

Model Name: Z370M DS3H

rev 1.0

SHEET

TITLE

01	COVER SHEET
02	BOM & PCB MODIFY HISTORY
03	BLOCK DIAGRAM
04	CPU_LGA1151-A
05	CPU_LGA1151-B-DDR4
06	CPU_LGA1151-C
07	CPU_LGA1150-D
08	DDR4 CHANNEL A
09	DDR4 CHANNEL B
10	PCH_CLK BUFFER
11	PCH_DMI,USB,PCIE
12	PCH_MISC
13	PCH SATA,PCIE,SATA_EXPRESS
14	PCH PWR
15	PCH GND
16	ITE 8686 LPC IO
17	HWM
18	FAN CTRL--SIO
19	PCI EXPRESS*16 SLOT
20	PCI EXPRESS*1 SLOT
21	
22	DUAL BIOS
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27	ISL95866 PWM-IRON
28	ISL95866 VCORE-IRON

SHEET

TITLE

29	ISL95866 VCCGT-IRON
30	VCCSA_VCCIO_VCCPLL
31	RT8237_DDR_BEAD
32	RT8068A_VPP
33	RT8237_PCH-BEAD
34	DISCRETE POWER
35	NCT3933
36	ATX POWER , A_-PROCHOT
37	KB_MS_USB
38	DVI CONN
39	
40	
41	HDMI
42	REALTEK 8111G
43	USB30_LAN CONNECTOR-8111G
44	Realtek ALC887
45	REAR AUDIO JACK
46	ADUIO LED
47	F_USB30
48	F_USB
49	R_USB30
50	F_PANEL
51	M.2 X4 (A)
52	
53	COM, LPT, TPM
54	EMI-ESD
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56	NTC MAP

Gigabyte Technology

Title			Cover Sheet
Size	Document Number	Z370M DS3H	
Custom		Sheet	Rev 1.0
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**Model Name: Z370M DS3H**

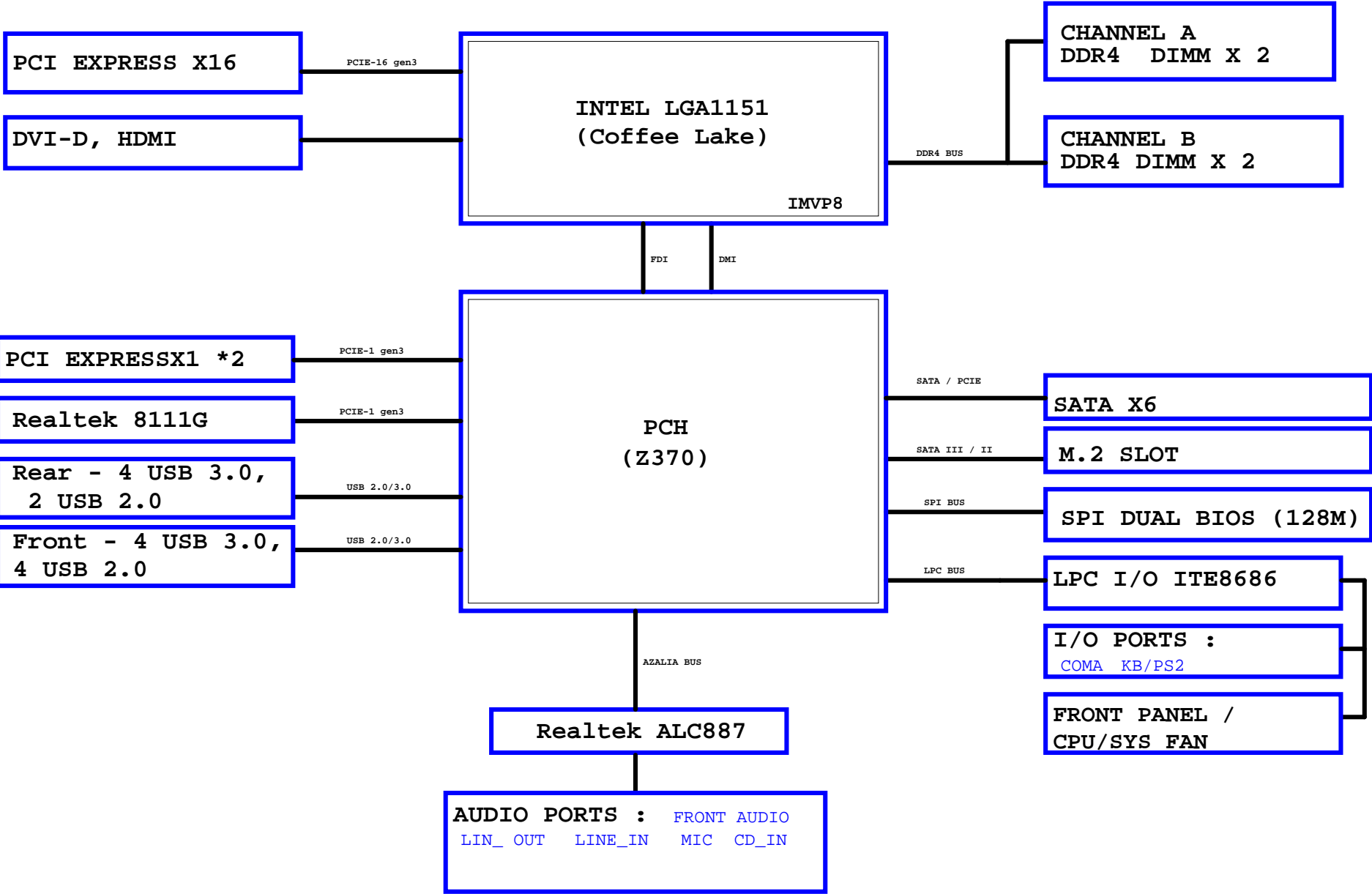
rev 1.0    Circuit or PCB layout change

## Component value change history

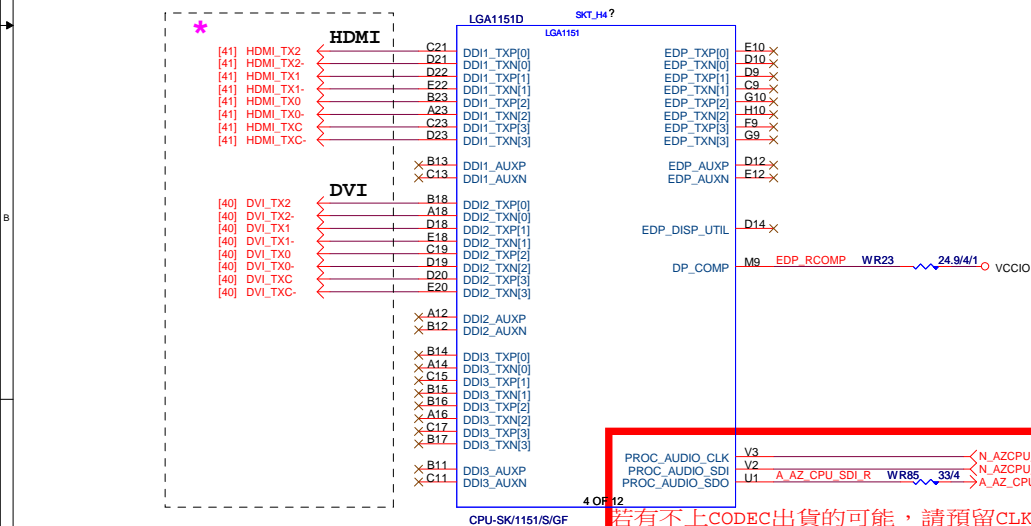
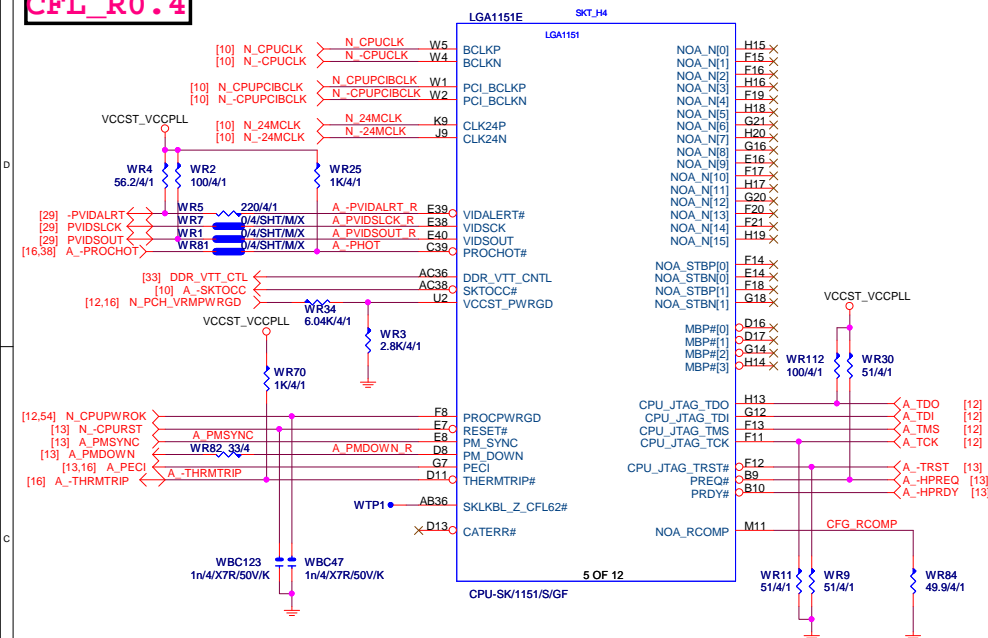
2017/12/26

[illegible][illegible]

BLOCK DIAGRAM



## CFL\_R0.4

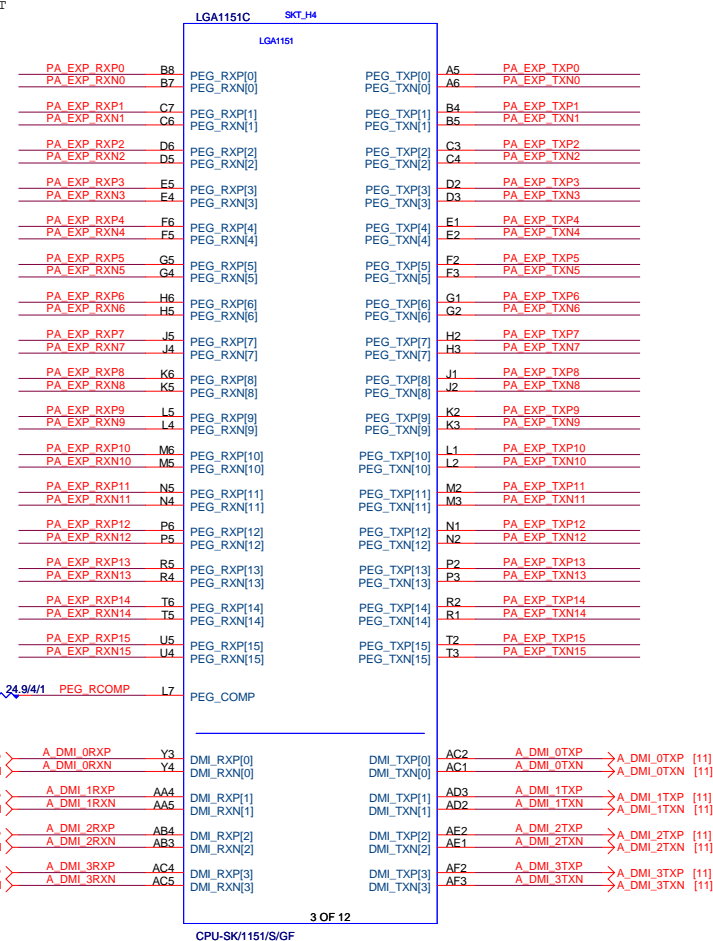


若有不上CODEC出貨的可能，請預留CLK and SDO對地電阻。

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

```
CFG[4]: 1=eDP enable / 0=eDP disable
CFG[7]: 1=PEG Train immediately following RESET
        0=PEG Wait for BIOS
CFG[13]: 1=VCCSA Fixed Mode / 0=SVID Mode
```

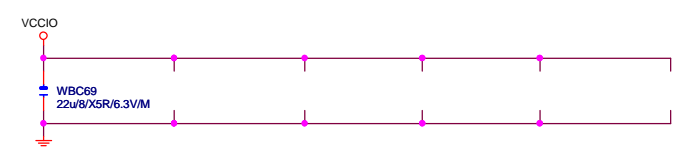
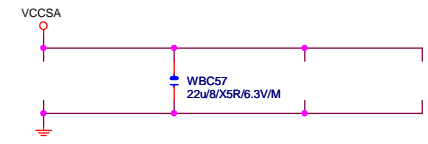
Bifurcation Config.	Signals Lanes		
	CFG[6]	CFG[5]	CFG[2]
1x16	1	1	1
1x16 Reversed	1	1	0
2x8	1	0	1
2x8 Reversed	1	0	0
1x8+2x4	0	0	1
1x8+2x4 Reversed	0	0	0



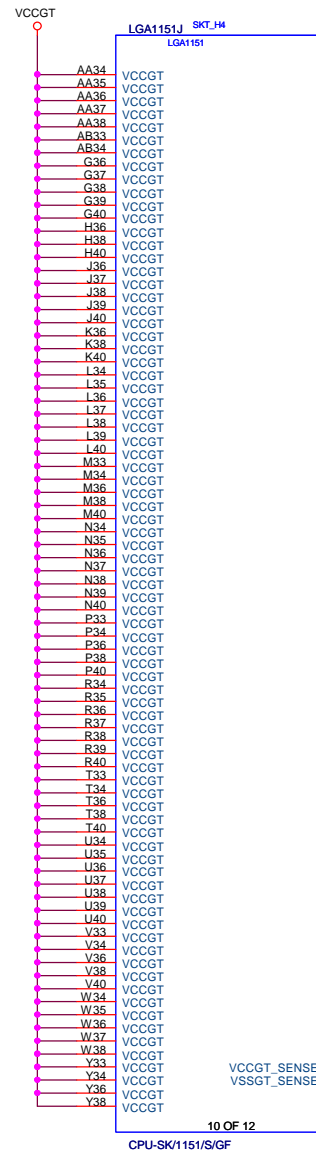
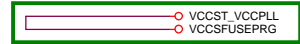
PA\_EXP\_TXP[0..15] >> PA\_EXP\_TXP[0..15] [19]  
PA\_EXP\_TXN[0..15] >> PA\_EXP\_TXN[0..15] [19]  
PA\_EXP\_RXP[0..15] >> PA\_EXP\_RXP[0..15] [19]  
PA\_EXP\_RXN[0..15] >> PA\_EXP\_RXN[0..15] [19]



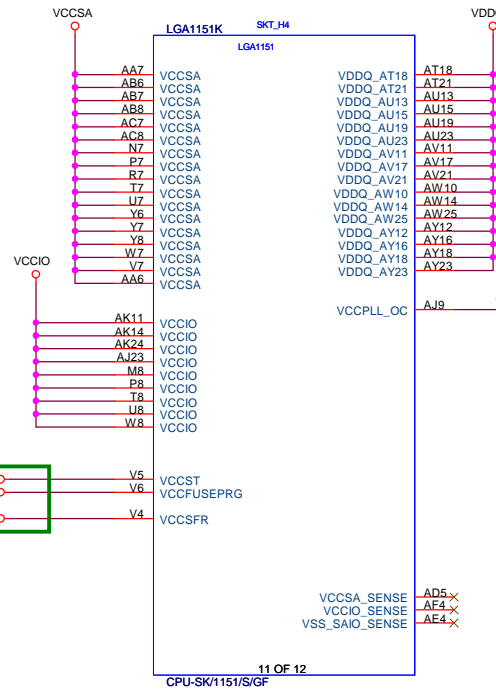
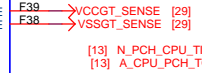
CFL\_R0.4



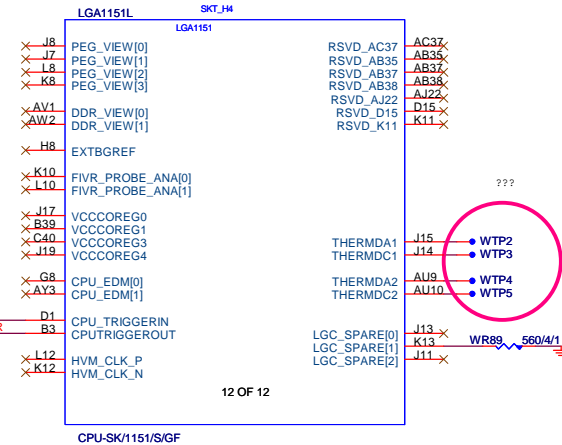
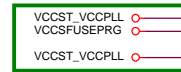
CPU POWER



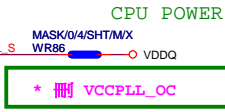
CPU-SK/1151/S/GF

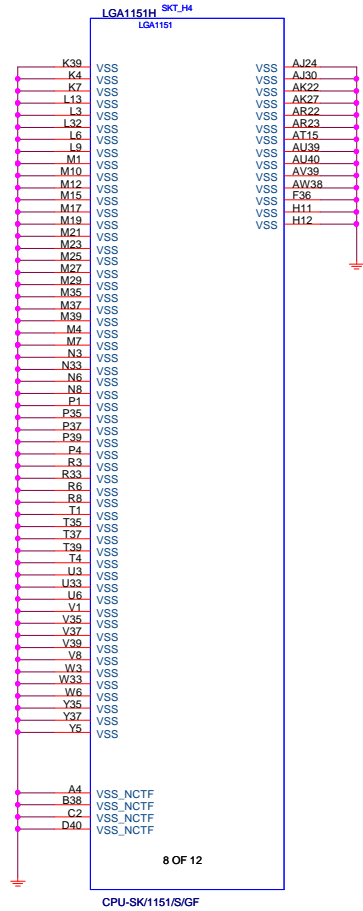
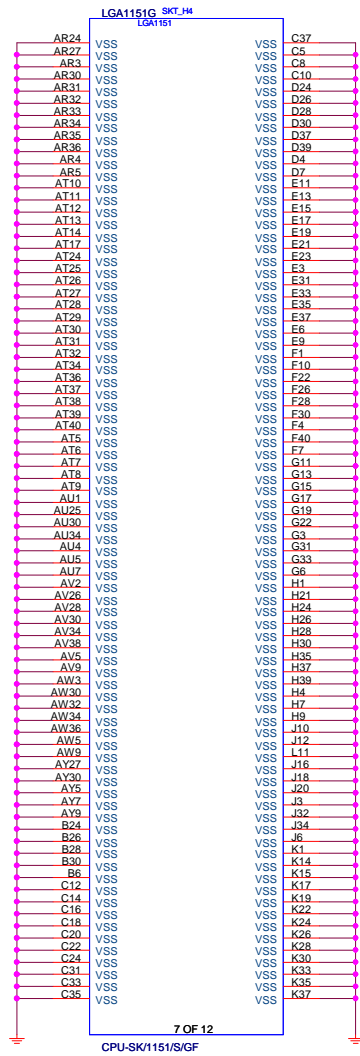
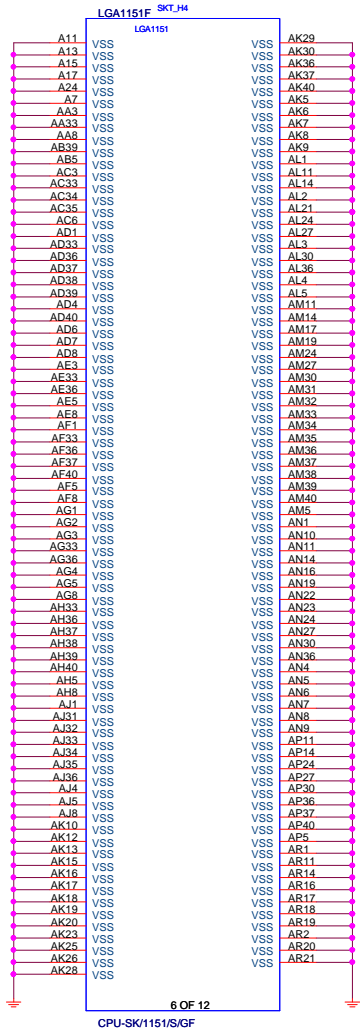
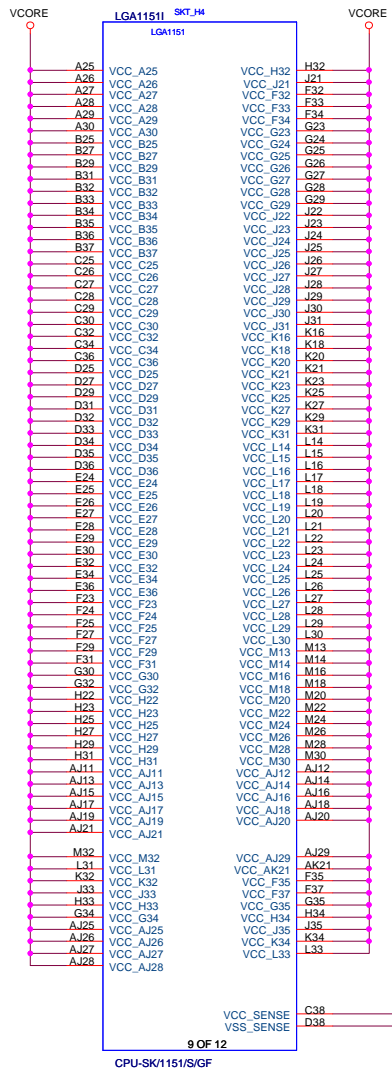


