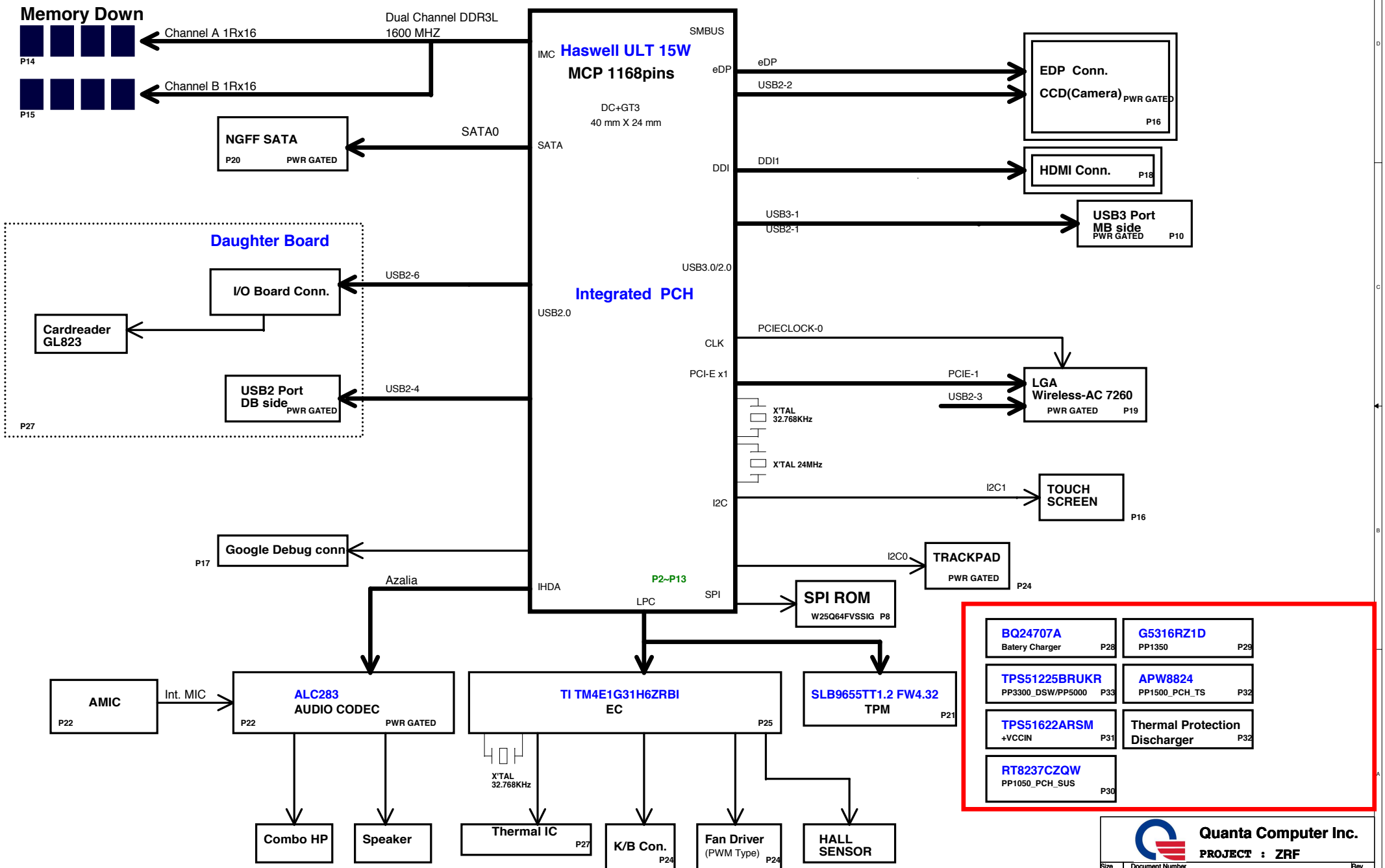
# Melvita (ZRF) SHB ULT SYSTEM BLOCK DIAGRAM

01

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PROJECT : ZRF

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|---|---|---|
| | Block Diagram | A |

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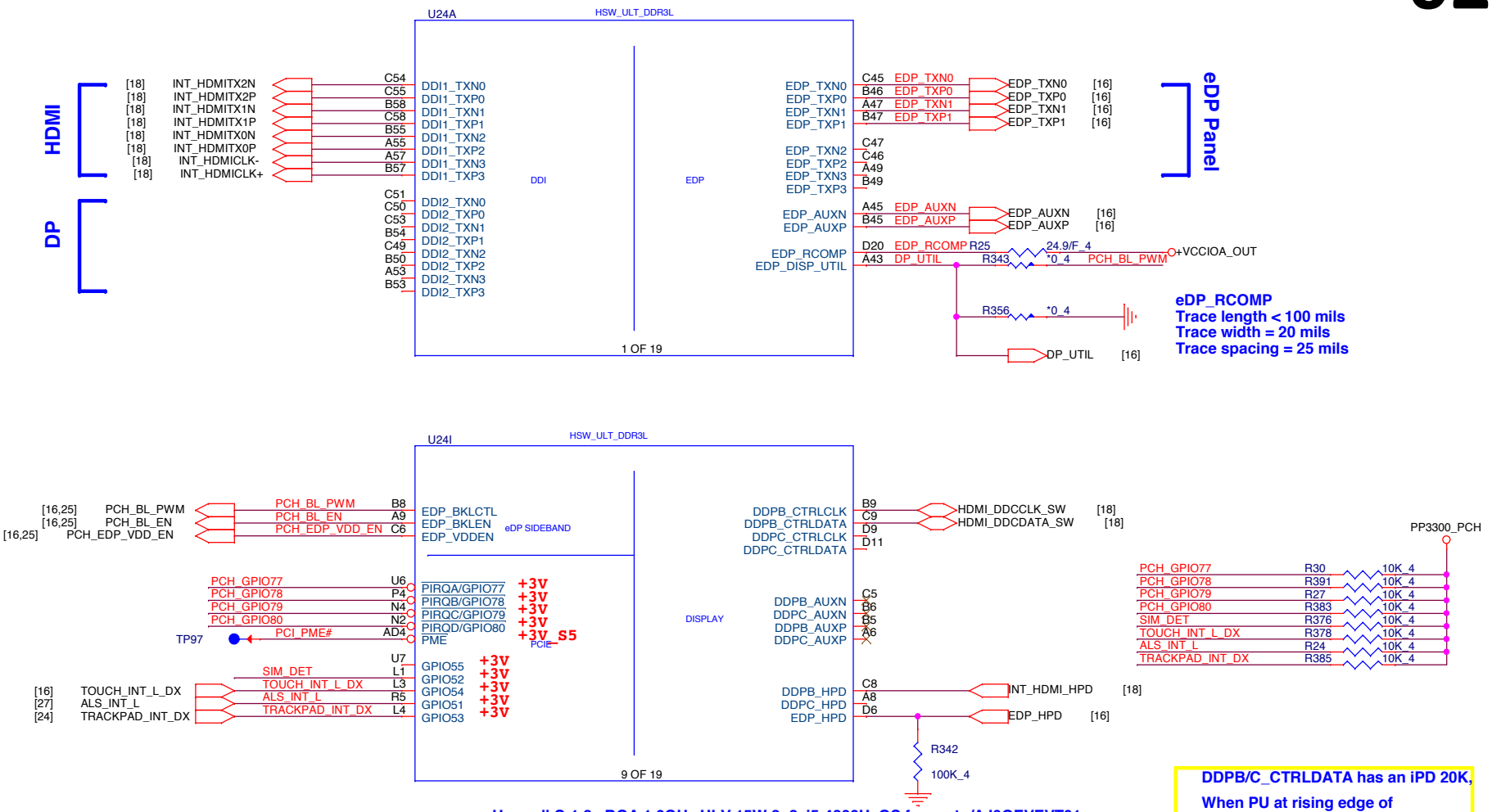
# Haswell ULT (DISPLAY,eDP)

02




Haswell C-1 2c BGA 1.6GHz ULV 15W 2+2 i5-4200U QS for proto/AJ0QEVEVT01

| | | | |
|---|---|---|---|
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# Haswell ULT (DDR3L)

U24C — HSW_ULT_DDR3L — DDR CHANNEL A — 3 OF 19

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| [14] | M_A_DQ<0> | AH63 | SA_DQ0 | SA_CLK#0 | AU37 | M_A_DIM0_CK_DDR0_DN | [14] |
| [14] | M_A_DQ<1> | AH62 | SA_DQ1 | SA_CLK0 | AV37 | M_A_DIM0_CK_DDR0_DP | [14] |
| [14] | M_A_DQ<2> | AK63 | SA_DQ2 | SA_CLK#1 | AW36 | | |
| [14] | M_A_DQ<3> | AK62 | SA_DQ3 | SA_CLK1 | AY36 | | |
| [14] | M_A_DQ<4> | AH61 | SA_DQ4 | | | | |
| [14] | M_A_DQ<5> | AH60 | SA_DQ5 | SA_CKE0 | AW43 | M_A_DIM0_CKE0 | [14] |
| [14] | M_A_DQ<6> | AK61 | SA_DQ6 | SA_CKE1 | AY42 | TP127 | |
| [14] | M_A_DQ<7> | AK60 | SA_DQ7 | SA_CKE2 | AY43 | TP128 | |
| [14] | M_A_DQ<8> | AM63 | SA_DQ8 | SA_CKE3 | | TP129 | |
| [14] | M_A_DQ<9> | AM62 | SA_DQ9 | | | | |
| [14] | M_A_DQ<10> | AP63 | SA_DQ10 | SA_CS#0 | AR32 | M_A_DIM0_CS0_N | [14] |
| [14] | M_A_DQ<11> | AP62 | SA_DQ11 | SA_CS#1 | | TP41 | |
| [14] | M_A_DQ<12> | AM61 | SA_DQ12 | | | | |
| [14] | M_A_DQ<13> | AM60 | SA_DQ13 | SA_ODT0 | AP32 | TP40 | |
| [14] | M_A_DQ<14> | AP61 | SA_DQ14 | | | | |
| [14] | M_A_DQ<15> | AP60 | SA_DQ15 | SA_RAS | AY34 | M_A_RAS_N | [14] |
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| [14] | M_A_DQ<17> | AR58 | SA_DQ17 | SA_CAS | AU34 | M_A_CAS_N | [14] |
| [14] | M_A_DQ<18> | AM57 | SA_DQ18 | | | | |
| [14] | M_A_DQ<19> | AK57 | SA_DQ19 | SA_BA0 | AU35 | M_A_BS0 | [14] |
| [14] | M_A_DQ<20> | AL58 | SA_DQ20 | SA_BA1 | AV35 | M_A_BS1 | [14] |
| [14] | M_A_DQ<21> | AK58 | SA_DQ21 | SA_BA2 | AY41 | M_A_BS2 | [14] |
| [14] | M_A_DQ<22> | AR57 | SA_DQ22 | | | | |
| [14] | M_A_DQ<23> | AN57 | SA_DQ23 | SA_MA0 | AU36 | | |
| [14] | M_A_DQ<24> | AP55 | SA_DQ24 | SA_MA1 | AY37 | M_A_A<0> | [14] |
| [14] | M_A_DQ<25> | AR55 | SA_DQ25 | SA_MA2 | AR38 | M_A_A<1> | [14] |
| [14] | M_A_DQ<26> | AM54 | SA_DQ26 | SA_MA3 | AP36 | M_A_A<2> | [14] |
| [14] | M_A_DQ<27> | AK54 | SA_DQ27 | SA_MA4 | AU39 | M_A_A<3> | [14] |
| [14] | M_A_DQ<28> | AL55 | SA_DQ28 | SA_MA5 | AR36 | M_A_A<4> | [14] |
| [14] | M_A_DQ<29> | AK55 | SA_DQ29 | SA_MA6 | AV40 | M_A_A<5> | [14] |
| [14] | M_A_DQ<30> | AR54 | SA_DQ30 | SA_MA7 | AW39 | M_A_A<6> | [14] |
| [14] | M_A_DQ<31> | AN54 | SA_DQ31 | SA_MA8 | AY39 | M_A_A<7> | [14] |
| [14] | M_A_DQ<32> | AY58 | SA_DQ32 | SA_MA9 | AU40 | M_A_A<8> | [14] |
| [14] | M_A_DQ<33> | AW58 | SA_DQ33 | SA_MA10 | AP35 | M_A_A<9> | [14] |
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| [14] | M_A_DQ<36> | AY58 | SA_DQ36 | SA_MA13 | AR35 | M_A_A<12> | [14] |
| [14] | M_A_DQ<37> | AU58 | SA_DQ37 | SA_MA14 | AV42 | M_A_A<13> | [14] |
| [14] | M_A_DQ<38> | AV56 | SA_DQ38 | SA_MA15 | AU42 | M_A_A<14> | [14] |
| [14] | M_A_DQ<39> | AU56 | SA_DQ39 | | | M_A_A<15> | [14] |
| [14] | M_A_DQ<40> | AY54 | SA_DQ40 | | | | |
| [14] | M_A_DQ<41> | AW54 | SA_DQ41 | SA_DQSN0 | AJ61 | | |
| [14] | M_A_DQ<42> | AY52 | SA_DQ42 | SA_DQSN1 | AN62 | M_A_DQS_DN<0> | [14] |
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| [14] | M_A_DQ<44> | AV54 | SA_DQ44 | SA_DQSN3 | AM55 | M_A_DQS_DN<2> | [14] |
| [14] | M_A_DQ<45> | AU54 | SA_DQ45 | SA_DQSN4 | AV57 | M_A_DQS_DN<3> | [14] |
| [14] | M_A_DQ<46> | AV52 | SA_DQ46 | SA_DQSN5 | AV53 | M_A_DQS_DN<4> | [14] |
| [14] | M_A_DQ<47> | AU52 | SA_DQ47 | SA_DQSN6 | AL43 | M_A_DQS_DN<5> | [14] |
| [14] | M_A_DQ<48> | AK40 | SA_DQ48 | SA_DQSN7 | AL48 | M_A_DQS_DN<6> | [14] |
| [14] | M_A_DQ<49> | AK42 | SA_DQ49 | | | M_A_DQS_DN<7> | [14] |
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| [14] | M_A_DQ<52> | AK45 | SA_DQ52 | SA_DQSP2 | AN58 | M_A_DQS_DP<1> | [14] |
| [14] | M_A_DQ<53> | AK43 | SA_DQ53 | SA_DQSP3 | AN55 | M_A_DQS_DP<2> | [14] |
| [14] | M_A_DQ<54> | AM40 | SA_DQ54 | SA_DQSP4 | AW57 | M_A_DQS_DP<3> | [14] |
| [14] | M_A_DQ<55> | AM42 | SA_DQ55 | SA_DQSP5 | AW53 | M_A_DQS_DP<4> | [14] |
| [14] | M_A_DQ<56> | AM46 | SA_DQ56 | SA_DQSP6 | AL42 | M_A_DQS_DP<5> | [14] |
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| [14] | M_A_DQ<59> | AK49 | SA_DQ59 | | | | |
| [14] | M_A_DQ<60> | AM48 | SA_DQ60 | SM_VREF_CA | AP49 | +VREF_CA_CPU | |
| [14] | M_A_DQ<61> | AK48 | SA_DQ61 | SM_VREF_DQ0 | AR51 | +VREFDQ_SA_M3 | |
| [14] | M_A_DQ<62> | AM51 | SA_DQ62 | SM_VREF_DQ1 | AP51 | +VREFDQ_SB_M3 | |
| [14] | M_A_DQ<63> | AK51 | SA_DQ63 | | | | |

# Haswell Processor (DDR3L)

U24D — HSW_ULT_DDR3L — DDR CHANNEL B — 4 OF 19

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| [15] | M_B_DQ<0> | AY31 | SB_DQ0 | SB_CK#0 | AM38 | M_B_DIM0_CK_DDR0_DN | [15] |
| [15] | M_B_DQ<1> | AW31 | SB_DQ1 | SB_CK0 | AN38 | M_B_DIM0_CK_DDR0_DP | [15] |
| [15] | M_B_DQ<2> | AY29 | SB_DQ2 | SB_CK#1 | AK38 | | |
| [15] | M_B_DQ<3> | AW29 | SB_DQ3 | SB_CK1 | AL38 | | |
| [15] | M_B_DQ<4> | AV31 | SB_DQ4 | | | | |
| [15] | M_B_DQ<5> | AU31 | SB_DQ5 | SB_CKE0 | AY49 | M_B_DIM0_CKE0 | [15] |
| [15] | M_B_DQ<6> | AV29 | SB_DQ6 | SB_CKE1 | AU50 | TP130 | |
| [15] | M_B_DQ<7> | AU29 | SB_DQ7 | SB_CKE2 | AW49 | TP131 | |
| [15] | M_B_DQ<8> | AY27 | SB_DQ8 | SB_CKE3 | AV50 | TP132 | |
| [15] | M_B_DQ<9> | AW27 | SB_DQ9 | | | | |
| [15] | M_B_DQ<10> | AY25 | SB_DQ10 | SB_CS#0 | AM32 | M_B_DIM0_CS0_N | [15] |
| [15] | M_B_DQ<11> | AW25 | SB_DQ11 | SB_CS#1 | AK32 | TP35 | |
| [15] | M_B_DQ<12> | AV27 | SB_DQ12 | | | | |
| [15] | M_B_DQ<13> | AU27 | SB_DQ13 | SB_ODT0 | AL32 | TP31 | |
| [15] | M_B_DQ<14> | AV25 | SB_DQ14 | | | | |
| [15] | M_B_DQ<15> | AU25 | SB_DQ15 | SB_RAS | AM35 | M_B_RAS_N | [15] |
| [15] | M_B_DQ<16> | AM29 | SB_DQ16 | SB_WE | AK35 | M_B_WE_N | [15] |
| [15] | M_B_DQ<17> | AK29 | SB_DQ17 | SB_CAS | AM33 | M_B_CAS_N | [15] |
| [15] | M_B_DQ<18> | AL28 | SB_DQ18 | | | | |
| [15] | M_B_DQ<19> | AK28 | SB_DQ19 | SB_BA0 | AL35 | M_B_BS0 | [15] |
| [15] | M_B_DQ<20> | AR29 | SB_DQ20 | SB_BA1 | AM36 | M_B_BS1 | [15] |
| [15] | M_B_DQ<21> | AN29 | SB_DQ21 | SB_BA2 | AU49 | M_B_BS2 | [15] |
| [15] | M_B_DQ<22> | AR28 | SB_DQ22 | | | | |
| [15] | M_B_DQ<23> | AP28 | SB_DQ23 | SB_MA0 | AP40 | | |
| [15] | M_B_DQ<24> | AN26 | SB_DQ24 | SB_MA1 | AR40 | M_B_A<0> | [15] |
| [15] | M_B_DQ<25> | AR26 | SB_DQ25 | SB_MA2 | AP42 | M_B_A<1> | [15] |
| [15] | M_B_DQ<26> | AR25 | SB_DQ26 | SB_MA3 | AR42 | M_B_A<2> | [15] |
| [15] | M_B_DQ<27> | AP25 | SB_DQ27 | SB_MA4 | AR45 | M_B_A<3> | [15] |
| [15] | M_B_DQ<28> | AK26 | SB_DQ28 | SB_MA5 | AP45 | M_B_A<4> | [15] |
| [15] | M_B_DQ<29> | AM26 | SB_DQ29 | SB_MA6 | AW46 | M_B_A<5> | [15] |
| [15] | M_B_DQ<30> | AK25 | SB_DQ30 | SB_MA7 | AY46 | M_B_A<6> | [15] |
| [15] | M_B_DQ<31> | AL25 | SB_DQ31 | SB_MA8 | AY47 | M_B_A<7> | [15] |
| [15] | M_B_DQ<32> | AY23 | SB_DQ32 | SB_MA9 | AU46 | M_B_A<8> | [15] |
| [15] | M_B_DQ<33> | AW23 | SB_DQ33 | SB_MA10 | AK36 | M_B_A<9> | [15] |
| [15] | M_B_DQ<34> | AY21 | SB_DQ34 | SB_MA11 | AV47 | M_B_A<10> | [15] |
| [15] | M_B_DQ<35> | AW21 | SB_DQ35 | SB_MA12 | AU47 | M_B_A<11> | [15] |
| [15] | M_B_DQ<36> | AV23 | SB_DQ36 | SB_MA13 | AK33 | M_B_A<12> | [15] |
| [15] | M_B_DQ<37> | AU23 | SB_DQ37 | SB_MA14 | AR46 | M_B_A<13> | [15] |
| [15] | M_B_DQ<38> | AV21 | SB_DQ38 | SB_MA15 | AP46 | M_B_A<14> | [15] |
| [15] | M_B_DQ<39> | AU21 | SB_DQ39 | | | M_B_A<15> | [15] |
| [15] | M_B_DQ<40> | AY19 | SB_DQ40 | | | | |
| [15] | M_B_DQ<41> | AW19 | SB_DQ41 | SB_DQSN0 | AW30 | | |
| [15] | M_B_DQ<42> | AY17 | SB_DQ42 | SB_DQSN1 | AV26 | M_B_DQS_DN<0> | [15] |
| [15] | M_B_DQ<43> | AW17 | SB_DQ43 | SB_DQSN2 | AN28 | M_B_DQS_DN<1> | [15] |
| [15] | M_B_DQ<44> | AV19 | SB_DQ44 | SB_DQSN3 | AN25 | M_B_DQS_DN<2> | [15] |
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| [15] | M_B_DQ<46> | AV17 | SB_DQ46 | SB_DQSN5 | AV18 | M_B_DQS_DN<4> | [15] |
| [15] | M_B_DQ<47> | AU17 | SB_DQ47 | SB_DQSN6 | AN21 | M_B_DQS_DN<5> | [15] |
| [15] | M_B_DQ<48> | AR21 | SB_DQ48 | SB_DQSN7 | AN18 | M_B_DQS_DN<6> | [15] |
| [15] | M_B_DQ<49> | AR22 | SB_DQ49 | | | M_B_DQS_DN<7> | [15] |
| [15] | M_B_DQ<50> | AL21 | SB_DQ50 | SB_DQSP0 | AV30 | | |
| [15] | M_B_DQ<51> | AM22 | SB_DQ51 | SB_DQSP1 | AW26 | M_B_DQS_DP<0> | [15] |
| [15] | M_B_DQ<52> | AN22 | SB_DQ52 | SB_DQSP2 | AM28 | M_B_DQS_DP<1> | [15] |
| [15] | M_B_DQ<53> | AP21 | SB_DQ53 | SB_DQSP3 | AM25 | M_B_DQS_DP<2> | [15] |
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| [15] | M_B_DQ<55> | AK22 | SB_DQ55 | SB_DQSP5 | AW18 | M_B_DQS_DP<4> | [15] |
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| [15] | M_B_DQ<60> | AK20 | SB_DQ60 | | | | |
| [15] | M_B_DQ<61> | AM20 | SB_DQ61 | | | | |
| [15] | M_B_DQ<62> | AR18 | SB_DQ62 | | | | |
| [15] | M_B_DQ<63> | AP18 | SB_DQ63 | | | | |

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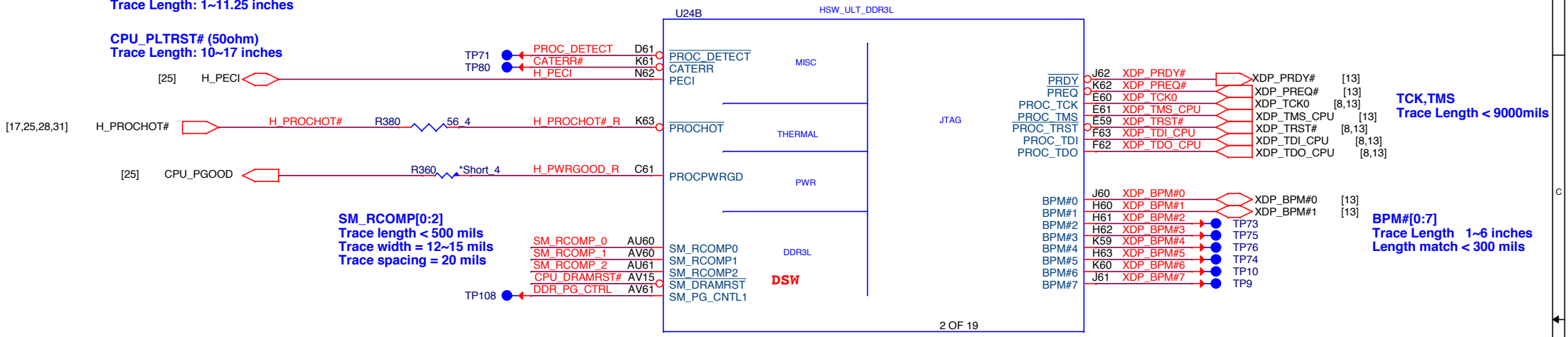
04

# Haswell ULT (SIDEBAND)

**H_PECI (50ohm)**
**Route on microstrip only**
**Spacing >18 mils**
**Trace Length: 0.4~6.125 iches**

**H_PWRGOOD (50ohm)**
**Trace Length: 1~11.25 inches**

**CPU_PLTRST# (50ohm)**
**Trace Length: 10~17 inches**

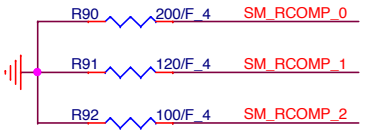



**TCK,TMS**
**Trace Length < 9000mils**

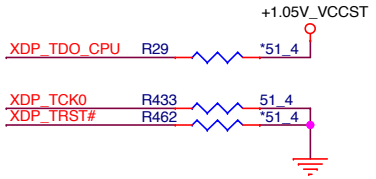
**SM_RCOMP[0:2]**
**Trace length < 500 mils**
**Trace width = 12~15 mils**
**Trace spacing = 20 mils**

**BPM#[0:7]**
**Trace Length 1~6 inches**
**Length match < 300 mils**

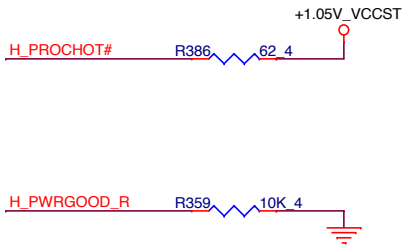
## DRAM COMP



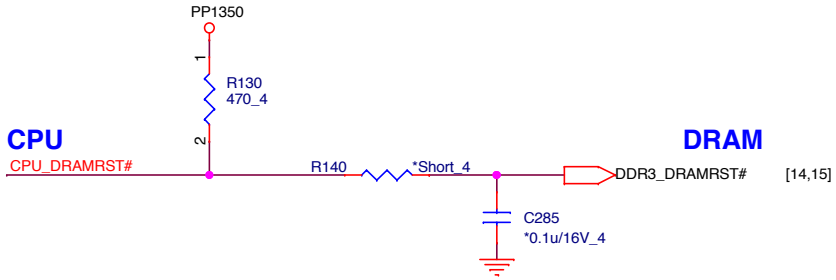

## XDP PU/PD




## PU/PD of CPU




## DRAMRST

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# Haswell ULT (POWER)

05

| VDDQ Output Decoupling Recommendations | | |
|---|---|---|
| 330uFx2 | 7343 | BOT socket side |
| 22uFx11 | 0805 | 5 onTOP, 6 on BOT inside socket cavity |
| 10uFx10 | 0805 | 5 onTOP, 5 on BOT inside socket cavity |

| VCC Output Decoupling Recommendations | | |
|---|---|---|
| 470uFx4 | 7343 | TOP socket side |
| 22uFx8 | 0805 | 4 on TOP, 4 on BOT near socket edge |
| 22uFx11 | 0805 | TOP, inside socket cavity |
| 10uFx11 | 0805 | BOT, inside socket cavity |

## SVID

Layout note: need routing together and ALERT need between CLK and DATA.

