

Model Name: GA-Z170X-Gaming 3 EU

SHEET TITLE Rev 1.02

01	COVER SHEET
02	BOM & PCB MODIFY HISTORY
03	BLOCK DIAGRAM
04	CPU_LGA1150-A
05	CPU_LGA1150-B_DDR4
06	CPU_LGA1150-C
07	CPU_LGA1150-D
08	DDR4 CHANNEL A 1,2
09	DDR4 CHANNEL B 1,2
10	PCH_RGB,CLK BUFFER
11	PCH DMI,USB,PCIE
12	PCH MISC
13	PCH SATA,PCIE,SATA EXPRESS
14	PCH_PWR,GND
15	DUAL BIOS
16	ITE 8628 LPC IO
17	HMW
18	FAN CTRL--SIO
19	PCI EXPRESS X16 SLOT
20	PCI EXPRESS X4 SLOT(PCH)
21	PCI EXPRESS X1 SLOTS
22	M.2 X4
23	SATA EXPRESS
24	ISL95856 PWM
25	ISL95856 MOS_VCORE
26	ISL95856 MOS_VCCGT
27	VCCSA_VCCIO_VCCPLL
28	RT8120_DDR

SHEET TITLE

29	RT8120_VPP
30	RT8120_PCH
31	DISCRETE POWER1
32	NCT3933
33	ATX POWER , A_-PROCHOT
34	KB_MS_USB
35	DVI CONN
36	PTN3356 - DP to VGA - IC
37	PTN3356 - DP to VGA - Conn
38	HDMI CONN_170
39	R_USB30
40	KILLER E2201
41	USB30 LAN CONNECTOR-E2201
42	Realtek ALC1150
43	REAR AUDIO JACK
44	Audio Power
45	F_USB30
46	F_USB BOX Header
47	COM,TPM,THB
48	F_PANEL
49	PCI EXPRESS X8 SLOT
50	PCI EXPRESS X16 SWITCH
51	IDT6V41530_CLK BUFFER
52	ALPINE RIDGE CIO & DP
53	ALPINE RIDGE POWER
54	HD3SS3212&TUSB321_A
55	EMI ESD
56	2nd M.2 X4
57	M.2 SWITCH
58	TABLE LIST

Rev 1.02

Component value change history

P-Code: U15003-0

[illegible]

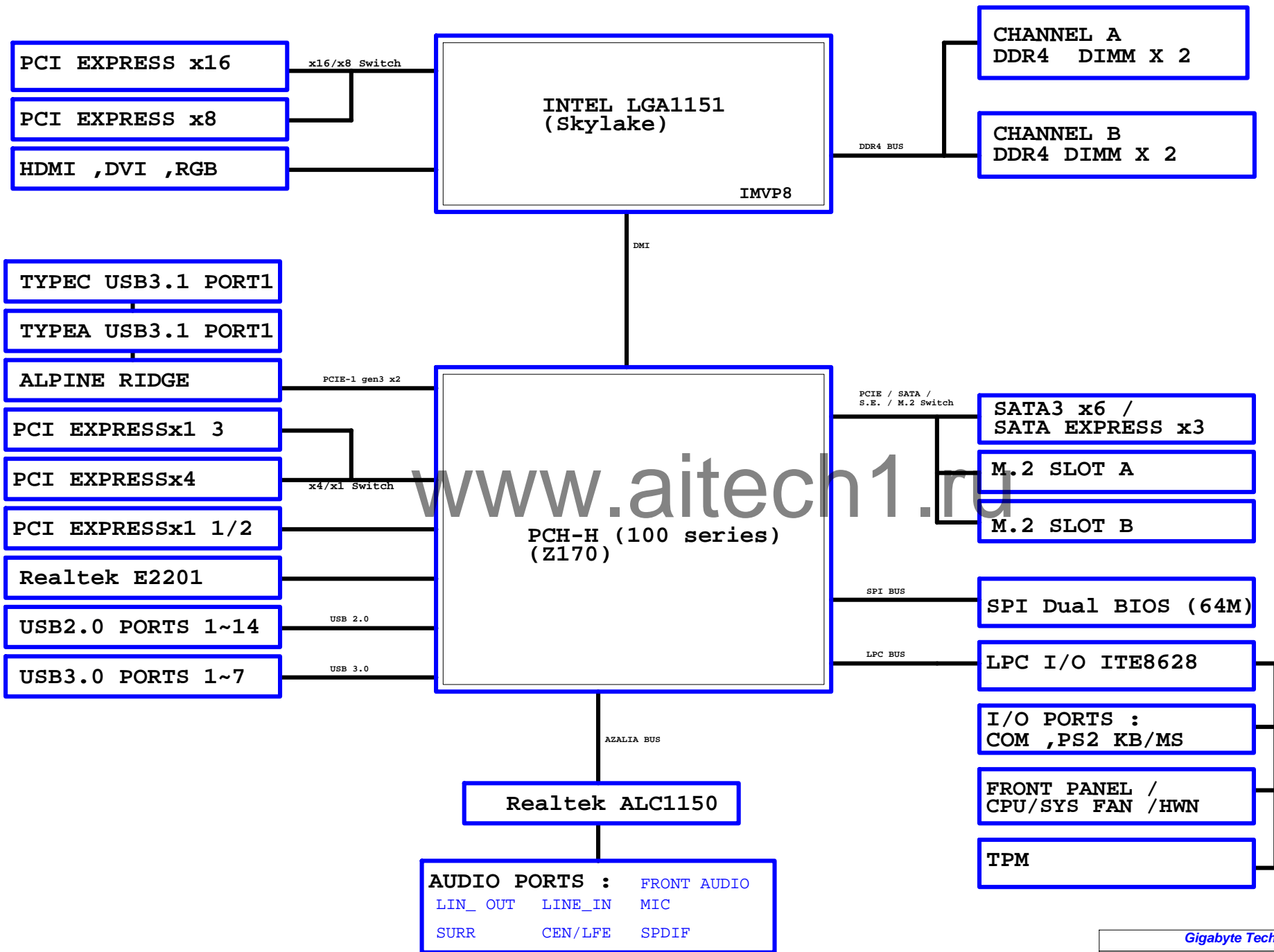
Circuit or PCB layout change

[illegible]

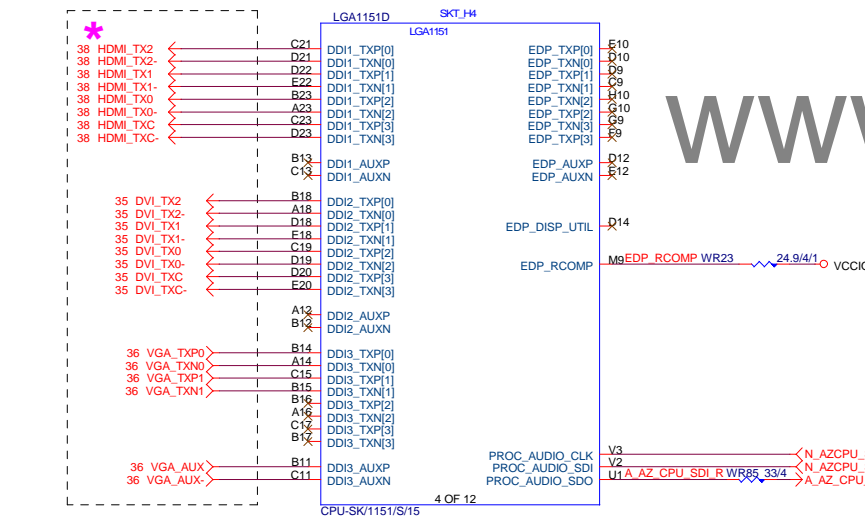
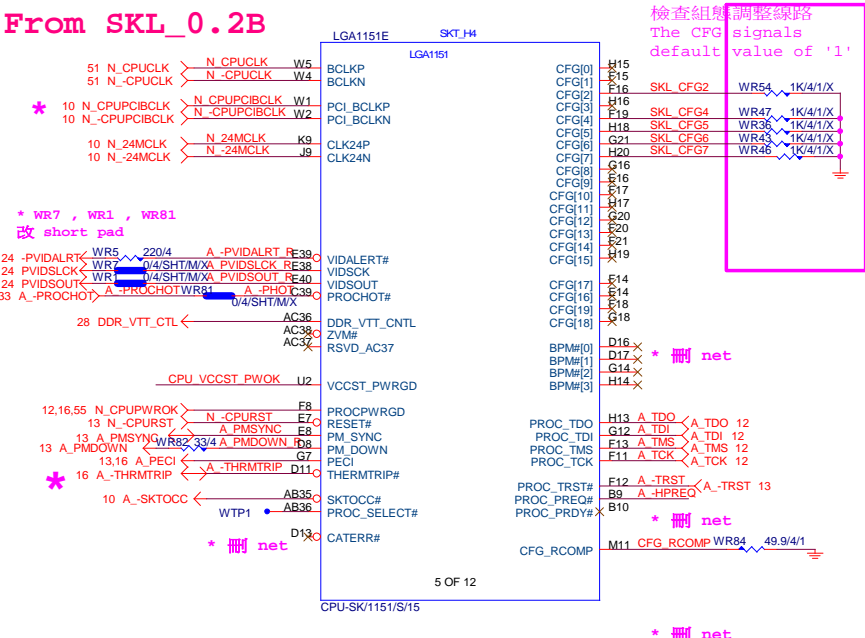
GIGABYTE™

Title			
BOM & PCB MODIFY HISTORY			
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BLOCK DIAGRAM

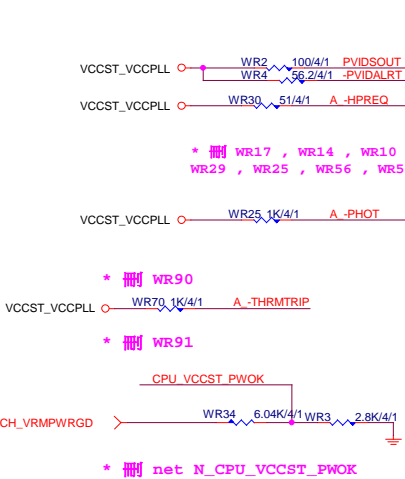
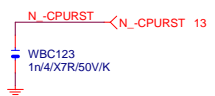


From SKL_0.2B



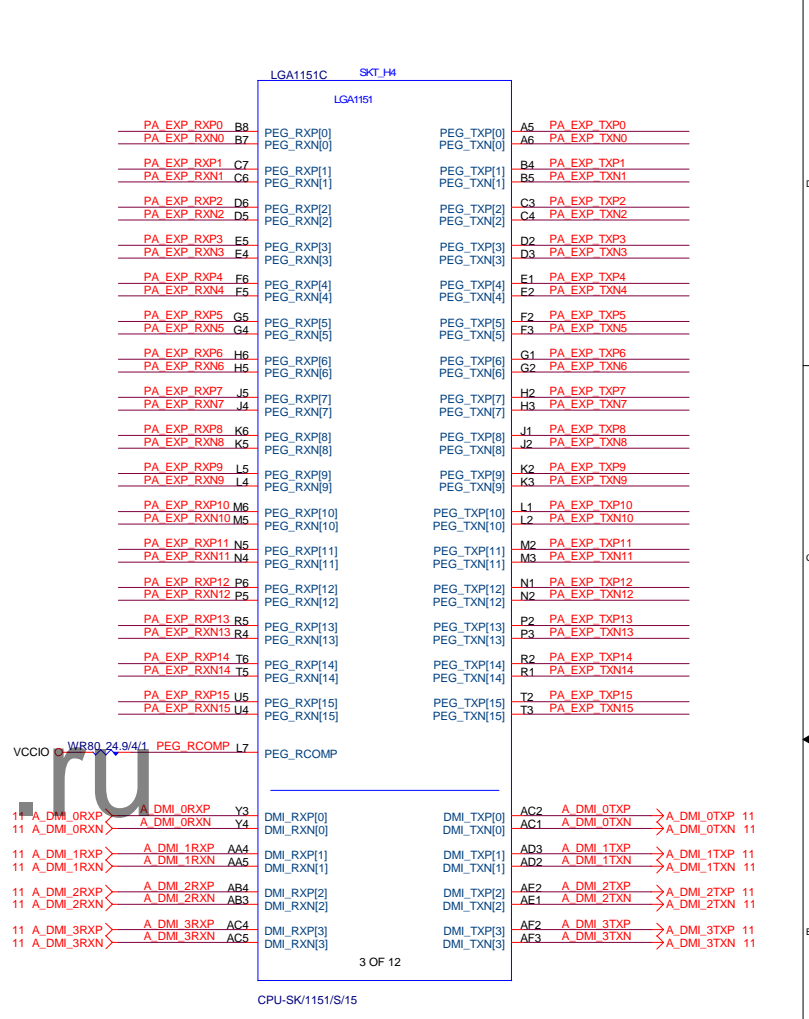
G-15u : (CPU-SK/1151/S/15)
10SC1-F01151-11R / 10SC1-F01151-12R
G-FL : (CPU-SK/1151/S/GF)
10SC1-F01151-21R / 10SC1-F01151-22R

-CPURST



```
CFG[2]:x16 Lane Numbering
Reversal. 1=
NORMAL;0=reversal
CFG[4]: eDP
enable:1:disable/0=enable
CFG[6.5]:PCI Express* Bifurcation; 11=
1 x16 PCI Express;10=2x8 PCI Express
CFG[7]: PEG Training:1=(default) PEG Train
immediately following RESET#;0=PEG Wait
for BIOS
```

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



PA_EXP_TXP[0..15] >>> PA_EXP_TXP[0..15] 19,50
PA_EXP_TXN[0..15] >>> PA_EXP_TXN[0..15] 19,50
PA_EXP_RXP[0..15] >>> PA_EXP_RXP[0..15] 19,50
PA_EXP_RXN[0..15] >>> PA_EXP_RXN[0..15] 19,50

W=12 mil out of CPU
S=15 mil out of CPU

Intel CRB

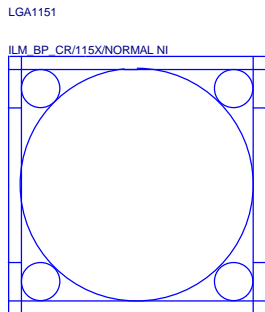
CPU LGA1151-A

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* 改DDR4 net



Need check the new CPU ME

8 MDT_A[0..3] ← MDT_A[0..3]

9 MDT_B[0..3] ← MDT_B[0..3]

8 MDA[0..63] ← MDA[0..63]

9 MDB[0..63] ← MDB[0..63]

8 M_QDSB[0..7] ← M_QDSB[0..7]

8 M_-QDSB[0..7] ← M_-QDSB[0..7]

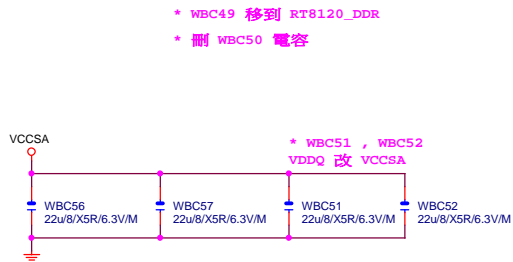
8 MAA_A[0..16] ← MAA_A[0..16]

9 MAAB[0..16] ← MAAB[0..16]

9 M_QDSB[0..7] ← M_QDSB[0..7]

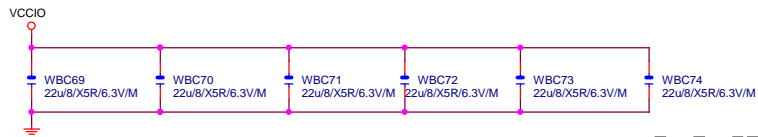
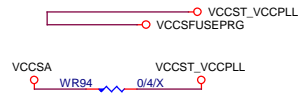
9 M_-QDSB[0..7] ← M_-QDSB[0..7]

Intel CRB			
Title			
CPU LGA1151-B			
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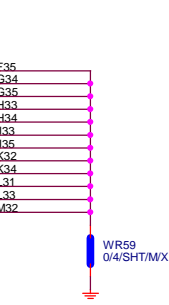
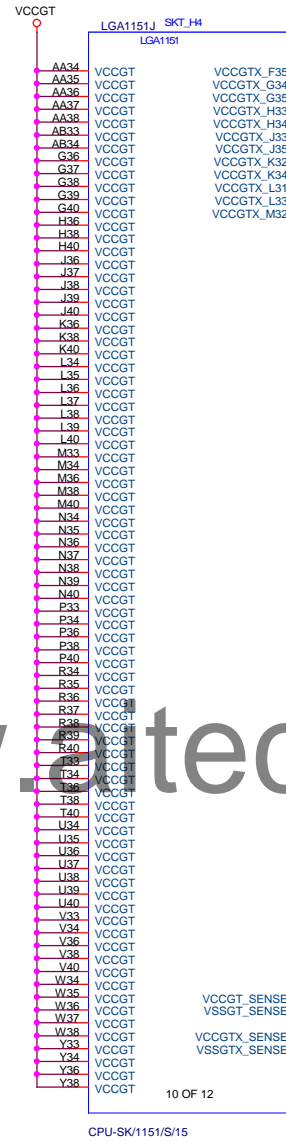


