

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

Gigabyte Technology

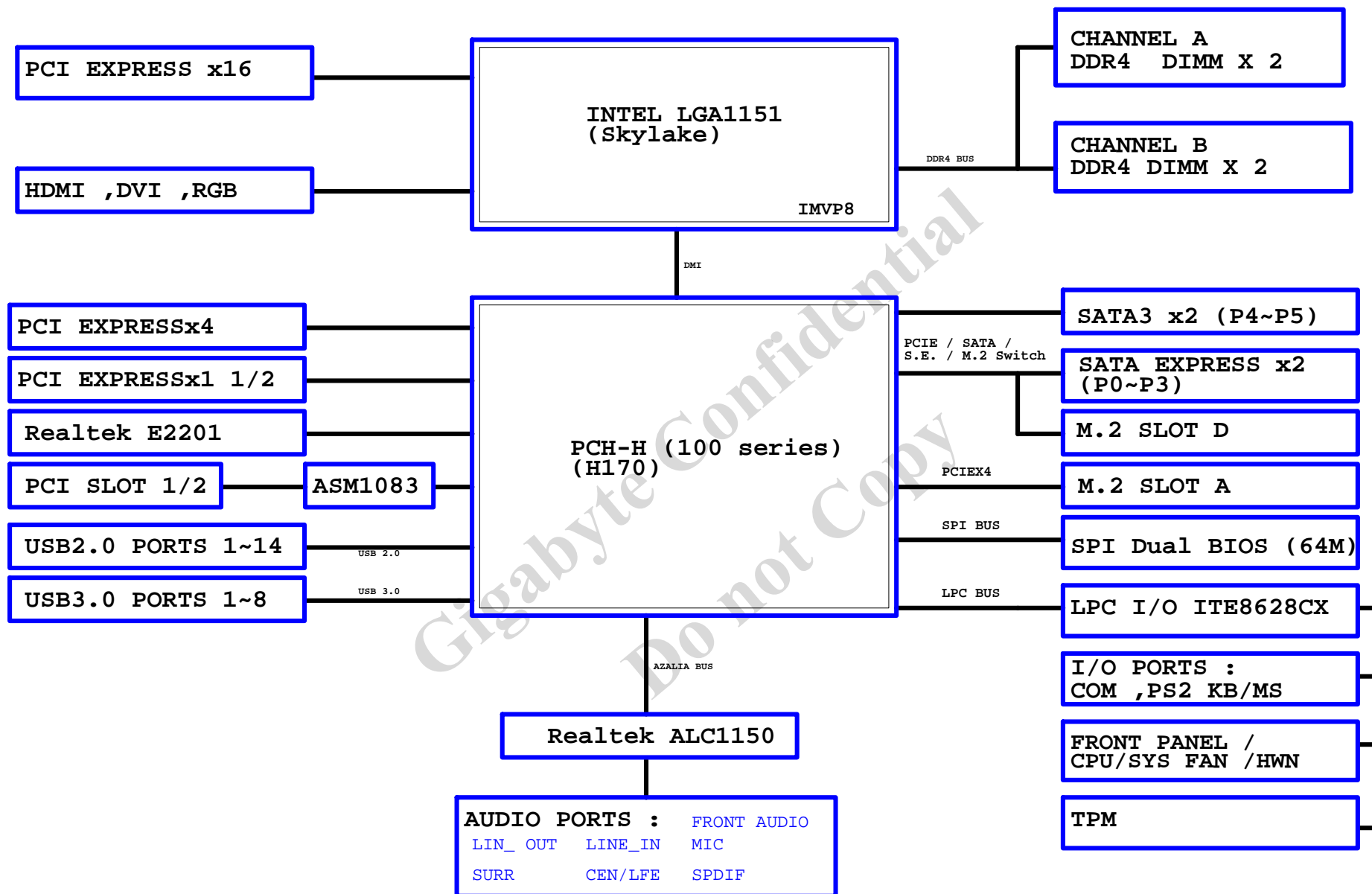
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Size	Document Number	GA-H170-Gaming 3	Rev
Custom			1.01
Date:	Wednesday, January 20, 2016	Sheet	1 of 55

P-Code: U15040-0
9MH170G3-00

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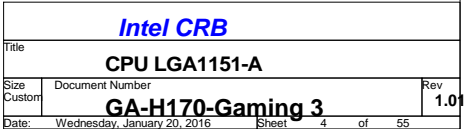
			
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Size	Document Number	Rev	
Custom	GA-H170-Gaming 3	1.01	
Date: Wednesday, January 20, 2016		Sheet 2 of 55	

BLOCK DIAGRAM

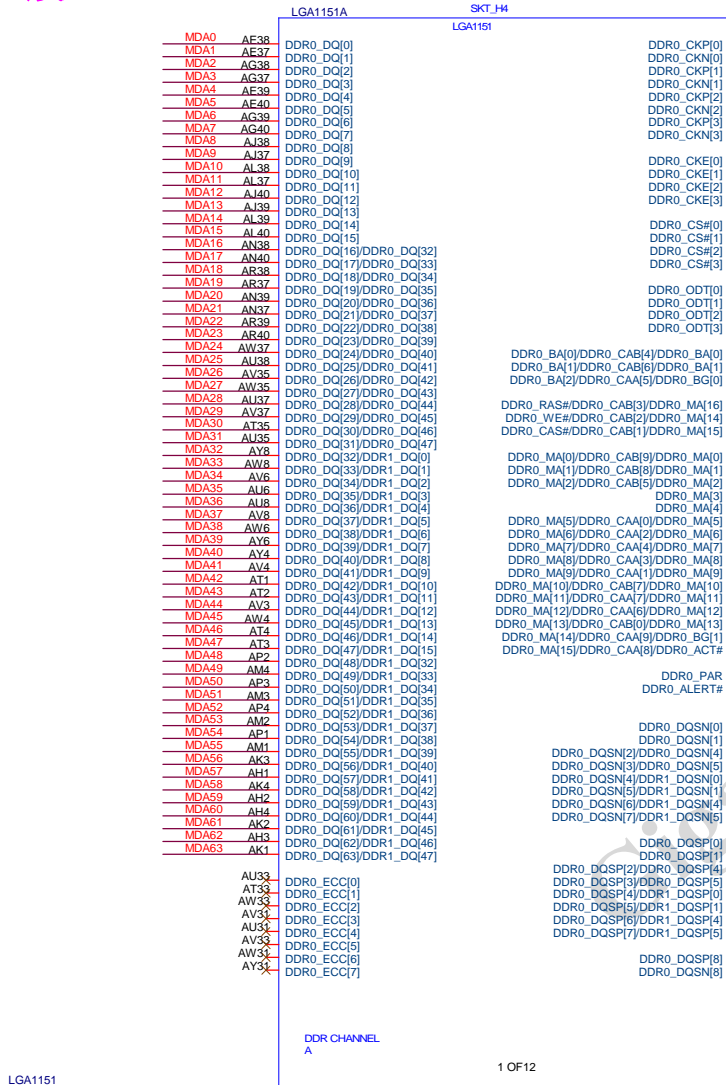


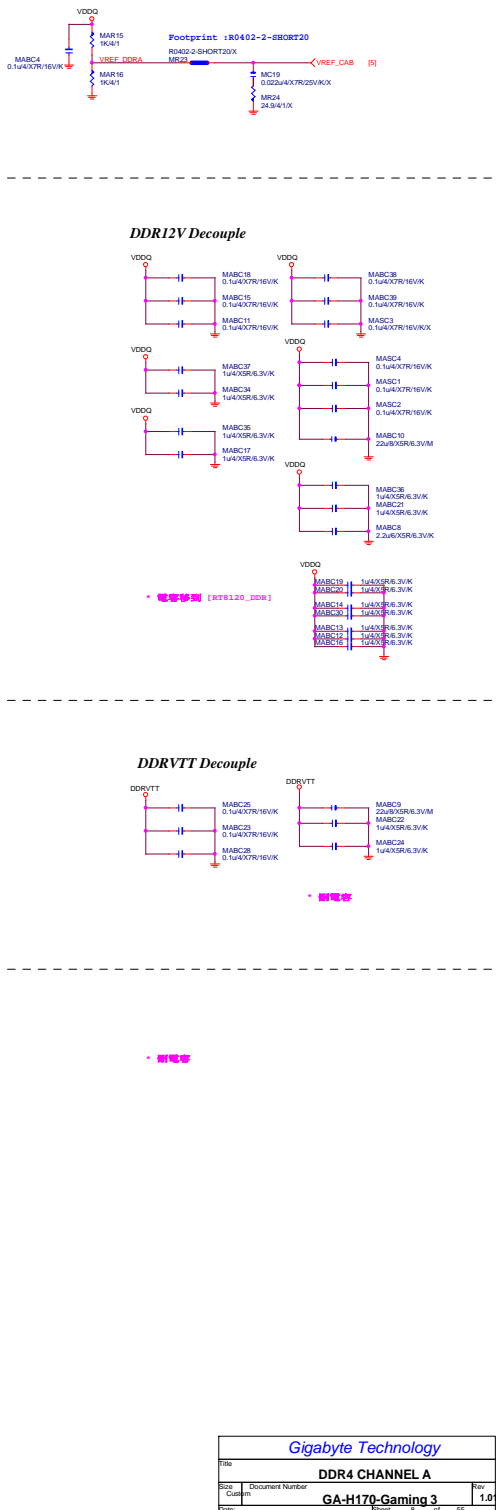
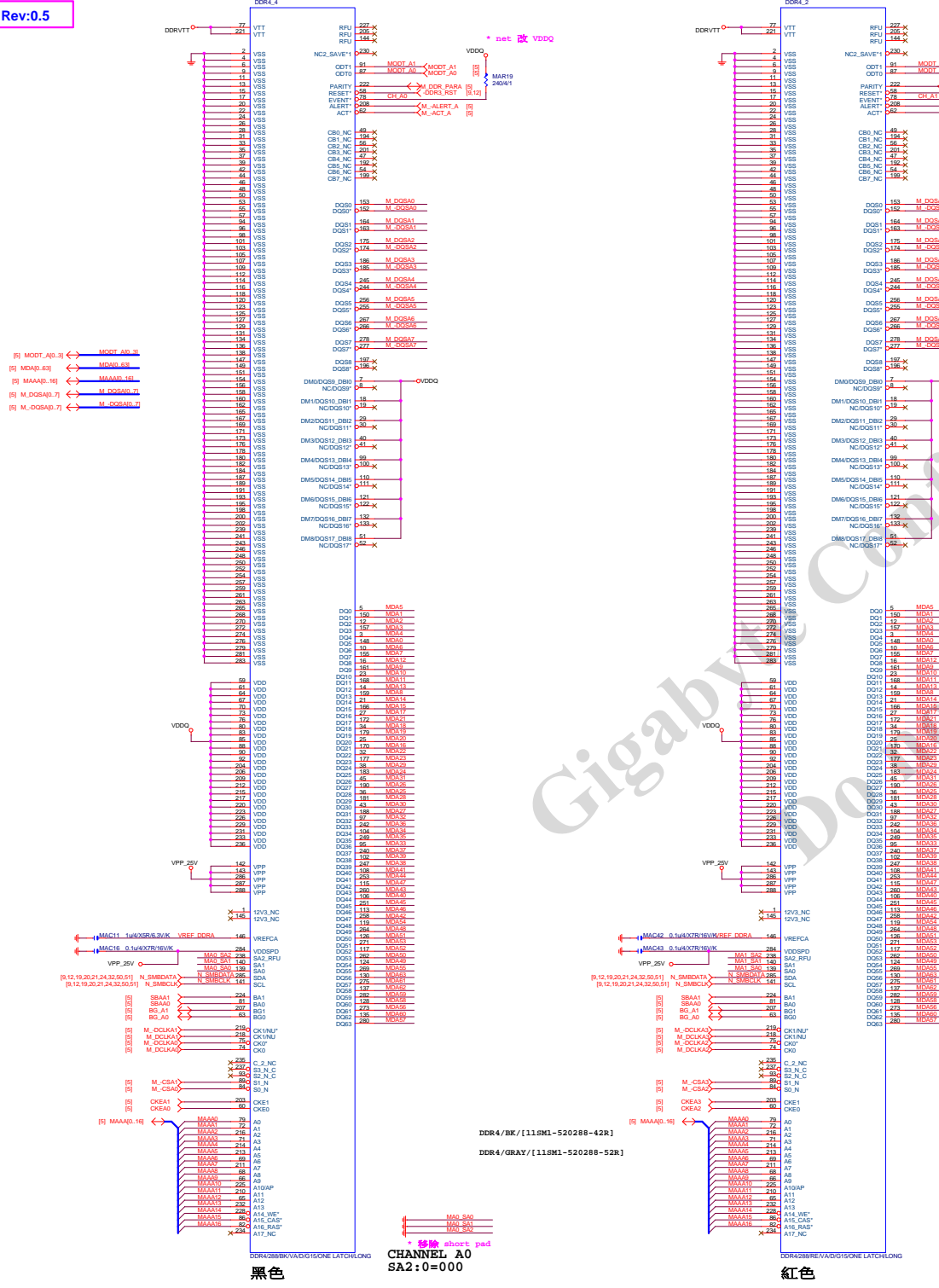
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檢查組態調整線路	
The CFG signals	
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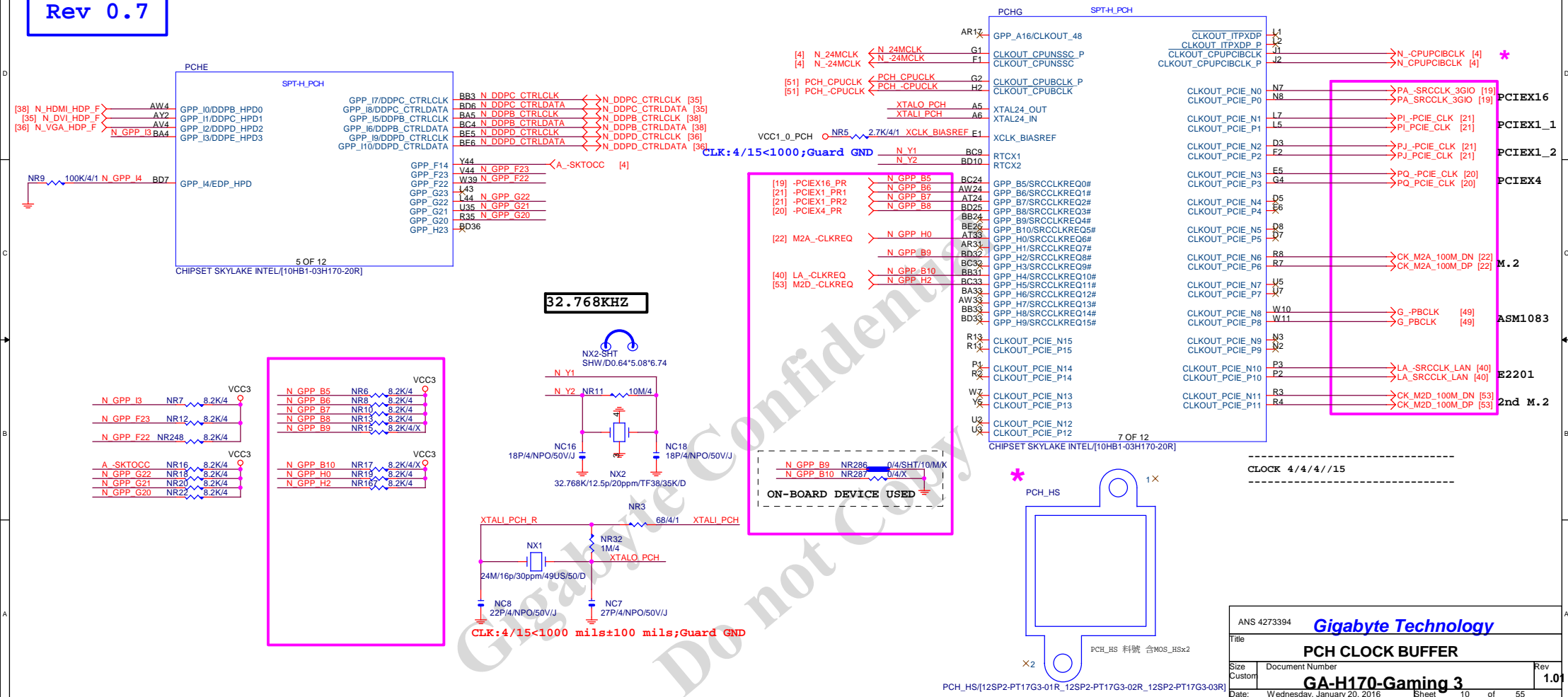