Place PU resistor close to CPU

Place PU resistor close to CPU

## VCCST PWRGD

20141205 EOD parts, change PN.

| | |
|---|---|
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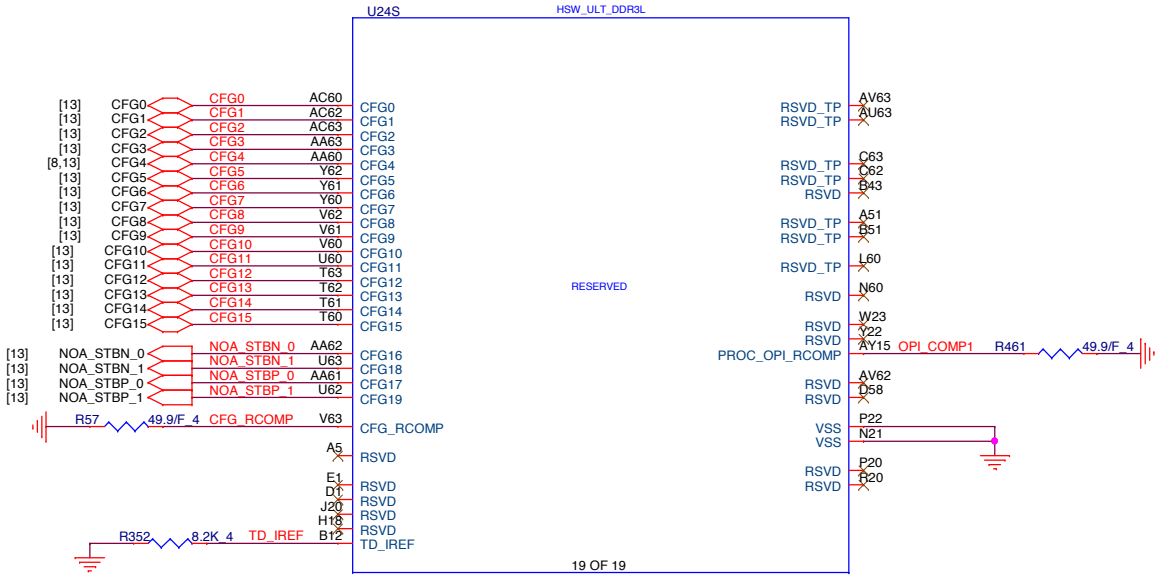
# Haswell ULT (CFG,RSVD)

06




## Processor Strapping

| | 1 | 0 | |
|---|---|---|---|
| CFG0<br>EAR-STALL/NOT STALL RESET SEQUENCE AFTER PCU PLL IS LOCKED | **(DEFAULT) NORMAL OPERATION; NO STALL** | STALL | CFG0 R417 *1K_4 |
| CFG1<br>PCH/ PCH LESS MODE SELECTION | **(DEFAULT) NORMAL OPERATION** | PCH-LESS MODE | CFG1 R423 *1K_4 |
| CFG3<br>PHYSICAL_DEBUG_ENABLED (DFX PRIVACY) | **DISABLED<br>NO PHYSICAL DISPLAY PORT ATTACHED TO<br>EMBEDDED DISPLAY PORT** | ENABLED<br>AN EXTERNAL DISPLAY PORT DEVICE IS CONNECTED<br>TO THE EMBEDDED DISPLAY PORT | CFG3 R409 *1K_4 |
| CFG 8<br>ALLOW THE USE OF NOA ON LOCKED UNITS | **DISABLED(DEFAULT); IN THIS CASE, NOA WILL BE DISABLED IN LOCKED UNITS AND ENABLED IN UN-LOCKED UNITS** | ENABLED; NOA WILL BE AVAILABLE REGARDLESS OF THE LOCKING OF THE UNIT | CFG8 R403 *1K_4 |
| CFG9<br>NO SVID PROTOCOL CAPABLE VR CONNECTED | **VRS SUPPORTING SVID PROTOCOL ARE PRESENT** | NO VR SUPPORTING SVID IS PRESENT. THE CHIP WILL NOT GENERATE (OR RESPOND TO) SVID ACTIVITY | CFG9 R394 *1K_4 |
| CFG10<br>SAFE MODE BOOT | **POWER FEATURES ACTIVATED DURING RESET** | POWER FEATURES (ESPECIALLY CLOCK GATINE ARE NOT ACTIVATED | CFG10 R56 *1K_4 |
| | | | |

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PROJECT : ZRF

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# Haswell ULT PCH (PM)

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U24H — HSW_ULT_DDR3L — SYSTEM POWER MANAGEMENT — 8 OF 19

[25] PCH_SUSACK_L — R428 *0_4 — SUSACK#_R — AK2 SUSACK
[13,17] SYS_RESET# — SYS_RESET# — AC3 SYS_RESET
[5,13,25] SYS_PWROK — SYS_PWROK — C265 *1u/6.3V_4 — R421 *Short_4 — SYS_PWROK_R — AG2 SYS_PWROK
PCH_PWROK — R482 *Short_4 — PCH_PWROK_R — AY7 PCH_PWROK
APWROK_R — AB5 APWROK
PCI_PLTRST# — AG7 PLTRST — +3V_S5

[25] PCH_RSMRST_L — R478 *Short_4 — PCH_RSMRST# — AW6 RSMRST
[25] PCH_SUSWARN_L — R453 *0_4 — PCH_SUSPWRACK — AV4 SUSWARN/SUSPWRDNACK/GPIO30 — DSW — +3V_S5
[25] PCH_PWRBTN_L — R147 *Short_4 — PCH_PWRBTN# — AL7 PWRBTN — DSW
[28] ACPRESENT — R61 *Short_4 — PCH_ACPRESENT — AJ8 ACPRESENT/GPIO31 — DSW
PCH_BATLOW# — AN4 BATLOW/GPIO72 — +3V_S5
[13,25] PCH_SLP_S0_L — R415 *Short_4 — PCH_SLP_S0#_R — AF3 SLP_S0 — DSW
TP37 — AM5 SLP_WLAN/GPIO29

PCH_SUSPWRACK — R427 0_4 — SUSACK#_R

**4/22 modify, default skip EC control**

DSWVRMEN — DSW
DPWROK — DSW
WAKE — DSW

AW7 DSWVREN — Deep Sx — DSWVREN [8]
AV5 DPWROK_R — R477 *Short_4 — PCH_DPWROK [25]
AJ5 PCIE_PCH_WAKE# — R74 *Short_4 — PCH_WAKE_L [25]

CLKRUN/GPIO32 — +3V
SUS_STAT/GPIO61 — +3V_S5
SUSCLK/GPIO62 — +3V_S5
SLP_S5/GPIO63 — DSW

V5 CLKRUN# — R38 *Short_4 — LPC_CLKRUN_L — LPC_CLKRUN_L [25]
AG4 PCH_SUS_STAT — TP27
AE6 PCH_SUSCLK — PCH_SUSCLK [19]
AP5 PCH_SLP_S5_L — PCH_SLP_S5_L [13,25,29,34]

SLP_S4 — DSW — AJ6 PCH_SLP_S4_L — PCH_SLP_S4_L [13]
SLP_S3 — DSW — AT4 PCH_SLP_S3_L — PCH_SLP_S3_L [13,25,29,30,32,34]
SLP_A — DSW — AL5 PCH_SLP_A_L — PCH_SLP_A_L [13]
SLP_SUS — DSW — AP4 PCH_SLP_SUS_L — PCH_SLP_SUS_L [25,34]
SLP_LAN — DSW — AJ7 PCH_SLP_LAN# — TP38

## PCH PM PU/PD

PP3300_PCH
CLKRUN# — R37 8.2K_4
SYS_RESET# — R406 10K_4

PCH_RSMRST# — R479 10K_4
SYS_PWROK — R80 *10K_4
DPWROK_R — R473 100K/F_4

PP3300_PCH_SUS
PCH_SUSPWRACK — R454 10K_4
SYS_PWROK — R426 *1K_4

PP3300_DSW
PCH_ACPRESENT — R62 10K_4
PCH_BATLOW# — R444 8.2K_4
PCIE_PCH_WAKE# — R75 10K_4
PCH_PWRBTN# — R151 *10K_4

## PCH PWROK

[5,25] PCH_PWROK — PCH_PWROK — R483 *Short_4 — PCH_PWROK_R
R487 100K_4
PCH_RSMRST_L — R474 *0_4 — DPWROK_R
Non Deep Sx

## PLTRST# Buffer

PCI_PLTRST# — R152 *Short_4 — PLTRST#
PP3300_PCH
C94 *0.1u/16V_4
U6 *TC7SH08FU
PCI_PLTRST# — PLTRST# [13,19,21,25]
R155 100K_4

**4/22 modify, default is bypass PLTRST#**

Quanta Computer Inc.
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| | PCH 1/6 (PM) | A |
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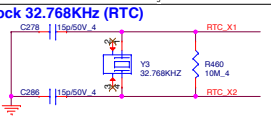
# Haswell ULT PCH (RTC/HDA/SATA/SPI)

# Haswell ULT PCH(LPC,SPI,SMBUS,C-LINK,THERMAL)

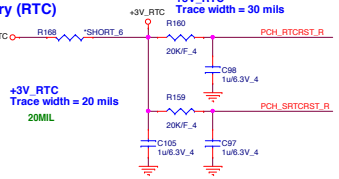
**08**

## RTC Clock 32.768KHz (RTC)

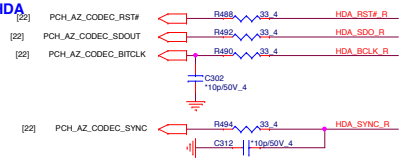



## RTC Circuitry (RTC)

+3V_RTC
Trace width = 30 mils



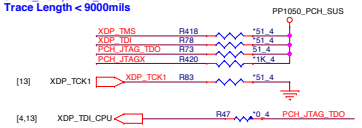

## HDA



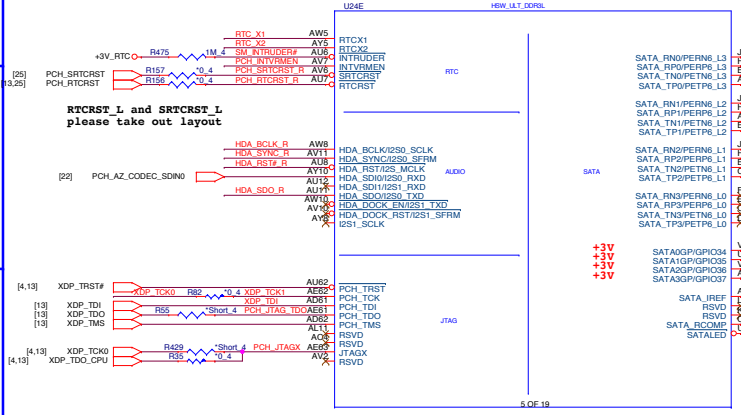

## PCH JTAG

JTAG_TCK,JTAG_TMS
Trace Length < 9000mils

MP remove(Intel)

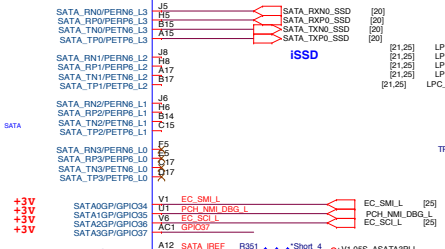


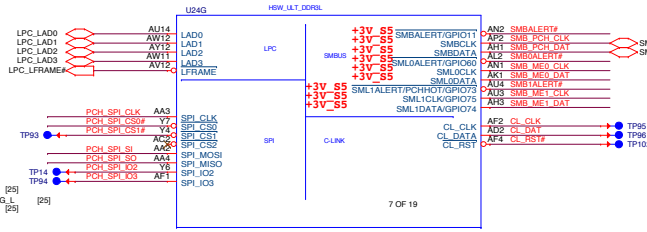

## Haswell ULT PCH (RTC/HDA/SATA/SPI)




**RTCRST_L and SRTCRST_L please take out layout**

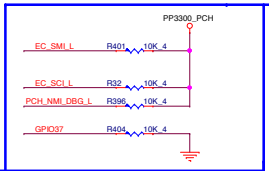
**SATA_RCOMP**
**Impedance = 50 ohm**
**Trace length < 500 mils**
**Trace spacing = 15 mils**



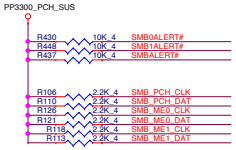




## LVDS Bridge



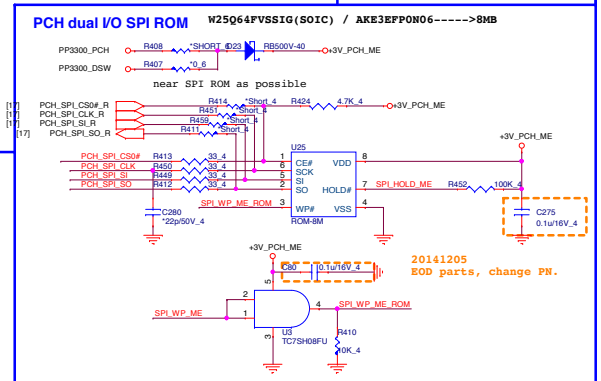




## SMBus

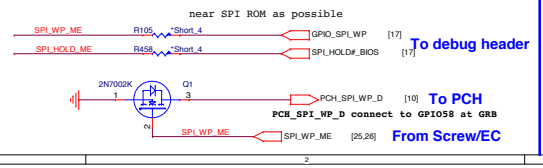



## PCH dual I/O SPI ROM

W25Q64FVSSIG(SOIC) / AKE3EFP0N06------>8MB




20141205
EOD parts, change PN.




## ULT Strapping Table

**Note: R493 need stuff on MP.**

| Pin Name | Strap description | Sampled | Configuration | note |
|---|---|---|---|---|
| GPIO81(SPKR) | No reboot on TCO Timer expiration | PWROK | 0 = Default enable (iPD 20K)<br>1 =Disable No-Reboot mode | PP3300_PCH R400 *1K_4 SPKR SPKR [10,22] |
| HDA_SDO | Flash Descriptor Security Override / Intel ME Debug Mode | PWROK | 0 = Default can program ME (iPD 20K)<br>1 =can't program ME | HDA_SDO_R R493 *0_4 PCH_HDA_SDO [25] |
| INTVRMEN | Integrated 1.05V VRM enable | ALWAYS | 1=Should be always pull-up | +3V_RTC R484 330K_4 PCH_INTVRMEN R485 *330K_4 |
| GPIO66 | Top-Block Swap override | | 0 = Default disable (iPD 20K)<br>1 = Enable TBS function | [10] GPIO66 PP3300_PCH R330 *1K_4 GPIO66 R340 *1K_4 |
| GPIO86 | Boot BIOS Strap Bit | | 0 = Default SPI (iPD 20K)<br>1 =LPC | [10] GPIO86 PP3300_PCH R1 *1K_4 GPIO86 R7 *1K_4 |
| GPIO15 | TLS(Transport layer security) | | 0 = Default enable w/o confidentiality(iPD 20K)<br>1 =Default enable with confidentiality | [10] GPIO15 PP3300_PCH_SUS R50 *8.2K_4 GPIO15 R58 *1K_4 x86 stuff |
| CFG4 | DP presence strap | | 0 = Enable an external display port is connected to the eDP<br>1 =disable | [6,13] CFG4 CFG4 R64 1K_4 |
| DSWVREN | Deep Sx well on die VR enable | | 1=Should be always pull-up | [7] DSWVREN +3V_RTC R476 330K_4 DSWVREN R472 *330K_4 |

**Quanta Computer Inc.**

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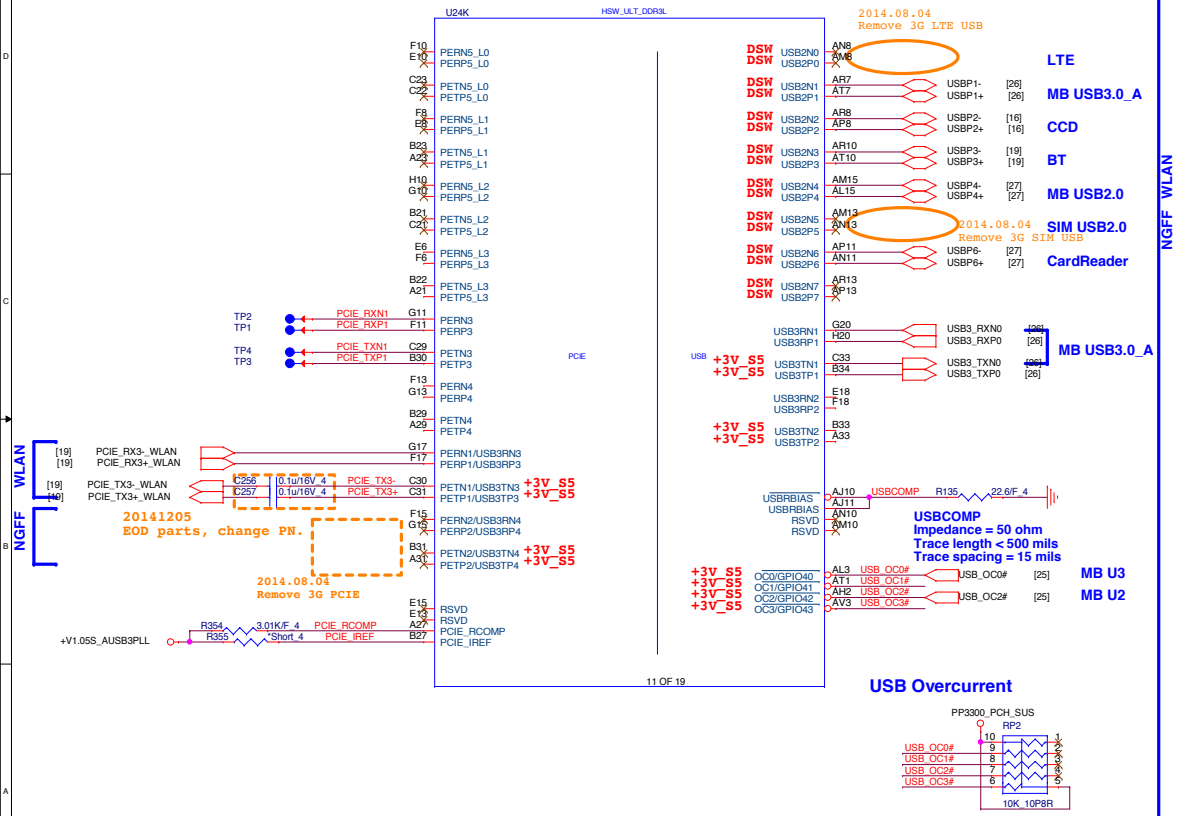
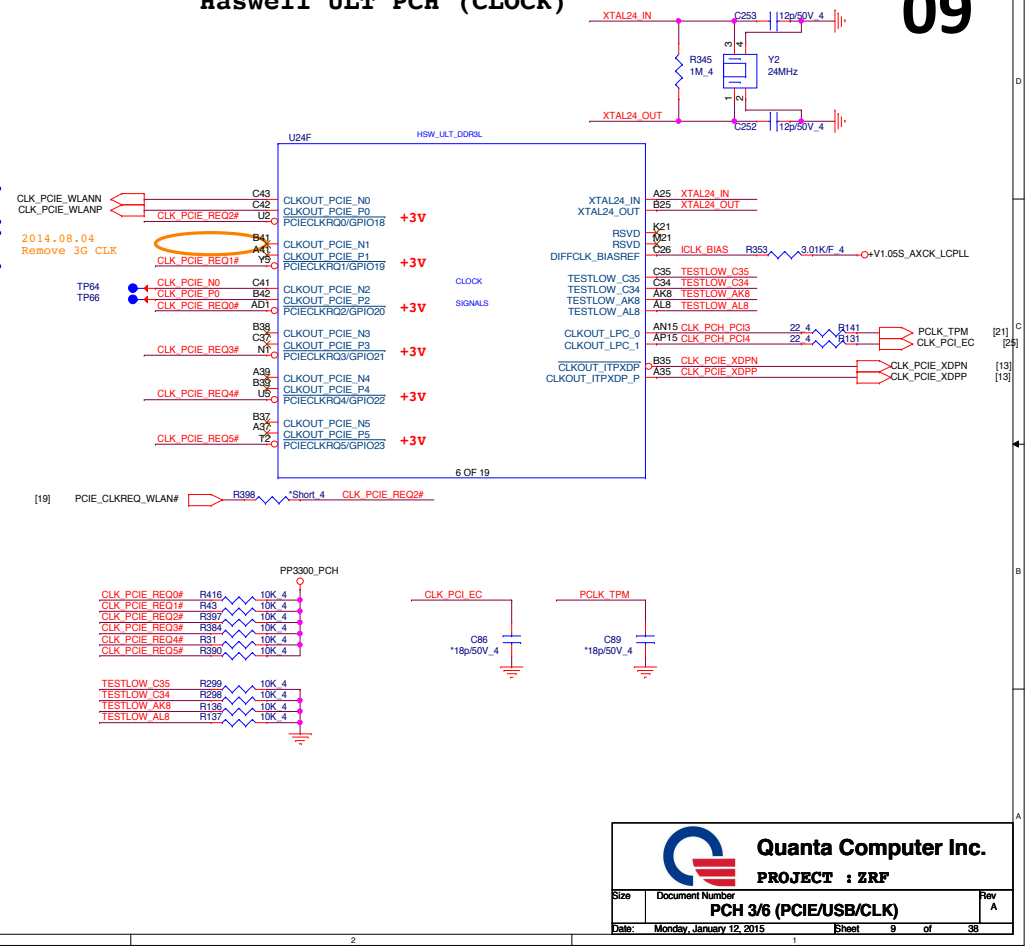
# Haswell ULT PCH (PCIE,USB3.0,USB2.0)