* 刪 WBC124, WBC125, WBC126, WBC127 電容

* WR94, WR59, WR86, WR60, WR61, WR62, WR63 改 short pad



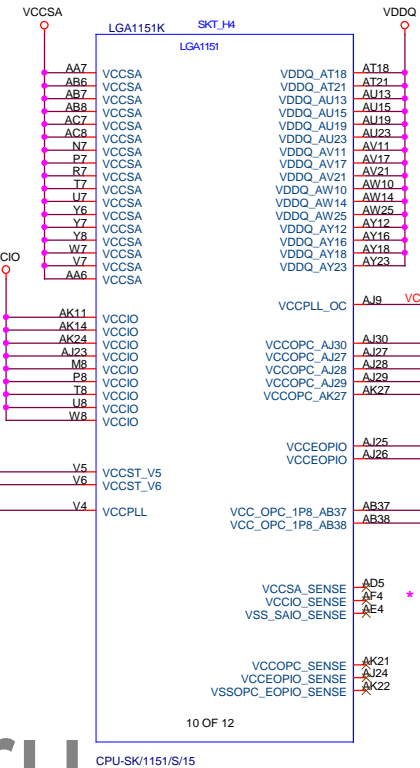
* 刪 VCCGT 電容



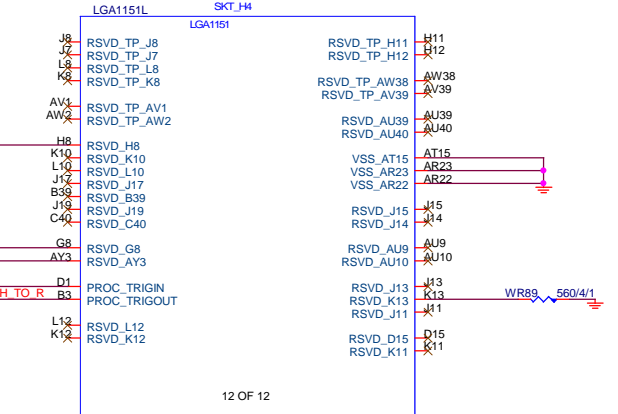
VCCST_VCCPLL
VCCSFUSEPRG
VCCST_VCCPLL

F39 VCCGT_SENSE 24
F38 VSSGT_SENSE 24
E37
E36

13 N_PCH_CPU_T1
13 A_CPU_PCH_TO

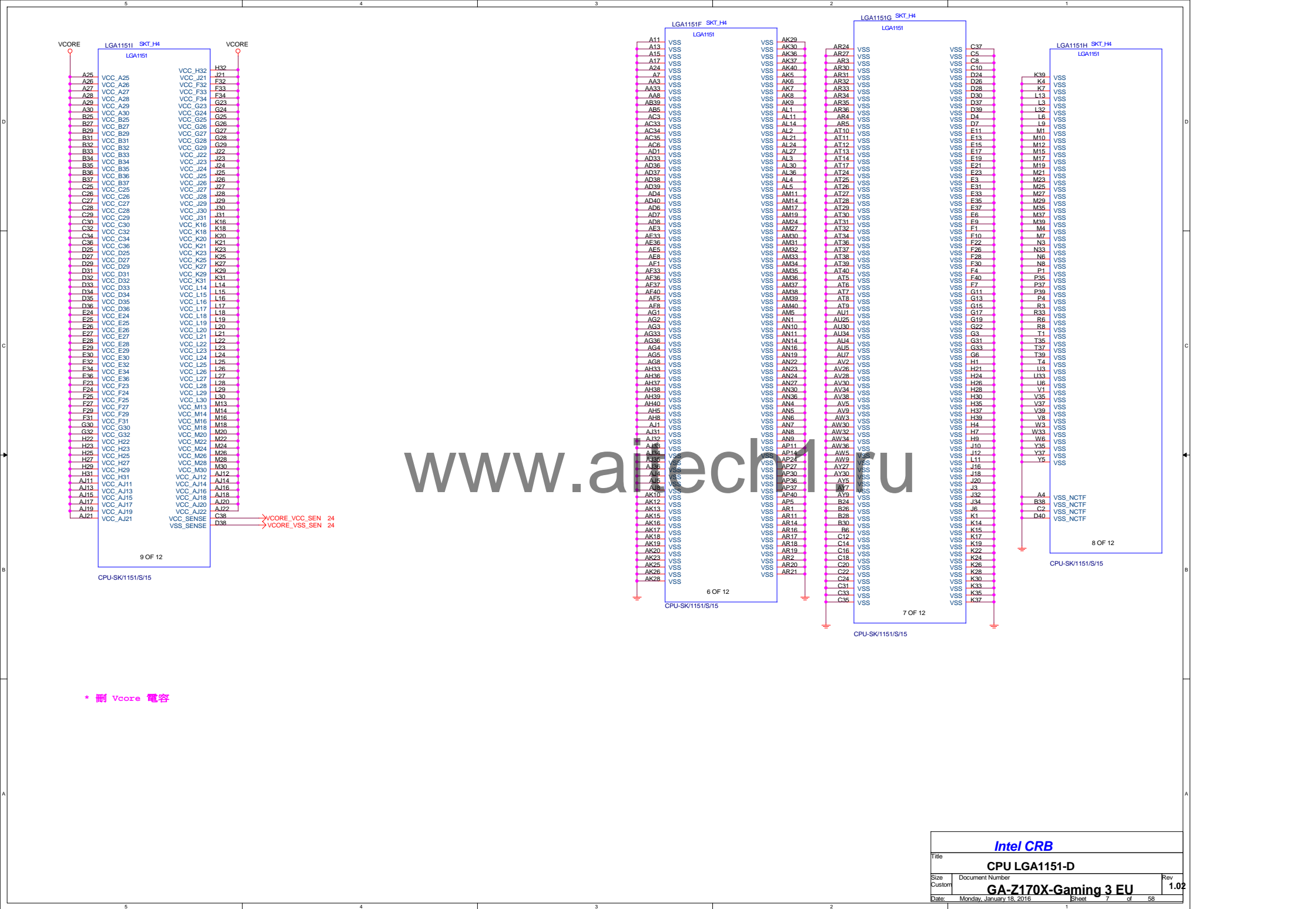


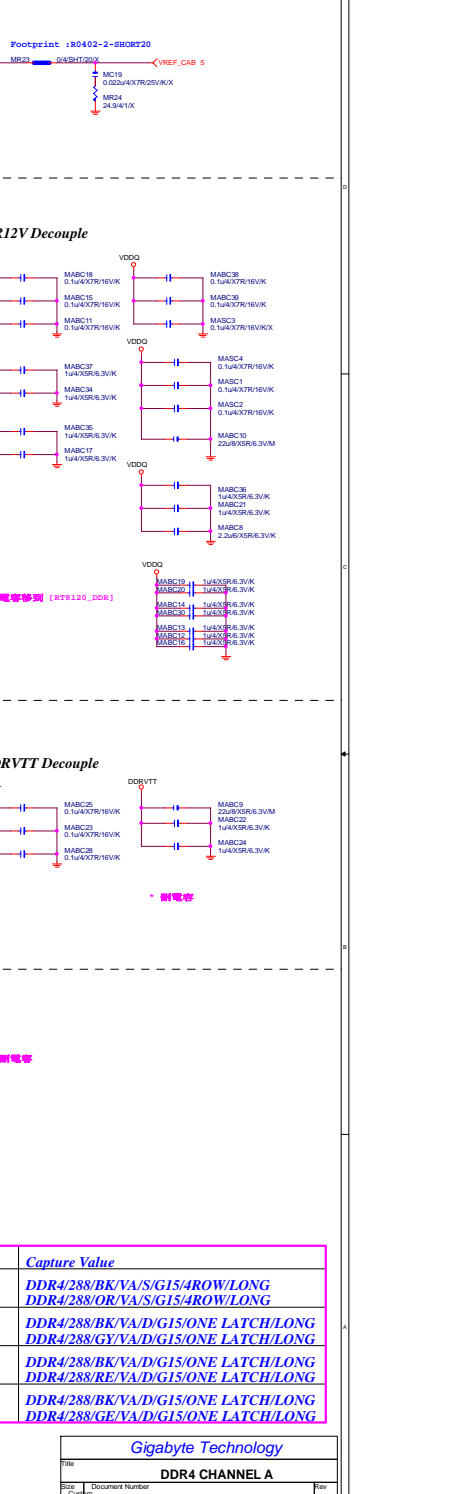
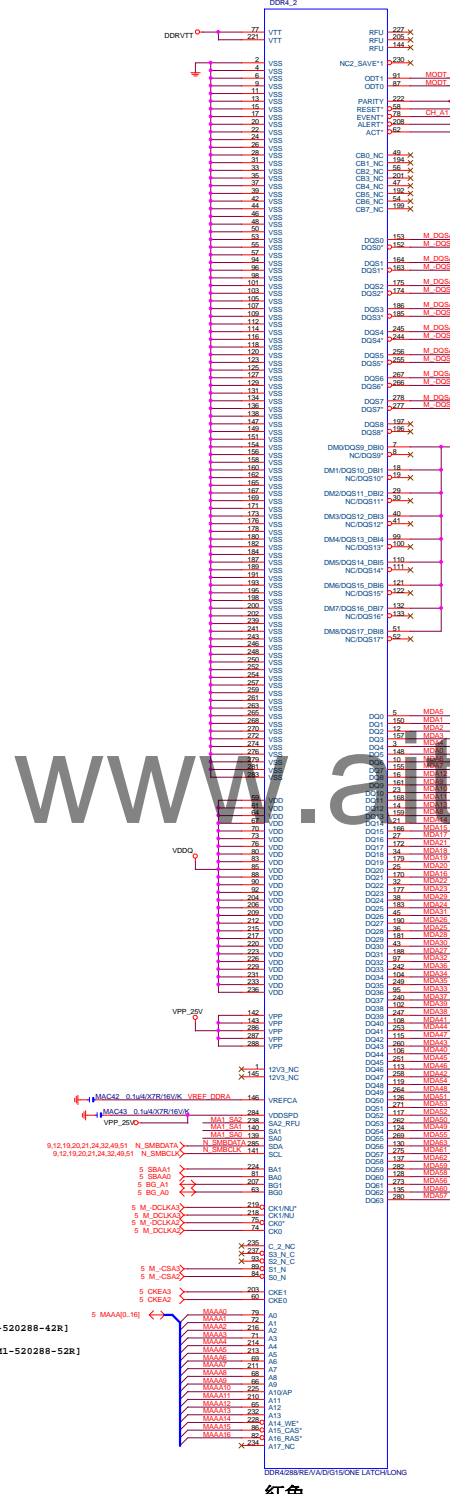
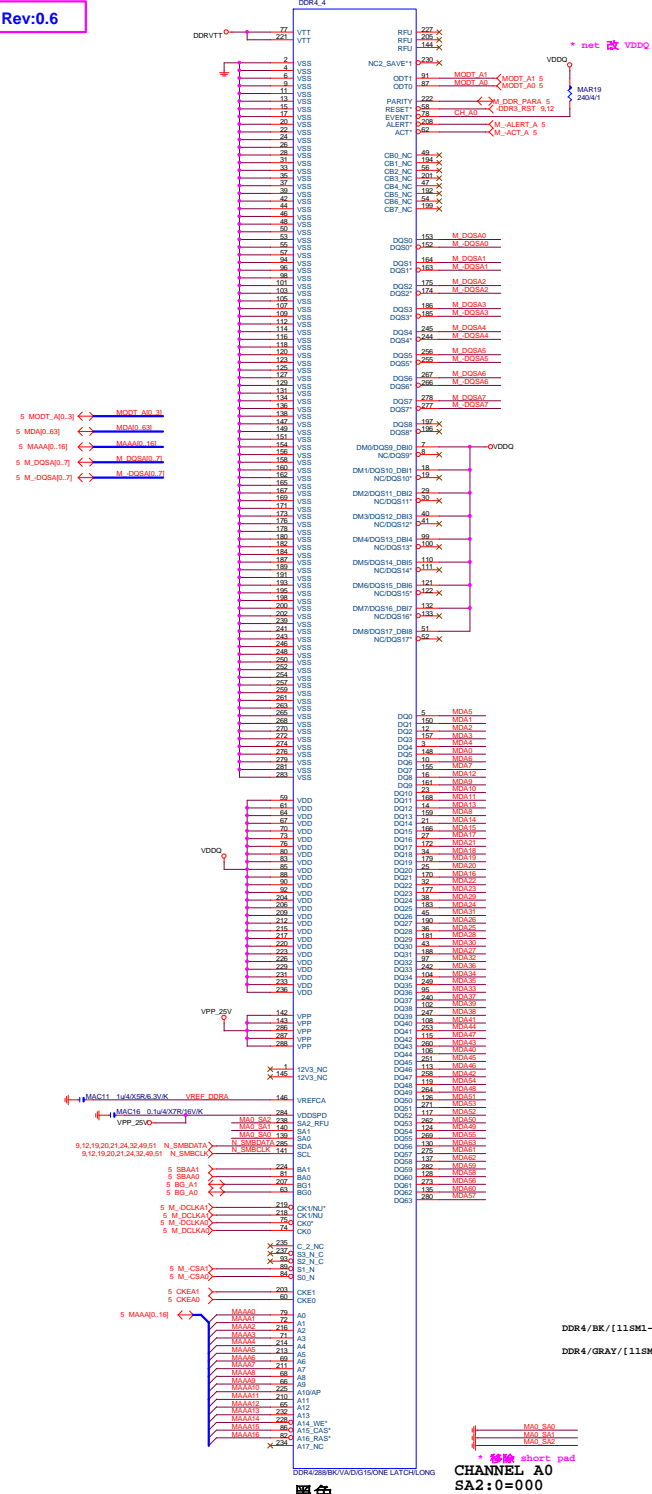
CPU-SK/1151/S/15