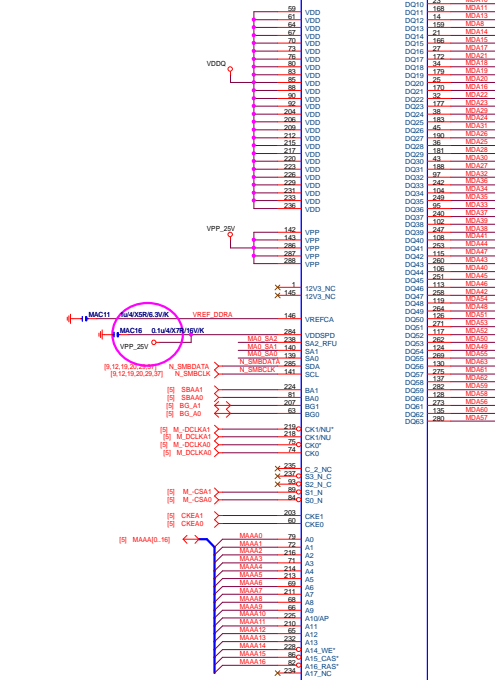
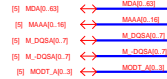
CPU-SK/1151/S/GF



CPU-SK/1151/S/GF







\* 黑色 雙耳扣

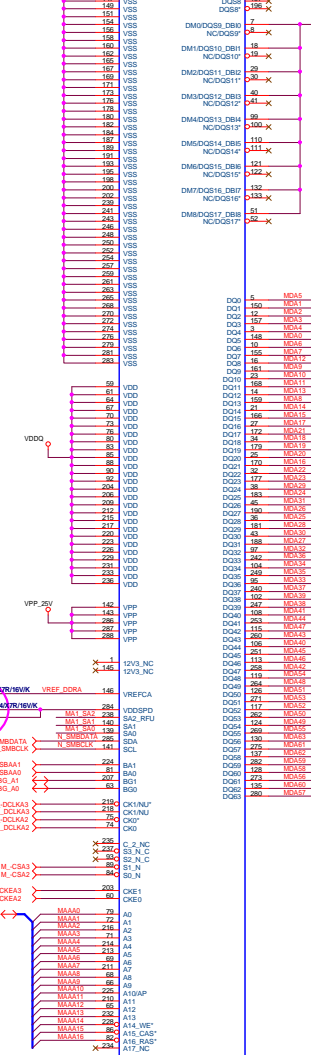
\* 黑色 雙耳扣



\* 移除 short  
CHANNEL AC  
532-0-000

\* 移除 short  
CHANNEL AC  
532-0-000

\* 移除 short  
CHANNEL AC  
532-0-000



\* 深灰色 雙耳掛

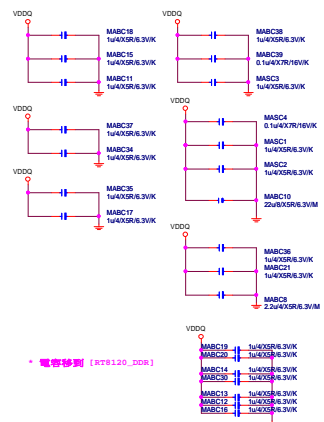
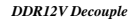
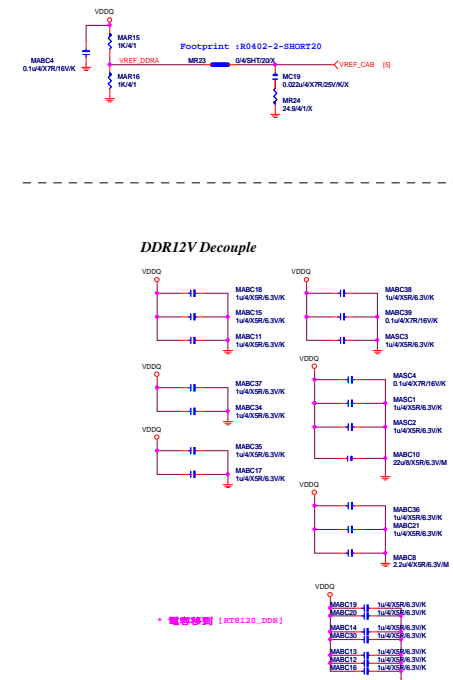
\* 深灰色 雙耳掛



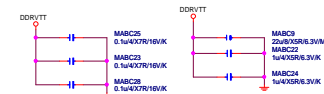
\* 移除 short  
CHANNEL A  
632-0-001

\* 移除 short  
CHANNEL A  
632-0-001

\* 移除 short  
CHANNEL A  
632-0-001



- 電容移到 [RT8120\_DD1]



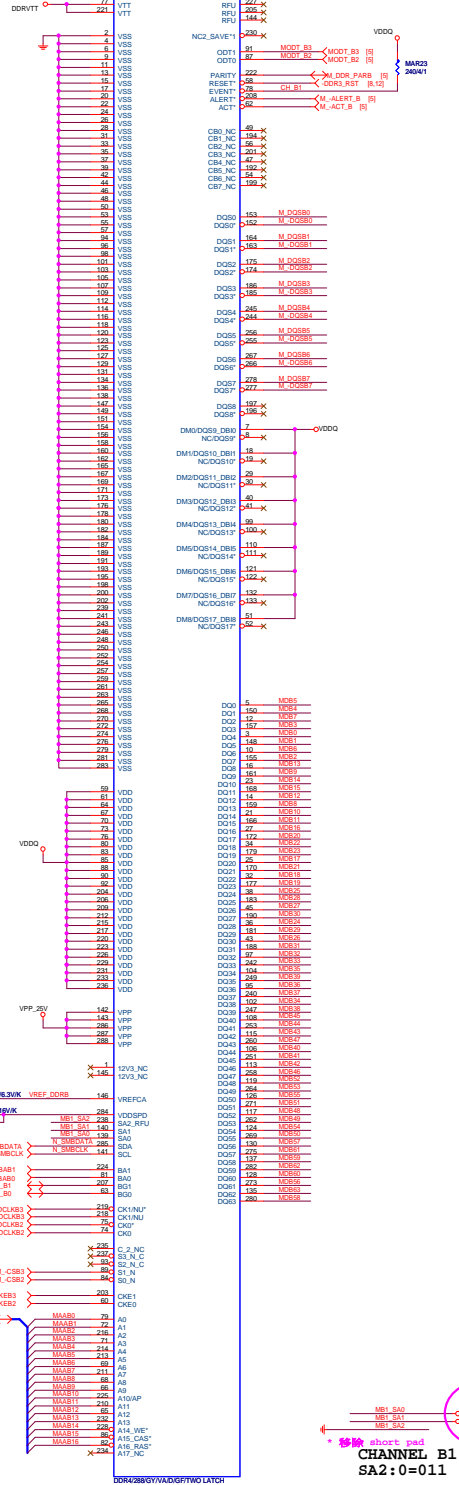
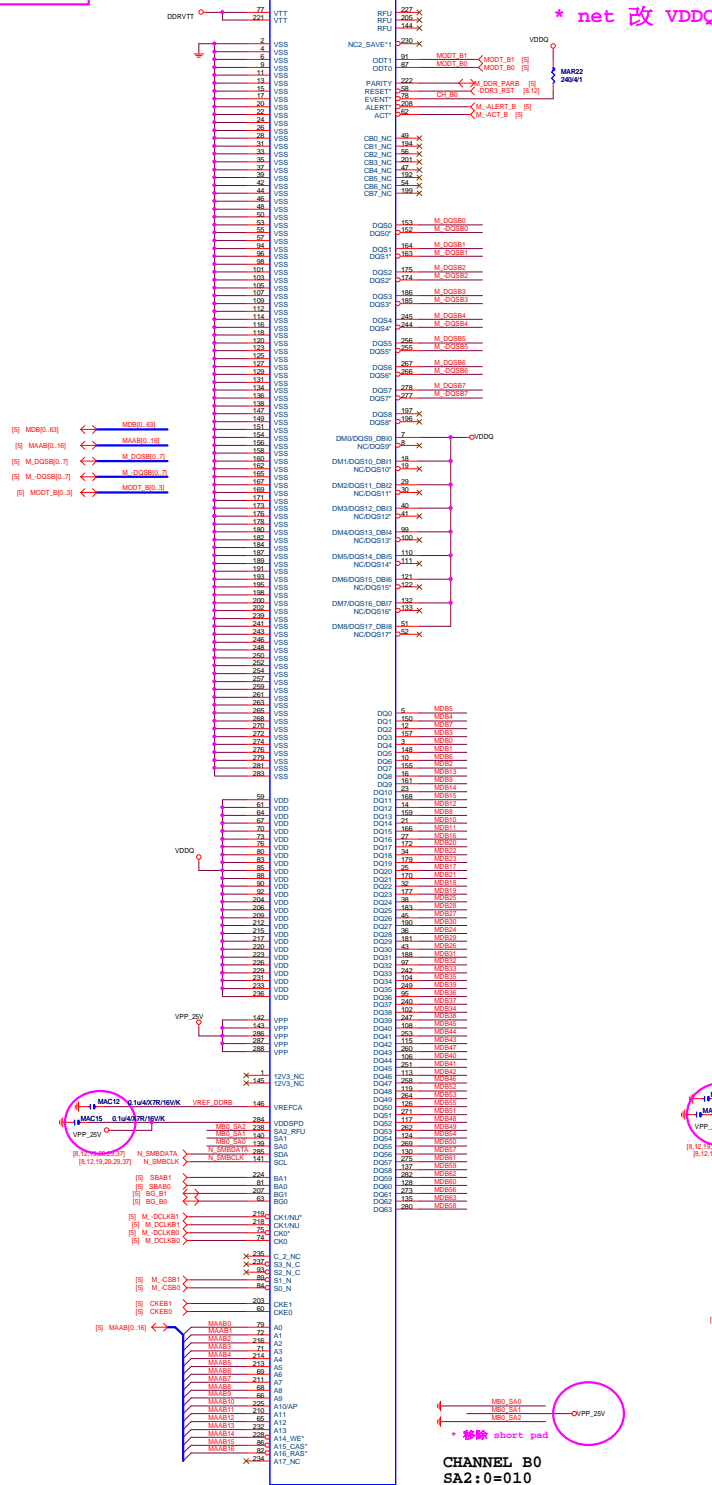
- 副電容

- 副電容

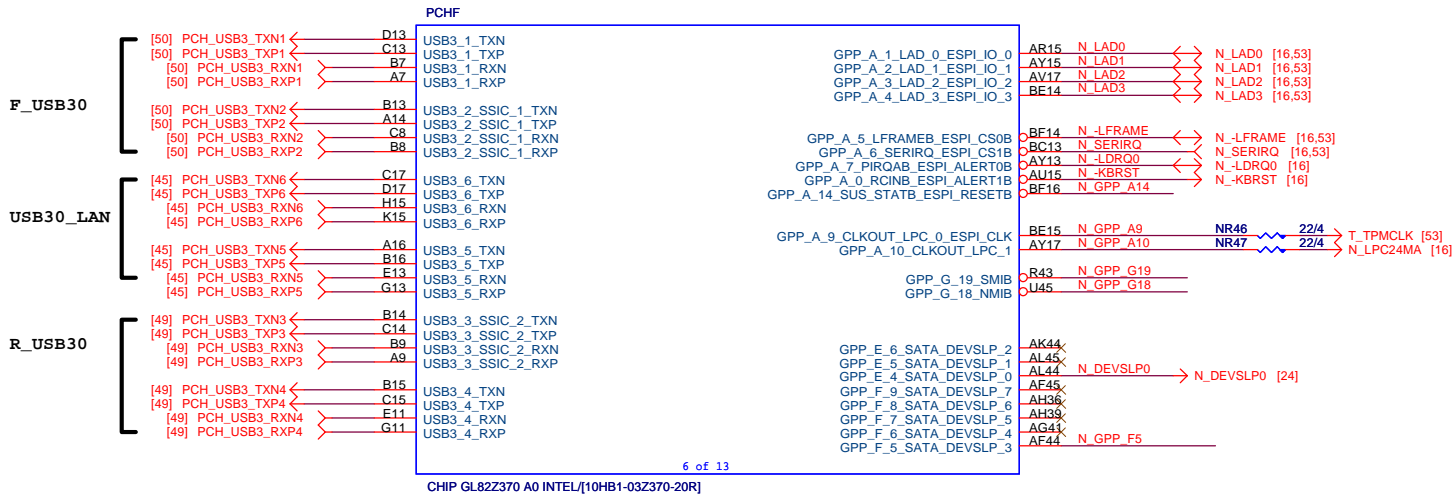
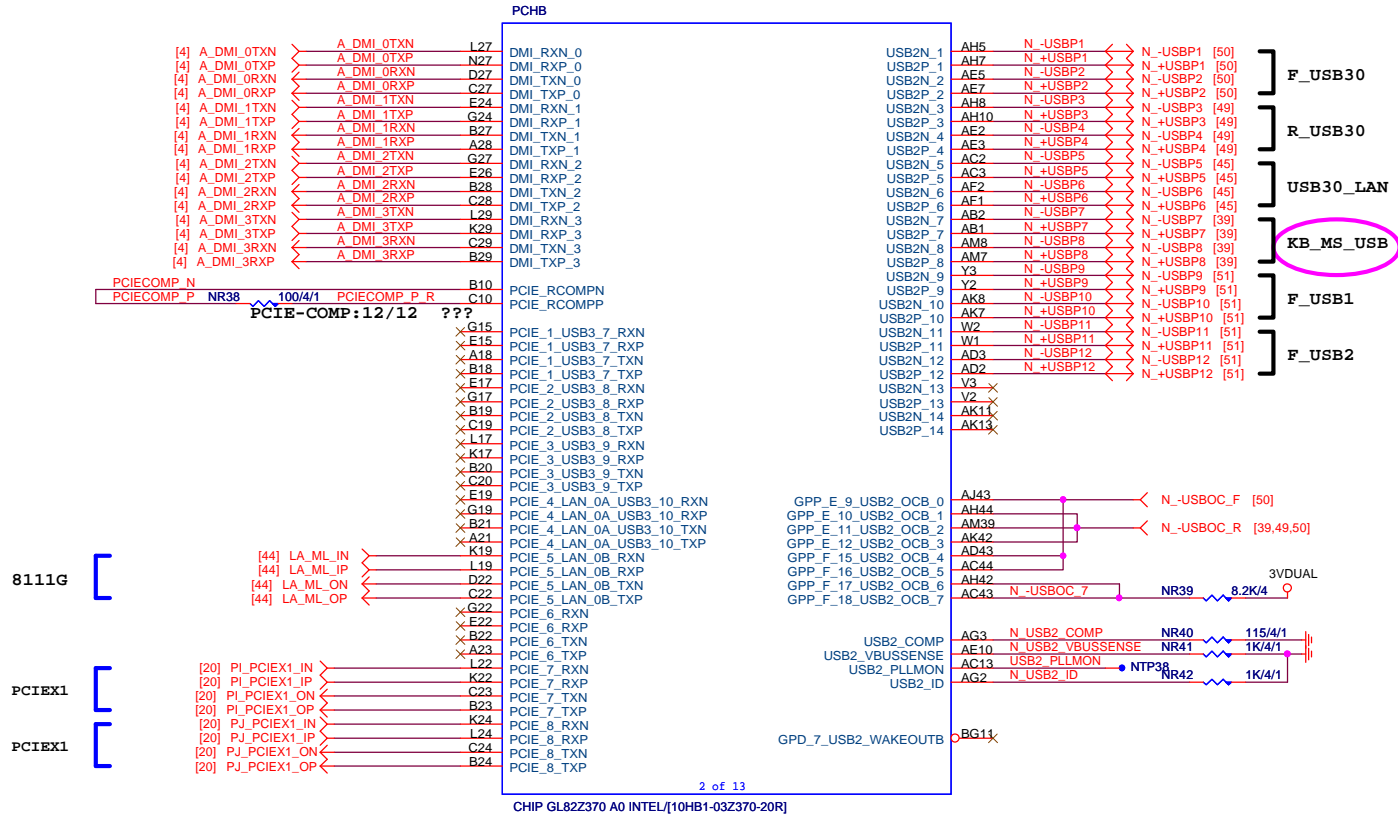
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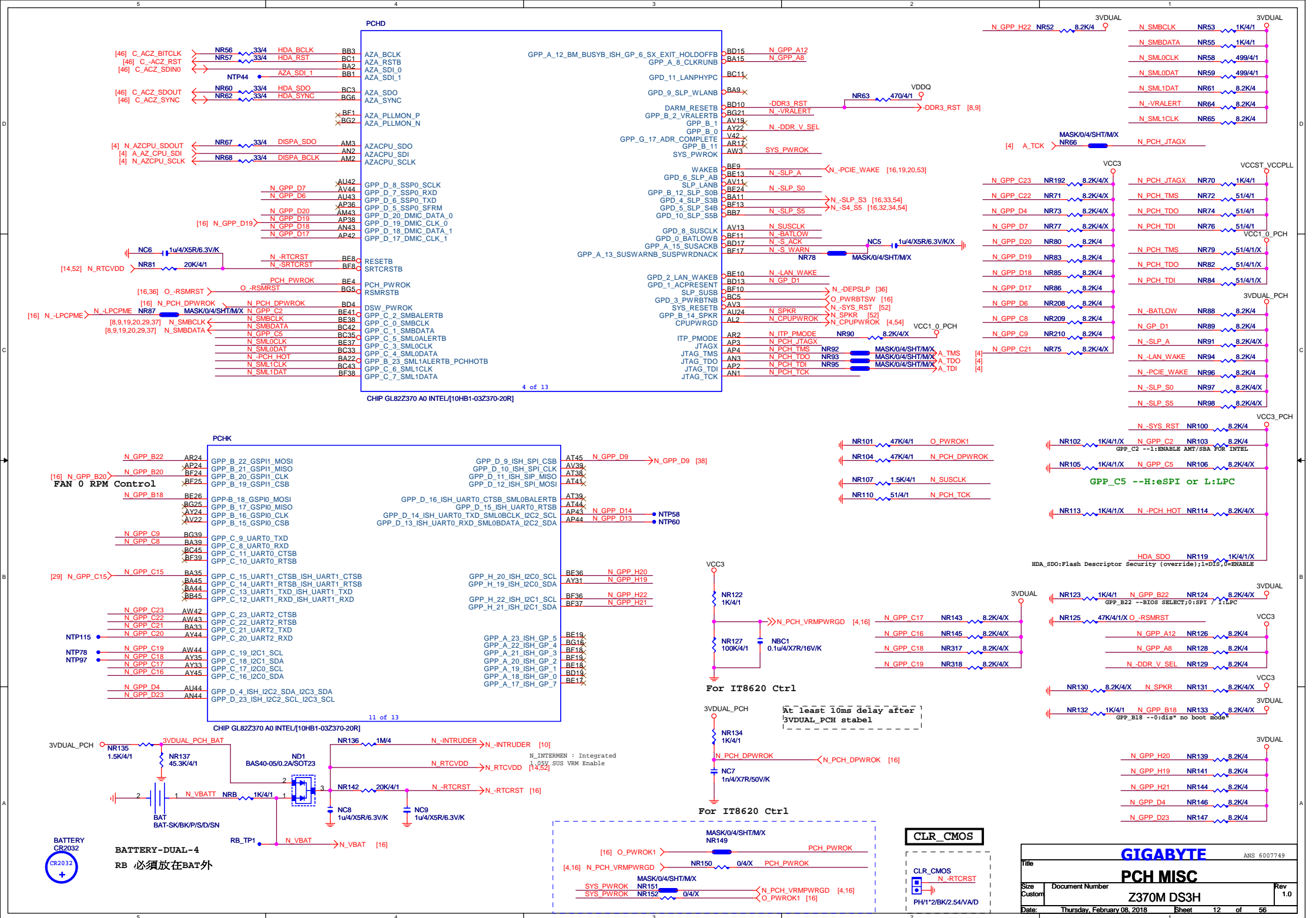
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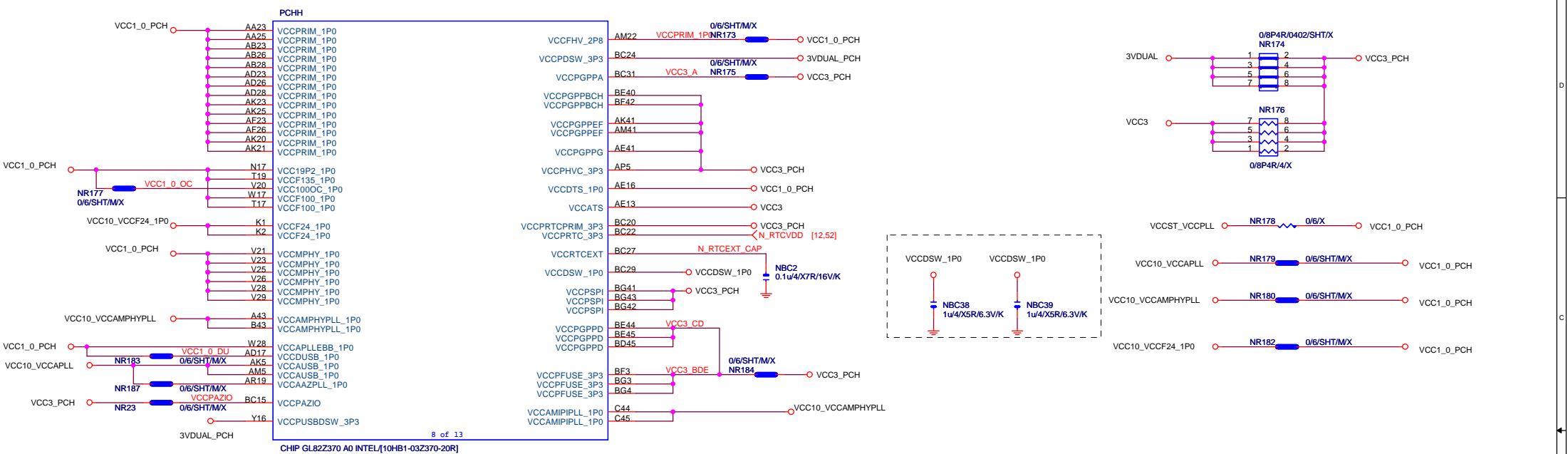




