1. Schematic Page Description :

ZHS/BTM-origins Schematic Ver :

I2C table

Function	Channel	Read	Write
Touch pad	I2C0	0x67	
Audio codec	I2C1	0x21	0x20
Light sensor	I2C4		

Function	Channel
PP3300_DSW	0x42
PP5000	0x41
PP1350	0x49
PP1050_PCH	0x43
PP1000_PCH	0x47

SMBus table

Function	Channel	Address
Battery	SMB0	
Thermal	SMB2	0x4C

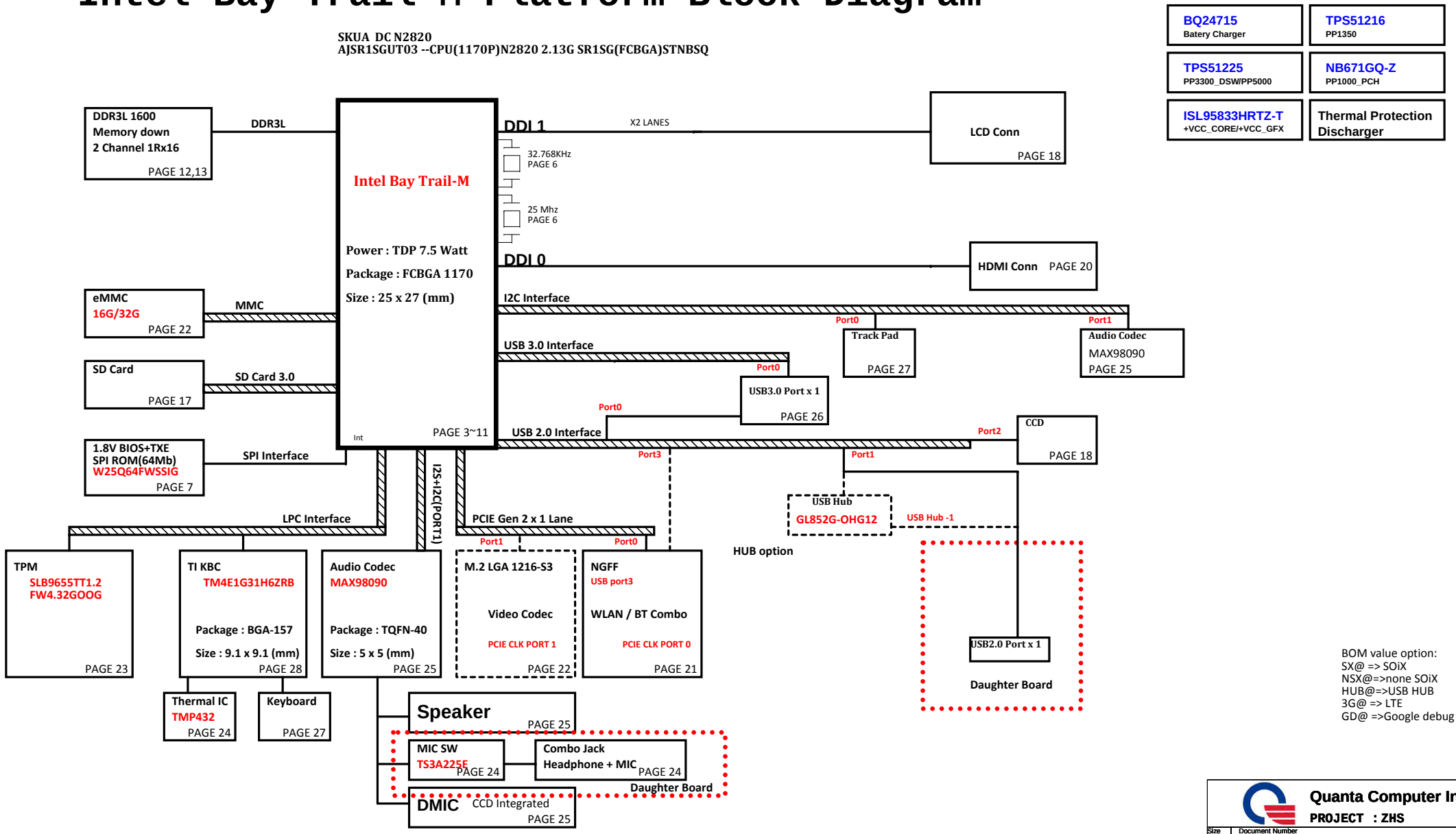
Quanta Computer Inc.
PROJECT : ZHS

Size	Document Number	Rev
	Sch Page description	1A

Date: Monday, August 10, 2015 Sheet 1 of 42

ZHR/BTM-Origins
Intel Bay Trail-M Platform Block Diagram

SKUA DC N2820
AJSR1SGUT03 --CPU(1170P)N2820 2.13G SR1SG(FCBGA)STNBSQ



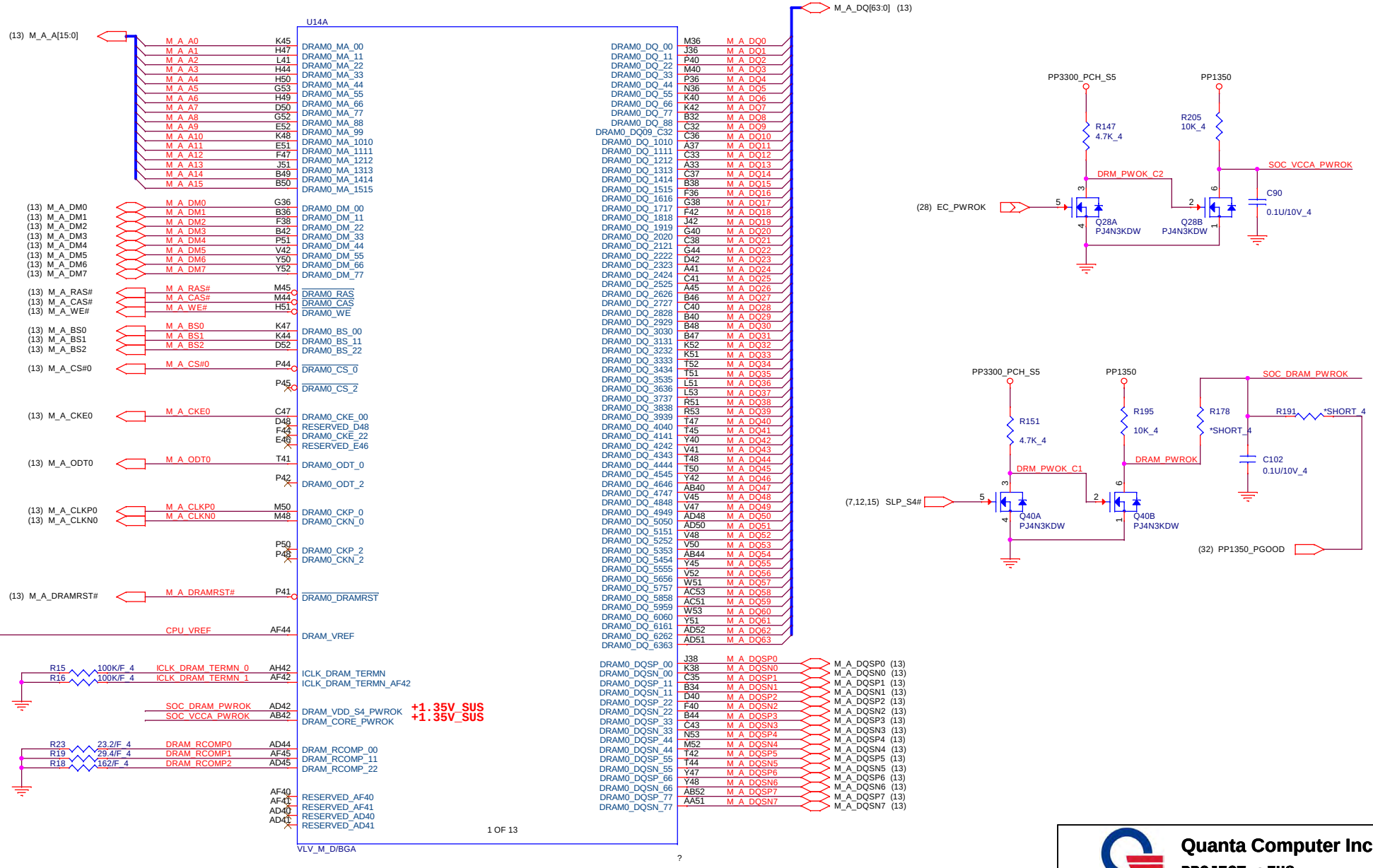
BQ24715 Batery Charger	TPS51216 PP1350
TPS51225 PP3300_DSW/PP5000	NB671GQ-Z PP1000_PCH
ISL95833HRTZ-T +VCC_CORE/+VCC_GFX	Thermal Protection Discharger

BOM value option:
SX@ => SOiX
NSX@=>none SOiX
HUB@=>USB HUB
3G@ => LTE
GD@ =>Google debug

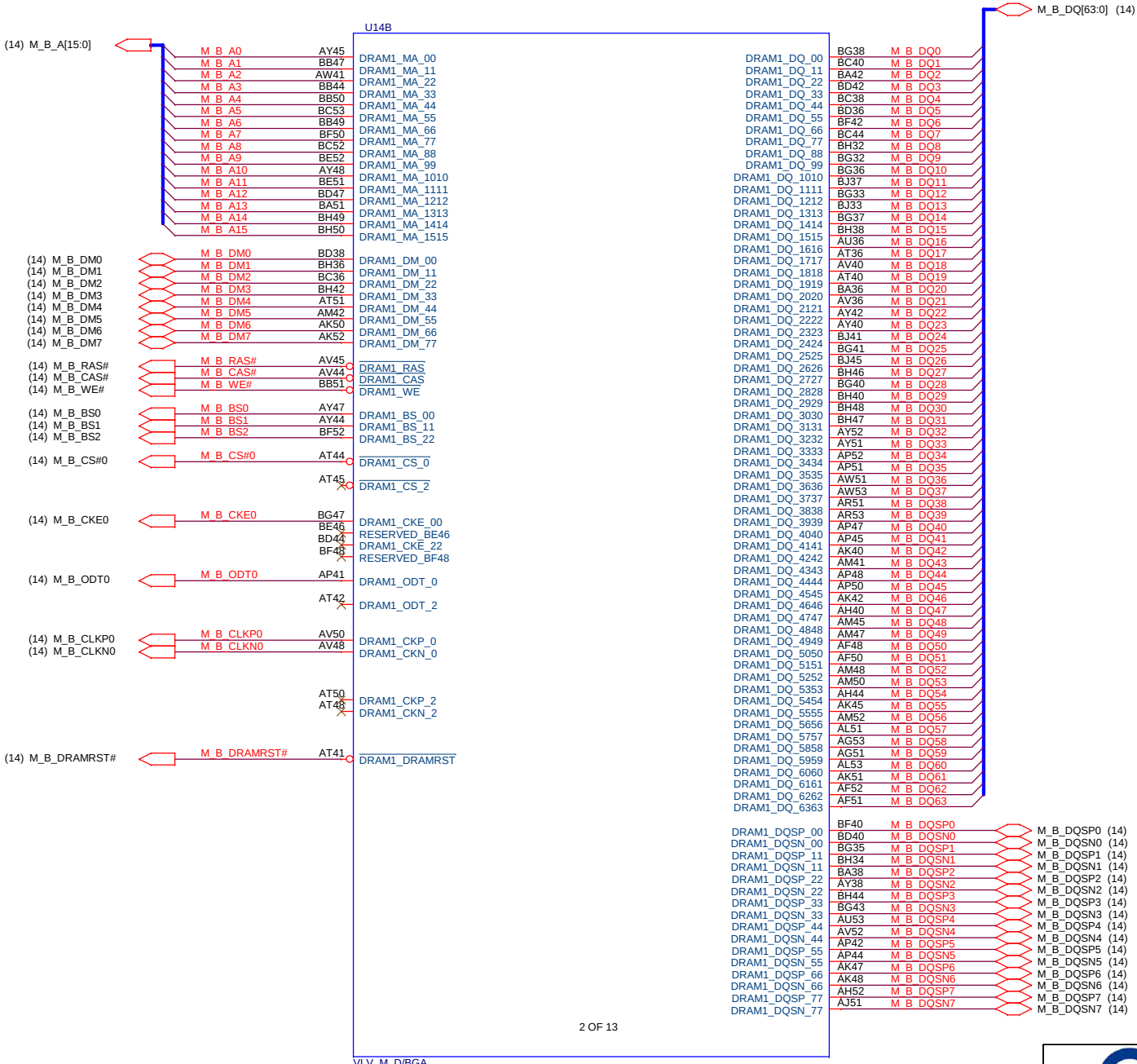
Quanta Computer Inc.
PROJECT : ZHS

Size	Document Number	Rev
	Block Diagram	1A

Date: Monday, August 10, 2015 Sheet 2 of 42



Quanta Computer Inc.		
PROJECT : ZHS		
Size	Document Number: Valley 1/9 (DDRA)	Rev: 1A
Date: Monday, August 10, 2015	Sheet 3 of 42	

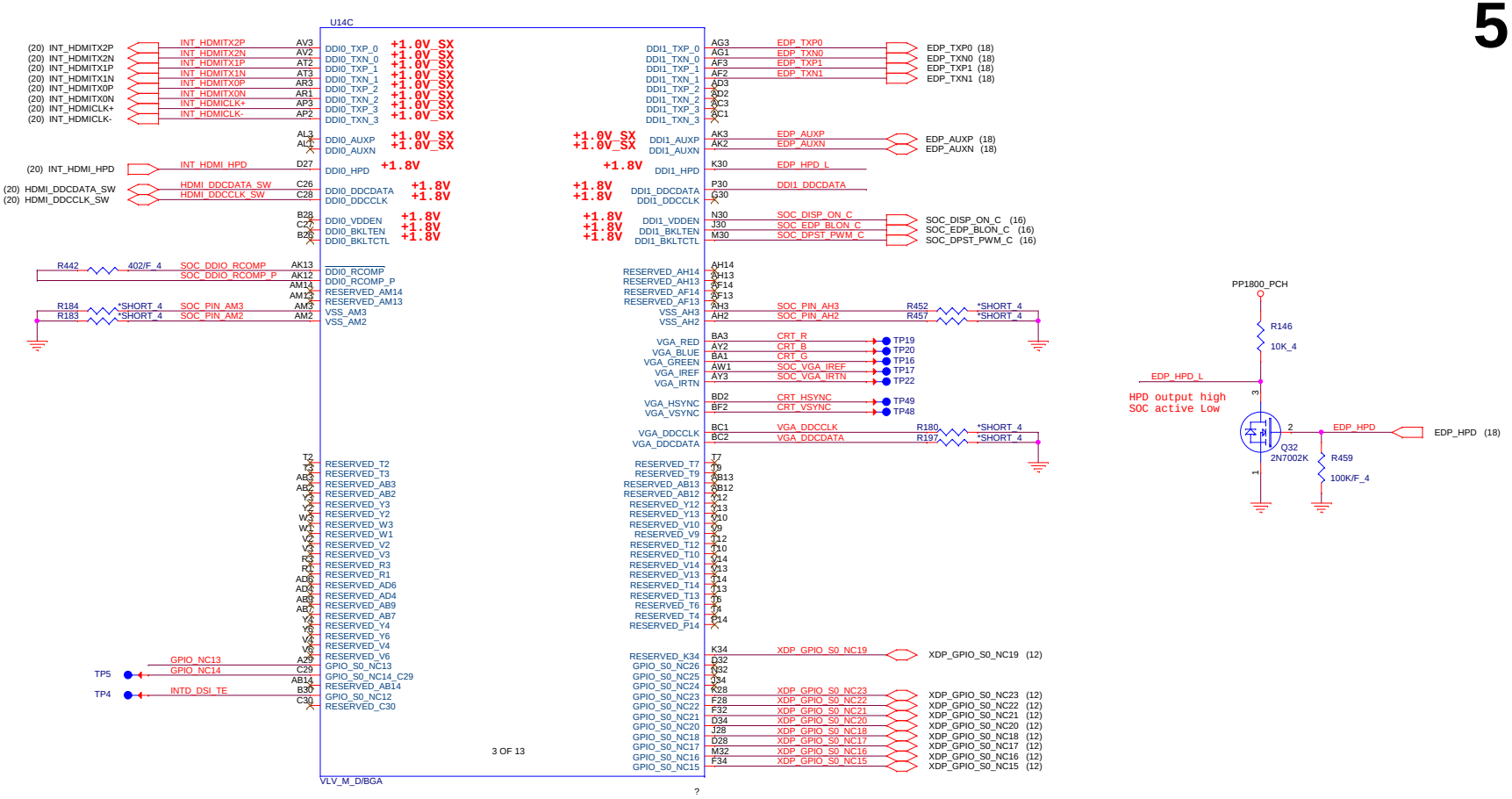


4

Quanta Computer Inc.

PROJECT : ZHS

Size	Document Number	Rev
	Valley 2/9 (DDRB)	1A
Date: Monday, August 10, 2015	Sheet 4 of 42	



BTM Strapping Table

Pin Name	Strap description	Sampled	Configuration	Note
GPIO_SO_SC_56	Top Swap (A16 Override)	PWROK	0 = Top address bit is unchanged **1 = Top address bit is inverted**	using SoC internal PU
LPE_I2S2_FRM	BIOS Boot Selection	PWROK	0 = LPC **1 = SPI**	using SoC internal PU
GPIO_SO_SC_65	Security Flash Descriptors	PWROK	0 = Override **1 = Normal operation**	
DDI0_DDCDATA	DDI0 Detect	PWROK	0 = DDI0 not detected **1 = DDI0 detected**	Pull up +1.8V at HDMI side
DDI1_DDCDATA	DDI1 Detect	PWROK	0 = DDI0 not detected **1 = DDI0 detected**	using SoC internal PU
GPIO_SO_NC_13				

Quanta Computer Inc.
PROJECT : ZHS
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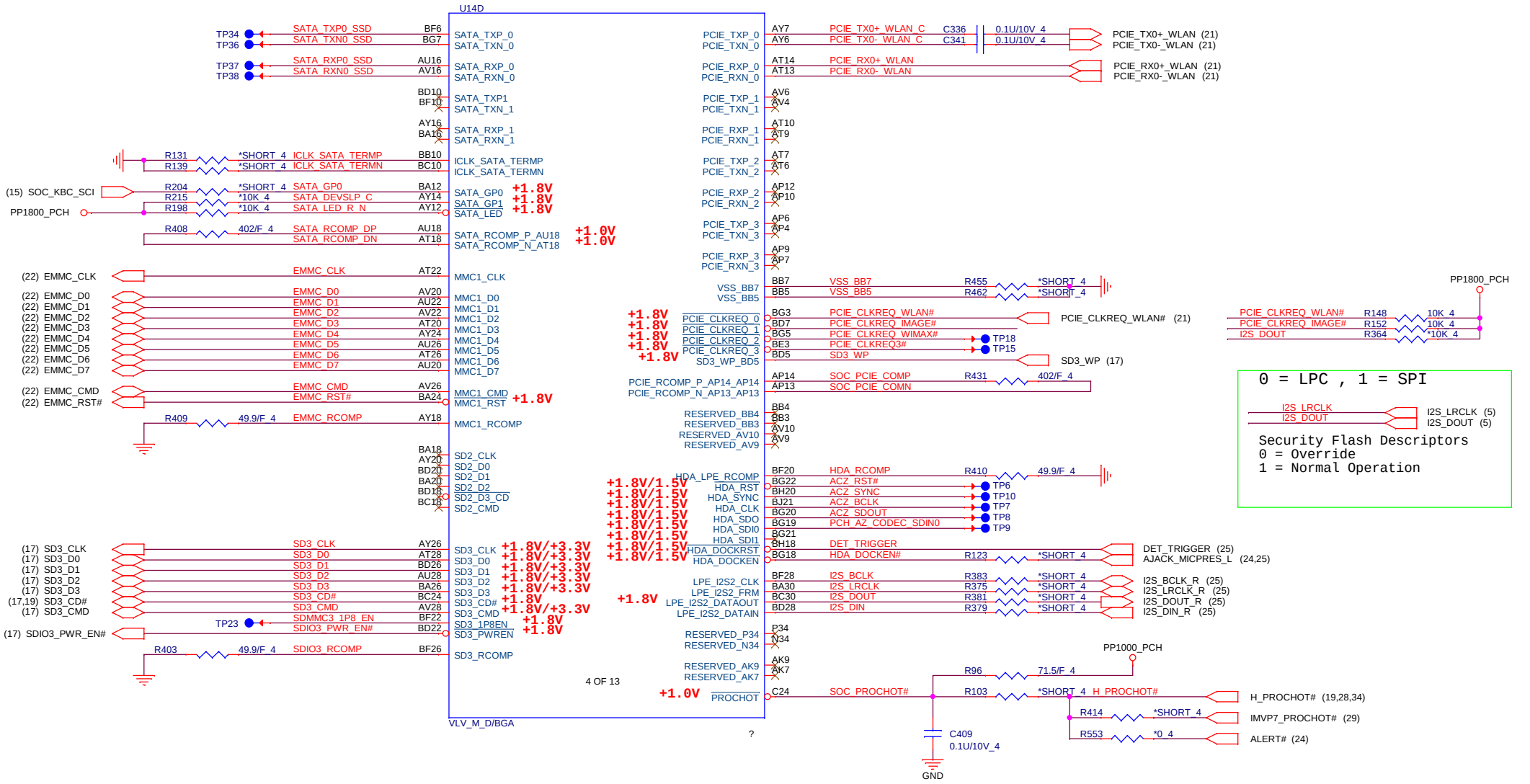
6
U14D
TP34
TP36
SATA_TXP0_SSD
SATA_TXN0_SSD
BF6
BG7
SATA_TXP_0
SATA_TXN_0
TP37
TP38
SATA_RXP0_SSD
SATA_RXN0_SSD
AU16
AV16
SATA_RXP_0
SATA_RXN_0
BD10
BF10
SATA_TXP1
SATA_TXN_1
AY16
BA16
SATA_RXP_1
SATA_RXN_1
R131
R139
*SHORT_4
ICLK_SATA_TERMP
ICLK_SATA_TERMN
BB10
BC10
ICLK_SATA_TERMP
ICLK_SATA_TERMN
(15) SOC_KBC_SCI
PP1800_PCH
R204
R215
R198
*SHORT_4
*10K_4
*10K_4
SATA_GP0
SATA_DEVSLP_C
SATA_LED_R_N
BA12
AY14
AY12
SATA_GP0
SATA_GP1
SATA_LED
+1.8V
+1.8V
+1.8V
R408
402/F_4
SATA_RCOMP_DP
SATA_RCOMP_DN
AU18
AT18
SATA_RCOMP_P_AU18
SATA_RCOMP_N_AT18
+1.0V
+1.0V
(22) EMMC_CLK
EMMC_CLK
AT22
MMC1_CLK
(22) EMMC_D0
(22) EMMC_D1
(22) EMMC_D2
(22) EMMC_D3
(22) EMMC_D4
(22) EMMC_D5
(22) EMMC_D6
(22) EMMC_D7
EMMC_D0
EMMC_D1
EMMC_D2
EMMC_D3
EMMC_D4
EMMC_D5
EMMC_D6
EMMC_D7
AV20
AU22
AV22
AT20
AY24
AU26
AT26
AU20
MMC1_D0
MMC1_D1
MMC1_D2
MMC1_D3
MMC1_D4
MMC1_D5
MMC1_D6
MMC1_D7
(22) EMMC_CMD
(22) EMMC_RST#
EMMC_CMD
EMMC_RST#
AV26
BA24
MMC1_CMD
MMC1_RST
+1.8V
R409
49.9/F_4
EMMC_RCOMP
AY18
MMC1_RCOMP
BA18
AY20
BD20
BA20
BD18
BC18
SD2_CLK
SD2_D0
SD2_D1
SD2_D2
SD2_D3_CD
SD2_CMD
(17) SD3_CLK
(17) SD3_D0
(17) SD3_D1
(17) SD3_D2
(17) SD3_D3
(17,19) SD3_CD#
(17) SD3_CMD
SD3_CLK
SD3_D0
SD3_D1
SD3_D2
SD3_D3
SD3_CD#
SD3_CMD
AY26
AT28
BD26
AU28
BA26
BC24
AV28
SD3_CLK
SD3_D0
SD3_D1
SD3_D2
SD3_D3
SD3_CD#
SD3_CMD
+1.8V/+3.3V
+1.8V/+3.3V
+1.8V/+3.3V
+1.8V/+3.3V
+1.8V
+1.8V/+3.3V
TP23
SDMMC3_1P8_EN
SDIO3_PWR_EN#
BF22
BD22
SD3_1P8EN
SD3_PWREN
+1.8V
+1.8V
(17) SDIO3_PWR_EN#
R403
49.9/F_4
SDIO3_RCOMP
BF26
SD3_RCOMP
4 OF 13
VLV_M_D/BGA
?
PCIE_TXP_0
PCIE_TXN_0
AY7
AY6
PCIE_TXP_0
PCIE_TXN_0
PCIE_TX0+_WLAN_C
PCIE_TX0-_WLAN_C
C336
C341
0.1U/10V_4
0.1U/10V_4
PCIE_TX0+_WLAN (21)
PCIE_TX0-_WLAN (21)
PCIE_RXP_0
PCIE_RXN_0
AT14
AT13
PCIE_RX0+_WLAN
PCIE_RX0-_WLAN
PCIE_RX0+_WLAN (21)
PCIE_RX0-_WLAN (21)
PCIE_TXP_1
PCIE_TXN_1
AV6
AV4
PCIE_RXP_1
PCIE_RXN_1
AT10
AT9
PCIE_TXP_2
PCIE_TXN_2
AT7
AT6
PCIE_RXP_2
PCIE_RXN_2
AP12
AP10
PCIE_TXP_3
PCIE_TXN_3
AP6
AP4
PCIE_RXP_3
PCIE_RXN_3
AP9
AP7
VSS_BB7
VSS_BB5
BB7
BB5
VSS_BB7
VSS_BB5
R455
R462
*SHORT_4
*SHORT_4
+1.8V
+1.8V
+1.8V
+1.8V
+1.8V
PCIE_CLKREQ_0
PCIE_CLKREQ_1
PCIE_CLKREQ_2
PCIE_CLKREQ_3
SD3_WP_BD5
BG3
BD7
BG5
BE3
BD5
PCIE_CLKREQ_WLAN#
PCIE_CLKREQ_IMAGE#
PCIE_CLKREQ_WIMAX#
PCIE_CLKREQ3#
SD3_WP
PCIE_CLKREQ_WLAN# (21)
TP18
TP15
SD3_WP (17)
PCIE_RCOMP_P_AP14_AP14
PCIE_RCOMP_N_AP13_AP13
AP14
AP13
SOC_PCIE_COMP
SOC_PCIE_COMN
R431
402/F_4
RESERVED_BB4
RESERVED_BB3
RESERVED_AV10
RESERVED_AV9
BB4
BB3
AV10
AV9
HDA_LPE_RCOMP
HDA_RST
HDA_SYNC
HDA_CLK
HDA_SDO
HDA_SDI0
HDA_SDI1
HDA_DOCKRST
HDA_DOCKEN
+1.8V/1.5V
+1.8V/1.5V
+1.8V/1.5V
+1.8V/1.5V
+1.8V/1.5V
+1.8V/1.5V
+1.8V/1.5V
BF20
BG22
BH20
BJ21
BG20
BG19
BG21
BH18
BG18
HDA_RCOMP
ACZ_RST#
ACZ_SYNC
ACZ_BCLK
ACZ_SDOUT
PCH_AZ_CODEC_SDIN0
DET_TRIGGER
HDA_DOCKEN#
R410
49.9/F_4
TP6
TP10
TP7
TP8
TP9
R123
*SHORT_4
DET_TRIGGER (25)
AJACK_MICPRES_L (24,25)
LPE_I2S2_CLK
LPE_I2S2_FRM
LPE_I2S2_DATAOUT
LPE_I2S2_DATAIN
+1.8V
BF28
BA30
BC30
BD28
I2S_BCLK
I2S_LRCLK
I2S_DOUT
I2S_DIN
R383
R375
R381
R379
*SHORT_4
*SHORT_4
*SHORT_4
*SHORT_4
I2S_BCLK_R (25)
I2S_LRCLK_R (25)
I2S_DOUT_R (25)
I2S_DIN_R (25)
RESERVED_P34
RESERVED_N34
RESERVED_AK9
RESERVED_AK7
P34
N34
AK9
AK7
+1.0V
PROCHOT
C24
SOC_PROCHOT#
PP1000_PCH
R96
71.5/F_4
R103
*SHORT_4
H_PROCHOT#
H_PROCHOT# (19,28,34)
R414
*SHORT_4
IMVP7_PROCHOT# (29)
R553
*0_4
ALERT# (24)
C409
0.1U/10V_4
GND
PP1800_PCH
PCIE_CLKREQ_WLAN#
PCIE_CLKREQ_IMAGE#
I2S_DOUT
R148
R152
R364
10K_4
10K_4
*10K_4
0 = LPC , 1 = SPI
I2S_LRCLK
I2S_DOUT
I2S_LRCLK (5)
I2S_DOUT (5)
Security Flash Descriptors
0 = Override
1 = Normal Operation
Quanta Computer Inc.
PROJECT : ZHS
Size
Document Number
Valley 4/9 (SD/PCIE/SATA)
Rev
1A
Date: Monday, August 10, 2015
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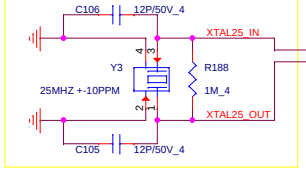
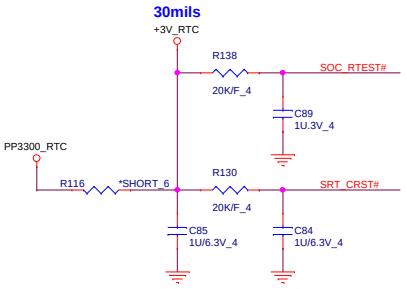
CRYSTAL 25MHZ

