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

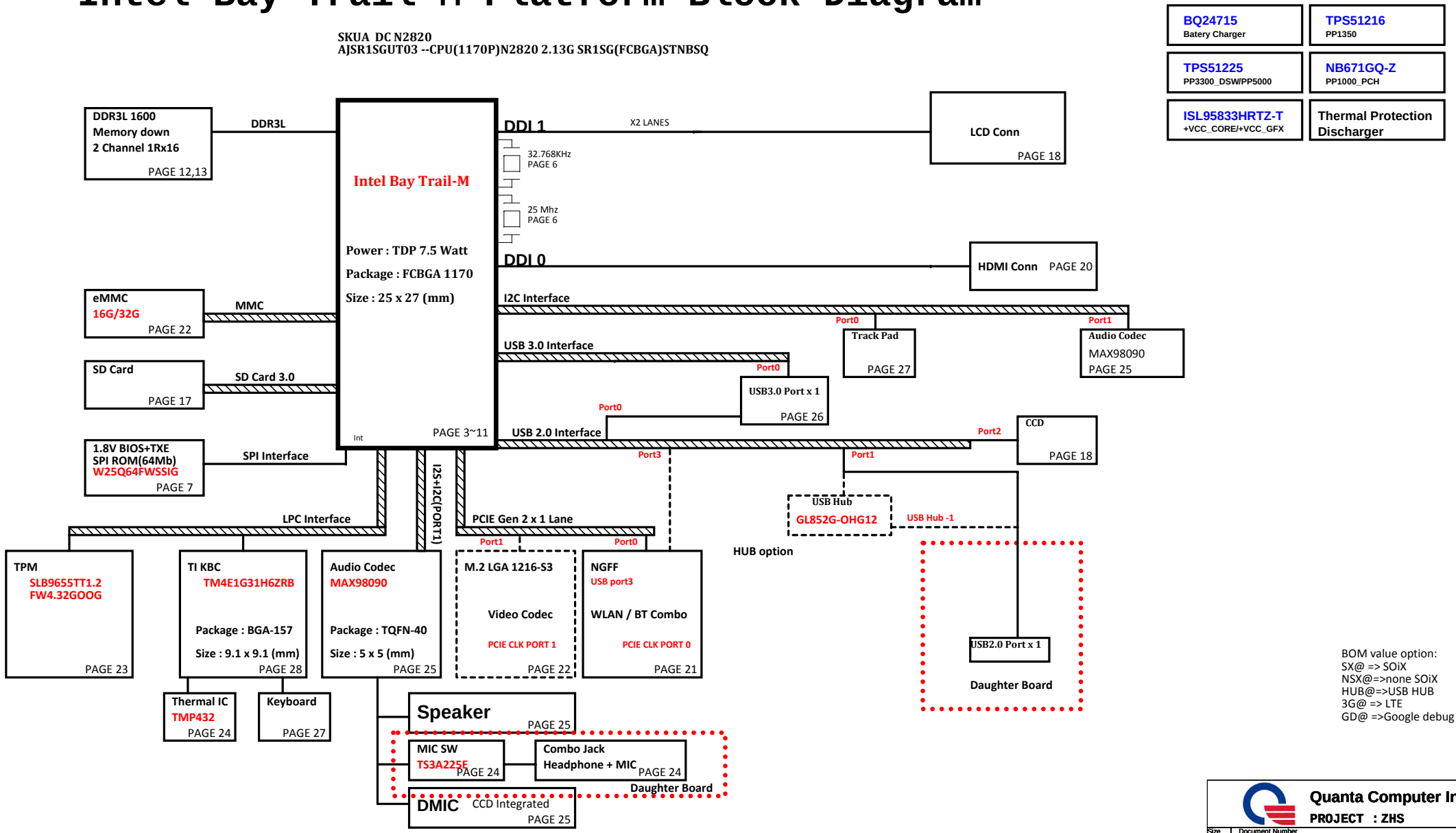
SMBus table

Function	Channel	Address
Battery	SMB0	
Thermal	SMB2	0x4C

Quanta Computer Inc.
PROJECT : ZHS
Size | Document Number: Sch Page description | Rev 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



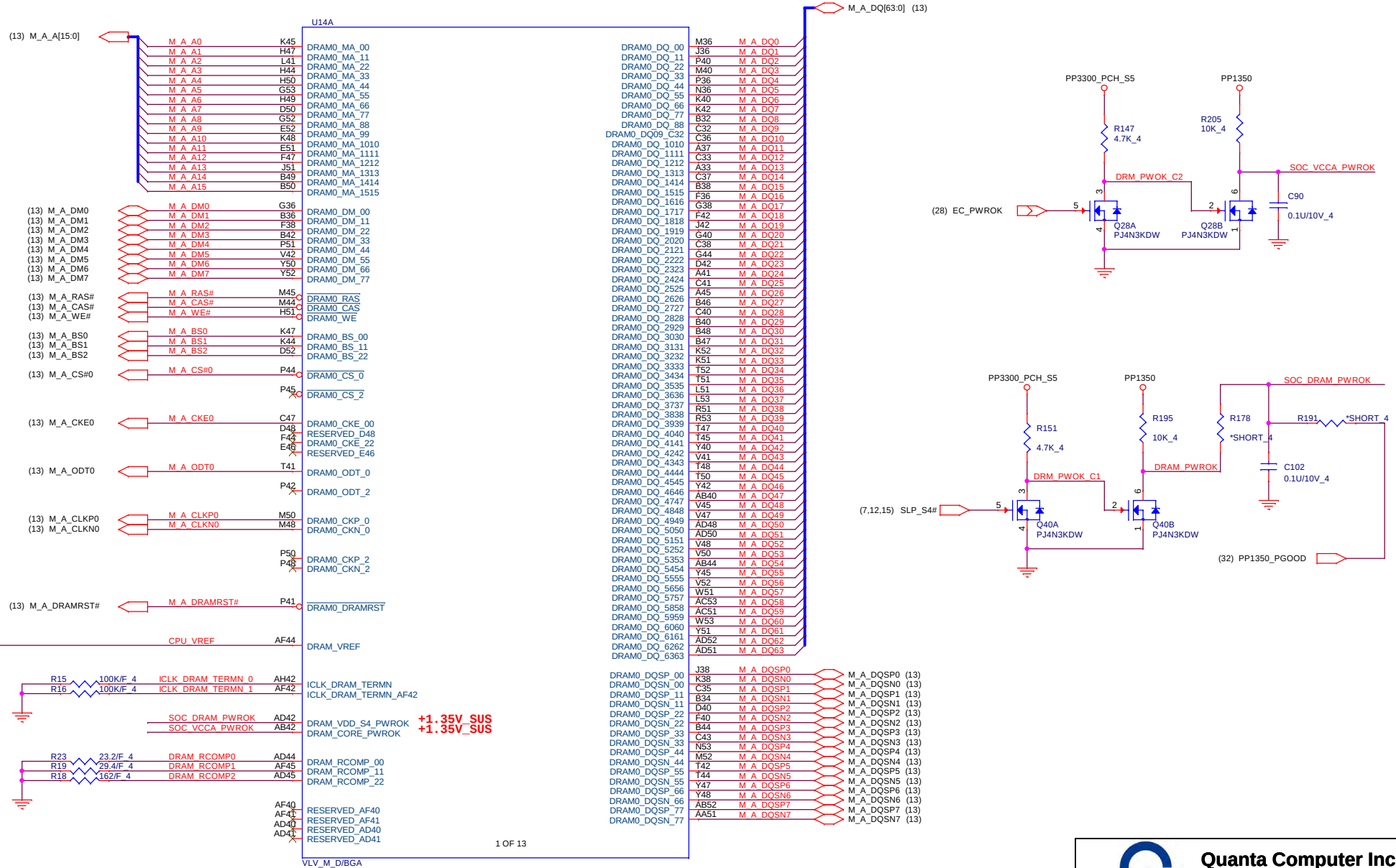
BQ24715 Batery Charger	TPS51216 PP1350
TPS51225 PP3300_DSW/PP5000	NB671GQ-Z PP1000_PCH
ISL95833HRTZ-T +VCC_CORE/+VCC_GFX	Thermal Protection Discharger

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

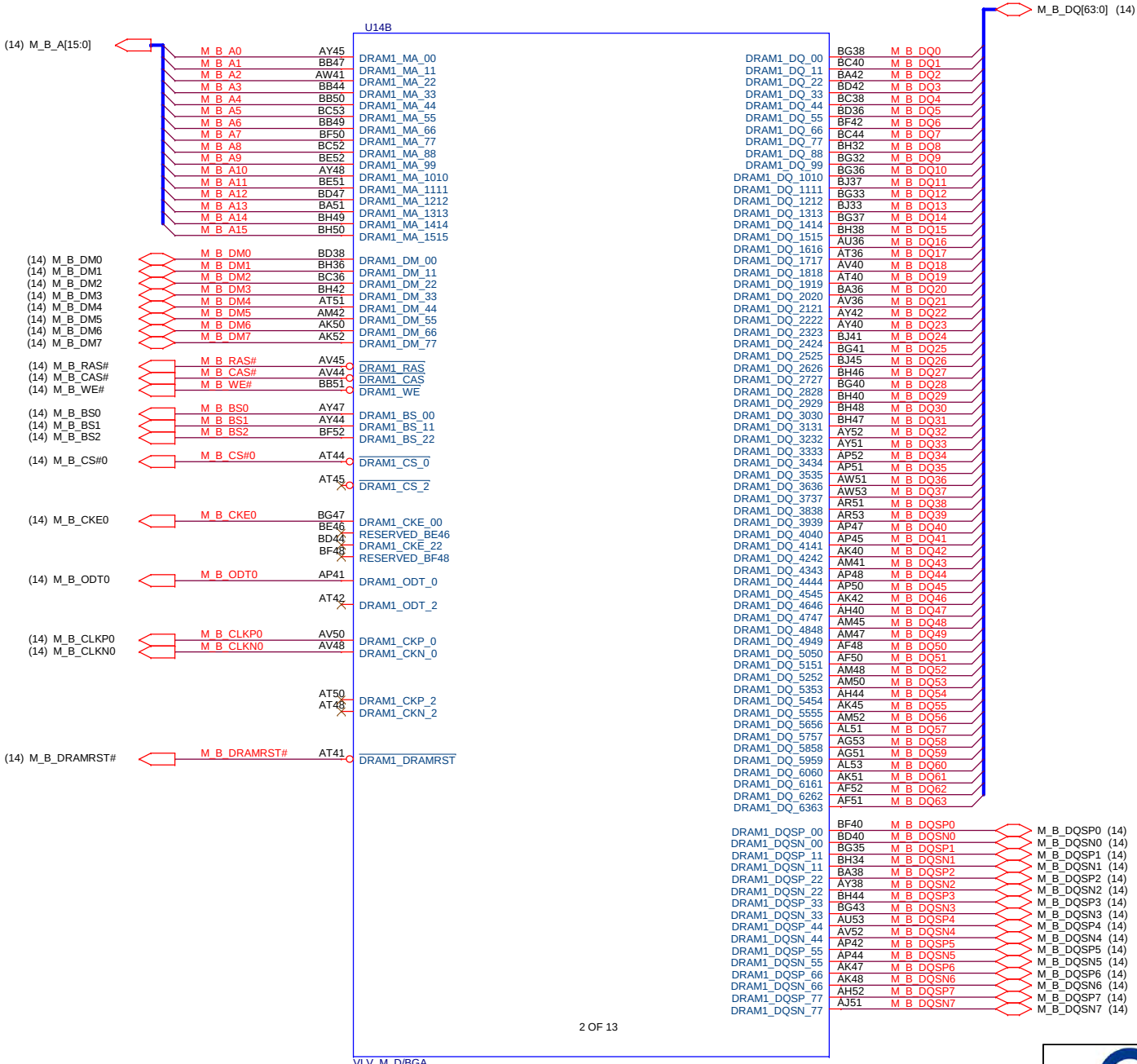
Quanta Computer Inc.
PROJECT : ZHS

Size	Document Number	Rev
	Block Diagram	1A

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



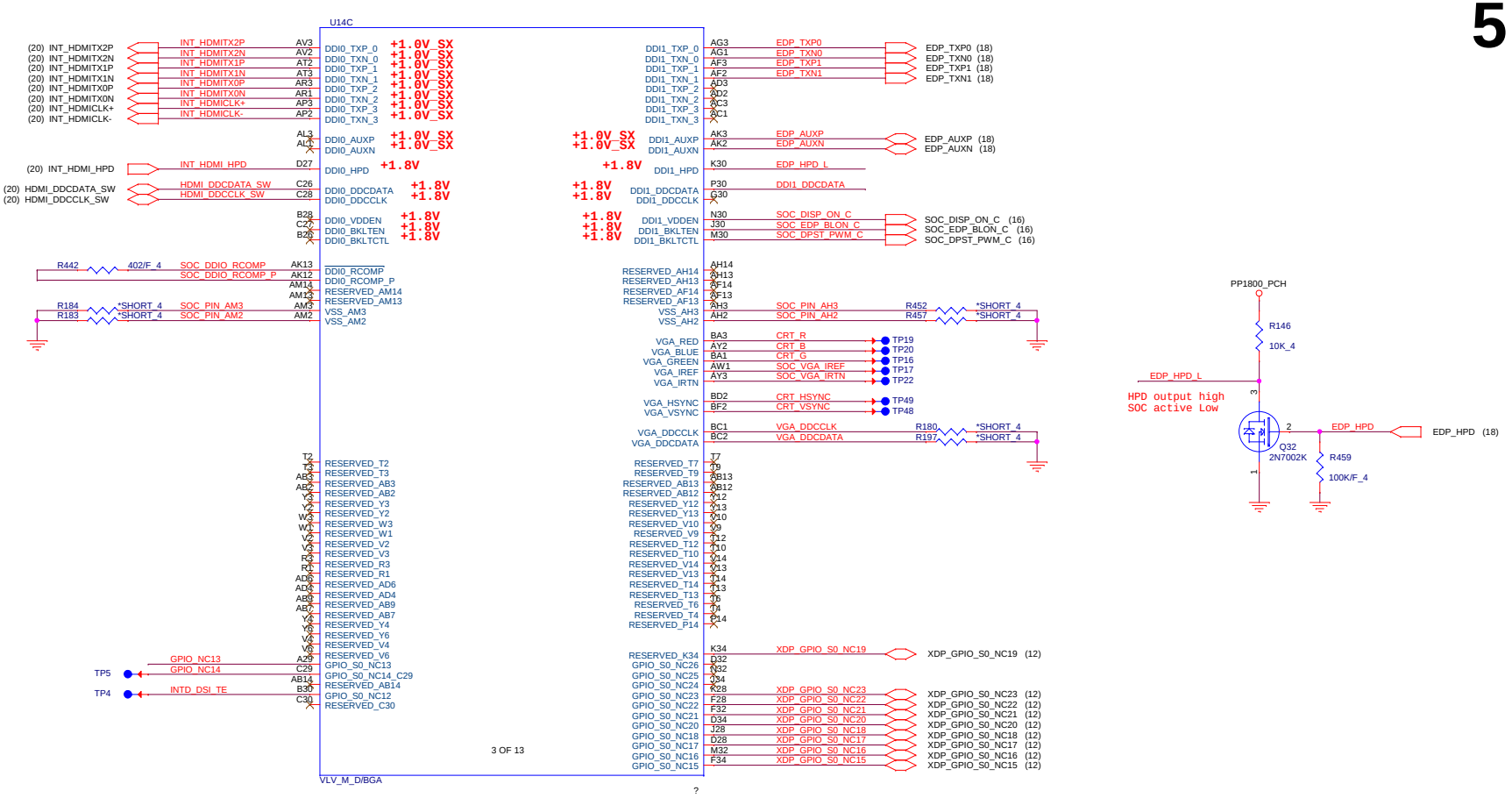
Quanta Computer Inc.		
PROJECT : ZHS		
Size	Document Number: Valley 1/9 (DDRA)	Rev: 1A
Date: Monday, August 10, 2015	Sheet 3 of 42	



4

Quanta Computer Inc.
PROJECT : ZHS

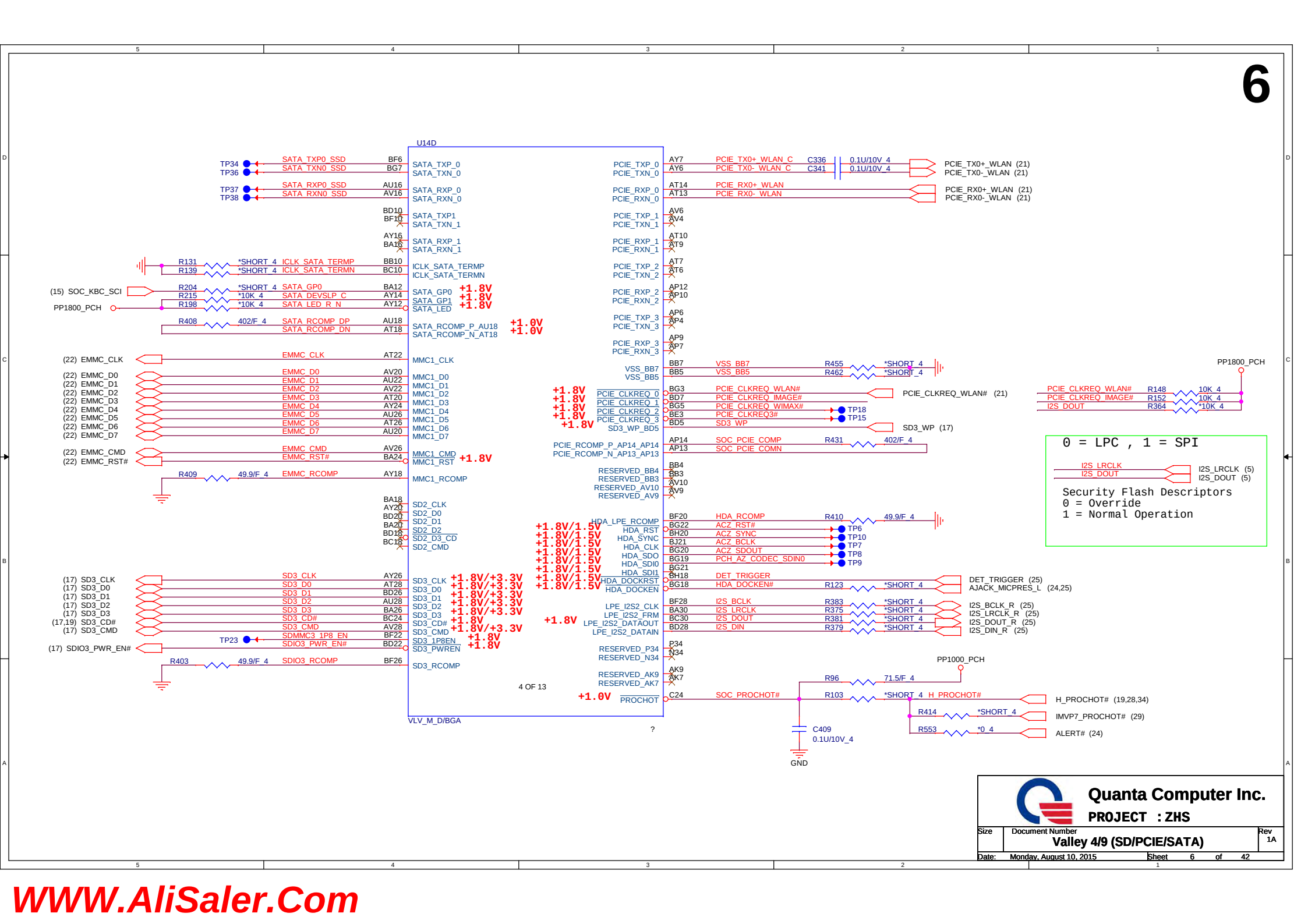
Size	Document Number	Rev
	Valley 2/9 (DDRB)	1A
Date: Monday, August 10, 2015	Sheet 4 of 42	



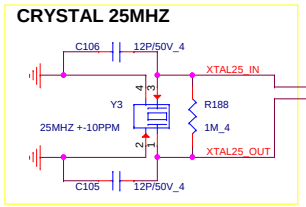
BTM Strapping Table

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				

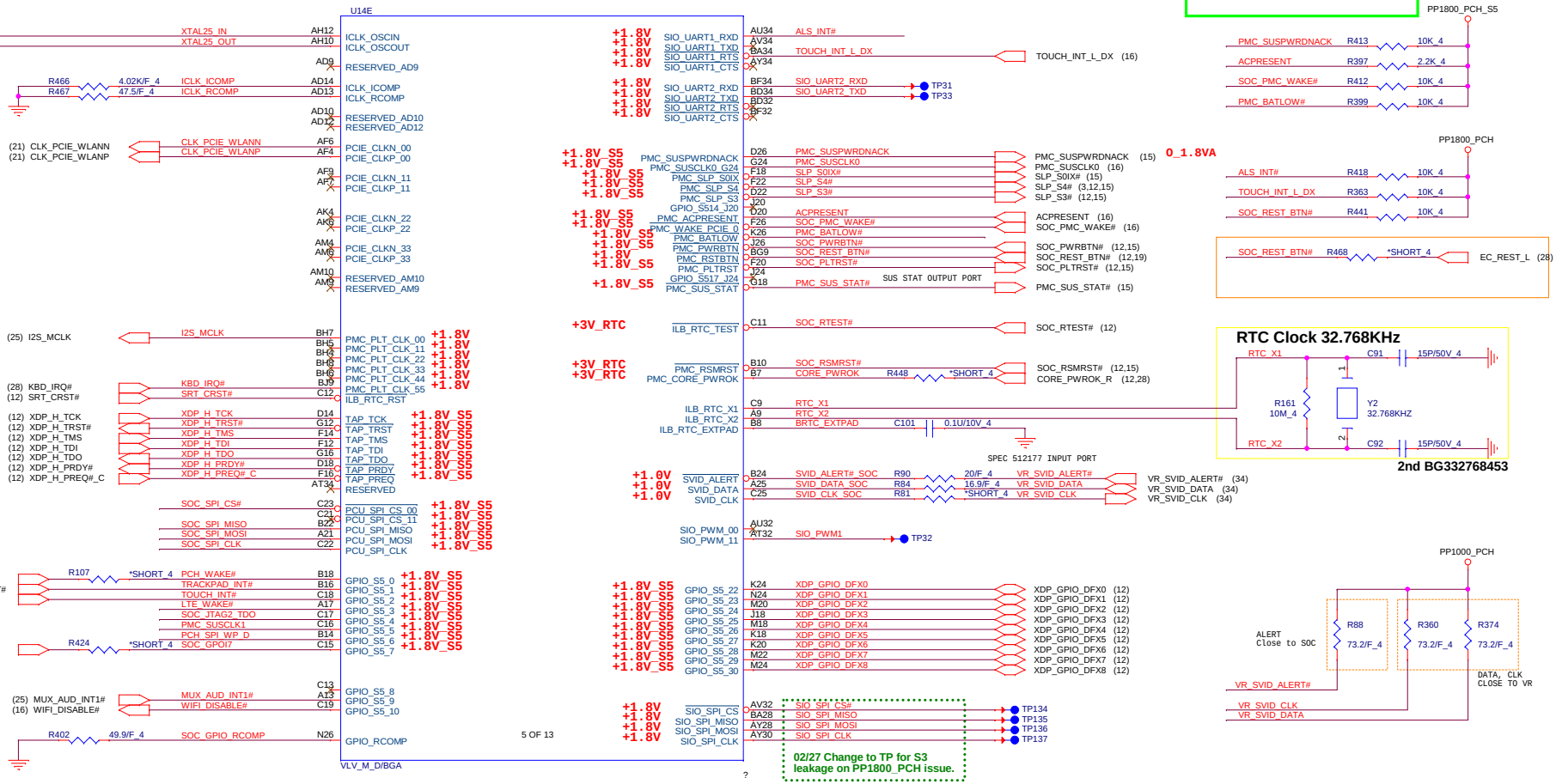
Quanta Computer Inc.
PROJECT : ZHS
Size | Document Number: Valley 3/9 (Display) | Rev 1A
Date: Monday, August 10, 2015 | Sheet 5 of 42


