

SHEET

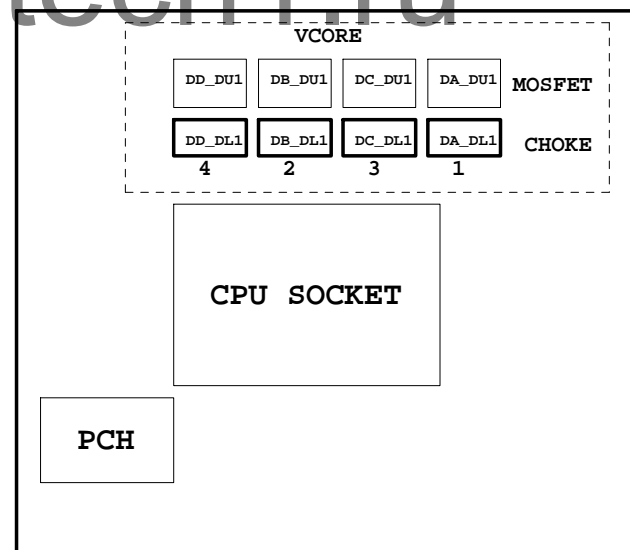
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SHEET

TITLE

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**Gigabyte Technology**

Title			
Cover Sheet			
Size	Document Number	GA-H81_AMP-UP	Rev
Custom			1.0
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GA-H81.AMP-UP

Version : 1.0

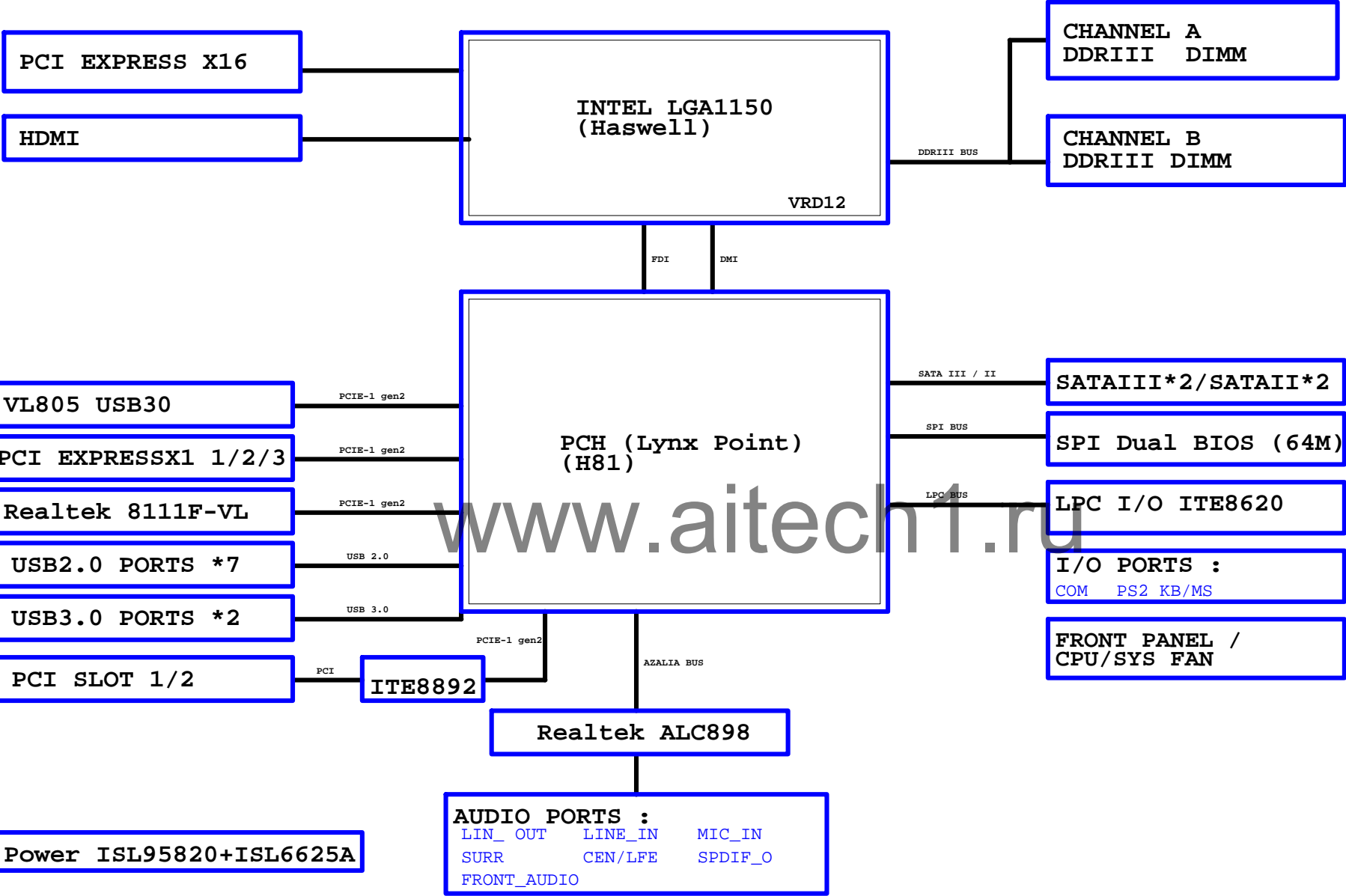
## Component value change history

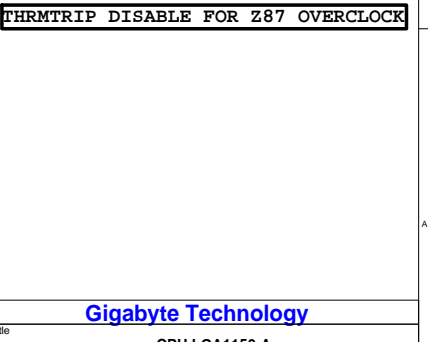
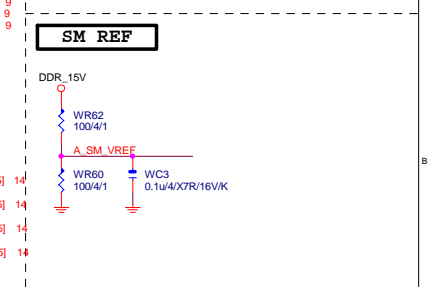
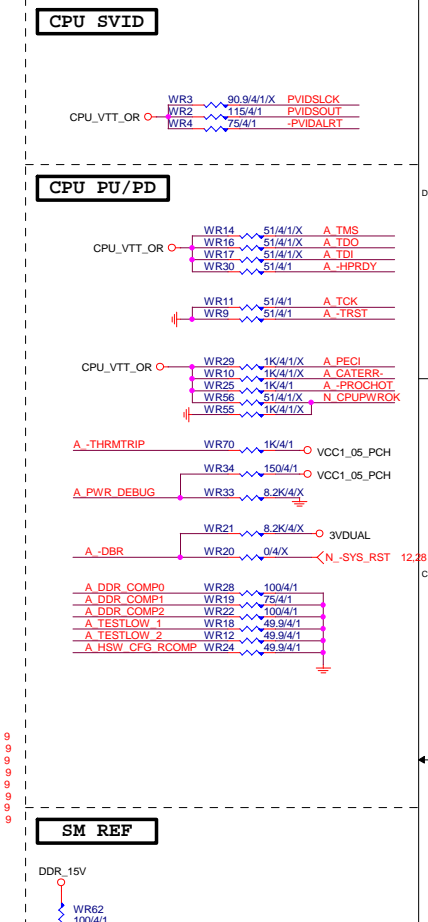
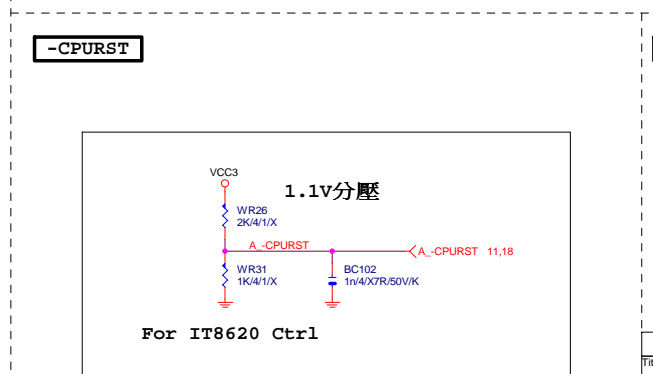
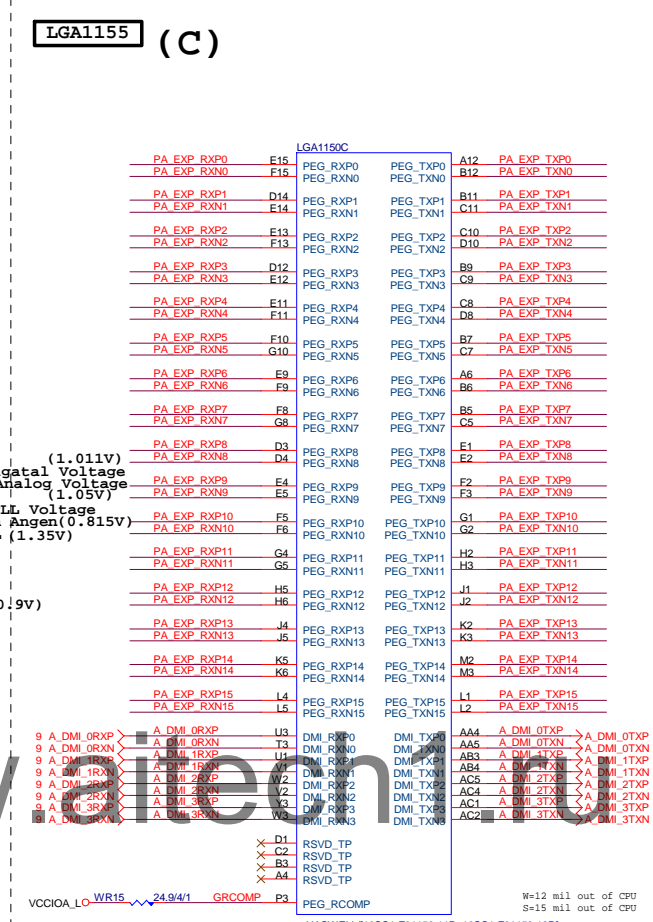
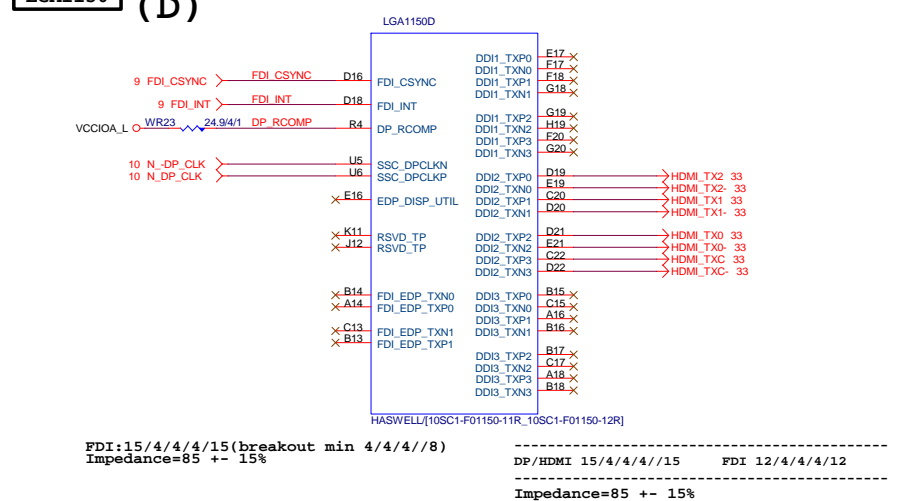
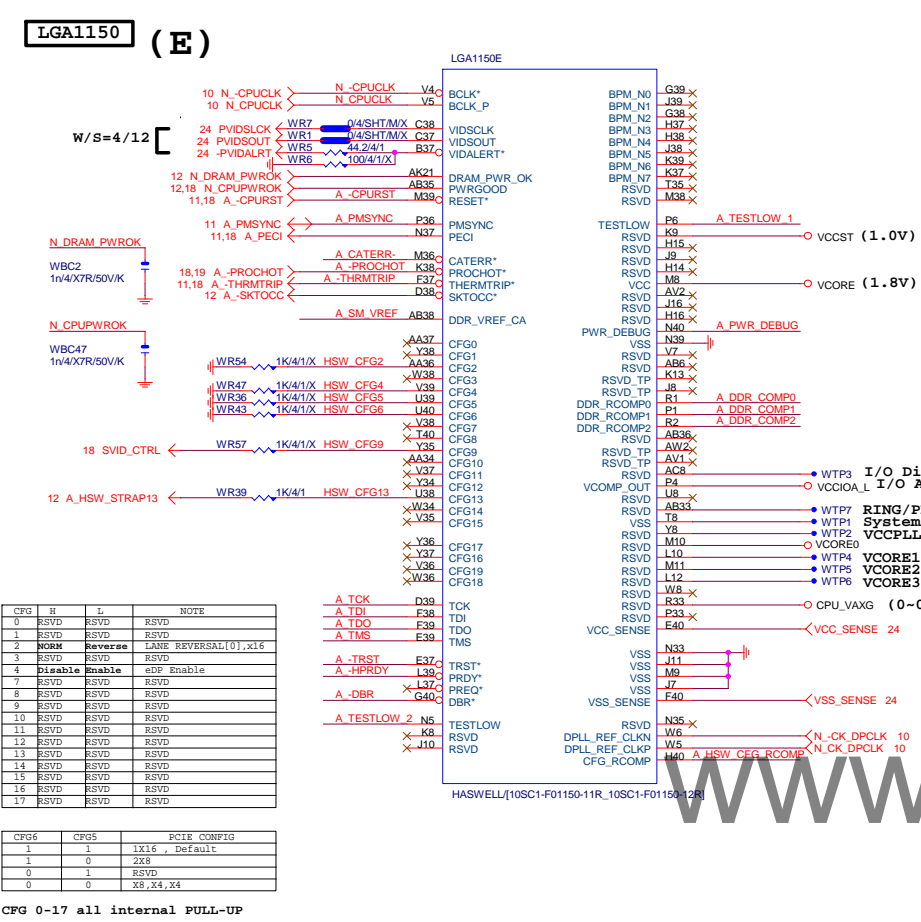
[illegible]

## Circuit or PCB layout change

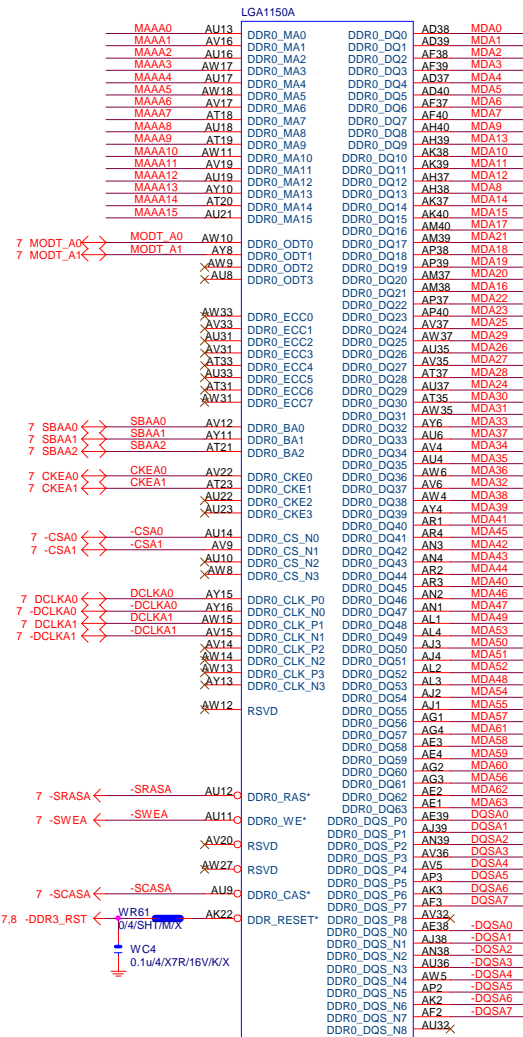
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BLOCK DIAGRAM





# LGA1150 (A)



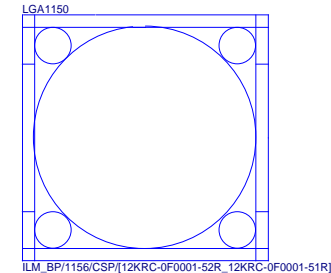
HASWELL[10SC1-F01150-11R\_10SC1-F01150-12R]

# LGA1150 (B)

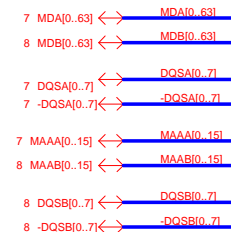


HASWELL[10SC1-F01150-11R\_10SC1-F01150-12R]

# LGA1150 (CR)



## DDR BUS



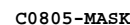
## Gigabyte Technology

Title		CPU LGA1150-B	
Size	Document Number	GA-H81_AMP-UP	
Custom			Rev 1.0
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(F, J)