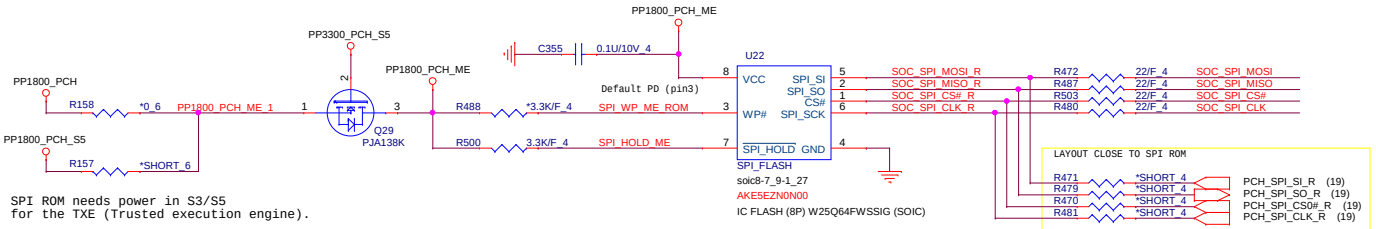


2nd BG625000121(HHE)

RTC Circuitry(RTC)

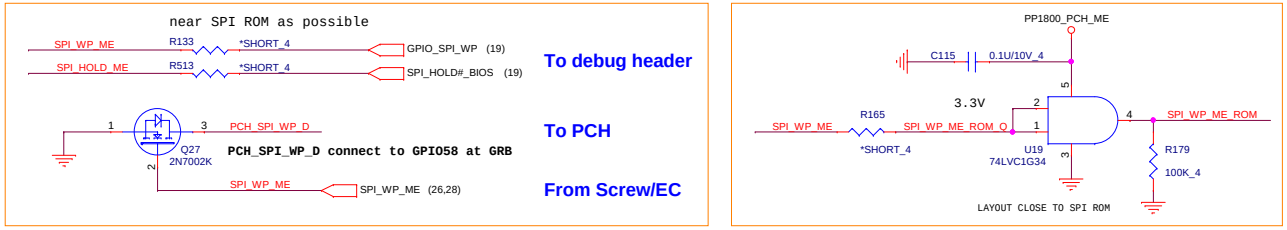


SPI_FLASH



SPI ROM needs power in S3/S5
for the TXE (Trusted execution engine).

SPI NOR FLASH



Quanta Computer Inc.		
PROJECT : ZHS		
Size	Document Number: Valley 5/9 (SPI/GPIO/CLK)	Rev: 1A
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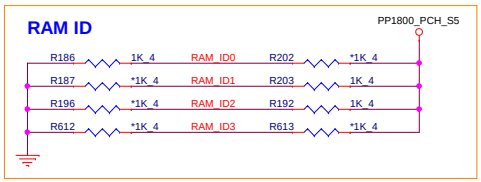
5/19 Update RAM ID for ZHQ and ZHS use.

Vender	RAM_ID 210	Q P/N	Mfr. PN	Freq.	Size	Pice	
Samsang	0x000	AKD5PGST514	K4B4G1646Q-HYK0	1600MHz	4GB	8	C2 SKU1
Hynix	0x001	AKD5JGETW04	H5TC4G63AFR-PBA	1600MHz	4GB	8	
Micron	0x010	AKD5DGSTL07	MT41K128M16JT-125M:K	1600MHz	2GB	8	
Hynix	0x011	AKD5PGSTW03	H5TC4G63MFR-PBA	1600MHz	2GB	4	
Hynix	0x100	AKD5PGSTW13	H5TC4G63CFR-PBA	1600MHz	2GB	4	
Hynix	0x101	AKD5JGETW04	H5TC4G63AFR-PBA	1600MHz	2GB	4	
Hynix	0x110	AKD5PGSTW13	H5TC4G63CFR-PBA	1600MHz	4GB	8	C2 SKU2
Hynix	0x111	AKD5PGSTW03	H5TC4G63MFR-PBA	1600MHz	4GB	8	



PP1800_PCH_S5 — R426 10K_4 LTE_DISABLE#

U14F

LTE_DISABLE# → GPIO_S5_31

RAM_ID0 → GPIO_S5_36
RAM_ID1 → GPIO_S5_37
RAM_ID2 → GPIO_S5_38
RAM_ID3 → GPIO_S5_40

PORT 1 USB CONN
PORT 2 LTE
PORT 3 NA
PORT 4 NA
→ **MB USB3.0** / **HUB1** / **CCD** / **BT**

(26) USBP0+ / (26) USBP0- → USB_DP0 / USB_DN0
(22) USBP1+ / (22) USBP1- → USB_DP1 / USB_DN1
(18) USBP2+ / (18) USBP2- → USB_DP2 / USB_DN2
(21) USBP3+ / (21) USBP3- → USB_DP3 / USB_DN3

R437 1K/F_4 ICLK_USB_TERMN_0 — R425 1K/F_4 ICLK_USB_TERMN_1 → ICLK_USB_TERMN_D10 / ICLK_USB_TERMN

(15,26) USB_OC0# — R97 10K_4 USB_OC0# — R189 10K_4 USB_OC1# — PP1800_PCH_S5 — (15,24) USB_OC1# → USB_OC_00 / USB_OC_11 (+1.8V_S5 / +1.8V_S5)

R443 45.3/F_4 USB_RCOMP → USB_RCOMPO / USB_RCOMPI

R436 *0_4 USB_PLL_MON → USB_PLL_MON

USB_HSIC0_DATA / USB_HSIC0_STROBE

USB_HSIC1_DATA / USB_HSIC1_STROBE

R185 45.3/F_4 USB_HSIC_RCOMP → USB_HSIC_RCOMP
R415 49.9/F_4 LPC_RCOMP → LPC_RCOMP

(23) PCLK_TPM — R446 *0_4 — R449 *SHORT_4 CLK_PCI_EC_R — R112 22/F_4 SOC_CLKOUT_1 — (28) CLK_PCI_EC
(28) LPC_CLKRUN_L — LPC_CLKRUN_L R109 *SHORT_4 SOC_CLKRUN# — R115 22/F_4 SOC_CLKOUT_0 — SOC_CLKOUT_0

(23,28) LPC_LAD0 → LPC_LAD0
(23,28) LPC_LAD1 → LPC_LAD1
(23,28) LPC_LAD2 → LPC_LAD2
(23,28) LPC_LAD3 → LPC_LAD3
(23,28) LPC_LFRAME# → LPC_LFRAME#
(15) SOC_SERIRQ → SOC_SERIRQ

LPC_RCOMP / ILB_LPC_AD_00 / ILB_LPC_AD_11 / ILB_LPC_AD_22 / ILB_LPC_AD_33 / ILB_LPC_FRAME / ILB_LPC_CLK_00 / ILB_LPC_CLK_11 / ILB_LPC_CLKRUN / ILB_LPC_SERIRQ
(+1.8V/+3.3V)

PP1800_PCH — R120 2.2K_4 SMB_SOC_DATA — R125 2.2K_4 SMB_SOC_CLK — R141 2.2K_4 SMB_SOC_ALERTB

(12) SMB_SOC_DATA → SMB_SOC_DATA
(12) SMB_SOC_CLK → SMB_SOC_CLK
SMB_SOC_ALERTB

PCU_SMB_DATA / PCU_SMB_CLK / PCU_SMB_ALERT (+1.8V)

GND — R483 *0_4 SOC_CLKRUN#

6 OF 13
VLV_M_D/BGA

RESERVED_M10 / RESERVED_M9 / RESERVED_P7 / RESERVED_P6 / RESERVED_M7 / RESERVED_M12 / USB3_REXT0 — USB3_P0_REXT R440 1.24K/F_4
RESERVED_P10 / RESERVED_P12 / RESERVED_M4 / RESERVED_M6

USB3_RXP0 / USB3_RXN0 — USB3_RXP0 (26) / USB3_RXN0 (26)
USB3_TXP0 / USB3_TXN0 — USB3_TXP0 (26) / USB3_TXN0 (26)

RESERVED_H8 / RESERVED_H7 / RESERVED_H5 / RESERVED_H4

R420 *0_4 — SOC_UART_TX — SOC_UART_RX
Un-Stuff for Test Only

+1.8V GPIO_S0_SC_55 → BD12 TRACKPAD_INT_DX → TRACKPAD_INT_DX (27)
+1.8V GPIO_S0_SC_56 → BC12 GPIO_S0_SC_56 → GPIO_S0_SC_56 (5)
+1.8V GPIO_S0_SC_57 → BD14 SOC_UART_TX → SOC_UART_TX (19)
+1.8V GPIO_S0_SC_58 → BC14 SIM_DET_C
+1.8V GPIO_S0_SC_59 → BF14 EC_IN_RW_C → EC_IN_RW_C (16)
+1.8V GPIO_S0_SC_60 → BD16
+1.8V GPIO_S0_SC_61 → BC16 SOC_UART_RX → SOC_UART_RX (19)

+1.8V ILB_8254_SPKR → BH12

PP1800_PCH
TRACKPAD_INT_DX R433 10K_4
SIM_DET_C R422 10K_4

PP1800_PCH
I2C_0_SDA_R R438 4.7K_4
I2C_0_SCL_R R432 4.7K_4
I2C_1_SDA_R R421 4.7K_4
I2C_1_SCL_R R416 4.7K_4

+1.8V SIO_I2C0_DATA → BH22 I2C_0_SDA_C R102 22/F_4 I2C_0_SDA_R (16)
+1.8V SIO_I2C0_CLK → BG23 I2C_0_SCL_C R95 22/F_4 I2C_0_SCL_R (16) — **Touch pad**

+1.8V SIO_I2C1_DATA → BG24 I2C_1_SDA_C R89 22/F_4 I2C_1_SDA_R (25)
+1.8V SIO_I2C1_CLK → BH24 I2C_1_SCL_C R83 22/F_4 I2C_1_SCL_R (25) — **Audio Codec**

+1.8V SIO_I2C2_DATA → BG25
+1.8V SIO_I2C2_CLK → BJ25

+1.8V SIO_I2C3_DATA → BG26
+1.8V SIO_I2C3_CLK → BH26

PP1800_PCH
I2C_4_SDA R398 *4.7K_4
I2C_4_SCL R394 *4.7K_4
I2C_5_SDA R392 TS@4.7K_4
I2C_5_SCL R389 TS@4.7K_4

+1.8V SIO_I2C4_DATA → BF27 I2C_4_SDA R625 *TS@22/F_4 I2C_5_SDA
+1.8V SIO_I2C4_CLK → BG27 I2C_4_SCL R626 *TS@22/F_4 I2C_5_SCL — **Light sensor**

+1.8V SIO_I2C5_DATA → BH28 I2C_5_SDA_C R71 TS@22/F_4 I2C_5_SDA (16)
+1.8V SIO_I2C5_CLK → BG28 I2C_5_SCL_C R65 TS@22/F_4 I2C_5_SCL (16) — **Touch panel**

PP1800_PCH
I2C_NFC_SDA R368 *4.7K_4
I2C_NFC_SCL R367 *4.7K_4

+1.8V SIO_I2C6_DATA → BJ29
+1.8V SIO_I2C6_CLK → BG29

GPIO_S0_SC_092 / GPIO_S0_SC_093 → BH30 I2C_NFC_SDA / BG30 I2C_NFC_SCL — **NFC**

?

Quanta Computer Inc.
PROJECT : ZHS

Size	Document Number	Rev
	Valley 6/9 (USB/LPC/I2C)	1A

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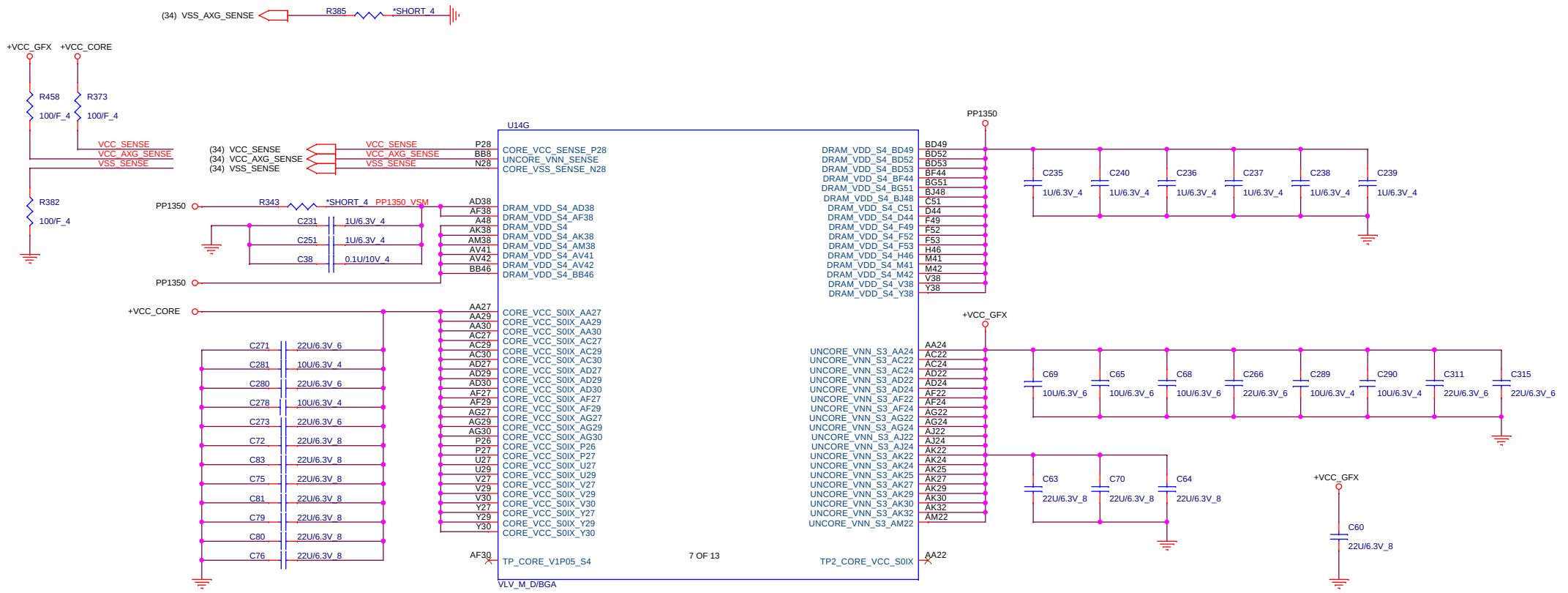
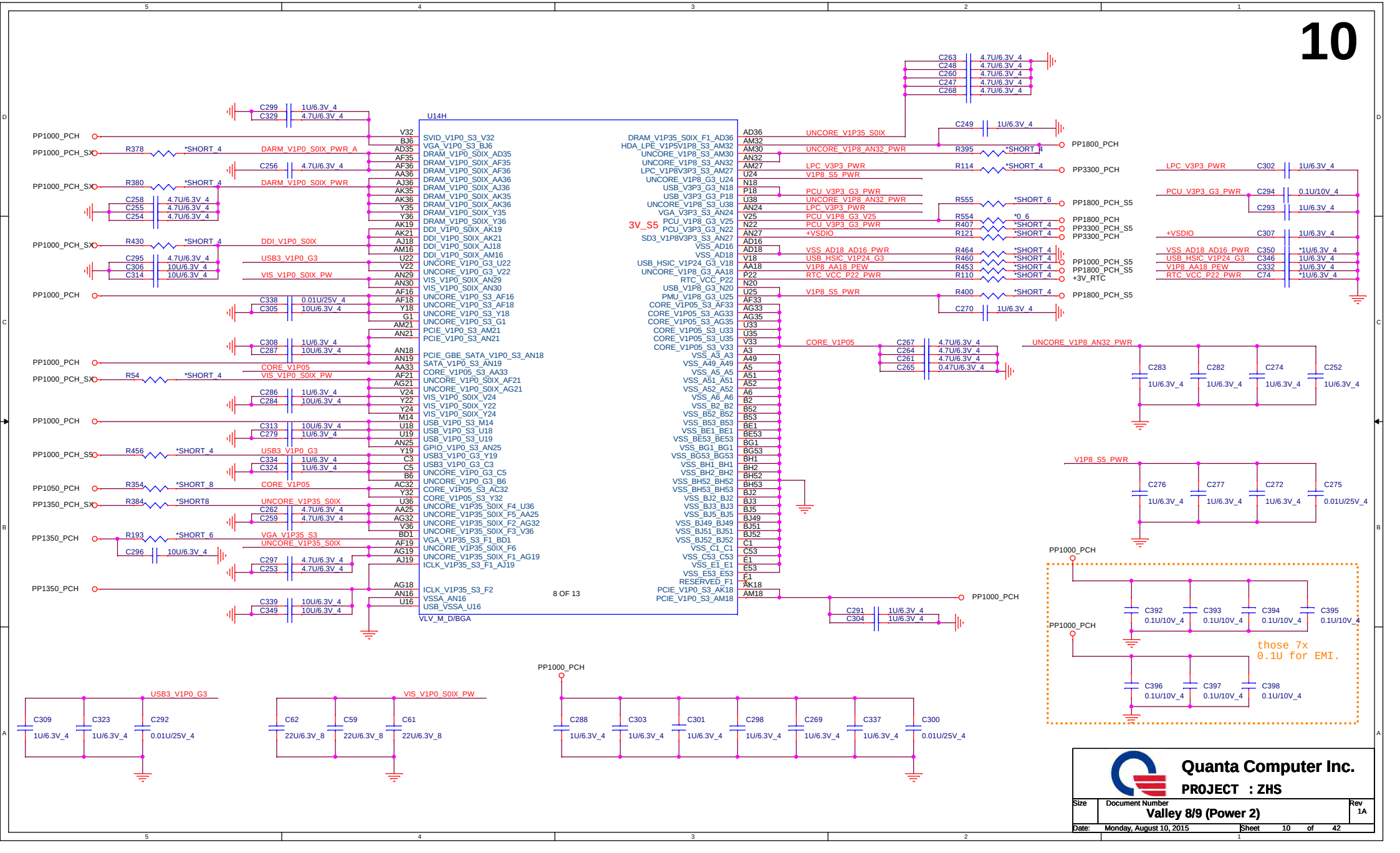
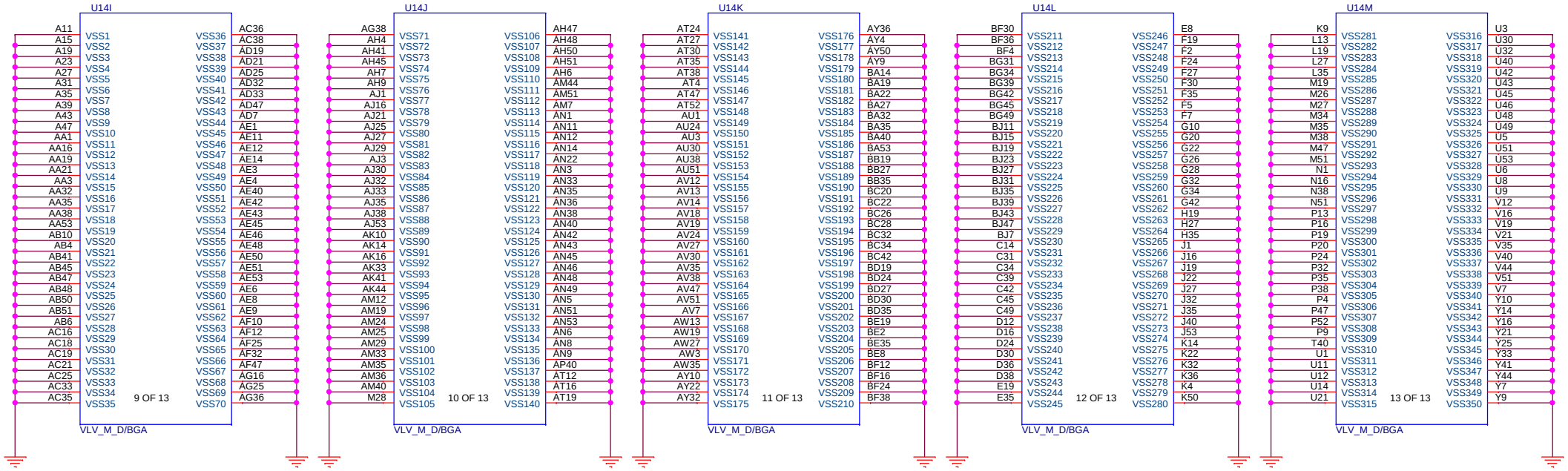


Quanta Computer Inc.

