

Model Name: GA-Z270MX-GAMING 5
SHEET TITLE

Rev 1.01

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_LGA1151-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	PCH_GND
16	ITE 8686 LPC IO
17	HMW
18	FAN CTRL--SIO
19	PCI EXPRESS X16 SLOT
20	PCI EXPRESS X8 SLOT
21	PCI EXPRESS X16 SWITCH
22	PCI EXPRESS X4 SLOT
23	PCI EXPRESS X1 SLOT
24	SATA 0/1/2/3/4/5
25	ISL95856 PWM-Ferrite-1H2L
26	ISL95856 MOS_VCORE-F-1H2L
27	ISL95856 MOS_VCCGT-F-1H2L
28	VCCSA_VCCIO_VCCPLL-Ferrite
29	RT8120_DDR Ferrite
30	RT8120_VPP Ferrite
31	RT8120_PCH Ferrite
32	DISCRETE POWER1
33	NCT3933
34	ATX POWER , A_-PROCHOT
35	KB_MS_USB

SHEET

TITLE

36	F_USB30
37	F_USB20
38	R_USB30
39	ALC1220
40	REAR AUDIO JACK
41	PCH/AUDIO/PCIE/REAR LED
42	PCB/CPU/DDR/LED_C LED
43	LAYOUT RULE
44	KILLER E2500
45	USB30_LAN-E2500
46	IDT6V41630_CLK BUFFER
47	COM , TPM , 80 port , THB_C
48	F_PANEL
49	ASM2142 USB31A
50	U3.1 PORT A
51	TI HD3SS3212&TUSB321_B
52	HDMI
53	DP_OUT
54	M2A_32G
55	U.2_32G
56	DUAL BIOS
57	USB_DAC POWER
58	EMI/ESD
59	NTC MAP
60	POWER MAP
61	POWER零件使用表
62	TABLE LIST
63	CPU POWER-Z系列
64	
65	

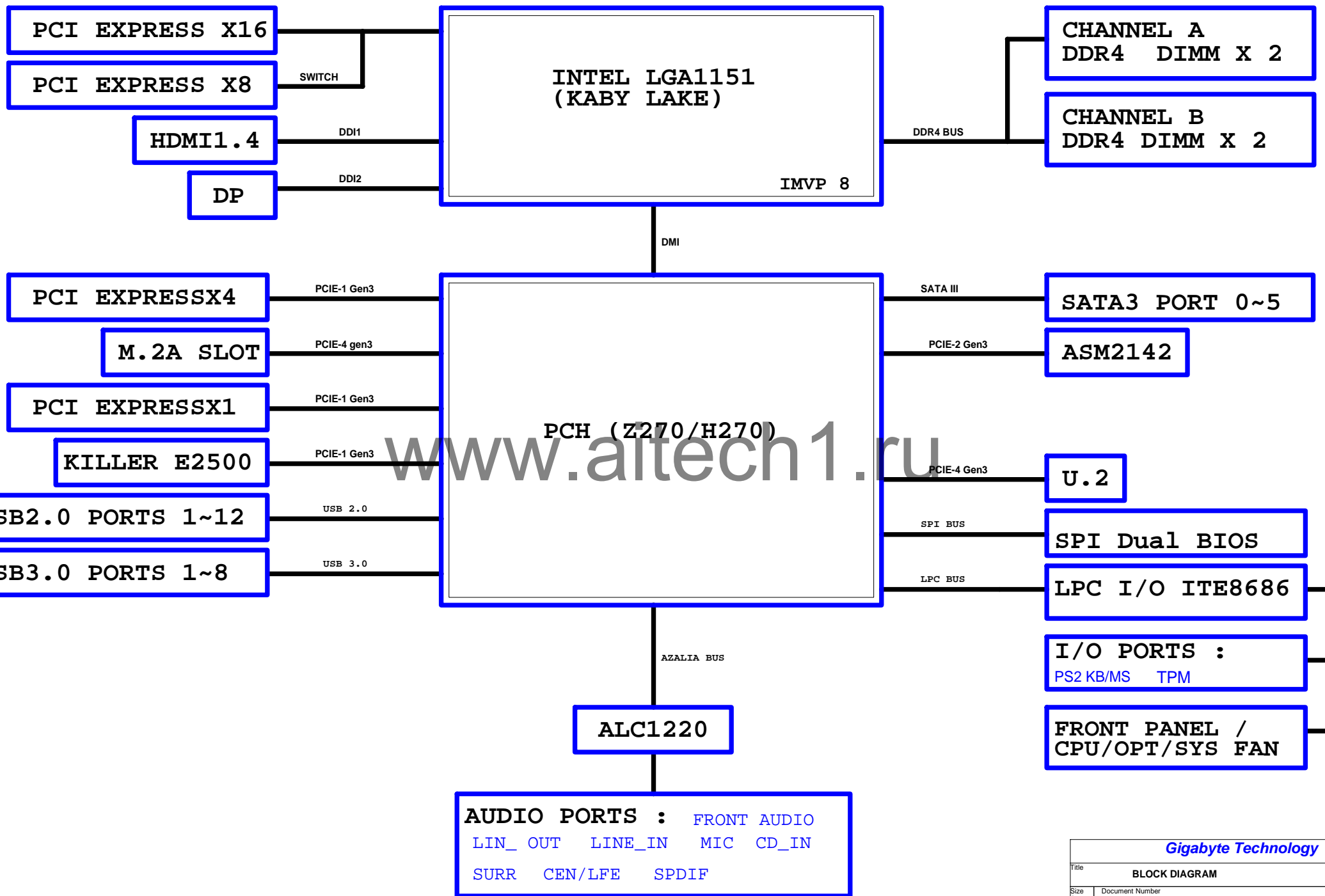
Component value change history

[illegible]

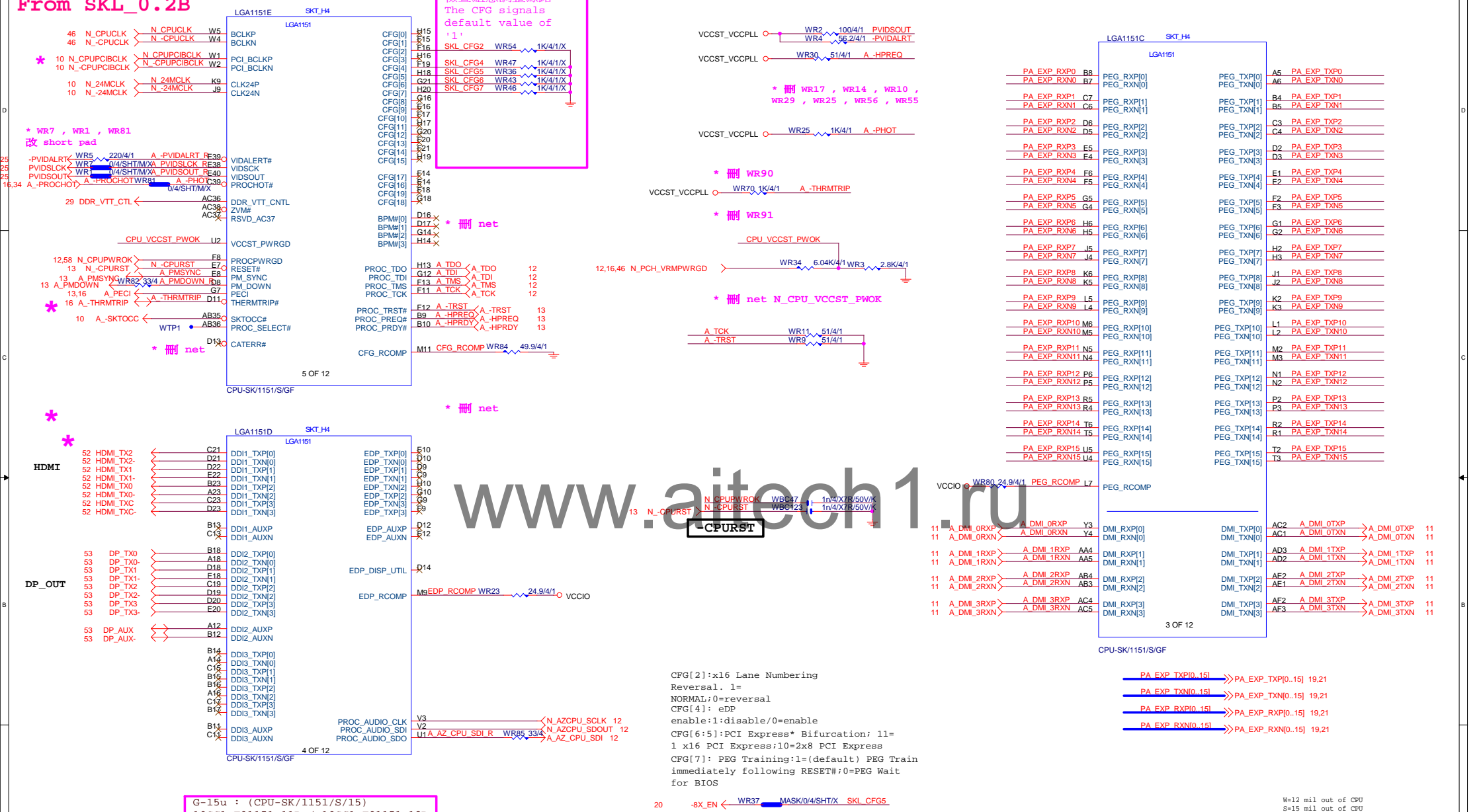
Circuit or PCB layout change

[illegible]

BLOCK DIAGRAM



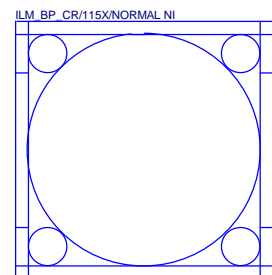
From SKL_0.2B



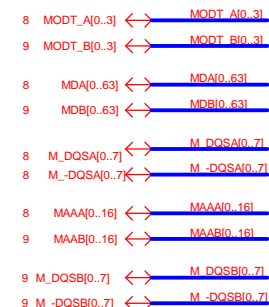
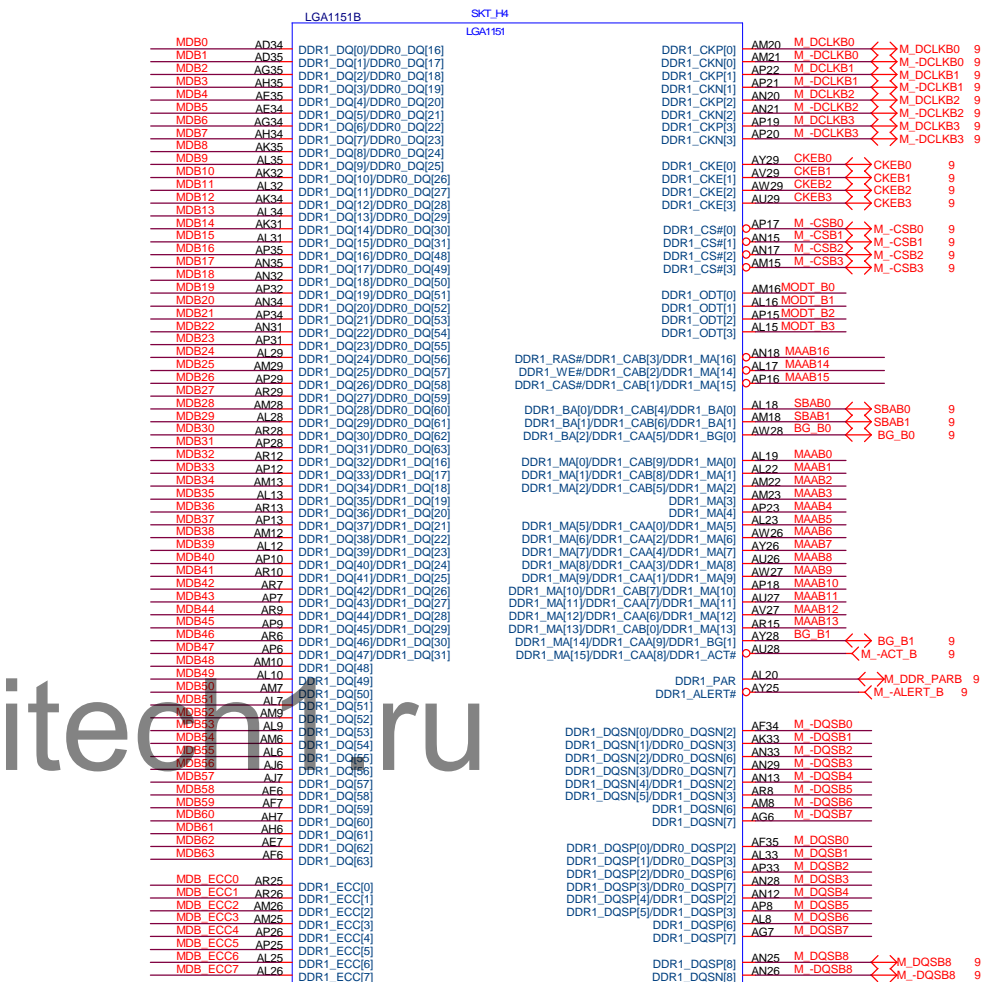
Bifurcation Config.	Signals Lanes		
	CFG[6]	CFG[5]	CFG[2]
1x16	1	1	1
1x16 Reversed	1	1	0
2x8	1	0	1
2x8 Reversed	1	0	0
1x8+2x4	0	0	1
1x8+2x4 Reversed	0	0	0

Gigabyte Technology			
Title CPU LGA1151-A			
Size Custom	Document Number GA-Z270MX-GAMING 5		Rev 1.01
Date:	Friday, November 18, 2016	Sheet	4 of 63

* 改DDR4 net

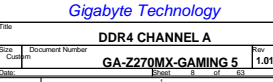


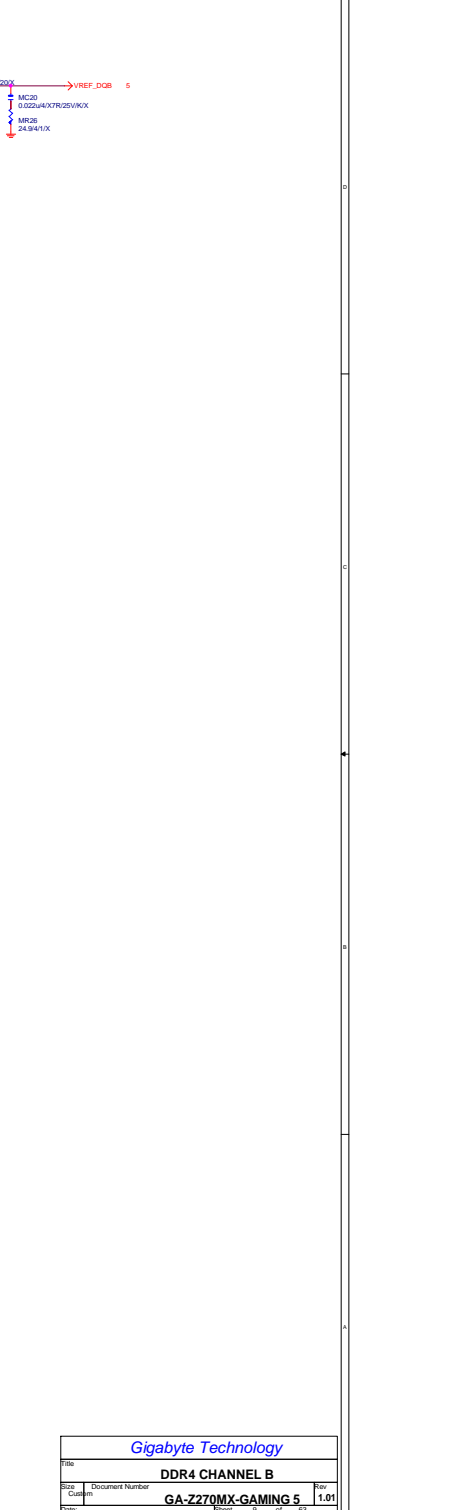
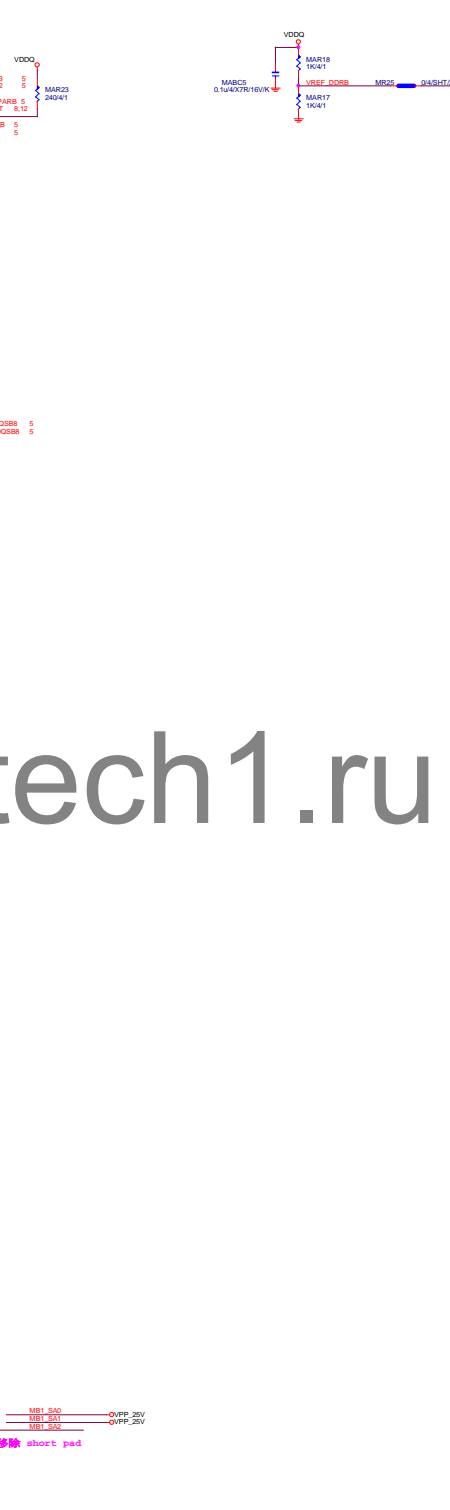
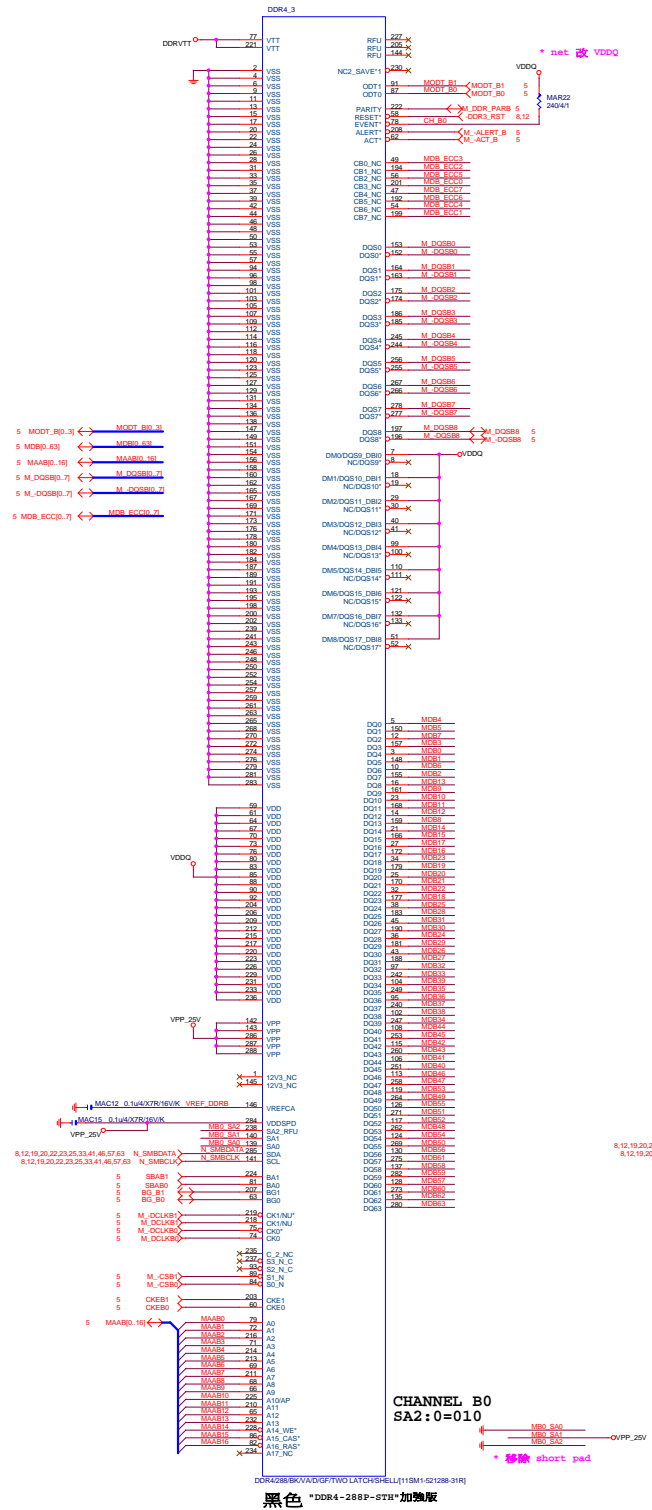
Need check the new CPU ME

