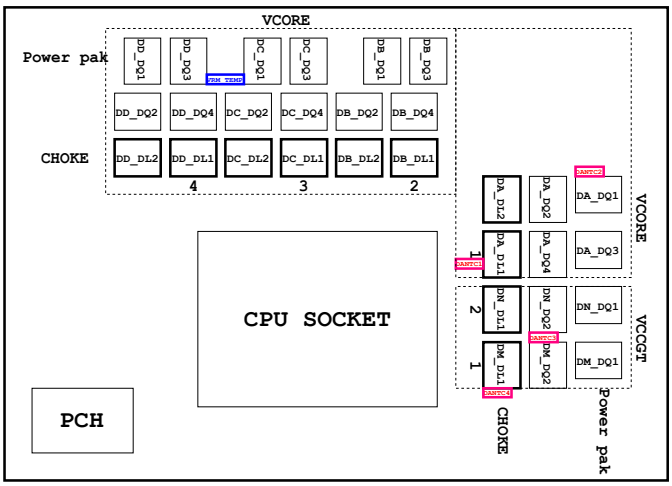
Model Name: Z390 UD

Revision :1.05

SHEET	TITLE
01	COVER SHEET
02	BOM & PCB MODIFY HISTORY
03	BLOCK DIAGRAM
04	CPU_LGA1151-A
05	CPU_LGA1151-B-DDR4
06	CPU_LGA1151-C
07	CPU_LGA1151-D
08	DDR 4 CHANNEL A
09	DDR 4 CHANNEL B
10	PCH CLOCK/DDC/BIOS
11	PCH DMI,USB,PCIE
12	PCH MISC
13	PCH SATA,PCIE,CNVI
14	PCH PWR
15	PCH GND,Heatsink
16	ITE 8688 LPC IO_RGB_LED
17	HWM
18	FAN CTRL-CFL-SIO
19	Dual BIOS for CS mode
20	CEC Logic
21	PCIEX16 SLOT
22	PCIEX4 SLOT1
23	PCIEX4 SLOT2
24	PCIEX1*3 SLOT
25	SATA
26	M.2 x4 (A)
27	COM, TPM, THB
28	VCORE ISL69138(PWM)
29	VCORE_ISL69138(Vcore_PPAK-1)
30	VCORE_ISL69138(Vcore_PPAK-2)
31	VCORE_ISL69138(Vcore_PPAK-3)
32	VCORE_ISL69138(VccGT_PPAK)
33	VCCSA_VCCIO_VCCPLL
34	RT8120_DDR_CHOKE-IRON-2L
35	RT8120_VPP_CHOKE-IRON-合金
36	RT8120_PCH-CHOKE-IRON
37	DISCRETE POWER

SHEET	TITLE
38	ATX POWER ,-PROCHOT
39	NCP3933 OVER VOLTAGE
40	HDMI NO LS/R_USB30
41	R_USB30 ,KB_MS
42	CNVi M2 WIFI
43	REALTEK RTL8118
44	USB30_LAN CONNECTOR-8118
45	Realtek ALC887
46	REAR AUDIO JACK
47	F_USB30
48	F_USB
49	F_PANEL ,OC_PIN
50	Audio / DEBUG / XMP LED
51	EMI-ESD
52	POWER MAP
53	NTC MAP



Gigabyte Technology

Title: Cover Sheet

Size: Custom | Document Number: Z390 UD | Rev: 1.05

Date: Tuesday, November 12, 2019 | Sheet 1 of 53

Model Name: Z390 UD

Revision :1.05

P-Code: U18024-0

Tip-Top: 9MZ39UD-00-01

Component value change history

Date	Change Item	Reason
2018.04.27	0.1 New BOM release PCB:0.1	New Model ,Modify from Z390 GAMING 7 Rev0.1
2018.06.27	0.2 E-BOM release PCB:0.2	Modify 模組線路 ,down size 部分 MLCC 1u/4 , 10u/8 Modify CPU PWM 模組線路 Digital 10+2 相 Add 2x2 pin connector Modify Codec to ALC887
2018.07.11	0.3 E-BOM release PCB:0.3	Modify CPU PWM R & Choke 值
2018.08.01	1.0A E-BOM release PCB:1.0	Add VCCPLL_OC regulator control Add Diode WD1 ,WD2 for CFG5/CFG6 leakage MASK CECU1 ,CNVI ,CNVI_WIFI footprint Update LED ,CPU PWM ,SIO ,M.2 模組線路 Update Note PCIEx16/x4 smbus
2018.08.10	1.0B P-BOM release PCB:1.0	Update TMOS,RMOS P/N for 1.5mm thermal pad Update DAU1 P/N:10TA1-669138-07R
2018.08.20	1.0C P-BOM release PCB:1.0	PM note spec change ,沒有 RGB MCU 的機種將M2U1 NXP SMBUS level shifter 移除
2018.08.22	1.0D P-BOM release PCB:1.0	RD note PWM DAU1 update F/W P/N : 10TA1-669138-0AR
2018.08.31	1.0H P-BOM release PCB:1.01	Modify PCB 文字面 for PM request
2018.10.15	1.0I P-BOM release PCB:1.01	Modify VPP_25V for EMC 3x3 Mosfet MA_DQ4 ,MA_DQ5 ,MA_DR29
2019.08.28	1.0J P-BOM release PCB:1.01	Modify VPP_25V for ON 3x3 Mosfet MA_DQ4 ,MA_DQ5 ,MA_DR29
2019.11.13	1.0N P-BOM release PCB:1.05	Modify for 導入DIP Choke自動插件版本
2019.12.26	1.0N ECN-BOM release PCB:1.05	移除PVT來上線PCB 胜宏

Circuit or PCB layout change

Date	Change Item	Reason
2018.04.26	Rev 0.1 Gerber-out	Modify from Z390 GAMING 7 Rev0.1
2018.06.26	Rev 0.2 Gerber-out	Modify 模組線路 ,down size 部分 MLCC 1u/4 , 10u/8 Modify DDR 4L Layout走線請參考Z390 AORUS Rev 9.0 DDR slot 命名修改 Channel B : DDR4_3 => DDR4_B1 ; DDR4_1 => DDR4_B2 Channel A : DDR4_4 => DDR4_A1 ; DDR4_2 => DDR4_A2 Modify CPU PWM 模組線路 Digital 10+2 相 Layout走線請參考Z390 AORUS Rev 8.01 預留後置板甲 Layout 預留後置板甲 LED Layout Add 2x2 pin connector
2018.07.10	Rev 0.3 Gerber-out	Modify PCB Rev0.3 文字面
2018.07.31	Rev 1.0 Gerber-out	Add VCCPLL_OC regulator control Add Diode WD1 ,WD2 for CFG5/CFG6 leakage MASK CECU1 ,CNVI ,CNVI_WIFI footprint Update LED ,CPU PWM ,SIO ,M.2 模組線路 Update Note PCIEx16/x4 smbus
2018.08.31	Rev 1.01 Gerber-out	Modify PCB 文字面 for PM request
2019.11.12	Rev 1.05 Gerber-out	Modify for 導入DIP Choke自動插件版本

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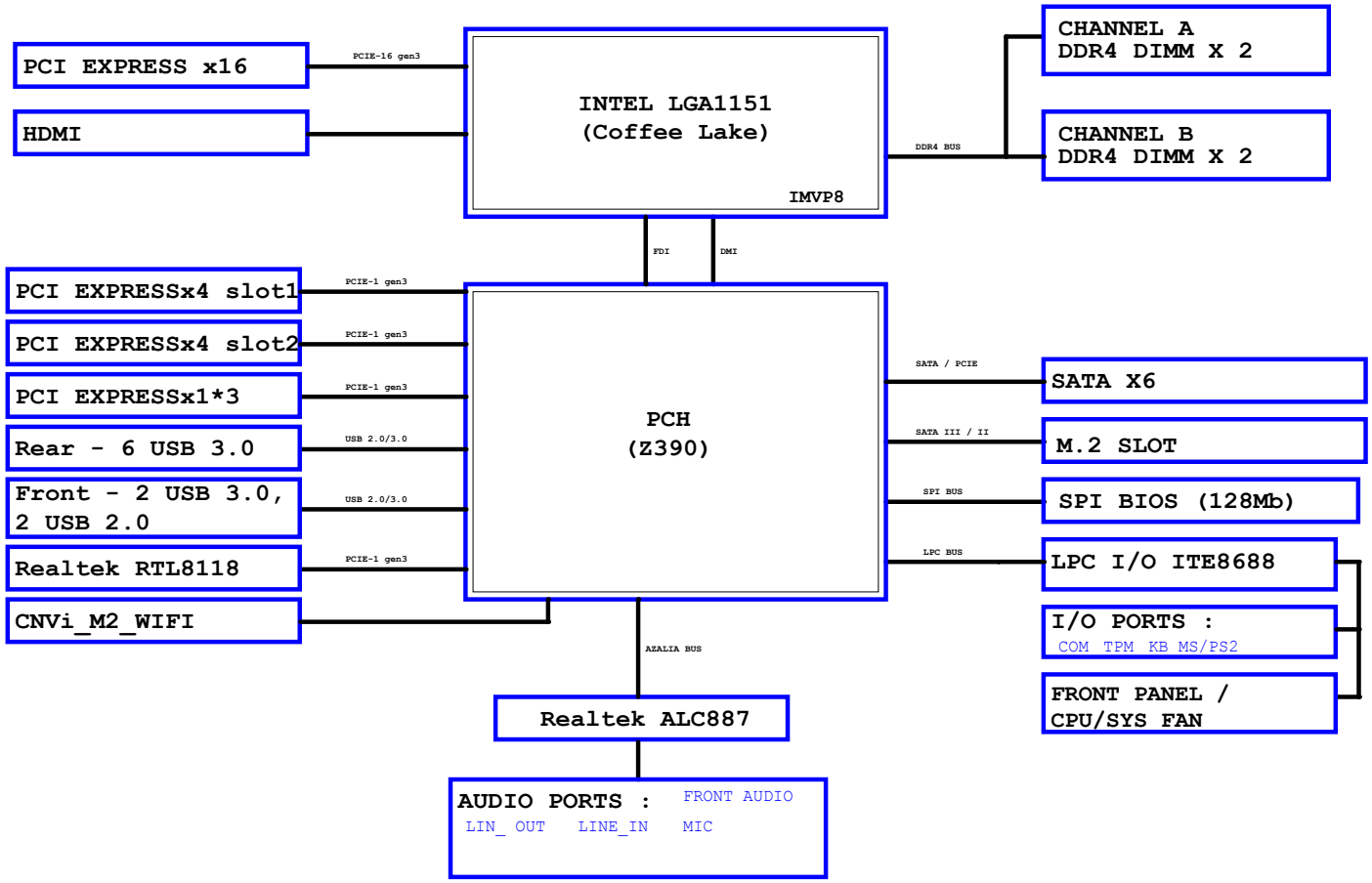
Title: BOM & PCB MODIFY HISTORY

Size: Custom | Document Number: Z390 UD | Rev: 1.05

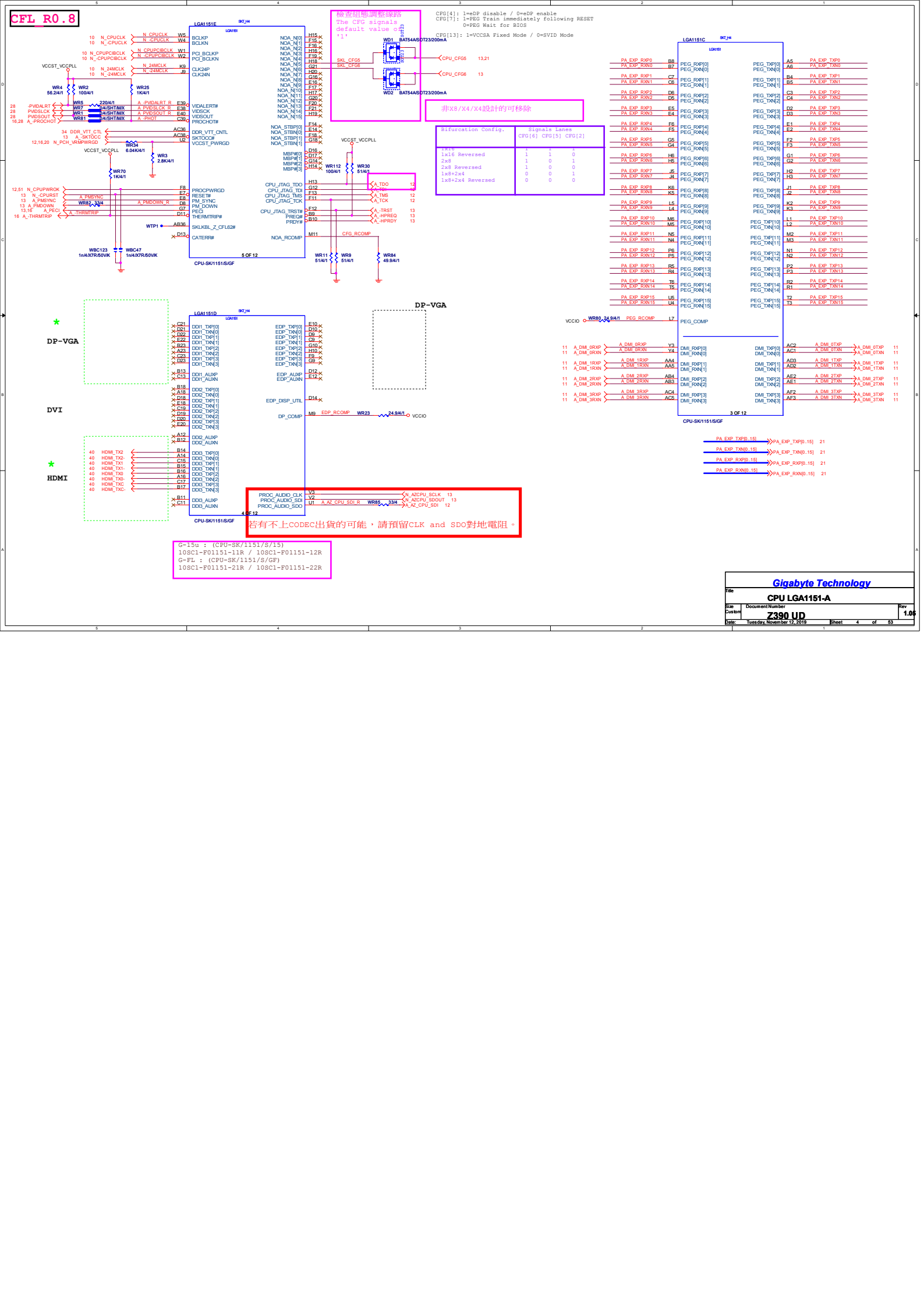
Date: Wednesday, December 25, 2019 | Sheet 2 of 53

BLOCK DIAGRAM



Gigabyte Technology		
Title: BLOCK DIAGRAM		
Size: C	Document Number: Z390 UD	Rev: 1.05
Date: Tuesday, November 12, 2019	Sheet 3 of 53	

CFL R0.8


LGA1151E
SKT_H4
BCLKP
BCLKN
PCI_BCLKP
PCI_BCLKN
CLK24P
CLK24N
VIDALERT#
VIDSCK
VIDSOUT
PROCHOT#
DDR_VRT_CNTL
SKTOCC#
VCCST_PWRGD
PROCPWRGD
RESET#
PM_SYNC
PM_DOWN
PEG
THERMTRIP#
SKLKBL_Z_CFL62#
CATERR#
NOA_RCOMP
CPU_JTAG_TDO
CPU_JTAG_TDI
CPU_JTAG_TMS
CPU_JTAG_TCK
CPU_JTAG_TRST#
PREQ#
PRDY#
MBPI#[0]
MBPI#[1]
MBPI#[2]
MBPI#[3]
5 OF 12
CPU-SK/1151/S/GF
檢查組態調整硬件
The CFG signals default value of '1'
SKL_CFG5
SKL_CFG6
CPU_CFG5
CPU_CFG6
WD1 BAT54A/SOT23/200mA
WD2 BAT54A/SOT23/200mA
非X8/X4/X4設計的可移除
Bifurcation Config.
Signals Lanes
CFG[6] CFG[5] CFG[2]
1x16
1x16 Reversed
2x8
2x8 Reversed
1x8+2x4
1x8+2x4 Reversed
CFG[4]: 1=eDP disable / 0=eDP enable
CFG[7]: 1=PEG Train immediately following RESET
0=PEG Wait for BIOS
CFG[13]: 1=VCCSA Fixed Mode / 0=SVID Mode
LGA1151C
PEG_RXP[0]
PEG_RXN[0]
PEG_RXP[1]
PEG_RXN[1]
PEG_RXP[2]
PEG_RXN[2]
PEG_RXP[3]
PEG_RXN[3]
PEG_RXP[4]
PEG_RXN[4]
PEG_RXP[5]
PEG_RXN[5]
PEG_RXP[6]
PEG_RXN[6]
PEG_RXP[7]
PEG_RXN[7]
PEG_RXP[8]
PEG_RXN[8]
PEG_RXP[9]
PEG_RXN[9]
PEG_RXP[10]
PEG_RXN[10]
PEG_RXP[11]
PEG_RXN[11]
PEG_RXP[12]
PEG_RXN[12]
PEG_RXP[13]
PEG_RXN[13]
PEG_RXP[14]
PEG_RXN[14]
PEG_RXP[15]
PEG_RXN[15]
PEG_TXP[0]
PEG_TXN[0]
PEG_TXP[1]
PEG_TXN[1]
PEG_TXP[2]
PEG_TXN[2]
PEG_TXP[3]
PEG_TXN[3]
PEG_TXP[4]
PEG_TXN[4]
PEG_TXP[5]
PEG_TXN[5]
PEG_TXP[6]
PEG_TXN[6]
PEG_TXP[7]
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PEG_TXP[10]
PEG_TXN[10]
PEG_TXP[11]
PEG_TXN[11]
PEG_TXP[12]
PEG_TXN[12]
PEG_TXP[13]
PEG_TXN[13]
PEG_TXP[14]
PEG_TXN[14]
PEG_TXP[15]
PEG_TXN[15]
PEG_COMP
3 OF 12
CPU-SK/1151/S/GF
DMI_RXP[0]
DMI_RXN[0]
DMI_RXP[1]
DMI_RXN[1]
DMI_RXP[2]
DMI_RXN[2]
DMI_RXP[3]
DMI_RXN[3]
DMI_TXP[0]
DMI_TXN[0]
DMI_TXP[1]
DMI_TXN[1]
DMI_TXP[2]
DMI_TXN[2]
DMI_TXP[3]
DMI_TXN[3]
LGA1151D
DDI1_TXP[0]
DDI1_TXN[0]
DDI1_TXP[1]
DDI1_TXN[1]
DDI1_TXP[2]
DDI1_TXN[2]
DDI1_TXP[3]
DDI1_TXN[3]
DDI1_AUXP
DDI1_AUXN
DDI2_TXP[0]
DDI2_TXN[0]
DDI2_TXP[1]
DDI2_TXN[1]
DDI2_TXP[2]
DDI2_TXN[2]
DDI2_TXP[3]
DDI2_TXN[3]
DDI2_AUXP
DDI2_AUXN
DDI3_TXP[0]
DDI3_TXN[0]
DDI3_TXP[1]
DDI3_TXN[1]
DDI3_TXP[2]
DDI3_TXN[2]
DDI3_TXP[3]
DDI3_TXN[3]
DDI3_AUXP
DDI3_AUXN
EDP_TXP[0]
EDP_TXN[0]
EDP_TXP[1]
EDP_TXN[1]
EDP_TXP[2]
EDP_TXN[2]
EDP_TXP[3]
EDP_TXN[3]
EDP_AUXP
EDP_AUXN
EDP_DISP_UTIL
DP_COMP
4 OF 12
CPU-SK/1151/S/GF
DP-VGA
DVI
HDMI
PROC_AUDIO_CLK
PROC_AUDIO_SDI
PROC_AUDIO_SDO
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
Gigabyte Technology
CPU LGA1151-A
Z390 UD
1.05
Tuesday, November 12, 2019
Sheet 4 of 53

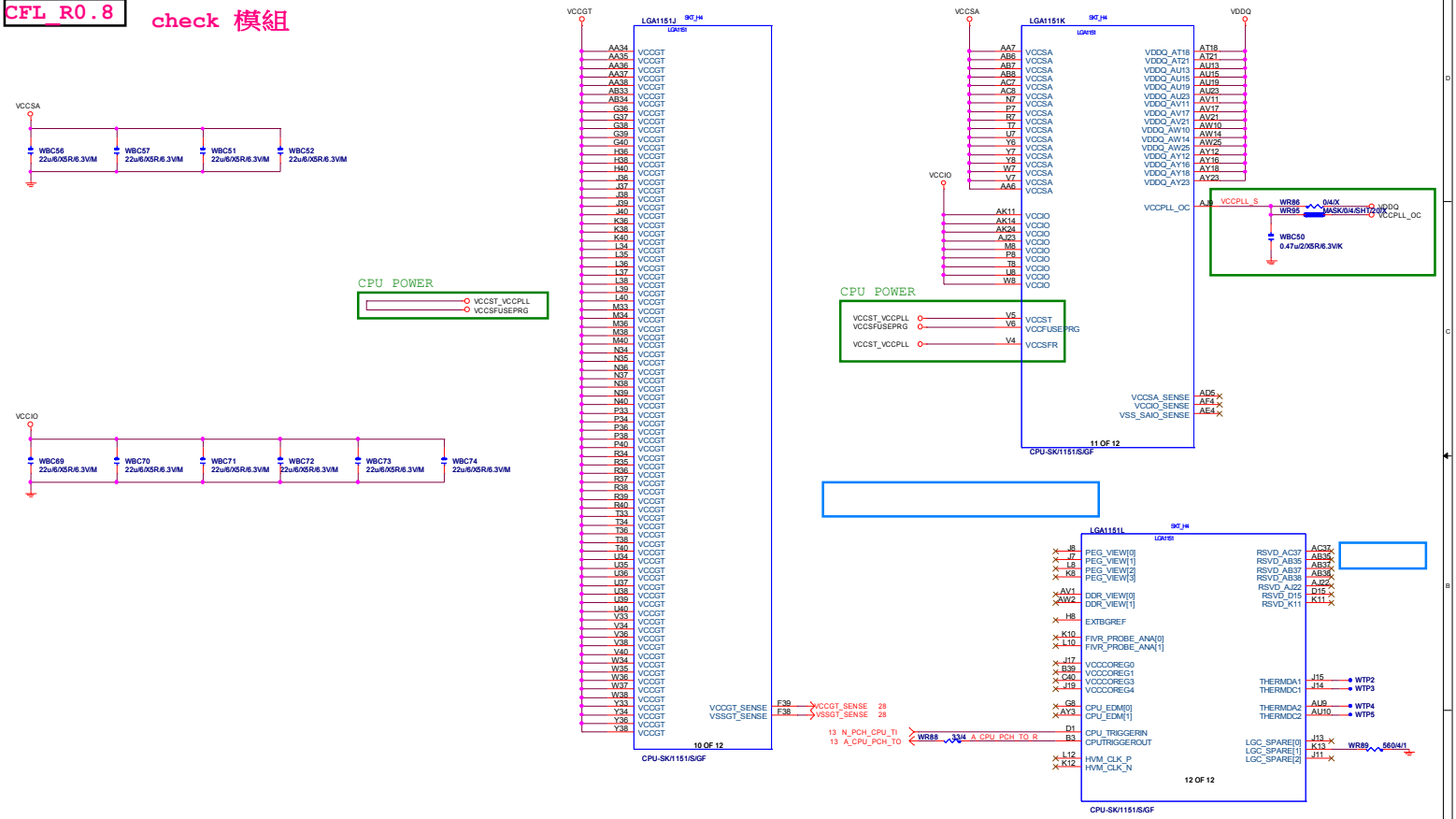
CFL_R0.8

Title	CPU LGA1151-B
Size: Custom	Document Number: Z390 UD
Rev	1.06
Date: Tuesday, November 12, 2019	Sheet 5 of 53

