

SHEET

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SHEET

TITLE

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37	CNV_i_M2_WIFI
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45	LAYOUT_RULE
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48	D_LED
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50	HDMI_CONN
51	F_PANEL
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55	VCORE_PStage-2
56	VCORE_PStage-3
57	VCCSA_VCCIO-IRON-Z系列
58	CPU_POWER-Z系列
59	RT8120_DDR_CHOKE-IRON-2L
60	RT8120_VPP_CHOKE-IRON
61	RT8120_PCH-CHOKE
62	DISCRETE_POWER
63	NCT3933
64	CEC_Logic_IT5211
65	VCCGT_PPAK

Gigabyte Technology

Title			
Cover Sheet			
Size	Document Number	Rev	
Custom	Z390 AORUS Elite	1.0	
Date	Friday, August 10, 2018	Sheet	1 of 65

Model Name: Z390 AORUS Elite

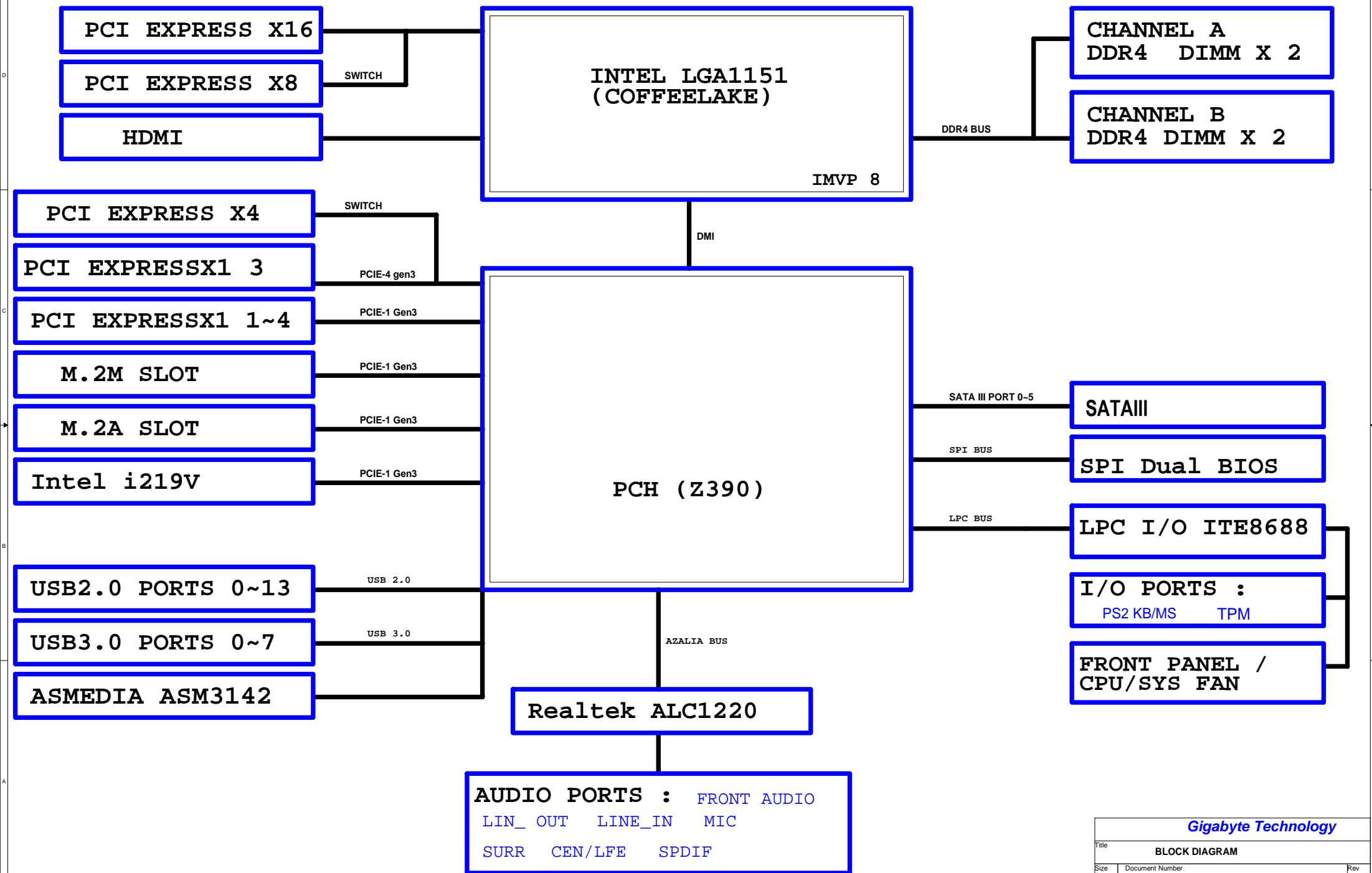
Component value change history

Data	Change Item	Reason
2018/04/26	First Release	9MZ39ARS-00-01
2018/06/25	1. 修改 power to 12+1 DR. MOS	9MZ39ELT-00-01
2018/08/01	1. 0ohm改0ohm short pad 2. Add WD1,WD2 3. Remove CNVI 4. LED_C1&LED_C2改PH1X4	9MZ39ELT-00-10A
2018/08/01	1. Re-Driver change Rev B 2. PCH change to -30R 3. Add U31AR7,U31AR9 for Re-Driver RX 4. PWM ISL69138IRAZ-T-C14 INTERSI to ISL69138IRAZ-T-C28 5. Remove OR84,OR171,OR212漏電issue 6. PCB remove 精成,add 勝宏	9MZ39ELT-00-10B

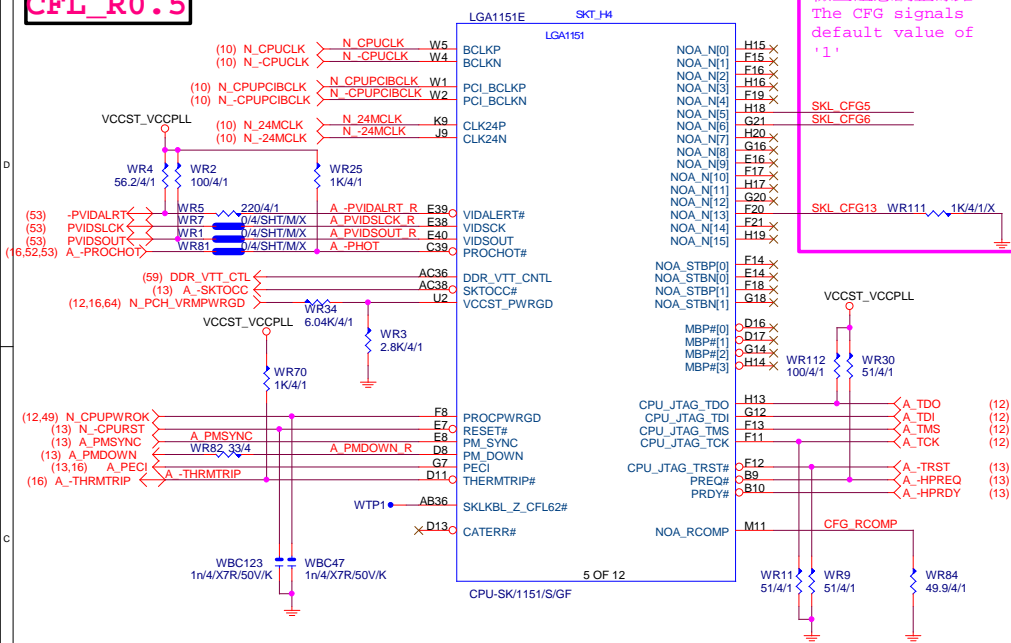
Circuit or PCB layout change

DATE	Change Item	Reason
2018/03/19 Rev 0.1	1. 由Z390 AORUS PRO Rev 0.1修改	
2018/06/19 Rev 0.1	1.修改M.2 SMBUS線路 2.Add Oq18 3.OBC2、OBC15、BSC2、BSC4、PWF_C5 to 0201 0.47UF 4.Add OR112、OR113、OR114 5.Del OR19、OR20、OR21、OQ14、OQ15、OR205 6.Update PCH 模組線路 7.Update SIO模組線路 8.Update panel模組線路 9.Update LED 模組線路 10.Update power模組線路 11.FAN +12V電容改0603 12.PWM change to 12 phase DR.MOS 13.F_USB30C rename to F_USB31C 14.0.3uH choke footprint change to CHOKEL1X8MM-SMD-1 15.PWM change to 12 phase DR.MOS 16.Add DM1_DR11 17.ADD OD1 18.Model Name 改為Z390 AORUS Elite Rev 0.1	
2018/08/01 Rev 1.0	1.由Z390 AORUS ELITE Rev 0.1來修改 2.Add NR4 3.Add WD1,WD2 4.F_USB31C 改為F_USB30C 5.CNVI_WIFI footprint改為WIFI-EKEY-MODULE-1 6.LED_C1&LED_C2改為Footprint PH1X4-ROW-L 7.Delete MCUQ38 8.CECU1 改MASK 9.部分0ohm 改 0ohm short pad	

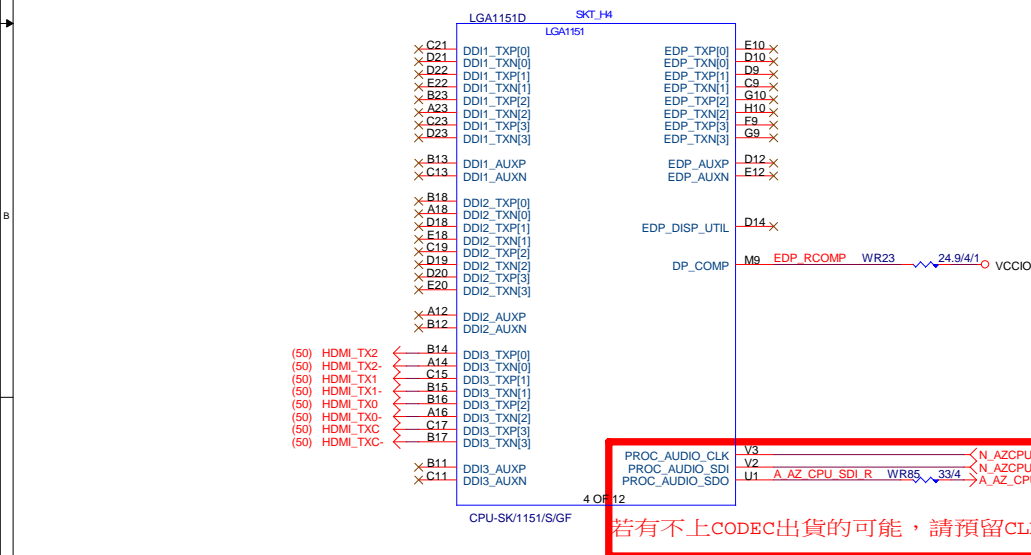
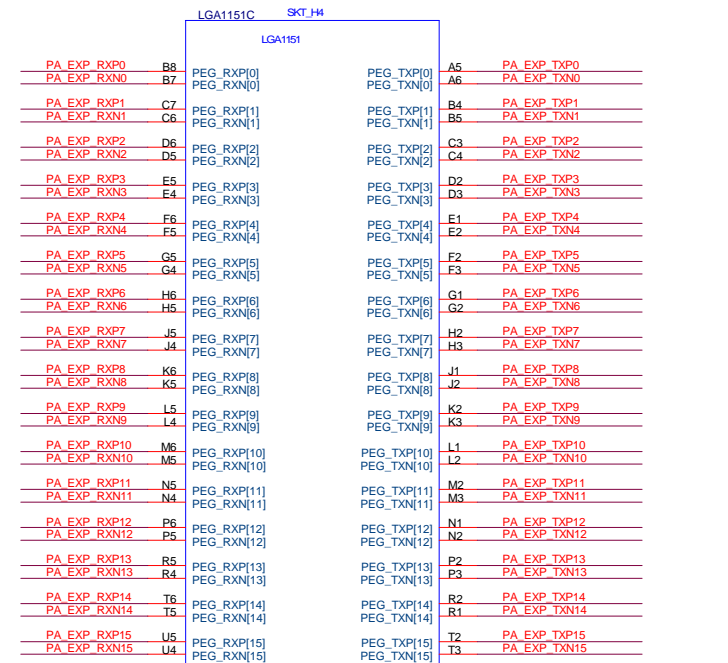
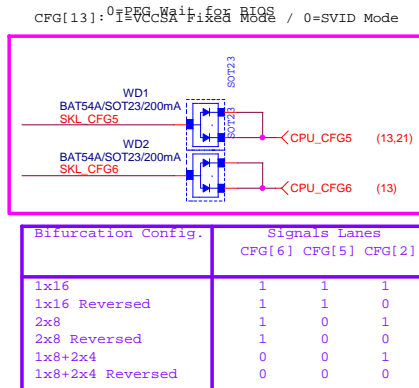
# BLOCK DIAGRAM



## CFL\_R0.5

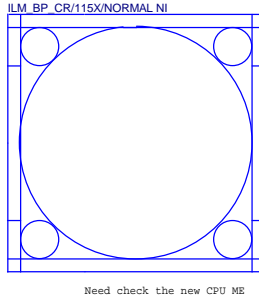
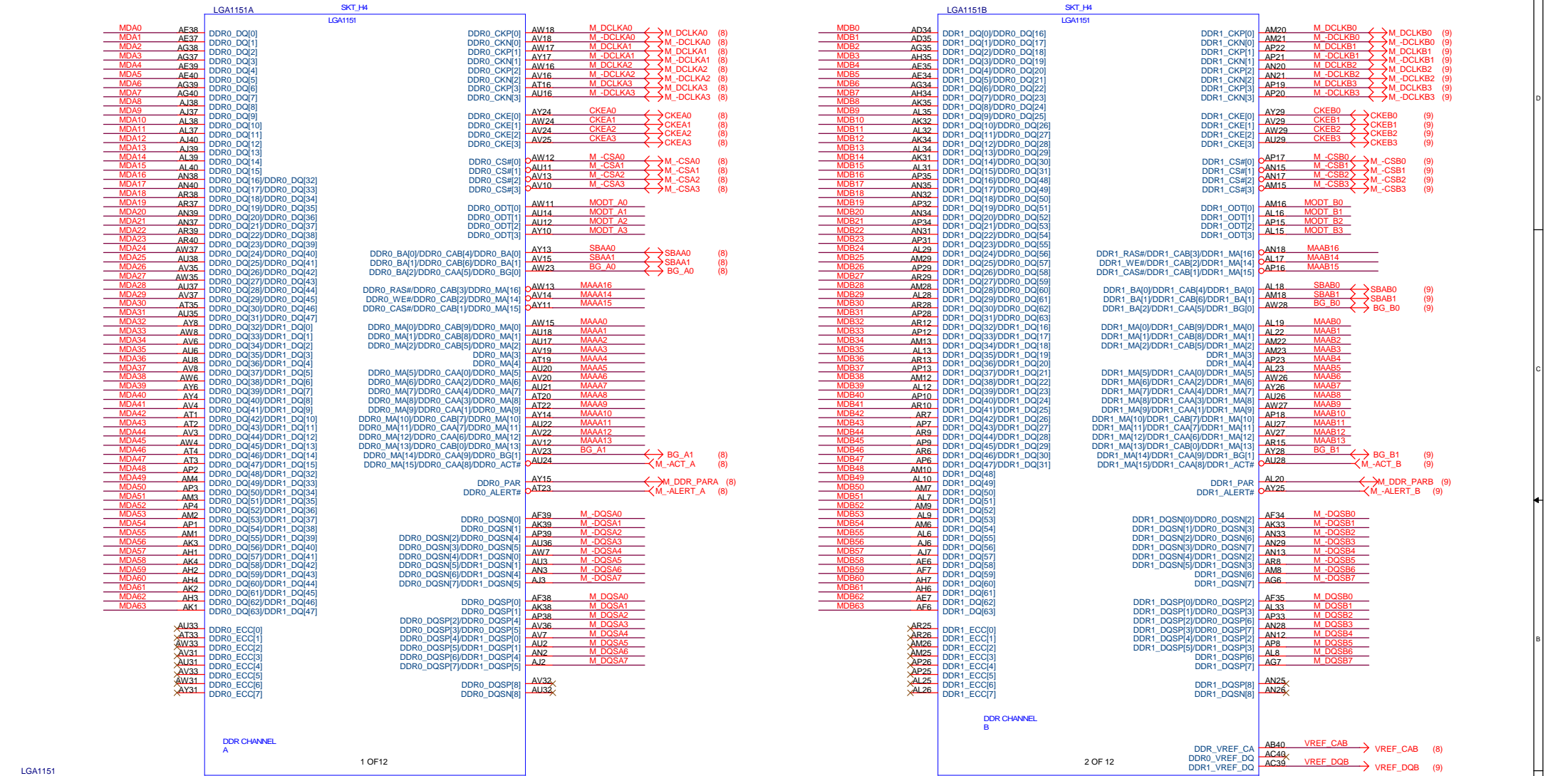


檢查組態調整線路  
The CFG signals  
default value of  
'1'



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



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

**Gigabyte Technology**

Title  
**CPU LGA1151-B**

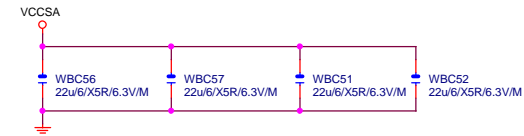
Size  
Custom

Document Number  
**Z390 AORUS Elite**

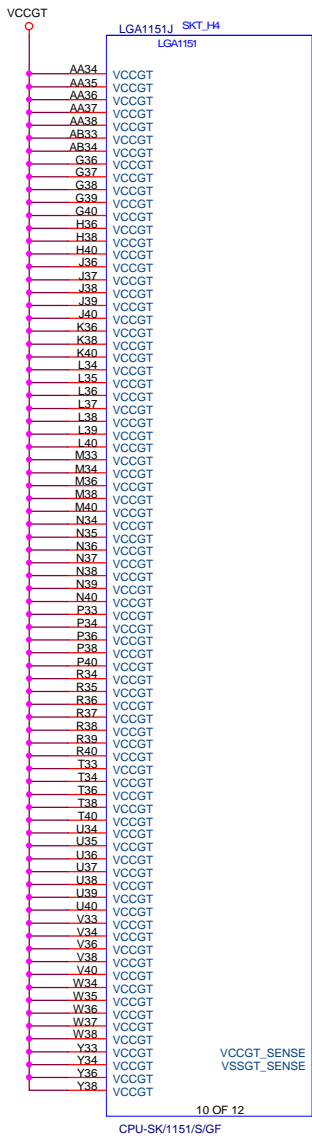
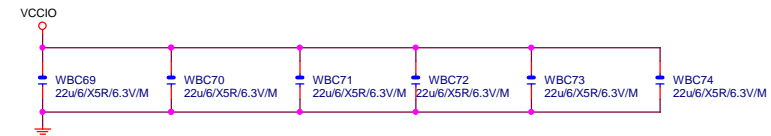
Date: Friday, August 10, 2018

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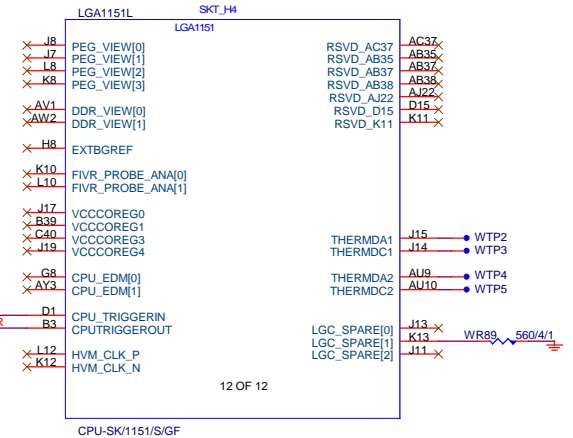
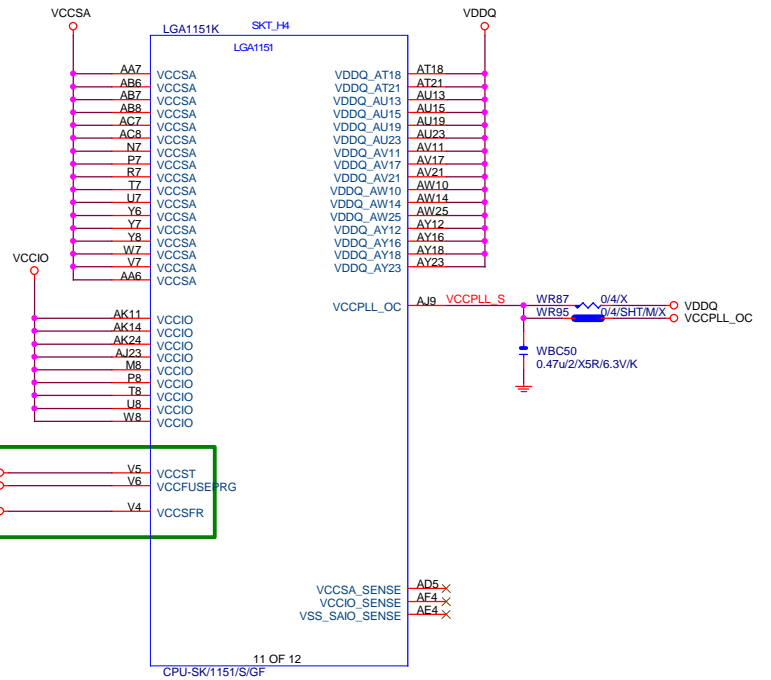
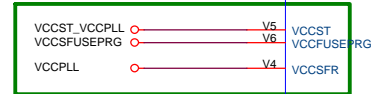
Rev  
**1.0**

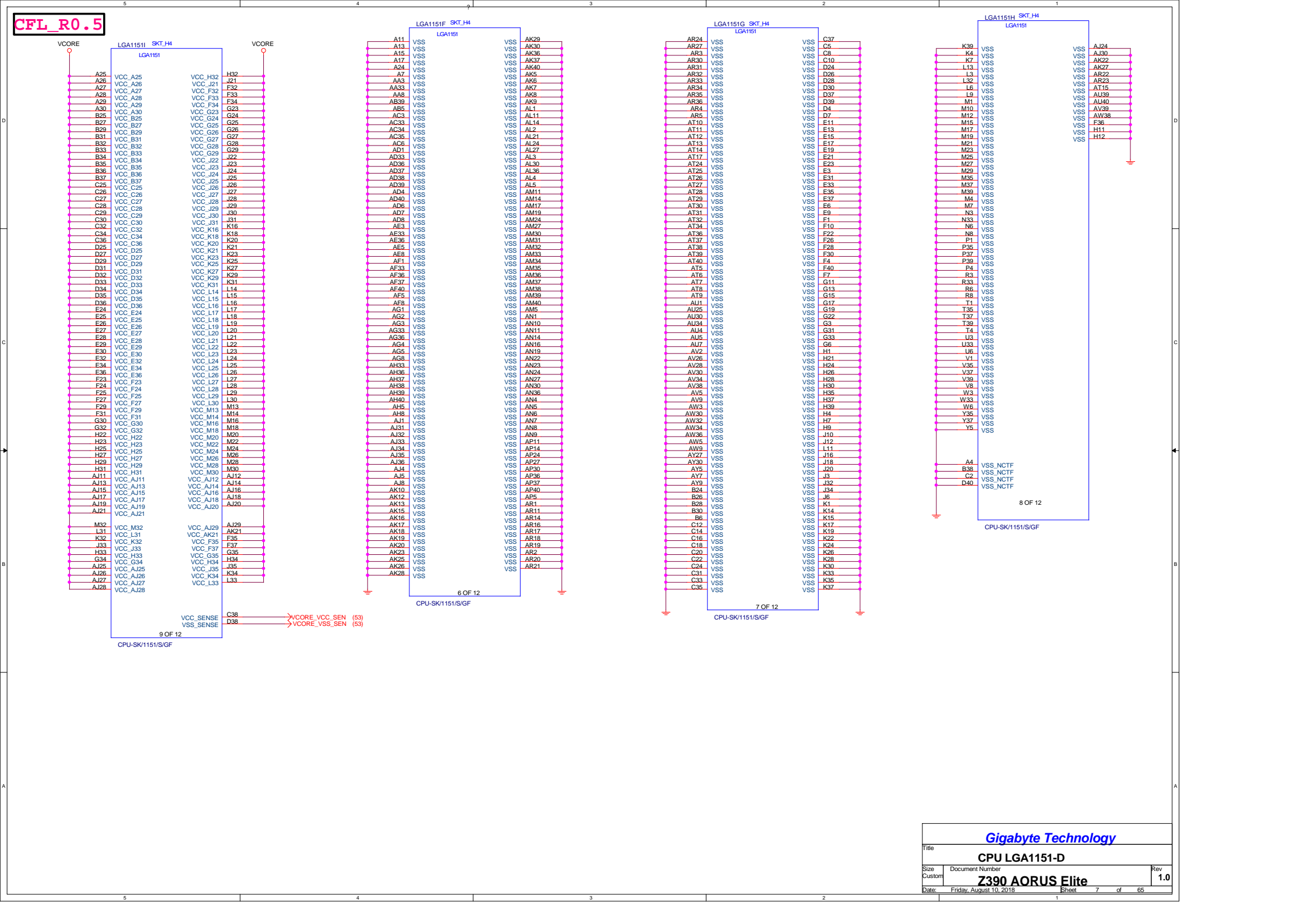


CPU POWER

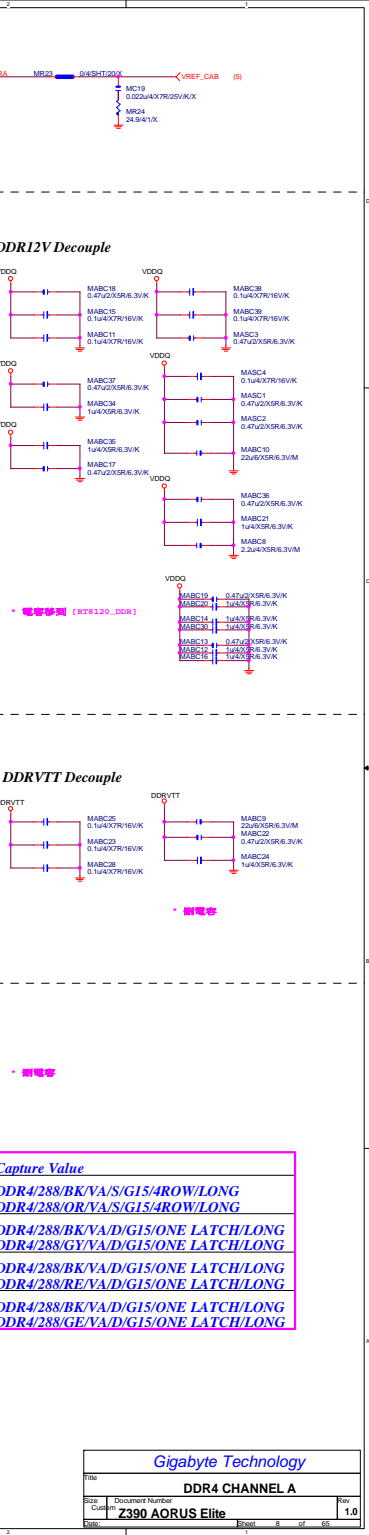
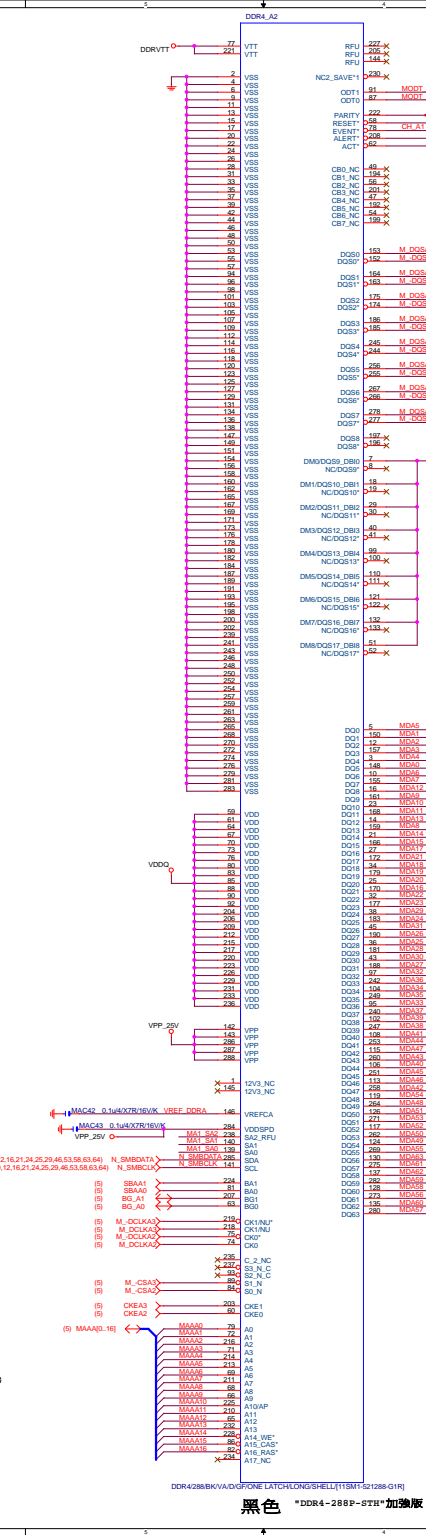


CPU POWER

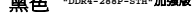
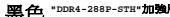




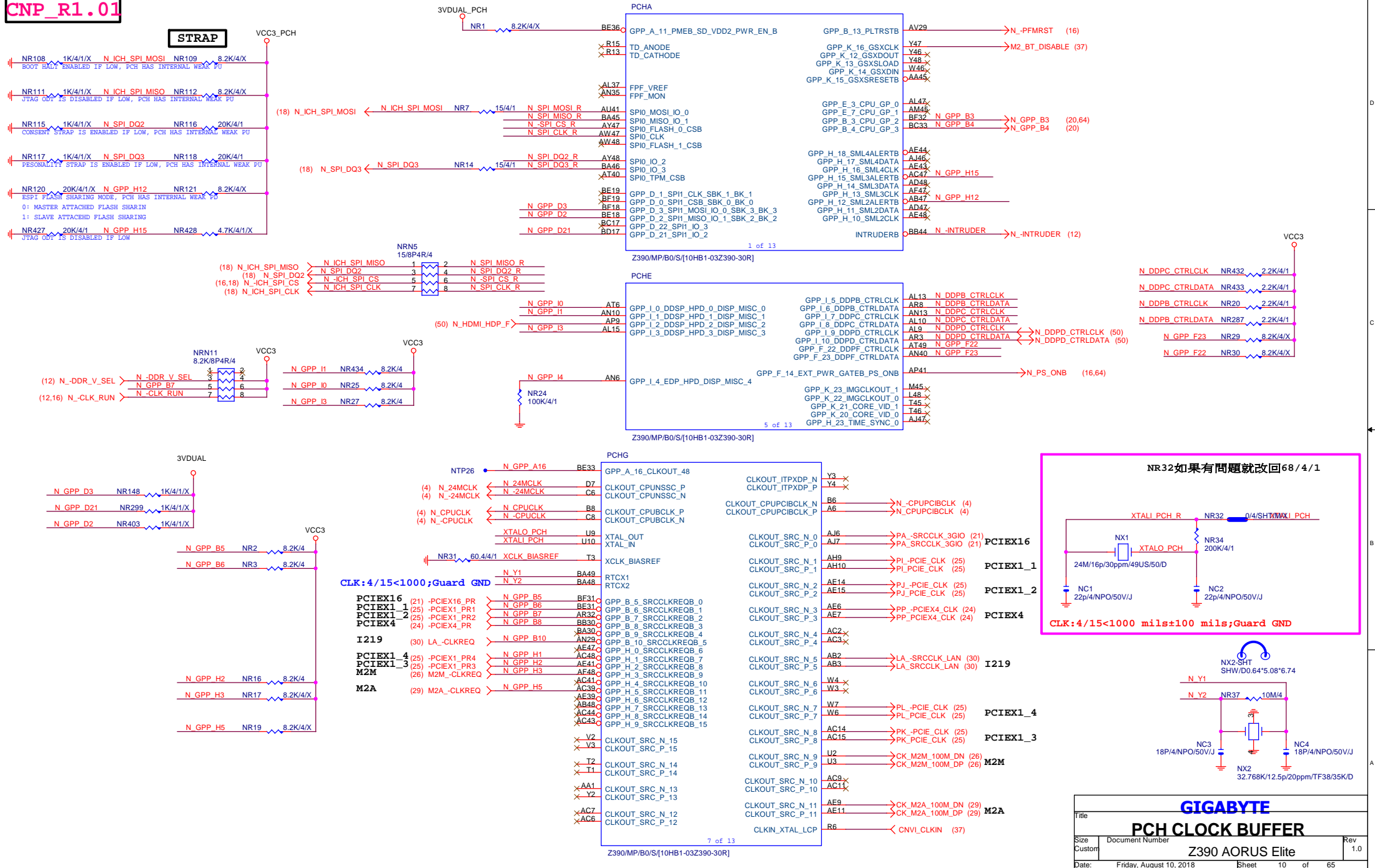




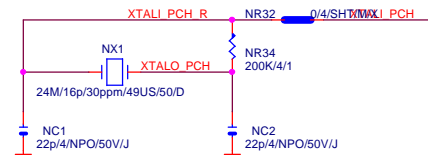




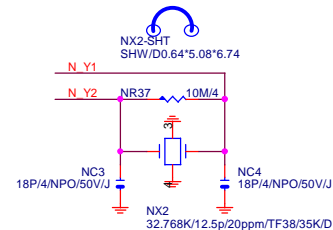
## STRAP



NR32如果有問題就改回68/4/1



CLK:4/15<1000 mils±100 mils;Guard GND



## GIGABYTE

## PCH CLOCK BUFFER

7390 AORUS Elite

Title			
PCH CLOCK BUFFER			
Size	Document Number	Rev	
Custom	Z390 AORUS Elite	1.0	
Date:	Friday, August 10, 2018	Sheet	10 of 65