6
U14D
SATA_TXP0_SSD
SATA_TXN0_SSD
SATA_RXP0_SSD
SATA_RXN0_SSD
SATA_TXP1
SATA_TXN1
SATA_RXP1
SATA_RXN1
ICLK_SATA_TERMP
ICLK_SATA_TERMN
SATA_GP0
SATA_GP1
SATA_LED
SATA_RCOMP_P_AU18
SATA_RCOMP_N_AT18
EMMC_CLK
EMMC_D0
EMMC_D1
EMMC_D2
EMMC_D3
EMMC_D4
EMMC_D5
EMMC_D6
EMMC_D7
EMMC_CMD
EMMC_RST#
EMMC_RCOMP
SD2_CLK
SD2_D0
SD2_D1
SD2_D2
SD2_D3_CD
SD2_CMD
SD3_CLK
SD3_D0
SD3_D1
SD3_D2
SD3_D3
SD3_CD#
SD3_CMD
SDMMC3_1P8_EN
SDIO3_PWR_EN#
SD3_1P8EN
SD3_PWREN
SD3_RCOMP
PCIE_TXP_0
PCIE_TXN_0
PCIE_RXP_0
PCIE_RXN_0
PCIE_TXP_1
PCIE_TXN_1
PCIE_RXP_1
PCIE_RXN_1
PCIE_TXP_2
PCIE_TXN_2
PCIE_RXP_2
PCIE_RXN_2
PCIE_TXP_3
PCIE_TXN_3
PCIE_RXP_3
PCIE_RXN_3
PCIE_CLKREQ_0
PCIE_CLKREQ_1
PCIE_CLKREQ_2
PCIE_CLKREQ_3
SD3_WP_BD5
PCIE_RCOMP_P_AP14_AP14
PCIE_RCOMP_N_AP13_AP13
RESERVED_BB4
RESERVED_BB3
RESERVED_AV10
RESERVED_AV9
HDA_LPE_RCOMP
HDA_RST
HDA_SYNC
HDA_CLK
HDA_SDO
HDA_SDI0
HDA_SDI1
HDA_DOCKRST
HDA_DOCKEN
LPE_I2S2_CLK
LPE_I2S2_FRM
LPE_I2S2_DATAOUT
LPE_I2S2_DATAIN
RESERVED_P34
RESERVED_N34
RESERVED_AK9
RESERVED_AK7
PROCHOT
4 OF 13
VLV_M_D/BGA
PCIE_TX0+_WLAN_C
PCIE_TX0-_WLAN_C
PCIE_RX0+_WLAN
PCIE_RX0-_WLAN
VSS_BB7
VSS_BB5
PCIE_CLKREQ_WLAN#
PCIE_CLKREQ_IMAGE#
PCIE_CLKREQ_WIMAX#
PCIE_CLKREQ3#
SD3_WP
SOC_PCIE_COMP
SOC_PCIE_COMN
HDA_RCOMP
ACZ_RST#
ACZ_SYNC
ACZ_BCLK
ACZ_SDOUT
PCH_AZ_CODEC_SDIN0
DET_TRIGGER
HDA_DOCKEN#
I2S_BCLK
I2S_LRCLK
I2S_DOUT
I2S_DIN
SOC_PROCHOT#
0 = LPC , 1 = SPI
Security Flash Descriptors
0 = Override
1 = Normal Operation
Quanta Computer Inc.
PROJECT : ZHS
Valley 4/9 (SD/PCIE/SATA)
Size
Document Number
Rev 1A
Date: Monday, August 10, 2015
Sheet 6 of 42
WWW.AliSaler.Com

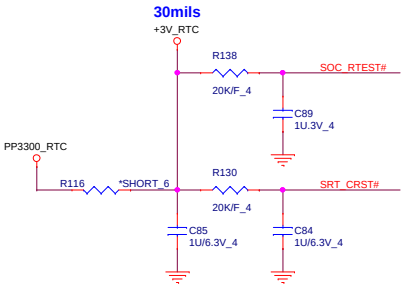
CRYSTAL 25MHZ



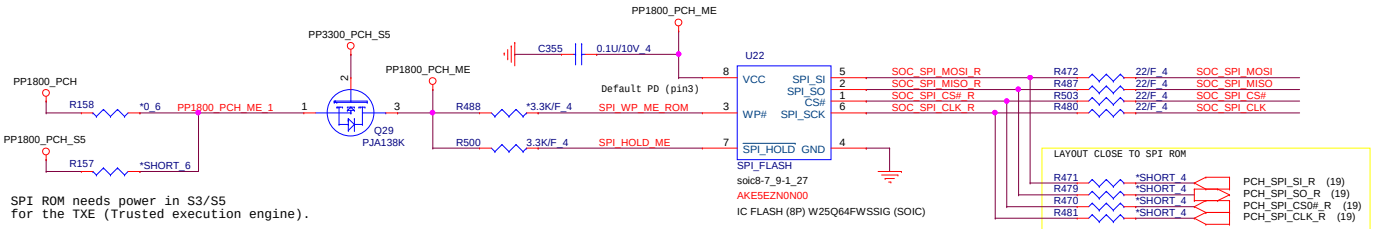
2nd BG625000121(HHE)



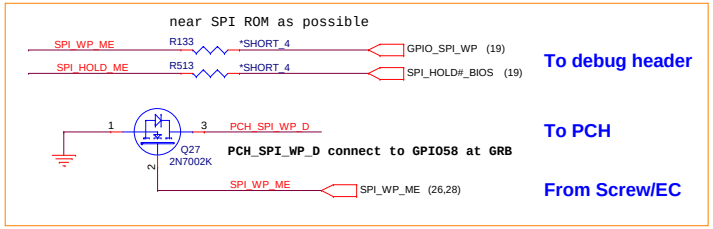
RTC Circuitry(RTC)

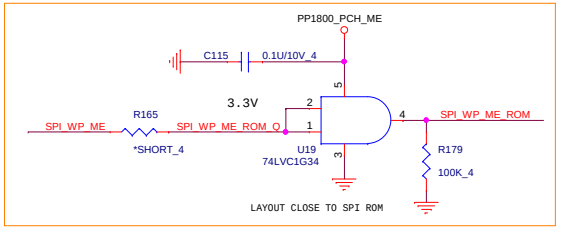


SPI_FLASH



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

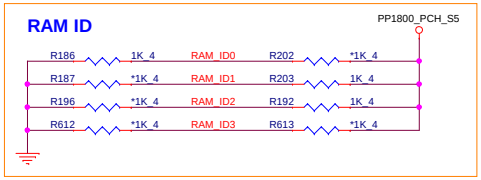




Quanta Computer Inc.		
PROJECT : ZHS		
Size	Document Number: Valley 5/9 (SPI/GPIO/CLK)	Rev: 1A
Date: Monday, August 10, 2015	Sheet 7 of 42	

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	



PORT 1 USB CONN
PORT 2 LTE
PORT 3 NA
PORT 4 NA

MB USB3.0
HUB1
CCD
BT

PP1800_PCH_S5 R426 10K_4 LTE_DISABLE#

U14F

LTE_DISABLE# → GPIO_S5_31 (G2)
RAM_ID0 → GPIO_S5_32 (M3)
RAM_ID1 → GPIO_S5_33 (L1)
RAM_ID2 → GPIO_S5_34 (K2)
GPIO_S5_35 (K3)
GPIO_S5_36 (M2)
GPIO_S5_37 (N3)
GPIO_S5_38 (P2)
GPIO_S5_39 (L3)
RAM_ID3 → GPIO_S5_40 (J3)
GPIO_S5_41 (P3)
GPIO_S5_42 (H3)
GPIO_S5_43 (B12)

(26) USBP0+ / (26) USBP0- → USB_DP0 (M16) / USB_DN0 (K16)
(22) USBP1+ / (22) USBP1- → USB_DP1 (J14) / USB_DN1 (G14)
(18) USBP2+ / (18) USBP2- → USB_DP2 (K12) / USB_DN2 (J12)
(21) USBP3+ / (21) USBP3- → USB_DP3 (K10) / USB_DN3 (H10)

R437 1K/F_4 ICLK_USB_TERMN_0 D10
R425 1K/F_4 ICLK_USB_TERMN_1 F10
ICLK_USB_TERMN_D10
ICLK_USB_TERMN

(15,26) USB_OC0#
PP1800_PCH_S5
(15,24) USB_OC1#
R97 10K_4 USB_OC0# C20
R189 10K_4 USB_OC1# B20
USB_OC_00 / USB_OC_11 → +1.8V_S5 +1.8V_S5

R443 45.3/F_4 USB_RCOMP D6
USB_RCOMPO
C7 USB_RCOMPI

R436 *0_4 USB_PLL_MON M13
USB_PLL_MON

B4 USB_HSIC0_DATA
B5 USB_HSIC0_STROBE
E2 USB_HSIC1_DATA
D2 USB_HSIC1_STROBE

R185 45.3/F_4 USB_HSIC_RCOMP A7
USB_HSIC_RCOMP
R415 49.9/F_4 LPC_RCOMP
BF18 LPC_RCOMP

(23) PCLK_TPM
R446 *0_4
R449 *SHORT_4 CLK_PCI_EC_R
LPC_CLKRUN_L R109 *SHORT_4 SOC_CLKRUN#
(28) CLK_PCI_EC
(28) LPC_CLKRUN_L
(15) SOC_SERIRQ

(23,28) LPC_LAD0 BH16
(23,28) LPC_LAD1 BJ17
(23,28) LPC_LAD2 BJ13
(23,28) LPC_LAD3 BG14
(23,28) LPC_LFRAME# BG17
R115 22/F_4 SOC_CLKOUT_0 BG15
R112 22/F_4 SOC_CLKOUT_1 BH14
SOC_SERIRQ BG13
LPC_AD_00 / LPC_AD_11 / LPC_AD_22 / LPC_AD_33 / LPC_FRAME / LPC_CLK_00 / LPC_CLK_11 / LPC_CLKRUN / 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
(12) SMB_SOC_CLK
SMB_SOC_DATA BG12
SMB_SOC_CLK BH10
SMB_SOC_ALERTB BG11
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 M10
RESERVED_M9 M9
RESERVED_P7 P7
RESERVED_P6 P6
RESERVED_M7 M7
USB3_REXT0 M12 USB3_P0_REXT R440 1.24K/F_4
RESERVED_P10 P10
RESERVED_P12 P12
RESERVED_M4 M4
RESERVED_M6 M6
USB3_RXP0 D4 USB3_RXP0 (26) USB3_RXP0
USB3_RXN0 E3 USB3_RXN0 (26) USB3_RXN0
USB3_TXP0 K6 USB3_TXP0 (26) USB3_TXP0
USB3_TXN0 K7 USB3_TXN0 (26) USB3_TXN0
RESERVED_H8 H8
RESERVED_H7 H7
RESERVED_H5 H5
RESERVED_H4 G4

R420 SOC_UART_TX SOC_UART_RX *0_4
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

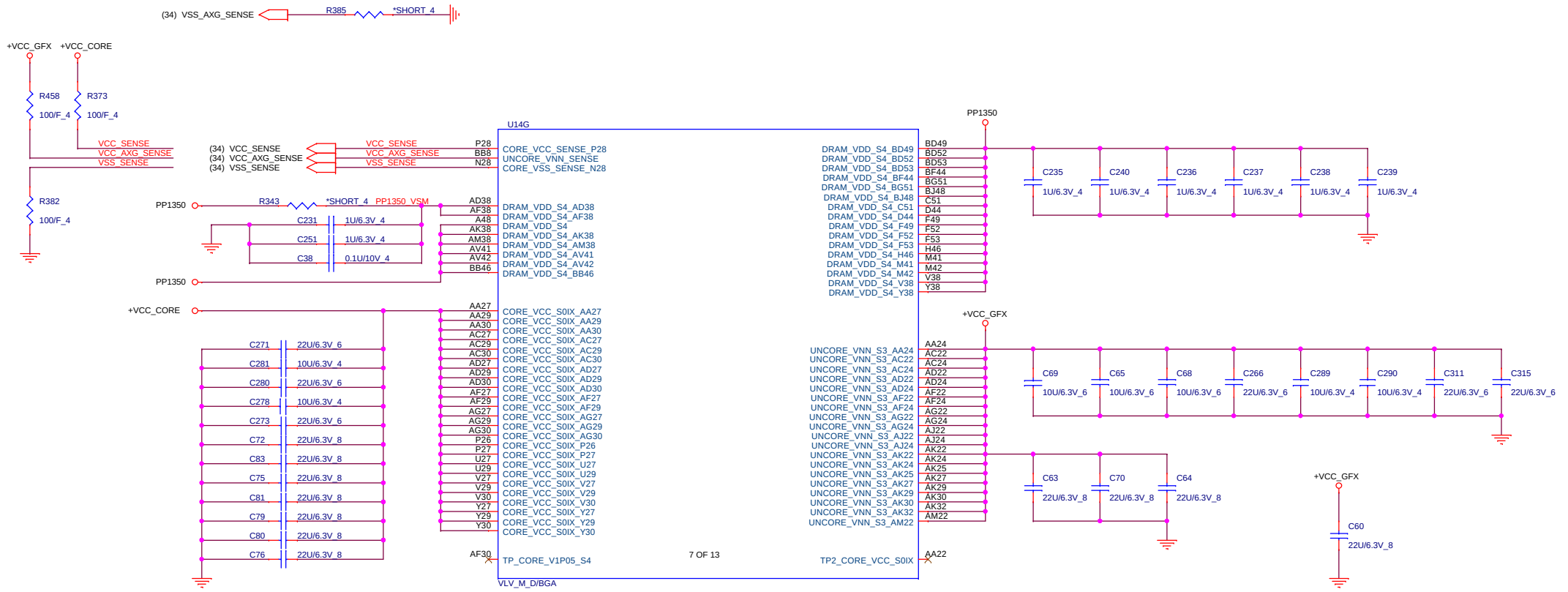
+1.8V SIO_I2C4_DATA BF27 I2C_4_SDA R625 *TS@22/F_4 I2C_5_SDA
+1.8V SIO_I2C4_CLK BG27 I2C_4_SCL R626 *TS@22/F_4 I2C_5_SCL
Light sensor
+1.8V SIO_I2C5_DATA BH28 I2C_5_SDA_C R71 TS@22/F_4 I2C_5_SDA (16)
+1.8V SIO_I2C5_CLK BG28 I2C_5_SCL_C R65 TS@22/F_4 I2C_5_SCL (16)
Touch panel
+1.8V SIO_I2C6_DATA BJ29
+1.8V SIO_I2C6_CLK BG29

PP1800_PCH
I2C_NFC_SDA R368 *4.7K_4
I2C_NFC_SCL R367 *4.7K_4

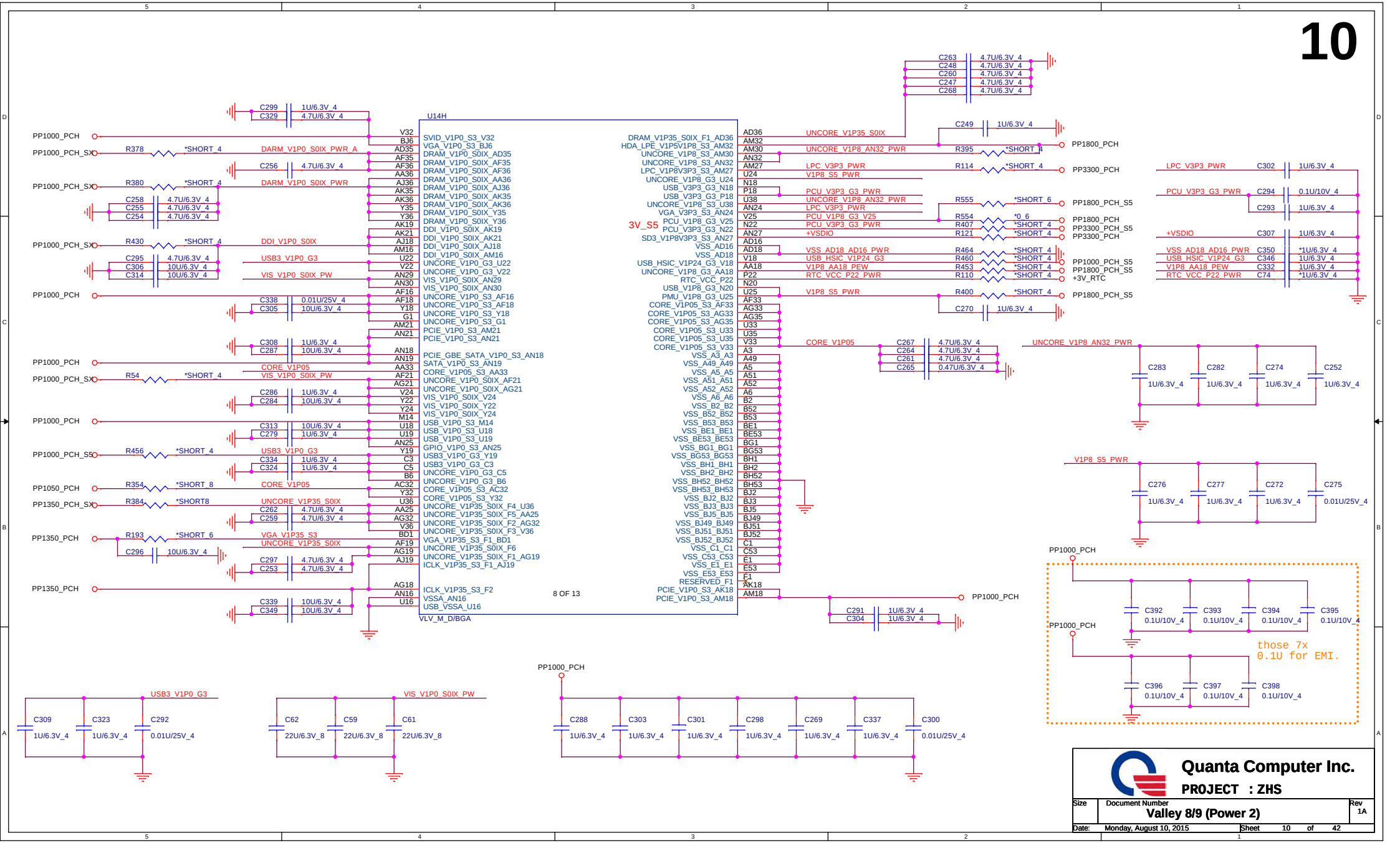
GPIO_S0_SC_092 BH30 I2C_NFC_SDA
GPIO_S0_SC_093 BG30 I2C_NFC_SCL
NFC

?

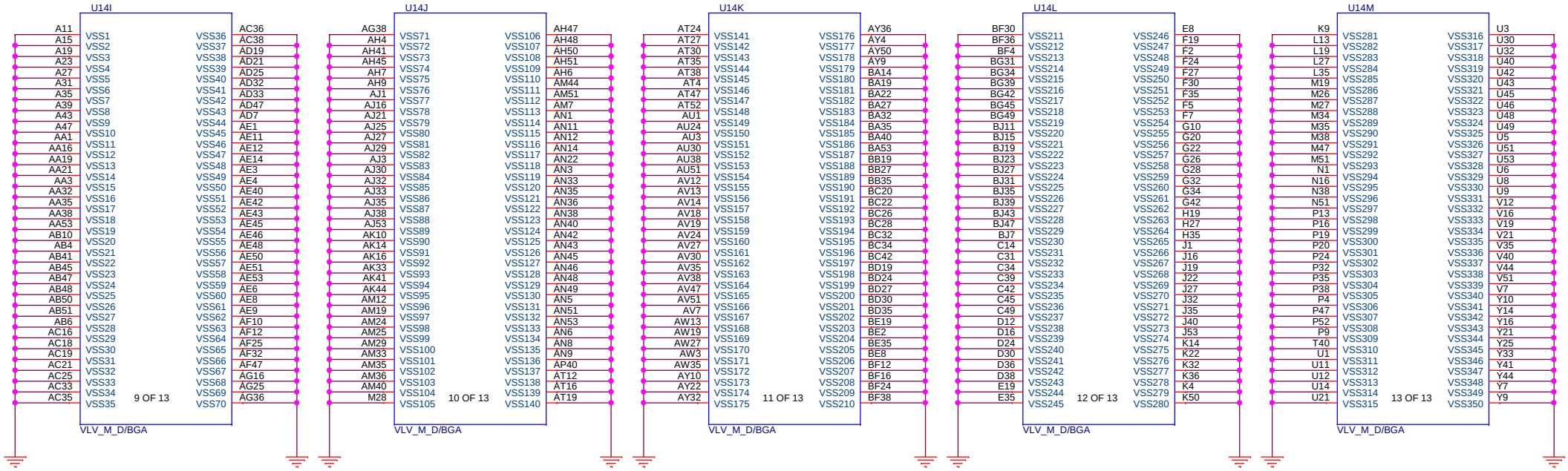
Quanta Computer Inc.
PROJECT : ZHS
Size | Document Number: Valley 6/9 (USB/LPC/I2C) | Rev 1A
Date: Monday, August 10, 2015 Sheet 8 of 42



Quanta Computer Inc.		
PROJECT : ZHS		
Size	Document Number: Valley 7/9 (Power 1)	Rev: 1A
Date: Monday, August 10, 2015	Sheet 9 of 42	



Quanta Computer Inc.		
PROJECT : ZHS		
Size	Document Number: Valley 8/9 (Power 2)	Rev: 1A
Date: Monday, August 10, 2015	Sheet 10 of 42	



Quanta Computer Inc.