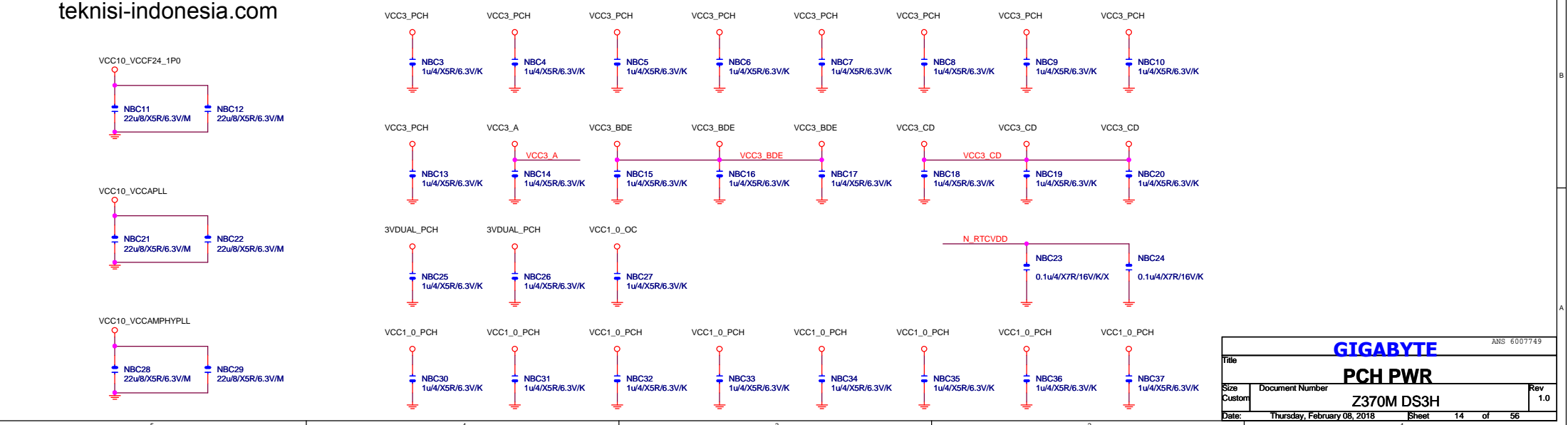








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PCH PWR				
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PCHI		
A25	VSS	A42
A30	VSS	D45
P22	VSS	BG44
AV38	VSS	BE44
AV45	VSS	BF45
AV8	VSS	BF2
AY11	VSS	W29
AY19	VSS	A35
AY37	VSS	AG23
AY4	VSS	A40
AY42	VSS	AA1
AY8	VSS	AA17
B25	VSS	AA18
B3	VSS	AA20
B30	VSS	C1
B35	VSS	A12
B4	VSS	AA28
B41	VSS	AA29
BA13	VSS	AB17
BA17	VSS	AC32
BA37	VSS	AE4
BA29	VSS	AE8
BA31	VSS	AF18
BA37	VSS	AF20
BA4	VSS	AF21
BA42	VSS	AF25
BB40	VSS	AF28
BC38	VSS	AF29
BC40	VSS	AF4
BC9	VSS	AF42
BD11	VSS	AG18
BD16	VSS	AG20
BD2	VSS	AG21
BD21	VSS	AG23
BD25	VSS	AG25
F2	VSS	AG26
F31	VSS	AG28
E6	VSS	AG28
E8	VSS	AH11
F39	VSS	AH13
F43	VSS	AH30
G4	VSS	AH32
G40	VSS	AH33
G42	VSS	AH38
F6	VSS	AJ1
G9	VSS	AJ17
H11	VSS	AJ18
H13	VSS	AJ20
H17	VSS	AJ21
H19	VSS	AJ23
H22	VSS	AJ26
H24	VSS	AJ26
H27	VSS	AJ28
H29	VSS	AJ29
H33	VSS	AJ45
H35	VSS	AK10
H38	VSS	AK14
H4	VSS	AK16
H42	VSS	AK17
H9	VSS	AK18
J4	VSS	AK26
M36	VSS	AK28
M38	VSS	AM14
M4	VSS	AN14
M8	VSS	AP19
M9	VSS	AR22
N13	VSS	AR27
N15	VSS	AU29
N19	VSS	AU33
N22	VSS	AV1
N24	VSS	AV10
N31	VSS	AV15
N42	VSS	AV24
P10	VSS	AV27
P12	VSS	AV33
AV35	VSS	

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CHIP GL82Z370 A0 INTEL[10HB1-03Z370-20R]

PCHL		
BD34	VSS[70]	AB18
BD39	VSS[71]	AB20
BD7	VSS[72]	AB21
BE2	VSS[73]	AB25
BF43	VSS[74]	AB29
BF2	VSS[75]	AB4
BG18	VSS[76]	AB42
BG23	VSS[77]	AC10
BG28	VSS[78]	AC11
BG32	VSS[79]	AC14
BG37	VSS[80]	AC16
BG40	VSS[81]	AC38
BG9	VSS[83]	AC4
C1	VSS[84]	AC5
A12	VSS[85]	AC7
C2	VSS[86]	AC8
C37	VSS[87]	AD1
A6	VSS[88]	AD18
C9	VSS[89]	AD20
D1	VSS[90]	AD21
D10	VSS[91]	AD25
D12	VSS[92]	AD29
D15	VSS[93]	AD45
D16	VSS[94]	AE11
B12	VSS[95]	AE14
D19	VSS[96]	AE32
D21	VSS[97]	AE33
D24	VSS[98]	AE38
D25	VSS[99]	AK29
D29	VSS[100]	AK30
D30	VSS[101]	AK32
D33	VSS[102]	AK35
D35	VSS[103]	AK39
D36	VSS[104]	AL4
D39	VSS[105]	AL42
D44	VSS[106]	AM10
D7	VSS[107]	AM11
P13	VSS[108]	AM13
P15	VSS[109]	AM17
P17	VSS[110]	AM19
P19	VSS[111]	AM24
P31	VSS[112]	AM27
P33	VSS[113]	AM29
P35	VSS[114]	AM32
P4	VSS[115]	AM33
P42	VSS[116]	AM4
P8	VSS[117]	AN45
R1	VSS[118]	AP10
R32	VSS[119]	AP11
T10	VSS[120]	AP13
T14	VSS[121]	AP15
T22	VSS[122]	AP22
T29	VSS[123]	AP27
T32	VSS[124]	AP31
T36	VSS[125]	AP33
T38	VSS[126]	AP34
Y38	VSS[127]	AP39
Y4	VSS[128]	T4
Y8	VSS[129]	W26
T42	VSS[130]	V16
T5	VSS[131]	V17
U4	VSS[132]	V18
U42	VSS[133]	V30
V10	VSS[134]	V32
V14	VSS[135]	V33
W3	VSS[136]	V38
AR13	VSS[137]	V4
AR31	VSS[138]	V8
AR33	VSS[139]	W18
AR4	VSS[140]	W20
AT10	VSS[141]	W21
AT13	VSS[142]	W23
AT35	VSS[143]	W25
AT37	VSS[144]	
AT42	VSS[145]	
VSS[66]	VSS_1	A44
AU11	VSS_10	BE1
AU17	VSS_11	BD1
BD30	VSS_14	B1
W45	VSS_15	B2
Y13	VSS_16	A3
Y14	VSS_17	A4
Y30	VSS_18	B44
Y32	VSS_2	B45
Y33	VSS_3	
BG14		

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CHIP GL82Z370 A0 INTEL[10HB1-03Z370-20R]

SB\_HEATSIN

X2

1X



BGAHSINK\_SB-N

PCH\_HS

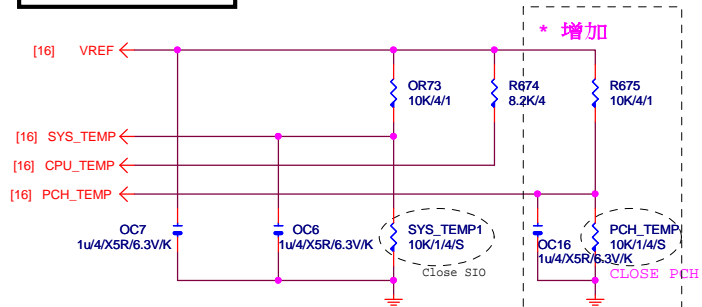
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ANS 6007749		
Title		
PCH GND		
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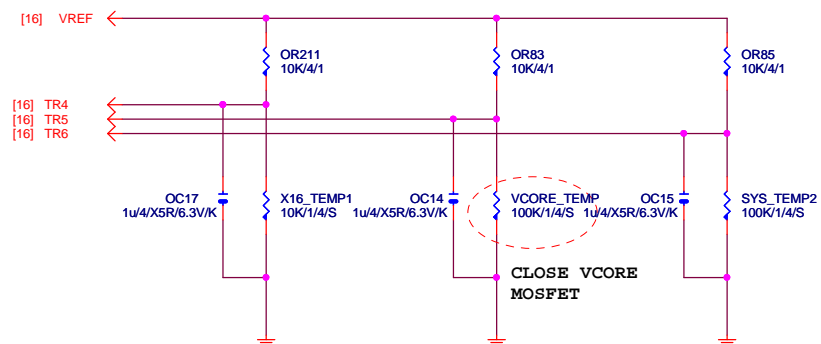




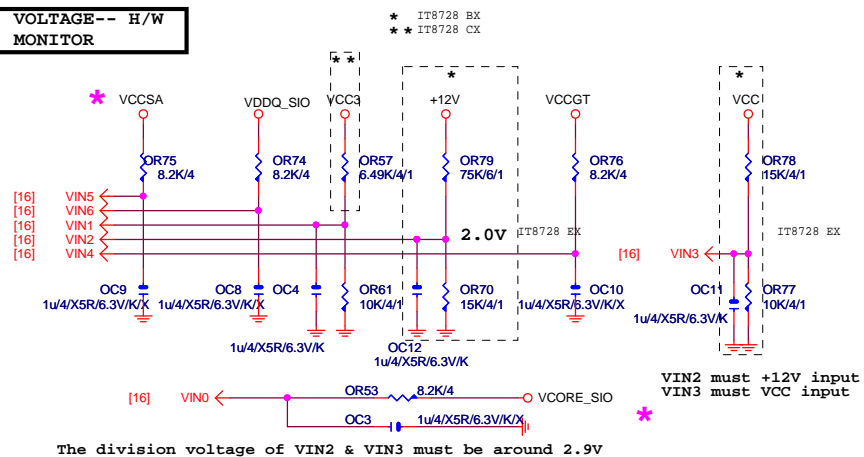
# TEMP H/W MONITOR



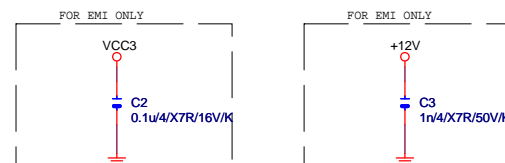
## 5個FAN時使用



# VOLTAGE-- H/W MONITOR



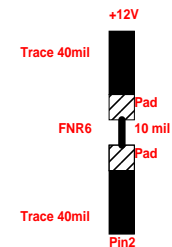
★Update 2015-04.24



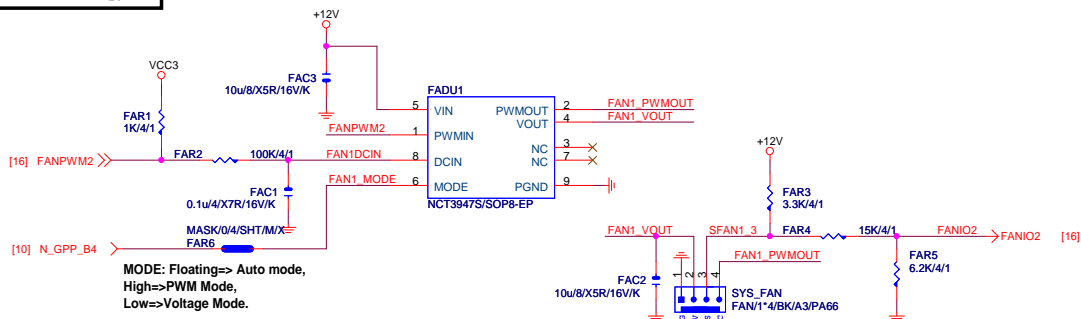
Gigabyte Technology

Title		
HWM,KB/MS, FAN CTRL		
Size	Document Number	Rev
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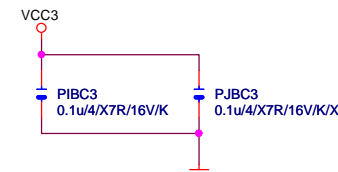
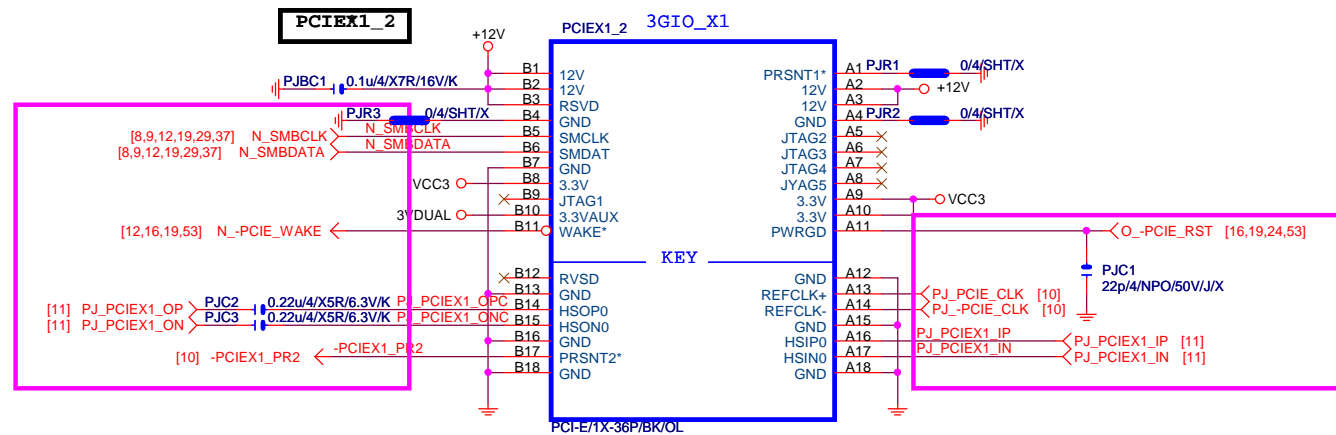
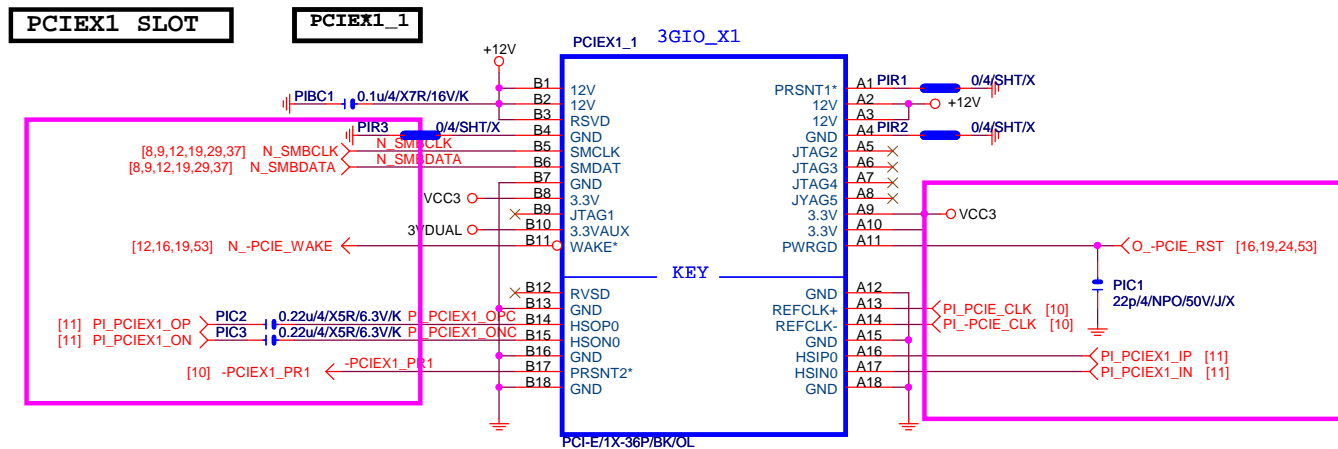


A. SYSTEM FAN1



Title				FAN CTRL			
Size	Document Number						Rev
Custom	Z370M DS3H						1.0
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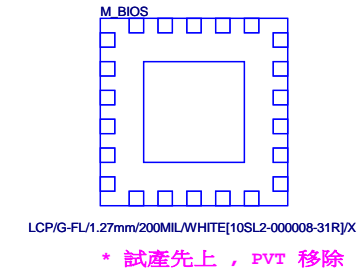
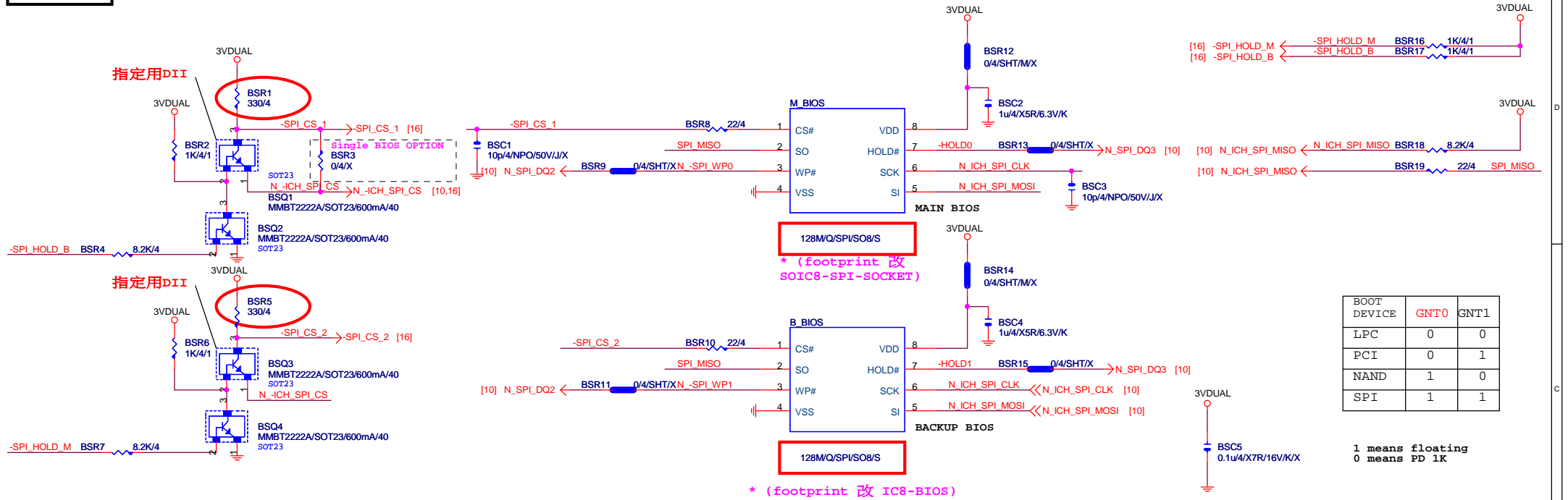


