

# Model Name: GA-H170-Gaming 3

SHEET TITLE Rev 1.01

01	COVER SHEET
02	BOM & PCB MODIFY HISTORY
03	BLOCK DIAGRAM
04	CPU_LGA1150-A
05	CPU_LGA1150-B_DDR4
06	CPU_LGA1150-C
07	CPU_LGA1150-D
08	DDR4 CHANNEL A 1,2
09	DDR4 CHANNEL B 1,2
10	PCH_RGB,CLK BUFFER
11	PCH DMI,USB,PCIE
12	PCH MISC
13	PCH SATA,PCIE,SATA EXPRESS
14	PCH_PWR,GND
15	DUAL BIOS
16	ITE 8628 LPC IO
17	HMW
18	FAN CTRL--SIO
19	PCI EXPRESS X16 SLOT
20	PCI EXPRESS X4 SLOT(PCH)
21	PCI EXPRESS X1 SLOTS
22	M.2 X4
23	SATA EXPRESS
24	ISL95856 PWM
25	ISL95856 MOS_VCORE
26	ISL95856 MOS_VCCGT
27	VCCSA_VCCIO_VCCPLL
28	RT8120_DDR

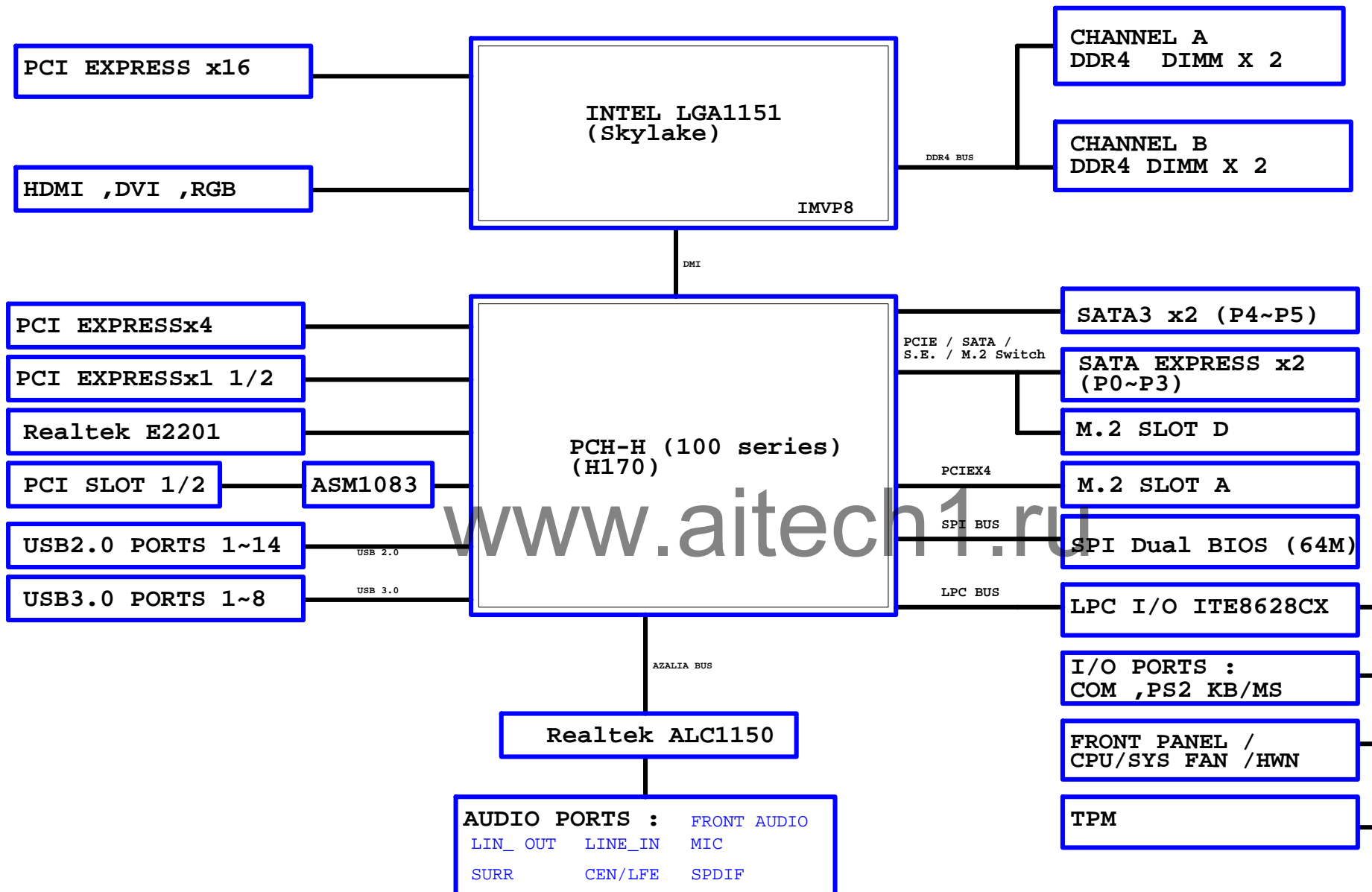
SHEET TITLE

29	RT8120_VPP
30	RT8120_PCH
31	DISCRETE POWER1
32	NCT3933
33	ATX POWER , A_-PROCHOT
34	KB_MS_USB
35	DVI CONN
36	PTN3356 - DP to VGA - IC
37	PTN3356 - DP to VGA - Conn
38	HDMI CONN
39	R_USB30
40	KILLER E2201
41	USB30 LAN CONNECTOR-E2201
42	Realtek ALC1150
43	REAR AUDIO JACK
44	Audio Power
45	F_USB30
46	F_USB BOX Header
47	COM,TPM,THB
48	F_PANEL
49	ASM1083
50	PCI SLOT 1&2
51	IDT6V41530_CLK BUFFER
52	EMI ESD
53	2nd M.2 X4
54	M.2 SWITCH
55	TABLE LIST

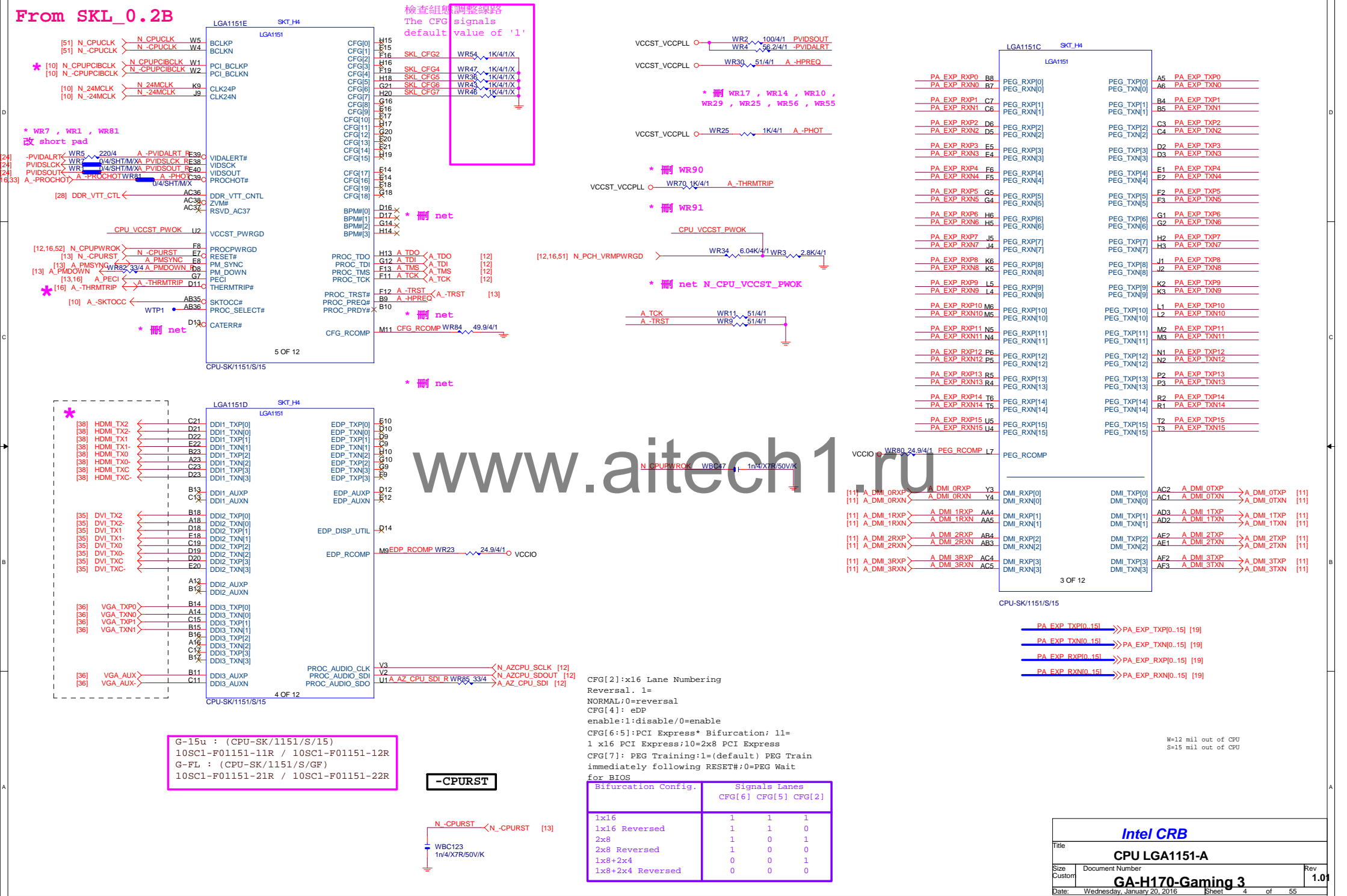
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9MH170G3-00

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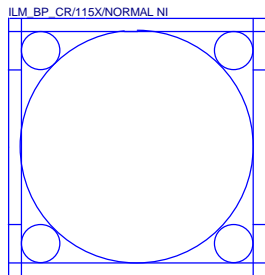
# BLOCK DIAGRAM



From SKL\_0.2B

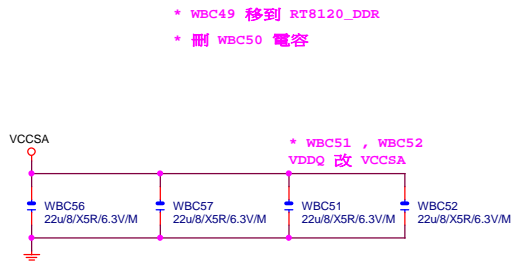


# \* 改DDR4 net



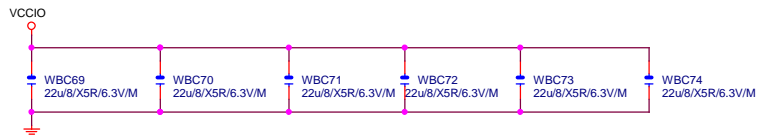
- [8] MODT\_A[0..3] <=> MODT\_A10..31
- [9] MODT\_B[0..3] <=> MODT\_B10..31
- [8] MDA[0..63] <=> MDA10..631
- [9] MDB[0..63] <=> MDB10..631
- [8] M\_DQSA[0..7] <=> M\_DQSA10..71
- [8] M\_-DQSA[0..7] <=> M\_-DQSA10..71
- [8] MAA[0..16] <=> MAA10..161
- [9] MAA[0..16] <=> MAA10..161
- [9] M\_DQSB[0..7] <=> M\_DQSB10..71
- [9] M\_-DQSB[0..7] <=> M\_-DQSB10..71

<b>Intel CRB</b> <b>CPU LGA1151-B</b>		
Size	Document Number	Rev
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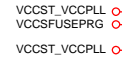
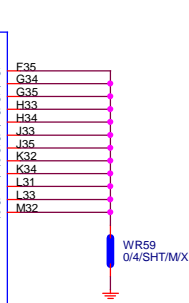
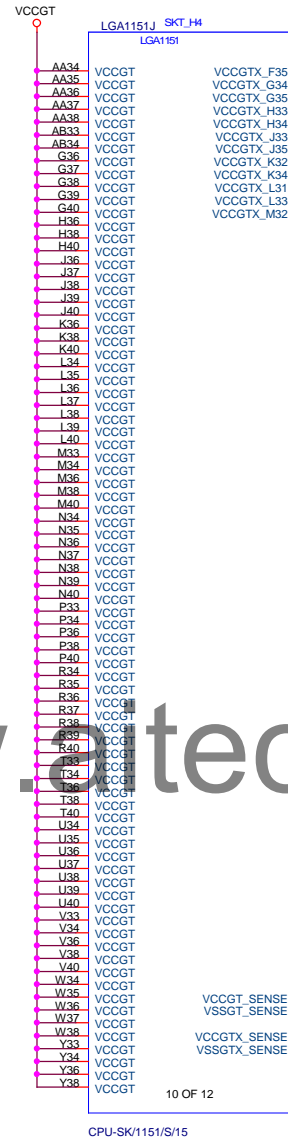


\* 刪 WBC124, WBC125, WBC126, WBC127 電容

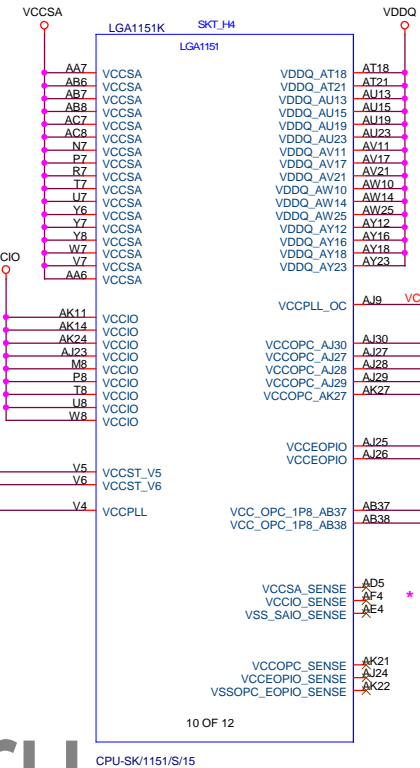
\* WR59, WR86, WR60, WR61, WR62, WR63 改 short pad



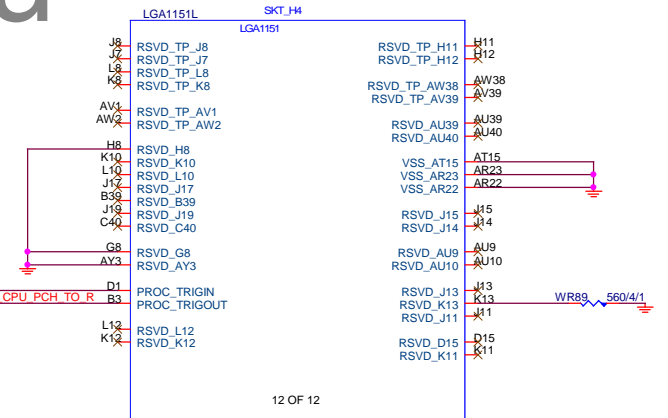
\* 刪 VCCGT 電容



[13] N\_PCH\_CPU\_T1 < WR88 > 334 A\_CPU\_PCH\_TO R

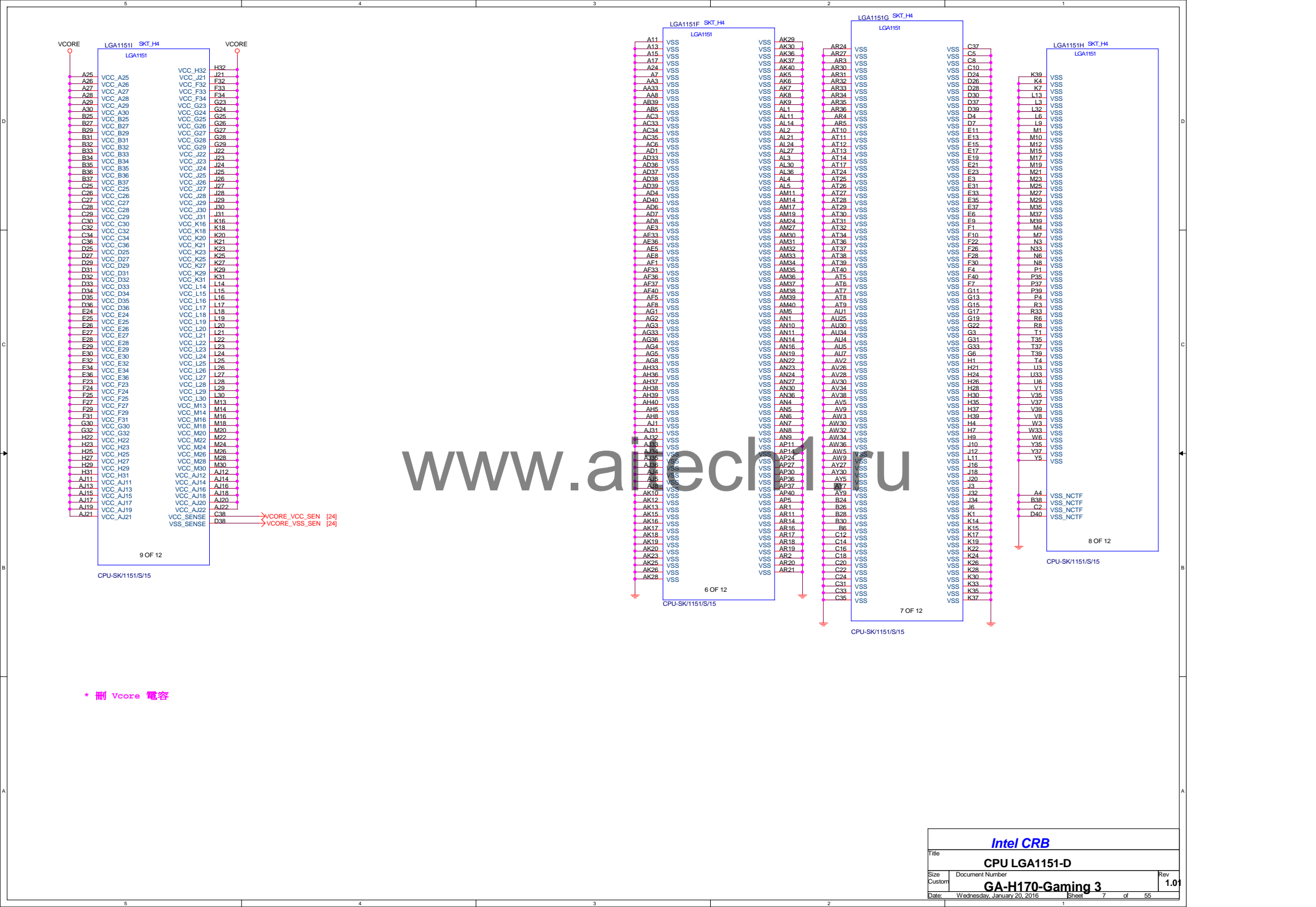


CPU-SK/1151/S/15

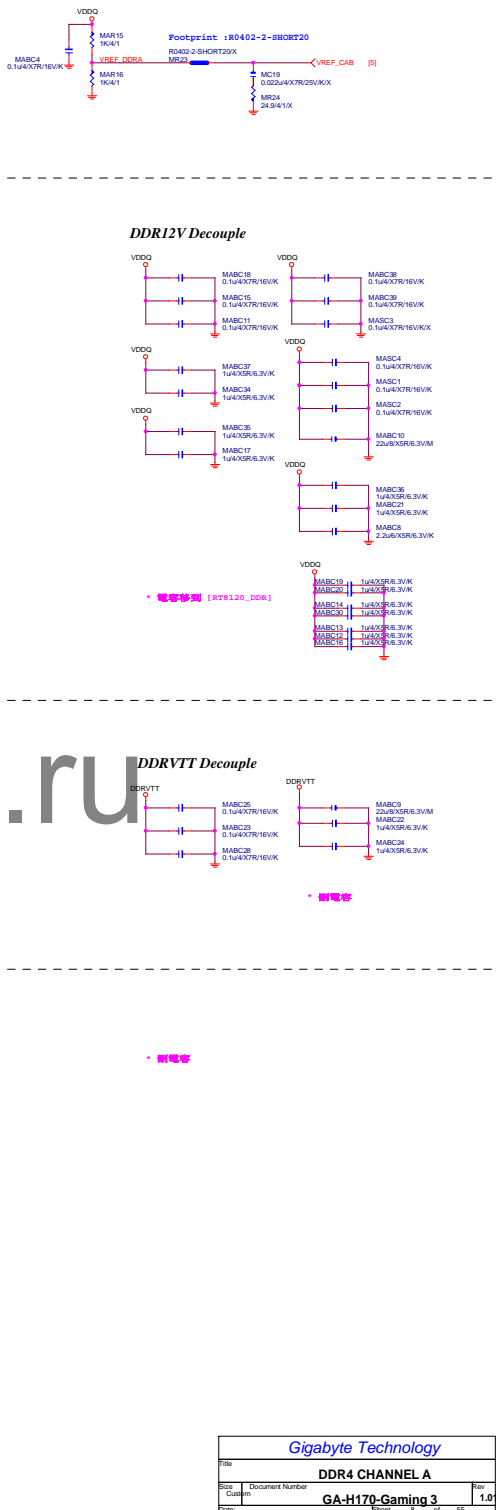
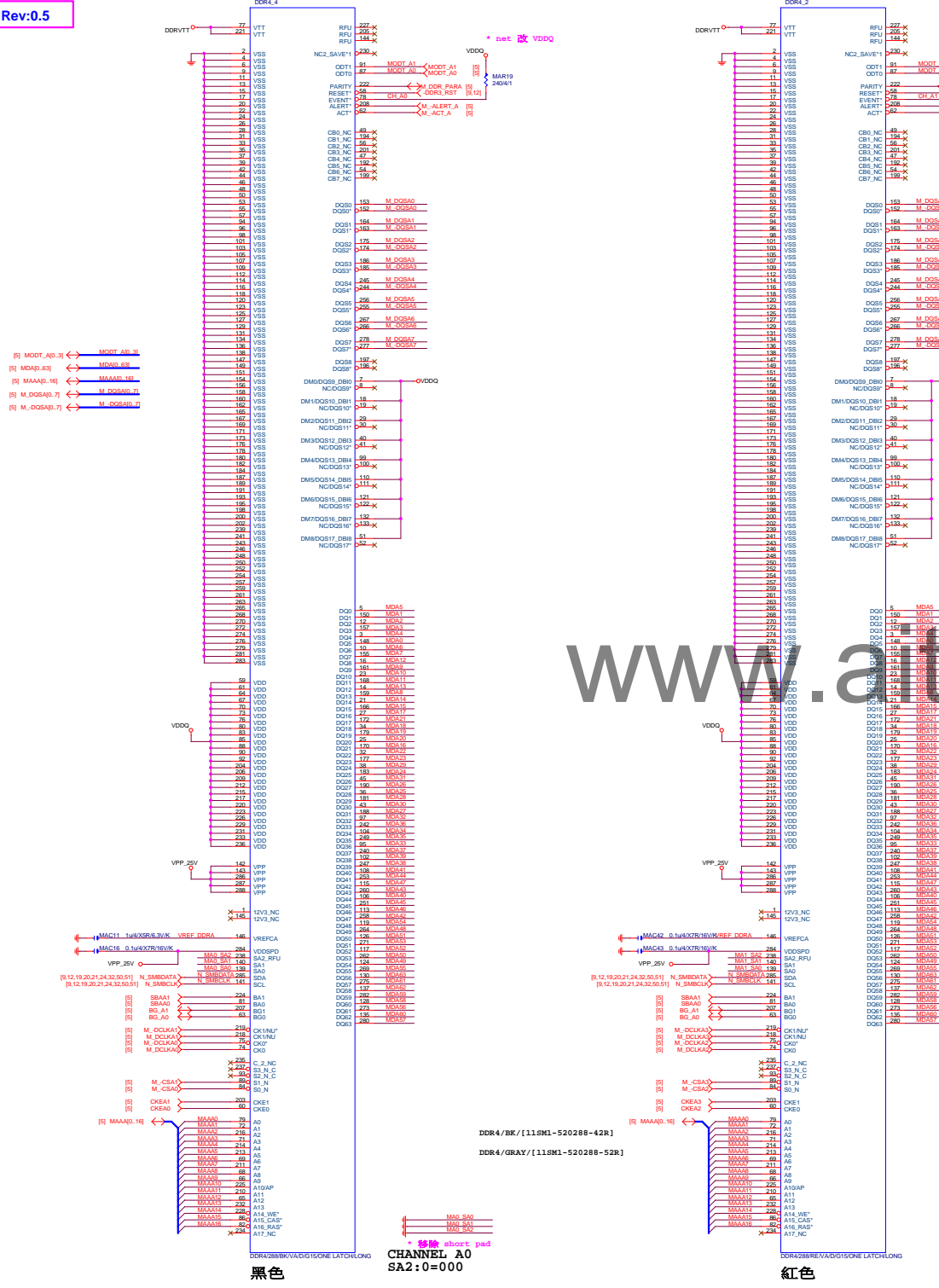


