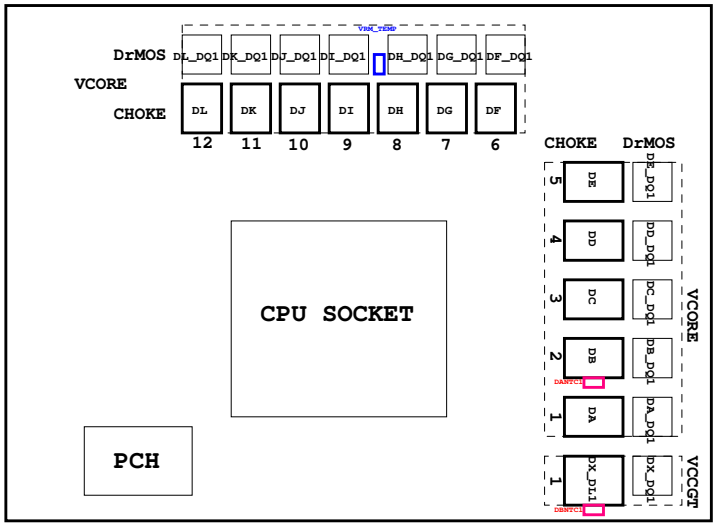
Model Name: Z590 UD AC

rev 1.01

SHEET	TITLE	
01	COVER SHEET	
02	BOM & PCB MODIFY HISTORY	
03	BLOCK DIAGRAM	
04	CPU_LGA1200-A	(RKL_R0.12)
05	CPU_LGA1200-B-DDR4	(RKL_R0.12)
06	CPU_LGA1200-C	(RKL_R0.12)
07	CPU_LGA1200-D	(RKL_R0.12)
08	DDR 4 CHANNEL A	(CML_R0.1)
09	DDR 4 CHANNEL B	(CML_R0.1)
10	PCH CLK,DMI,CNVI	(RKL_R0.15)
11	PCH SPI,USB	(RKL_R0.15)
12	PCH PCIE,SATA	(RKL_R0.15)
13	PCH ESPI,MISC	(RKL_R0.15)
14	PCH GPP,HDA	(RKL_R0.15)
15	PCH PWR, GND	(RKL_R0.15)
16	Heatsink	
17	ITE ITE8689	(RKL_R0.1)
18	HWM	(RKL_R0.1)
19	FAN CTRL-CFL-SIO_5 FAN	(RKL_R0.1)
20	Single BIOS for CS mode	(RKL_R0.1)
21	PCI EXPRESS X16 SLOT	(REV0.3)
22	PCI EXPRESS X4 SLOT(PCH)	(REV0.51)
23	PCI EXPRESS X1 *3	(REV0.51)
24	SATA	
25	M.2 x4 (A)	(RKL_R0.1)
26	M.2 x2 (M)	(RKL_R0.1)
27	M.2 x4 (P)	(RKL_R0.1)
28	COM,LPT,TPM, THB	(CML_R0.94)
29	ISL69269_L=0.15u	(RKL_R0.1)
30	RAA229001_L=0.15u	(RKL_R0.1)
31	VCORE_PSTAGE-1_L=0.15u	(RKL_R0.1)
32	VCORE_PSTAGE-2_L=0.15u	(RKL_R0.1)
33	VCORE_PSTAGE-3_L=0.15u	(RKL_R0.1)
34	VCCGT_PSTAGE_L=0.15u	(RKL_R0.1)
35	VCCSA_MOS	(RKL_R0.1)
36	VCCIO-Ferrite-Z系列	(RKL_R0.2)
37	VCCIO2-Ferrite-Z系列	(RKL_R0.2)
38	RT8120_DDR_CHOKE-Ferrite-2L	(RKL_R0.1)
39	RT8120_VPP_CHOKE-合金	
40	NCP81269_VCC18_PCH	
41	RT8068_VCC1V8_PRIM	
42	DISCRETE POWER	(REV0.1)
43	ATX POWER , A_-PROCHOT	
44	DP PORT	(RKL_R0.96)
45	CNVi_M2_WIFI	(CML_R0.94)
46	Redriver_A_Type-A	(RKL_R0.1)
47	R_USB30	(CML_R0.94)
48	GENESYS GL850S_1	(RKL_R0.1)
49	GENESYS GL850S_2	(RKL_R0.1)

SHEET	TITLE	
50	F_USB20	(CML_R0.94)
51	F_U32	(CML_R0.94)
52	KB_MS_USB	(CML_R0.94)
53	FRONT Type-C USB3.1 GEN2	
54	REALTEK RTL8125BS	(CML_R0.3)
55	U32_LAN CONNECTOR-8125	(CML_R0.3)
56	Realtek ALC897	(RKL_R6.0)
57	REAR AUDIO JACK	(RKL_R6.0)
58	CPU POWER-1	(RKL_R0.11)
59	CPU POWER-1	(RKL_R0.11)
60	NCT3933	(RKL_R0.11)
61	F_PANEL	
62	IT5702	(RKL_R1.0)
63	PCH/AUDIO/DEBUG/C_LED1/2	(RKL_R1.0)
64	D_LED1/D_LED2	(RKL_R1.0)
65	SMBUS SWITCH	(RKL_R0.1)
66	CKG	(RKL_R0.1)
67	EMI-ESD	
68	POWER MAP	
69	NTC MAP	



Gigabyte Technology

Title: Cover Sheet

Size: Custom | Document Number: Z590 UD AC | Rev: 1.01

Date: Wednesday, December 30, 2020 | Sheet 1 of 69

Model Name: Z590 UD AC

rev1.01

Component value change history

2017/07/19

Data	Change Item	Reason
2020/07/27	Modify from Z590 GAMINGX Rev0.1	
2020/08/28	Z590 UD AC Rev0.1 First release	
	9MZ59UDAC-00-01 BOM	
	9MZ59UDAC-00-02	
2020/11/02	1.修改M.2螺絲料號 3. SIO->IT8689E/AX/S 4.DDR 0.47uF->1uF	
	5.HUAX1,HUBX1->10XT5-812000-40R/10XT5-V12000-00R	
	6.NX1->10XT5-824000-30R/10XT5-V24000-00R 7.ANTENNA,ANTENNA1	
	->11NH6-010001-D1R/D2R/F1R/F2R 8.WIFI_FRAME->12AC2-000004-31R/41R	
	9.NR157,NR158,NR159,NR160->X 10.SMBUS SW不上件 11.DAJP1->X 12.DFR35->X,DFQ5	
	,DFQ6,DGQ5,DGQ6->NTTFS4C10NTAG 13.IO_SH->11AIO-010061-02R	
	14.SIO->10HP2-118689-20R 15.WBC97->10CL3-S63300-01R/11R	
	16.CNVI-CAP->11KWP-000001-31R,WIFI_FRAME刪除12AC2-000004-31R	
	9MZ59UDAC-00-02A	
2020/11/25	1.BOM改上RTL8125 ,U32_LAN->USB3+LAN/2.5G/BU/GO,Y/OS/RA/D/1/15KV	
	2.OD2,OR98->X, OD1,OR96上件 3.CKG全部不上件走internal	
	4.80A,80M,80P->CR/[12KS2-110202-31R]/X	
	9MZ59UDAC-00-10A	
2020/12/09	1.ECD_U1->10HP2-NW5702-20R/A1R 2.80A,80M,80P->12KS2-110202-31R/X	
	3.NR110->X 4.U4,WR107,WR106->X 5.PCH->10HB1-03Z590-20R	
	6.LGA1200->12KRC-SF0001-83R 7.DFQ2,DFQ3上件 8.DFR43->42.2K/4/1	
	,DFR44->21K/4/1 9.DAU1->10TA1-669269-14R 10.DBU1->10TA1-622901-06R	
	11.LKL2->10LC3-04100B-01R/10LC4-05100B-61R 12.M_BIOS->10SL2-000008-71R/X	
	9MZ59UDAC-00-10E	
2021/02/05	1.WIFI_MODULE->20CB1-029462-00R 2.WR3->3.16K/4/1,OR27->X	

Circuit or PCB layout change

DATE	Change Item	Reason
2020/07/27	Modify from Z590 GAMINGX Rev0.1	
PCB:0.1	1.Z590 UD AC Rev0.1 PCB first release	
2020/08/24	2.Layout由XZ590 GAMINGX Rev0.1修改	
PCB:0.2		
2020/10/29	1.統一Flex IO,M.2 GPIO 2.PEGX4_RXP0, PEGX4_RXN0 SWAP	
	3.Del NTP123,NTP124 ,N_GPP_I8改為N_GPP_I7 ,N_GPP_I9改為N_GPP_I8	
	4.OC PIN改GPIO 5.修改VCCIO_PWGD 6.QFLASH+改接Redriver typeA	
	7.HDMI換成DP 8.VCCST_PGD接Level shift	
PCB:1.0		
2020/12/15	1.DGR36.DGR37,ECDR4,ECDR5改short pad 2.Add NPB_C10	
	2.PCH 0ohm改為SHORT PAD 3.Del NR54, LAYOUT 不變 , NET移除VCC1V8_PRIM_R	
	4.EFR9,WR89,WR126,WR105,WR95->SHORT PAD 5.Add NR45, CNVR24	
	6.CKA_U1 Footprint->IC56QFN-2_5GB_LAN-MASK 7.Add DPAQ8,DPAQ9	
	8.ECDR2 Footprint-> R0402-2-SHORT20-MASK	
PCB:1.1		
2020/12/23	1.Page45改名稱CNVI->M2_WIFI ,WIFI_FRAME->WIFI	
	,CNVI-WIFI-SK->WIFI-SK ,CNVI-CAP->WIFI-CAP	
	2.Add DPD1,DPAR13	
PCB:1.01		
2020/12/30	1.改文字面Z590 UD AC Rev1.1->Z590 UD AC Rev1.01	

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Title: BOM & PCB MODIFY HISTORY

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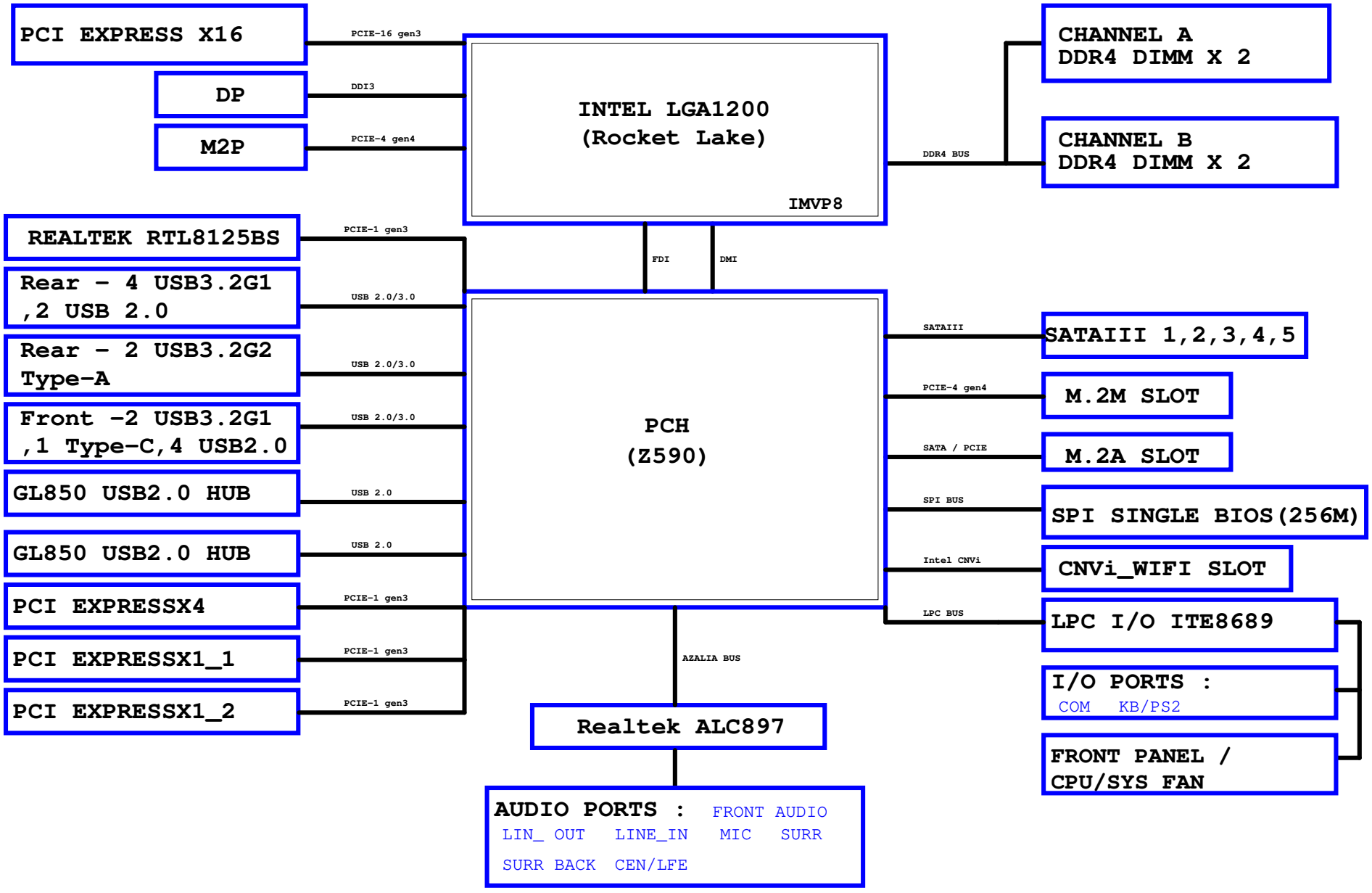
Date: Friday, February 05, 2021 | Sheet 2 of 69

BLOCK DIAGRAM



Gigabyte Technology		
Title: BLOCK DIAGRAM		
Size: C	Document Number: Z590 UD AC	Rev: 1.01
Date: Wednesday, December 30, 2020	Sheet 3 of 69	

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

CFG[4]: 1=eDP enable / 0=eDP disable
CFG[7]: 1=PEG Train immediately following RESET
0=PEG Wait for BIOS

CFG[13]: 1=VCCSA Fixed Mode / 0=SVID Mode

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

LEVEL SHIFT
Z590機種修改

WQ2盡量靠近CPU.其他可以放遠一點

若有不上CODEC出貨的可能，請預留CLK and SDO對地電阻。

Title	CPU LGA1200-A
Size	Custom
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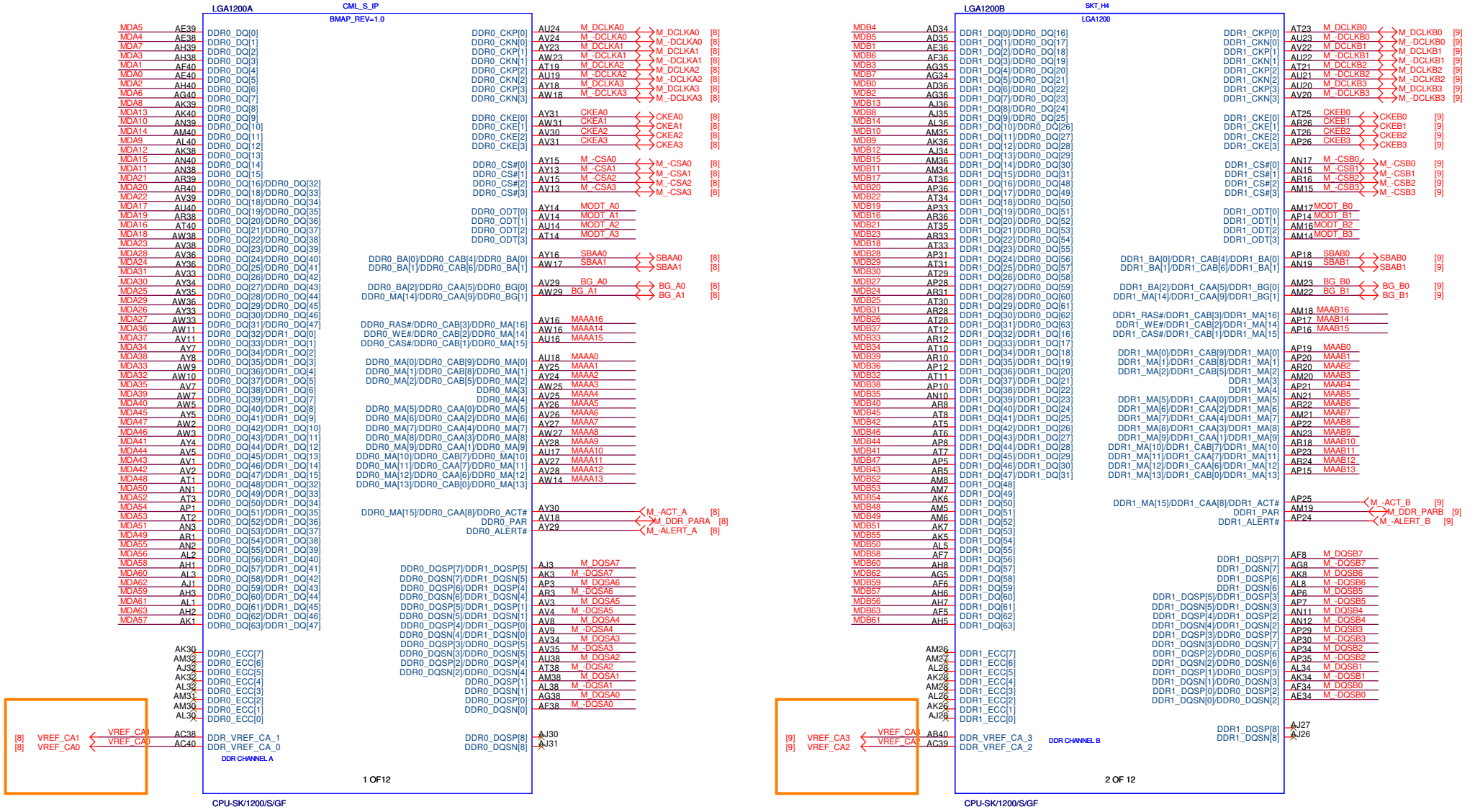
Gigabyte Technology



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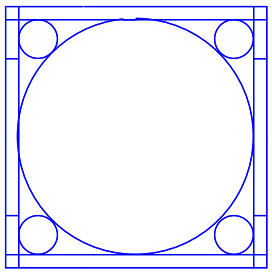

黑色cover

LGA1200
ILM_BP_CR/1200/BKNI/[12KRC-SF0001-83R_12KRC-SF0001-84R]

Gigabyte Technology			
Title: CPU LGA1200-B			
Size: Custom	Document Number: Z590 UD AC		Rev: 1.01
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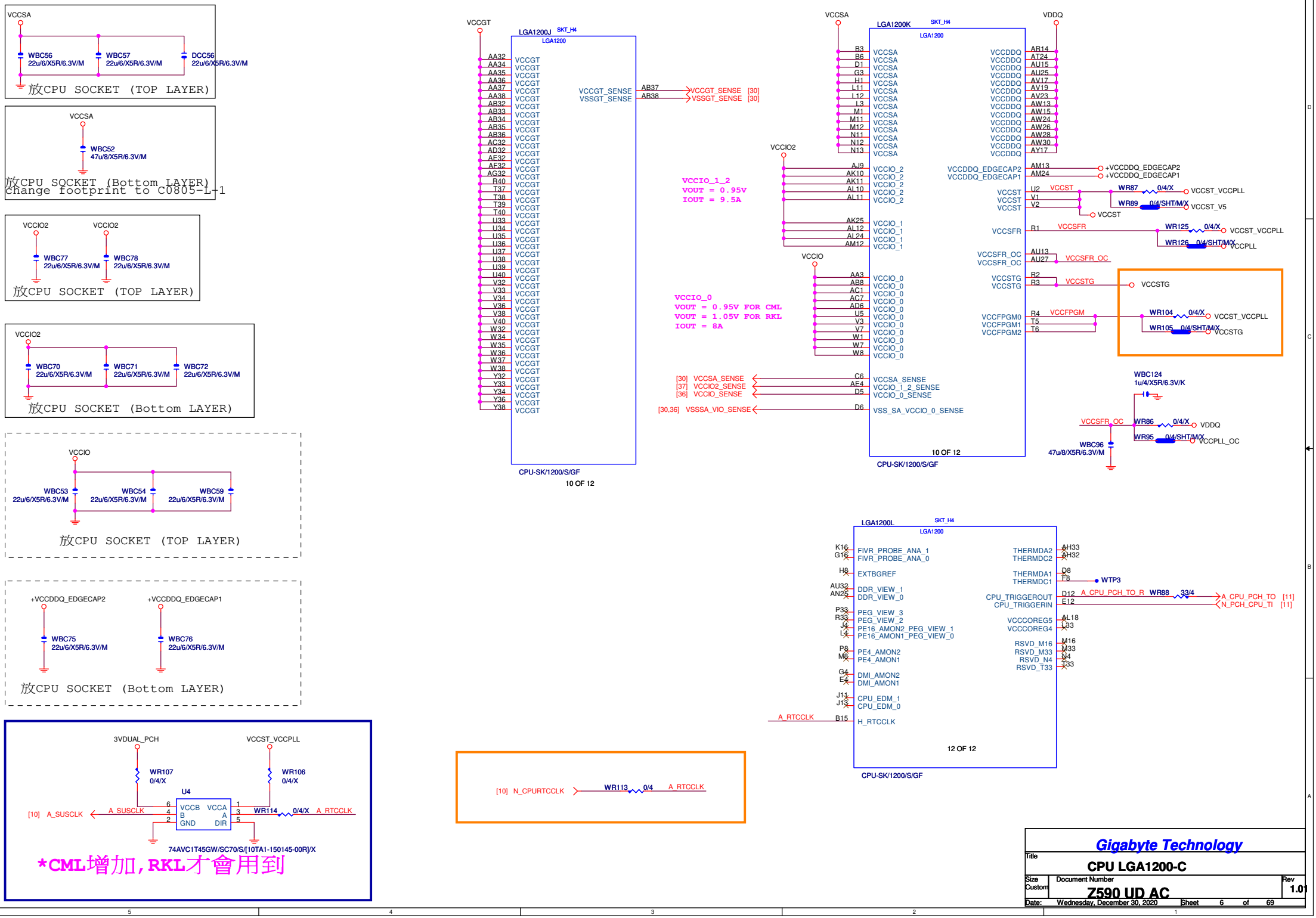
VCCSA
WBC56 22u/6/X5R/6.3V/M
WBC57 22u/6/X5R/6.3V/M
DCC56 22u/6/X5R/6.3V/M
放CPU SOCKET (TOP LAYER)
VCCSA
WBC52 47u/8/X5R/6.3V/M
放CPU SOCKET (Bottom LAYER)
change footprint to C0805-L-1
VCCIO2
VCCIO2
WBC77 22u/6/X5R/6.3V/M
WBC78 22u/6/X5R/6.3V/M
放CPU SOCKET (TOP LAYER)
VCCIO2
WBC70 22u/6/X5R/6.3V/M
WBC71 22u/6/X5R/6.3V/M
WBC72 22u/6/X5R/6.3V/M
放CPU SOCKET (Bottom LAYER)
VCCIO
WBC53 22u/6/X5R/6.3V/M
WBC54 22u/6/X5R/6.3V/M
WBC59 22u/6/X5R/6.3V/M
放CPU SOCKET (TOP LAYER)
+VCCDDQ_EDGECAP2
+VCCDDQ_EDGECAP1
WBC75 22u/6/X5R/6.3V/M
WBC76 22u/6/X5R/6.3V/M
放CPU SOCKET (Bottom LAYER)
3VDUAL_PCH
VCCST_VCCPLL
WR107 0/4/X
WR106 0/4/X
U4
VCCB
B
GND
VCCA
A
DIR
[10] A_SUSCLK
A_SUSCLK
WR114 0/4/X A_RTCCLK
74AVC1T45GW/SC70/S/[10TA1-150145-00R]/X
*CML增加,RKL才會用到
VCCGT
LGA1200J SKT_H4
LGA1200
VCCGT_SENSE
VSSGT_SENSE
AB37
AB38
[30] VCCGT_SENSE
[30] VSSGT_SENSE
CPU-SK/1200/S/GF
10 OF 12
VCCSA
LGA1200K SKT_H4
LGA1200
VDDQ
VCCIO2
VCCIO_1_2
VOUT = 0.95V
IOUT = 9.5A
VCCIO
VCCIO_0
VOUT = 0.95V FOR CML
VOUT = 1.05V FOR RKL
IOUT = 8A
[30] VCCSA_SENSE
[37] VCCIO2_SENSE
[36] VCCIO_SENSE
[30,36] VSSSA_VIO_SENSE
VCCSA_SENSE
VCCIO_1_2_SENSE
VCCIO_0_SENSE
VSS_SA_VCCIO_0_SENSE
+VCCDDQ_EDGECAP2
+VCCDDQ_EDGECAP1
VCCST
VCCSFR
VCCSFR_OC
VCCSTG
VCCFPGM
VCCFPGM0
VCCFPGM1
VCCFPGM2
WR87 0/4/X
WR89 0/4/SHT/M/X
WR125 0/4/X
WR126 0/4/SHT/M/X
WR104 0/4/X
WR105 0/4/SHT/M/X
VCCST_VCCPLL
VCCST_V5
VCCSFR_OC
VCCSTG
VCCFPGM
VCCPLL
VCCPLL_OC
WBC124 1u/4/X5R/6.3V/K
WBC96 47u/8/X5R/6.3V/M
WR86 0/4/X
WR95 0/4/SHT/M/X
10 OF 12
CPU-SK/1200/S/GF
LGA1200L SKT_H4
LGA1200
FIVR_PROBE_ANA_1
FIVR_PROBE_ANA_0
EXTBGREF
DDR_VIEW_1
DDR_VIEW_0
PEG_VIEW_3
PEG_VIEW_2
PE16_AMON2_PEG_VIEW_1
PE16_AMON1_PEG_VIEW_0
PE4_AMON2
PE4_AMON1
DMI_AMON2
DMI_AMON1
CPU_EDM_1
CPU_EDM_0
H_RTCCLK
A_RTCCLK
THERMDA2
THERMDC2
THERMDA1
THERMDC1
CPU_TRIGGEROUT
CPU_TRIGGERIN
VCCCOREG5
VCCCOREG4
RSVD_M16
RSVD_M33
RSVD_N4
RSVD_T33
WTP3
A_CPU_PCH_TO_R WR88 33/4
A_CPU_PCH_TO [11]
N_PCH_CPU_TI [11]
12 OF 12
CPU-SK/1200/S/GF
[10] N_CPURTCCLK
WR113 0/4
A_RTCCLK
Gigabyte Technology
Title
CPU LGA1200-C
Size
Custom
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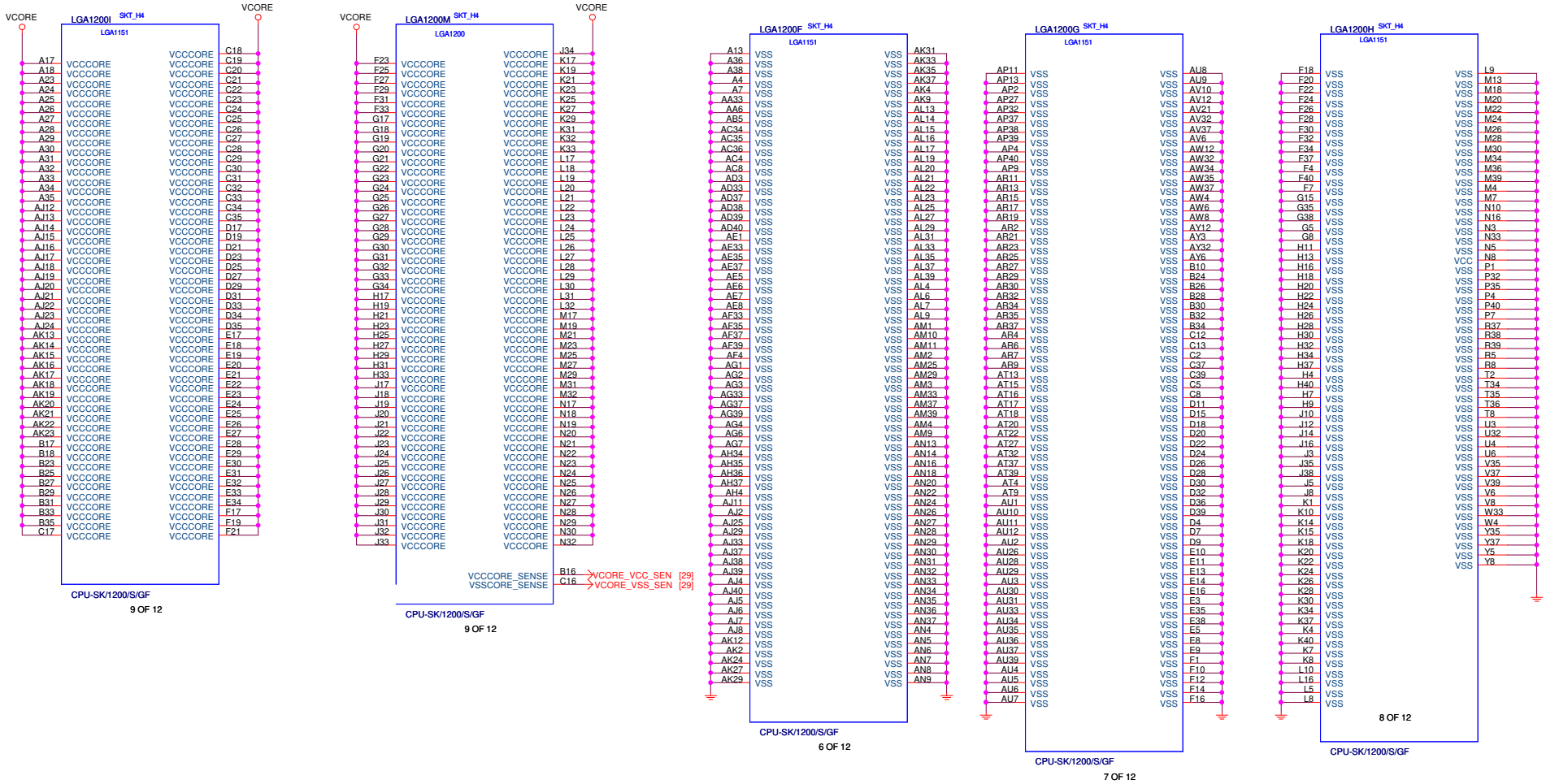

* 刪 Vcore 電容

Gigabyte Technology			
Title: CPU LGA1200-D			
Size: Custom	Document Number: Z590 UD AC		Rev: 1.01
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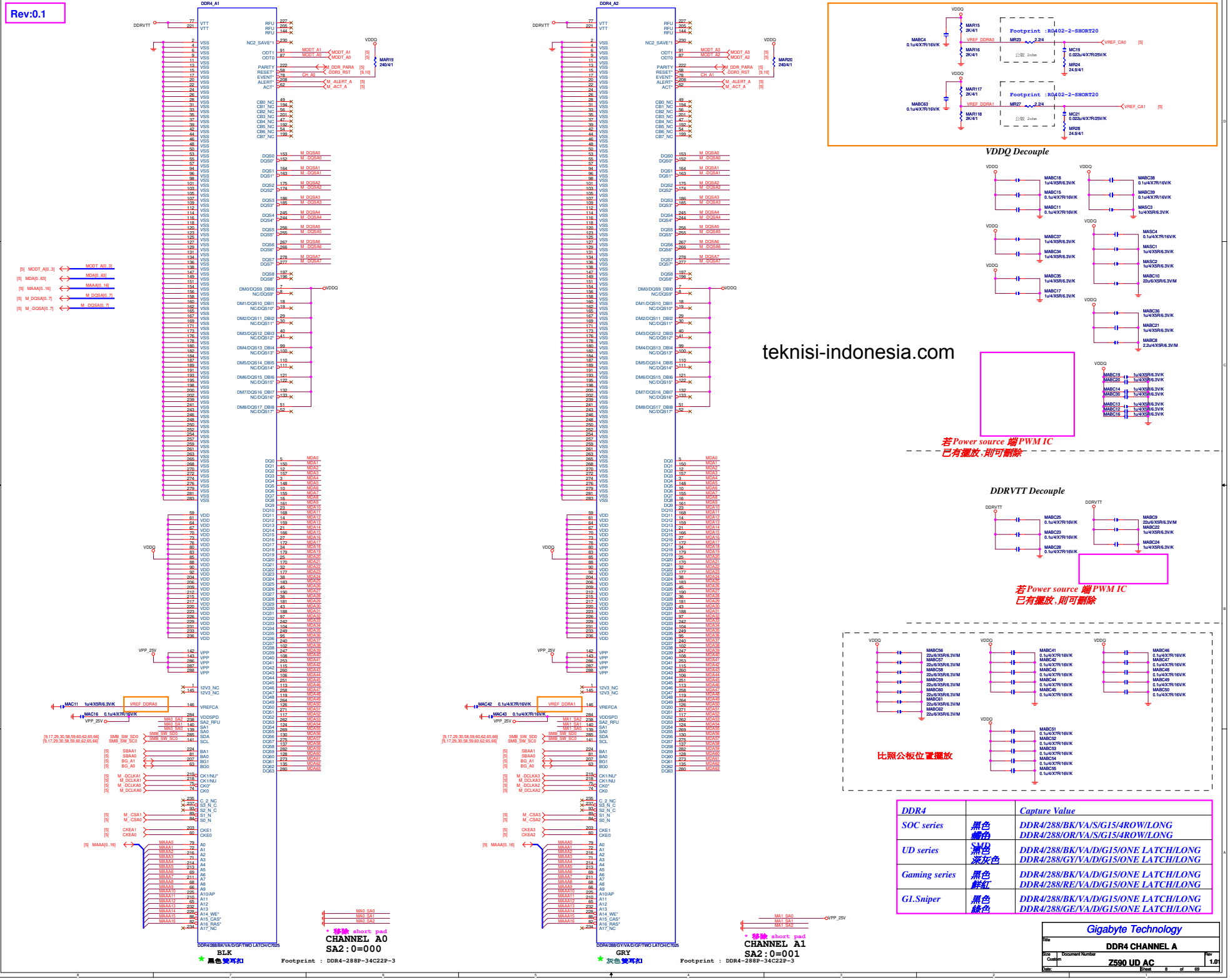
Rev:0.1



VDDQ Decouple

若Power source 端PWM IC
已有擺放,則可刪除

DDRVTT Decouple

若Power source 端PWM IC
已有擺放,則可刪除

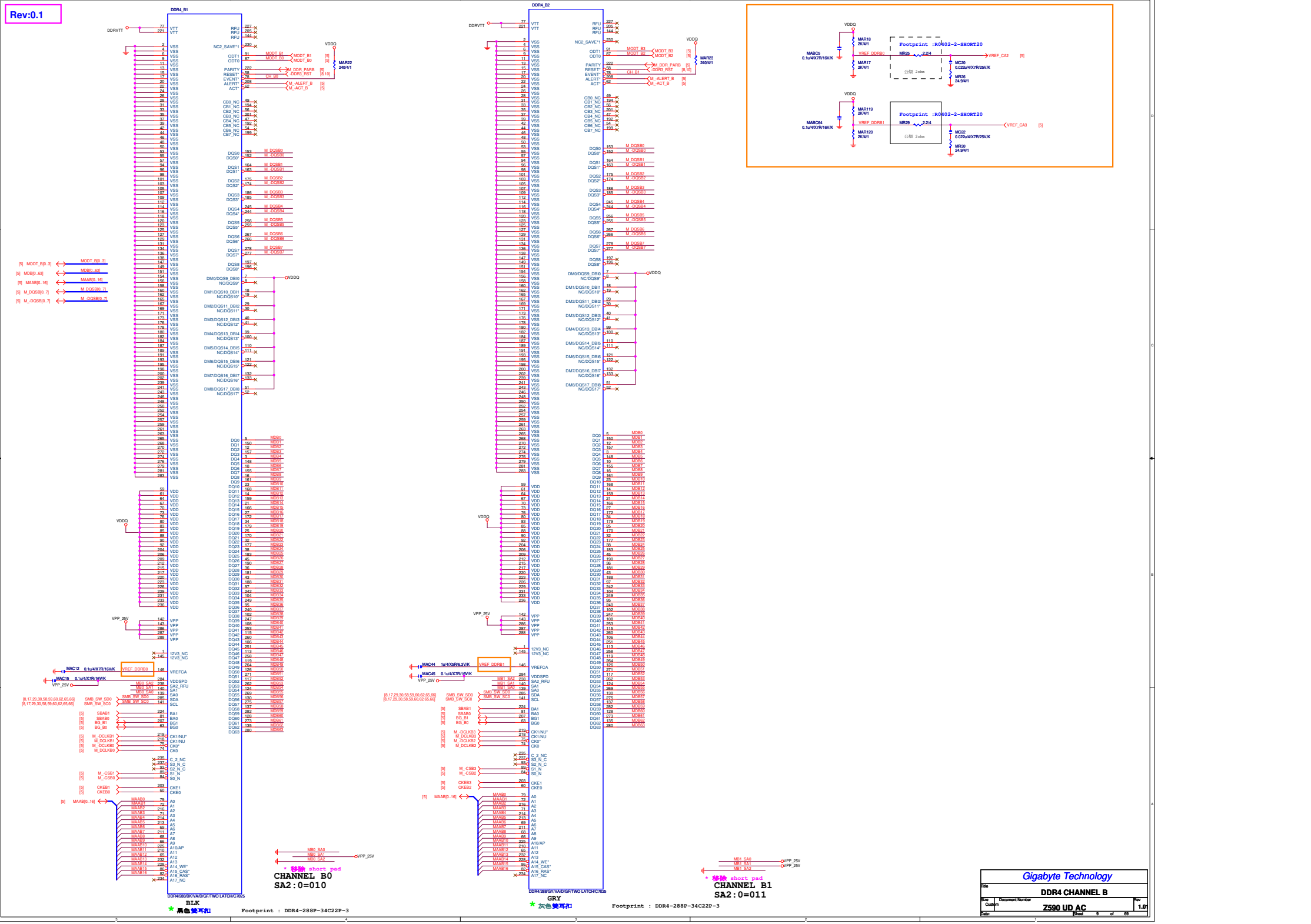
比照公板位置擺放

DDR4		Capture Value
SOC series	黑色 橘色	DDR4/288/BK/VA/S/G15/4ROW/LONG DDR4/288/OR/VA/S/G15/4ROW/LONG
UD series	SKU 黑色 深灰色	DDR4/288/BK/VA/D/G15/ONE LATCH/LONG DDR4/288/GY/VA/D/G15/ONE LATCH/LONG
Gaming series	黑色 紅色	DDR4/288/BK/VA/D/G15/ONE LATCH/LONG DDR4/288/RE/VA/D/G15/ONE LATCH/LONG
G1.Sniper	黑色 綠色	DDR4/288/BK/VA/D/G15/ONE LATCH/LONG DDR4/288/GE/VA/D/G15/ONE LATCH/LONG

Gigabyte Technology

Title	DDR4 CHANNEL A		
Size	Document Number		Rev
Custom	Z590 UD AC		1.0
Date:		Sheet 8 of 69	

Rev:0.1



Gigabyte Technology	
Title	DDR4 CHANNEL B
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Date:	Sheet 9 of 69

RKL_TGP_PCH-H R0.15

C10_WAKE RESERVED/BIOS NEED TO PROGRAM
INTERNAL PD ON THIS PIN.

max 6vias <10000mils

CHECK RKL A_RTCCLK FROM
CPU OR PCH?

