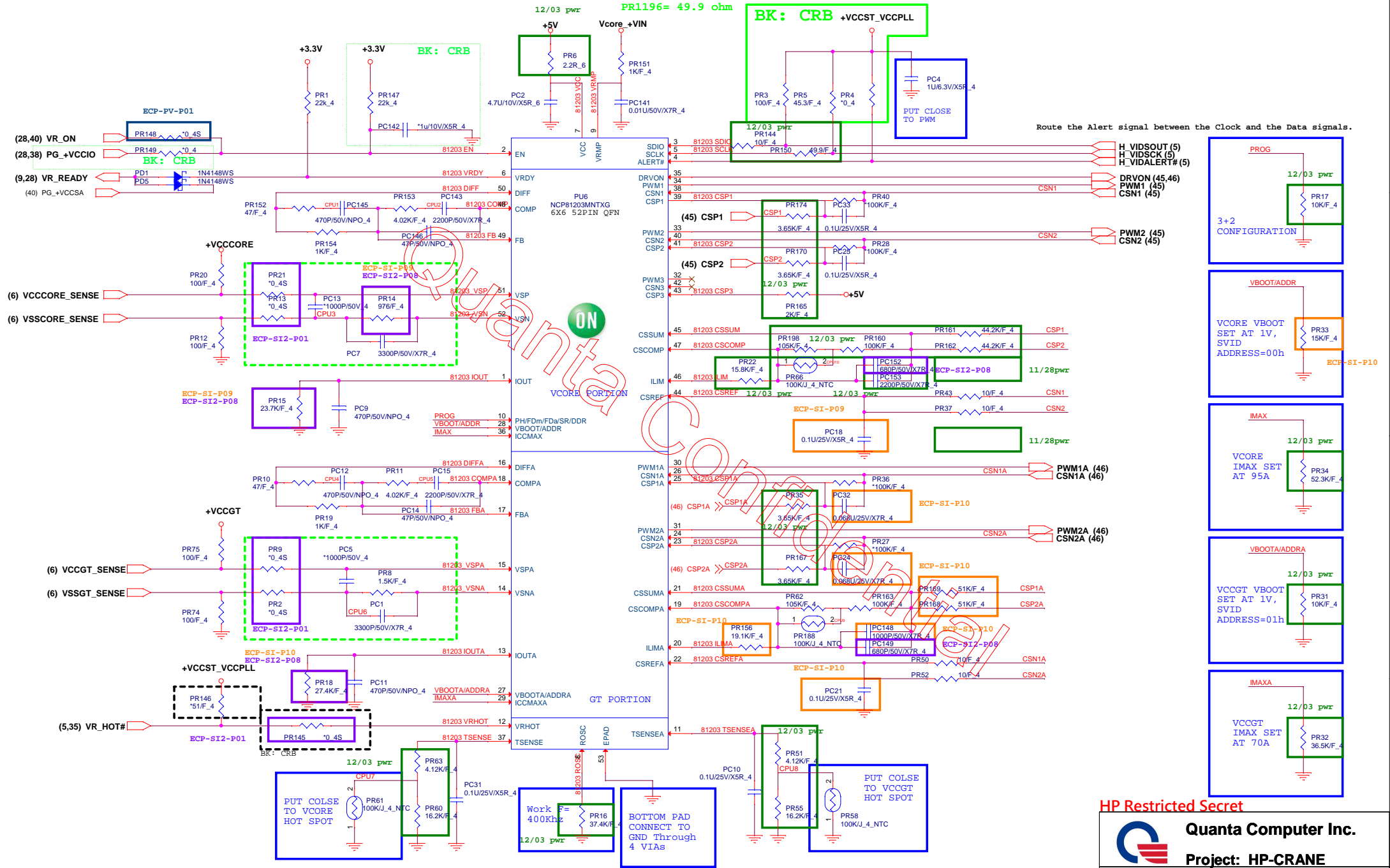
HP Restricted Secret

 <b>Quanta Computer Inc.</b> <b>Project: HP-CRANE</b>		
Title	<b>Discharge</b>	
Size	Document Number <b>810606-000</b>	Rev <b>A</b>
Page Modified: Wednesday, July 29, 2015		
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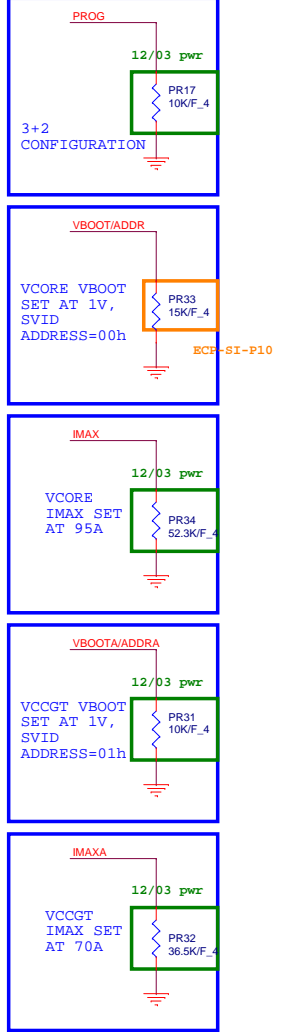
# Intel SKYLAKE IMVP8 POWER CKT - 3+2 PHASE

44

PR1166= 10 ohm  
PR1196= 49.9 ohm



Route the Alert signal between the Clock and the Data signals.



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**Quanta Computer Inc.**

**Project: HP-CRANE**

Title <b>VCC_CORE &amp; VCC_GT</b>		Rev <b>A</b>
Size	Document Number <b>810606-000</b>	
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**Quanta Computer Inc.**