ITEM	USB P1	USB P2	USB P3	USB P4	USB P5	USB P6
H310	U3.1 Gen1	U3.1 Gen1	U3.1 Gen1	U3.1 Gen1	N/A	N/A
B360	U3.1 Gen2	U3.1 Gen2	U3.1 Gen2	U3.1 Gen2	U3.1 Gen1	U3.1 Gen1
Q360	U3.1 Gen2	U3.1 Gen2	U3.1 Gen2	U3.1 Gen2	U3.1 Gen1	U3.1 Gen1
H370	U3.1 Gen2	U3.1 Gen2	U3.1 Gen2	U3.1 Gen2	U3.1 Gen1	U3.1 Gen1
Z390	U3.1 Gen2	U3.1 Gen2	U3.1 Gen2	U3.1 Gen2	U3.1 Gen2	U3.1 Gen2
Q370	U3.1 Gen2	U3.1 Gen2	U3.1 Gen2	U3.1 Gen2	U3.1 Gen2	U3.1 Gen2

USB pin out map

USB31\_1  
USB31\_2  
USB31\_3  
USB31\_4  
USB31\_5  
USB31\_6  
USB30\_7  
USB30\_8  
USB30\_9  
USB30\_10

PCH

F\_USB30C

R\_USB31

R\_USB30

DMI need to reverse

PCBH

(4) A_DMI_3TXN	>	A_DMI_3TXN	K34
(4) A_DMI_3TXP	>	A_DMI_3TXP	J35
(4) A_DMI_3RXN	>	A_DMI_3RXN	B33
(4) A_DMI_3RXP	>	A_DMI_3RXP	G33
(4) A_DMI_2TXN	>	A_DMI_2TXN	G33
(4) A_DMI_2TXP	>	A_DMI_2TXP	F34
(4) A_DMI_2RXN	>	A_DMI_2RXN	C32
(4) A_DMI_2RXP	>	A_DMI_2RXP	B32
(4) A_DMI_1TXN	>	A_DMI_1TXN	K32
(4) A_DMI_1TXP	>	A_DMI_1TXP	J32
(4) A_DMI_1RXN	>	A_DMI_1RXN	C31
(4) A_DMI_1RXP	>	A_DMI_1RXP	B31
(4) A_DMI_0TXN	>	A_DMI_0TXN	G30
(4) A_DMI_0TXP	>	A_DMI_0TXP	F30
(4) A_DMI_0RXN	>	A_DMI_0RXN	C29
(4) A_DMI_0RXP	>	A_DMI_0RXP	B29

ITEM	USB P7 PCIE P1	USB P8 PCIE P2	USB P9 PCIE P3	USB P10 PCIE P4	PCIE P5	PCIE P6	PCIE P7	PCIE P8
H310	N/A	N/A	N/A	N/A	PCIE GbE	PCIE	PCIE	PCIE
B360	N/A	N/A	N/A	N/A	PCIE GbE	PCIE	PCIE	PCIE
Q360	U3.1 Gen1	U3.1 Gen1	N/A	N/A	PCIE GbE	PCIE	PCIE	PCIE
H370	U3.1 Gen1	U3.1 Gen1	PCIE	PCIE	PCIE GbE	PCIE	PCIE	PCIE
Z390	U3.1 Gen1 PCIE	U3.1 Gen1 PCIE	U3.1 Gen1 PCIE	U3.1 Gen1 PCIE	PCIE GbE	PCIE	PCIE	PCIE
Q370	U3.1 Gen1 PCIE	U3.1 Gen1 PCIE	U3.1 Gen1 PCIE	U3.1 Gen1 PCIE	PCIE GbE	PCIE	PCIE	PCIE

USB30\_LAN

F\_USB30

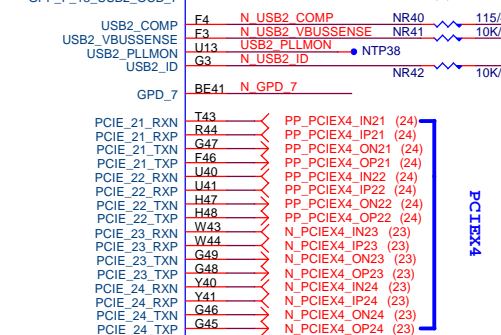
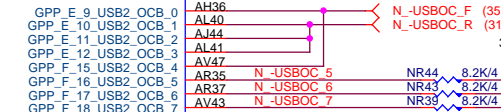
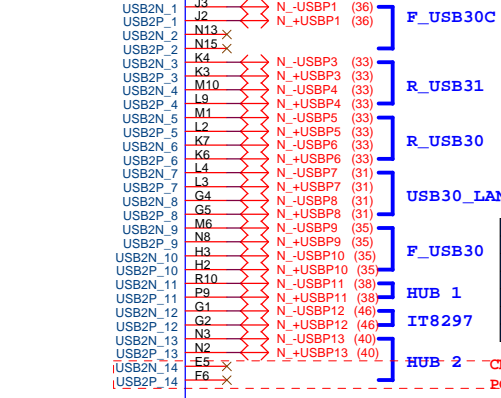
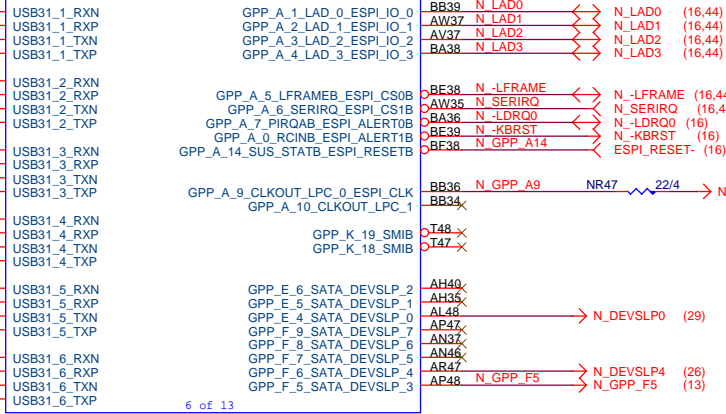
I219V

PCIEX1\_1

PCIEX1\_2

PCIEX1\_4

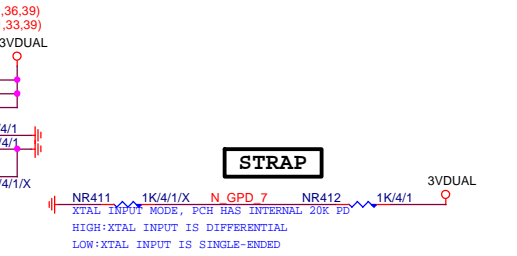
(31) PCH_USB3_RXN7	>	G17	PCIE_1_USB31_7_RXN
(31) PCH_USB3_RXP7	>	F16	PCIE_1_USB31_7_RXP
(31) PCH_USB3_TXN7	>	A17	PCIE_1_USB31_7_TXN
(31) PCH_USB3_TXP7	>	B17	PCIE_1_USB31_7_TXP
(31) PCH_USB3_RXN8	>	R21	PCIE_2_USB31_8_RXN
(31) PCH_USB3_RXP8	>	P21	PCIE_2_USB31_8_RXP
(31) PCH_USB3_TXN8	>	B18	PCIE_2_USB31_8_TXN
(31) PCH_USB3_TXP8	>	C18	PCIE_2_USB31_8_TXP
(35) PCH_USB3_RXN9	>	K18	PCIE_3_USB31_9_RXN
(35) PCH_USB3_RXP9	>	J18	PCIE_3_USB31_9_RXP
(35) PCH_USB3_TXN9	>	C19	PCIE_3_USB31_9_TXN
(35) PCH_USB3_TXP9	>	N18	PCIE_3_USB31_9_TXP
(35) PCH_USB3_RXN10	>	R18	PCIE_4_USB31_10_RXN
(35) PCH_USB3_RXP10	>	D20	PCIE_4_USB31_10_RXP
(35) PCH_USB3_TXN10	>	C20	PCIE_4_USB31_10_TXN
(35) PCH_USB3_TXP10	>	F20	PCIE_4_USB31_10_TXP
(30) LA_ML_IN	>	G20	PCIE_5_LAN_0A_RXN
(30) LA_ML_OP	>	B21	PCIE_5_LAN_0A_RXP
(30) LA_ML_ON	>	A22	PCIE_5_LAN_0A_TXN
(25) PL_PCIE1X1_IN	>	K21	PCIE_5_LAN_0A_TXP
(25) PL_PCIE1X1_OP	>	J21	PCIE_6_RXP
(25) PL_PCIE1X1_ON	>	D21	PCIE_6_TXN
(25) PL_PCIE1X1_OP	>	C21	PCIE_6_TXP
(25) PJ_PCIE1X1_IN	>	J24	PCIE_7_RXN
(25) PJ_PCIE1X1_OP	>	C23	PCIE_7_RXP
(25) PJ_PCIE1X1_ON	>	B23	PCIE_7_TXN
(25) PJ_PCIE1X1_OP	>	F24	PCIE_7_TXP
(25) PL_PCIE1X1_IN	>	G24	PCIE_8_RXN
(25) PL_PCIE1X1_OP	>	B24	PCIE_8_RXP
(25) PL_PCIE1X1_ON	>	C24	PCIE_8_TXN
(25) PL_PCIE1X1_OP	>	C24	PCIE_8_TXP



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ITEM	USB P10	USB P11	USB P12	USB P13	USB P14
H310	N/A	N/A	N/A	N/A	USB2
B360	USB2	USB2	N/A	N/A	USB2
Q360	USB2	USB2	USB2	USB2	USB2
H370	USB2	USB2	USB2	USB2	USB2
Z390	USB2	USB2	USB2	USB2	USB2
Q370	USB2	USB2	USB2	USB2	USB2

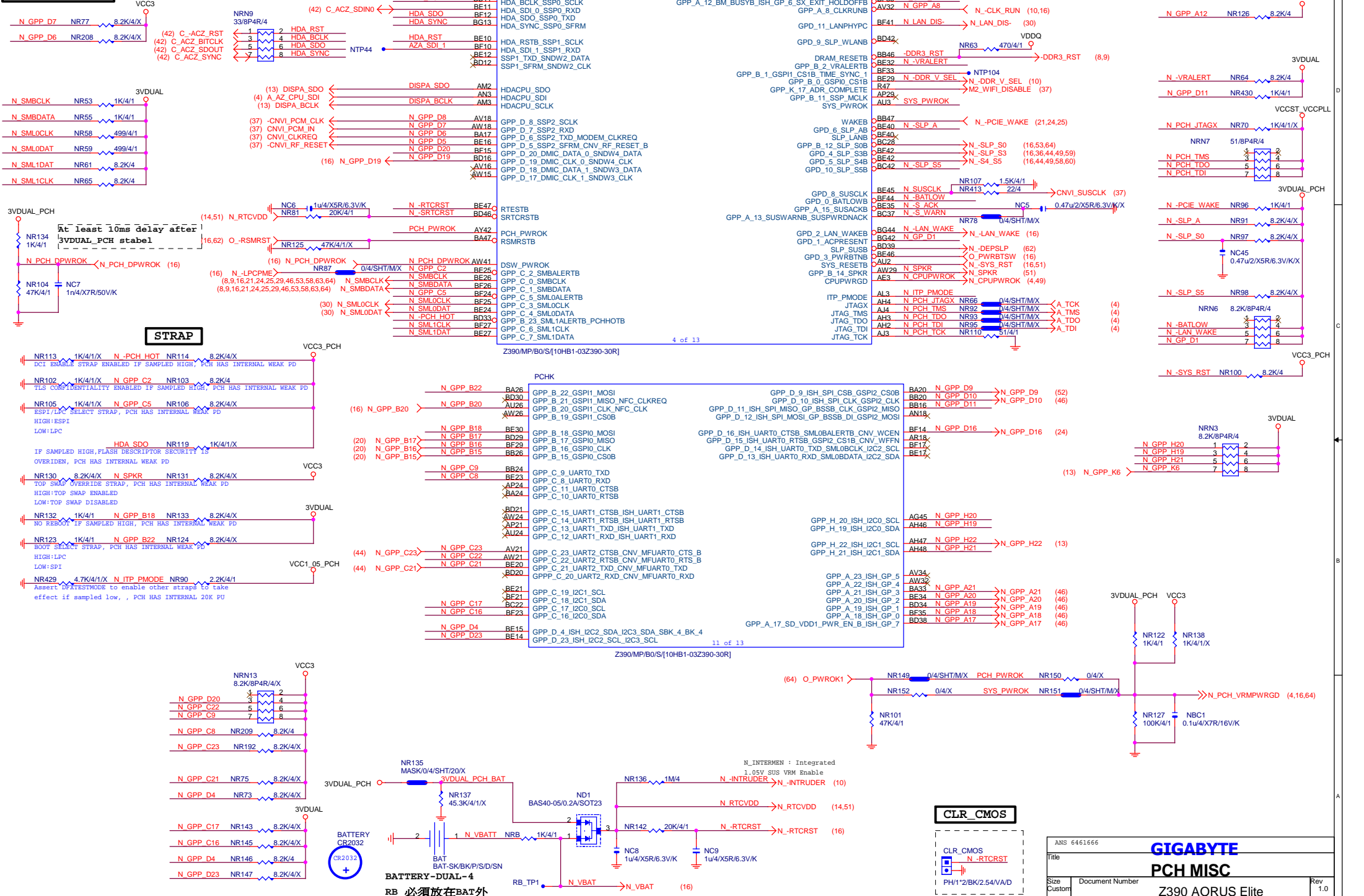
CNV1的B7功能enable時  
PCH的USB2.0\_port14會被disable



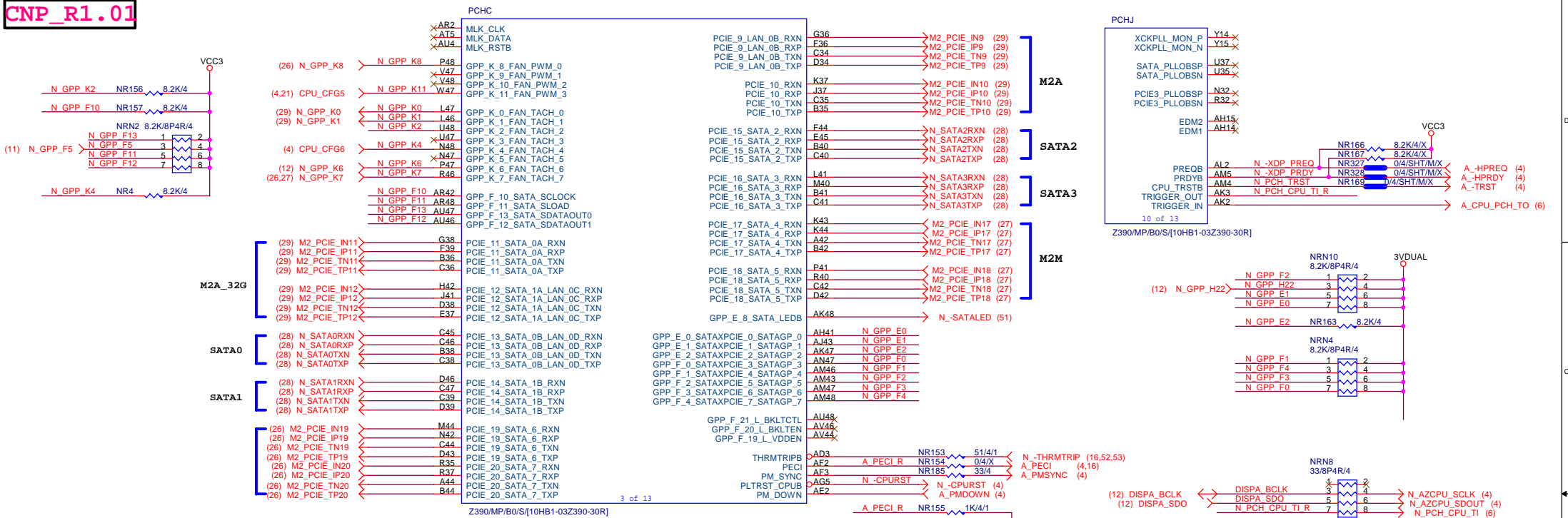
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B360	PCIE	PCIE	PCIE	PCIE
Q360	PCIE	PCIE	PCIE	PCIE
H370	PCIE	PCIE	PCIE	PCIE
Z390	PCIE	PCIE	PCIE	PCIE
Q370	PCIE	PCIE	PCIE	PCIE

ANS 6461666		<b>GIGABYTE</b>	
Title		<b>PCH DMI,USB,PCIE</b>	
Size	Document Number	Z390 AORUS Elite	
Custom		Rev 1.0	
Date:	Friday, August 10, 2018	Sheet	11 of 65

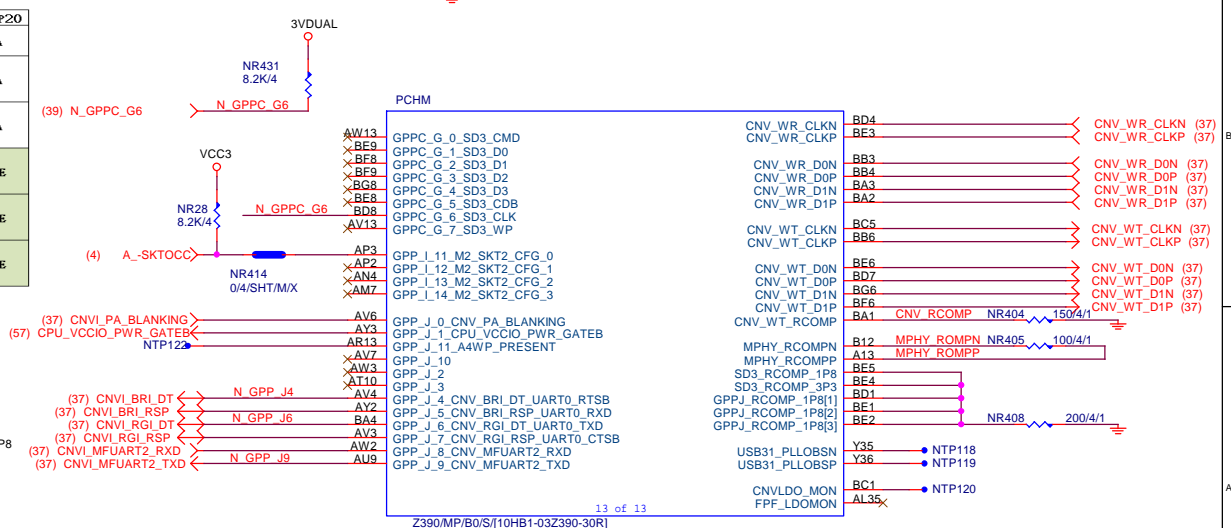
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H310	GbE	N/A	PCIE	PCIE GbE	GbE SATA 0	SATA 1	SATA2	SATA 3	N/A	N/A	N/A	N/A
B360	PCIE GbE	PCIE	PCIE SATA 0A	PCIE GbE SATA 1A	GbE SATA 0B	SATA 1B	SATA2	SATA 3	SATA4	SATA5	N/A	N/A
Q360	PCIE GbE	PCIE	PCIE SATA 0A	PCIE GbE SATA 1A	PCIE GbE SATA 0B	PCIE SATA 1B	SATA2	SATA 3	SATA4	SATA5	N/A	N/A
H370	PCIE GbE	PCIE	PCIE SATA 0A	PCIE GbE SATA 1A	PCIE GbE SATA 0B	PCIE SATA 1B	PCIE SATA 2	PCIE SATA 3	SATA4	SATA5	PCIE	PCIE
Z390	PCIE GbE	PCIE	PCIE SATA 0A	PCIE GbE SATA 1A	PCIE GbE SATA 0B	PCIE SATA 1B	PCIE SATA 2	PCIE SATA 3	PCIE SATA 4	PCIE SATA 5	PCIE	PCIE
Q370	PCIE GbE	PCIE	PCIE SATA 0A	PCIE GbE SATA 1A	PCIE GbE SATA 0B	PCIE SATA 1B	PCIE SATA 2	PCIE SATA 3	PCIE SATA 4	PCIE SATA 5	PCIE	PCIE



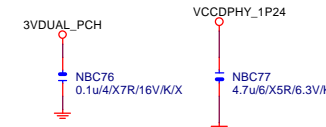
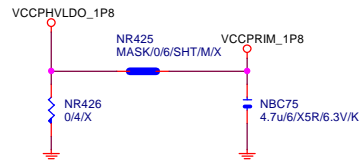
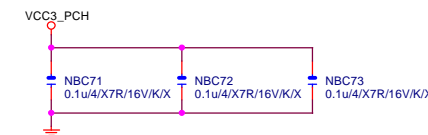
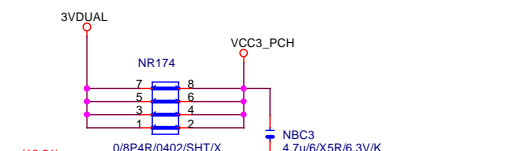
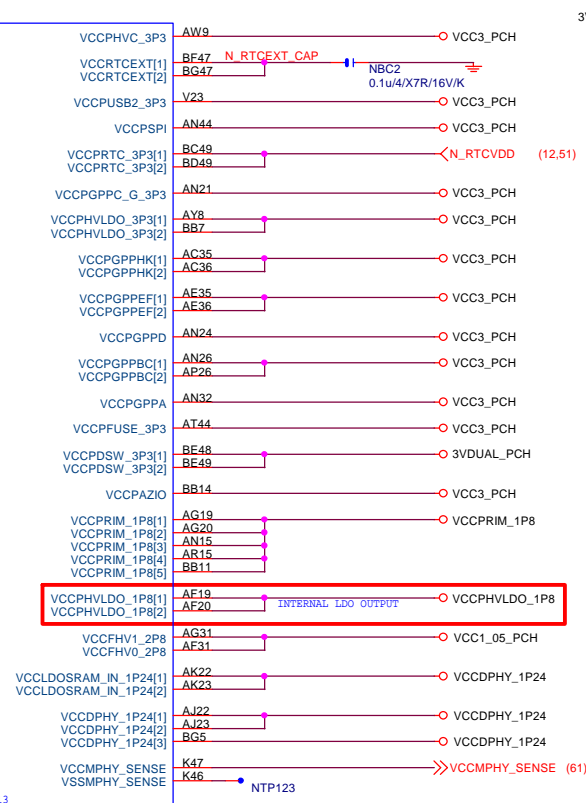
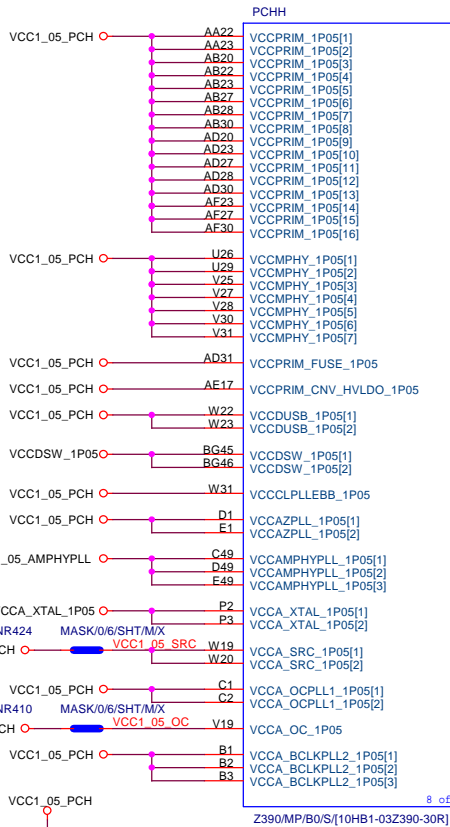
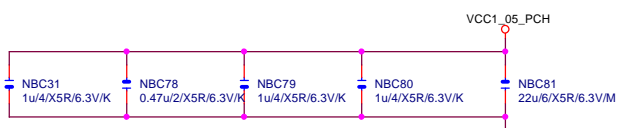
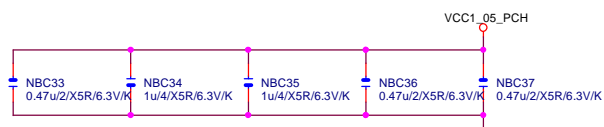
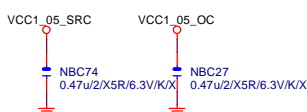
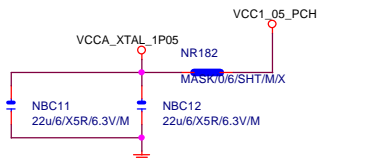
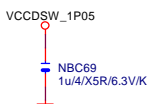
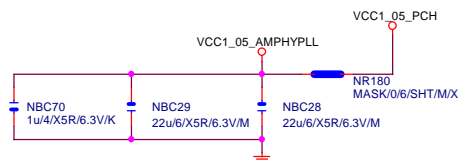
**STRAP**

**NR415** 8.2K/4X **N\_GPP\_J4** **NR416** 8.2K/4  
 XTAL FREQUENCY SELECTION, PCH HAS INTERNAL 20K PU  
 1 = 24MHz (25MHz WHEN XTAL FREQ DIVIDER NON ZERO)  
 0 = 38.4/19.2MHz

**NR417** 8.2K/4X **N\_GPP\_J6** **NR418** 8.2K/4  
 CNVI  
 0 = INTEGRATED CNVI ENABLE  
 1 = INTEGRATED CNVI DISABLE

**NR419** 8.2K/4X **N\_GPP\_J9** **NR420** 8.2K/4X  
 SELECT USB SPI BIOS FLASH INTERFACE OPERATING VOLTAGE, PCH HAS INTERNAL 20K PU  
 1 = VCCPSPI IS CONNECTED TO 1.8V RAIL  
 0 = VCCPSPI IS CONNECTED TO 3.3V RAIL

VCCPRIM1\_P8

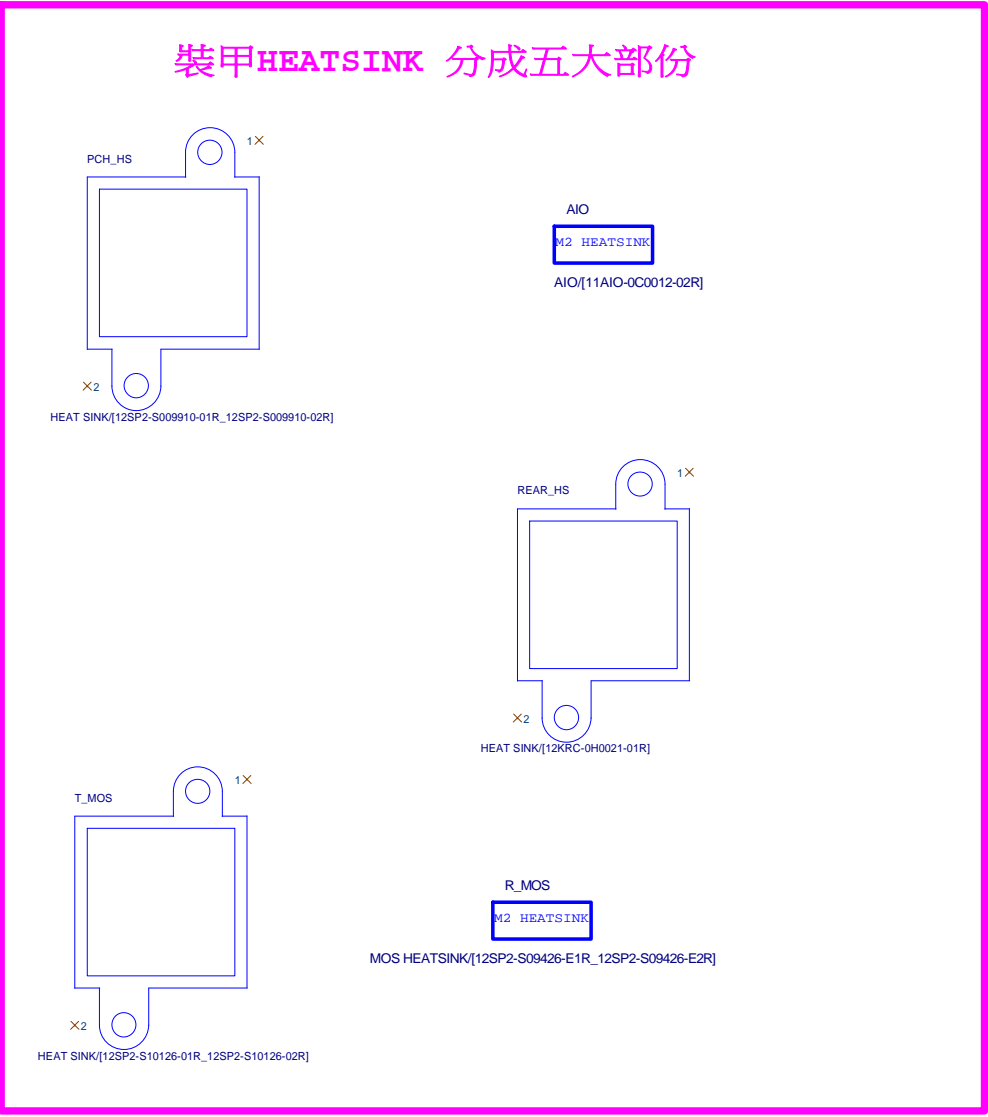


PCHL		
A2	VSS	AL12
A28	VSS	AL17
A3	VSS	AL21
A33	VSS	AL24
A37	VSS	AL26
A4	VSS	AL29
A45	VSS	AL33
A46	VSS	AL38
A47	VSS	AM1
A48	VSS	AM18
A5	VSS	AM32
A8	VSS	AM49
AA19	VSS	AN12
AA20	VSS	AN16
AA25	VSS	AN34
AA27	VSS	AN38
AA28	VSS	AP4
AA30	VSS	AP46
AA31	VSS	AR12
AA49	VSS	AR16
AA5	VSS	AR34
AB19	VSS	AR38
AB25	VSS	AT1
AB31	VSS	AT16
AC12	VSS	AT18
AC17	VSS	AT21
AC33	VSS	AT24
AC38	VSS	AT26
AC4	VSS	AT29
AC46	VSS	AT32
AD1	VSS	AT34
AD19	VSS	AT45
AD2	VSS	AV11
AD22	VSS	AV39
AD25	VSS	AW10
AD49	VSS	AW4
AE12	VSS	AW40
AE33	VSS	AW46
AE38	VSS	B47
AE4	VSS	B48
AE46	VSS	B49
AF22	VSS	BA12
AF25	VSS	BA14
AF28	VSS	BA44
AG1	VSS	BA5
AG22	VSS	BA6
AG23	VSS	BB41
AG25	VSS	BB43
AG27	VSS	BB9
AG28	VSS	M16
AG30	VSS	BC10
AG49	VSS	BC13
AH12	VSS	BC15
AH17	VSS	BC19
AH33	VSS	BC24
AH38	VSS	BC26
AH19	VSS	BC31
AJ20	VSS	BC35
AJ25	VSS	BC40
AJ27	VSS	BC45
AJ28	VSS	BC8
AJ30	VSS	BD43
AJ31	VSS	BE44
AK19	VSS	BF1
AK20	VSS	BF2
AK25	VSS	BF3
AK27	VSS	BF48
AK28	VSS	BF49
AK30	VSS	BG17
AK31	VSS	BG2
AK4	VSS	BG22
AK46	VSS	BG25
		BG28

