

Model Name: GA-H87-HD3

1.02

SHEET

TITLE

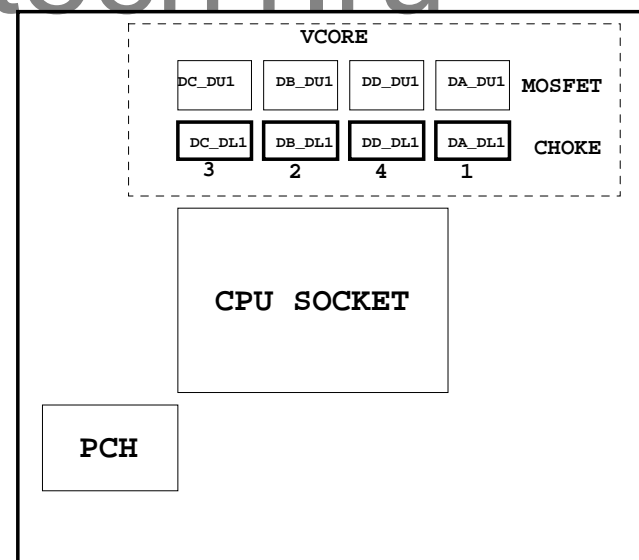
| | |
|----|--------------------------|
| 01 | COVER SHEET |
| 02 | BOM & PCB MODIFY HISTORY |
| 03 | BLOCK DIAGRAM |
| 04 | CPU_LGA1150-A |
| 05 | CPU_LGA1150-B |
| 06 | CPU_LGA1150-C |
| 07 | DDR III CHANNEL A |
| 08 | DDR III CHANNEL B |
| 09 | PCH_FDI,DMI,USB,PCIE |
| 10 | PCH_RGB,CLK BUFFER |
| 11 | PCH_HOST,SATA,PCI |
| 12 | PCH_GPIO,CTRL,AUDIO |
| 13 | PCH_PWR,GND |
| 14 | PCI EXPRESS*16 SLOT |
| 15 | PCIEX1*2 , PCIEX4 SLOT |
| 16 | ITE8892 PCI BRIDGE |
| 17 | PCI SLOT 1&2 |
| 18 | I/O ITE8728 |
| 19 | COM, -PROHOT, R_USB |
| 20 | Dual BIOS / LPT |
| 21 | ALC892 CODEC |
| 22 | REAR AUDIO JACK |
| 23 | VCORE_ ISL95820_1 |
| 24 | VCORE_ ISL95820_2 |
| 25 | DDR15V / M3 POWER |
| 26 | NCP3933 OVER VOLTAGE |
| 27 | DISCRETE POWER |

SHEET

TITLE

| | |
|----|------------------------|
| 28 | F_PANEL , F_USB2.0/3.0 |
| 29 | ATX POWER, CLOCK GEN |
| 30 | HWM , KB/MS , FAN CTRL |
| 31 | Realtek 8111F-VL |
| 32 | DVI |
| 33 | HDMI |
| 34 | TABLE LIST |
| 35 | |
| 36 | |
| 37 | |
| 38 | |
| 39 | |
| 40 | |

www.aitech1.ru



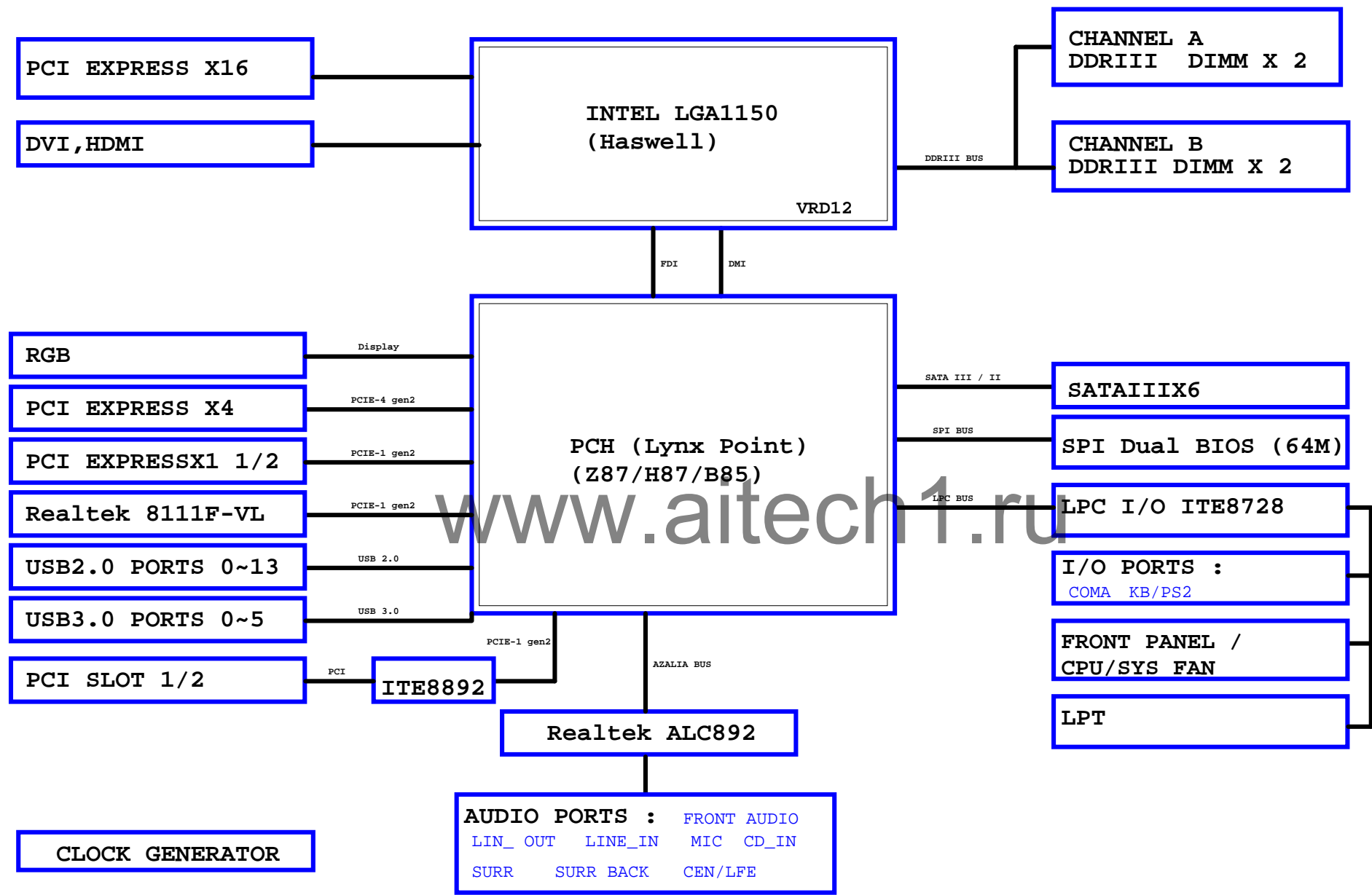
Gigabyte Technology

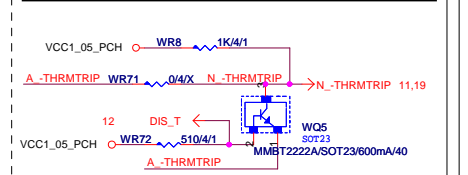
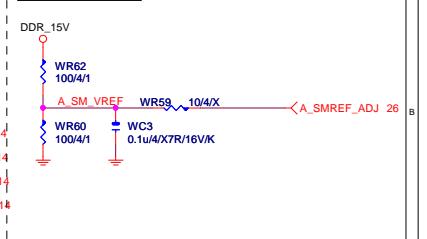
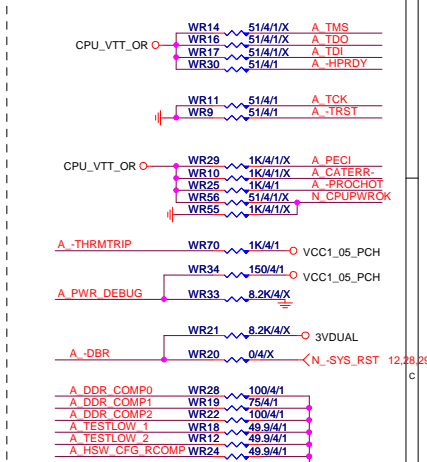
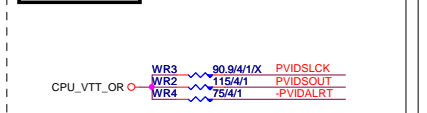
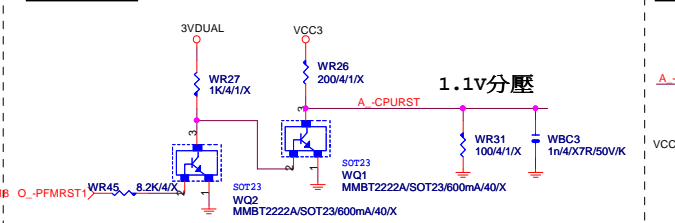
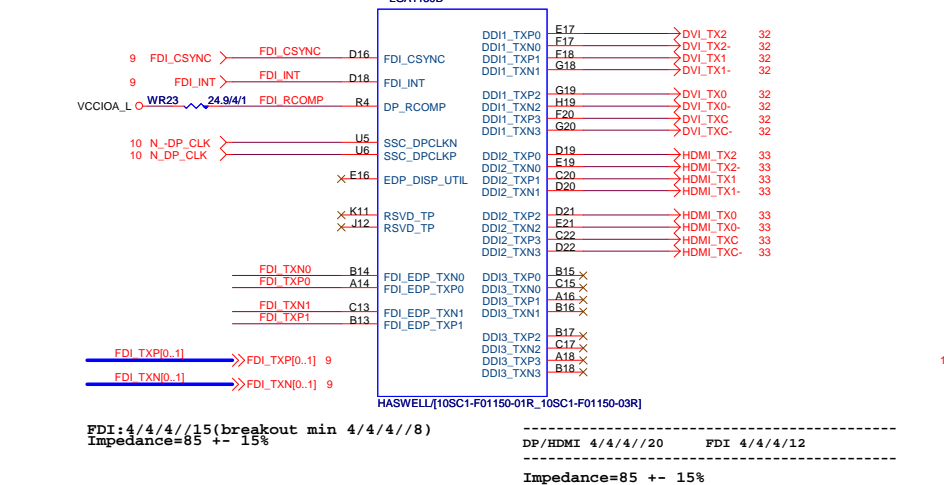
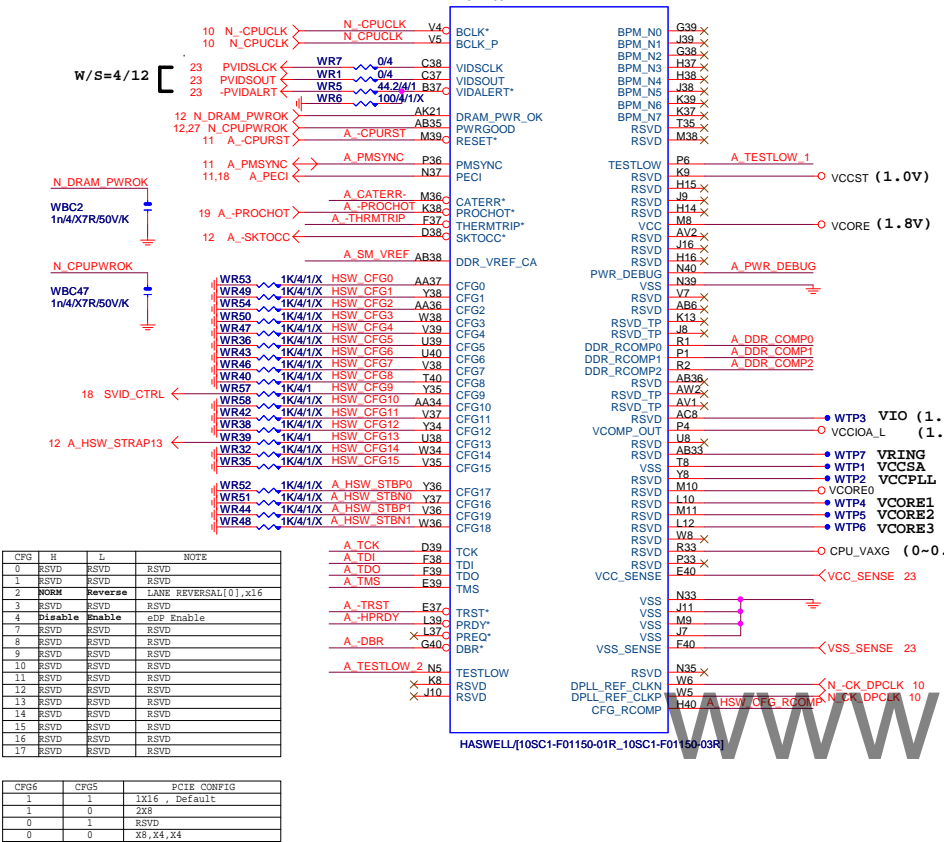
| | | | |
|-------------|------------------------|------------|---------|
| Title | | | |
| Cover Sheet | | | |
| Size | Document Number | GA-H87-HD3 | Rev |
| Custom | | | 1.02 |
| Date: | Friday, March 22, 2013 | Sheet | 1 of 34 |

Component value change history

[illegible][illegible]

BLOCK DIAGRAM

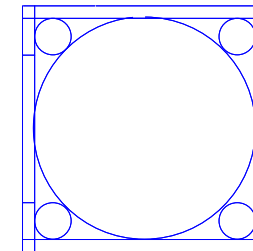




LGA1150A

HASWELL/[10SC1-F01150-01R_10SC1-F01150-03R]

LGA1150B

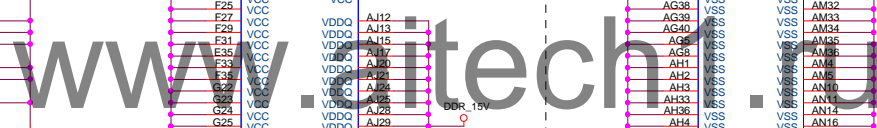
HASWELL\10SC1-F01150-01R_10SC1-F01150-03RLGA1150
ILM_BP/1156/CSP

7 MODT_A[0..3] ↔ MDA[0..63]
 8 MODT_B[0..3] ↔ MDB[0..63]
 7 DQSA[0..7] ↔ DQSB[0..7]
 7 -DQSA[0..7] ↔ -DQSB[0..7]
 7 MAAA[0..15] ↔ MAAB[0..15]
 8 MAAB[0..15] ↔ MAAA[0..15]
 8 DQSB[0..7] ↔ DQSA[0..7]
 8 -DQSB[0..7] ↔ -DQSA[0..7]

(F, J)



(G,H,I)

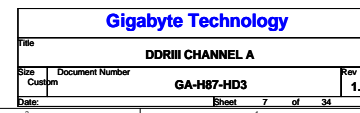
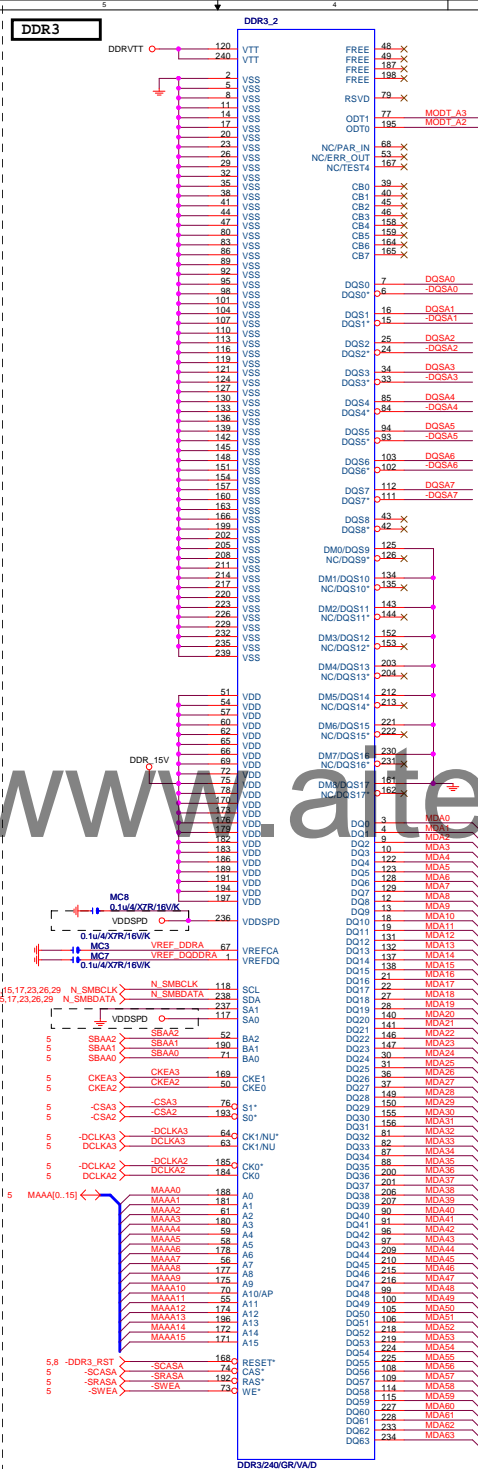


(X30)