**Project: HP-CRANE**

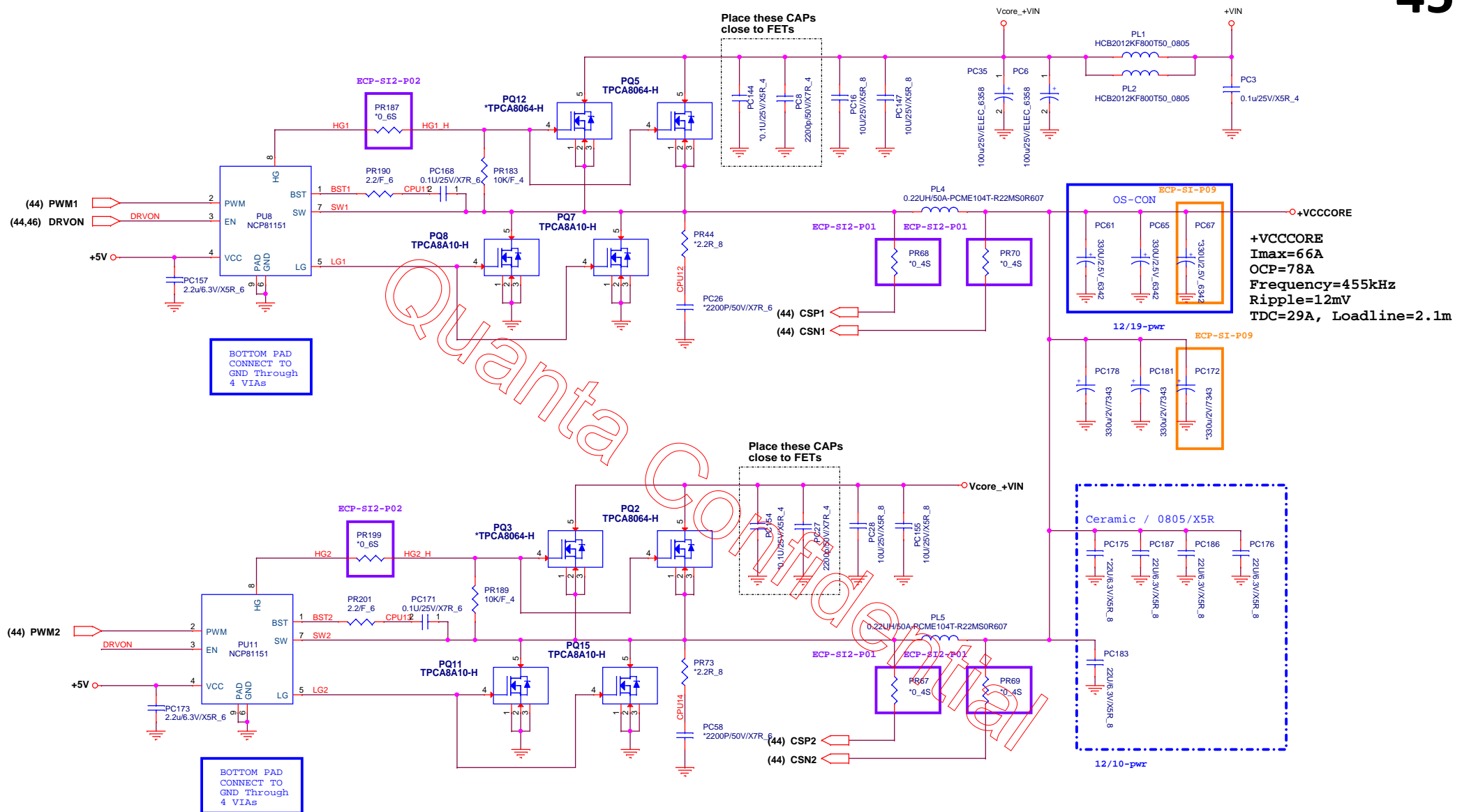
Title **VCORE OUT STAGE**

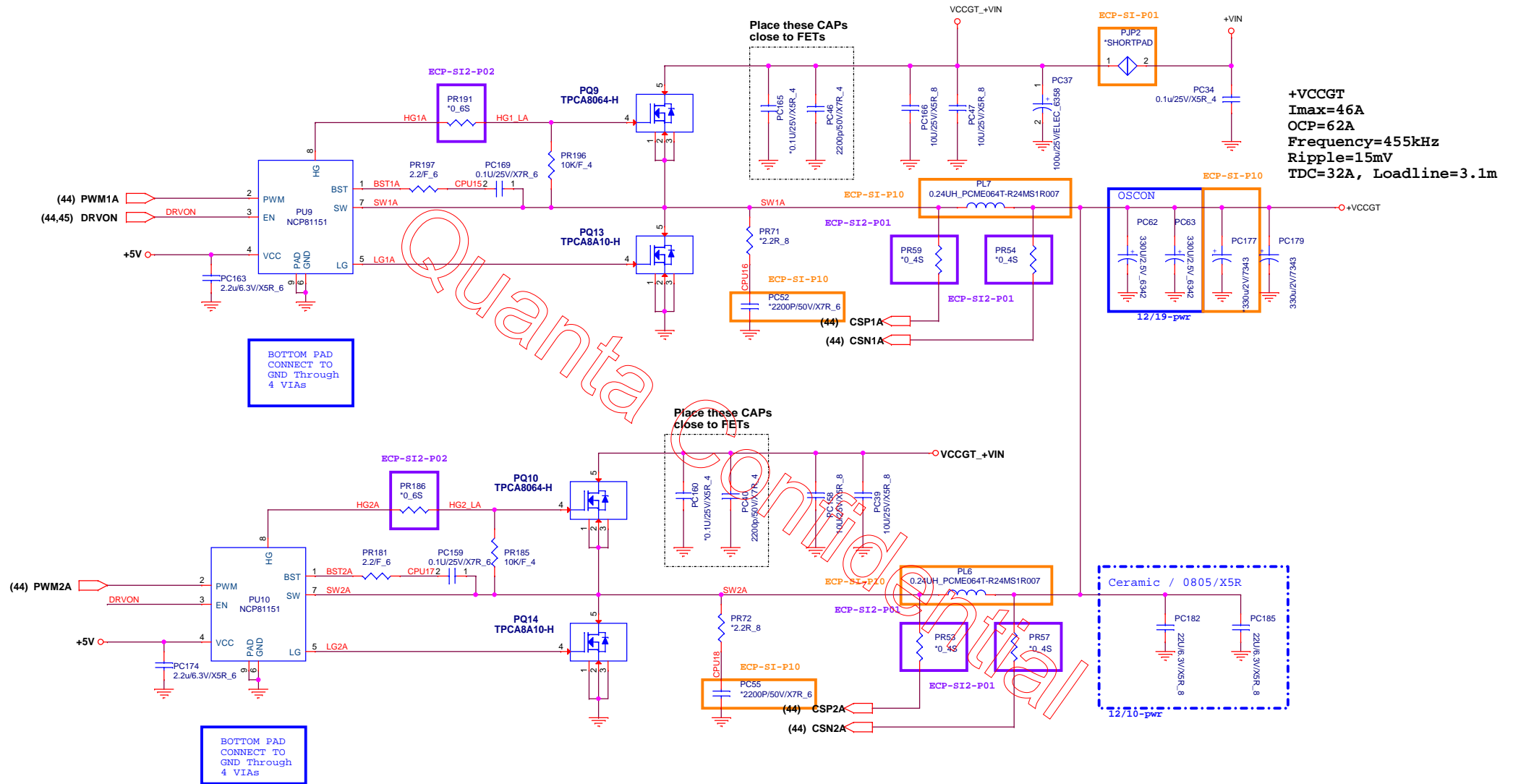
Size	Document Number <b>810606-000</b>
------	--------------------------------------

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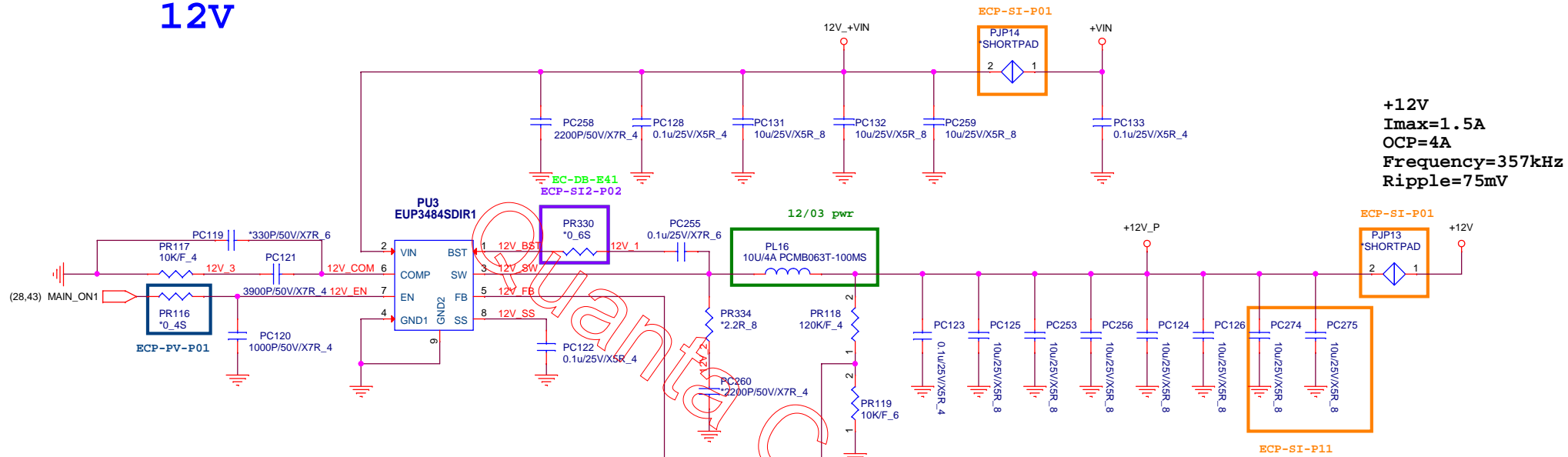


Quanta Computer Inc.