Gigabyte Technology

CFL_R0.8

check 模組



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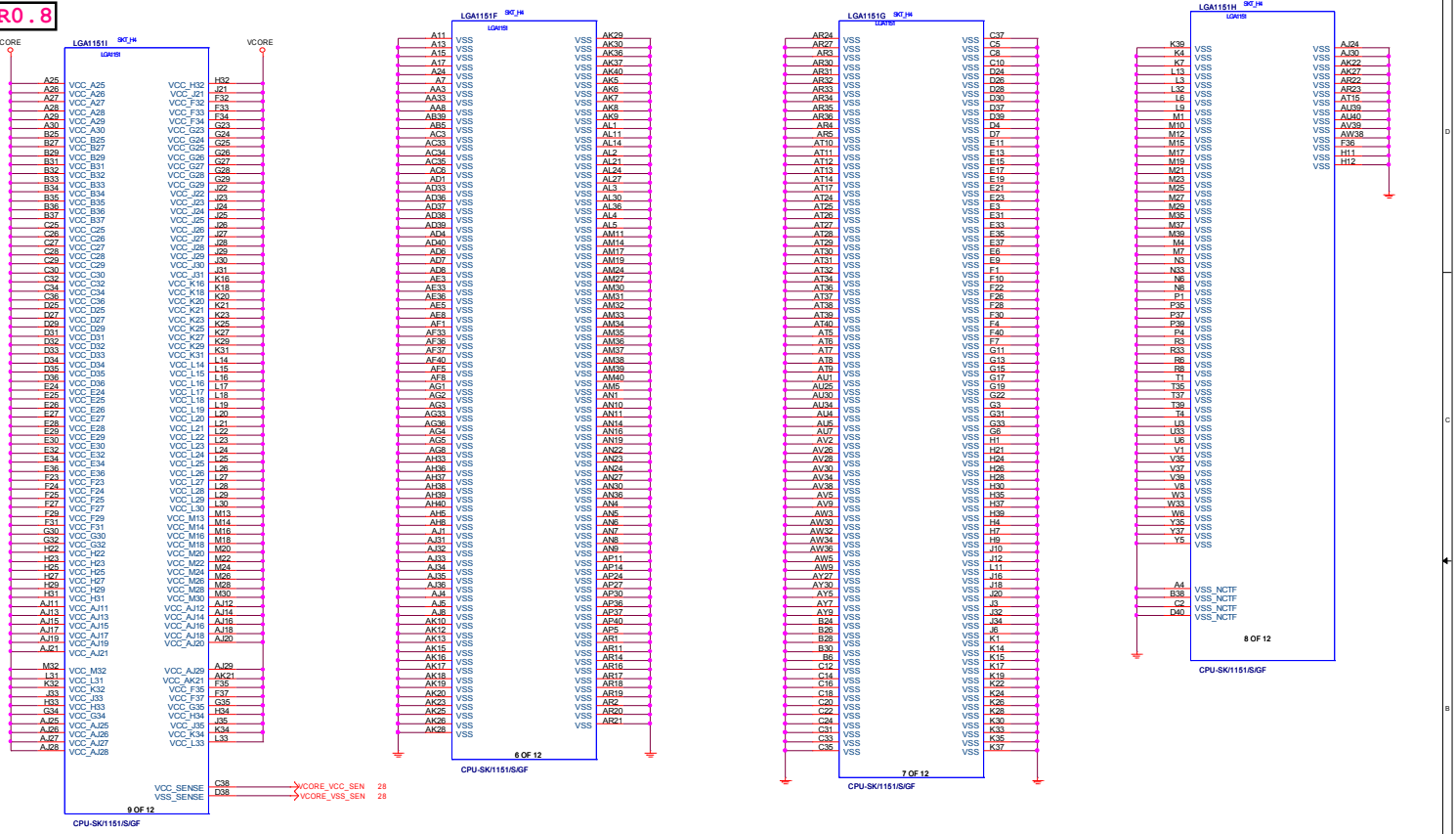
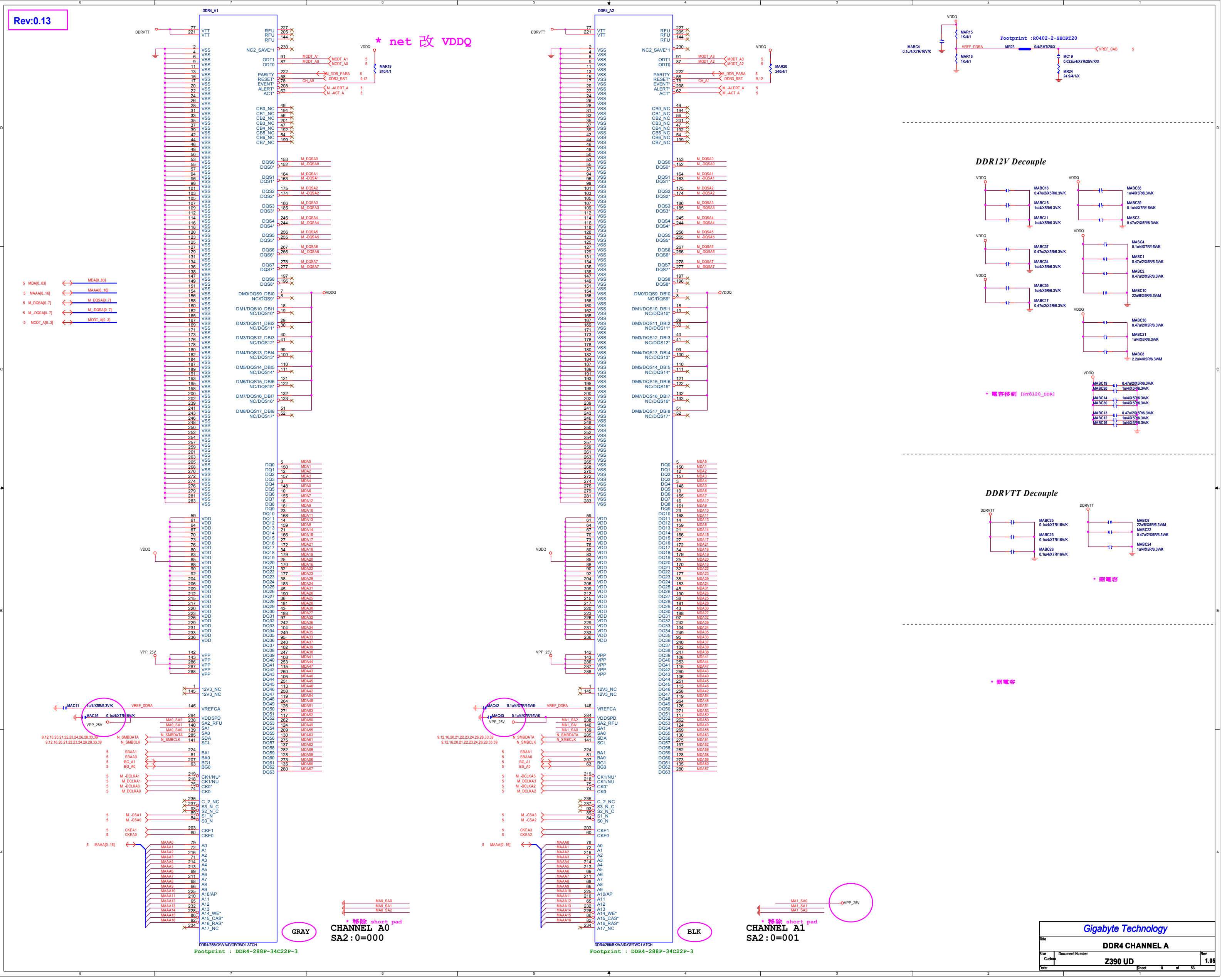
Gigabyte Technology		
Title: CPU LGA1151-C		
Size: Custom	Document Number: Z390 UD	Rev: 1.06
Date: Tuesday, November 12, 2019	Sheet 6 of 53	

CFL R0.8

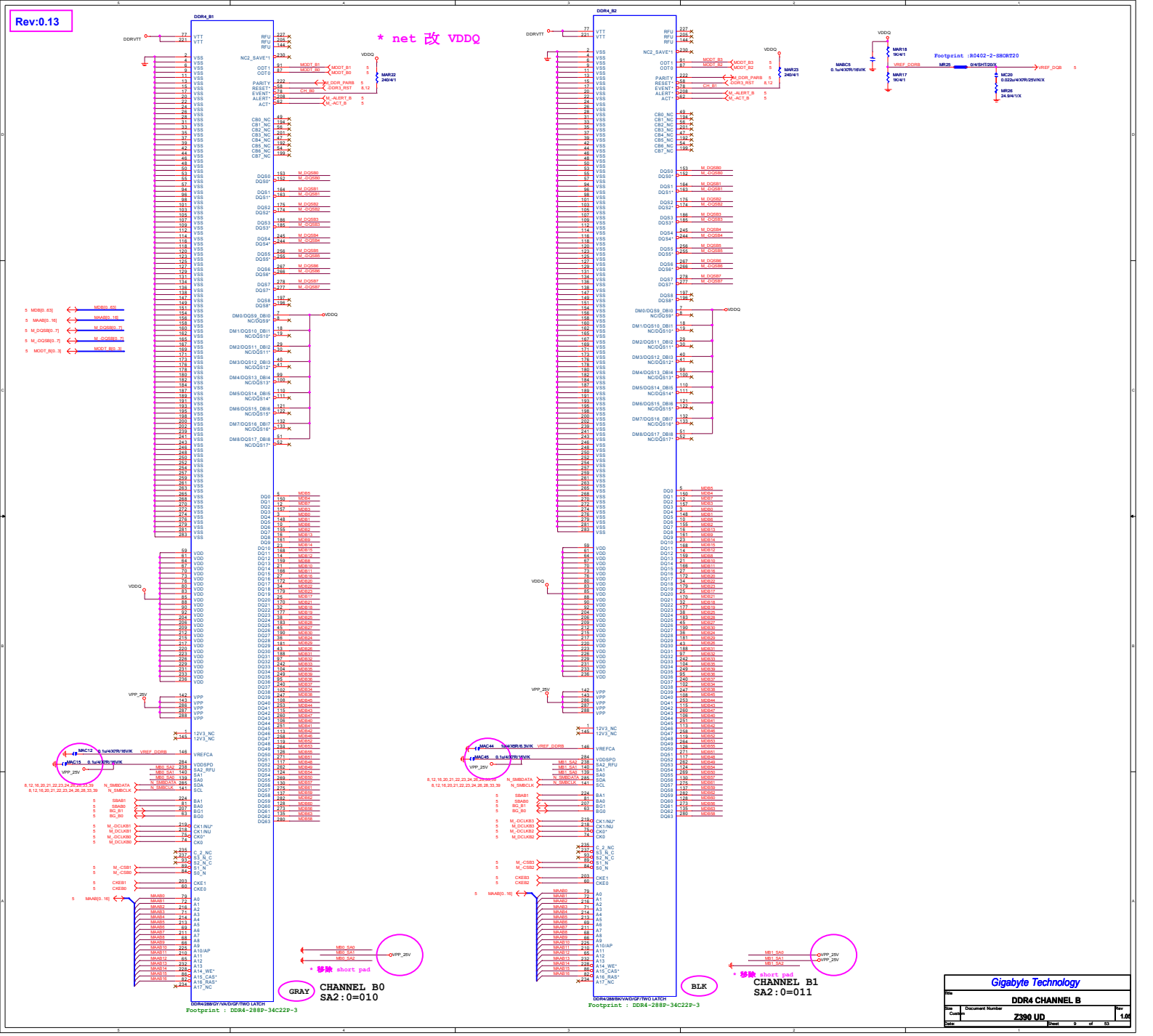


Gigabyte Technology			
Title: CPU LGA1151-D			
Size: Custom	Document Number: Z390 UD		Rev: 1.05
Date: Tuesday, November 12, 2019	Sheet 7 of 53		

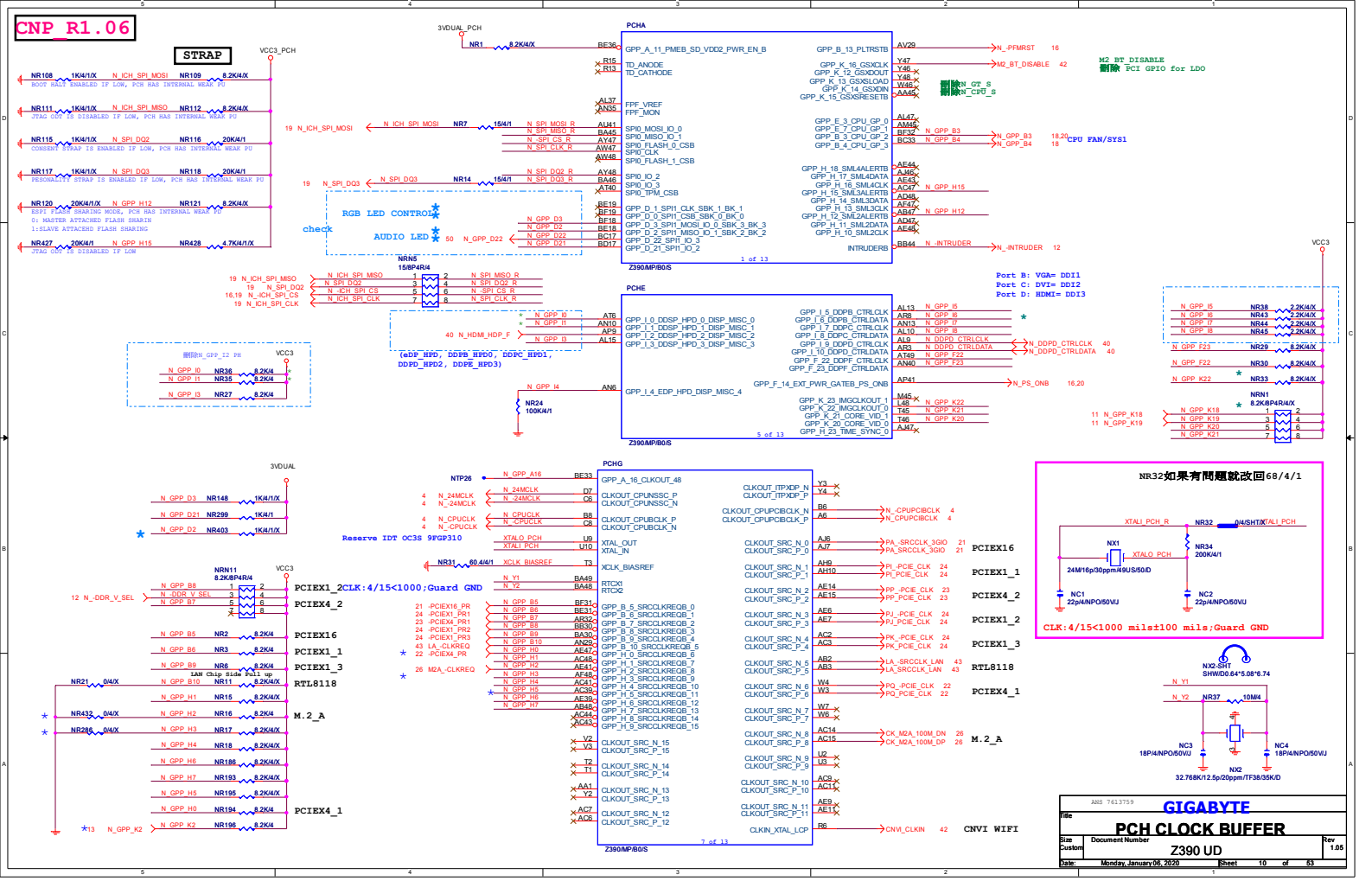


Rev:0.13
* net 改 VDDQ
Footprint :R0402-2-SHORT20
DDR12V Decouple
DDRVTT Decouple
DDR4_A1
DDR4_A2
GRAY
CHANNEL A0
SA2:0=000
BLK
CHANNEL A1
SA2:0=001
Footprint : DDR4-288P-34C22P-3
Footprint : DDR4-288P-34C22P-3
Gigabyte Technology
DDR4 CHANNEL A
Z390 UD
1.0

Rev:0.13



Gigabyte Technology		
Title	DDR4 CHANNEL B	
Size: Custom	Document Number: Z390 UD	Rev: 1.0
Date:	Sheet 9 of 53	


CNP_R1.06
STRAP
PCHA
PCHE
PCHG
RGB LED CONTROL
AUDIO LED
check
Port B: VGA= DDI1
Port C: DVI= DDI2
Port D: HDMI= DDI3
M2_BT_DISABLE
PCI GPIO for LDO
CPU FAN/SYS1
Reserve IDT OC3S 9FGP310
CLK:4/15<1000 mils±100 mils;Guard GND
NR32如果有問題就改回68/4/1
PCH CLOCK BUFFER
GIGABYTE
Z390 UD
Monday, January 06, 2020

CNP R1.06

注意左側Table及下方訊號名稱改USB31

Item	USB P1	USB P2	USB P3	USB P4	USB P5	USB P6	USB P7 PCIE P1	USB P8 PCIE P2	USB P9 PCIE P3	USB P10 PCIE P4
H310	USB3.0	USB3.0	USB3.0	USB3.0	NA	NA	NA	NA	NA	NA
B350	USB3.1	USB3.1	USB3.1	USB3.1	USB3.0	USB3.0	NA	NA	NA	NA
Q350	USB3.1	USB3.1	USB3.1	USB3.1	USB3.0	USB3.0	USB3.0	USB3.0	NA	NA
H370	USB3.1	USB3.1	USB3.1	USB3.1	USB3.0	USB3.0	USB3.0	USB3.0	PCIE	PCIE
Z370	USB3.1	USB3.1	USB3.1	USB3.1	USB3.1	USB3.1	USB3.0 PCIE	USB3.0 PCIE	USB3.0 PCIE	USB3.0 PCIE
Q370	USB3.1	USB3.1	USB3.1	USB3.1	USB3.1	USB3.1	USB3.0 PCIE	USB3.0 PCIE	USB3.0 PCIE	USB3.0 PCIE

