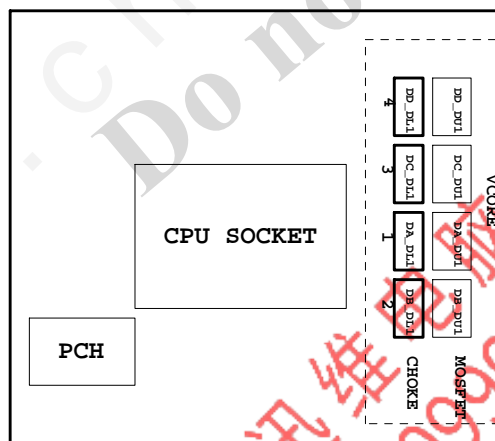


01	COVER SHEET
02	BOM & PCB MODIFY HISTORY
03	BLOCK DIAGRAM
04	CPU_LGA1151-A
05	CPU_LGA1151-B-DDR3
06	CPU_LGA1151-C
07	CPU_LGA1151-D
08	DDR 4 CHANNEL A
09	DDR 4 CHANNEL B
10	PCH CLOCK BUFFER
11	PCH DMI,USB,PCIE
12	PCH MISC
13	PCH SATA,PCIE,SATA EXPRESS
14	PCH_PWR,GND
15	Dual BIOS
16	I/O ITE8628
17	HWM
18	FAN CTRL-SIO
19	PCIEX16 SLOT
20	
21	
22	
23	
24	
25	
26	ISL95858_856 PWM
27	ISL95858_856 MOS_VCORE
28	ISL95858_856 MOS_VCCGT
29	VCCSA_VCCIO_VCCPLL
30	RT8237_DDR_BEAD
31	
32	RT8237_PCH-BEAD
33	DISCRETE POWER
34	NCP3933 OVER VOLTAGE

35	ATX POWER , -PROCHOT
36	KB_MS_USB
37	DVI
38	RTD2168 - DP to VGA - IC
39	RTD2168 - DP to VGA - Conn
40	HDMI
41	R_USB30
42	Realtek 8111G
43	USB30_LAN CONNECTOR-8111G
44	ALC887-VD2 CODEC
45	REAR AUDIO JACK
46	F_USB30
47	F_USB20
48	COM , LPT , TPM
49	F_PANEL
50	TABLE LIST



Gigabyte Technology



Rev 1.0

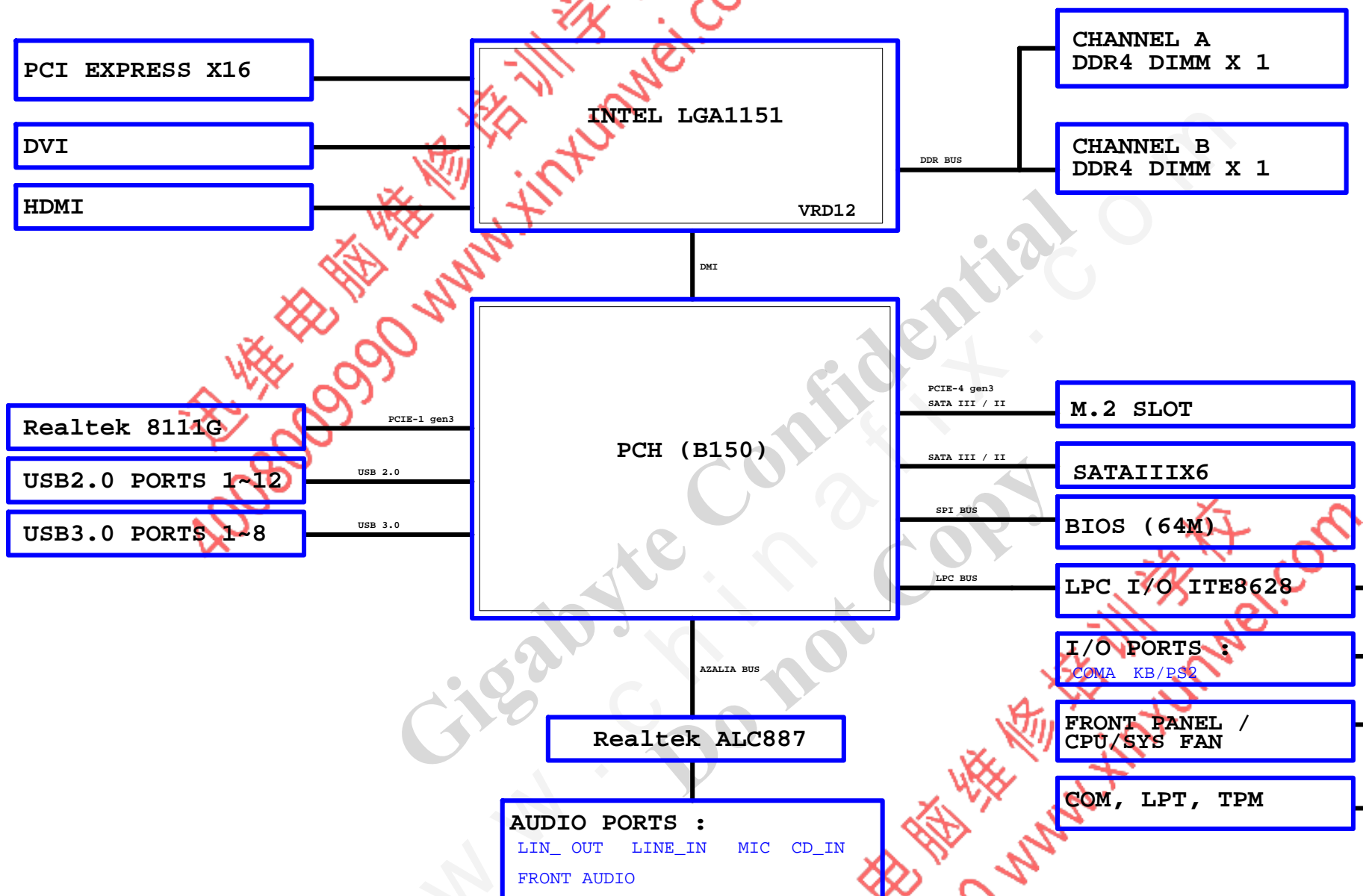
Circuit or PCB layout change

2016/06/14

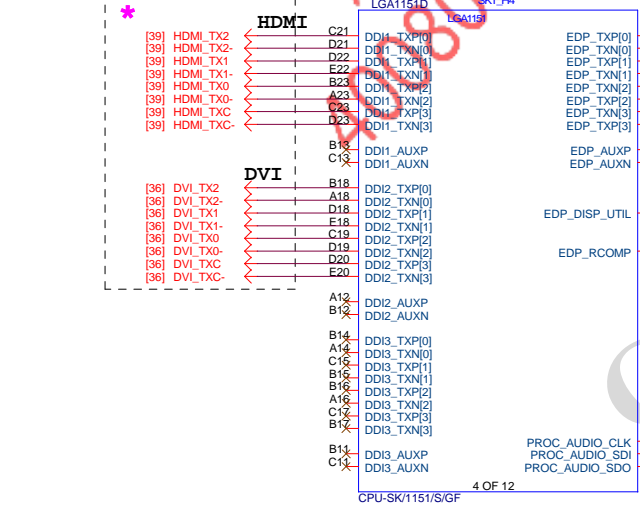
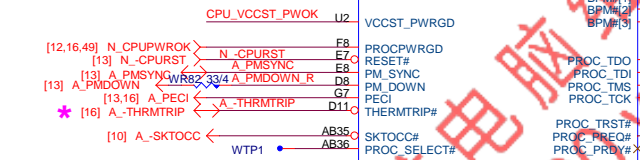
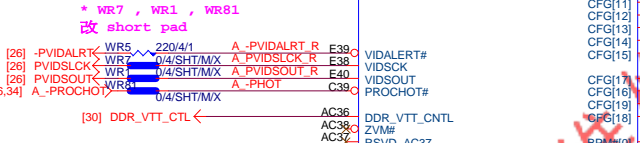
[illegible][illegible]

BLOCK DIAGRAM

www.xinxunwei.com 400-800-9990



Rev0.2B

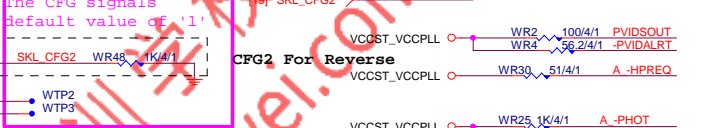


G-15u : (CPU-SK/1151/S/15)
10SC1-F01151-11R / 10SC1-F01151-12R
G-FL : (CPU-SK/1151/S/GF)
10SC1-F01151-21R / 10SC1-F01151-22R

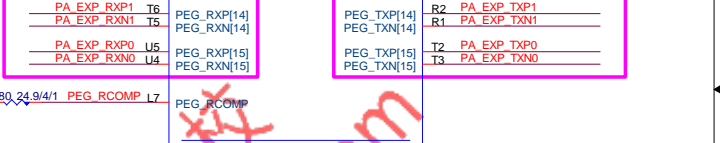
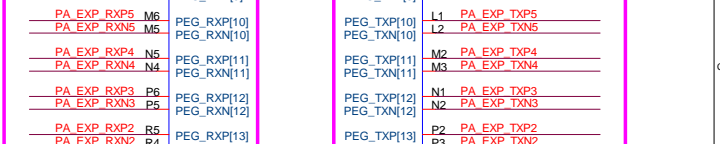
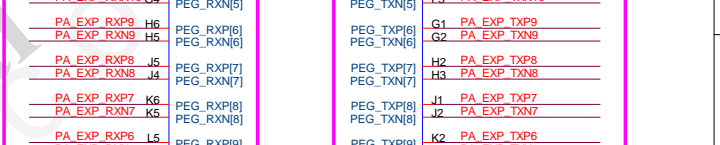
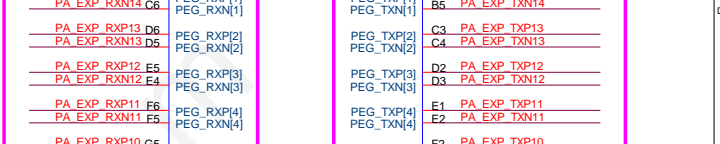
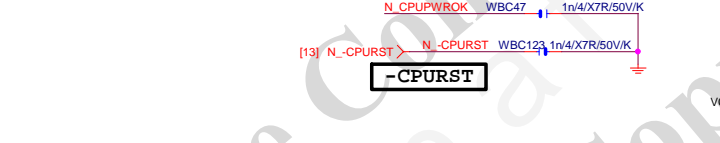
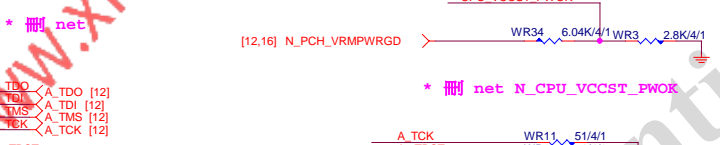
4 layer HDMI/DP/eDP/=====4/4/4//15
6 layer HDMI/DP/eDP/=====4/5.5/4//15

Impedance=85 +- 15%

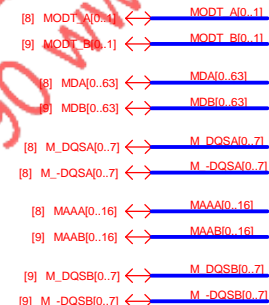
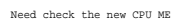
www.xinxunwei.com 400-800-9990

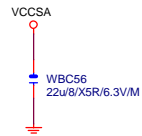


Bifurcation Config.	Signals Lanes
CFG[6] CFG[5] CFG[2]	
1x16 Reversed	1 1 0
2x8	1 0 1
2x8 Reversed	1 0 0
1x8+2x4	0 0 1
1x8+2x4 Reversed	0 0 0

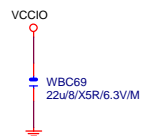


Gigabyte Technology		
CPU LGA1151-A		
Size Custom	Document Number	Rev 1.0
GA-B150M-Gaming PIO		
Date: Monday, June 20, 2016	Sheet 4	of 52

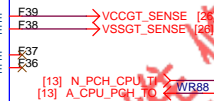
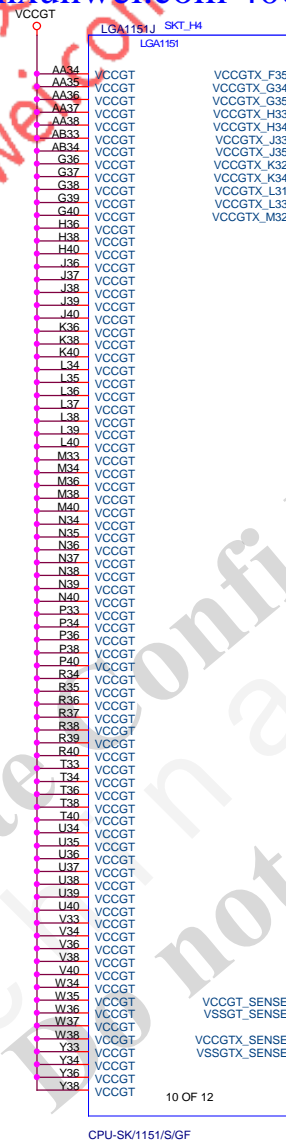
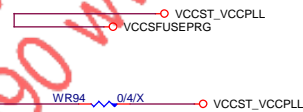




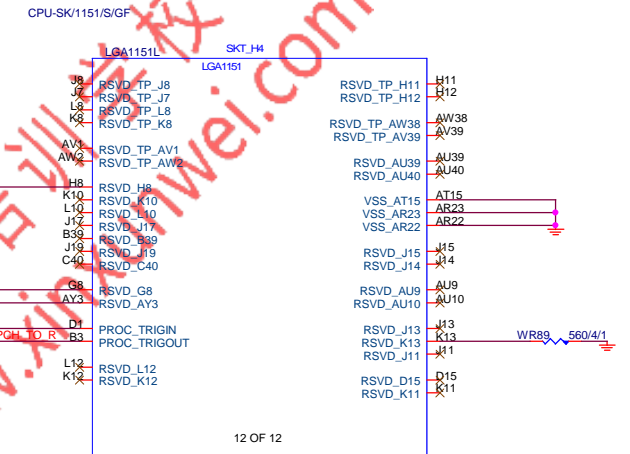
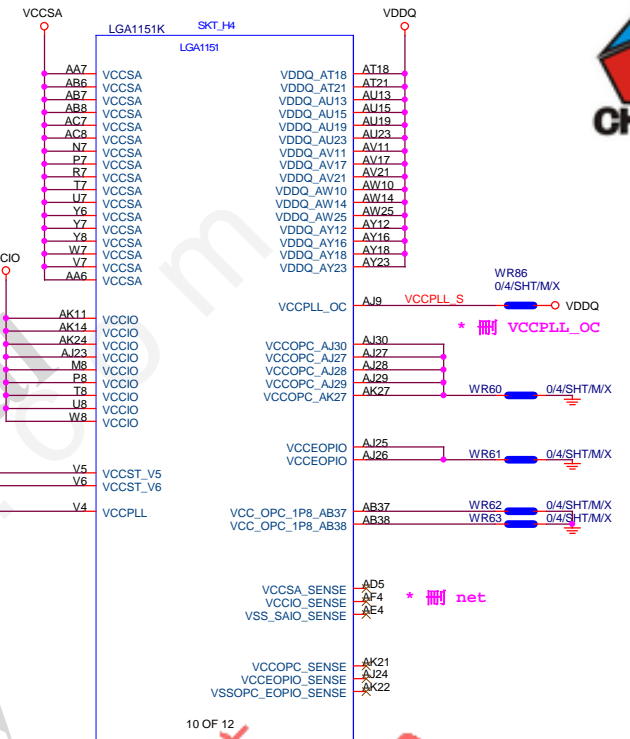
* 删 WBC124 , WBC125 , WBC126 , WBC127 电容