CPU-SK/1151/S/15

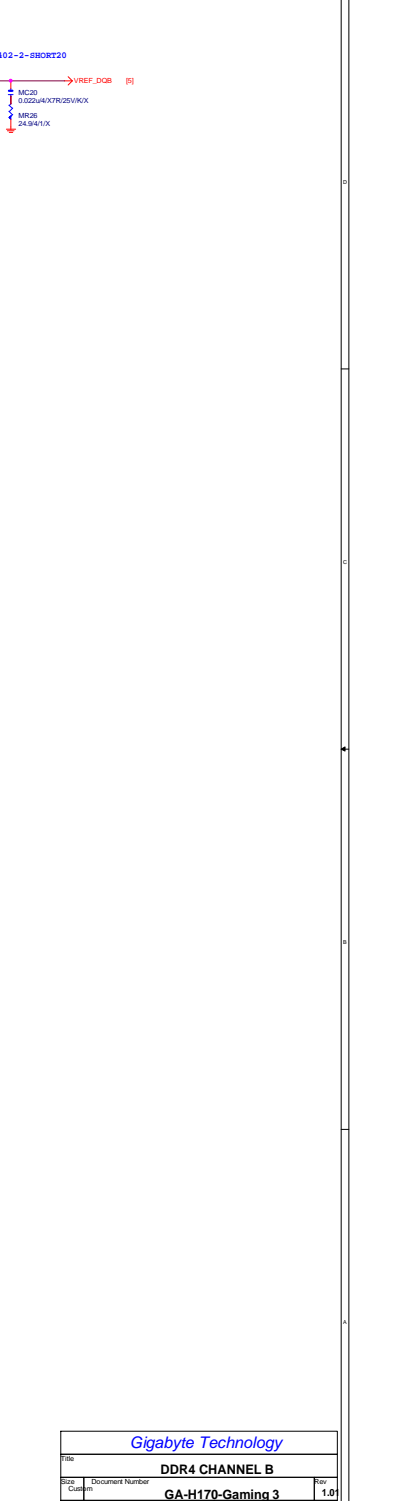
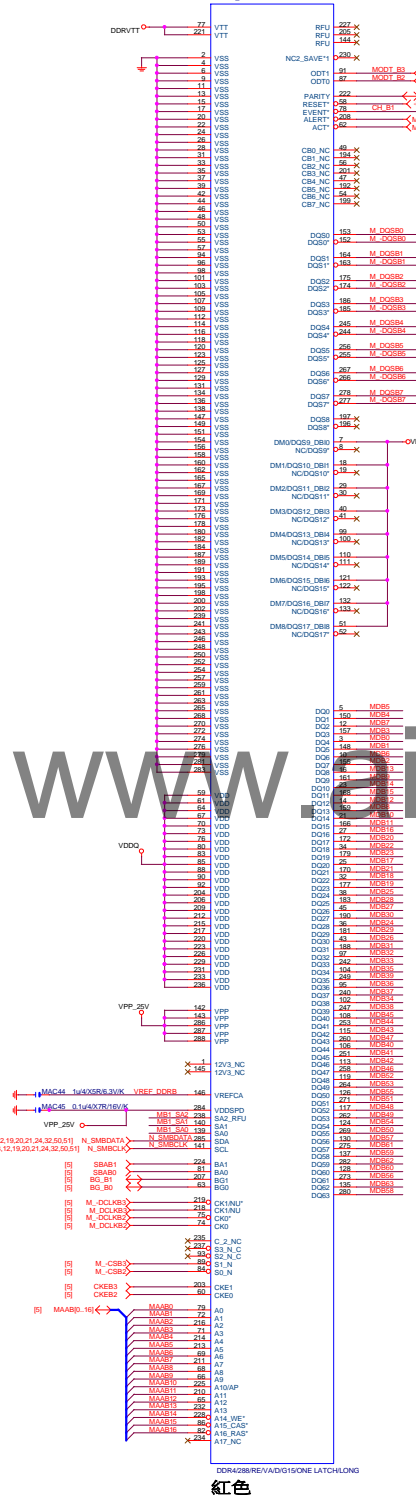
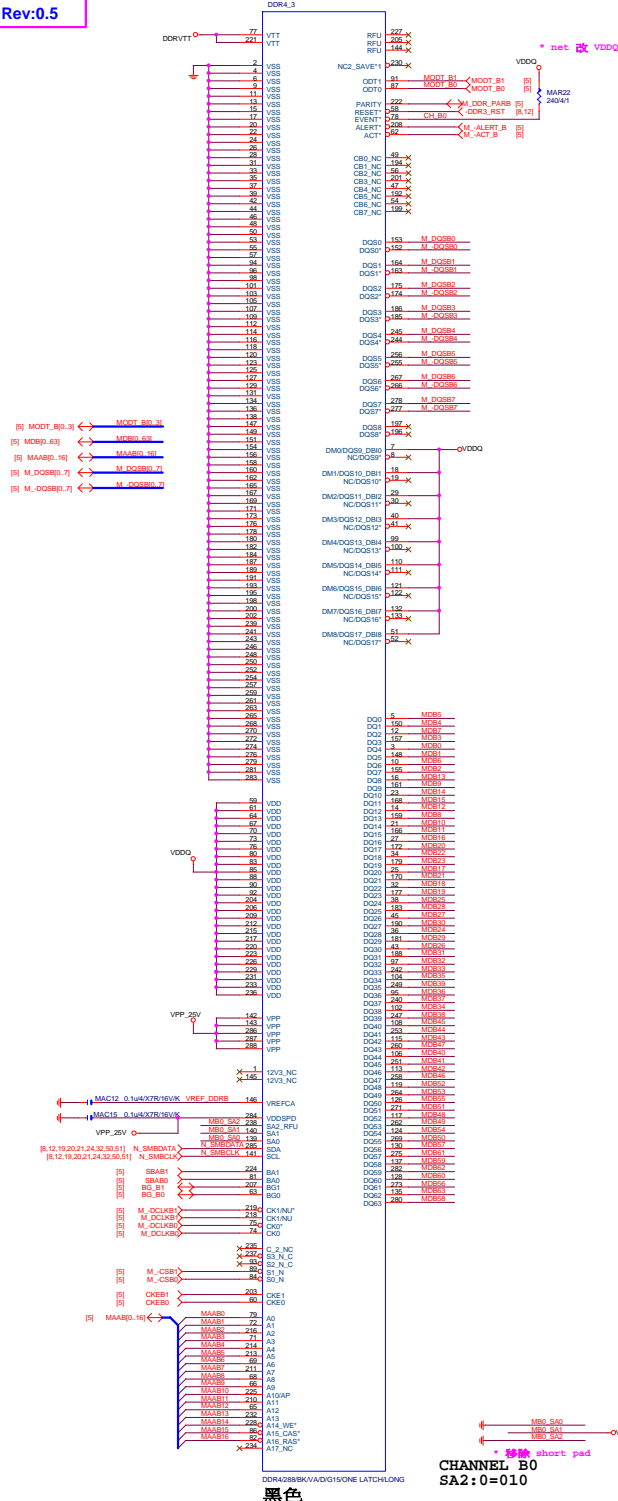
Intel CRB			
Title			
CPU LGA1151-C			
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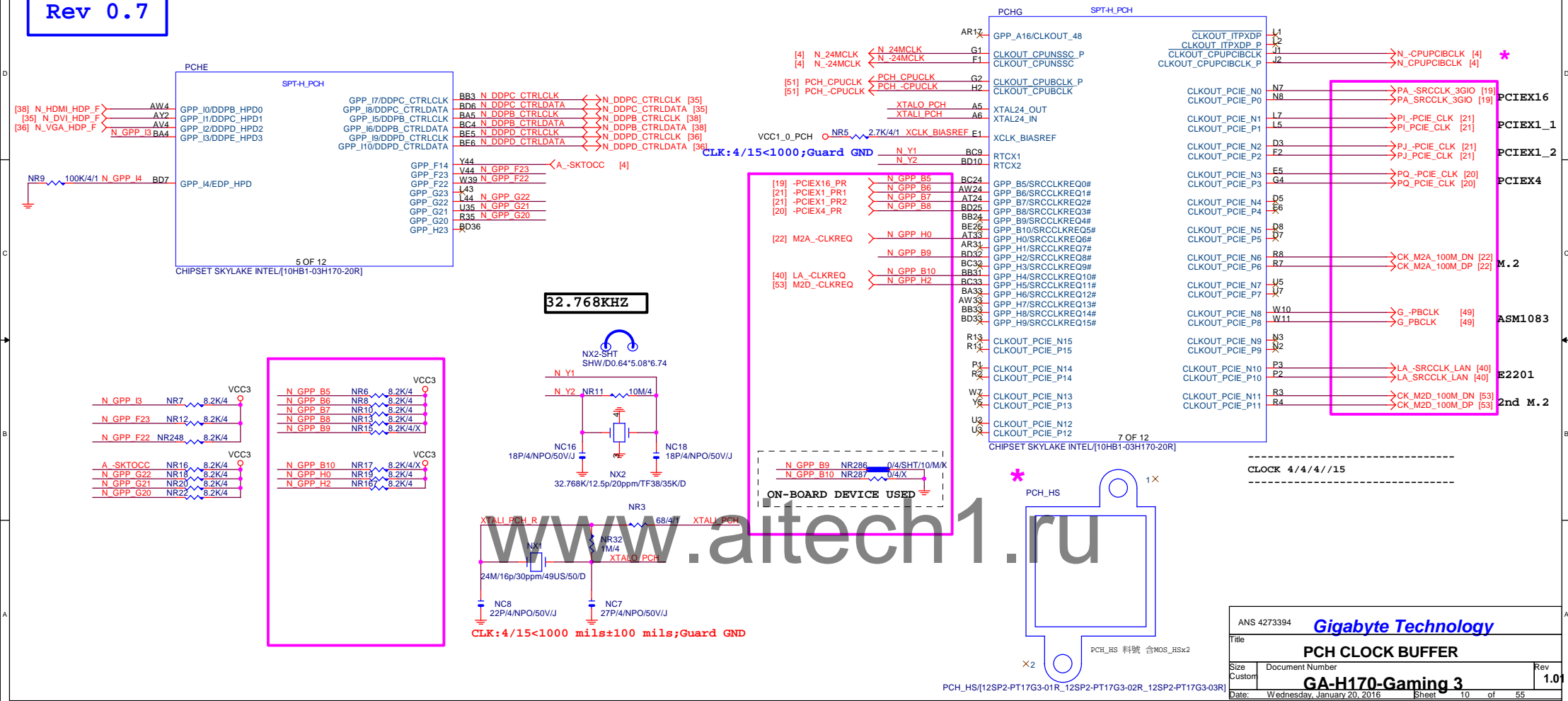