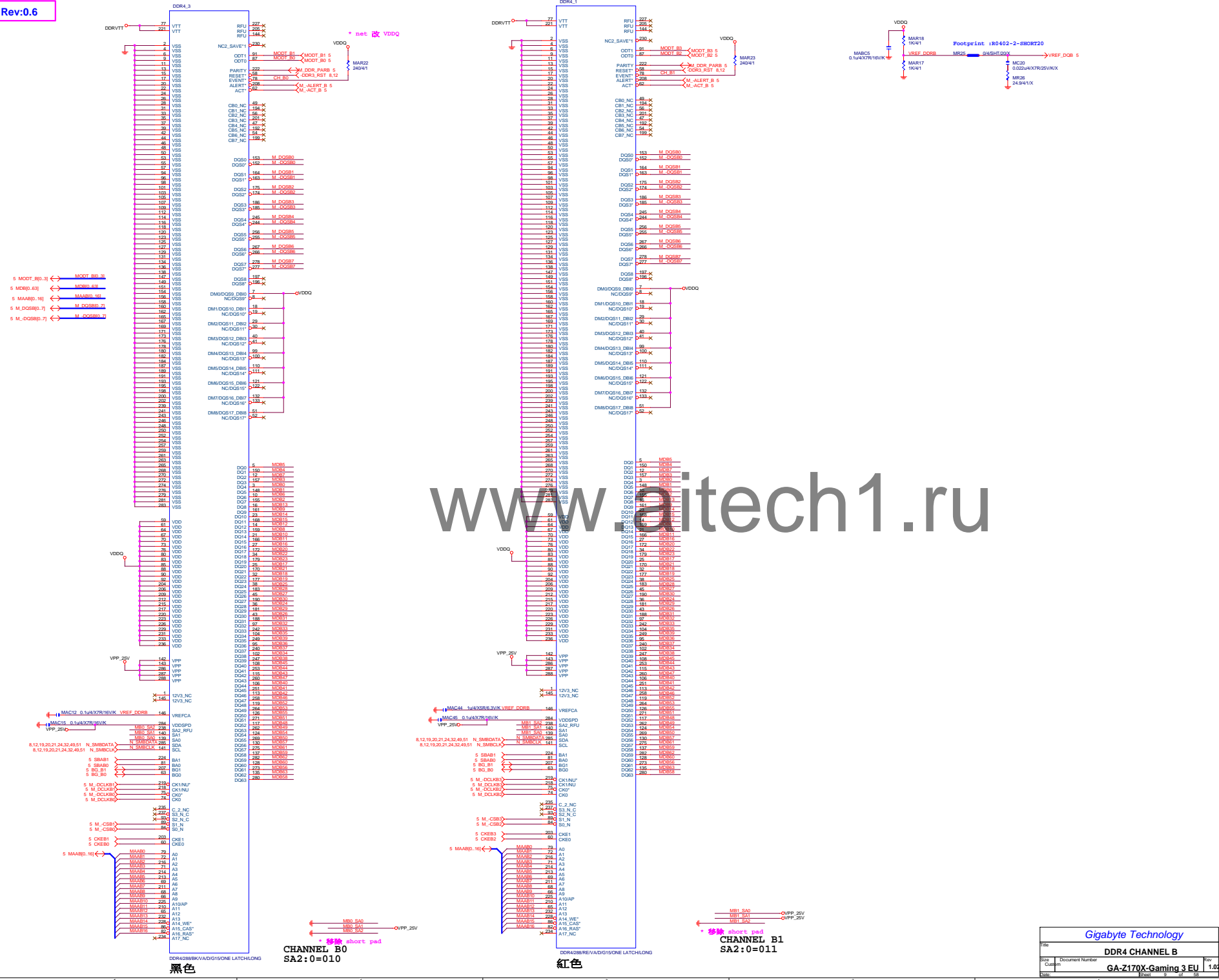


CPU-SK/1151/S/15

Intel CRB			
Title			
CPU LGA1151-C			
Size	Document Number	Rev	
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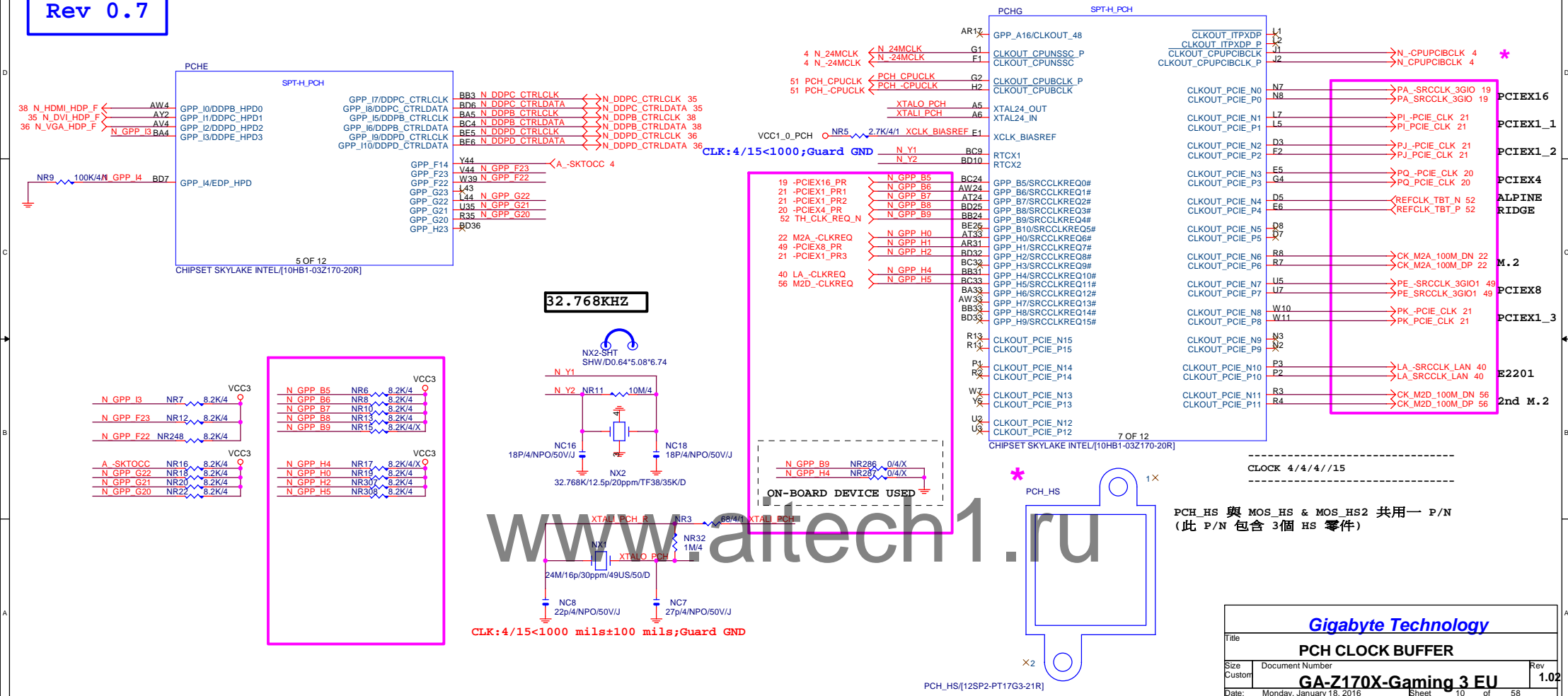
File: DDR4 CHANNEL B

Size: Document Number

GA-Z170X-Gaming 3 EU

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Rev 0.7



PCH_HS 與 MOS_HS & MOS_HS2 共用一 P/N
(此 P/N 包含 3個 HS 零件)

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PCH CLOCK BUFFER

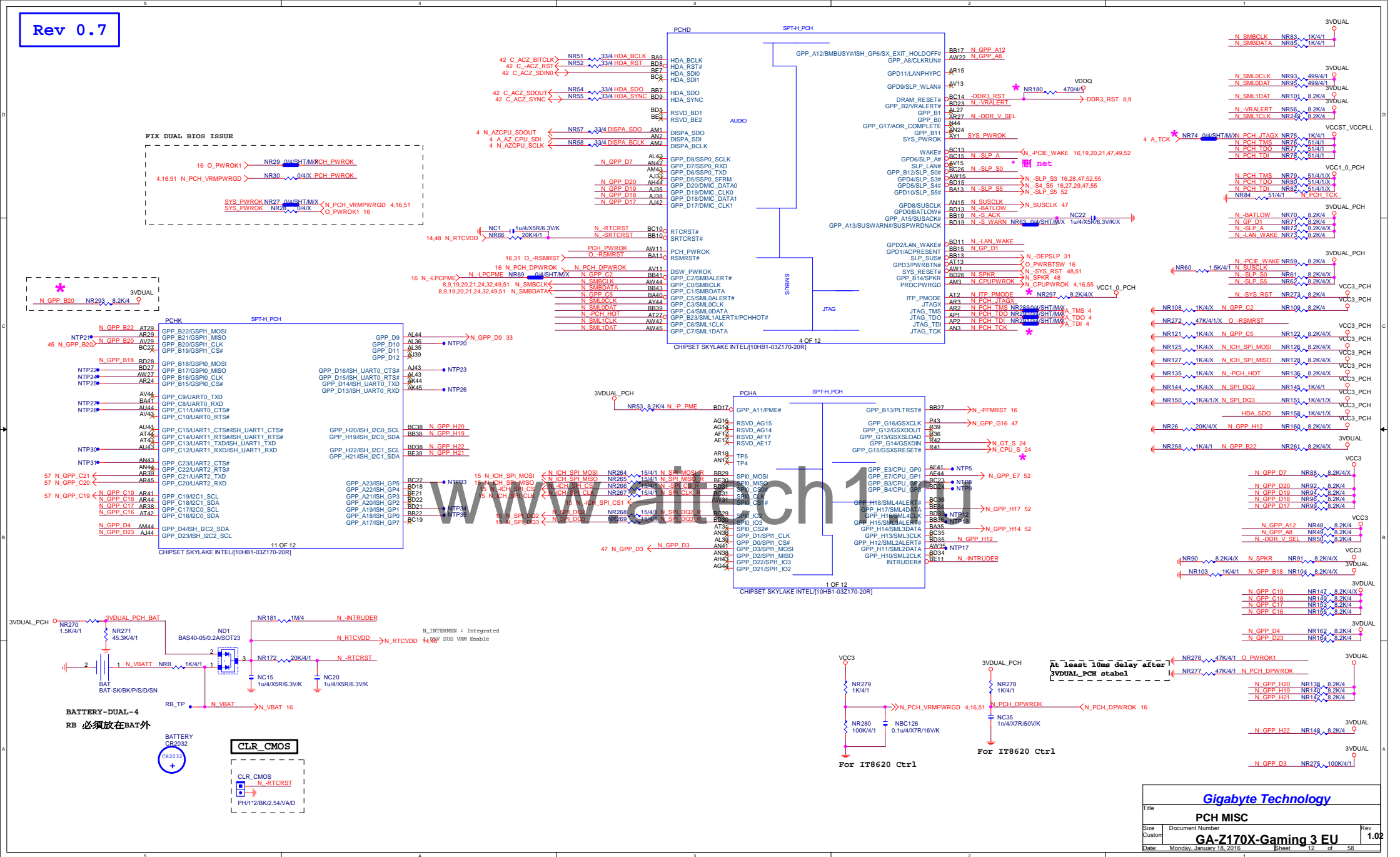
GA-Z170X-Gaming 3 EU

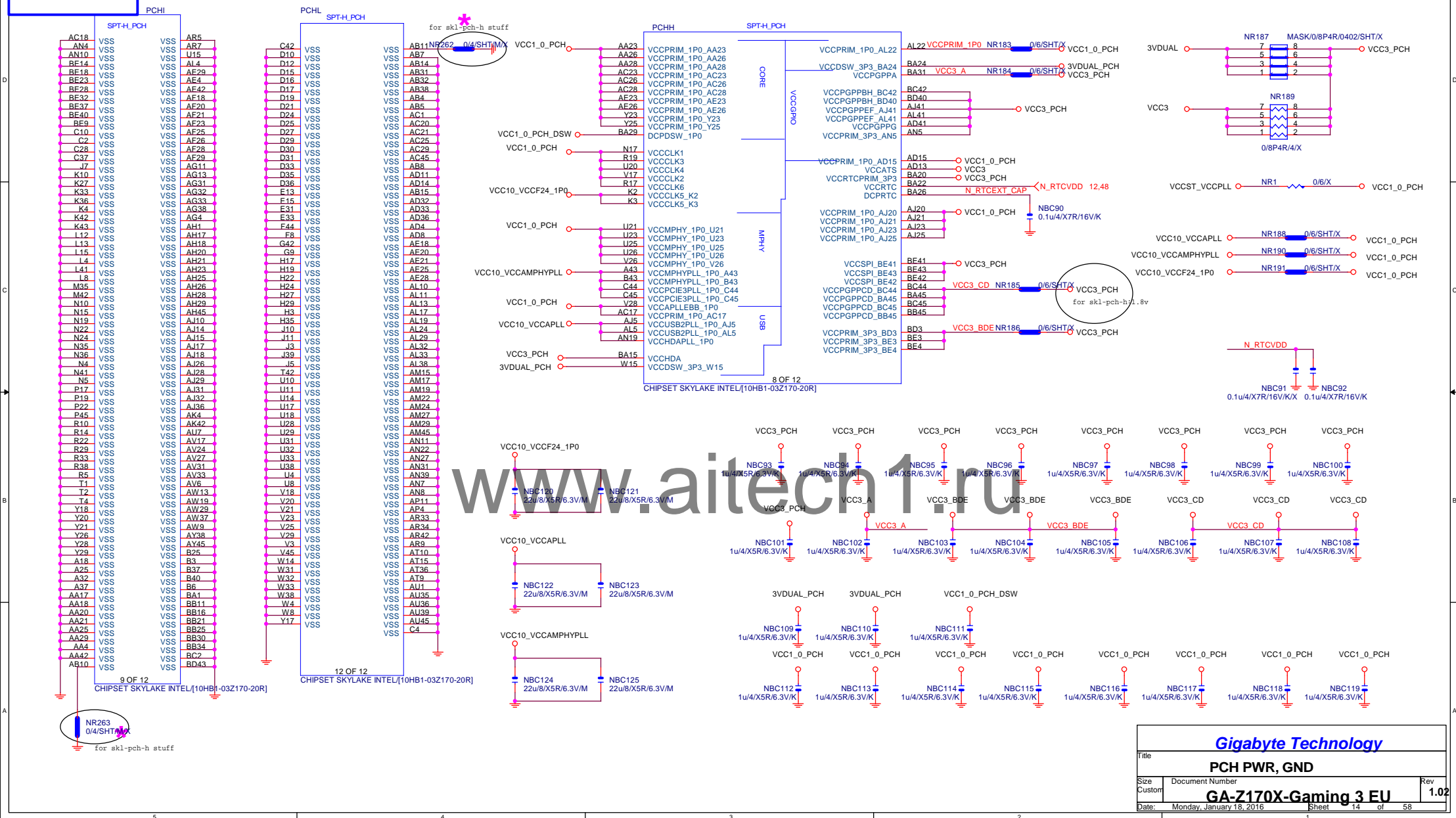
1.02

Date: Monday, January 18, 2016

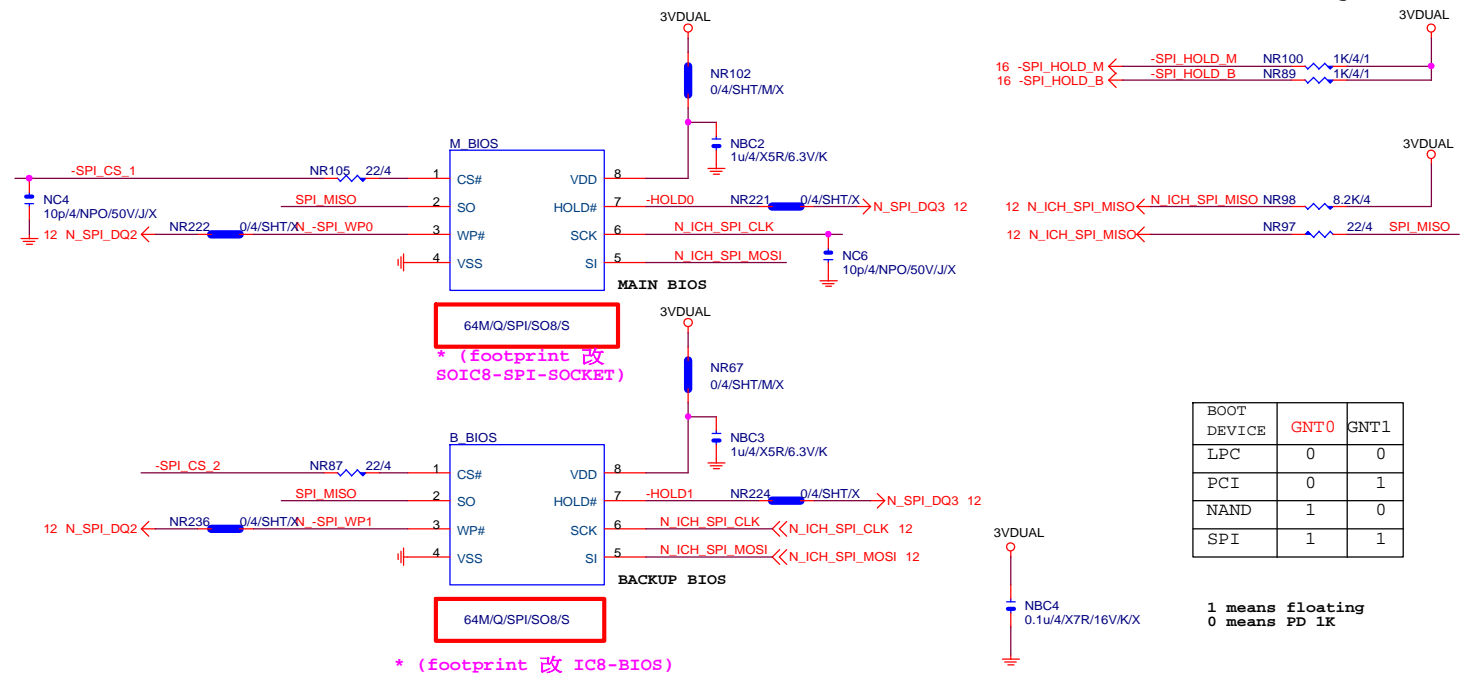
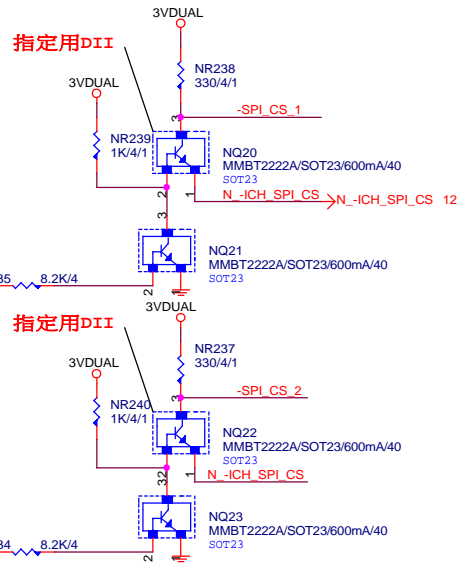
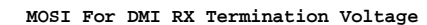
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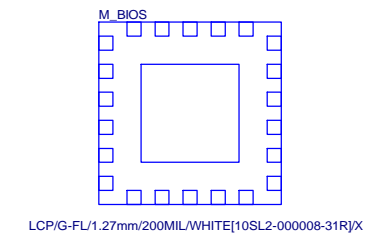