PCHA

NR406 20K/4/X N_C10WAKE AJ4 C10_WAKE
PCH_CPUCLK B8 CLKOUT_CPUBCLK_DP
PCH_-CPUCLK A9 CLKOUT_CPUBCLK_DN
N_24MCLK C8 CLKOUT_CPUNSSC_DP
N_-24MCLK D8 CLKOUT_CPUNSSC_DN
N_CPUPCIBCLK A6 CLKOUT_CPUPCIBCLK_DP
N_C-PUPCIBCLK A5 CLKOUT_CPUPCIBCLK_DN
N_CPURTCCLK AD1 CLKOUT_CPURTC
AC11 CLKOUT_CPUBCLK2_DP
AC12 CLKOUT_CPUBCLK2_DN

CNV_WT_D1P AU16 CNV_WT_D1P
CNV_WT_D1N AW15 CNV_WT_D1N
CNV_WT_D0P AY15 CNV_WT_D0P
CNV_WT_D0N BA14 CNV_WT_D0N
CNV_WT_CLKP AU14 CNV_WT_CLKP
CNV_WT_CLKN AW13 CNV_WT_CLKN
CNV_WR_D1P BE11 CNV_WR_D1P
CNV_WR_D1N BD11 CNV_WR_D1N
CNV_WR_D0P BD13 CNV_WR_D0P
CNV_WR_D0N BC13 CNV_WR_D0N
CNV_WR_CLKP BD12 CNV_WR_CLKP
CNV_WR_CLKN BC12 CNV_WR_CLKN
NR404 150/4/1 CNV_RCOMP BE12 CNV_WT_RCOMP
NTP120 BE14 CNVLDO_MON
NR169 0/4/SHT/M/X N_PCH_TRST AE4 CPU_TRSTB
N_CPUPWROK AC3 CPUPWRGD

CLKOUT_SRC_P_15 T2
CLKOUT_SRC_N_15 T3
CLKOUT_SRC_P_14 AA1
CLKOUT_SRC_N_14 Y2
CLKOUT_SRC_P_13 R4
CLKOUT_SRC_N_13 R5
CLKOUT_SRC_P_12 AB4
CLKOUT_SRC_N_12 AB3
CLKOUT_SRC_P_11 W4
CLKOUT_SRC_N_11 W5
CLKOUT_SRC_P_10 T4
CLKOUT_SRC_N_10 T5
CLKOUT_SRC_P_9_G4 W8
CLKOUT_SRC_N_9_G4 W6
CLKOUT_SRC_P_8 W3 → LK_SRCCLK_LAN [54]
CLKOUT_SRC_N_8 V4 → LK_-SRCCLK_LAN [54] LAN_I219V
CLKOUT_SRC_P_7_G4 T8 → M2P_100M_DP_N [66]
CLKOUT_SRC_N_7_G4 T7 → M2P_100M_DN_N [66] M2P_CPU
CLKOUT_SRC_P_6 U4 → M2M_100M_DP_N [26]
CLKOUT_SRC_N_6 U3 → M2M_100M_DN_N [26] M2M_SB
CLKOUT_SRC_P_5 Y4
CLKOUT_SRC_N_5 Y3
CLKOUT_SRC_P_4_G4 V13 → M2A_100M_DP_N [25]
CLKOUT_SRC_N_4_G4 V15 → M2A_100M_DN_N [25] M2A_SB
CLKOUT_SRC_P_3_G4 U9 → PP_PCIE_CLK [22]
CLKOUT_SRC_N_3_G4 V11 → PP_-PCIE_CLK [22] PCIEX4
CLKOUT_SRC_P_2 AG15 → PJ_PCIE_CLK [23]
CLKOUT_SRC_N_2 AG13 → PJ_-PCIE_CLK [23] PCIEX1_2
CLKOUT_SRC_P_1 AE11 → PI_PCIE_CLK [23]
CLKOUT_SRC_N_1 AE9 → PI_-PCIE_CLK [23] PCIEX1_1
CLKOUT_SRC_P_0_G4 Y9 → PA_SRCCLK_N [66]
CLKOUT_SRC_N_0_G4 Y11 → PA_-SRCCLK_N [66] PCIEX16

FH82Z590 RKM3/S/[10HB1-03Z590-20R]

**注意:紅框CLOCK OUT定義GEN4,不可變動

CPU GEN4

CPU GEN4

CLKOUT_PCIE_P/N [9, 7, 4, 3, 0] = Must be used for PCIe* Gen4 support

PCHB

[54] N_-LAN_DIS AL47 GPD_12
N_-SLP_S5 AK46 GPD_11_LANPHYPC
AJ47 GPD_10_SLP_S5B
N_SUSCLK AJ46 GPD_9_SLP_WLANB
AJ45 GPD_8_SUSCLK
GPD_7 AL46 GPD_7/STRAP
N_-SLP_A AF46 GPD_6_SLP_AB
N_-S4_S5 AE46 GPD_5_SLP_S4B
[17,28,39,58,59,62,67] N_-S4_S5
[17,28,38,53,58,62,67] N_-SLP_S3 AF47 GPD_4_SLP_S3B
[17] O_PWRBTSW AH47 GPD_3_PWRBTNB
[17] N_-LAN_WAKE AH48 GPD_2_LAN_WAKEB
N_GP_D1 AH46 GPD_1_ACPRESENT
N_-BATLOW AG45 GPD_0_BATLOWB

Y33 FPF_VREF
Y35 FPF_MON
V32 FPF_LDOMON

AJ42 FIVR_VTGT_VNN
AB20 FIVR_VLOAD_VNN
AJ44 FIVR_VTGT_VCC1P05
AJ22 FIVR_VLOAD_VCC1P05
[45] CNVI_CLKIN AK39 FIVR_REFCLK
AL41 FIVR_EXTBGREF
AH37 FIVR_ANAPB_1
AK37 FIVR_ANAPB_0
AH17 EDM2
AH18 EDM1
[17,62] N_PCH_DPWROK AB46 DSW_PWROK
[8,9] -DDR3_RST AC46 -DDR3_RST
DRAM_RESETB

DMI_7_TXP C25 A_DMI_7RXP [4]
DMI_7_TXN A25 A_DMI_7RXN [4]
DMI_7_RXP J24 A_DMI_7TXP [4]
DMI_7_RXN L24 A_DMI_7TXN [4]
DMI_6_TXP D26 A_DMI_6RXP [4]
DMI_6_TXN C26 A_DMI_6RXN [4]
DMI_6_RXP R22 A_DMI_6TXP [4]
DMI_6_RXN P22 A_DMI_6TXN [4]
DMI_5_TXP D27 A_DMI_5RXP [4]
DMI_5_TXN C27 A_DMI_5RXN [4]
DMI_5_RXP P26 A_DMI_5TXP [4]
DMI_5_RXN R26 A_DMI_5TXN [4]
DMI_4_TXP E28 A_DMI_4RXP [4]
DMI_4_TXN D29 A_DMI_4RXN [4]
DMI_4_RXP F26 A_DMI_4TXP [4]
DMI_4_RXN H26 A_DMI_4TXN [4]
DMI_3_TXP C29 A_DMI_3RXP [4]
DMI_3_TXN B29 A_DMI_3RXN [4]
DMI_3_RXP L26 A_DMI_3TXP [4]
DMI_3_RXN J26 A_DMI_3TXN [4]
DMI_2_TXP E30 A_DMI_2RXP [4]
DMI_2_TXN D30 A_DMI_2RXN [4]
DMI_2_RXP J29 A_DMI_2TXP [4]
DMI_2_RXN L29 A_DMI_2TXN [4]
DMI_1_TXP D31 A_DMI_1RXP [4]
DMI_1_TXN C30 A_DMI_1RXN [4]
DMI_1_RXP F30 A_DMI_1TXP [4]
DMI_1_RXN H30 A_DMI_1TXN [4]
DMI_0_TXP D32 A_DMI_0RXP [4]
DMI_0_TXN C32 A_DMI_0RXN [4]
DMI_0_RXP J32 A_DMI_0TXP [4]
DMI_0_RXN L31 A_DMI_0TXN [4]

FH82Z590 RKM3/S/[10HB1-03Z590-20R]

GPD: 3.3 V only, powered by the PCH DSW_3P3 power rail.

STRAP

3VDUAL_PCH
NR210 8.2K/4/X GPD_7 NR237 100K/4/X
Reserved.this strap should sample LOW.INTERNAL PD.

3VDUAL_PCH
N_GP_D1 NR89 8.2K/4
N_-LAN_WAKE NR94 8.2K/4
N_-SLP_S5 NR98 8.2K/4/X
N_-SLP_A NR91 8.2K/4/X
N_-BATLOW NR88 8.2K/4

VDDQ
-DDR3_RST NR67 470/4/1

N_SUSCLK MAX 2 LOADS SUPPORTED
N_SUSCLK NR235 33/4/1 A_SUSCLK [6]
NR234 33/4/1 CNVI_SUSCLK [45]
NR119 1K/4/1/X

3VDUAL_PCH 3VDUAL
NR134 1K/4/1/X
NR444 1K/4/1
N_PCH_DPWROK
NR111 47K/4/1
NC7 1n/4/X7R/50V/K
CLOSE TO PCH
At least 10ms delay after 3VDUAL_PCH stabel

PCH Signal Glitch Free
N_-SLP_S3 NR120 100K/4/1/X
N_-S4_S5 NR121 100K/4/1/X
N_-SLP_S5 NR127 100K/4/1/X

ANS 08656340
Gigabyte Technology
Title: PCH CLK,DMI,CNVI
Size: B
Document Number: Z590 UD AC
Rev: 1.01
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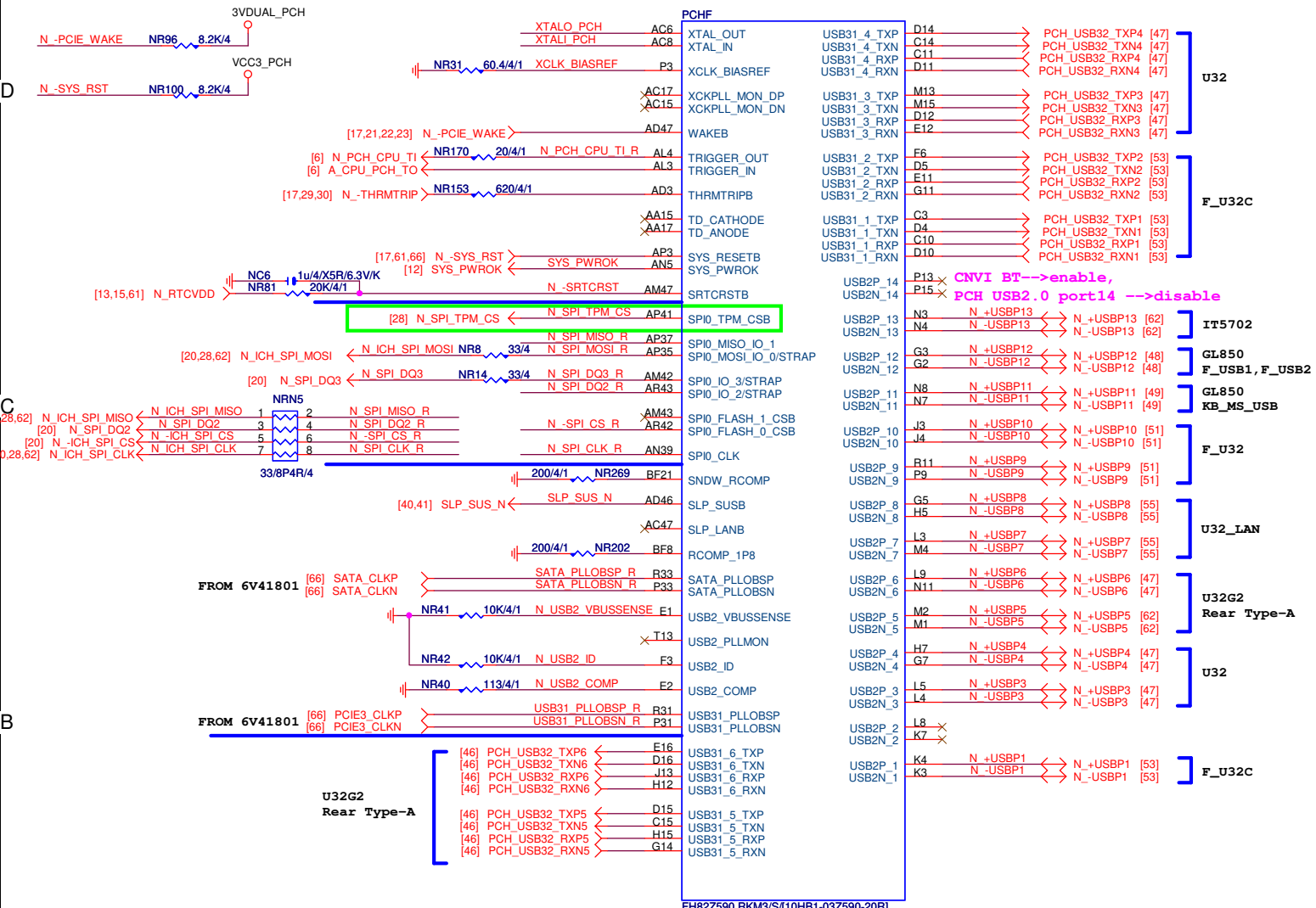
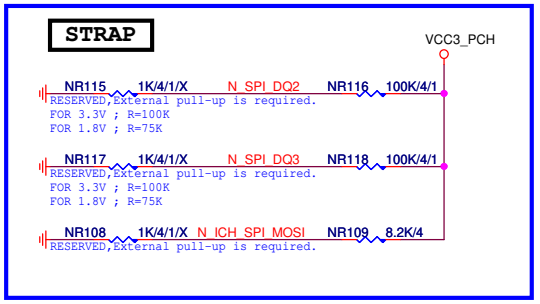
RKL_TGP_PCH-H R0.15



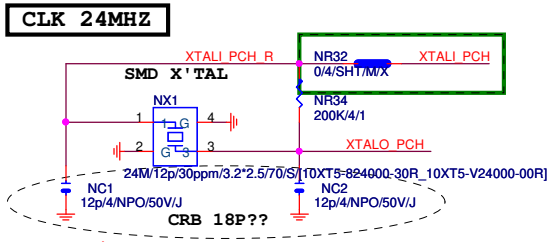
Intel 500 series PCH USB configration P1~P6						
ITEM	USB P1	USB P2	USB P3	USB P4	USB P5	USB P6
H510	U3.2 Gen1x1	U3.2 Gen1x1	U3.2 Gen1x1	U3.2 Gen1x1	NA	NA
B560	U3.2 Gen2x1	U3.2 Gen2x1	U3.2 Gen2x1	U3.2 Gen2x1	U3.2 Gen1x1	U3.2 Gen1x1
H570	U3.2 Gen2x1	U3.2 Gen2x1	U3.2 Gen2x1	U3.2 Gen2x1	U3.2 Gen1x1	U3.2 Gen1x1
Z590	U3.2 Gen2x1	U3.2 Gen2x1	U3.2 Gen2x1	U3.2 Gen2x1	U3.2 Gen2x1	U3.2 Gen2x1
Q570	U3.2 Gen2x1	U3.2 Gen2x1	U3.2 Gen2x1	U3.2 Gen2x1	U3.2 Gen2x1	U3.2 Gen2x1
W580	U3.2 Gen2x1	U3.2 Gen2x1	U3.2 Gen2x1	U3.2 Gen2x1	U3.2 Gen2x1	U3.2 Gen2x1
	Gen2x2		Gen2x2		Gen2x2	

Intel 500 series PCH USB20 configration						
ITEM	USB P1~9	USB P10	USB P11	USB P12	USB P13	USB P14
H510	USB2	NA	NA	NA	NA	For Intel® Wireless-AC
B560	USB2	USB2	USB2	NA	NA	
H570	USB2	USB2	USB2	USB2	USB2	
Z590	USB2	USB2	USB2	USB2	USB2	
Q570	USB2	USB2	USB2	USB2	USB2	
W580	USB2	USB2	USB2	USB2	USB2	

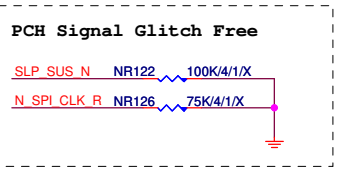
STRAP



CLK 24MHZ



PCH Signal Glitch Free



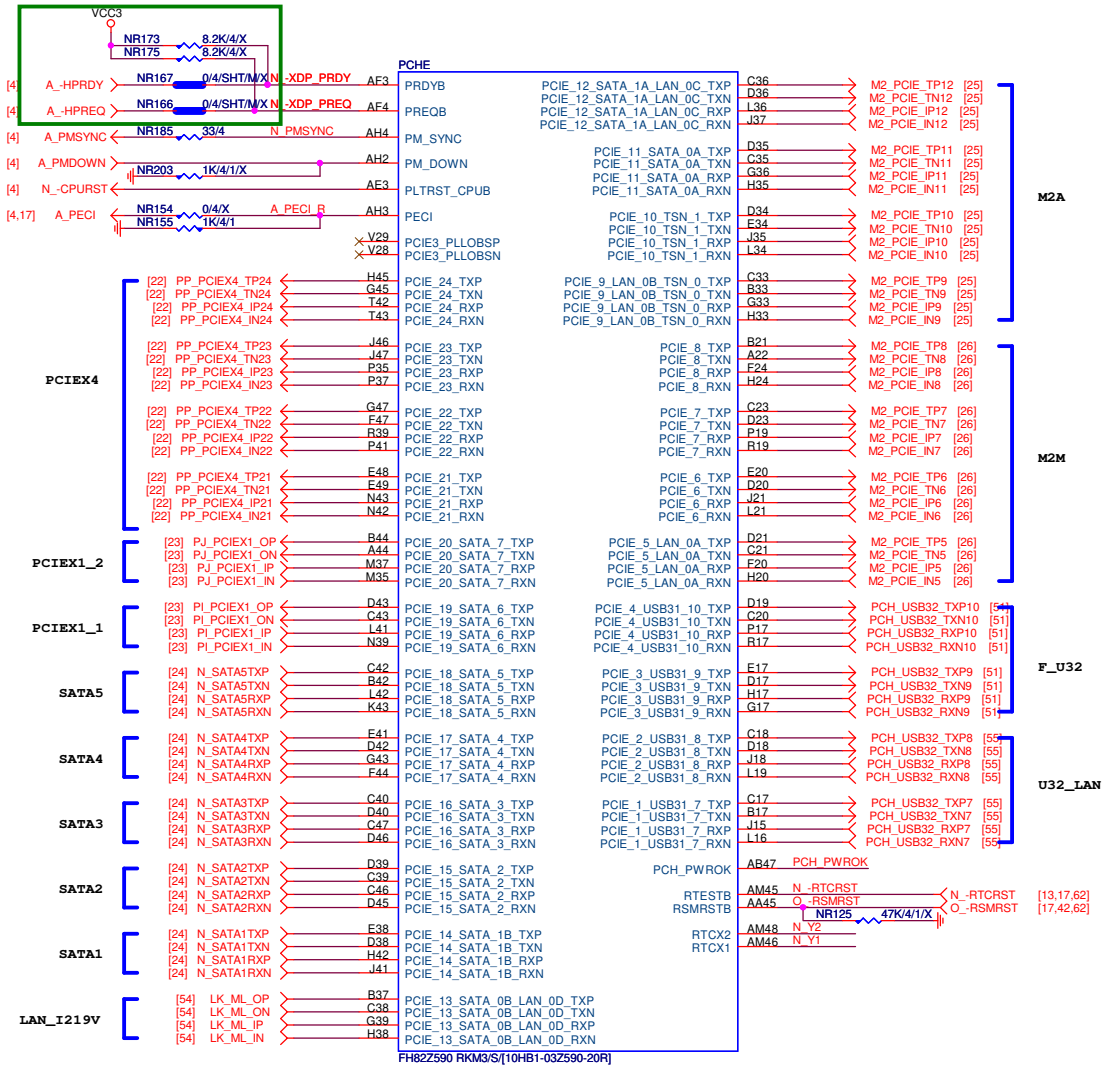
ANS 08656340 **Gigabyte Technology**

Title: **PCH SPI,USB**

Size: Custom | Document Number: **Z590 UD AC** | Rev: 1.01

Date: Thursday, February 18, 2021 | Sheet 11 of 69

RKL_TGP_PCH-H R0.15



Intel 500 series PCH PCIE P5~P12								
ITEM	PCIE P5	PCIE P6	PCIE P7	PCIE P8	PCIE P9	PCIE P10	PCIE P11	PCIE P12
H510	PCIE /GbE	PCIE	PCIE	PCIE	GbE ONLY	N/A	PCIE	PCIE /GbE
B560	PCIE /GbE	PCIE	PCIE	PCIE	PCIE /GbE	PCIE	PCIE SATA_0'	PCIE SATA_1' GbE
H570	PCIE /GbE	PCIE	PCIE	PCIE	PCIE /GbE	PCIE	PCIE SATA_0'	PCIE SATA_1' GbE
Z590	PCIE /GbE	PCIE	PCIE	PCIE	PCIE /GbE	PCIE	PCIE SATA_0'	PCIE SATA_1' GbE
Q570	PCIE /GbE	PCIE	PCIE	PCIE	PCIE /GbE	PCIE	PCIE SATA_0'	PCIE SATA_1' GbE
W580	PCIE /GbE	PCIE	PCIE	PCIE	PCIE /GbE	PCIE	PCIE SATA_0'	PCIE SATA_1' GbE
					Intel® RST for x2/x4 M.2			

Intel 500 series PCH PCIE P13~P24												
ITEM	PCIE P13	PCIE P14	PCIE P15	PCIE P16	PCIE P17	PCIE P18	PCIE P19	PCIE P20	PCIE P21	PCIE P22	PCIE P23	PCIE P24
H510	SATA_0 /GbE	SATA_1	SATA_2	SATA_3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
B560	SATA_0 /GbE	SATA_1	SATA_2	SATA_3	SATA_4	SATA_5	N/A	N/A	PCIE	PCIE	PCIE	PCIE
H570	PCIE SATA_0 GbE	PCIE SATA_1	PCIE SATA_2	PCIE SATA_3	PCIE SATA_4	PCIE SATA_5	PCIE	PCIE	PCIE	PCIE	PCIE	PCIE
Z590	PCIE SATA_0 GbE	PCIE SATA_1	PCIE SATA_2	PCIE SATA_3	PCIE SATA_4	PCIE SATA_5	PCIE	PCIE	PCIE	PCIE	PCIE	PCIE
Q570	PCIE SATA_0 GbE	PCIE SATA_1	PCIE SATA_2	PCIE SATA_3	PCIE SATA_4	PCIE SATA_5	PCIE	PCIE	PCIE	PCIE	PCIE	PCIE
W580	PCIE SATA_0 GbE	PCIE SATA_1	PCIE SATA_2	PCIE SATA_3	PCIE SATA_4	PCIE SATA_5	PCIE SATA_6	PCIE SATA_7	PCIE	PCIE	PCIE	PCIE
					Intel® RST for x2/x4 M.2				Intel® RST for x2/x4 M.2			

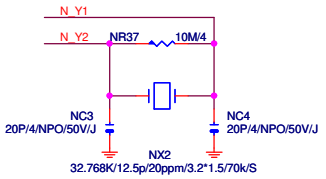
RTC 32.768KHZ

DIP X'TAL

Del DIP NX1

OPTION

SMD X'TAL



Intel 500 series PCH USB P7~P10				
ITEM	USB P7	USB P8	USB P9	USB P10
H510	NA	NA	NA	NA
B560	NA	NA	NA	NA
H570	U3.2 Gen1x1	U3.2 Gen1x1	PCIE	PCIE
Z590	U3.2 Gen2x1	U3.2 Gen2x1	U3.2 Gen2x1	U3.2 Gen2x1
	PCIE	PCIE	PCIE	PCIE
Q570	U3.2 Gen2x1	U3.2 Gen2x1	U3.2 Gen1x1	U3.2 Gen1x1
	PCIE	PCIE	PCIE	PCIE
W580	U3.2 Gen2x1	U3.2 Gen2x1	U3.2 Gen2x1	U3.2 Gen2x1
	PCIE	PCIE	PCIE	PCIE

RNS 08656340	Gigabyte Technology	
Title	PCH PCIE,SATA	
Size Custom	Document Number Z590 UD AC	Rev 1.01
Date: Thursday, February 18, 2021	Sheet 12 of 69	

RKL_TGP_PCH-H R0.15

GPP_D PU/PD

GPP_B PU/PD

3VDUAL
NR296 8.2K/4 N_-VRALERT
N_-SLP_S0 NR438 100K/4/1

3VDUAL
CLKREQ
NR2 8.2K/4 N_GPP_B5 PCIEX16
NR3 8.2K/4 N_GPP_B6 PCIEX1_1
NR4 8.2K/4 N_GPP_B7 PCIEX1_2
NR5 8.2K/4 N_GPP_B8 PCIEX4
NR6 8.2K/4 N_GPP_B9 M2A

ON-BOARD DEVICE PULL DOWN
N_GPP_B9 NR13 8.2K/4/X

PCHD

MINI LOAD
For 4 PIN OC BOTTOM
THB_C PCIEX16 BIFURCATION
THB_C PCIEX16 BIFURCATION
PCIEX16 BIFURCATION
PCIEX16 BIFURCATION
SMBUS SW
SYS_FAN4 MODE
SYS_FAN3 MODE
SYS_FAN2 MODE
SYS_FAN1 MODE
CPU_FAN MODE
REMOVE N_-DDR_V_SEL

[14] N_GPP_D23	N_GPP_D23	AU29	GPP_D_23_UART3_CTSB_THC1_SPI2_INTB	GPPC_A_14 AW46
		AY30	GPP_D_22_UART3_RTSB_THC1_SPI2_RSTB	GPPC_A_13_ESPI_ALERT3B AV46
		AW29	GPP_D_21_UART3_TXD_THC1_SPI2_IO_3	GPPC_A_12_ESPI_ALERT2B AV47
		BD30	GPP_D_20_UART3_RXD_THC1_SPI2_IO_2	GPPC_A_11_ESPI_ALERT1B AU45
[17] N_GPP_D19	N_GPP_D19	BD35	GPP_D_19_GSPI3_MOSI_THC1_SPI2_IO_1	GPPC_A_10_ESPI_ALERT0B AU46 ESPI_ALERT → ESPI_ALERT [17]
		BD34	GPP_D_18_GSPI3_MISO_THC1_SPI2_IO_0	GPPC_A_9_ESPI_CS3B AU47
		BC34	GPP_D_17_GSPI3_CLK_THC1_SPI2_CLK	GPPC_A_8_ESPI_CS2B AT48
		BE35	GPP_D_16_GSPI3_CS0B_THC1_SPI2_CSB	GPPC_A_7_ESPI_CS1B AT46
	N_SML1DAT	BB30	GPP_D_15_SML1DATA	GPPC_A_6_ESPI_RESETB AT45 ESPI_RESET- → ESPI_RESET- [17]
		BC30	GPP_D_14_SPI1_IO_3_THC0_SPI1_IO_3	GPPC_A_5_ESPI_CLK AR47 N_GPP_A5 NR46 10/4 → ESPI_CLK [17]
		BE30	GPP_D_13_SPI1_IO_2_THC0_SPI1_IO_2	GPPC_A_4_ESPI_CS0B AR46 ESPI_CS- → ESPI_CS- [17]
		BD31	GPP_D_12_ISH_UART0_CTSB_SML0BALERTB	GPPC_A_3_ESPI_IO_3_SUSACKB AP46 N_ESPI_IO3 NR50 10/4 → ESPI_IO3 [17]
		BD32	GPP_D_11	GPPC_A_2_ESPI_IO_2_SUSWARNB_SUSPWRDNACK AP47 N_ESPI_IO2 NR69 10/4 → ESPI_IO2 [17]
[43] N_GPP_D11	N_SML0DAT	BC33	GPP_D_10_SML0DATA	GPPC_A_1_ESPI_IO_1 AN45 N_ESPI_IO1 NR70 10/4 → ESPI_IO1 [17]
[54] N_SML0DAT	N_SML0CLK	BE32	GPP_D_9_SML0CLK	GPPC_A_0_ESPI_IO_0 AN46 N_ESPI_IO0 NR72 10/4 → ESPI_IO0 [17]
[54] N_SML0CLK	N_GPP_D8	BD36	GPP_D_8_I2S2_SCLK_THC0_SPI1_INTB	
[45] -CNVI_PCM_CLK	N_GPP_D7	BE36	GPP_D_7_I2S2_RXD_THC0_SPI1_RSTB	STRAP/GPPC_G_15_DDP2_CTRLDATA_TBT_LSX1_B AL21 N_GPP_G15
[45] CNVI_PCM_IN	N_GPP_D6	AY33	GPP_D_6_I2S2_TXD_MODEM_CLKREQ_CRF_XTAL_CLKREQ	GPPC_G_14_DDP2_CTRLCLK_TBT_LSX1_A AN21 N_GPP_G14
[45] CNVI_CLKREQ	N_GPP_D5	BA33	GPP_D_5_I2S2_SFRM_CNV_RF_RESET_B	STRAP/GPPC_G_13_DDP1_CTRLDATA_TBT_LSX0_B AU19 N_GPP_G13
[45] -CNVI_RF_RESET	N_SML1CLK	BF33	GPP_D_4_SML1CLK	GPPC_G_12_DDP1_CTRLCLK_TBT_LSX0_A AW18 N_GPP_G12
	N_GPP_D3	BD33	GPP_D_3_SPI1_MOSI_IO_0_THC0_SPI1_IO_0_SBK_3_BK_3	STRAP/GPPC_G_11_ISH_SPI_MOSI_DDP4_CTRLDATA_GSPI2_MOSI_TBT_LSX3_B AY17 N_GPP_G11
[61] N_GPP_D3	NTP123	BE33	GPP_D_2_SPI1_MISO_IO_1_THC0_SPI1_IO_1_SBK_2_BK_2	GPPC_G_10_ISH_SPI_MISO_DDP4_CTRLCLK_GSPI2_MISO_TBT_LSX3_A BA17
	NTP124	AW32	GPP_D_1_SPI1_CLK_THC0_SPI1_CLK_SBK_1_BK_1	STRAP/GPPC_G_9_ISH_SPI_CLK_DDP3_CTRLDATA_GSPI2_CLK_TBT_LSX2_B BC17 N_GPP_G9
		AU31	GPP_D_0_SPI1_CSB_THC0_SPI1_CSB_SBK_0_BK_0	GPPC_G_8_ISH_SPI_CSB_DDP3_CTRLCLK_GSPI2_CS0B_TBT_LSX2_A BE18
[28] N_GPP_C23		BB26	GPP_C_23_UART2_CTSB_CNV_MFUART0_CTS_B	GPPC_G_7 BF17 N_GPPC_G7 → N_GPPC_G7 [51] USB_OC
[21] N_GPP_C22		AU26	GPP_C_22_UART2_RTSB_CNV_MFUART0_RTS_B	GPPC_G_6 BD17 N_GPPC_G6 → N_GPPC_G6 [28] SPI TPM
[28] N_GPP_C21		AW26	GPP_C_21_UART2_TXD_CNV_MFUART0_TXD	GPPC_G_5_SLP_DRAMB BE17
[21] N_GPP_C20		AY26	GPP_C_20_UART2_RXD_CNV_MFUART0_RXD	GPPC_G_4_GMII_MDIO_0 BD16
		BD20	GPP_C_19_I2C1_SCL	GPPC_G_3_GMII_MDC_0 BC16 DDPB/C -->CHIPSET U3C
		BE21	GPP_C_18_I2C1_SDA	GPPC_G_2_DNX_FORCE_RELOAD BE15
		BD21	GPP_C_17_I2C0_SCL	GPPC_G_1_DDPA_CTRLDATA BD15 N_DDPA_CTRLDATA
		BC22	GPP_C_16_I2C0_SDA	GPPC_G_0_DDPA_CTRLCLK BD14 N_DDPA_CTRLCLK
		BE23	GPP_C_15_UART1_CTSB_ISH_UART1_CTSB	
		BD24	GPP_C_14_UART1_RTSB_ISH_UART1_RTSB	GPPC_RCOMP BG13 GPPC_RCOMP 200/4/1 NR47
		BD23	GPP_C_13_UART1_TXD_ISH_UART1_TXD	
[21] N_GPP_C12		BC28	GPP_C_12_UART1_RXD_ISH_UART1_RXD	MPHY_RCOMPP B13 PCIECOMP_P_R 100/4/1 NR38 PCIECOMP_P
[21] N_GPP_C11		BD29	GPP_C_11_UART0_CTSB	MPHY_RCOMPN A13 PCIECOMP_N
[65] N_GPP_C10		BF29	GPP_C_10_UART0_RTSB	
		BE29	GPP_C_9_UART0_TXD	MLK_RSTB AR3
		BE27	GPP_C_8_UART0_RXD	
		BB24	GPP_C_7_ISH_I2C2_SCL_I2C3_SCL	MLK_DATA AR4
		AY24	GPP_C_6_ISH_I2C2_SDA_I2C3_SDA_SBK_4_BK_4	MLK_CLK AP4
	N_GPP_C5	BD27	GPP_C_5_SML0ALERTB/STRAP	
		BE25	GPP_C_4_ISH_UART0_TXD_SML0BCLK_I2C2_SCL	JTAGX AM2 N_PCH_JTAGX NR66 0/4/SHT/M/X → N_PCH_JTAGX [4]
[17] N_-LPCPME	NR9 0/4/SHT/M/X	BE24	GPP_C_3_ISH_UART0_RXD_SML0BDATA_I2C2_SDA	JTAG_TMS AM4 N_PCH_TMS NR92 0/4/SHT/M/X → N_PCH_TMS [4]
[65] N_SMBDATA	N_SMBDATA	BD26	GPP_C_2_SMBALERTB/STRAP	JTAG_TDO AM3 N_PCH_TDO NR93 0/4/SHT/M/X → N_PCH_TDO [4]
[65] N_SMBCLK	N_SMBCLK	BD25	GPP_C_1_SMBDATA	JTAG_TDI AN4 N_PCH_TDI NR95 0/4/SHT/M/X → N_PCH_TDI [4]
		BE26	GPP_C_0_SMBCLK	JTAG_TCK AM5 N_PCH_TCK NR110 51/4/1/X → N_PCH_TCK [4]
	N_-PCH_HOT	BD42		PLACE 51OHM PD WITHIN 1.1INCH OF PCH
	N_GPP_B22	AW41	GPP_B_23_SML1ALERTB_PCHHOTB/STRAP	STRAP/DBG_PMODE AG5 N_ITP_PMODE
		BE46	GPP_B_22_GSPI1_MOSI/STRAP	
	N_GPP_B20	BB42	GPP_B_21_GSPI1_MISO_NFC_CLKREQ	INTRUDERB AE47 N_-INTRUDER
[17] N_GPP_B20		BD45	GPP_B_20_GSPI1_CLK_NFC_CLK	
	N_GPP_B18	AU36	GPP_B_19_GSPI1_CS0B	HDACPU_SDO AJ5 DISPA_SDO NR298 33/4 → N_AZCPU_SDOUT [4]
		BA36	GPP_B_18_GSPI0_MOSI/STRAP	HDACPU_SDI AK4 → A_AZ_CPU_SDI [4]
[19] N_GPP_B17		AY38	GPP_B_17_GSPI0_MISO	IN HDACPU_BCLK AJ3 DISPA_BCLK NR68 33/4 → N_AZCPU_SCLK [4]
[19] N_GPP_B16		BA39	GPP_B_16_GSPI0_CLK	
[19] N_GPP_B15		BD40	GPP_B_15_GSPI0_CS0B	
[61] N_SPKR	N_SPKR	BD39	GPP_B_14_SPKR/STRAP	
[17,62] N_-PFMRST	N_-PFMRST	BE40	GPP_B_13_PLTRSTB	
[17,29] N_-SLP_S0	N_-SLP_S0	BE39	GPP_B_12_SLP_S0B	
		BD38	GPP_B_11_I2S_MCLK	
[25] M2A_-CLKREQ	N_GPP_B9	BE38	GPP_B_10_SRCCLKREQB_5	
[22] -PCIEX4_PR	N_GPP_B8	BF37	GPP_B_9_SRCCLKREQB_4	
[23] -PCIEX1_PR2	N_GPP_B7	BD37	GPP_B_8_SRCCLKREQB_3	
[23] -PCIEX1_PR1	N_GPP_B6	BC38	GPP_B_7_SRCCLKREQB_2	
[21] -PCIEX16_PR	N_GPP_B5	BC37	GPP_B_6_SRCCLKREQB_1	
[19] N_GPP_B4		AU34	GPP_B_5_SRCCLKREQB_0	
[19] N_GPP_B3		AW35	GPP_B_4_CPU_GP_3	
	N_-VRALERT	AY35	GPP_B_3_CPU_GP_2	
		AY42	GPP_B_2_VRALERTB	
		AW37	GPP_B_1_GSPI1_CS1B_TIME_SYNC_1	
			GPP_B_0_GSPI0_CS1B	

FH82Z590 RKM3/S/[10HB1-03Z590-20R]

NR46/NR50/NR69/NR70/NR72 CLOSE TO PCH<500mil

TCP* pins can be routed to USB-C* connector or DP/HDMI native connector

VCC3
N_DDPA_CTRLDATA NR35 2.2K/4/1
N_DDPA_CTRLCLK NR48 2.2K/4/1

VCCSTG
N_PCH_TMS NR79 51/4/1
N_PCH_TDO NR82 100/4/1
N_PCH_TDI NR84 51/4/1
N_PCH_JTAGX

GPPC_A/GPPC_G (VCCPRIM_3P3 or VCCPRIM_1P8): each pin voltage is selected by setting the corresponding voltage select soft strap of the pin.

BATTERY

NRB1 必須放在BAT外
DIP款式矮的電池座
BATTERY-DN-1

3VDUAL_PCH
ND1 BAS40-05/0.2A/SOT23
NR136 1M/4 N_-INTRUDER
N_RTCVDD → N_RTCVDD [11,15,61]
N_-RTCRST → N_-RTCRST [12,17,62]
N_VBATT NRB1 1K/4/1
NR142 20K/4/1
BAT
BAT-SK/BK/P/S/D/SN
NC8 1u/4/X5R/6.3V/K
NC9 1u/4/X5R/6.3V/K
RB_TP1
N_VBAT → N_VBAT [17]
BATTERY CR2032

STRAP

VCC3
NR130 8.2K/4/X N_SPKR NR131 8.2K/4/X
TOP SWAP OVERRIDE STRAP, PCH HAS INTERNAL WEAK PD
HIGH:TOP SWAP ENABLED
LOW:TOP SWAP DISABLED

3VDUAL
NR132 1K/4/1/X N_GPP_B18 NR133 8.2K/4/X
NO REBOOT IF SAMPLED HIGH, PCH HAS INTERNAL WEAK PD
NR123 1K/4/1/X N_GPP_B22 NR124 8.2K/4/X
Boot BIOS Strap (BBS),PCH HAS INTERNAL WEAK PD.
1 : ESPI PERIPHERAL CHANNEL
0 : SPI(MAF) OR ESPI FLASH CHANNEL(SAF)

VCC3_PCH
NR102 1K/4/1/X N_GPP_C2 NR103 8.2K/4
TLS Confidentiality IF SAMPLED HIGH, CH HAS INTERNAL WEAK PD
NR105 1K/4/1/X N_GPP_C5 NR106 8.2K/4/X
ESPI DISABLE STRAP PCH HAS INTERNAL WEAK PD
HIGH:DISABLE
LOW:ENABLE(DEFAULT)
For eSPI

VCC3_PCH
NR113 1K/4/1/X N_-PCH_HOT NR114 8.2K/4/X
CPUNSSC Clock Frequency, PCH HAS INTERNAL 20K PD
0 = 38.4 MHz clock (direct from crystal) (default)
1 = 19.2 MHz clock (derived from 38.4 MHz crystal)

V1P05A
NR249 1K/4/1/X N_ITP_PMODE
Reserved.INTERNAL WEAK PH.

3VDUAL_PCH
* RKL
NR243 20K/4/X N_GPP_G15 NR247 2.2K/4/X
NR244 20K/4/X N_GPP_G13 NR248 2.2K/4/X
NR245 20K/4/X N_GPP_G11 NR241 2.2K/4/X
NR246 20K/4/X N_GPP_G9 NR242 2.2K/4/X
TBT VCCIO CONFIGURATION,PCH HAS INTERNAL WEAK PD
HIGH:3.3V
LOW:1.8V

For eSPI
VCCBT
ESPI_ALERT NR49 8.2K/4/X
NR137 75K/4/1 ESPI_RESET- NR51 8.2K/4/X
NR138 75K/4/1 ESPI_CS- NR57 8.2K/4/X

VCC3
N_GPP_G12 NR275 3.3K/4/1

3VDUAL
N_SMBCLK NR53 1K/4/1
N_SMBDATA NR55 1K/4/1
N_SML0CLK NR58 499/4/1
N_SML0DAT NR59 499/4/1
N_SML1DAT NR61 8.2K/4
N_SML1CLK NR292 8.2K/4
N_GPP_D3 NR52 8.2K/4
N_GPPC_G7 NR71 8.2K/4

3VDUAL_PCH
NR277 20K/4/X N_GPP_G14 NR278 2.2K/4/X

PCH Signal Glitch Free

N_-PFMRST NR129 100K/4/1/X

CLR_CMOS

CLR_CMOS
N_-RTCRST
PH/1*2/BK/2.54/VA/D

ANS 08656340 Gigabyte Technology

Title: PCH ESPI,MISC
Size: Custom
Document Number: Z590 UD AC
Rev: 1.01
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RKL_TGP_PCH-H R0.15

PCHC

FH82Z590 RKM3/S/[10HB1-03Z590-20R]

Fixed voltage on certain GPIO groups: GPD (3.3 V), GPP_J and GPP_S (1.8 V/VCCPRIM_1P8)

STRAP

FIXED ERP漏電

HDA_SDO:Flash Descriptor Security (override);
1=DIS,0=ENABLE
PCH INTERNAL PD

REMOVE NR23 0ohm

ESPI FLASH SHARING MODE,INTERNAL 20K PD
0: MASTER ATTACHED FLASH SHARIN
1: SLAVE ATTACEHD FLASH SHARING

Reserved.INTERNAL 20K PD.
0=> JTAG ODT is disabled
1=> JTAG ODT is enabled

SPI FLASH INTERFACE VOLTAGE,INTERNAL 20K PD
0=> VCCSPI at 3.3 V (Default)
1=> VCCSPI at 1.8 V

XTAL Frequency Selection,INTERNAL 20K PD
0 = 38.4 MHz (default)
1 = 24 MHz

M.2 CNVi Mode Select,external PU is required.
0=>Integrated CNVi enabled.
1=>Integrated CNVi disabled.
Note: When connected to the PCH CNVi interface, the device internal PD resistor will pull the strap low to enable CNVi interface

Display Port DDC/HOT PLUG SIGNAL		
CPU PORT	PCH DDC	PCH HPD
DDI_A/EDP	GPP_G0/G1	GPP_K6
DDI_1/B	GPP_I5/I6	GPP_K7
DDI_2/C	GPP_G12/G13	GPP_I1
DDI_3/D	GPP_G14/G15	GPP_I2

**
HPD: DDI*. PULL DOWN IF NO USE.

DP

PCH Signal Glitch Free

CLKREQ

ON-BOARD DEVICE

注意:PWM SIDE PD 100K.

