

Model Name: GA-H81M-S2VP

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 SLOT |
| 16 | PCI SLOT |
| 17 | ITE 8620 LPC IO |
| 18 | COM,LPT,KB_MS_USB |
| 19 | HWM,FAN CTRL,OV,-PROCHOT |
| 20 | Single BIOS |
| 21 | F_USB30,FP,FUSB,SPK,SATALED |
| 22 | Realtek ALC887-VD2 |
| 23 | REAR AUDIO JACK |
| 24 | REALTEK RTL8111F |
| 25 | DISCRETE POWER |
| 26 | ATX |
| 27 | VCORE ISL95812_1 |

SHEET

TITLE

| | |
|----|------------------|
| 28 | VCORE ISL95812_2 |
| 29 | RT8120_DDR POWER |
| 30 | DVI, R_USB30 |
| 31 | IT8892E |
| 32 | USB3 VL805 |

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Gigabyte Technology

Cover Sheet

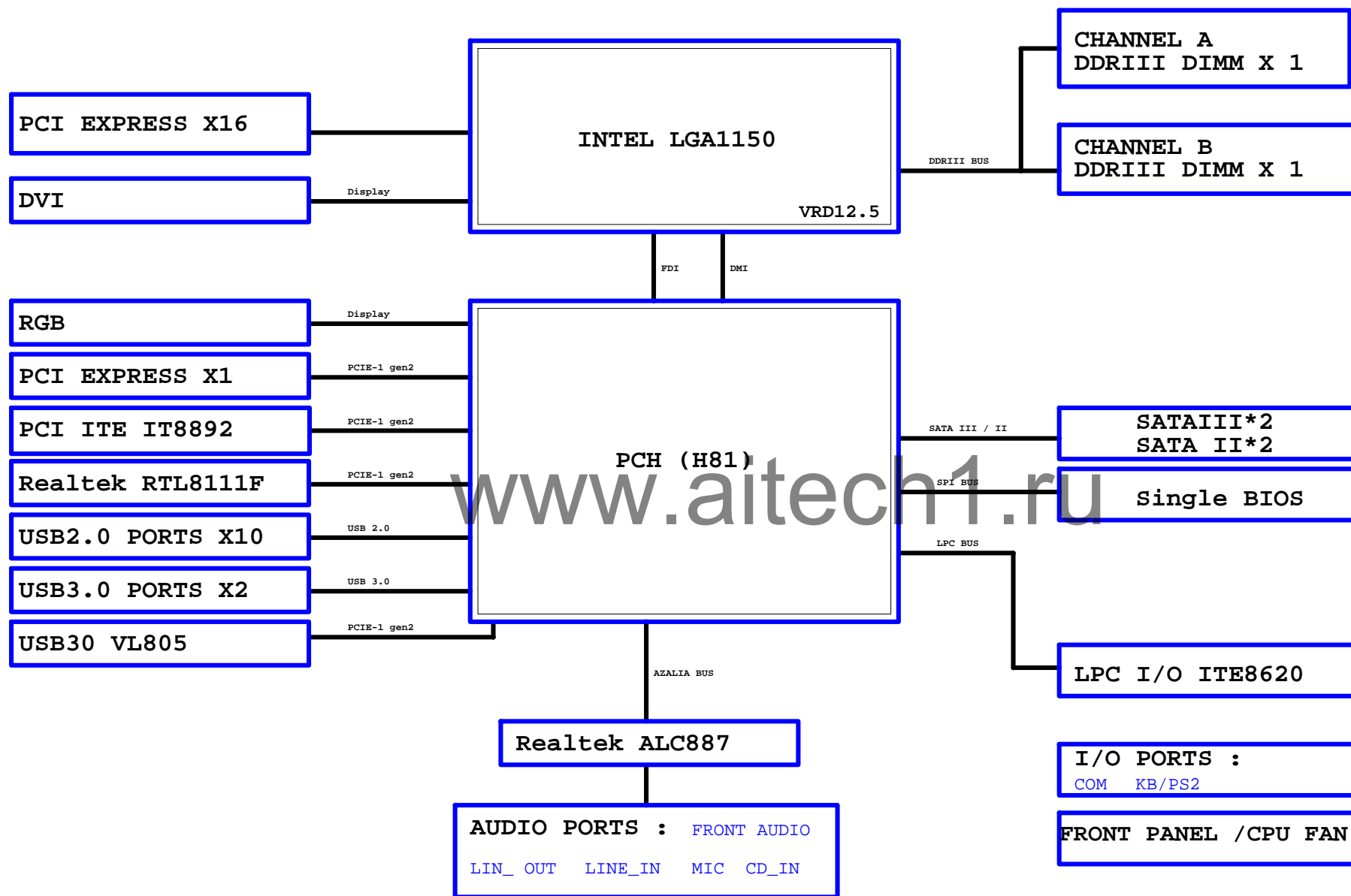
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| Size Custom | Document Number GA-H81M-S2VP | Rev 1.0 |
| Date: Thursday, December 19, 2013 | Sheet 1 of 32 | |

Revision 1.0

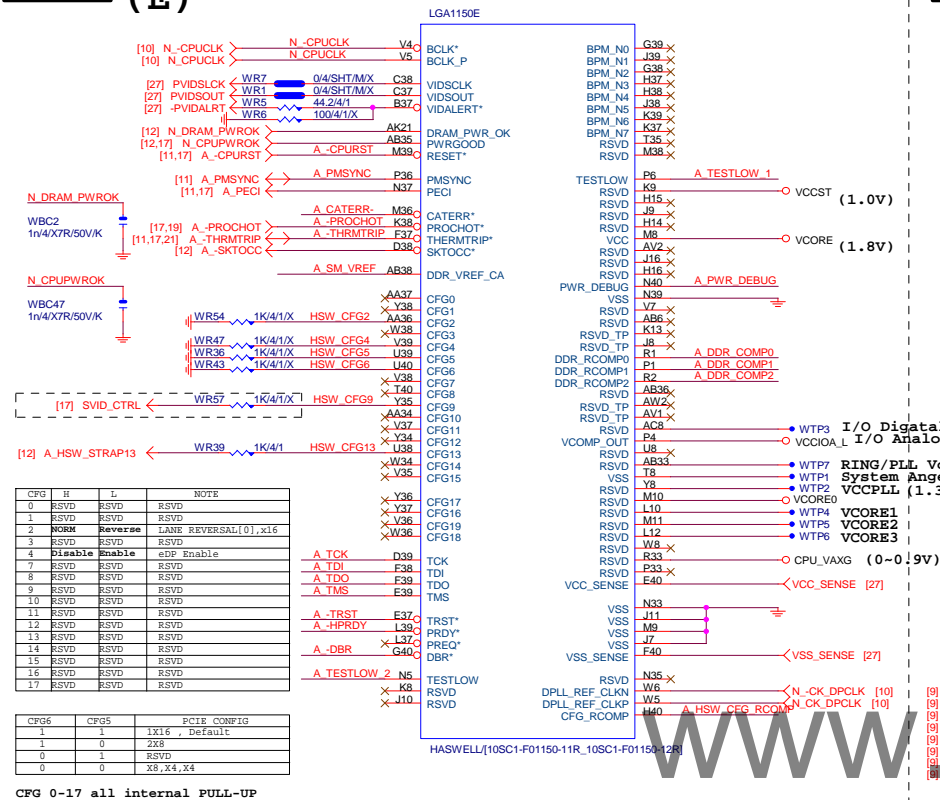
Component value change history

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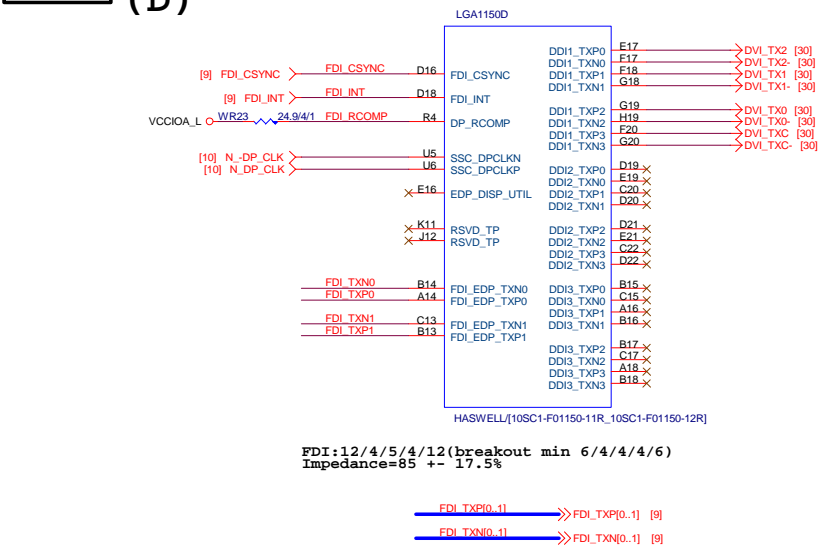
BLOCK DIAGRAM



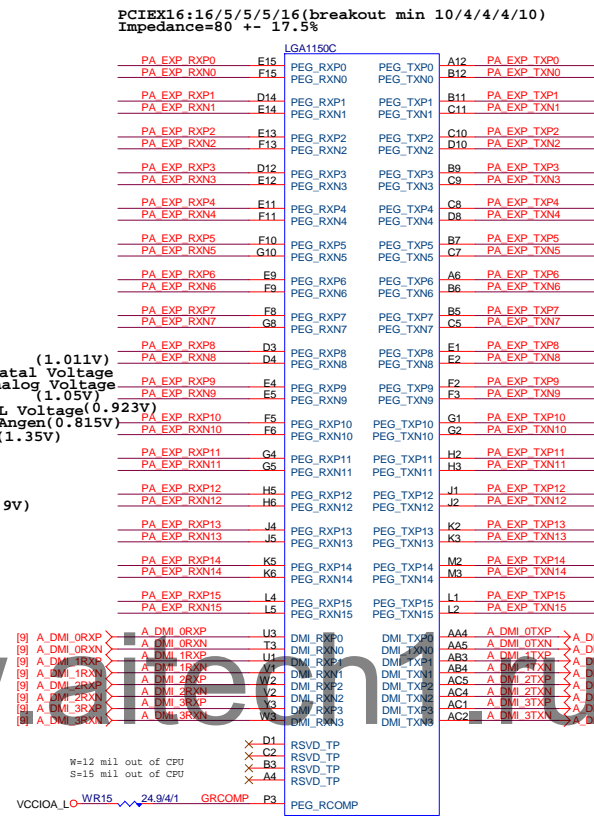
LGA1150 (E)



LGA1150 (D)



LGA1155 (C)



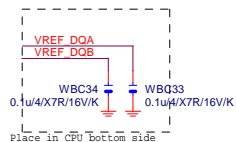
LGA1150 (A)

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|----------|---------|-------------|----------|------|-------|
| 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 | AU17 | DDR0_MA5 | DDR0_D05 | AD40 | MDA5 |
| MAAA5 | AW18 | DDR0_MA6 | DDR0_D06 | AE37 | MDA6 |
| MAAA6 | AV17 | DDR0_MA7 | DDR0_D07 | AF40 | MDA7 |
| MAAA7 | AT18 | DDR0_MA8 | DDR0_D08 | AH40 | MDA9 |
| MAAA8 | AU18 | DDR0_MA9 | DDR0_D09 | AH39 | MDA10 |
| MAAA9 | AT19 | DDR0_MA10 | DDR0_D10 | AK38 | MDA11 |
| MAAA10 | AW11 | DDR0_MA11 | DDR0_D11 | AK39 | MDA12 |
| MAAA11 | AV19 | DDR0_MA12 | DDR0_D12 | AH37 | MDA12 |
| MAAA12 | AU19 | DDR0_MA13 | DDR0_D13 | AH38 | MDA14 |
| MAAA13 | AT20 | DDR0_MA14 | DDR0_D14 | AK40 | MDA15 |
| MAAA14 | AW21 | DDR0_MA15 | DDR0_D15 | AM40 | MDA17 |
| MODT_A0 | AW10 | DDR0_ODT0 | DDR0_D16 | AM39 | MDA21 |
| MODT_A1 | AV8 | DDR0_ODT1 | DDR0_D17 | AP38 | MDA18 |
| AW9 | AW9 | DDR0_ODT2 | DDR0_D18 | AP39 | MDA19 |
| AW8 | AW8 | DDR0_ODT3 | DDR0_D19 | AM37 | MDA20 |
| AW33 | AW33 | DDR0_ECC0 | DDR0_D20 | AM38 | MDA16 |
| AW31 | AW31 | DDR0_ECC1 | DDR0_D21 | AP37 | MDA22 |
| AW31 | AW31 | DDR0_ECC2 | DDR0_D22 | AP40 | MDA23 |
| AW33 | AW33 | DDR0_ECC3 | DDR0_D23 | AV37 | MDA25 |
| AW33 | AW33 | DDR0_ECC4 | DDR0_D24 | AW37 | MDA29 |
| AW31 | AW31 | DDR0_ECC5 | DDR0_D25 | AU35 | MDA26 |
| AW31 | AW31 | DDR0_ECC6 | DDR0_D26 | AV35 | MDA27 |
| AW31 | AW31 | DDR0_ECC7 | DDR0_D27 | T137 | MDA28 |
| SBAA0 | SBAA0 | DDR0_CS_N0 | DDR0_D28 | AU37 | MDA24 |
| SBAA1 | SBAA1 | DDR0_CS_N1 | DDR0_D29 | AT35 | MDA30 |
| SBAA2 | SBAA2 | DDR0_CS_N2 | DDR0_D30 | AW35 | MDA31 |
| CKEA0 | CKEA0 | DDR0_CS_N3 | DDR0_D31 | AY6 | MDA33 |
| CKEA1 | CKEA1 | DDR0_CLK_P0 | DDR0_D32 | AU6 | MDA37 |
| CSA0 | CSA0 | DDR0_CLK_P1 | DDR0_D33 | AV4 | MDA34 |
| CSA1 | CSA1 | DDR0_CLK_P2 | DDR0_D34 | AU4 | MDA35 |
| DCLKA0 | DCLKA0 | DDR0_CLK_P3 | DDR0_D35 | AW6 | MDA36 |
| DCLKA1 | DCLKA1 | DDR0_CLK_N0 | DDR0_D36 | AV6 | MDA32 |
| DCLKA2 | DCLKA2 | DDR0_CLK_N1 | DDR0_D37 | AW4 | MDA38 |
| DCLKA3 | DCLKA3 | DDR0_CLK_N2 | DDR0_D38 | AY4 | MDA39 |
| DCLKA4 | DCLKA4 | DDR0_CLK_N3 | DDR0_D39 | AR1 | MDA41 |
| CSA0 | CSA0 | DDR0_CS_N0 | DDR0_D40 | AR4 | MDA45 |
| CSA1 | CSA1 | DDR0_CS_N1 | DDR0_D41 | AN3 | MDA42 |
| DCLKA0 | DCLKA0 | DDR0_CLK_P0 | DDR0_D42 | AN4 | MDA43 |
| DCLKA1 | DCLKA1 | DDR0_CLK_P1 | DDR0_D43 | AR2 | MDA44 |
| DCLKA2 | DCLKA2 | DDR0_CLK_P2 | DDR0_D44 | AR3 | MDA40 |
| DCLKA3 | DCLKA3 | DDR0_CLK_P3 | DDR0_D45 | AN2 | MDA46 |
| DCLKA4 | DCLKA4 | DDR0_CLK_N0 | DDR0_D46 | AN1 | MDA47 |
| DCLKA5 | DCLKA5 | DDR0_CLK_N1 | DDR0_D47 | AL1 | MDA49 |
| DCLKA6 | DCLKA6 | DDR0_CLK_N2 | DDR0_D48 | AL4 | MDA53 |
| DCLKA7 | DCLKA7 | DDR0_CLK_N3 | DDR0_D49 | AL3 | MDA50 |
| DCLKA8 | DCLKA8 | DDR0_CLK_N4 | DDR0_D50 | AJ4 | MDA51 |
| DCLKA9 | DCLKA9 | DDR0_CLK_N5 | DDR0_D51 | AL2 | MDA52 |
| DCLKA10 | DCLKA10 | DDR0_CLK_N6 | DDR0_D52 | AJ2 | MDA48 |
| DCLKA11 | DCLKA11 | DDR0_CLK_N7 | DDR0_D53 | AJ2 | MDA54 |
| DCLKA12 | DCLKA12 | DDR0_CLK_N8 | DDR0_D54 | AJ1 | MDA55 |
| RSVD | RSVD | DDR0_CS_N0 | DDR0_D55 | AG1 | MDA57 |
| RSVD | RSVD | DDR0_CS_N1 | DDR0_D56 | AG4 | MDA61 |
| RSVD | RSVD | DDR0_CS_N2 | DDR0_D57 | AE3 | MDA58 |
| RSVD | RSVD | DDR0_CS_N3 | DDR0_D58 | AE4 | MDA59 |
| RSVD | RSVD | DDR0_CS_N4 | DDR0_D59 | AG2 | MDA60 |
| RSVD | RSVD | DDR0_CS_N5 | DDR0_D60 | AG3 | MDA56 |
| RSVD | RSVD | DDR0_CS_N6 | DDR0_D61 | AE2 | MDA62 |
| RSVD | RSVD | DDR0_CS_N7 | DDR0_D62 | AE1 | MDA63 |
| RSVD | RSVD | DDR0_CS_N8 | DDR0_D63 | AE39 | DQSA0 |
| RSVD | RSVD | DDR0_CS_N9 | DDR0_D64 | AJ39 | DQSA1 |
| RSVD | RSVD | DDR0_CS_N10 | DDR0_D65 | AN39 | DQSA2 |
| RSVD | RSVD | DDR0_CS_N11 | DDR0_D66 | AV36 | DQSA3 |
| RSVD | RSVD | DDR0_CS_N12 | DDR0_D67 | AV5 | DQSA4 |
| RSVD | RSVD | DDR0_CS_N13 | DDR0_D68 | AP3 | DQSA5 |
| RSVD | RSVD | DDR0_CS_N14 | DDR0_D69 | AK3 | DQSA6 |
| RSVD | RSVD | DDR0_CS_N15 | DDR0_D70 | AF3 | DQSA7 |
| RSVD | RSVD | DDR0_CS_N16 | DDR0_D71 | AV32 | DQSA8 |
| RSVD | RSVD | DDR0_CS_N17 | DDR0_D72 | AE38 | DQSA9 |
| RSVD | RSVD | DDR0_CS_N18 | DDR0_D73 | AJ38 | DQSA1 |
| RSVD | RSVD | DDR0_CS_N19 | DDR0_D74 | AN38 | DQSA2 |
| RSVD | RSVD | DDR0_CS_N20 | DDR0_D75 | AJ36 | DQSA3 |
| RSVD | RSVD | DDR0_CS_N21 | DDR0_D76 | AW5 | DQSA4 |
| RSVD | RSVD | DDR0_CS_N22 | DDR0_D77 | AP2 | DQSA5 |
| RSVD | RSVD | DDR0_CS_N23 | DDR0_D78 | AK2 | DQSA6 |
| RSVD | RSVD | DDR0_CS_N24 | DDR0_D79 | AF2 | DQSA7 |
| RSVD | RSVD | DDR0_CS_N25 | DDR0_D80 | AJ32 | DQSA8 |