DUAL BIOS

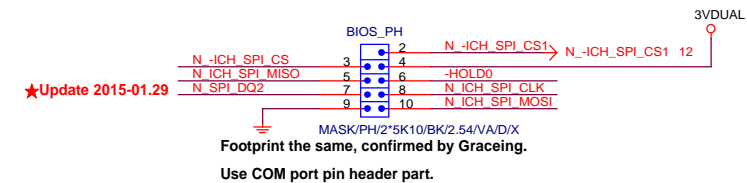


Rev: 0.42



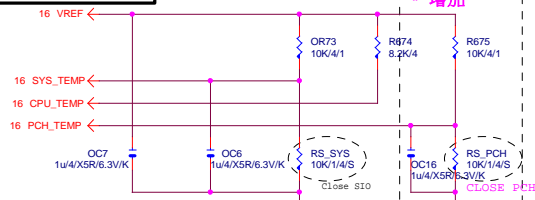
* 試產先上，PVT 移除

BIOS_PH

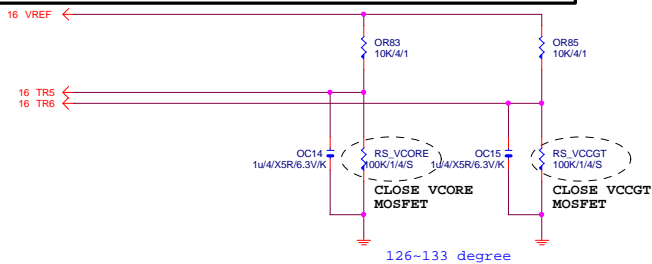


REV:1.08

TEMP H/W MONITOR

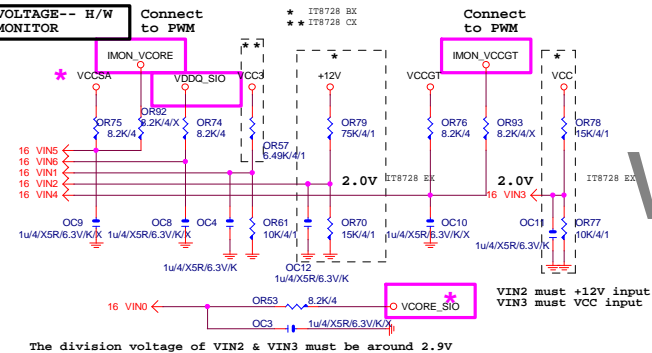


RS_VCORE、RS_VCCGT、CLOSE CPU_VCORE & VCCGT MOSFET

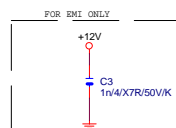
~~PROCHOT: 有mos meartsink 不用prochot function~~

126-133 degree

VOLTAGE-- H/W MONITOR

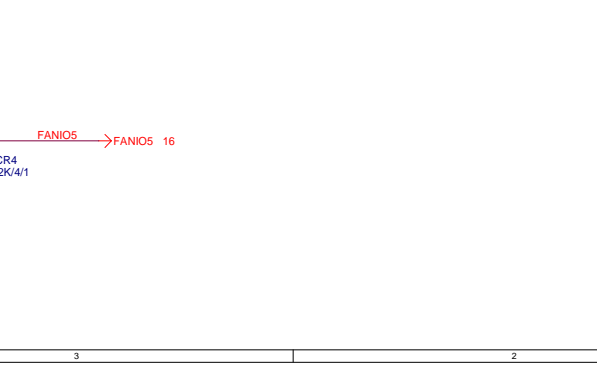
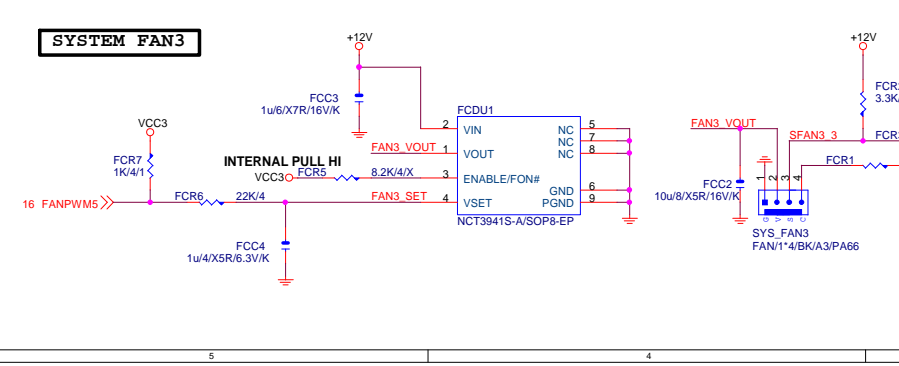
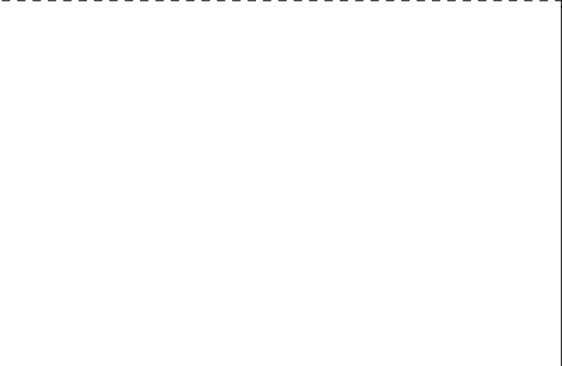
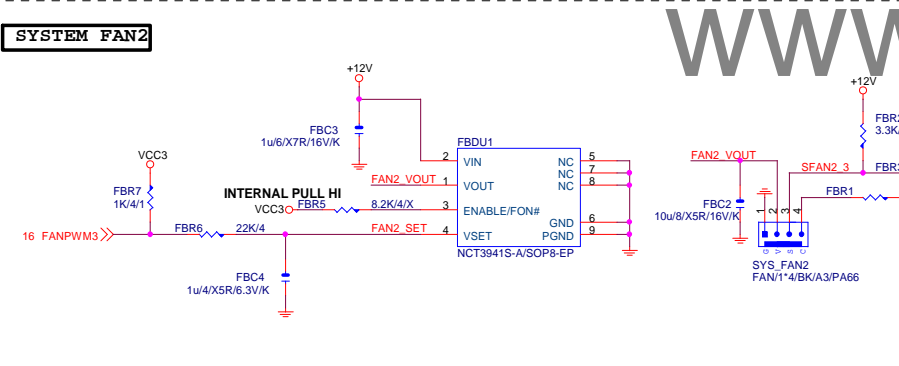
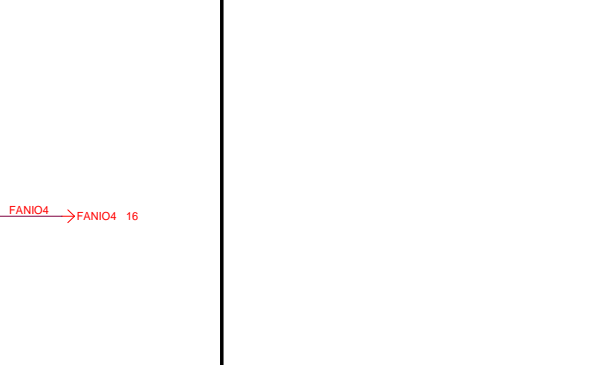
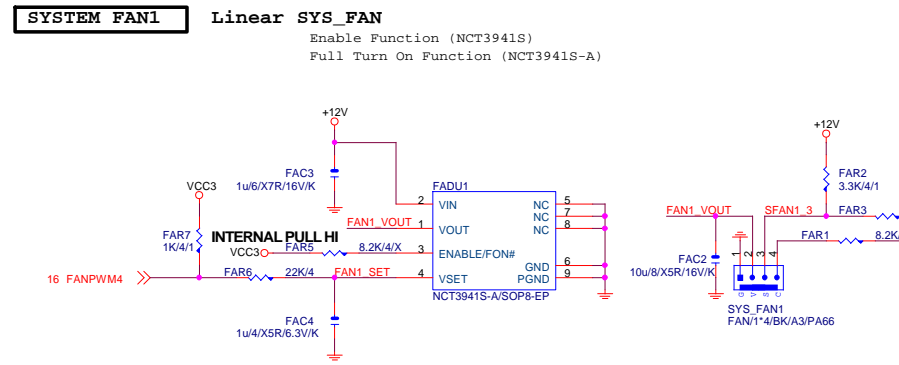
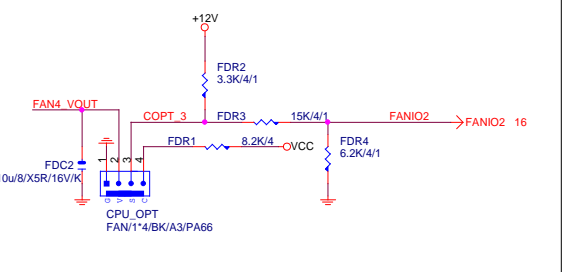
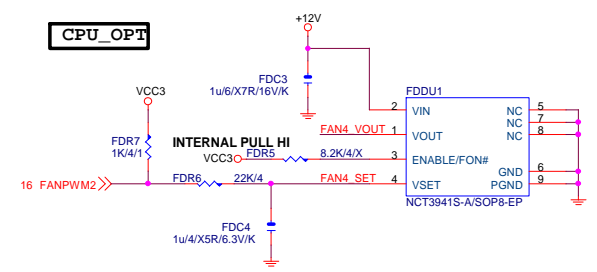
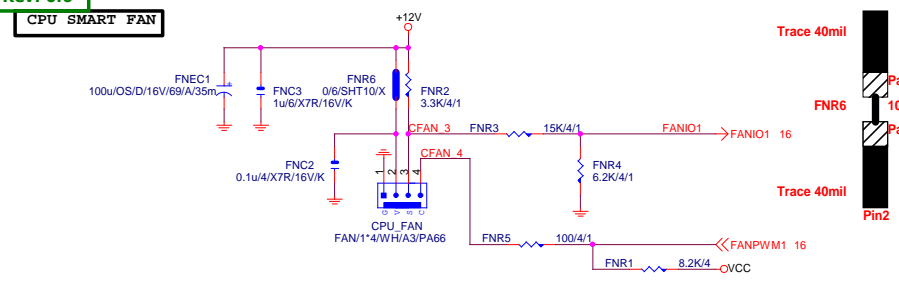


The division voltage of VIN2 & VIN3 must be around 2.9V



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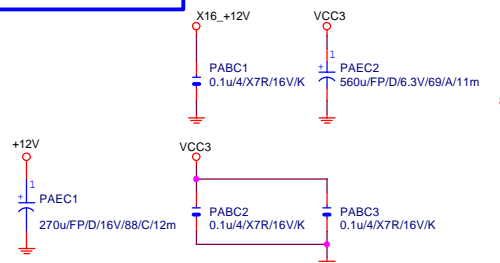
Title			HWM
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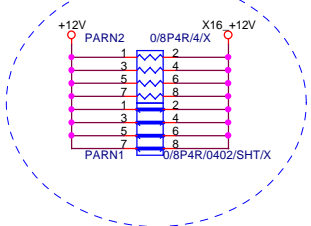
Rev 0.3

PCIEX16 CAP



PCIEX16 PROTECT SHT

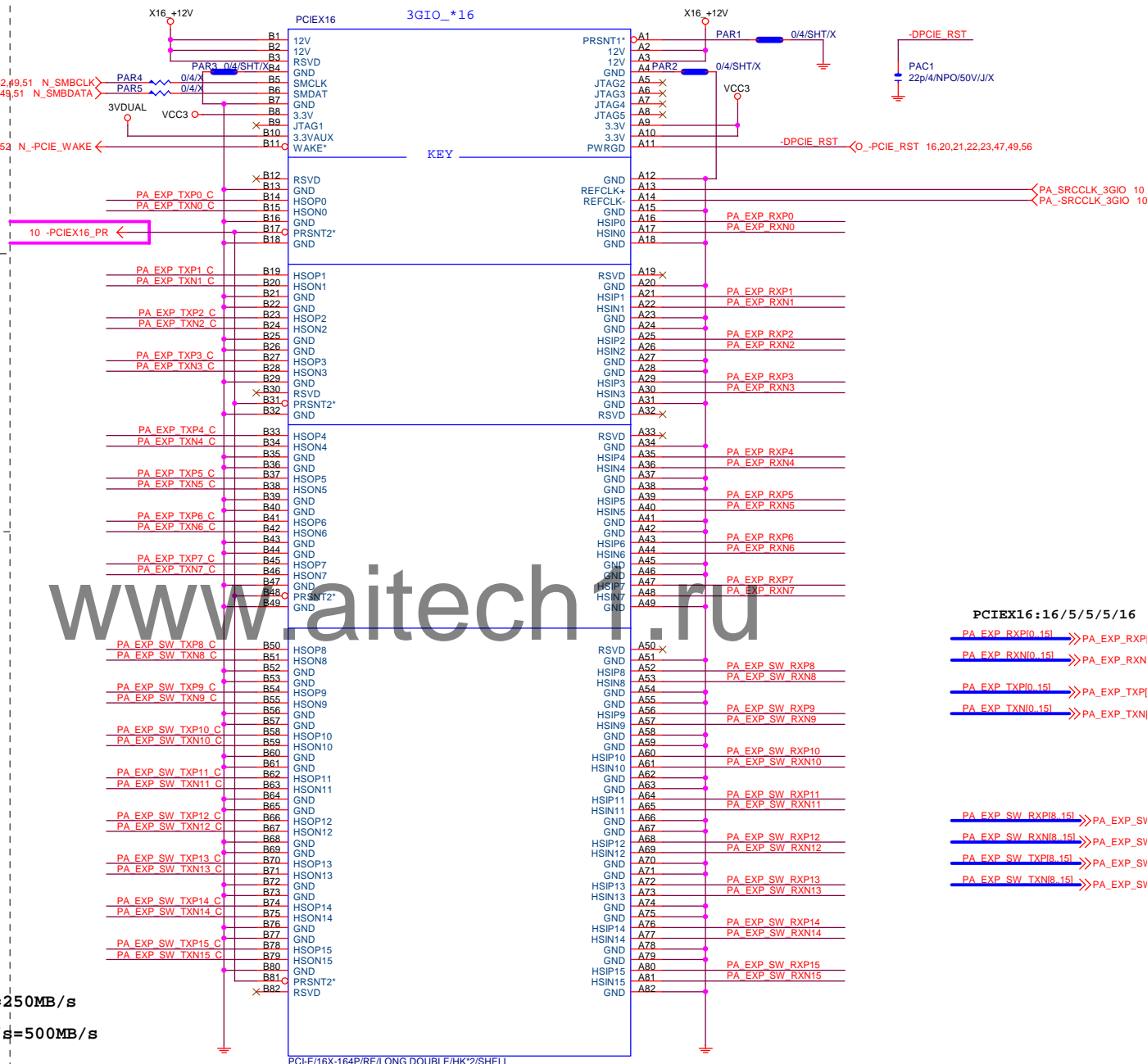
+12 protect short-wire test



PCIEX16 AC CAP

PA EXP TXP0	PAC5	0.22u/4/X5R/6.3V/K	PA EXP TXP0 C
PA EXP TXN0	PAC4	0.22u/4/X5R/6.3V/K	PA EXP TXN0 C
PA EXP TXP1	PAC6	0.22u/4/X5R/6.3V/K	PA EXP TXP1 C
PA EXP TXN1	PAC7	0.22u/4/X5R/6.3V/K	PA EXP TXN1 C
PA EXP TXP2	PAC8	0.22u/4/X5R/6.3V/K	PA EXP TXP2 C
PA EXP TXN2	PAC9	0.22u/4/X5R/6.3V/K	PA EXP TXN2 C
PA EXP TXP3	PAC10	0.22u/4/X5R/6.3V/K	PA EXP TXP3 C
PA EXP TXN3	PAC11	0.22u/4/X5R/6.3V/K	PA EXP TXN3 C
PA EXP TXP4	PAC12	0.22u/4/X5R/6.3V/K	PA EXP TXP4 C
PA EXP TXN4	PAC13	0.22u/4/X5R/6.3V/K	PA EXP TXN4 C
PA EXP TXP5	PAC14	0.22u/4/X5R/6.3V/K	PA EXP TXP5 C
PA EXP TXN5	PAC15	0.22u/4/X5R/6.3V/K	PA EXP TXN5 C
PA EXP TXP6	PAC16	0.22u/4/X5R/6.3V/K	PA EXP TXP6 C
PA EXP TXN6	PAC17	0.22u/4/X5R/6.3V/K	PA EXP TXN6 C
PA EXP TXP7	PAC18	0.22u/4/X5R/6.3V/K	PA EXP TXP7 C
PA EXP TXN7	PAC19	0.22u/4/X5R/6.3V/K	PA EXP TXN7 C
PA EXP SW TXP8	PAC20	0.22u/4/X5R/6.3V/K	PA EXP SW TXP8 C
PA EXP SW TXN8	PAC21	0.22u/4/X5R/6.3V/K	PA EXP SW TXN8 C
PA EXP SW TXP9	PAC22	0.22u/4/X5R/6.3V/K	PA EXP SW TXP9 C
PA EXP SW TXN9	PAC23	0.22u/4/X5R/6.3V/K	PA EXP SW TXN9 C
PA EXP SW TXP10	PAC24	0.22u/4/X5R/6.3V/K	PA EXP SW TXP10 C
PA EXP SW TXN10	PAC25	0.22u/4/X5R/6.3V/K	PA EXP SW TXN10 C
PA EXP SW TXP11	PAC26	0.22u/4/X5R/6.3V/K	PA EXP SW TXP11 C
PA EXP SW TXN11	PAC27	0.22u/4/X5R/6.3V/K	PA EXP SW TXN11 C
PA EXP SW TXP12	PAC28	0.22u/4/X5R/6.3V/K	PA EXP SW TXP12 C
PA EXP SW TXN12	PAC29	0.22u/4/X5R/6.3V/K	PA EXP SW TXN12 C
PA EXP SW TXP13	PAC30	0.22u/4/X5R/6.3V/K	PA EXP SW TXP13 C
PA EXP SW TXN13	PAC31	0.22u/4/X5R/6.3V/K	PA EXP SW TXN13 C
PA EXP SW TXP14	PAC32	0.22u/4/X5R/6.3V/K	PA EXP SW TXP14 C
PA EXP SW TXN14	PAC33	0.22u/4/X5R/6.3V/K	PA EXP SW TXN14 C
PA EXP SW TXP15	PAC34	0.22u/4/X5R/6.3V/K	PA EXP SW TXP15 C
PA EXP SW TXN15	PAC35	0.22u/4/X5R/6.3V/K	PA EXP SW TXN15 C

