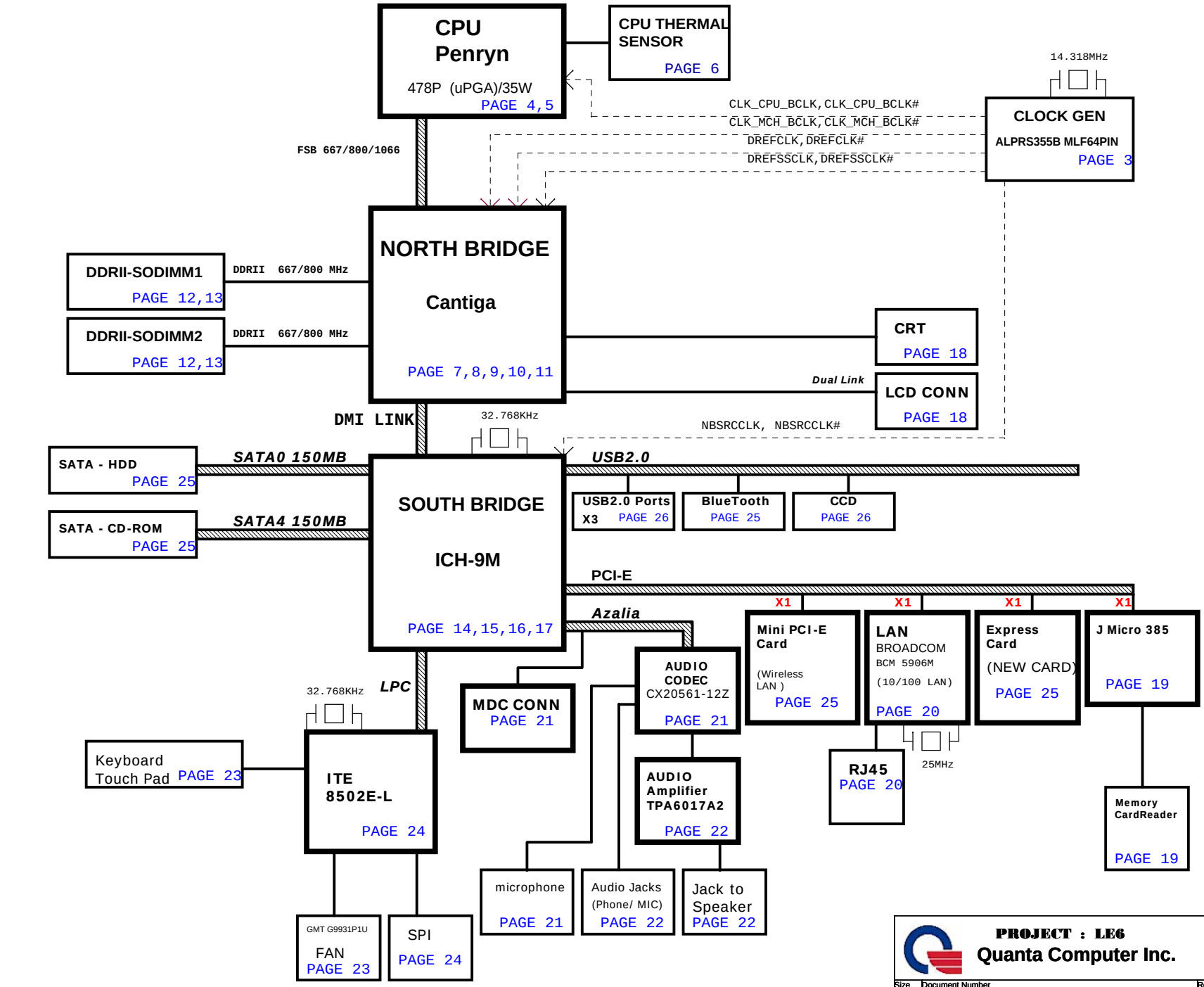
LE6 BLOCK DIAGRAM

01

PCB STACK UP

6L

- LAYER 1 : TOP
- LAYER 2 : GND
- LAYER 3 : IN1
- LAYER 4 : IN2
- LAYER 5 : VCC
- LAYER 6 : BOT



PROJECT : LE6

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Custom	BLOCK DIAGERAM	1A

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Board Stack up Description

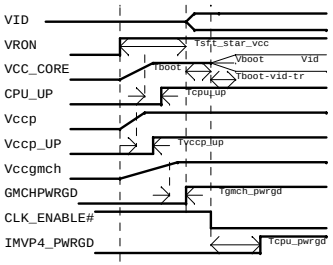
PCB Layers

Layer 1		TOP
Layer 2		GND
Layer 3		IN1
Layer 4		IN2
Layer 5		SVCC
Layer 6		BOTTOM

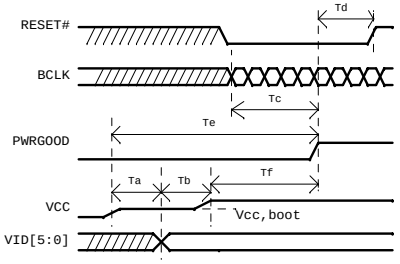
Voltage Rails

Voltage Rails	ON S0~S2	ON S3	ON S4	ON S5	Control signal
VCC_CORE	X				VRON
+1.5V	X				MAINON
+1.05V	X				MAINON
5V_S5/3V_S5/1.5V_S5	X	X	X	X	S5_ON
5VSUS/3VSUS/1.8VSUS	X	X			SUSON
SMDDR_VTERM/+2.5V/+3V/+5V/+12V	X				MAINON
+VCC_GFX_CORE/+1.2V_GFX_PCIE	X				MAINON
LANVCC	X	X	X	X	LAN_ON
3VPCU	X	X	X	X	VL
5VPCU	X	X	X	X	VL

Power On Sequencing Timing Diagram

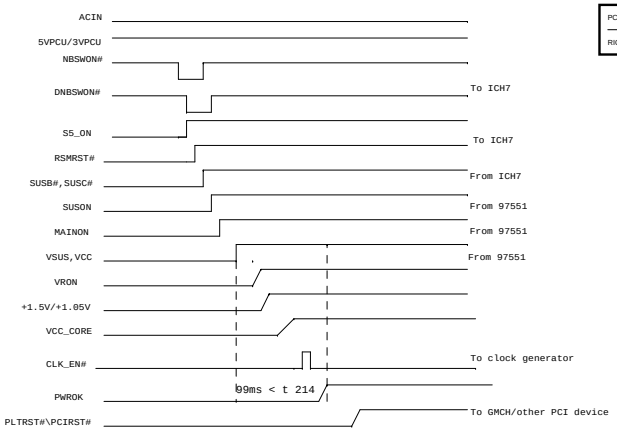


YONAH Power-up Timing Specifications



Ta=VCC and VCCP asseration to VID[5:0] vaild
Tb=VID[5:0] stable to VCC vaild
Tc=BCLK stable to PWRGOOD assertion
Td=PWRGOOD to RESET# de-assertion time
Te=Vcc,boot vaild to PWRGOOD assertion time

ACIN POWER ON TIMING



PCI DEVICE	IDSEL#	REQ# / GNT#	Interrupts
RICOH832	AD25	REQ0# / GNT0#	INT E#/F#

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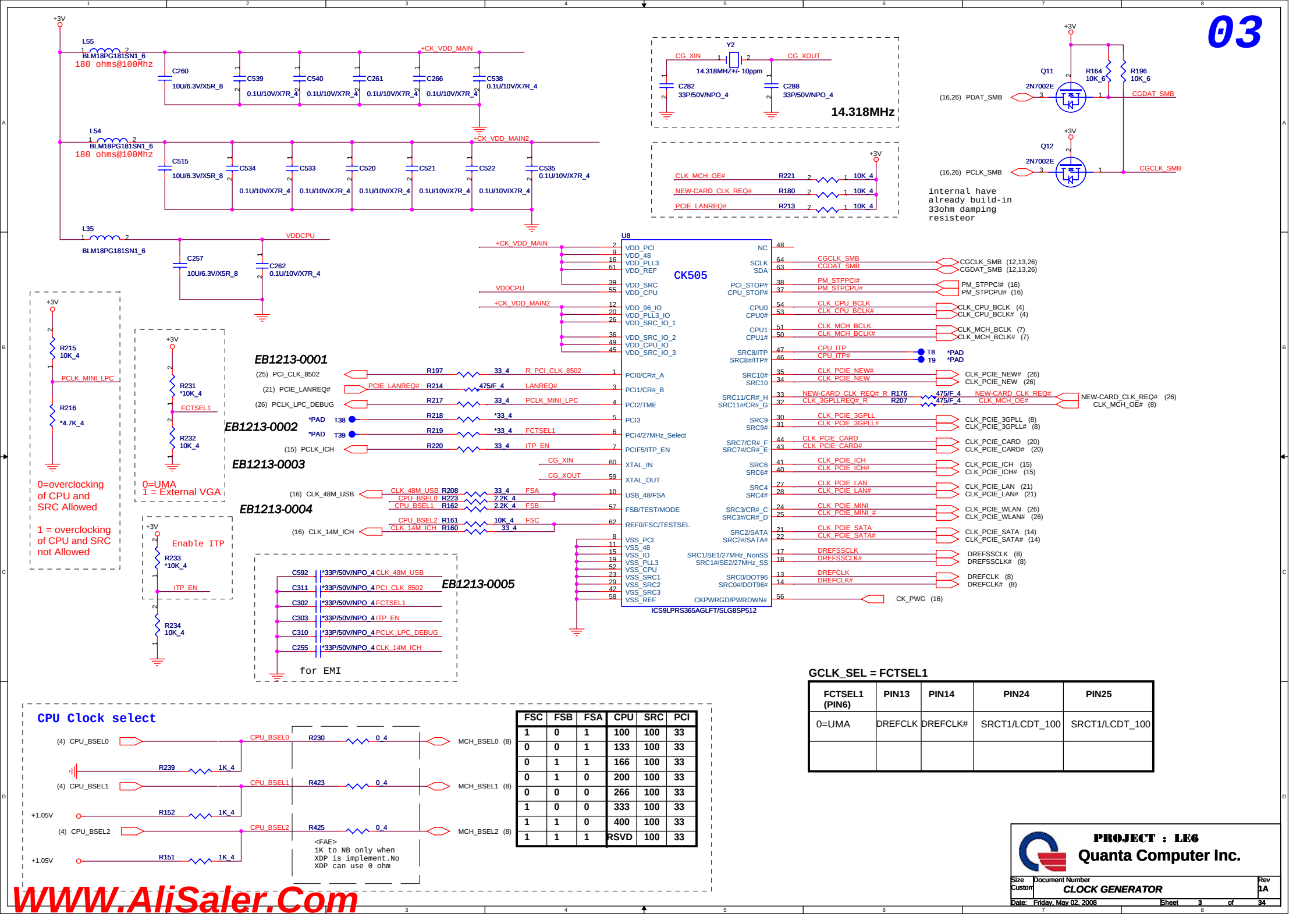

GCLK_SEL = FCTSEL1

FCTSEL1 (PIN6)	PIN13	PIN14	PIN24	PIN25
0=UMA	DREFCLK	DREFCLK#	SRCT1/LCDT_100	SRCT1/LCDT_100

FSC	FSB	FSA	CPU	SRC	PCI
1	0	1	100	100	33
0	0	1	133	100	33
0	1	1	166	100	33
0	1	0	200	100	33
0	0	0	266	100	33
1	0	0	333	100	33
1	1	0	400	100	33
1	1	1	RSVD	100	33

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Custom	CLOCK GENERATOR	1A
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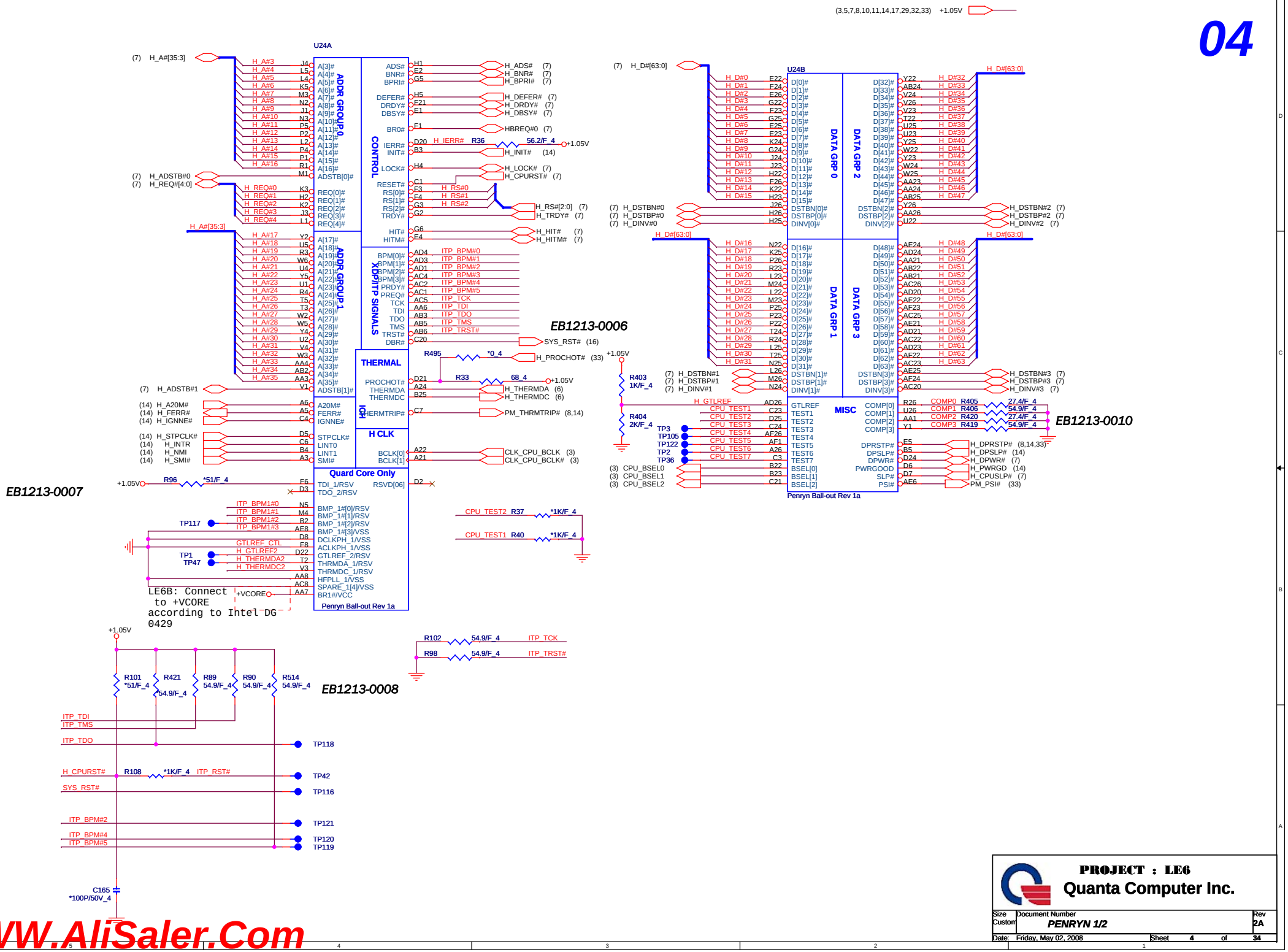

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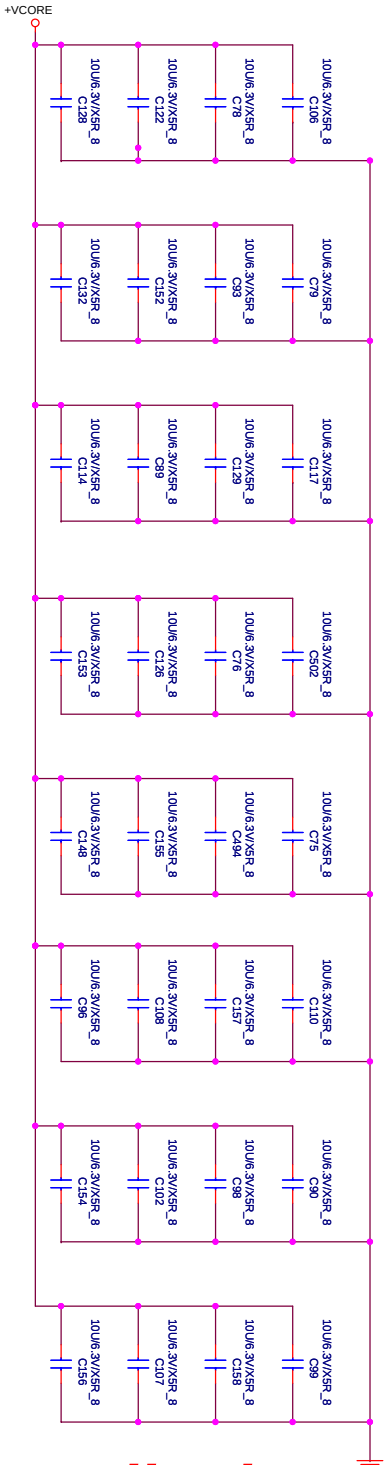