USB pin out map

PCH

USB31_1
USB31_2
USB31_3
USB31_4
USB31_5
USB31_6
USB30_7
USB30_8
USB30_9
USB30_10

R_USB30_2 GEN2

USB30_LAN GEN2

R_USB30_1 GEN2

PCHF

Z390/MP/B0/S 6 of 13

DMI need to reverse

PCHB

Z390/MP/B0/S 2 of 13

R_USB30_2
USB30_LAN
R_USB30_1
F_USB30
F_USB

CNVI的BT功能enable時
PCH的USB2.0 port14會被disable

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

H370 USB only

H370 PCIE only

F_USB30
RTL8118
PCIEX1_3
PCIEX4_1
PCIEX4_2

STRAP

XTAL INPUT MODE, PCH HAS INTERNAL 20K PD
HIGH:XTAL INPUT IS DIFFERENTIAL
LOW:XTAL INPUT IS SINGLE-ENDED

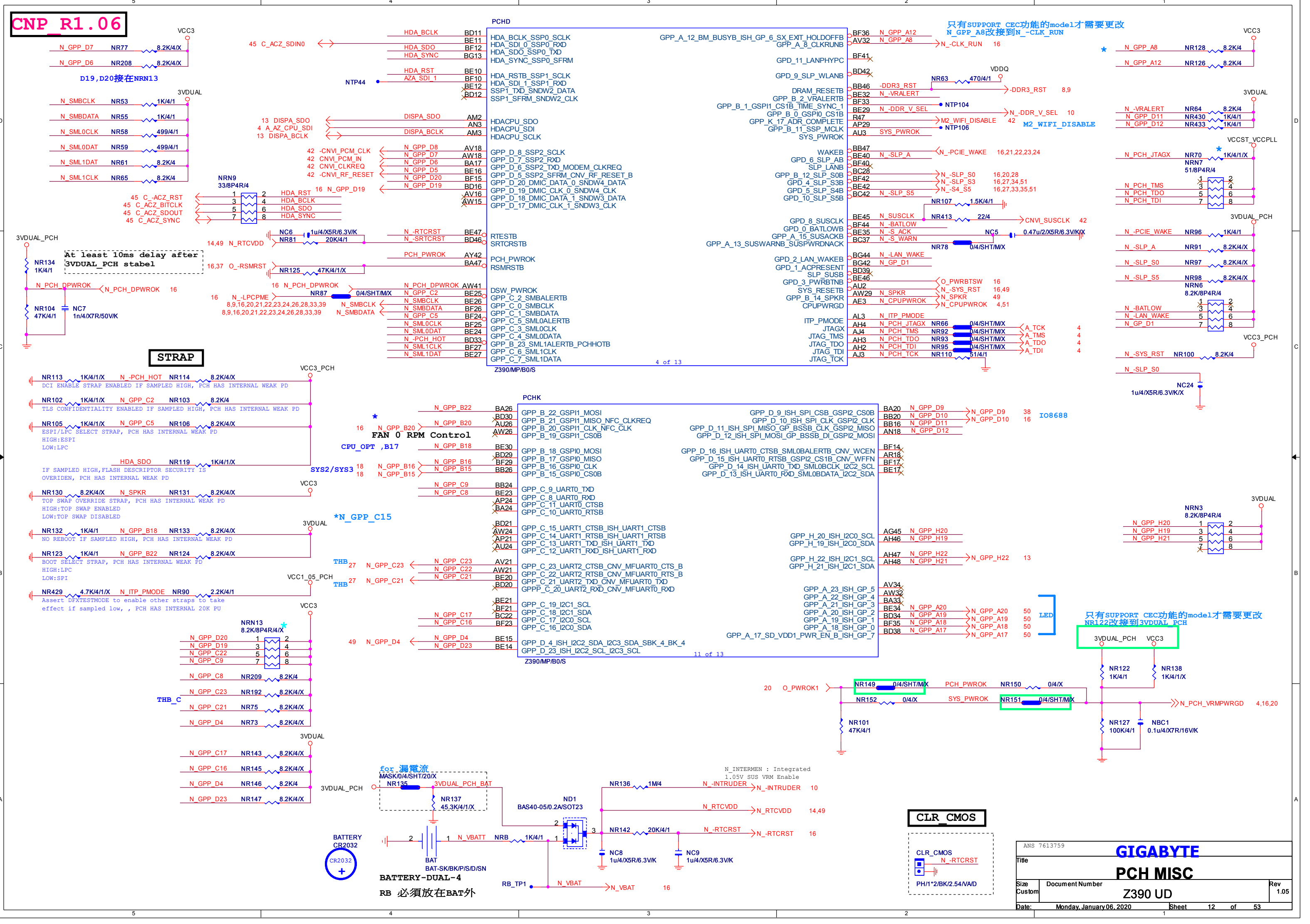
ANS 7613759

GIGABYTE

Title: PCH DMI,USB,PCIE

Size: Custom | Document Number: Z390 UD | Rev: 1.05

Date: Monday, January 06, 2020 | Sheet 11 of 53



CNP_R1.06
D19,D20接在NRN13
At least 10ms delay after 3VDUAL_PCH stabel
STRAP
DCI ENABLE STRAP ENABLED IF SAMPLED HIGH, PCH HAS INTERNAL WEAK PD
TLS CONFIDENTIALITY ENABLED IF SAMPLED HIGH, PCH HAS INTERNAL WEAK PD
ESPI/LPC SELECT STRAP, PCH HAS INTERNAL WEAK PD
HIGH:ESPI
LOW:LPC
IF SAMPLED HIGH,FLASH DESCRIPTOR SECURITY IS OVERIDEN, PCH HAS INTERNAL WEAK PD
TOP SWAP OVERRIDE STRAP, PCH HAS INTERNAL WEAK PD
HIGH:TOP SWAP ENABLED
LOW:TOP SWAP DISABLED
NO REBOOT IF SAMPLED HIGH, PCH HAS INTERNAL WEAK PD
BOOT SELECT STRAP, PCH HAS INTERNAL WEAK PD
HIGH:LPC
LOW:SPI
Assert DFXTESTMODE to enable other straps to take effect if sampled low, , PCH HAS INTERNAL 20K PU
FAN 0 RPM Control
CPU_OPT ,B17
SYS2/SYS3
*N_GPP_C15
THB
THB_C
PCHD
Z390/MP/B0/S
4 of 13
PCHK
11 of 13
只有SUPPORT CEC功能的model才需要更改
N_GPP_A8改接到N_-CLK_RUN
M2_WIFI_DISABLE
IO8688
LED
只有SUPPORT CEC功能的model才需要更改
NR122改接到3VDUAL_PCH
for 漏電流
N_INTERMEN : Integrated 1.05V SUS VRM Enable
BATTERY CR2032
BATTERY-DUAL-4
RB 必須放在BAT外
CLR_CMOS
GIGABYTE
PCH MISC
Z390 UD
Rev 1.05
Monday, January 06, 2020
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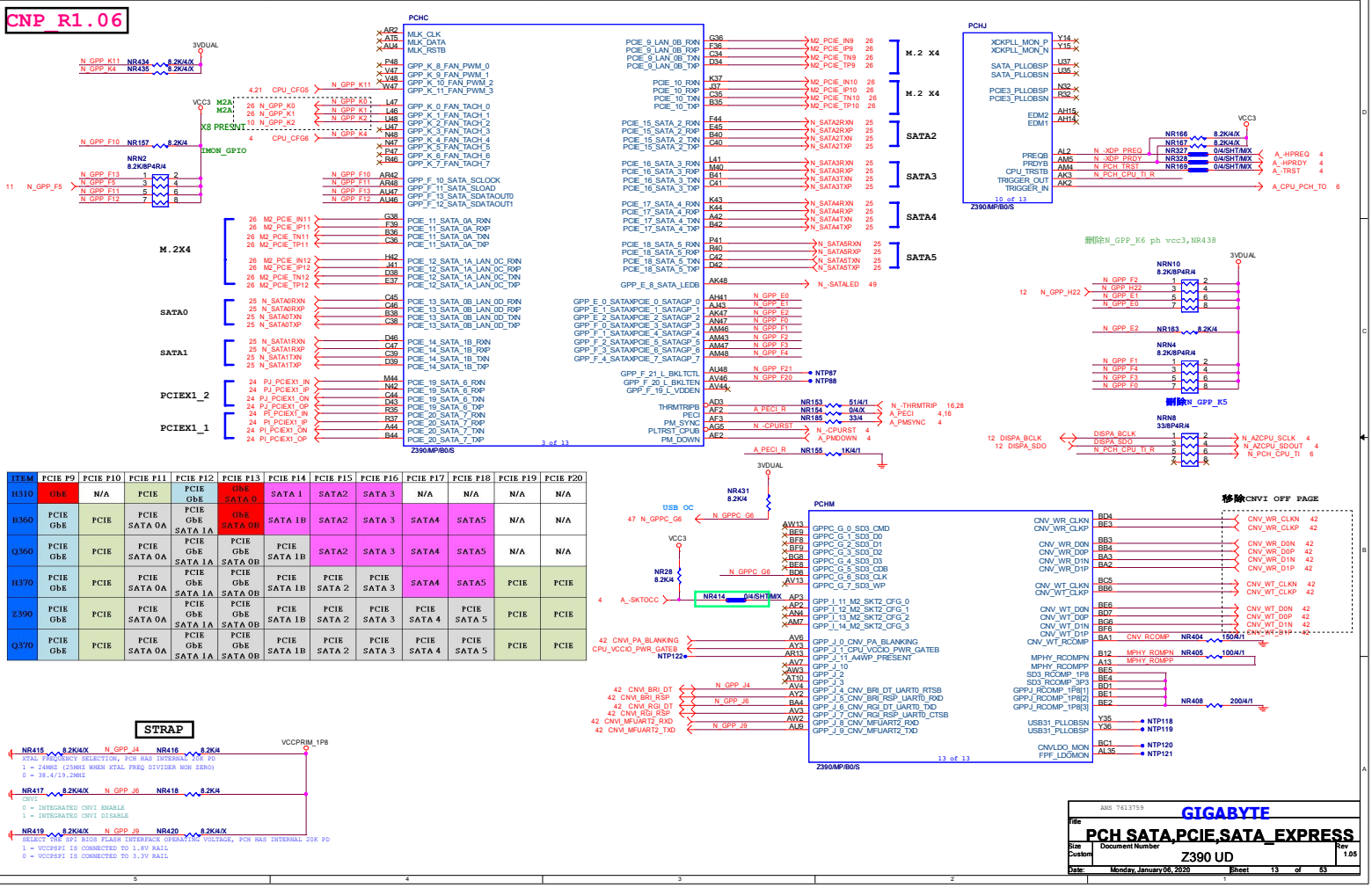
CNP_R1.06



ITEM	PCIE P9	PCIE P10	PCIE P11	PCIE P12	PCIE P13	PCIE P14	PCIE P15	PCIE P16	PCIE P17	PCIE P18	PCIE P19	PCIE P20
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

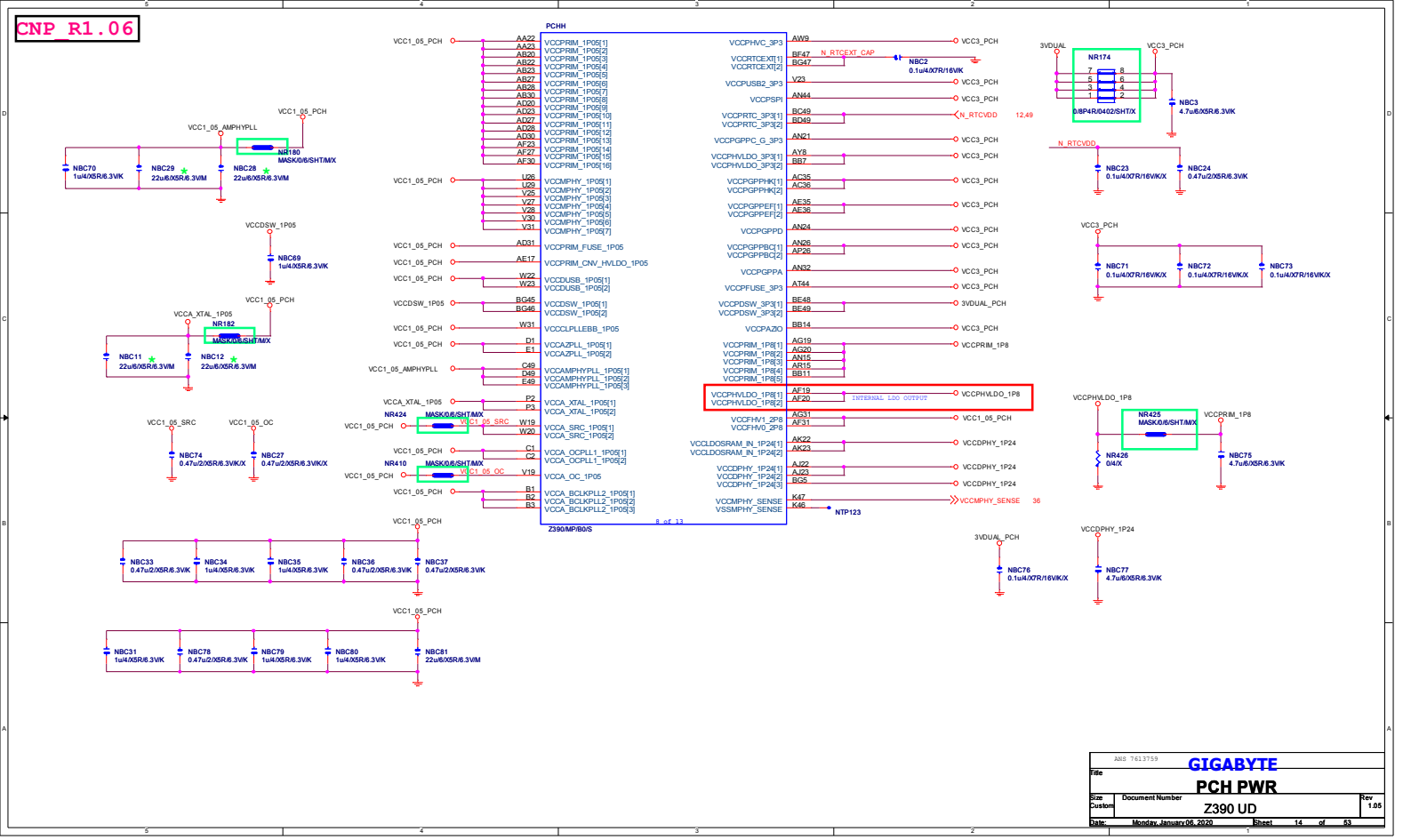
ANS 7613759

GIGABYTE

Title: PCH SATA,PCIE,SATA_EXPRESS

Size	Document Number	Rev
Custom	Z390 UD	1.05

Date: Monday, January 06, 2020 Sheet 13 of 53



ANS 7613759

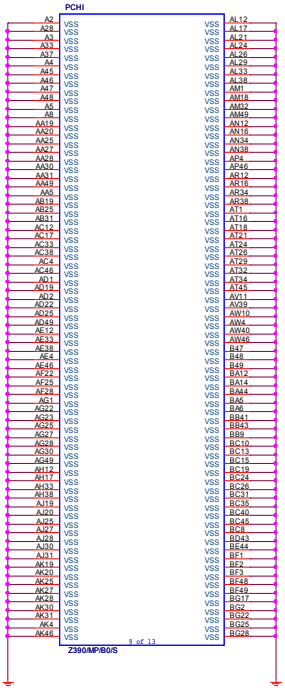
GIGABYTE

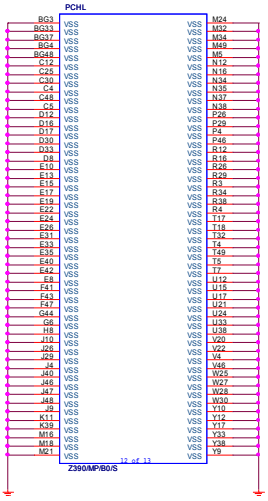
Title: PCH PWR

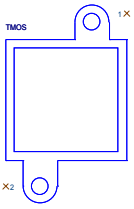
Size	Document Number	Rev
Custom	Z390 UD	1.05

Date: Monday, January 06, 2020 Sheet 14 of 53

CNP_R1.06

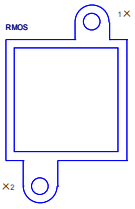






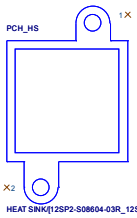
HEAT SINK(12SP2-S09426-G1R_12SP2-S09426-G2R_12SP2-S09426-G3R]

Footprint : same Z370 HD3
MOSHSINK-Z370_HD3P-T
PN: 12SP2-S09426-G1R/G2R/G3R
1.5mm thermal pad



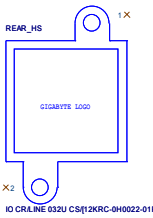
HEAT SINK(12SP2-S08026-G1R_12SP2-S08026-G2R_12SP2-S08026-G3R]

Footprint : same Z370 HD3
MOSHSINK-Z370_HD3P-R
PN: 12SP2-S08026-G1R/G2R/G3R
1.5mm thermal pad



HEAT SINK[12SP2-S08604-03R_12SP2-S08604-01R]

Footprint : same H370 HD3
BGAHSINK-Z370_HD3P
PN:12SP2-S08604-03R/01R



IO CRA.INE 032U CS/[12KRC-0H0022-01R]/X

Footprint :
Z390_AORUS_G7_IO_COVER
PN: 12KRC-0H0022-01R

ANS 7613759	GIGABYTE		
Title	PCH GND		
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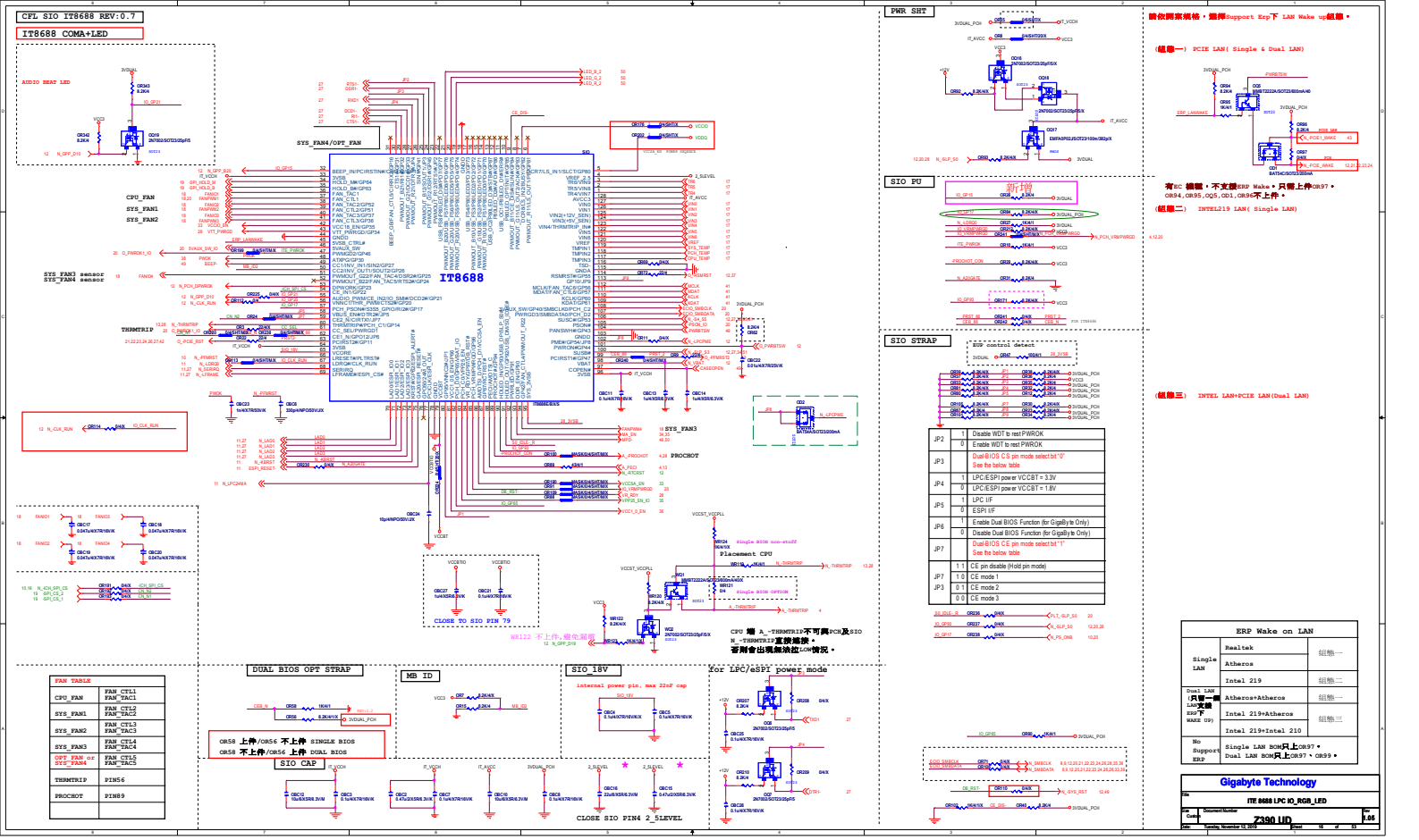
Date: Monday, January 06, 2020	Sheet 15 of 53		

CFL SIO IT8688 REV:0.7

IT8688 COMA+LED



PWR SHT

SIO PU

SIO STRAP

JP2	1	Disable WDT to rest PWROK
	0	Enable WDT to rest PWROK
JP3		Dual-BIOS CS pin mode select bit "0" See the bellow table
JP4	1	LPC/ESPI power VCCBT = 3.3V
	0	LPC/ESPI power VCCBT = 1.8V
JP5	1	LPC I/F
	0	ESPI I/F
JP6	1	Enable Dual BIOS Function (for GigaByte Only)
	0	Disable Dual BIOS Function (for GigaByte Only)
JP7		Dual-BIOS CE pin mode select bit "1" See the bellow table
JP7 JP3	1 1	CE pin disable (Hold pin mode)
	1 0	CE mode 1
	0 1	CE mode 2
	0 0	CE mode 3

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

DUAL BIOS OPT STRAP

OR58 上件/OR56 不上件 SINGLE BIOS

OR58 不上件/OR56 上件 DUAL BIOS

MB ID

SIO 1.8V

internal power pin, max 22nF cap

SIO CAP

for LPC/eSPI power mode

CPU 端 A_THRMTRIP不可與PCH及SIO N_THRMTRIP直接連接，否則會出現無法拉CPU情況。

請依開案規格，選擇Support Erp下 LAN Wake up組態。

(組態一) PCIE LAN(Single & Dual LAN)

有EC 機種，不支援ERP Wake，只需上件OR97，OR94,OR95,OQ5,OD1,OR96不上件。

(組態二) INTEL219 LAN(Single LAN)

(組態三) INTEL LAN+PCIE LAN(Dual LAN)

ERP Wake on LAN

Single LAN	Realtek	組態一
	Atheros	
	Intel 219	組態二
Dual LAN (只管一顆LAN支援ERP下WAKE UP)	Atheros+Atheros	組態一
	Intel 219+Atheros	組態三
	Intel 219+Intel 210	
No Support ERP	Single LAN BOM只上OR97， Dual LAN BOM只上OR97，OR99。	

Gigabyte Technology

ITE 8688 LPC IO_RGB_LED

Z390 UD

Rev 1.05

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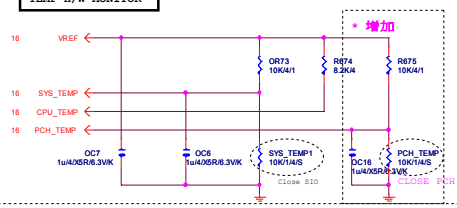
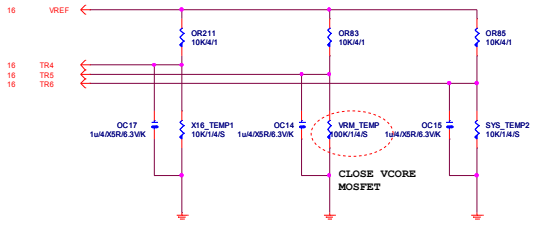
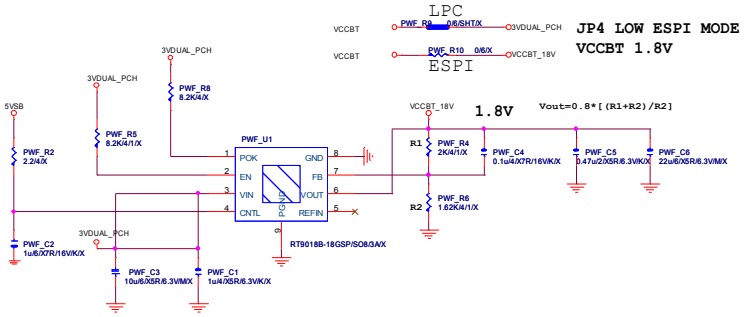
TEMP H/W MONITOR

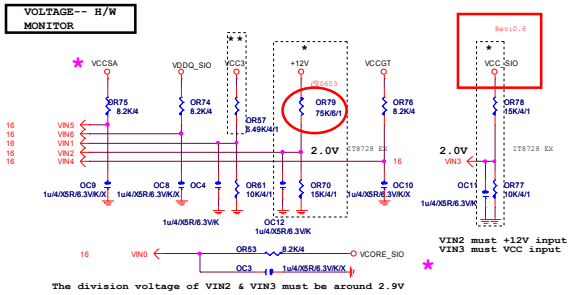


5個FAN時使用

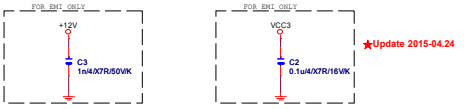




VOLTAGE-- H/W MONITOR



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



★Update 2015-04.24

Gigabyte Technology			
Title: HWM,KB/MS, FAN CTRL			
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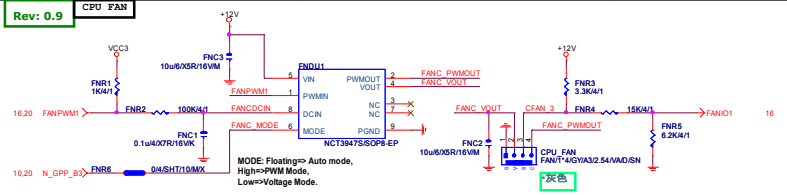
Rev: 0.9

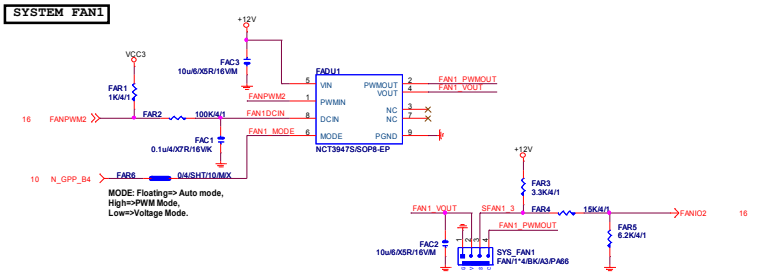
CPU_FAN



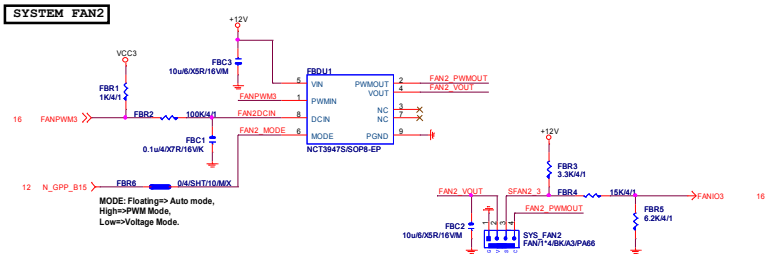
IO 4 FAN

CPU_FAN
SYS_FAN1
SYS_FAN2
SYS_FAN3

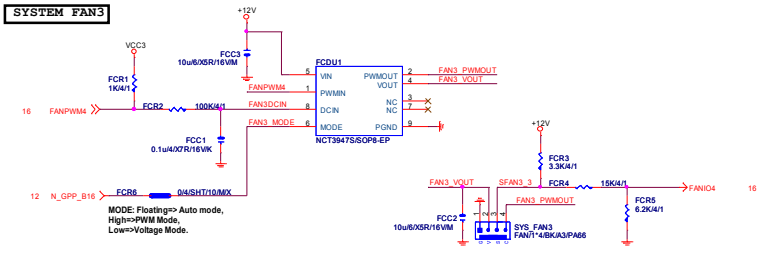
SYSTEM FAN1



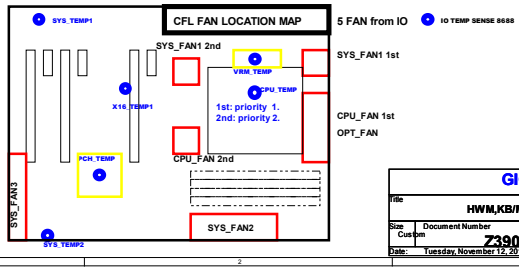
SYSTEM FAN2



SYSTEM FAN3



CPU_OPT



GIGABYTE

Title: HWM,KB/MS, FAN CTRL

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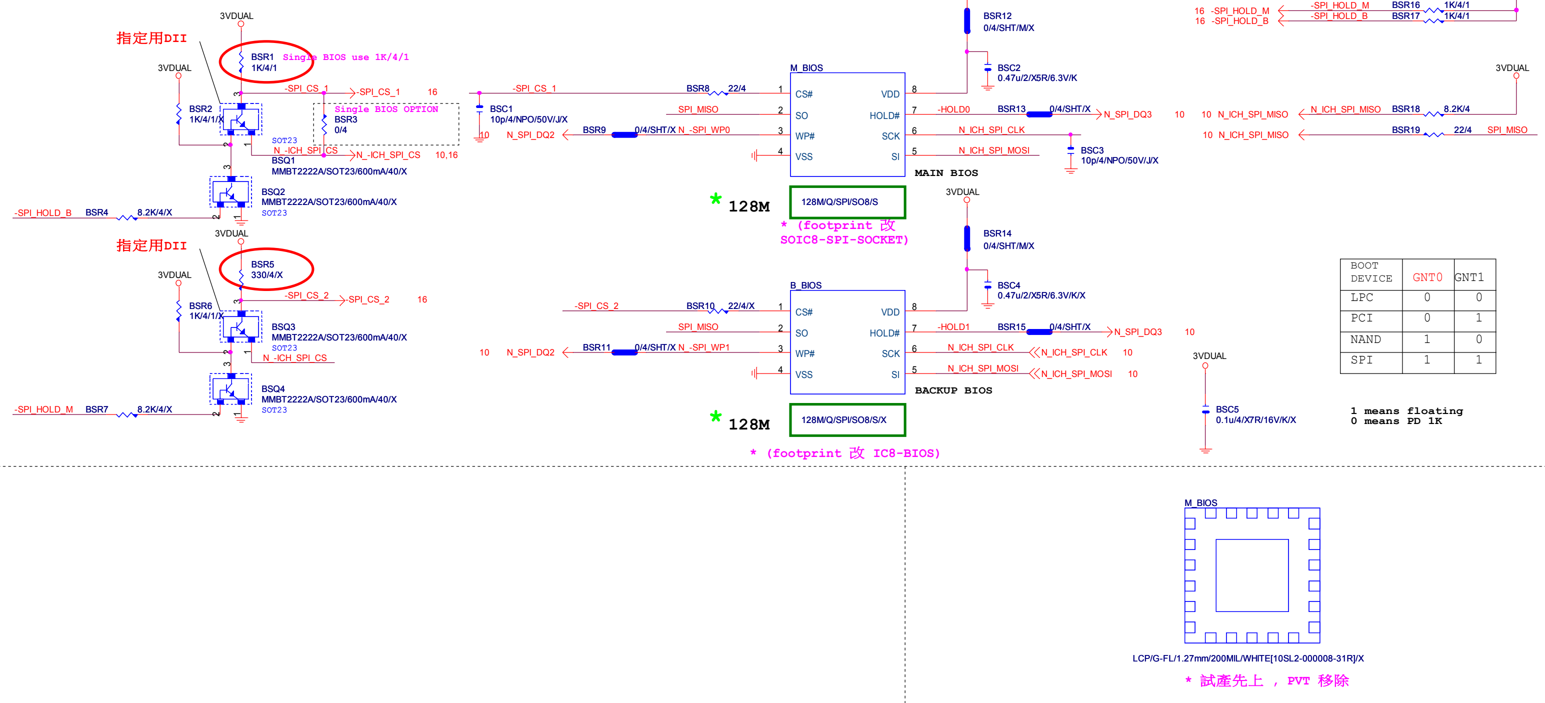
DUAL BIOS