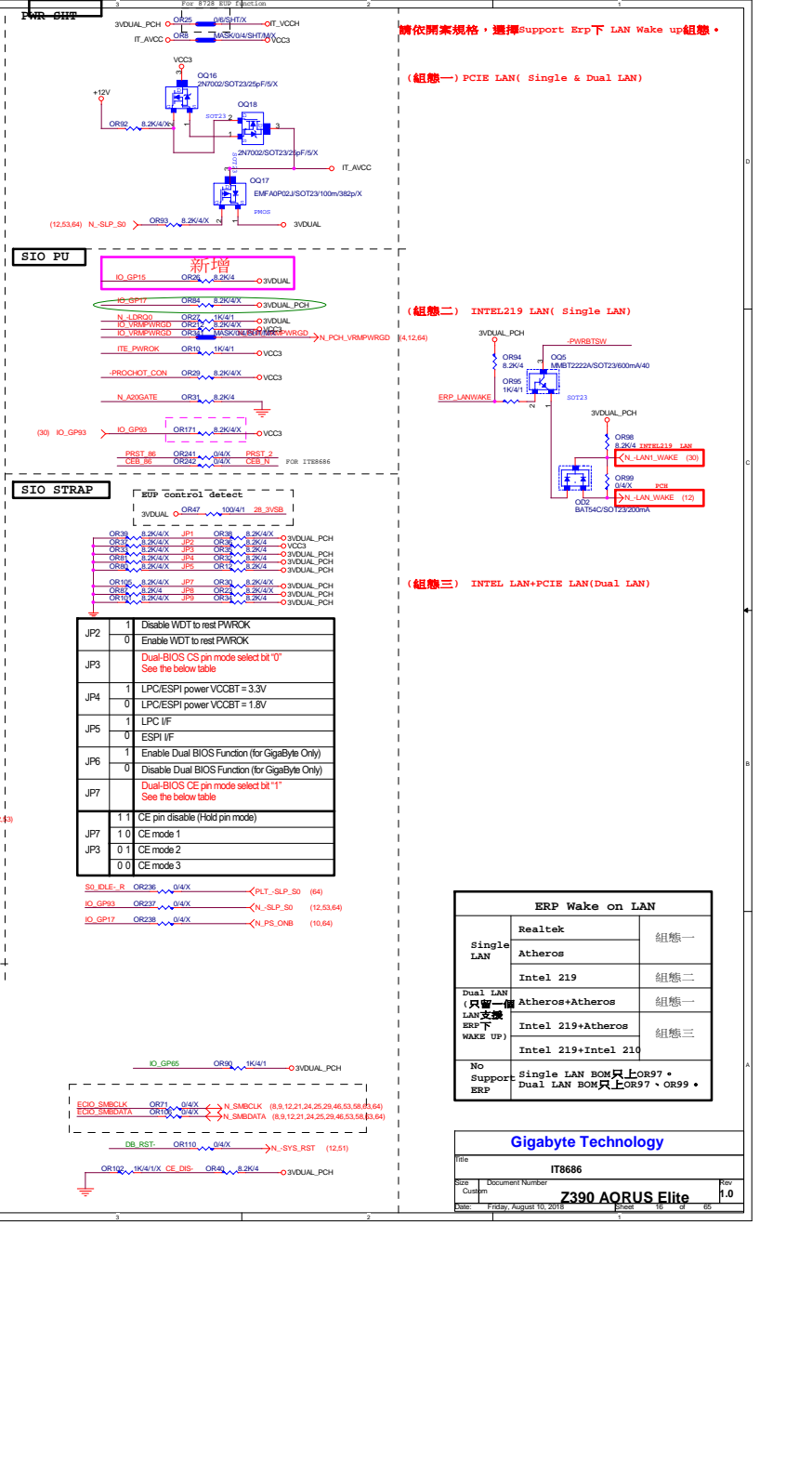
PCHL		
BG3	VSS	M24
BG33	VSS	M32
BG37	VSS	M34
BG4	VSS	M49
BG48	VSS	M5
C12	VSS	N12
C25	VSS	N16
C30	VSS	N34
C4	VSS	N35
C48	VSS	N37
C5	VSS	N38
D12	VSS	P26
D16	VSS	P29
D17	VSS	P4
D30	VSS	P46
D33	VSS	R12
D8	VSS	R16
E10	VSS	R26
E13	VSS	R28
E15	VSS	R3
E17	VSS	R34
E19	VSS	R38
E22	VSS	R4
E24	VSS	T17
E26	VSS	T18
E31	VSS	T32
E33	VSS	T4
E35	VSS	T49
E40	VSS	T5
E42	VSS	T7
E8	VSS	U12
F41	VSS	U15
F43	VSS	U17
F47	VSS	U21
G44	VSS	U24
G6	VSS	U33
H8	VSS	U38
J10	VSS	V20
J26	VSS	V22
J29	VSS	V4
J4	VSS	V46
J40	VSS	W25
J46	VSS	W27
J47	VSS	W28
J48	VSS	W30
J9	VSS	Y10
K11	VSS	Y12
K39	VSS	Y17
M16	VSS	Y33
M18	VSS	Y38
M21	VSS	Y9

Z390/MP/B0/S/[10HB1-03Z390-30R]

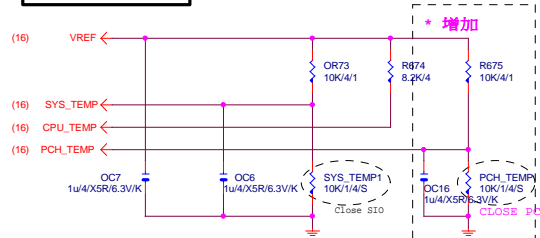
12 of 13





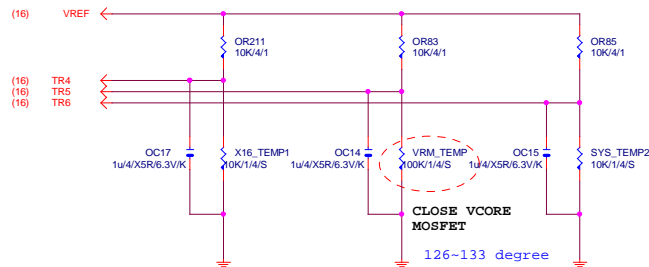


# TEMP H/W MONITOR

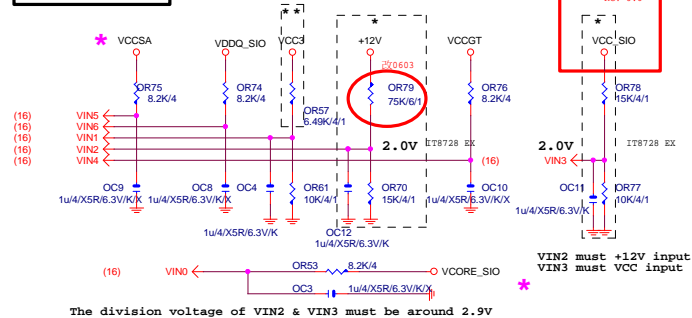


5個FAN時使用

8個FAN時使用

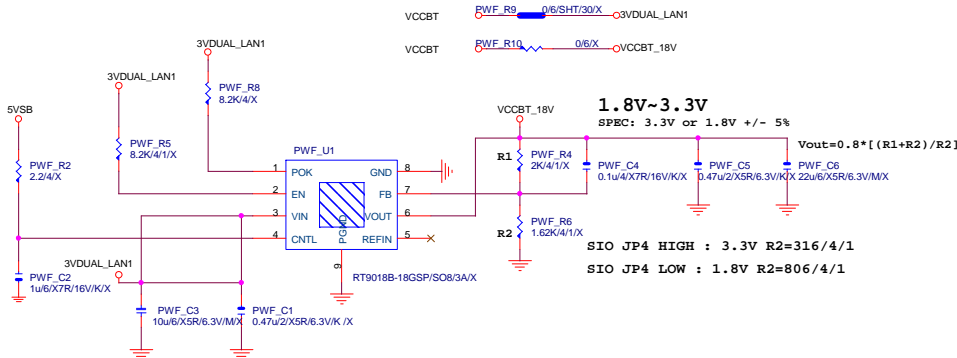


# VOLTAGE-- H/W MONITOR

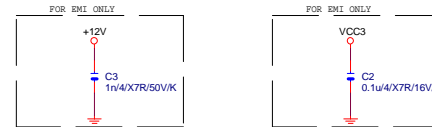


低階機種: 3個FAN時使用

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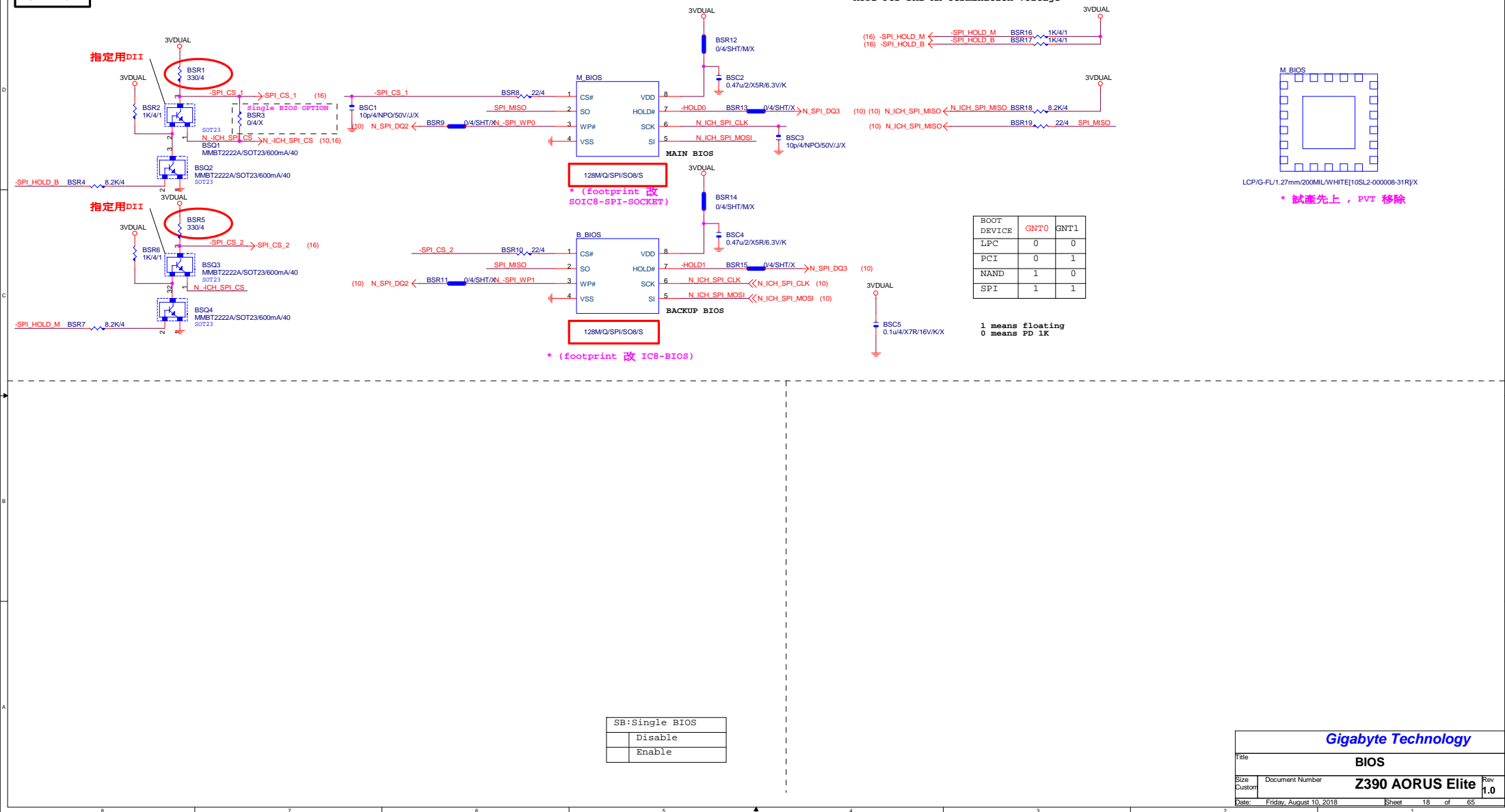
(靠近ATX CONNECTOR)



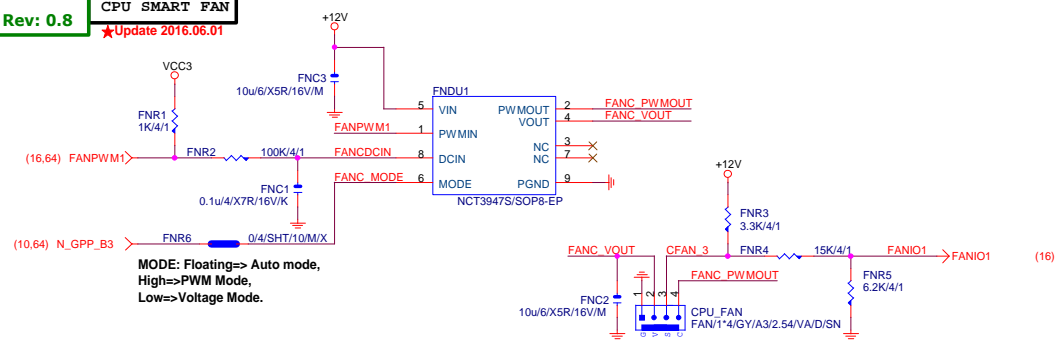
Gigabyte Technology

Title			HWM,KB/MS, FAN CTRL
Size	Document Number	Rev	
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Date: Friday, August 10, 2018			Sheet 17 of 65

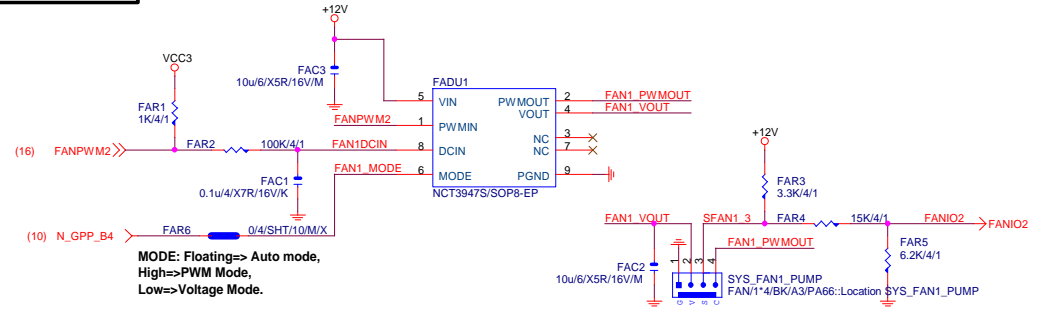
## DUAL BIOS



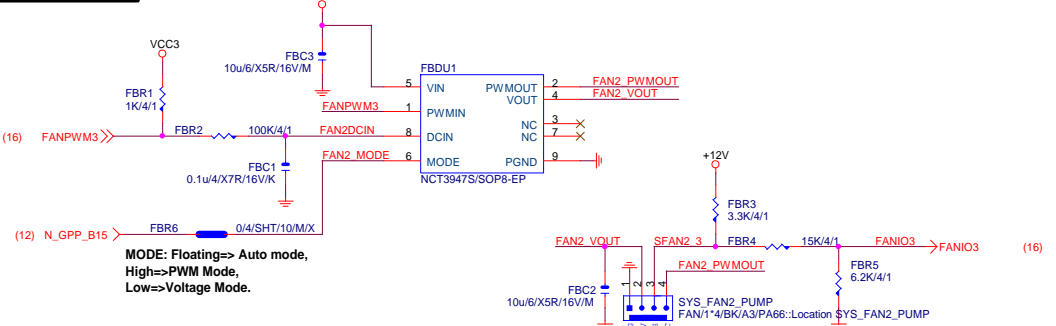
5					4					3					2					1																																													
D																																																																	
C																																																																	
B																																																																	
A																																																																	
																			<table><tr><td colspan="3">Title</td><td colspan="3">8FAN</td></tr><tr><td>Size</td><td>Custom</td><td colspan="3">Document Number</td><td>Rev</td></tr><tr><td colspan="2"></td><td colspan="3" rowspan="2"><b>Z390 AORUS Elite</b></td><td><b>1.0</b></td></tr><tr><td>Date:</td><td colspan="4">Friday, August 10, 2018</td><td>Sheet 19 of 65</td></tr></table>																	Title			8FAN			Size	Custom	Document Number			Rev			<b>Z390 AORUS Elite</b>			<b>1.0</b>	Date:	Friday, August 10, 2018				Sheet 19 of 65	1					
Title			8FAN																																																														
Size	Custom	Document Number			Rev																																																												
		<b>Z390 AORUS Elite</b>			<b>1.0</b>																																																												
Date:	Friday, August 10, 2018				Sheet 19 of 65																																																												



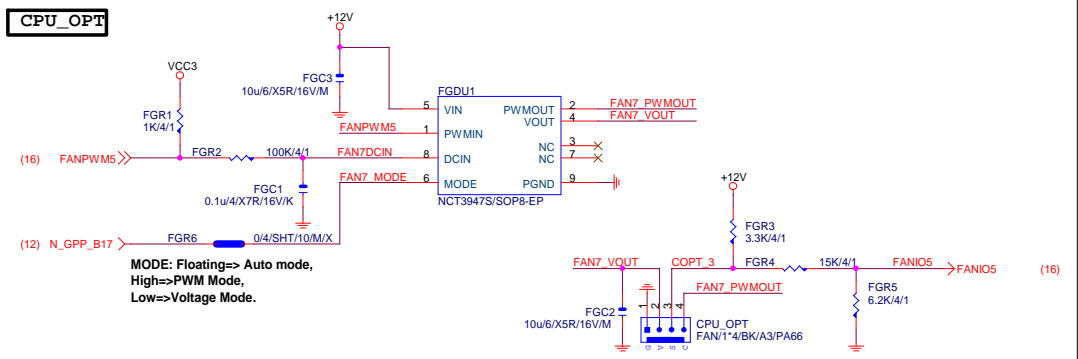
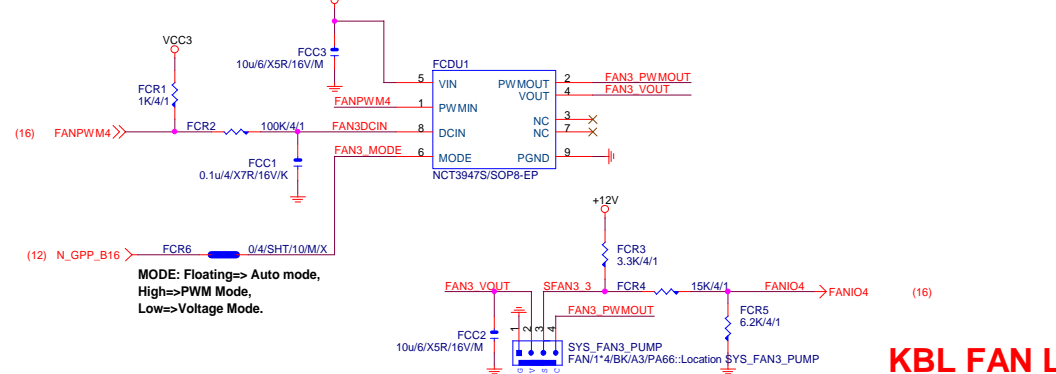
**SYSTEM FAN1**



**SYSTEM FAN2**



**SYSTEM FAN3**



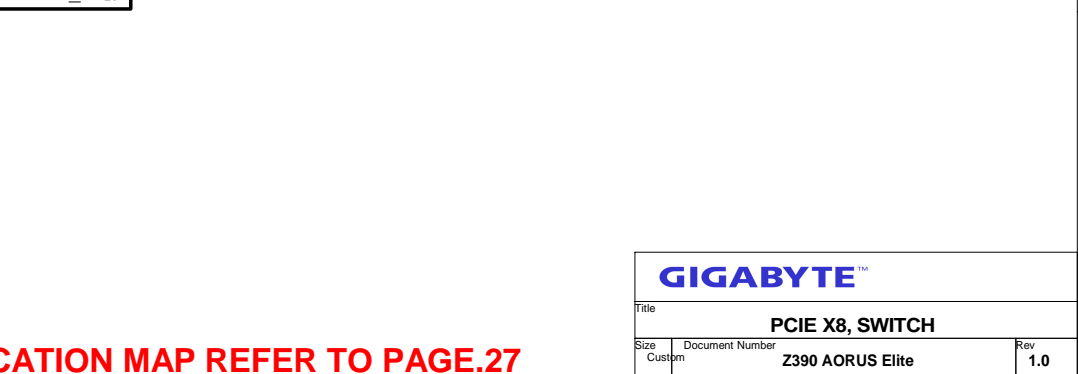
**SYSTEM FAN5 PUMP**



**SYSTEM FAN6 PUMP**

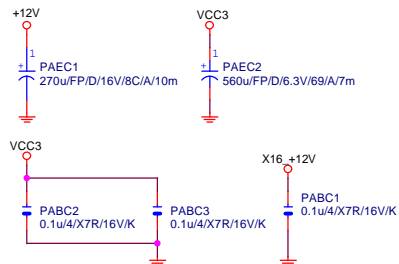


**SYSTEM\_FAN4**

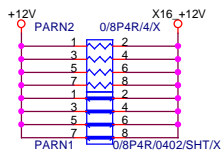


**KBL FAN LOCATION MAP REFER TO PAGE.27**

## PCIEX16 CAP



## PCIEX16 PROTECT SHT



## PCIEX16 Coupling CAP

PA EXP TXP0	PAC5	0.22u4/X5R/6.3V/K	PA EXP TXP0 C
PA EXP TXP1	PAC4	0.22u4/X5R/6.3V/K	PA EXP TXN0 C
PA EXP TXP2	PAC8	0.22u4/X5R/6.3V/K	PA EXP TXP1 C
PA EXP TXN1	PAC7	0.22u4/X5R/6.3V/K	PA EXP TXN1 C
PA EXP TXP3	PAC8	0.22u4/X5R/6.3V/K	PA EXP TXP2 C
PA EXP TXN2	PAC9	0.22u4/X5R/6.3V/K	PA EXP TXN2 C
PA EXP TXP4	PAC10	0.22u4/X5R/6.3V/K	PA EXP TXP3 C
PA EXP TXN3	PAC11	0.22u4/X5R/6.3V/K	PA EXP TXN3 C
PA EXP TXP4	PAC12	0.22u4/X5R/6.3V/K	PA EXP TXP4 C
PA EXP TXN4	PAC13	0.22u4/X5R/6.3V/K	PA EXP TXN4 C
PA EXP TXP5	PAC14	0.22u4/X5R/6.3V/K	PA EXP TXP5 C
PA EXP TXN5	PAC15	0.22u4/X5R/6.3V/K	PA EXP TXN5 C
PA EXP TXP6	PAC16	0.22u4/X5R/6.3V/K	PA EXP TXP6 C
PA EXP TXN6	PAC17	0.22u4/X5R/6.3V/K	PA EXP TXN6 C
PA EXP TXP7	PAC18	0.22u4/X5R/6.3V/K	PA EXP TXP7 C
PA EXP TXN7	PAC19	0.22u4/X5R/6.3V/K	PA EXP TXN7 C
PA EXP TXP8	PAC21	0.22u4/X5R/6.3V/K	PA EXP TXP8 C
PA EXP TXN8	PAC20	0.22u4/X5R/6.3V/K	PA EXP TXN8 C
PA EXP TXP9	PAC22	0.22u4/X5R/6.3V/K	PA EXP TXP9 C
PA EXP TXN9	PAC23	0.22u4/X5R/6.3V/K	PA EXP TXN9 C
PA EXP TXP10	PAC24	0.22u4/X5R/6.3V/K	PA EXP TXP10 C
PA EXP TXN10	PAC25	0.22u4/X5R/6.3V/K	PA EXP TXN10 C
PA EXP TXP11	PAC26	0.22u4/X5R/6.3V/K	PA EXP TXP11 C
PA EXP TXN11	PAC27	0.22u4/X5R/6.3V/K	PA EXP TXN11 C
PA EXP TXP12	PAC28	0.22u4/X5R/6.3V/K	PA EXP TXP12 C
PA EXP TXN12	PAC29	0.22u4/X5R/6.3V/K	PA EXP TXN12 C
PA EXP TXP13	PAC30	0.22u4/X5R/6.3V/K	PA EXP TXP13 C
PA EXP TXN13	PAC31	0.22u4/X5R/6.3V/K	PA EXP TXN13 C
PA EXP TXP14	PAC32	0.22u4/X5R/6.3V/K	PA EXP TXP14 C
PA EXP TXN14	PAC33	0.22u4/X5R/6.3V/K	PA EXP TXN14 C
PA EXP TXP15	PAC34	0.22u4/X5R/6.3V/K	PA EXP TXP15 C
PA EXP TXN15	PAC35	0.22u4/X5R/6.3V/K	PA EXP TXN15 C

## BOM Option

**加強版金屬build-in RGB LED slot**

Footprint: PCIESLOT-164STH-X299

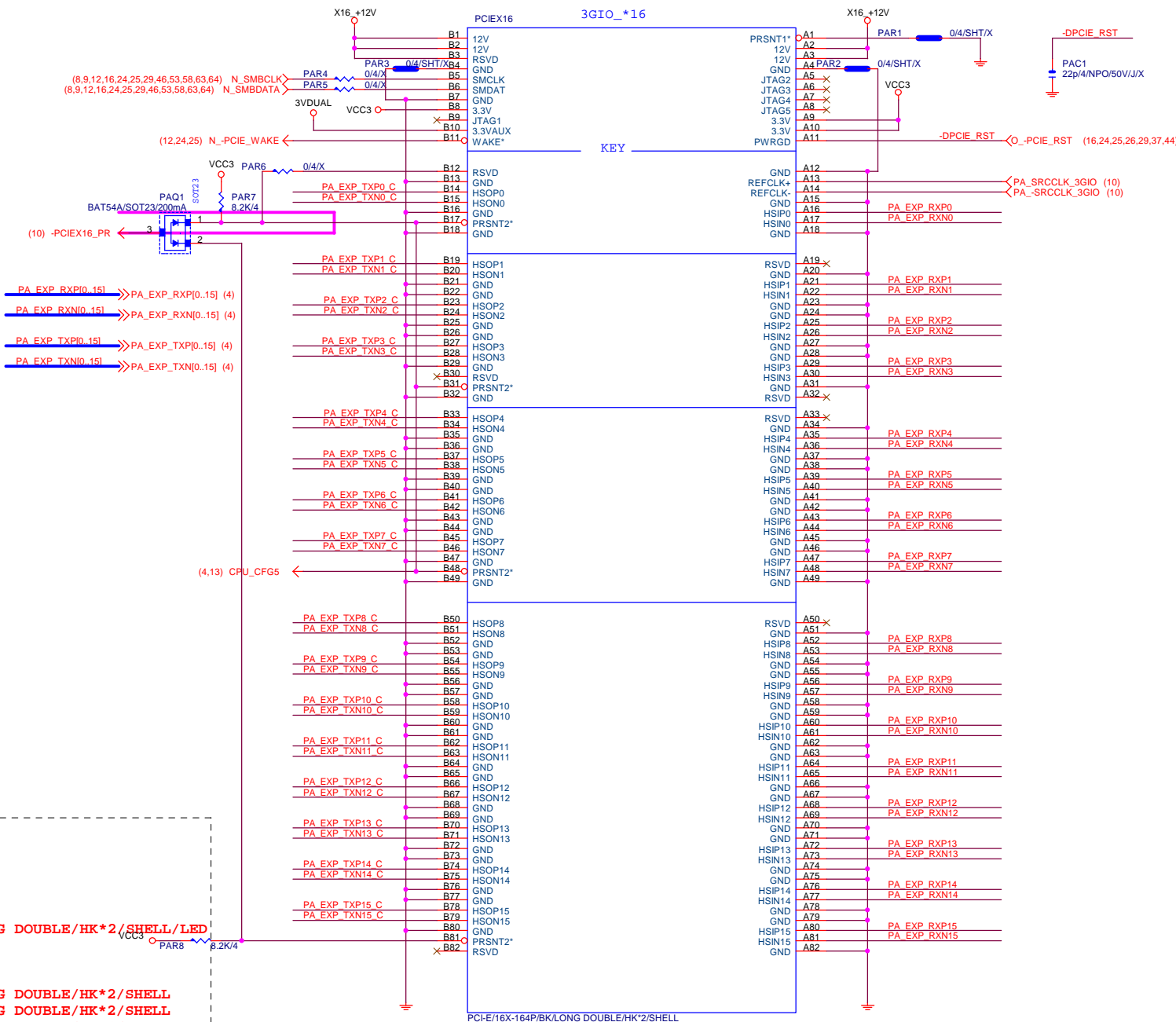
Value: 黑 PCI-E/16X-164P/BK/LONG DOUBLE/HK\*2/SHELL/LED

加強版金屬slot (無LED透光)

Footprint: PCIESLOT-164STH

Value:	深灰	PCI-E/16X-164P/GY/LONG	DOUBLE/HK*2/SHELL
	橘	PCI-E/16X-164P/OR/LONG	DOUBLE/HK*2/SHELL
	鮮紅	PCI-E/16X-164P/RE/LONG	DOUBLE/HK*2/SHELL
	迷彩	PCI-E/16X-164P/LB/LONG	DOUBLE/HK*2/SHELL
	黑	PCI-E/16X-164P/BK/LONG	DOUBLE/HK*2/SHELL
	綠	PCI-E/16X-164P/BU/LONG	DOUBLE/HK*2
	鍊黑	PCI-E/16X-164P/BK/LONG	DOUBLE/HK*2/BK NI SH