Project: HP-CRANE

Title <b>VCCGT OUTPUT STAGE</b>		
Size	Document Number <b>810606-000</b>	Rev <b>A</b>
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12V



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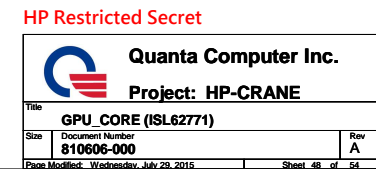
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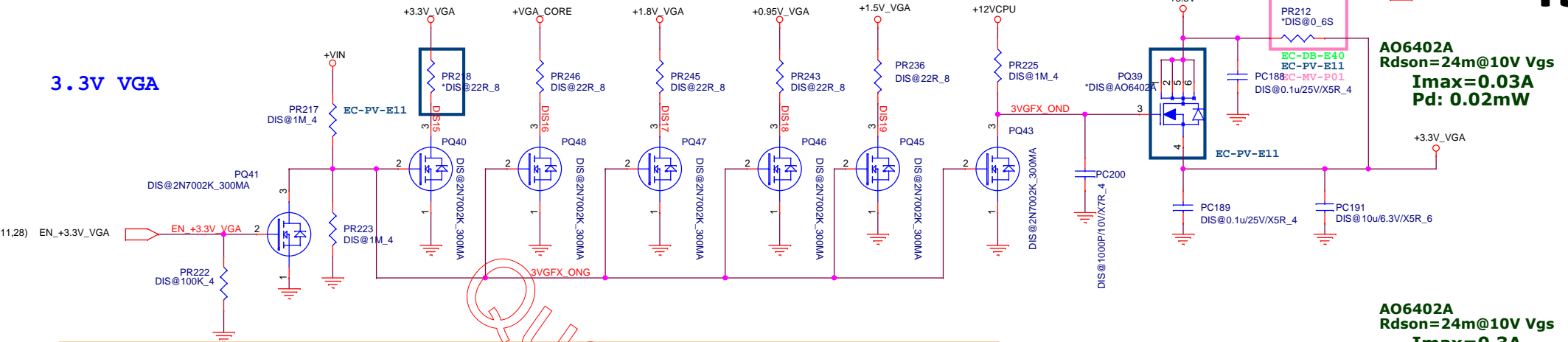
Title <b>+12V</b>		
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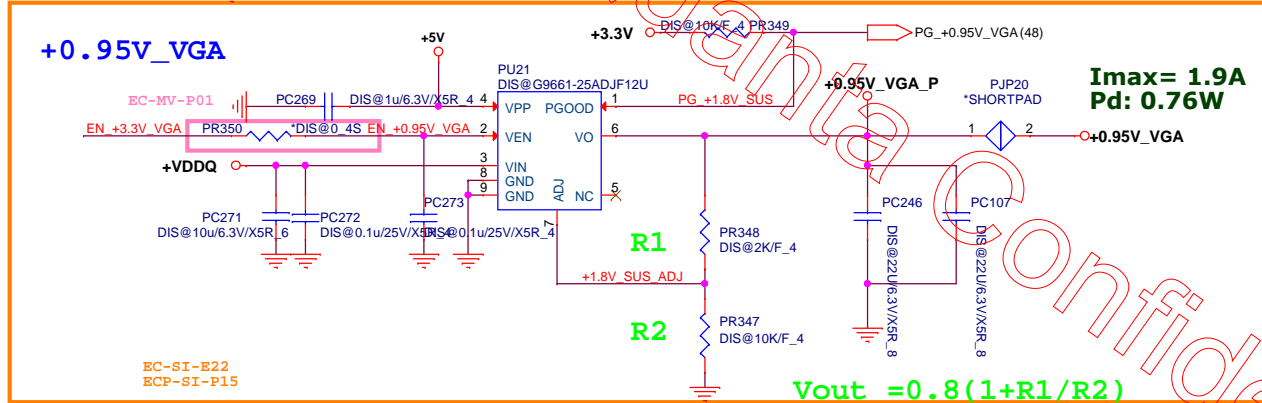




