

Model Name: GA-H81M-D2V

Revision 2.01

SHEET

TITLE

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

SHEET

TITLE

28	VCORE ISL95812_2
29	RT8120_DDR POWER
30	LPT
31	DVI
32	IT8892E ( NA )
33	USB3 VL805

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Cover Sheet

Size Custom	Document Number <b>GA-H81M-D2V</b>	Rev <b>2.01</b>
Date: Wednesday, May 21, 2014	Sheet 1 of 33	

### Component value change history

## Circuit or PCB layout change

**PCB : S4VNB ( 精成, 全成信, 伊利安達 )**

**S:單文**

#### 4: 四層板

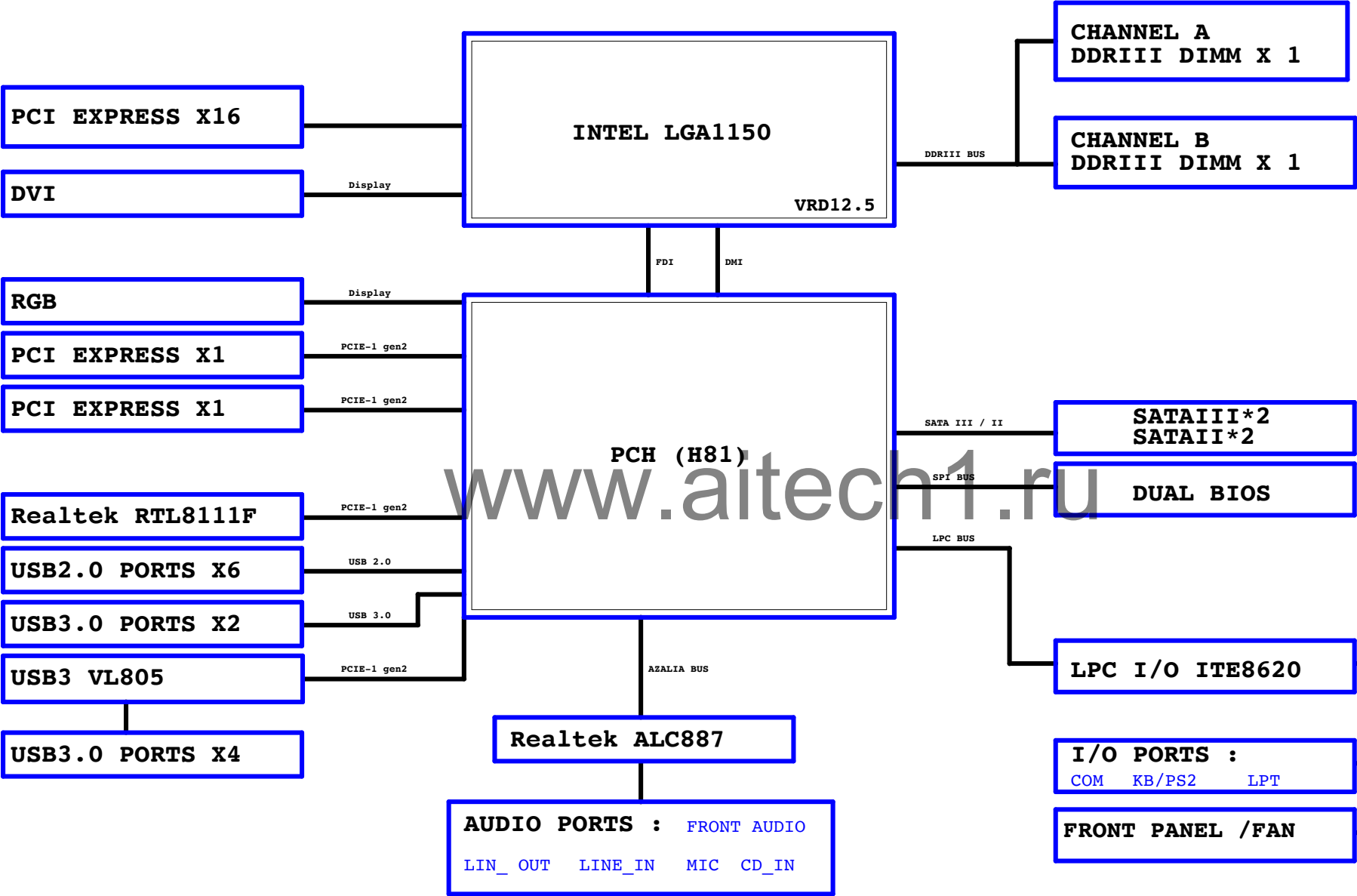
**v: 第二層是VCC**

**N:咖啡色**

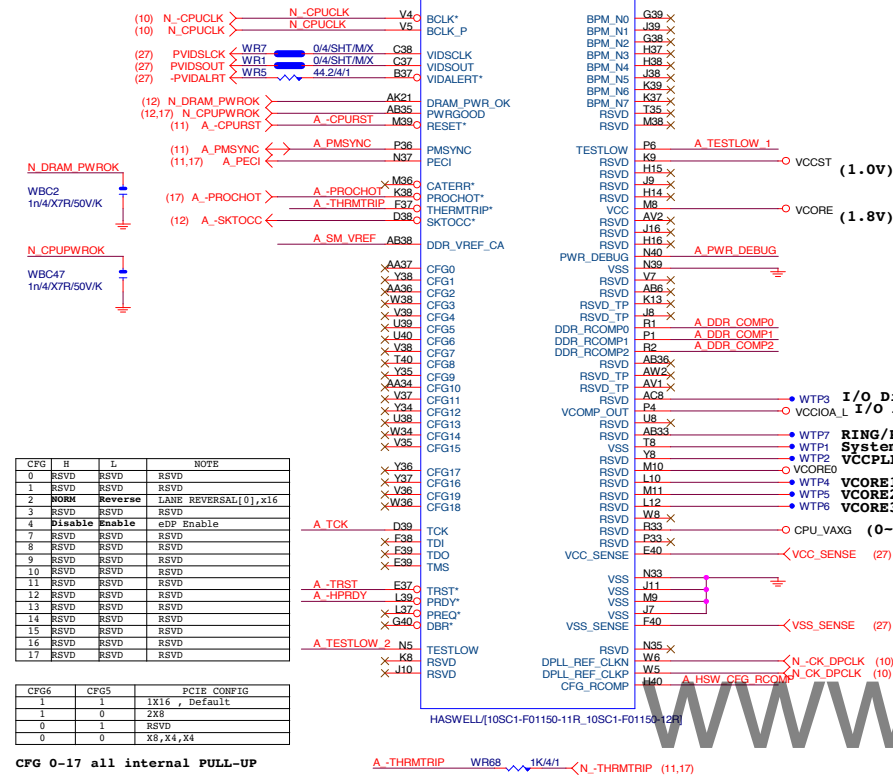
## B: 製程

<p align="center"><b><i>Gigabyte Technology</i></b></p>			
<p align="center"><b>BOM &amp; PCB MODIFY HISTORY</b></p>			
<p>Size Custom</p>	<p>Document Number</p> <p align="center"><b>GA-H81M-D2V</b></p>	<p>Rev</p> <p align="center"><b>2.01</b></p>	
<p>Date:</p>	<p>Wednesday, May 21, 2014</p>	<p>Sheet</p>	<p>2 of 33</p>

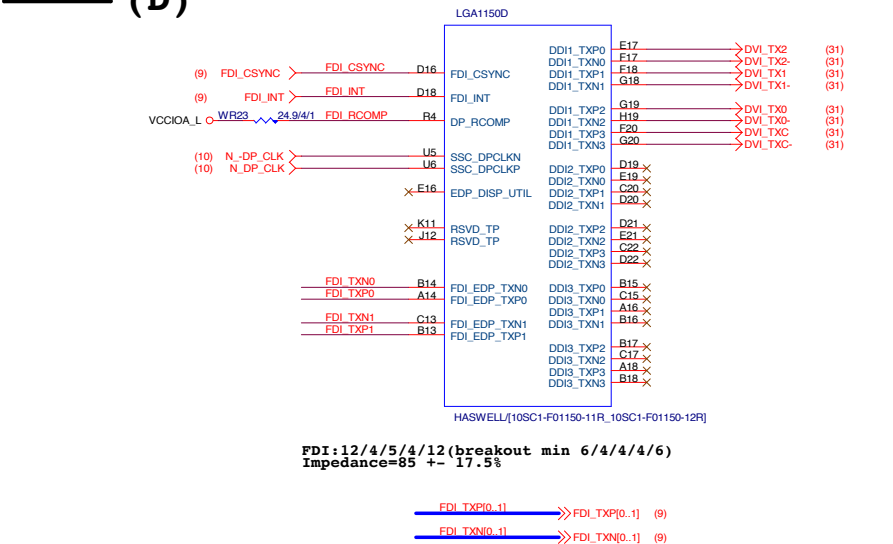
BLOCK DIAGRAM



# LGA1150 (E)



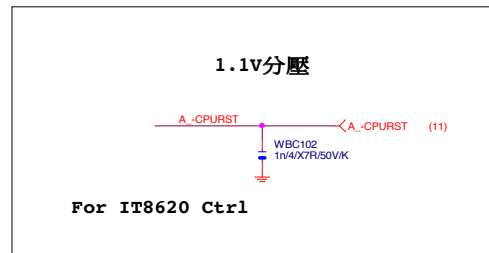
# LGA1150 (D)



# LGA1155 (C)



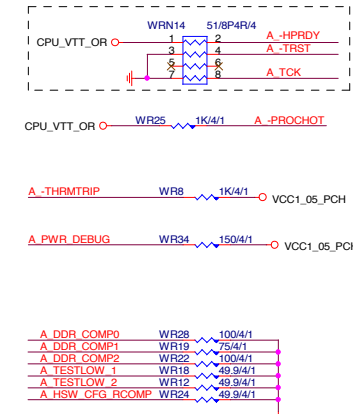
# -CPURST



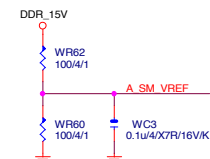
# CPU SVID



# CPU PU/PD



# SM REF



# Gigabyte Technology

CPU LGA1150-A

Title	CPU LGA1150-A
Size	Custom
Document Number	GA-H81M-D2V
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LGA1150

(A)

LGA1150A			
MAAA0	AU13	DDR0_MA0	DDR0_D00
MAAA1	AV16	DDR0_MA1	DDR0_D01
MAAA2	AU16	DDR0_MA2	DDR0_D02
MAAA3	AW17	DDR0_MA3	DDR0_D03
MAAA4	AU17	DDR0_MA4	DDR0_D04
MAAA5	AW18	DDR0_MA5	DDR0_D05
MAAA6	AW17	DDR0_MA6	DDR0_D06
MAAA7	AT18	DDR0_MA7	DDR0_D07
MAAA8	AU18	DDR0_MA8	DDR0_D08
MAAA9	AT19	DDR0_MA9	DDR0_D09
MAAA10	AW11	DDR0_MA10	DDR0_D10
MAAA11	AV19	DDR0_MA11	DDR0_D11
MAAA12	AU19	DDR0_MA12	DDR0_D12
MAAA13	AT20	DDR0_MA13	DDR0_D13
MAAA14	AT20	DDR0_MA14	DDR0_D14
MAAA15	AU21	DDR0_MA15	DDR0_D15
MODT_A0	AW10	DDR0_ODT0	DDR0_D16
MODT_A1	AY8	DDR0_ODT1	DDR0_D17
	AW9	DDR0_ODT2	DDR0_D18
	AW8	DDR0_ODT3	DDR0_D19
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**(F, J)**