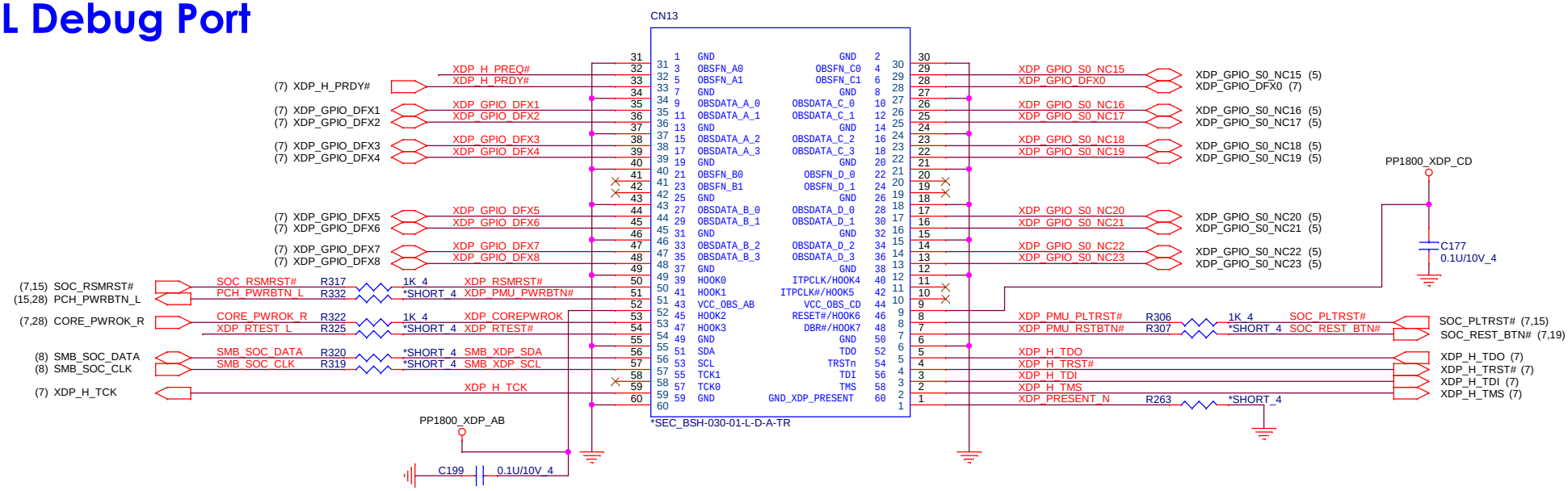
PROJECT : ZHS

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

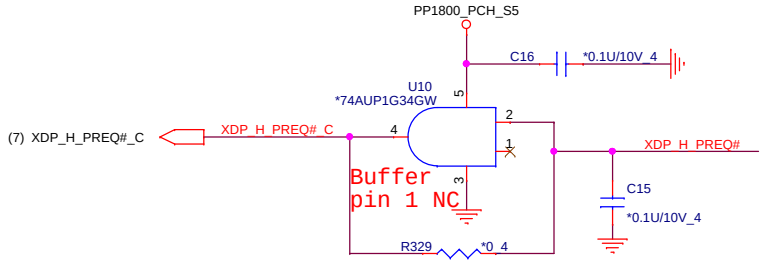
Date: Monday, August 10, 2015 Sheet 11 of 42

INTEL Debug Port

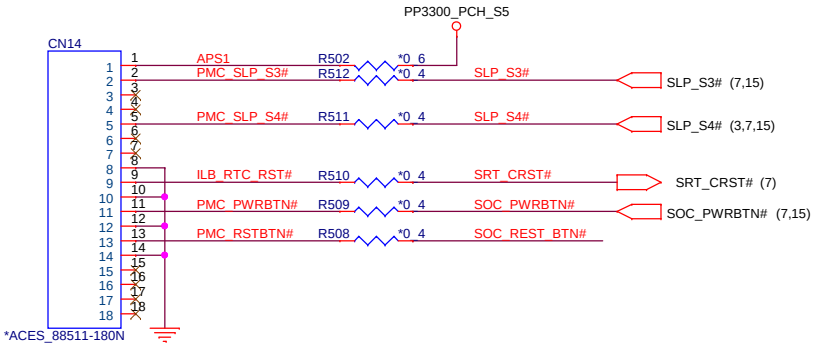
12



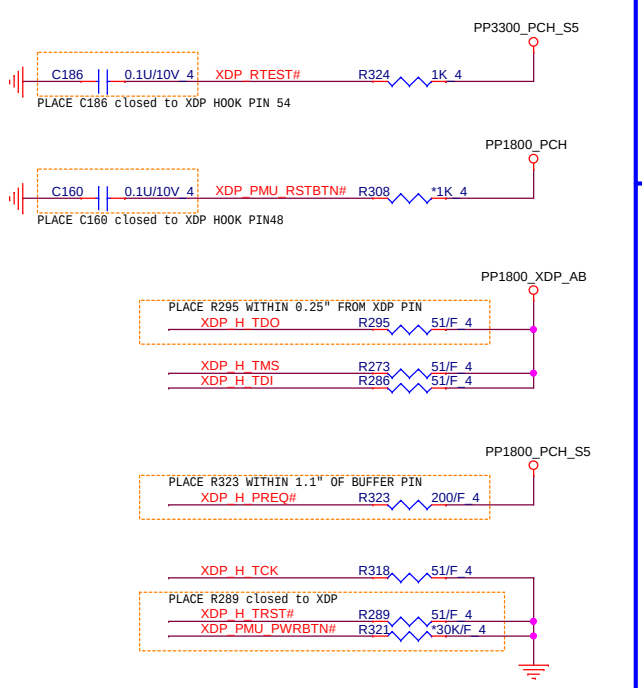
XDP



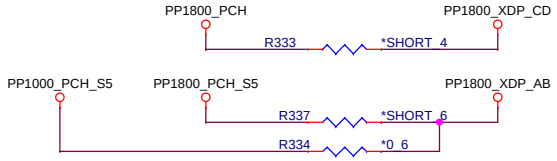
APS



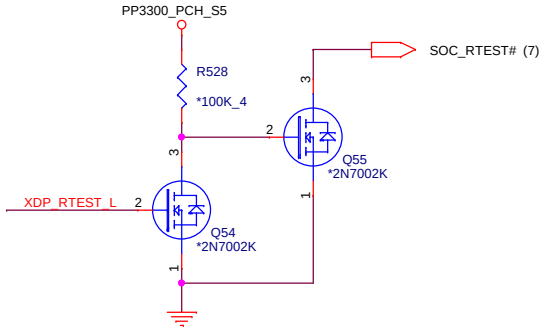
XDP



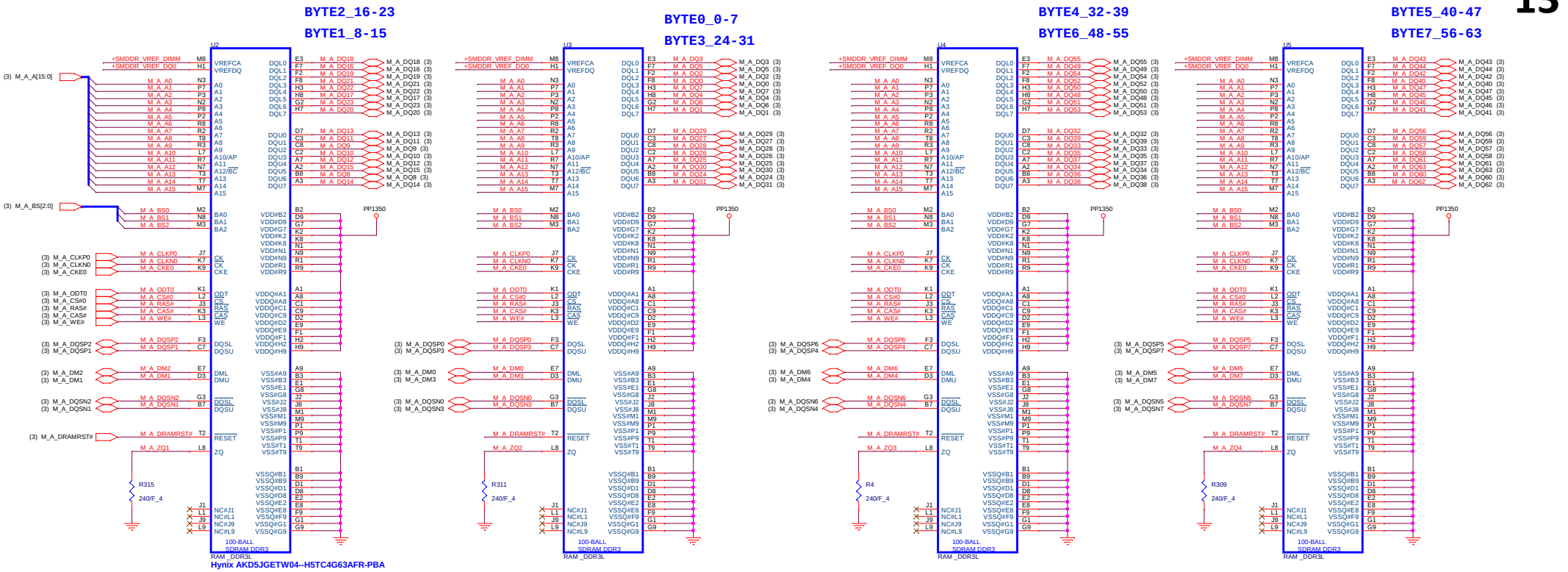
INTEL Debug Port Power



XDP Reset

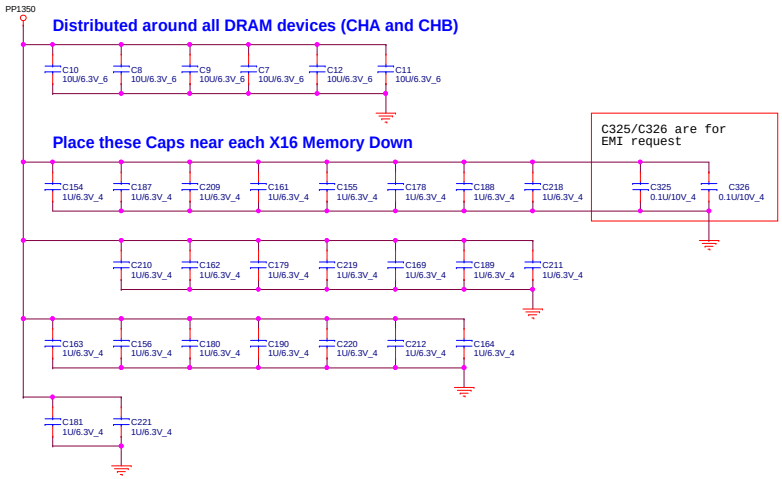


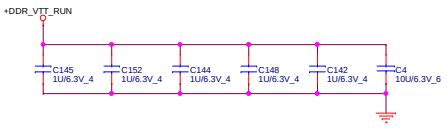
Quanta Computer Inc.		
PROJECT : ZHS		
Size	Document Number	Rev
	CPU XDP / APS	1A
Date: Monday, August 10, 2015	Sheet 12 of 42	

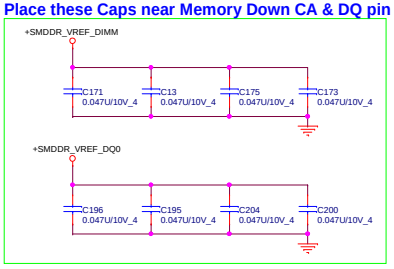


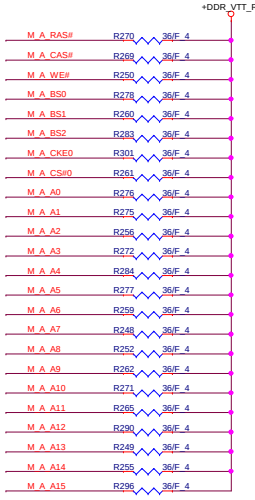
Hynix AKD5JGETW04--H5TC4G63AFR-PBA

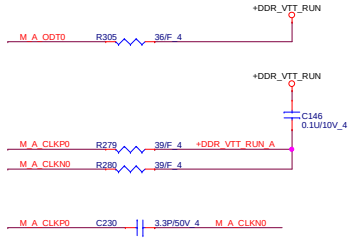
Vendor	P/N	
Hynix	AKD5JGETW04	DDR3L 1600Mhz 4Gb
Elpida	AKD5JGST400	DDR3L 1333Mhz 4Gb
	AKD5JGST404	DDR3L 1600Mhz 4Gb

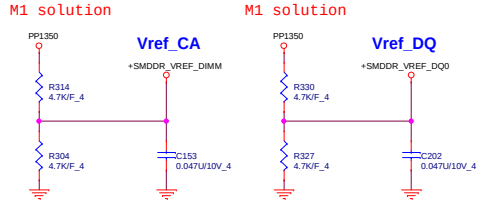












Quanta Computer Inc.
PROJECT : ZHS

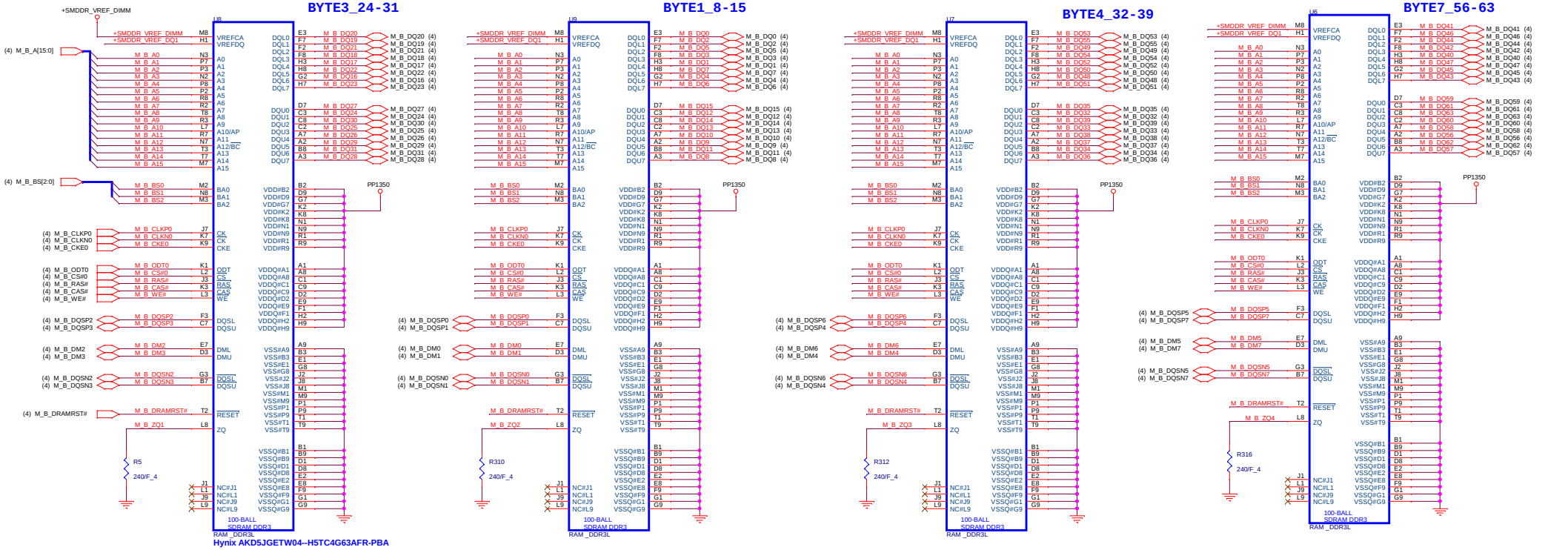
Size	Document Number	Rev
	DDR3L MEMORY DOWNx16 A	1A
Date: Monday, August 10, 2015	Sheet 13 of 42	

BYTE2_16-23
BYTE3_24-31

BYTE0_0-7
BYTE1_8-15

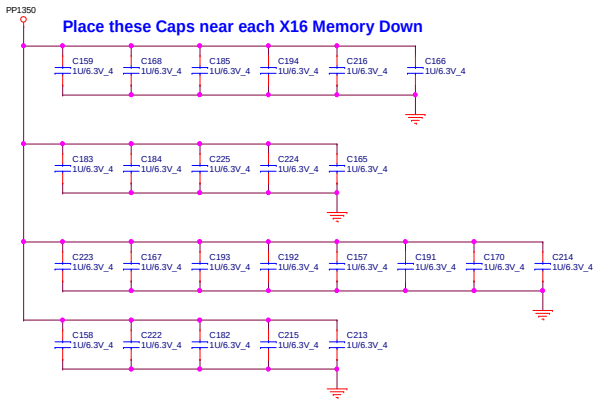
BYTE6_48-55
BYTE4_32-39

BYTE5_40-47
BYTE7_56-63

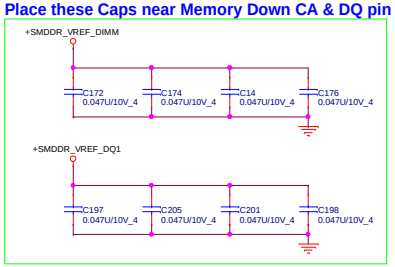


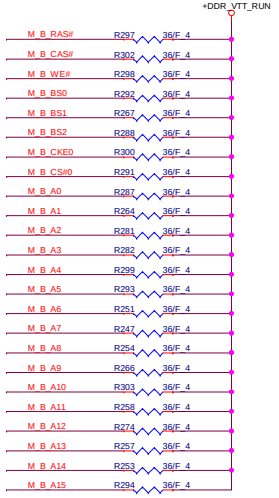
Vendor	P/N	
Hynix	AKD5JGETW04	DDR3L 1600Mhz 4Gb
Elpida	AKD5JGST400	DDR3L 1333Mhz 4Gb
	AKD5JGST404	DDR3L 1333Mhz 4Gb

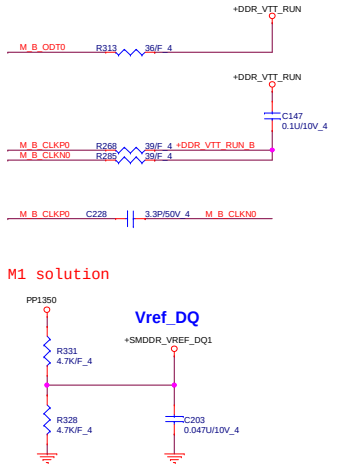
Place these Caps near each X16 Memory Down



Place these Caps near Memory Down CA & DQ pin



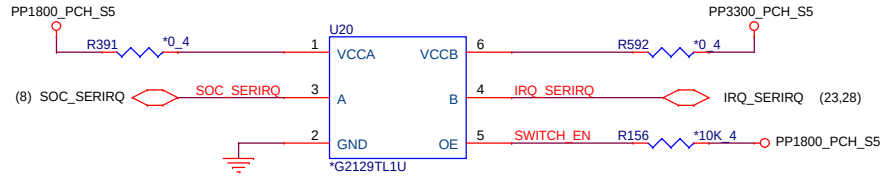


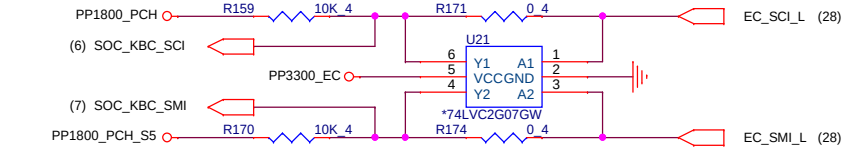


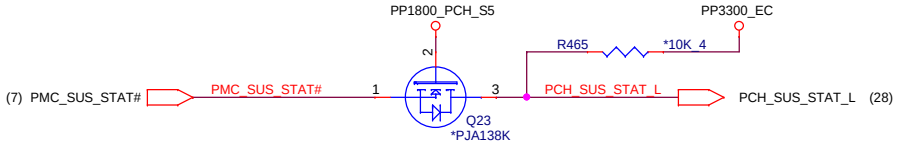
Quanta Computer Inc.
PROJECT : ZHS

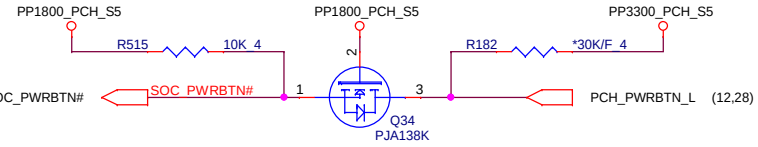
Size	Document Number	Rev
	DDR3L MEMORY DOWNx16 CH-B	1A
Date: Monday, August 10, 2015	Sheet 14 of 42	

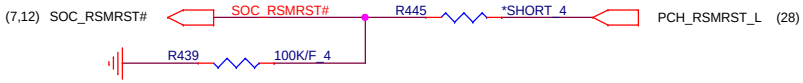
PWRON SEQUENCE

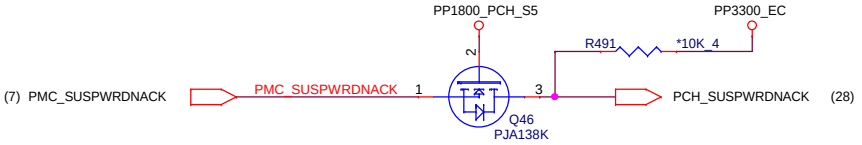




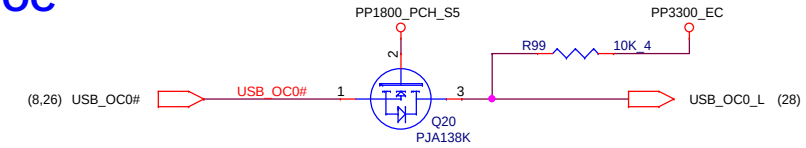


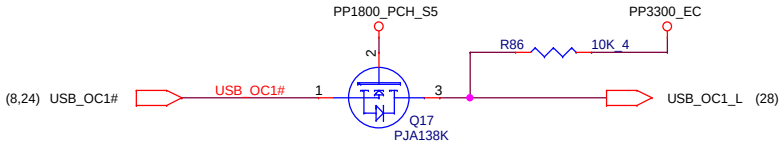




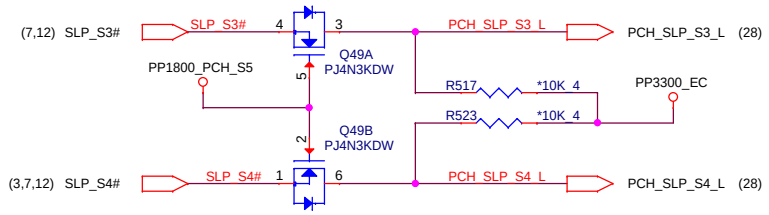


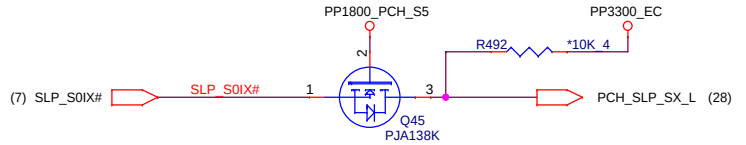
USB OC

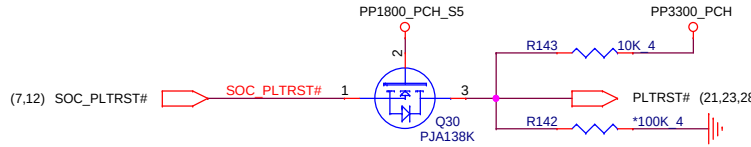




PWRON SEQUENCE

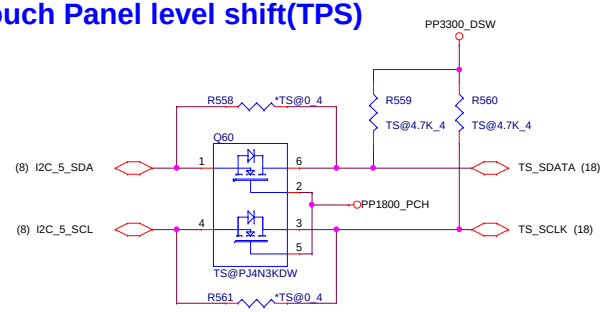






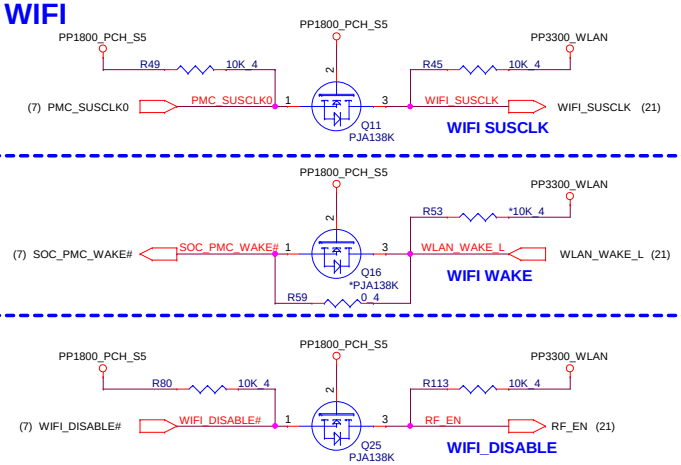
Quanta Computer Inc.		
PROJECT : ZHS		
Size	Document Number: Level Shifter (SOC_EC)	Rev: 1A
Date: Monday, August 10, 2015	Sheet 15 of 42	