## 3.3V VGA

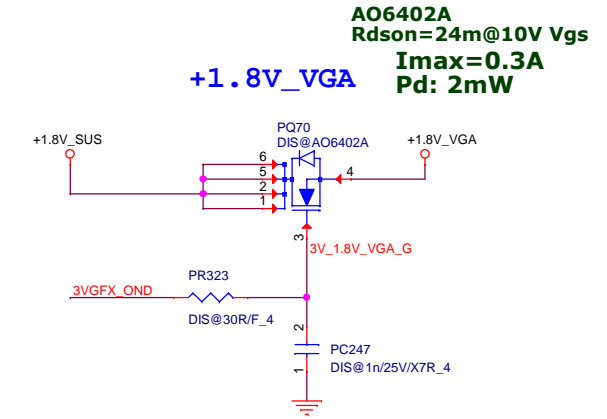


## +0.95V\_VGA



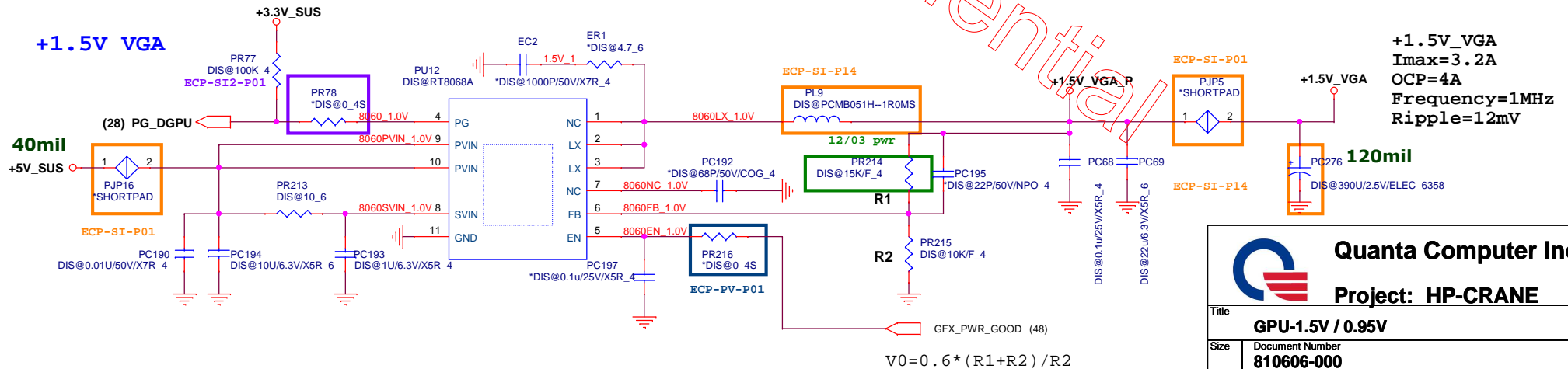
**Imax= 1.9A**  
**Pd: 0.76W**

## +1.8V\_VGA



**AO6402A**  
**Rdson=24m@10V Vgs**  
**Imax=0.3A**  
**Pd: 2mW**

## +1.5V VGA

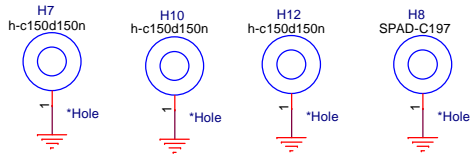


**+1.5V\_VGA**  
**Imax=3.2A**  
**OCP=4A**  
**Frequency=1MHz**  
**Ripple=12mV**

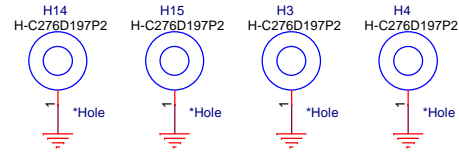
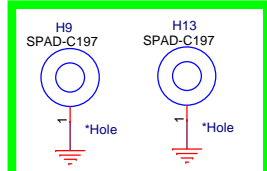
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Title	GPU-1.5V / 0.95V		
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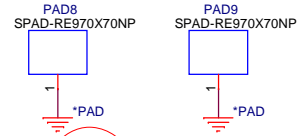
## CPU HOLE



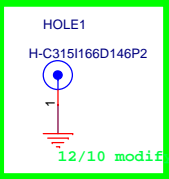
EC-DB-E23



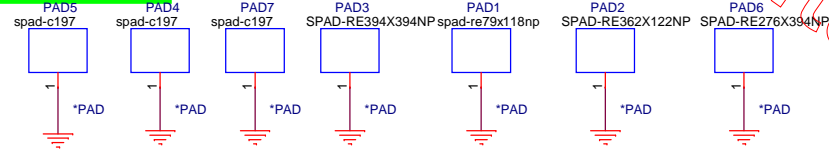
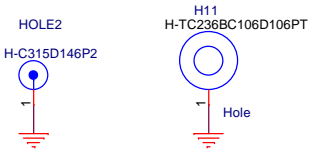
## SD CARD SHAPE



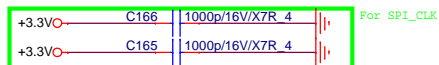
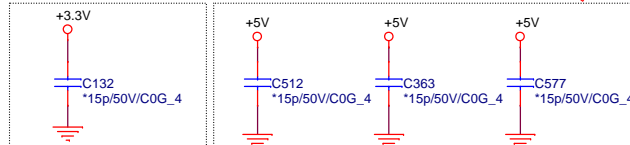
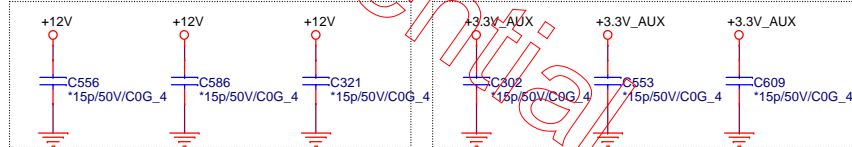
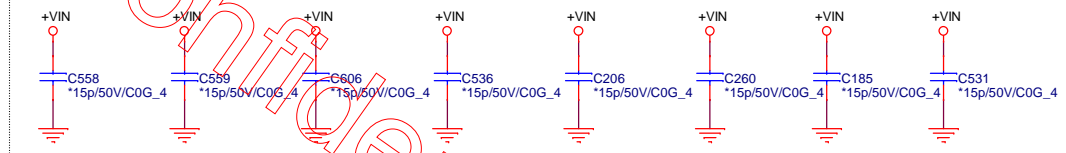
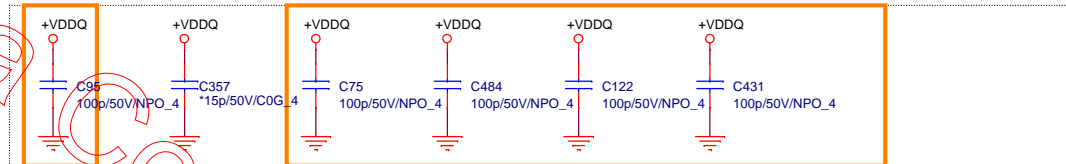
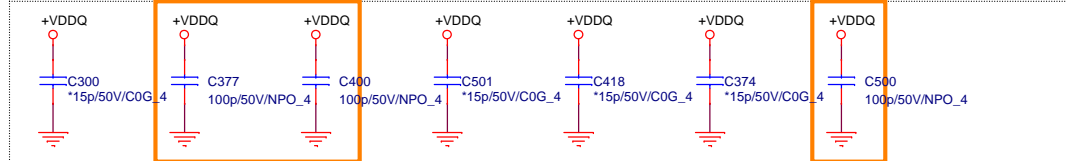
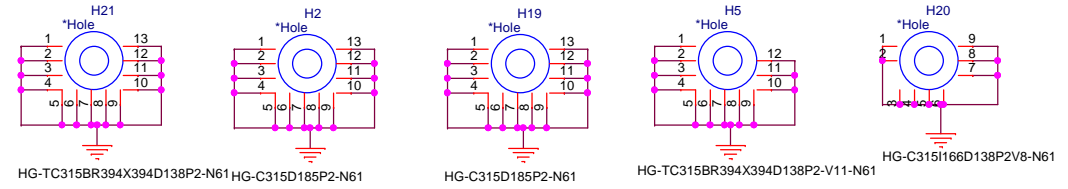
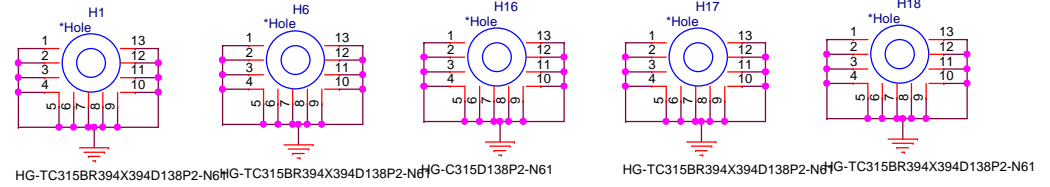
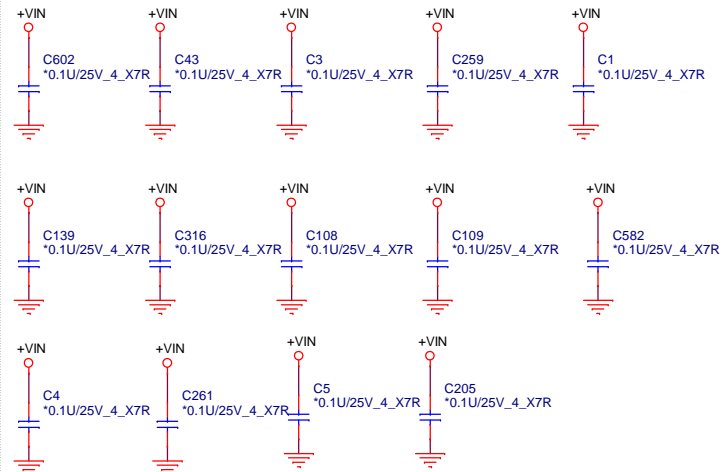
## VGA HOLE