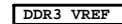


(X18)

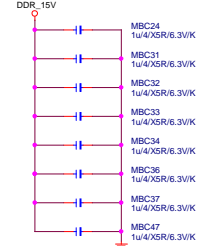
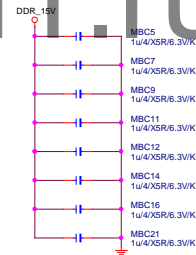


(x9)

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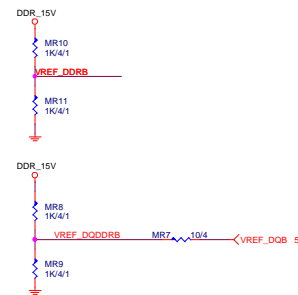
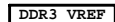
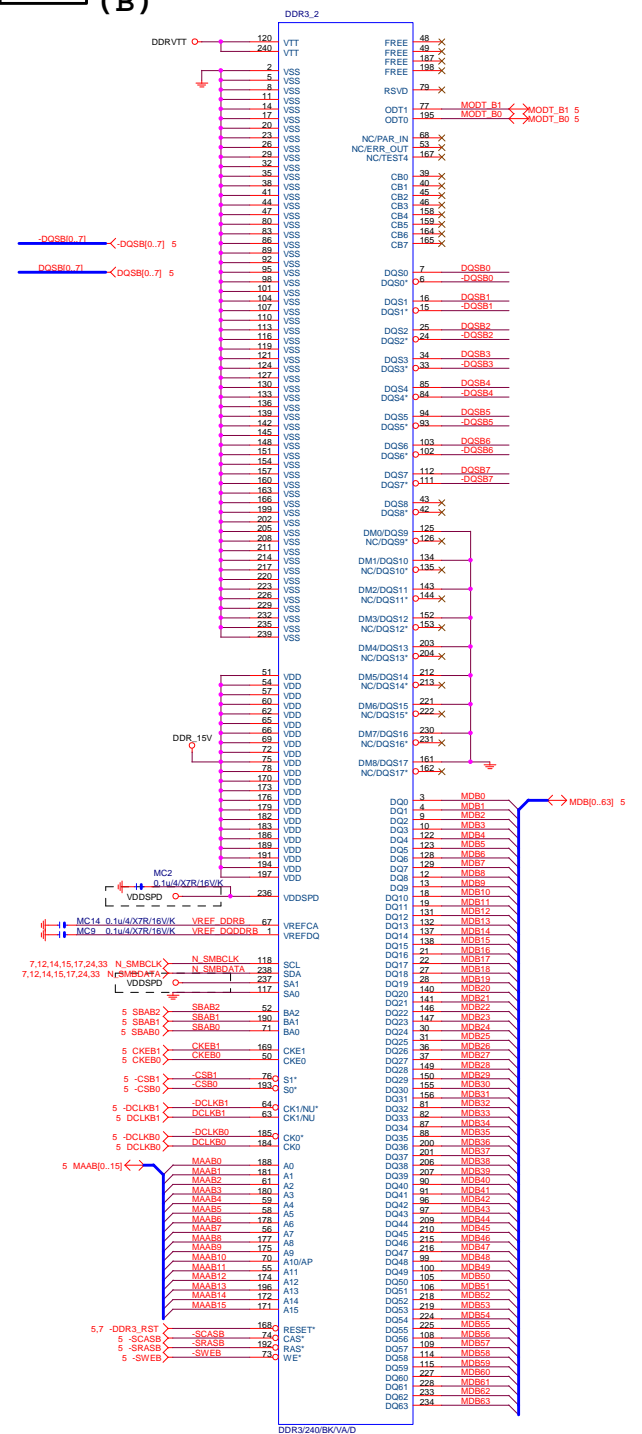
DDRVTT Decouple



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(B)



DDR3 1066,1333,1600MHZ BANDWIDTH

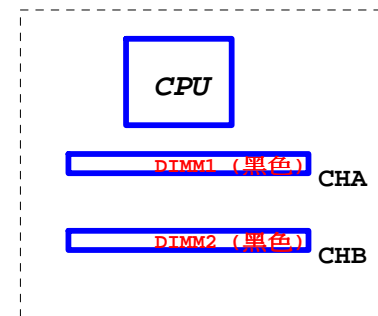
```
DDR3 1066MHZ
DDR3 clock=533MHZ
DDR3 single channel bandwidth=533x2x8Byte=8.5GB/s
DDR3 dual channel bandwidth=533x2x2x8Byte=17GB/s
```

```
DDR3 1333MHZ
DDR3 clock=667MHZ
DDR3 single channel bandwidth=10.6GB/s
DDR3 dual channel bandwidth=21GB/s
```

```
DDR3 1600MHZ
DDR3 clock=800MHZ
DDR3 single channel bandwidth=12.8GB/s
DDR3 dual channel bandwidth=25.6GB/s
```

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COUPON



**DIMM1 (黑色)**

CHA

**DIMM2 (黑色)**

 CHB

## Gigabyte Technology

Title			
DDRIII CHANNEL B			
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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%

B85: Port 6/7 N/A  
H81: Port 6/7/12/13 N/A

4 A.DMI\_0TXN A.DMI\_0TXN L24  
4 A.DMI\_0TXP A.DMI\_0TXP K24  
4 A.DMI\_0RXN A.DMI\_0RXN C20  
4 A.DMI\_0RXP A.DMI\_0RXP B20  
4 A.DMI\_1TXN A.DMI\_1TXN H24  
4 A.DMI\_1TXP A.DMI\_1TXP G24  
4 A.DMI\_1RXN A.DMI\_1RXN D21  
4 A.DMI\_1RXP A.DMI\_1RXP B21  
4 A.DMI\_2TXN A.DMI\_2TXN F26  
4 A.DMI\_2TXP A.DMI\_2TXP G26  
4 A.DMI\_2RXN A.DMI\_2RXN C22  
4 A.DMI\_2RXP A.DMI\_2RXP C22  
4 A.DMI\_3TXN A.DMI\_3TXN K26  
4 A.DMI\_3TXP A.DMI\_3TXP L26  
4 A.DMI\_3RXN A.DMI\_3RXN A24  
4 A.DMI\_3RXP A.DMI\_3RXP B24

PCHB

DML\_RXN\_0  
DML\_RXP\_0  
DML\_TXN\_0  
DML\_TXP\_0  
DML\_RXN\_1  
DML\_RXP\_1  
DML\_TXN\_1  
DML\_TXP\_1  
DML\_RXN\_2  
DML\_RXP\_2  
DML\_TXN\_2  
DML\_TXP\_2  
DML\_RXN\_3  
DML\_RXP\_3  
DML\_TXN\_3  
DML\_TXP\_3

USBN\_0  
USBP\_0  
USBN\_1  
USBP\_1  
USBN\_2  
USBP\_2  
USBN\_3  
USBP\_3  
USBN\_4  
USBP\_4  
USBN\_5  
USBP\_5  
USBN\_6  
USBP\_6  
USBN\_7  
USBP\_7  
USBN\_8  
USBP\_8  
USBN\_9  
USBP\_9  
USBN\_10  
USBP\_10  
USBN\_11  
USBP\_11  
USBN\_12  
USBP\_12  
USBN\_13  
USBP\_13

V/N L: 6/7 N/A

H81:2/13

DML\_RCOMP  
PCIE\_RCOMP  
CLKIN\_DML\_N  
CLKIN\_DML\_P

PCIE\_PERN\_1\_USB3\_RXN\_2  
PCIE\_PERP\_1\_USB3\_RXP\_2  
PCIE\_PETN\_1\_USB3\_TXN\_2  
PCIE\_PETP\_1\_USB3\_TXP\_2  
PCIE\_PERN\_2\_USB3\_RXN\_3  
PCIE\_PERP\_2\_USB3\_RXP\_3  
PCIE\_PETN\_2\_USB3\_TXN\_3  
PCIE\_PETP\_2\_USB3\_TXP\_3

OC0B\_GP59  
OC1B\_GP40  
OC2B\_GP41  
OC3B\_GP42  
OC4B\_GP43  
OC5B\_GP9  
OC6B\_GP10  
OC7B\_GP14

USBRBIASB  
USBRBIAS  
CLKIN\_DOT96N  
CLKIN\_DOT96P

PCIE\_PERN\_3  
PCIE\_PERP\_3  
PCIE\_PETN\_3  
PCIE\_PETP\_3  
PCIE\_PERN\_4  
PCIE\_PERP\_4  
PCIE\_PETN\_4  
PCIE\_PETP\_4  
PCIE\_PERN\_5  
PCIE\_PERP\_5  
PCIE\_PETN\_5  
PCIE\_PETP\_5  
PCIE\_PERN\_6  
PCIE\_PERP\_6  
PCIE\_PETN\_6  
PCIE\_PETP\_6  
PCIE\_PERN\_7  
PCIE\_PERP\_7  
PCIE\_PETN\_7  
PCIE\_PETP\_7  
PCIE\_PERN\_8  
PCIE\_PERP\_8  
PCIE\_PETN\_8  
PCIE\_PETP\_8

H81:PCIE 7/8  
N/A

H81/S[10HB1-030H81-10R]

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

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

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

PCH

(F)

28 PCH\_USB3\_RXN0  
28 PCH\_USB3\_RXP0  
28 PCH\_USB3\_TXN0  
28 PCH\_USB3\_TXP0  
28 PCH\_USB3\_RXN1  
28 PCH\_USB3\_RXP1  
28 PCH\_USB3\_TXN1  
28 PCH\_USB3\_TXP1

PCHF

FDILINK

USB3\_RXN\_0  
USB3\_RXP\_0  
USB3\_TXN\_0  
USB3\_TXP\_0

USB3\_RXN\_1  
USB3\_RXP\_1  
USB3\_TXN\_1  
USB3\_TXP\_1

USB3\_RXN\_4  
USB3\_RXP\_4  
USB3\_TXN\_4  
USB3\_TXP\_4

USB3\_RXN\_5  
USB3\_RXP\_5  
USB3\_TXN\_5  
USB3\_TXP\_5

TACH6\_GP70  
TACH7\_GP71

H81/S[10HB1-030H81-10R]

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

CK\_SRCCLK\_PCH NR89 8.2K/4  
CK\_SRCCLK\_PCH NR88 8.2K/4  
Mount for integrated clock Generation Mode

CK\_DOTCLK NR92 8.2K/4  
CK\_DOTCLK NR91 8.2K/4  
NR92 short to GND in non graphic SKU

PCH

(J)

PCHJ

AT1 VSS\_NCTF  
AT41 VSS\_NCTF  
AU1 VSS\_NCTF  
AV1 VSS\_NCTF  
AV2 VSS\_NCTF  
AV40 VSS\_NCTF  
AV41 VSS\_NCTF  
AW2 VSS\_NCTF  
AW40 VSS\_NCTF  
B41 VSS\_NCTF  
C41 VSS\_NCTF  
D1 VSS\_NCTF  
D41 VSS\_NCTF

TP22  
TP23  
TP21  
TP20  
TP14  
TP15  
TP12

TP10  
TP11  
TP9

TP3  
TP4  
TP1  
TP2

TP5  
TP6  
TP7  
TP8

VSS  
VSS  
VSS

H81/S[10HB1-030H81-10R]

U11  
U10  
U14  
AK14  
K34  
K33  
AH24

L16  
K16  
AM34

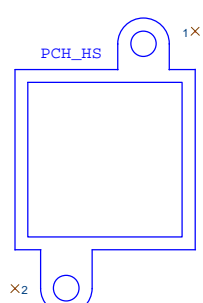
R12  
N12  
L22  
K22

R4  
K5  
P5  
L5

AC31  
AF3  
AV21

PCH H/S

LOW COST PCH HEATSINK



HEAT SINK/N-BG/GBT MK/Z87/KWOG[12SP2-S04208-61R\_12SP2-S04208-62R\_12SP2-S04208-63R]

NEW H81 MODEL  
Footprint: BGAHSINK-75;  
3mm孔徑

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		
Size Custom	Document Number GA-H81 AMP-UP	Rev 1.0
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The diagram shows the PCHE pinout for the H81/S[10HB1-030H81-10R] processor. It includes connections for VCC3, NR36 (8.2K/4/1X), NR35 (0/4), and NR34 (0/4/SHTX). The pinout is organized into columns: PCHE, DDPB\_HPD, VGA\_HSNC, VGA\_VSYNC, VGA\_RED, VGA\_GREEN, VGA\_BLUE, VGA\_IRTN, VGA\_DDC\_DATA, VGA\_DDC\_CLK, DAC\_IREF, DDPB\_CTRLCLK, DDPB\_CTRLDATA, DDPB\_CTRLCLK, DDPD\_CTRLCLK, DDPD\_CTRLDATA, and DDC\_DIFF. The diagram also shows connections for NR36, NR35, and NR34. The pinout is organized into columns: PCHE, DDPB\_HPD, VGA\_HSNC, VGA\_VSYNC, VGA\_RED, VGA\_GREEN, VGA\_BLUE, VGA\_IRTN, VGA\_DDC\_DATA, VGA\_DDC\_CLK, DAC\_IREF, DDPB\_CTRLCLK, DDPB\_CTRLDATA, DDPB\_CTRLCLK, DDPD\_CTRLCLK, DDPD\_CTRLDATA, and DDC\_DIFF. The diagram also shows connections for NR36, NR35, and NR34.

Pin	Signal	Notes
33	N_HDMI_HDP_F	
NR35	0/4	
NR36	8.2K/4/1X	
NR34	0/4/SHTX	
PCHE		
DDPB_HPD		
VGA_HSNC		
VGA_VSYNC		
VGA_RED		
VGA_GREEN		
VGA_BLUE		
VGA_IRTN		
VGA_DDC_DATA		
VGA_DDC_CLK		
DAC_IREF		
DDPB_CTRLCLK		
DDPB_CTRLDATA		
DDPB_CTRLCLK		
DDPD_CTRLCLK		
DDPD_CTRLDATA		
DDC_DIFF		

Close PCH<0.75";4/10;+-1000;GND

VGA 4/20;+-200MILS;GND REF

DDC DIFF 4/5;+-1000

N VGA RSET NR34 0/4/SHTX IREF 4/12;+-1000

N DDPB\_CTRLCLK 33

N DDPB\_CTRLDATA 33

N DDPD\_CTRLCLK 33

N DDPD\_CTRLDATA 33

H81/S[10HB1-030H81-10R]

VGA DISABLE	
R,G,B	NC OR GND
IRTN	IREF GND
VGA_HSNC, VGA_VSYNC, DDC_CLK, DDC_DATA	NC
POWER VCCADAC(AF2), VCCADACBG(AE1) GND	

[illegible]

N -CLK\_GND NR42 8.2K/4  
N' CLK\_GND NR41 8.2K/4

N PCHCLK14 NR118 8.2K/4

Mount for integrated clock Generation Mode

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5

<b>Gigabyte Technology</b>			
<b>PCH DISPLAY ,CLK BUFFER</b>			
Size Custom	Document Number <b>GA-H81 AMP-UP</b>		Rev 1.0
Date:	Friday, August 16, 2013	Sheet	10 of 34

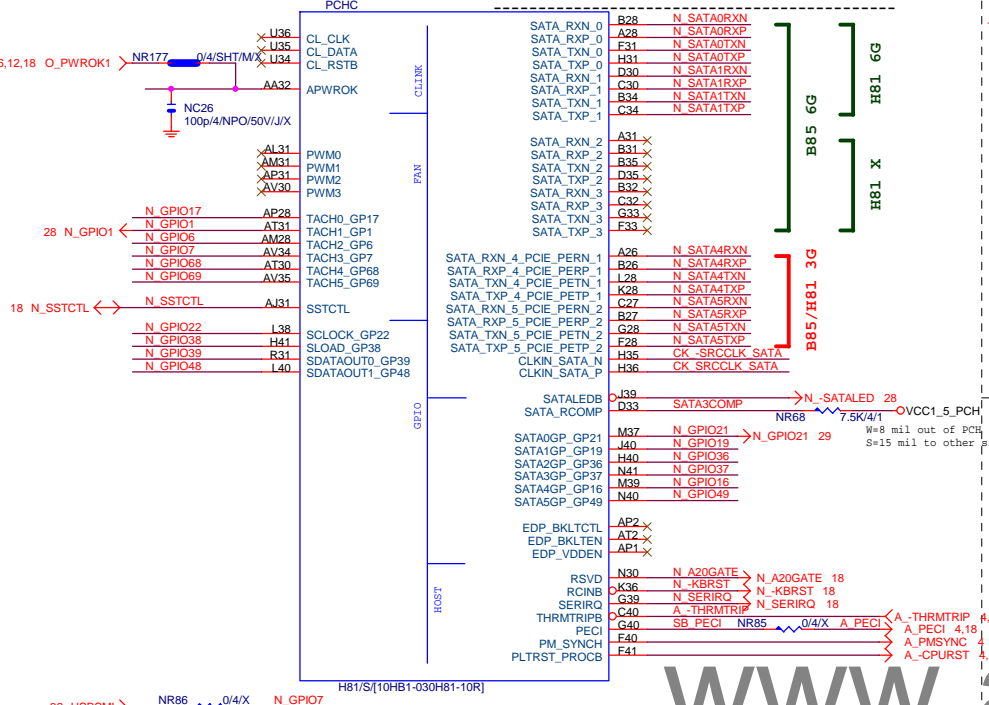
# PCH (C)