# Haswell ULT PCH (CLOCK)

09




| | | |
|---|---|---|
| Quanta Computer Inc. | | |
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# Haswell ULT PCH (GPIO,CPU/MISC,NCTF)



U24J — HSW_ULT_DDR3L — 10 OF 19

[24] TRACKPAD_INT_L
[8] GPIO15
TP19
TP20
LTE_DISABLE_L need PU to +3V_LTE
TP28
[8] PCH_SPI_WP_D
20140807 Remove 3G, GPIO pull high.
[11] MODPHY_EN
[24] EC_IN_RW
[16] TOUCH_INT_L
[22] PP5000_CODEC_EN
[19] WLAN_DISABLE_L
R88 *Short_4
[20] DEVSLP0
[8,22] SPKR

| | | | |
|---|---|---|---|
| PCH_GPIO76 | P1 | BMBUSY/GPIO76 | +3V |
| LTE_WAKE_L_Q | AU2 | GPIO8 | +3V_S5 |
| TRACKPAD_INT_L | AM7 | LAN_PHY_PWR_CTRL/GPIO12 | DSW |
| | AD6 | GPIO15 | +3V_S5 |
| PCH_SSD_12_EN | Y1 | GPIO16 | +3V |
| PCH_SSD_18_EN | T3 | GPIO17 | +3V |
| GPIO24 | AD5 | GPIO24 | +3V_S5 |
| WK_GPIO27 | AN5 | GPIO27 | DSW |
| GPIO28 | AD7 | GPIO28 | +3V_S5 |
| ODD_PRSNT# | AN3 | GPIO26 | +3V_S5 |
| GPIO56 | AG6 | GPIO56 | +3V_S5 |
| PP3300_CCD_EN | AP1 | GPIO57 | +3V_S5 |
| PCH_SPI_WP_D | AL4 | GPIO58 | +3V_S5 |
| LTE_DISABLE_L | AT5 | GPIO59 | +3V_S5 |
| PP3300_SSD_EN | AK4 | GPIO44 | +3V_S5 |
| RAM_ID2 | AB6 | GPIO47 | +3V_S5 |
| TPM_LP_EN_L | U4 | GPIO48 | +3V |
| PP3300_SSD_IO_EN | Y3 | GPIO49 | +3V |
| GPIO50 | P3 | GPIO50 | +3V |
| MODPHY_EN | Y2 | HSIOPC/GPIO71 | +3V |
| RAM_ID0 | AT3 | GPIO13 | +3V_S5 |
| GPIO14 | AH4 | GPIO14 | +3V_S5 |
| TOUCH_INT_L | AM4 | GPIO25 | DSW |
| | AG5 | GPIO45 | +3V_S5 |
| | AG3 | GPIO46 | +3V_S5 |
| RAM_ID1 | AM3 | GPIO9 | +3V_S5 |
| WLAN_WAKE_L_Q | AM2 | GPIO10 | +3V_S5 |
| DEVSLP0 | P2 | DEVSLP0/GPIO33 | +3V |
| GPIO70 | C4 | SDIO_POWER_EN/GPIO70 | +3V |
| GPIO38 | L2 | DEVSLP1/GPIO38 | +3V |
| GPIO39 | N5 | DEVSLP2/GPIO39 | +3V |
| | V2 | SPKR/GPIO81 | +3V |

CPU/MISC: THRMTRIP, RCIN/GPIO82, SERIRQ, PCH_OPI_RCOMP, RSVD, RSVD

| | | | |
|---|---|---|---|
| D60 | THRMTRIP# | | |
| V4 | EC_RCIN_L | EC_RCIN_L | [25] |
| T4 | IRQ_SERIRQ | IRQ_SERIRQ | [21,25] |
| AW15 | OPI_COMP2 | R463 49.9/F_4 | |
| AF20 | | | |
| AB21 | | | |

GPIO:

| | | | |
|---|---|---|---|
| R6 | GPIO83 | GSPI0_CS/GPIO83 | +3V |
| L6 | GPIO84 | GSPI0_CLK/GPIO84 | +3V |
| N6 | GPIO85 | GSPI0_MISO/GPIO85 | +3V |
| L8 | GPIO86 | GSPI0_MOSI/GPIO86 | +3V |
| R7 | GPIO87 | GSPI1_CS/GPIO87 | +3V |
| L5 | GPIO88 | GSPI1_CLK/GPIO88 | +3V |
| N7 | GPIO89 | GSPI1_MISO/GPIO89 | +3V |
| K2 | GPIO90 | GSPI1_MOSI/GPIO90 | +3V |
| J1 | GPIO91 | UART0_RXD/GPIO91 | +3V |
| K3 | GPIO92 | UART0_TXD/GPIO92 | +3V |
| J2 | GPIO93 | UART0_RTS/GPIO93 | +3V |
| G1 | GPIO94 | UART0_CTS/GPIO94 | +3V |
| K4 | GPIO0 | UART1_RXD/GPIO0 | +3V |
| G2 | GPIO1 | UART1_TXD/GPIO1 | +3V |
| J3 | GPIO2 | UART1_RST/GPIO2 | +3V |
| J4 | GPIO3 | UART1_CTS/GPIO3 | +3V |
| F2 | I2C0_SDA_GPIO4 | I2C0_SDA/GPIO4 | +3V |
| F3 | I2C0_SCL_GPIO5 | I2C0_SCL/GPIO5 | +3V |
| G4 | I2C1_SDA_GPIO6 | I2C1_SDA/GPIO6 | +3V |
| F1 | I2C1_SCL_GPIO7 | I2C1_SCL/GPIO7 | +3V |
| E3 | GPIO64 | SDIO_CLK/GPIO64 | +3V |
| F4 | GPIO65 | SDIO_CMD/GPIO65 | +3V |
| D3 | GPIO66 | SDIO_D0/GPIO66 | +3V |
| E4 | GPIO67 | SDIO_D1/GPIO67 | +3V |
| C3 | GPIO68 | SDIO_D2/GPIO68 | +3V |
| E2 | GPIO69 | SDIO_D3/GPIO69 | +3V |

GPIO86 [8] **strapping**

I2C0_SDA_GPIO4 [24]
I2C0_SCL_GPIO5 [24] **TRACKPAD**
I2C1_SDA_GPIO6 [16,27]
I2C1_SCL_GPIO7 [16,27] **TOUCHSCREEN / ALS**

GPIO66 [8] **strapping**

## PCH GPIO PU/PD

PP3300_PCH

useless GPIO:

| | | |
|---|---|---|
| EC_RCIN_L | R44 | 10K_4 |
| IRQ_SERIRQ | R36 | 10K_4 |
| PCH_SSD_12_EN | R399 | *10K_4 |
| PCH_SSD_18_EN | R33 | *10K_4 |
| DEVSLP0 | R382 | 10K_4 |
| PCH_GPIO76 | R393 | 10K_4 |
| ODD_PRSNT# | R440 | 10K_4 |
| TPM_LP_EN_L | R402 | 10K_4 |
| PP3300_SSD_IO_EN | R405 | *10K_4 |
| GPIO50 | R392 | 10K_4 |
| GPIO70 | R348 | 10K_4 |
| GPIO38 | R375 | 10K_4 |
| GPIO39 | R6 | 10K_4 |

GSP:

| | | |
|---|---|---|
| GPIO83 | R28 | *10K_4 |
| GPIO84 | R8 | *10K_4 |
| GPIO85 | R5 | *10K_4 |
| GPIO87 | R20 | *10K_4 |
| GPIO88 | R2 | *10K_4 |
| GPIO89 | R4 | *10K_4 |
| GPIO90 | R377 | *10K_4 |
| GPIO91 | R364 | *10K_4 |

UART:

| | | |
|---|---|---|
| GPIO92 | R369 | *10K_4 |
| GPIO93 | R365 | *10K_4 |
| GPIO94 | R363 | *10K_4 |
| GPIO0 | R3 | *10K_4 |
| GPIO1 | R362 | *10K_4 |
| GPIO2 | R366 | *10K_4 |
| GPIO3 | R370 | *10K_4 |

SDIO:

| | | |
|---|---|---|
| GPIO64 | R329 | *10K_4 |
| GPIO65 | R349 | *10K_4 |
| GPIO67 | R335 | *10K_4 |
| GPIO68 | R341 | *10K_4 |
| GPIO69 | R339 | *10K_4 |

I2C:

| | | |
|---|---|---|
| I2C0_SDA_GPIO4 | R333 | 4.7K_4 |
| I2C0_SCL_GPIO5 | R334 | 4.7K_4 |
| I2C1_SDA_GPIO6 | R331 | 4.7K_4 |
| I2C1_SCL_GPIO7 | R332 | 4.7K_4 |

PP3300_DSW

WK_GPIO27 — R96 10K_4, R79 *10K_4

**GPIO27 : If not used then use 8.2-kΩ to 10-kΩ pull-down to GND.**

PP3300_PCH_SUS

| | | |
|---|---|---|
| GPIO28 | R49 | 10K_4 |
| PP3300_CCD_EN | R16 | *10K_4 |
| PP3300_SSD_EN | R575 | *10K_4 |
| LTE_DISABLE_L | R629 | 10K_4 |
| PP3300_CCD_EN | R15 | 100K_4 |
| PP3300_SSD_EN | R570 | 100K_4 |

PP3300_PCH_SUS

R146 10K_4 LTE_WAKE_L_Q
R145 10K_4 WLAN_WAKE_L_Q

PP3300_PCH / PP3300_PCH_SUS

G Path: R97 0_4; R89 10K_4 PCH_SPI_WP_D; R81 10K_4 GPIO14
I Path: R101 *0_4

PP3300_DSW / PP3300_PCH_SUS

I Path: R150 *0_4; R143 10K_4 TRACKPAD_INT_L; R139 10K_4 TOUCH_INT_L
G Path: R144 0_4

## RAM ID

PP3300_PCH_SUS

R39 10K_4 RAM_ID2 — R45 *10K_4
R434 10K_4 RAM_ID1 — R435 *10K_4
R446 10K_4 RAM_ID0 — R447 *10K_4

| Vender | RAM_ID ID2 | ID1 | ID0 | Q PN | Mfr. PN | Freq. |
|---|---|---|---|---|---|---|
| Micron(4G) | 0 | 0 | 0 | AKD5JGSTL10 | MT41K256M16HA-125:E | 1600MHz |
| Hynix(4G) | 0 | 0 | 1 | AKD5JGETW04 | H5TC4G63AFR-PBA | 1600MHz |
| Hynix(4G) | 0 | 1 | 0 | AKD5PGSTW13 | H5TC4G63AFR-PBA(25nm) | 1600MHz |
| Micron(2G) | 1 | 0 | 0 | AKD5JGSTL10 | MT41K256M16HA-125:E | 1600MHz |
| Hynix(2G) | 1 | 0 | 1 | AKD5JGETW04 | H5TC4G63AFR-PBA | 1600MHz |
| Hynix(2G) | 1 | 1 | 0 | AKD5PGSTW13 | H5TC4G63AFR-PBA(25nm) | 1600MHz |

## CPU thermal trip

+1.05V_VCCST
IMVP_PWRGD_3V — 2 — Q11 FDV301N
+1.05V_VCCST — R313 1K_4 — R314 1K_4
THRMTRIP# — Q12 MMBT3904-7-F — SYS_SHDN# [25,32,33]

[19,25,34] PP3300_WLAN_EN
WLAN_WAKE_L_Q — Q23 2N7002K — WLAN_WAKE_L [19]

2014.8.07 Remove NGFF 3G SCH
two channel MOS change to single channel

[5,31] VCORE_PGOOD

U23 74AUP1G07GW: NC, A, GND, VCC, Y
+1.05V_VCCST — C249 0.1u/16V_4 — PP3300_PCH — R344 10K_4 — IMVP_PWRGD_3V [25]

20141205 EOD parts, change PN.

Quanta Computer Inc.
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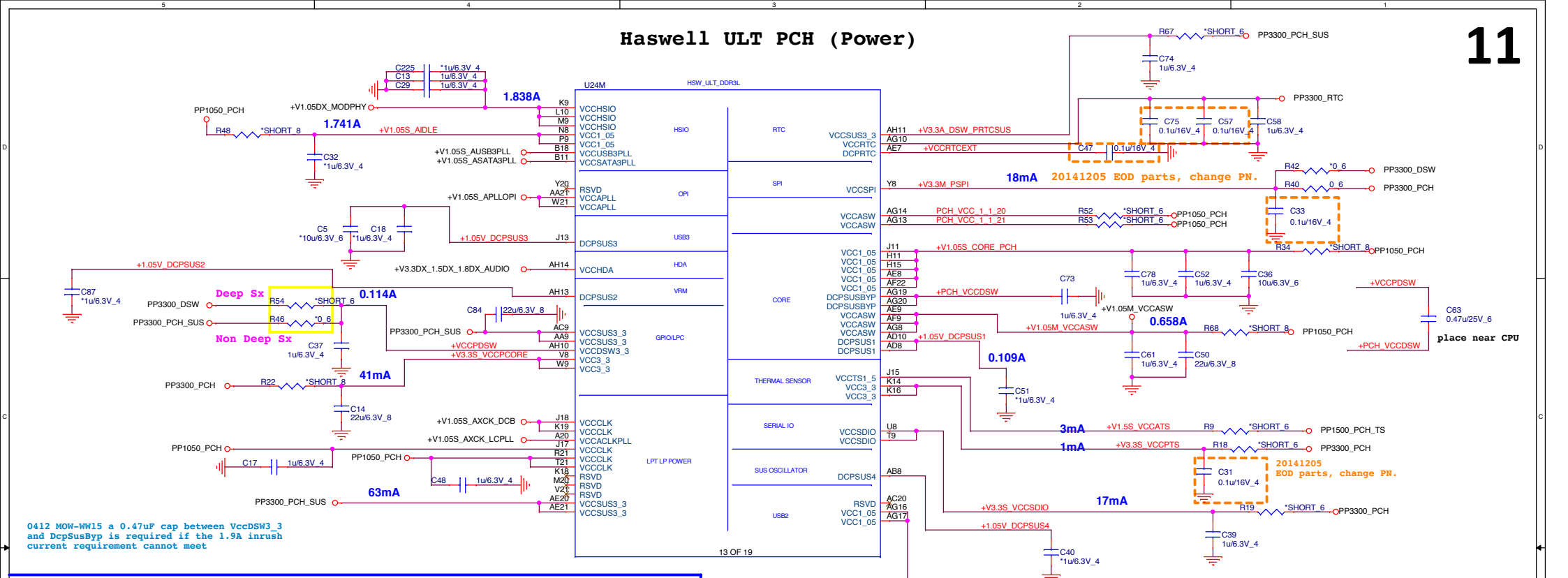
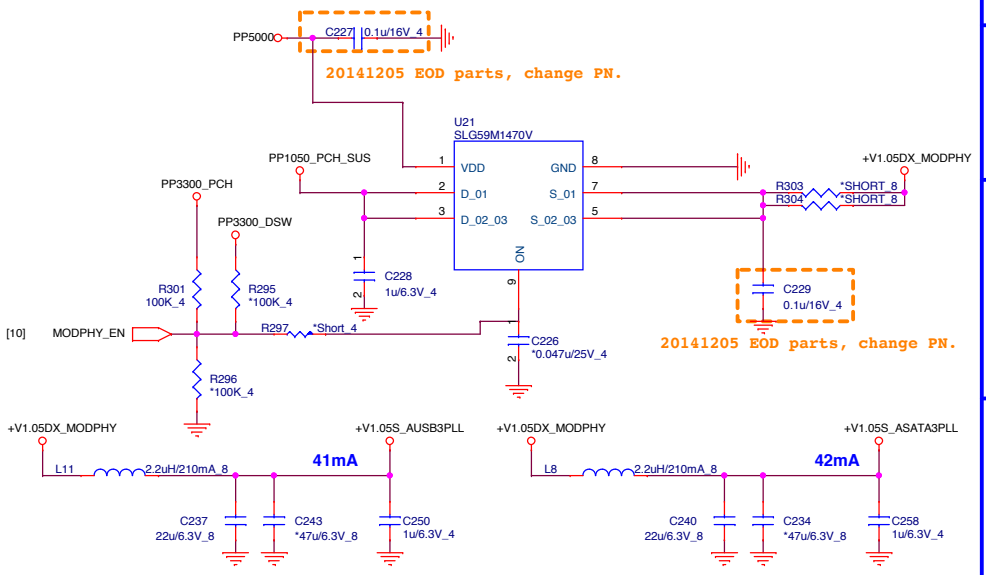
# Haswell ULT PCH (Power)



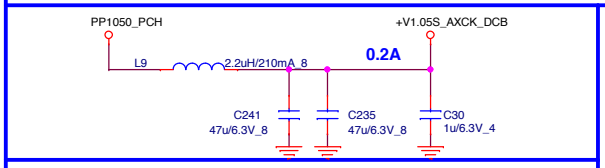



## PCH VCCHSIO Power

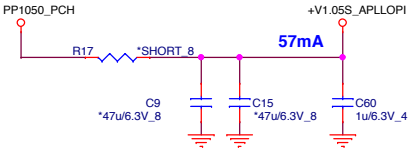




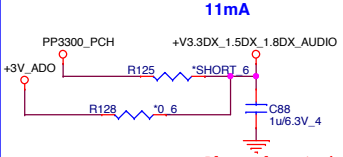


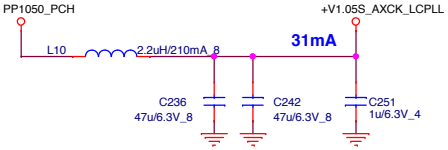



## VCCAPLL power



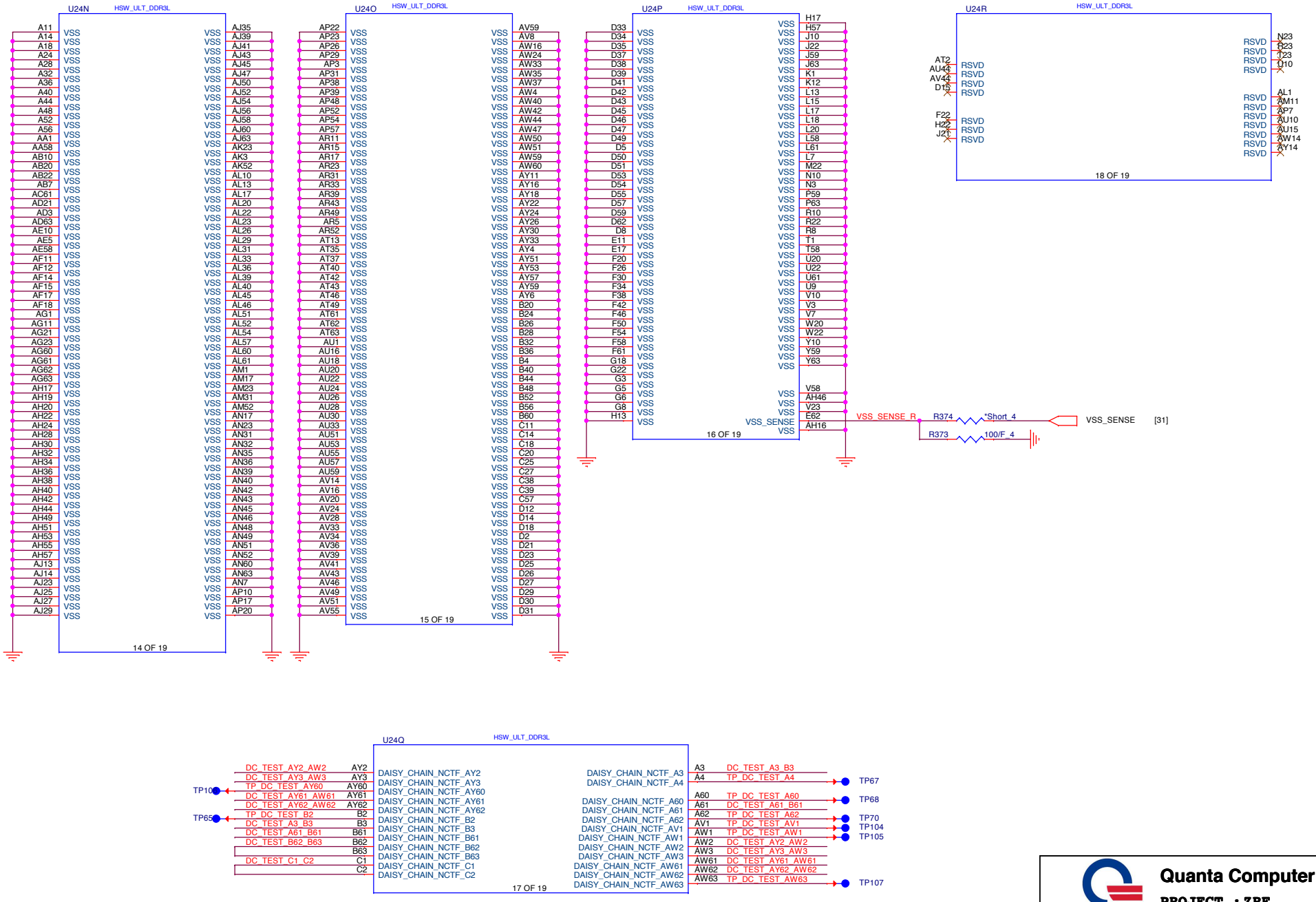

## PCH HDA Power



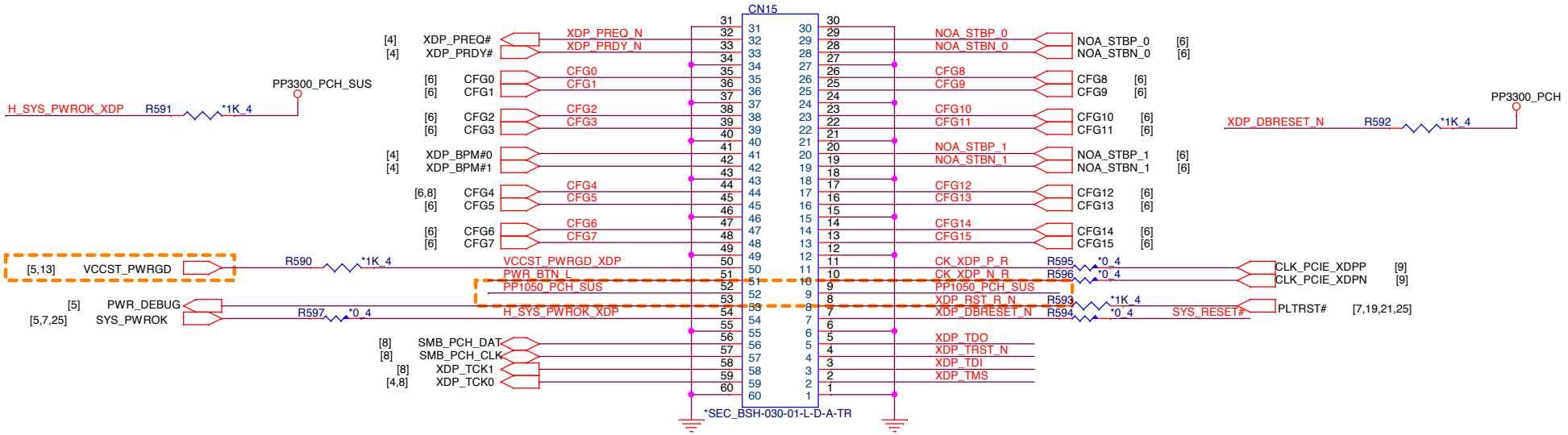




| | | |
|---|---|---|
| Quanta Computer Inc. | | |
| PROJECT : ZRF | | |
| Size | Document Number: PCH 5/6 (POWER) | Rev: A |
| Date: Monday, January 12, 2015 | Sheet 11 of 38 | |

# Haswell ULT (GND)

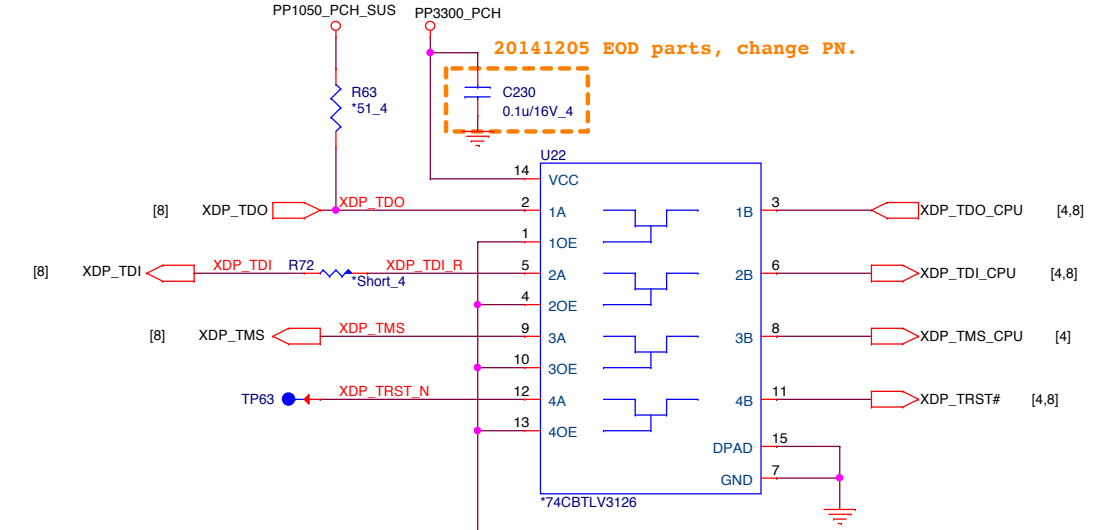



| | | |
|---|---|---|
| Quanta Computer Inc. | | |
| PROJECT : ZRF | | |
| Size | Document Number: PCH 6/6 (GND) | Rev: A |
| Date: Monday, January 12, 2015 | Sheet 12 of 38 | |

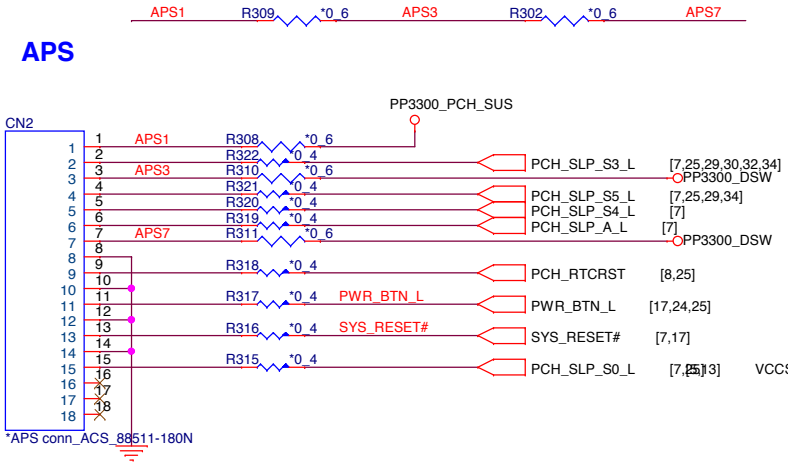


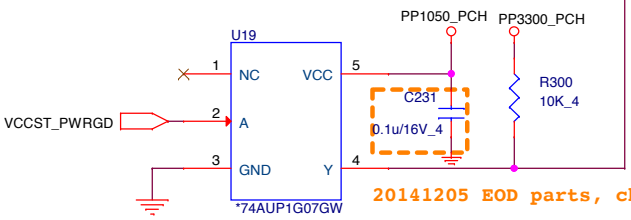

20141021 Intel require modify ITP CN15 P9/P51 add PP1050_PCH_SUS, P50 PP1050_PGOOD change to VCCST_PWRGD.

20141205 EOD parts, change PN.




## APS




20141205 EOD parts, change PN.

Quanta Computer Inc.