VCCIO VID

M2A_SB IFDET
M2A_SB DETECT

THB_C2

M2M_SB DEVSLP
M2P_CPU DEVSLP

M2M DETECT

E1/E0-->Multi Key

Internal pullup

RESERVED STRAP

ANS 08656340

Gigabyte Technology

Title: PCH GPP,HDA

Size: Custom | Document Number: Z590 UD AC | Rev: 1.01

Date: Thursday, February 18, 2021 | Sheet 14 of 69

RKL_TGP_PCH-H R0.15

NR174 MASK/0/8P4R/0402/SHT/X
3VDUAL 1 2 3 4 5 6 7 8 VCC3_PCH

REMOVE NR176

REMOVE NR54
VCC1V8_PRIM — VCC1V8_PRIM
1.8V@3A

+V1P8A=+VCCPRIM_1P8

close to pin BG46
N_RTCVDD — NBC23 1u/4/X5R/6.3V/K — NBC24 0.1u/4/X7R/16V/K

VCC1P05_OUT_FET — NBC43 0.1u/4/X7R/16V/K — NBC44 0.1u/4/X7R/16V/K — NBC45 0.1u/4/X7R/16V/K — NBC46 0.1u/4/X7R/16V/K

VCC0P85_PCH close to PCH — NBC83 2.2u/4/X5R/6.3V/M
VCCDPHY_1P24 close to PCH — NBC1 4.7u/6/X5R/6.3V/K
VCCPRIM_1P05 — NBC28 0.1u/4/X7R/16V/K

VCC3_PCH — NBC13 1u/4/X5R/6.3V/K — NBC15 1u/4/X5R/6.3V/K — NBC16 1u/4/X5R/6.3V/K — NBC17 1u/4/X5R/6.3V/K — NBC18 1u/4/X5R/6.3V/K — NBC19 1u/4/X5R/6.3V/K — NBC20 1u/4/X5R/6.3V/K

3VDUAL_PCH — NBC25 1u/4/X5R/6.3V/K — NBC26 1u/4/X5R/6.3V/K
VCC1V8_PRIM — NBC39 1u/4/X5R/6.3V/K — NBC73 1u/4/X5R/6.3V/K — NBC74 1u/4/X5R/6.3V/K — NBC75 1u/4/X5R/6.3V/K

VCC3 — NBC79 1u/4/X5R/6.3V/K — NBC80 1u/4/X5R/6.3V/K
VCC1V8_PRIM — NBC38 1u/4/X5R/6.3V/K — NBC76 1u/4/X5R/6.3V/K

PCHG

AD4	VCCST_OVERRIDE	VCCLDOSTD_OUT_0P85	BF4 → VCC0P85_PCH
		VCCLDOSTD_OUT_0P85	BG3
		VCCLDOSTD_OUT_0P85	BG4
VCC3_PCH — V18	VCCPUSB2_3P3		
[11,13,61] N_RTCVDD — BF46	VCCPRTC_3P3	VCCIN_AUX_PCH	AA38 → VCC18_PCH
BG46	VCCPRTC_3P3	VCCIN_AUX_PCH	AC38
BG47	VCCPRTC_3P3	VCCIN_AUX_PCH	AC39
		VCCIN_AUX_PCH	AC41
VCCPRIM_1P05 — AK22	VCCPRIM_FUSE_1P05	VCCIN_AUX_PCH	AC42
		VCCIN_AUX_PCH	AC44
AJ20	VCCPRIM_CNVLDOPLL_1P05	VCCIN_AUX_PCH	AD38
		VCCIN_AUX_PCH	AD39
AA27	VCCPRIM_1P8	VCCIN_AUX_PCH	AD41
AB22	VCCPRIM_1P8	VCCIN_AUX_PCH	AD42
AB23	VCCPRIM_1P8	VCCIN_AUX_PCH	AD44
AB25	VCCPRIM_1P8	VCCIN_AUX_PCH	AE38
AB27	VCCPRIM_1P8	VCCIN_AUX_PCH	AE39
AD20	VCCPRIM_1P8	VCCIN_AUX_PCH	AE41
AD22	VCCPRIM_1P8	VCCIN_AUX_PCH	AE42
AD23	VCCPRIM_1P8	VCCIN_AUX_PCH	AE44
AD25	VCCPRIM_1P8	VCCIN_AUX_PCH	AG38
AD27	VCCPRIM_1P8		
AF20	VCCPRIM_1P8	VCCIN_AUX_VCCSENSE	AH39 → VCC18_PCH_VCCSENSE [40]
AF22	VCCPRIM_1P8	VCCIN_AUX_VSSSENSE	AH41 → VCC18_PCH_VSSSENSE [40]
AF23	VCCPRIM_1P8		
AF25	VCCPRIM_1P8	VCCDPHY_1P24	BD1
AF27	VCCPRIM_1P8	VCCDPHY_1P24	BD2 → VCCDPHY_1P24
		VCCDPHY_1P24	BE1
VCC3_PCH — AA18	VCCPGPPI		
		VCCA_CLKLDO_1P8	P29 → VCCA_CLKLDO_1P8
VCC3_PCH — AP22	VCCPGPPR	VCCA_CLKLDO_1P8	R29
VCC3_PCH — AG18	VCCPGPPHK		
AM37	VCCPGPPEF	VCCPRIM_1P05	AK21 → VCCPRIM_1P05
AU24	VCCPGPPD		
VCC3_PCH — AP19	VCCPGPPG_3P3	VCC1P05	W20
AP24	VCCPGPPBC	VCC1P05	W22
VCC3_A — AP29	VCCPGPPA_3P3	VCC1P05	W23
		VCC1P05	W25 → VCC1P05_OUT_FET
VCC3_PCH — AT35	VCCPFUSE_3P3		
VCC1V8_PRIM — Y37	VCCPFUSE_1P8	VCC_VNNEXT_1P05	AN29
		VCC_V1P05EXT_1P05	AN28 → NTP121
BD48	VCCPDSW_3P3		
3VDUAL_PCH — BD49	VCCPDSW_3P3		
BE49	VCCPDSW_3P3		

FH82Z590 RKM3/S/[10HB1-032590-20R]

1.8V@10.9A

internally with a LDO 1.24 V for CNVi logic

NR239 0/6/X — V1P05A RESERVED

FIVR output rail:1.05V,used for CPU rails VCCST/STG.

VCCPGPPR:Audio Power 3.3 V or 1.8 V.
VCCPGPPBC/D/EF/HK/I:Power rail for GPIOs
REMOVE VCC10_VCCF24_1P0/VCC10_VCCAPLL/VCC10_VCCAMPHYPLL

VCC1V8_PRIM close to pin R29/P29 — NR232 MASK/0/6/SHT/M/X — NR260 0/4 — NBC47 47u/8/X5R/6.3V/M
VCCA_CLKLDO_1P8 — NBC40 0.1u/4/X7R/16V/K — NBC41 0.1u/4/X7R/16V/K — NBC42 0.1u/4/X7R/16V/K

CHECK ESPI POWER LEVEL?
GROUP A INTEL USE 3.3V
VCCBT — VCC3_PCH — NR56 0/6/X — NR224 MASK/0/6/SHT/M/K
VCC3_A — NBC14 1u/4/X5R/6.3V/K

VCC18_PCH PLACE NEAR PCH BGA — NBC48 47u/8/X5R/6.3V/M — NBC49 47u/8/X5R/6.3V/M — NBC50 47u/8/X5R/6.3V/M — NBC51 47u/8/X5R/6.3V/M — NBC52 47u/8/X5R/6.3V/M — NBC86 10u/6/X5R/6.3V/M — NBC87 10u/6/X5R/6.3V/M — NBC88 10u/6/X5R/6.3V/M — NBC89 10u/6/X5R/6.3V/M

VCC18_PCH PLACE UNDERNEATH PCH BGA — NBC81 22u/8/X5R/6.3V/M — NBC82 22u/8/X5R/6.3V/M — NBC84 22u/8/X5R/6.3V/M — NBC85 22u/8/X5R/6.3V/M

PCHH

AW25	VSS	VSS	F42
AW39	VSS	VSS	F8
AY25	VSS	VSS	G1
AY43	VSS	VSS	G41
AY5	VSS	VSS	G48
AY7	VSS	VSS	G49
B1	VSS	VSS	G9
B2	VSS	VSS	H25
B4	VSS	VSS	H43
B46	VSS	VSS	H8
B48	VSS	VSS	J11
B49	VSS	VSS	J25
B6	VSS	VSS	J39
BA41	VSS	VSS	J9
BA43	VSS	VSS	K11
BA49	VSS	VSS	K39
BA9	VSS	VSS	K45
BB25	VSS	VSS	K5
BB44	VSS	VSS	L14
BB8	VSS	VSS	L25
BC11	VSS	VSS	M12
BC15	VSS	VSS	M17
BC19	VSS	VSS	M19
BC24	VSS	VSS	M21
BC25	VSS	VSS	M22
BC26	VSS	VSS	M24
BC31	VSS	VSS	M25
BC35	VSS	VSS	M26
BC39	VSS	VSS	M28
BC41	VSS	VSS	M29
BC9	VSS	VSS	M31
BF1	VSS	VSS	M33
BF13	VSS	VSS	M38
BF2	VSS	VSS	M49
BF42	VSS	VSS	M5
BF48	VSS	VSS	P12
BF49	VSS	VSS	P21
BG17	VSS	VSS	P24
BG2	VSS	VSS	P25
BG22	VSS	VSS	P28
BG25	VSS	VSS	P38
BG28	VSS	VSS	P4
BG33	VSS	VSS	P45
BG37	VSS	VSS	P5
BG41	VSS	VSS	R21
BG48	VSS	VSS	R24
BG9	VSS	VSS	R25
C1	VSS	VSS	R28
C12	VSS	VSS	T1
C24	VSS	VSS	T12
C4	VSS	VSS	T15
C49	VSS	VSS	T17
C7	VSS	VSS	T33
D1	VSS	VSS	T38
D13	VSS	VSS	T49
D2	VSS	VSS	U19
D24	VSS	VSS	U21
D25	VSS	VSS	U22
D33	VSS	VSS	U24
D37	VSS	VSS	U25
D48	VSS	VSS	U26
D49	VSS	VSS	U28
D7	VSS	VSS	U29
E13	VSS	VSS	U31
E15	VSS	VSS	V12
E19	VSS	VSS	V17
E22	VSS	VSS	V21
E24	VSS	VSS	V22
E25	VSS	VSS	V24
E26	VSS	VSS	V25
E31	VSS	VSS	V26
E33	VSS	VSS	V33
E35	VSS	VSS	V38
E37	VSS	VSS	V5
E39	VSS	VSS	W27
E9	VSS	VSS	W28
F25	VSS	VSS	W30
	VSS	VSS	W44
	VSS	VSS	Y12
	VSS	VSS	Y13
	VSS	VSS	Y15
	VSS	VSS	Y17
	VSS	VSS	Y18
	VSS	VSS	Y32
	VSS	VSS	Y38

FH82Z590 RKM3/S/[10HB1-032590-20R]

PCHI

A17	VSS	VSS	AJ23
A2	VSS	VSS	AJ25
A28	VSS	VSS	AJ27
A3	VSS	VSS	AJ28
A33	VSS	VSS	AK12
A37	VSS	VSS	AK17
A4	VSS	VSS	AK18
A41	VSS	VSS	AK24
A45	VSS	VSS	AK25
A46	VSS	VSS	AK26
A47	VSS	VSS	AK28
A48	VSS	VSS	AK29
AA12	VSS	VSS	AK30
AA13	VSS	VSS	AK32
AA20	VSS	VSS	AK33
AA22	VSS	VSS	AK35
AA23	VSS	VSS	AK38
AA25	VSS	VSS	AK45
AA29	VSS	VSS	AK5
AA30	VSS	VSS	AL19
AA32	VSS	VSS	AL22
AA33	VSS	VSS	AL24
AA35	VSS	VSS	AL25
AA37	VSS	VSS	AL26
AA49	VSS	VSS	AL28
AA5	VSS	VSS	AL29
AB28	VSS	VSS	AL31
AC13	VSS	VSS	AM1
AC18	VSS	VSS	AM12
AC35	VSS	VSS	AM17
AC37	VSS	VSS	AM33
AC4	VSS	VSS	AM35
AC45	VSS	VSS	AM38
AC5	VSS	VSS	AM49
AC9	VSS	VSS	AN17
AD11	VSS	VSS	AN19
AD12	VSS	VSS	AN22
AD13	VSS	VSS	AN24
AD15	VSS	VSS	AN25
AD17	VSS	VSS	AN26
AD18	VSS	VSS	AN31
AD28	VSS	VSS	AN33
AD35	VSS	VSS	AP12
AD37	VSS	VSS	AP17
AD45	VSS	VSS	AP21
AD49	VSS	VSS	AP25
AD5	VSS	VSS	AP26
AD6	VSS	VSS	AP28
AD8	VSS	VSS	AP31
AD9	VSS	VSS	AP33
AE12	VSS	VSS	AP38
AE13	VSS	VSS	AP45
AE15	VSS	VSS	AP5
AE17	VSS	VSS	AT1
AE18	VSS	VSS	AT12
AE35	VSS	VSS	AT17
AE37	VSS	VSS	AT19
AE45	VSS	VSS	AT21
AE5	VSS	VSS	AT22
AF28	VSS	VSS	AT24
AG1	VSS	VSS	AT25
AG12	VSS	VSS	AT26
AG17	VSS	VSS	AT28
AG20	VSS	VSS	AT29
AG22	VSS	VSS	AT31
AG23	VSS	VSS	AT33
AG25	VSS	VSS	AT37
AG27	VSS	VSS	AT49
AG28	VSS	VSS	AT5
AG35	VSS	VSS	AU25
AG37	VSS	VSS	AU41
AG49	VSS	VSS	AV11
AH12	VSS	VSS	AV39
AH13	VSS	VSS	AV45
AH15	VSS	VSS	AV5
AH35	VSS	VSS	AW11
AH38	VSS	VSS	AW24

FH82Z590 RKM3/S/[10HB1-032590-20R]

ANS 08656340

Gigabyte Technology

Title: PCH PWR, GND

Size: Custom | Document Number: Z590 UD AC | Rev: 1.01

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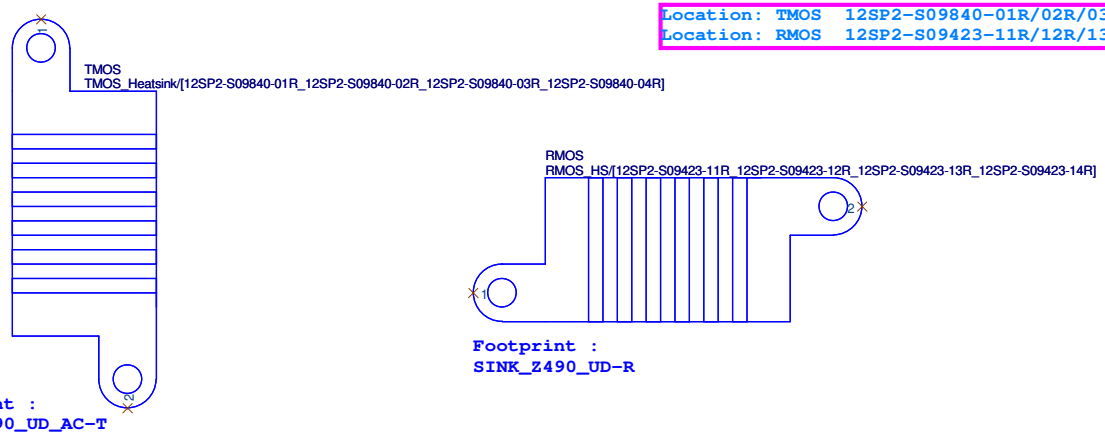
裝甲HEATSINK 分成四大部份

MOS_HS

Location: TMOS 12SP2-S09840-01R/02R/03R/04R
Location: RMOS 12SP2-S09423-11R/12R/13R/14R

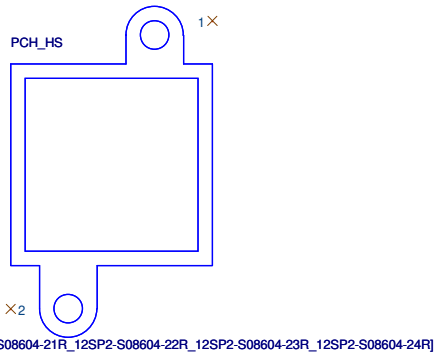


Footprint :
SINK_Z590_UD_AC-T

Footprint :
SINK_Z490_UD-R

PCH_HS

Location: PCH_HS 12SP2-S08604-21R/22R/23R/24R

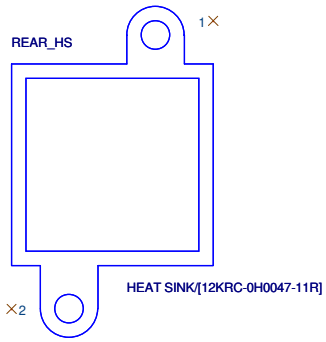


PCH_FS/[12SP2-S08604-21R_12SP2-S08604-22R_12SP2-S08604-23R_12SP2-S08604-24R]

Footprint :
BGAHSINK-Z370_HD3P

裝甲

Location: REAR_HS 12KRC-0H0047-11R

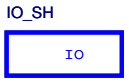


HEAT SINK/[12KRC-0H0047-11R]

Footprint :
Z490_UD_IO_COVER

後窗鐵片

Location: IO_SH
UD 11AIO-010061-12R
UD AC 11AIO-010061-02R



IO/[11AIO-010061-02R]

*UD與UD AC鐵片不同

- PCB顏色 ： 咖啡黑
- 文字面 ： 灰色
- 疊構 ： 2E7 (2OZ)
- 圖騰:ID設計Z590版GIGABYTE UD

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Gigabyte Technology		
Title: Heatsink		
Size: Custom	Document Number: Z590 UD AC	Rev: 1.01
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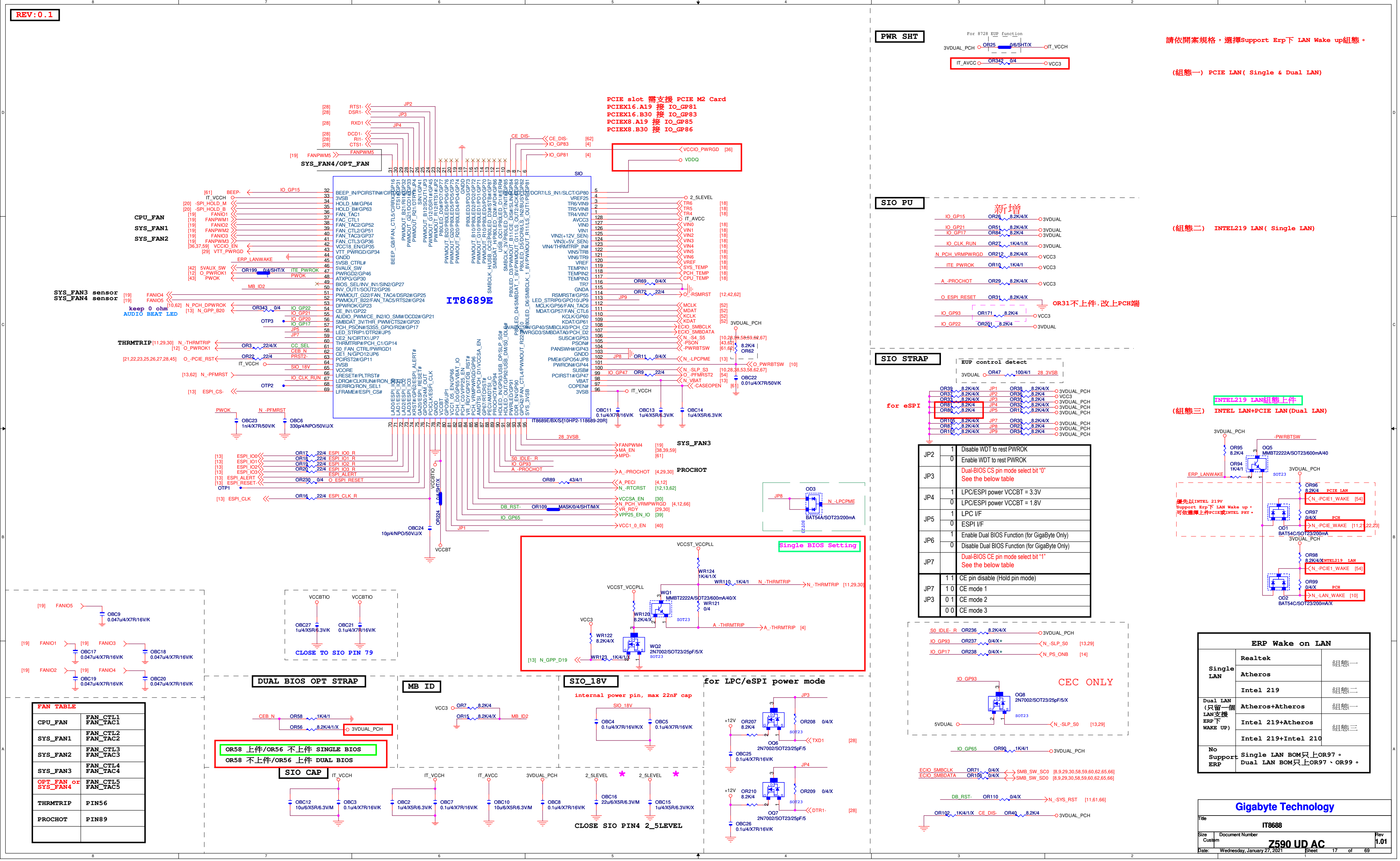
REV:0.1



JP	Setting	Function
JP2	1	Disable WDT to rest PWROK
	0	Enable WDT to rest PWROK
JP3		Dual-BIOS CS pin mode select bit "0" See the below 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 below 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

ERP Wake on LAN

Single LAN	Realtek	組態一
	Atheros	
	Intel 219	組態二
Dual LAN (只留一個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
Title: IT8688
Size: Custom | Document Number: Z590 UD AC | Rev: 1.01
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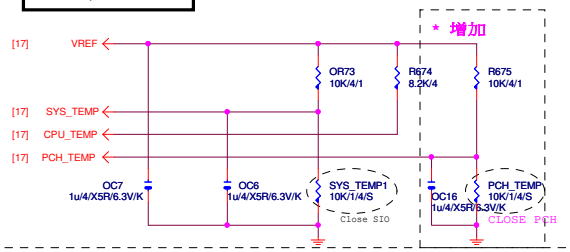
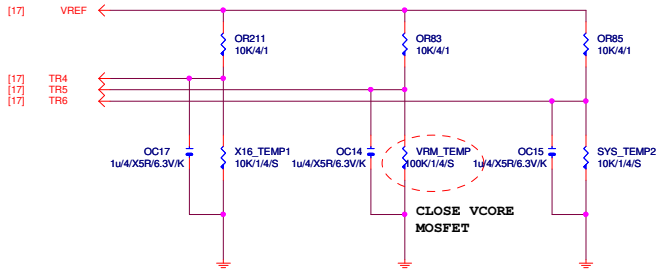
TEMP H/W MONITOR

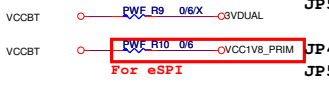


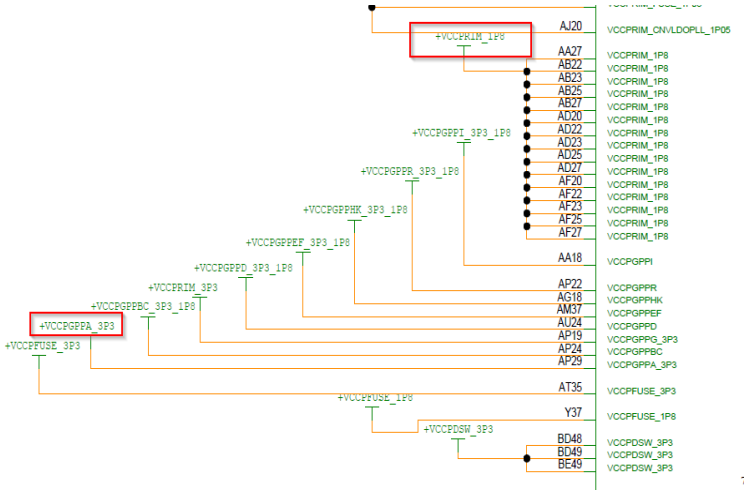
5個FAN時使用



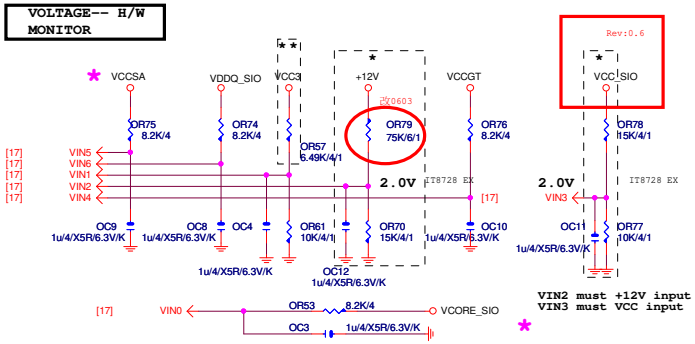
JP4 HI ESPI MODE VCCBT 3.3V
JP5 HI ESPI MODE LPC I/F

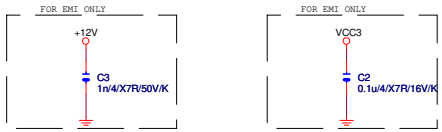
JP4 LO ESPI MODE VCCBT 1.8V
JP5 LO ESPI MODE ESPI I/F





VOLTAGE-- H/W MONITOR





★Update 2015-04.24

Gigabyte Technology		
Title: HWM,KB/MS, FAN CTRL		
Size: Custom	Document Number: Z590 UD AC	Rev: 1.01
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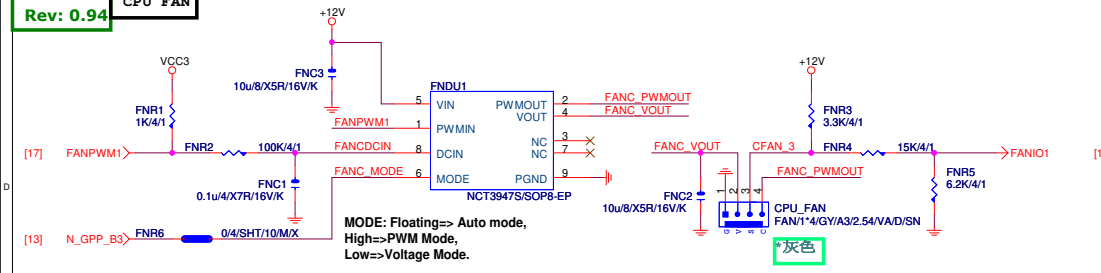
Rev: 0.94

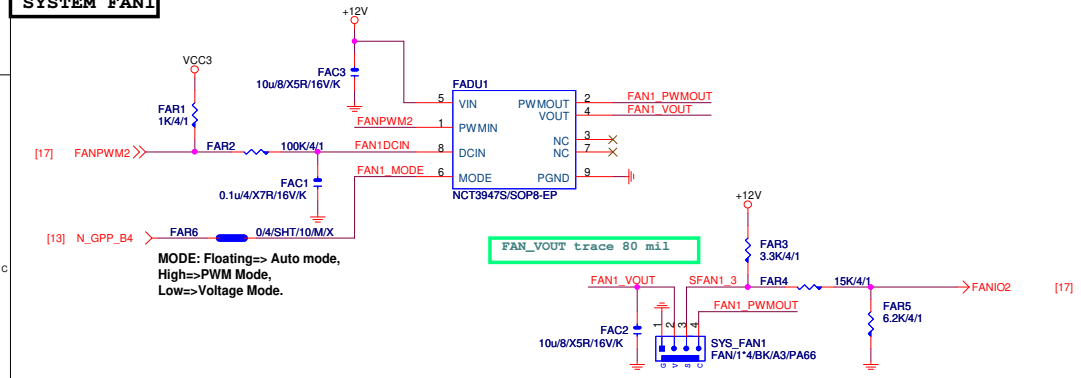
CPU FAN



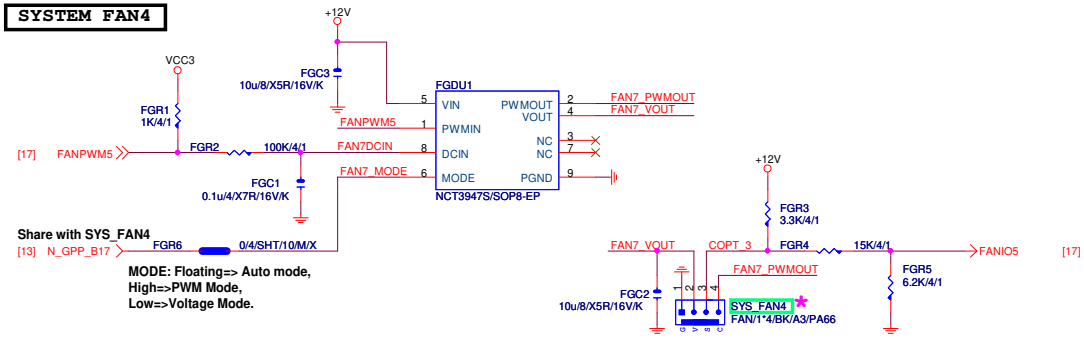
IO 4 FAN

CPU_FAN
SYS_FAN1
SYS_FAN2
SYS_FAN3
SYS_FAN4

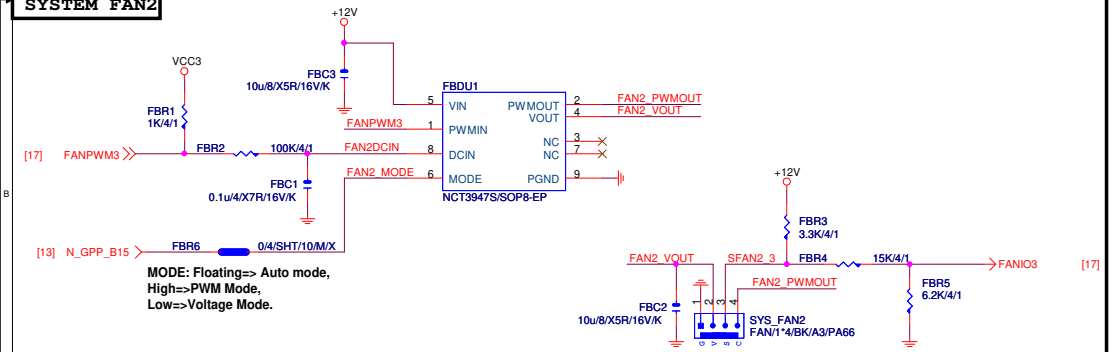
SYSTEM FAN1

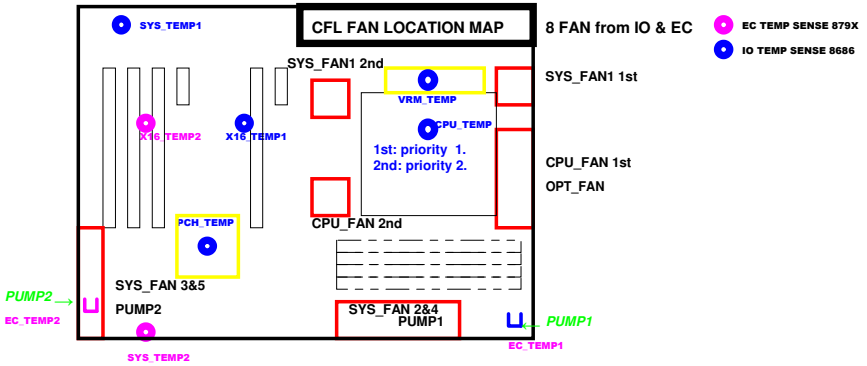


SYSTEM FAN4

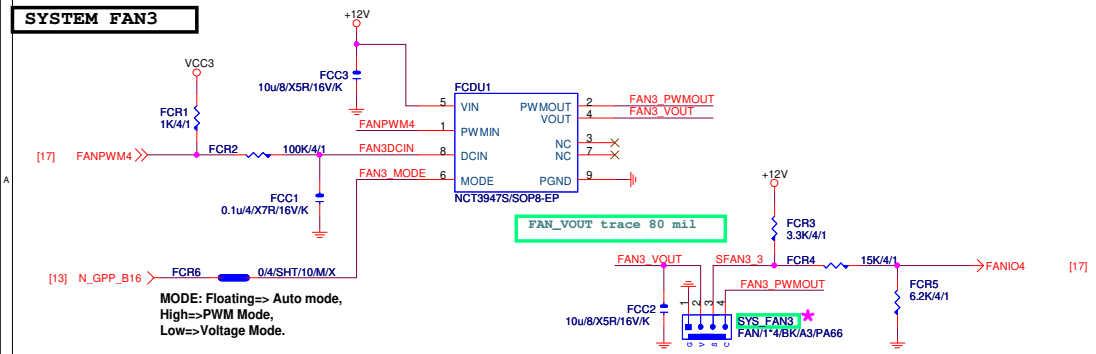


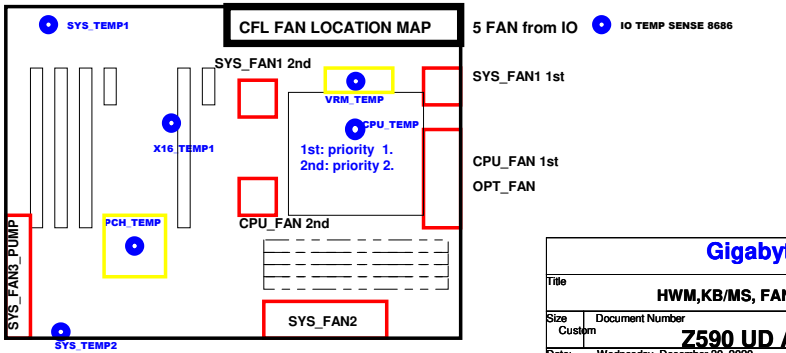
SYSTEM FAN2





SYSTEM FAN3





Gigabyte Technology

Title	HWM,KB/MS, FAN CTRL
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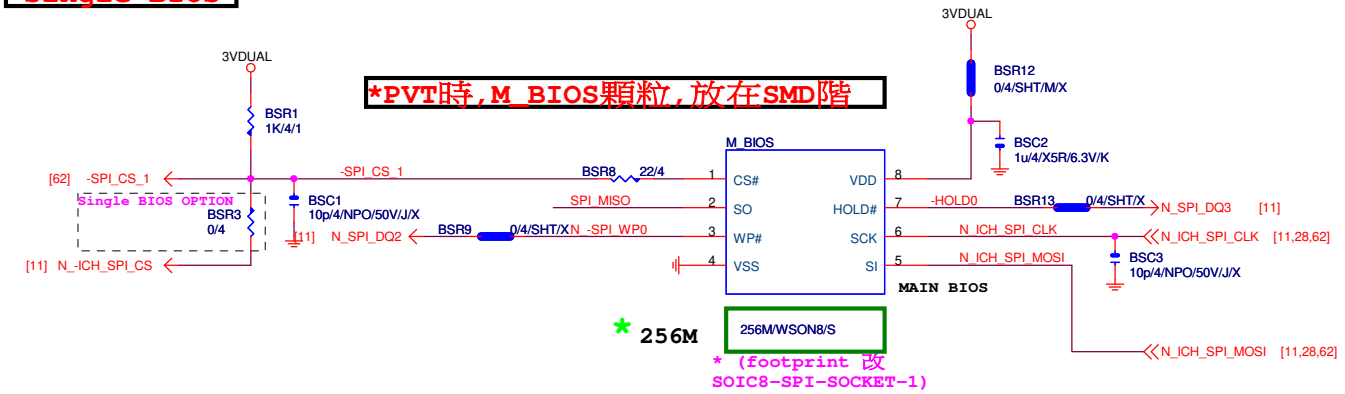
DUAL BIOS

*Single BIOS

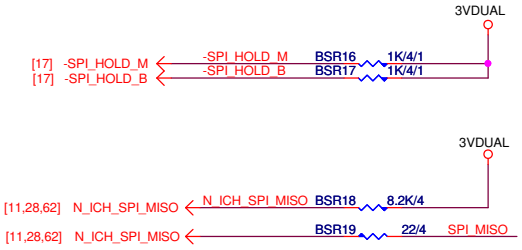
*PVT時,M_BIOS顆粒,放在SMD階



* 256M

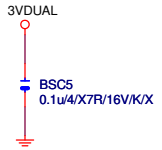
* (footprint 改 SOIC8-SPI-SOCKET-1)

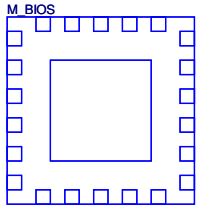
MOSI For DMI RX Termination Voltage



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

1 means floating
0 means PD 1K





LCP/G-FL/1.27mm/200MIL/WHITE[10SL2-000008-71R]/X

* 試產先上 , PVT 移除

Gigabyte Technology		
Title: BIOS		
Size: Custom	Document Number: Z590 UD AC	Rev: 1.01
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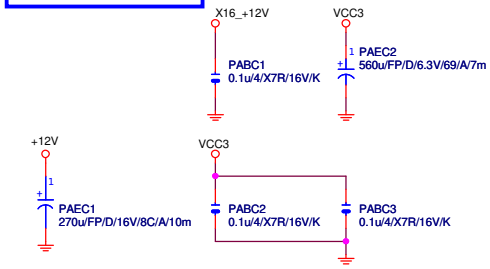
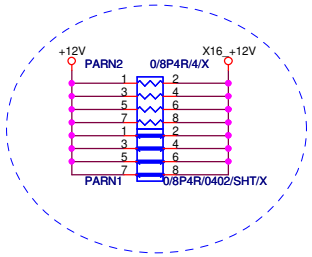
Rev 0.3

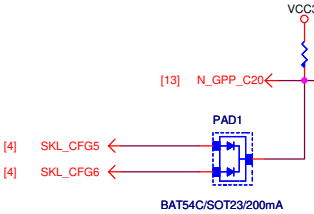
PCIEX16 CAP



PCIEX16 PROTECT SHT



+12 protect
short-wire test



PCIEX16 AC CAP

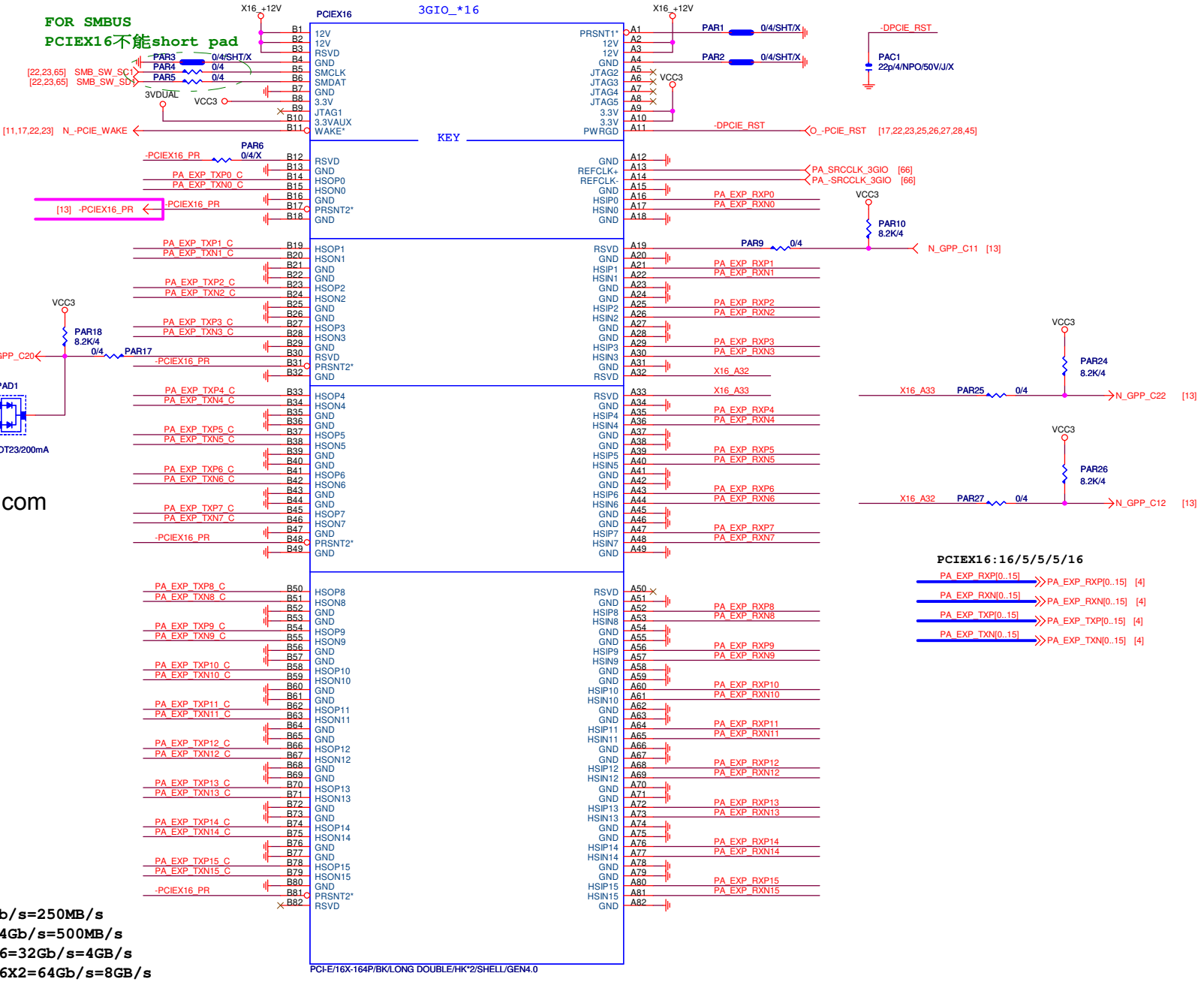
teknisi-indonesia.com

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 SLOT

PCIESLOT-164STH

FOR SMBUS
PCIEX16不能short pad



PCIEX16:16/5/5/5/16

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]