* 改DDR4 net



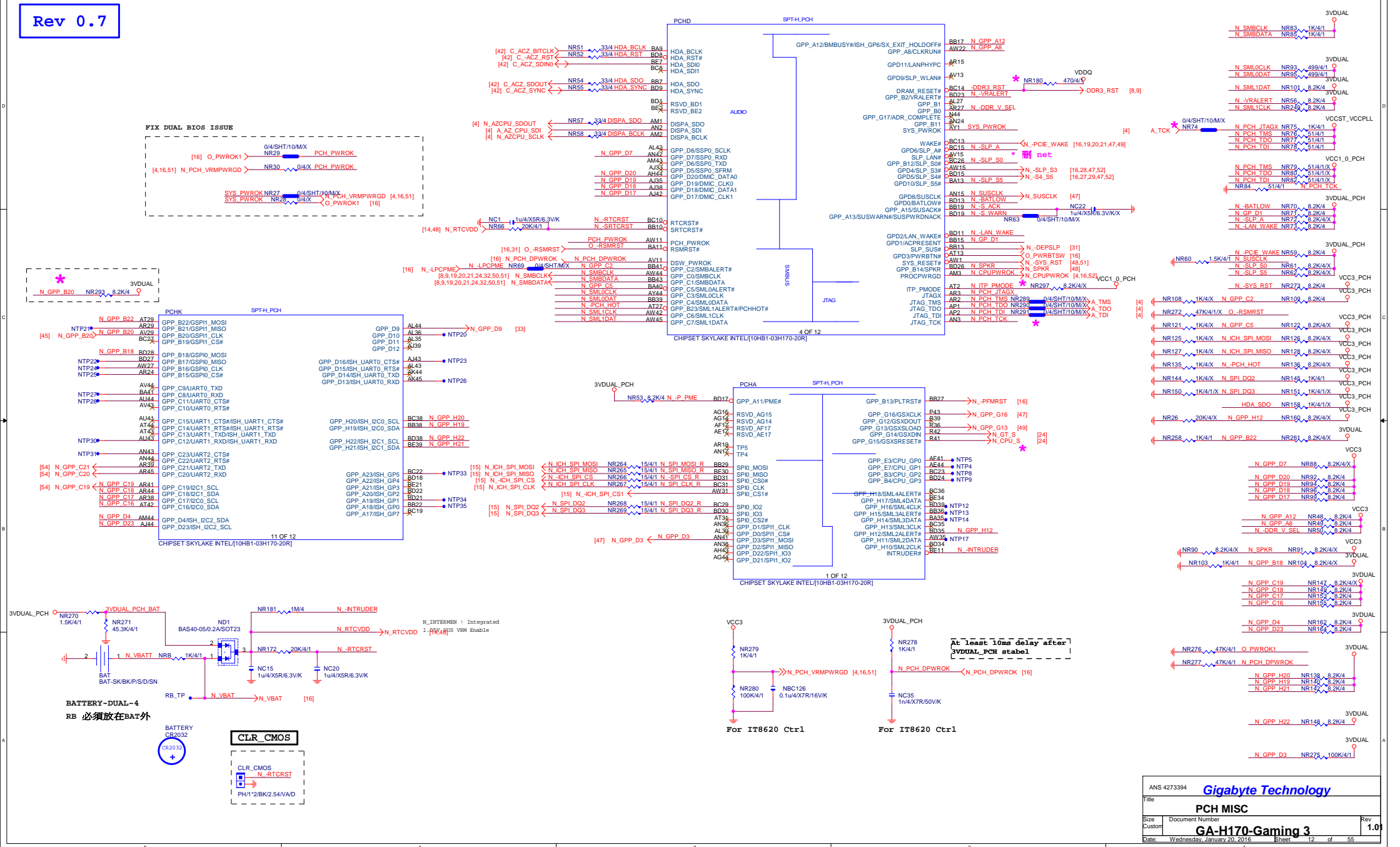


Rev 0.7

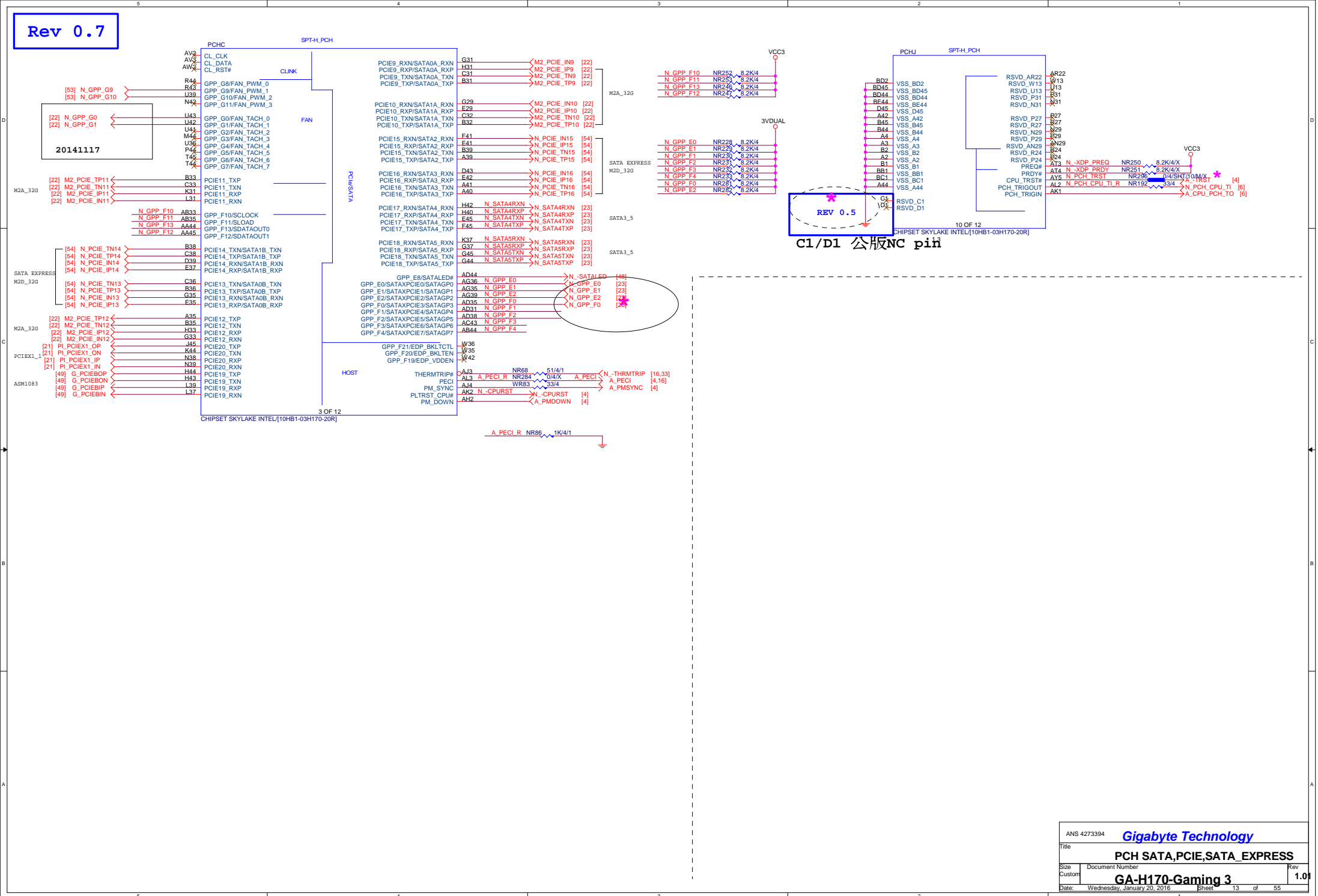


ANS 4273394		Gigabyte Technology	
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PCH CLOCK BUFFER			
Size Custom	Document Number		Rev
	GA-H170-Gaming 3		1.0
Date:	Wednesday, January 20, 2016		Sheet 10 of 55

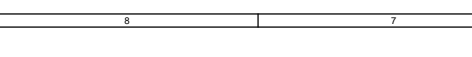
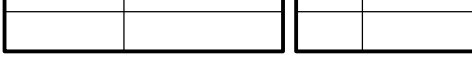
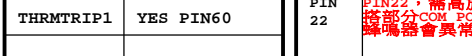
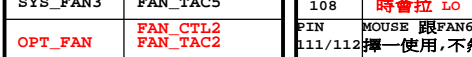
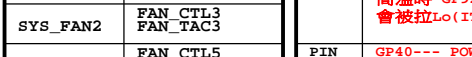
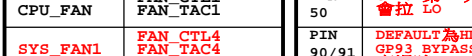
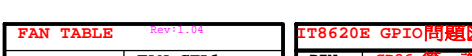
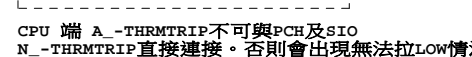
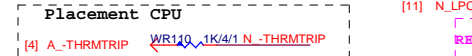
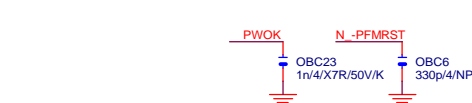
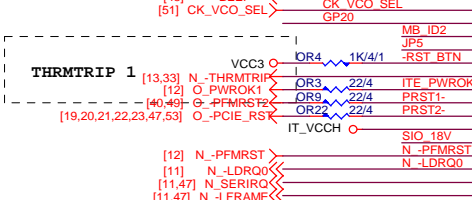
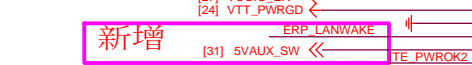
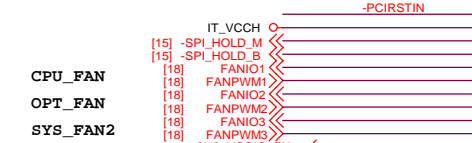
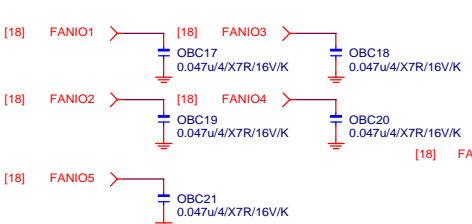




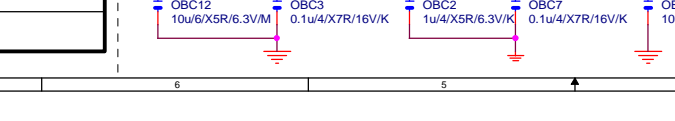
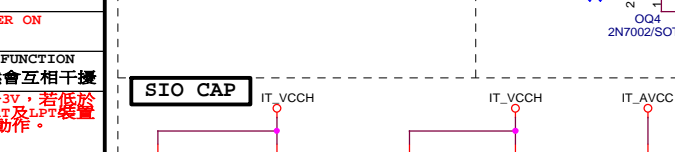
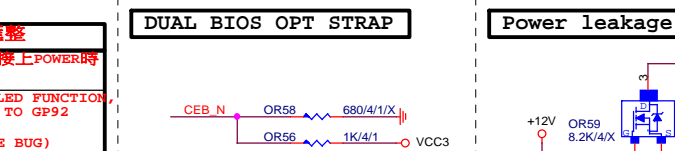
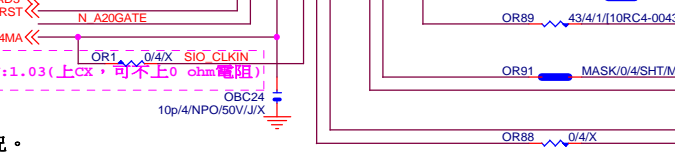
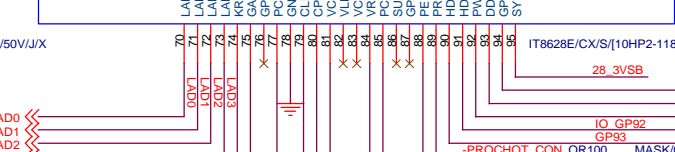
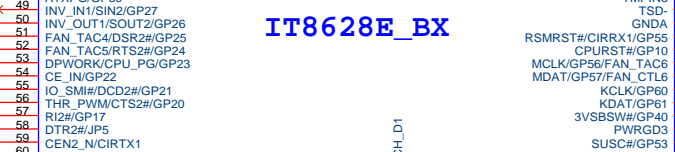
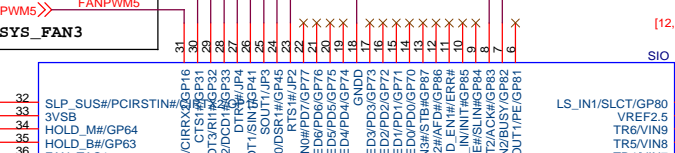
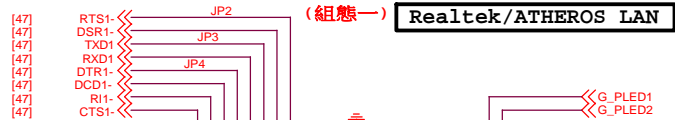
Rev 0.7



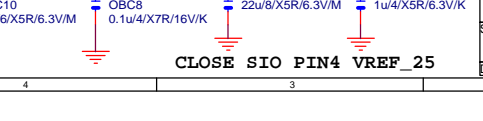
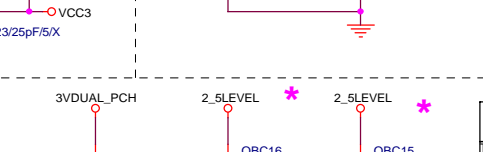
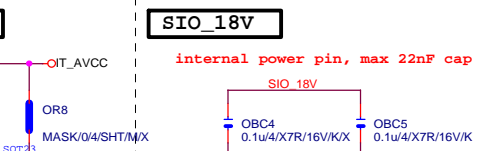
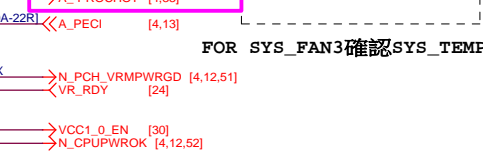
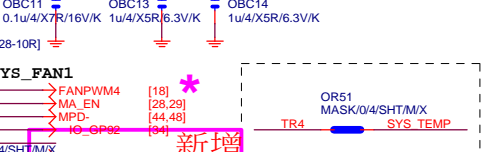
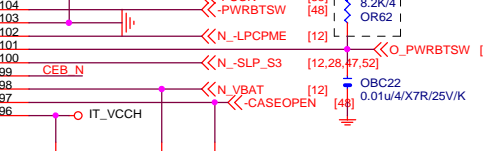
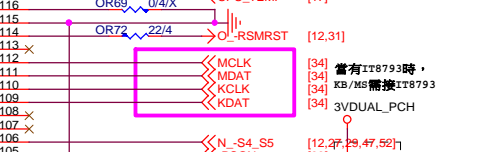
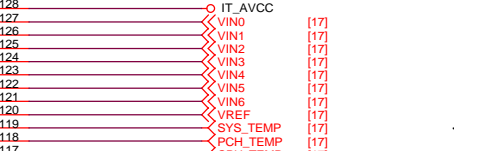
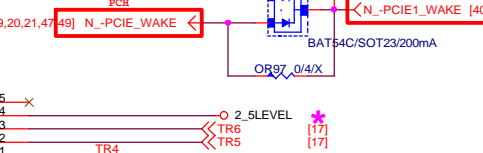
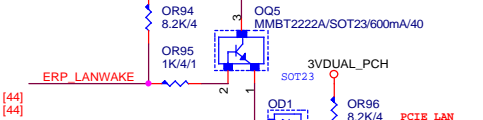
SIO IT8628CX REV:1.08



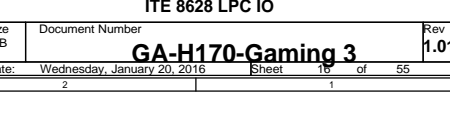
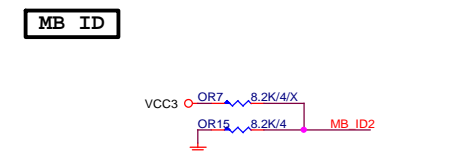
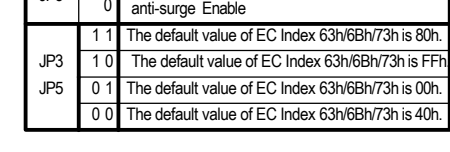
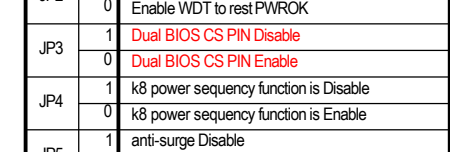
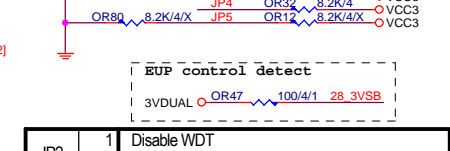
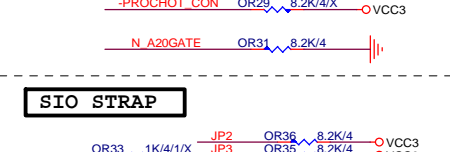
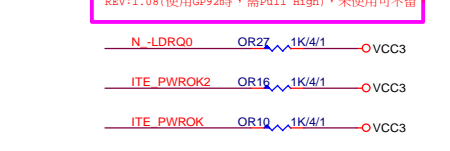
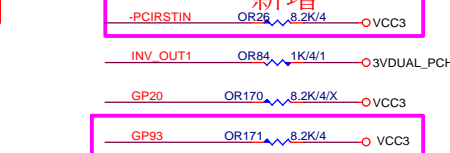
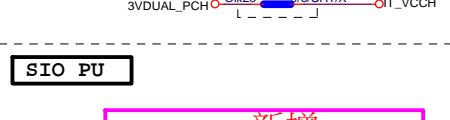
ERP WAKE on LAN (依LAN組態選擇)



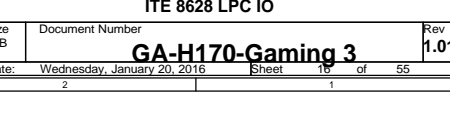
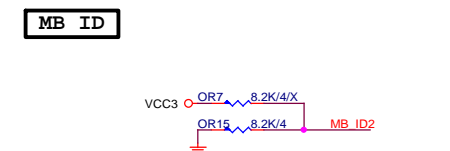
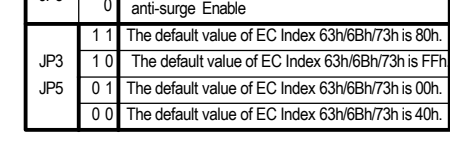
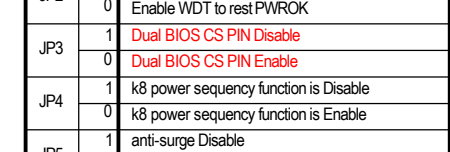
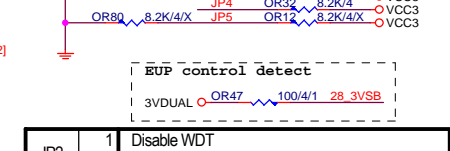
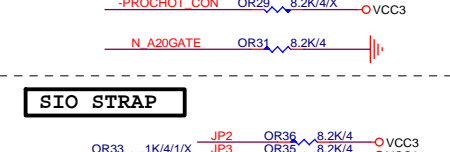
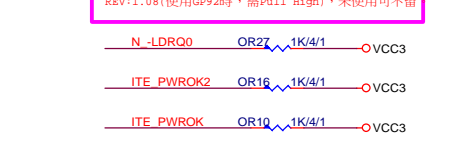
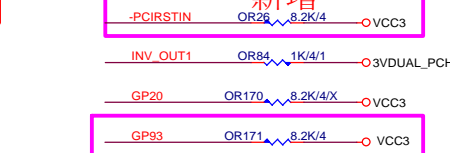
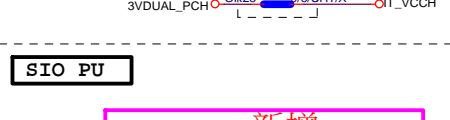
Realtek/ATHEROS LAN



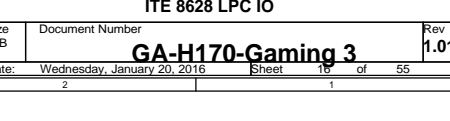
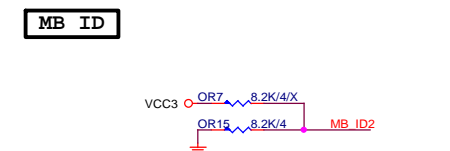
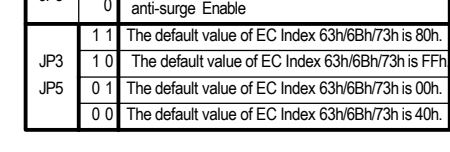
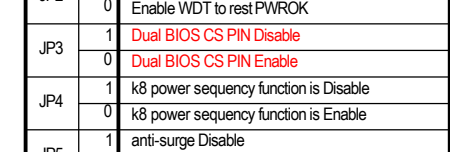
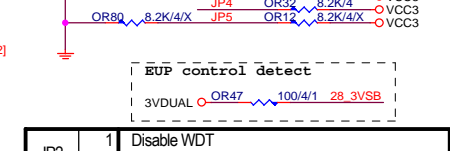
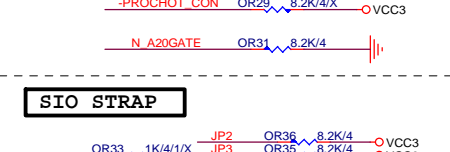
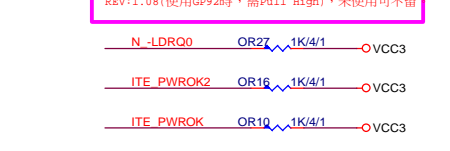
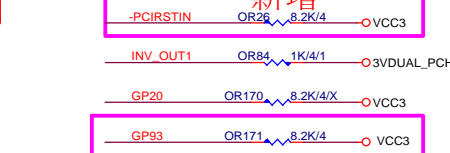
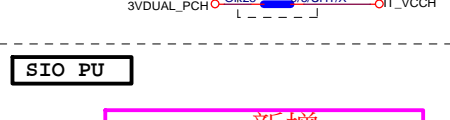
PWR SHT



SIO PU



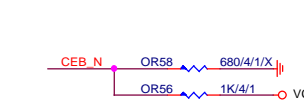
SIO STRAP



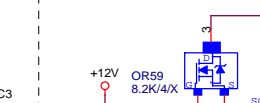
FAN TABLE	
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SYS_FAN1	FAN_CTL4 FAN_TAC4
SYS_FAN2	FAN_CTL3 FAN_TAC3
SYS_FAN3	FAN_CTL5 FAN_TAC5
OPT_FAN	FAN_CTL2 FAN_TAC2
THRMTRIP1	YES PIN60

IT8620E GPIO問題匯整	
PIN 50	GP26-第一次接上POWER時會拉 Lo
PIN 90/91	DEFAULT為HDLDE 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裝置端線路會異常動作。

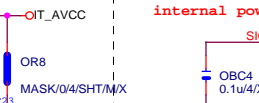
DUAL BIOS OPT STRAP



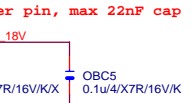
Power leakage



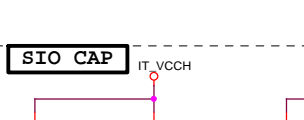
SIO_18V



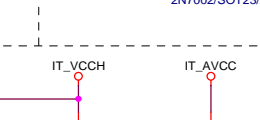
MB ID



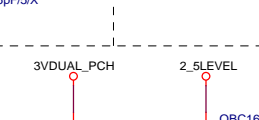
SIO CAP



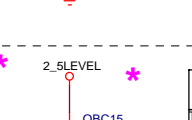
Power leakage



SIO_18V



MB ID



Gigabyte Technology

ITE 8628 LPC IO

GA-H170-Gaming 3

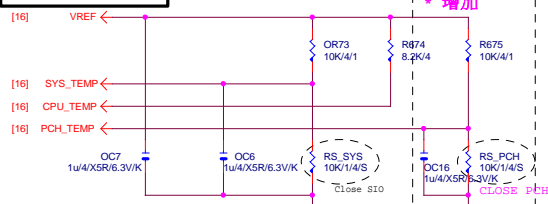
Rev 1.01

Wednesday, January 20, 2016

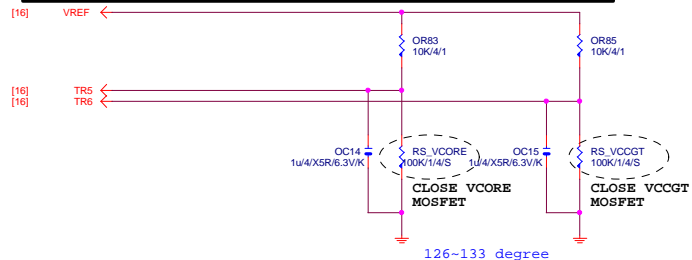
Sheet 16 of 55

REV:1.07

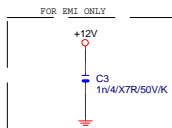
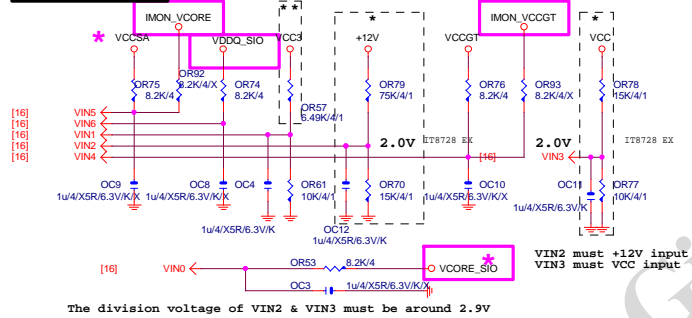
TEMP H/W MONITOR