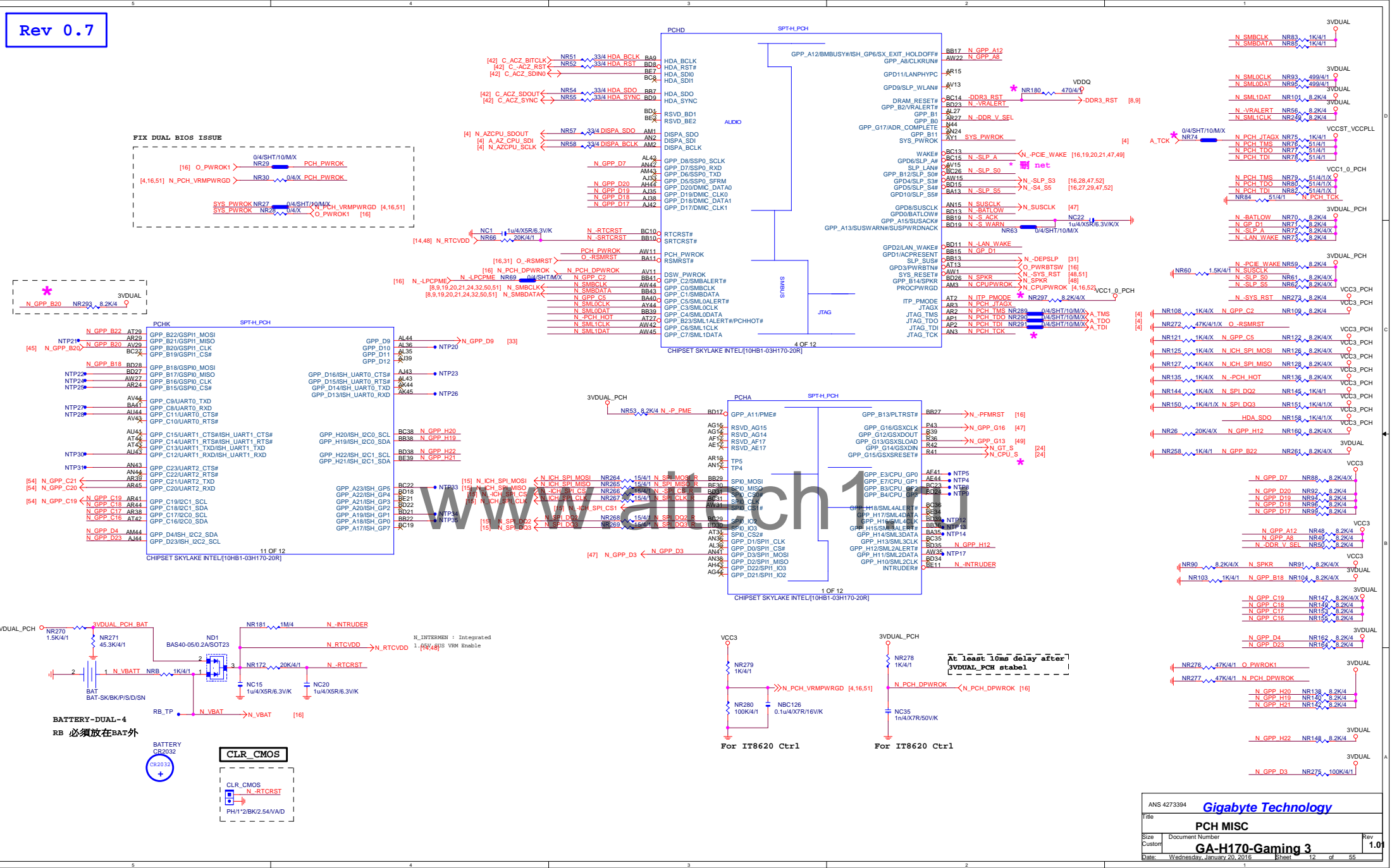




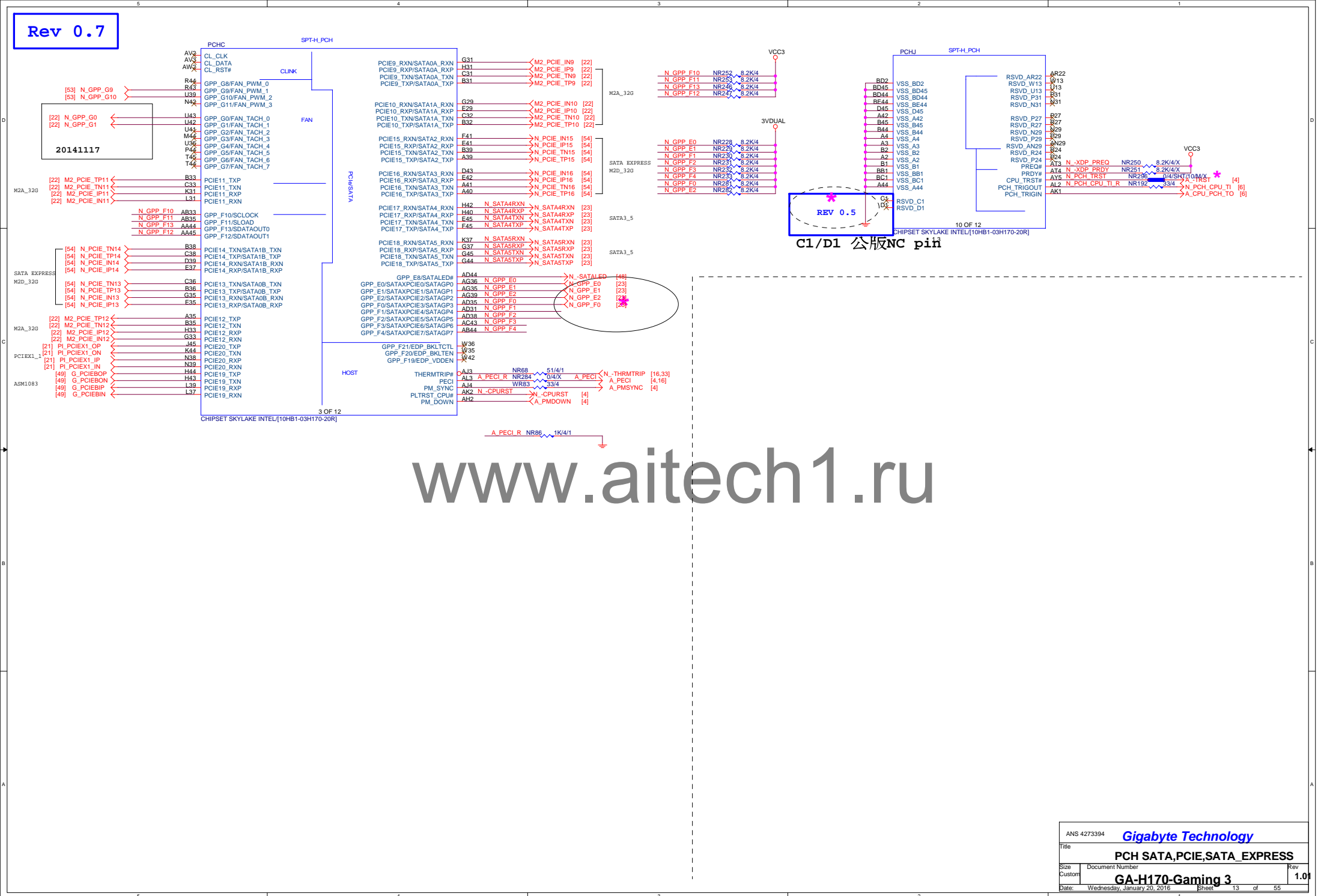
Rev 0.7

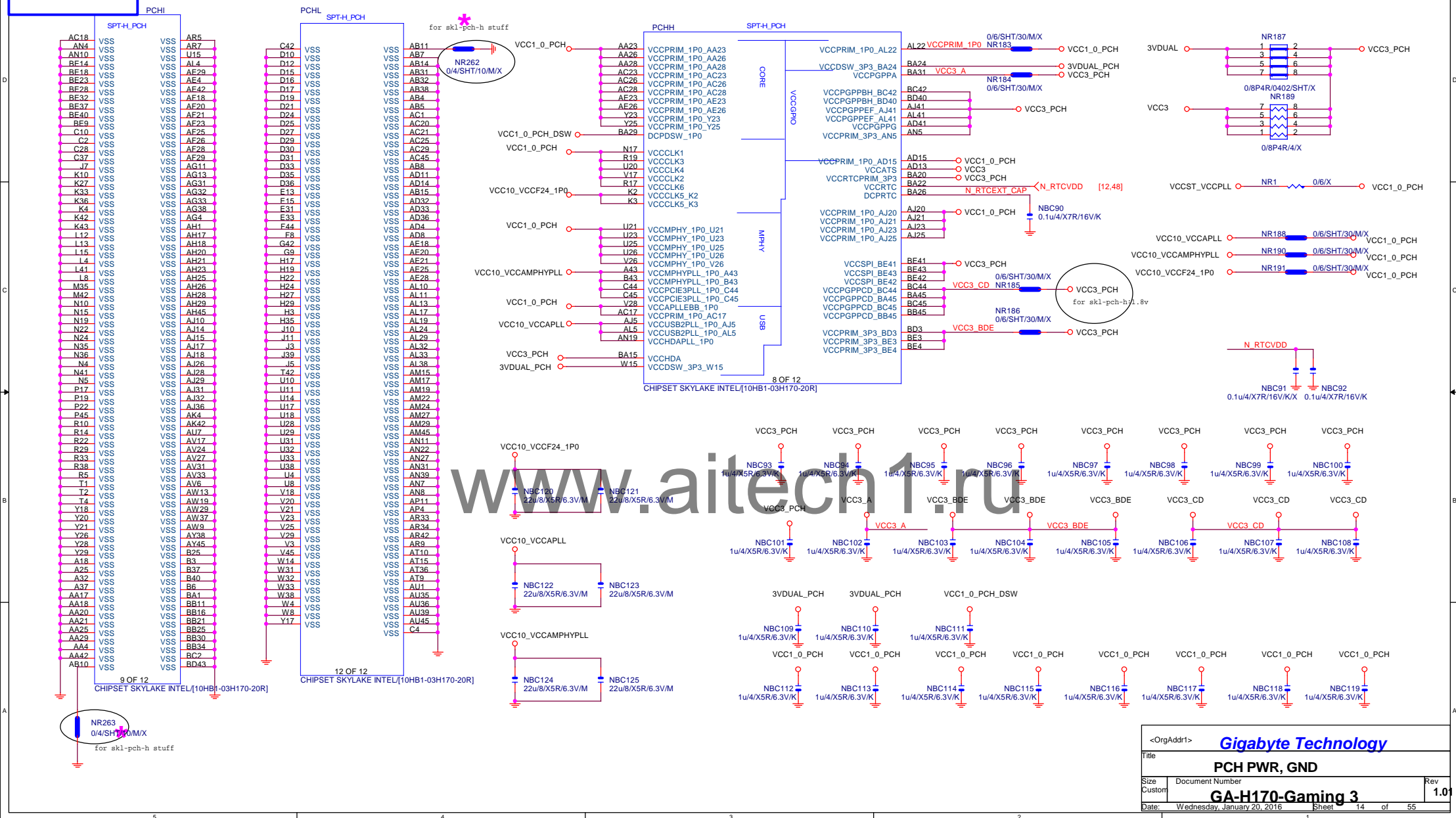






Rev 0.7





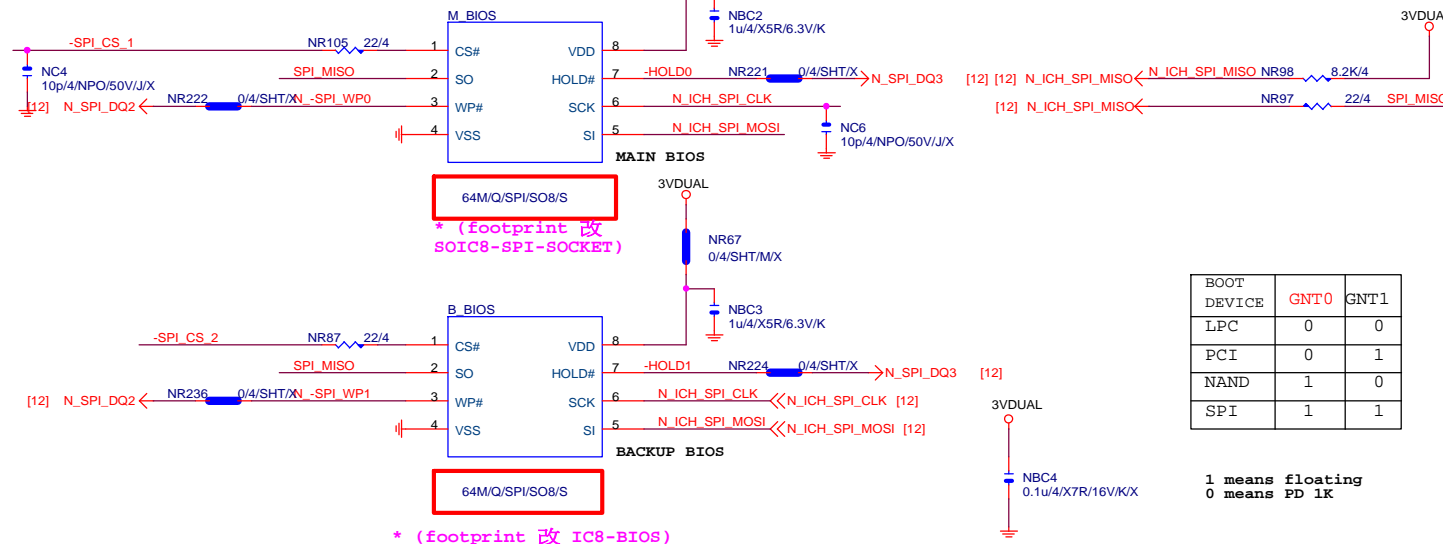


# DUAL BIOS

# MOSI For DMI RX Termination Voltage

指定用DII

指定用DII

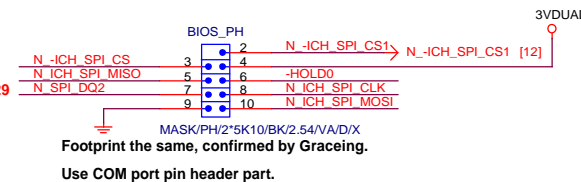


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Rev: 0.42

# BIOS\_PH

★Update 2015-01-29

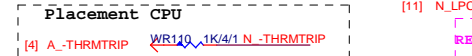
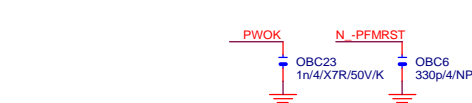
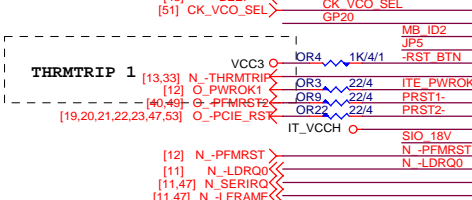
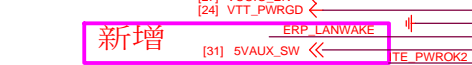
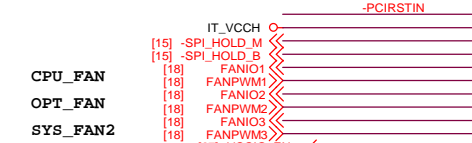
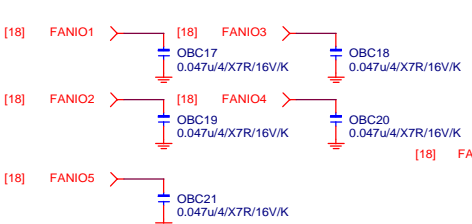


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Size	Document Number	GA-H170-Gaming 3	
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SIO IT8628CX REV:1.08

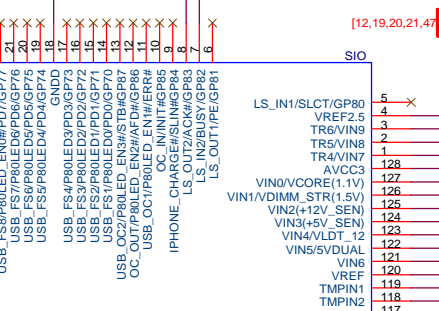
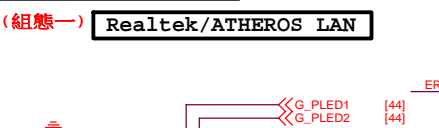


CPU 端 A\_-THRMTRIP不可與PCH及SIO N\_-THRMTRIP直接連接。否則會出現無法拉Low情況。

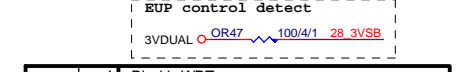
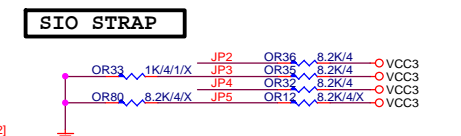
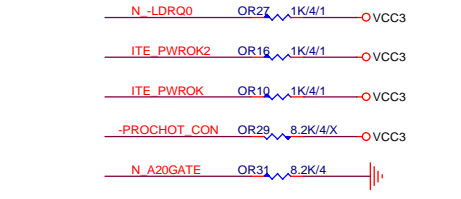
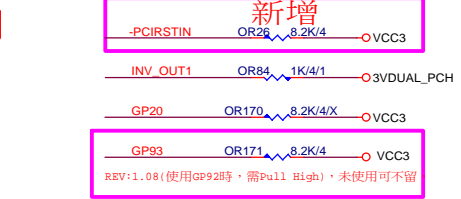
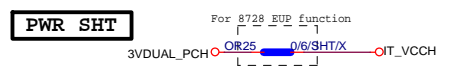
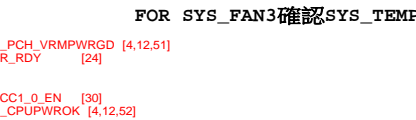
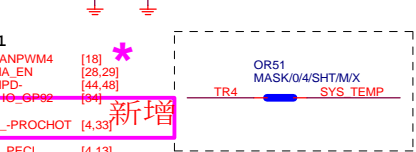
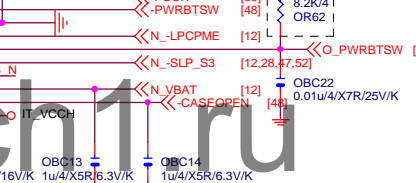
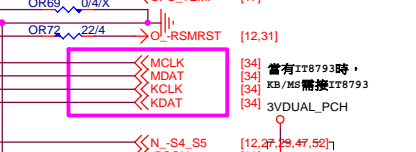
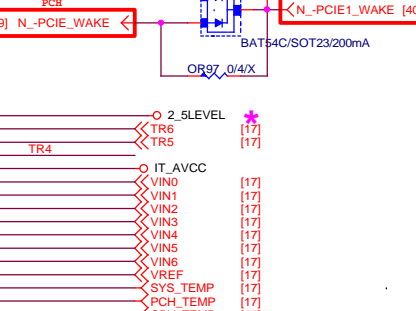
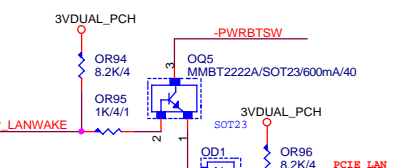
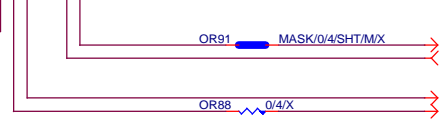
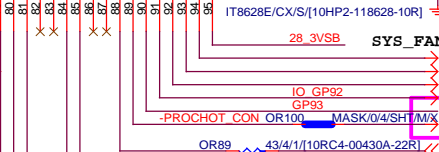
FAN TABLE	
CPU_FAN	FAN_CTL1 FAN_TAC1
SYS_FAN1	FAN_CTL4 FAN_TAC4
SYS_FAN2	FAN_CTL3 FAN_TAC3
SYS_FAN3	FAN_CTL5 FAN_TAC5
OPT_FAN	FAN_CTL2 FAN_TAC2
THRMTRIP1	YES PIN60

IT8620E GPIO問題匯整	
PIN 50	GP26-第一次接上POWER時會拉 Lo
PIN 90/91	DEFAULT為HDLLED FUNCTION, GP93 BYPASS TO GP92 高溫時 GP92 會被拉Lo(ITE BUG)
PIN 108	GP40--- POWER ON 時會拉 Lo
PIN 111/112	MOUSE 跟FAN6 FUNCTION 擇一使用, 不然會互相干擾
PIN 22	PIN22, 需高於3V, 若低於將部分CON PORT及FET裝置 蜂鳴器會異常動作。

ERP WAKE on LAN (依LAN組態選擇)



IT8628E\_BX

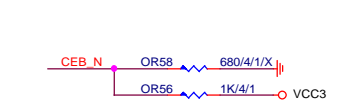


JP2	1	Disable WDT
	0	Enable WDT to rest PWROK
JP3	1	Dual BIOS CS PIN Disable
	0	Dual BIOS CS PIN Enable
JP4	1	k8 power sequency function is Disable
	0	k8 power sequency function is Enable
JP5	1	anti-surge Disable
	0	anti-surge Enable
JP3	1 1	The default value of EC Index 63h/6Bh/73h is 80h.
	1 0	The default value of EC Index 63h/6Bh/73h is FFh.
JP5	0 1	The default value of EC Index 63h/6Bh/73h is 00h.
	0 0	The default value of EC Index 63h/6Bh/73h is 40h.

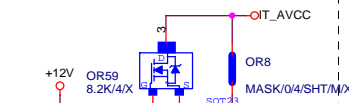
FAN TABLE	
CPU_FAN	FAN_CTL1 FAN_TAC1
SYS_FAN1	FAN_CTL4 FAN_TAC4
SYS_FAN2	FAN_CTL3 FAN_TAC3
SYS_FAN3	FAN_CTL5 FAN_TAC5
OPT_FAN	FAN_CTL2 FAN_TAC2
THRMTRIP1	YES PIN60

IT8620E GPIO問題匯整	
PIN 50	GP26-第一次接上POWER時會拉 Lo
PIN 90/91	DEFAULT為HDLLED FUNCTION, GP93 BYPASS TO GP92 高溫時 GP92 會被拉Lo(ITE BUG)
PIN 108	GP40--- POWER ON 時會拉 Lo
PIN 111/112	MOUSE 跟FAN6 FUNCTION 擇一使用, 不然會互相干擾
PIN 22	PIN22, 需高於3V, 若低於將部分CON PORT及FET裝置 蜂鳴器會異常動作。

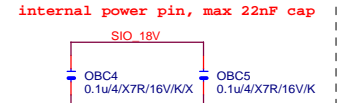
DUAL BIOS OPT STRAP



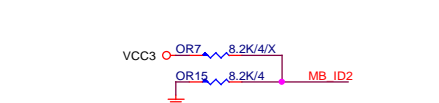
Power leakage



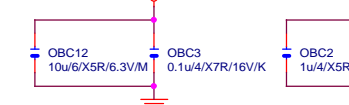
SIO\_18V



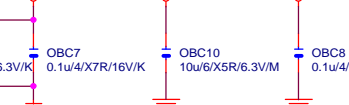
MB ID



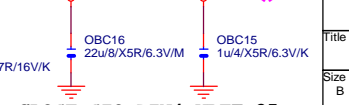
SIO CAP



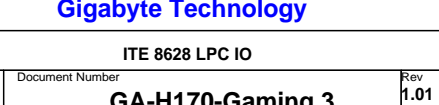
IT\_VCC



IT\_AVCC



3VDUAL\_PCH



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Title: ITE 8628 LPC IO

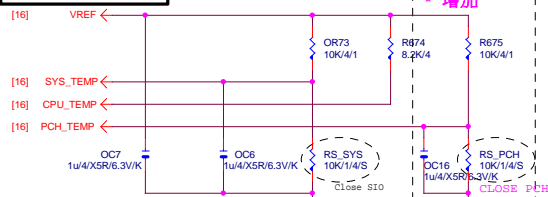
Size B Document Number: GA-H170-Gaming 3

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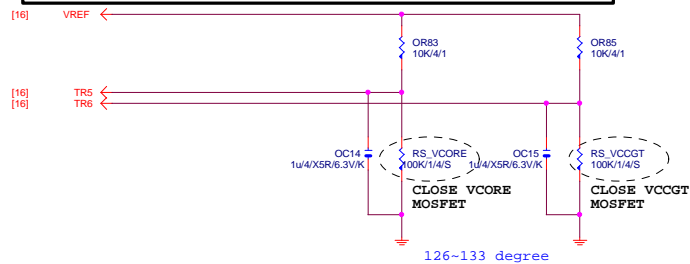
Rev 1.01

REV:1.07

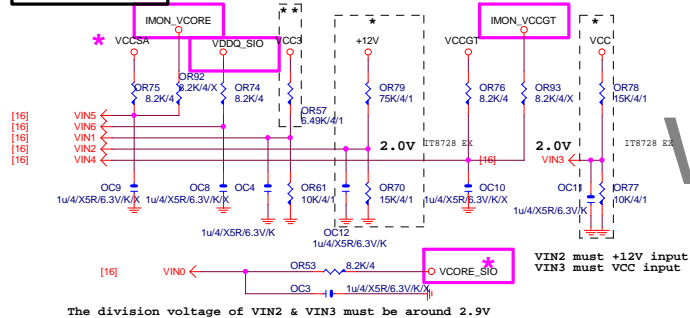
## TEMP H/W MONITOR



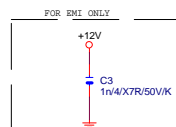
## RS\_VCORE、RS\_VCCGT、CLOSE CPU\_VCORE &amp; VCCGT MOSFET

~~PROCHOT: 有mos meartsink 不用prochot function~~

## VOLTAGE-- H/W MONITOR



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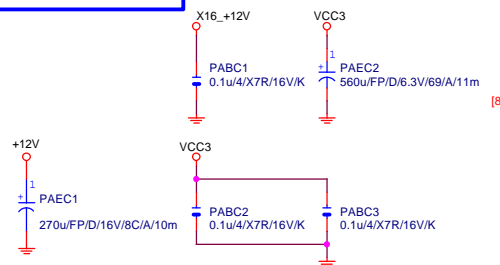
Gigabyte Technology

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Size	Document Number	Rev	1.01
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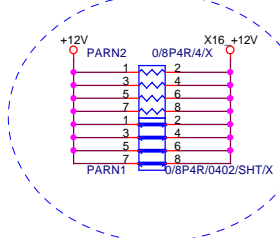
Rev 0.3

## PCIEX16 CAP



## PCIEX16 PROTECT SHT

+12 protect short-wire test



## PCIEX16 AC CAP

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

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

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

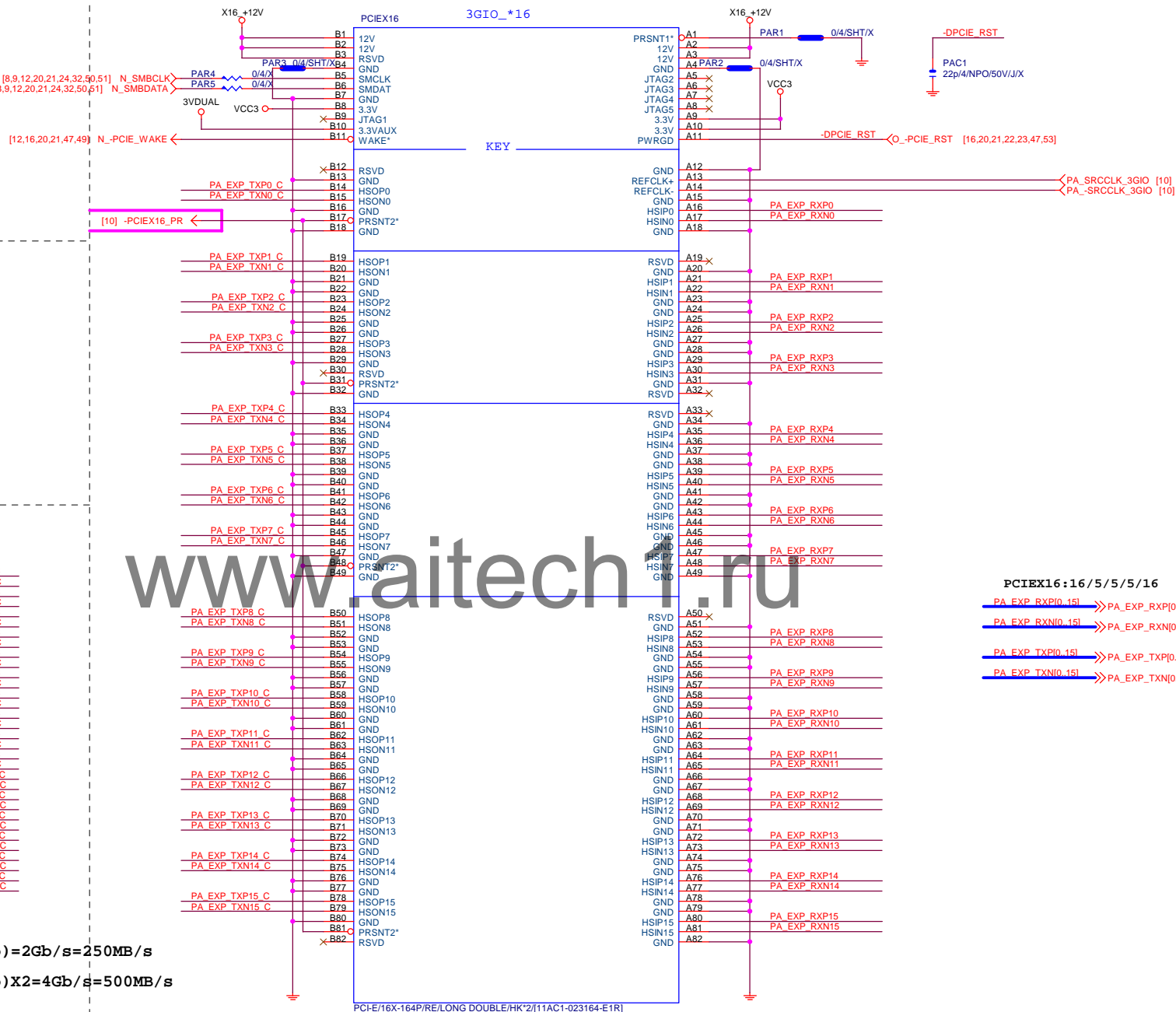
PCE-E X1(雙向) BANDWITH=2.5GHz\*(8b/10b)X2=4Gb/s=500MB/s

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--&gt; 5GHZ

## PCIEX16 SLOT



PCI-E/16X-164P/RE/LONG DOUBLE/HK\*2(11AC1-023164-E1R)