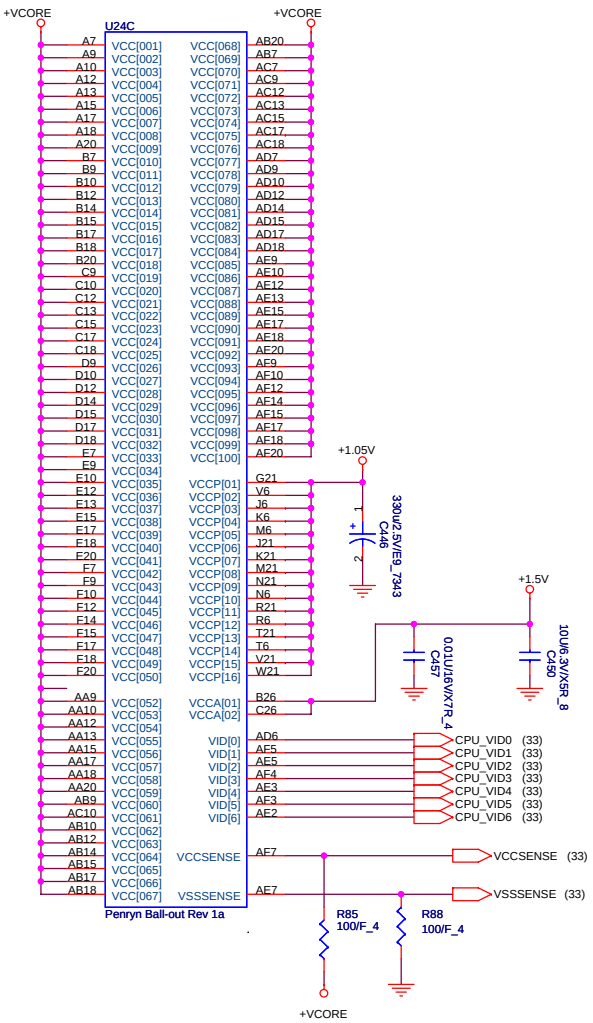

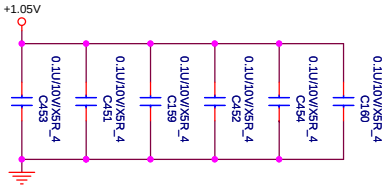

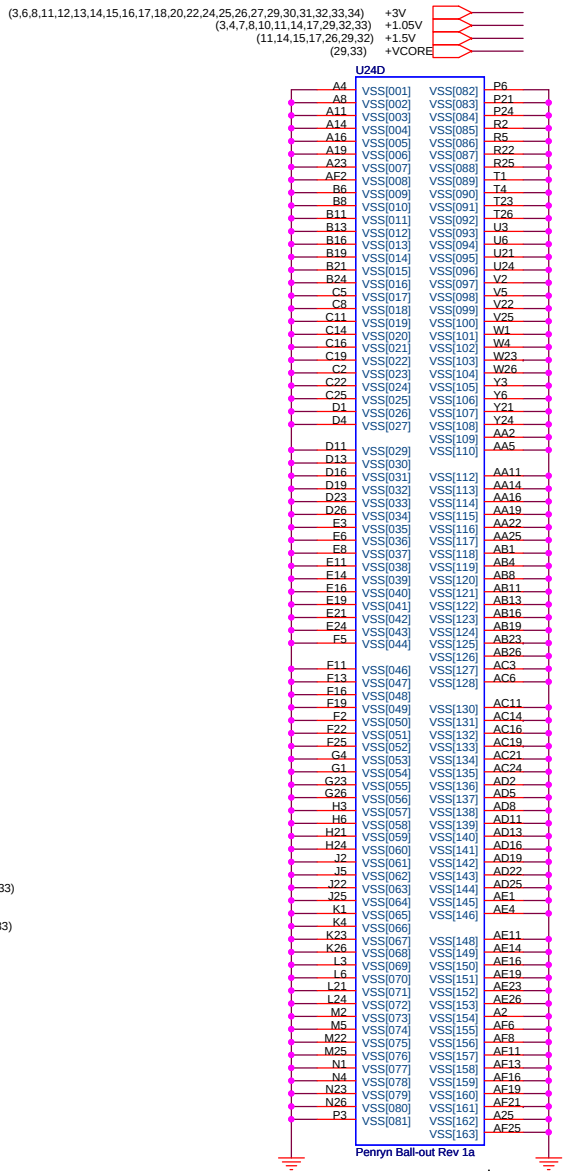

05

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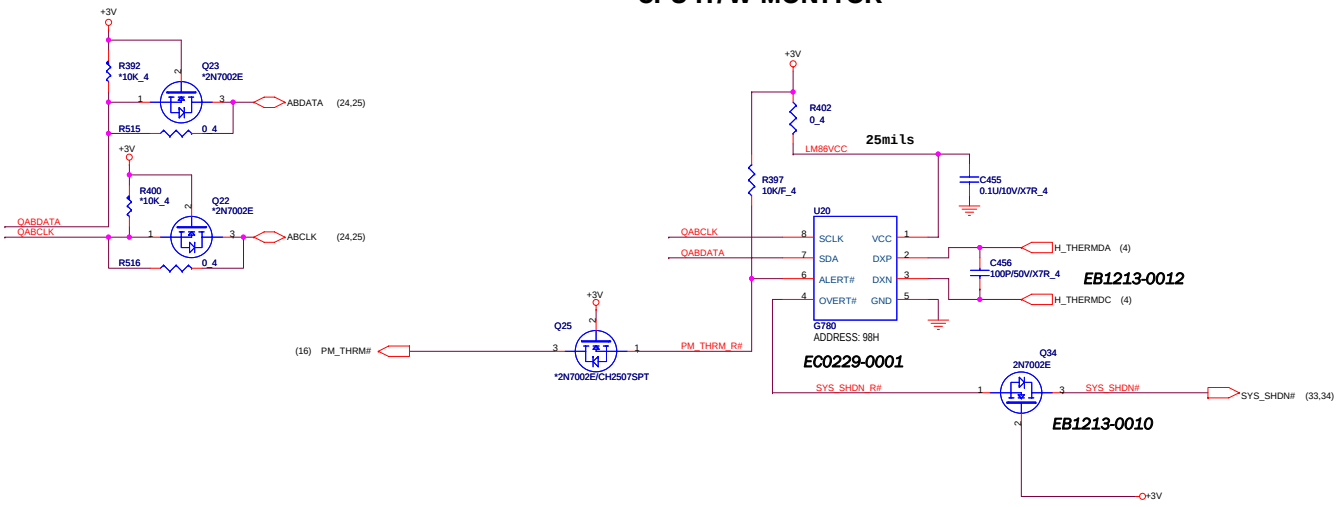
CPU H/W MONITOR



EB1213-0011

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C	CPU THERMAL/HW PRODCT	1A

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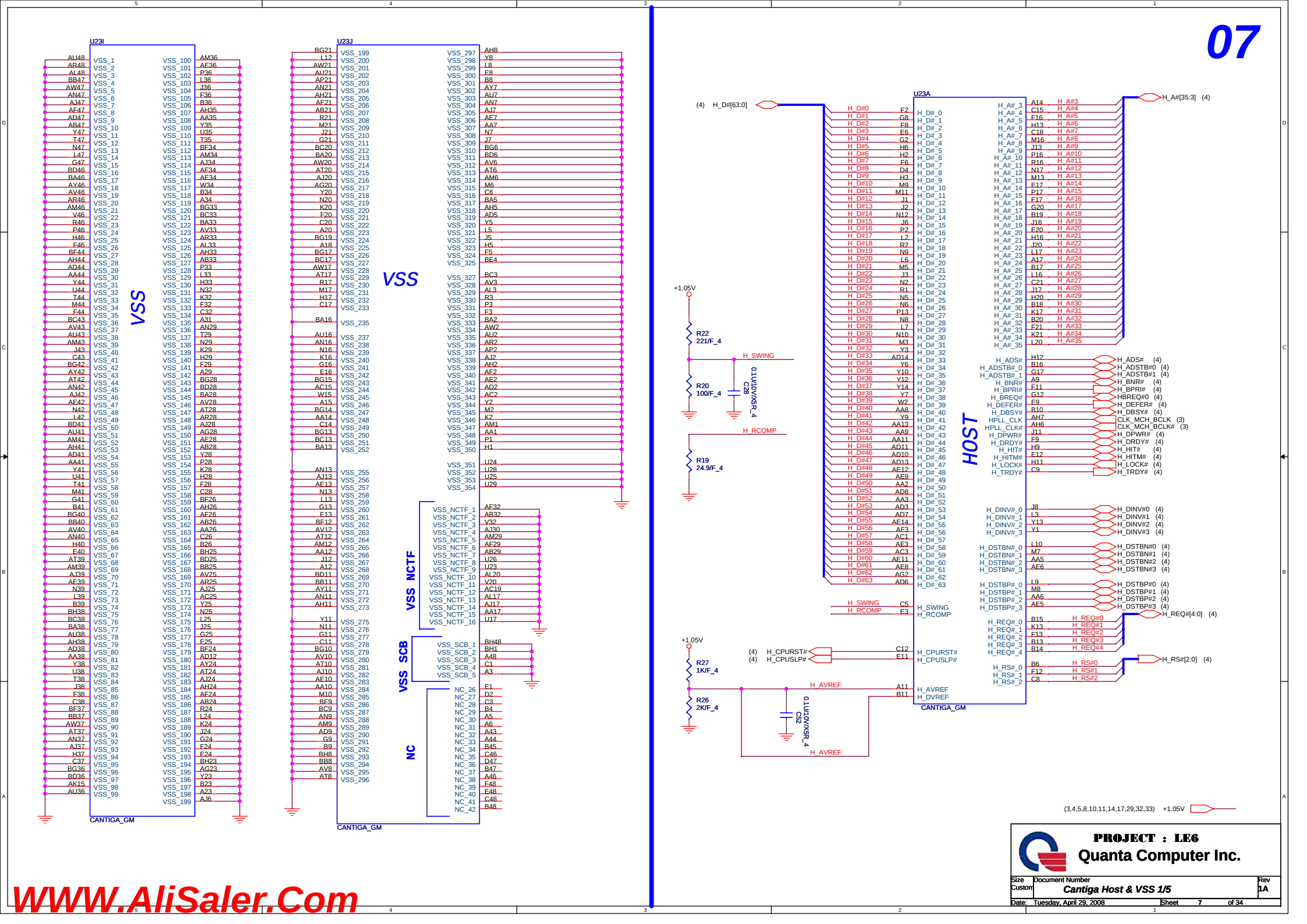

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MCH_CFG_5 DMIx2 selection

Low: DMIx2
High: DMIx4 (Default)

MCH_CFG_16 FSB Dynamic ODT

Low: Dynamic ODT disabled
High: Dynamic ODT enabled (Default)

MCH_CFG_9 PCI Express Graphic Lane

Low: Reverse Lane
High: Normal operation(Default)

MCH_CFG_19 DMI Lane Reversal

Low: Normal (Default)
High: Lane Reserved

MCH_CFG_6 iTPM Host Interface

Low: iTPM Host Interface enabled
High: iTPM Host Interface disabled (Default)

MCH_CFG_7 Intel (R) Management Engine Crypto

Low: Intel (R) Management Engine Crypto
TLS cipher suite with no confidentiality
High: Intel (R) Management Engine Crypto
TLS cipher suite with no confidentiality (Default)

MCH_CFG_10 PCIe Lookback Enable

Low: Enabled
High: Disabled (Default)

MCH_CFG_12/13 XOR/ALLZ/CLOCK Un-gating

MCH_CFG_13	MCH_CFG_12	Configuration
0	0	Reserved
1	0	XOR Mode enabled
0	1	All-Z Mode enabled
1	1	Normal operation (Default)

(3,6,11,12,13,14,15,16,17,18,20,22,24,25,26,27,29,30,31,32,33,34) +3V
(10,11,12,29,31,32) +1.8VSUS
(3,4,5,7,10,11,14,17,29,32,33) +1.05V
(11) +1.05V_PEG

U23B

RSVD: RSVD1 RSVD2 RSVD3 RSVD4 RSVD5 RSVD6 RSVD7 RSVD8 RSVD9 RSVD14 RSVD15 RSVD16 RSVD17 RSVD20 RSVD22 RSVD23 RSVD24 RSVD25

CLK/DDR CLK/CONTROL/COMPENSATION: SA_CK_0 SA_CK_1 SB_CK_0 SB_CK_1 SA_CK#_0 SA_CK#_1 SB_CK#_0 SB_CK#_1 SA_CKE_0 SA_CKE_1 SB_CKE_0 SB_CKE_1 SA_CS#_0 SA_CS#_1 SB_CS#_0 SB_CS#_1 SA_ODT_0 SA_ODT_1 SB_ODT_0 SB_ODT_1 SM_RCOMP SM_RCOMP# SM_RCOMP_VOH SM_RCOMP_VOL SM_VREF SM_PWROK SM_REXT SM_DRAMRST# — M_A_CLK0 (12) M_A_CLK1 (12) M_B_CLK0 (12) M_B_CLK1 (12) M_A_CLK0# (12) M_A_CLK1# (12) M_B_CLK0# (12) M_B_CLK1# (12) M_A_CKE0 (12,13) M_A_CKE1 (12,13) M_B_CKE0 (12,13) M_B_CKE1 (12,13) M_A_CS#0 (12,13) M_A_CS#1 (12,13) M_B_CS#0 (12,13) M_B_CS#1 (12,13) M_A_ODT0 (12,13) M_A_ODT1 (12,13) M_B_ODT0 (12,13) M_B_ODT1 (12,13) SM_RCOMP_VOH SM_RCOMP_VOL +0.9VSMVREF_MCH SW_PWROK_NB SM_REXT TP_SM_DRAMRST# — R62 80.6/F_4, R48 80.6/F_4, R79 10K/F_4, R35 499/F_4, TP18, +1.8VSUS

CLK: DPLL_REF_CLK DPLL_REF_CLK# DPLL_REF_SSCLK DPLL_REF_SSCLK# PEG_CLK PEG_CLK# — DREFCLK (3) DREFCLK# (3) DREFSSCLK (3) DREFSSCLK# (3) CLK_PCIE_3GPLL (3) CLK_PCIE_3GPLL# (3)

ME JTAG: TP22 TP16 TP15 TP14 — ME_JTAG_TCK ME_JTAG_TDI ME_JTAG_TDO ME_JTAG_TMS

DMI: DMI_RXN_0 DMI_RXN_1 DMI_RXN_2 DMI_RXN_3 DMI_RXP_0 DMI_RXP_1 DMI_RXP_2 DMI_RXP_3 DMI_TXN_0 DMI_TXN_1 DMI_TXN_2 DMI_TXN_3 DMI_TXP_0 DMI_TXP_1 DMI_TXP_2 DMI_TXP_3 — DMI_TXN[3:0] (15) DMI_TXP[3:0] (15) DMI_RXN[3:0] (15) DMI_RXP[3:0] (15)

CFG: (3) MCH_BSEL0 (3) MCH_BSEL1 (3) MCH_BSEL2 — MCH_CFG_3 MCH_CFG_4 MCH_CFG_5 MCH_CFG_6 MCH_CFG_7 MCH_CFG_8 MCH_CFG_10 MCH_CFG_11 MCH_CFG_14 MCH_CFG_15 MCH_CFG_16 MCH_CFG_17 MCH_CFG_18 MCH_CFG_20 — R55 *2.2K_4, R52 *2.2K_4, R50 *2.2K_4, R51 *2.2K_4, R42 *2.2K_4, R57 *4.02K/F_4 — TP5 TP10 TP8 TP9 TP7 TP4 TP6 TP13 — +3V

GRAPHICS VID: GFX_VID_0 GFX_VID_1 GFX_VID_2 GFX_VID_3 GFX_VID_4 GFX_VR_EN — GFXVR_VID_0 GFXVR_VID_1 GFXVR_VID_2 GFXVR_VID_3 GFXVR_VID_4 GFXVR_EN — TP114 TP115 TP17 TP24 TP20 TP113

PM: (16) PM_SYNC# (4,14,33) H_DPRSTP# (12,13) PM_EXTTS#0 (13) PM_EXTTS#1 (16,33) DELAY_VR_PWRGOOD (15) PLT_RST-R# (4,14) PM_THRMTRIP# (16,33) DPRSLPVR — PM_SYNC# PM_DPRSTP# PM_EXT_TS#_0 PM_EXT_TS#_1 PWROK RSTIN# THERMTRIP# DPRSLPVR — PM_EXTTS#0 PM_EXTTS#1 — R24 100/F_4 RST_IN# MCH — R500 *0_4

LE6B : Add R500 4/29

+3V — R77 10K/F_4 PM_EXTTS#0 — R73 10K/F_4 PM_EXTTS#1

ME: CL_CLK CL_DATA CL_PWROK CL_RST# CL_VREF — CL_CLK0 (16) CL_DATA0 (16) ECPWROK (16,25) CL_RST#0 (16) — 0.35 V — MCH_CLVREF — R113 1K/F_4, R109 499/F_4, C108 0.1U/10V/X5R_4 — +1.05V

MISC: DDPC_CTRLCLK DDPC_CTRLDATA SDVO_CTRLCLK SDVO_CTRLDATA CLKREQ# ICH_SYNC# TSATN# — DDPC_CTRLCLK DDPC_CTRLDATA SDVO_CLK SDVO_DATA — R527 *0_4, R528 *0_4, R529 *0_4 — TP11 TP12 TP134 TP135 — CLK_MCH_OE# (3) MCH_ICH_SYNC# (16) — MCH_TSATN R25 56.2/F_4 — +1.05V

HDA: HDA_BCLK HDA_RST# HDA_SDI HDA_SDO HDA_SYNC — TP136 TP138 TP137 TP139 TP140

EC0225-0001

NC: NC_1 … NC_26

CANTIGA_GM

U23C

LVDS: DPST_PWM L_BKLT_CTRL LVDS_BLON L_BKLT_EN L_CTRL_CLK L_CTRL_DATA L_DDC_CLK L_DDC_DATA L_VDD_EN LVDS_IBG LVDS_VBG LVDS_VREFH LVDS_VREFL LVDSA_CLK# LVDSA_CLK LVDSB_CLK# LVDSB_CLK LVDSA_DATA#_0 LVDSA_DATA#_1 LVDSA_DATA#_2 LVDSA_DATA#_3 LVDSA_DATA_0 LVDSA_DATA_1 LVDSA_DATA_2 LVDSA_DATA_3 LVDSB_DATA#_0 LVDSB_DATA#_1 LVDSB_DATA#_2 LVDSB_DATA#_3 LVDSB_DATA_0 LVDSB_DATA_1 LVDSB_DATA_2 LVDSB_DATA_3

TV: TVA_DAC TVB_DAC TVC_DAC TV_RTN TV_DCONSEL_0 TV_DCONSEL_1

VGA: CRT_BLUE CRT_GREEN CRT_RED CRT_IRTN CRT_DDC_CLK CRT_DDC_DATA CRT_HSYNC CRT_TVO_IREF CRT_VSYNC

PCI-EXPRESS GRAPHICS: PEG_COMPI PEG_COMPO — T37 PEG_COMP R81 49.9/F_4 — +1.05V_PEG; PEG_RX#_0 … PEG_RX#_15; PEG_RX_0 … PEG_RX_15; PEG_TX#_0 … PEG_TX#_15; PEG_TX_0 … PEG_TX_15

CANTIGA_GM

(18) DPST_PWM (18) LVDS_BLON — R72 10K/F_4 L_CTRL_CLK, R78 10K/F_4 L_CTRL_DATA — +3V
(18) EDIDCLK (18) EDIDDATA — EDIDCLK_INT EDIDDATA_INT
(18) DISP_ON — DISP_ON_INT — R418 2.37K/F_4 LVDS_IBG — TP109 LVDS_VBG
(18) LA_CLK# (18) LA_CLK — TP108 TP110 — LA_DATAN3 — TP112
(18) LA_DATAN0 (18) LA_DATAN1 (18) LA_DATAN2 — LA_DATAP3 — TP111
TP107 TP25 TP19 TP23 — LB_DATAN3 — TP106 TP26 TP21 TP28 — LB_DATAP3
T2 T3 T4 — TV_COMP1 TV_Y/G1 TV_C/R1 — R43 75/F_4, R45 75/F_4, R49 75/F_4 — R83 0_4 TV_DCONSEL0, R82 0_4 TV_DCONSEL1
(18) CRT_B (18) CRT_G (18) CRT_R — R59 150/F_4, R56 150/F_4, R60 150/F_4 — CRT_B_1 CRT_G_1 CRT_R_1
(18) DDCCLK (18) DDCDATA (18) HSYNC_COM (18) VSYNC_COM — DDCCLK_INT DDCDATA_INT HSYNC_INT VSYNC_INT — R76 33_4 R80 1.02K/F_4 CRTIREF R75 33_4