MOSI EOSIDECTrRDMTeRMiTetminaVoltageltage



指定用DII
3VDUAL
BSR1 1K/4/1 Single BIOS use 1K/4/1
BSR2 1K/4/1/X
-SPI_CS_1
-SPI_CS_1 16
Single BIOS OPTION
BSR3 0/4
SOT23
N_-ICH_SPI_CS
N_-ICH_SPI_CS 10,16
BSQ1 MMBT2222A/SOT23/600mA/40/X
BSQ2 MMBT2222A/SOT23/600mA/40/X
SOT23
-SPI_HOLD_B BSR4 8.2K/4/X
指定用DII
BSR5 330/4/X
BSR6 1K/4/1/X
-SPI_CS_2
-SPI_CS_2 16
BSQ3 MMBT2222A/SOT23/600mA/40/X
SOT23
N_-ICH_SPI_CS
BSQ4 MMBT2222A/SOT23/600mA/40/X
SOT23
-SPI_HOLD_M BSR7 8.2K/4/X
BSC1 10p/4/NPO/50V/J/X
10 N_SPI_DQ2 BSR9 0/4/SHT/X N_-SPI_WP0
BSR8 22/4
SPI_MISO
M_BIOS
CS# SO WP# VSS VDD HOLD# SCK SI
BSR12 0/4/SHT/M/X
BSC2 0.47u/2/X5R/6.3V/K
-HOLD0 BSR13 0/4/SHT/X N_SPI_DQ3 10
N_ICH_SPI_CLK
N_ICH_SPI_MOSI
BSC3 10p/4/NPO/50V/J/X
MAIN BIOS
128M
128M/Q/SPI/SO8/S
* (footprint 改 SOIC8-SPI-SOCKET)
BSR14 0/4/SHT/M/X
BSC4 0.47u/2/X5R/6.3V/K/X
B_BIOS
-SPI_CS_2 BSR10 22/4/X
SPI_MISO
10 N_SPI_DQ2 BSR11 0/4/SHT/X N_-SPI_WP1
-HOLD1 BSR15 0/4/SHT/X N_SPI_DQ3 10
N_ICH_SPI_CLK N_ICH_SPI_CLK 10
N_ICH_SPI_MOSI N_ICH_SPI_MOSI 10
BACKUP BIOS
128M
128M/Q/SPI/SO8/S/X
* (footprint 改 IC8-BIOS)
16 -SPI_HOLD_M -SPI_HOLD_M BSR16 1K/4/1
16 -SPI_HOLD_B -SPI_HOLD_B BSR17 1K/4/1
10 N_ICH_SPI_MISO N_ICH_SPI_MISO BSR18 8.2K/4
10 N_ICH_SPI_MISO BSR19 22/4 SPI_MISO
BSC5 0.1u/4/X7R/16V/K/X
M_BIOS
LCP/G-FL/1.27mm/200MIL/WHITE[10SL2-000008-31R]/X
* 試產先上 , PVT 移除

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

1 means floating
0 means PD 1K

Gigabyte Technology

Title: BIOS

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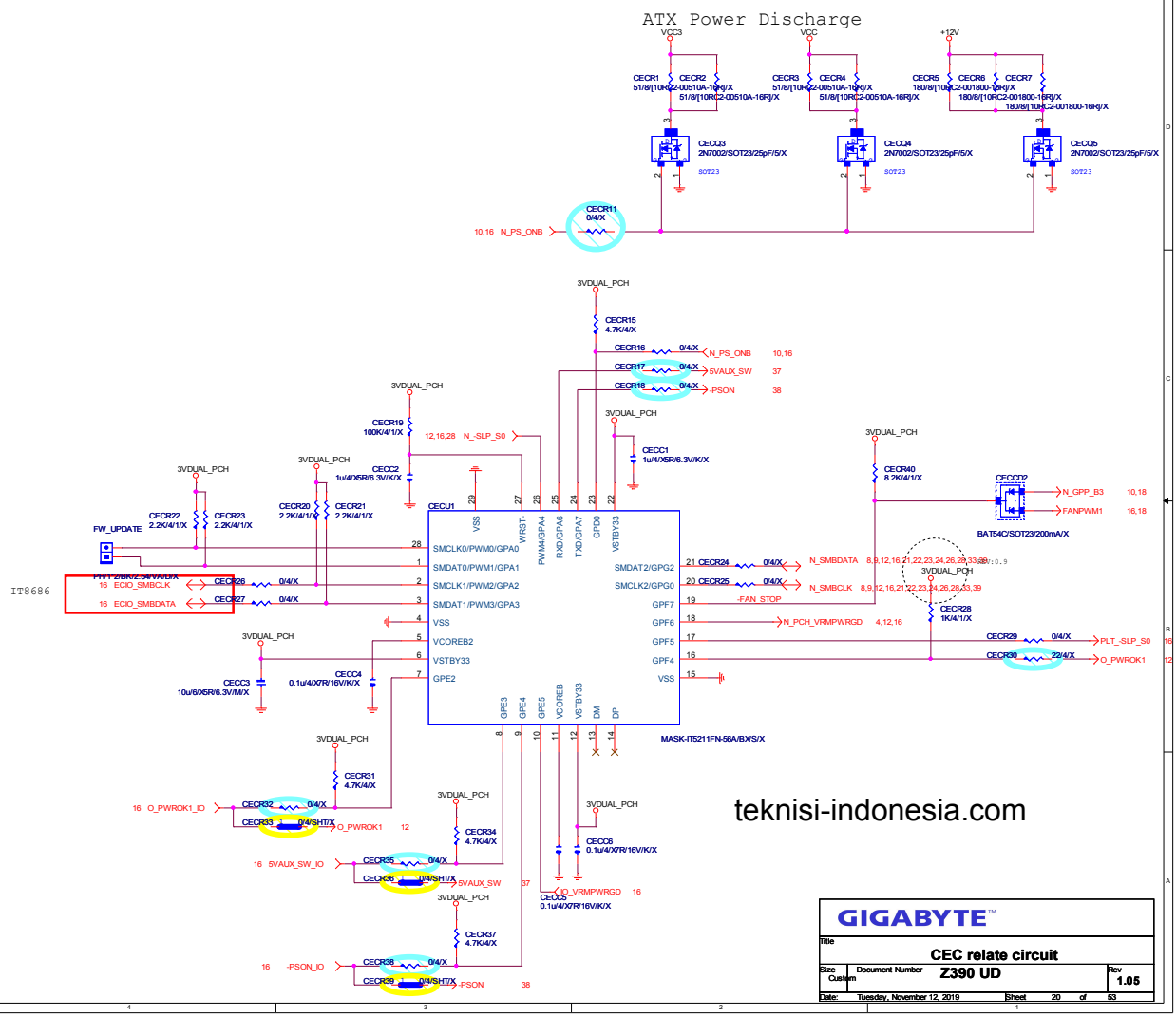
CEC_R0.3



GIGABYTE™

Title: CEC relate circuit

Size: Custom | Document Number: Z390 UD | Rev: 1.05

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Rev 0.3

PCIEX16 CAP

X16_+12V
VCC3
PABC1 0.1u/4/X7R/16V/K
PAEC2 560u/FP/D/6.3V/69/A/7m
8,9,12,16,20,22,23,24,26,28,33,39
8,9,12,16,20,22,23,24,26,28,33,39
+12V
PAEC1 270u/FP/D/16V/8C/A/10m
PABC2 0.1u/4/X7R/16V/K
PABC3 0.1u/4/X7R/16V/K

PCIEX16 SLOT

PCIESLOT-164STH

PCIEX16 3GIO_*16

PAR3 0/4/SHT/X
PAR4 0/4/X
PAR5 0/4/X
N_SMBCLK
N_SMBDATA
3VDUAL
VCC3
12,16,22,23,24 N_PCIE_WAKE
PAR6 0/4/X
-PCIEX16_PR
PAQ1 BAT54A/SOT23/200mA
PAR7 8.2K/4/X
CPU_CFG5
10 -PCIEX16_PR

KEY

X16_+12V
PAR1 0/4/SHT/X
PAR2 0/4/SHT/X
VCC3
-DPCIE_RST
PAC1 22p/4/NPO/50V/J/X
-DPCIE_RST
O_-PCIE_RST 16,22,23,24,26,27,42
PA_SRCCLK_3GIO 10
PA_SRCCLK_3GIO 10

PA_EXP_RXP0
PA_EXP_RXN0
PA_EXP_RXP1
PA_EXP_RXN1
PA_EXP_RXP2
PA_EXP_RXN2
PA_EXP_RXP3
PA_EXP_RXN3
PA_EXP_RXP4
PA_EXP_RXN4
PA_EXP_RXP5
PA_EXP_RXN5
PA_EXP_RXP6
PA_EXP_RXN6
PA_EXP_RXP7
PA_EXP_RXN7
PA_EXP_RXP8
PA_EXP_RXN8
PA_EXP_RXP9
PA_EXP_RXN9
PA_EXP_RXP10
PA_EXP_RXN10
PA_EXP_RXP11
PA_EXP_RXN11
PA_EXP_RXP12
PA_EXP_RXN12
PA_EXP_RXP13
PA_EXP_RXN13
PA_EXP_RXP14
PA_EXP_RXN14
PA_EXP_RXP15
PA_EXP_RXN15

PA_EXP_TXP0_C
PA_EXP_TXN0_C
PA_EXP_TXP1_C
PA_EXP_TXN1_C
PA_EXP_TXP2_C
PA_EXP_TXN2_C
PA_EXP_TXP3_C
PA_EXP_TXN3_C
CPU_CFG5
PA_EXP_TXP4_C
PA_EXP_TXN4_C
PA_EXP_TXP5_C
PA_EXP_TXN5_C
PA_EXP_TXP6_C
PA_EXP_TXN6_C
PA_EXP_TXP7_C
PA_EXP_TXN7_C
4,13 CPU_CFG5
PA_EXP_TXP8_C
PA_EXP_TXN8_C
PA_EXP_TXP9_C
PA_EXP_TXN9_C
PA_EXP_TXP10_C
PA_EXP_TXN10_C
PA_EXP_TXP11_C
PA_EXP_TXN11_C
PA_EXP_TXP12_C
PA_EXP_TXN12_C
PA_EXP_TXP13_C
PA_EXP_TXN13_C
PA_EXP_TXP14_C
PA_EXP_TXN14_C
PA_EXP_TXP15_C
PA_EXP_TXN15_C

PAR8 8.2K/4
VCC3
-PCIEX16_PR_R

PCIE-E/16X-164P/BK/LONG DOUBLE/HK*2/SHELL
黑色金屬加強

PCIEX16 PROTECT SHT

+12 protect
short-wire test
+12V
X16_+12V
PARN2 0/8P4R/4/X
PARN1 0/8P4R/0402/SHT/X

PCIEX16 AC CAP

PA_EXP_TXP0	PAC5	0.22u/4/X5R/6.3V/K	PA_EXP_TXP0_C
PA_EXP_TXN0	PAC4	0.22u/4/X5R/6.3V/K	PA_EXP_TXN0_C
PA_EXP_TXP1	PAC6	0.22u/4/X5R/6.3V/K	PA_EXP_TXP1_C
PA_EXP_TXN1	PAC7	0.22u/4/X5R/6.3V/K	PA_EXP_TXN1_C
PA_EXP_TXP2	PAC8	0.22u/4/X5R/6.3V/K	PA_EXP_TXP2_C
PA_EXP_TXN2	PAC9	0.22u/4/X5R/6.3V/K	PA_EXP_TXN2_C
PA_EXP_TXP3	PAC10	0.22u/4/X5R/6.3V/K	PA_EXP_TXP3_C
PA_EXP_TXN3	PAC11	0.22u/4/X5R/6.3V/K	PA_EXP_TXN3_C
PA_EXP_TXP4	PAC12	0.22u/4/X5R/6.3V/K	PA_EXP_TXP4_C
PA_EXP_TXN4	PAC13	0.22u/4/X5R/6.3V/K	PA_EXP_TXN4_C
PA_EXP_TXP5	PAC14	0.22u/4/X5R/6.3V/K	PA_EXP_TXP5_C
PA_EXP_TXN5	PAC15	0.22u/4/X5R/6.3V/K	PA_EXP_TXN5_C
PA_EXP_TXP6	PAC16	0.22u/4/X5R/6.3V/K	PA_EXP_TXP6_C
PA_EXP_TXN6	PAC17	0.22u/4/X5R/6.3V/K	PA_EXP_TXN6_C
PA_EXP_TXP7	PAC18	0.22u/4/X5R/6.3V/K	PA_EXP_TXP7_C
PA_EXP_TXN7	PAC19	0.22u/4/X5R/6.3V/K	PA_EXP_TXN7_C
PA_EXP_TXP8	PAC21	0.22u/4/X5R/6.3V/K	PA_EXP_TXP8_C
PA_EXP_TXN8	PAC20	0.22u/4/X5R/6.3V/K	PA_EXP_TXN8_C
PA_EXP_TXP9	PAC22	0.22u/4/X5R/6.3V/K	PA_EXP_TXP9_C
PA_EXP_TXN9	PAC23	0.22u/4/X5R/6.3V/K	PA_EXP_TXN9_C
PA_EXP_TXP10	PAC24	0.22u/4/X5R/6.3V/K	PA_EXP_TXP10_C
PA_EXP_TXN10	PAC25	0.22u/4/X5R/6.3V/K	PA_EXP_TXN10_C
PA_EXP_TXP11	PAC26	0.22u/4/X5R/6.3V/K	PA_EXP_TXP11_C
PA_EXP_TXN11	PAC27	0.22u/4/X5R/6.3V/K	PA_EXP_TXN11_C
PA_EXP_TXP12	PAC28	0.22u/4/X5R/6.3V/K	PA_EXP_TXP12_C
PA_EXP_TXN12	PAC29	0.22u/4/X5R/6.3V/K	PA_EXP_TXN12_C
PA_EXP_TXP13	PAC30	0.22u/4/X5R/6.3V/K	PA_EXP_TXP13_C
PA_EXP_TXN13	PAC31	0.22u/4/X5R/6.3V/K	PA_EXP_TXN13_C
PA_EXP_TXP14	PAC32	0.22u/4/X5R/6.3V/K	PA_EXP_TXP14_C
PA_EXP_TXN14	PAC33	0.22u/4/X5R/6.3V/K	PA_EXP_TXN14_C
PA_EXP_TXP15	PAC34	0.22u/4/X5R/6.3V/K	PA_EXP_TXP15_C
PA_EXP_TXN15	PAC35	0.22u/4/X5R/6.3V/K	PA_EXP_TXN15_C

PCIEX16:16/5/5/5/5/16

PA_EXP_RXP[0..15] → PA_EXP_RXP[0..15] 4
PA_EXP_RXN[0..15] → PA_EXP_RXN[0..15] 4
PA_EXP_TXP[0..15] → PA_EXP_TXP[0..15] 4
PA_EXP_TXN[0..15] → PA_EXP_TXN[0..15] 4

PCI-E REV:1.1--> 2.5GHZ
PCE-E X1(單向) BANDWITH=2.5GHz*(8b/10b)=2Gb/s=250MB/s
PCE-E X1(雙向) BANDWITH=2.5GHz*(8b/10b)X2=4Gb/s=500MB/s
PCE-E X16(單向) BANDWITH=2.5GHz*(8b/10b)X16=32Gb/s=4GB/s
PCE-E X16(雙向) BANDWITH=2.5GHz*(8b/10b)X16X2=64Gb/s=8GB/s

PCI-E REV:2.0--> 5GHZ
PCE-E X1(單向) BANDWITH=5GHz*(8b/10b)=4Gb/s=500MB/s

PCI-E REV:3.0--> 8GHZ
PCE-E X1(單向) BANDWITH=8GHz*(128b/130b)=8Gb/s=1GB/s

Gigabyte Technology

Title: PCI EXPRESS * 16

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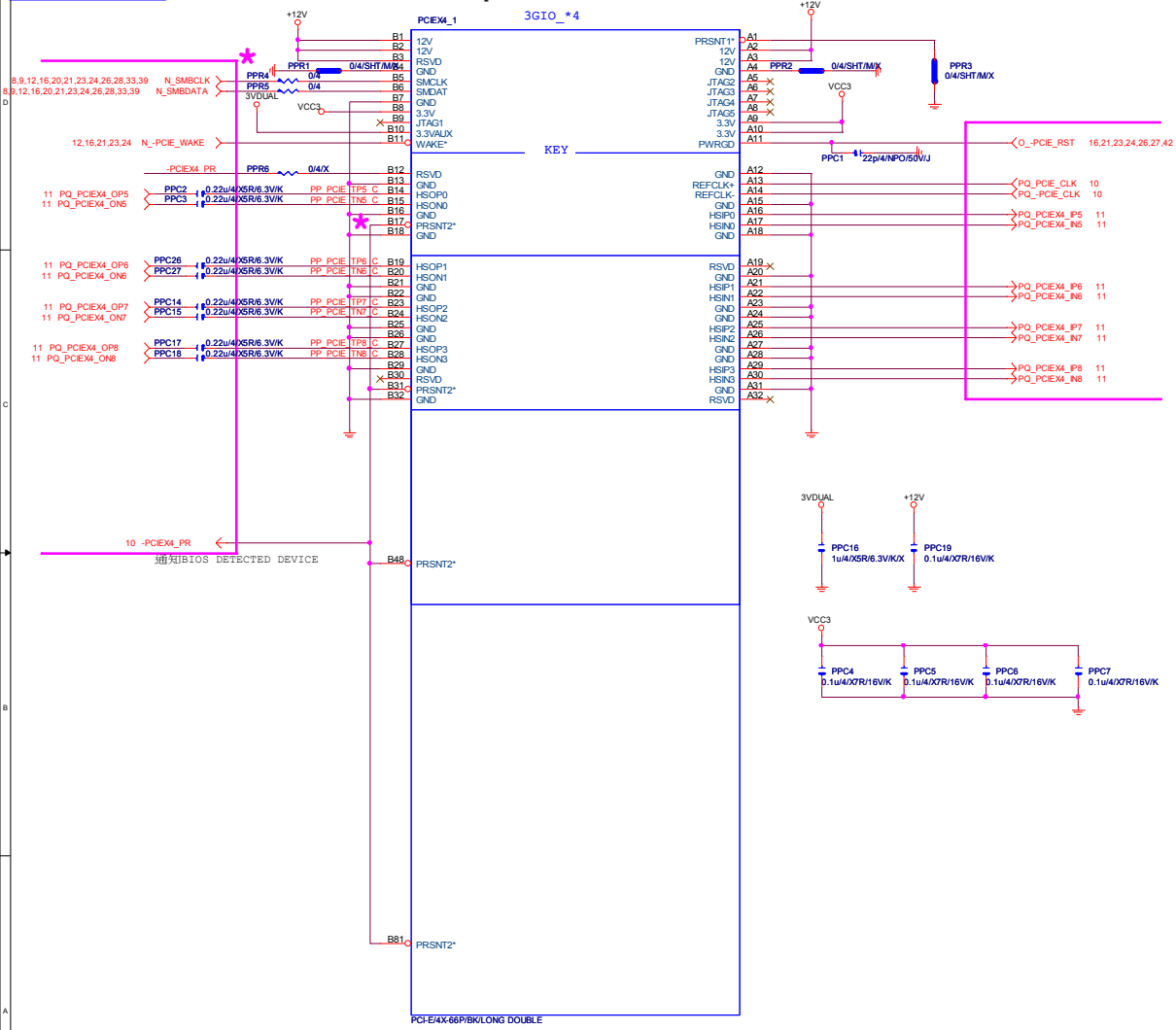
PCIE*4

Footprint "PCIESLOT-64P-1"



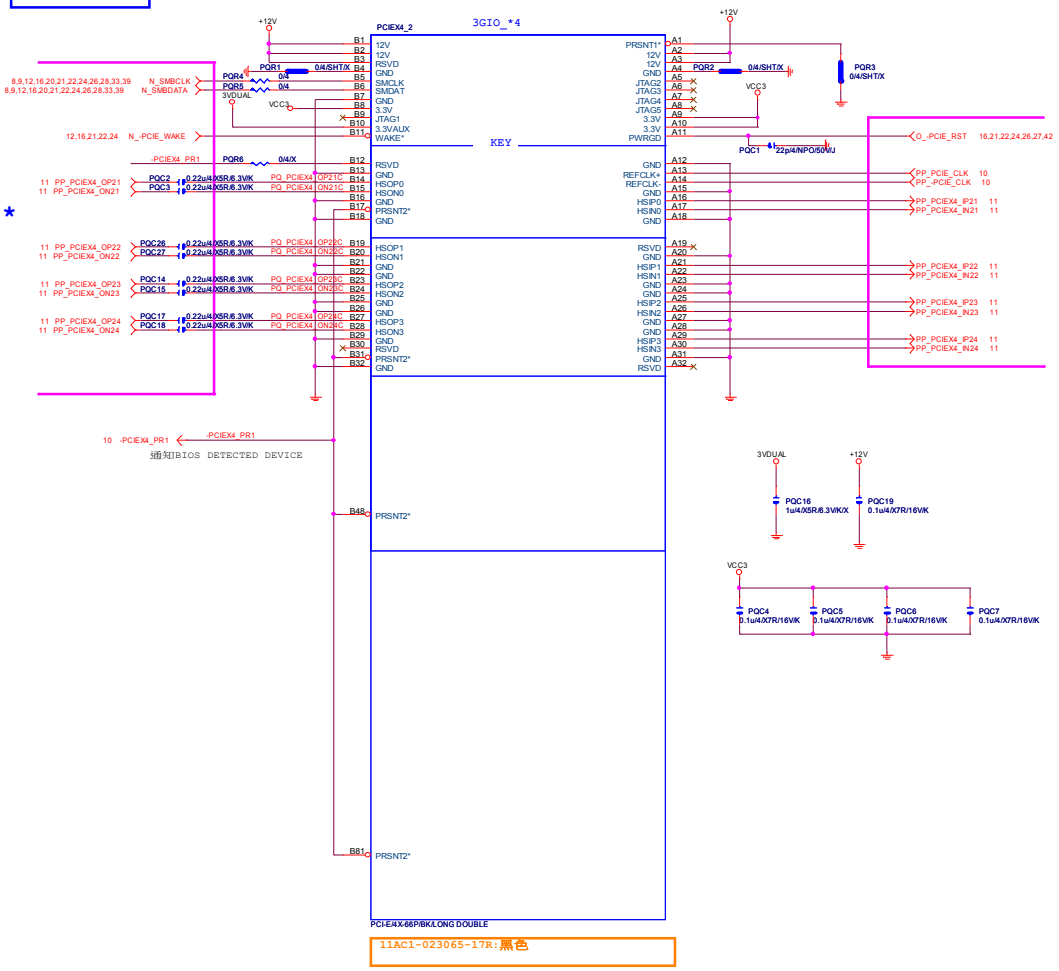
11AC1-023065-17R:黑色

Gigabyte Technology			
Title: PCIE_X4			
Size: Custom	Document Number: Z390 UD		Rev: 1.0
Date: Tuesday, November 12, 2019	Sheet 22 of 53		

