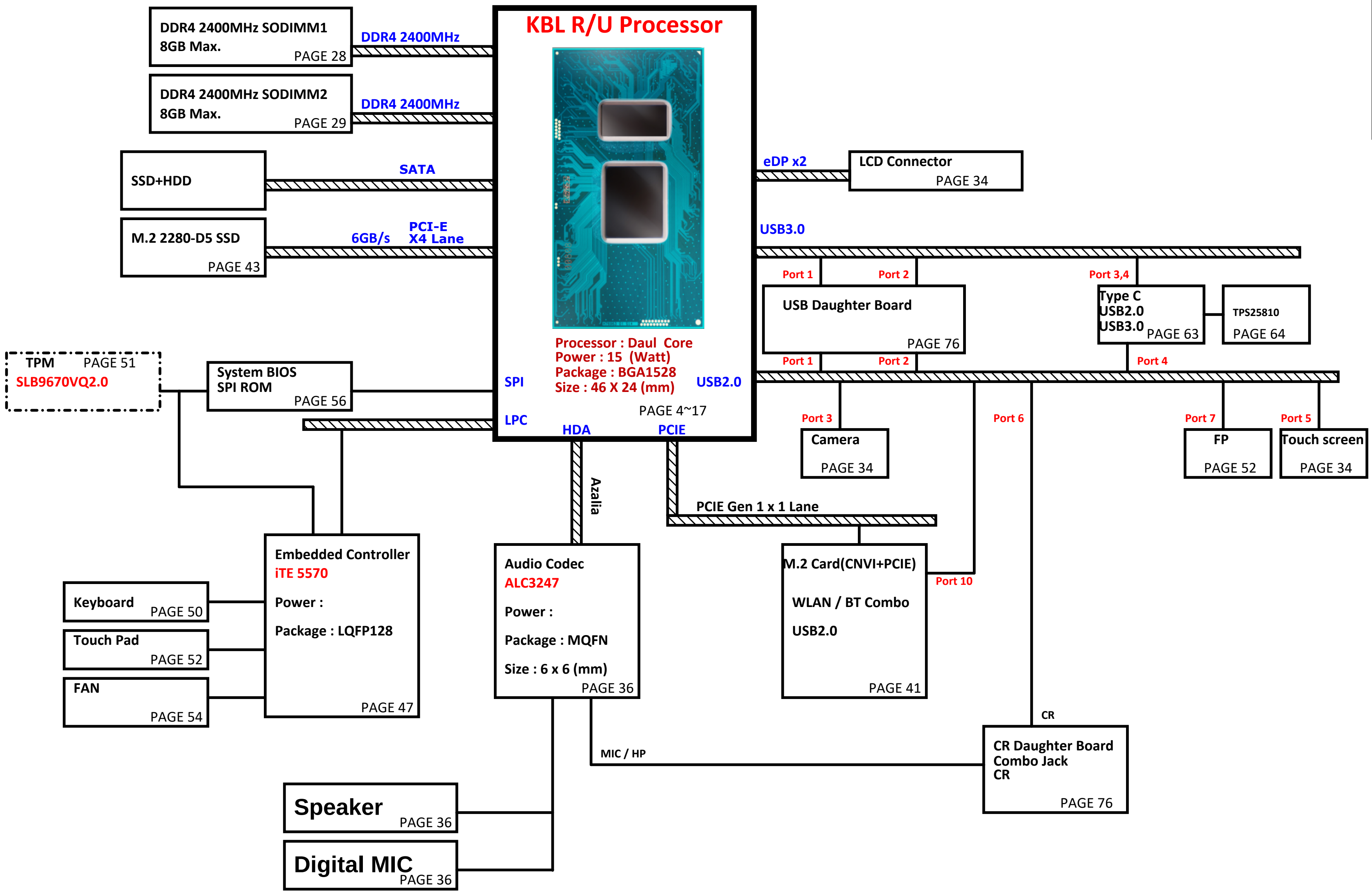
PCB 6L STACK UP

LAYER 1 : TOP
LAYER 2 : SGND
LAYER 3 : IN1
LAYER 4 : IN2
LAYER 5 : SGND1
LAYER 6 : BOT



PROJECT : OP5A

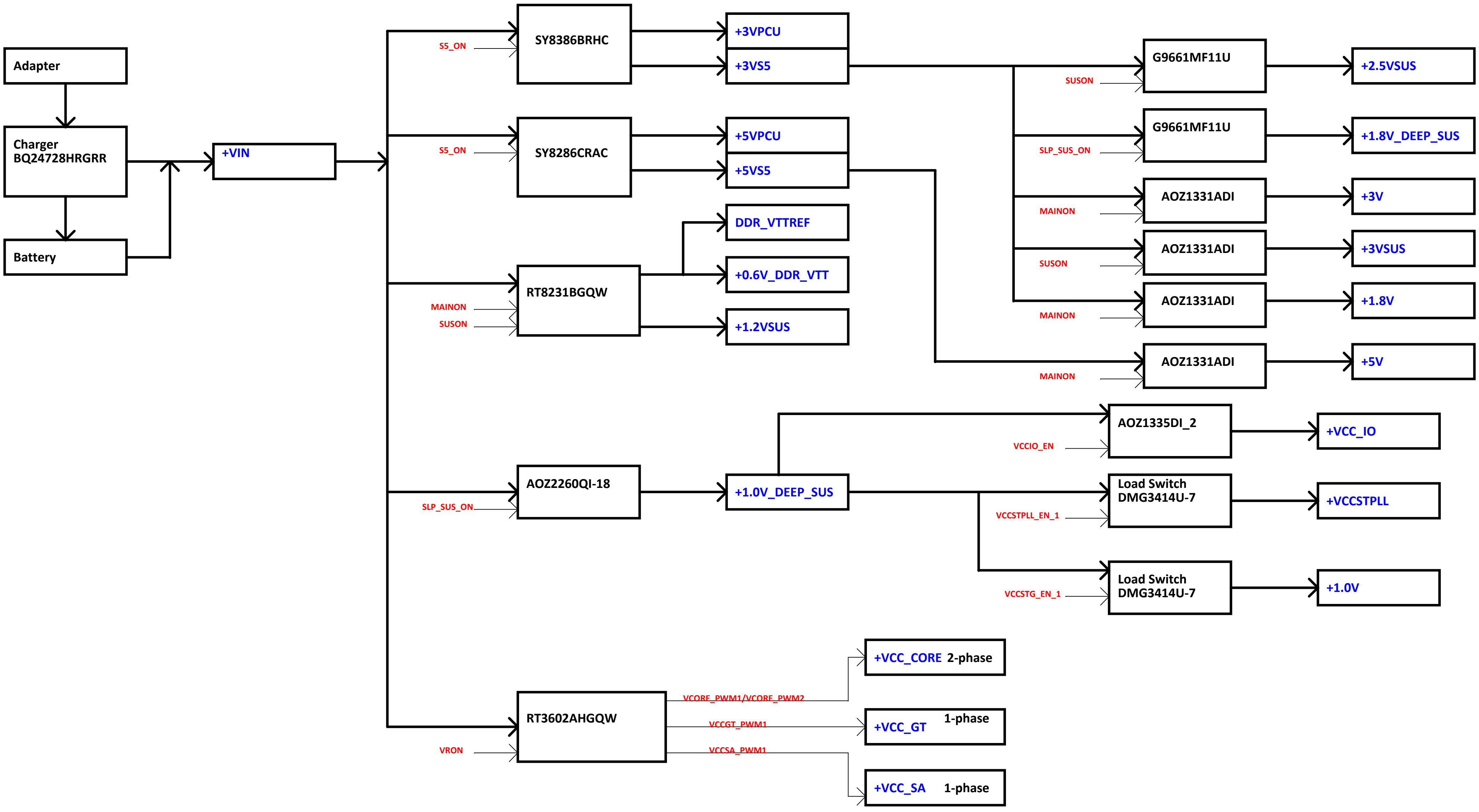
Quanta Computer Inc.

NB5

Size	Document Number	Rev
Custom	Block Diagram	1A

Date: Wednesday, April 03, 2019 Sheet 1 of 90

Power Diagram



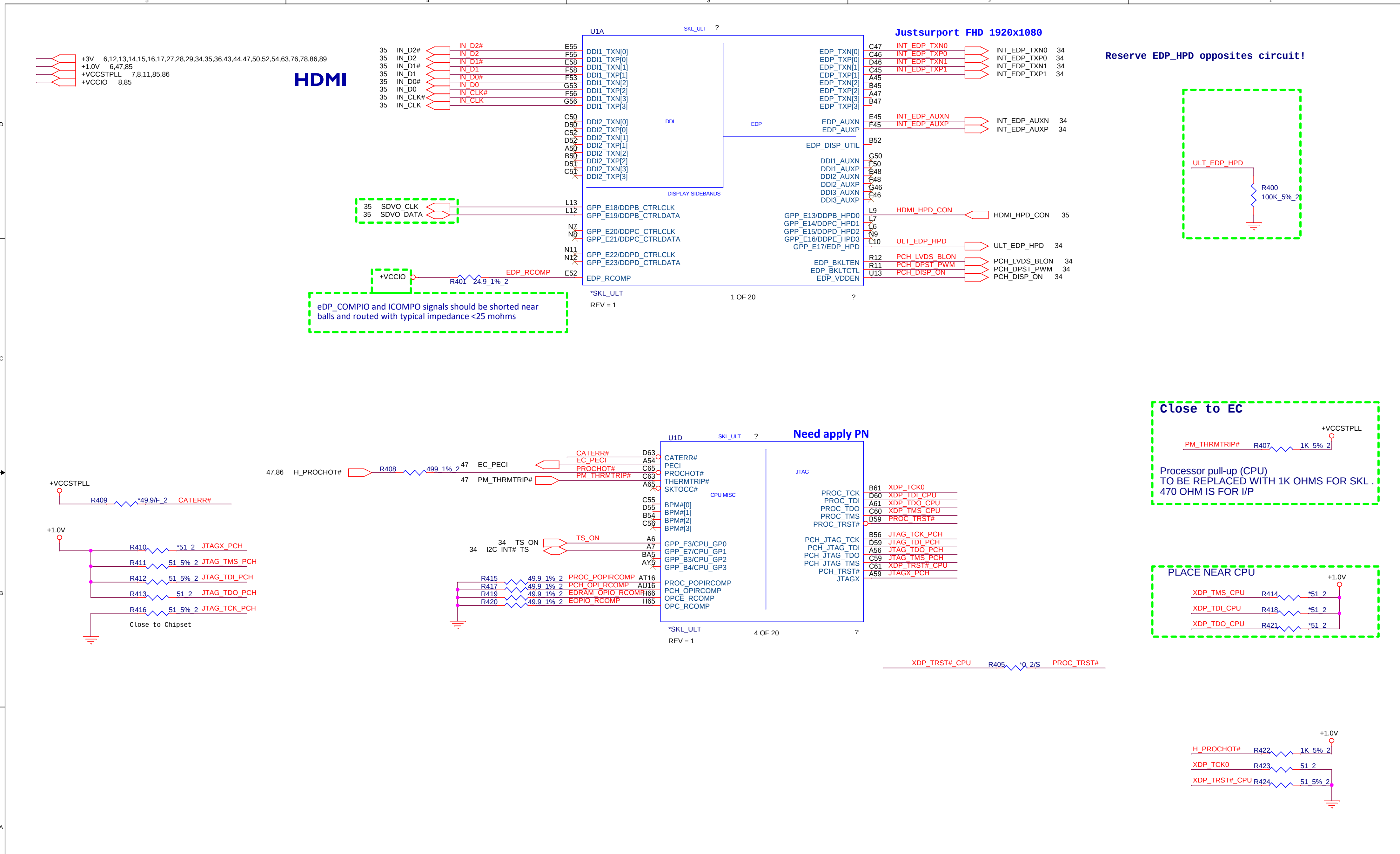
NB5

PROJECT : OP5A

Quanta Computer Inc.

Size	Document Number	Rev
	Power Diagram	1A

Date: Wednesday, April 03, 2019 Sheet 2 of 90



NB5

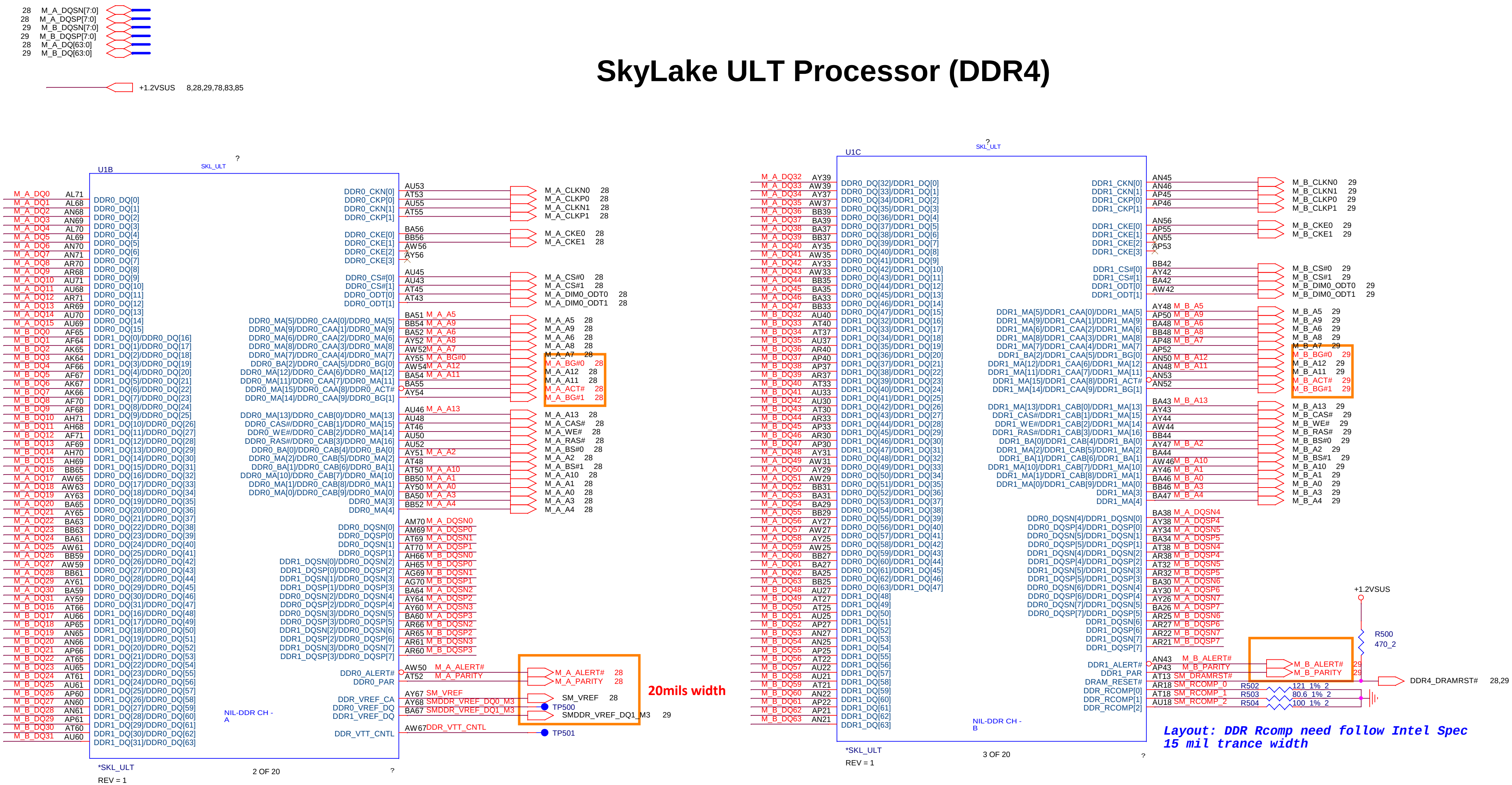
PROJECT : OP5A

Quanta Computer Inc.

Size	Document Number	Rev
Custom	02 -- SKYPAKE 1/15 (eDP/DDI)	1A

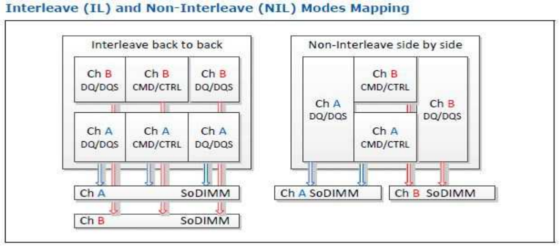
Date: Wednesday, April 03, 2019 Sheet 4 of 90

SkyLake ULT Processor (DDR4)



Layout: DDR Rcomp need follow Intel Spec
15 mil trance width

Interleave (IL) and Non-Interleave (NIL) Modes Mapping



PROJECT : OP5A

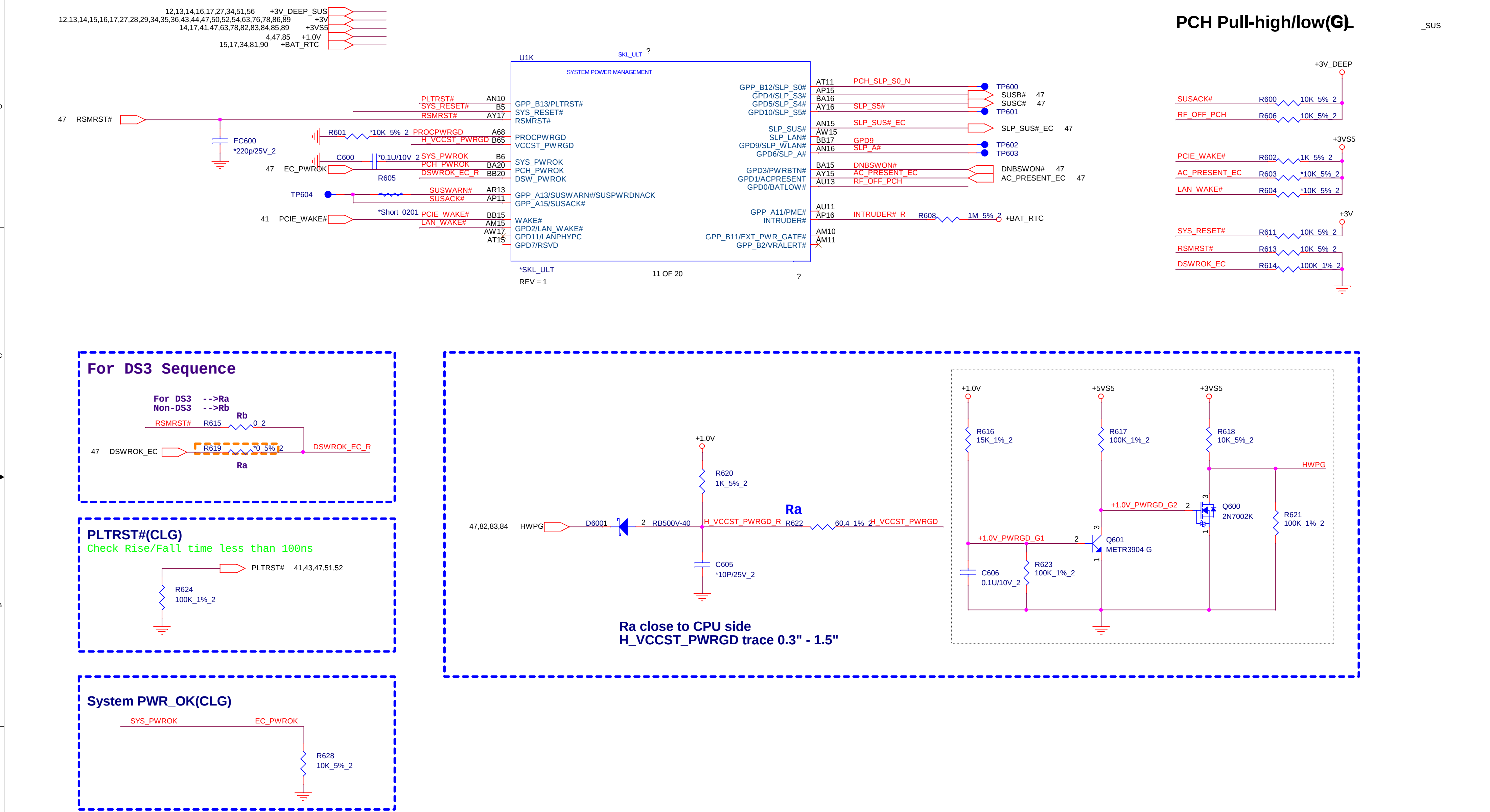
Quanta Computer Inc.

NB5

Size	Document Number	Rev
Custom	03 -- SKYLAKE 2/15(DDR4 I/F)	1A

Date: Wednesday, April 03, 2019 Sheet 5 of 90

PCH Pull-high/low(G)



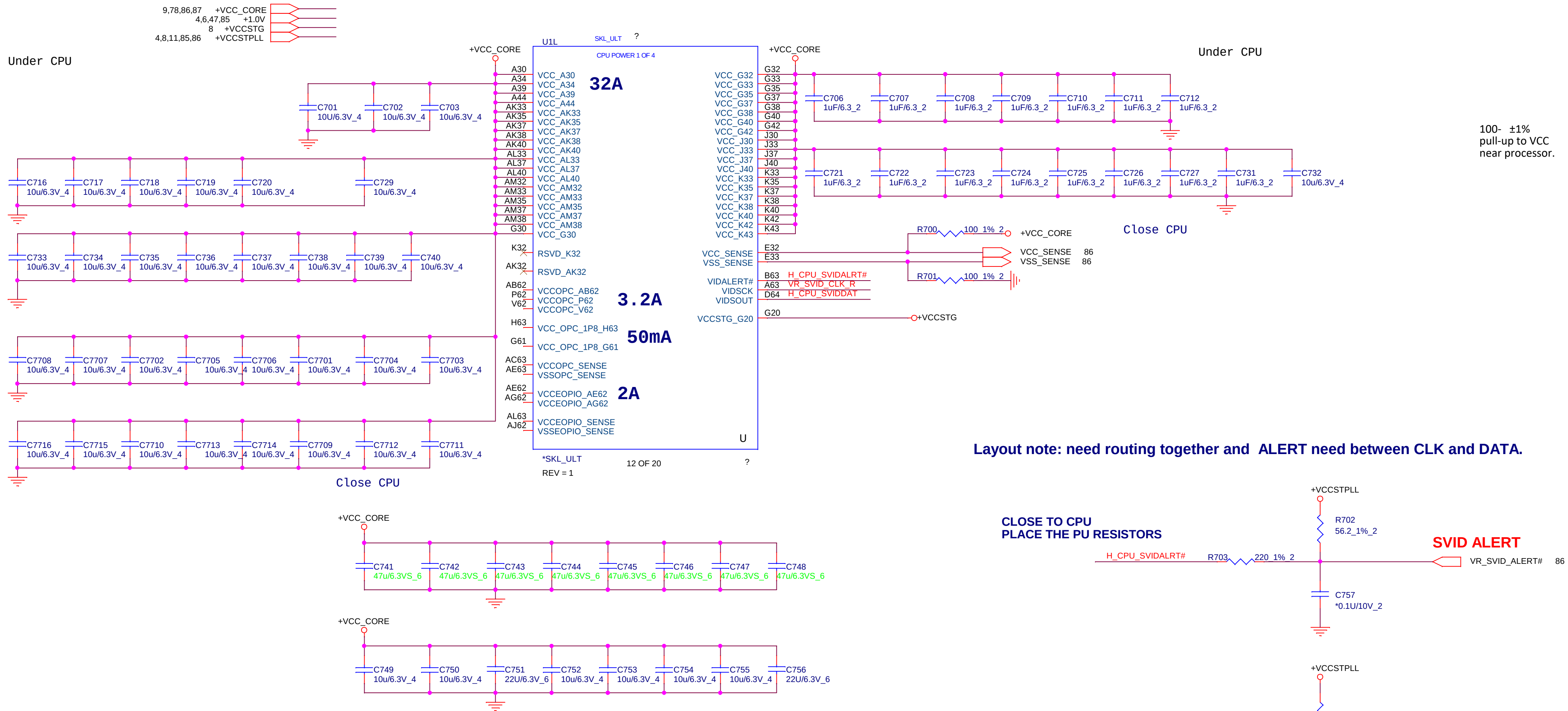
PROJECT : OP5A

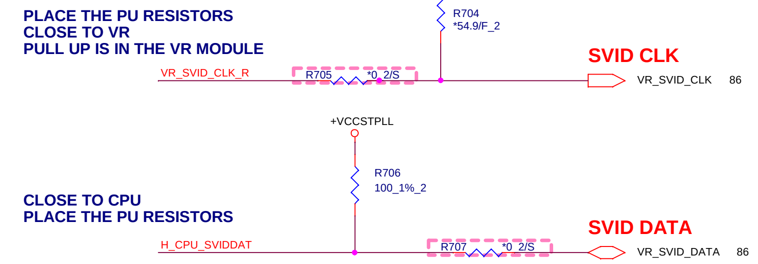
Quanta Computer Inc.