Gigabyte Technology

Title			PCIE_X4	
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DUAL BIOS

MOSI For DMI RX Termination Voltage



Rev 0.6

M.2 Lane4 from PCH port18

M.2 Lane3 from PCH port17

M.2 Lane2 from PCH port16

M.2 Lane1 from PCH port15

支援SATA and M.2 function

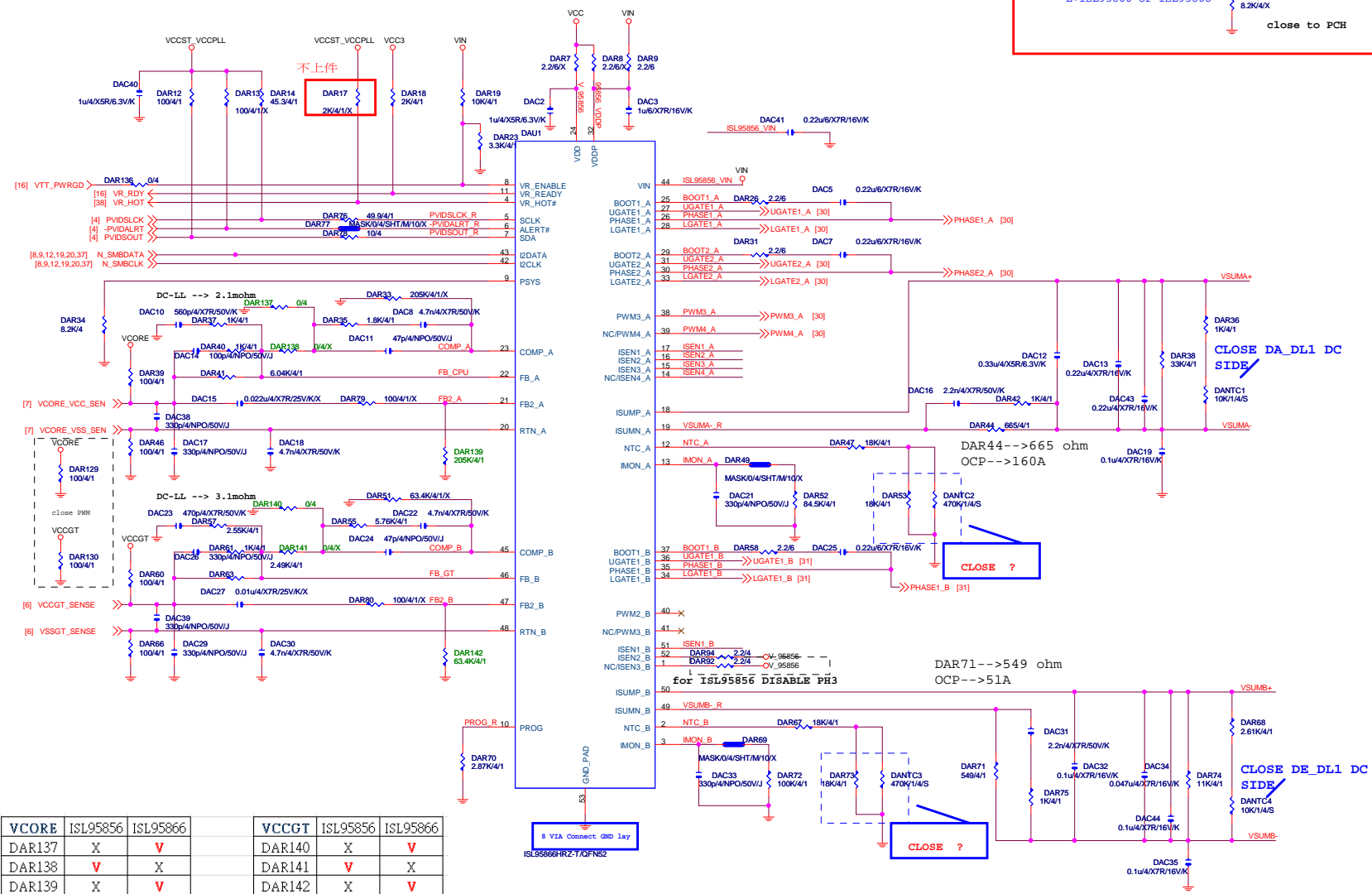
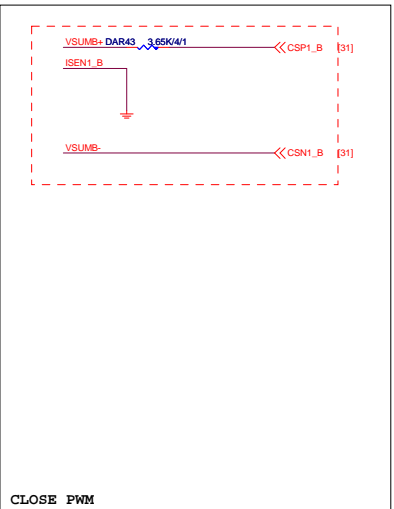
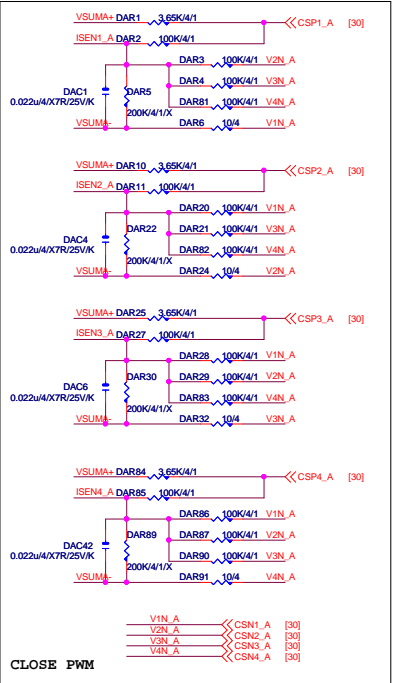
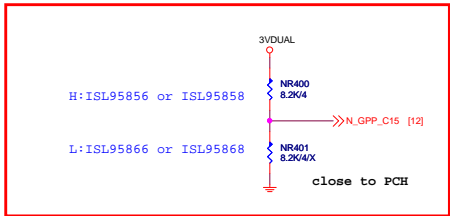
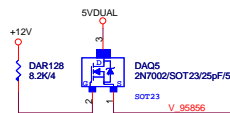
需與M2\_-CLKREQ對應

\* Footprint : NGFF-M-75P-8CM-09MM-SMD

DIP螺柱

SMD螺柱

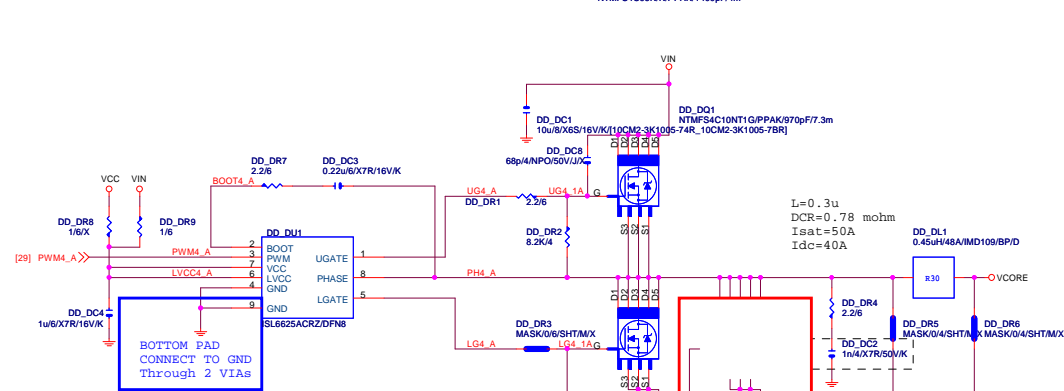
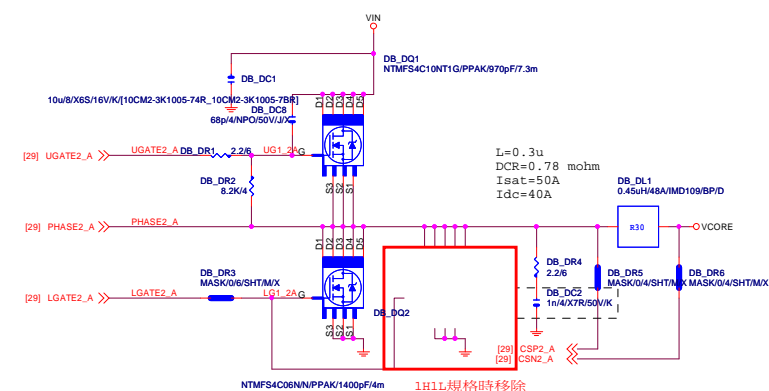
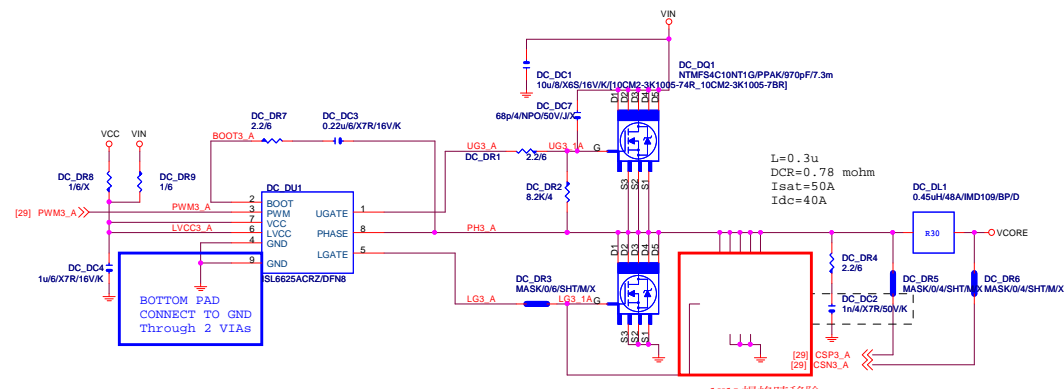
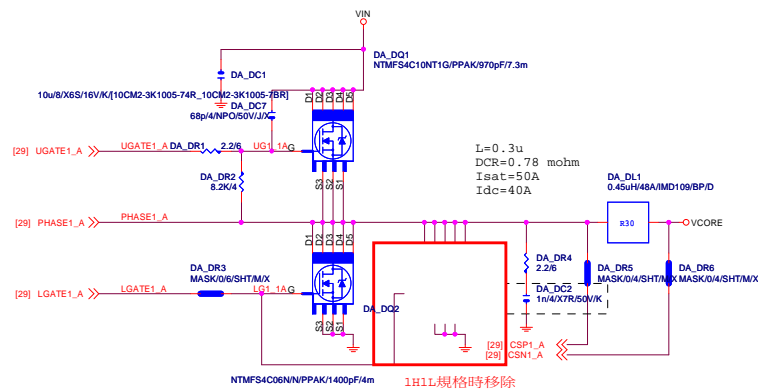
DIP螺絲



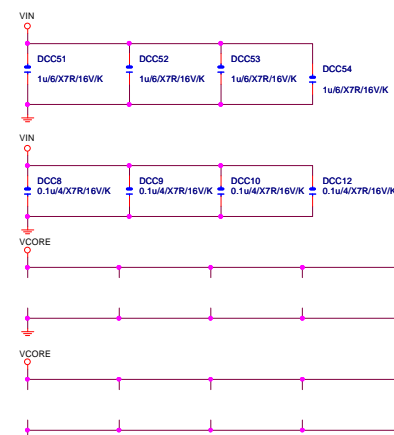
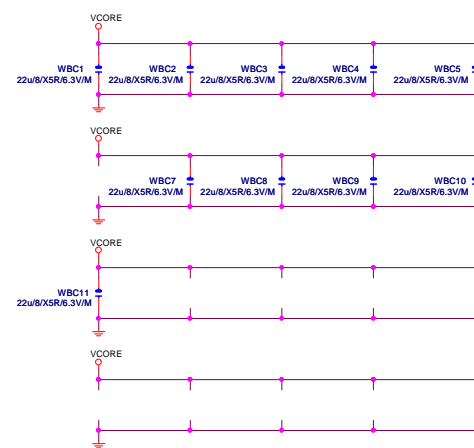
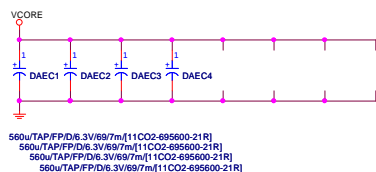
VSCORE	ISL95856	ISL95866	VCCGT	ISL95856	ISL95866
DAR137	X	V	DAR140	X	V
DAR138	V	X	DAR141	V	X
DAR139	X	V	DAR142	X	V
DAC15	V	X	DAC27	V	X
DAR79	V	X	DAR80	V	X
DAR33	V	X	DAR51	V	X

REV:0.1

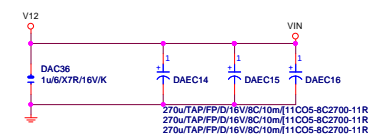
## VCORE



```
VCORE  CAP  560u*4PCS
          22u*10PCS
```

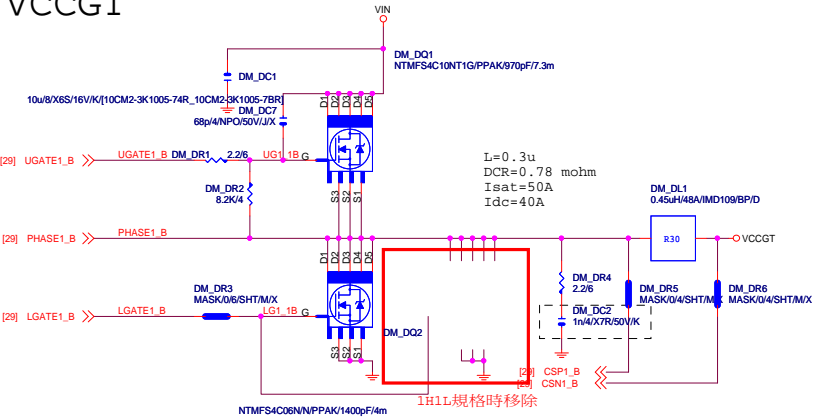


## VIN CAP 270u\*3PCS

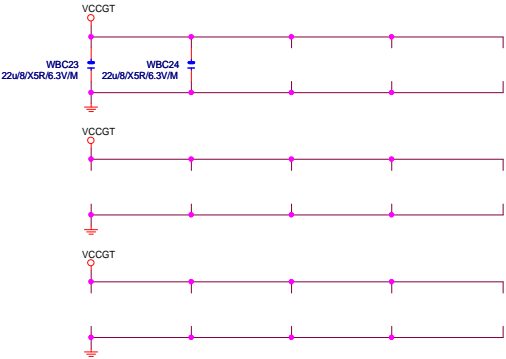
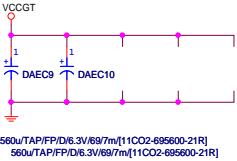




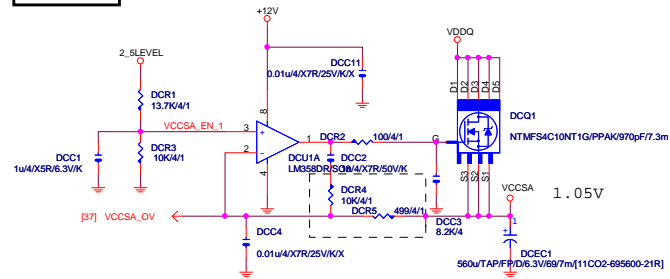
VCCGT



VCCGT CAP 560u\*2PCS  
22u\*4PCS

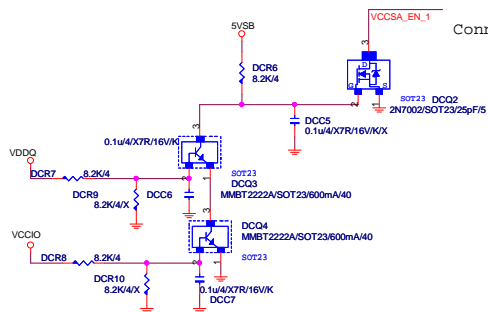


# VCCSA

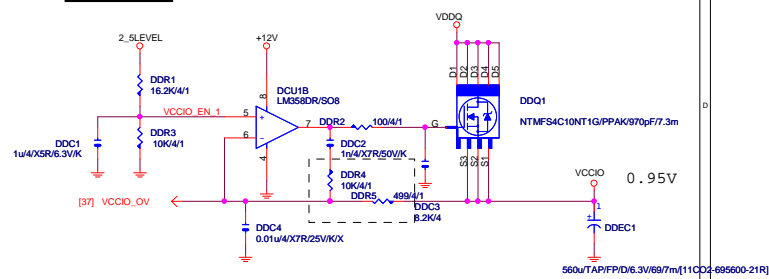


Connect to IT8793

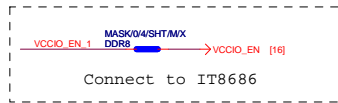
Connect to IT8686



# VCCIO

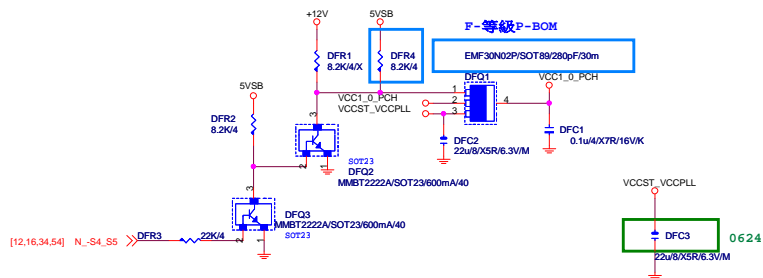


Connect to IT8686



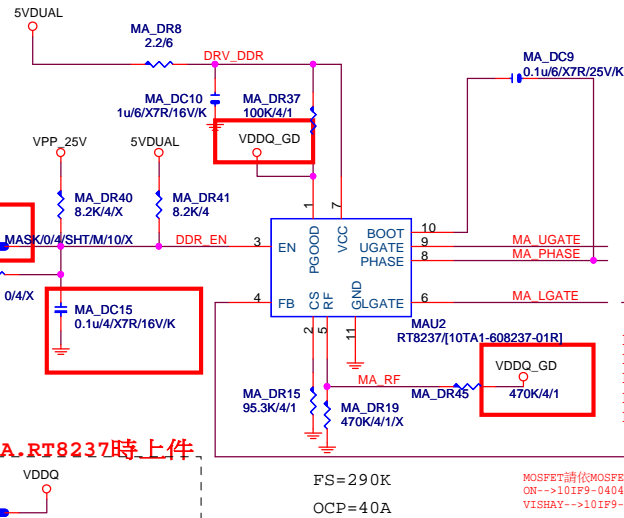
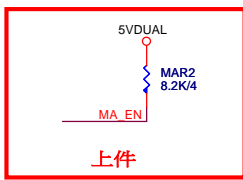
VCCGT  
放CPU端。

# VCCST\_VCCPLL



REV:0.1

## DDR4



MA\_DR38.MA\_DC15

VPP\_25V使用8120.8068A.RT8237時上件

## PWR SEQ

CLOSE TO DDR POWER PLANE

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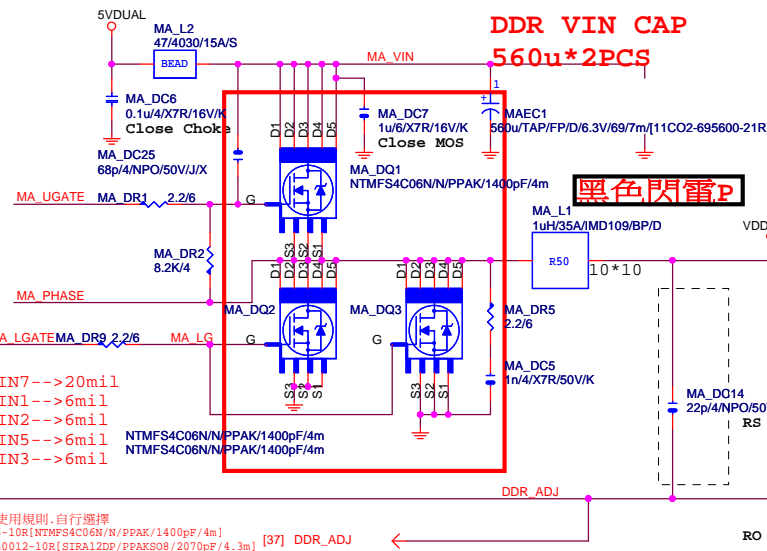
For power sequence require

VPP\_25V使用8120時上件

MAU1上RT9045時上件(不可MASK)

MA\_VTT\_REF

CHOKE與CAP料號可變

DDR VIN CAP  
560u\*2PCS

黑色閃雷P

SUPPORT DDR4

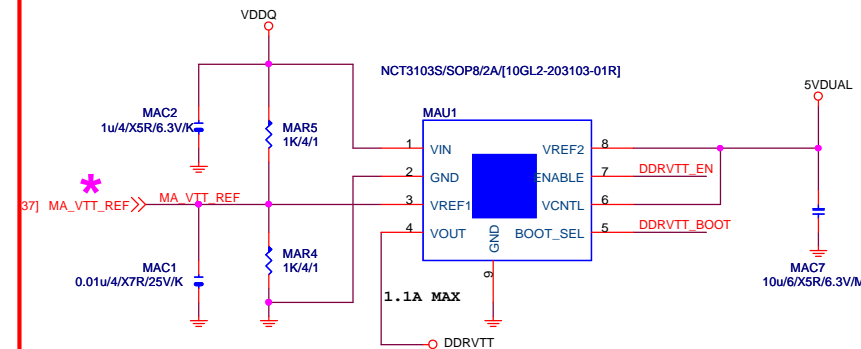
1.2V

L=1u  
DCR=2.5 mohm  
Isat=35A  
Idc=28A

請放置CHOKE一出來位置.先預留.  
請自行確認ripple後再決定是否上件

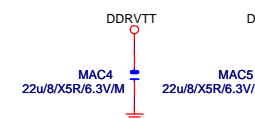
Remote sense請從最重的負載端點拉回

## DDRVTT



## DDRVTT CAP

\* 大電容 x0



[4] DDR\_VTT\_CTL MAU110 MASK/0/4/SHT/M/10/X DDRVTT\_EN  
[2,16,54] N\_SLP\_S3 MAU111 MASK/0/4/SHT/M/10/X DDRVTT\_BOOT

GIGABYTE™

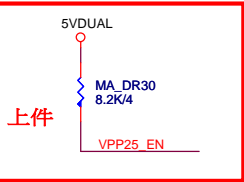
RT8237\_DDR4 POWER

Size Document Number Rev  
Custom Z370M DS3H 1.0

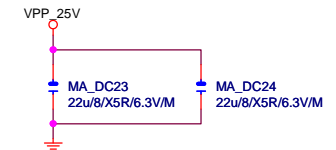
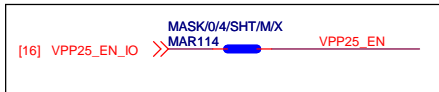
Date: Thursday, February 08, 2018 Sheet 33 of 56