SATA3 : 20/4/4/4/20 (breakout min 8/4/4/4/8)

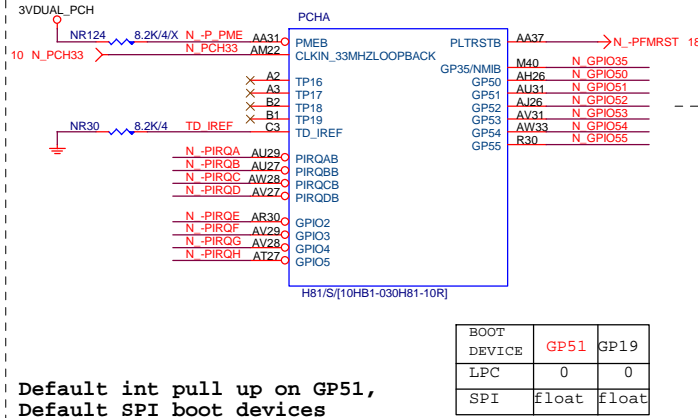
Impedance=85 +- 17.5%

SATA2 15/4/4/4/15

SATA3 20/4/4/4/20



# PCH (A)



Default int pull up on GP51,  
Default SPI boot devices

# ME PWROK

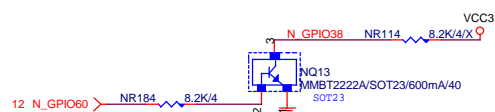
GPIO37 PU ENABLE SBA  
For H87&B85



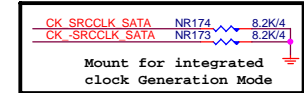
# GPIO38 Ctrl

MFG Mode

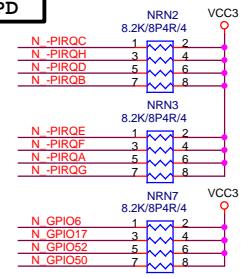
N\_GPIO38 : Lo --> Enable  
Hi --> Disable



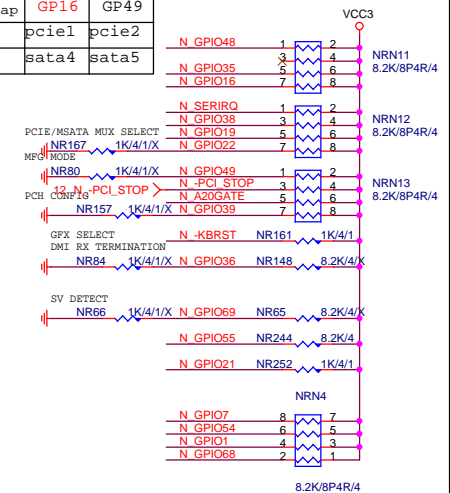
# PCH CLK PD



# PCH PU/PD



soft strap	GP16	GP49
0	pcie1	pcie2
1	sata4	sata5

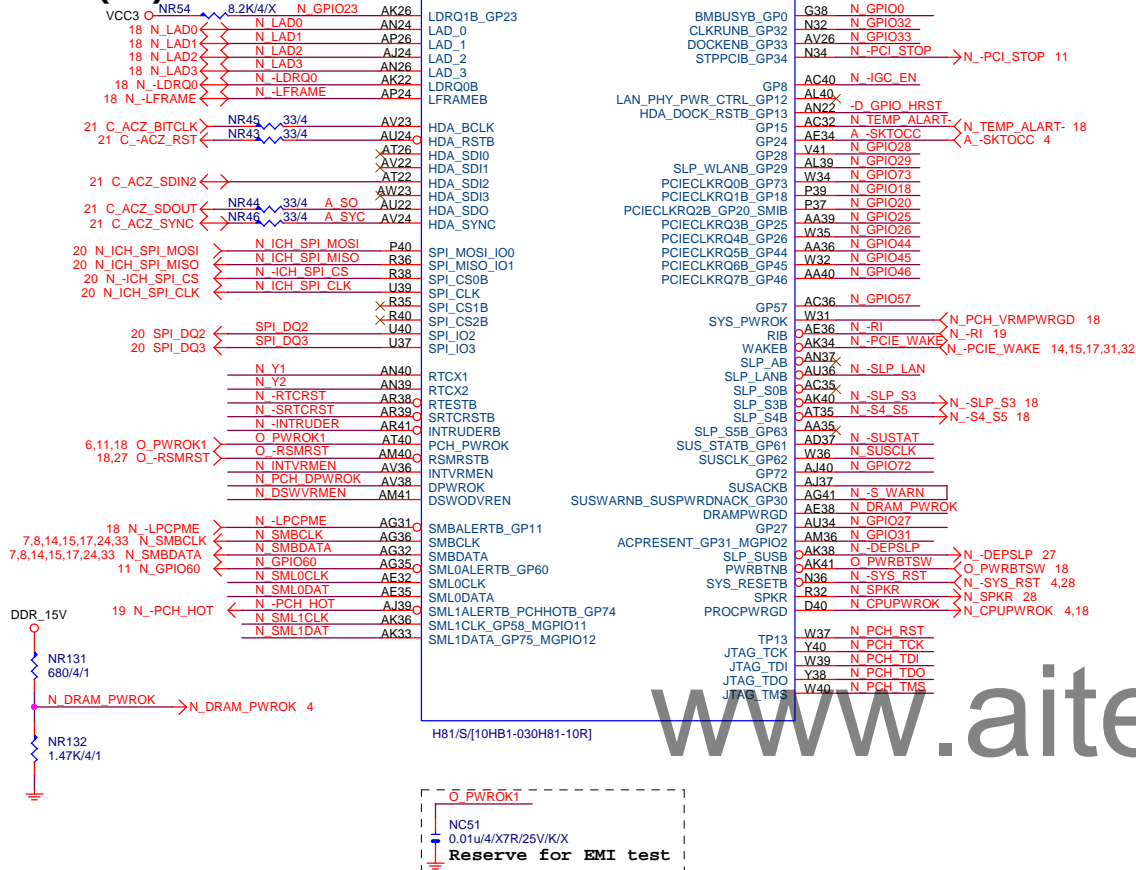


# Gigabyte Technology

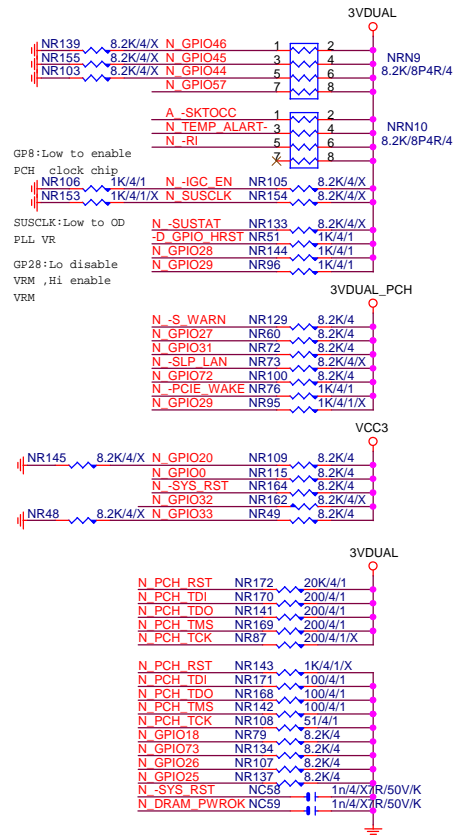
PCH HOST , SATA, PCI		
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## PCH

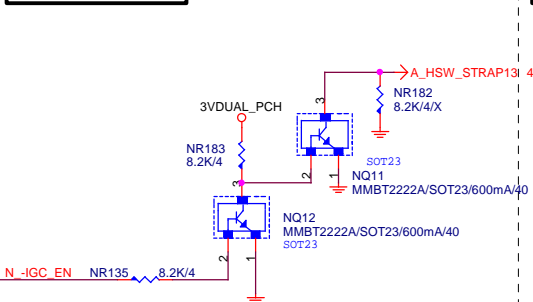
(D)



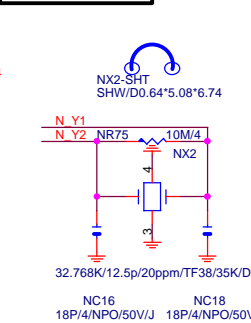
## PCH PU/PD



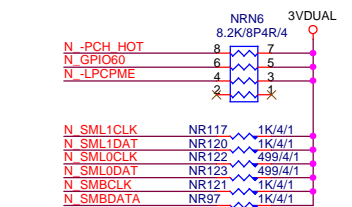
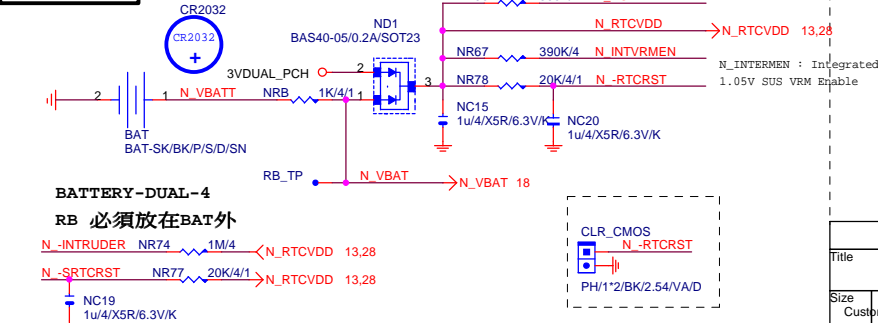
## HSW\_STRAP13



## 32.768KHZ



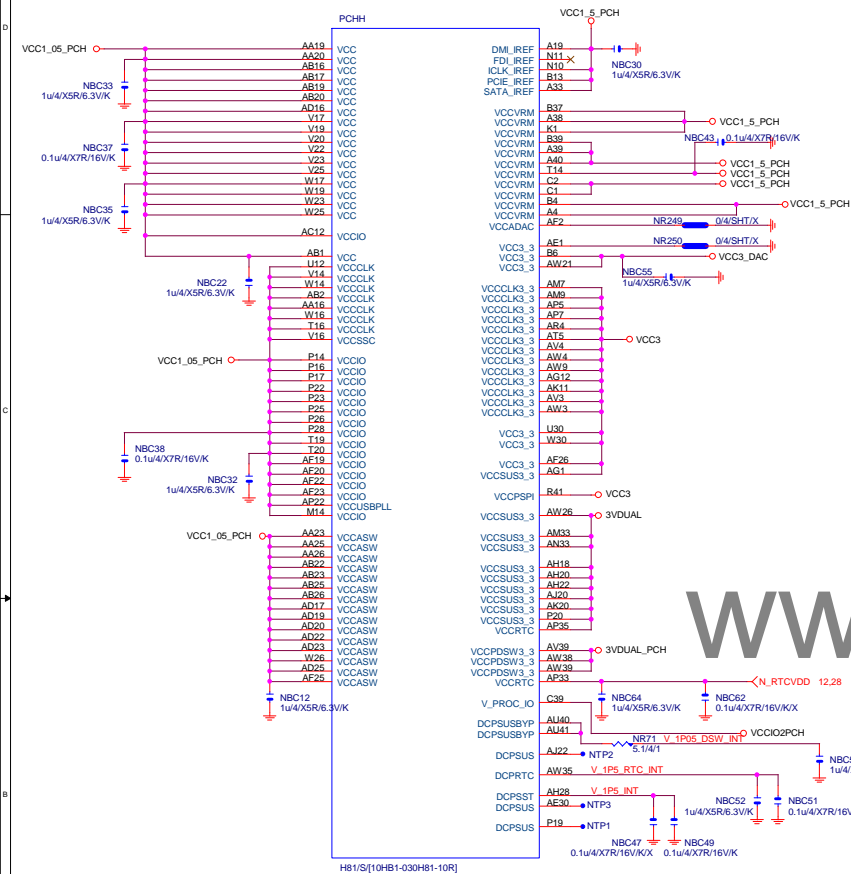
## CLR\_CMOS



Gigabyte Technology

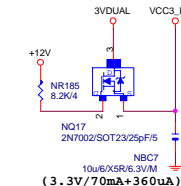
Title		PCH GPIO , CTRL , AUDIO	
Size	Document Number	Rev	
Custom	GA-H81 AMP-UP	1.0	
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# PCH (H)

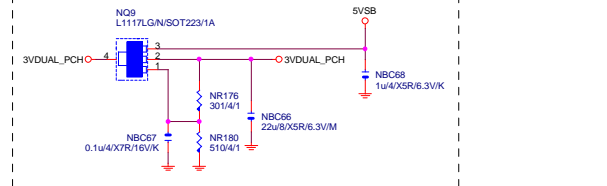


# VCC3\_DAC

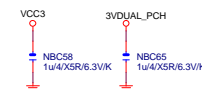
CLOSE北橋(注意震盪水波紋)



# 3VDUAL\_PCH



# SHT\_PWR



# CAP

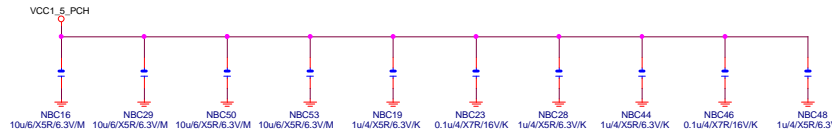
(3.3V) (X6)

(1.05V) (X5)

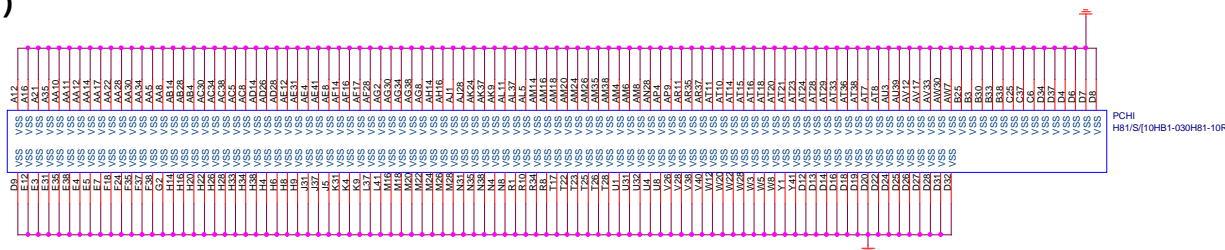
(1.05V) (X6)

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

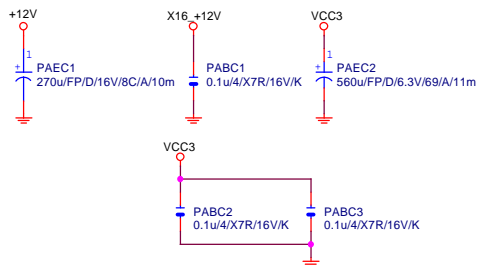
(1.5V) (X10)