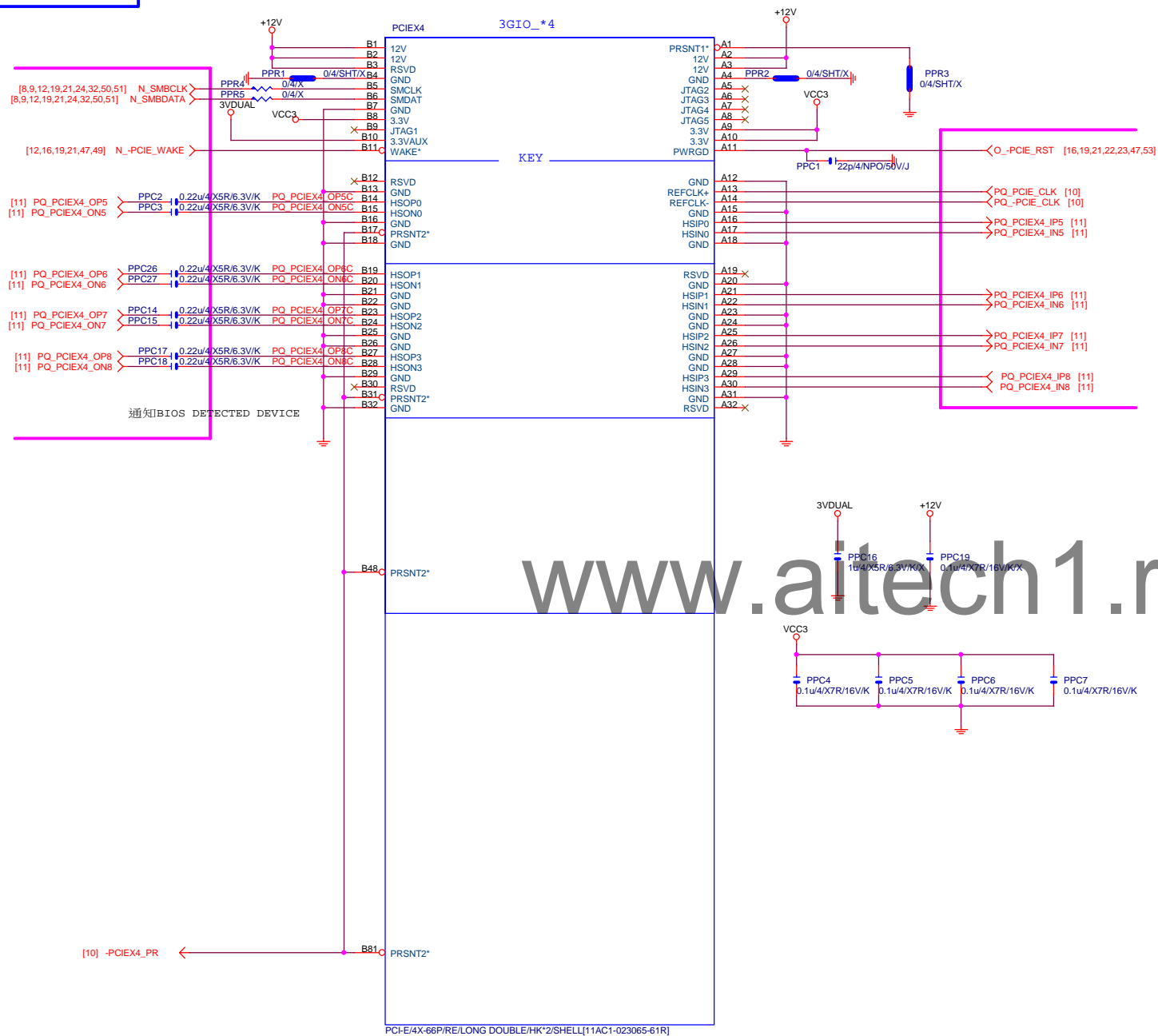
紅色

## PCIEX16:16/5/5/5/16

PA EXP RXP0.15I	>>PA_EXP_RXP0.15I [4]
PA EXP RXN0.15I	>>PA_EXP_RXN0.15I [4]
PA EXP TXP0.15I	>>PA_EXP_TXP0.15I [4]
PA EXP TXN0.15I	>>PA_EXP_TXN0.15I [4]

Gigabyte Technology

Title			
PCI EXPRESS * 16			
Size	Document Number	Rev	
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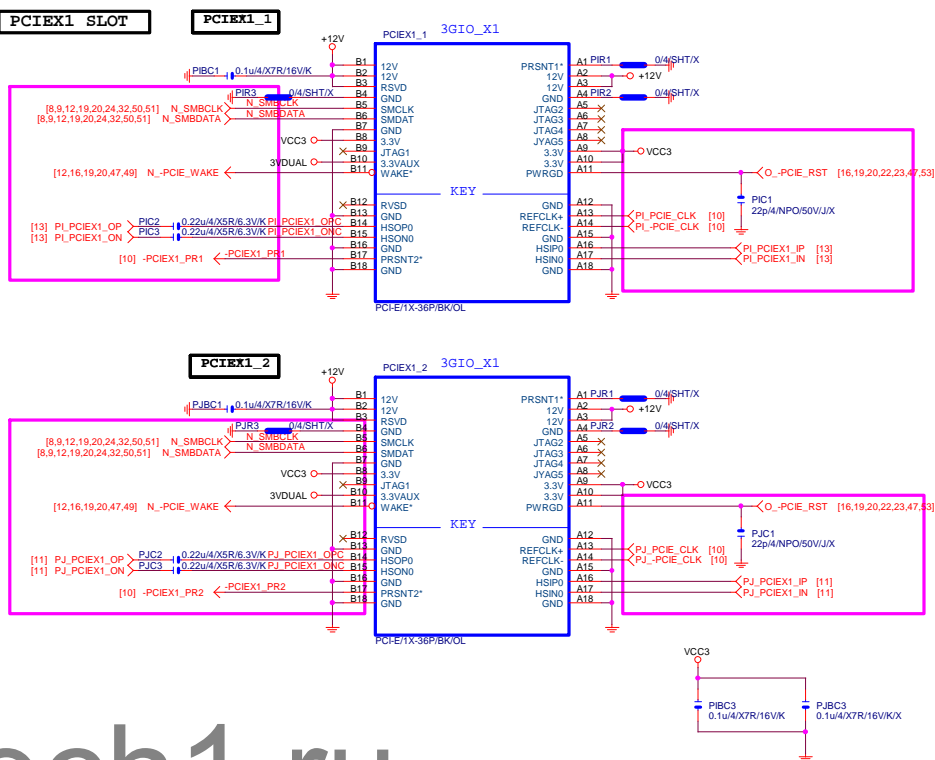


紅色STH

GIGABYTE

PCIE\_X4

Title		
GA-H170-Gaming 3		
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PCIE X4/X1 SWITCH

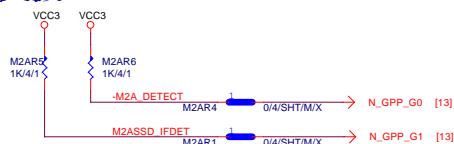
## M.2 Lane4 from PCH port18

## M.2 Lane3 from PCH port17

## M.2 Lane2 from PCH port16

## M.2 Lane2 from PCH port15

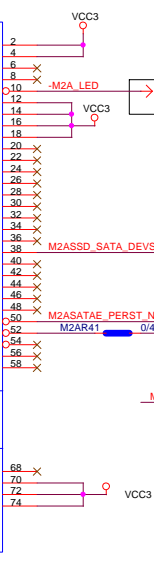
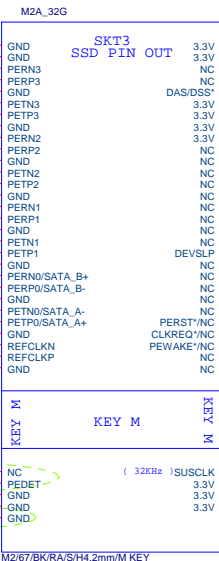
## 支援SATA and M.2 function



需與M2-CLKREQ對應

SATA : GND  
PCIE : NC

M2插卡時為Low

M2ASSD\_SATA\_PERST\_N  
M2AC7  
10p/4/NPO/50V/J/X

## DIP螺柱

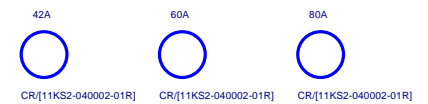


CR[12KSF-F10303-01R]



DIP螺絲

## SMD螺柱

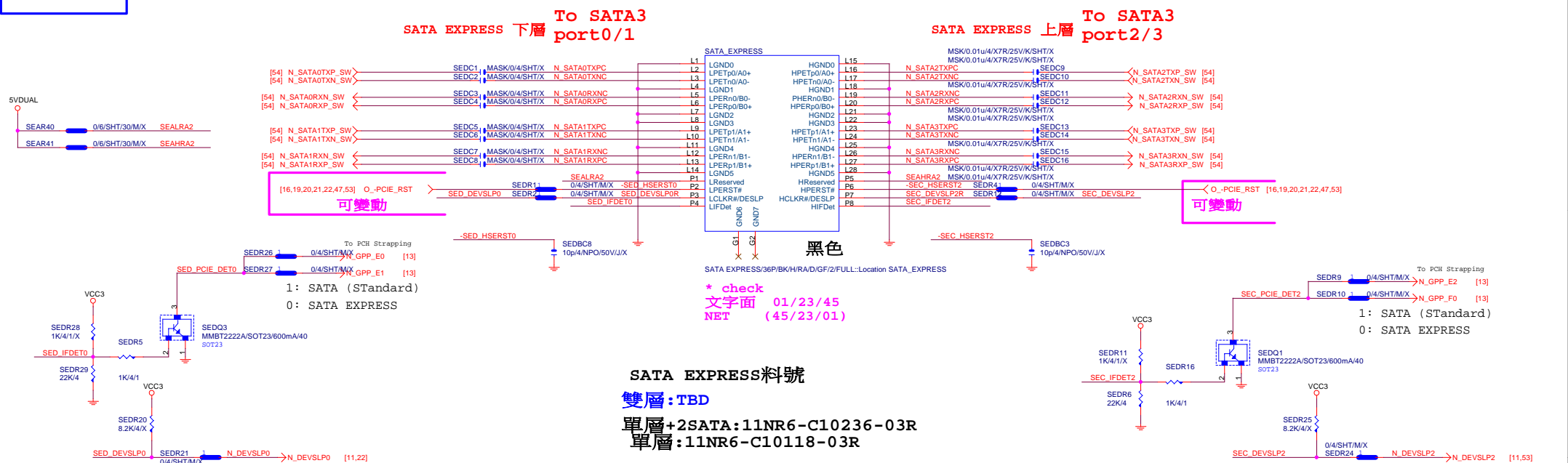


CR[11KS2-040002-01R] CR[11KS2-040002-01R] CR[11KS2-040002-01R]

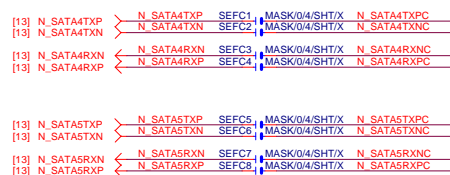
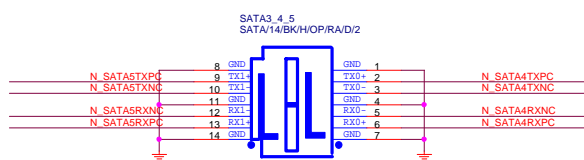
M.2 有插卡 /沒插卡 GPP_G0	M.2插何種卡? GPP_G1	SATA Express 插何種硬碟? GPP_E0/E2/F1	IO15 (S0)	IO16 (S1)	IO17	IO18	IO19 (S0)	IP20 (S1)
有插卡 (Low)	SATA Mode (Low)	SATA (Hi)	SATA (M.2)	PCIE x1	PCIE x1	PCIE x1	PCIE x1	SATA
		SATA Express (Low)	SATA (M.2)	PCIE x1	PCIE x1	PCIE x1	SATA Express	
	PCIE Mode (Hi)	SATA (Hi)	PCIE x4 (For M.2)				SATA	SATA
		SATA Express (Low)	PCIE x4 (For M.2)				SATA Express	
沒插卡 (Hi)	Don't Care (Hi)	SATA (Hi)	PCIE x4				SATA	SATA
		SATA Express (Low)	PCIE x4				SATA Express	



Rev 0.9



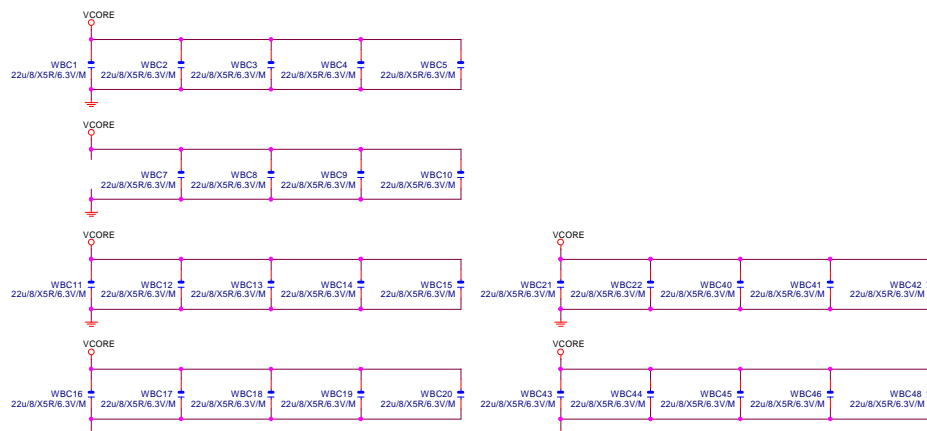
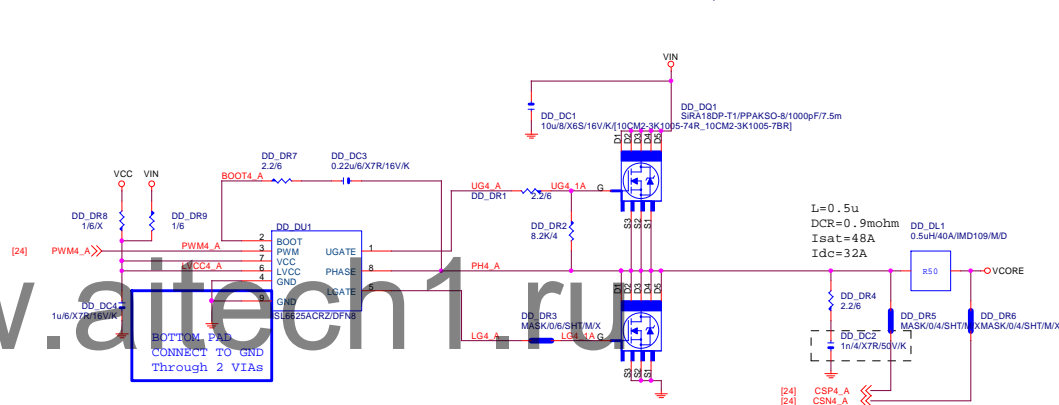
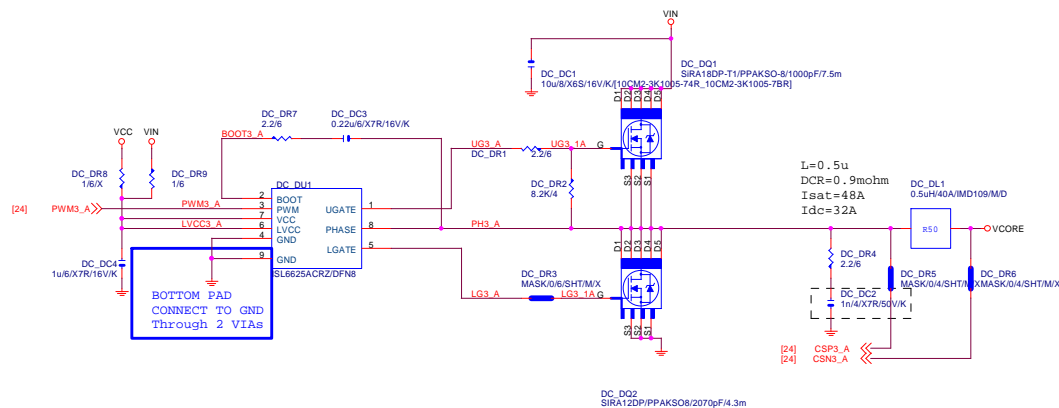
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SATA 5	(文字面寫SATA 1)
SATA 4	(文字面寫SATA 0)
SATA 3	
SATA 2	
SATA 1	(文字面寫SATA 5)
SATA 0	(文字面寫SATA 4)

<p align="center"><b>GIGABYTE Technology</b></p>		
<p align="center"><b>SATA EXPRESS</b></p>		
<p>Size Custom</p>	<p>Document Number</p>	<p>Rev 1.0</p>
<p align="center"><b>GA-H170-Gaming 3</b></p>		
<p>Date: Wednesday, January 30, 2016 22:23:55</p>		





DALI1  
0.5uH/40A/IMD109/M/D

V12

DAC36  
1u6/X7R/16V/K

R50

DAEC14  
270uF/16V/8C/A/10m

DAEC15  
270uF/16V/8C/A/10m

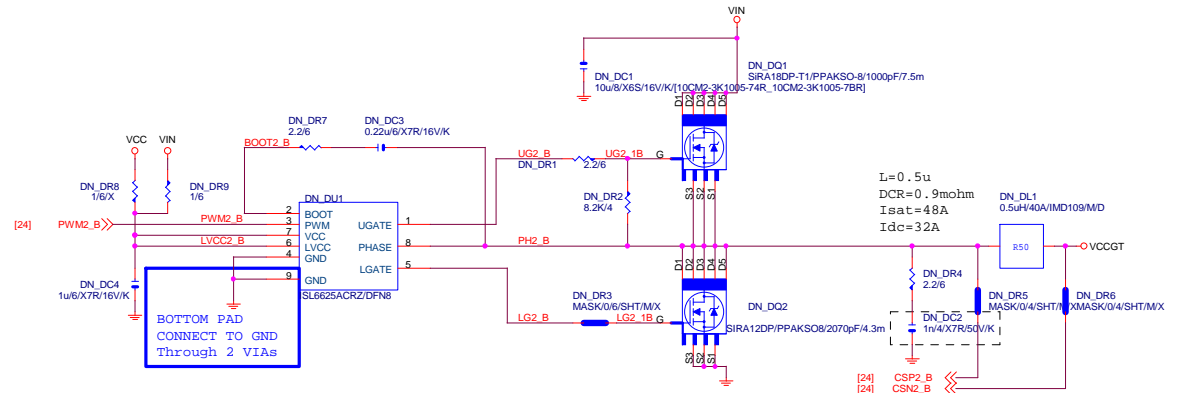
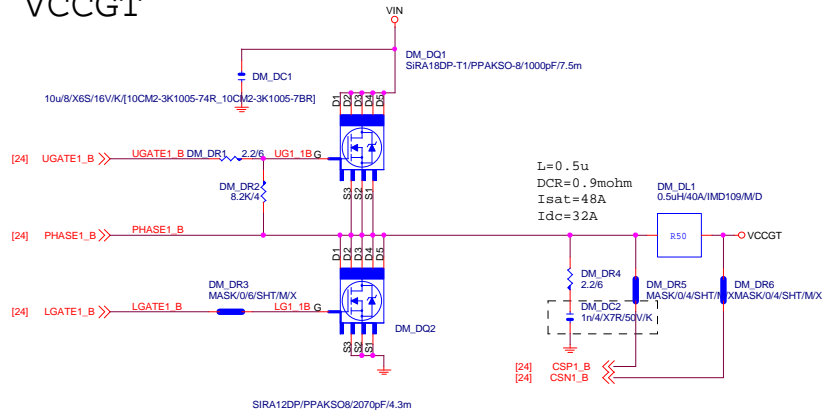
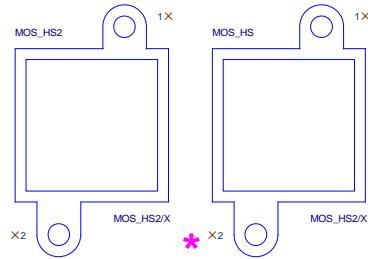
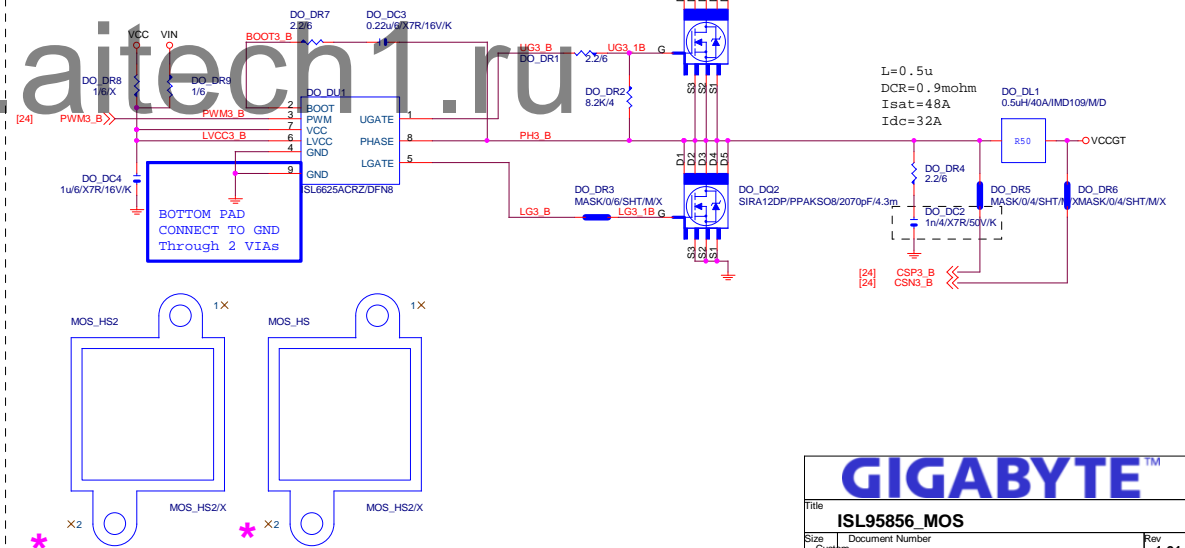
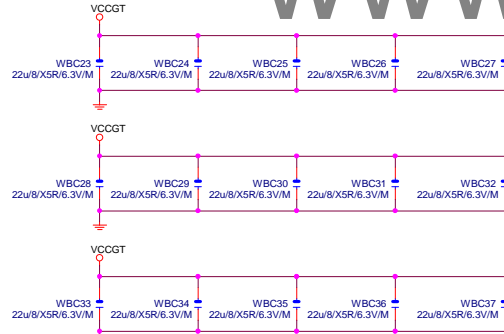
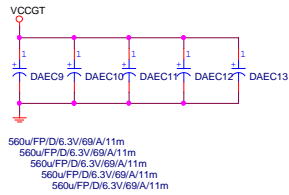
DAEC1  
270uF/16V/8C/A/10m

VIN

# GIGABYTE

Title			
ISL95856_MOS			
Size	Document Number	Rev	
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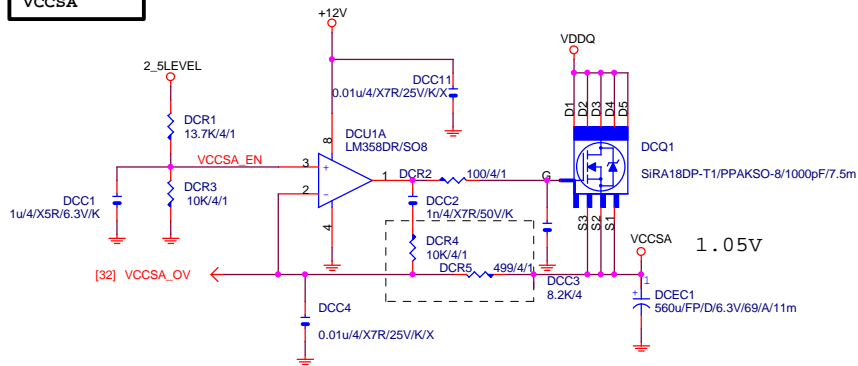
## VCCGT