NB5

Size	Document Number	Rev
Custom	04 -- SKYLAKE 3/15(PowerManger)	1A

Date: Wednesday, April 03, 2019 Sheet 6 of 90





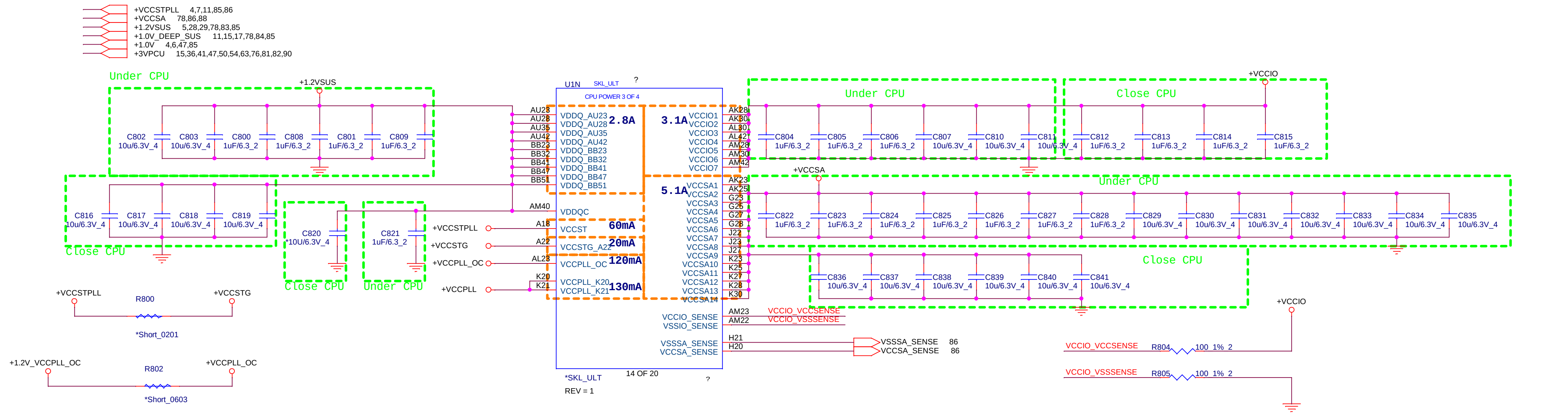
Power Rail	Description	Control
V_{CC}	Processor IA Cores Power Rail	SVID
Vcc_{GT}	Processor Graphics Power Rails	SVID
Vcc_{GTX}	Processor Graphics Extended Power Rail Available only for GT3/GT4 processor SKUs	SVID
Vcc_{SA}	System Agent Power Rail	SVID/Fixed (SKU dependent)
Vcc_{IO}	IO Power Rail	Fixed
Vcc_{ST}	Sustain Power Rail	Fixed
Vcc_{PLL}	Processor PLLs power rail	Fixed
V_{DDQ}	Integrated Memory Controller Power Rail	Fixed (Memory technology dependent)
Vcc_{OPC}	Processor OPC power rail (available only in SKU's with OPC)	Fixed
Vcc_{OPC_1P8}	Processor OPC power rail (available only in SKU's with OPC)	Fixed
Vcc_{EOPIO}	Processor EOPIO power rail (available only in SKU's with OPC)	Fixed

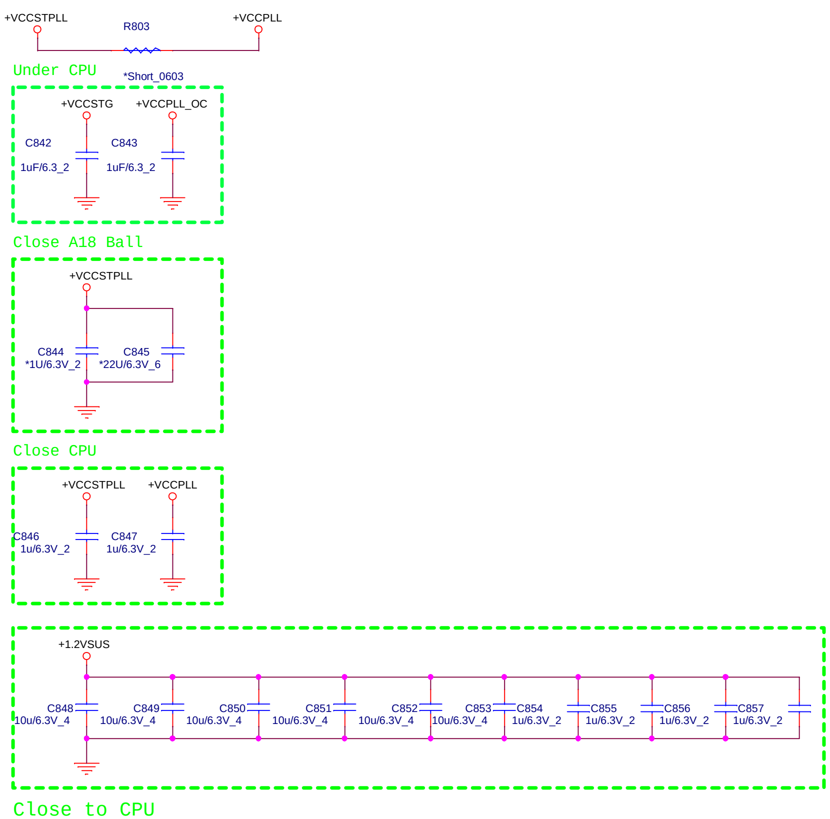
NB5

PROJECT : OP5A
Quanta Computer Inc.

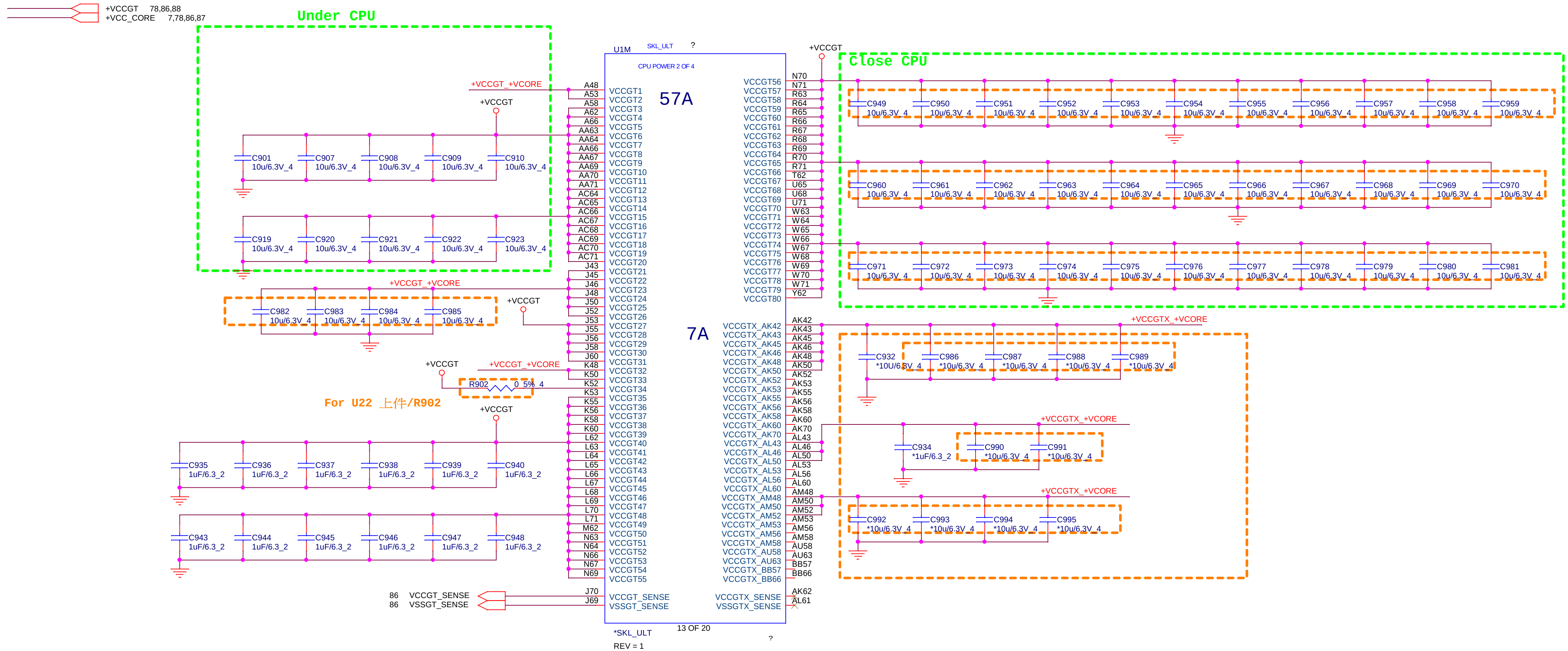
Size	Document Number	Rev
Custom	05 -- SKYLAKE 4/15 (POWER-1)	1A

Date: Wednesday, April 03, 2019 Sheet 7 of 90





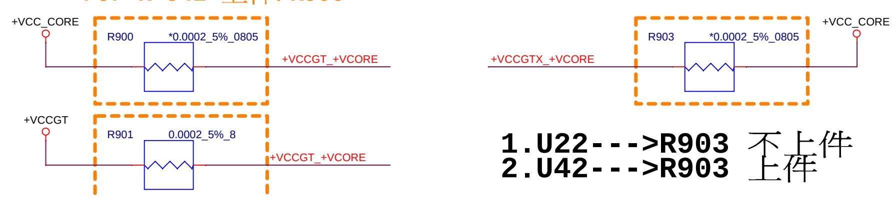
Power Rail	Description	Control
V_{CC}	Processor IA Cores Power Rail	SVID
Vcc_{GT}	Processor Graphics Power Rails	SVID
Vcc_{GTX}	Processor Graphics Extended Power Rail Available only for GT3/GT4 processor SKUs	SVID
Vcc_{SA}	System Agent Power Rail	SVID/Fixed (SKU dependent)
Vcc_{IO}	IO Power Rail	Fixed
Vcc_{ST}	Sustain Power Rail	Fixed
Vcc_{PLL}	Processor PLLs power rail	Fixed
V_{DDQ}	Integrated Memory Controller Power Rail	Fixed (Memory technology dependent)
Vcc_{OPC}	Processor OPC power rail (available only in SKU's with OPC)	Fixed
Vcc_{OPC_1P8}	Processor OPC power rail (available only in SKU's with OPC)	Fixed
Vcc_{EOPIO}	Processor EOPIO power rail (available only in SKU's with OPC)	Fixed



1.U22---C932/C986/C987/C988/C989/C934/C990/C991/C992/C993/C994/C995/C982/C983/C984/C985 不上件

2.U42---C932/C986/C987/C988/C989/C934/C990/C991/C992/C993/C994/C995/C982/C983/C984/C985 上件

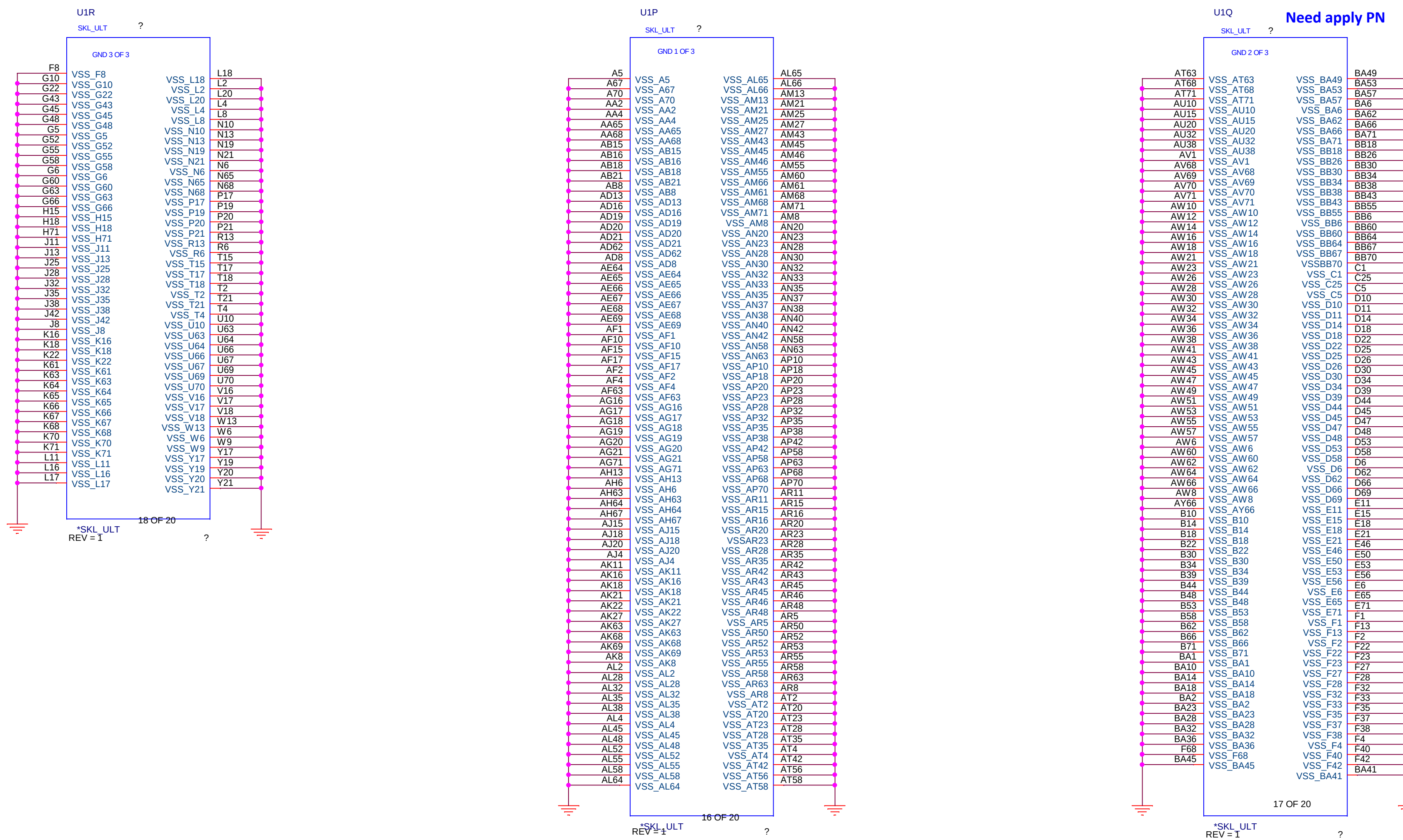
For R-U42 上件/R900



For U22 上件/R901

1.U22--->R903 不上件
2.U42--->R903 上件

Power Rail	Description	Control
V_{CC}	Processor IA Cores Power Rail	SVID
Vcc_{GT}	Processor Graphics Power Rails	SVID
Vcc_{GTX}	Processor Graphics Extended Power Rail Available only for GT3/GT4 processor SKUs	SVID
Vcc_{SA}	System Agent Power Rail	SVID/Fixed (SKU dependent)
Vcc_{IO}	IO Power Rail	Fixed
Vcc_{ST}	Sustain Power Rail	Fixed
Vcc_{PLL}	Processor PLLs power rail	Fixed
V_{DDQ}	Integrated Memory Controller Power Rail	Fixed (Memory technology dependent)
Vcc_{OPC}	Processor OPC power rail (available only in SKU's with OPC)	Fixed
Vcc_{OPC_1P8}	Processor OPC power rail (available only in SKU's with OPC)	Fixed
Vcc_{EOPIO}	Processor EOPIO power rail (available only in SKU's with OPC)	Fixed



Need apply PN

PROJECT : OP5A

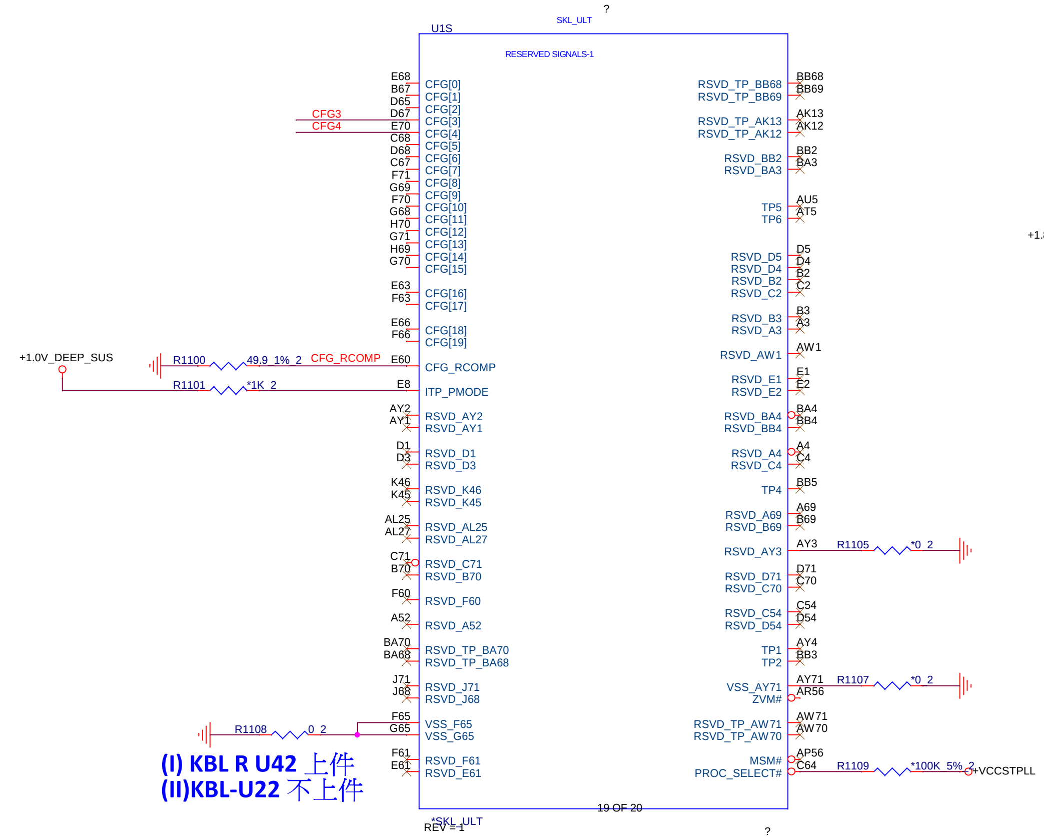
Quanta Computer Inc.

NB5

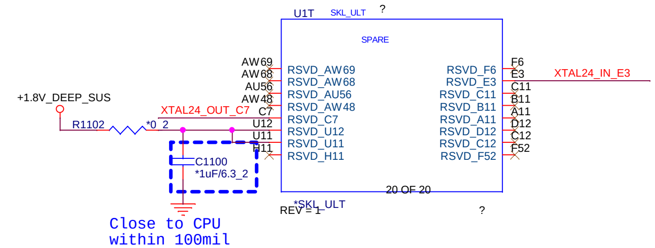
Size	Document Number	Rev
Custom	08 -- SKYLAKE 7/15 (GND)	1A

Date: Wednesday, April 03, 2019 Sheet 10 of 90

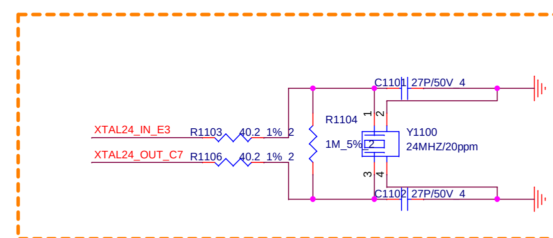
+1.0V_DEEP_SUS 15,17,78,84,85
+VCCSTPLL 4,7,8,85,86
+1.8V_DEEP_SUS 17,47,76,84,89



(I) KBL R U42 上件
(II)KBL-U22 不上件



Close to CPU
within 100mil

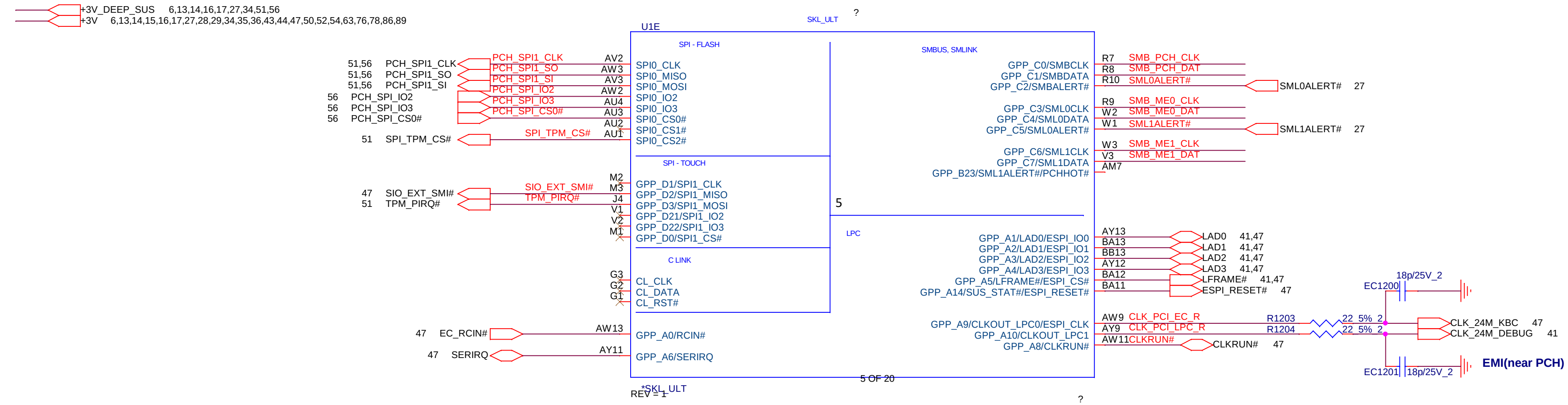


stuff on KBL R U42
Non-stuff on KBL-U22

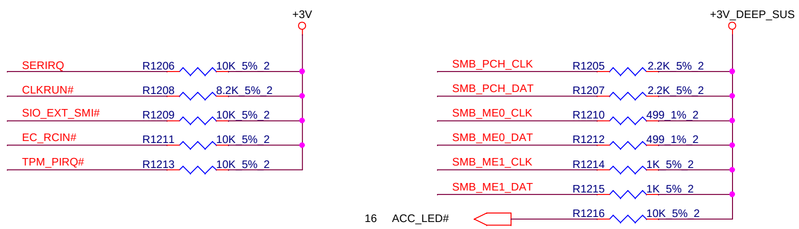
Processor Strapping

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

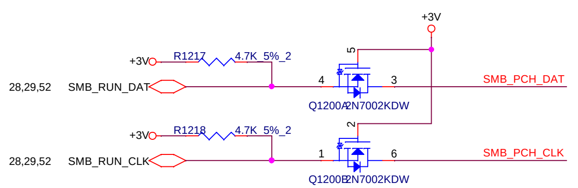
	1	0	Circuit
CFG3 (Physcial Debug Enable) DFX Privacy	Disable:	Enable: Set DFX Enable in DFX interface MSR	CFG3 R1110 *1K_2
CFG4 (DP Presence Strap)	Disable; No physical DP attached to eDP	Enable; An ext DP device is connected to eDP	CFG4 R1111 1K_2