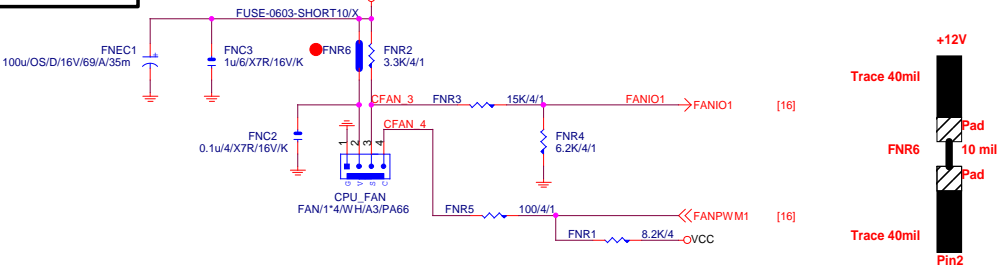
RS_VCORE、RS_VCCGT、CLOSE CPU_VCORE & VCCGT MOSFET
-PROCHOT: 有mos meartsink 不用prochot function



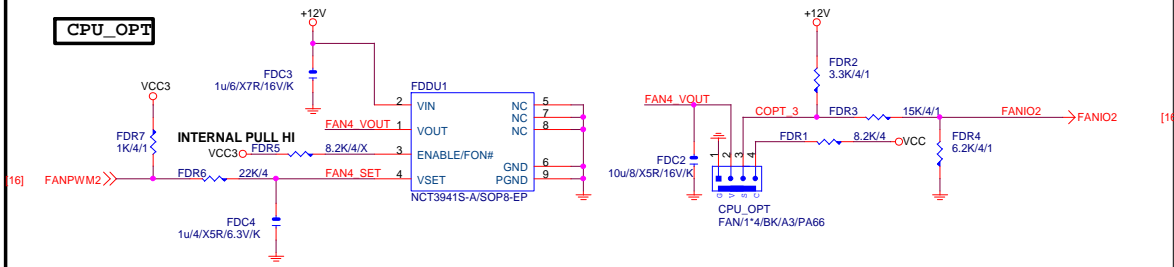
VOLTAGE-- H/W MONITOR



CPU SMART FAN



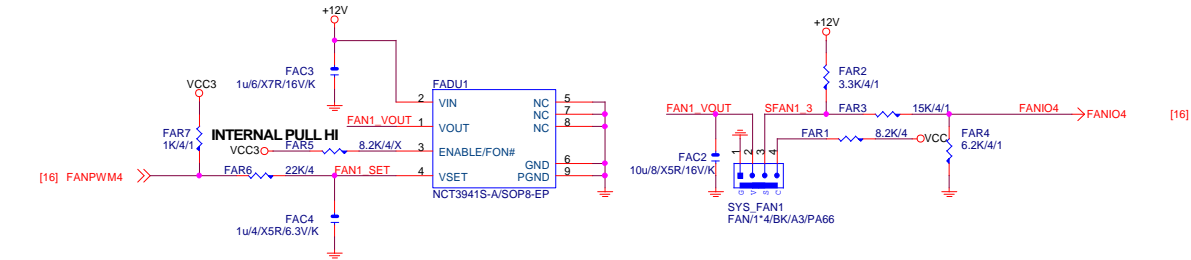
CPU_OPT



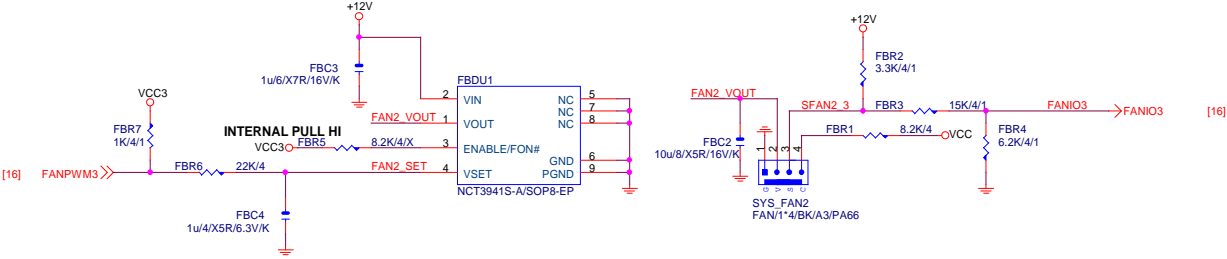
SYSTEM FAN1

Linear SYS_FAN

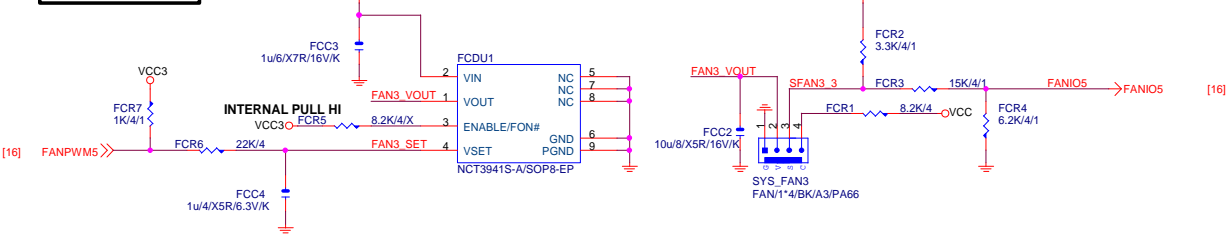
Enable Function (NCT3941S)
Full Turn On Function (NCT3941S-A)



SYSTEM FAN2



SYSTEM FAN3



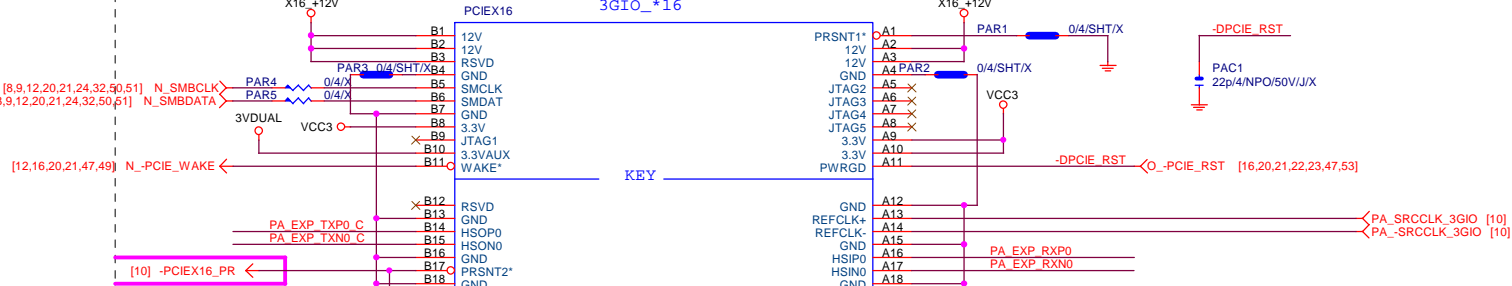
GIGABYTE

Title			FAN CTRL
Size	Custom	Document Number	Rev
		GA-H170-Gaming 3	1.01
Date:	Wednesday, January 20, 2016	Sheet	18 of 55

PCIEX16 CAP

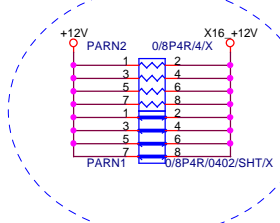
PCIEX16 SLOT

PCIESLOT-164DN-Q



PCIEX16 PROTECT SHT

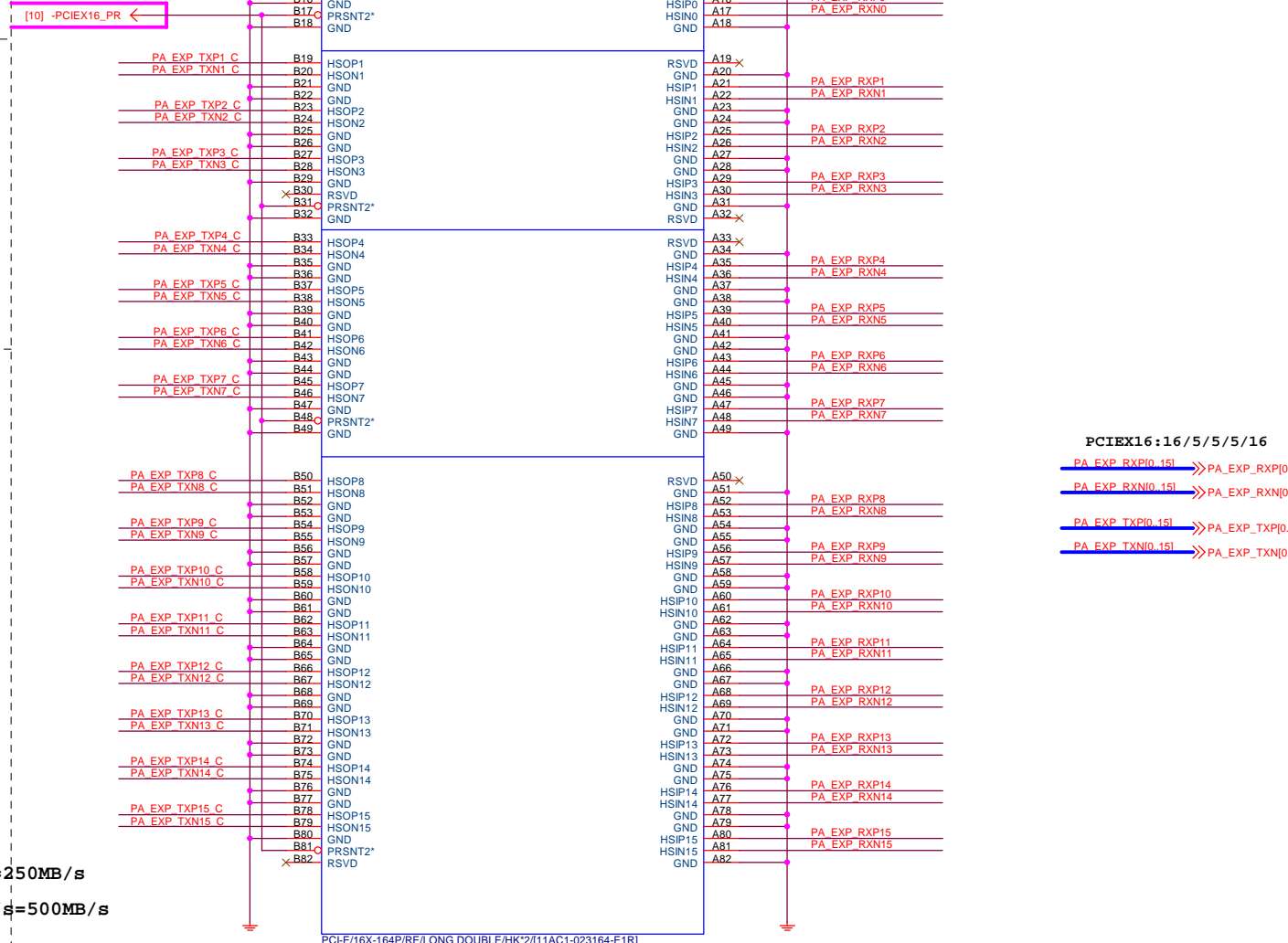
```
+12 protect
short-wire test
```



PCIEX16	AC	CAP
---------	----	-----

PA EXP TXP0	PAC5	0.22u4/X5R6.3V/K	PA EXP TXP0 C
PA EXP TXP1	PAC4	0.22u4/X5R6.3V/K	PA EXP TXP1 C
PA EXP TXP2	PAC6	0.22u4/X5R6.3V/K	PA EXP TXP2 C
PA EXP TXN1	PAC7	0.22u4/X5R6.3V/K	PA EXP TXN1 C
PA EXP TXP2	PAC8	0.22u4/X5R6.3V/K	PA EXP TXP2 C
PA EXP TXN2	PAC9	0.22u4/X5R6.3V/K	PA EXP TXN2 C
PA EXP TXP3	PAC10	0.22u4/X5R6.3V/K	PA EXP TXP3 C
PA EXP TXN3	PAC11	0.22u4/X5R6.3V/K	PA EXP TXN3 C
PA EXP TXP4	PAC12	0.22u4/X5R6.3V/K	PA EXP TXP4 C
PA EXP TXN4	PAC13	0.22u4/X5R6.3V/K	PA EXP TXN4 C
PA EXP TXP5	PAC14	0.22u4/X5R6.3V/K	PA EXP TXP5 C
PA EXP TXN5	PAC15	0.22u4/X5R6.3V/K	PA EXP TXN5 C
PA EXP TXP6	PAC16	0.22u4/X5R6.3V/K	PA EXP TXP6 C
PA EXP TXN6	PAC17	0.22u4/X5R6.3V/K	PA EXP TXN6 C
PA EXP TXP7	PAC18	0.22u4/X5R6.3V/K	PA EXP TXP7 C
PA EXP TXN7	PAC19	0.22u4/X5R6.3V/K	PA EXP TXN7 C
PA EXP TXP8	PAC21	0.22u4/X5R6.3V/K	PA EXP TXP8 C
PA EXP TXN8	PAC20	0.22u4/X5R6.3V/K	PA EXP TXN8 C
PA EXP TXP9	PAC22	0.22u4/X5R6.3V/K	PA EXP TXP9 C
PA EXP TXN9	PAC23	0.22u4/X5R6.3V/K	PA EXP TXN9 C
PA EXP TXP10	PAC24	0.22u4/X5R6.3V/K	PA EXP TXP10 C
PA EXP TXN10	PAC25	0.22u4/X5R6.3V/K	PA EXP TXN10 C
PA EXP TXP11	PAC26	0.22u4/X5R6.3V/K	PA EXP TXP11 C
PA EXP TXN11	PAC27	0.22u4/X5R6.3V/K	PA EXP TXN11 C
PA EXP TXP12	PAC28	0.22u4/X5R6.3V/K	PA EXP TXP12 C
PA EXP TXN12	PAC29	0.22u4/X5R6.3V/K	PA EXP TXN12 C
PA EXP TXP13	PAC30	0.22u4/X5R6.3V/K	PA EXP TXP13 C
PA EXP TXN13	PAC31	0.22u4/X5R6.3V/K	PA EXP TXN13 C
PA EXP TXP14	PAC32	0.22u4/X5R6.3V/K	PA EXP TXP14 C
PA EXP TXN14	PAC33	0.22u4/X5R6.3V/K	PA EXP TXN14 C
PA EXP TXP15	PAC34	0.22u4/X5R6.3V/K	PA EXP TXP15 C
PA EXP TXN15	PAC35	0.22u4/X5R6.3V/K	PA EXP TXN15 C

PCI-E REV:2.0--> 5GHZ



PCIEX16:16/5/5/5/16

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

PA_EXP_RXN[0..15] >> PA_EXP_RXN[0..15] [4]

PA_EXP_TXP[0..15] >> PA_EXP_TXP[0..15] [4]

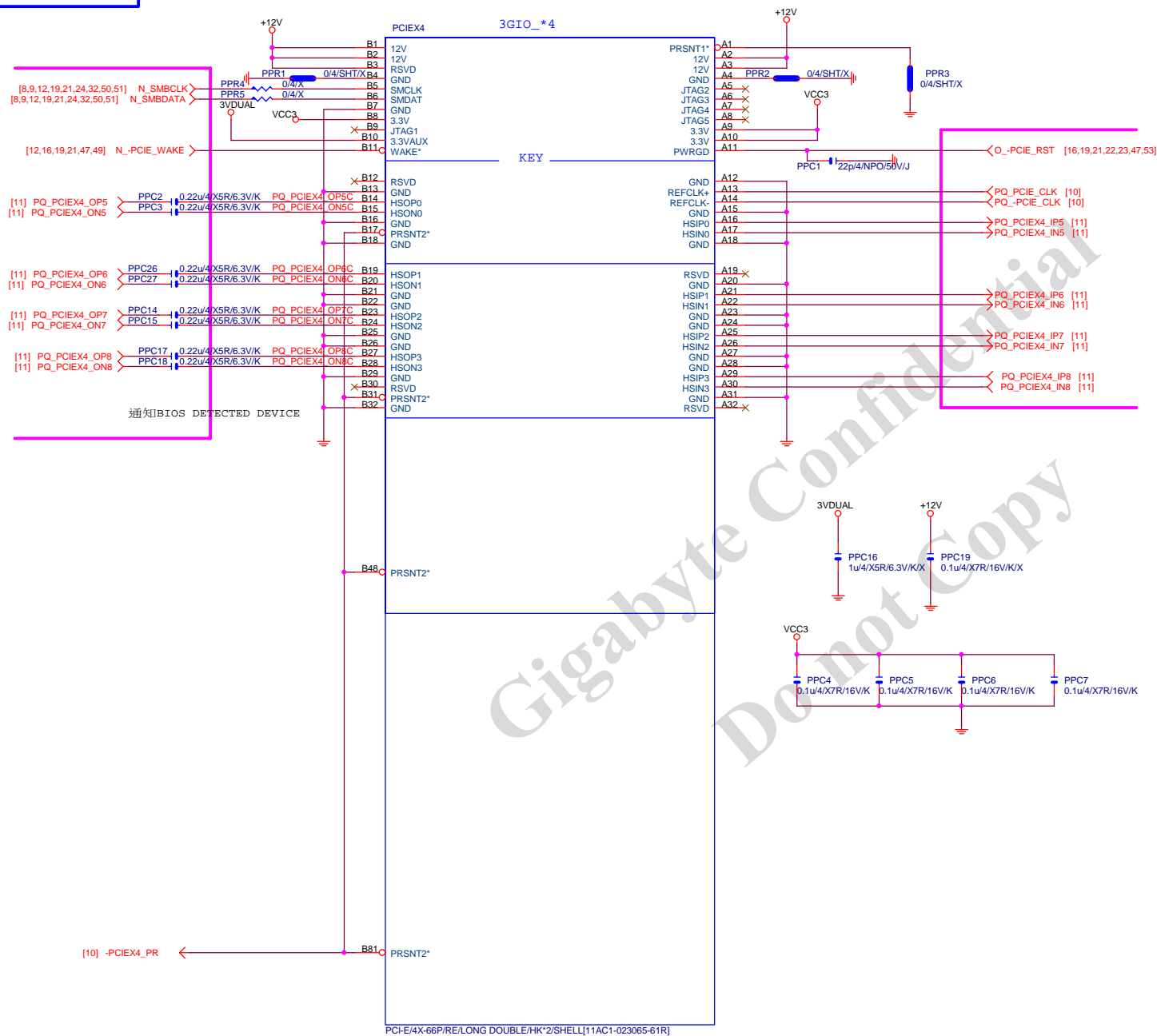
PA_EXP_TXN[0..15] >> PA_EXP_TXN[0..15] [4]

紅色

Gigabyte Technology

PCI EXPRESS * 16

Size Custom	Document Number GA-H170-Gaming 3	Rev 1.0
Date:	Wednesday, January 20, 2016	Sheet 19 of 55