黑色 金屬 加強

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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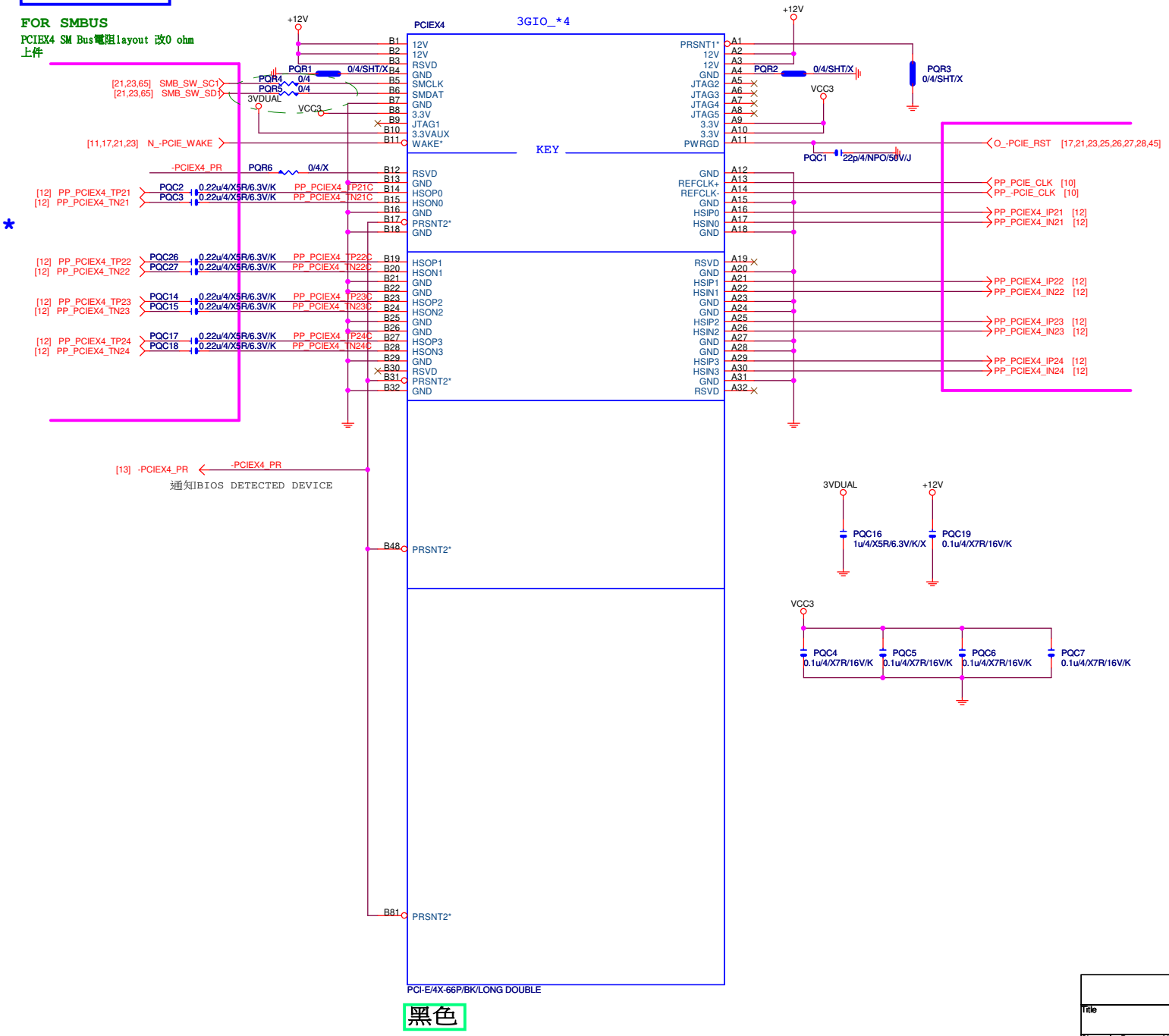
Rev 0.51

PCIE*4

* Footprint "PCIESLOT-64P-1"

FOR SMBUS

PCIEX4 SM Bus電阻layout 改0 ohm 上件



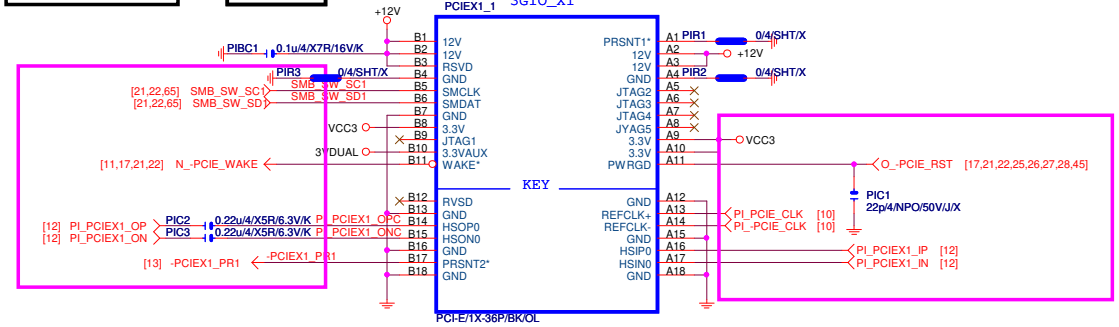
黑色

Gigabyte Technology		
Title	PCIE_X4	
Size: Custom	Document Number: Z590 UD AC	Rev: 1.01
Date: Wednesday, December 30, 2020	Sheet 22 of 69	

Rev 0.51

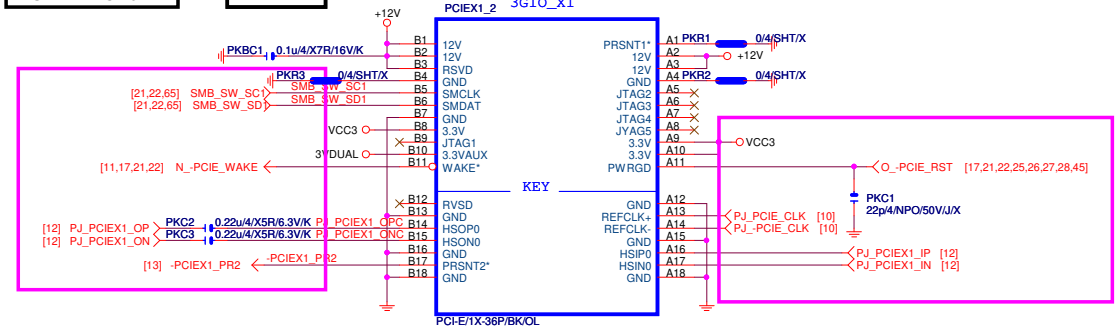
PCIEX1 SLOT

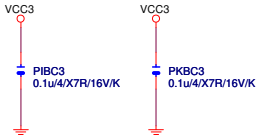
PCIEX1_1



PCIEX1 SLOT

PCIEX1_2





Gigabyte Technology

Title: PCIE X1 *3

Size: Custom | Document Number: Z590 UD AC | Rev: 1.01

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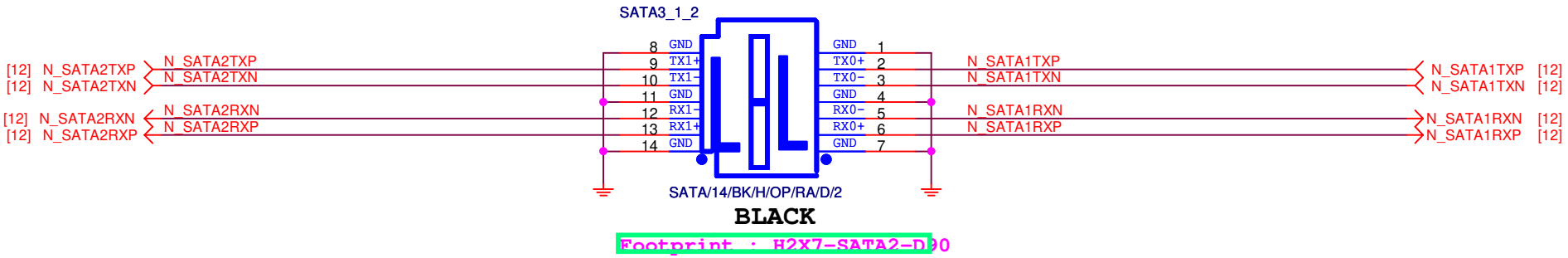
IO19/IO20 To SATA3 port1/2

SATA3 1/2

4 SATA3 from Z590 (180度R-A)

1 SATA3 from Z590 (90度V-A)

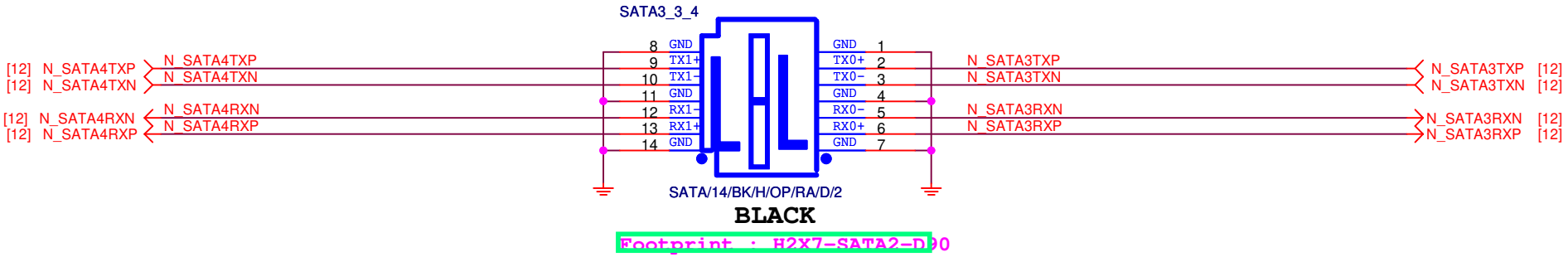
上 Port (8~14)　　下 Port (1~7)



IO21/IO22 To SATA3 port3/4

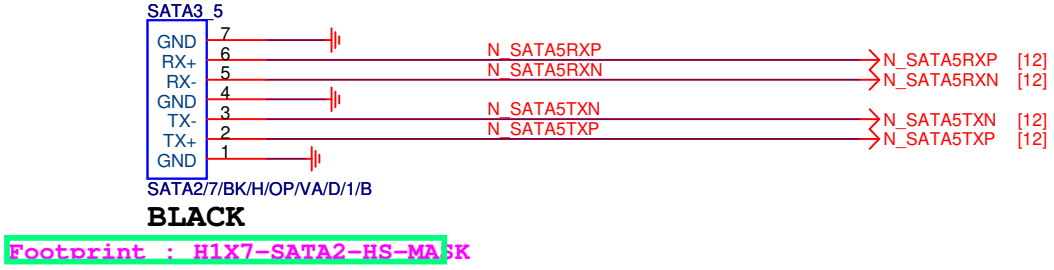
SATA3 2/3

上 Port (8~14)　　下 Port (1~7)



IO23 To SATA3 port5

SATA3 4/5



Gigabyte Technology

Title: SATA

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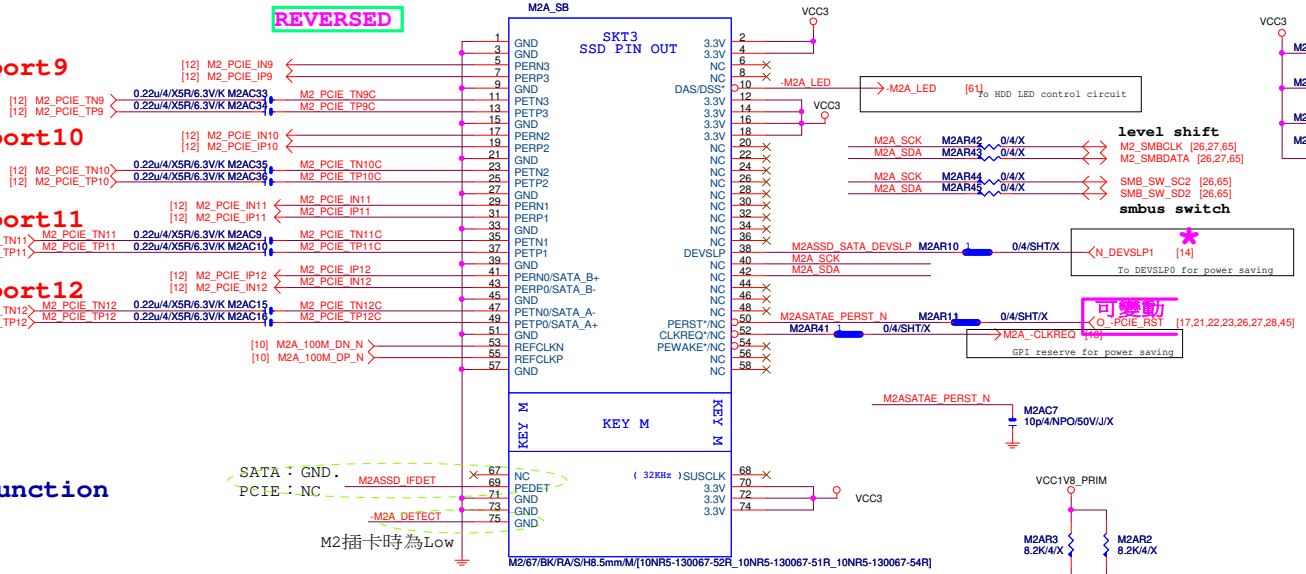
Rev 0.1

M.2 Lane4 from PCH port9

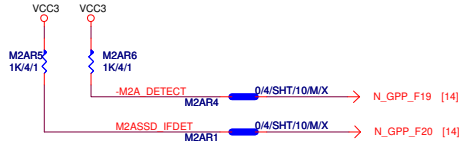
M.2 Lane3 from PCH port10

M.2 Lane2 from PCH port11

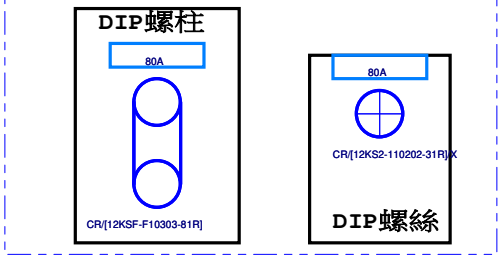
M.2 Lane1 from PCH port12

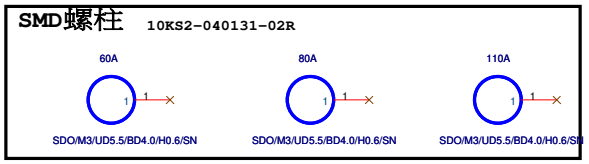


支援SATA and M.2 function



放在包材裡





★ Footprint : HOLE_C236D165-A
10KS2-040131-02R:SDO/M3/UD5.5/BD4.0/H0.6/SN

Flex IO priority	N_GPP_F20	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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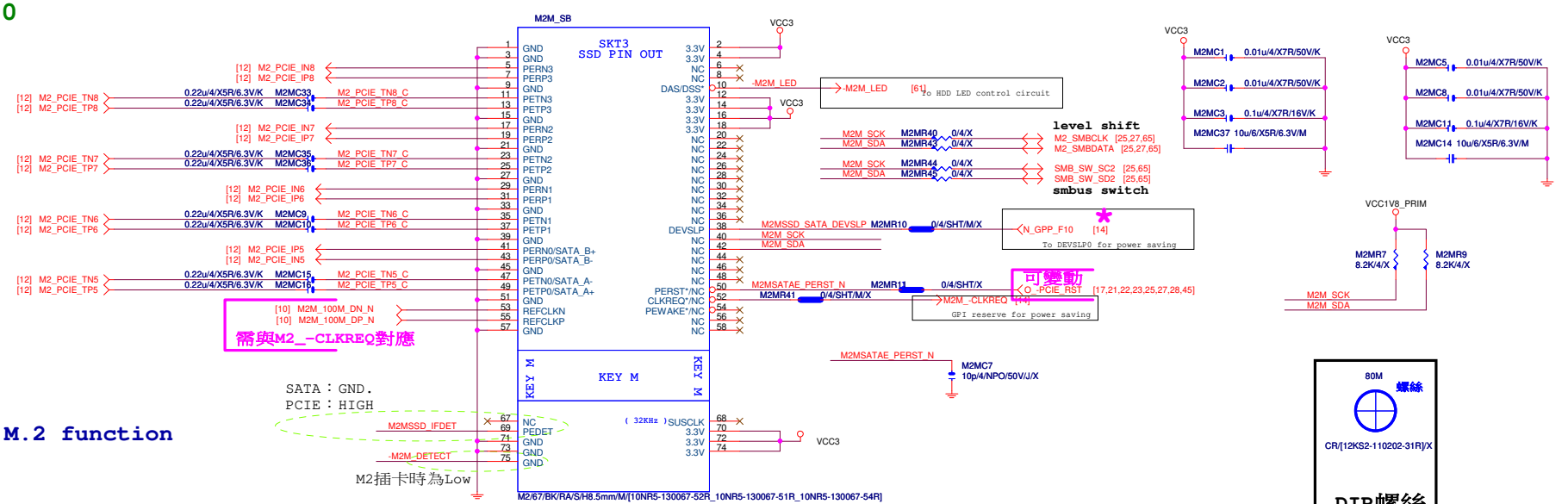
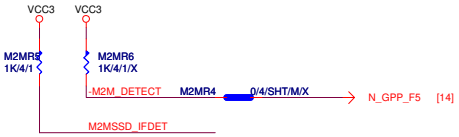
Rev 0.1

Z390

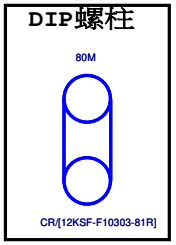


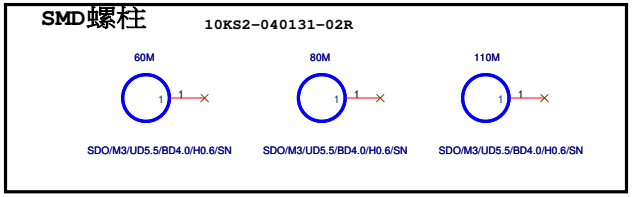
支援SATA and M.2 function



架高

Footprint : M2_110_H2MM8W





Flex IO priority	N_GPP_F5	IO22 PCIe#17	IO23 PCIe#18	IO24 PCIe#19	IO25 PCIe#20
M2M SATA	L	SATA 4	SATA 5	PCIE	PCIE
M2M PCIE	H	PCIE	PCIE	PCIE	PCIE

Gigabyte Technology

Title: M.2 X4

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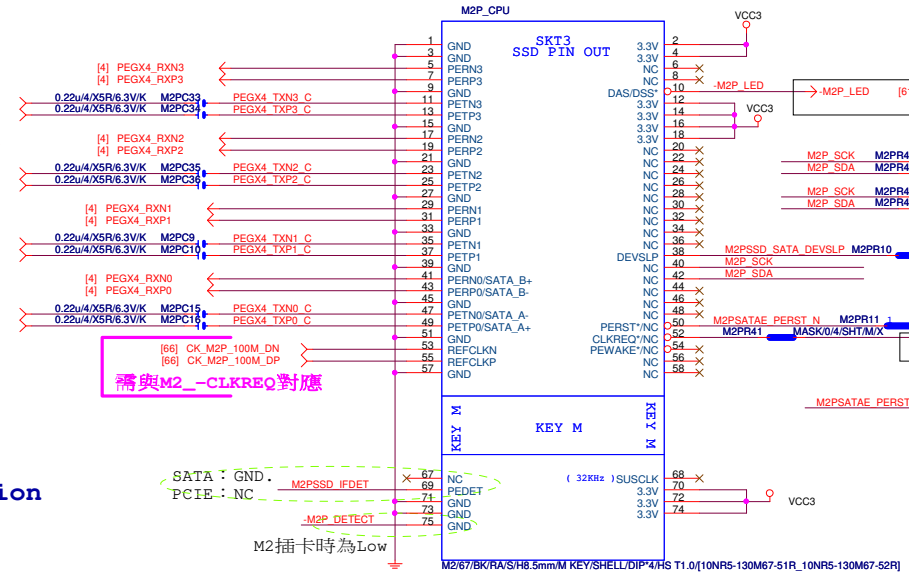
Rev 0.1

M.2 Lane4 from CPU port4

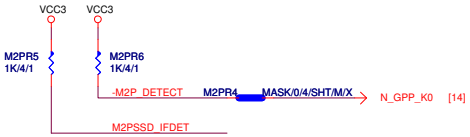
M.2 Lane3 from CPU port3

M.2 Lane2 from CPU port2

M.2 Lane1 from CPU port1

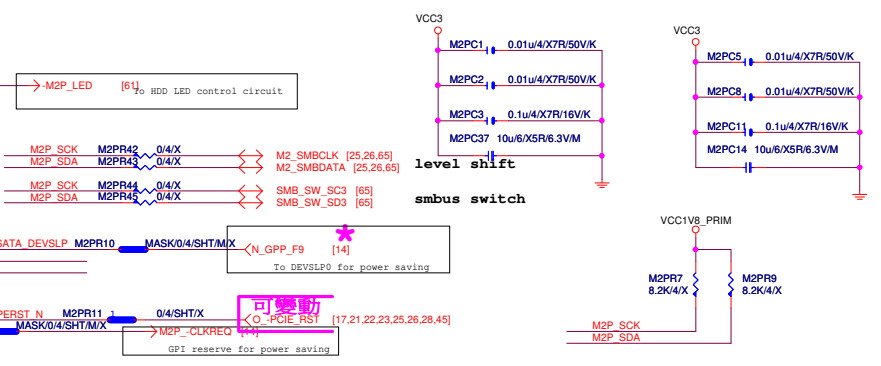


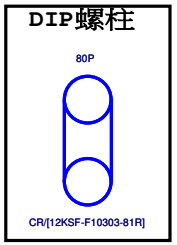
支援SATA and M.2 function

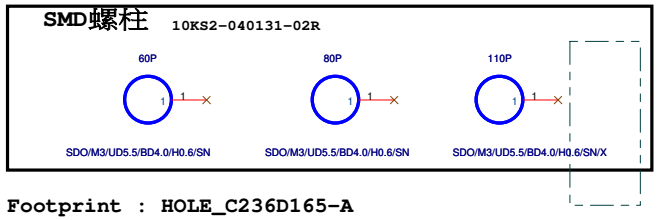


架高 金屬 加強

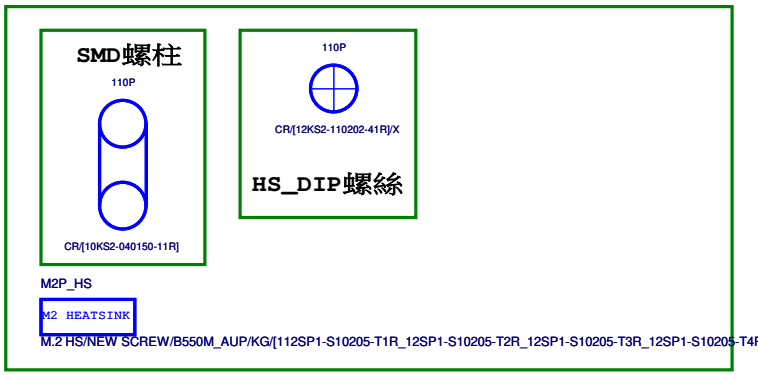
Footprint : M2_110_H2MM8W







Footprint : HOLE_C236D165-A



Gigabyte Technology

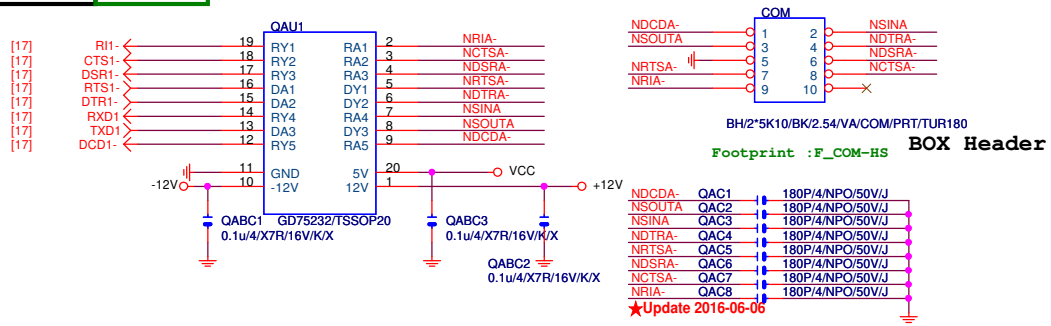
Title: M.2 X4 (P)

Size: Custom | Document Number: Z590 UD AC | Rev: 1.01

Date: Wednesday, December 30, 2020 | Sheet 27 of 69

COM PORT

Rev: 0.94

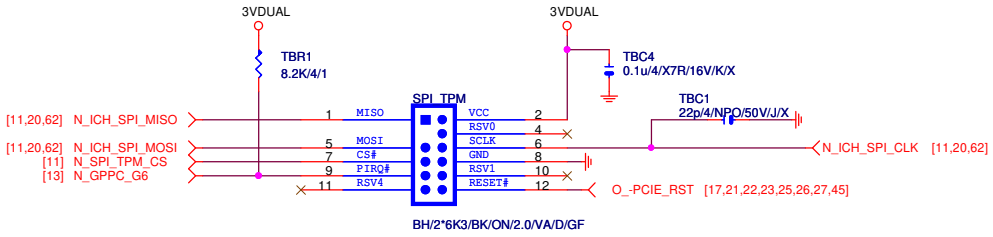


LPT PORT

RTD3 GPIO refer by Intel RVP

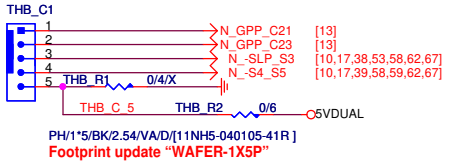
GPIO	CFL-S	CML-U	CML-H	CML-S
TBT_PERST_N	GPP_F_2	GPPC_C15_SLOT1_RST_N	GPP_F4_SATAPCIE7	GPP_F2
TBT_Wake_N	GPP_H_15	GPPC_D11_SLOT1_WAKE_N	GPPK_18	GPP_H15
RTD3_PWN_EN	GPP_I_5	GPPC_D15	GPP_H_16_SML4_CLK	GPP_K23

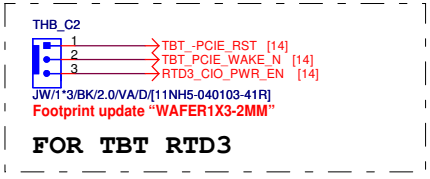
TPM CONNECT



Thunderbolt

★Update 2015-12-29





Z490系列使用

TBT_-PCIE_RST : CFL connector to GPP_F_2
TBT_PCIE_WAKE_N : CFL connector to GPP_H_15
RTD3_CIO_PWR_EN : CFL connector to GPP_K_3

Gigabyte Technology		
Title: FP,F_USB,USB PWR,BZ		
Size: Custom	Document Number: Z590 UD AC	Rev: 1.01
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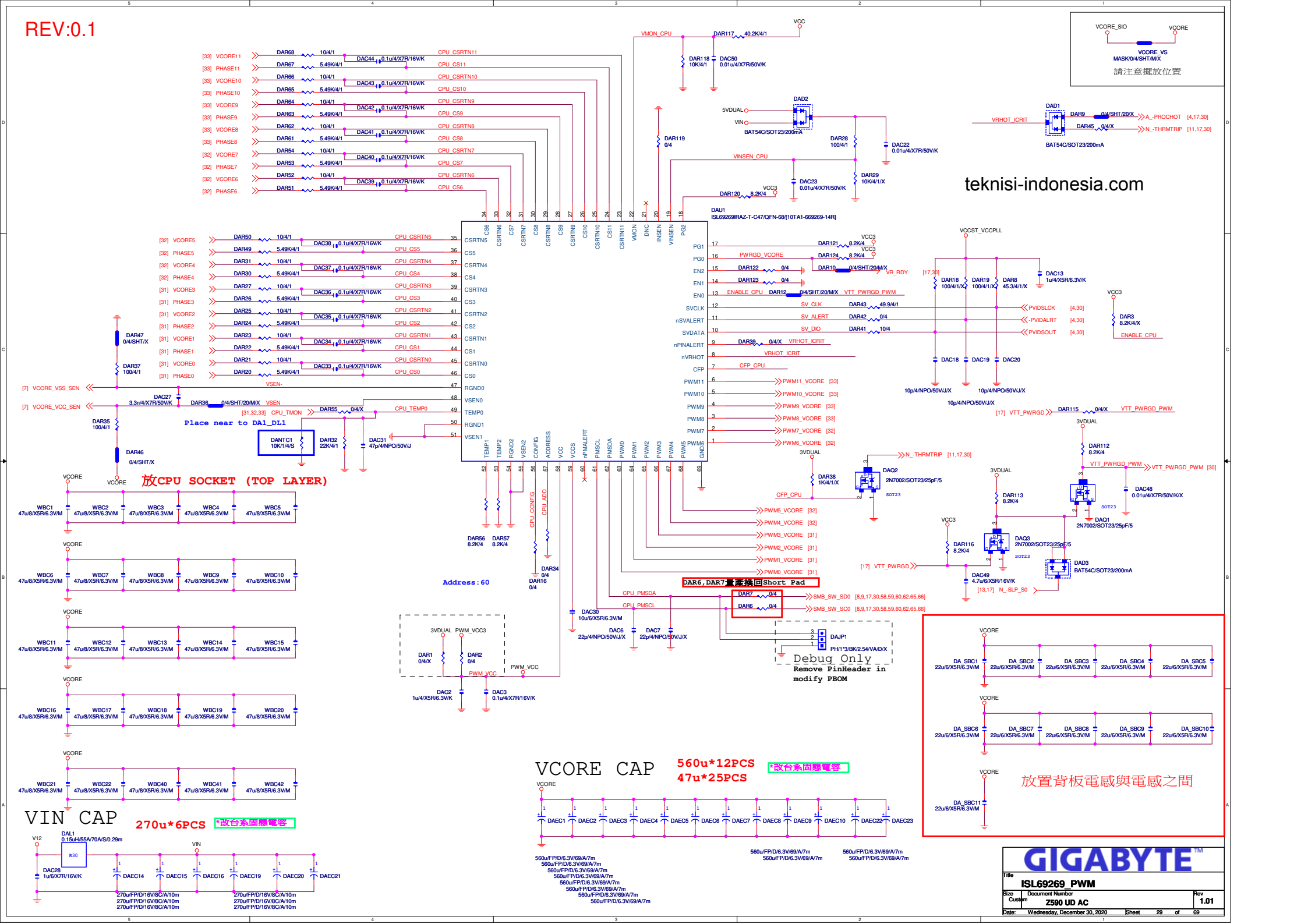
REV:0.1


VCORE_SIO
VCORE
VCORE_VS
MASK/0/4/SHT/M/X
請注意擺放位置
teknisi-indonesia.com
DAU1
ISL69269IRAZ-T-C47/QFN-68[10TA1-669269-14R]
CPU_CSRTN11
CPU_CS11
CPU_CSRTN10
CPU_CS10
CPU_CSRTN9
CPU_CS9
CPU_CSRTN8
CPU_CS8
CPU_CSRTN7
CPU_CS7
CPU_CSRTN6
CPU_CS6
CPU_CSRTN5
CPU_CS5
CPU_CSRTN4
CPU_CS4
CPU_CSRTN3
CPU_CS3
CPU_CSRTN2
CPU_CS2
CPU_CSRTN1
CPU_CS1
CPU_CSRTN0
CPU_CS0
VSEN-
VSEN
CPU_TMON
CPU_TEMP0
Place near to DA1_DL1
DANTC1
10K/1/4/S
放CPU SOCKET (TOP LAYER)
Address:60
DAR6,DAR7量產換回Short Pad
Debug Only
Remove PinHeader in modify PBOM
VIN CAP
270u*6PCS
*改台系固態電容
VCORE CAP
560u*12PCS
47u*25PCS
*改台系固態電容
放置背板電感與電感之間
GIGABYTE
ISL69269_PWM
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29
69

REV:0.1

Connect to IT8688

Place near to DX_DL1

Address:63

* A_CPU_ID
1: RKL -->ADDRESS=63_ID=0
0: CML -->ADDRESS=63_ID=7

VCCGT CAP

*改台系固態電容

560u*3PCS

47u*7PCS

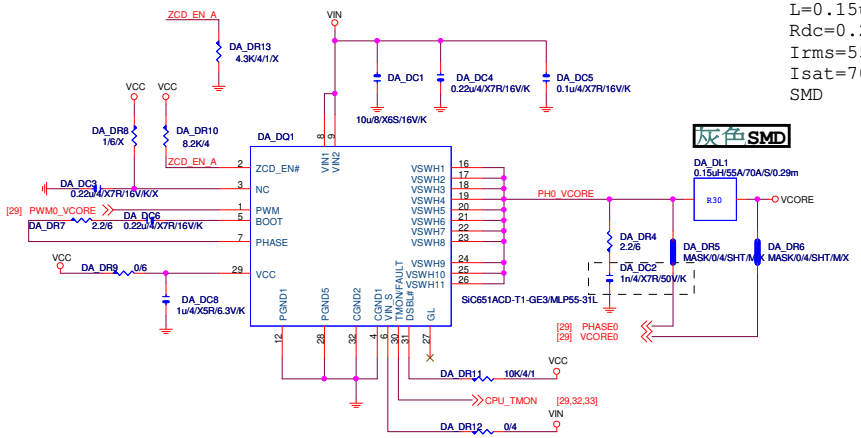
放CPU SOCKET (Bottom LAYER)

20MIL

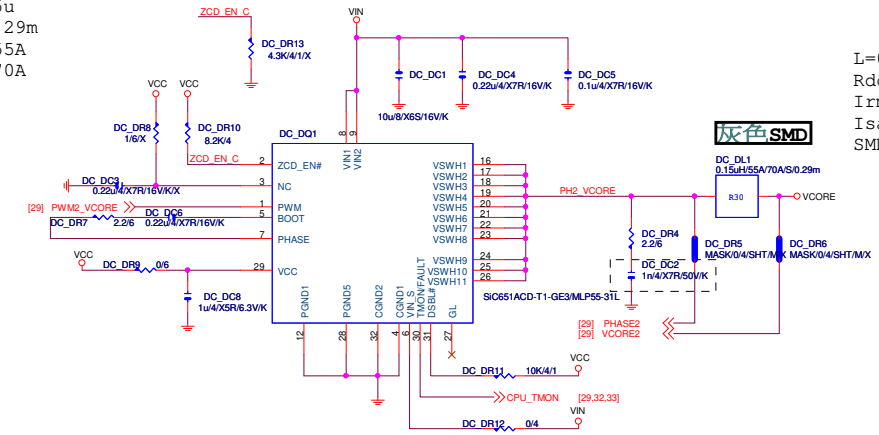
Title	RAA229001_PWM
Size / Custom	Document Number: Z590 UD AC
Rev	1.01
Date:	Wednesday, December 30, 2020
Sheet	30 of 69

REV:0.1

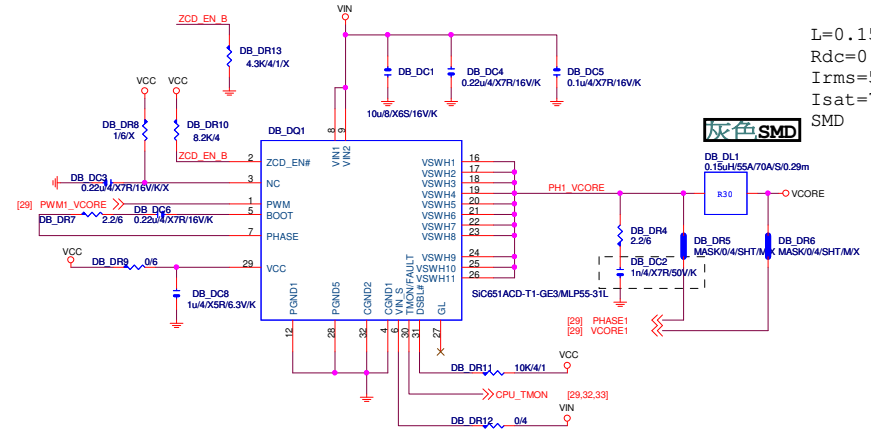
DRMOS使用NCP302155時PIN2 and PIN3要上件(Ex:DA_DR13.DA_DR8.DA_DC3)



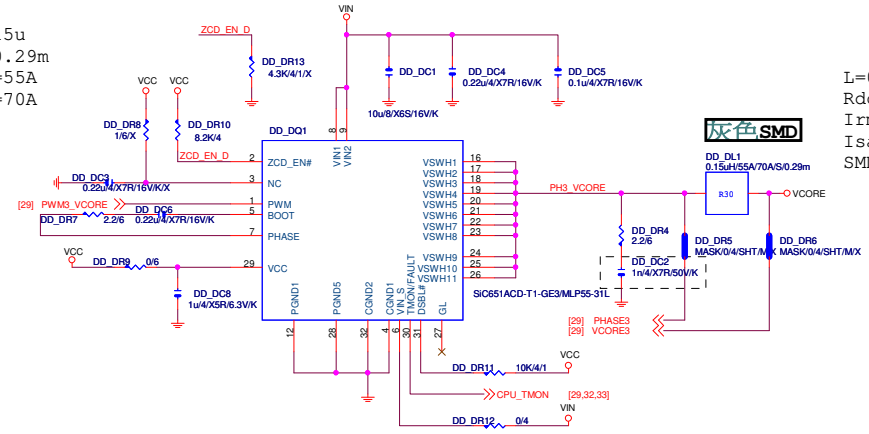
L=0.15u
Rdc=0.29m
Irms=55A
Isat=70A
SMD



L=0.15u
Rdc=0.29m
Irms=55A
Isat=70A
SMD



L=0.15u
Rdc=0.29m
Irms=55A
Isat=70A
SMD



L=0.15u
Rdc=0.29m
Irms=55A
Isat=70A
SMD

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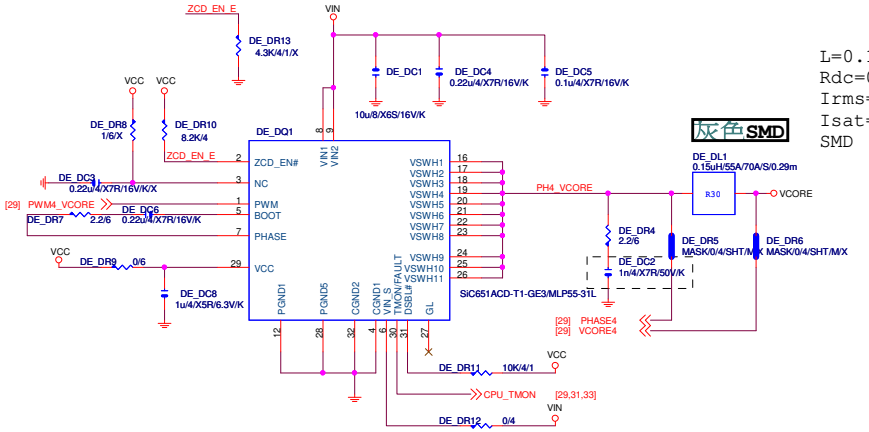
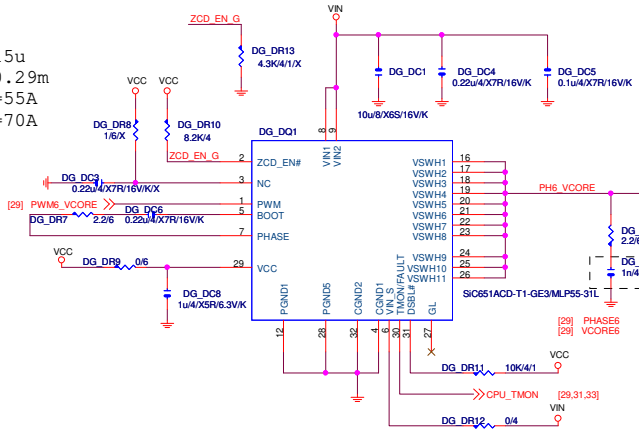
Title	VCORE_DRMOS-1	
Size: Custom	Document Number: Z590 UD AC	Rev: 1.01
Date: Wednesday, December 30, 2020	Sheet 31 of 69	

REV:0.1

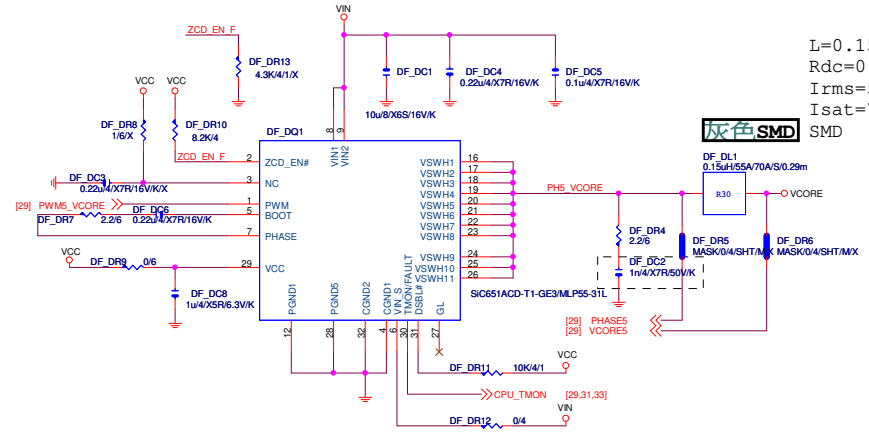
DRMOS使用NCP302155時PIN2 and PIN3要上件(Ex:DA_DR13.DA_DR8.DA_DC3)