Touch Panel level shift(TPS)

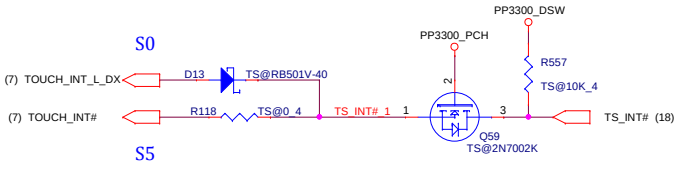


LTE

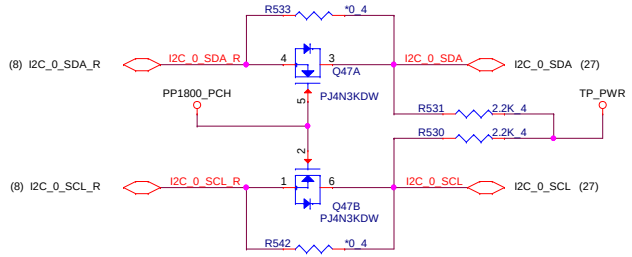
WIFI



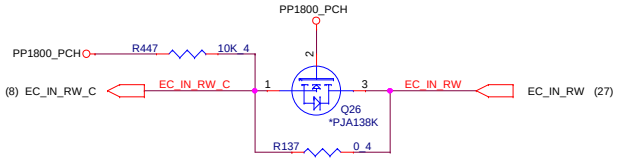
Touch Screen(TPS)



Track Pad

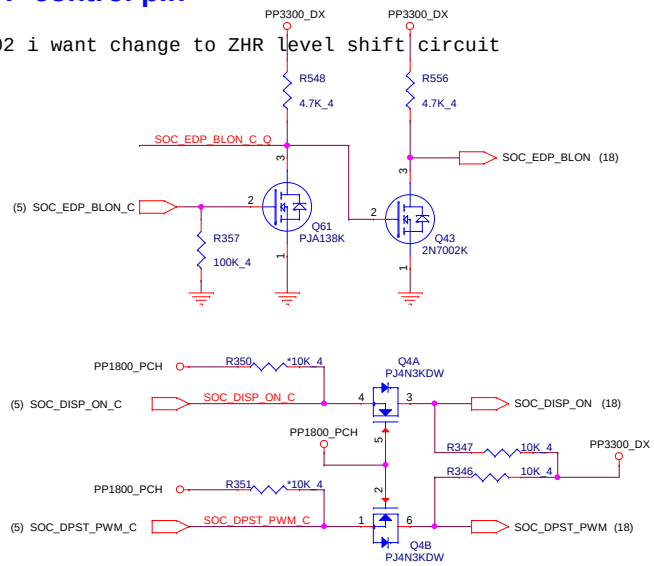


HW RESET

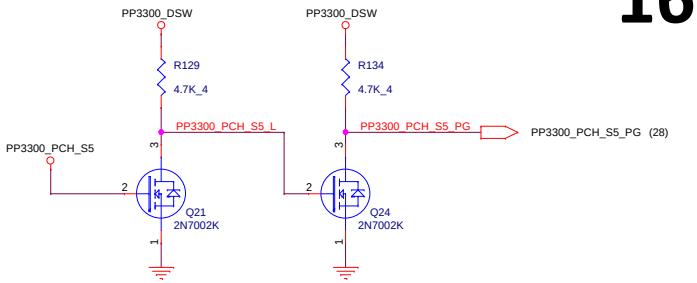


eDP control pin

0402 i want change to ZHR level shift circuit

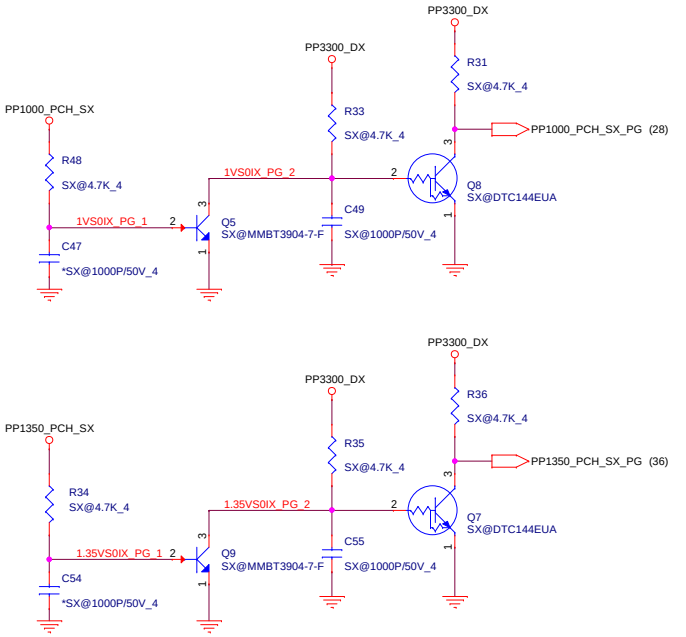


S5 Power Good(+3V_S5)

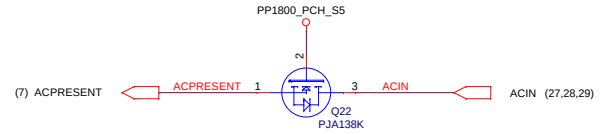


S0iX Power Good

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



AC Detect



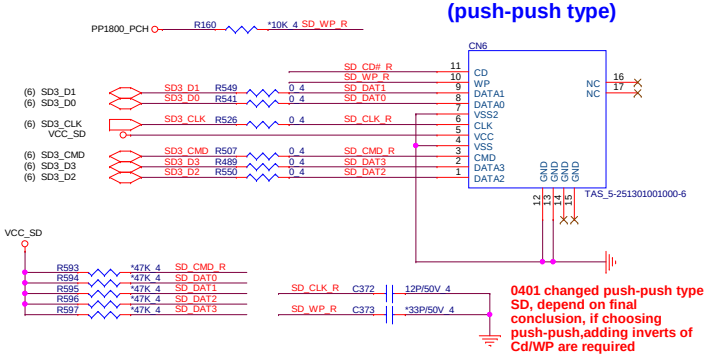
Quanta Computer Inc.
PROJECT : ZHS

Size	Document Number	Rev
	Level Shifter (SOC_DEV)	1A

Date: Monday, August 10, 2015 Sheet 16 of 42

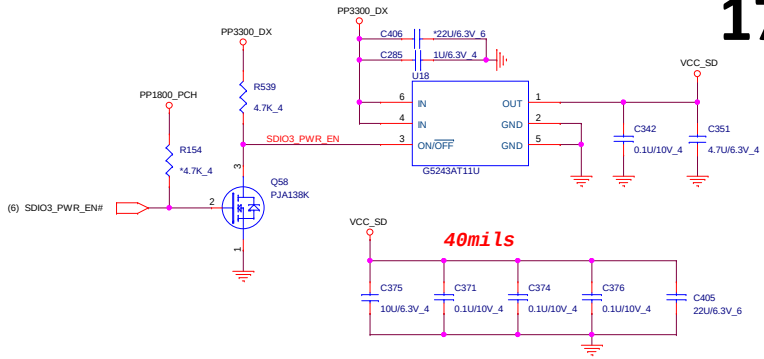
SD/MMC CARD READER CONNECTOR (CBS)

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

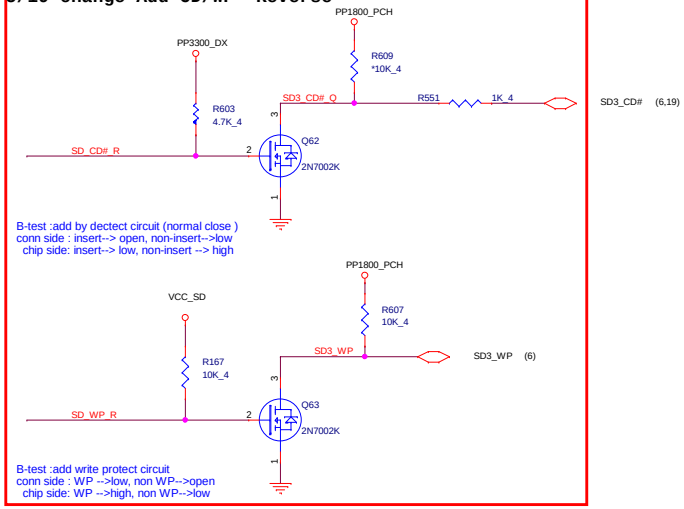


0401 changed push-push type SD, depend on final conclusion, if choosing push-push,adding inverts of Cd/WP are required

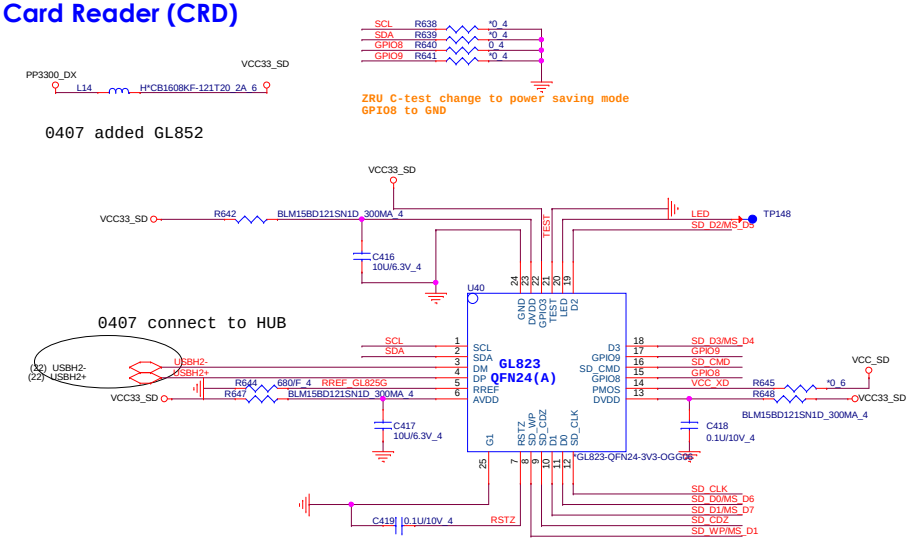
SD card power (CBS)



5/19 change Add CD/WP Reverse



Card Reader (CRD)



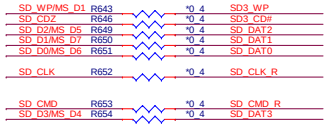
GPIO8	GPIO9	FUNCTION
NC	NC	Default Configuration
NC	GND	Remote wake up enable
GND	NC	Power saving enable
GND	GND	ESD mode enable

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

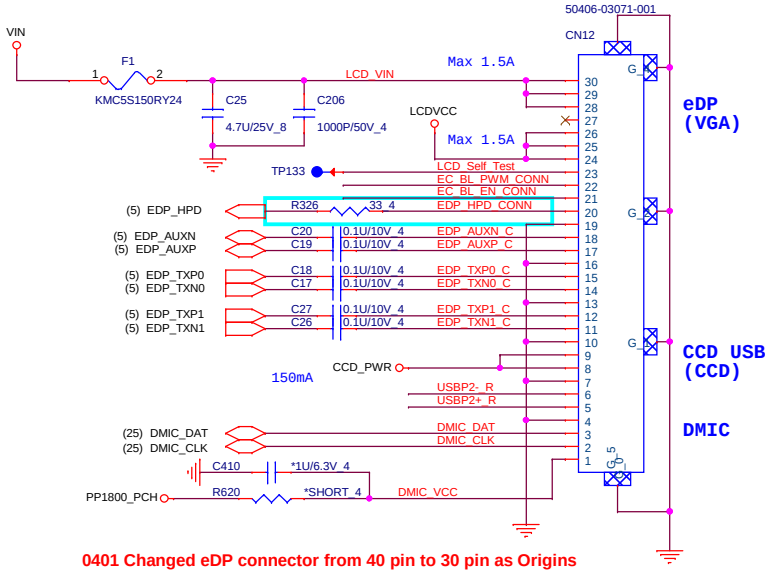


Quanta Computer Inc.

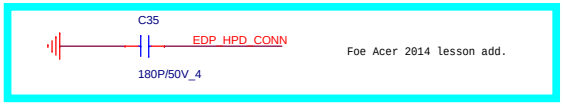
PROJECT : ZHS

Size	Document Number	Rev
	SDIO CardReader /USB HUB	1A
Date: Monday, August 10, 2015	Sheet 17 of 42	

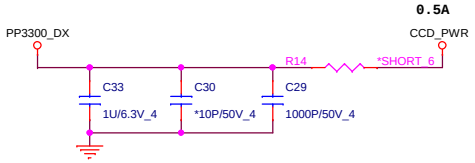
LCD CONN



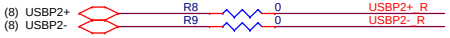
0401 Changed eDP connector from 40 pin to 30 pin as Origins



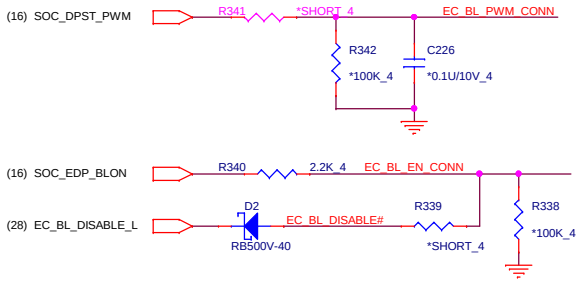
CCD Power(CCD)



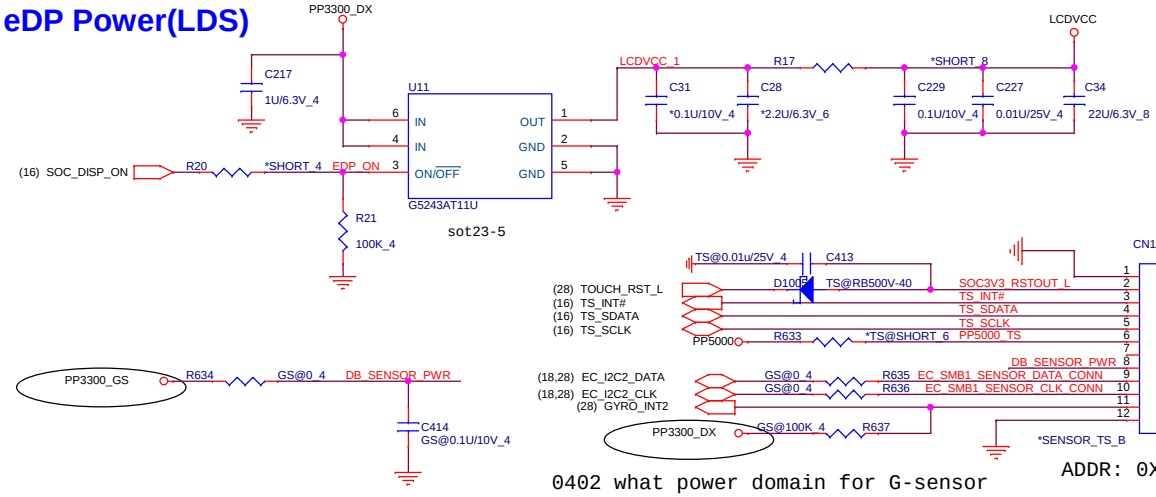
CCD USB(CCD)



eDP panel control(LDS)



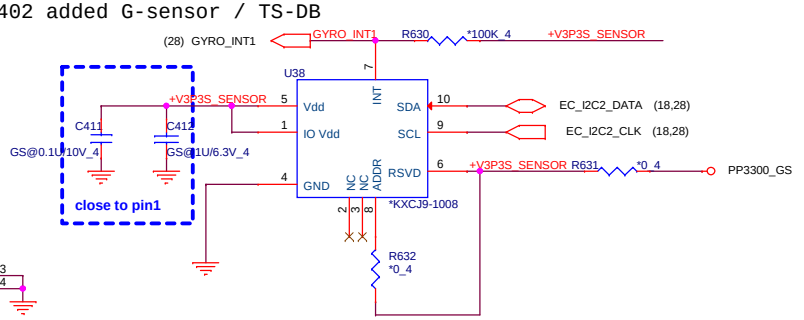
eDP Power(LDS)



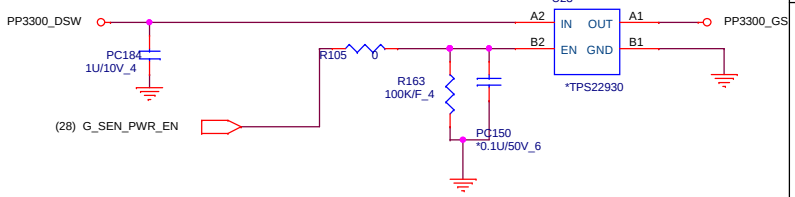
0402 what power domain for G-sensor

ADDR: 0X0E

0402 added G-sensor / TS-DB



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



Quanta Computer Inc.
PROJECT : ZHS

Size	Document Number	Rev
	LVDS/CCD/TS	1A
Date: Monday, August 10, 2015	Sheet 18 of 42	

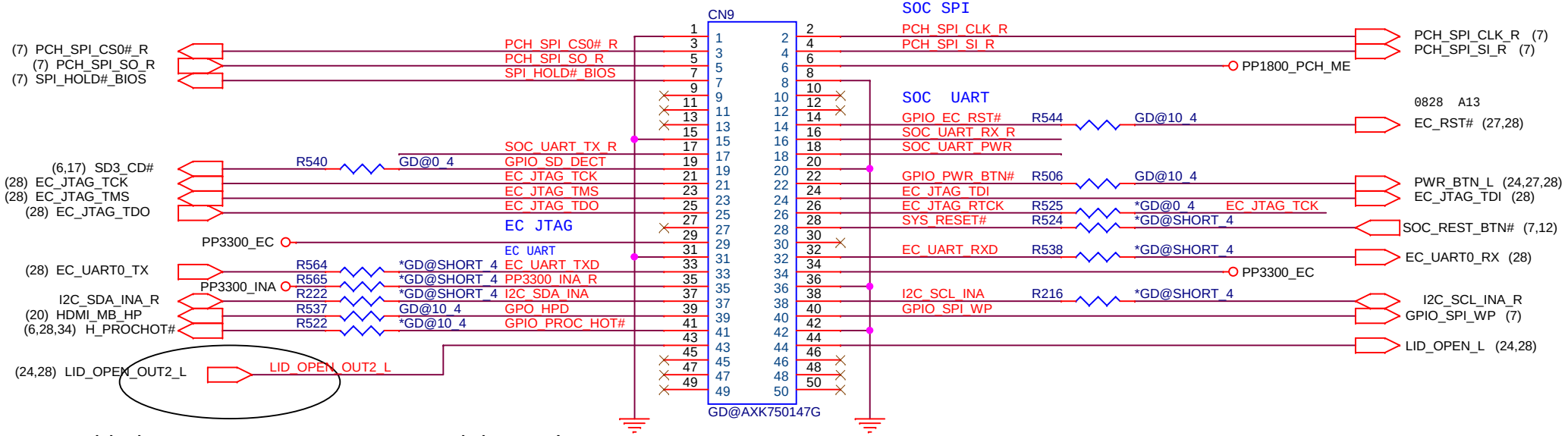
GOOGLE Debug Port(MPC)

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

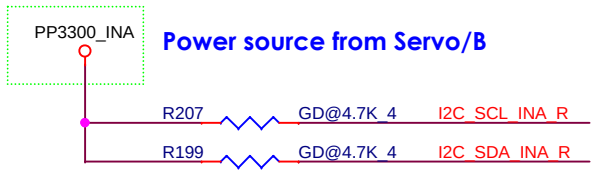
50 pin BTB is MUST, don't use 42 pin

Socket part number AXK750147G



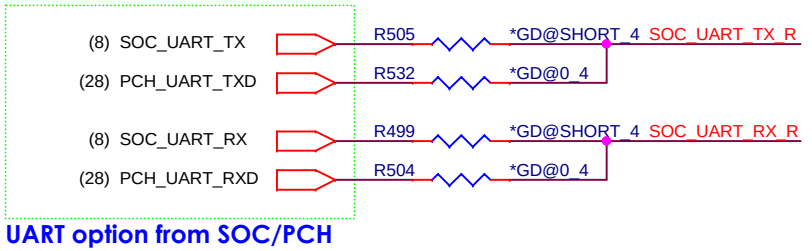
0402 added LID_OPEN_OUT2_L on G-debug pin 43

Servo/B I2C Power(MPC)



UART Power(MPC)

UART(MPC)

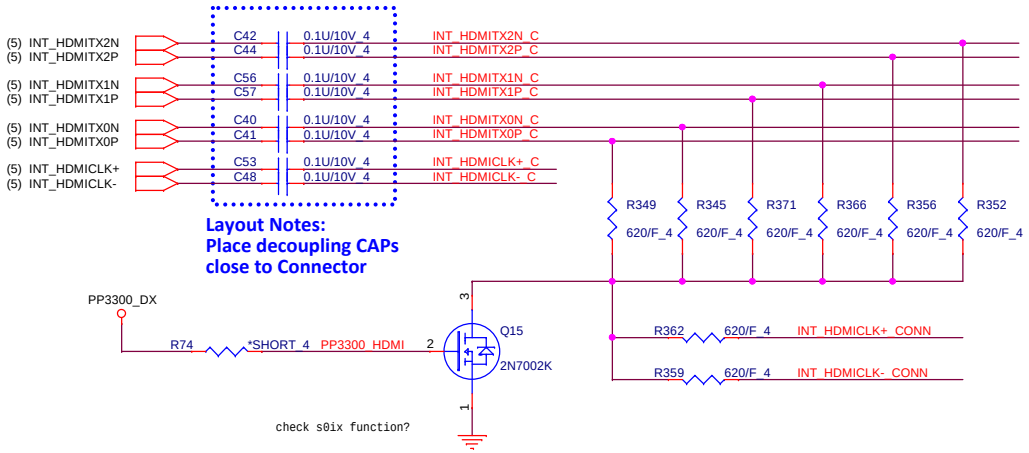


Quanta Computer Inc.