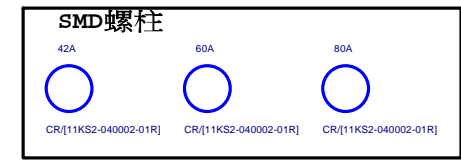
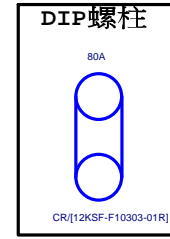
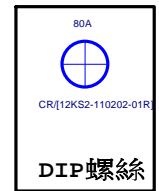
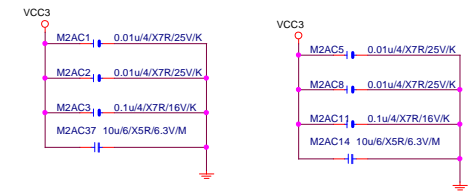
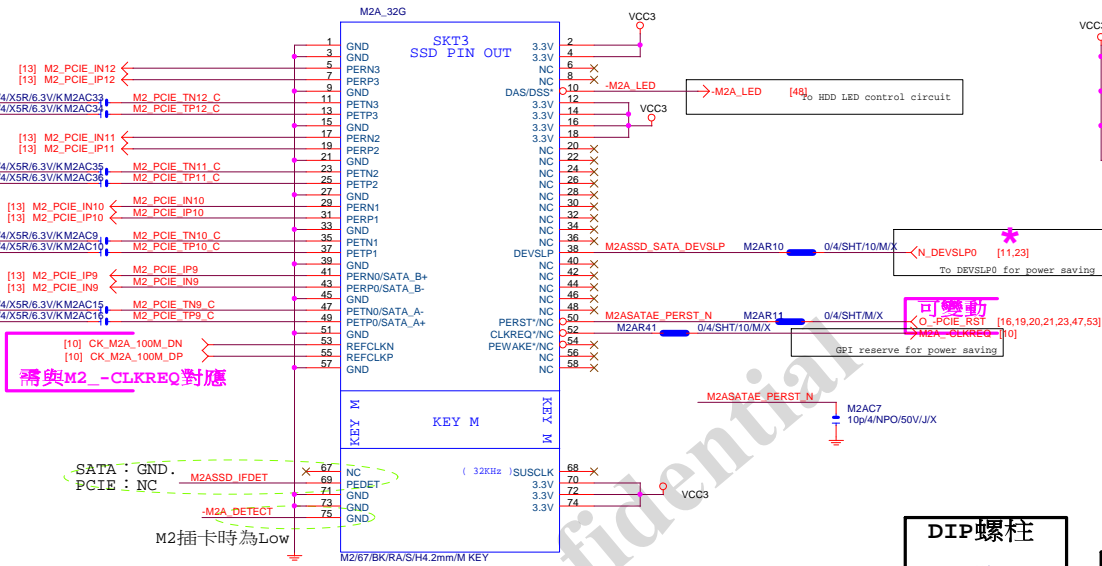
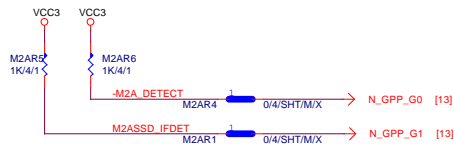
紅色STH

GIGABYTE

PCIE_X4

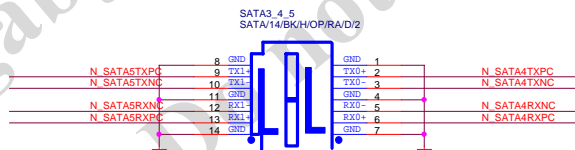
Title		
GA-H170-Gaming 3		
Size	Document Number	Rev
Custom		1.0
Date:	Wednesday, January 20, 2016	Sheet 20 of 55

支援SATA and M.2 function

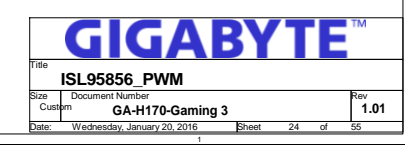


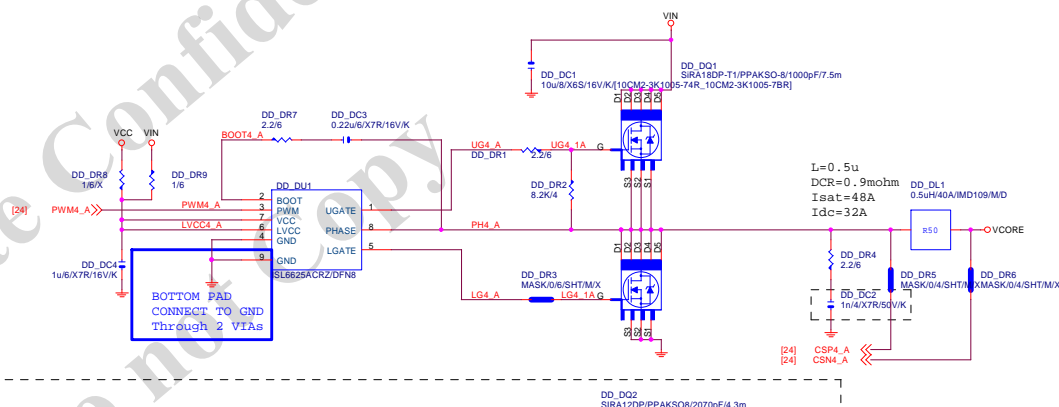
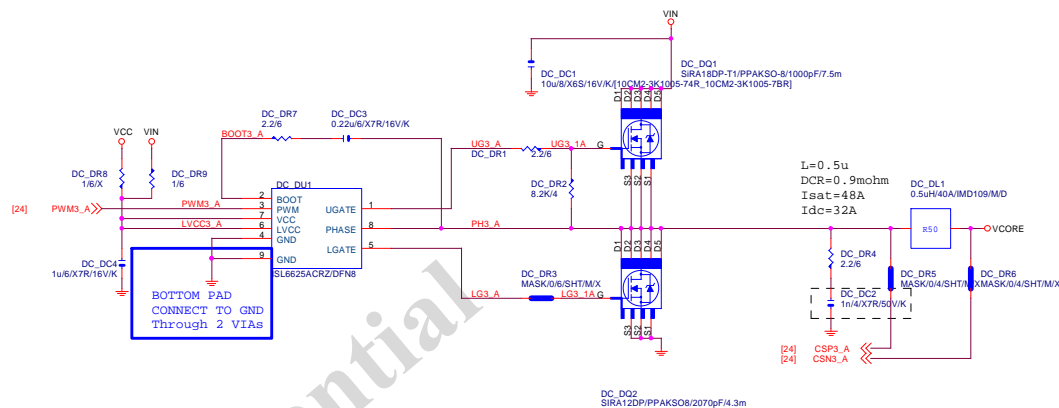
M.2 有插卡 /沒插卡 GPP_G0	M.2插何種卡？ GPP_G1	SATA Express 插何種硬碟？ GPP_E0/E2/F1	I015 (S0)	I016 (S1)	I017	I018	I019 (S0)	IP20 (S1)
有插卡 (Low)	SATA Mode (Low)	SATA (Hi)	SATA (M.2)	PCIE x1	PCIE x1	PCIE X1	PCIE x1	SATA
		SATA Express (Low)	SATA (M.2)	PCIE x1	PCIE x1	PCIE x1	SATA Express	
	PCIE Mode (Hi)	SATA (Hi)	PCIE 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	

SATA EXPRESS 上層 To SATA3
port2/3

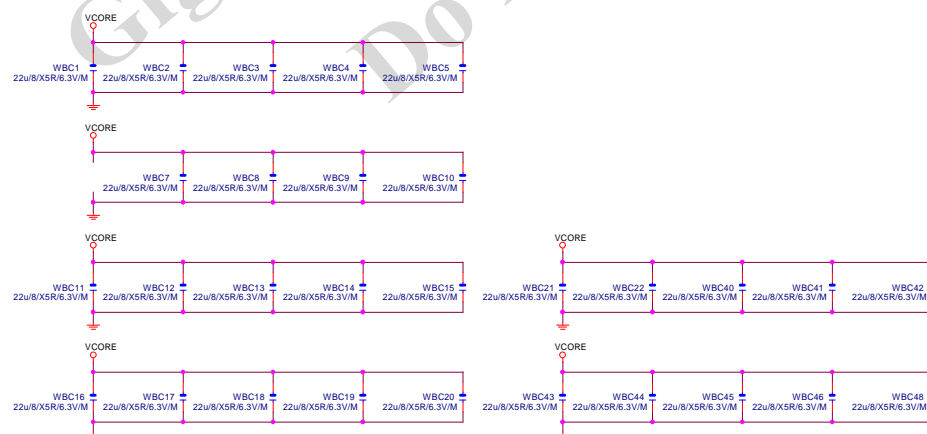


SATA 5	(文字面寫SATA 1)
SATA 4	(文字面寫SATA 0)
SATA 3	
SATA 2	
SATA 1	(文字面寫SATA 5)
SATA 0	(文字面寫SATA 4)

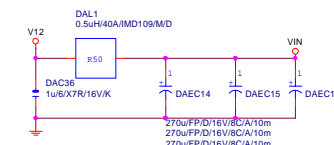




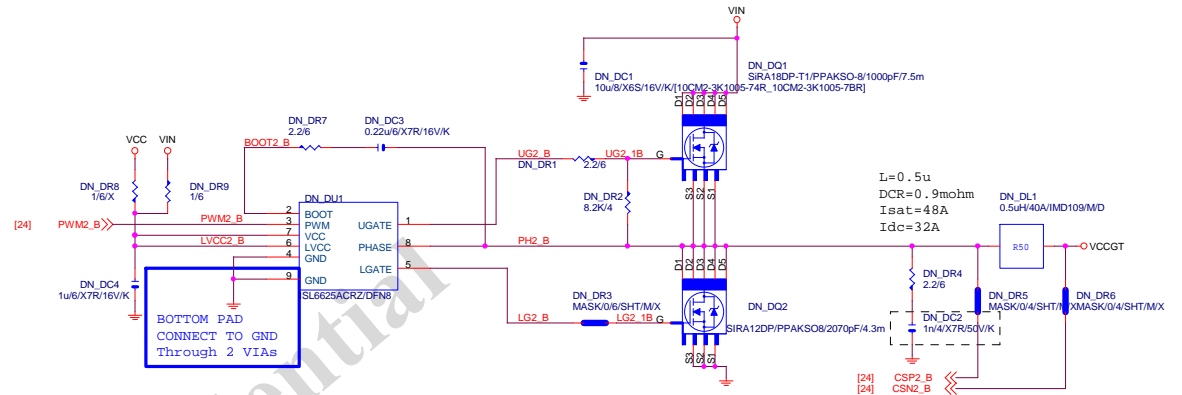
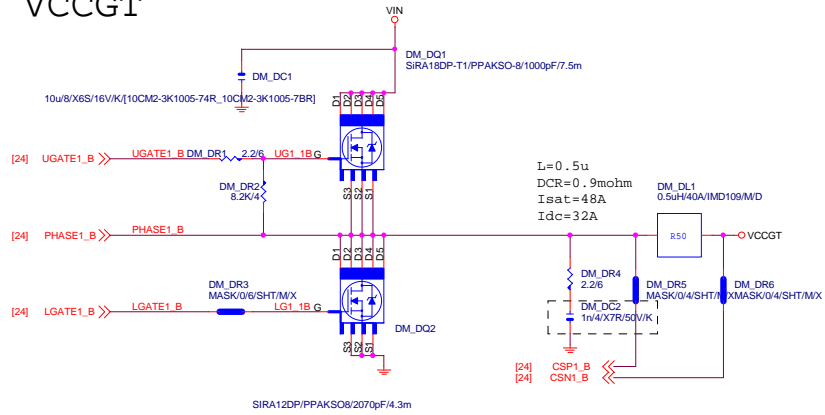
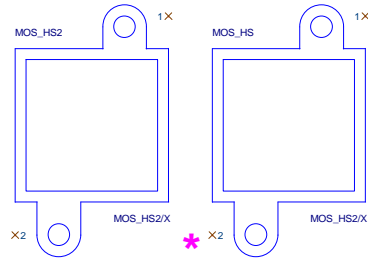
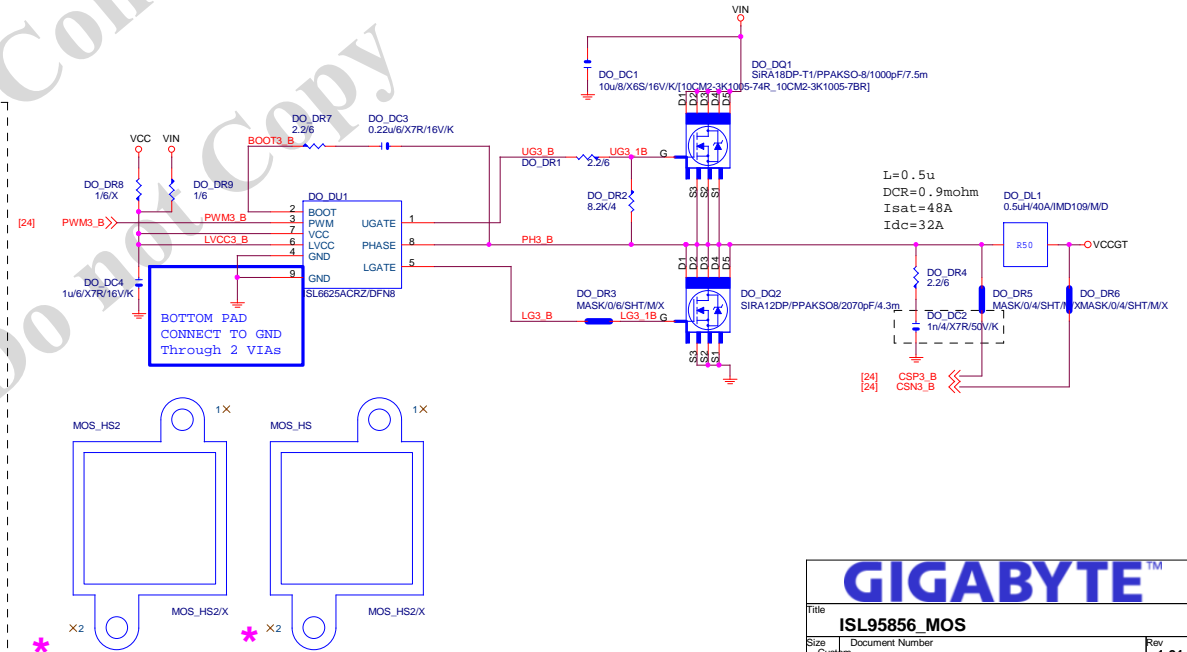
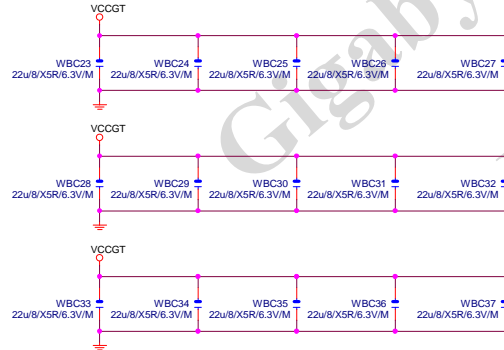
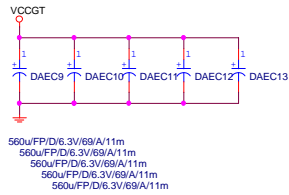
560uF/D₅.3V/69A/11m
 560uF/D₆.3V/69A/11m
 560uF/D₇.3V/69A/11m
 560uF/D₈.3V/69A/11m
 560uF/D₉.3V/69A/11m
 560uF/D₁₀.3V/69A/11m
 560uF/D₁₁.3V/69A/11m



VIN	CAP	270u*3PCS
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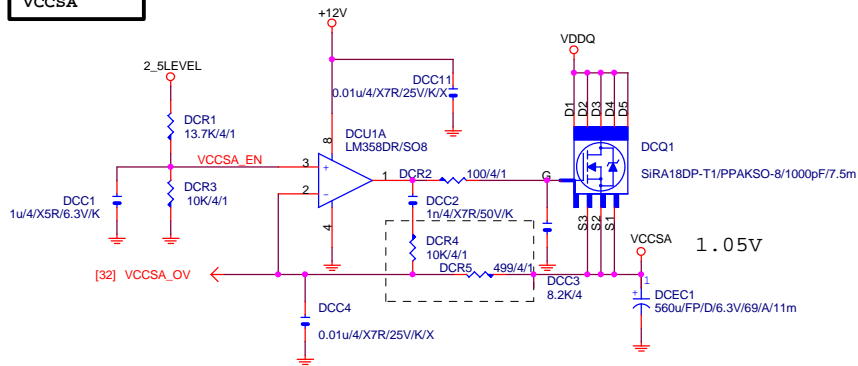
VCCGT

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

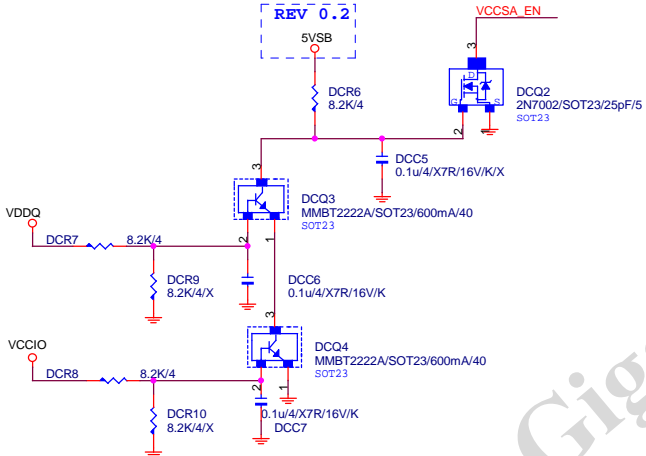
GIGABYTE™			
Title			
ISL95856 MOS			
Size	Document Number	Rev	
Custom	GA-H170-Gaming 3	1.01	
Date:	Wednesday, January 20, 2016	Sheet	26 of 55

REV:0.4

VCCSA

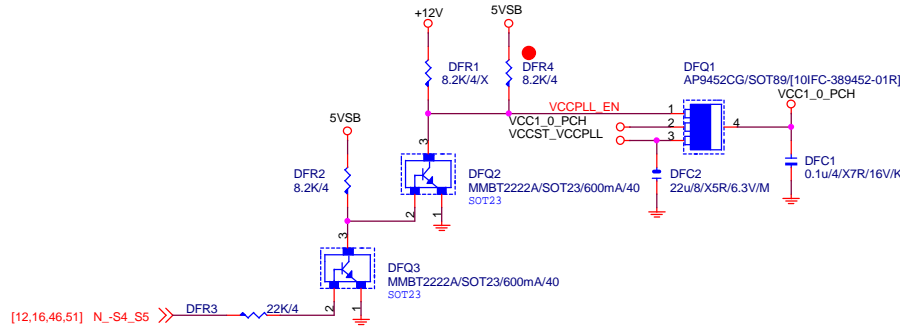


REV 0.2

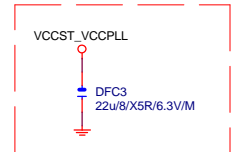


REV:0.2

VCCST_VCCPLL



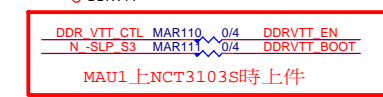
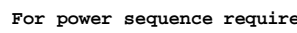
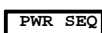
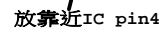
靠近CPU



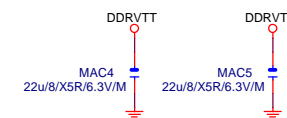
GIGABYTE™

Title			VCCSA_VCCIO_no 44E
Size	Document Number	Rev	
Custom	GA-H170-Gaming 3	1.01	
Date:	Wednesday, January 20, 2016	Sheet	27 of 55

DDR4



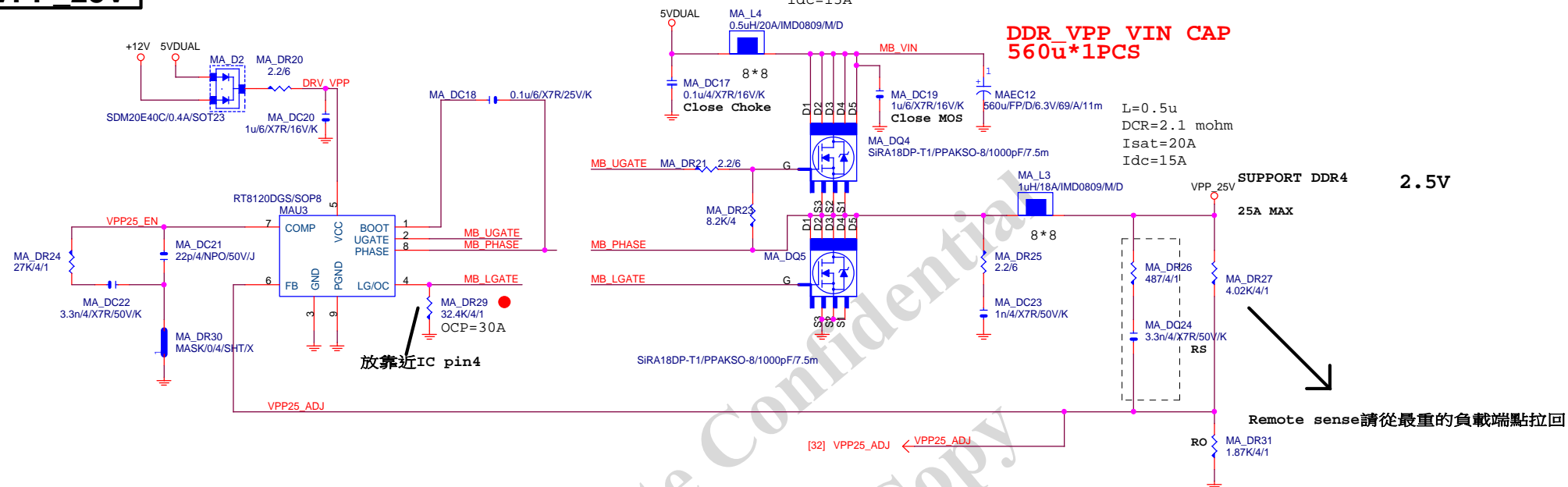
DDRVTT CAP

**GIGABYTE™**

Title			
RT8120_DDR4 POWER			
Size	Document Number	Rev	
Custom	GA-H170-Gaming 3	1.01	
Date:	Wednesday, January 20, 2016	Sheet	28 of 55