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

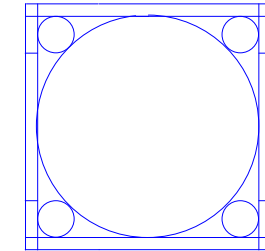
LGA1150 (B)

| | | | | | |
|----------|---------|--------------|----------|------|-------|
| 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 | AW25 | DDR1_MA9 | DDR1_D09 | AL35 | MDB9 |
| MAAB9 | AP18 | DDR1_MA10 | DDR1_D10 | AL31 | MDB11 |
| MAAB10 | AY25 | DDR1_MA11 | DDR1_D11 | AK34 | MDB12 |
| MAAB11 | AY26 | DDR1_MA12 | DDR1_D12 | AK35 | MDB13 |
| MAAB12 | AR15 | DDR1_MA13 | DDR1_D13 | AK32 | MDB14 |
| MAAB13 | AV27 | DDR1_MA14 | DDR1_D14 | AL32 | MDB15 |
| MAAB14 | AY28 | DDR1_MA15 | DDR1_D15 | AL34 | MDB17 |
| MODT_B0 | AM17 | DDR1_ODT0 | DDR1_D16 | AP34 | MDB21 |
| MODT_B1 | AL16 | DDR1_ODT1 | DDR1_D17 | AN31 | MDB19 |
| AM16 | AM16 | DDR1_ODT2 | DDR1_D18 | AP31 | MDB23 |
| AK15 | AK15 | DDR1_ODT3 | DDR1_D19 | AP35 | MDB20 |
| AM26 | AM26 | DDR1_ECC0 | DDR1_D20 | AP35 | MDB16 |
| AM25 | AM25 | DDR1_ECC1 | DDR1_D21 | AN32 | MDB18 |
| AP25 | AP25 | DDR1_ECC2 | DDR1_D22 | AP32 | MDB22 |
| AP26 | AP26 | DDR1_ECC3 | DDR1_D23 | AM29 | MDB25 |
| AL26 | AL26 | DDR1_ECC4 | DDR1_D24 | AM28 | MDB28 |
| AL25 | AL25 | DDR1_ECC5 | DDR1_D25 | AR29 | MDB27 |
| AR26 | AR26 | DDR1_ECC6 | DDR1_D26 | AR28 | MDB30 |
| AR25 | AR25 | DDR1_ECC7 | DDR1_D27 | AL28 | MDB24 |
| AK17 | AK17 | DDR1_BA0 | DDR1_D28 | AL28 | MDB29 |
| SBAB0 | SBAB0 | DDR1_BA1 | DDR1_D29 | AP29 | MDB26 |
| SBAB1 | SBAB1 | DDR1_BA2 | DDR1_D30 | AP28 | MDB31 |
| SBAB2 | SBAB2 | DDR1_CKE0 | DDR1_D31 | AR12 | MDB32 |
| CKEB0 | CKEB0 | DDR1_CKE1 | DDR1_D32 | AR12 | MDB33 |
| CKEB1 | CKEB1 | DDR1_CKE2 | DDR1_D33 | AL13 | MDB34 |
| 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 |
| DCLKB4 | DCLKB4 | DDR1_CLK_N0 | DDR1_D40 | AP9 | MDB41 |
| DCLKB5 | DCLKB5 | DDR1_CLK_N1 | DDR1_D41 | AR6 | MDB47 |
| DCLKB6 | DCLKB6 | DDR1_CLK_N2 | DDR1_D42 | AP6 | MDB43 |
| DCLKB7 | DCLKB7 | DDR1_CLK_N3 | DDR1_D43 | AR10 | MDB44 |
| DCLKB8 | DCLKB8 | DDR1_CLK_N4 | DDR1_D44 | AP10 | MDB40 |
| DCLKB9 | DCLKB9 | DDR1_CLK_N5 | DDR1_D45 | AR7 | MDB46 |
| DCLKB10 | DCLKB10 | DDR1_CLK_N6 | DDR1_D46 | AP7 | MDB42 |
| DCLKB11 | DCLKB11 | DDR1_CLK_N7 | DDR1_D47 | AM9 | MDB52 |
| DCLKB12 | DCLKB12 | DDR1_CLK_N8 | DDR1_D48 | AL9 | MDB53 |
| DCLKB13 | DCLKB13 | DDR1_CLK_N9 | DDR1_D49 | AL6 | MDB50 |
| DCLKB14 | DCLKB14 | DDR1_CLK_N10 | DDR1_D50 | AL7 | MDB55 |
| DCLKB15 | DCLKB15 | DDR1_CLK_N11 | DDR1_D51 | AM10 | MDB48 |
| DCLKB16 | DCLKB16 | DDR1_CLK_N12 | DDR1_D52 | AL10 | MDB49 |
| DCLKB17 | DCLKB17 | DDR1_CLK_N13 | DDR1_D53 | AM6 | MDB54 |
| DCLKB18 | DCLKB18 | DDR1_CLK_N14 | DDR1_D54 | AM7 | MDB51 |
| DCLKB19 | DCLKB19 | DDR1_CLK_N15 | DDR1_D55 | AH6 | MDB61 |
| DCLKB20 | DCLKB20 | DDR1_CLK_N16 | DDR1_D56 | AH7 | MDB60 |
| DCLKB21 | DCLKB21 | DDR1_CLK_N17 | DDR1_D57 | AE6 | MDB59 |
| DCLKB22 | DCLKB22 | DDR1_CLK_N18 | DDR1_D58 | AE7 | MDB63 |
| DCLKB23 | DCLKB23 | DDR1_CLK_N19 | DDR1_D59 | AJ6 | MDB56 |
| DCLKB24 | DCLKB24 | DDR1_CLK_N20 | DDR1_D60 | AJ7 | MDB57 |
| DCLKB25 | DCLKB25 | DDR1_CLK_N21 | DDR1_D61 | AG6 | MDB58 |
| DCLKB26 | DCLKB26 | DDR1_CLK_N22 | DDR1_D62 | AF7 | MDB62 |
| DCLKB27 | DCLKB27 | DDR1_CLK_N23 | DDR1_D63 | AF35 | DQSB0 |
| DCLKB28 | DCLKB28 | DDR1_CLK_N24 | DDR1_D64 | AL33 | DQSB1 |
| DCLKB29 | DCLKB29 | DDR1_CLK_N25 | DDR1_D65 | AP33 | DQSB2 |
| DCLKB30 | DCLKB30 | DDR1_CLK_N26 | DDR1_D66 | AN28 | DQSB3 |
| DCLKB31 | DCLKB31 | DDR1_CLK_N27 | DDR1_D67 | AN12 | DQSB4 |
| DCLKB32 | DCLKB32 | DDR1_CLK_N28 | DDR1_D68 | AP8 | DQSB5 |
| DCLKB33 | DCLKB33 | DDR1_CLK_N29 | DDR1_D69 | AL8 | DQSB6 |
| DCLKB34 | DCLKB34 | DDR1_CLK_N30 | DDR1_D70 | AG7 | DQSB7 |
| DCLKB35 | DCLKB35 | DDR1_CLK_N31 | DDR1_D71 | AN25 | DQSB8 |
| DCLKB36 | DCLKB36 | DDR1_CLK_N32 | DDR1_D72 | AK33 | DQSB1 |
| DCLKB37 | DCLKB37 | DDR1_CLK_N33 | DDR1_D73 | AN33 | DQSB2 |
| DCLKB38 | DCLKB38 | DDR1_CLK_N34 | DDR1_D74 | AN29 | DQSB3 |
| DCLKB39 | DCLKB39 | DDR1_CLK_N35 | DDR1_D75 | AN13 | DQSB4 |
| DCLKB40 | DCLKB40 | DDR1_CLK_N36 | DDR1_D76 | AR8 | DQSB5 |
| DCLKB41 | DCLKB41 | DDR1_CLK_N37 | DDR1_D77 | AM8 | DQSB6 |
| DCLKB42 | DCLKB42 | DDR1_CLK_N38 | DDR1_D78 | AG6 | DQSB7 |
| DCLKB43 | DCLKB43 | DDR1_CLK_N39 | DDR1_D79 | AN26 | DQSB8 |
| DCLKB44 | DCLKB44 | DDR1_CLK_N40 | DDR1_D80 | AN26 | DQSB8 |



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

LGA1150 (CR)

CR
CPU RETENTION/X

LGA1150_P

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

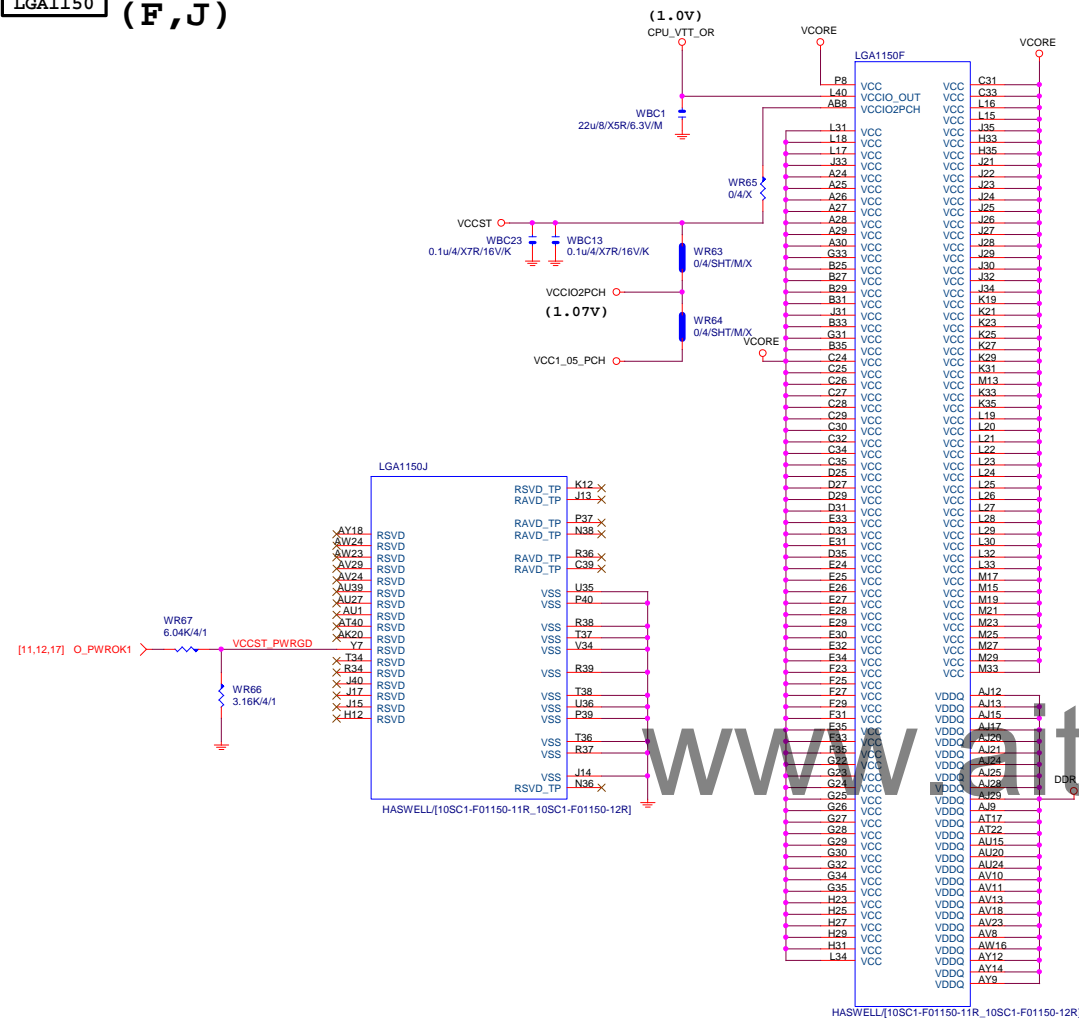
DDR BUS

| | |
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| [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 |