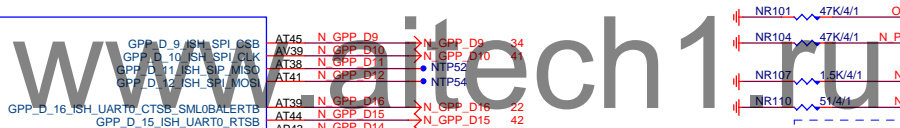


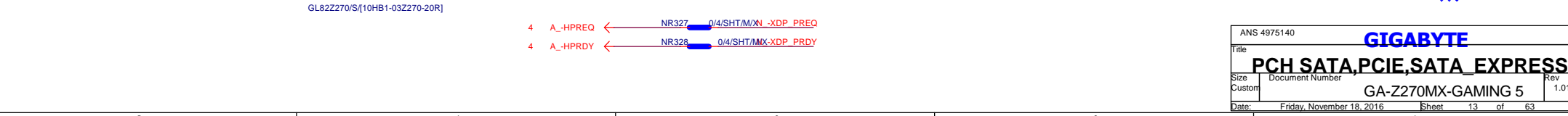
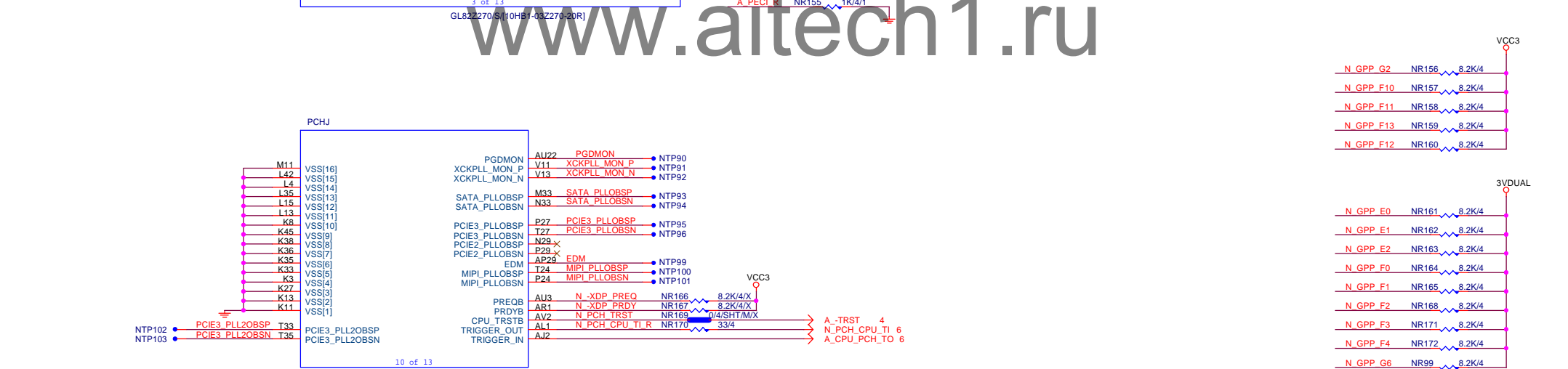
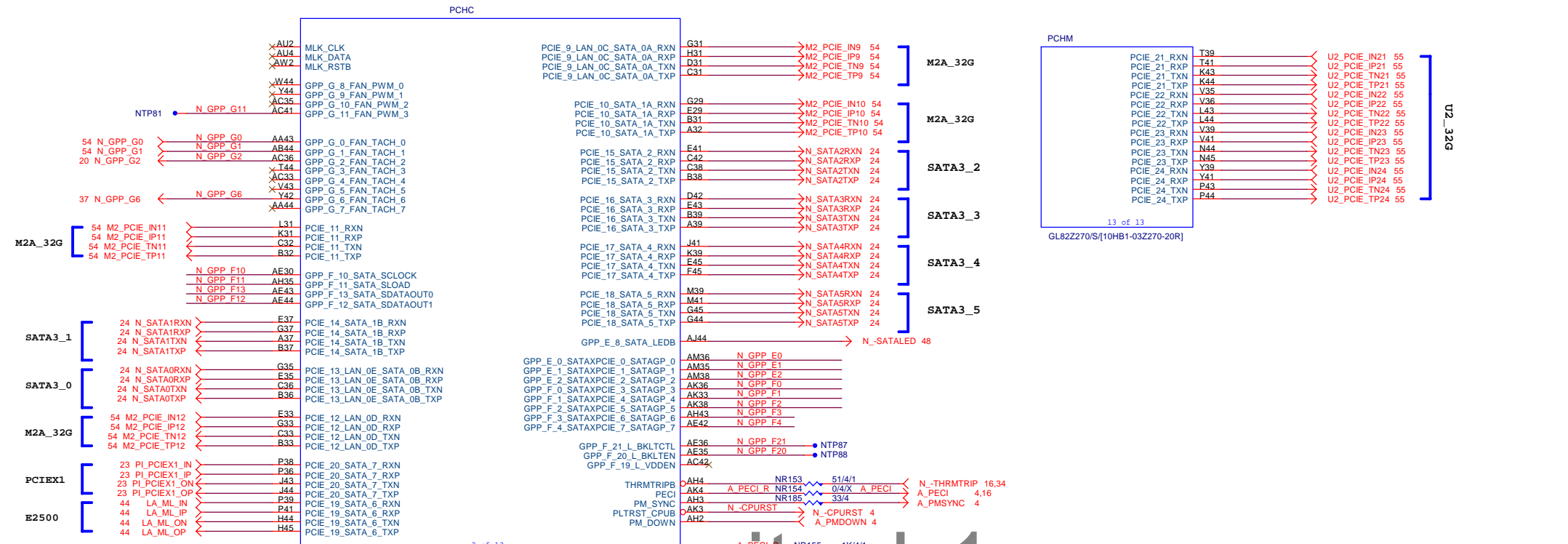
Gigabyte Technology

Title			
CPU LGA1151-B			
Size Custom	Document Number		Rev
	GA-Z270MX-GAMING 5		1.01
Date:	Friday, November 18, 2016	Sheet 5 of 63	

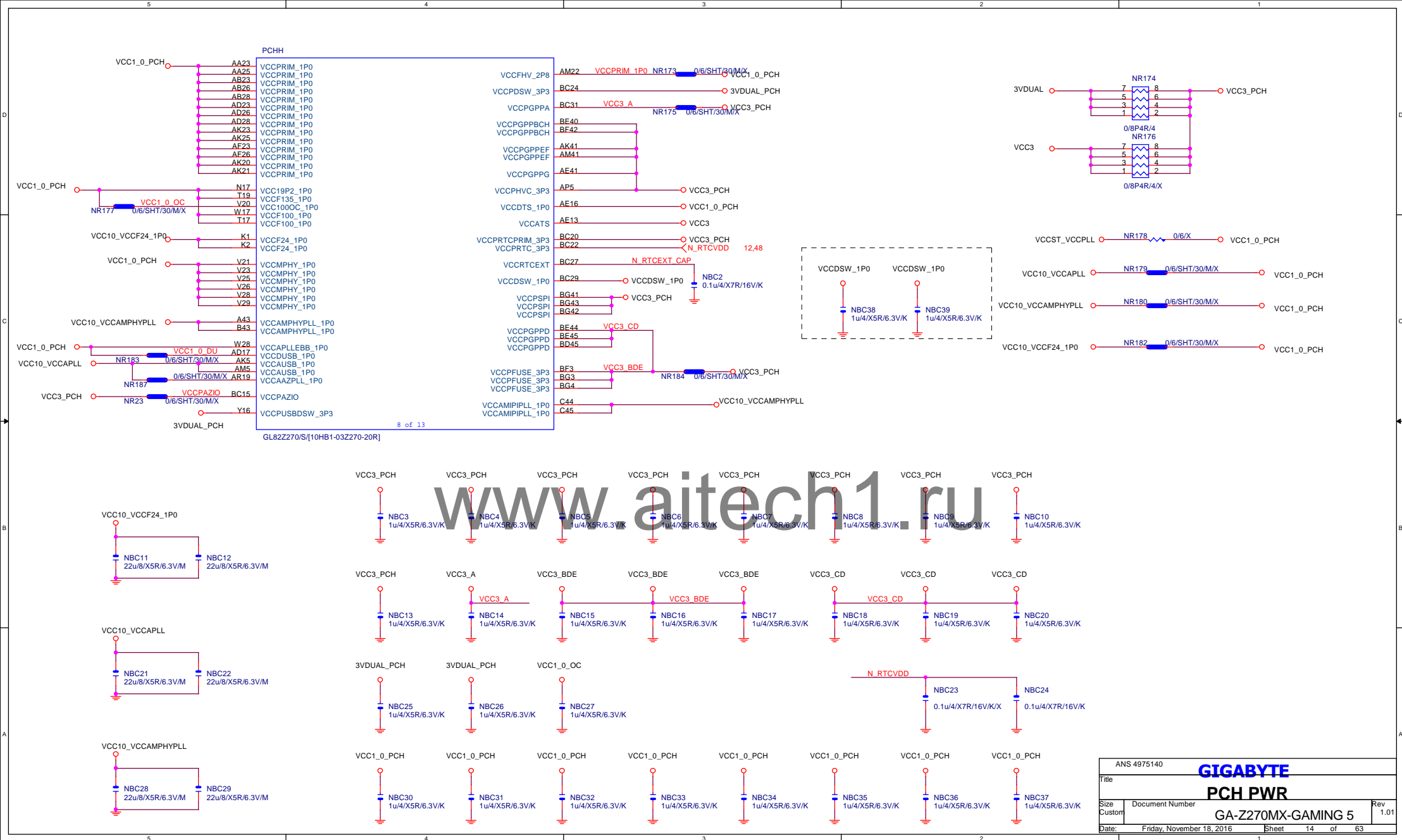








ANS 4975140		GIGABYTE	
Title		PCH SATA,PCIE,SATA_EXPRESS	
Size	Document Number	GA-Z270MX-GAMING 5	
Custom		Rev 1.01	
Date:	Friday, November 18, 2016	Sheet	13 of 63

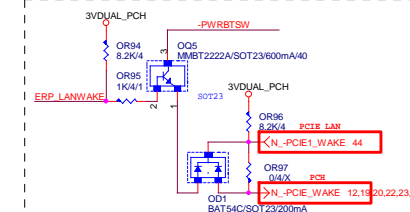
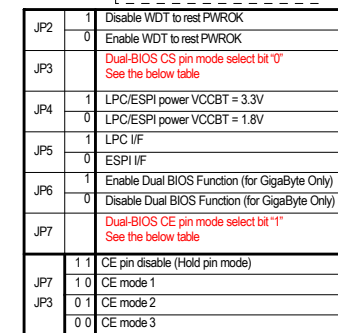


PCHL		
A25	VSS	VSS
A30	VSS	VSS
P22	VSS	VSS
AV38	VSS	VSS
AV45	VSS	VSS
AV8	VSS	VSS
AY11	VSS	VSS
AY19	VSS	VSS
AY37	VSS	VSS
AY4	VSS	VSS
AY42	VSS	VSS
AY8	VSS	VSS
B25	VSS	VSS
B3	VSS	VSS
B30	VSS	VSS
B35	VSS	VSS
B4	VSS	VSS
B41	VSS	VSS
BA13	VSS	VSS
BA17	VSS	VSS
BA37	VSS	VSS
BA4	VSS	VSS
BA42	VSS	VSS
BA40	VSS	VSS
BC38	VSS	VSS
BC40	VSS	VSS
BC9	VSS	VSS
BD11	VSS	VSS
BD16	VSS	VSS
BD2	VSS	VSS
BD21	VSS	VSS
BD25	VSS	VSS
F2	VSS	VSS
F31	VSS	VSS
E6	VSS	VSS
E8	VSS	VSS
F39	VSS	VSS
F43	VSS	VSS
G4	VSS	VSS
G40	VSS	VSS
G42	VSS	VSS
F6	VSS	VSS
G9	VSS	VSS
H11	VSS	VSS
H19	VSS	VSS
H22	VSS	VSS
H24	VSS	VSS
H27	VSS	VSS
H29	VSS	VSS
H33	VSS	VSS
H35	VSS	VSS
H38	VSS	VSS
H4	VSS	VSS
H42	VSS	VSS
H9	VSS	VSS
J4	VSS	VSS
M36	VSS	VSS
M4	VSS	VSS
M8	VSS	VSS
M9	VSS	VSS
N13	VSS	VSS
N15	VSS	VSS
N19	VSS	VSS
N22	VSS	VSS
N24	VSS	VSS
N31	VSS	VSS
N42	VSS	VSS
P10	VSS	VSS
P12	VSS	VSS
AV35	VSS	VSS

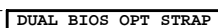
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GL82Z270/S/[10HB1-03Z270-20R]

PCHL		
BD34	VSS[70]	VSS[1]
BD39	VSS[71]	VSS[2]
BD7	VSS[72]	VSS[3]
BE2	VSS[73]	VSS[4]
BF43	VSS[74]	VSS[5]
BF2	VSS[75]	VSS[6]
BG18	VSS[76]	VSS[7]
AG23	VSS[77]	VSS[8]
AG28	VSS[78]	VSS[9]
AG32	VSS[79]	VSS[10]
AG37	VSS[80]	VSS[11]
AG40	VSS[81]	VSS[12]
AG9	VSS[83]	VSS[13]
AG21	VSS[84]	VSS[14]
A12	VSS[85]	VSS[15]
C2	VSS[86]	VSS[16]
C37	VSS[87]	VSS[17]
A6	VSS[88]	VSS[18]
AG32	VSS[89]	VSS[19]
D1	VSS[90]	VSS[20]
D10	VSS[91]	VSS[21]
D12	VSS[92]	VSS[22]
D15	VSS[93]	VSS[23]
D16	VSS[94]	VSS[24]
B12	VSS[95]	VSS[25]
D19	VSS[96]	VSS[26]
D21	VSS[97]	VSS[27]
D24	VSS[98]	VSS[28]
D25	VSS[99]	VSS[29]
D29	VSS[100]	VSS[30]
AG20	VSS[101]	VSS[31]
AG21	VSS[102]	VSS[32]
AG23	VSS[103]	VSS[33]
AG25	VSS[104]	VSS[34]
D36	VSS[105]	VSS[35]
D39	VSS[106]	VSS[36]
D44	VSS[107]	VSS[37]
D7	VSS[108]	VSS[38]
P13	VSS[109]	VSS[39]
AH13	VSS[110]	VSS[40]
AH30	VSS[111]	VSS[41]
AH32	VSS[112]	VSS[42]
AH33	VSS[113]	VSS[43]
AH38	VSS[114]	VSS[44]
AJ1	VSS[115]	VSS[45]
AJ17	VSS[116]	VSS[46]
AJ18	VSS[117]	VSS[47]
AJ20	VSS[118]	VSS[48]
AJ21	VSS[119]	VSS[49]
AJ23	VSS[120]	VSS[50]
AJ26	VSS[121]	VSS[51]
AJ26	VSS[122]	VSS[52]
AJ28	VSS[123]	VSS[53]
AJ29	VSS[124]	VSS[54]
AJ45	VSS[125]	VSS[55]
AK10	VSS[126]	VSS[56]
AK14	VSS[127]	VSS[57]
AK16	VSS[128]	VSS[58]
AK17	VSS[129]	VSS[59]
AK18	VSS[130]	VSS[60]
AK26	VSS[131]	VSS[61]
AK28	VSS[132]	VSS[62]
AM14	VSS[133]	VSS[63]
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AM14	VSS[378]	VSS[308]
AM14	VSS[379]	VSS[309]
AM14	VSS[380]	VSS[310]
AM14	VSS[381]	VSS[311]
AM14	VSS[382]	VSS[312]
AM14	VSS[383]	VSS[313]
AM14	VSS[384]	VSS[314]
AM14	VSS[385]	VSS[315]
AM14	VSS[386]	VSS[316]
AM14	VSS[387]	VSS[317]
AM14	VSS[388]	VSS[318]
AM14	VSS[389]	VSS[319]
AM14	VSS[390]	VSS[320]
AM14	VSS[391]	VSS[321]
AM14	VSS[392]	VSS[322]</

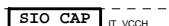


FAN TABLE	
CPU_FAN	FAN_CTL1 FAN_TAC1
SYS_FAN1	FAN_CTL2 FAN_TAC2
SYS_FAN2	FAN_CTL3 FAN_TAC3
SYS_FAN3	FAN_CTL4 FAN_TAC4
OPT_FAN or SYS_FAN4	FAN_CTL5 FAN_TAC5
THRMTRIP	PIN56
PROCHOT	PIN89



CEB N OR58 1K/4X
OR56 8.2K/4/1 3VDDUAL_PCH REV:0.2

OR58 上件/OR56 不上件 SINGLE BIOS
OR58 不上件/OR56 上件 DUAL BIOS

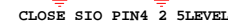


internal power pin, max 22nF cap

SIO 18V

OBC4
0.1u/4/X7R/16V/K/X

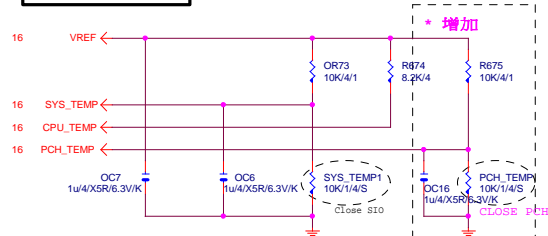
OBC5
0.1u/4/X7R/16V/K/X



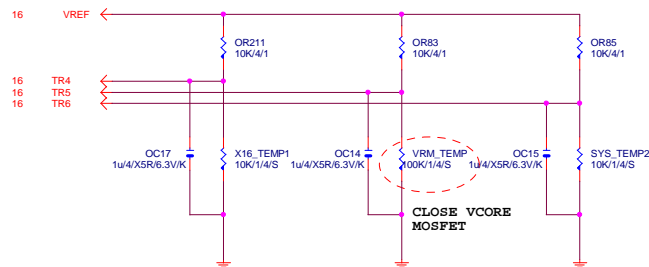
Gigabyte Technology

Title		IT8686		Re	
Size C	Document Number			1.	
		GA-Z270MX-GAMING 5			
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TEMP H/W MONITOR



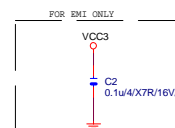
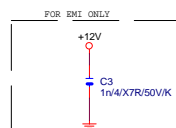
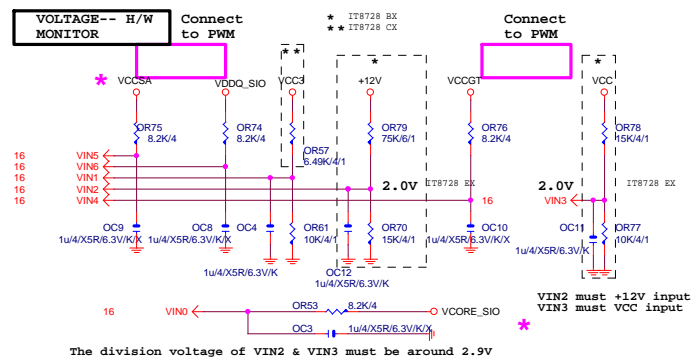
5個FAN時使用



8個FAN時使用

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VOLTAGE-- H/W MONITOR

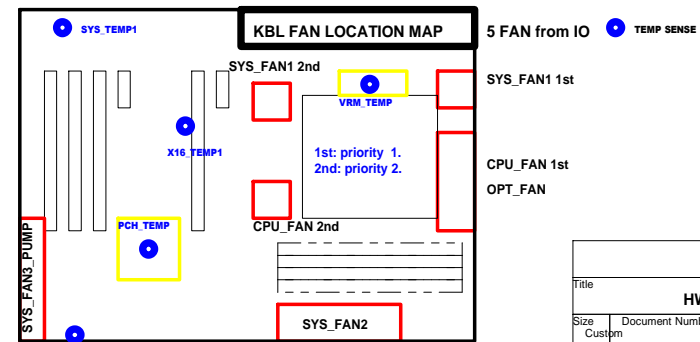
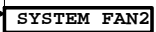


★Update 2015-04.24

Gigabyte Technology

Title			HWM,KB/MS, FAN CTRL
Size	Document Number	Rev	
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Rev: 0.82 ★Update 2016.06.01



PCIEX16 CAP

PCIEX16 SLOT

PCIESLOT-164STH



PCIEX16:16/5/5/5/16

PA EXP RXP[0..15] >> PA EXP RXP[0..15] 4.21

PA_EXP_RXN[0..15] >> PA_EXP_RXN[0..15] 4,21

PA_EXP_TXP[0..15] \gg PA_EXP_TXP[0..15] 4,21

PA_EXP_TXN[0..15] >> PA_EXP_TXN[0..15] 4,21

PA_EXP_SW_RXP[8..15] >> PA_EXP_SW_RXP[8..15]

PA_EXP_SW_RXN[8..15]

PA_EXP_SW_TXP[8..15] >> PA_EXP_SW_TXP[8..15]

PA_EXP_SW_TXN[8..15]

Abstract

Gigabyte Technology

PCI EXPRESS * 16

Document Number

GA-Z270MX-GAMING

2	1
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黑色金屬加強

Gigabyte Technology

PCI EXPRESS * 16

Document Number **CA 707091X CAMP**

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Rev 0.3

PCIEXPRESS-985TH

PCIEXPRESS PROTECT SHT

+12V protect short-wire test

請選用model上沒用到的USB port

Part Number	Value	Footprint
PE EXP SW TXP8	PEC7	0.22u4/XSR/6.3V/K
PE EXP SW TXN8	PEC8	0.22u4/XSR/6.3V/K
PE EXP SW TXP9	PEC9	0.22u4/XSR/6.3V/K
PE EXP SW TXN9	PEC10	0.22u4/XSR/6.3V/K
PE EXP SW TXP10	PEC11	0.22u4/XSR/6.3V/K
PE EXP SW TXN10	PEC12	0.22u4/XSR/6.3V/K
PE EXP SW TXP11	PEC13	0.22u4/XSR/6.3V/K
PE EXP SW TXN11	PEC14	0.22u4/XSR/6.3V/K
PE EXP SW TXP12	PEC15	0.22u4/XSR/6.3V/K
PE EXP SW TXN12	PEC16	0.22u4/XSR/6.3V/K
PE EXP SW TXP13	PEC17	0.22u4/XSR/6.3V/K
PE EXP SW TXN13	PEC18	0.22u4/XSR/6.3V/K
PE EXP SW TXP14	PEC19	0.22u4/XSR/6.3V/K
PE EXP SW TXN14	PEC20	0.22u4/XSR/6.3V/K
PE EXP SW TXP15	PEC21	0.22u4/XSR/6.3V/K
PE EXP SW TXN15	PEC22	0.22u4/XSR/6.3V/K

Gigabyte Technology

PCI EXPRESS X8

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[illegible]

Rev 0.3

PCIESLOT-985TH

3GIO_*8

PCIE8

PER11 0/4/X

PER8 0/4/X

PER9 0/4/X

PER6 0/4/SHT/X

PER7 0/4/SHT/X

PER5 0/4/SHT/X

PER10 0/4/SHT/X

PER4 0/4/X

PER3 0/4/X

PER2 0/4/X

PER1 0/4/X

PER12 0/4/X

PER13 0/4/X

PER14 0/4/X

PER15 0/4/X

PER16 0/4/X

PER17 0/4/X

PER18 0/4/X

PER19 0/4/X

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PER263 0/4/X

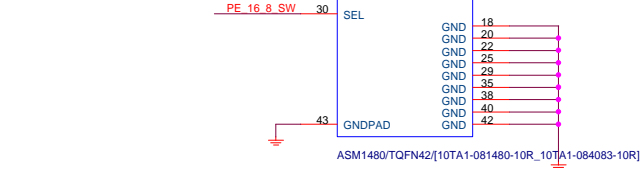
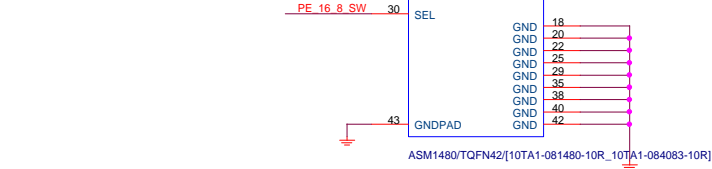
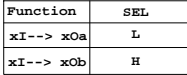
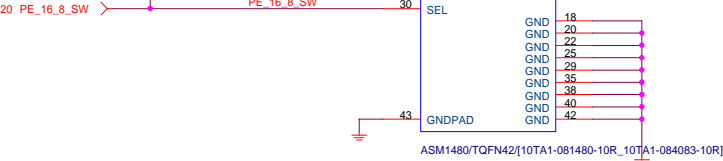
PER264 0/4/X

PER265 0/4/X

PER26

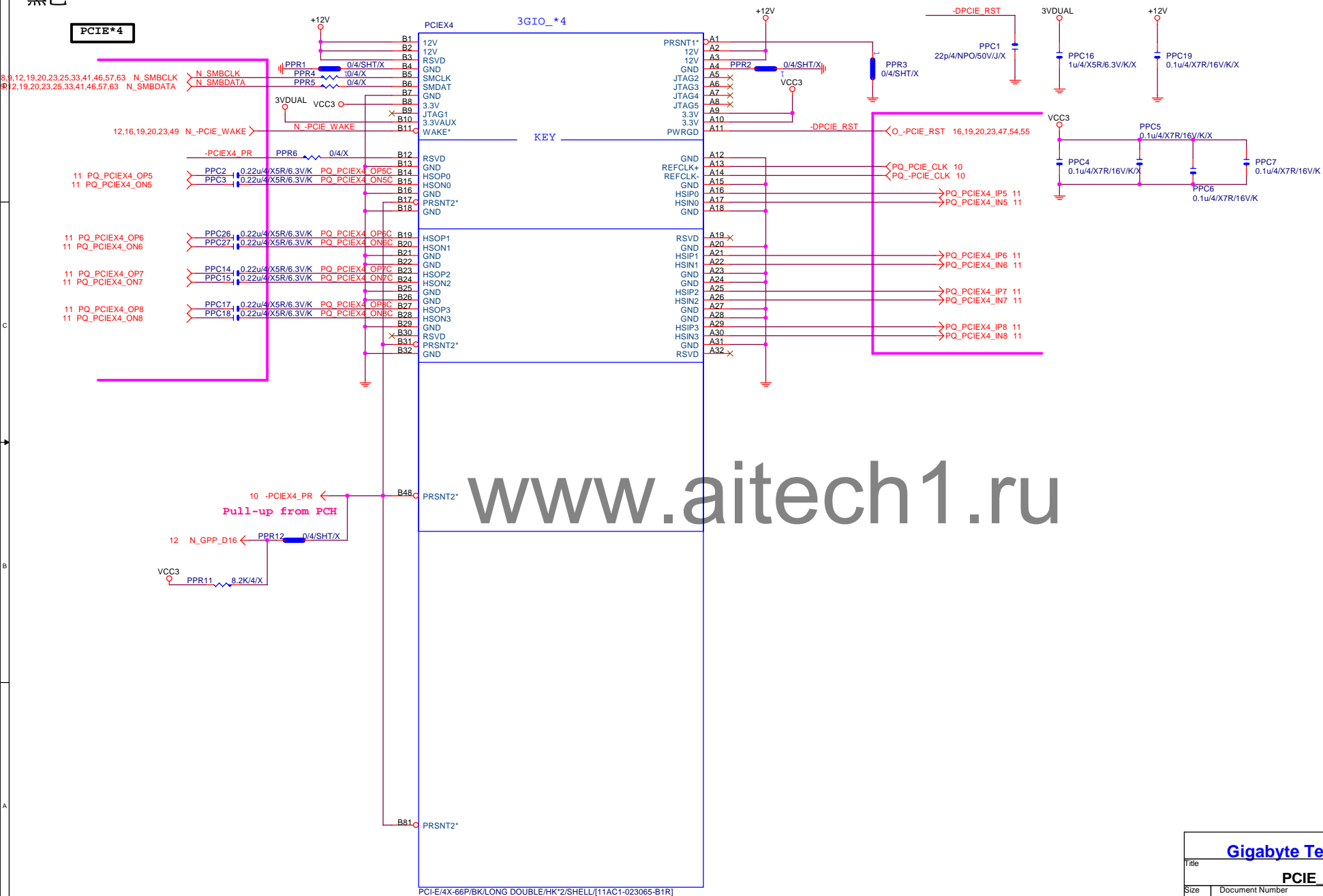
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Rev 0.3