PROJECT : ZHS

Size	Document Number	Rev
	Valley 7/9 (Power 1)	1A
Date: Monday, August 10, 2015	Sheet 9 of 42	


10
U14H
8 OF 13
VLV_M_D/BGA
Quanta Computer Inc.
PROJECT : ZHS
Valley 8/9 (Power 2)
Size
Document Number
Rev
1A
Date: Monday, August 10, 2015
Sheet 10 of 42
those 7x
0.1U for EMI.



Quanta Computer Inc.

PROJECT : ZHS

Size	Document Number	Rev
	Valley 9/9 (GND)	1A

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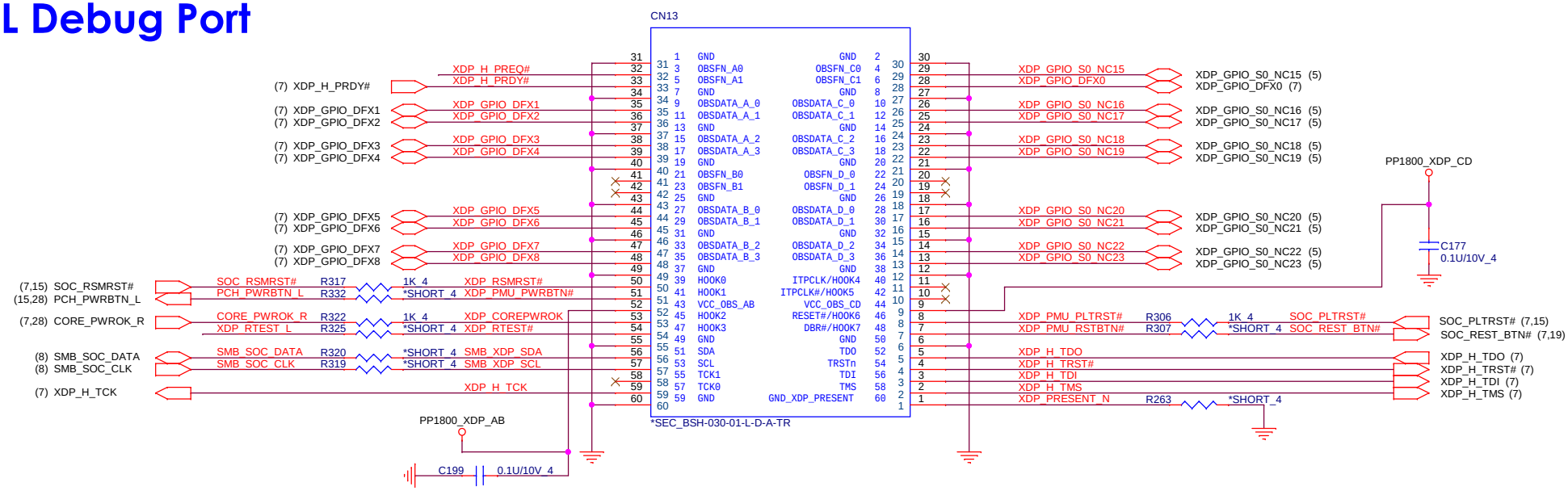
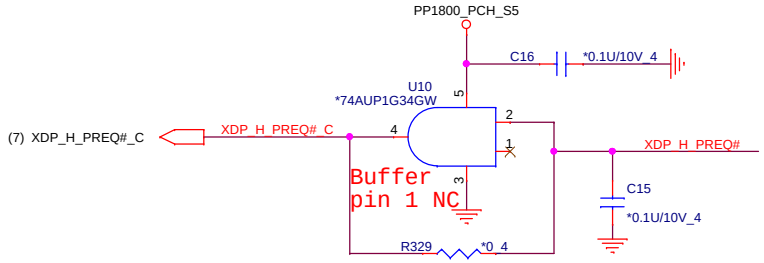
INTEL Debug Port

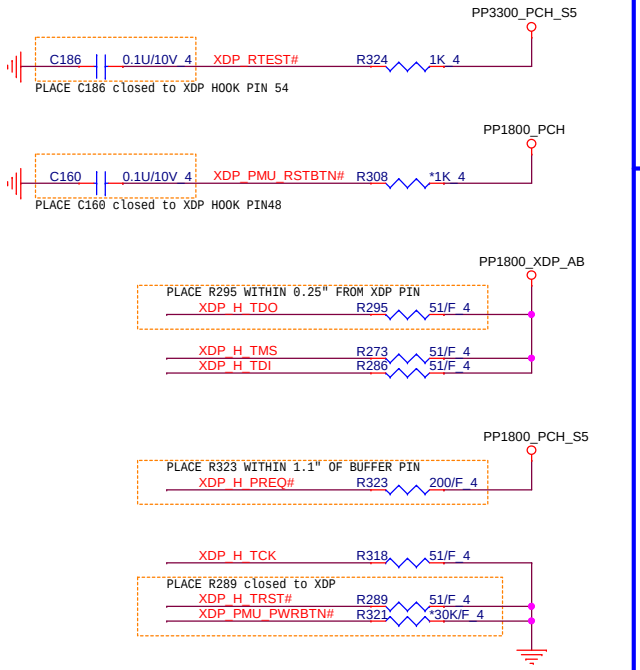
12



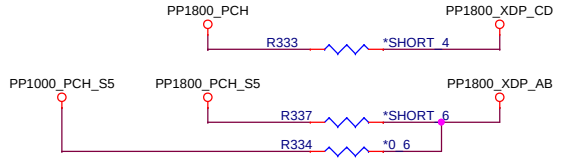
XDP



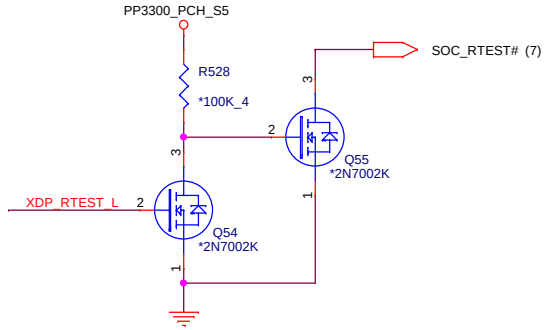
XDP



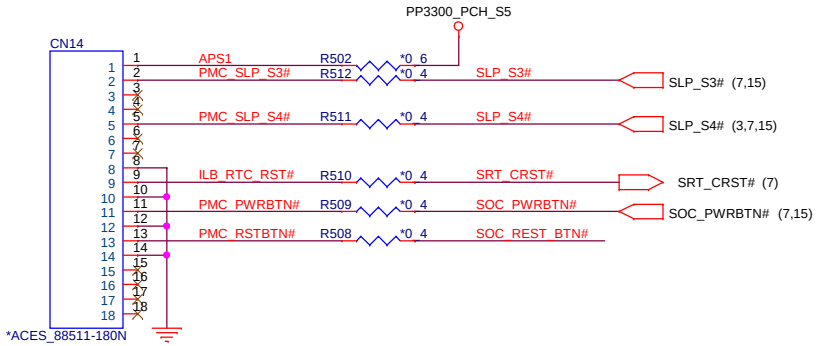
INTEL Debug Port Power



XDP Reset



APS



Quanta Computer Inc.		
PROJECT : ZHS		
Size	Document Number	Rev
	CPU XDP / APS	1A
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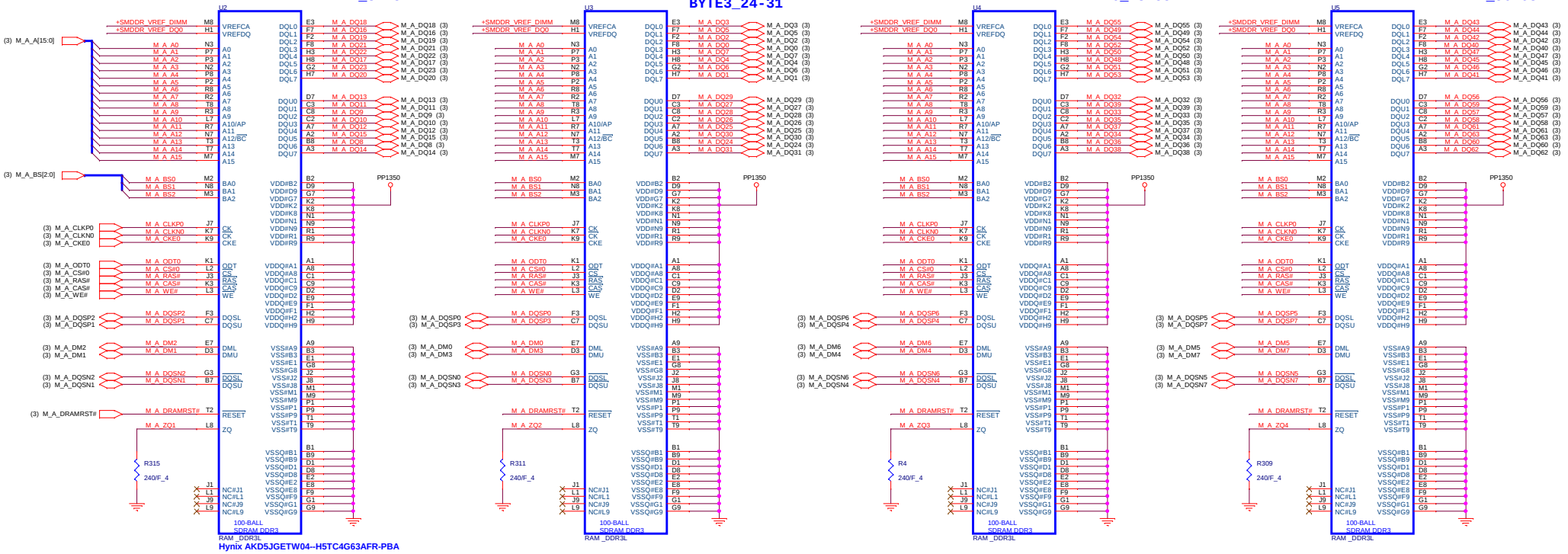
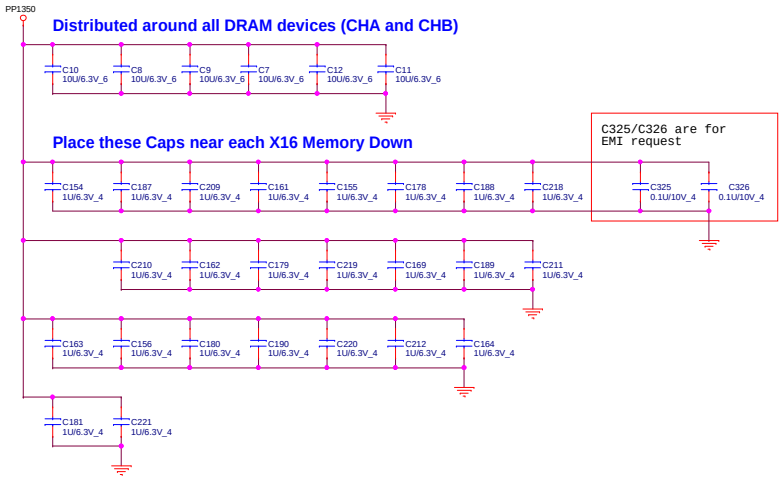
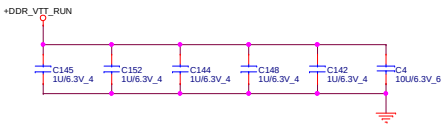
BYTE2_16-23
BYTE1_8-15
BYTE0_0-7
BYTE3_24-31
BYTE4_32-39
BYTE6_48-55
BYTE5_40-47
BYTE7_56-63

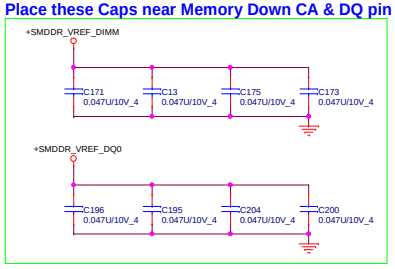


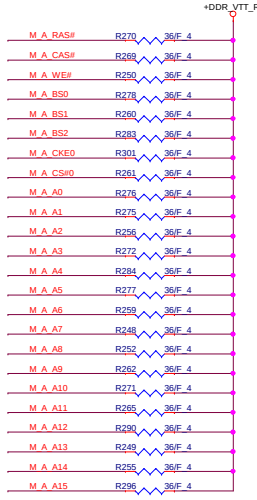
Hynix AKD5JGETW04--H5TC4G63AFR-PBA

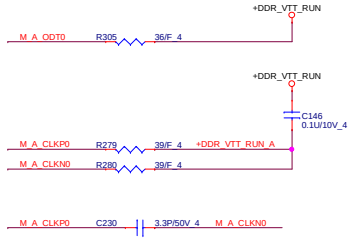
Vendor	P/N	
Hynix	AKD5JGETW04	DDR3L 1600Mhz 4Gb
Elpida	AKD5JGST400	DDR3L 1333Mhz 4Gb
	AKD5JGST404	DDR3L 1600Mhz 4Gb

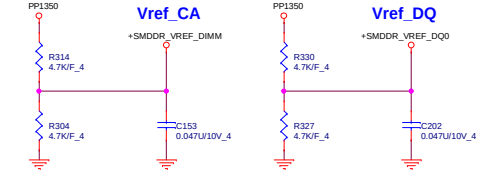












Quanta Computer Inc.
PROJECT : ZHS

Size	Document Number	Rev
	DDR3L MEMORY DOWNx16 A	1A
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BYTE2_16-23
BYTE3_24-31

BYTE0_0-7
BYTE1_8-15

BYTE6_48-55
BYTE4_32-39

BYTE5_40-47
BYTE7_56-63

Hynix AKD5JGETW04--H5TC4G63AFR-PBA

Vendor	P/N	
Hynix	AKD5JGETW04	DDR3L 1600Mhz 4Gb
Elpida	AKD5JGST400	DDR3L 1333Mhz 4Gb
	AKD5JGST404	DDR3L 1333Mhz 4Gb

Place these Caps near each X16 Memory Down

Place these Caps near Memory Down CA & DQ pin

M1 solution

Vref_DQ

Quanta Computer Inc.
PROJECT : ZHS

Size	Document Number	Rev
	DDR3L MEMORY DOWNx16 CH-B	1A

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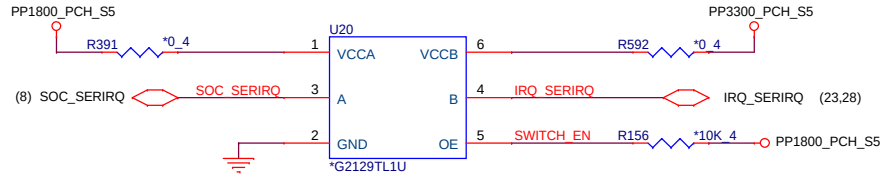
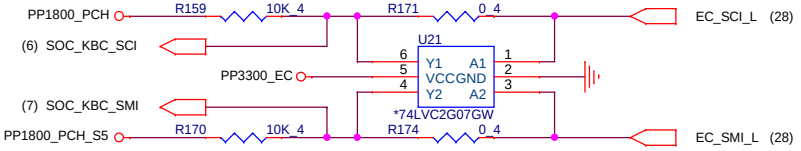
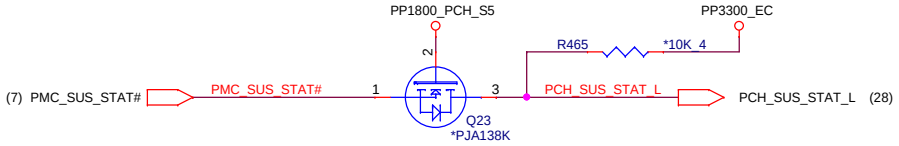
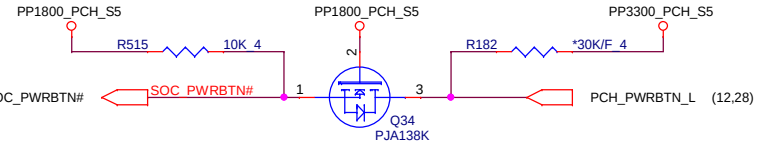
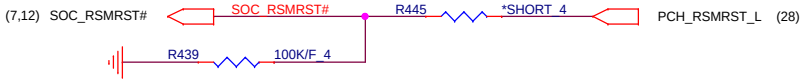
PWRON SEQUENCE

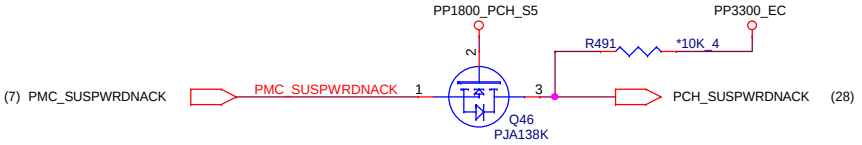




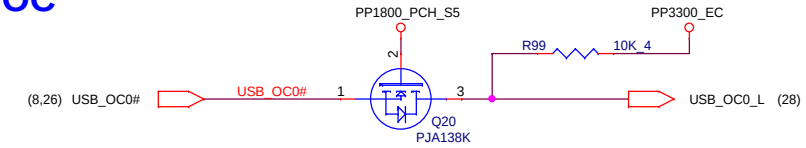




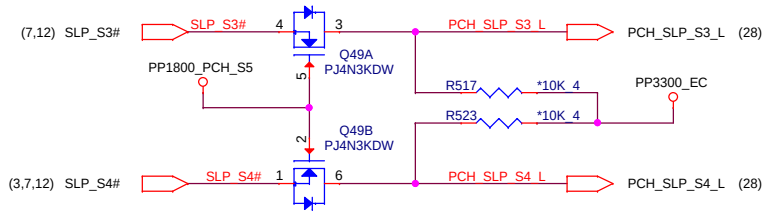


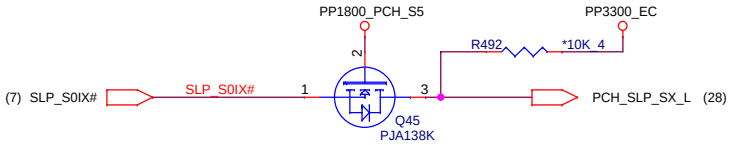


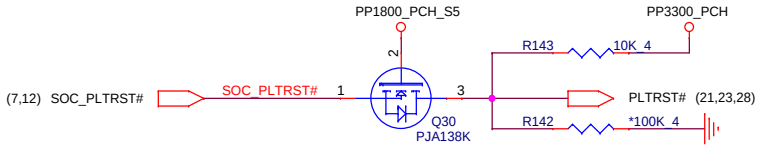
USB OC



PWRON SEQUENCE







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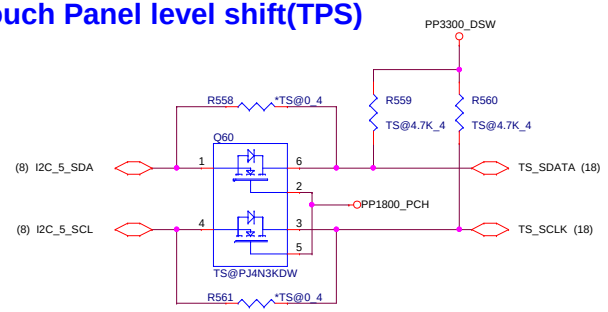
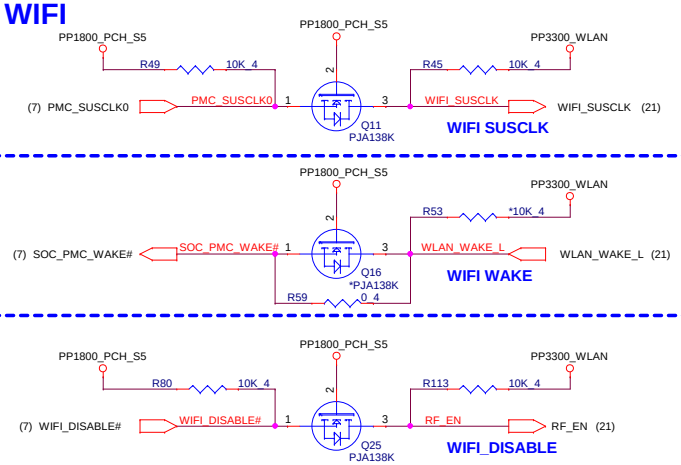
Quanta Computer Inc.		
PROJECT : ZHS		
Size	Document Number: Level Shifter (SOC_EC)	Rev: 1A
Date: Monday, August 10, 2015	Sheet 15 of 42	

Touch Panel level shift(TPS)

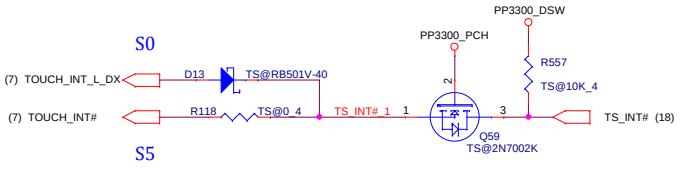


LTE

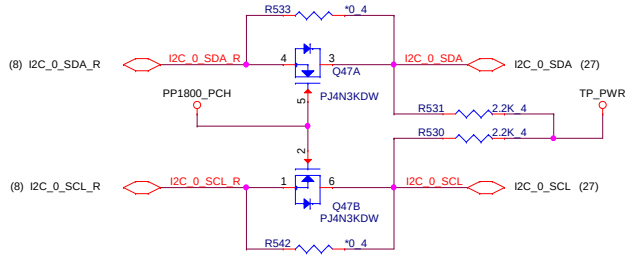
WIFI



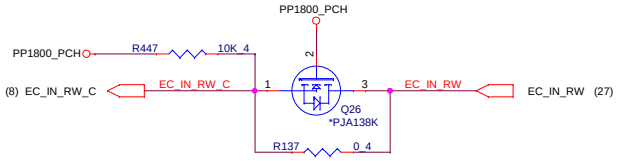
Touch Screen(TPS)



