

Model Name: GA-H81M-S1

Revision 1.0

SHEET

TITLE

| | |
|----|----------------------------|
| 01 | COVER SHEET |
| 02 | BOM & PCB MODIFY HISTORY |
| 03 | BLOCK DIAGRAM |
| 04 | CPU_LGA1150-A |
| 05 | CPU_LGA1150-B |
| 06 | CPU_LGA1150-C |
| 07 | DDR III CHANNEL A |
| 08 | DDR III CHANNEL B |
| 09 | PCH_FDI,DMI,USB,PCIE,NVRAM |
| 10 | PCH_DP,CLK BUFFER |
| 11 | PCH_HOST,SATA,PCI |
| 12 | PCH_GPIO,CTRL,AUDIO |
| 13 | PCH_PWR,GND |
| 14 | PCI EXPRESS*16 SLOT |
| 15 | PCI EXPRESS X1 *2 SLOT |
| 16 | ITE 8620 |
| 17 | COM,KB_MS_USB,USB30_20 |
| 18 | HWM,FAN CTRL,OV,-PROCHOT |
| 19 | DUAL BIOS |
| 20 | FP,FUSB,SPK,SATALED |
| 21 | Realtek ALC887-VD2 |
| 22 | REAR AUDIO JACK |
| 23 | REALTEK RTL8111F |
| 24 | DISCRETE POWER |
| 25 | ATX , CLOCK GEN |
| 26 | VCORE ISL95812_1 |
| 27 | VCORE ISL95812_2 |

SHEET

TITLE

| | |
|----|------------------|
| 28 | RT8120_DDR POWER |
| 29 | |
| 30 | |
| 31 | |
| 32 | |

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Gigabyte Technology

Cover Sheet

| | | |
|------------------------------|--------------------------------------|-------------------|
| Size Custom | Document Number GA-H81M-S1 | Rev 1.0 |
| Date: Tuesday, July 09, 2013 | Sheet 1 of 29 | |

Model Name: GA-H81M-S1

Revision 1.0

Component value change history

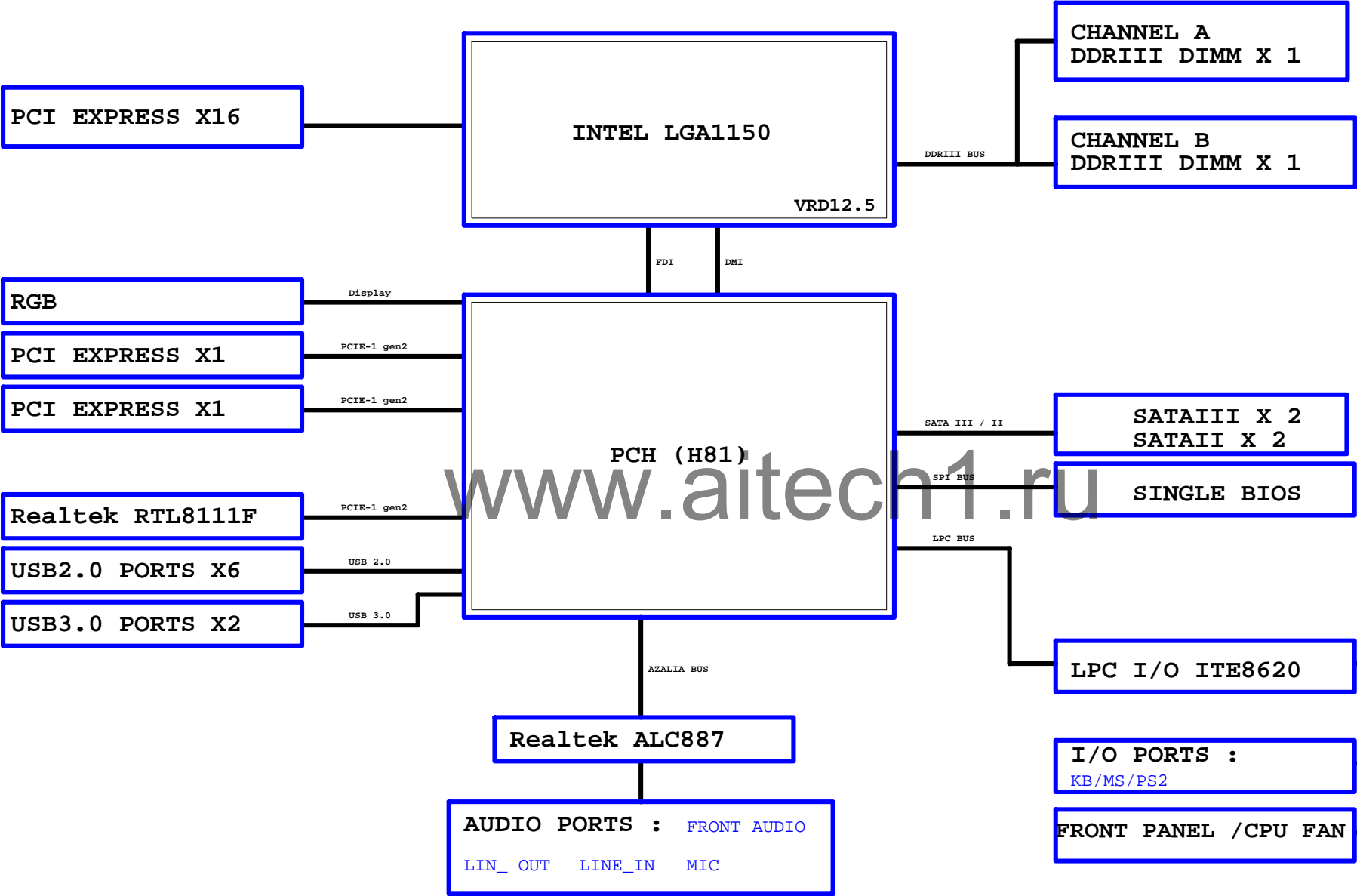
2013/05/02

[illegible]

Circuit or PCB layout change

[illegible]

BLOCK DIAGRAM



CFG 0-17 all internal PULL-UP

Diagram illustrating the LGA1150D pin connections for FDI signals. The diagram shows a central pin grid with various signals connected to specific pins. Signals include FDI_CSYSYNC, FDI_INT, FDI_RCOMP, FDI_TXN0, FDI_TXP0, FDI_TXN1, and FDI_TXP1. Connections are shown as red lines with labels like [9] FDI_CSYSYNC, [9] FDI_INT, [10] N_DP_CLK, [10] N_DP_CLK, FDI_TXN0, FDI_TXP0, FDI_TXN1, and FDI_TXP1. A blue box highlights the central pin grid area. A legend at the bottom shows FDI_TXP0.1 and FDI_TXN0.1 connected to pins [9] and [10] respectively.

| PCIEX16:16/5/5/5/16(breakout min 10/4/4/4/10) | | | | | | | | | |
|--|-----|-----------|-----------|-----|--------------|--|--|--|--|
| Impedance=80 +- 1.5% | | | | | | | | | |
| LGA1150C | | | | | | | | | |
| PA EXP RXP0 | E15 | PEG_RXP0 | PEG_TXP0 | A12 | PA EXP TXP0 | | | | |
| PA EXP RXN0 | F15 | PEG_RXN0 | PEG_TXN0 | B12 | PA EXP TXN0 | | | | |
| PA EXP RXP1 | D14 | PEG_RXP1 | PEG_TXP1 | B11 | PA EXP TXP1 | | | | |
| PA EXP RXN1 | E14 | PEG_RXN1 | PEG_TXN1 | C11 | PA EXP TXN1 | | | | |
| PA EXP RXP2 | E13 | PEG_RXP2 | PEG_TXP2 | C10 | PA EXP TXP2 | | | | |
| PA EXP RXN2 | F13 | PEG_RXN2 | PEG_TXN2 | D10 | PA EXP TXN2 | | | | |
| PA EXP RXP3 | D12 | PEG_RXP3 | PEG_TXP3 | B9 | PA EXP TXP3 | | | | |
| PA EXP RXN3 | E12 | PEG_RXN3 | PEG_TXN3 | C9 | PA EXP TXN3 | | | | |
| PA EXP RXP4 | E11 | PEG_RXP4 | PEG_TXP4 | C8 | PA EXP TXP4 | | | | |
| PA EXP RXN4 | F11 | PEG_RXN4 | PEG_TXN4 | D8 | PA EXP TXN4 | | | | |
| PA EXP RXP5 | F10 | PEG_RXP5 | PEG_TXP5 | B7 | PA EXP TXP5 | | | | |
| PA EXP RXN5 | G10 | PEG_RXN5 | PEG_TXN5 | C7 | PA EXP TXN5 | | | | |
| PA EXP RXP6 | E9 | PEG_RXP6 | PEG_TXP6 | A6 | PA EXP TXP6 | | | | |
| PA EXP RXN6 | F9 | PEG_RXN6 | PEG_TXN6 | B6 | PA EXP TXN6 | | | | |
| PA EXP RXP7 | F8 | PEG_RXP7 | PEG_TXP7 | B5 | PA EXP TXP7 | | | | |
| PA EXP RXN7 | G8 | PEG_RXN7 | PEG_TXN7 | C5 | PA EXP TXN7 | | | | |
| PA EXP RXP8 | D3 | PEG_RXP8 | PEG_TXP8 | E1 | PA EXP TXP8 | | | | |
| PA EXP RXN8 | D4 | PEG_RXN8 | PEG_TXN8 | F2 | PA EXP TXN8 | | | | |
| PA EXP RXP9 | E4 | PEG_RXP9 | PEG_TXP9 | F2 | PA EXP TXP9 | | | | |
| PA EXP RXN9 | E5 | PEG_RXN9 | PEG_TXN9 | G2 | PA EXP TXN9 | | | | |
| PA EXP RXP10 | F5 | PEG_RXP10 | PEG_TXP10 | G1 | PA EXP TXP10 | | | | |
| PA EXP RXN10 | F6 | PEG_RXN10 | PEG_TXN10 | H2 | PA EXP TXN10 | | | | |
| PA EXP RXP11 | G4 | PEG_RXP11 | PEG_TXP11 | H1 | PA EXP TXP11 | | | | |
| PA EXP RXN11 | G5 | PEG_RXN11 | PEG_TXN11 | J1 | PA EXP TXP12 | | | | |
| PA EXP RXP12 | H5 | PEG_RXP12 | PEG_TXP12 | J2 | PA EXP TXN12 | | | | |
| PA EXP RXN12 | H6 | PEG_RXN12 | PEG_TXN12 | K2 | PA EXP TXP13 | | | | |
| PA EXP RXP13 | J4 | PEG_RXP13 | PEG_TXP13 | K3 | PA EXP TXN13 | | | | |
| PA EXP RXN13 | J5 | PEG_RXN13 | PEG_TXN13 | M2 | PA EXP TXP14 | | | | |
| PA EXP RXP14 | K5 | PEG_RXP14 | PEG_TXP14 | M3 | PA EXP TXN14 | | | | |
| PA EXP RXN14 | K6 | PEG_RXN14 | PEG_TXN14 | L2 | PA EXP TXP15 | | | | |
| PA EXP RXP15 | L4 | PEG_RXP15 | PEG_TXP15 | L1 | PA EXP TXN15 | | | | |
| PA EXP RXN15 | L5 | PEG_RXN15 | PEG_TXN15 | | | | | | |
| A DMI ORXP | U3 | DMI_RXP0 | DMI_TXP0 | A44 | A DMI OTXP | | | | |
| A DMI ORXN | T3 | DMI_RXN0 | DMI_TXN0 | A45 | A DMI OTXN | | | | |
| A DMI 1RXP | U1 | DMI_RXP1 | DMI_TXP1 | AB3 | A DMI 1TXP | | | | |
| A DMI 1RXN | U2 | DMI_RXN1 | DMI_TXN1 | AB4 | A DMI 1TXN | | | | |
| A DMI 2RXP | V2 | DMI_RXP2 | DMI_TXP2 | AC5 | A DMI 2TXP | | | | |
| A DMI 2RXN | V3 | DMI_RXN2 | DMI_TXN2 | AC4 | A DMI 2TXN | | | | |
| A DMI 3RXP | W3 | DMI_RXP3 | DMI_TXP3 | AC1 | A DMI 3TXP | | | | |
| A DMI 3RXN | W4 | DMI_RXN3 | DMI_TXN3 | AC2 | A DMI 3TXN | | | | |
| <div> <div> <div>W=12 mil out of CPU</div> <div>S=15 mil out of CPU</div> </div> <div> <div>RSVD_TP</div> <div>RSVD_TP</div> <div>RSVD_TP</div> <div>RSVD_TP</div> </div> </div> | | | | | | | | | |

1.1V分壓

VCC3

WR26
2K4/1/X

WR31
1K4/1/X

A_CPUREST

BC102
1n4/X/R/50V/K

A_CPUREST [11,16]

For IT8620 Ctrl

CPU_VTT_OR

| | | |
|-----|------------|-----------|
| WR3 | 90.9/4/1/X | PVIDSLCK |
| WR2 | 115/4/1 | PVIDSOUT |
| WR4 | 75/4/1 | -PVIDALRT |

| CPU_VTT_O | VCC1_05_PCH |
|-----------------|---------------------------|
| WR16 514/1/X | A TMS |
| WR16 514/1/X | A TDO |
| WR17 514/1/X | A TDI |
| WR30 514/1/x | A-HPRDY |
| WR11 514/1/x | A TCK |
| WR9 514/1/x | A-TRST |
| WR29 1K4/1/X | A PECl |
| WR10 1K4/1/X | A-CATERR |
| WR25 1K4/1/x | A-PROCHOT |
| WR56 514/1/X | N-PUPWROK |
| WR55 1K4/1/X | |
| A-THRMTrip | WR8 1K4/1 x VCC1_05_PCH |
| A-PWR_DEBUG | WR34 150/4/1 VCC1_05_PCH |
| | WR33 10K4/1/X |
| A-DBR | WR21 8.2K4/X 3VDUAL |
| | WR20 0/4/X N_SYS_RST [12] |
| A-DDR_COMP0 | WR28 100/4/1 |
| A-DDR_COMP1 | WR19 75/4/1 |
| A-DDR_COMP2 | WR22 100/4/1 |
| A-TESTLOW_1 | WR18 49.9/4/1 |
| A-TESTLOW_2 | WR12 49.9/4/1 |
| A-HSW_CFG_RCOMP | WR24 49.9/4/1 |

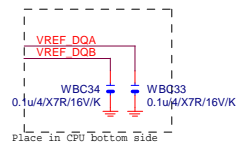
LGA1150 (A)