GPIO Pull UP



SMBus/Pull-up(CLG)

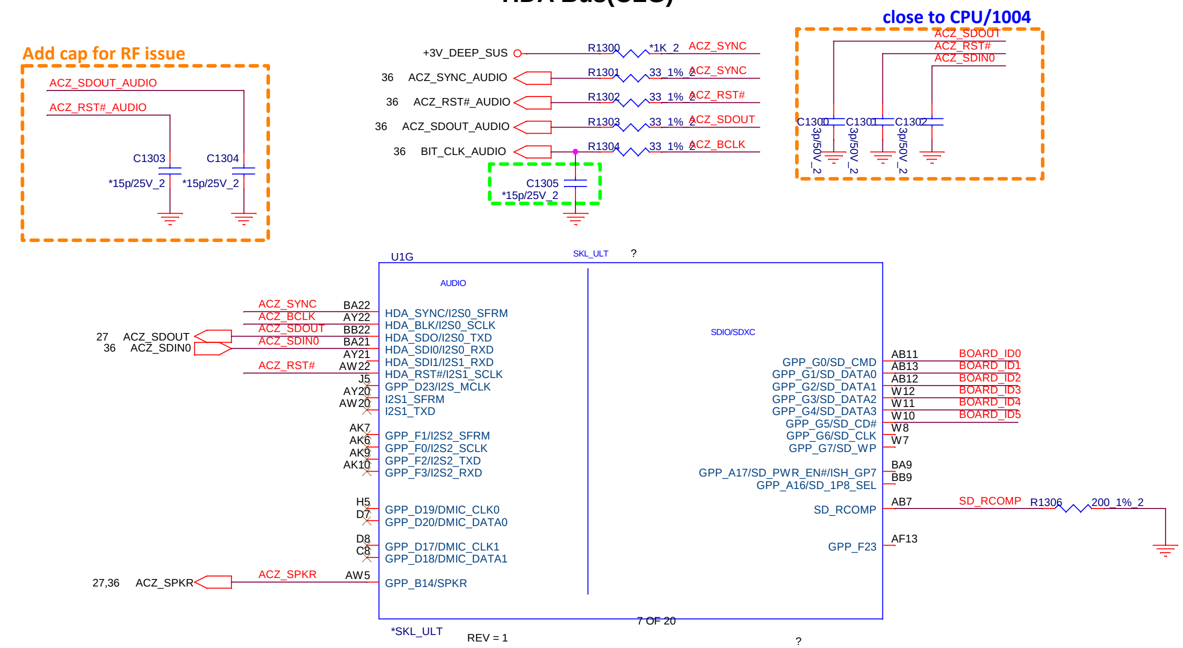


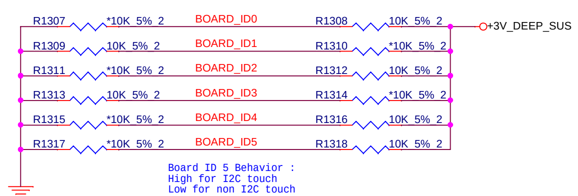
Touch Pad
XDP
DDR4

PROJECT : OP5A	Quanta Computer Inc.
Size: Custom	Document Number: 10 -- SKYLAKE 09/15(SPI/LPC/SM)
Rev	1A
Date: Wednesday, April 03, 2019	Sheet 12 of 90

NB5

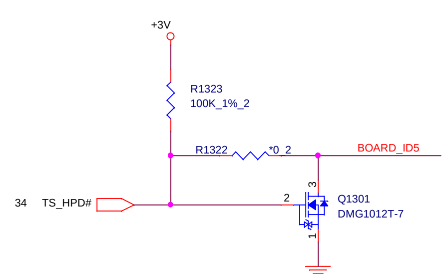
HDA Bus(CLG)





Board ID 5 Behavior :
High for I2C touch
Low for non I2C touch

for T/S Determination

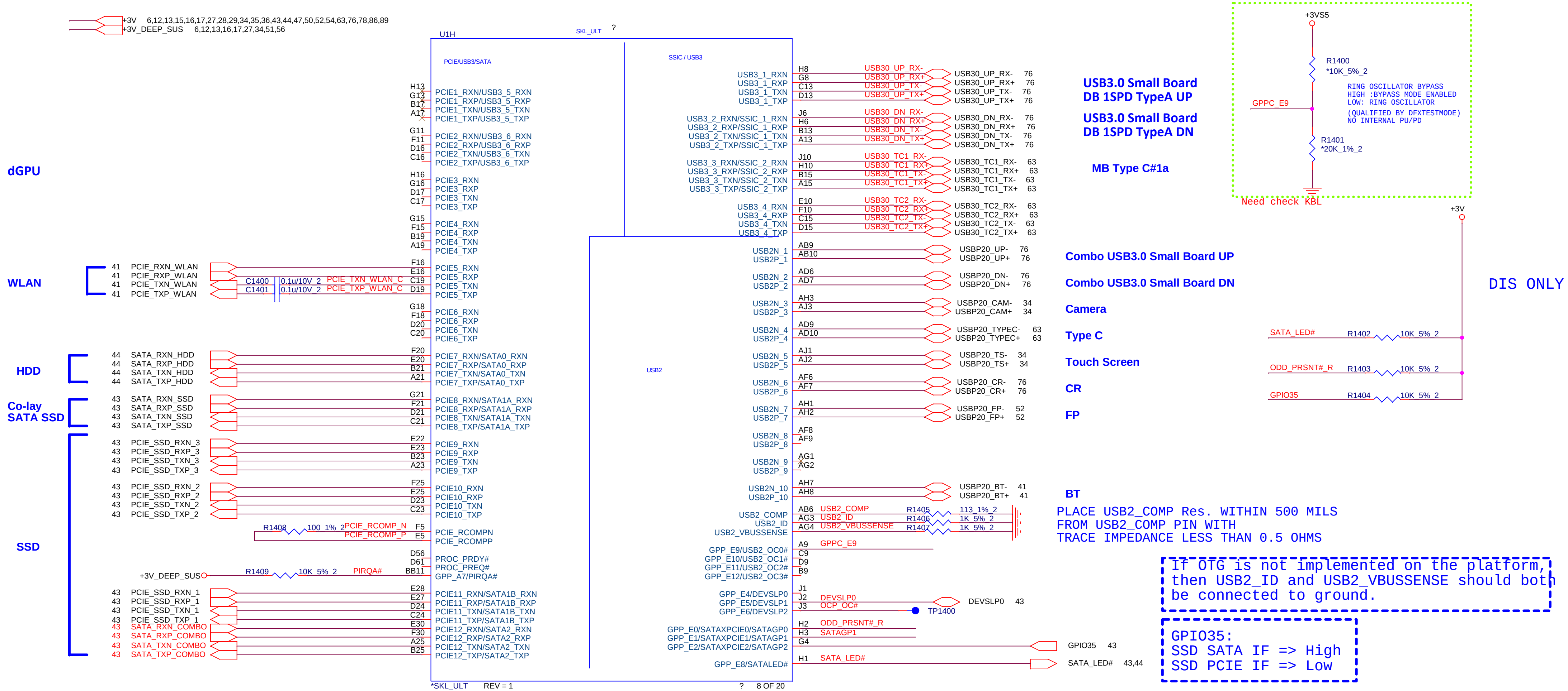


WHL/KBL	Board ID 5	Board ID 4	Board ID 3	BOARD_ID[2:1:0]
Model	ID5	ID4	ID3	ID2 ID1 ID0
Definition	1 : active by eDP cable 0 : Reserve Active By eDP Cable	1 : USB touch 0 : I2C touch	Reserved =0	100 : 15 WHL 000 : 14 WHL 101 : 15 KBL 001 : 14 KBL 110 : 15 GML 010 : 14 GML

PROJECT : OP5A
Quanta Computer Inc.
NB5

Size	Document Number	Rev
Custom	11 -- SKYLAKE 10/15(HDA)	1A

Date: Wednesday, April 03, 2019 Sheet 13 of 90



PLACE USB2_COMP Res. WITHIN 500 MILS
FROM USB2_COMP PIN WITH
TRACE IMPEDANCE LESS THAN 0.5 OHMS

If OTG is not implemented on the platform,
then USB2_ID and USB2_VBUSSENSE should both
be connected to ground.

GPIO35:
SSD SATA IF => High
SSD PCIE IF => Low

2016/9/7
For Base-U the SATA1B/SATA2 delete

PCI-E Port Mapping Table

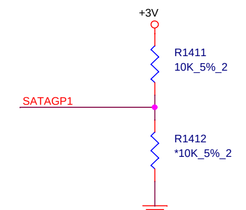
PCI-E Port	Function	CLK RQ Port	Function
Port1	NA	Port0	NA
Port2	NA	Port1	NC
Port3	NA	Port2	SSD
Port4	NA	Port3	WLAN
Port5	WLAN	Port4	LAN
Port6	LAN	Port5	Un-used
Port7	HDD		
Port8	Co-lay SSD		
Port9	SSD		
Port10	SSD		
Port11	SSDx2		
Port12	SSDx2/ SATA2		

USB3.0 Port Mapping Table

USB3.0	Function
PORT-1	USB3.0 Small Board
PORT-2	USB3.0 Small Board
PORT-3	Type C
PORT-4	Type C

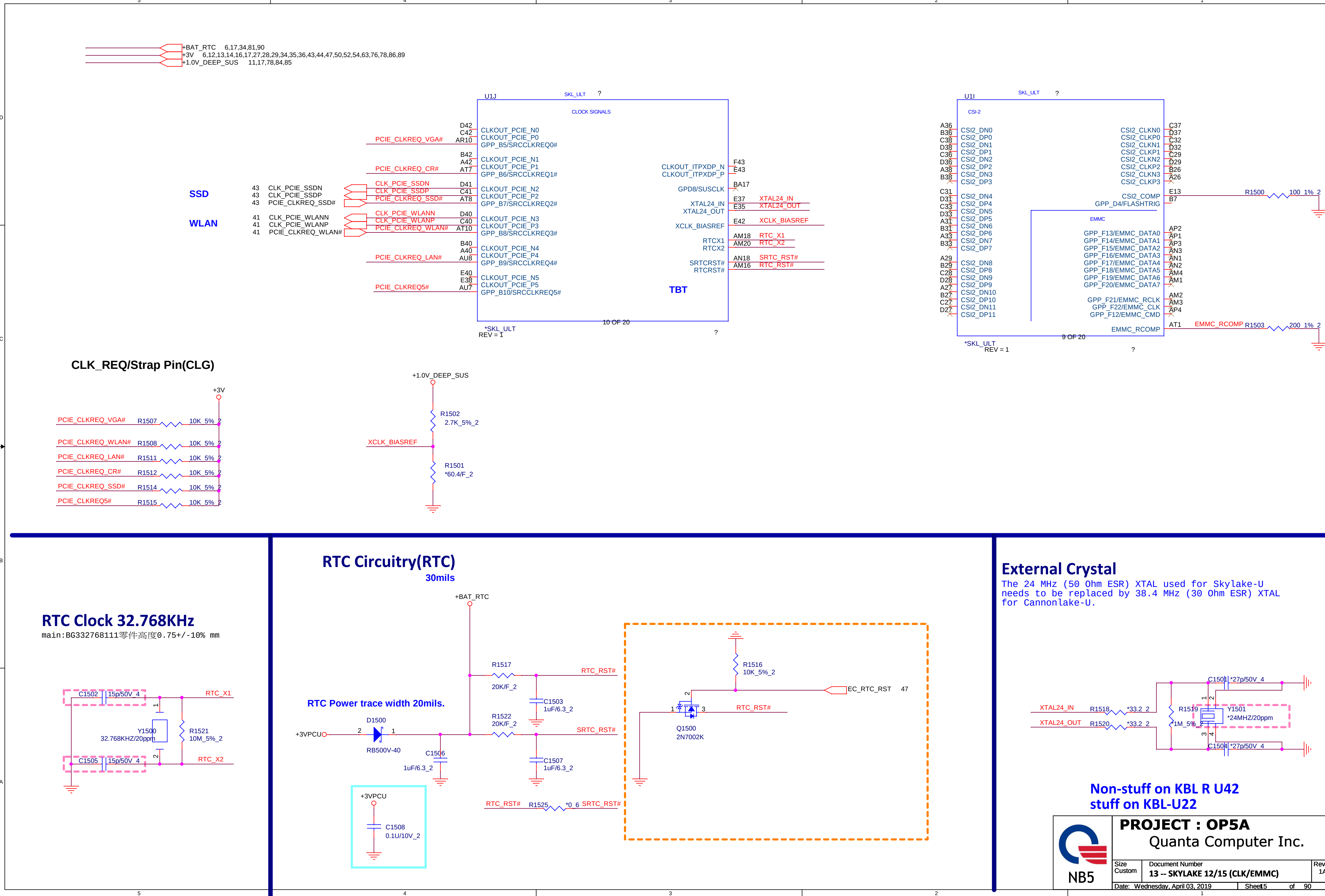
USB2.0 Port Mapping Table

USB2.0	Function
PORT-1	Cobime USB3.0 MB-1
PORT-2	Cobime USB3.0 Small Board
PORT-3	Camera
PORT-4	Type C
PORT-5	Touch Screen
PORT-6	CardReader
PORT-7	Finger print
PORT-8	NC
PORT-9	NC
PORT-10	BT



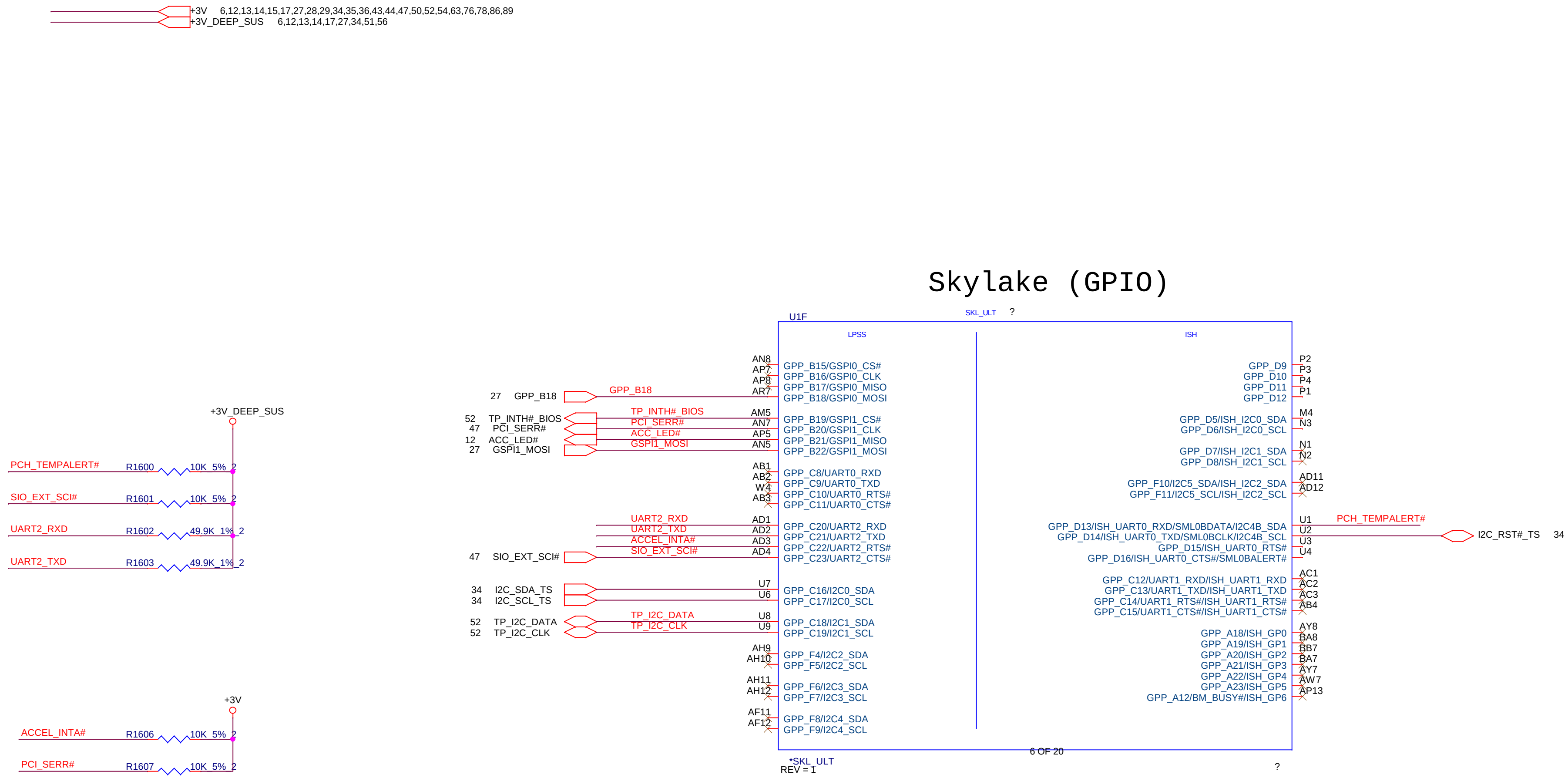
SATAGP1:
CardReader => High
ODD => Low

PROJECT : OP5A
Quanta Computer Inc.
NB5
Size Custom
Document Number 11 -- SKYLAKE 10/15(HDA)
Rev 1A
Date: Wednesday, April 03, 2019 Sheet 14 of 90



+BAT_RTC 6,17,34,81,90
+3V 6,12,13,14,16,17,27,28,29,34,35,36,43,44,47,50,52,54,63,76,78,86,89
+1.0V_DEEP_SUS 11,17,78,84,85
U1J
SKL_ULT
CLOCK SIGNALS
CLKOUT_PCIE_N0
CLKOUT_PCIE_P0
GPP_B5/SRCCLKREQ0#
CLKOUT_PCIE_N1
CLKOUT_PCIE_P1
GPP_B6/SRCCLKREQ1#
CLKOUT_PCIE_N2
CLKOUT_PCIE_P2
GPP_B7/SRCCLKREQ2#
CLKOUT_PCIE_N3
CLKOUT_PCIE_P3
GPP_B8/SRCCLKREQ3#
CLKOUT_PCIE_N4
CLKOUT_PCIE_P4
GPP_B9/SRCCLKREQ4#
CLKOUT_PCIE_N5
CLKOUT_PCIE_P5
GPP_B10/SRCCLKREQ5#
CLKOUT_ITPXDP_N
CLKOUT_ITPXDP_P
GPD8/SUSCLK
XTAL24_IN
XTAL24_OUT
XCLK_BIASREF
RTCX1
RTCX2
SRTCRST#
RTCRST#
TBT
10 OF 20
*SKL_ULT
REV = 1
PCIE_CLKREQ_VGA#
PCIE_CLKREQ_CR#
SSD
43 CLK_PCIE_SSDN
43 CLK_PCIE_SSDP
43 PCIE_CLKREQ_SSD#
WLAN
41 CLK_PCIE_WLANN
41 CLK_PCIE_WLANP
41 PCIE_CLKREQ_WLAN#
PCIE_CLKREQ_LAN#
PCIE_CLKREQ5#
XTAL24_IN
XTAL24_OUT
XCLK_BIASREF
RTC_X1
RTC_X2
SRTC_RST#
RTC_RST#
U1I
SKL_ULT
CSI-2
CSI2_DN0 … CSI2_DP11
CSI2_CLKN0
CSI2_CLKP0
CSI2_CLKN1
CSI2_CLKP1
CSI2_CLKN2
CSI2_CLKP2
CSI2_CLKN3
CSI2_CLKP3
CSI2_COMP
GPP_D4/FLASHTRIG
EMMC
GPP_F13/EMMC_DATA0
GPP_F14/EMMC_DATA1
GPP_F15/EMMC_DATA2
GPP_F16/EMMC_DATA3
GPP_F17/EMMC_DATA4
GPP_F18/EMMC_DATA5
GPP_F19/EMMC_DATA6
GPP_F20/EMMC_DATA7
GPP_F21/EMMC_RCLK
GPP_F22/EMMC_CLK
GPP_F12/EMMC_CMD
EMMC_RCOMP
R1500 100_1%_2
EMMC_RCOMP R1503 200_1%_2
9 OF 20
*SKL_ULT
REV = 1
CLK_REQ/Strap Pin(CLG)
+3V
PCIE_CLKREQ_VGA# R1507 10K_5%_2
PCIE_CLKREQ_WLAN# R1508 10K_5%_2
PCIE_CLKREQ_LAN# R1511 10K_5%_2
PCIE_CLKREQ_CR# R1512 10K_5%_2
PCIE_CLKREQ_SSD# R1514 10K_5%_2
PCIE_CLKREQ5# R1515 10K_5%_2
+1.0V_DEEP_SUS
R1502 2.7K_5%_2
XCLK_BIASREF
R1501 *60.4/F_2
RTC Clock 32.768KHz
main:BG332768111零件高度0.75+/-10% mm
C1502 15p/50V_4
RTC_X1
Y1500 32.768KHZ/20ppm
R1521 10M_5%_2
C1505 15p/50V_4
RTC_X2
RTC Circuitry(RTC)
30mils
+BAT_RTC
RTC Power trace width 20mils.
+3VPCU
D1500 RB500V-40
C1506 1uF/6.3_2
R1517 20K/F_2
RTC_RST#
C1503 1uF/6.3_2
R1522 20K/F_2
SRTC_RST#
C1507 1uF/6.3_2
+3VPCU
C1508 0.1U/10V_2
RTC_RST# R1525 *0_6 SRTC_RST#
R1516 10K_5%_2
EC_RTC_RST 47
Q1500 2N7002K
RTC_RST#
External Crystal
The 24 MHz (50 Ohm ESR) XTAL used for Skylake-U needs to be replaced by 38.4 MHz (30 Ohm ESR) XTAL for Cannonlake-U.
XTAL24_IN R1518 *33.2_2
XTAL24_OUT R1520 *33.2_2
R1519 1M_5%_2
C1501 *27p/50V_4
Y1501 *24MHZ/20ppm
C1504 *27p/50V_4
Non-stuff on KBL R U42
stuff on KBL-U22
PROJECT : OP5A
Quanta Computer Inc.
NB5
Size Custom
Document Number 13 -- SKYLAKE 12/15 (CLK/EMMC)
Rev 1A
Date: Wednesday, April 03, 2019
Sheet 15 of 90

Skylake (GPIO)



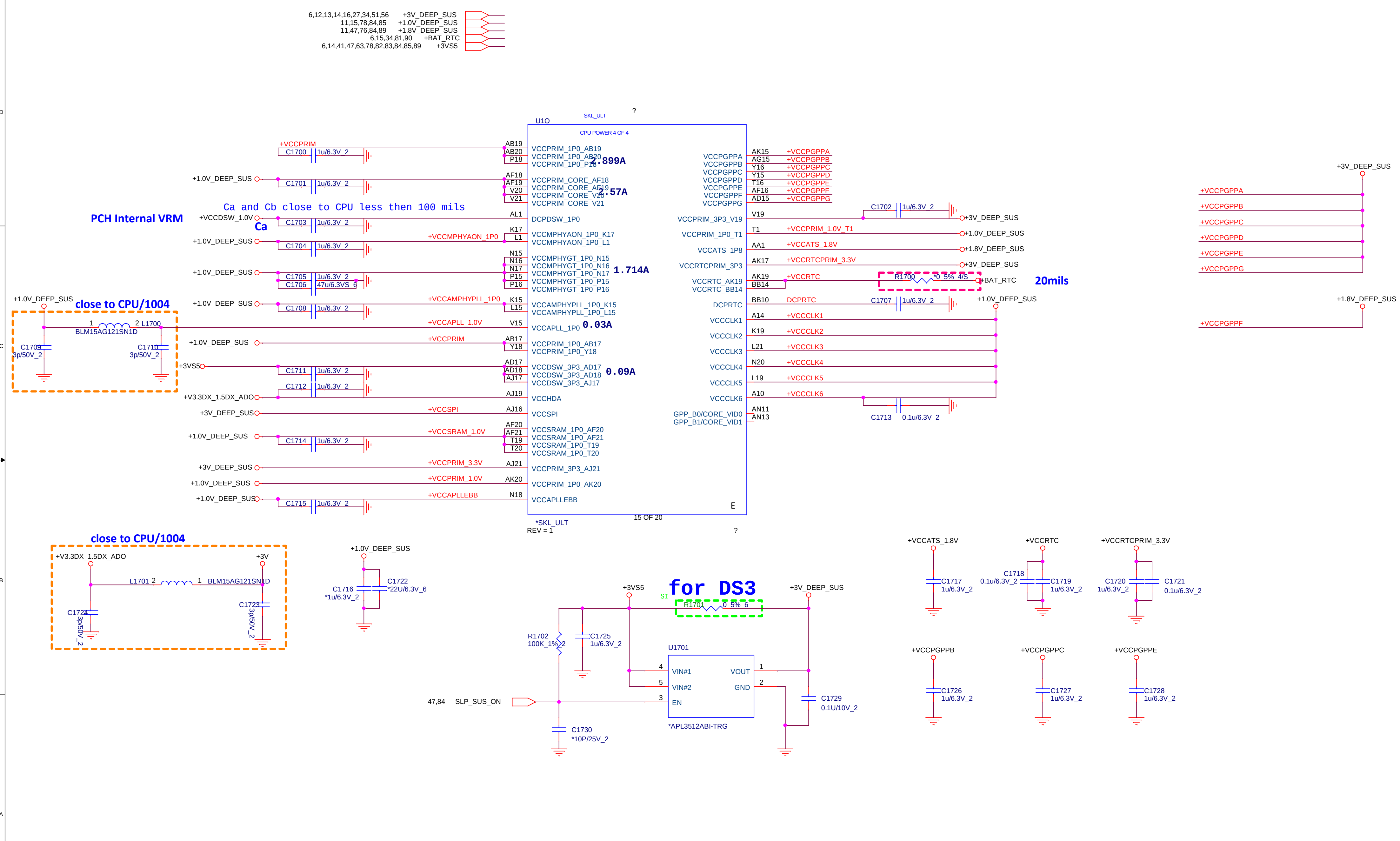
PROJECT : OP5A

Quanta Computer Inc.