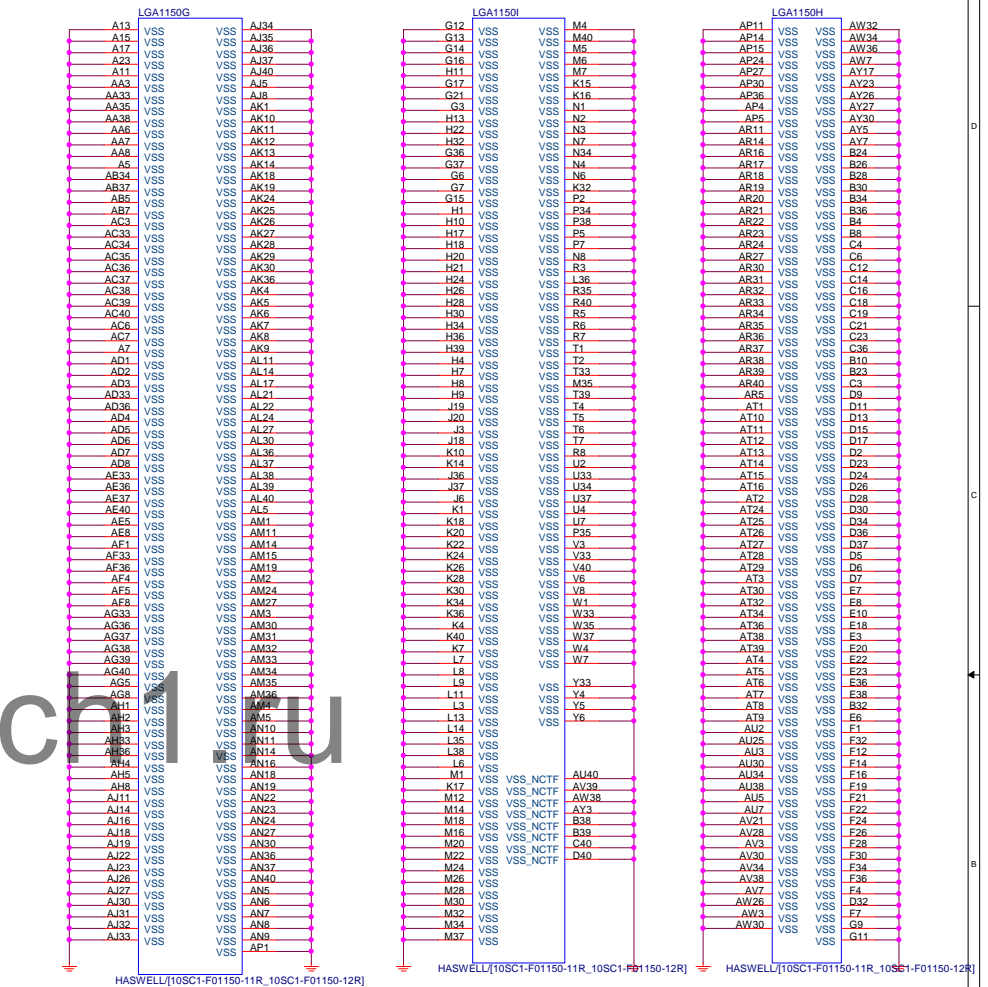
Gigabyte Technology

| | | | | |
|-----------------------------------|-----------------|---|--|------------|
| Title | | | | Rev 1.0 |
| CPU LGA1150-B | | | | |
| Size | Document Number | | | |
| Custom | GA-H81M-S2VP | | | |
| Date: Thursday, December 19, 2013 | | | | |
| Sheet | | 5 | | of |
| 32 | | | | |

LGA1150 (F,J)

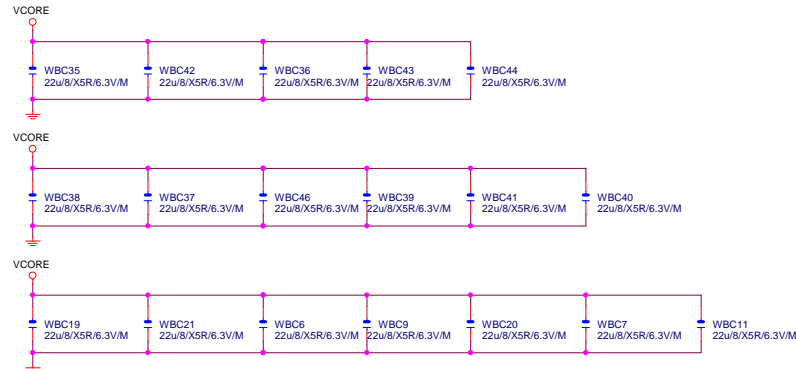


LGA1155 (G,H,I)



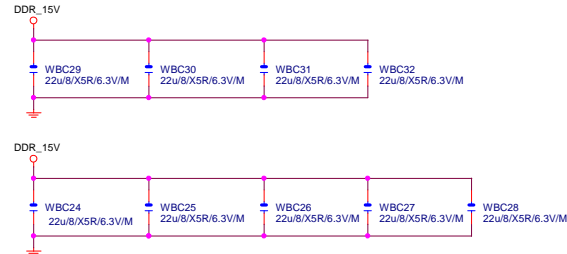
VCore CAP

(X18)



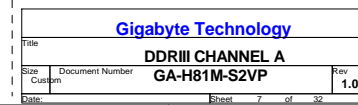
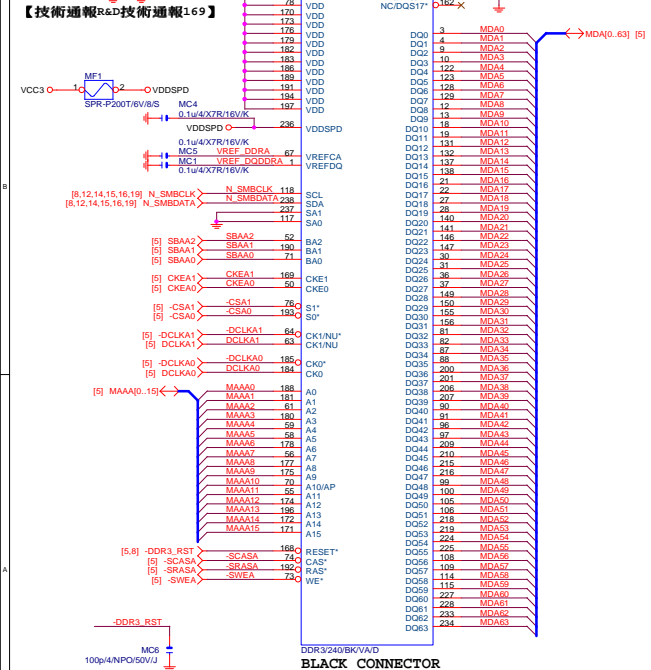
DDR CAP

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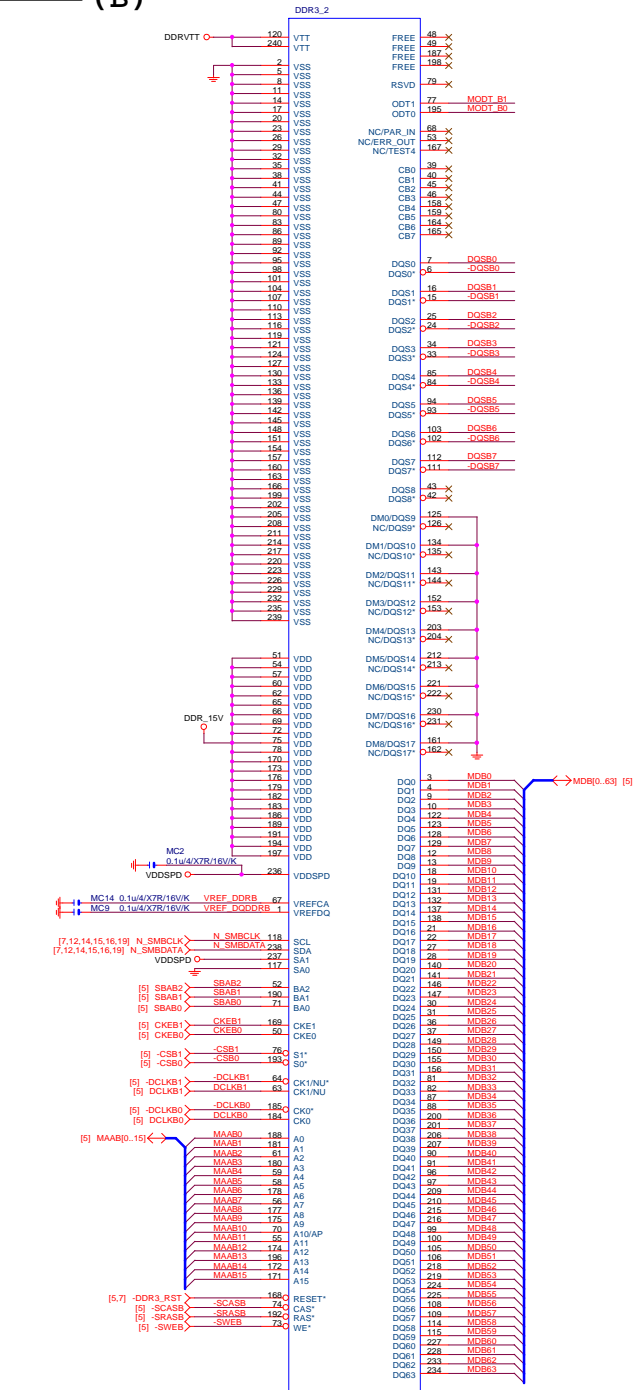
Gigabyte Technology

| | | | |
|---------------|-----------------------------|-------|---------|
| Title | | | |
| CPU LGA1150-C | | | |
| Size | Document Number | | Rev |
| Custom | GA-H81M-S2VP | | 1.0 |
| Date: | Thursday, December 19, 2013 | Sheet | 6 of 32 |

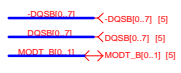


DDR3

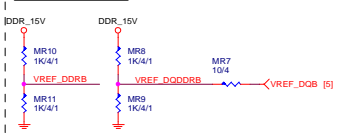
(B)



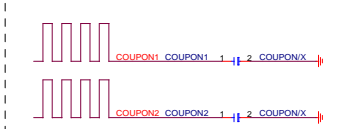
DDR3 240/BK/V/A/D
BLACK CONNECTOR



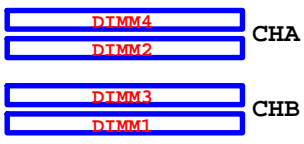
DDR3 VREF



COUPON

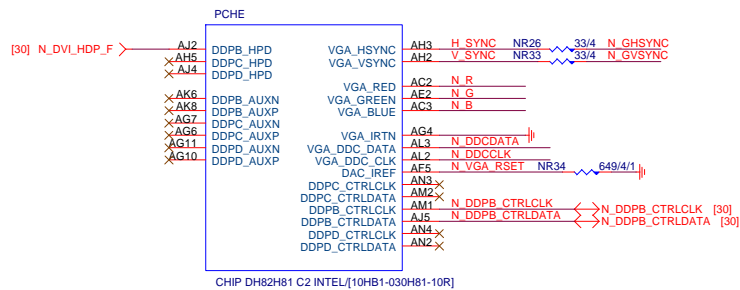


CPU

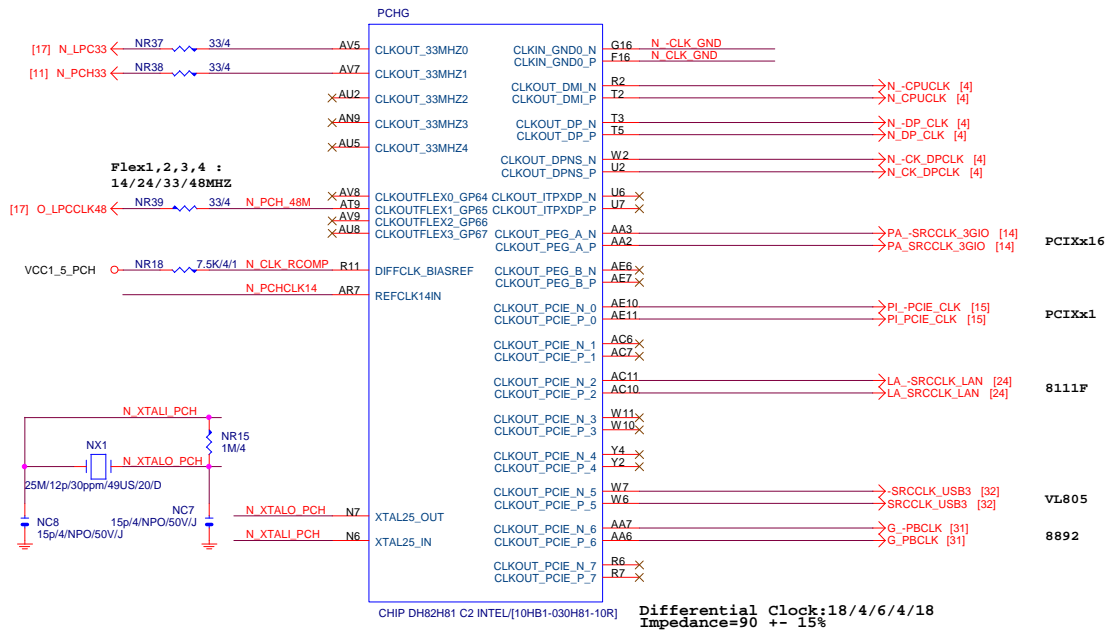


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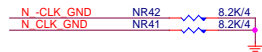
PCH (E)



PCH (G)



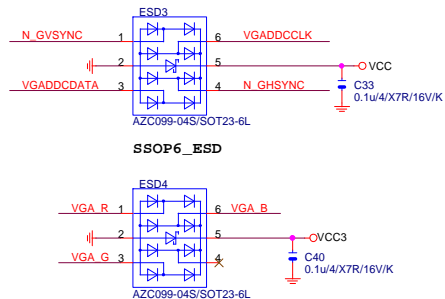
| |
|------------|
| PCH CLK PD |
|------------|



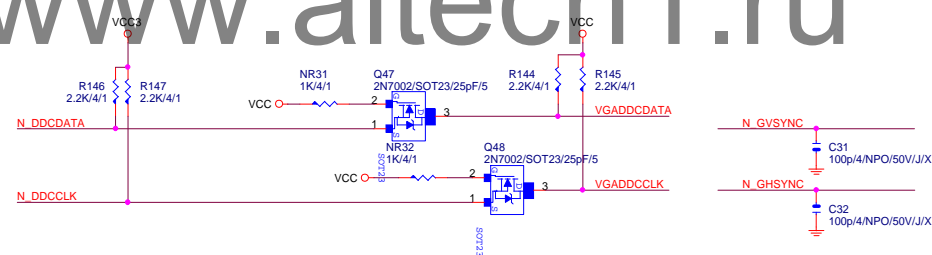
Mount for integrated clock Generation
Mode