# PCH (I)

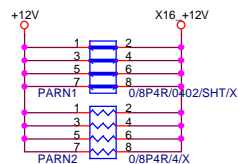


PCIEX16 CAP
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PCIEX16	PROTECT	SHT
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```
+12 protect
short-wire test
```



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

PCI-E REV:1.1--&gt; 2.5GHZ

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

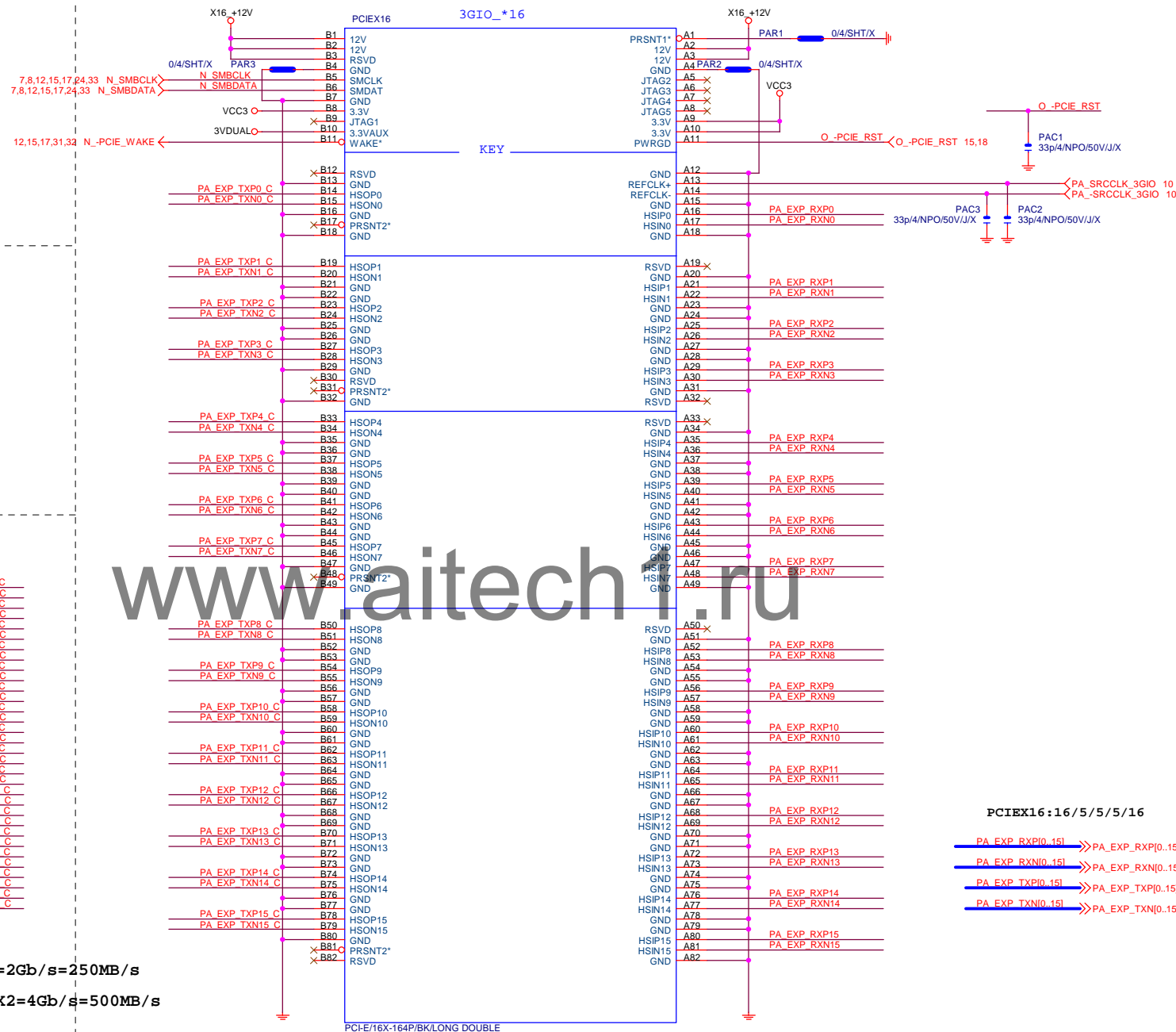
PCE-E X1(雙向) BANDWIDTH=2.5GHz\*(8b/10b)X2=4Gb/s=500MB/s

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

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

PCI-E REV:2.0--&gt; 5GHZ

## PCIEX16 SLOT



PCIEX16:16/5/5/5/16

PA EXP RXP[0..15] >> PA EXP RXP[0..15] A

PA EXP RXP[0..15]    >> PA EXP RXP[0..15] 4