NB5

Size	Document Number	Rev
Custom	14 -- SKYLAKE 13/15 (GPIO)	1A

Date: Wednesday, April 03, 2019 Sheet 16 of 90



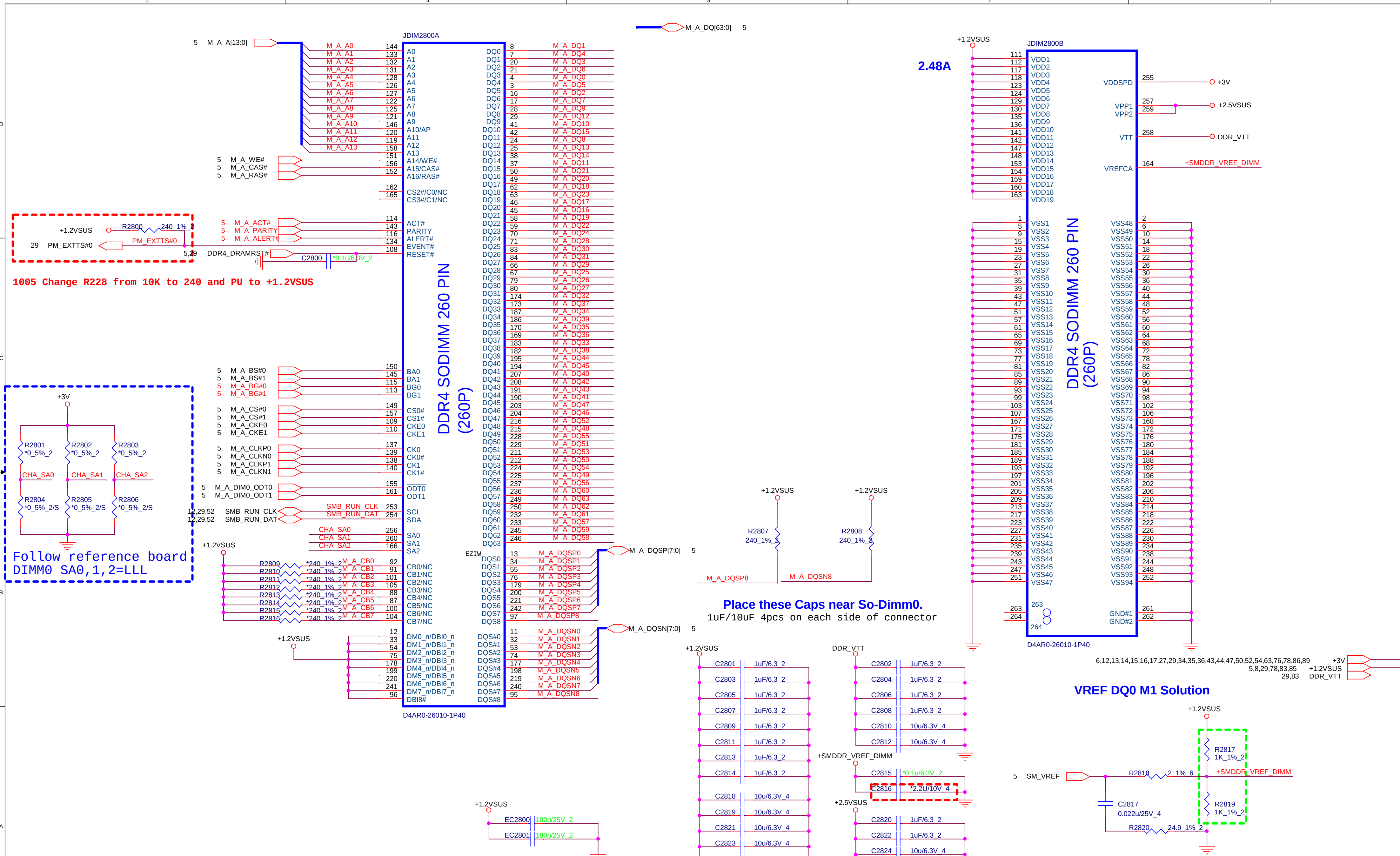
PROJECT : OP5A

Quanta Computer Inc.

NB5

Size	Document Number	Rev
Custom	**15 -- SKYLAKE 14/15(PCH POWER)**	1A

Date: Wednesday, April 03, 2019 Sheet 17 of 90



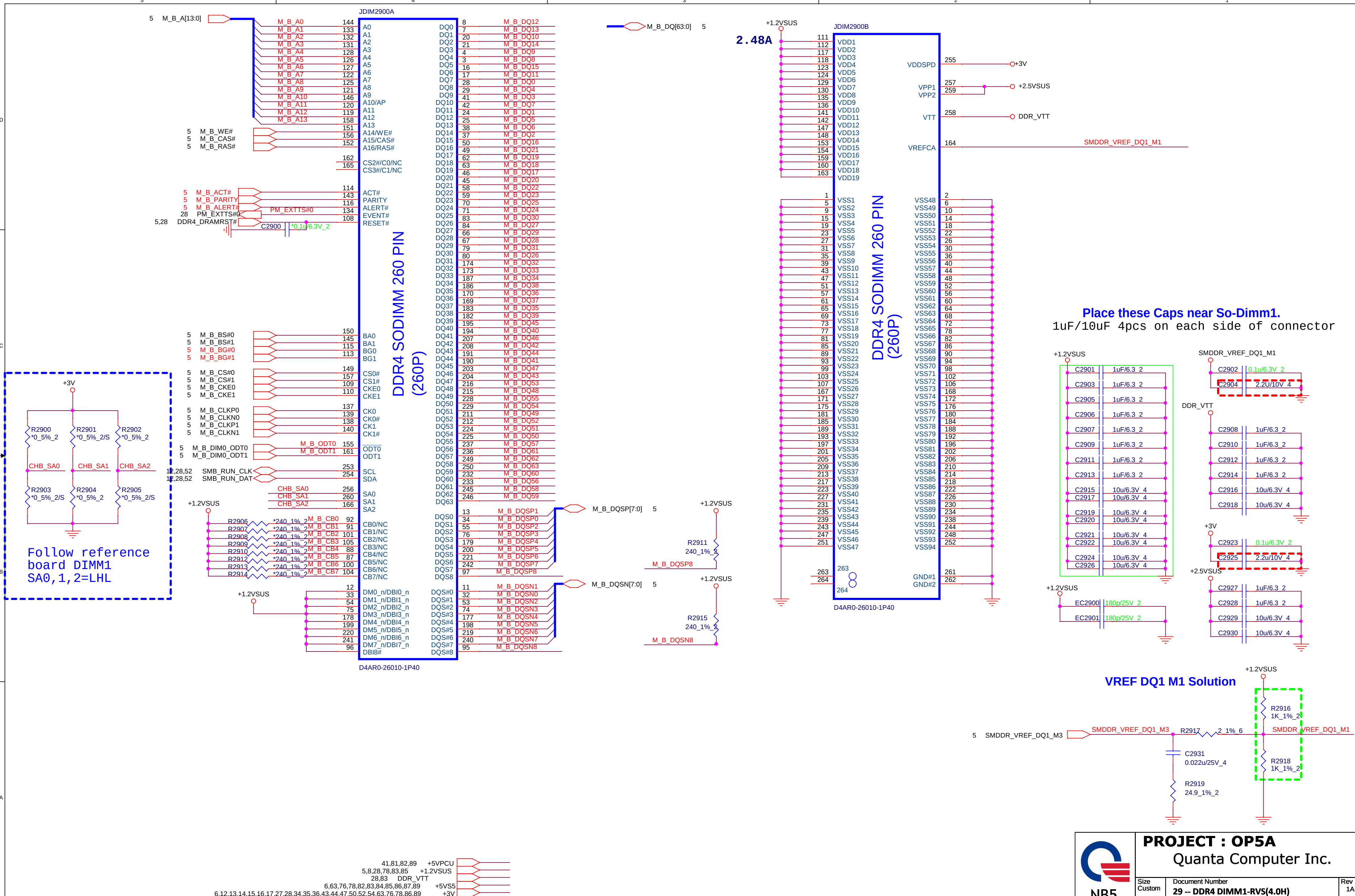
PROJECT : OP5A

Quanta Computer Inc.

NB5

Size	Document Number	Rev
Custom	28 -- DDR4 DIMM0-STD(4.0H)	1A

Date: Wednesday, April 03, 2019 Sheet 28 of 90



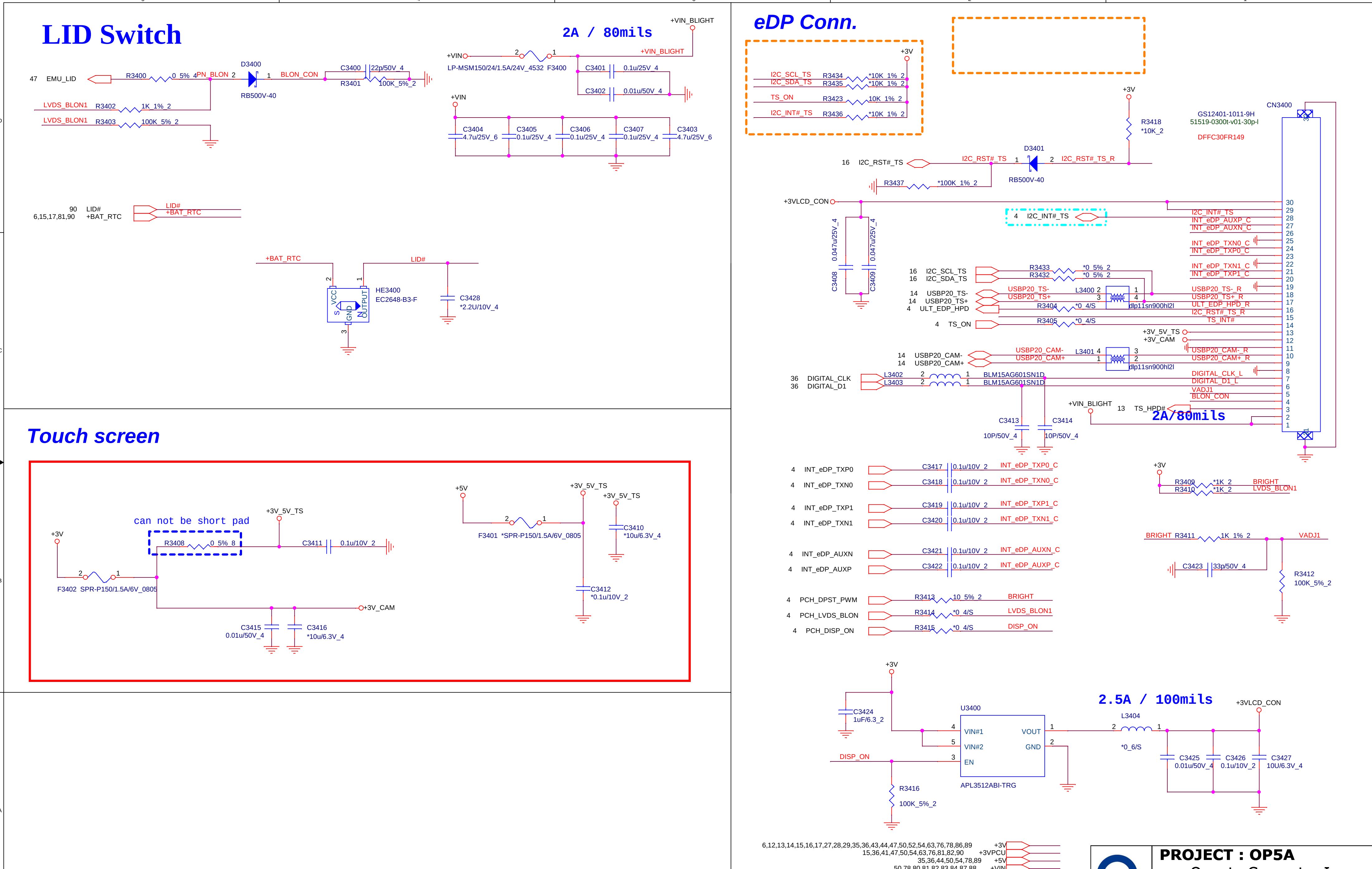
PROJECT : OP5A

Quanta Computer Inc.

NB5

Size	Document Number	Rev
Custom	29 -- DDR4 DIMM1-RVS(4.0H)	1A

Date: Wednesday, April 03, 2019 Sheet 29 of 90



PROJECT : OP5A

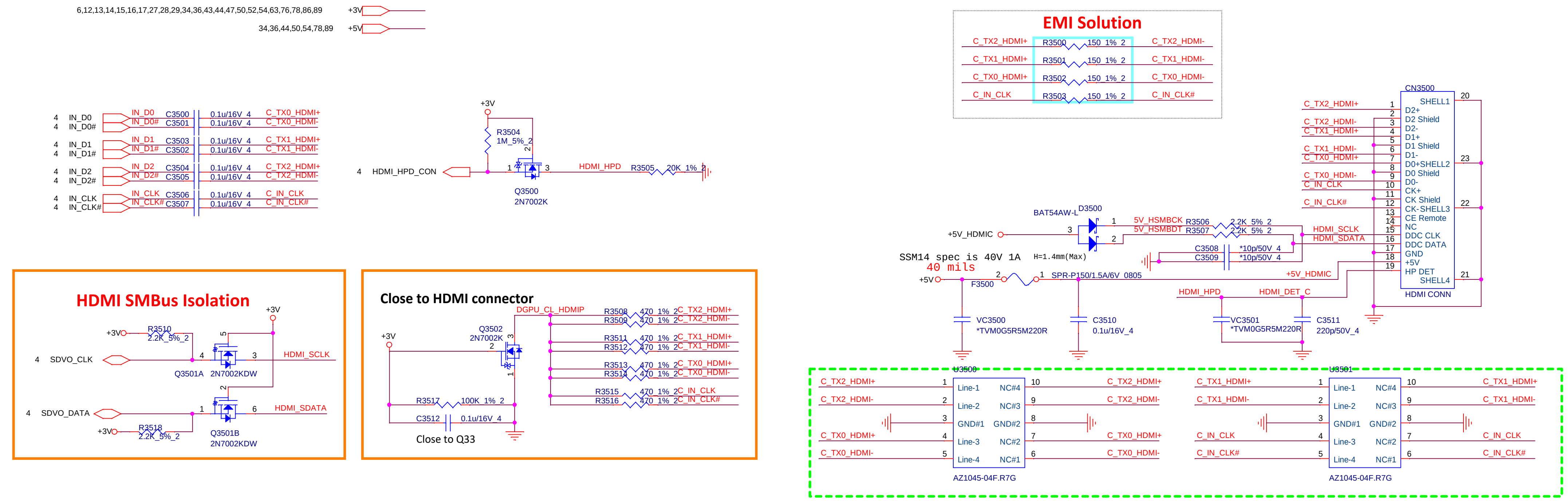
Quanta Computer Inc.

NB5

Size	Document Number	Rev
Custom	34 -- eDP CONN/LID/CAM/D-MIC/TS	1A

Date: Wednesday, April 03, 2019 Sheet 34 of 90

HDMI CONN



PROJECT : OP5A

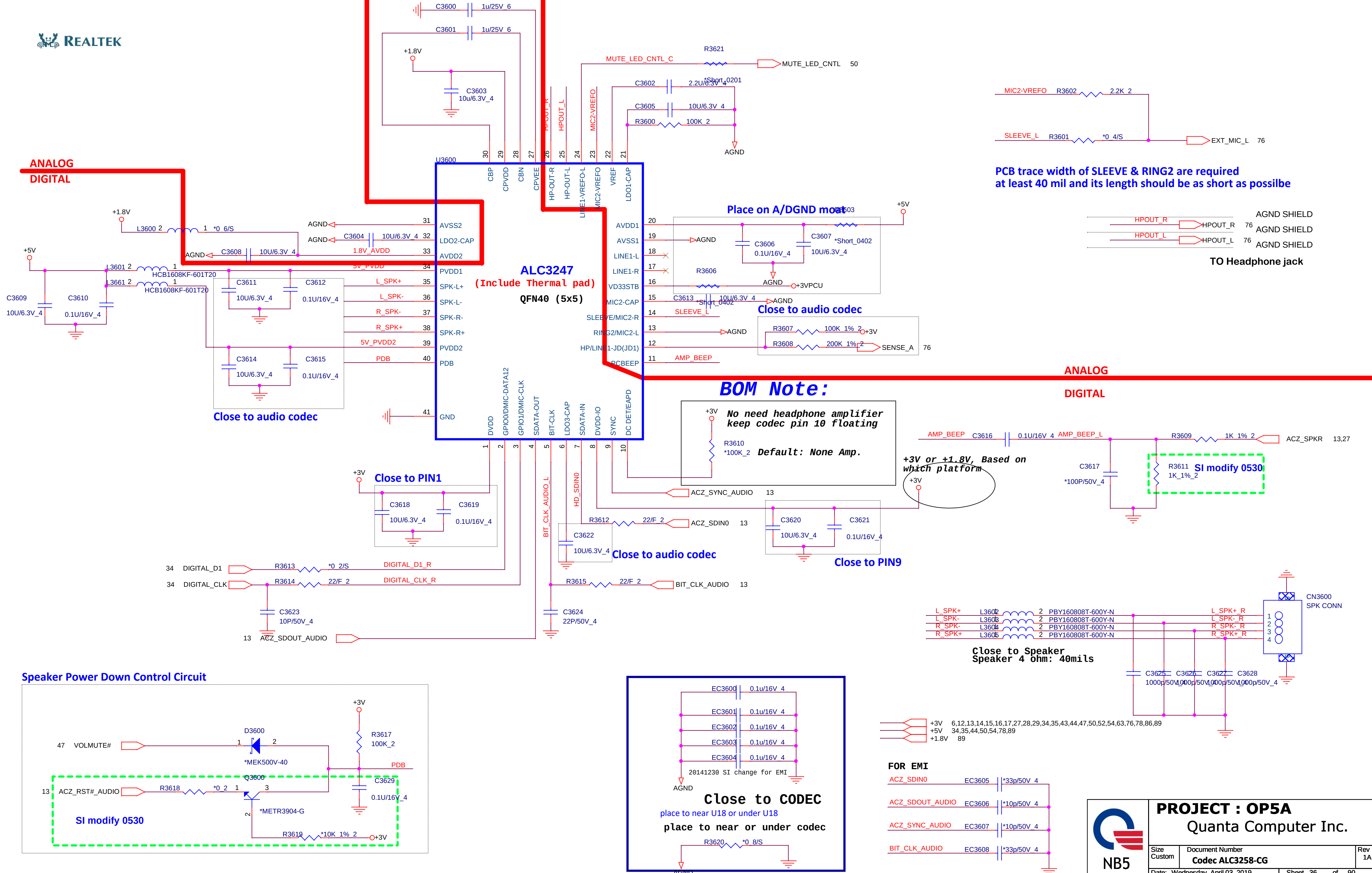
Quanta Computer Inc.

NB5

Size	Document Number	Rev
Custom	HDMI	1A

Date: Wednesday, April 03, 2019 Sheet 35 of 90

Audio Codec



NB5

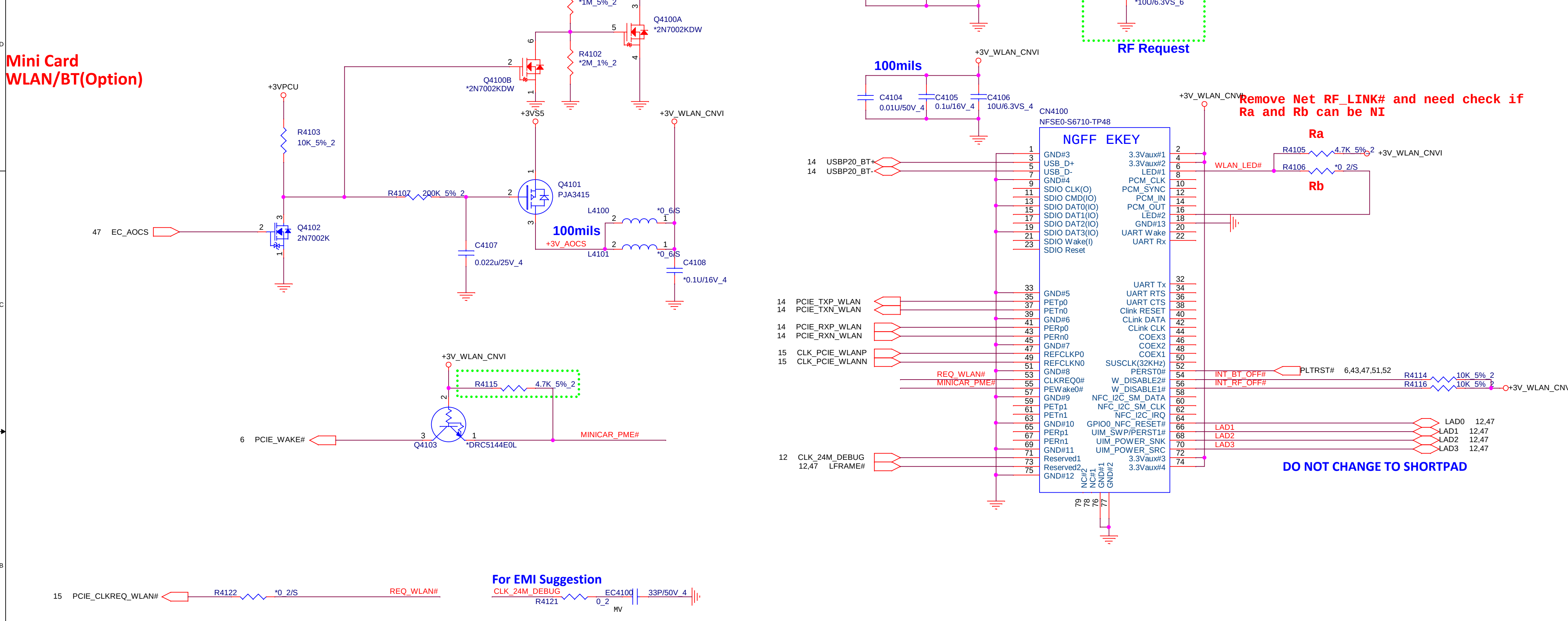
PROJECT : OP5A

Quanta Computer Inc.