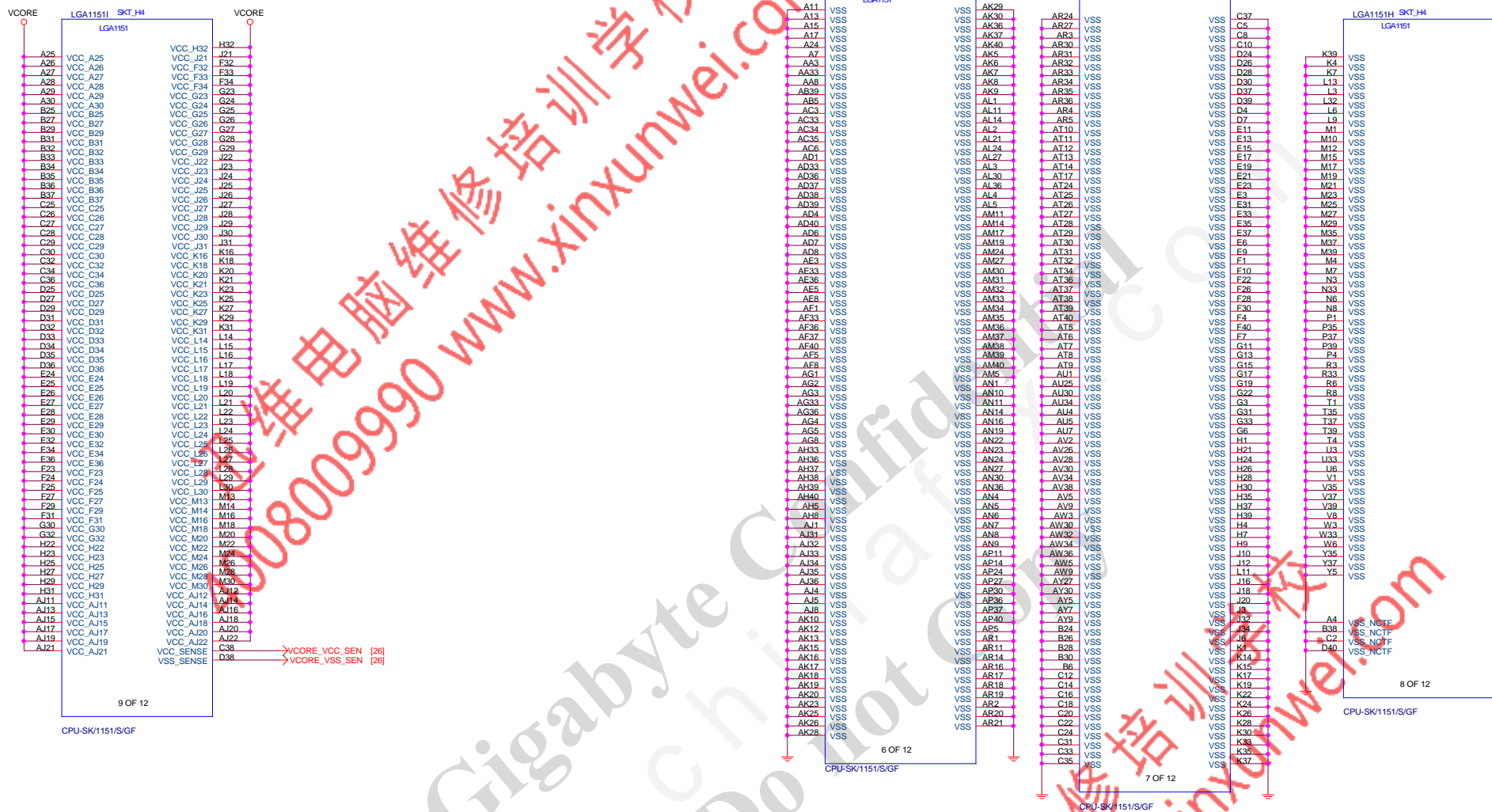


* 删 VCCGT 电容

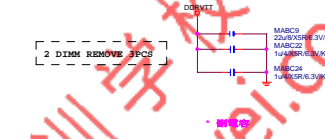
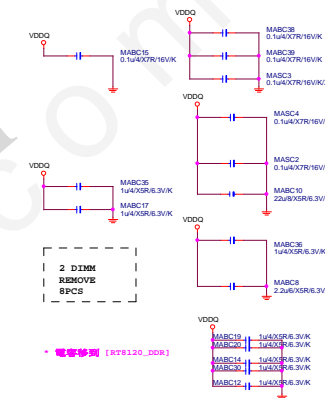
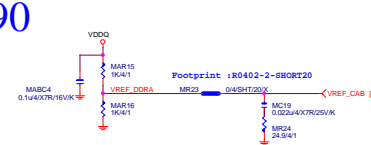


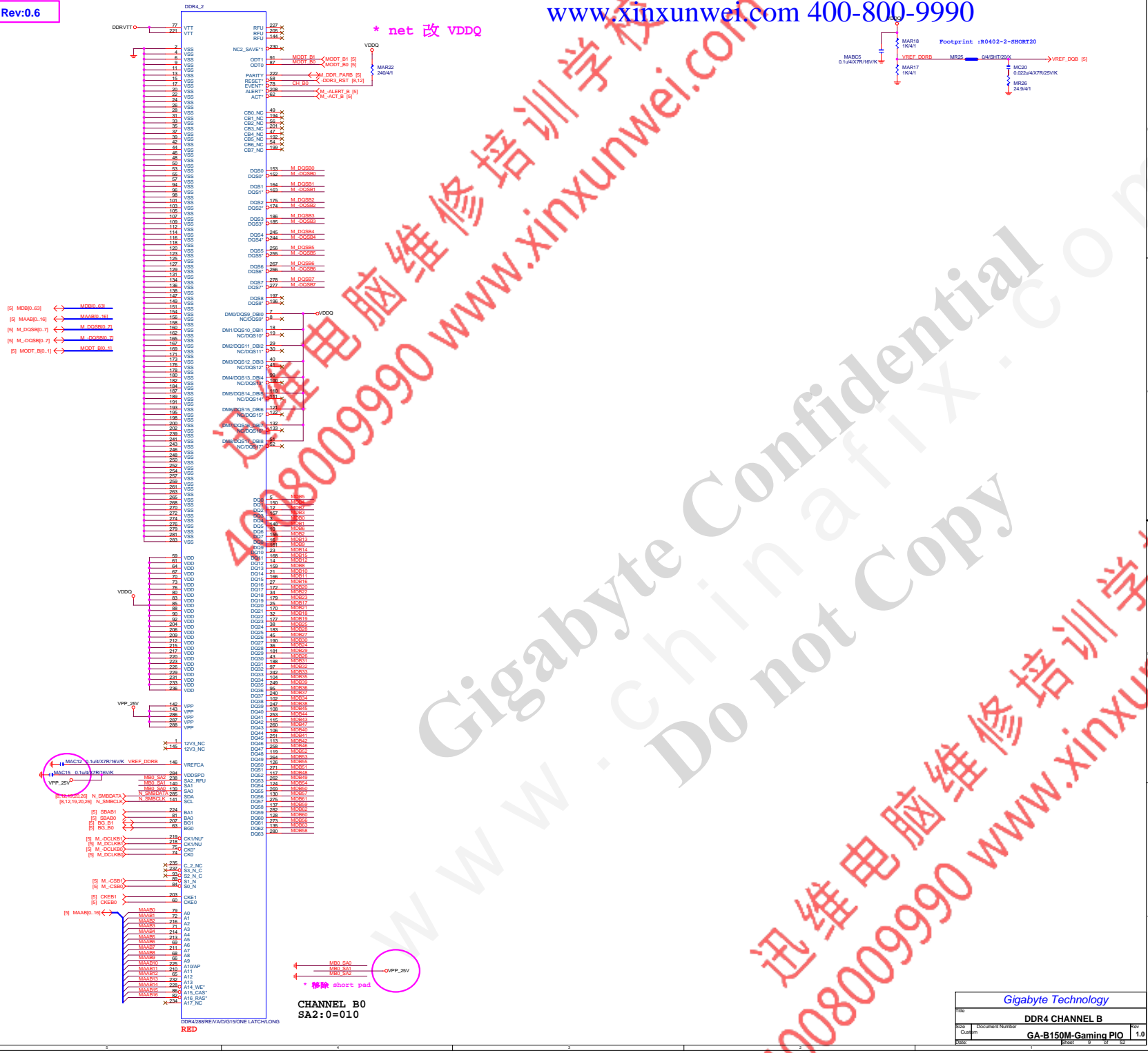
[13] N_PCH_CPU_L12
[13] A_CPU_PGH_TO





* 刪 Vcore 電容





CHANNEL B0
SA2:0=010

Gigabyte Technology			
File	DDR4 CHANNEL B		
Doc Number	GA-B150M-Gaming PIO		
Version	1.0	Rev	1.0

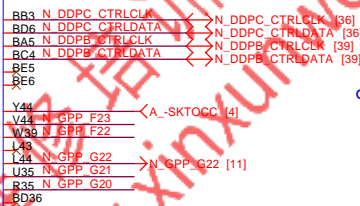
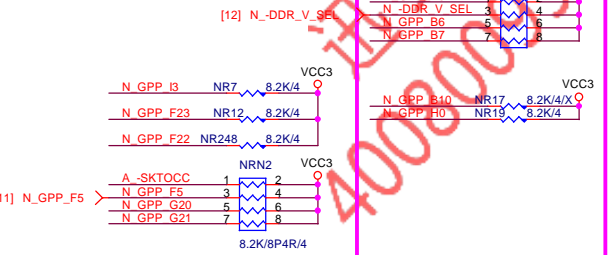
PCIEX16

M.2 WIFI

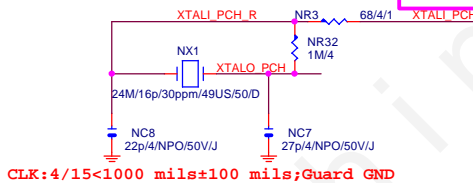
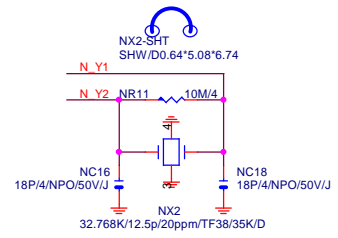
RTL8111HS

M. 2

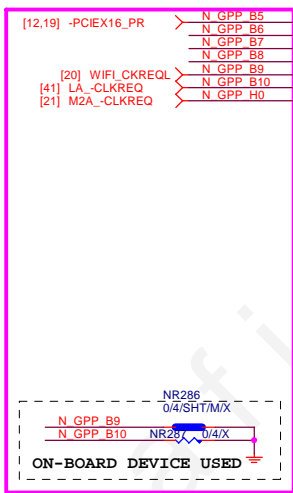
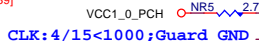
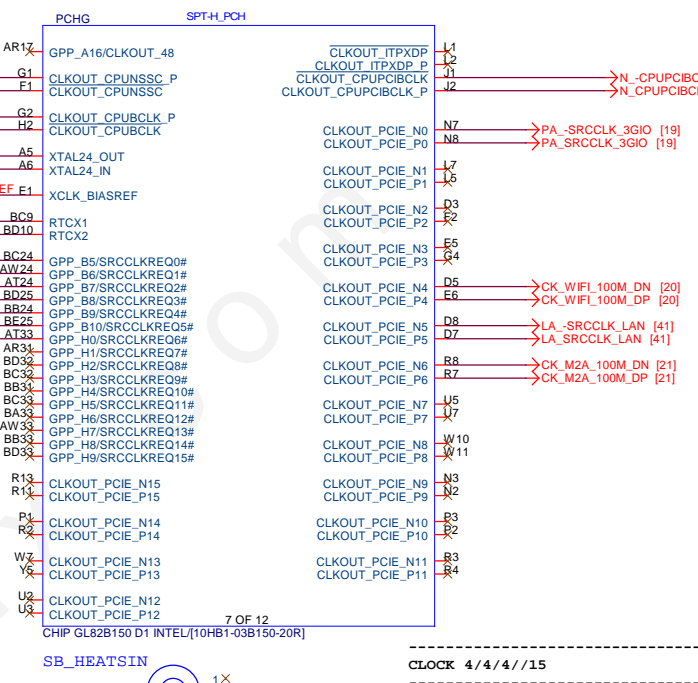
[39]	N_HDMI_HDP_F	AW4	GPP_I0/DDPB_HPD0
[36]	N_DVI_HDP_F	AY2	GPP_1/DDPC_HPD1
		AV4	GPP_I2/DDPD_HPD2
	N_GPP_I3	BA4	GPP_I3/DDPE_HPD3