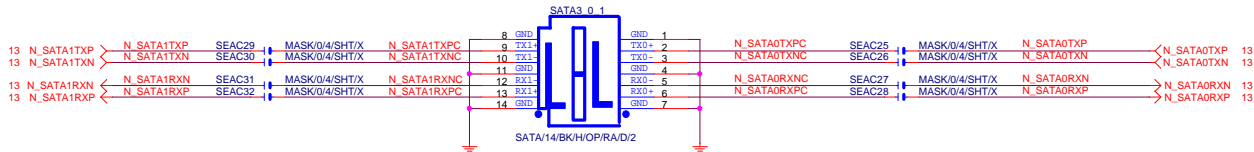
黑色

Footprint "PCIESLOT-64STH-1"



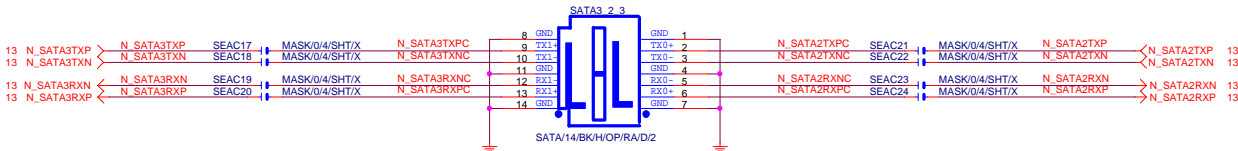
PCI-E/4X-66P/BK/LONG DOUBLE/HK*2/SHELL/[11AC1-023065-B1R]

SATA3
port0/1



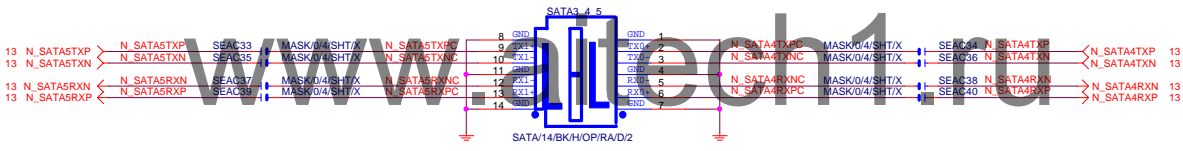
BLACK CONNECTOR

SATA3
port2/3

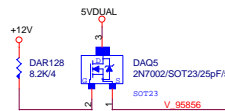
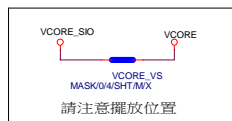


BLACK CONNECTOR

SATA3
port4/5

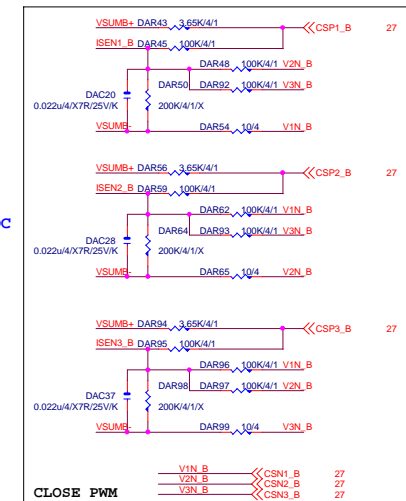
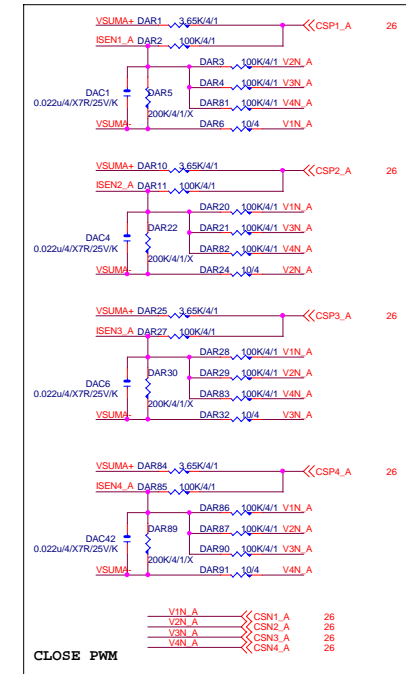
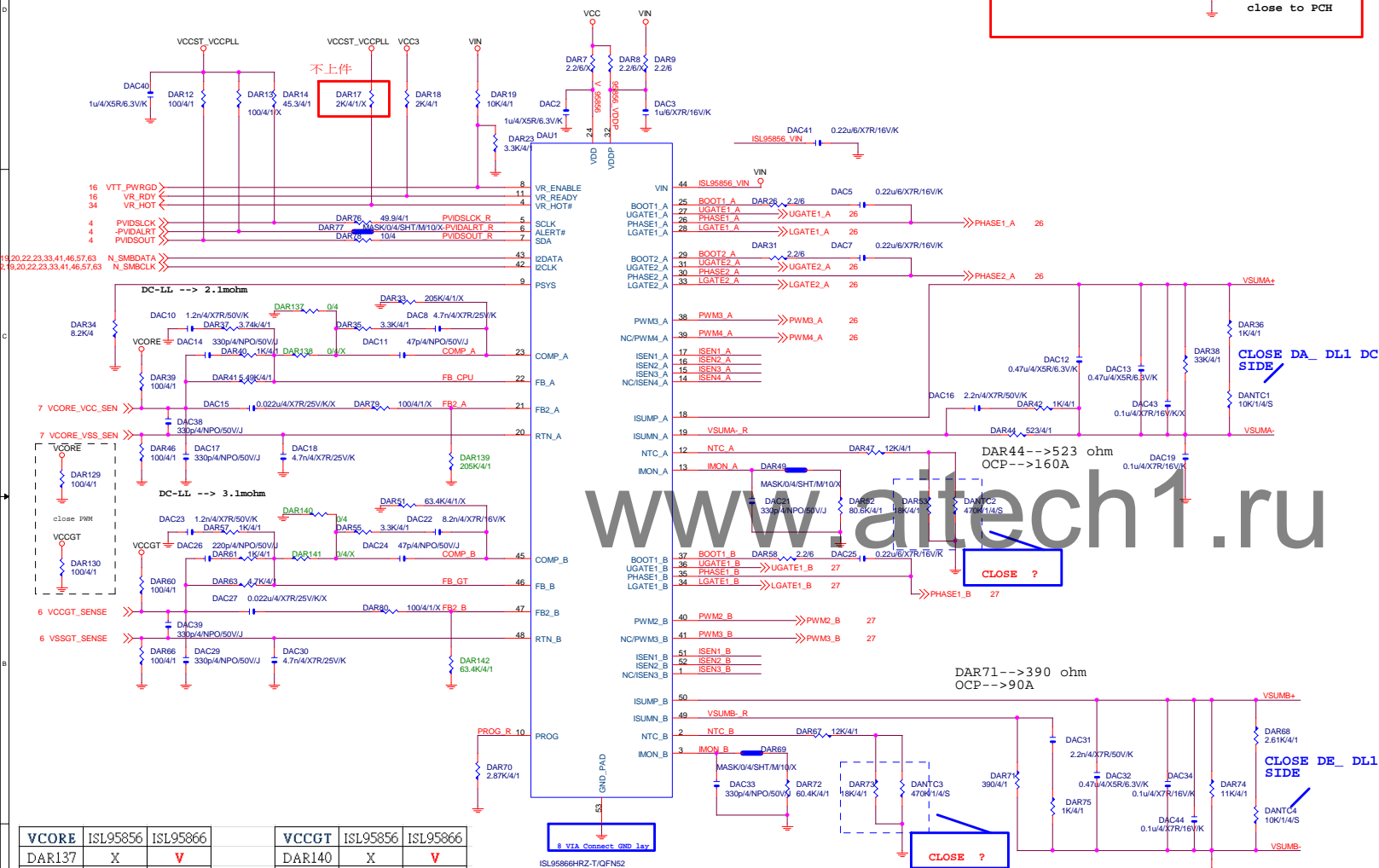


BLACK CONNECTOR

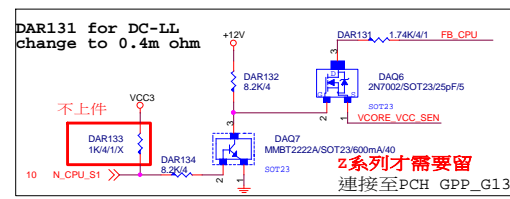
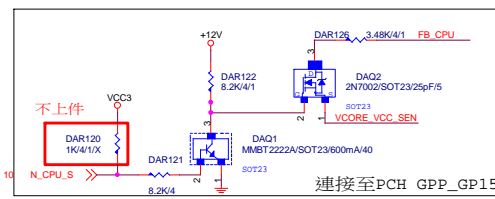
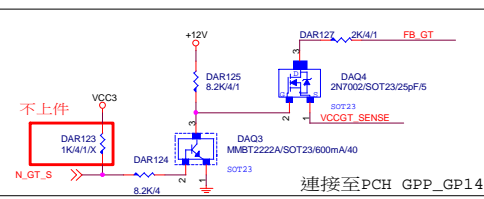


H: ISL95856 or ISL95858
L: ISL95866 or ISL95868

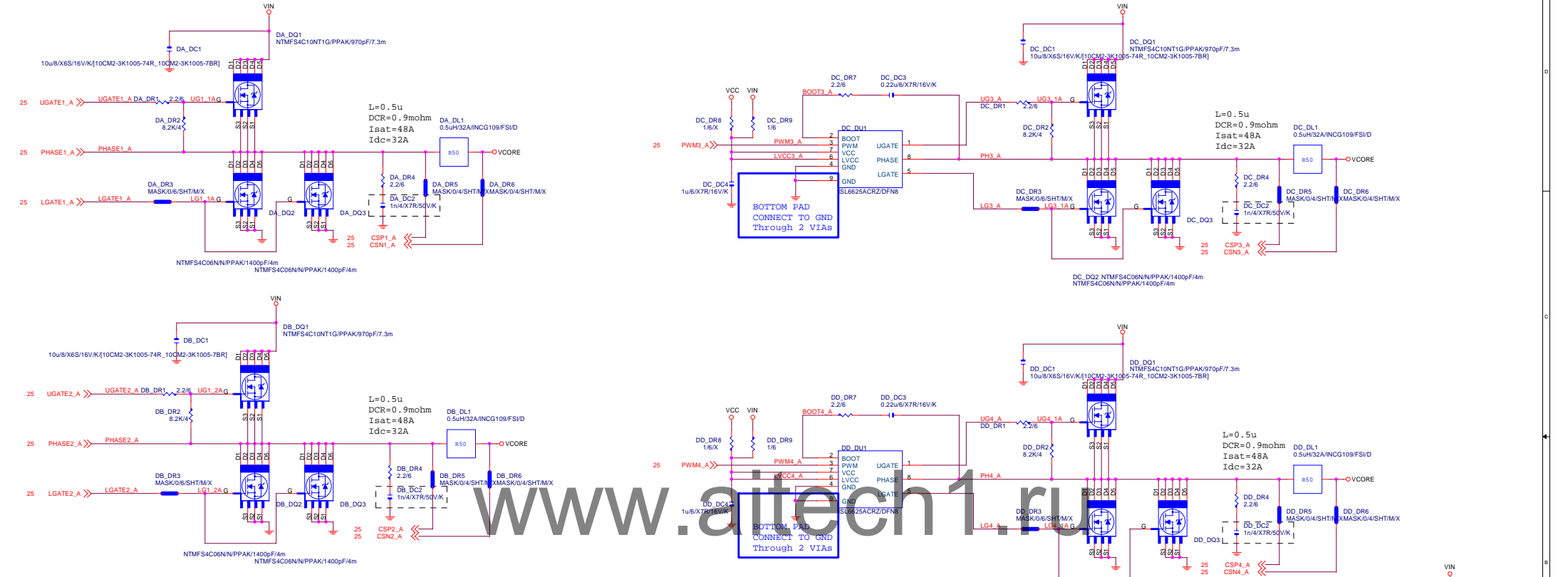
close to PCH



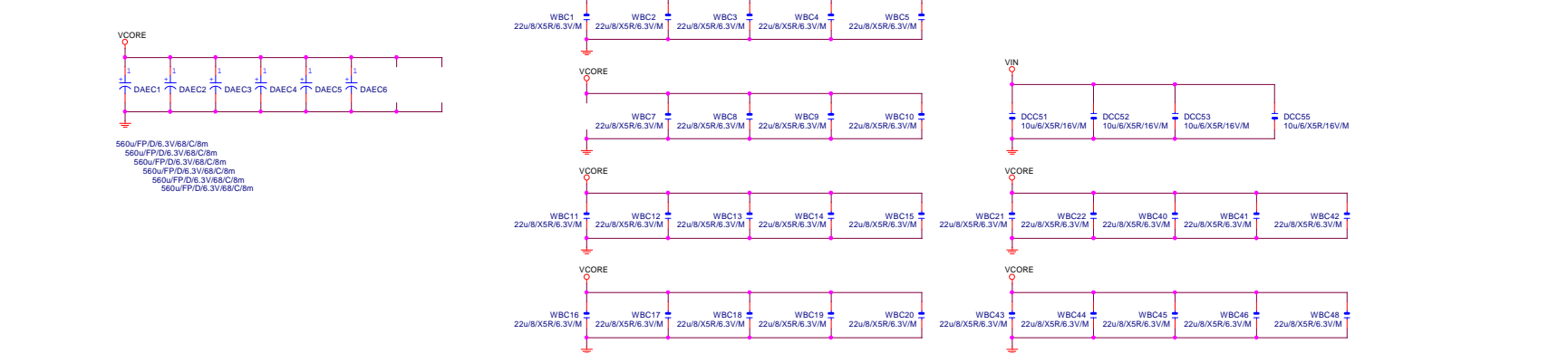
VCCORE	ISL95856	ISL95866	VCCGT	ISL95856	ISL95866
DAR137	X	V	DAR140	X	V
DAR138	V	X	DAR141	V	X
DAR139	X	V	DAR142	X	V
DAC15	V	X	DAC27	V	X
DAR79	V	X	DAR80	V	X
DAR33	V	X	DAR51	V	X



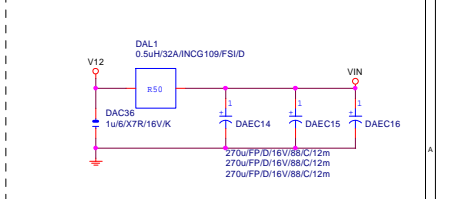
VCORE



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



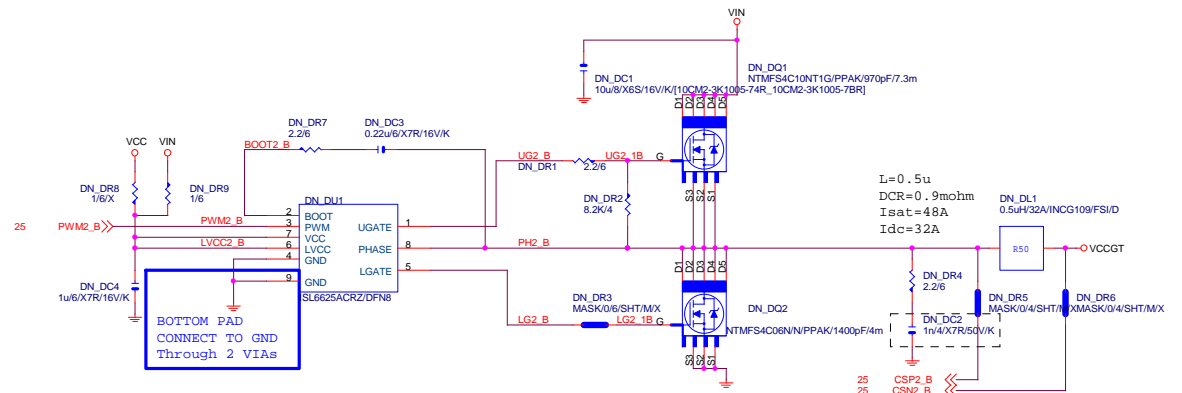
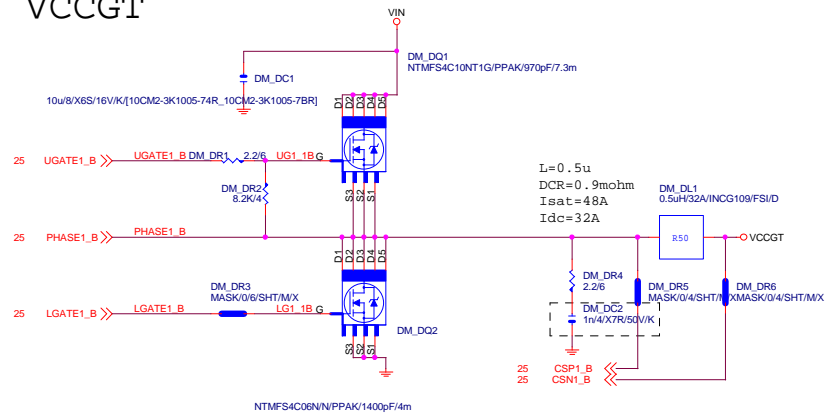
VIN CAP 270u*3PCS



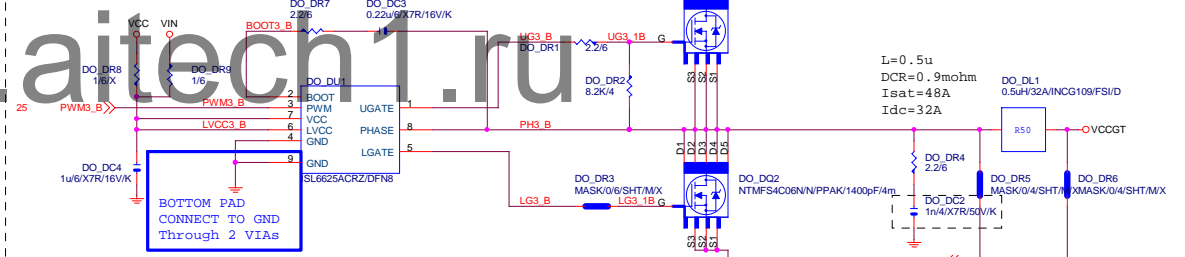
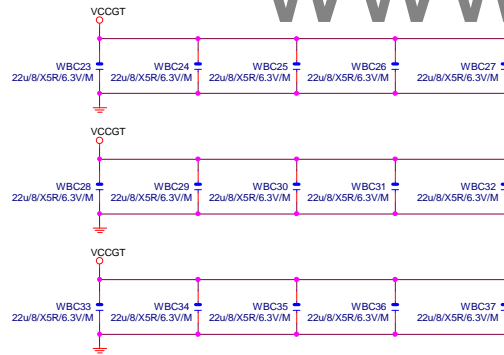
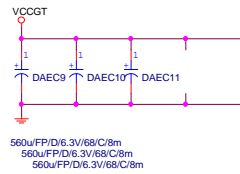
GIGABYTE™

ISL95856_MOS	
Size	Document Number
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VCCGT

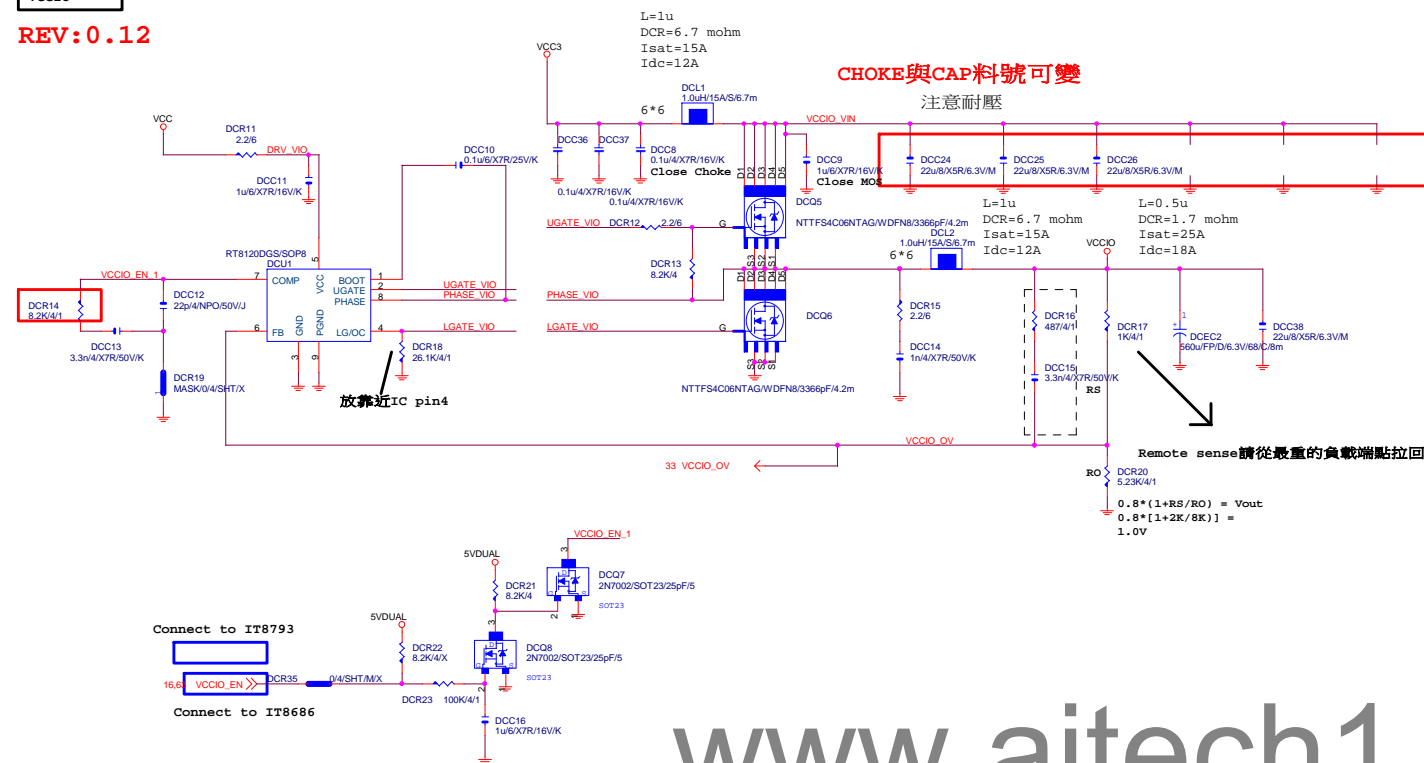


VCCGT CAP 560u*5PCS 22u*15PCS

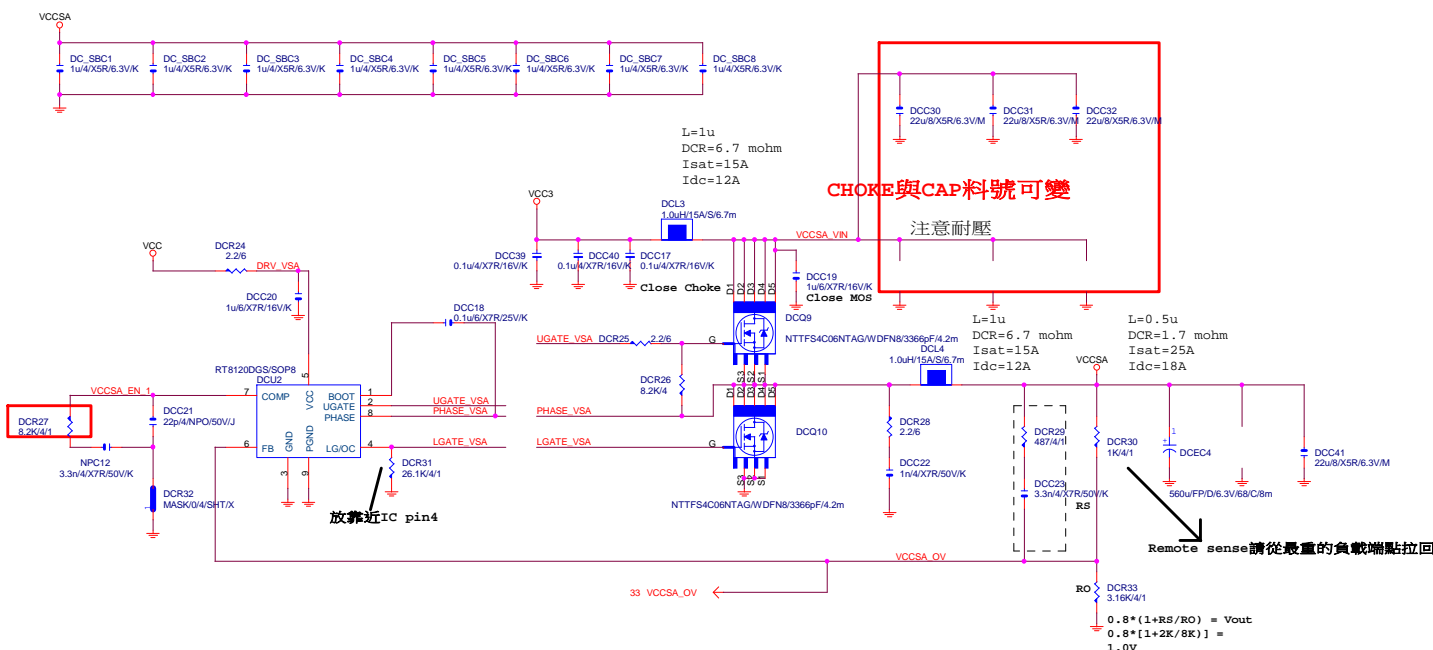
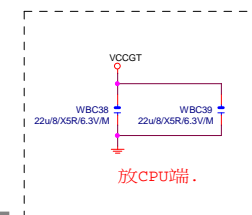