**VPP 25V**

L=1u  
DCR=3.2 mohm  
Isat=18A  
Idc=15A

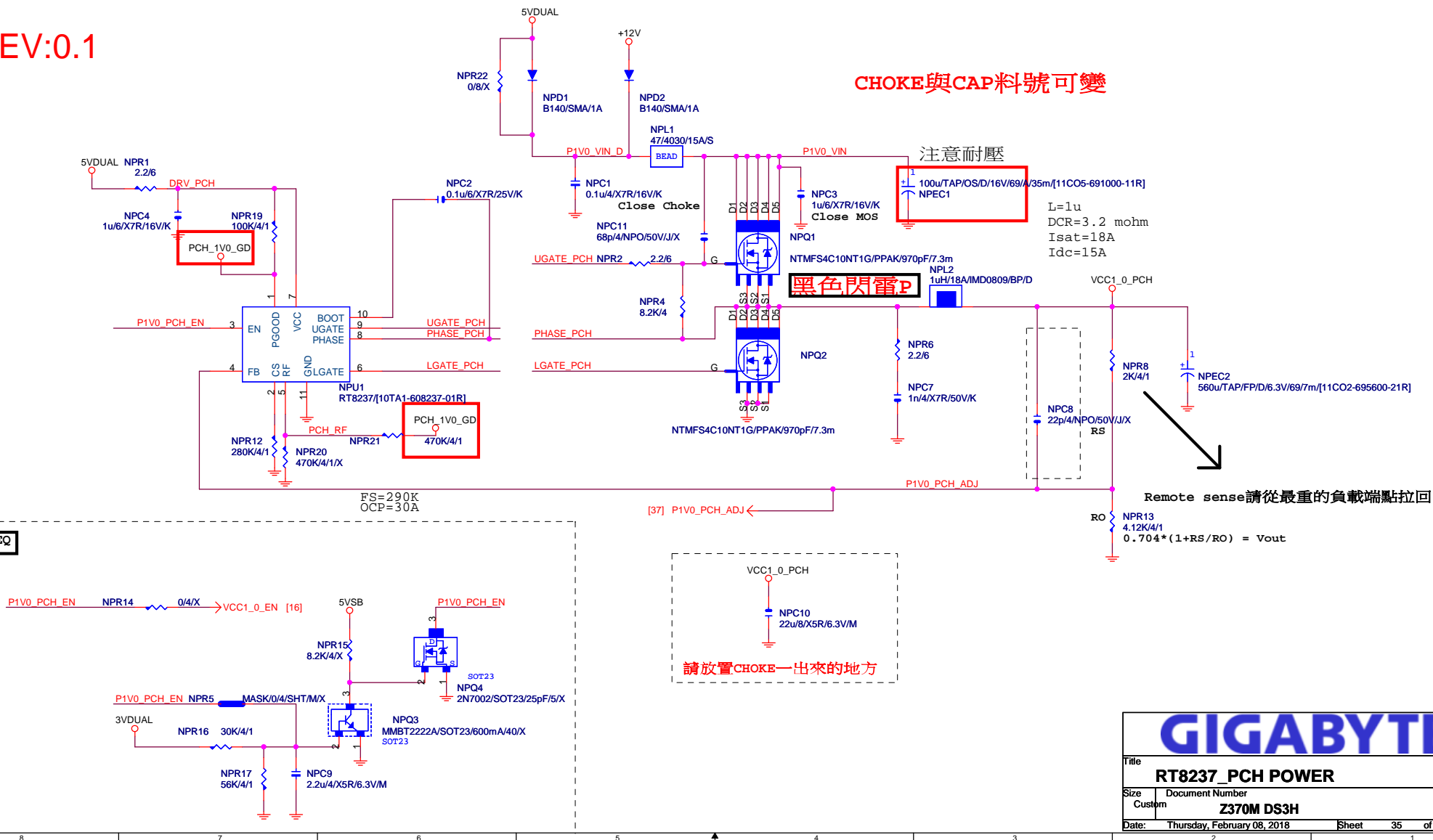


\* 冊 MA\_DR32

**GIGABYTE™**

Title			
RT8068A_VPP25 POWER			
Size	Document Number	Rev	
Custom	Z370M DS3H	1.0	
Date:	Thursday, February 08, 2018	Sheet	34 of 56

REV:0.1

**GIGABYTE™**

Title				
RT8237_PCH POWER				
Size	Document Number			Rev
Custom	Z370M DS3H			1.0
Date:	Thursday, February 08, 2018	Sheet	35	of 56

REV: 0.51

[16] 5VAUX SW



NBC67  
0.1u/4/X7R/16V/K

Q4  
L1085DG/TO252/5A

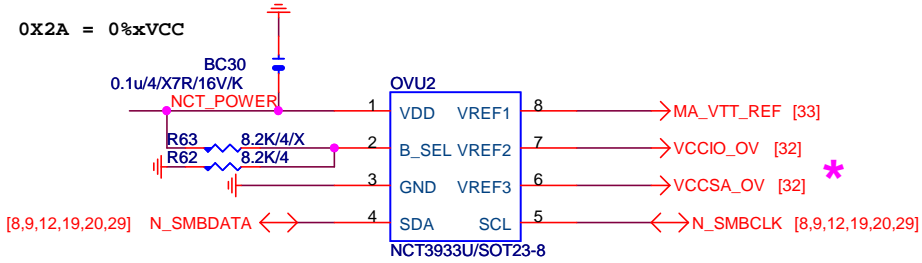
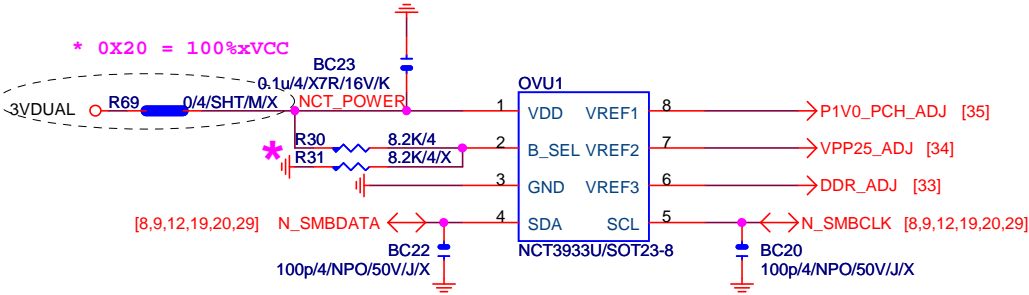
R37  
100Ω/1

R38  
169Ω/1

[12] N.-D.

Title			
<b>DISCRETE POWER</b>			
Size	Document Number		Rev
Custom	<b>Z370M DS3H</b>		<b>1.0</b>
Date:	Thursday, February 08, 2018	Sheet	36 of 56

OVER VOLTAGE



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

CPU CORE VR-2

Size Custom

Document Number

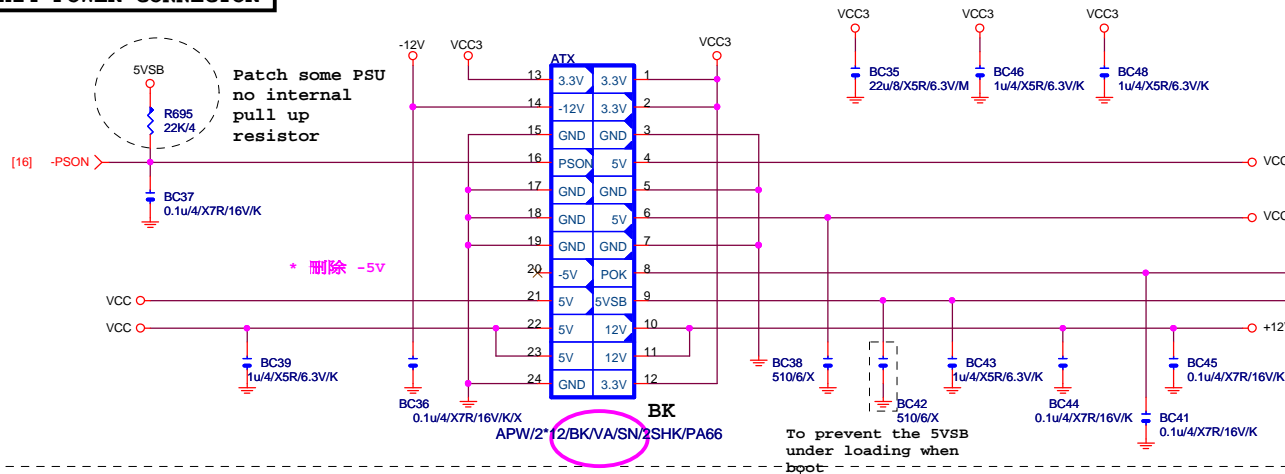
**Z370M DS3H**

Rev 1.0

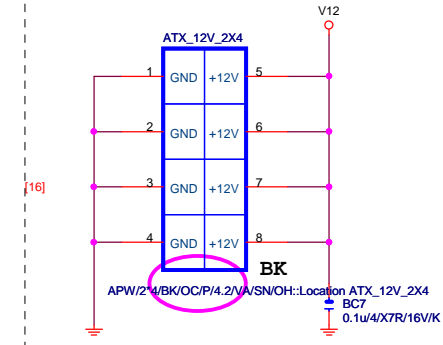
Date: Thursday, February 08, 2018

Sheet 37 of 56

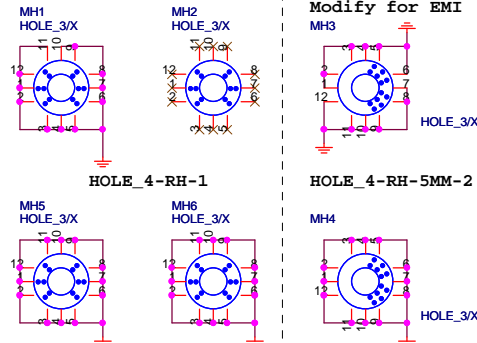
## ATXX24 POWER CONNECTOR



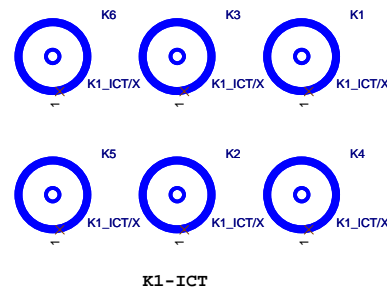
## ATXX4 POWER CONNECTOR



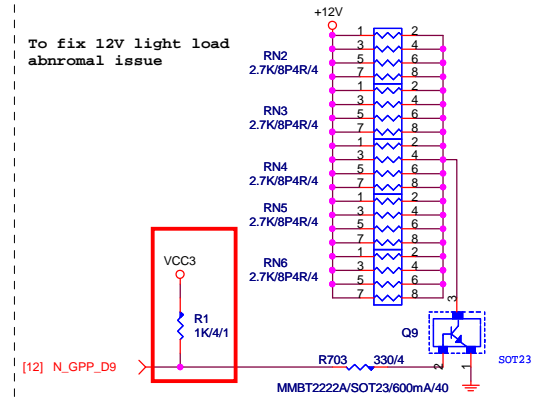
## 螺絲孔



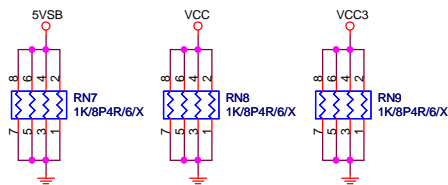
## 固定孔/光學點



## +12V DUMMY LOAD



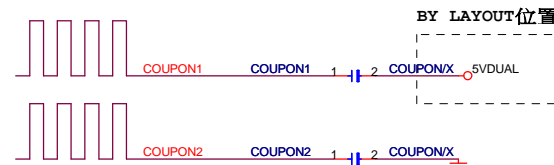
## DUMMY LOAD



## -PROHOT



## COUPON



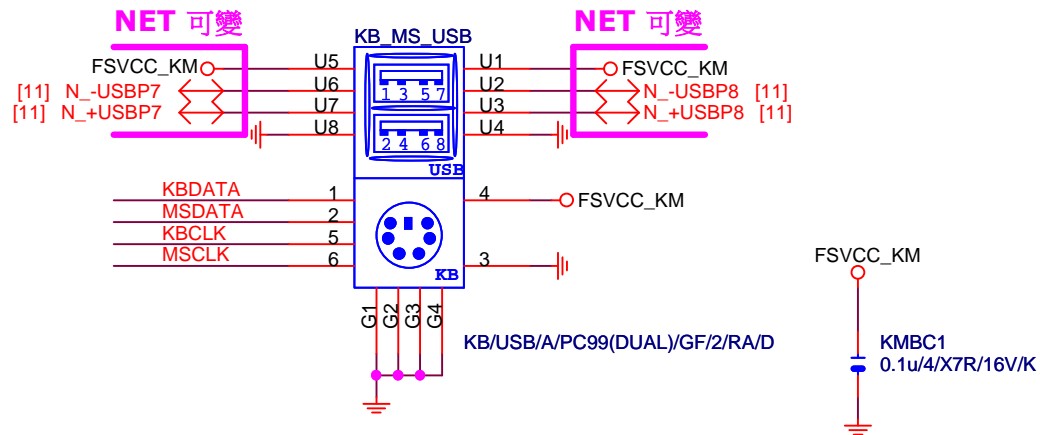
## Gigabyte Technology

Title			ATX POWER CONNECTOR
Size	Document Number	Z370M DS3H	
Custom			Rev 1.0
Date:	Thursday, February 08, 2018	Sheet 38 of 56	

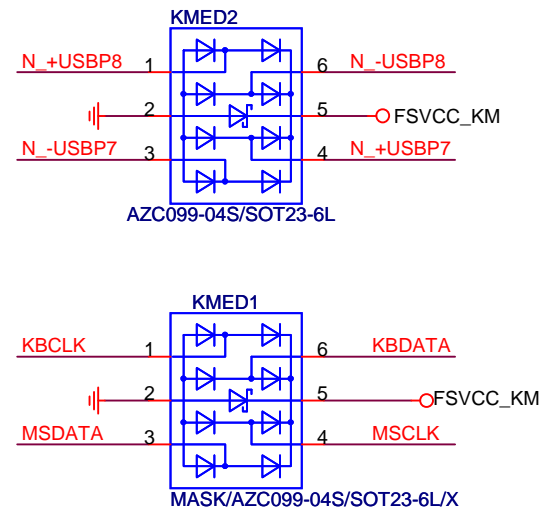


## KB\_MS\_USB

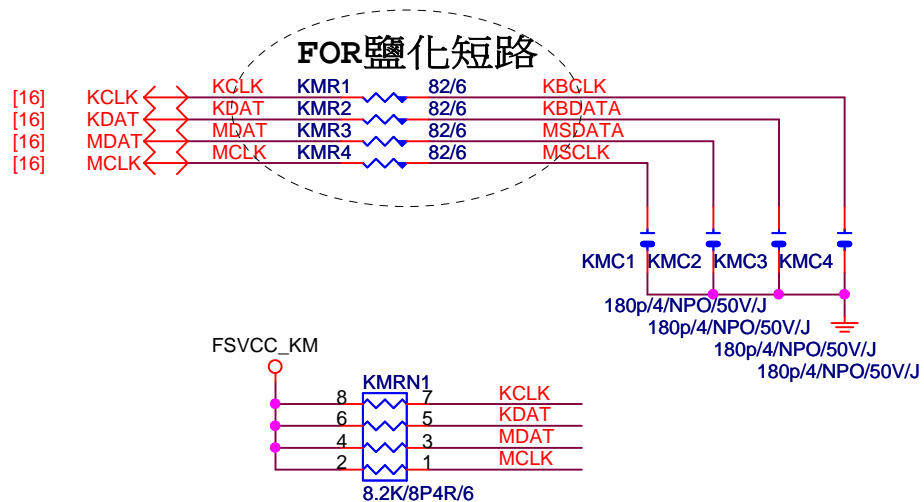
Rev: 0.7



## ESD

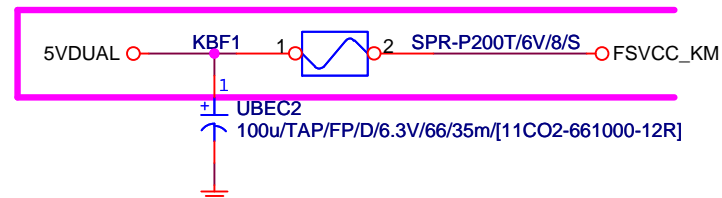


## KB\_MS\_USB DAMPING/PU

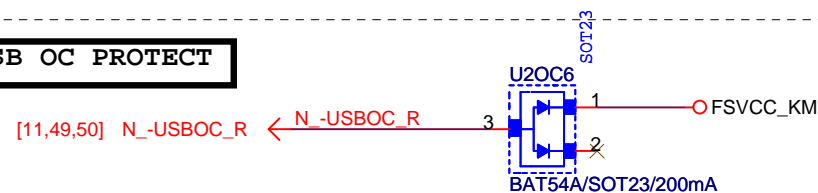


## KB\_MS\_USB PWR

## NET 可變, 與其他USB SHARE



## USB OC PROTECT



Gigabyte Technology

Title

KB\_MS\_USB

Size

Document Number

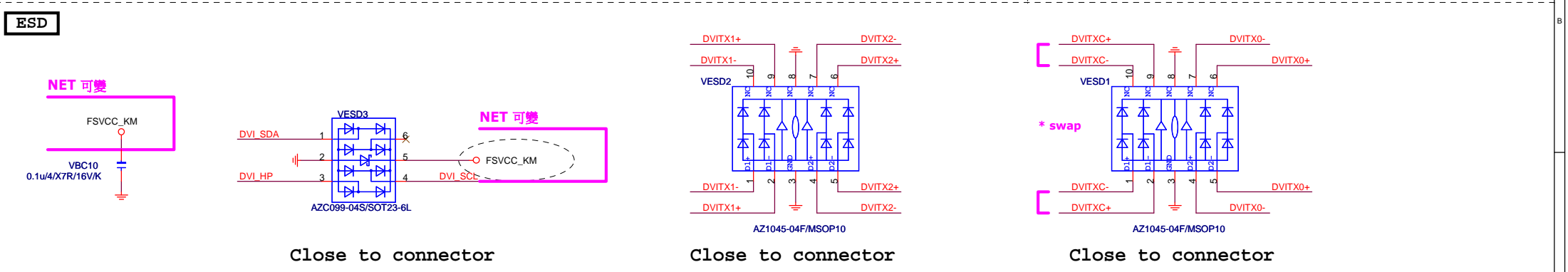
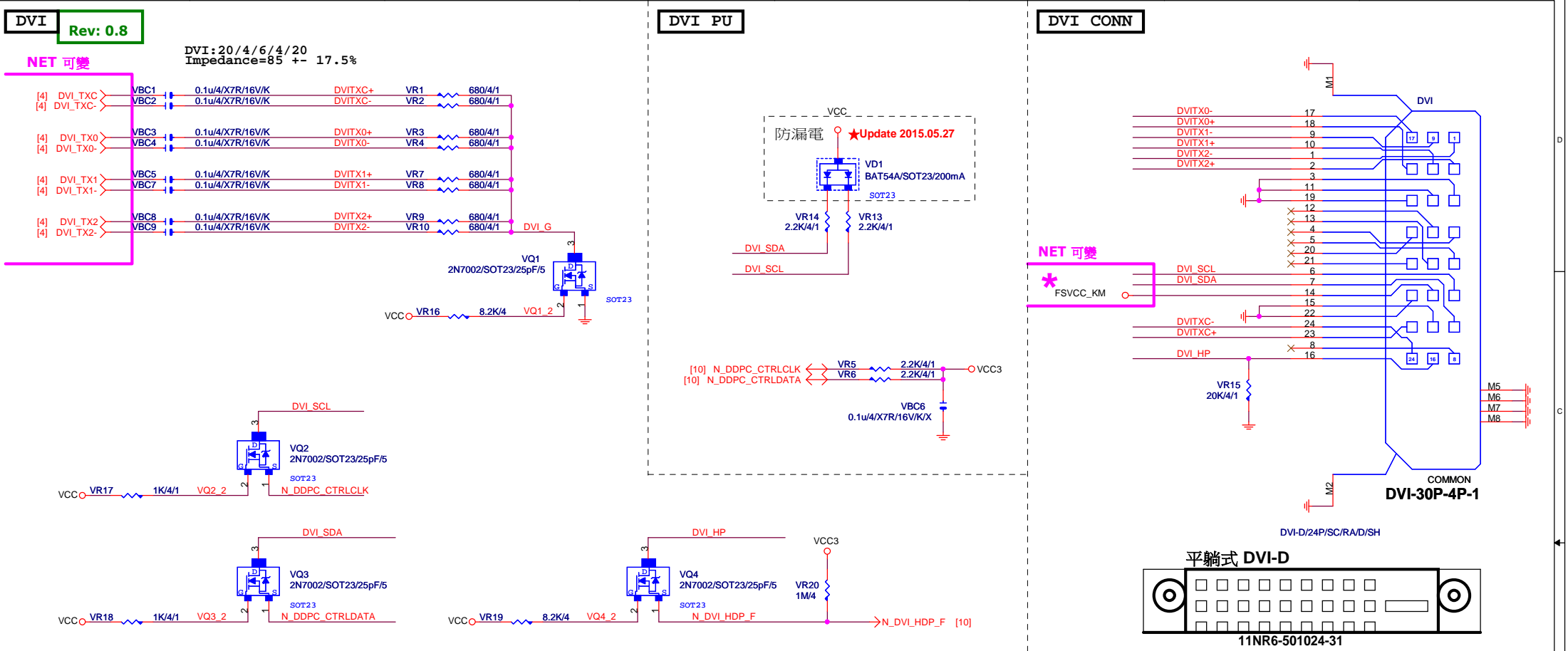
Z370M DS3H