```
PA_EXP_RXN[0..15]  >> PA_EXP_RXN[0..15]
```

```
PA_EXP_TYP[0..15]  >>
```

PA\_EXP\_TXN[0..15] >> PA\_EXP\_TXP[0..15] 4

PA\_EXP\_TXN[0..15] >> PA\_EXP\_TXN[0..15] 4

Circuitry Technology

## Gigabyte Technology

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PCI EXPRESS \* 16

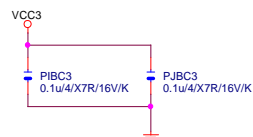
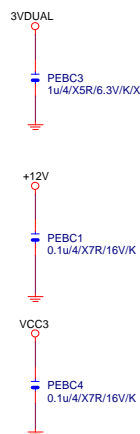
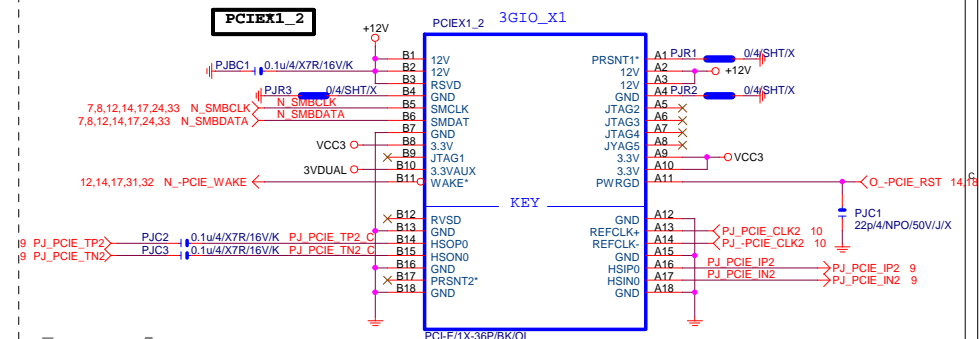
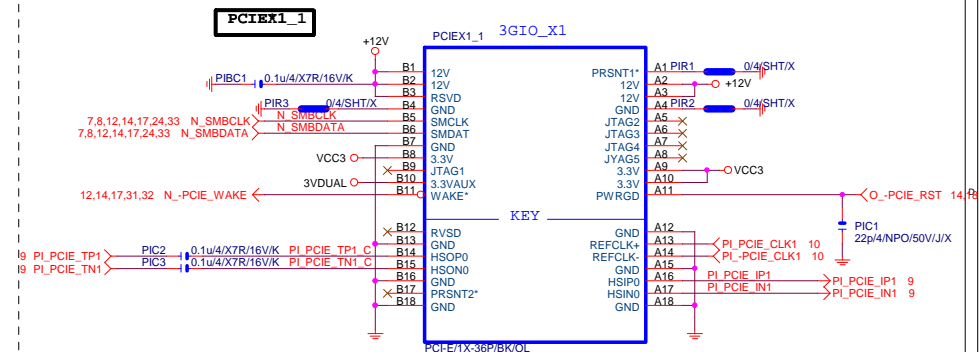
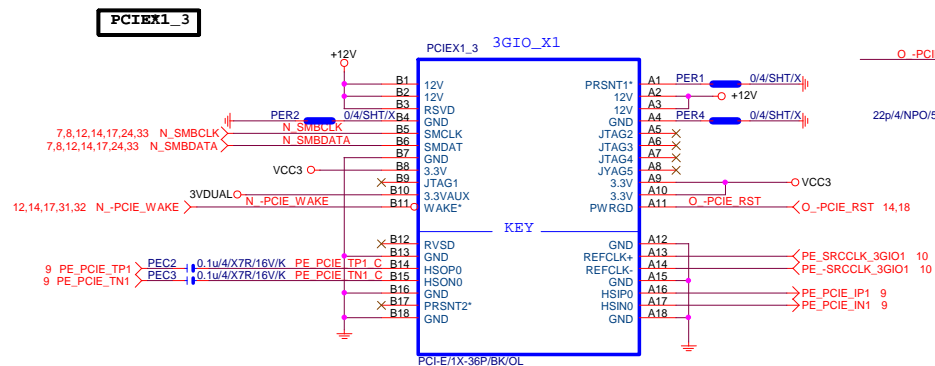
Document Number **GA-H81** AM

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e: Friday, August 16, 2013		Sheet
2		

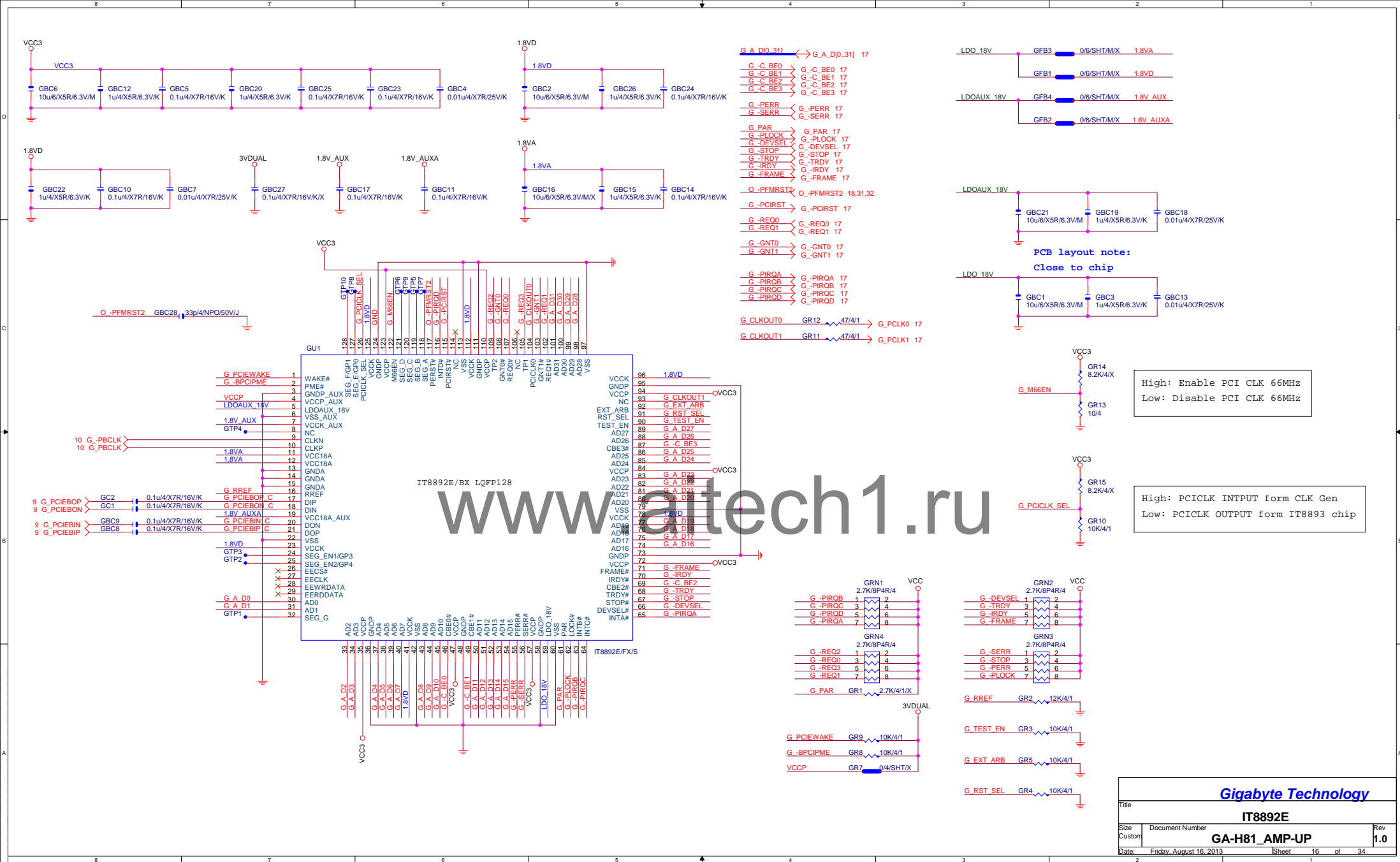
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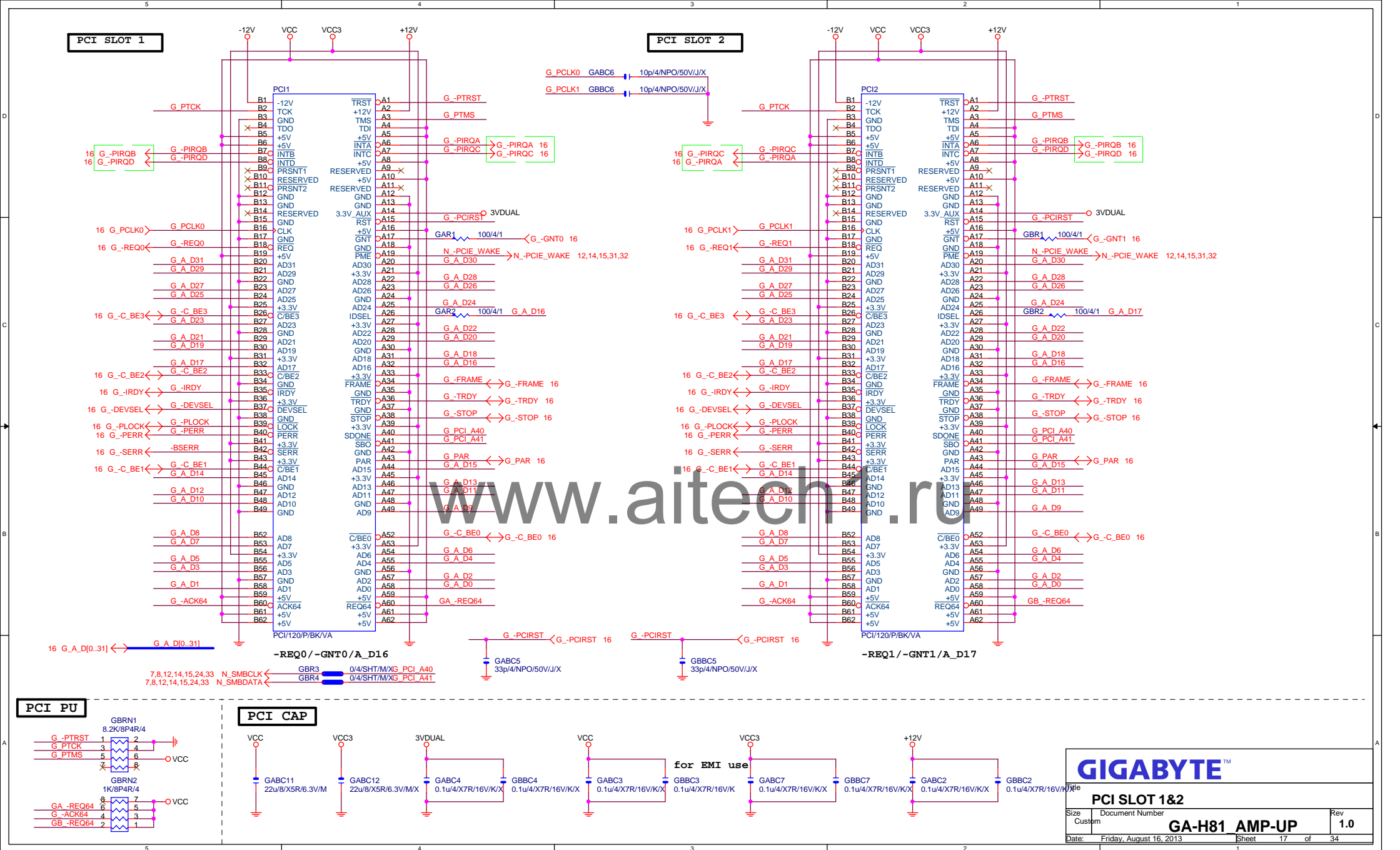


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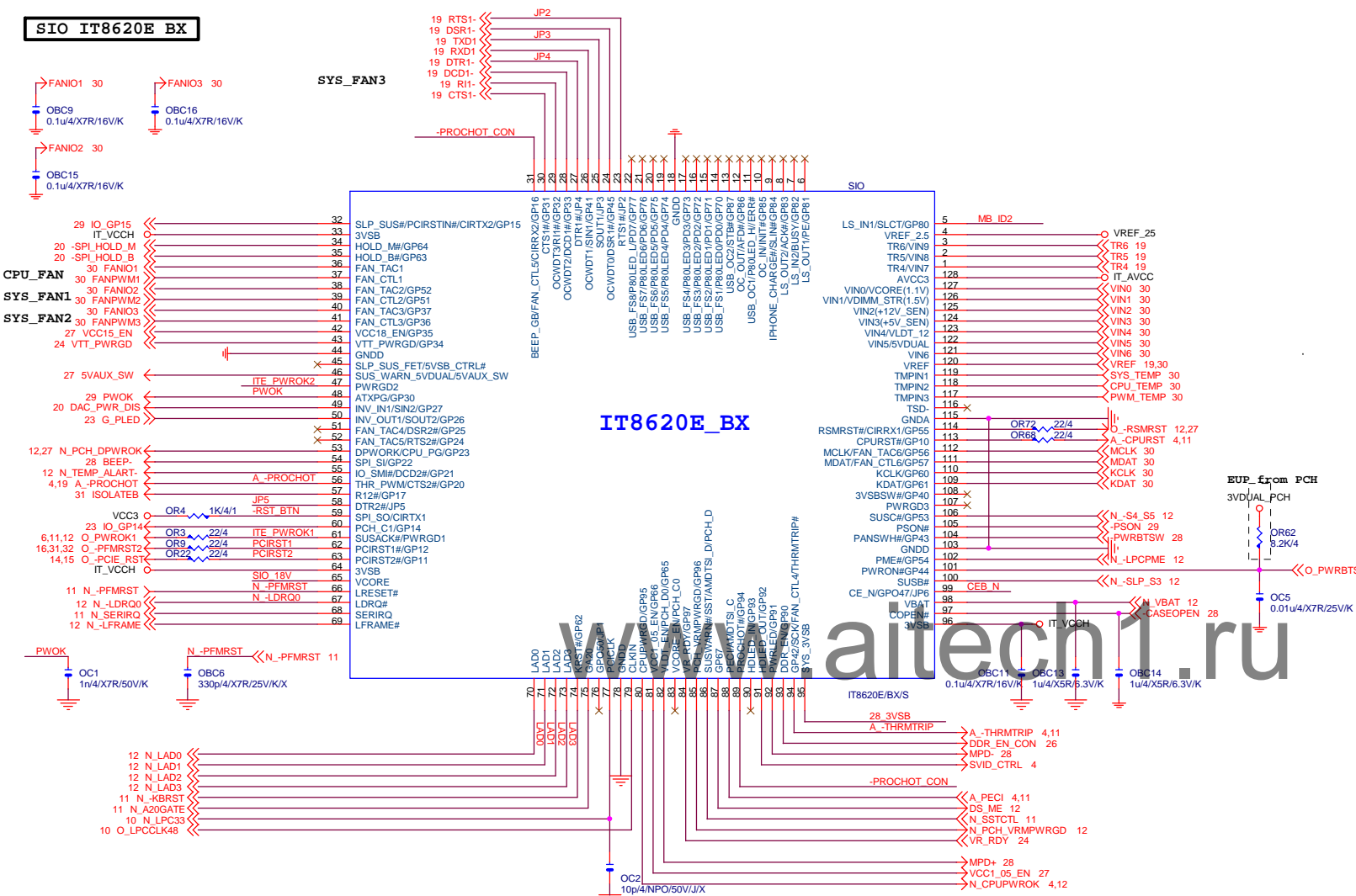
Gigabyte Technology		
Title		
PCIE X1 1,2,3		
Size	Document Number	Rev
Custom	GA-H81 AMP-UP	1.0
Date:	Friday, August 16, 2013	Sheet 15 of 34



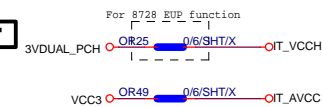




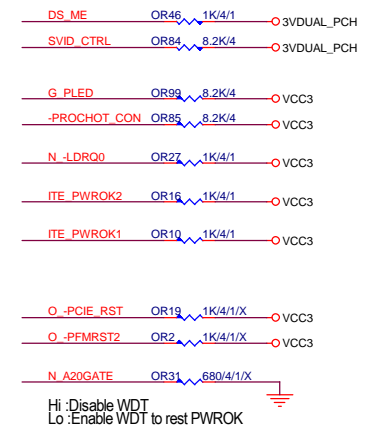
## SIO IT8620E BX



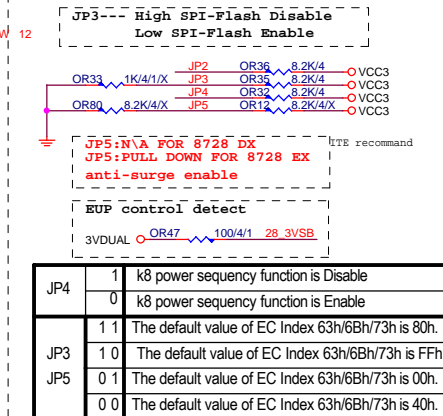
## PWR SHT



## SIO PU



## SIO STRAP



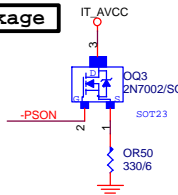
## IT8728F NOTE

IT8728	
PIN121	VCORE_EN/PCH_C0
PIN120	VLDI_EN/PCH_D0
PIN19	ATXPG
PIN31	PCH_C1
PIN53	SST/AMDTSTI_D/MTRB#/PCH_D1
PIN55	PECI/AMDTSTI_C/DRVB#
PIN66	SYS_3VSB
PIN70	GP47
PIN95	VIN2(VCC5)
PIN96	VIN1(VCC12)
PIN97	VIN1/VDIMM_STR(1.5V)
PIN98	VIN0/VCORE(1.1V)/NC

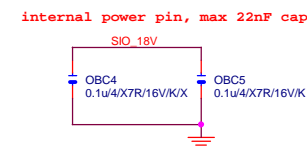
## DUAL BIOS OPT STRAP



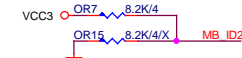
## Power leakage



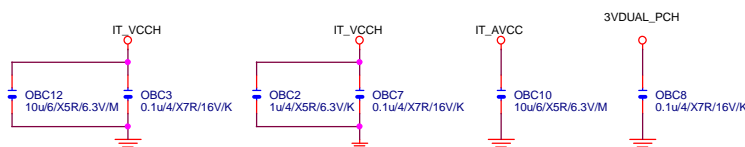
## SIO\_18V



## MB ID



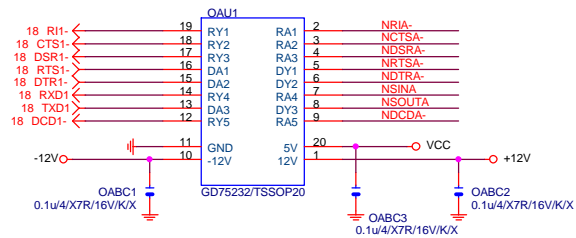
## SIO CAP



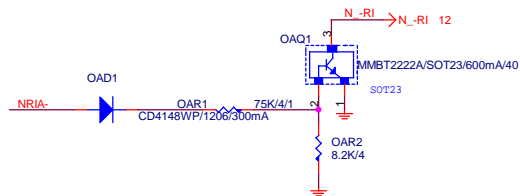
## Gigabyte Technology

Title		
ITE 8620 LPC IO		
Size	Document Number	Rev
Custom	GA-H81 AMP-UP	1.0
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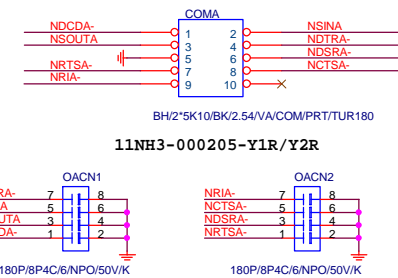
## COMA



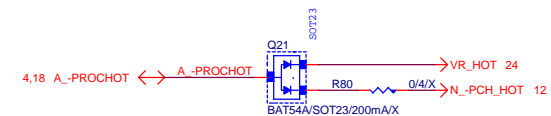
## COM RI



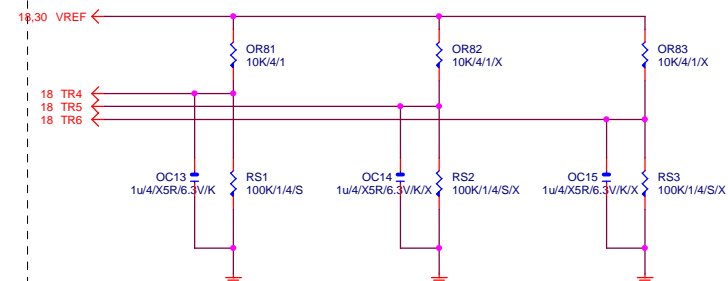
## COM BUFFER



## -PROHOT



## PROHOT



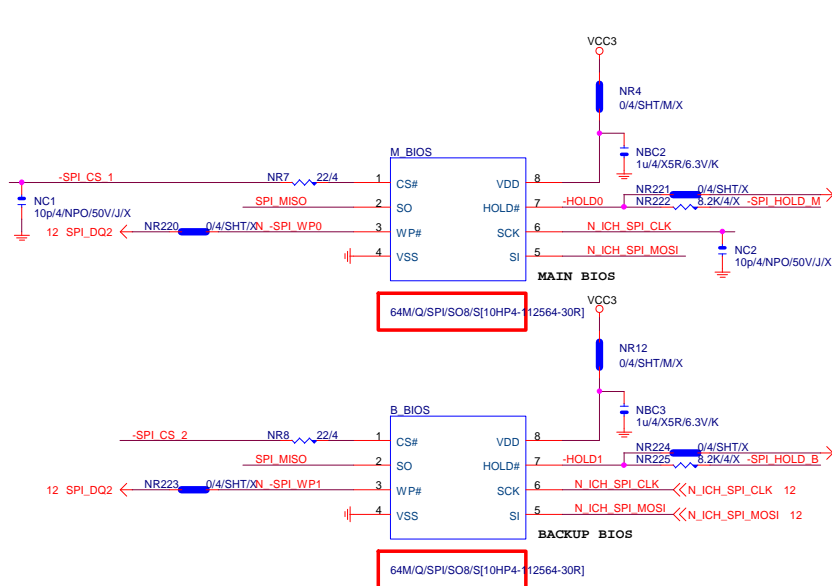
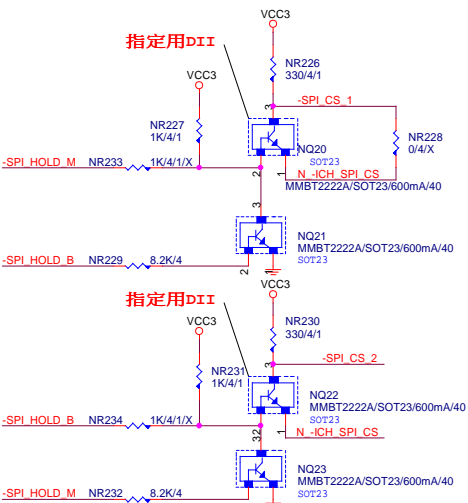
RS1 close DBQ1 、  
RS2 close DDQ1 、  
RS3 close DAQ1 、  
Others close SIO

Gigabyte Technology

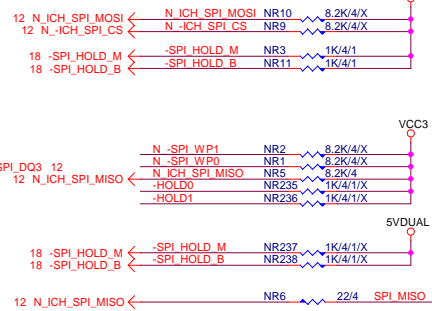
Title			
COM & PROHOT			
Size	Document Number	Rev	
Custpm		1.0	
Date:	Friday, August 16, 2013	Sheet	19 of 34

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# DUAL BIOS



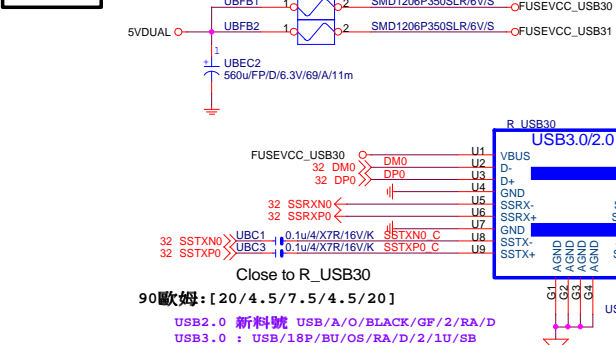