PCIEX16 SLOT
--------------

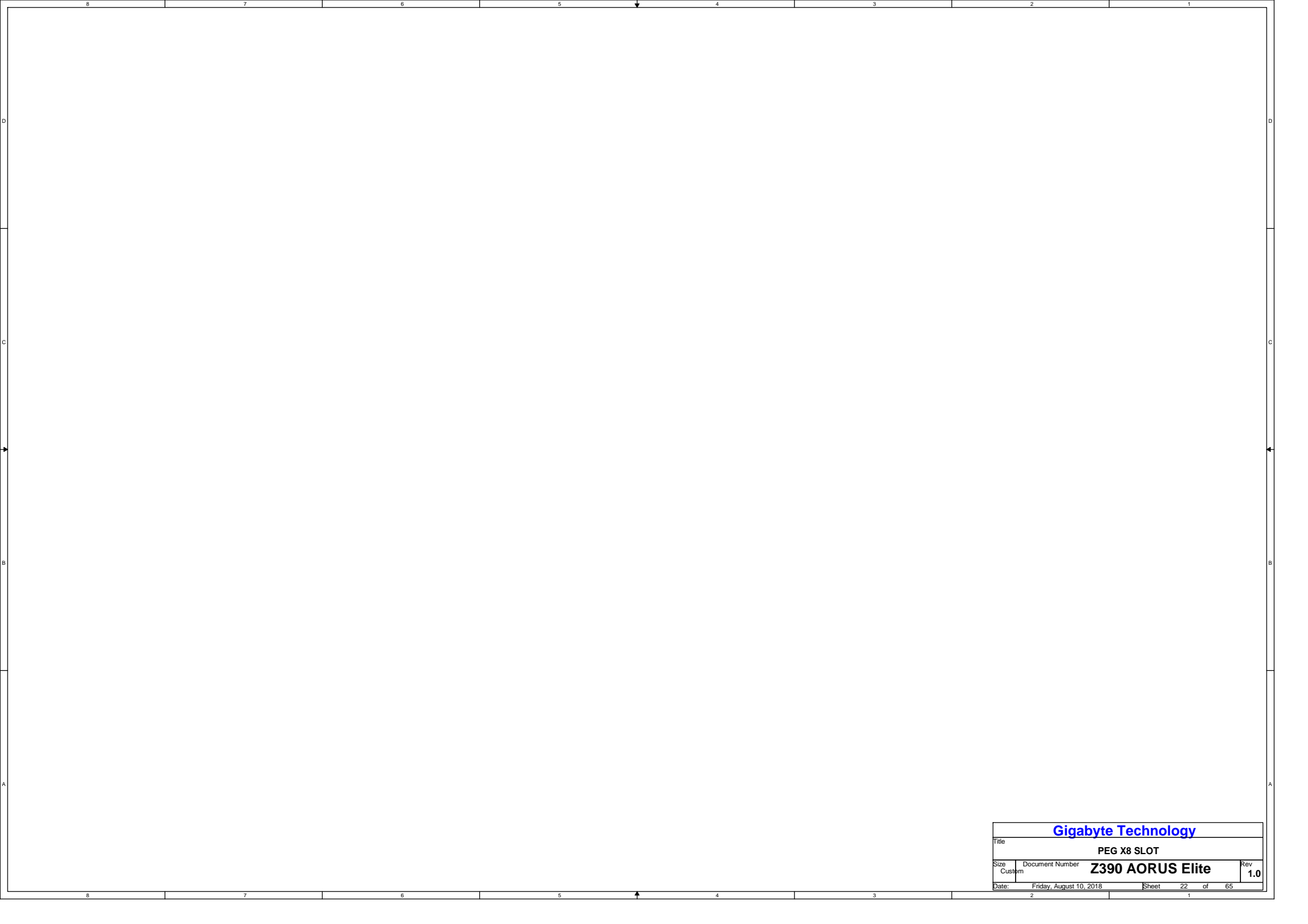


```
PCI-E REV:1.1--> BANDWIDTH=2.5GHz*(8b/10b)X16=32Gb/s=4GB/s
PCI-E REV:2.0--> BANDWIDTH=5GHz*(8b/10b)=4Gb/s=500MB/s
PCI-E REV:3.0--> BANDWIDTH=8GHz*(128b/130b)=8Gb/s=1GB/s
```

## Gigabyte Technology

PEG X16 SLOT

Size Custom	Document Number	<b>Z390 AORUS Elite</b>	Rev	1.0
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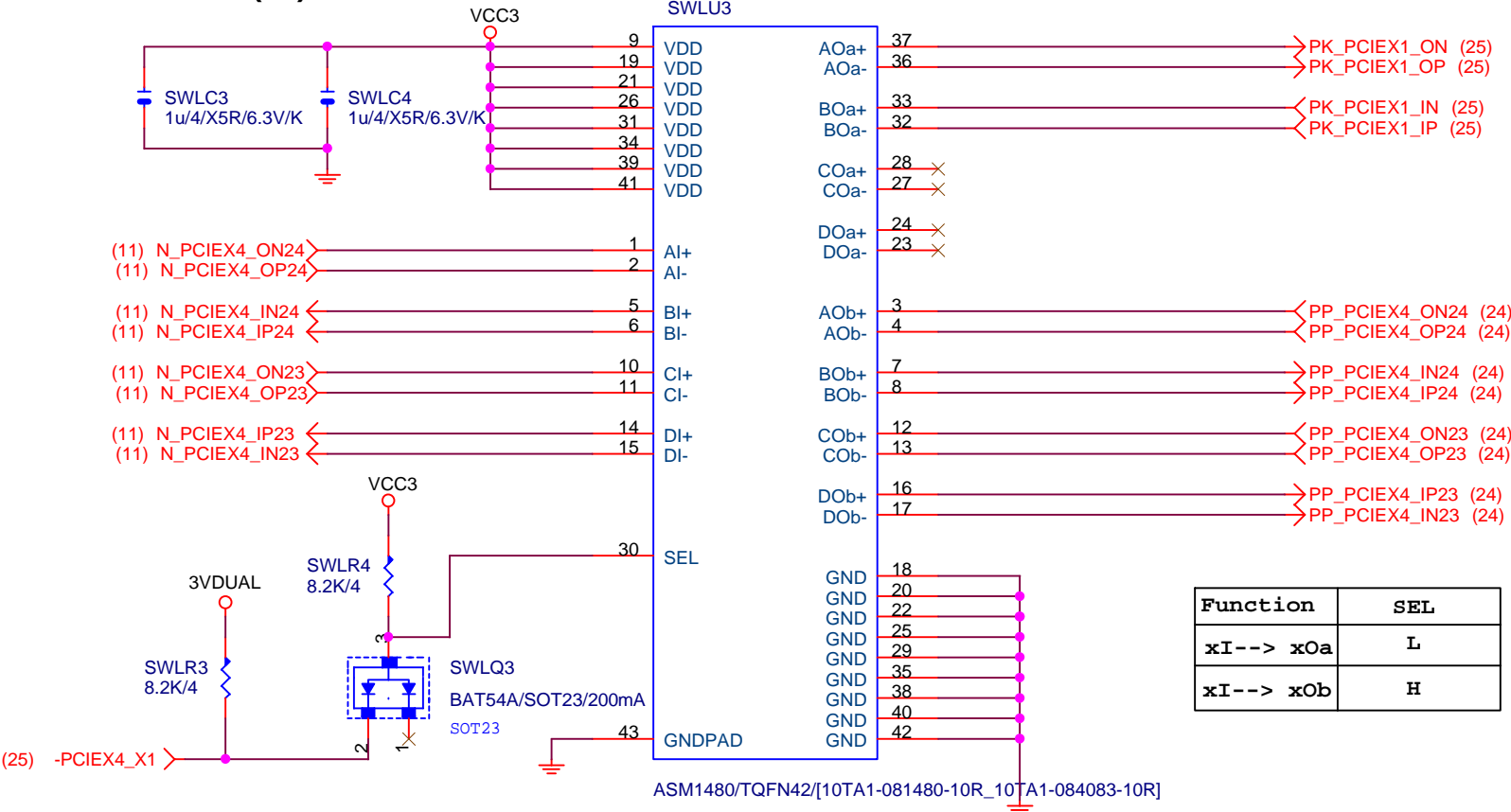


Gigabyte Technology			
Title		PEG X8 SLOT	
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Rev 0.1

(M) TYPE



Function	SEL
xI--> xOa	L
xI--> xOb	H

Gigabyte Technology

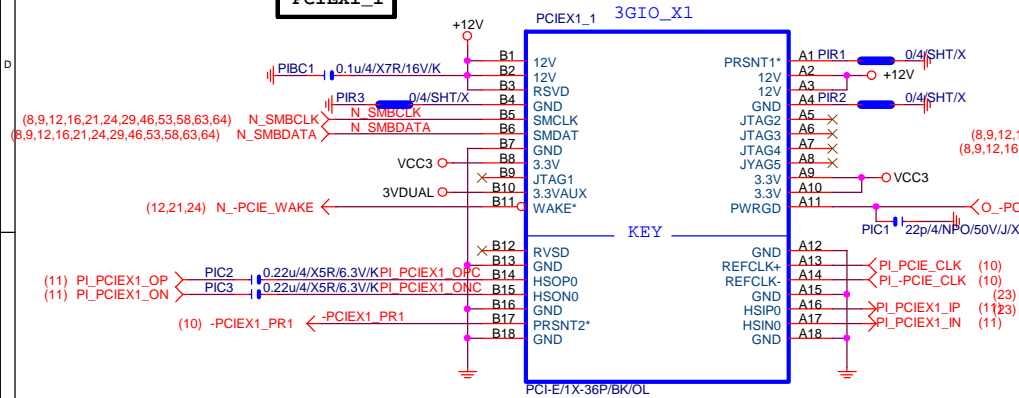
PCIEX4\_PCIEX1\_4 SWITCH



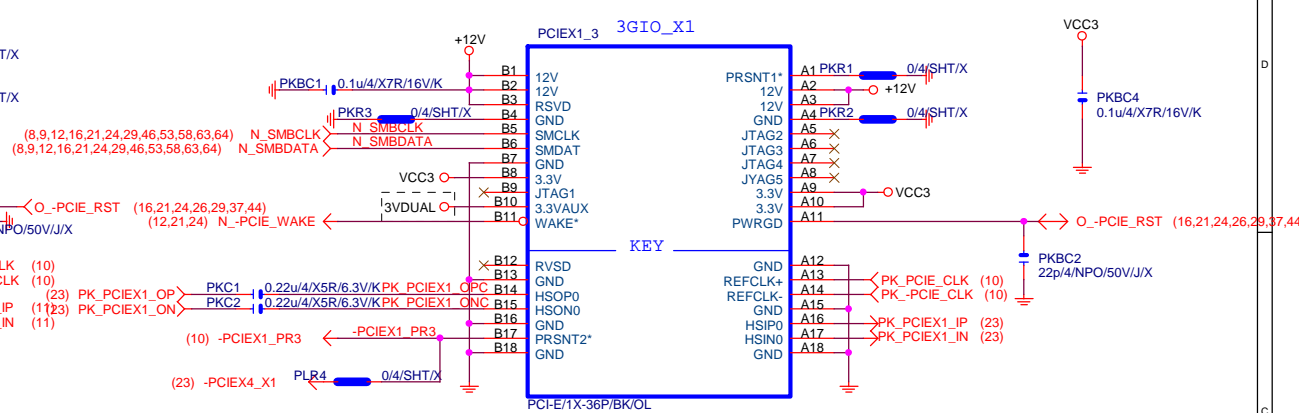
Rev 0.3

PCIE1 SLOT

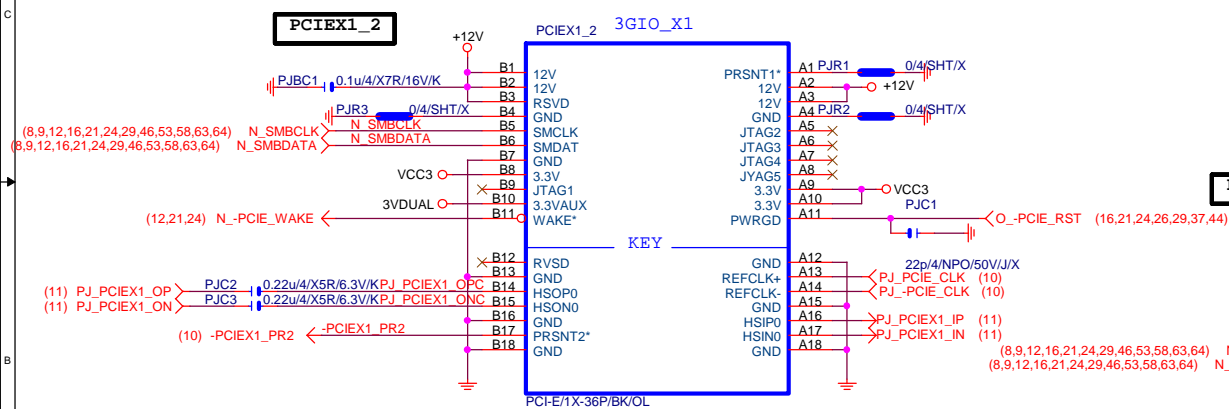
PCIE1\_1



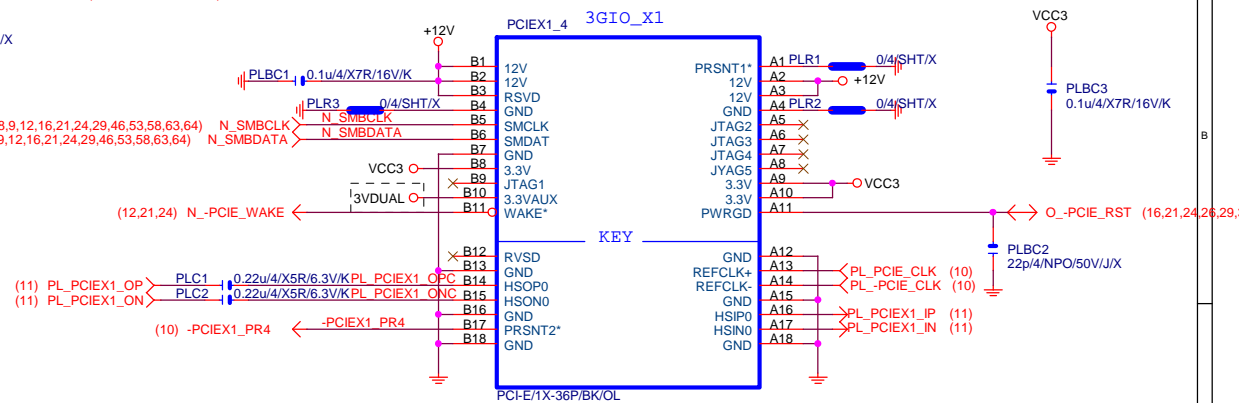
PCIE\*1\_3



PCIE1\_2



PCIE\*1\_4



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Gigabyte Technology


Title		
PCIE_X1 1,2,3		
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Rev 0.1



**SMD螺柱**


80M



CR/[10KS2-040150-11R]


**SMD 螺柱** 10KS2-040131-01R

42M




SDO/M3/UD5.5/BD4.0/H0.6/SN

60M



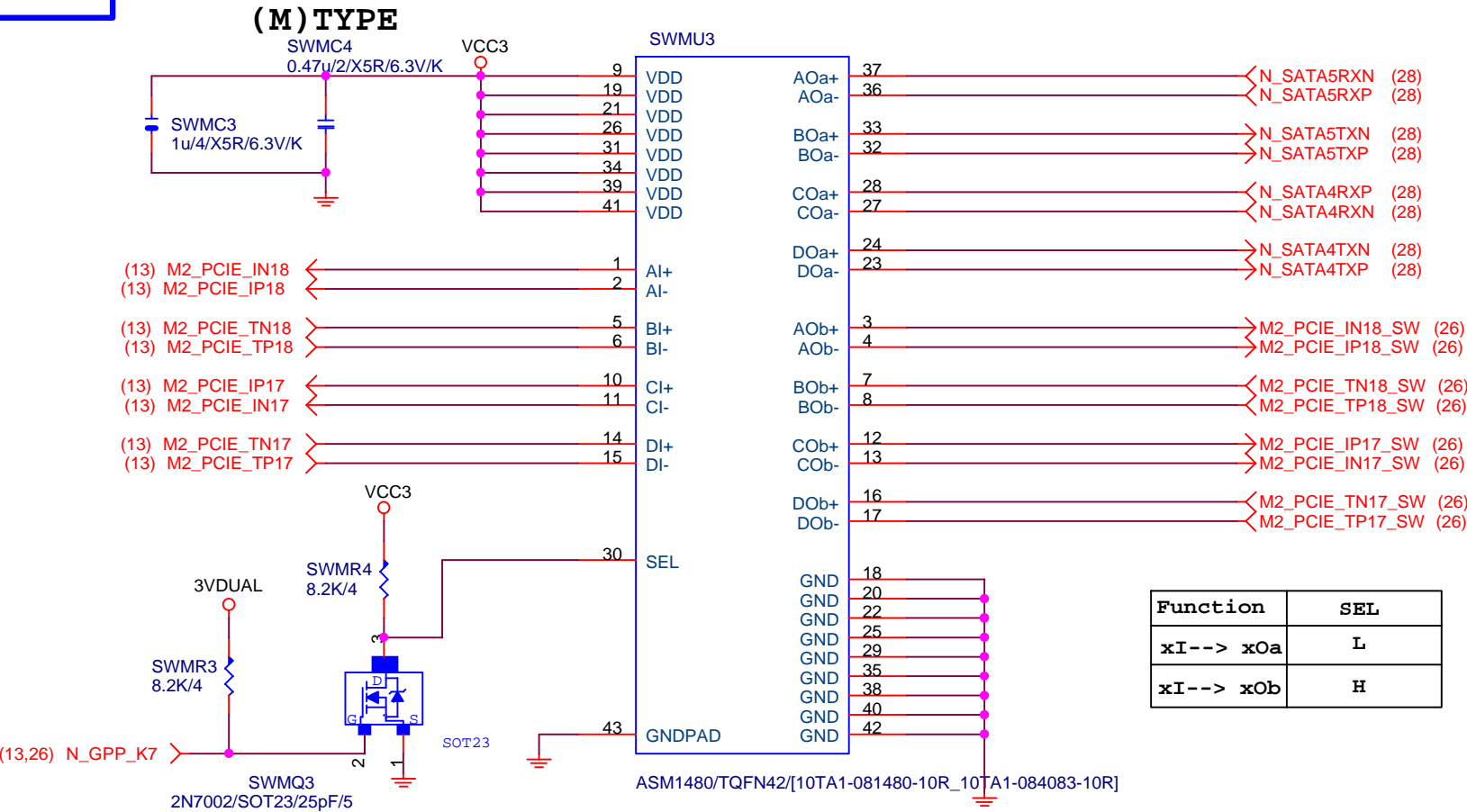
SDO/M3/UD5.5/BD4.0/H0.6/SN

80M



SDO/M3/UD5.5/BD4.0/H0.6/SN/X

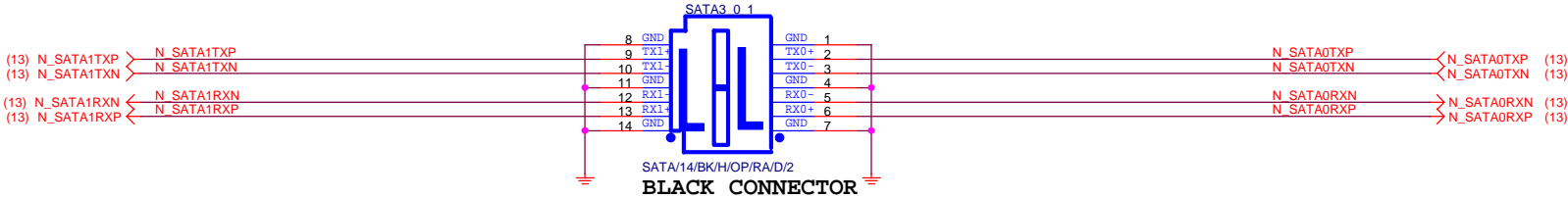
Rev 0.1



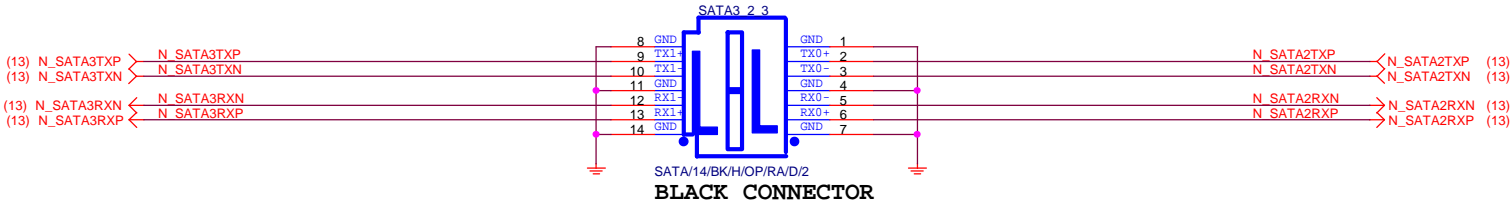
Flex IO priority	N_GPP_K7	SATA 4	SATA 5
M2M	L	NA	NA

Gigabyte Technology			
M.2X4_S4~S5 SWITCH			
Title			
Size A	Document Number	Z390 AORUS Elite	Rev 1.0
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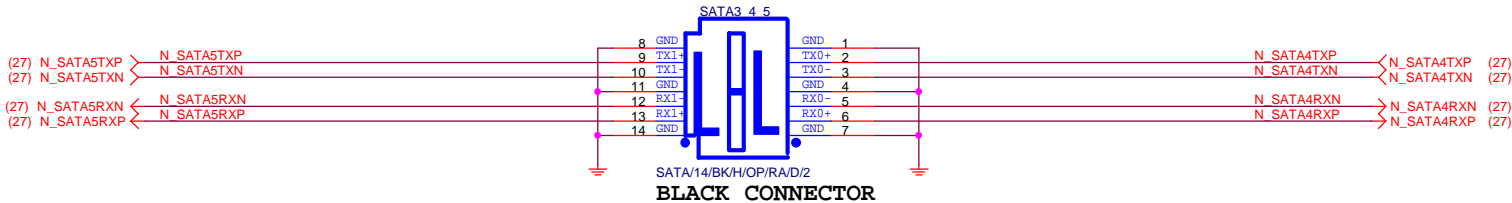
SATA3  
port0/1



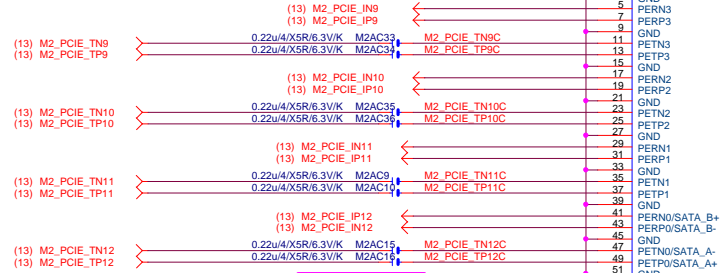
SATA3  
port2/3



SATA3  
port4/5

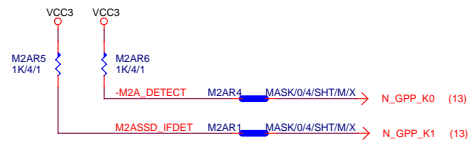


Rev 0.1



## PCIE LANE REVERSE

## 支援SATA and M.2 function



請與M2\_-CLKREQ對應

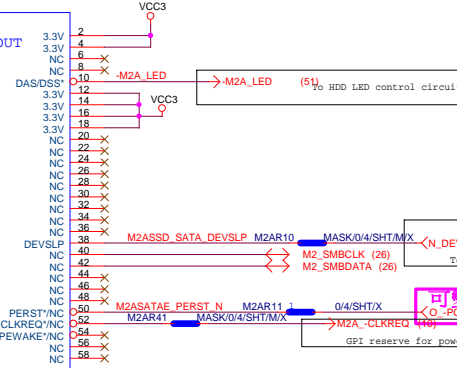


## 架高

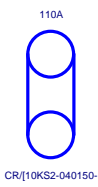
M2A  
M2 HEATSINK

M.2 HEATSINK[12SP1-S10205-81R\_12SP1-S10205-82R]

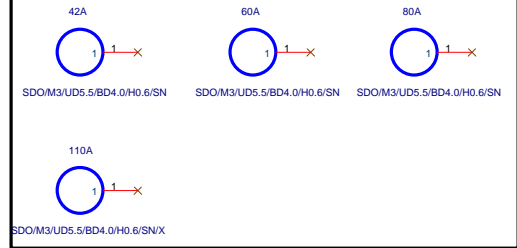
Flex IO priority	N_GPP_K1	IO14 PCIe#9	IO15 PCIe#10	IO16 PCIe#11	IO17 PCIe#12
M2A SATA	L	PCIE	PCIE	SATA 0	SATA 1
M2A PCIE (PCIE Reverse)	H	PCIE	PCIE	PCIE	PCIE



## SMD螺柱

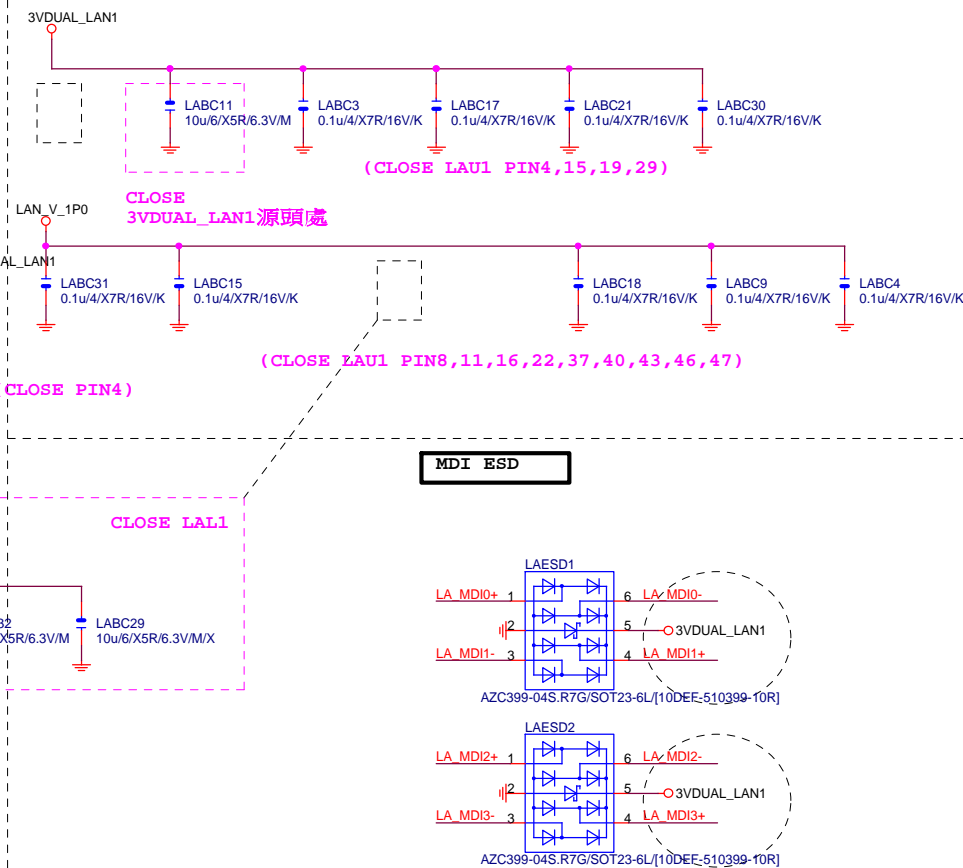
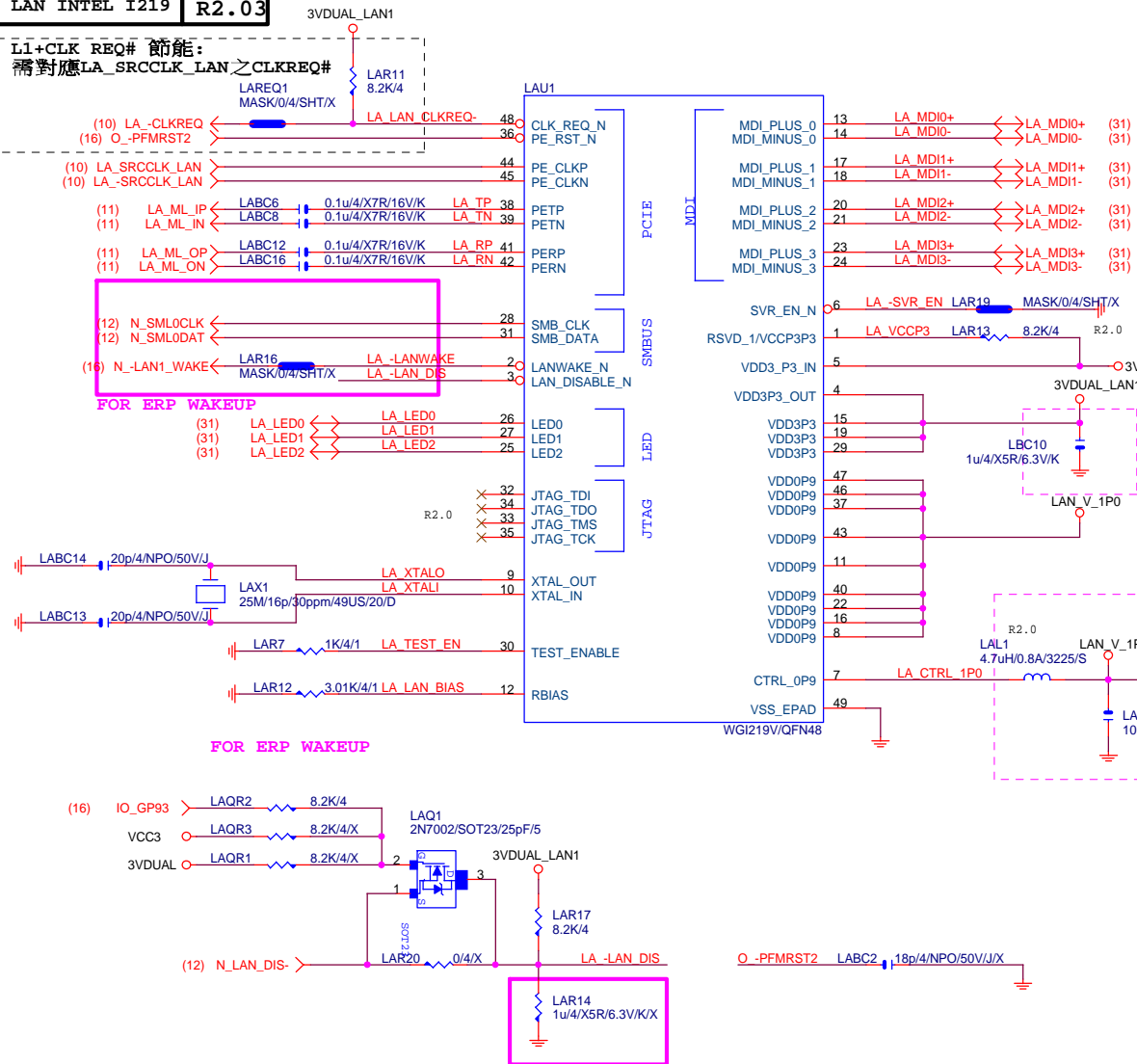


## SMD螺柱



Gigabyte Technology		
Title	M.2 X4	
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L1+CLK REQ# 節能:  
需對應LA\_SRCCLK\_LAN之CLKREQ#

Gigabyte Technology

INTEL I219

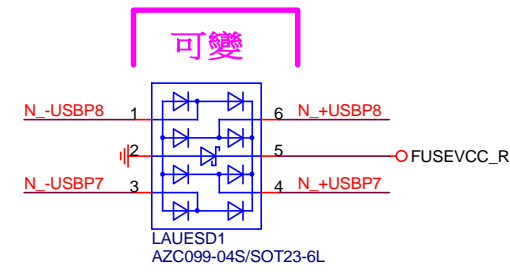
Z390 AORUS Elite

Rev  
1.0

Title		Date: Friday, August 10, 2018	
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Custom			