+1.8VSUS — R69 1K/F_4 — SM_RCOMP_VOH — C105 0.01U/16V/X7R_4, C100 2.2U/6.3V/X5R_6 — R64 3.01K/F_4
SM_RCOMP_VOL — C115 0.01U/16V/X7R_4, C111 2.2U/6.3V/X5R_6 — R61 1K/F_4

+1.8VSUS — R104 *1K/F_4 — R105 0_4 — +0.9VSMVREF (12,31)
+0.9VSMVREF_MCH — C162 0.1U/10V/X5R_4, C161 470PF/50V/X7R_4 — R97 *1K/F_4
HP SVTP TEST

For UMA HDMI Function

EB1213-0013

HPD# Inverting Level Shifting Circuit

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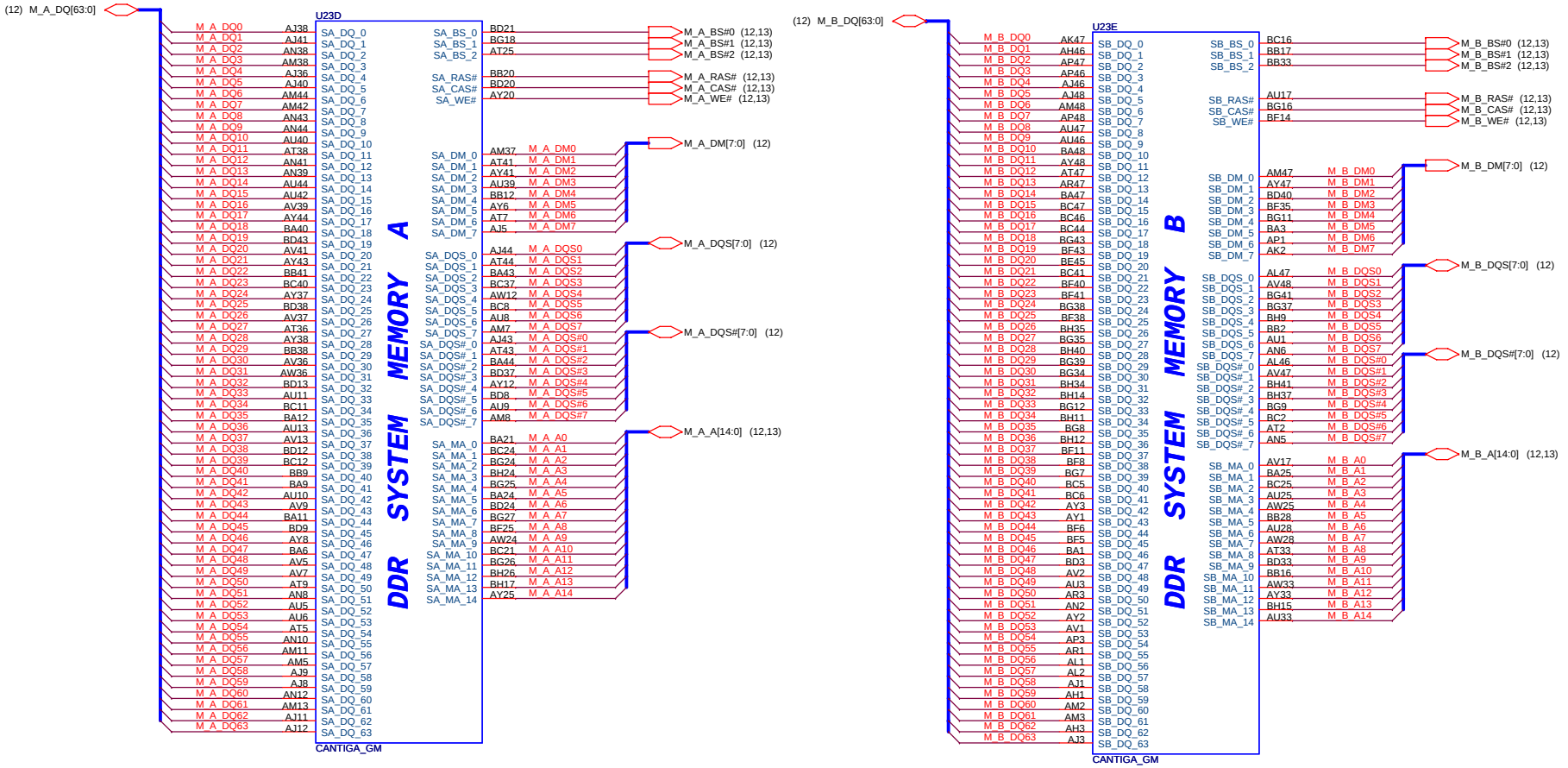

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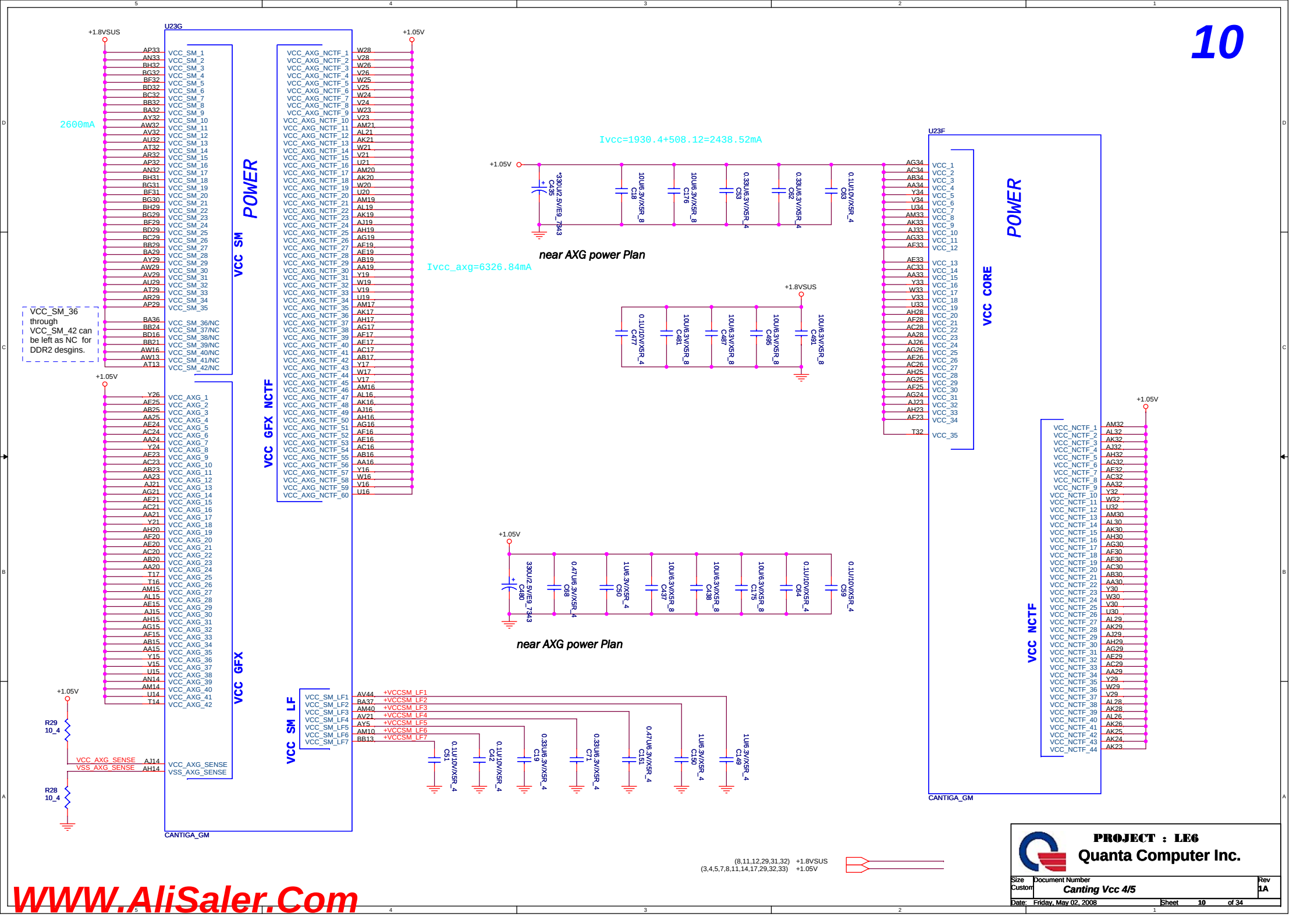

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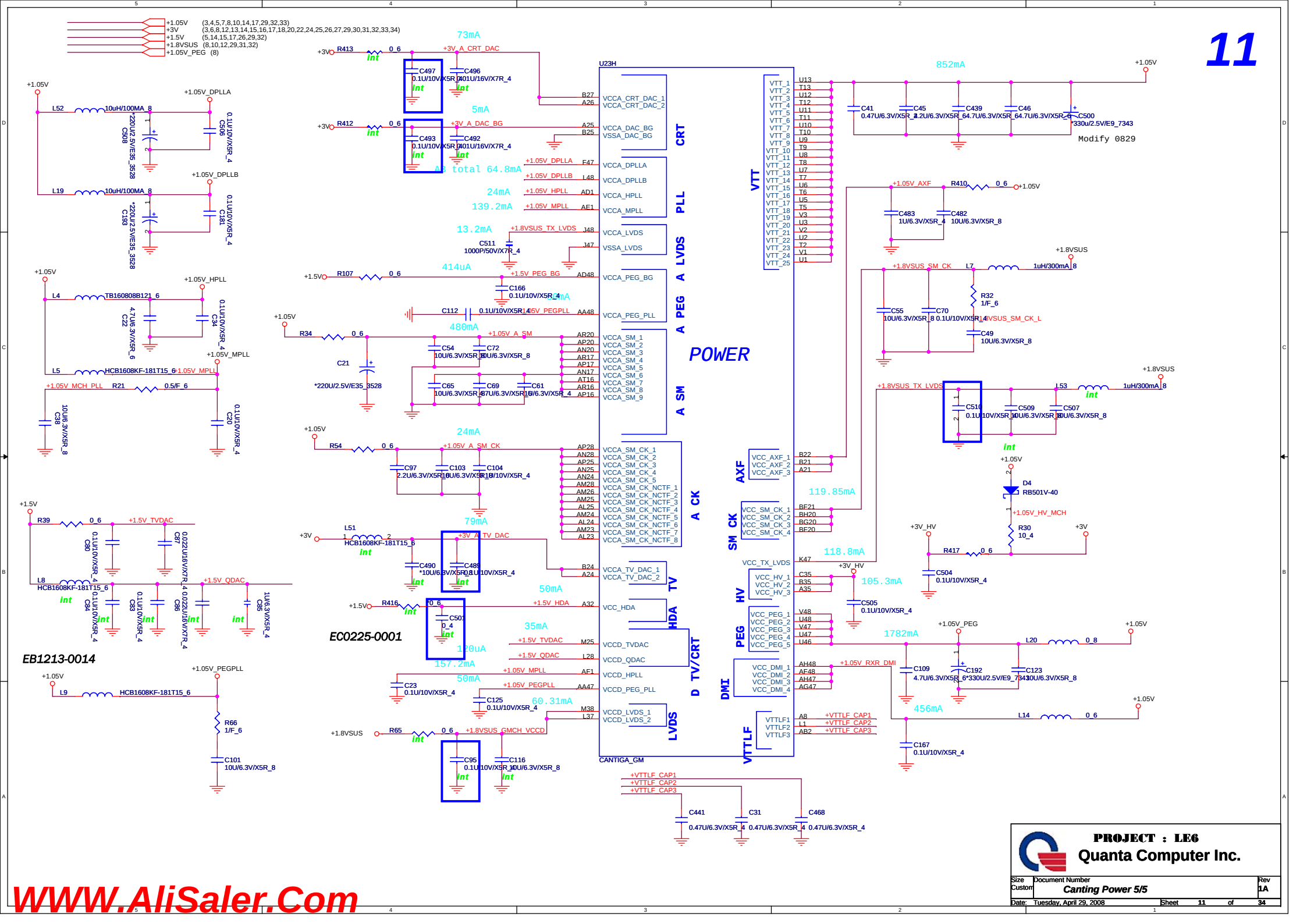
11
POWER
+1.05V (3,4,5,7,8,10,14,17,29,32,33)
+3V (3,6,8,12,13,14,15,16,17,18,20,22,24,25,26,27,29,30,31,32,33,34)
+1.5V (5,14,15,17,26,29,32)
+1.8VSUS (8,10,12,29,31,32)
+1.05V_PEG (8)
U23H
CRT
PLL
LVDS
A PEG
A SM
A CK
TV
HDA
D TV/CRT
VTT
AXF
SM CK
HV
PEG
DMI
VTTLF
CANTIGA_GM
73mA
5mA
A3 total 64.8mA
24mA
139.2mA
13.2mA
414uA
480mA
24mA
79mA
50mA
35mA
120uA
157.2mA
50mA
60.31mA
852mA
119.85mA
118.8mA
105.3mA
1782mA
456mA
EC0225-0001
EB1213-0014
Modify 0829
PROJECT : LE6
Quanta Computer Inc.
Canting Power 5/5
Size Custom
Rev 1A
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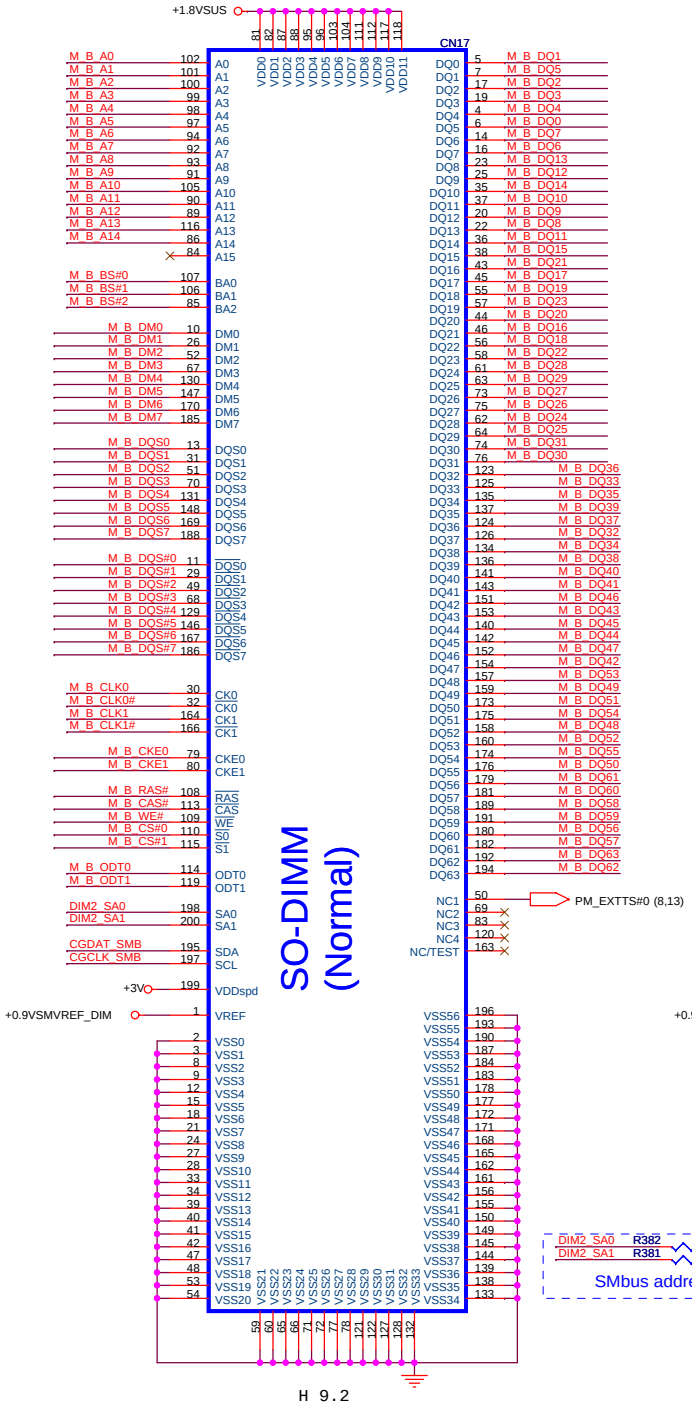
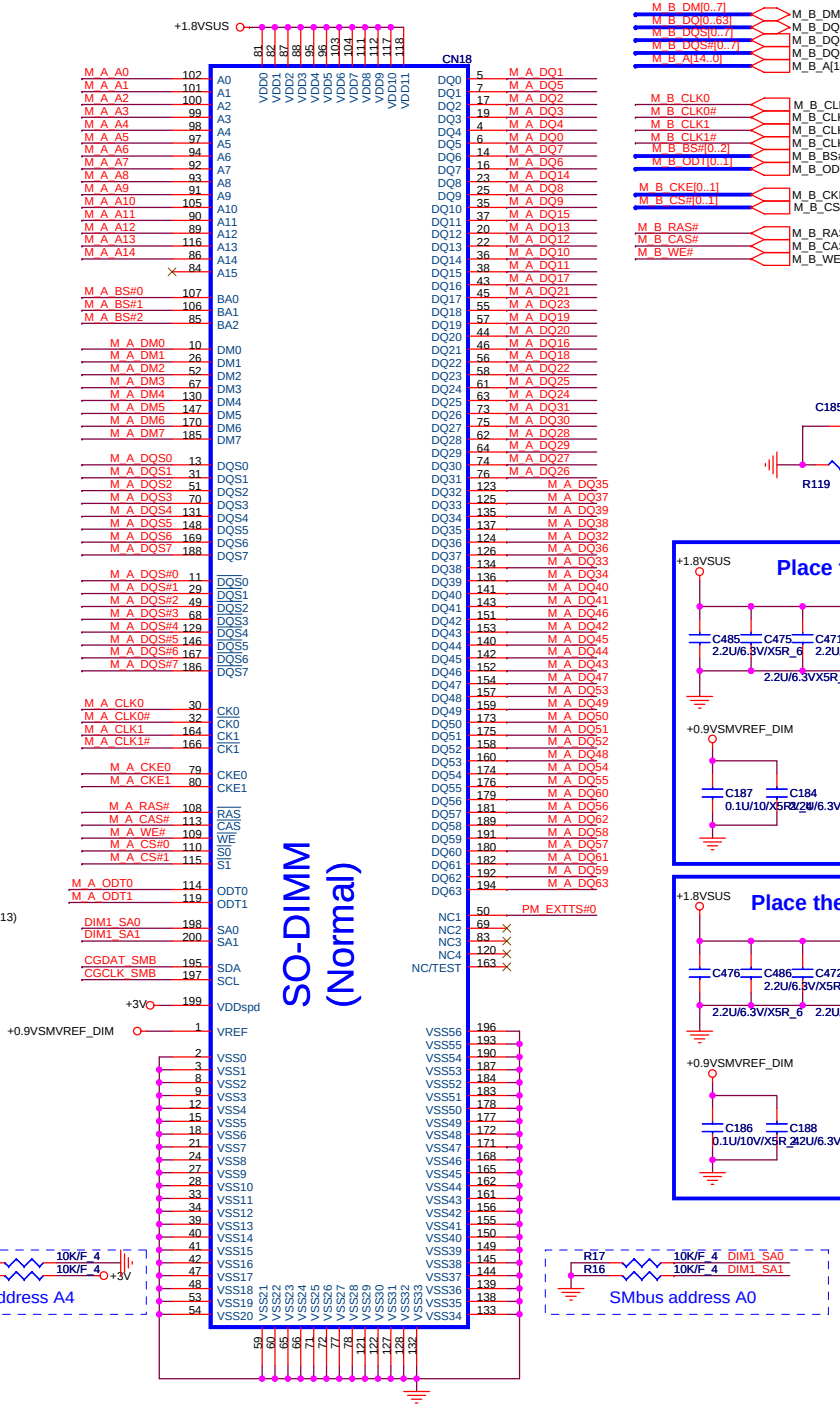
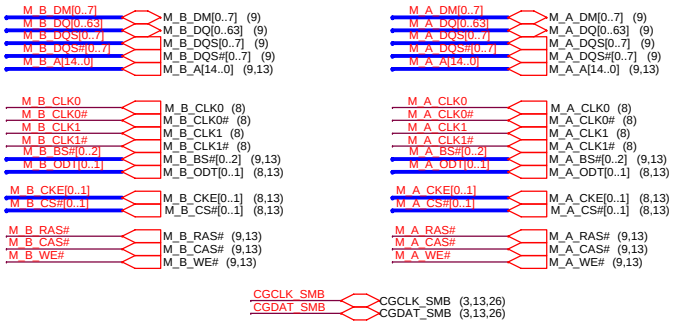
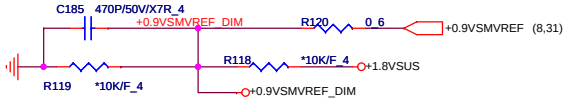