GIGABYTE™			
Title			
ISL95856 MOS			
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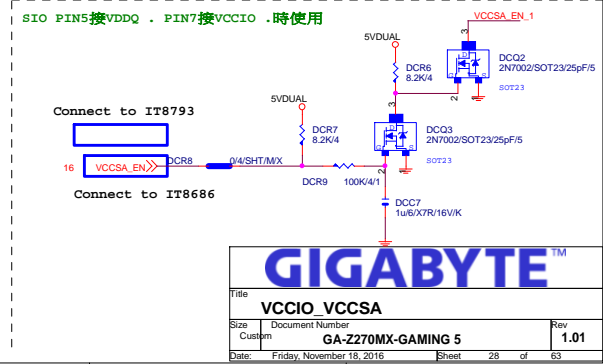
REV:0.12



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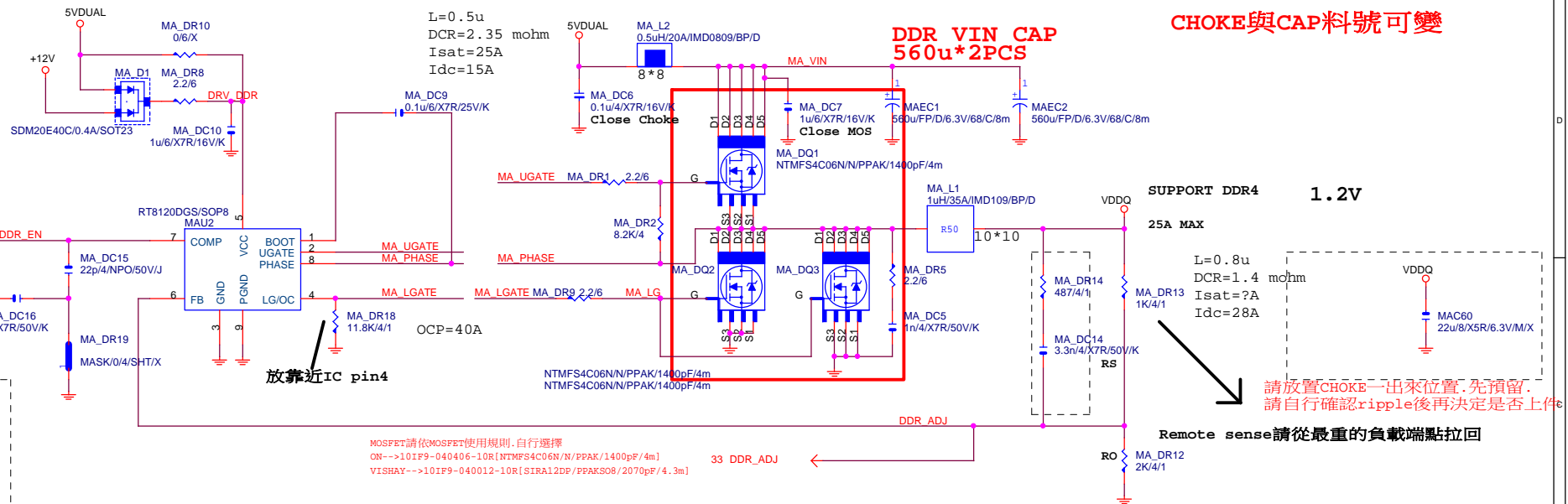


SIO PIN5 . PIN7 用在其他function時使用



REV: 0.1

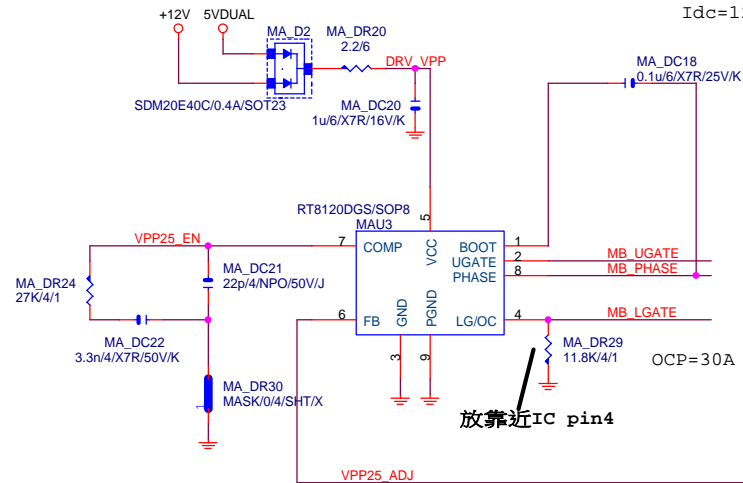
DDR4



REV:0.1

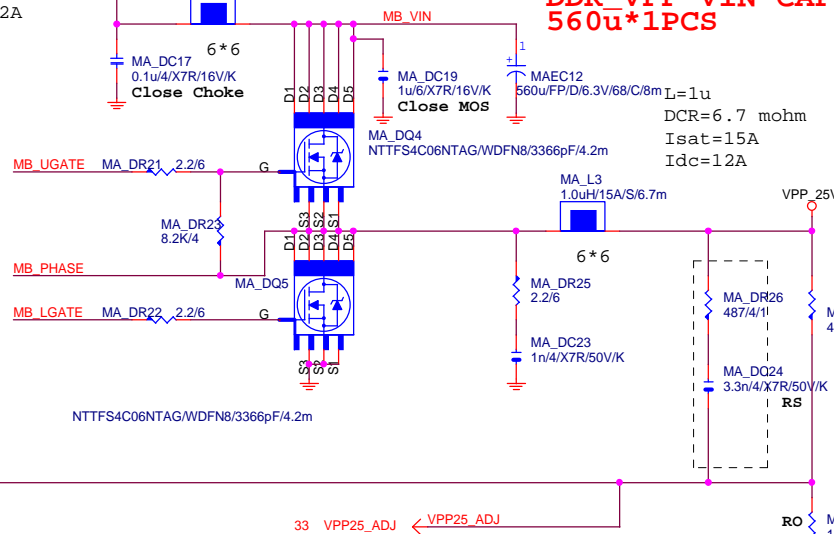
VPP_25V

L=1u
DCR=6.7 mohm
Isat=15A
Idc=12A



放靠近IC pin4

OCP=30A



CHOKE與CAP料號可變

DDR_VPP VIN CAP
560u*1PCS

$V_{(BR)DSS}$	$R_{DS(on) MAX}$	$I_D MAX$
30 V	4.2 mΩ @ 10 V	67 A
	6.1 mΩ @ 4.5 V	

DCR=6.7 mohm
Isat=15A
Idc=12A

SUPPORT DDR4

2.5V

VPP_25V

25A MAX

MA_DR27

4.02K/4/1

MA_DR26

487/4/1

MA_DR25

2.2/6

MA_DR24

3.3n/4/X7R/50V/K

MA_DR23

1n/4/X7R/50V/K

MA_DR22

2.2/6

MA_DR21

2.2/6

MA_DR20

2.2/6

MA_DR19

1u/6/X7R/16V/K

MA_DR18

0.1u/4/X7R/16V/K

MA_DR17

0.1u/4/X7R/16V/K

MA_DR16

0.1u/4/X7R/16V/K

MA_DR15

0.1u/4/X7R/16V/K

MA_DR14

0.1u/4/X7R/16V/K

MA_DR13

0.1u/4/X7R/16V/K

MA_DR12

0.1u/4/X7R/16V/K

MA_DR11

0.1u/4/X7R/16V/K

MA_DR10

0.1u/4/X7R/16V/K

MA_DR09

0.1u/4/X7R/16V/K

MA_DR08

0.1u/4/X7R/16V/K

MA_DR07

0.1u/4/X7R/16V/K

MA_DR06

0.1u/4/X7R/16V/K

MA_DR05

0.1u/4/X7R/16V/K

MA_DR04

0.1u/4/X7R/16V/K

MA_DR03

0.1u/4/X7R/16V/K

MA_DR02

0.1u/4/X7R/16V/K

MA_DR01

0.1u/4/X7R/16V/K

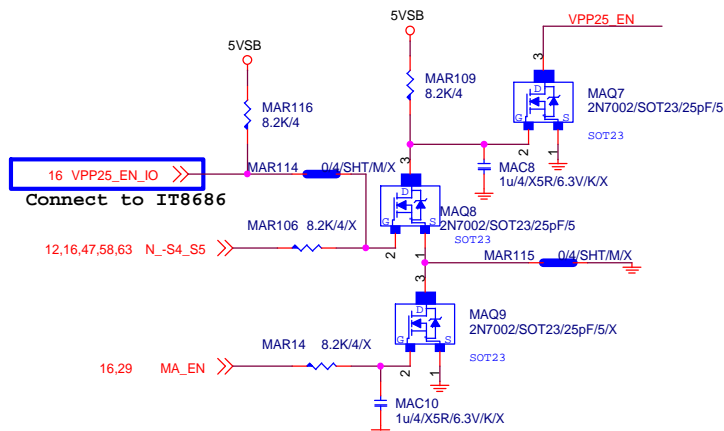
請放置CHOKE--出來位置.先預留.
請自行確認ripple後再決定是否上件

Remote sense請從最重的負載端點拉回

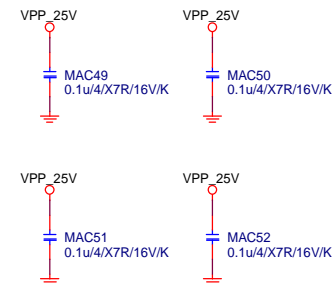
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PWR_SEQ

* 刪 MA_DR32

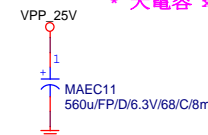


Connect to IT8686



VPP CAP 560u*1PCS

* 大電容 x1

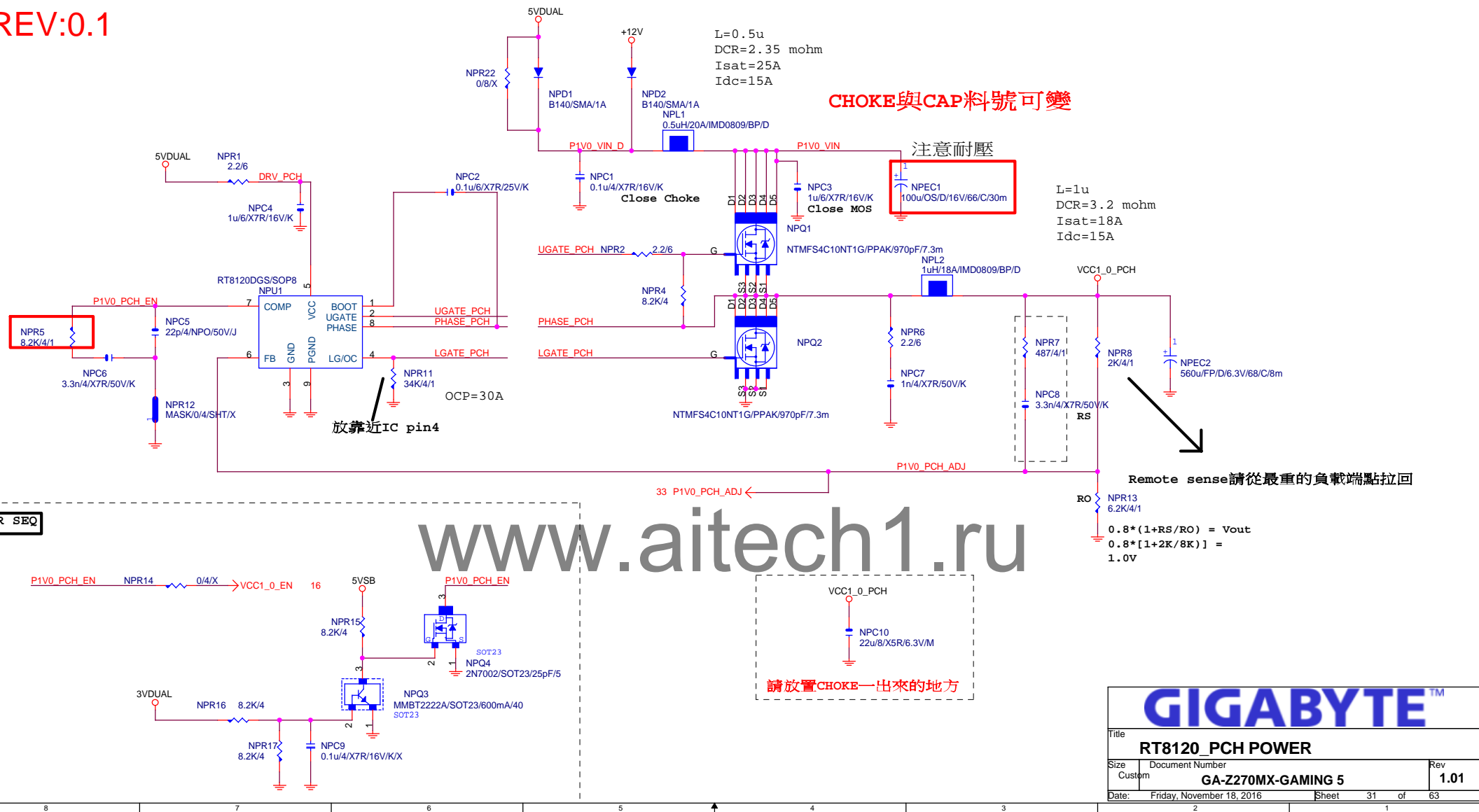


GIGABYTE™

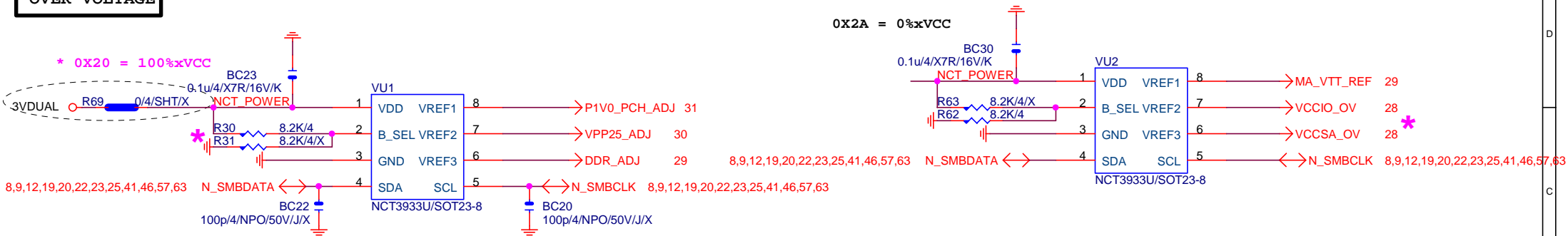
RT8120_VPP25 POWER		
Title	Document Number	Rev
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1.01

REV:0.1



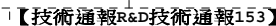
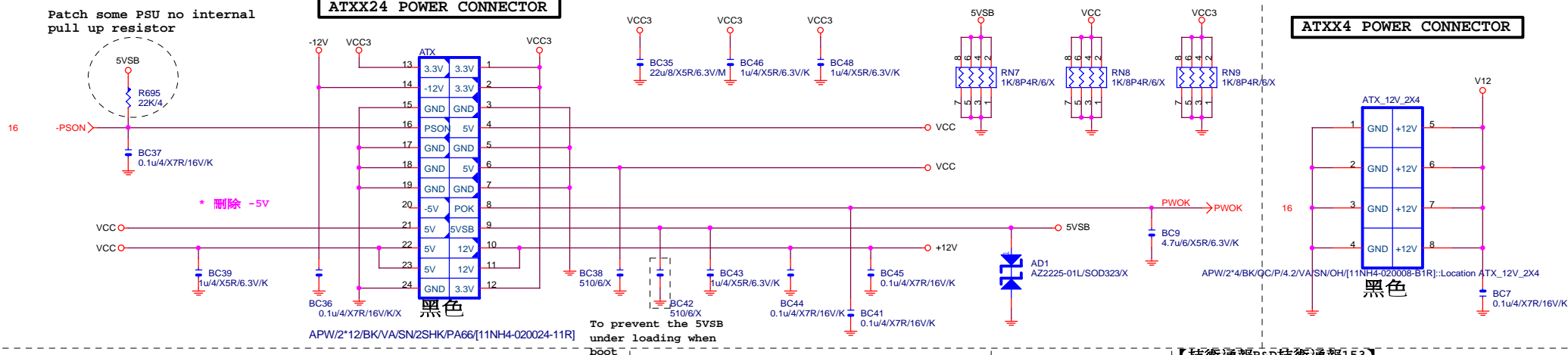
OVER VOLTAGE



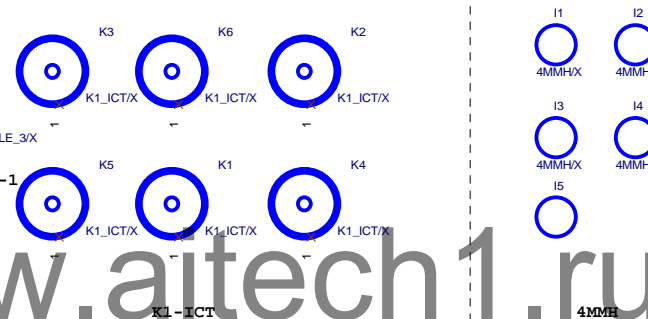
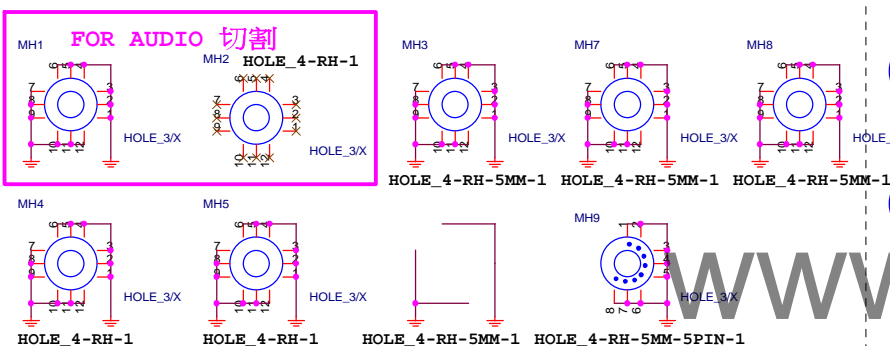
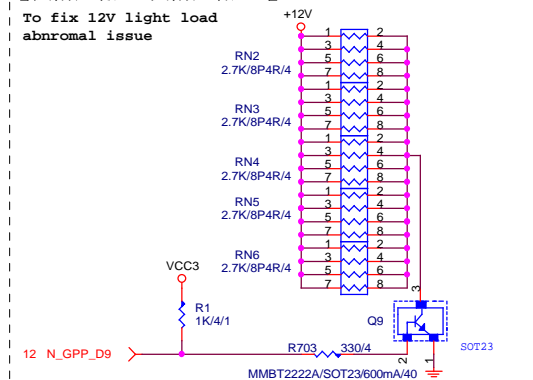
NCT3933	0X2A	0X20	0X22
VREF1	DDRVTT	VREF_DDRA_DQ	PCH Core
VREF2	VREF_DDRA_CA	N/A	VCC1_5_PCH
VREF3	VREF_DDRA_CA	VREF_DDRB_DQ	SMREF

Gigabyte Technology			
CPU CORE VR-2			
Title	GA-Z270MX-GAMING 5		
Size Custom	Document Number	Rev 1.01	
Date:	Friday, November 18, 2016	Sheet 33 of 63	

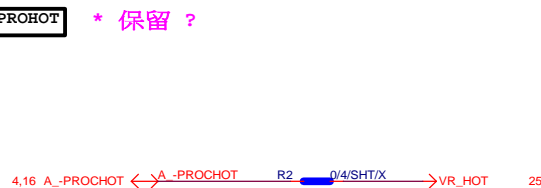
ATXX4 POWER CONNECTOR



To fix 12V light load
abnromal issue

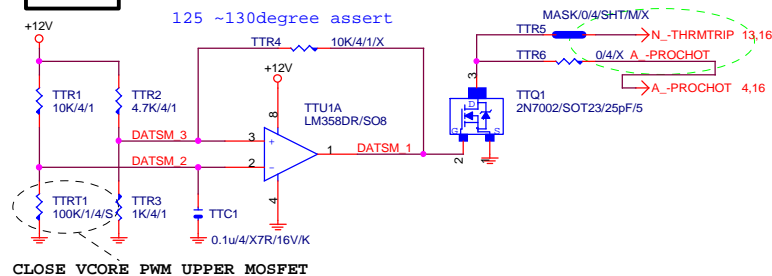


-PROHOT * 保留？



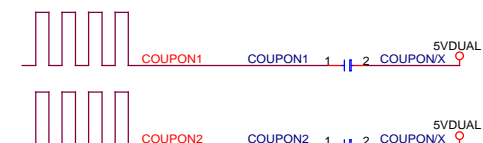
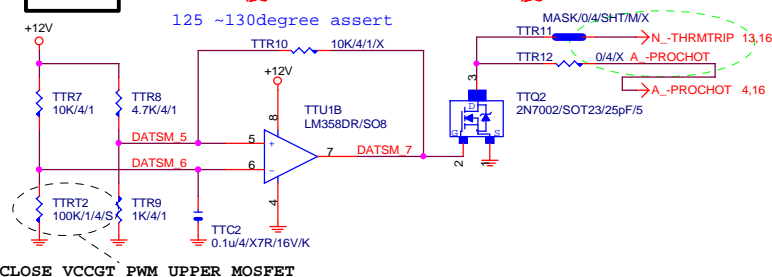
-PROHOT