Track Pad

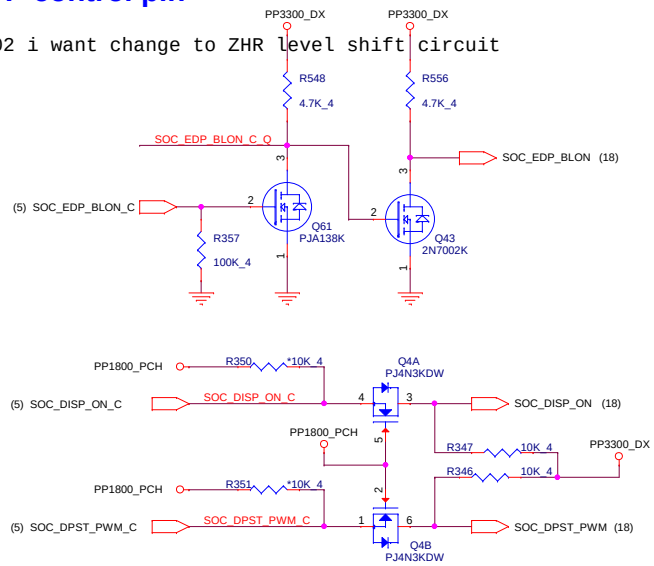


HW RESET

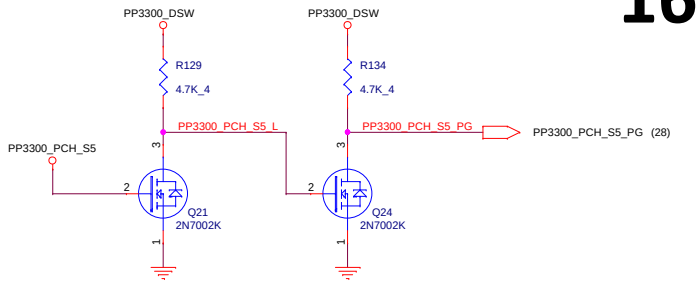


eDP control pin

0402 i want change to ZHR level shift circuit

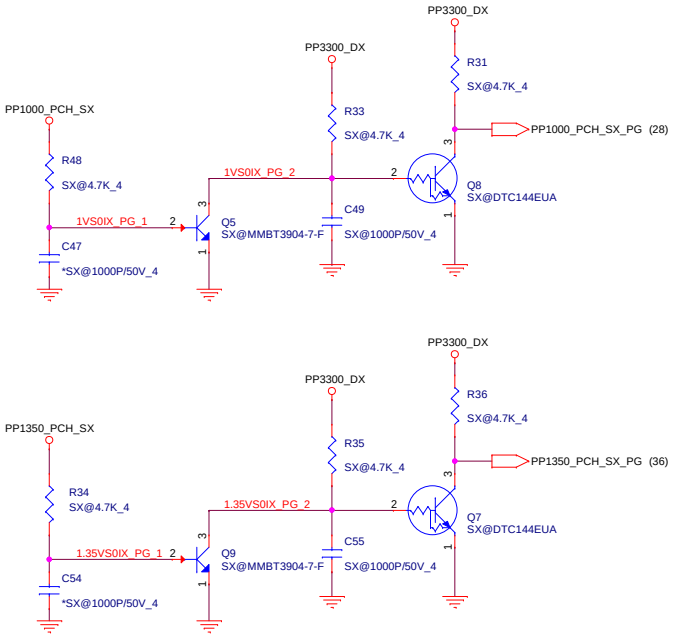


S5 Power Good(+3V_S5)

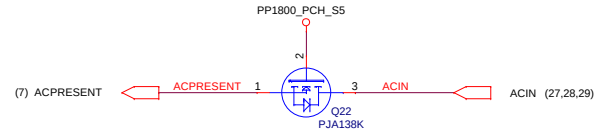


S0iX Power Good

for proto type only, can remove at MP stage if S0ix is not needed



AC Detect



Quanta Computer Inc.
PROJECT : ZHS

Size	Document Number	Rev
	Level Shifter (SOC_DEV)	1A
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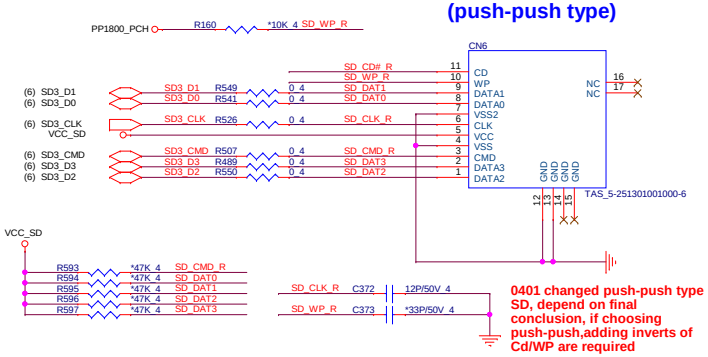
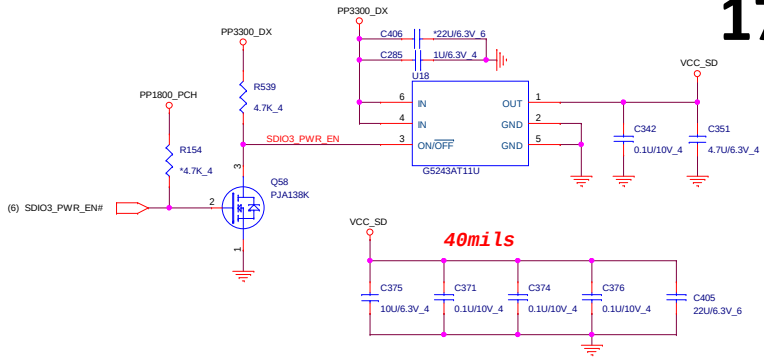
SD/MMC CARD READER CONNECTOR (CBS)

This is full size SD card (push-push type)

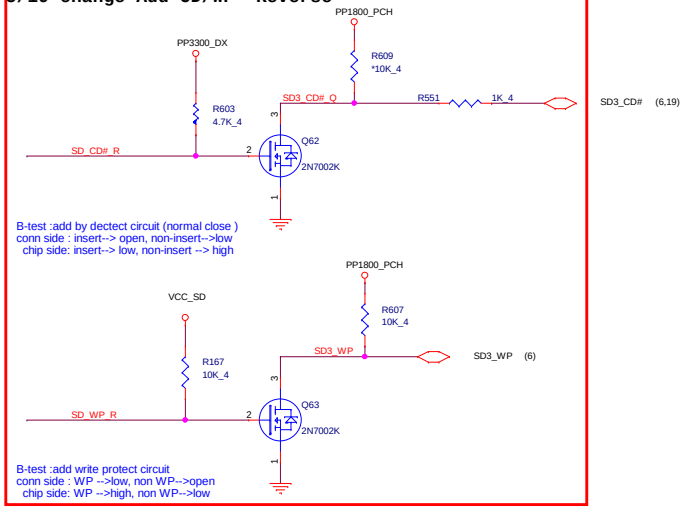


0401 changed push-push type SD, depend on final conclusion, if choosing push-push,adding inverts of Cd/WP are required

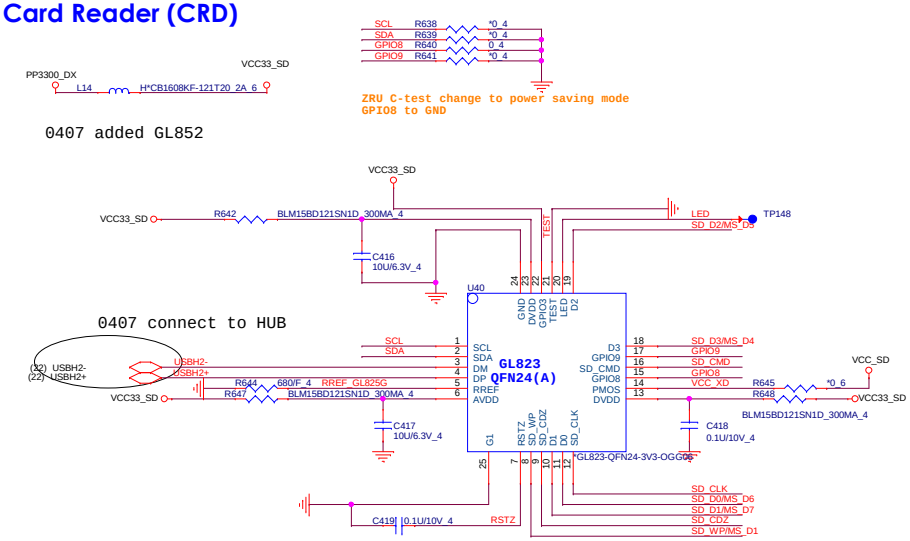
SD card power (CBS)



5/19 change Add CD/WP Reverse



Card Reader (CRD)



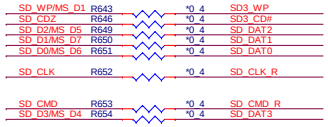
GPIO8	GPIO9	FUNCTION
NC	NC	Default Configuration
NC	GND	Remote wake up enable
GND	NC	Power saving enable
GND	GND	ESD mode enable

Application Note

SCL	FUNCTION
NC	Default "Generic STORAGE DEVICE" String
GND	"USB Flash Disk" String

SDA	FUNCTION
NC	Default Support Serial Number
GND	Non Support Serial Number

0407 reserved GL852 bus



Quanta Computer Inc.
PROJECT : ZHS

Size	Document Number	Rev
	SDIO CardReader /USB HUB	1A
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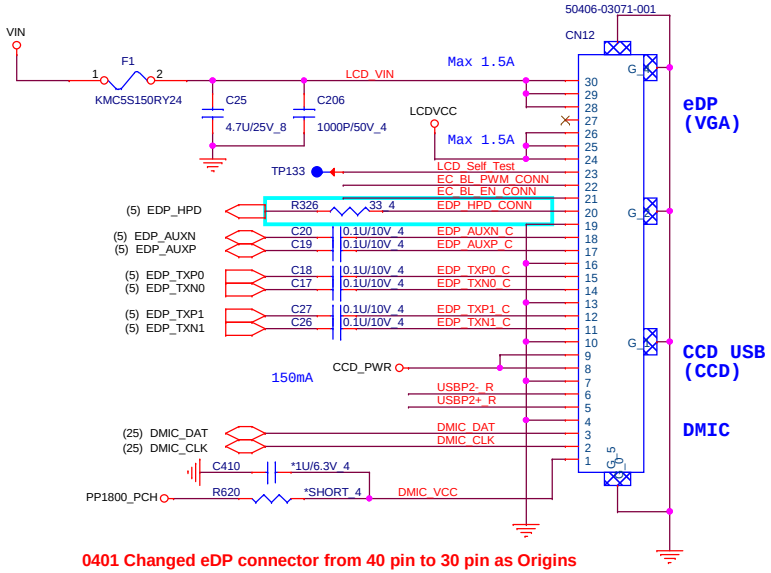
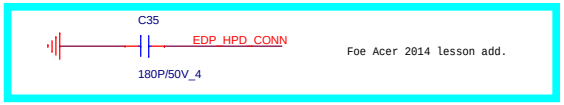
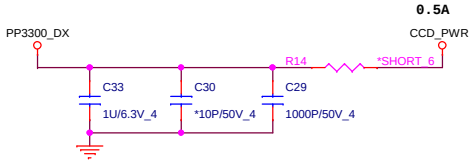
LCD CONN



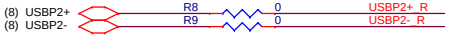
0401 Changed eDP connector from 40 pin to 30 pin as Origins



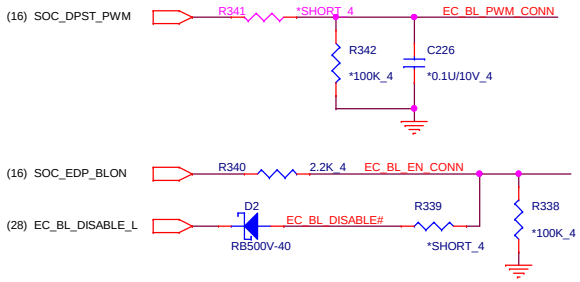
CCD Power(CCD)



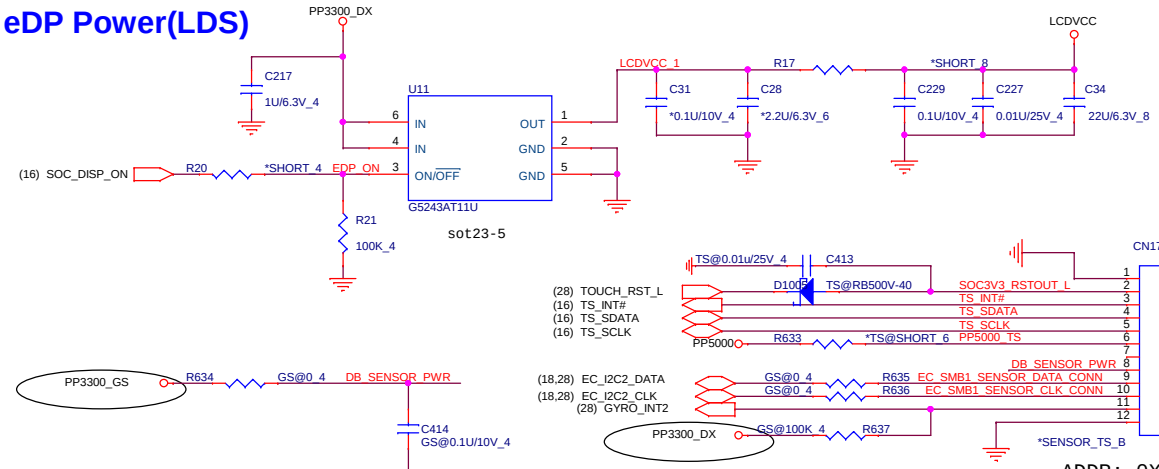
CCD USB(CCD)



eDP panel control(LDS)

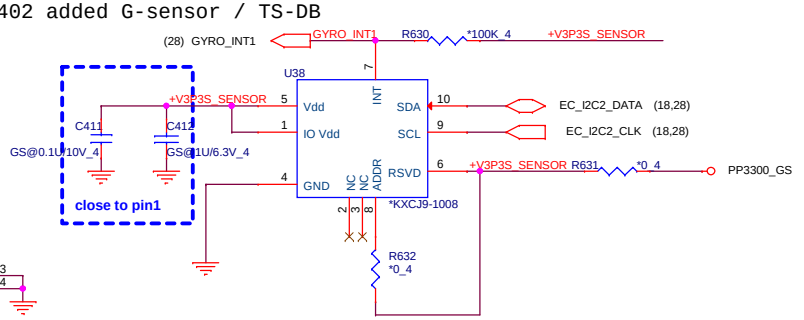


eDP Power(LDS)



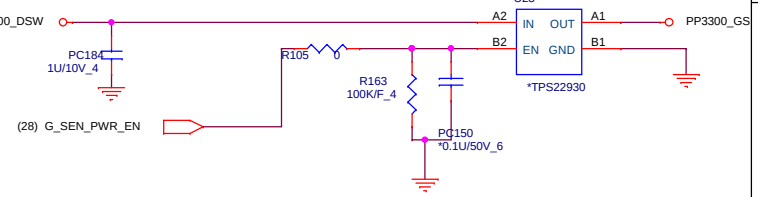
0402 what power domain for G-sensor

0402 added G-sensor / TS-DB



ADDR: 0X0F(Write: 0x1E,Read: 0x1F)

ADDR: 0X0E



Quanta Computer Inc.
PROJECT : ZHS
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LVDS/CCD/TS | 1A
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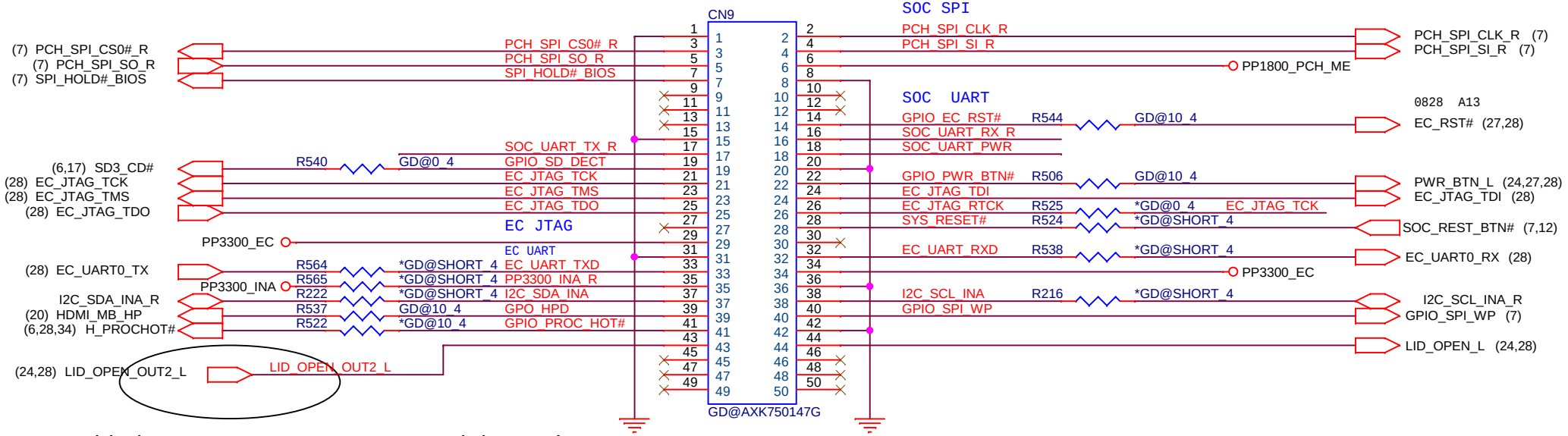
GOOGLE Debug Port(MPC)

PIN7 OD
PIN14 OD
PIN19 OD
PIN22 OD
PIN28 OD
PIN30 OD
PIN37 OD
PIN38 OD
PIN39 OD
PIN41 OD
PIN43 OD
PIN44 OD
PIN45 OD
PIN46 OD
PIN47 OD
PIN48 OD
PIN49 OD
PIN50 OD

19

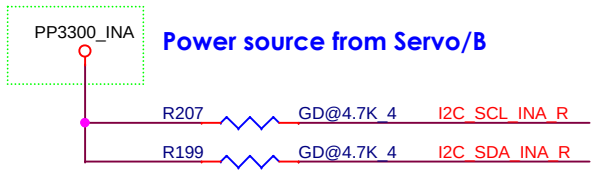
50 pin BTB is MUST, don't use 42 pin

Socket part number AXK750147G



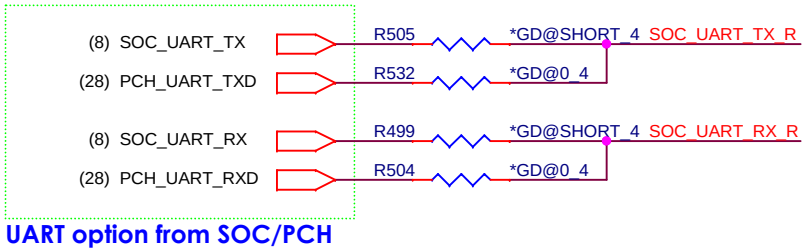
0402 added LID_OPEN_OUT2_L on G-debug pin 43

Servo/B I2C Power(MPC)



UART Power(MPC)

UART(MPC)



Quanta Computer Inc.

PROJECT : ZHS

Size	Document Number	Rev
	Google Debug	1A
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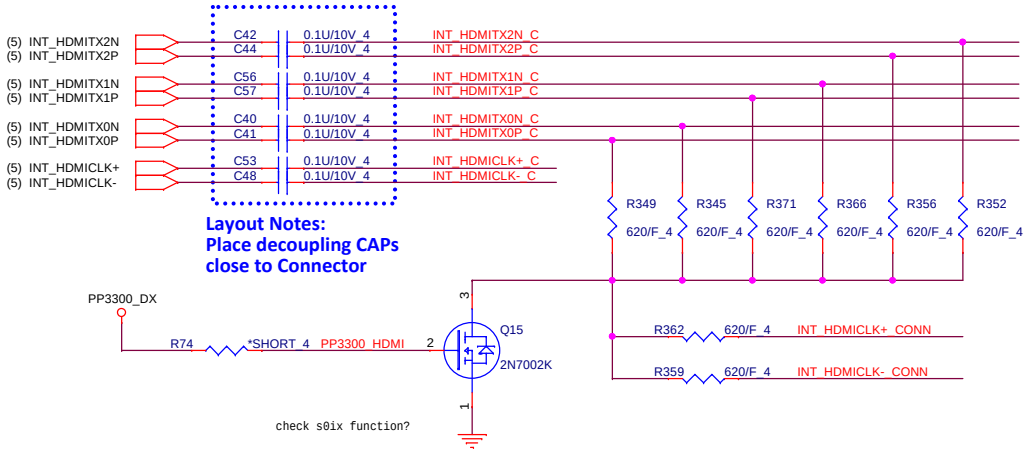
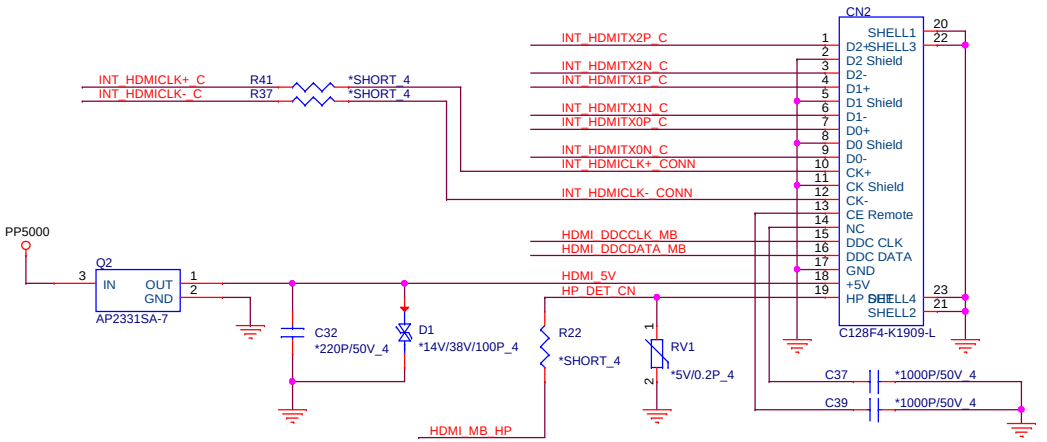
HDMI Cost Reduced level shift (HDM)



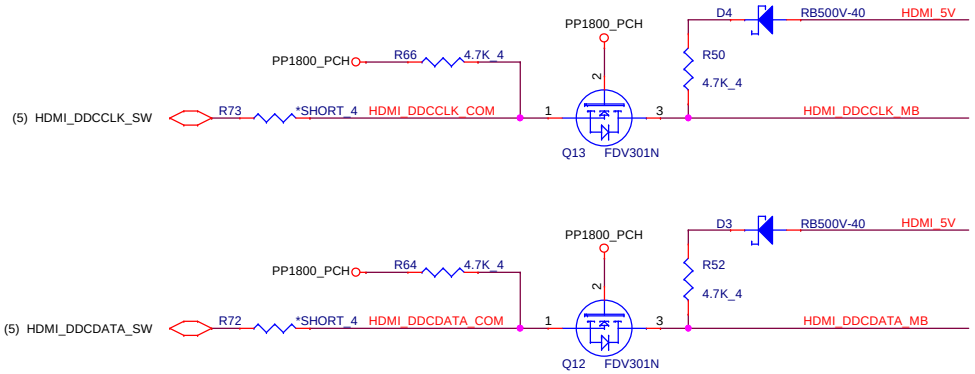
HDMI connector (HDM)

20

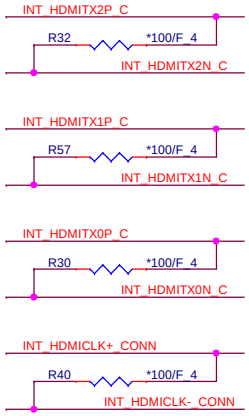


0401 Changed HDMI connector as Origins use

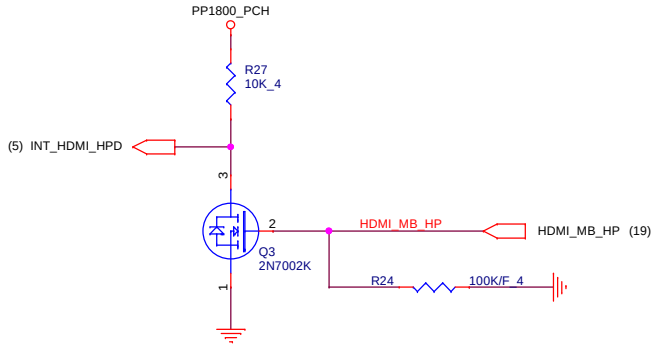
HDMI DDC (HDM)