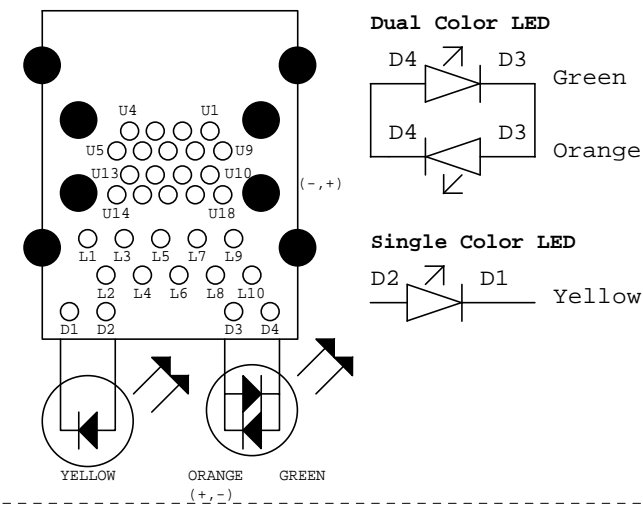
# USB30\_LAN CONNECTOR R2.03

## RMA ESD PROTECT note:可變更USB NAME



USB上白下藍:USB3+LAN/1G/GO,Y/OS/RA/D/G30/15KV/Q FLASH

## USB30 LAN LAYOUT示意圖



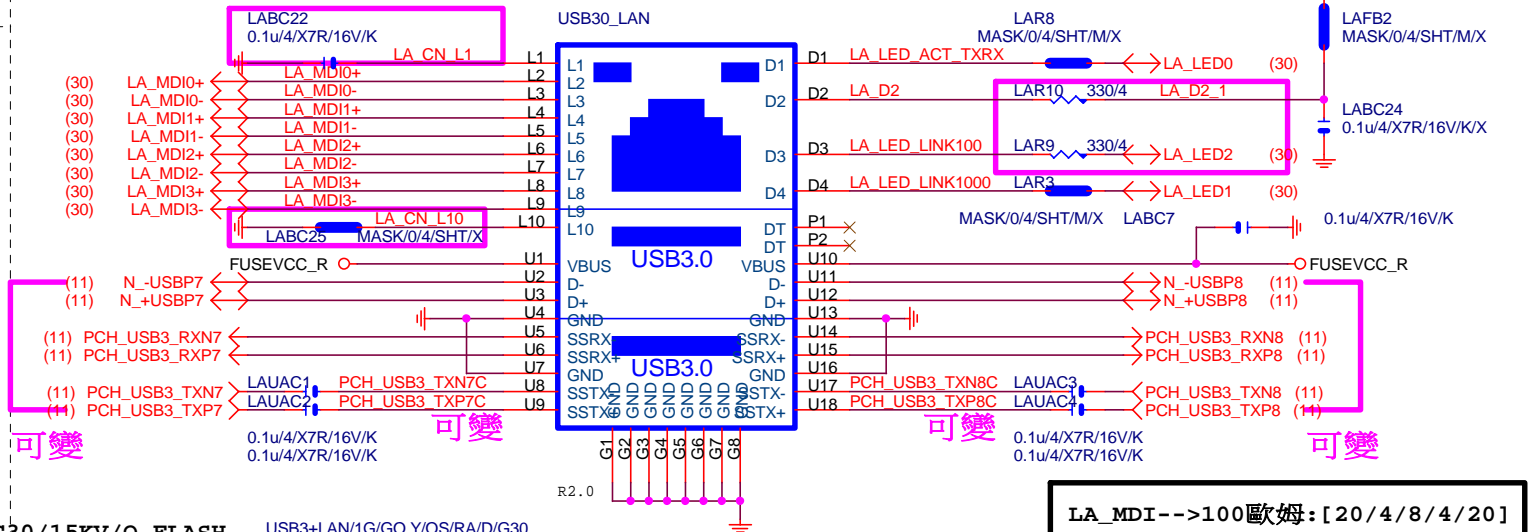
## LAN COVER FOOT PRINT:LAN COVER

可變  
[視SPEC需求]

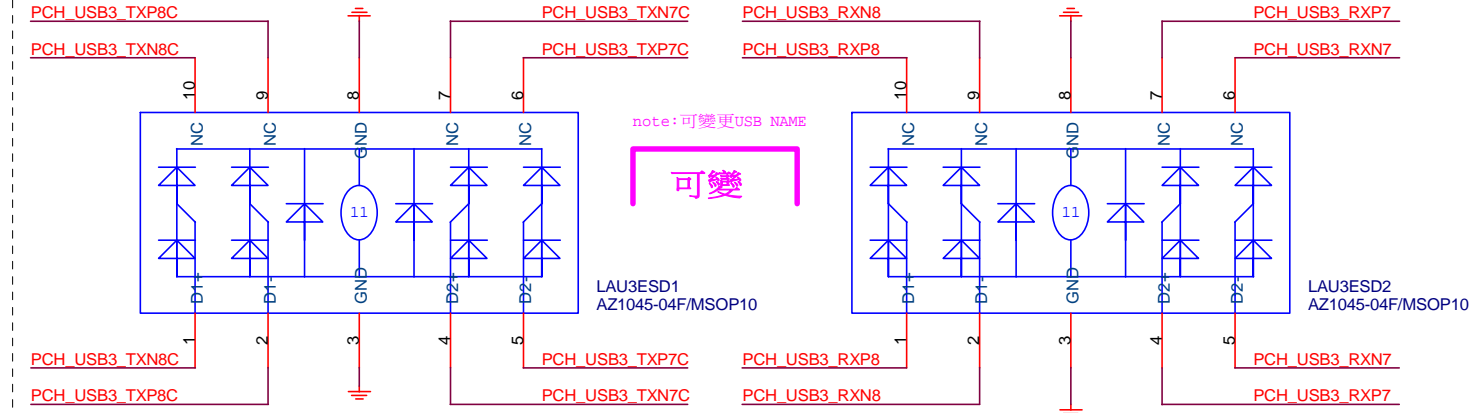
# USB LAN CONNECTOR

note:可變更USB NAME

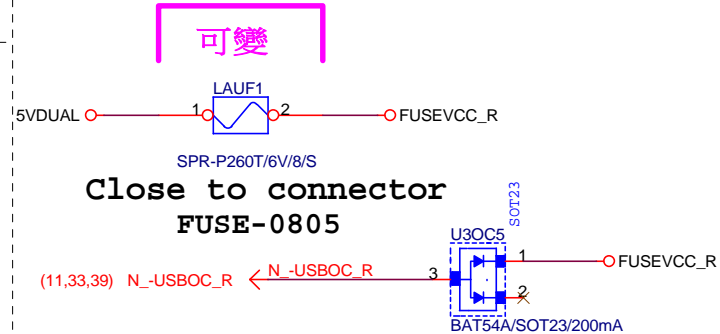
[I219]



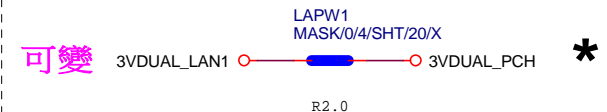
LA MDI-->100歐姆:[20/4/8/4/20]



## USB POWER note:可變更FUSE

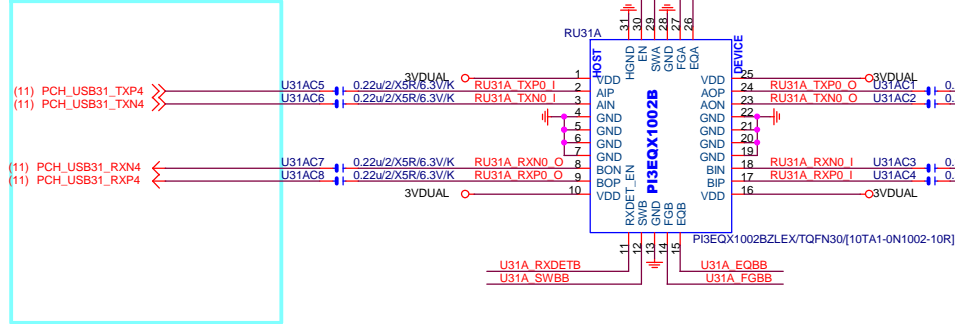


## LAN POWER note: lan power連接及電流

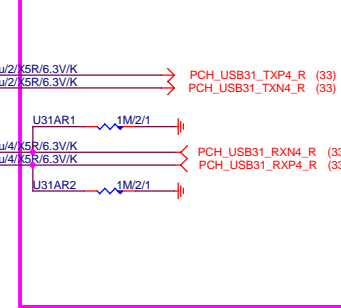


Gigabyte Technology		
LAN CONNECTOR-I219		
Z390 AORUS Elite		
Title	Document Number	Rev 1.0
Size Custom		
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## PCH Site



## USB TypeA Connector Site

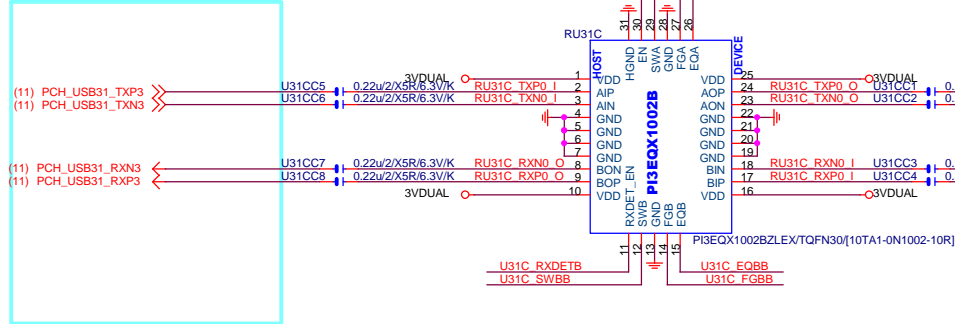


### Layout Rule:

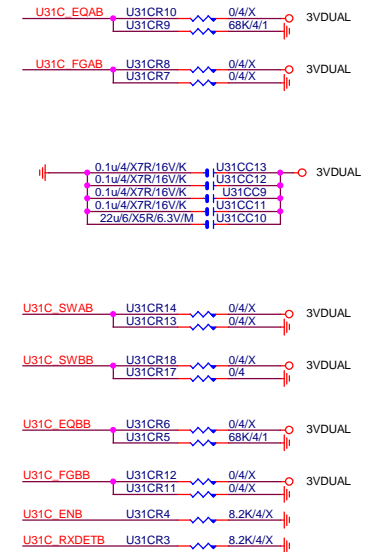
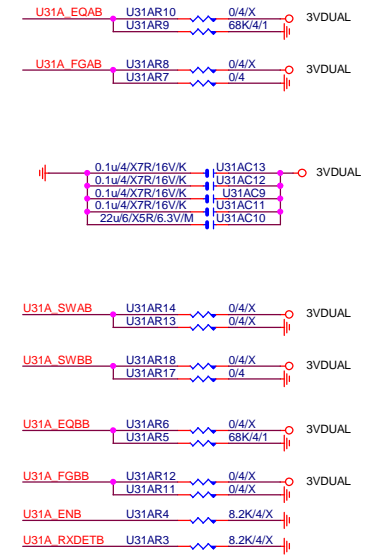
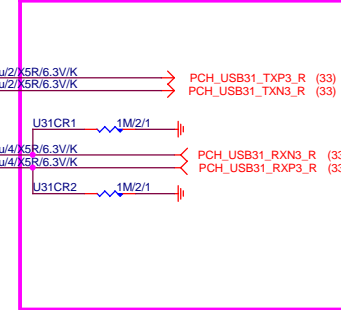
1. Differential Pair can't be swaped
2. Redriver to Connector Length min. 500mil

www.teknisi-indonesia.com

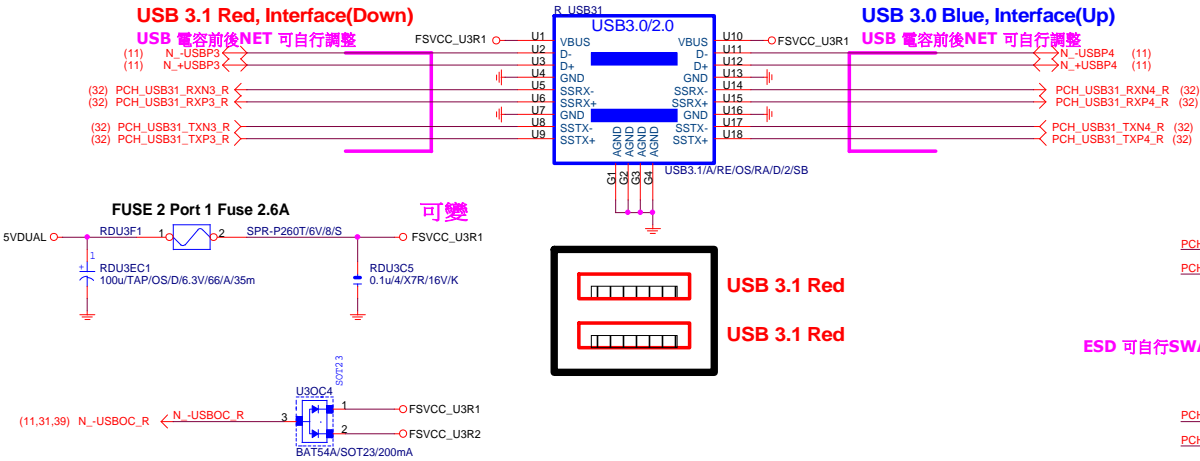
## PCH Site



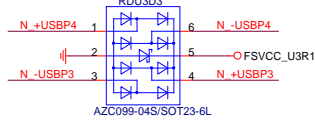
## USB TypeA Connector Site



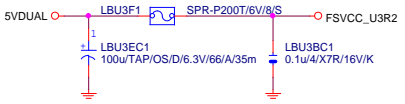
GIGABYTE™			
Title PI3EQX1002B Redriver/DC-J_A/B			
Size Custom	Document Number Z390 AORUS Elite		Rev 1.0
Date: Friday, August 10, 2018	Sheet 32	of 65	



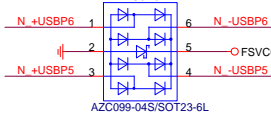
ESD 可自行SWAP PIN



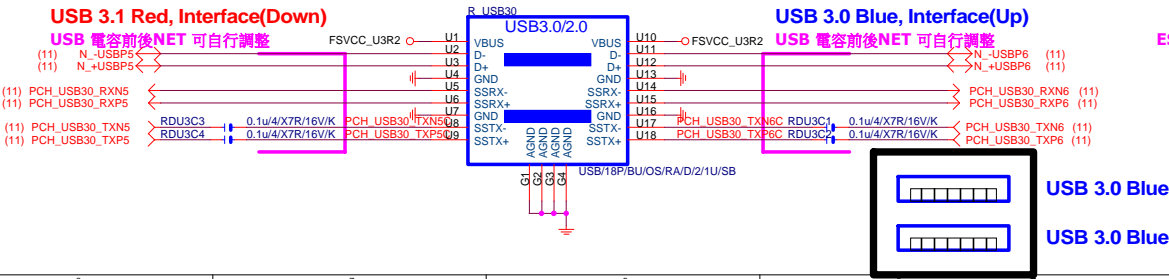
CONNECTOR 自行調整



ESD 可自行SWAP PIN



CONNECTOR 自行調整



GIGABYTE			
Title			
R_USB31 TYPE A			
Size	Document Number	Z390 AORUS Elite	
Custom		Rev	1.0
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**GIGABYTE™**

Title **TI HD3SS3220 Rear**

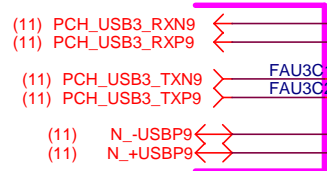
Size C Document Number **Z390 AORUS Elite**

Rev **1.0**

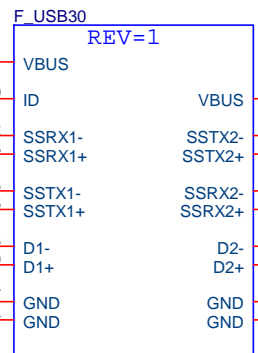
Date: Friday, August 10, 2018 Sheet 34 of 65

## Front USB3.0

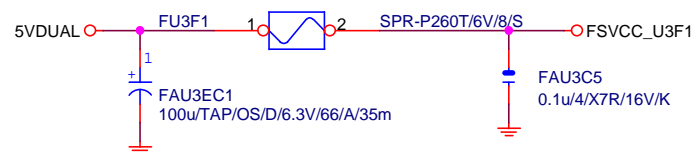
NET 自行調整



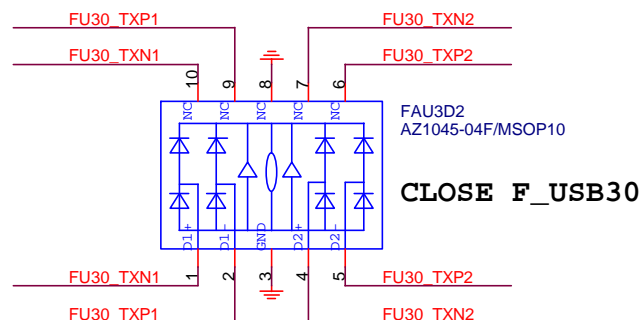
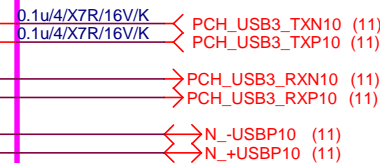
FSVCC\_U3F1



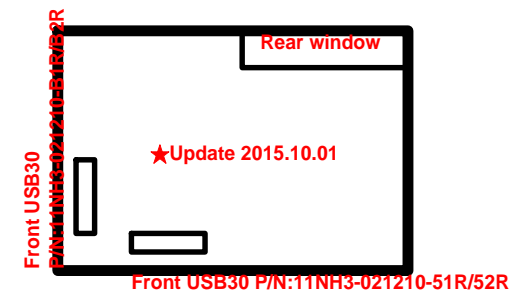
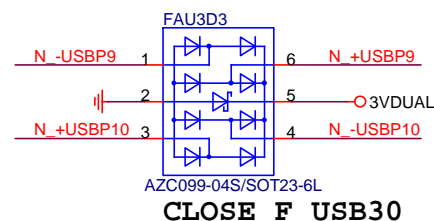
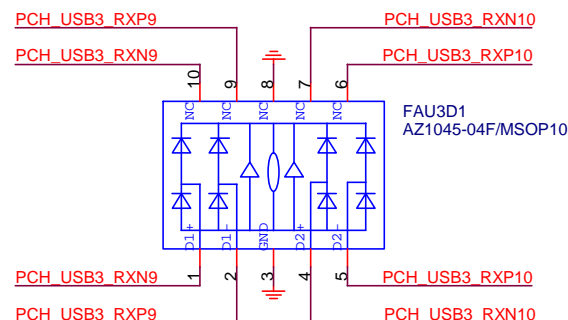
Check F\_USB30 location.  
★Update 2015.10.01



NET 可自行調整



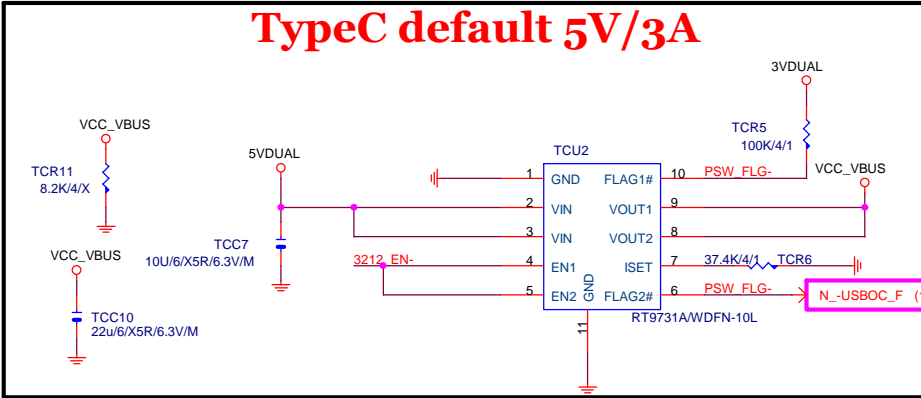
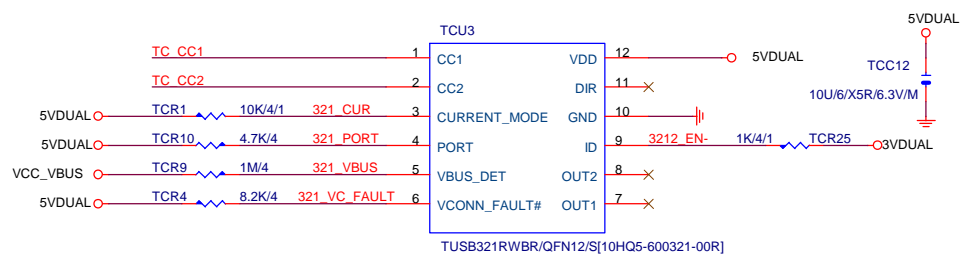
NET 可自行調整



GIGABYTE

Title		R_USB30,F_USB30, USB_OC	
Size	Document Number	Z390 AORUS Elite	
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# Type C U30 SW Rev. 1.02

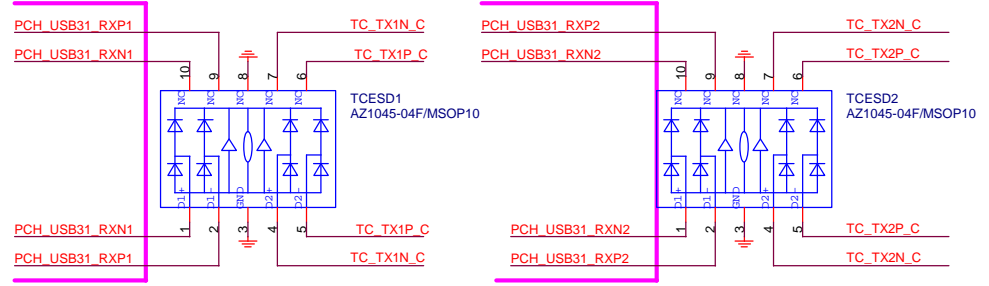
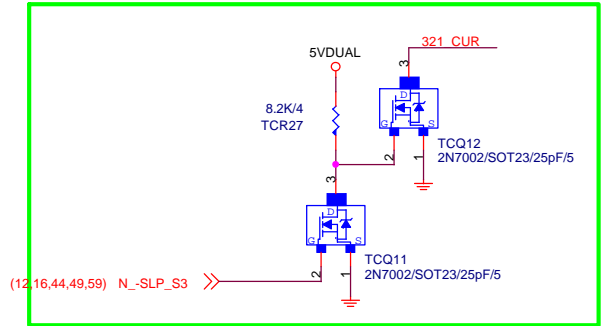


## CURRENT MODE

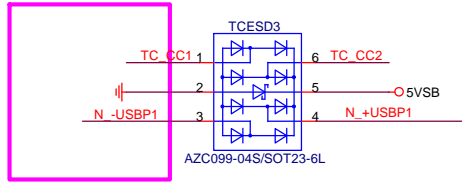
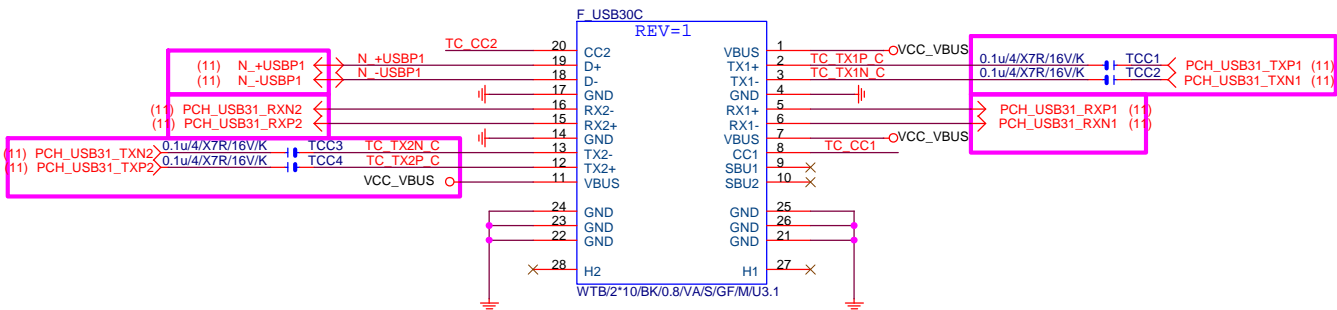
- L - Default current / Pull down to GND or NC
  - M - Medium (1.5A) current / Pull up to VDD 500K
  - H - High (3.0A) current / Pull up to VDD 10K
- For VBUS current limit at 900mA on S3

## PORT

- H - HOST
  - L - Device
  - NC - Dual
- Role



Color markers can be changed by model

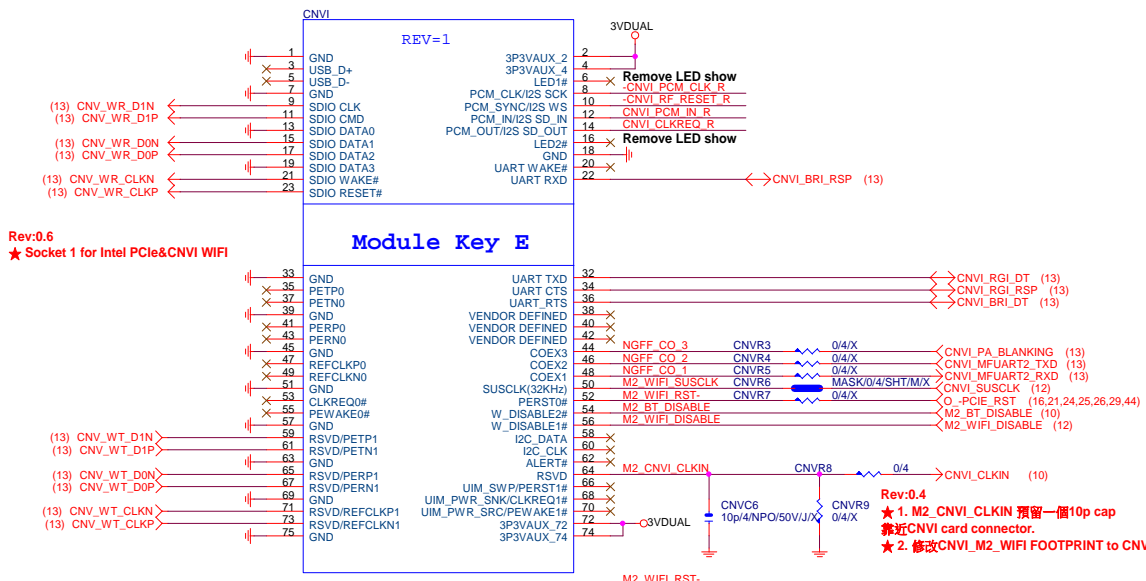


USB2.0 can be used the same source

**GIGABYTE™**

Title		
TI TUSB321		
Size	Document Number	Rev
B	Z390 AORUS Elite	1.0
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CNVi M2 WIFI



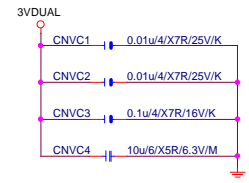
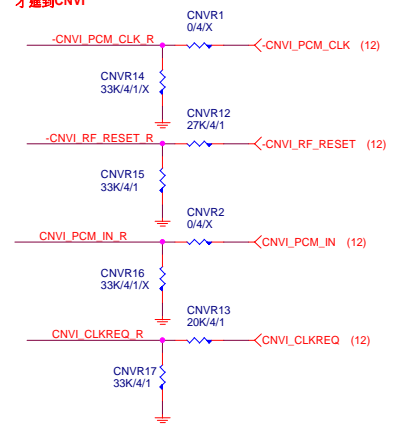
**直立**  
**Footprint Notice.**  
★Update 2015-07-22  
★Footprint for 直立式 SMD: WIFLEKEY  
★SMD P/N: 直立式 10NH5-130067-11R.