| | | | | | |
|----------|--------|-------------|-----------|------|-------|
| LGA1150A | | DDR0_MA0 | DDR0_D00 | AD38 | MDA0 |
| MAAA0 | AU13 | DDR0_MA1 | DDR0_D01 | AD39 | MDA1 |
| MAAA1 | AV16 | DDR0_MA2 | DDR0_D02 | AF38 | MDA2 |
| MAAA2 | AU16 | DDR0_MA3 | DDR0_D03 | AF39 | MDA3 |
| MAAA3 | AW17 | DDR0_MA4 | DDR0_D04 | AD37 | MDA4 |
| MAAA4 | AW18 | DDR0_MA5 | DDR0_D05 | AD40 | MDA5 |
| MAAA5 | AW17 | DDR0_MA6 | DDR0_D06 | AE37 | MDA6 |
| MAAA6 | AT18 | DDR0_MA7 | DDR0_D07 | AF40 | MDA7 |
| MAAA7 | AU18 | DDR0_MA8 | DDR0_D08 | AH40 | MDA9 |
| MAAA8 | AT19 | DDR0_MA9 | DDR0_D09 | AH39 | MDA10 |
| MAAA9 | AW11 | DDR0_MA10 | DDR0_D10 | AK38 | MDA10 |
| MAAA10 | AW11 | DDR0_MA11 | DDR0_D11 | AK39 | MDA11 |
| MAAA11 | AV19 | DDR0_MA12 | DDR0_D12 | AH37 | MDA12 |
| MAAA12 | AU19 | DDR0_MA13 | DDR0_D13 | AH38 | MDA13 |
| MAAA13 | AT20 | DDR0_MA14 | DDR0_D14 | AK37 | MDA14 |
| MAAA14 | AT20 | DDR0_MA15 | DDR0_D15 | AK40 | MDA15 |
| MAAA15 | AU21 | DDR0_MA16 | DDR0_D16 | AM40 | MDA17 |
| MODT_A0 | AW10 | DDR0_ODT0 | DDR0_ODT0 | AM39 | MDA21 |
| MODT_A1 | AY8 | DDR0_ODT1 | DDR0_ODT1 | AP38 | MDA18 |
| AW9 | AW9 | DDR0_ODT2 | DDR0_ODT2 | AP39 | MDA19 |
| AW8 | AW8 | DDR0_ODT3 | DDR0_ODT3 | AM37 | MDA20 |
| AW33 | AW33 | DDR0_ECC0 | DDR0_ECC0 | AM38 | MDA16 |
| AW33 | AW33 | DDR0_ECC1 | DDR0_ECC1 | AP37 | MDA22 |
| AU31 | AU31 | DDR0_ECC2 | DDR0_ECC2 | AP40 | MDA23 |
| AU31 | AU31 | DDR0_ECC3 | DDR0_ECC3 | AW37 | MDA29 |
| AU33 | AU33 | DDR0_ECC4 | DDR0_ECC4 | AU35 | MDA26 |
| AT31 | AT31 | DDR0_ECC5 | DDR0_ECC5 | AW35 | MDA27 |
| AW31 | AW31 | DDR0_ECC6 | DDR0_ECC6 | AT37 | MDA28 |
| AW31 | AW31 | DDR0_ECC7 | DDR0_ECC7 | AU37 | MDA24 |
| SBAA0 | SBAA0 | DDR0_BA0 | DDR0_D32 | AT35 | MDA30 |
| SBAA1 | SBAA1 | DDR0_BA1 | DDR0_D33 | AW35 | MDA31 |
| SBAA2 | SBAA2 | DDR0_BA2 | DDR0_D34 | AW6 | MDA33 |
| CKEA0 | CKEA0 | DDR0_CKE0 | DDR0_D35 | AU4 | MDA35 |
| CKEA1 | CKEA1 | DDR0_CKE1 | DDR0_D36 | AW6 | MDA36 |
| CSA0 | CSA0 | DDR0_CS_N0 | DDR0_D37 | AW6 | MDA32 |
| CSA1 | CSA1 | DDR0_CS_N1 | DDR0_CKE2 | AW4 | MDA38 |
| DCLKA0 | DCLKA0 | DDR0_CLK_P0 | DDR0_CKE3 | AW4 | MDA39 |
| DCLKA1 | DCLKA1 | DDR0_CLK_P1 | DDR0_D38 | AR1 | MDA41 |
| DCLKA2 | DCLKA2 | DDR0_CLK_P2 | DDR0_D39 | AR4 | MDA45 |
| DCLKA3 | DCLKA3 | DDR0_CLK_P3 | DDR0_D40 | AN3 | MDA42 |
| RSVD | RSVD | DDR0_CS_N2 | DDR0_D41 | AN4 | MDA43 |
| RSVD | RSVD | DDR0_CS_N3 | DDR0_D42 | AR2 | MDA44 |
| RSVD | RSVD | DDR0_CS_N4 | DDR0_D43 | AR3 | MDA40 |
| RSVD | RSVD | DDR0_CS_N5 | DDR0_D44 | AN2 | MDA46 |
| RSVD | RSVD | DDR0_CS_N6 | DDR0_D45 | AN1 | MDA47 |
| RSVD | RSVD | DDR0_CS_N7 | DDR0_D46 | AL1 | MDA49 |
| RSVD | RSVD | DDR0_CS_N8 | DDR0_D47 | AL4 | MDA53 |
| RSVD | RSVD | DDR0_CS_N9 | DDR0_D48 | AL4 | MDA50 |
| RSVD | RSVD | DDR0_CS_N10 | DDR0_D49 | AJ4 | MDA51 |
| RSVD | RSVD | DDR0_CS_N11 | DDR0_D50 | AL2 | MDA52 |
| RSVD | RSVD | DDR0_CS_N12 | DDR0_D51 | AJ2 | MDA48 |
| RSVD | RSVD | DDR0_CS_N13 | DDR0_D52 | AJ2 | MDA54 |
| RSVD | RSVD | DDR0_CS_N14 | DDR0_D53 | AJ1 | MDA55 |
| RSVD | RSVD | DDR0_CS_N15 | DDR0_D54 | AG1 | MDA57 |
| RSVD | RSVD | DDR0_CS_N16 | DDR0_D55 | AG4 | MDA61 |
| RSVD | RSVD | DDR0_CS_N17 | DDR0_D56 | AE3 | MDA58 |
| RSVD | RSVD | DDR0_CS_N18 | DDR0_D57 | AE4 | MDA59 |
| RSVD | RSVD | DDR0_CS_N19 | DDR0_D58 | AG2 | MDA60 |
| RSVD | RSVD | DDR0_CS_N20 | DDR0_D59 | AG3 | MDA56 |
| RSVD | RSVD | DDR0_CS_N21 | DDR0_D60 | AE2 | MDA62 |
| RSVD | RSVD | DDR0_CS_N22 | DDR0_D61 | AE1 | MDA63 |
| RSVD | RSVD | DDR0_CS_N23 | DDR0_D62 | AE39 | DQSA0 |
| RSVD | RSVD | DDR0_CS_N24 | DDR0_D63 | AJ39 | DQSA1 |
| RSVD | RSVD | DDR0_CS_N25 | DDR0_D64 | AN39 | DQSA2 |
| RSVD | RSVD | DDR0_CS_N26 | DDR0_D65 | AV36 | DQSA3 |
| RSVD | RSVD | DDR0_CS_N27 | DDR0_D66 | AV5 | DQSA4 |
| RSVD | RSVD | DDR0_CS_N28 | DDR0_D67 | AK3 | DQSA5 |
| RSVD | RSVD | DDR0_CS_N29 | DDR0_D68 | AF3 | DQSA6 |
| RSVD | RSVD | DDR0_CS_N30 | DDR0_D69 | AV32 | DQSA7 |
| RSVD | RSVD | DDR0_CS_N31 | DDR0_D70 | AE38 | DQSA0 |
| RSVD | RSVD | DDR0_CS_N32 | DDR0_D71 | AJ38 | DQSA1 |
| RSVD | RSVD | DDR0_CS_N33 | DDR0_D72 | AN38 | DQSA2 |
| RSVD | RSVD | DDR0_CS_N34 | DDR0_D73 | AJ36 | DQSA3 |
| RSVD | RSVD | DDR0_CS_N35 | DDR0_D74 | AW5 | DQSA4 |
| RSVD | RSVD | DDR0_CS_N36 | DDR0_D75 | AP2 | DQSA5 |
| RSVD | RSVD | DDR0_CS_N37 | DDR0_D76 | AK2 | DQSA6 |
| RSVD | RSVD | DDR0_CS_N38 | DDR0_D77 | AF2 | DQSA7 |
| RSVD | RSVD | DDR0_CS_N39 | DDR0_D78 | AU32 | DQSA7 |

HASWELL[10SC1-F01150-11R_10SC1-F01150-12R]

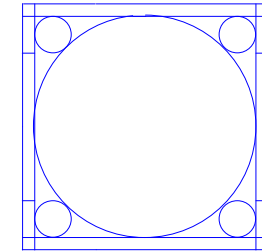
LGA1150 (B)

| | | | | | |
|----------|--------|--------------|----------|------|-------|
| LGA1150B | | DDR1_MA0 | DDR1_D00 | AE34 | MDB0 |
| MAAB0 | AL19 | DDR1_MA1 | DDR1_D01 | AE35 | MDB1 |
| MAAB1 | AK23 | DDR1_MA2 | DDR1_D02 | AG35 | MDB2 |
| MAAB2 | AM23 | DDR1_MA3 | DDR1_D03 | AH35 | MDB3 |
| MAAB3 | AP23 | DDR1_MA4 | DDR1_D04 | AD34 | MDB4 |
| MAAB4 | AL23 | DDR1_MA5 | DDR1_D05 | AD35 | MDB5 |
| MAAB5 | AY24 | DDR1_MA6 | DDR1_D06 | AG34 | MDB6 |
| MAAB6 | AY25 | DDR1_MA7 | DDR1_D07 | AH34 | MDB7 |
| MAAB7 | AU26 | DDR1_MA8 | DDR1_D08 | AL34 | MDB8 |
| MAAB8 | AW26 | DDR1_MA9 | DDR1_D09 | AL35 | MDB9 |
| MAAB9 | AP18 | DDR1_MA10 | DDR1_D10 | AL31 | MDB10 |
| MAAB10 | AY25 | DDR1_MA11 | DDR1_D11 | AL31 | MDB11 |
| MAAB11 | AY25 | DDR1_MA12 | DDR1_D12 | AK34 | MDB12 |
| MAAB12 | AY26 | DDR1_MA13 | DDR1_D13 | AK35 | MDB13 |
| MAAB13 | AR15 | DDR1_MA14 | DDR1_D14 | AK32 | MDB14 |
| MAAB14 | AV27 | DDR1_MA15 | DDR1_D15 | AL32 | MDB15 |
| MAAB15 | AY28 | DDR1_MA16 | DDR1_D16 | AL34 | MDB17 |
| MODT_B0 | AM17 | DDR1_ODT0 | DDR1_D17 | AP34 | MDB21 |
| MODT_B1 | AL16 | DDR1_ODT1 | DDR1_D18 | AN31 | MDB19 |
| AM16 | AM16 | DDR1_ODT2 | DDR1_D19 | AP31 | MDB23 |
| AK15 | AK15 | DDR1_ODT3 | DDR1_D20 | AN35 | MDB20 |
| AM26 | AM26 | DDR1_ECC0 | DDR1_D21 | AP35 | MDB16 |
| AM25 | AM25 | DDR1_ECC1 | DDR1_D22 | AN32 | MDB18 |
| AP25 | AP25 | DDR1_ECC2 | DDR1_D23 | AP32 | MDB22 |
| AP28 | AP28 | DDR1_ECC3 | DDR1_D24 | AM29 | MDB25 |
| AL26 | AL26 | DDR1_ECC4 | DDR1_D25 | AM28 | MDB28 |
| AL25 | AL25 | DDR1_ECC5 | DDR1_D26 | AR29 | MDB27 |
| AR26 | AR26 | DDR1_ECC6 | DDR1_D27 | AR28 | MDB30 |
| AR26 | AR26 | DDR1_ECC7 | DDR1_D28 | AL28 | MDB24 |
| AK17 | AK17 | DDR1_BA0 | DDR1_D29 | AP29 | MDB29 |
| SBAB1 | SBAB1 | DDR1_BA1 | DDR1_D30 | AP28 | MDB26 |
| SBAB2 | SBAB2 | DDR1_BA2 | DDR1_D31 | AP28 | MDB31 |
| CKEB0 | CKEB0 | DDR1_CKE0 | DDR1_D32 | AR12 | MDB32 |
| CKEB1 | CKEB1 | DDR1_CKE1 | DDR1_D33 | AL13 | MDB33 |
| CSB0 | CSB0 | DDR1_CS_N0 | DDR1_D34 | AL12 | MDB35 |
| CSB1 | CSB1 | DDR1_CS_N1 | DDR1_D35 | AR13 | MDB36 |
| DCLKB0 | DCLKB0 | DDR1_CLK_P0 | DDR1_D36 | AP13 | MDB37 |
| DCLKB1 | DCLKB1 | DDR1_CLK_P1 | DDR1_D37 | AM13 | MDB38 |
| DCLKB2 | DCLKB2 | DDR1_CLK_P2 | DDR1_D38 | AM12 | MDB39 |
| DCLKB3 | DCLKB3 | DDR1_CLK_P3 | DDR1_D39 | AR9 | MDB45 |
| RSVD | RSVD | DDR1_CLK_N0 | DDR1_D40 | AP9 | MDB41 |
| RSVD | RSVD | DDR1_CLK_N1 | DDR1_D41 | AR6 | MDB47 |
| RSVD | RSVD | DDR1_CLK_N2 | DDR1_D42 | AP6 | MDB43 |
| RSVD | RSVD | DDR1_CLK_N3 | DDR1_D43 | AR10 | MDB44 |
| RSVD | RSVD | DDR1_CLK_N4 | DDR1_D44 | AP10 | MDB40 |
| RSVD | RSVD | DDR1_CLK_N5 | DDR1_D45 | AR7 | MDB46 |
| RSVD | RSVD | DDR1_CLK_N6 | DDR1_D46 | AP7 | MDB42 |
| RSVD | RSVD | DDR1_CLK_N7 | DDR1_D47 | AM9 | MDB52 |
| RSVD | RSVD | DDR1_CLK_N8 | DDR1_D48 | AL9 | MDB53 |
| RSVD | RSVD | DDR1_CLK_N9 | DDR1_D49 | AL6 | MDB50 |
| RSVD | RSVD | DDR1_CLK_N10 | DDR1_D50 | AL7 | MDB55 |
| RSVD | RSVD | DDR1_CLK_N11 | DDR1_D51 | AM10 | MDB48 |
| RSVD | RSVD | DDR1_CLK_N12 | DDR1_D52 | AL10 | MDB49 |
| RSVD | RSVD | DDR1_CLK_N13 | DDR1_D53 | AM6 | MDB54 |
| RSVD | RSVD | DDR1_CLK_N14 | DDR1_D54 | AM7 | MDB51 |
| RSVD | RSVD | DDR1_CLK_N15 | DDR1_D55 | AH6 | MDB61 |
| RSVD | RSVD | DDR1_CLK_N16 | DDR1_D56 | AH7 | MDB60 |
| RSVD | RSVD | DDR1_CLK_N17 | DDR1_D57 | AE6 | MDB59 |
| RSVD | RSVD | DDR1_CLK_N18 | DDR1_D58 | AE7 | MDB63 |
| RSVD | RSVD | DDR1_CLK_N19 | DDR1_D59 | AJ6 | MDB56 |
| RSVD | RSVD | DDR1_CLK_N20 | DDR1_D60 | AJ7 | MDB57 |
| RSVD | RSVD | DDR1_CLK_N21 | DDR1_D61 | AG6 | MDB58 |
| RSVD | RSVD | DDR1_CLK_N22 | DDR1_D62 | AF7 | MDB62 |
| RSVD | RSVD | DDR1_CLK_N23 | DDR1_D63 | AF35 | DQSB0 |
| RSVD | RSVD | DDR1_CLK_N24 | DDR1_D64 | AL33 | DQSB1 |
| RSVD | RSVD | DDR1_CLK_N25 | DDR1_D65 | AN28 | DQSB2 |
| RSVD | RSVD | DDR1_CLK_N26 | DDR1_D66 | AN29 | DQSB3 |
| RSVD | RSVD | DDR1_CLK_N27 | DDR1_D67 | AN12 | DQSB4 |
| RSVD | RSVD | DDR1_CLK_N28 | DDR1_D68 | AP8 | DQSB5 |
| RSVD | RSVD | DDR1_CLK_N29 | DDR1_D69 | AL8 | DQSB6 |
| RSVD | RSVD | DDR1_CLK_N30 | DDR1_D70 | AG7 | DQSB7 |
| RSVD | RSVD | DDR1_CLK_N31 | DDR1_D71 | AN25 | DQSB8 |
| RSVD | RSVD | DDR1_CLK_N32 | DDR1_D72 | AK33 | DQSB1 |
| RSVD | RSVD | DDR1_CLK_N33 | DDR1_D73 | AN33 | DQSB2 |
| RSVD | RSVD | DDR1_CLK_N34 | DDR1_D74 | AN29 | DQSB3 |
| RSVD | RSVD | DDR1_CLK_N35 | DDR1_D75 | AN13 | DQSB4 |
| RSVD | RSVD | DDR1_CLK_N36 | DDR1_D76 | AR8 | DQSB5 |
| RSVD | RSVD | DDR1_CLK_N37 | DDR1_D77 | AM8 | DQSB6 |
| RSVD | RSVD | DDR1_CLK_N38 | DDR1_D78 | AG6 | DQSB7 |
| RSVD | RSVD | DDR1_CLK_N39 | DDR1_D79 | AN26 | DQSB8 |



HASWELL[10SC1-F01150-11R_10SC1-F01150-12R]

LGA1150 (CR)

CR
CPU RETENTION/X

LGA1150



ILM_BP/1156/CSP/ILM_BP/1156/CSP/[12KRC-0F0001-52R_12KRC-0F0001-51R]

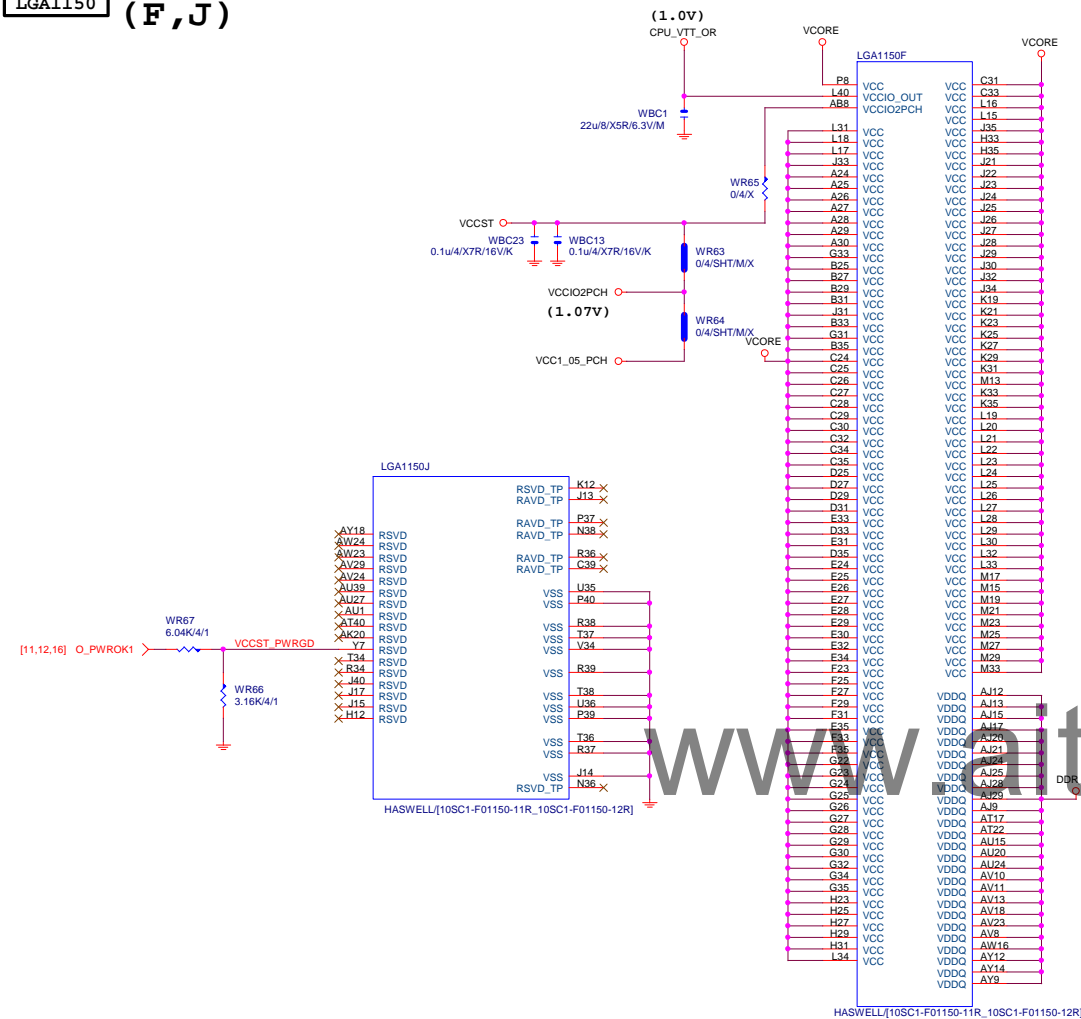
DDR BUS

| | |
|------------------|------------|
| [7] MODT_A[0..1] | MODT_A0..1 |
| [8] MODT_B[0..1] | MODT_B0..1 |
| [7] MDA[0..63] | MDA0..63 |
| [8] MDB[0..63] | MDB0..63 |
| [7] DQSA[0..7] | DQSA0..7 |
| [7] DQSA[0..7] | DQSA0..7 |
| [7] MAA[0..15] | MAA0..15 |
| [8] MAB[0..15] | MAB0..15 |
| [8] DQSB[0..7] | DQSB0..7 |
| [8] DQSB[0..7] | DQSB0..7 |