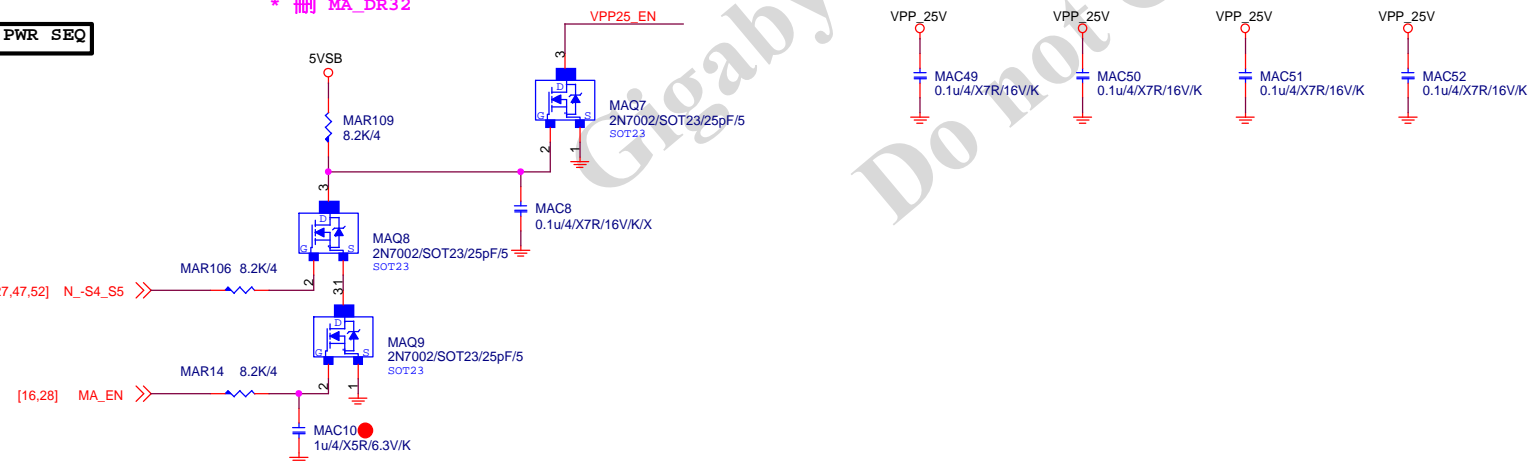
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VPP_25V



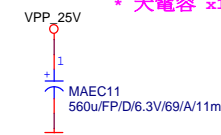
PWR_SEQ

* 刪 MA_DR32



VPP CAP 560u*1PCS

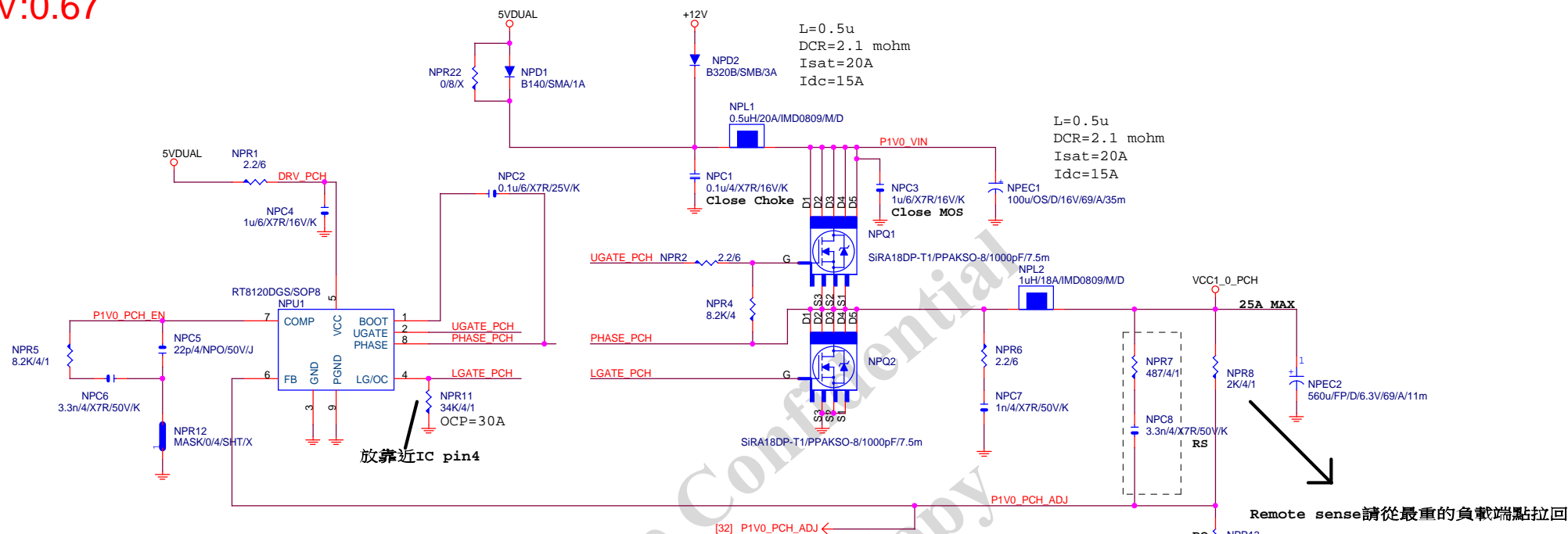
* 大電容 x1



GIGABYTE™

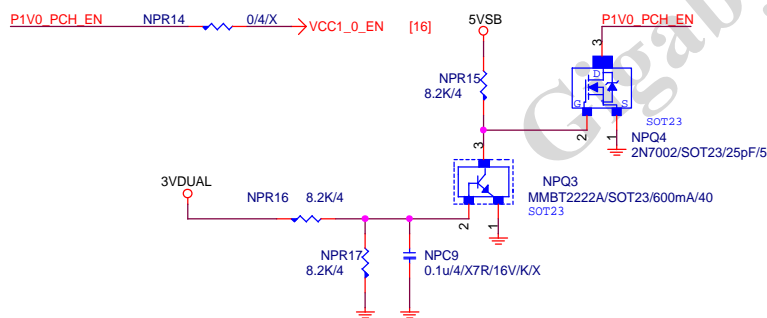
Title		
RT8120_VPP25 POWER		
Size	Document Number	Rev
Custom	GA-H170-Gaming 3	1.01
Date:	Wednesday, January 20, 2016	Sheet 29 of 55

REV:0.67



Remote sense請從最重的負載端點拉回

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



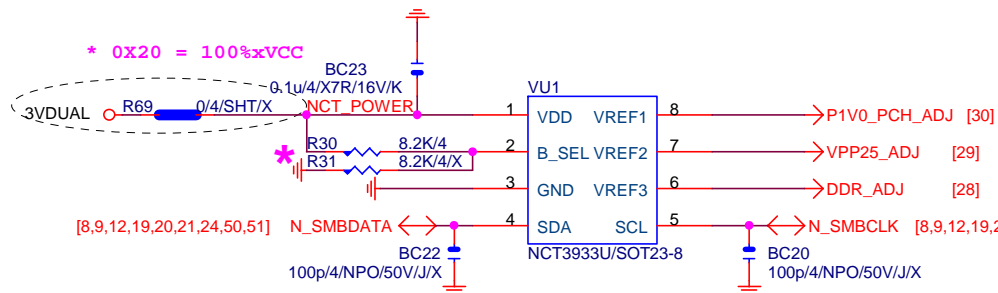
請放置CHOKE一出來的地方

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

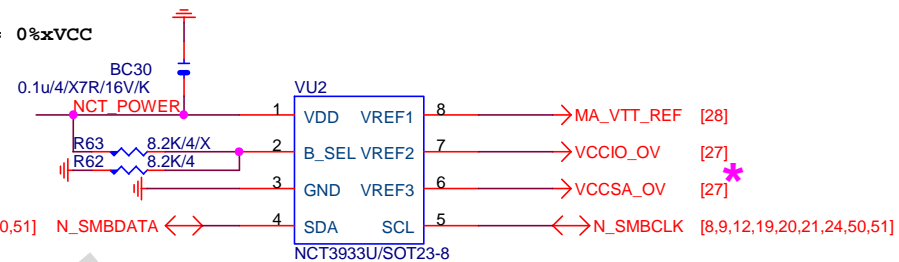
5VDUAL



OVER VOLTAGE



0X2A = 0%xVCC



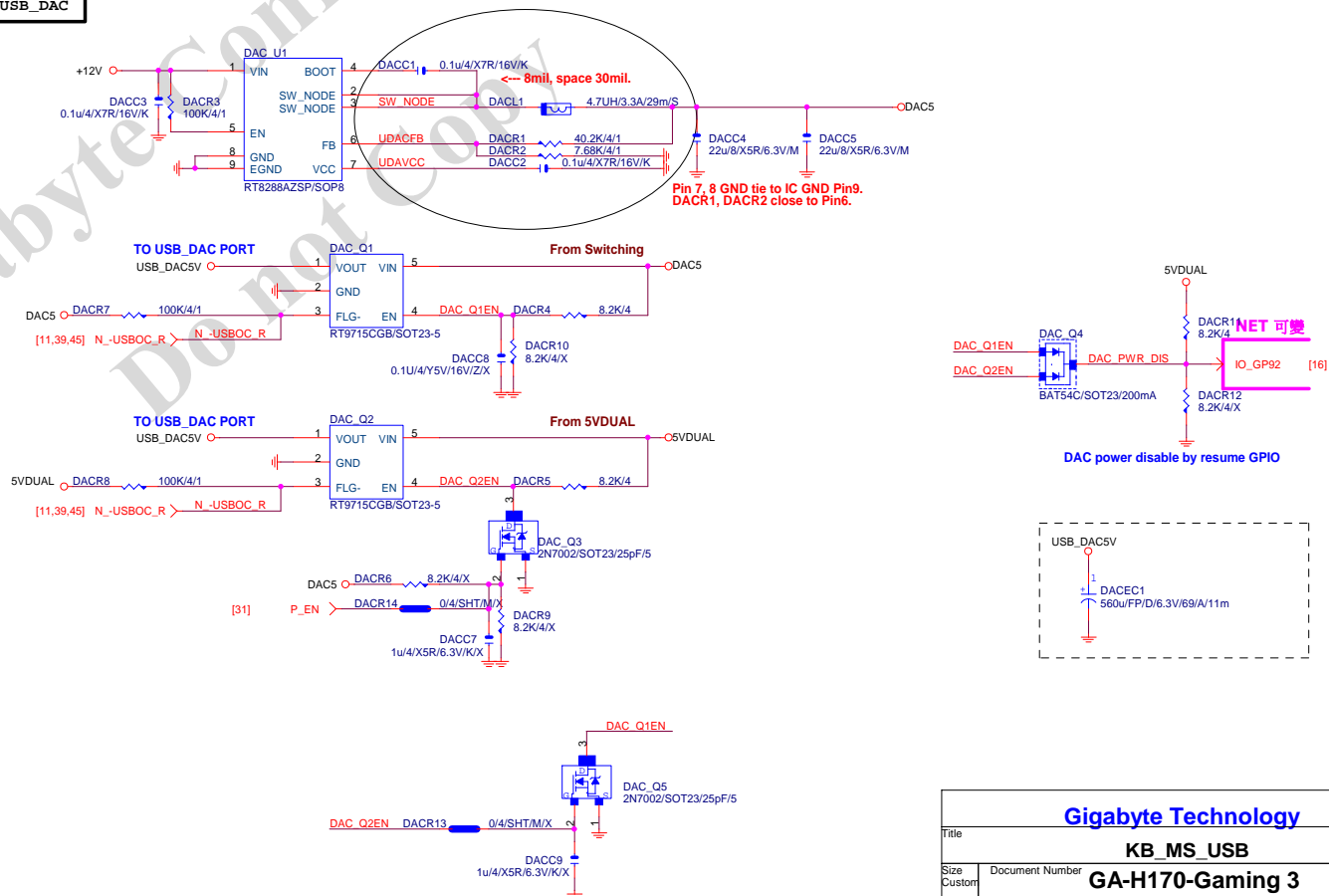
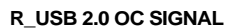
0X22 = 75%xVCC

* 删除 OVU3

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

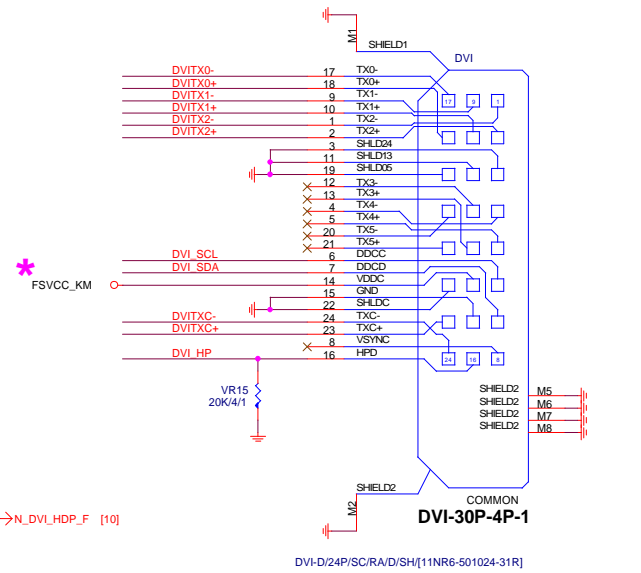
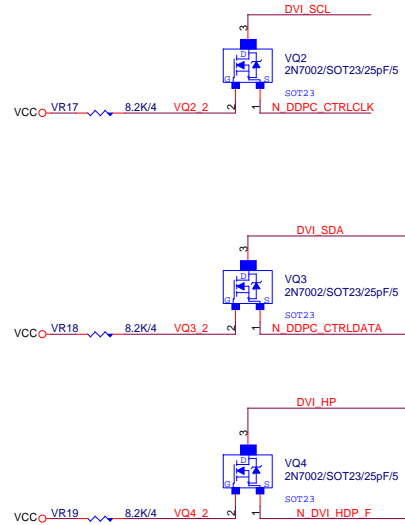
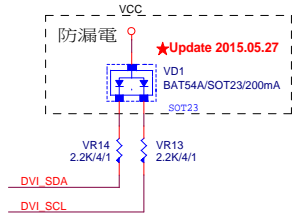
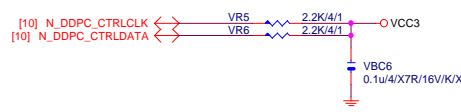
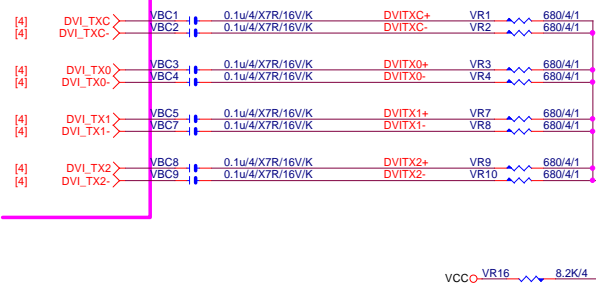
Gigabyte Technology			
Title			
NCT3933			
Size	Document Number	Rev	
Custom	GA-H170-Gaming 3	1.01	
Date:	Wednesday, January 20, 2016	Sheet	32 of 55

Rev
1.01

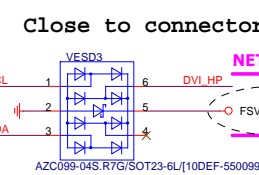
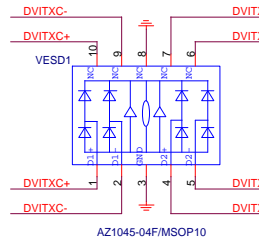
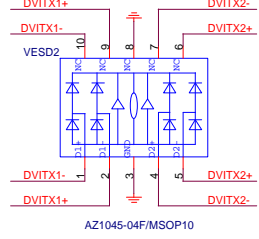


DVI:20/4/6/4/20
Impedance=85 +- 17.5%

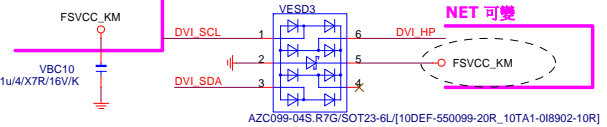
NET 可變



Close to connector



NET 可變



AZC099-04S.R7G/SOT23-6L/[10DEF-550099-20R_10TA1-0I8902-10R]

Gigabyte Technology

DVI CONN		
Title	DVI CONN	
Size	Document Number	Rev
Custom	GA-H170-Gaming 3	1.01
Date:	Wednesday, January 20, 2016	Sheet 35 of 55

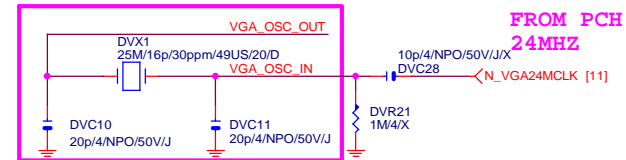
ROM PART: PTN3356R1BS/[10HQ5-A23356-10R]
FLASH PART: PTN3356F1BS/[10HQ5-A23356-20R]

省X'TAL COST DOWN:

- 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

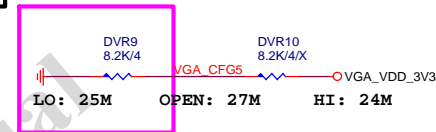
From PCH 24MHz Issue



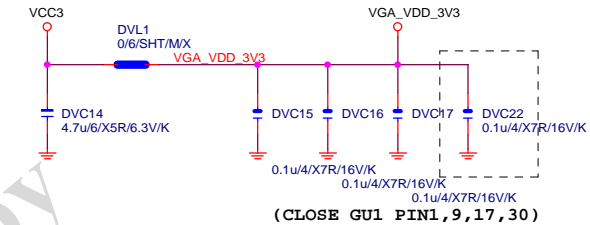
FROM PCH
24MHZ

CFG5

For Crystal Less

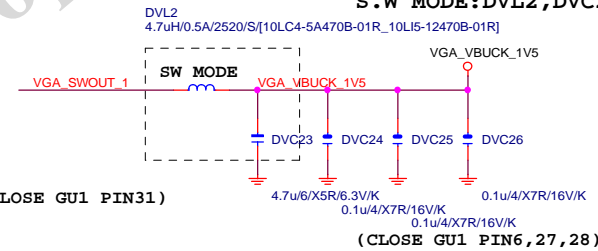


ADAPTER POWER



(CLOSE GU1 PIN1,9,17,30)

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

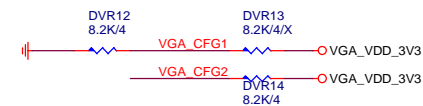


(CLOSE GU1 PIN31)

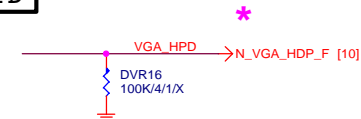
(CLOSE GU1 PIN6,27,28)

CFG1&2

Non-Compliant



HPD



Gigabyte Technology
NXP-PTN3356

Title	GA-H170-Gaming 3	Rev	1.01
Size	Custom	Document Number	GA-H170-Gaming 3
Date:	Wednesday, January 20, 2016	Sheet	36 of 55