**(G, H, I)**



(X18)



(x9)



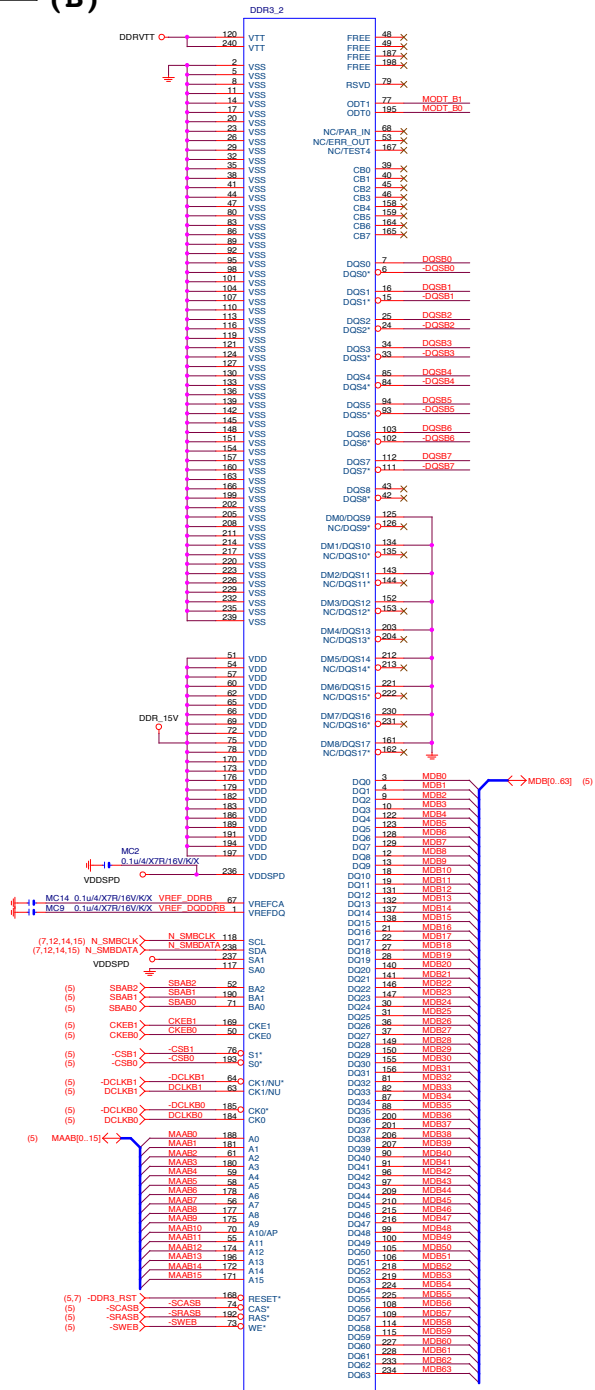
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Size	Document Number	GA-H81M-D2V				Rev	2.0
Custom							
Date: Tuesday, May 27, 2014				Sheet 6 of 33			



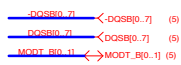


DDR3

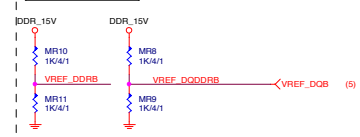
(B)



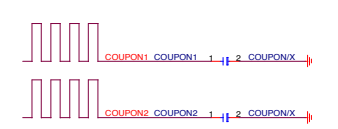
BLACK CONNECTOR



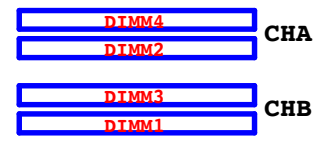
DDR3 VREF



COUPON



CPU



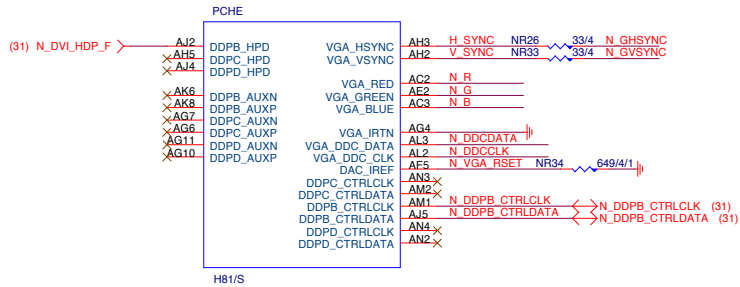
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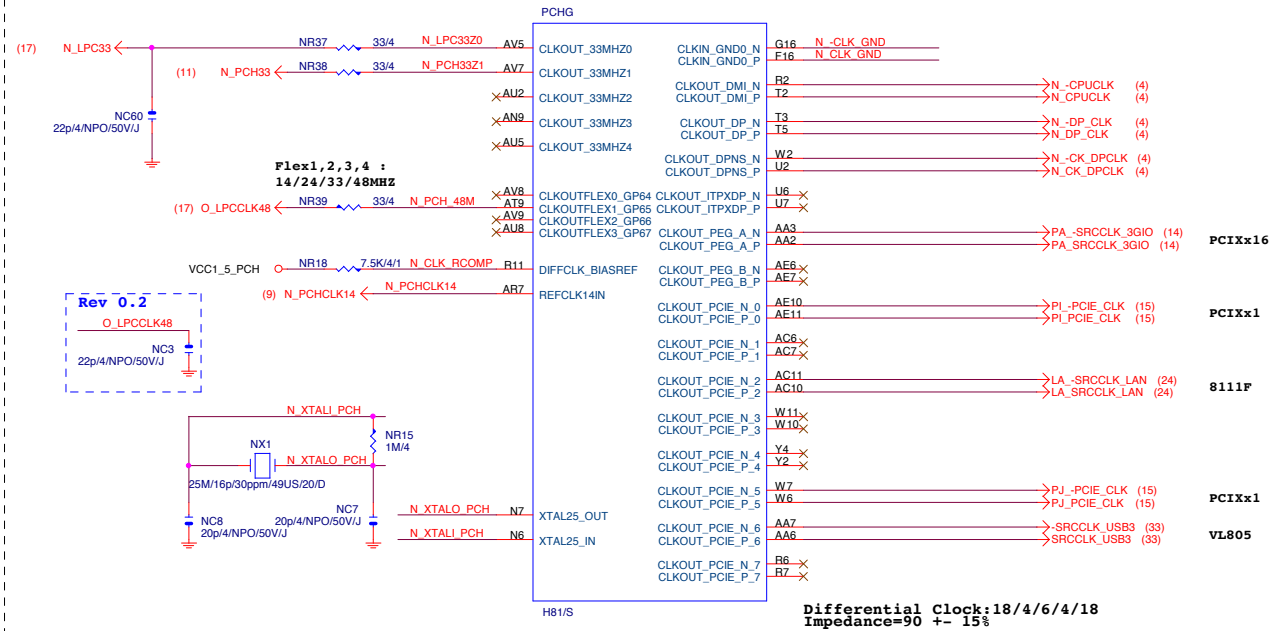
PCH

(E)

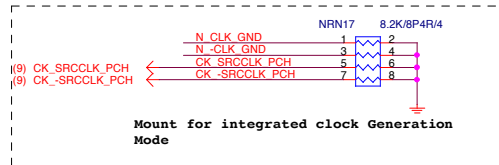


PCH

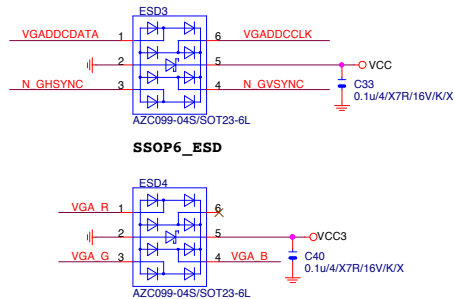
(G)



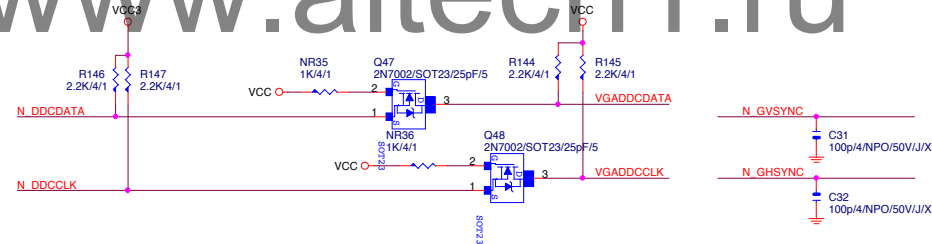
PCH CLK PD



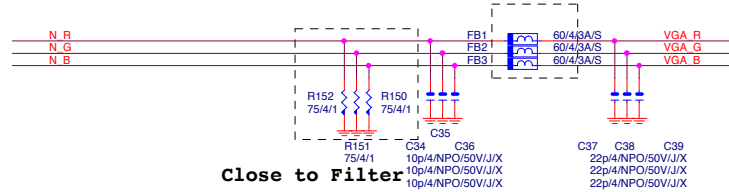
VGA ESD



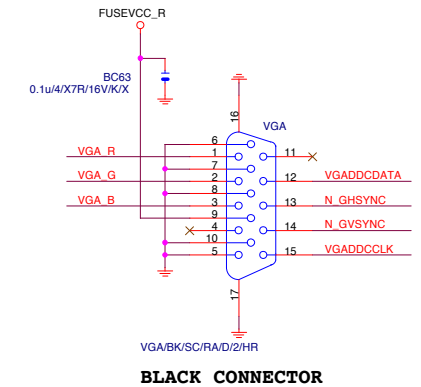
VGA DDC



VGA DDC



VGA CONNECTOR



Gigabyte Technology

Title			PCH DISPLAY, CLK BUFFER		
Size			GA-H81M-D2V		
Date:			Tuesday, May 27, 2014		
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# PCH (C)

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

PCHC

CL\_CLK

CL\_DATA

CL\_RSTB

APWROK

PWM0

PWM1

PWM2

PWM3

TACH0\_GP17

TACH1\_GP1

TACH2\_GP6

TACH3\_GP7

TACH4\_GP8

TACH5\_GP69

SSTCTL

SCLOCK\_GP22

SLOAD\_GP38

SDATAOUT0\_GP39

SDATAOUT1\_GP48

GPIO

H81/S

GPIO17

GPIO1

GPIO6

GPIO7

GPIO68

GPIO22

GPIO38

GPIO39

GPIO48

GPIO17

GPIO1

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GPIO6

GPIO7

GPIO68

GPIO22

GPIO38

GPIO39

GPIO48

GPIO17

GPIO1

GPIO6

GPIO7

GPIO68

GPIO22

GPIO38

GPIO39

GPIO48

GPIO17

GPIO1

GPIO6

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GPIO39

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GPIO17

GPIO1

GPIO6

GPIO7

GPIO68

GPIO22

GPIO38

GPIO39

GPIO48

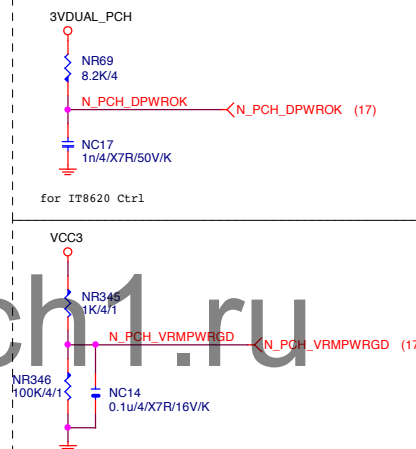
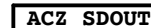
GPIO17