Rev 0.51

PCIE*4 *

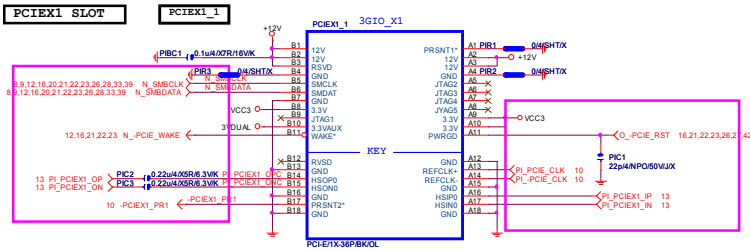
Footprint "PCIESLOT-64P-1"



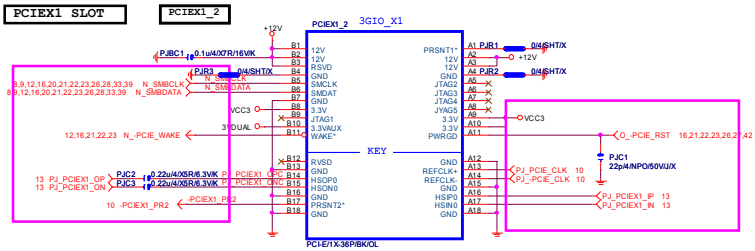
Gigabyte Technology	
Title	PCIE_X4
Size: Custom	Document Number: Z390 UD
Rev	1.06
Date: Tuesday, November 12, 2019	Sheet 23 of 53

Rev 0.51

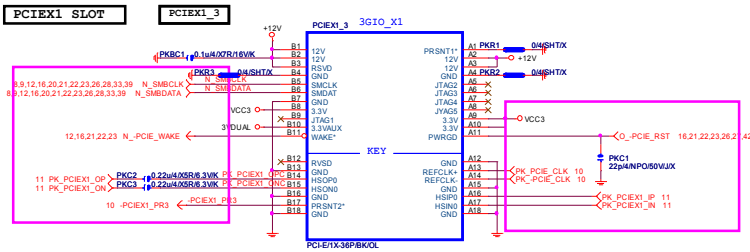
PCIEX1 SLOT PCIEX1_1

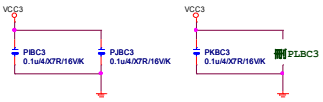


PCIEX1 SLOT PCIEX1_2



PCIEX1 SLOT PCIEX1_3





刪除PCIEX1_4

PCIEX1 SLOT PCIEX1_4

Gigabyte Technology		
Title: PCIE_X4		
Size: Custom	Document Number: Z390 UD	Rev: 1.0
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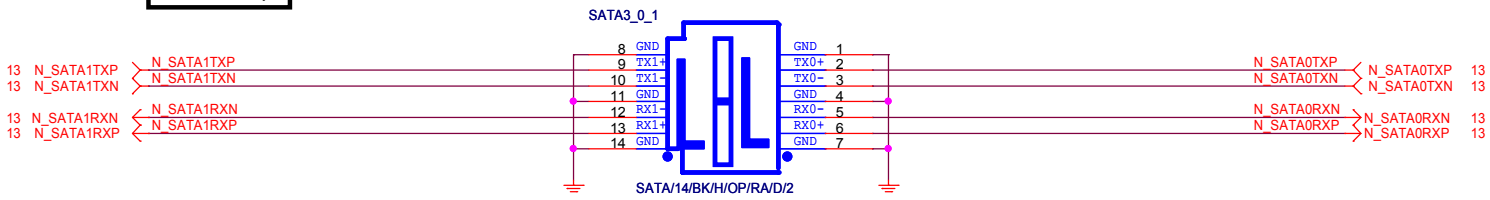
IO18/IO19 To SATA3 port0/1 (90度R-A, 180度V-A)

上 Port (8~14)　　下 Port (1~7)　　6 SATA3 from Z390 (90度R-A)

SATA3 0/1



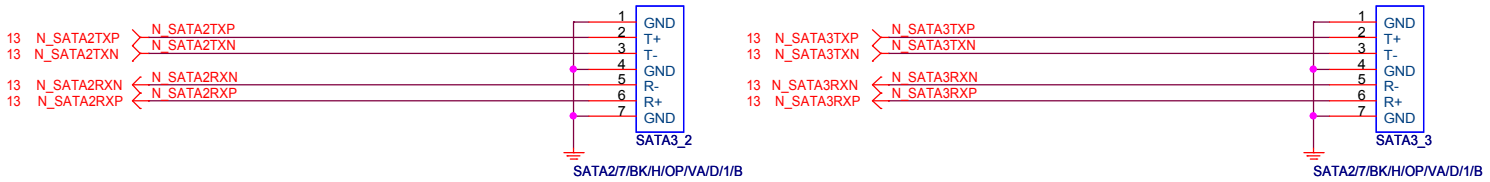
BLACK

Footprint : H2X7-SATA2-D90

IO20/IO21 To SATA3 port2/3

上 Port (8~14)　　下 Port (1~7)

SATA3 2/3



BLACK

Footprint : H1X7-SATA2-HS-MASK

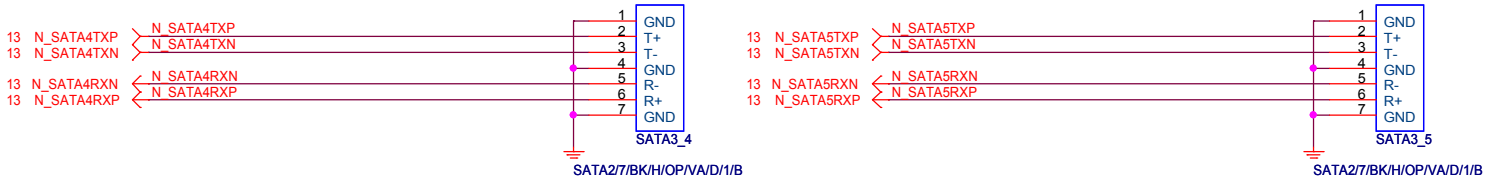
BLACK

Footprint : H1X7-SATA2-HS-MASK

IO22/IO23 To SATA3 port4/5

上 Port (8~14)　　下 Port (1~7)

SATA3 4/5



BLACK

Footprint : H1X7-SATA2-HS-MASK

BLACK

Footprint : H1X7-SATA2-HS-MASK

Gigabyte Technology		
Title: SATA		
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Rev 0.6

Z390

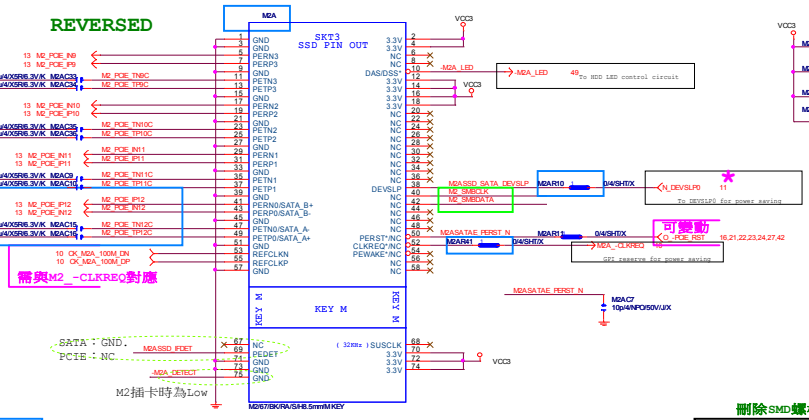
REVERSED

M.2 Lane4 from PCH port14

M.2 Lane3 from PCH port15

M.2 Lane2 from PCH port16

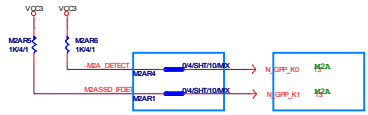
M.2 Lane2 from PCH port17



需與M2_-CLKREQ對應

可變動

支援SATA and M.2 function



若M2A_32G有架高
原本的DIP螺柱太矮了,更新為
CR/[12KSF-F10303-11R]

DIP螺柱

DIP螺絲

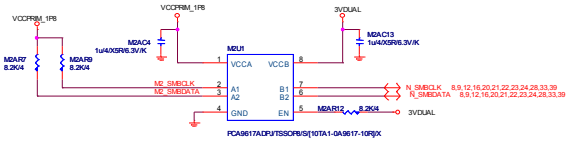
架高

刪除SMD螺柱文字面 "A" ,不要show 出在PCB文字面上

SMD螺柱 10KS2-040131-01R

★ Footprint : HOLE_C236D165-A

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



Gigabyte Technology			
Title: M.2 X4			
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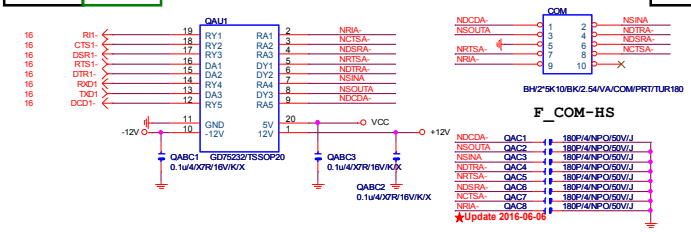
COM PORT Rev: 0.91



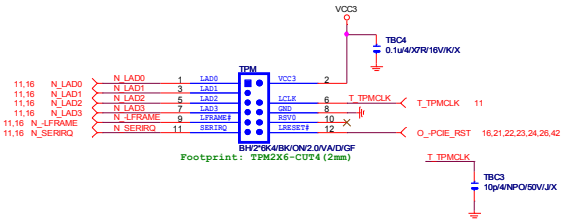
COM RI N/A

F_COM-HS

LPT PORT

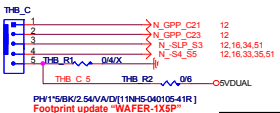
模組為: IT8686 LPT+COMA, 單獨刪除LPT...CHHECK.

TPM CONNECT



Thunderbolt

★Update 2015-12-29



Gigabyte Technology			
Title: COM, TPM ,THB			
Size: Custom	Document Number: Z390 UD		Rev: 1.05
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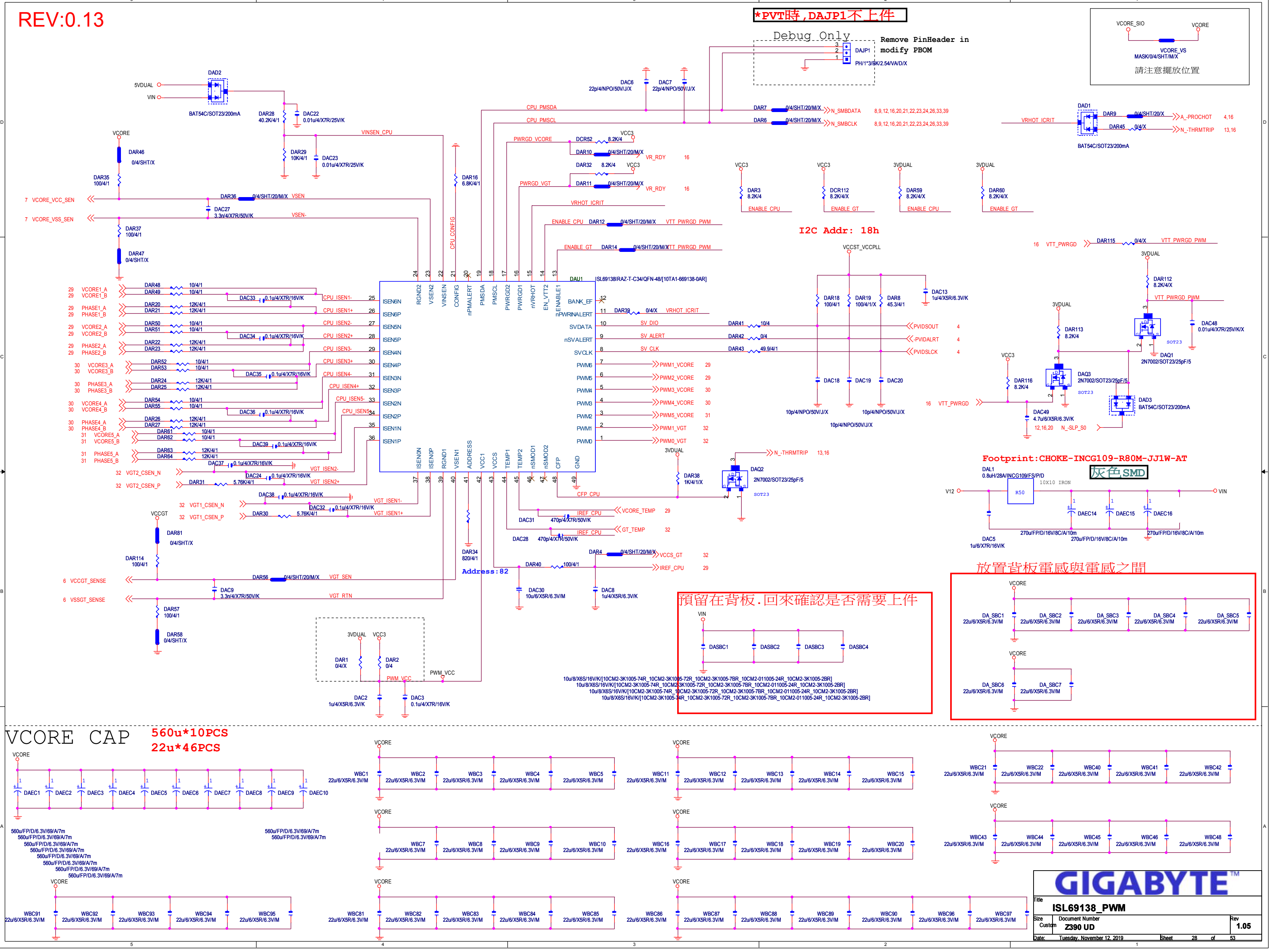
REV:0.13
*PVT時,DAJP1不上件
Debug Only
Remove PinHeader in modify PBOM
VCORE_SIO
VCORE
VCORE_VS
請注意擺放位置
DAD2
5VDUAL
VIN
BAT54C/SOT23/200mA
DAR28 40.2K/4/1
DAC22 0.01u/4/X7R/25V/K
VINSEN_CPU
DAR29 10K/4/1
DAC23 0.01u/4/X7R/25V/K
DAR46 0/4/SHT/X
DAR35 100/4/1
VCORE_VCC_SEN
VCORE_VSS_SEN
DAR36 0/4/SHT/20/M/X
VSEN
DAC27 3.3n/4/X7R/50V/K
VSEN-
DAR37 100/4/1
DAR47 0/4/SHT/X
CPU_PMSDA
CPU_PMSCL
PWRGD_VCORE
PWRGD_VGT
VRHOT_ICRIT
ENABLE_CPU
ENABLE_GT
DAR7 0/4/SHT/20/M/X N_SMBDATA
DAR6 0/4/SHT/20/M/X N_SMBCLK
DAD1
DAR9 0/4/SHT/20/M/X A_PROCHOT
DAR45 0/4/X N_THRMTRIP
BAT54C/SOT23/200mA
VR_RDY
VTT_PWRGD_PWM
I2C Addr: 18h
VCCST_VCCPLL
DAU1 ISL69138IRAZ-T-C34/QFN-48/[10TA1-669138-0AR]
ISEN6N ISEN6P ISEN5N ISEN5P ISEN4N ISEN4P ISEN3N ISEN3P ISEN2N ISEN2P ISEN1N ISEN1P
RGND2 VSEN2 VINSEN CONFIG nPMALERT PMSDA PMSCL PWRGD2 PWRGD1 nVRHOT EN_VTT2 ENABLE1
BANK_EF nPWRINALERT SVDATA nSVALERT SVCLK PWM6 PWM5 PWM4 PWM3 PWM2 PWM1 PWM0
ISEN0N ISEN0P RGND1 VSEN1 ADDRESS VCC1 VCCS TEMP1 TEMP2 nSMOD1 nSMOD2 CFP GND
SV_DIO SV_ALERT SV_CLK
PVIDSOUT PVIDALRT PVIDSCLK
PWM1_VCORE PWM2_VCORE PWM3_VCORE PWM4_VCORE PWM5_VCORE PWM1_VGT PWM0_VGT
DAQ1 2N7002/SOT23/25pF/5
DAQ3 2N7002/SOT23/25pF/5
DAD3 BAT54C/SOT23/200mA
DAC48 0.01u/4/X7R/25V/K/X
DAC49 4.7u/6/X5R/6.3V/K
N_SLP_S0
VTT_PWRGD
N_THRMTRIP
DAQ2 2N7002/SOT23/25pF/5
Footprint:CHOKE-INCG109-R80M-JJ1W-AT
灰色SMD
DAL1 0.8uH/28A/INCG109/FS/P/D
V12
VIN
DAEC14 DAEC15 DAEC16
270u/FP/D/16V/8C/A/10m
DAC5 1u/6/X7R/16V/K
Address:82
DAR34 820/4/1
CFP_CPU
IREF_CPU
VCORE_TEMP
GT_TEMP
DAC31 470p/4/X7R/50V/K
DAC28 470p/4/X7R/50V/K
DAR4 0/4/SHT/20/M/X VCCS_GT
DAR40 100/4/1
DAC30 10u/6/X5R/6.3V/M
DAC8 1u/4/X5R/6.3V/K
VCCGT
DAR81 0/4/SHT/X
DAR114 100/4/1
VCCGT_SENSE
VSSGT_SENSE
DAR56 0/4/SHT/20/M/X VGT_SEN
DAC9 3.3n/4/X7R/50V/K
VGT_RTN
DAR57 100/4/1
DAR58 0/4/SHT/X
DAR1 0/4/X
DAR2 0/4
PWM_VCC
DAC2 1u/4/X5R/6.3V/K
DAC3 0.1u/4/X7R/16V/K
預留在背板.回來確認是否需要上件
DASBC1 DASBC2 DASBC3 DASBC4
放置背板電感與電感之間
DA_SBC1 DA_SBC2 DA_SBC3 DA_SBC4 DA_SBC5 DA_SBC6 DA_SBC7
22u/6/X5R/6.3V/M
VCORE CAP
560u*10PCS
22u*46PCS
DAEC1 DAEC2 DAEC3 DAEC4 DAEC5 DAEC6 DAEC7 DAEC8 DAEC9 DAEC10
560u/FP/D/6.3V/69/A/7m
WBC1 WBC2 WBC3 WBC4 WBC5 WBC11 WBC12 WBC13 WBC14 WBC15 WBC21 WBC22 WBC40 WBC41 WBC42
WBC7 WBC8 WBC9 WBC10 WBC16 WBC17 WBC18 WBC19 WBC20 WBC43 WBC44 WBC45 WBC46 WBC48
WBC91 WBC92 WBC93 WBC94 WBC95 WBC81 WBC82 WBC83 WBC84 WBC85 WBC86 WBC87 WBC88 WBC89 WBC90 WBC96 WBC97
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Title ISL69138_PWM
Size Custom
Document Number Z390 UD
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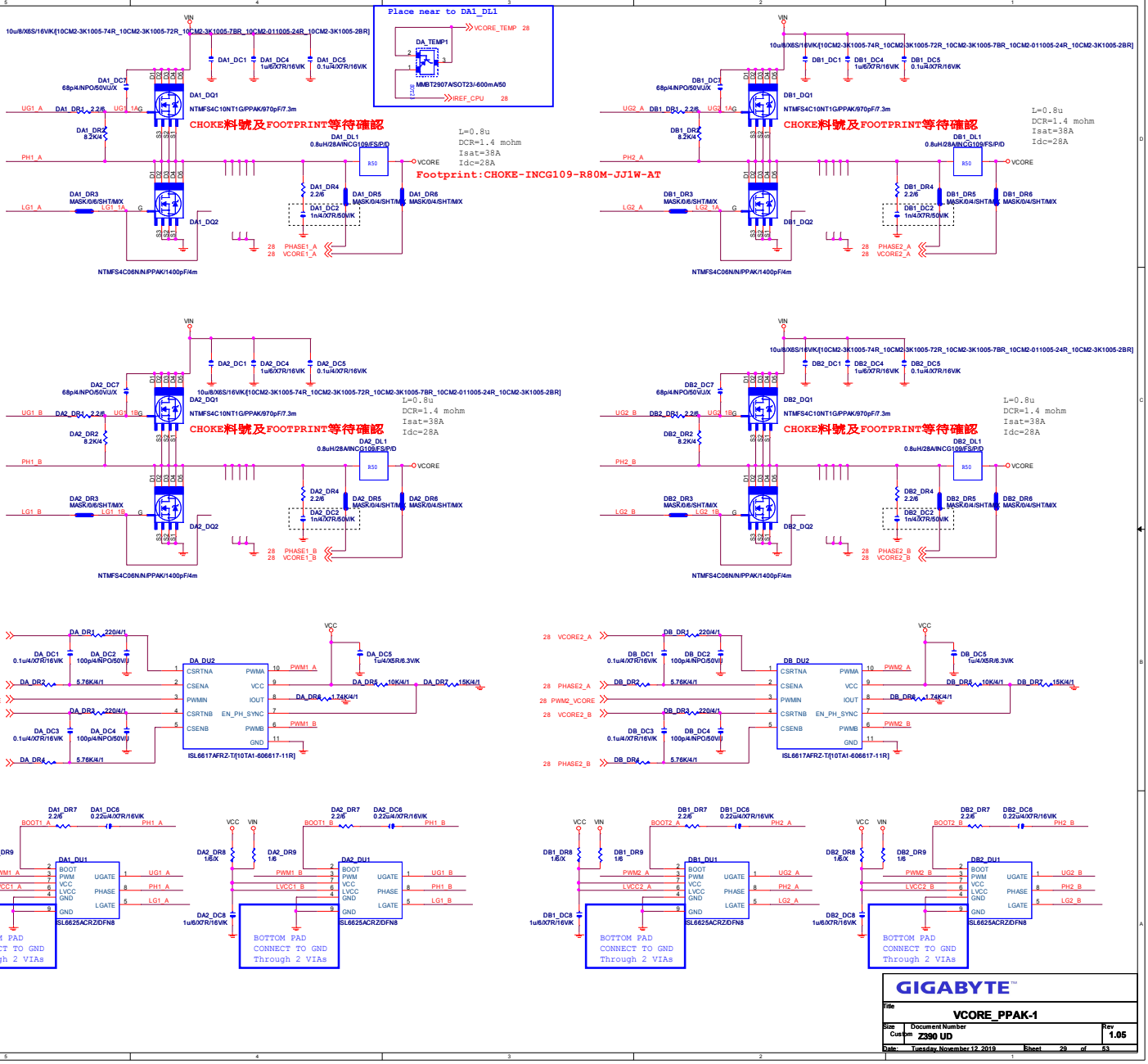
REV:0.13