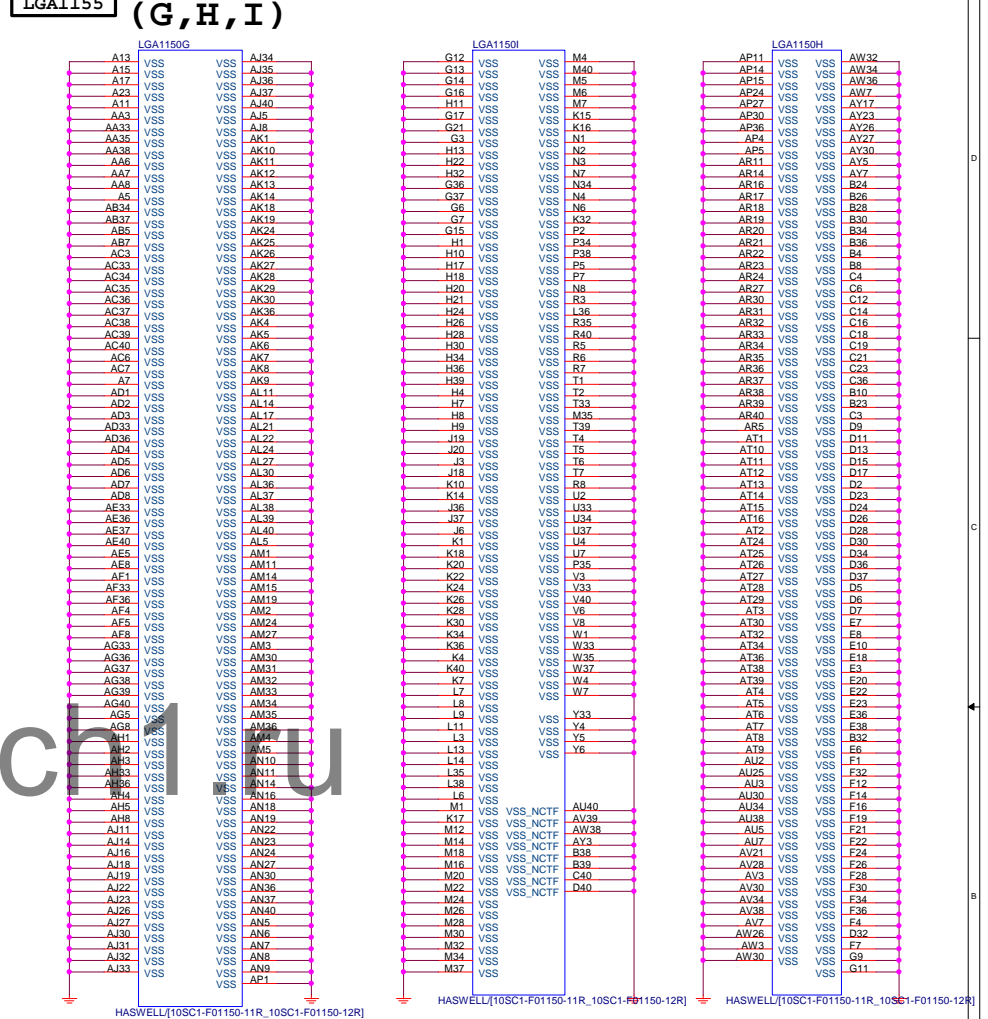
Gigabyte Technology

| | | | |
|--------|------------------------|---------------|---------|
| Title | | CPU LGA1150-B | |
| Size | Document Number | GA-H81M-S1 | |
| Custom | | | Rev 1.0 |
| Date: | Tuesday, July 09, 2013 | Sheet | 5 of 29 |

LGA1150 (F,J)

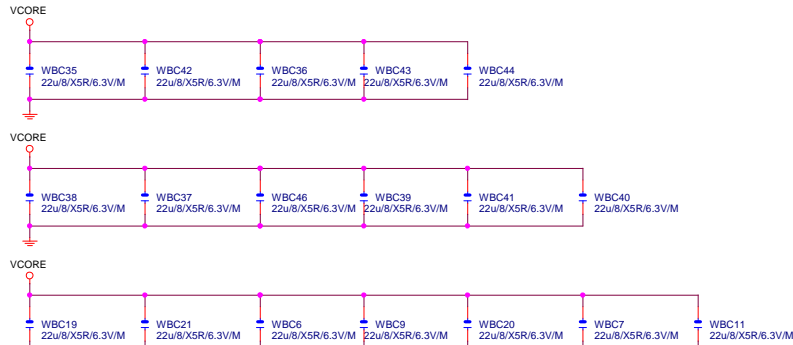


LGA1155 (G,H,I)



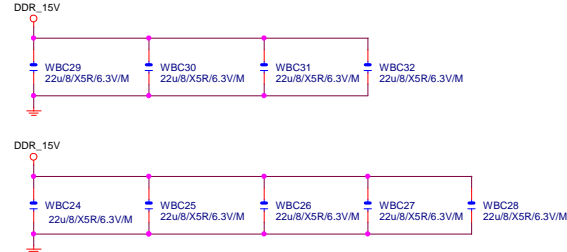
VCore CAP

(X18)



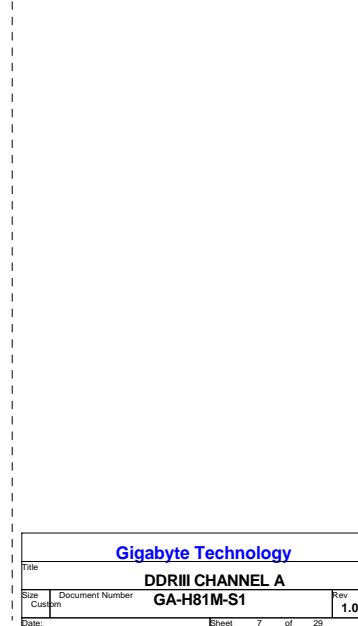
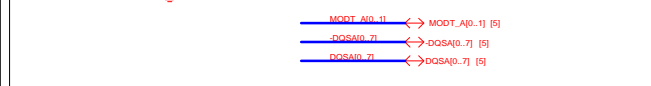
DDR CAP

(x9)



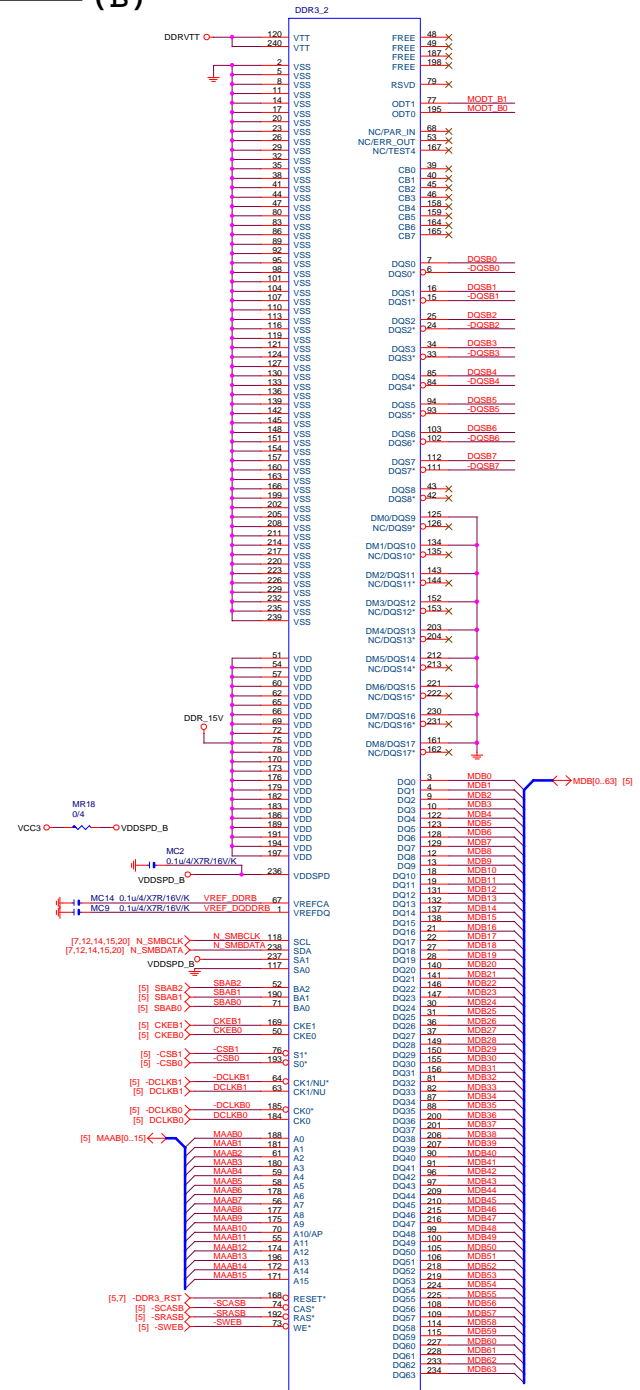
Gigabyte Technology

| | | | |
|---------------|------------------------|-------|---------|
| Title | | | |
| CPU LGA1150-C | | | |
| Size | Document Number | Rev | |
| Custom | GA-H81M-S1 | 1.0 | |
| Date: | Tuesday, July 09, 2013 | Sheet | 6 of 29 |

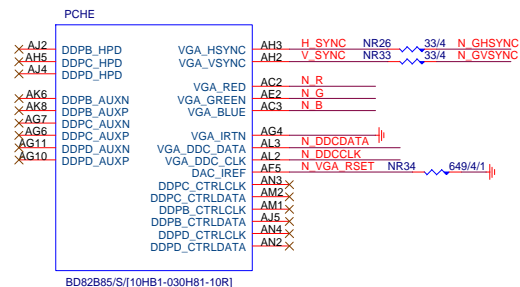


DDR3

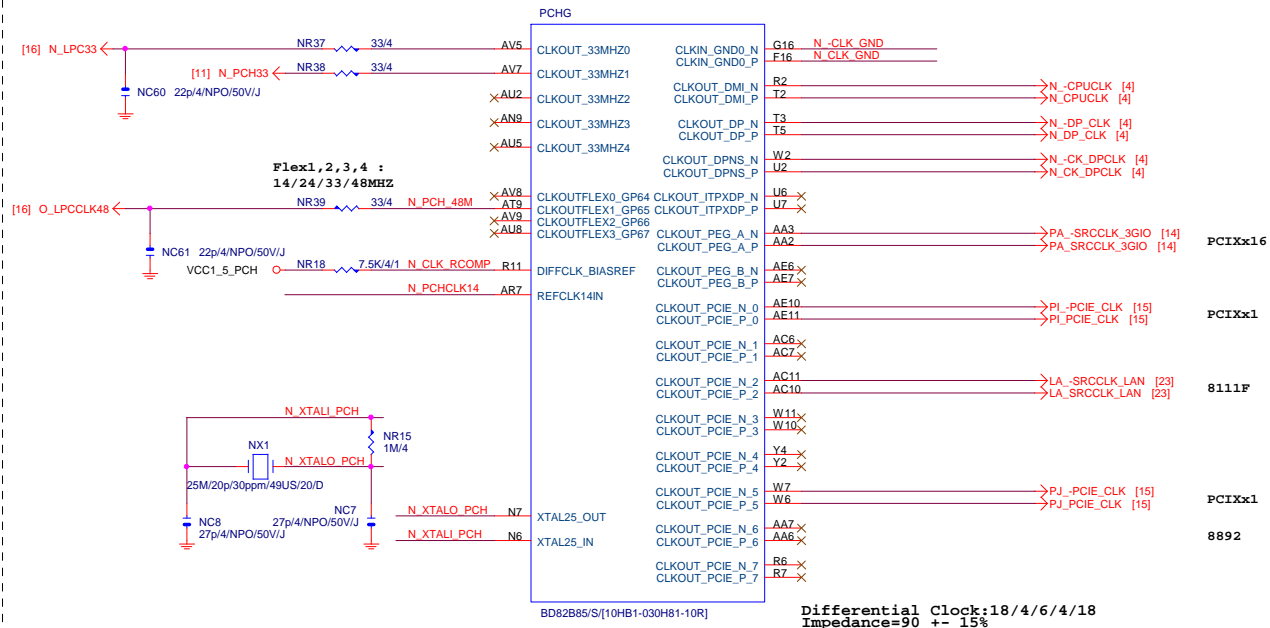
(B)



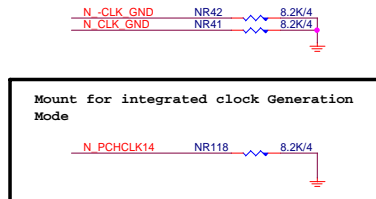
PCH (E)



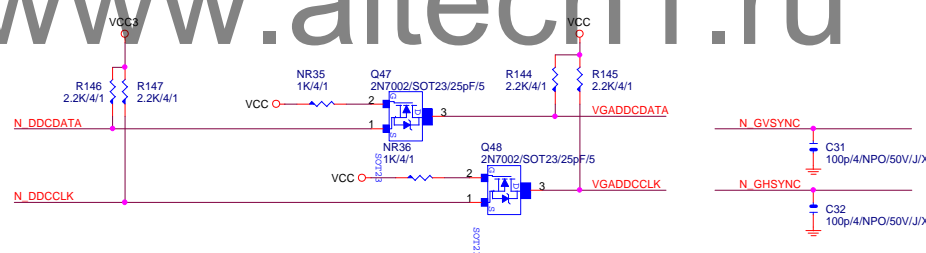
PCH (G)



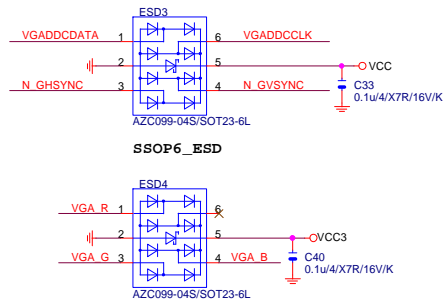
PCH CLK PD



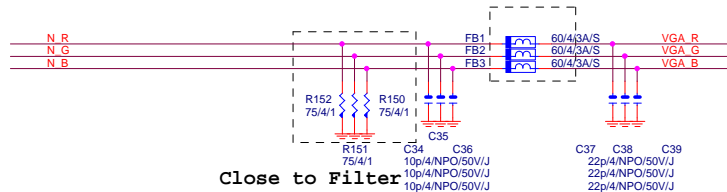
VGA DDC



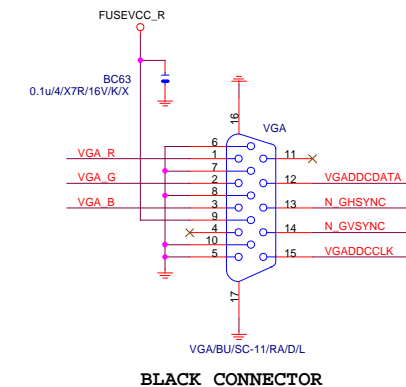
VGA ESD



VGA DDC



VGA CONNECTOR

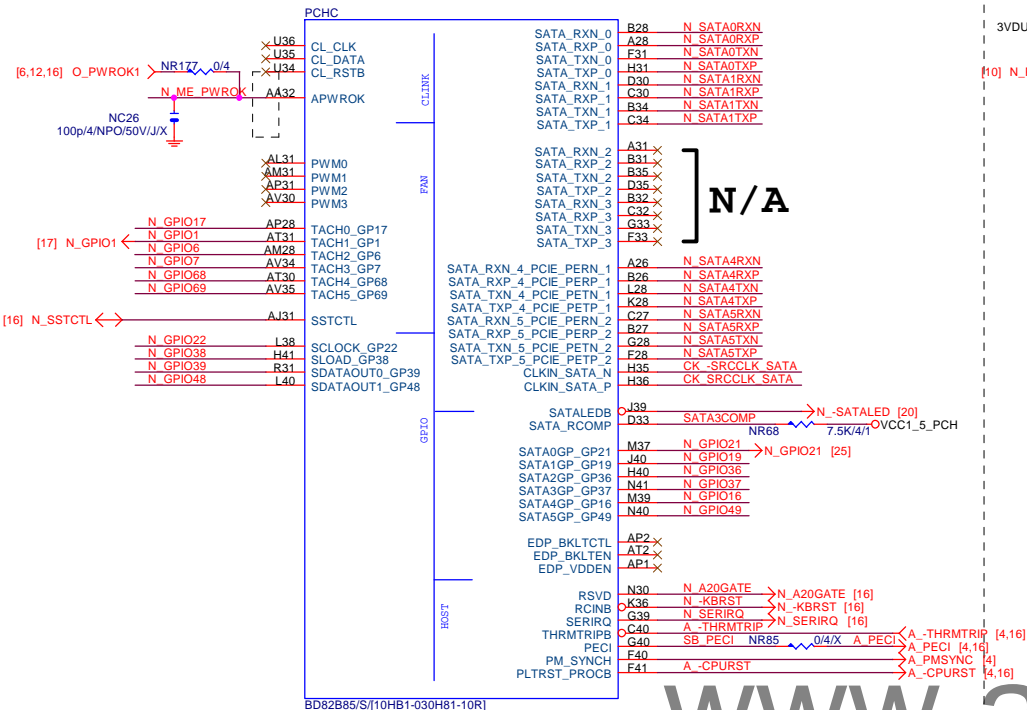


BLACK CONNECTOR

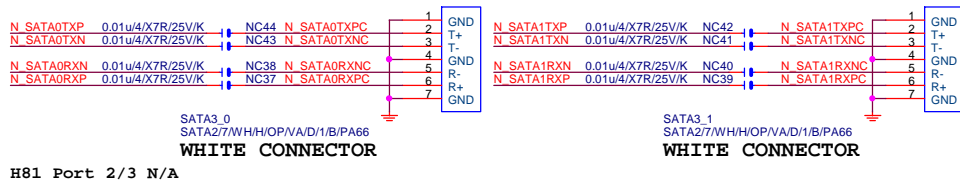
| Gigabyte Technology | | | |
|------------------------|------------------------|------------|----------|
| Title | | | |
| PCH DISPLAY_CLK BUFFER | | | |
| Size | Document Number | GA-H81M-S1 | |
| Custom | | Rev 1.0 | |
| Date: | Tuesday, July 09, 2013 | Sheet | 10 of 29 |