EMI



HDMI-detect (HDM)



Quanta Computer Inc.		
PROJECT : ZHS		
Size	Document Number	Rev
	HDMI	1A
Date: Monday, August 10, 2015	Sheet 20 of 42	

WIFI/BT COMBO NGFF E KEY(MNC)

21

CN16

NGFF

			GND	75	
+WL_VDD		74	3.3Vaux	GND	73	NFC_NOT_ALLOWED → TP51
		72	3.3Vaux	RESERVED	71	
		70	NC	RESERVED	69	
TP27	NFC_ANT_N	68	NFC_ANT_N	GND	67	
TP26	NFC_ANT_P	66	NFC_ANT_P	PETn1	65	
TP25	NFC_VDDANT	64	NFC_VDDANT	PETp1	63	
		62		GND	61	
PIN54: disable Antenna		60	ALERT	PERn1	59	
PIN52: power down CHIP		58	I2C_CLK	PERp1	57	
		56	I2C_DATA	GND	55	WLAN_WAKE_L
	RF_EN	54	W_DISABLE#	PEWake0#	53	PCIE_CLKREQ_WLAN#_Q
	PDN#	52	PDN#	CLKREQ0#	51	
	WLAN_RST#	50	PERST0#	GND	49	
		48	SUSCLK_32KHz	REFCLKN0	47	CLK_PCIE_WLANN (7)
TP42	LTE_SOUT	46	LTE_SOUT	REFCLKP0	45	CLK_PCIE_WLANP (7)
TP43	LTE_SIN	44	LTE_SIN	GND	43	
		42	NC	PETn0	41	PCIE_RX0-_WLAN (6)
TP29	NFC_WI_IN	40	NFC_WI_IN	PETp0	39	PCIE_RX0+_WLAN (6)
TP1	NFC_SWP2_IO	38	NFC_SWP2_IO	GND	37	
TP39	NFC_ACTIVE	36	NC	PERn0	35	PCIE_TX0-_WLAN (6)
NFC Security		34	UART_CTS	PERp0	33	PCIE_TX0+_WLAN (6)
		32	UART_RTS	GND		
TP28	WIFI_UART_RX		UART_Rx			

SLOT A-SD

		30	KEY	KEY	31	
		28	KEY	KEY	29	
		26	KEY	KEY	27	
		24	KEY	KEY	25	
			KEY	KEY		
TP30	WIFI_UART_TX	22	UART_Tx	SDIO_RESET	23	WIFI_SDIO_RESET → TP113
		20	UART_Wake	SDIO_WAKE	21	WIFI_SDIO_WAKE → TP114
TP3	BT_LED	18	GND	SDIO_DAT3	19	WIFI_SDIO_DAT3 → TP115
		16	LED#2	SDIO_DAT2	17	WIFI_SDIO_DAT2 → TP116
TP129	PCM_IN	14	PCM_IN	SDIO_DAT1	15	WIFI_SDIO_DAT1 → TP117
TP130	PCM_OUT	12	PCM_OUT	SDIO_DAT0	13	WIFI_SDIO_DAT0 → TP118
TP131	PCM_SYNC	10	PCM_SYNC	SDIO_CMD	11	WIFI_SDIO_CMD → TP119
TP132	PCM_CLK	8	PCM_CLK	SDIO_CLK	9	WIFI_SDIO_CLK → TP120
TP2	WLAN_LED1#	6	LED#1	GND	7	
		4	3.3Vaux	USB_D-	5	USBP3- (8)
+WL_VDD		2	3.3Vaux	USB_D+	3	USBP3+ (8)
			GND GND	GND	1	

76 77

WLAN_NGFF CONN(Type 2230)_51745-0750P-005

WAKE/REQ 53, 55 is OD

W/L

BT

0401 Changed WiFi NGFF connector as Origins use

WLAN_OFF_L POWER DOWN LAN CHIP from EC?
WIFI_DISABLE_L disable Antenna from PCH?

(Low Active) (16) RF_EN
(Low Active) (28) WLAN_OFF_L
(15,23,28) PLTRST#
(16) WIFI_SUSCLK

R55 *SHORT_4
R46 *SHORT_4

+WL_VDD
R47 *10K_4 PDN#

WL/BT NGFF Power

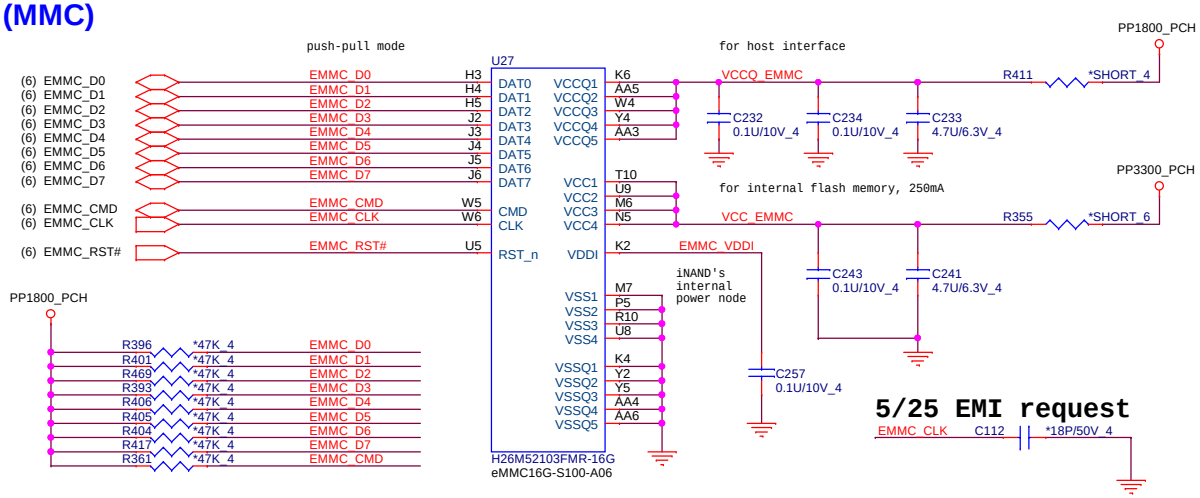
PP3300_WLAN
R39
*SHORT_8
C52 10U/6.3V_6
C244 0.1U/10V_4
C50 *0.1U/10V_4
C51 *0.1U/10V_4
+WL_VDD

+WL_VDD
R42 *10K_4
PP1800_PCH
Q10 *PJA138K
PCIE_CLKREQ_WLAN# (6)
PCIE_CLKREQ_WLAN#_Q
R44 *SHORT_4

Quanta Computer Inc.
PROJECT : ZHS

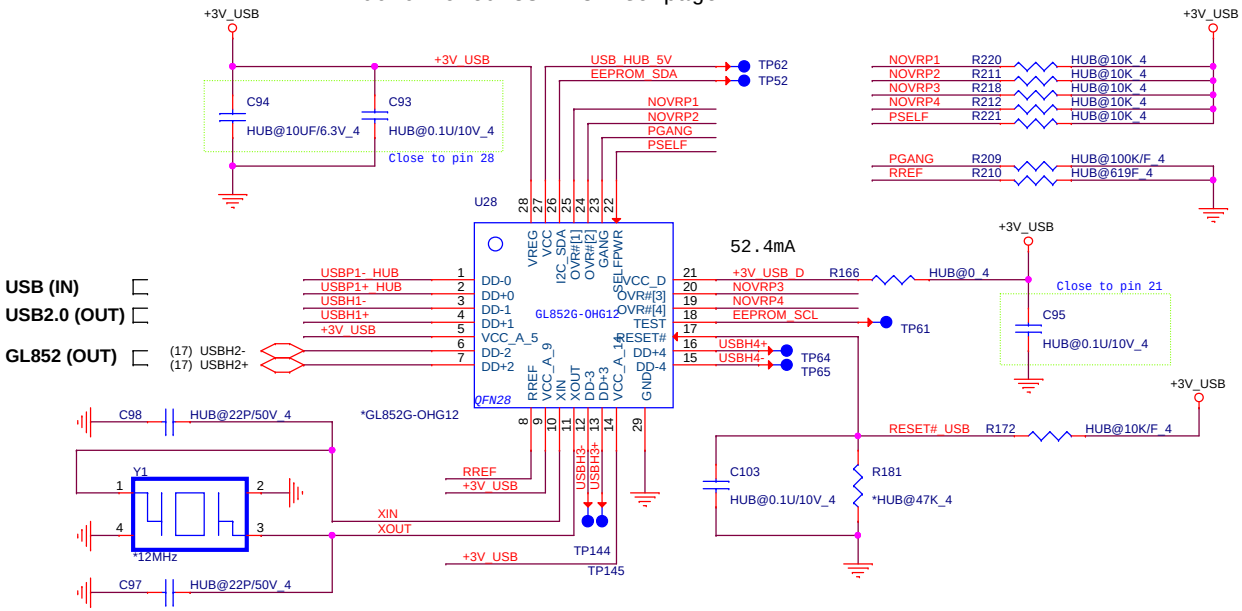
Size	Document Number	Rev
	WIFI / BT	1A
Date: Monday, August 10, 2015	Sheet 21 of 42	

EMMC (MMC)

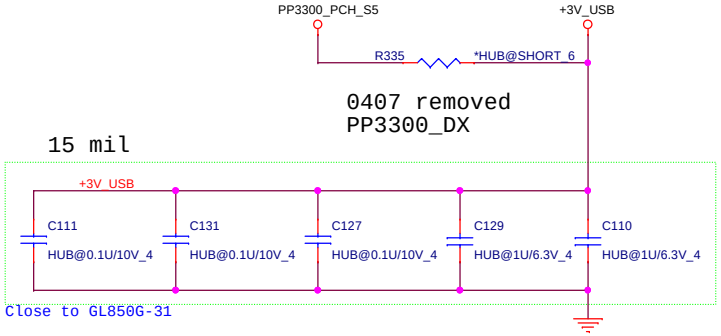


USB HUB (HUB)

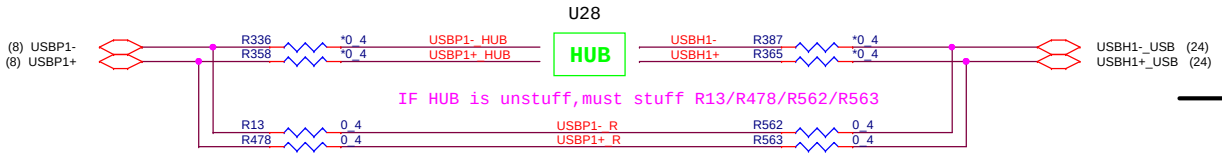
0616 moved USB HUB to page 22



USB HUB power (HUB)



USB option for GL852/USB2.0 (HUB)



To IO/B

USB 2.0 CONN

Quanta Computer Inc.

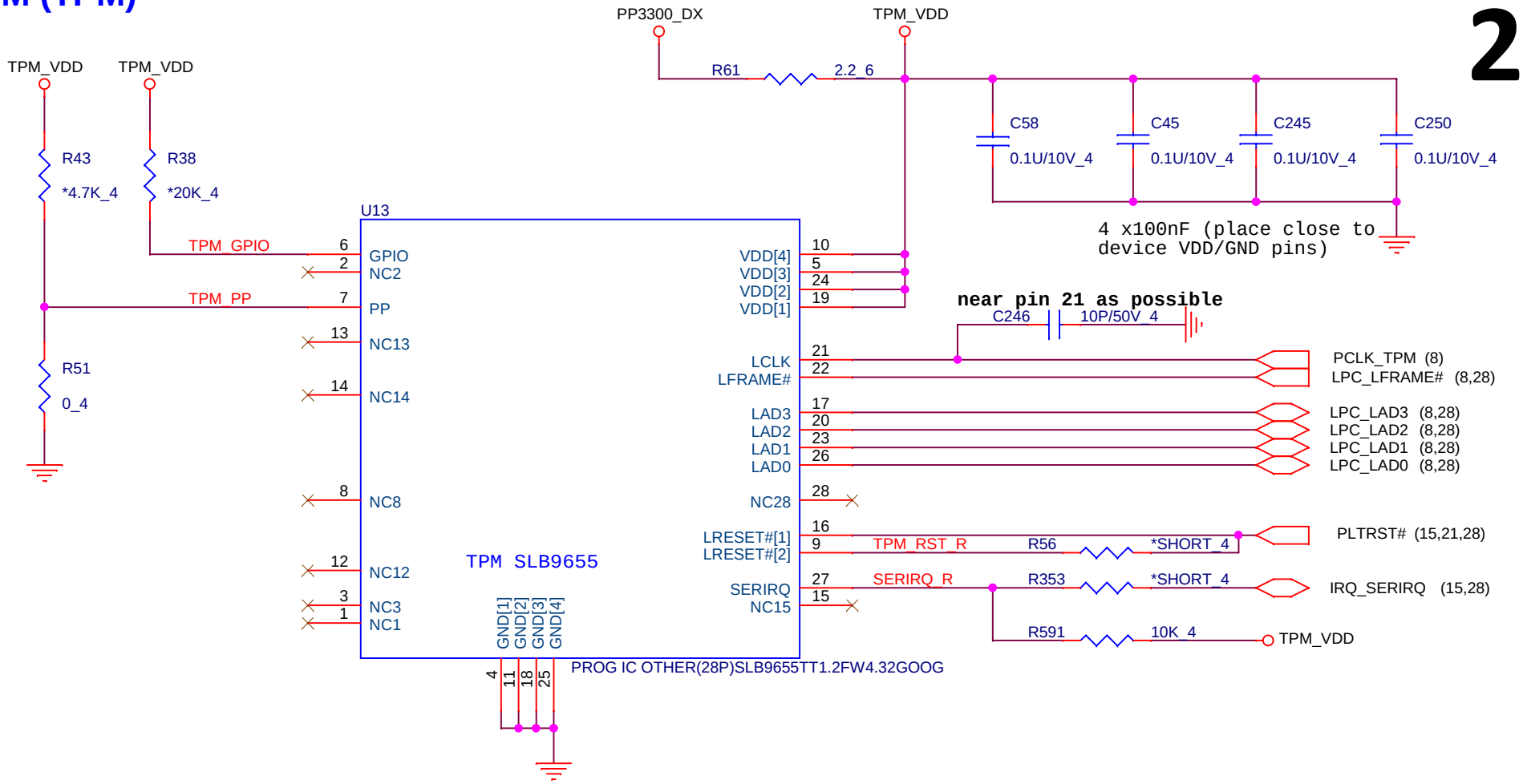
PROJECT : ZHS

Size	Document Number	Rev
	EMMC / LTE NGFF	1A

Date: Monday, August 10, 2015 Sheet 22 of 42

TPM (TPM)

23

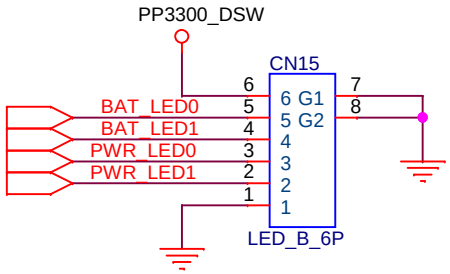


LED board(UIF)

0402 Changed LED board connector as Origins use

BATT_BLUE
BATT_Amber
PWR_Blue
Suspend_Amber

(28) BAT_LED0
(28) BAT_LED1
(28) PWR_LED0
(28) PWR_LED1

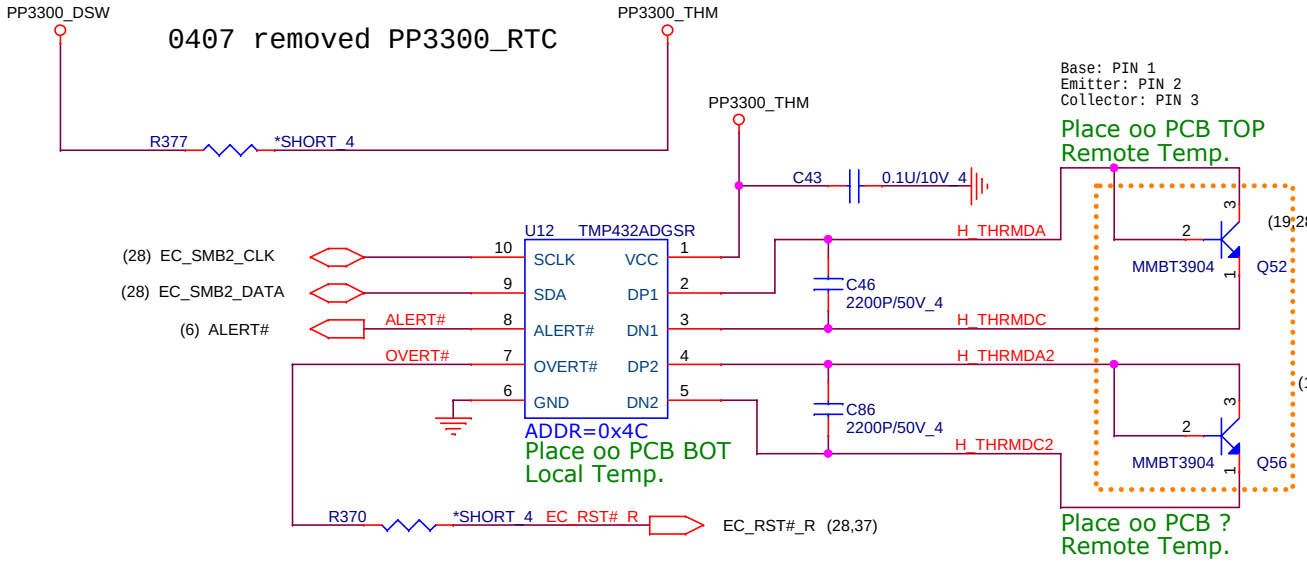


Quanta Computer Inc.

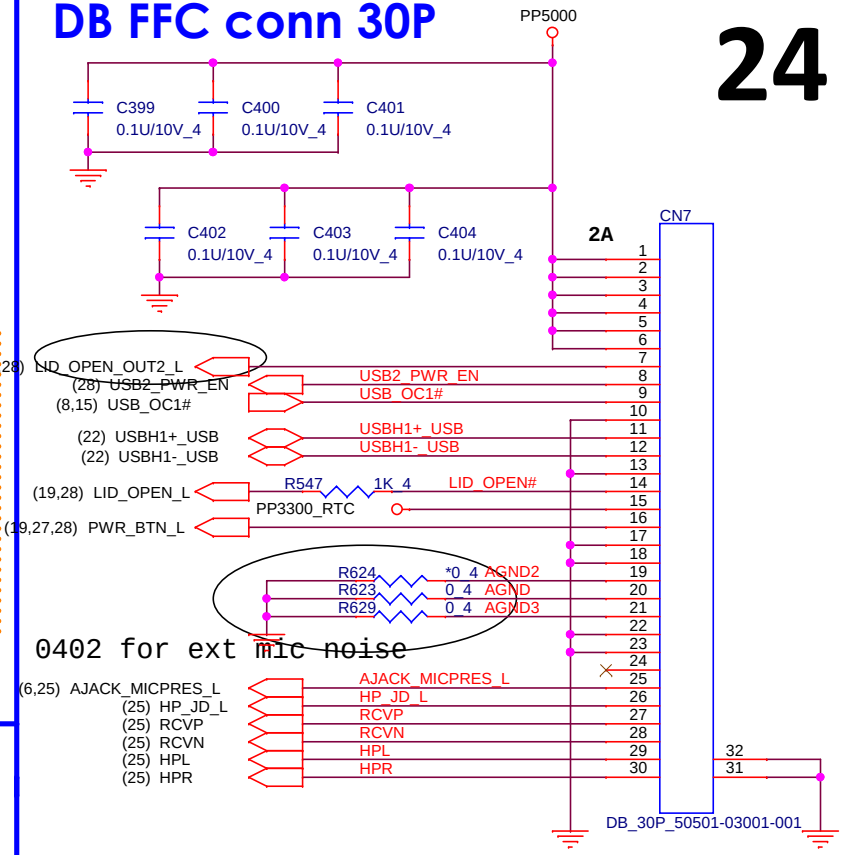
PROJECT : ZHS

Size	Document Number	Rev
	TPM SLB9655 / LED	1A
Date: Monday, August 10, 2015	Sheet 23 of 42	

Thermal Sensor(THM)



DB FFC conn 30P



USB 2.0_ILIM_SEL (USB)

Quanta Computer Inc.		
PROJECT : ZHS		
Size	Document Number: DB/Thermal sensor/LTE PWR	Rev: 1A
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AUDIO CODEC (ADO)

25

PP1800_PCH

BOM Change to 0_4 due to material shortage

L13 60ohm@100MHz_4

PP1800_CODEC_AVDD

R217 *SHORT_6

PP1800_CODEC_DVDDIO

+5VA

C366 1U/16V_4 C365 0.1U/10V_4 C367 10U/6.3V_4

C359 0.1U/10V_4 C364 1U/16V_4 C358 1U/16V_4

C357 1U/16V_4 C360 0.1U/10V_4 C363 10U/6.3V_4

Close to PIN26 Close to PIN38

U25

MAX98090AETL+T

DVDDIO DVDD AVDD HPVDD SPKLVDD SPKRVDD

(7) I2S_MCLK R228 *SHORT_4 CODEC_CLK_IN 35 MCLK

(6) I2S_BCLK_R 33 BCLK

(6) I2S_LRCLK_R 32 LRCLK

(6) I2S_DOUT_R 30 SDIN

(6) I2S_DIN_R 31 SDOUT

SPKLP SPKLN SPKRP SPKRN

16 L_SPK+

15 L_SPK-

12 R_SPK+

11 R_SPK-

(8) I2C_1_SDA_R 37 SDA

(8) I2C_1_SCL_R 36 SCL

MICBIAS 22 MICBIAS_1 R223 *SHORT_4 MICBIAS

C118 1U/10V_4 R234 2.2K_4

(7) MUX_AUD_INT1# R219 *SHORT_4 CODEC_INT_OD_L 34 IRQ_L

PP1800_CODEC_AVDD R225 10K_4

(18) DMIC_DAT DMIC_DAT R605 *SHORT_4 DMIC_DAT_L 19 IN1/DMD

(18) DMIC_CLK DMIC_CLK R606 *SHORT_4 DMIC_CLK_L 18 IN2/DMC

20 IN3

21 IN4

RCVP/LOUTL 8

RCVN/LOUTR 9

(24) RCVP RCVP C120 1U/10V_4 CODEC_MIC_L_P

(24) RCVN RCVN C119 1U/10V_4 CODEC_MIC_L_N

CODEC_C1P 39 C1P

C133 1U/16V_4

CODEC_C1N 40 C1N

HPSNS 5 RCVN

JACKSNS 7 MIC_DET R600 *0_4 RCVP

HPL 4 HPOUT-L R238 5.6_4 HPL HPL (24)

HPR 6 HPOUT-R R239 5.6_4 HPR HPR (24)

REF 23

BIAS 24

3 CPVDD

2 CPVSS

C138 1U/10V_4 C135 1U/10V_4

C116 1U/10V_4 C117 2.2U/6.3V_4 R240 *4.7K_4 R237 *4.7K_4

DGND AGND HPGND SPKRGND SPKLGND

29 25 1 10 17

SOC DET (ADO)

PP1800_PCH

R176 330K_4 C99 1U/6.3V_4

(6) DET_TRIGGER

Q38 2N7002K

HP_JD_L (24)

PP1800_PCH

(6,24) AJACK_MICPRES_L AJACK_MICPRES_L R124 10K_4

Codec PWR 5V (ADO)

PP5000 DIGITAL ANALOG AVDD1 +5VA

L12 HCB1005KF_1.5A_4

C125 *0.1U/10V_4 C126 *10U/6.3V_6 C370 0.1U/10V_4 C369 10U/6.3V_4

Internal Speaker (ADO)

40mil for each signal

0402 ZHR had same circuit on SPK

follow 0C1 pin define

L_SPK+ R229 *SHORT_6 L_SPK+_1

L_SPK- R232 *SHORT_6 L_SPK-_1

R_SPK- R241 *SHORT_6 R_SPK-_1

R_SPK+ R233 *SHORT_6 R_SPK+_1

CN11 SPK_CONN_4P

C128 10P/50V_4 C134 10P/50V_4 C139 10P/50V_4 C136 10P/50V_4

DMIC(ADO)

5/25 EMI request

DMIC_DAT C130 *10P/50V_4

DMIC_CLK C132 *10P/50V_4

0402 changed for ext MIC noise

Quanta Computer Inc.