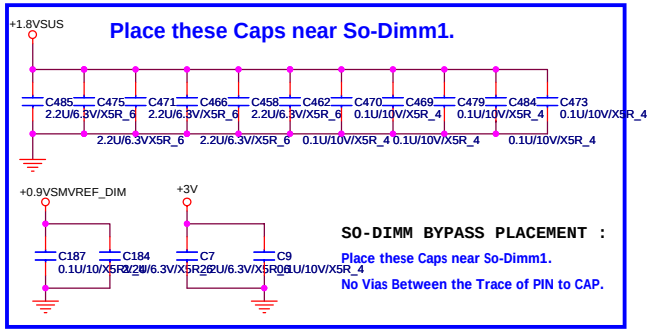
H 9.2

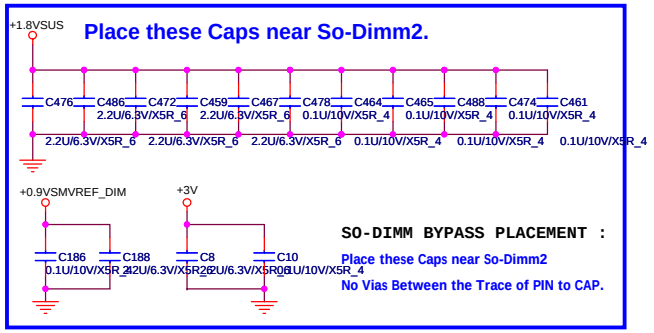


H 5.2









(8,10,11,29,31,32) +1.8VSUS
(3,6,8,11,13,14,15,16,17,18,20,22,24,25,26,27,29,30,31,32,33,34) +3V

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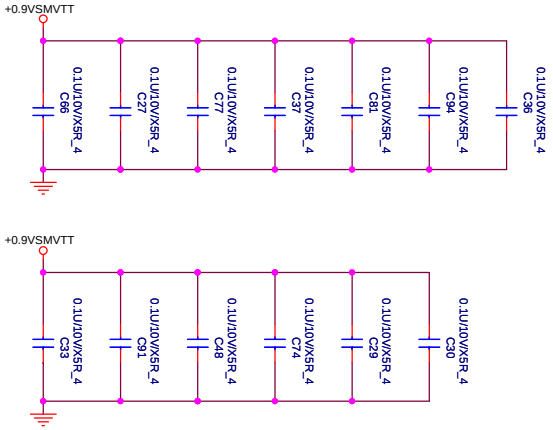
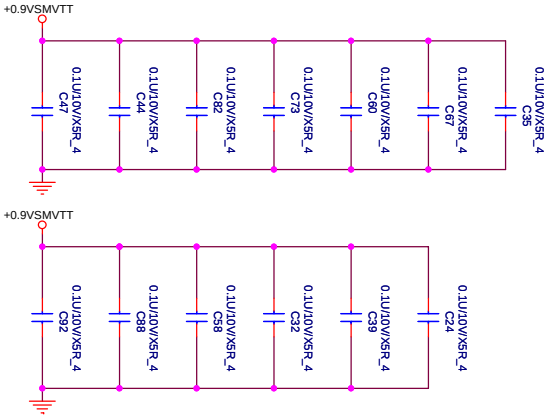
DDRII DUAL CHANNEL A,B.

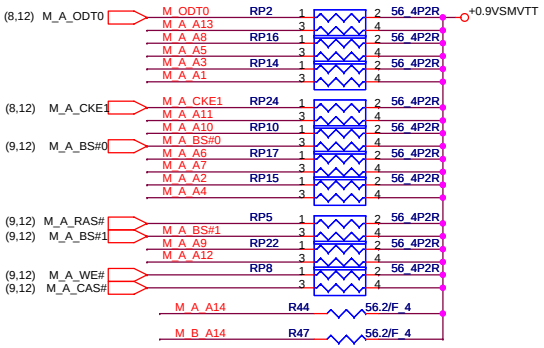
DDRII A CHANNEL

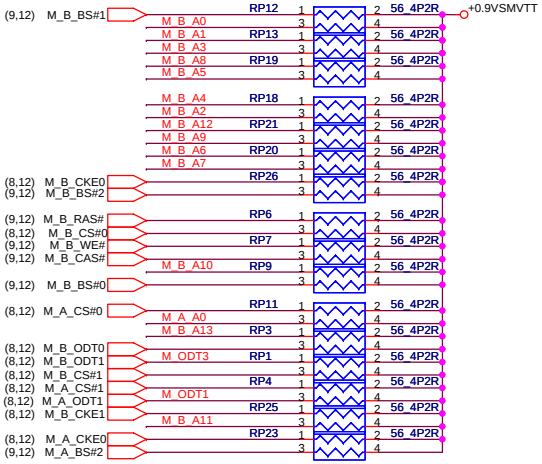


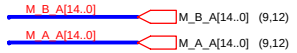
DDRII B CHANNEL

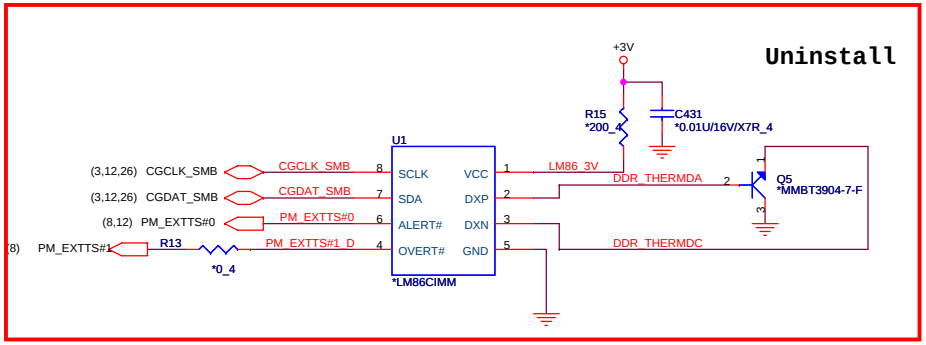


Layout note: Place one cap close to every 2 pullup resistors terminated to SMDDR_VTERM









+0.9VSMVTT (29,31)

+3V (3,6,8,11,12,14,15,16,17,18,20,22,24,25,26,27,29,30,31,32,33,34)

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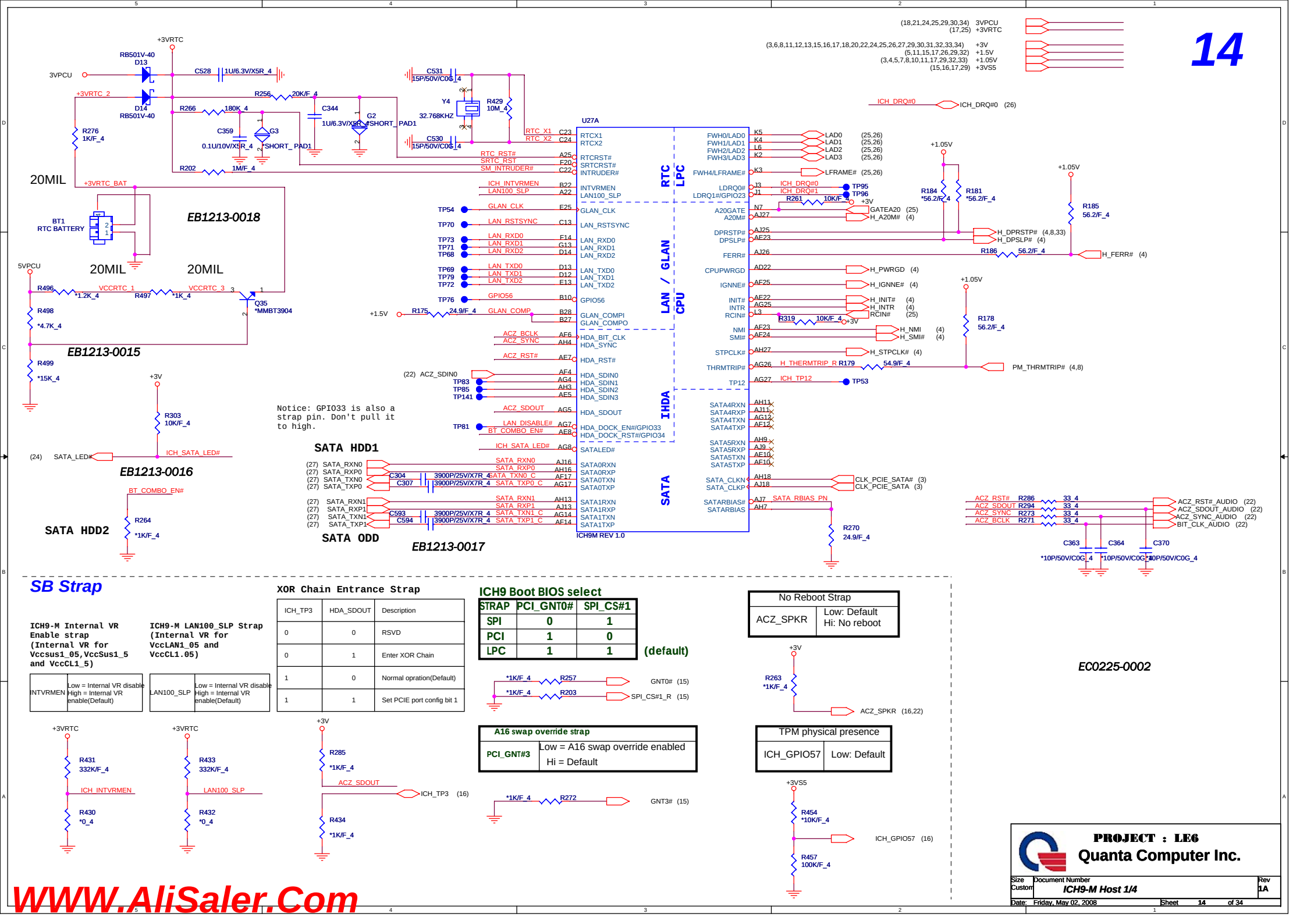
PROJECT : LE6

Quanta Computer Inc.

Size	Document Number	Rev
Custom	DDR2 termination	1A

Date: Tuesday, April 29, 2008 Sheet 13 of 34



SB Strap

ICH9-M Internal VR Enable strap (Internal VR for Vccsus1_05,VccSus1_5 and VccCL1_5)

INTVRMEN	Low = Internal VR disable High = Internal VR enable(Default)

ICH9-M LAN100_SLP Strap (Internal VR for VccLAN1_05 and VccCL1.05)

LAN100_SLP	Low = Internal VR disable High = Internal VR enable(Default)

XOR Chain Entrance Strap

ICH_TP3	HDA_SDOUT	Description
0	0	RSVD
0	1	Enter XOR Chain
1	0	Normal opration(Default)
1	1	Set PCIE port config bit 1

ICH9 Boot BIOS select

STRAP	PCI_GNT0#	SPI_CS#1	
SPI	0	1	
PCI	1	0	
LPC	1	1	(default)

No Reboot Strap	
ACZ_SPKR	Low: Default Hi: No reboot

A16 swap override strap	
PCI_GNT#3	Low = A16 swap override enabled Hi = Default

TPM physical presence	
ICH_GPIO57	Low: Default

EC0225-0002

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Size	Document Number	Rev
Custom	ICH9-M Host 1/4	1A
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(5,11,14,17,26,29,32) +1.5V
(3,6,8,11,12,13,14,16,17,18,20,22,24,25,26,27,29,30,31,32,33,34) +3V
(16,22,24,26,29,33) 3VSUS

EC0225-0004

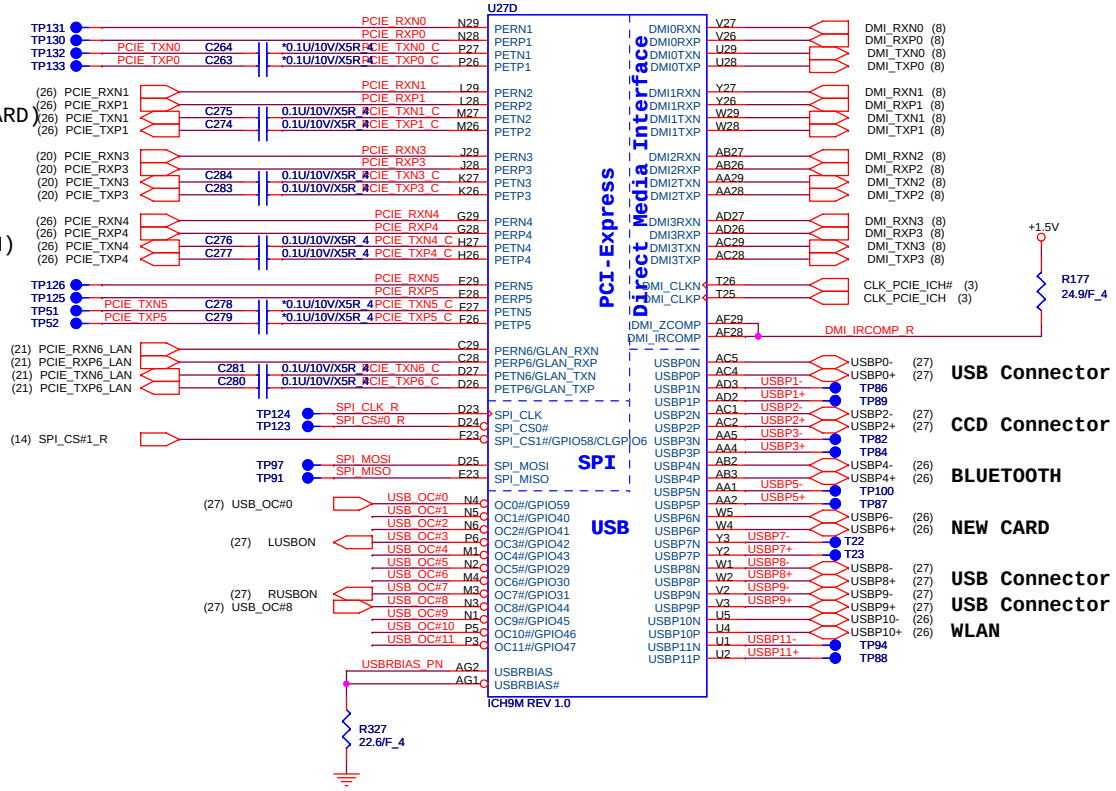
EXPRESS CARD (NEW CARD)

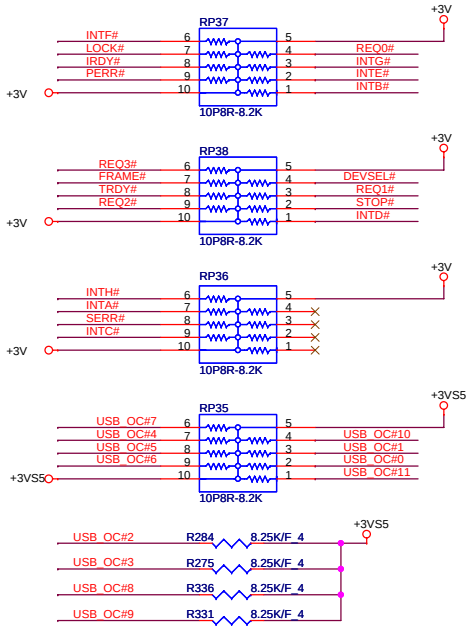
CRAD READER PCI-E

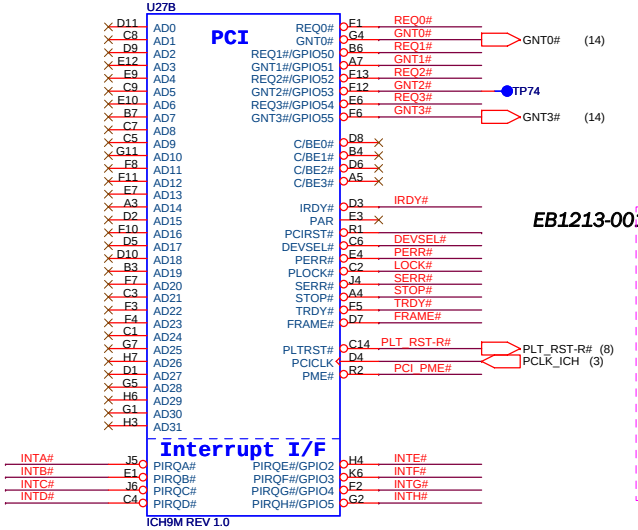
MINI CARD PCI-E(WLAN)

EC0225-0003

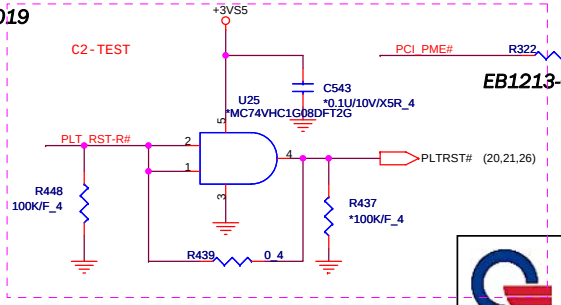
PCIE-LAN



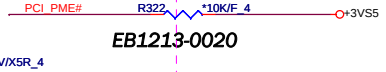




EB1213-0019



EB1213-0020



LE6B: Delete HDMI SPI flash IC and relate circuit
2008-4-24

PROJECT : LE6
Quanta Computer Inc.