VCCGT CAP 560u\*5PCS  
22u\*15PCS

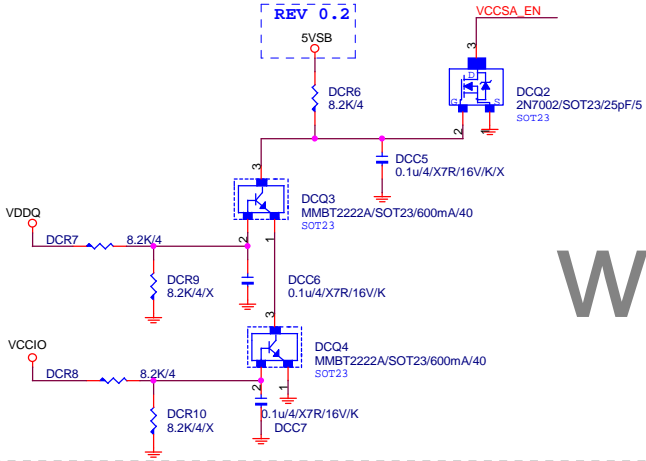
GIGABYTE™			
Title			
ISL95856 MOS			
Size	Document Number	Rev	
Custom	GA-H170-Gaming 3	1.01	
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REV:0.4

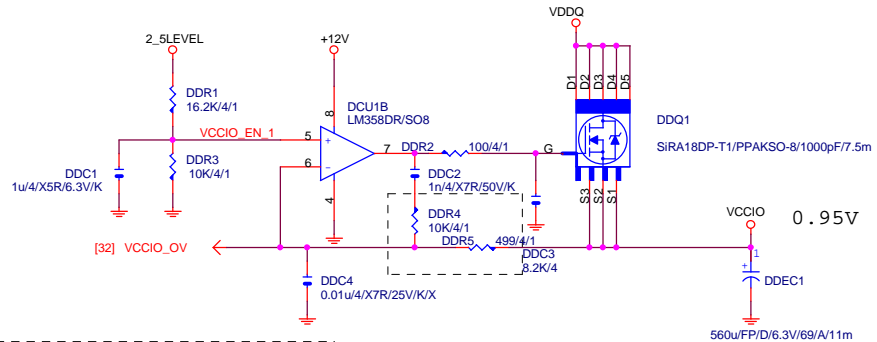
VCCSA



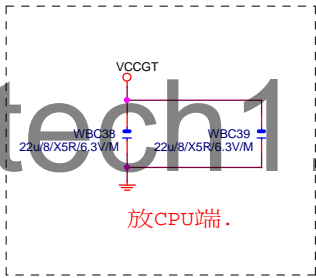
REV 0.2



VCCIO



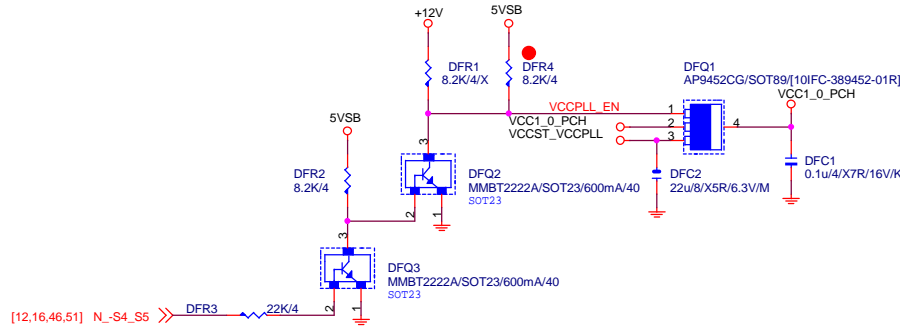
VCCIO\_EN 1 DDR10 0/4/SHT/10/M/X  
Connect to IT8620 [16]



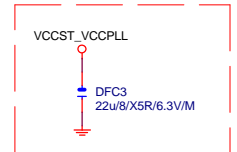
放CPU端.

REV:0.2

VCCST\_VCCPLL



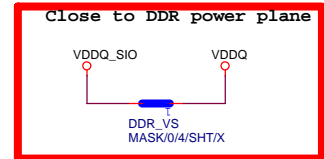
靠近CPU



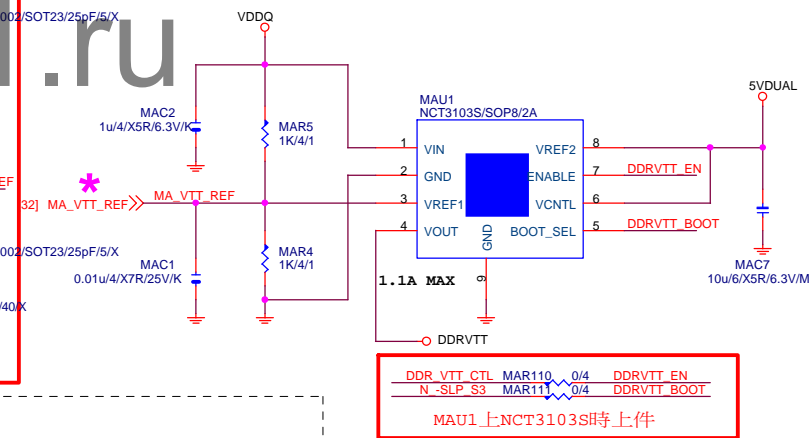
GIGABYTE™

Title			VCCSA_VCCIO_no 44E
Size	Custom	Document Number	GA-H170-Gaming 3
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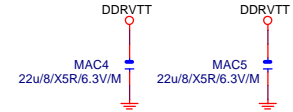
DDR4



Remote sense請從最重的負載端點拉回



DDRVTT CAP



**GIGABYTE™**

Title				
<b>RT8120_DDR4 POWER</b>				
Size	Document Number			Rev
Custom	<b>GA-H170-Gaming 3</b>			<b>1.01</b>
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**VPP 25V**

DDR\_VPP VIN CAP  
560u\*1PCS

SUPPORT DDR4 2.5V

Remote sense請從最重的負載端點拉回

VPP CAP 560u\*1PCS

\* 大電容 x1

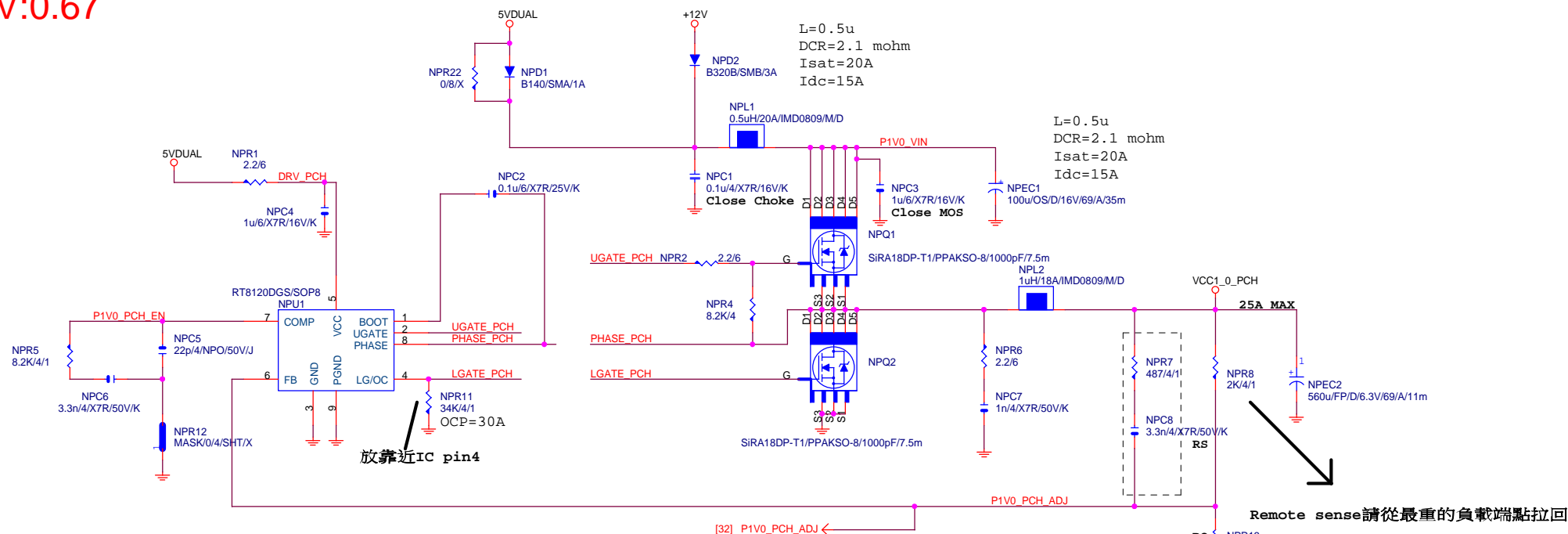
**GIGABYTE™**

Title			
RT8120_VPP25 POWER			
Size	Document Number	Rev	
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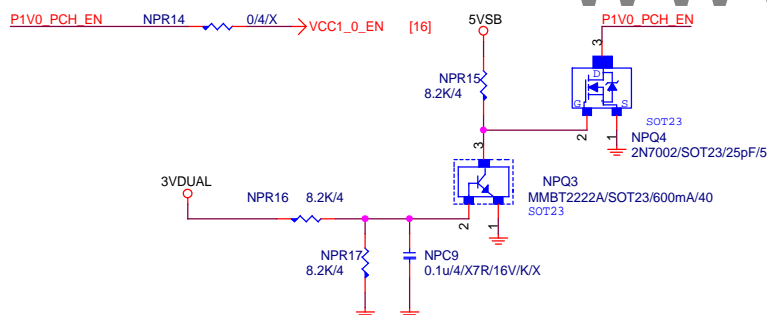
REV:0.67



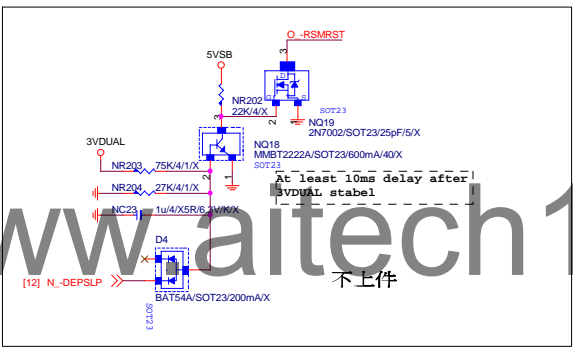
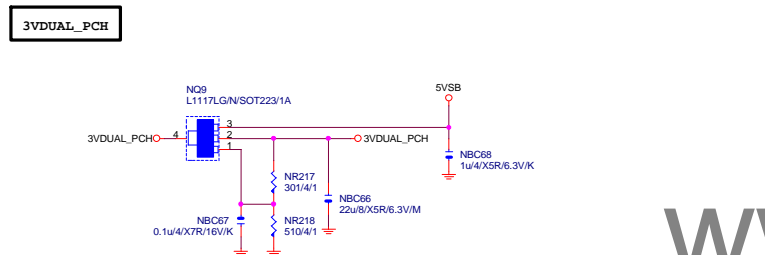
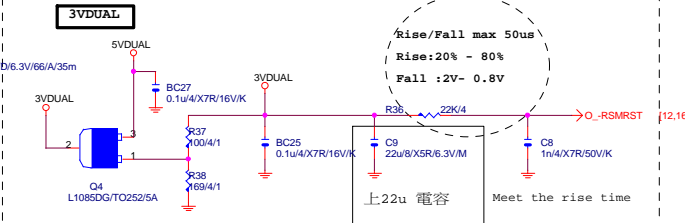
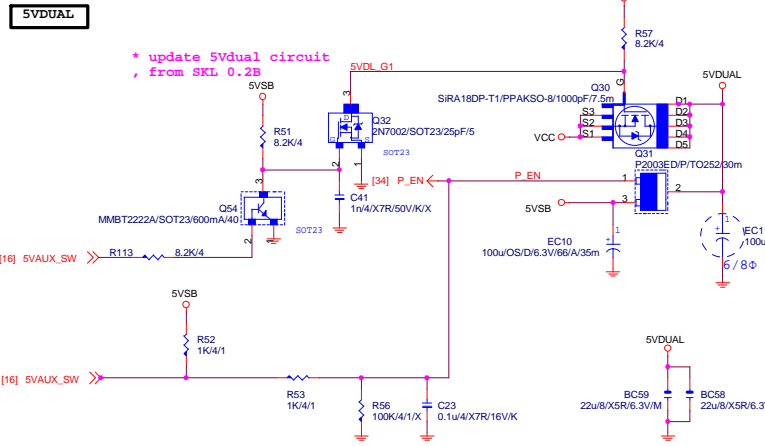
Remote sense請從最重的負載端點拉回

$$\begin{aligned} 0.8 \cdot (1 + R_S/R_O) &= V_{out} \\ 0.8 \cdot [1 + 2K/8K] &= \\ 1.0V \end{aligned}$$

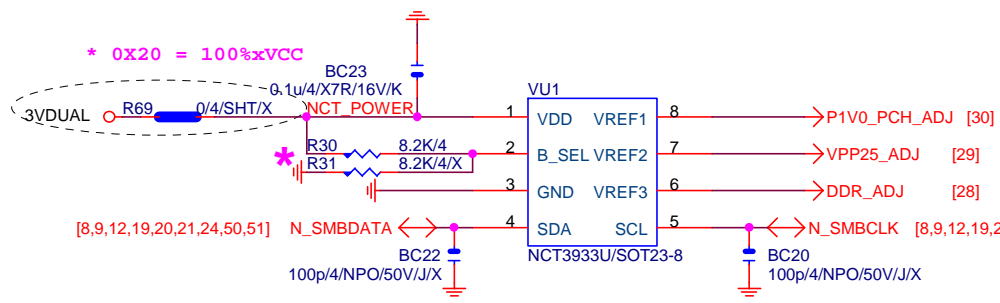
請放置CHOKE一出來的地方

**GIGABYTE™**

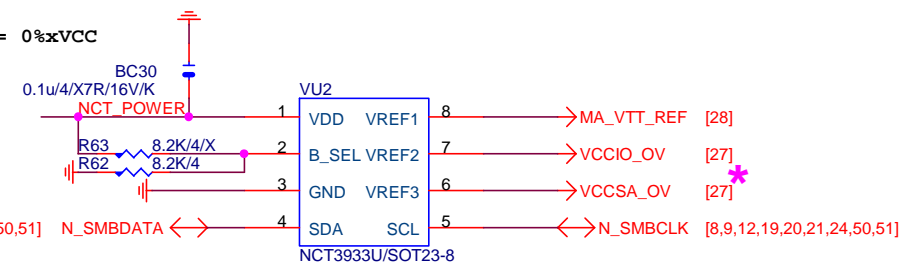
Title <b>RT8120_PCH POWER</b>			
Size Custom	Document Number <b>GA-H170-Gaming 3</b>	Rev <b>1.01</b>	
Date: Wednesday, January 20, 2016	Sheet 30 of 55		



OVER VOLTAGE



0X2A = 0%xVCC



0X22 = 75%xVCC

\* 删除 OVU3

NCT3933	0X2A	0X20	0X22
VREF1	DDRVTT	VREF_DDRA_DQ	PCH Core
VREF2	VREF_DDRA_CA	N/A	VCCL_5_PCH
VREF3	VREF_DDRA_CA	VREF_DDRB_DQ	SMREF

**Gigabyte Technology**

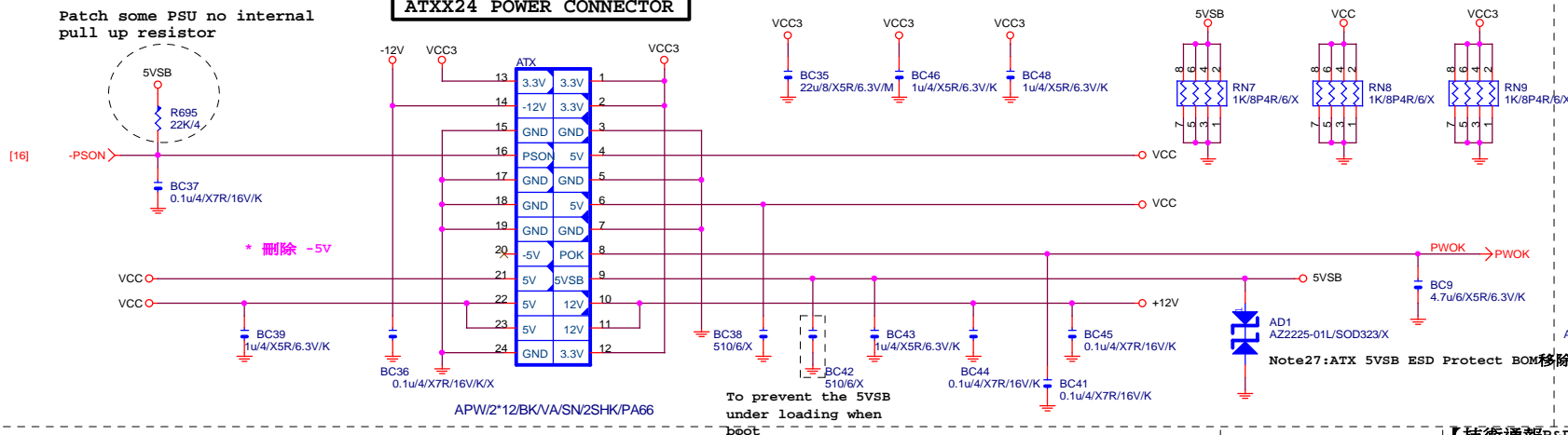
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Size: Custom Document Number: GA-H170-Gaming 3 Rev: 1.01

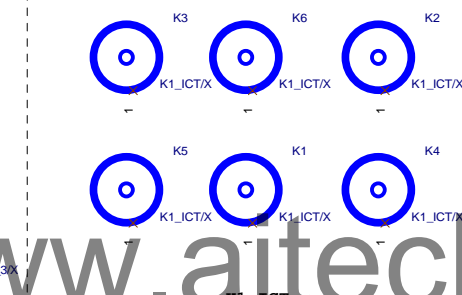
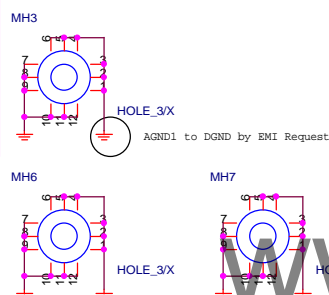
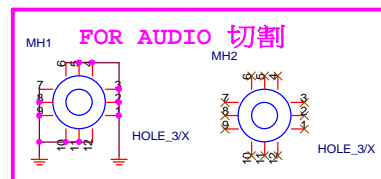
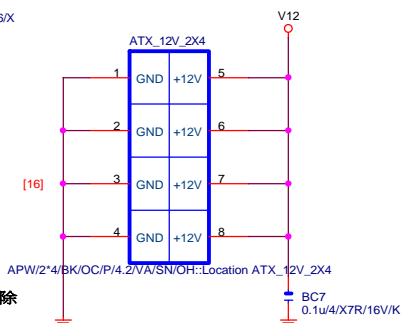
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Patch some PSU no internal pull up resistor

## ATXX24 POWER CONNECTOR

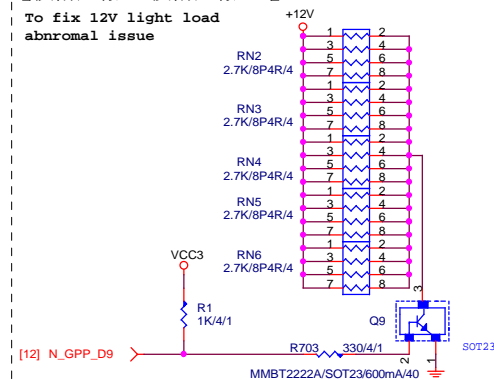


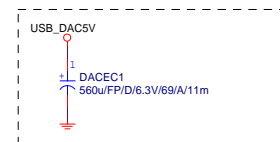
## ATXX4 POWER CONNECTOR



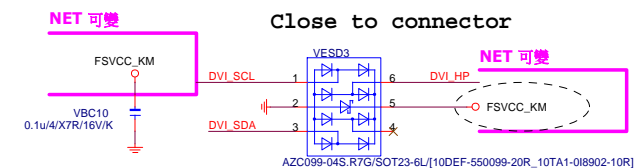
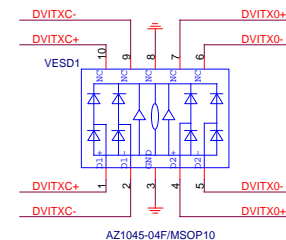
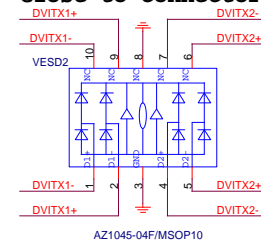
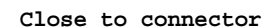
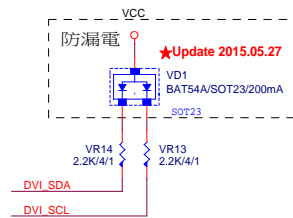
## 【技術通報R&D技術通報153】

To fix 12V light load abnormal issue





## NET 可變



ROM PART: PTN3356R1BS/[10HQ5-A23356-10R]  
FLASH PART: PTN3356F1BS/[10HQ5-A23356-20R]

省X'TAL COST DOWN:

1. 上件:

DVC28 [10p/4/NPO/50V/J]

DVC11 [10p/4/NPO/50V/J]~修改值  
DVR10 [8.2K/4]

2. 删除:

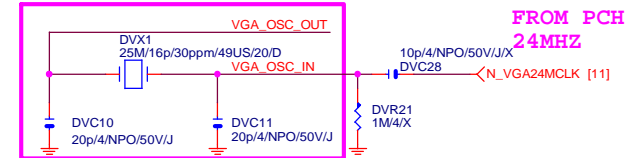
DVX1 [25M/16p/30ppm/49US/20/D]

DVC10 [20p/4/NPO/50V/J]

DVR9 [8.2K/4]