放置PCH端

[10] N_DDPD_CTRLCLK <--> DVR19 2.2K/4/1 <--> VCC3
[10] N_DDPD_CTRLDATA <--> DVR20 2.2K/4/1 <--> VCC3

D

C

B

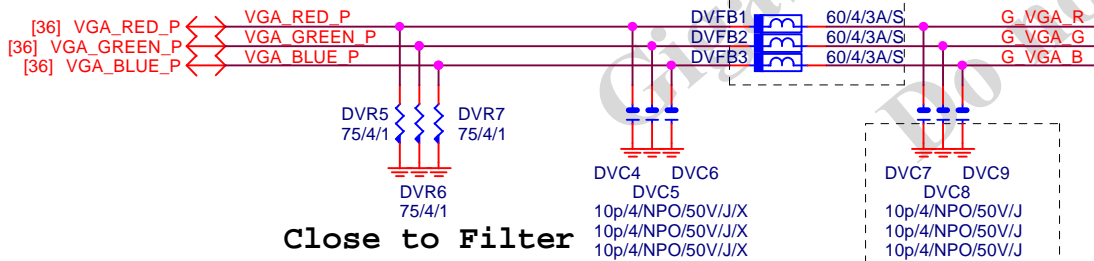
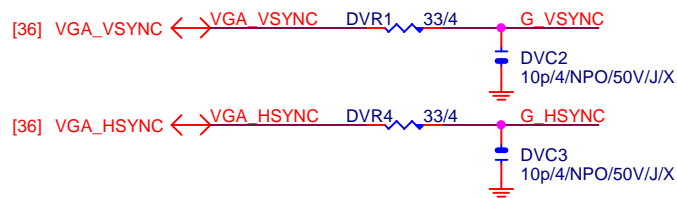
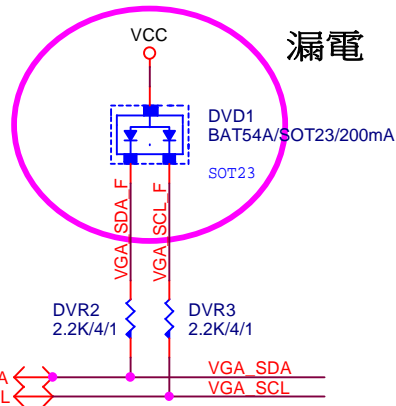
A

D

C

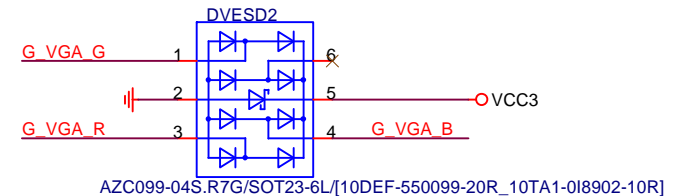
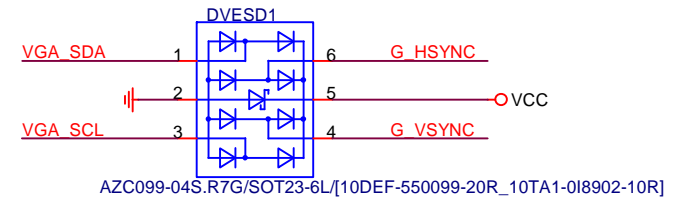
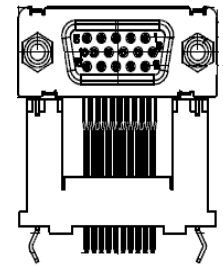
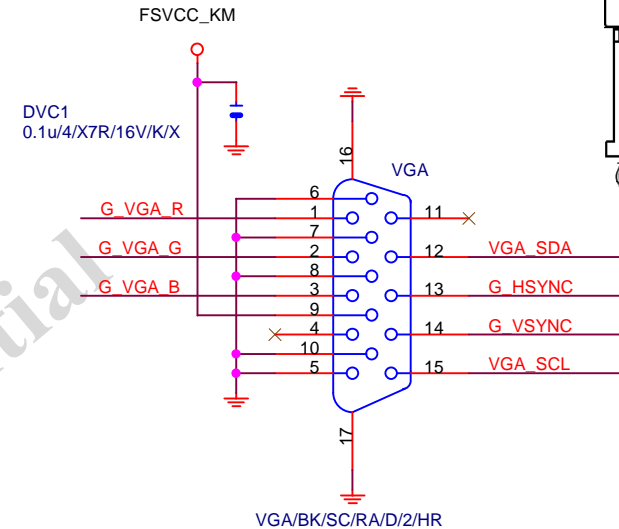
B

A



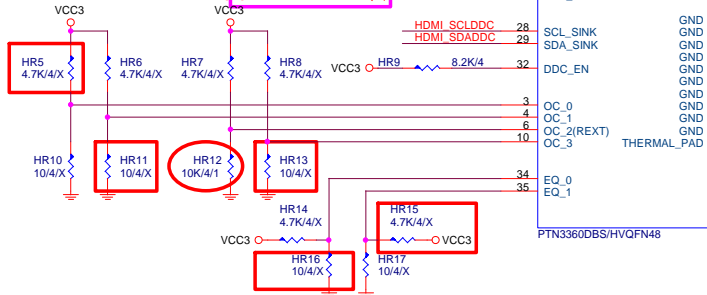
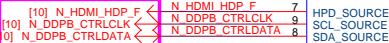
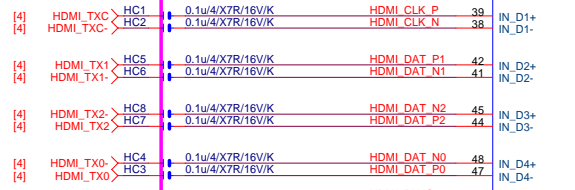
Close to Filter

FOR EMI



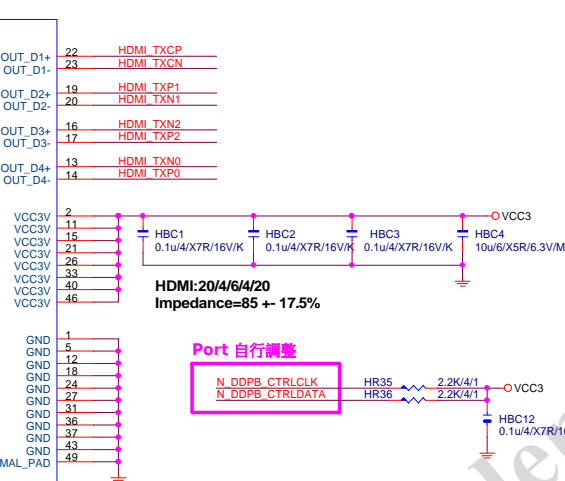
Gigabyte Technology
NXP-PTN3356

Title				Rev 1.01
NXP-PTN3356				
Size Custom	Document Number			GA-H170-Gaming 3
Date:	Wednesday, January 20, 2016	Sheet	37 of 55	



PTN3360:PIN 4/10/34/35 NC PIN,都不上值;只上HR12:10K
PTN3360DBS/HVQFN48

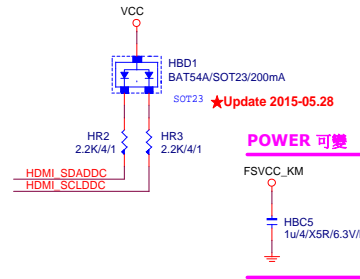
ASM1442:紅色框要上,HR12:3.16K
ASM1442K/QFN-48L/[10TA1-051442-30R]



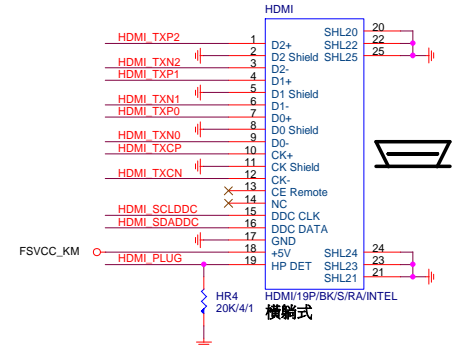
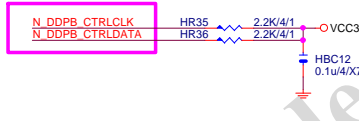
【技術通報R&D技術通報150】

HDMI eye diagram 1.4版(deep color)會fail

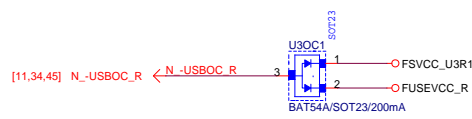
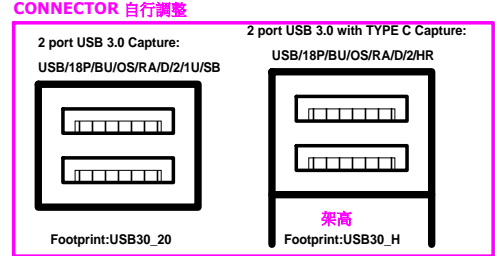
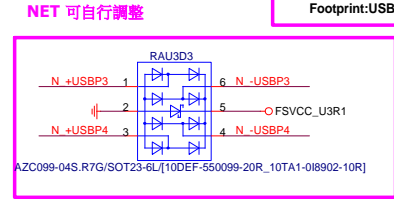
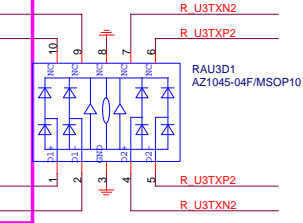
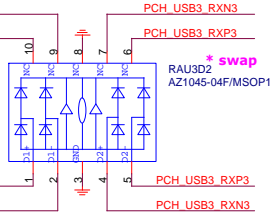
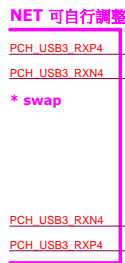
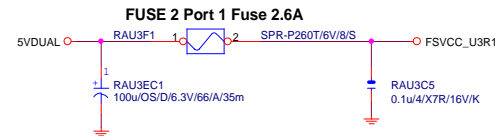
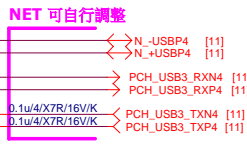
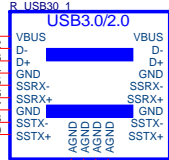
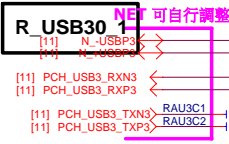
原因: 因目前的HDMI訊號過長,造成RISING TIME過慢,而會壓到eye diagram
改善: ASMEDIA ASM1442 : 3.16K(PIN6 PULL DOWN電阻) 10ohm(PIN4 PULL DOWN電阻)

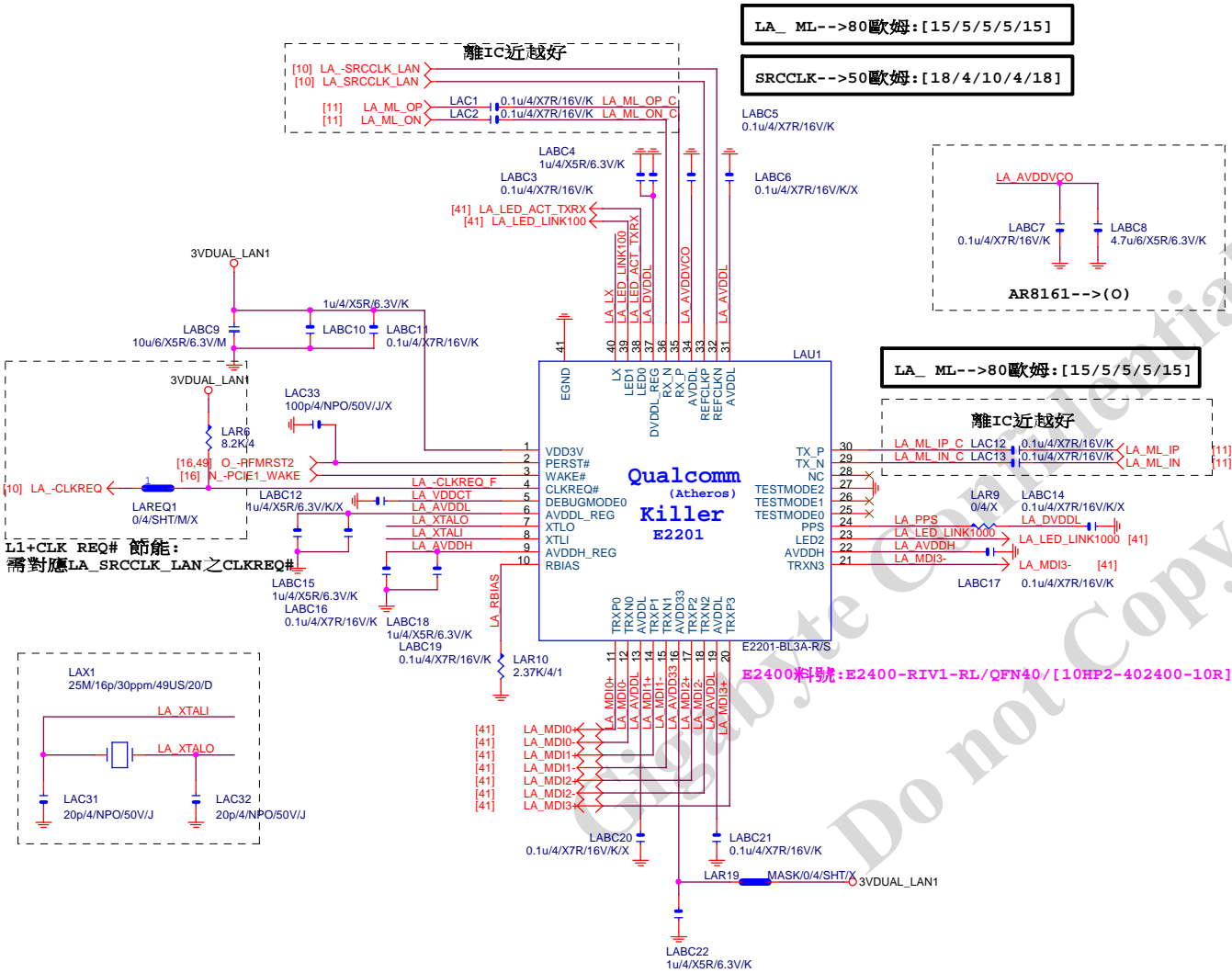


POWER 可變

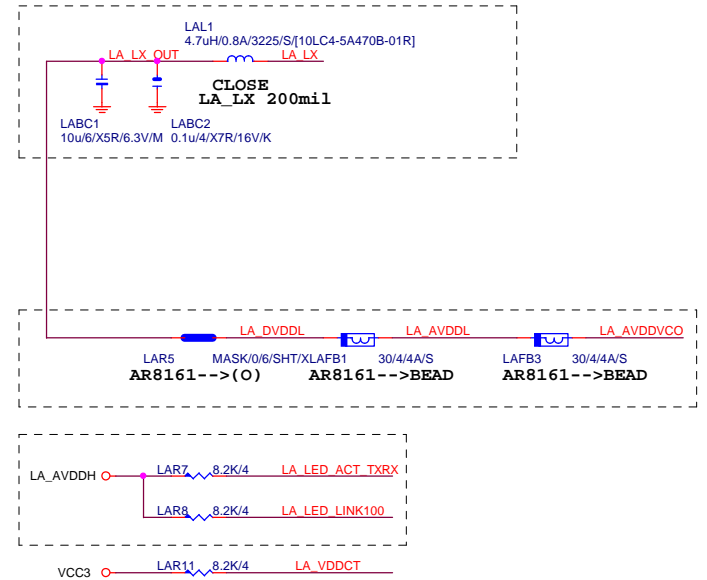


Rev: 0.53





E2400料號:E2400-RIV1-RL/QFN40/[10HP2-402400-10R]



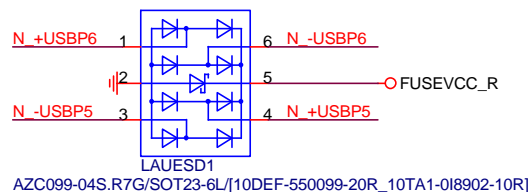
Gigabyte Technology			
KILLER E2201			
GA-H170-Gaming 3	Rev 1.01		
Date: Wednesday, January 20, 2016	Sheet 40	of 55	

R1.05

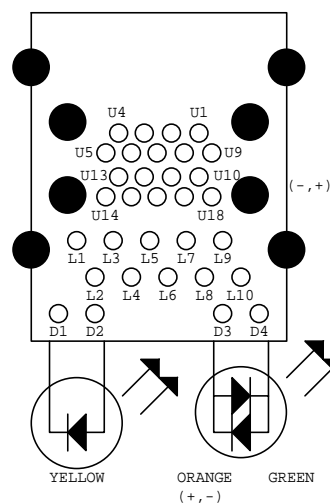
RMA ESD PROTECT

note:可變更USB NAME

可變



USB30_LAN LAYOUT示意圖



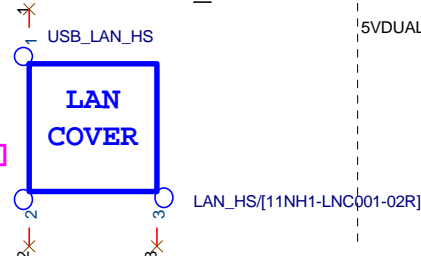
Dual Color LED

Single Color LED

D2 / D1 Yellow

LAN COVER

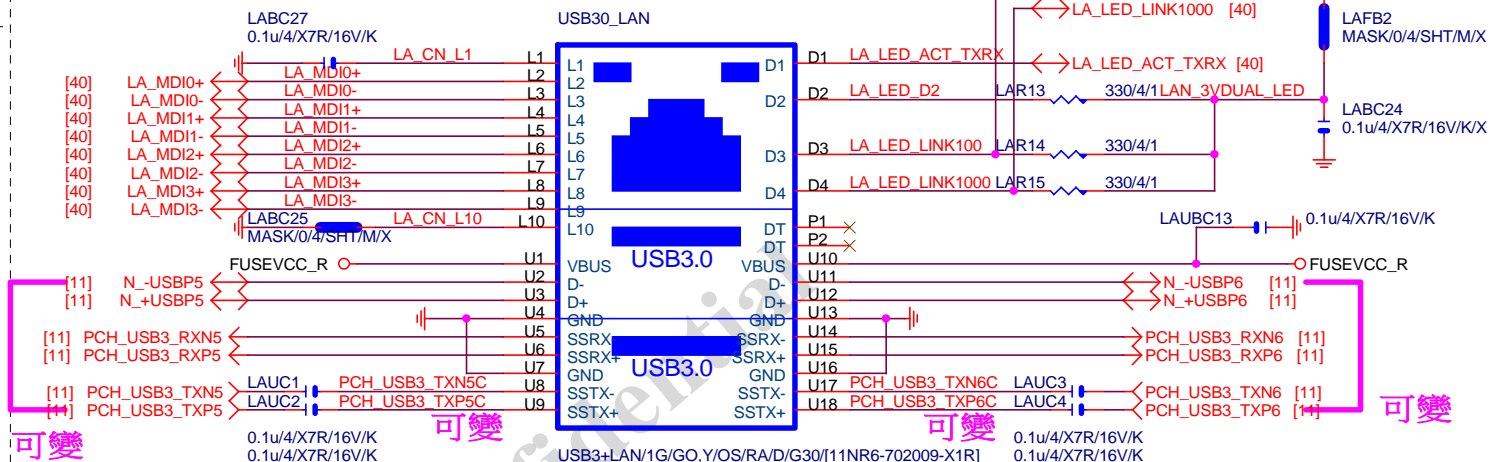
FOOT PRINT:LAN COVER



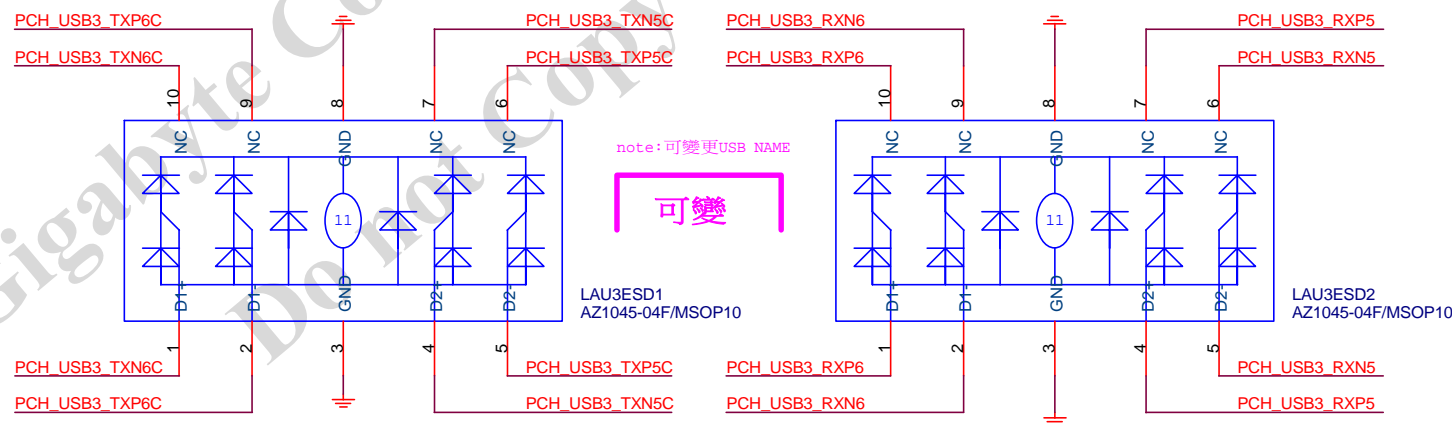
USB_LAN CONNECTOR

note:可變更USB NAME

[E2201]