Rev

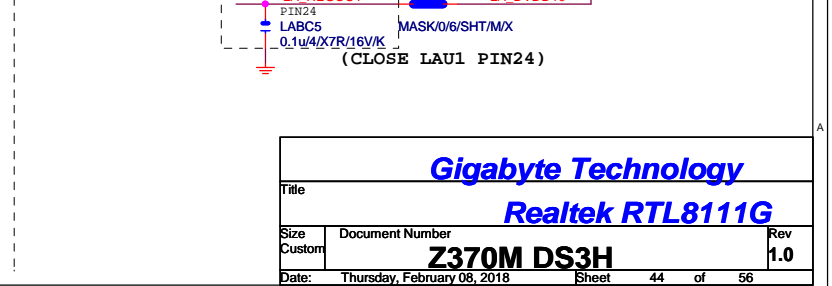
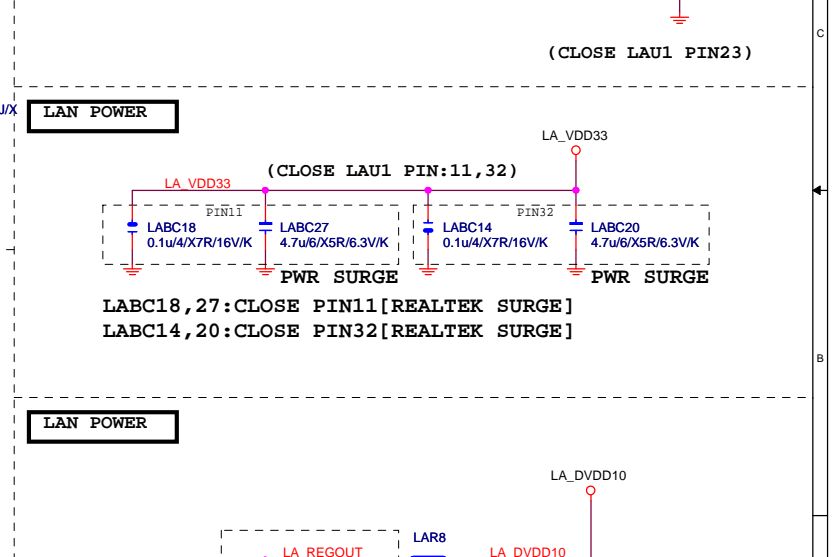
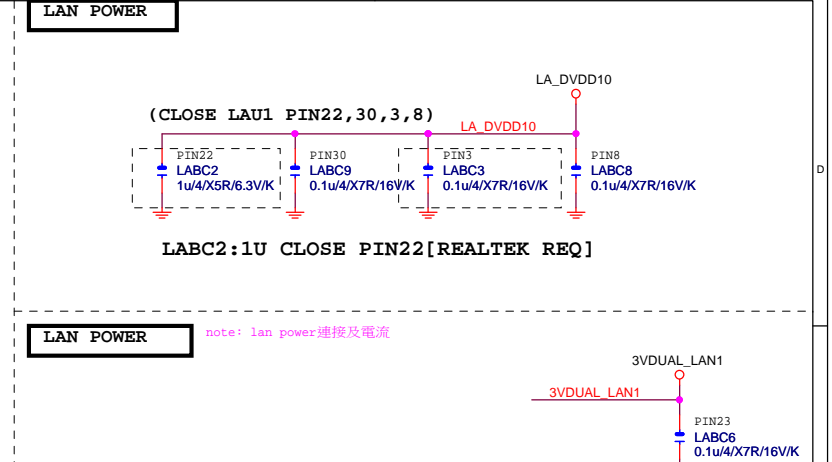
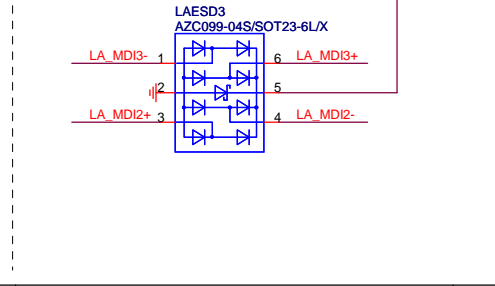
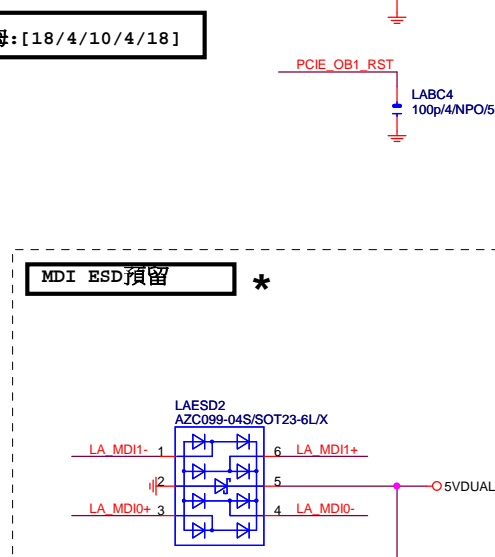
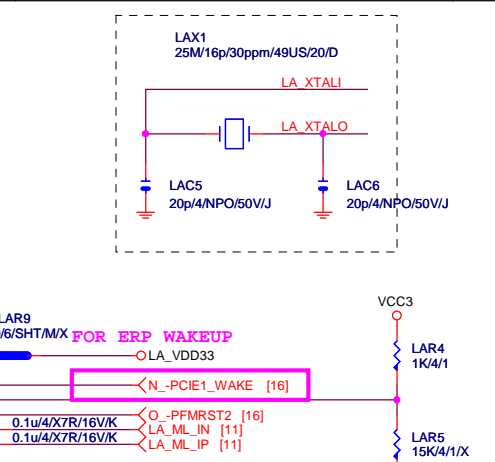
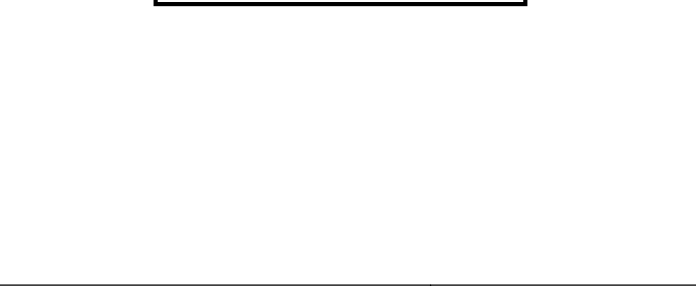
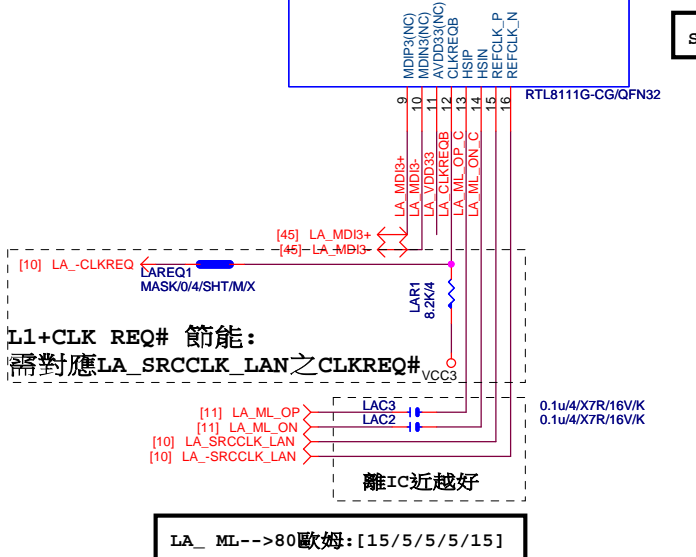
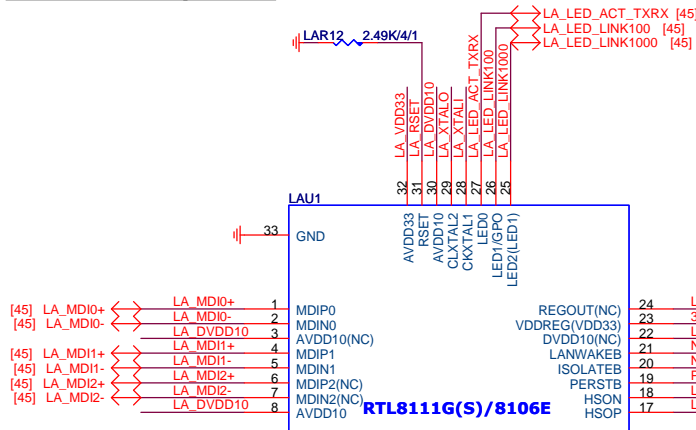
1.0

Date: Thursday, February 08, 2018

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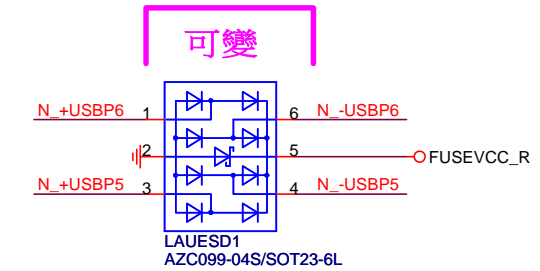




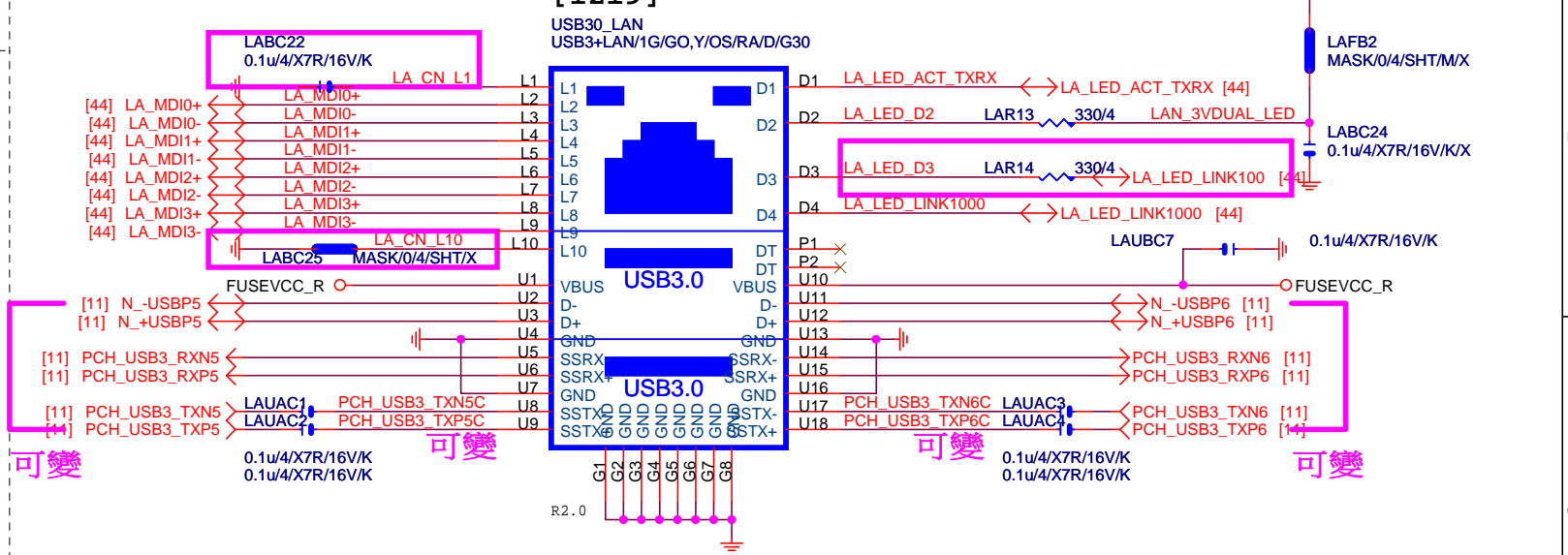
Gigabyte Technology			
Realtek RTL8111G			
Z370M DS3H			
Rev 1.0			
Date: Thursday, February 08, 2018			
Sheet 44 of 56			

USB\_LAN CONNECTOR R1.1

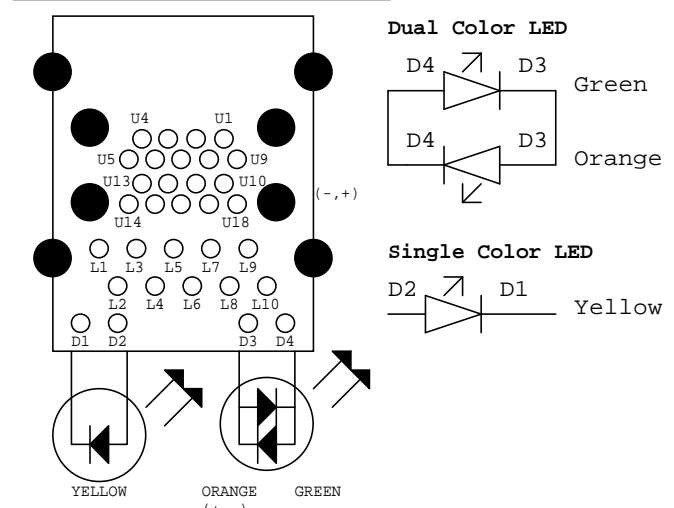
RMA ESD PROTECT note:可變更USB NAME



USB\_LAN CONNECTOR note:可變更USB NAME

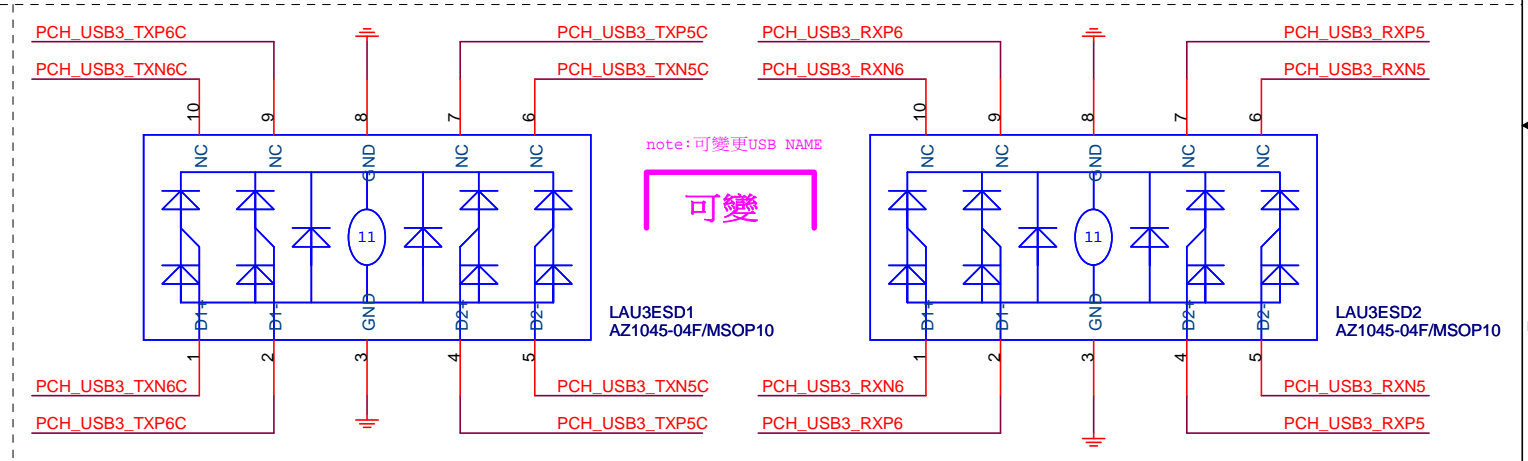


USB30\_LAN LAYOUT示意圖

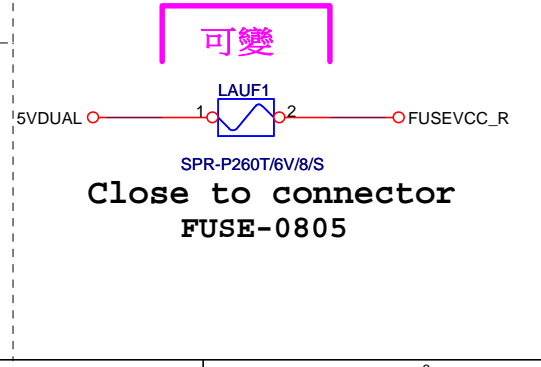


LAN\_COVER FOOT PRINT:LAN\_COVER

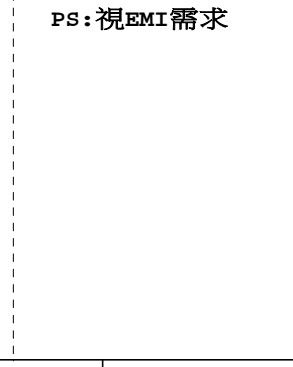
可變  
[-D3H不加蓋]