GPIO1

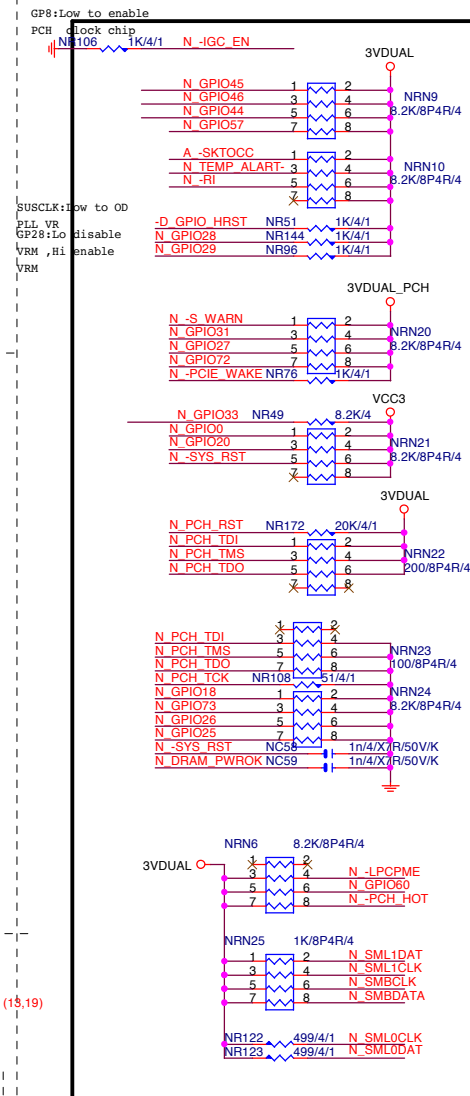
GPIO6

GPIO7

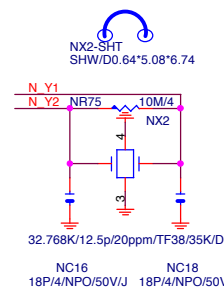
**(D)**



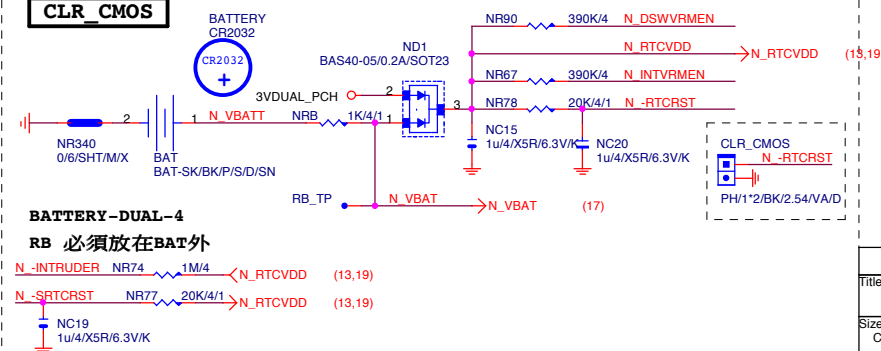
GP8:Low to enable



**32.768KHZ**



CLR	CMOS
-----	------



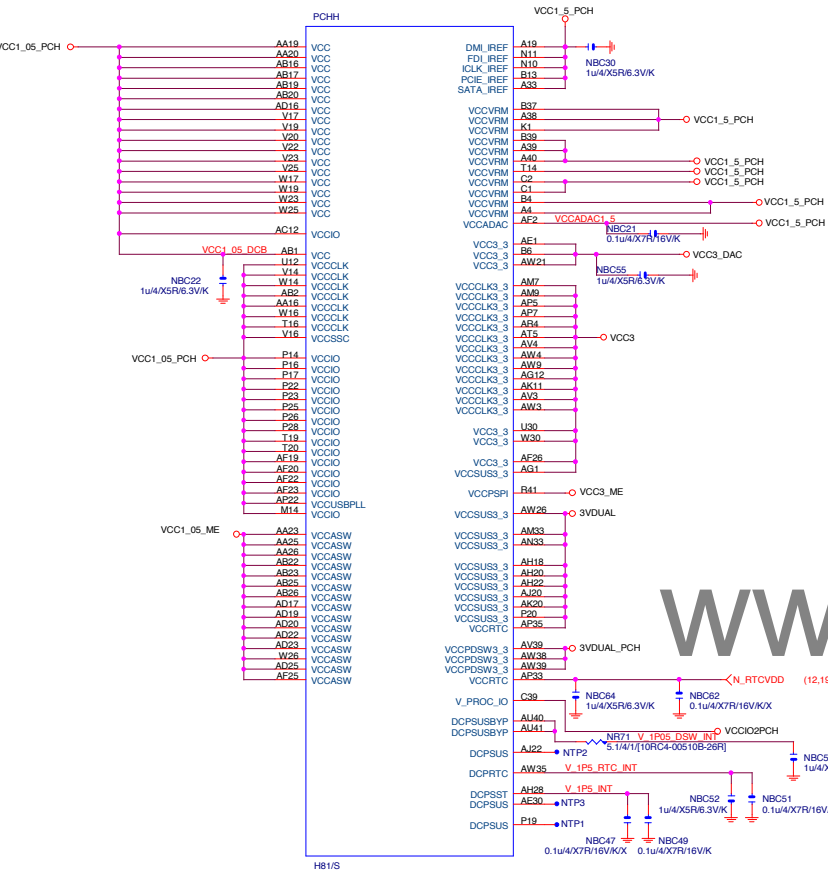
## Gigabyte Technology

## PCH GPIO , CTRL , AUDIO

GA-H81M-D2V

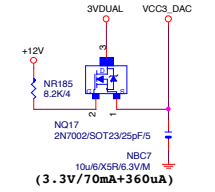
Rev	2.0
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# PCH (H)

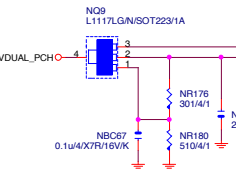


## VCC3\_DAC

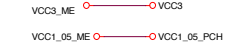
CLOSE北橋(注意震盪水波紋)



## 3VDUAL\_PCH



## SHT\_PWR



## CAP

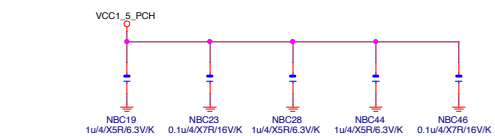
(3.3V) (X6)

(1.05V) (X5)

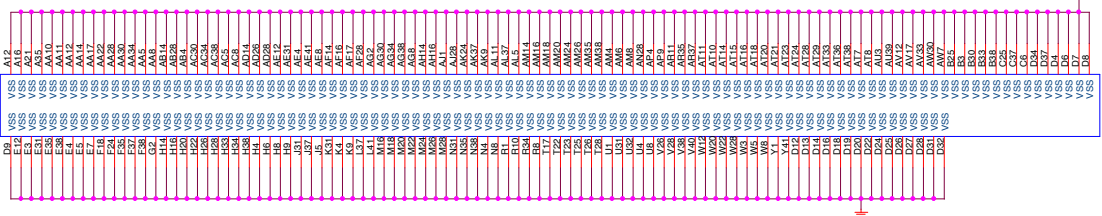
(1.05V) (X6)

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

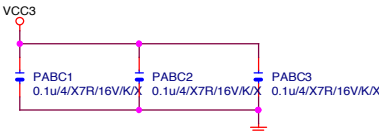
(1.05V) (X10)



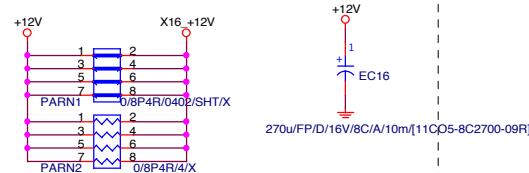
# PCH (I)



# PCIEX16 CAP



# PCIEX16 PROTECT SHT



# PCIEX16 AC CAP

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

PA EXP RXP0.[15] >>> PA\_EXP\_RXP[0..15] (4)

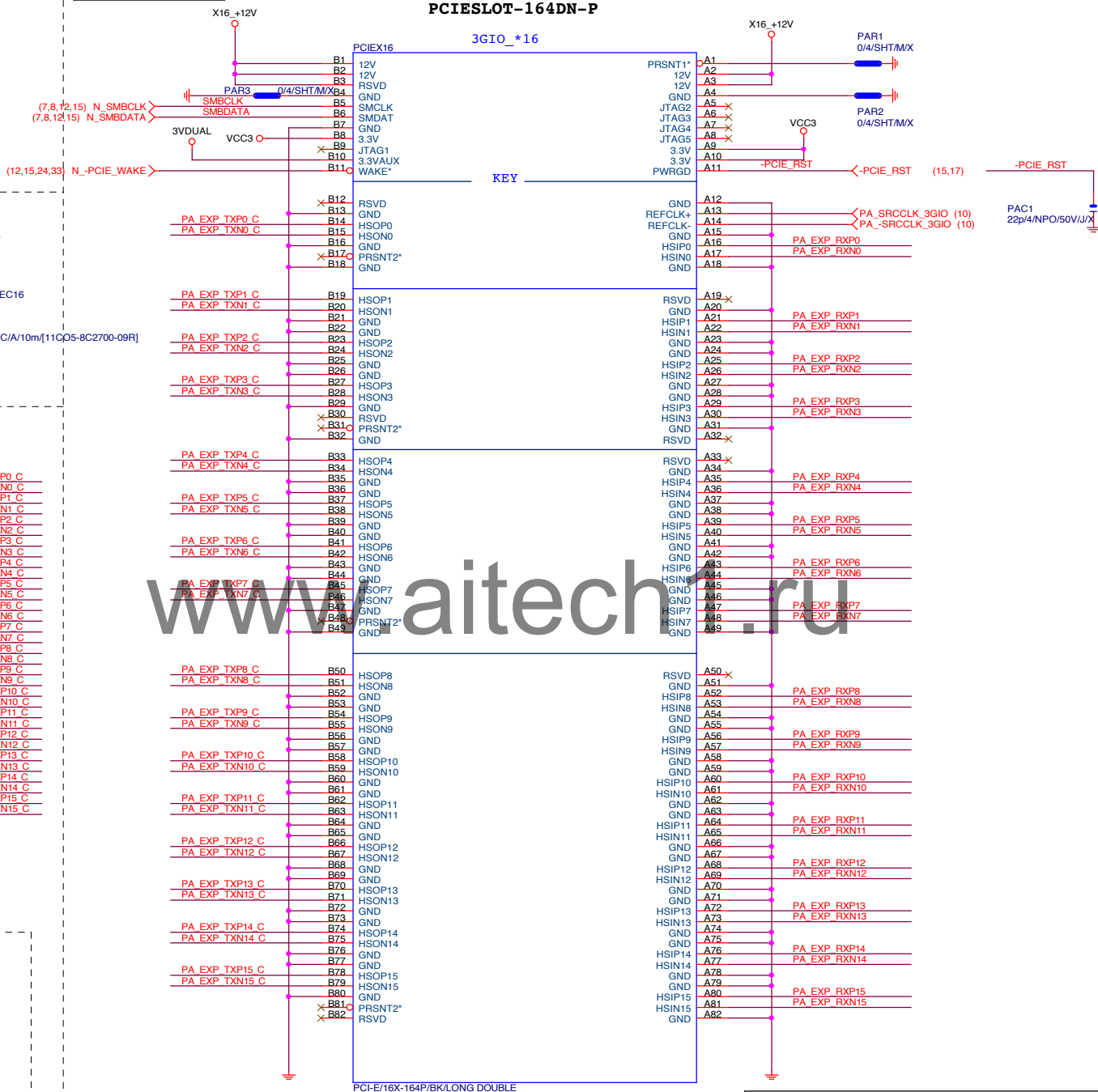
PA EXP RXN0.[15] >>> PA\_EXP\_RXN[0..15] (4)