PROJECT : ZRF

| Size | Document Number | Rev |
|---|---|---|
| | CPU/PCH XDP | A |
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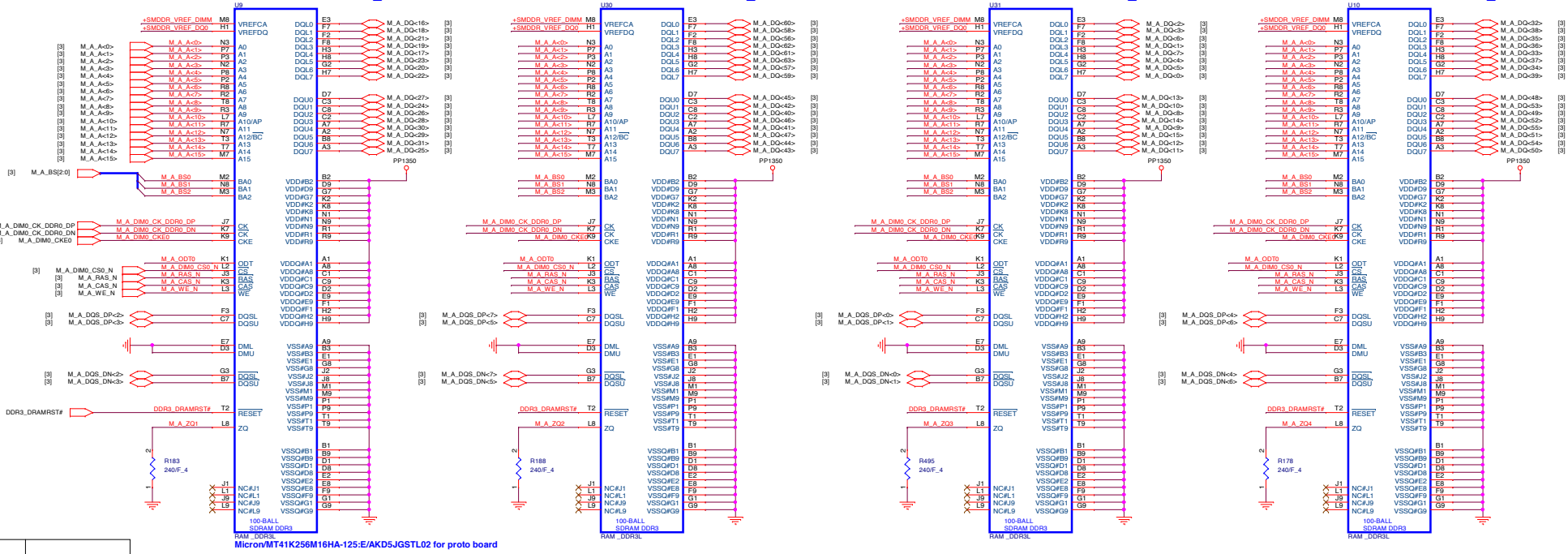
<DDR>

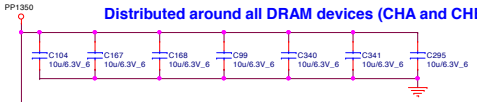
BYTE2_16-23
BYTE3_24-31
BYTE7_56-63
BYTE5_40-47
BYTE0_0-7
BYTE1_8-15
BYTE4_32-39
BYTE6_48-55



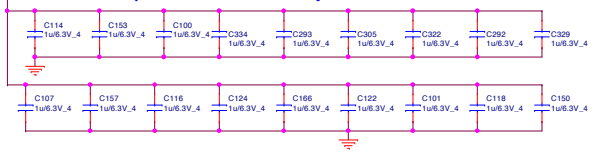

Micron/MT41K256M16HA-125:E/AKD5JGSTL02 for proto board

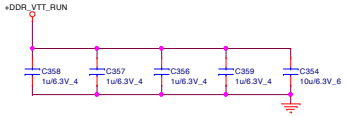
| Vendor | P/N | |
|---|---|---|
| Hynix | | |
| Elpida | AKD5JGST400 | DDR3L 1333Mhz 4Gb |
| | AKD5JGST404 | DDR3L 1600Mhz 4Gb |

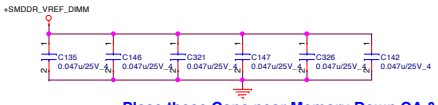
Distributed around all DRAM devices (CHA and CHB)



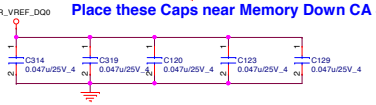

Place these Caps near each X16 Memory Down



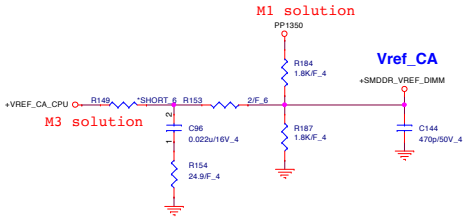



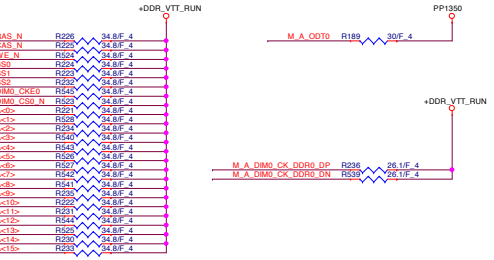




Place these Caps near Memory Down CA & DQ pin

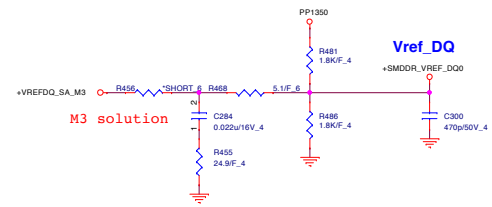



M1 solution




M1 solution




S_CLIP1 *SUL-12A2M
S_CLIP3 *SUL-12A2M
S_CLIP2 *SUL-12A2M
S_CLIP4 *SUL-12A2M

Quanta Computer Inc.
PROJECT : ZRF

| Size | Document Number | Rev |
|---|---|---|
| | DDR3L MEMORY DOWNx16 A | A |

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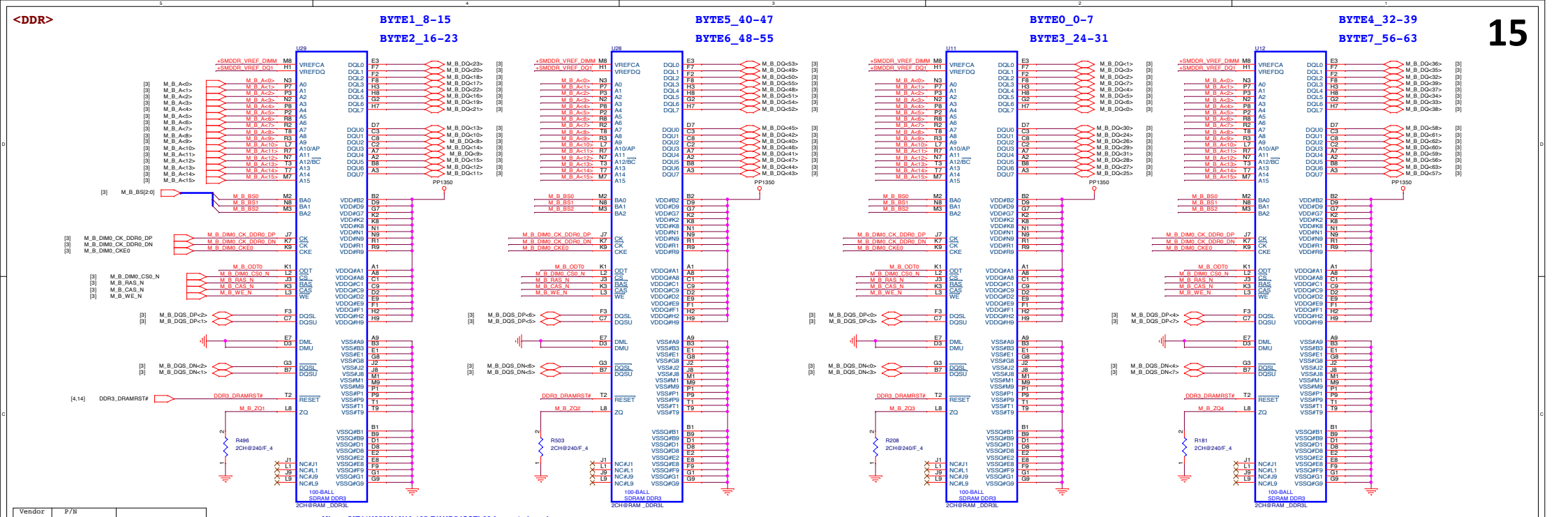
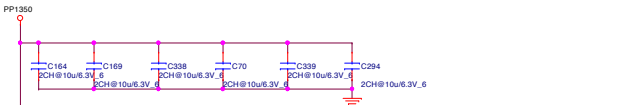
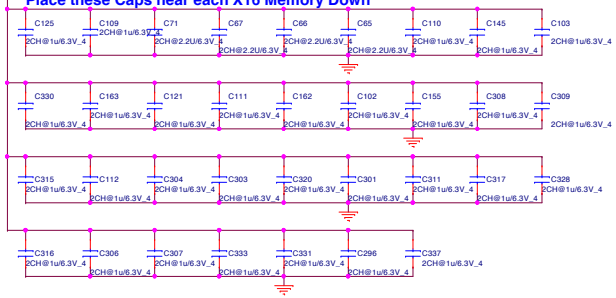


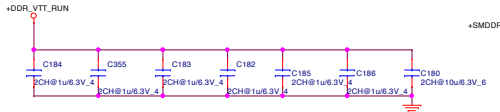

Micron/MT41K256M16HA-125:E/AKD5JGSTL02 for proto board

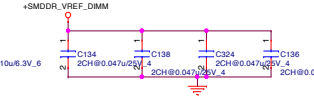
| Vendor | P/N | |
|---|---|---|
| Hynix | AKD5JGETW04 | DDR3L 1600Mhz 4Gb |
| Elpida | AKD5JGST407 | DDR3L 1600Mhz 4Gb |
| Micron | AKD5JGSTL10 | DDR3L 1600Mhz 4Gb |




Place these Caps near each X16 Memory Down

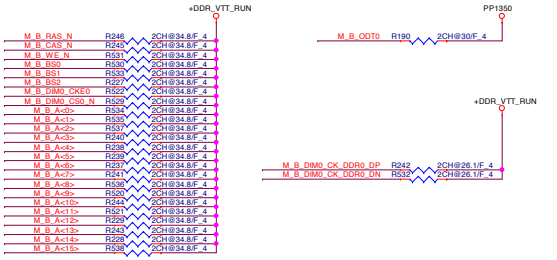


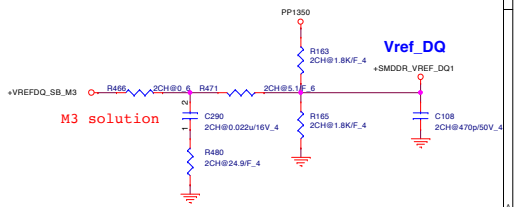





Place these Caps near Memory Down CA & DQ pin




M1 solution

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Document Number
DDR3L MEMORY DOWNx16 B
Rev A
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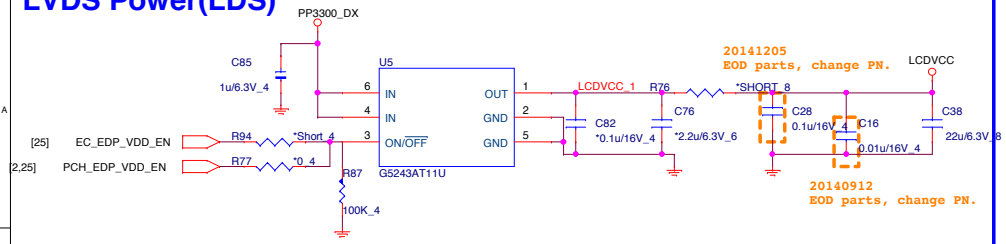
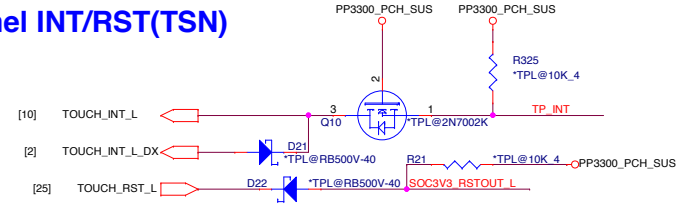
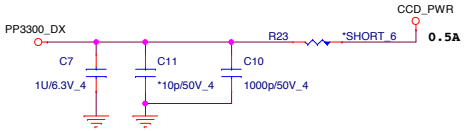
## LVDS Power(LDS)



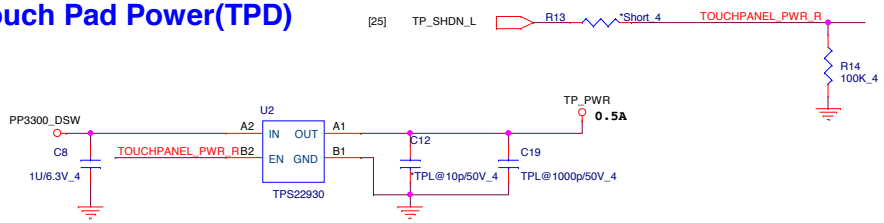

## Touch Panel INT/RST(TSN)



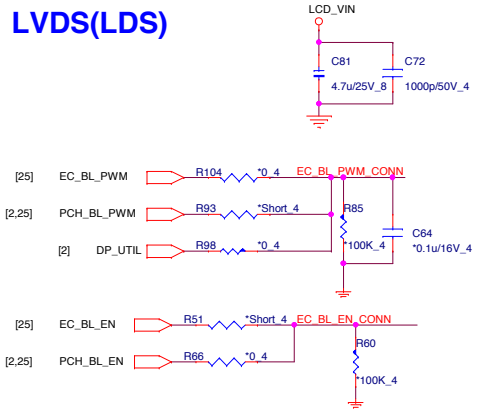

## CCD power(CCD)

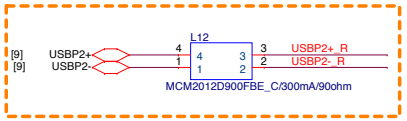



## Touch Pad Power(TPD)




## LVDS(LDS)

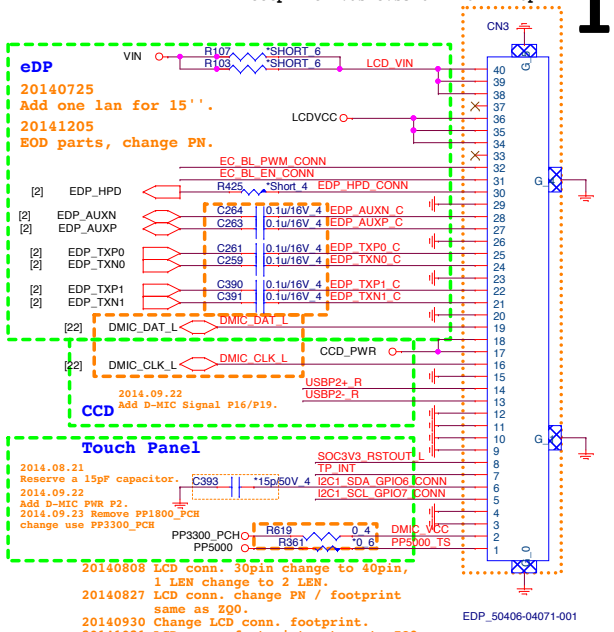



20141201 Stuff L12, remove R371/R372.

CCD(CCD)

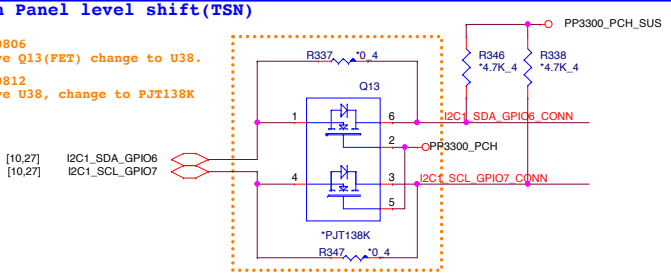
LVDS CONN
DFHS40FS095
footprint lvds-cvs5402m1rb-nh-40p-1




## Touch Panel level shift(TSN)

20140806
remove Q13(FET) change to U38.

20140812
Remove U38, change to PJT138K




Quanta Computer Inc.

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| Size | Document Number | Rev |
|---|---|---|
| | LVDS/CCD/DMIC/TS | A |

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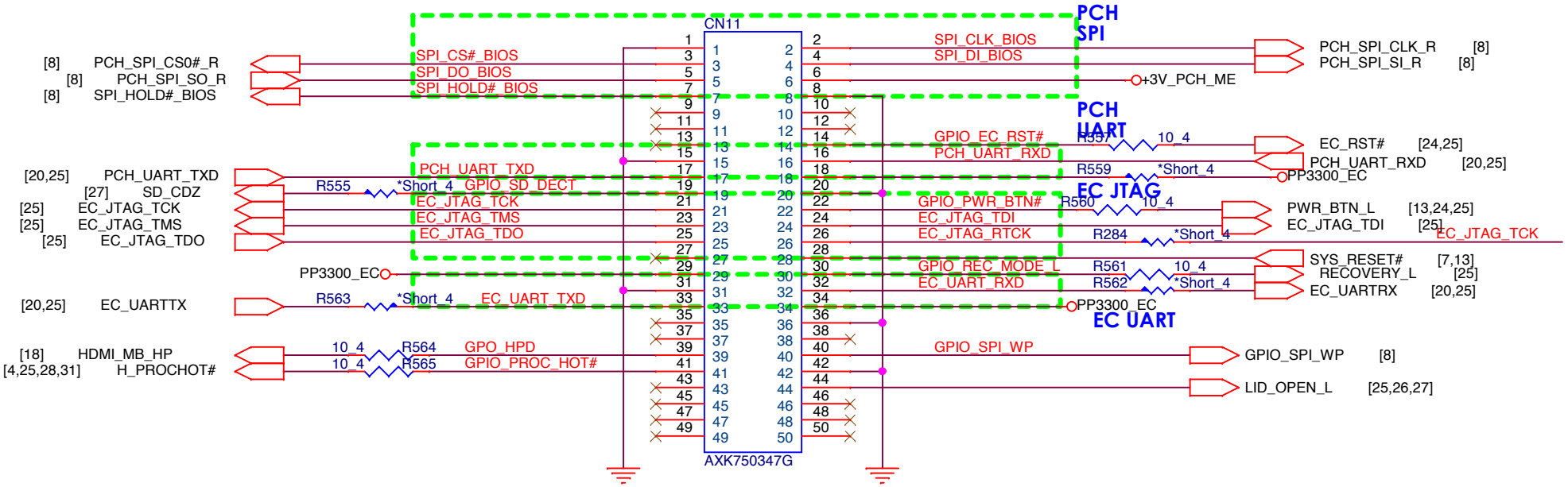
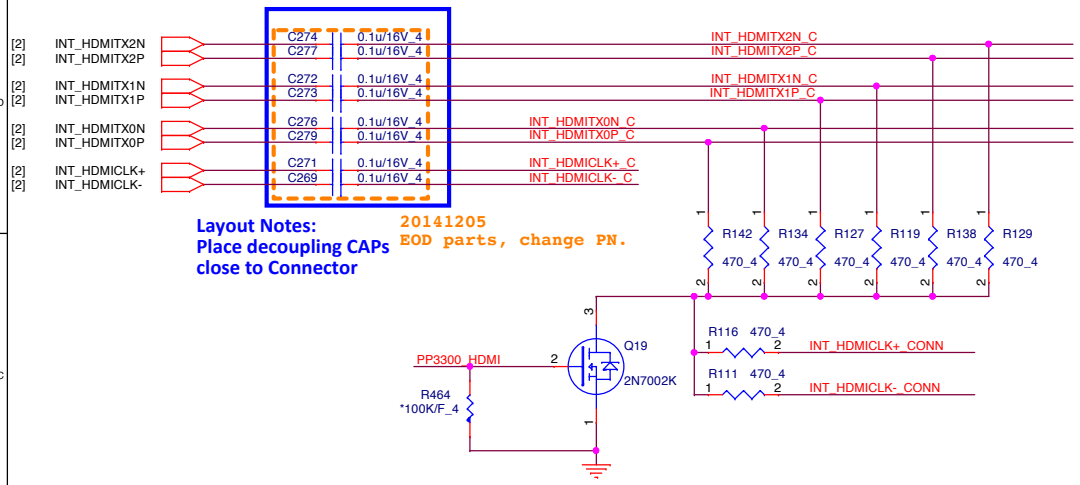
# Debug Port(DBG)

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




| | | |
|---|---|---|
| Quanta Computer Inc. PROJECT : ZRF | | |
| Size | Document Number: Google Debug | Rev: A |
| Date: Monday, January 12, 2015 | Sheet 17 of 38 | |

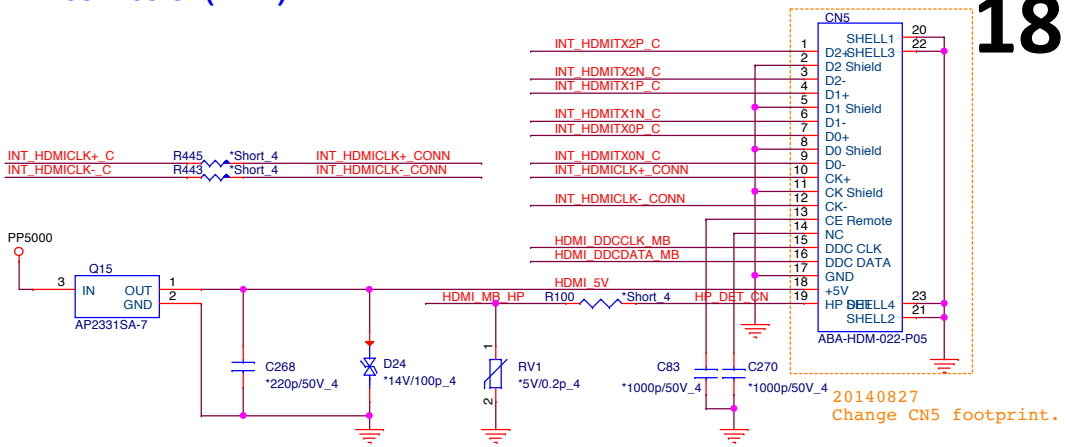
## HDMI Cost Reduced level shift (HDM)




Layout Notes:
Place decoupling CAPs close to Connector

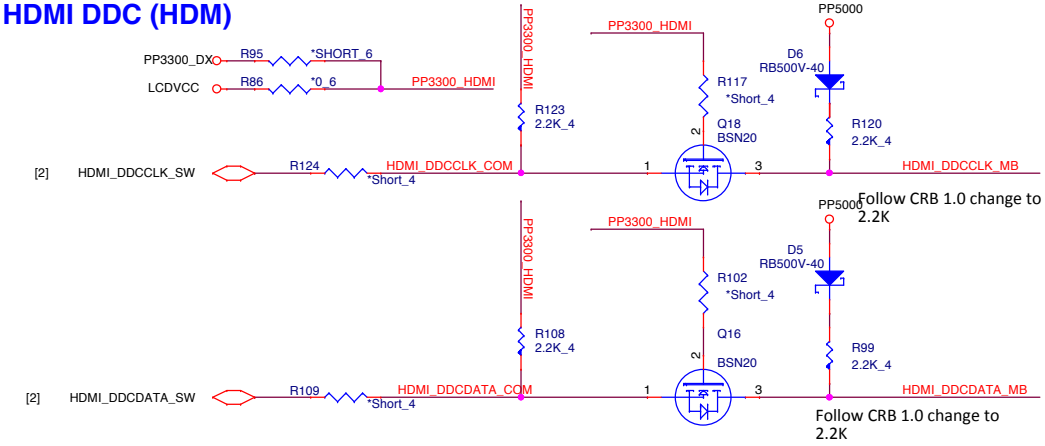
20141205
EOD parts, change PN.