Size	Document Number	Rev
Custom	ICH9-M PCIE 2/4	1A
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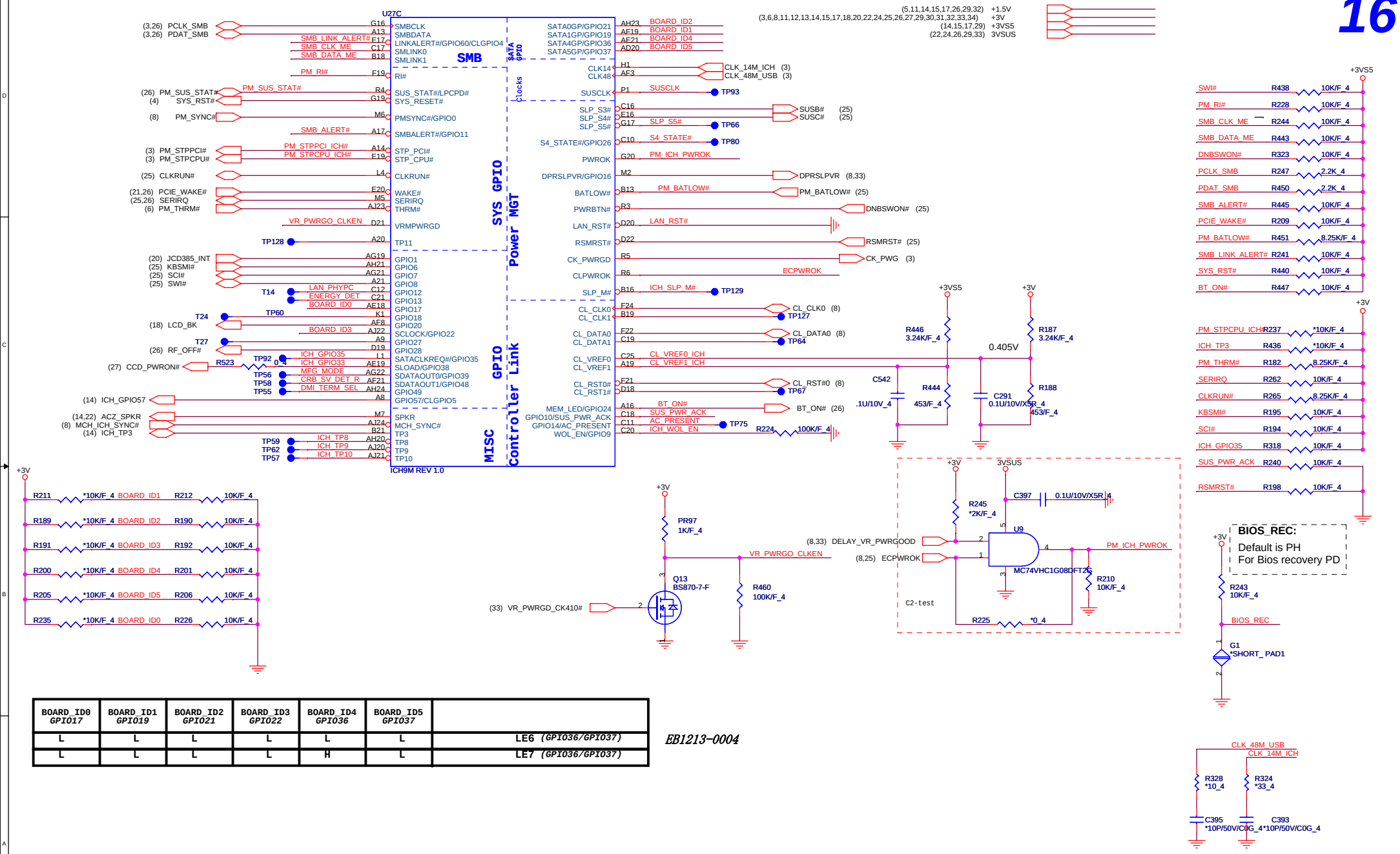

BOARD_ID0 GPIO17	BOARD_ID1 GPIO19	BOARD_ID2 GPIO21	BOARD_ID3 GPIO22	BOARD_ID4 GPIO36	BOARD_ID5 GPIO37	
L	L	L	L	L	L	LE6 (GPIO36/GPIO37)
L	L	L	L	H	L	LE7 (GPIO36/GPIO37)

EB1213-0004

PROJECT : LE6

Quanta Computer Inc.

Size	Document Number	Rev
Custom	ICH9-M GPIO 3/4	1A

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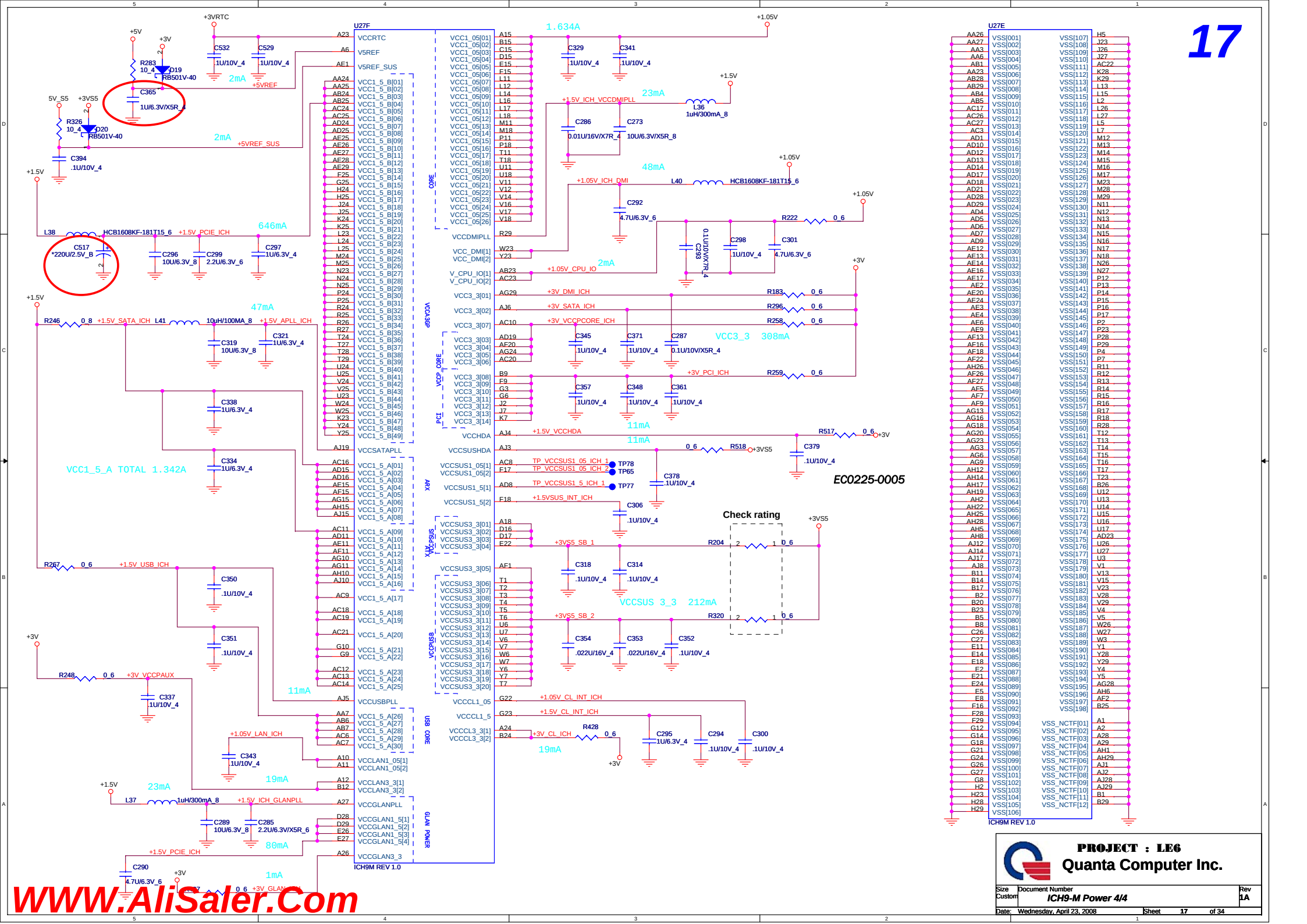
17
U27F
ICH9M REV 1.0
U27E
ICH9M REV 1.0
VCCRTC
V5REF
V5REF_SUS
VCCDMIPLL
VCC_DMI[1]
VCC_DMI[2]
V_CPU_IO[1]
V_CPU_IO[2]
VCCSATAPLL
VCCUSBPLL
VCCCL1_05
VCCCL1_5
VCCCL3_3[1]
VCCCL3_3[2]
VCCHDA
VCCSUSHDA
VCCSUS1_05[1]
VCCSUS1_05[2]
VCCSUS1_5[1]
VCCSUS1_5[2]
VCCLAN1_05[1]
VCCLAN1_05[2]
VCCLAN3_3[1]
VCCLAN3_3[2]
VCCGLANPLL
VCCGLAN1_5[1]
VCCGLAN1_5[2]
VCCGLAN1_5[3]
VCCGLAN1_5[4]
VCCGLAN3_3
CORE
VCCA3GP
VCCP_CORE
PCI
RTC
SUS
VCCP_SUS
USB CORE
GLAN POWER
1.634A
23mA
48mA
2mA
646mA
47mA
VCC3_3 308mA
11mA
11mA
VCC1_5_A TOTAL 1.342A
VCCUS 3_3 212mA
19mA
23mA
80mA
1mA
Check rating
EC0225-0005
PROJECT : LE6
Quanta Computer Inc.
ICH9-M Power 4/4
Size Custom
Document Number
Rev 1A
Date: Wednesday, April 23, 2008
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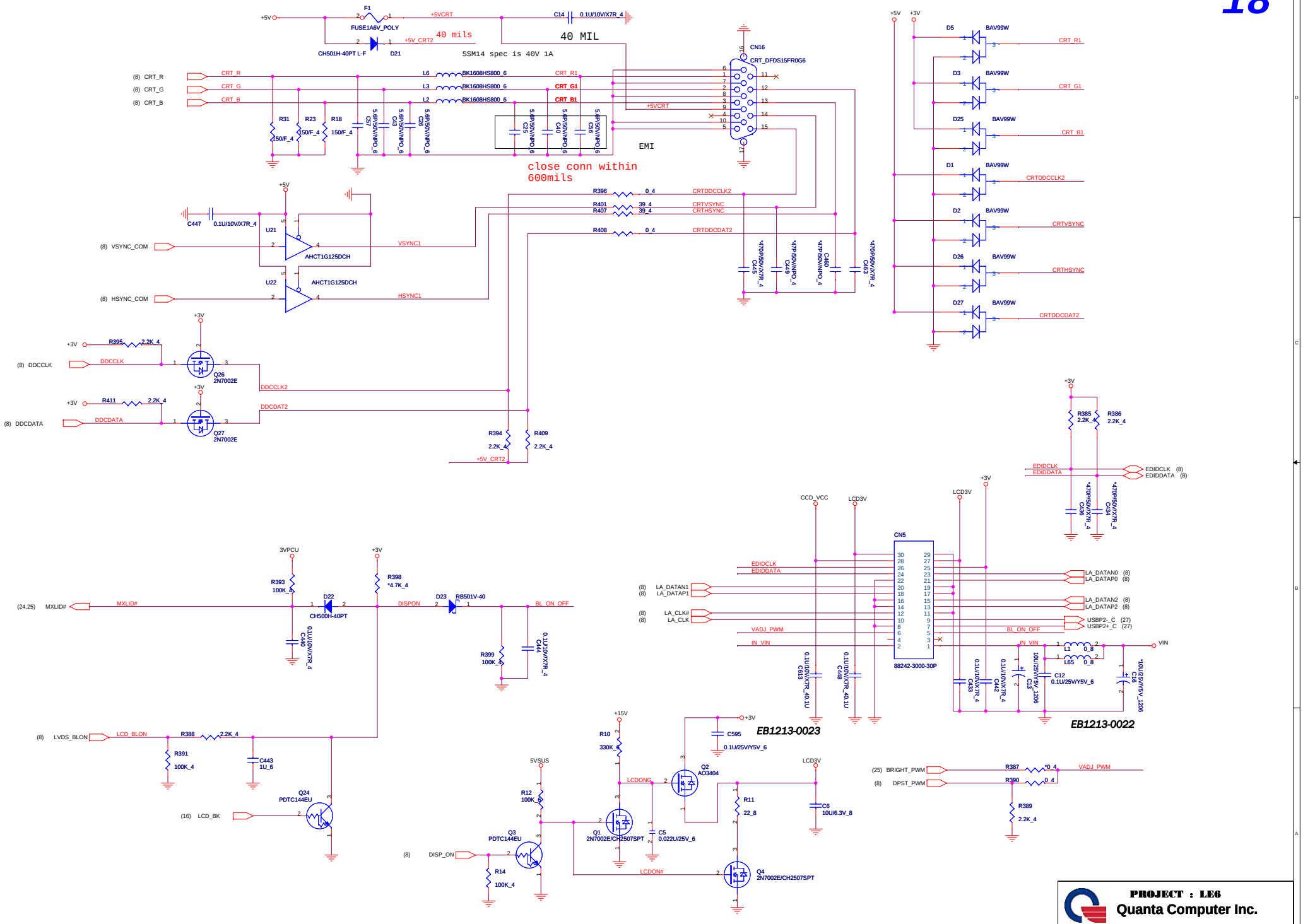
CRT PORT



PROJECT : LE6

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Size	Document Number	Rev
C	CRT/LCD/LID SWITCH	1A

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Quanta Computer Inc.

Size	Document Number	Rev
Custom	PS8101 & HDMI CONN	1A

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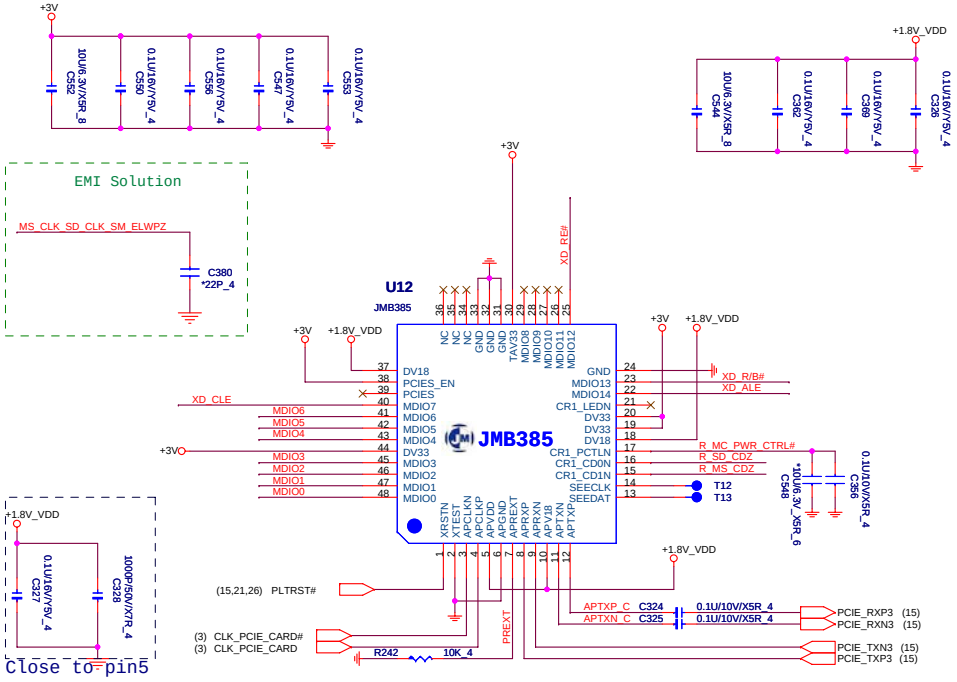
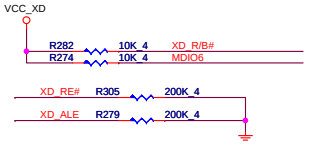
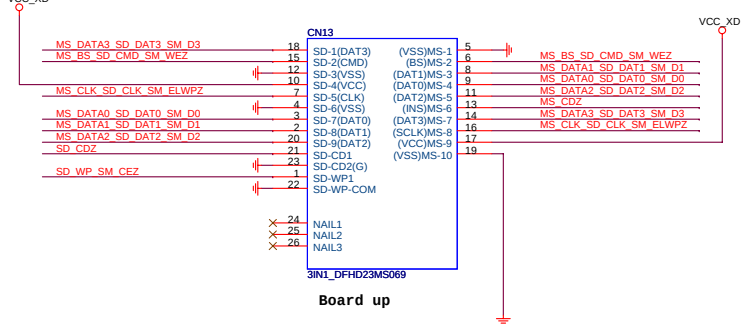
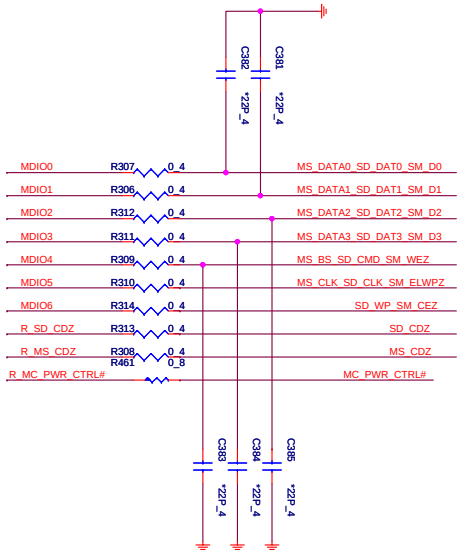
3 IN 1 CARD READER