PA EXP TXP0.[15] >>> PA\_EXP\_TXP[0..15] (4)

PA EXP TXN0.[15] >>> PA\_EXP\_TXN[0..15] (4)

The auxiliary reset circuit is only required for PCIe Gen3 margining and functional link training

# PCIEX16 SLOT



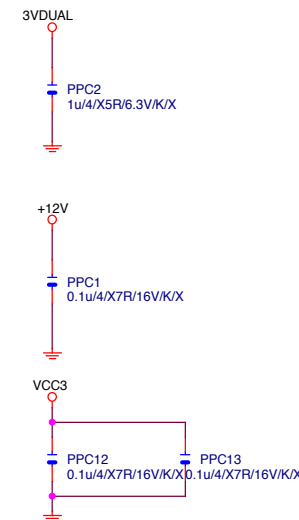
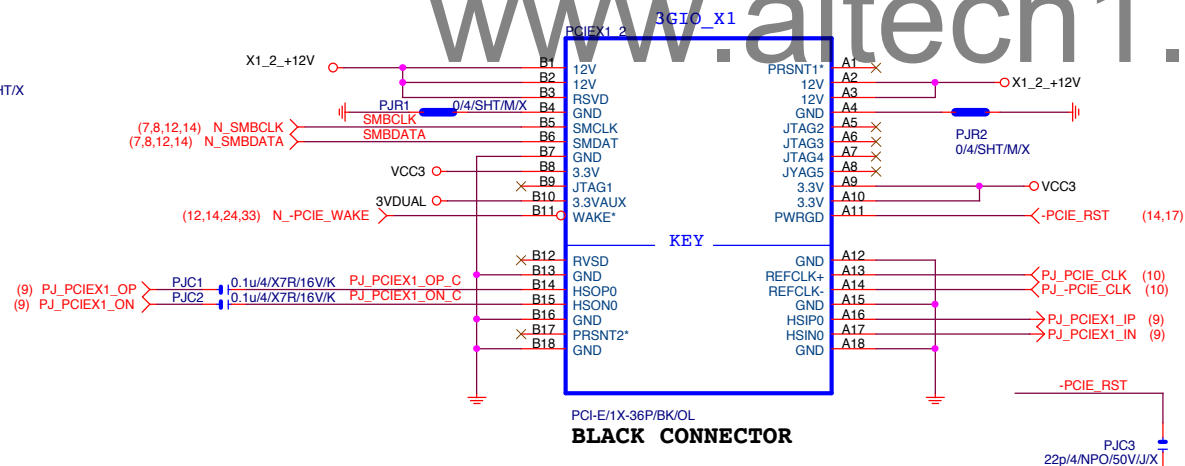
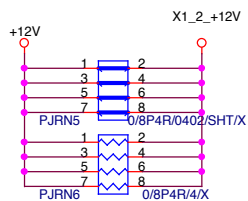
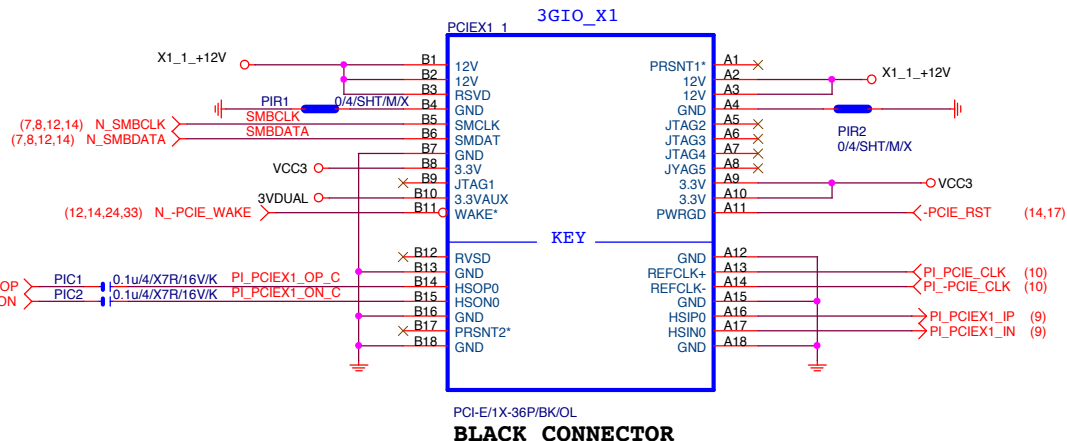
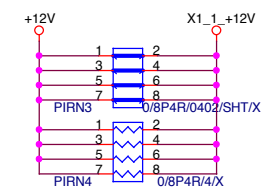
BLACK CONNECTOR

Gigabyte Technology

Title			PCI EXPRESS * 16		
Size			GA-H81M-D2V		
Custom			2.01		
Date:			Tuesday, May 27, 2014		
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# PCIEX1 SLOT



Gigabyte Technology			
PCI EXPRESS X 1 PORT			
Title	Document Number	GA-H81M-D2V	Rev 2.01
Size Custom	Date: Tuesday, May 27, 2014		Sheet 15 of 33

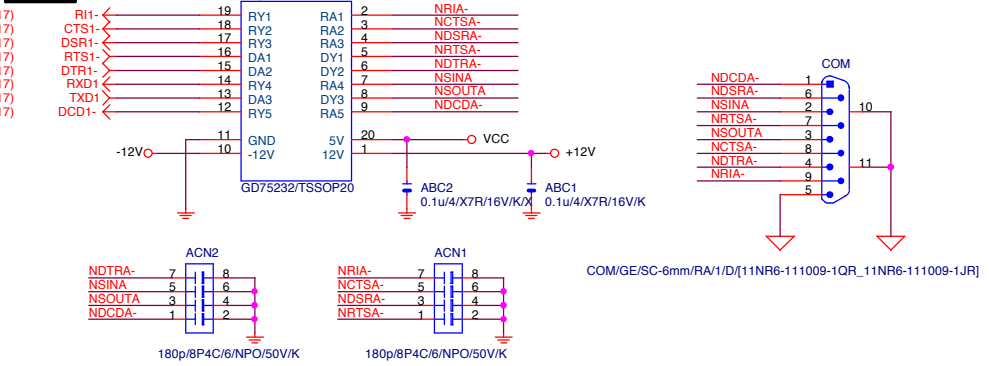


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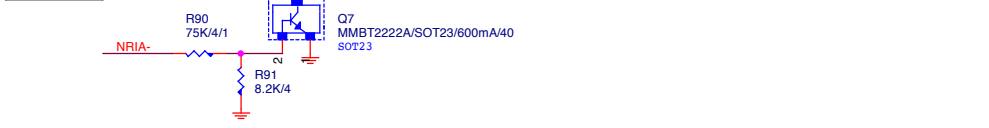
Gigabyte Technology			
Title			
PCI SLOT 1&2			
Size	Document Number		Rev
Custom	GA-H81M-D2V		2.01
Date:	Wednesday, May 21, 2014	Sheet	16 of 33
	2		1