## HDMI connector (HDM)

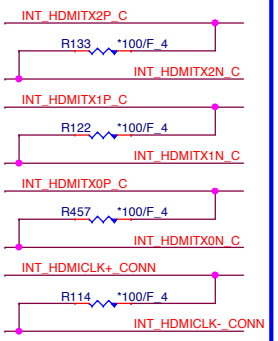



20140827
Change CN5 footprint.

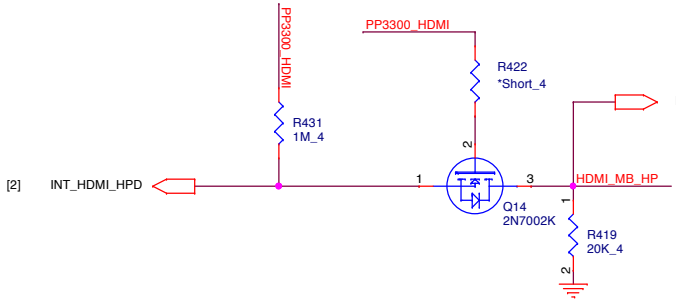
## HDMI DDC (HDM)




## EMI (HDM)




## HDMI-detect (HDM)




**Quanta Computer Inc.**

PROJECT : ZRF

| Size | Document Number | Rev |
|---|---|---|
| | HDMI | A |
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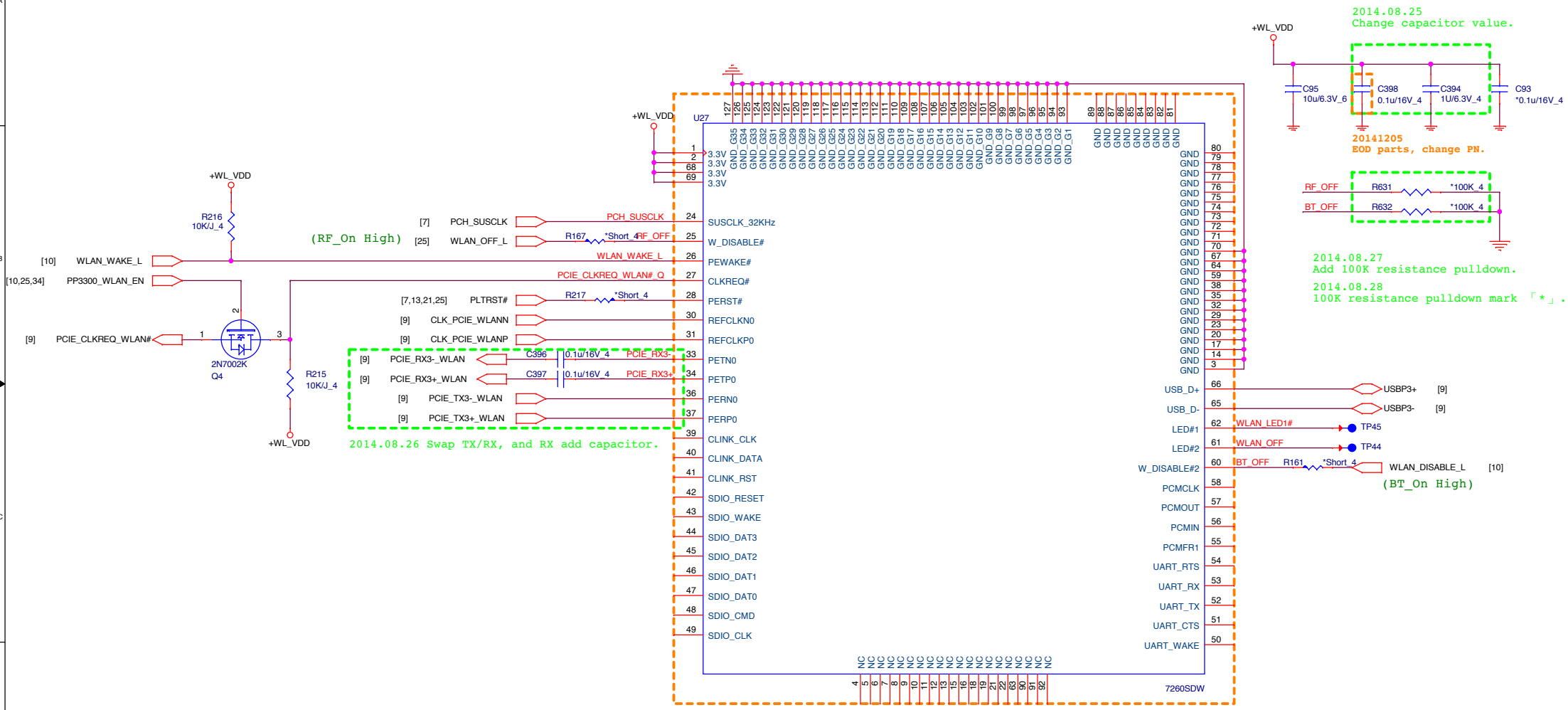
# WLAN\BT LGA Combo Card






20140820 On board IC change to same as ZS8 connector
20140822 Return to another wifi onboard module 7260SDW
20140826 Change wifi onboard module 7260SDW footprint
20140909 Change wifi onboard module 7260SDW footprint
20141014 Change wifi onboard module 7260SDW PN.

Quanta Computer Inc.
PROJECT : ZRF

| Size | Document Number | Rev |
|---|---|---|
| | WIFI / BT | A |

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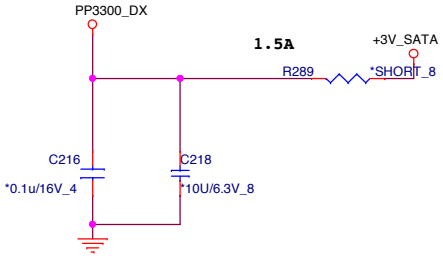
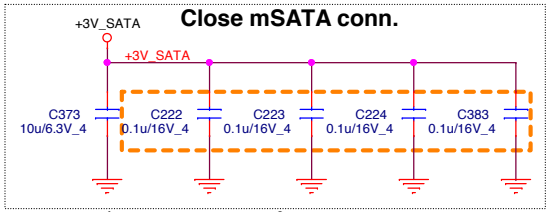
# NGFF SSD connector.
## San Disk SSD Card.

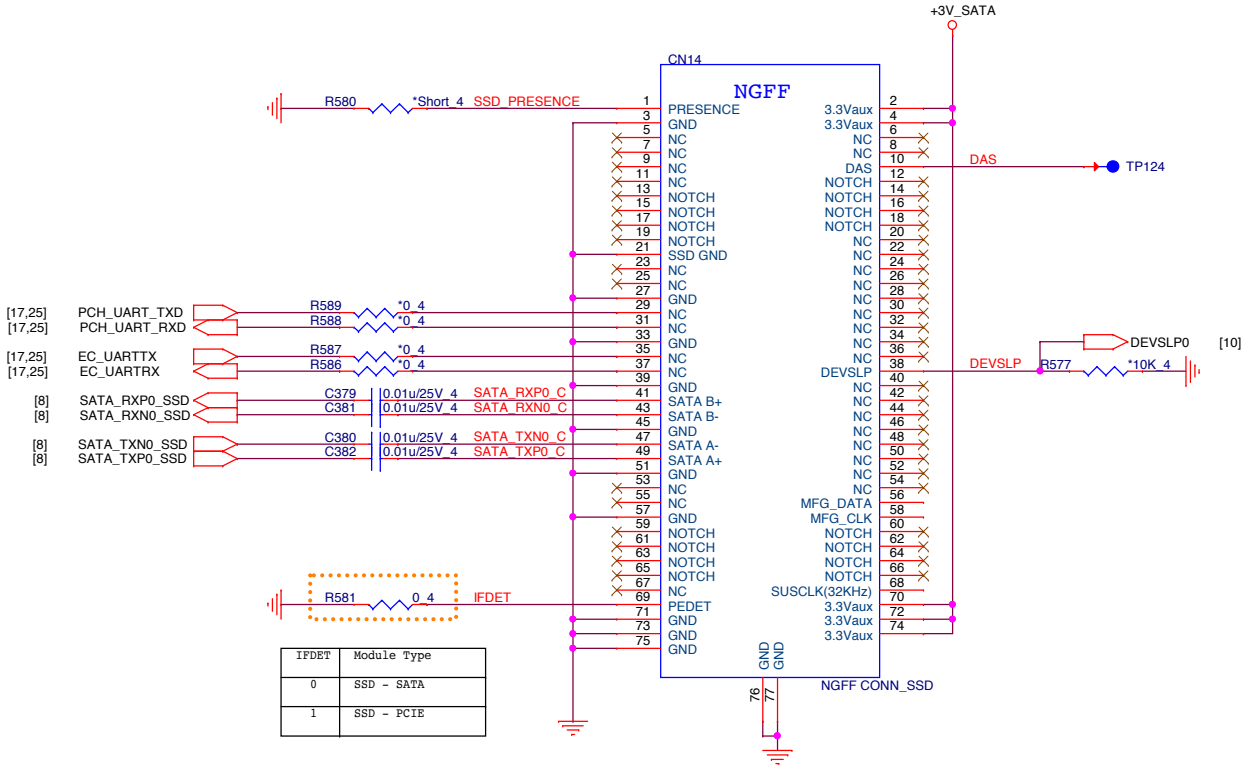





20141205 EOD parts, change PN.

rating = 1000mA @ 128G




| IFDET | Module Type |
|---|---|
| 0 | SSD - SATA |
| 1 | SSD - PCIE |

Quanta Computer Inc.

PROJECT : ZRF

| Size | Document Number | Rev |
|---|---|---|
| | NGFF SSD | A |
| Date: Monday, January 12, 2015 | Sheet 20 of 38 | |

# TPM (TPM)



20141201 Change TPM power.

4 x100nF (place close to device VDD/GND pins)

PP3300_PCH

R470
2.2_6

TPM_VDD

20141205 EOD parts, change PN.

C297 0.1u/16V_4
C287 0.1u/16V_4
C298 0.1u/16V_4
C288 0.1u/16V_4

TPM_VDD

R467
*20K_4

U7

TPM_GPIO

R465 0_4 TPM_PP

TPM_VDD R469 *4.7K_4

0411 FAE : install R80 value is 4K7,
and PIN7 wo an internal PD

| | | |
|---|---|---|
| 6 | GPIO | |
| 2 | NC2 | |
| 7 | PP | |
| 13 | NC13 | |
| 14 | NC14 | |
| 8 | NC8 | |
| 12 | NC12 | |
| 3 | NC3 | |
| 1 | NC1 | |
| 4 | GND[1] | |
| 11 | GND[2] | |
| 18 | GND[3] | |
| 25 | GND[4] | |

TPM SLB9655

SLB9655

| | | |
|---|---|---|
| 10 | VDD[4] | |
| 5 | VDD[3] | |
| 24 | VDD[2] | |
| 19 | VDD[1] | |
| 21 | LCLK | PCLK_TPM [9] |
| 22 | LFRAME# | LPC_LFRAME# [8,25] |
| 17 | LAD3 | LPC_LAD3 [8,25] |
| 20 | LAD2 | LPC_LAD2 [8,25] |
| 23 | LAD1 | LPC_LAD1 [8,25] |
| 26 | LAD0 | LPC_LAD0 [8,25] |
| 28 | NC28 | |
| 16 | LRESET#[1] | |
| 9 | LRESET#[2] | TPM_RST_R R148 *Short_4 PLTRST# [7,13,19,25] |
| 27 | SERIRQ | SERIRQ_R R491 *Short_4 IRQ_SERIRQ [10,25] |
| 15 | NC15 | |

near pin 21 as possible

C291 *10p/50V_4

0411 FAE : a 0ohm between pin9 to LRESET signals

Quanta Computer Inc.

PROJECT : ZRF

| Size | Document Number | Rev |
|---|---|---|
| | TPM SLB9655 / LED | A |
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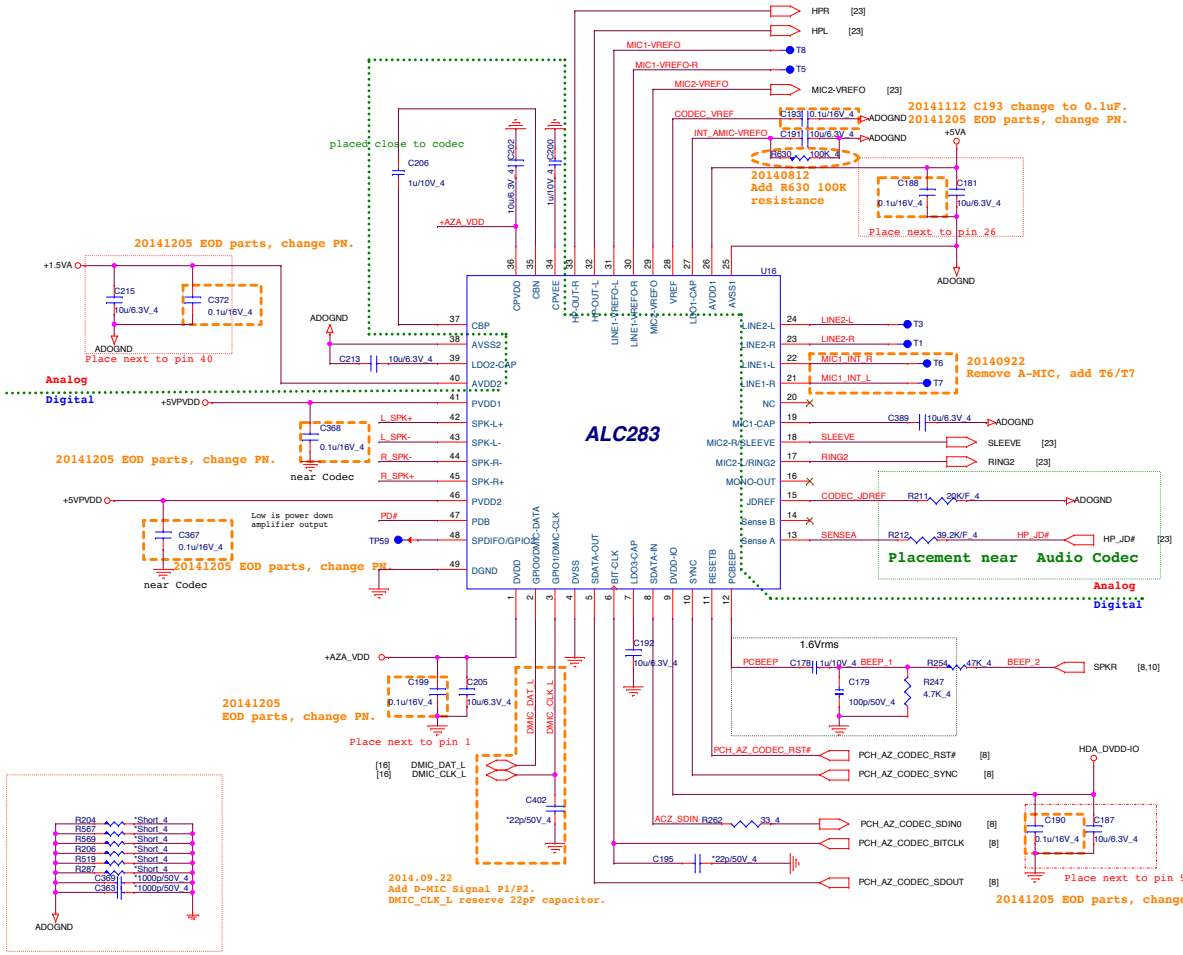
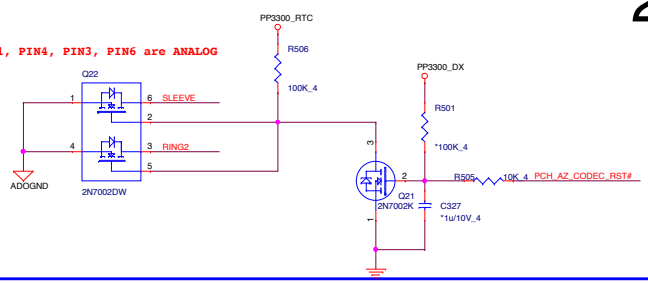
# Codec(ADO)



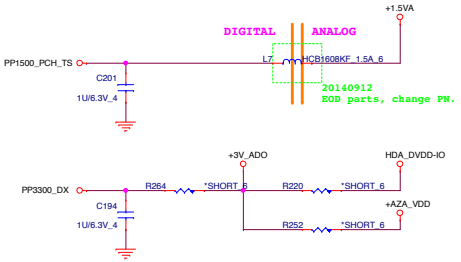

# Grounding circuit(ADO)



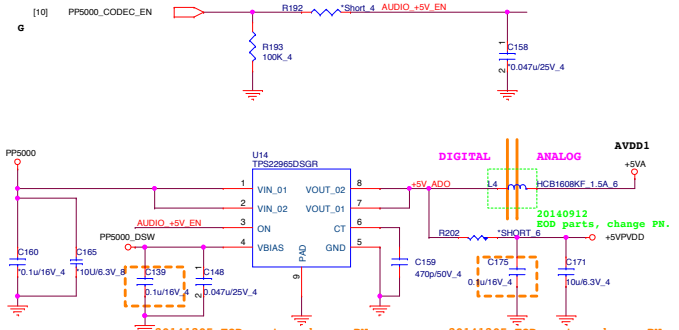

# D-Mic

20140922 Remove A-MIC, add D-MIC same as Hugo(ZHQ)

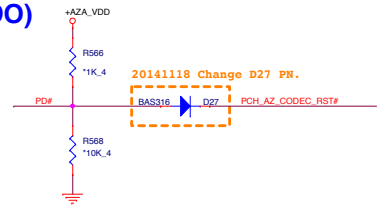
# Codec PWR 3V/1.5V(ADO)



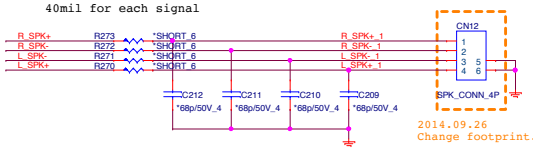

# Codec PWR 5V(ADO)




# Mute(ADO)




# Internal Speaker




| | | | |
|---|---|---|---|
| Quanta Computer Inc. | | | |
| PROJECT : ZRF | | | |
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| | ALC283/HP/SPK | | A |
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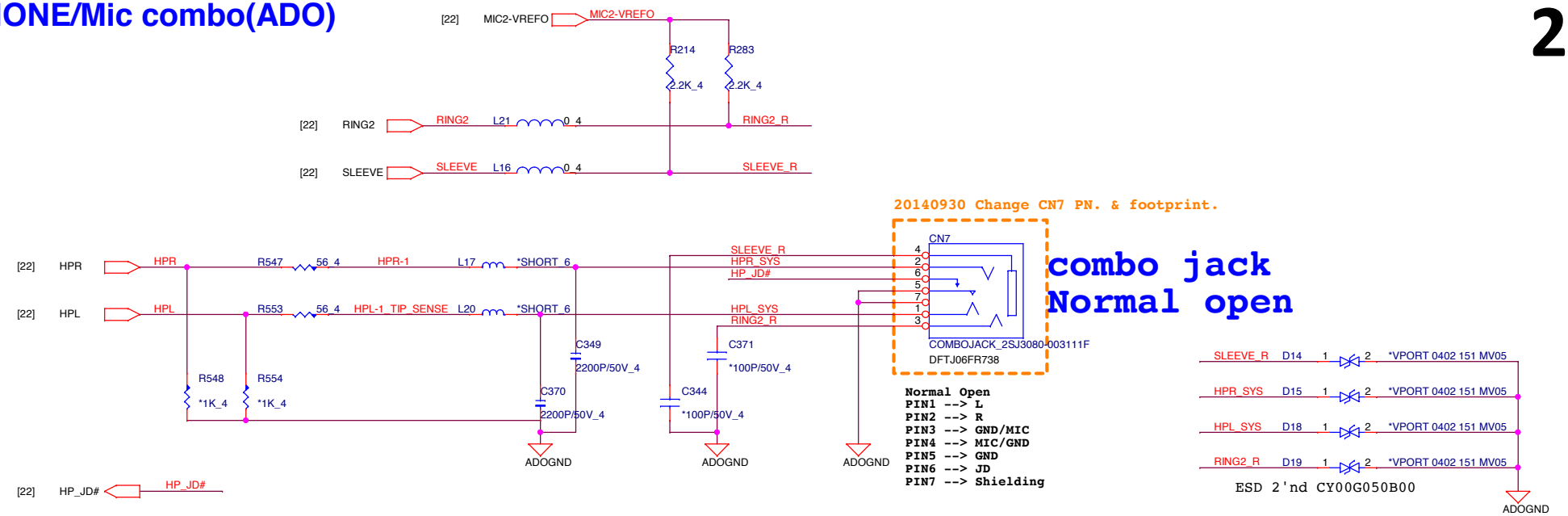
# HEADPHONE/Mic combo(ADO)






| | | | |
|---|---|---|---|
| Quanta Computer Inc. | | | |
| PROJECT : ZRF | | | |
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| | Audio Headset SW | | A |
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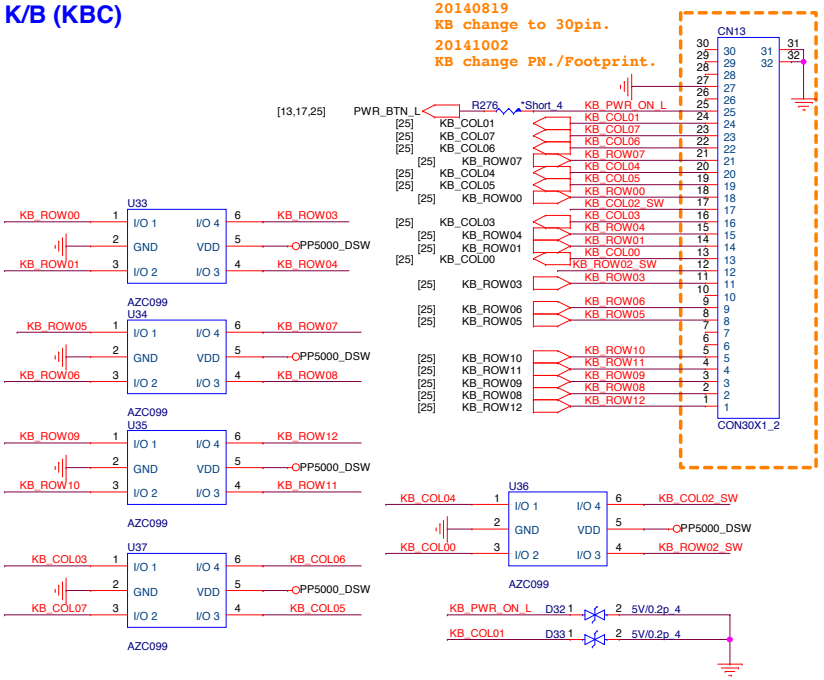
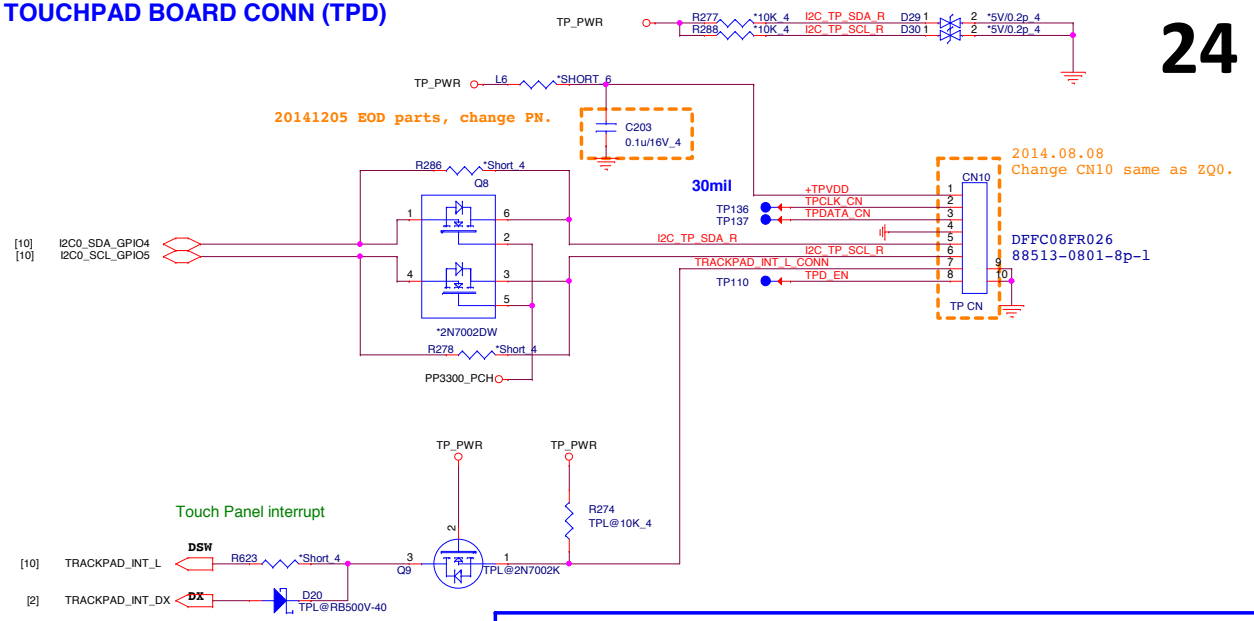
## K/B (KBC)