PROJECT : ZHS

Size	Document Number	Rev
	Audio Codec/SPK/DMIC	1A

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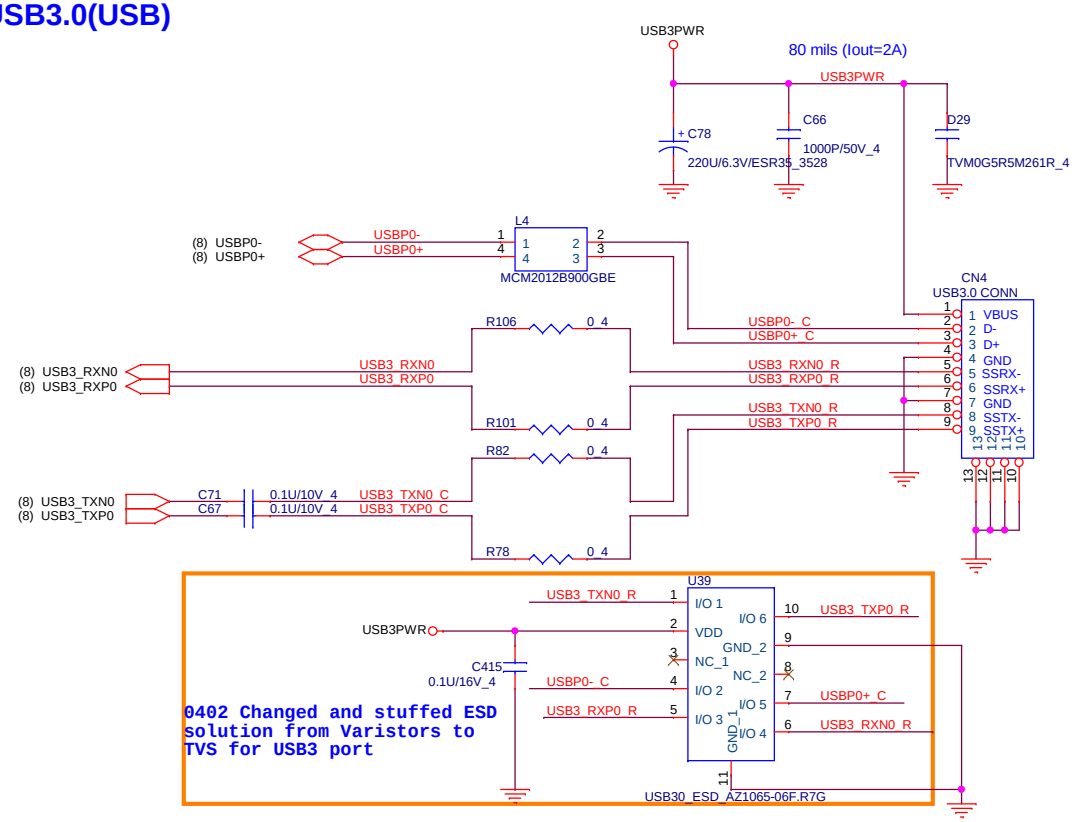
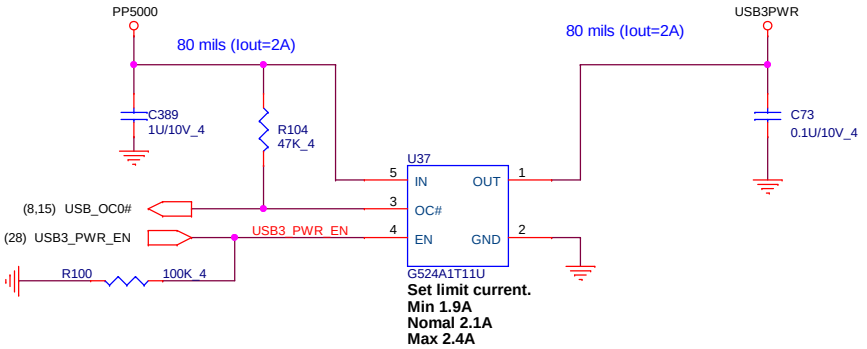
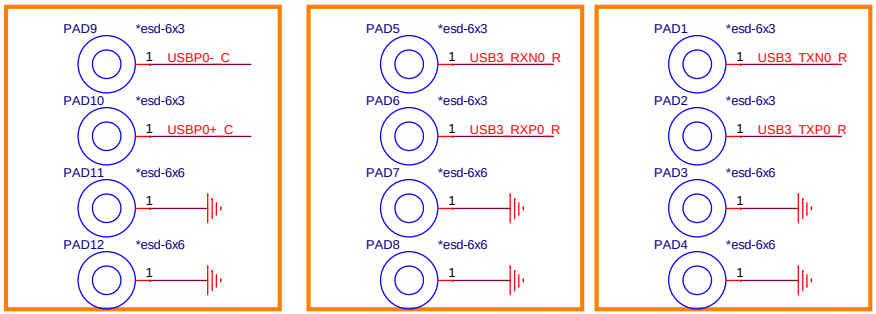
USB3.0(USB)



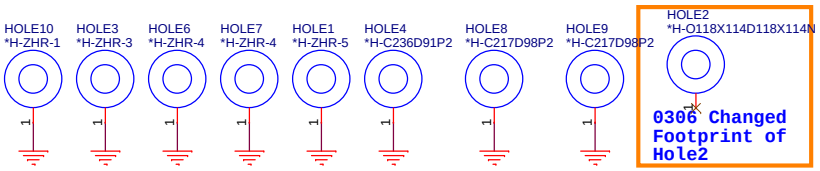
USB Switch



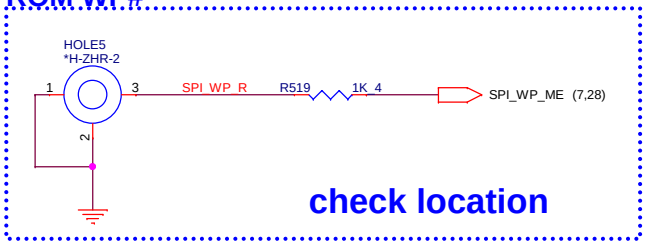
0804 Added PAD1-12 as ESD protection

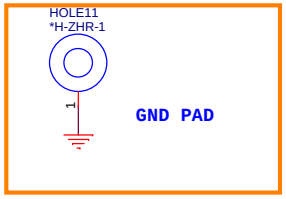


HOLE(OTH)



ROM WP#





Quanta Computer Inc.		
PROJECT : ZHS		
Size	Document Number: USB3/Hole	Rev: 1A
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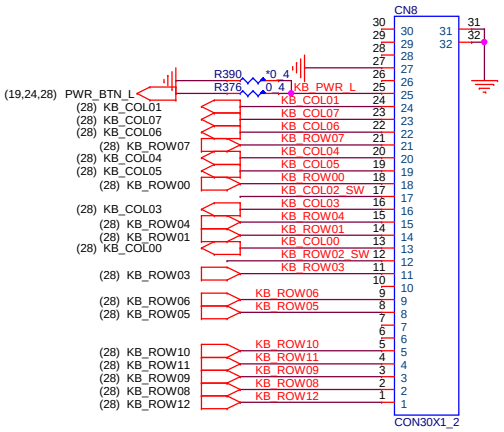
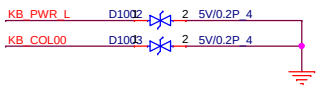
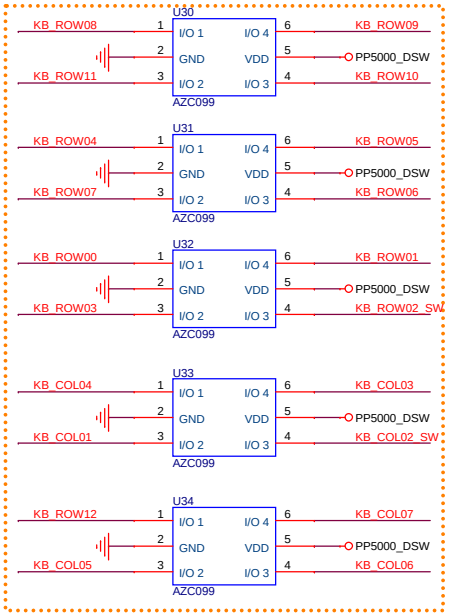
K/B (KBC)

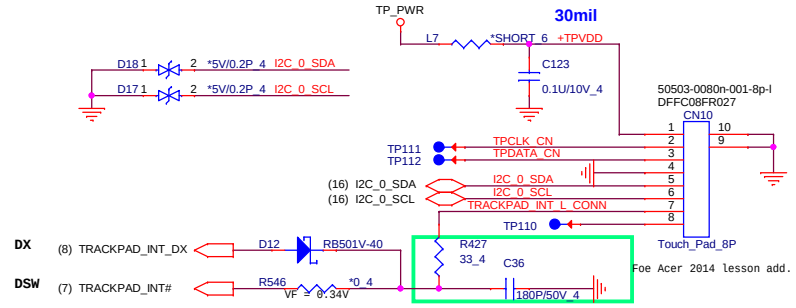


0402 Changed HDMI connector as Origins use

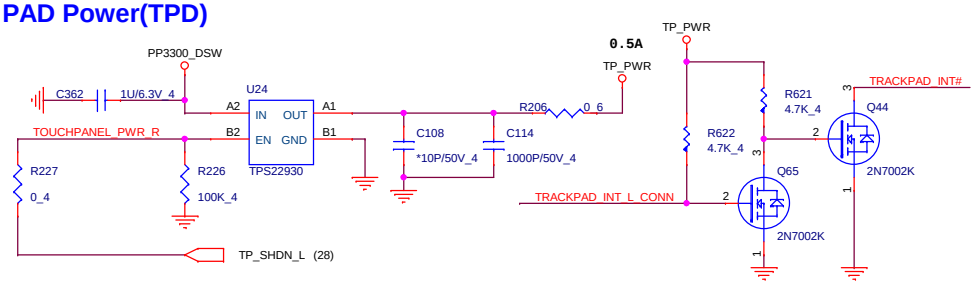




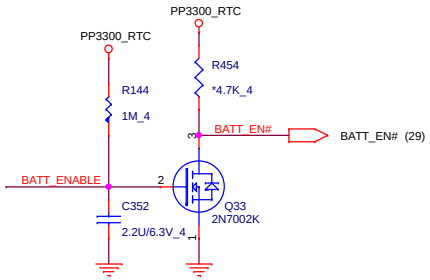
Track PAD BOARD CONN (TPD)



Track PAD Power(TPD)



HOLELESS RESET 2-CHIP(KBC)

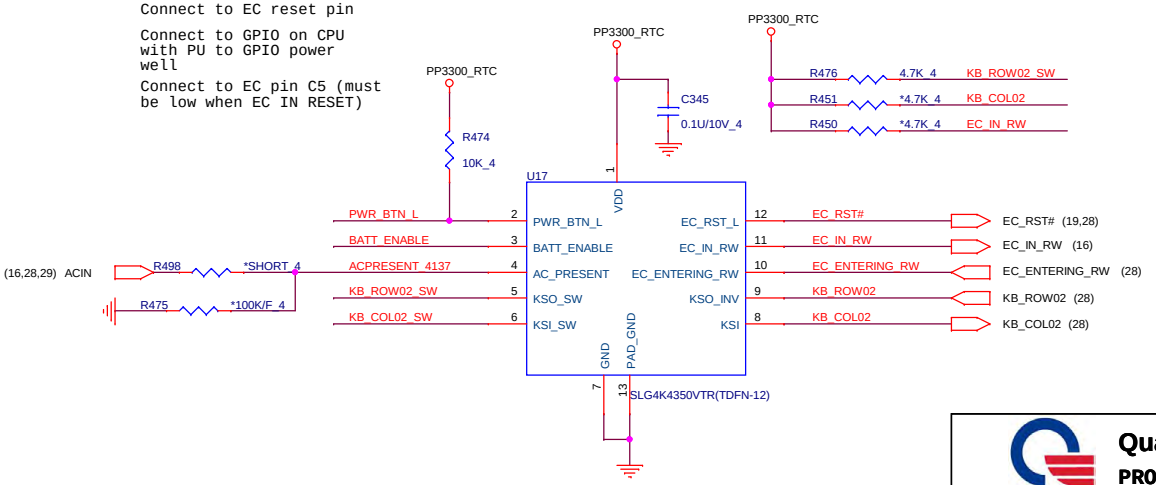


0407 removed SW1

Connect to EC reset pin

Connect to GPIO on CPU with PU to GPIO power well

Connect to EC pin C5 (must be low when EC IN RESET)



Quanta Computer Inc.

PROJECT : ZHS

Size	Document Number	Rev
	KB/TP/HW Reset	1A
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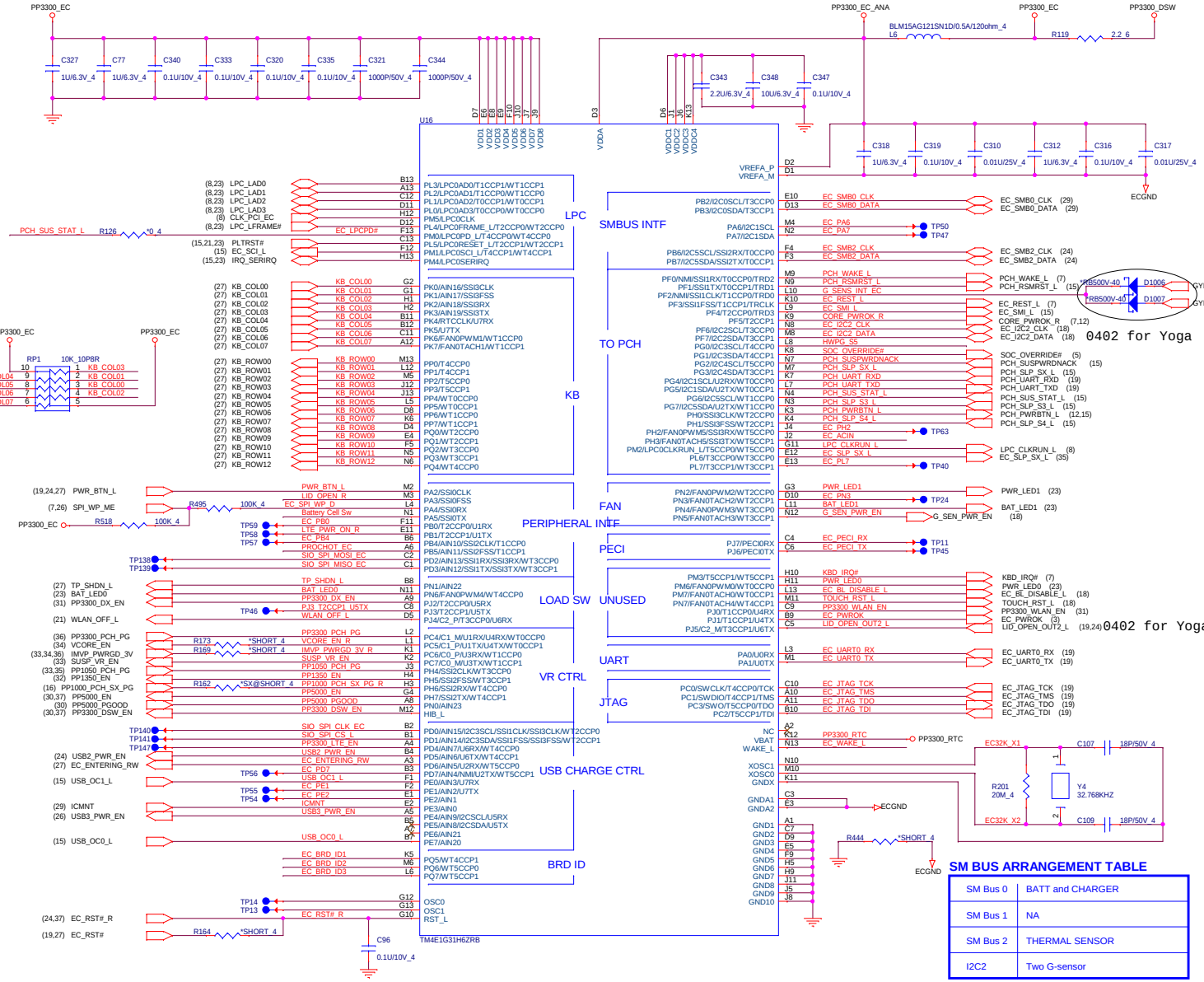
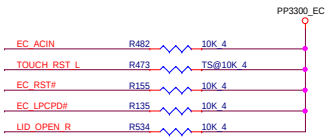
EC(KBC)

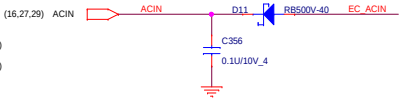


Pull-up(KBC)

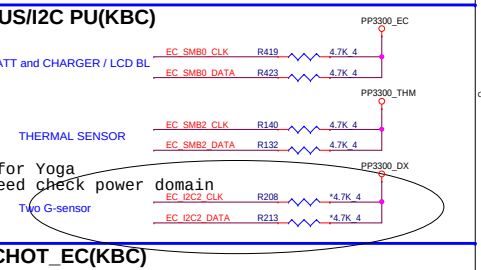


LID_OPEN(KBC)

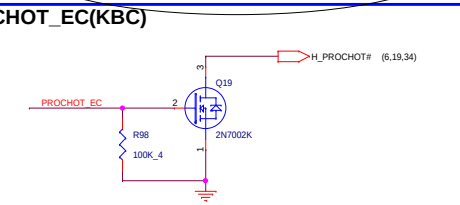
ACIN_EC(KBC)



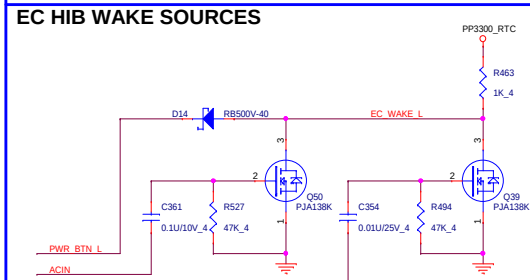
SM BUS/I2C PU(KBC)



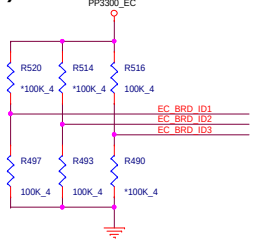
PROCHOT_EC(KBC)



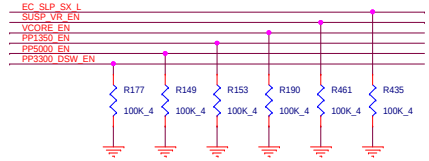
EC HIB WAKE SOURCES



Board_ID(KBC)

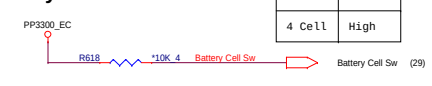


Pull-down(KBC)



HWPG(KBC)

Battery cell select



3 Cell	float
4 Cell	High

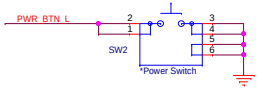
OD pin list

- EC_REST_L
- BAT_LED0
- BAT_LED1
- PCH_RSMRST_L
- SMBUS
- IRQ_SERIRQ
- EC_BL_DISABLE_L

SM BUS ARRANGEMENT TABLE

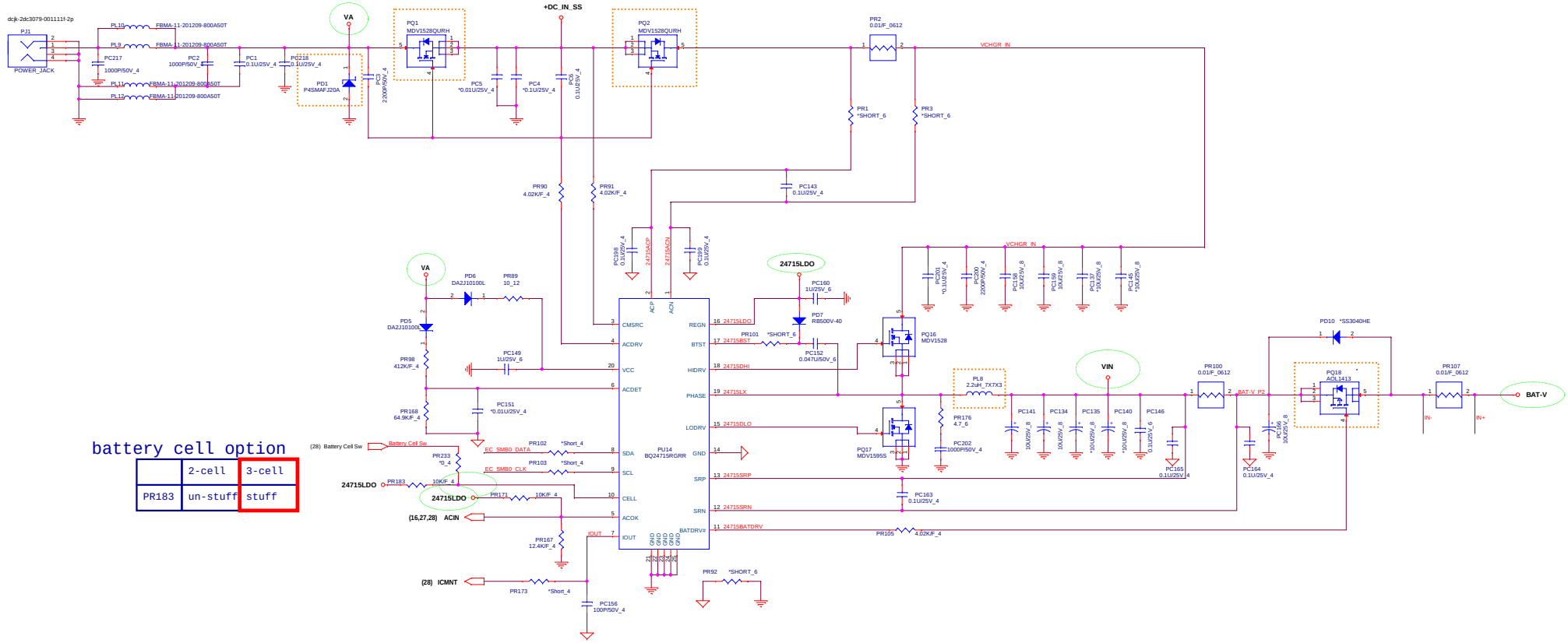
SM Bus 0	BATT and CHARGER
SM Bus 1	NA
SM Bus 2	THERMAL SENSOR
I2C2	Two G-sensor