## WLAN HOLE



## Place around +VIN trace



For SPI\_CLK

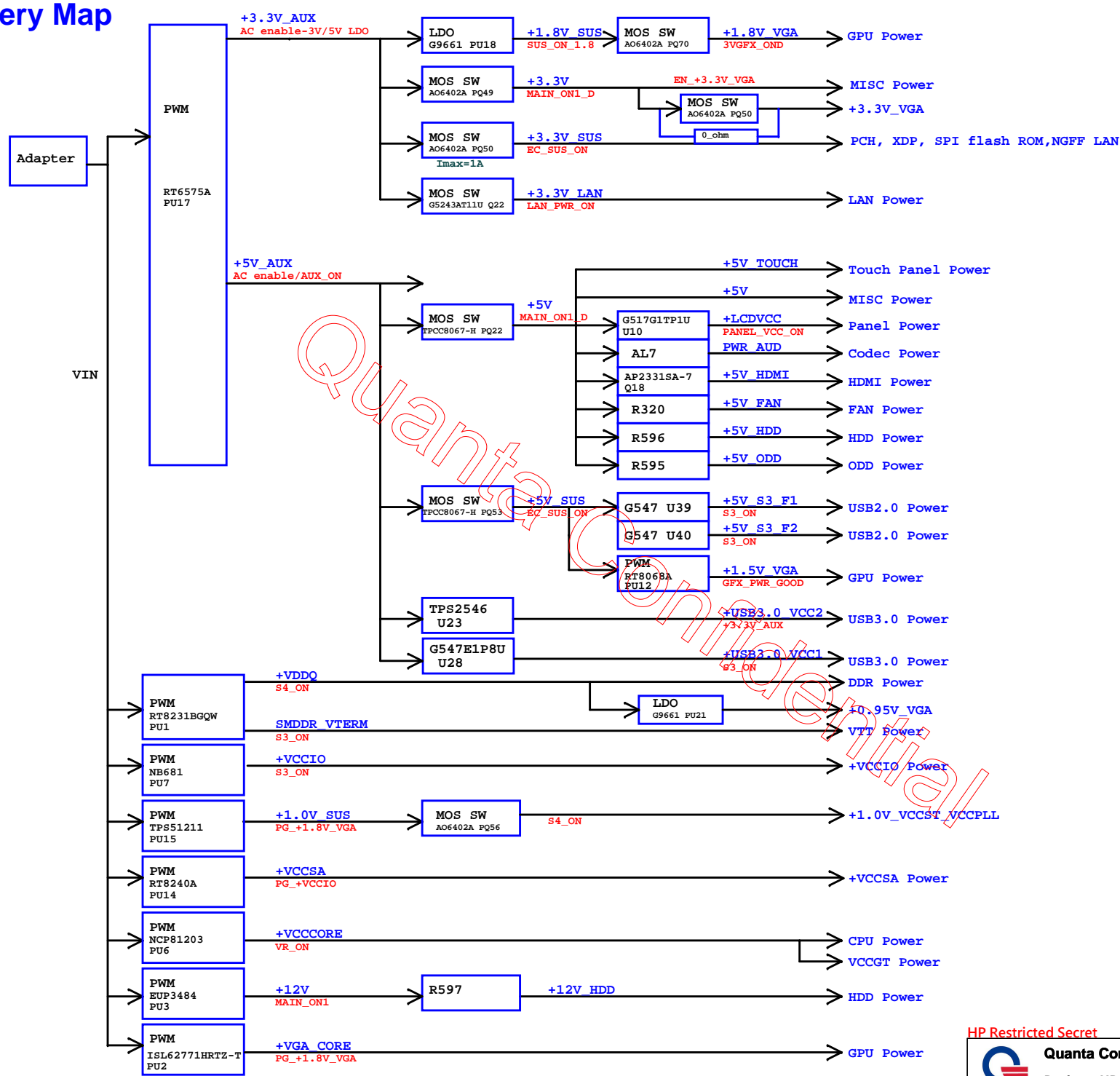
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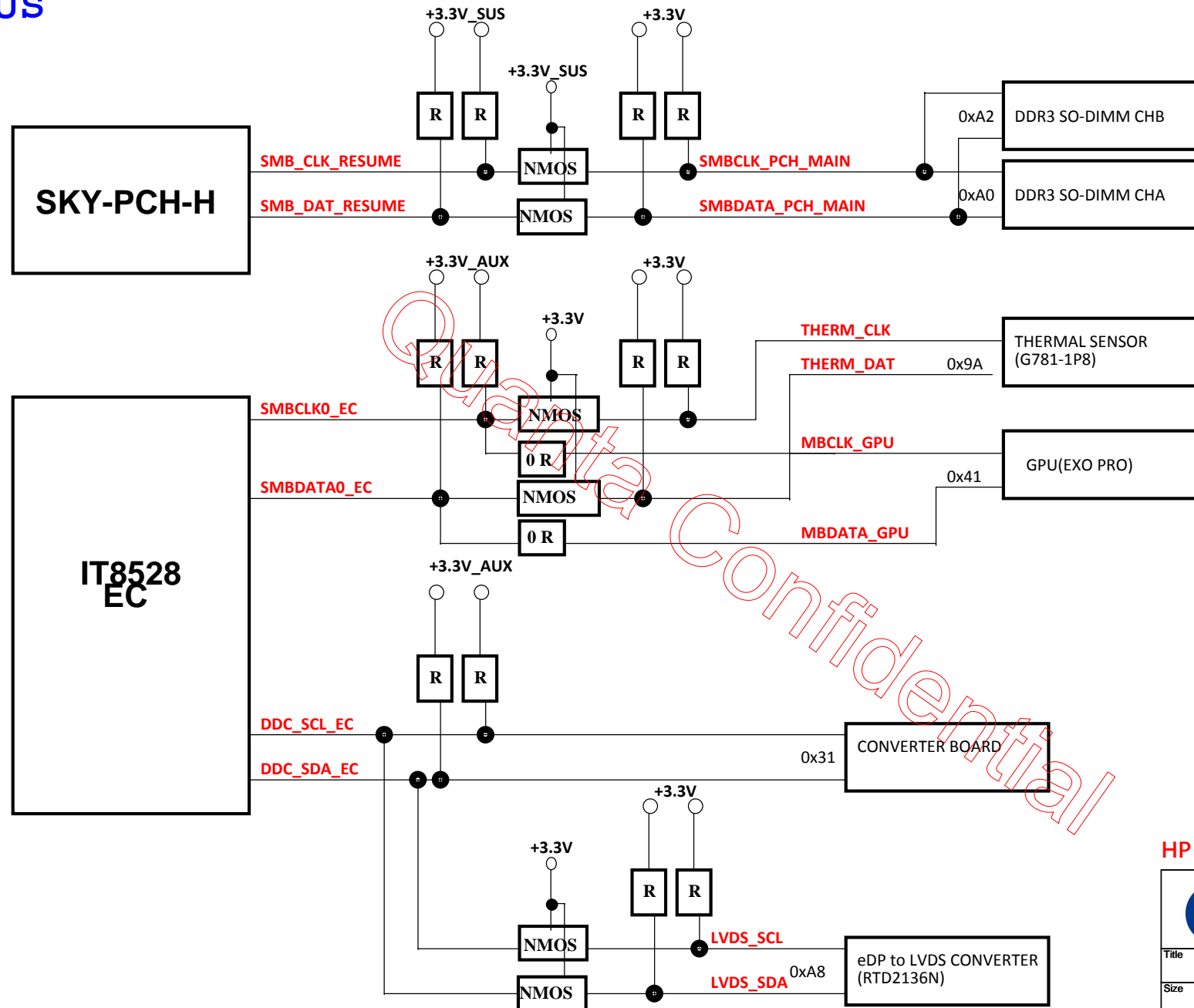