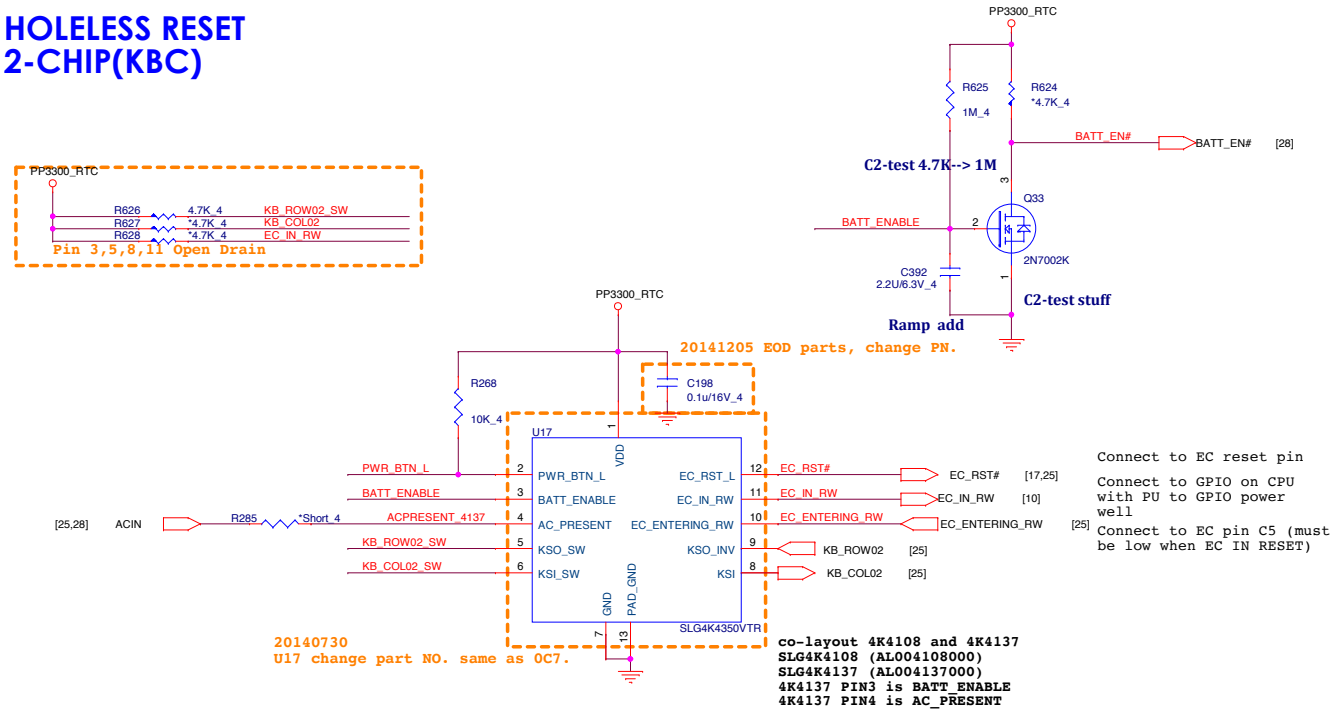
20140819
KB change to 30pin.
20141002
KB change PN./Footprint.




## TOUCHPAD BOARD CONN (TPD)




## HOLELESS RESET 2-CHIP(KBC)




Connect to EC reset pin

Connect to GPIO on CPU with PU to GPIO power well

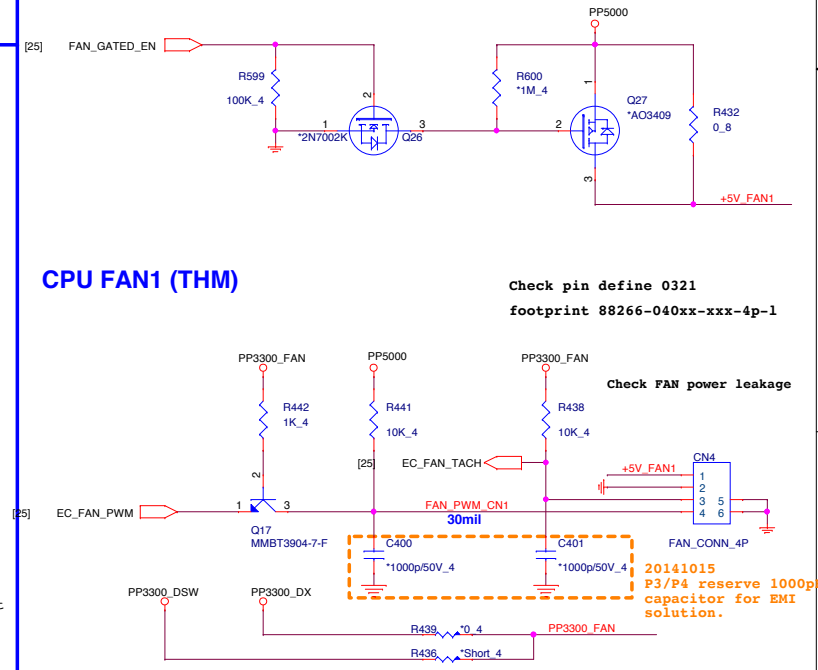
Connect to EC pin C5 (must be low when EC IN RESET)

co-layout 4K4108 and 4K4137
SLG4K4108 (AL004108000)
SLG4K4137 (AL004137000)
4K4137 PIN3 is BATT_ENABLE
4K4137 PIN4 is AC_PRESENT

## CPU FAN1 (THM)

Check pin define 0321

footprint 88266-040xx-xxx-4p-1




Quanta Computer Inc.

PROJECT : ZRF

| Size | Document Number | Rev |
|---|---|---|
| | KB/TP/FAN/HW Reset | A |

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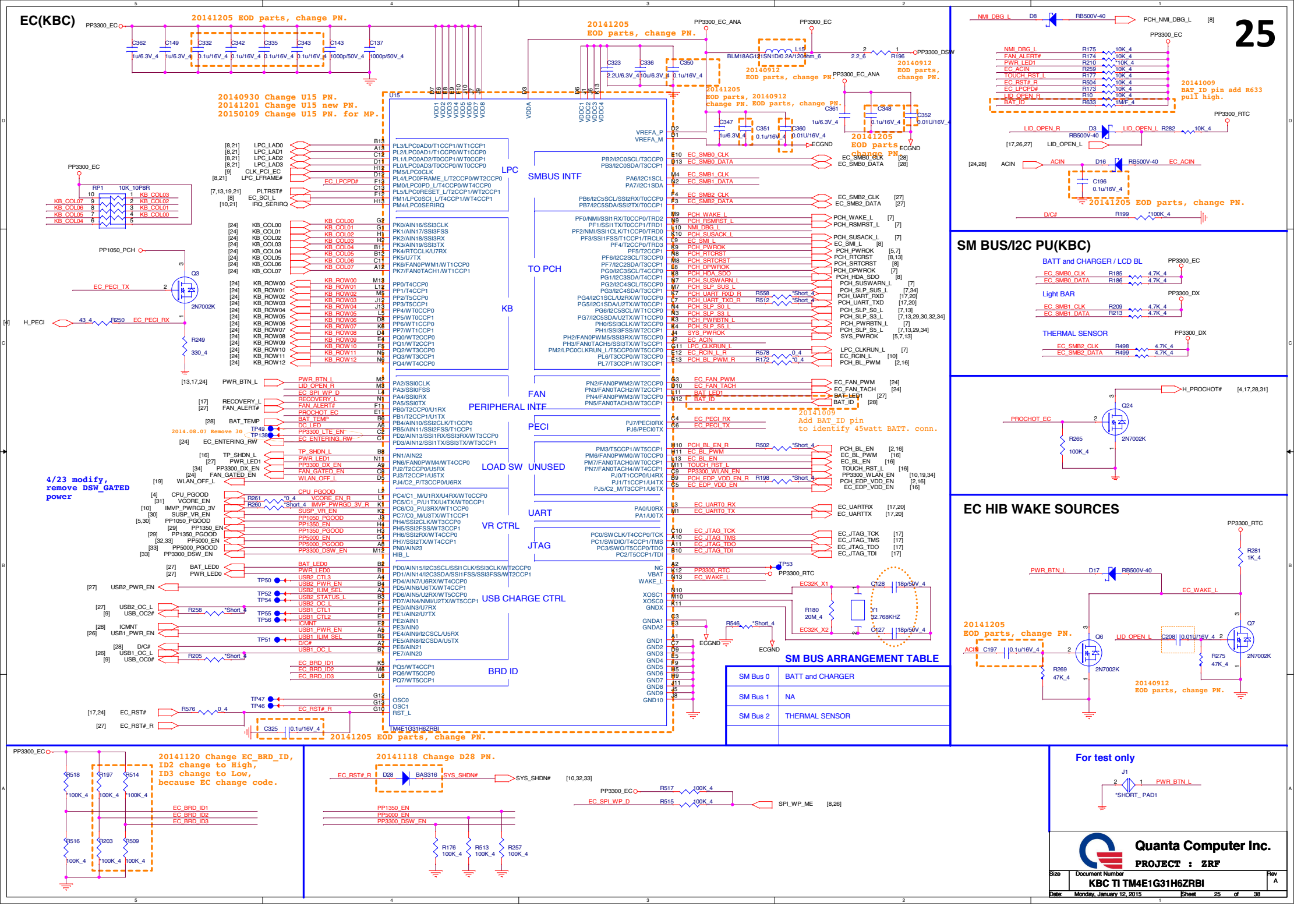
EC(KBC)
20141205 EOD parts, change PN.
20140930 Change U15 PN.
20141201 Change U15 new PN.
20150109 Change U15 PN. for MP.
U15
TM4E1G31H6ZRBI
LPC
SMBUS INTF
TO PCH
KB
FAN
PERIPHERAL INTF
PECI
LOAD SW UNUSED
UART
VR CTRL
JTAG
USB CHARGE CTRL
BRD ID
20141205 EOD parts, change PN.
20140912 EOD parts, change PN.
20141009 Add BAT_ID pin to identify 45watt BATT. conn.
4/23 modify, remove DSW_GATED power
2014.08.07 Remove 3G
SM BUS ARRANGEMENT TABLE
SM Bus 0 BATT and CHARGER
SM Bus 1 NA
SM Bus 2 THERMAL SENSOR
20141009 BAT_ID pin add R633 pull high.
SM BUS/I2C PU(KBC)
BATT and CHARGER / LCD BL
Light BAR
THERMAL SENSOR
EC HIB WAKE SOURCES
20141120 Change EC_BRD_ID, ID2 change to High, ID3 change to Low, because EC change code.
20141118 Change D28 PN.
For test only
Quanta Computer Inc.
PROJECT : ZRF
KBC TI TM4E1G31H6ZRBI
Rev A
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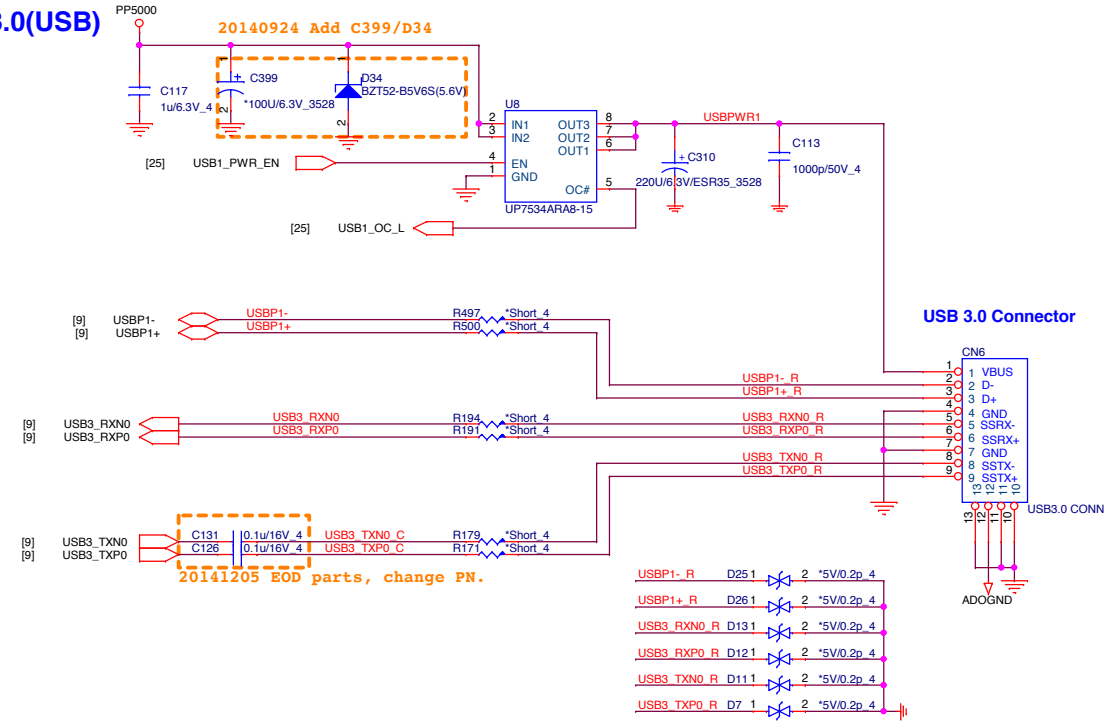
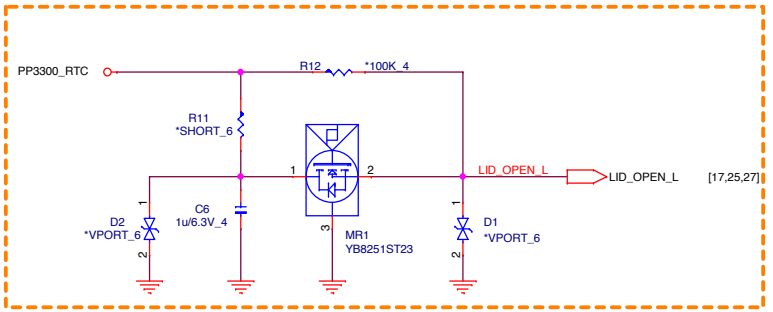
25

## USB3.0(USB)

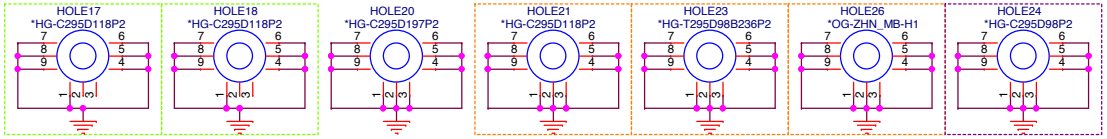



## Lid Switch (HSR)

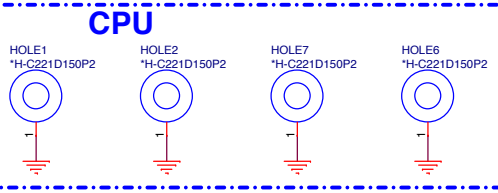


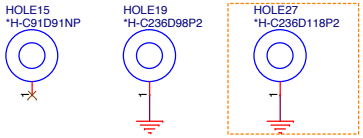

20140923 Add Lid Switch (HSR)

## HOLE(OTH)




### CPU




20140828
1. Add HOLE27
2. Change HOLE17/HOLE18/HOLE21/HOLE22 /HOLE23/HOLE26 footprint
3. Remove HOLE9/HOLE16

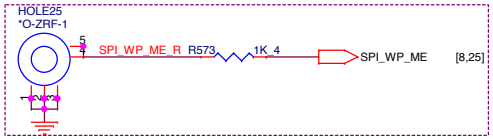
20140829
1. Change HOLE27 footprint
2. HOLE17/HOLE18/HOLE22 remove Pin1/Pin2/Pin3

20140901
1. Remove HOLE22

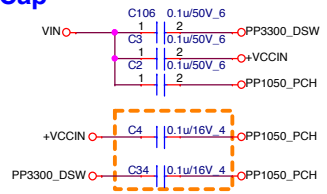
20140923
1. Remove battery enable, change to HOLE24

20140926
1. HOLE24 change footprint.
2. HOLE25 Add more 2pin & change footprint.
3. Remove HOLE3/4/5/8/10/11/12/13/14.

## ROM WP#




## EMI Cap




20141205 EOD parts, change PN.

Quanta Computer Inc.
PROJECT : ZRF

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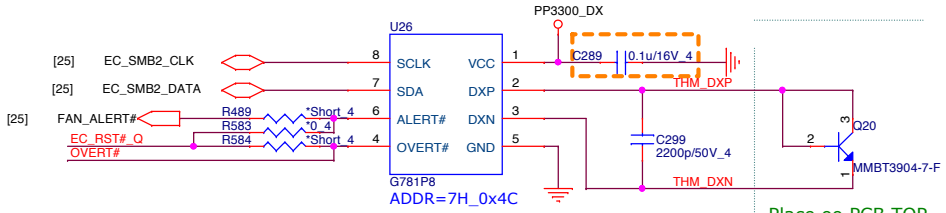
|---|---|---|
| | USB3/Hole | A |
| Date: Monday, January 12, 2015 | Sheet 26 of 38 | |

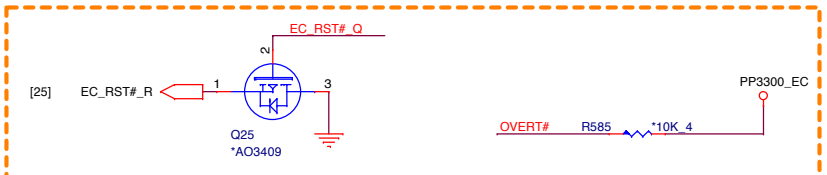
# Thermal Sensor(THM)

20141205 EOD parts, change PN.



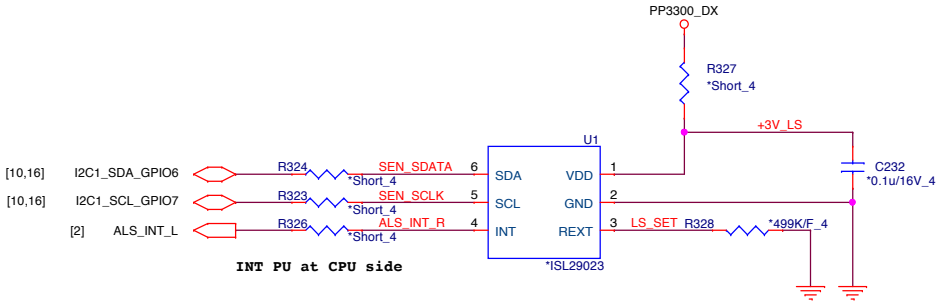

Place oo PCB BOT
Local Temp.

Place oo PCB TOP
Remote Temp.