PROJECT : ZHS

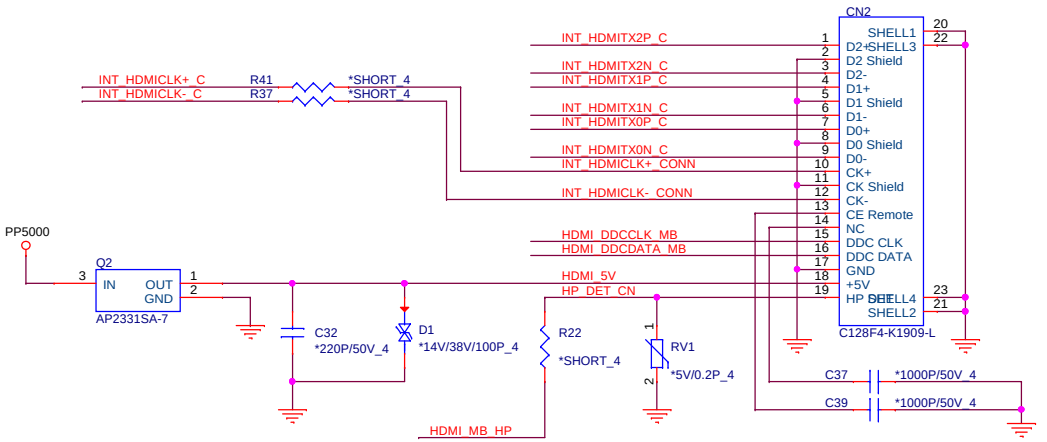
Size	Document Number	Rev
	Google Debug	1A
Date: Monday, August 10, 2015	Sheet 19 of 42	

HDMI Cost Reduced level shift (HDM)



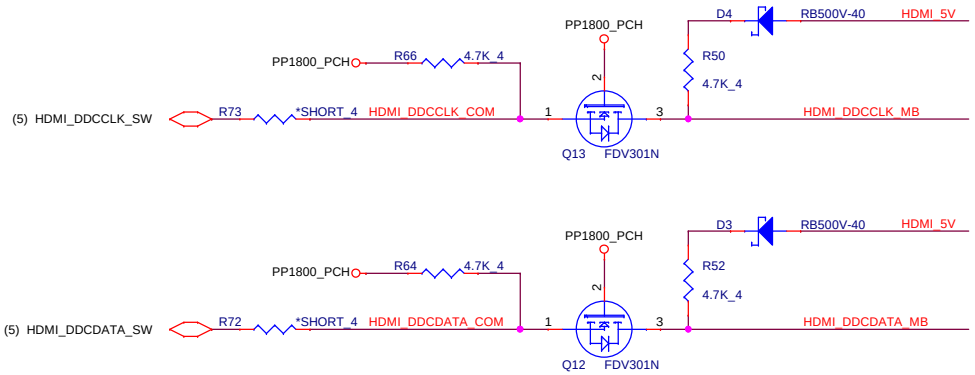
HDMI connector (HDM)

20

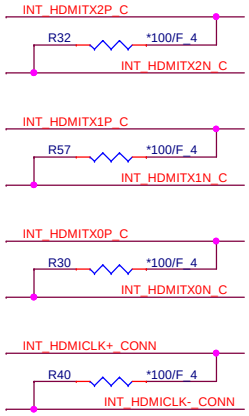


0401 Changed HDMI connector as Origins use

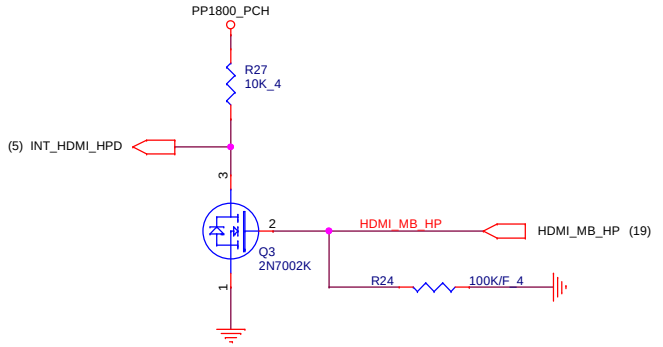
HDMI DDC (HDM)



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
(Low Active) (16) RF_EN	RF_EN	54	W_DISABLE#	PEWake0#	53	PCIE_CLKREQ_WLAN#_Q → WLAN_WAKE_L (16)
(Low Active) (28) WLAN_OFF_L	R55 *SHORT_4 PDN#	52	PDN#	CLKREQ0#	51	
(15,23,28) PLTRST#	R46 *SHORT_4 WLAN_RST#	50	PERST0#	GND	49	
(16) WIFI_SUSCLK		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)
TP28	WIFI_UART_RX	32	UART_RTS	GND		
			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

+WL_VDD → R47 *10K_4 PDN#

WAKE/REQ 53, 55 is OD

W/L

BT

0401 Changed WiFi NGFF connector as Origins use

WL/BT NGFF Power

PP3300_WLAN → R39 *SHORT_8 → +WL_VDD

C52 10U/6.3V_6 | C244 0.1U/10V_4 | C50 *0.1U/10V_4 | C51 *0.1U/10V_4

+WL_VDD → R42 *10K_4 → PCIE_CLKREQ_WLAN#_Q

PP1800_PCH → Q10 *PJA138K (2, 3, 1)

R44 *SHORT_4

PCIE_CLKREQ_WLAN# (6)

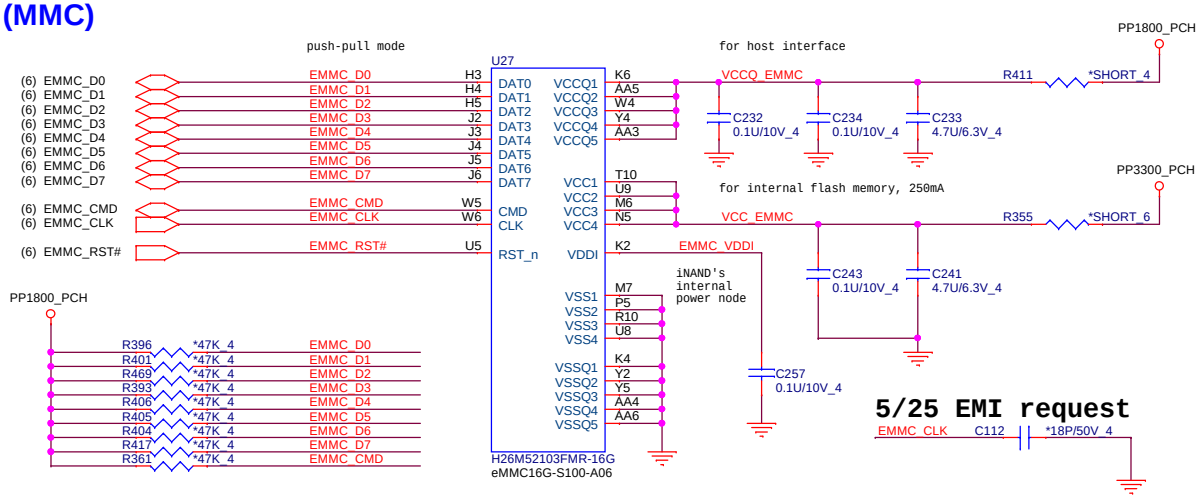
Quanta Computer Inc.

PROJECT : ZHS

Size	Document Number	Rev
	WIFI / BT	1A

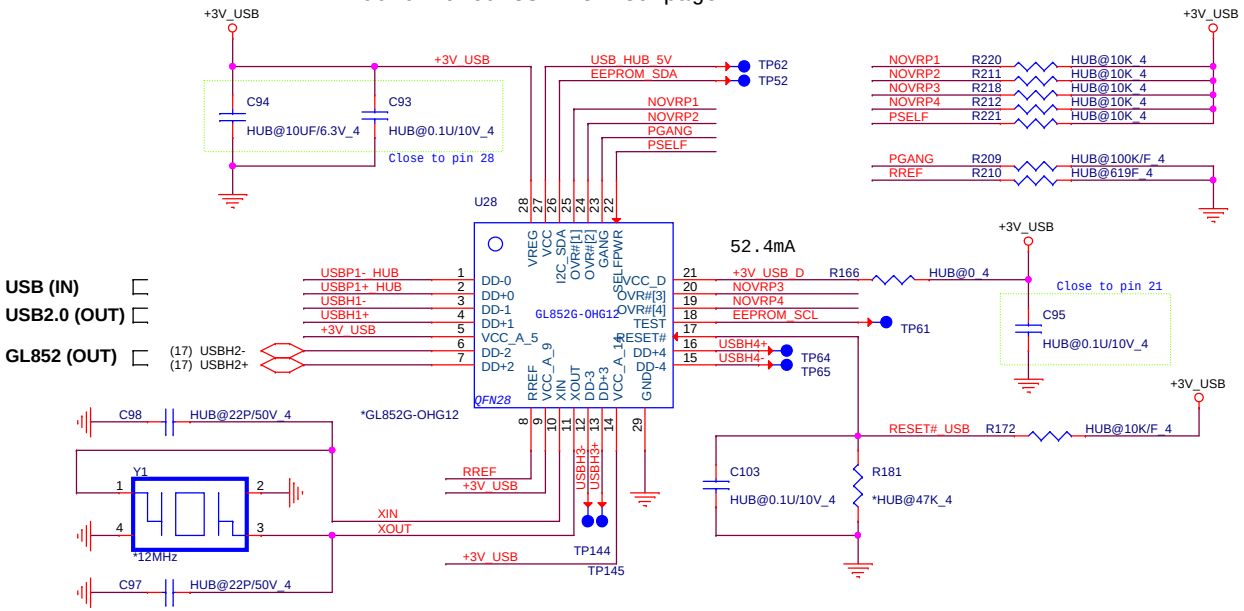
Date: Monday, August 10, 2015 Sheet 21 of 42

EMMC (MMC)

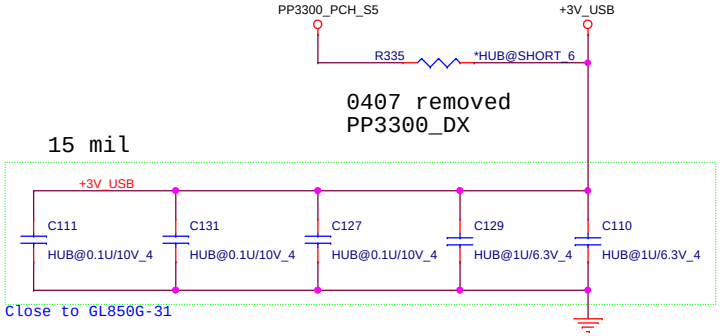


USB HUB (HUB)

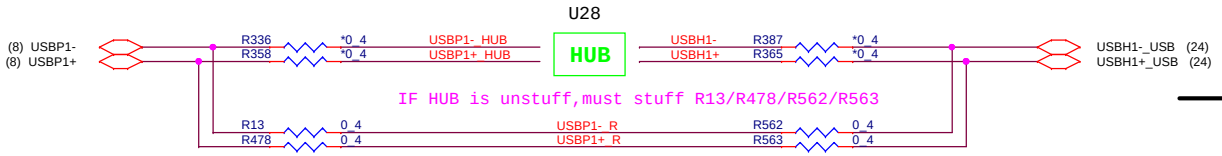
0616 moved USB HUB to page 22



USB HUB power (HUB)



USB option for GL852/USB2.0 (HUB)



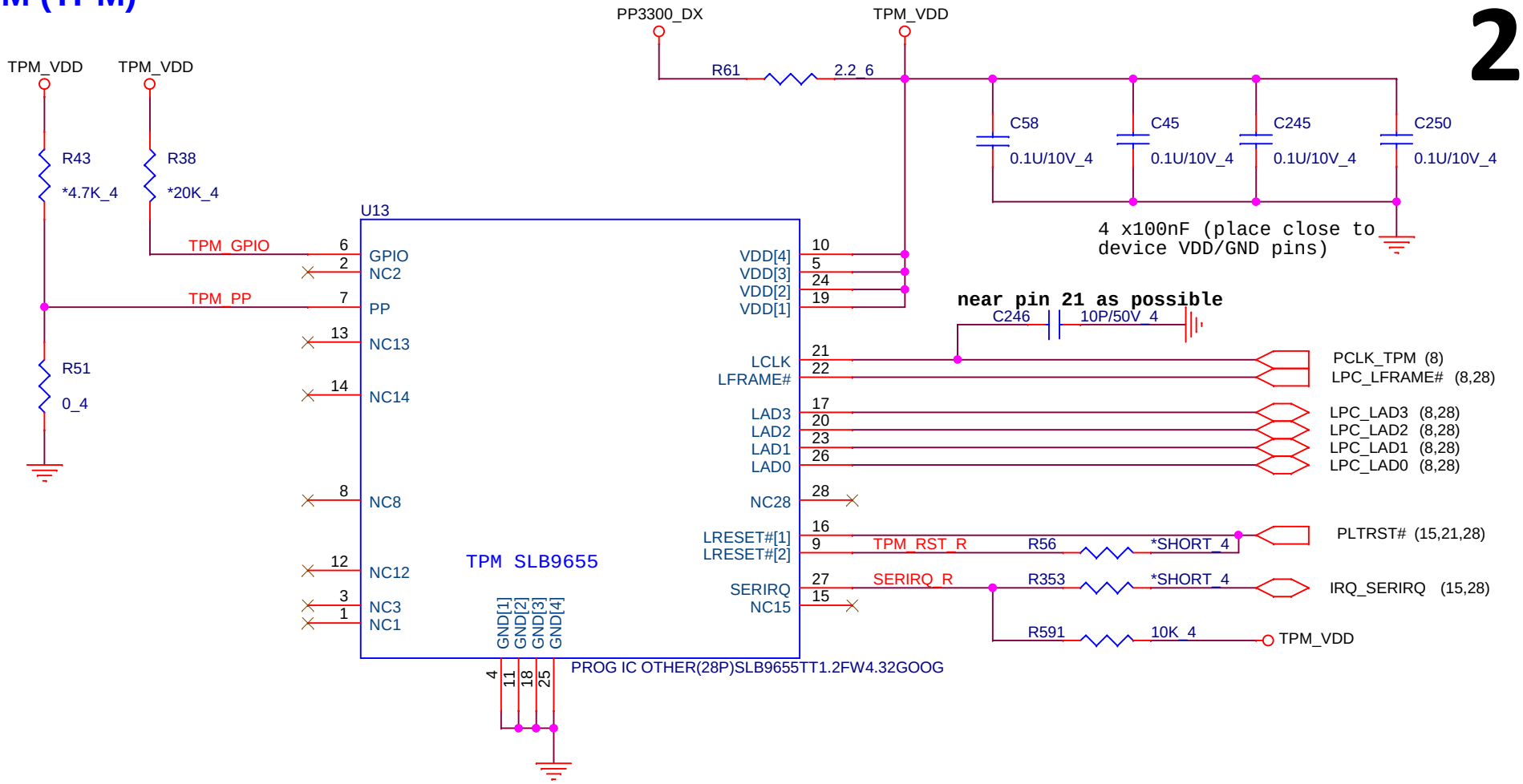
To IO/B

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)

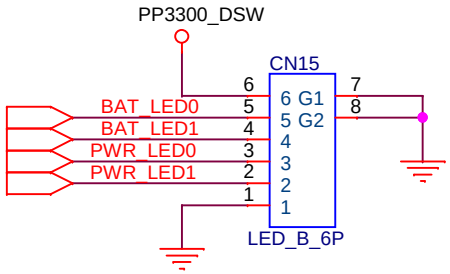


LED board(UIF)

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

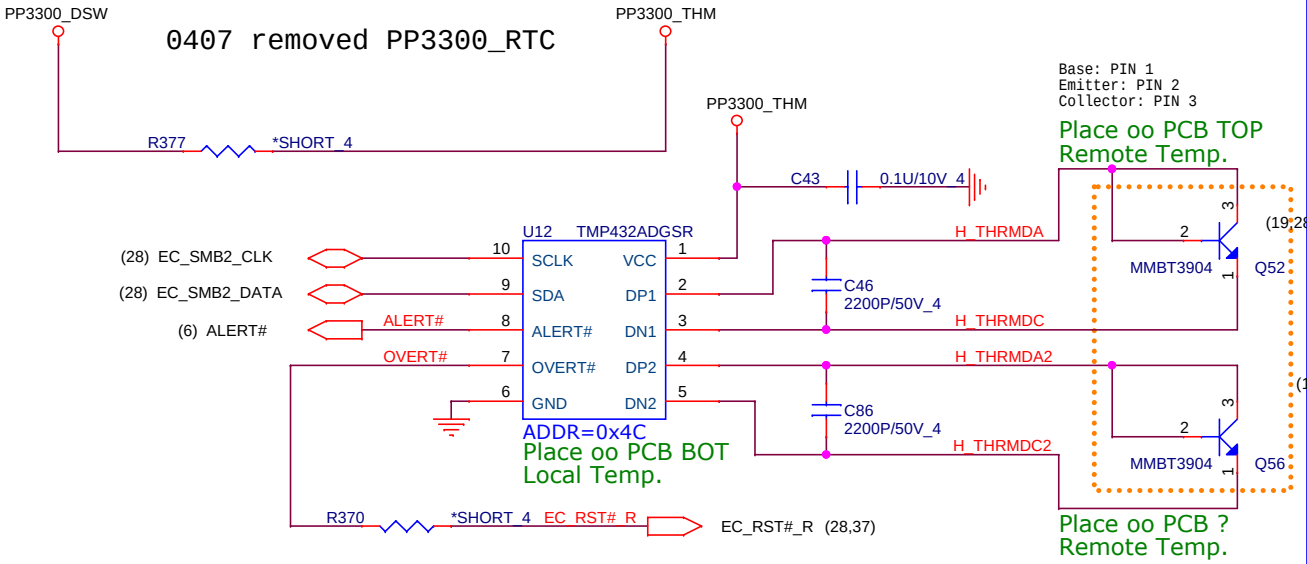


Quanta Computer Inc.

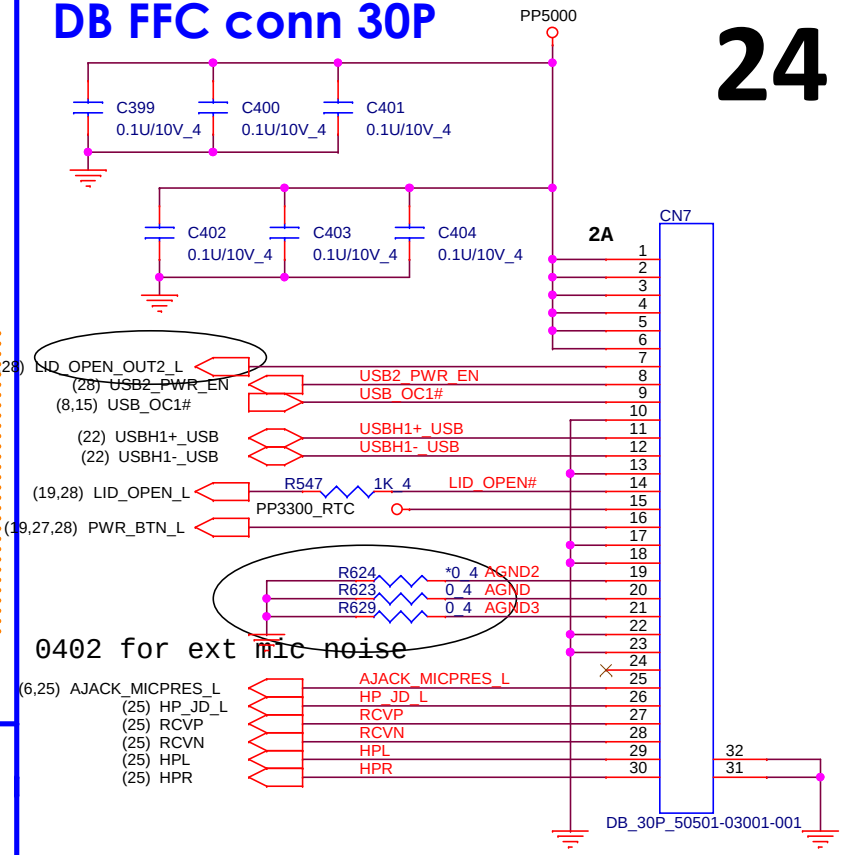
PROJECT : ZHS

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

Thermal Sensor(THM)



DB FFC conn 30P



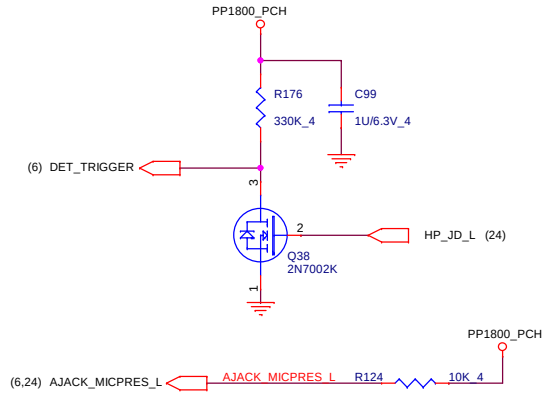
USB 2.0_ILIM_SEL (USB)

Quanta Computer Inc.		
PROJECT : ZHS		
Size	Document Number: DB/Thermal sensor/LTE PWR	Rev: 1A
Date: Monday, August 10, 2015	Sheet 24 of 42	

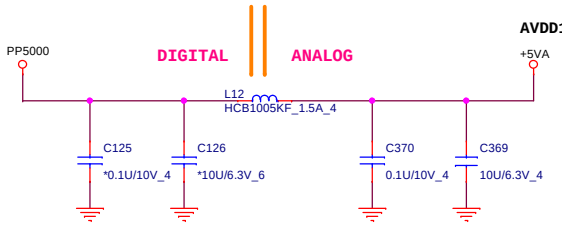
AUDIO CODEC (ADO)

25

SOC DET (ADO)



Codec PWR 5V (ADO)

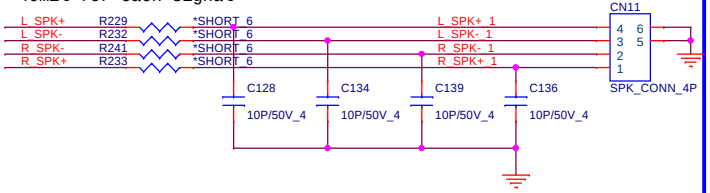


Internal Speaker (ADO)