OTP:130度 / PCB THERMAL TRIP:128 度
125 ~130degree assert



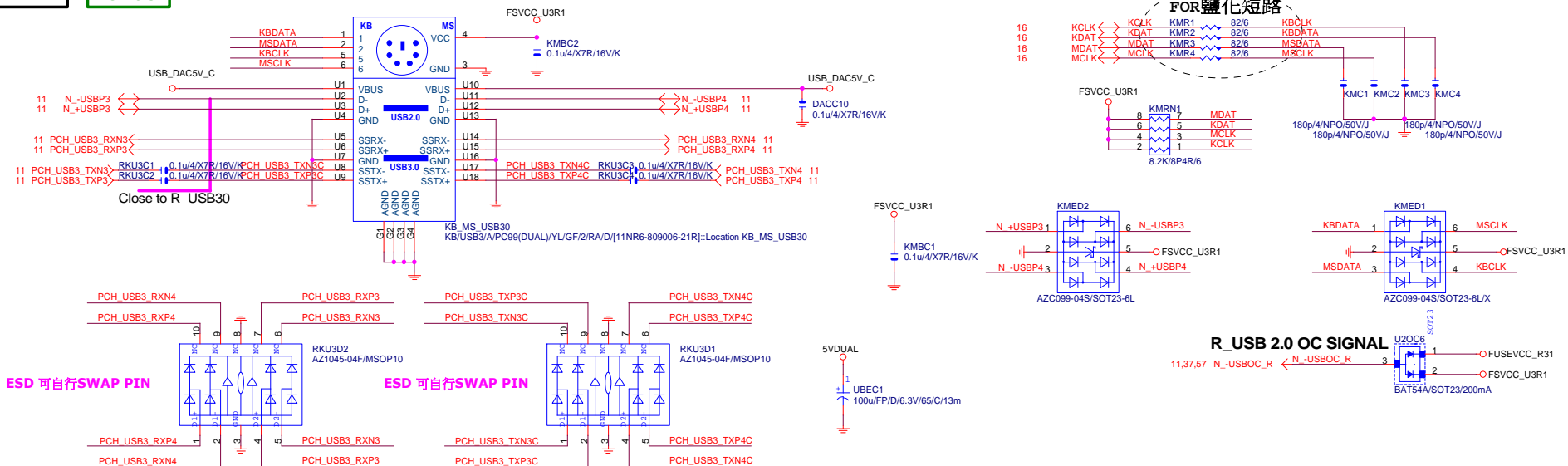
-PROHOT

OTP:130度 / PCB THERMAL TRIP:129 度
125 ~130degree assert

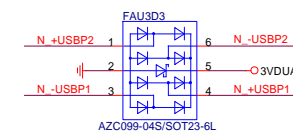


Gigabyte Technology

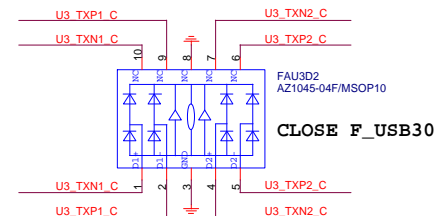
Title			
ATX POWER CONNECTOR			
Size	Document Number		Rev
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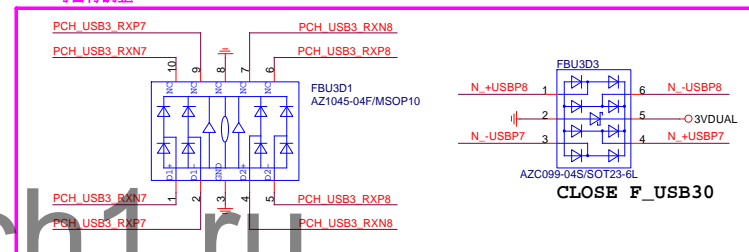
20/BK/UN/2.0
黑色



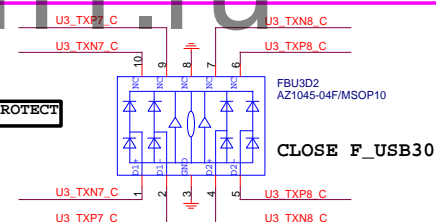
Pin 12: D2+ D2- (USB3+)

Pin 13: SND GND (USB3-)

U3_TXP7_C



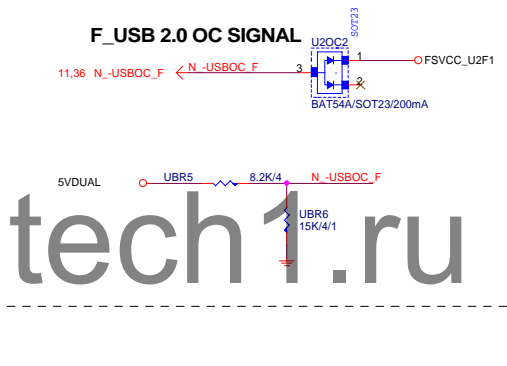
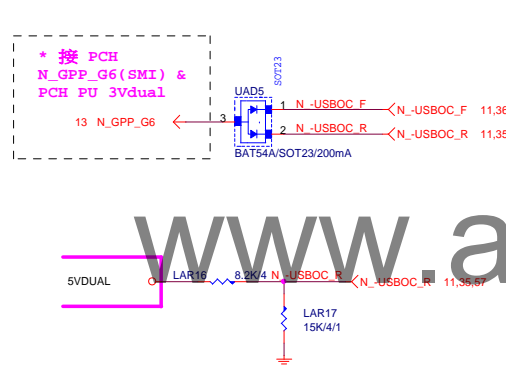
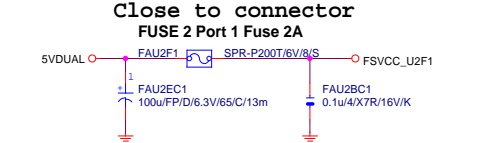
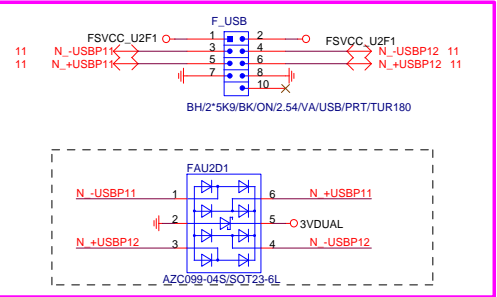
黑色



Title			
R_USB30,F_USB30, USB_OC			
Size Custom	Document Number	GA-Z270MX-GAMING 5	Rev 1.01
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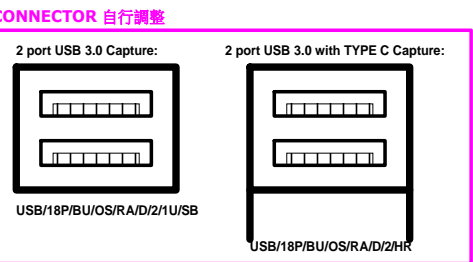
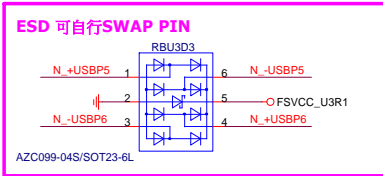
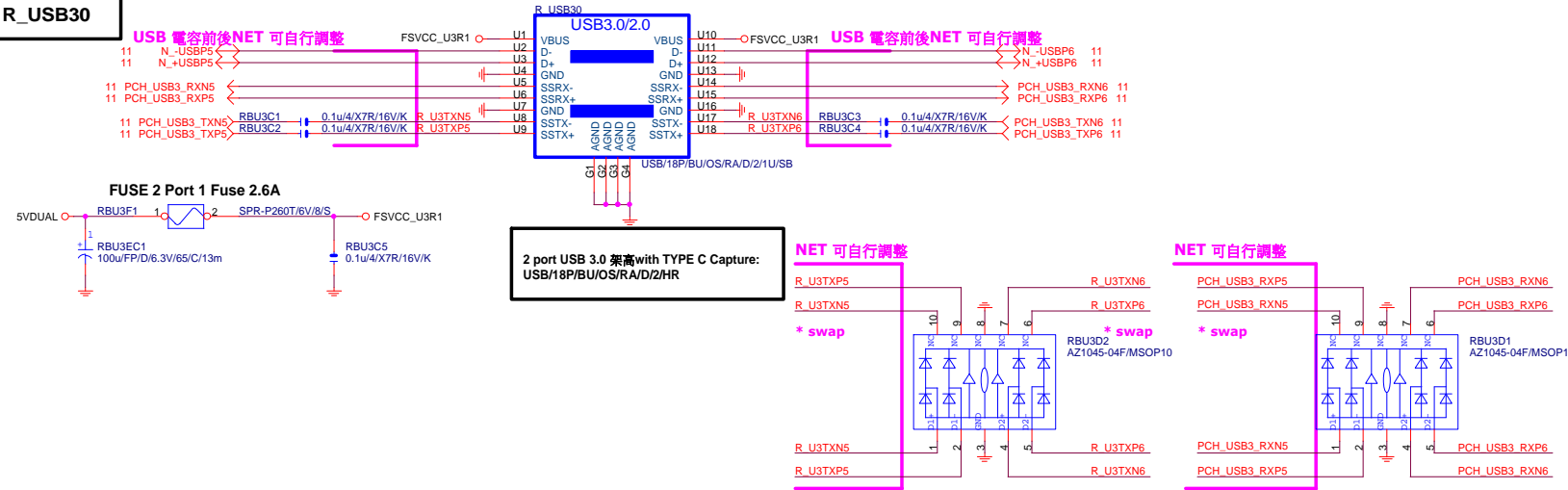
NET 可變

NET 可變



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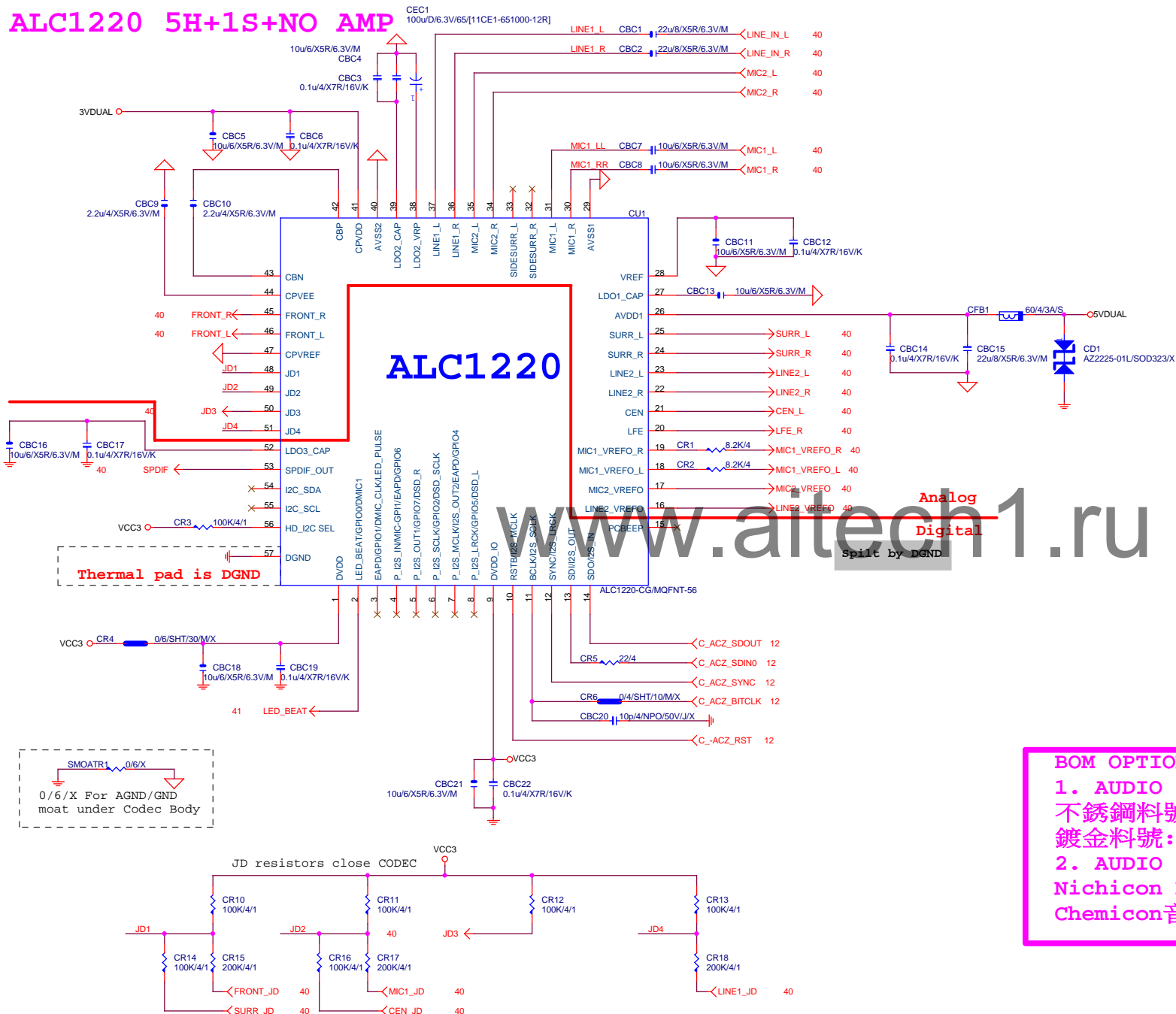
R_USB30



<div>Gigabyte Technology</div> <div>KB_MS_USB3, R_USB30</div>			
Title			
Size Custom	Document Number	Rev 1.01	
GA-Z270MX-GAMING 5			
Date: Friday, November 18, 2016	Sheet 38	of 63	
2	1		

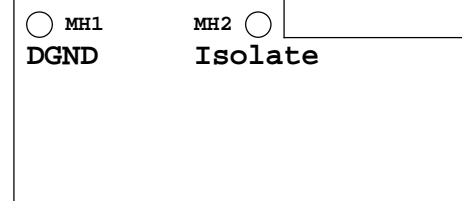
Rev 0.53

ALC1220 5H+1S+NO AMP



LAYOUT注意:螺絲孔下GND方式

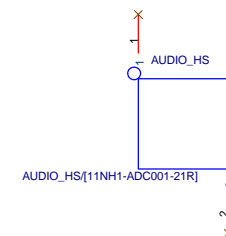
1. MH1下DGND
2. MH2一律改為Isolate



LAYOUT注意:是否要加?

AGND切割線

音效區域印刷



BOM OPTION :

1. AUDIO CONNECT

不銹鋼料號:11NR6-403025-A2R

鍍金料號:11NR6-403025-92R

2. AUDIO CAP

Nichicon MW音效電容 : 11CE1-651000-12R

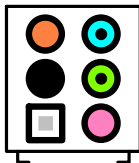
Chemicon音效電容 : 11CE2-651000-05R

Gigabyte Technology

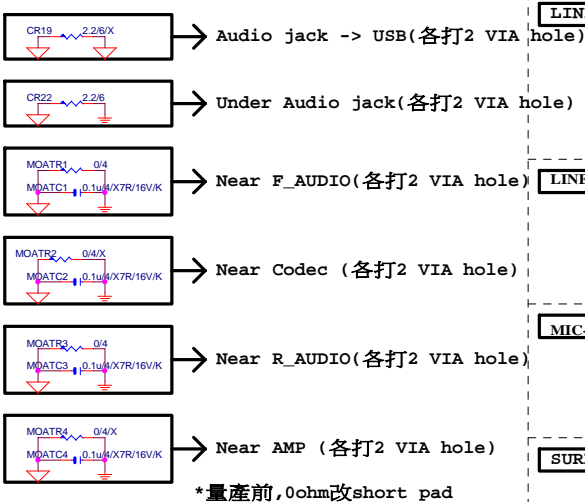
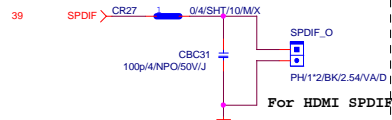
Title			ALC1220		
Size			Document Number		
Custom			GA-Z270MX-GAMING 5		
Date:			Friday, November 18, 2016		
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Rev			1.01		

Rev 0.53

AZALIA JACK



SPDIF OUT



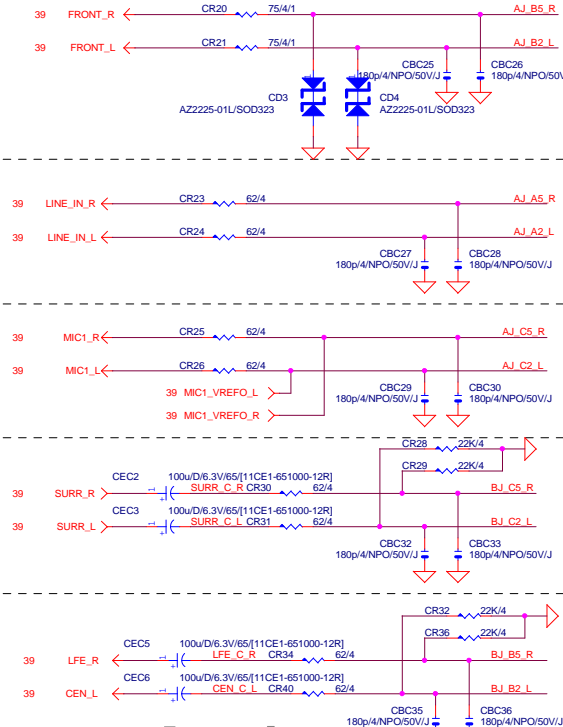
LINE-OUT

LINE-IN

MIC-IN

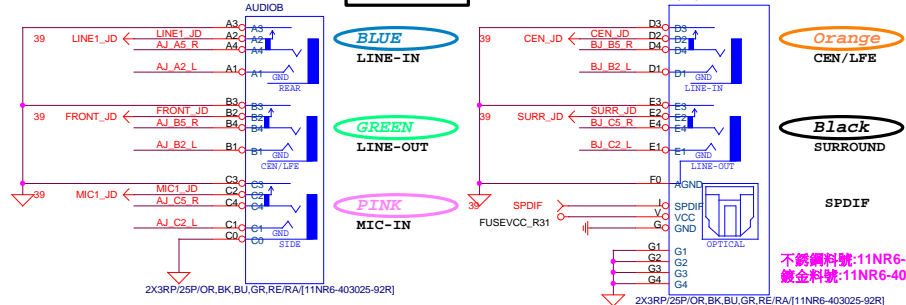
SURROUND

CEN/LFE

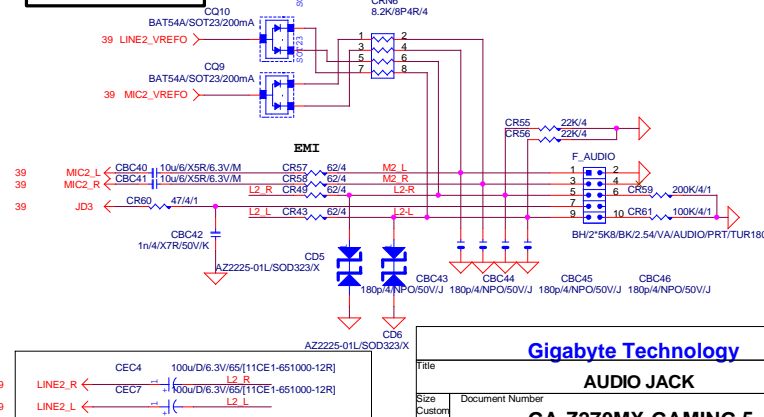


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AZALIA JACK



AZALIA FRONT PANEL



Gigabyte Technology

AUDIO JACK

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GA-Z270MX-GAMING 5

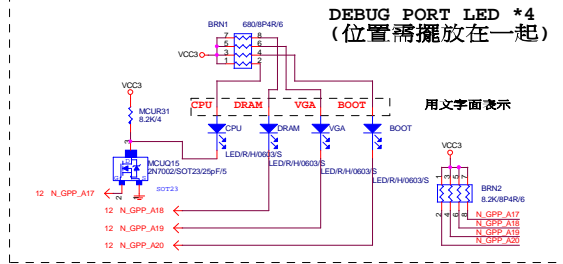
第一區 LED

Rev 0.63

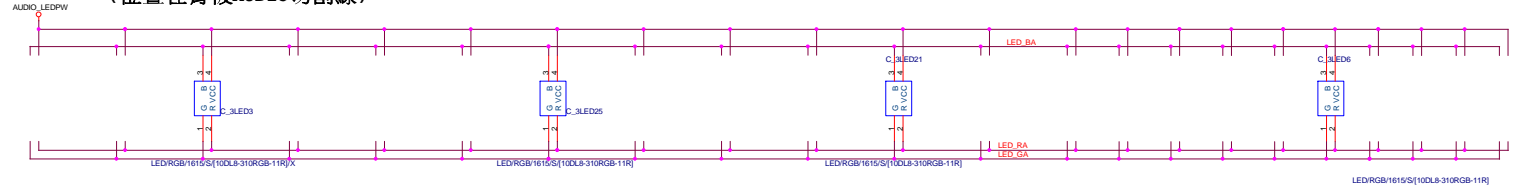
LED GPIO PIN DEFINE

N_GPP_A17	CPU DEBUG
N_GPP_A18	DDR DEBUG
N_GPP_A19	VGA DEBUG
N_GPP_A20	BOOT DEBUG
N_GPP_A21	XMP LED SWITCH
N_GPP_A22	TURBO LED SWITCH
N_GPP_D15	LED_C LED SWITCH
N_GPP_D17	PCIEX16 LED SWITCH
N_GPP_D18	PCIEX8 LED SWITCH

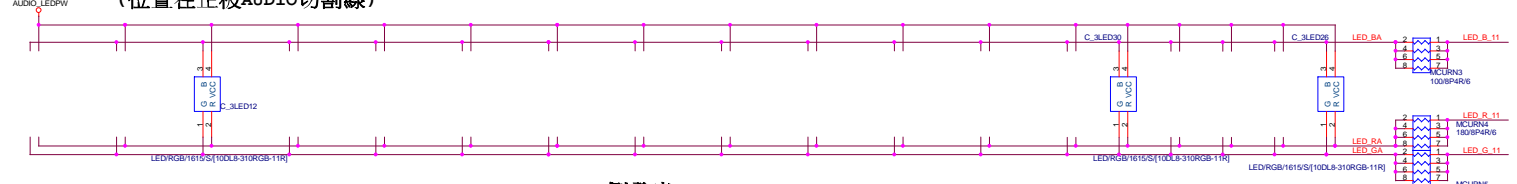
DEBUG PORT LED *4 (位置需擺放在一起)



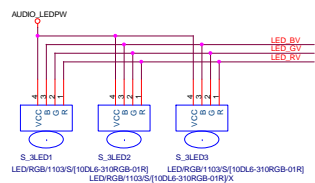
FOR AUDIO 正發光 LED*40 (位置在背板AUDIO切割線)



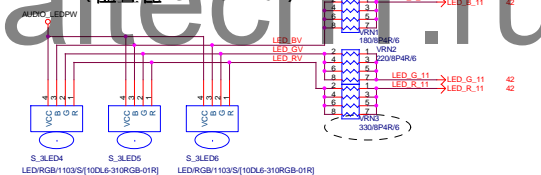
FOR AUDIO 正發光 LED*40 (位置在正板AUDIO切割線)



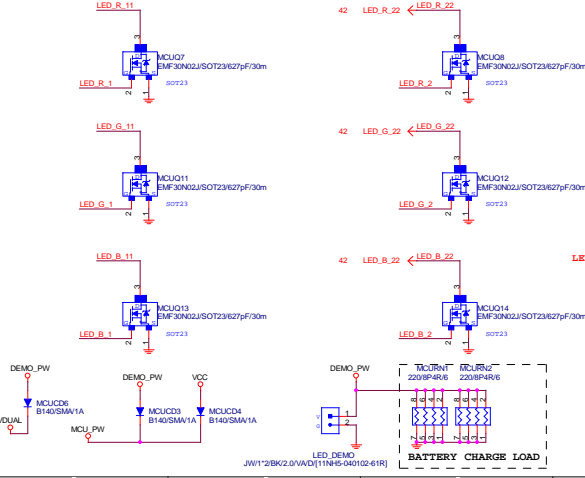
FOR PCIEX16 側發光 LED*3 (位置在PCIEX16 SLOT)