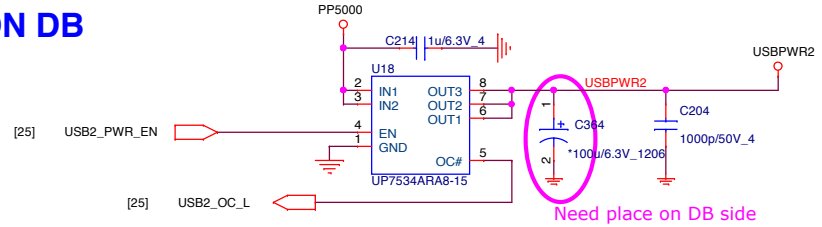

20140925 Q25/R585 mark 「*」 un-stuff.
OVERT# power PP3300_DX change to PP3300_EC.

# Light sensor & TP (ALS)

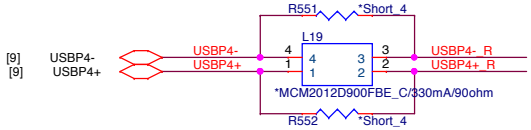


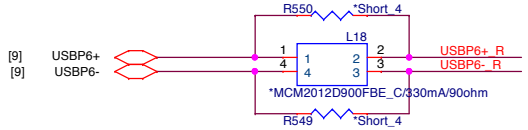

ADDR: 1000100

# FUNCTION DB



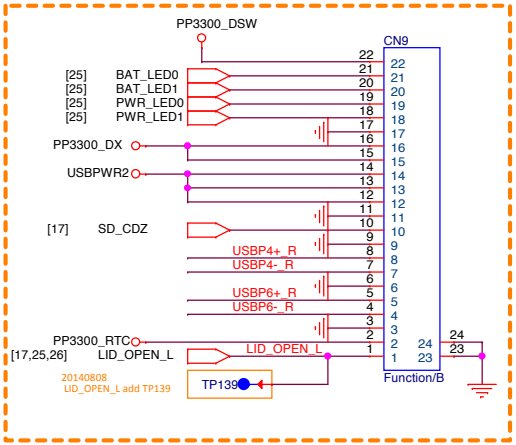

Need place on DB side




| | |
|---|---|
| HSR | +3VPCU |
| | LID_OPEN_L |
| | GND |
| LED | +3VPCU |
| | LED x 4 |
| | GND |
| USB | +3V x 2 |
| | GND x 2 |
| | USBP0+ |
| | USBP0- |
| CR | CR_DET |
| | +3V x 2 |
| | USBP6+ |
| | USBP6- |
| | GND x 2 |
| LID | PP3300_RTC |
| | LID_OPEN_L |

footprint 50501-0220n-v01-22p-l
DFFC22FR019




20140728 Modify to 22pin.
20140819 Change footprint

Quanta Computer Inc.
PROJECT : ZRF

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|---|---|---|
| | DB/ALS/Thermal sensor | A |
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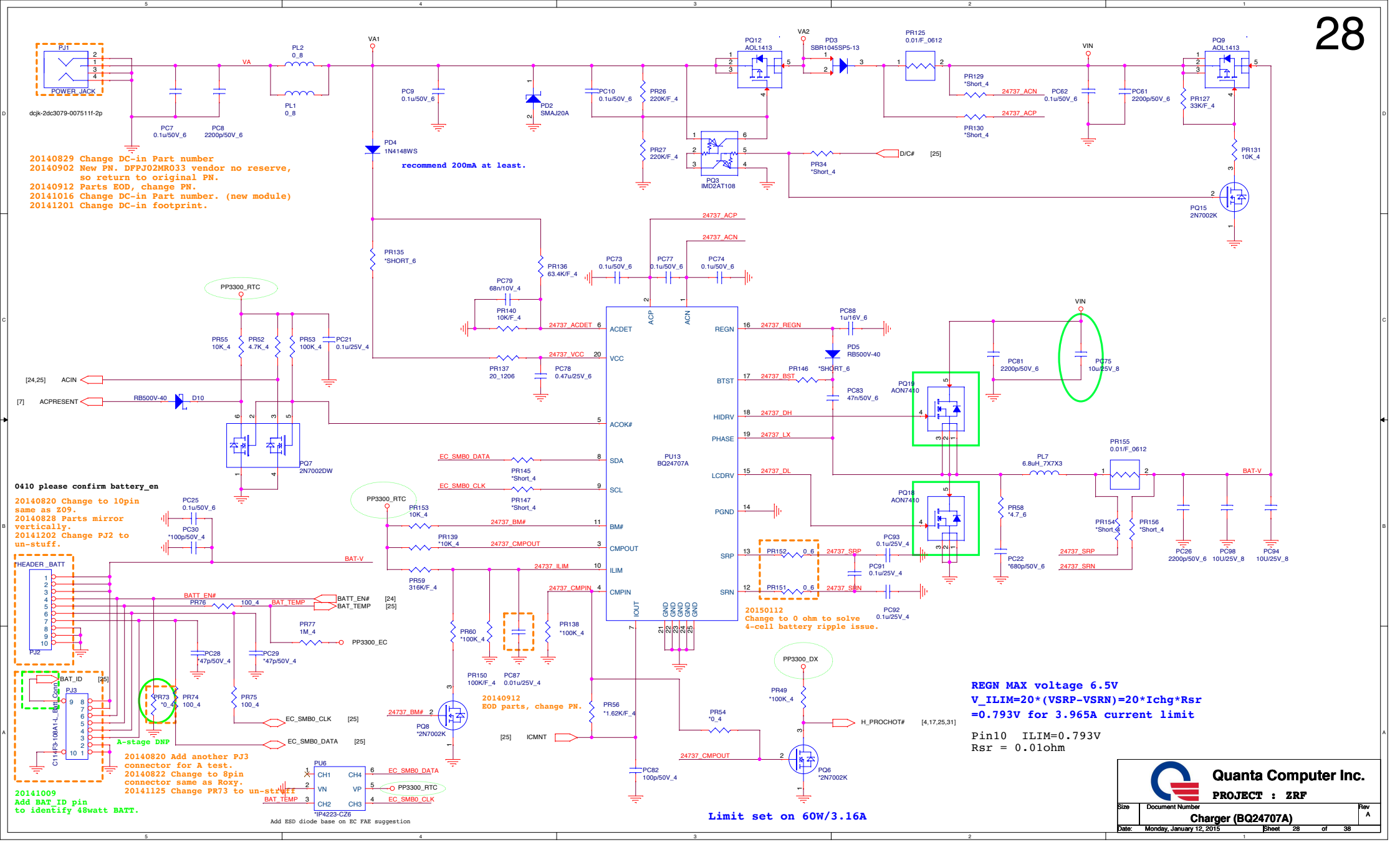
20140829 Change DC-in Part number
20140902 New PN. DFPJ02MR033 vendor no reserve, so return to original PN.
20140912 Parts EOD, change PN.
20141016 Change DC-in Part number. (new module)
20141201 Change DC-in footprint.
recommend 200mA at least.
0410 please confirm battery_en
20140820 Change to 10pin same as Z09.
20140828 Parts mirror vertically.
20141202 Change PJ2 to un-stuff.
A-stage DNP
20140820 Add another PJ3 connector for A test.
20140822 Change to 8pin connector same as Roxy.
20141125 Change PR73 to un-stuff
20141009 Add BAT_ID pin to identify 48watt BATT.
Add ESD diode base on EC FAE suggestion
20140912 EOD parts, change PN.
20150112 Change to 0 ohm to solve 4-cell battery ripple issue.
REGN MAX voltage 6.5V
V_ILIM=20*(VSRP-VSRN)=20*Ichg*Rsr
=0.793V for 3.965A current limit
Pin10 ILIM=0.793V
Rsr = 0.01ohm
Limit set on 60W/3.16A
PU13 BQ24707A
ACDET
ACP
ACN
VCC
ACOK#
SDA
SCL
BM#
CMPOUT
ILIM
CMPIN
IOUT
REGN
BTST
HIDRV
PHASE
LCDRV
PGND
SRP
SRN
GND
PP3300_RTC
PP3300_EC
PP3300_DX
VIN
VA
VA1
VA2
BAT-V
ACIN
ACPRESENT
D/C#
H_PROCHOT#
ICMNT
EC_SMB0_CLK
EC_SMB0_DATA
BAT_TEMP
BATT_EN#
BAT_ID
24737_ACP
24737_ACN
24737_ACDET
24737_VCC
24737_REGN
24737_BST
24737_DH
24737_LX
24737_DL
24737_BM#
24737_CMPOUT
24737_ILIM
24737_CMPIN
24737_SRP
24737_SRN
PJ1 POWER_JACK
dcjk-2dc3079-007511f-2p
PJ2 HEADER_BATT
PJ3 C114F3-10BA1-L
PQ7 2N7002DW
PQ8 *2N7002K
PQ6 *2N7002K
PQ15 2N7002K
PQ12 AOL1413
PQ9 AOL1413
PQ3 IMD2AT108
PQ19 AON7410
PQ18 AON7410
PD1 RB500V-40
PD2 SMAJ20A
PD3 SBR1045SP5-13
PD4 1N4148WS
PD5 RB500V-40
PU6 *IP4223-CZ6
PL1 0_8
PL2 0_8
PL7 6.8uH_7X7X3
PR125 0.01/F_0612
PR155 0.01/F_0612
PR135 *SHORT_6
PR146 *SHORT_6
PR34 *Short_4
PR129 *Short_4
PR130 *Short_4
PR145 *Short_4
PR147 *Short_4
PR154 *Short_4
PR156 *Short_4
PR131 10K_4
PR127 33K/F_4
PR136 63.4K/F_4
PR140 10K/F_4
PR137 20_1206
PR153 10K_4
PR139 *10K_4
PR59 316K/F_4
PR60 *100K_4
PR138 *100K_4
PR150 100K/F_4
PR56 *1.62K/F_4
PR54 *0_4
PR49 *100K_4
PR152 0_6
PR151 0_6
PR58 *4.7_6
PR22 *680p/50V_6
PR55 10K_4
PR52 4.7K_4
PR53 100K_4
PR76 100_4
PR77 1M_4
PR73 *0_4
PR74 100_4
PR75 100_4
PR26 220K/F_4
PR27 220K/F_4
PC7 0.1u/50V_6
PC8 2200p/50V_6
PC9 0.1u/50V_6
PC10 0.1u/50V_6
PC21 0.1u/25V_4
PC25 0.1u/50V_6
PC30 *100p/50V_4
PC28 *47p/50V_4
PC29 *47p/50V_4
PC79 68n/10V_4
PC78 0.47u/25V_6
PC73 0.1u/50V_6
PC77 0.1u/50V_6
PC74 0.1u/50V_6
PC88 1u/16V_6
PC83 47n/50V_6
PC81 2200p/50V_6
PC75 10u/25V_8
PC62 0.1u/50V_6
PC61 2200p/50V_6
PC93 0.1u/25V_4
PC91 0.1u/25V_4
PC92 0.1u/25V_4
PC87 0.01u/25V_4
PC82 100p/50V_4
PC26 2200p/50V_6
PC98 10U/25V_8
PC94 10U/25V_8
[24,25] ACIN
[7] ACPRESENT
[25] ICMNT
[4,17,25,31] H_PROCHOT#
[24] BATT_EN#
[25] BAT_TEMP
[25] BAT_ID
[25] EC_SMB0_CLK
[25] EC_SMB0_DATA
[25] D/C#
Quanta Computer Inc.
PROJECT : ZRF
Charger (BQ24707A)
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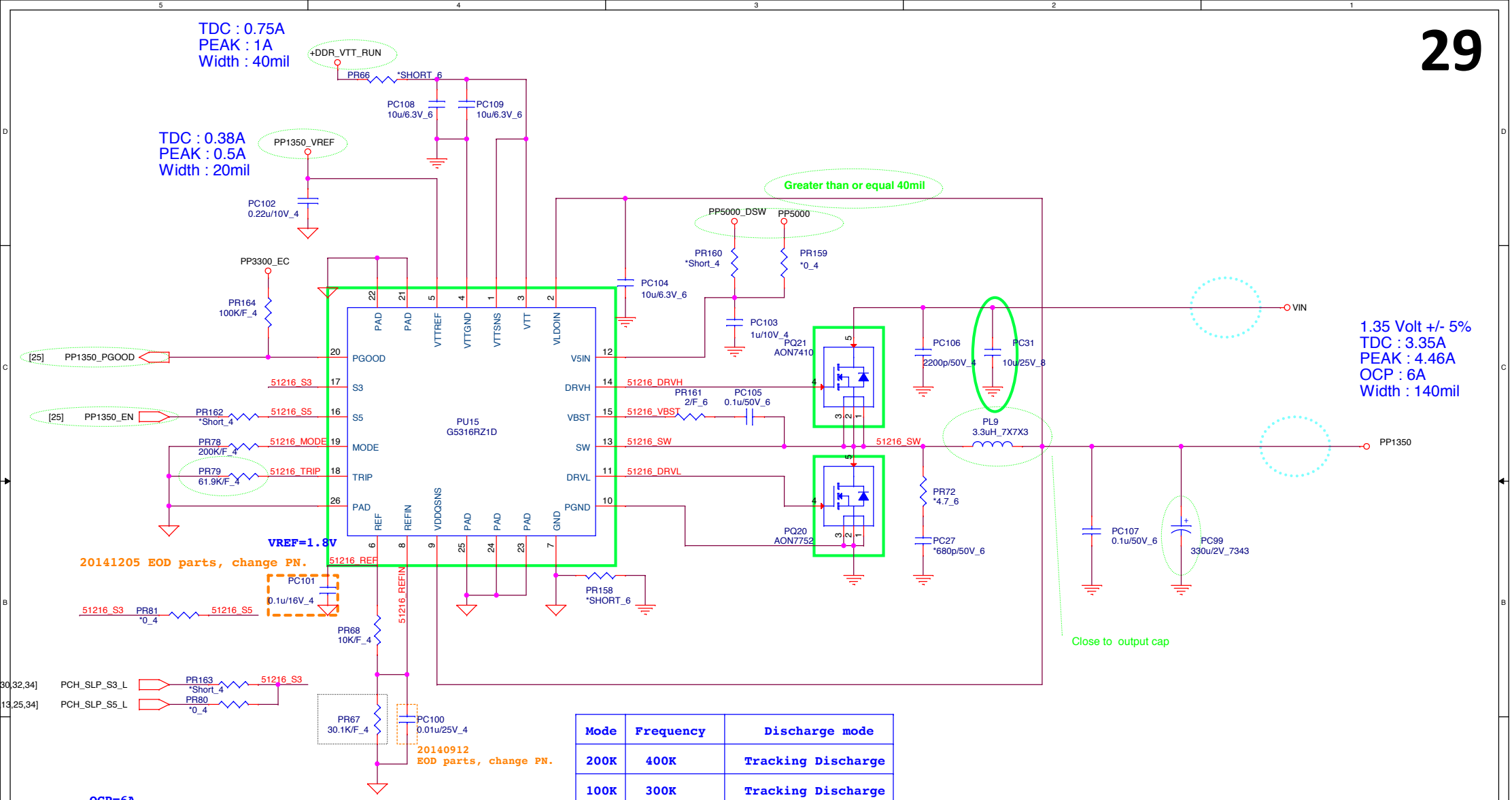


| Mode | Frequency | Discharge mode |
|---|---|---|
| 200K | 400K | Tracking Discharge |
| 100K | 300K | Tracking Discharge |

| | 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 |

OCP=6A
L ripple current
=(19-1.35)*1.35/(3.3u*400k*19)
=0.95A
Vtrip=[6-(0.95/2)]*14mohm
=0.07735V
Rlimit=0.07335/10uA*8=61.88Kohm

Quanta Computer Inc.
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|---|---|---|
| | DDR 1.35V (G5316) | A |
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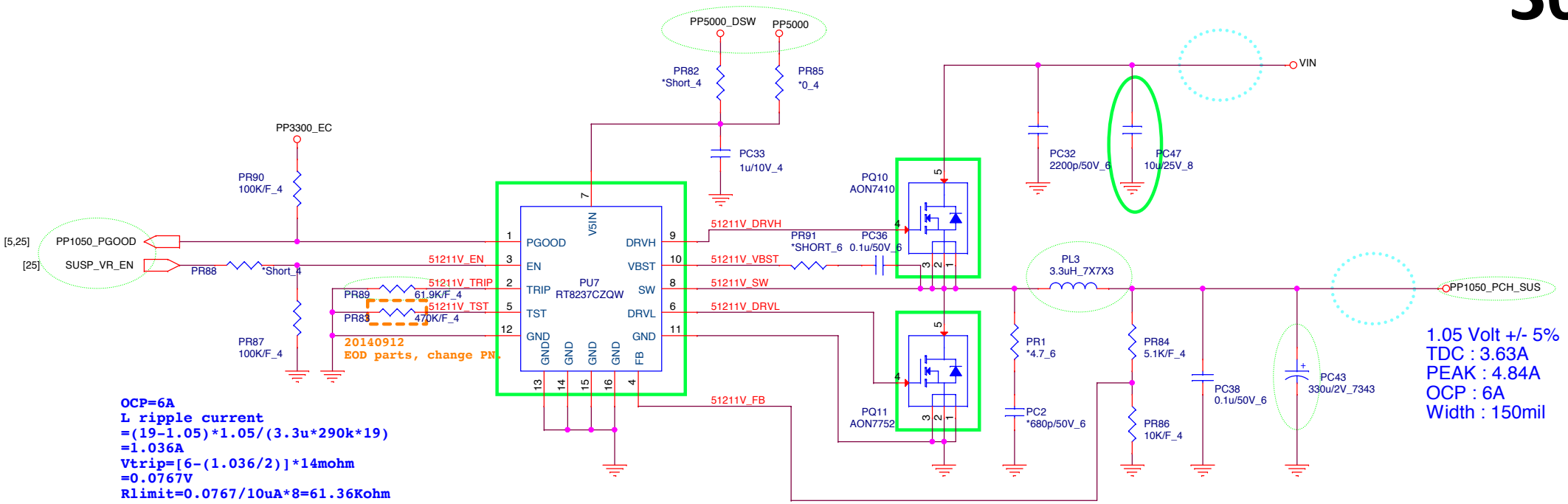
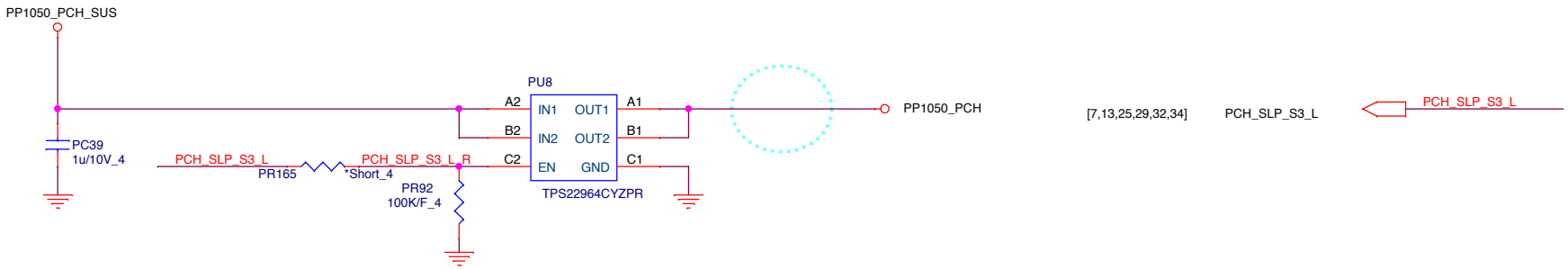



place at PQ37 area




| | | |
|---|---|---|
| Quanta Computer Inc. | | |
| PROJECT : ZRF | | |
| Size | Document Number: +1.05V (RT8237) | Rev: A |
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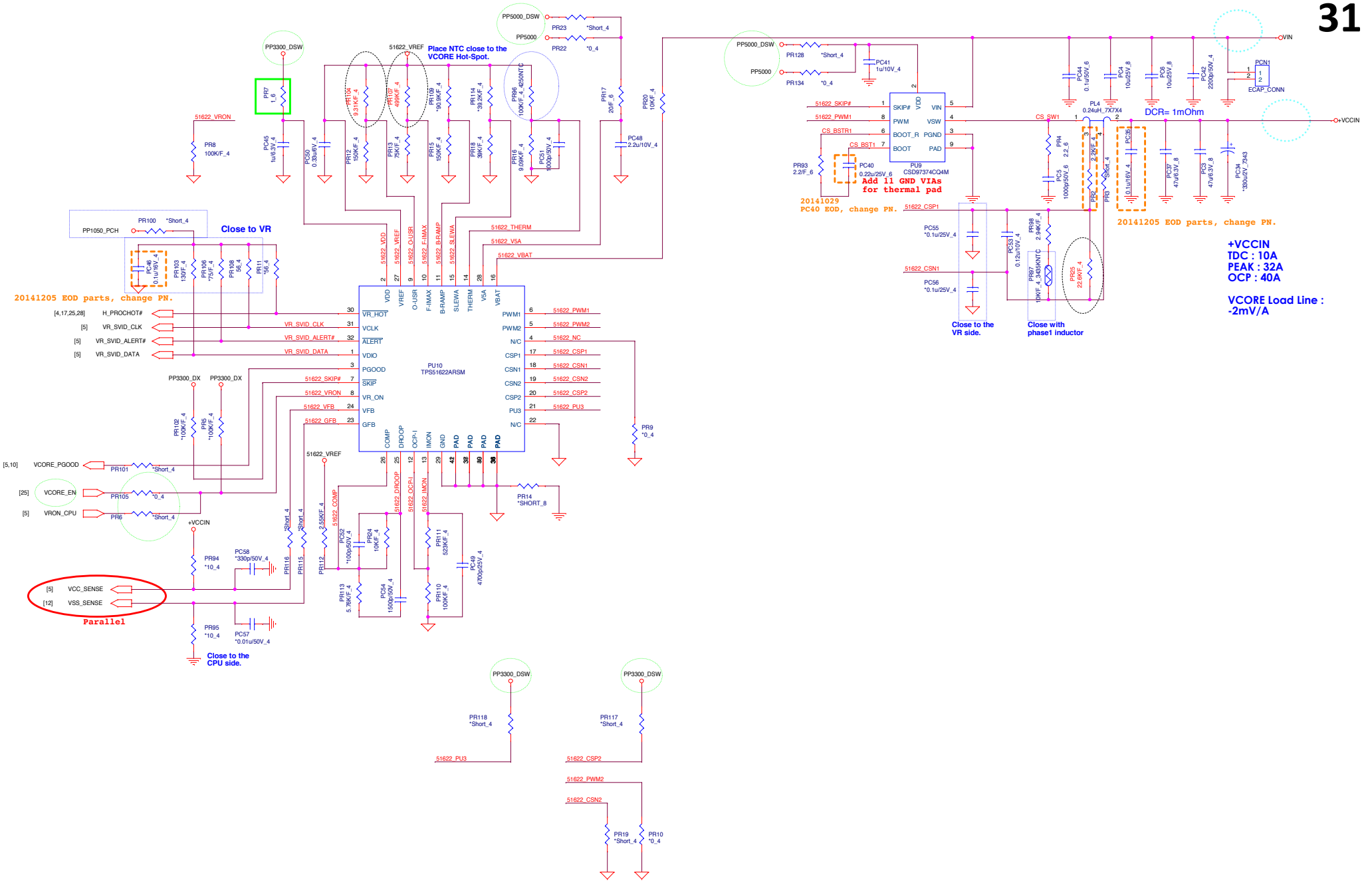
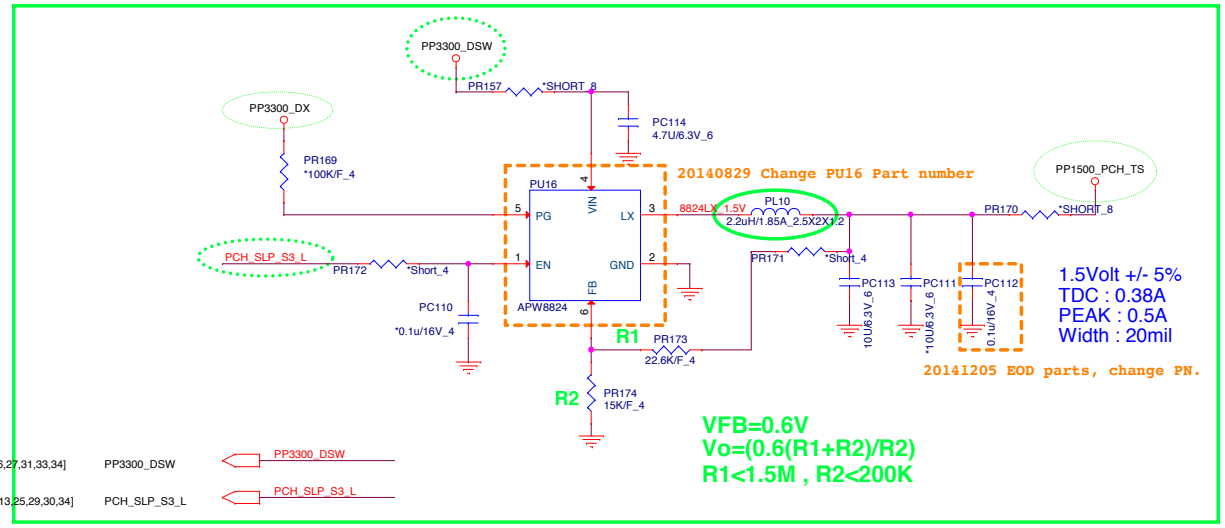
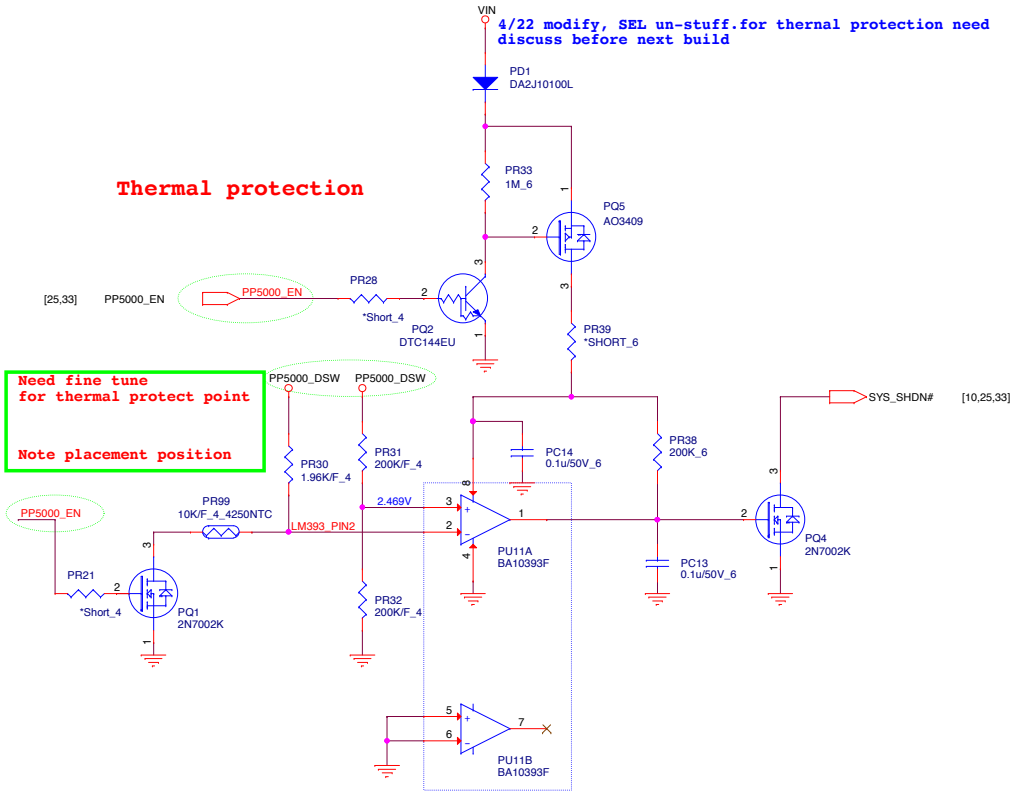



Quanta Computer Inc.