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Title <b>HOLE/VIN CAP/RF CAP</b>		
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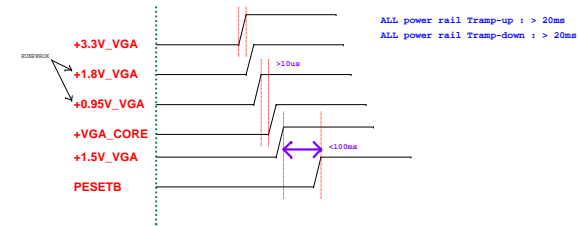
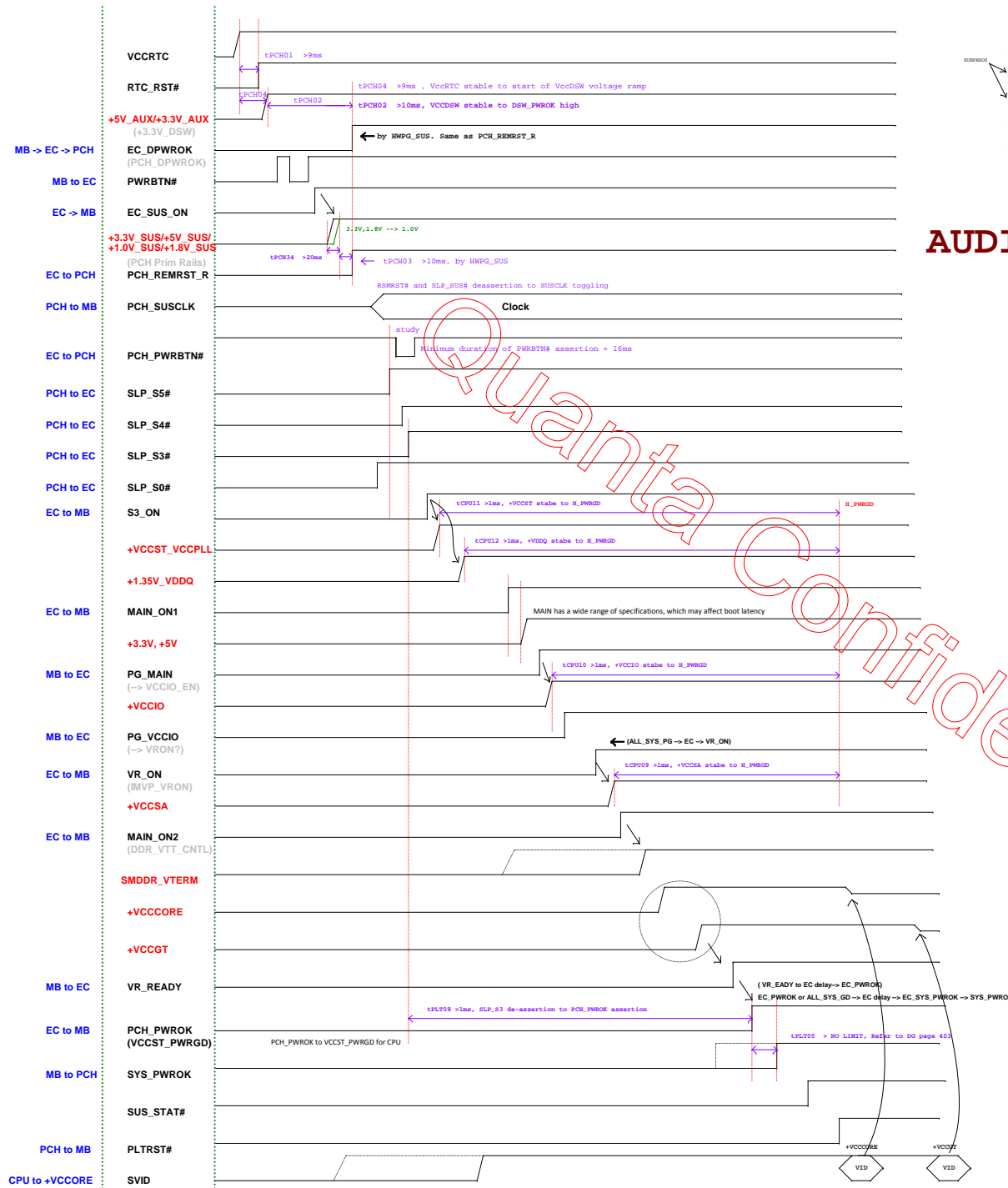
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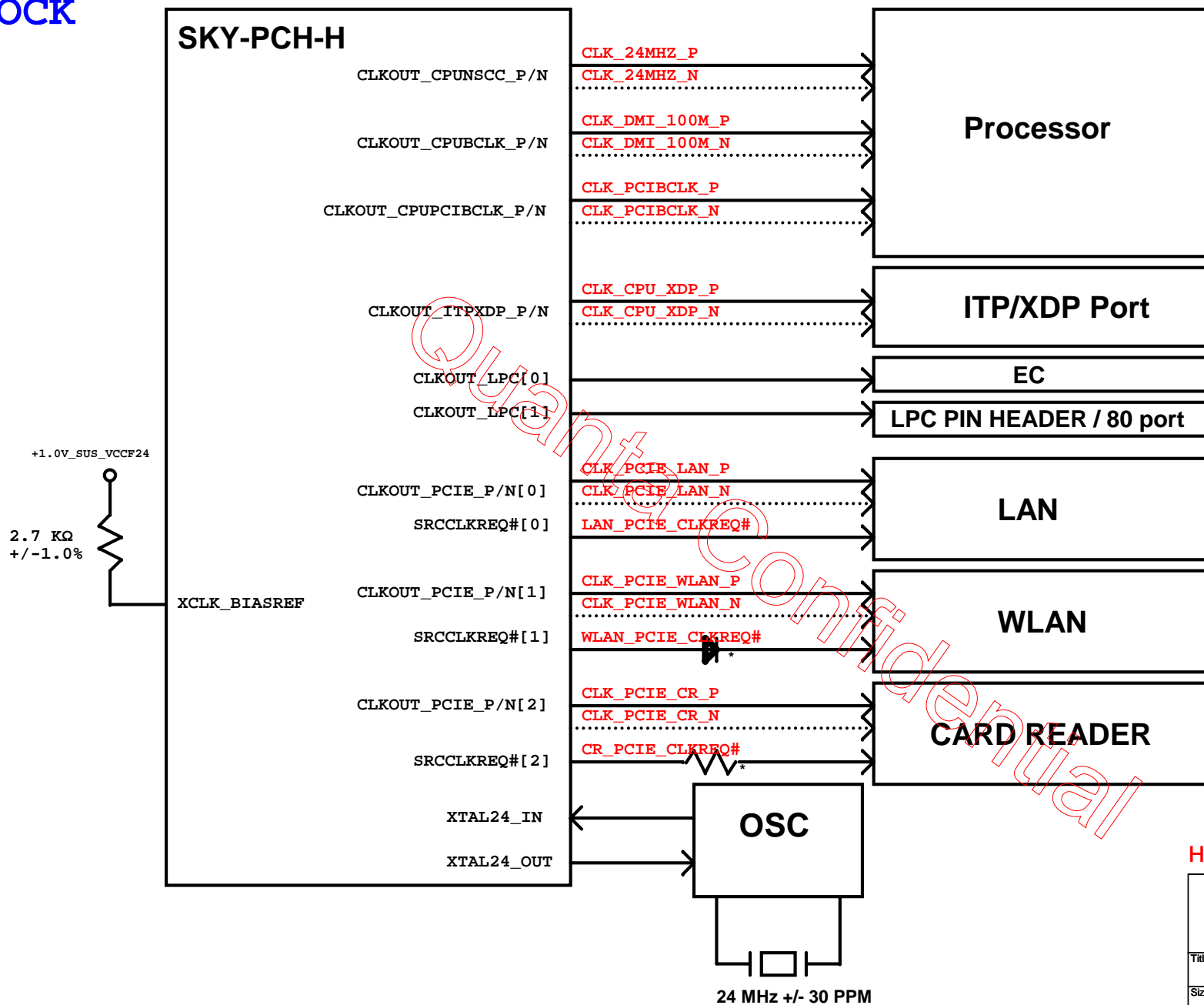
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Title	SMBus	
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## AMD dGPU POWER SEQUENCE 53