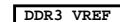
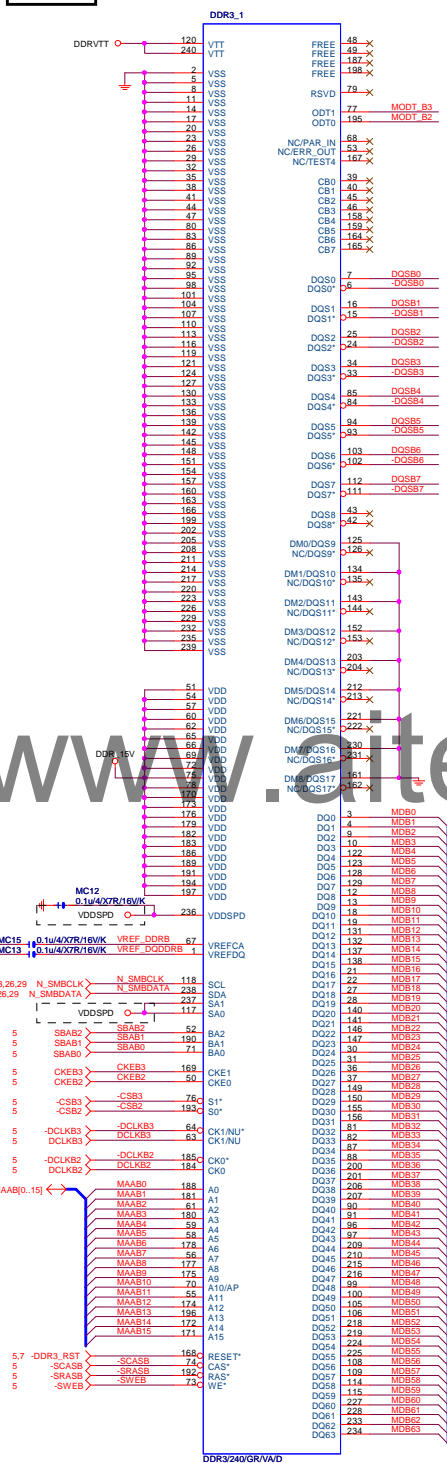
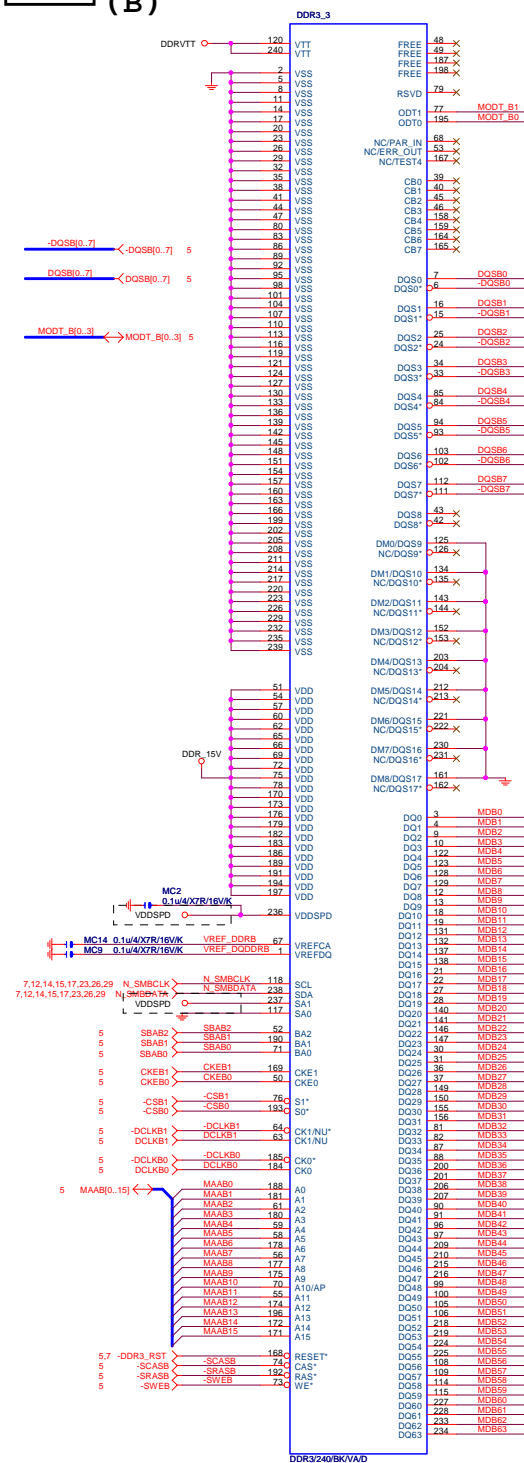
(X15)







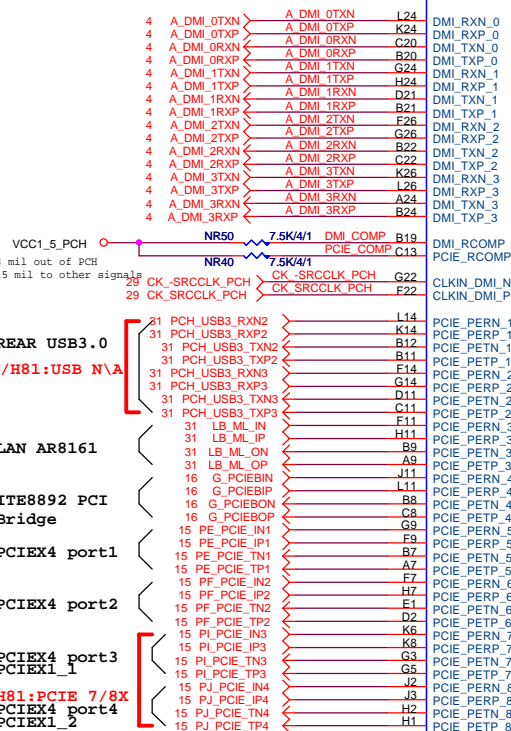
(B)



PCH (B)

DMI:12/4/4/12(breakout min 8/4/4/4/8)
Impedance=85 +- 17.5%

USB2.0 : 12/5/7/5/12 (breakout min 8/4/4/4/8)
Impedance=85 +- 15%



放靠近 Device & PCI-E Slot

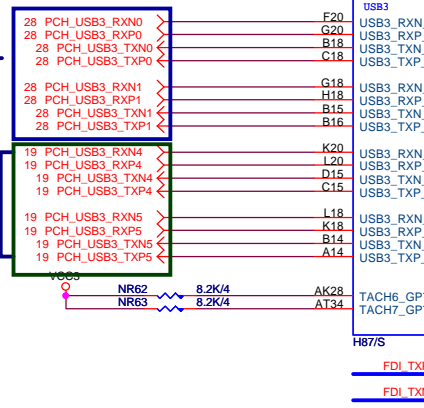
H87/S

PCH PCIE ,DMI 4/4/4//15 Impedance=85 +- 15%

usb2.0 5/7/5//12
usb3.0 5/7/5//20 Impedance=85 +- 15%

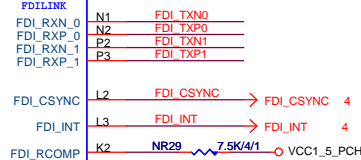
PCH (F)

Port要對應



PCHF

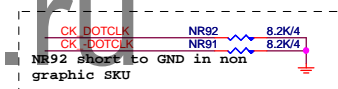
FDILINK



FDI:12/4/5/4/12
Impedance=85 +- 17.5%

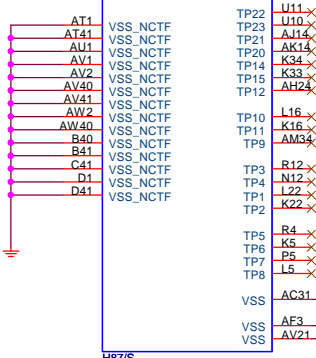
USB3.0:20/5/7/5/20 (breakout min 8/4/4/4/8) ; ONLY 3 VIAS
Impedance=85 +- 17.5%
Back Panel < 10000 MILS
Front Panel < 6000 MILS

Mount for integrated clock Generation Mode



PCH (J)

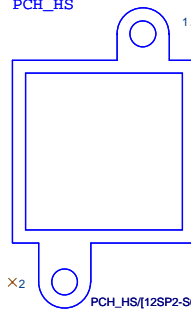
PCHJ



H87/S

PCH H/S

PCH_HS



PCH_HS[12SP2-S06012-01R_12SP2-S06012-02R_12SP2-S06012-03R]

USB TABLE

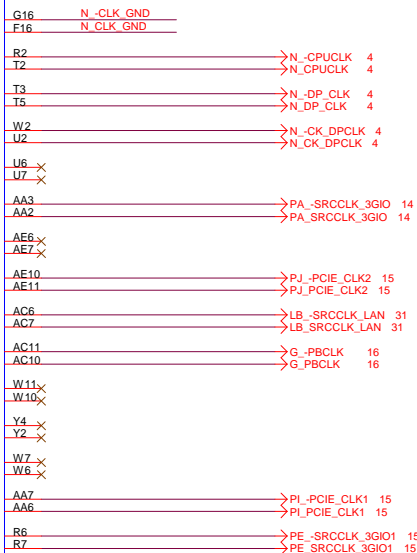
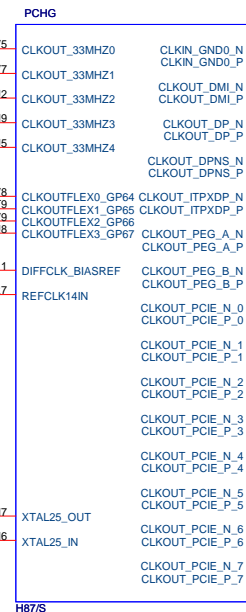
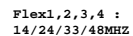
OC[3:0]# for Device 29 (ports 0-7)
OC[7:4]# for Device 26 (ports 8-13)

| USB OC# Configure | |
|-------------------|----------|
| OC0# | USB0,1 |
| OC1# | USB2,3 |
| OC2# | USB4,5 |
| OC3# | USB6,7 |
| OC4# | USB8,9 |
| OC5# | USB10,11 |
| OC6# | USB12,13 |
| OC7# | Not Use |

Gigabyte Technology

| Title | | | |
|-----------------------|------------------------|------------|---------|
| PCH FDI,DMI,USB ,PCIE | | | |
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PCH (G)



Differential Clock: 18/4/6/4/18
Impedance=90 +- 15%

PCIXx16

PCIXx1 2

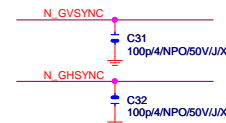
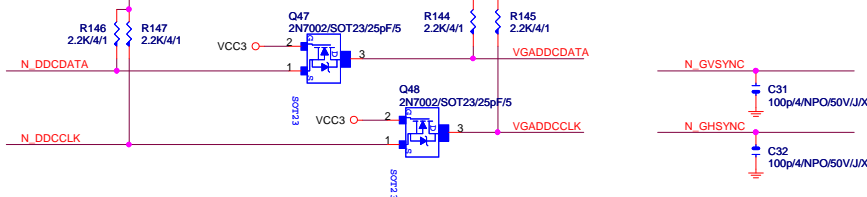
lan 8111F-VL

ITE8892

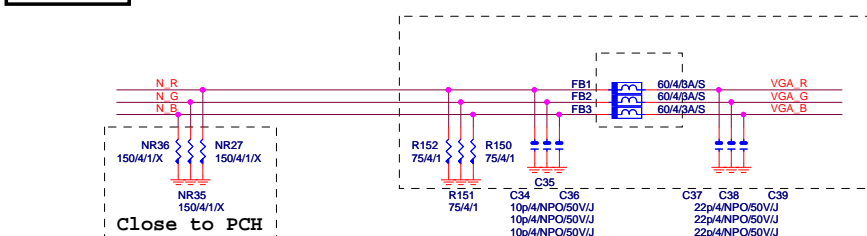
PCIXx4

PCIXx4

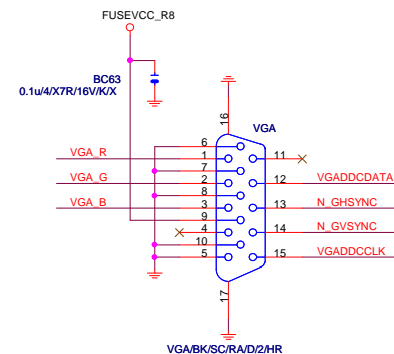
VGA DDC



VGA DDC



Close to VGA connector

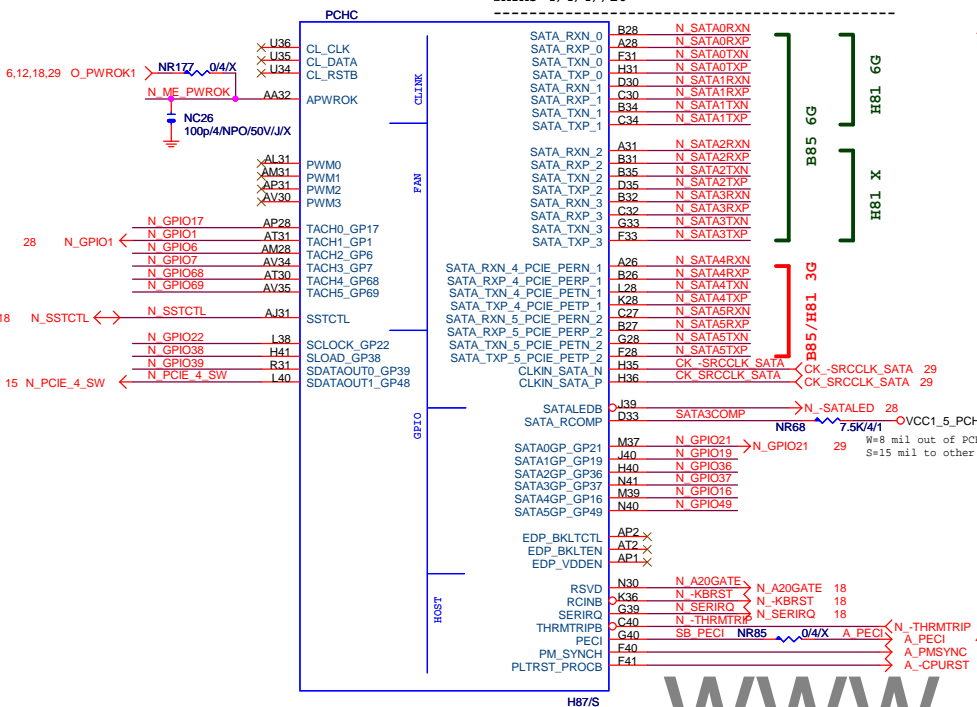


Gigabyte Technology

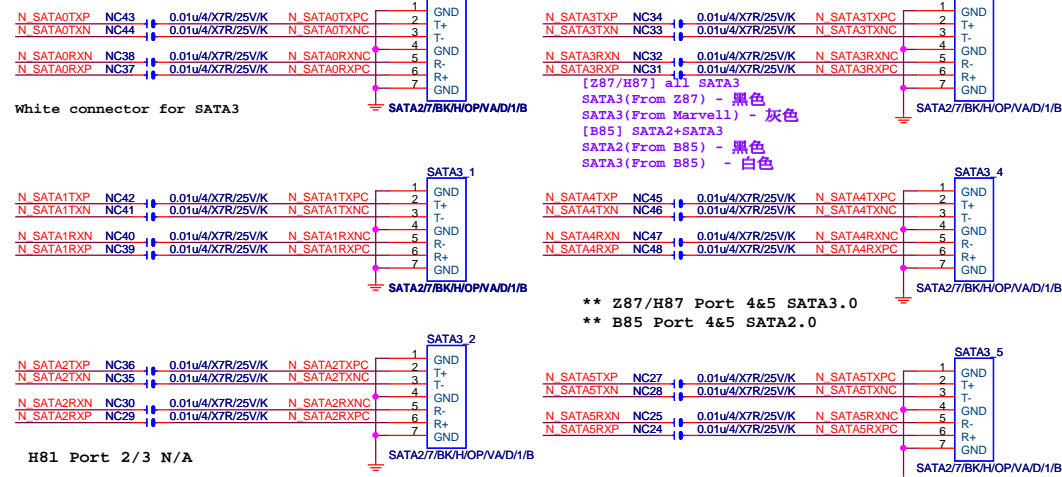
| | | | |
|-------------------------|------------------------|-------|----------|
| Title | | | |
| PCH DISPLAY ,CLK BUFFER | | | |
| Size | Document Number | Rev | |
| Custom | GA-H87-HD3 | 1.02 | |
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PCH (C)

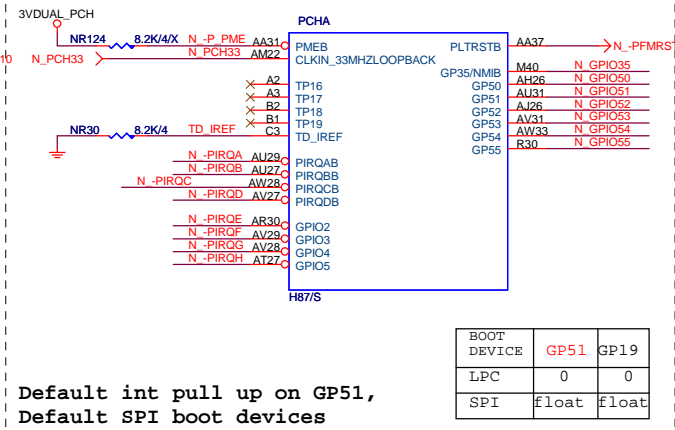
SATA3 : 20/4/4/20 (breakout min 8/4/4/8)
Impedance=85 +- 17.5%
SATA2 4/4/4/15
SATA3 4/4/4/20



SATA CONNECTOR

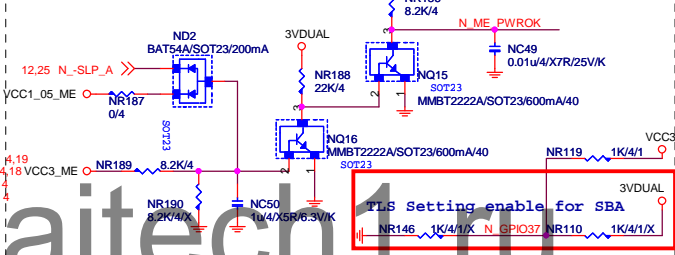


PCH (A)

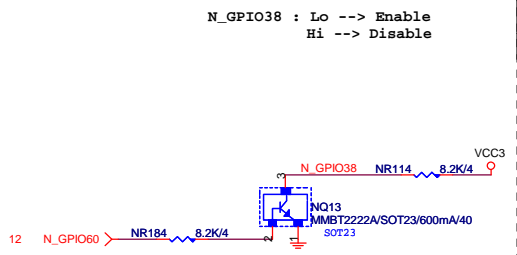


Default int pull up on GP51,
Default SPI boot devices

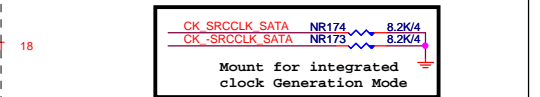
ME PWROK



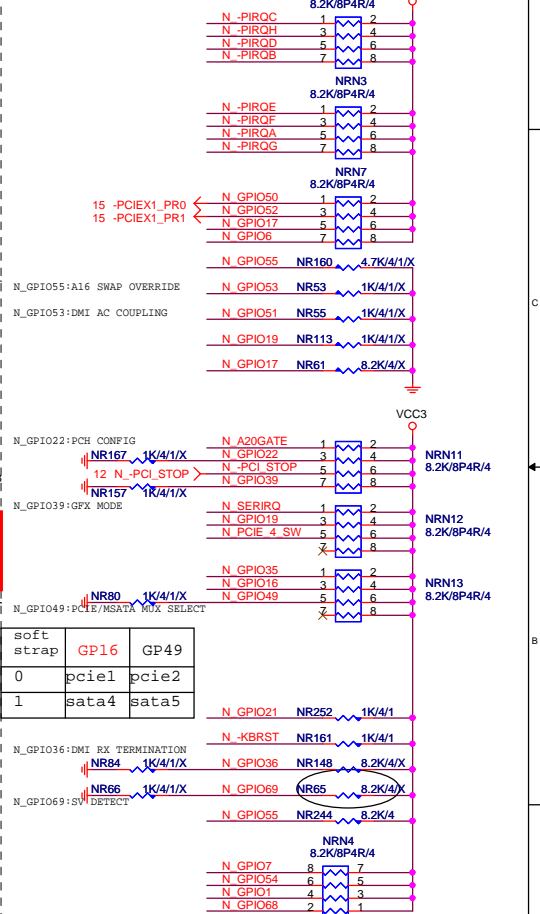
GPIO38 Ctrl



PCH CLK PD



PCH PU/PD



Gigabyte Technology

GA-H87-HD3

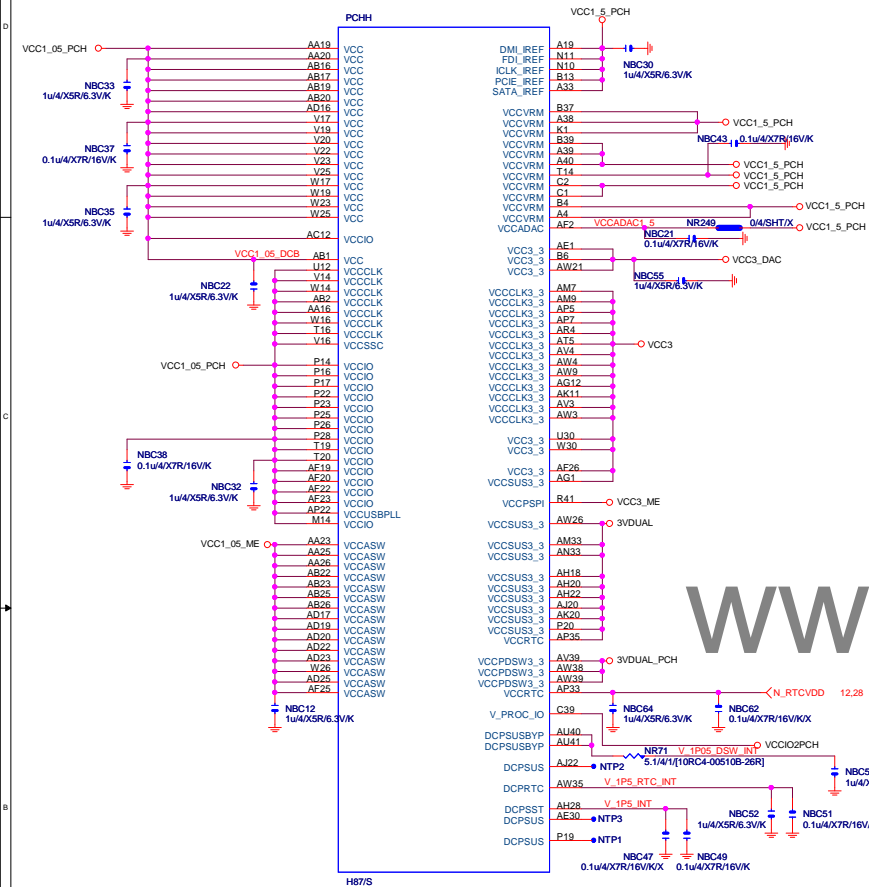
Document Number

Rev 1.02

Friday, March 22, 2013

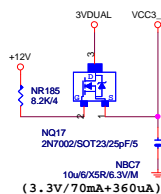
Sheet 11 of 34

PCH (H)