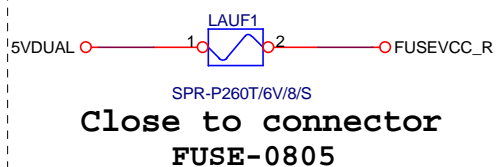
LA MDI-->100歐姆:[20/4/8/4/20]



USB POWER

note:可變更FUSE

可變



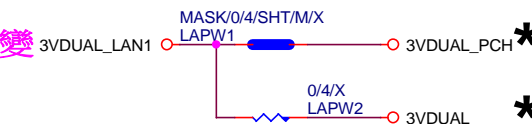
EMI SHORT PAD

PS:視EMI需求



LAN POWER

可變



Gigabyte Technology

LAN CONNECTOR-E2201

Size Custom	Document Number GA-H170-Gaming 3	Rev 1.01
Date: Wednesday, January 20, 2016	Sheet 41 of 55	

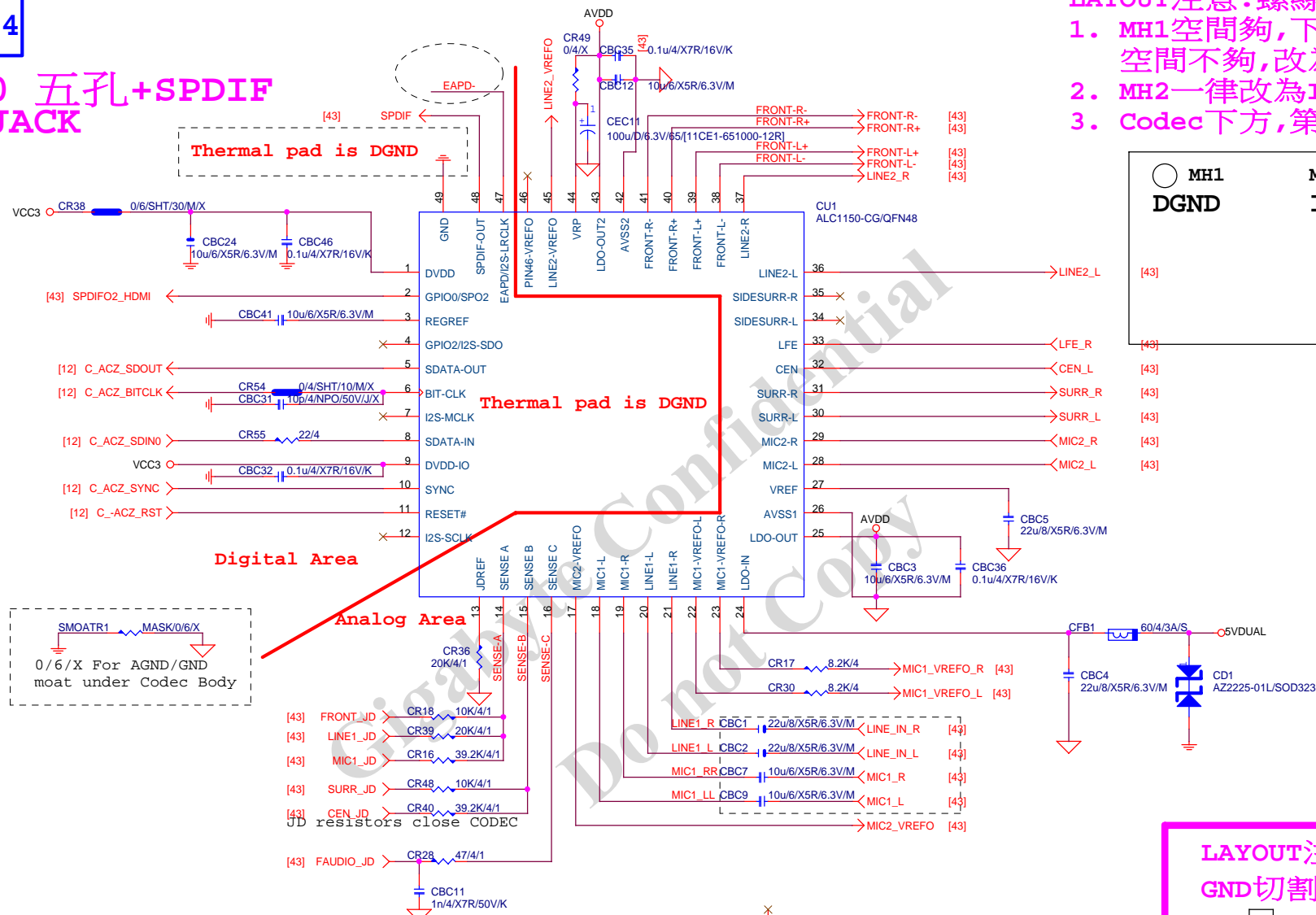
GA-H170-Gaming 3

Rev

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

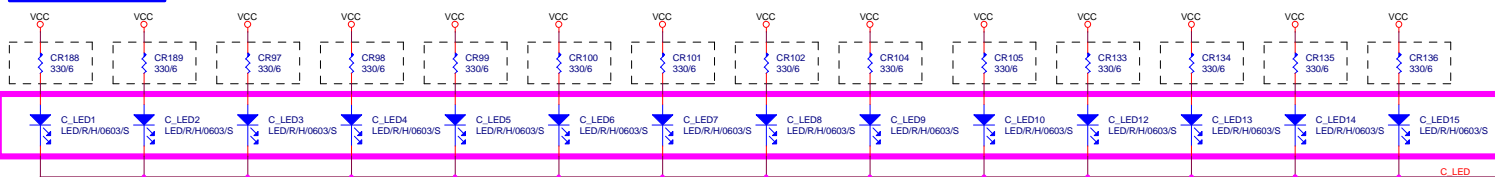


LAYOUT注意:要加
GND切割線

音效區域印刷

Gigabyte Technology

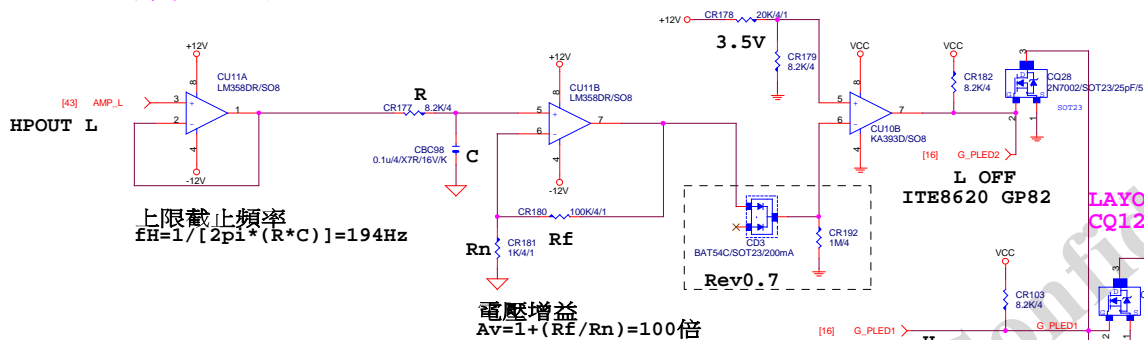
Title			
ALC1150			
Size Custom	Document Number	GA-H170-Gaming 3	Rev 1.01
Date:	Wednesday, January 20, 2016	Sheet 42 of 55	



VALUE可變,LED顏色請自行修改

[UD/SOC系列--> 白光LED(黃色):LED/W/6/S]

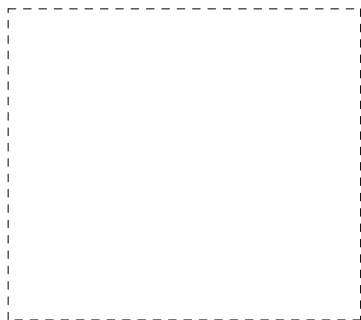
[GAMING系列--> 紅光LED(紅色):LED/R/H/0603/S]



Rear Panel LED ON/OFF

IO_GP80	
AR LED ON	H
AR LED OFF	L

LAYOUT OPTION : 除了GAMING3系列和Z1704N-GAMING5不要LAYOUT, 其餘GAMING系列機種都要留LAYOUT

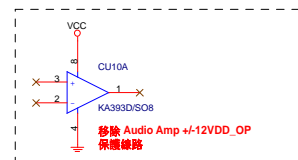


ITE8620 GP83
(可以和IMPD-不同步)

ITE8620 GP91

AUDIO LED Control (沒有LPT model)

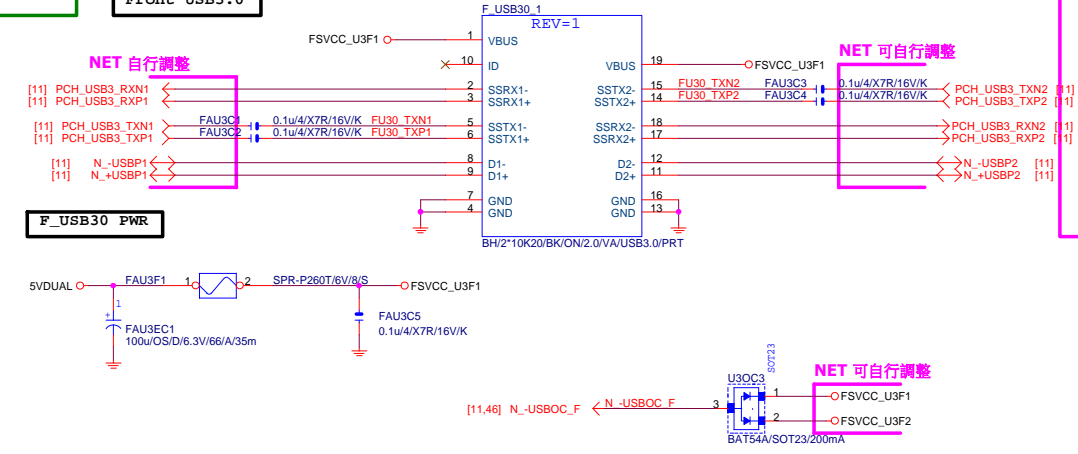
	IO_GP82	IO_GP83	IO_GP91
Still Mode	L	H	L
OFF Mode	L	L	L
Pluse Mode	L	H	BREATH
Beat Mode	OD	H	L



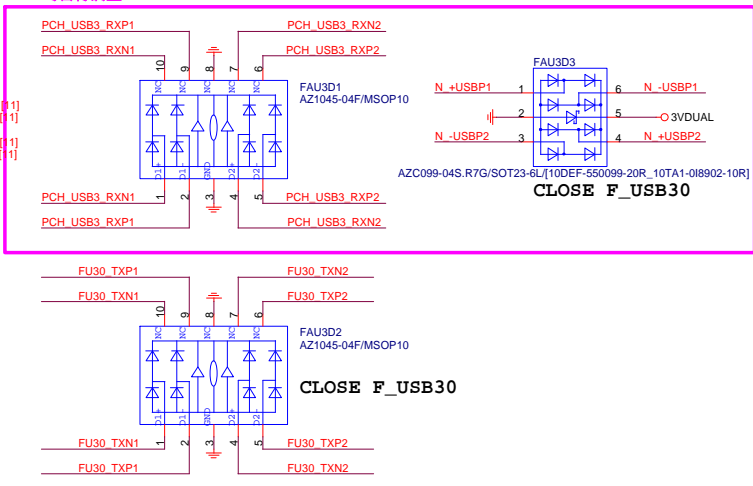
GIGABYTE™

Title			AUDIO LED
Size	Document Number	Rev	1.01
Custom	GA-H170-Gaming 3		
Date:	Wednesday, January 20, 2016	Sheet	44 of 55

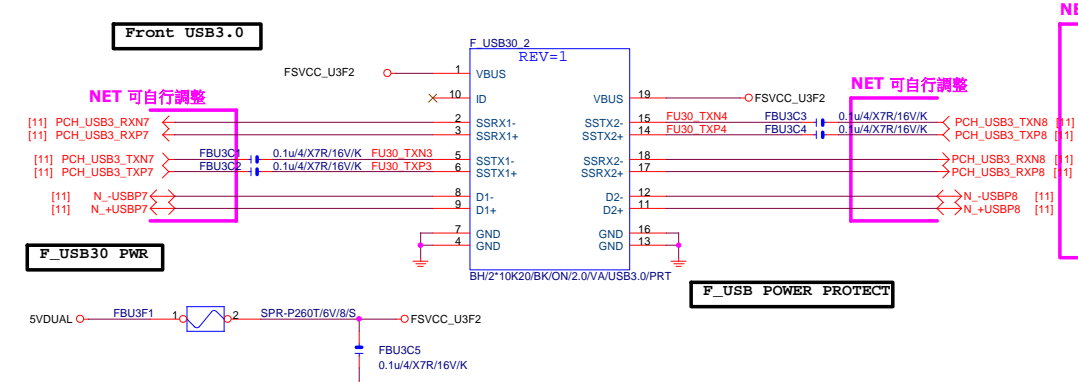
Front USB3.0



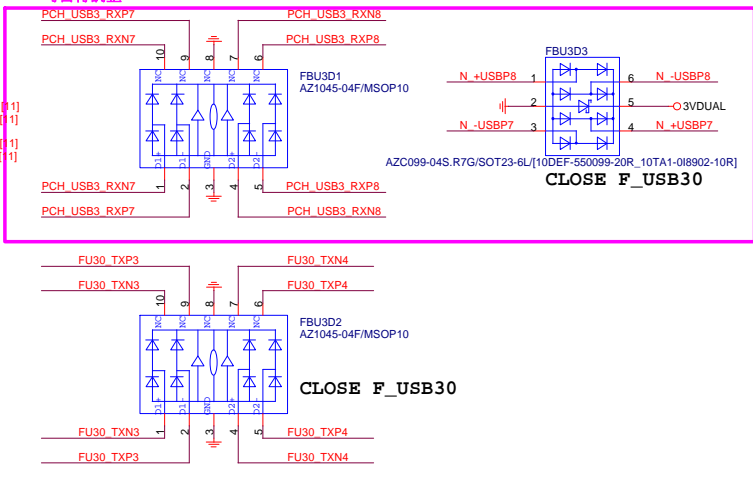
NET 可自行調整



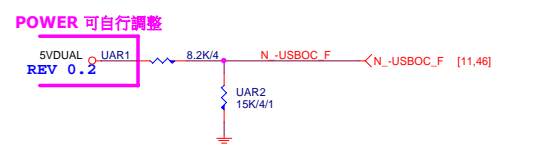
Front USB3.0



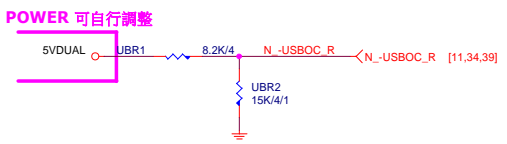
NET 可自行調整



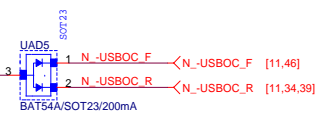
-USBOC_F



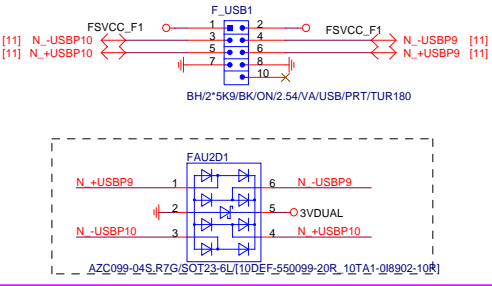
-USBOC_R



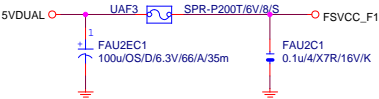
* 接 PCH
N_GPP_B20 (SMI) &
PCH PU 3Vdual



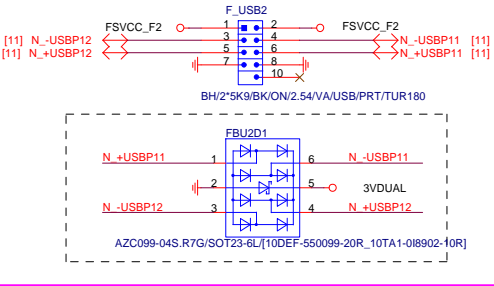
NET 可變



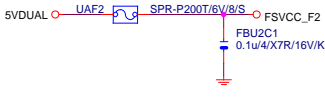
Close to connector
FUSE 2 Port 1 Fuse 2A



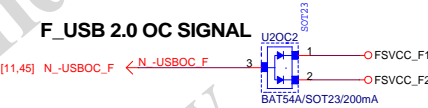
NET 可變



Close to connector
FUSE 2 Port 1 Fuse 2A



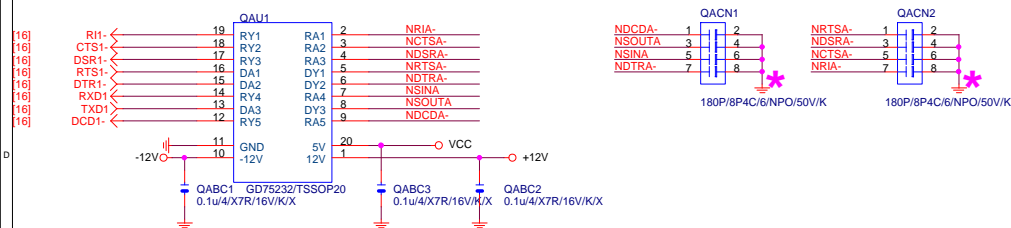
F_USB 2.0 OC SIGNAL



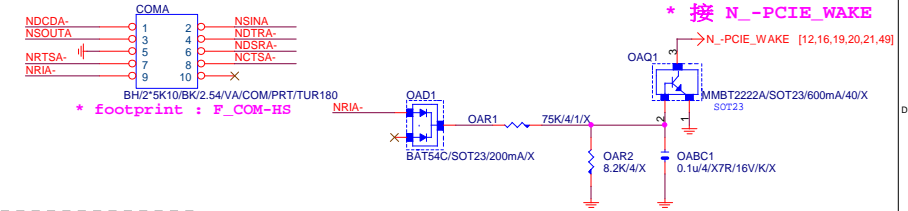
Gigabyte Confidential
Do not Copy

Rev: 0.7

COM PORT



COMA

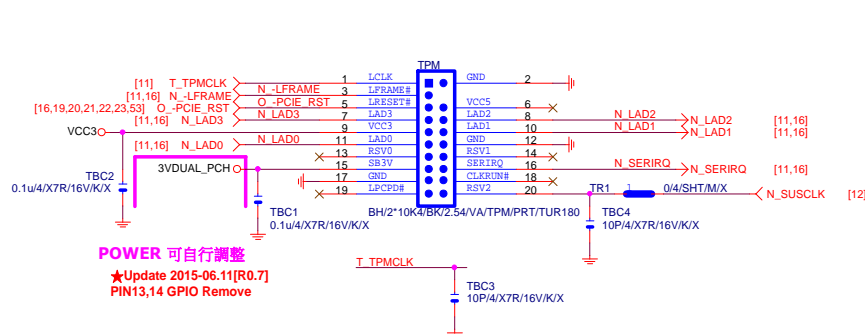


Rev: 0.3

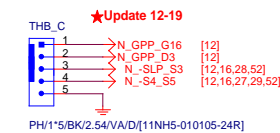
TURBO KEY

LPT PORT

TPM CONNECT



Thunderbolt

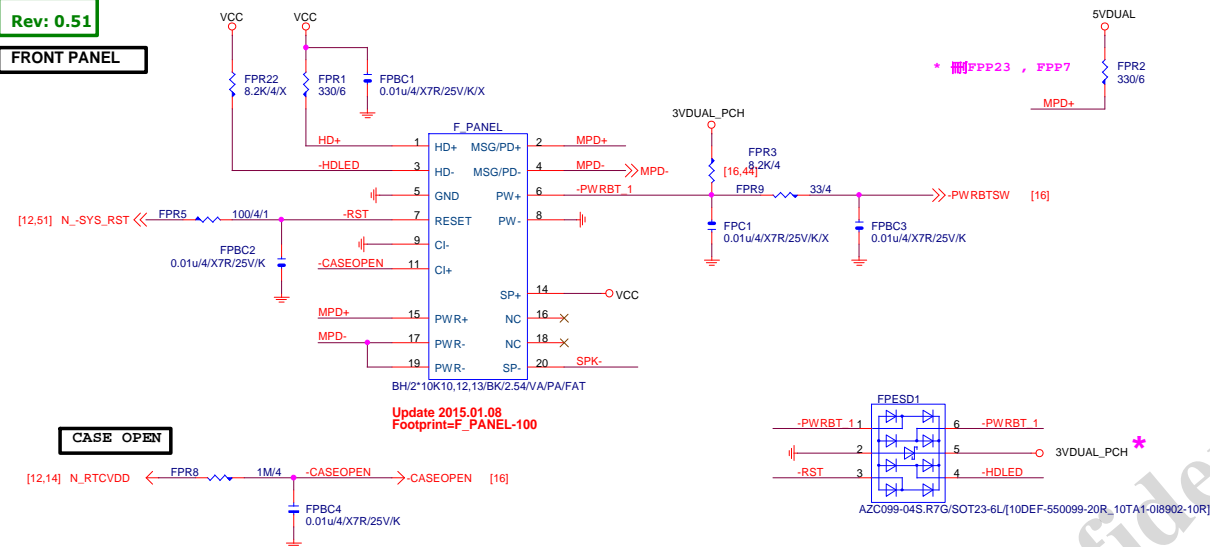


Gigabyte Technology

Title			COM,TPM,THB
Size	Document Number	GA-H170-Gaming 3	
Custom		Rev	1.01
Date:	Wednesday, January 20, 2016	Sheet	47 of 55