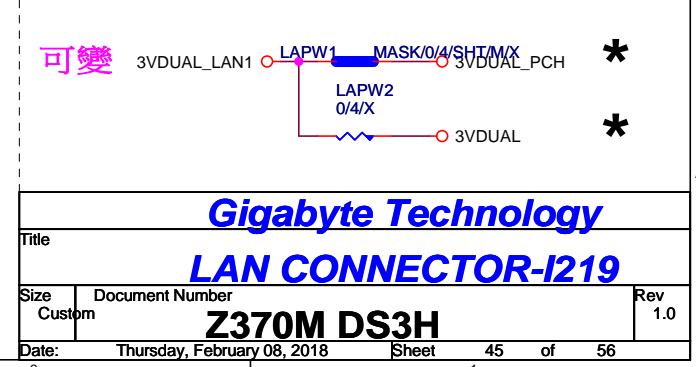
USB POWER note:可變更FUSE



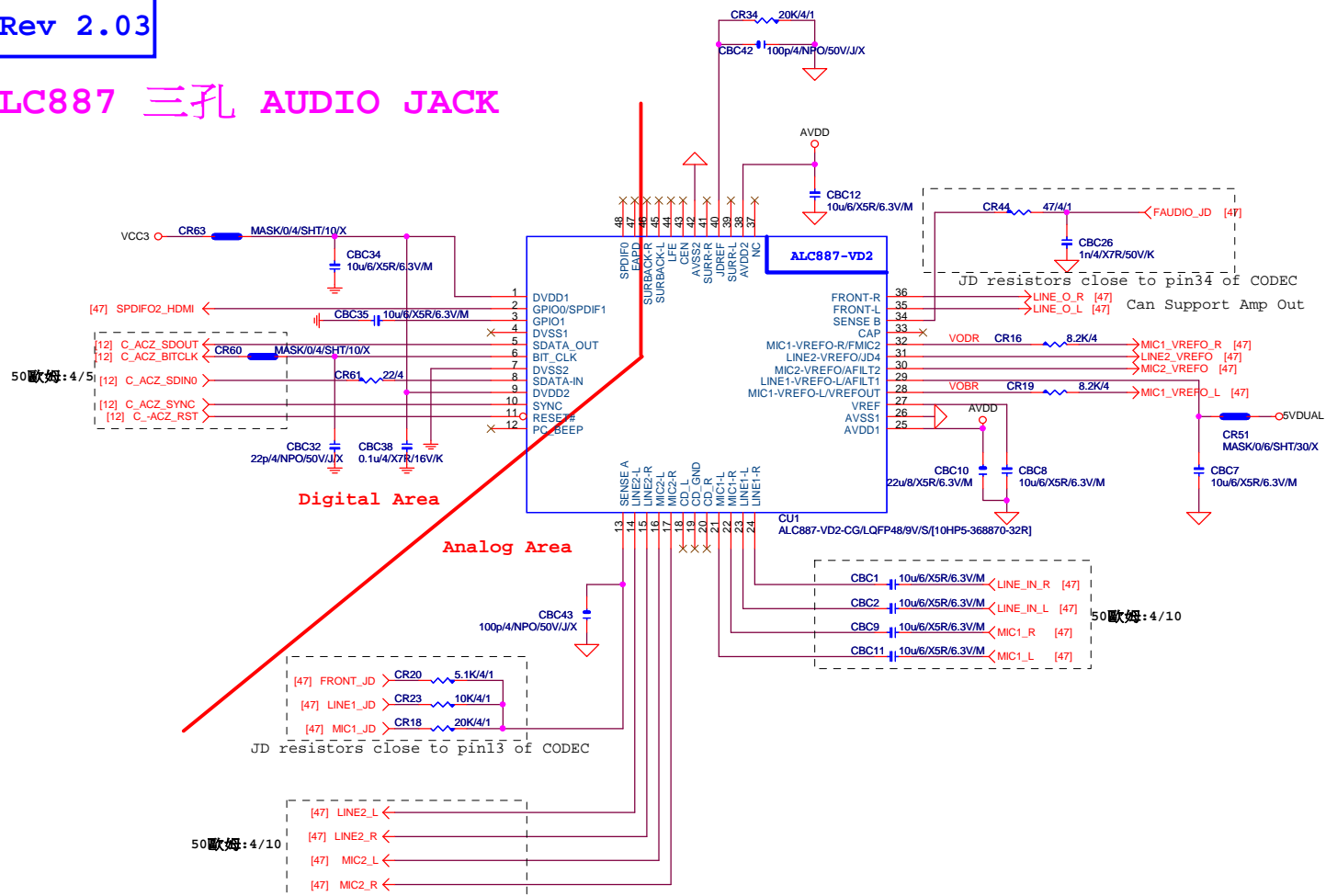
EMI SHORT PAD PS:視EMI需求



LAN POWER note: lan power連接及電流



## ALC887 三孔 AUDIO JACK



**LAYOUT注意: 螺絲孔下GND方式**

1. MH1空間夠, 下DGND
2. MH2一律改為Isolate

<input type="radio"/> MH1	<input type="radio"/> MH2
DGND	Isolate

**LAYOUT注意: 要加**

**GND切割線**

**音效區域印刷**



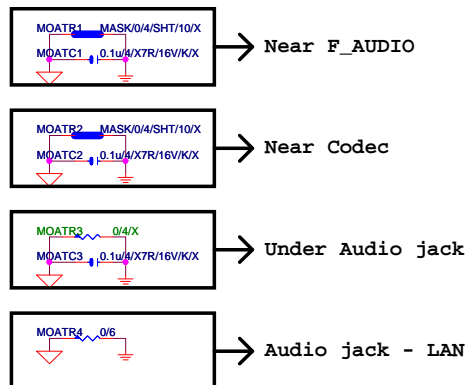
\*料號後補  
\*LAYOUT與否, 依照各Model spec

**BOM OPTION :**

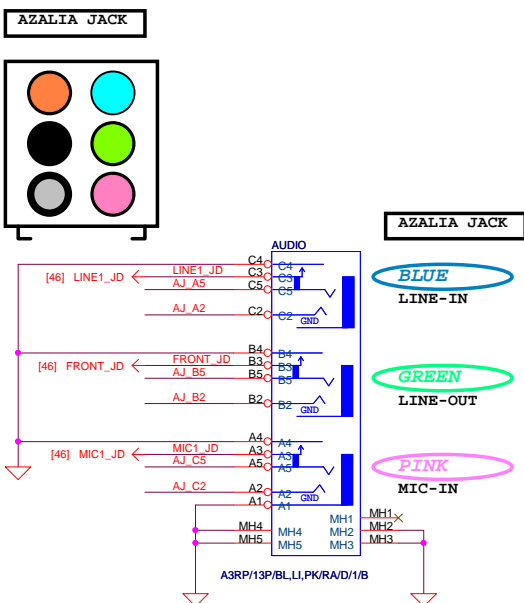
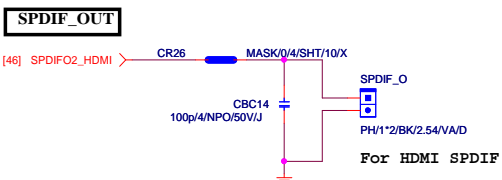
1. Chemicon音效電容
2. 金屬外罩 Reserve (上件與否, 依照各Model spec)
3. LED Reserve (上件與否和LED顏色, 依照各Model spec)

<b>Gigabyte Technology</b>		
Title <b>HD AUDIO ALC887</b>		
Size Custom	Document Number <b>Z370M DS3H</b>	Rev <b>1.0</b>
Date: Thursday, February 08, 2018	Sheet 46 of 56	

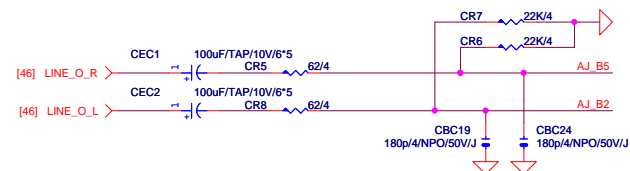
Rev 2.03



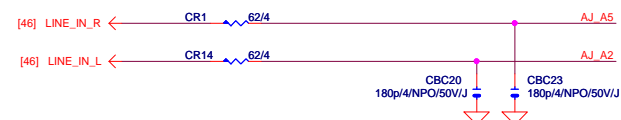
\*量産前, 0ohm改short pad



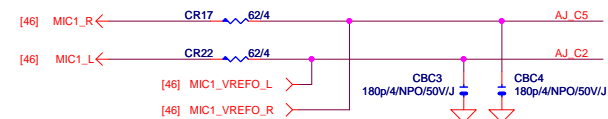
## LINE-OUT



## LINE-IN



## MIC-IN

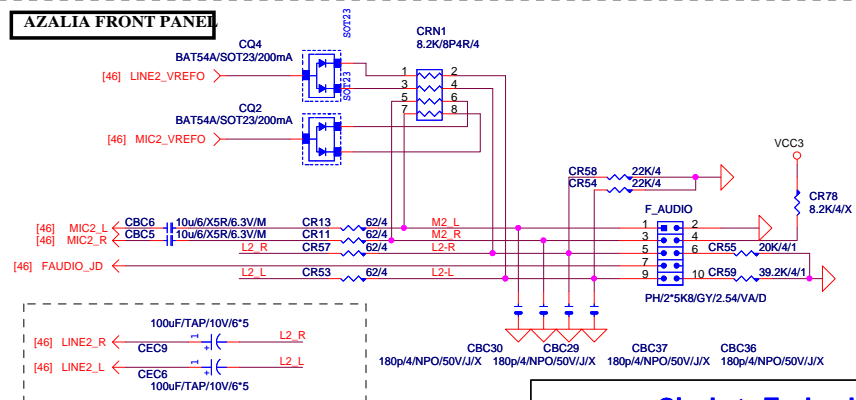


## SURROUND

## CEN/LFE

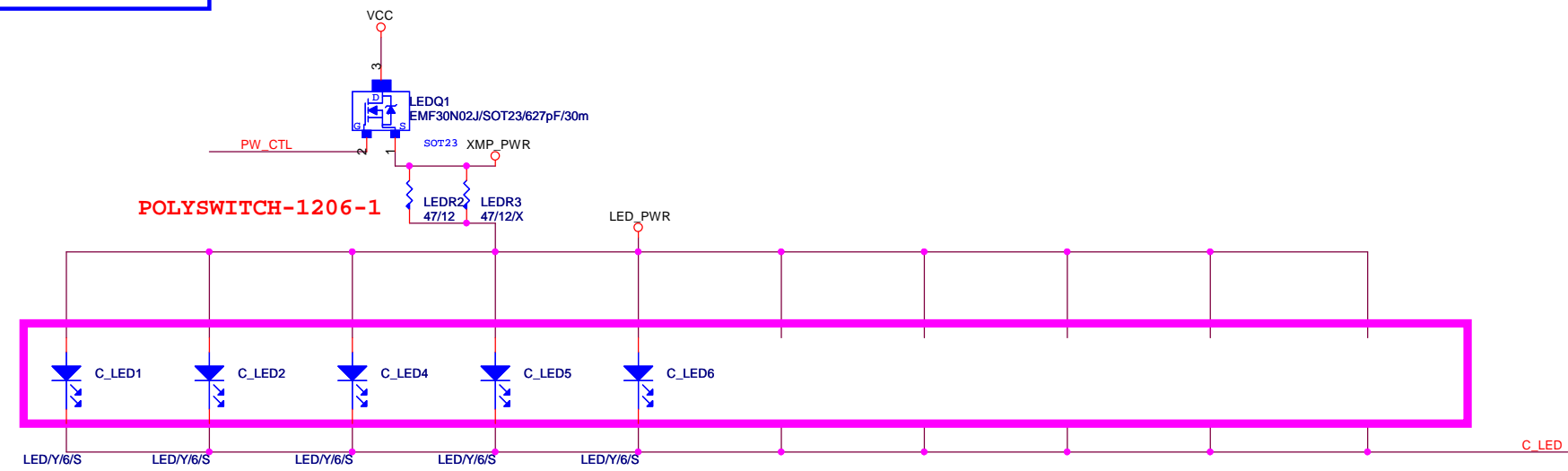
## SURR BACK

## AZALIA FRONT PANEL



Gigabyte Technology

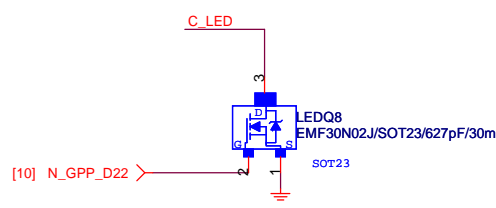
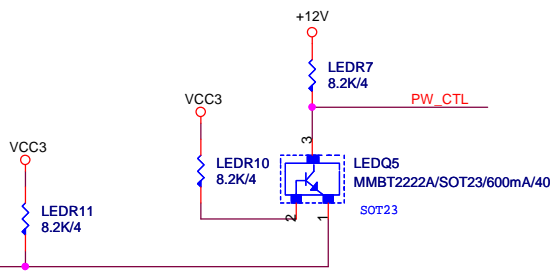
Title		
AUDIO JACK		
Size	Document Number	Rev
Custom	Z370M DS3H	1.0
Date:	Thursday, February 08, 2018	Sheet 47 of 56



Ambient LED Control

	N_GPP_D22
Full Mode	H
OFF Mode	L

[10] N\_GPP\_D22 >  
ON/OFF

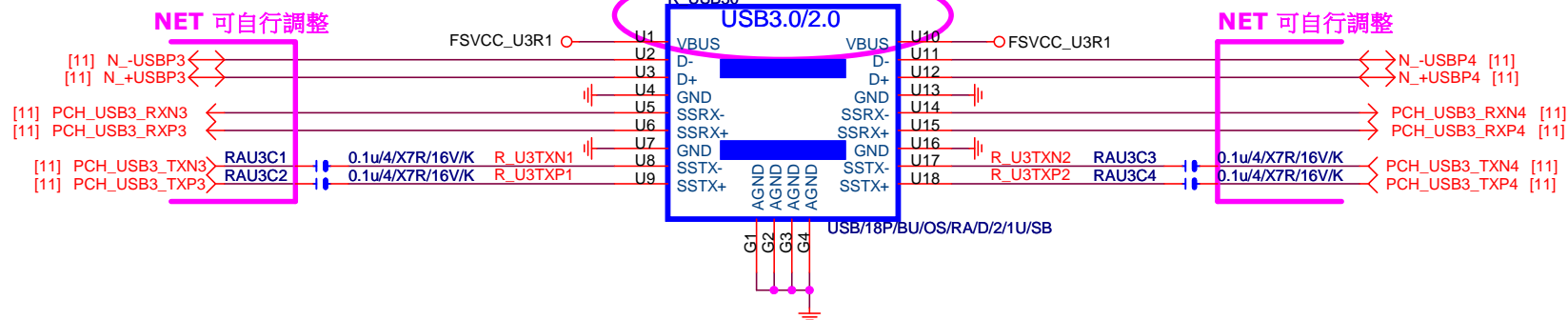


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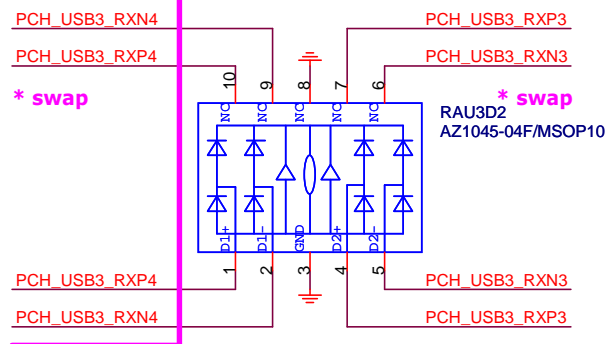
Rev: 0.7

ESD 可自行SWAP PIN ,CONN端 NET 名稱 不可

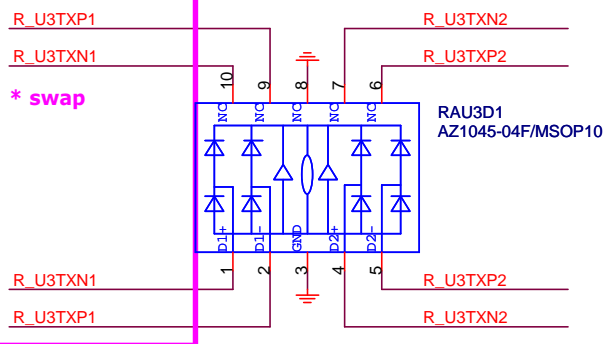


ESD

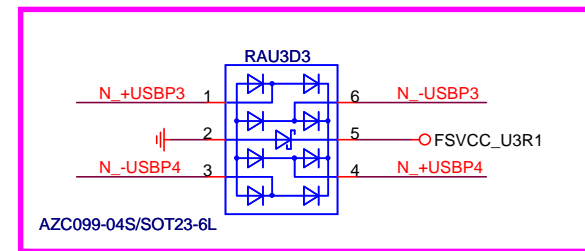
**NET 可自行調整**



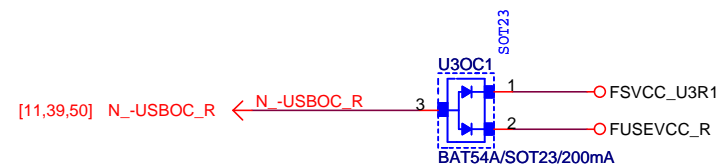
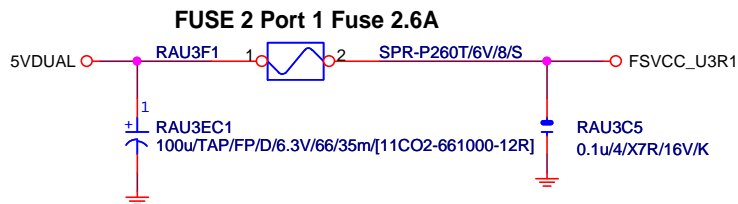
**NET 可自行調整**



**NET 可自行調整**

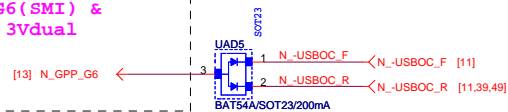
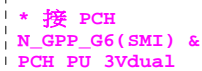
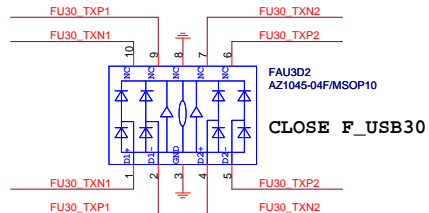


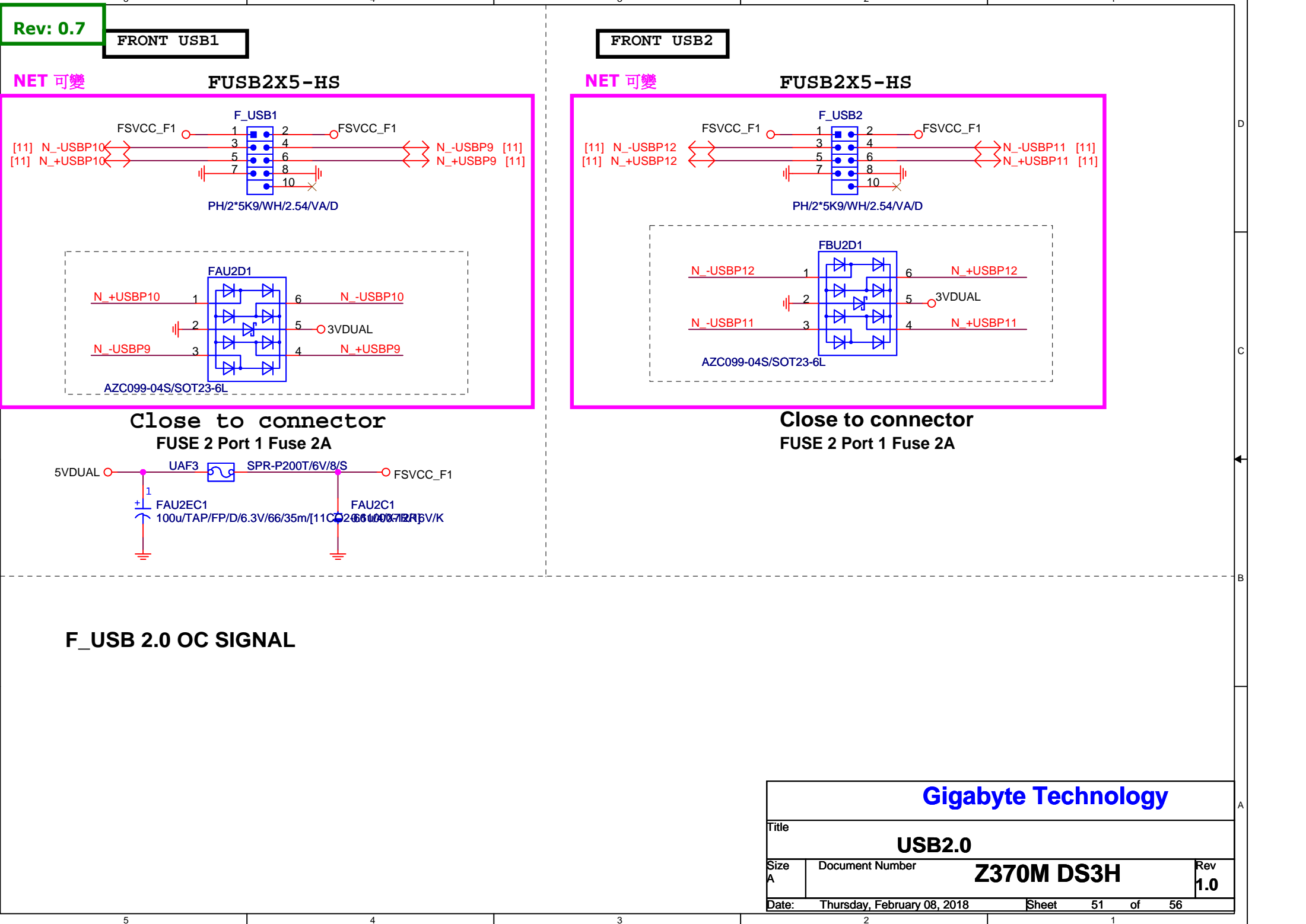
FUSE



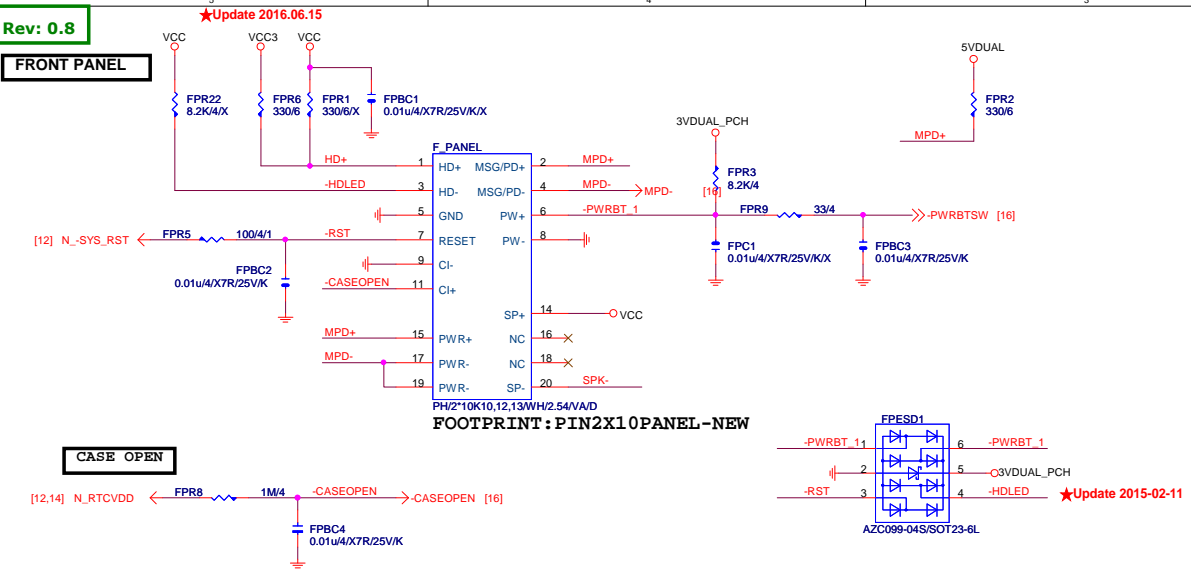
Gigabyte Technology

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R_USB30,USB_OC		
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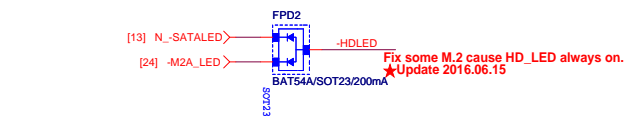