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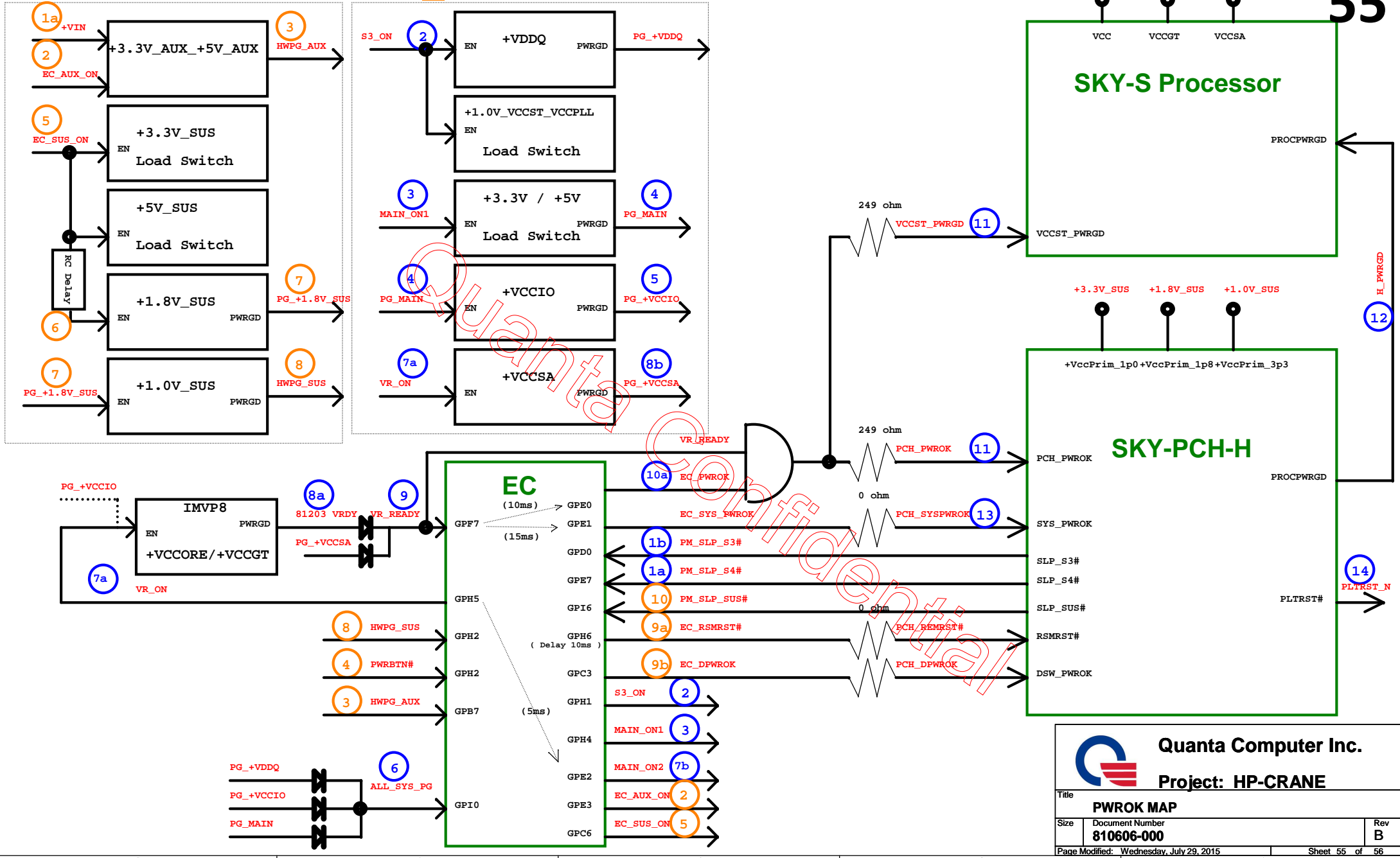


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Project: HP-CRANE

Title <b>CLOCK MAP</b>		
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# PWROK MAP / RSMRST\_PWRGD#



**DB to SI Change List**

EC-SI-E01 Un-stuff CPU HW straps, R444,R61,R462 -- Page 5  
EC-SI-E02 Un-stuff H\_PWRGD pull down, R493 -- Page 9  
EC-SI-E03 Un-stuff SPI\_I02 pull down, R589 -- Page 9  
EC-SI-E04 Change Q13 gate power rail, -- Page 9  
EC-SI-E05 Remove Q12 and add R698/R697 -- Page 9  
EC-SI-E06 Remove C583 to fix DRAMRST rise time -- Page 9  
EC-SI-E07 For XDP only, R596,R587 -- Page 10  
EC-SI-E08 Don't populate R532 for +3.3V Leakage -- Page 11  
EC-SI-E14 Don't populate AR3 for +3.3V Leakage -- Page 25  
EC-SI-E15 Change AR1 to 4.7 ohm for EA -- Page 25  
EC-SI-E16 Change from +3.3V to +3.3V\_AUX for EC\_SMI#\_R for +3.3V\_SUS Leakage -- Page 25  
EC-SI-E17 Don't stuff R402/R403 for +3.3V\_SUS leakage -- Page 28  
EC-SI-E18 Change U29.72 to IOUT -- Page 28  
EC-SI-E19 Add EC6 220pf on +5V\_SUS, EC5 220pf on PWRBTN#, EC4 220pf on PWR\_ON\_LED# -- Page 32  
EC-SI-E20 Add serial resistor R699 on L\_FRAME# -- Page 28  
EC-SI-E21 xChange serial resistor from 33ohm to 100ohm on F\_LAD0\_R,F\_LAD1\_R,F\_LAD2\_R,F\_LAD3\_RmL\_FRAME#\_R,L\_FRAME#\_R,F\_LAD0\_D,F\_LAD1\_D,F\_LAD2\_D,F\_LAD3\_D,R405,R406,R408,R456,R455,R454,R453 -- Page 28  
EC-SI-E22 Add 0.95V\_VGA power LDO circuit -- Page 49  
EC-SI-E23 Stuff some capacitors EMI reserved before -- Page 50  
EC-SI-E24 Change AD4,AD5,AD6,AD7 part and their pin2 connect to GND -- Page 25  
EC-SI-E25 Change DDR3L socket, JDIM1,JDIM2-- Page 14,15  
EC-SI-E26 Add ESD protector for 3D CAMERA, U41-- Page 29  
EC-SI-E27 Add ESD capacitor for Audio codec return path AC38,AC30,AC45 -- Page 25  
EC-SI-E28 C203, C204, C592 and C593 change with 1000pf cap for ESD -- Page 26  
EC-SI-E29 AL1-AL4 change to 220 ohm bead same as previous mode for EMI, AL1-AL4 -- Page 25  
EC-SI-E30 Add ESD protector for DMIC (close to CN6) -- Page 25