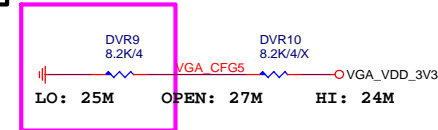
## 25M Crystal

From PCH 24MHz Issue

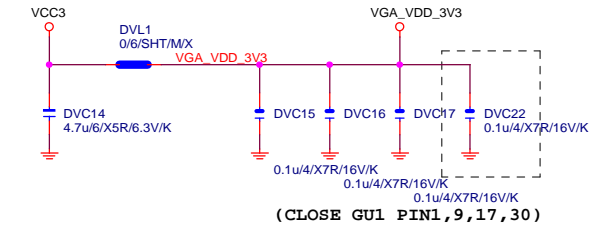
FROM PCH  
24MHZ

## CFG5

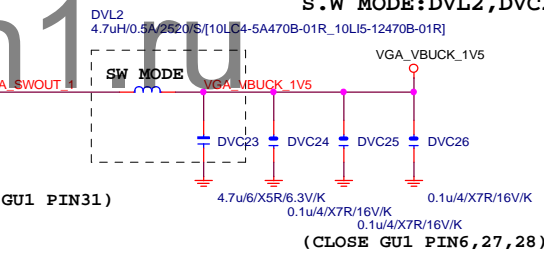
For Crystal Less



## ADAPTER POWER



(CLOSE GU1 PIN1,9,17,30)

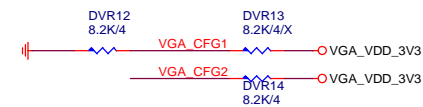
LDO MODE: DVL2, DVC23-->X  
S.W MODE: DVL2, DVC23-->O

(CLOSE GU1 PIN31)

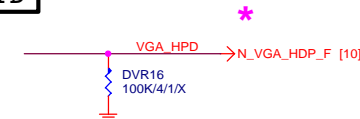
(CLOSE GU1 PIN6,27,28)

## CFG1&amp;2

Non-Compliant



## HPD

Gigabyte Technology  
NXP-PTN3356

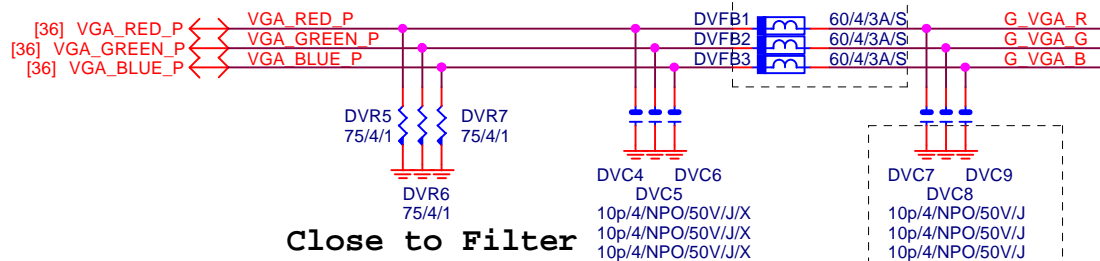
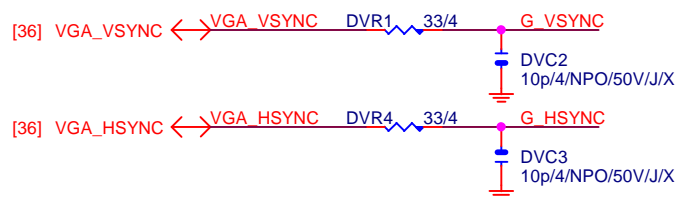
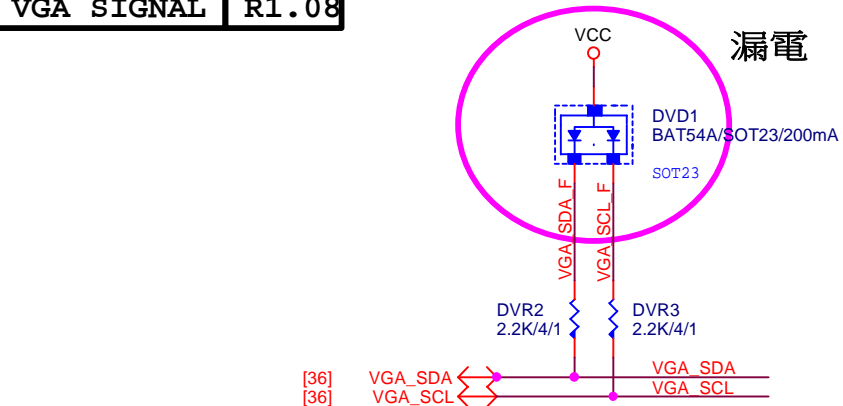
Title	GA-H170-Gaming 3	Rev	1.01
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Custom			
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放置PCH端

[10] N\_DDPD\_CTRLCLK <--> DVR19 2.2K/4/1 <--> VCC3  
[10] N\_DDPD\_CTRLDATA <--> DVR20 2.2K/4/1 <--> VCC3

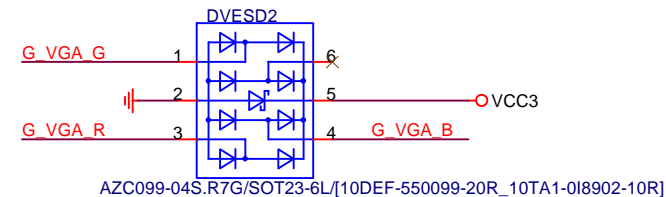
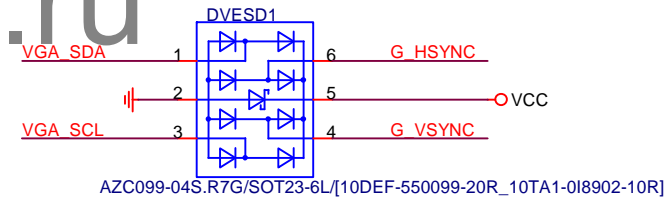
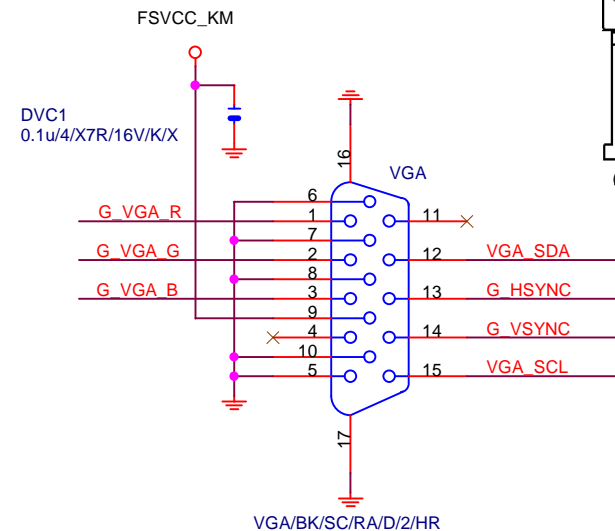
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Close to Filter

FOR EMI



Gigabyte Technology  
NXP-PTN3356

Title

Size  
Custom

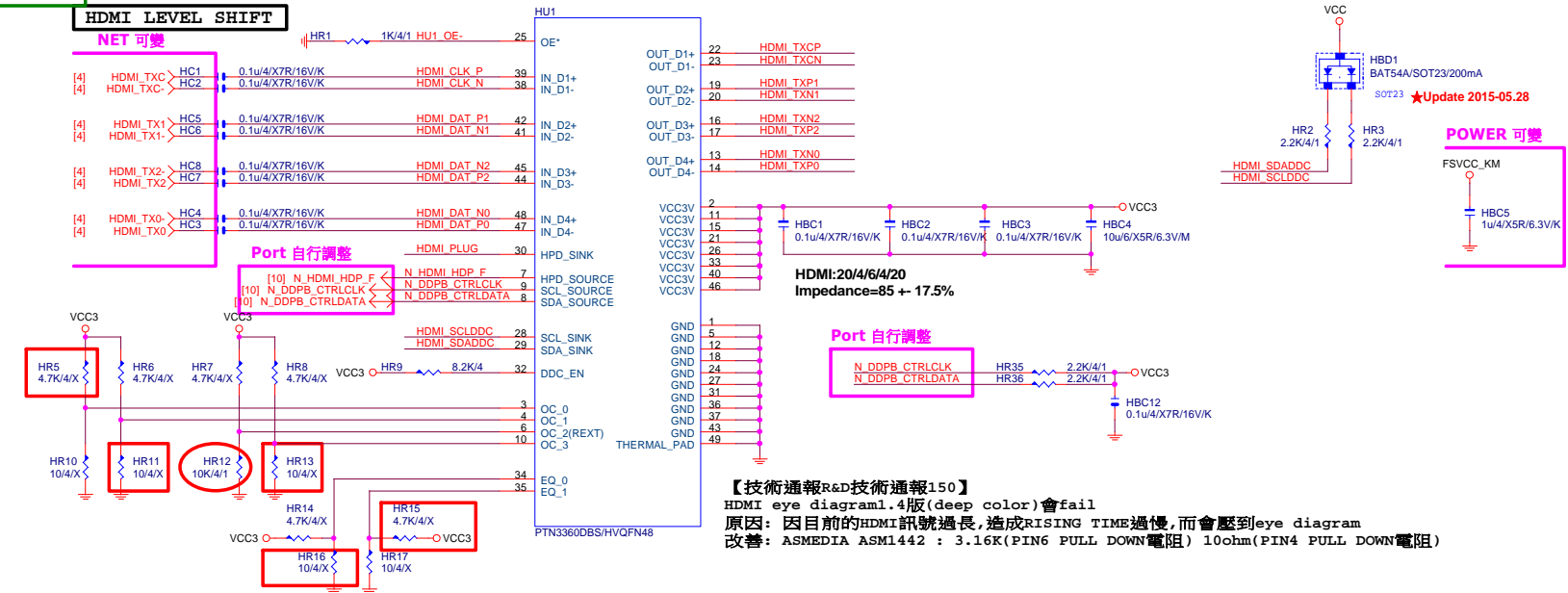
Document Number

GA-H170-Gaming 3

Rev  
1.01

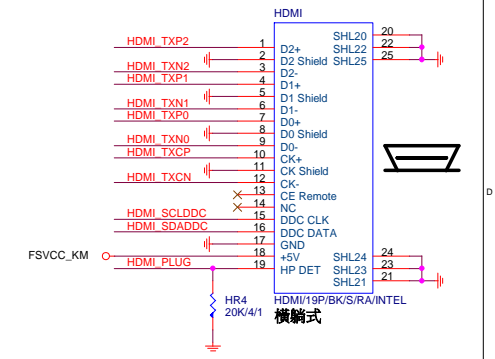
Date: Wednesday, January 20, 2016

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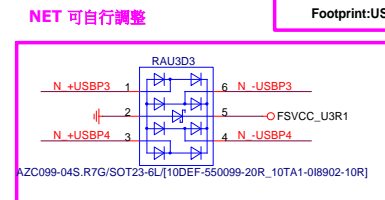
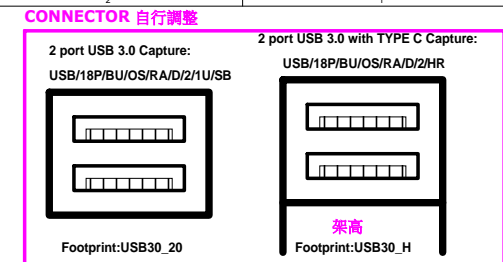
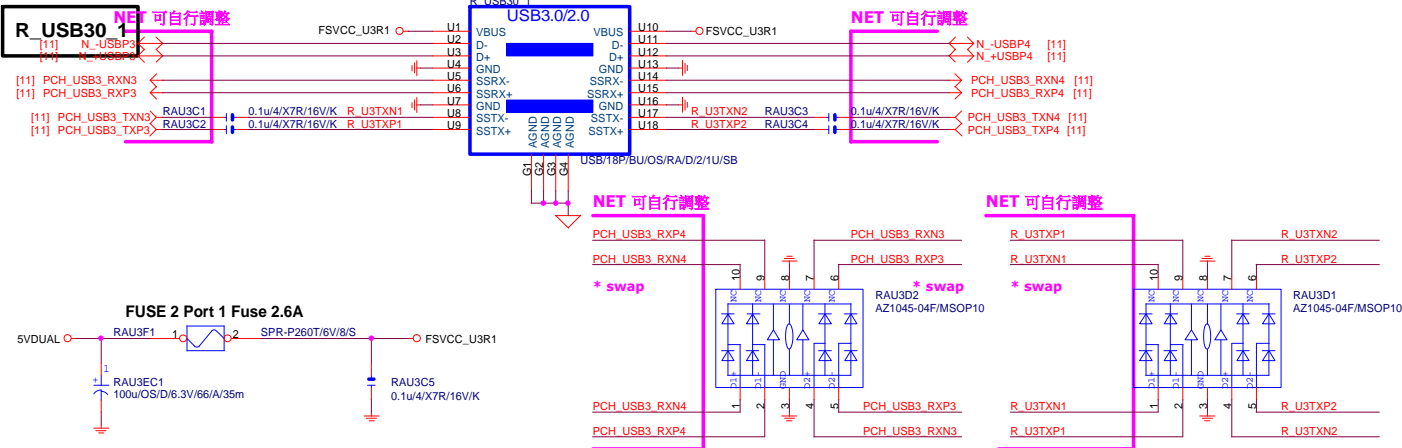


PTN3360:PIN 4/10/34/35 NC PIN,都不上值;只上HR12:10K  
PTN3360DBS/HVQFN48  
ASM1442:紅色框要上,HR12:3.16K  
ASM1442K/QFN-48L/[10TA1-051442-30R]

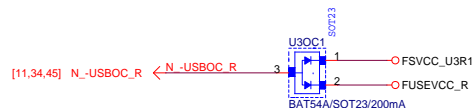
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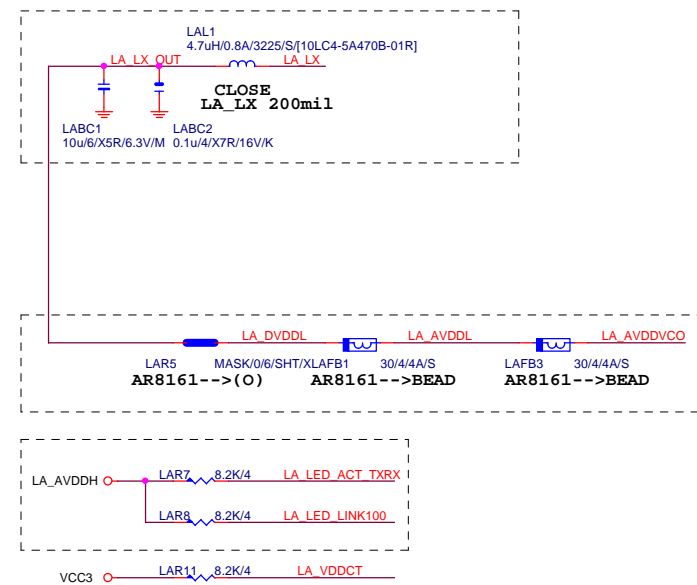
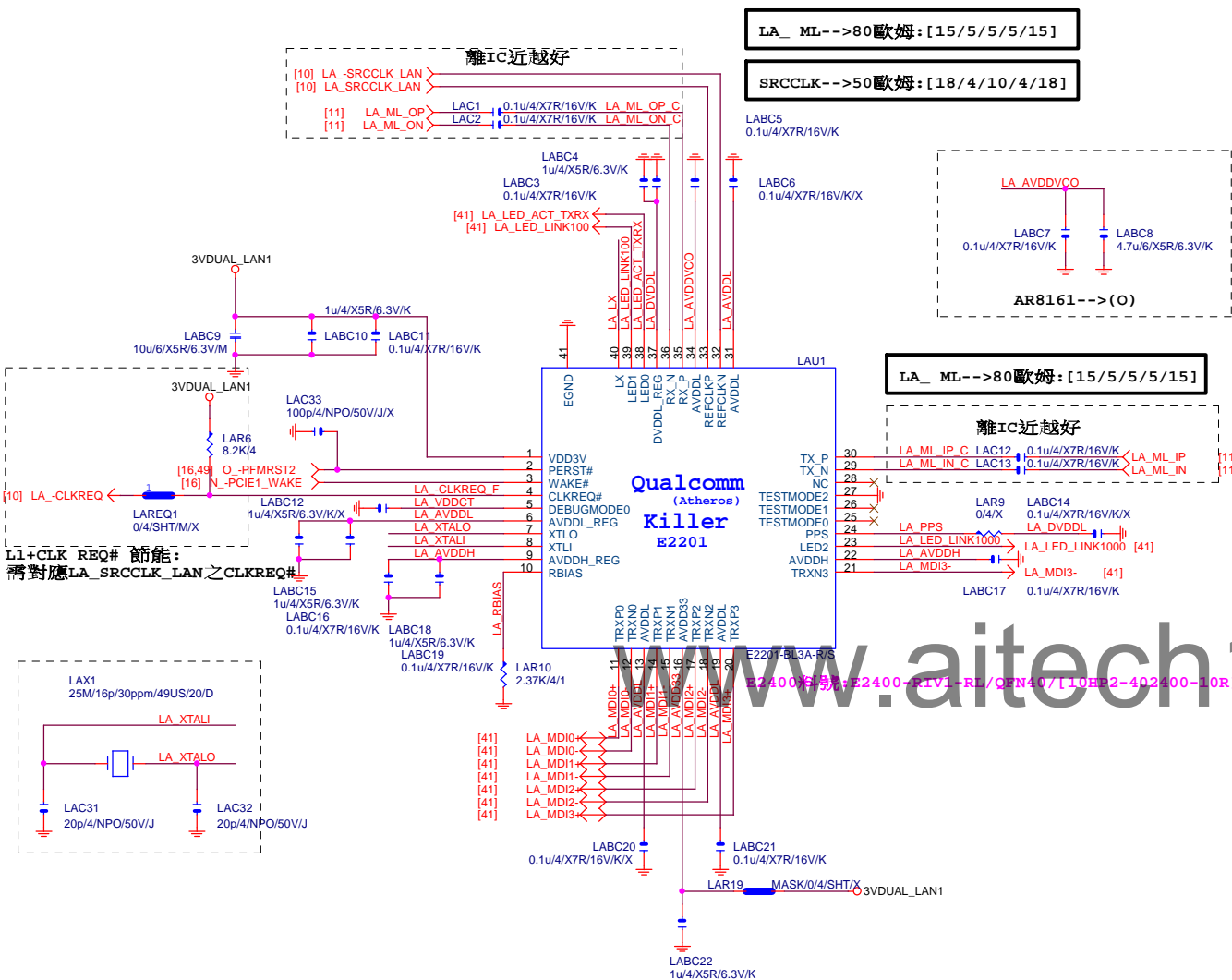
Rev: 0.53



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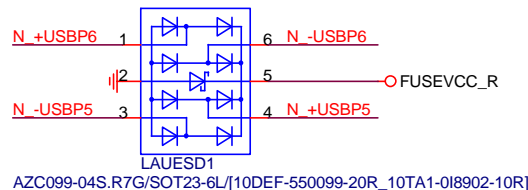
Gigabyte Technology			
Title			
R_USB30,F_USB30, USB_OC			
Size	Document Number	GA-H170-Gaming 3	
Custom			Rev 1.01
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## R1.05

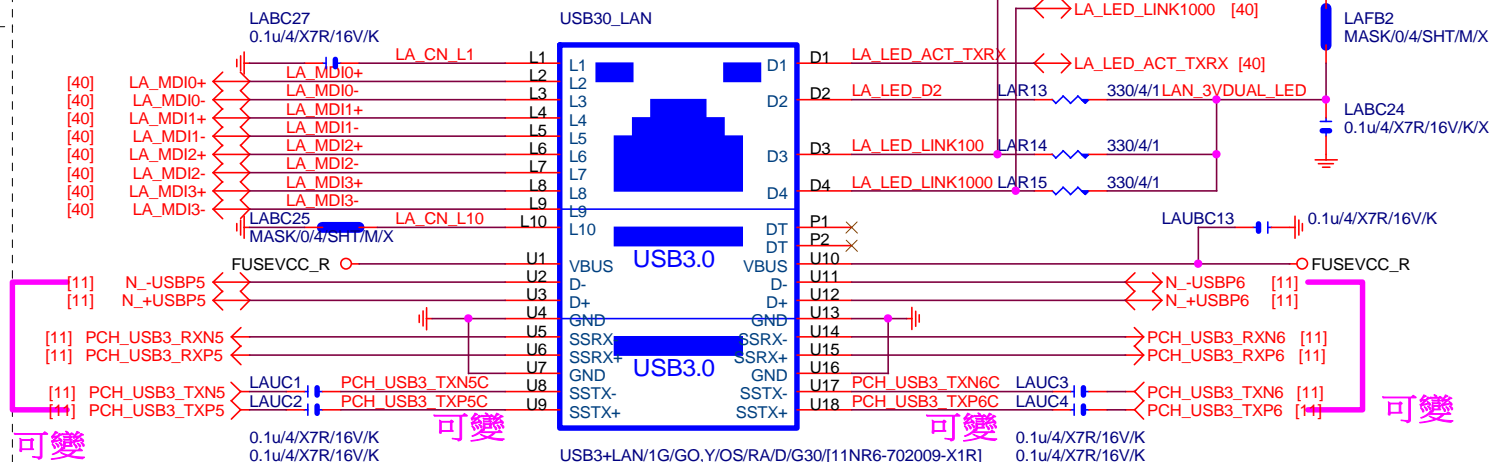
note:可變更USB NAME

## 可變



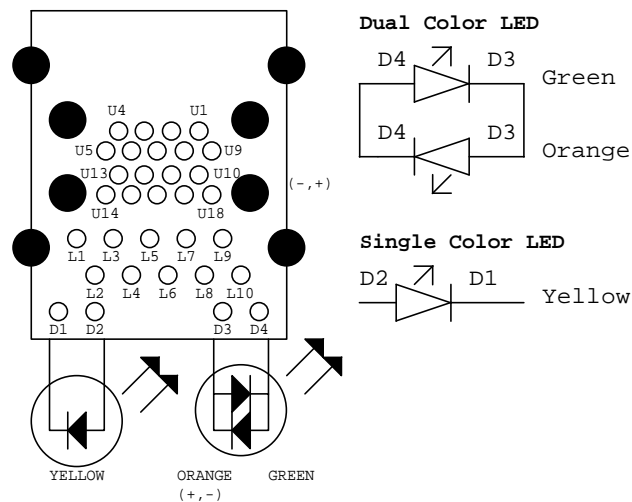
note:可變更USB NAME

[E2201]