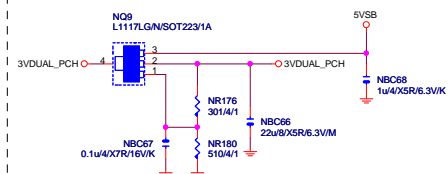


VCC3_DAC

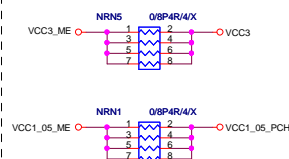
CLOSE北橋(注意震盪水波紋)



3VDUAL_PCH

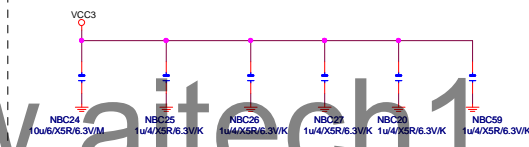


SHT_PWR

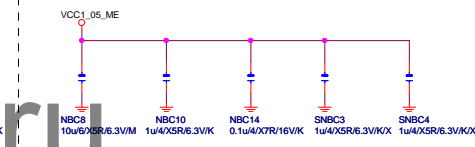


CAP

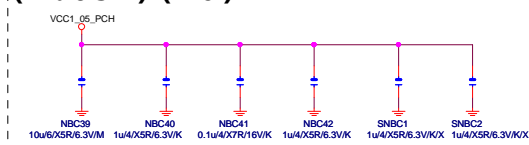
(3.3V) (X6)



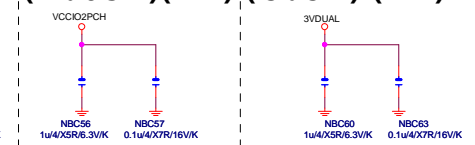
(1.05V) (X5)



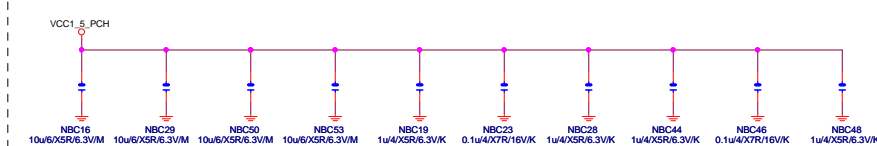
(1.05V) (X6)



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



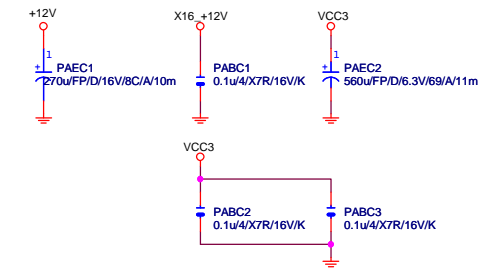
(1.5V) (X10)



PCH (I)

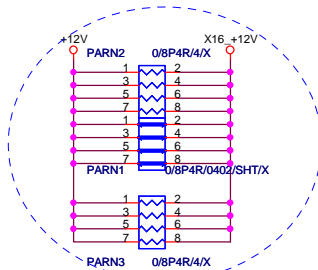


PCIEX16 CAP



PCIEX16 PROTECT SHT

+12 protect short-wire test



PCIEX16 AC CAP

| | | | |
|----------------|-------|--------------------|----------------|
| PA EXP TXP0 C | PAC5 | 0.22u/4/X5R/6.3V/K | PA EXP TXP0 C |
| PA EXP TXN0 C | PAC4 | 0.22u/4/X5R/6.3V/K | PA EXP TXN0 C |
| PA EXP TXP1 C | PAC6 | 0.22u/4/X5R/6.3V/K | PA EXP TXP1 C |
| PA EXP TXN1 C | PAC7 | 0.22u/4/X5R/6.3V/K | PA EXP TXN1 C |
| PA EXP TXP2 C | PAC8 | 0.22u/4/X5R/6.3V/K | PA EXP TXP2 C |
| PA EXP TXN2 C | PAC9 | 0.22u/4/X5R/6.3V/K | PA EXP TXN2 C |
| PA EXP TXP3 C | PAC10 | 0.22u/4/X5R/6.3V/K | PA EXP TXP3 C |
| PA EXP TXN3 C | PAC11 | 0.22u/4/X5R/6.3V/K | PA EXP TXN3 C |
| PA EXP TXP4 C | PAC12 | 0.22u/4/X5R/6.3V/K | PA EXP TXP4 C |
| PA EXP TXN4 C | PAC13 | 0.22u/4/X5R/6.3V/K | PA EXP TXN4 C |
| PA EXP TXP5 C | PAC14 | 0.22u/4/X5R/6.3V/K | PA EXP TXP5 C |
| PA EXP TXN5 C | PAC15 | 0.22u/4/X5R/6.3V/K | PA EXP TXN5 C |
| PA EXP TXP6 C | PAC16 | 0.22u/4/X5R/6.3V/K | PA EXP TXP6 C |
| PA EXP TXN6 C | PAC17 | 0.22u/4/X5R/6.3V/K | PA EXP TXN6 C |
| PA EXP TXP7 C | PAC19 | 0.22u/4/X5R/6.3V/K | PA EXP TXP7 C |
| PA EXP TXN7 C | PAC18 | 0.22u/4/X5R/6.3V/K | PA EXP TXN7 C |
| PA EXP TXP8 C | PAC20 | 0.22u/4/X5R/6.3V/K | PA EXP TXP8 C |
| PA EXP TXN8 C | PAC21 | 0.22u/4/X5R/6.3V/K | PA EXP TXN8 C |
| PA EXP TXP9 C | PAC22 | 0.22u/4/X5R/6.3V/K | PA EXP TXP9 C |
| PA EXP TXN9 C | PAC23 | 0.22u/4/X5R/6.3V/K | PA EXP TXN9 C |
| PA EXP TXP10 C | PAC24 | 0.22u/4/X5R/6.3V/K | PA EXP TXP10 C |
| PA EXP TXN10 C | PAC25 | 0.22u/4/X5R/6.3V/K | PA EXP TXN10 C |
| PA EXP TXP11 C | PAC26 | 0.22u/4/X5R/6.3V/K | PA EXP TXP11 C |
| PA EXP TXN11 C | PAC27 | 0.22u/4/X5R/6.3V/K | PA EXP TXN11 C |
| PA EXP TXP12 C | PAC28 | 0.22u/4/X5R/6.3V/K | PA EXP TXP12 C |
| PA EXP TXN12 C | PAC29 | 0.22u/4/X5R/6.3V/K | PA EXP TXN12 C |
| PA EXP TXP13 C | PAC30 | 0.22u/4/X5R/6.3V/K | PA EXP TXP13 C |
| PA EXP TXN13 C | PAC31 | 0.22u/4/X5R/6.3V/K | PA EXP TXN13 C |
| PA EXP TXP14 C | PAC32 | 0.22u/4/X5R/6.3V/K | PA EXP TXP14 C |
| PA EXP TXN14 C | PAC33 | 0.22u/4/X5R/6.3V/K | PA EXP TXN14 C |
| PA EXP TXP15 C | PAC34 | 0.22u/4/X5R/6.3V/K | PA EXP TXP15 C |
| PA EXP TXN15 C | PAC35 | 0.22u/4/X5R/6.3V/K | PA EXP TXN15 C |

PCI-E REV:1.1--> 2.5GHZ

PCE-E X1(單向) BANDWITH=2.5GHz*(8b/10b)=2Gb/s=250MB/s

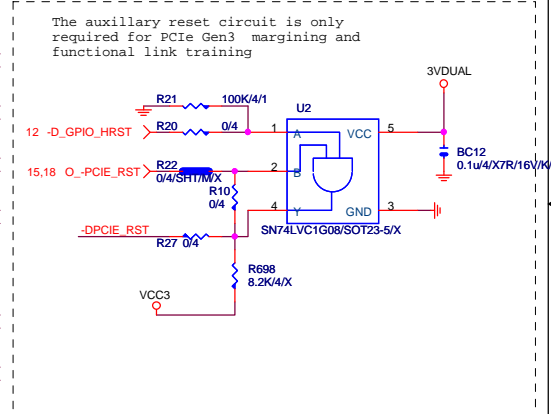
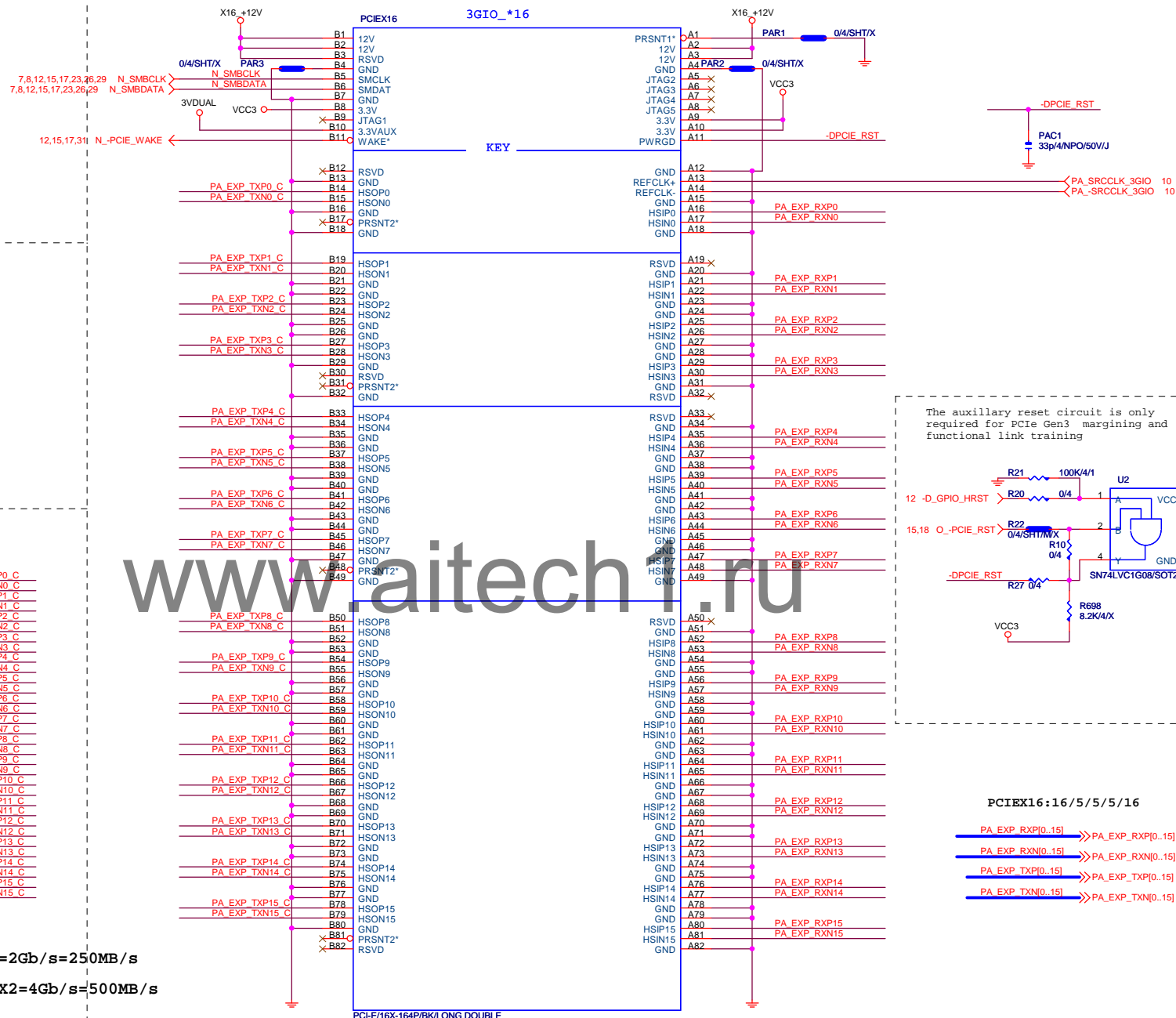
PCE-E X1(雙向) BANDWITH=2.5GHz*(8b/10b)X2=4Gb/s=500MB/s

PCE-E X16(單向) BANDWITH=2.5GHz*(8b/10b)X16=32Gb/s=4GB/s

PCE-E X16(雙向) BANDWITH=2.5GHz*(8b/10b)X16X2=64Gb/s=8GB/s

PCI-E REV:2.0--> 5GHZ

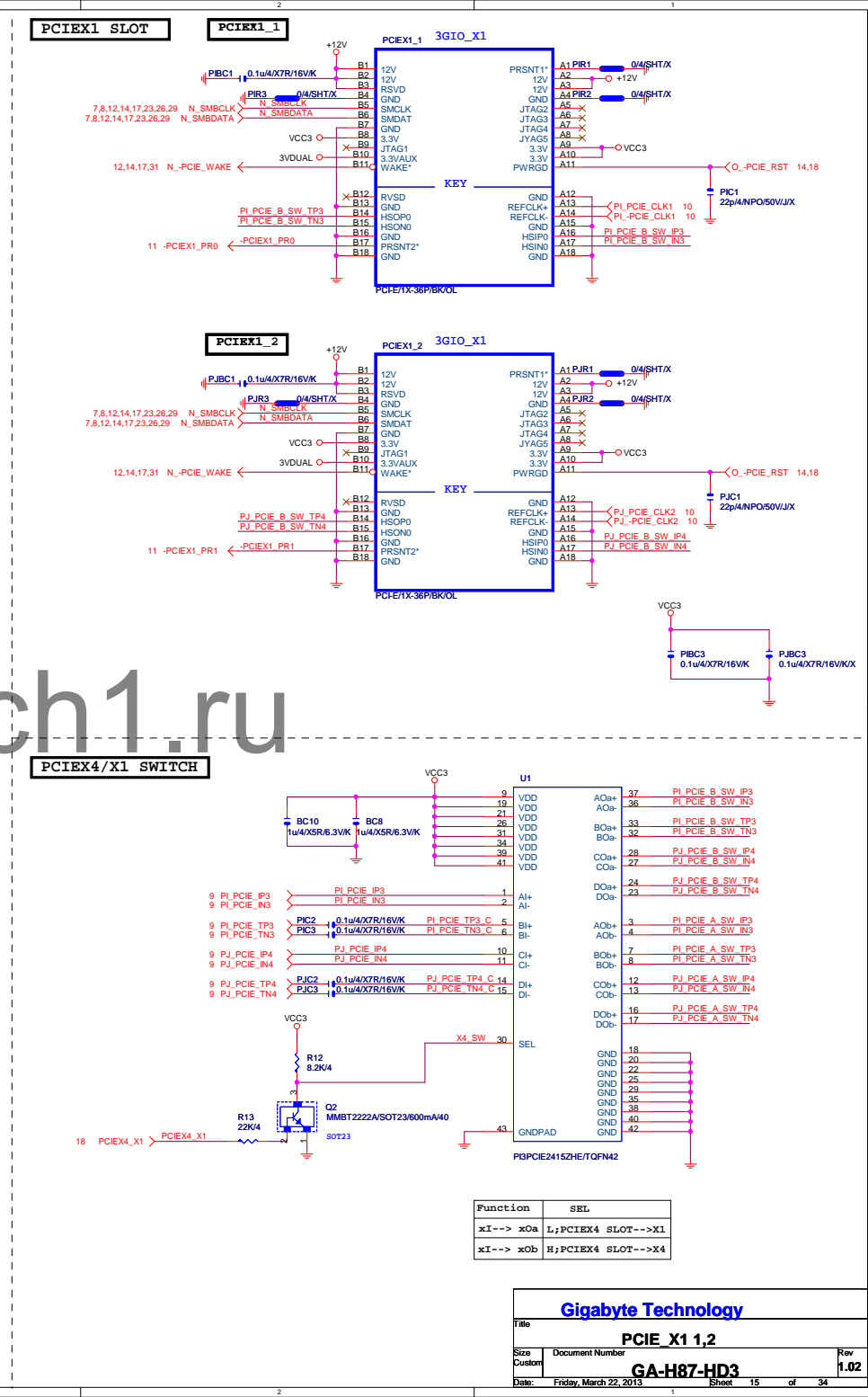
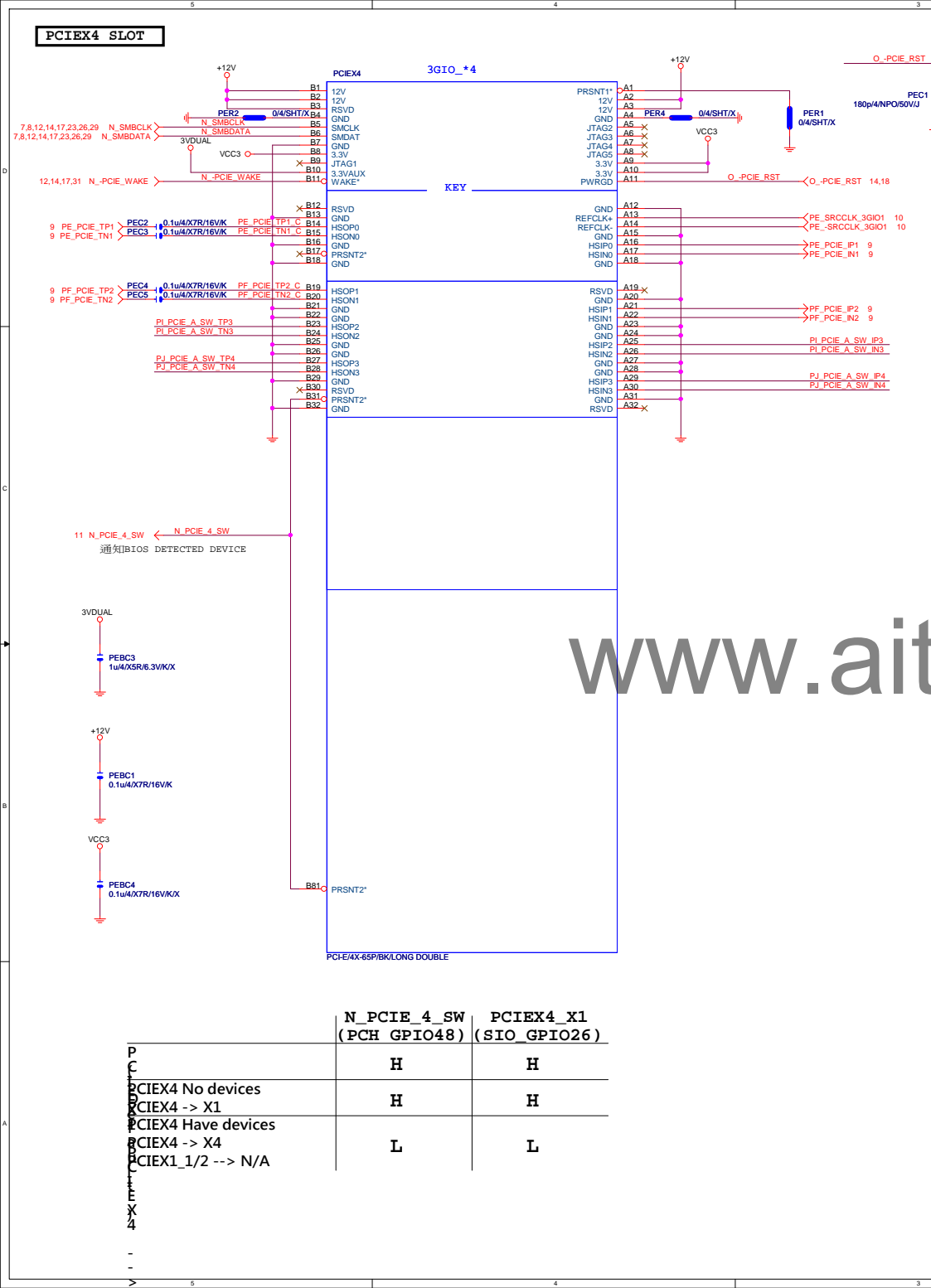
PCIEX16 SLOT