32.768KHZ



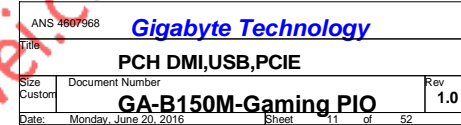
CLK:4/15<1000 mils±100 mils;Guard GND

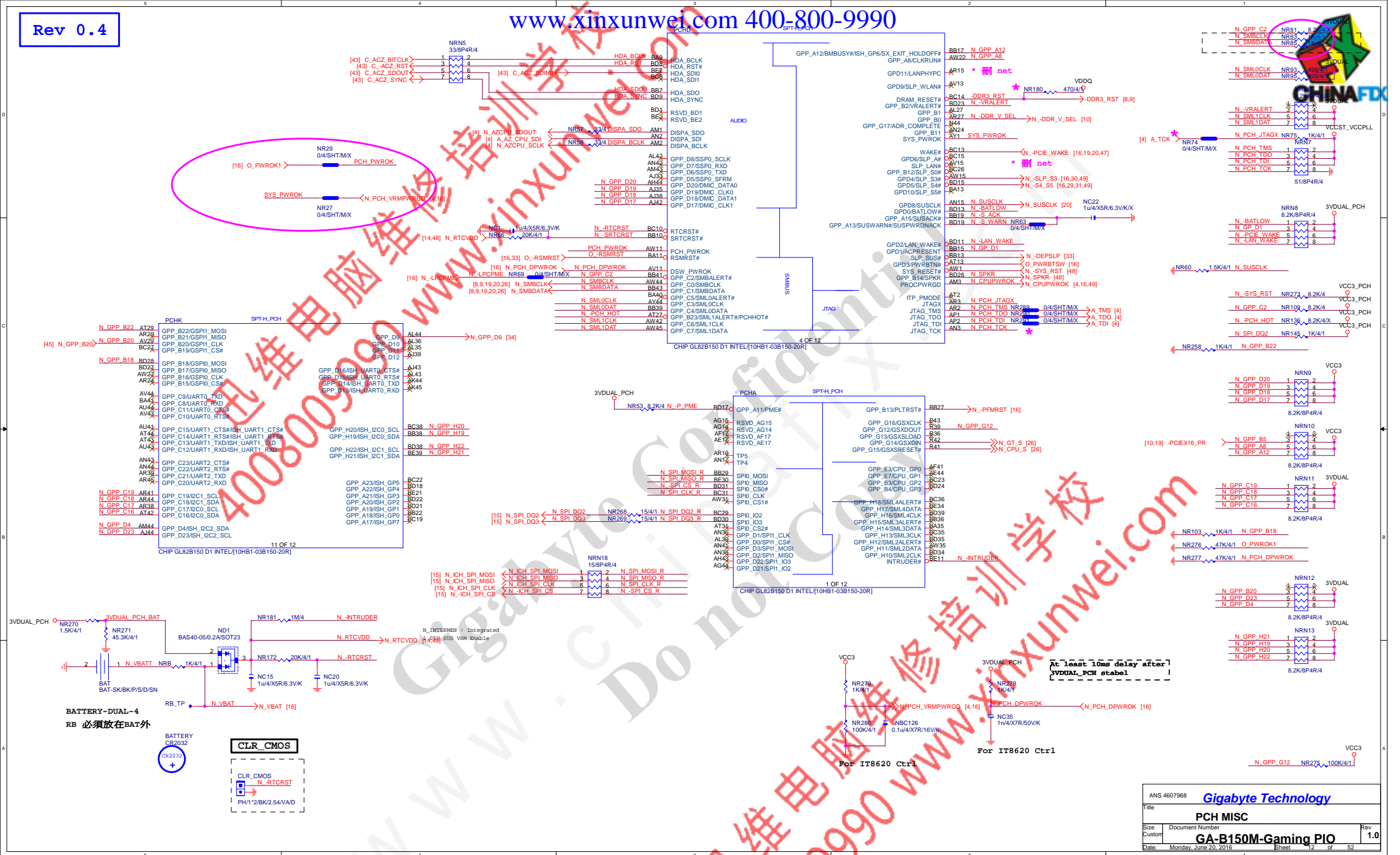
ON-BOARD DEVICE USED 

LOW COST ICH7 HEATSINK
BLACK HS

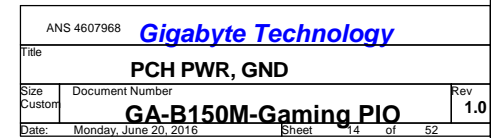
PCH_HS
PCH_HS[12SP2-030005-51R_12SP2-030005-52R_12SP2-030005-53R]

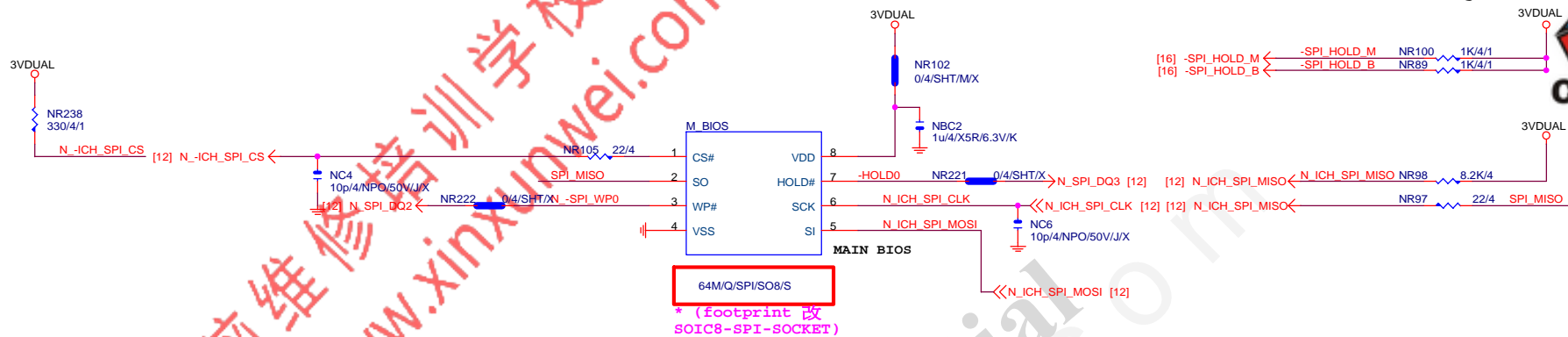
ANS 4607968		Gigabyte Technology	
Title		PCH CLOCK BUFFER	
Size Custom	Document Number	Rev 1.0	
GA-B150M-Gaming PIO			
Date:	Monday, June 20, 2016	Sheet	10 of 52





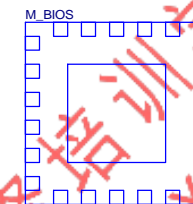






BOOT DEVICE	GNT0	GNT1
LPC	0	0
PCI	0	1
NAND	1	0
SPI	1	1

1 means floating
0 means PD 1K

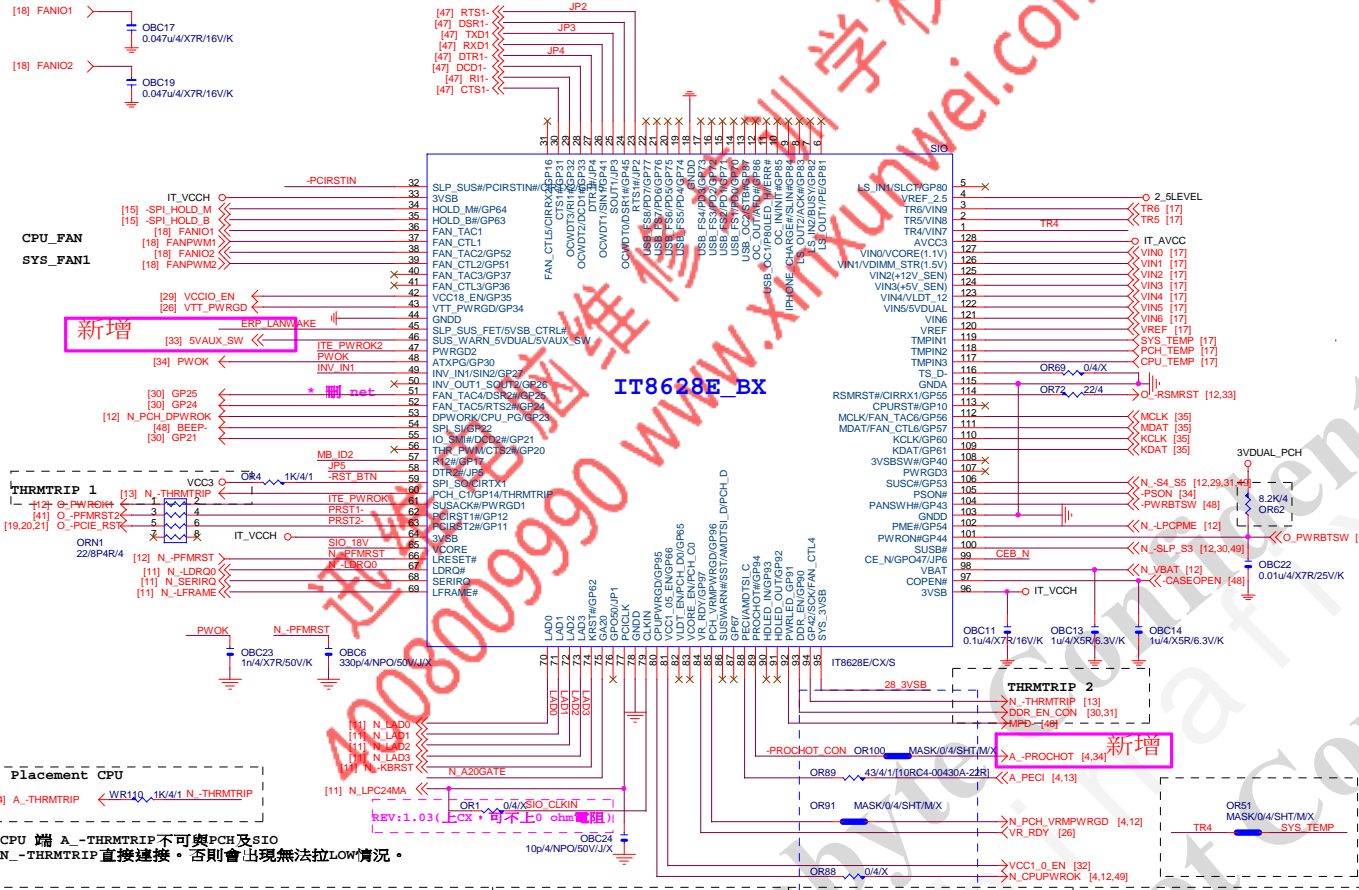


LCP/G-FL/1.27mm/200MIL/WHITE[10SL2-000008-31R]X

試產先上 PVT 移除

Gigabyte Technology

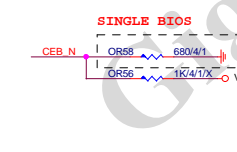
Title		BIOS
Size	Document Number	GA-B150M-Gaming P10
Custom		1.0
Date:	Monday, June 20, 2016	Sheet 15 of 52



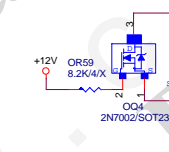
FAN TABLE	
CPU_FAN	FAN_CTL1 FAN_TAC1
SYS_FAN1	FAN_CTL2 FAN_TAC2
SYS_FAN2	FAN_CTL3 FAN_TAC3
SYS_FAN3	FAN_CTL5 FAN_TAC5
OPT_FAN or SYS_FAN4	N/A
THRMTrip1	YES PIN60
THRMTrip2	YES PIN94

IT8628E GPIO問題匯整	
PIN 50	GP26-第一次接上POWER時 會拉 Lo
PIN 90/91	DEFAULT為HDLed 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 該部分COM PORT及LPT將會 跳碼或會異常動作。

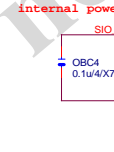
DUAL BIOS OPT STRAP



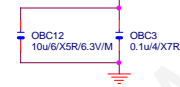
Power leakage



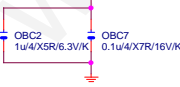
SIO 18V



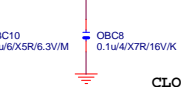
SIO CAP



IT_VCCH



IT_AVCC



3VDUAL_PCH



MB ID



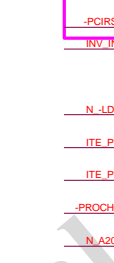
CLOSE SIO PIN4 2.5LEVEL



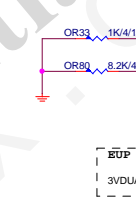
For SHT



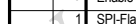
SIO PU



SIO STRAP



EUP control detect



JP2	1	Disable WDT
JP2	0	Enable WDT to rest PWR0K
JP3	1	SPI-Flash Disable
JP3	0	SPI-Flash Enable
JP4	1	k8 power function is Disable
JP4	0	k8 power function is Enable
JP5	1	anti-surge Disable
JP5	0	anti-surge Enable
JP3	1 1	The default value of EC Index 63h/68h/73h is 80h.
JP3	1 0	The default value of EC Index 63h/68h/73h is FFh.
JP5	0 1	The default value of EC Index 63h/68h/73h is 00h.
JP5	0 0	The default value of EC Index 63h/68h/73h is 40h.

ERP WAKE on LAN (組態一)

Realtek/ATHEROS LAN

Gigabyte Technology

ITE 8628 LPC IO

GA-B150M-Gaming PIO

Rev

Size Custom

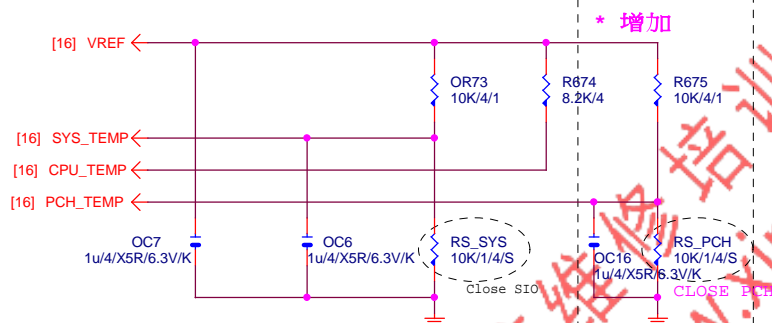
Document Number

Date: Monday, June 20, 2016

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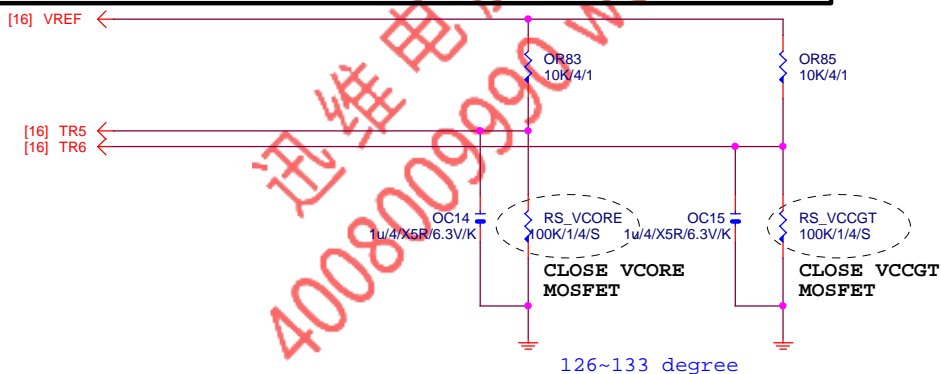
TEMP H/W MONITOR