(C)

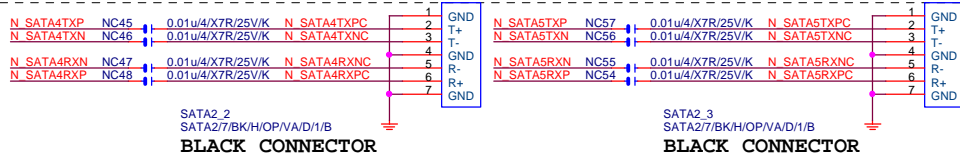
SATA3 : 20/7.5/4.5/7.5/20 (breakout min 8/4/4/4/8)
Impedance=90 +- 17.5%
SATA2 : 15/7.5/4.5/7.5/15 (breakout min 8/4/4/4/8)
Impedance=90 +- 17.5%



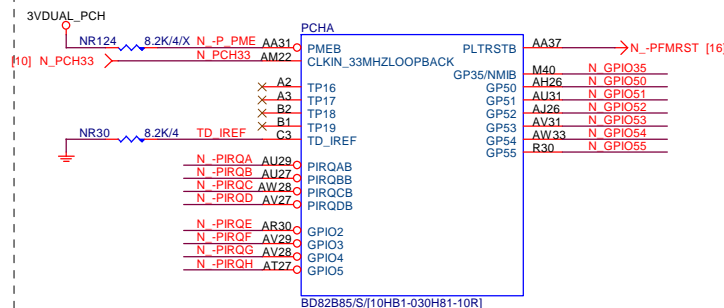
SATA CONNECTOR



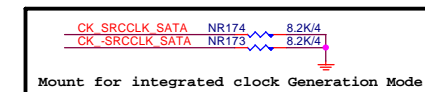
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** Z87/H87 Port 4&5 SATA3.0
** B85 Port 4&5 SATA2.0
```



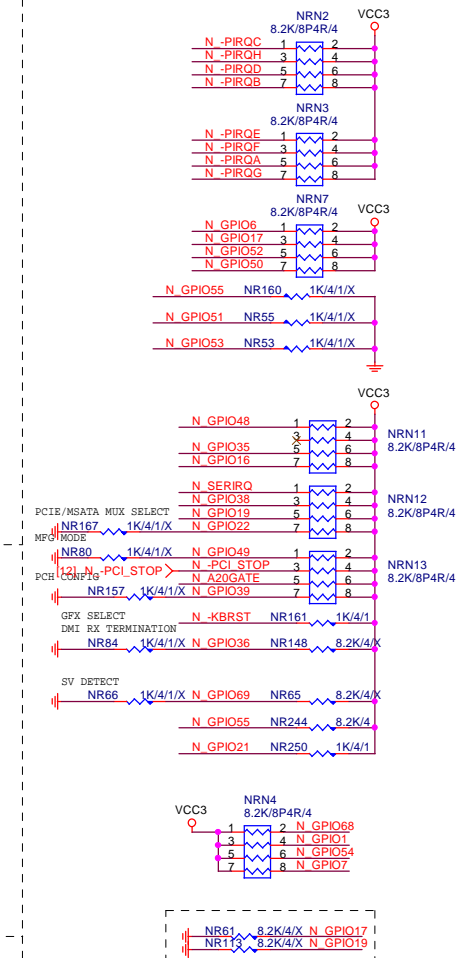
PCH (A)



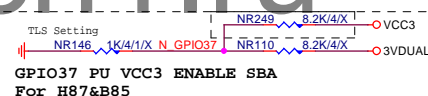
| | | |
|-----|-----|----|
| PCH | CLK | PD |
|-----|-----|----|



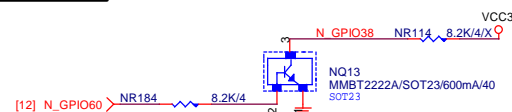
| | |
|-----|-------|
| PCH | PU/PD |
|-----|-------|



ME PWROK



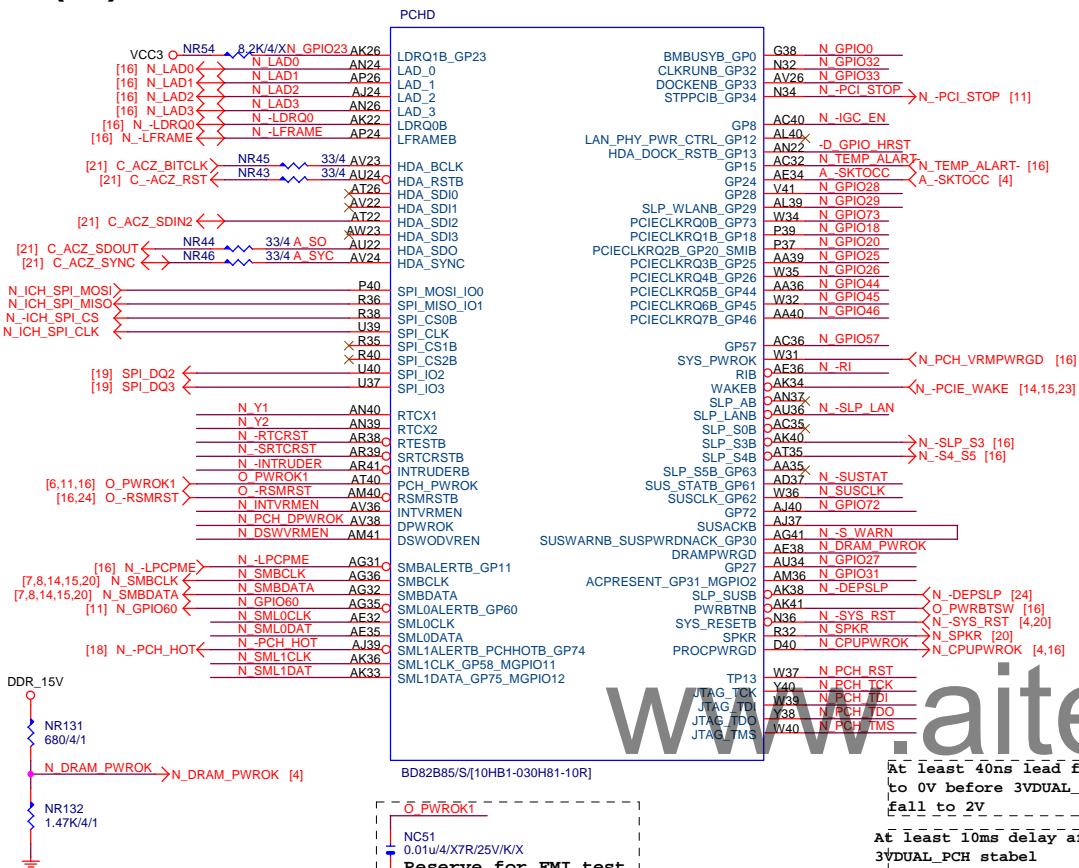
GPI038 Ctrl



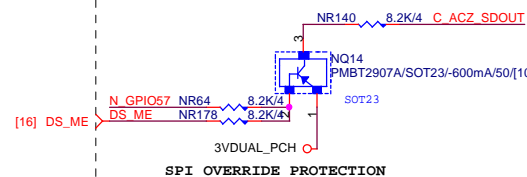
Gigabyte Technology

| | | | |
|----------------------|------------------------|-------|----------|
| Title | | | |
| PCH HOST , SATA, PCI | | | |
| Size | Document Number | | Rev |
| Custom | GA-H81M-S1 | | 1.0 |
| Date: | Tuesday, July 09, 2013 | Sheet | 11 of 29 |

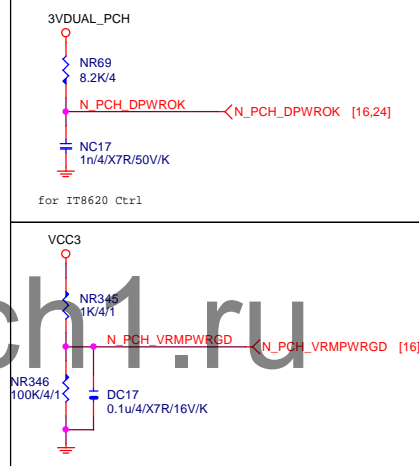
(D)



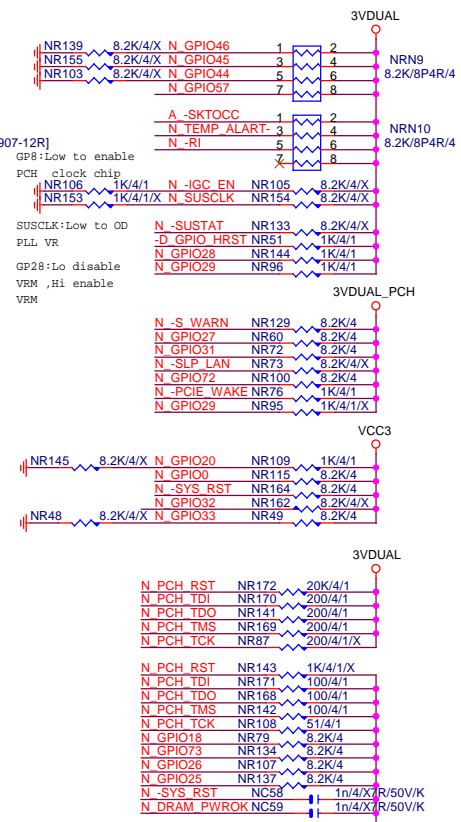
ACZ_SDOUT



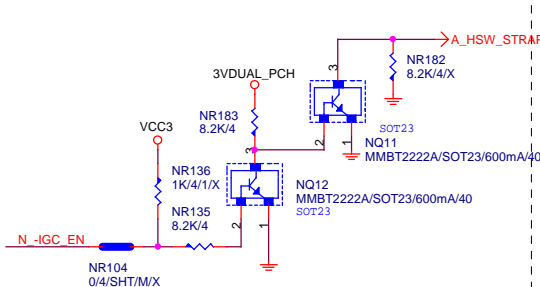
PCH_DPWROK



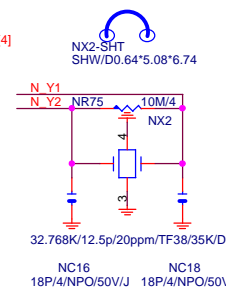
| PCH | PU/PD |
|-----|-------|
|-----|-------|



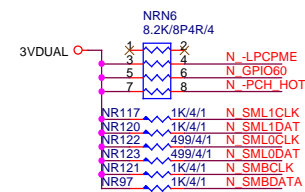
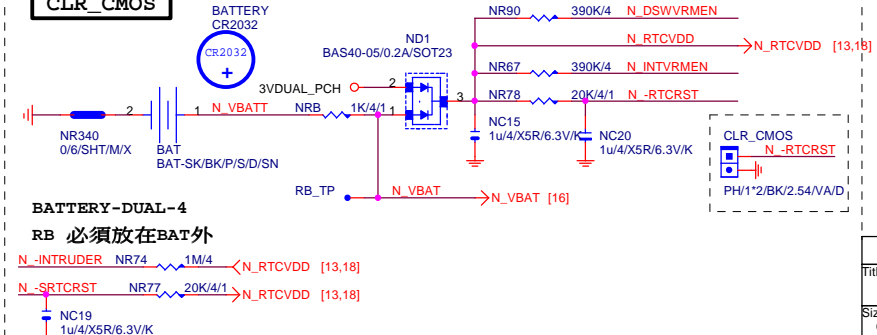
HSW_STRAP13



32.768KHZ



| |
|----------|
| CLR_CMOS |
|----------|



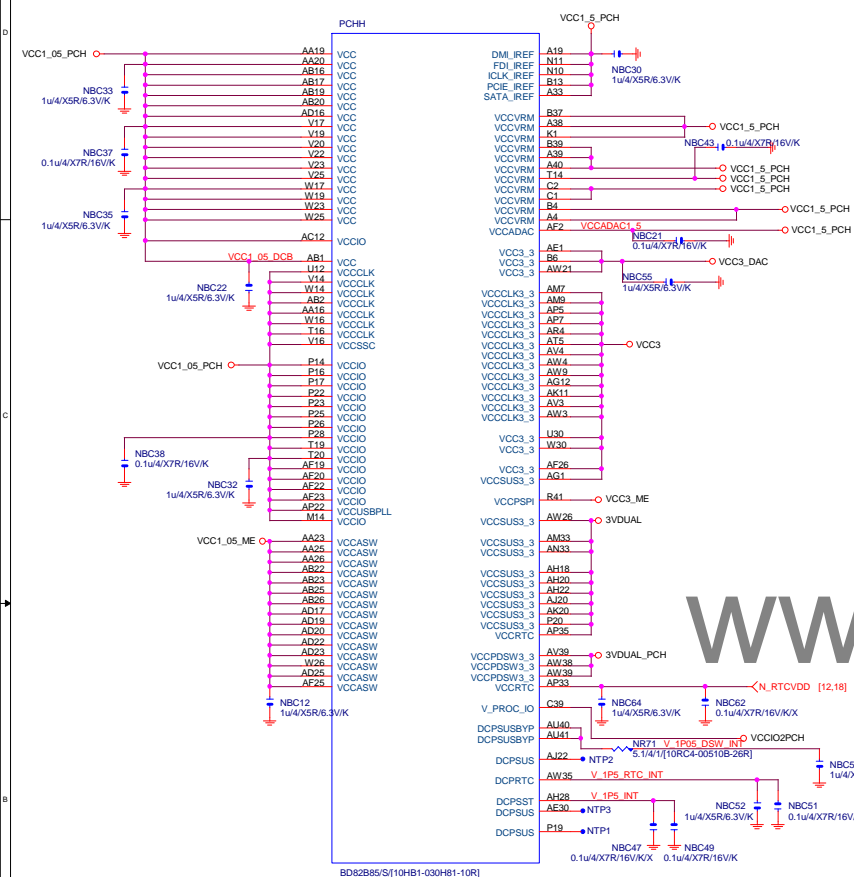
Gigabyte Technology

PCH GPIO , CTRL , AUDIO

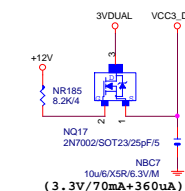
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|----------------|--------------------------------------|-------------------|
| Size Custom | Document Number GA-H81M-S1 | Rev 1.0 |
|----------------|--------------------------------------|-------------------|

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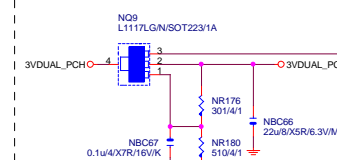
PCH (H)



VCC3_DAC



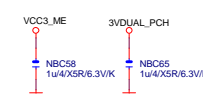
3VDUAL_PCH



SHT PWR

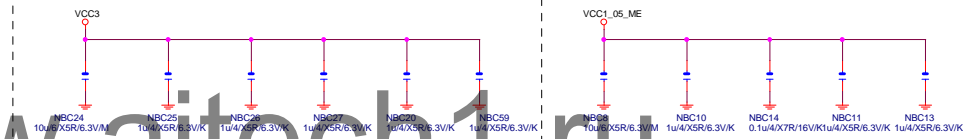


CAP

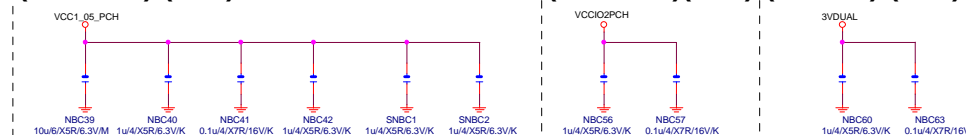


(3.3V) (X6)

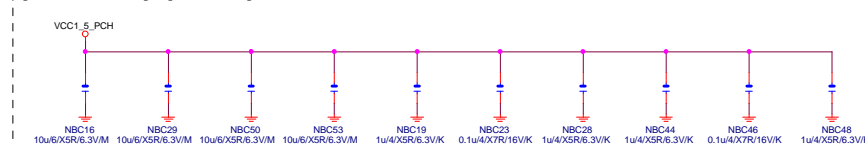
(1.05V) (x5)



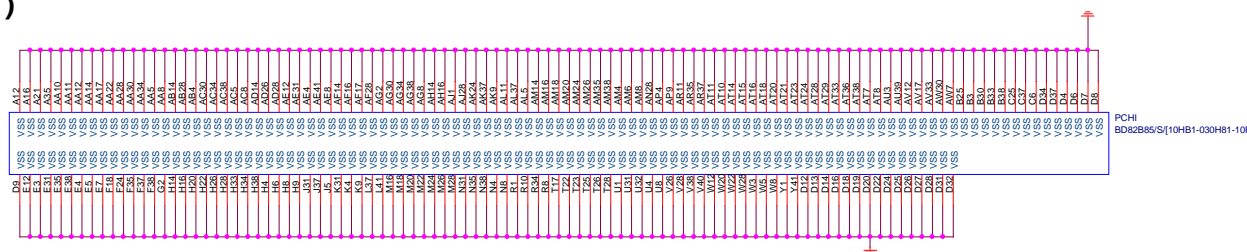
(1.05V)(x6)

$$-(1.05V)(x_2) - (3.3V)(x_2)$$


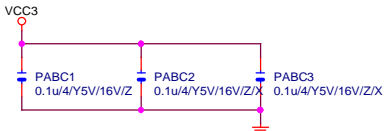
(1.05V) (x10)



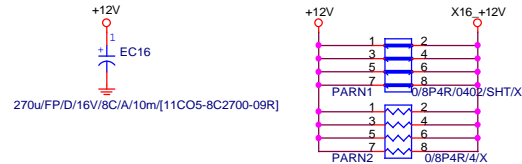
PCH (I)



PCIEX16 CAP



PCIEX16 PROTECT SHT

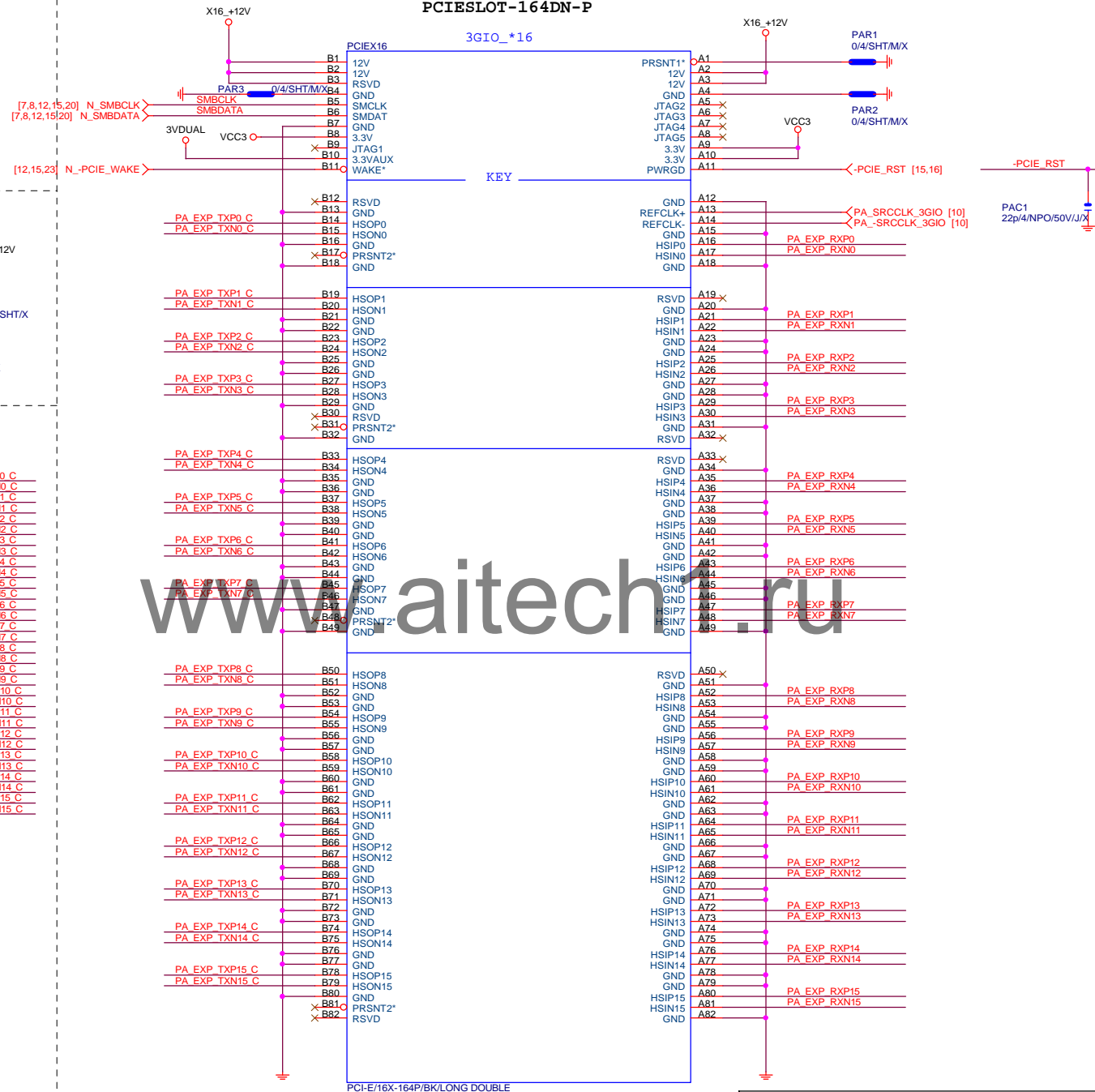


PCIEX16 AC CAP

| | | | |
|--------------|-------|-------------------|----------------|
| PA EXP TXP0 | PAC5 | 0.22u4/X5R/6.3V/K | PA EXP TXP0 C |
| PA EXP TXN0 | PAC4 | 0.22u4/X5R/6.3V/K | PA EXP TXN0 C |