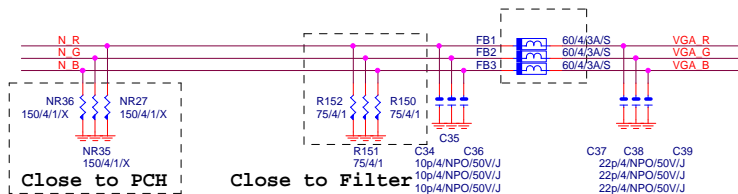
VGA ESD



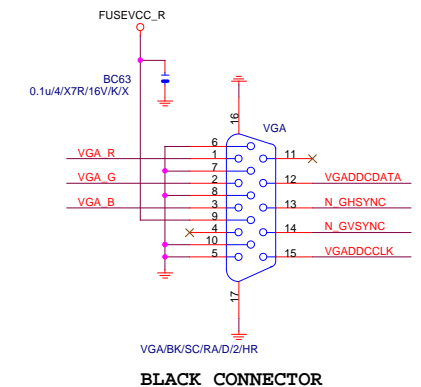
VGA DDC



VGA DDC



VGA CONNECTOR



Gigabyte Technology

PCH DISPLAY ,CLK BUFFER

GA-H81M-S2VP

| | | | | | |
|-------|-----------------------------|-------|----|----|----|
| Date: | Thursday, December 19, 2013 | Sheet | 10 | of | 32 |
|-------|-----------------------------|-------|----|----|----|

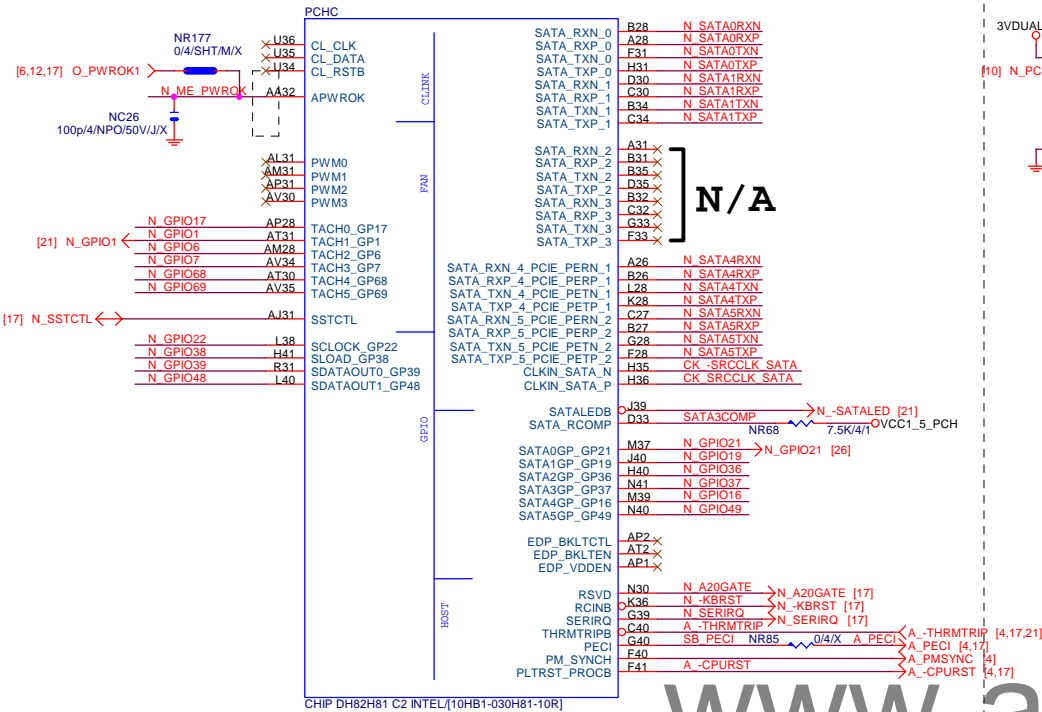
Date: Thursday, December 19, 2013 Sheet 10 of 32

Date: Thursday, December 19, 2013 Sheet 10 of 32

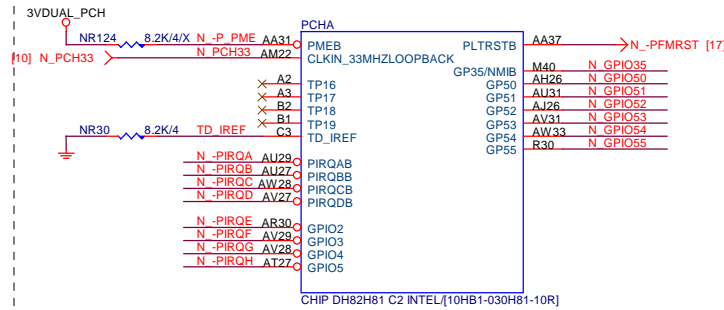
Date: Thursday, December 19, 2013 Sheet 10 of 32

PCH (C)

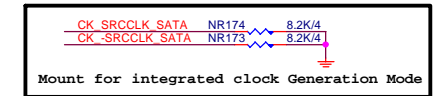
SATA3 : 20/7.5/4.5/7.5/20 (breakout min 8/4/4/4/8)
Impedance=90 +- 17.5%
SATA2 : 15/7.5/4.5/7.5/15 (breakout min 8/4/4/4/8)
Impedance=90 +- 17.5%



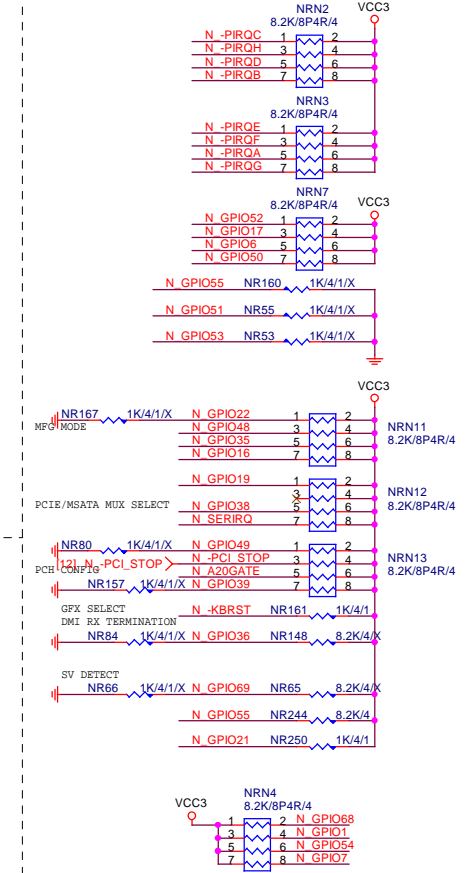
PCH (A)



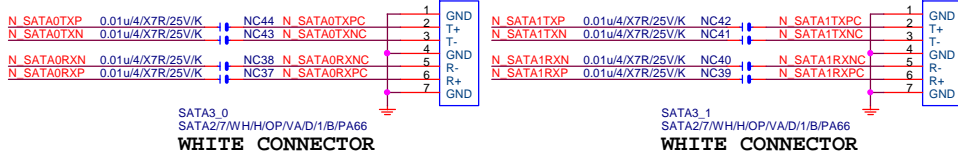
PCH CLK PD



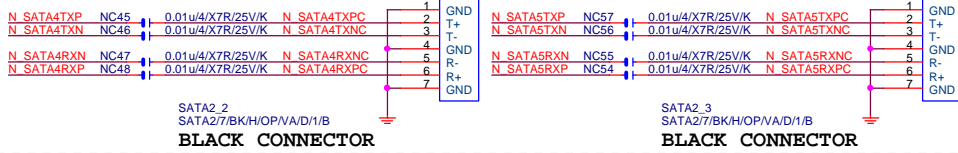
PCH PU/PD



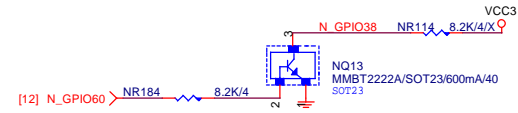
SATA CONNECTOR



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



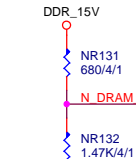
GPIO38 Ctrl



Gigabyte Technology

| Title | | | |
|----------------------|-----------------------------|-------|----------|
| PCH HOST , SATA, PCI | | | |
| GA-H81M-S2VP | | | |
| Size | Document Number | Rev | |
| Custm | | 1.0 | |
| Date: | Thursday, December 19, 2013 | Sheet | 11 of 32 |

(D)



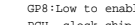
ACZ_SDOUT



PCH_DPWROK



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

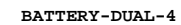


HSW_STRAP13

32.768KHZ



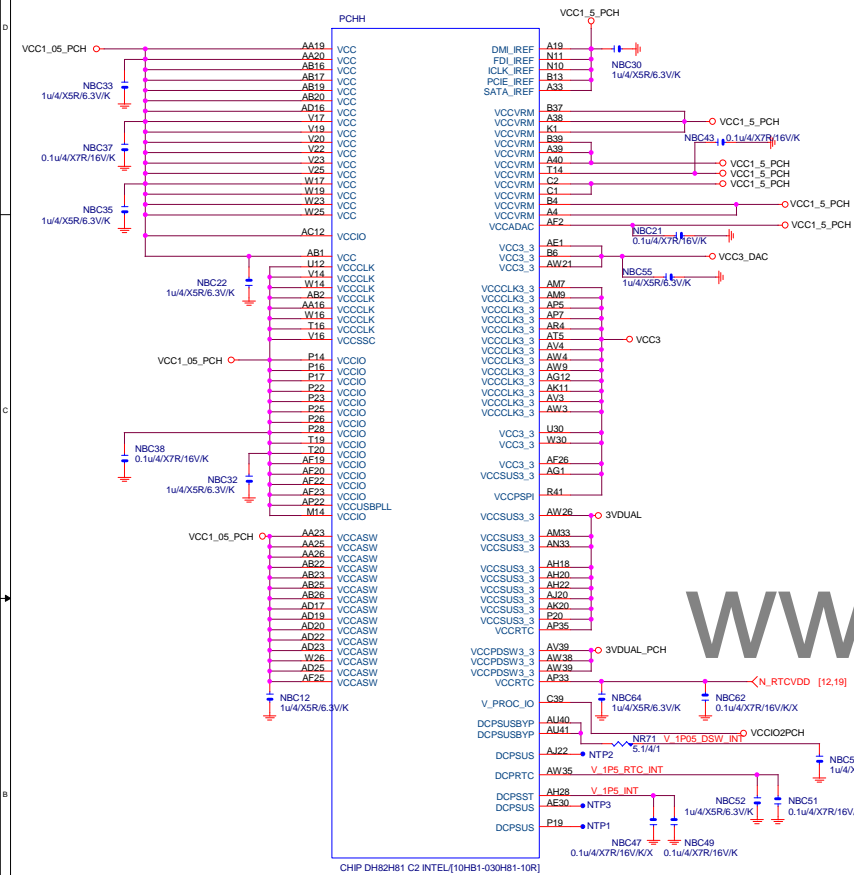
| |
|----------|
| CLR_CMOS |
|----------|



Gigabyte Technology

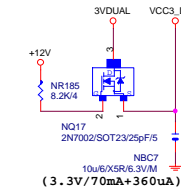
| | | | | | | | |
|--------|-----------------------------|--|-------|-----------------------|----|----|--|
| Title | | | | PCH GPIO, CTRL, AUDIO | | | |
| Size | Document Number | | | Rev | | | |
| Custom | GA-H81M-S2VP | | | 1.0 | | | |
| Date: | Thursday, December 19, 2013 | | Sheet | 12 | of | 32 | |

PCH (H)

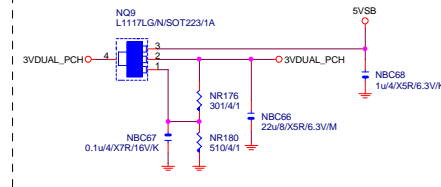


VCC3_DAC

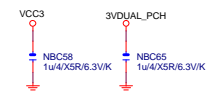
CLOSE北橋(注意震盪水波紋)



3VDUAL_PCH



SHT_PWR



CAP

(3.3V) (X6)

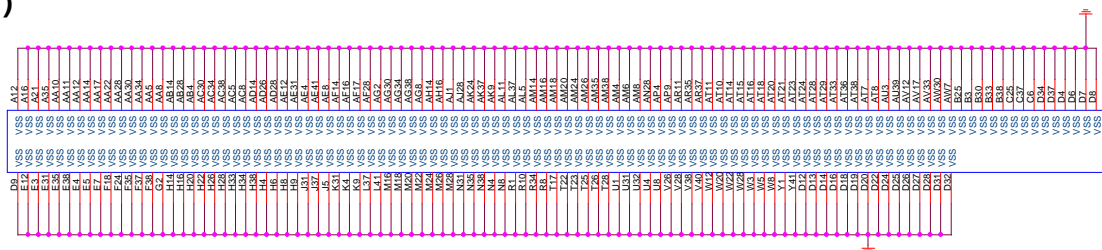
(1.05V) (X5)

(1.05V) (X6)

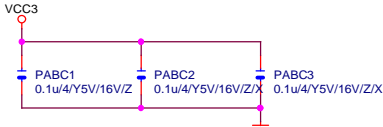
(1.05V) (X2) (3.3V) (X2)

(1.05V) (X10)

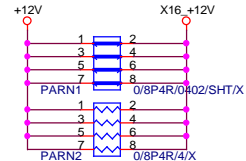
PCH (I)



PCIEX16 CAP



PCIEX16 PROTECT SHT

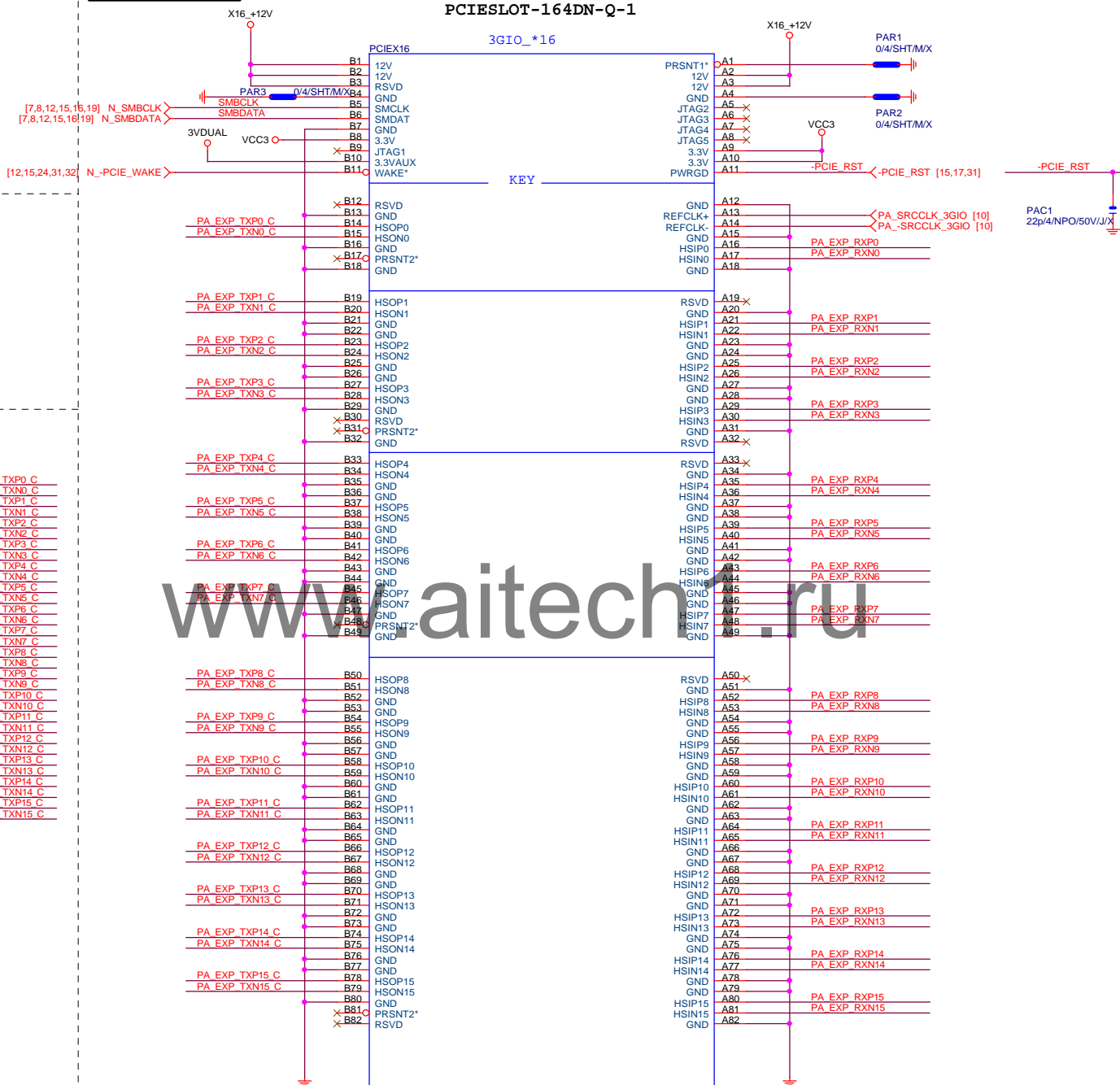


PCIEX16 AC CAP

| | | | |
|--------------|-------|-------------------|----------------|
| 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 RXP0.[15] >>> PA_EXP_RXP[0..15] [4]
 PA EXP RXN0.[15] >>> PA_EXP_RXN[0..15] [4]
 PA EXP TXP0.[15] >>> PA_EXP_TXP[0..15] [4]
 PA EXP TXN0.[15] >>> PA_EXP_TXN[0..15] [4]