PCIEX16 SLOT



PCIEX16:16/5/5/5/16

PA EXP RXPI0.15]	>>>PA_EXP_RXPI0.15]	4.50
PA EXP RXNI0.15]	>>>PA_EXP_RXNI0.15]	4.50
PA EXP TXPI0.15]	>>>PA_EXP_TXPI0.15]	4.50
PA EXP TXNI0.15]	>>>PA_EXP_TXNI0.15]	4.50
PA EXP SW RXPI8.15]	>>>PA_EXP_SW_RXPI8.15]	50
PA EXP SW RXNI8.15]	>>>PA_EXP_SW_RXNI8.15]	50
PA EXP SW TXPI8.15]	>>>PA_EXP_SW_TXPI8.15]	50
PA EXP SW TXNI8.15]	>>>PA_EXP_SW_TXNI8.15]	50

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

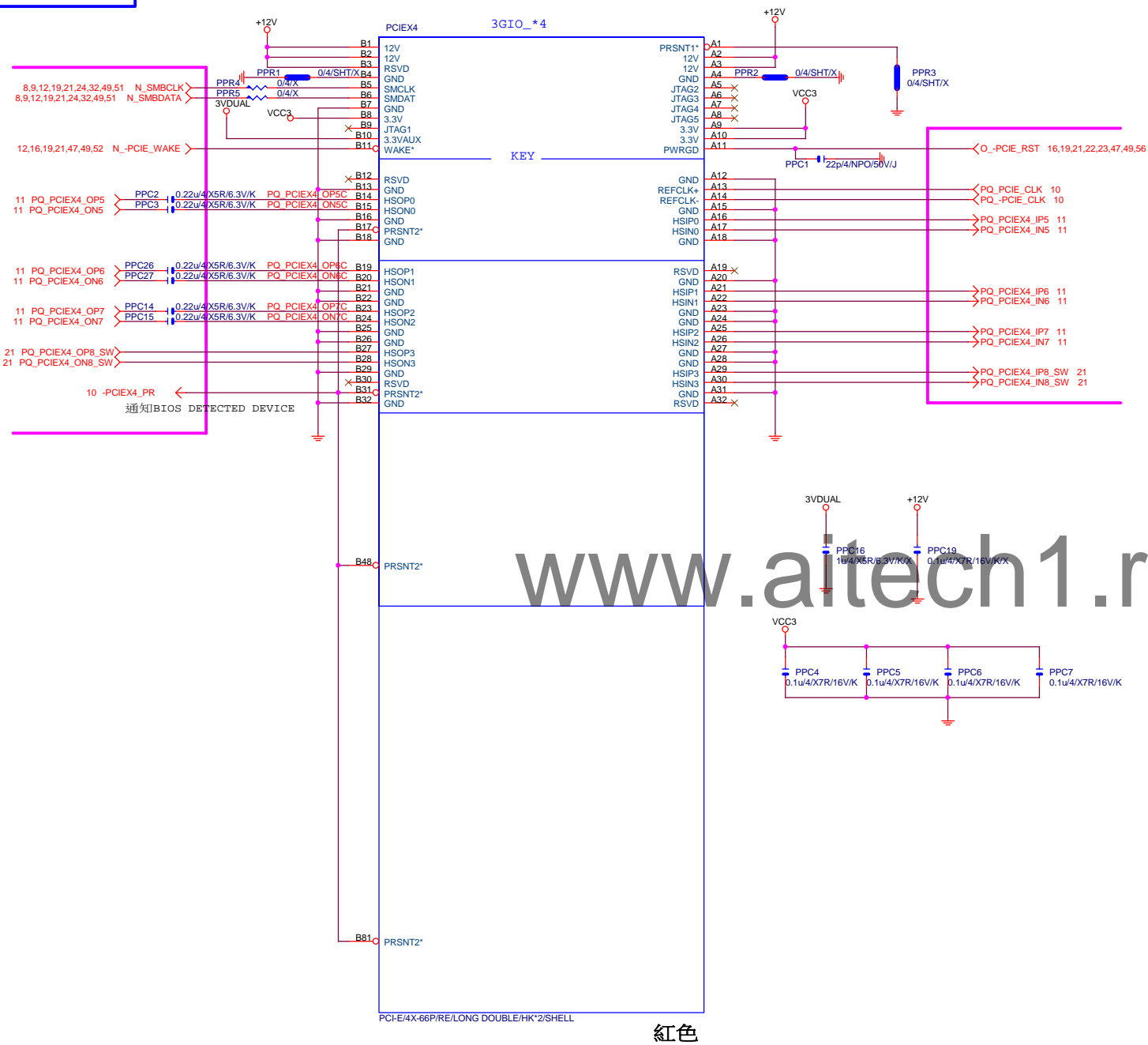
PCE-E X16(雙向) BANDWITH=2.5GHz*(8b/10b)X16X2=64Gb/s=8GB/s

PCI-E REV:2.0--> 5GHZ

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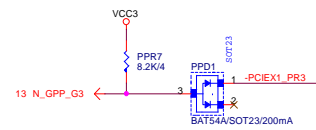
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GIGABYTE

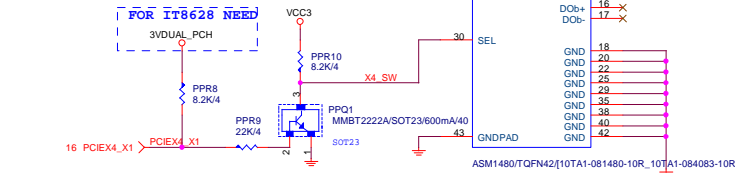
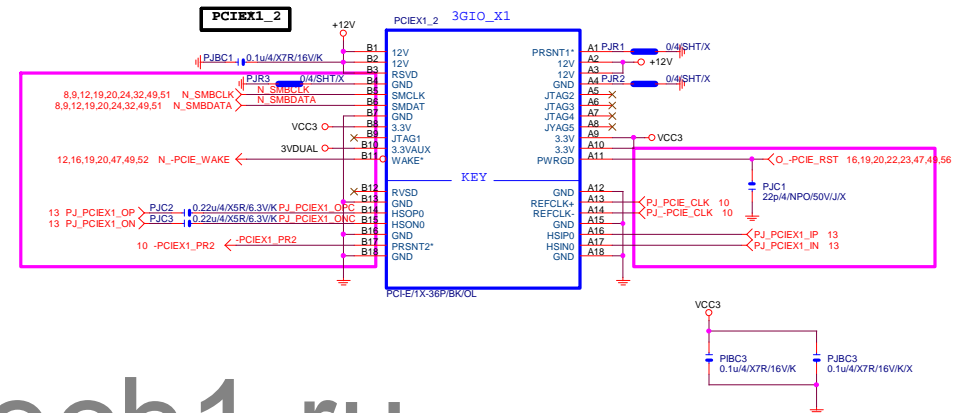
PCIE_X4

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GA-Z170X-Gaming 3 EU 1.02



	N_GPP_G3 (PCH_GPP_G3)	PCIEX4_X1 (SIO_GPIO27)
PCIEX4 -> X4 M2_WIFI -> N/A PCIEX1 --> N/A (Default)	H	H
PCIEX4 -> X1 M2_WIFI -> X1 PCIEX1 --> X1	L	L



Function	SEL
xI--> x0a	L;PCIEX4 SLOT-->X
xI--> x0b	H;PCIEX4 SLOT-->X

M.2 Lane4 from PCH port18

13 M2_PCIE_TN12
13 M2_PCIE_IP12

0.22u4/X5R/6.3V/K/M2AC33
0.22u4/X5R/6.3V/K/M2AC33

M2_PCIE_TN12_C
M2_PCIE_TP12_C

M.2 Lane3 from PCH port17

13 M2_PCIE_TN11
13 M2_PCIE_IP11

0.22u4/X5R/6.3V/K/M2AC35
0.22u4/X5R/6.3V/K/M2AC35

M2_PCIE_TN11_C
M2_PCIE_TP11_C

M.2 Lane2 from PCH port16

13 M2_PCIE_TN10
13 M2_PCIE_IP10

0.22u4/X5R/6.3V/K/M2AC35
0.22u4/X5R/6.3V/K/M2AC35

M2_PCIE_TN10_C
M2_PCIE_TP10_C

M.2 Lane2 from PCH port15

13 M2_PCIE_TN9
13 M2_PCIE_IP9

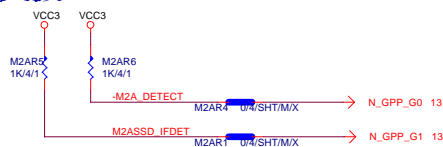
0.22u4/X5R/6.3V/K/M2AC15
0.22u4/X5R/6.3V/K/M2AC15

M2_PCIE_TN9_C
M2_PCIE_TP9_C

10 CK_M2A_100M_DN
10 CK_M2A_100M_DP

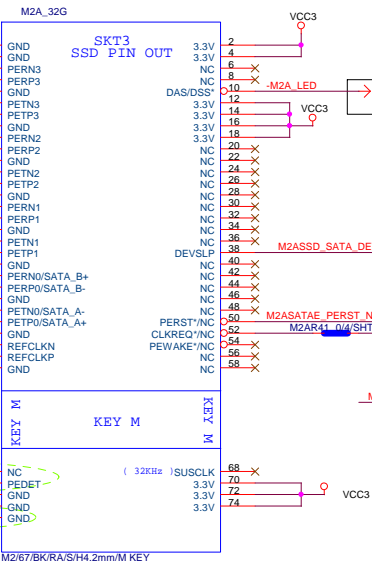
需與M2_-CLKREQ對應

支援SATA and M.2 function



SATA : GND
PCIE : NC

M2插卡時為Low



M2ASSD_SATA_DEVSLP M2AR10 0/4/SHT/M/X

N_DEVSLP0 11,23

To DEVSLP0 for power saving

M2ASATAE_PERST_N M2AR11 0/4/SHT/X

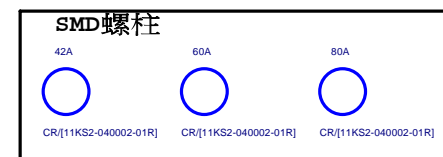
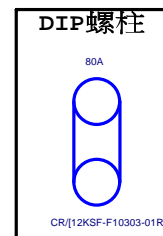
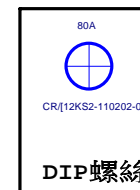
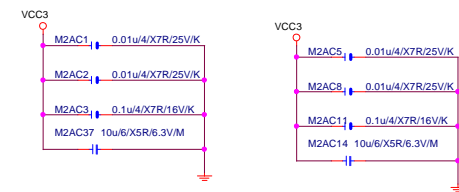
M2A_CLKREQ 48

可變電力

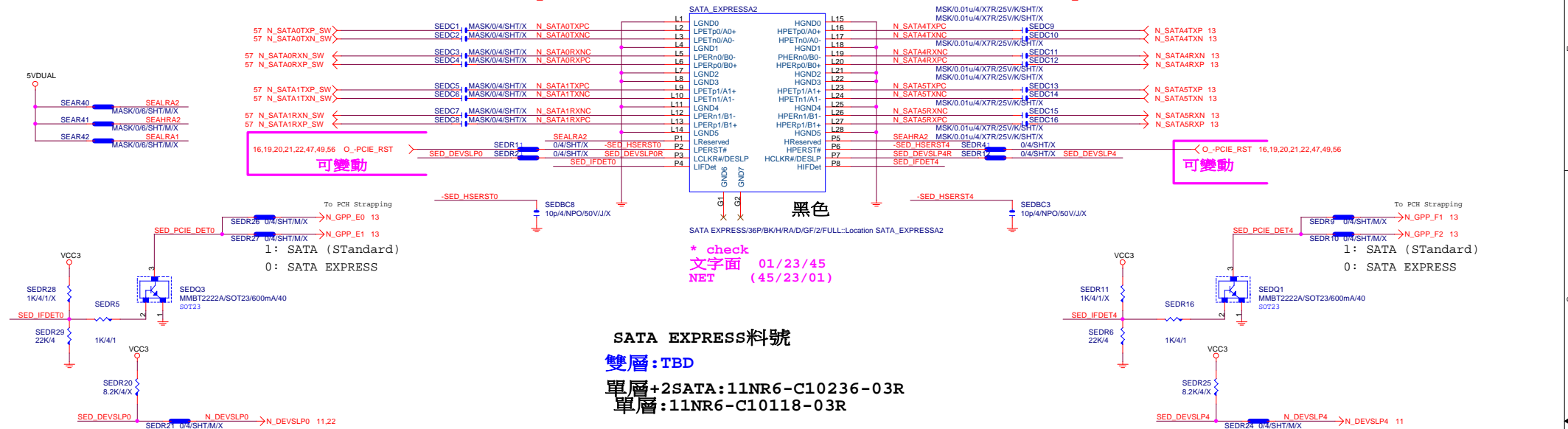
O_-PCIE_RST 16,19,20,21,23,47,49,56

GPI reserve for power saving

M2ASATAE_PERST_N M2AC7 10p4/NPO/50V/J/X



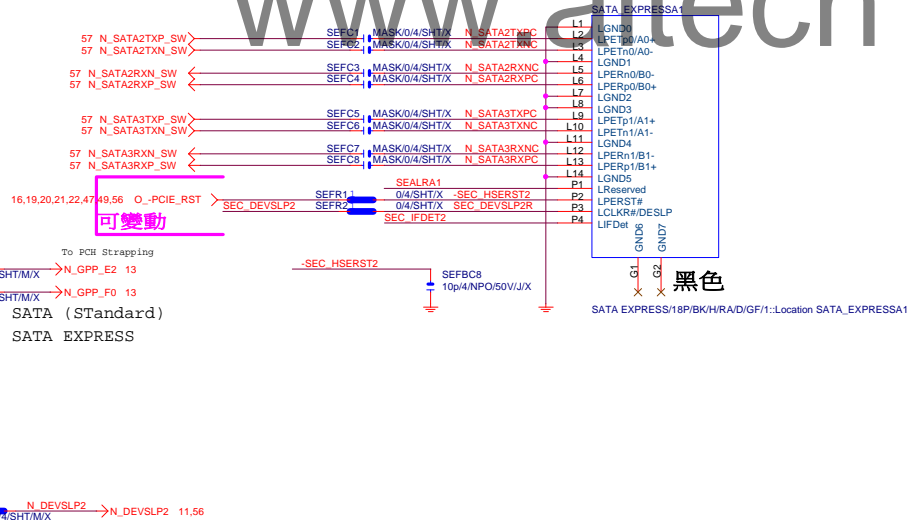
M.2 有插卡 /沒插卡 GPP_G0	M.2插何種卡? GPP_G1	SATA Express 插何種硬碟? GPP_E0/E2/F1	IO15 (S0)	IO16 (S1)	IO17	IO18	IO19 (S0)	IP20 (S1)
有插卡 (Low)	SATA Mode (Low)	SATA (Hi)	SATA (M.2)	PCIE x1	PCIE x1	PCIE x1	PCIE x1	SATA
		SATA Express (Low)	SATA (M.2)	PCIE x1	PCIE x1	PCIE x1	SATA Express	
	PCIE Mode (Hi)	SATA (Hi)	PCIE x4 (For M.2)				SATA	SATA
		SATA Express (Low)	PCIE x4 (For M.2)				SATA Express	
沒插卡 (Hi)	Don't Care (Hi)	SATA (Hi)	PCIE x4				SATA	SATA
		SATA Express (Low)	PCIE x4				SATA Express	