For testing only



Quanta Computer Inc.
PROJECT : ZHS

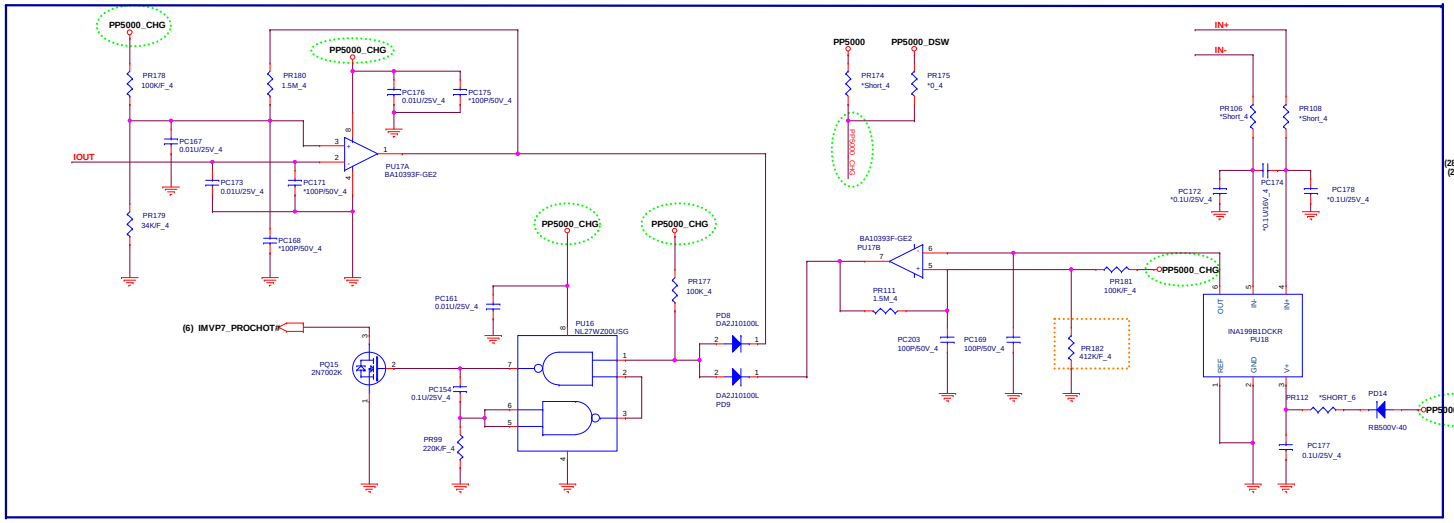
Size	Document Number	Rev
	KBC TI TM4E1G31H6ZRBI	1A
Date: Monday, August 10, 2015	Sheet 28 of 42	



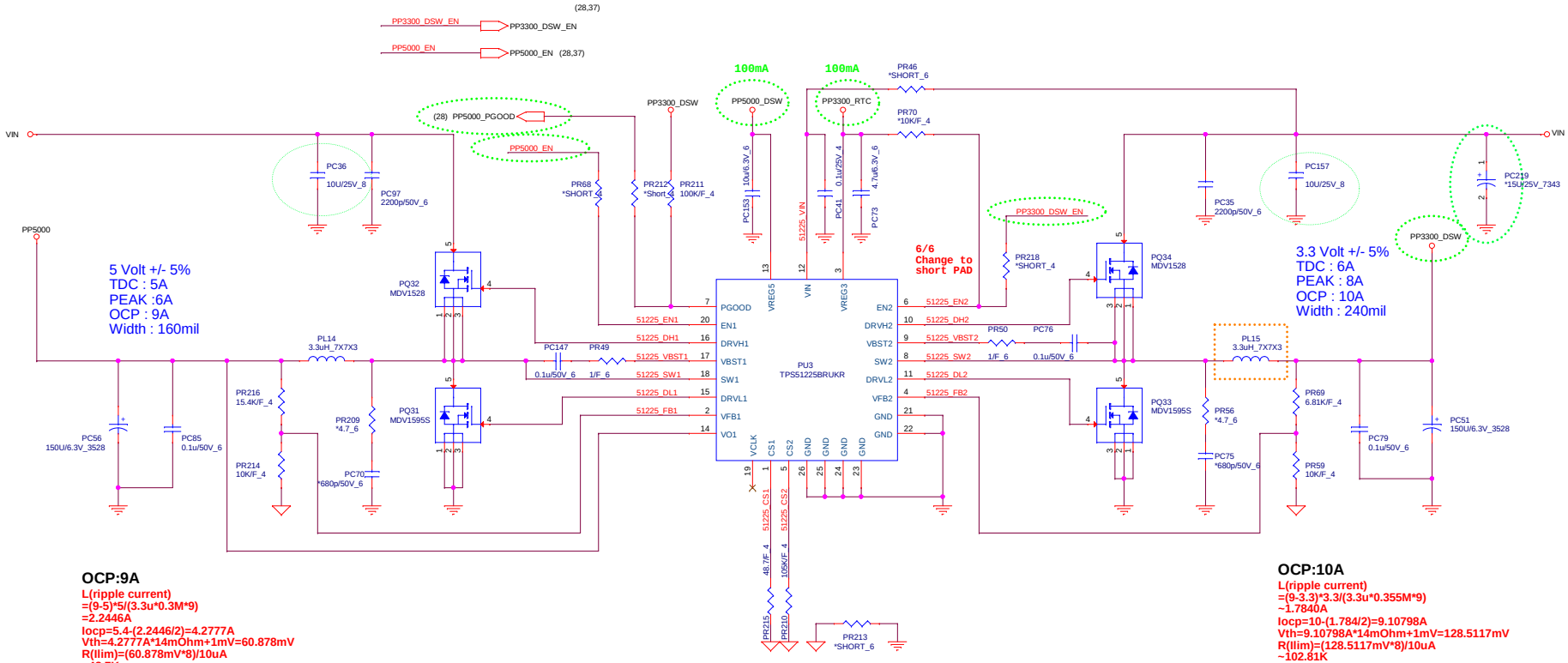
battery cell option

	2-cell	3-cell
PR183	un-stuff	stuff

10ms one-shot circuit



Quanta Computer Inc.		
PROJECT :		
Size	Document Number: Charger(BQ24715)	Rev: 1A
Date: Monday, August 10, 2015	Sheet 29 of 42	



OCP:9A

L(ripple current)
=(9-5)*5/(3.3u*0.3M*9)
=2.2446A
Iocp=5.4-(2.2446/2)=4.2777A
Vth=4.2777A*14mOhm+1mV=60.878mV
R(Ilim)=(60.878mV*8)/10uA
=48.7K

OCP:10A

L(ripple current)
=(9-3.3)*3.3/(3.3u*0.355M*9)
~1.7840A
Iocp=10-(1.784/2)=9.10798A
Vth=9.10798A*14mOhm+1mV=128.5117mV
R(Ilim)=(128.5117mV*8)/10uA
~102.81K

Quanta Computer Inc.		
PROJECT :		
Size	Document Number: SYSTEM 5V/3V (TPS51225BRUKR)	Rev: 1A
Date: Monday, August 10, 2015	Sheet 30 of 42	

(36) PP1800_PCH_S5_PG
(28) PP3300_DX_EN

PP1800_PCH_S5_PG
PP3300_DX_EN

PP3300_DSW
PR71 *Short_8
PC82 1U/10V_4

0407 removed PP3300_DX

PR60 *0_8
PU6
PP3300_WLAN_R
A2 IN OUT A1
PP3300_WLAN
(28) PP3300_WLAN_EN
PP3300_WLAN_EN
PR44 *Short_4
PP3300_WLAN_EN_R B2 EN GND B1
PR53 100K/F_4
TPS22930
PC63 *0.1U/50V_6

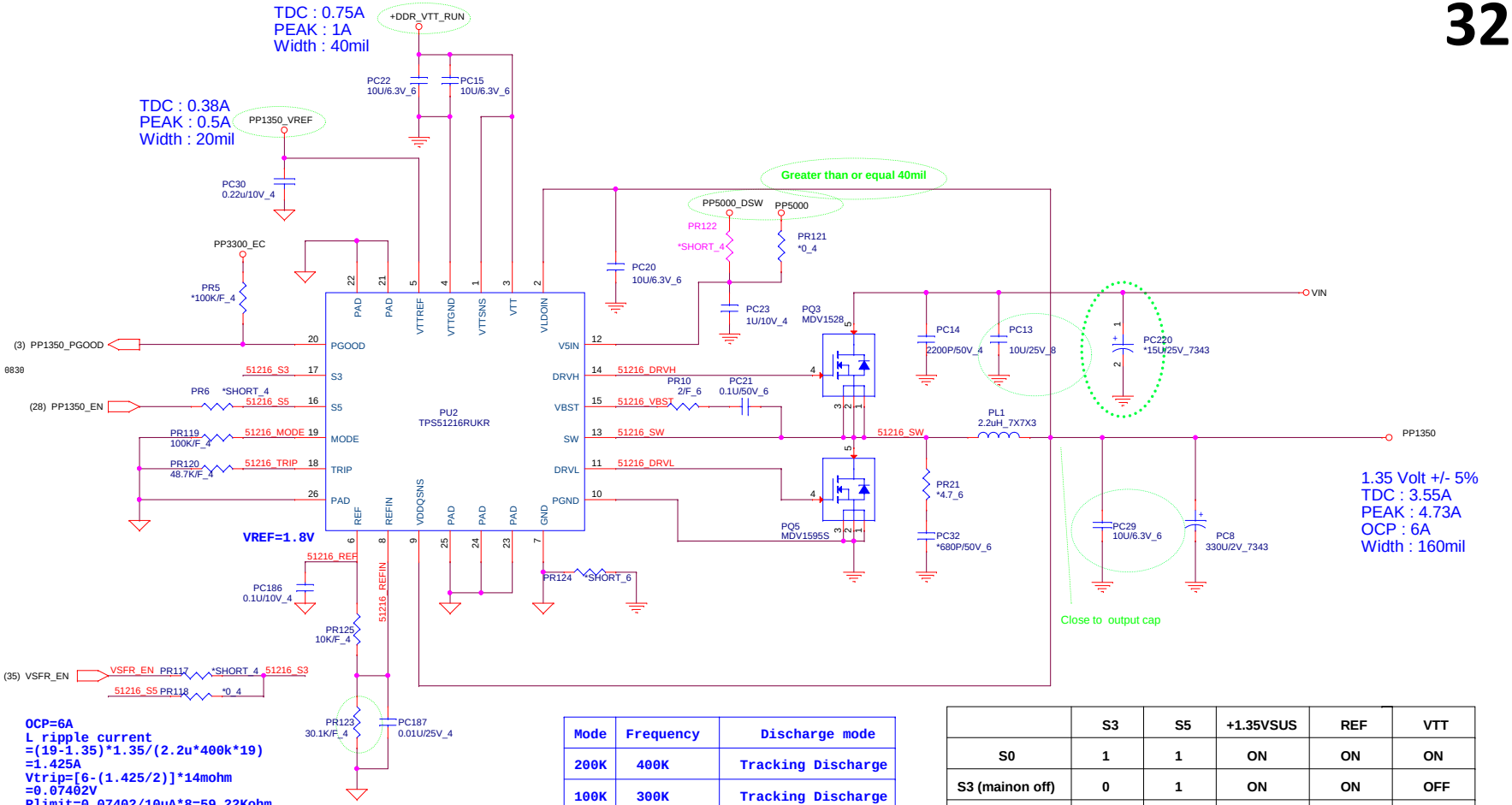
DX should be earlier than VREN by EC.

PP3300_DSW
PC162 1U/10V_4
PP1800_PCH_S5_PG
PR95 *Short_4
PR96 *100K/F_4
PC148 *0.1U/50V_6
PU13
A2 IN OUT A1
B2 EN GND B1
TPS22930
PP3300_PCH_S5

PP3300_DSW
PC17 1U/10V_4
PP3300_DX_EN
PR15 *Short_4
PP3300_DX_EN_R
PR14 100K/F_4
PU1
A2 IN1 OUT1 A1
B2 IN2 OUT2 B1
C2 EN GND C1
TPS22964CYZPR
PP3300_DX

Quanta Computer Inc.
PROJECT :

Size	Document Number	Rev
	Load Switch	1A
Date: Monday, August 10, 2015	Sheet 31 of 42	



Mode	Frequency	Discharge mode
200K	400K	Tracking Discharge
100K	300K	Tracking Discharge

	S3	S5	+1.35VSUS	REF	VTT
S0	1	1	ON	ON	ON
S3 (mainon off)	0	1	ON	ON	OFF
S4/S5	0	0	OFF	OFF	OFF

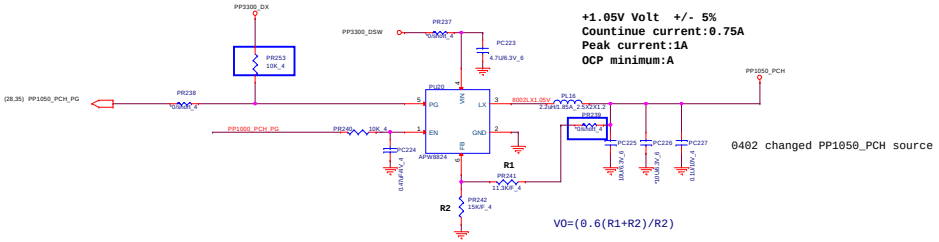
Quanta Computer Inc.
PROJECT :

Size	Document Number	Rev
	DDR 1.35V(TPS51216)	1A

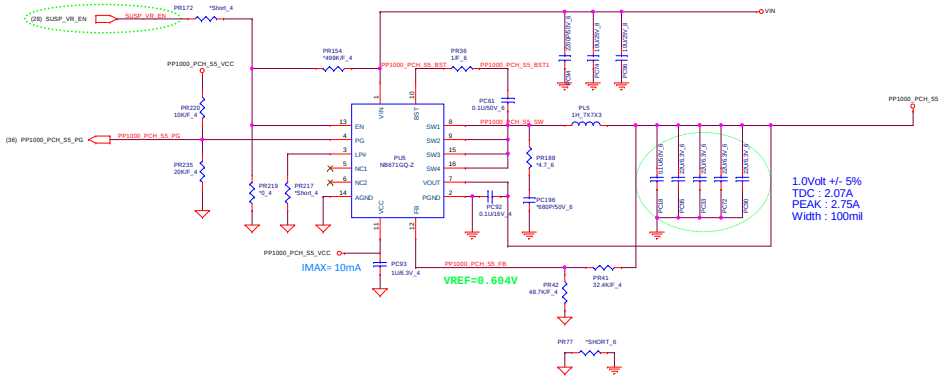
Date: Monday, August 10, 2015 Sheet 32 of 42

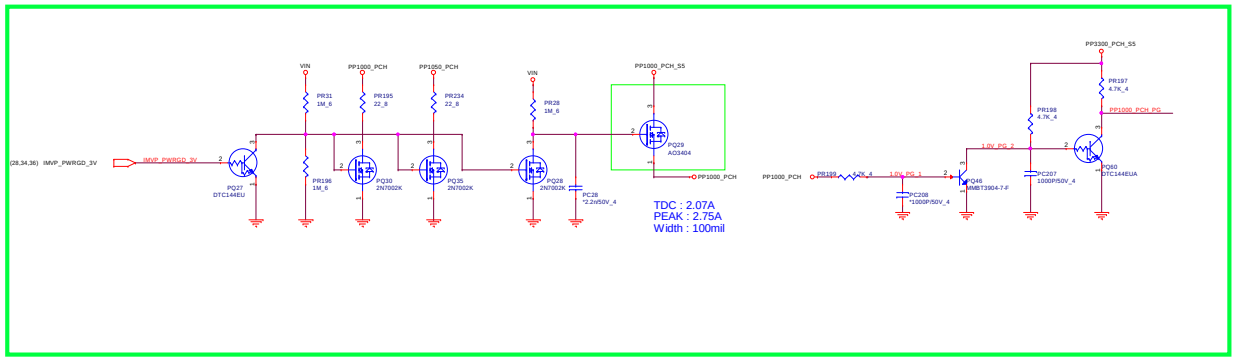
5/19 change Add PG 10K PU

+1.05V Volt +/- 5%
Countinue current:0.75A
Peak current:1A
OCP minimum:A



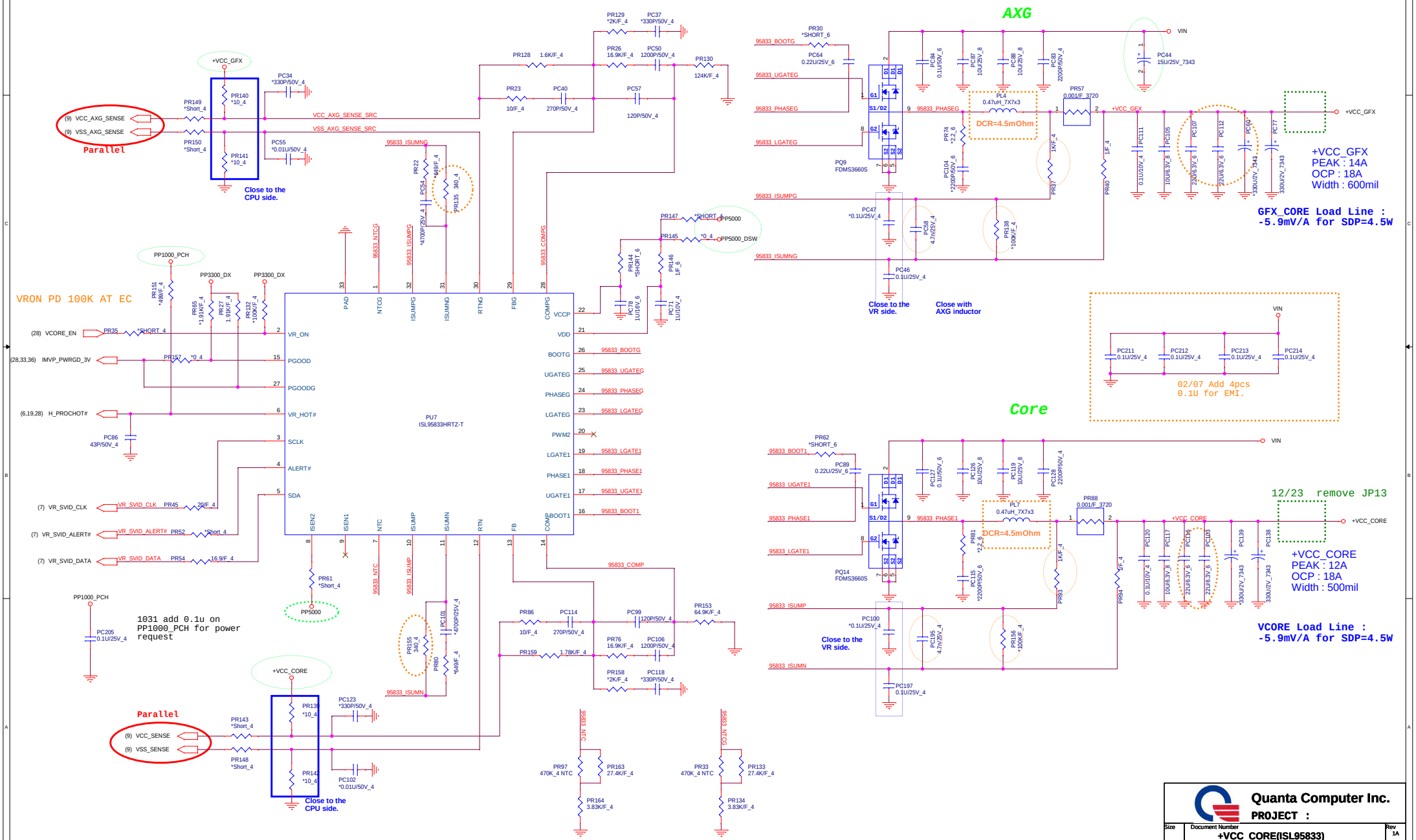
0402 changed PP1050_PCH source

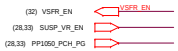


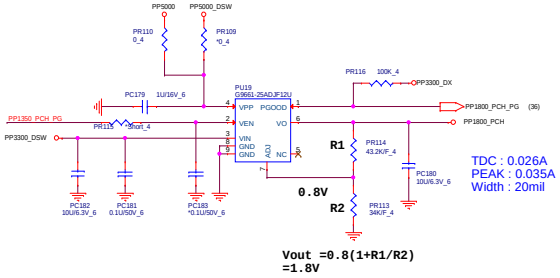


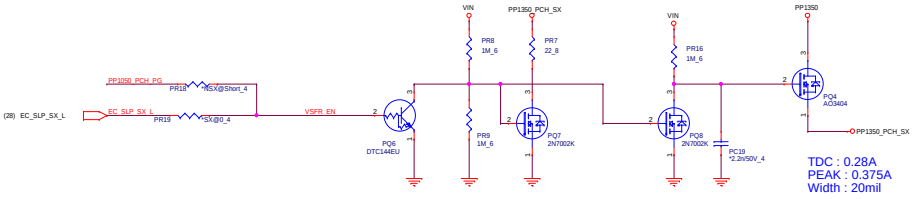
Quanta Computer Inc.
PROJECT :

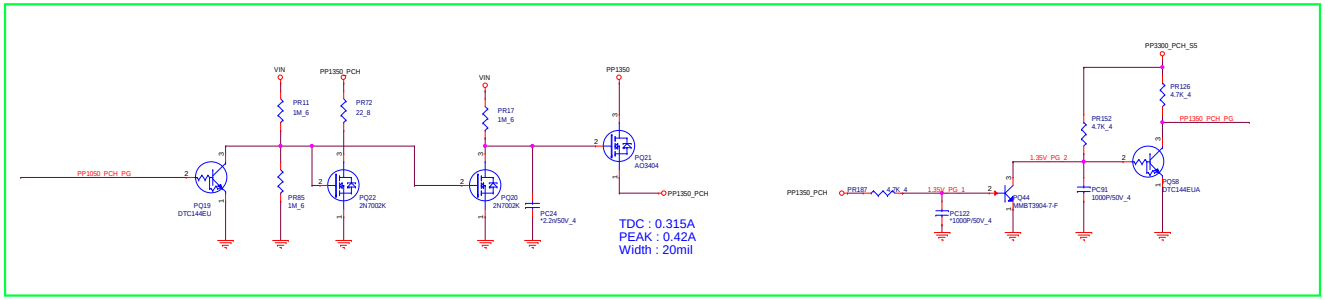
Size	Document Number	Rev
	+1.05V/+1V(NB671LGQ-Z)	1A
Date: Monday, August 19, 2013	Sheet 33 of 42	


VRON PD 100K AT EC
PU7
ISL95833HRTZ-T
Parallel
Close to the CPU side.
Close to the VR side.
Close with AXG inductor
AXG
Core
DCR=4.5mOhm
+VCC_GFX
PEAK : 14A
OCP : 18A
Width : 600mil
GFX_CORE Load Line :
-5.9mV/A for SDP=4.5W
+VCC_CORE
PEAK : 12A
OCP : 18A
Width : 500mil
VCORE Load Line :
-5.9mV/A for SDP=4.5W
02/07 Add 4pcs
0.1U for EMI.
12/23 remove JP13
1031 add 0.1u on
PP1000_PCH for power
request
Quanta Computer Inc.
PROJECT :
+VCC_CORE(ISL95833)
Monday, August 10, 2015





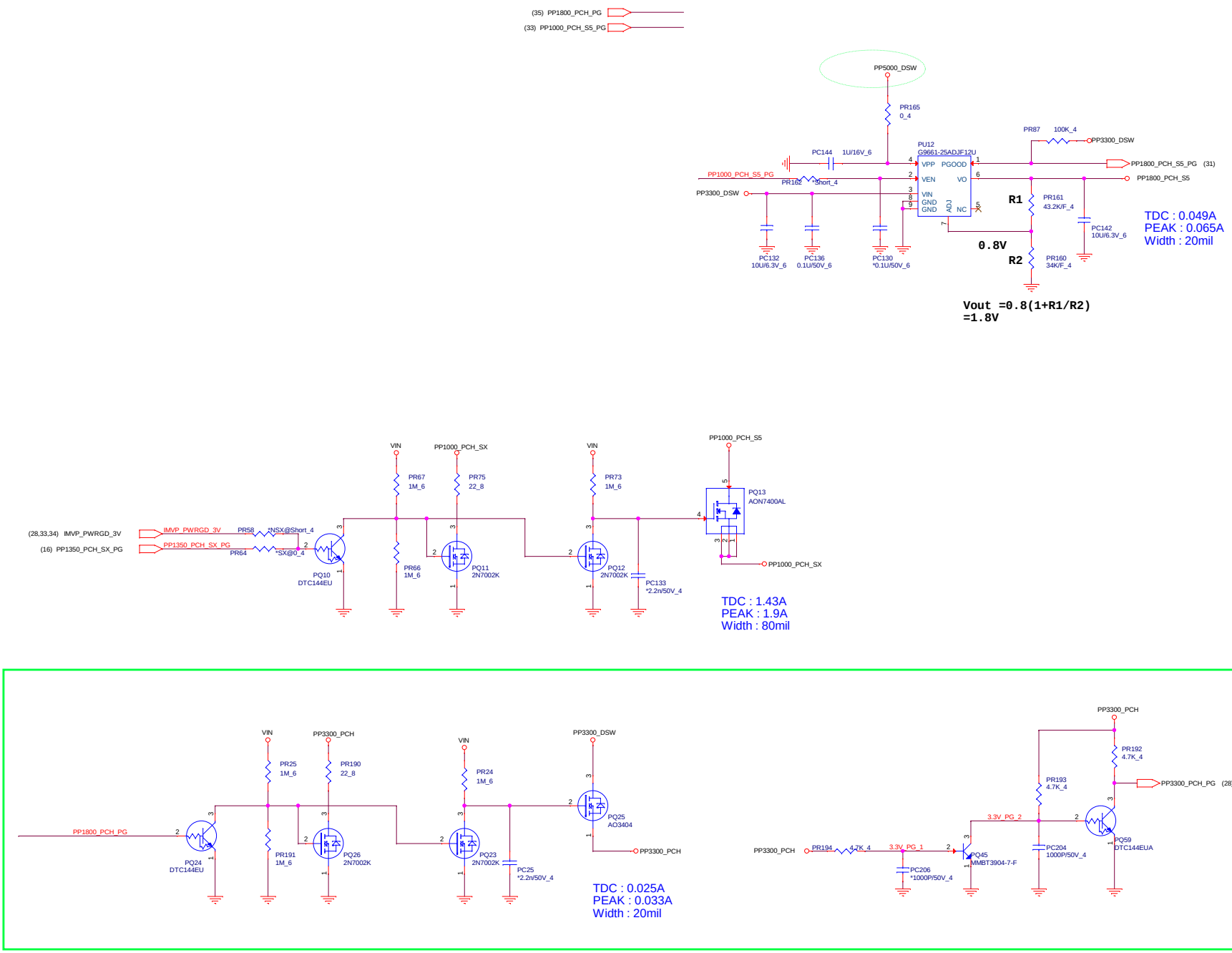




Quanta Computer Inc.