Size	Document Number	Rev
Custom	Codec ALC3258-CG	1A

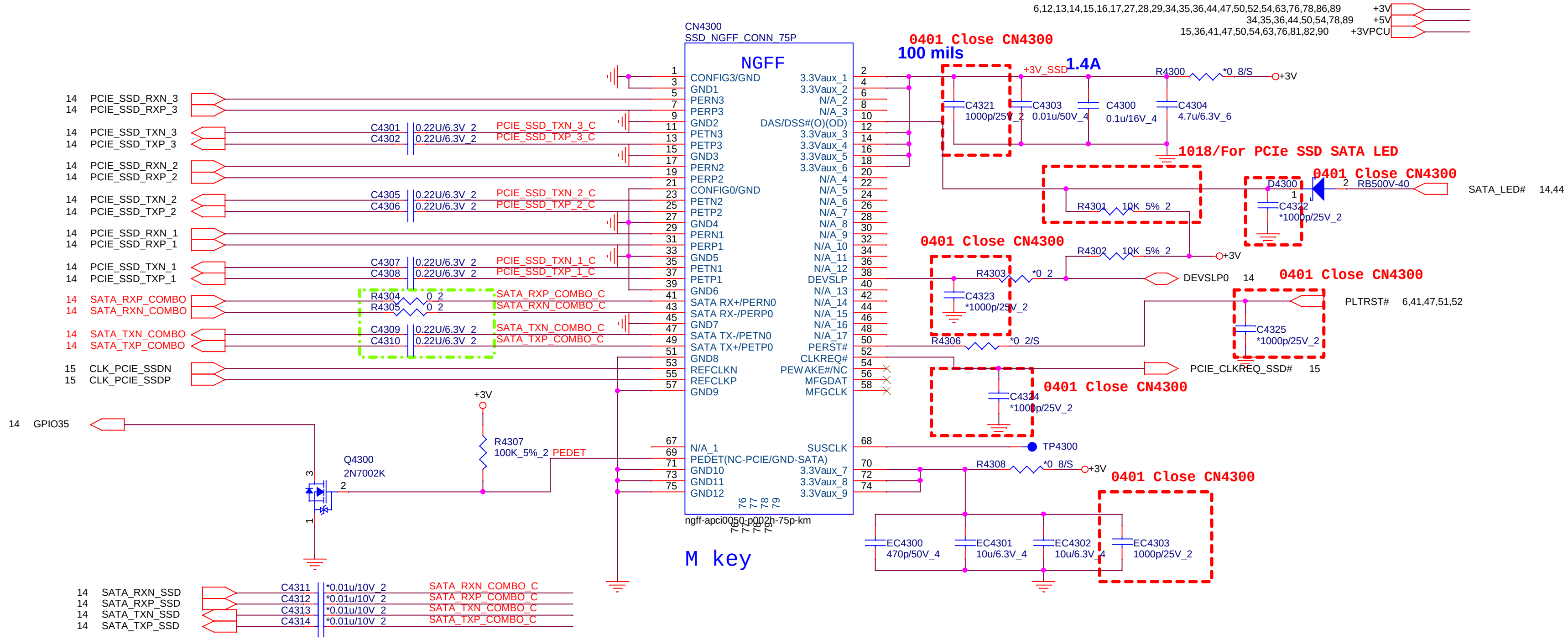
Date: Wednesday, April 03, 2019 Sheet 36 of 90

WLAN



NB5	PROJECT : OP5A	
	Quanta Computer Inc.	
Size: Custom	Document Number: WLAN(NGFF)	Rev: 1A
Date: Wednesday, April 03, 2019	Sheet 41 of 90	

SATA SSD



PROJECT : OP5A

Quanta Computer Inc.

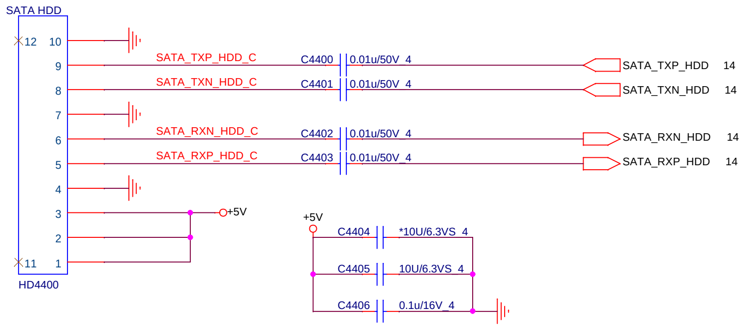
NB5

Size	Document Number	Rev
Custom	SSD(NGFF)	1A

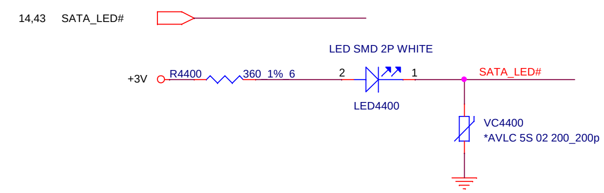
Date: Wednesday, April 03, 2019 Sheet 43 of 90

6,12,13,14,15,16,17,27,28,29,34,35,36,43,47,50,52,54,63,76,78,86,89 +3V

SATA HDD & LED



SATA LED

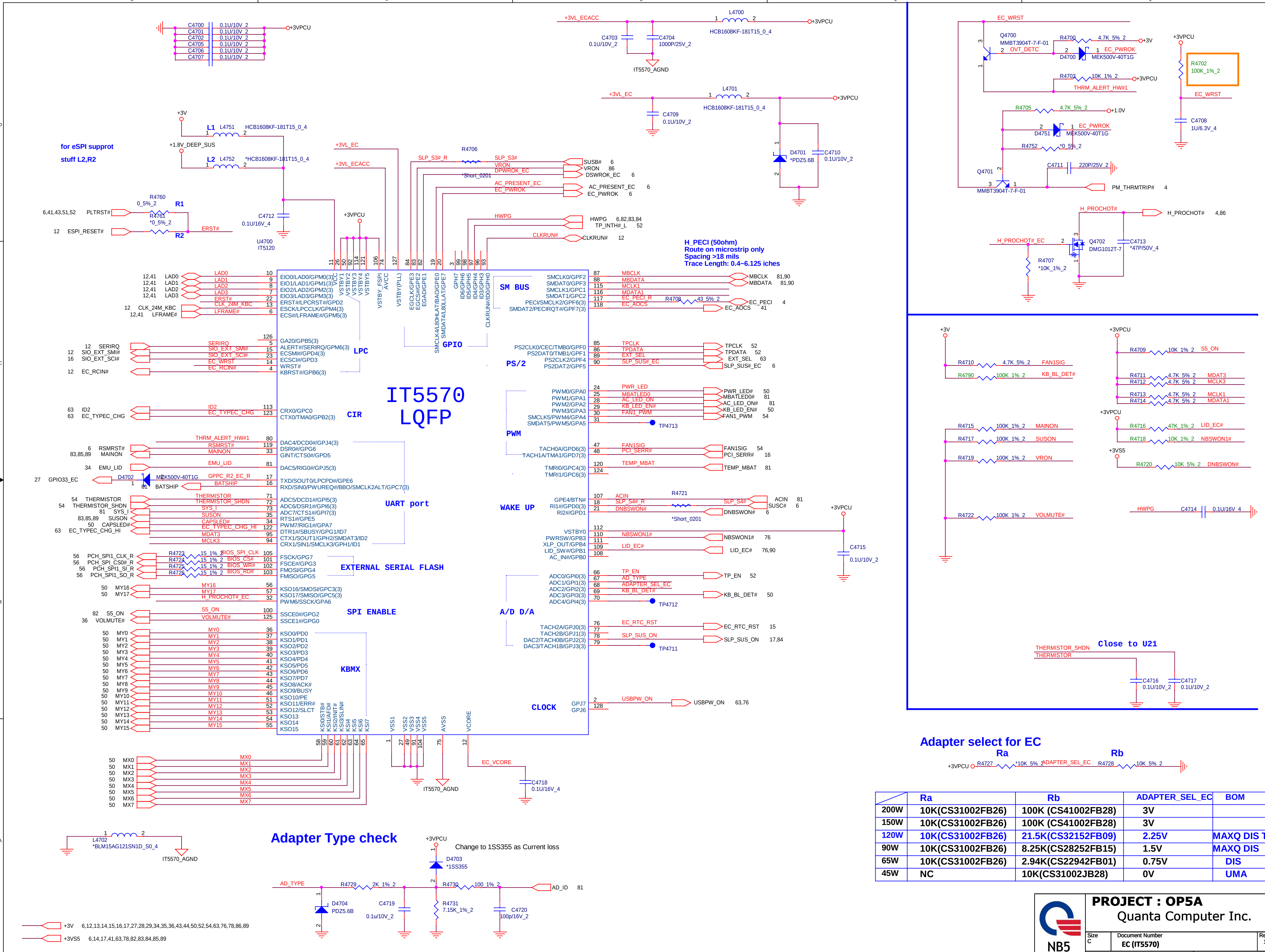


PROJECT : OP5A
Quanta Computer Inc.

NB5

Size	Document Number	Rev
Custom	HDD/ODD	1A

Date: Wednesday, April 03, 2019 Sheet 44 of 90



	Ra	Rb	ADAPTER_SEL_EC	BOM
200W	10K(CS31002FB26)	100K (CS41002FB28)	3V	
150W	10K(CS31002FB26)	100K (CS41002FB28)	3V	
120W	10K(CS31002FB26)	21.5K(CS32152FB09)	2.25V	MAXQ DIS TI
90W	10K(CS31002FB26)	8.25K(CS28252FB15)	1.5V	MAXQ DIS
65W	10K(CS31002FB26)	2.94K(CS22942FB01)	0.75V	DIS
45W	NC	10K(CS31002JB28)	0V	UMA

PROJECT : OP5A

Quanta Computer Inc.

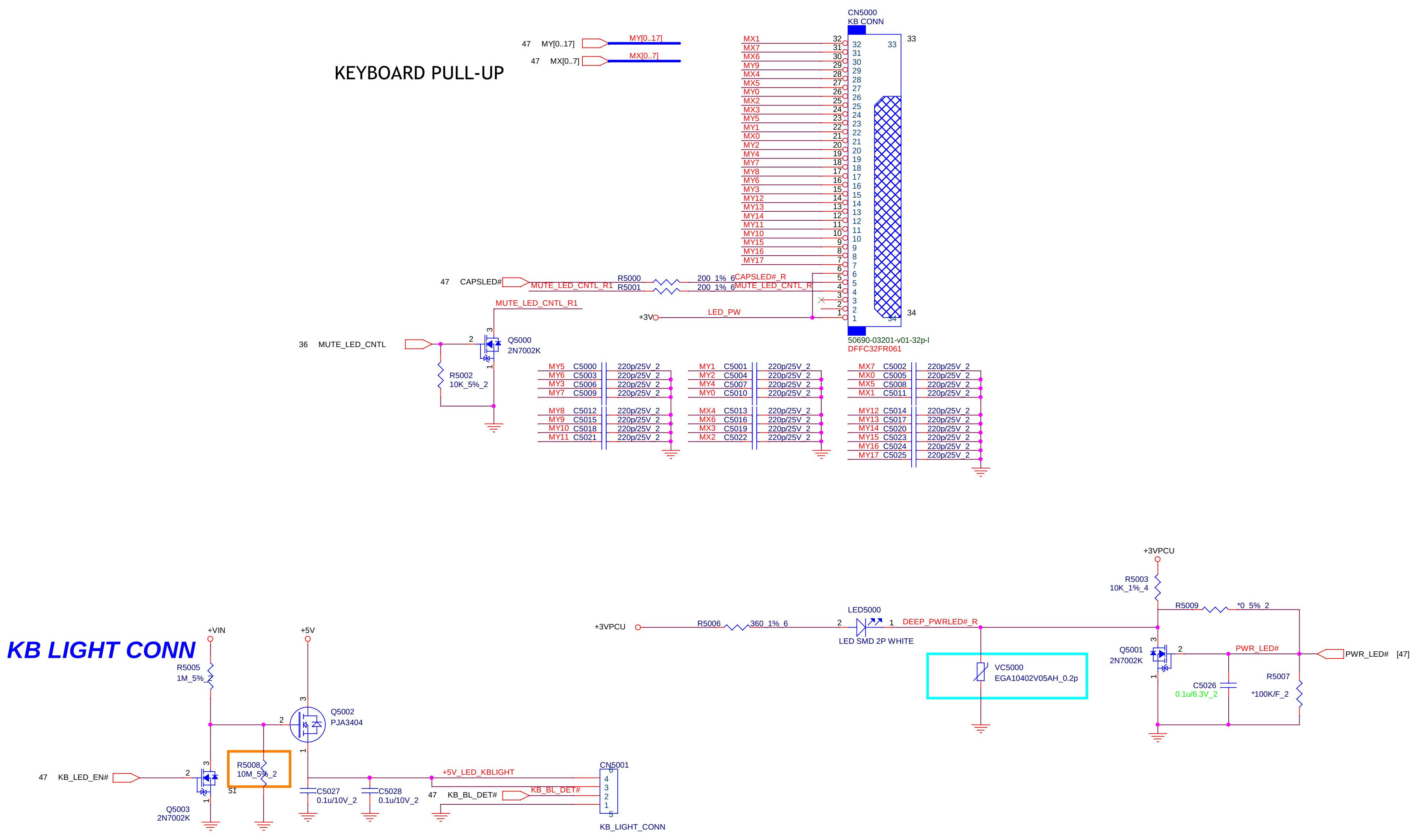
NB5

Size: C | Document Number: EC (IT5570) | Rev: 1A

Date: Wednesday, April 03, 2019 | Sheet 47 of 90

KEYBOARD Con.

KEYBOARD PULL-UP



6,14,17,41,47,63,78,82,83,84,85,89 +3VS5
6,12,13,14,15,16,17,27,28,29,34,35,36,43,44,47,52,54,63,76,78,86,89 +3V
6,63,76,78,82,83,84,85,86,87,89 +5VS5
63,64 +TYPEC_VBUS

NB5

PROJECT : OP5A

Quanta Computer Inc.

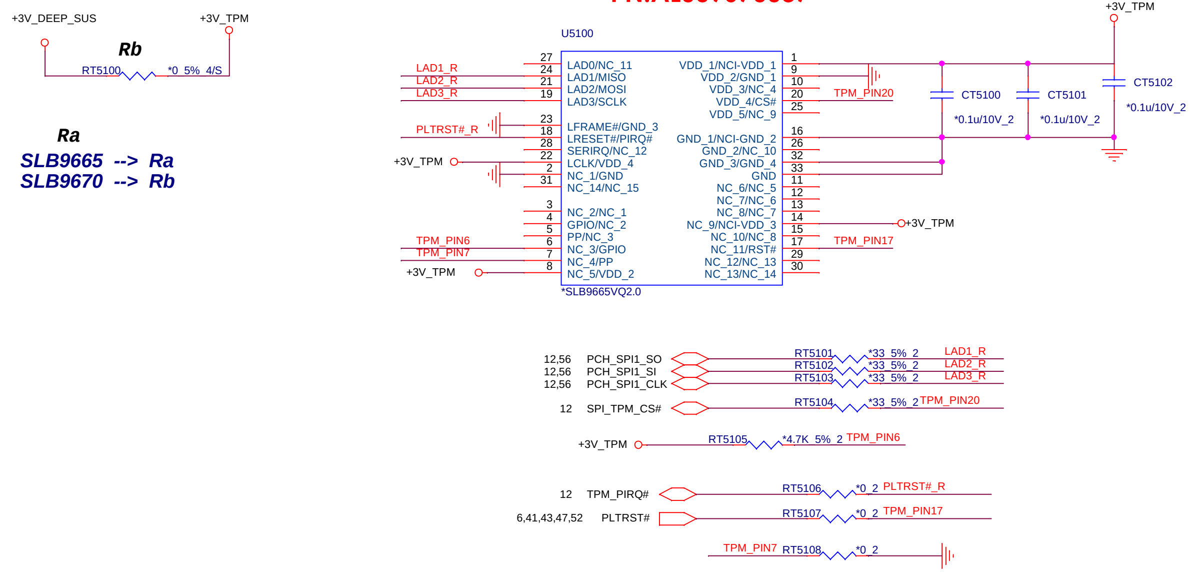
Size	Document Number	Rev
Custom	KB/KB LIGHT	1A

Date: Wednesday, April 03, 2019 Sheet 50 of 90

TPM

TPM (2.0)

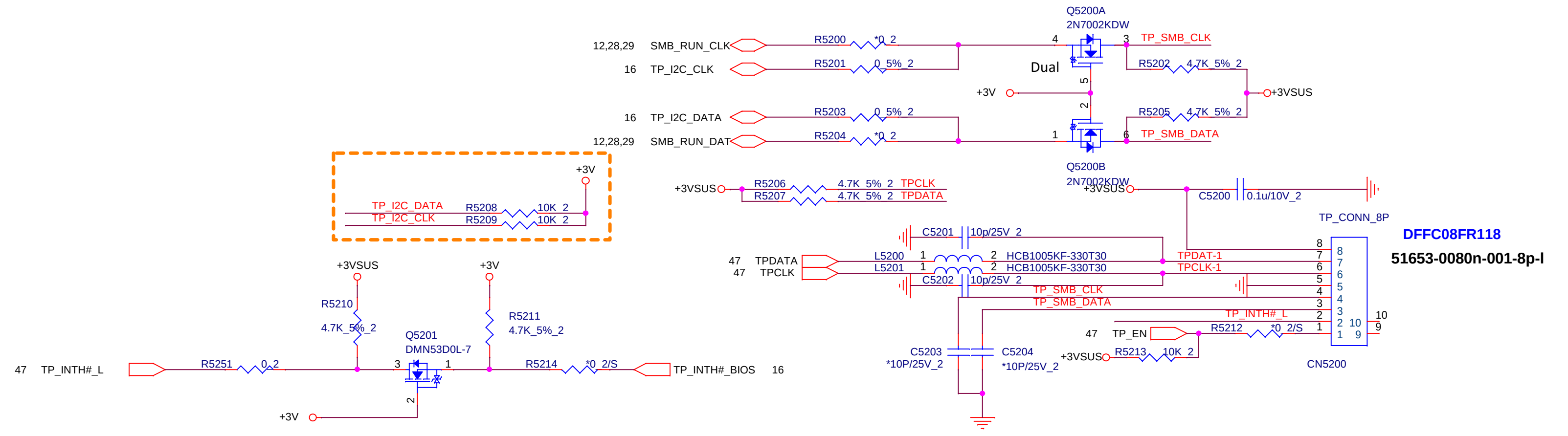
FW 7.83 **PN:AL009670037**



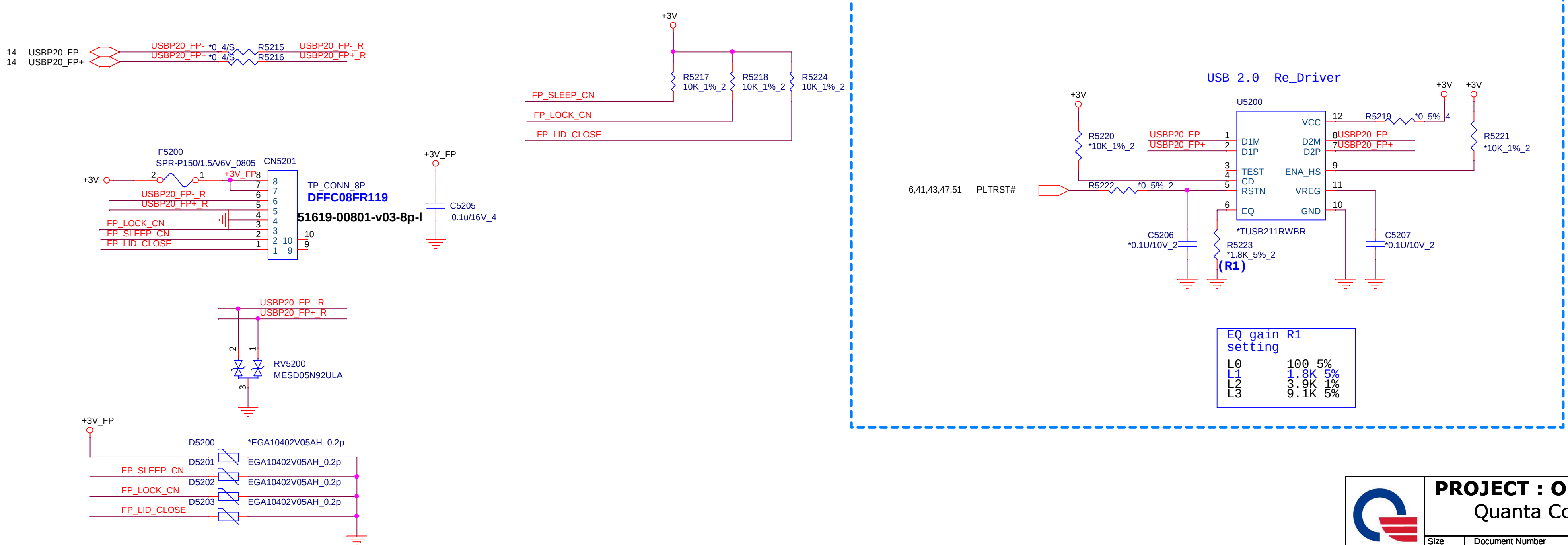
For 9670 stuff

NB5	**PROJECT : OP5A**	Quanta Computer Inc.
Size	Document Number: **TPM**	Rev 1A
Date: Wednesday, April 03, 2019	Sheet 61	of 90

Touch Pad



Finger print



EQ gain R1 setting

L0	100 5%
L1	1.8K 5%
L2	3.9K 1%
L3	9.1K 5%

PROJECT : OP5A

Quanta Computer Inc.

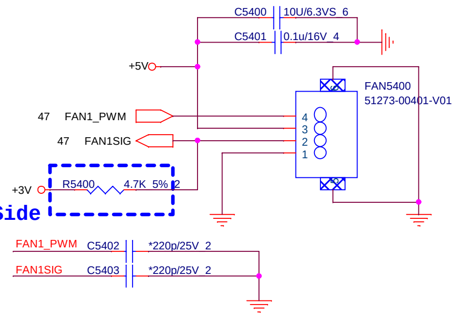
NB5

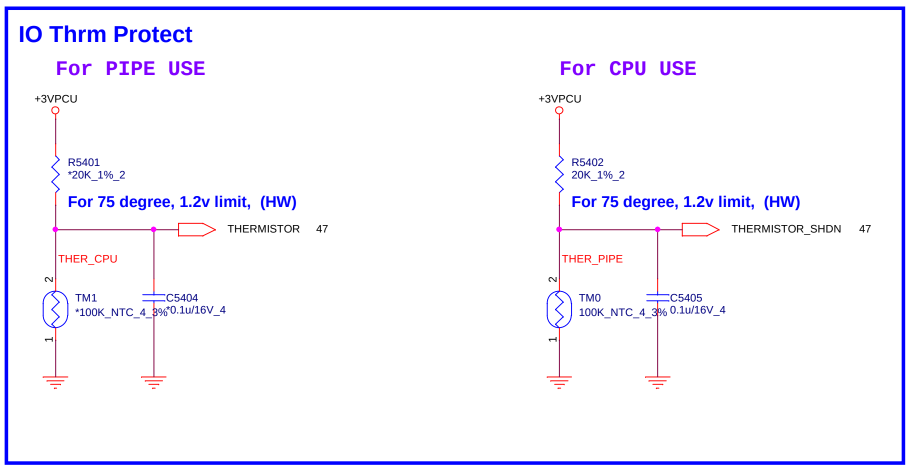
Size	Document Number	Rev
Custom	Touch pad/Finger Print	1A

Date: Wednesday, April 03, 2019 Sheet 52 of 90

FAN/Thermal

FAN





PROJECT : OP5A
Quanta Computer Inc.