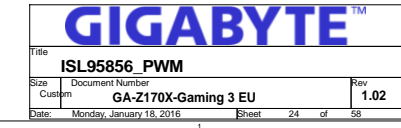
雙層:TBD

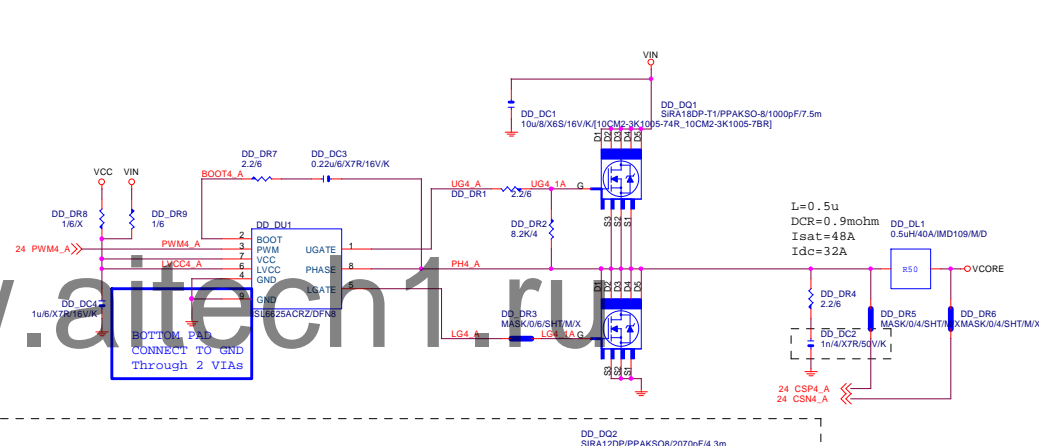
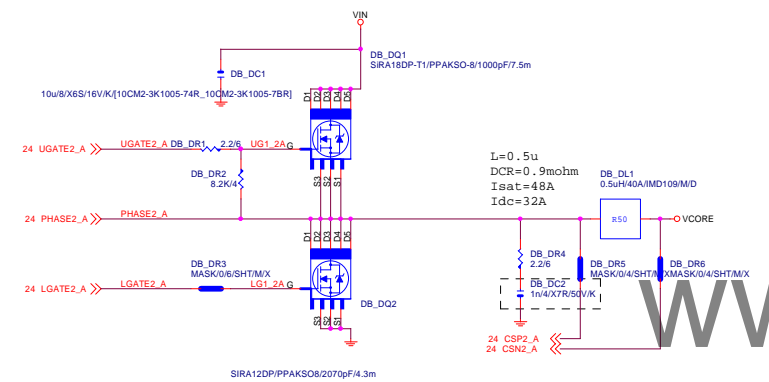
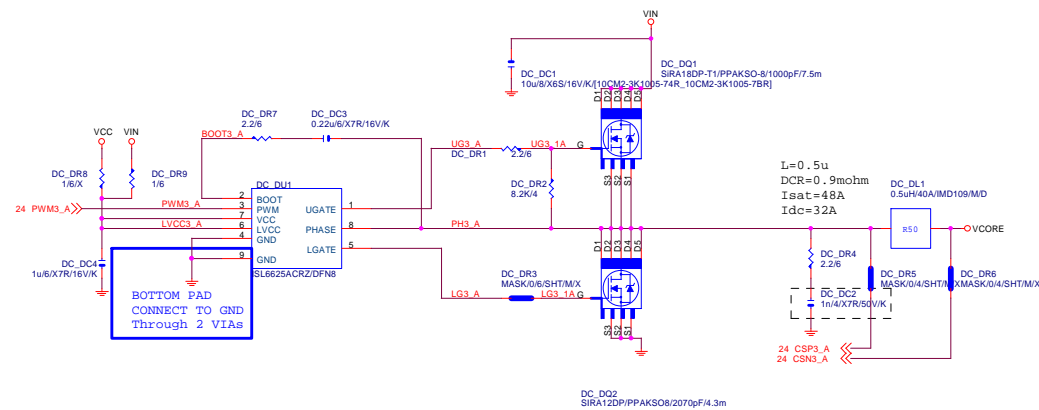
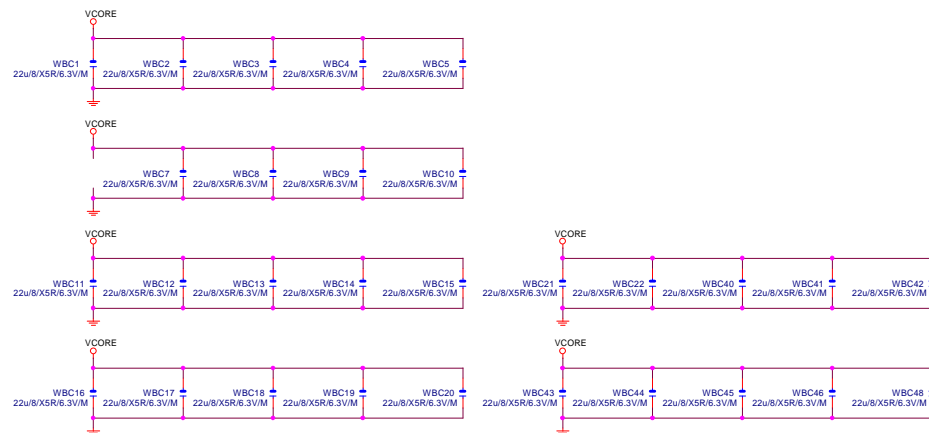
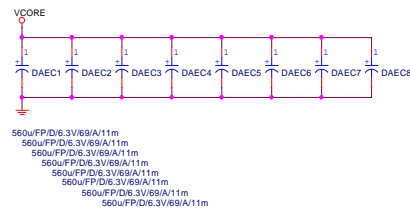
單層: 11NR6-C10118-03R

To SATA3
port2/3

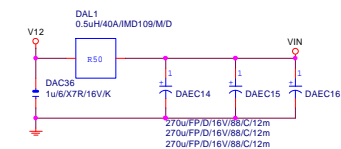


SATA 5	(文字面寫SATA 1)
SATA 4	(文字面寫SATA 0)
SATA 3	
SATA 2	
SATA 1	(文字面寫SATA 5)
SATA 0	(文字面寫SATA 4)



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

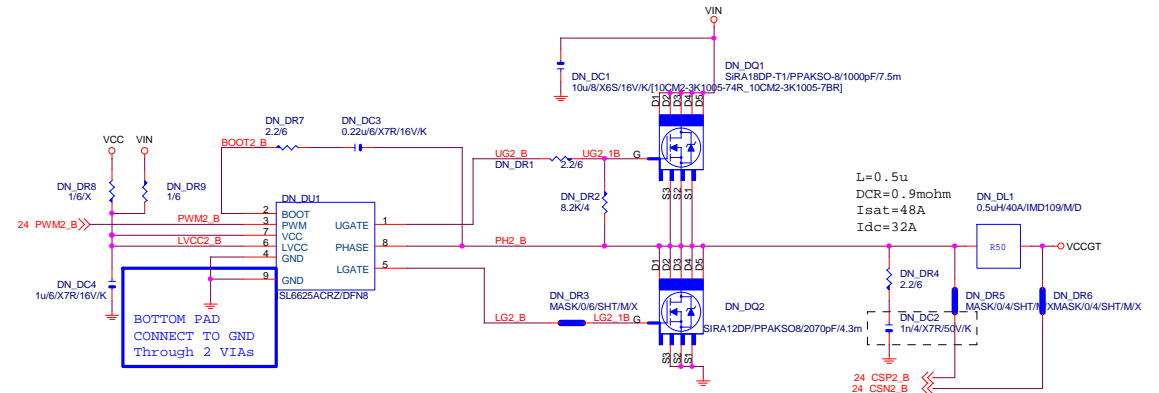
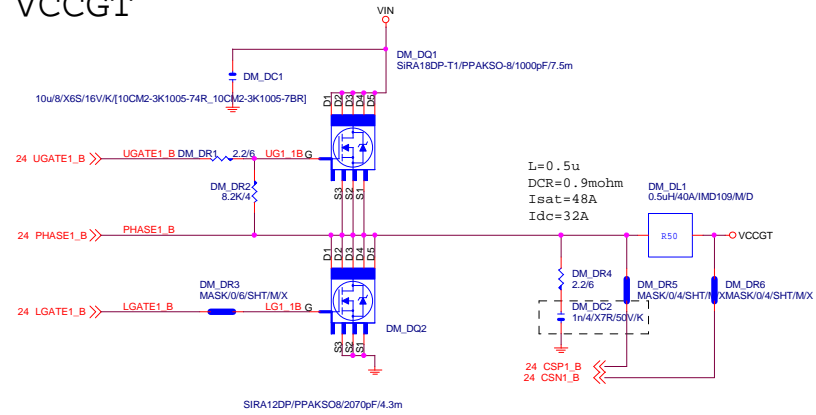
VIN	CAP	270u*3PCS
-----	-----	-----------



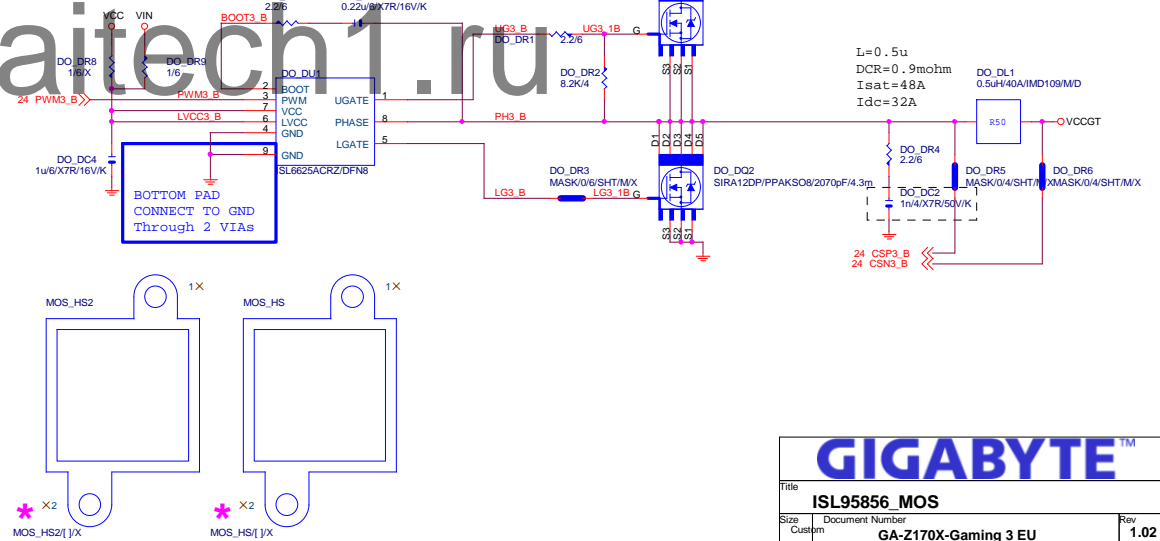
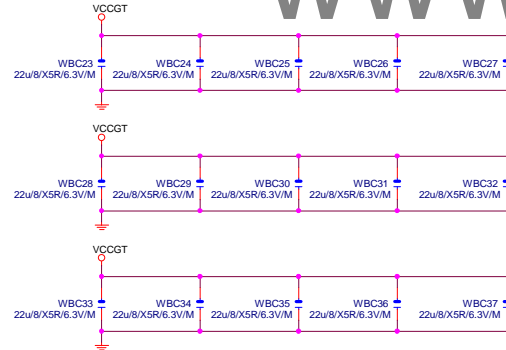
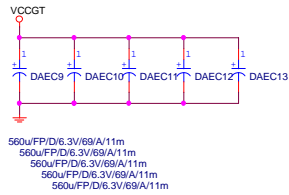
GIGABYTE

Title			
ISL95856_MOS			
Size	Document Number	Rev	
Custom	GA-Z170X-Gaming 3 EU	1.02	
Date:	Monday, January 18, 2016	Sheet	25 of 58

VCCGT



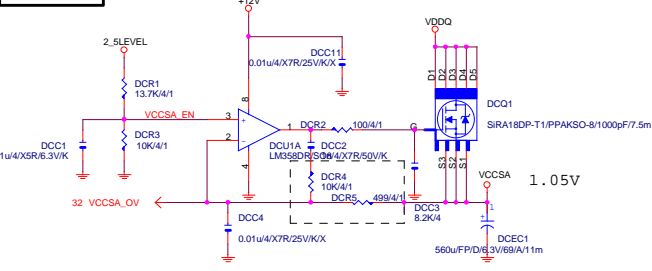
VCCGT CAP 560u*5PCS 22u*15PCS



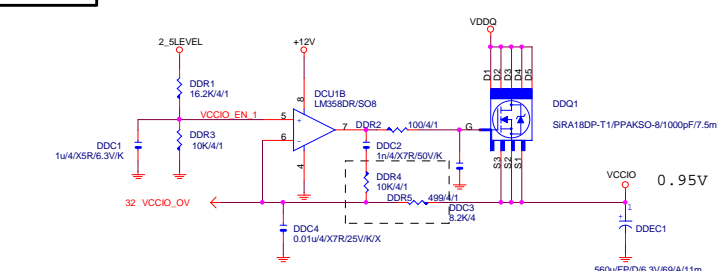
GIGABYTE™			
Title			
ISL95856 MOS			
Size	Document Number	Rev	
Custom	GA-Z170X-Gaming 3 EU	1.02	
Date:	Monday, January 18, 2016	Sheet	26 of 58

REV:0.4

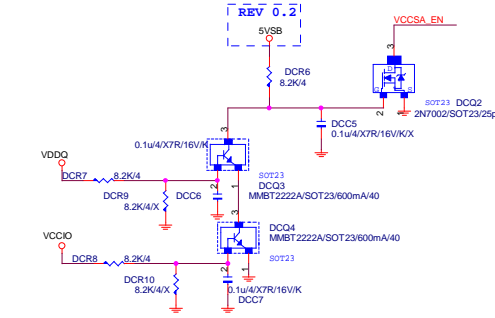
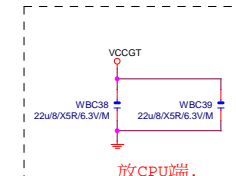
VCCSA



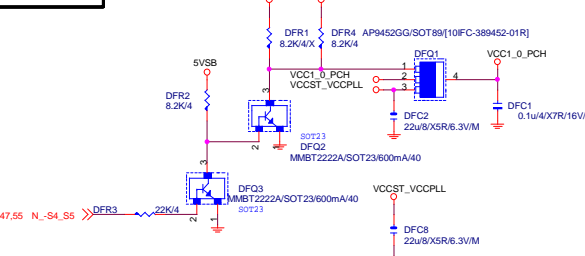
VCCIO



Connect to IT8620



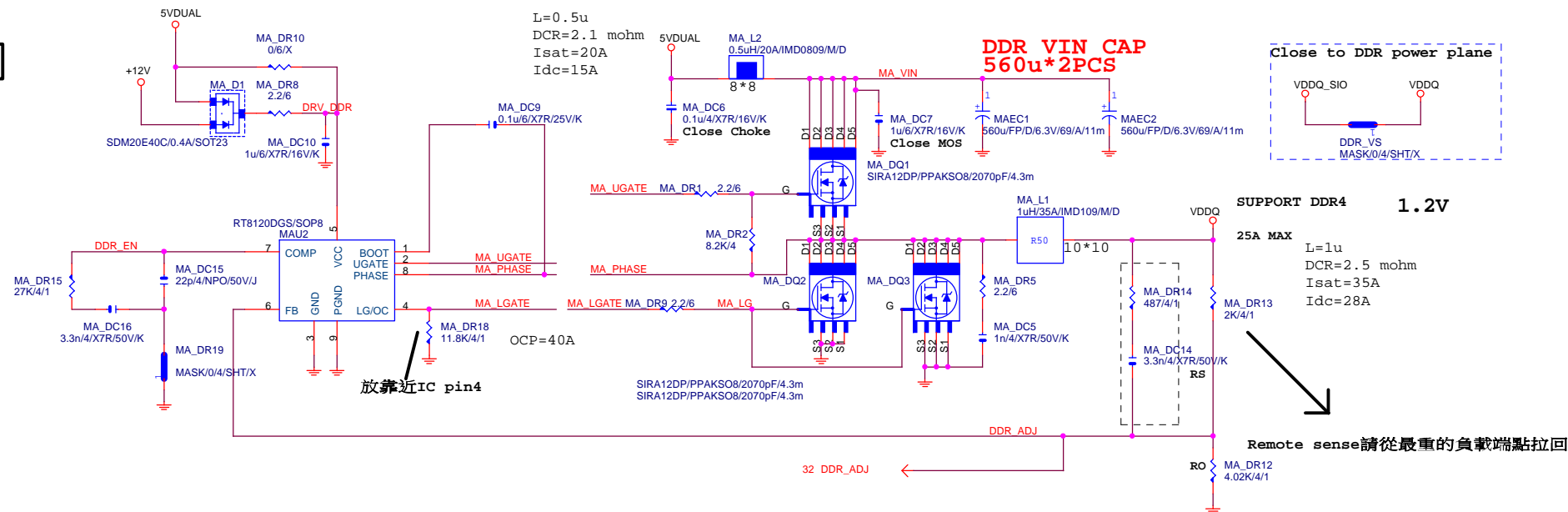
VCCST_VCCPLL



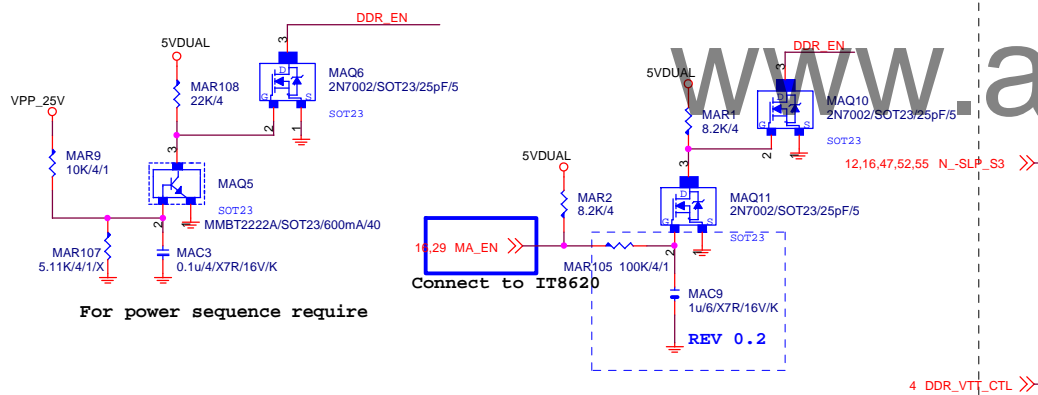
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REV: 0.88