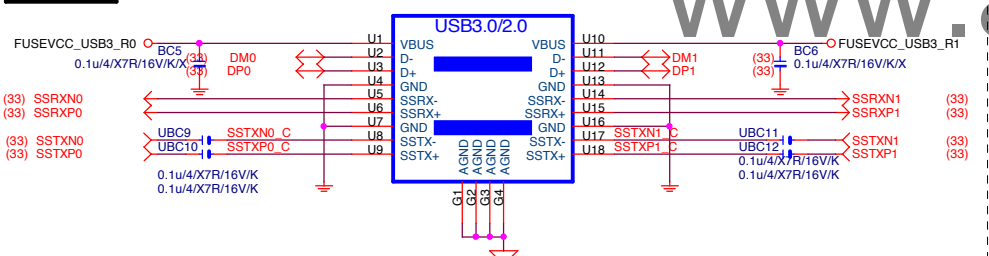
COM



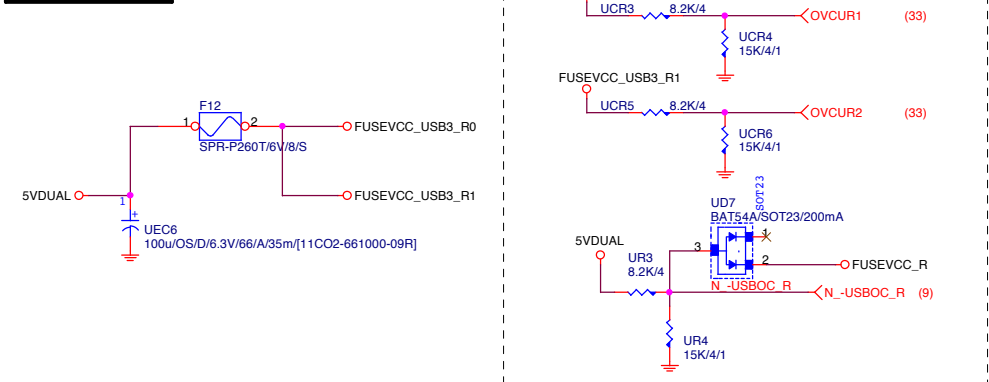
COM RI



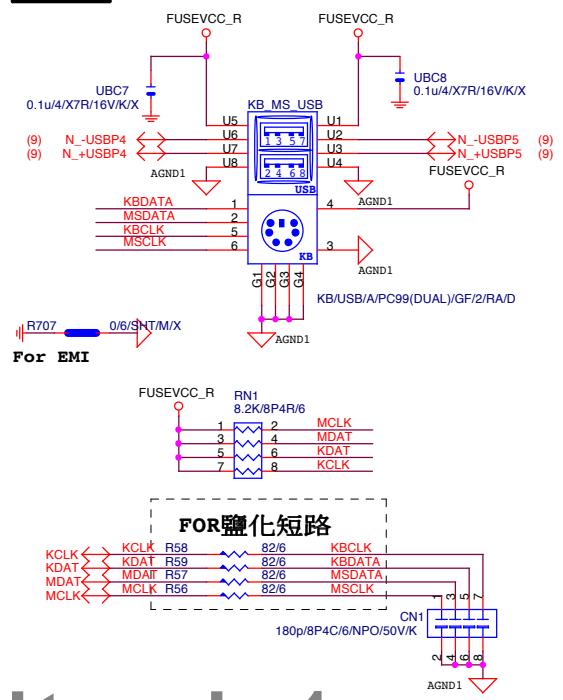
USB30\_20



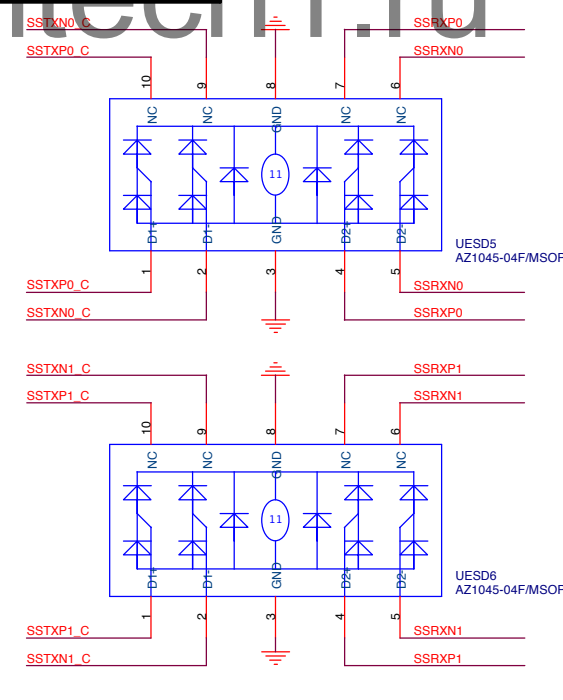
USB30\_20 PWR



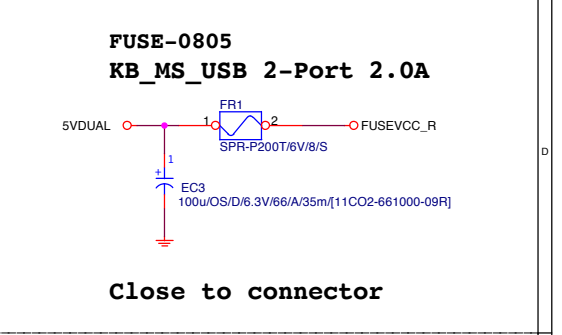
KB/MS



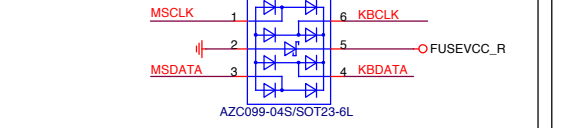
USB30\_20 ESD PROTECT



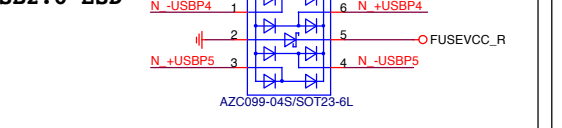
USB2.0 PWR



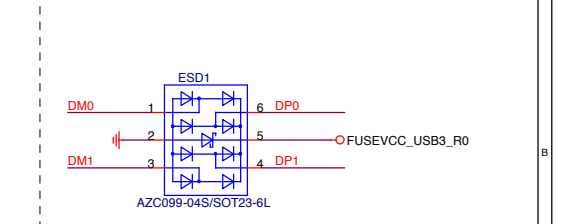
KB/MS ESD



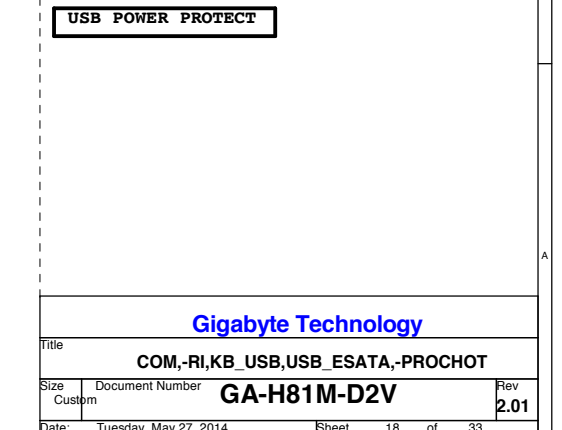
USB2.0 ESD



USB2.0 ESD

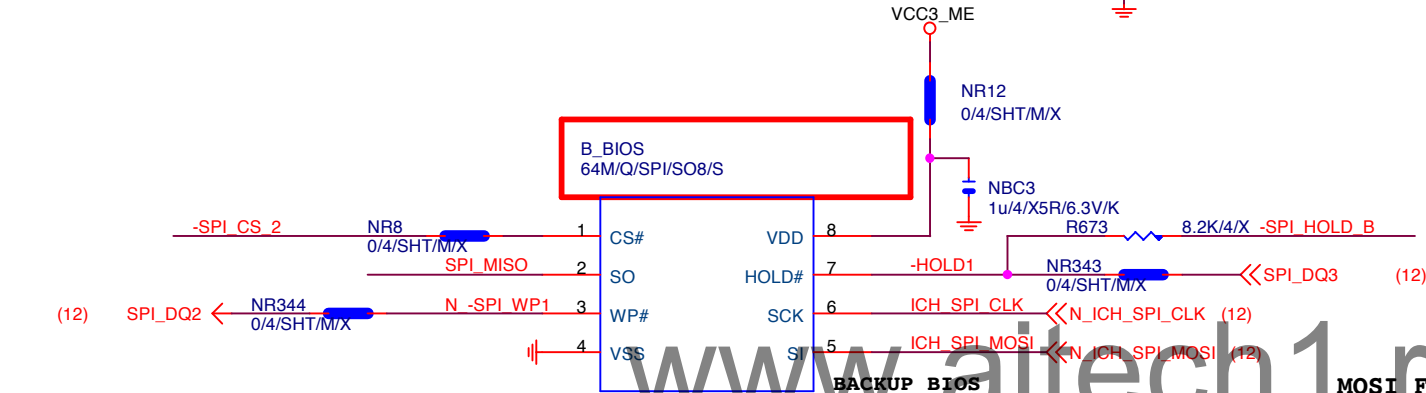


USB POWER PROTECT



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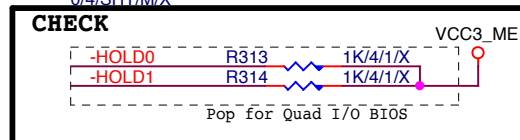
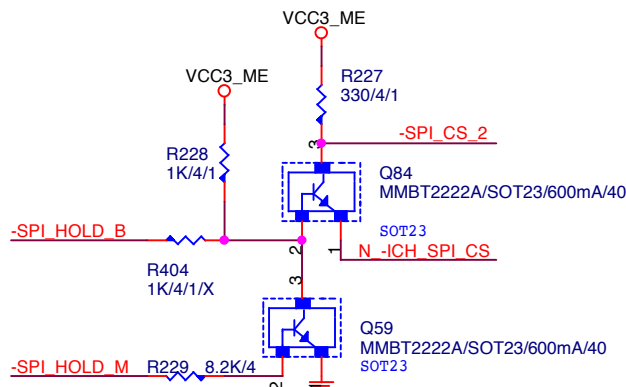
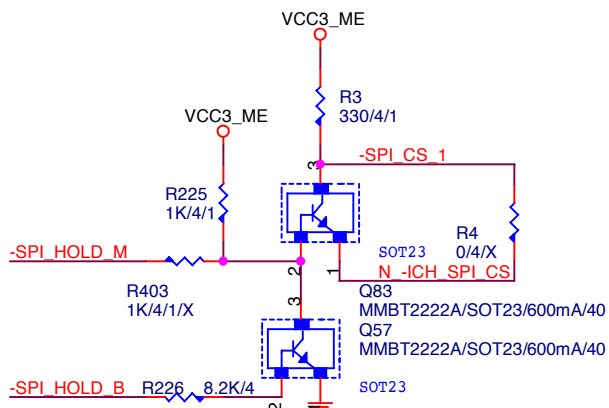
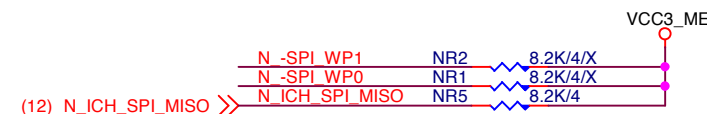
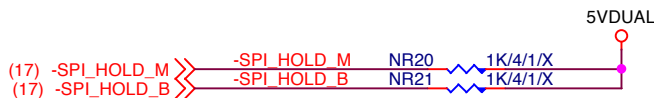
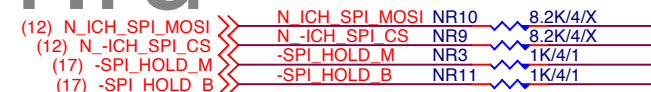