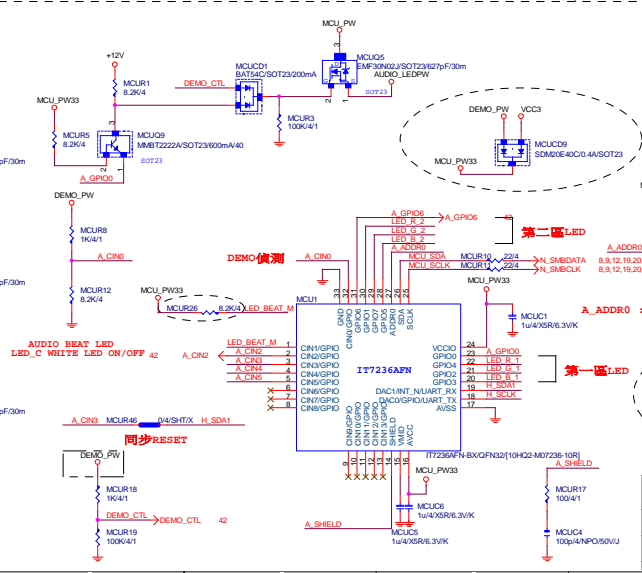
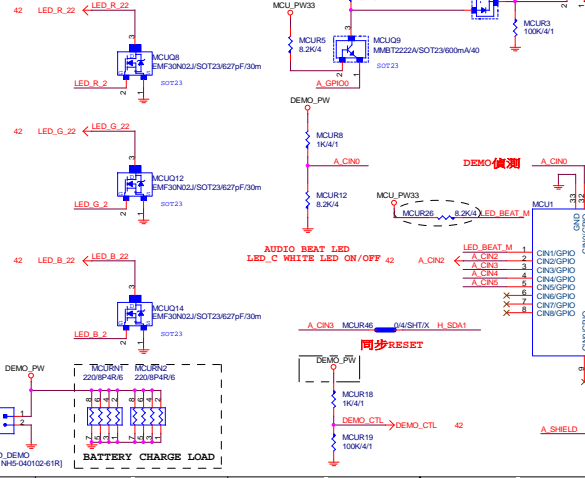
FOR PCIEX8 側發光 LED*3 (位置在PCIEX8 SLOT)



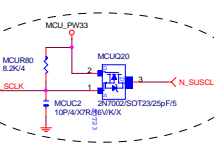
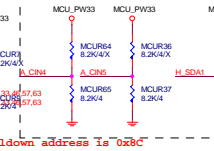
第一區 LED CONTROL



第二區 LED CONTROL



IC ADDRESS : 50



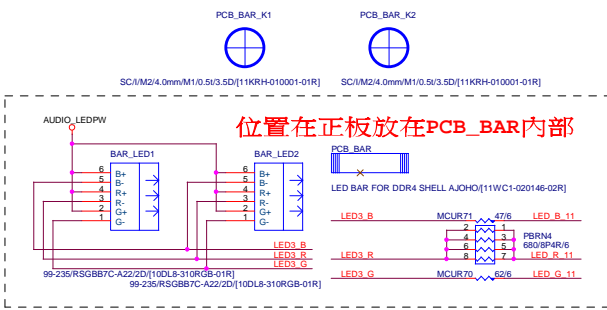
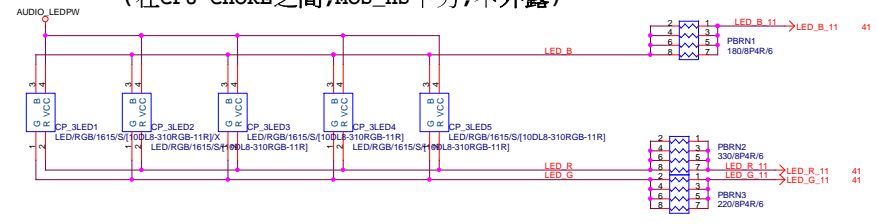
GIGABYTE
CPU/AUDIO/PCIE LED
Size: 100mm x 100mm
Date: Friday, November 15, 2016
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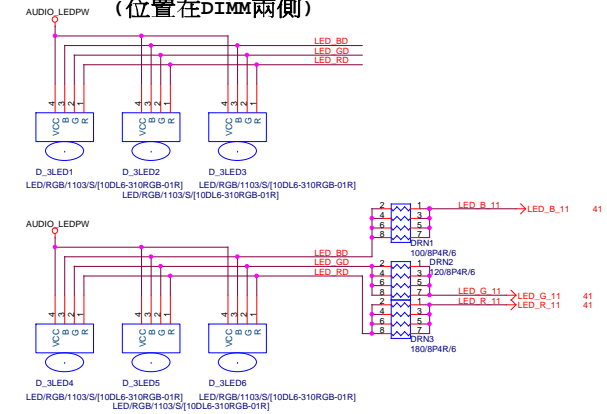
第二區 LED

Rev 0.63

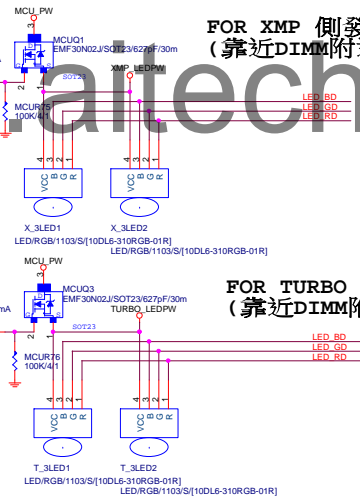
FOR CPU 正發光 LED*5
(在CPU CHOKE之間,MOS_HS下方,不外露)



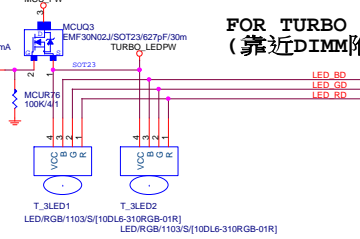
FOR DIMM 側發光 LED*6
(位置在DIMM兩側)



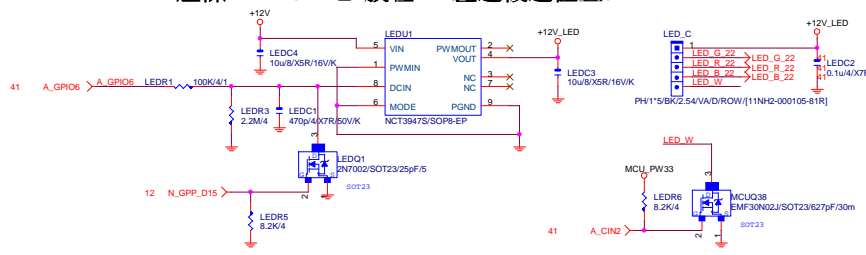
FOR XMP 側發光 LED*2
(靠近DIMM附近放背板鏤空)



FOR TURBO 側發光 LED*2
(靠近DIMM附近放背板鏤空)



FOR 燈條 LED (LED_C放在PCB左邊板邊位置)



RGB LED LAYOUT 注意事項：

1. Debug LED 文字面表示如右所示 (LED請擺在一起)
2. 背板 RGB LED 方向整板請統一如下
(整板正極可統一朝下或朝上)
3. 正板 RGB LED 統一方向即可
4. LED RGB 10PCS 以上走20mils
LED RGB 10PCS 以下空間問題可以走10mils
LED電源一律走20mils
5. MCU LED 出pin的走線4mils,如:LED_R_1,LED_G_1,LED_B_1
過晶體的走線20mils,包含過排組到LED的走線如:LED_R_11,LED_G_11,LED_B_11..
6. XMP/TURBO/G1.GAMING 側發光 LED 位置如下

Debug LED 文字面 (單色LED)

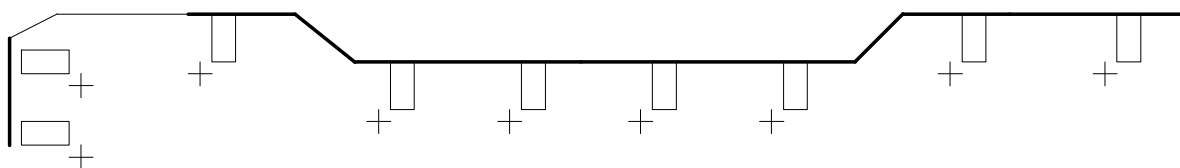
VGA CPU

BOOT DRAM

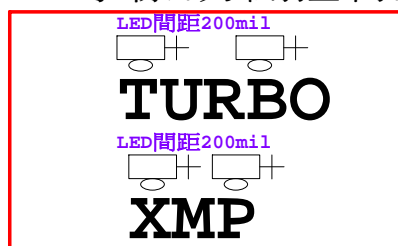
PCB板邊透光model name鏤空+背面 RGB LED



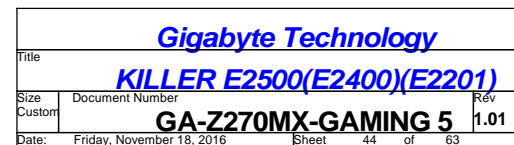
Audio Ground切割線+背面 RGB LED



"Turbo", "XMP"字樣(分開控制) 鏤空+背面 RGB側發光 LED



GIGABYTE™		
MODEL/PCB LED		
Title	Document Number	Rev
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USB_LAN CONNECTOR

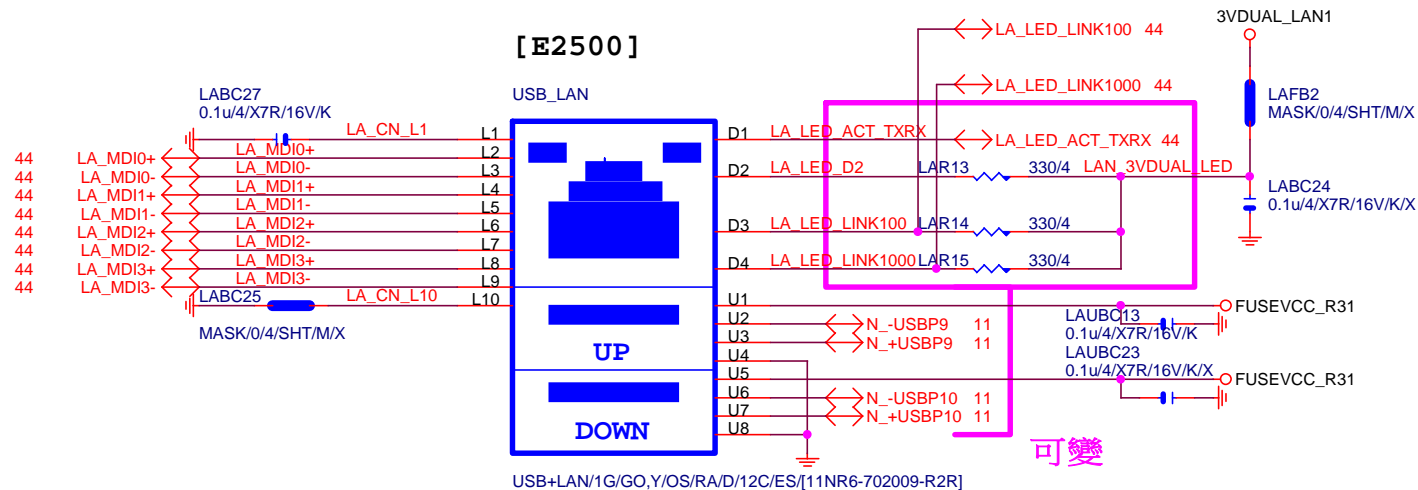
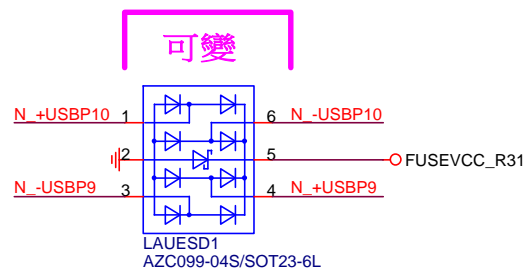
R1.06

USB_LAN CONNECTOR

note:可變更USB NAME

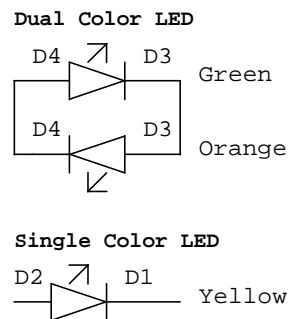
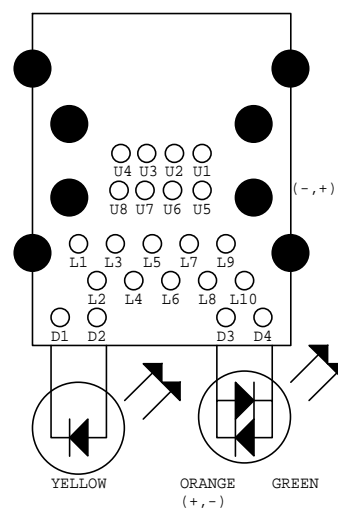
RMA ESD PROTECT

note:可變更USB NAME



LA_MDI-->100歐姆:[20/4/8/4/20]

USB_LAN LAYOUT示意圖



USB POWER

note:可變更FUSE

可變

5VDUAL ○ — FUSEVCC_R

Close to connector

USB LAN 2-Port 2.0A

FUSE-0805

LAN_COVER

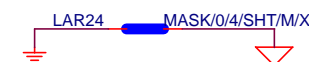
FOOT PRINT:LAN_COVER

可變 [視SPEC需求]

[視SPEC需求]

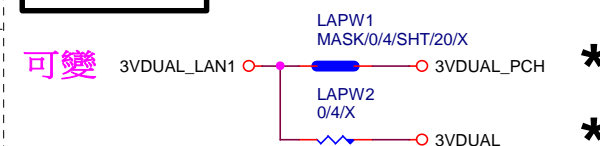
EMI SHORT PAD

PS:視EMI需求



LAN POWER

note: lan power連接及電流

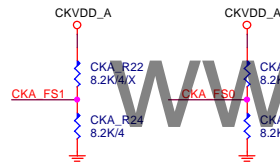
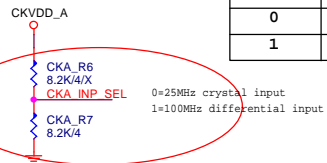
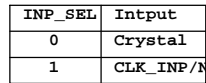
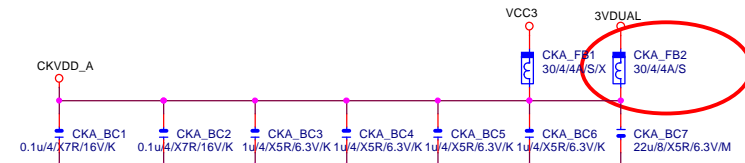


Gigabyte Technology

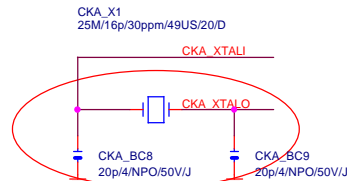
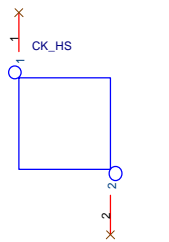
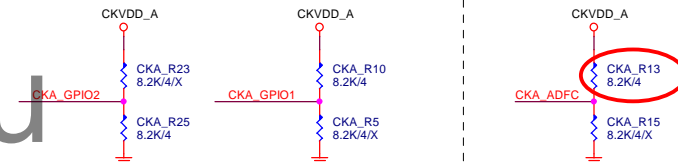
LAN CONNECTOR-E2500

Size Custom	Document Number GA-Z270MX-GAMING 5	Rev 1.01
Date: Friday, November 18, 2016	Sheet 45 of 63	

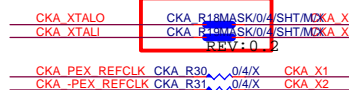
IDT6V41630



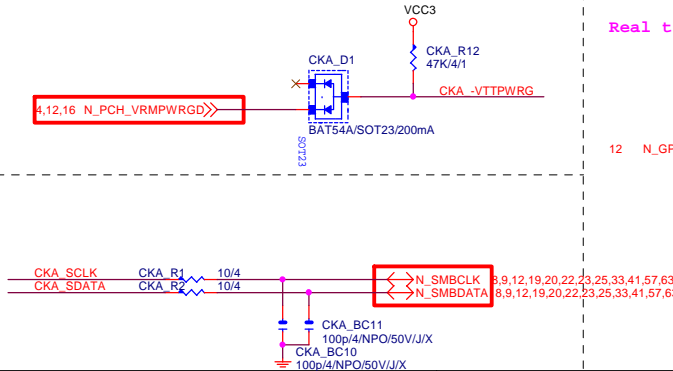
B53b1(FS1)	B53b0(FS0)	VCO (MHz)	CPU Divider	CPU (MHz)	Typ SS%	Typ SS ON/OFF
0	0	200.00	2.00	100.00	-	OFF
0	1	400.00	4.00	100.00	-	OFF
1	0	100.00	10.00	100.00	-0.50%	ON
1	1	100.00	1.00	100.00	-	OFF



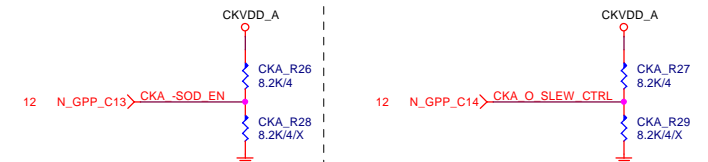
Defaults
CKX1.CKBC8.CKBC9.CKR18.CKR19 上件
CKR30.CKR31 不上件



SMBUS



Frequency change slew rate control



GIGABYTE™

Title	IDT6V41630_CLK BUFFER
-------	-----------------------

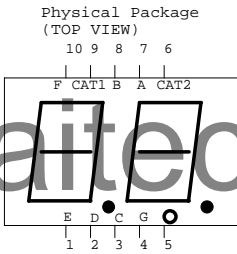
Size	Document Number	Rev
Custom	GA-Z270MX-GAMING 5	1.01
Date:	Friday, November 18, 2016	Sheet 46 of 63

*可變，依需求上件不上件。

COM PORT

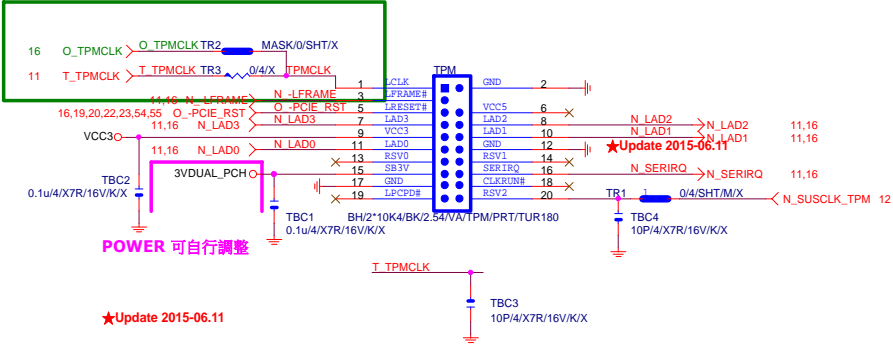
COMA

80 PORT



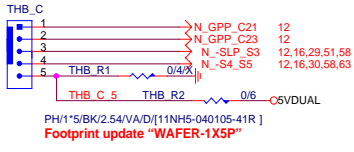
www.aitech1.ru

TPM CONNECT



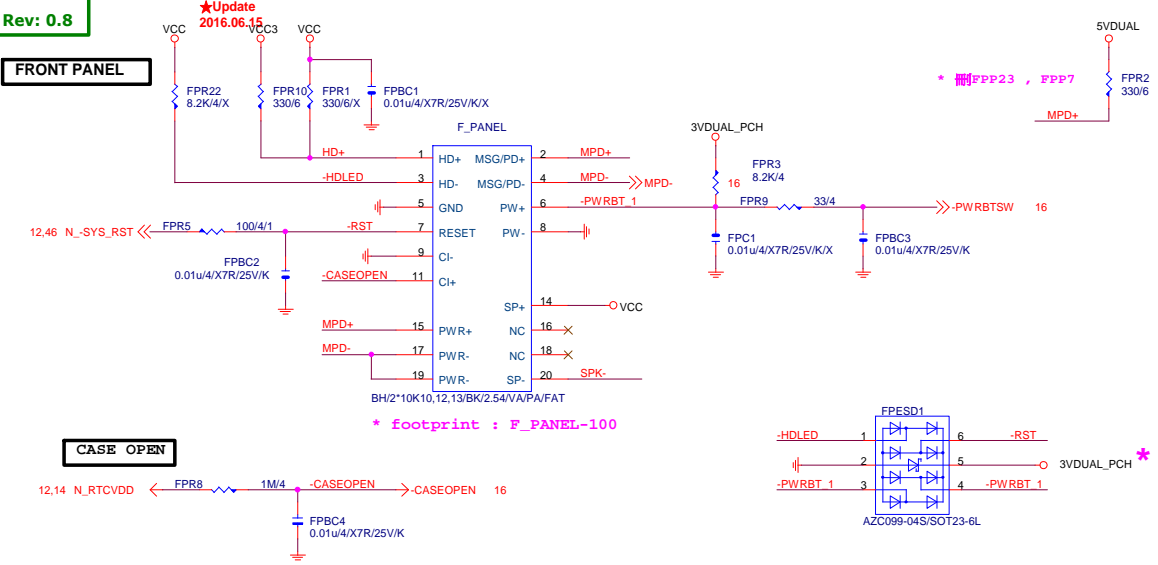
Thunderbolt

★Update 2015-12-29

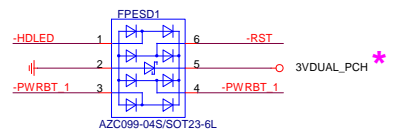
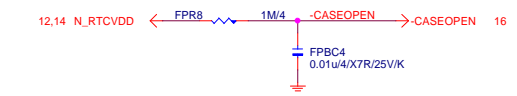


Rev: 0.8

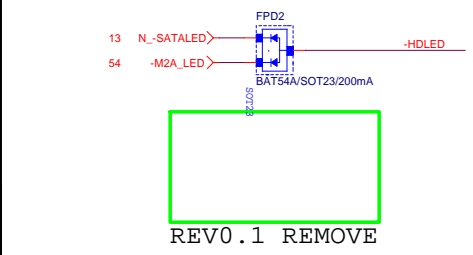
FRONT PANEL



CASE OPEN

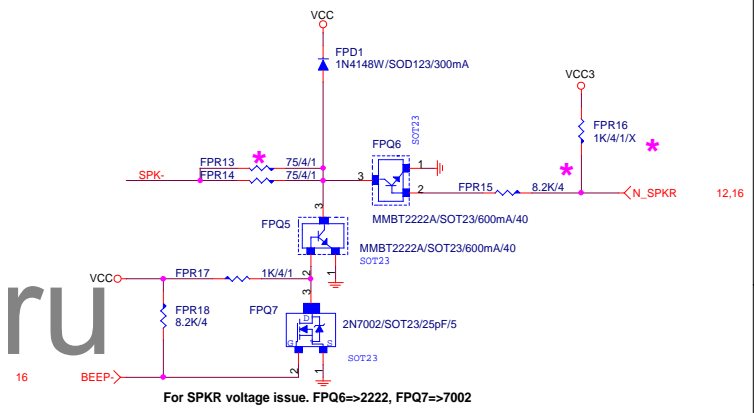


SATA LED SATALED# signal open-collector, pull-up (8.2 kΩ to 10 kΩ) to Vcc3_3



SPEAKER

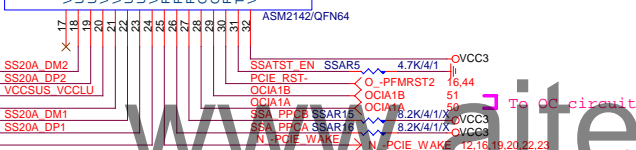
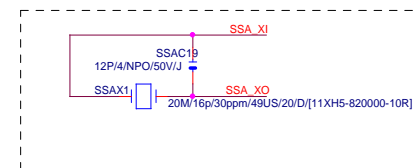
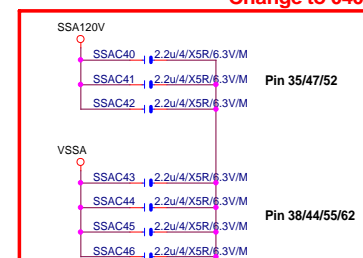
For SPKR voltage issue. FPQ6=>2222, FPQ7=>7002