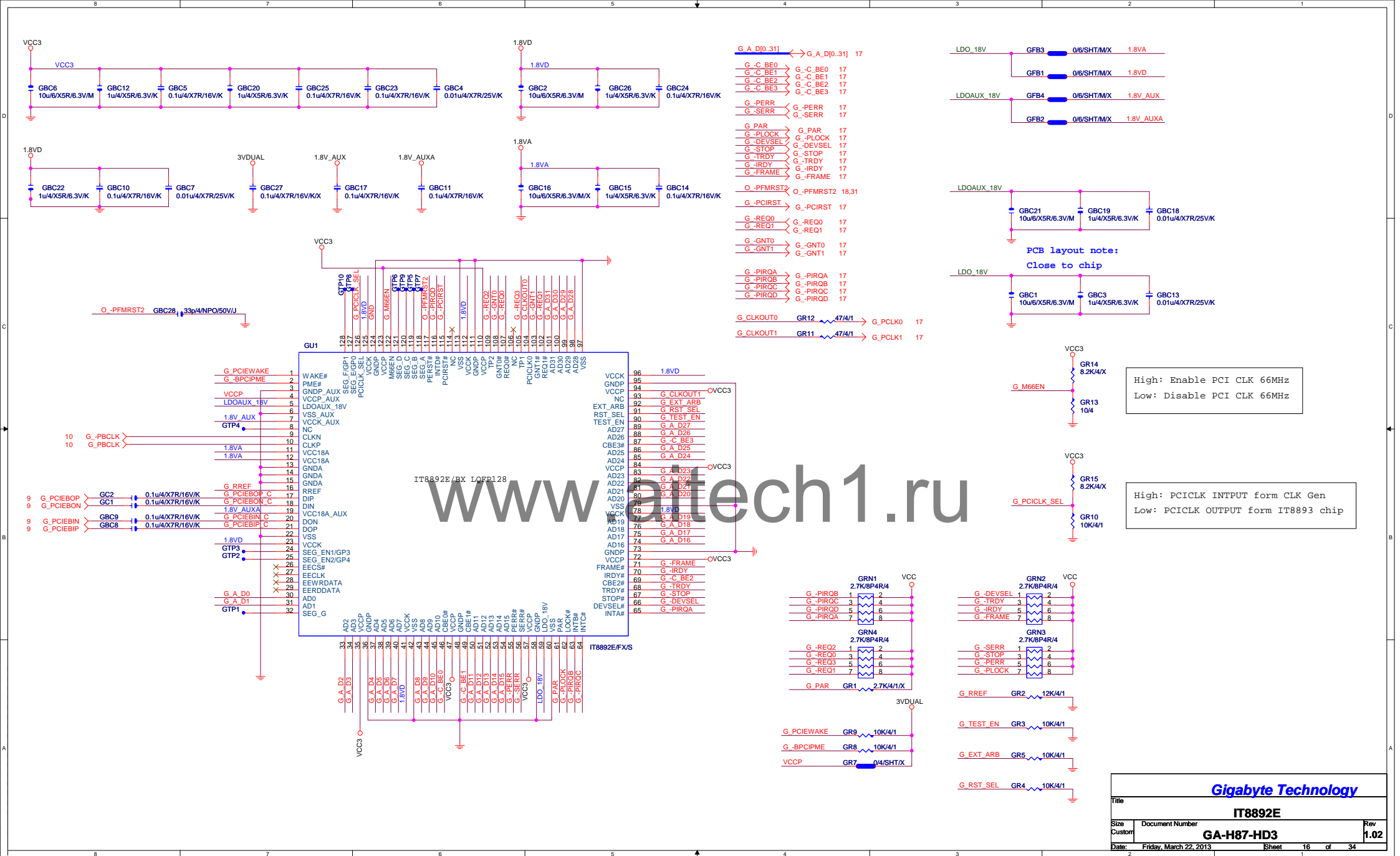


PCIEX16:16/5/5/5/16

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

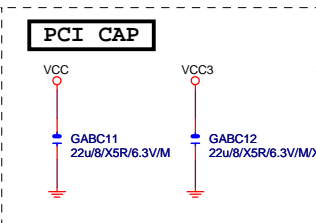
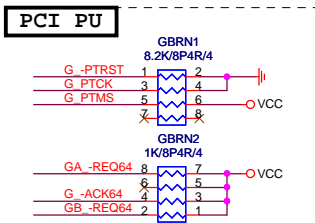
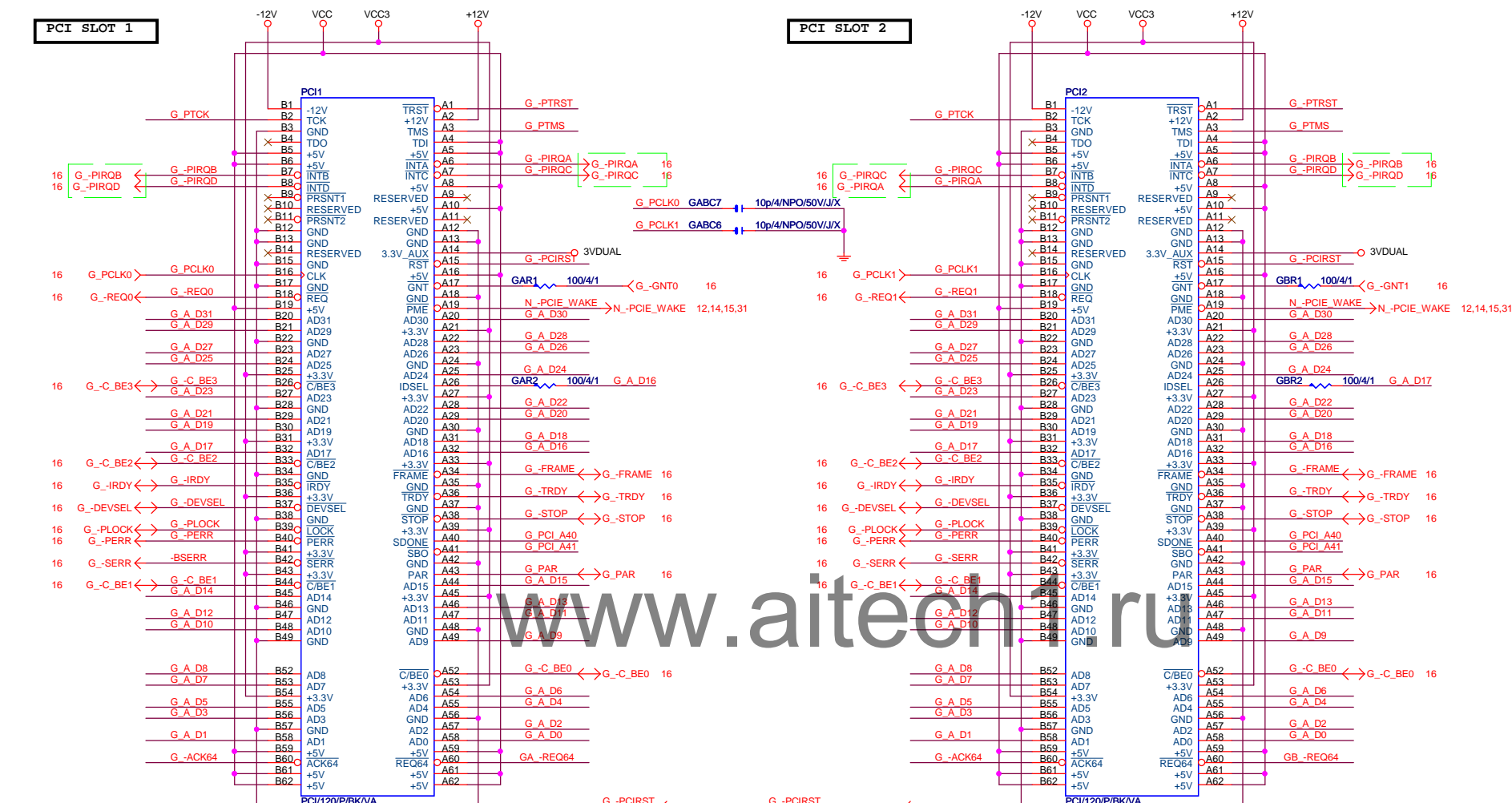
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|---------------------|------------------------|-----------------|----------|
| Gigabyte Technology | | | |
| PCI EXPRESS * 16 | | | |
| Size Custom | | Document Number | Rev |
| | | GA-H87-HD3 | 1.02 |
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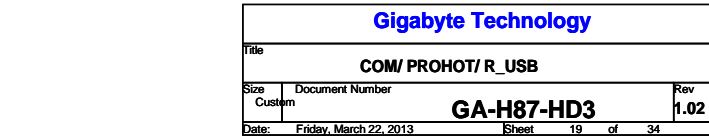
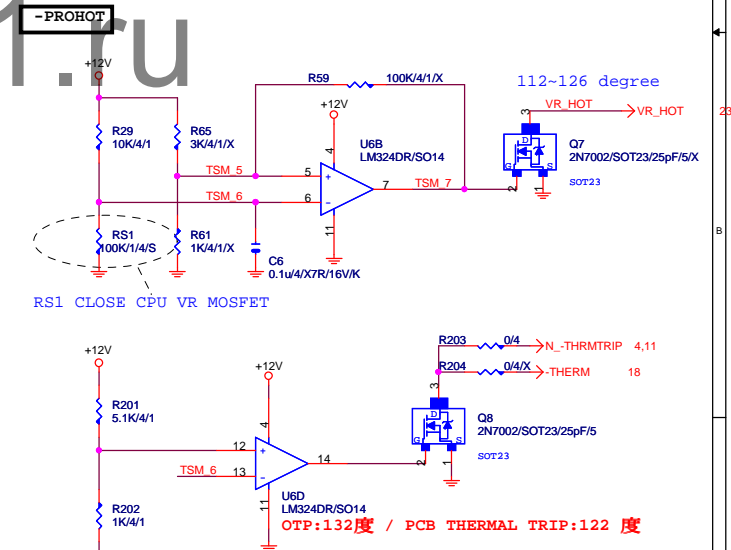
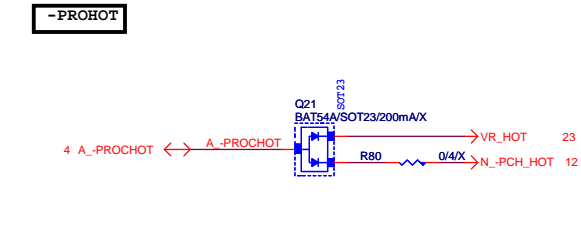
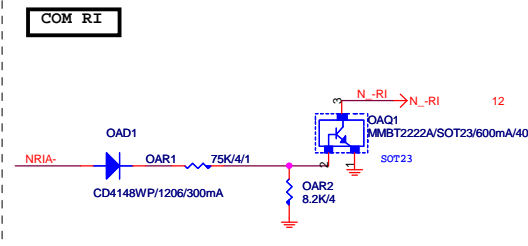
PCI SLOT 1

PCI SLOT 2

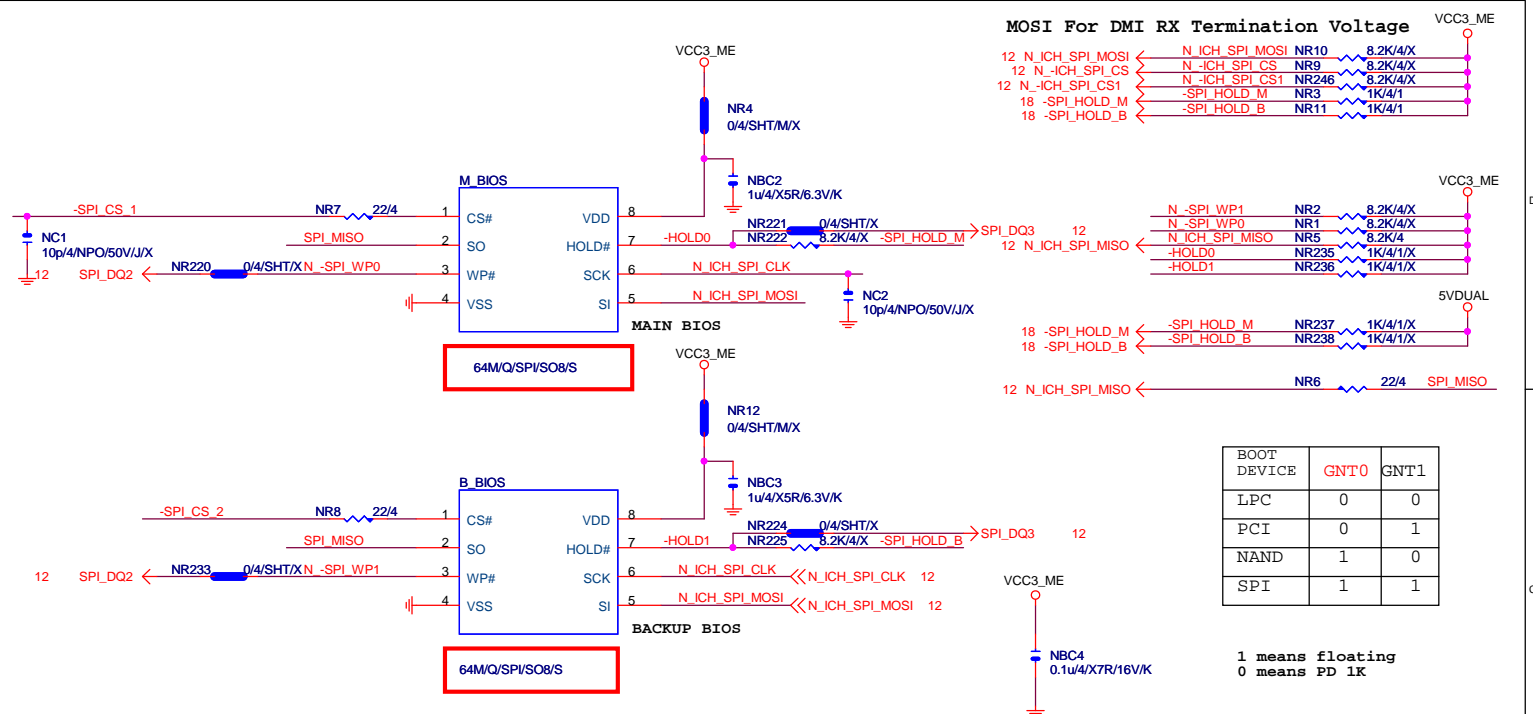
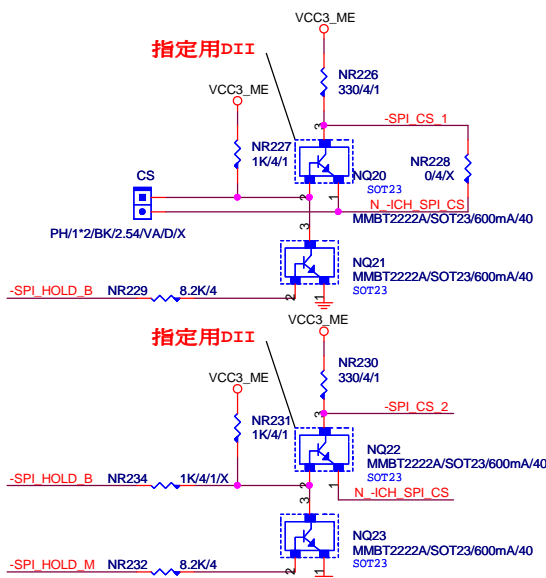