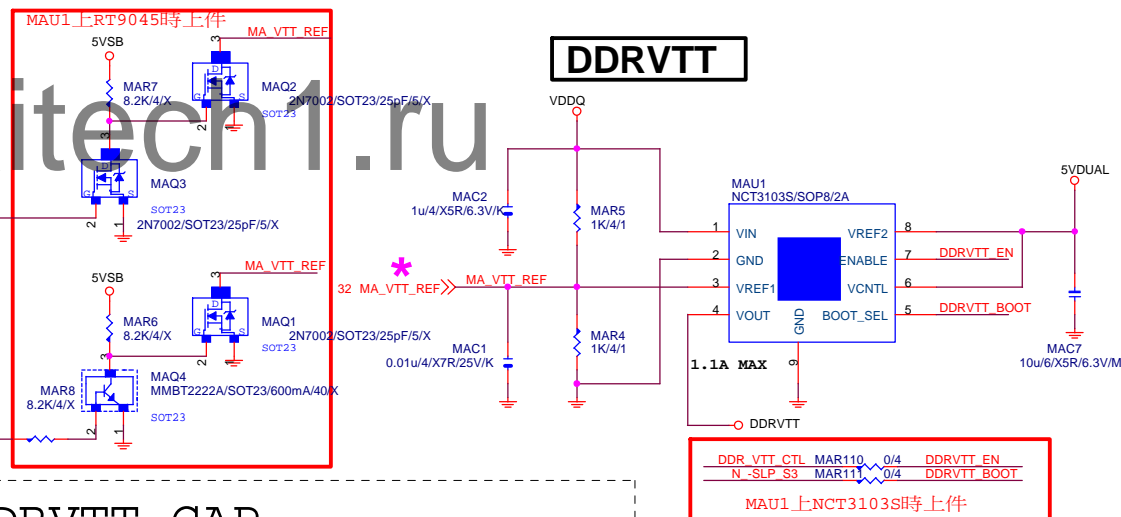
DDR4



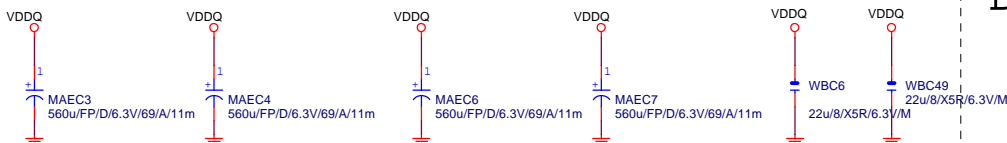
PWR SEQ



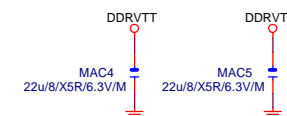
DDRVTT



DDR CAP 560u*4PCS * 大電容 x4



DDRVTT CAP

**GIGABYTE™**

RT8120 DDR4 POWER

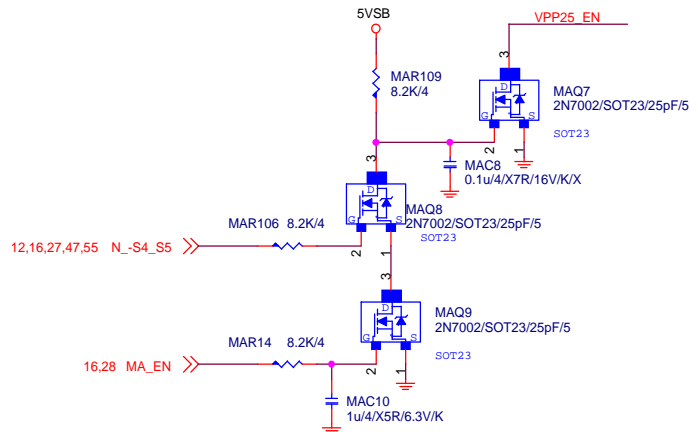
Size	Document Number	Rev
Custom	GA-Z170X-Gaming 3 EU	1.02
Date:	Monday, January 18, 2016	Sheet 28 of 58

VPP 25V

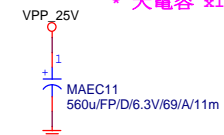
DDR_VPP VIN CAP
560u*1PCS



* 删除 MA_DR32

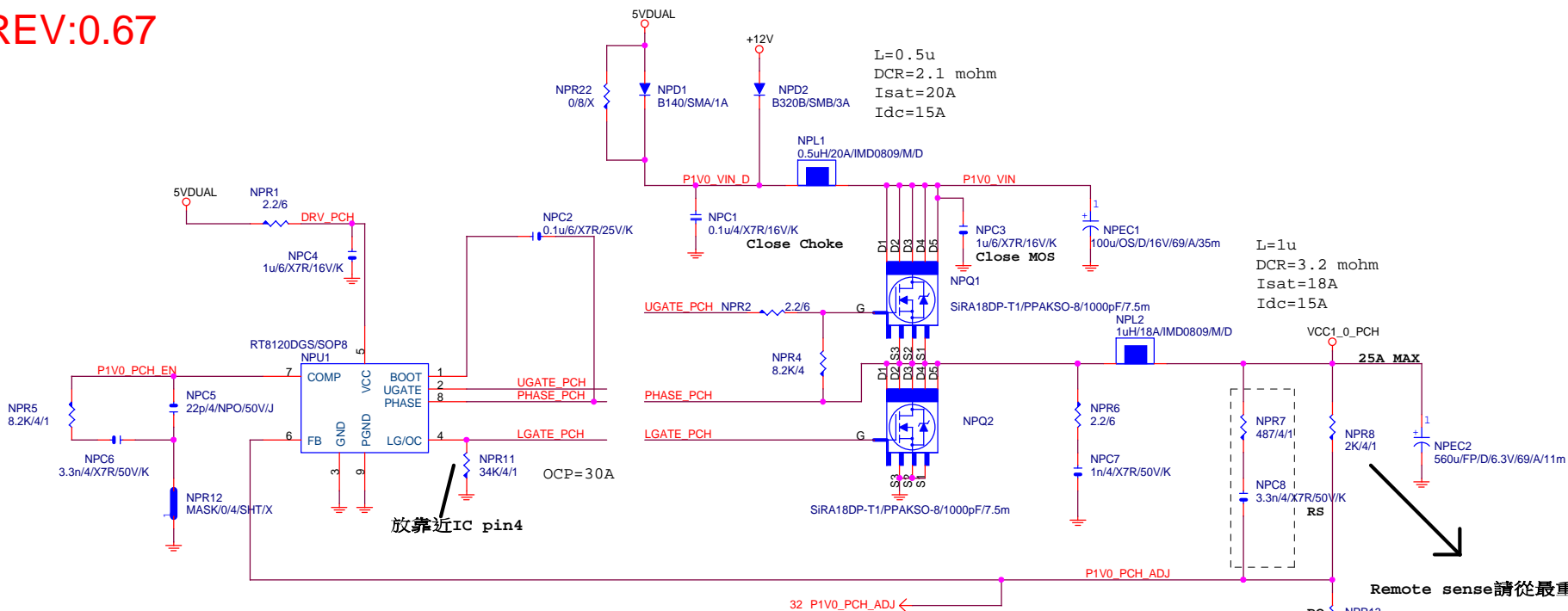


* 大電容 x1

**GIGABYTE™**

Title			
RT8120_VPP25 POWER			
Size	Document Number	Rev	
Custom	GA-Z170X-Gaming 3 EU	1.02	
Date:	Monday, January 18, 2016	Sheet	29 of 58

REV:0.67

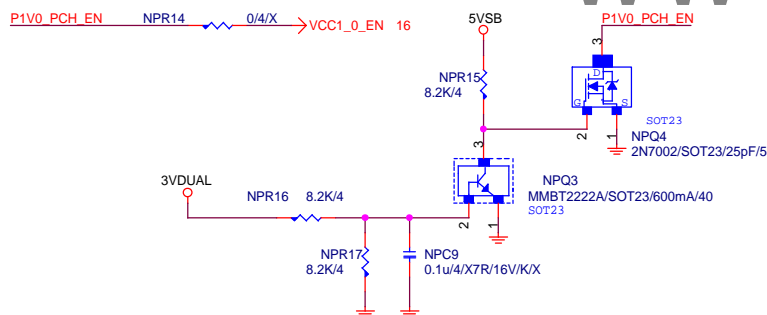


放靠近IC pin4

Remote sense請從最重的負載端點拉回

請放置CHOKE一出來的地方

PWR_SEQ



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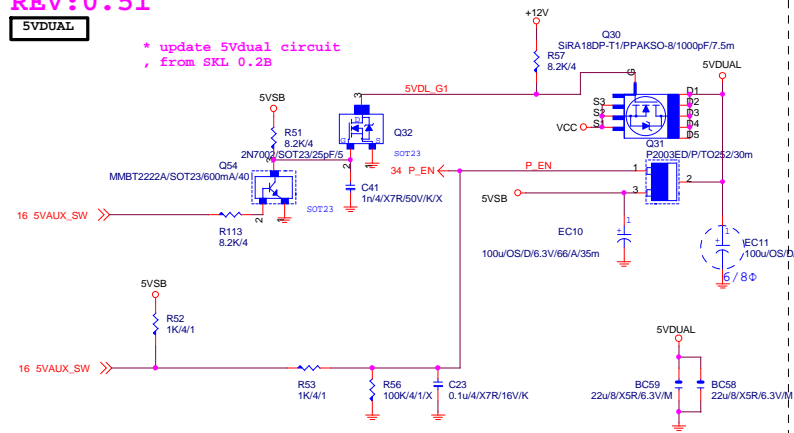
GIGABYTE™

Title			
RT8120_PCH POWER			
Size	Document Number	Rev	
Custom	GA-Z170X-Gaming 3 EU	1.02	
Date:	Monday, January 18, 2016	Sheet	30 of 58

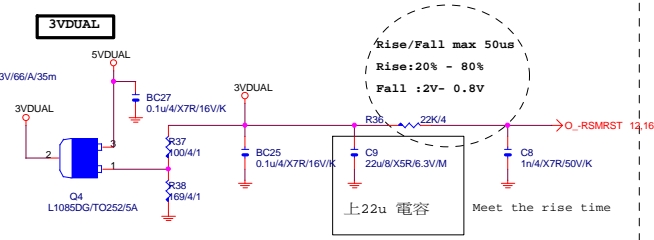
REV:0.51

5VDUAL

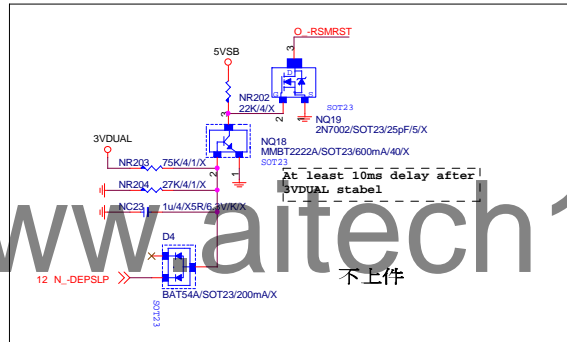
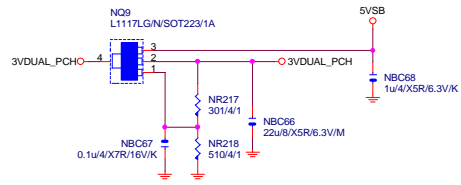
* update 5VDual circuit
from SKL 0.2B



3VDUAL



3VDUAL_PCH



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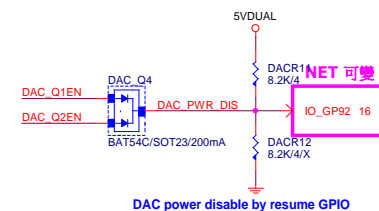
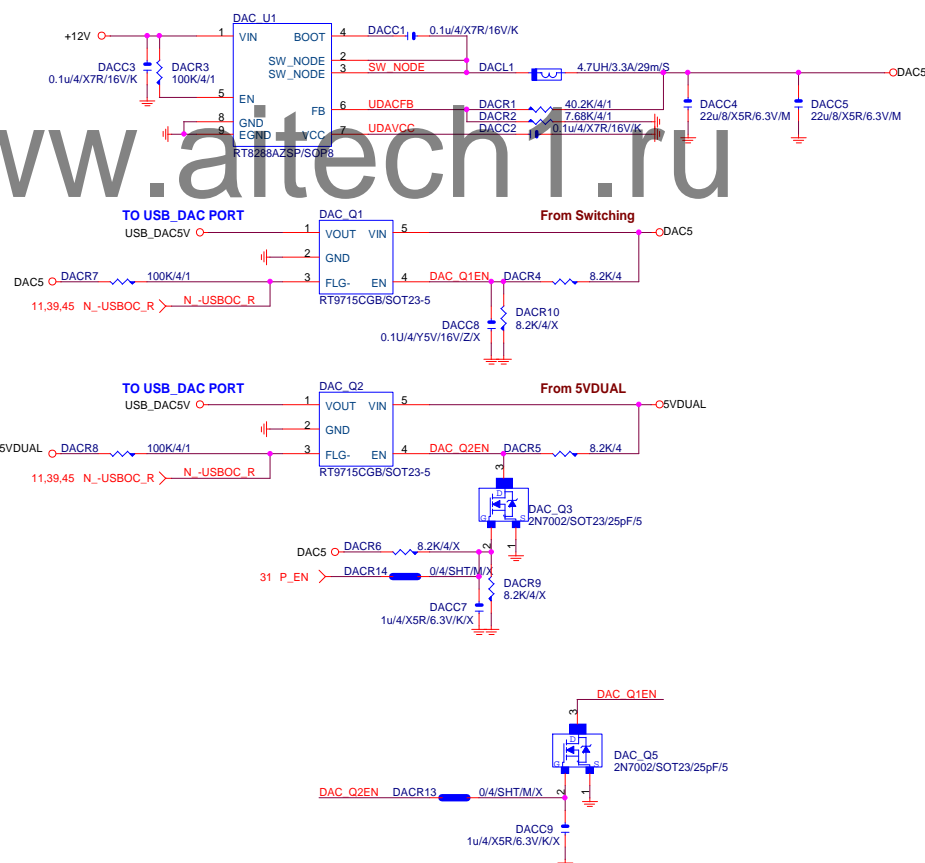
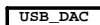
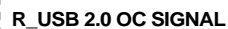
Gigabyte Technology

Title	DISCRETE POWER
Size	Custom
Document Number	GA-Z170X-Gaming 3 Ed. 1.02
Date	Monday, January 18, 2016
Sheet	31 of 58

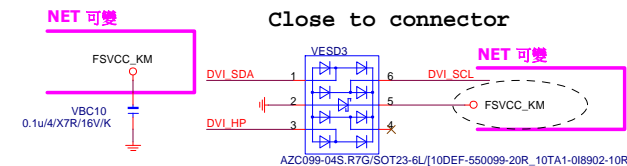
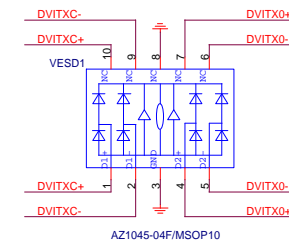
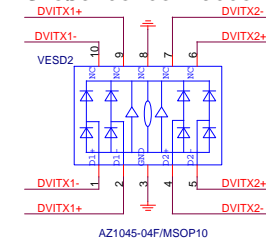
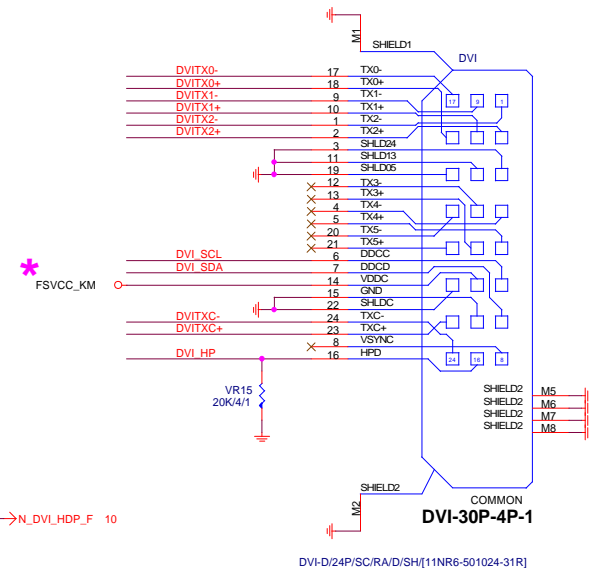
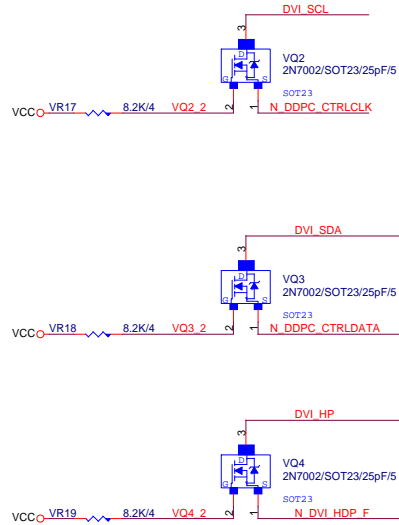
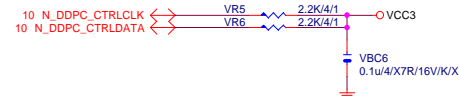
APW/2*4/BK/OC/P/4.2/VA/SN/OH::Location ATX_12V_2X