NB5

Size	Document Number	Rev
	FAN/Thermal	1A

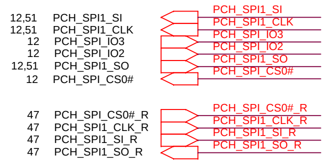
Date: Wednesday, April 03, 2019 Sheet 54 of 90

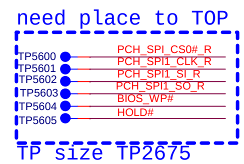
FLASH ROM

GLK / KBL :

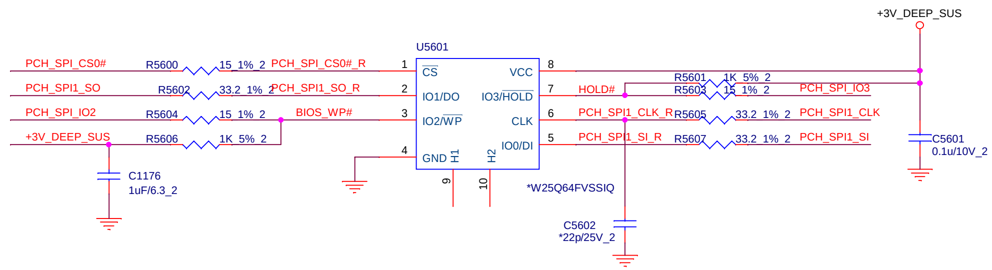
Vendor	Size	SO8	
		Vendor PN	QCI PN
GigaDevice	8M	GD25B64CSIGR	AKE2EZN0Q00
Winbond	8M	W25Q64JVSSIQ	AKE3EFP0N07
XMC	8M	XM25QH64AHIGT	AKE3EZP0X00

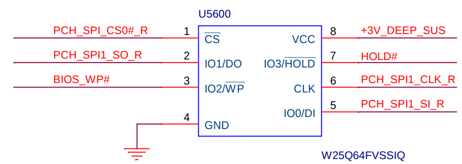
P/N DG008000011 (Socket)

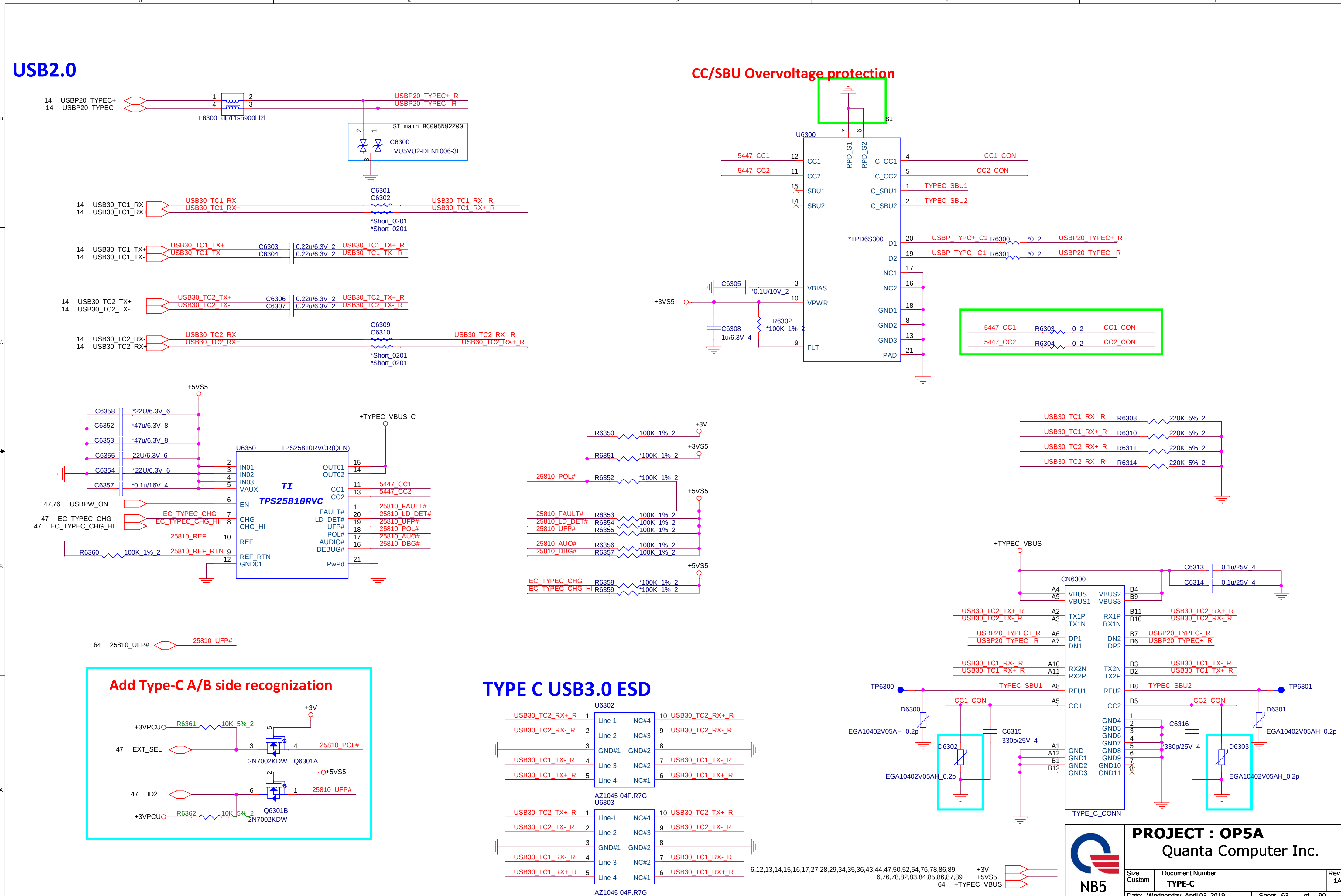


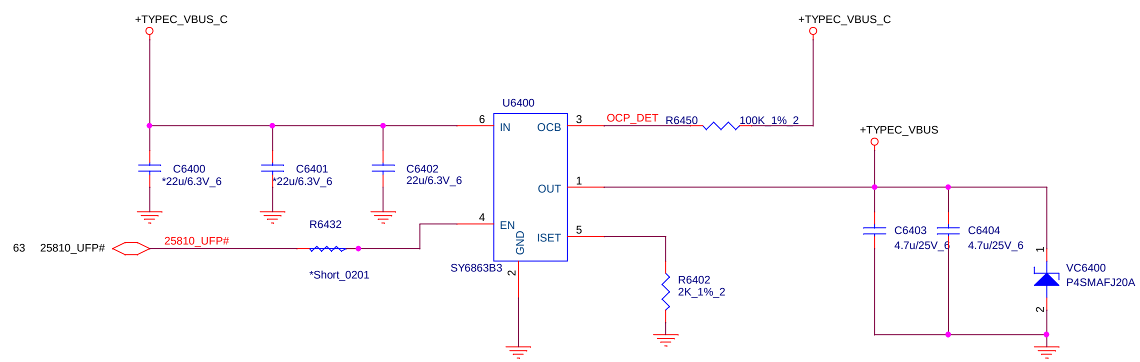


PCH SPI ROM(CLG)






USB2.0
14 USBP20_TYPEC+
14 USBP20_TYPEC-
L6300 dlp11sn900hl2l
USBP20_TYPEC+_R
USBP20_TYPEC-_R
SI main BC005N92Z00
C6300
TVU5VU2-DFN1006-3L
14 USB30_TC1_RX-
14 USB30_TC1_RX+
USB30_TC1_RX-
USB30_TC1_RX+
C6301
C6302
*Short_0201
*Short_0201
USB30_TC1_RX-_R
USB30_TC1_RX+_R
14 USB30_TC1_TX+
14 USB30_TC1_TX-
USB30_TC1_TX+
USB30_TC1_TX-
C6303
C6304
0.22u/6.3V_2
0.22u/6.3V_2
USB30_TC1_TX+_R
USB30_TC1_TX-_R
14 USB30_TC2_TX+
14 USB30_TC2_TX-
USB30_TC2_TX+
USB30_TC2_TX-
C6306
C6307
USB30_TC2_TX+_R
USB30_TC2_TX-_R
14 USB30_TC2_RX-
14 USB30_TC2_RX+
USB30_TC2_RX-
USB30_TC2_RX+
C6309
C6310
USB30_TC2_RX-_R
USB30_TC2_RX+_R
CC/SBU Overvoltage protection
SI
U6300
RPD_G1
RPD_G2
5447_CC1 12 CC1
5447_CC2 11 CC2
15 SBU1
14 SBU2
C_CC1 4 CC1_CON
C_CC2 5 CC2_CON
C_SBU1 1 TYPEC_SBU1
C_SBU2 2 TYPEC_SBU2
*TPD6S300
D1 20 USBP_TYPC+_C1 R6300 *0_2 USBP20_TYPEC+_R
D2 19 USBP_TYPC-_C1 R6301 *0_2 USBP20_TYPEC-_R
NC1 17
NC2 16
GND1 18
GND2 8
GND3 13
PAD 21
C6305 *0.1U/10V_2 3 VBIAS
+3VS5 10 VPWR
C6308 1u/6.3V_4
R6302 *100K_1%_2
9 FLT
5447_CC1 R6303 0_2 CC1_CON
5447_CC2 R6304 0_2 CC2_CON
+5VS5
C6358 *22U/6.3V_6
C6352 *47u/6.3V_8
C6353 *47u/6.3V_8
C6355 22U/6.3V_6
C6354 *22U/6.3V_6
C6357 *0.1u/16V_4
+TYPEC_VBUS_C
U6350 TPS25810RVCR(QFN)
TI
TPS25810RVC
IN01 IN02 IN03 VAUX
OUT01 OUT02
CC1 CC2
5447_CC1
5447_CC2
47,76 USBPW_ON 6 EN
47 EC_TYPEC_CHG 7 CHG
47 EC_TYPEC_CHG_HI 8 CHG_HI
25810_REF 10 REF
R6360 100K_1%_2 25810_REF_RTN 9 REF_RTN
12 GND01
FAULT# LD_DET# UFP# POL# AUDIO# DEBUG#
25810_FAULT#
25810_LD_DET#
25810_UFP#
25810_POL#
25810_AUO#
25810_DBG#
PwPd 21
R6350 100K_1%_2 +3V
R6351 *100K_1%_2 +3VS5
25810_POL# R6352 *100K_1%_2
+5VS5
25810_FAULT# R6353 100K_1%_2
25810_LD_DET# R6354 100K_1%_2
25810_UFP# R6355 100K_1%_2
25810_AUO# R6356 100K_1%_2
25810_DBG# R6357 100K_1%_2
EC_TYPEC_CHG R6358 *100K_1%_2
EC_TYPEC_CHG_HI R6359 *100K_1%_2
USB30_TC1_RX-_R R6308 220K_5%_2
USB30_TC1_RX+_R R6310 220K_5%_2
USB30_TC2_RX+_R R6311 220K_5%_2
USB30_TC2_RX-_R R6314 220K_5%_2
64 25810_UFP# 25810_UFP#
Add Type-C A/B side recognization
+3V
+3VPCU R6361 10K_5%_2
47 EXT_SEL
2N7002KDW Q6301A
25810_POL#
+5VS5
47 ID2
Q6301B 2N7002KDW
25810_UFP#
+3VPCU R6362 10K_5%_2
TYPE C USB3.0 ESD
U6302
Line-1 Line-2 GND#1 Line-3 Line-4
NC#4 NC#3 GND#2 NC#2 NC#1
USB30_TC2_RX+_R
USB30_TC2_RX-_R
USB30_TC1_TX-_R
USB30_TC1_TX+_R
AZ1045-04F.R7G
U6303
USB30_TC2_TX+_R
USB30_TC2_TX-_R
USB30_TC1_RX-_R
USB30_TC1_RX+_R
AZ1045-04F.R7G
+TYPEC_VBUS
C6313 0.1u/25V_4
C6314 0.1u/25V_4
CN6300
VBUS VBUS1 VBUS2 VBUS3
TX1P TX1N RX1P RX1N
DP1 DN1 DN2 DP2
RX2N RX2P TX2N TX2P
RFU1 RFU2
CC1 CC2
GND GND1 GND2 GND3
GND4 GND5 GND6 GND7 GND8 GND9 GND10 GND11
TYPE_C_CONN
USB30_TC2_TX+_R
USB30_TC2_TX-_R
USBP20_TYPEC+_R
USBP20_TYPEC-_R
USB30_TC1_RX-_R
USB30_TC1_RX+_R
USB30_TC2_RX+_R
USB30_TC2_RX-_R
USBP20_TYPEC-_R
USBP20_TYPEC+_R
USB30_TC1_TX-_R
USB30_TC1_TX+_R
TP6300 TYPEC_SBU1
TYPEC_SBU2 TP6301
CC1_CON CC2_CON
D6300 EGA10402V05AH_0.2p
C6315 330p/25V_4
D6302 EGA10402V05AH_0.2p
C6316 330p/25V_4
D6301 EGA10402V05AH_0.2p
D6303 EGA10402V05AH_0.2p
6,12,13,14,15,16,17,27,28,29,34,35,36,43,44,47,50,52,54,76,78,86,89 +3V
6,76,78,82,83,84,85,86,87,89 +5VS5
64 +TYPEC_VBUS
PROJECT : OP5A
Quanta Computer Inc.
NB5
Size Custom
Document Number TYPE-C
Rev 1A
Date: Wednesday, April 03, 2019
Sheet 63 of 90



PROJECT : OP5A

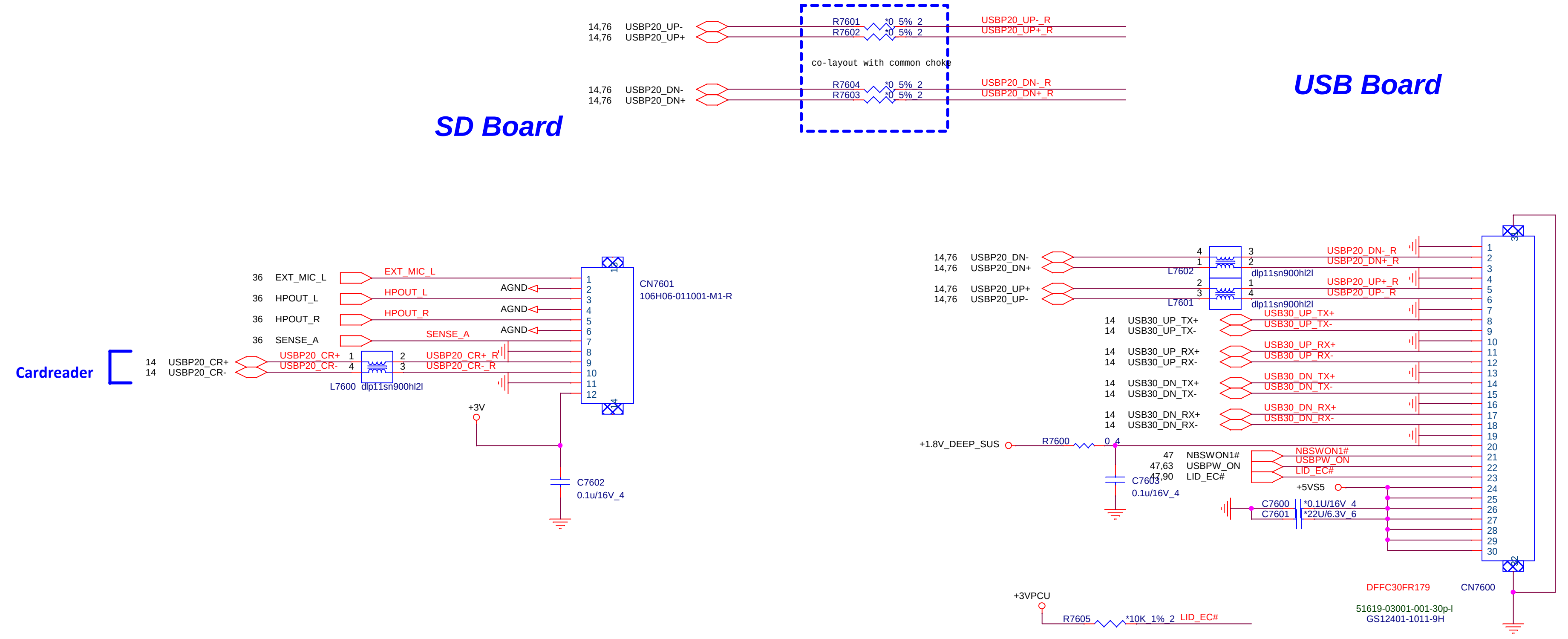
Quanta Computer Inc.

NB5

Size	Document Number	Rev
	TYPE-C Load Switch	1A

Date: Wednesday, April 03, 2019 Sheet 64 of 90

Daughter Board



PROJECT : OP5A

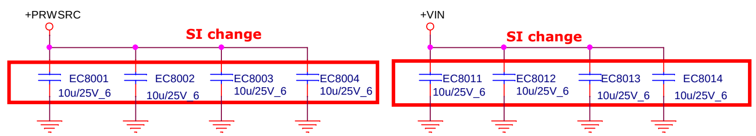
Quanta Computer Inc.

NB5

Size	Document Number	Rev
	I2C Path	1A

Date: Wednesday, April 03, 2019 Sheet 76 of 90

Reserve for EMI function test

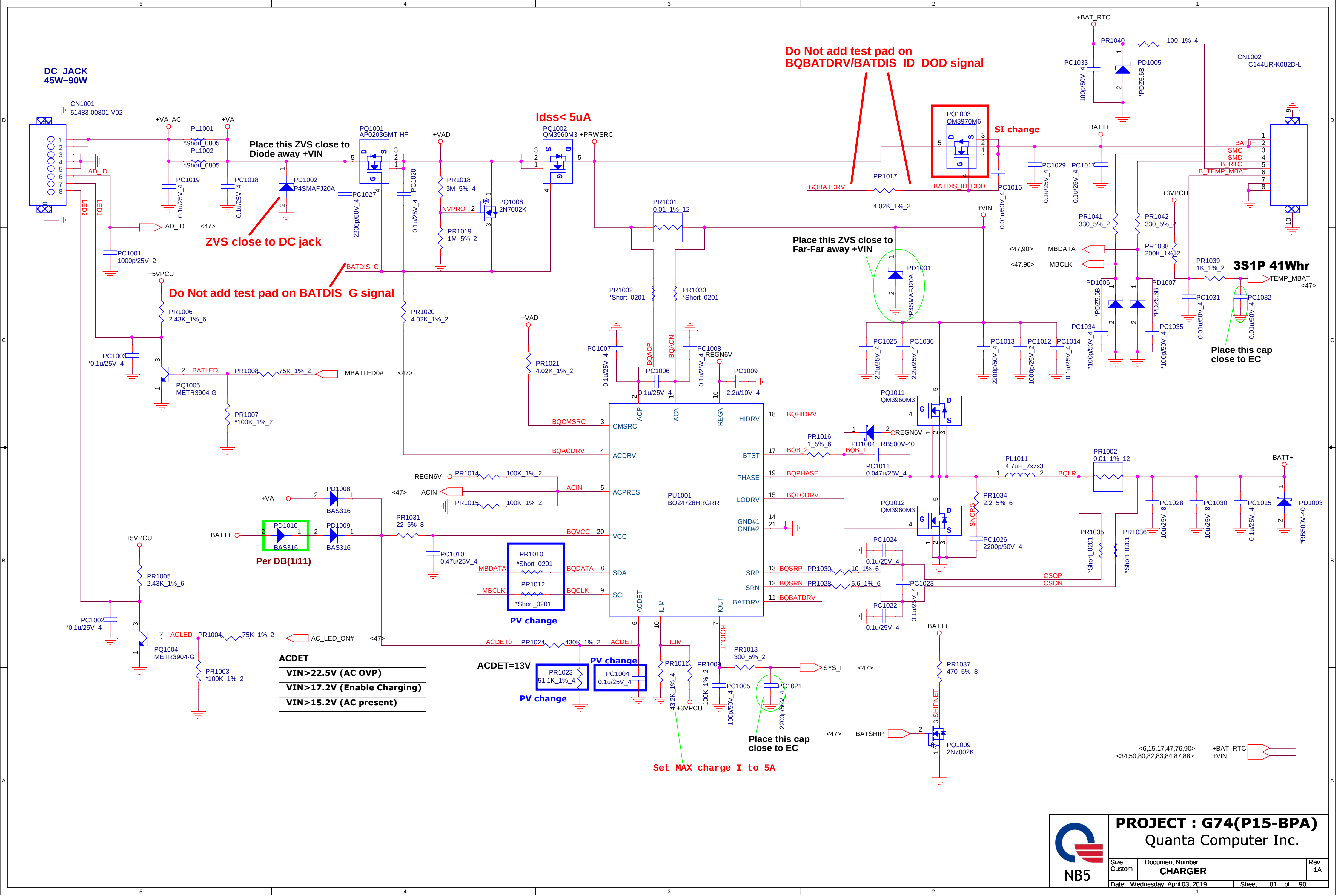


NB5

PROJECT : G7E
Quanta Computer Inc.