PCI SLOT 1&2

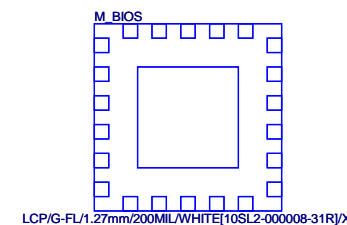
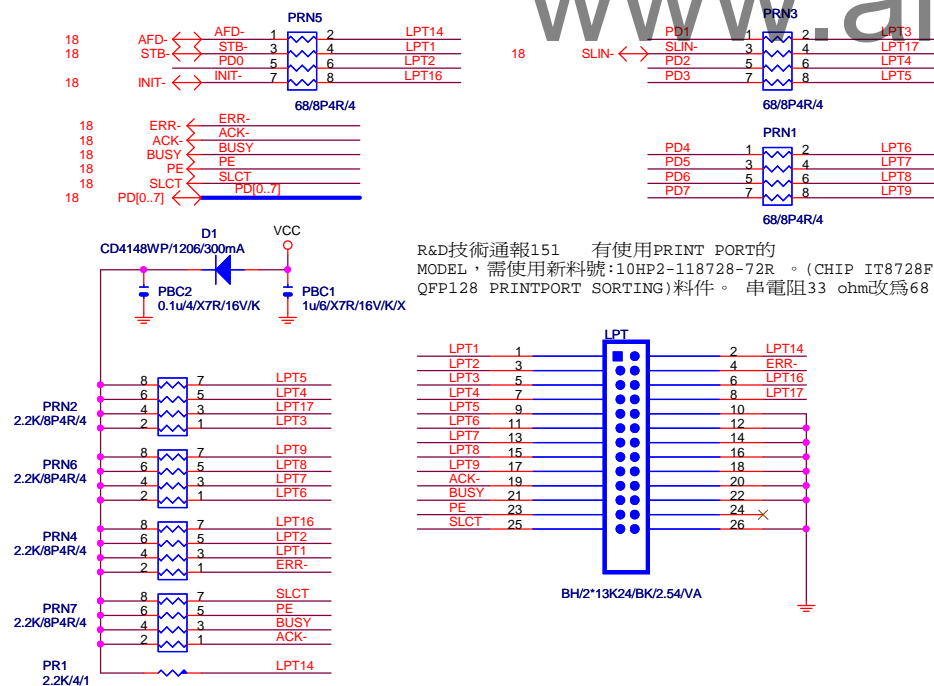
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|--------|------------------------|----------------|
| Size | Document Number | Rev |
| Custom | GA-H87-HD3 | 1.02 |
| Date: | Friday, March 22, 2013 | Sheet 17 of 34 |



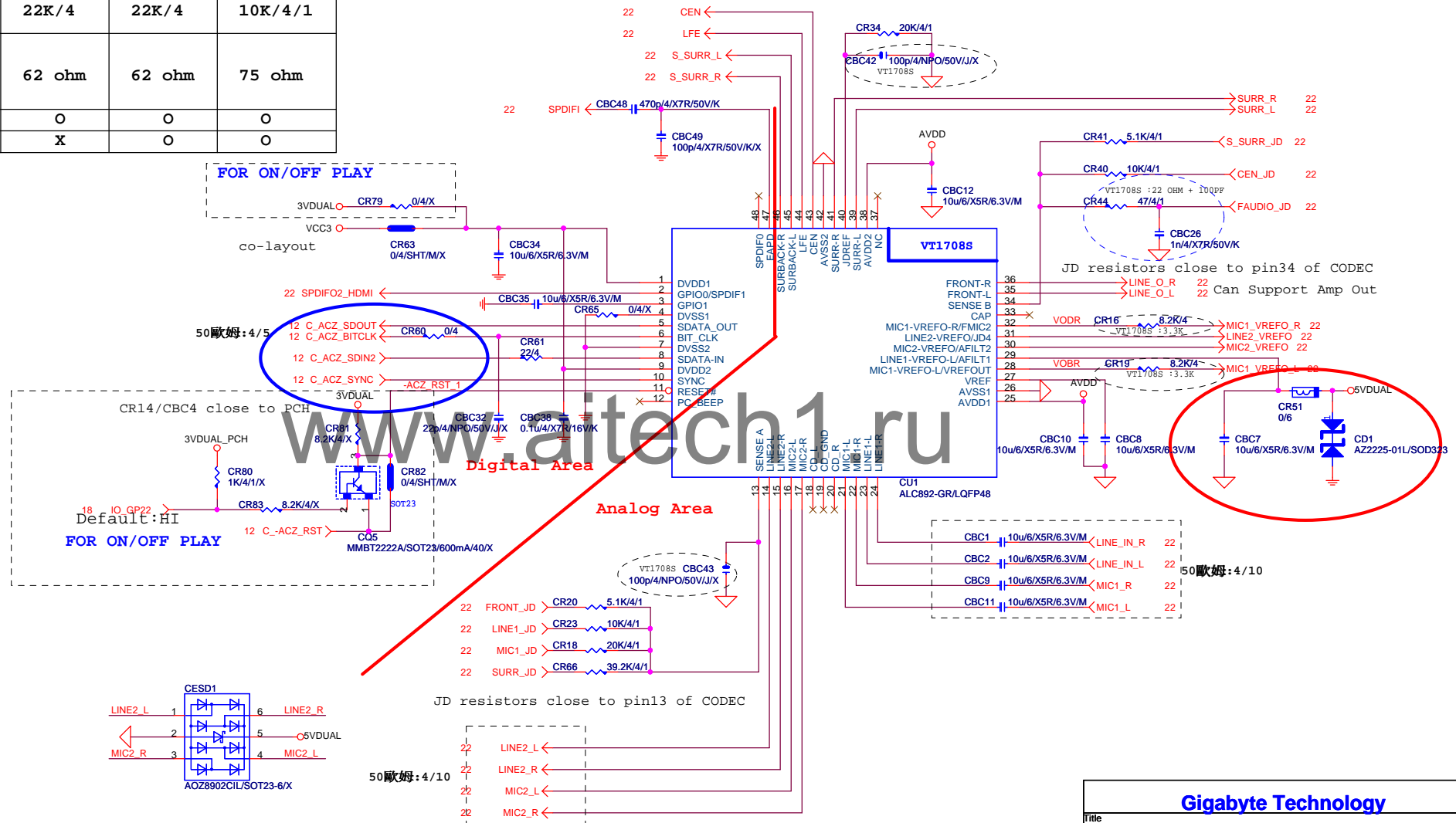
DUAL BIOS



LPT PORT

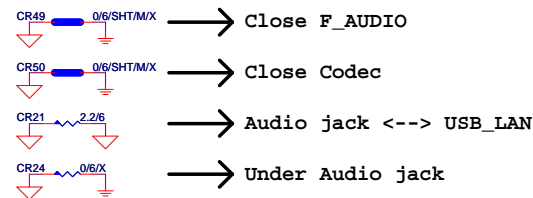


| | ALC892 | ALC887-VD2 | VT1708S-CE |
|--|-----------|------------|------------|
| CR44/CBC26 | 47ohm+1nF | 47ohm+1nF | 22ohm+100P |
| CBC42/CBC43 | X | X | 100P/4 |
| CR16/CR19 CR52/CR56/CR10/CR9 | 8.2K/4 | 8.2K/4 | 3.3K/4/1 |
| CR6/CR7/CR58/CR54/ CR67/CR68/CR69/CR70 | 22K/4 | 22K/4 | 10K/4/1 |
| CR5/CR8/CR1/CR14/ CR17/CR22/CR73/CR74/ CR13/CR11/CR57/CR53/ CR75/CR76 | 62 ohm | 62 ohm | 75 ohm |
| CR51/CD1/CBC7 | O | O | O |
| CESD1 | X | O | O |

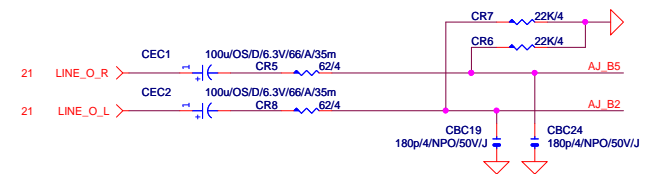


Gigabyte Technology

| | | | |
|--------|------------------------|------------|----------|
| Title | HD AUDIO ALC892 | | |
| Size | Document Number | GA-H87-HD3 | Rev |
| Custom | | | 1.02 |
| Date: | Friday, March 22, 2013 | Sheet | 21 of 34 |



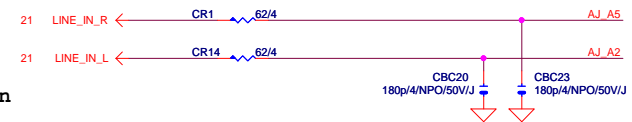
LINE-OUT



LINE-IN

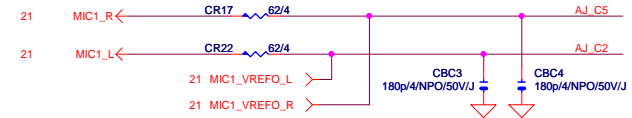
Verify MIC function
in LINE-in

Only reserved for ALC888

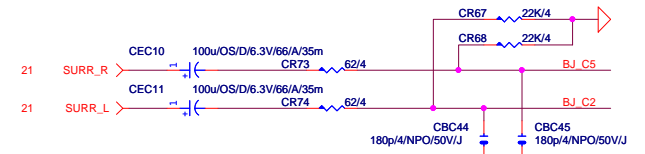


For 889A/888

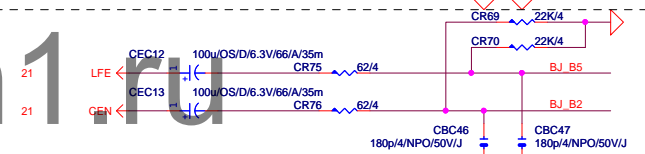
MIC-IN



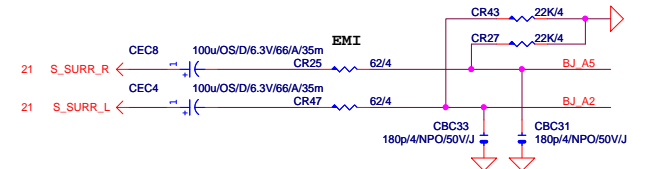
SURROUND



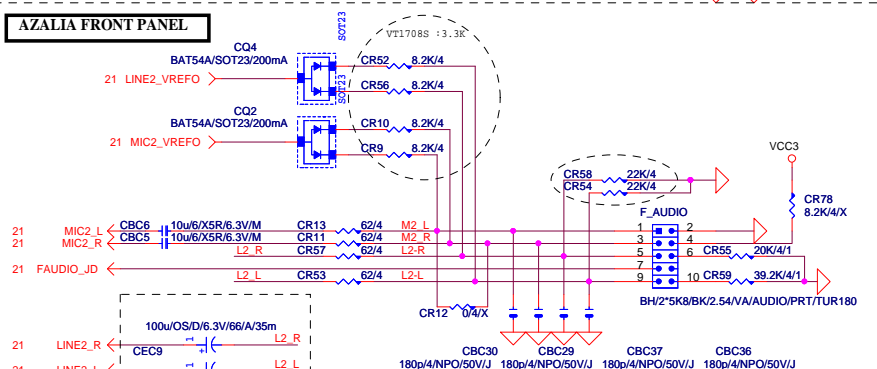
CEN/LFE



SURR BACK



AZALIA FRONT PANEL



Gigabyte Technology

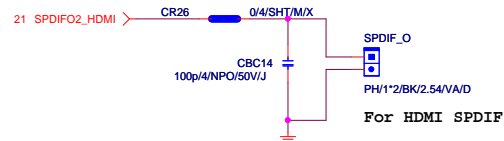
AUDIO JACK

GA-H87-HD3

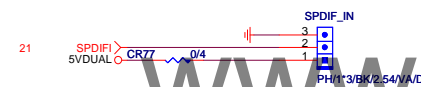
Rev 1.02

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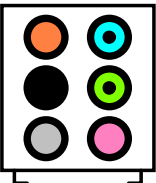
SPDIF_OUT



SPDIF_IN



AZALIA JACK

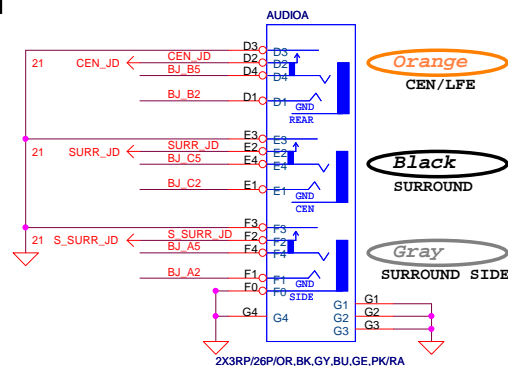
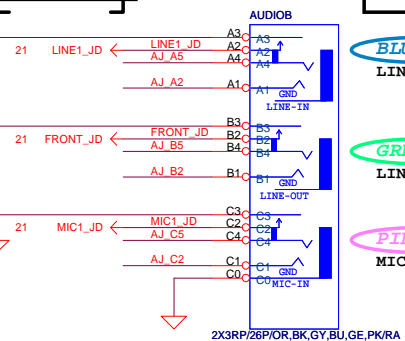


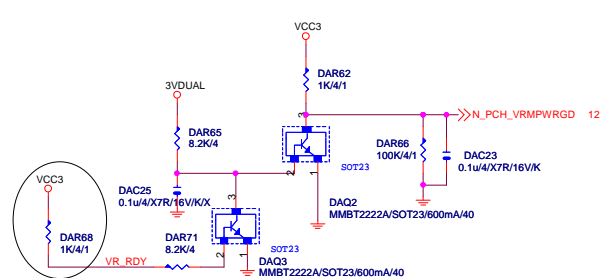
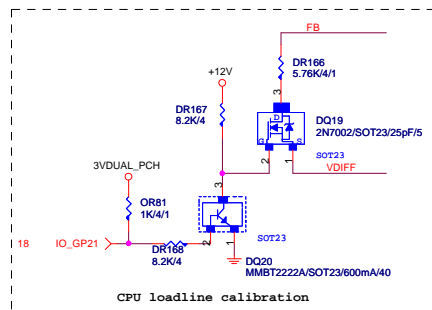
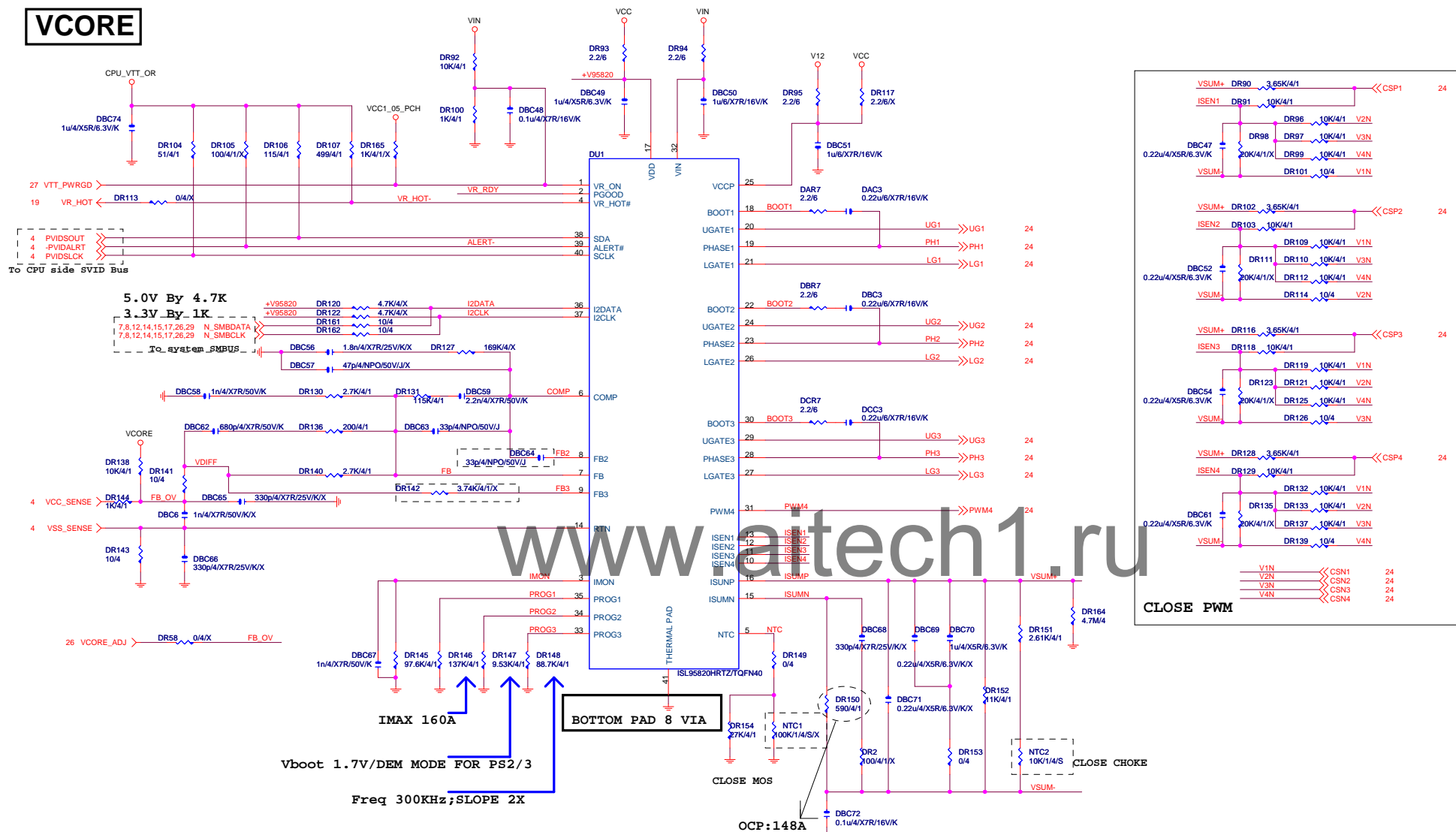
AZALIA JACK

BLUE
LINE-IN

GREEN
LINE-OUT

PINK
MIC-IN

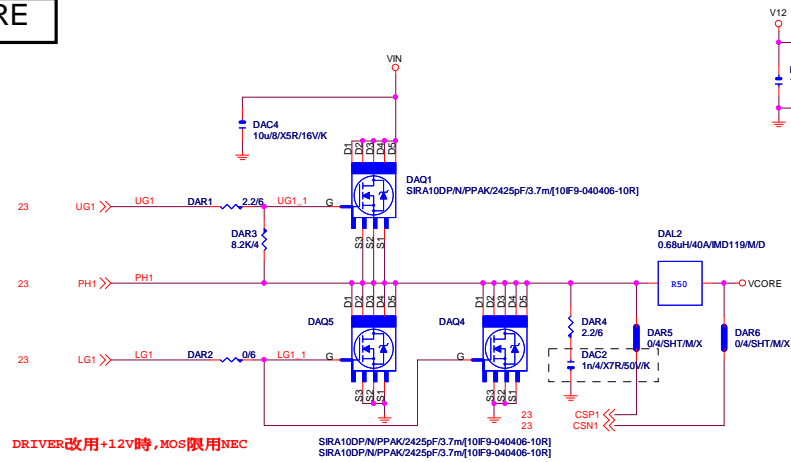


VCORE

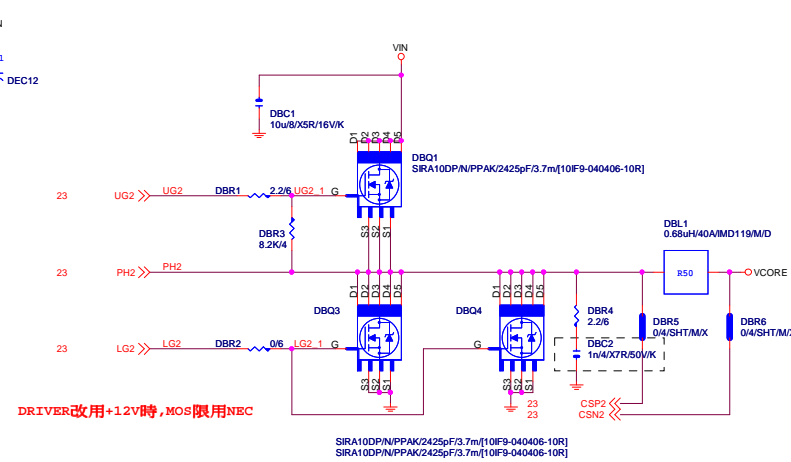
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| Gigabyte Technology | | | |
| Title VCORE_ ISL95820 | | | |
| Size | Document Number | | Rev |
| Custom | GA-H87-HD3 | | 1 |
| Date: | Friday, March 22, 2013 | Sheet | 23 of 34 |