GIGABYTE			
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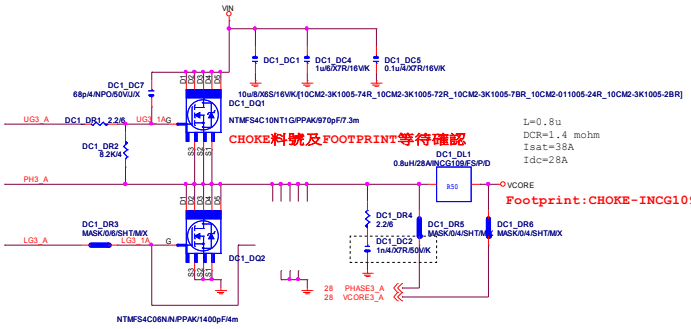
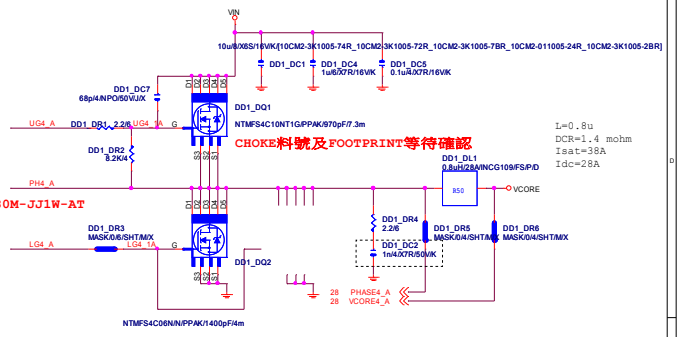
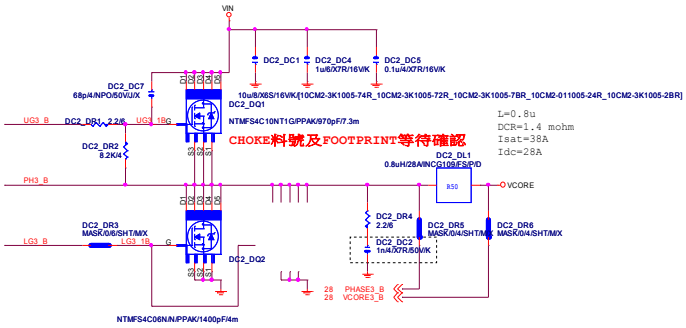
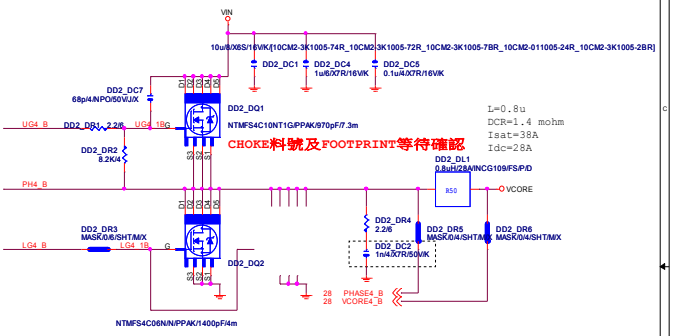
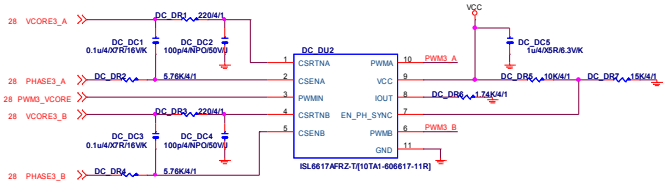
REV:0.13

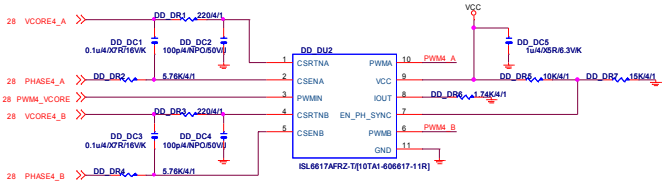


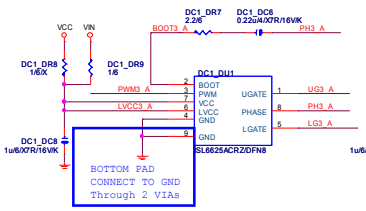


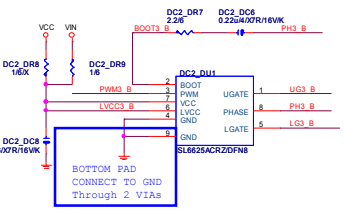


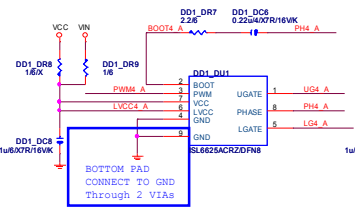


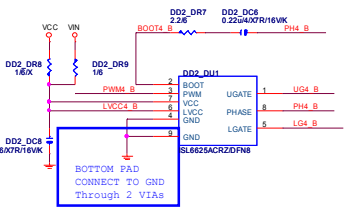












GIGABYTE™

Title	VCORE_PPAK-2	
Size: Custom	Document Number: Z390 UD	Rev: 1.05
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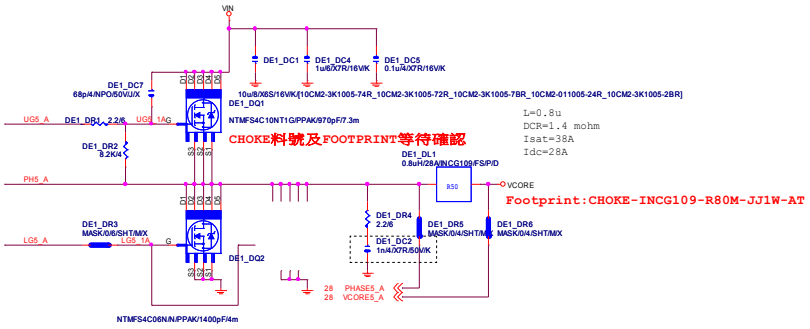
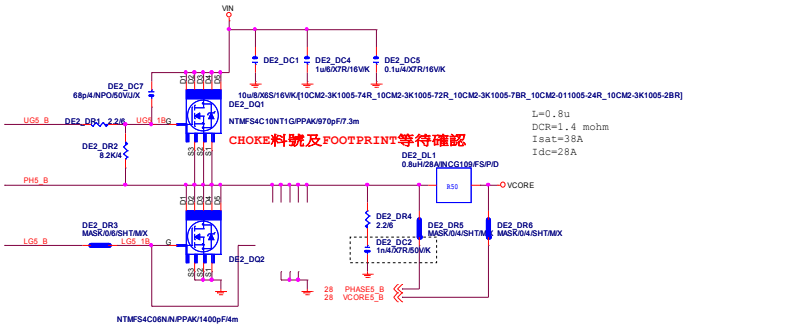
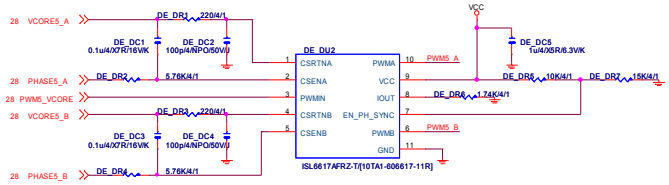
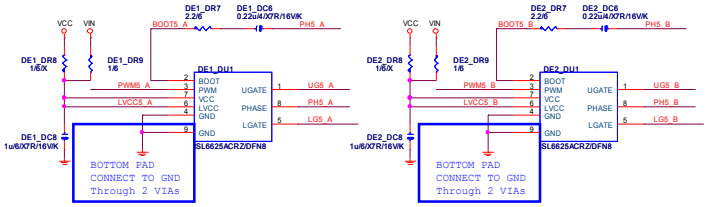
REV:0.13









GIGABYTE™

Title	VCORE_PPAK-3	
Size: Custom	Document Number: Z390 UD	Rev: 1.05
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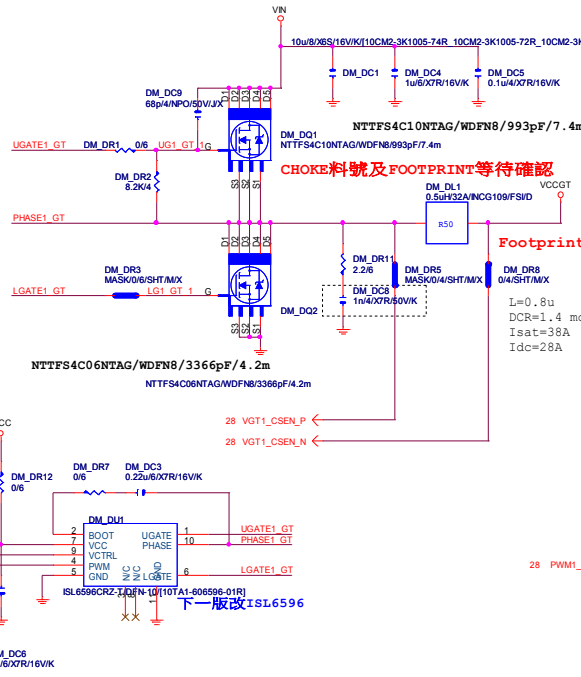
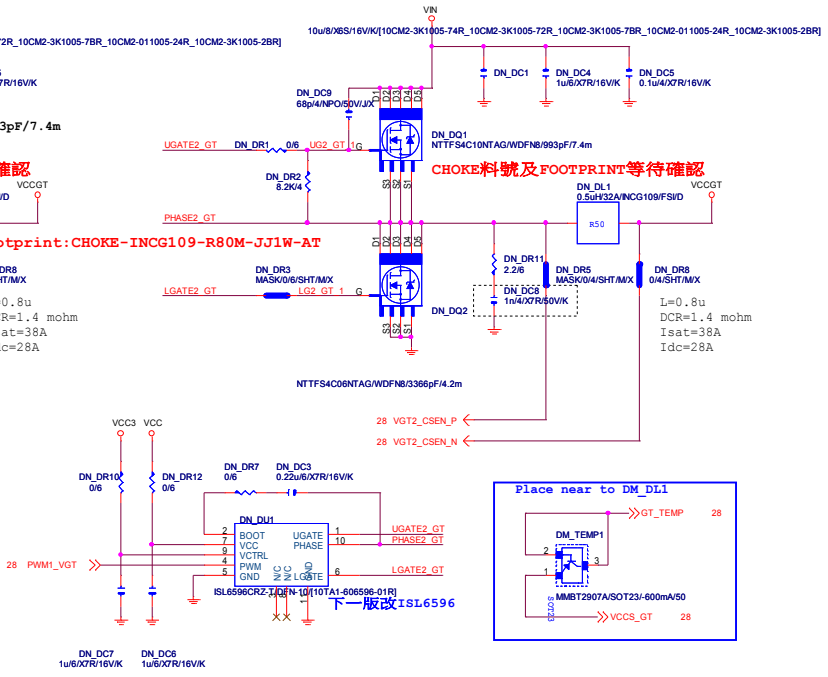
REV:0.13

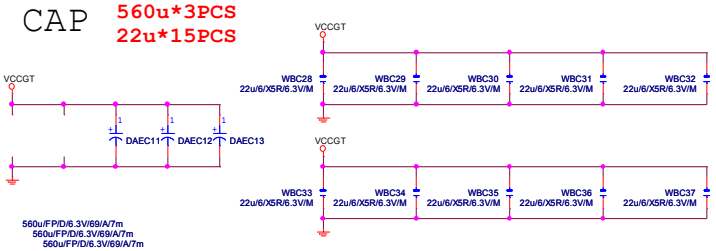
VCCGT

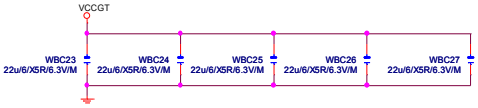




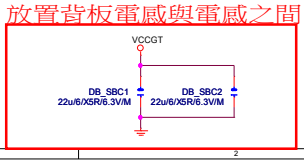
VCCGT CAP

560u*3PCS
22u*15PCS





放置背板電感與電感之間



Gigabyte Technology

Title: VCCGT_PPAK

Size: B | Document Number: Z390 UD | Rev: 1.05

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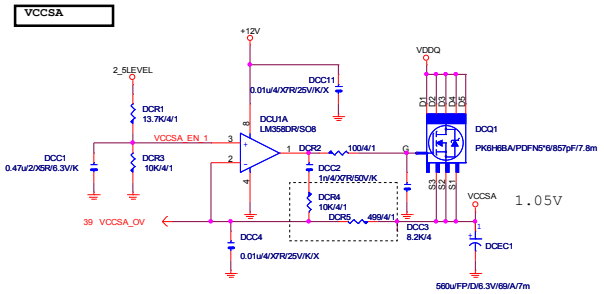
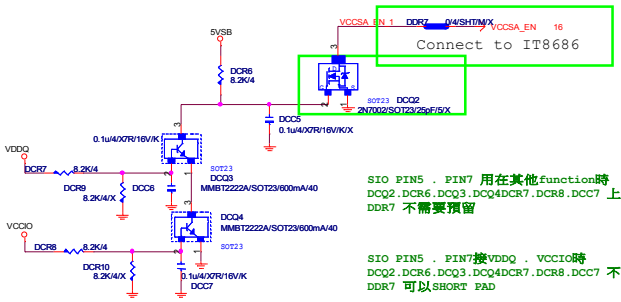
REV:0.13

VCCSA



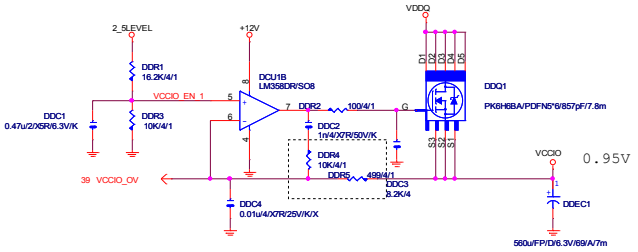
Connect to IT8793

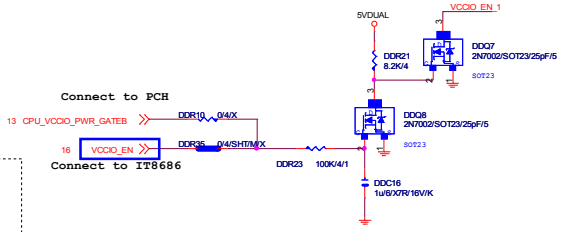


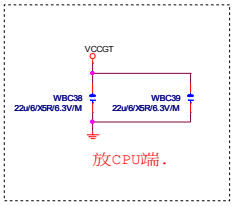
SIO PIN5 . PIN7 用在其他function時
DCQ2.DCR6.DCQ3.DCQ4DCR7.DCR8.DCC7 上件
DDR7 不需要預留

SIO PIN5 . PIN7接VDDQ . VCCIO時
DCQ2.DCR6.DCQ3.DCQ4DCR7.DCR8.DCC7 不上件
DDR7 可以SHORT PAD

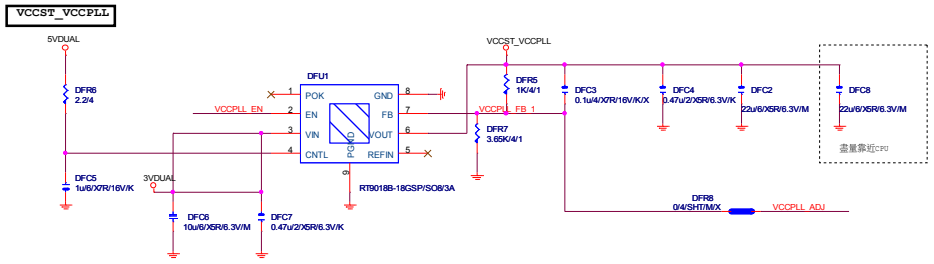
VCCIO

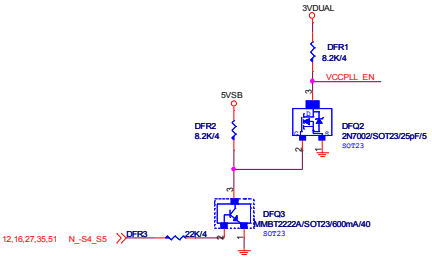




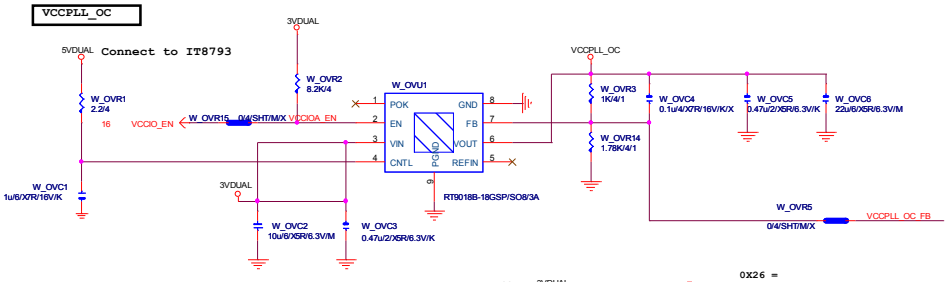


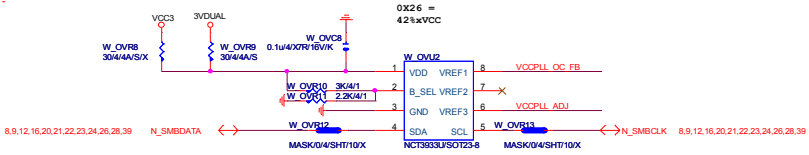
VCCST_VCCPLL





VCCPLL_OC





GIGABYTE™

Title	CPU POWER VCCSA_VCCIO_VCCPLL	
Size: Custom	Document Number: Z390 UD	Rev: 1.05
Date: Tuesday, November 12, 2019	Sheet 33 of 53	

REV:0.11

DDR4

Footprint:CHOKE1U-R50M-IF-AT

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

DDR VIN CAP
560u*2PCS

CHOKE與CAP料號可變

Footprint:CHOKE05U-40A-1R0-AT

SUPPORT DDR4

1.2V

25A MAX

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

OCP=40A

放靠近IC pin4

CLOSE TO DDR POWER PLANE

Remote sense請從最重的負載端點拉回

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

MOSFET請依MOSFET使用規則,自行選擇

PWR SEQ

For power sequence require

Connect to IT8793

Connect to IT8686

DDRVTT

NCT3103S/SOP8/2A

1.1A MAX

MAU1上NCT3103S時上件

DDR CAP 560u*4PCS 22u*2PCS

* 大電容 x4

指定footprint "EC6D8MM-RH-2"

DDRVTT CAP

* 大電容 x0

GIGABYTE

RT8120_DDR4 POWER

Size: Custom | Document Number: Z390 UD | Rev: 1.05

Date: Tuesday, November 12, 2019 | Sheet 34 of 53

REV:0.11

VPP_25V

SMD Molding(合金)
10LC4-15100B-01R CORE 1.0uH 15A
TAI-TECH SMD TMPA0603S-1R0MN-D
DCR=6.7m

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

CHOKE-合金

4. VPP_25V CHOKE footprint 改CHOKE6X6mm_SMD-1

CHOKE與CAP料號可變

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

DDR_VPP VIN CAP
560u*1PCS

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

SUPPORT DDR4 2.5V
25A MAX

OCP=30A

放靠近IC pin4

NTTFS4C06NTAG/WDFN8/3366pF/4.2m

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

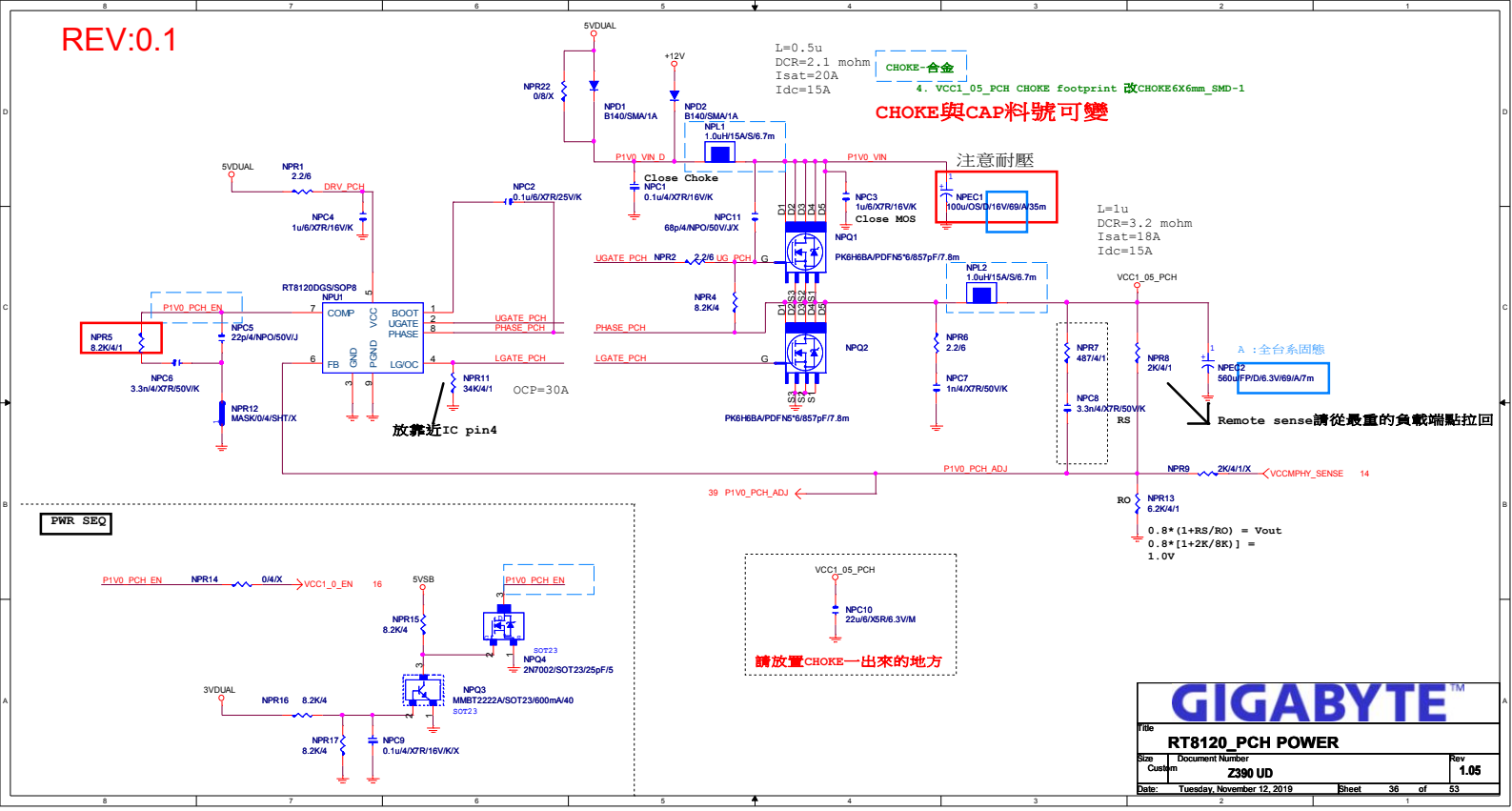
Connect to IT8686

VPP_25V CAP 560u*1PCS

* 大電容 x1

Title	RT8120_VPP25 POWER
Size / Document Number	Custom / Z390 UD
Rev	1.05
Date:	Tuesday, November 12, 2019
Sheet	35 of 53

REV:0.1



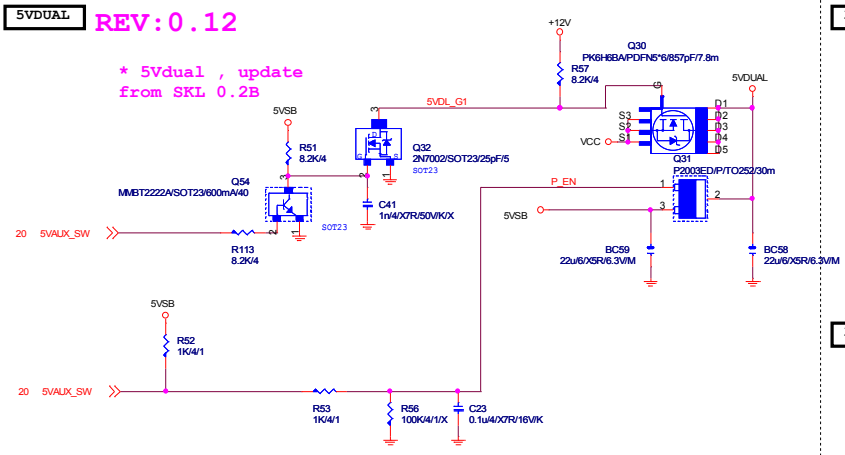
GIGABYTE™

Title	RT8120_PCH POWER	
Size: Custom	Document Number: Z390 UD	Rev: 1.05
Date: Tuesday, November 12, 2019	Sheet 36 of 53	