BOOT DEVICE	GNT0	GNT1
LPC	0	0
PCI	0	1
NAND	1	0
SPI	1	1

1 means floating  
0 means PD 1K

#### MOSI For DMI RX Termination Voltage



**Gigabyte Technology**

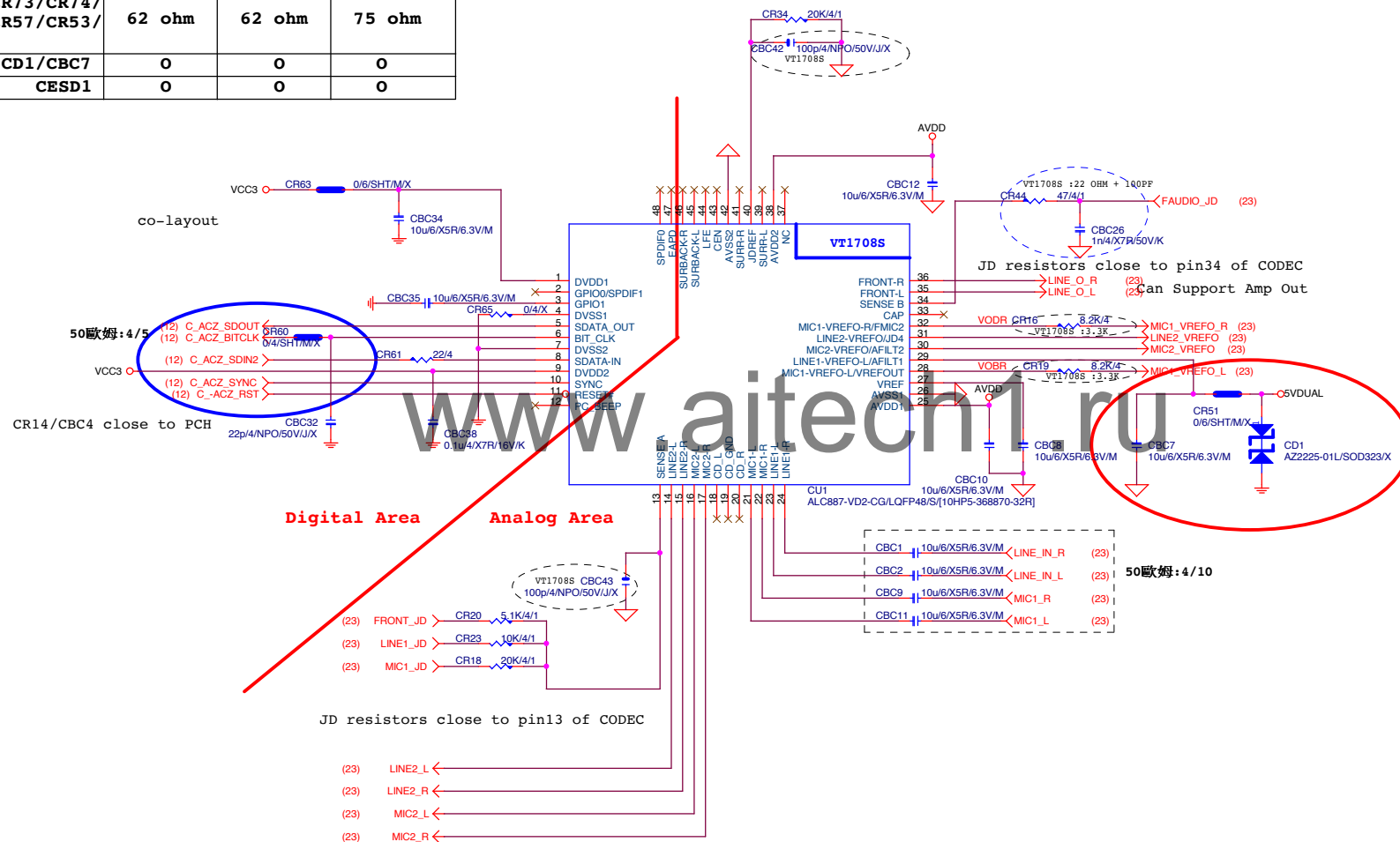
**DUAL BIOS**

**GA-H81M-D2V**

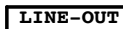
Title		Rev
Size	Document Number	2.01
Custom		
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	ALC892	ALC887-VD2	VT1708S-CE
CR44/CBC26	47ohm+1nF	47ohm+1nF	22ohm+100P
CBC42/CBC43	X	X	100P/4
CR6/CR7/CR58/CR54/ CR67/CR68/CR69/CR70	22K/4	22K/4	10K/4/1
CR5/CR8/CR1/CR14/ CR17/CR22/CR73/CR74/ CR13/CR11/CR57/CR53/ CR75/CR76	62 ohm	62 ohm	75 ohm
CR51/CD1/CBC7	0	0	0
CESD1	0	0	0





**MIC-IN**

### AZALIA FRONT PANEL



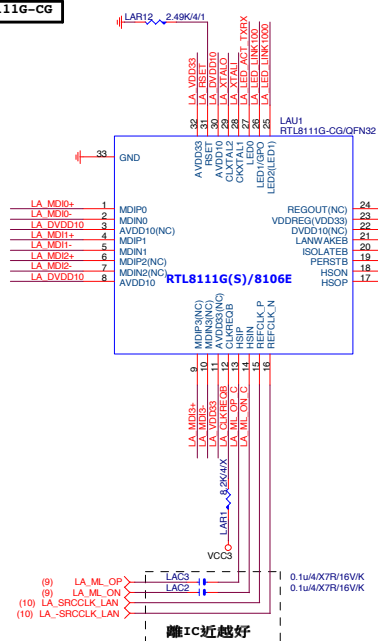
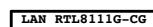
### AUDIO JACK

GA-H81M-D2V

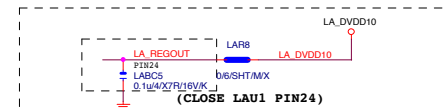
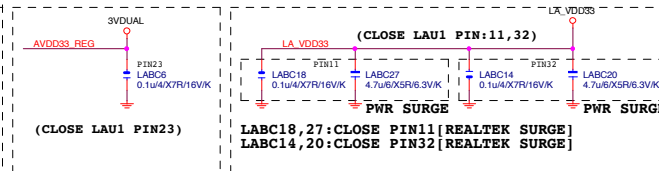
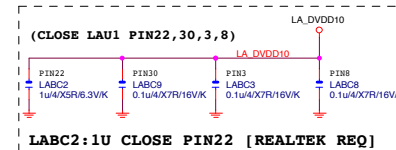
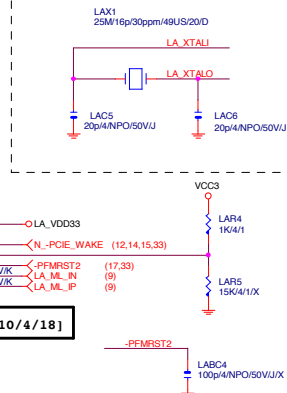
Rev
2.01

Date: Tuesday, May 27, 2014

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LA\_ML-->80歐姆:[15/5/5/5/15]



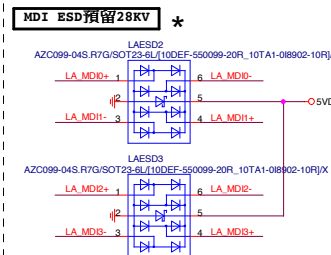
NOTE:  
RT8106E:PIN3,11,22,24-->NC  
LABC2LABC3,LABC5,LABC18,LABC27-->N/A

BOM NOTICE

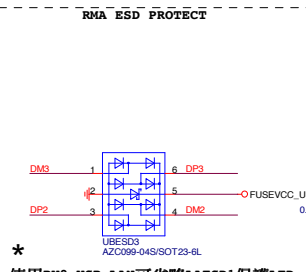
料號	規格	廠商
11NR6-702009-96R 1G LAN (12core)		UDE(RU9 ESD+)
[LED獨立走線,可省略外加AZC099料件LAESD1]		

1. 9KV ESD BOM:  
USB\_LAN (RU9):11NR6-702009-96R

2. 28KV ESD BOM:  
USB\_LAN (RU9):11NR6-702009-96R  
LAESD2, LAESD3: 上件AZC398-04S

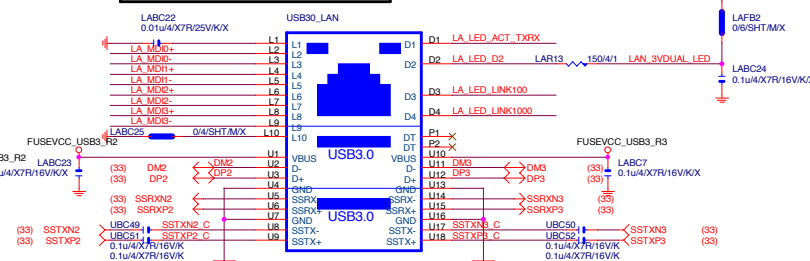


## USB\_LAN CONNECTOR



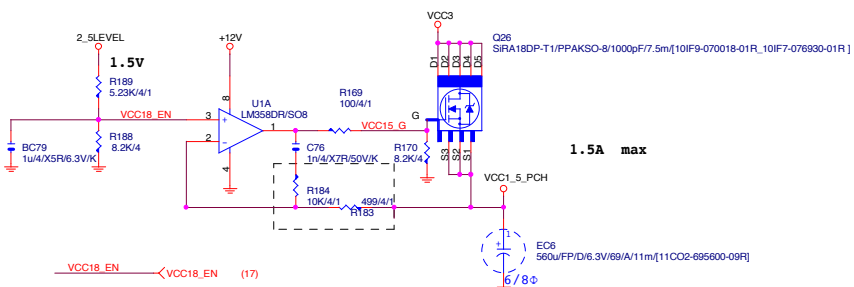
UBESD3  
AZC099-04S/SOT23-6L

使用RU9 USB LAN可省略LAESD1保護LED

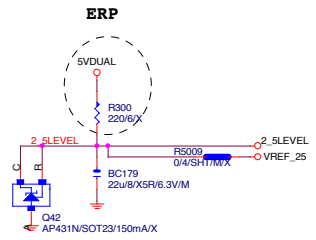


USB3+RJ45/11NR6-702009-K1R

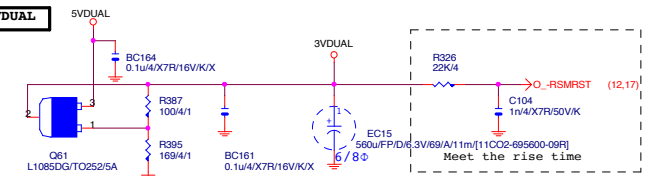
VCC1\_8\_PCR



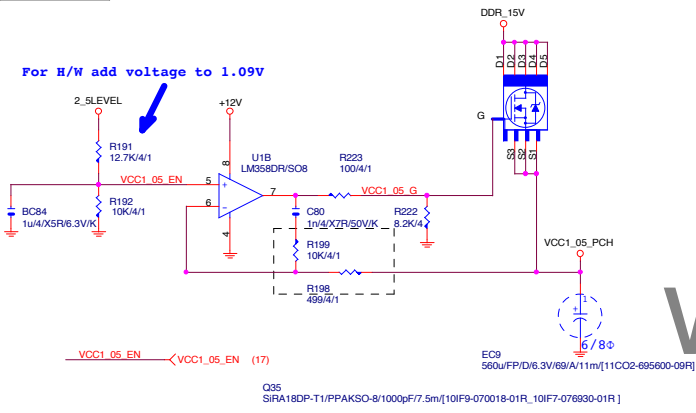
2\_5LEVEL



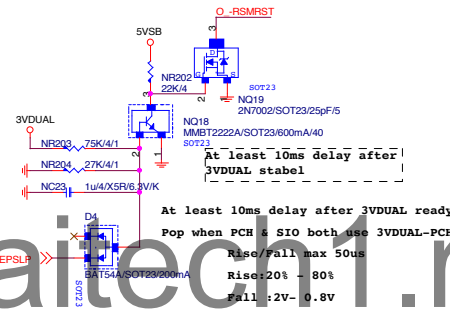
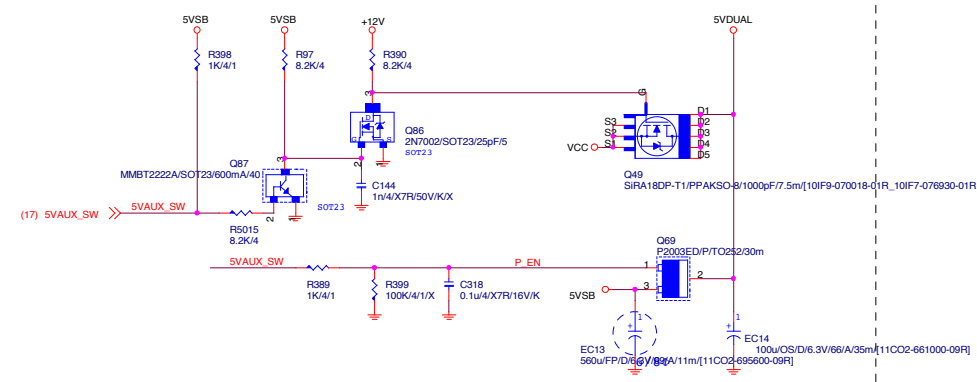
3VDUAL