VCORE

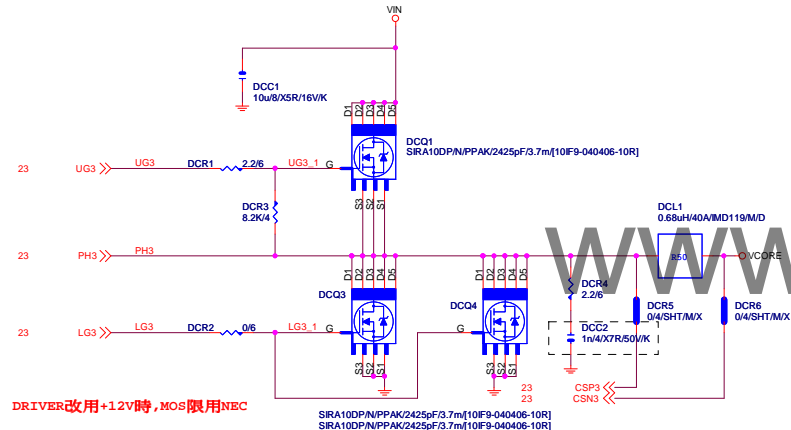
[1]



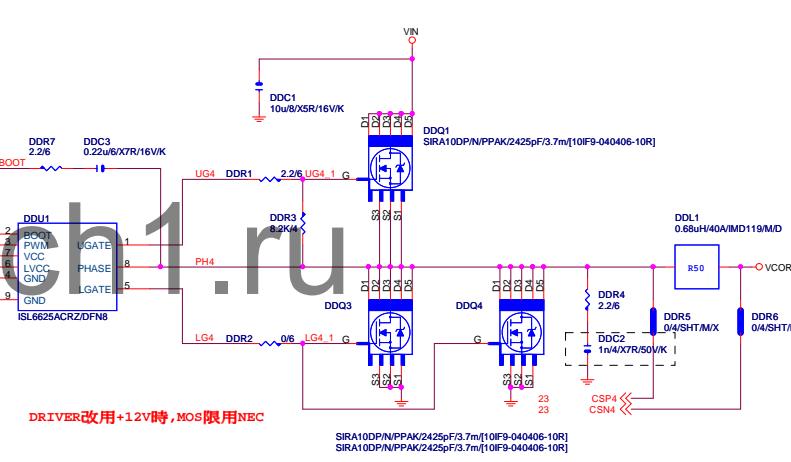
[2]



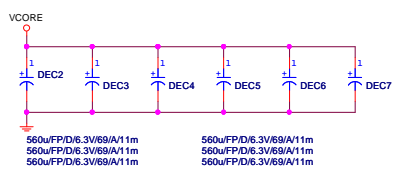
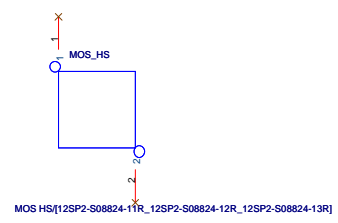
[3]



[4]

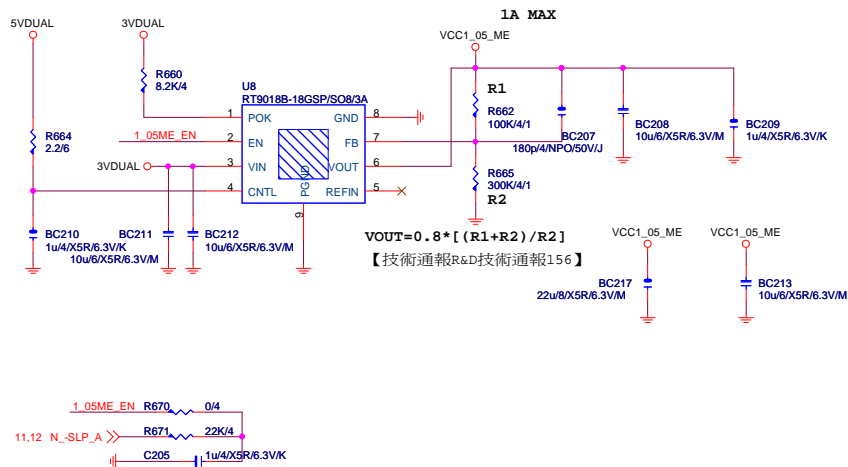


MOSFET HEATSINK

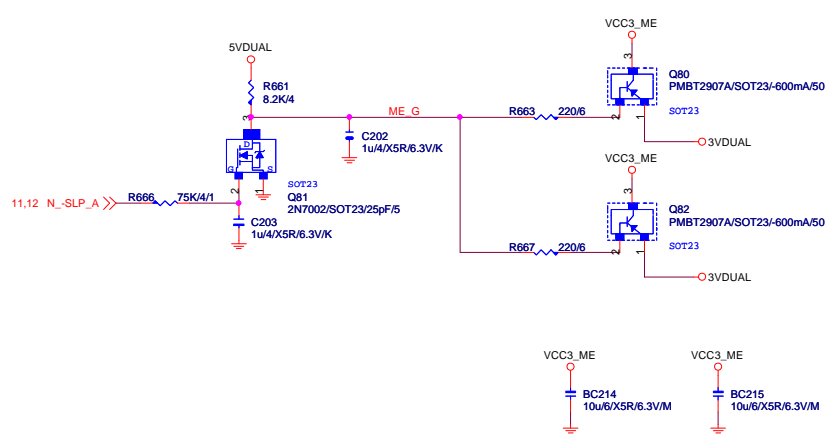


| Gigabyte Technology | | | |
|---------------------|------------------------|----------------|----------|
| Title | ISL95820_2 | | |
| Size | Document Number | GA-H87-HD3 | Rev 1.02 |
| Date | Friday, March 22, 2013 | Sheet 24 of 34 | |

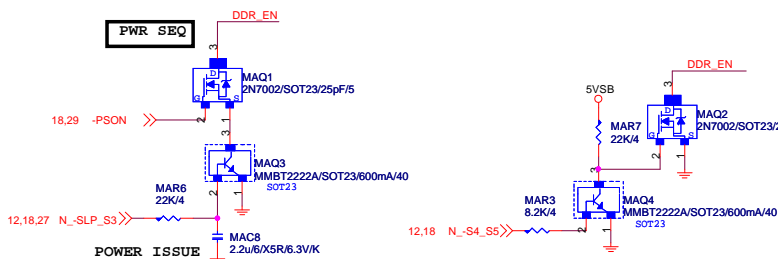
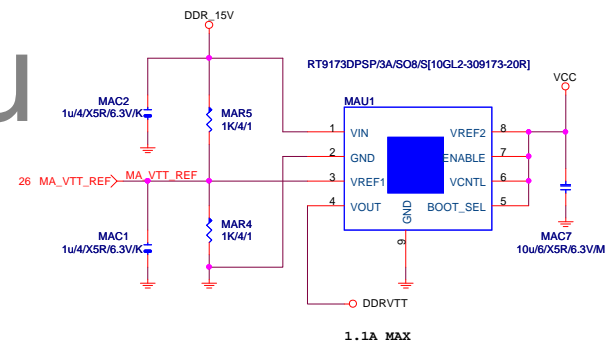
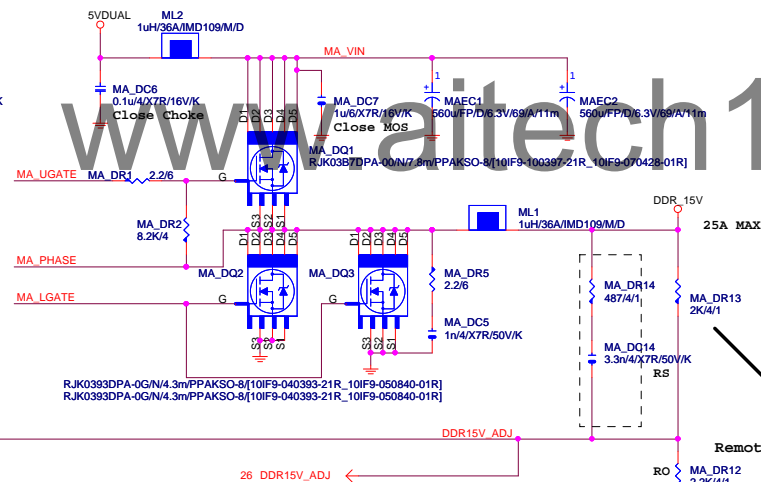
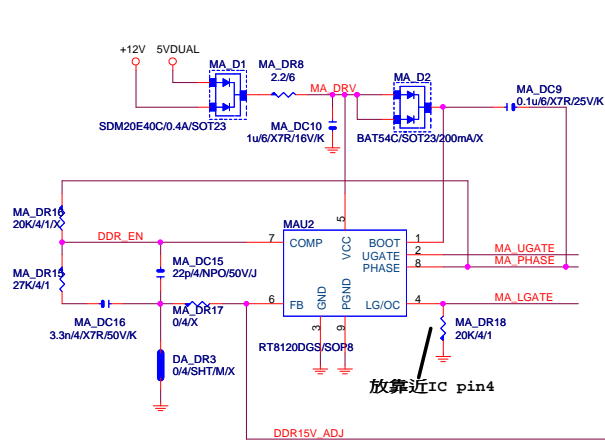
VCC1_05_ME



VCC3_ME



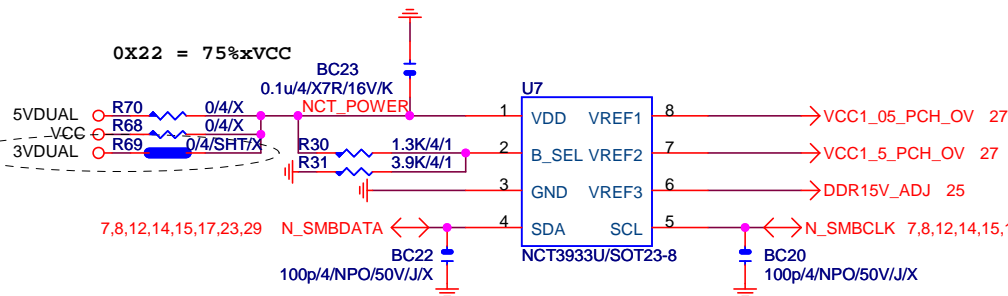
DDR_15V



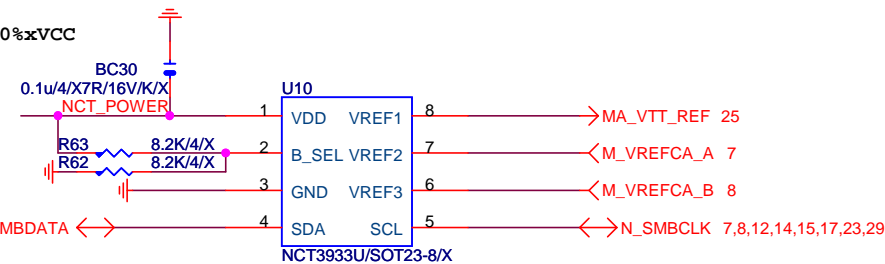
VIN=5V, VOUT=1.5V, IOUT=25A, PHASE=1 1.527V
IRMS=11.45A
560u/FP/D/6.3V/68/8m RIPPLE CURRENT=4.7A
Coefficient=1.7(85°C), 1(105°C)
VIN Ripple current=4.7X1.7=7.99A(85°C)
-->故固態電容須2X7.99=15.98>11.45A

OCP:35.82A for Rds=6.7m for vishay@4.5V
OCP:72.727A for Rds=3.3m for renesas@10V
OCP:48A=Roset*Iocset / Rds(on)
=12K*10uA / [5/5]

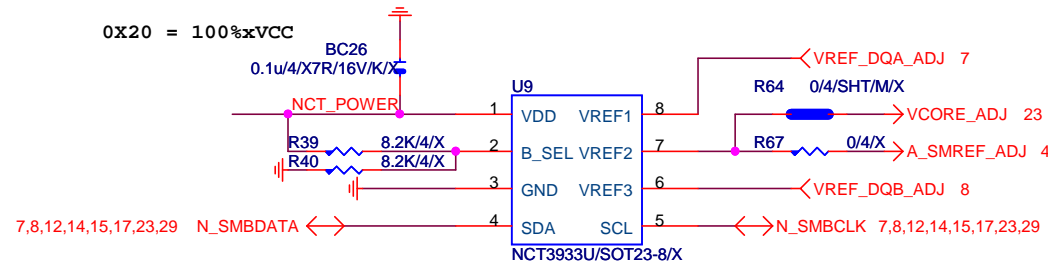
OVER VOLTAGE



0X2A = 0%xVCC



0X20 = 100%xVCC

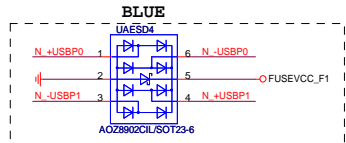
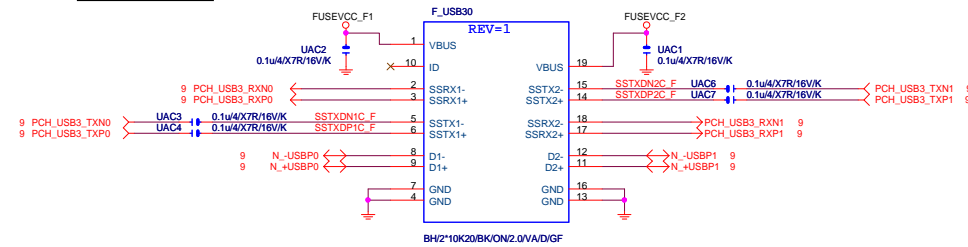


| NCT3933 | 0X2A | 0X20 | 0X22 |
|---------|--------------|--------------|------------|
| VREF1 | DDRVTT | VREF_DDRA_DQ | PCH Core |
| VREF2 | VREF_DDRA_CA | N/A | VCC1_5_PCH |
| VREF3 | VREF_DDRA_CA | VREF_DDRB_DQ | SMREF |

Gigabyte Technology

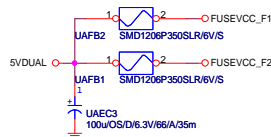
| | | |
|---------------|------------------------|----------------|
| Title | | |
| CPU CORE VR-2 | | |
| Size | Document Number | Rev |
| Custom | GA-H87-HD3 | 1.02 |
| Date: | Friday, March 22, 2013 | Sheet 26 of 34 |

Front USB3.0

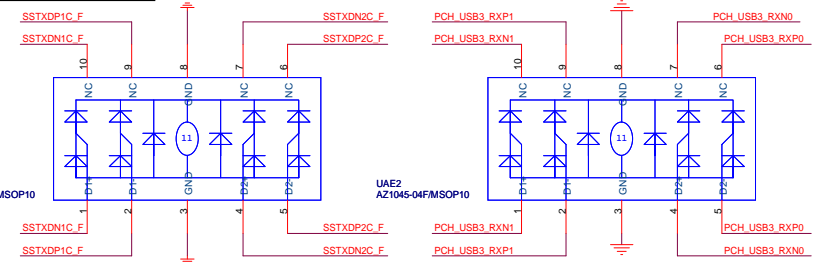


Close to connector

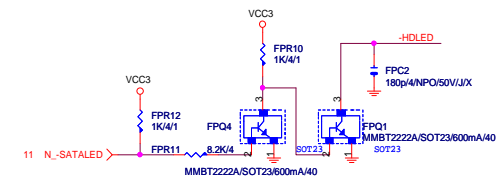
F_USB30 PWR



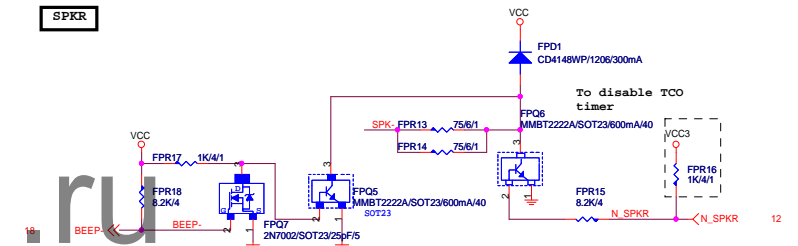
F_USB30 ESD PROTECT



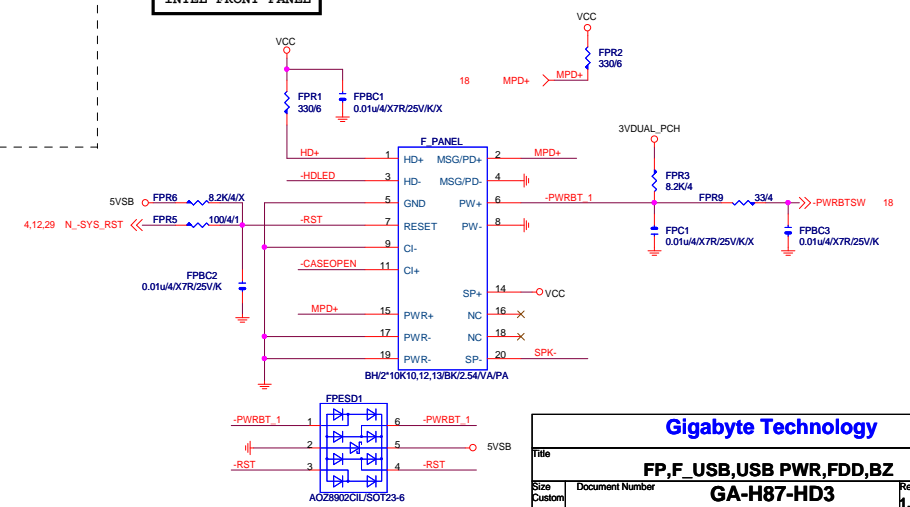
SATA LED



SPKR

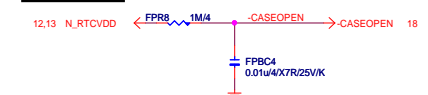


INTEL FRONT PANEL

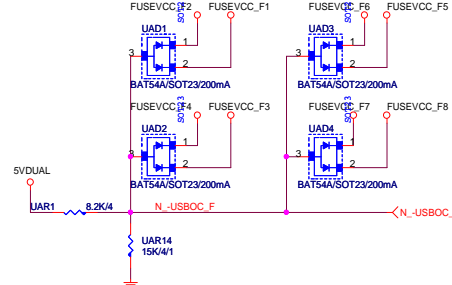


| Gigabyte Technology | | | |
|---------------------|--|-------------------------|--|
| Title | | FP,F_USB,USB PWR,FDD,BZ | |
| Size | | Document Number | |
| Custom | | GA-H87-HD3 | |
| Date: | | Friday, April 26, 2013 | |
| Sheet | | 28 of 34 | |
| Rev | | 1.02 | |