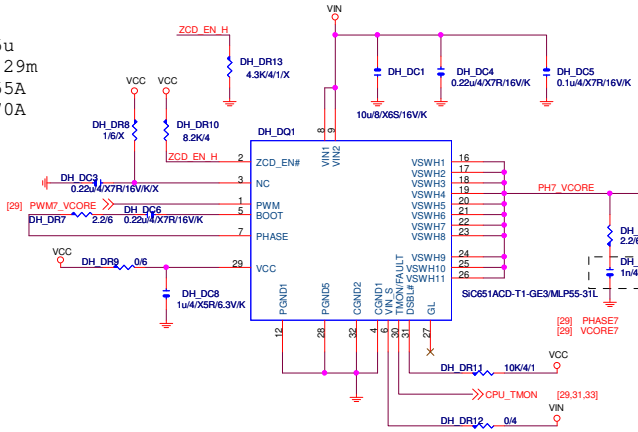
L=0.15u
Rdc=0.29m
Irms=55A
Isat=70A
SMD



L=0.15u
Rdc=0.29m
Irms=55A
Isat=70A
SMD



L=0.15u
Rdc=0.29m
Irms=55A
Isat=70A
SMD



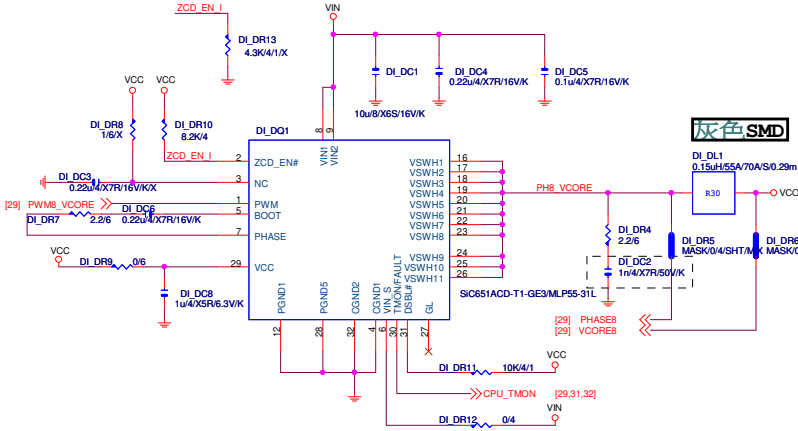
L=0.15u
Rdc=0.29m
Irms=55A
Isat=70A
SMD

GIGABYTE™

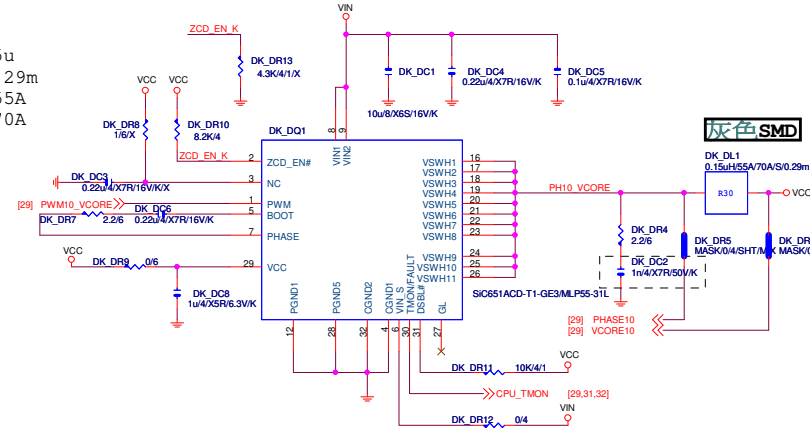
Title	VCORE_DRMOS-2	
Size: Custom	Document Number: Z590 UD AC	Rev: 1.01
Date: Wednesday, December 30, 2020	Sheet 32 of 69	

REV:0.1

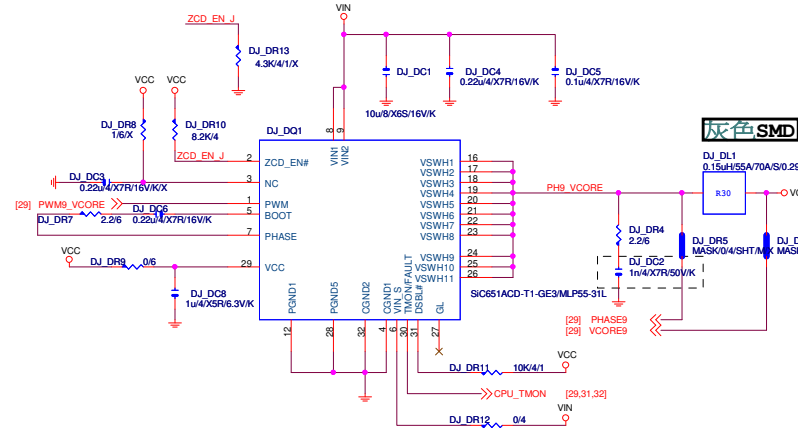
DRMOS使用NCP302155時PIN2 and PIN3要上件(Ex:DA_DR13.DA_DR8.DA_DC3)



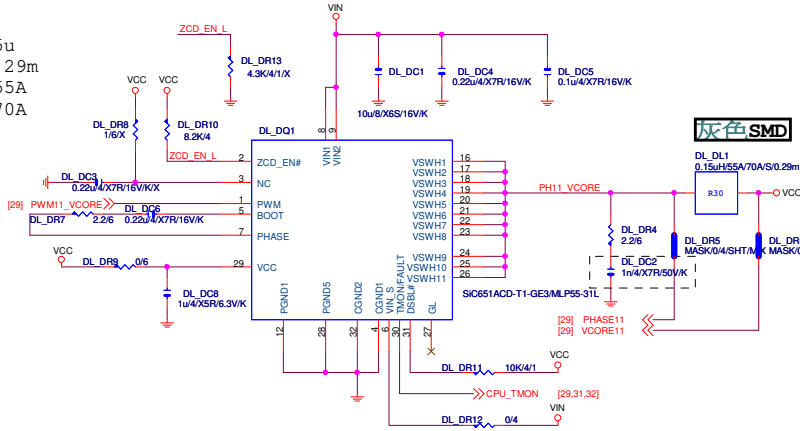
L=0.15u
Rdc=0.29m
Irms=55A
Isat=70A
SMD



L=0.15u
Rdc=0.29m
Irms=55A
Isat=70A
SMD



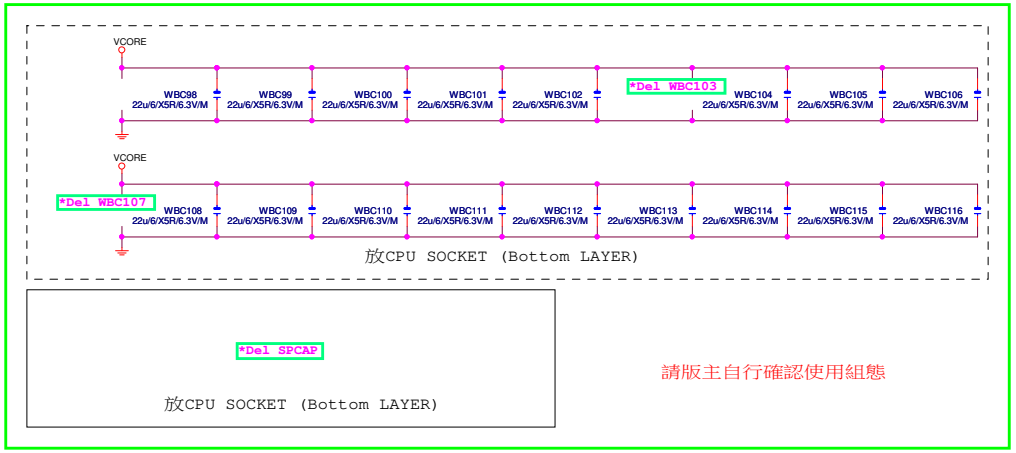
L=0.15u
Rdc=0.29m
Irms=55A
Isat=70A
SMD



L=0.15u
Rdc=0.29m
Irms=55A
Isat=70A
SMD

*Del SPCAP

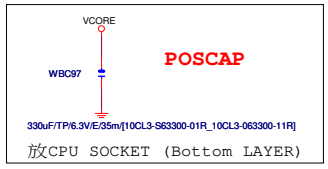
請版主自行確認是否使用
請版主自行確認使用330u or 470u



*Del SPCAP

放CPU SOCKET (Bottom LAYER)

請版主自行確認使用組態



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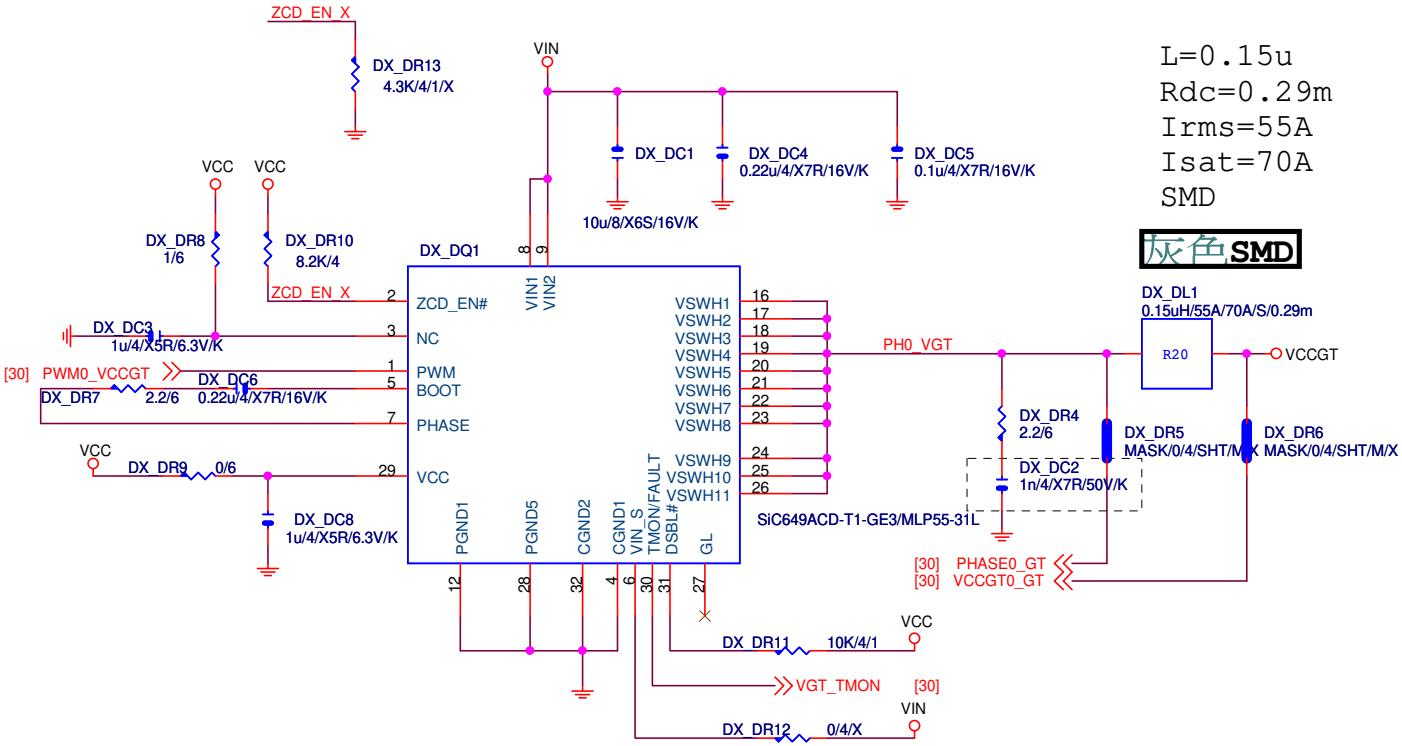
Title	VCORE_DRMOS-3	
Size: Custom	Document Number: Z590 UD AC	Rev: 1.01
Date: Wednesday, December 30, 2020	Sheet 33 of 69	

REV:0.1

DRMOS使用NCP302155時PIN2 and PIN3要上件(Ex:DA_DR13.DA_DR8.DA_DC3)



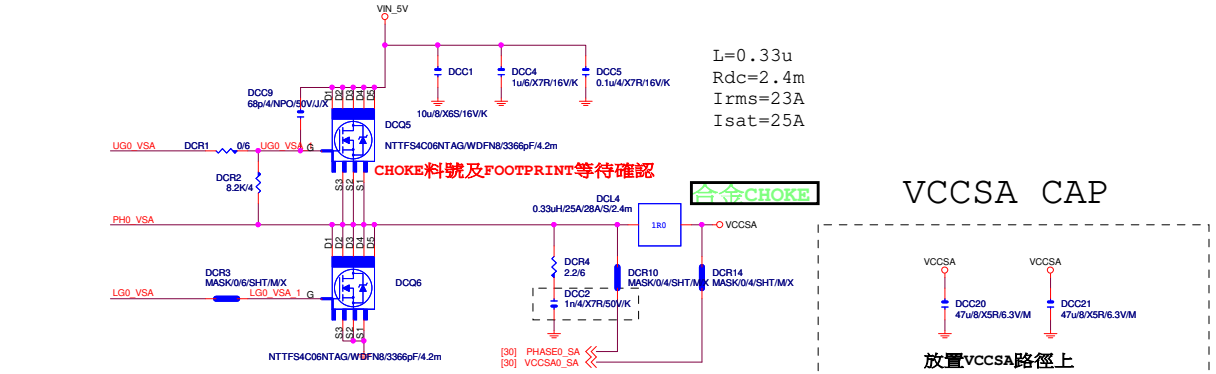
L=0.15u
Rdc=0.29m
Irms=55A
Isat=70A
SMD

灰色SMD

GIGABYTE™

Title	VCCGT_DRMOS	
Size: Custom	Document Number: Z590 UD AC	Rev: 1.01
Date: Wednesday, December 30, 2020	Sheet 34 of 69	

REV:0.1



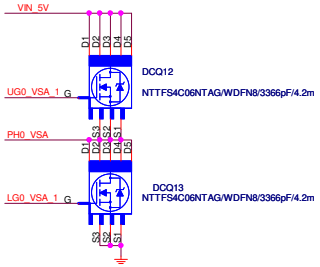
CHOKE料號及FOOTPRINT等待確認

合令CHOKE

L=0.33u
Rdc=2.4m
Irms=23A
Isat=25A

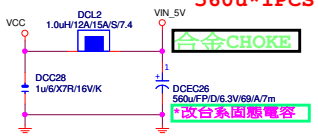
VCCSA CAP

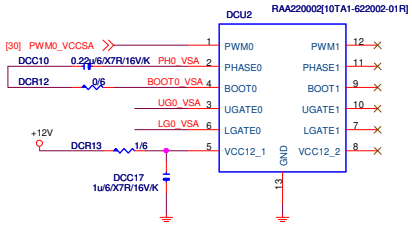
放置VCCSA路徑上

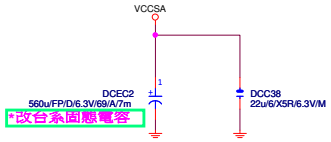


VIN CAP

560u*1PCS







CPU SOCKET 已經有22u/6 *4pcs

GIGABYTE			
Title: VCCSA MOSFET			
Size: Custom	Document Number: Z590 UD AC		Rev: 1.01
Date: Wednesday, December 30, 2020	Sheet 35 of 69		

VCCIO

RKL MODIFY

REV:0.2

5VDUAL

DFR11 2.2/6

DRV_VIO

DFC11 1u/6/X7R/16V/K

VCC

DFR10 100K/4/1

VCCIO_PG

VCC3

DFR25 8.2K/4

VCCIO_EN_1

DFR18 169K/4/1 VCCIO_CS

VCCIO_EN_1

VCCIO0_MODE

DFU2

VCC UGATE

PGOOD BOOT

EN PHASE

CS LGATE

GND LPM

RGND

FB

MODE G0 G1

RT6541AGQW/WDFN-14L

UGATE_VIO

VCCIO_BOOT DFR19 0/6 DFC10 0.1u/6/X7R/25V/K

PHASE_VIO

LGATE_VIO

VIO_LPM DFR20 0/4

VIO_RGND

VCCIO0_G0

VCCIO0_G1

CPU_VCCIO_PWR_GATEB [14,37,58]

DFR34 0/4/X VIO_VSA_RGND

DFR26 0/4

放置靠近output cap端

使用GPIO超壓

1. DFR26須改為100/4/1
2. DFR34需上件

VIO_VSA_RGND DFR35 0/4/X VSSSA_VIO_SENSE [6,30]

請盡量靠近分支點

RKL MODIFY

VCC1V8_PRIM

DFR24 8.2K/4/X

VIO_LPM

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

CHOKE與CAP料號可變

合令CHOKE

注意耐壓

VCC

DCL1 1.0uH/12A/15A/S/7.4 6*6

DFC36 0.1u/4/X7R/16V/K

DFC37 0.1u/4/X7R/16V/K

DFC39 Close Choke 0.1u/4/X7R/16V/K

DFC27 68p/4/NPO/50V/J/X 0.1u/4/X7R/16V/K

VCCIO_VIN

DFC9 1u/6/X7R/16V/K Close MOS

DFC24 10u/8/X5R/16V/K

DFC25 10u/8/X5R/16V/K

DFC26 10u/8/X5R/16V/K

DFQ5

NTTFS4C10NTAG/WDFN8/993pF/7.4m

UGATE_VIO DFR12 2.2/6

DFR13 8.2K/4

PHASE_VIO

LGATE_VIO

DFQ6

NTTFS4C10NTAG/WDFN8/993pF/7.4m

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

合令CHOKE

DFL2 1.0uH/12A/15A/S/7.4 6*6

VCCIO

使用GPIO超壓須移除

DFR15 2.2/6

DFC14 1n/4/X7R/50V/K

DFR16 487/4/1/X

DFR17 1K/4/1

DFEC2 560u/FP/D/6.3V/69/A/7m

DFC38 22u/6/X5R/6.3V/M

DFR15 3.3n/4/X7R/50V/K/X RS

*改台系固態電容

VCCIO_OV

ADDRESS=2A

VREF=02

[4] VCCIO_OV

DFR28 100/4/1/X

DFR27 10K/4/1/X

DFR9 0/4/X

VCCIO_SENSE [6]

使用GPIO超壓須上件

DFC50 47u/8/X5R/6.3V/M

DFC51 47u/8/X5R/6.3V/M

DFC52 47u/8/X5R/6.3V/M

DFC53 47u/8/X5R/6.3V/M

DFC54 47u/8/X5R/6.3V/M

DFC55 47u/8/X5R/6.3V/M

放CPU SOCKET (Bottom LAYER)

VCCIO_EN DFR36 0/4/X VCCIO_EN_1

Connect to IT8795

Connect to IT8686

[17,37,59] VCCIO_EN DCR35 MASK/0/4/SHT/X

DCR22 8.2K/4/X

DCR23 100K/4/1

DCC16 1u/6/X7R/16V/K

DCR21 8.2K/4

DCQ7 2N7002/SOT23/25pF/5

DCQ8 2N7002/SOT23/25pF/5

SOT23

* A_CPU_ID
1: RKL -->VCCIO=1.05V
0: CML -->VCCIO=0.95V

DFR37 8.2K/4/1

A_CPU_ID_N

DFQ11 2N7002/SOT23/25pF/5

[4,30,37,59] A_CPU_ID

VCCIO0_G1

DFQ1 2N7002/SOT23/25pF/5

DFR38 100K/4/1

DFR39 0/4/X

VCCIO0_G0

DFR40 100K/4/1

DFR41 0/4/X

VCCIO0_MODE

DFR14 100K/4/1

DFR42 0/4/X

VCCIO_OV

DFR33 422K/4/1/X VIO_RGND

DFR43 42.2K/4/1

DFR44 21K/4/1

DFR29 100K/4/1/X

DFR31 100K/4/1/X

DFQ2 2N7002/SOT23/25pF/5

DFQ3 2N7002/SOT23/25pF/5

[14] VCCIO_VID1

[14] VCCIO_VID2

VIO_RGND

DFR30 100K/4/1

DFR32 100K/4/1

DFC28 0.1u/4/X7R/16V/K

DFC29 0.1u/4/X7R/16V/K

VCCIO_VID1-->GPP_F_22

VCCIO_VID2-->GPP_F_23

使用GPIO超壓須上件

VCC3

DGR3 100K/4/1/X

VCCIO_PG DGR36 MASK/0/4/SHT/X VCCIO_PWRGD

Connector to SIO PIN7

VCCIO_PWRGD [17]

3VDUAL

DGR2 100K/4/1/X

DGQ2 2N7002/SOT23/25pF/5/X

DGR4 100K/4/1

DGQ10 2N7002/SOT23/25pF/5

* A_CPU_ID_N
0: RKL
1: CML

DGQ1 2N7002/SOT23/25pF/5/X

DGQ3 2N7002/SOT23/25pF/5

DGQ4 2N7002/SOT23/25pF/5

VCCIO_PG

A_CPU_ID_N

[37] VCCIO2_PG

VCCIO2_PG

VCCIO_VID1	VCCIO_VID2	VCCIO_0_G1	VOUT
LOW	LOW	LOW	0.950V
LOW	LOW	HIGH	1.050V
HIGH	LOW	HIGH	1.075V
LOW	HIGH	HIGH	1.100V
HIGH	HIGH	HIGH	1.125V

Mode	VR	Mode logic	LPM	VID Setting G1 logic	VID Setting G0 logic	VOUT (V)
Mode1	VCCIO	0	0	x	x	0(LPM)
			1	0	0	0.85
			1	0	1	0.875
			1	1	0	0.95
			1	1	1	0.975
Mode2	VPRIMCORE	Floating	0	x	x	0.7V(LPM)
			1	0	0	0.85
			1	0	1	0.9
			1	1	0	0.95
			1	1	1	1
Mode3	VccEDRAM/ VccEOPIO	1	0	x	x	0(LPM)
			1	0	0	0.8
			1	0	1	0.95
			1	1	0	1
			1	1	1	1.05

GIGABYTE

Title: VCCIO

Size: Custom | Document Number: Z590 UD AC | Rev: 1.01

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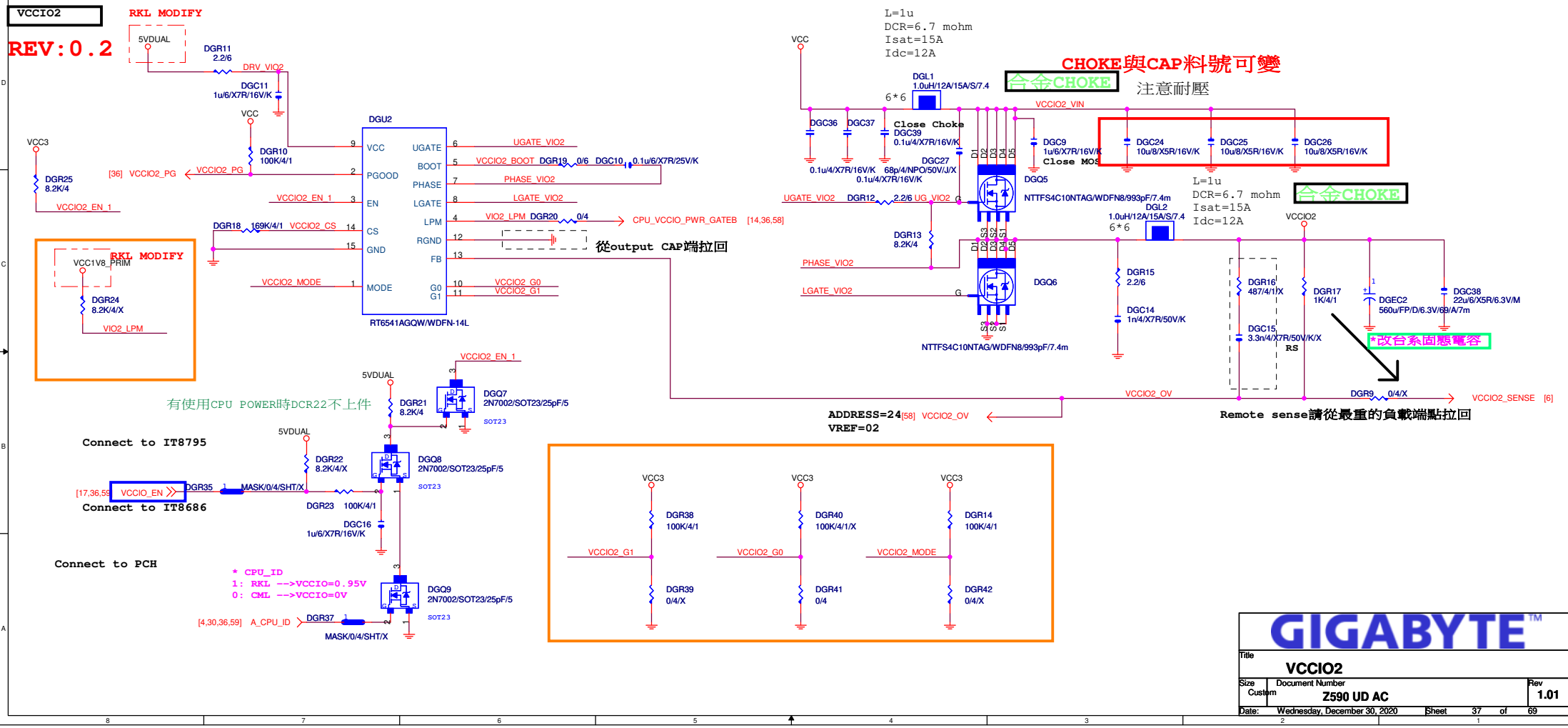
VCCIO2
RKL MODIFY
REV:0.2
5VDUAL
DGR11 2.2/6
DRV_VIO2
DGC11 1u/6/X7R/16V/K
VCC
VCC3
DGR10 100K/4/1
DGR25 8.2K/4
[36] VCCIO2_PG
VCCIO2_PG
VCCIO2_EN_1
DGU2
VCC
PGOOD
EN
CS
GND
MODE
UGATE
BOOT
PHASE
LGATE
LPM
RGND
FB
G0
G1
RT6541AGQW/WDFN-14L
UGATE_VIO2
VCCIO2_BOOT DGR19 0/6 DGC10 0.1u/6/X7R/25V/K
PHASE_VIO2
LGATE_VIO2
VIO2_LPM DGR20 0/4
CPU_VCCIO_PWR_GATEB [14,36,58]
DGR18 169K/4/1 VCCIO2_CS
VCCIO2_MODE
VCCIO2_G0
VCCIO2_G1
從output CAP端拉回
RKL MODIFY
VCC1V8_PRIM
DGR24 8.2K/4/X
VIO2_LPM
L=1u
DCR=6.7 mohm
Isat=15A
Idc=12A
CHOKE與CAP料號可變
合金CHOKE
注意耐壓
VCC
DGL1 1.0uH/12A/15A/S/7.4
6*6
VCCIO2_VIN
DGC36
DGC37
Close Choke
DGC39 0.1u/4/X7R/16V/K
0.1u/4/X7R/16V/K
DGC27 68p/4/NPO/50V/J/X
0.1u/4/X7R/16V/K
DGC9 1u/6/X7R/16V/K
Close MOS
DGC24 10u/8/X5R/16V/K
DGC25 10u/8/X5R/16V/K
DGC26 10u/8/X5R/16V/K
DGQ5
NTTFS4C10NTAG/WDFN8/993pF/7.4m
UGATE_VIO2 DGR12 2.2/6 UG_VIO2
DGR13 8.2K/4
PHASE_VIO2
LGATE_VIO2
DGQ6
NTTFS4C10NTAG/WDFN8/993pF/7.4m
DGL2 1.0uH/12A/15A/S/7.4
6*6
L=1u
DCR=6.7 mohm
Isat=15A
Idc=12A
合金CHOKE
VCCIO2
DGR15 2.2/6
DGC14 1n/4/X7R/50V/K
DGR16 487/4/1/X
DGR17 1K/4/1
DGEC2 560u/FP/D/6.3V/69/A/7m
DGC38 22u/6/X5R/6.3V/M
DGC15 3.3n/4/X7R/50V/K/X
RS
*改台系固態電容
VCCIO2_OV
DGR9 0/4/X
VCCIO2_SENSE [6]
ADDRESS=24 [58] VCCIO2_OV
VREF=02
Remote sense請從最重的負載端點拉回
有使用CPU POWER時DCR22不上件
5VDUAL
DGR21 8.2K/4
DGQ7 2N7002/SOT23/25pF/5
SOT23
Connect to IT8795
DGR22 8.2K/4/X
DGQ8 2N7002/SOT23/25pF/5
[17,36,59] VCCIO_EN
DGR35
MASK/0/4/SHT/X
Connect to IT8686
DGR23 100K/4/1
DGC16 1u/6/X7R/16V/K
Connect to PCH
* CPU_ID
1: RKL -->VCCIO=0.95V
0: CML -->VCCIO=0V
DGQ9 2N7002/SOT23/25pF/5
[4,30,36,59] A_CPU_ID
DGR37
MASK/0/4/SHT/X
VCC3
DGR38 100K/4/1
DGR39 0/4/X
VCCIO2_G1
DGR40 100K/4/1/X
DGR41 0/4
VCCIO2_G0
DGR14 100K/4/1
DGR42 0/4/X
VCCIO2_MODE
GIGABYTE
Title
VCCIO2
Size Custom
Document Number
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REV:0.1

DDR4

L=0.5u
DCR=2.35 mohm
Isat=25A
Idc=15A

合金CHOKE

CHOKE與CAP料號可變

DDR VIN CAP
560u*2PCS

MA_VIN Rev 9.0

MAC63 0.1u/4/X7R/16V/K
MAC62 22u/6/X5R/6.3V/M

5VDUAL
+12V
MA_DR10 0/6/X
MA_D1
MA_DR8 2.2/6
DRV_DDR
BAT721C/SOT23/0.2A/S/[10DK1-420721-12R]
MA_DC10 1u/6/X7R/16V/K
MA_DC9 0.1u/6/X7R/25V/K

MA_L2 1.0uH/15A/S/6.7m
6*6
MA_DC6 0.1u/4/X7R/16V/K Close Choke
MA_DC25 68p/4/NPO/50V/J/X
MA_DC7 1u/6/X7R/16V/K Close MOS
MAEC1 560u/FP/D/6.3V/69/A/7m
MAEC2 560u/FP/D/6.3V/69/A/7m
MA_DQ1 NTMFS4C06N/N/PPAK/1400pF/4m

灰色DIP

SUPPORT DDR4 1.2V
25A MAX

RT8120DGS/SOP8
MAU2
COMP VCC BOOT UGATE PHASE FB GND PGND LG/OC
DDR_EN
MA_DR15 27K/4/1
MA_DC15 22p/4/NPO/50V/J
MA_DC16 3.3n/4/X7R/50V/K
MA_DR19
MASK/0/4/SHT/X
MA_UGATE
MA_PHASE
MA_LGATE
MA_DR18 11.8K/4/1
OCP=40A
放靠近IC pin4

MA_UGATE MA_DR1 2.2/6 MA_UG
MA_DR2 8.2K/4
MA_PHASE
MA_LGATE MA_DR9 2.2/6 MA_LG
MA_DQ2
MA_DQ3
MA_DR5 2.2/6
MA_DC5 1n/4/X7R/50V/K
NTMFS4C06N/N/PPAK/1400pF/4m
NTMFS4C06N/N/PPAK/1400pF/4m

MA_L1 0.8uH/28A/INCG109/FS/D
R50
10*10
VDDQ
MA_DR14 487/4/1
MA_DC14 3.3n/4/X7R/50V/K RS
MA_DR13 1K/4/1

L=0.8u
DCR=1.4 mohm
Isat=?A
Idc=28A

MAC60 22u/6/X5R/6.3V/M/X

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

DDR_ADJ
Remote sense請從最重的負載端點拉回
RO MA_DR12 2K/4/1
[60] DDR_ADJ

VDDQ_SIO VDDQ
DDR_VS
MASK/0/4/SHT/M/X
CLOSE TO DDR POWER PLANE

MOSFET請依MOSFET使用規則.自行選擇
ON-->10IF9-040406-10R[NTMFS4C06N/N/PPAK/1400pF/4m]
VISHAY-->10IF9-040012-10R[SIRA12DP/PPAKSO8/2070pF/4.3m]

PWR SEQ

5VDUAL
DDR_EN
MAR108 22K/4
MAQ6 2N7002/SOT23/25pF/5
SOT23
MAQ5 MMBT2222A/SOT23/600mA/40
SOT23
[39] VPP25V_GD
MAR107 5.11K/4/1/X
MAC3 0.1u/4/X7R/16V/K
For power sequence require

MAR1 8.2K/4
MAQ10 2N7002/SOT23/25pF/5
MAR2 8.2K/4
MAQ11 2N7002/SOT23/25pF/5
[17,39,59] MA_EN
MAR113 MASK/0/4/SHT/X
MAR105 100K/4/1
MAC9 1u/6/X7R/16V/K

DDRVTT

VDDQ
NCT3103S/SOP8/2A
MAU1
VIN GND VREF1 VOUT VREF2 ENABLE VCNTL BOOT_SEL
MAC2 1u/4/X5R/6.3V/K
MAR5 1K/4/1
[60] MA_VTT_REF
MA_VTT_REF
MAC1 0.01u/4/X7R/50V/K
MAR4 1K/4/1
1.1A MAX
DDRVTT_EN
DDRVTT_BOOT
MAC7 10u/6/X5R/6.3V/M
DDRVTT

[4] DDR_VTT_CTL
[10,17,28,53,58,62,67] N_-SLP_S3
DDR_VTT_CTL MAR110 DDRVTT_EN
N_-SLP_S3 MAR111 DDRVTT_BOOT
0/4/SHT/M/X
0/4/SHT/M/X
MAU1上NCT3103S時上件

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

VDDQ
MAEC3 560u/FP/D/6.3V/69/A/7m
MAEC4 560u/FP/D/6.3V/69/A/7m
* 大電容 x4
MAEC6 560u/FP/D/6.3V/69/A/7m
MAEC7 560u/FP/D/6.3V/69/A/7m
指定footprint "EC6D8MM-RH-2"

WBC49 22u/6/X5R/6.3V/M
Del WBC50

DDRVTT CAP

* 大電容 x0
MAC4 22u/6/X5R/6.3V/M
MAC5 22u/6/X5R/6.3V/M

GIGABYTE

Title	RT8120_DDR4 POWER	
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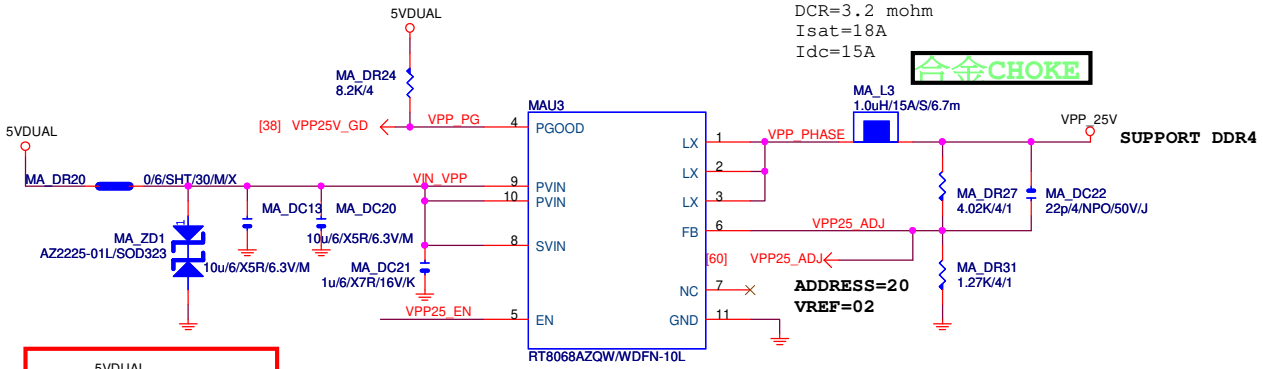
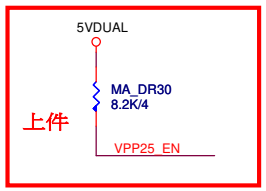
VPP_25V

CHOKE與CAP料號可變

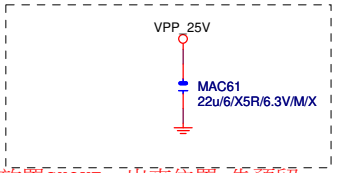
L=1u
DCR=3.2 mohm
Isat=18A
Idc=15A

合金CHOKE





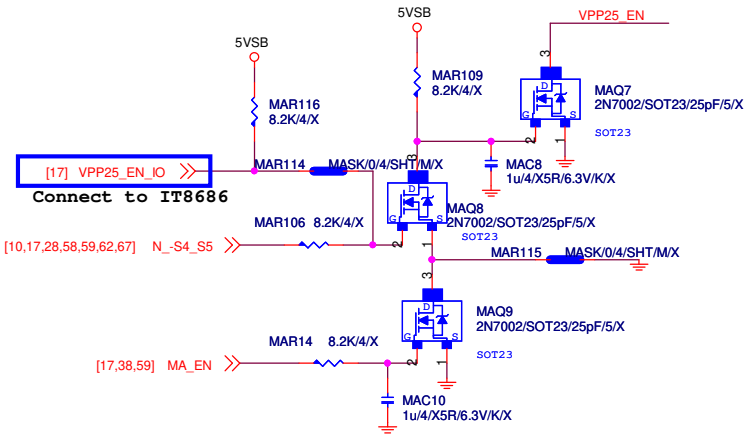
2.5V

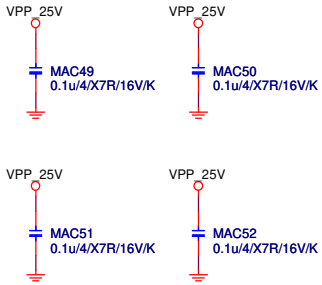


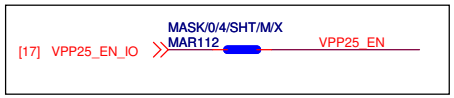
請放置CHOKE一出來位置.先預留.
請自行確認ripple後再決定是否上件

PWR SEQ

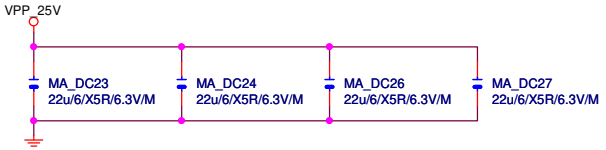
* 刪 MA_DR32







VPP CAP 22u*4PCS



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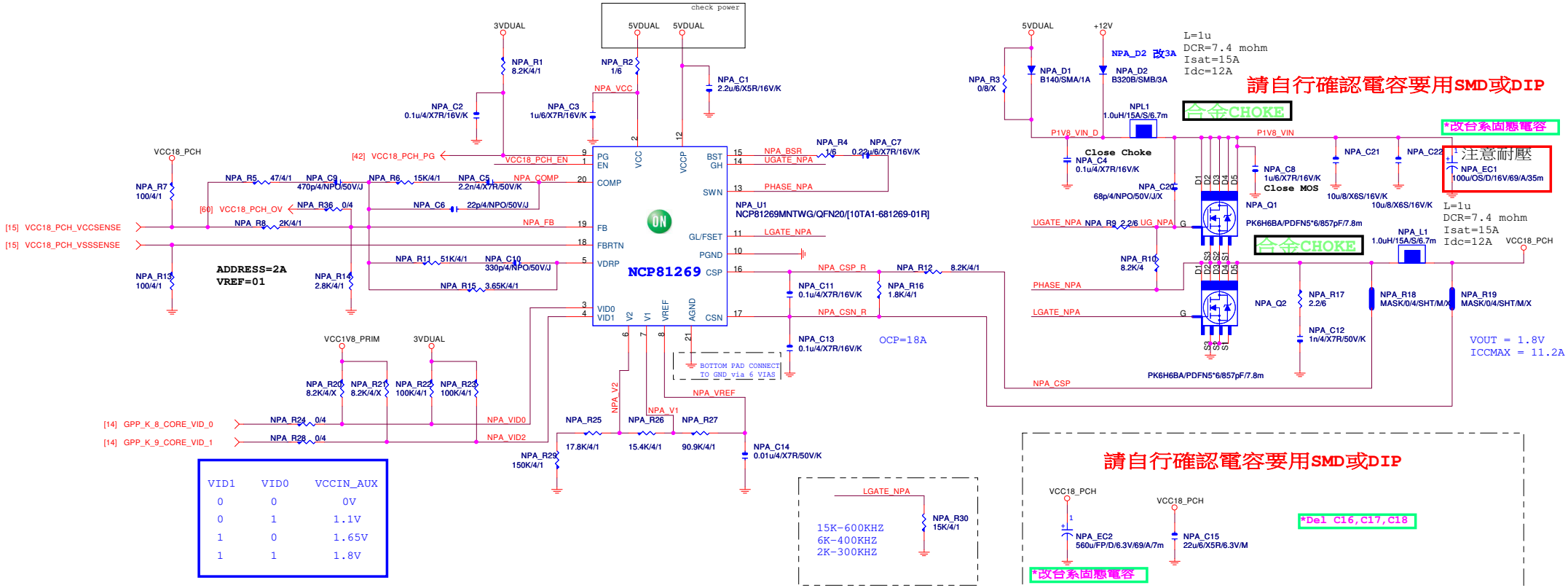
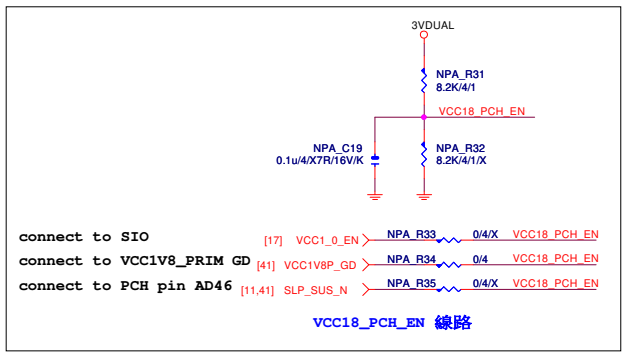
Title	RT8068_VPP25 POWER	
Size: Custom	Document Number: Z590 UD AC	Rev: 1.01
Date: Wednesday, December 30, 2020	Sheet 39 of 69	