PCIEX16 SLOT

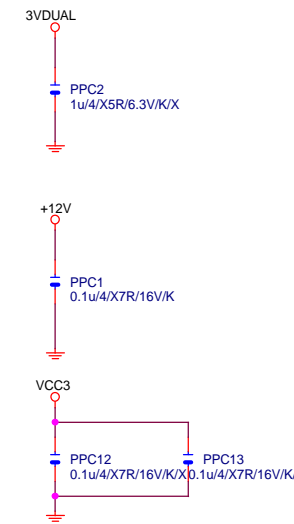
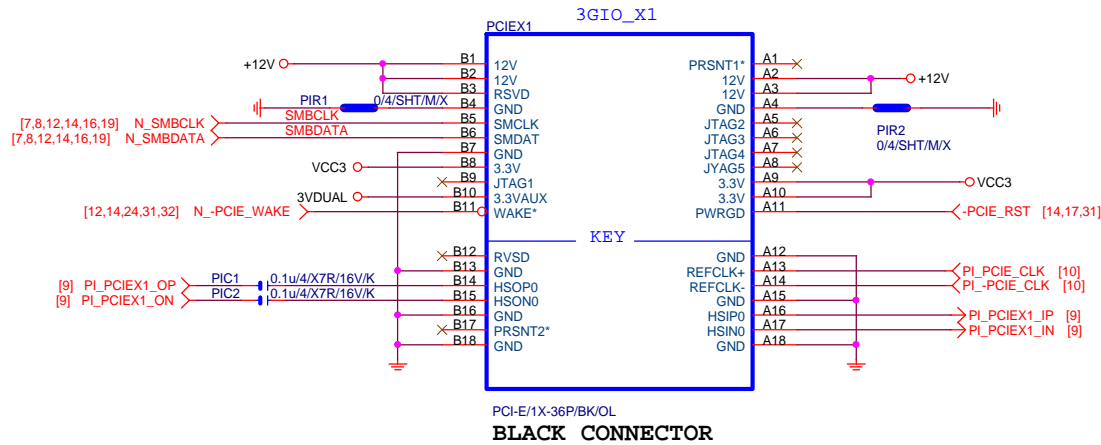


BLACK CONNECTOR

Gigabyte Technology

| | | | | | |
|--------|--|--|-----------------------------|--|--|
| Title | | | PCI EXPRESS * 16 | | |
| Size | | | GA-H81M-S2VP | | |
| Custom | | | Rev 1.0 | | |
| Date: | | | Thursday, December 19, 2013 | | |
| | | | Sheet 14 of 32 | | |

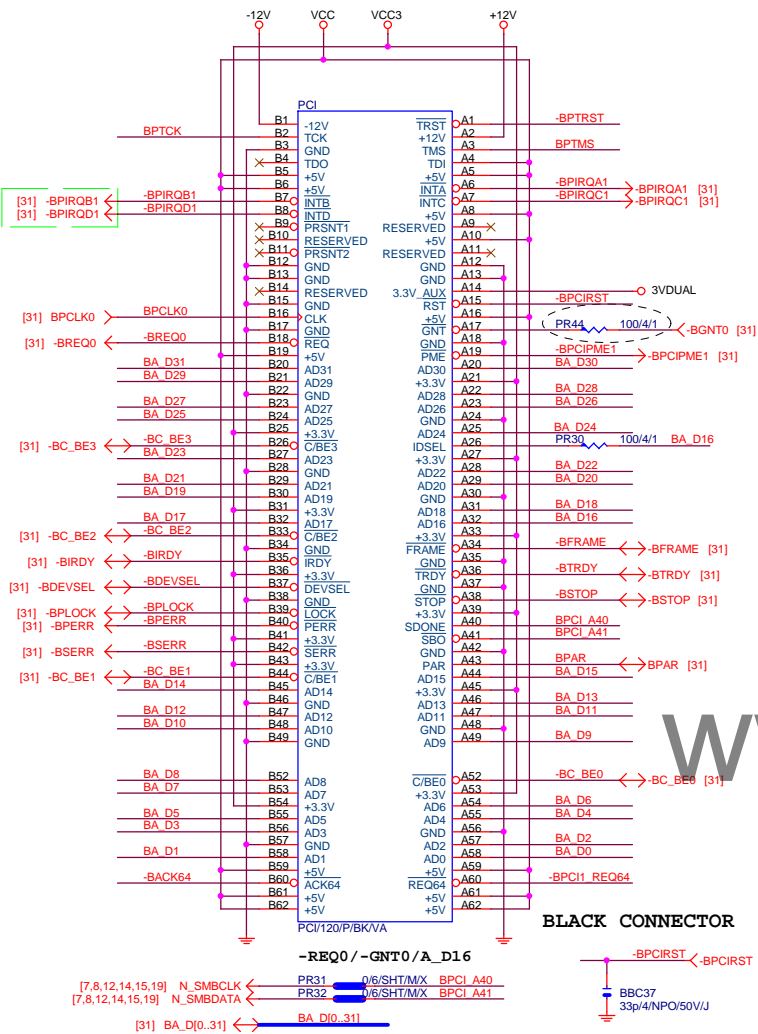
PCIEX1 SLOT



www.aitech1.ru

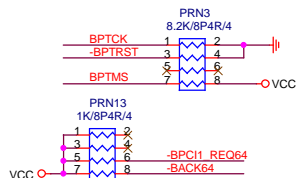
| Gigabyte Technology | | | |
|----------------------|-----------------------------|-------|----------|
| Title | | | |
| PCI EXPRESS X 1 PORT | | | |
| Size | Document Number | | Rev |
| Custom | GA-H81M-S2VP | | 1.0 |
| Date: | Thursday, December 19, 2013 | Sheet | 15 of 32 |

PCI SLOT 1

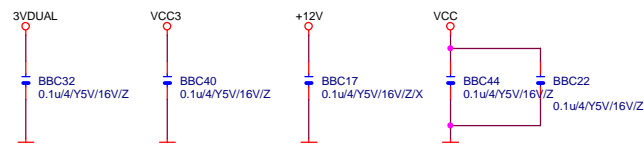


www.aitech1.ru

| | |
|-----|----|
| PCI | PU |
|-----|----|



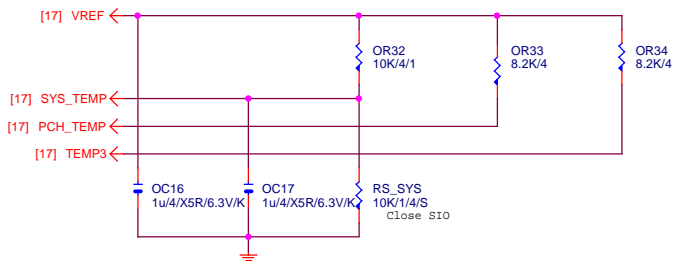
PCI CAP



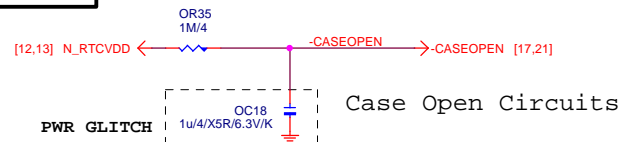
Gigabyte Technology

| | | | |
|-----------------------------------|-----------------|--------------|---------|
| Title | | | |
| PCI SLOT 1&2 | | | |
| Size Custom | Document Number | GA-H81M-S2VP | Rev 1.0 |
| Date: Thursday, December 19, 2013 | Sheet 16 | of 32 | |

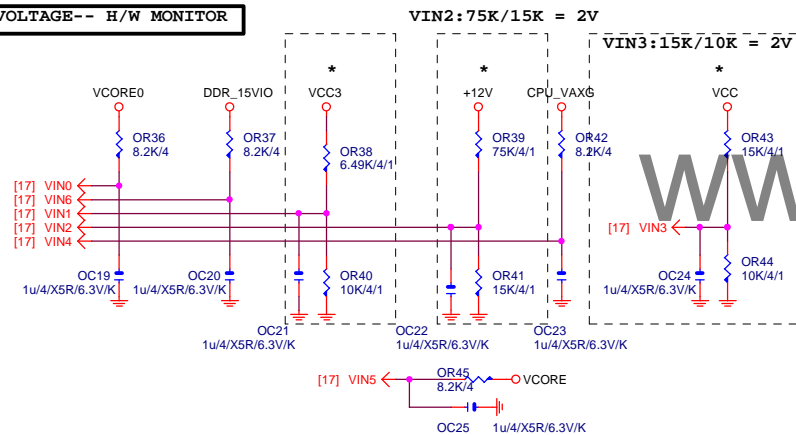
TEMP H/W MONITOR



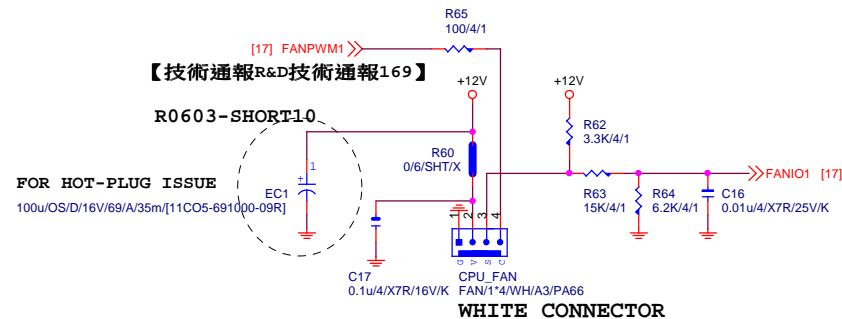
CASE OPEN



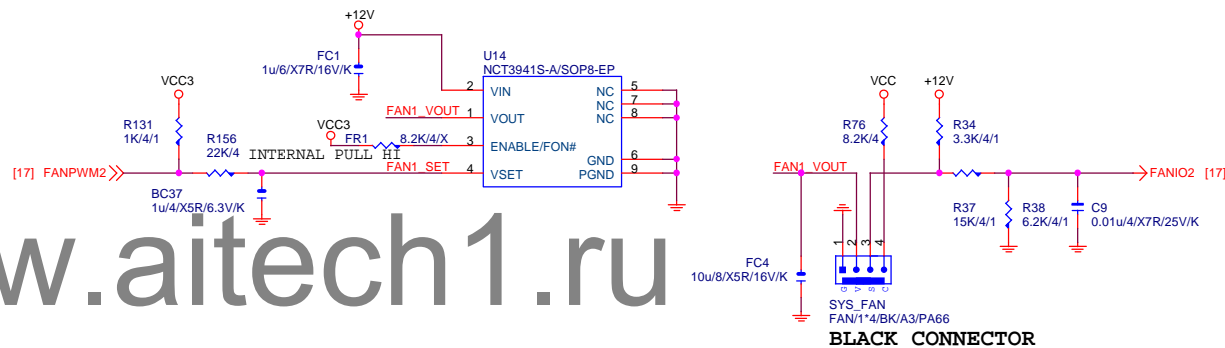
VOLTAGE-- H/W MONITOR



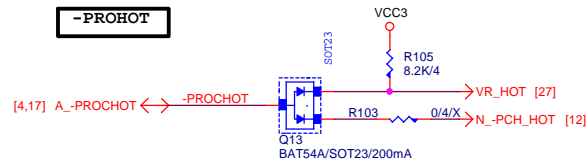
CPU SMART FAN



SYS SMART FAN

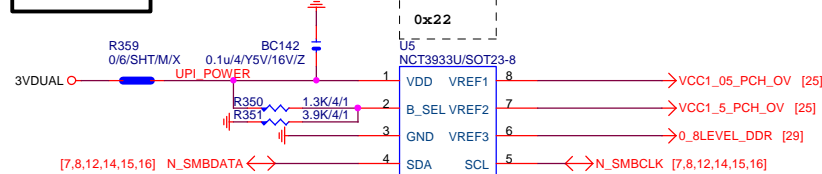


-PROHOT



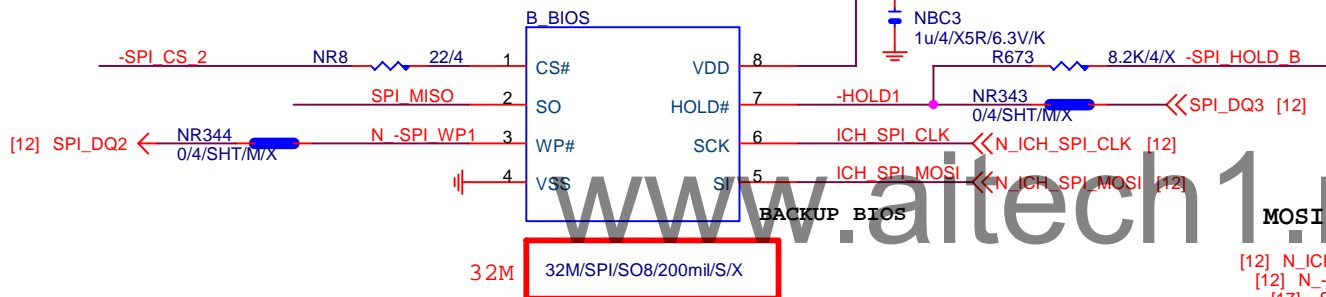
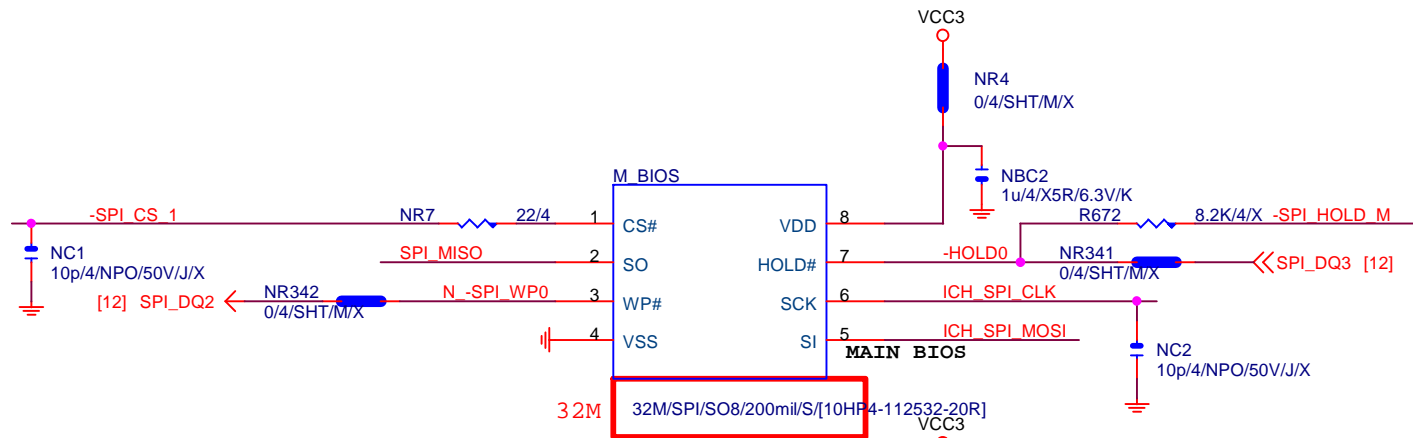
接pwm feedback pin