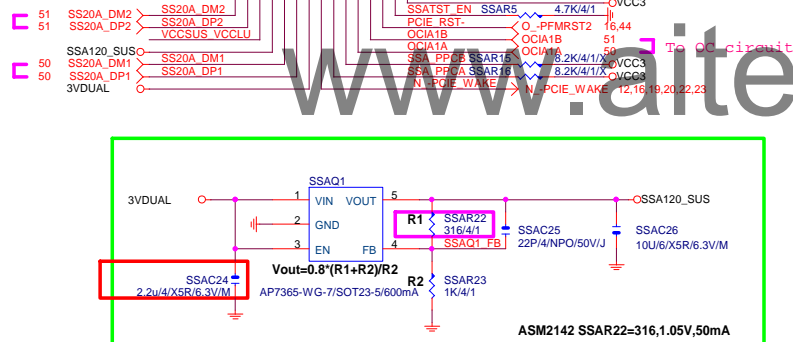
www.aitech1.ru

ASM2142 USB3.1

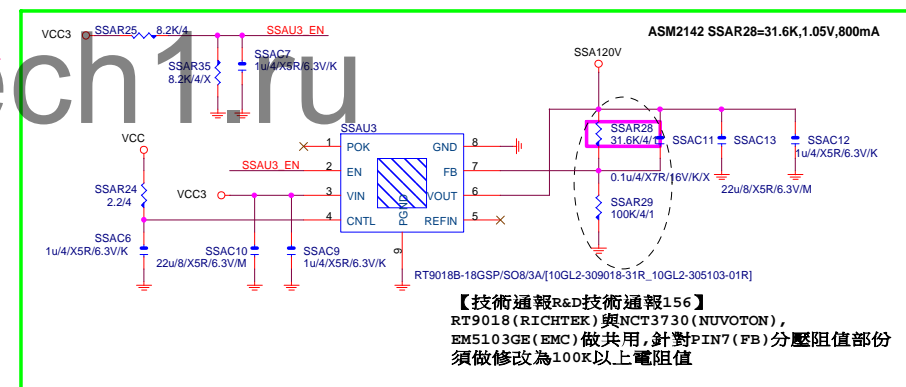
Change to 0402



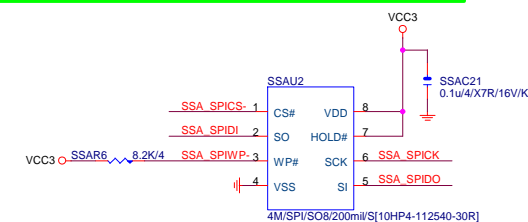
To USB Conn




ASM2142 2.5V, 300mA



【技術通報R&D技術通報156】
RT9018(RICHTEK)與NCT3730(NUVOTON),
EM5103GE(EMC)做共用,針對PIN7(FB)分壓阻值部份
須做修改為100K以上電阻值



				
Title				
<div style="text-align: center;"> ASM2142 </div>				
Size	Custom	Document Number	Rev	
		<div style="text-align: center;"> GA-Z270MX-GAMING 5 </div>	<div style="text-align: right;"> 1.01 </div>	
Date:	Friday, November 18, 2016		Sheet	49 of 63

ASM2142 USB31 Host Rev0.2

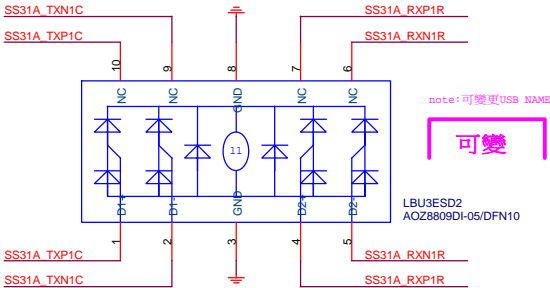
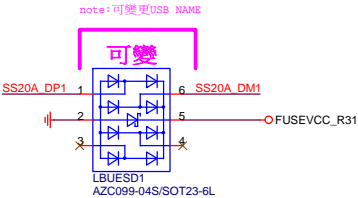
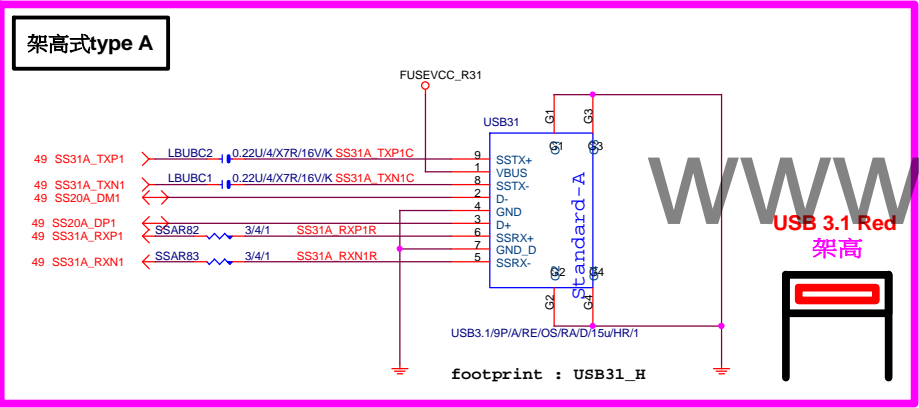
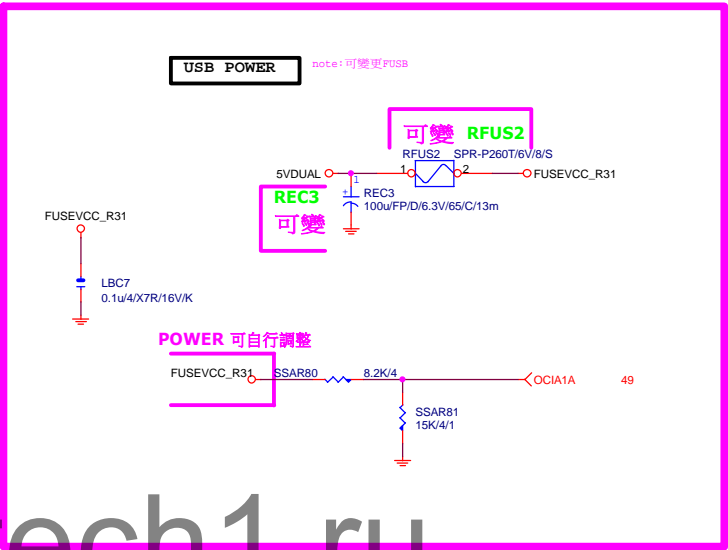
平躺式type A

後窗Rule : (後窗由左至右)
DIP電容 : REC1, REC3, REC2
FUSE : RFUS1, RFUS2, RFUS3, RFUS4...



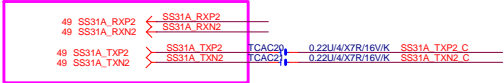
USB31 TYPE A Connector which chooses for project demand

架高式type A

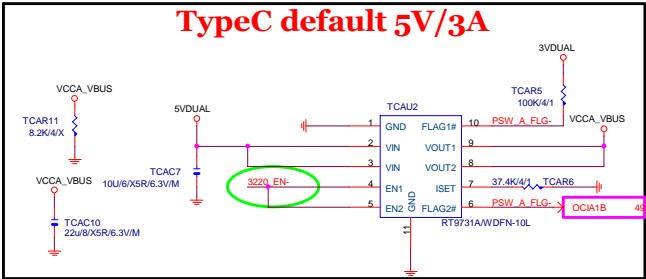
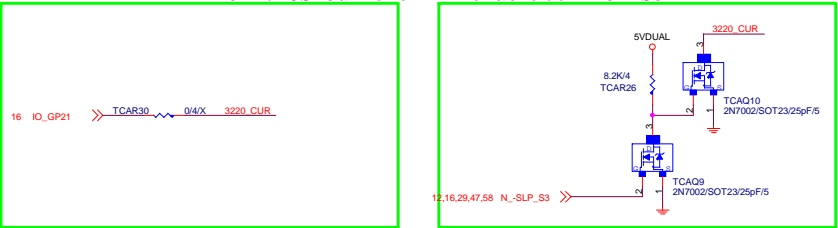


ASM2142 USB31 Host Rev0.2

USB 3.x SuperSpeed

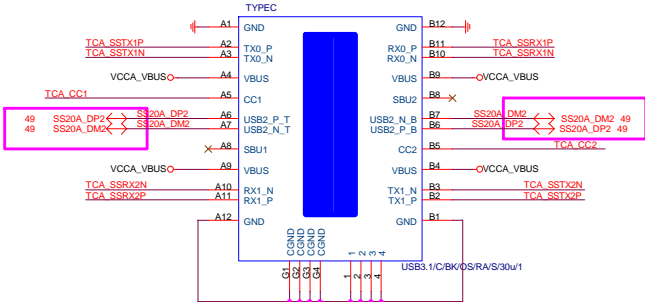


For VBUS current limit at 900mA on S3



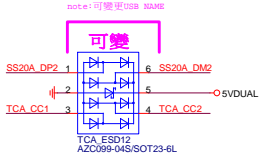
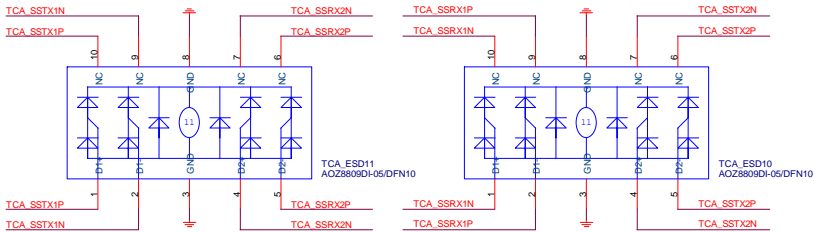
PORT
H - HOST (DFP/SOURCE)
L - Device (UFP/SINK)
NC - Dual Role (DRP)

CURRENT MODE
L - Default (900mA) / Pull down to GND or NC
M - Medium (1.5A) / Pull up to VDD 500K
H - High (3.0A) / Pull up to VDD 10K

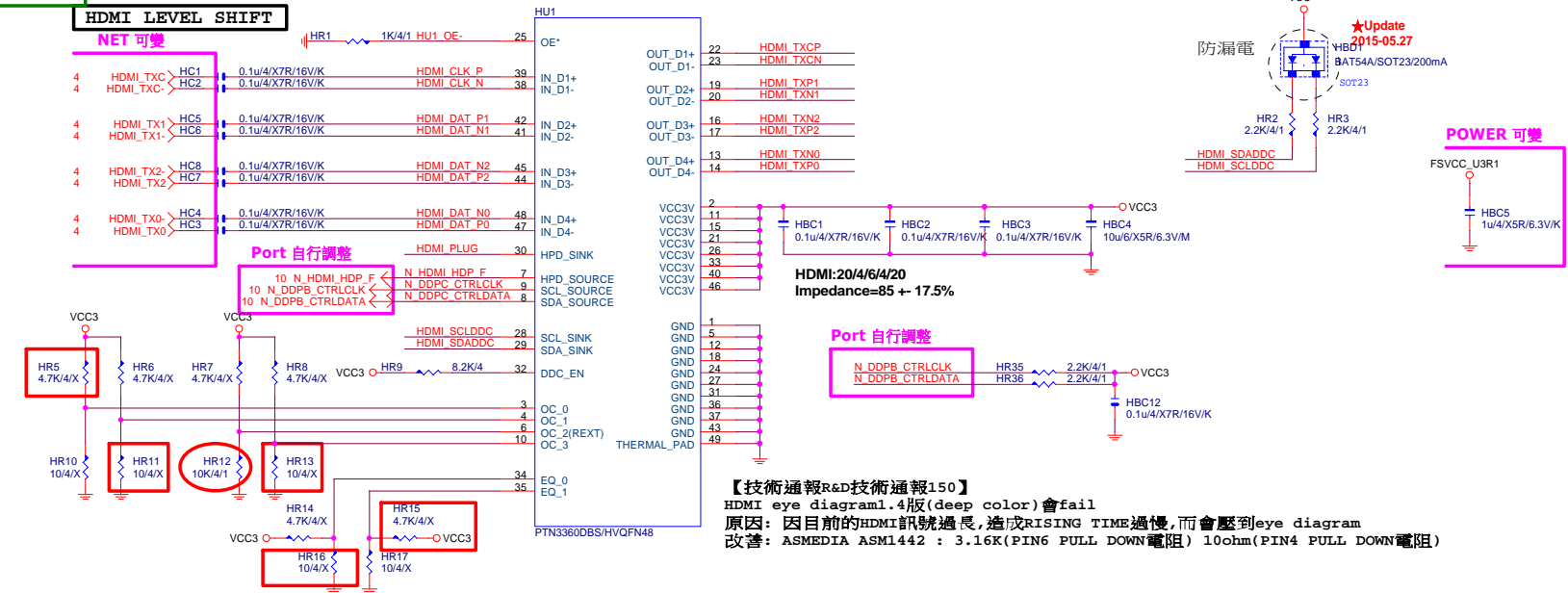


USB2.0 can be used the same source

Color markers can be changed by model

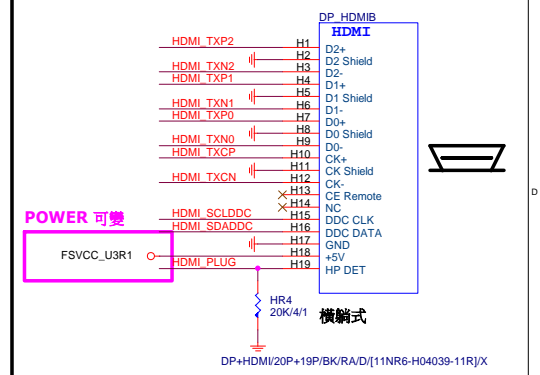


GIGABYTE™		
TI HD3SS3212		
Size C	Document Number	Rev
	GA-Z270MX-GAMING 5	1.01
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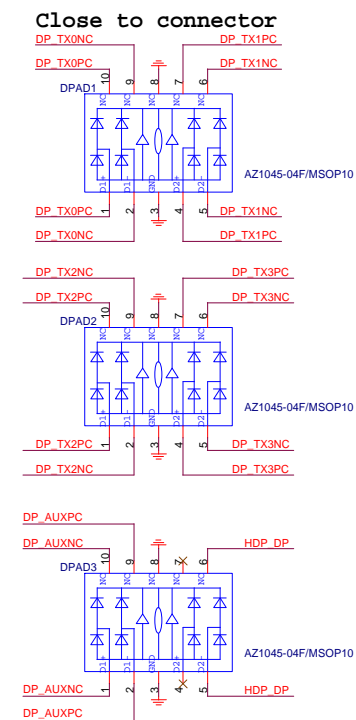
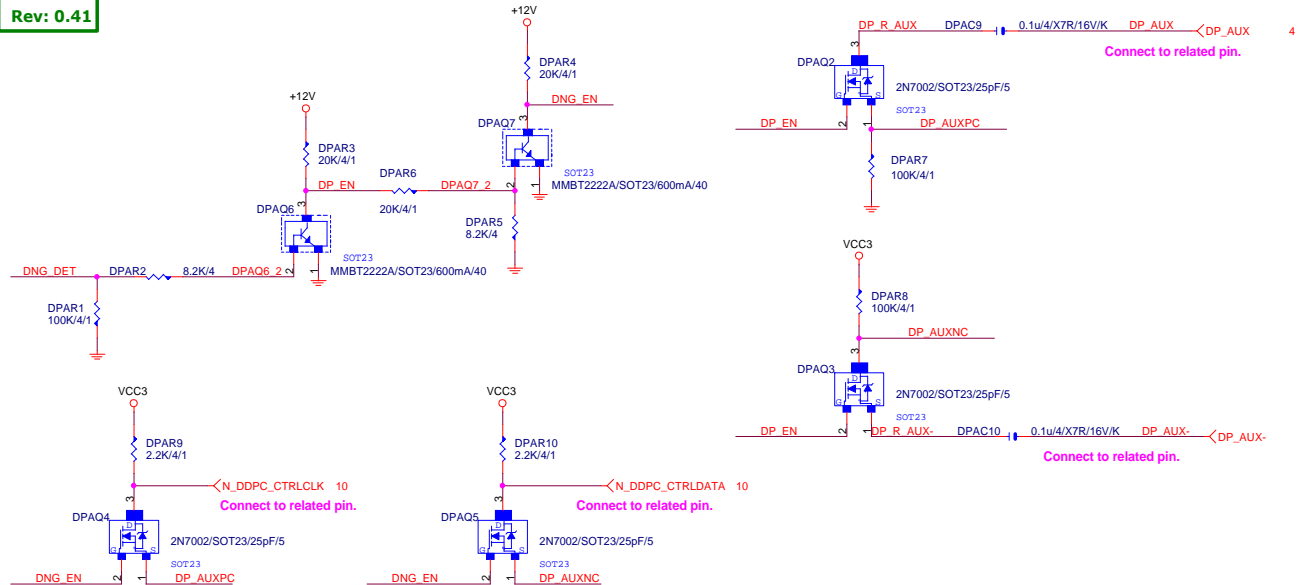


PTN3360:PIN 4/10/34/35 NC PIN,都不上值;只上HR12:10K
ASM1442:紅色框要上,HR12:3.16K

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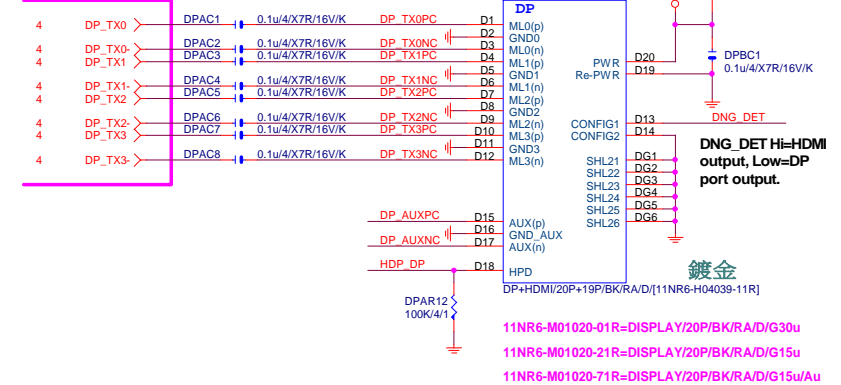
POWER 可變
FSVCC_U3R1
HBC5 1u/4/X5R/6.3V/K
HR4 20K/4/1
橫躺式
直立式
P/N:11NR6-H01019-K1R



SINGLE Display Port

Display Port with HDMI, or HDMI only.

NET FROM CPU 可變



DP

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Gigabyte Technology

DP PORT

Title	Document Number	Rev
Size	GA-Z270MX-GAMING 5	1.01
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Rev 0.6

M.2 Lane4 from PCH port12

M.2 Lane3 from PCH port11

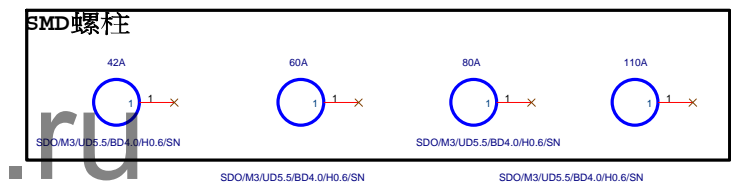
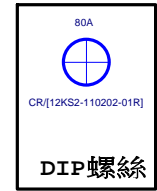
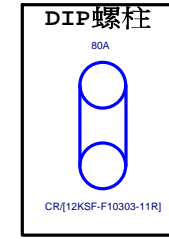
M.2 Lane2 from PCH port10

M.2 Lane1 from PCH port9

支援SATA and M.2 function

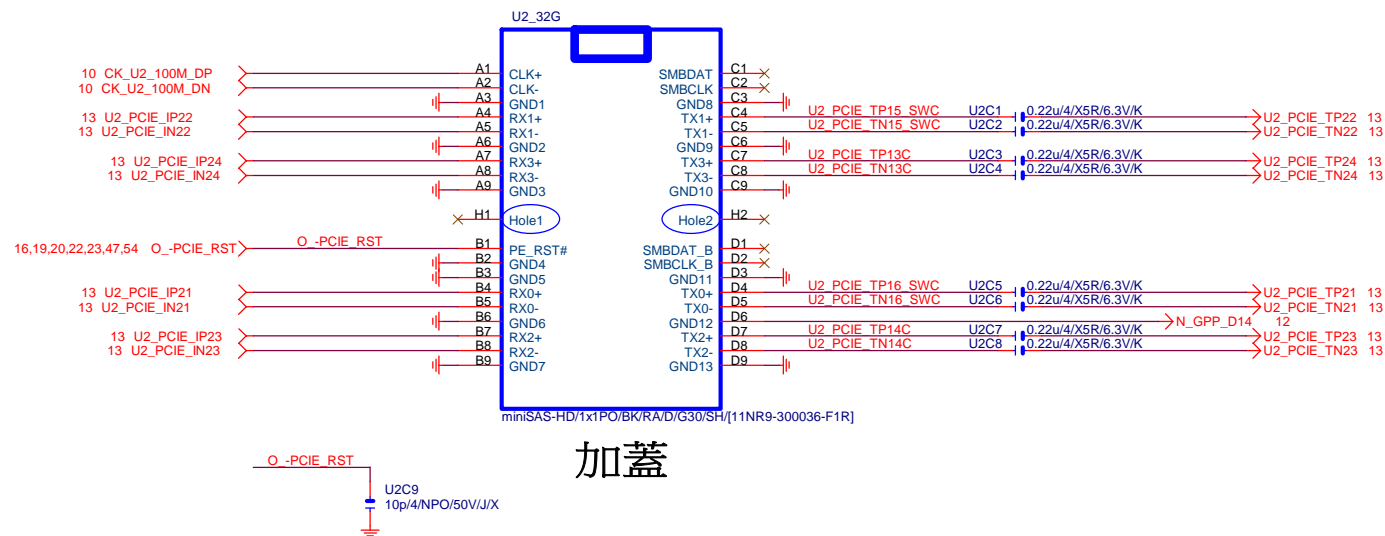
需與M2-CLKREQ對應

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GIGABYTE Technology			
M.2 X4			
Size	Document Number	Rev	
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Rev 0.3



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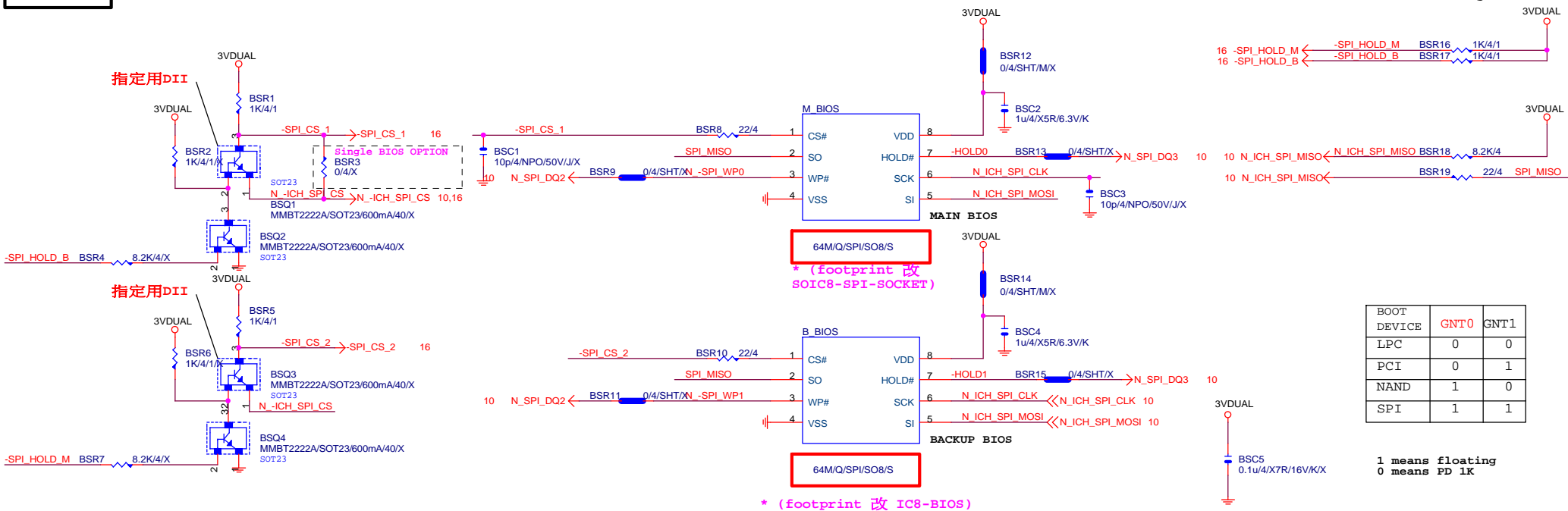
Title		
M.2 to MINISAS		
Size	Document Number	Rev
B	GA-Z270MX-GAMING 5	1.01
Date:	Friday, November 18, 2016	Sheet 55 of 63