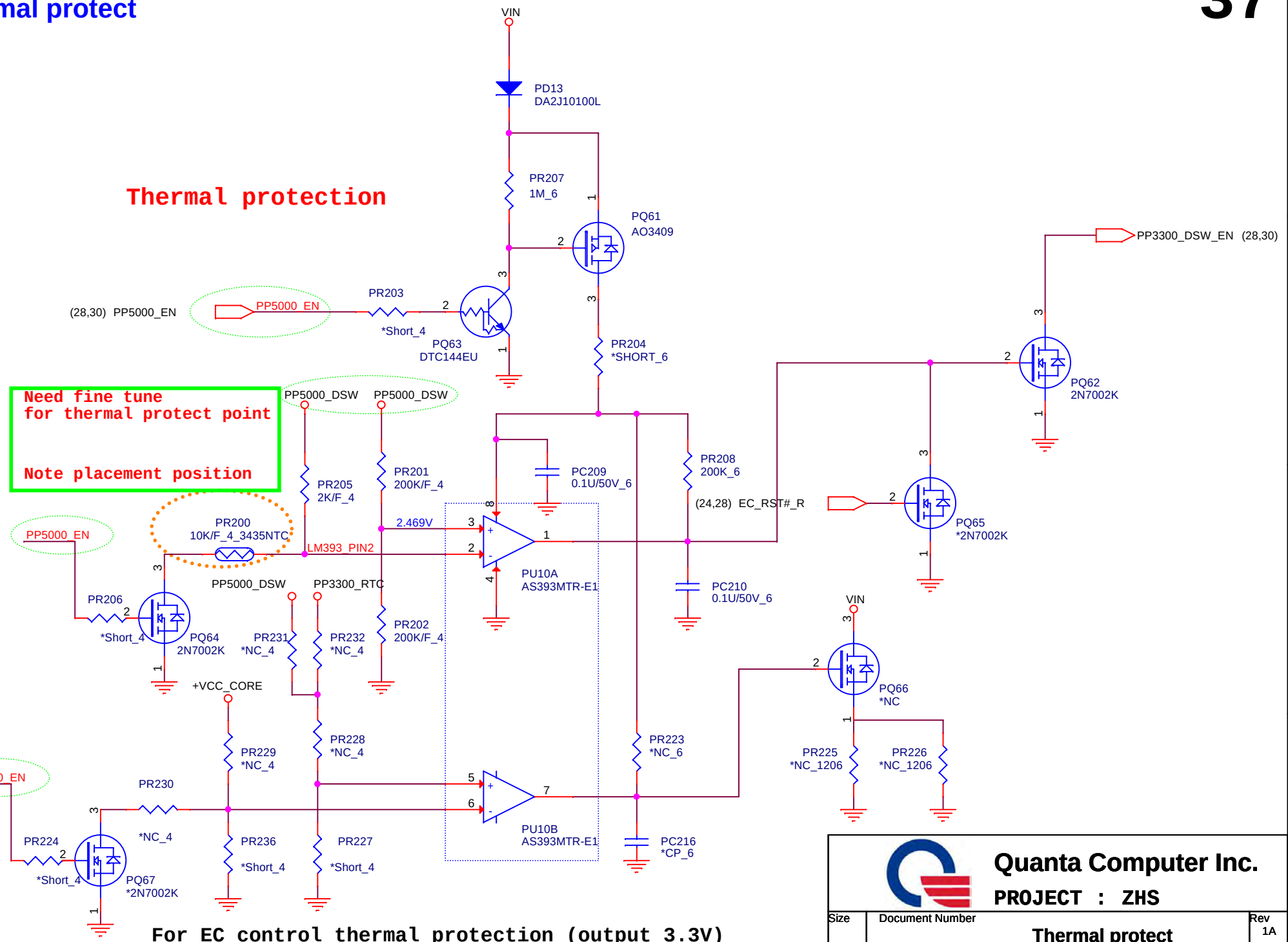
PROJECT :

Size	Document Number	Rev
	LDO (1V/1.35V/1.5V/1.8V)	1A
Date: Monday, August 10, 2015	Sheet 35 of 42	



Quanta Computer Inc.		
PROJECT :		
Size	Document Number: LDO(1.2V/3.3V/1.8V)	Rev: 1A
Date: Monday, August 10, 2015	Sheet 36 of 42	

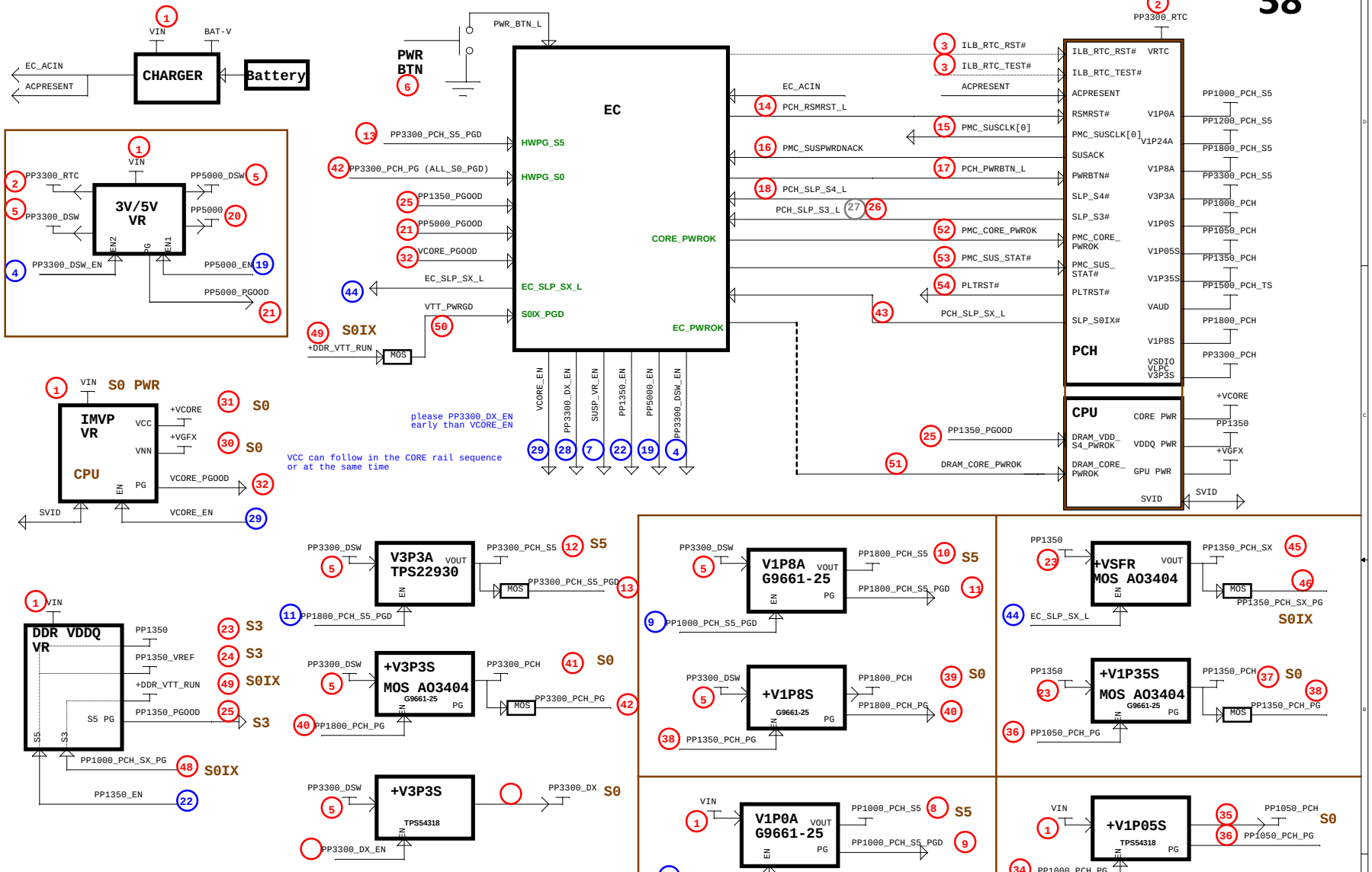
Thermal protect



For EC control thermal protection (output 3.3V)

Quanta Computer Inc.		
PROJECT : ZHS		
Size	Document Number: Thermal protect	Rev: 1A
Date: Monday, August 10, 2015	Sheet 37 of 42	

Support S0iX



t1 : RTC_VCC to ILB_RTC_TEST# de-assertion 9ms -min (2-3)
t1 : RTC_VCC to PMC_RSMRST# de-assertion 9ms-min (2-11)

t2 : V3P3A valid to PMC_RSMRST# de-assertion 10us -min (8-11)

t3 : PMC_RSMRST# to Internal RTC clock stable 100ms -max (11- RTC clock)

t4 : Internal RTC clock stable to PMC_SUSCLK[0] toggling 5ms -min (RTC clock - 12)

t5 : PMC_SLP_S4# de-assertion to PMC_SLP_S3# de-assertion 30us -min (15-25)

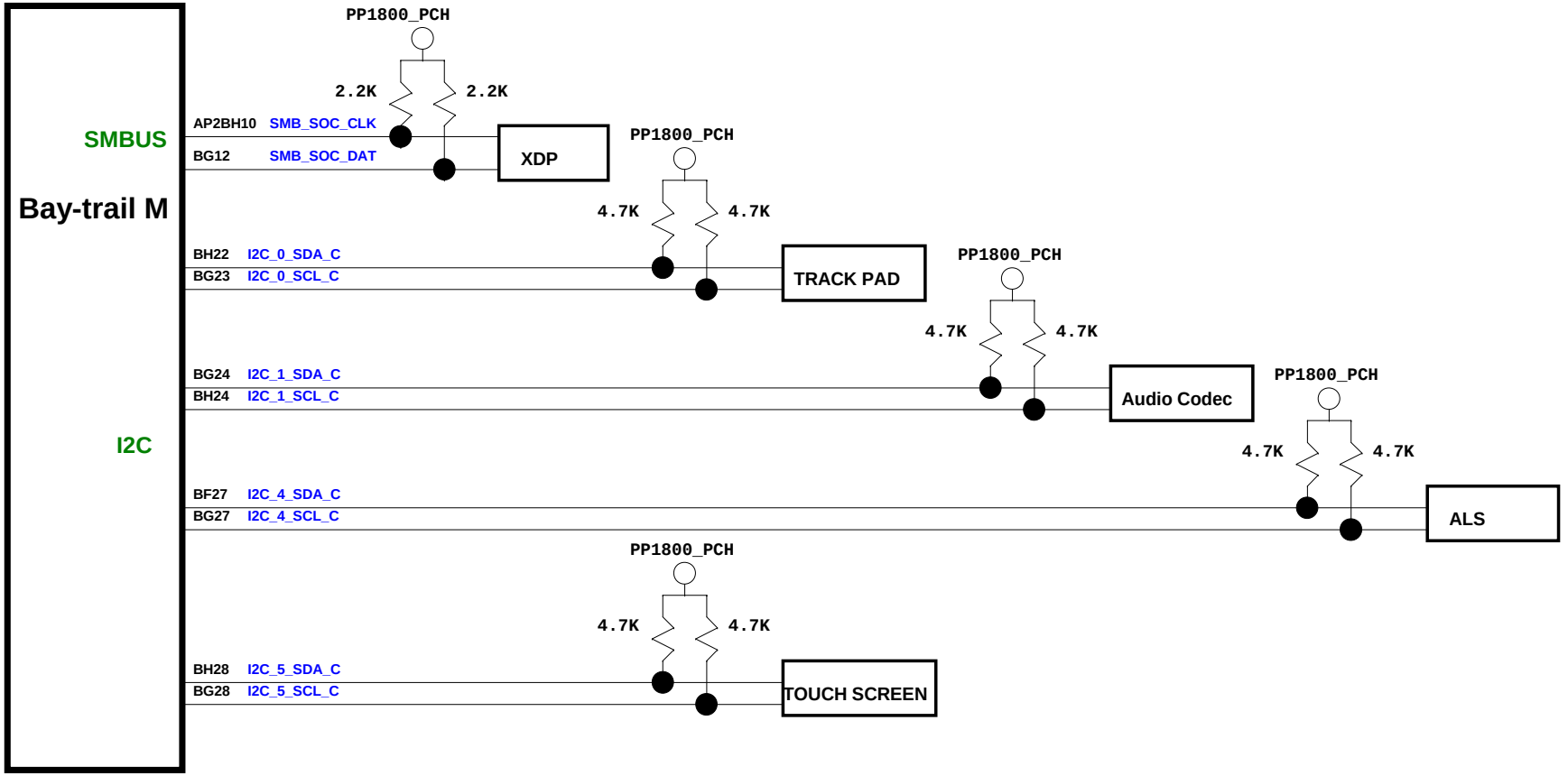
t6a : Core Well stable to DRAM_CORE_PWROK and PMC_CORE_PWROK assertion (no PCIE device) 10ms -min (43-45)
t6b : Core Well stable to DRAM_CORE_PWROK and PMC_CORE_PWROK assertion (for power rails needed by pcie device) 99ms -min (43-45)

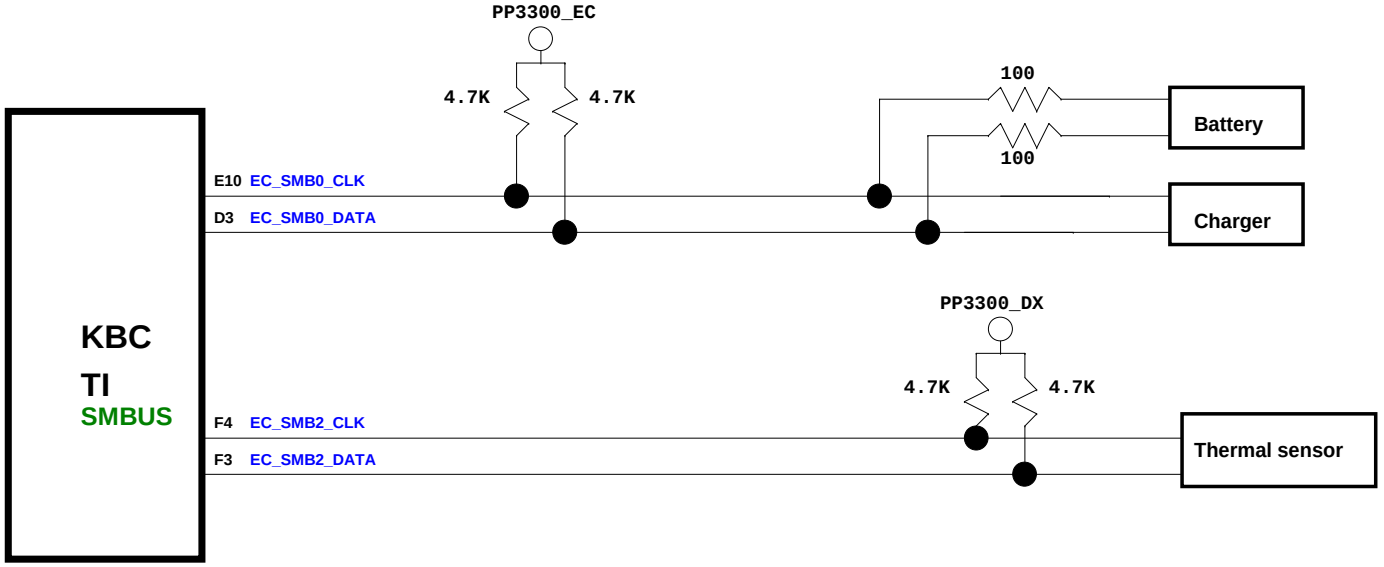
t7 : DRAM/PMC_CORE_PWROK to PMC_SUS_STAT# 1ms -min (45-46)

t8 : PMC_SUS_STAT# de-assertion to PMC_PLTRST# de-assertion 60us -min (46-47)

a 10us to 2000us delay is required between rails to avoid inrush current caused by multiple loads turning on simultaneously and fast charging of VR output decoupling

Quanta Computer Inc.		
PROJECT : ZHS		
Size	Document Number: Power Sequence	Rev 1A
Date: Monday, August 10, 2015	Sheet 38 of 42	

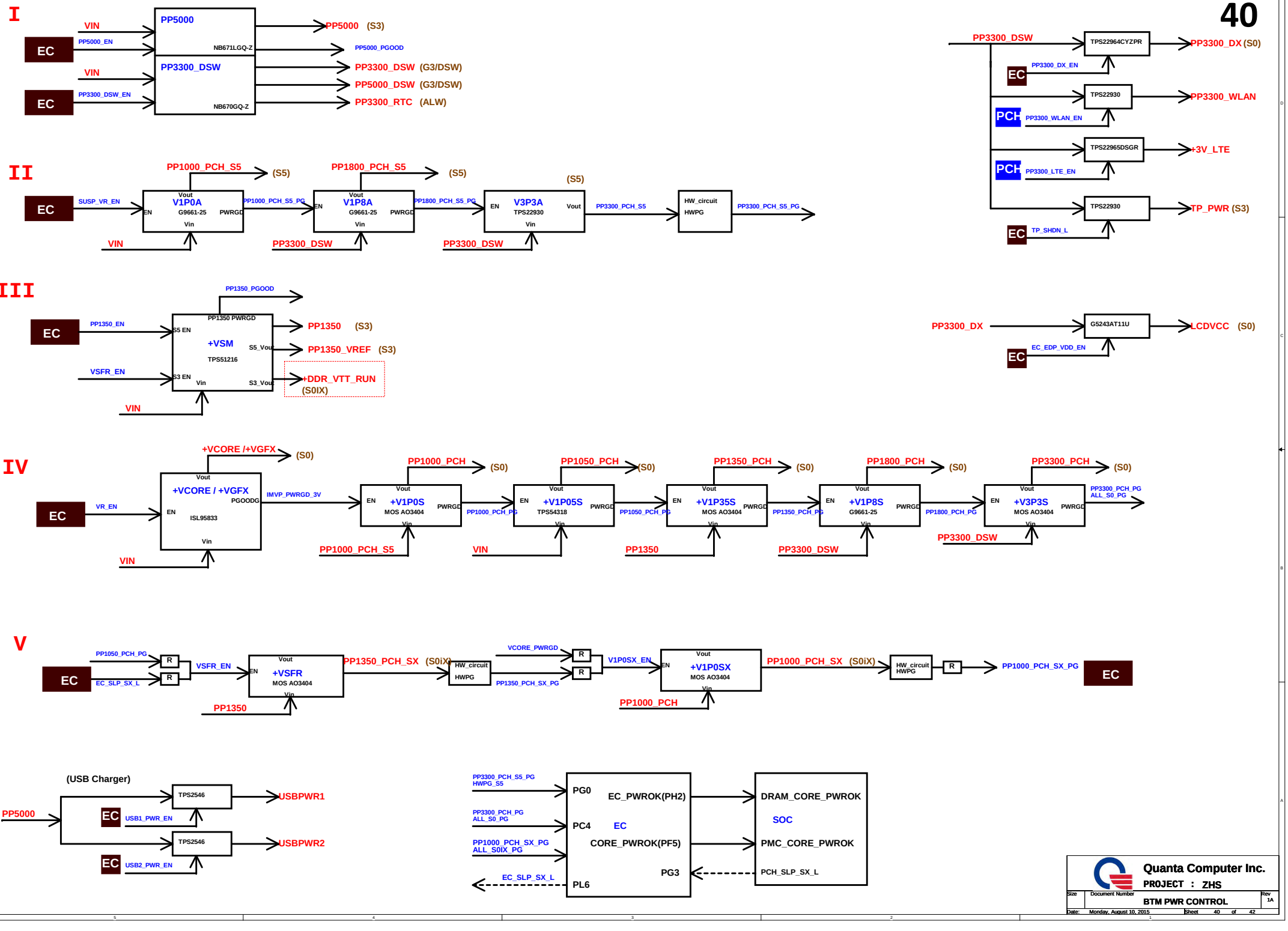




Quanta Computer Inc.
PROJECT : ZHS

Size	Document Number	Rev
	SMBUS_I2C	1A

Date: Monday, August 10, 2015 Sheet 39 of 42



Quanta Computer Inc.
PROJECT : ZHS

Size	Document Number	Rev
	BTM PWR CONTROL	1A

Date: Monday, August 10, 2015 Sheet 40 of 42

Model	Version	CHANGE LIST
ZHS M/B	1A	1. 2015/05/19 :Update RAM ID for ZHQ and ZHS use.(page8) 2. 2015/05/19 : add R200 and R214 LTE_WAKE# and PMC_SUSCLK1 pull high to PP1800_PCH_S5 for can't into S3 issue (Page7) 3. 2015/05/19 : add R426 LTE_DISABLE# Pull-High to PP1800_PCH_S5 for can't into S3 issue.(Page 8) 4.2015/05/19 : add R603/R609/Q62/R167/R607/Q63 FOR SD Card can't work issue.(page 17) 5.2015/05/19 : add PR523 10k Pull-high to PP3300_DX for can't power on issue (Page 41) 6.2015/05/19 : add PR234 and PQ35 for PP1050_PCH 放電線路(Page 41) 7.2015/05/19 : EMI request add PC189 for EMI issue. (Page 39) 8.2015/05/19 : EMI request add C112 for EMI issue. (page22) 9.2015/05/19 : EMI request add C130/C132 DMIC CLK/DAT for EMI issue(Page22)
		1. 2015/06/19 : Add C35 and Change R326 to 33 ohm for Acer ESD request (page18) 2. 2015/06/19 : Add Pad1~Pad12 for Acer ESD request (page26) 3. 2015/06/19 : Add R427 33 ohm Acer ESD request (page27) 4. 2015/06/19 : Del R490 , Add R516 for SANYO battery 5. 2015/06/19 : Change 0 ohm to Short Pad: R14,R17,R39,R217 6. 2015/08/10 : Change 0 ohm to Short Pad: PR46,PR218,PR68,PR248,PR244,PR247,PR243,PR249,PR245,PR122,PR6,PR117,PR250,PR246

Model	Version	CHANGE LIST
	2B	
	3C	
	3D	

DOC NO.	PROJECT MODEL :	Chrome	APPROVED BY:		DATE:	Quanta Computer Inc. PROJECT : ZIIS
	PART NUMBER:		DRAWING BY:		REVISON:	Size: Document Number: Change list 2 Rev: 1A
						Date: Monday, March 03, 2008 Sheet 41 of 45