OV NCT3933



Gigabyte Technology

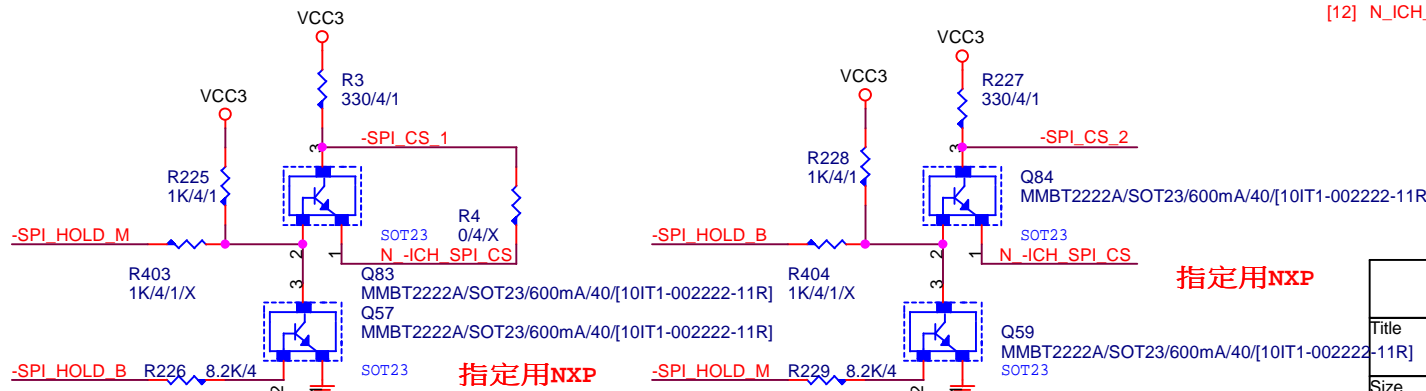
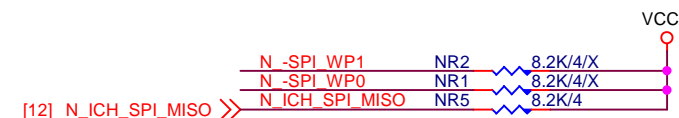
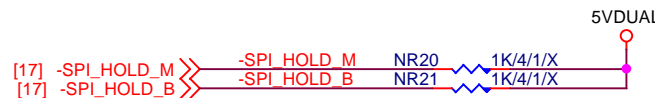
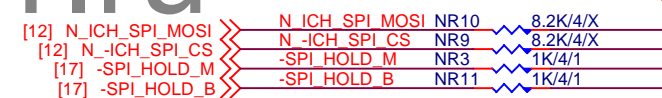
| | | | | | |
|-----------------|--|--|-----------------------------|--|--|
| Title | | | HWM,FAN CTRL,OV | | |
| Size | | | GA-H81M-S2VP | | |
| Document Number | | | Rev 1.0 | | |
| Date: | | | Thursday, December 19, 2013 | | |
| Sheet | | | 19 of 32 | | |



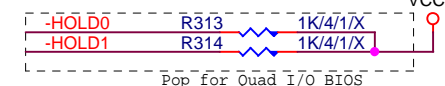
| BOOT DEVICE | GNT0 | GNT1 |
|-------------|------|------|
| LPC | 0 | 0 |
| PCI | 0 | 1 |
| NAND | 1 | 0 |
| SPI | 1 | 1 |

1 means floating
0 means PD 1K

MOSI For DMI RX Termination Voltage



CHECK



指定用NXP

Gigabyte Technology

DUAL BIOS

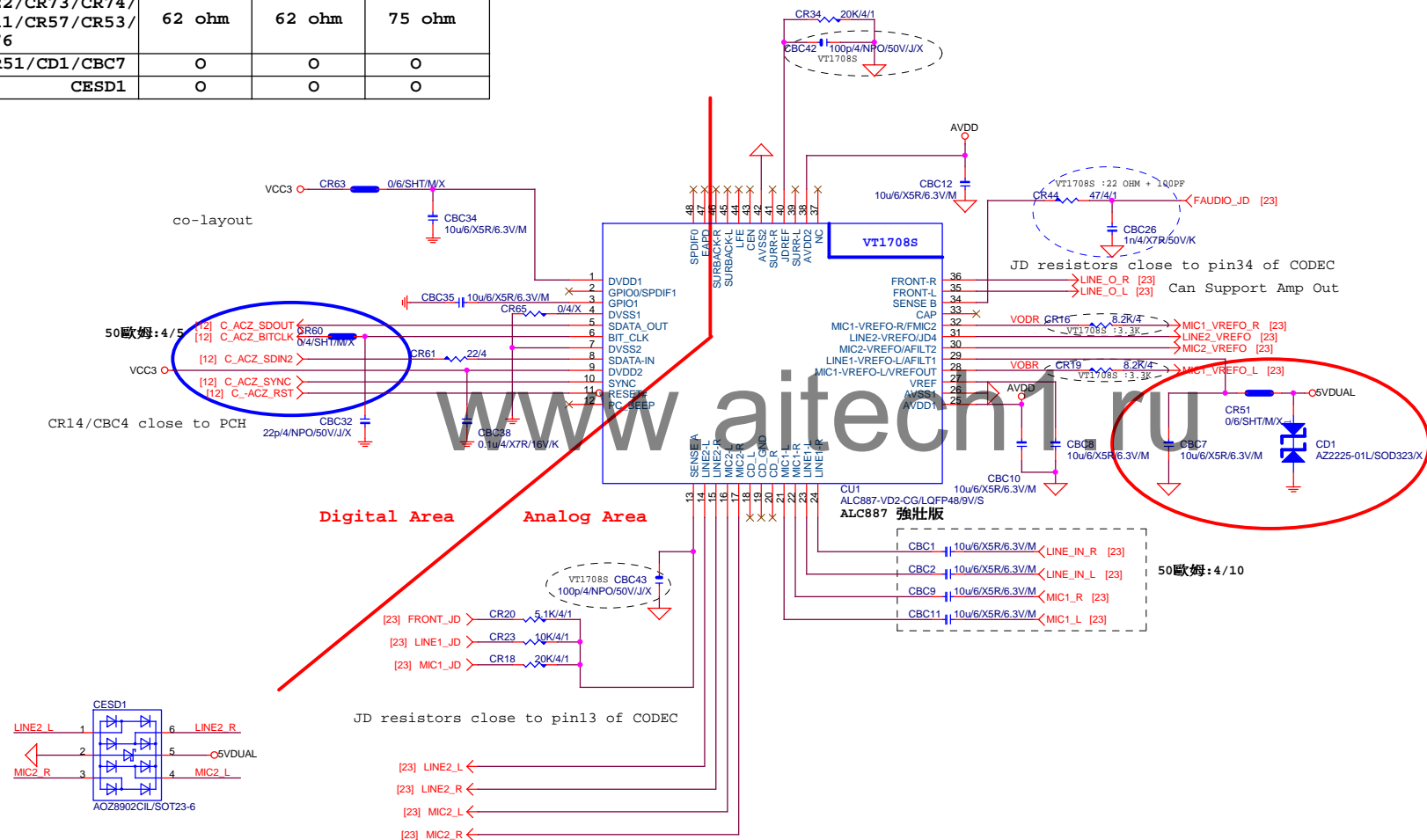
GA-H81M-S2VP

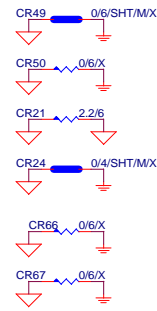
Rev 1.0

| | | |
|-------|-----------------------------|----------------|
| Title | Document Number | Rev |
| | | 1.0 |
| Date | Thursday, December 19, 2013 | Sheet 20 of 32 |

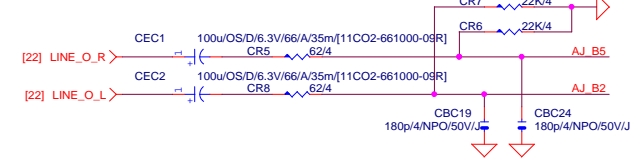
AZALIA CODEC **ALC892/ALC887-VD2/VT1708-CE Colay**

| | 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 |





LINE-OUT



LINE-IN

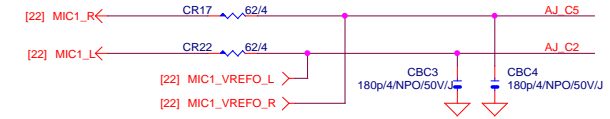
Verify MIC function
in LINE-in

Only reserved for ALC888

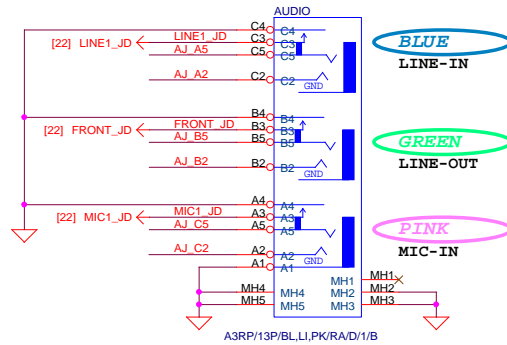


For 889A/888

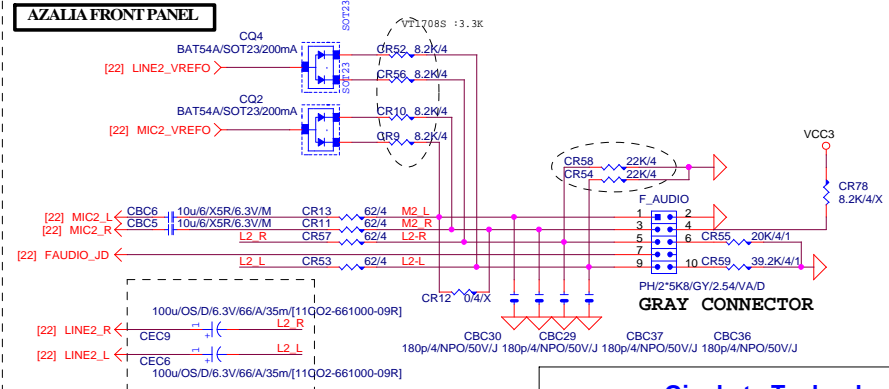
MIC-IN



SPDIF_OUT



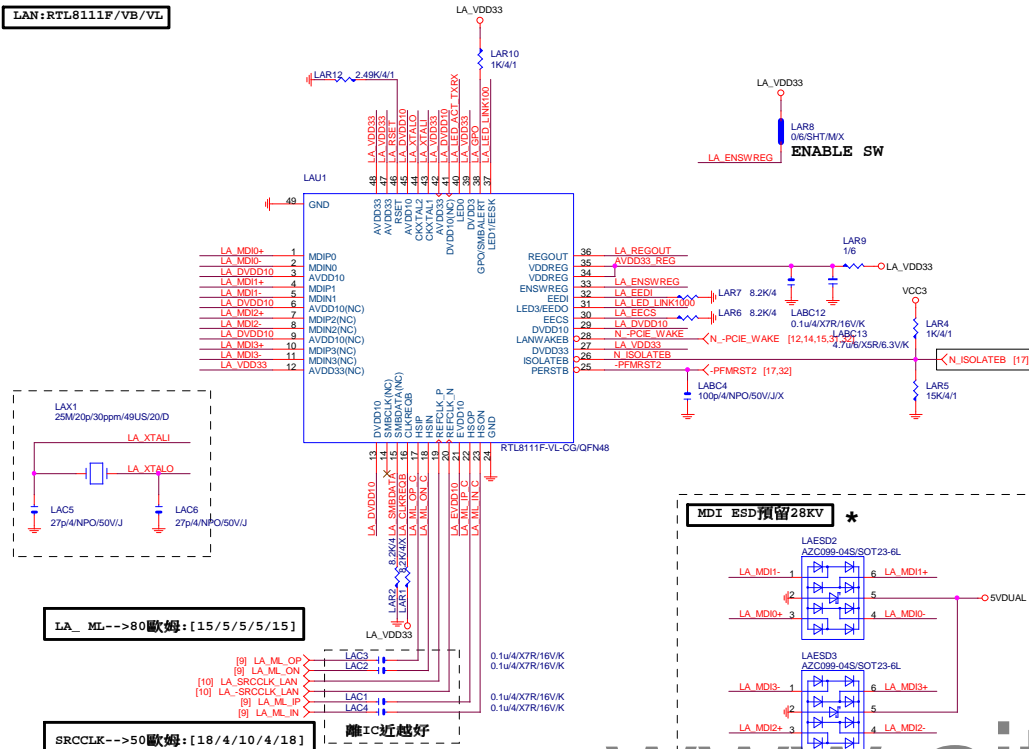
AZALIA FRONT PANEL



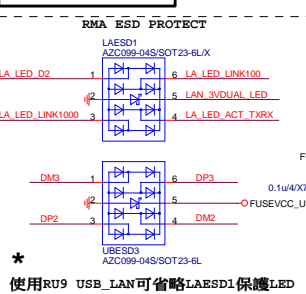
Gigabyte Technology

| Title | | | |
|------------|-----------------------------|--------------|----------|
| AUDIO JACK | | | |
| Size | Document Number | GA-H81M-S2VP | |
| Custom | | | Rev 1.0 |
| Date: | Thursday, December 19, 2013 | Sheet | 23 of 32 |

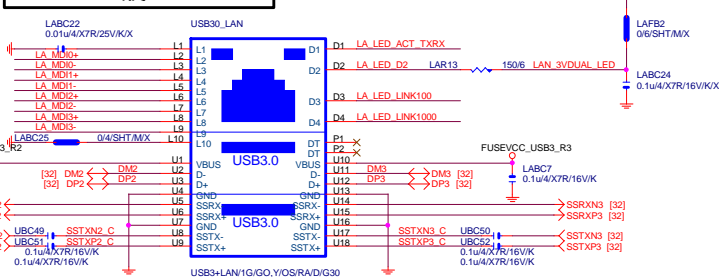
```
LAN:RTL8111F/VB/VL
```



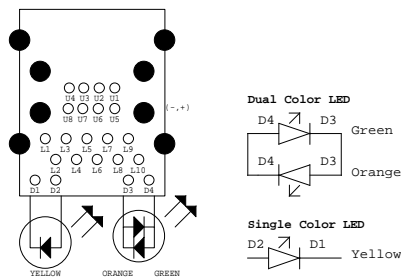
USB_LAN CONNECTOR



LA_MDI-->100歐姆:[20/4/8/4/20]