CARDREADER POWER

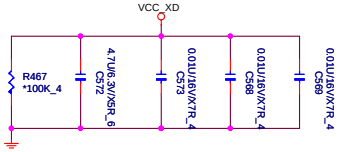
Memory Card Power Supply

EB1213-0025

Use 0805 type and over 20 mils trace width on both side

EB1213-0026

DEL some parts for Q32 R469 C577



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PROJECT : LE6

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Size	Document Number	Rev
Custom	JMB385 - Card Reader	2A
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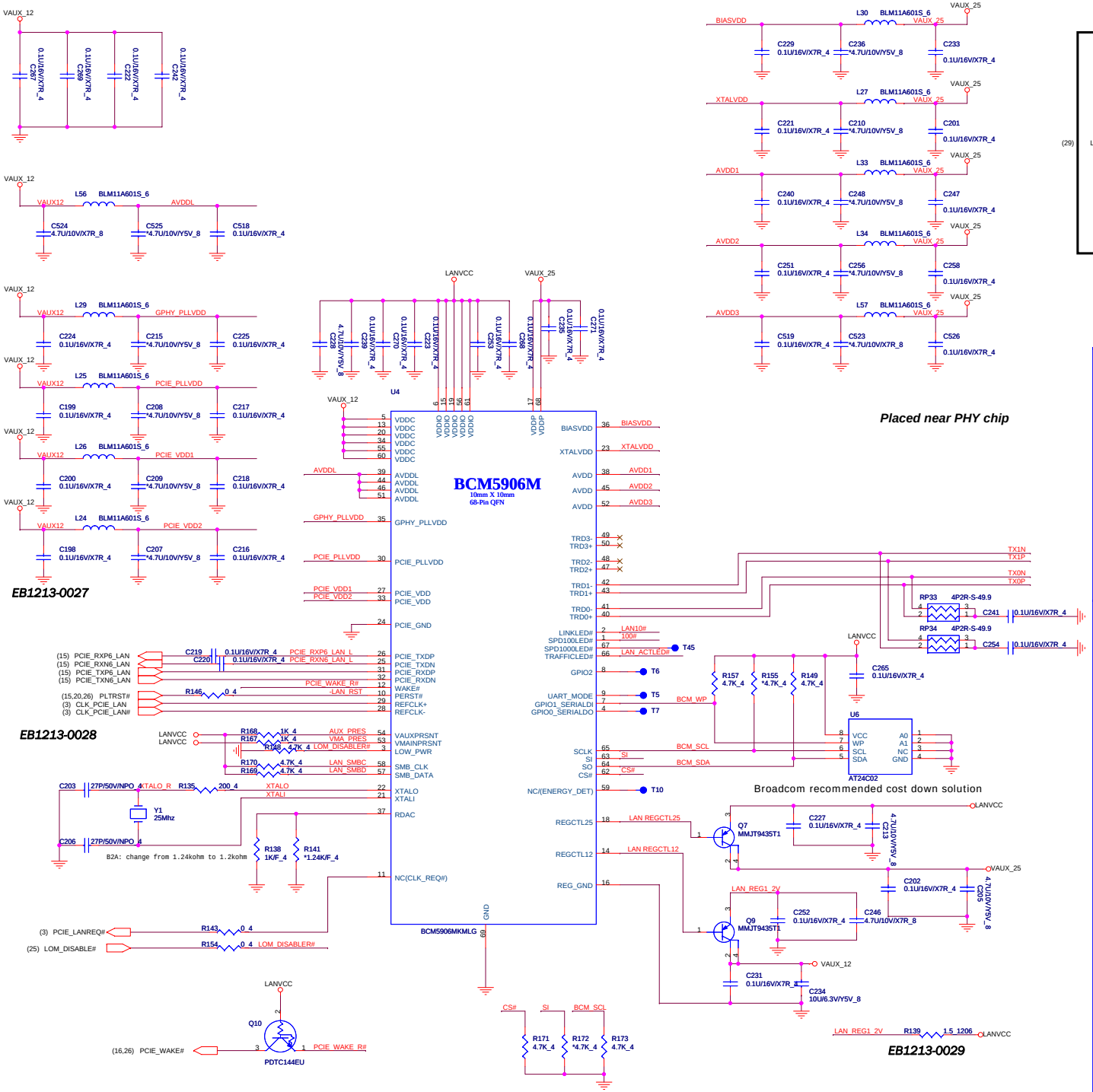

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PROJECT : LE6

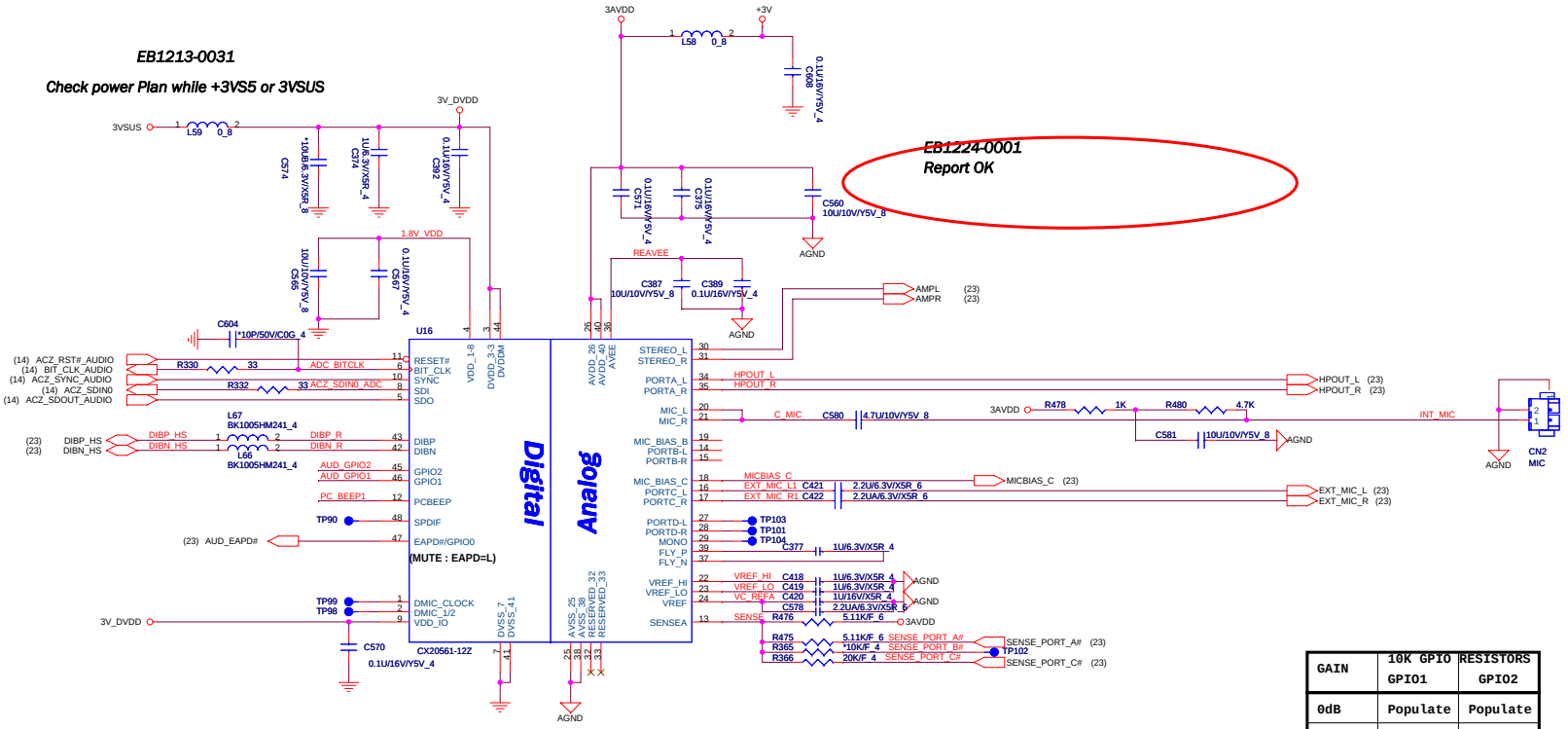
Quanta Computer Inc.

Size	Document Number	Rev
C	LAN	1A

Date: Friday, May 02, 2008 Sheet 21 of 34

EB1213-0031

Check power Plan while +3VS5 or 3VSUS



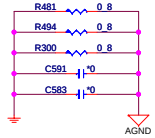
EB1213-0032

Check power Plan while +1.5VS5 or 1.5VSUS

GAIN	10K GPIO GPIO1	RESISTORS GPIO2
0dB	Populate	Populate
-6dB	Omit	Omit
-12dB	Populate	Omit
-16dB	Omit	Populate

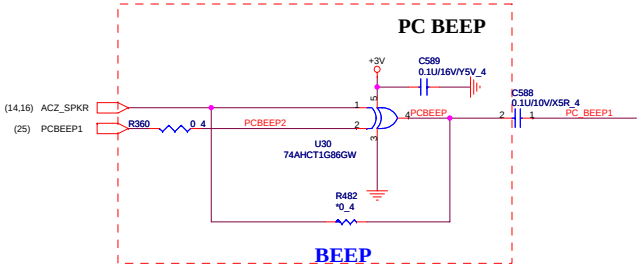
STEREO	INTERNAL SPEAKERS
PORT-A	EXTERNAL HEAD-PHONE
MIC	INTERNAL MIC
PORT-B	EXTERNAL MIC

FOR EMI SOLUTION



Default gain is -6dB without populating the 10K ohm pull down resistors going to GPIO1 and GPIO2

LE6B:Add R360 and change U30 to OR gate base on customer request



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PROJECT : LE6

Quanta Computer Inc.

Size	Document Number	Rev
C	AUDIO CODEC(CX20561-12Z)	1A

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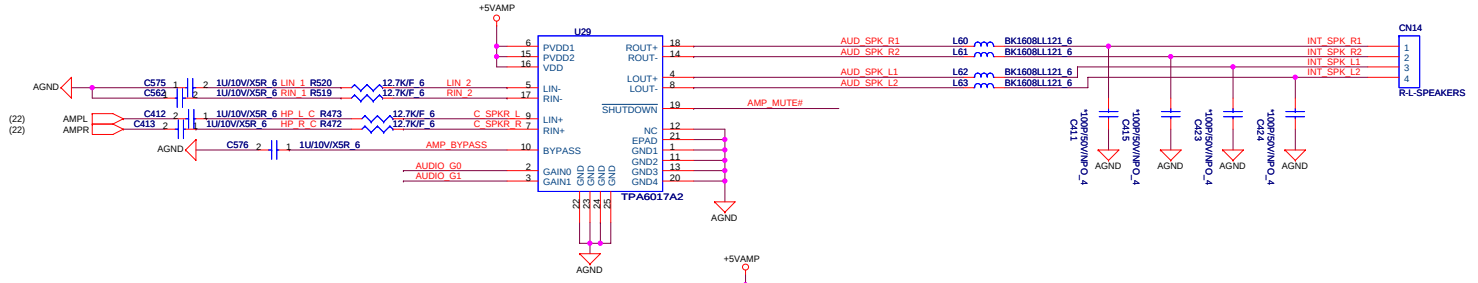
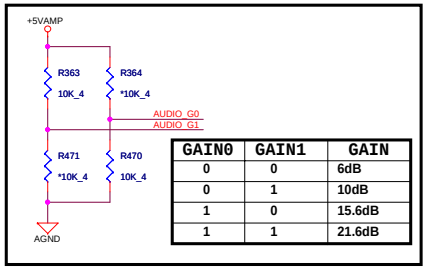
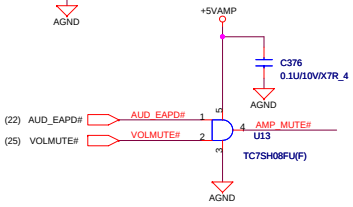
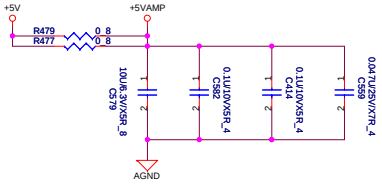
INTERNAL SPEAKER AMPLIFIER





GAIN0	GAIN1	GAIN
0	0	6dB
0	1	10dB
1	0	15.6dB
1	1	21.6dB

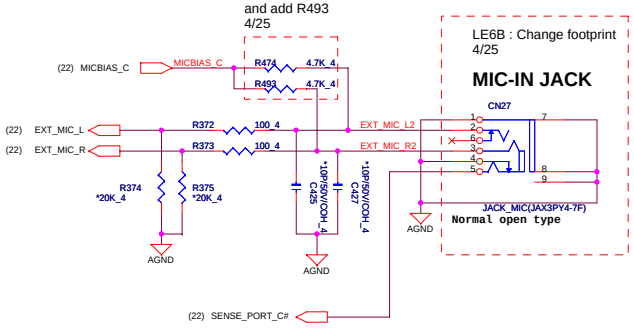




LE6B : Change connrction of MICBIAS_C and add R493 4/25

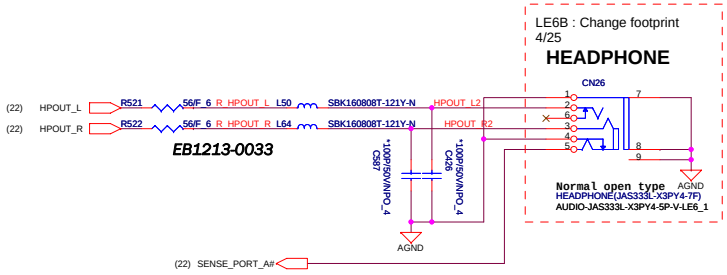
LE6B : Change footprint 4/25

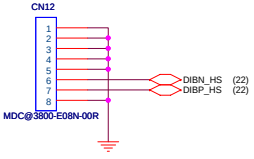
MIC-IN JACK



LE6B : Change footprint 4/25

HEADPHONE





Modem connector

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Quanta Computer Inc.

Size	Document Number	Rev
C	TPA6017 & JACKS & MDC	1A
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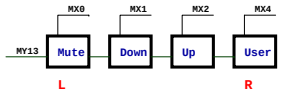
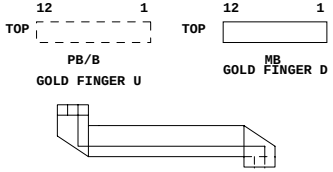
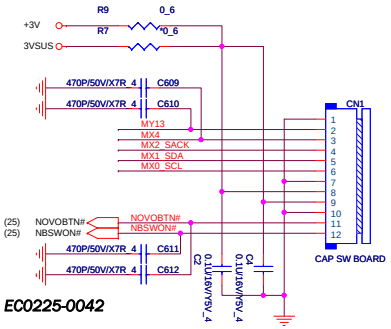
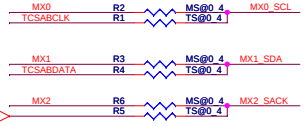




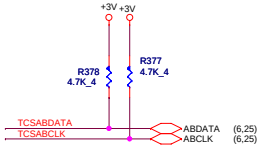


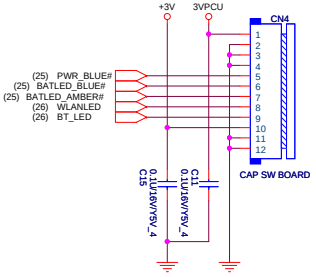
EC0225-0042

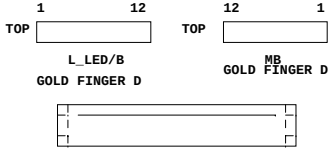


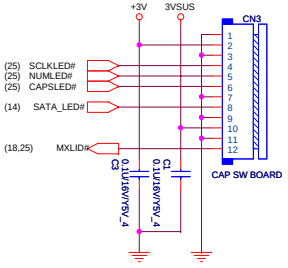
check EC and Vendor for CTS

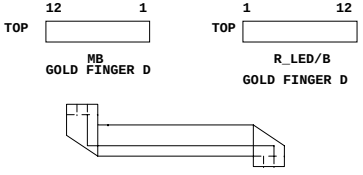
EB1213-0022

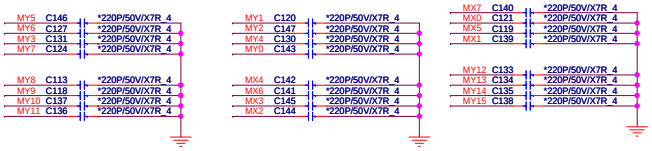




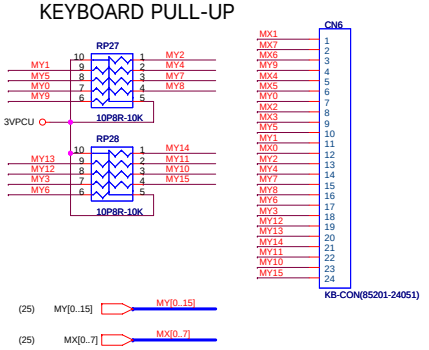




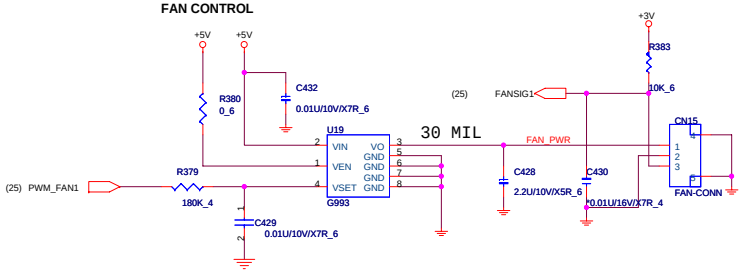


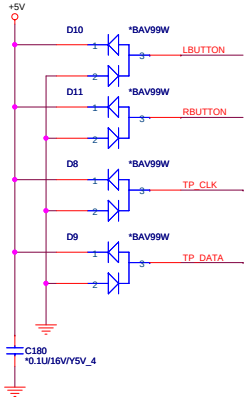


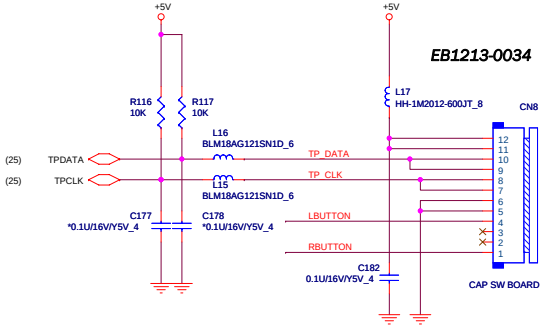
KEYBOARD PULL-UP



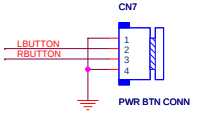
FAN CONTROL







EB1213-0034



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PROJECT : LE6

Quanta Computer Inc.