REV 1.04



RS_VCORE, RS_VCCGT, CLOSE CPU_VCORE & VCCGT MOSFET

-PROCHOT:有mos heartsink不用prochot function

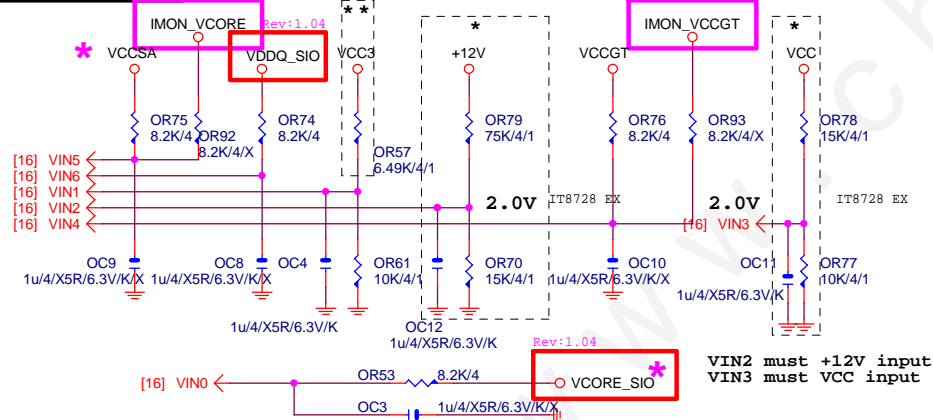


VOLTAGE-- H/W MONITOR

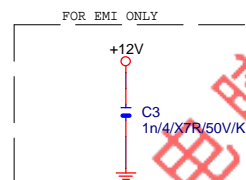
Connect to PWM

* IT8728 BX
** IT8728 CX

Connect to PWM

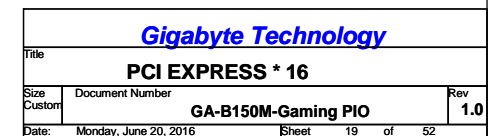


The division voltage of VIN2 & VIN3 must be around 2.9V

VIN2 must +12V input
VIN3 must VCC input

Gigabyte Technology

Title		
HWM,KB/MS, FAN CTRL		
Size	Document Number	Rev
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Date:	Monday, June 20, 2016	Sheet 17 of 52

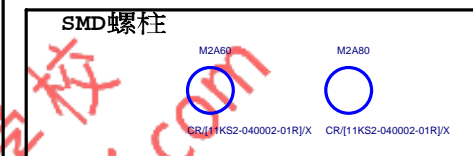
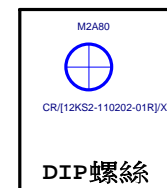
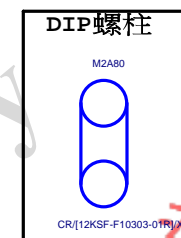


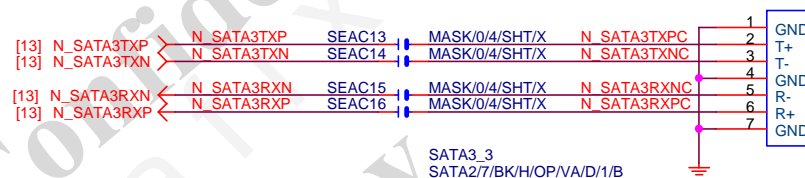
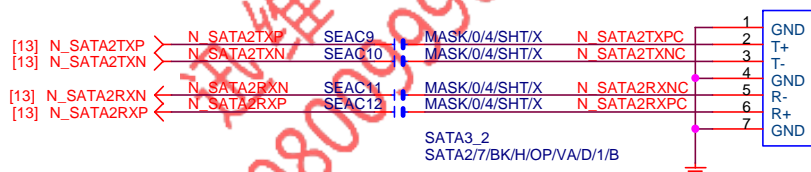
Title			
M2_WIFI_E_KEY			
Size B	Document Number	GA-B150M-Gaming PIO	Rev 1.0
Date:	Monday, June 20, 2016	Sheet 20 of	45

M.2 Lane2 from PCH port15

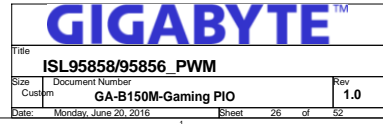


M.2 有插卡 /沒插卡 GPP_G0	M.2插何種卡？ GPP_G1	SATA Express 插何種硬碟？ GPP_E0/E2/F1	I015 (S0)	I016 (S1)	I017	I018	I019 (S0)	IP20 (S1)
有插卡 (Low)	SATA Mode (Low)	SATA (Hi)	SATA (M.2)	PCIE x1	PCIE x1	PCIE X1	PCIE x1	SATA
		SATA Express (Low)	SATA (M.2)	PCIE x1	PCIE x1	PCIE x1	SATA Express	
	PCIE Mode (Hi)	SATA (Hi)	PCIE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





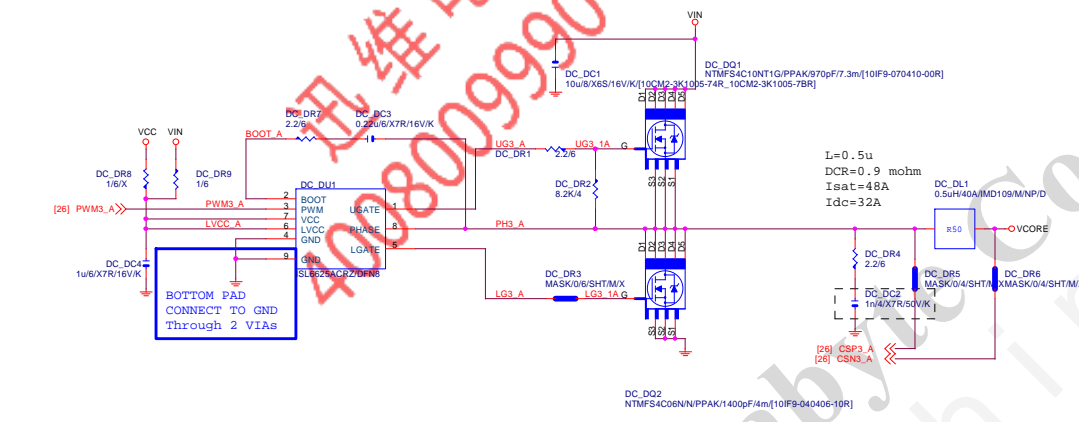
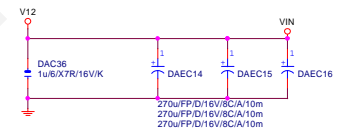
Gigabyte Technology		
Title		
SATA EXPRESS		
Size	Document Number	Rev
Custom	GA-B150M-Gaming PIO	1.0
Date:	Monday, June 20, 2016	Sheet 1 of 22



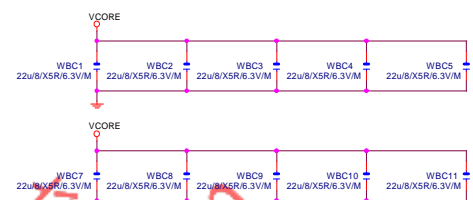
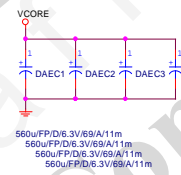
VCORE



VIN CAP 270u*3PCS



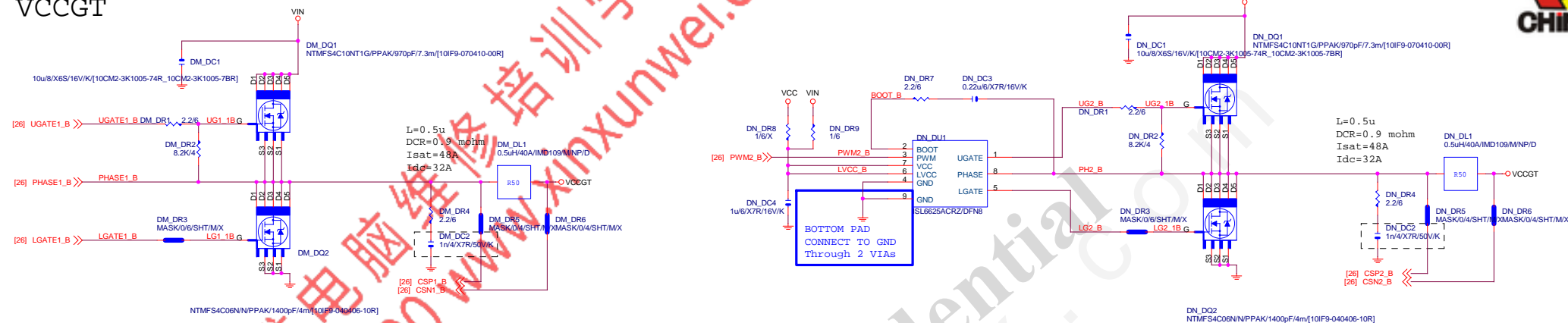
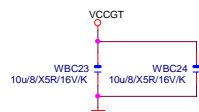
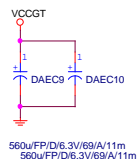
VCORE CAP 560u*8PCS 22u*29PCS



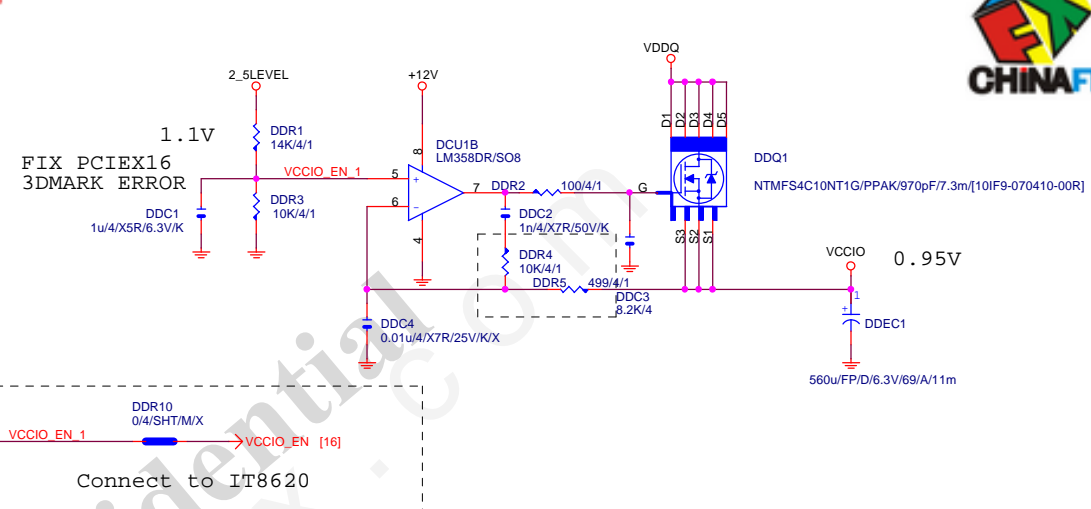
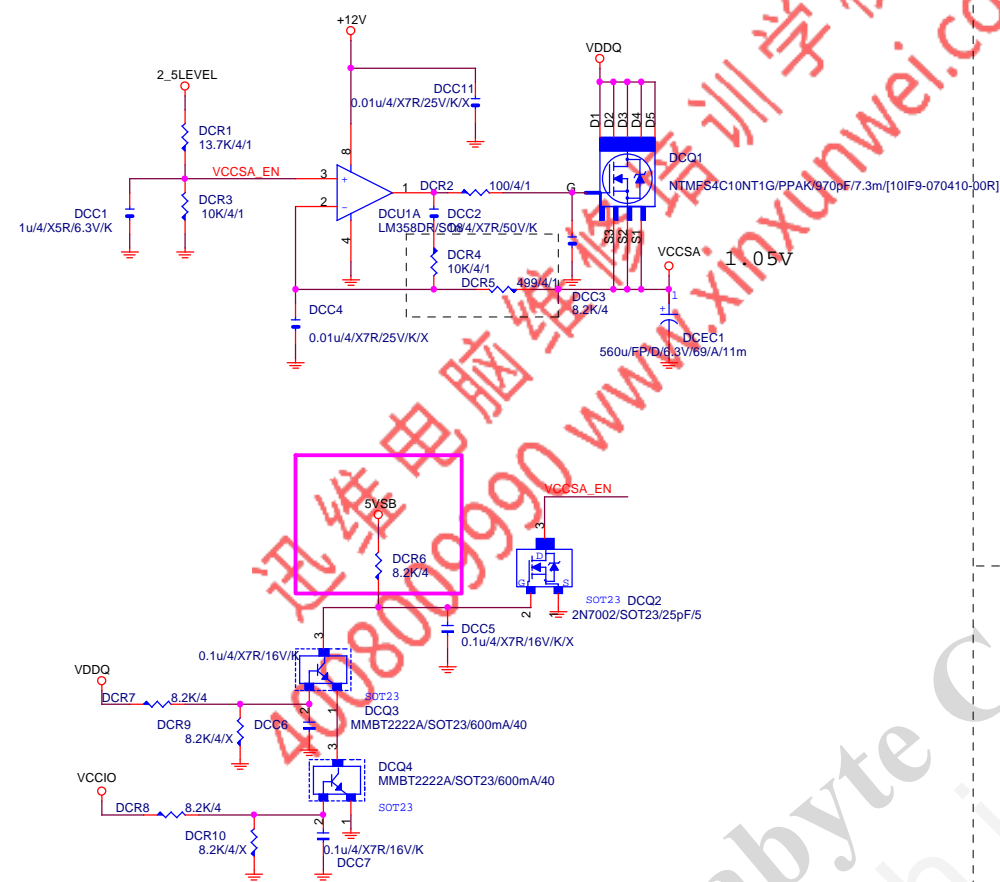
GIGABYTE™			
Title			
ISL95858_MOS			
Size	Document Number		Rev
Custom	GA-B150M-Gaming PIO		1.0
Date:	Monday, June 20, 2016	Sheet 27 of	52