VID1	VID0	VCCIN_AUX
0	0	0V
0	1	1.1V
1	0	1.65V
1	1	1.8V



Title	NCP81269_PCH POWER
Size	Custom
Document Number	Z590 UD AC
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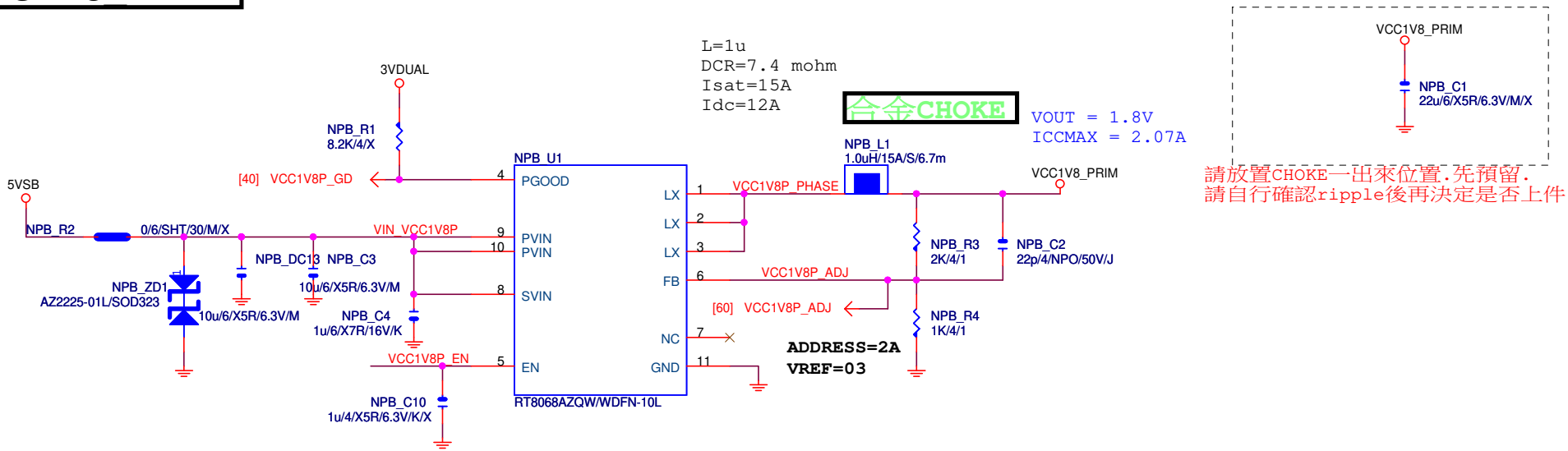
Date:	Wednesday, December 30, 2020
Sheet	40 of 69

REV:0.1

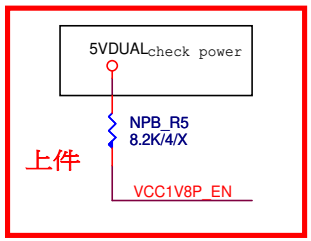
VCC1V8_PRIM

CHOKE與CAP料號可變



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

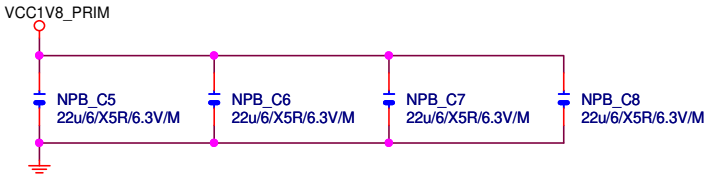
PWR SEQ



connect to PCH pin AD46

[11,40] SLP_SUS_N — NPB_R6 0/4 — VCC1V8P_EN

VCC1V8_PRIM CAP 22u*4PCS



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Title: RT8068_VCC1V8_PRIM		
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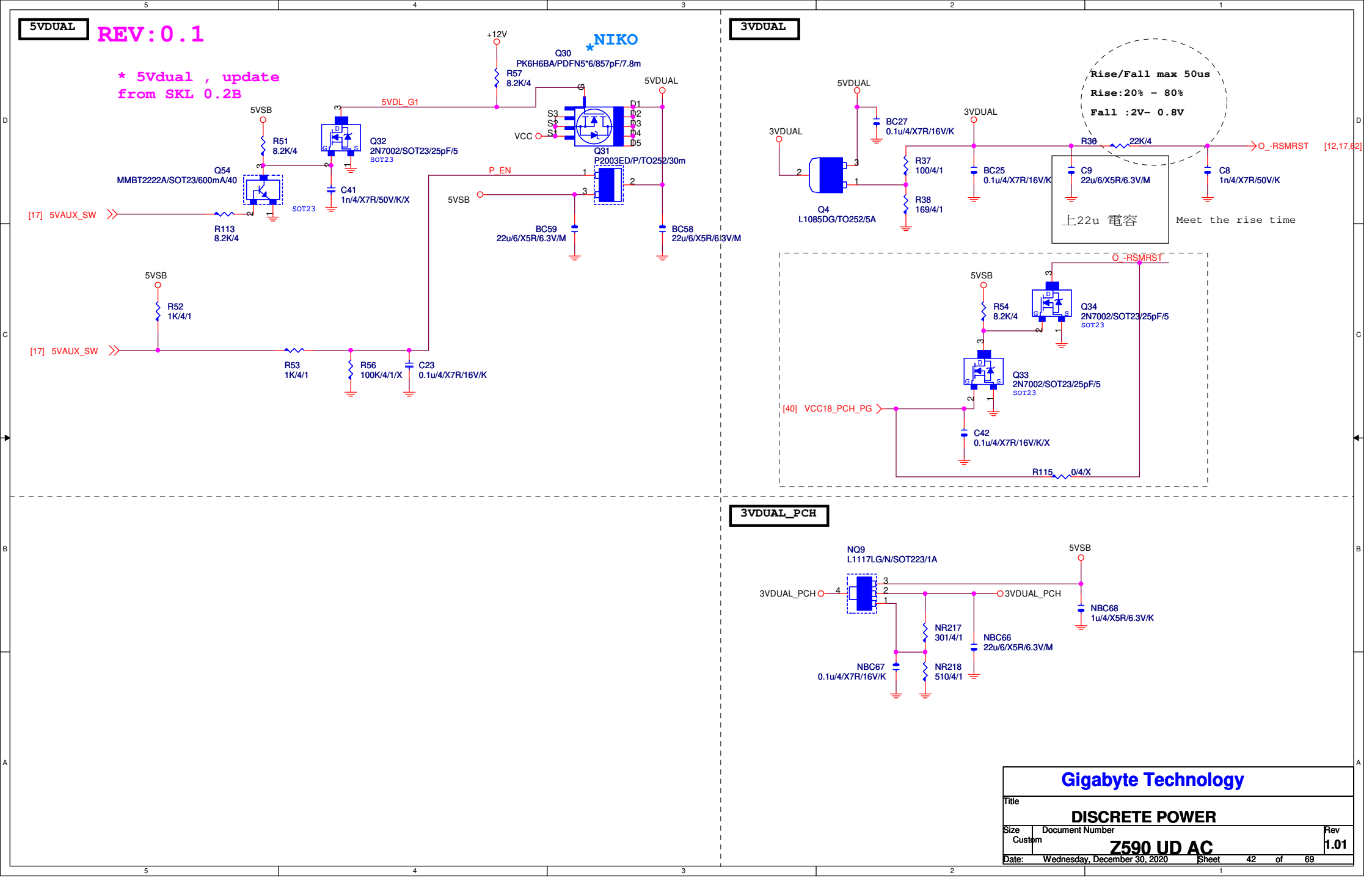

Gigabyte Technology		
Title: DISCRETE POWER		
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ATXX24 POWER CONNECTOR

2x12(空心Pin)
FOOTPRINT:ATXPWR_24-6

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

5VSB
R695 22K/4
Patch some PSU no internal pull up resistor
[17,62] -PSON
BC37 0.1u/4/X7R/16V/K

-12V VCC3 VCC3
ATX
13 3.3V 3.3V 1
14 -12V 3.3V 2
15 GND GND 3
16 PSON 5V 4
17 GND GND 5
18 GND 5V 6
19 GND GND 7
20 -5V POK 8
21 5V 5VSB 9
22 5V 12V 10
23 5V 12V 11
24 GND 3.3V 12
BK

VCC3 VCC3 VCC3
BC35 22u/6/X5R/6.3V/M
BC46 1u/4/X5R/6.3V/K
BC48 1u/4/X5R/6.3V/K

VCC
VCC
PWOK
PWOK
5VSB
+12V
BC9 4.7u/6/X5R/6.3V/K
AD1 AZ2225-01L/SOD323/X

VCC
VCC
BC39 1u/4/X5R/6.3V/K
BC36 0.1u/4/X7R/16V/K/X
APW/2*12/BK/VA/SN/2SHK/PA66

* 刪除 -5V

BC38 510/6/X
BC42 510/6/X
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

To prevent the 5VSB under loading when boot

ATXX4 POWER CONNECTOR

2x4 (實心Pin)
FOOTPRINT:ATXPW2X4-SOLID

V12
ATX_12V_2X4
1 GND +12V 5
2 GND +12V 6
3 GND +12V 7
4 GND +12V 8
BK
[17]
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

MH1 HOLE_3/X HOLE_4-RH-1 MH2 HOLE_3/X
FOR AUDIO 切割
MH3 HOLE_3/X HOLE_4-RH-5MM-2 半圈
MH7 HOLE_3/X HOLE_4-RH-1
MH5 HOLE_3/X HOLE_4-RH-1
MH6 HOLE_3/X HOLE_4-RH-5MM-2 半圈
MH9 HOLE_3/X HOLE_4-RH-5MM-2 半圈
MH8 HOLE_3/X HOLE_4-RH-5MM-2 半圈
MH4 HOLE_3/X HOLE_4-RH-5MM-5PIN-2

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

V12
ATX_12V_2X2
4 +12V GND 1
3 +12V GND 2
APW/2*2/BK/OC/P/4.2/VA/SN/OH/S
BC1118 0.1u/4/X7R/16V/K

+12V DUMMY LOAD

To fix 12V light load abnromal issue

+12V
RN2 2.7K/8P4R/4
RN3 2.7K/8P4R/4
RN4 2.7K/8P4R/4
RN5 2.7K/8P4R/4
RN6 2.7K/8P4R/4
RN10 2.7K/8P4R/4
RN11 2.7K/8P4R/4
RN12 2.7K/8P4R/4
RN13 2.7K/8P4R/4
RN14 2.7K/8P4R/4
RN15 2.7K/8P4R/4

VCC3
R1 1K/4/1/X
Q9
[13] N_GPP_D11
R703 330/4
EMF30N02J/SOT23/627pF/30m

DUMMY LOAD

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

COUPON

BY LAYOUT位置

COUPON1 COUPON1 1 2 COUPON/X 5VDUAL
COUPON2 COUPON2 1 2 COUPON/X 5VDUAL
COUPON3 COUPON3 1 2 COUPON/X
COUPON4 COUPON4 1 2 COUPON/X

Gigabyte Technology

Title: ATX POWER CONNECTOR
Size: Custom
Document Number: Z590 UD AC
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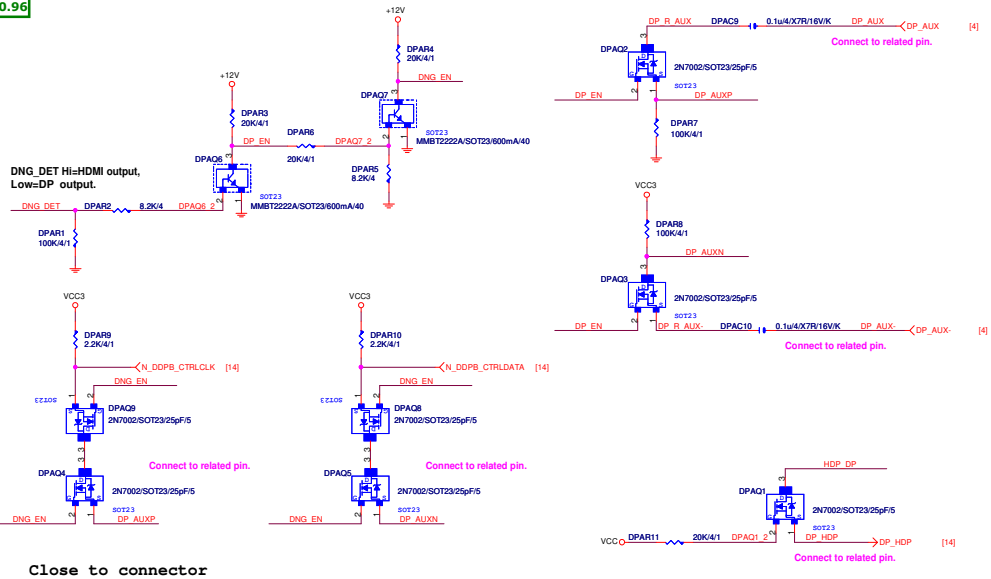
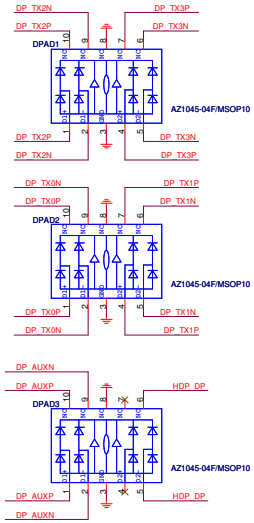
Rev: 0.96

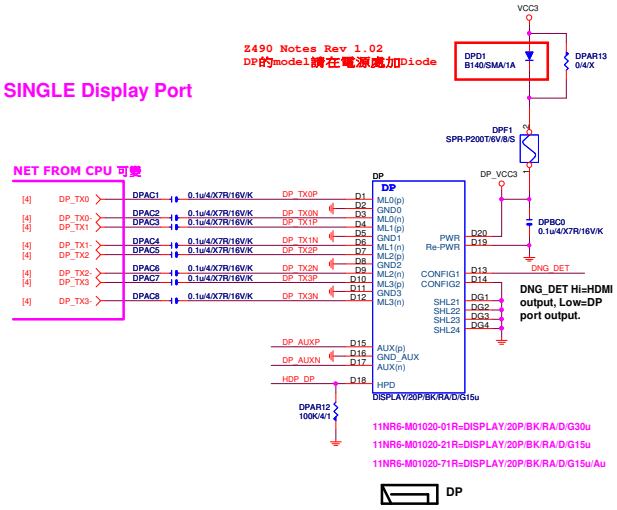


Close to connector



Z490 Notes Rev 1.02
DP的model請在電源處加Diode

SINGLE Display Port



11NR6-M01020-01R=DISPLAY/20P/BK/RA/D/G30u
11NR6-M01020-21R=DISPLAY/20P/BK/RA/D/G15u
11NR6-M01020-71R=DISPLAY/20P/BK/RA/D/G15u/Au

DP

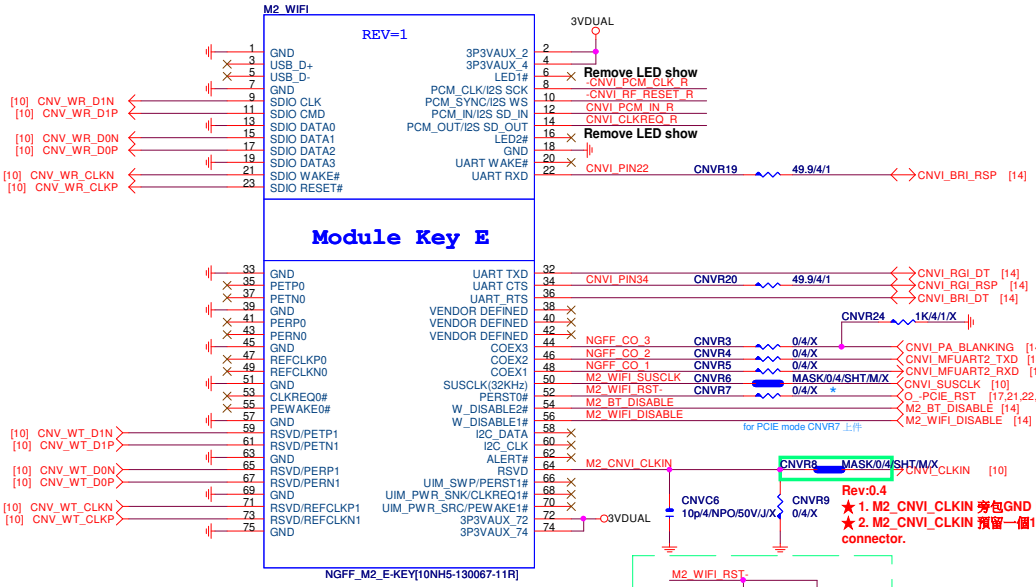
Gigabyte Technology			
Title: DP PORT			
Size: Custom	Document Number: Z590 UD AC		Rev: 1.01
Date: Wednesday, December 30, 2020	Sheet 44 of 69		

Rev: 0.94

CNVi_M2_WIFI

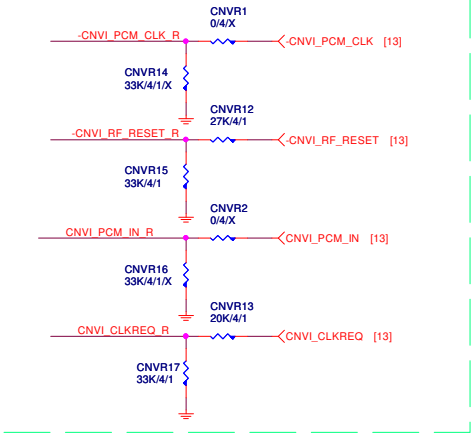
*全部上件

不支援PCIE介面WIFI及USB介面BT



Rev:0.6

★ 1. 將PCH吐出的3.3V 經分壓為1.8V 才進到CNVI



Rev:0.4

★ 1. M2_CNVI_CLKIN 旁包GND LINE,且200mil打一個GND via.

★ 2. M2_CNVI_CLKIN 預留一個10p cap 靠近CNVI card connector.

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.

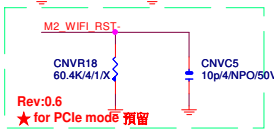
★Update 2015-07-22

★Footprint for 橫躺式高: NGFF-E-75P-3

★Footprint for 橫躺式矮: CNVI

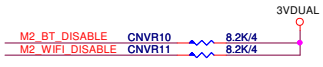
★ 橫躺式高SMD P/N:10NR5-130067-61R

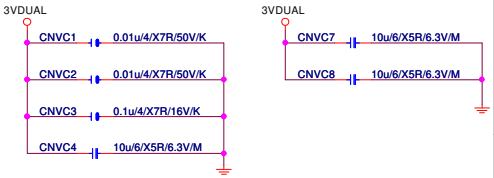
★ 橫躺式矮SMD P/N:10NR5-130067-22R



Rev:0.6

★ for PCIe mode 預留





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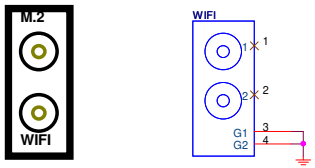
量產不附

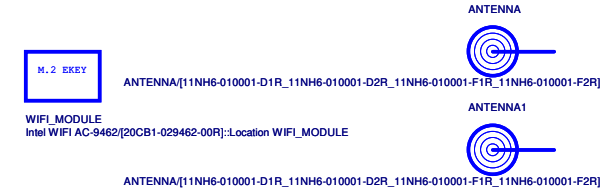
一套WIFI MODULE包含外框+WIFI CARD+天線



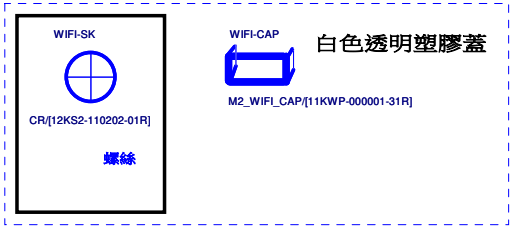
新款WIFI鐵殼

Layout Library : wifi-ekey-module-1

Tiptop P/N : 12AC2-000004-31R



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



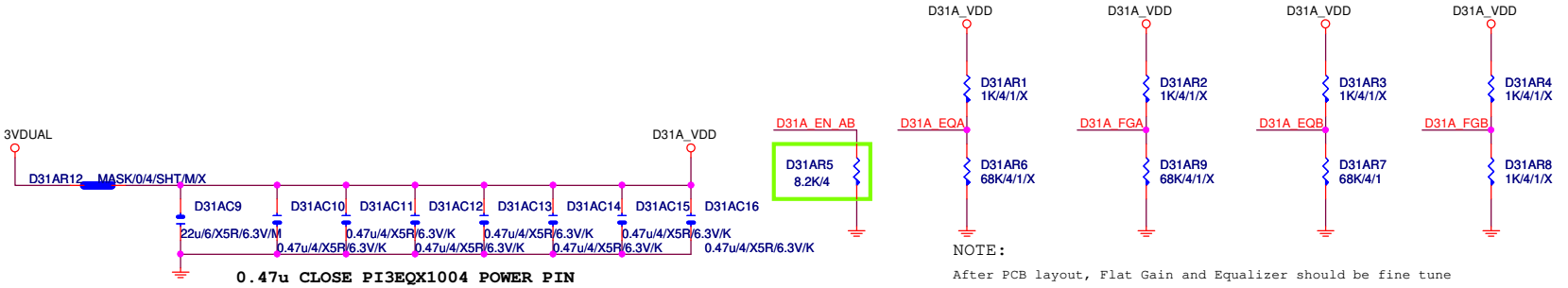
GIGABYTE

Title	CNVi_M2_WIFI	
Size: Custom	Document Number: Z590 UD AC	Rev: 1.01
Date: Wednesday, December 30, 2020	Sheet 45 of 69	

USB3.2 GEN2 PI3EQX1004E Rev0.1

Type-A

GROUP A



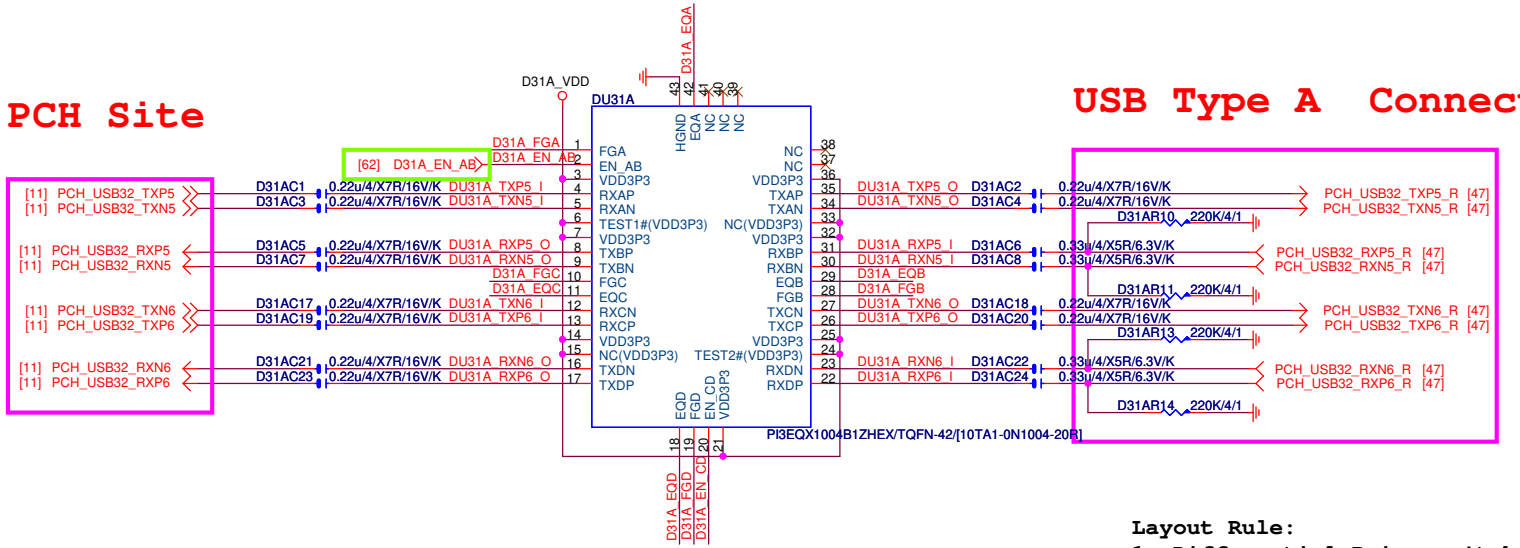
NOTE:

After PCB layout, Flat Gain and Equalizer should be fine tune

PCH Site

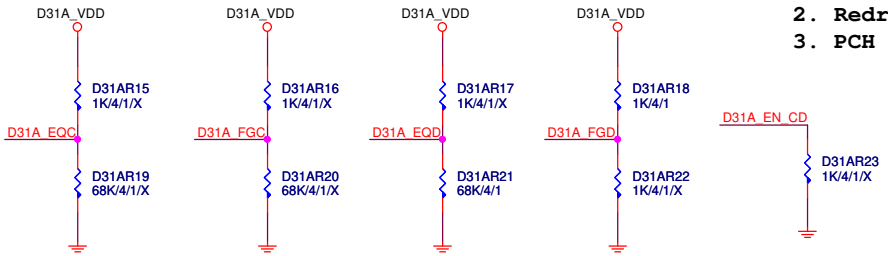
可變

USB Type A Connector Site



Layout Rule:

1. Differential Pair can't be swaped
2. Redriver to Connector Length min. 1 inch
3. PCH to Redriver Length min. 6 inch



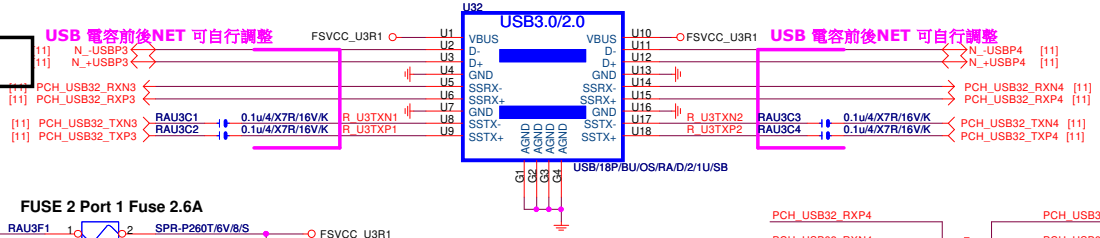
GIGABYTE™

Title: Redriver_A_TYPE-A		
Size: B	Document Number: Z590 UD AC	Rev: 1.01
Date: Wednesday, December 30, 2020	Sheet 46 of 69	

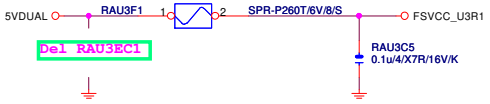
Rev: 0.94

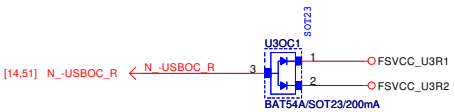
U32

USB 電容前後NET 可自行調整

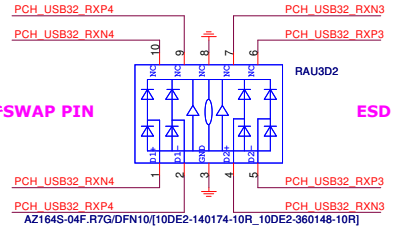


FUSE 2 Port 1 Fuse 2.6A

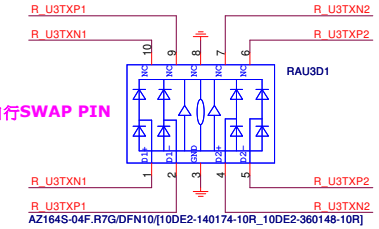




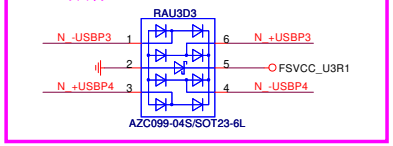
ESD 可自行SWAP PIN



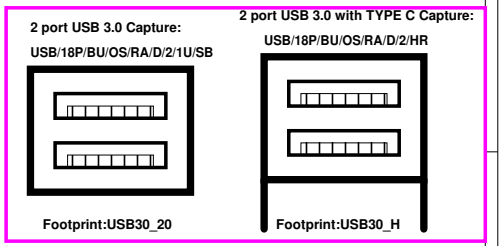
ESD 可自行SWAP PIN



ESD 可自行SWAP PIN

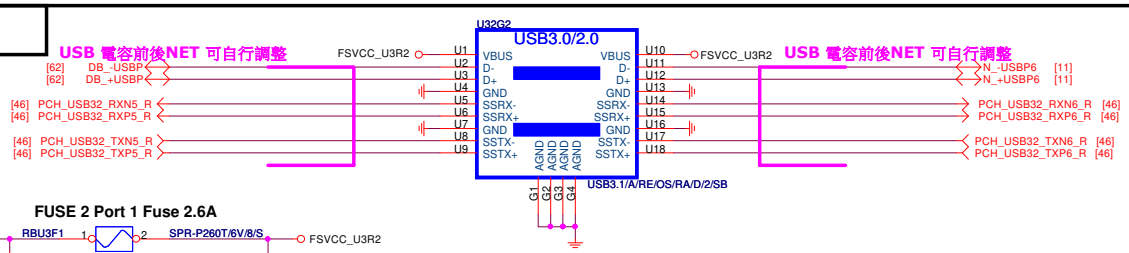


CONNECTOR 自行調整

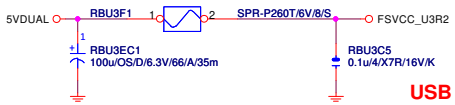


U32G2

USB 電容前後NET 可自行調整

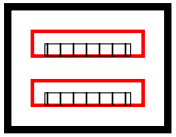


FUSE 2 Port 1 Fuse 2.6A

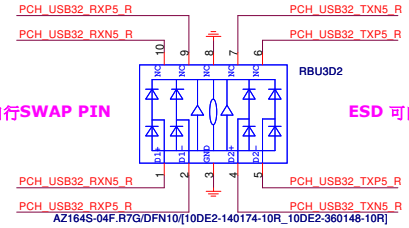


USB 3.1 Red

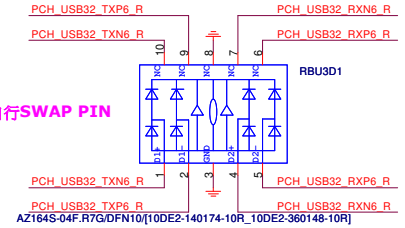
USB 3.1 Red



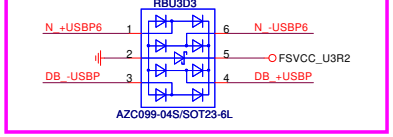
ESD 可自行SWAP PIN



ESD 可自行SWAP PIN



ESD 可自行SWAP PIN



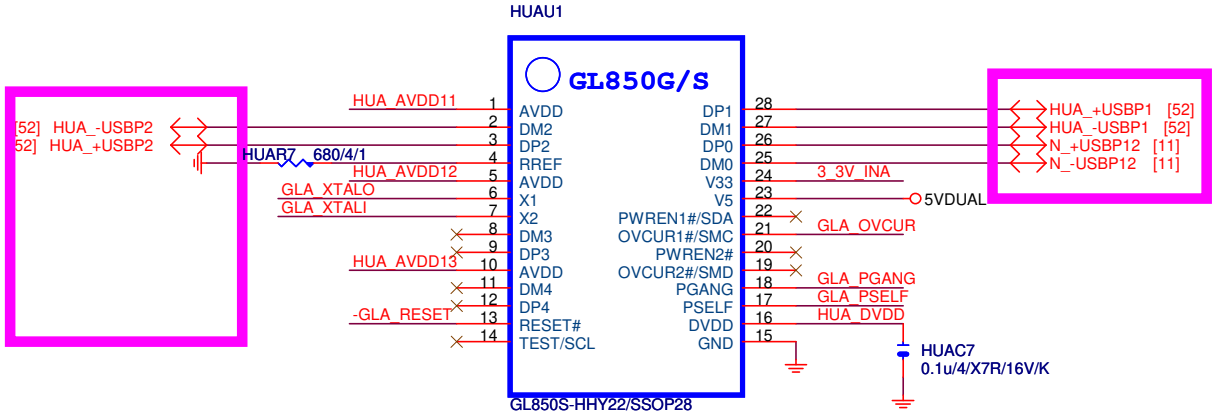
KB_MS_U32

GIGABYTE

Title	R_USB30		
Size: Custom	Document Number: Z590 UD AC		Rev: 1.01
Date: Wednesday, December 30, 2020	Sheet 47 of 69		

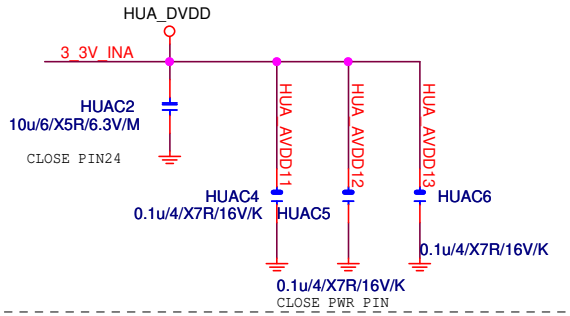
USB20 HUB_1

Single USB2 HUB used Rev 0.1

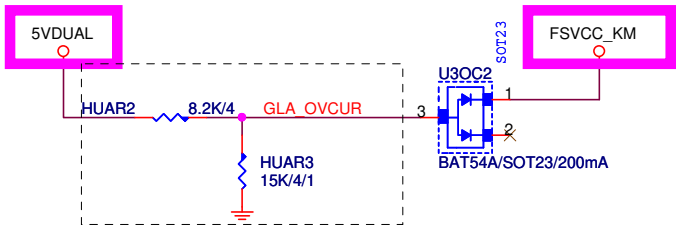


SSOP28-IT8209R

HUB PWR

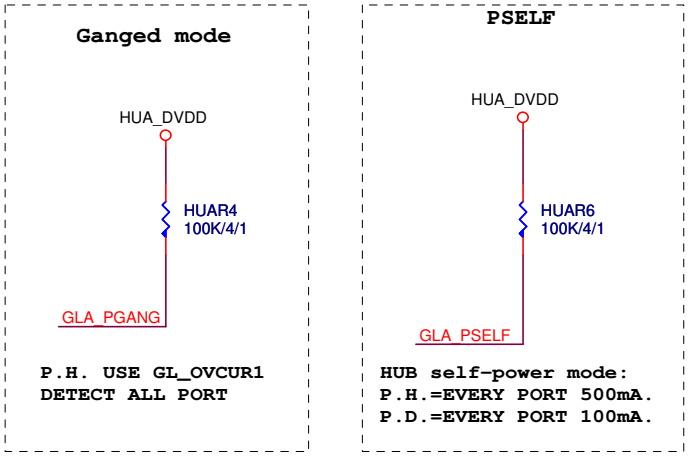


HUB OVER CURRENT SENSE

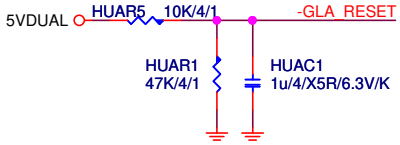


GL850S的over current pin請接到GL850S不要接到PCH,
PCH端改為pull-high 3VDUAL.

HUB MODE

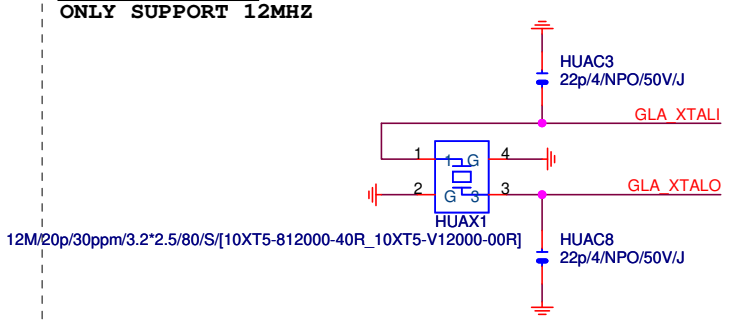


HUB RESET



HUB CRYSTAL

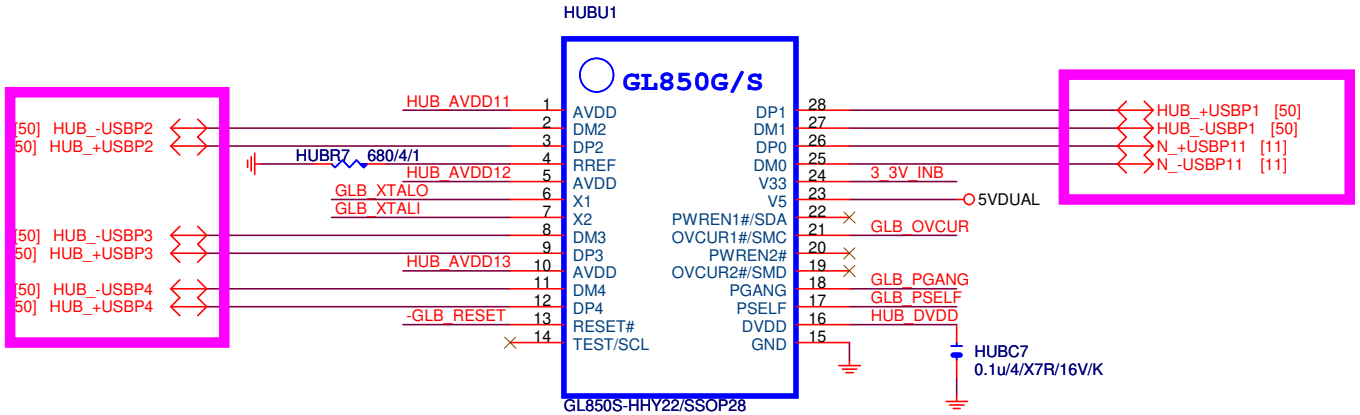
ONLY SUPPORT 12MHZ



Gigabyte Technology			
Title: HUB GL850GS_1			
Size: Custom	Document Number: Z590 UD AC		Rev: 1.01
Date: Wednesday, December 30, 2020	Sheet 48 of 69		

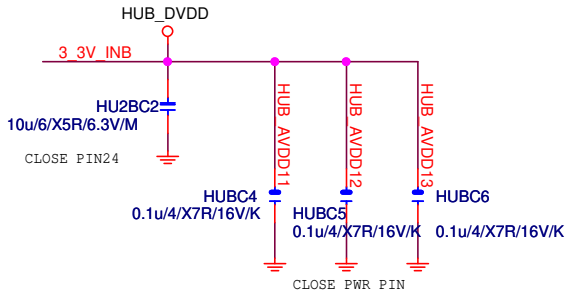
USB20 HUB_2

Dual USB2 HUB used Rev 0.1

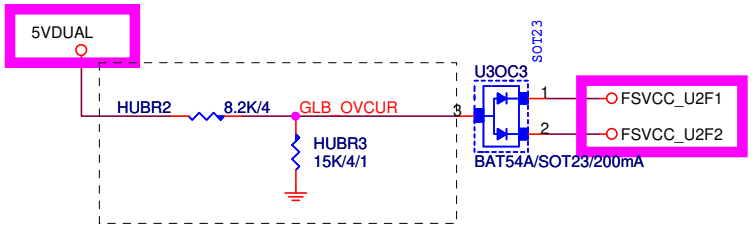


SSOP28-IT8209R

HUB PWR



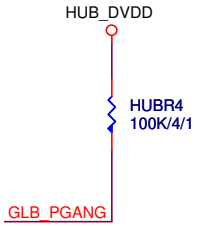
HUB OVER CURRENT SENSE



GL850S的over current pin請接到GL850S不要接到PCH, PCH端改為pull-high 3VDUAL.