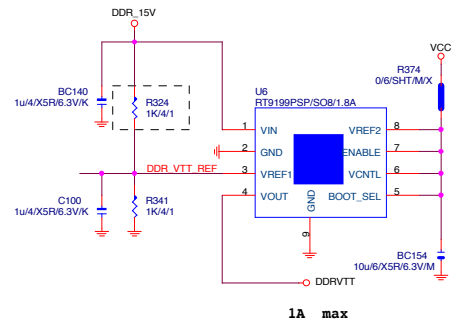
VCC1\_05\_PCH



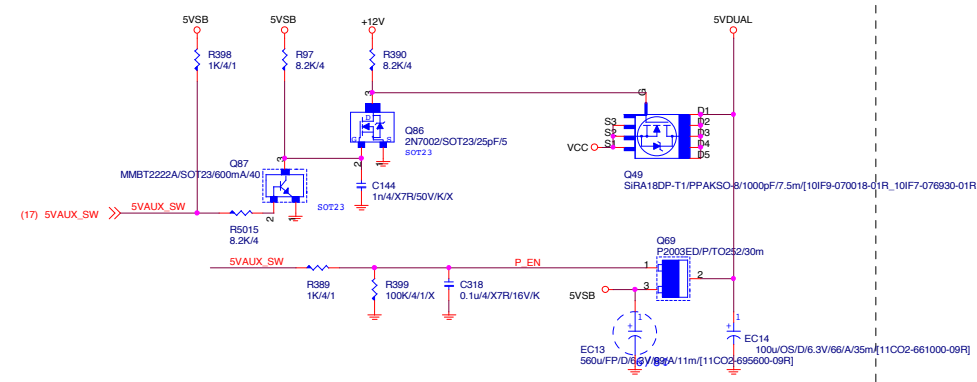
5VDUAL SHORT PROTECT



DDRVTT

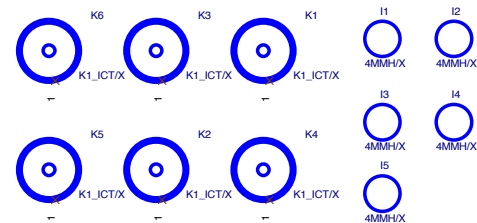
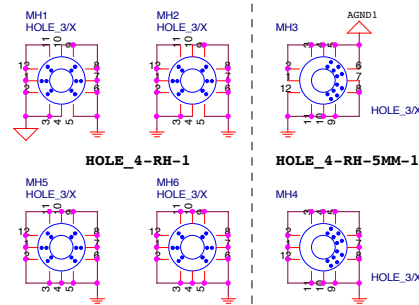
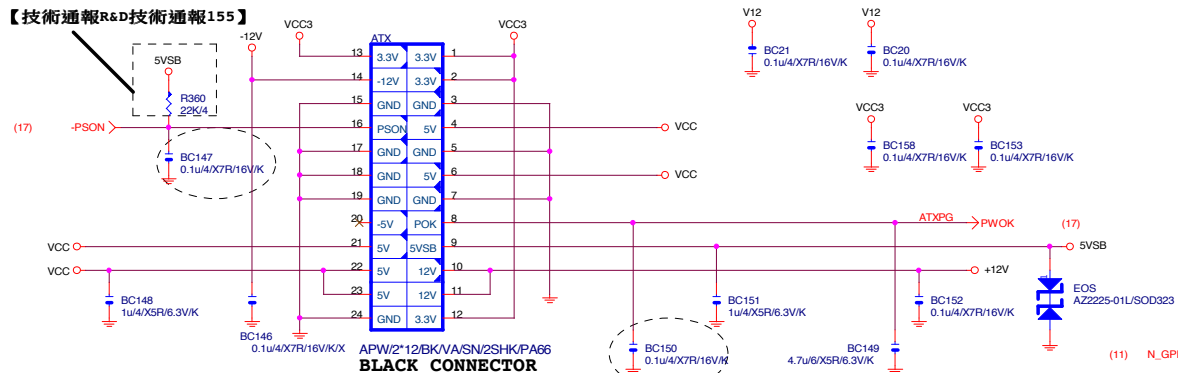


5VDUAL



# ATXX24 POWER CONNECTOR

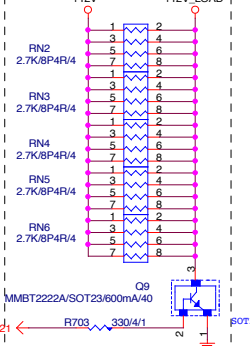
【技術通報R&D技術通報155】



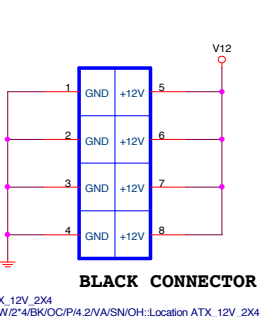
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## 【技術通報R&D技術通報153】

To fix 12V light load abnormality issue

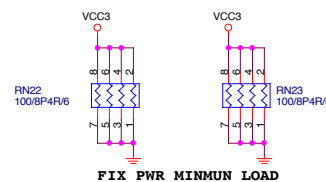


# ATXX4 POWER CONNECTOR



## PWOK PATCH

【技術通報R&D技術通報154】



Gigabyte Technology

ATX CONNECTOR

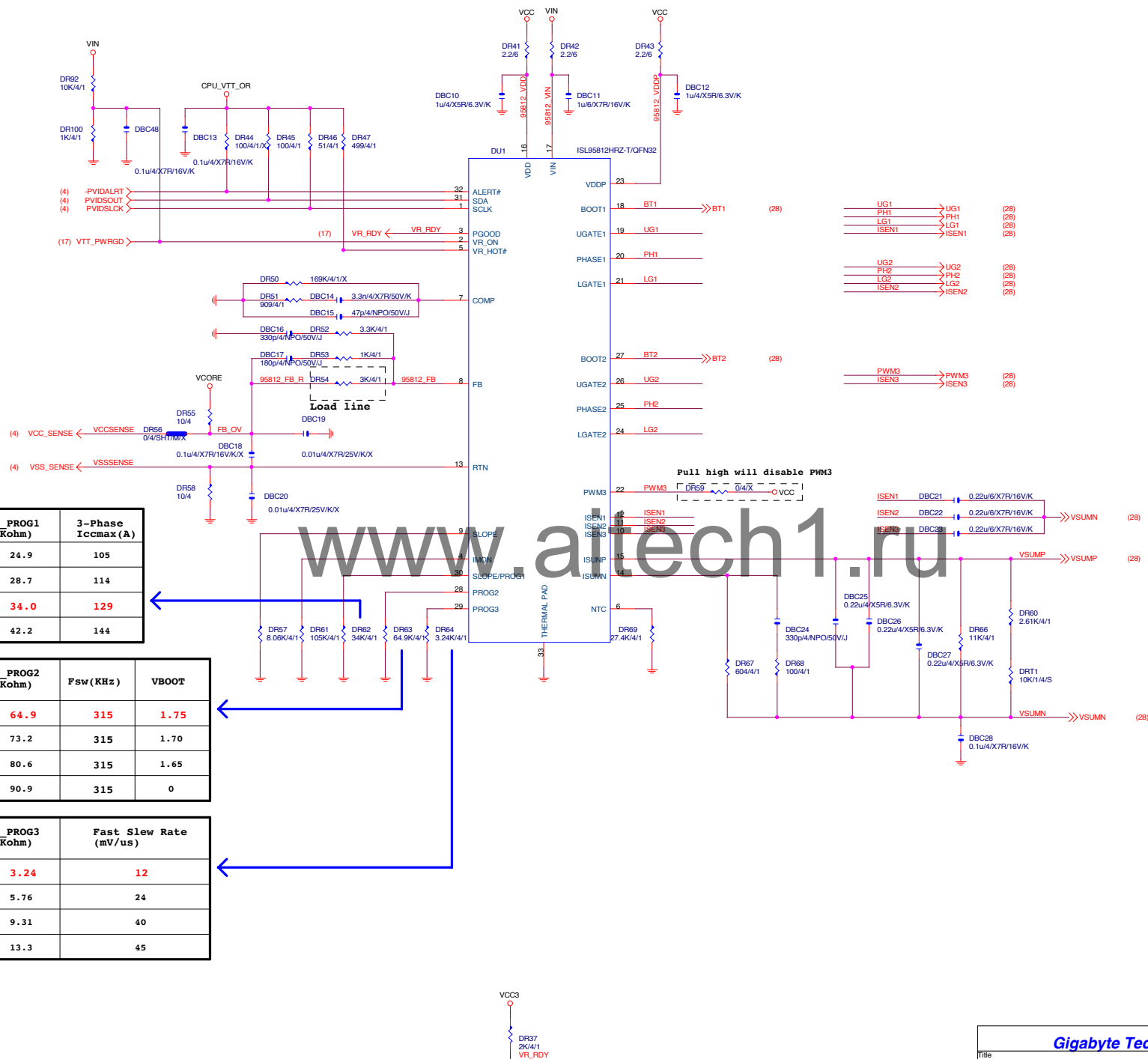
GA-H81M-D2V

Rev 2.01

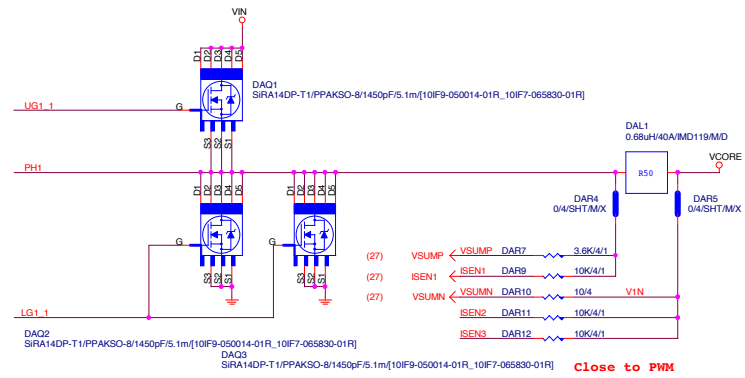
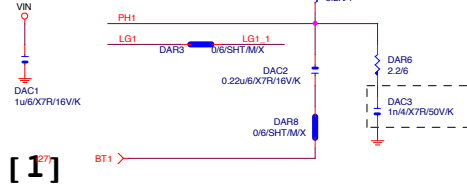
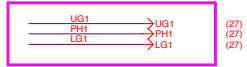
R_PROG1 (Kohm)	3-Phase Iccmax (A)
24.9	105
28.7	114
<b>34.0</b>	<b>129</b>
42.2	144

R_PROG2 (Kohm)	Fsw (KHz)	VBOOT
<b>64.9</b>	<b>315</b>	<b>1.75</b>
73.2	315	1.70
80.6	315	1.65
90.9	315	0