# MOSI For DMI RX Termination Voltage



BOOT DEVICE	GNT'0	GNT'1
LPC	0	0
PCI	0	1
NAND	1	0
SPI	1	1

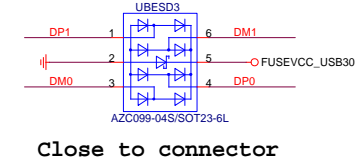
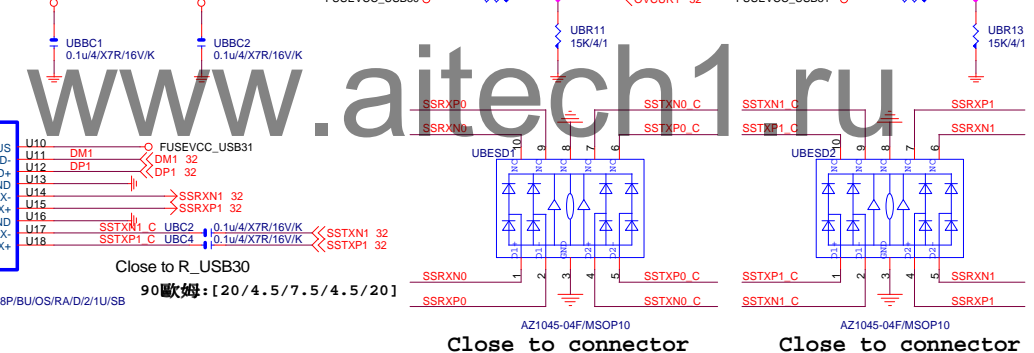
1 means floating  
0 means PD 1K

# R\_USB3.0

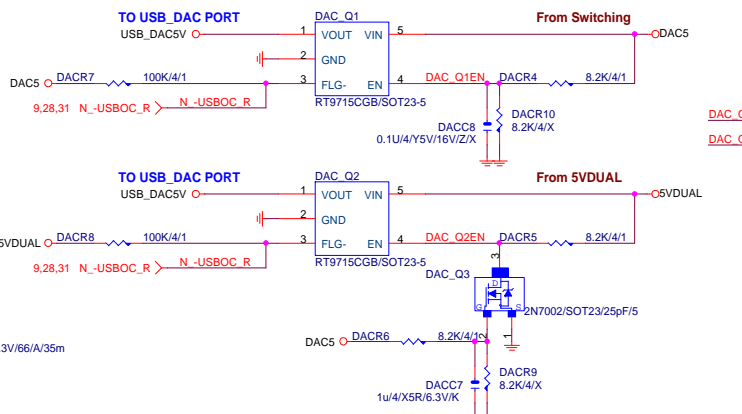
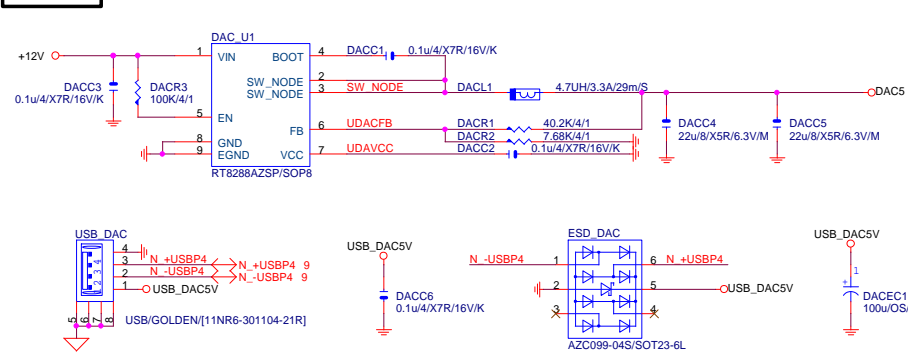


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# 100MILS

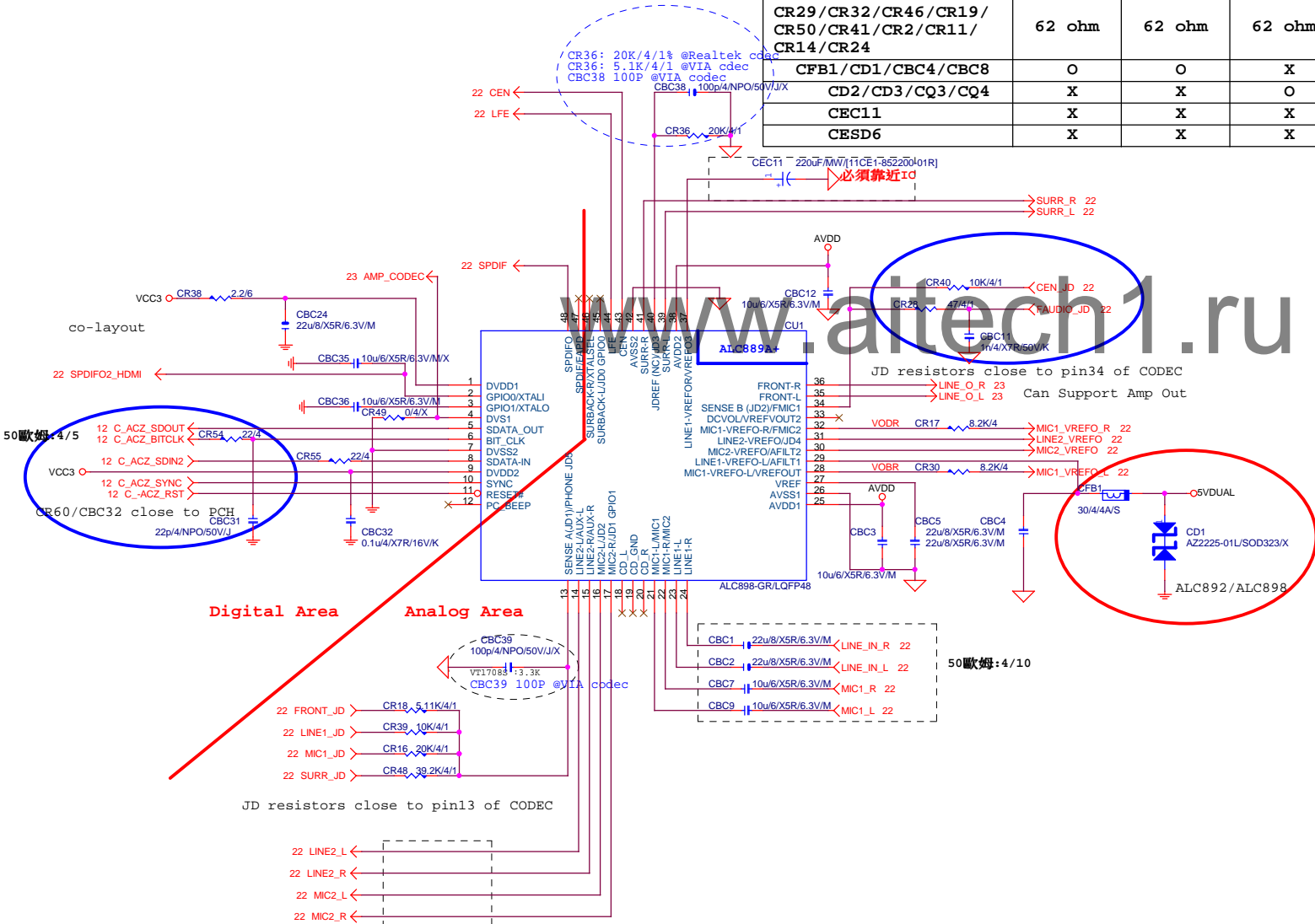


# USB\_DAC



Gigabyte Technology			
Title BIOS, R_USB30, USB_DAC			
Size Custom	Document Number	Rev	
	GA-H81_AMP-UP	1.0	
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	ALC662	ALC887-VD2	ALC889	VT1708S-CD	VT1708S-CE	VT2021	ALC898/ALC892
CR49	X	X	O	O	X	O	X
CBC36	O	O	X	X	O	X	O
CR28/CBC11	47ohm+1nF	47ohm+1nF	47ohm+1nF	22ohm+100P	22ohm+100P	47ohm+1nF	47ohm+1nF
CR52	X	O	O	O	O	O	O
CR57	O	X	X	X	X	X	X
CBC1/CBC2	10uF/X5R	10uF/X5R	22uF/X5R	10uF/X5R	10uF/X5R	10uF/X5R	22uF/X5R
CR36	20K/4/1	20K/4/1	20K/4/1	5.1K/4/1	20K/4/1	5.1K/4/1	20K/4/1
CR17/CR30/ CR25/CR15/CR12/CR3/	8.2K/4	8.2K/4	8.2K/4	3.3K/4/1	3.3K/4/1	3.3K/4/1	8.2K/4
CBC38/CBC39	X	X	X	100P/4	100P/4	X	X
CR10/CR8/CR20/CR45/ CR42/CR51/CR27/CR26	22K/4	22K/4	22K/4	10K/4/1	10K/4/1	10K/4/1	22K/4
CR7/CR9/CR5/CR13/ CR29/CR32/CR46/CR19/ CR50/CR41/CR2/CR11/ CR14/CR24	62 ohm	62 ohm	62 ohm	75 ohm	75 ohm	75 ohm	62 ohm
CFB1/CD1/CBC4/CBC8	O	O	X	X	O	X	O
CD2/CD3/CQ3/CQ4	X	X	O	O	X	O	X
CEC11	X	X	X	X	X	X	O
CESD6	X	X	X	O	O	O	X

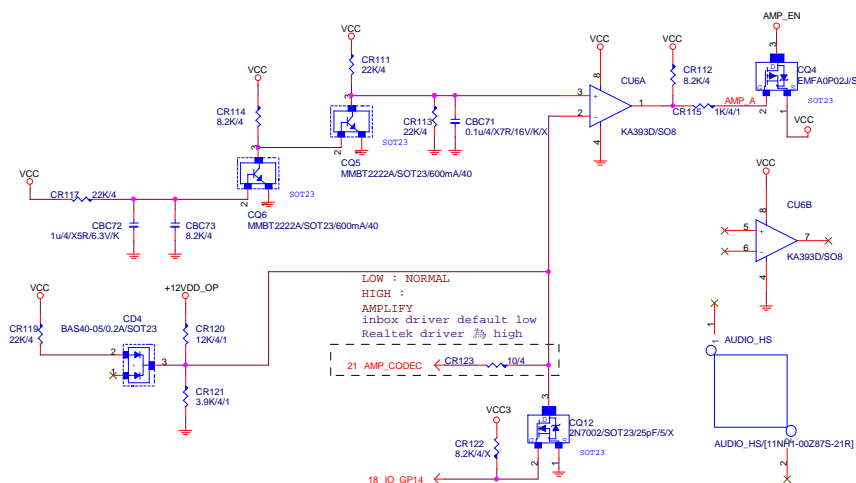
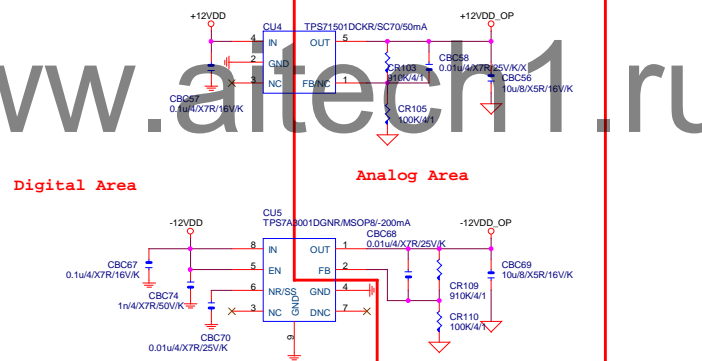
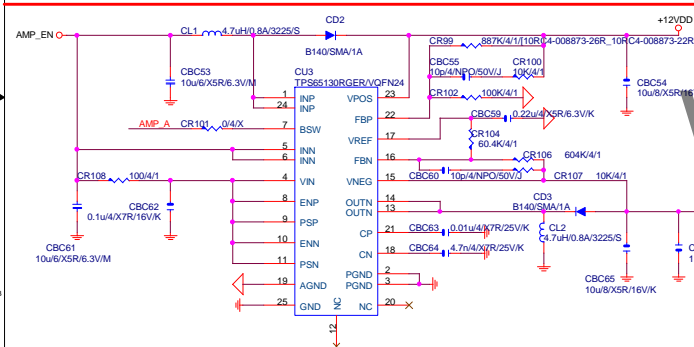
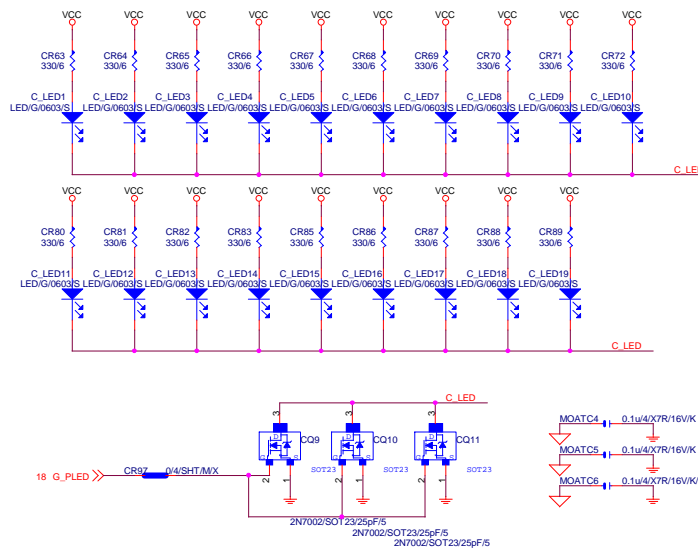
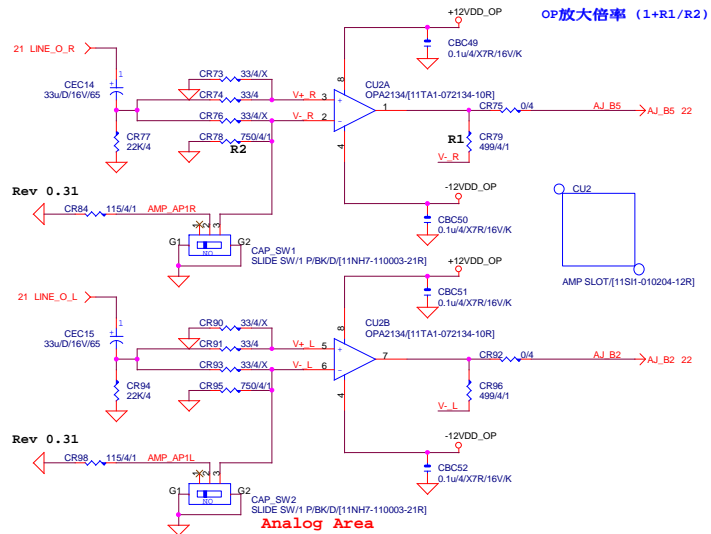


## Gigabyte Technology

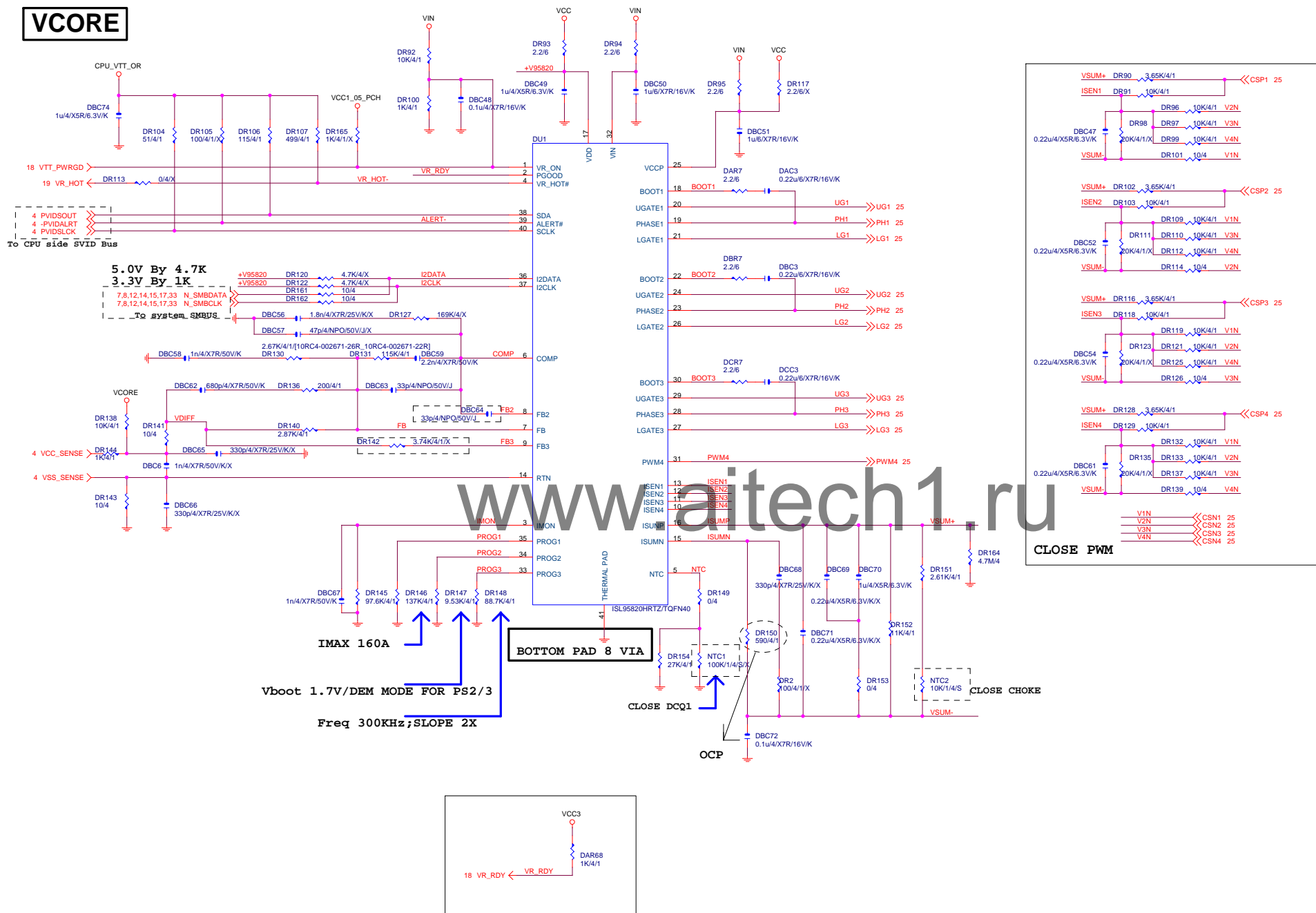
Title	HD AUDIO ALC898 Codec		
Size	Custom	Document Number	GA-H81_AMP-UP
Date:	Friday, August 16, 2013	Sheet	21 of 34
Rev	1.0		



AMPLIFIED



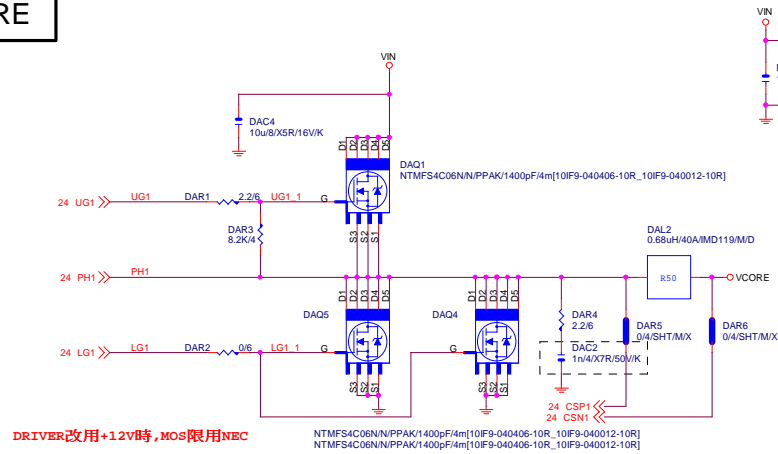
<b>Gigabyte Technology</b>			
<b>AMPLIFIER</b>			
Size	Document Number		Rev
Custom	<b>GA-H81 AMP-UP</b>		1.0
Date:	Friday, August 16, 2013	Sheet	23 of 34

**VCORE**

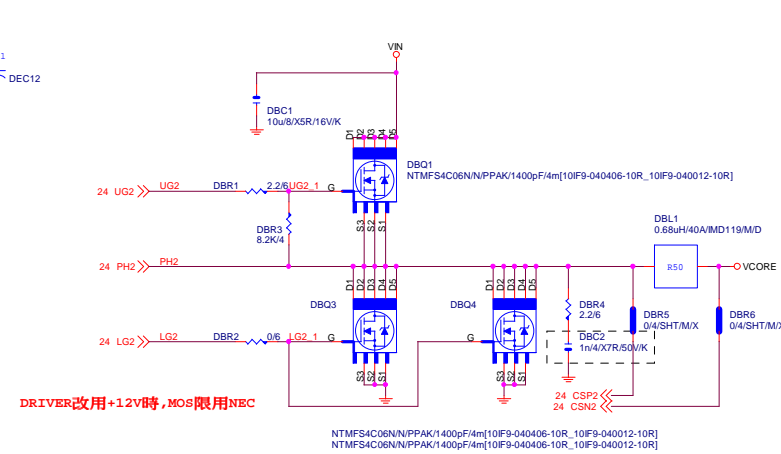


# VCORE

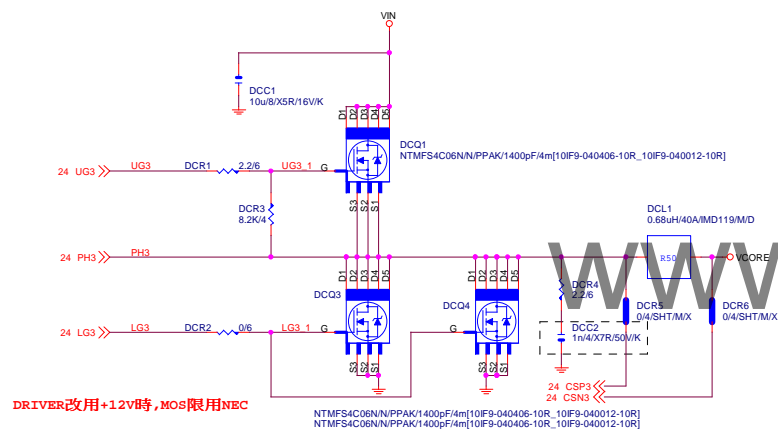
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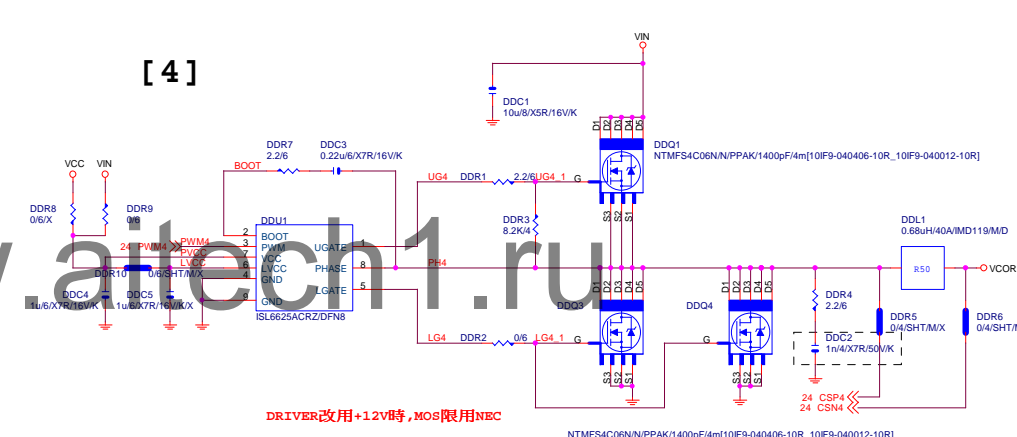
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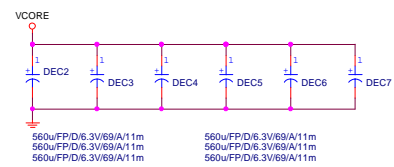
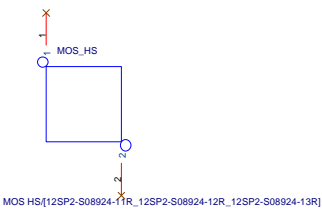
[ 3 ]



[ 4 ]



# MOSFET HEATSINK

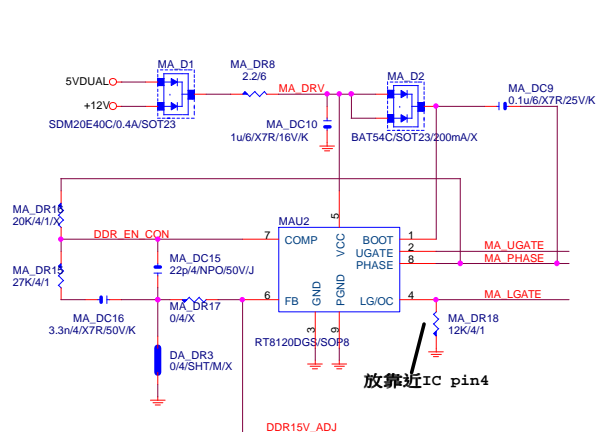


Gigabyte Technology			
Title	VCORE_ISL95820_2		
Size	Document Number	GA-H81_AMP-UP	Rev 1.0
Custom			
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VCC1\_05\_ME