ECP-SI-P01 change footprint to short pad, PJP1-PJP19 -- Page35-49  
ECP-SI-P02 change current sense IC multiple and EC detect system power consumption,PU20,PR133,PR351,PR132 -- Page 35  
ECP-SI-P03 add power rating,PQ26,PC101 -- Page 36  
ECP-SI-P04 adjust output voltage and common design. PR30/PC48/PC49 -- Page 36  
ECP-SI-P05 adjust sequence and remote sense resistor.PC156/PR192/PR193 -- Page 38  
ECP-SI-P06 common design. PC102 -- Page 39  
ECP-SI-P07 common design. PC104/PC106-- Page 40  
ECP-SI-P08 adjust sequence. PR327/PR328-- Page  
ECP-SI-P09 Iout and load line setting. PR14/PR15/PC18/PC67/PC172-- Page 44  
ECP-SI-P10 OCP, Iout, load line setting and common design. PR33/PR18/PR156/PR168/PR169/PC24/PC32/PC148/PC21/PL6/PL7/PC52/PC55-- Page 44  
ECP-SI-P11 improve ripple. PC274/PC275-- Page 47  
ECP-SI-P12 OCP, load line setting and common design. PR96/PR237/PC82/PL10/PL11-- Page 48  
ECP-SI-P13 Remove PG.+1.8V\_VGA circuit. PQ42/PQ44/PR224/PR226 -- Page48  
ECP-SI-P14 add power rating. PL9/PC276 -- Page 49  
ECP-SI-P15 change power solution from load switch to LDO. PQ16/PR76/PC66/PC107/PC246/PU21/PR147/PR349/PR348/PR350/PR269/PC271/PC272/PC273 -- Page49

**SI-1 to SI-2 Change List**

EC-SI2-E01 Chagne 0 ohm to shortpad., R115 -- Page 31  
EC-SI2-E02 Chagne 0 ohm to shortpad., AR35,AR39,AR9 -- Page 25  
EC-SI2-E03 Change and stuff Audio power., AU2,AR20,AR46,AR45 -- Page 25  
EC-SI2-E04 Chagne 0 ohm to shortpad. L23,R32, -- Page 24  
EC-SI2-E05 Un-stuff Intel ME Crypto TLS pull up resistor, R198 -- Page 9  
EC-SI2-E06 Chagne 0 ohm to shortpad., R649 -- Page 9  
EC-SI2-E07 Stuff VREALRTB\_PU pull up resistor, R604 -Page 9  
EC-SI2-E08 Un-stuff BMUSV pull up, R619 --Page 9  
EC-SI2-E09 Chagne 0 ohm to shortpad.-- Page 10  
EC-SI2-E10 Un-stuff GPP\_F\_11, GPP\_G\_5 pull up ,R156/R536 -- Page 10  
EC-SI2-E11 Chagne 0 ohm to shortpad. R595 -- Page 12  
EC-SI2-E12 Chagne 0 ohm to shortpad, R533/R534. -- Page 22  
EC-SI2-E13 Chagne 0 ohm to shortpad, R313 -- Page 23  
EC-SI2-E14 Chagne 0 ohm to shortpad, R426 -- Page 28  
EC-SI2-E15 Un-stuff SPI\_MOST to XDP\_HOOK3, R76-- Page 34  
EC-SI2-E16 Un-stuff PCH\_SUSCLK pull down, R265 -- Page 9  
EC-SI2-E17 Reserve commond choke / 0 ohm on PCIE\_WLAN\_RX signal close to PCH side. R701/R700.L41 -- Page 28  
EC-SI2-E18 Delete 0 ohm., R558,R551,R258,R622 -- Page 9,10,34

ECP-SI2-P01 change 0R\_0402 to shortpad, -- Page35-40, 44-46,48-49  
ECP-SI2-P02 change 0R\_0603 to shortpad, PR56,PR187,PR199,PR186,PR191,PR330,PR84 -- Page 37, 45-48  
ECP-SI2-P03 add adapter protect detect schematic ,PR370,PR371,PR372,PR373,PR374 -- Page 35  
ECP-SI2-P04 delete adapter protect detect schematic . PU16,PD7,PC220,PC222,PC242,PR257,PR258,PR260,PR265,PR266,PR303,PR307,PR309 -- Page 35  
ECP-SI2-P05 adjust VDDQ power rail output voltage.PR30 -- Page 37  
ECP-SI2-P06add VCCIO power rail efficiency PL3 -- Page 38  
ECP-SI2-P07 detel PJP18 and add PL21.-- Page 40  
ECP-SI2-P08 change PR14,PR15,PR18,PC149,PC152 value- Page44

**SI-2 to PV Change List**

EC-PV-E01 Change serial resistor value from 0 ohm to 100ohm on EC\_PRHOT\_S - page5  
EC-PV-E02 Chagne 0 ohm to shortpad., R107,R487,R294,R295,R265,R599,R281,R273,R264,R545,R290,R288,R243,R539,R644,R540,R224,R274,R245, R289,R553,R301,R297,R366,R495,R369,R501,L33,R299,R226,R671,R670,R677,R686,R573,AR20,AR14,AR7,R356,R312,R667,R360,R687,R400,R391,R398,R379,R378, R334,R701,R700,R433,R475,R427,R404,R561,R203,R361,R1,R86,R201 -- Page 5,9,10,11,12,13,14,15,16,22,23,24,25,26,27,28,30,31,32,34  
EC-PV-E03 Remove 0 ohm and short net on CPU XDP traces., R472,R482,R486,R468,R470,R110,R109 -- Page 5  
EC-PV-E04 Remove 0 ohm., R647,R432,R428,R69,R62 -- Page 10,28,34  
EC-PV-E05 Reserve 0 ohm for AMD dgfix power off mode. R702, -- Page 9  
EC-PV-E06 Don't stuff R559/R571 and stuff R572/R557 -- Page 12  
EC-PV-E07 Don't stuff some components for TPM., R279,R278,R269,R257,R285,R241,R244,C183,C174,C175 -- Page 33  
EC-PV-E08 Don't stuff components, R606,C59,R70,R460,R448,C579,R613 -Page 34


ECP-PV-P01 change 0R\_0402 to shortpad, -- PR373,PR374,PR351,PR157,PR159,PR298,PR263,PR111  
PR113,?PR203,PR148,PR116,PR230,PR216 Page35,37,39,40,42,44,47,48,49

**PV to PV2 Change List**

EC-PV2-E01 Change CN1 footprint SMT suggestion -- Page 32  
EC-PV2-E02 Change 0 ohm to shortpad. R233,R578,AR10,R91,R166,R266,R267,R175,R173,R167,R48,R49  
EC-PV2-E03 Remove co-lay 0ohm:R194,R195,R196,R197,R180,R181,R178,R179,R182,R183,R192,R193,R188,R189,R187,R186,R185,R184 -- Page 24  
R351,R352,R349,R349,R657,R658,R659,R660,R662,R663,R664,R665 -- Page 30  
EC-PV2-E04 Board ID to PV2 -- Page 12  
EC\_PV2\_P01 Throttling point setting change: UMA(182K), DIS(97.6K) -- Page 35  
EC\_PV2\_P02 Adapter ID setting change: UMA(45.3K), DIS(26.7K). -- Page 35  
EC\_PV2\_P03 Remove power control of +VCCPLL\_OC related circuit. -- Page 42  
EC\_PV2\_P04 Remove Discharge related circuit of +VCCPLL\_OC. -- Page 43

**PV2 to MV Change List**

EC-MV-E01 Change 0 ohm to shortpad. R132,R133,R143,R100,R103,R474,R122,R126,R127,R510,R511,R394,R395,R206  
EC-MV-E02 Board ID to MV -- Page 12  
EC\_MV\_P01 Change 0 ohm to shortpad. PR212,PR350

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<b>Change List</b>			
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