FRONT PANEL

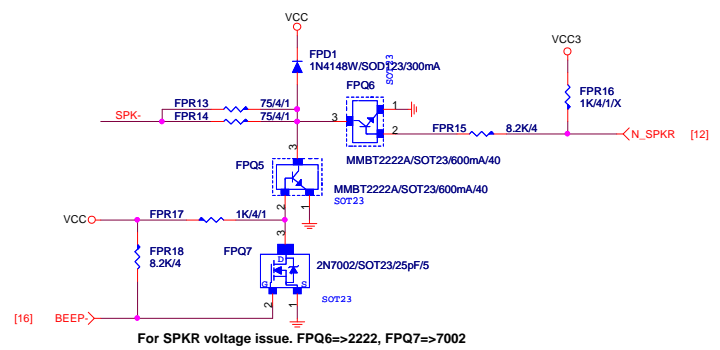


FRONT PANEL SHORT

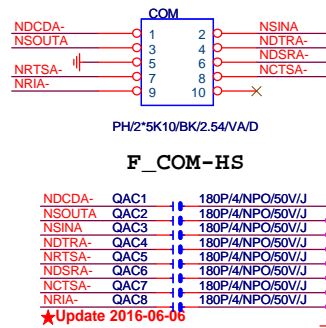
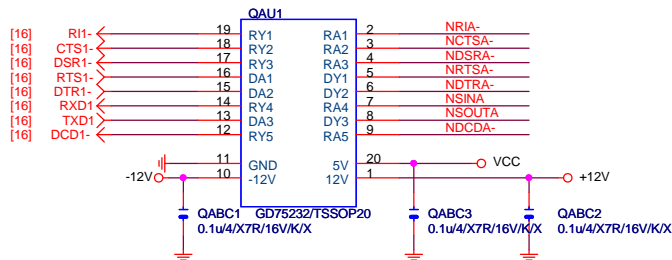
SATA/M.2 LED



SPKR

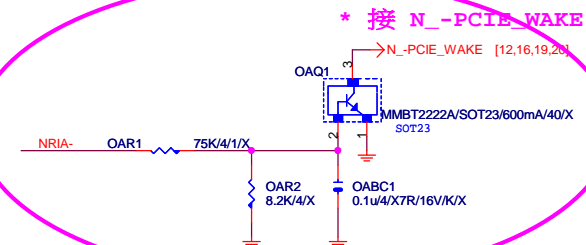


Rev: 0.7



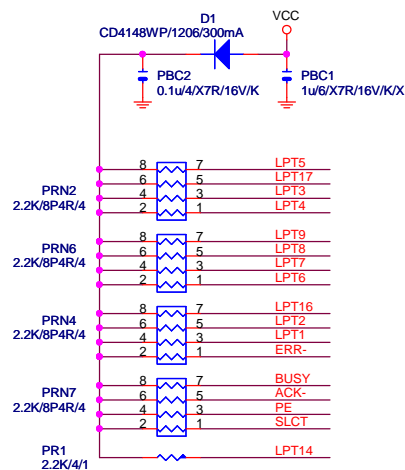
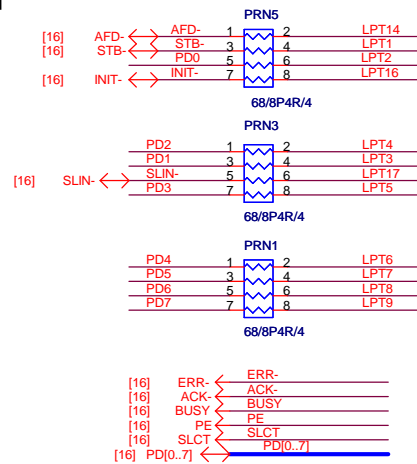
COM RI

1 N/A

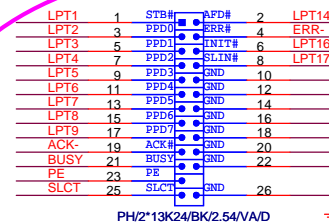


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LPT PORT

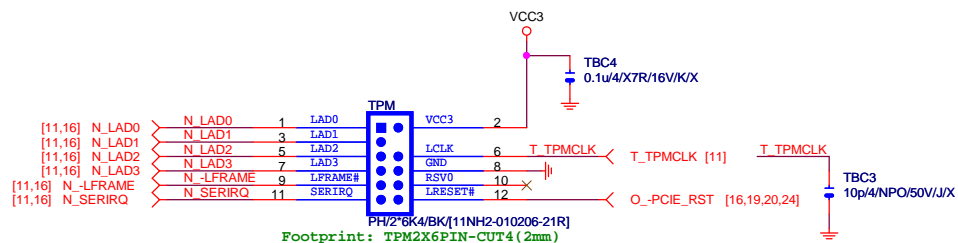


LPT



F\_LPT-HS

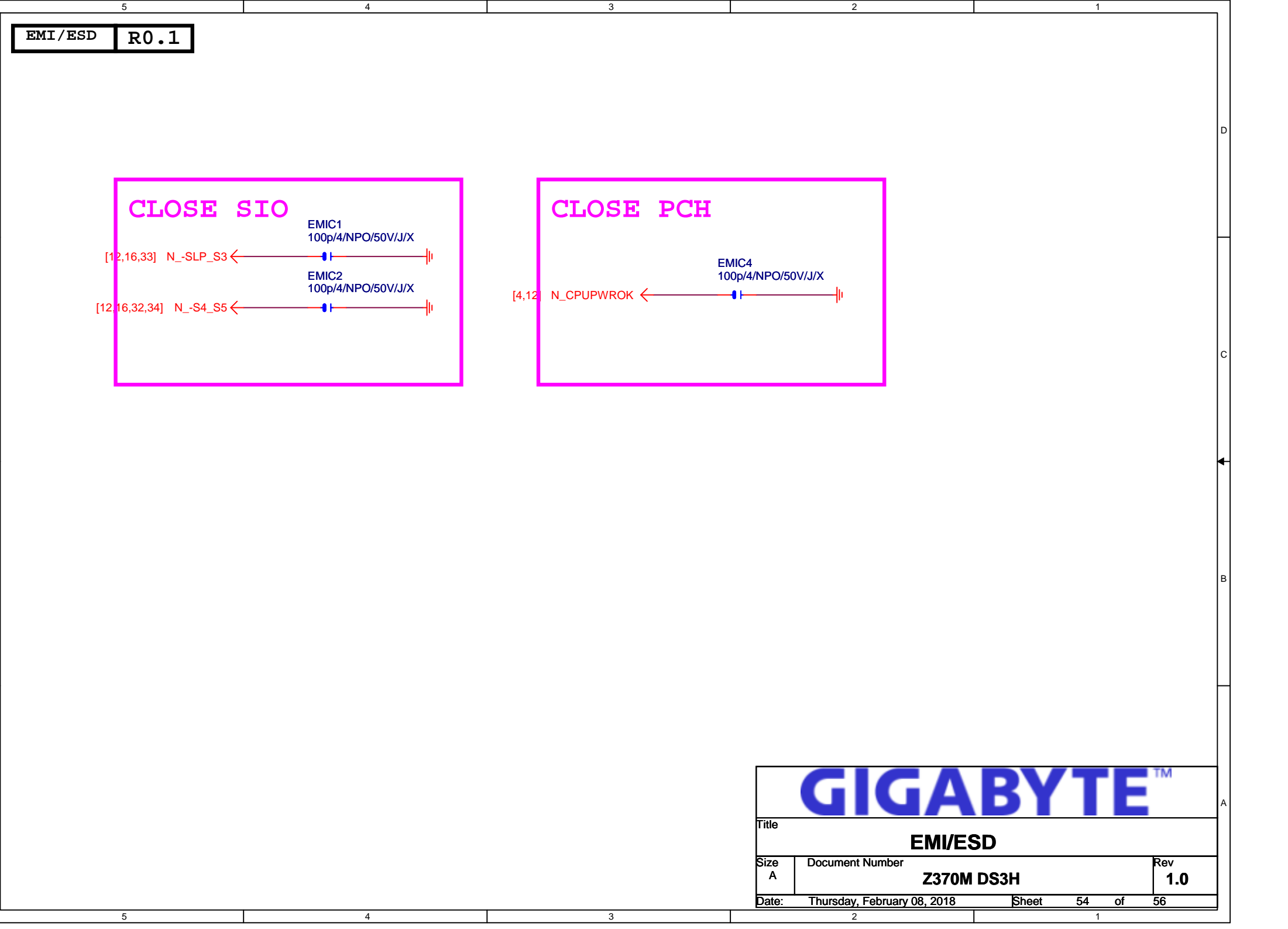
R&D技術通報151 有使用PRINT PORT的  
MODEL, 需使用新料號:10HP2-118728-72R。(CHIP IT8728F/EX (GB) ITE/SMD  
QFP128 PRINTPORT SORTING)料件。串電阻33 ohm改為68 ohm。

**TPM CONNECT**

Thunderbolt

★Update 2015-12-29

## Gigabyte Technology



## CLOSE SIO

EMIC1  
100p/4/NPO/50V/J/X

[12,16,33] N\_-SLP\_S3 ←

EMIC2  
100p/4/NPO/50V/J/X

[12,16,32,34] N\_-S4\_S5 ←

## CLOSE PCH

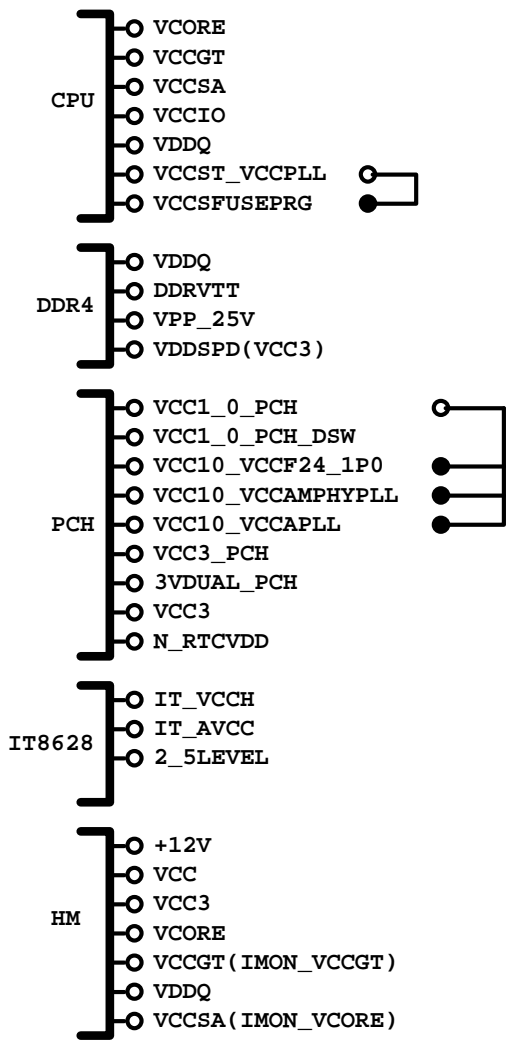
EMIC4  
100p/4/NPO/50V/J/X

[4,12] N\_CPUPWROK ←

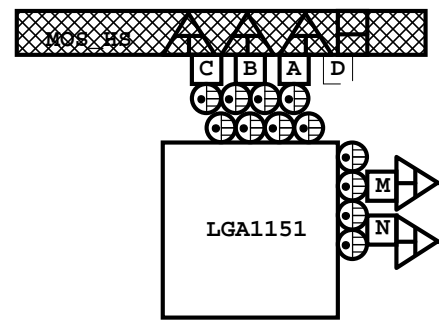
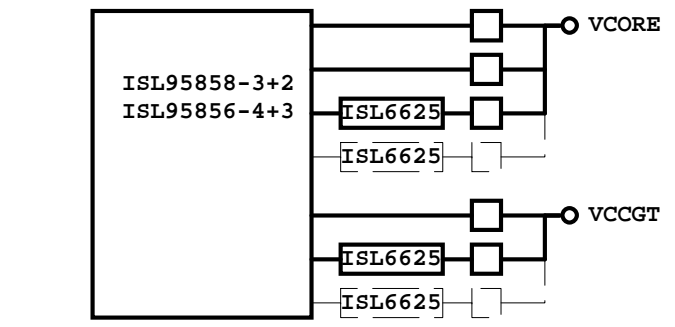
GIGABYTE™

Title			
EMI/ESD			
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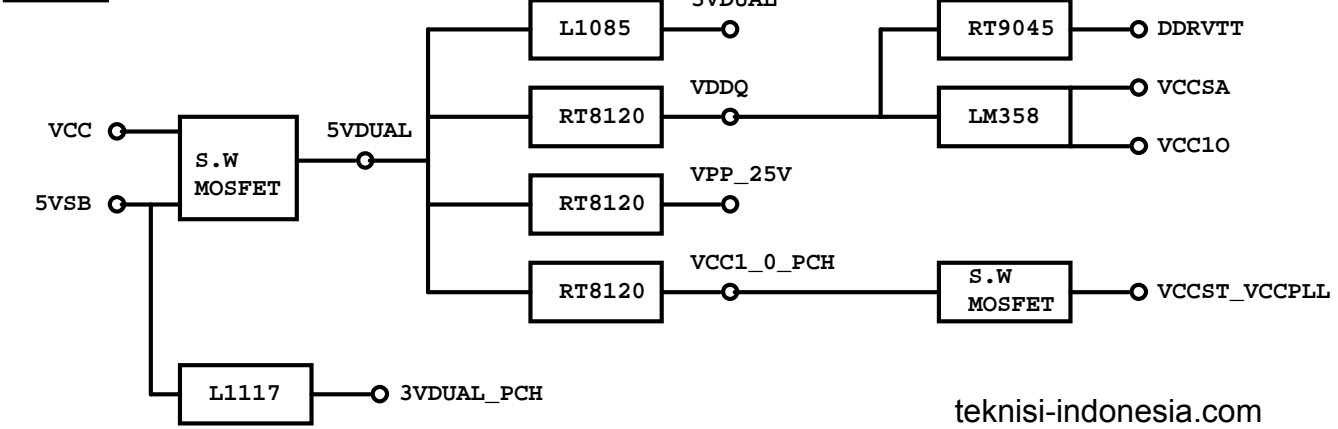
POWER BLOCK MAP



VCORE/VCCGT

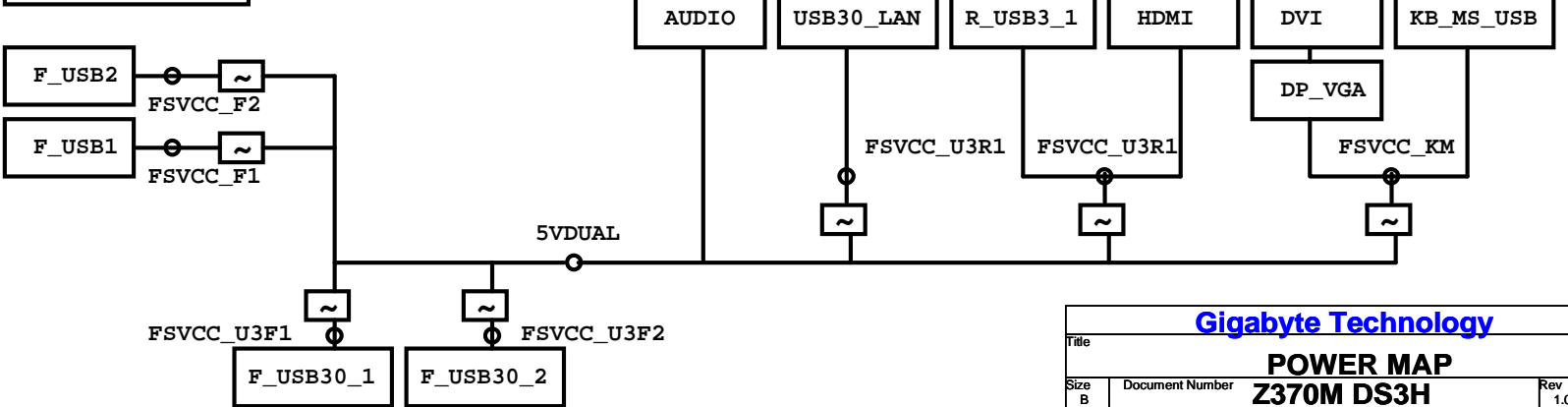


POWER

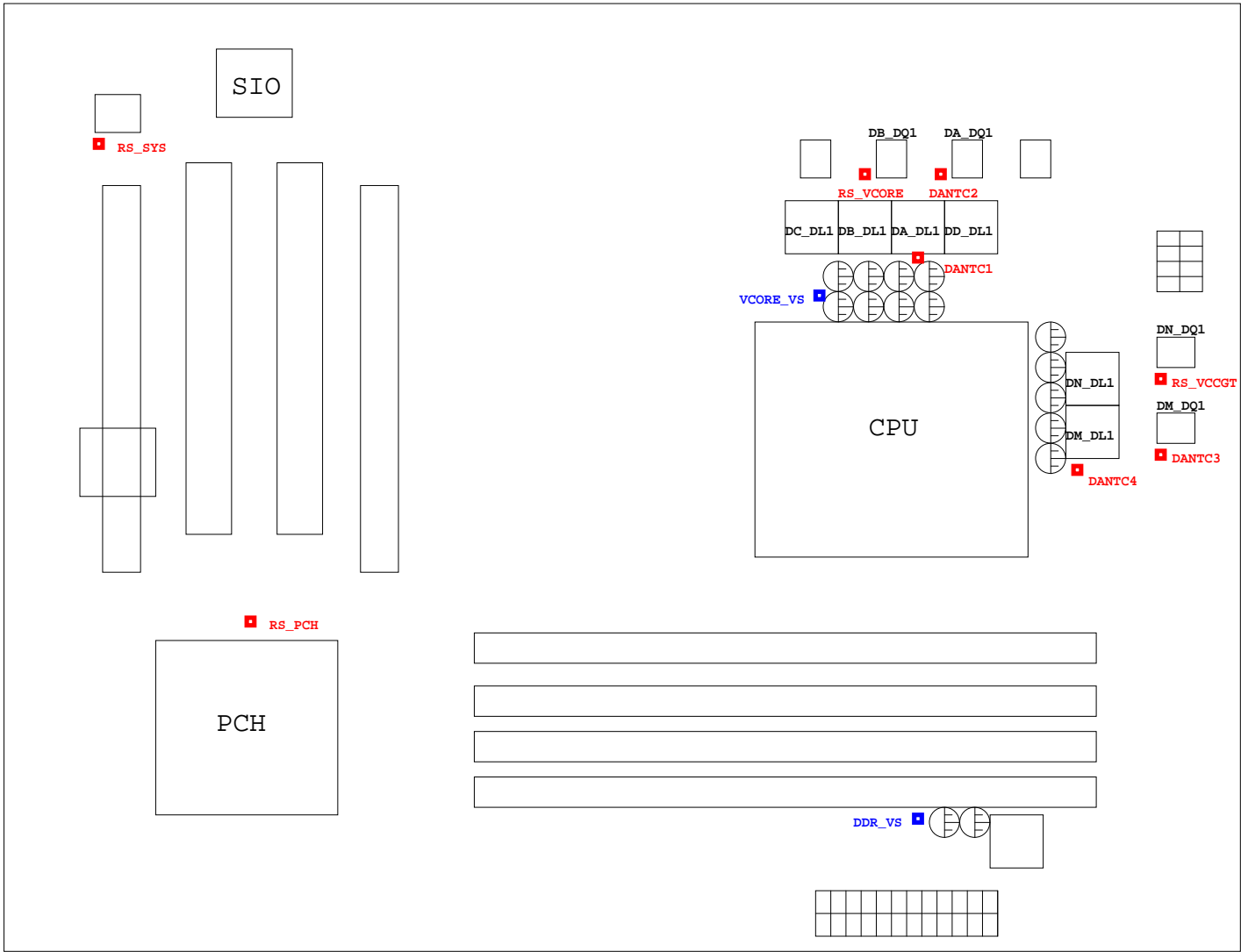


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FUSE POWER F/R



Gigabyte Technology			
Title			
POWER MAP			
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熱敏電阻	擺放靠近位置	走線方式
DANTC1	DA_DL1	N/A
DANTC2	DA_DQ1	Differential
DANTC3	DM_DQ1	N/A
DANTC4	DM_DL1	Differential
RS_VCORE	DB_DQ1	N/A
RS_VCCGT	DN_DQ1	N/A
RS_PCH	PCH	N/A
RS_SYS	CU1	N/A