**橫躺**  
**Footprint Notice.**  
★Update 2015-07-22  
★Footprint for 橫躺式高: NGFF-E-75P-3  
★Footprint for 橫躺式矮: NGFF-E-75P-2

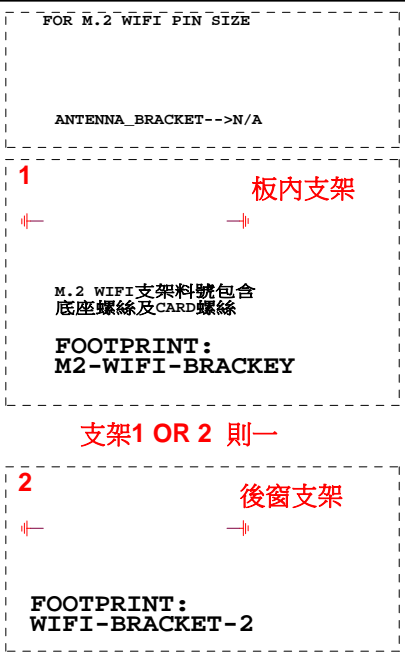
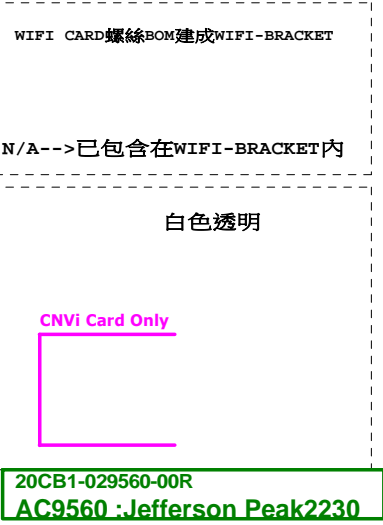
Rev:0.6  
★for PCIe mode 預留  
★ 橫躺式高SMD P/N:10NR5-130067-61R  
★ 橫躺式矮SMD P/N:10NR5-130067-22R

Rev:0.4  
★ 1. M2\_CNVI\_CLKIN 預留一個10p cap 靠近CNVi card connector.  
★ 2. 修改CNVi\_M2\_WIFI FOOTPRINT to CNVi

Rev:0.6  
★ 1. 將PCH吐出的3.3V 經分壓為1.8V 才進到CNVi

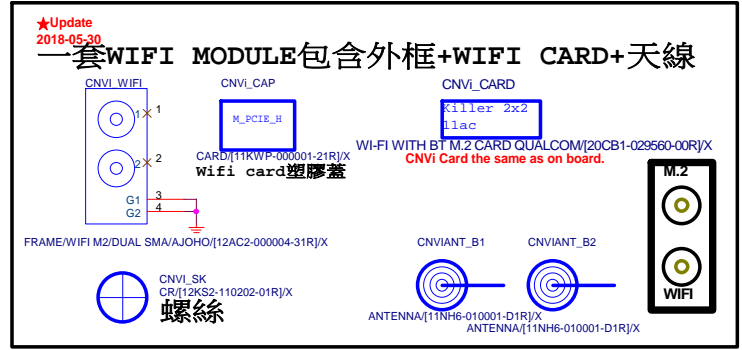


FOR M.2 WIFI MODULE ON BOARD



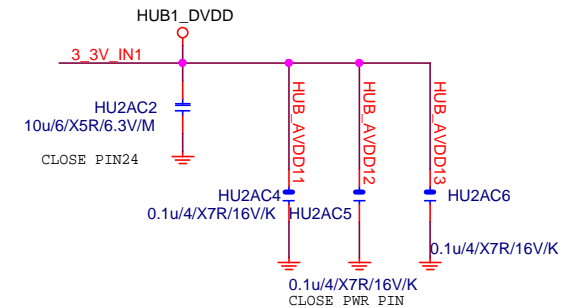
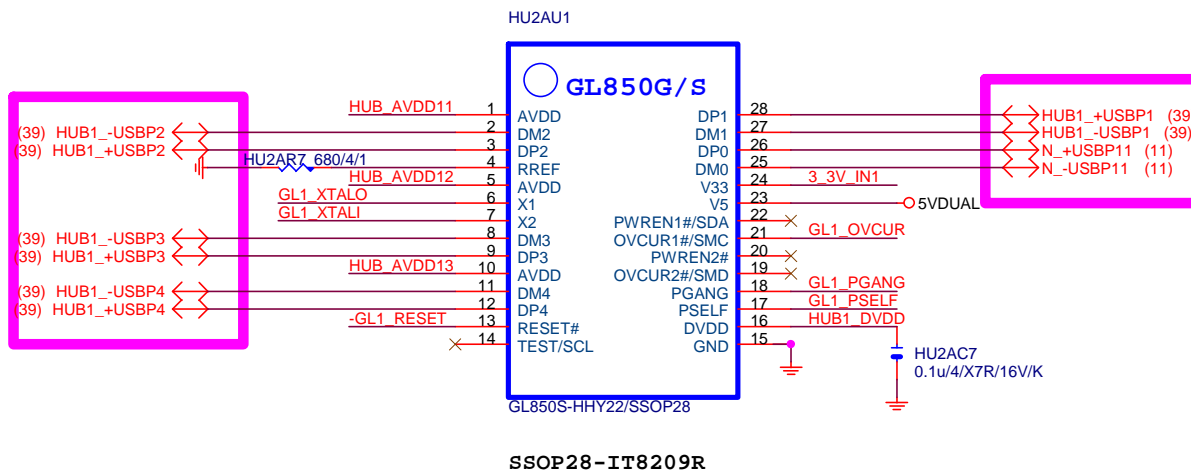
DIP螺絲 SMD螺柱  
矮 橫躺SMD M.2 矮 OR 高則一  
高 DIP螺絲 SMD螺柱

FOR M.2 WIFI MODULE @ REAR PANEL

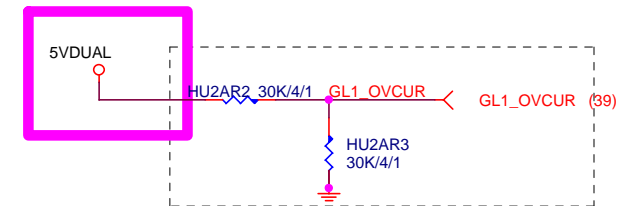


兩片式WIFI金屬殼改為單件式  
Layout Library : wifi-ekey-module-1  
Tiptop P/N : 12AC2-000004-31R

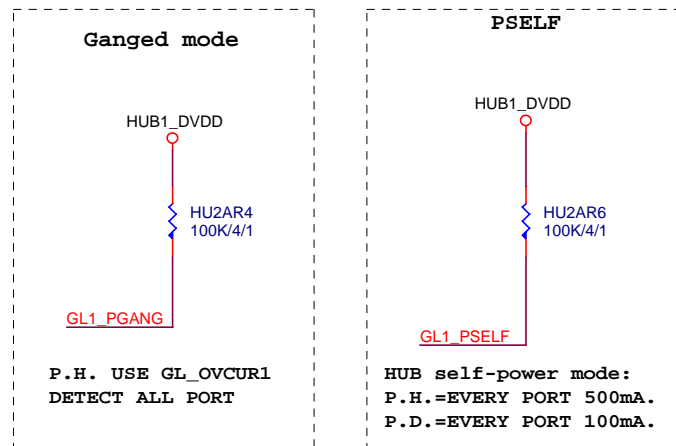




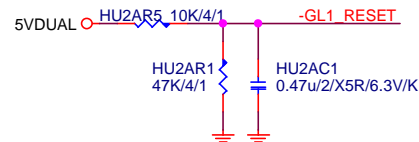
## HUB OVER CURRENT SENSE



## HUB MODE

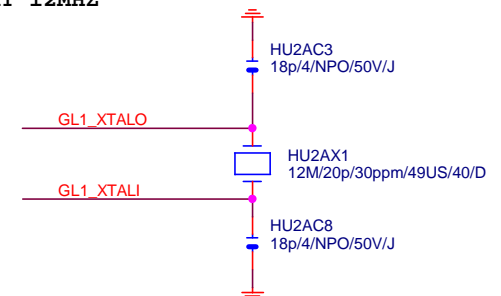


## HUB RESET



## HUB CRYSTAL

ONLY SUPPORT 12MHZ



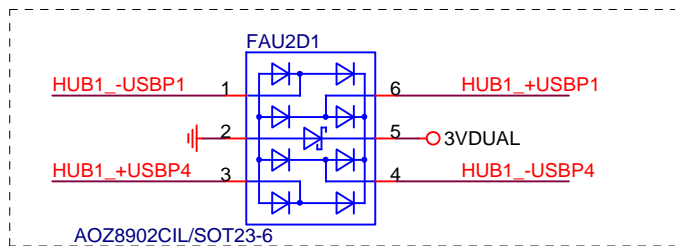
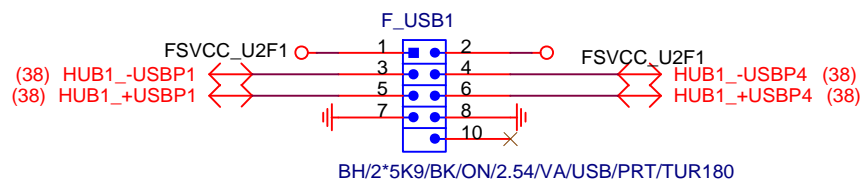
Gigabyte Technology

Title			
HUB GL850GS_1			
Size	Document Number	Rev	
Custom	Z390 AORUS Elite	1.0	
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Rev: 0.52

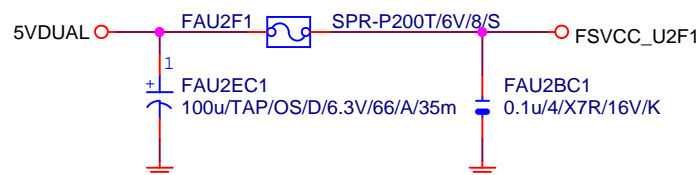
## FRONT USB1

NET 可變

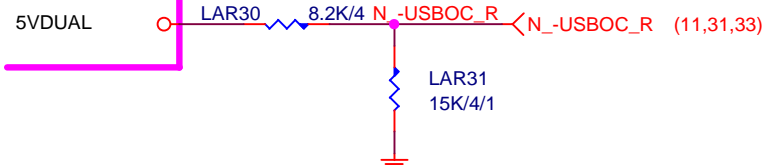
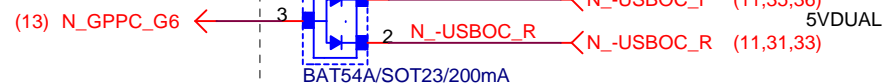


Close to connector

FUSE 2 Port 1 Fuse 2A

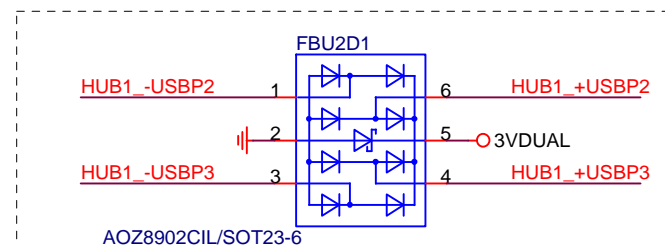
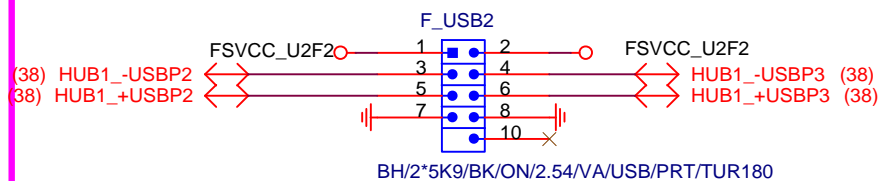


\* 接 PCH  
N\_GPP\_G6(SMI) &  
PCH PU 3Vdual



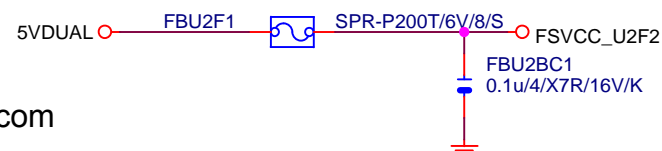
## FRONT USB2

NET 可變

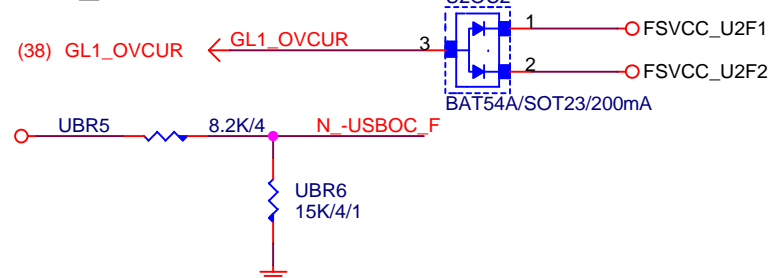


Close to connector

FUSE 2 Port 1 Fuse 2A

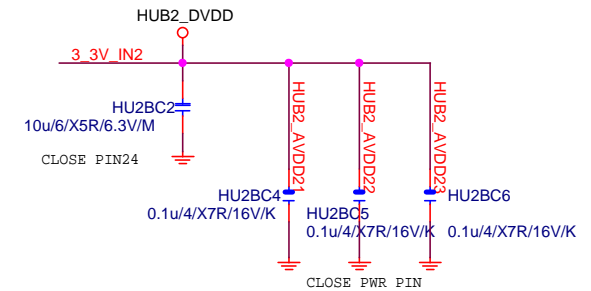


F\_USB 2.0 OC SIGNAL

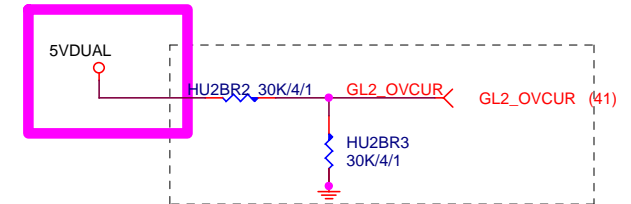


Gigabyte Technology

Title		
USB2.0		
Size A	Document Number	Rev
	Z390 AORUS Elite	1.0
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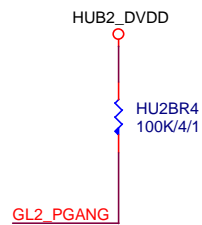


## HUB OVER CURRENT SENSE



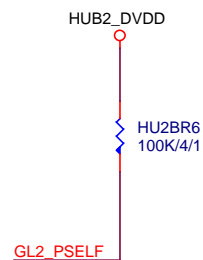
## HUB MODE

## Ganged mode



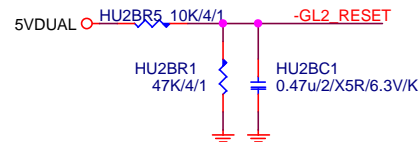
P.H. USE GL\_OVCUR1  
DETECT ALL PORT

## PSELF



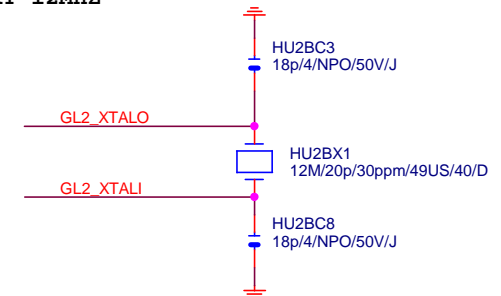
HUB self-power mode:  
P.H.=EVERY PORT 500mA.  
P.D.=EVERY PORT 100mA.

## HUB RESET



## HUB CRYSTAL

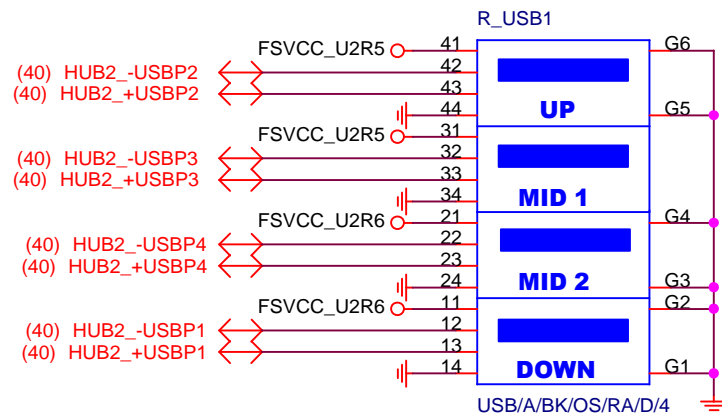
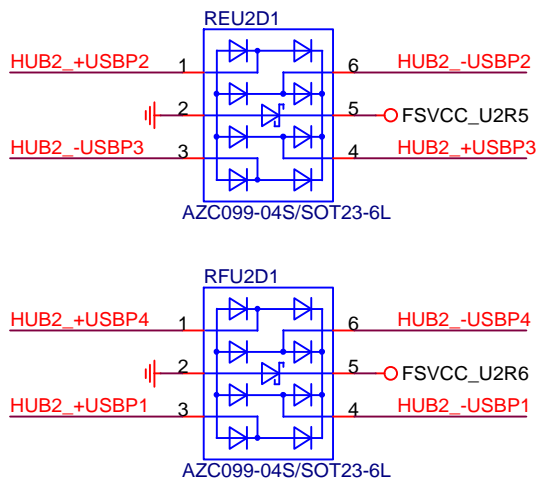
ONLY SUPPORT 12MHZ

**Gigabyte Technology**

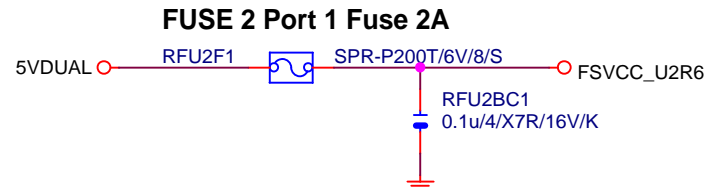
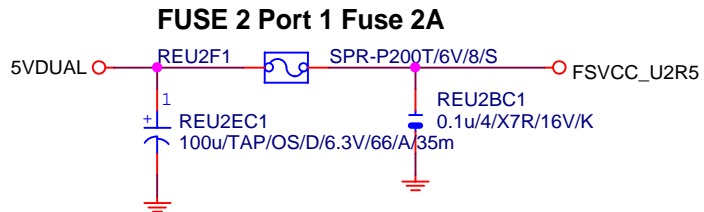
Title			
HUB GL850GS_2			
Size	Document Number	Rev	
Custpm	Z390 AORUS Elite	1.0	
Date:	Friday, August 10, 2018	Sheet	40 of 65

Rev: 0.6

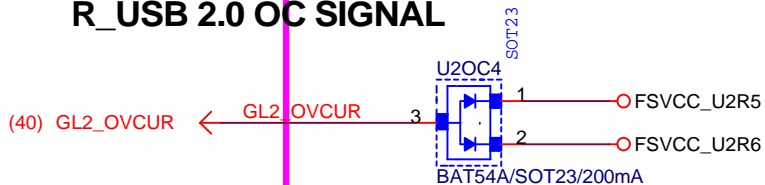
Rear USB1



NET 可變



R\_USB 2.0 OC SIGNAL

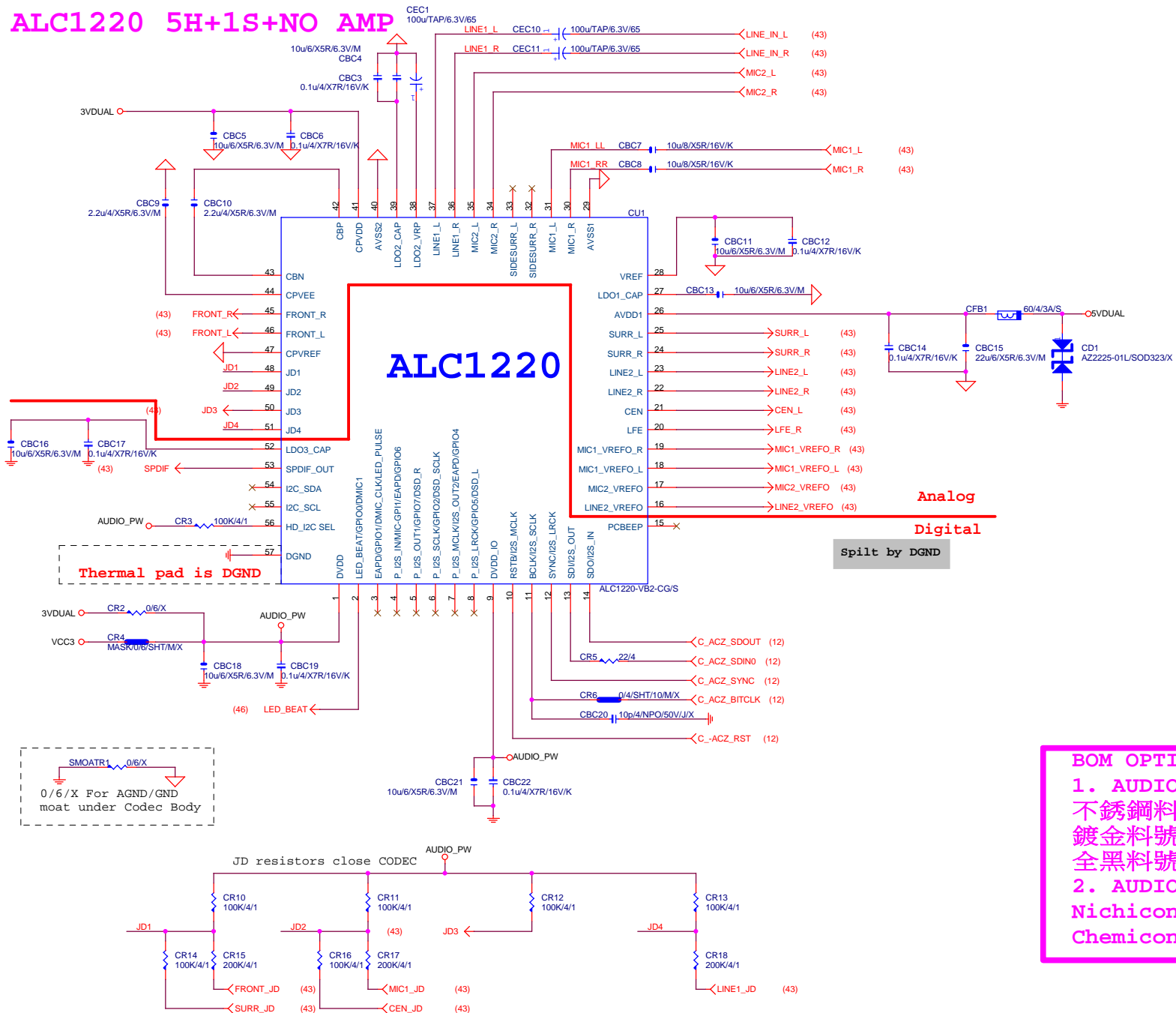


GIGABYTE

Title			
COM,-RI,KB_USB,USB_ESATA,-PROCHOT			
Size A	Document Number	Z390 AORUS Elite	Rev 1.0
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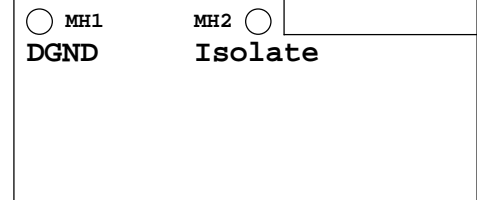
Rev 3.1

# ALC1220 5H+1S+NO AMP



LAYOUT注意:螺絲孔下GND方式

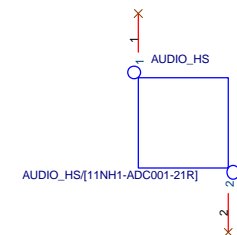
1. MH1下DGND
2. MH2一律改為Isolate



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-A3R

鍍金料號:11NR6-403025-92R

全黑料號:11NR6-403025-B1R

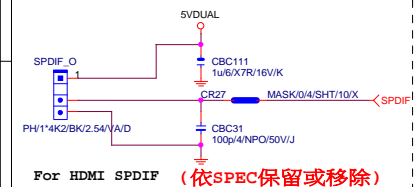
2. AUDIO CAP

Nichicon MW音效電容 : 100u/TAP/6.3V/65

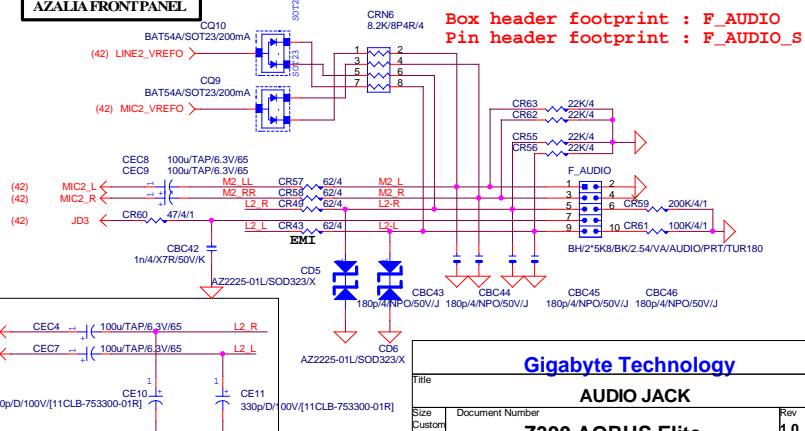
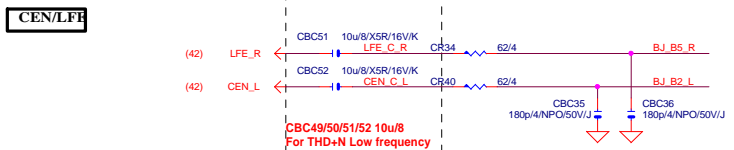
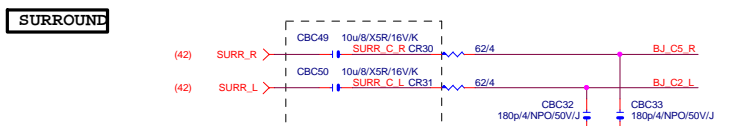
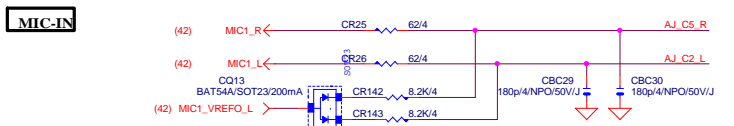
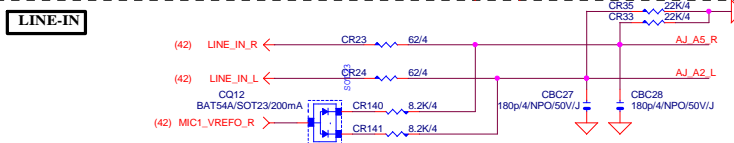
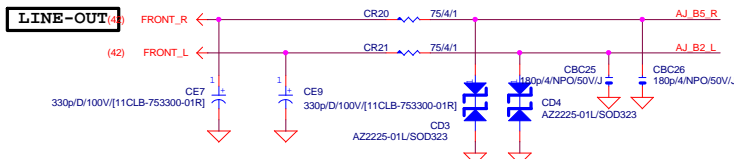
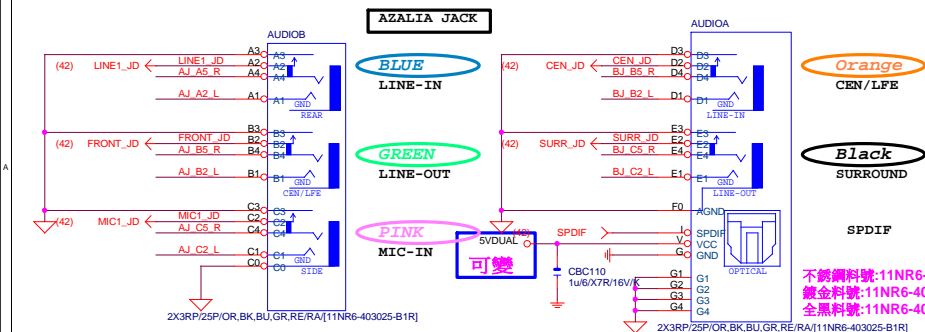
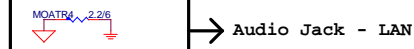
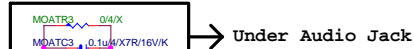
Chemicon音效電容 : 100uF/TAP/10V/6\*5


Gigabyte Technology

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Rev			1.0		



For HDMI SPDIF (依SPEC保留或移除)

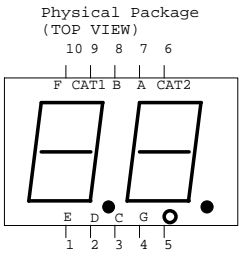


<div style="text-align: center;">  </div>			
Title			
AUDIO JACK			
Size	Document Number	Rev	
Custom	Z390 AORUS Elite	1.0	
Date:	Friday, August 10, 2018	Sheet	43 of 65

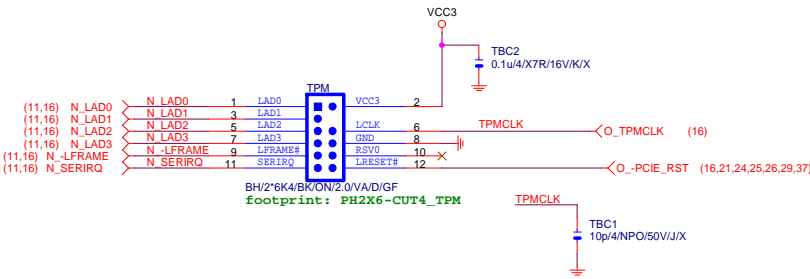
COM PORT

COMA

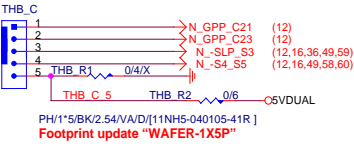
80 PORT



TPM CONNECT



Thunderbolt  
★Update 2015-12-29



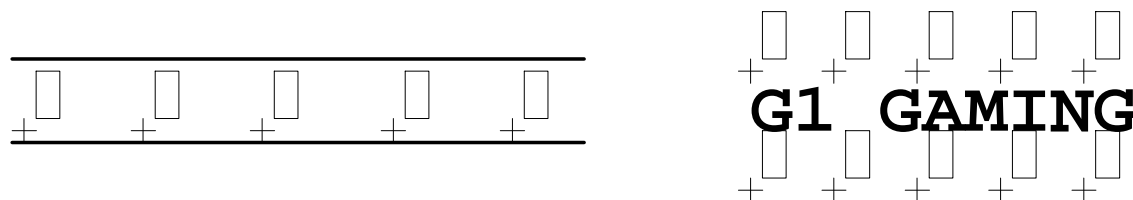
Gigabyte Technology

Title			FP,F_USB,USB PWR,BZ		
Size	Document Number				Rev
Custom	Z390 AORUS Elite				1.0
Date:	Friday, August 10, 2018				
Sheet	44	of	65		

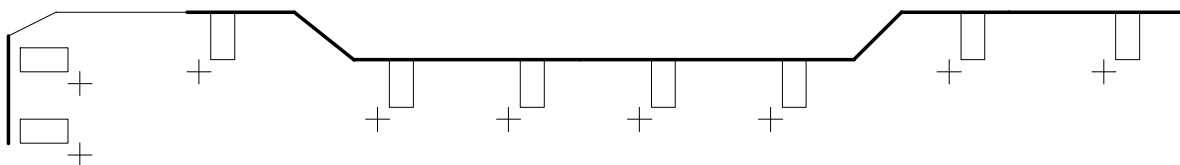
## RGB LED LAYOUT 注意事項：

1. Debug LED (各LED依CPU/DRAM/VGA/BOOT個別位置擺放)
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. MCU\_PW & MCU\_PW33電源一律走20mils
5. ECF1,ECF2,ECF3,ECF5 兩端電源走80mils或用鋪銅方式加粗
6. MCU LED 出pin的走線4mils,如:LED\_R\_1,LED\_G\_1,LED\_B\_1 .....
7. LED RGBW rule :W/S=10/5 mils 如:LED\_R\_11,LED\_G\_11,LED\_B\_11..  
(包含從晶體到排阻到LED的net)
8. Digital LED NET rule W/S=4/8 mils  
GPD0\_SDA\_B,GPD0\_SDA\_BB,GPD0\_SDA\_C,GPD0\_SDA\_CC

PCB板邊透光model name鏤空+背面 RGB LED



Audio Ground切割線+背面 RGB LED



"XMP"字樣鏤空+背面 RGB測發光 LED

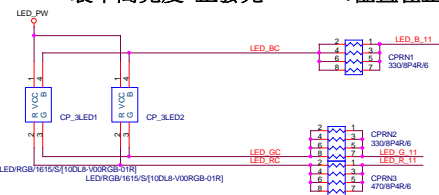


GIGABYTE™			
Title			
LAYOUT GUIDE			
Size	Document Number	Rev	
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## 第一區 LED

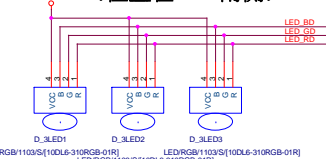
FOR 裝甲高亮度 正發光 LED\*2 (位置在正板,依據裝甲設計擺放)



FOOTPRINT:LED\_4P\_RGB高亮度

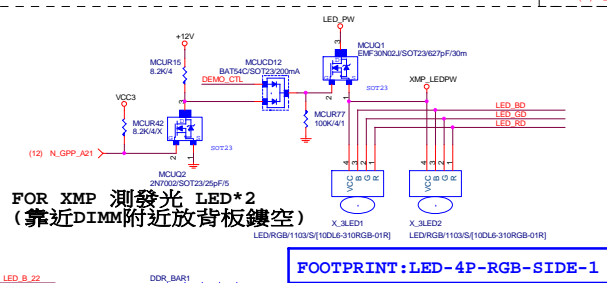
## 第二區 LED

FOR DIMM 側發光 LED\*12 (位置在DIMM兩側)



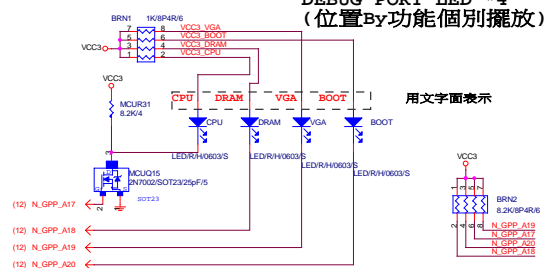
FOOTPRINT:LED-4P-RGB-SIDE-1

FOR XMP 測發光 LED\*2 (靠近DIMM附近放背板鑲空)



FOOTPRINT:LED-4P-RGB-SIDE-1

## DEBUG PORT LED \*4 (位置By功能個別擺放)



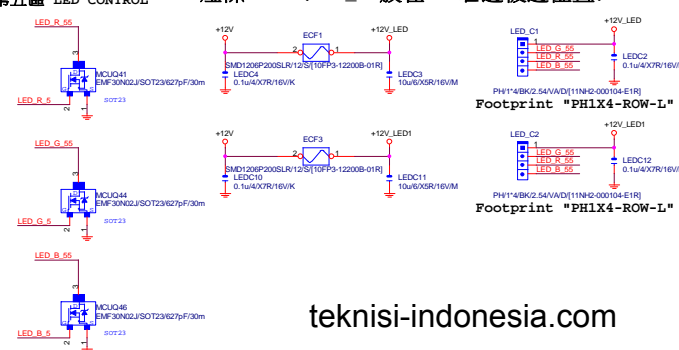
用文字面表示

N_GPP_A17	CPU DEBUG
N_GPP_A18	DDR DEBUG
N_GPP_A19	VGA DEBUG
N_GPP_A20	BOOT DEVICE DEBUG
N_GPP_A21	XMP LED SWITCH
N_GPP_A22	TURBO LED SWITCH
N_GPP_D12	LED_IO LED SWITCH