40mil for each signal

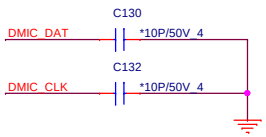
0402 ZHR had same circuit on SPK

follow 0C1 pin define

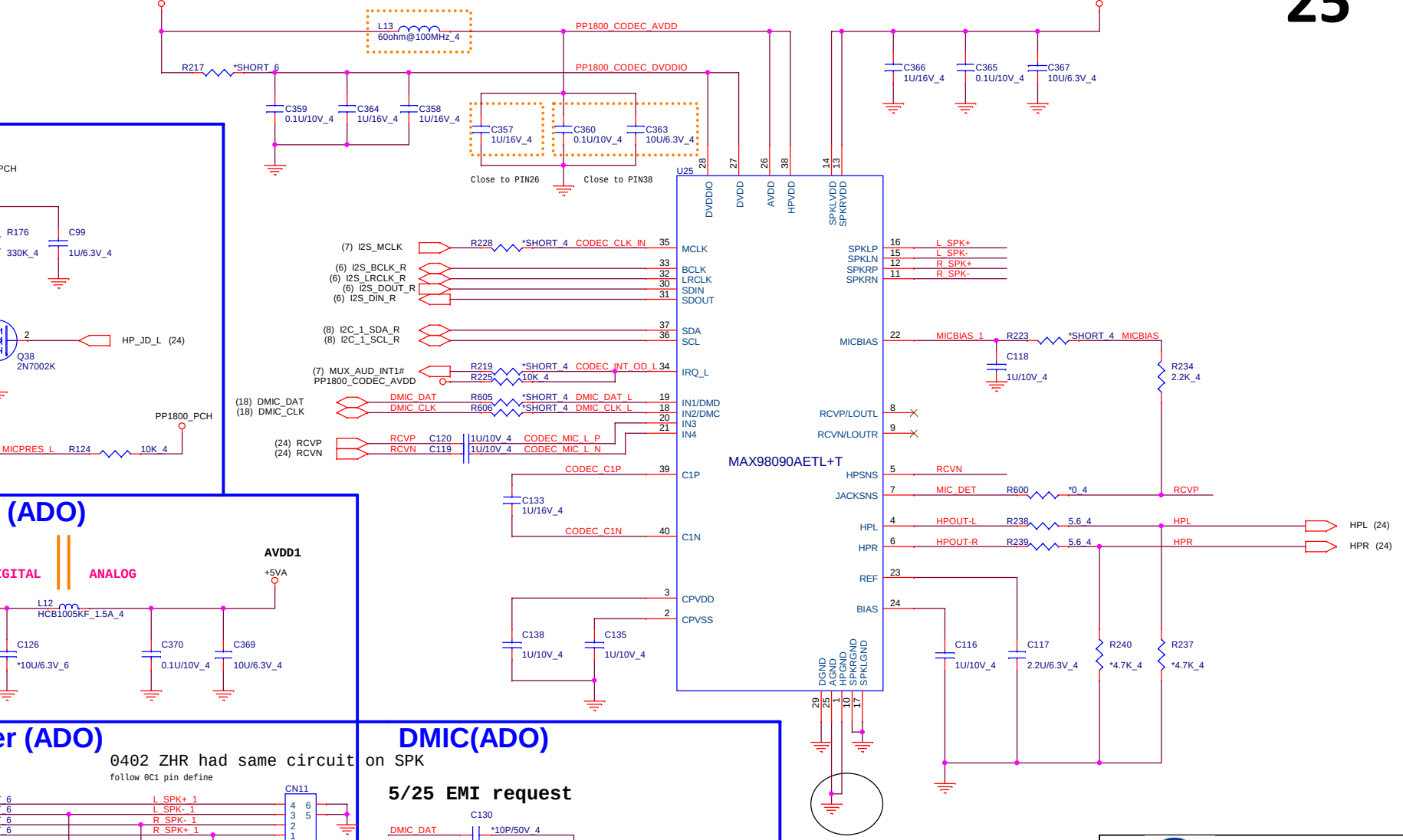


DMIC(ADO)

5/25 EMI request



0402 changed for ext MIC noise



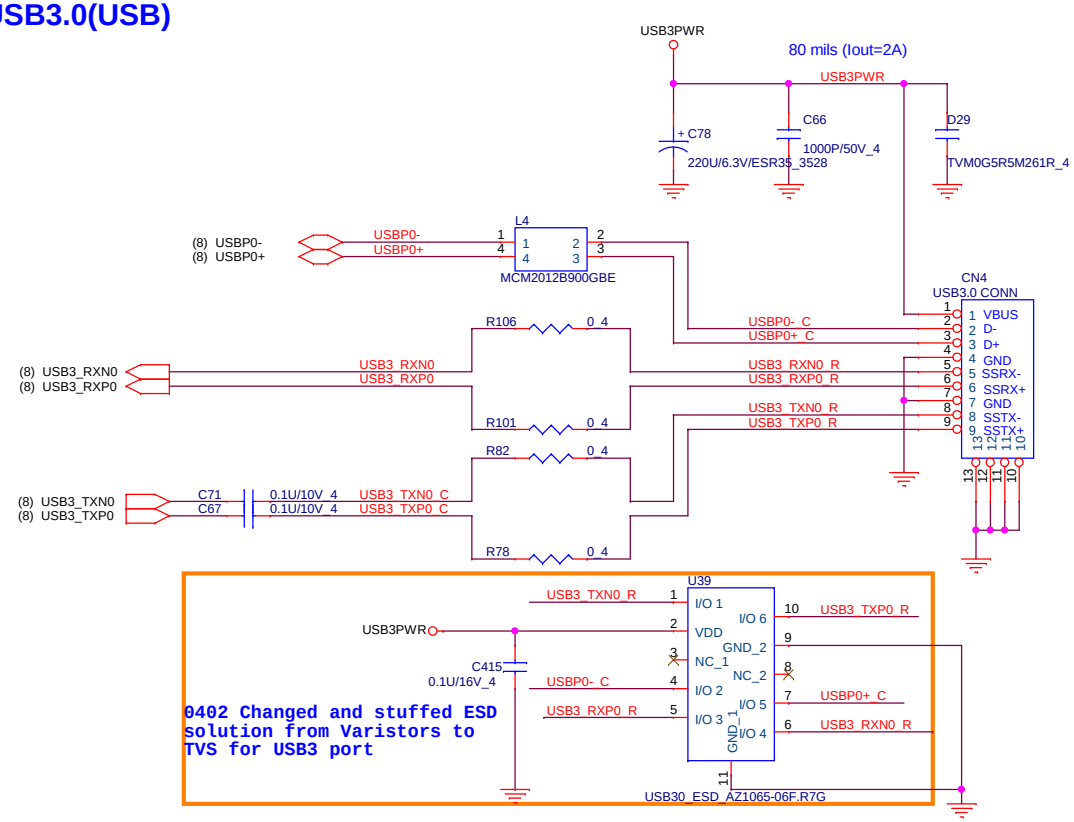
Quanta Computer Inc.

PROJECT : ZHS

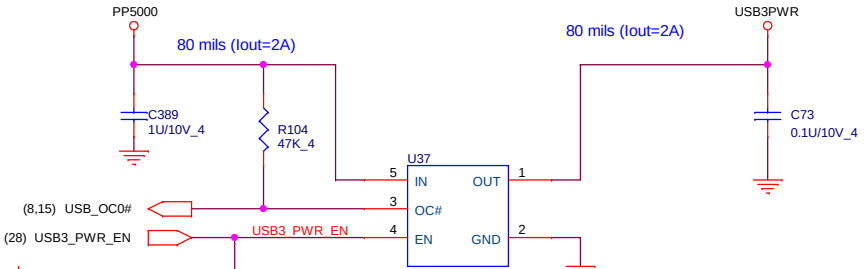
Size	Document Number	Rev
	Audio Codec/SPK/DMIC	1A

Date: Monday, August 10, 2015 Sheet 25 of 42

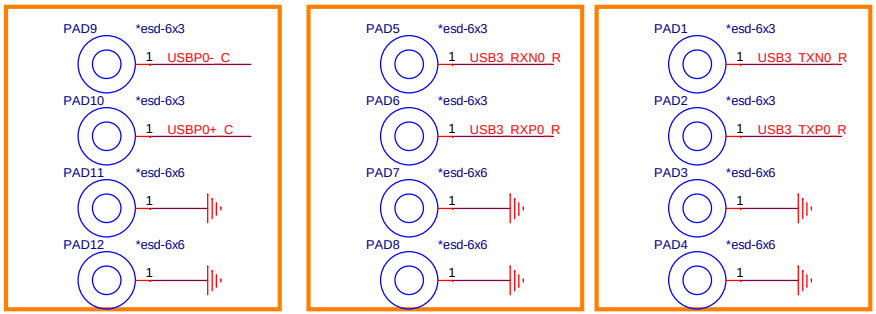
USB3.0(USB)



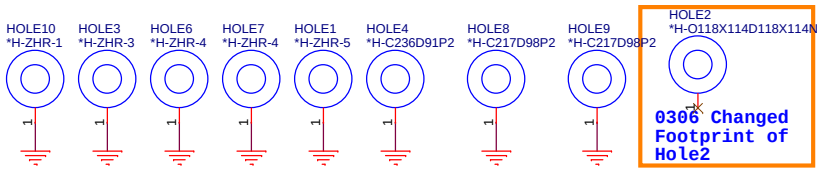
USB Switch



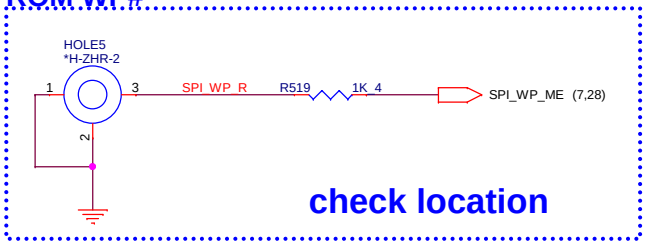
0804 Added PAD1-12 as ESD protection

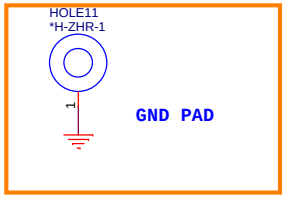


HOLE(OTH)



ROM WP#

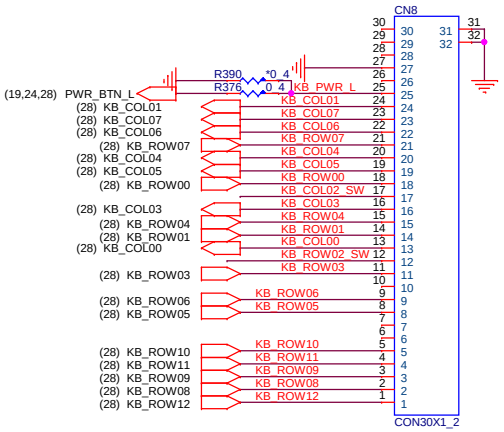




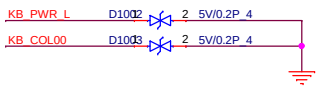
Quanta Computer Inc.
PROJECT : ZHS

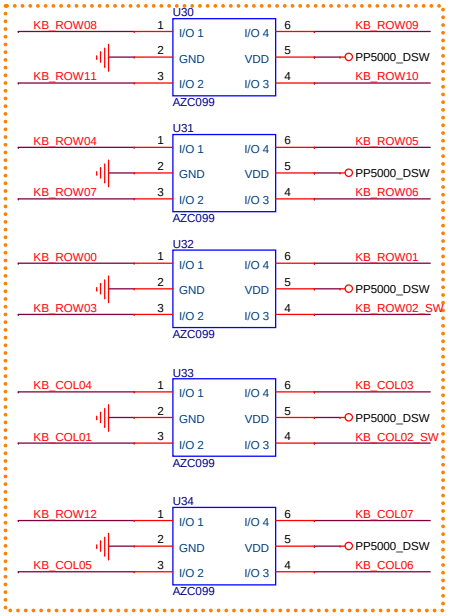
Size	Document Number	Rev
	USB3/Hole	1A
Date: Monday, August 10, 2015	Sheet 26 of 42	

K/B (KBC)



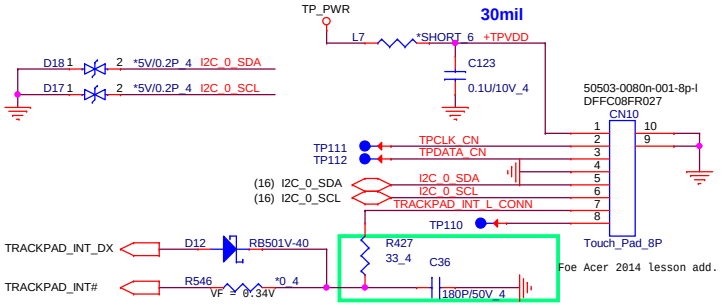
0402 Changed HDMI connector as Origins use



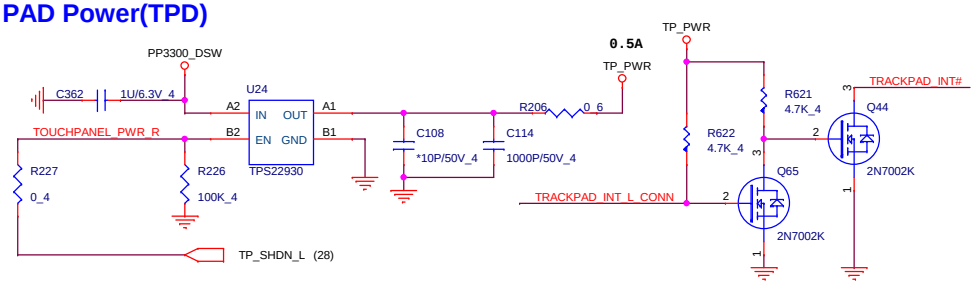


Track PAD BOARD CONN (TPD)

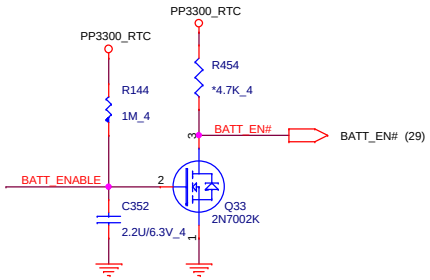
27



Track PAD Power(TPD)



HOLELESS RESET 2-CHIP(KBC)

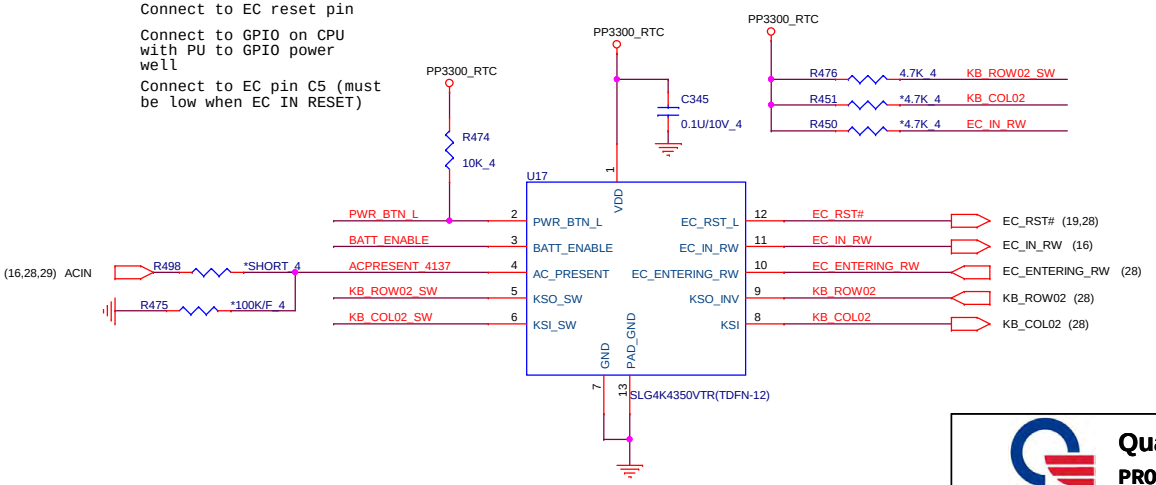


0407 removed SW1

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)

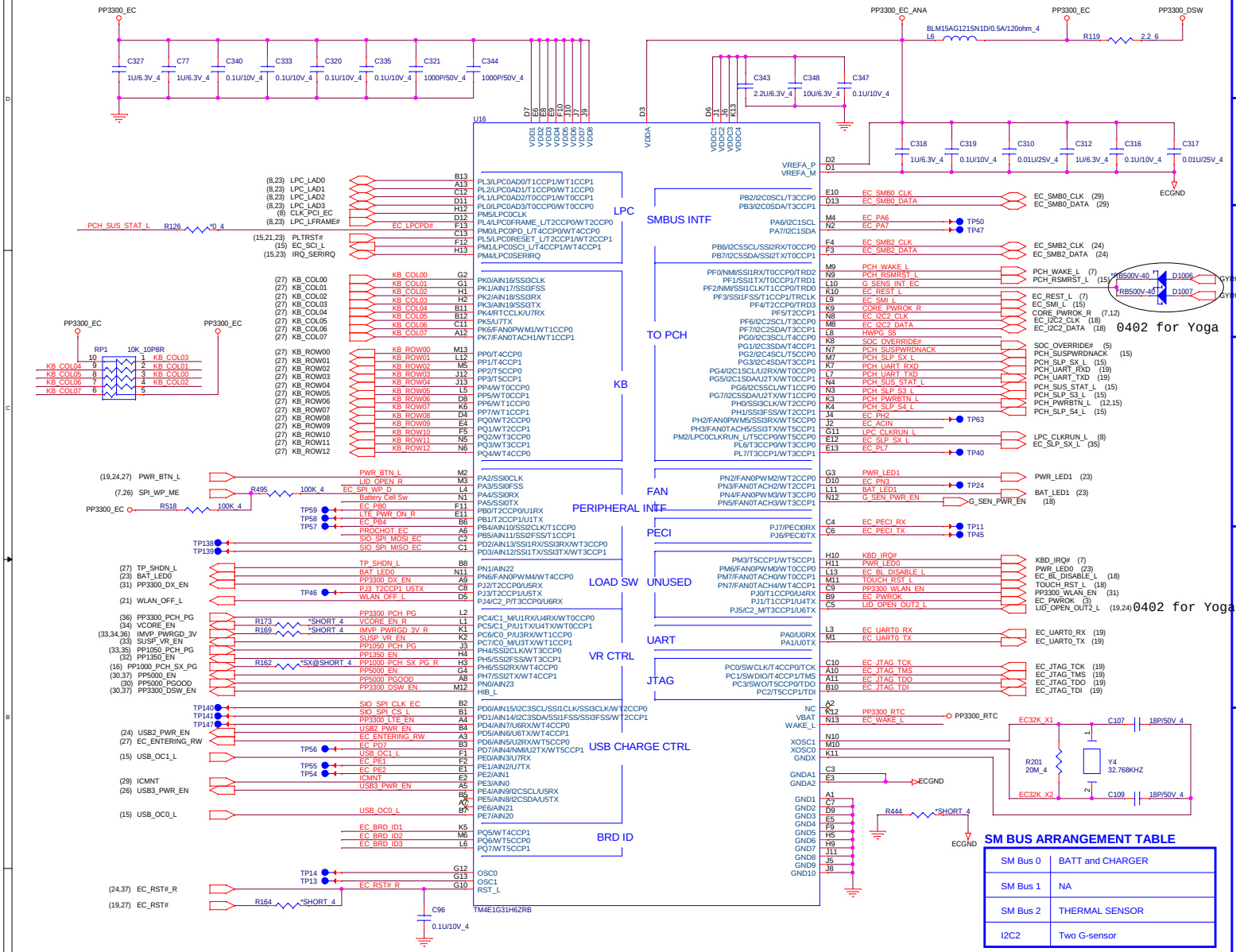


Quanta Computer Inc.

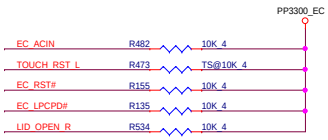
PROJECT : ZHS

Size	Document Number	Rev
	KB/TP/HW Reset	1A
Date: Monday, August 10, 2015	Sheet 27 of 42	

EC(KBC)

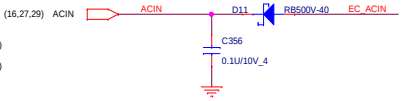


Pull-up(KBC)

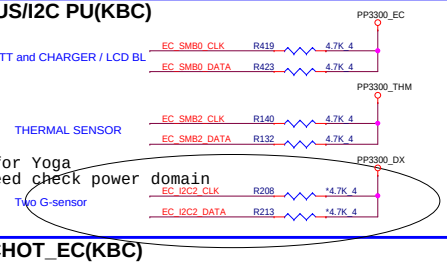


LID_OPEN(KBC)

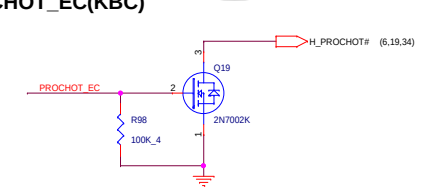
ACIN_EC(KBC)



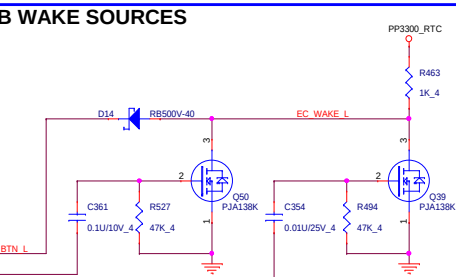
SM BUS/I2C PU(KBC)



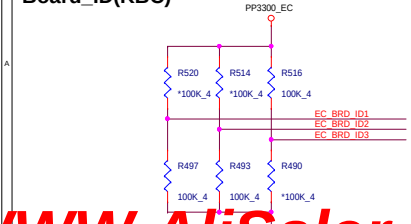
PROCHOT_EC(KBC)



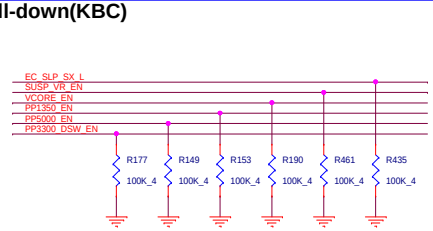
EC HIB WAKE SOURCES



Board_ID(KBC)

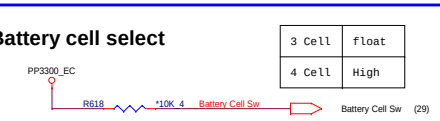


Pull-down(KBC)



HWPG(KBC)