DUAL BIOS

MOSI For DMI RX Termination Voltage

指定用DII

指定用DII



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

1 means floating
0 means PD 1K

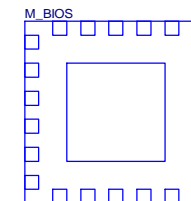
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BIOS_SW

BIOS_SW	
1	MAIN_BIOS
2	BACKUP_BIOS

SB:Single BIOS

Disable
Enable



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

* 試産先上, PVT 移除

Gigabyte Technology

Title BIOS		
Size Custom	Document Number	Rev 1.01
GA-Z270MX-GAMING 5		
Date: Friday, November 18, 2016	Sheet 56 of 63	

USB_DAC_A

REV:0.1

F_USB30_1

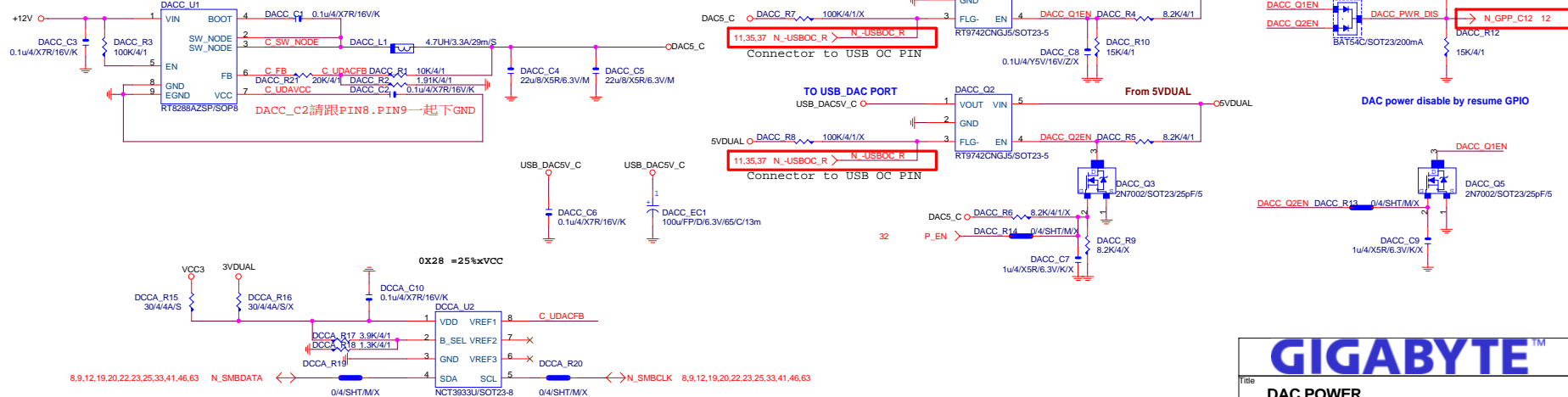
USB_DAC_B

F_USB30_2

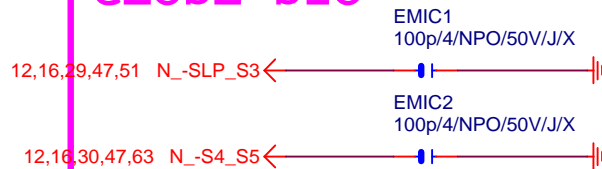
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USB_DAC_C

KB_MS_USB0



CLOSE SIO



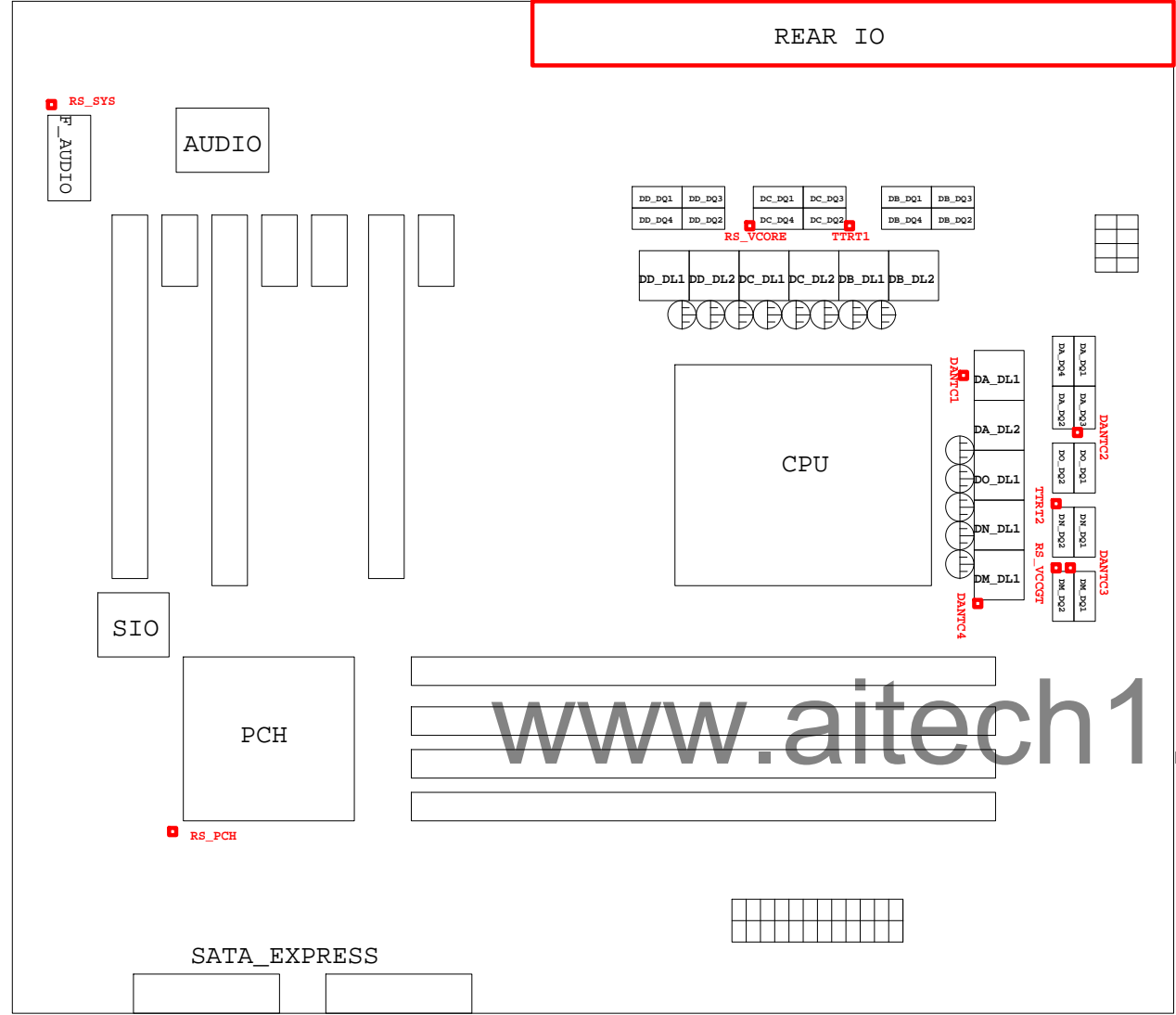
CLOSE PCH



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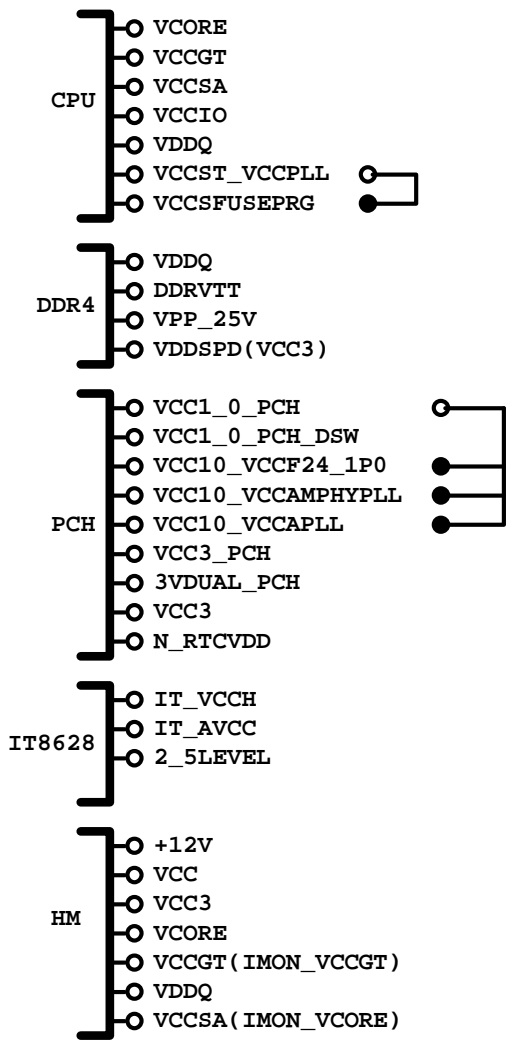
GIGABYTE™

Title			EM/ESD		
Size A	Document Number				Rev
	GA-Z270MX-GAMING 5				1.01
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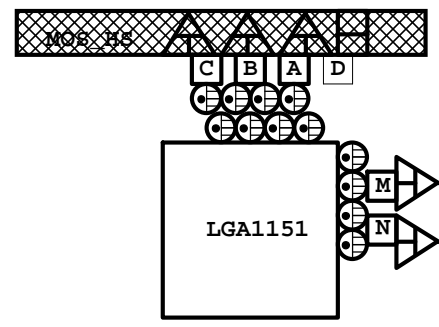
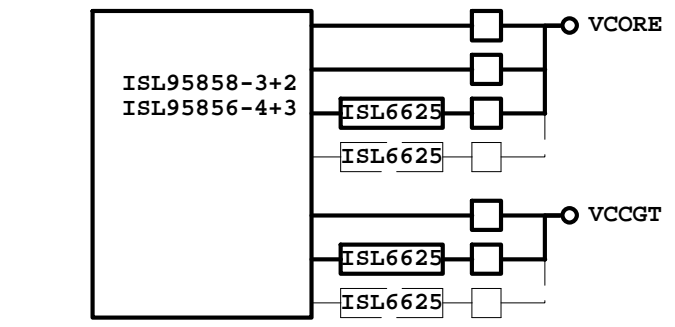


熱敏電阻	擺放靠近位置	走線方式
DANTC1	DA_DL2	Differential
DANTC2	DA_DQ3	Differential
DANTC3	DM_DQ2	Differential
DANTC4	DM_DL1	Differential
RS_VCORE	DC_DQ4	N/A
RS_VCCGT	DM_DQ2	N/A
TTRT1	DC_DQ2	N/A
TTRT2	DN_DQ2	N/A
RS_PCH	PCH	N/A
RS_SYS	F_AUDIO	N/A

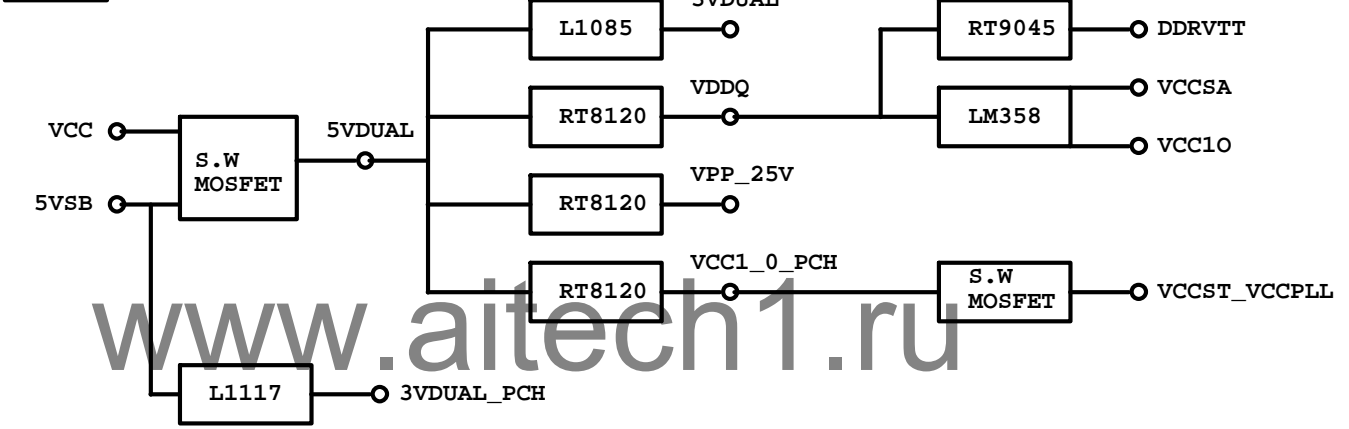
POWER BLOCK MAP



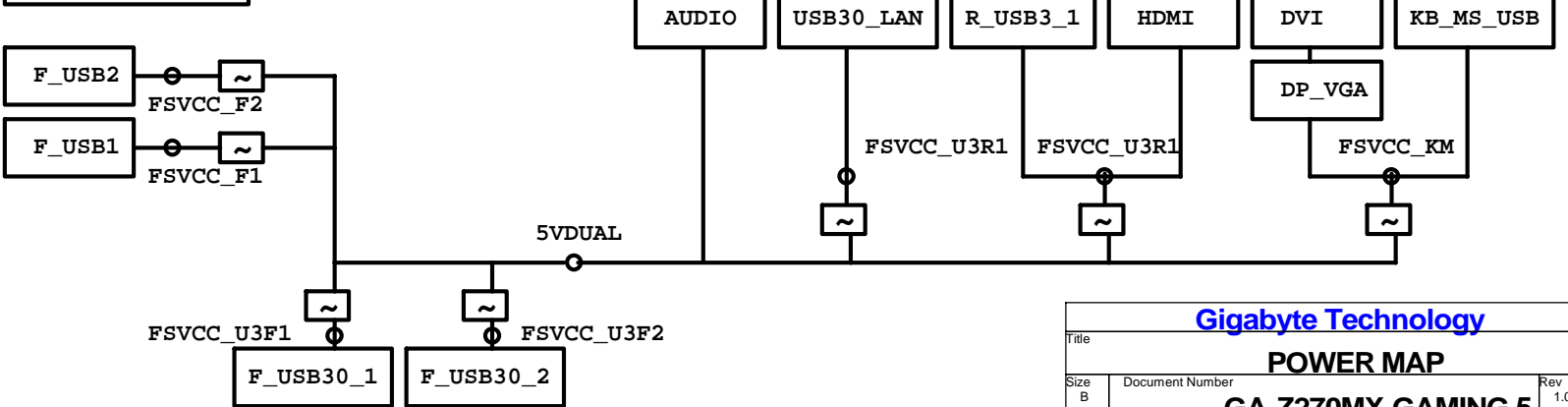
VCORE/VCCGT



POWER



FUSE POWER F/R



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	閃電P
DIP	11LC5-M4500C-11R	0.5uH/40A/IMD109/M/NP/D	10*10	CHOKE05U-40A-1PQ-3	無閃電P
DIP	11LC5-M2500C-01R	0.5uH/20A/IMD0809/M/D	8*8	CHOKE1U-R50M-IF	

Skylake Iron Choke閃電P導入機種如下:
[1] Z170/H170 機種全部導入
[2] B150/H110Gaming機種導入, 其餘不導入

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	10LC5-F4300C-01R	0.3uH/40A/SIUC/FR/S	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
PWM	RT8237C/D	10TA1-608237-01R		IC10DFN-NIS5132

REGULATOR

		料號	Capture Value	Footprint
	NCT3103S	10GL2-203103-01R	NCT3103S/SOP8/2A	IC8-EP50IC

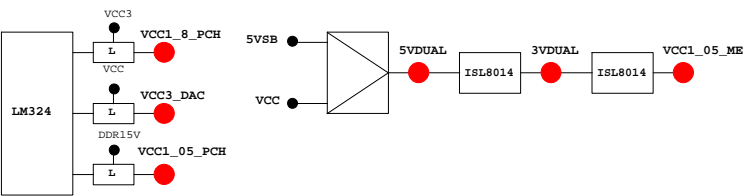
GIGABYTE™			
Title RT8120_DDR4 POWER			
Size Custom	Document Number GA-Z270MX-GAMING 5		Rev 1.01
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PCH GPIO LIST TABLE					
PIN NAME	PWR	Default	USAGE	NOTE	
GP0	MAIN	H-Z	GPI	GPIO0	N/A
GP1/TACH1	MAIN		GPI	GPIO1	N/A
GP2/PIRQE#	MAIN		GPI	-PIRQE	P/U 8.2K 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

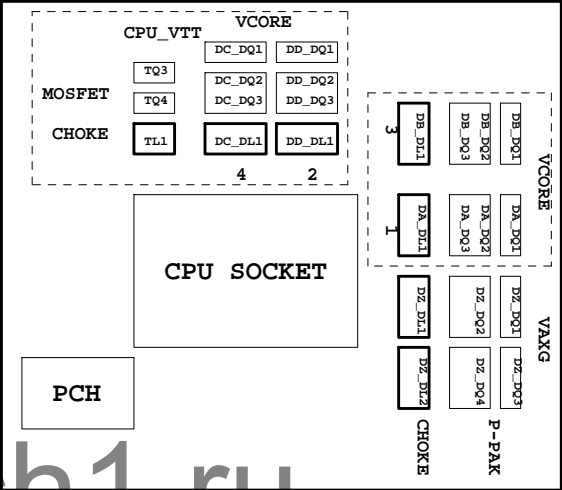
Super I/O ITE8720 GPIO Table

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	
VID05/GP27/SIN2	LOW_PWR_2	
PCIRST2#/GP11	-PWRST1	
PCIRST1#/GP12	-PWRST2	
3VBSBW#/GP40	CSI_F0	BSEL166_1
SUSC#/GP53	CSI_F1	BSEL166_2
GP23/SI	BSEL166_3/CSISBSL	
VID00/GP20/CTS2#	CPUT_LED1_C	BSEL166_4
GP65/VDDA_EN/GB_01	MB_ID2	
PD6/GP76/BUSS01	MB_ID3	
PD7/GP77/BUSS02	MB_ID4	
AFD#/GP86/SMBC_R	SEC_PIN	FST_2X8
INIT#/GP85/SMBD_M	SEC_2x8	GTLREF_AD2
ACK#/GP83	DDR_LED1_C	
VID01/GP21/DCD2#	DDR_LED2_C	
STB#/GP87/SMBC_M	DDR_LED3_C	
PWRON#/GP44	VCORE_OV1	
PANSWH#/GP43	PWRBTSW	
KDAT/GP61	-PWRBTSW	
KCLK/GP60	KDAT	
MDAT/GP57	KCLK	
MACL/GP56	MDAT	
GP66/VLDT_EN/GB_02	NBT_LED1_C	MCLK
SVD/PCIRSTIN#/CIRTX/GP15	PWM2_CR	
KDAT/GP61	PWM2_CR	
GP67/CPU_PG/GB_03	EN_LOADLINE	IT_GP67/-EN_PWM2
SLIN#/GP84/SMBD_R	-EN_PWM2	
PSI_L/FAN_CLT5/CIRRX2/GP16	-THERM	
VID04/GP26/SOUT2	DDR18V_PH2_EN	
VID02/FAN_TAC5/GP24/DSR2#	DDR18V_LED	
VID06/GP17/RI2#	1_1V_PH_EN	
VID07/JP6/DTR2#	JP6	
PD5/GP75/BUSS00	SB_LED3_C	



PWM各相位的擺法如下：



BIOS超電壓對應表

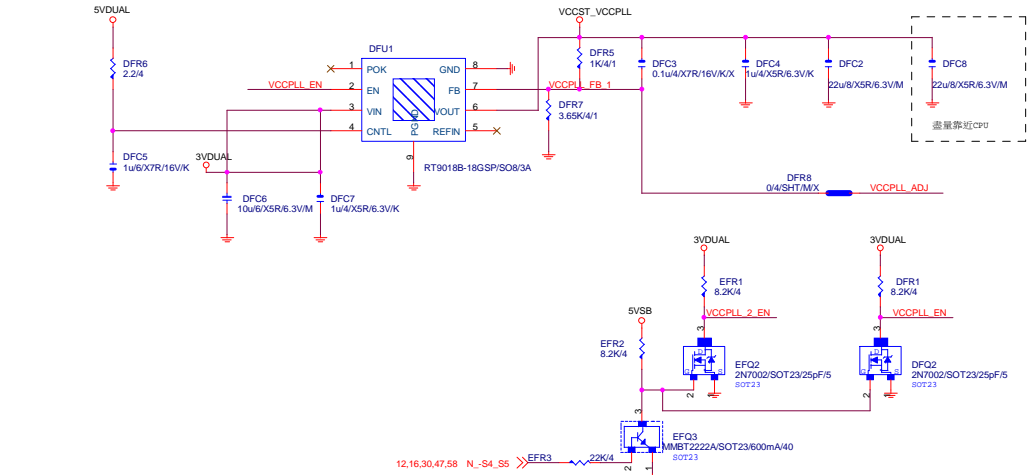
線路圖名稱	BIOS選項
Vcore	CPU Vcore
CPU_VTT	CPU Termination
CPU_VAXG	CPU Graphic Core
VCC1_8_PCH	CPU PLL
VCC1_05_PCH	PCH core
3VDUAL	3VDUAL
DDR15V	DRAM voltage
DDRVTT	DRAM Terminatio
VREF_CA_A/VREF_CA_B	DRAM Address Ref
VREF_DQ_A/VREF_DQ_B	DRAM Data Ref

散熱模組料號：

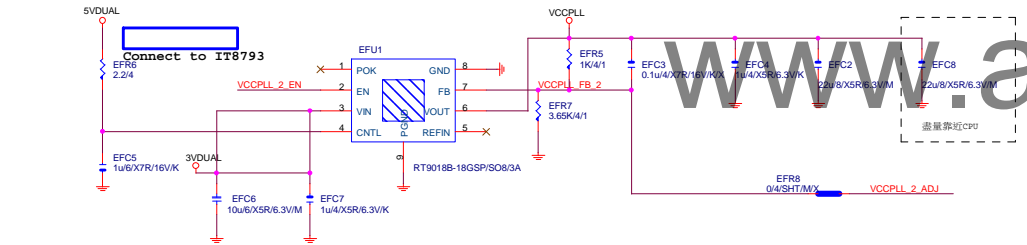
Z77-D3H :
PCH :
12SP2-S05511-01R/02R/03R
MOSFET :
12SP2-S08924-01R/02R/03R

	3 pin FAN control	4 pin FAN control	FAN speed	Controller
CPU FAN	FANPWM1	FANPWM3	FANIO1	IT8720
	ICH_FAN_PWM2	ICH_FAN_PWM0	ICH_FAN_TACH0	PCH
SYS FAN	FANPWM2	N/A	FANIO2	IT8720
	ICH_FAN_PWM1	N/A	ICH_FAN_TACH1	PCH
PWR FAN	N/A	N/A	FANIO3	IT8720
			ICH_FAN_TACH2	PCH

VCCST_VCCPLL 替換原先MOS開關線路



VCCPLL



VCCPLL_OC