PROJECT : ZRF

| Size | Document Number | Rev |
|---|---|---|
| | +VCCIN(TPS51622) | A |
| Date: Monday, January 12, 2015 | Sheet 31 of 38 | |




For EC control thermal protection (output 3.3V)

Quanta Computer Inc.

PROJECT : ZRF

| Size | Document Number | Rev |
|---|---|---|
| | +1.5V/Thermal protect | A |

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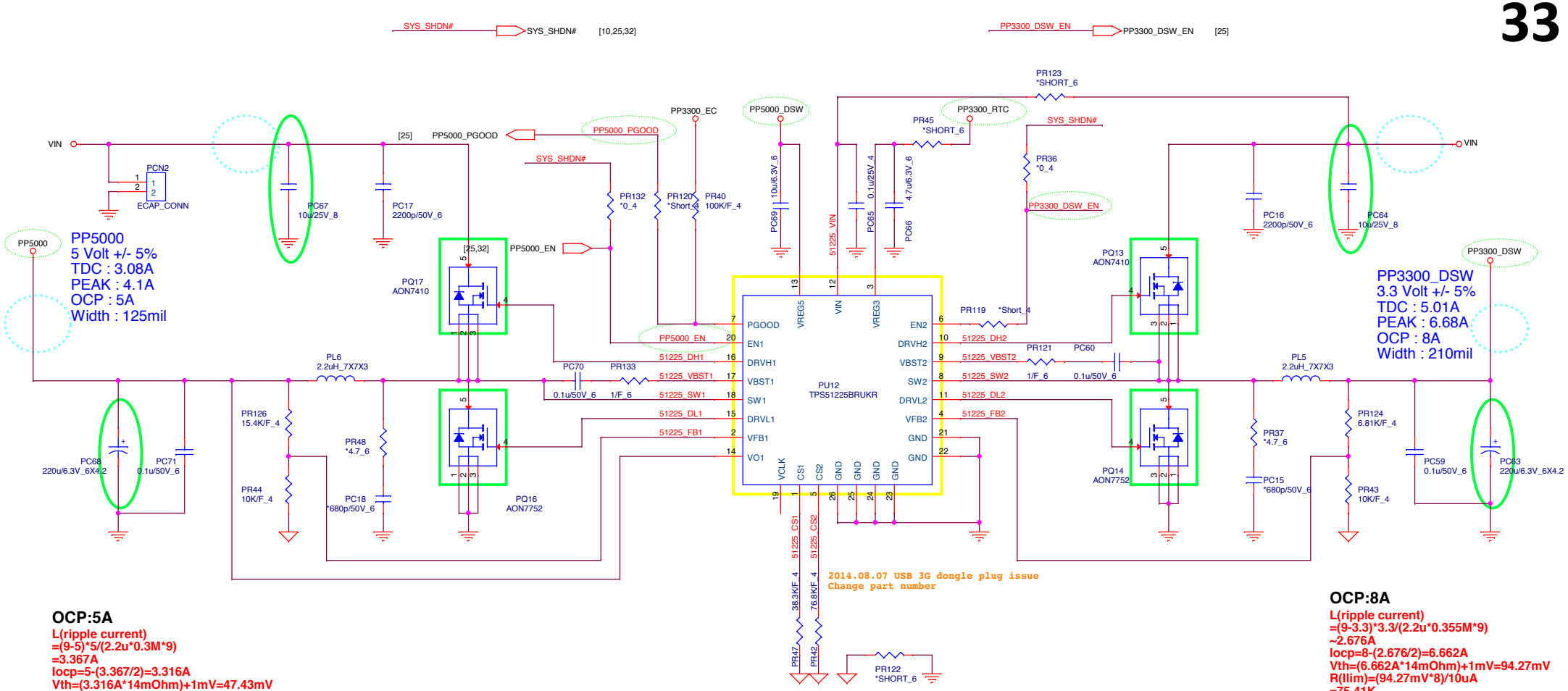


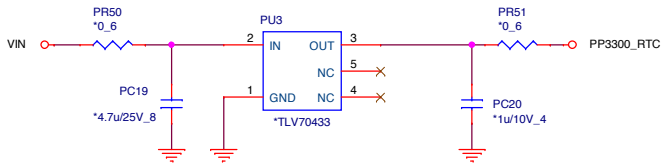


| | | |
|---|---|---|
| Quanta Computer Inc. | | |
| PROJECT : ZRF | | |
| Size | Document Number: SYSTEM 5V/3V (TPS51225) | Rev: A |
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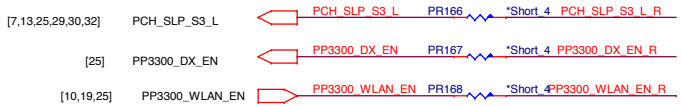
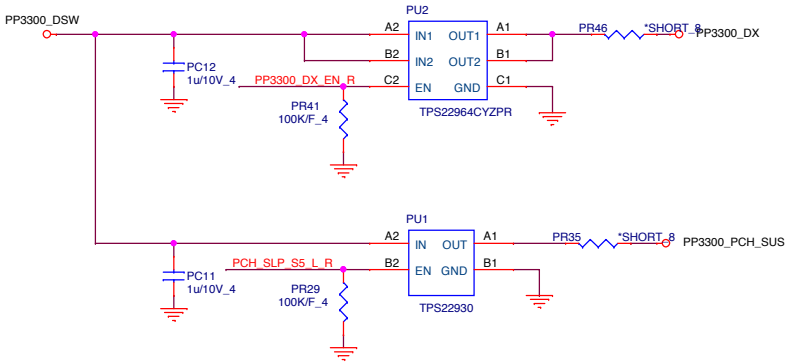
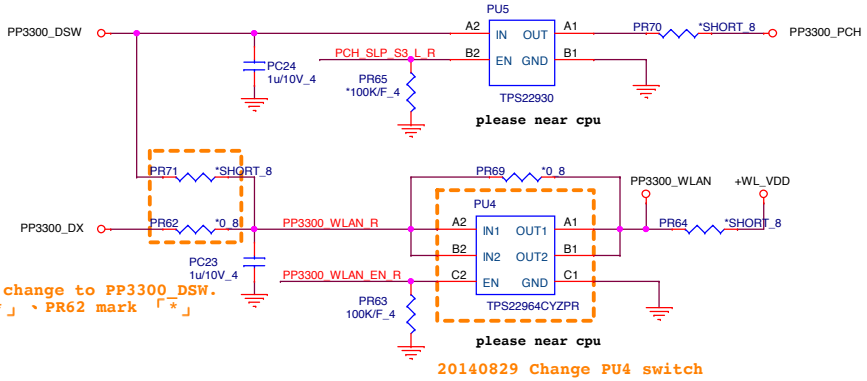
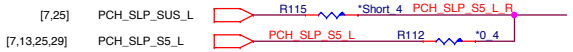



20140902 Power change to PP3300_DSW.
PR71 cancel 「*」、PR62 mark 「*」

20140829 Change PU4 switch

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|---|---|---|
| | Load Switch | A |

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# Battery Mode



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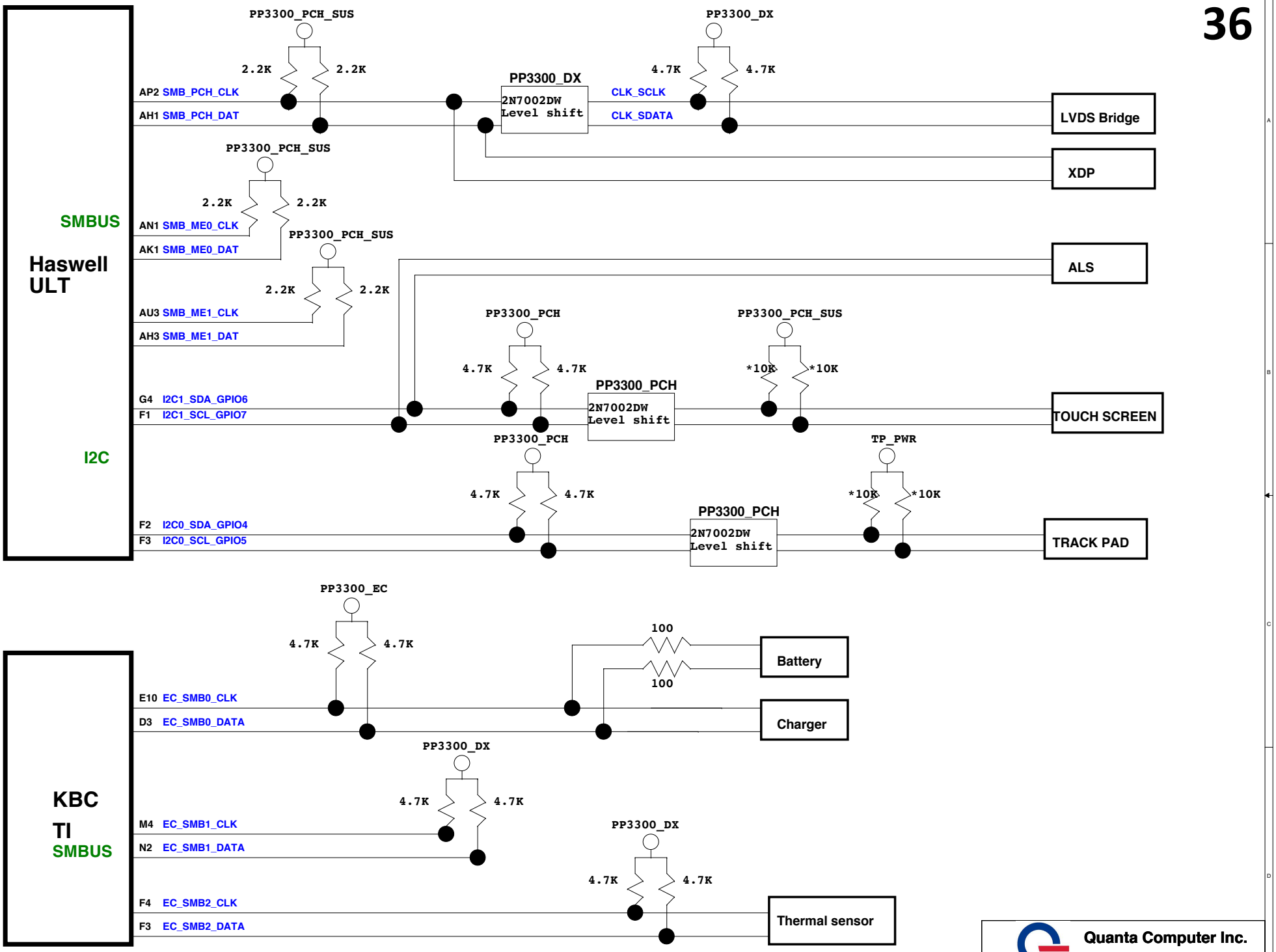


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|---|---|---|
| | SMBUS_I2C | A |
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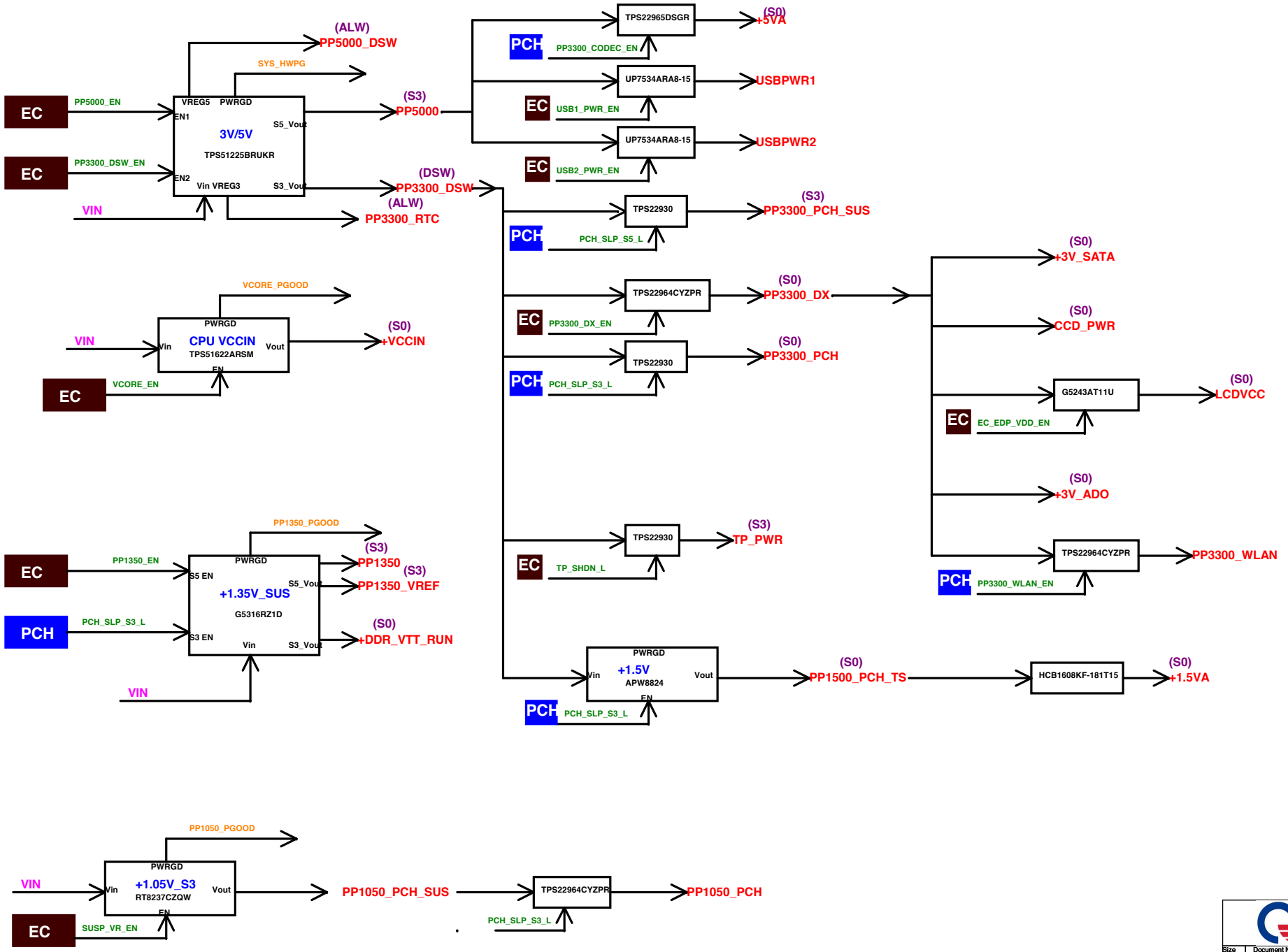


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| Size | Document Number | Rev |
|---|---|---|
| | ULT PWR CONTROL | A |

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| Model | Version | CHANGE LIST |
|---|---|---|
| ZRF | 1A-1 | 2014/07/28 Hall sensor change to LED board. (MR1)<br>2014/07/28 Page24: Change touchpad conn. as Hugo. (CN10) (change to larger pitch)<br>2014/07/28 Page25: Cardreader conn. 20 pin change to 22 pin. (CN9)<br>2014/07/28 Page24: Add Q44 on Track Pad INT# for leakage issue |
| | 1A-2 | 2014/07/30 Page24: U17 change part NO. same as 0C7. |
| | 1A-3 | 2014/08/04 Page16: LCD conn. 30pin change to 40pin, 1 LEN change to 2 LEN. (CN3) |
| | 1A-4 | 2014/08/06 Page16: touchpanel level shift remove Q13 change to U38. |
| | 1A-5 | 2014/08/07 Page24: Remove 3G/SIM. Q23 MOS 1 channel change to 2 channel,<br>remove USBP9n- + USBP5+ pin, remove NGFF PCIE pin, remove NGFF CLK pin, GPIO59 pull high.<br>2014/08/07 Page33: System 5V/3V change part NO. (PU12) |
| | 1A-6 | 2014/08/08 Page16: Touch panel INT/RST(TPS) mark 「*」<br>2014/08/08 Page24: Change CN10 same as ZQ0.<br>2014/08/08 Page27: LID_OPEN_L pin add TP139 |
| | 1A-7 | 2014/08/11 Page10: LTE_DISABLE_L (GPIO39) pull high to PP3300_PCH_SUS<br>2014/08/11 Page27: Remove light semor. |
| | 1A-8 | 2014/08/12 Page16: touchpanel level shift remove U38 change to PJT138K.<br>2014/08/12 Page22: Codec pin27 add 100K resistance |
| | 1A-9 | 2014/08/19 Page24: KB change to 30pin.<br>2014/08/19 Page27: CR cable connector change footprint |
| | 1A-10 | 2014/08/20 Page19: Wifi on board IC change to same as ZS8 connector.<br>2014/08/20 Page28: PJ2 battery connector change to 10pin same as Z09.<br>2014/08/20 Page28: Add another PJ3 battery connector for A test. |
| | 1A-11 | 2014/08/21 Page16: LCD conn. I2C1_SDA_GPIO6_CONN pin reserve a 15pF capacitor. |
| | 1A-12 | 2014/08/22 Page19: Wifi return to another onboard module 7260SDW<br>2014/08/22 Page28: PJ3 battery connector change to 8pin same as Roxy. |
| | 1A-13 | 2014/08/25 Page19: Change power capacitor value. |
| | 1A-14 | 2014/08/26 Page28: Change power output MOS/capacitor. (PQ18 + PQ19 + PC75)<br>2014/08/26 Page29: Change power output MOS/capacitor. (PQ20 + PQ21 + PC31)<br>2014/08/26 Page30: Change power output MOS/capacitor. (PQ10 + PQ11 + PC47)<br>2014/08/26 Page32: Change 1.5V solution IC.<br>2014/08/26 Page33: Change power output MOS/capacitor. (PQ13 + PQ14 + PQ16 + PQ17 + PC63 + PC64 + PC67 + PC68)<br>2014/08/26 Page19: Wifi PCIE TX/RX swap, and RX add capacitor.<br>2014/08/26 Page19: Change wifi onboard module 7260SDW footprint. |
| | 1A-15 | 2014/08/27 Page19: Pin W_DISABLE# / W_DISABLE#2 add 100K resistance pulldown.<br>2014/08/27 Page16: LCD conn. change PN / footprint same as ZQ0.<br>2014/08/27 Page18: Change HDMI conn. CN5 footprint. |
| | 1A-16 | 2014/08/28 Page28: BATT conn. P12 mirror vertically.<br>2014/08/28 Page26: 1. Add HOLE27.<br>2.Change HOLE17/HOLE18/HOLE21/HOLE22/HOLE23/HOLE26 footprint.<br>3. Remove HOLE9/HOLE16.<br>2014/08/28 Page19: Wifi 100K resistance R631/R632 mark 「*」 |
| | 1A-17 | 2014/08/29 Page34: Change LDO PU4 switch<br>2014/08/29 Page28: Change PJ1 DC-IN part number.<br>2014/08/29 Page32: Change 1.5V PU16 part number. |
| | 1A-18 | 2014/09/2 Page28: DC-in return to original PN. |
| | 1A-19 | 2014/09/9 Page19: Change wifi onboard module 7260SDW footprint. |
| | 1A-20 | 2014/09/12 Page16: C16 EOD, change PN.<br>2014/09/12 Page20: C379/C380/C381/C382 EOD, change PN.<br>2014/09/12 Page22: L45,7 EOD, change PN.<br>2014/09/12 Page25: C208/C352/C360/L15 EOD, change PN.<br>2014/09/12 Page28: PC87/PJ1 EOD, change PN.<br>2014/09/12 Page29: PC100 EOD, change PN.<br>2014/09/12 Page30: PR83 EOD, change PN. |
| | 1B-1 | 2014/09/22 Page22: A-MIC change to D-MIC same as Hugo(ZHQ). |
| | 1B-2 | 2014/09/23 Page26: Add Lid Switch (HSI)<br>2014/09/23 Page22: D-MIC PWR remove PP1800_PCH, change use PP3300_PCH. |
| | 1B-3 | 2014/09/24 Page26: USB3.0 U8 P1/P2 add C399/D34. |
| | 1B-4 | 2014/09/25 Page27: Thermal MOSFET Q25/Resistance R585 mark 「*」 un-stuff.<br>OVERT# power PP3300_DX change to PP3300_EC. |
| | 1B-5 | 2014/09/26 Page22: Change CN12 footprint. |
| | 1B-6 | 2014/09/30 Page23: Change CN7 Audio_Jack PN. & footprint.<br>2014/09/30 Page16: Change CN3 LCD conn. footprint.<br>2014/09/30 Page25: Change U5 EC PN. |
| | 1B-7 | 2014/10/02 Page24: KB change PN./Footprint. |
| | 1C-1 | 2014/10/09 Page25: EC N12 pin add BAT_ID to identify 48watt BATT. conn. & add R633 pull high.<br>2014/10/09 Page28: BATT. conn. add BAT_ID to identify 48watt BATT. |
| | 1C-2 | 2014/10/14 Page19: Change wifi onboard module 7260SDW PN. |
| | 1C-3 | 2014/10/15 Page24: Fan connector Pin3/Pin4 reserve 1000pF capacitor for EMI solution. |
| | 1C-4 | 2014/10/16 Page28: Change DC-in PN. (new module) |
| | 1C-5 | 2014/10/20 Page34: LDO PU4 power change to PP3300_DSW, PR71 cancel 「*」 + PR62 mark 「*」 |
| | 1C-6 | 2014/10/21 Page16: LCD conn. footprint return to ZQ0.<br>2014/10/21 Page13: Intel require modify ITP CN15 P9/P51 add PP1050_PCH_SUS, P50 PP1050_PGOOD change to VCCST_PWRGD. |
| | 1D-1 | 2014/10/29 Page31: PC40 EOD, change PN. |
| | 1D-2 | 2014/11/12 Page22: C193 change to 0.1uF.<br>2014/11/12 Page all: 0 ohm resistance change to short pad. |
| | 1D-3 | 2014/11/18 Page22/Page25: change D27/D28 PN. |
| | 1D-4 | 2014/11/20 Page25 Change EC_BRD_ID, ID2 change to High, ID3 change to Low, because EC change code. |
| | 1D-5 | 2014/11/25 Page28 Change PR73 to un-stuff. |
| | 1D-6 | 2014/12/01 Page21 Change TPM power.<br>2014/12/01 Page22 DMIC_CLK_L reserve 22pF capacitor.<br>2014/12/01 Page25 Change EC new PN.<br>2014/12/01 Page27 Stuff L12, remove R371/R372.<br>2014/12/01 Page28 Change DC-in footprint. |
| | 1D-6 | 2014/12/02 Page28 Change PJ2 to un-stuff. |
| | 1D-7 | 2014/12/05 CH4102K1B03 EOD parts, change PN. CH4103K1B08.<br>2014/12/05 CH4102K.B93 EOD parts, change PN. CH4103K1B08.<br>2014/12/05 CS22212FB11 EOD parts, change PN. CS22202FB08.<br>2014/12/05 「R549/R550/R598/R600/140/R387/R313/R360/R381/R388/R147/R415/R421/R477/R478/R492/R483/R61/R74/R351/R429/R55/R355/R399/R374/R100/R109/R124/R192/R278/R285/R286/R198/R205/R259/R260/R502/R512/R558/R489/R584/R148/R491/R152/R133/R425/R51/R93/R94/R102/R117/R423/PR33/R284/R555/R559/R562/R563/R546/PR129/PR130/PR145/PR147/PR154/PR156/PR34/PR73/PR171/PR172/PR117/PR118/R204/R206/R287/R519/R567/R568/PR160/PR162/PR163/PR165/PR82/PR88/PR100/PR101/PR115/PR116/PR126/PR119/PR23/PR121/PR28/PR119/PR120/R369/R38/R105/R411/R414/R451/R459/R489/R88/R297/R72/R371/R372/R443/R445/R461/R167/R217/R276/R436/R171/R179/R191/R194/R497/R598/R551/R552/R0/PR166/PR167/PR168/R115/L17/L20/R456/R168/R125/R18/R19/R52/R53/R54/R67/R9/R95/R11/PR146/R408/R103/R107/R23/R202/R220/R252/R264/PR158/PR86/PR91/PR39/PR122/R270/R271/R272/R273/R14-49/L6/PR135/PR123/PR45/R34/R59/R17/R22/R303/R304/R468/R84/R76/R289/PR14/PR170/PR175/PR35/PR46/PR64/PR70/PR71」 0 ohm change to shortpad. |
| | 1D-8 | 2015/01/09 Page25 Change U15 EC IC PN. for MP. |
| | 1D-9 | 2015/01/12 Page28 Change resistance PR151/PR152 to 0 ohm to solve 4-cell battery ripple issue. |

| DOC NO. | PROJECT MODEL : | Chrome | APPROVED BY: | | DATE: | |
|---|---|---|---|---|---|---|
| | PART NUMBER: | | DRAWING BY: | | REVISON: | |

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Change list
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