Battery cell select

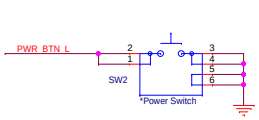


3 Cell	float
4 Cell	High

OD pin list

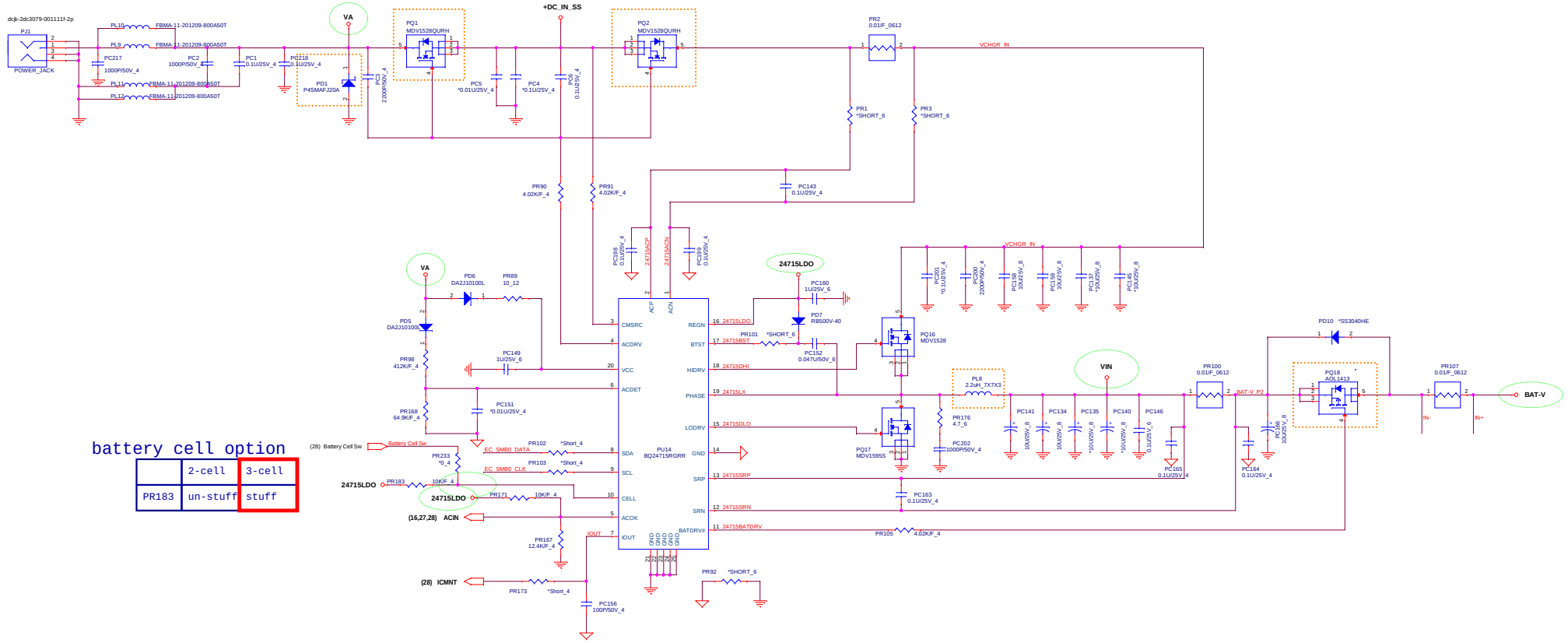
EC_REST_L
BAT_LED0
BAT_LED1
PCH_RSMRST_L
SMBUS
IRQ_SERIRQ
EC_BL_DISABLE_L

For testing only



Quanta Computer Inc.
PROJECT : ZHS

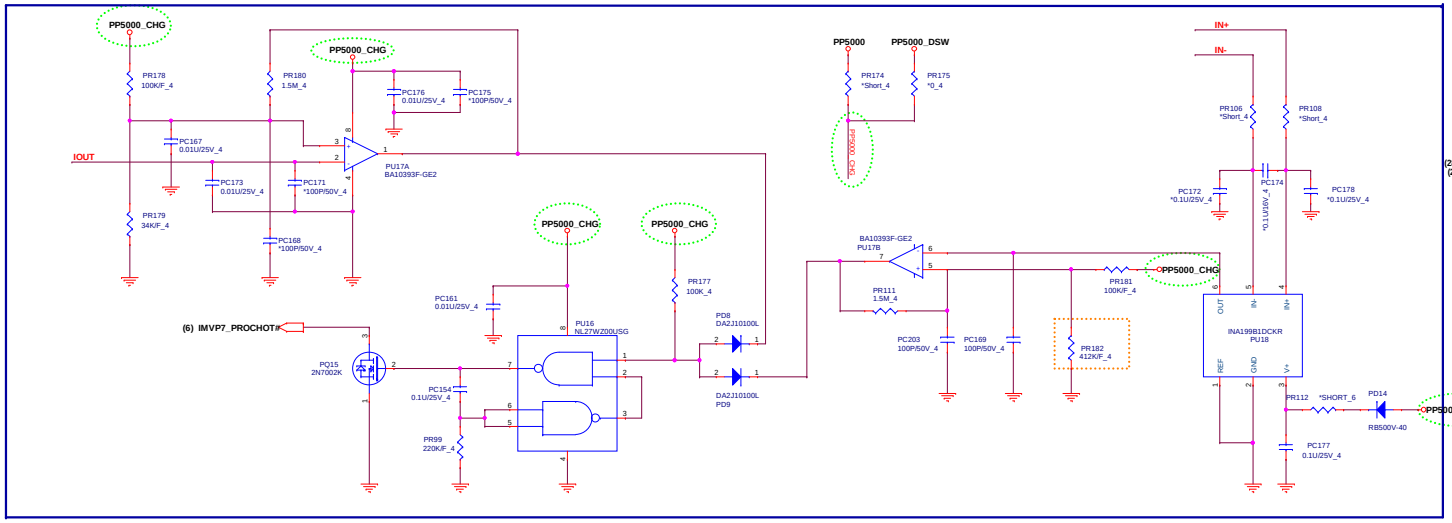
Size	Document Number	Rev
	KBC TI TM4E1G31H6ZRBI	1A
Date: Monday, August 10, 2015	Sheet 28 of 42	



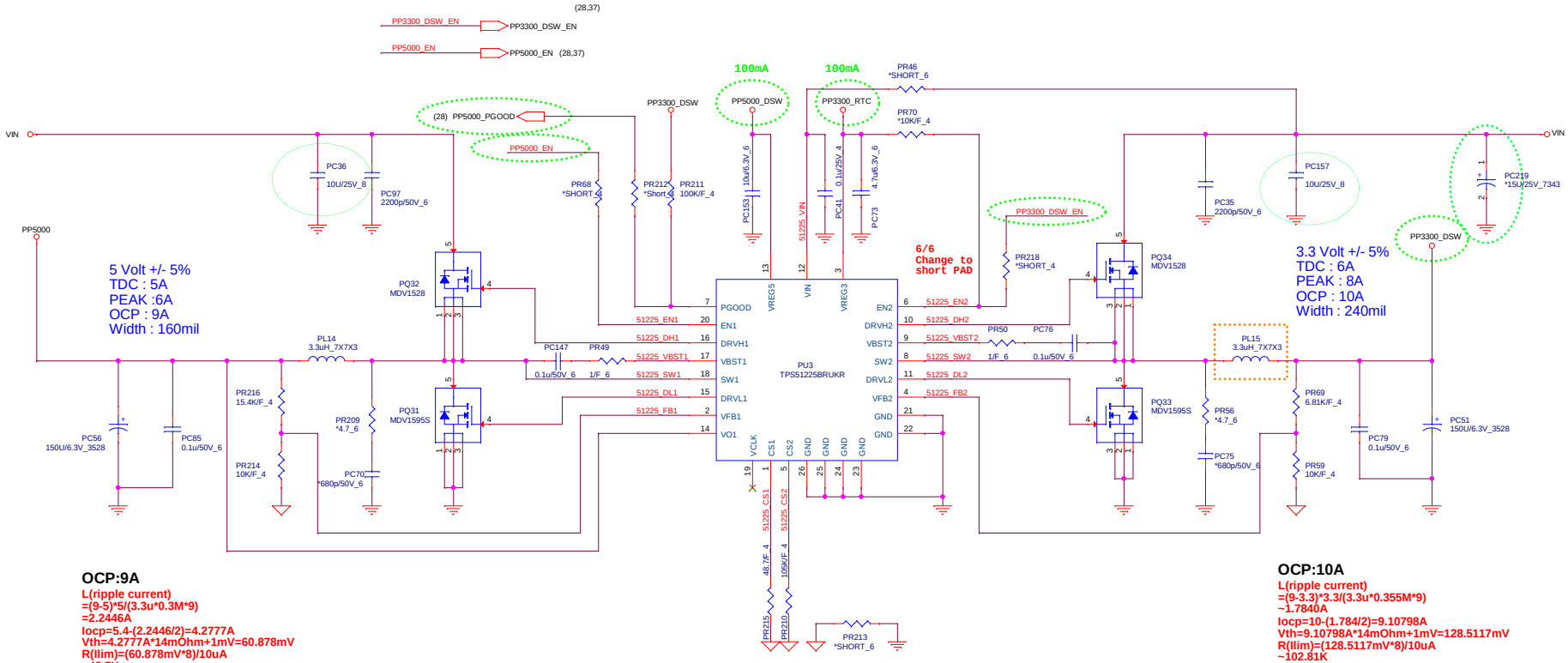
battery cell option

	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	Rev
	SYSTEM 5V/3V (TPS51225BRUKR)	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

0407 removed PP3300_DX

PP3300_DSW
PR71 *Short_8
PC82 1U/10V_4

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

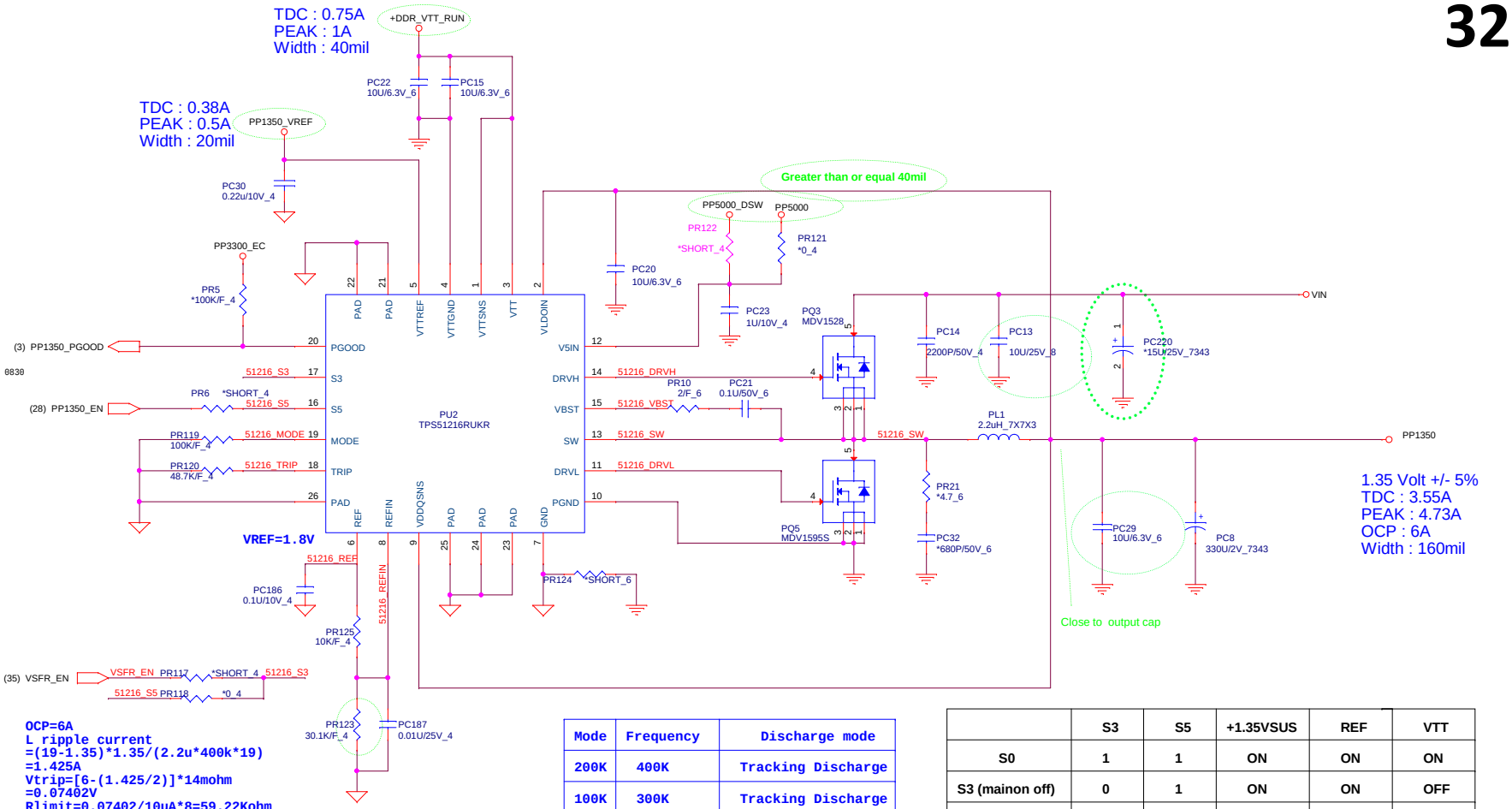
DX should be earlier than VREN by EC.

PP3300_DSW
PC162 1U/10V_4
PP1800_PCH_S5_PG
PR95 *Short_4
PR96 *100K/F_4
PC148 *0.1U/50V_6
PU13
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
TPS22964CYZPR
A2 A1 B2 B1 C2 C1 IN1 OUT1 IN2 OUT2 EN GND
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

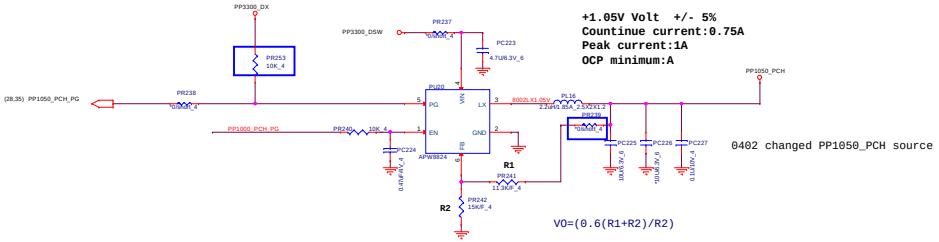
Quanta Computer Inc.
PROJECT :

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

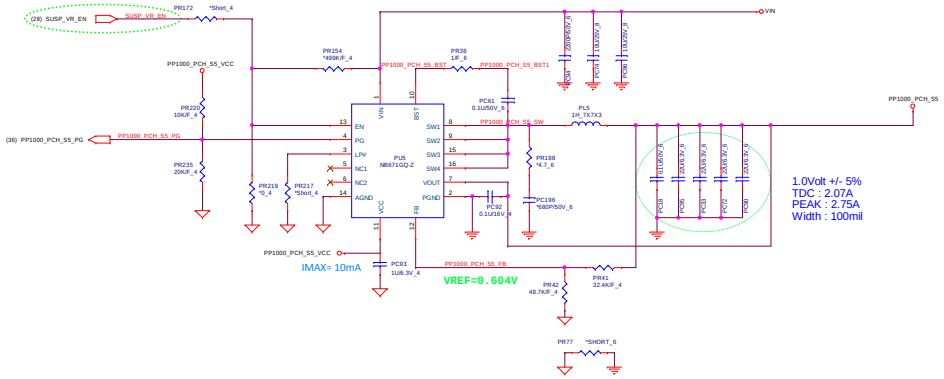
Date: Monday, August 10, 2015 Sheet 32 of 42

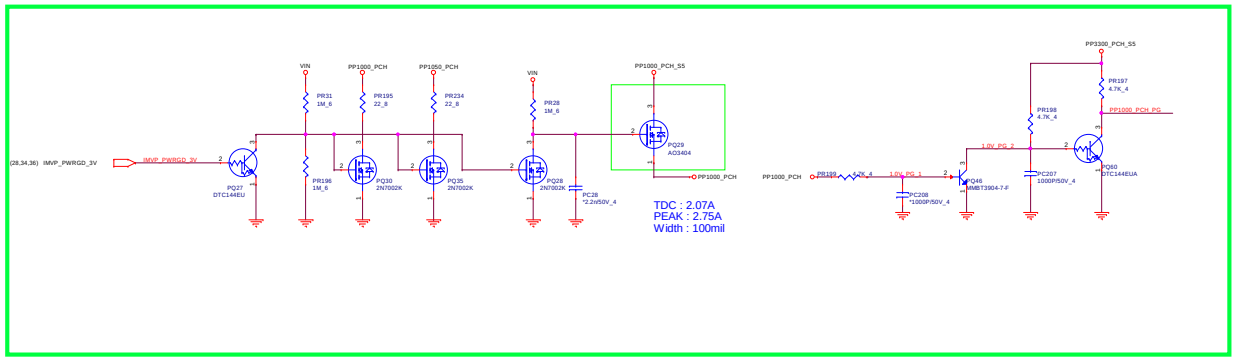
5/19 change Add PG 10K PU

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



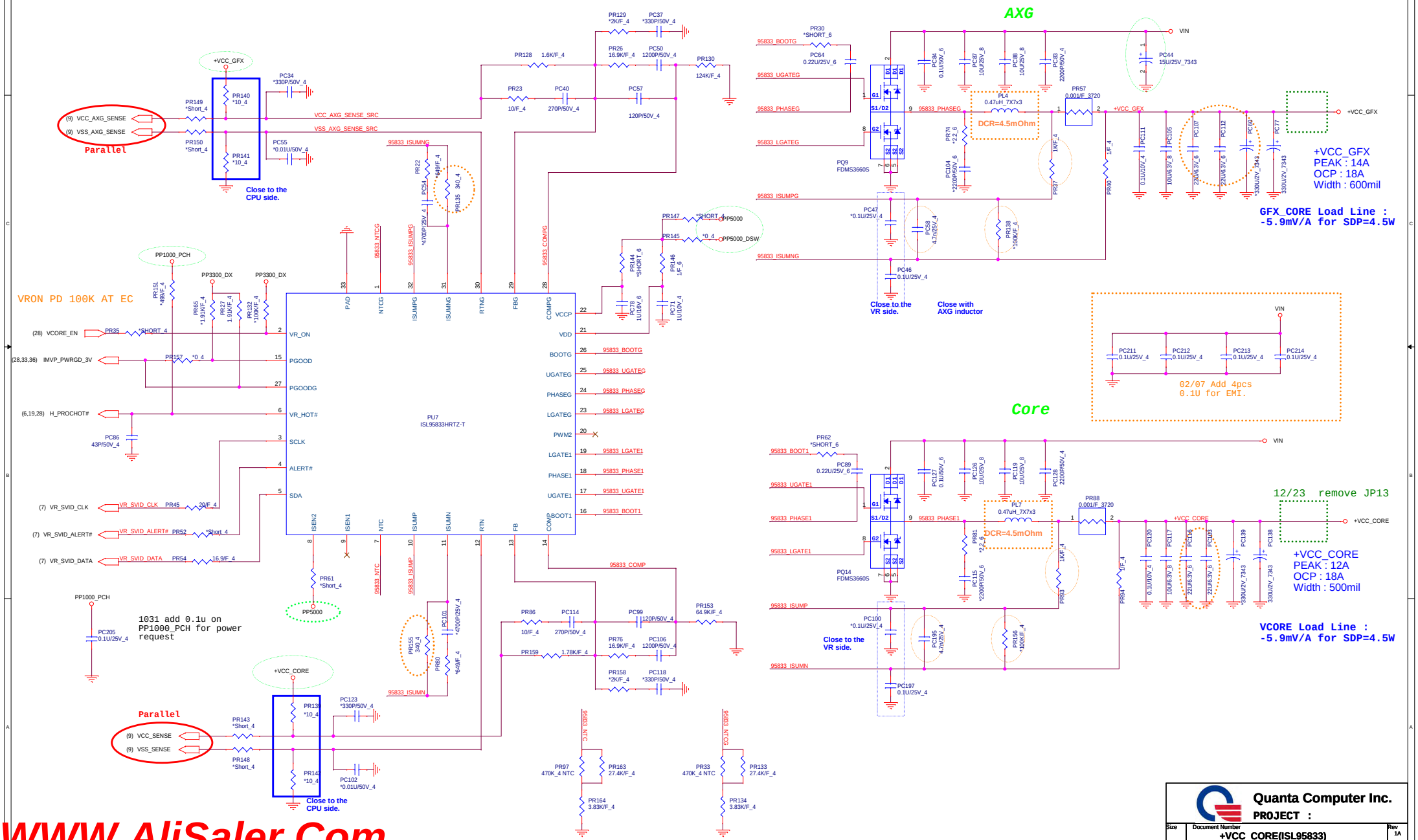
0402 changed PP1050_PCH source

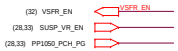


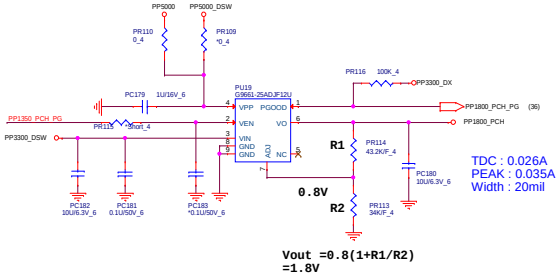


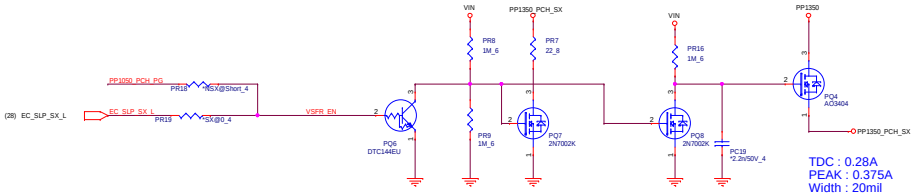
Quanta Computer Inc.
PROJECT :

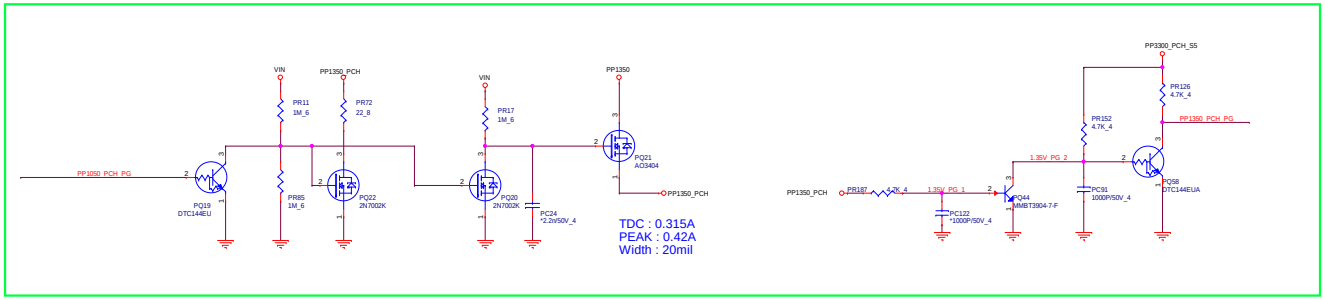
Size	Document Number	Rev
	+1.05V/+1V(NB671LGQ-Z)	1A
Date: Monday, August 18, 2014	Sheet 33 of 42	


AXG
Core
VRON PD 100K AT EC
PU7
ISL95833HRTZ-T
Parallel
Close to the CPU side.
Close to the VR side.
Close with AXG inductor
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
WWW.AliSaler.Com
Quanta Computer Inc.
PROJECT :
+VCC_CORE(ISL95833)
Monday, August 10, 2015
Sheet 34 of 42