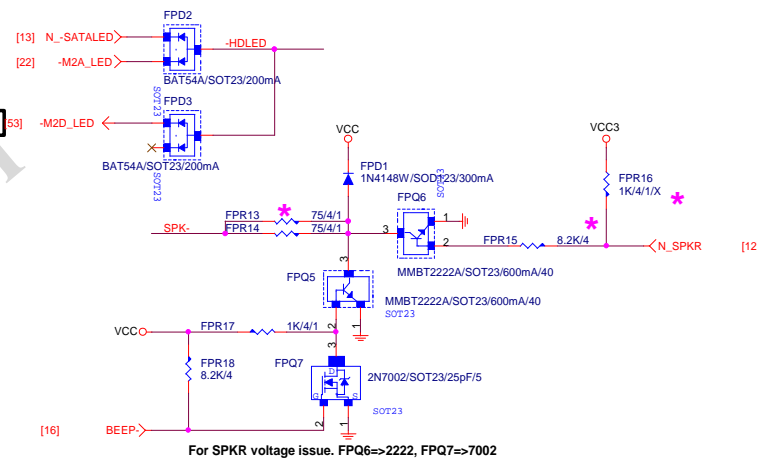
Rev: 0.51

FRONT PANEL



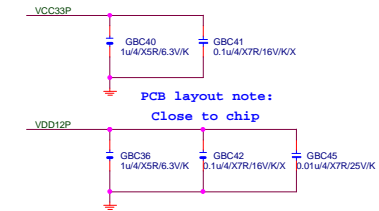
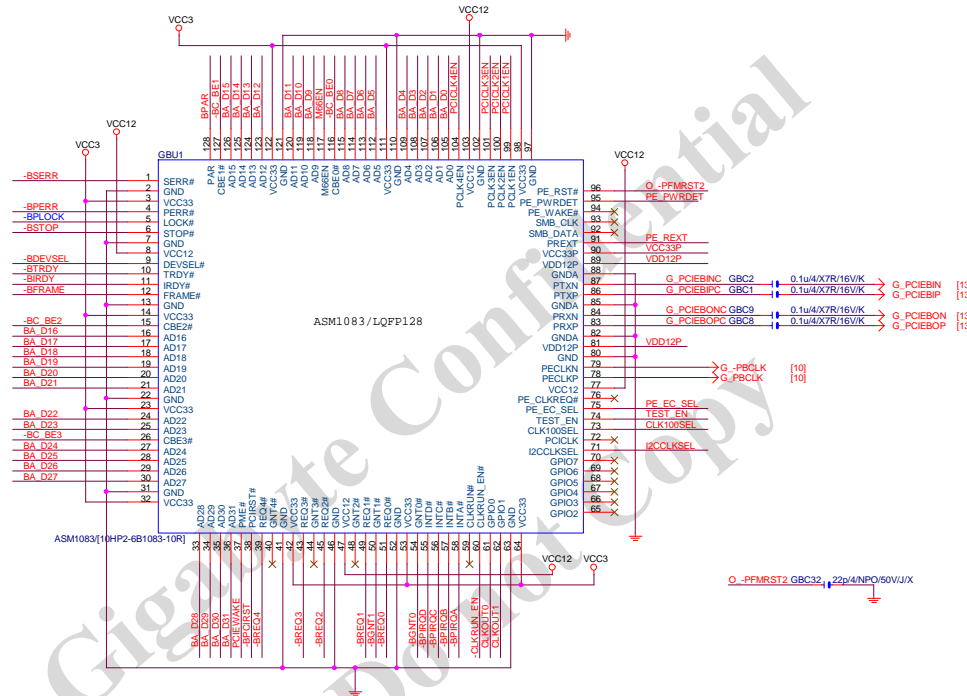
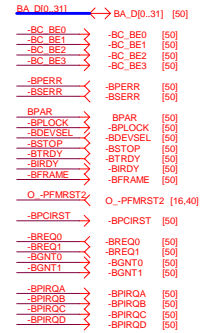
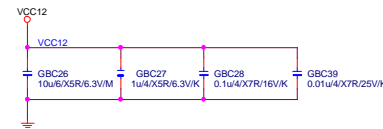
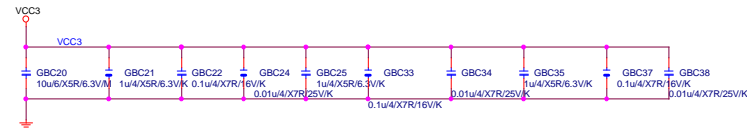
SATA LED

SPKR

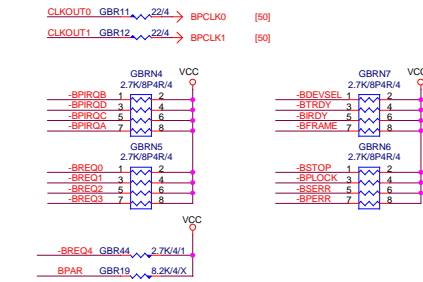


Gigabyte Technology

Title			FRONT PANEL
Size	Document Number	GA-H170-Gaming 3	Rev 1.01
Date:	Wednesday, January 20, 2016	Sheet 48 of 55	



PCB layout note:
Close to chip



CLK100SEL Strapping Set

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

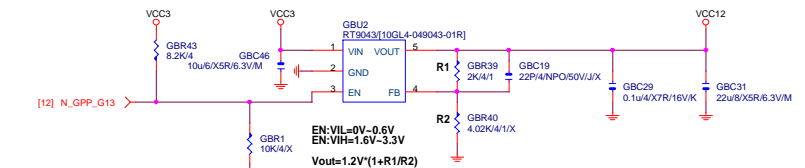
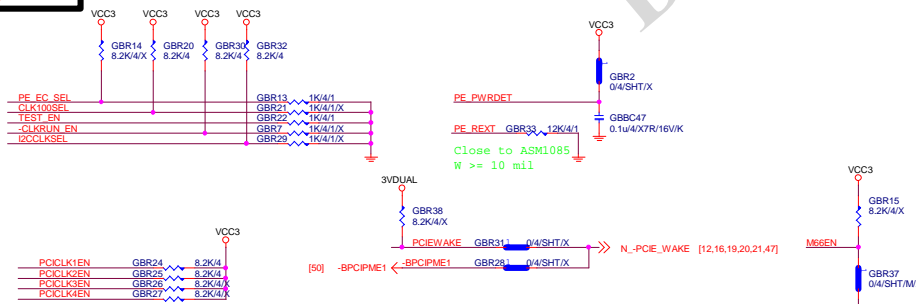
PE_EC_SEL-
 "H" for Express Card mode
 "L" for PCIe Riser Card mode

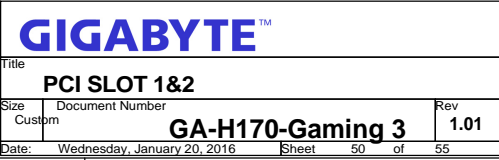
CLK100SEL-
 "H" for PECLK input only
 "L" for PECLK & PCICKL input

```
TEST_EN-
"H" for Test Mode Enable
"L" for Test Mode Disable
```

```
-CLKRUN_EN-
"H" for CLKRUN Mode Disable
"L" for CLKRUN Mode Enable
```

```
I2CLKSEL-
"H" is 135KHz I2CLK
"L" is 67.5KHz I2CLK
```





REV:1.10A

IDT6V41510/IDT6V41520/IDT6V41530

*可變，依需求上件不上件。

請依使用情況(0 ohm 請修改為short Pad)

INP_SEL	Intput
0	Crystal
1	CLK_INP/N

CK_VCO_SEL	VCO
0	400M
1	1200M

Location	CLK BUFFER	PCH CLK
WR100	MOUNT	N/A
WR101	MOUNT	N/A
NR302	MOUNT	N/A
NR303	MOUNT	N/A
WR102	N/A	MOUNT
WR103	N/A	MOUNT
NR300	N/A	MOUNT
NR301	N/A	MOUNT

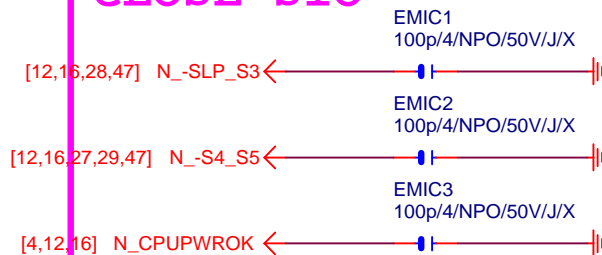
CLK BUFFER 未上件時，零件FOOTPRINT需修改為IC32QFN-SL-MASK

[4,12,16] N_PCH_VRMPWRGD

CK SCLK CKR1 MASK/10/4/X
CK SDATA CKR2 MASK/10/4/X
N_SMBCLK [8,9,12,19,20,21,24,32,50]
N_SMBDATA [8,9,12,19,20,21,24,32,50]
CKBC10 CKBC11
MASK/100p/4/NPO/50V/J/X

GIGABYTE™		
Title IDT6V41510_CLK BUFFER		
Size Custom	Document Number GA-H170-Gaming 3	Rev 1.01
Date: Wednesday, January 20, 2016	Sheet 51	of 55

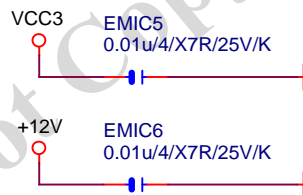
CLOSE SIO



CLOSE PCH



EMI Alain 2015/03/04 modify



GIGABYTE™

Title

EMI/ESD

Size
A

Document Number

GA-H170-Gaming 3

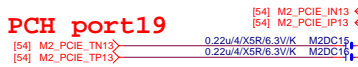
Rev

1.01

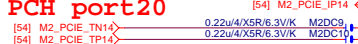
Date: Wednesday, January 20, 2016

Sheet 52 of 55

M.2 Lane2 from PCH port19



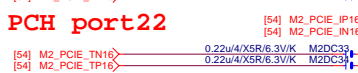
M.2 Lane2 from PCH port20



M.2 Lane3 from PCH port21

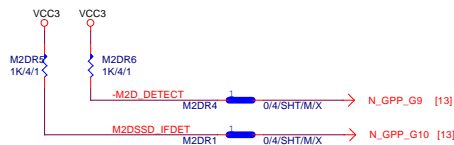


M.2 Lane4 from PCH port22



[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 GPP_G9	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

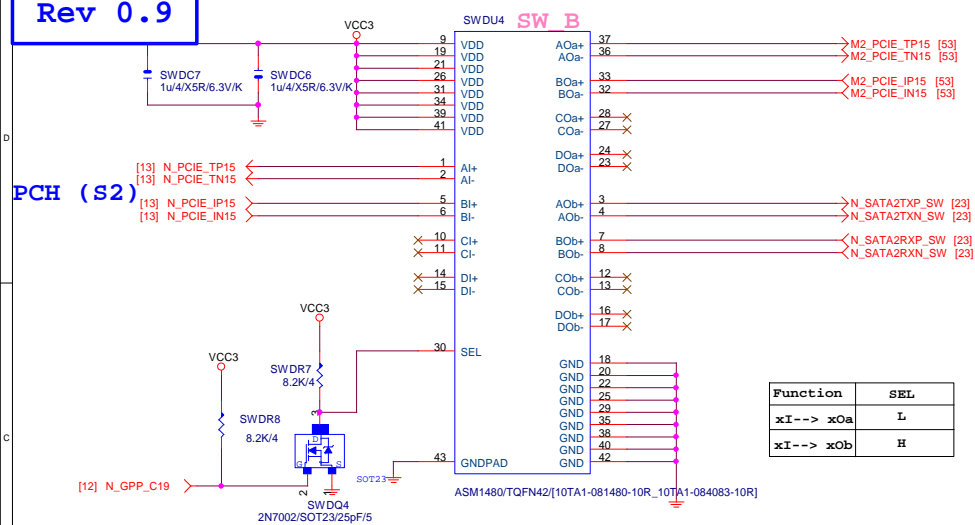
M.2沒插卡+SATA S0~3

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&S.E.D

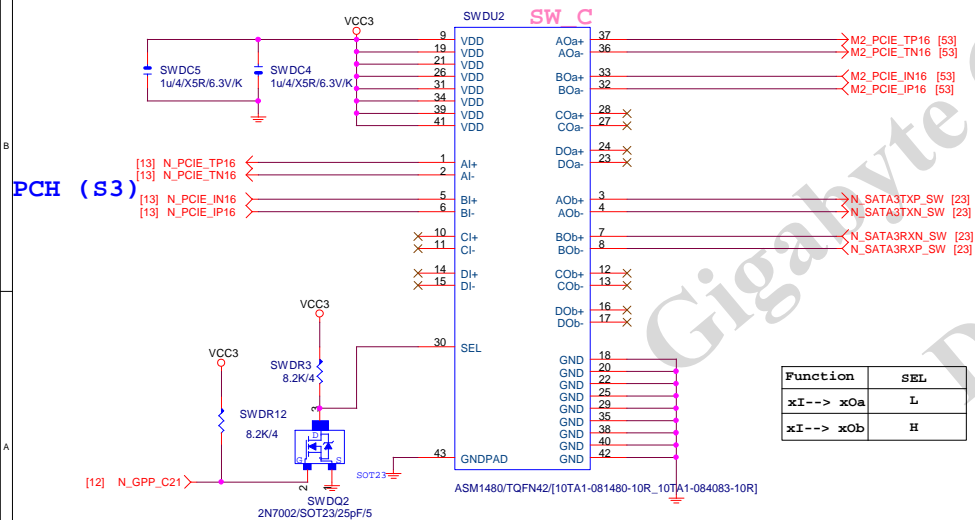
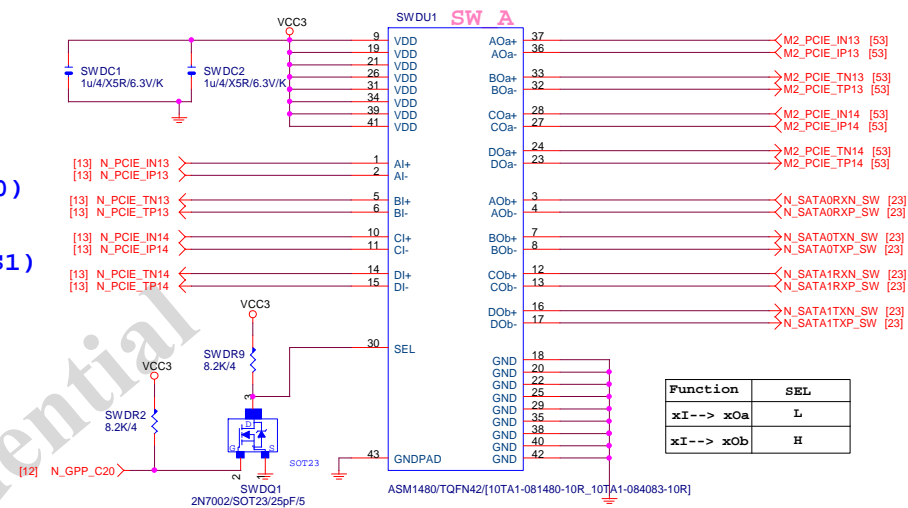
WHEN	PCH GPIO	SETUP	SWITCH
GPP_G7	H	GPP_C20	L
GPP_G8	H	GPP_C19	L
GPP_F1/F2	L	GPP_C21	L

GIGABYTE Technology			
Title	M.2 X4		
Size	Document Number	Rev	
Custom	GA-H170-Gaming 3	1.01	
Date:	Wednesday, January 20, 2016	Sheet	53 of 55



PCH (S0)

PCH (S1)

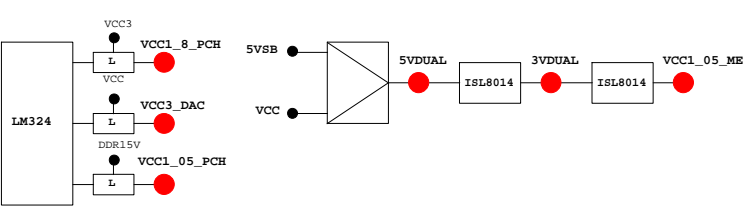


PCH GPIO LIST TABLE					
PIN NAME	PWR	Default	USAGE	NOTE	
GP0	MAIN	H-Z	GPI	GPIO0	N/A
GP1/TACH1	MAIN		GPI	GPIO1	N/A
GP2/PIRQE#	MAIN		GPI	-PIRQE	P/U 8.2K VCC3
GP3/PIRQF#	MAIN		GPI	-PIRQF	P/U 8.2K VCC3
GP4/PIRQG#	MAIN		GPI	-PIRQG	P/U 8.2K VCC3
GP5/PIRQH#	MAIN		GPI	-PIRQH	P/U 8.2K VCC3
GP6/TACH2	MAIN		GPI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

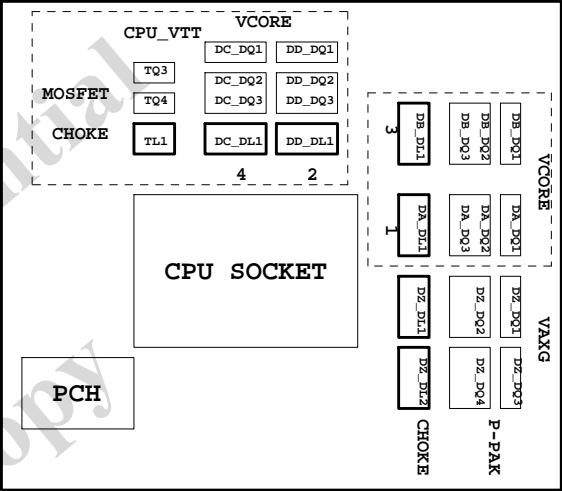
Super I/O ITE8720 GPIO Table

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	
VIDO5/GP27/SIN2	LOW_PWR_2	
PCIRST2#/GP11	-PFMRST1	
PCIRST1#/GP12	-PFMRST2	
3VSBSW#/GP40	CSI_F0	BSREL166_1
SUSC#/GP53	CSI_F1	BSREL166_2
GP23/SI	BSREL166_3/CSISBSL	
VIDO0/GP20/CTS2#	CPUT_LED1_C	BSREL166_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	
VIDO1/GP21/DCD2#	DDR_LED2_C	
STB#/GP87/SMBC_M	DDR_LED3_C	
PWRON#/GP44	VCORE_OV1	
PANSWH#/GP43	PWRBTSW	
KDAT/GP61	-PWRBTSW	
KCLK/GP60	KDAT	
MDAT/GP57	KCLK	
MACL/GP56	MDAT	
GP66/VLDT_EN/GB_02	NBT_LED1_C	MCLK
SVD/PCIRSTIN#/CIRTX/GP15	PWM2_CR	
KDAT/GP61	PWM2_CR	
GP67/CPU_PG/GB_03	EN_LOADLINE	IT_GP67/-EN_PWM2
SLIN#/GP84/SMBD_R	-EN_PWM2	
PSI_L/FAN_CLT5/CIRRXL/GP16	-THERM	
VIDO4/GP26/SOUT2	DDR18V_PH2_EN	
VIDO2/FAN_TAC5/GP24/DSR2#	DDR18V_LED	
VIDO6/GP17/RI2#	1_1V_PH_EN	
VIDO7/JP6/DTR2#	JP6	
PD5/GP75/BUSS00	SB_LED3_C	



PWM各相位的擺法如下：



BIOS超電壓對應表：

散熱模組料號：

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

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