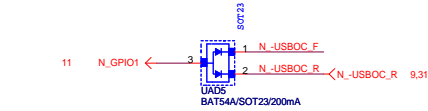
CASE OPEN



-USBOC_F

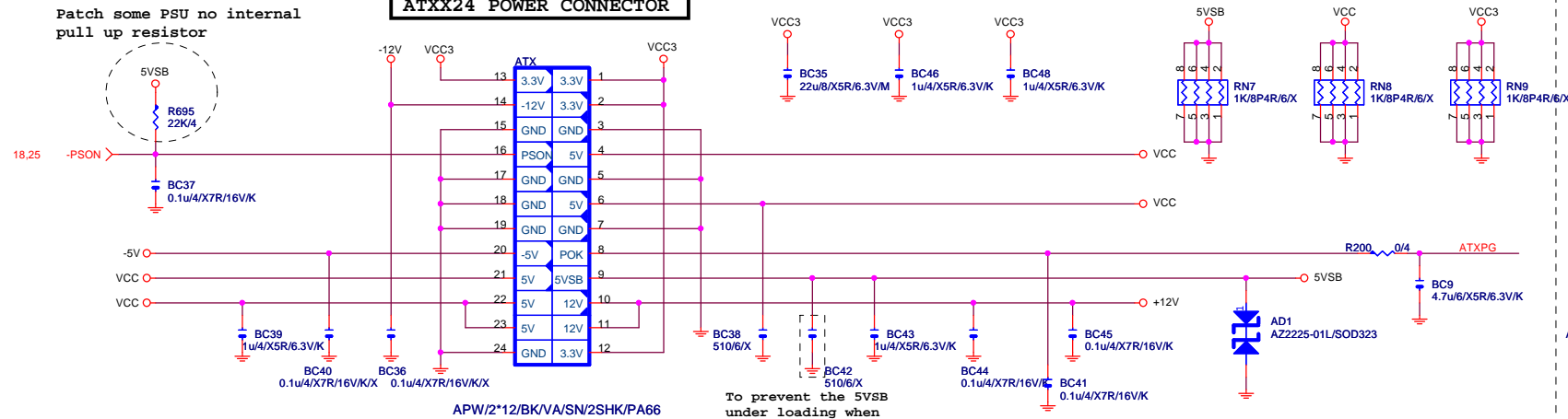


F_USB POWER PROTECT



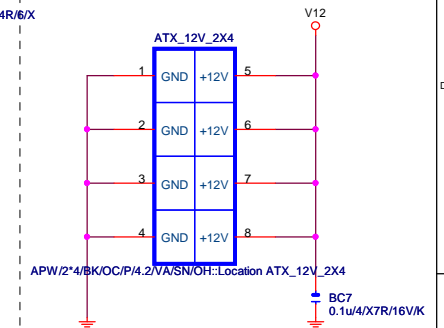
Patch some PSU no internal pull up resistor

ATXX24 POWER CONNECTOR

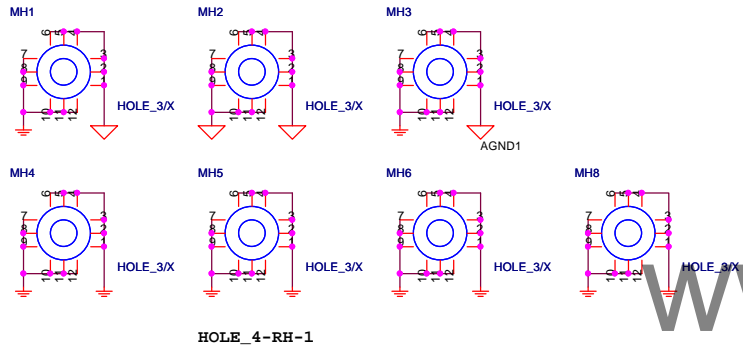


APW/2*12/BK/VA/SN/2SHK/PA66

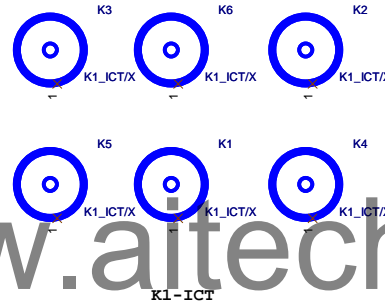
ATXX4 POWER CONNECTOR



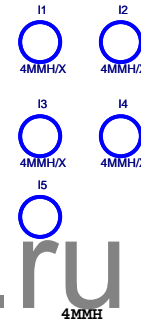
APW/2*4/BK/OC/PA/2/VA/SN/OH:Location ATX_12V_2X4



HOLE_4-RH-1



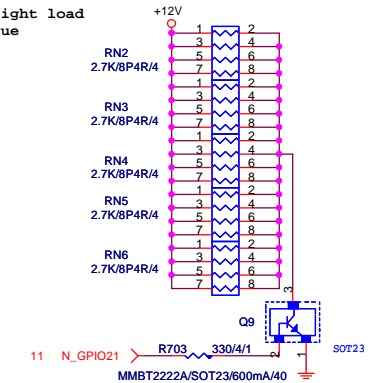
K1-ICT



4MMH

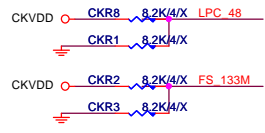
【技術通報R&D技術通報153】

To fix 12V light load abnormal issue

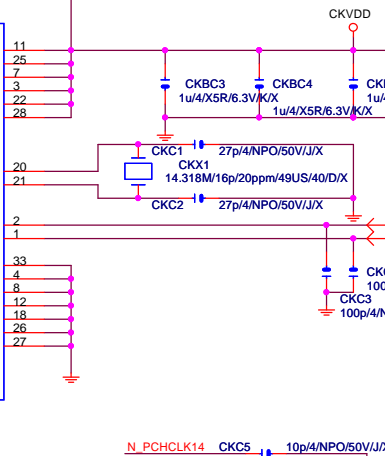
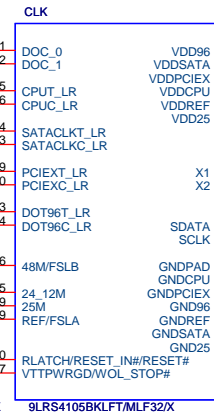
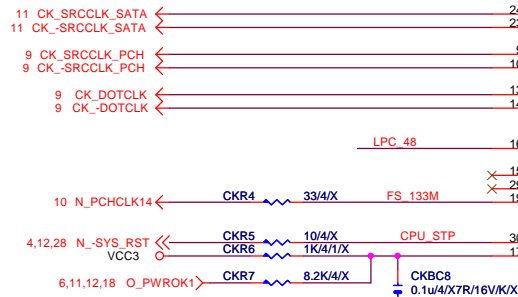


CLK GEN

CPU Frequency Selection

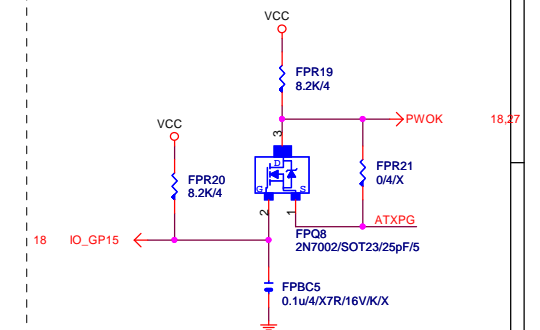


| FSLB | FSLA | CPU |
|------|------|----------------|
| 0 | 0 | 100M <Default> |
| 0 | 1 | 133M |
| 1 | 0 | 200M |
| 1 | 1 | 166M |



PWOK PATCH

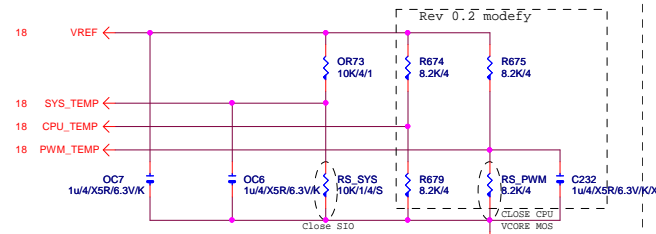
【技術通報R&D技術通報154】



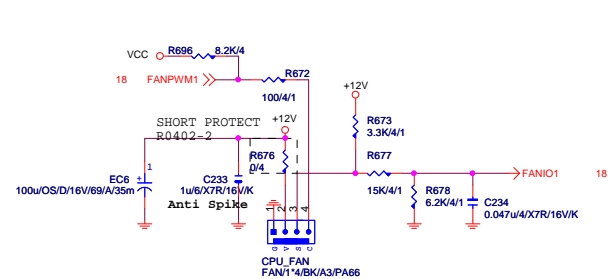
Gigabyte Technology

| | | |
|---------------------|------------------------|----------------|
| Title | | |
| ATX POWER CONNECTOR | | |
| Size | Document Number | Rev |
| Custom | GA-H87-HD3 | 1.02 |
| Date | Friday, March 22, 2013 | Sheet 29 of 34 |

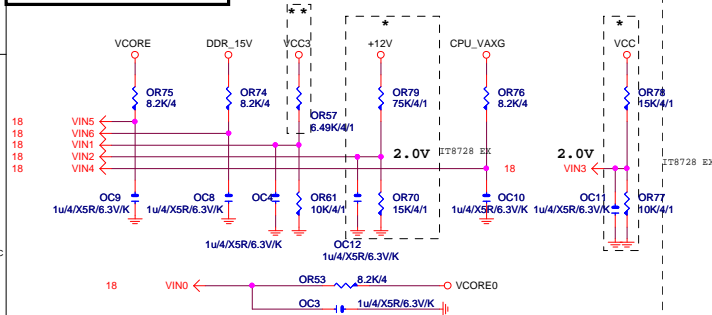
TEMP H/W MONITOR



CPU SMART FAN

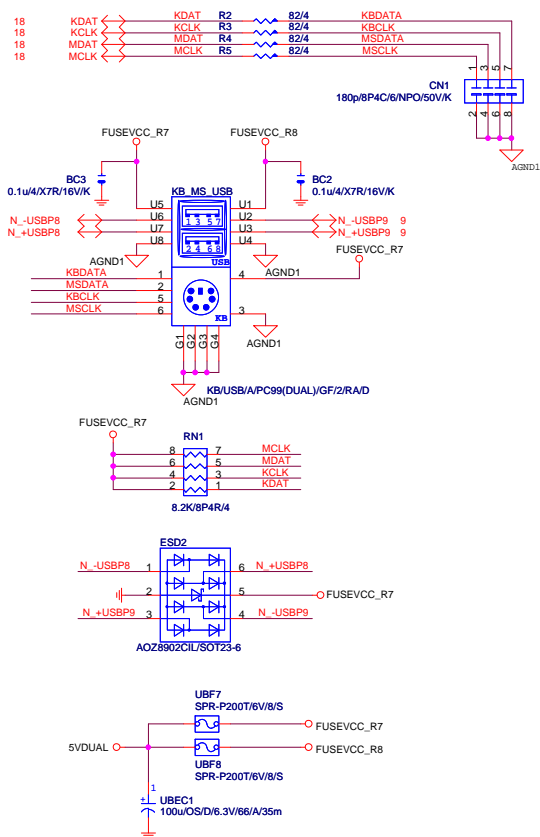


VOLTAGE-- H/W MONITOR



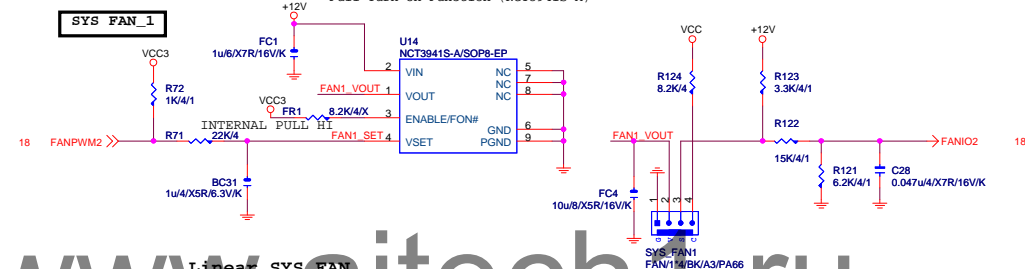
The division voltage of VIN2 & VIN3 must be around 2.9V

KB/USB

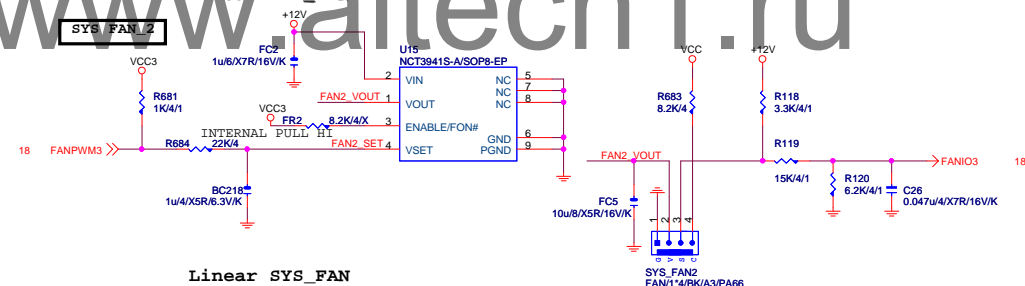


Linear SYS_FAN

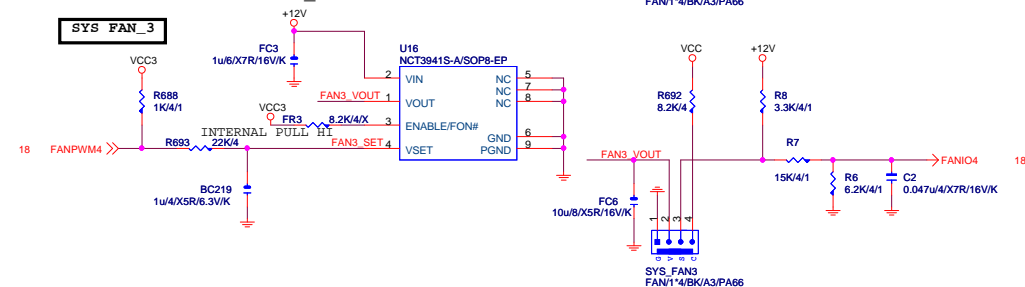
Enable Function (NCT3941S)
Full Turn On Function (NCT3941S-A)



Linear SYS FAN



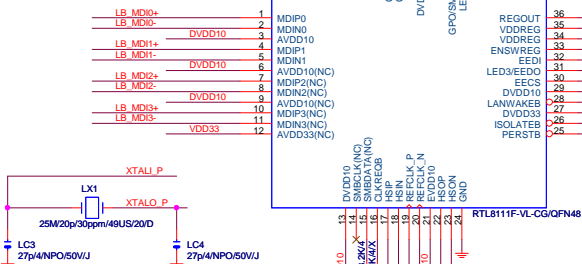
Linear SYS_FAN



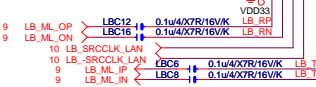
Gigabyte Technology

| | | | | | | | |
|--------|------------------------|--|--|---------------------|----|-------|--|
| Title | | | | HWM,KB/MS, FAN CTRL | | | |
| Size | Document Number | | | Rev | | | |
| Custom | GA-H87-HD3 | | | 1.02 | | | |
| Date: | Friday, March 22, 2013 | | | Sheet | 30 | of 34 | |

100歐姆:[20/4/8/4/20]

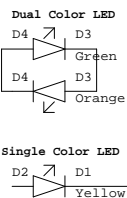
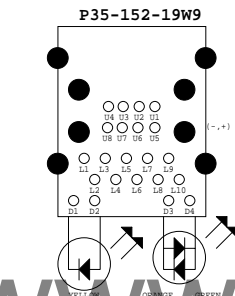


80歐姆:[15/5/5/5/15]



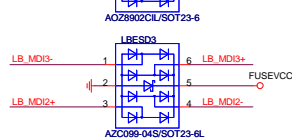
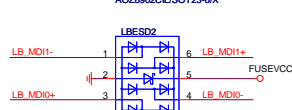
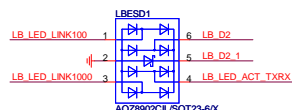
SRCCLK 50歐姆:[18/4/10/4/18]

離IC近越好

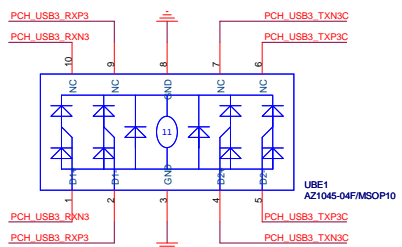
FOR DSM MODE
(DEEP SLEEP MODE)

USB30_LAN CONNECTOR

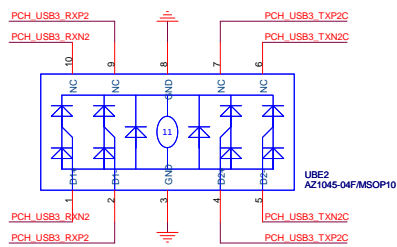
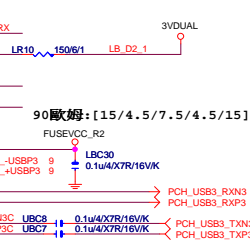
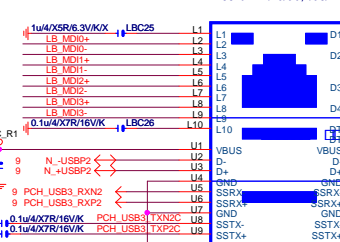
100歐姆:[20/4/8/4/20]



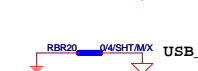
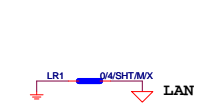
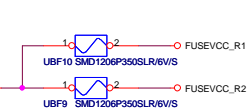
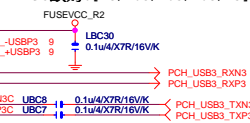
CLOSE USB30_LAN



CLOSE USB30_LAN

USB30_LAN
USB3-LAN1GGO,YOSRAD/G30[11NR6-702009-K1R]