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

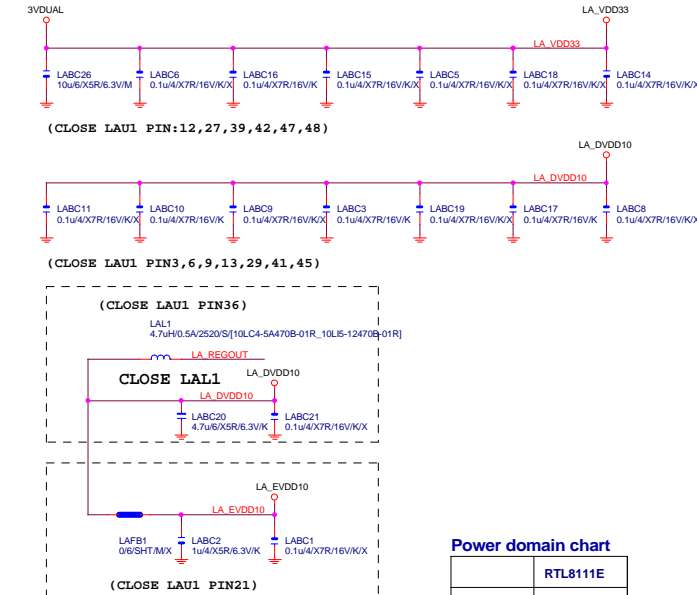


BOM NOTICE *

| 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

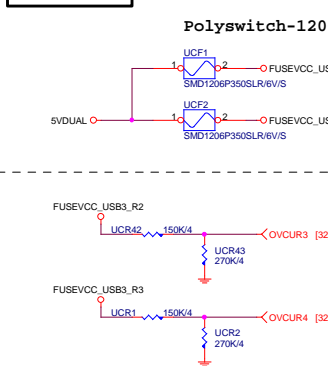
IN POWER



Power domain charts

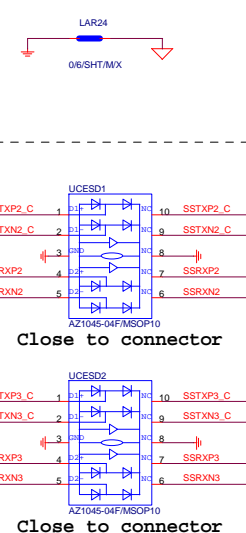
| | |
|--------|----------|
| | RTL8111E |
| AVDD33 | 3.3V |
| DVDD33 | 3.3V |
| VDDREG | 3.3V |
| DVDD10 | 1.05V |

USB POWER



EMI SHORT PAD

PS:視EMI需求

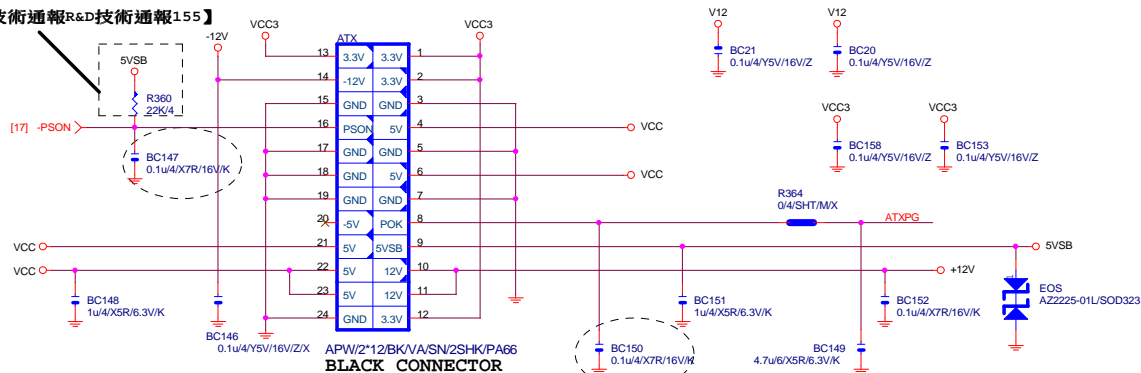


Gigabyte Technology

| | | | |
|--------|-----------------------------|-------------------------|------------|
| Title | | Realtek RTL8111G | |
| Size | Document Number | GA-H81M-S2VP | Rev |
| Custom | | | 1.0 |
| Date: | Thursday, December 19, 2013 | Sheet | 24 of 32 |

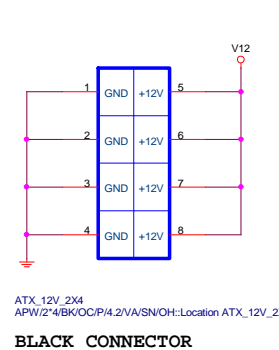
ATXX24 POWER CONNECTOR

【技術通報R&D技術通報155】



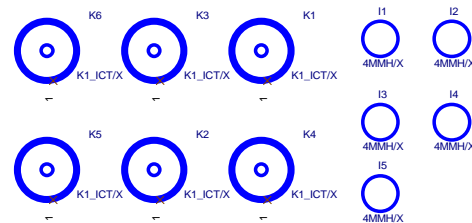
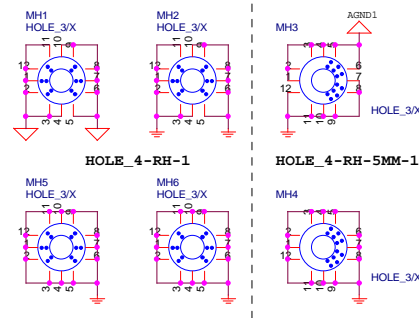
BLACK CONNECTOR

ATXX4 POWER CONNECTOR



ATX_12V_2X4
APW/2'4BK/OC/P/4.2V/A/SN/OH:Location ATX_12V_2X4

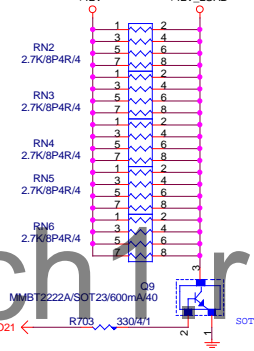
BLACK CONNECTOR



To prevent the 5VSB under loading when boot

【技術通報R&D技術通報153】

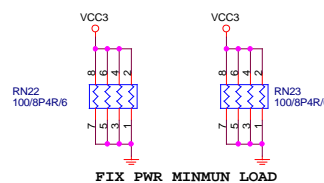
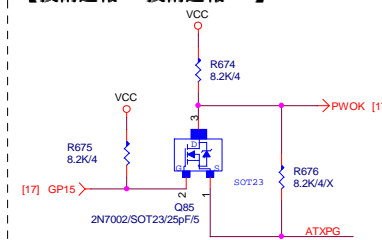
To fix 12V light load abnormal issue



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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-S2VP

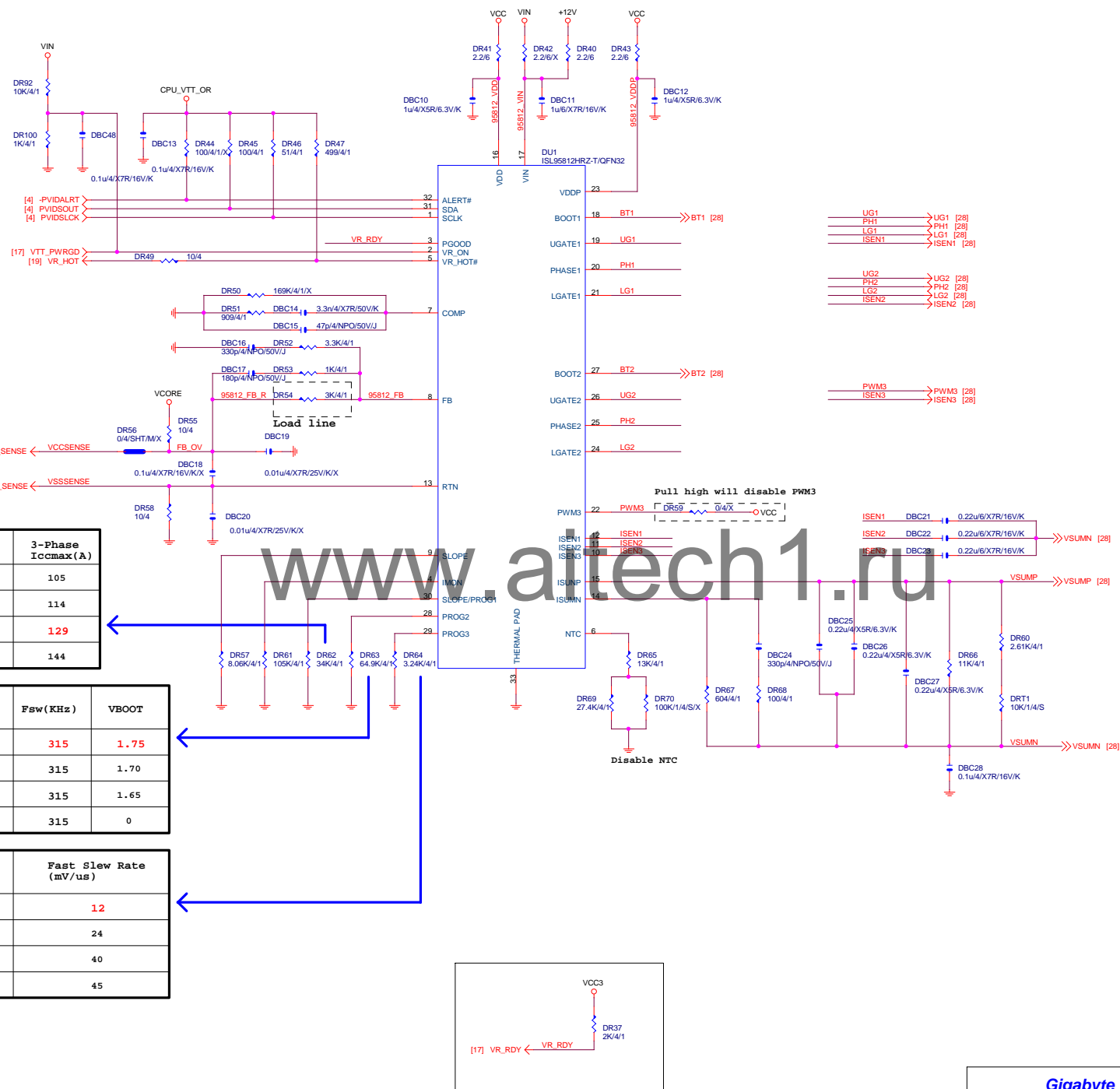
Rev 1.0

Date: Thursday, December 19, 2013 Sheet 26 of 32

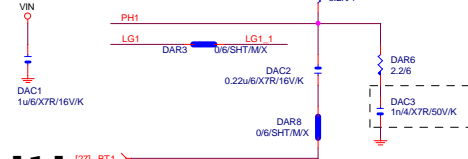
| R_PROG1 (Kohm) | 3-Phase Iccmax(A) |
|-------------------|----------------------|
| 24.9 | 105 |
| 28.7 | 114 |
| 34.0 | 129 |
| 42.2 | 144 |

| R_PROG2 (Kohm) | Fsw(KHz) | VBOOT |
|-------------------|----------|-------|
| 64.9 | 315 | 1.75 |
| 73.2 | 315 | 1.70 |
| 80.6 | 315 | 1.65 |
| 90.9 | 315 | 0 |

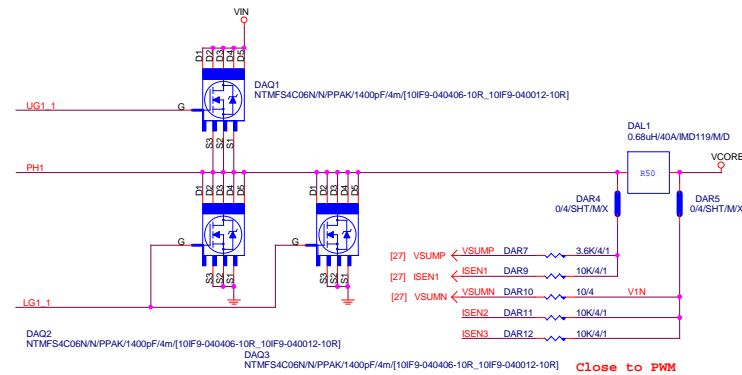
| R_PROG3 (Kohm) | Fast Slew Rate (mV/us) |
|-------------------|---------------------------|
| 3.24 | 12 |
| 5.76 | 24 |
| 9.31 | 40 |
| 13.3 | 45 |



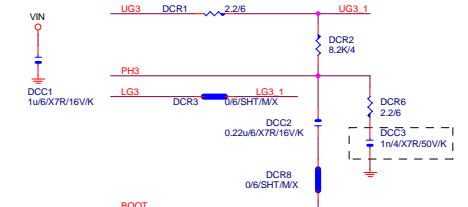
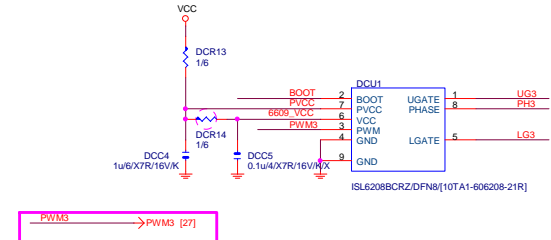
PHASE 1



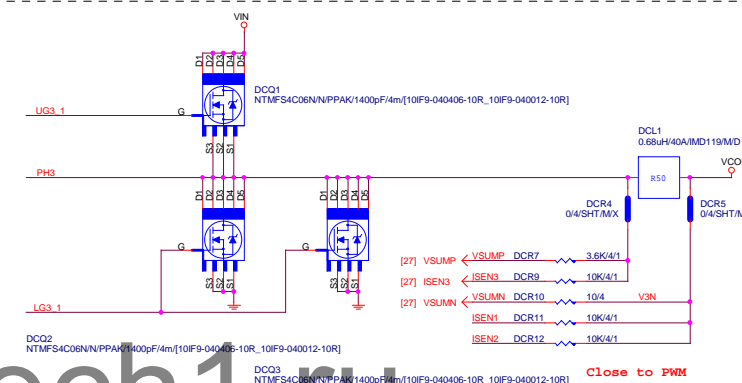
[1] [27] BT1



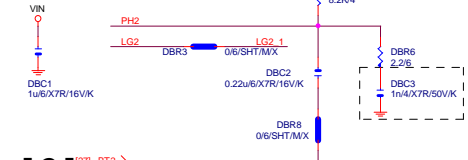
PHASE 3



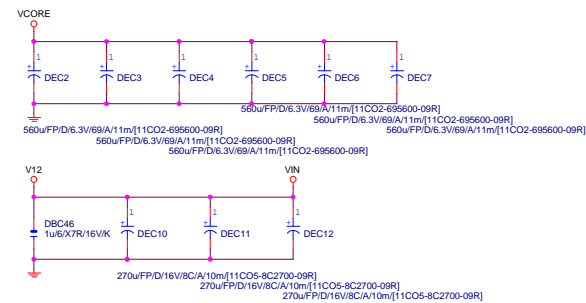
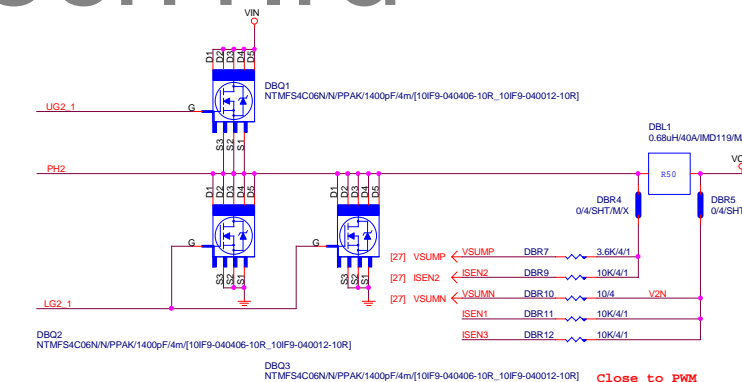
[3] [27] BT2