Size	Document Number	Rev
C	KEYBOARD/FAN	1A
Date: Tuesday, April 29, 2008	Sheet 24 of 34	

IT8512/IT8502

POWER SWITCH

16Mbit (2M Byte), SPI

Note 1 : Since all GPIO belong to VSTBY power domain, and there are some special considerations below:
(1) If it is output to external VCC derived power domain circuit, this signal should be isolated by a diode such as KBRST# and GA20.
(2) If it is input from external VCC derived power domain circuit, this external circuit must consider not to float the GPIO input.

Note 2 :
(1) Each input pin should be driven or pulled.
(2) Each output-drain output pin should be pulled.

Layout Note:
Place all capacitors close to IT8512.

Layout Note:
net "3VPCU" and "RTC_VCC" minimum trace width 12mils.

Layout Note:
Place R471,R498,R534 within 500 mils from SPI Flash.Place R567 within 500mils from R534; R520 within 500mils from R498 and R570 within 500mils from R471.

Layout Note:
32.768kHz clock lines:
a. If possible, please avoid using any through-hole.
b. Please make the trace length short, and the trace width wide enough.
c. The spacing to the closest neighbor should be wide enough.

TMKBC Function	
High	Enable
Low	Disable

R3444	FLASH TYPE SELECT
High	LPC/FWH FLASH ROM
Low	SPI FLASH ROM (Default)

EB1213-0035

EB1213-0036

EC0225-0042

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Quanta Computer Inc.

Size	Document Number	Rev
Custom	EC IT8502	1A

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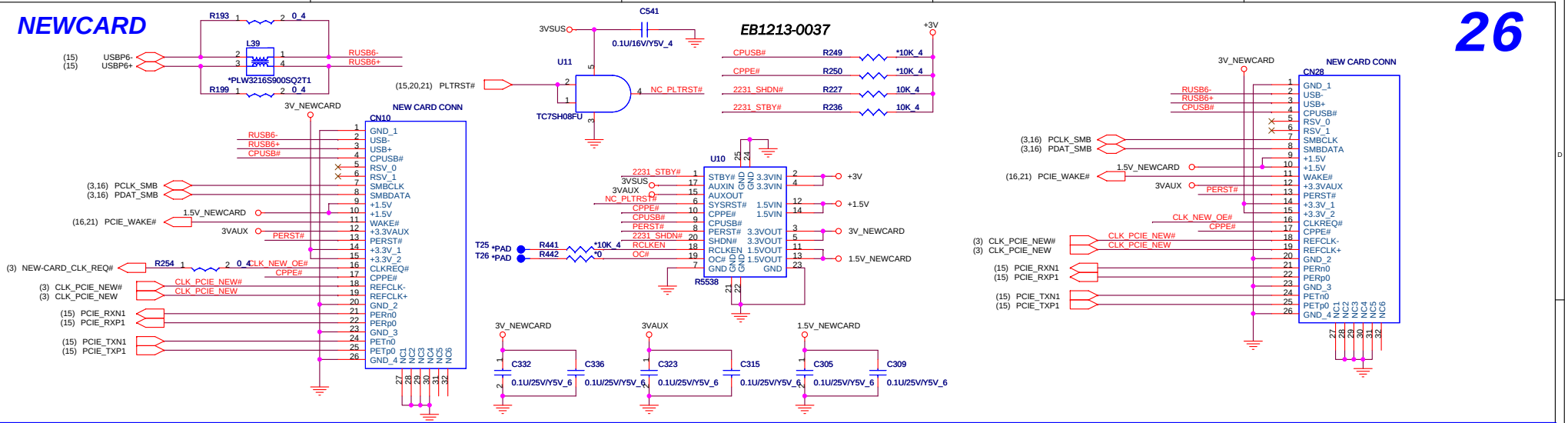
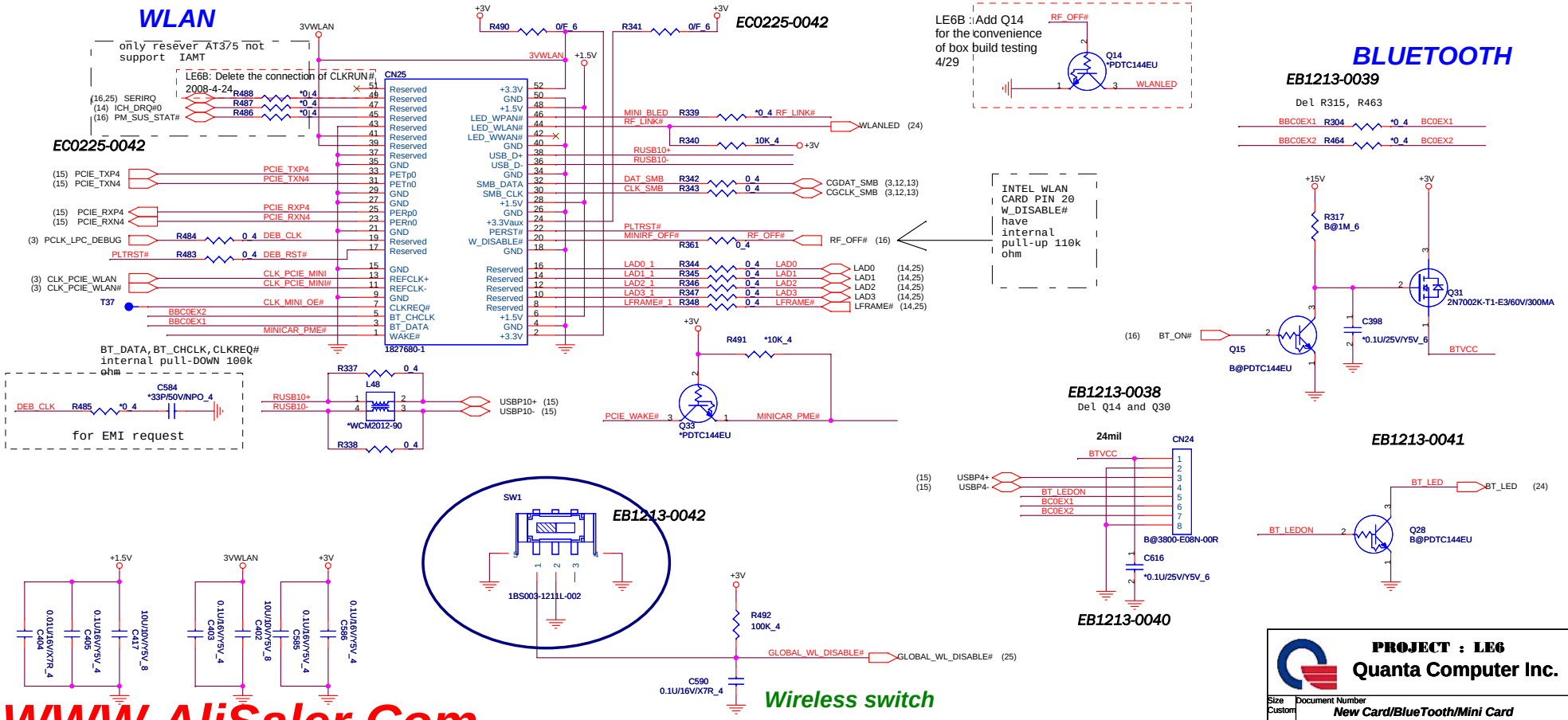
NEWCARD



Mini PCI-E Card 1
WLAN



BLUETOOTH

Wireless switch

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PROJECT : LE6

Quanta Computer Inc.

Size	Document Number	Rev
Custom	New Card/BlueTooth/Mini Card	1A
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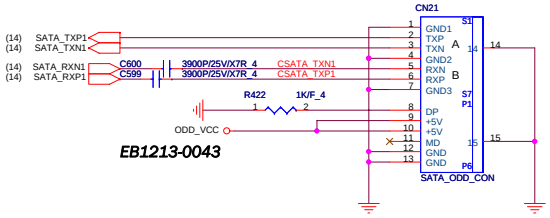
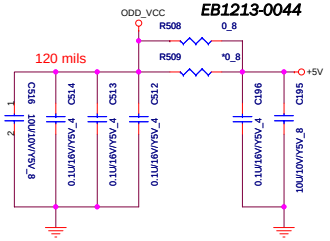
SATA CD-ROM



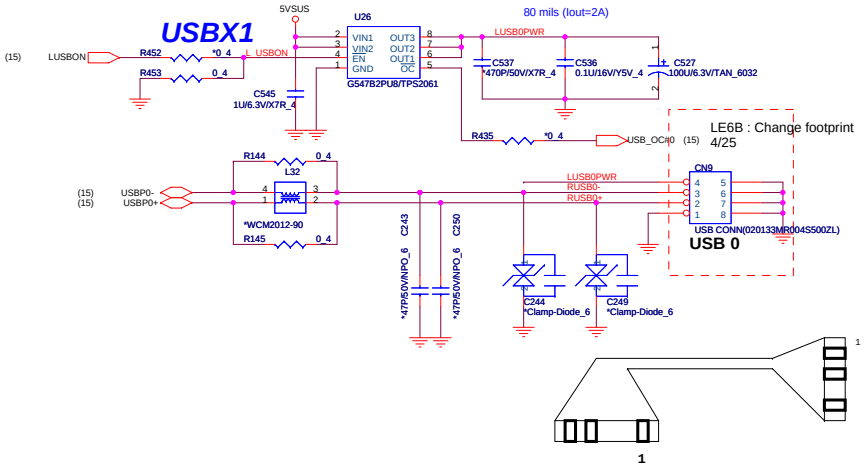
EB1213-0043

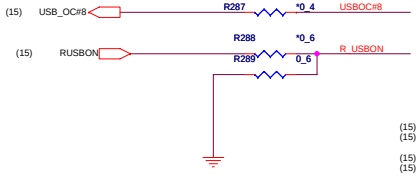
0 ohm szie from 0603 to 0805

EB1213-0044

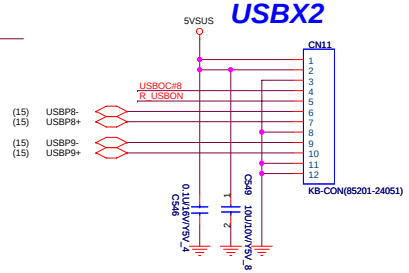


USBX1

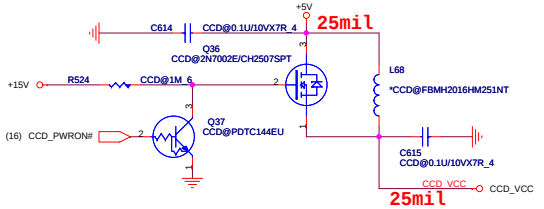


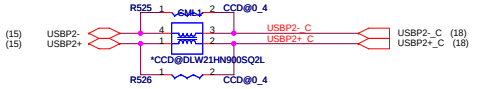


USBX2



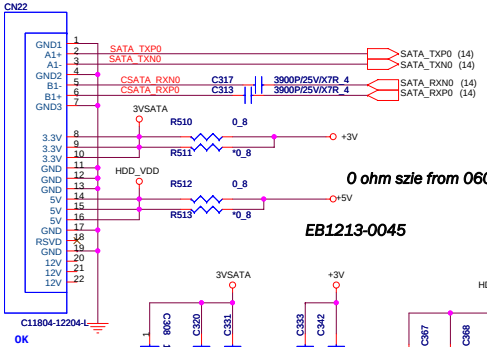
CCD MODULE





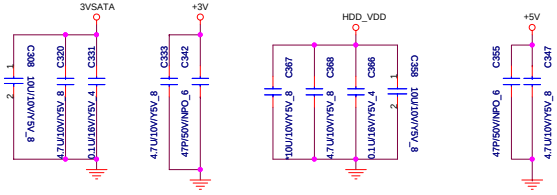
CCD_PWRON#	High	Low
	Disable	Enable

SATA_1 CONNECTOR



0 ohm szie from 0603 to 0805

EB1213-0045



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Quanta Computer Inc.

Size	Document Number	Rev
C	SATA HDD/ODD USB*1	1A

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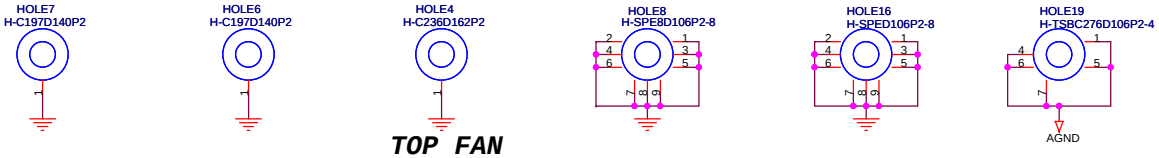
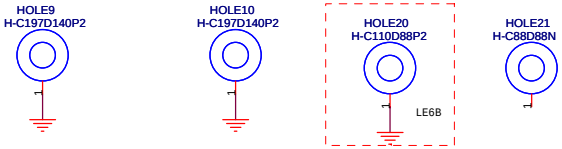
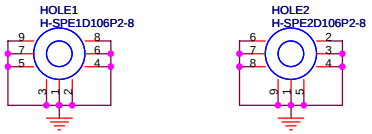


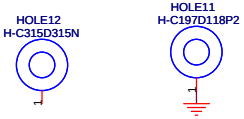
TOP FAN



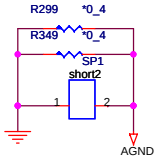
CPU

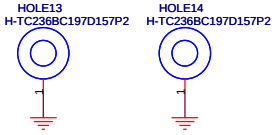
EB1221-0001



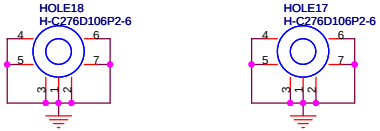


EB1213-0019





MINI-PCIe



USB

EB1224-0001

RSPKR

RSPKL

BOT NB

PROJECT : LE6

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Size	Document Number	Rev
Custom	EMI PAD/SCREW/DEBUG PORT	1A

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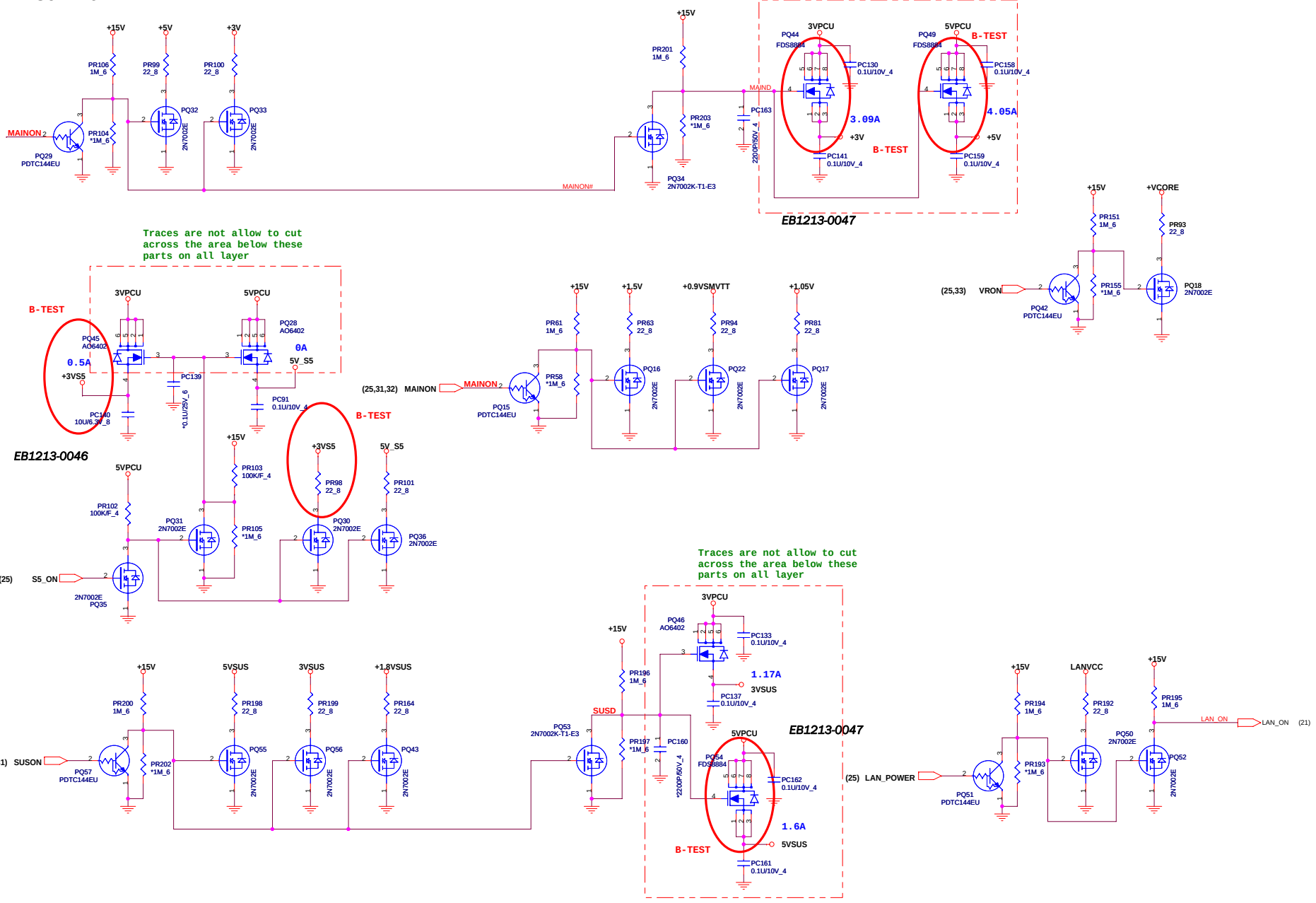
DISCHARGE



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PROJECT : LE6

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Size	Document Number	Rev
Custom	Discharge	1A