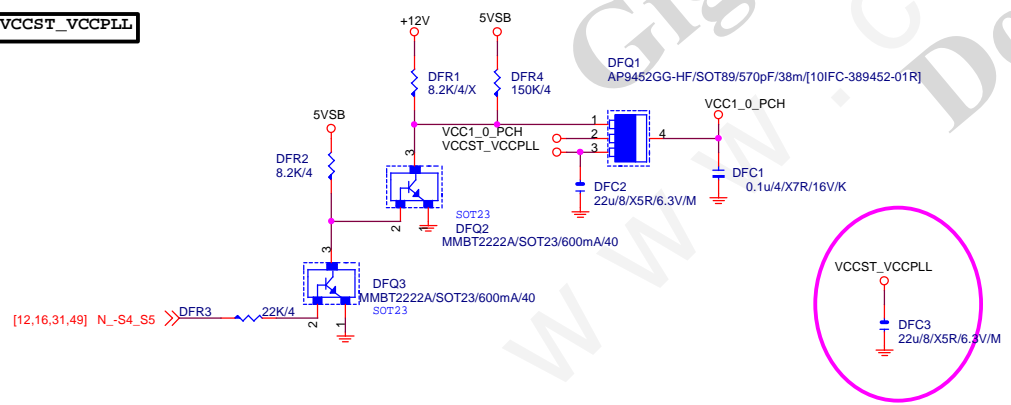
VCCGT

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

GIGABYTE™			
Title			
ISL95858_MOS			
Size	Document Number	Rev	
Custom	GA-B150M-Gaming PIO	1.0	
Date:	Monday, June 20, 2016	Sheet	28 of 52



VCCST_VCCPLL



GIGABYTE™			
Title VCCSA_VCCIO			
Size Custom	Document Number GA-B150M-Gaming PIO		Rev 1.0
Date: Monday, June 20, 2016	Sheet 29	of 52	

REV:0.33

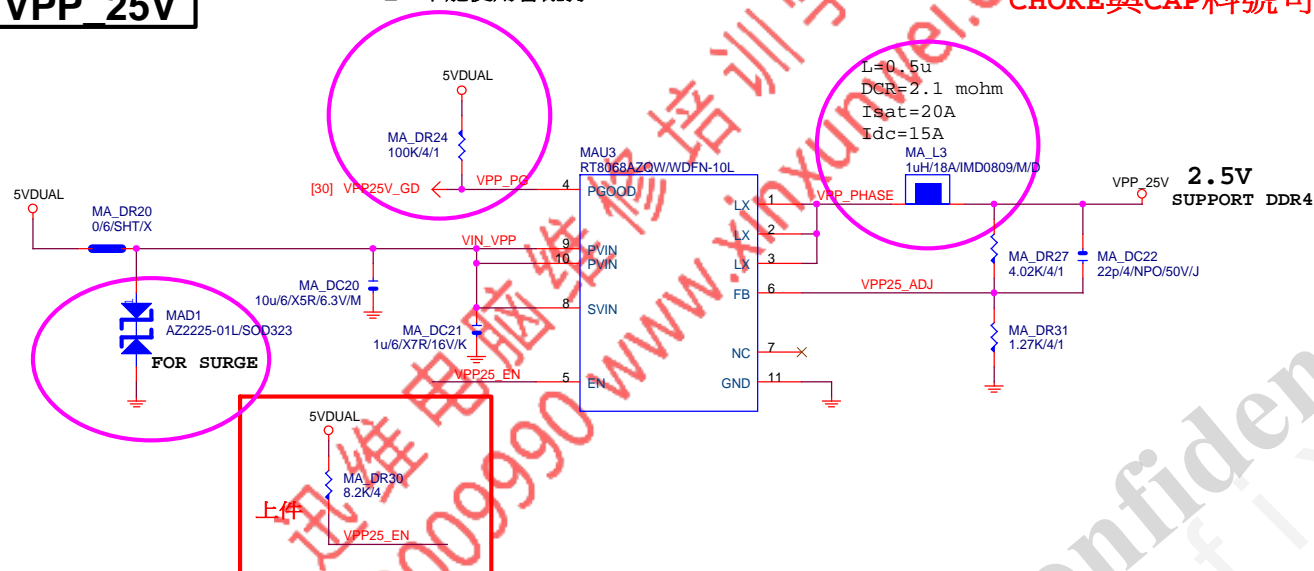
www.xinxunwei.com 400-800-9990



VPP_25V

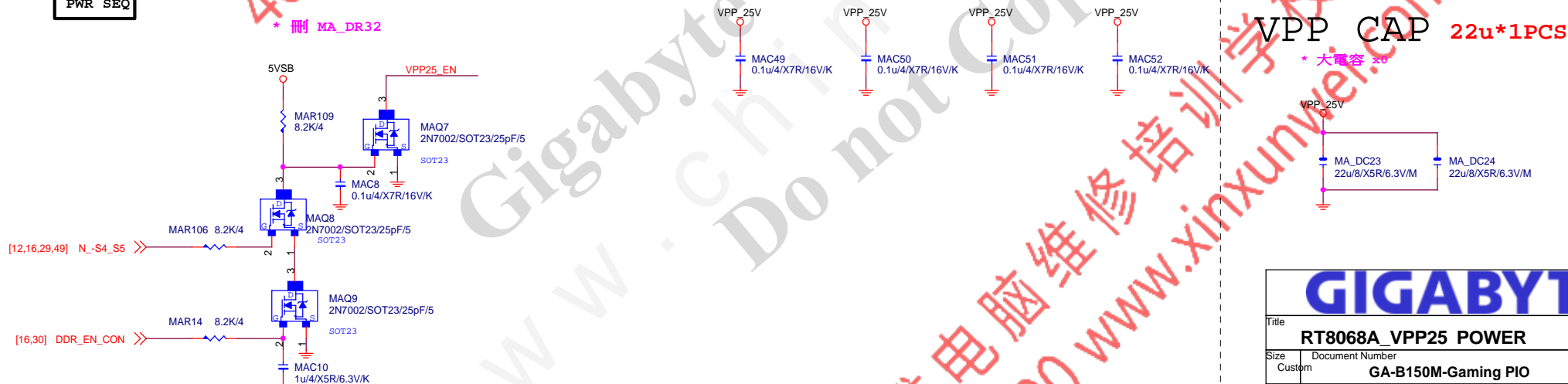
VPP25V_GD不能使用會亂打

CHOKE與CAP料號可變



PWR_SEQ

* 刪 MA_DR32



GIGABYTE™

Title		
RT8068A_VPP25 POWER		
Size	Document Number	Rev
Custom	GA-B150M-Gaming PIO	1.0
Date:	Monday, June 20, 2016	Sheet 31 of 52

REV:0.47

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CHOKES與CAP料號可變

注意耐壓

L=0.5u
DCR=2.1 mohm
Isat=20A
Idc=15A

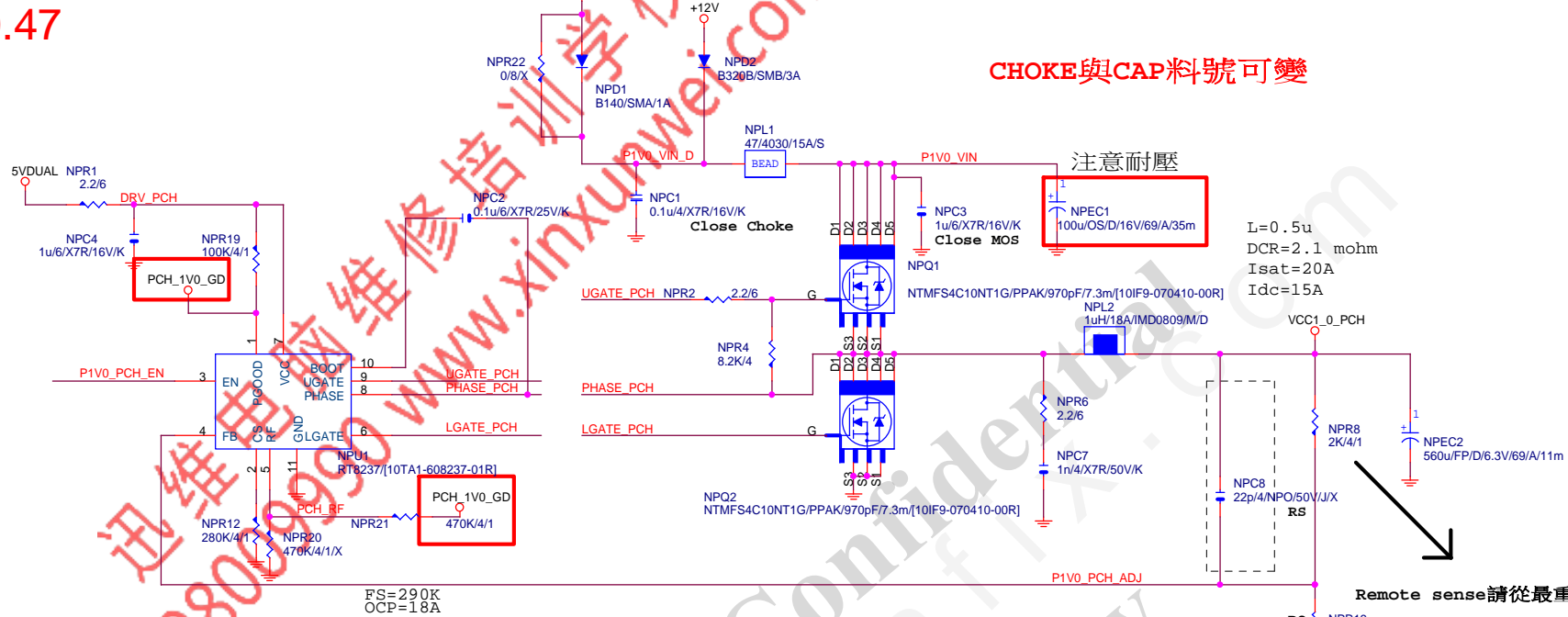
Remote sense請從最重的負載端點拉回

請放置CHOKES一出來的地方

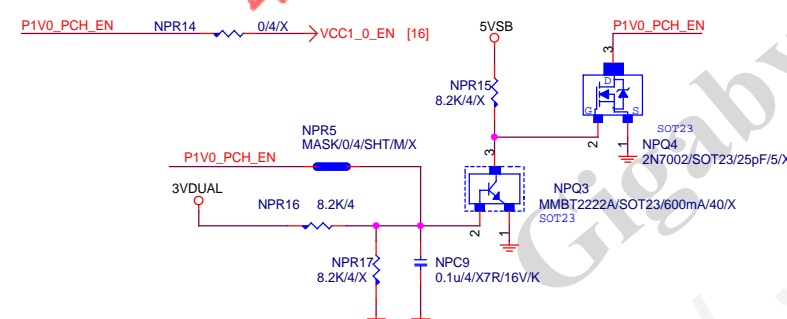
GIGABYTE™

Title
RT8237_PCH POWER

Size	Document Number	Rev
Custom	GA-B150M-Gaming P10	1.0
Date:	Monday, June 20, 2016	Sheet 32 of 52



PWR_SEQ



* 5Vdual , update
from SKL 0.2B

[16] 5VAUX_SW

[16] 5VAUX_SW

3VDUAL_PCH

O_-RSMRST

不上件

[12] N_DEPSLP

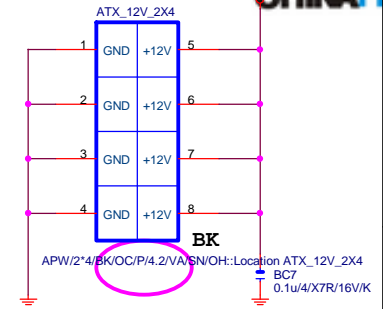
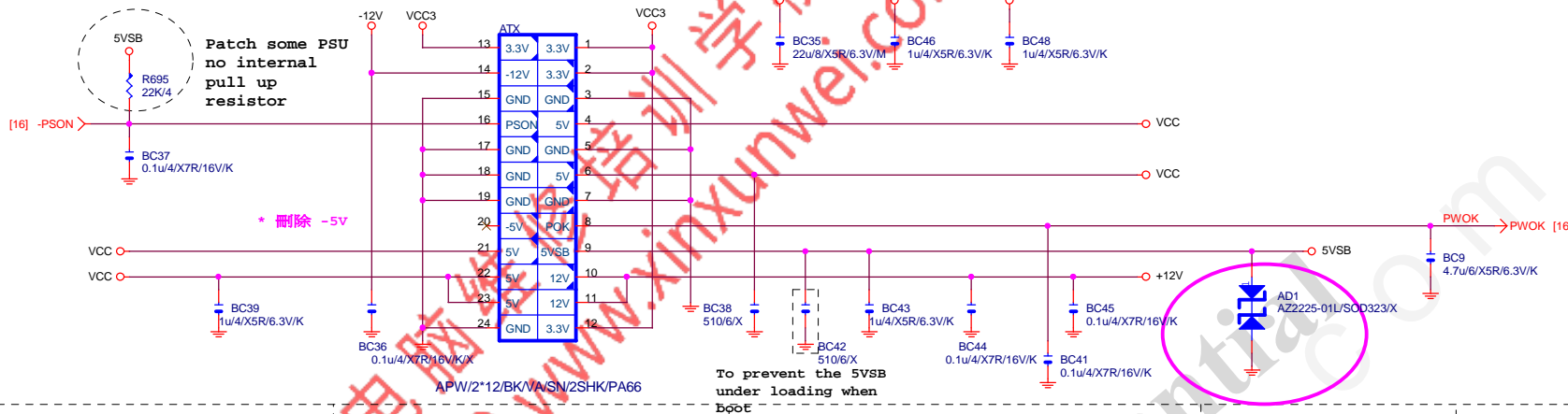
Gigabyte Technology

Title				
DISCRETE POWER				
Size	Document Number			Rev
Custom	GA-B150M-Gaming P10			1.0
Date:	Monday, June 20, 2016		Sheet	33 of 52

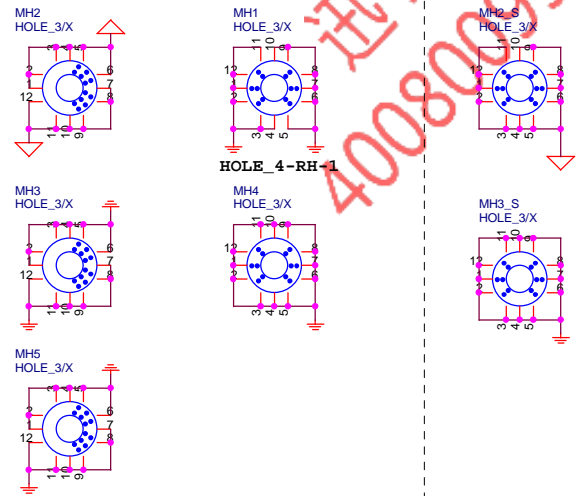
ATXX24 POWER CONNECTOR

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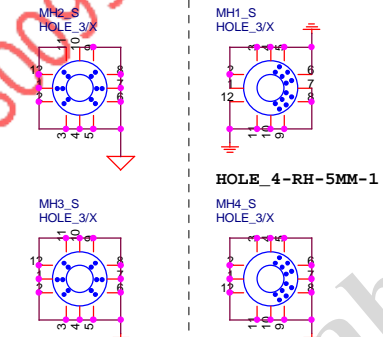
ATXX4 POWER CONNECTOR