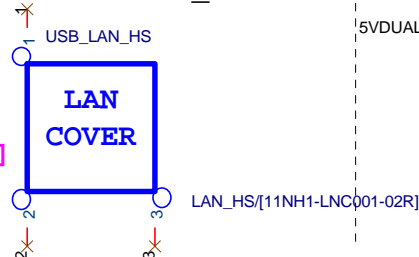
LA\_MDI-->100歐姆:[20/4/8/4/20]

## Dual Color LED



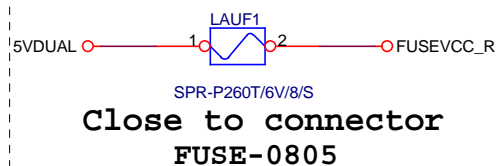
FOOT PRINT:LAN COVER

可變  
[視SPEC需求]



note:可變更FUSE

## 可變

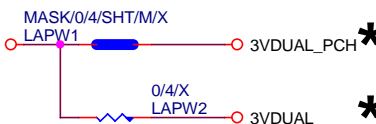


## LAN POWER

PS:視EMI需求



## 可變



## Gigabyte Technology

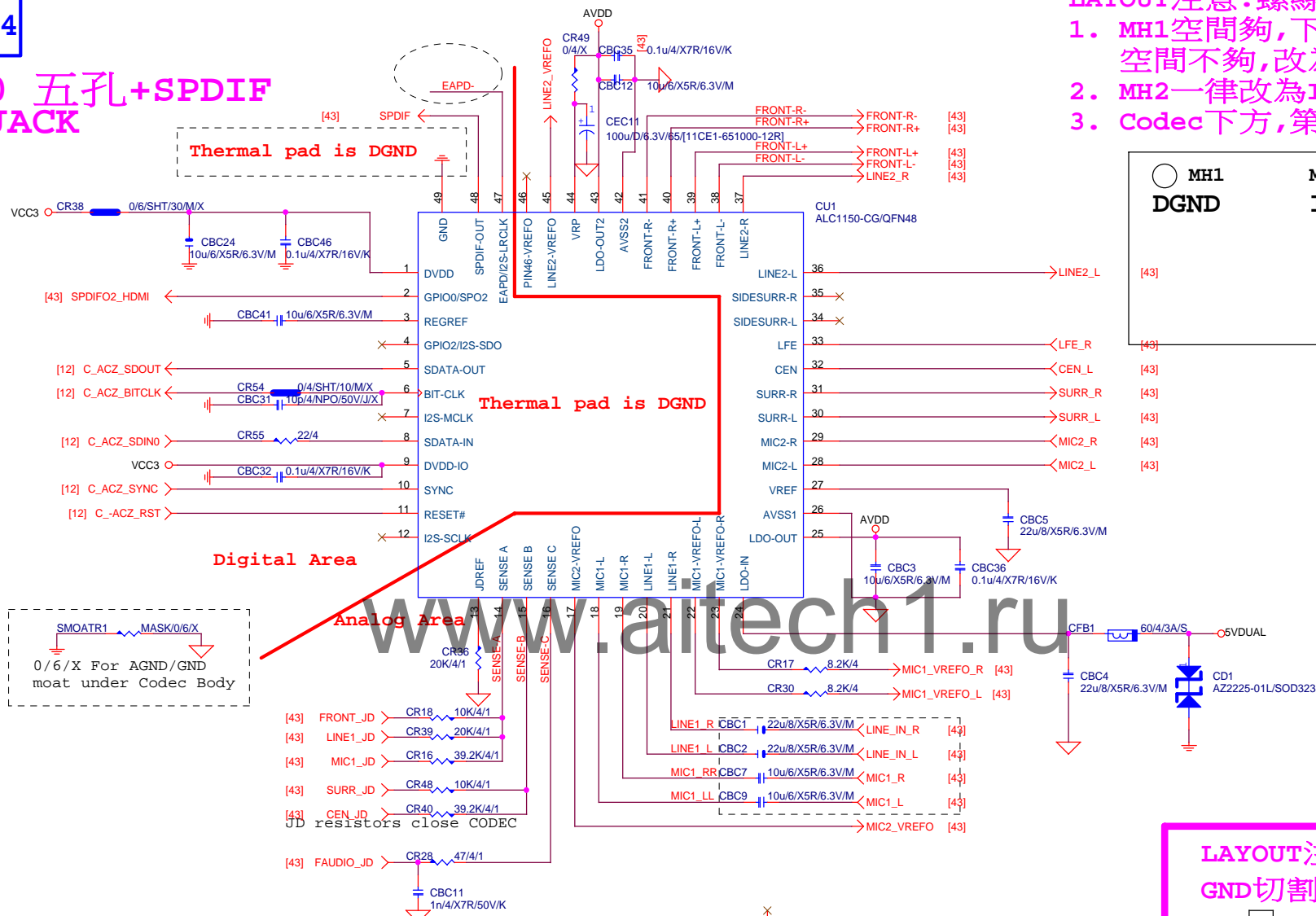
## LAN CONNECTOR-E2201

## GA-H170-Gaming 3

Title			
LAN CONNECTOR-E2201			
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Rev 0.94

# ALC1150 五孔+SPDIF AUDIO JACK



LAYOUT注意:螺絲孔下GND方式

1. MH1空間夠,下DGND  
空間不夠,改為Isolate
2. MH2一律改為Isolate
3. Codec下方,第二層必須參考GND

MH1  
DGND

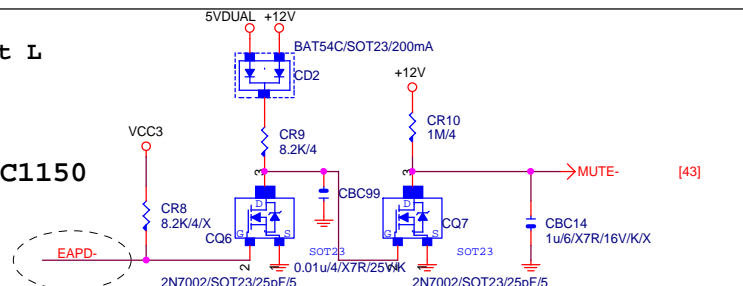
MH2  
Isolate

LAYOUT注意:要加  
GND切割線



EAPD: Default L  
H : ON  
L : OFF

Close to ALC1150

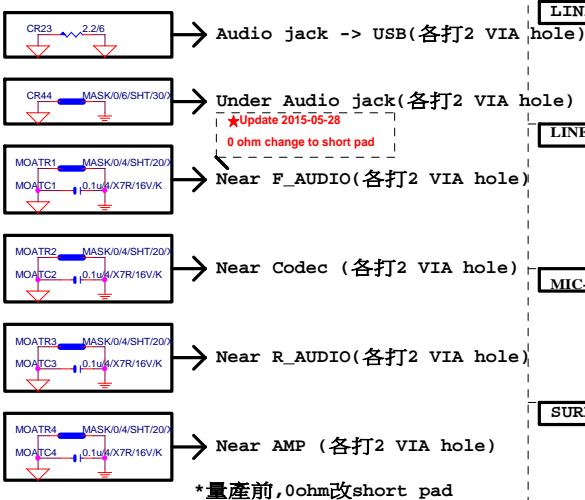
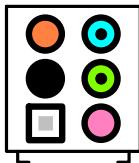


Gigabyte Technology

Title				
ALC1150				
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Rev 0.94

AZALIA JACK



LINE-OUT

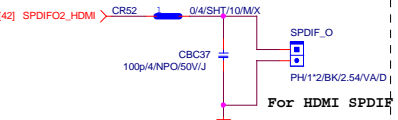
LINE-IN

MIC-IN

SURROUND

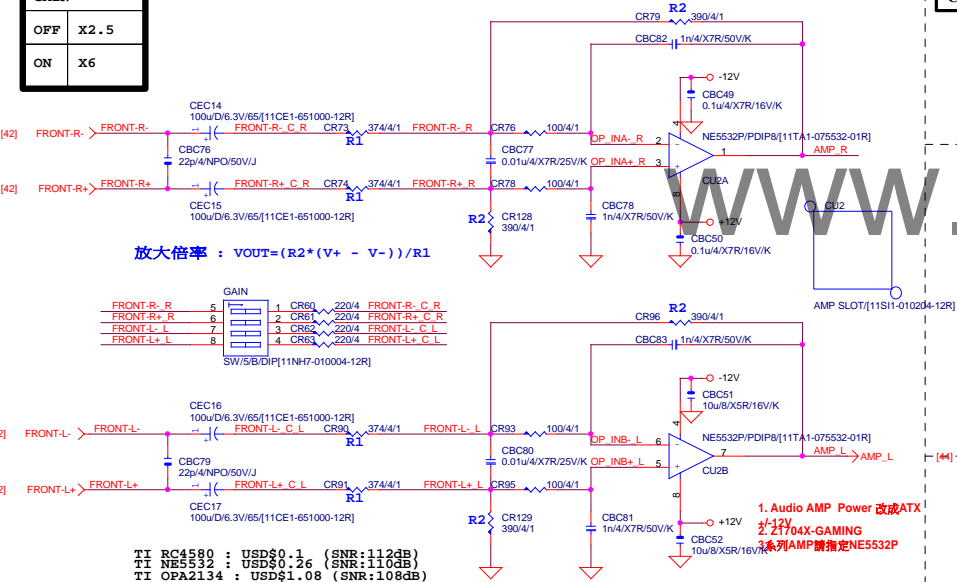
CEN/LFE

SPDIF OUT

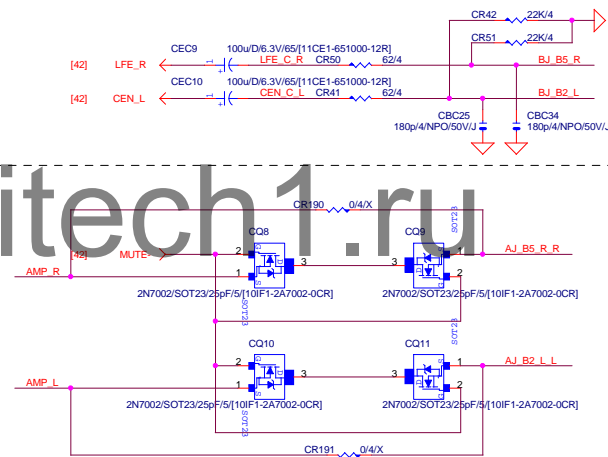
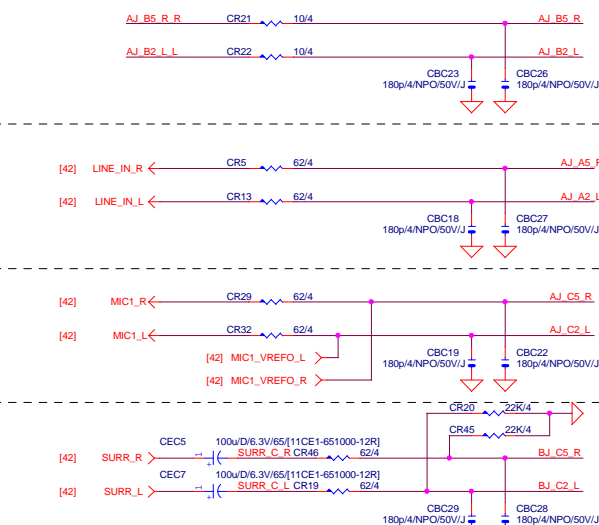
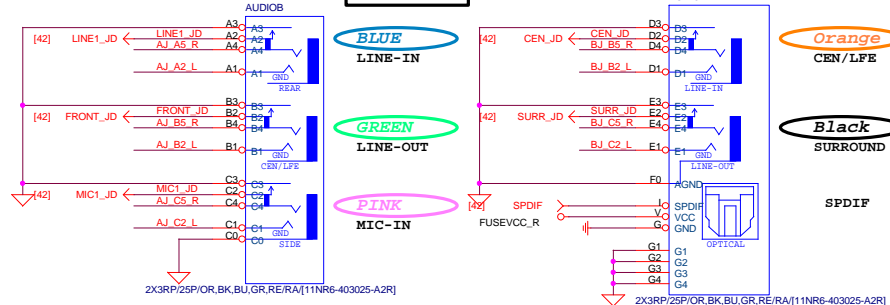


GAIN	
OFF	X2.5
ON	X6

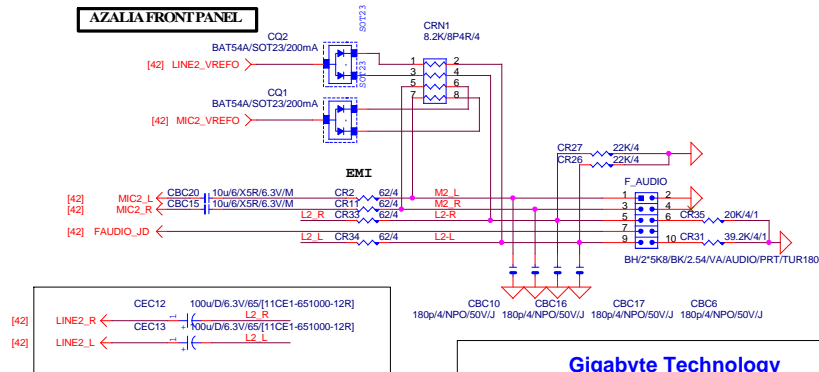
## Differential to Single-End AMPLIFIED



AZALIA JACK



AZALIA FRONT PANEL

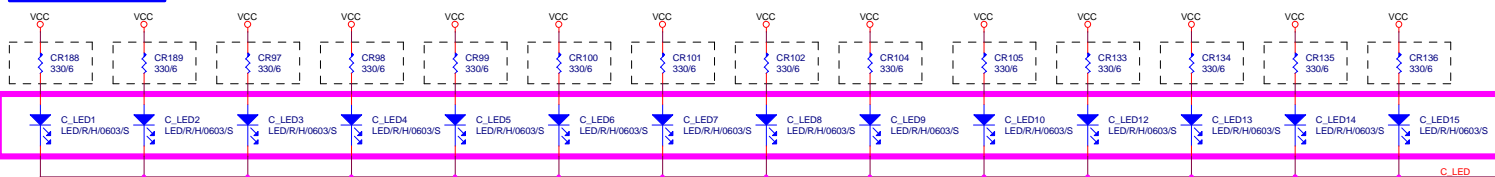


Gigabyte Technology

File	AUDIO JACK	
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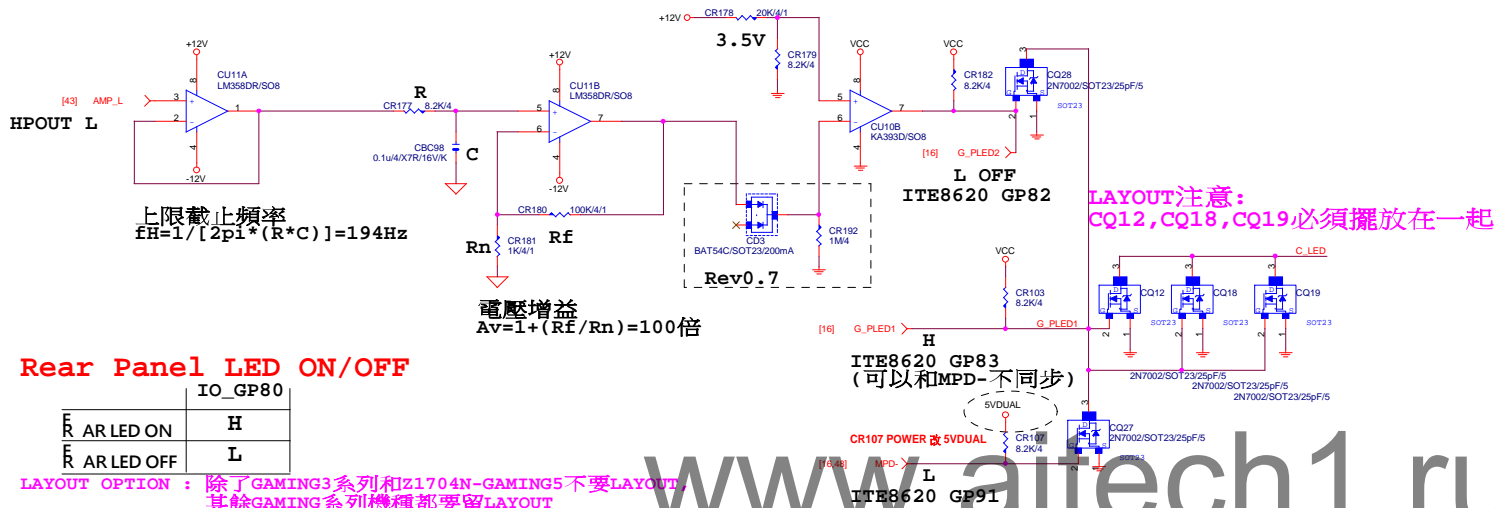




VALUE可變,LED顏色請自行修改

[UD/SOC系列--> 白光LED(黃色):LED/W/6/S]

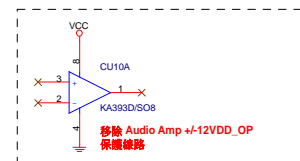
[GAMING系列--> 紅光LED(紅色):LED/R/H/0603/S]



## Rear Panel LED ON/OFF

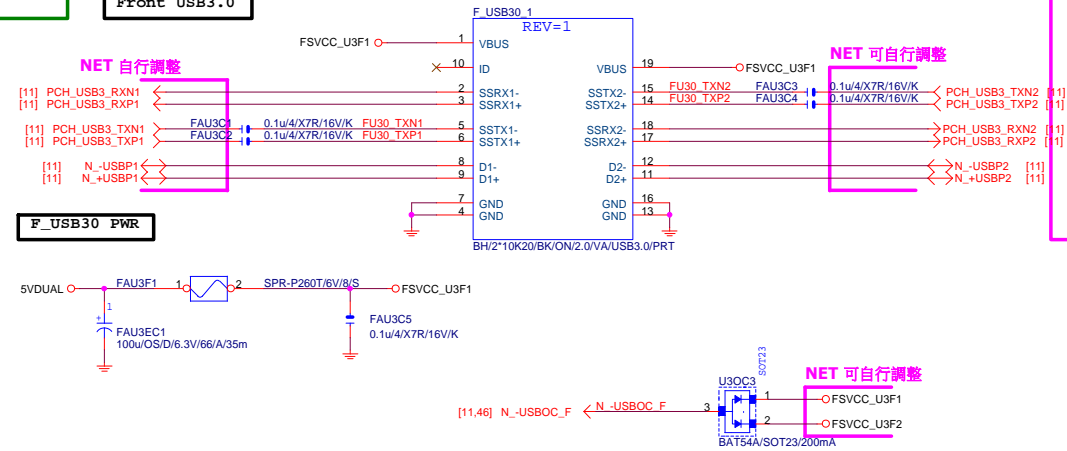
## AUDIO LED Control (沒有LPT model)

	IO_GP82	IO_GP83	IO_GP91
Still Mode	L	H	L
OFF Mode	L	L	L
Pluse Mode	L	H	BREATH
Beat Mode	OD	H	L

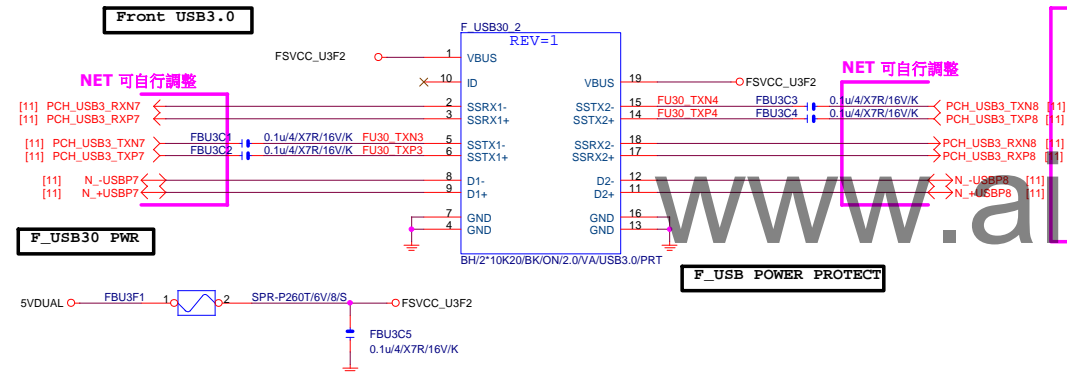
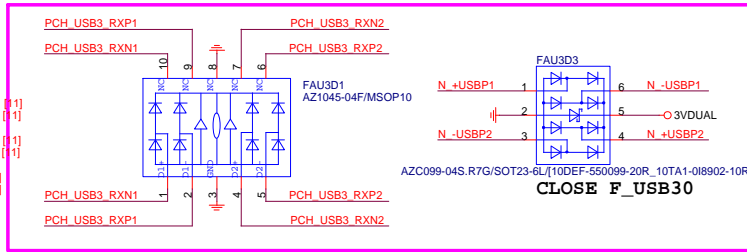


# GIGABYTE™

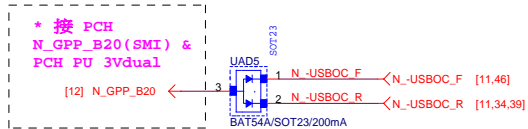
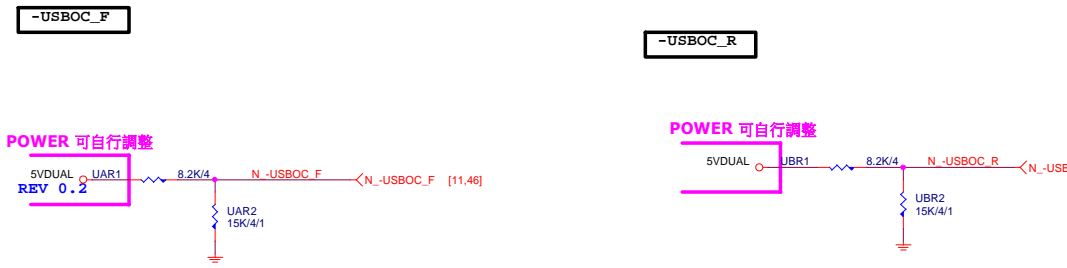
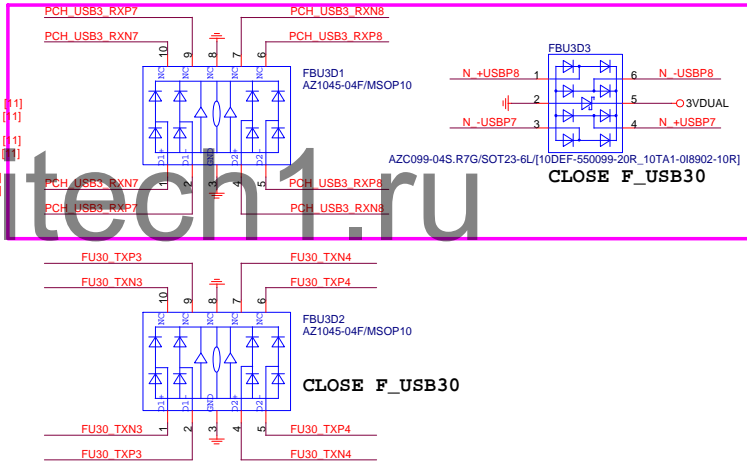
Front USB3.0