## 第五區 LED

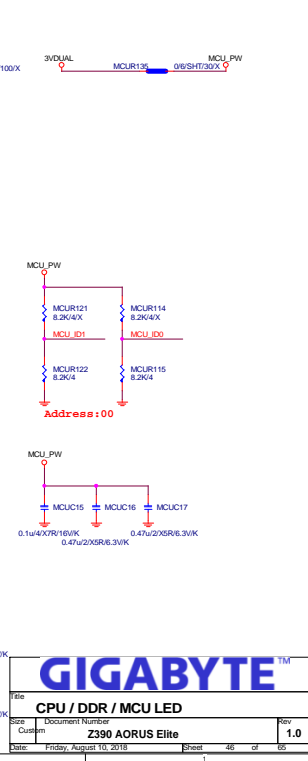
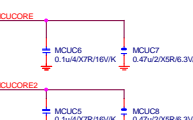
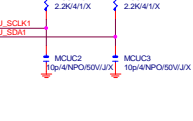
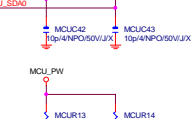
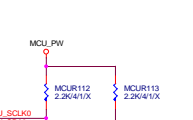
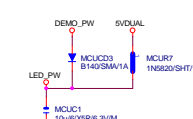
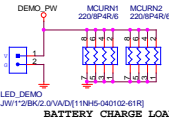
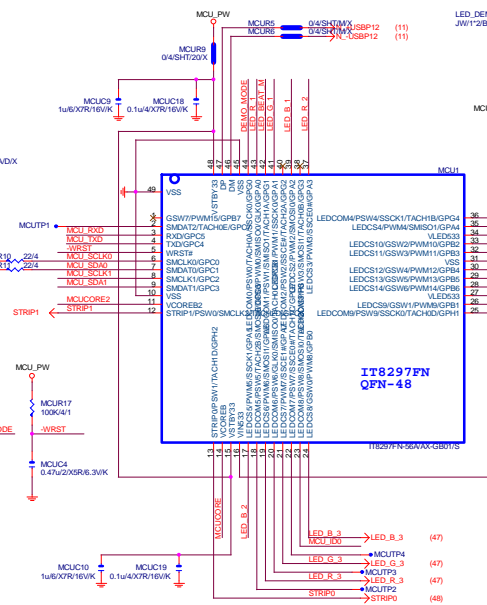
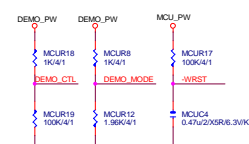
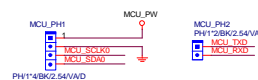
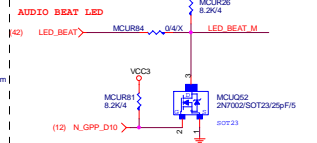
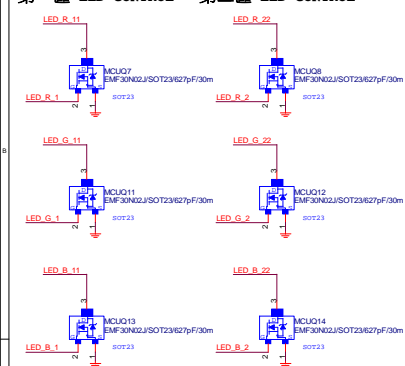
燈條 LED (LED\_C1放在PCB左邊板邊位置)  
燈條 LED (LED\_C2放在PCB右邊板邊位置)

第五區 LED CONTROL



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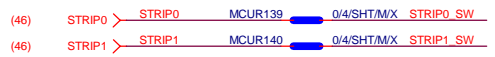
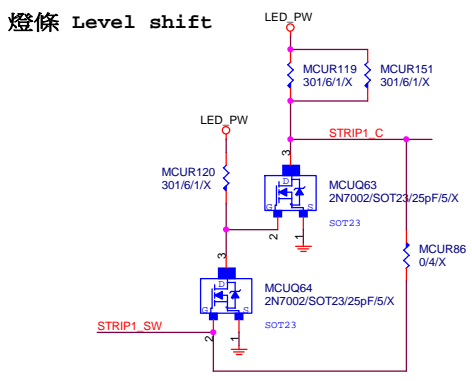
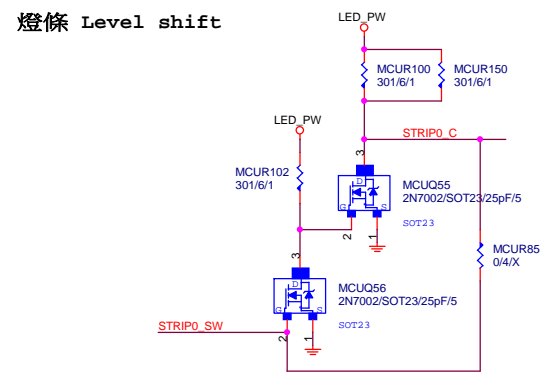
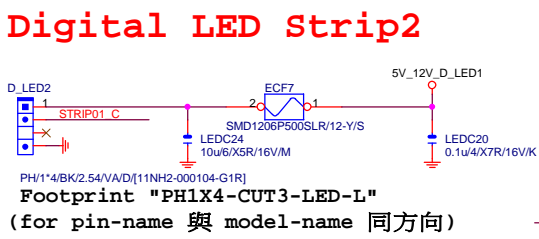
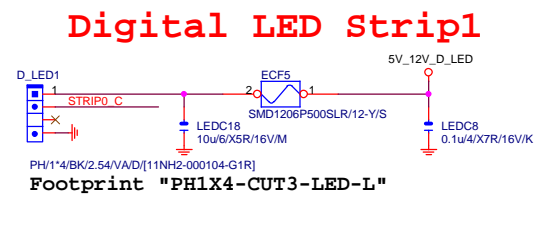
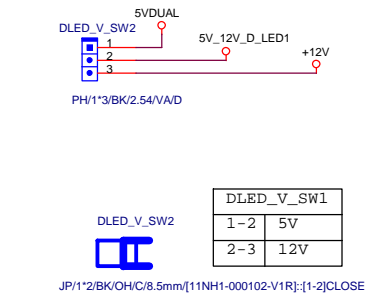
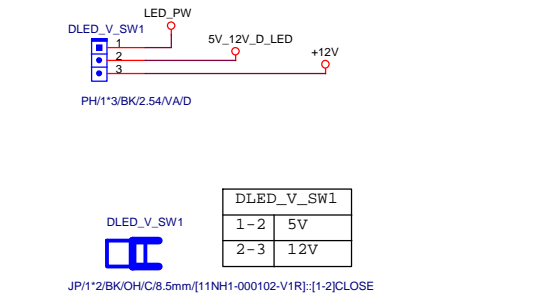
## 第一區 LED CONTROL 第二區 LED CONTROL



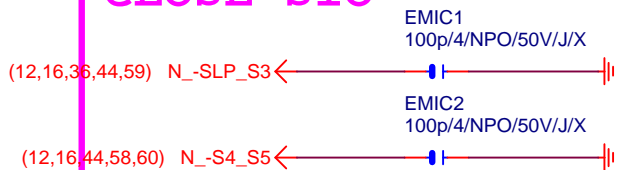


第六區 LED (靠近左上板邊位置)

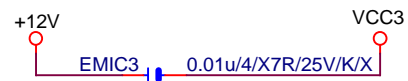
第七區 LED (靠近右下CPU板邊位置)



## CLOSE SIO



## CLOSE PCH



# GIGABYTE™

Title

EM/ESD

Size  
A

Document Number

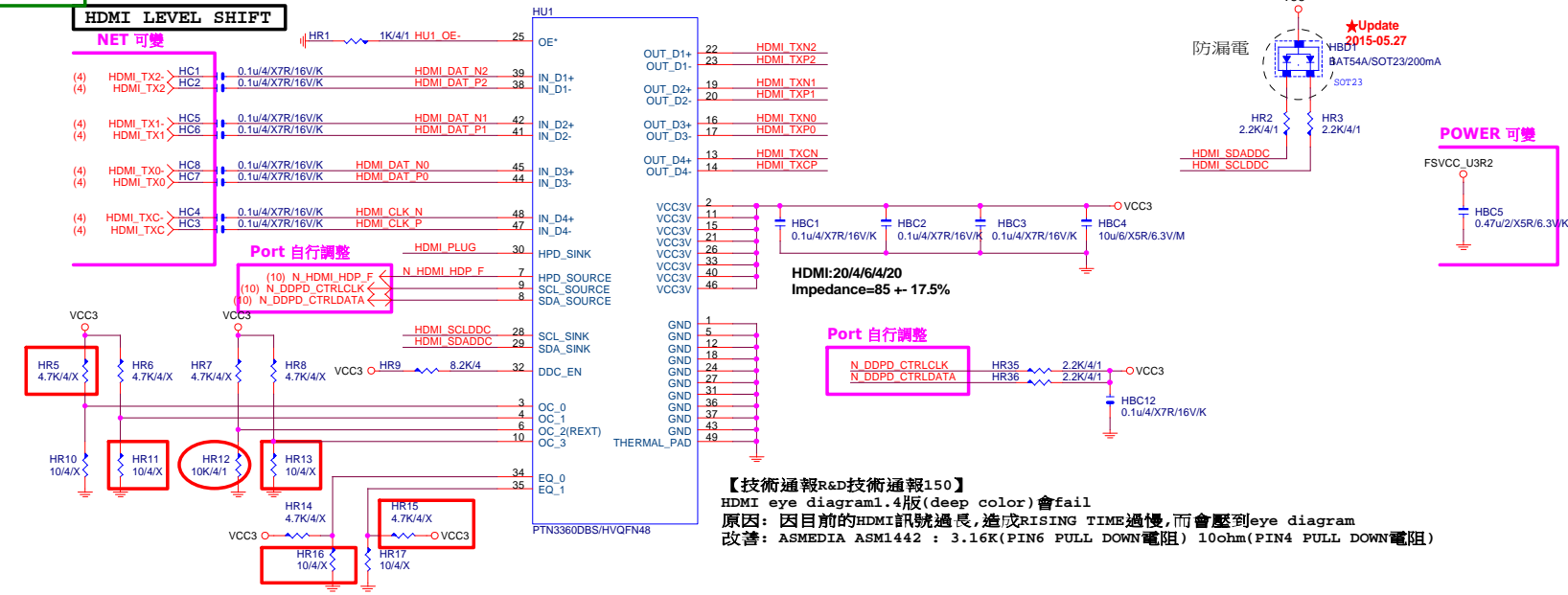
Z390 AORUS Elite

Rev

1.0

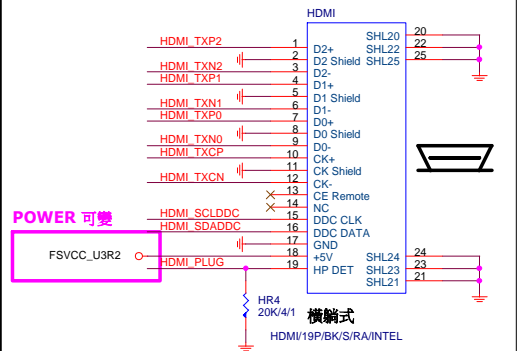
Date: Friday, August 10, 2018

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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

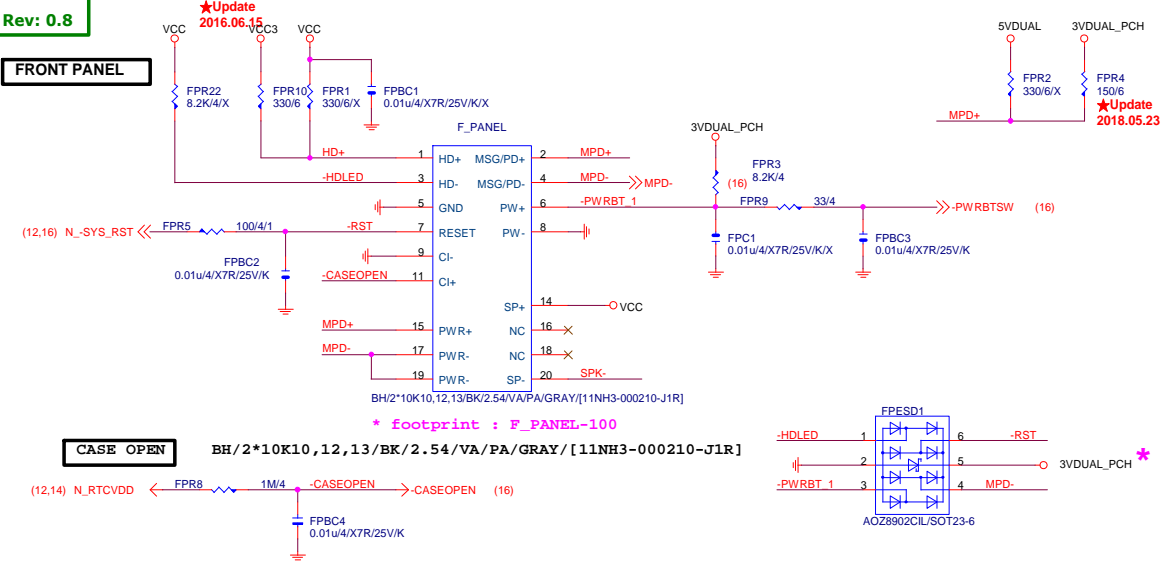
【技術通報R&D技術通報150】  
HDMI eye diagram1.4版(deep color)會fail  
原因: 因目前的HDMI訊號過長,造成RISING TIME過慢,而會壓到eye diagram  
改善: ASMEDIA ASM1442 : 3.16K(PIN6 PULL DOWN電阻) 10ohm(PIN4 PULL DOWN電阻)



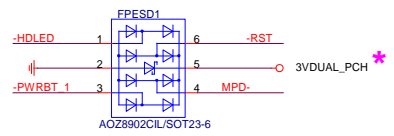
直立式  
P/N:11NR6-H01019-K1R

Rev: 0.8

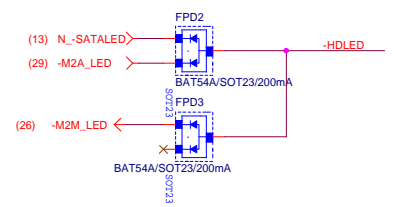
FRONT PANEL



CASE OPEN BH/2\*10K10,12,13/BK/2.54/VA/PA/GRAY/[11NH3-000210-J1R]

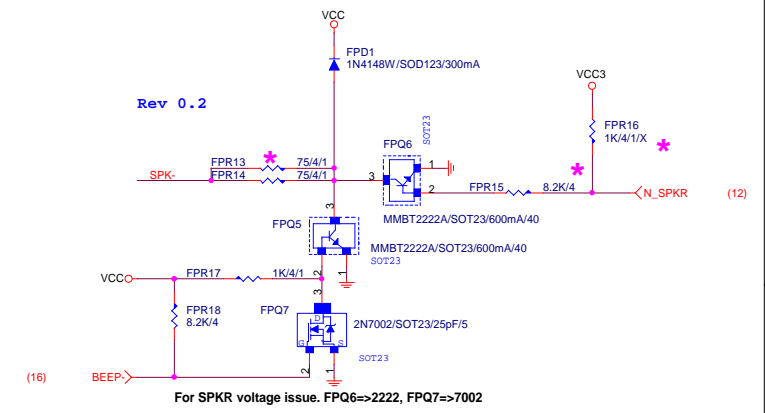


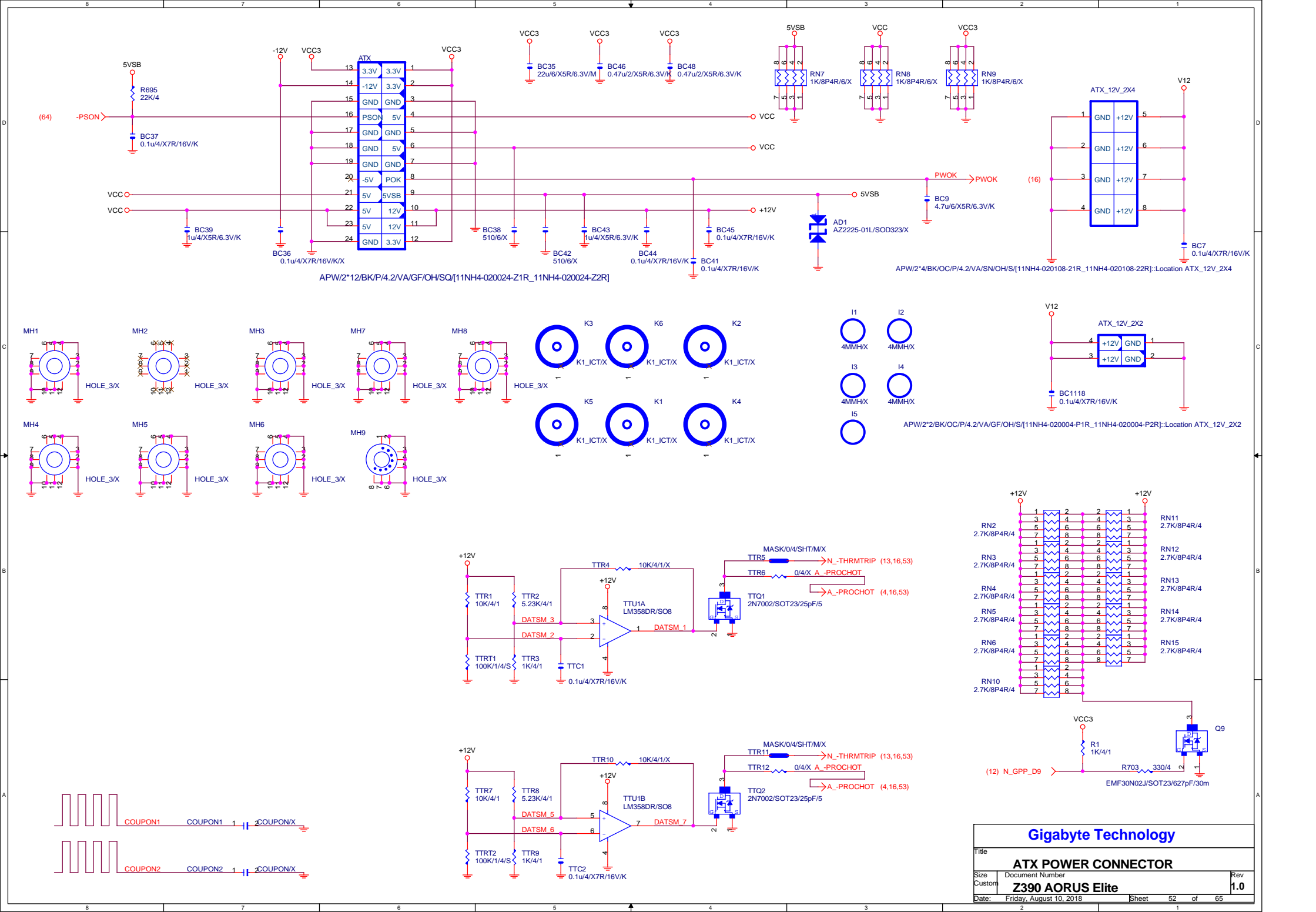
SATA LED SATALED# signal open-collector,pull-up (8.2 kΩ to 10 kΩ) to Vcc3\_3



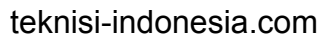
SPEAKER

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



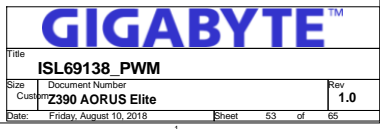


**\*PVT時,DAJP1不上件**

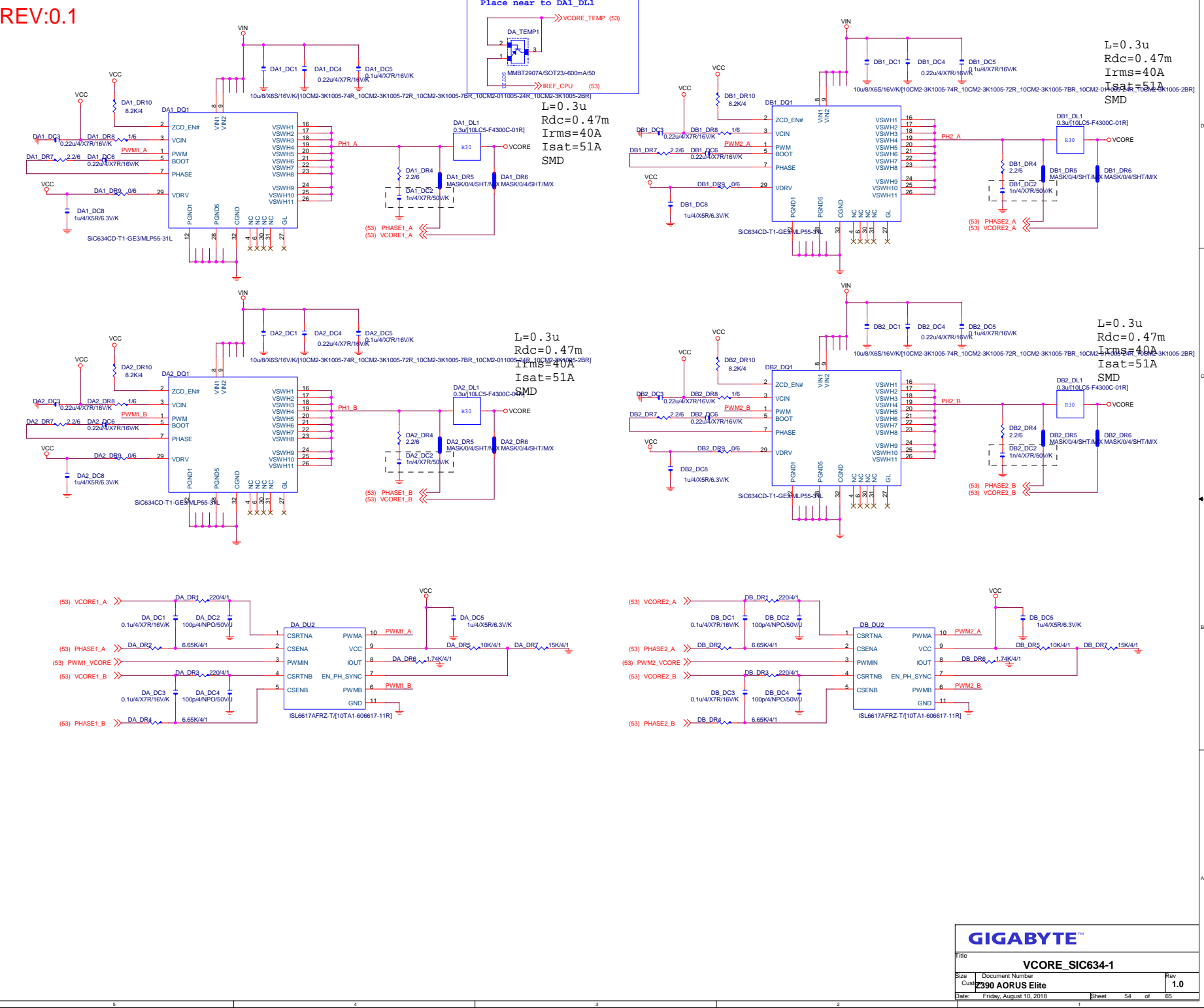


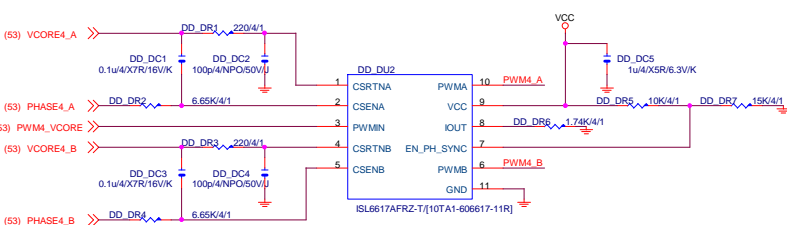
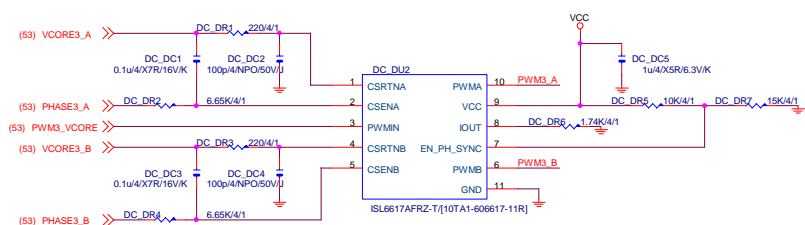
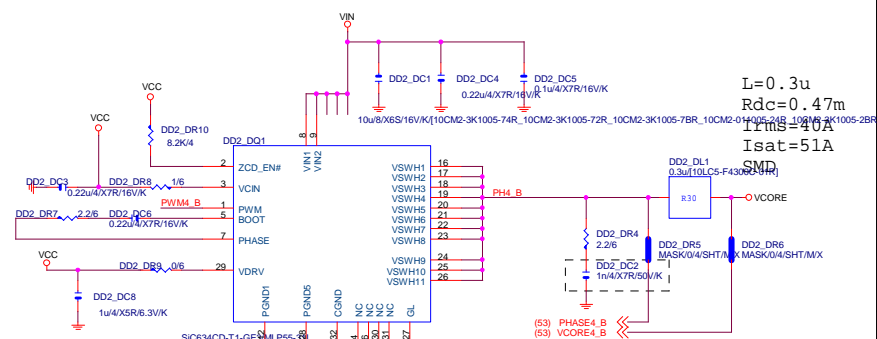
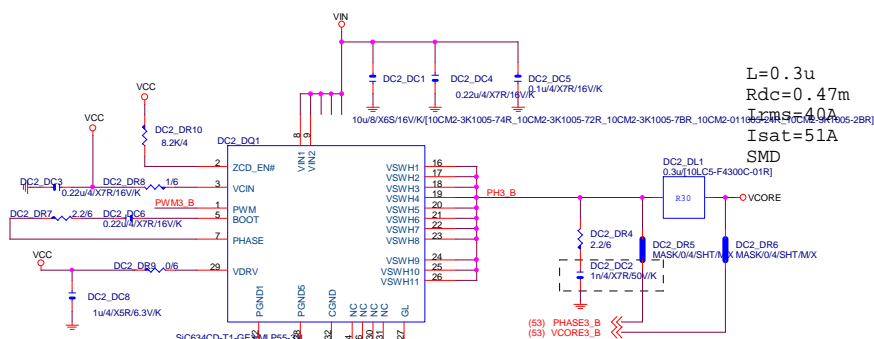
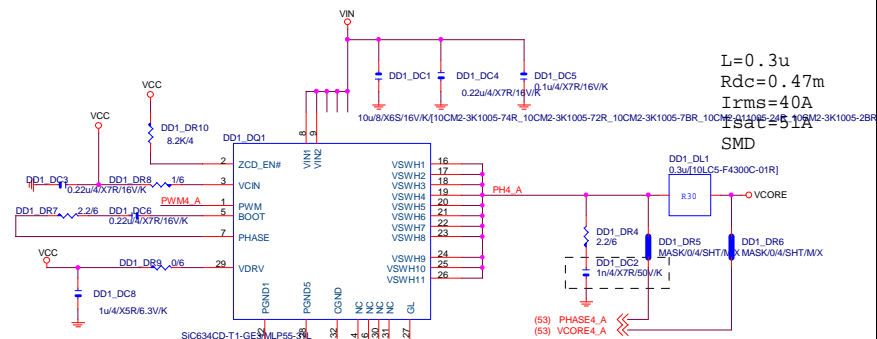
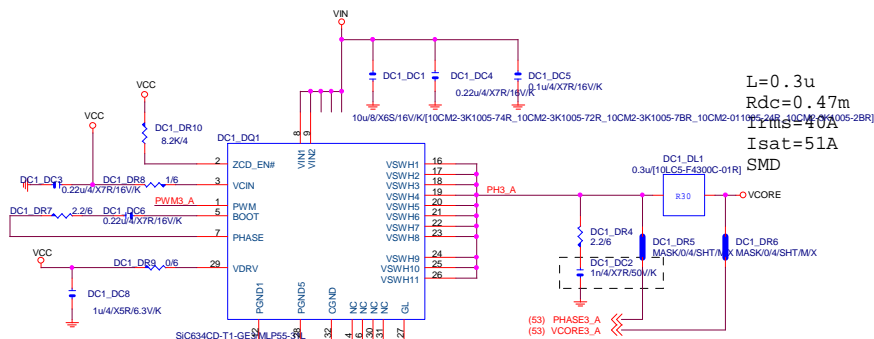
預留在背板,回來確認是否需要上件

## 放置背板電感與電感之間





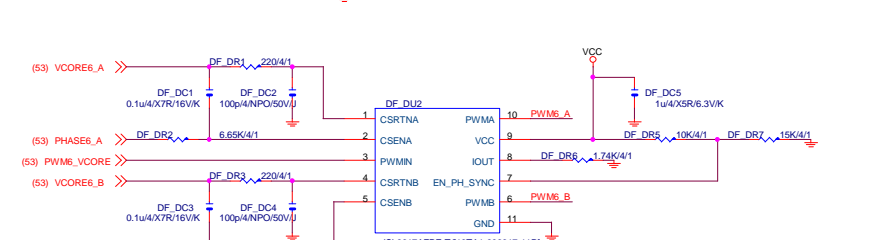
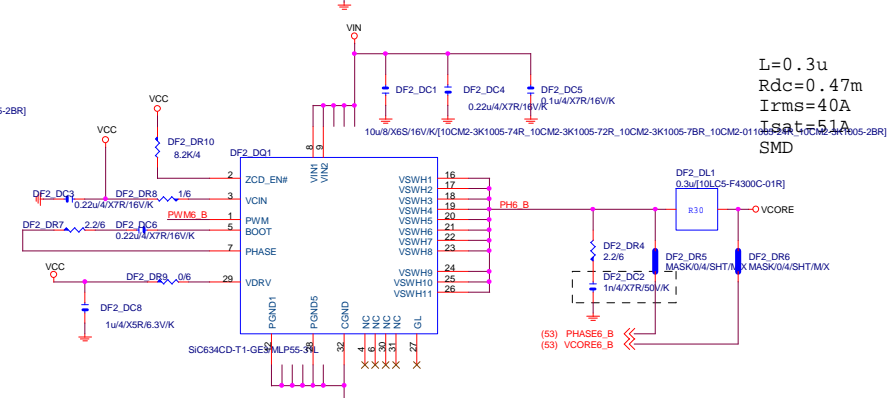
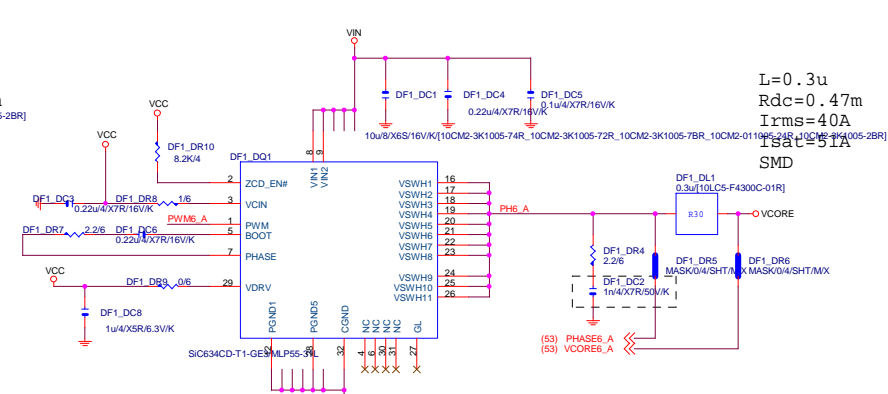
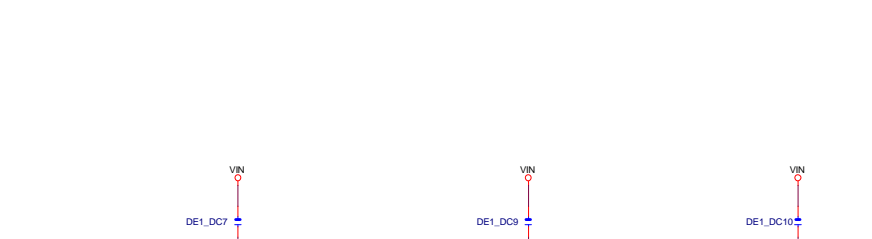
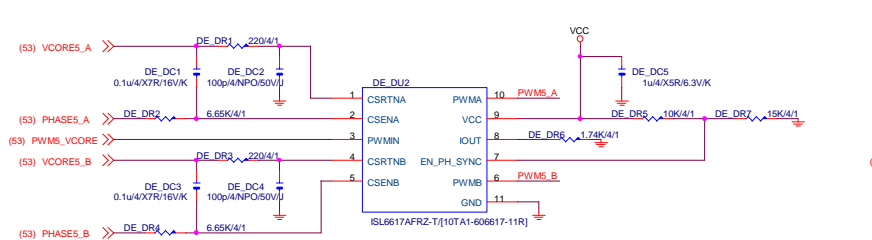
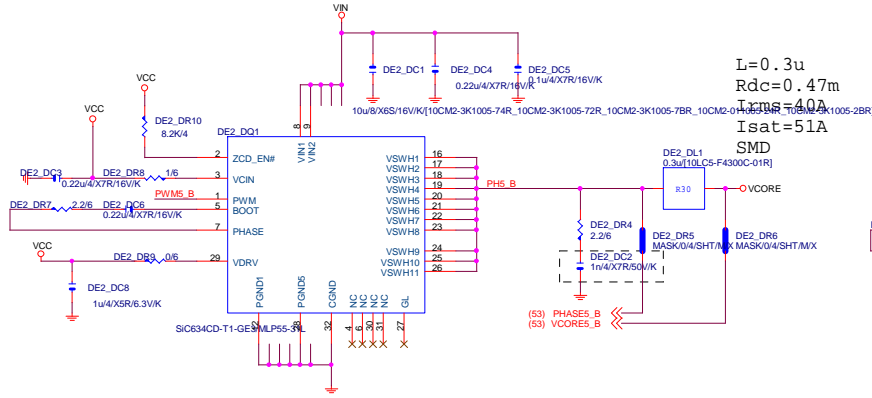
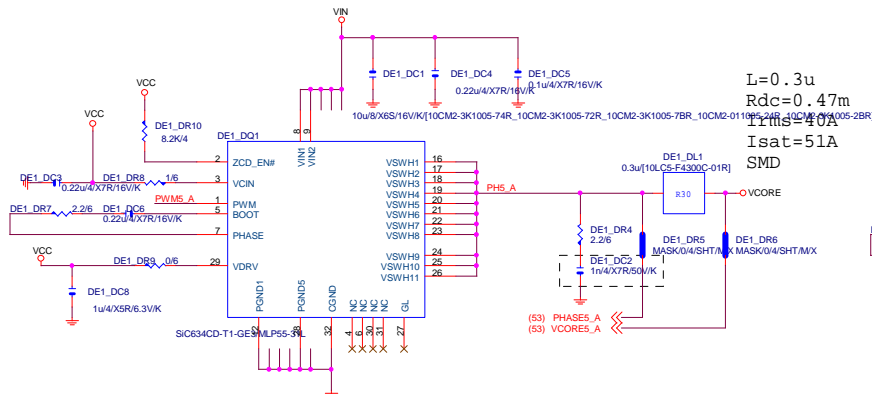