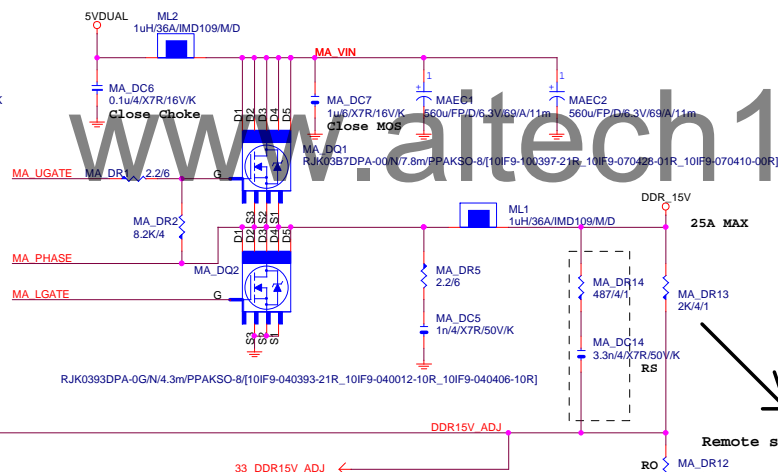
VCC3\_ME

## DDR 15V



放靠近IC pin4

DDR\_EN\_CON ← DDR\_EN\_CON 18



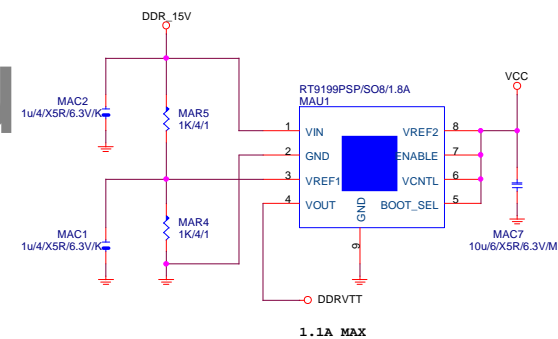
VIN=5V, VOUT=1.5V, IOUT=25A, PHASE=1  
IRMS=11.45A

560u/FP/D/6.3V/68/8m RIPPLE CURRENT=4.7A  
Coefficient=1.7(85°C), 1(105°C)

VIN Ripple current=4.7X1.7=7.99A(85°C)  
-->故固態電容須2X7.99=15.98>11.45A

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]

## DDRVTT



Remote sense請從最重的負載端點拉回

$$0.8 \cdot (1 + RS/RO) = V_{out}$$

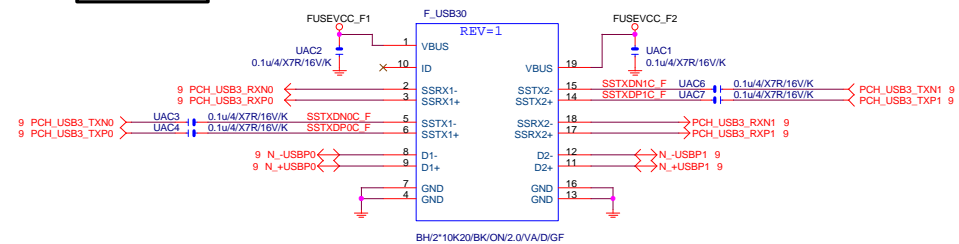
$$0.8 \cdot [1 + 2K/2.2K] = 1.527V$$

GIGABYTE™

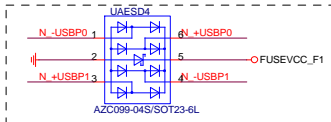
Title			
DDR15V / M3 POWER			
Size	Document Number	Rev	
Custom	GA-H81_AMP-UP	1.0	
Date:	Friday, August 16, 2013	Sheet	26 of 34



## Front USB3.0

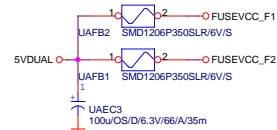


BLUE

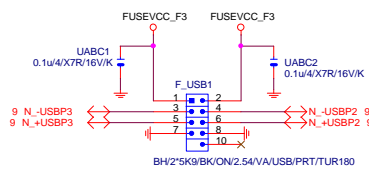


Close to connector

F_USB30 PWR	
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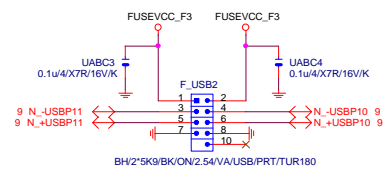


FRONT USB1



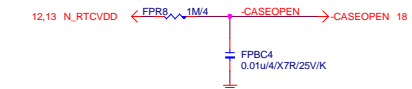
Close to connector

FRONT USB2

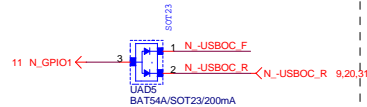


Close to connector

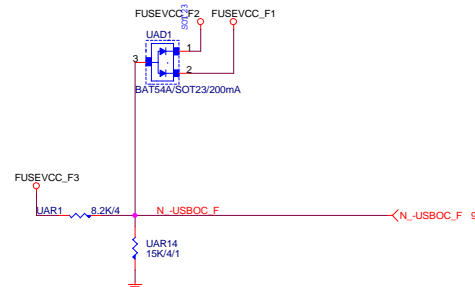
**CASE OPEN**



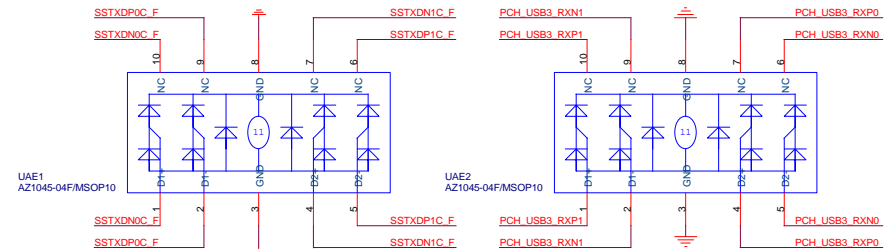
F_USB POWER PROTECT
---------------------



## -USB\_OC\_F

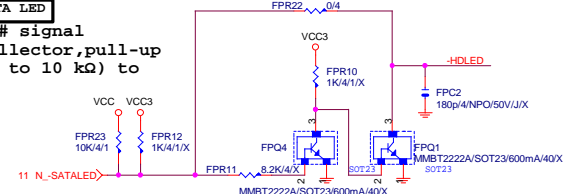


F\_USB30 ESD PROTEC

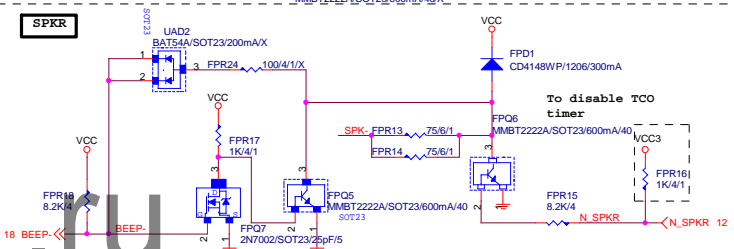


SATA LED

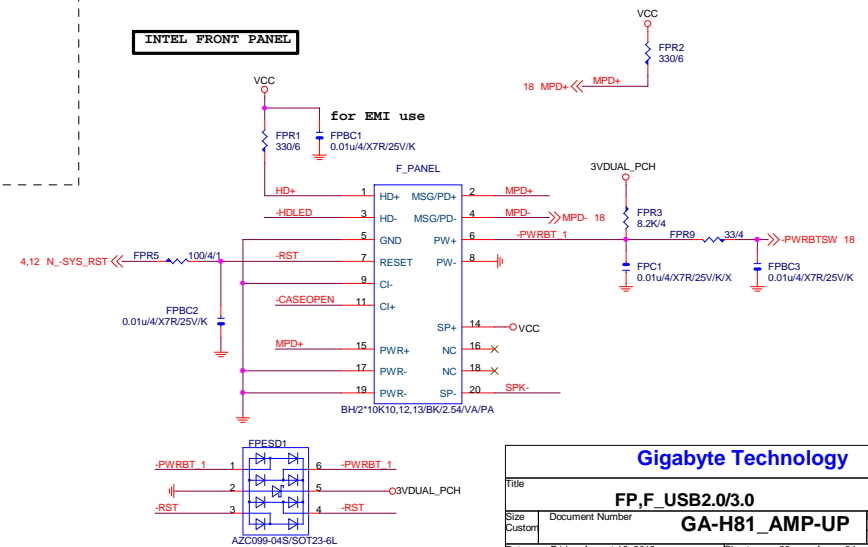
```
| SATALED# signal
| open-collector,pull-up
| (8.2 kΩ to 10 kΩ) to
| Vcc3_3
```



## SPKR



## INTEL FRONT PANEL

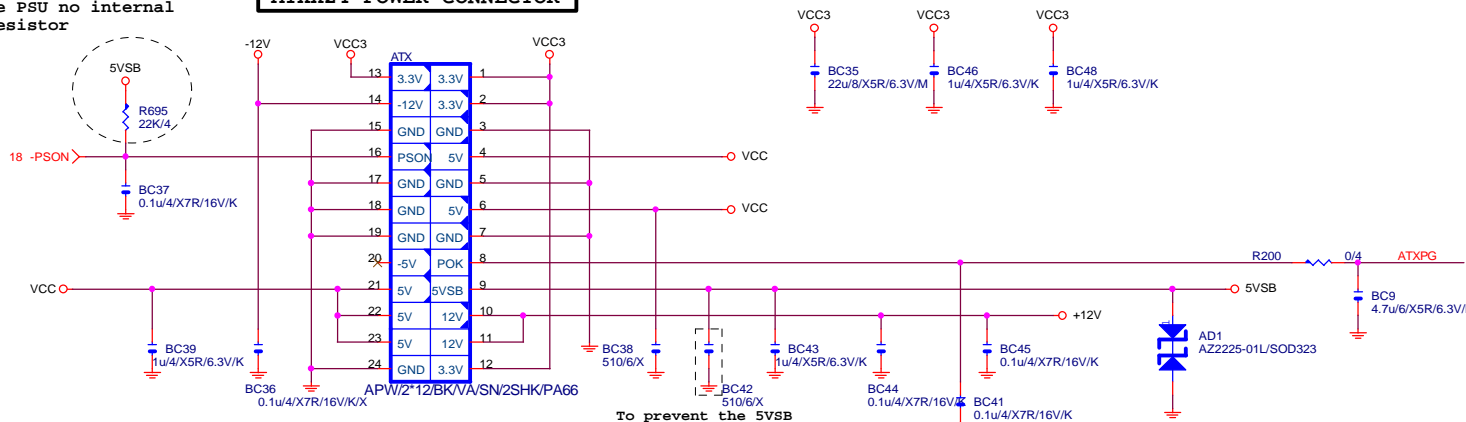


## Gigabyte Technology

Title			
FP,F_USB2.0/3.0			
Size	Document Number		Rev
Custom	GA-H81_AMP-UP		1.0
Date:	Friday, August 16, 2013	Sheet	28 of 34

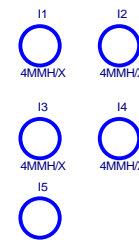
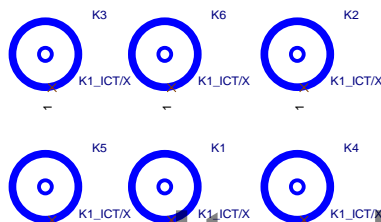
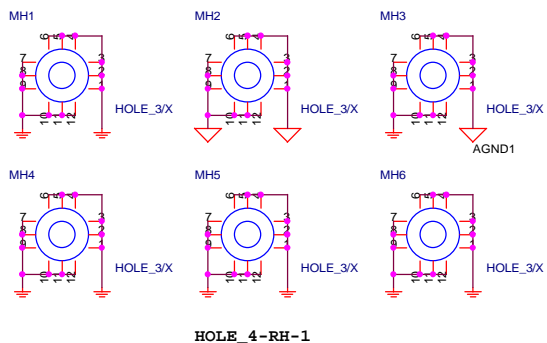
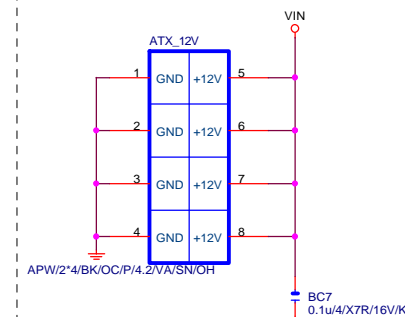
Patch some PSU no internal pull up resistor

## ATXX24 POWER CONNECTOR



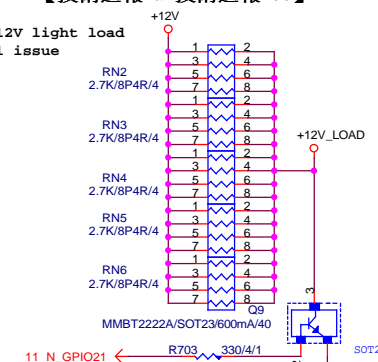
To prevent the 5VSB under loading when boot

## ATXX4 POWER CONNECTOR



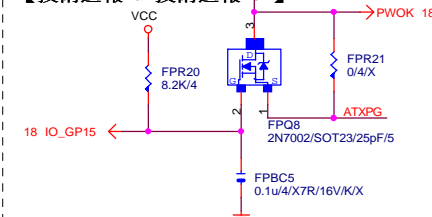
## 【技術通報R&D技術通報153】

To fix 12V light load abnormal issue



## PWOK PATCH

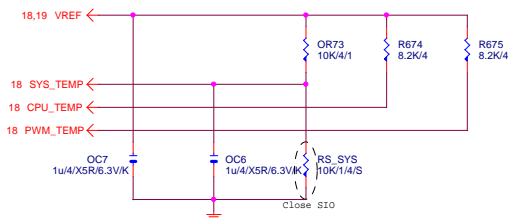
## 【技術通報R&D技術通報154】



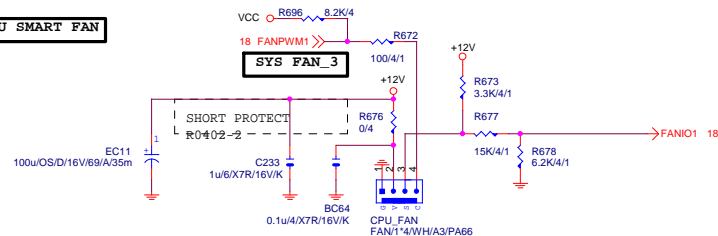
Gigabyte Technology

Title			ATX POWER CONNECTOR
Size	Document Number	GA-H81_AMP-UP	
Custom			Rev 1.0
Date:	Friday, August 16, 2013	Sheet	29 of 34

## TEMP H/W MONITOR



## CPU SMART FAN

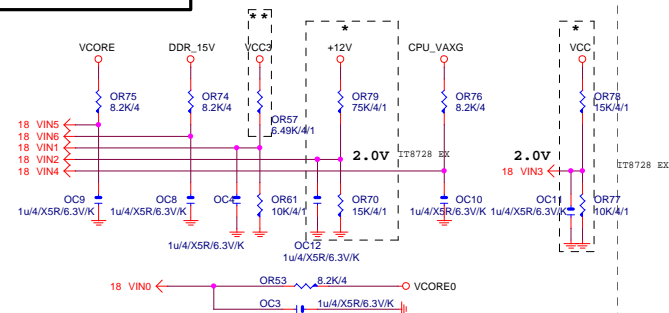


VOLTAGE-- H/W MONITOR