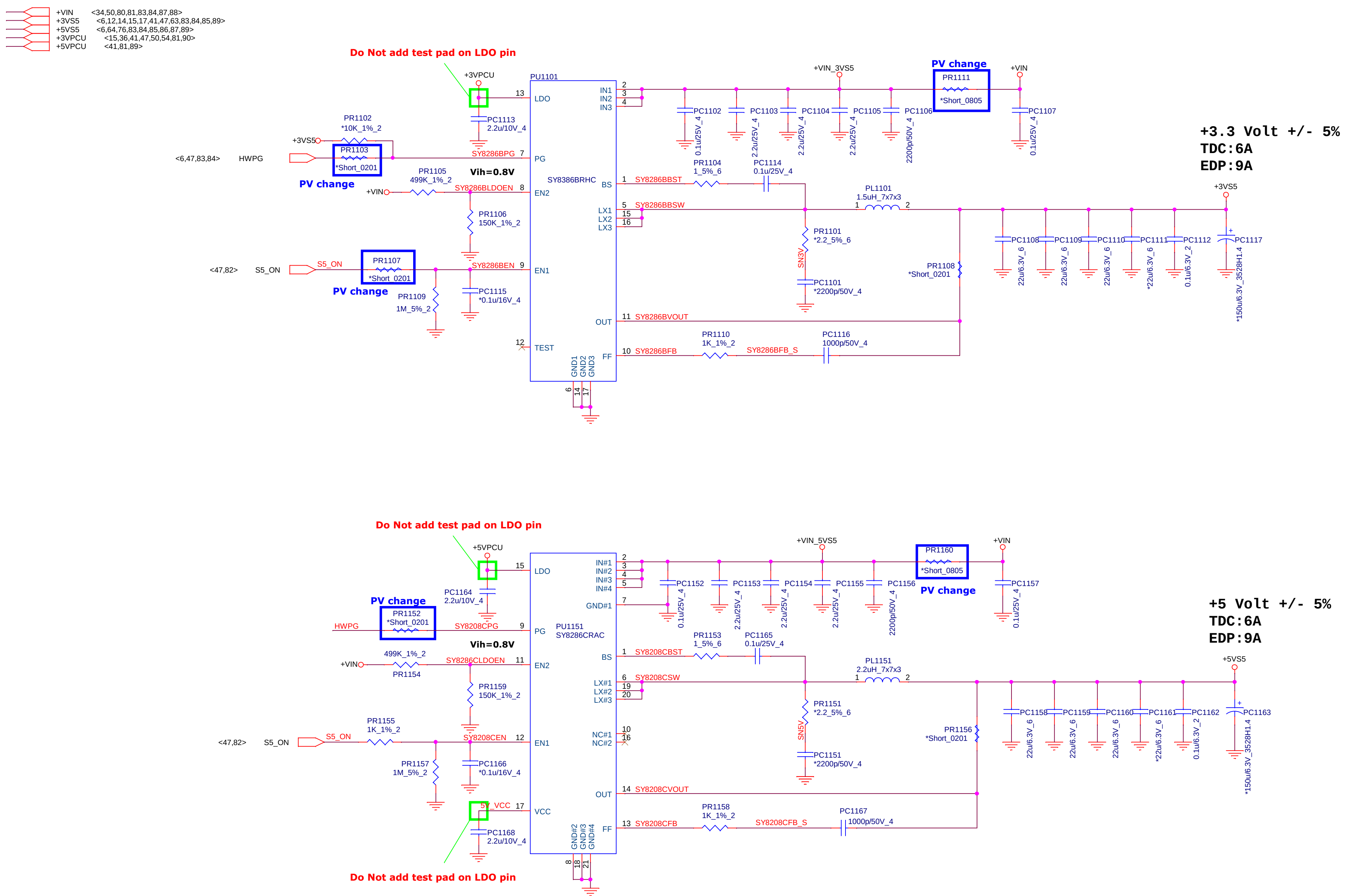
Size	Document Number	Rev
Custom	**EMI FOR POWER RESERVE**	1A

Date: Wednesday, April 03, 2019 Sheet 80 of 90



DC_JACK
45W~90W
CN1001
51483-00801-V02
Place this ZVS close to
Diode away +VIN
ZVS close to DC jack
Do Not add test pad on BATDIS_G signal
Idss< 5uA
Do Not add test pad on
BQBATDRV/BATDIS_ID_DOD signal
SI change
PQ1003
QM3970M6
CN1002
C144UR-K082D-L
3S1P 41Whr
Place this ZVS close to
Far-Far away +VIN
Place this cap
close to EC
PU1001
BQ24728HRGRR
Per DB(1/11)
PV change
ACDET
VIN>22.5V (AC OVP)
VIN>17.2V (Enable Charging)
VIN>15.2V (AC present)
ACDET=13V
Set MAX charge I to 5A
PROJECT : G74(P15-BPA)
Quanta Computer Inc.
NB5
CHARGER
Rev 1A
Date: Wednesday, April 03, 2019
Sheet 81 of 90

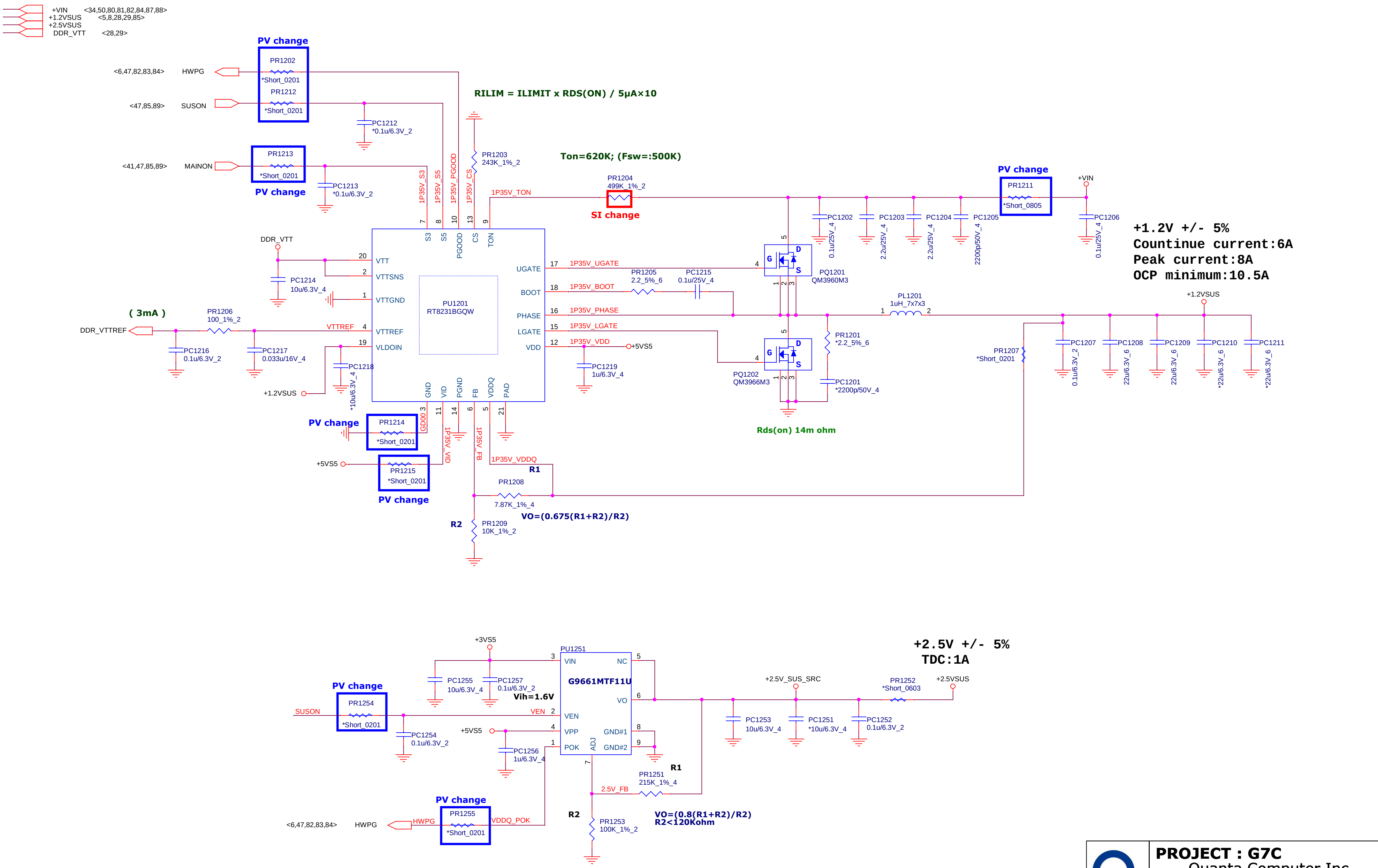
DC/DC +3VS5/+5VS5



PROJECT : G7C
Quanta Computer Inc.
BU5

Size	Document Number	Rev
Custom	+3/5VS5(SY8286B/SY8286C)	1A

Date: Wednesday, April 03, 2019 Sheet 82 of 90

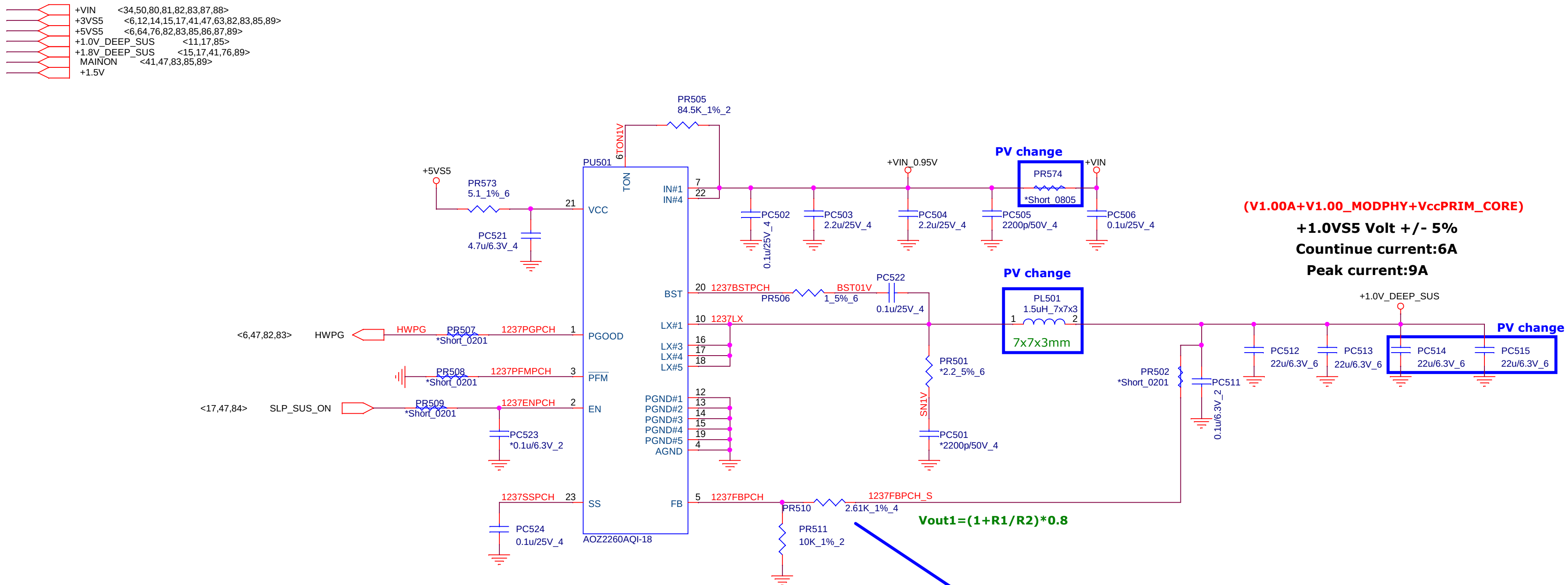


PROJECT : G7C
Quanta Computer Inc.

BU5

Size	Document Number	Rev
Custom	DDR/2.5VSUS(RT8231B)	1A

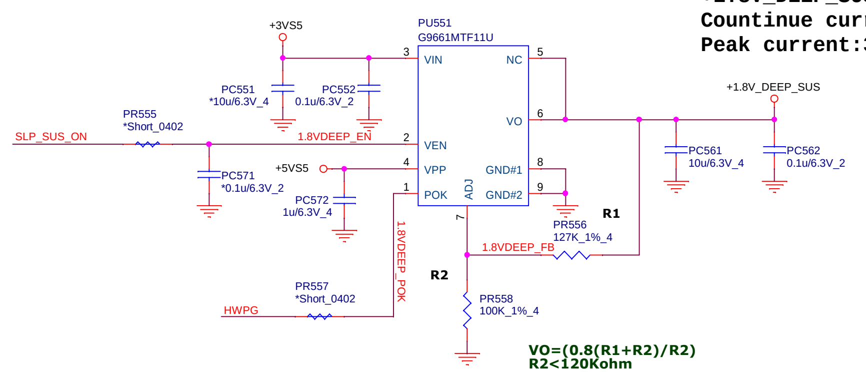
Date: Wednesday, April 03, 2019 Sheet 83 of 90



Vo	Rton
0.95V	82k
1V	84.5k
1.05V	95.3k
1.35V	113k
1.5V	127k

	1.91K	CS21912FB13	0.95V
SKL/KBL	2.61K	CS22612FB15	1V
CNL/CFL/WHL	3.16K	CS23162FB04	1.05V

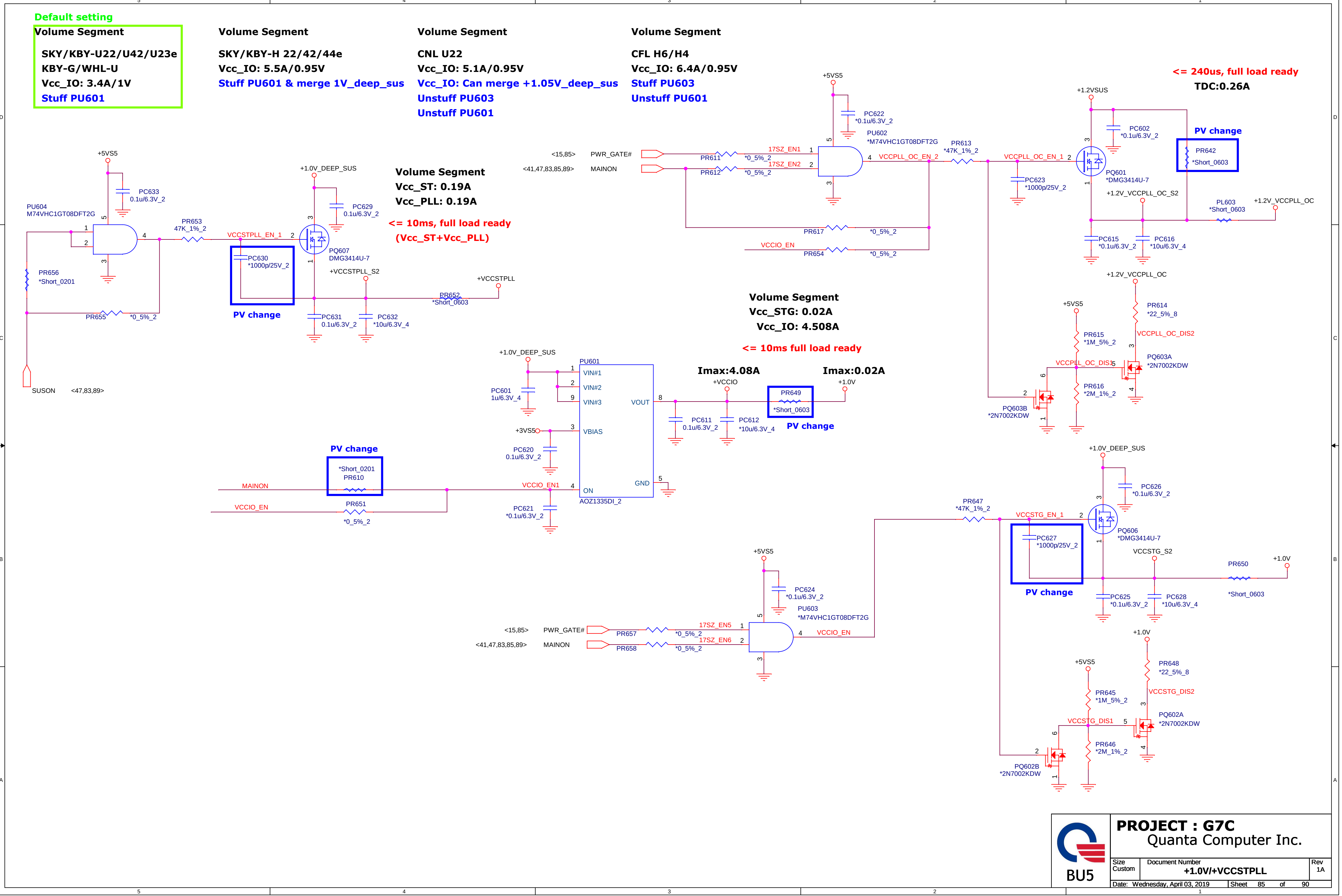
+1.8V_DEEP_SUS +/- 5%
Countinue current:1.0A
Peak current:3A

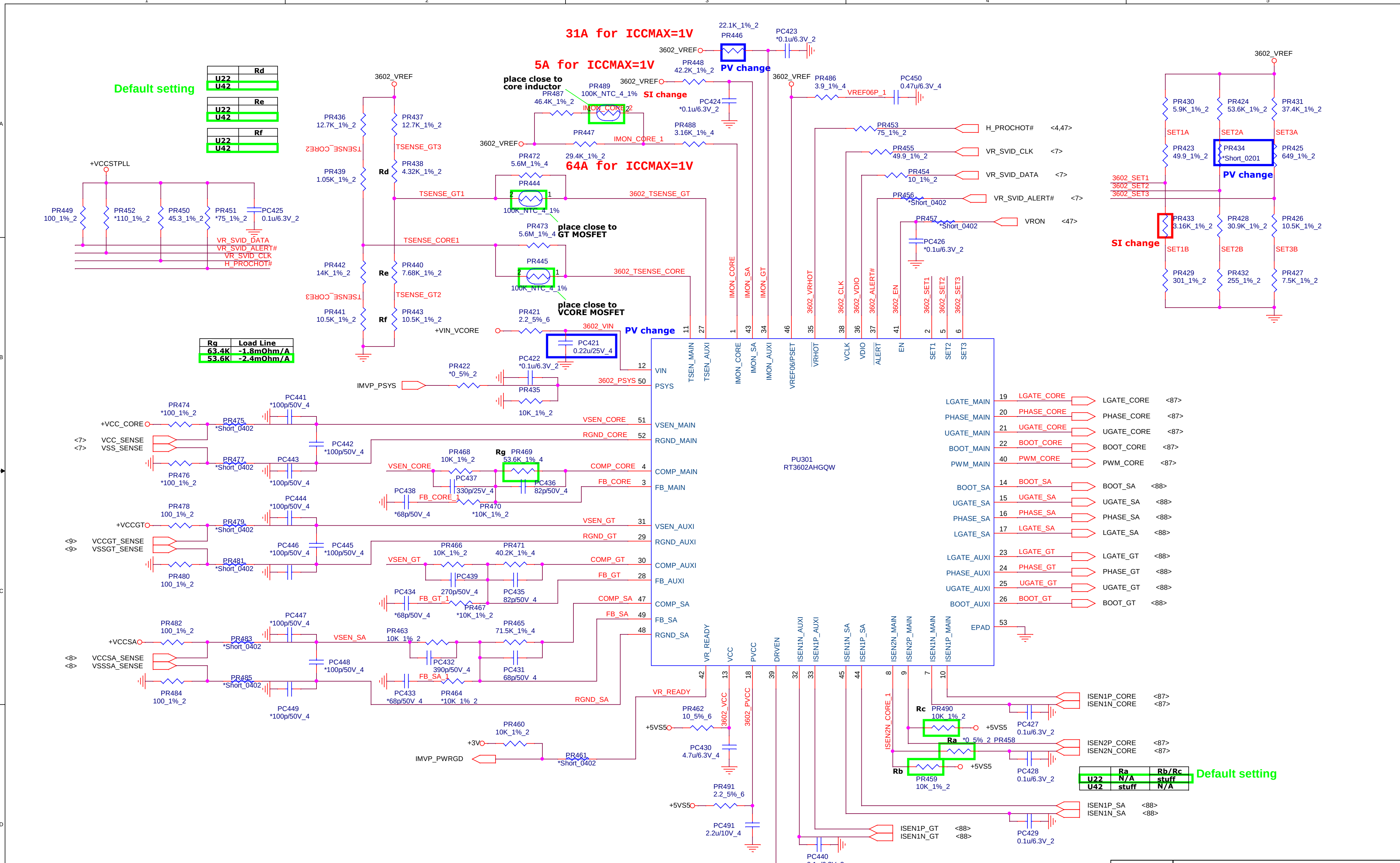


PROJECT : G7C
Quanta Computer Inc.
BU5

Size	Document Number	Rev
Custom	+1.0V/+1.8V_DEEP_SUS	1A

Date: Wednesday, April 03, 2019 | Sheet 84 of 90


Default setting
Volume Segment
SKY/KBY-U22/U42/U23e
KBY-G/WHL-U
Vcc_IO: 3.4A/1V
Stuff PU601
Volume Segment
SKY/KBY-H 22/42/44e
Vcc_IO: 5.5A/0.95V
Stuff PU601 & merge 1V_deep_sus
Volume Segment
CNL U22
Vcc_IO: 5.1A/0.95V
Vcc_IO: Can merge +1.05V_deep_sus
Unstuff PU603
Unstuff PU601
Volume Segment
CFL H6/H4
Vcc_IO: 6.4A/0.95V
Stuff PU603
Unstuff PU601
<= 240us, full load ready
TDC:0.26A
PV change
PR642
*Short_0603
+5VS5
PC622
*0.1u/6.3V_2
PU602
*M74VHC1GT08DFT2G
<15,85> PWR_GATE#
<41,47,83,85,89> MAINON
PR611 *0_5%_2 17SZ_EN1
PR612 *0_5%_2 17SZ_EN2
VCCPLL_OC_EN_2
PR613
*47K_1%_2
VCCPLL_OC_EN_1
PC623
*1000p/25V_2
+1.2VSUS
PC602
*0.1u/6.3V_2
PQ601
*DMG3414U-7
+1.2V_VCCPLL_OC_S2
PL603
*Short_0603
+1.2V_VCCPLL_OC
PC615
*0.1u/6.3V_2
PC616
*10u/6.3V_4
PR617 *0_5%_2
VCCIO_EN
PR654 *0_5%_2
+5VS5
PC633
0.1u/6.3V_2
PU604
M74VHC1GT08DFT2G
PR653
47K_1%_2
VCCSTPLL_EN_1
+1.0V_DEEP_SUS
PC629
0.1u/6.3V_2
PQ607
DMG3414U-7
Volume Segment
Vcc_ST: 0.19A
Vcc_PLL: 0.19A
<= 10ms, full load ready
(Vcc_ST+Vcc_PLL)
PC630
*1000p/25V_2
PV change
+VCCSTPLL_S2
+VCCSTPLL
PR652
*Short_0603
PR656
*Short_0201
PR655 *0_5%_2
PC631
0.1u/6.3V_2
PC632
*10u/6.3V_4
SUSON <47,83,89>
+1.2V_VCCPLL_OC
PR614
*22_5%_8
VCCPLL_OC_DIS2
+5VS5
PR615
*1M_5%_2
VCCPLL_OC_DIS1
PQ603A
*2N7002KDW
PR616
*2M_1%_2
PQ603B
*2N7002KDW
Volume Segment
Vcc_STG: 0.02A
Vcc_IO: 4.508A
<= 10ms full load ready
Imax:4.08A
Imax:0.02A
+VCCIO
+1.0V
PR649
*Short_0603
PV change
+1.0V_DEEP_SUS
PU601
VIN#1
VIN#2
VIN#3
VOUT
VBIAS
ON
GND
AOZ1335DI_2
PC601
1u/6.3V_4
+3VS5
PC620
0.1u/6.3V_2
PC611
0.1u/6.3V_2
PC612
*10u/6.3V_4
PV change
*Short_0201
PR610
MAINON
VCCIO_EN
PR651
*0_5%_2
VCCIO_EN1
PC621
*0.1u/6.3V_2
+1.0V_DEEP_SUS
PC626
*0.1u/6.3V_2
PR647
*47K_1%_2
VCCSTG_EN_1
PQ606
*DMG3414U-7
PC627
*1000p/25V_2
PV change
VCCSTG_S2
PR650
*Short_0603
+1.0V
PC625
*0.1u/6.3V_2
PC628
*10u/6.3V_4
+5VS5
PC624
*0.1u/6.3V_2
PU603
*M74VHC1GT08DFT2G
<15,85> PWR_GATE#
<41,47,83,85,89> MAINON
PR657 *0_5%_2 17SZ_EN5
PR658 *0_5%_2 17SZ_EN6
VCCIO_EN
+1.0V
PR648
*22_5%_8
VCCSTG_DIS2
+5VS5
PR645
*1M_5%_2
VCCSTG_DIS1
PQ602A
*2N7002KDW
PR646
*2M_1%_2
PQ602B
*2N7002KDW
PROJECT : G7C
Quanta Computer Inc.
BU5
Size Custom
Document Number
+1.0V/+VCCSTPLL
Rev 1A
Date: Wednesday, April 03, 2019
Sheet 85 of 90



	Rd
U22	
U42	

	Re
U22	
U42	

	Rf
U22	
U42	

Rg	Load Line
63.4K	-1.8mOhm/A
53.6K	-2.4mOhm/A

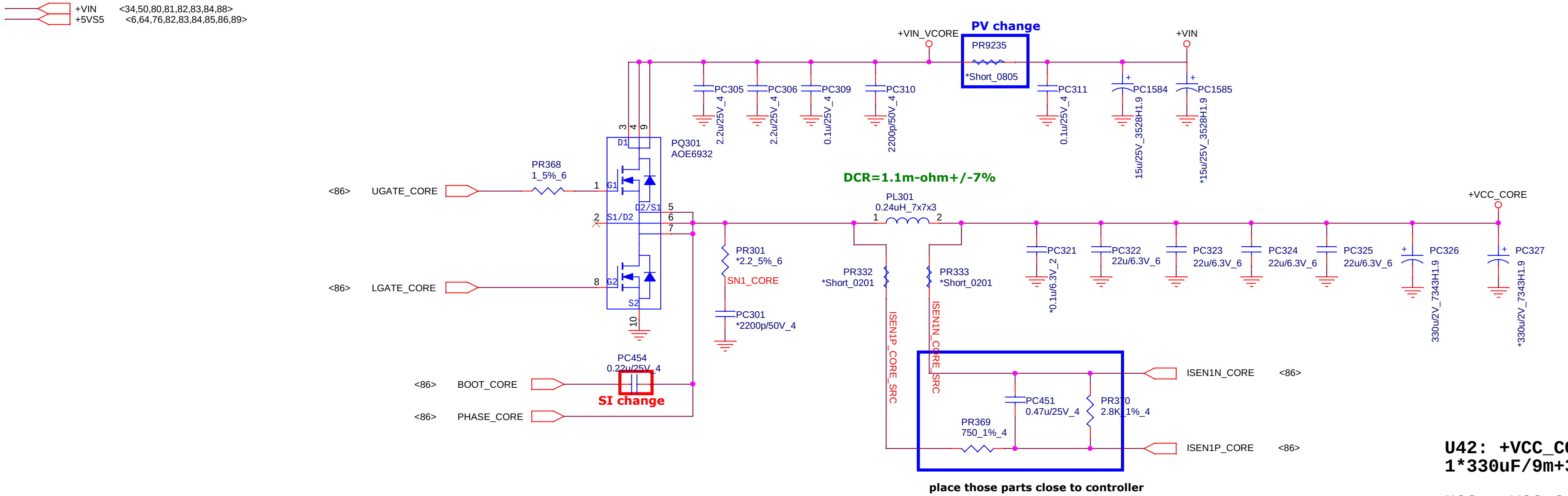
	Ra	Rb/Rc
U22	N/A	stuff
U42	stuff	N/A

PROJECT : G7C
Quanta Computer Inc.