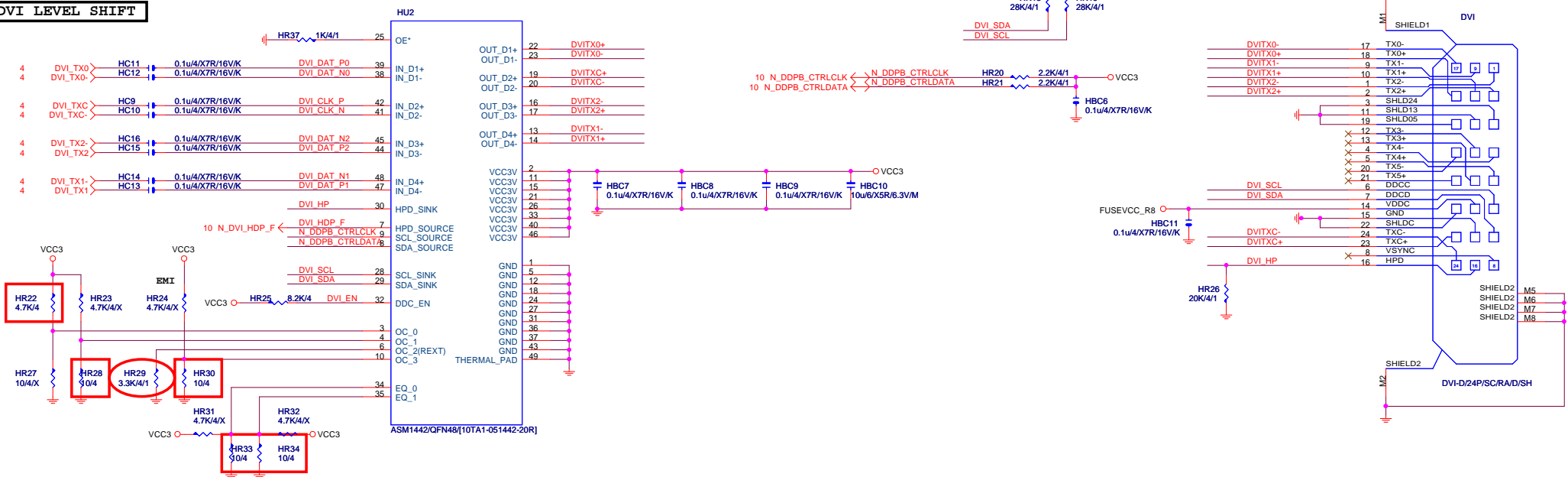
90歐姆:[15/4.5/7.5/4.5/15]



DVI LEVEL SHIFT

DVI:20/4/6/4/20

Impedance=85 +- 17.5%



PTN3360:PIN 4/10/34/35 NC PIN,都不上值;只上HR29:10K

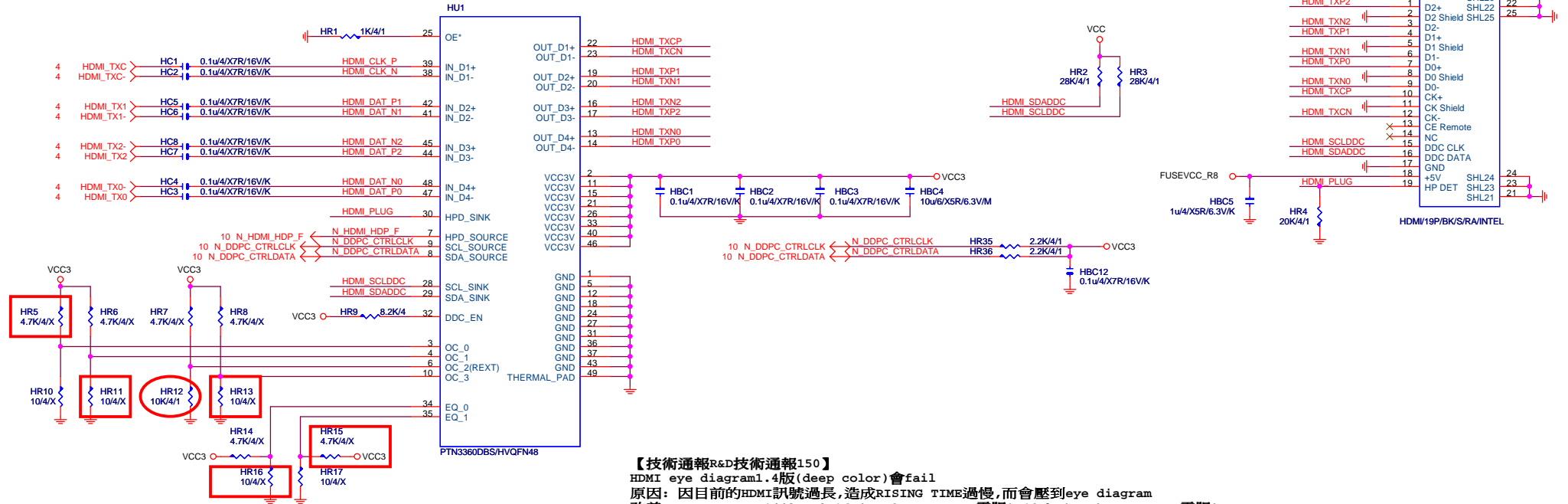
ASM1442:紅色框要上,HR29:3.3K

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| Gigabyte Technology | | | |
|---------------------|------------------------|-------|----------|
| TI TSB43AB23 1394 | | | |
| Size | Document Number | Rev | |
| Custom | GA-H87-HD3 | 1.02 | |
| Date: | Friday, April 26, 2013 | Sheet | 32 of 34 |

HDMI LEVEL SHIFT

HDMI:20/4/6/4/20
Impedance=85 +- 17.5%



PTN3360:PIN 4/10/34/35 NC PIN,都不上值;只上HR12:10K
ASM1442:紅色框要上,HR12:3.16K

【技術通報R&D技術通報150】

HDMI eye diagram1.4版(deep color)會fail

原因: 因目前的HDMI訊號過長,造成RISING TIME過慢,而會壓到eye diagram

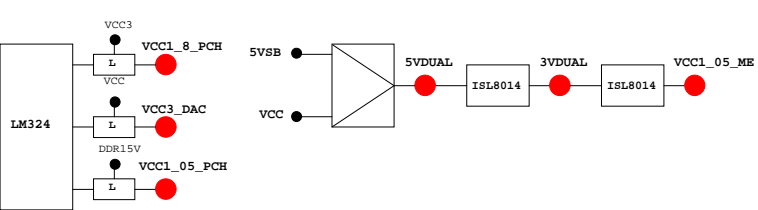
改善: ASMEDIA ASM1442 : 3.16K(PIN6 PULL DOWN電阻) 10ohm(PIN4 PULL DOWN電阻)

| | | | |
|---------------------------------|--------------------------------------|--|--------------------|
| GIGABYTE™ | | | |
| Title HDMI | | | |
| Size Custom | Document Number GA-H87-HD3 | | Rev 1.02 |
| Date: Friday, March 29, 2013 | Sheet 33 | | of 34 |

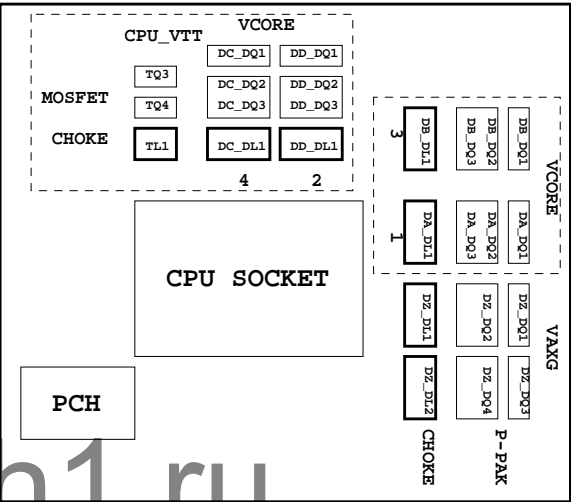
| PIN NAME | PWR | AFTER PLT35T | Default | USAGE | NOTE |
|----------------|------|--------------|---------|--------------------|-----------------|
| GP0 | MAIN | H-Z | GPI | GPIO0 | N/A |
| GP1/TACH1 | MAIN | | GPI | GPIO1 | N/A |
| GP2/PIRQE# | MAIN | | GPI | -PIRQE | P/U 8.2K VCC3 |
| GP3/PIRQF# | MAIN | | GPI | -PIRQF | P/U 8.2K VCC3 |
| GP4/PIRQG# | MAIN | | GPI | -PIRQG | P/U 8.2K VCC3 |
| GP5/PIRQH# | MAIN | | GPI | -PIRQH | P/U 8.2K VCC3 |
| GP6/TACH2 | MAIN | | GPI | PCIEX1 Detect | P/U 8.2K VCC3 |
| GP7/TACH3 | MAIN | | GPI | GPIO7 | P/U 8.2K VCC3 |
| GP8 | STBY | H | GPI | GPIO8 | N/A |
| GP9/OC5# | STBY | | NATIVE | USB OC5# | N/A |
| GP10/OC6# | STBY | | NATIVE | USB OC6# | N/A |
| GP11/SMBALERT# | STBY | | NATIVE | USB PWR protect | P/U 8.2K 3VDUAL |
| GP12 | STBY | L | GPI | GPIO12 | N/A |
| GP13 | STBY | L | GPI | LPCPME# | P/U 8.2K 3VDUAL |
| GP14/OC7# | STBY | | NATIVE | USB OC7# | N/A |
| GP15 | STBY | L | GPI | GPIO15(TLS Enable) | P/U 8.2K 3VDUAL |
| GP16 | MAIN | | GPI | GPIO16 | P/U 8.2K VCC3 |
| GP17/TACH0 | MAIN | | GPI | GPIO17 | P/U 8.2K VCC3 |
| GP18 | MAIN | | GPI | Mobile Only | N/A |
| GP19 | MAIN | | GPI | GPIO19 | P/U 8.2K VCC3 |
| GP20 | MAIN | | GPI | GPIO20 | P/U 8.2K VCC3 |
| GP21 | MAIN | | GPI | GPIO21 | P/U 8.2K VCC3 |
| GP22 | MAIN | H-Z | GPI | GPIO22 | P/U 8.2K VCC3 |
| GP23 | MAIN | | GPI | GPIO23 | N/A |
| GP24 | STBY | L | GPI | SKTOCC# | N/A |
| GP25 | STBY | | | Mobile Only | N/A |
| GP26 | STBY | | | Mobile Only | N/A |
| GP27 | STBY | H | GPO | GPIO27 | P/U 8.2K 3VDUAL |
| GP28 | STBY | H | GPO | PWR LED | P/U 8.2K 3VDUAL |
| GP29 | STBY | L | GPI | GPIO29 | N/A |
| GP30 | STBY | H-Z | GPI | Mobile Only | N/A |
| GP31 | STBY | H-Z | GPI | Mobile Only | N/A |
| GP32 | MAIN | H | GPO | N/A | N/A |
| GP33 | MAIN | H | GPO | N/A | N/A |
| GP34 | MAIN | H-Z | GPI | -PCI_STOP | P/U 8.2K VCC3 |
| GP35 | MAIN | L | GPO | -ACZ_DET | P/U 8.2K VCC3 |
| GP36 | MAIN | | GPI | N/A | N/A |
| GP37 | MAIN | | GPI | N/A | N/A |
| GP38 | MAIN | H-Z | GPI | PCIEX4 Detect | P/U 8.2K VCC3 |
| GP39 | MAIN | H-Z | GPI | GPIO39 | P/U 8.2K VCC3 |
| GP40 | STBY | | NATIVE | USB OC1# | N/A |
| GP41 | STBY | | NATIVE | USB OC2# | N/A |
| GP42 | STBY | | NATIVE | USB OC3# | N/A |
| GP43 | STBY | | NATIVE | USB OC4# | N/A |
| GP44 | STBY | L | NATIVE | GPIO44 | P/U 8.2K 3VDUAL |
| GP45 | STBY | | NATIVE | GPIO45 | P/U 8.2K 3VDUAL |
| GP46 | STBY | L | NATIVE | GPIO46 | P/U 8.2K 3VDUAL |
| GP47 | STBY | | | Mobile Only | N/A |
| GP48 | MAIN | H-Z | IN | GPIO48 | P/U 8.2K 3VDUAL |
| GP49 | MAIN | H-Z | IN | GPIO49 | P/U 8.2K 3VDUAL |
| GP50 | MAIN | | NATIVE | -REQ1 | P/U 2.2K VCC |
| GP51 | MAIN | H | NATIVE | -GNT1 | N/A |
| GP52 | MAIN | | NATIVE | -REQ2 | P/U 2.2K VCC |
| GP53 | MAIN | H | NATIVE | -GNT2 | N/A |
| GP54 | MAIN | | NATIVE | -REQ3 | P/U 2.2K VCC |
| GP55 | MAIN | H | NATIVE | -GNT3 | N/A |
| GP56 | STBY | | NATIVE | Mobile Only | N/A |
| GP57 | STBY | H-Z | IN | VCORE_OV1 | P/U 8.2K 3VDUAL |
| GP58 | STBY | H-Z | NATIVE | F_USB_OC# | P/U 8.2K 3VDUAL |
| GP59 | STBY | | NATIVE | USB_OC0# | N/A |
| GP60 | STBY | H-Z | NATIVE | N/A(Reverse) | P/U 8.2K 3VDUAL |
| GP61 | STBY | L | NATIVE | -SUSTAT | N/A |
| GP62 | STBY | L | NATIVE | SUSCLK | N/A |
| GP63 | STBY | L | NATIVE | GPIO63 | N/A |
| GP64 | MAIN | L | NATIVE | CLKOUTFLEX0 | N/A |
| GP65 | MAIN | L | NATIVE | CLKOUTFLEX1 | N/A |
| GP66 | MAIN | L | NATIVE | CLKOUTFLEX2 | N/A |
| GP67 | MAIN | L | NATIVE | CLKOUTFLEX3 | N/A |
| GP72 | STBY | H-Z | NATIVE | VCORE_OV4 | P/U 8.2K 3VDUAL |
| GP73 | STBY | | | Mobile Only | N/A |
| GP74 | STBY | H-Z | NATIVE | 1_05V_OV2 | P/U 8.2K 3VDUAL |
| GP75 | STBY | H-Z | NATIVE | N/A(Reverse) | P/U 8.2K 3VDUAL |

| PIN NAME | USAGE | NOTE |
|----------------------------|------------------|------|
| SVC/PECI_RQT/GP14 | -PECI_REQ | |
| PWROK1/GP13 | PWROK1/ITE_PWROK | |
| KRST#/GP62 | -KBRST | |
| SO/GP50 | -ICH_SPI_CS | |
| IRTX/GP47/CE2_N/JP7 | CEB_N | |
| GP46/IRRX | -LAN2_DSM | |
| PSION#/GP42 | -PSON | |
| PWROK2#/GP41 | PECI_CTL | |
| PCIRST3#/GP10/VDIMM_STR_EN | -PCIE_RST | |
| RSMRST#CIRRXL/GP55 | -RSMRST | |
| PME#/GP54 | -LPCPME | |
| PD5/GP75/BUSS00 | N/A | |

| PIN NAME | USAGE | NOTE |
|----------------------------|-------------------|------------------|
| FAN_TAC2/GP52 | FANIO2 | |
| FAN_TAC3/GP37 | FANIO3 | |
| VIDO3/FAN_TAC4/GP25/DSR2# | FANIO4 | |
| FAN_CTL2/GP51 | FANPWM2 | |
| FAN_CTL3/GP36 | FANPWM3 | |
| VID4/GP34 | BEEP- | |
| VID3/GP33 | TURBO1 | |
| VID2/GP32 | TURBO0 | |
| VCORE_GOOD/VID6/GP63 | CPUT_LED1_C | |
| VID5/GP35 | CPUT_LED2_C | |
| VID1/GP31 | CPUT_LED3_C | |
| VID0/GP30 | -LAN1_DSM | NBT_LED1_C |
| PD3/GP73/BUSSI1 | CPU_LED1_C | |
| PE/GP81 | CPU_LED2_C | |
| BUSY/GP82 | CPU_LED3_C | |
| PD3/GP73/BUSSI1 | SB_LED1_C | |
| PD4/GP74/BUSSI2 | SB_LED2_C | |
| VCORE_EN/VID7/GP64 | IT_GP64 | SB_LED3_C |
| PD0/GP70 | NB_LED1_C | |
| PD1/GP71 | NB_LED2_C | |
| PD2/GP72/BUSSI0 | NB_LED3_C | |
| GP22/SCK | LOW_PWR_1 | |
| VIDO5/GP27/SIN2 | LOW_PWR_2 | |
| PCIRST2#/GP11 | -PFMRST1 | |
| PCIRST1#/GP12 | -PFMRST2 | |
| 3VBSBW#/GP40 | CSI_F0 | BSEL166_1 |
| SUSC#/GP53 | CSI_F1 | BSEL166_2 |
| GP23/SI | BSEL166_3/CSISBSL | |
| VIDO0/GP20/CTS2# | CPUT_LED1_C | BSEL166_4 |
| GP65/VDDA_EN/GB_01 | MB_ID2 | |
| PD6/GP76/BUSSO1 | MB_ID3 | |
| PD7/GP77/BUSSO2 | MB_ID4 | |
| AFD#/GP86/SMBC_R | 2X PIN | FST_2X8 |
| INIT#/GP85/SMBD_M | SEC_2x8 | GTLREF_AD2 |
| ACK#/GP83 | DDR_LED1_C | |
| VIDO1/GP21/DCD2# | DDR_LED2_C | |
| STB#/GP87/SMBC_M | DDR_LED3_C | |
| PWRON#GP44 | VCORE_OV1 | |
| PANSWH#/GP43 | PWRBTSW | |
| KDAT/GP61 | -PWRBTSW | |
| KCLK/GP60 | KDAT | |
| MDAT/GP57 | KCLK | |
| MACL/GP56 | MDAT | |
| GP66/VLDT_EN/GB_02 | NBT_LED1_C | MCLK |
| SVD/PCIRSTIN#/CIRTX/GP15 | PWM2_CR | |
| KDAT/GP61 | PWM2_CR | |
| GP67/CPU_PG/GB_03 | EN_LOADLINE | IT_GP67/-EN_PWM2 |
| SLIN#/GP84/SMBD_R | -EN_PWM2 | |
| PSI_L/FAN_CLT5/CIRRX2/GP16 | -THERM | |
| VIDO4/GP26/SOUT2 | DDR18V_PH2_EN | |
| VIDO2/FAN_TAC5/GP24/DSR2# | DDR18V_LED | |
| VIDO6/GP17/RI2# | 1_1V_PH_EN | |
| VIDO7/JP6/DTR2# | JP6 | |
| PD5/GP75/BUSSO0 | SB_LED3_C | |



PWM各相位的擺法如下：



BIOS超電壓對應表：

| 線路圖名稱 | BIOS選項 |
|---------------------|------------------|
| Vcore | CPU Vcore |
| CPU_VTT | CPU Termination |
| CPU_VAXG | CPU Graphic Core |
| VCC1_8_PCH | CPU PLL |
| VCC1_05_PCH | PCH core |
| 3VDUAL | 3VDUAL |
| DDR15V | DRAM voltage |
| DDRVTT | DRAM Termination |
| VREF_CA_A/VREF_CA_B | DRAM Address Ref |
| VREF_DQ_A/VREF_DQ_B | DRAM Data Ref |

| | 3 pin FAN control | 4 pin FAN control | FAN speed | Controller |
|---------|-------------------|-------------------|---------------|------------|
| CPU FAN | FANPWM1 | FANPWM3 | FANIO1 | IT8720 |
| | ICH_FAN_PWM2 | ICH_FAN_PWM0 | ICH_FAN_TACH0 | PCH |
| SYS FAN | FANPWM2 | N/A | FANIO2 | IT8720 |
| | ICH_FAN_PWM1 | N/A | ICH_FAN_TACH1 | PCH |
| PWR FAN | N/A | N/A | FANIO3 | IT8720 |
| | | | ICH_FAN_TACH2 | PCH |

散熱模組料號:

Z77-D3H :
PCH :
12SP2-S05511-01R/02R/03R
MOSFET :
12SP2-S08924-01R/02R/03R