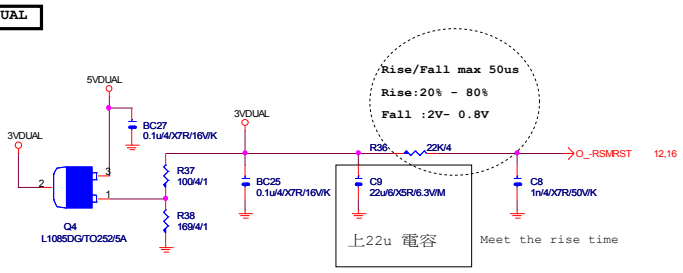
5VDUAL

REV:0.12

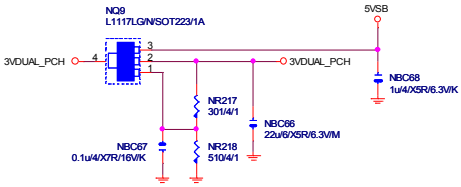
* 5Vdual , update from SKL 0.2B



3VDUAL



3VDUAL_PCH



O_-RSMRST （不上件）

Gigabyte Technology		
Title: DISCRETE POWER		
Size: Custom	Document Number: Z390 UD	Rev: 1.05
Date: Tuesday, November 12, 2019	Sheet 37 of 53	

ATXX24 POWER CONNECTOR

2x12(實心Pin)
FOOTPRINT:ATXPWR_24-SOLID

11NH4-020004-P1R/P2R 實心4P耐高溫+鍍錫料號
11NH4-020108-21R/22R 實心8P耐高溫+鍍錫料號
11NH4-020024-Z1R/Z2R 實心24P耐高溫+鍍錫料號

Patch some PSU no internal pull up resistor

R885 22K/4

BC37 0.1u/4/X7R/16V/K

* 刪除 -5V

BC39 1u/4/X5R/6.3V/K

BC36 0.1u/4/X7R/16V/K/X

APW/2*12/BK/P/4.2/VA/SN/OH/SQ

BC35 22u/6/X5R/6.3V/M

BC46 1u/4/X5R/6.3V/K

BC48 1u/4/X5R/6.3V/K

BC38 510/6/X

BC42 510/6/X

To prevent the 5VSB under loading when boot

BC43 1u/4/X5R/6.3V/K

BC44 0.1u/4/X7R/16V/K

BC45 0.1u/4/X7R/16V/K

BC41 0.1u/4/X7R/16V/K

2x2 (實心Pin)
FOOTPRINT:ATX_4-SOLID

APW/2*2/BK/OC/P/4.2/VA/SN/OH/S::ATX_12V_2X2

BC1118 0.1u/4/X7R/16V/K

AD1 AZ2225-01L/SOD323/X

BC9 4.7u/6/X5R/6.3V/K

ATXX4 POWER CONNECTOR

2x4 (實心Pin)
FOOTPRINT:ATXPW2X4-SOLID

APW/2*4/BK/OC/P/4.2/VA/SN/OH/S/PA9T::ATX_12V_2X4

BC7 0.1u/4/X7R/16V/K

螺絲孔

FOR AUDIO 切割

MH1 HOLE_3/X HOLE_4-RH-1
MH2 HOLE_3/X HOLE_4-RH-1
MH3 HOLE_3/X HOLE_4-RH-5MM-2
MH5 HOLE_3/X HOLE_4-RH-1
MH6 HOLE_3/X HOLE_4-RH-1
MH8 HOLE_3/X HOLE_4-RH-5MM-2
MH7 HOLE_3/X HOLE_4-RH-1

固定孔/光學點

K6 K3 K1
K5 K2 K4
K1_ICT/X
K1-ICT

To prevent the 5VSB under loading when boot

I1 I2 I3 I4 I5
4MMH/X
4MMH

+12V DUMMY LOAD

To fix 12V light load abnromal issue

RN2 RN3 RN4 RN5 RN6 RN10 RN11 RN12 RN13 RN14 RN15
2.7K/8P4R/4

Q9

R1 1K/4/1/X

Check R1 是否會漏電

R703 330/4

EMF30N12J/SOT23/627pF/30nF

DUMMY LOAD

5VSB VCC VCC3
RN7 RN8 RN9
1K/8P4R/6/X

-PROHOT

COUPON

BY LAYOUT位置

COUPON1 COUPON2
COUPON/X

Gigabyte Technology

Title: ATX POWER CONNECTOR

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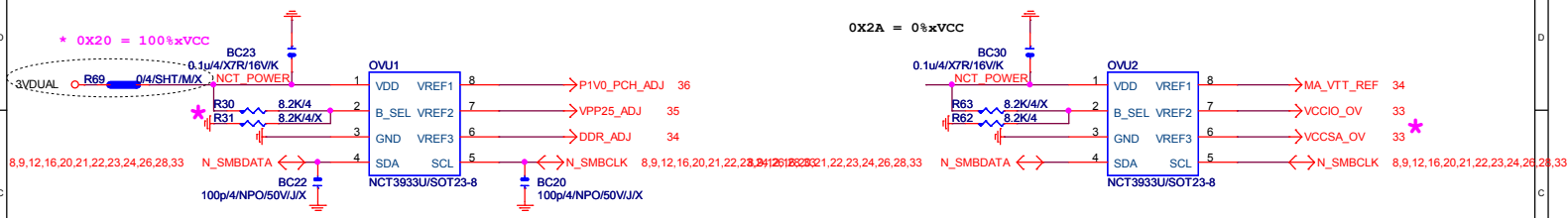
OVER VOLTAGE



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

Title: CPU CORE VR-2 NCT3933

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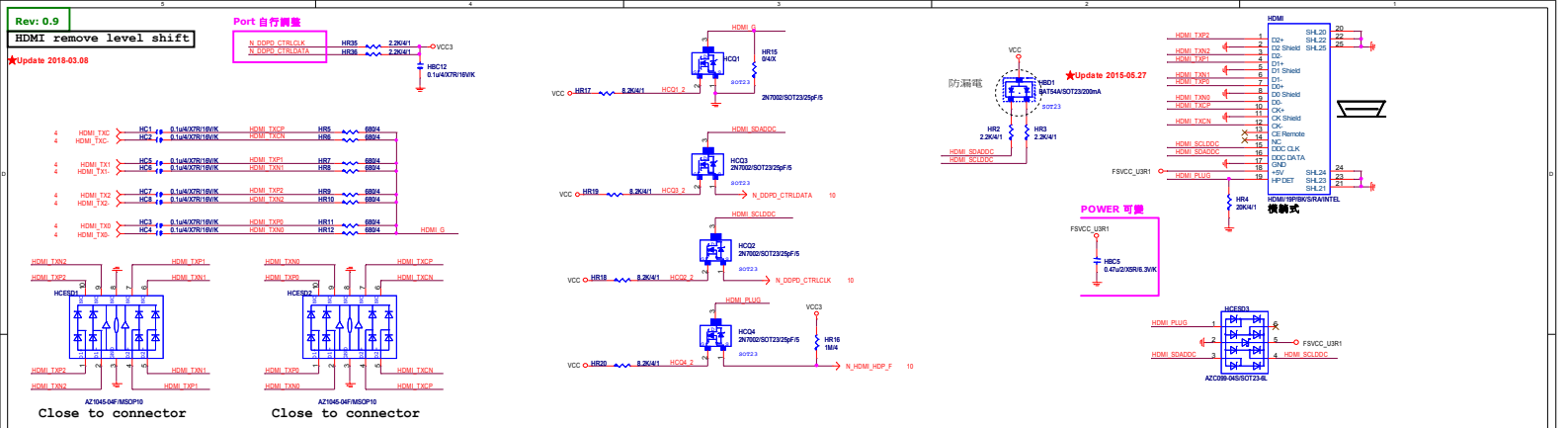

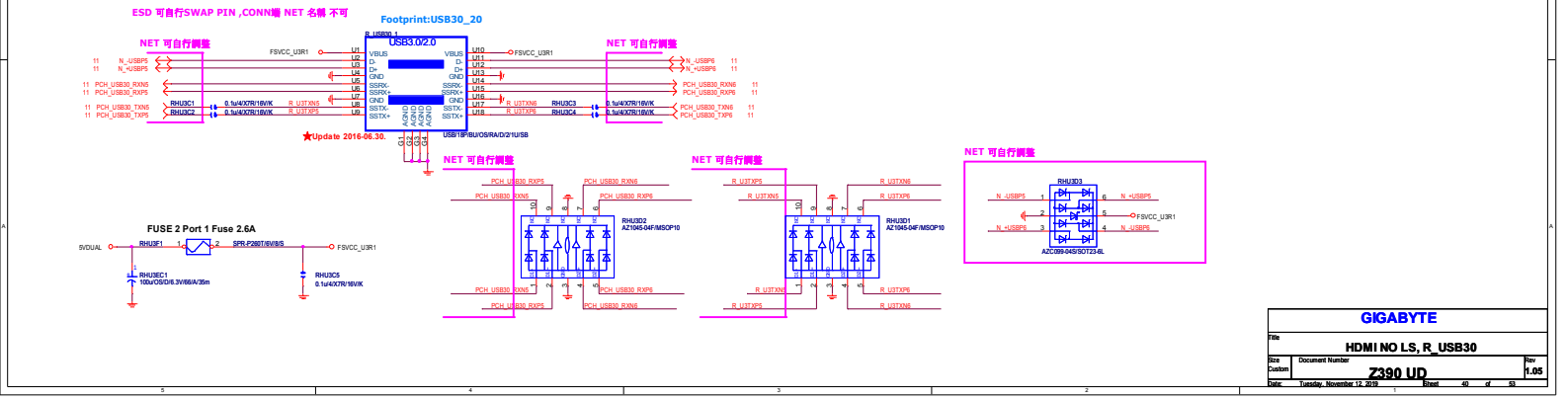

GIGABYTE	
Title	HDMI NO LS, R_USB30
Size: Custom	Document Number: Z390 UD
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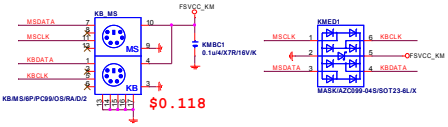
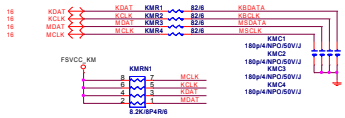
Date: Tuesday, November 12, 2019	Sheet 40 of 53

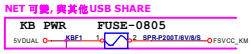
Rev: 0.8

KB/MS





NET 可變, 與其他USB SHARE

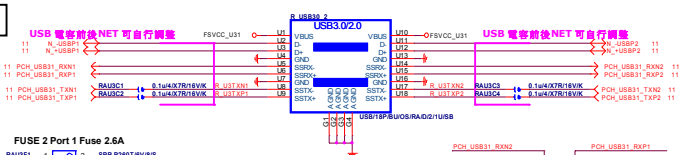


刪除RKMEC1

Rev: 0.8

R_USB30_1

USB 電容前後NET 可自行調整

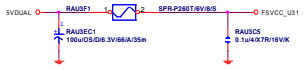


★Update 2015-03.05

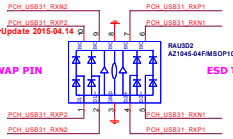
USB 電容前後NET 可自行調整

★Update 2015-03.05

FUSE 2 Port 1 Fuse 2.6A

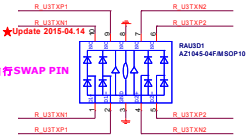


ESD 可自行SWAP PIN



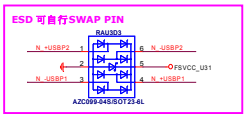
★Update 2015-04.14

ESD 可自行SWAP PIN

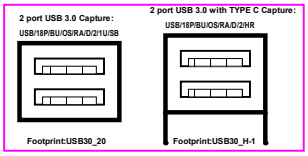


★Update 2015-04.14

ESD 可自行SWAP PIN



CONNECTOR 自行調整



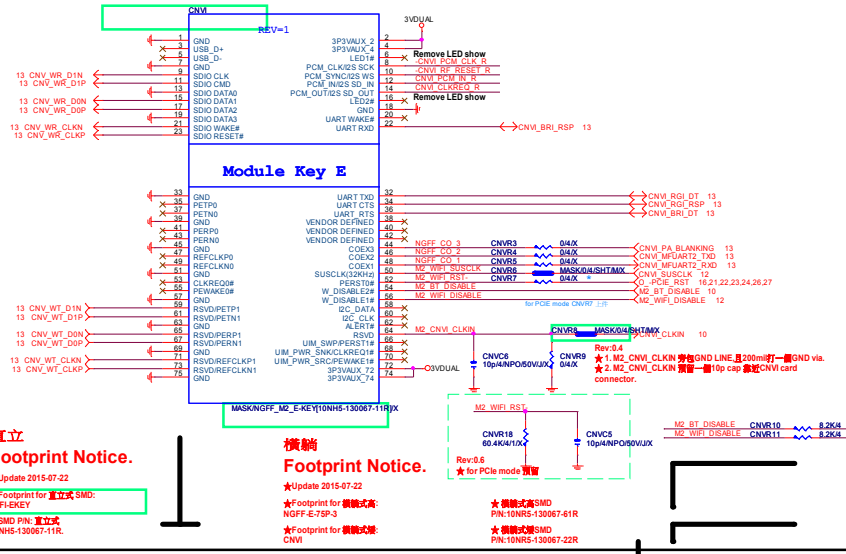
Gigabyte Technology

Title	R_USB30, KB_MS	
Size: C	Document Number: Z390 UD	Rev: 1.05
Date: Tuesday, November 12, 2019	Sheet 41 of 53	

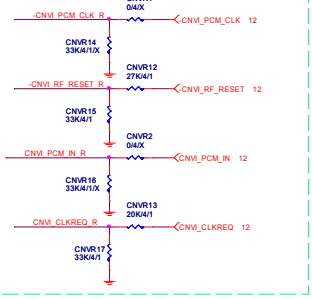
Rev: 0.91

不支援PCIE介面WIFI及USB介面BT

CNVi_M2_WIFI



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



直立

Footprint Notice.

★Update 2015-07-22

★Footprint for 直立式 SMD: WIFI-EKEY

★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-7SP-3

★Footprint for 橫躺式矮: CNVI

★ 橫躺式高SMD P/N:10NR5-130067-61R

★ 橫躺式矮SMD P/N:10NR5-130067-22R

先貼B360N WIFI ~CHECK 模組

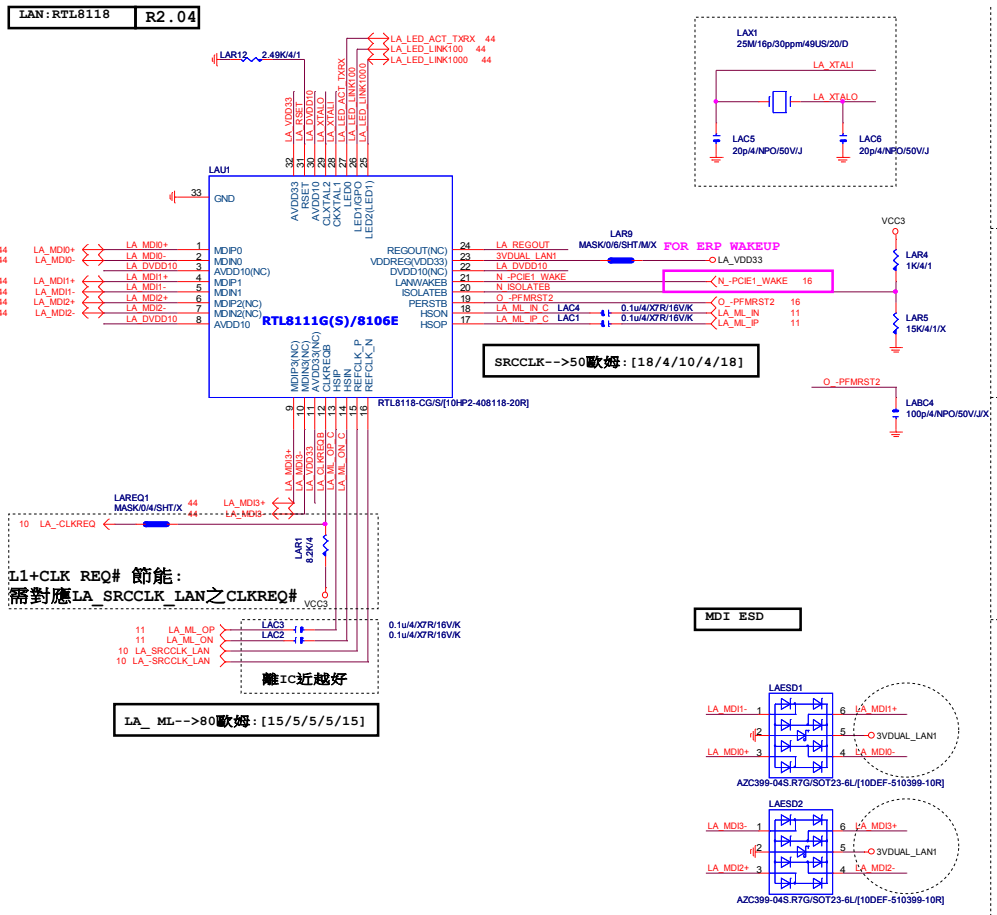
一套WIFI MODULE包含外框+WIFI CARD+天線

Footprint WIFI-EKEY+ WIFI-EKEY-MODULE-1 should be a package.

GIGABYTE

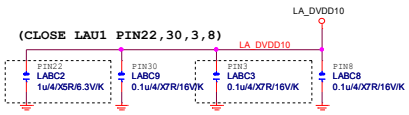
Title	CNVi_M2_WIFI	
Size: Custom	Document Number: Z390 UD	Rev: 1.05
Date: Tuesday, November 12, 2019	Sheet 42 of 53	

LAN:RTL8118 R2.04



MDI ESD

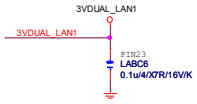
LAN POWER



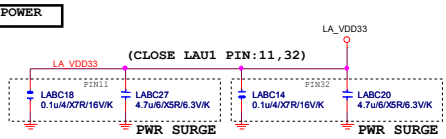
LABC2:1U CLOSE PIN22[REALTEK REQ]

LAN POWER

note: lan power連接及電流

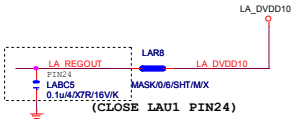


LAN POWER



LABC18,27:CLOSE PIN11[REALTEK SURGE]
LABC14,20:CLOSE PIN32[REALTEK SURGE]

LAN POWER



Gigabyte Technology			
Title: Realtek RTL8118			
Size: Custom	Document Number: Z390 UD		Rev: 1.05
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USB30_LAN CONNECTOR R2.04

RMA ESD PROTECT

note:可變更USB NAME

可變

N_+USBP4 1 6 N_-USBP4

2 5 FSVCC_U3R2

N_+USBP3 3 4 N_-USBP3

LAUESD1

AZC099-04S/SOT23-6L

USB_LAN CONNECTOR

note:可變更USB NAME

[RTL8118]

3VDUAL_LAN1

LABC22 0.01u/4/X7R/25V/K/X

LA_CN_L1

LA_MDI0+ 43

LA_MDI0- 43

LA_MDI1+ 43

LA_MDI1- 43

LA_MDI2+ 43

LA_MDI2- 43

LA_MDI3+ 43

LA_MDI3- 43

LABC25 MASK/0/4/SHT/M/X

LA_CN_L10

USB30_LAN

USB3.0

D1 LA_LED_ACT_TXRX LA_LED_ACT_TXRX 43

D2 LA_LED_D2 LAR13 330/4 LAN_3VDUAL_LED

D3 LA_LED_D3 LAR14 330/4 LA_LED_LINK100 43

D4 LA_LED_LINK1000 LA_LED_LINK1000 43

LAFB2 MASK/0/4/SHT/M/X

LABC24 0.1u/4/X7R/16V/K/X

LAUBC7 0.1u/4/X7R/16V/K

FSVCC_U3R2

N_-USBP3 11

N_+USBP3 11

PCH_USB30_RXN3 11

PCH_USB30_RXP3 11

PCH_USB30_TXN3 11

PCH_USB30_TXP3 11

LAUC1 LAUC2

PCH_USB30_TXN3C PCH_USB30_TXP3C

0.1u/4/X7R/16V/K

0.1u/4/X7R/16V/K

可變 可變 可變 可變 可變

N_-USBP4 11

N_+USBP4 11

PCH_USB30_RXN4 11

PCH_USB30_RXP4 11

PCH_USB30_TXN4 11

PCH_USB30_TXP4 11

LAUC3 LAUC4

PCH_USB30_TXN4C PCH_USB30_TXP4C

0.1u/4/X7R/16V/K

0.1u/4/X7R/16V/K

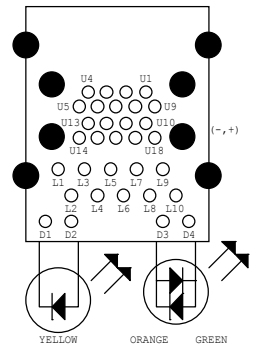
R2.0

LA_MDI-->100歐姆:[20/4/8/4/20]

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

USB3+LAN/1G/GO,Y/OS/RA/D/G30

USB30_LAN LAYOUT示意圖



Dual Color LED

D4 D3 Green

D4 D3 Orange

Single Color LED

D2 D1 Yellow

RMA ESD PROTECT

note:可變更USB NAME

PCH_USB30_TXP4C

PCH_USB30_TXN4C

PCH_USB30_TXN3C

PCH_USB30_TXP3C

PCH_USB30_RXP3

PCH_USB30_RXN3

PCH_USB30_RXN4

PCH_USB30_RXP4

NC NC GND NC NC

D1+ D1- GND D2- D2+

LAU3ESD1

AZ1045-04F/MSOP10

可變

LAU3ESD2

AZ1045-04F/MSOP10

USB POWER

note:可變更FUSE

可變

LAU3F1

5VDUAL

FSVCC_U3R2

SPR-P260T/6V/8/S

REC2

100u/OS/D/6.3V/66/A/35m

FUSE-0805

Close to connector

LAN POWER

note: lan power連接及電流

LAPW1 MASK/0/4/SHT/20/X

可變

3VDUAL_LAN1

3VDUAL_PCH

*ERP WOL

Gigabyte Technology

Title: LAN CONNECTOR-RTL8118

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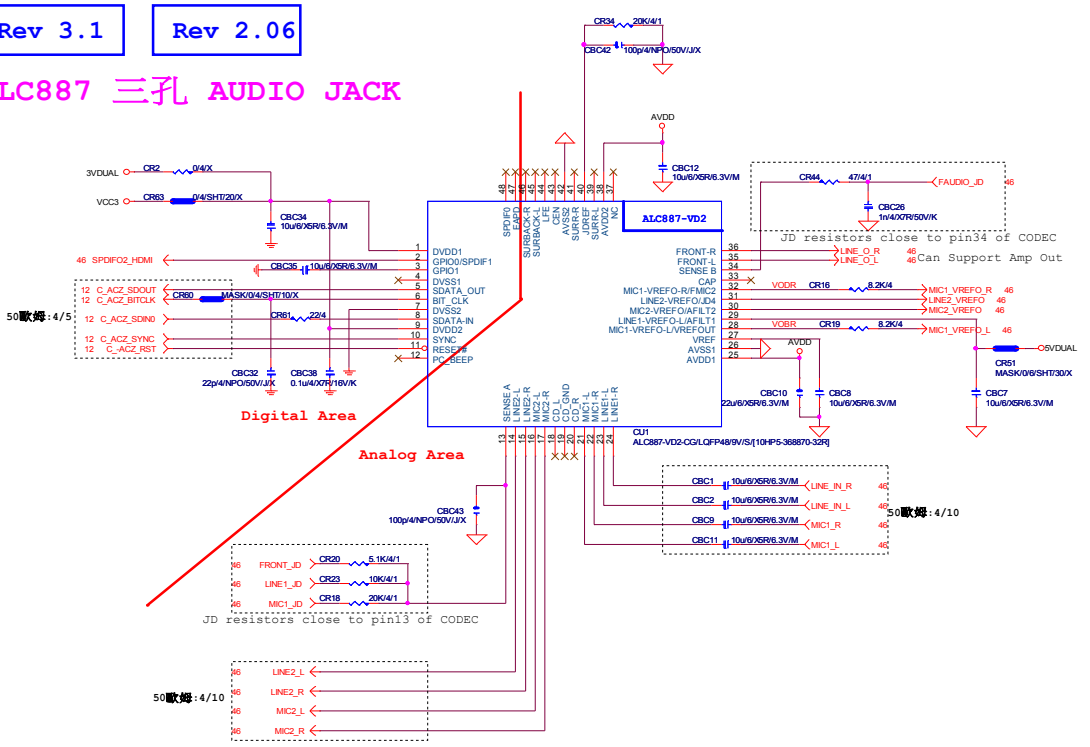
Rev 3.1