PHASE 2

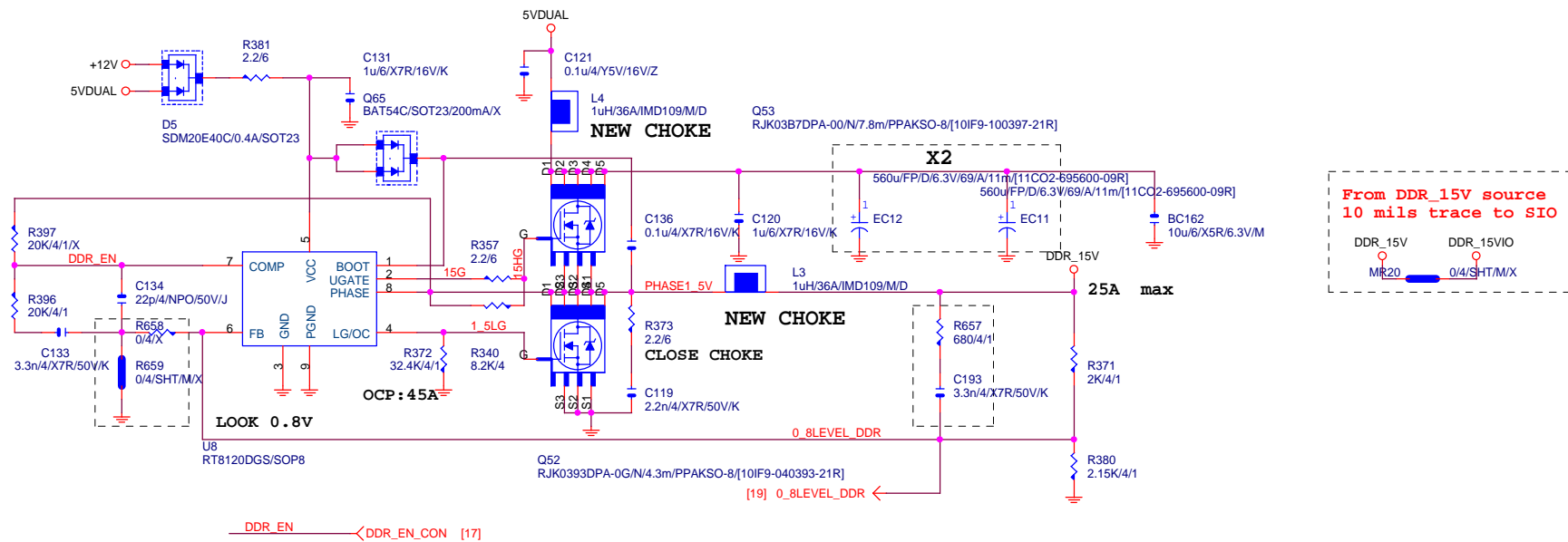


[2] [27] BT2



| Gigabyte Technology | | | |
|---------------------|-----------------------------|---------------|----------|
| Title | | CPU CORE VR-2 | |
| Size | Document Number | GA-H81M-S2VP | |
| Custom | | Rev 1.0 | |
| Date | Thursday, December 10, 2013 | Sheet | 28 of 32 |

DDR15V



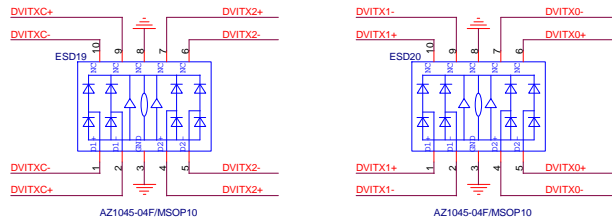
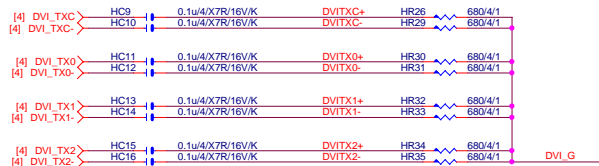
PWR SEQ

VIN=5V,VOUT=1.5V,IOUT=25A,PHASE=1
IRMS=11.45A
560u/FP/D/6.3V/688m 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=(Iocp*Lgate,rdson)/Iocset
Rocset=(45A*6.7mOhm)/10uA = 30K
Iocset=10uA
```

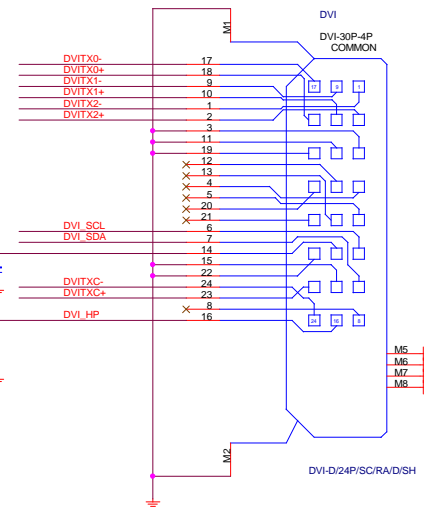
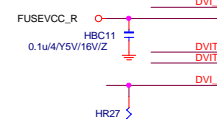
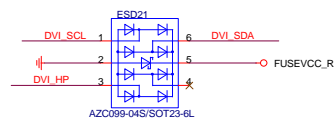
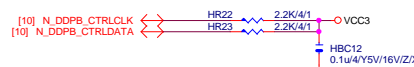
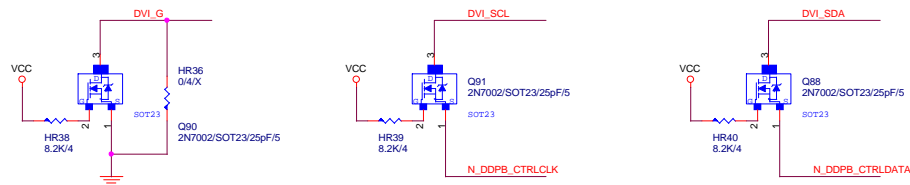
| | | | |
|-----------------------------------|-----------------------------|---------------------|-------------------|
| <i>Gigabyte Technology</i> | | | |
| Title | | | |
| DDR POWER | | | |
| Size Custom | Document Number | GA-H81M-S2VP | Rev 1.0 |
| Date: | Thursday, December 19, 2013 | Sheet 29 of 32 | |

DVI LEVEL SHIFT



Close to connector

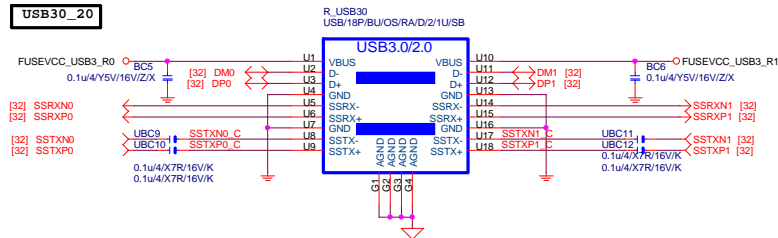
Close to connector



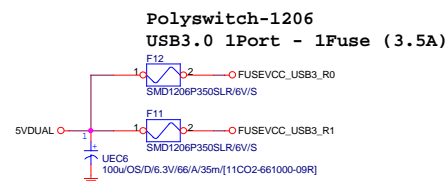
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USB30_20 ESD PROTECT

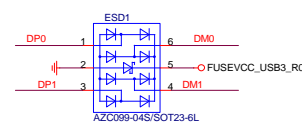
USB30_20



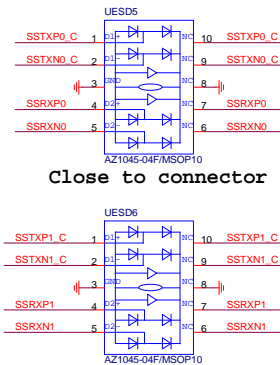
USB30_20 PWR



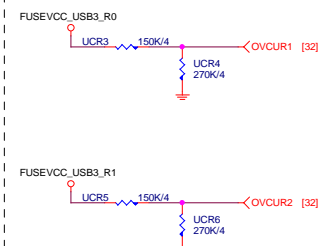
USB2.0 ESD



USB3.0 ESD



-USBOC_R

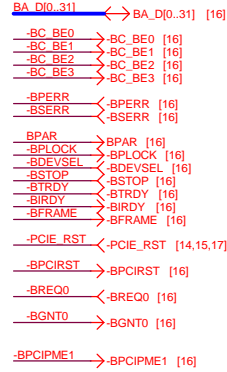


Gigabyte Technology

| | |
|--------|-----------------------------|
| File | DVI |
| Size | Document Number |
| Custom | GA-H81M-S2VP |
| Date | Thursday, December 19, 2013 |
| Sheet | 30 of 32 |
| Rev | 1.0 |

PCIE TO PCI

PCI:5/4/5 Impedance=50 +- 15%



High: Enable PCI CLK 66MHz
Low: Disable PCI CLK 66MHz

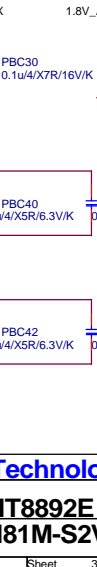
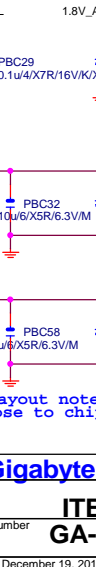
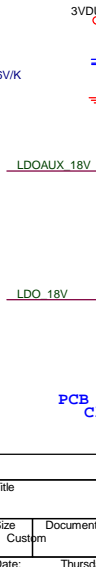
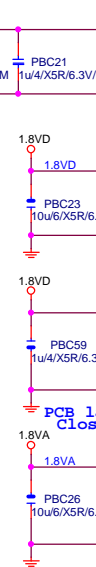
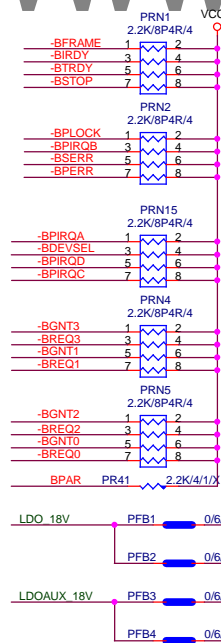
High: PCICLK INPUT form CLK Gen
Low: PCICLK OUTPUT form IT8893 chip

IT8892

PCI slot

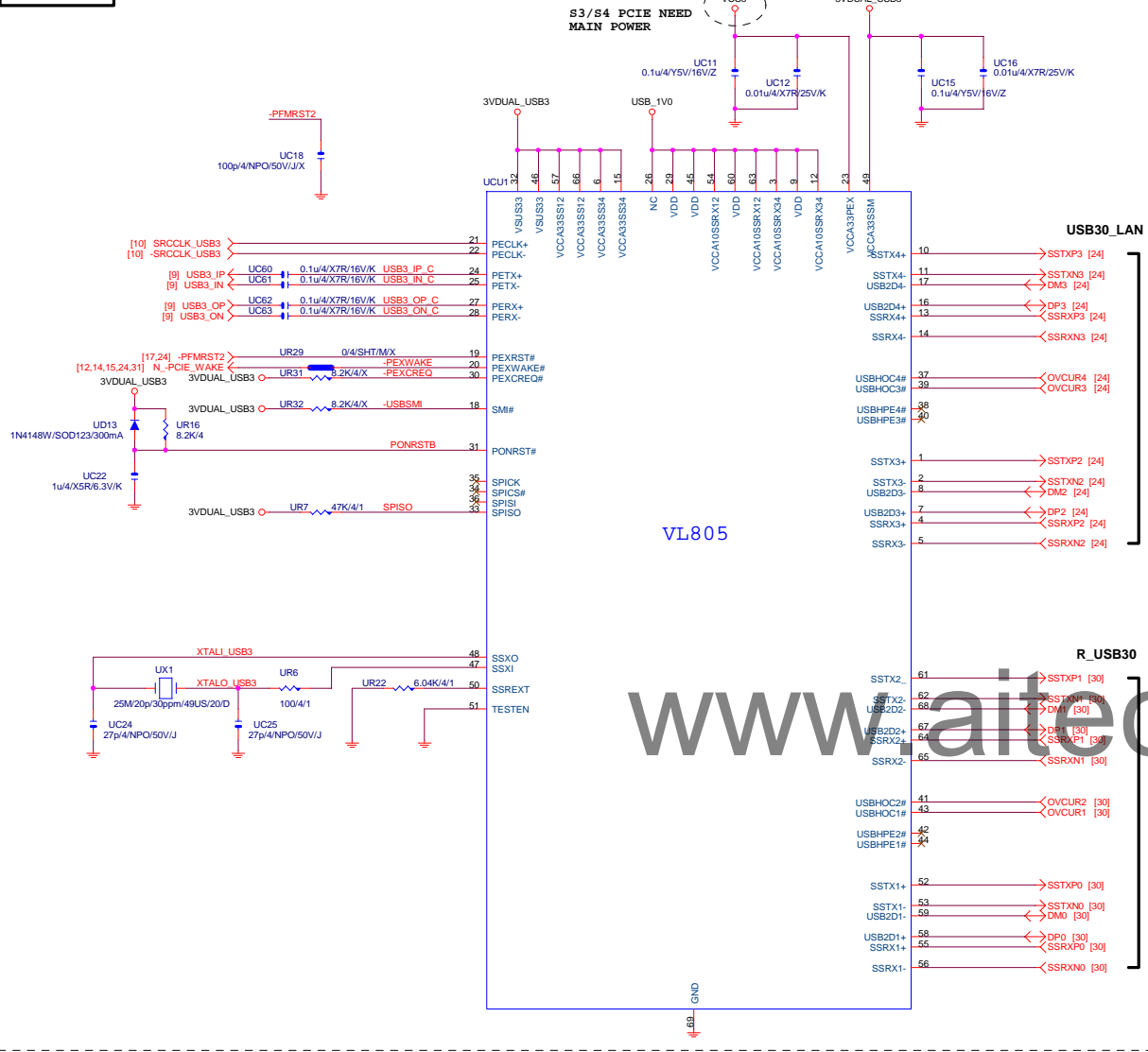
chipset side

www.aitech.com



| Gigabyte Technology | | | |
|---------------------|-----------------------------|-------|----------|
| Title | | | |
| ITE IT8892E | | | |
| GA-H81M-S2VP | | | |
| Size | Document Number | Rev | 1.0 |
| Custom | | | |
| Date: | Thursday, December 19, 2013 | Sheet | 31 of 32 |

USB3.0 VL805



USB3.0 POWER