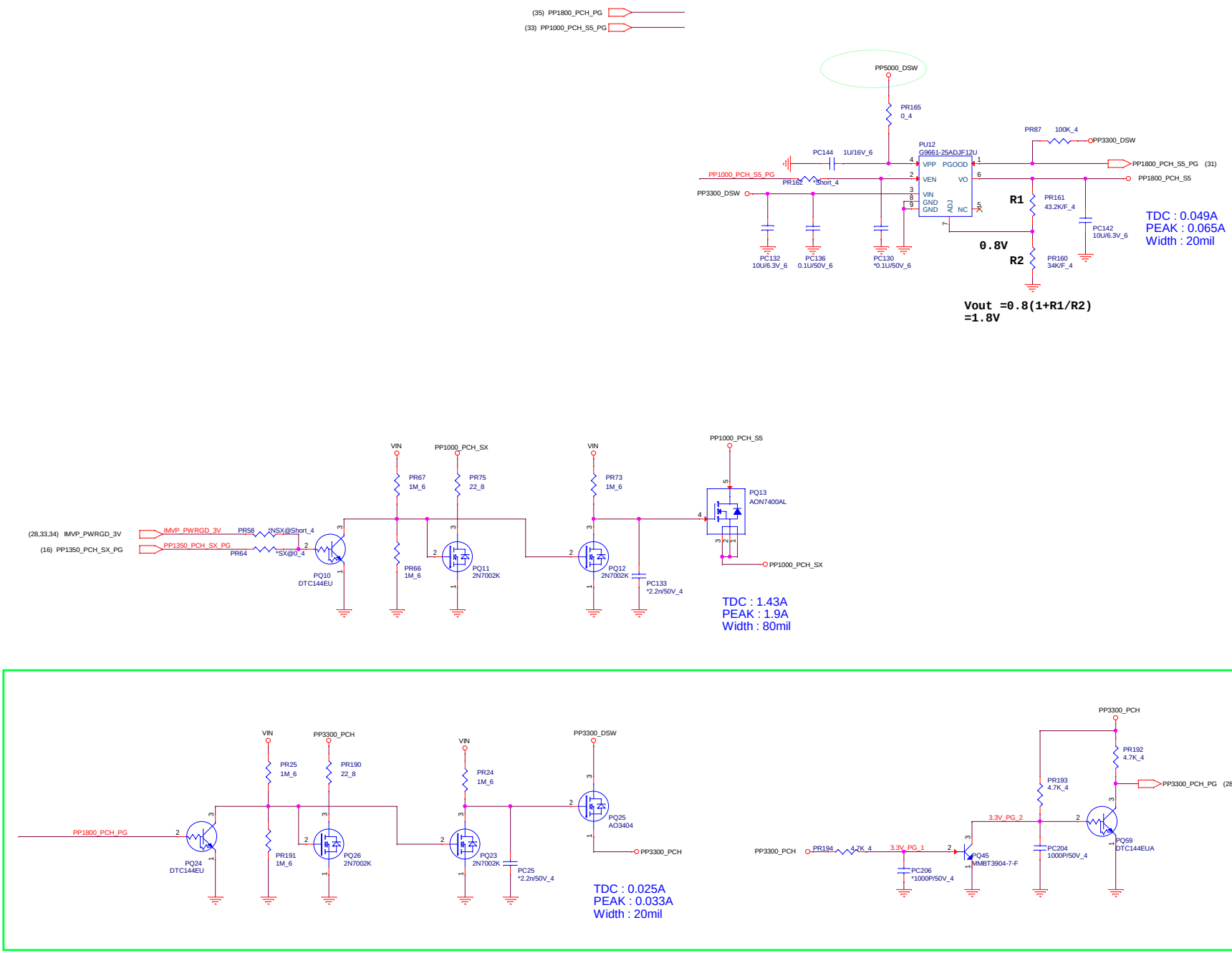






Quanta Computer Inc.
PROJECT :

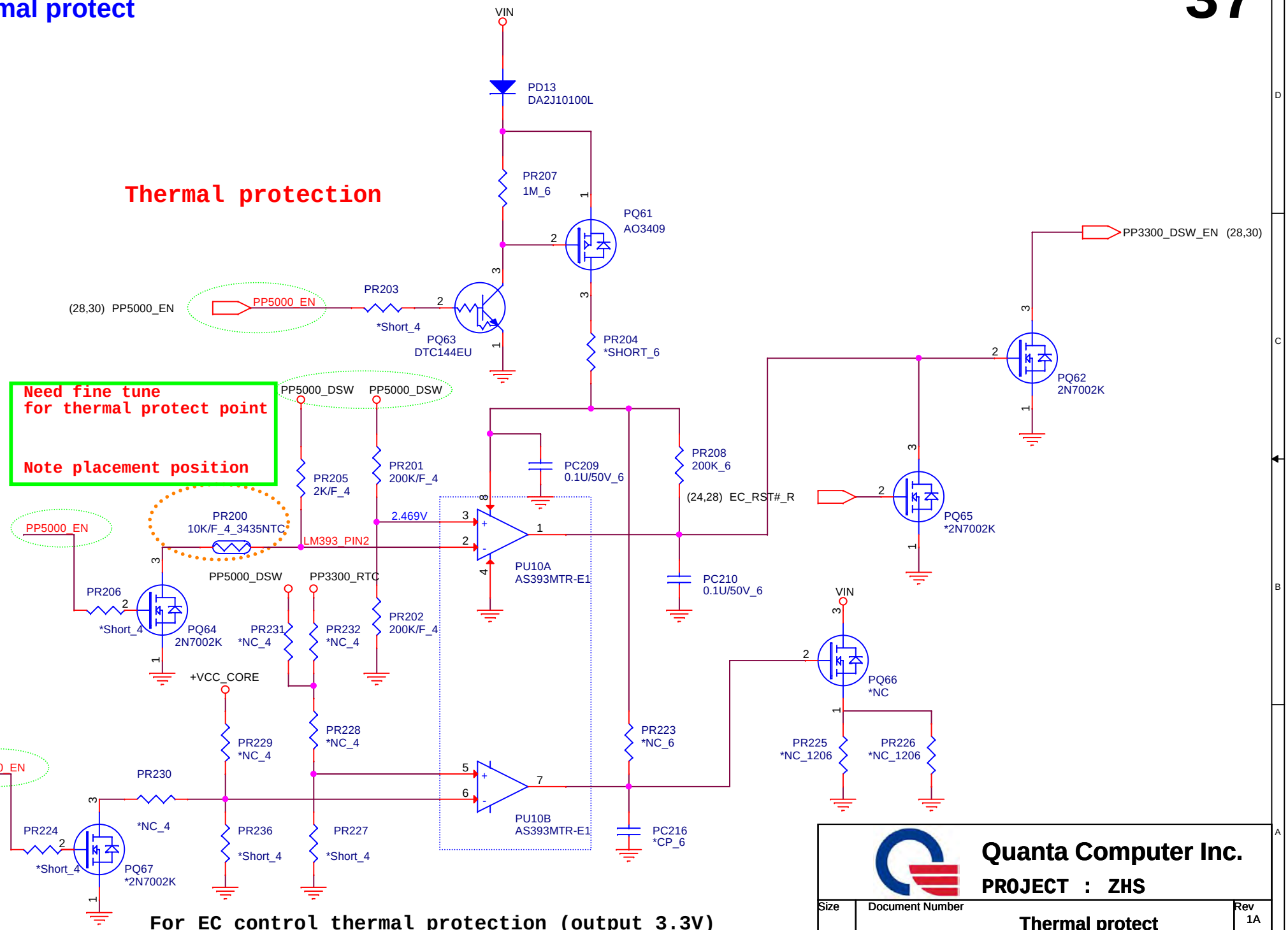
Size	Document Number	Rev
	LDO (1V/1.35V/1.5V/1.8V)	1A
Date: Monday, August 10, 2015	Sheet 35 of 42	



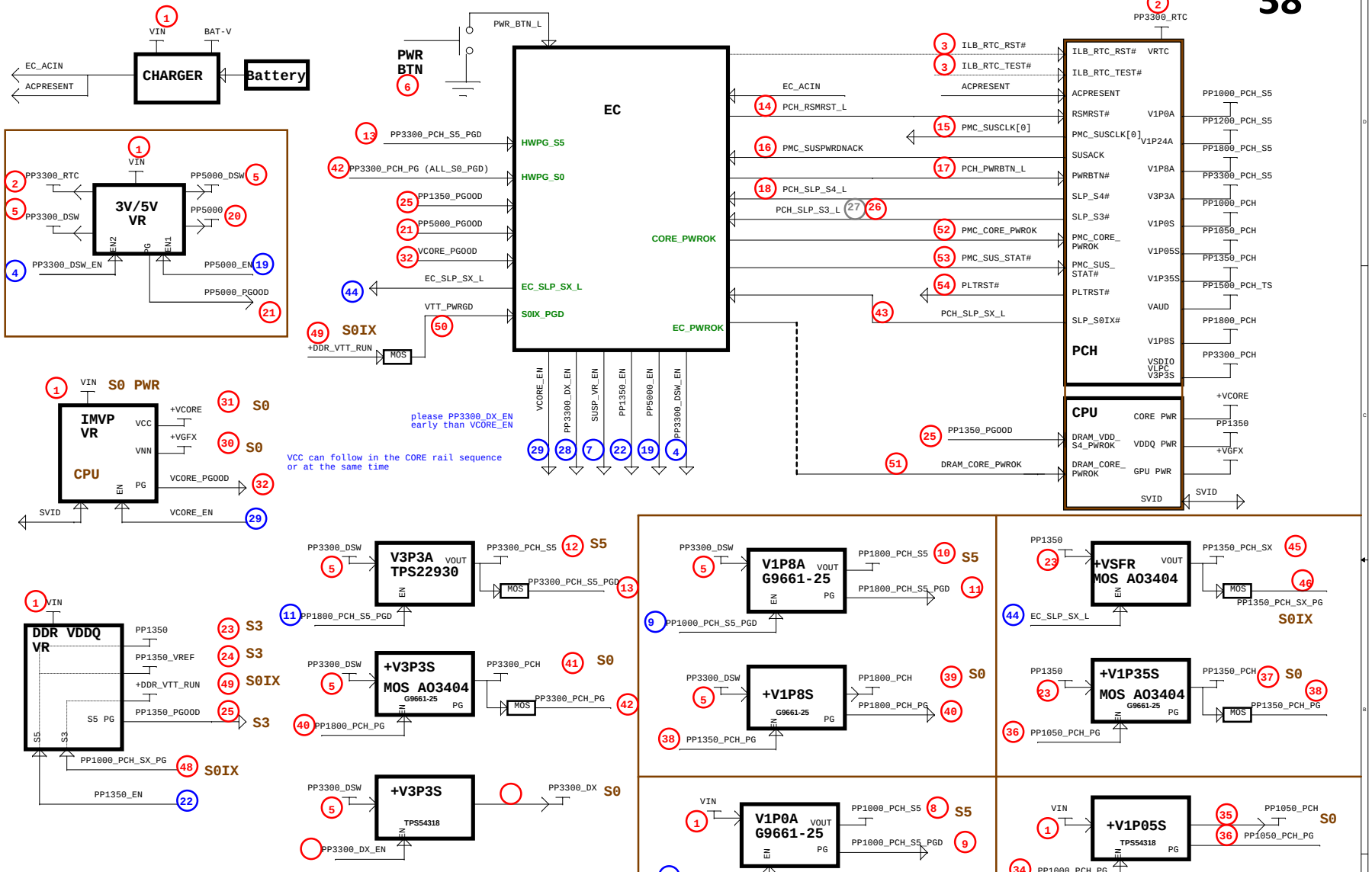
Quanta Computer Inc.
PROJECT :

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

Thermal protect



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



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)

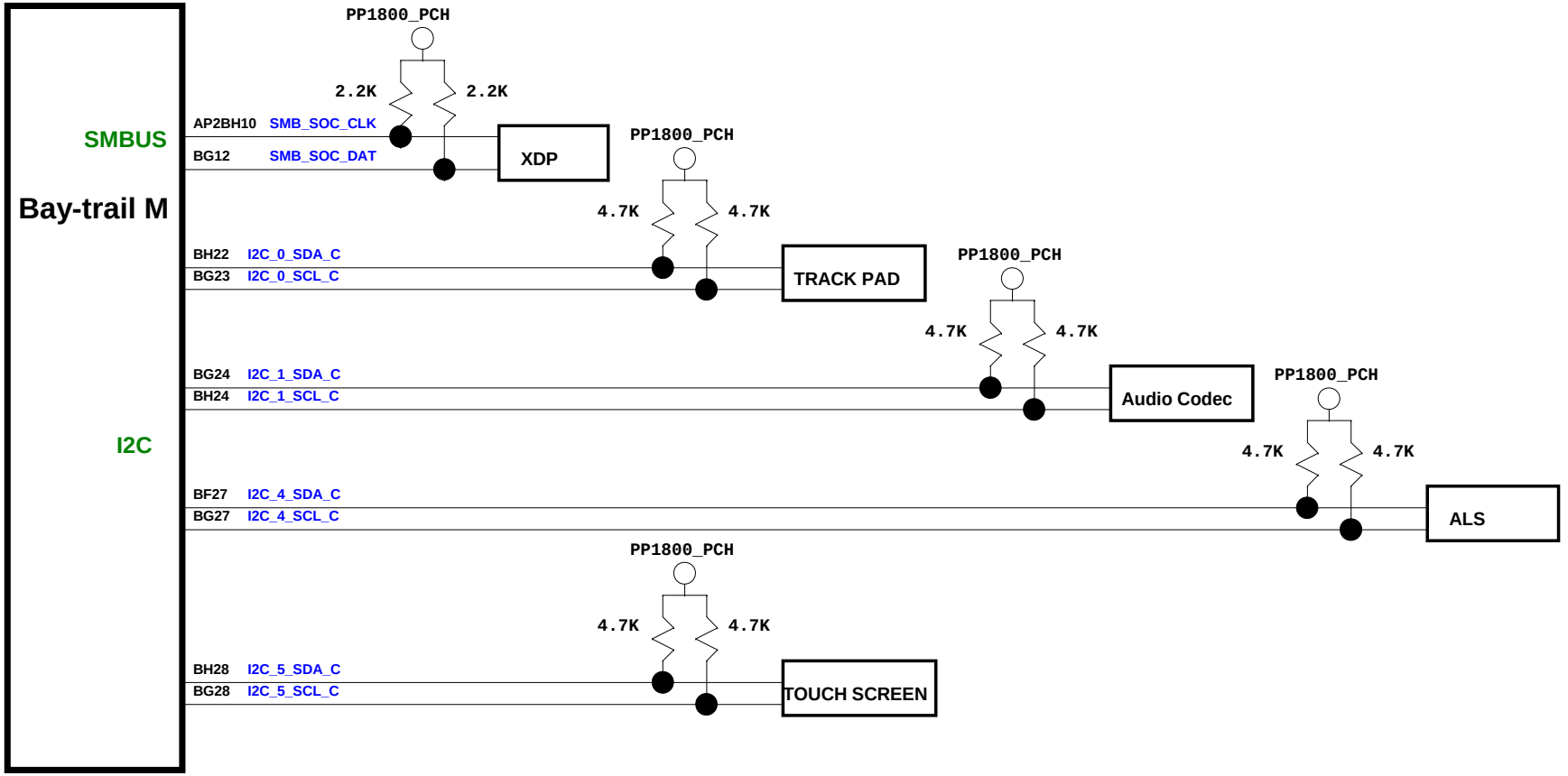
t6a : Core Well stable to DRAM_CORE_PWROK and PMC_CORE_PWROK assertion (no PCIE device) 10ms -min (43-45)
t6b : Core Well stable to DRAM_CORE_PWROK and PMC_CORE_PWROK assertion (for power rails needed by pcie device) 99ms -min (43-45)

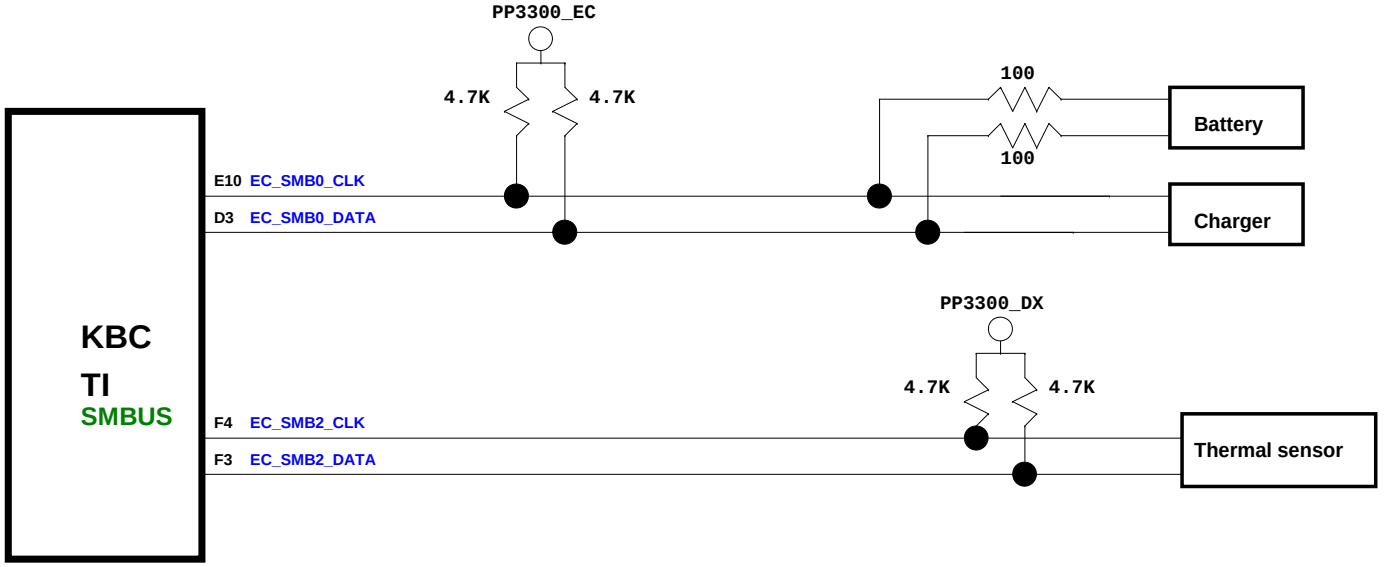
t7 : DRAM/PMC_CORE_PWROK to PMC_SUS_STAT# 1ms -min (45-46)

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
Power Sequence
Size | Document Number | Rev 1A
Date: Monday, August 10, 2015 | Sheet 38 of 42



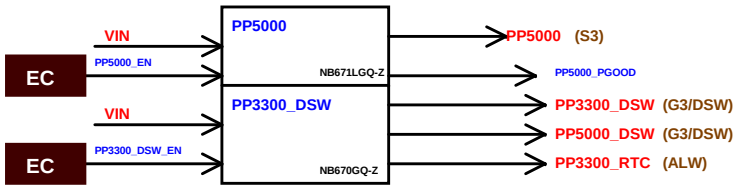


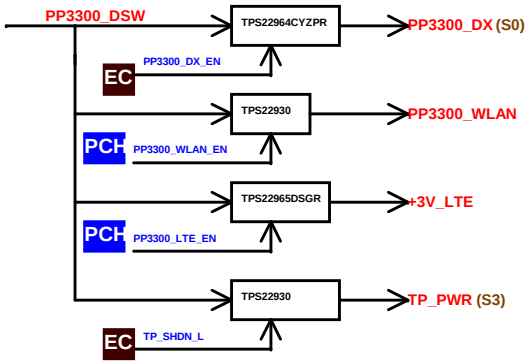
Quanta Computer Inc.
PROJECT : ZHS

Size	Document Number	Rev
	SMBUS_I2C	1A

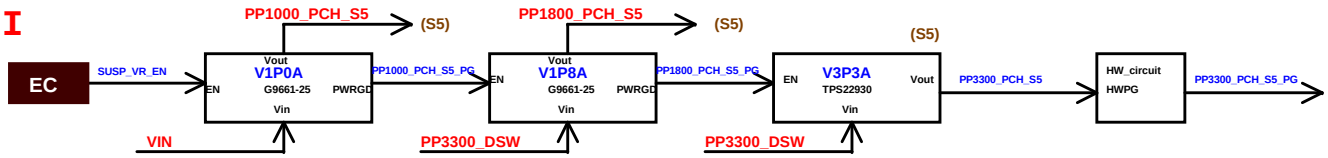
Date: Monday, August 10, 2015 Sheet 39 of 42

I

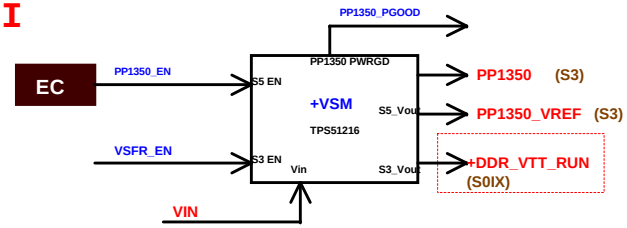


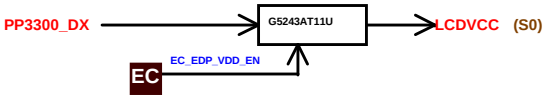


II

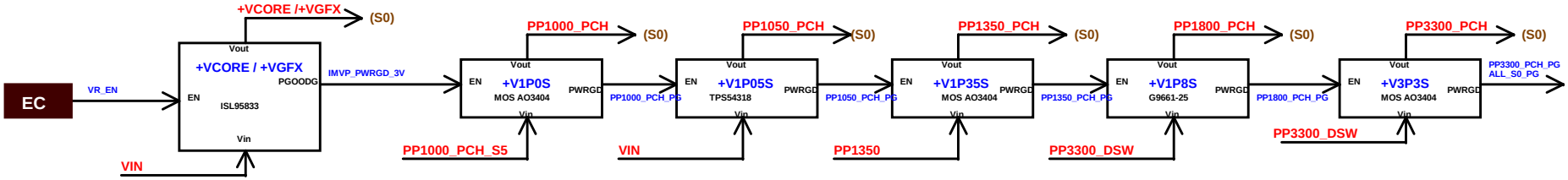


III

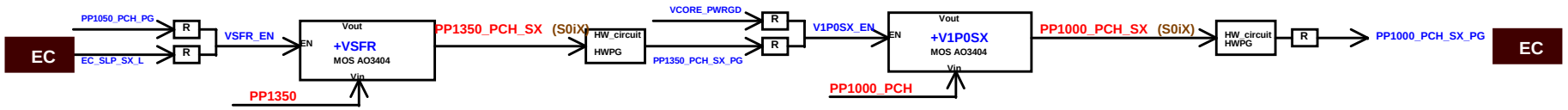


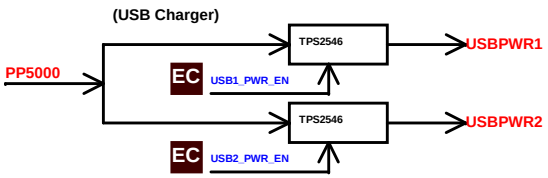


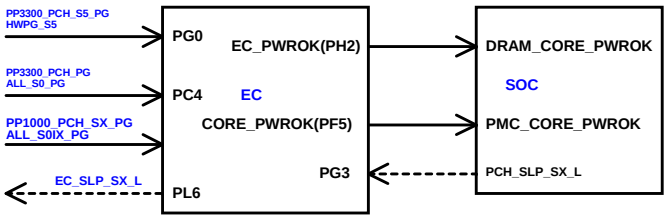
IV



V







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	41
	2B		
	3C		
	3D		

DOC NO.	PROJECT MODEL :	Chrome	APPROVED BY:		DATE:		Quanta Computer Inc. PROJECT : ZMS
	PART NUMBER:		DRAWING BY:		REVISON:		Change list 2