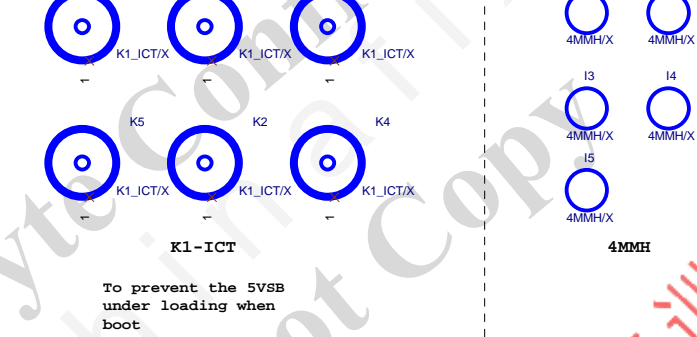
螺絲孔



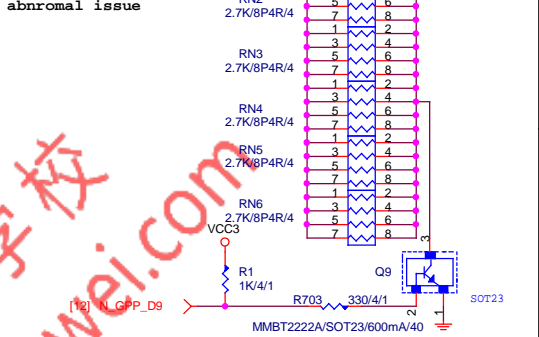
螺絲孔(Standard)



固定孔/光學點



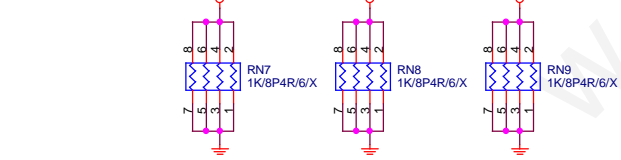
+12V DUMMY LOAD



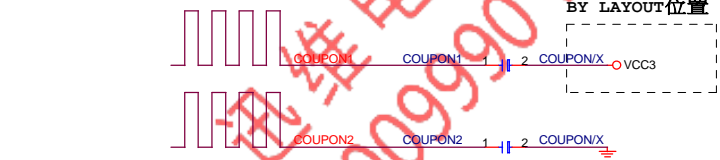
-PROHOT



DUMMY LOAD



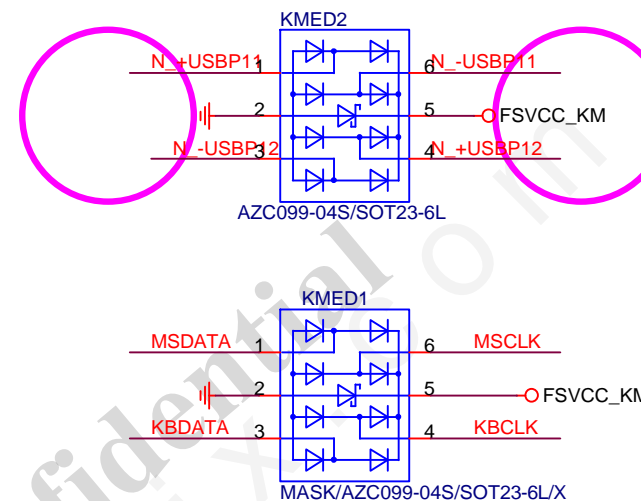
COUPON



Gigabyte Technology			
Title			
ATX POWER CONNECTOR			
Size	Document Number	GA-B150M-Gaming PIQ.0	
Custom		Rev	
Date:	Monday, June 20, 2016	Sheet	34 of 52

Rev: 0.7

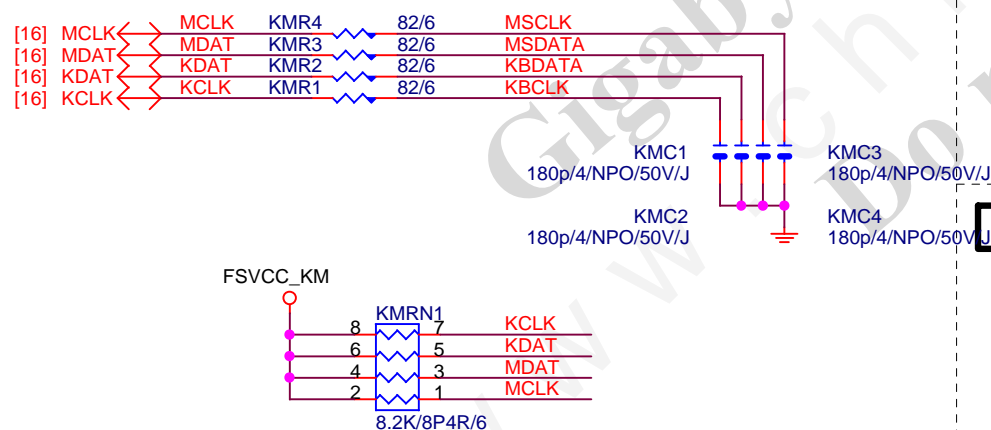
ESD



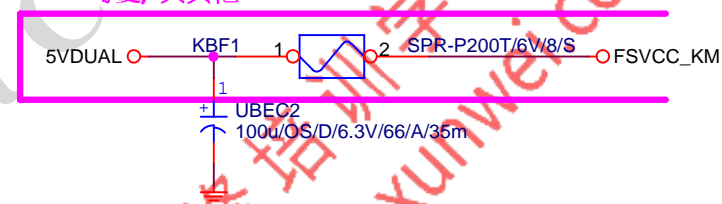
FOR 鹽化短路

KB_MS_USB DAMPING/PU

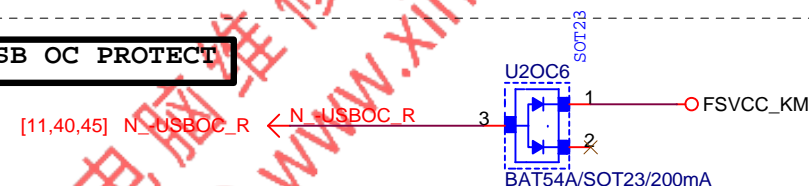
KB MS USB PWR



NET 可變, 與其他USB SHARE



USB OC PROTECT

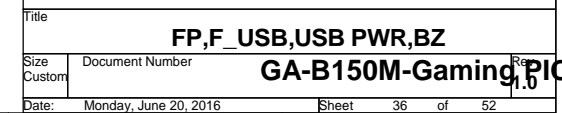


Gigabyte Technology

AUDIO JACK

GA-B150M-Gaming P19

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NET 可變

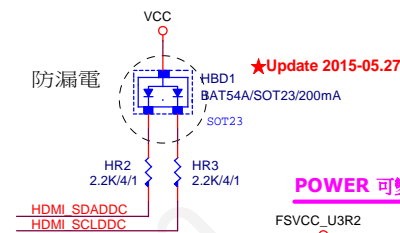


Port 自行調整

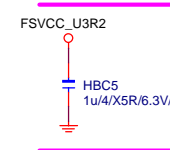
【技術通報R&D技術通報150】

HDMI eye diagram1.4版(deep color)會fail

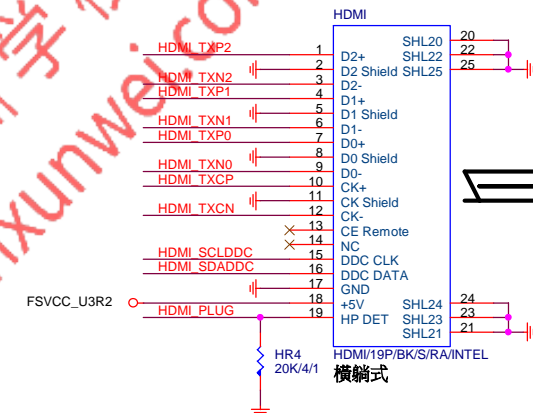
原因：因目前的HDMI訊號過長，造成RISING TIME過慢，而會壓到eye diagram
改善：ASMEEDIA ASM1442 : 3.16K(PIN6 PULL DOWN電阻) 10ohm(PIN4 PULL DOWN電阻)



POWER 可變



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



Gigabyte Technology

Title			
HDMI			
Size B	Document Number	GA-B150M-Gaming PIC Rev 1.0	
Date:	Monday, June 20, 2016	Sheet	39 of 52

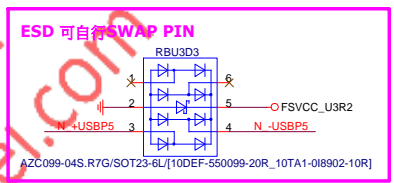
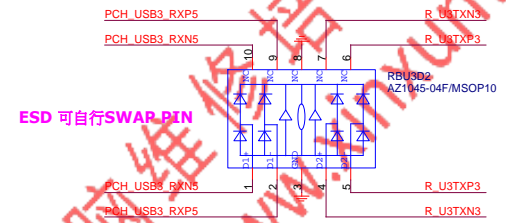
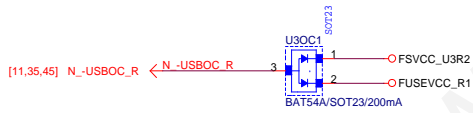
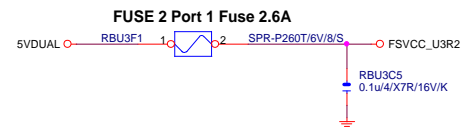
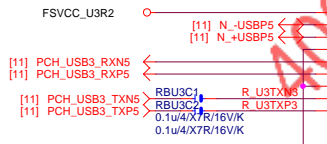


FUSE

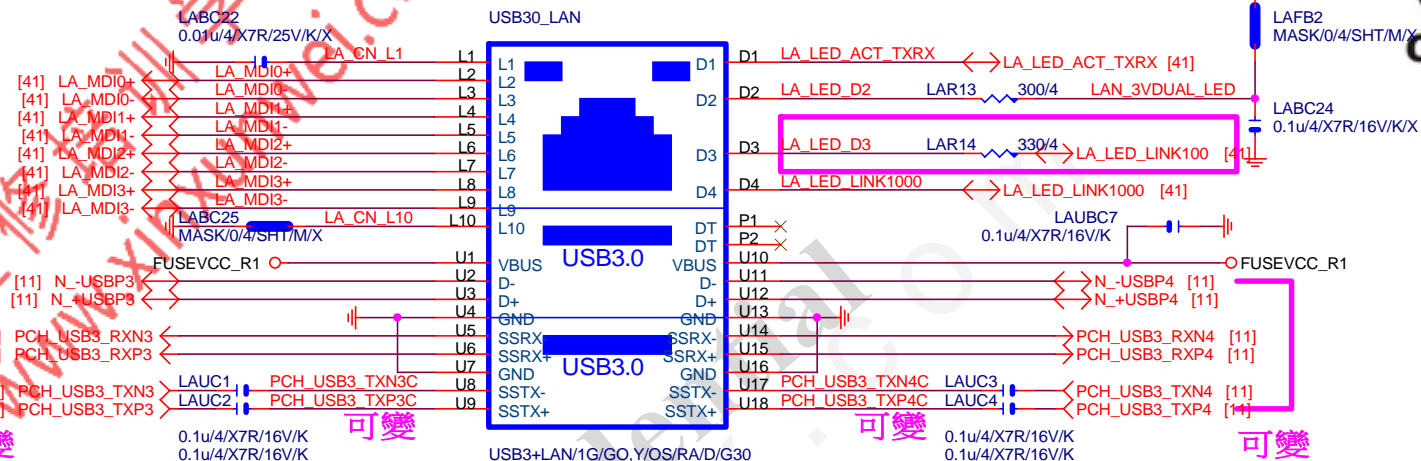
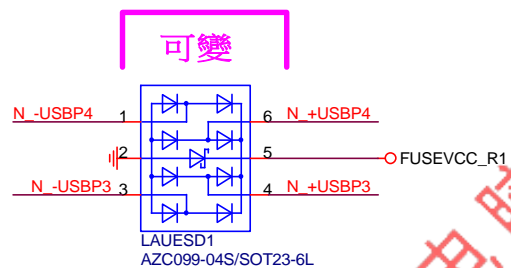
REAR USB30

USB30-SINGLE

USB30
SINGLE USB30/11NR6-301009-C1R]

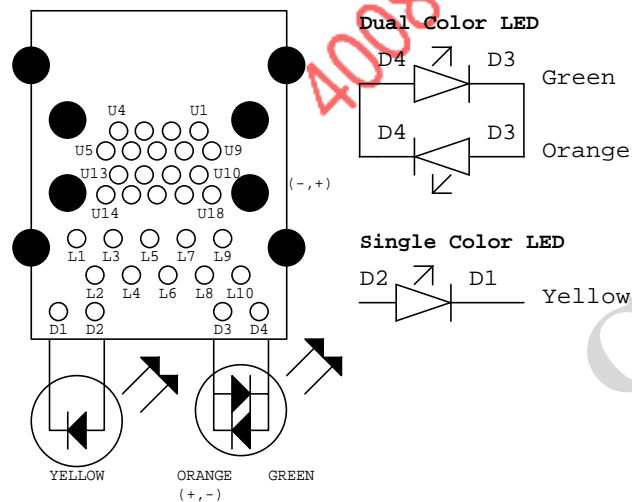


note:可變更USB NAME

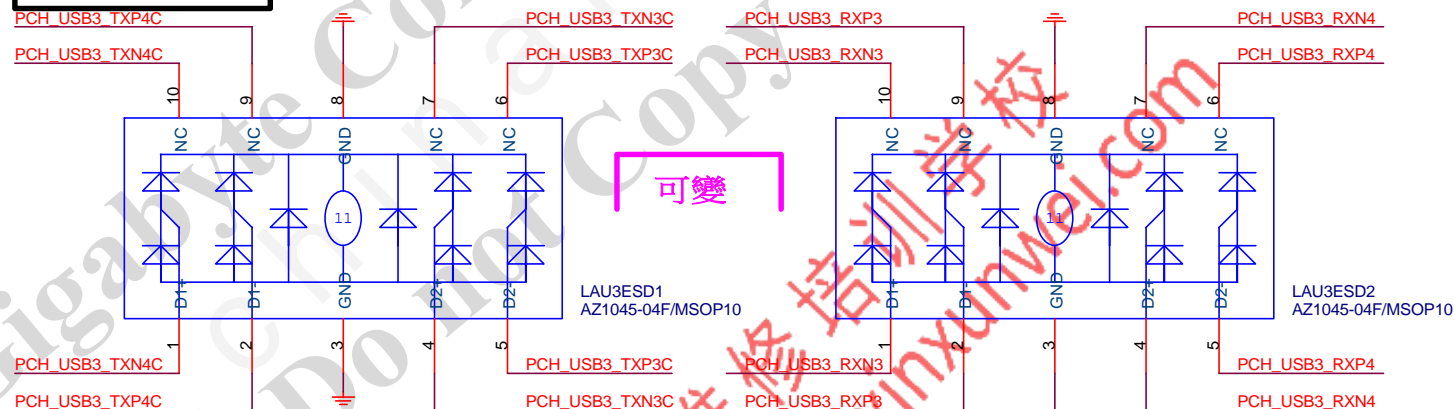


LA_MDI-->100歐姆:[20/4/8/4/20]