| PA EXP TXP1 | PAC6 | 0.22u4/X5R/6.3V/K | PA EXP TXP1 C |
| PA EXP TXN1 | PAC7 | 0.22u4/X5R/6.3V/K | PA EXP TXN1 C |
| PA EXP TXP2 | PAC8 | 0.22u4/X5R/6.3V/K | PA EXP TXP2 C |
| PA EXP TXN2 | PAC9 | 0.22u4/X5R/6.3V/K | PA EXP TXN2 C |
| PA EXP TXP3 | PAC10 | 0.22u4/X5R/6.3V/K | PA EXP TXP3 C |
| PA EXP TXN3 | PAC11 | 0.22u4/X5R/6.3V/K | PA EXP TXN3 C |
| PA EXP TXP4 | PAC12 | 0.22u4/X5R/6.3V/K | PA EXP TXP4 C |
| PA EXP TXN4 | PAC13 | 0.22u4/X5R/6.3V/K | PA EXP TXN4 C |
| PA EXP TXP5 | PAC14 | 0.22u4/X5R/6.3V/K | PA EXP TXP5 C |
| PA EXP TXN5 | PAC15 | 0.22u4/X5R/6.3V/K | PA EXP TXN5 C |
| PA EXP TXP6 | PAC16 | 0.22u4/X5R/6.3V/K | PA EXP TXP6 C |
| PA EXP TXN6 | PAC17 | 0.22u4/X5R/6.3V/K | PA EXP TXN6 C |
| PA EXP TXP7 | PAC18 | 0.22u4/X5R/6.3V/K | PA EXP TXP7 C |
| PA EXP TXN7 | PAC19 | 0.22u4/X5R/6.3V/K | PA EXP TXN7 C |
| PA EXP TXP8 | PAC20 | 0.22u4/X5R/6.3V/K | PA EXP TXP8 C |
| PA EXP TXN8 | PAC21 | 0.22u4/X5R/6.3V/K | PA EXP TXN8 C |
| PA EXP TXP9 | PAC22 | 0.22u4/X5R/6.3V/K | PA EXP TXP9 C |
| PA EXP TXN9 | PAC23 | 0.22u4/X5R/6.3V/K | PA EXP TXN9 C |
| PA EXP TXP10 | PAC24 | 0.22u4/X5R/6.3V/K | PA EXP TXP10 C |
| PA EXP TXN10 | PAC25 | 0.22u4/X5R/6.3V/K | PA EXP TXN10 C |
| PA EXP TXP11 | PAC26 | 0.22u4/X5R/6.3V/K | PA EXP TXP11 C |
| PA EXP TXN11 | PAC27 | 0.22u4/X5R/6.3V/K | PA EXP TXN11 C |
| PA EXP TXP12 | PAC28 | 0.22u4/X5R/6.3V/K | PA EXP TXP12 C |
| PA EXP TXN12 | PAC29 | 0.22u4/X5R/6.3V/K | PA EXP TXN12 C |
| PA EXP TXP13 | PAC30 | 0.22u4/X5R/6.3V/K | PA EXP TXP13 C |
| PA EXP TXN13 | PAC31 | 0.22u4/X5R/6.3V/K | PA EXP TXN13 C |
| PA EXP TXP14 | PAC32 | 0.22u4/X5R/6.3V/K | PA EXP TXP14 C |
| PA EXP TXN14 | PAC33 | 0.22u4/X5R/6.3V/K | PA EXP TXN14 C |
| PA EXP TXP15 | PAC34 | 0.22u4/X5R/6.3V/K | PA EXP TXP15 C |
| PA EXP TXN15 | PAC35 | 0.22u4/X5R/6.3V/K | PA EXP TXN15 C |

PA EXP RXIP0.15] >> PA_EXP_RXP[0.15] [4]
PA EXP RXN0.15] >> PA_EXP_RXN[0.15] [4]
PA EXP TXIP0.15] >> PA_EXP_TXP[0.15] [4]
PA EXP TXN0.15] >> PA_EXP_TXN[0.15] [4]

PCIEX16 SLOT



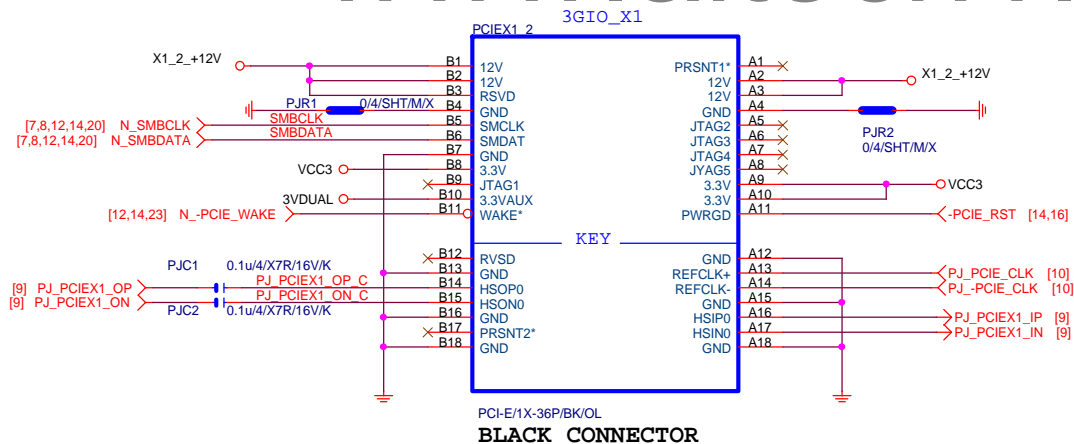
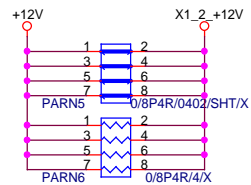
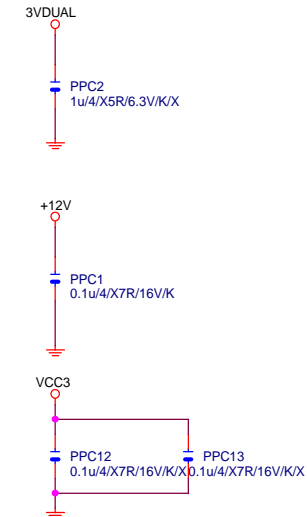
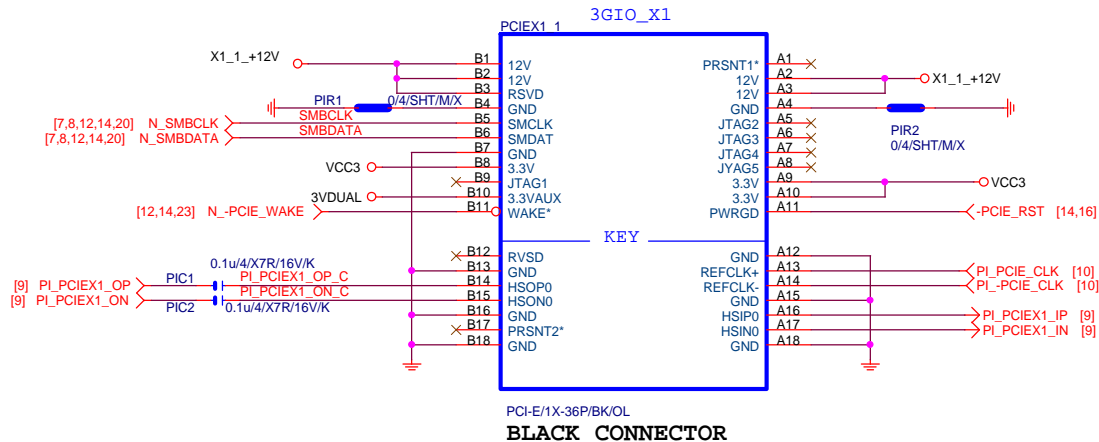
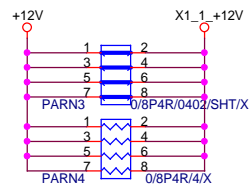
BLACK CONNECTOR

Gigabyte Technology

| | | | | |
|------------------------------|--|--|------------------|--|
| Title | | | PCI EXPRESS * 16 | |
| Size | | | GA-H81M-S1 | |
| Custom | | | Rev 1.0 | |
| Date: Tuesday, July 09, 2013 | | | Sheet 14 of 29 | |

PCIEX1 SLOT

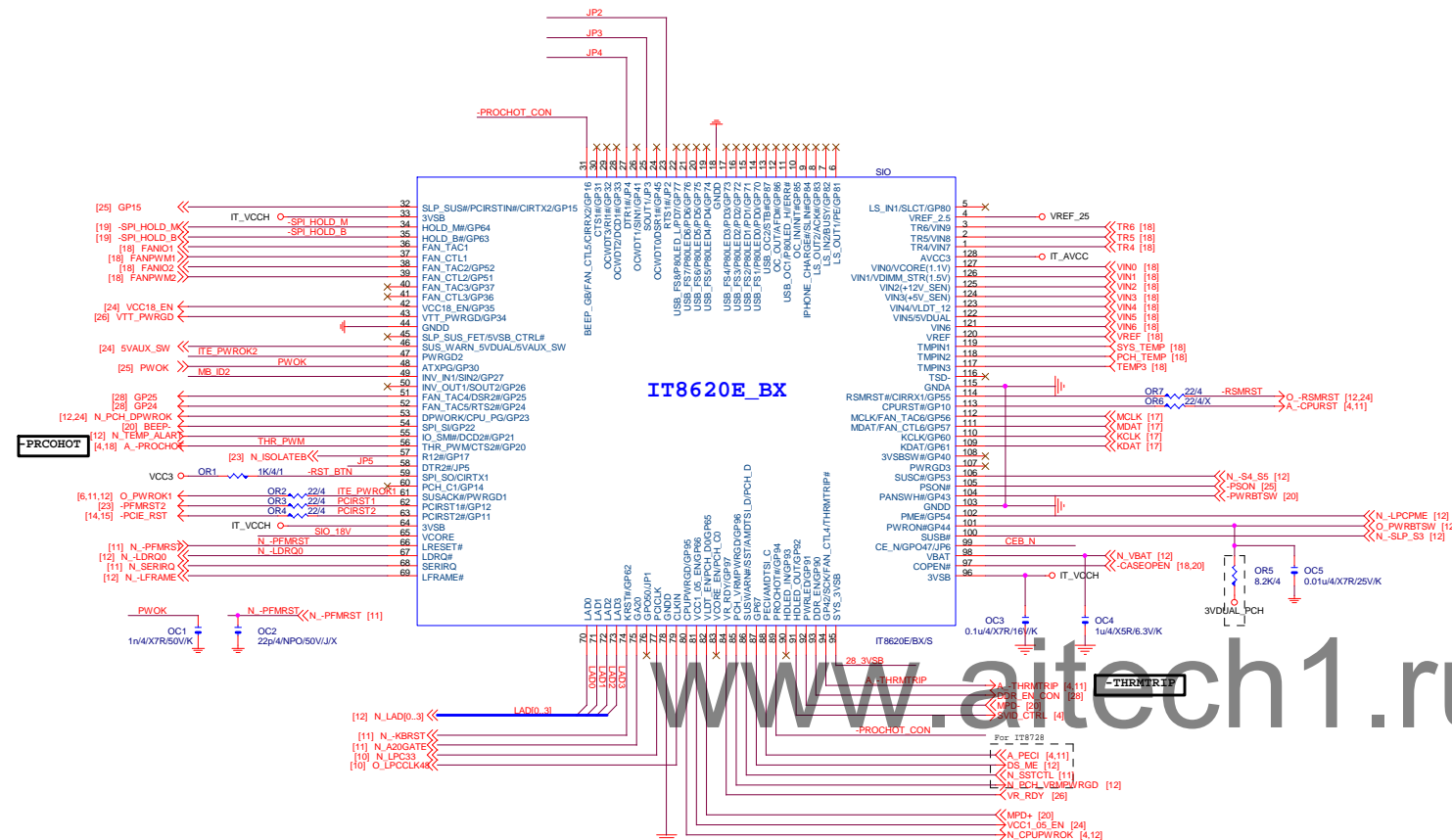
PCIEX1 PROTECT SHT



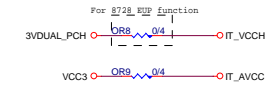
| Gigabyte Technology | | | |
|----------------------|------------------------|------------|----------|