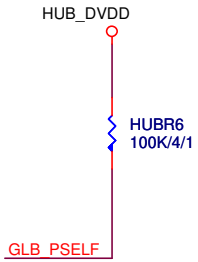
HUB MODE

Ganged mode



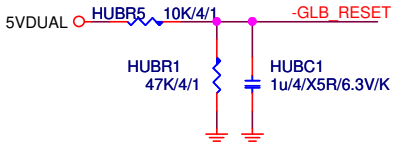
P.H. USE GL_OVCUR1
DETECT ALL PORT

PSELF



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

HUB RESET



HUB CRYSTAL

ONLY SUPPORT 12MHZ

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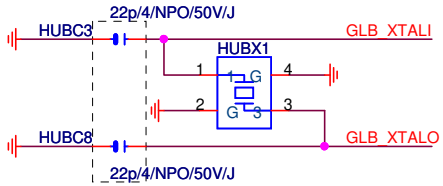


12M/20p/30ppm/3.2*2.5/80/S/[10XT5-812000-40R_10XT5-V12000-00R]

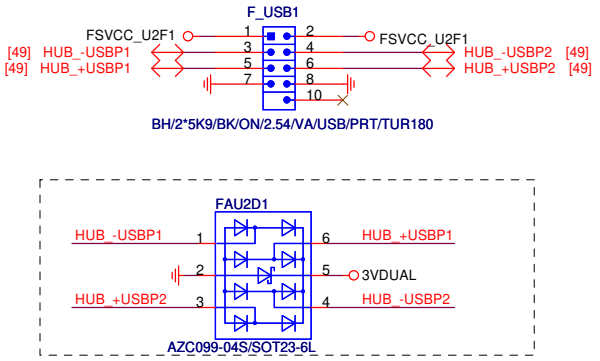
Gigabyte Technology

Title	HUB GL850GS_2	
Size: Custom	Document Number: Z590 UD AC	Rev: 1.01
Date: Wednesday, December 30, 2020	Sheet 49 of 69	

Rev: 0.94

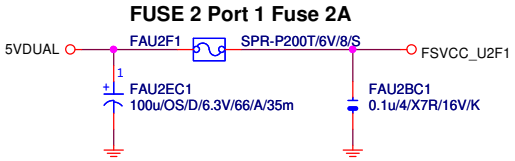
FRONT USB1

NET 可變



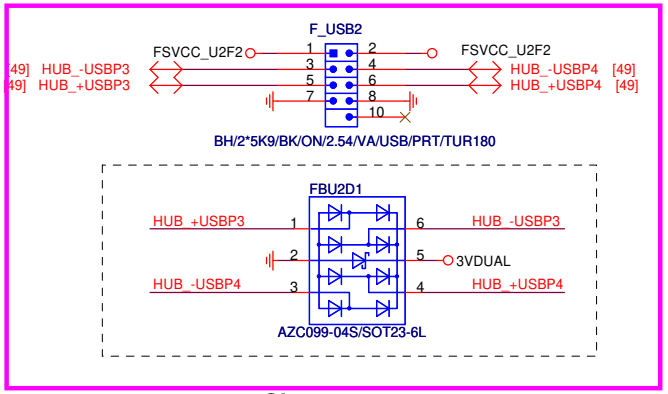
Close to connector

FUSE 2 Port 1 Fuse 2A



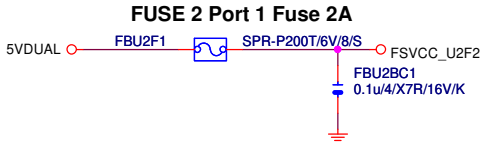
FRONT USB2

NET 可變



Close to connector

FUSE 2 Port 1 Fuse 2A

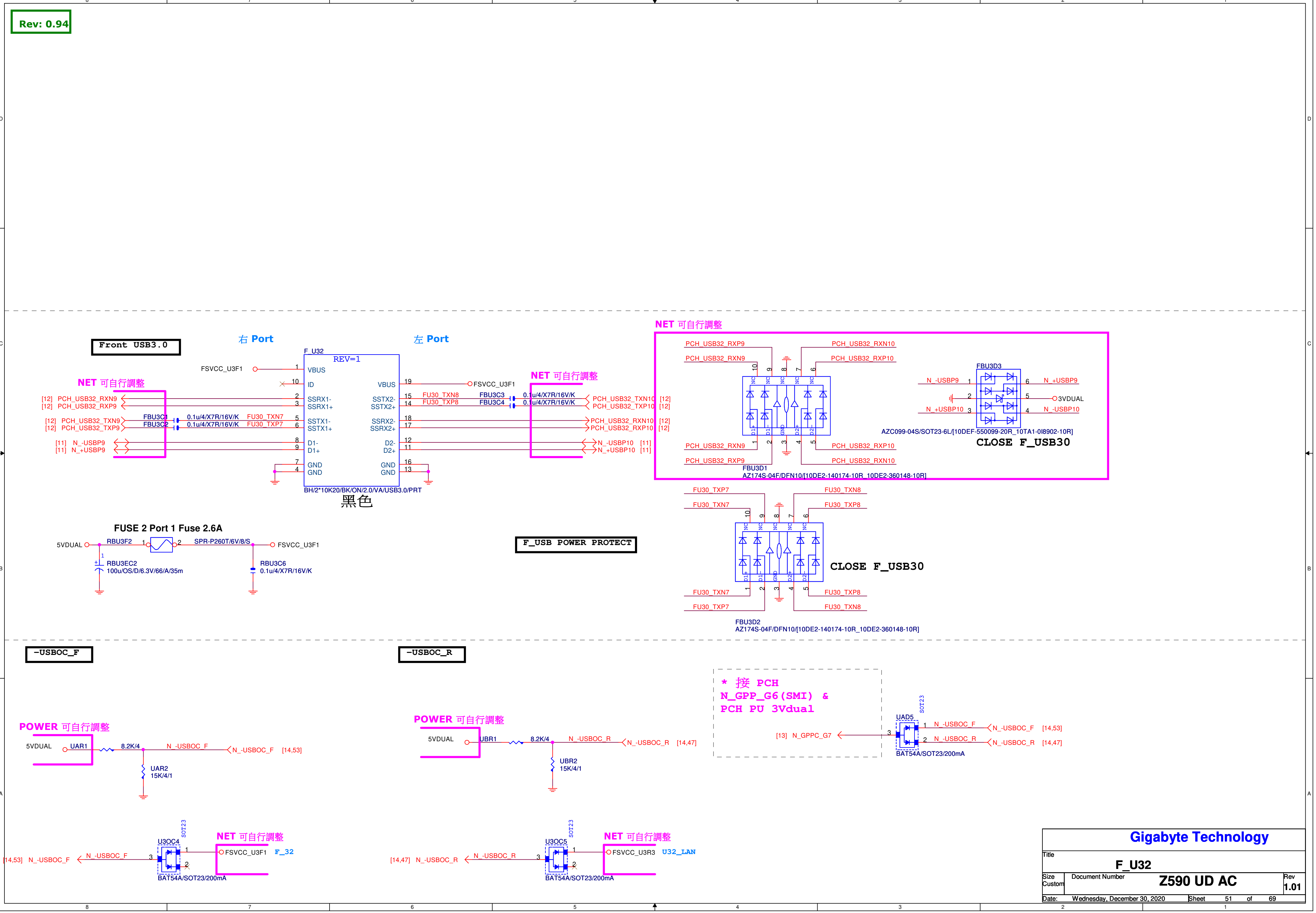


Gigabyte Technology

Title: USB2.0

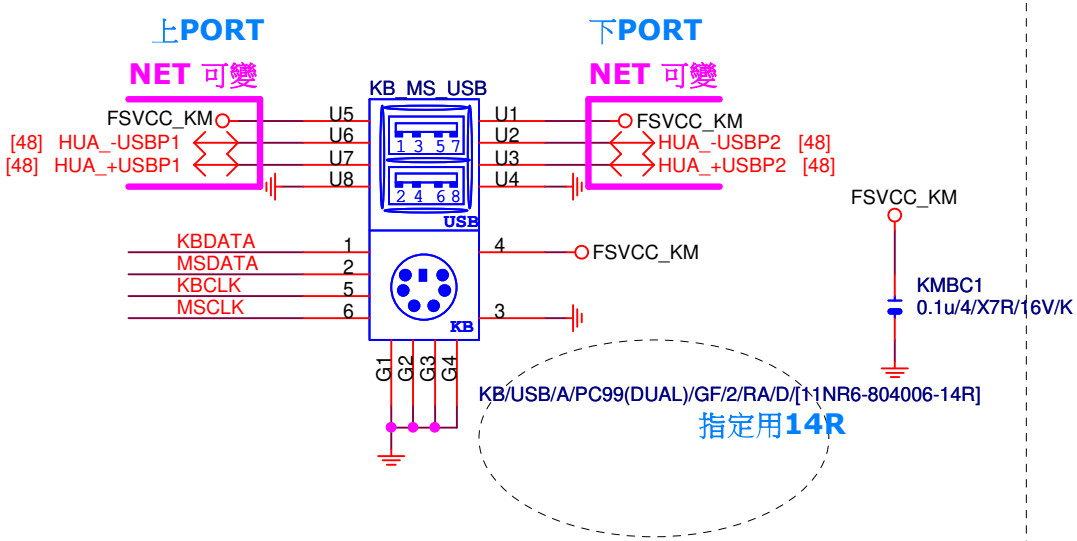
Size: Custom | Document Number: Z590 UD AC | Rev: 1.01

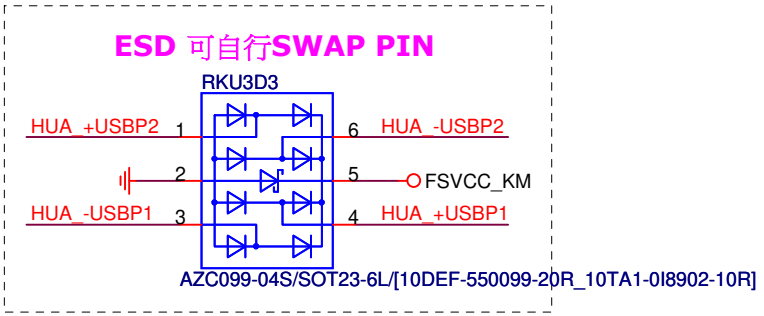
Date: Wednesday, December 30, 2020 | Sheet 50 of 69

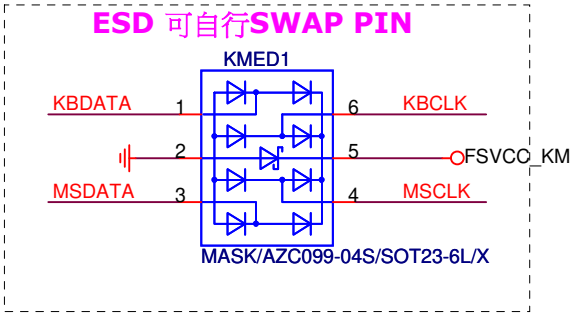

Rev: 0.94
Front USB3.0
右 Port
左 Port
F_U32
REV=1
FSVCC_U3F1
VBUS
ID
SSRX1-
SSRX1+
SSTX1-
SSTX1+
D1-
D1+
GND
SSTX2-
SSTX2+
SSRX2-
SSRX2+
D2-
D2+
BH/2*10K20/BK/ON/2.0/VA/USB3.0/PRT
黑色
NET 可自行調整
[12] PCH_USB32_RXN9
[12] PCH_USB32_RXP9
[12] PCH_USB32_TXN9
[12] PCH_USB32_TXP9
[11] N_-USBP9
[11] N_+USBP9
FBU3C1
FBU3C2
0.1u/4/X7R/16V/K
FU30_TXN7
FU30_TXP7
FU30_TXN8
FU30_TXP8
FBU3C3
FBU3C4
PCH_USB32_TXN10 [12]
PCH_USB32_TXP10 [12]
PCH_USB32_RXN10 [12]
PCH_USB32_RXP10 [12]
N_-USBP10 [11]
N_+USBP10 [11]
FUSE 2 Port 1 Fuse 2.6A
5VDUAL
RBU3F2
SPR-P260T/6V/8/S
RBU3EC2
100u/OS/D/6.3V/66/A/35m
RBU3C6
0.1u/4/X7R/16V/K
F_USB POWER PROTECT
PCH_USB32_RXP9
PCH_USB32_RXN9
PCH_USB32_RXN10
PCH_USB32_RXP10
FBU3D1
AZ174S-04F/DFN10/[10DE2-140174-10R_10DE2-360148-10R]
FBU3D3
N_-USBP9
N_+USBP9
N_+USBP10
N_-USBP10
3VDUAL
AZC099-04S/SOT23-6L/[10DEF-550099-20R_10TA1-0I8902-10R]
CLOSE F_USB30
FU30_TXP7
FU30_TXN7
FU30_TXN8
FU30_TXP8
FBU3D2
AZ174S-04F/DFN10/[10DE2-140174-10R_10DE2-360148-10R]
CLOSE F_USB30
-USBOC_F
-USBOC_R
POWER 可自行調整
5VDUAL
UAR1
8.2K/4
N_-USBOC_F
N_-USBOC_F [14,53]
UAR2
15K/4/1
UBR1
8.2K/4
N_-USBOC_R
N_-USBOC_R [14,47]
UBR2
15K/4/1
* 接 PCH
N_GPP_G6(SMI) &
PCH PU 3Vdual
[13] N_GPPC_G7
UAD5
SOT23
N_-USBOC_F [14,53]
N_-USBOC_R [14,47]
BAT54A/SOT23/200mA
[14,53] N_-USBOC_F
U3OC4
SOT23
FSVCC_U3F1
F_32
BAT54A/SOT23/200mA
[14,47] N_-USBOC_R
U3OC5
SOT23
FSVCC_U3R3
U32_LAN
BAT54A/SOT23/200mA
Gigabyte Technology
Title
F_U32
Size Custom
Document Number
Z590 UD AC
Rev
1.01
Date: Wednesday, December 30, 2020
Sheet 51 of 69

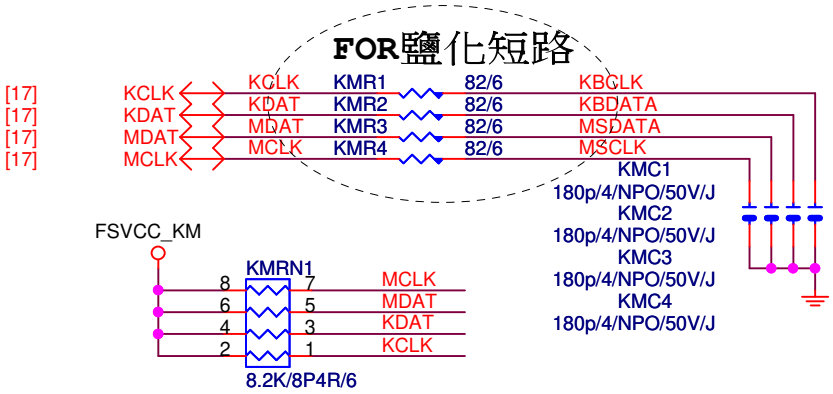
KB_MS_USB

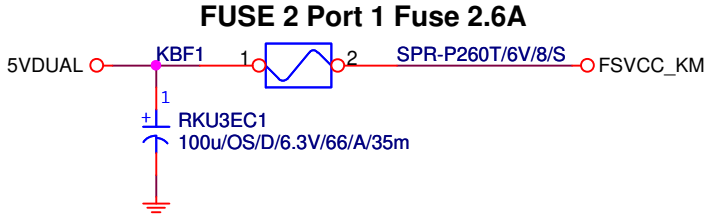
Rev: 0.94





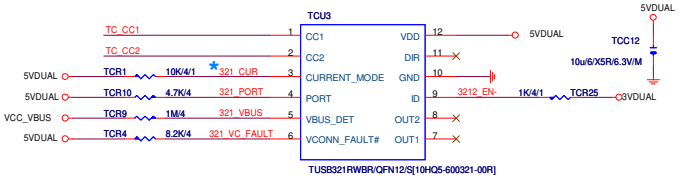






USB OC PROTECT

Gigabyte Technology		
Title: KB_MS_USB		
Size: A	Document Number: Z590 UD AC	Rev: 1.01
Date: Wednesday, December 30, 2020	Sheet 52 of 69	

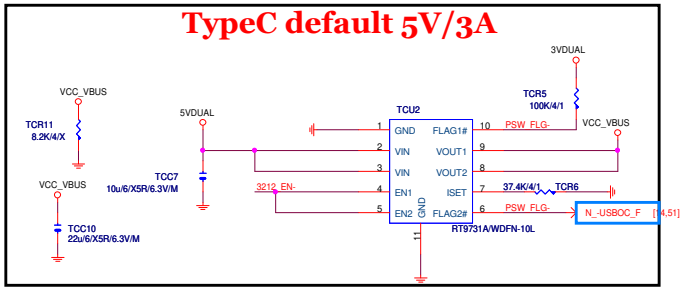


CURRENT MODE
L – Default current / Pull down to GND or NC
M – Medium (1.5A) current / Pull up to VDD 500K
H – High (3.0A) current / Pull up to VDD 10K

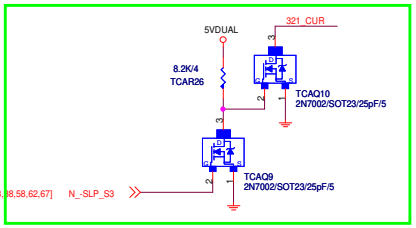
PORT
H – HOST
L – Device
NC – Dual Role

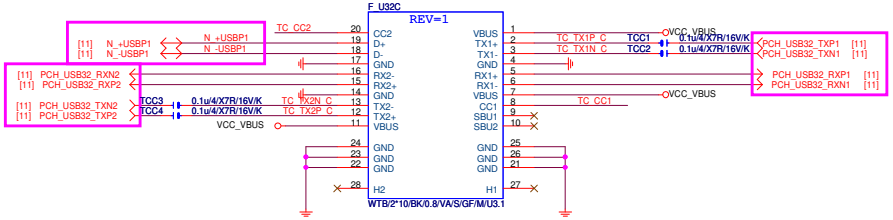
USB POWER

note:可變更FUSB



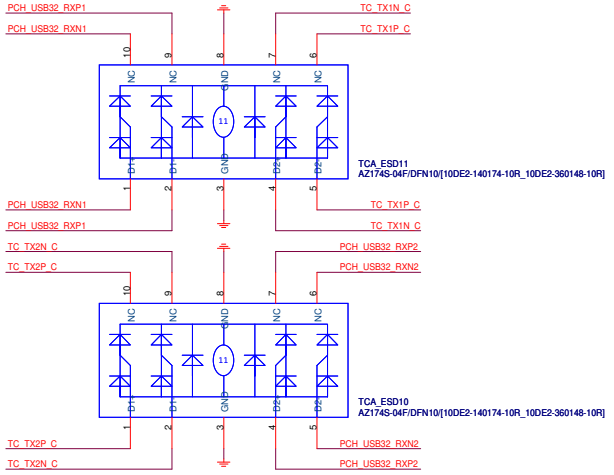
For VBUS current limit at 900mA on S3



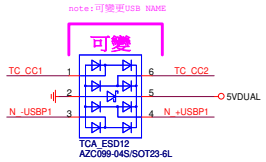


USB2.0 can be used the same source

Color markers can be changed by model



note:可變更USB NAME



Gigabyte Technology		
Title: R_USB30,USB_OC		
Size: C	Document Number: Z590 UD AC	Rev: 1.01
Date: Wednesday, December 30, 2020	Sheet 53 of 69	

LAN:RTL8125B(S) R0.3

POW_MODE

3VDUAL_LAN1
LKR1 4.7K/4/X
LK_POW_EXT_SWR
LKR2 0/4/X
Disable SWR

For RTL8125B
* Leave LKR1 to LKR2 NC

For RTL8125BS
* LKR1 for Enable SWR
* LKR2 for Disable SWR

For INTEL i219V
* LKR1 NC
* LKR2 0ohm

External Resistor

3VDUAL_LAN1
LKR6 4.7K/4 N_PCIE1_WAKE LKC38 4.7K/4/X N_PCIE1_WAKE [17]
LKR9 4.7K/4 PCIE_OB1_RST LKC5 100p/4/NPO/50V/J/X O_PFMRST2 [17]
LKR11 4.7K/4 LK_LED_LINK1000
VCC3
LKR7 4.7K/4 LK_CLKREQB LKR8 0/4 LK_CLKREQ [14]

LKR38 Reserver For debug

25M SMD Type

15p/4/NPO/50V/J LKC6
LK_XTALI
LK_XTALO
LKC7 15p/4/NPO/50V/J
LKX1 25M/12p/30ppm/3.2*2.5/35/S

MDI ESD預留

LKESD1 AZC399-04S.R7G/SOT23-6L/[10DEF-510399-10R]
LK_MDI1+ LK_MDI1- LK_MDI0- LK_MDI0+ 3VDUAL_LAN1

LKESD2 AZC399-04S.R7G/SOT23-6L/[10DEF-510399-10R]
LK_MDI3+ LK_MDI3- LK_MDI2- LK_MDI2+ 3VDUAL_LAN1

0.1u/4/X7R/16V/K
[12] LK_ML_IP LKC1 LK_ML_IP_C
[12] LK_ML_IN LKC2 LK_ML_IN_C
[10] LK_SRCCLK_LAN
[10] LK_-SRCCLK_LAN
[12] LK_ML_OP LKC3 LK_ML_OP_C
[12] LK_ML_ON LKC4 LK_ML_ON_C

[55] LK_MDI0+ LK_MDI0+
[55] LK_MDI0- LK_MDI0-
[55] LK_MDI1+ LK_MDI1+
[55] LK_MDI1- LK_MDI1-
[55] LK_MDI2+ LK_MDI2+
[55] LK_MDI2- LK_MDI2-
[55] LK_MDI3+ LK_MDI3+
[55] LK_MDI3- LK_MDI3-

3VDUAL_LAN1 LKR25 0/4 LKR26 0/4/X
LKR25 FOR RTL8125B(S)
LKR26 FOR INTEL i219V

LKR42 0/4/X LKFB1 0/4

RTL8125B(S)
LKFB1 : O
LKR42 : X

INTEL i219V
LKFB1 : X
LKR42 : O

FOR RTL8125B(S) FOR INTEL i219V
VCC3 LKR3 1K/4/1 LKR4 15K/4/1
3VDUAL_LAN1 LKR27 8.2K/4/X

LKR10 2.49K/4/1
LKR10
RTL8125B(S) : 2.49K
INTEL i219V : 3.01K

LKU1 RTL8125B(S) (RTL8111K)

LK_ISOLATEB 1 ISOLATEB
N_PCIE1_WAKE 2 LANWAKEB
LK_GPI 3 GPI (GPO)
3VDUAL_LAN1 4 NC/VDDREG (DVDD33)
AVDD33_P05 5 NC/VDDREG
LK_POW_EXT_SWR 6 POW_EXT_SWR/ENSWREG
LK_REGOUT 7 NC/REG_OUT
DVDD09 8 DVDD09 (DVDD10)
LK_XTALO 9 CKXTAL2
LK_XTALI 10 CKXTAL1
DVDD09 11 AVDD09 (AVDD10)
LK_RSET 12 RSET

PERSTB 36 PCIE_OB1_RST
(NC) LED3 35
(NC) AVDD33_XTAL 34 LK_AVDD33_XTAL LKR20 0/4 3VDUAL_LAN1
(NC) AVDD33 33 AVDD33_33
(SMBDATA) EEPROM_SEL 32 LKR21 0/4
EECS/SCL 31 LK_PIN31 LKR22 0/4/X N_SML0DAT [13]
(EEDI/SI/SDA) LED0/EEDI/SPISI/SDA 30 LK_LED_ACT_8125
DVDD33 29 3VDUAL_LAN1 LKR23 0/4/X
(NC) DVDD09 28 LK_PIN28 LKR24 0/4 DVDD09 N_SML0CLK [13]
LED1/EESK 27 LK_LED_LINK2500 LK_LED_LINK2500 [55]
(LED0/SPICSB) SPICSB 26 LK_LED_ACT_I219
LED2/EEDO 25 LK_LED_LINK1000 LK_LED_LINK1000 [55]

RTL8125BG-CG/S

Realtek RTL8125BG
VALUE : RTL8125BG-CG/S

INTEL i219V
VALUE : WGI219V/QFN48

FOOTPRINT:
IC48QFN-8111E-1

LK_LED_ACT_8125 LKR30 1K/4/1/X LKR28 0/4
LK_LED_ACT_I219 LKR29 0/4/X LK_LED_ACT_TXRX [55]

For RTL8125B(S)
LKR20 & 21 : O

For i219
LKR20 & 21 : X

For RTL8125B(S)
LKR24 : O
LKR22 & 23 : X

For i219
LKR24 : X
LKR20 & 21 : O

For RTL8125B(S)
LKR28 : O
LKR29 & 30 : X

For i219
LKR28 : X
LKR29 & 30 : O

FOR ERP WAKEUP
3VDUAL LKR40 8.2K/4/X LKQ1 2N7002/SOT23/25pF/5/X
3VDUAL_LAN1
LKR5 8.2K/4
[10] N_-LAN_DIS LKR41 0/4/X LK_GPI

SWR

NC
FOR 8125BS (SWR)
(CLOSE LKU1 PIN7)
FOR 8125BS (SWR)
LKL1 4.7uH/0.8A/3225/S/X
LK_REGOUT DVDD09
LKC16 4.7u/6/X5R/6.3V/K/X
LKC15 0.1u/4/X7R/16V/K/X
LKC17 1u/4/X5R/6.3V/K
(CLOSE LKL1)

EXTERNAL(0.9V) FOR 8125B(S)

LKR12 100K/4/1
3VDUAL_LAN1 VCC0P9_PG
LKR13 0/6/X
3VDUAL
LKR15 0/6
5VDUAL
LKC30 1u/4/X5R/6.3V/K
LKD1 AZ2225-01L/SOD323
LKC29 10u/6/X5R/6.3V/M
3VDUAL_LAN1 VCC0P9_EN
LKR17 8.2K/4
LK_POW_EXT_SWR
LKR32 0/4

LKU2 RT8068AZQW/WDFN-10L
PGOOD
PVIN PVIN
SVIN
LX LX LX
FB
NC
EN GND
LAN_PWR_VIN

1uH/4.6A/2520/S/[10LC3-04100B-01R_10LC4-05100B-61R]
LKL2 DVDD09
LX_09V
LKR14 8.2K/4
LKC24 22p/4/NPO/50V/J
LKC26 10u/6/X5R/6.3V/M
Close LKL2
DVDD09_FB
LKR16 13.7K/4/1
0.96V

External SWR
for RTL8125BS SWR disabled

LAN POWER

3VDUAL_LAN1
(10u CLOSE LKU1 PIN:15)
AVDD33_P15
LKR33 0/4
LKC8 10u/6/X5R/6.3V/M
LKC20 0.1u/4/X7R/16V/K
(2.2u CLOSE LKU1 PIN:19, 33)
LKC18 2.2u/4/X5R/6.3V/M
LKC19 2.2u/4/X5R/6.3V/M

(CLOSE LKU1 PIN: 29, 46)
3VDUAL_LAN1
LKC10 0.1u/4/X7R/16V/K
LKC11 0.1u/4/X7R/16V/K

3VDUAL_LAN1
(CLOSE LKU1 PIN: 5)
AVDD33_P05
LKR31 0/4
LKC12 0.1u/4/X7R/16V/K
LKC13 4.7u/6/X5R/6.3V/K
(CLOSE LKU1 PIN: 4)
LKC21 0.1u/4/X7R/16V/K
LKC22 4.7u/6/X5R/6.3V/K

(CLOSE LKU1 PIN: 34)
3VDUAL_LAN1
LKC14 2.2u/4/X5R/6.3V/M
VDD_P43
LKC23 1u/4/X5R/6.3V/K
(CLOSE LKU1 PIN: 43)

LAN POWER

DVDD09
(2.2u CLOSE LKU1 PIN:11,16,22)
LKC25 2.2u/4/X5R/6.3V/M
LKC27 2.2u/4/X5R/6.3V/M
LKC28 2.2u/4/X5R/6.3V/M
(CLOSE LKU1 PIN:37)
LKC31 1u/4/X5R/6.3V/K
LKC37 10u/6/X5R/6.3V/M
(2.2u CLOSE LKU1 PIN:47)
LKC32 2.2u/4/X5R/6.3V/M
(10u CLOSE LKU1 PIN:8,28)
LKC33 10u/6/X5R/6.3V/M
LKC34 10u/6/X5R/6.3V/M

Gigabyte Technology
Title: Realtek RTL8125B(S)
Size: Custom | Document Number: Z590 UD AC | Rev: 1.01
Date: Wednesday, December 30, 2020 | Sheet 54 of 69

USB_LAN CONNECTOR R0.3

RMA ESD PROTECT

note:可變更USB NAME

可變

N_+USBP7 1 6 N_-USBP7
2 5 FSVCC_U3R3
N_-USBP8 3 4 N_+USBP8

LAUESD1
AZC099-04S/SOT23-6L/[10DEF-550099-20R_10TA1-0I8902-10R]

USB_LAN CONNECTOR

note:可變更USB NAME

LA_MDI-->100歐姆:[20/4/8/4/20]

[i219V]

下 Port

上 Port

U32_LAN
USB3+LAN/2.5G/BU/GO.Y/OS/RA/D/1/15KV

For RTL8125B(S)
LKC35：X

For i219
LKC35：O

LKC35
0.1u/4/X7R/16V/K

LK_CN_L1

[54] LK_MDI0+ LK_MDI0+
[54] LK_MDI0- LK_MDI0-
[54] LK_MDI1+ LK_MDI1+
[54] LK_MDI1- LK_MDI1-
[54] LK_MDI2+ LK_MDI2+
[54] LK_MDI2- LK_MDI2-
[54] LK_MDI3+ LK_MDI3+
[54] LK_MDI3- LK_MDI3-

LKC39 0/4 LK_CN_L10

L1 L2 L3 L4 L5 L6 L7 L8 L9 L10

USB3.0

VBUS D- D+ GND SSRX SSRX+ GND SSTX SSTX+

D1 D2 D3 D4 DT DT VBUS D- D+ GND SSRX- SSRX+ GND SSTX- SSTX+

P1 P2

U1 U2 U3 U4 U5 U6 U7 U8 U9 U10 U11 U12 U13 U14 U15 U16 U17 U18

G1 G2 G3 G4 G5 G6 G7 G8

R2.0

LK_LED_ACT_TXRX [54]
LK_LED_D2 LKR18 330/4 LAN_3VDUAL_LED
LK_LED_D3 LKR19 330/4 LK_LED_LINK1000 [54]
LK_LED_LINK2500 [54]

3VDUAL_LAN1
LKFB2
MASK/0/4/SHT/M/X
LKC36
0.1u/4/X7R/16V/K/X

LABC7 0.1u/4/X7R/16V/K

FSVCC_U3R3

[11] N_-USBP7
[11] N_+USBP7
[12] PCH_USB32_RXN7
[12] PCH_USB32_RXP7
[12] PCH_USB32_TXN7
[12] PCH_USB32_TXP7

LAUAC1 PCH_USB32_TXN7C
LAUAC2 PCH_USB32_TXP7C

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

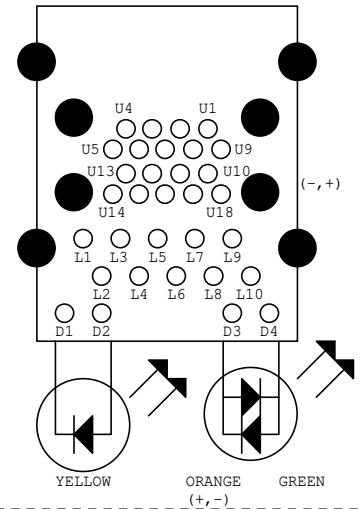
可變 可變

N_-USBP8 [11]
N_+USBP8 [11]
PCH_USB32_RXN8 [12]
PCH_USB32_RXP8 [12]
PCH_USB32_TXN8C LAUAC3
PCH_USB32_TXP8C LAUAC4
PCH_USB32_TXN8 [12]
PCH_USB32_TXP8 [12]

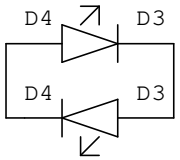
0.1u/4/X7R/16V/K
0.1u/4/X7R/16V/K

可變 可變

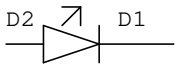
USB30_LAN LAYOUT示意圖



Dual Color LED



Single Color LED



RMA ESD PROTECT

note:可變更USB NAME

PCH_USB32_TXP8C
PCH_USB32_TXN8C
PCH_USB32_TXN8C
PCH_USB32_TXP8C
PCH_USB32_TXN7C
PCH_USB32_TXP7C
PCH_USB32_TXP7C
PCH_USB32_TXN7C

LAU3ESD1
AZ174S-04F/DFN10/[10DE2-140174-10R_10DE2-360148-10R]

可變

PCH_USB32_RXP7
PCH_USB32_RXN7
PCH_USB32_RXN7
PCH_USB32_RXP7
PCH_USB32_RXN8
PCH_USB32_RXP8
PCH_USB32_RXP8
PCH_USB32_RXN8

LAU3ESD2
AZ174S-04F/DFN10/[10DE2-140174-10R_10DE2-360148-10R]

USB POWER

note:可變更FUSE

可變

5VDUAL 1 LAU3F1 2 FSVCC_U3R3
SPR-P260T/6V/8/S
FUSE-0805

REC2 1
REC2
100u/OS/D/6.3V/66/A/35m

Close to connector

EMI SHORT PAD

PS:視EMI需求

LAN POWER

note: lan power連接及電流

可變

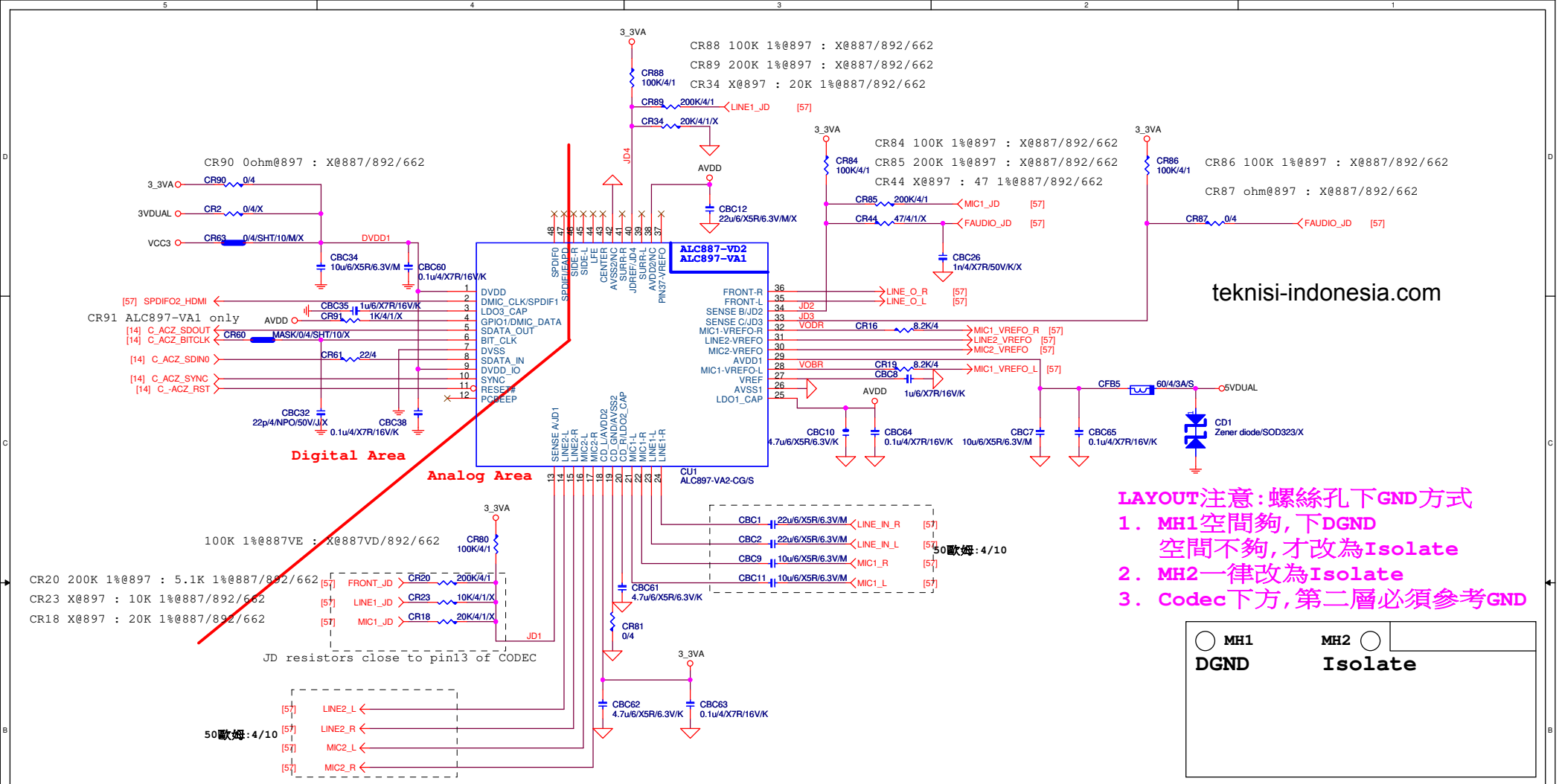
3VDUAL_LAN1 LAPW1 0/4 3VDUAL_PCH *
LAPW2 0/4/X 3VDUAL *

Gigabyte Technology

Title: LAN CONNECTOR-RTL8125B(S)

Size: Custom | Document Number: Z590 UD AC | Rev: 1.01

Date: Wednesday, December 30, 2020 | Sheet 55 of 69



LAYOUT注意:螺絲孔下GND方式

1. MH1空間夠,下DGND
   空間不夠,才改為Isolate
2. MH2一律改為Isolate
3. Codec下方,第二層必須參考GND

MH1	MH2
DGND	Isolate

		897	887/892/662
Pin03	LDO3	1uF	10uF
Pin09	DVDD-IO	0.1uF	1uF
Pin18	AVDD2	4.7uF/0.1uF	NC
CR81	AVDD2	0ohm	NC
Pin20	LDO2	4.7uF	NC
Pin25	LDO1	4.7uF	22uF
CR83	LDO1	NC	0ohm
Pin27	VREF	1uF	10uF
Pin38	AVDD2	NC	22uF

LAYOUT注意:要加

GND切割線

音效區域印刷

Pin20 LDO2

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)

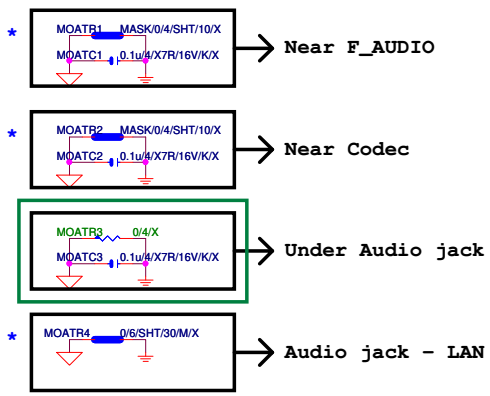
GIGABYTE

Title: HD AUDIO ALC887VE/887VD

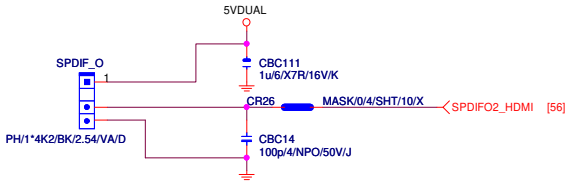
Size	Document Number	Rev
Custom	Z590 UD AC	1.01

Date: Wednesday, December 30, 2020 Sheet 56 of 69

Rev 6.0

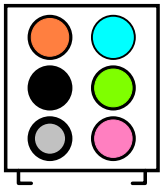


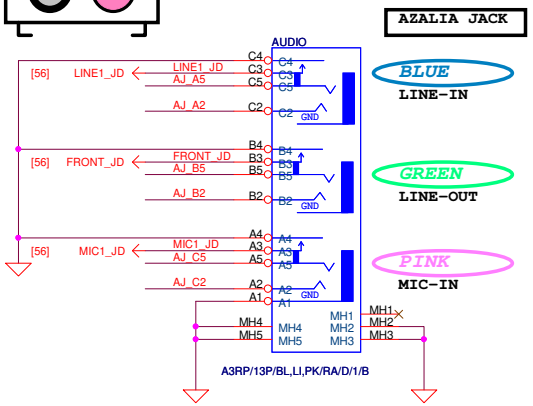
*量產前,MOATR1/MOATR2/MOATR4 ....0ohm改short pad



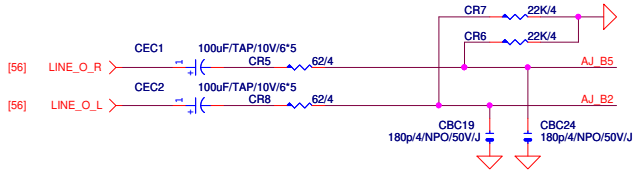
For HDMI SPDIF （依SPEC保留或移除）

AZALIA JACK

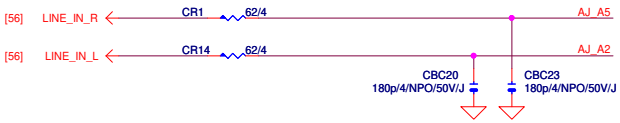




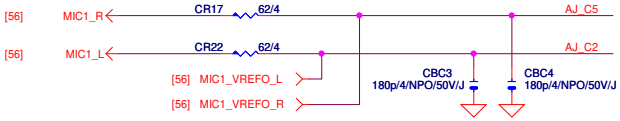
LINE-OUT



LINE-IN



MIC-IN

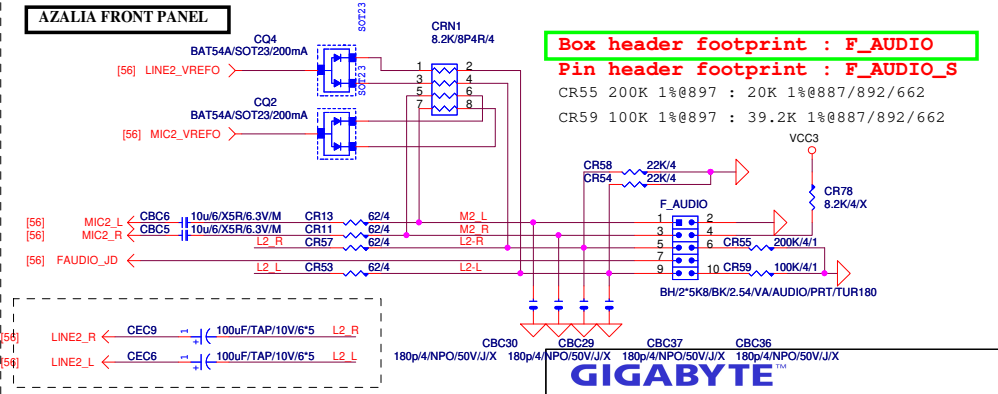


SURROUND

CEN/LFE

SURR BACK

AZALIA FRONT PANEL



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Title	AUDIO JACK	
Size: Custom	Document Number: Z590 UD AC	Rev: 1.01
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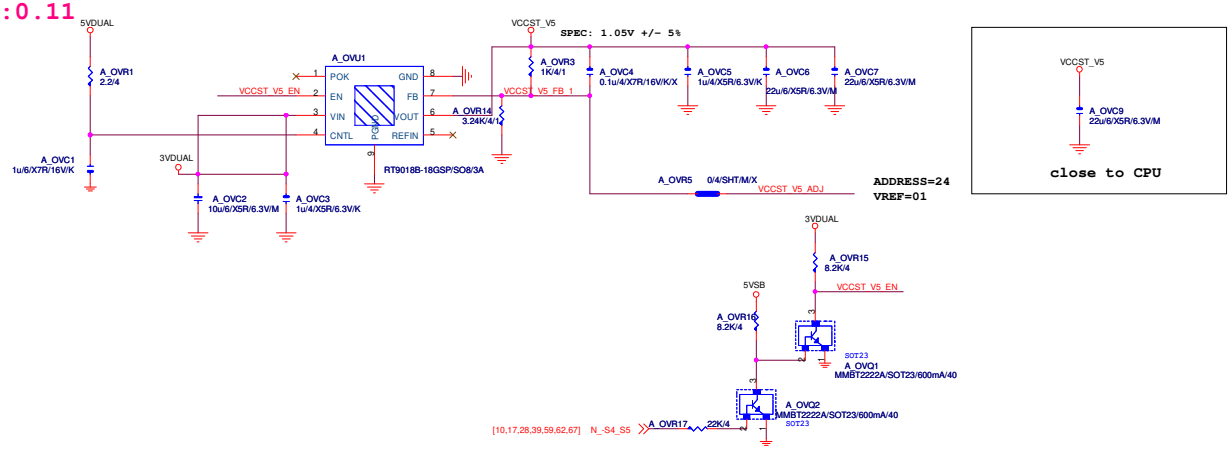
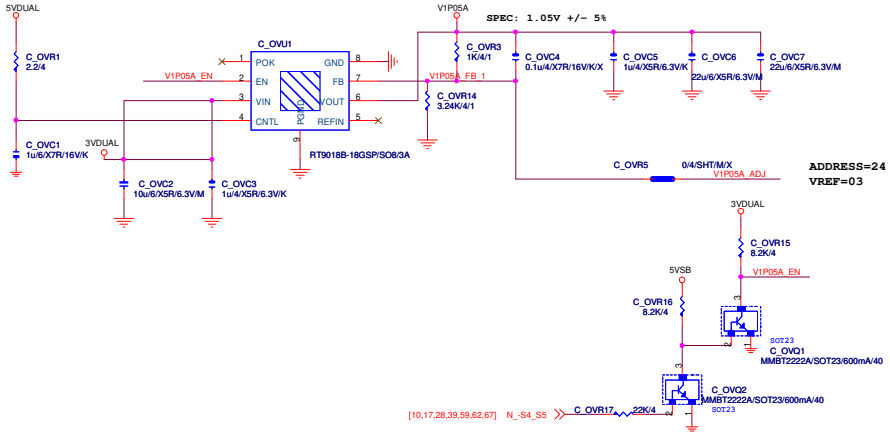
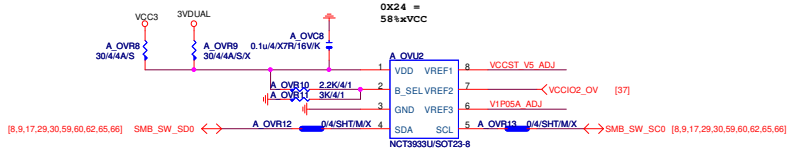
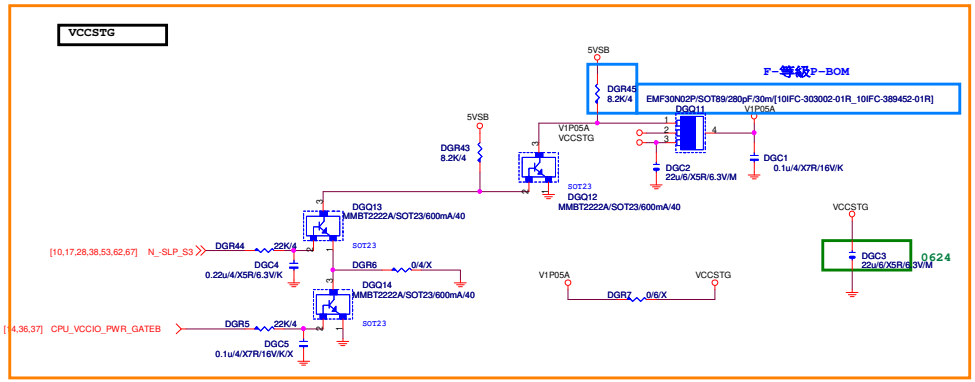
REV:0.11