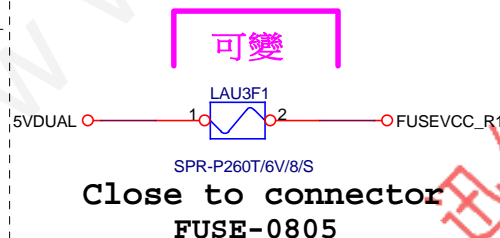
Dual Color LED



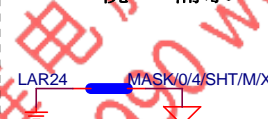
note:可變更USB NAME



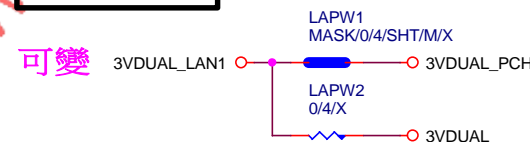
note:可變更FUSE



PS:視EMI需求



note: lan power連接及電流



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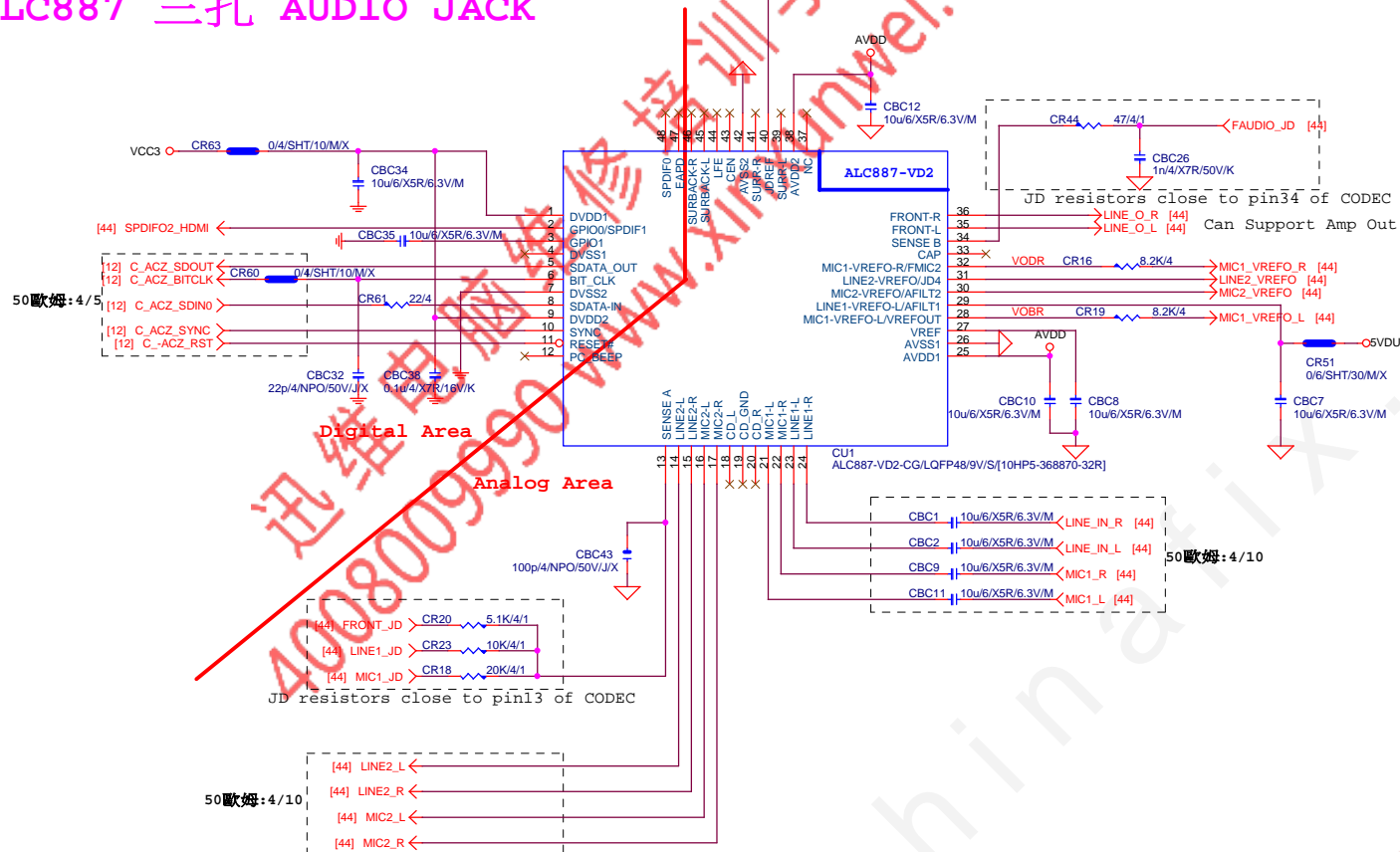
LAN CONNECTOR-RTL8111G

Size	Document Number
Custom	

GA-B150M-Gaming PIO



ALC887 三孔 AUDIO JACK



LAYOUT注意:螺絲孔下GND方式

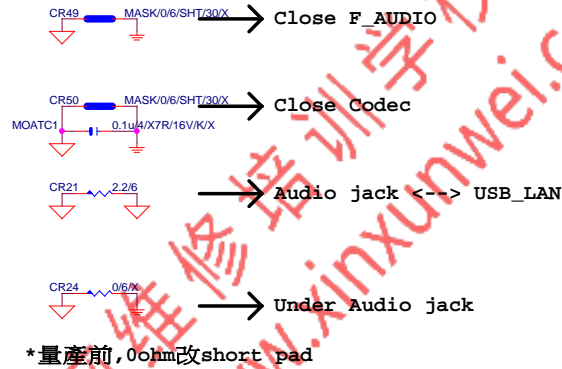
1. MH1空間夠, 下DGND
空間不夠, 改為Isolate
2. MH2一律改為Isolate

○ MH1
DGND

MH2 ○
Isolate

Rev 0.5

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LINE-OUT

LINE-IN

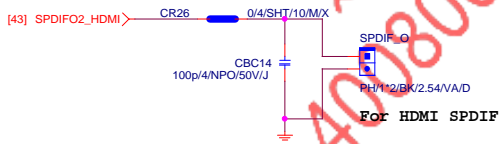
MIC-IN

SURROUND

CEN/LFE

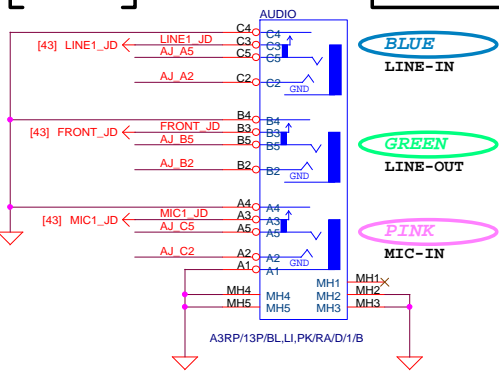
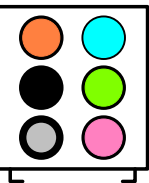
SURRBACK

SPDIF_OUT

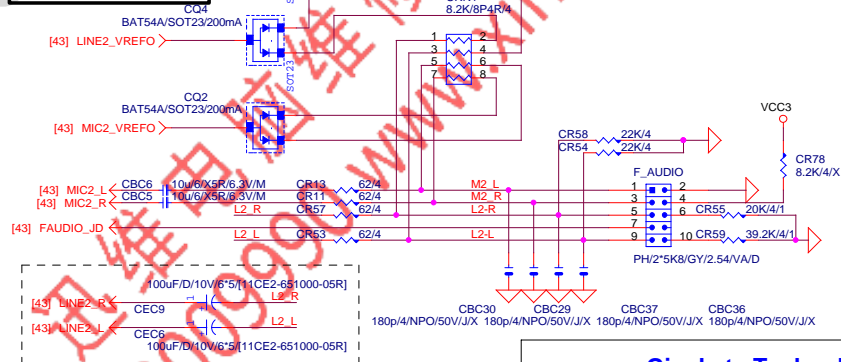


SPDIF_IN

AZALIA JACK



AZALIA FRONT PANEL



Gigabyte Technology

AUDIO JACK

GA-B150M-Gaming P10

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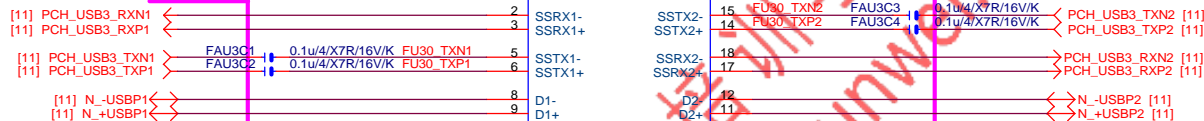
Rev: 0.53

Front USB3.0

F_USB30

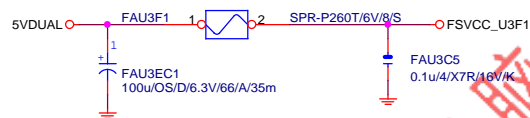
REV=1

NET 自行調整

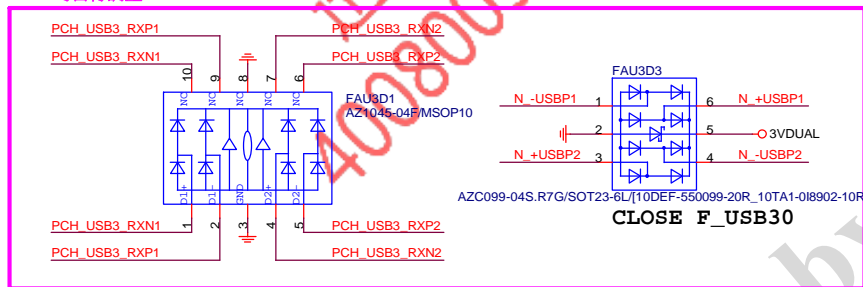


NET 可自行調整

F_USB30 PWR

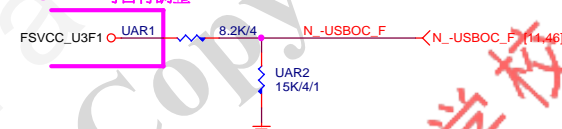


NET 可自行調整



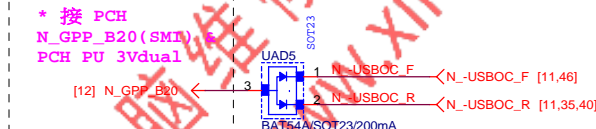
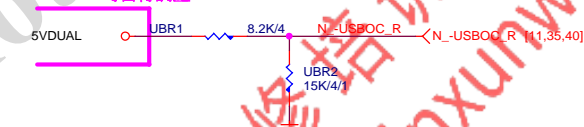
-USBOC_F

POWER 可自行調整



-USBOC_R

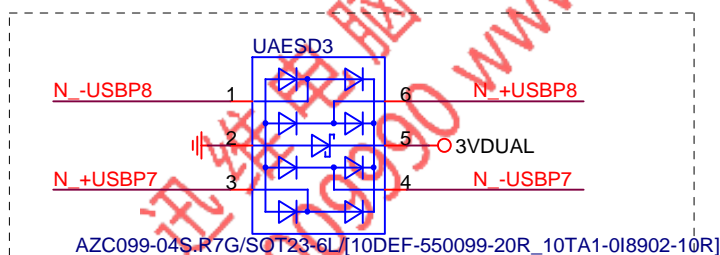
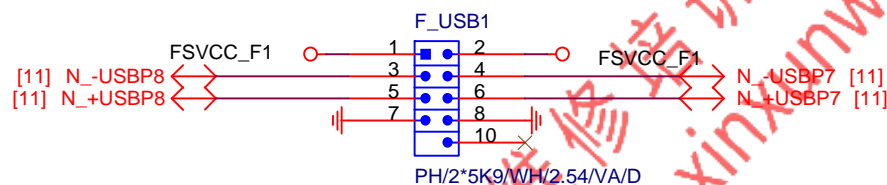
POWER 可自行調整



Gigabyte Technology

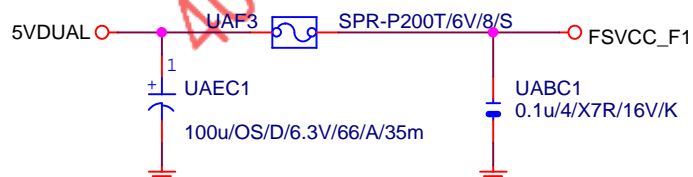
Title		R_USB30,F_USB30,USB_OC	
Size	Document Number	GA-B150M-Gaming P10	
Custom		1.0	
Date:	Monday, June 20, 2016	Sheet	45 of 52

NET 可變

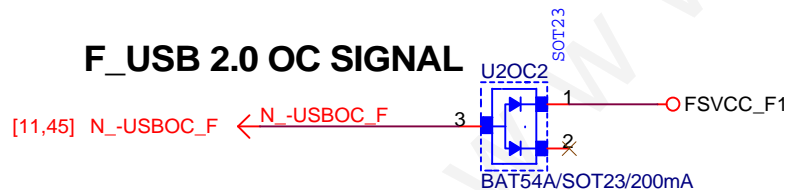


Close to connector

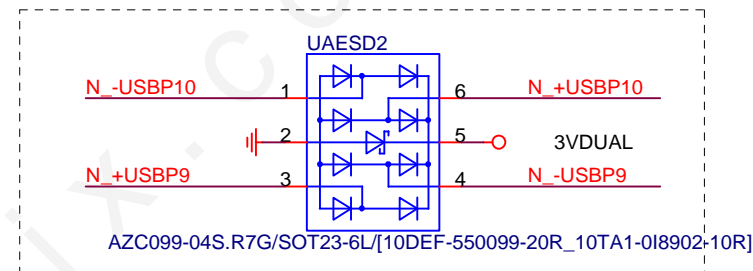
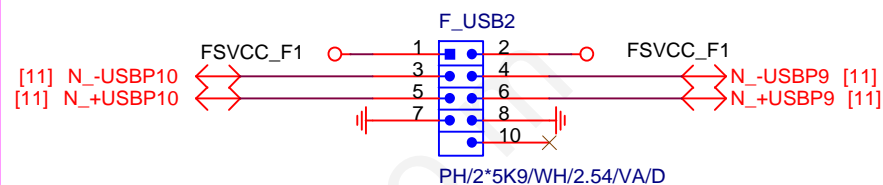
FUSE 2 Port 1 Fuse 2A