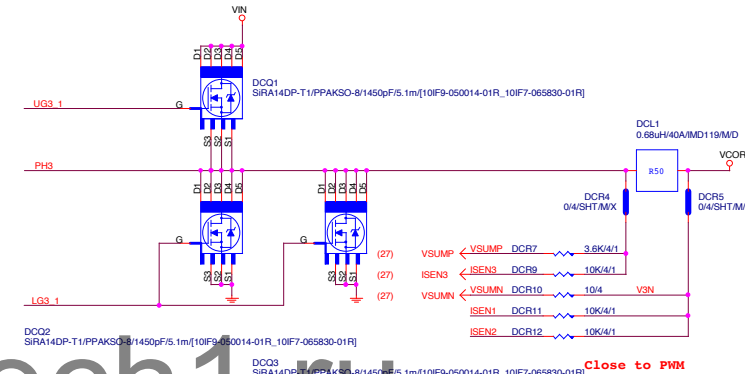
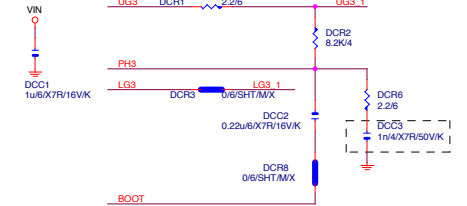
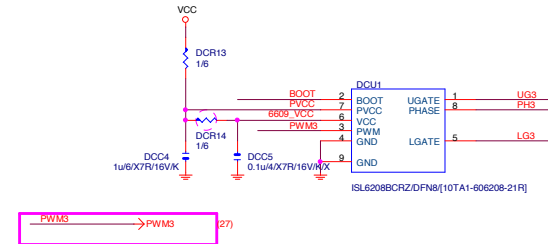
R_PROG3 (Kohm)	Fast Slew Rate (mV/us)
<b>3.24</b>	<b>12</b>
5.76	24
9.31	40
13.3	45



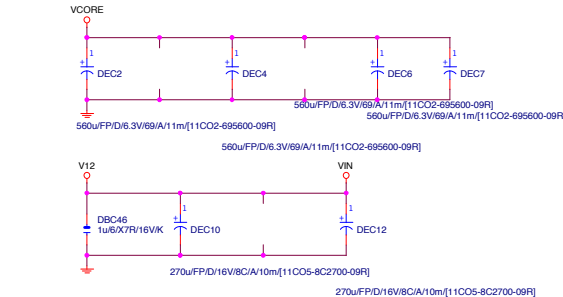
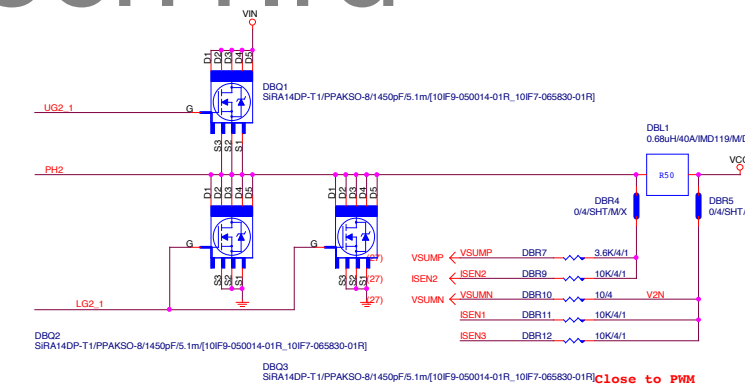
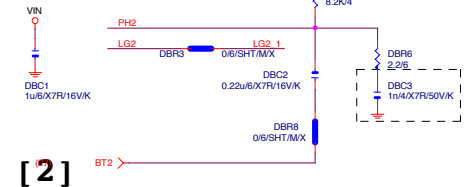
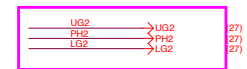
# PHASE 1

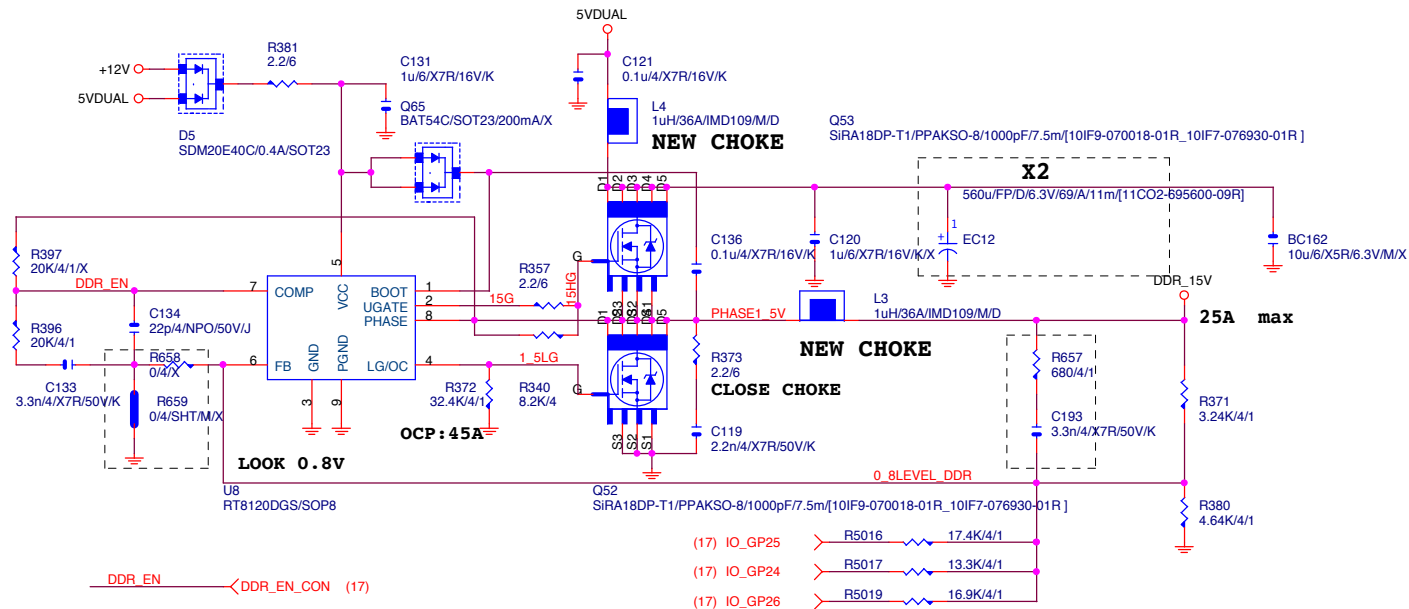


# PHASE 3



# PHASE 2





From DDR\_15V source  
10 mils trace to SIO

DDR\_15V  
MR20

DDR\_15VIO  
Q/4/SHT/M/X

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

Rocset=(Iocp\*Lgate, rdson)/Iocset  
Rocset=(45A\*6.7mOhm)/10uA = 30K  
Iocset=10uA

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DDR POWER			
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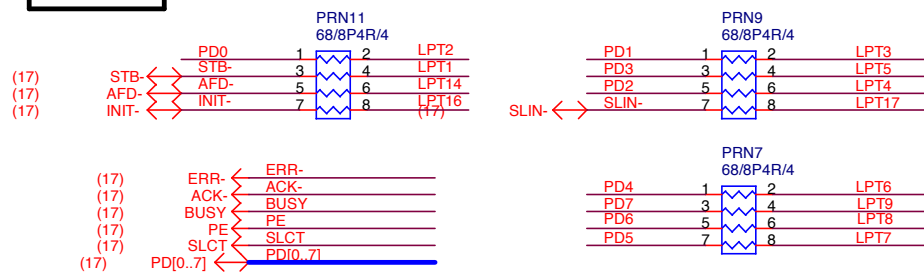


VCC1\_05\_ME

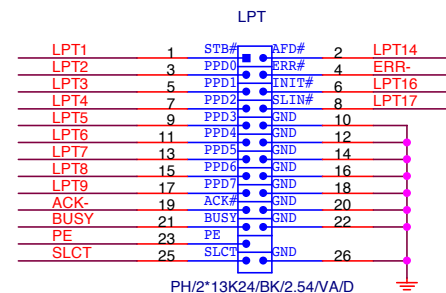
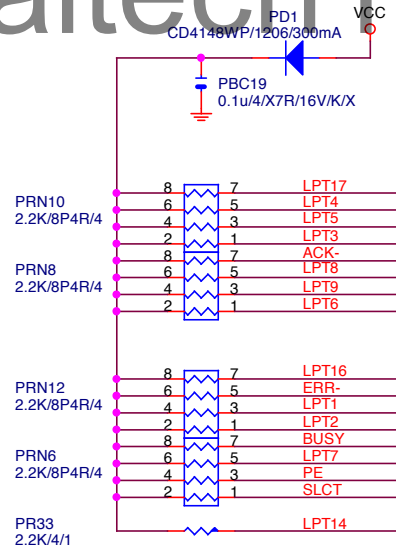
【技術通報R&D技術通報156】  
(RICHTER), (NUVOTON), (EMC)做共用  
PIN7分壓阻值須做修改為100K以上電阻值

VCC3\_ME

## LPT PORT



【技術通報R&D技術通報151】  
33ohm Change to 68ohm

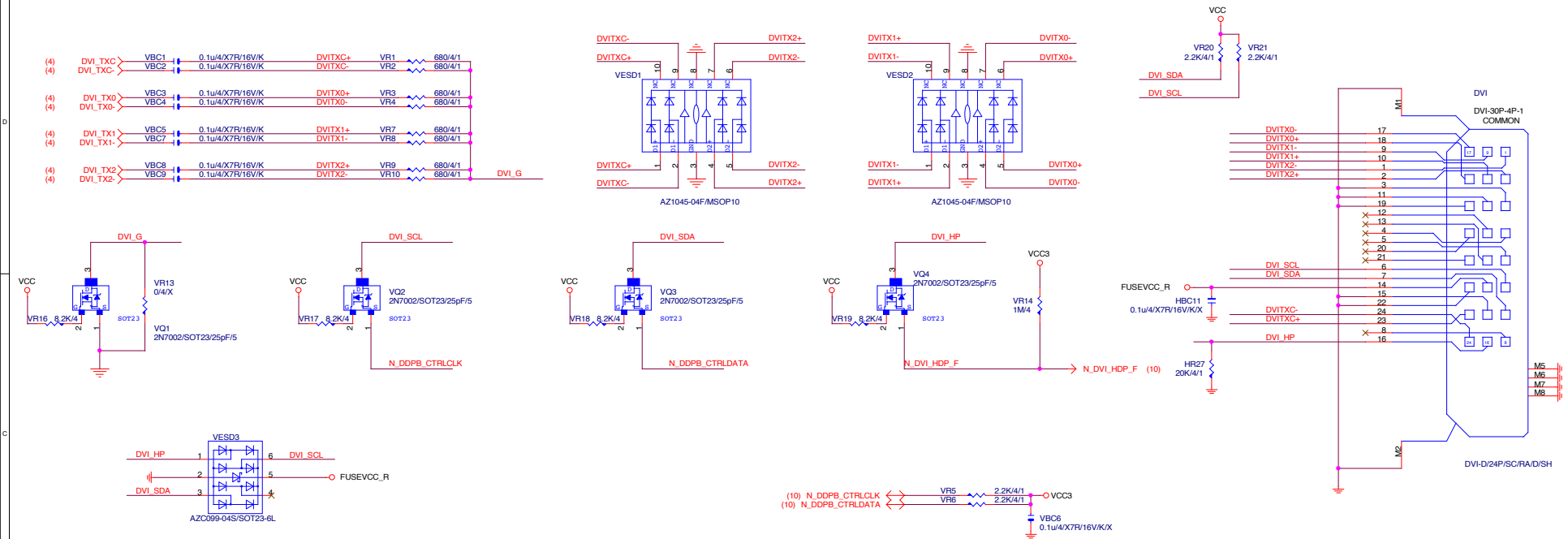


PH/2\*13K24/BK/2.54/NA/D

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DVI



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