| PCI EXPRESS X 1 PORT | | | |
| Title | Document Number | Rev | |
| Size | Custom | GA-H81M-S1 | |
| Date: | Tuesday, July 09, 2013 | Sheet | 15 of 29 |

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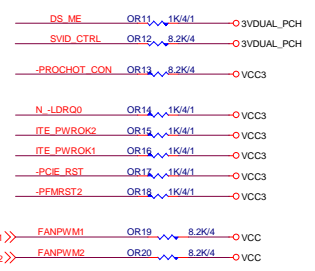
SIO IT8620



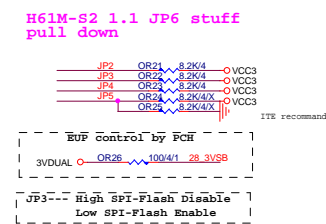
PWR SHT



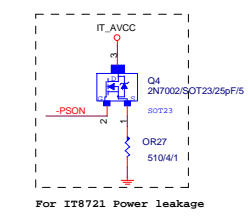
SIO PU



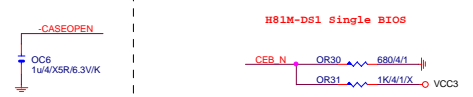
SIO STRAP



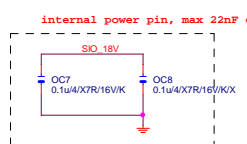
Power leakage



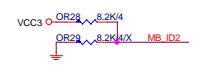
DUAL BIOS OPT STRAP



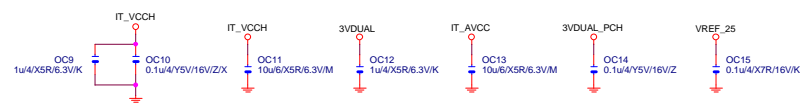
SIO_18V



MB ID



SIO CAP



Gigabyte Technology

| | | | |
|-------|------------------------|------------|-------------------------|
| Title | | | PCH GPIO , CTRL , AUDIO |
| Size | Document Number | GA-H81M-S1 | |
| C | | Rev | |
| | | 1.0 | |
| Date: | Tuesday, July 09, 2013 | Sheet | 16 of 29 |

COM

KB/MS

KB_MS ESD

USB2.0 PWR

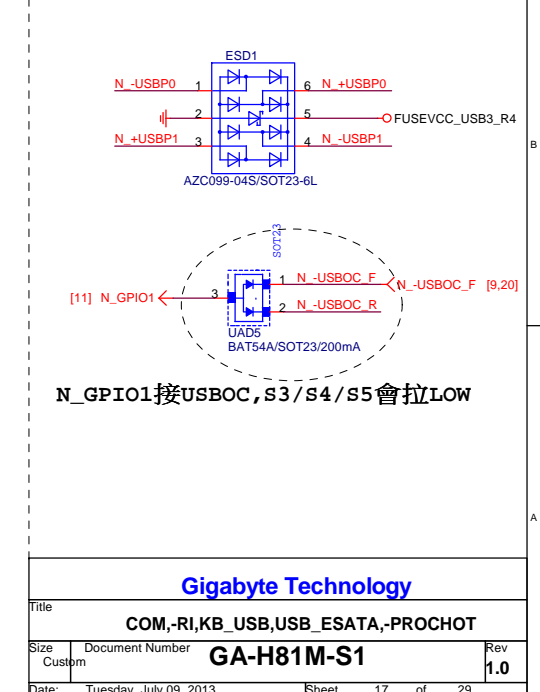
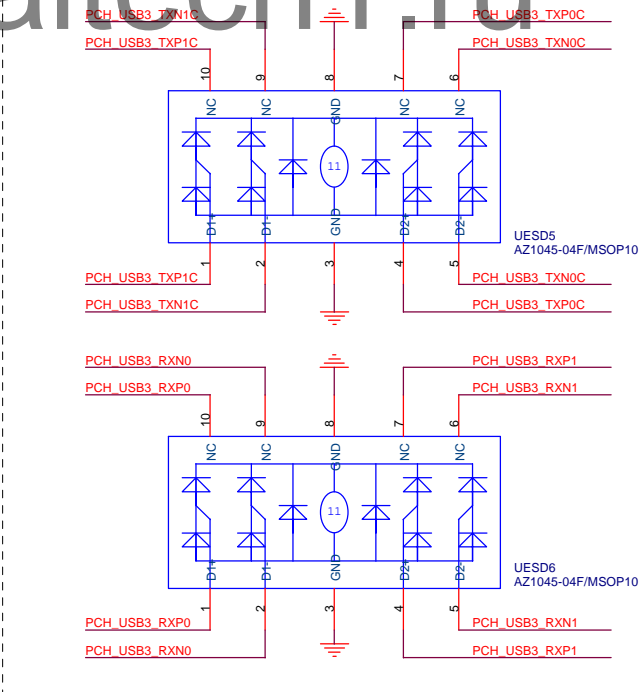
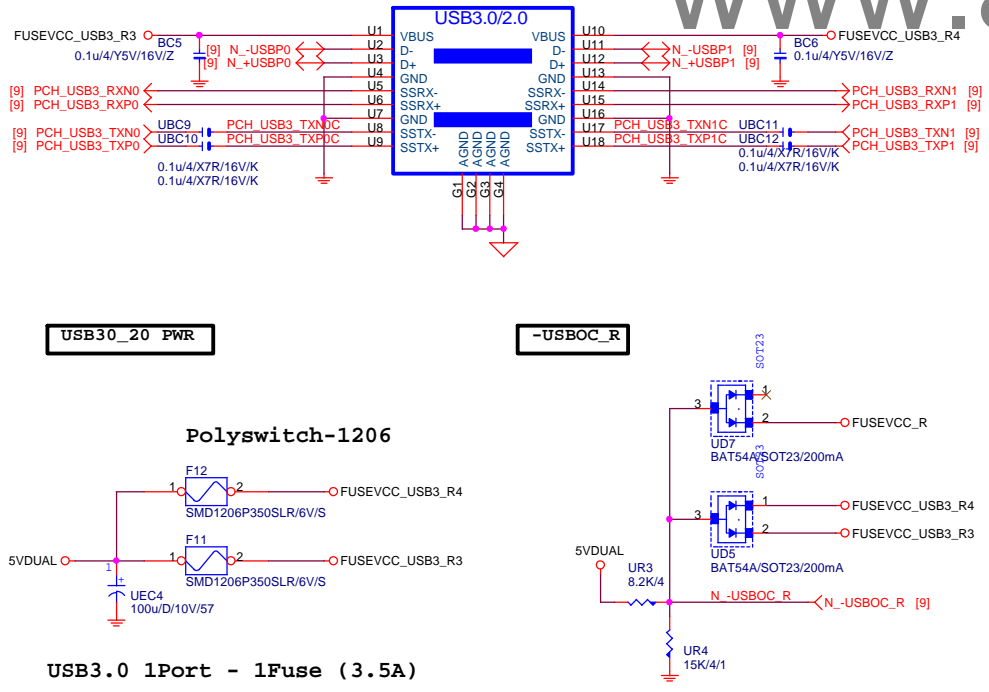
COM RI

USB30_20

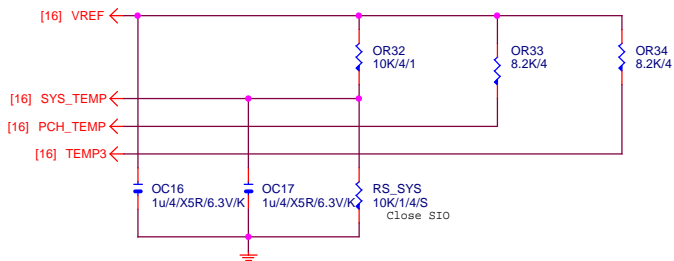
USB30_20 ESD PROTECT

USB3.0 ESD

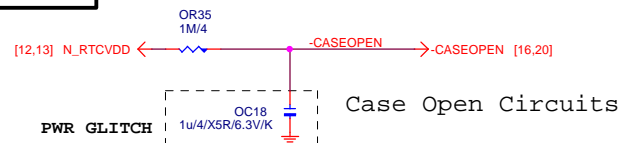
USB POWER PROTECT



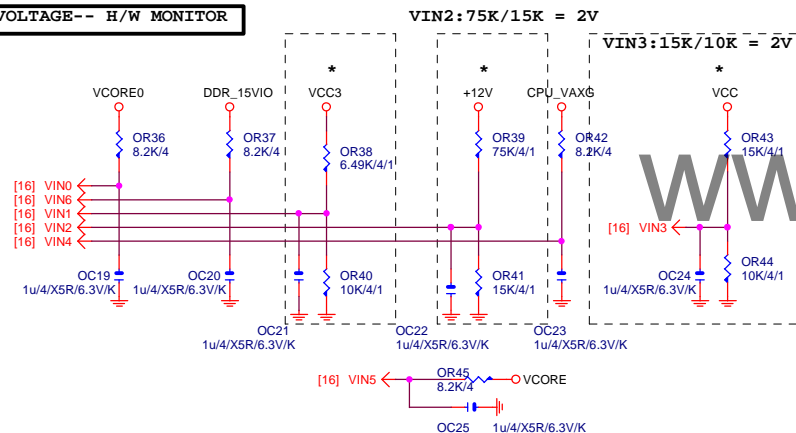
TEMP H/W MONITOR



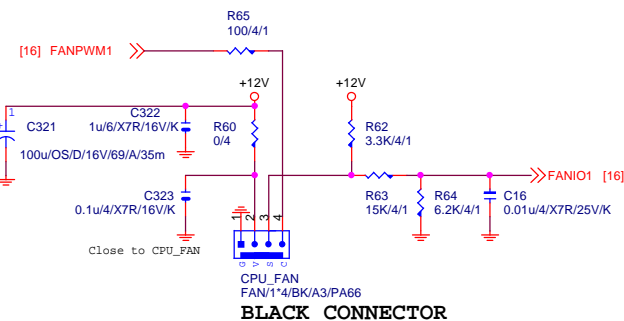
CASE OPEN



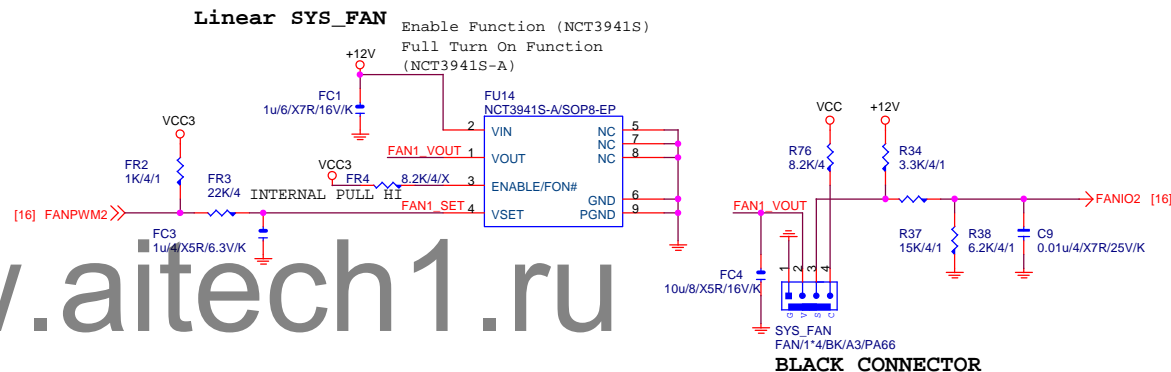
VOLTAGE-- H/W MONITOR



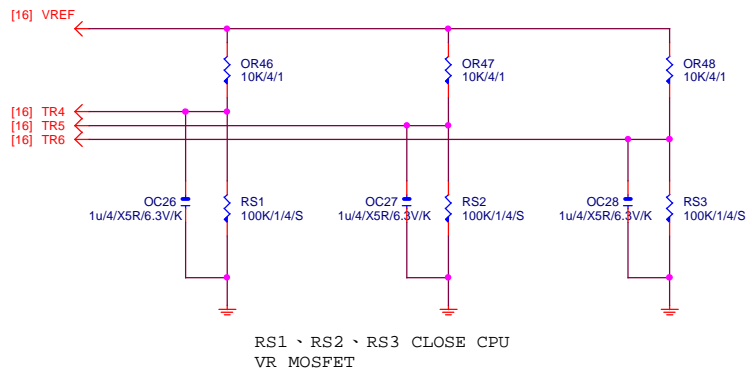
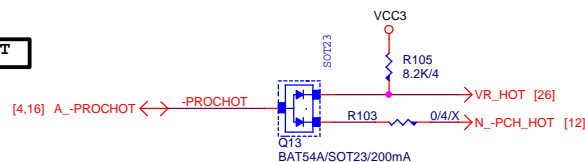
CPU SMART FAN



SYS SMART FAN

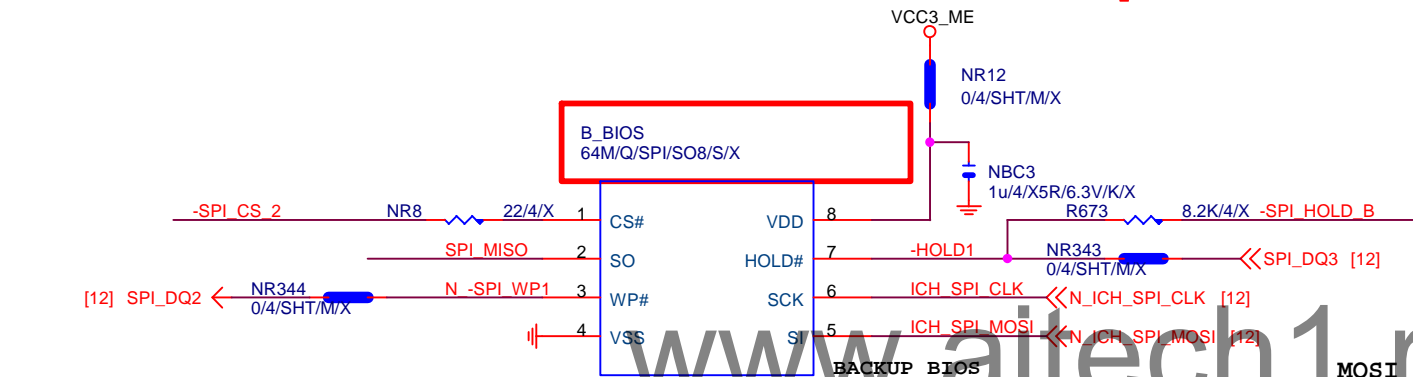
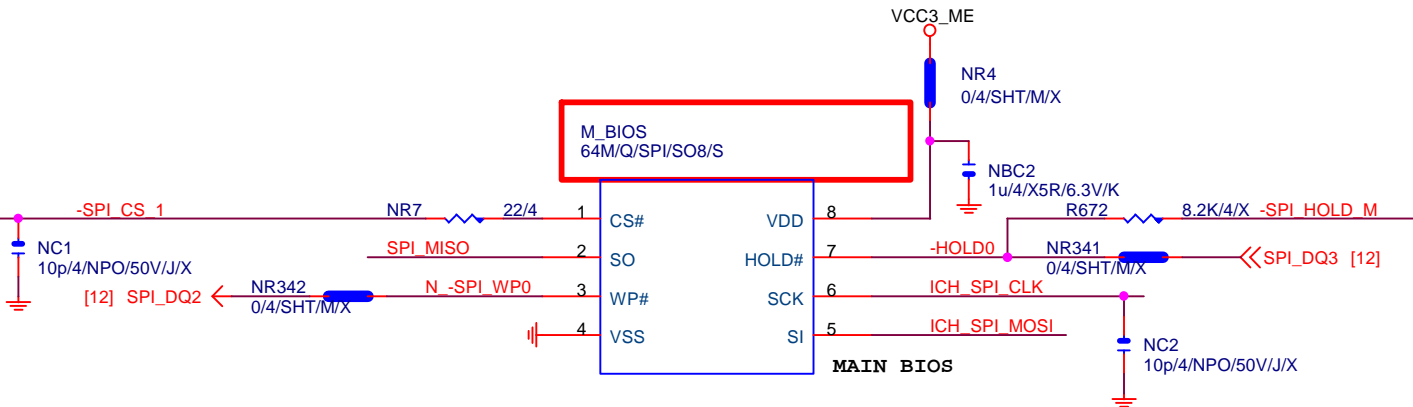


-PROHOT



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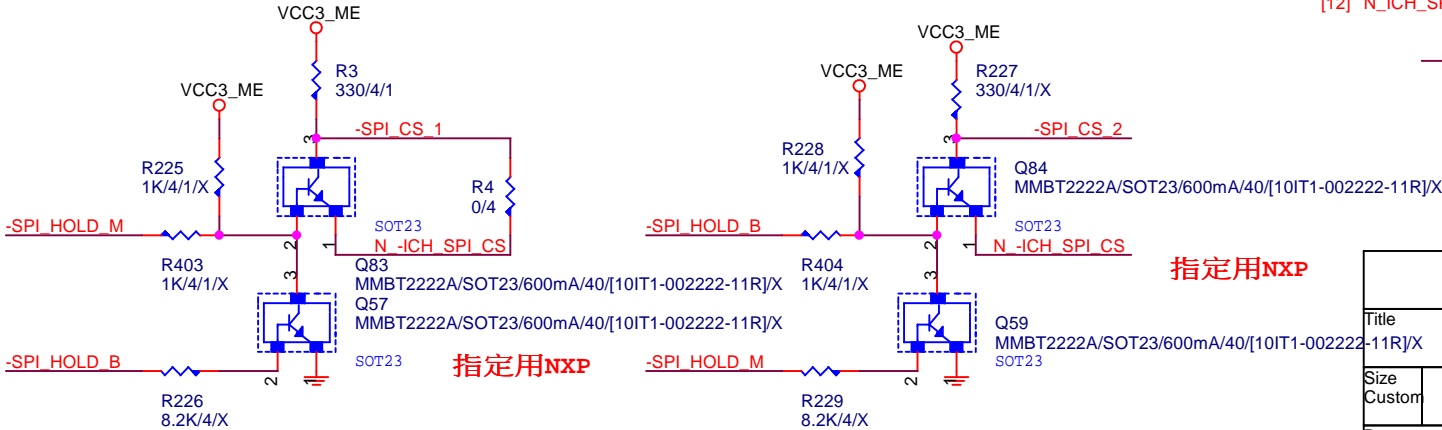
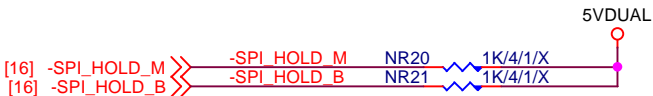
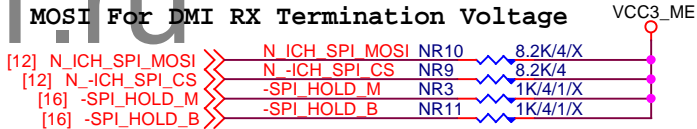
| | | | |
|-----------------|------------------------|-------|-----------------|
| Title | | | HWM,FAN CTRL,OV |
| Size | | | GA-H81M-S1 |
| Document Number | | | Rev 1.0 |
| Date: | Tuesday, July 09, 2013 | Sheet | 18 of 29 |



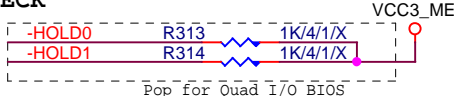
| BOOT DEVICE | GNT0 | GNT1 |
|-------------|------|------|
| LPC | 0 | 0 |
| PCI | 0 | 1 |
| NAND | 1 | 0 |
| SPI | 1 | 1 |

1 means floating
0 means PD 1K

MOSI For DMI RX Termination Voltage



CHECK

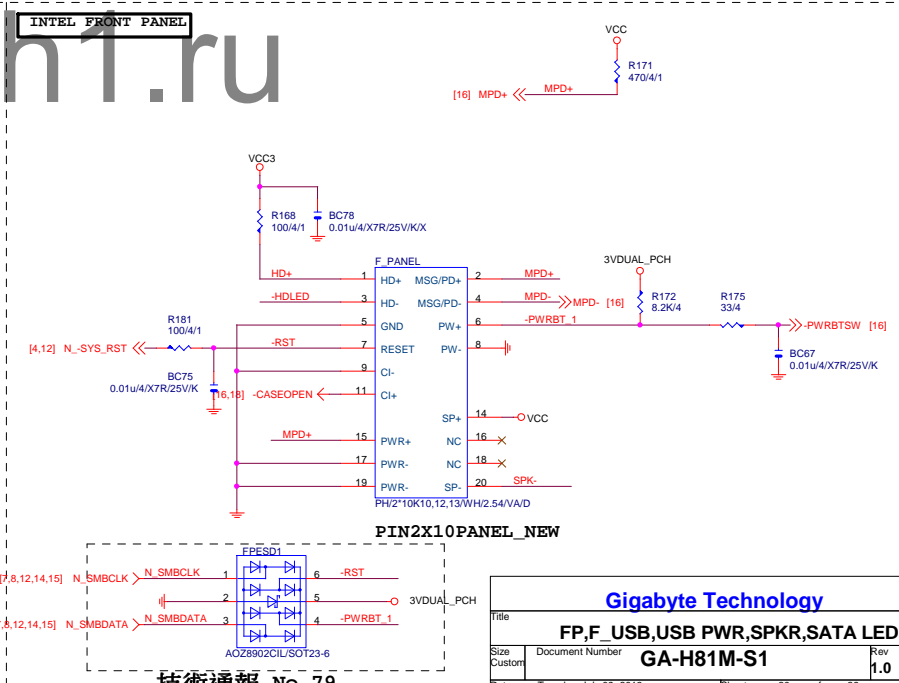
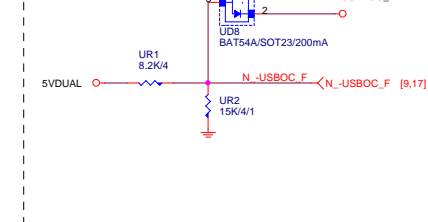
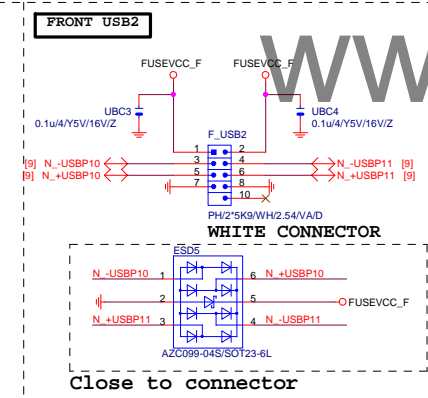
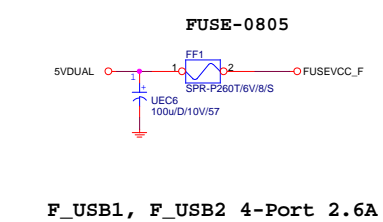
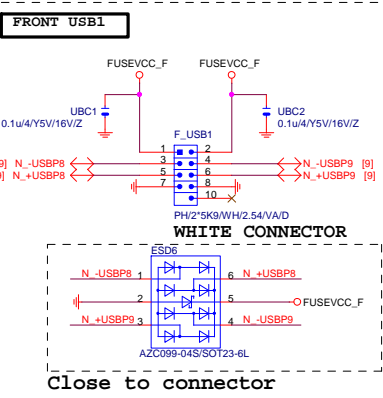
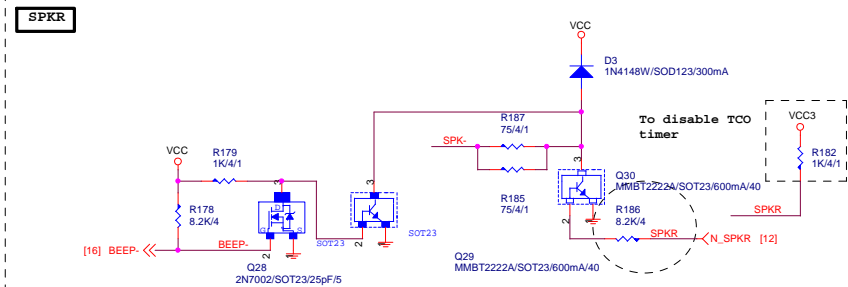
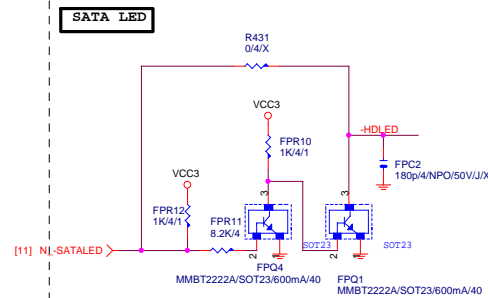


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DUAL BIOS

GA-H81M-S1

| | | |
|-------------|------------------------|-----|