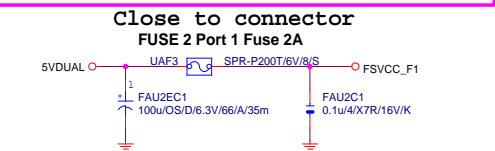
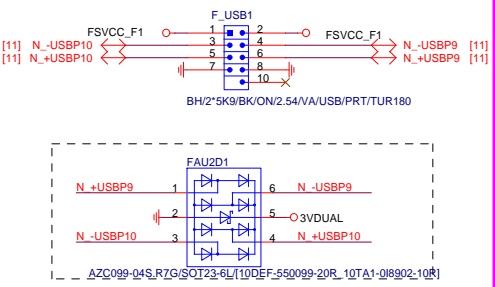
NET 可自行調整



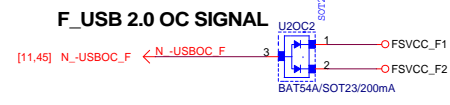
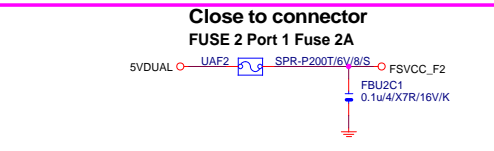
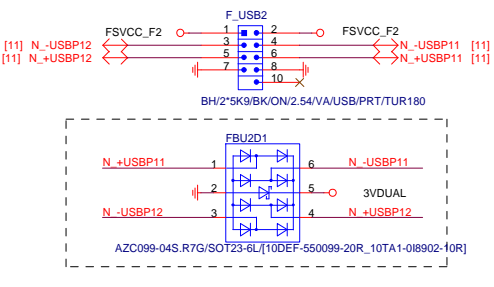
NET 可自行調整



NET 可變



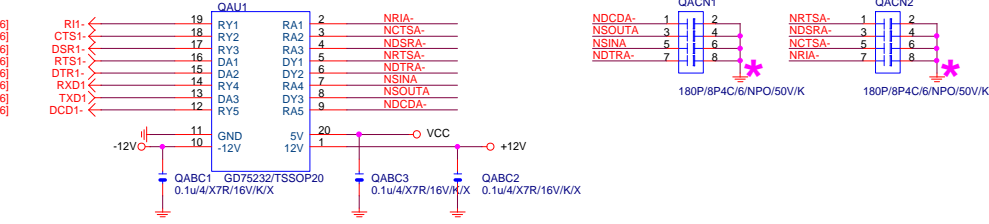
NET 可變



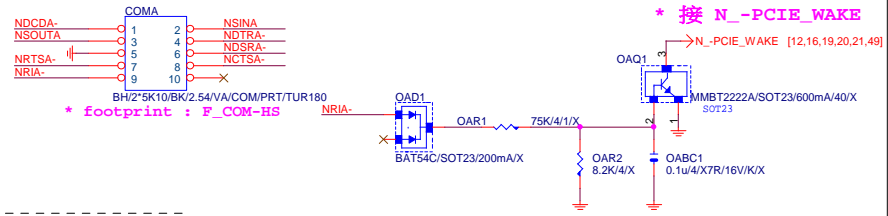
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Rev: 0.7

COM PORT



COMA



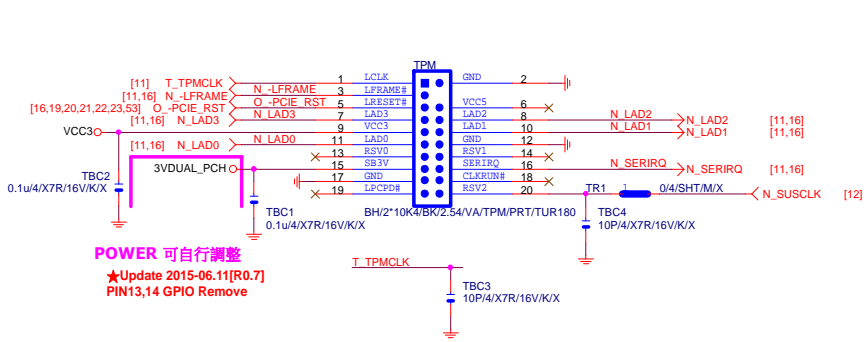
Rev: 0.3

TURBO KEY

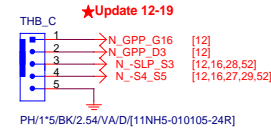
LPT PORT

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TPM CONNECT

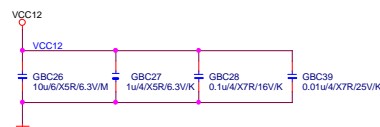
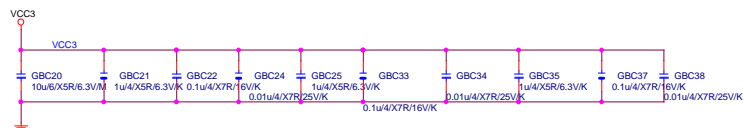


Thunderbolt

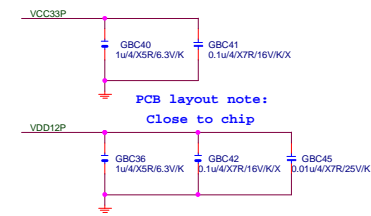
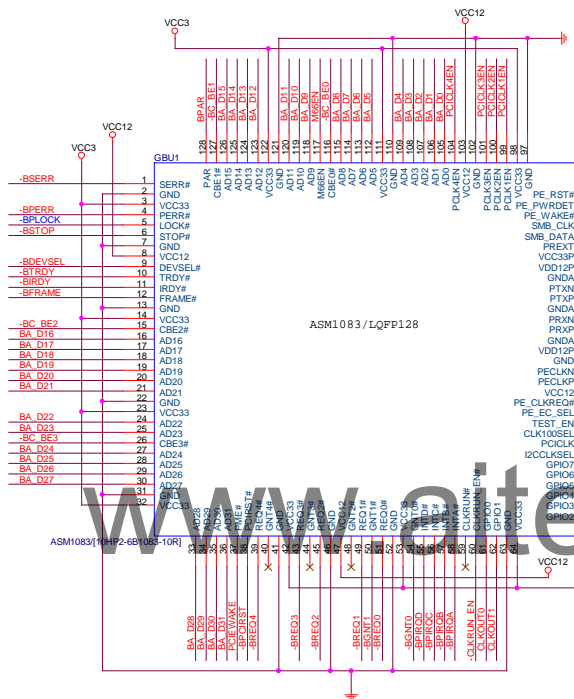


Gigabyte Technology			
Title			
COM,TPM,THB			
Size	Document Number	Rev	
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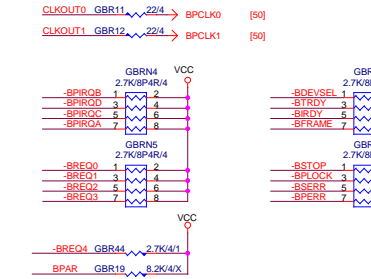




BA D10\_311 → BA\_D[0..31] [50]  
 -BC BE0 [50]  
 -BC BE1 [50]  
 -BC BE2 [50]  
 -BC BE3 [50]  
 -BPERR [50]  
 -BSERR [50]  
 -BPAR [50]  
 -BPLCK [50]  
 -BDEVSEL [50]  
 -BSTOP [50]  
 -BTRDY [50]  
 -BIRDY [50]  
 -BFRAME [50]  
 O\_PFMIRST2 [16,40]  
 -BPCIRST [50]  
 -BPCIRST [50]  
 -BREQ0 [50]  
 -BREQ1 [50]  
 -BGNT0 [50]  
 -BGNT1 [50]  
 -BPIRQA [50]  
 -BPIRQB [50]  
 -BPIROC [50]  
 -BPIROD [50]



PCB layout note:  
Close to chip



### CLK100SEL Strapping Set

CLK100SEL	H	L
PCIe CLK	100M +/-N%	100M +/-N%
PCICLK_IN	X	33M
PCICLK0	33M +/-N%	33M

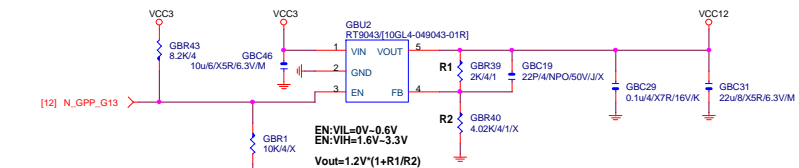
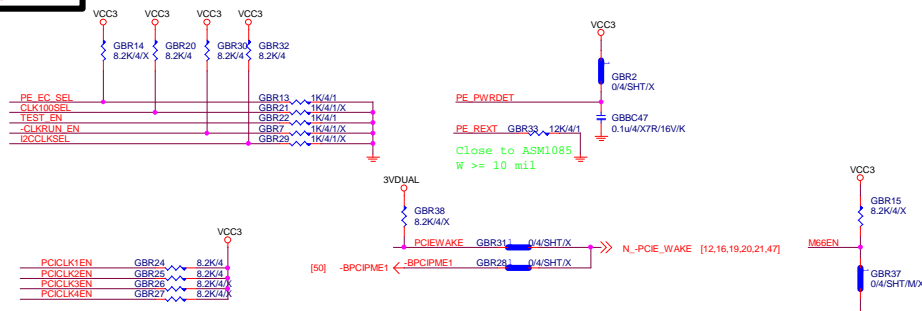
PE\_EC\_SEL-  
 "H" for Express Card mode  
 "L" for PCIe Riser Card mode

CLK100SEL-  
 "H" for PECLK input only  
 "L" for PECLK & PCICLK input

TEST\_EN-  
 "H" for Test Mode Enable  
 "L" for Test Mode Disable

-CLKRUN\_EN-  
 "H" for CLKRUN Mode Disable  
 "L" for CLKRUN Mode Enable

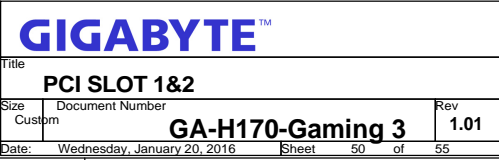
I2CCLKSEL-  
 "H" is 135KHz I2CCLK  
 "L" is 67.5KHz I2CCLK



EN-VIL=0V-0.6V  
 EN-VIH=1.6V-3.3V  
 Vout=1.2V\*(1+R1/R2)

Gigabyte Technology


Title			ASM1083	Rev	1.01
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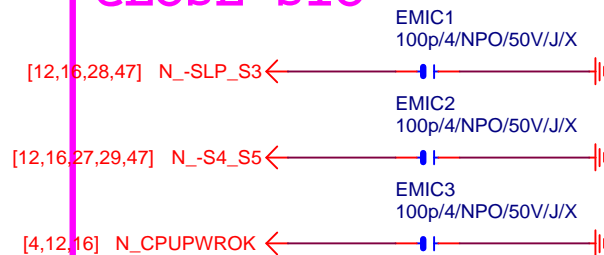


**IDT6V41510 / IDT6V41520 / IDT6V41530**



				
Title <b>IDT6V41510_CLK BUFFER</b>				
Size	Document Number			Rev
Custom	<b>GA-H170-Gaming 3</b>			<b>1.01</b>
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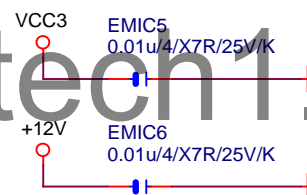
## CLOSE SIO



## CLOSE PCH



EMI Alain 2015/03/04 modify

**GIGABYTE™**

Title

**EMI/ESD**Size  
A

Document Number

**GA-H170-Gaming 3**

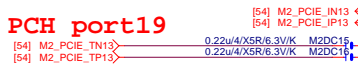
Rev

**1.01**

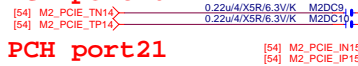
Date: Wednesday, January 20, 2016

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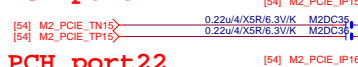
## M.2 Lane2 from PCH port19



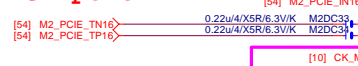
## M.2 Lane2 from PCH port20



## M.2 Lane3 from PCH port21

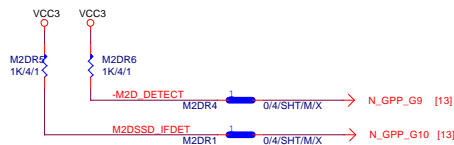


## M.2 Lane4 from PCH port22



[10] CK\_M2D\_100M\_DN  
[10] CK\_M2D\_100M\_DP  
需與M2\_-CLKREQ對應

## 支援SATA and M.2 function



M.2 有插卡 / 沒插卡	M.2插何種卡? GPP_G10	SATA Express 插何種硬碟? GPP_E0/E1/E2/F0	IO19 (S0)	IO20 (S1)	IO21 (S2)	IO22 (S3)
有插卡 (Low)	SATA Mode (Low)	SATA (Hi)	SATA	SATA	SATA	SATA (For M2)
		SATA Express (Low)	SATA	SATA	SATA	SATA (For M2)
	PCIe Mode (Hi)	SATA (Hi)	PCIEx4 (For M.2)			
		SATA Express (Low)	PCIEx4 (For M.2)			
沒插卡 (Hi)	Don't Care (Hi)	SATA (Hi)	SATA (S0)	SATA (S1)	SATA (S2)	SATA (S3)
		SATA Express (Low)	SATA Express (For S.E.0)		SATA Express (For S.E.1)	

## M.2-SATA+SATA S0~2

WHEN	PCH GPIO	SETUP	SWITCH
GPP_G7	L	GPP_C20	L
GPP_G8	L	GPP_C19	L
GPP_F1/F2	H (SATA)	GPP_C21	H

## M.2-SATA+S.E.D

WHEN	PCH GPIO	SETUP	SWITCH
GPP_G7	L	GPP_C20	L
GPP_G8	L	GPP_C19	L
GPP_F1/F2	L (S.E.)	GPP_C21	H

## M.2X4

WHEN	PCH GPIO	SETUP	SWITCH
GPP_G7	L	GPP_C20	H
GPP_G8	H	GPP_C19	H
GPP_F1/F2	H	GPP_C21	H

## M.2X2+S.E.

WHEN	PCH GPIO	SETUP	SWITCH
GPP_G7	L	GPP_C20	H
GPP_G8	H	GPP_C19	H
GPP_F1/F2	L	GPP_C21	H

## M.2沒插卡+SATA S0~3

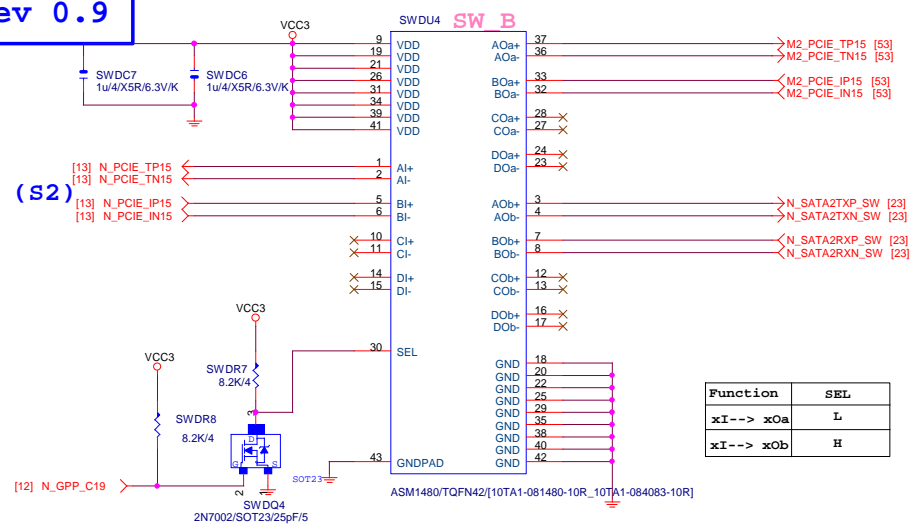
WHEN	PCH GPIO	SETUP	SWITCH
GPP_G7	H	GPP_C20	L
GPP_G8	H	GPP_C19	L
GPP_F1/F2	H	GPP_C21	L

## M.2沒插卡+S.E.C&amp;S.E.D

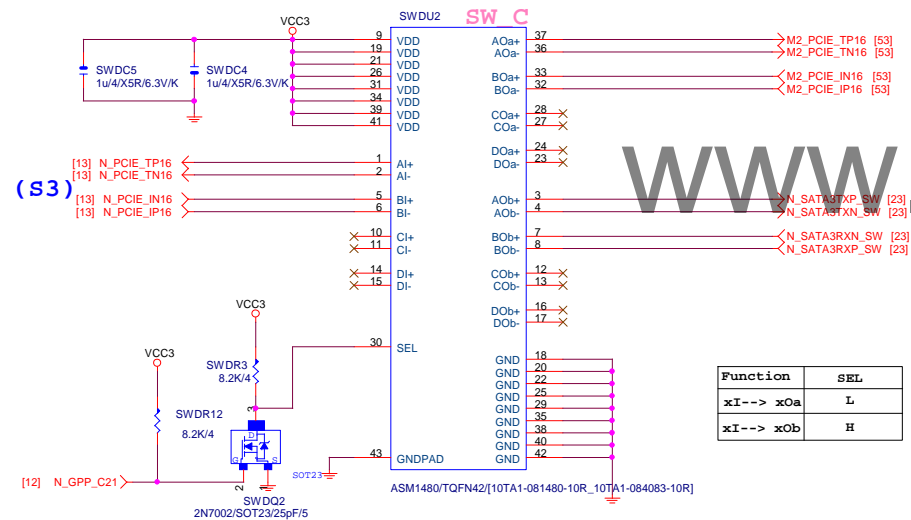
WHEN	PCH GPIO	SETUP	SWITCH
GPP_G7	H	GPP_C20	L
GPP_G8	H	GPP_C19	L
GPP_F1/F2	L	GPP_C21	L

GIGABYTE Technology			
Title	M.2 X4		
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PCH (S2)

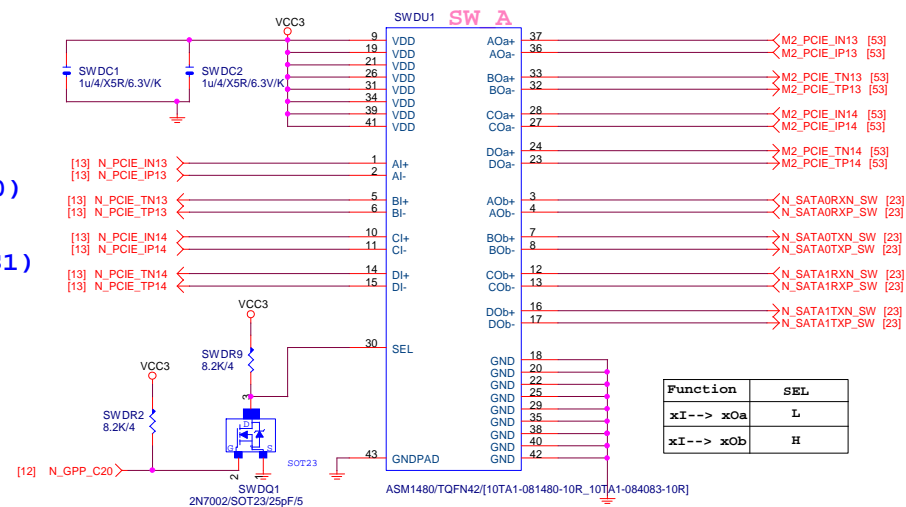


PCH (S3)



PCH (S0)

PCH (S1)



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**Gigabyte Technology**  
**M.2 SWITCH**

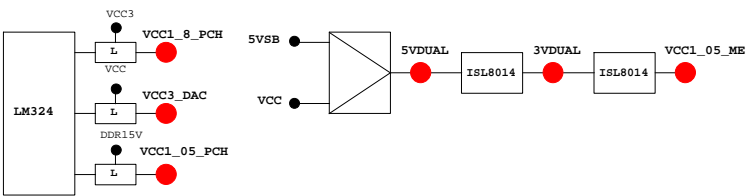
Title		Document Number		Rev
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PCH GPIO LIST TABLE					
PIN NAME	PWR	Default	USAGE	NOTE	
GP0	MAIN	H-Z	GPI	GPIO0	N/A
GP1/TACH1	MAIN		GPI	GPIO1	N/A
GP2/PIRQ#	MAIN		GPI	-PIRQE	P/U 8.2K VCC3
GP3/PIRQF#	MAIN		GPI	-PIRQF	P/U 8.2K VCC3
GP4/PIRQG#	MAIN		GPI	-PIRQG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

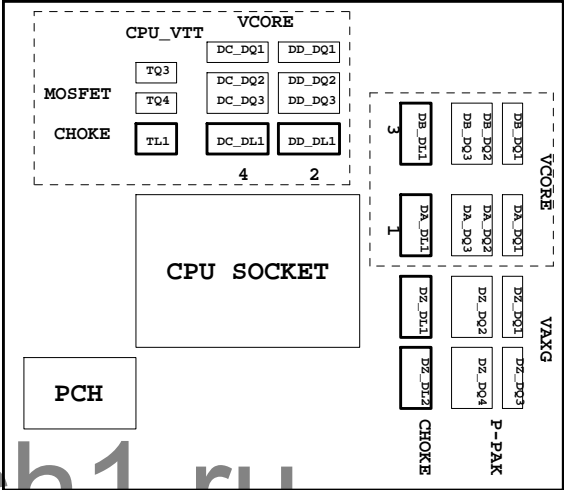
Super I/O ITE8720 GPIO Table

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	-PCI_E_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：



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 Terminatio
VREF_CA_A/VREF_CA_B	DRAM Address Ref
VREF_DQ_A/VREF_DQ_B	DRAM Data Ref

散熱模組料號：

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

	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