GIGABYTE™

Title	CPU POWER-1	
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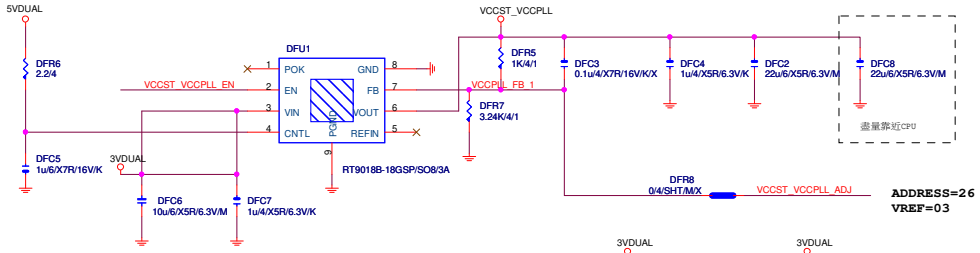
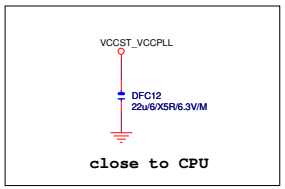
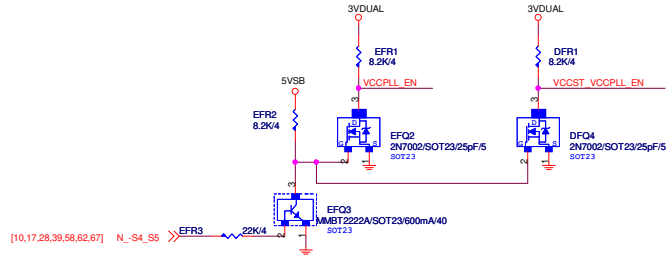
REV:0.11

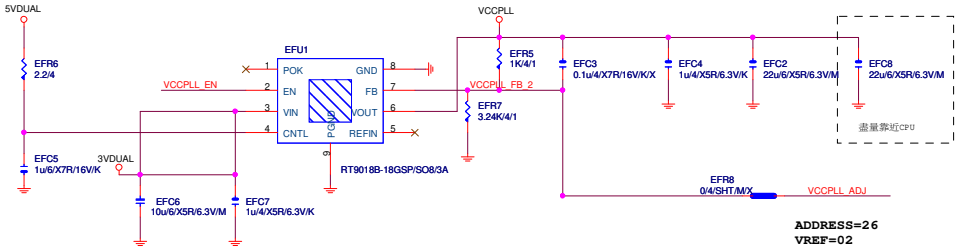
VCCST_VCCPLL 替換原先MOS開關線路

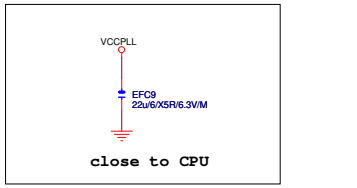


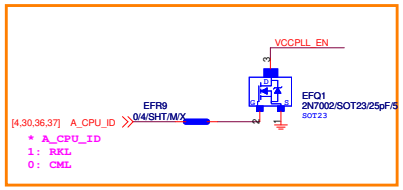




VCCPLL

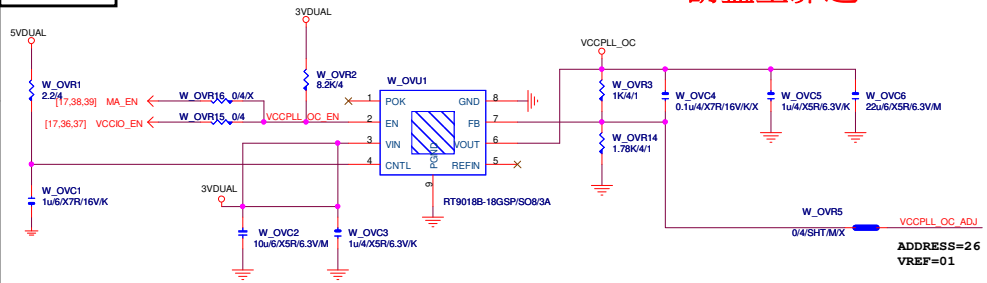


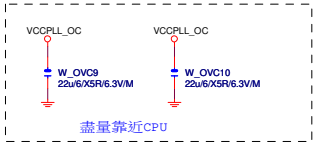


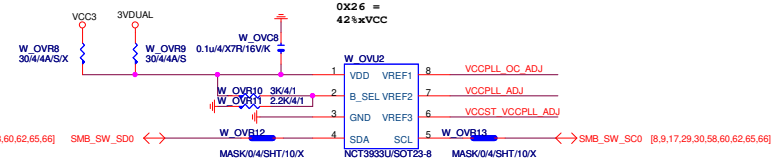


VCCPLL_OC

請盡量靠近CPU







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Title	CPU POWER-2	
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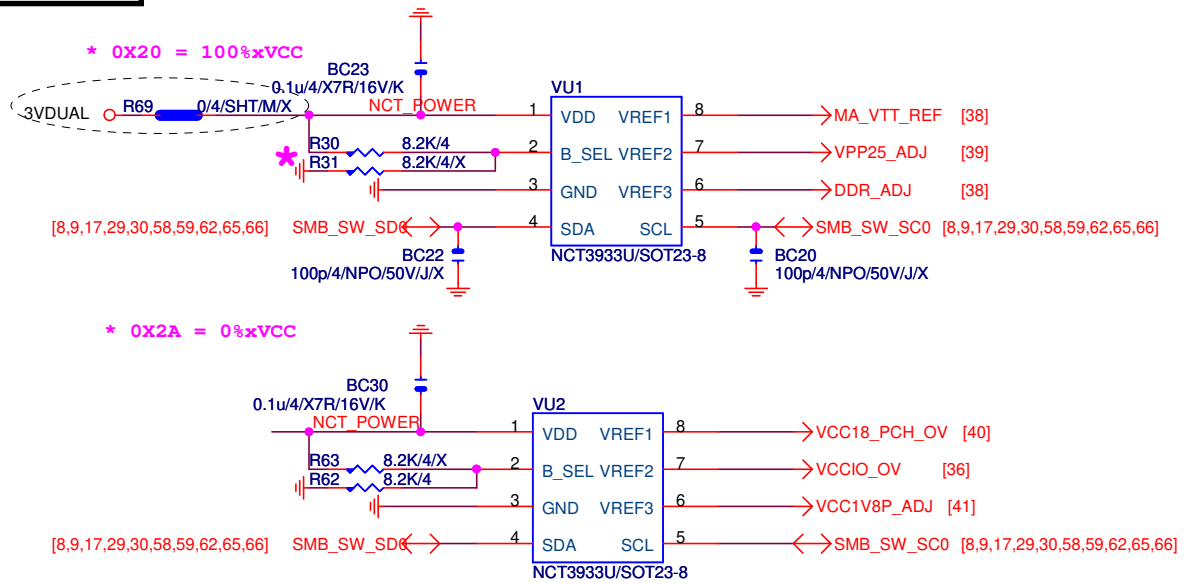
OVER VOLTAGE **REV:0.11**



NCT3933	0X2A	0X20
VREF1	VCC18_PCH	DDRVTT
VREF2	VCCIO	VPP25V
VREF3	VCC1V8_PRIM	VDDQ

Gigabyte Technology

Title: **CPU CORE VR-2**

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Rev: 0.94

FRONT PANEL

★Update 2016.06.15

VCC, VCC3, VCC

FPR22 8.2K/4/X

FPR6 150/6

FPR1 330/6/X

FPBC1 0.01u/4/X7R/50V/K/X

5VDUAL, 3VDUAL_PCH

FPR2 330/6/X

FPR4 150/6

★Update 2018.05.23

MPD+

3VDUAL_PCH

FPR3 8.2K/4 [17]

F_PANEL

1	HD+	MSG/PD+	2
3	HD-	MSG/PD-	4
5	GND	PW+	6
7	RESET	PW-	8
9	CI-		
11	CI+		
		SP+	14
15	PWR+	NC	16
17	PWR-	NC	18
19	PWR-	SP-	20

HD+, -HDLED, MPD+, MPD-, -PWRBT_1, -RST, -CASEOPEN

MPD+ → MPD-

-PWRBTSW [17,62]

FPR9 33/4

FPC1 0.01u/4/X7R/50V/K/X

FPBC3 0.01u/4/X7R/50V/K

[11,17,66] N_-SYS_RST

FPR5 100/4/1

FPBC2 0.01u/4/X7R/50V/K

BH/2*10K10,12,13/BK/2.54/VA/PA/FAT

Update 2015.01.08
Footprint=F_PANEL-100

CASE OPEN

[11,13,15] N_RTCVDD

FPR8 1M/4

-CASEOPEN → -CASEOPEN [17]

FPBC4 0.01u/4/X7R/50V/K

FPESD1

-HDLED, -PWRBT_1, MPD-, 3VDUAL_PCH, -RST

AZC099-04S/SOT23-6L/[10DEF-550099-20R_10TA1-0I8902-10R]

★Update 2015-02-11

SATA/M.2 LED

FPD2 BAT54A/SOT23/200mA

[14] N_-SATALED

[26] -M2M_LED

-HDLED

Fix some M.2 cause HD_LED always on.
★Update 2016.06.15

FPD3 BAT54A/SOT23/200mA

[25] -M2A_LED

[27] -M2P_LED

-HDLED

SPKR W/O EC

VCC

FPD1 1N4148W/SOD123/300mA

FPQ6 MMBT2222A/SOT23/600mA/40

SPK-

FPR13 75/4/1

FPR14 75/4/1

VCC3

FPR16 1K/4/1/X

FPR15 8.2K/4

N_SPKR [13]

FPQ5 MMBT2222A/SOT23/600mA/40

VCC

FPR17 1K/4/1

FPR18 8.2K/4

FPQ7 2N7002/SOT23/25pF/5

[17] BEEP-

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

FRONT PANEL SHORT

*** FOR 客戶Button**

OCD1 BAT54A/SOT23/200mA

OC_1

OC_PIN

OCR4 0/6

5VDUAL

PH/2*2K4/BK/2.54/VA/D

Footprint : PIN2X2-CUT4

OCR2 33/4

N_GPP_D3 [13]

TBOBC1 0.01u/4/X7R/50V/K

Gigabyte Technology		
Title: FRONT PANEL		
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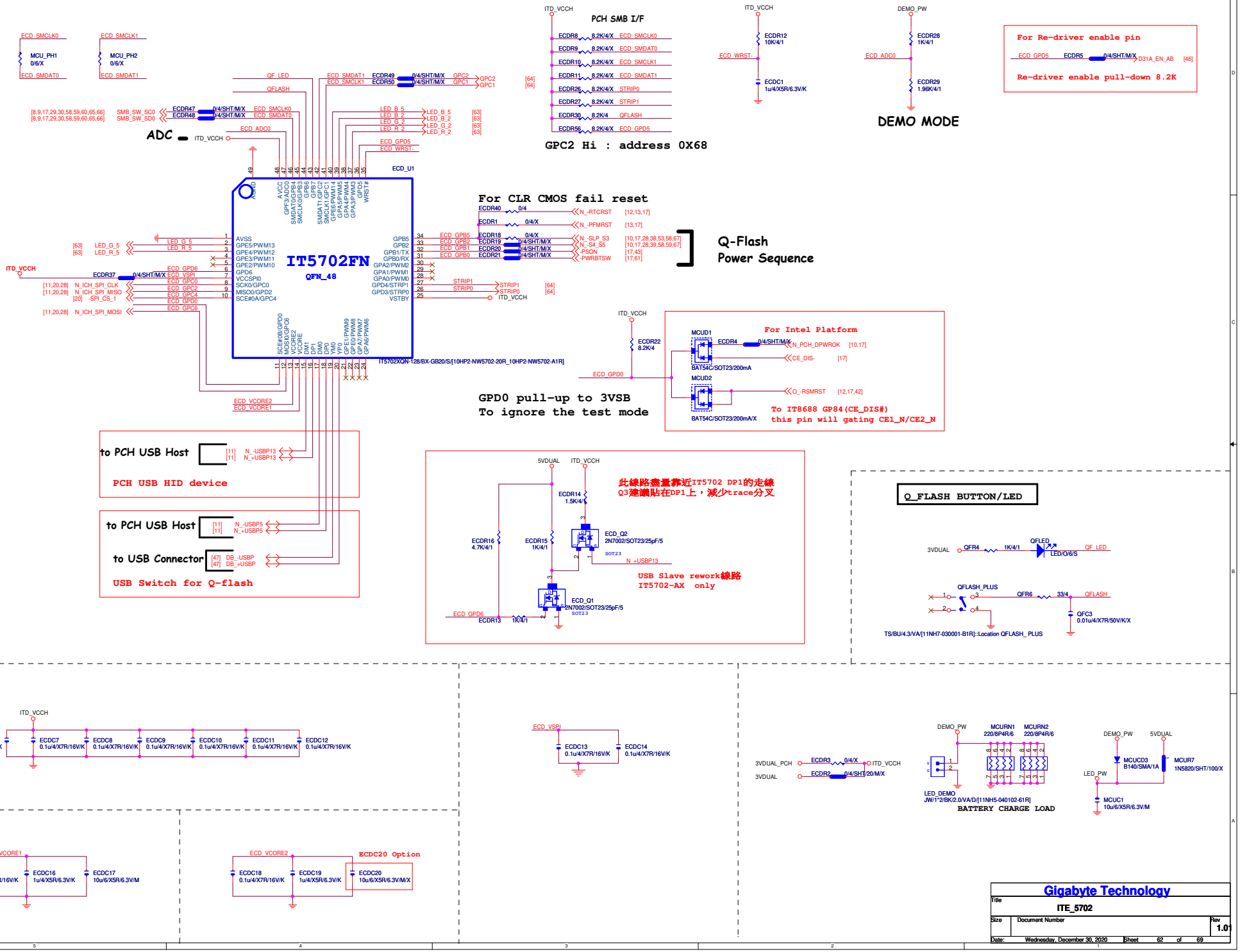
ECD_U1 請放在PCH到BIOS路徑上.避免線過長



Gigabyte Technology	
Title	ITE_5702
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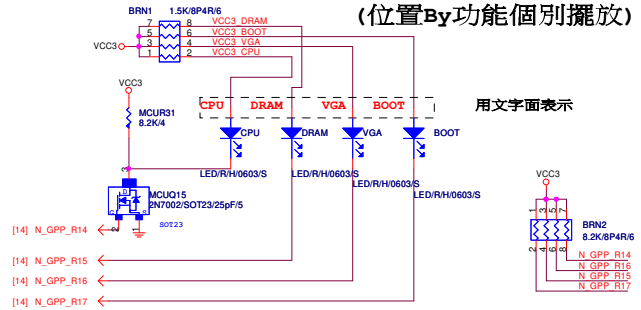
Rev 1.0

第一區 LED

DEBUG PORT LED *4
(位置By功能個別擺放)

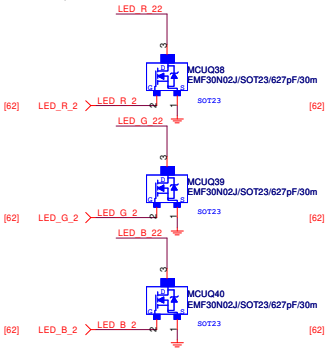


N_GPP_R14	CPU DEBUG
N_GPP_R15	DDR DEBUG
N_GPP_R16	VGA DEBUG
N_GPP_R17	BOOT DEVICE DEBUG

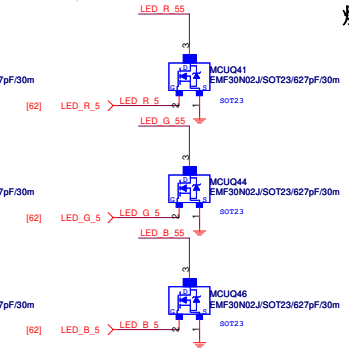
第三區 LED

第五區 LED

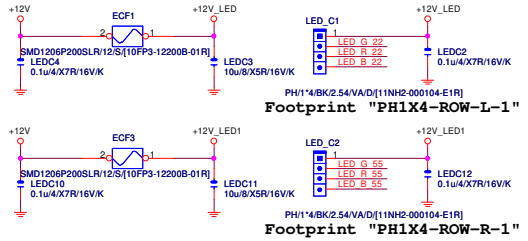
第二區 LED CONTROL



第五區 LED CONTROL



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)



第四區 LED

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Title	PCH/AUDIO/DEBUG/C_LED1/2	
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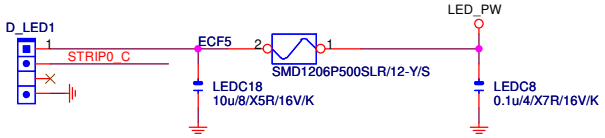
Rev 1.0

第六區 LED (靠近左上板邊位置)

Digital LED Strip1



Footprint PH1X4-CUT3-LED-L

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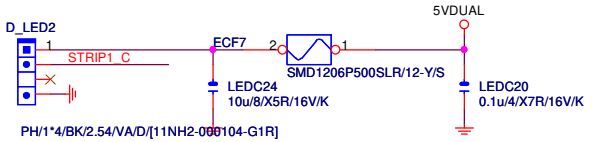
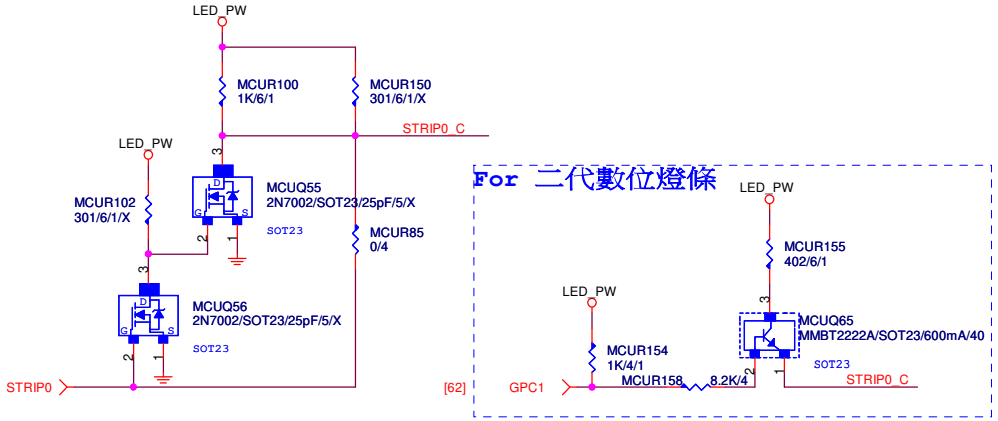
第七區(靠近右下CPU板邊位置)

Digital LED Strip2

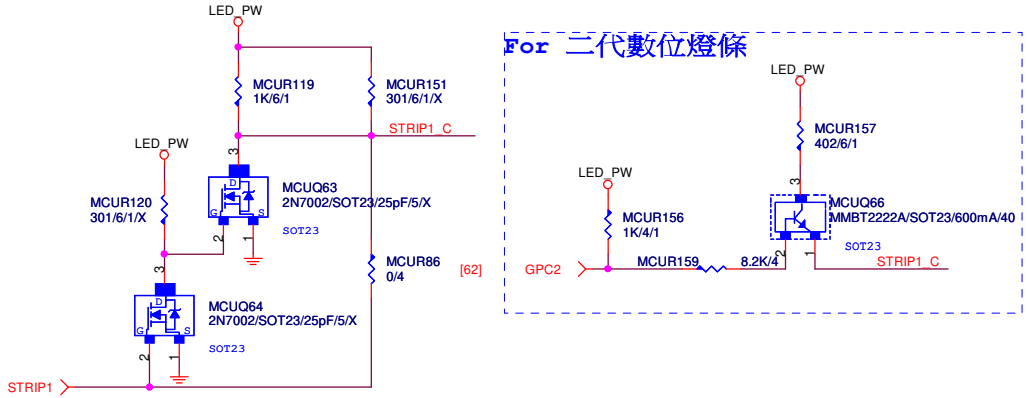


Footprint "PH1X4-CUT3-LED-R"
(for pin-name 與 model-name 同方向)

燈條 Level shift



燈條 Level shift



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Title	D_LED1/D_LED2	
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REV:0.1

*全部不上件

ADDRESS = 74

SMB_SW_U2
5VDUAL
VIN VOUT
GND
EN FB
SMB_SW_2V5
R1 SMB_SW_R17 3K/4/1/X
SMB_SW_FB
SMB_SW_C1 22P/4/NPO/50V/J/X
SMB_SW_C2 10U/6/X5R/6.3V/M/X
SMB_SW_C3 2.2u/4/X5R/6.3V/M/X
Vout=0.8*(R1+R2)/R2
AP7365-WG-7/SOT23-5/600mA/X
R2 SMB_SW_R20 1.4K/4/1/X
使用IT5706時不需上件

SMB_SW_VDD
SMB_SW_R2 8.2K/4/X
SMB_SW_A0
SMB_SW_R5 8.2K/4/X
SMB_SW_R3 8.2K/4/X
SMB_SW_A1
SMB_SW_R6 8.2K/4/X
SMB_SW_R18 8.2K/4/X
SMB_SW_A2
SMB_SW_R7 0/4/X

3VDUAL
SMB_SW_R1 0/6/X
3VDUAL_PCH
SMB_SW_R4 0/6/X
SMB_SW_2V5
SMB_SW_R8 0/6/X
使用IT5706時改上SMB_SW_R1

other

SMB_SW_U1
SMB_SW_R9 8.2K/4/X
SMB_SW_R10 0/4/X
SMB_SW_RST
[13] N_GPP_C10
N_SMBDATA [13]
N_SMBCLK [13]
RESET_N GND A1 A0 VDD SDA SCL
SD0 A2
SC0 SC3
SD1 SD3
SC1 VSS SD2 SC2
SMB_SW_A2
SMB_SW_SD0
SMB_SW_SC0
[8,9,17,29,30,58,59,60,62,66] SMB_SW_SD0
[8,9,17,29,30,58,59,60,62,66] SMB_SW_SC0
SMB_SW_SC3
SMB_SW_SD3
SMB_SW_SC3 [27]
SMB_SW_SD3 [27]
M2_P使用
NCT5946Y/QFN16/X
PCIE SLOT
SMB_SW_SD1
SMB_SW_SC1
[21,22,23] SMB_SW_SD1
[21,22,23] SMB_SW_SC1
SMB_SW_SC2
SMB_SW_SD2
SMB_SW_SC2 [25,26]
SMB_SW_SD2 [25,26]
M2_M and M2_A

PCH
3VDUAL
SMB_SW_R11 1.4K/4/1/X
SMB_SW_R12 1.4K/4/1/X
SMB_SW_SC0
SMB_SW_SD0
SMB_SW_R13 1.4K/4/1/X
SMB_SW_R14 1.4K/4/1/X
SMB_SW_SC1
SMB_SW_SD1

N_SMBCLK SMB_SW_R21 0/4 SMB_SW_SC0
N_SMBDATA SMB_SW_R22 0/4 SMB_SW_SD0
N_SMBCLK SMB_SW_R23 0/4 SMB_SW_SC1
N_SMBDATA SMB_SW_R24 0/4 SMB_SW_SD1

SMB_SW_U1 不上件時.電阻要上

VCC1V8_PRIM
M2AC4 1u/4/X5R/6.3V/K/X
M2U1
VCCA VCCB
A1 A2
B1 B2
GND EN
3VDUAL
M2AC13 1u/4/X5R/6.3V/K/X
[25,26,27] M2_SMBCLK
[25,26,27] M2_SMBDATA
N_SMBCLK
N_SMBDATA
M2AR12 8.2K/4/X
PCA9617ADPJ/TSSOP8/S/[10TA1-0A9617-10R]/X

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Title	SMBUS SWITCH	
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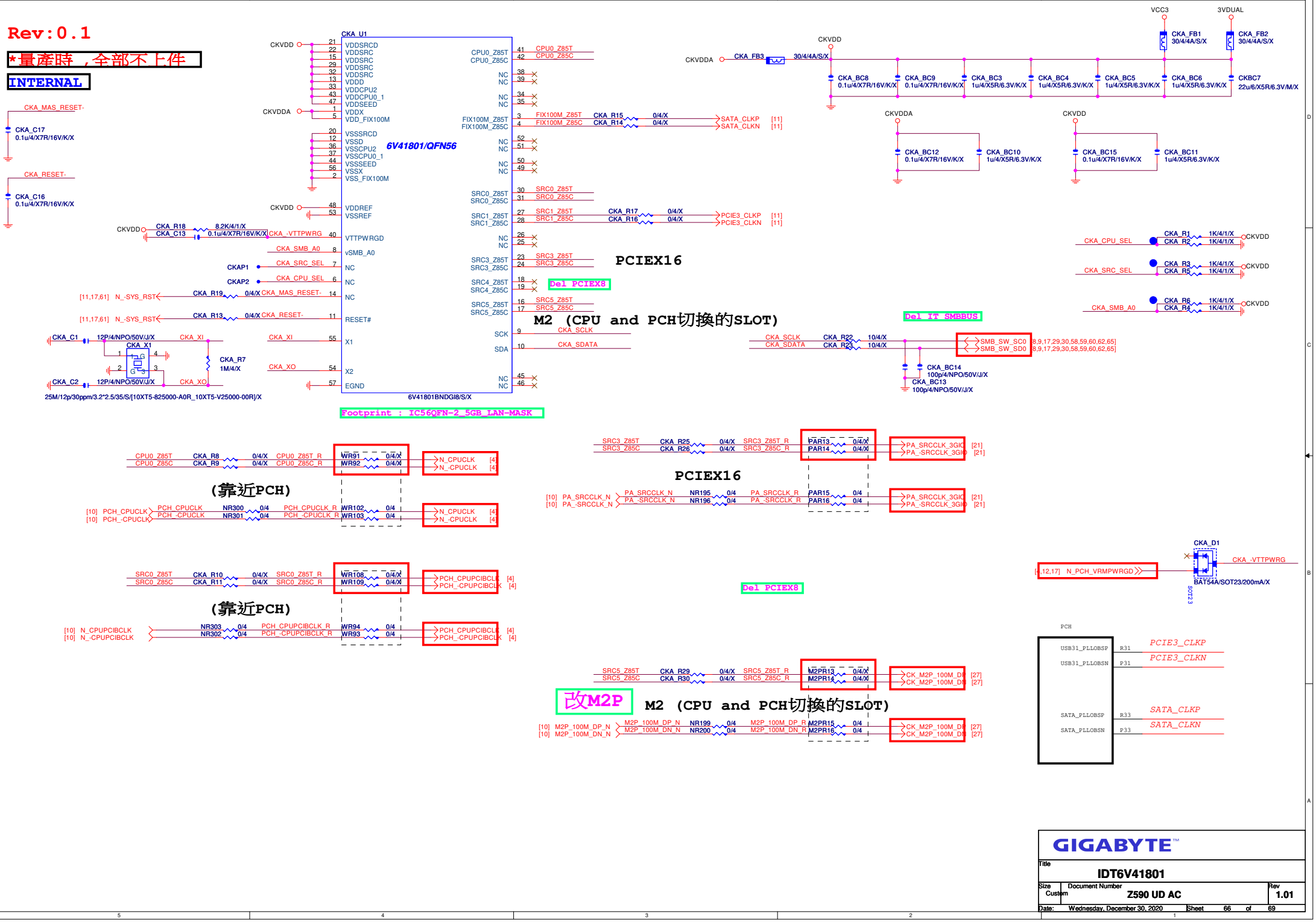
Rev:0.1

*量產時，全部不上件

INTERNAL



Title	IDT6V41801
Size	Custom
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EMI/ESD R0.1

CLOSE SIO

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

[10,17,28,38,53,58,62] N_-SLP_S3

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

[10,17,28,39,58,59,62] N_-S4_S5

CLOSE PCH

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

[4,10] N_CPUPWROK

GIGABYTE™

Title	EMI/ESD	
Size: A	Document Number: Z590 UD AC	Rev: 1.01
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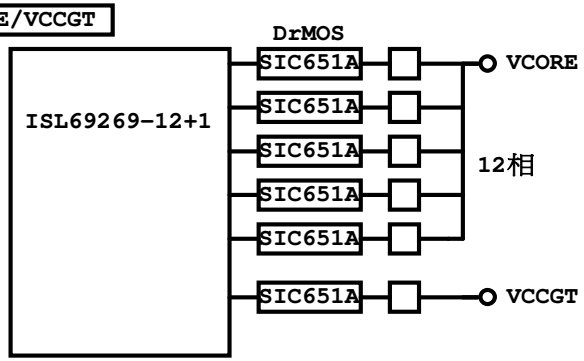
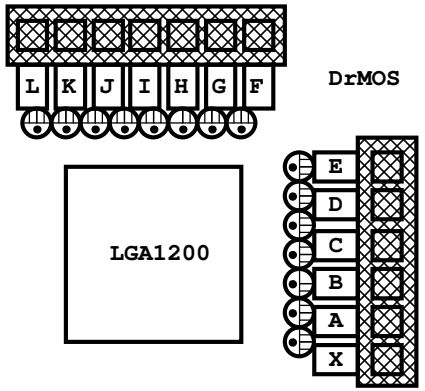
POWER BLOCK MAP

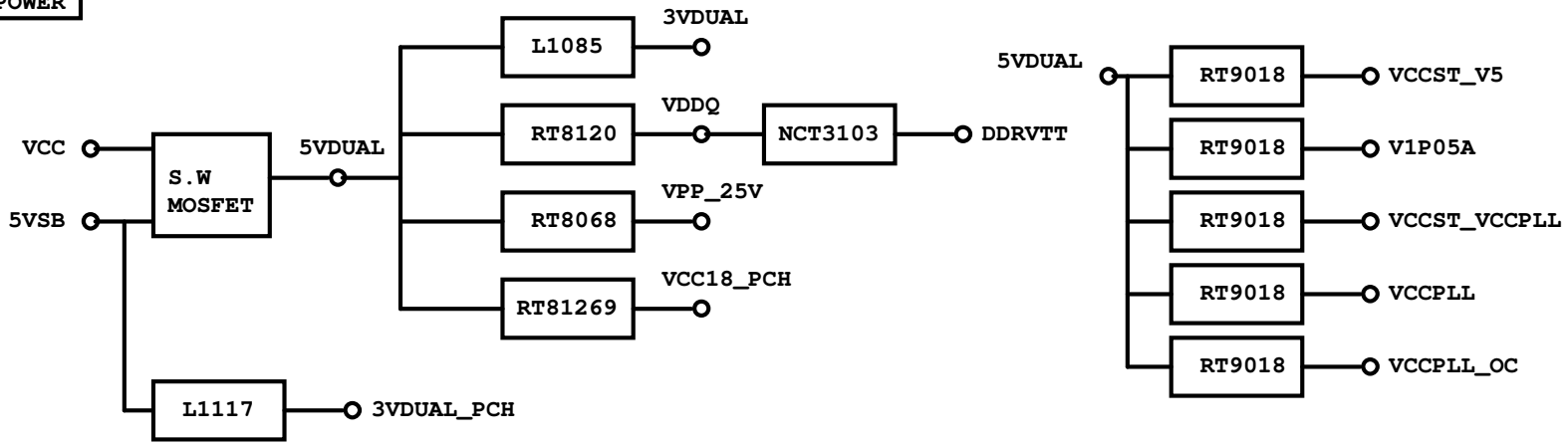
- CPU: VCORE, VCCGT, VCCSA, VCCIO, VCCIO2, VCCST_VCCPLL, VCCPLL, VCCPLL_OC, VCCST_V5, V1P05A, VCCSTG, VDDQ
- DDR4: VDDQ, DDRVTT, VPP_25V
- PCH: VCC18_PCH, VCC1V8_PRIM, VCCPRM_1P05, VCCDPHY_1P24, VCC0P85_PCH, VCC3_PCH, 3VDUAL_PCH, VCC3, N_RTCVDD
- IT8689: IT_VCCH, IT_AVCC, 2_5LEVEL
- HM: +12V, VCC, VCC3, VCORE, VCCGT(IMON_VCCGT), VDDQ, VCCSA(IMON_VCORE)

VCORE/VCCGT

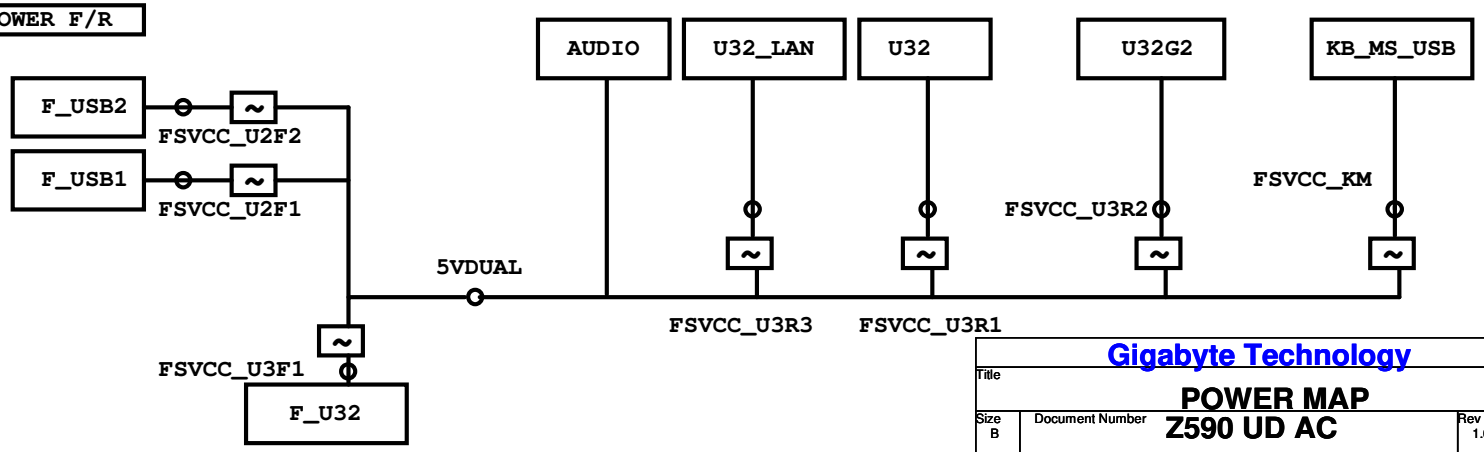




POWER



FUSE POWER F/R



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Title	POWER MAP	
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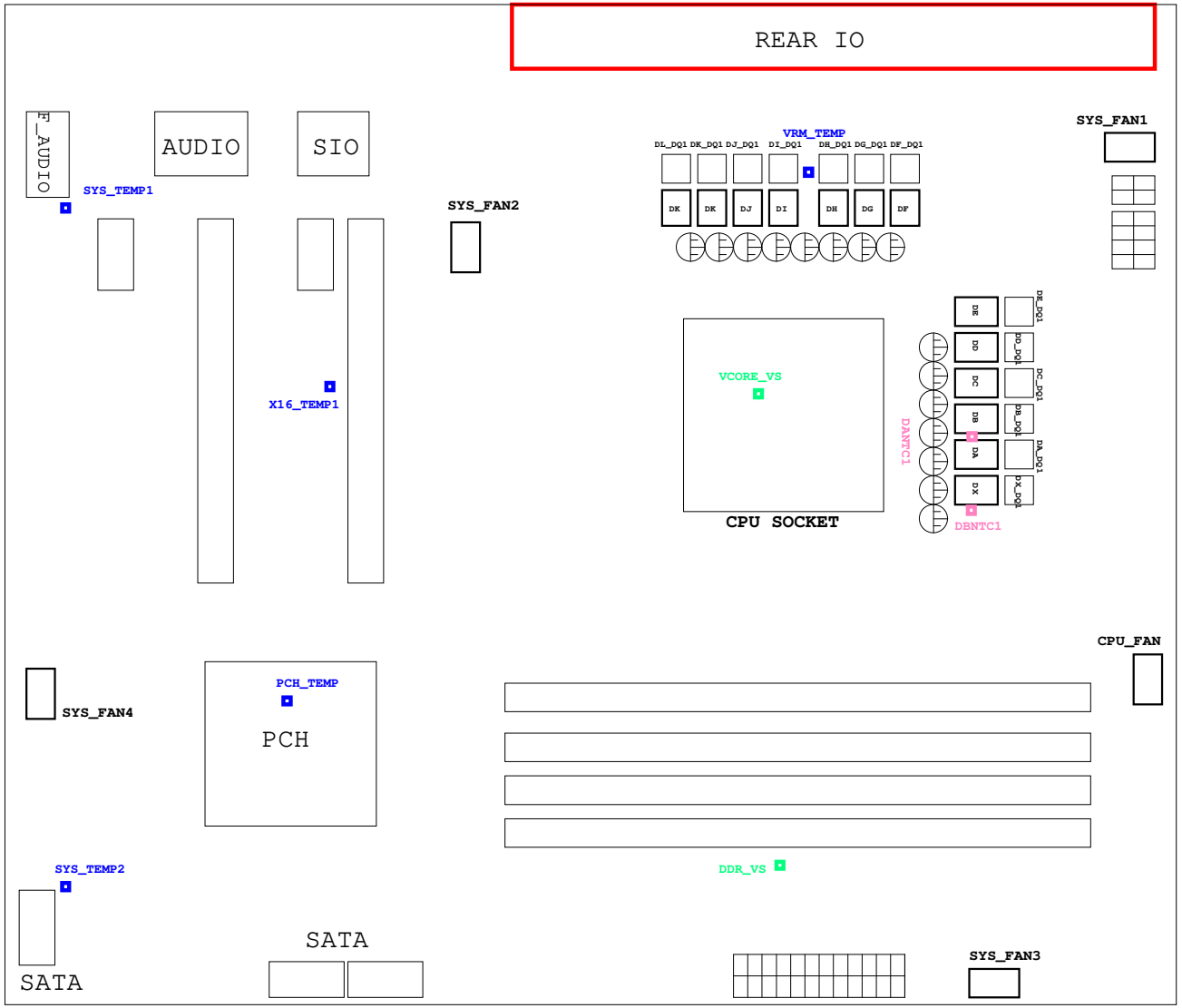

熱敏電阻	擺放靠近位置	走線方式
DANTC1	DB_DL1	Differential
DBNTC1	DX_DL1	Differential
VRM_TEMP	DC_DQ1	N/A
X16_TEMP1	PCIEX16	N/A
PCH_TEMP	PCH	N/A
SYS_TEMP1	F_AUDIO	N/A
SYS_TEMP2	F_PANEL	N/A

SIO RS
PWM RS
SIO VIN

FAN

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Title: NTC MAP

Size: Custom | Document Number: Z590 UD AC | Rev: 1.01

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