| Title | Document Number | Rev |
| Size Custom | Tuesday, July 09, 2013 | 1.0 |
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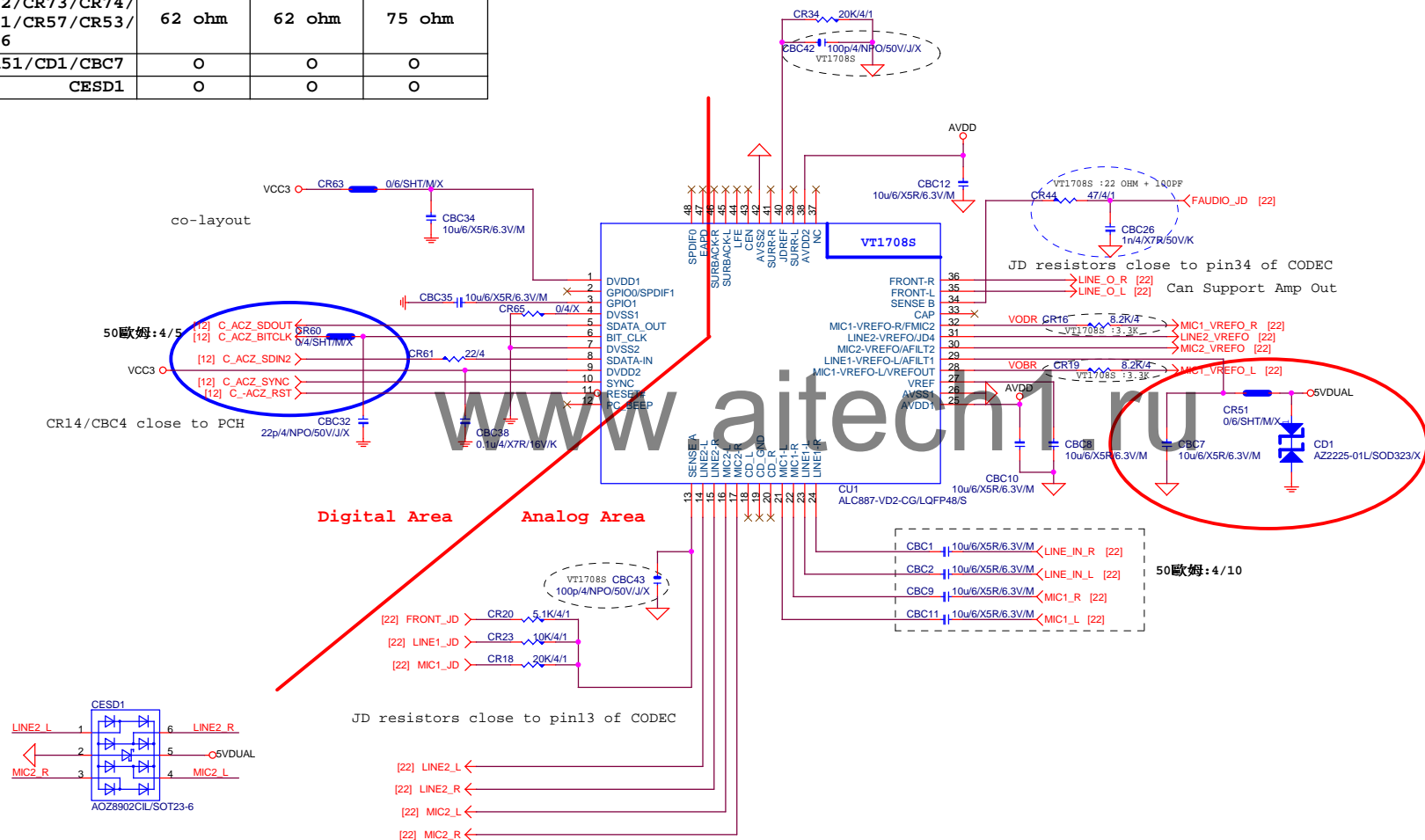


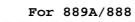
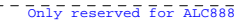
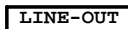
技術通報 No.79

| Gigabyte Technology | | | |
|--------------------------------|------------------------|-------|----------|
| FP,F_USB,USB PWR,SPKR,SATA LED | | | |
| GA-H81M-S1 | | | |
| Rev | 1.0 | | |
| Date: | Tuesday, July 09, 2013 | Sheet | 20 of 29 |

AZALIA CODEC **ALC892/ALC887-VD2/VT1708-CE Colay**

| | ALC892 | ALC887-VD2 | VT1708S-CE |
|--|-----------|------------|------------|
| CR44/CBC26 | 47ohm+1nF | 47ohm+1nF | 22ohm+100P |
| CBC42/CBC43 | X | X | 100P/4 |
| CR6/CR7/CR58/CR54/ CR67/CR68/CR69/CR70 | 22K/4 | 22K/4 | 10K/4/1 |
| CR5/CR8/CR1/CR14/ CR17/CR22/CR73/CR74/ CR13/CR11/CR57/CR53/ CR75/CR76 | 62 ohm | 62 ohm | 75 ohm |
| CR51/CD1/CBC7 | O | O | O |
| CESD1 | O | O | O |



**MIC-IN**

AZALIA FRONT PANEL



AUDIO JACK

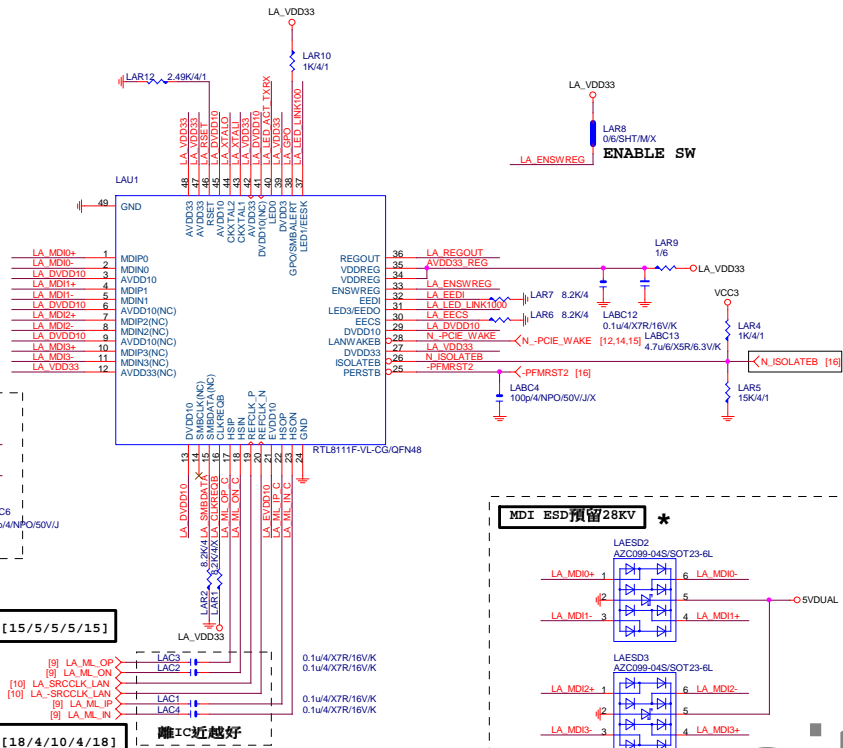
GA-H81M-S1

| |
|-----|
| Rev |
| 1.0 |

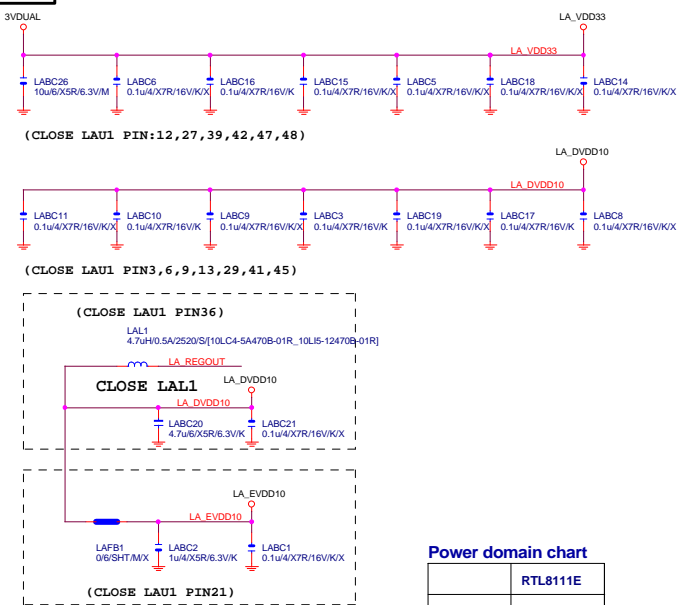
Date: Tuesday, July 09, 2013

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LAN:RTL8111F/VB/VL



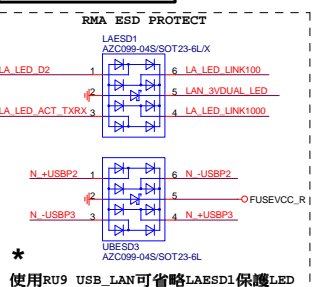
LAN POWER



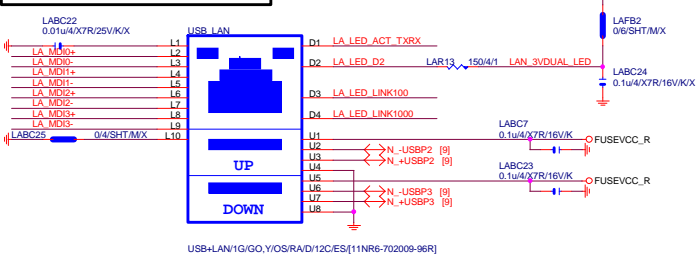
Power domain chart

| | RTL8111E |
|--------|----------|
| AVDD33 | 3.3V |
| DVDD33 | 3.3V |
| VDDREG | 3.3V |
| DVDD10 | 1.05V |

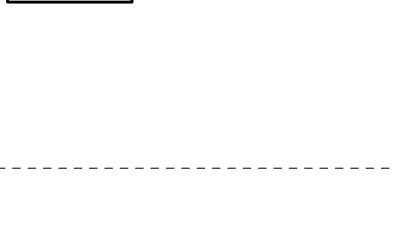
USB LAN CONNECTOR



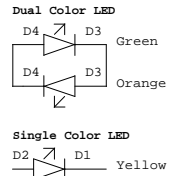
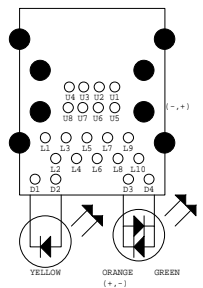
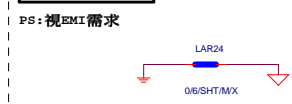
LA_MDI-->100歐姆:[20/4/8/4/20]



USB X3 POWER



EMI SHORT PAD



注意:USB PORT(目前:暫代6,7PORT)
USB-->90歐姆:[15/4.5/7.5/4.5/15]

BOM NOTICE *

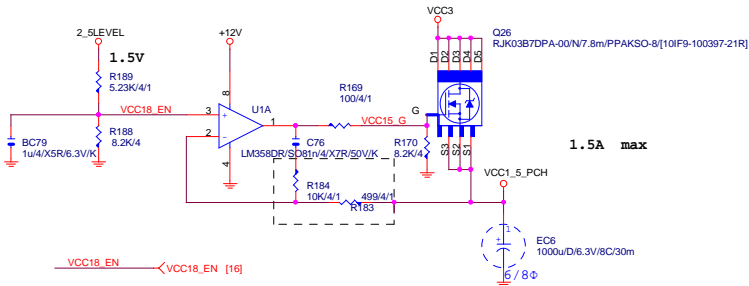
| 料號 | 規格 | 廠商 |
|--------------------------------|-----------------|---------------|
| 11NR6-702009-96R | 1G LAN (12core) | UDE(RU9 ESD+) |
| [LED獨立走線,可省略外加AZC099料件LAESD1] | | |
| 1. 9KV ESD BOM: | | |
| USB_LAN (RU9):11NR6-702009-96R | | |
| 2. 28KV ESD BOM: | | |
| USB_LAN (RU9):11NR6-702009-96R | | |
| LAESD2,LAESD3:上件AZC398-04S | | |

Gigabyte Technology

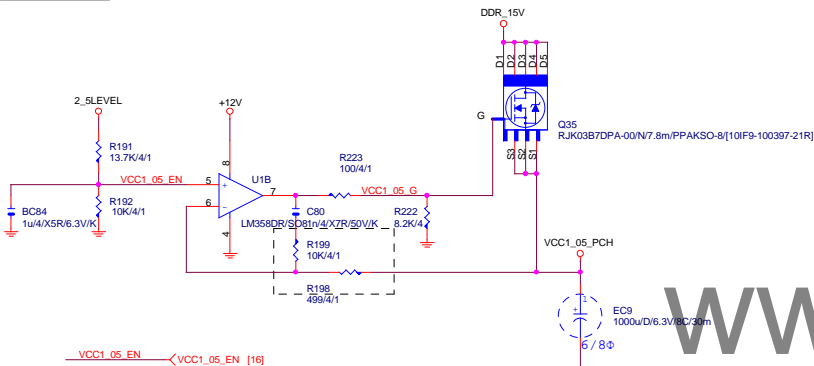
Realtek RTL8111G

| | | |
|------------------------------|-----------------|-----|
| Title | Document Number | Rev |
| Size | GA-H81M-S1 | 1.0 |
| Custom | | |
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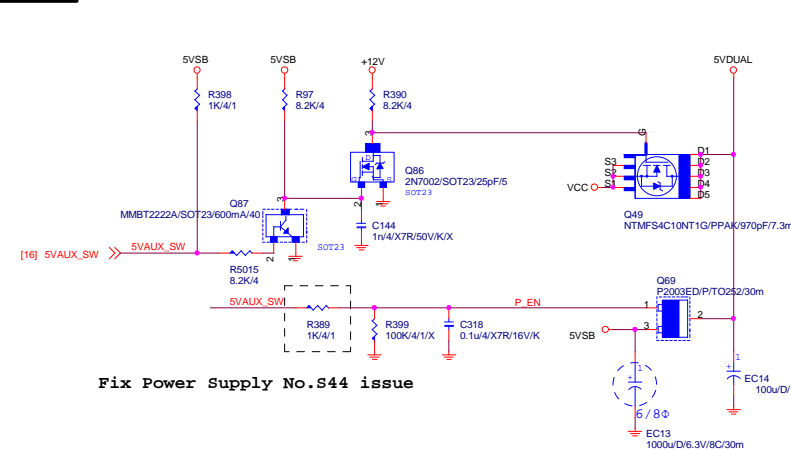
VCC1_8_PCH



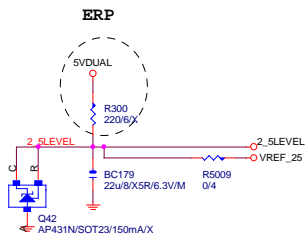
VCC1_05_PCH



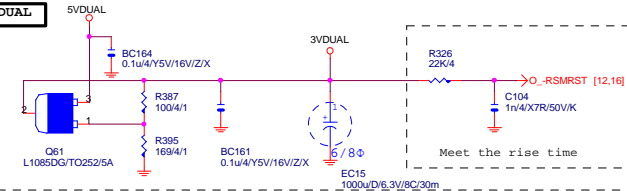
5VDUAL



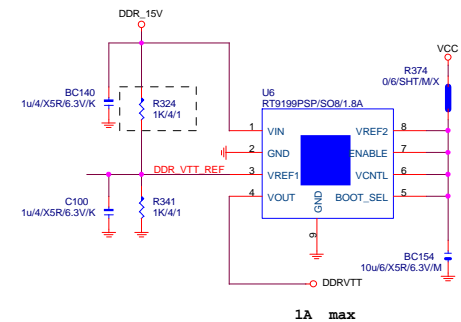