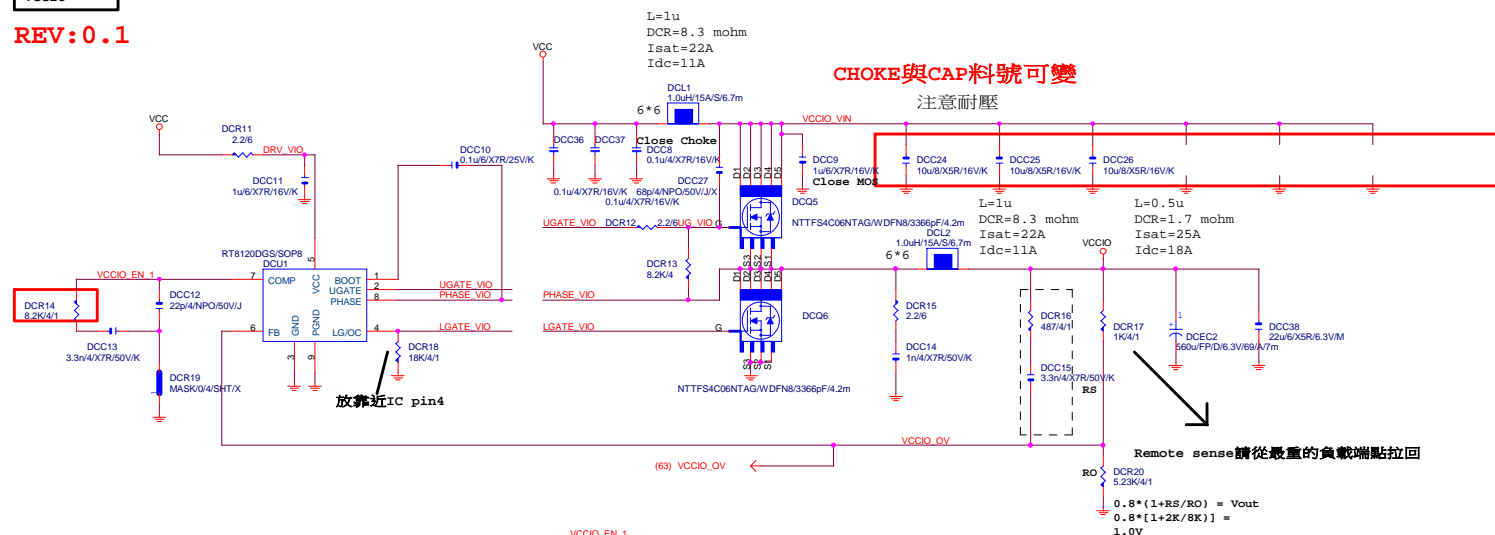
GIGABYTE™

Title			VCORE_SIC634-2
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Customer	Z390 AORUS Elite	Sheet	55 of 65
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REV:0.1



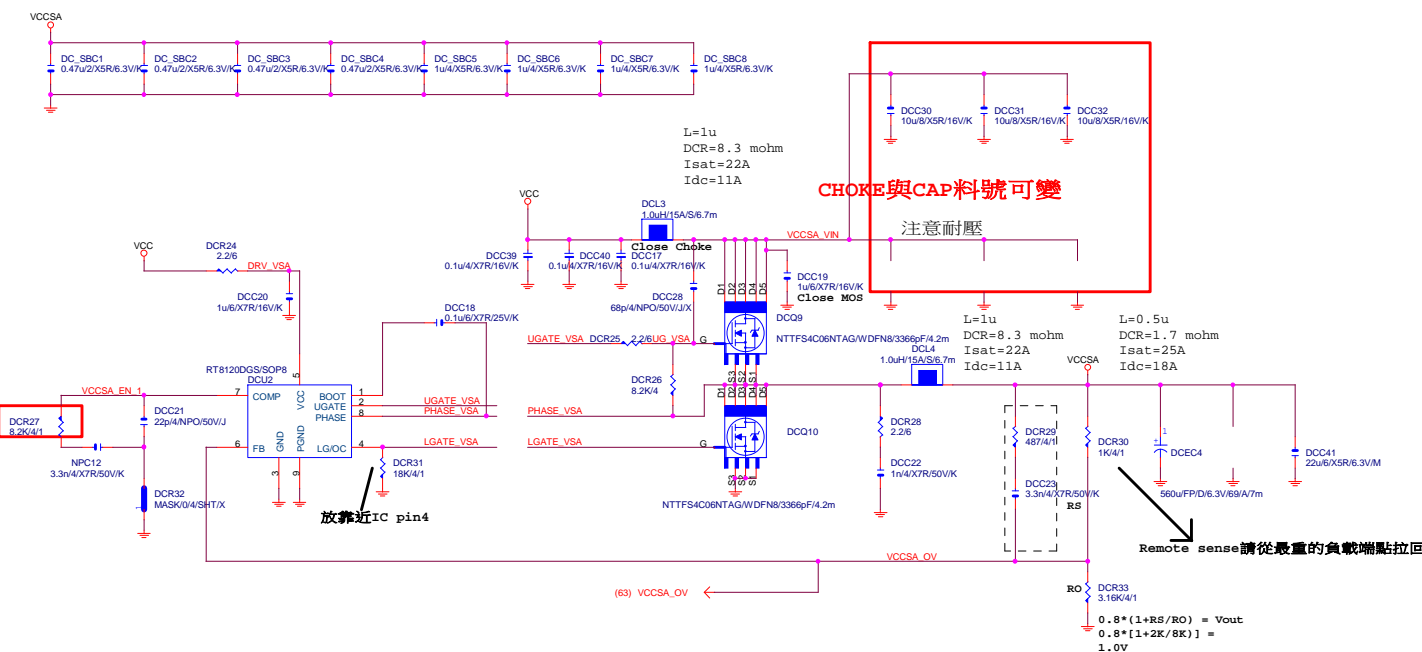
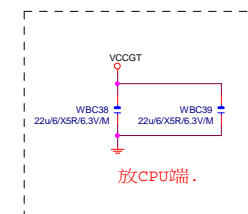
REV:0.1



有使用CPU POWER時DCR22不上件

Connect to IT8793

Connect to IT8686

(13) CPU\_VCCIO\_PWR\_GATEB  
Connect to PCH

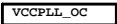
SIO PIN5 . PIN7 用在其他Function時使用

SIO PIN5接VDDQ . PIN7接VCCIO .時使用

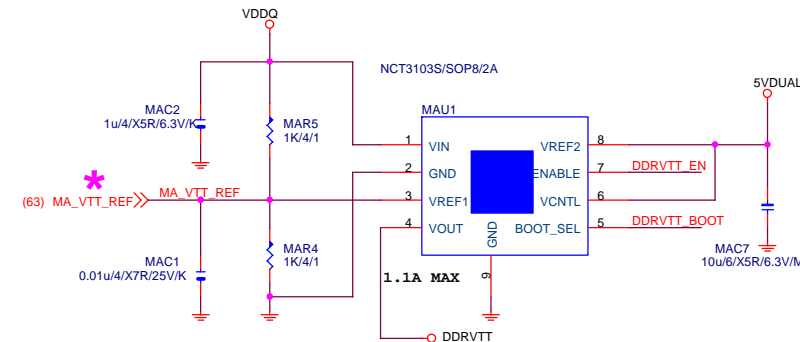
Connect to IT8793

Connect to IT8686

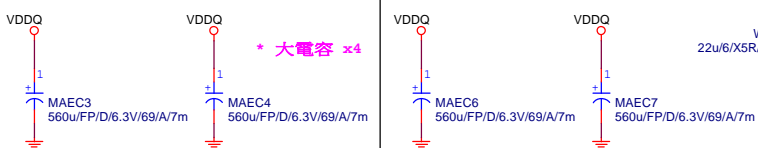
GIGABYTE™		
Title		
VCCIO_VCCSA		
Size	Document Number	Rev
Custom	3390 AORUS Elite	1.0
Date:	Friday, August 10, 2018	Sheet 57 of 65



## DDR4

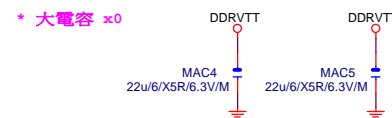


DDR	CAP	560u*4PCS	22u*2PCS
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指定footprint "EC6D8MM-RH-2"

DDRVTT CAP



(4) DDR\_VTT\_CTL >> DDR\_VTT\_CTL MAR110 0/4/SHT/M/X DDRVTT\_EN  
(3,6,14,49) N\_SLP\_S3 >> N\_SLP\_S3 MAR111 0/4/SHT/M/X DDRVTT\_BOOT

MAU1上NCT3103S時上件

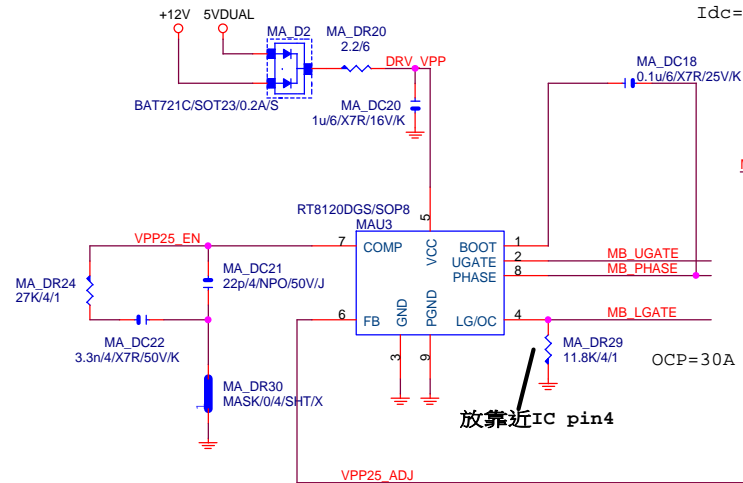
				
<b>Title</b> <b>RT8120_DDR4 POWER</b>				
<b>Size</b> Custom	<b>Document Number</b> <b>Z390 AORUS Elite</b>			<b>Rev</b> <b>1.0</b>
<b>Date:</b> Friday, August 10, 2018	<b>Sheet</b> 59	<b>of</b> 65		

REV:0.1

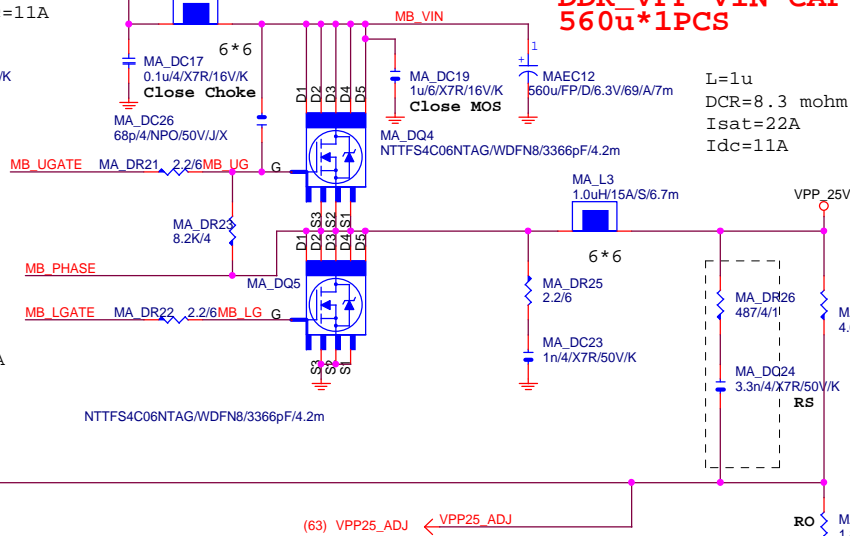
VPP\_25V

CHOKE與CAP料號可變

$L=1\mu$   
 $DCR=8.3\text{ m}\Omega$  5VDUAL  
 $I_{sat}=22A$   
 $I_{dc}=11A$



$L=1\mu$   
 $DCR=8.3\text{ m}\Omega$  5VDUAL  
 $I_{sat}=22A$   
 $I_{dc}=11A$



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

$L=1\mu$   
 $DCR=8.3\text{ m}\Omega$   
 $I_{sat}=22A$   
 $I_{dc}=11A$

SUPPORT DDR4 2.5V

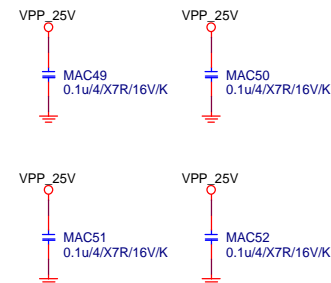
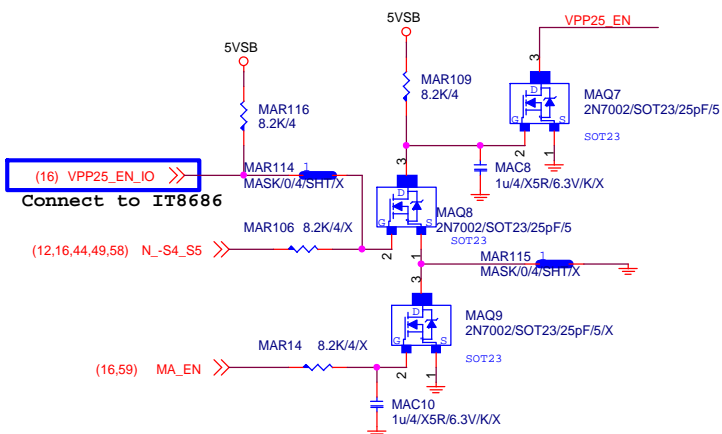
25A MAX

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

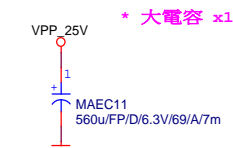
Remote sense請從最重的負載端點拉回

PWR\_SEQ

\* 刪 MA\_DR32



VPP CAP 560u\*1PCS

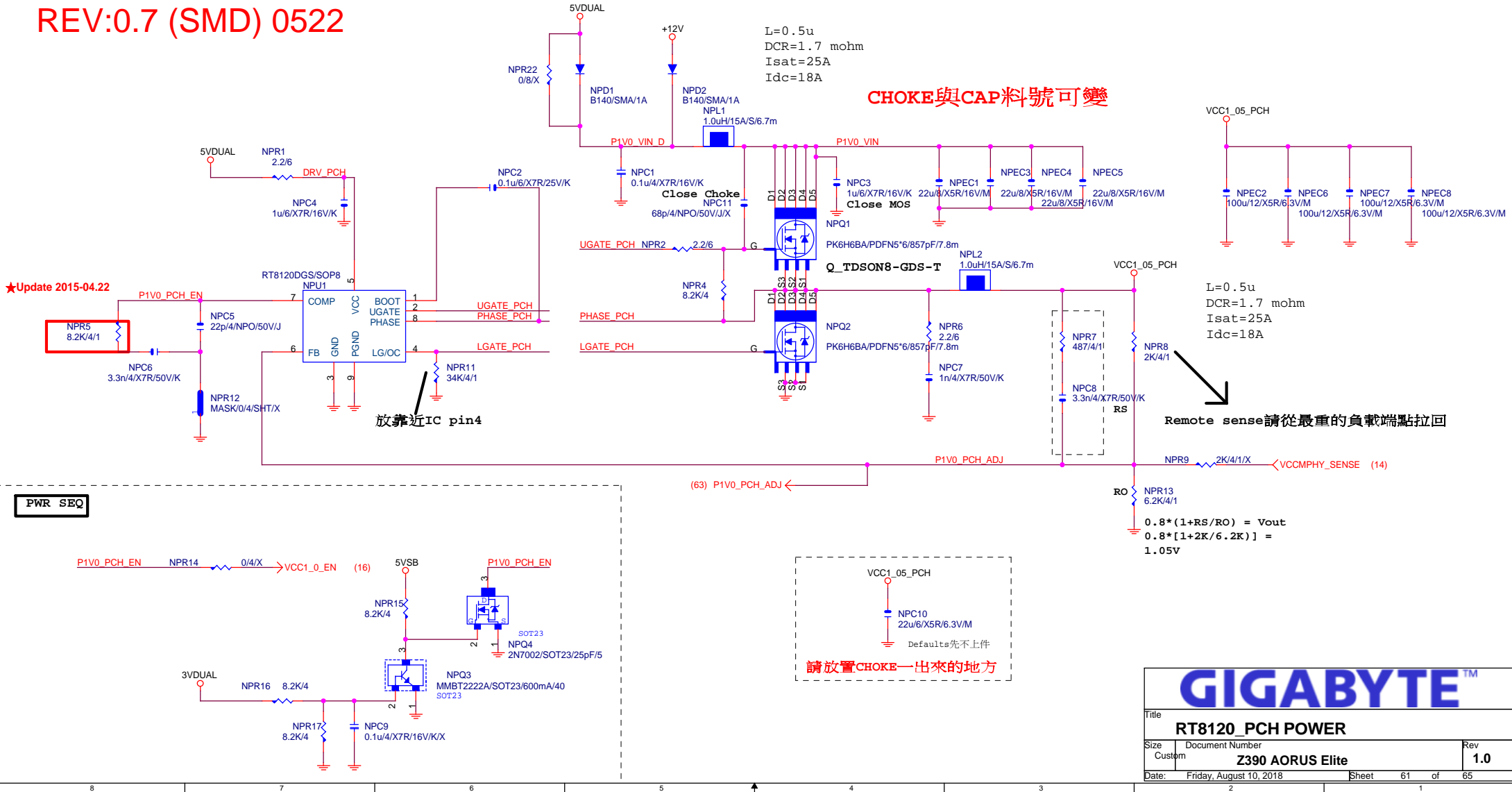


GIGABYTE™			
Title RT8120_VPP25 POWER			
Size Custom	Document Number Z390 AORUS Elite	Rev 1.0	
Date: Friday, August 10, 2018	Sheet 60	of 65	

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★Update 2015-04.22

PWR\_SEQ

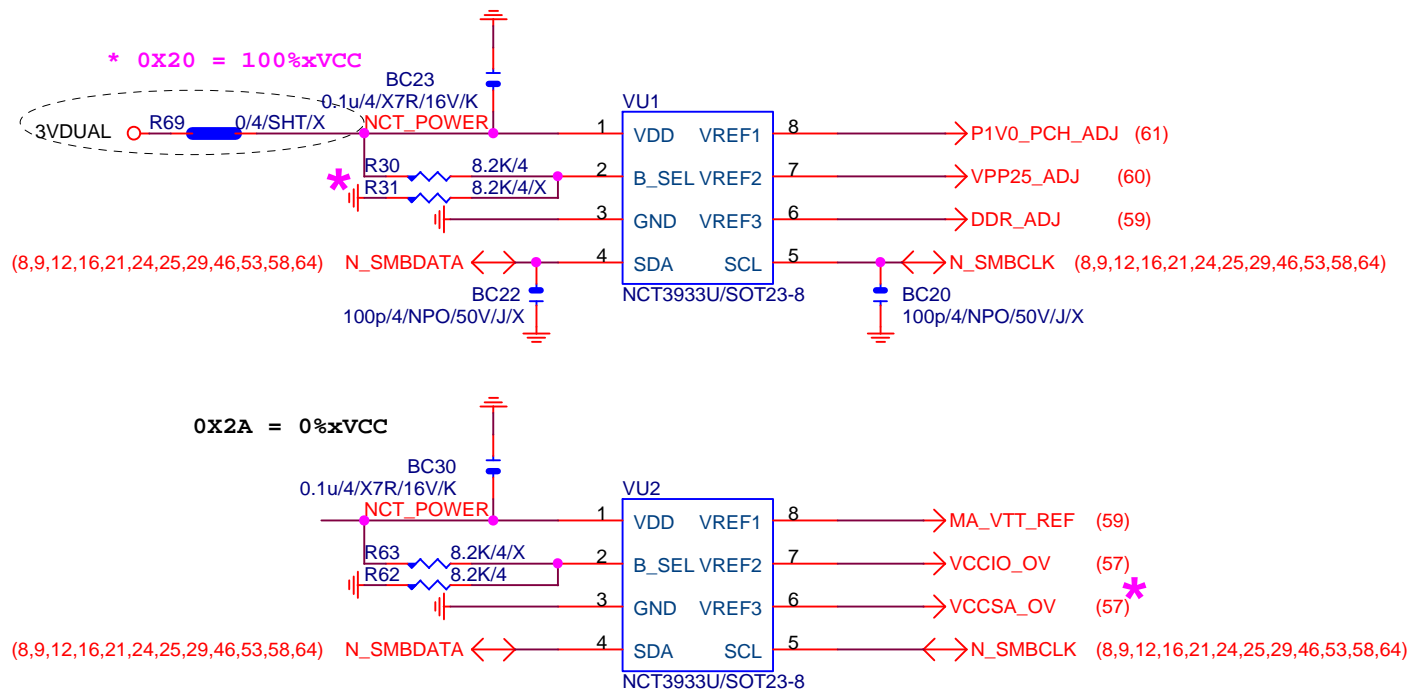


GIGABYTE™			
Title			
RT8120_PCH POWER			
Size	Document Number	Rev	
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# OVER VOLTAGE



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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

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Title

**CPU CORE VR-2**

Size  
A

Document Number

**Z390 AORUS Elite**

Rev  
**1.0**

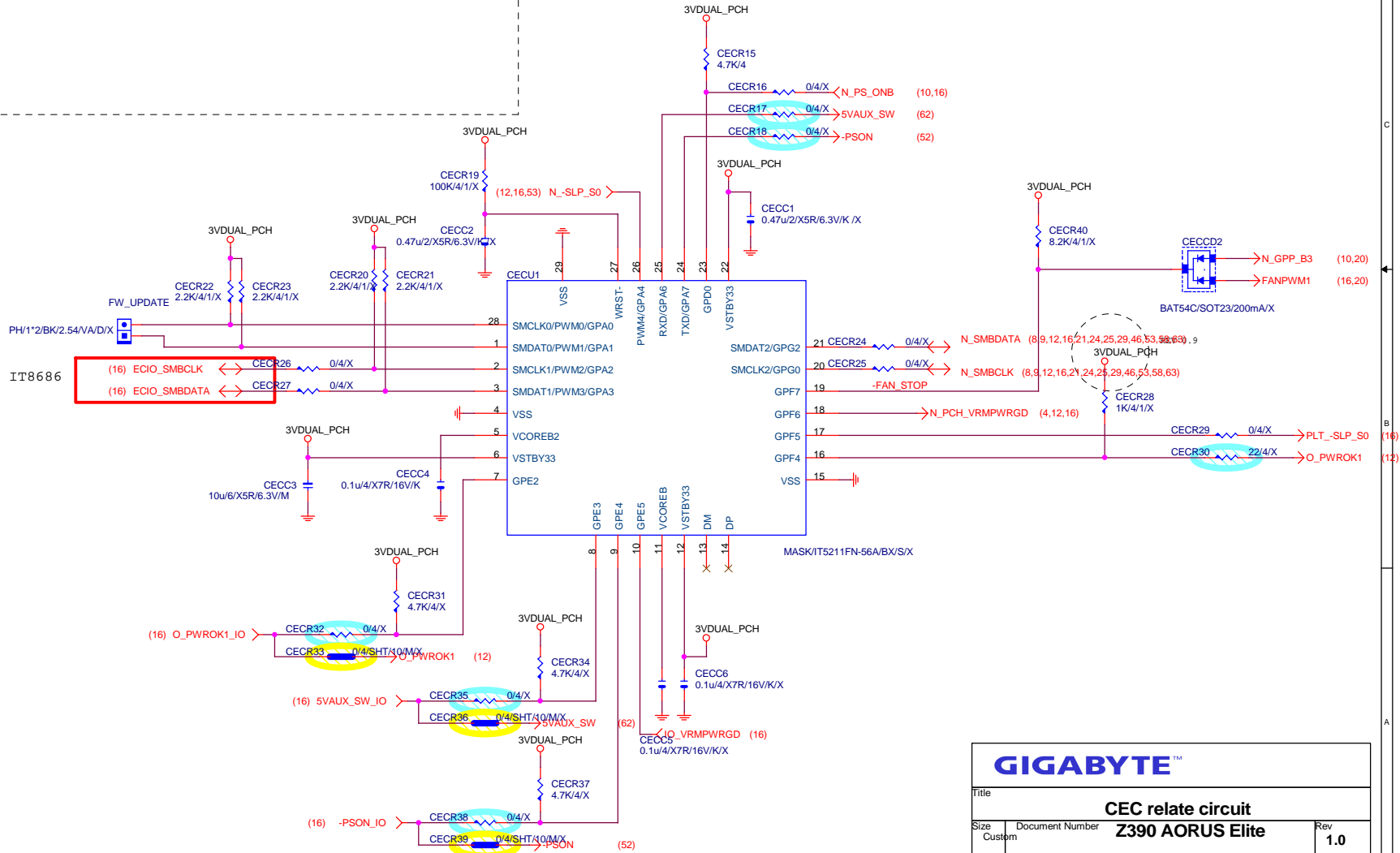
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CEC\_R0.3

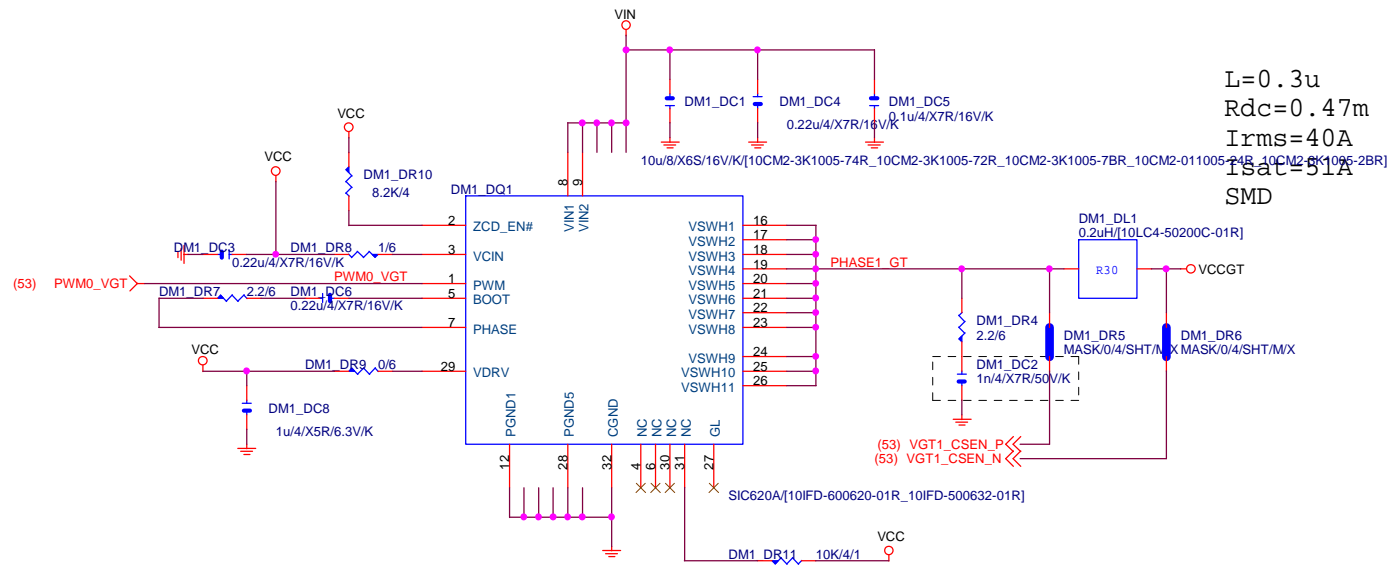
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PWM Controller Power

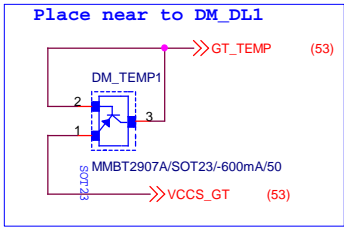


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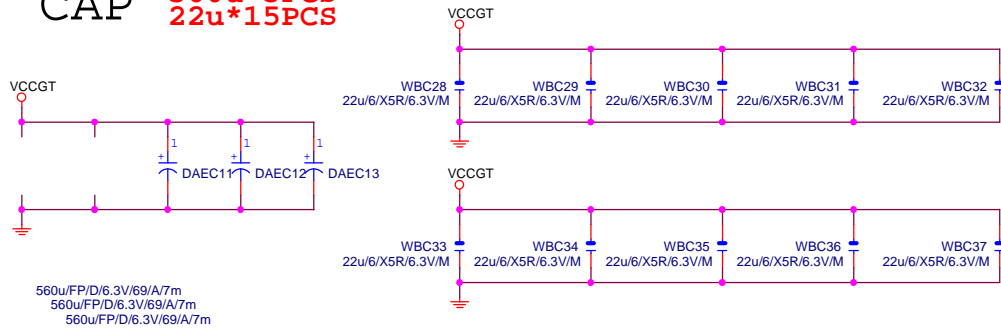
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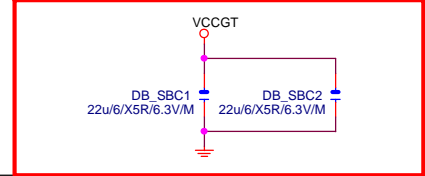
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SMD



VCCGT CAP 560u\*3PCS  
22u\*15PCS



放置背板電感與電感之間



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