BU5

Size	Document Number	Rev
Custom	CPU VR IC (RT3602AC)	2A

Date: Wednesday, April 03, 2019 Sheet 86 of 90



Default setting

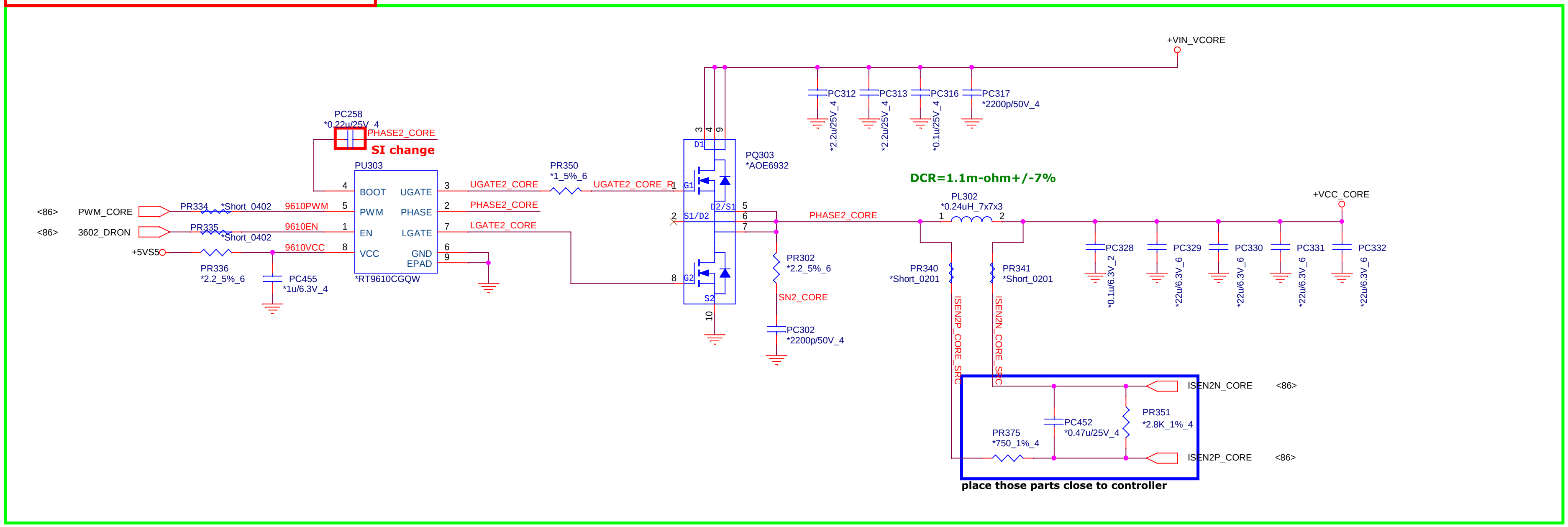
KBL U42(15W)
CPU CORE Volt
Countinue current:42A
Peak current:64A
OCP minimum:83A
LL= -2.4mV/A
VBOOT=0V
Address=00h

KBL U22(15W)
CPU CORE Volt
Countinue current:21A
Peak current:32A
OCP minimum:42A
LL= -2.4mV/A
VBOOT=0V
Address=00h

U42: +VCC_CORE
1*330uF/9m+30*22uF MLCC (total with EE)

U22: +VCC_CORE
1*330uF/9m+28*22uF MLCC (total with EE)

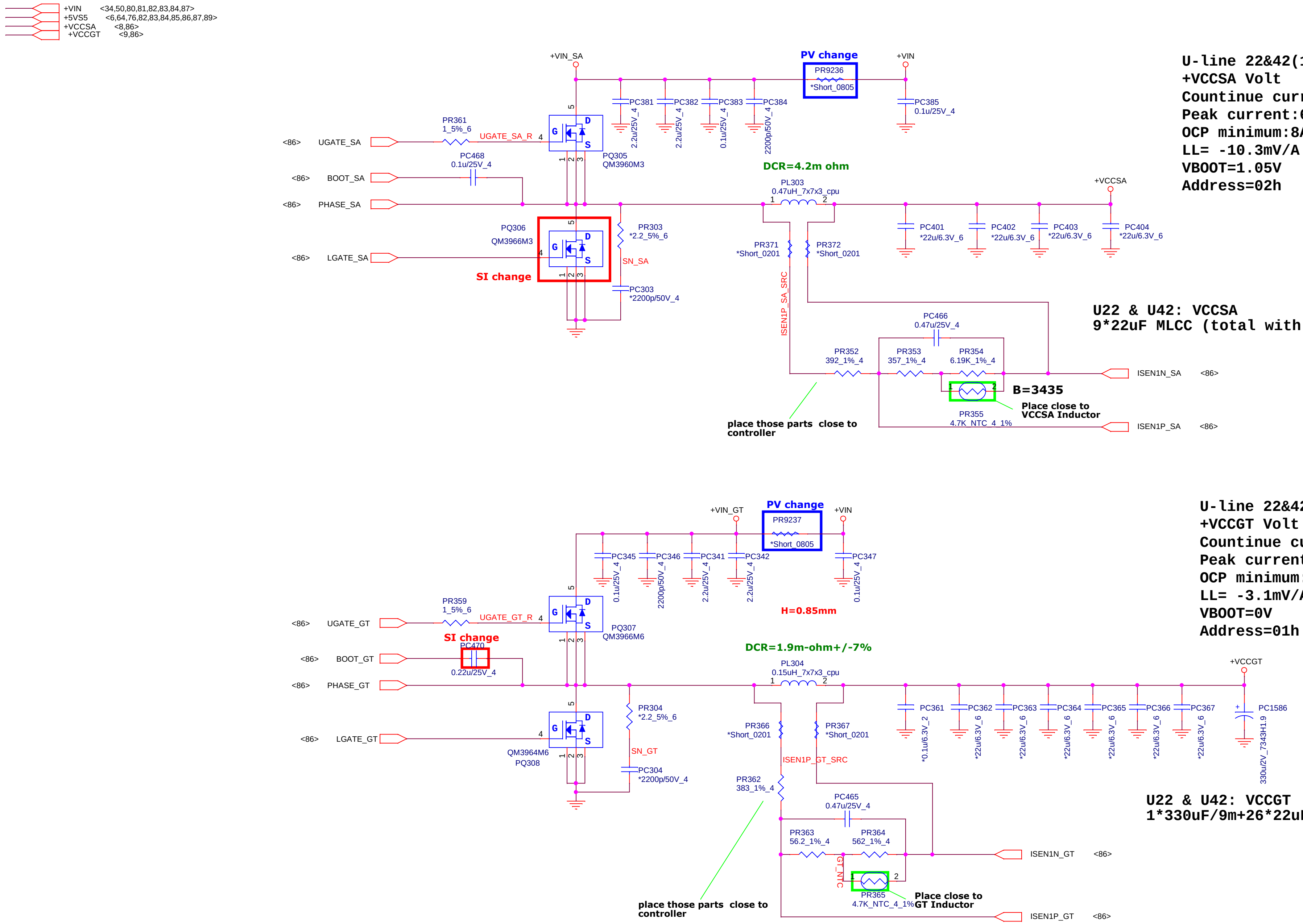
For U42 --> Add These Components



PROJECT : G7C
Quanta Computer Inc.
BU5

Size	Document Number	Rev
Custom	+VCCSA (NCP81253)	2A

Date: Wednesday, April 03, 2019 Sheet 87 of 90



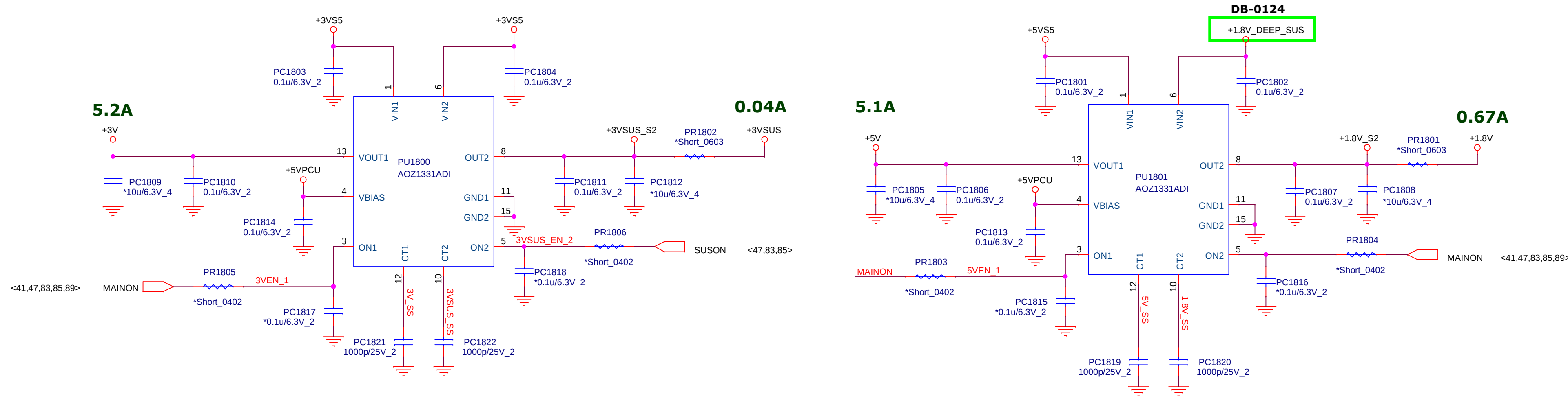
U-line 22&42(15W)
+VCCSA Volt
Countinue current:4A
Peak current:6A
OCP minimum:8A
LL= -10.3mV/A
VBOOT=1.05V
Address=02h

U22 & U42: VCCSA
9*22uF MLCC (total with EE)

U-line 22&42(15W)
+VCCGT Volt
Countinue current:18A
Peak current:31A
OCP minimum:35A
LL= -3.1mV/A
VBOOT=0V
Address=01h

U22 & U42: VCCGT
1*330uF/9m+26*22uF MLCC (total with EE)

BU5	**PROJECT : G7C** Quanta Computer Inc.	
Size: Custom	Document Number: +VCCSA (NCP81253)	Rev: 2A
Date: Wednesday, April 03, 2019	Sheet 88 of 90	



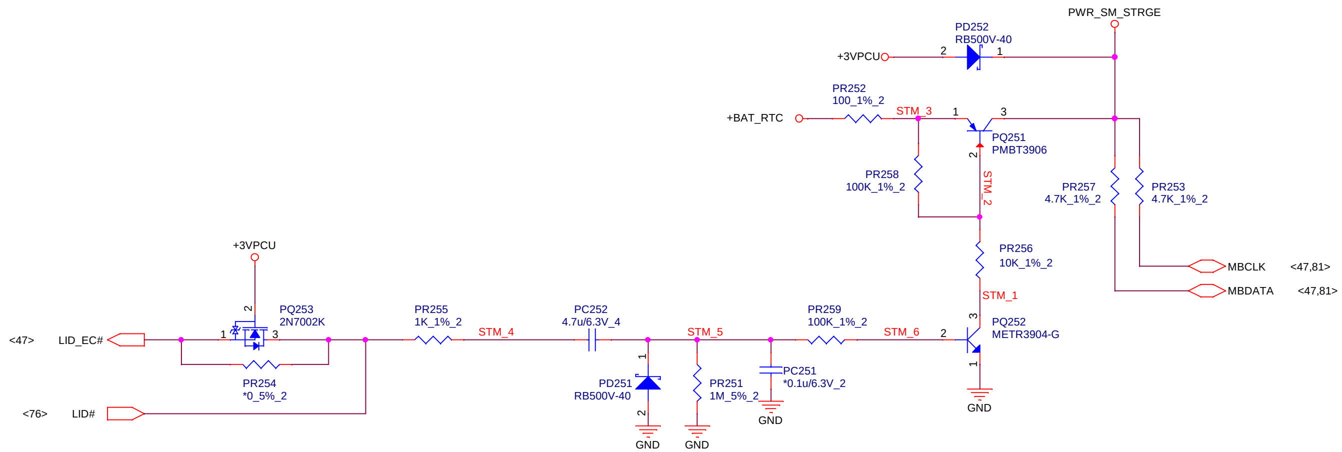
PROJECT : G7C
Quanta Computer Inc.

BU5

Size	Document Number	Rev
	Load switch IC(APL3523A)	1A

Date: Wednesday, April 03, 2019 | Sheet 89 of 90

+BAT_RTC <6,15,17,47,76,81>
+3VPCU <15,36,41,47,50,54,81,82>



PROJECT : G7C
Quanta Computer Inc.

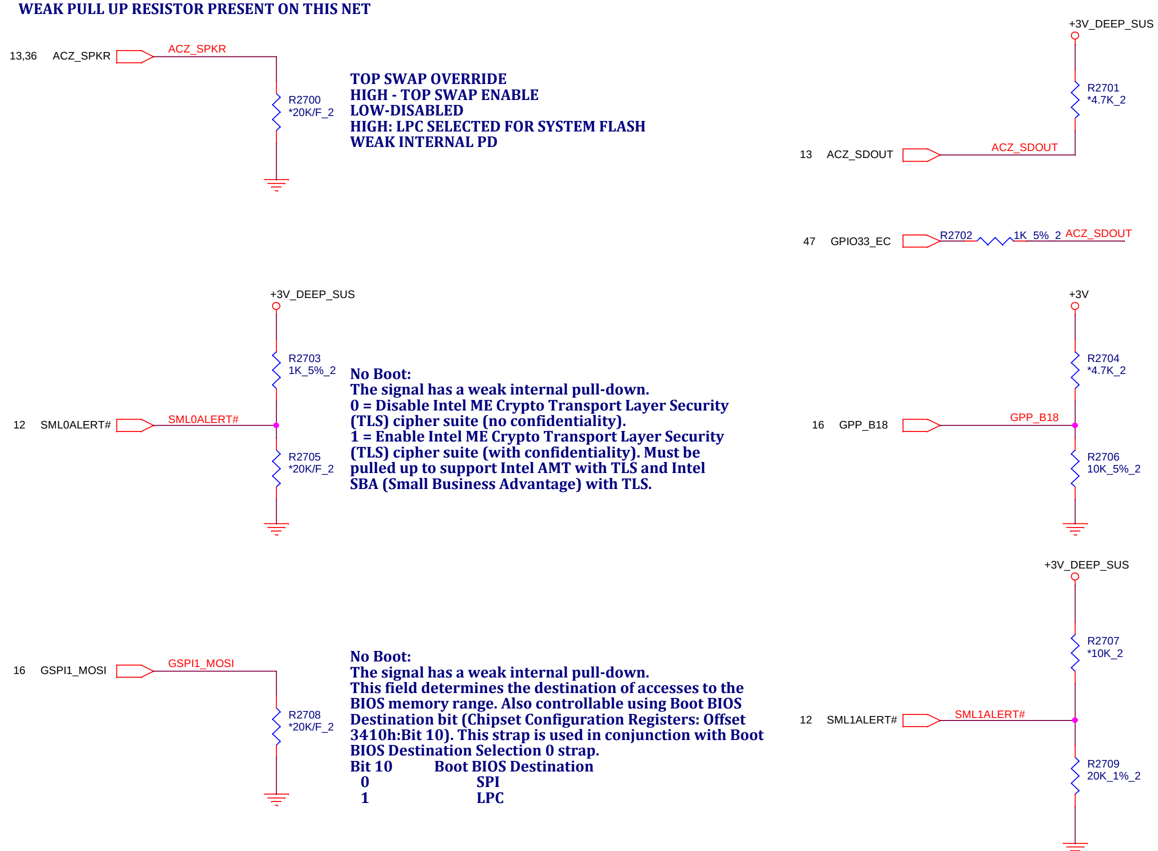
BU5

Size	Document Number	Rev
Custom	STORAGE MODE	1A

Date: Wednesday, April 03, 2019 Sheet 90 of 90

Functional Strap Definitions

DESIGN NOTE:
WEAK PULL UP RESISTOR PRESENT ON THIS NET



TOP SWAP OVERRIDE
HIGH - TOP SWAP ENABLE
LOW-DISABLED
HIGH: LPC SELECTED FOR SYSTEM FLASH
WEAK INTERNAL PD

No Boot:
The signal has a weak internal pull-down.
0 = Enable security measures defined in the Flash Descriptor.
1 = Disable Flash Descriptor Security (override). This strap should only be asserted high using external pull-up in manufacturing/debug environments ONLY. This function is useful when running ITP/XDP.

No Boot:
The signal has a weak internal pull-down.
0 = Disable Intel ME Crypto Transport Layer Security (TLS) cipher suite (no confidentiality).
1 = Enable Intel ME Crypto Transport Layer Security (TLS) cipher suite (with confidentiality). Must be pulled up to support Intel AMT with TLS and Intel SBA (Small Business Advantage) with TLS.

No Boot:
The signal has a weak internal pull-down.
0 = Disable No Reboot mode.
1 = Enable No Reboot mode
(PCH will disable the TCO Timer system reboot feature).
This function is useful when running ITP/XDP.

No Boot:
The signal has a weak internal pull-down.
This field determines the destination of accesses to the BIOS memory range. Also controllable using Boot BIOS Destination bit (Chipset Configuration Registers: Offset 3410h:Bit 10). This strap is used in conjunction with Boot BIOS Destination Selection 0 strap.

Bit 10	Boot BIOS Destination
0	SPI
1	LPC

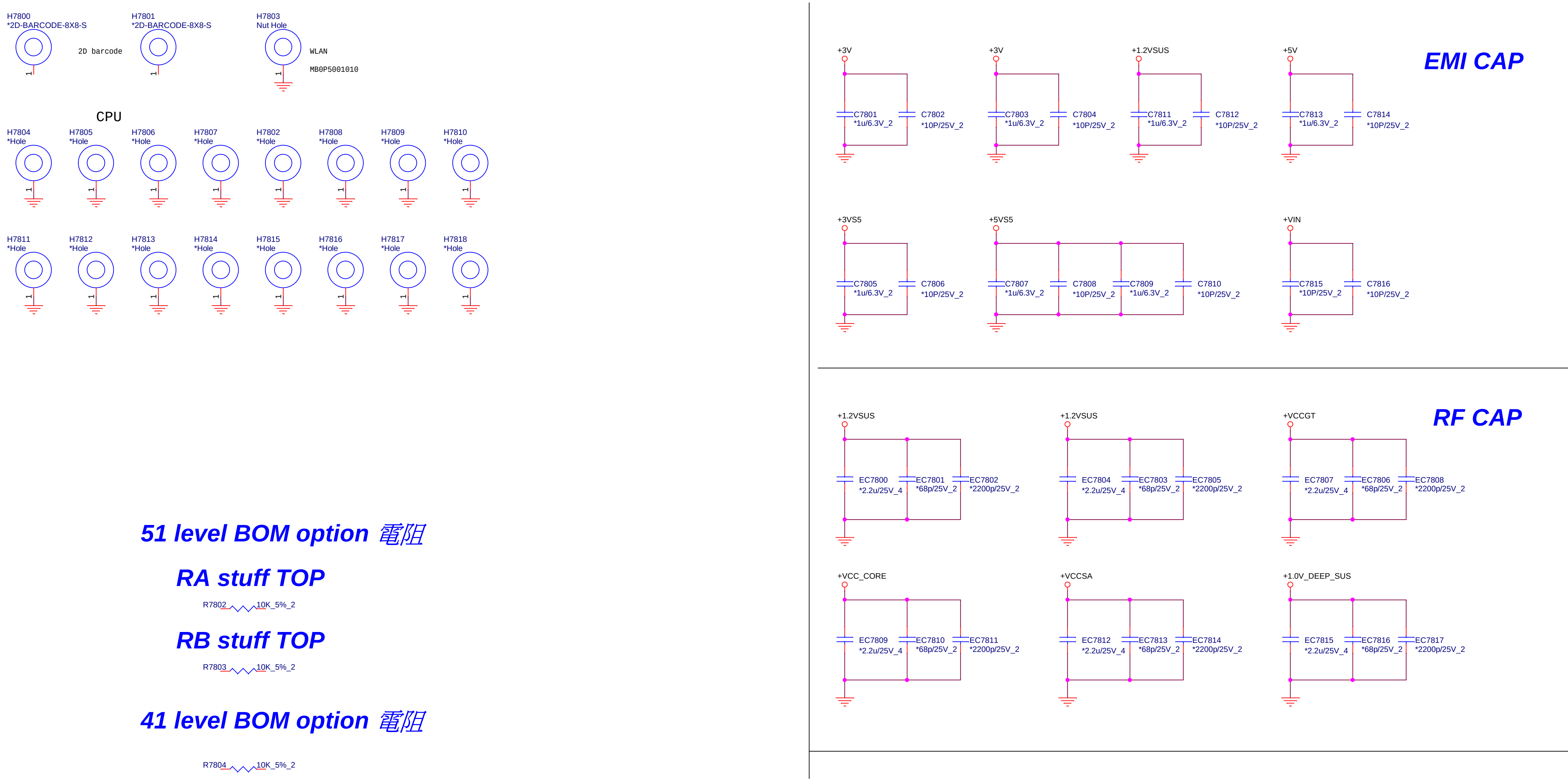
No Boot:
The signal has a weak internal pull-down.
0 = LPC Is selected for EC.
1 = eSPI Is selected for EC.

PROJECT : OP5A
Quanta Computer Inc.
NB5

Size	Document Number	Rev
	PCH STRAP	1A

Date: Wednesday, April 03, 2019 Sheet 27 of 90

EMI Cap/RF Cap/HOLE



NB5

PROJECT : OP5A

Quanta Computer Inc.

Size	Document Number	Rev
	EMI Cap/RF Cap	1A

Date: Wednesday, April 03, 2019 Sheet 78 of 90