2_5LEVEL



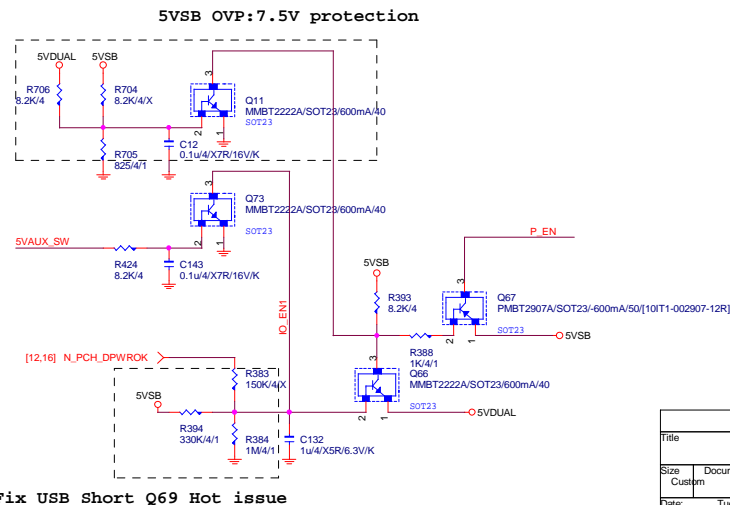
3VDUAL



DDRVTT



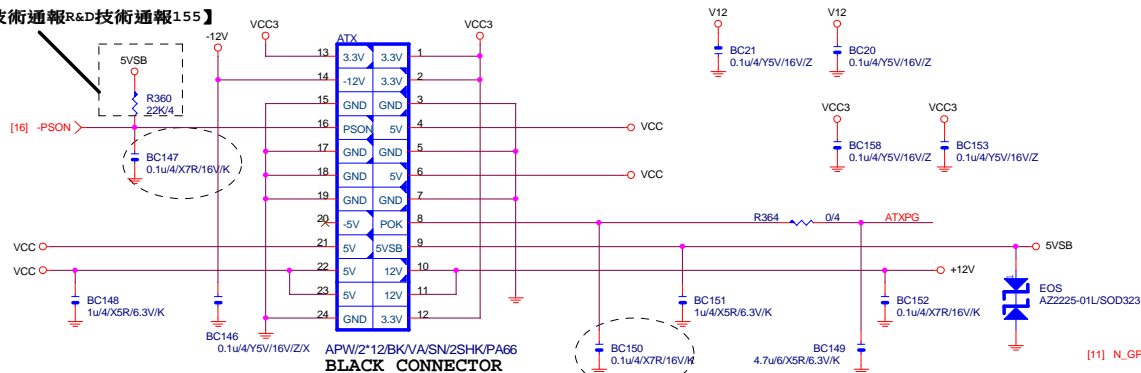
5VDUAL SHORT PROTECT



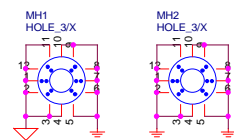
| | | | |
|----------------------------|------------------------|------------|----------|
| Gigabyte Technology | | | |
| Title | | | |
| DISCRETE POWER | | | |
| Size | Document Number | Rev | |
| Custom | GA-H81M-S1 | 1.0 | |
| Date: | Tuesday, July 09, 2013 | Sheet | 24 of 29 |

ATXX24 POWER CONNECTOR

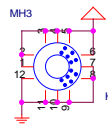
【技術通報R&D技術通報155】



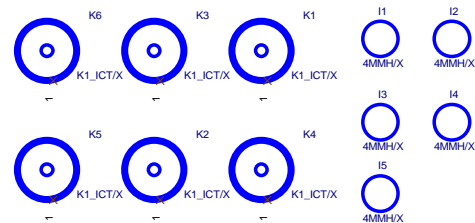
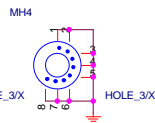
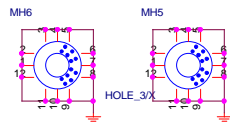
APW/2*12BK/VA/SN/2SHK/PA66
BLACK CONNECTOR



HOLE_4-RH-5MM-1



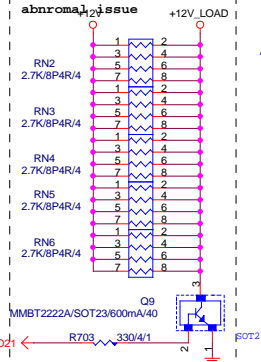
HOLE_4-RH-5MM-5PIN-1



TPM

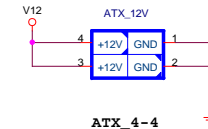
【技術通報R&D技術通報158】

To fix 12V light load abnormal issue



ATXX4 POWER CONNECTOR

APW/2*2BK/P/4.2/SN/PA66[11NH4-020004-G2R]

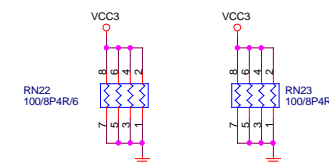
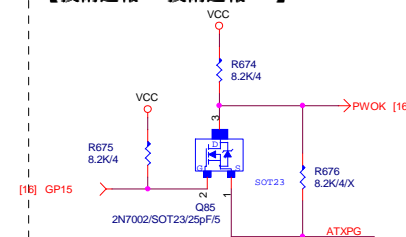


ATX_4-4

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PWOK PATCH

【技術通報R&D技術通報154】



FIX PWR MINMUN LOAD

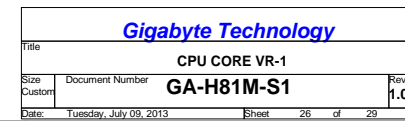
Gigabyte Technology

ATX CONNECTOR

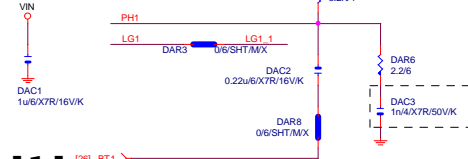
GA-H81M-S1

Rev 1.0

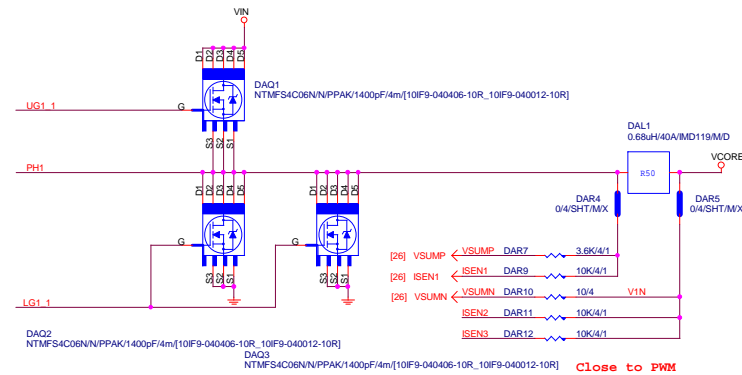
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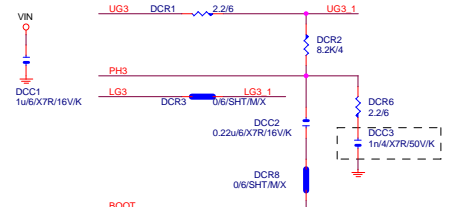
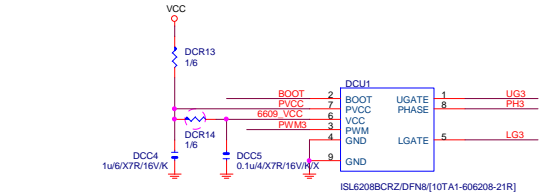
PHASE 1



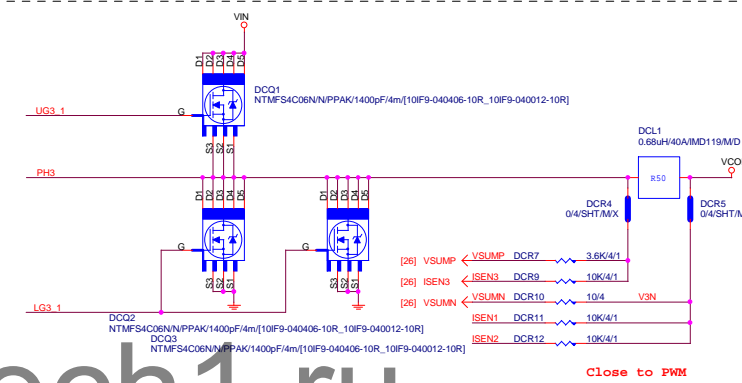
[1] [26] BT1



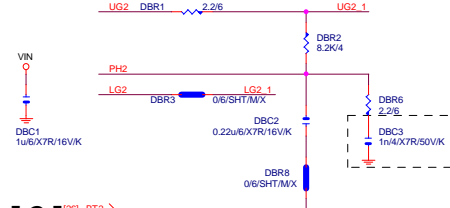
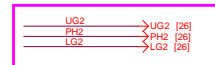
PHASE 3



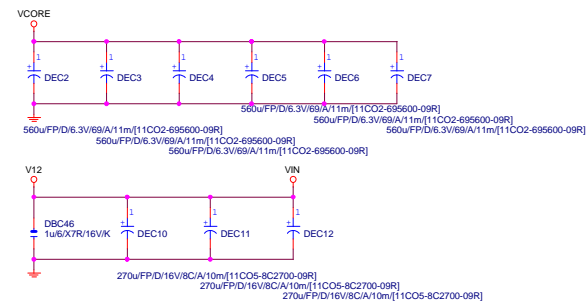
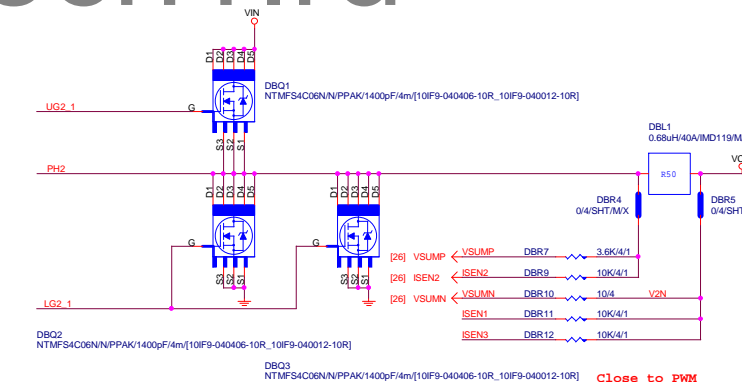
[3]



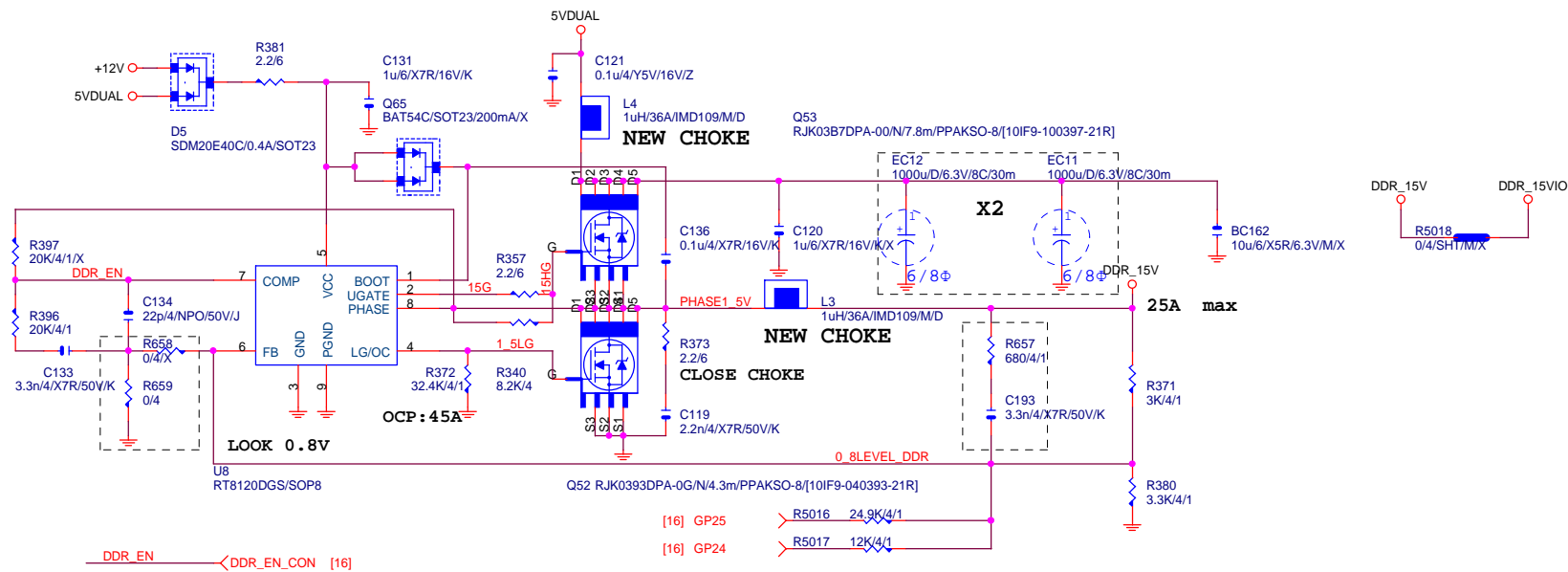
PHASE 2



[2] [26] BT2



| Gigabyte Technology | | | |
|---------------------|------------------------|---------------|----------|
| Title | | CPU CORE VR-2 | |
| Size | Document Number | GA-H81M-S1 | Rev 1.0 |
| Custom | | | |
| Date | Tuesday, July 09, 2013 | Sheet | 27 of 29 |



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VIN=5V, VOUT=1.5V, IOUT=25A, PHASE=1
 IRMS=11.45A
 560u/FP/D/6.3V/68/8m RIPPLE CURRENT=4.7A
 Coefficient=1.7(85°C), 1(105°C)
 VIN Ripple current=4.7X1.7=7.99A(85°C)
 -->故固態電容須2X7.99=15.98>11.45A

$Rocset = (I_{ocp} * L_{gate, rdson}) / I_{ocset}$
 $Rocset = (45A * 6.7m\Omega) / 10uA = 30K$
 $I_{ocset} = 10uA$

Gigabyte Technology

| Title | | |
|-----------|------------------------|----------------|
| DDR POWER | | |
| Size | Document Number | Rev |
| Custom | GA-H81M-S1 | 1.0 |
| Date: | Tuesday, July 09, 2013 | Sheet 28 of 29 |