```

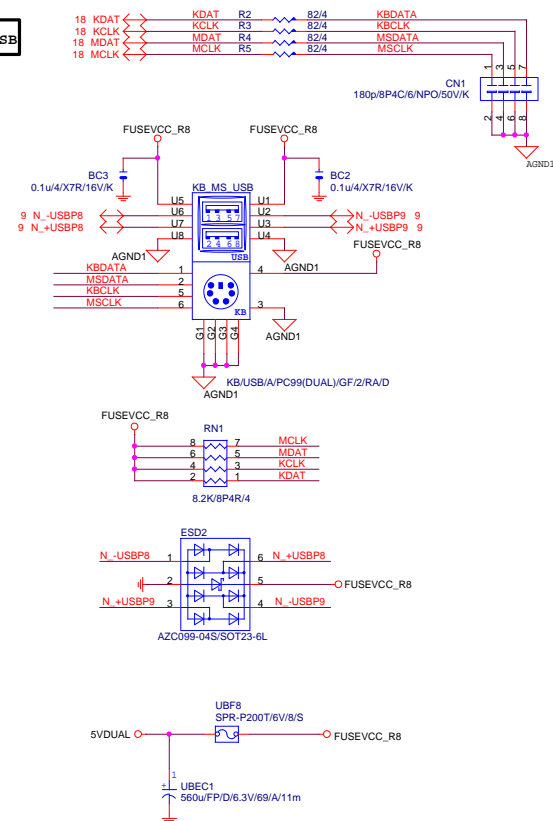
* IT8728 BX      VIN2 must +12V input
** IT8728 CX     VIN3 must VCC input

```



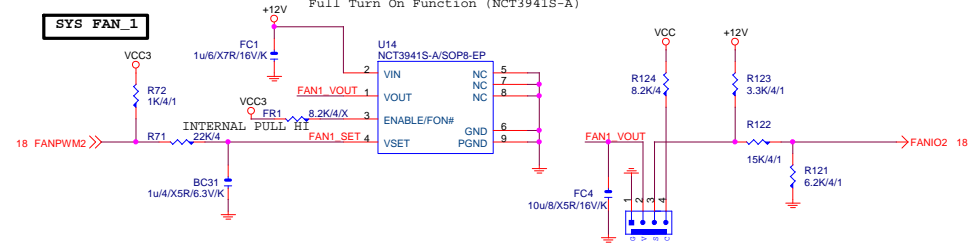
The division voltage of VIN2 & VIN3 must be around 2.9V

## KB/USB

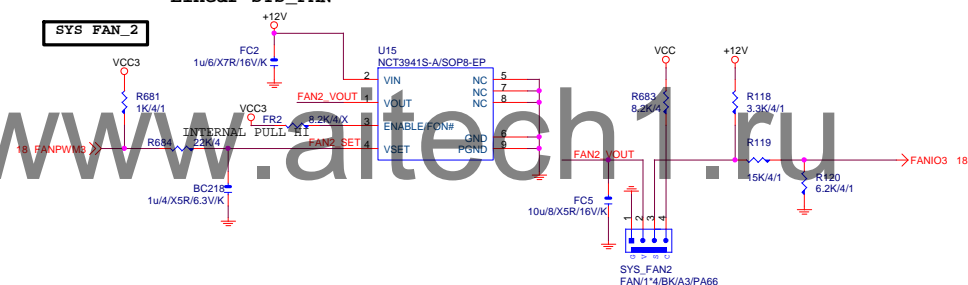


Linear SYS FAN

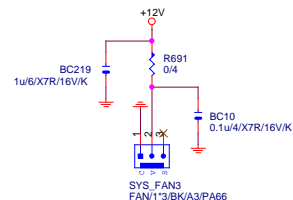
Enable Function (NCT3941S)  
Full Turn On Function (NCT3941S-A)



Linear SYS FAN



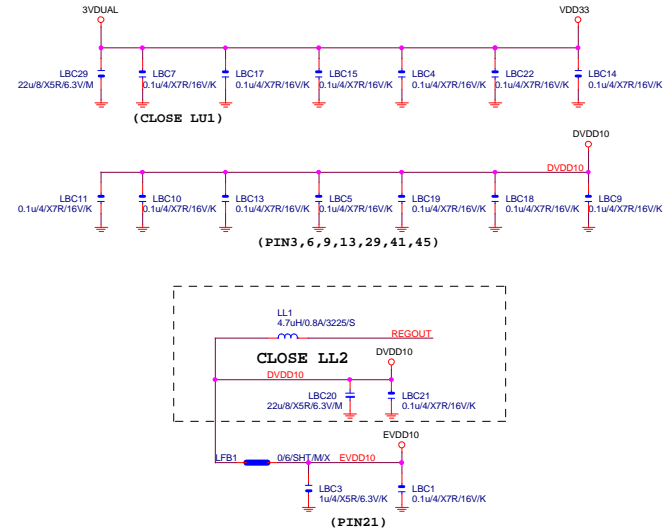
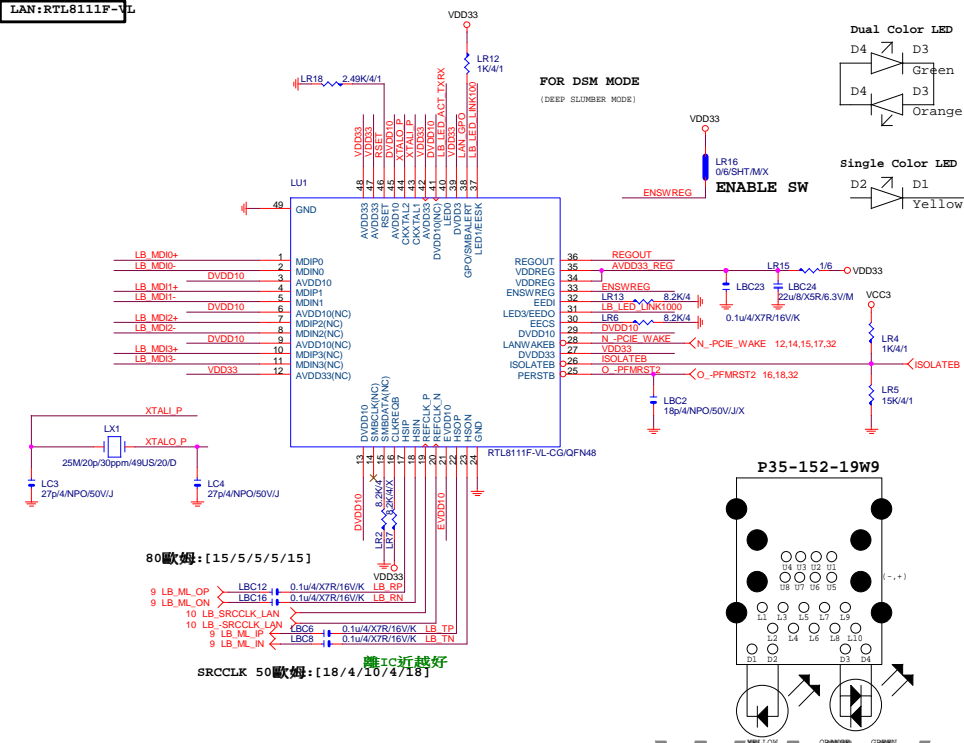
## SYS FAN\_3



## Gigabyte Technology

Title			
HWM,KB/MS, FAN CTRL			
Size	Document Number		Rev
Custom	GA-H81 AMP-UP		1.0
Date:	Friday, August 16, 2013	Sheet	30 of 34

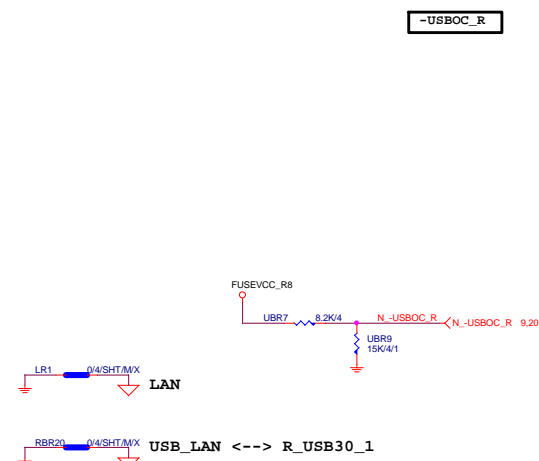
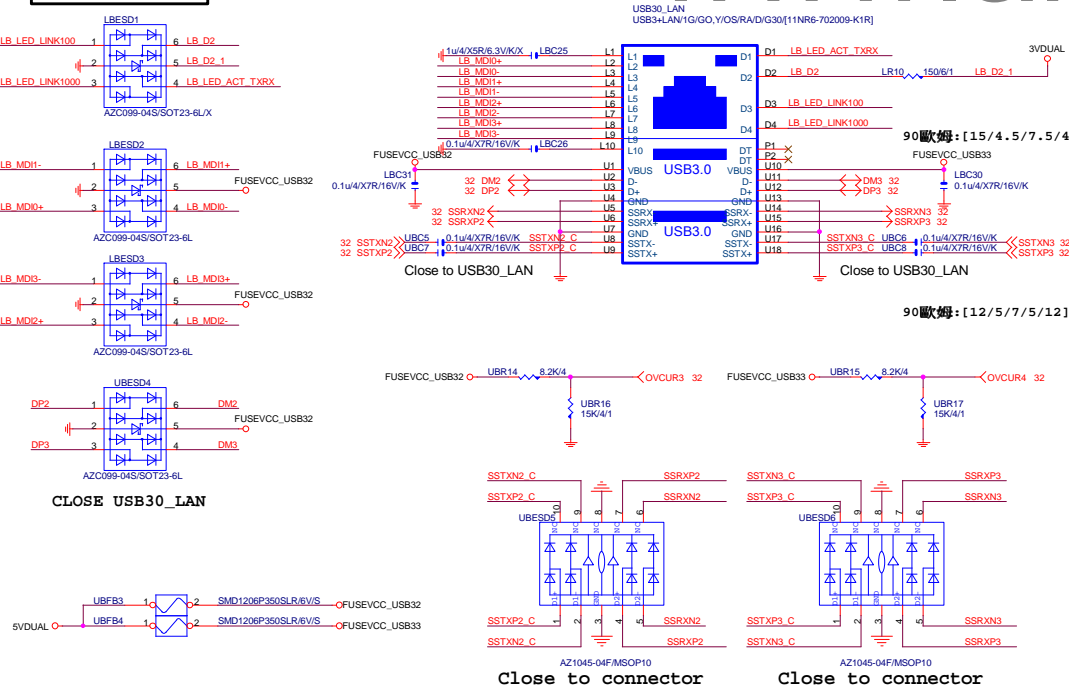
# LAN:RTL8111F-VL



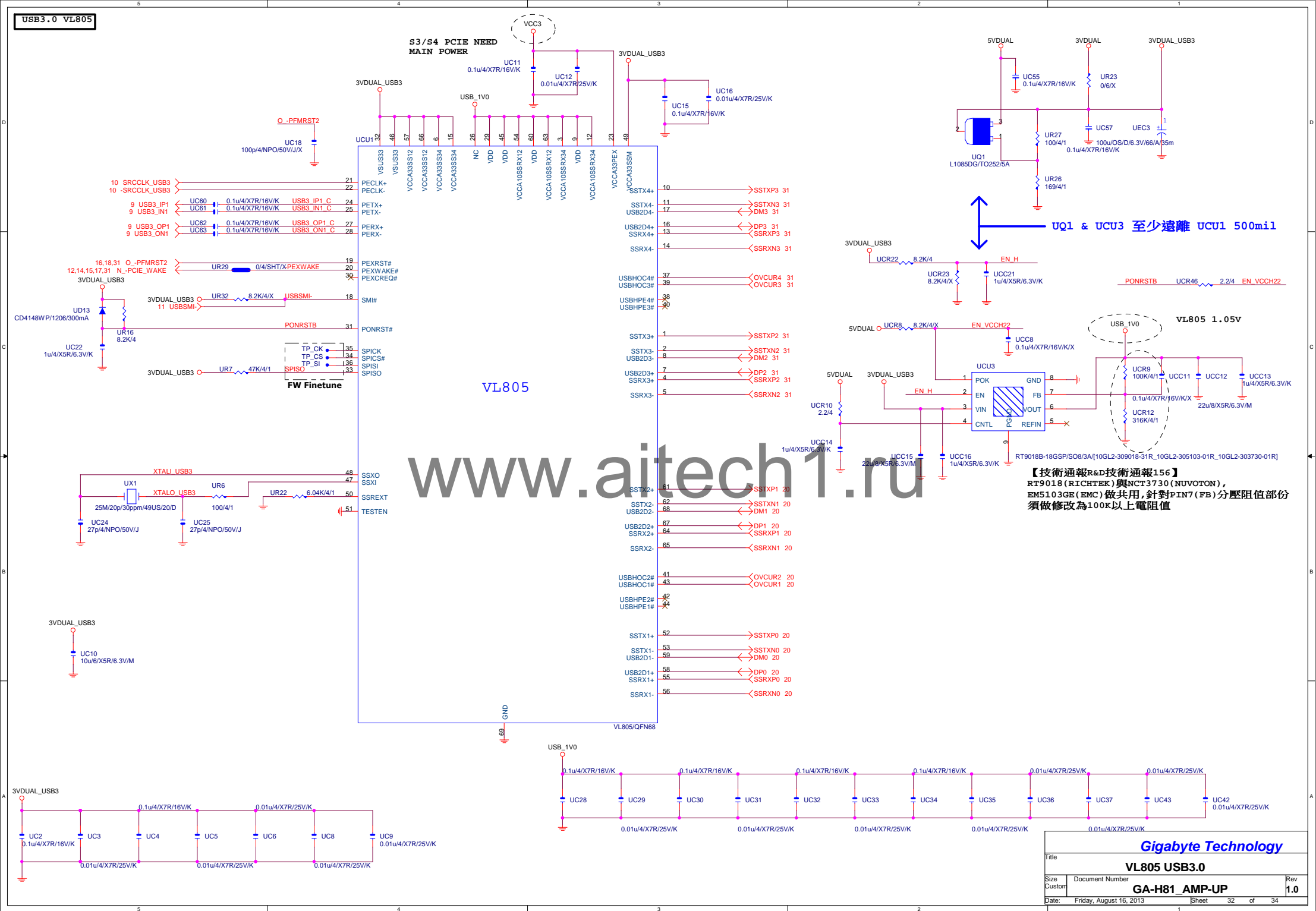
www.aitech1.ru

## USB30\_LAN CONNECTOR

100 Ohm: [20/4/10/4/20]

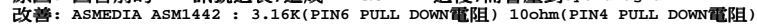


Gigabyte Technology			
RTL8111F-VL			
File	Document Number	GA-H81 AMP-UP	Rev 1.0
Date: Friday, August 16, 2013	Sheet 31 of 34		





Impedance=85 +- 17.5%

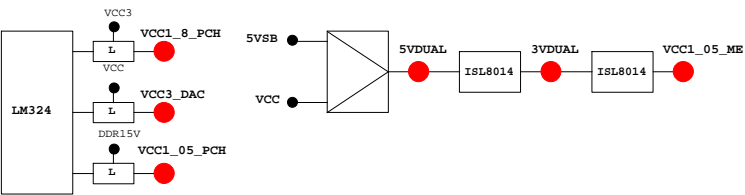


PCH GPIO LIST TABLE					
PIN NAME	PWR	Default	USAGE	NOTE	
GP0	MAIN	H-Z	GPI	GPIO0	N/A
GP1/TACH1	MAIN		GPI	GPIO1	N/A
GP2/PIRQ#	MAIN		GPI	-PIRQE	P/U 8.2K VCC3
GP3/PIRQF#	MAIN		GPI	-PIRQF	P/U 8.2K VCC3
GP4/PIRQG#	MAIN		GPI	-PIRQG	P/U 8.2K VCC3
GP5/PIRQH#	MAIN		GPI	-PIRQH	P/U 8.2K VCC3
GP6/TACH2	MAIN		GPI	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

Super I/O ITE8720 GPIO Table

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
SLCT/GP80	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	
VID05/GP27/SIN2	LOW_PWR_2	
PCIRST2#/GP11	-PWRST1	
PCIRST1#/GP12	-PWRST2	
3VBSBW#/GP40	CSI_F0	BSEL166_1
SUSC#/GP53	CSI_F1	BSEL166_2
GP23/SI	BSEL166_3/CSISBSL	
VID00/GP20/CTS2#	CPUT_LED1_C	BSEL166_4
GP65/VDDA_EN/GB_01	MB_ID2	
PD6/GP76/BUSS01	MB_ID3	
PD7/GP77/BUSS02	MB_ID4	
AFD#/GP86/SMBC_R	SEC_PIN	FST_2X8
INIT#/GP85/SMBD_M	SEC_2x8	GTLREF_AD2
ACK#/GP83	DDR_LED1_C	
VID01/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/CIRRXL2/GP16	-THERM	
VID04/GP26/SOUT2	DDR18V_PH2_EN	
VID02/FAN_TAC5/GP24/DSR2#	DDR18V_LED	
VID06/GP17/RI2#	1_1V_PH_EN	
VID07/JP6/DTR2#	JP6	
PD5/GP75/BUSS00	SB_LED3_C	



PWM各相位的擺法如下：