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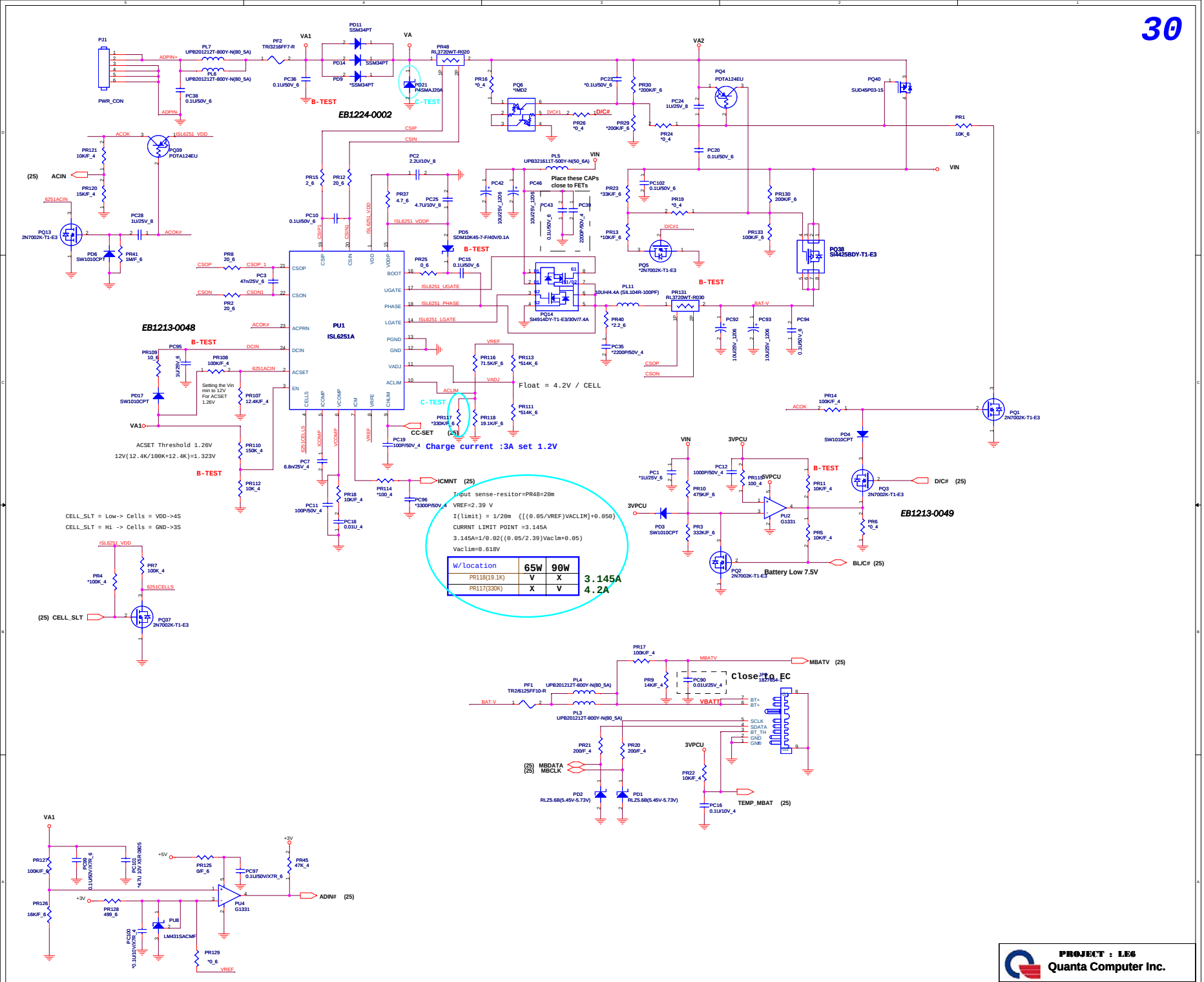

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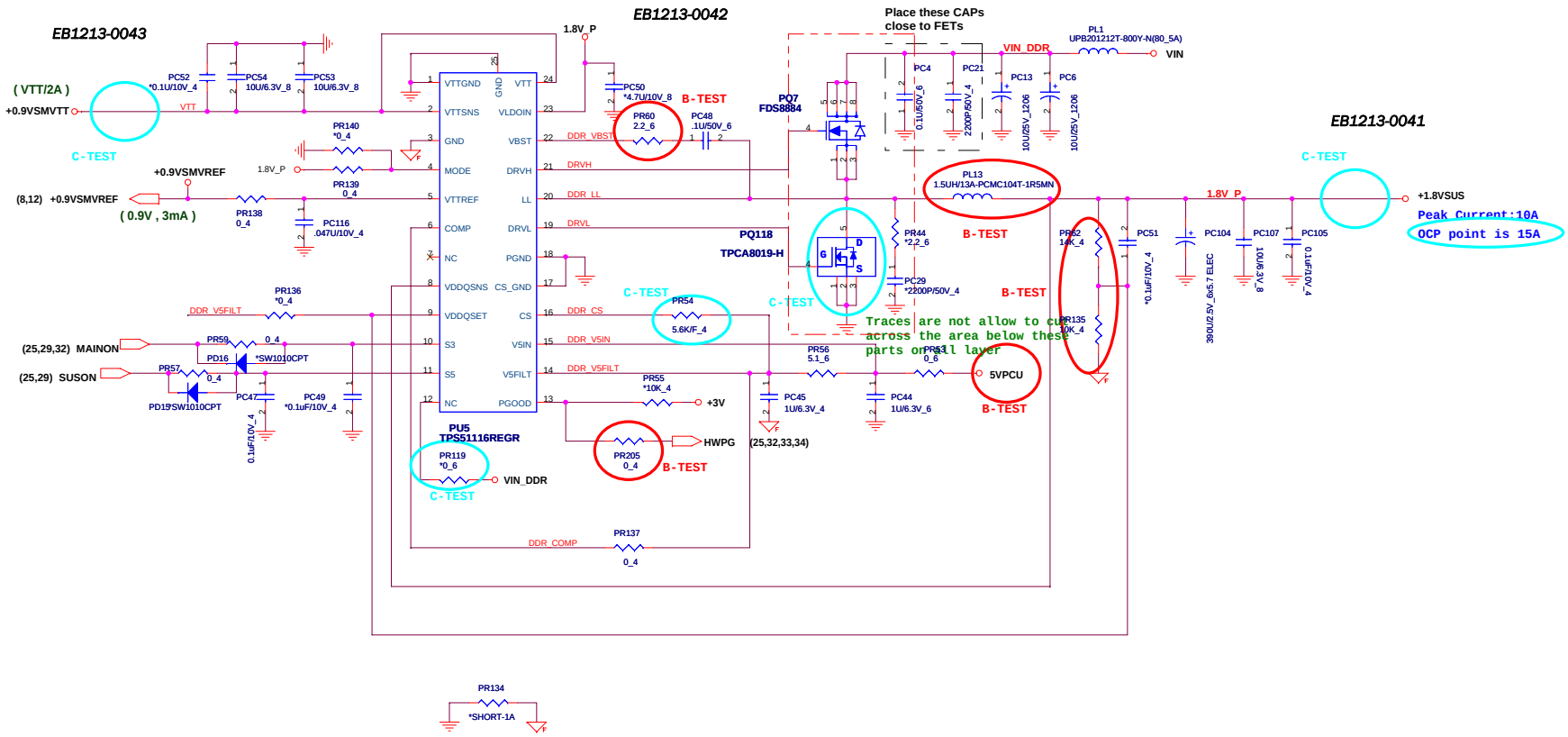
PROJECT : LE6
Quanta Computer Inc.
Size: Custom | Document Number: Charger (ISL6251A) | Rev: 1A
Date: Tuesday, April 29, 2008 | Sheet 30 of 34



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Quanta Computer Inc.			
Size: Custom	Document Number: DDR (TPS51116PEGR)		Rev: 1A
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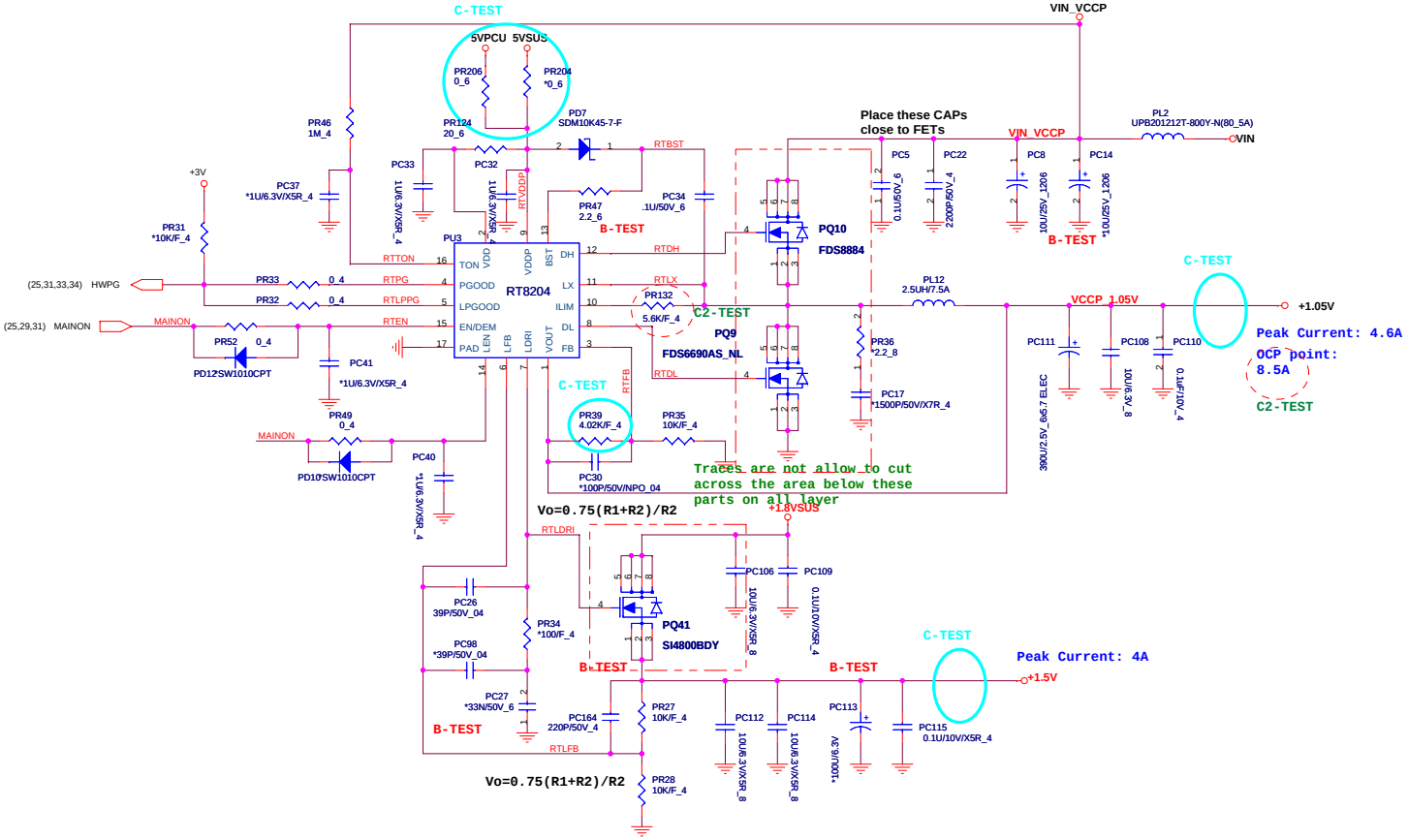

PROJECT : LE6

Quanta Computer Inc.

Size	Document Number	Rev
Custom	1.05V/1.5V/1.25V (ISL6228)	3A

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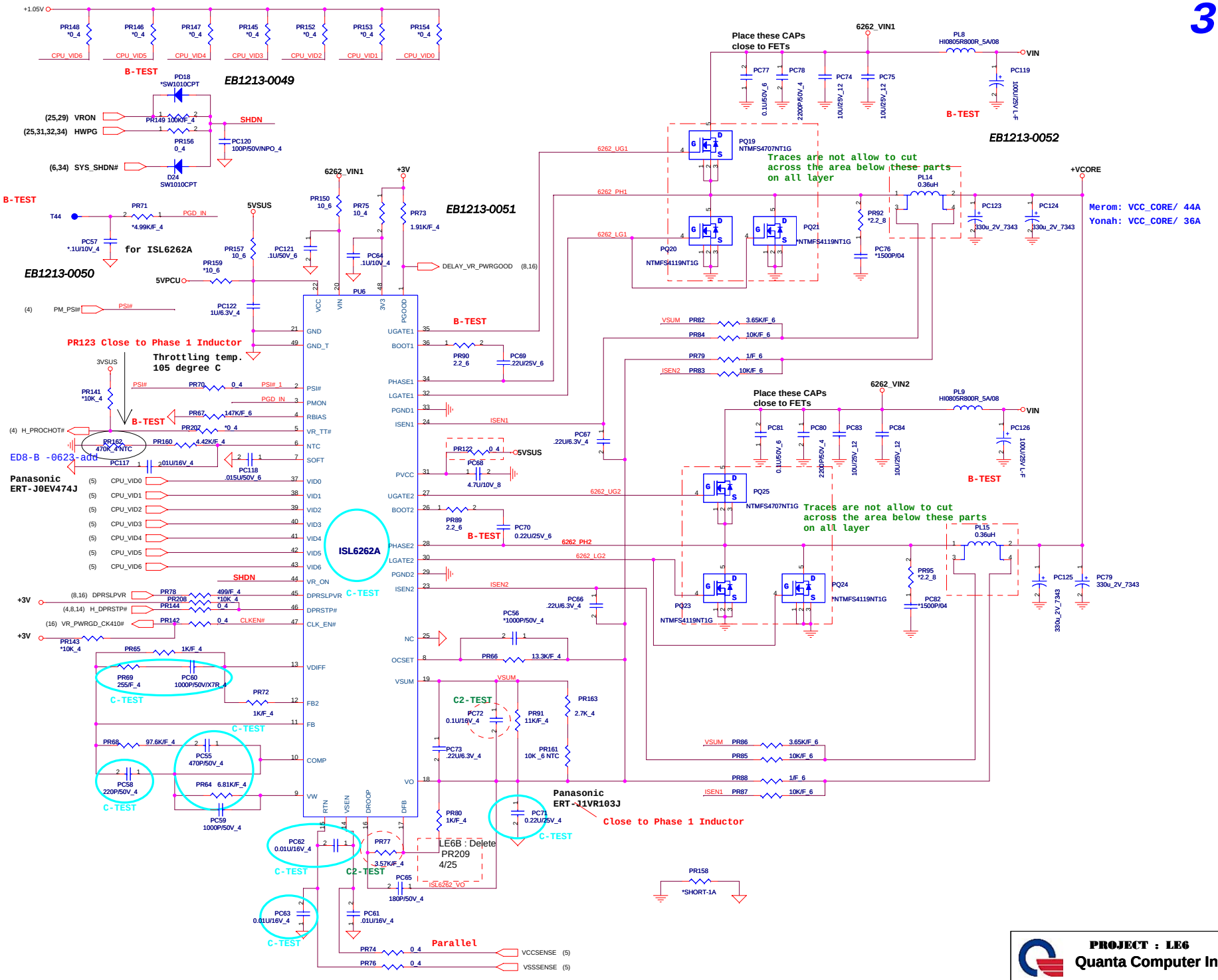

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PROJECT : LE6
Quanta Computer Inc.

Size	Document Number	Rev
Custom	CPU (ISL6266A)	3A

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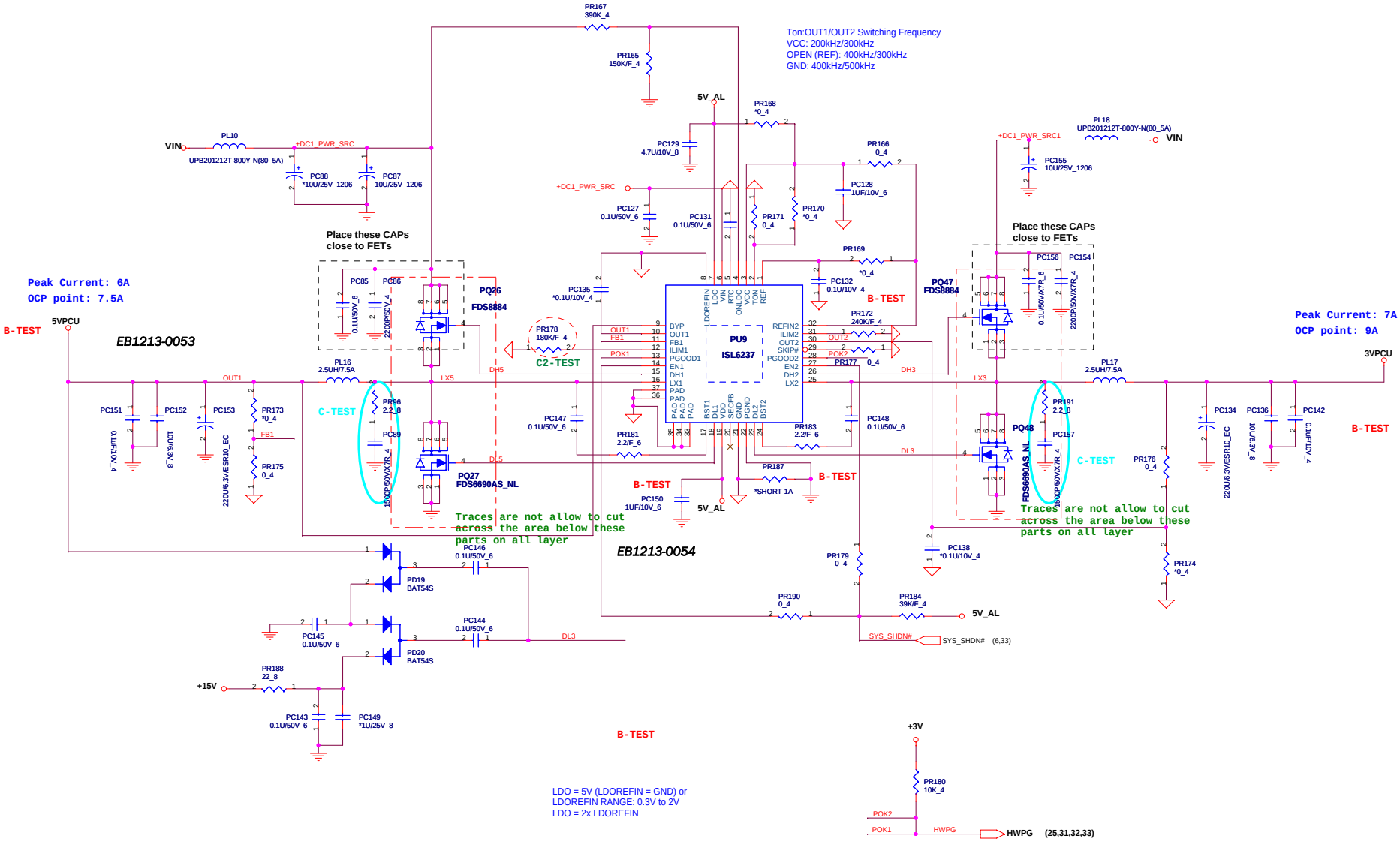
DC/DC 3VPCU/5VPCU/+15V



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Size	Document Number	Rev
Custom	3V/5V (ISL6237)	3A

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