F_USB 2.0 OC SIGNAL



NET 可變

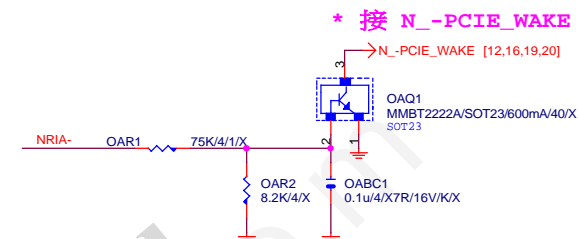
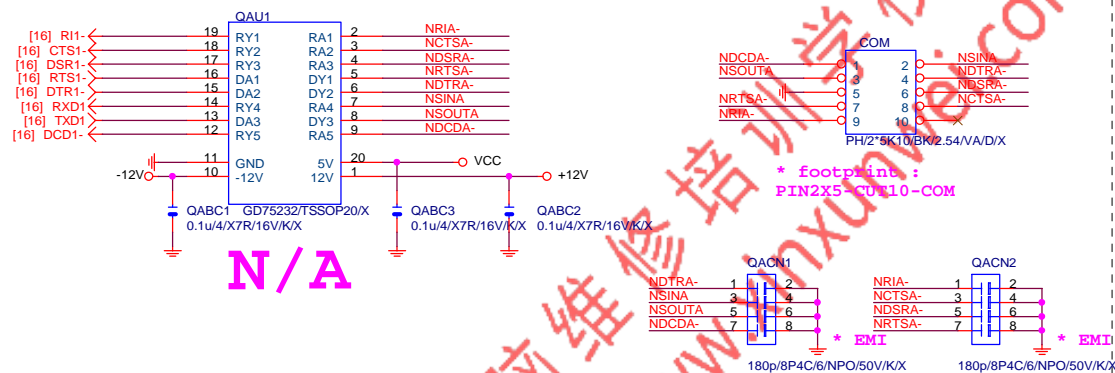


Gigabyte Technology

USB2.0

GA-B150M-Gaming P10

Title		Document Number	
Size		Date: Monday, June 20, 2016	
Custom		Sheet 46 of 52	

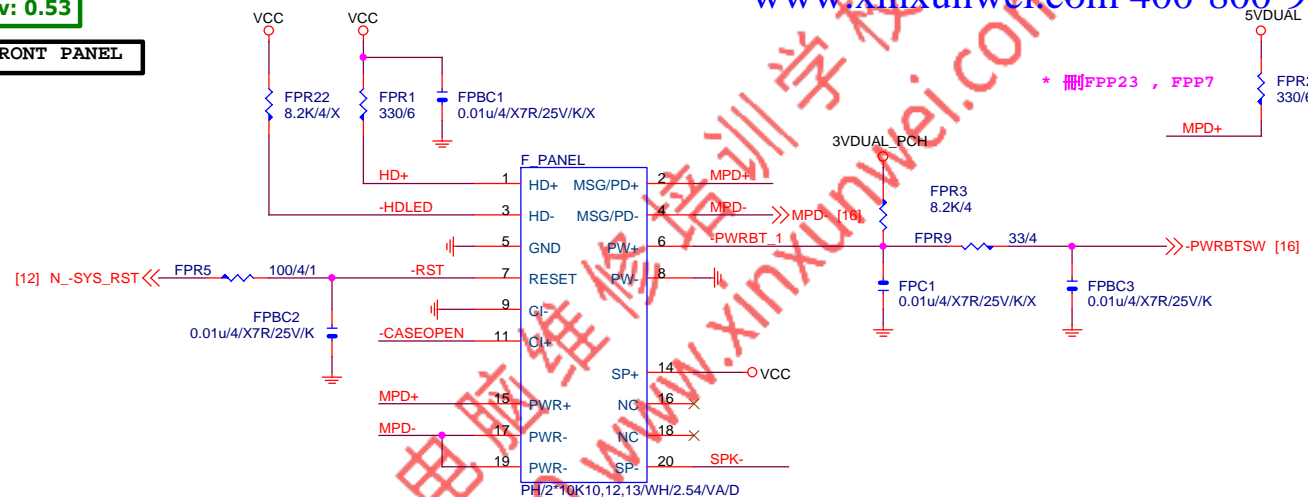


Rev: 0.53

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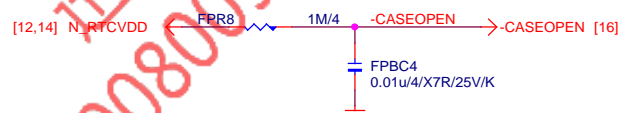


FRONT PANEL



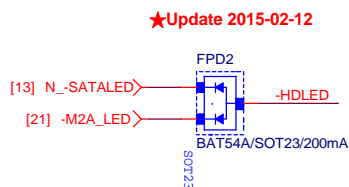
FOOTPRINT: PIN2X10PANEL-NEW

CASE OPEN

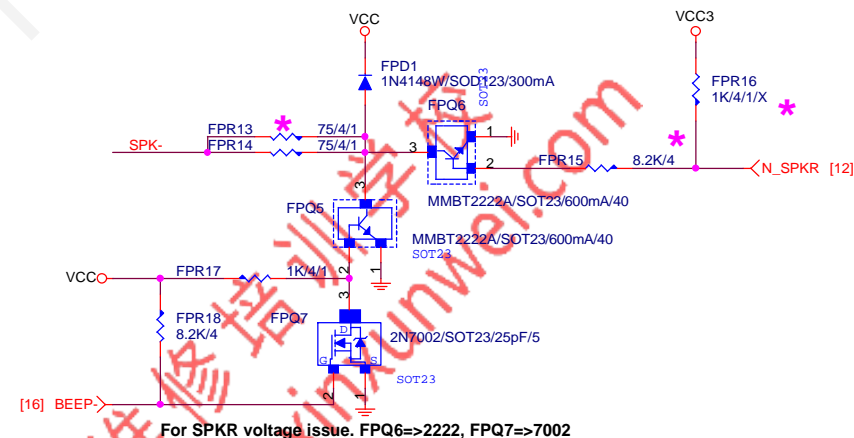


SATA LED

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

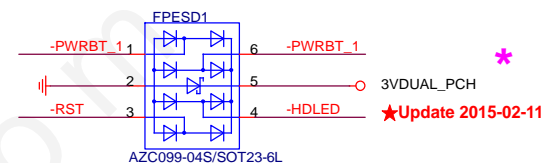


SPKR



For SPKR voltage issue. FPD6=>2222, FPD7=>7002

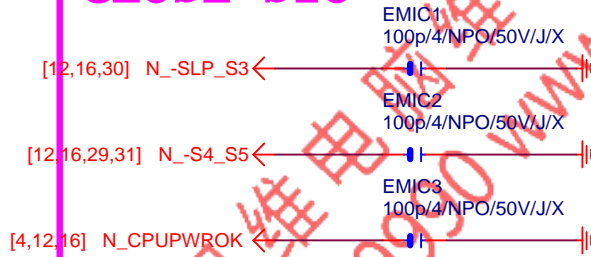
ESD



Gigabyte Technology

Title				FRONT PANEL			
Size	Document Number	GA-B150M-Gaming P10			Rev	1.0	
Custom							
Date:	Monday, June 20, 2016			Sheet	48	of	52

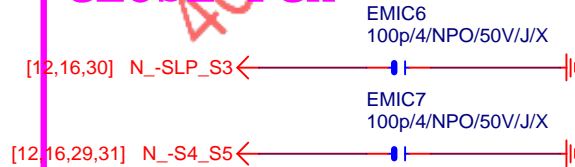
CLOSE SIO



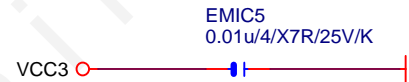
CLOSE PCH



CLOSE PCH

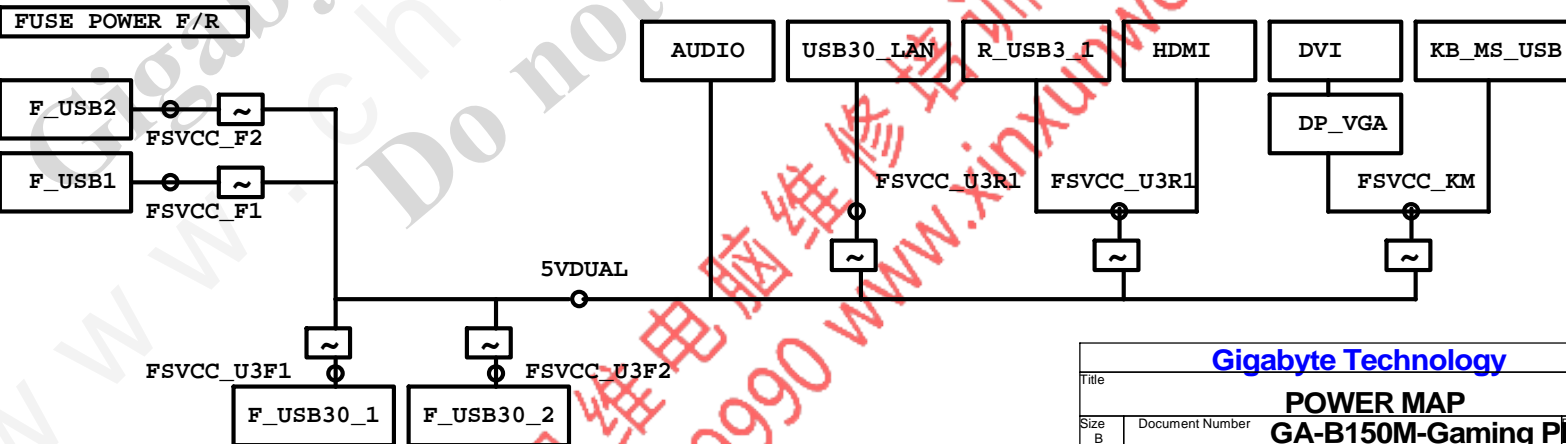
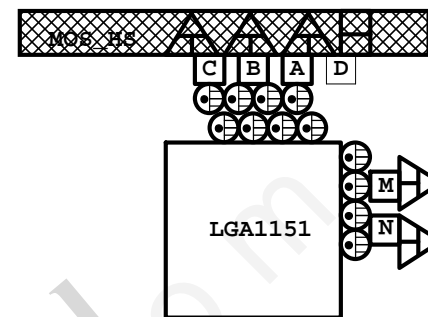


For H1703M-HD3 USB



GIGABYTE™

Title		
EMI/ESD		
Size A	Document Number GA-B150M-Gaming PIO	Rev 1.0
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固態電容料號.請自行修改

日系黑色固態	Capture Value
11C02-C85600-01R	560u/FP/D/6.3V/68/C/8m
11C05-C82700-01R	270u/FP/D/16V/88/C/12m
11C05-C61000-01R	100u/OS/D/16V/66/C/30m
11C02-C51000-01R	100u/FP/D/6.3V/65/C/13m

日系一般固態	Capture Value
11C02-685600-01R	560u/FP/D/6.3V/68/8m
11C05-882700-01R	270u/FP/D/16V/88/12m
11C05-661000-03R	100u/OS/D/16V/66/30m
11C02-651000-02R	100u/OS/D/6.3V/66/30m

台系固態	Capture Value
11C02-661000-09R	100u/OS/D/6.3V/66/A/35m
11C05-691000-09R	100u/OS/D/16V/69/A/35m
11C05-8C2700-09R	270u/FP/D/16V/8C/A/10m
11C02-695600-09R	560u/FP/D/6.3V/69/A/11m

IRON CHOKE

	料號	Capture Value	SIZE	Footprint
DIP	11LC5-M4500C-01R	0.5uH/40A/IMD109/M/D	10*10	CHOKE05U-40A-1PQ-3
DIP	11LC5-M2500C-01R	0.5uH/20A/IMD0809/M/D	8*8	CHOKE1U-R50M-IF

Ferrite

	料號	Capture Value	SIZE	Footprint
DIP	11LC5-F3500C-11R	0.5uH/32A/INCG109/FSI/D	10*10	CHOKE05U-40A-1PQ-3
DIP	11LC5-F2500C-11R	0.5uH/25A/INC0809/F/D	8*8	CHOKE1U-R50M-IF
SMD	未建(SIUC1007-R30M-JJ1W)		10*7	CHOKE11X8MM-SMD

BEAD

	料號	Capture Value	SIZE	Footprint
DIP	10LFB-15470A-01R	47/4030/15A/S	4*3	BEADC8B-BPH_SMD

PWM料號

		料號	Capture Value	Footprint
PWM	ISL95856	10TA1-695856-01R		IC52QFN-6x6-G
PWM	ISL95858	10TA1-695858-01R		IC52QFN-6x6-G
PWM	IR35201	10TA1-635201-00R		IC56QFN-9VRS4339
PWM	IR3570	10TA1-603570-00R		IC40MLFP-ISL95835



GIGABYTE™			
Title POWER零件使用表			
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The schematic shows the power supply for the LM324 and the ISL8014. The LM324 is powered by VCC3 (VCC1_8_PCH) and VCC3_DAC. The ISL8014 is powered by 5VSB and VCC, which are converted to 5VDUAL, then 3VDUAL, and finally VCC1_05_M.

The diagram illustrates the layout of a CPU board, showing the following components and their connections:

- CPU VTT**: A dashed box containing:
 - DC_DQ1** and **DD_DQ1**
 - DC_DQ2** and **DD_DQ2**
 - DC_DQ3** and **DD_DQ3**
 - DC_DL1** and **DD_DL1**
- VCORE**: A dashed box containing:
 - DB_DQ1**, **DB_DQ2**, **DB_DQ3**, **DB_DL1**
 - DA_DQ1**, **DA_DQ2**, **DA_DQ3**, **DA_DL1**
 - DZ_DQ1**, **DZ_DQ2**, **DZ_DQ3**, **DZ_DL1**
 - DZ_DQ4**, **DZ_DL2**
- MOSFET**: A dashed box containing:
 - TQ3** and **TQ4**
- CHOKE**: A dashed box containing:
 - TL1**
- CPU SOCKET**: A large central box.
- PCH**: A box at the bottom left.
- P-PAK**: A box at the bottom right.

Connections are indicated by lines and labels:

- 4** and **2** are labels for connections from the CPU VTT to the CPU SOCKET.
- 1** and **3** are labels for connections from the VCORE to the CPU SOCKET.
- CHOKE** is connected to the CPU SOCKET.
- P-PAK** is connected to the CPU SOCKET.

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

Gigabyte Technology			
Title			
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