Rev 2.06

ALC887 三孔 AUDIO JACK



LAYOUT注意:螺絲孔下GND方式

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

MH1	MH2
DGND	Isolate

LAYOUT注意:要加

GND切割線

音效區域印刷

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

Gigabyte Technology

Title: HD AUDIO ALC887

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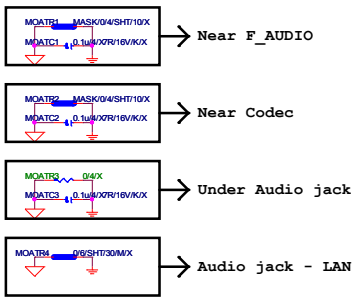
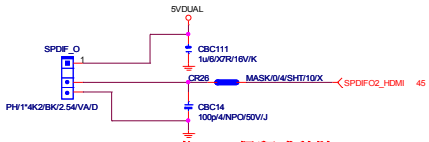
Rev 3.1

Rev 2.06

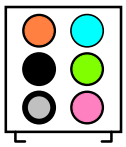


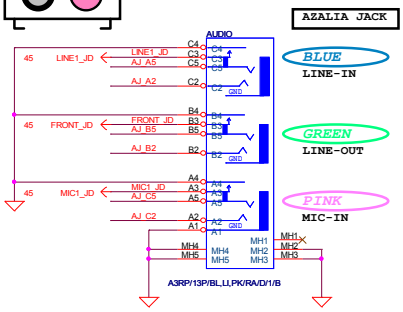
*量產前,0ohm改short pad



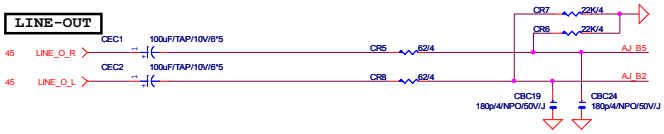
For HDMI SPDIF（依SPEC保留或移除）

AZALIA JACK

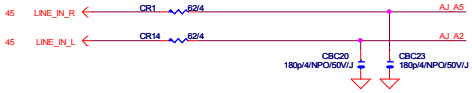




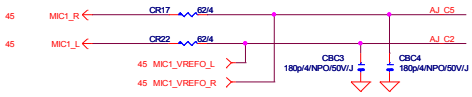
LINE-OUT



LINE-IN



MIC-IN

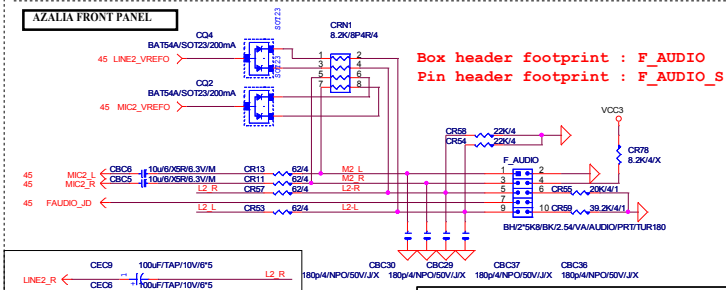


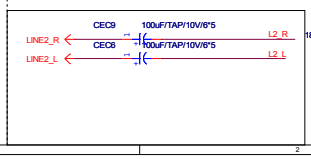
SURROUND

CEN/LFE

SURR BACK

AZALIA FRONT PANEL





Gigabyte Technology

Title: AUDIO JACK

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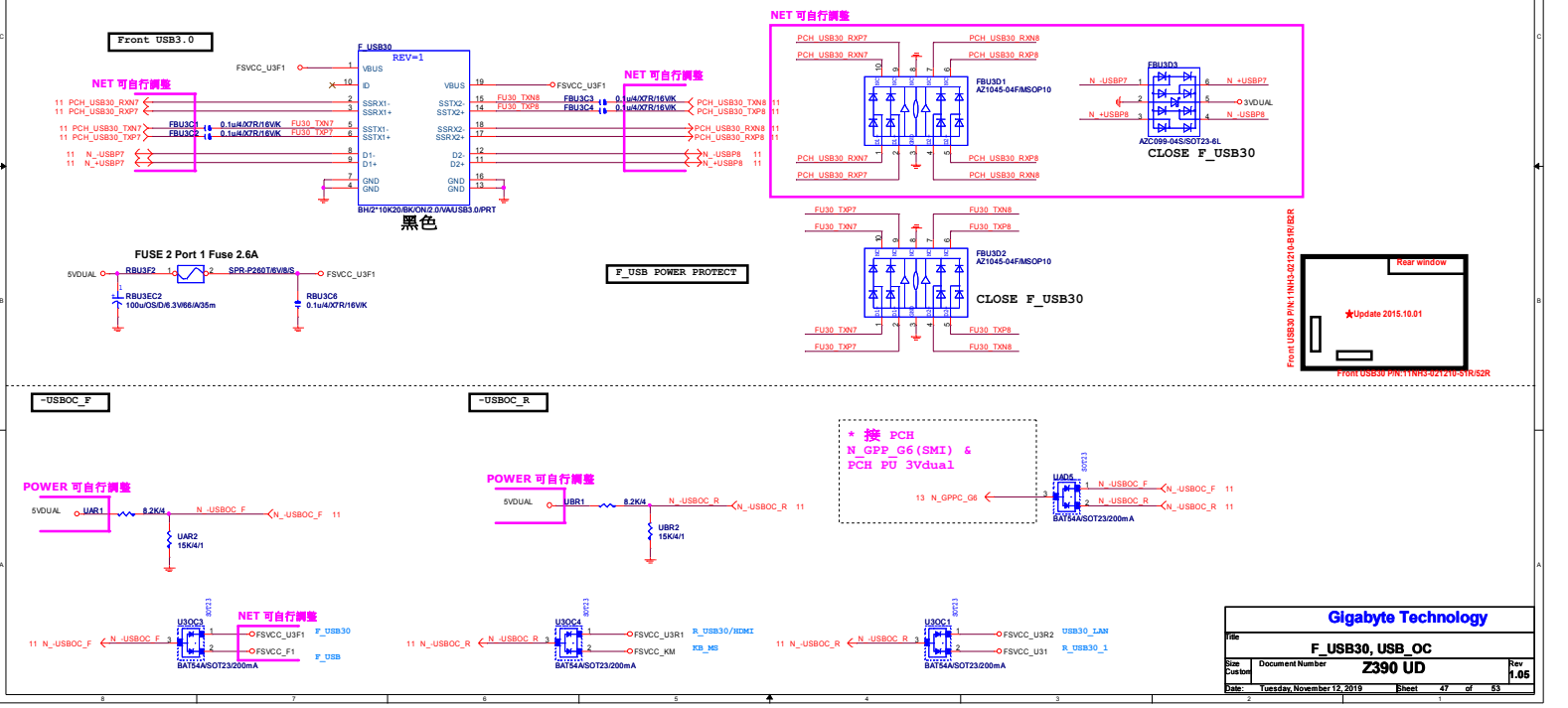
Rev: 0.8



Gigabyte Technology			
Title: F_USB30, USB_OC			
Size: Custom	Document Number: Z390 UD		Rev: 1.05
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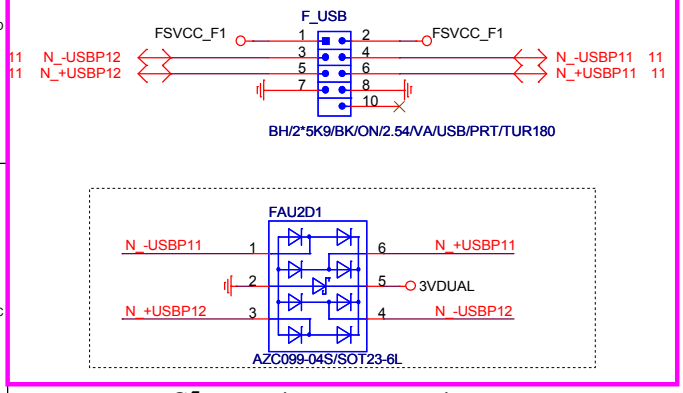
Rev: 0.8

FRONT USB1

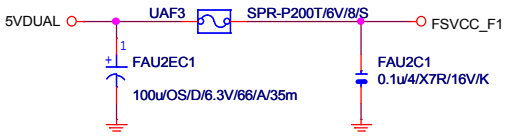
NET 可變

FUSB2X5-HS



Close to connector

FUSE 2 Port 1 Fuse 2A



FRONT USB2

刪除 FRONT USB2

F_USB 2.0 OC SIGNAL

刪除U2OC1 ,移至與U3OC3接

刪除U2OC1 , FRONT USB2

Gigabyte Technology

Title: USB2.0

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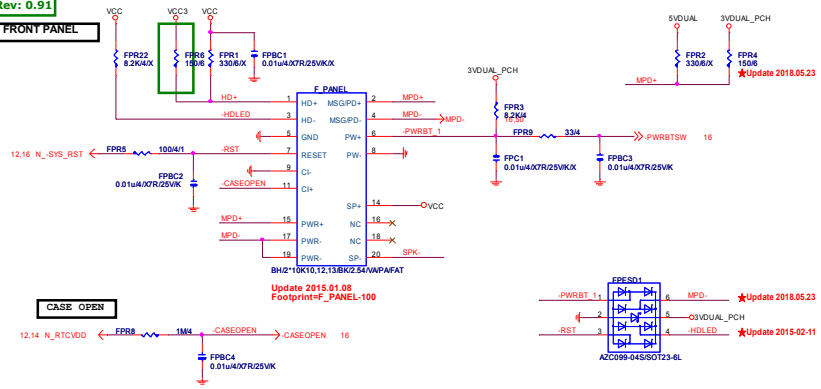
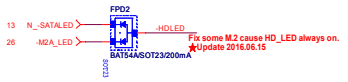
Rev: 0.91

FRONT PANEL

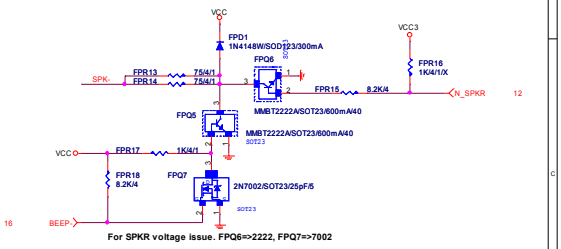


CASE OPEN

SATA/M.2 LED



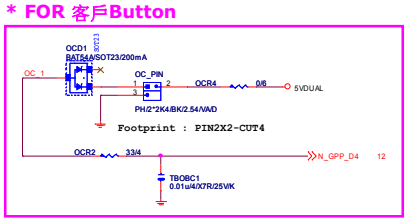
SPKR



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

FRONT PANEL SHORT

*** FOR 客戶Button**



Gigabyte Technology		
Title: FRONT PANEL		
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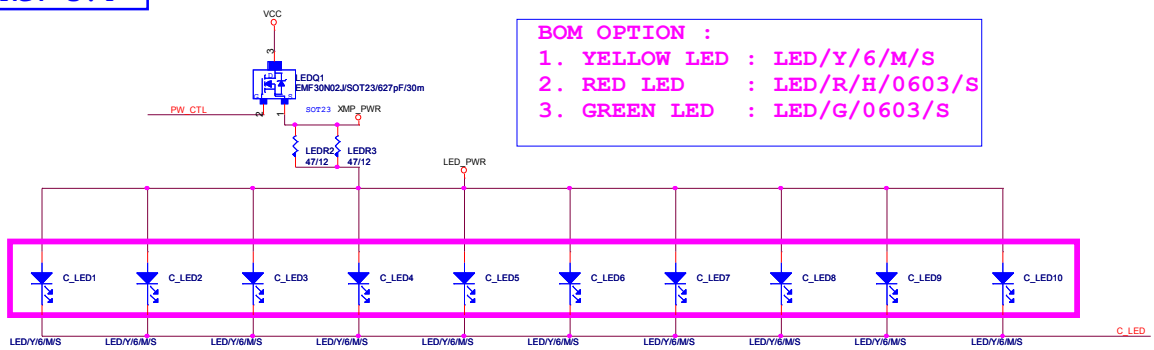
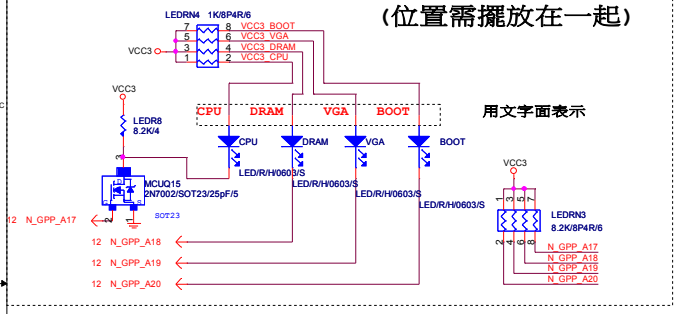
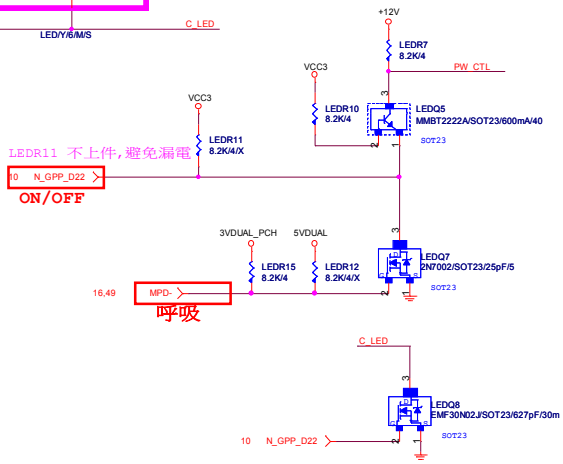
Rev 3.4

BOM OPTION :
1. YELLOW LED : LED/Y/6/M/S
2. RED LED : LED/R/H/0603/S
3. GREEN LED : LED/G/0603/S



DEBUG PORT LED *4
(位置需擺放在一起)





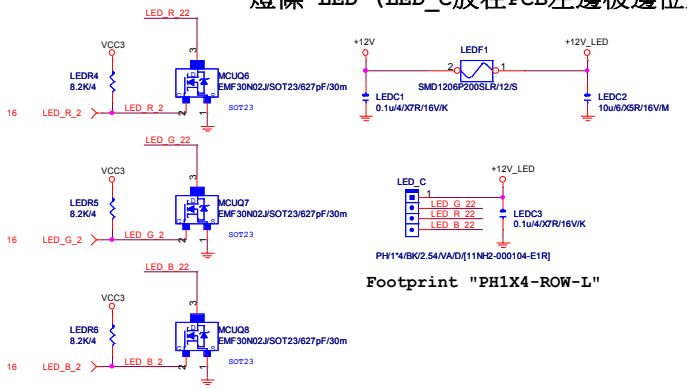
Ambient LED Control

	N_GPP_D22	IO_GP91
Still Mode	H	L
OFF Mode	L	L
Pluse Mode	H	BREATH

RGB LED CONTROL

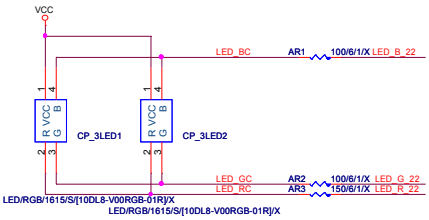
第二區 LED CONTROL

燈條 LED (LED_C放在PCB左邊板邊位置)



Footprint "PH1X4-ROW-L"

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

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Title	Amient Single LED	
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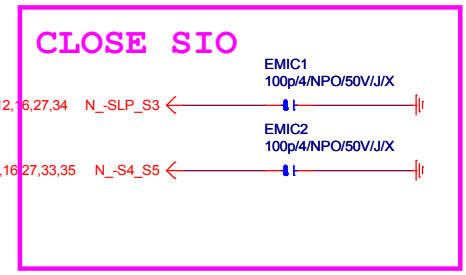
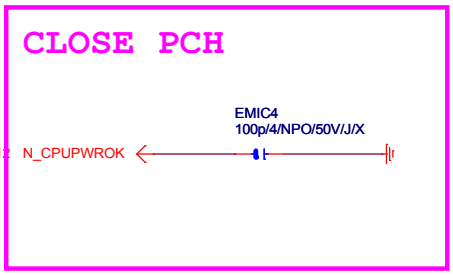
EMI/ESD R0.1





GIGABYTE™

Title	EMI/ESD		
Size A	Document Number Z390 UD		Rev 1.05
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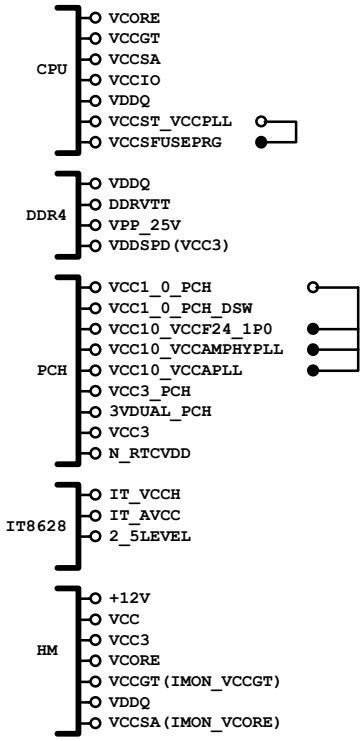
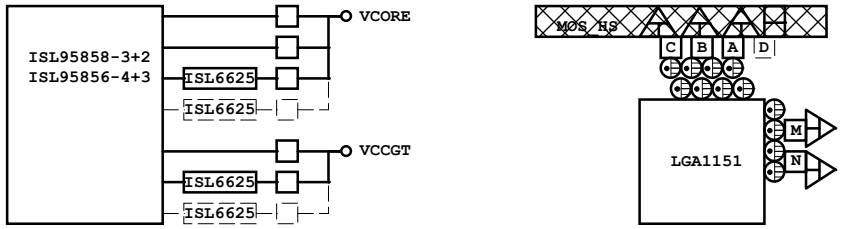
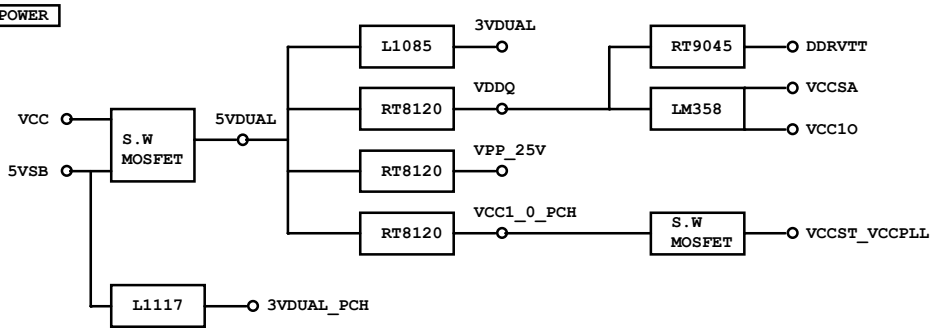
POWER BLOCK MAP



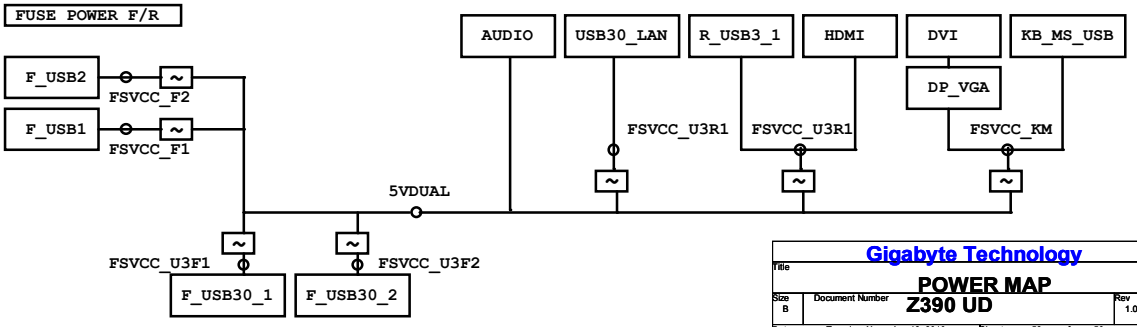
VCORE/VCCGT



POWER



FUSE POWER F/R



Gigabyte Technology

Title: POWER MAP

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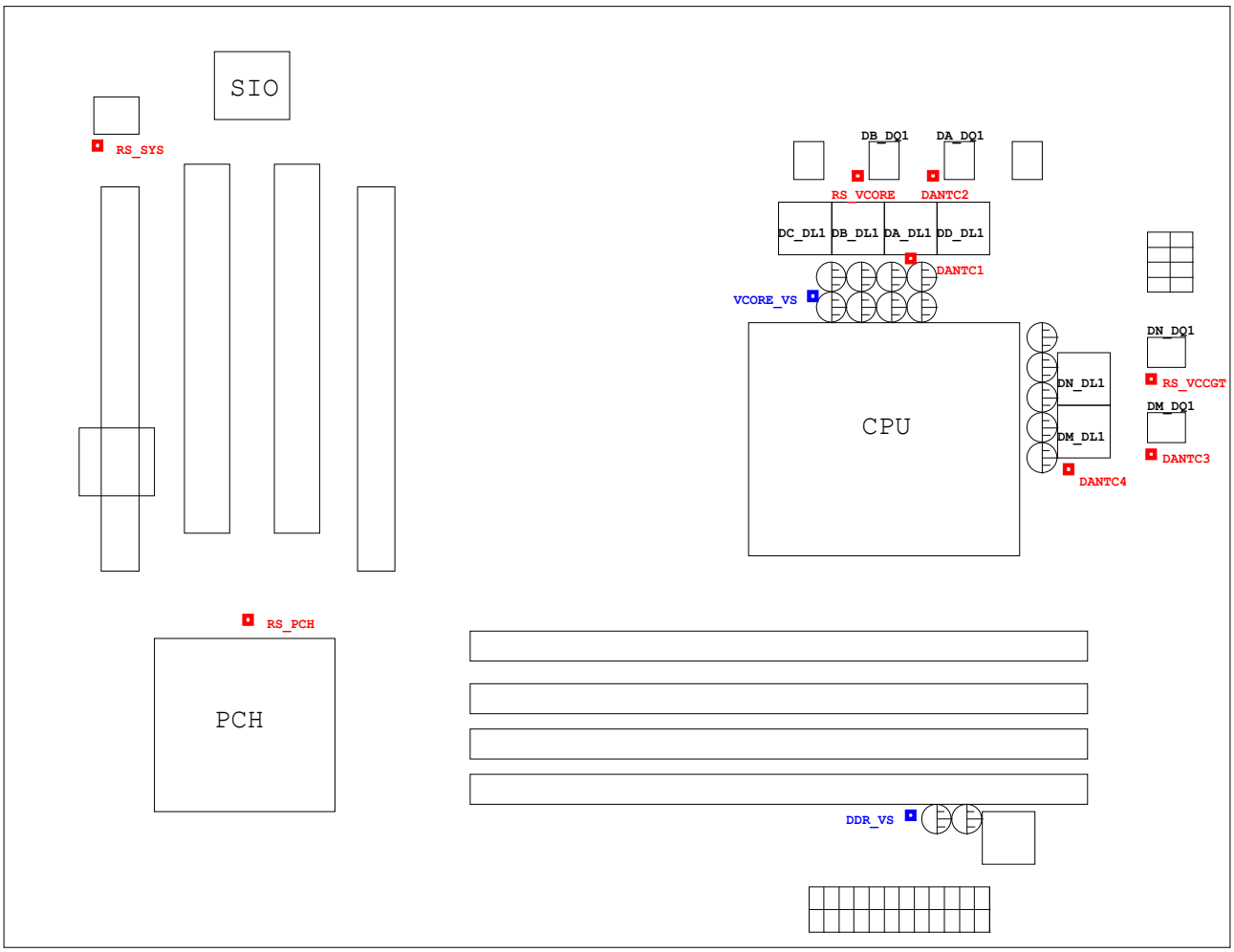

熱敏電阻	擺放靠近位置	走線方式
DANTC1	DA_DL1	N/A
DANTC2	DA_DQ1	Differential
DANTC3	DM_DQ1	N/A
DANTC4	DM_DL1	Differential
RS_VCORE	DB_DQ1	N/A
RS_VCCGT	DN_DQ1	N/A
RS_PCH	PCH	N/A
RS_SYS	CU1	N/A

Gigabyte Technology

Title: NTC MAP

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