12 N_GPP_D9

Title		ATX POWER CONNECTOR	
Size	Document Number	GA-Z170X-Gaming 3 E	Rev
Custom			P.O.
Date:	Monday, January 18, 2016	Sheet	33 of 58

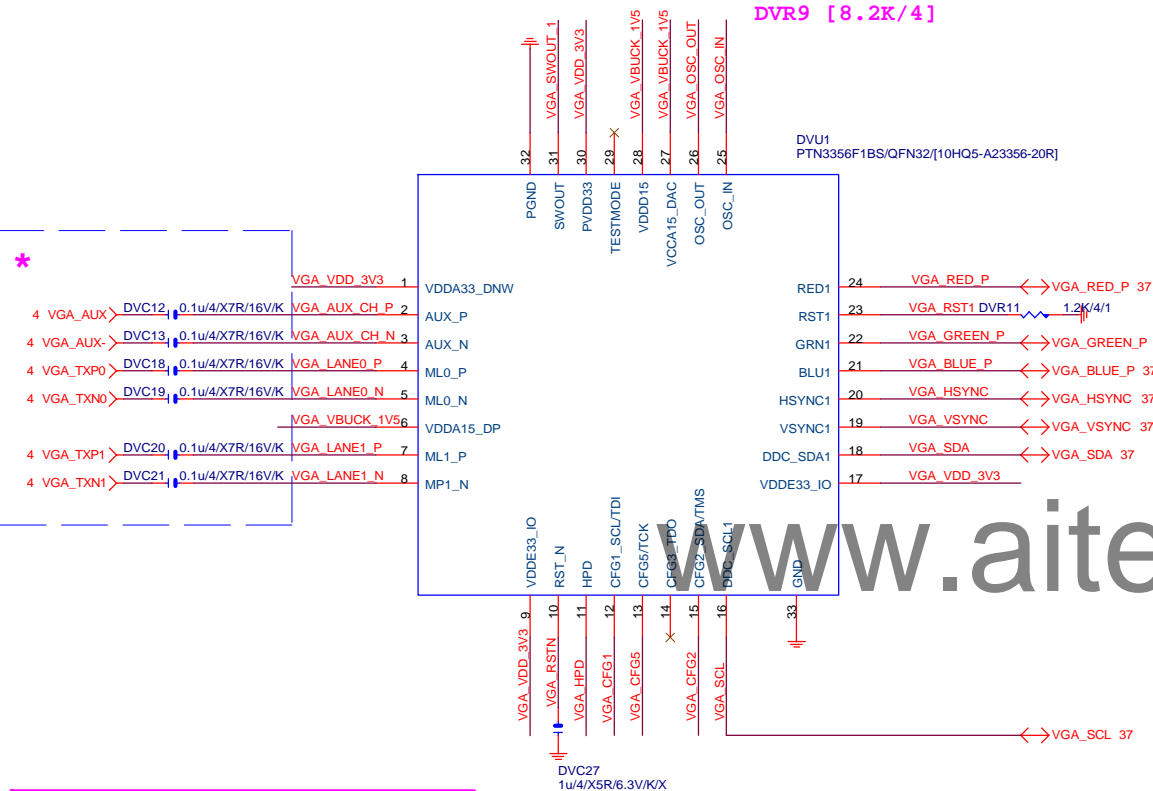


NET 可變



1. 上件:
DVC28 [10p/4/NPO/50V/J]
DVC11 [10p/4/NPO/50V/J]~修改值
DVR10 [8.2K/4]

2. 删除:
DVX1 [25M/16p/30ppm/49US/20/D]
DVC10 [20p/4/NPO/50V/J]
DVR9 [8.2K/4]



放置PCH端



Diagram illustrating the configuration of the **VGA_CFG5** pin. The pin is connected to a 25M resistor to LO, a 27M resistor to OPEN, and a 24M resistor to HI. The pin is also connected to a 8.2K resistor to VGA_CFG5 and a 8.2K resistor to VGA_VDD_3V3.

VCC3

DVL1
0/6/SHT/MX

VGA_VDD_3V3

DVC14
4.7uF/X5R/6.3V/K

DVC15
0.1uF/4/X7R/16V/K

DVC16
0.1uF/4/X7R/16V/K

DVC17
0.1uF/4/X7R/16V/K

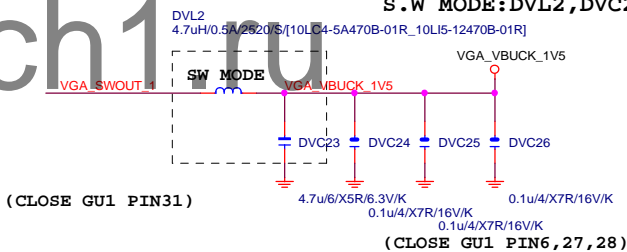
DVC22
0.1uF/4/X7R/16V/K

(CLOSE GU1 PIN1, 9, 17, 30)

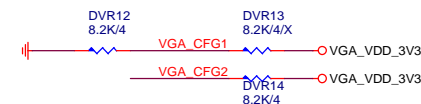
```

LDO  MODE:DVL2,DVC23-->X
S.W  MODE:DVL2,DVC23-->O

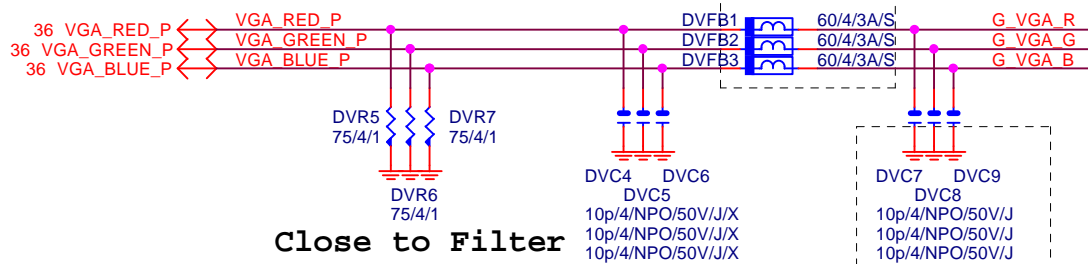
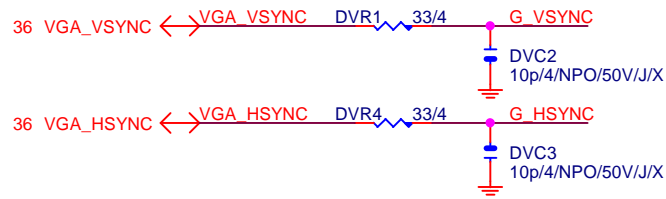
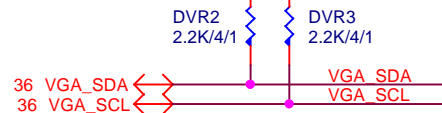
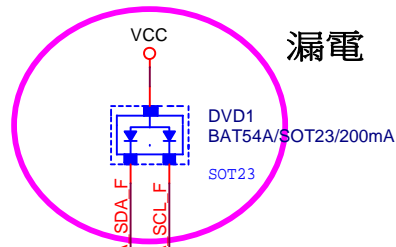
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Non-Compliant



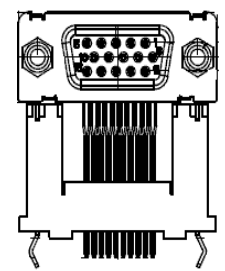
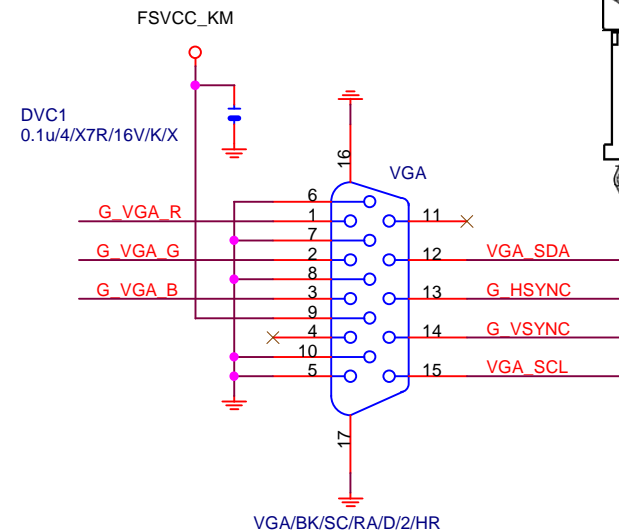
VGA SIGNAL R1.08



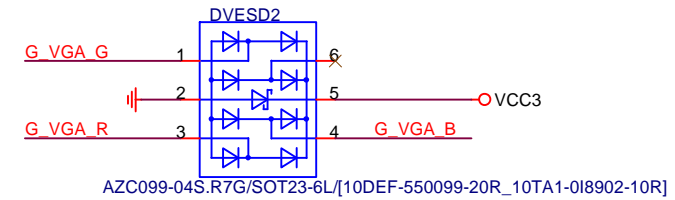
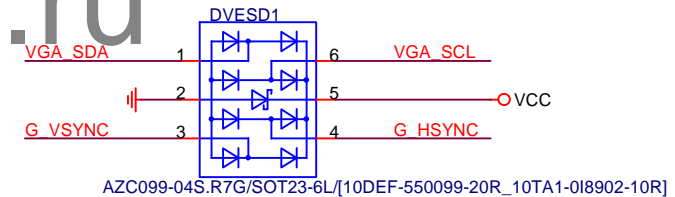
Close to Filter

FOR EMI

VGA CONN. 架高型VGA (BLACK)

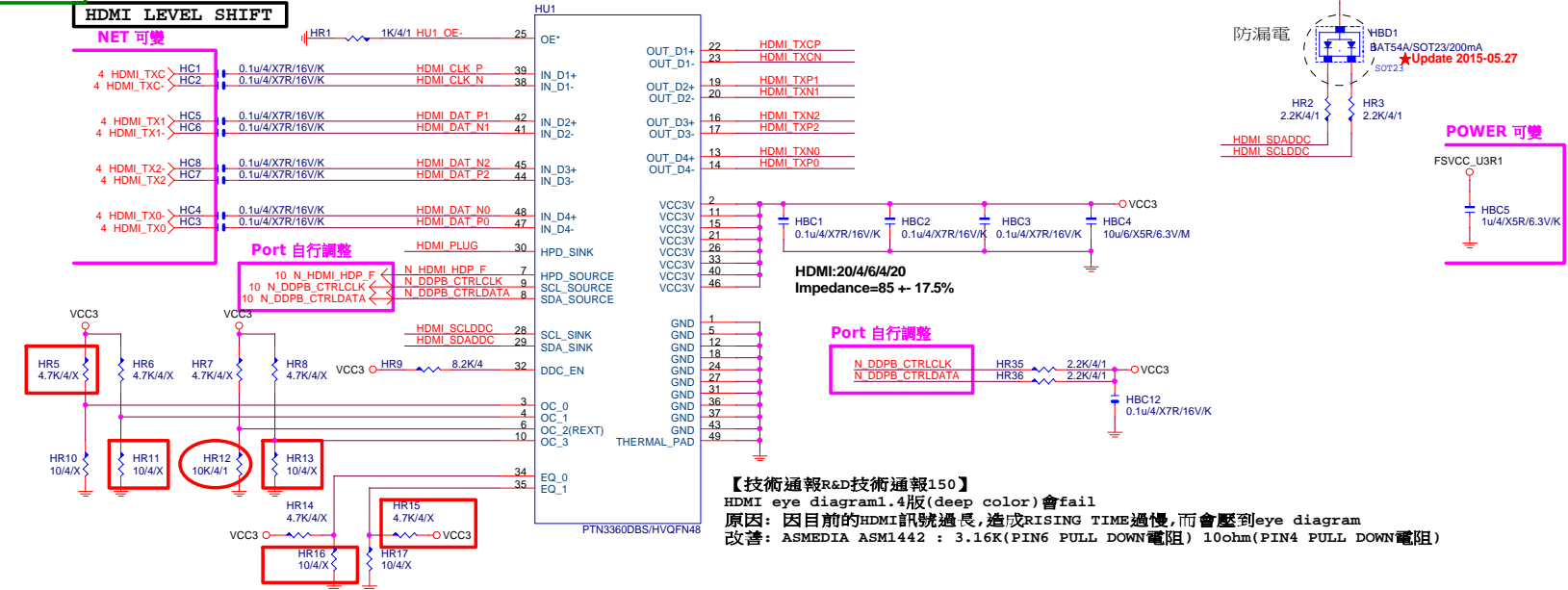


VGA ESD



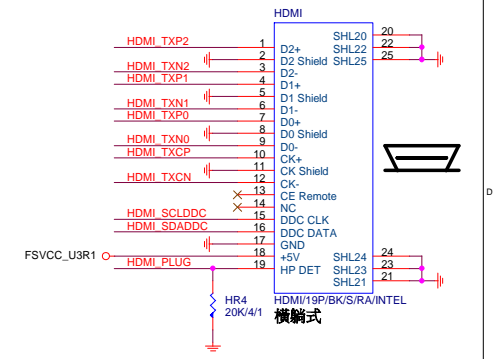
Gigabyte Technology			
NXP-PTN3356			
Title	GA-Z170X-Gaming 3 EU		
Size	Document Number	GA-Z170X-Gaming 3 EU	
Custom			
Date:	Monday, January 18, 2016	Sheet	37 of 58

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

【技術通報R&D技術通報150】
HDMI eye diagram 1.4版(deep color)會fail
原因: 因目前的HDMI訊號過長,造成RISING TIME過慢,而會壓到eye diagram
改善: ASMEDIA ASM1442 : 3.16K(PIN6 PULL DOWN電阻) 10ohm(PIN4 PULL DOWN電阻)



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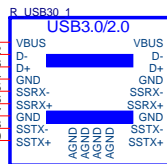
Rev: 0.31

R_USB30_1

NET 可自行調整

52 TBTB_USB2_D_N
52 TBTB_USB2_D_P
52 TBTB_CA2HD_0_N
52 TBTB_CA2HD_0_P
52 TBTB_HD2CA_0_N
52 TBTB_HD2CA_0_P

下 port for
Type-A USB3.1



NET 可自行調整

TBTB_CA2HD_0_P
TBTB_CA2HD_0_N

* swap

TBTB_CA2HD_0_N
TBTB_CA2HD_0_P

TBTB_CA2HD_0_N
TBTB_CA2HD_0_P

TBTB_CA2HD_0_N
TBTB_CA2HD_0_P

TBTB_CA2HD_0_N
TBTB_CA2HD_0_P

TBTB_CA2HD_0_N
TBTB_CA2HD_0_P

NET 可自行調整

N_-USBP9 11
N_+USBP9 11
PCH_USB3_RXN9 11
PCH_USB3_RXP9 11
PCH_USB3_TXN9 11
PCH_USB3_TXP9 11

NET 可自行調整

TBTB_HD2CA_0_N
TBTB_HD2CA_0_P

* swap

TBTB_HD2CA_0_N
TBTB_HD2CA_0_P

TBTB_HD2CA_0_N
TBTB_HD2CA_0_P

TBTB_HD2CA_0_N
TBTB_HD2CA_0_P

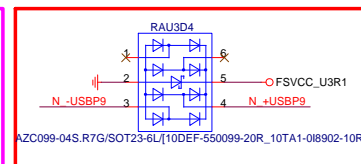
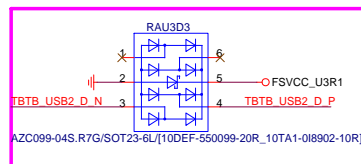
TBTB_HD2CA_0_N
TBTB_HD2CA_0_P

TBTB_HD2CA_0_N
TBTB_HD2CA_0_P

NET 可自行調整

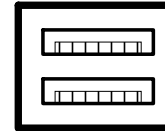
N_-USBP9 11
N_+USBP9 11
PCH_USB3_RXN9 11
PCH_USB3_RXP9 11
PCH_USB3_TXN9 11
PCH_USB3_TXP9 11

NET 可自行調整



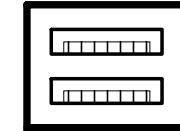
CONNECTOR 自行調整

2 port USB 3.0 Capture:
USB/18P/BU/OS/RA/D/2/1U/SB



Footprint:USB30_20

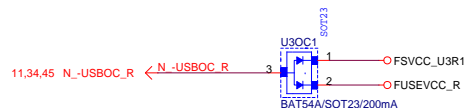
2 port USB 3.0 with TYPE C Capture:
USB/18P/BU/OS/RA/D/2/HR



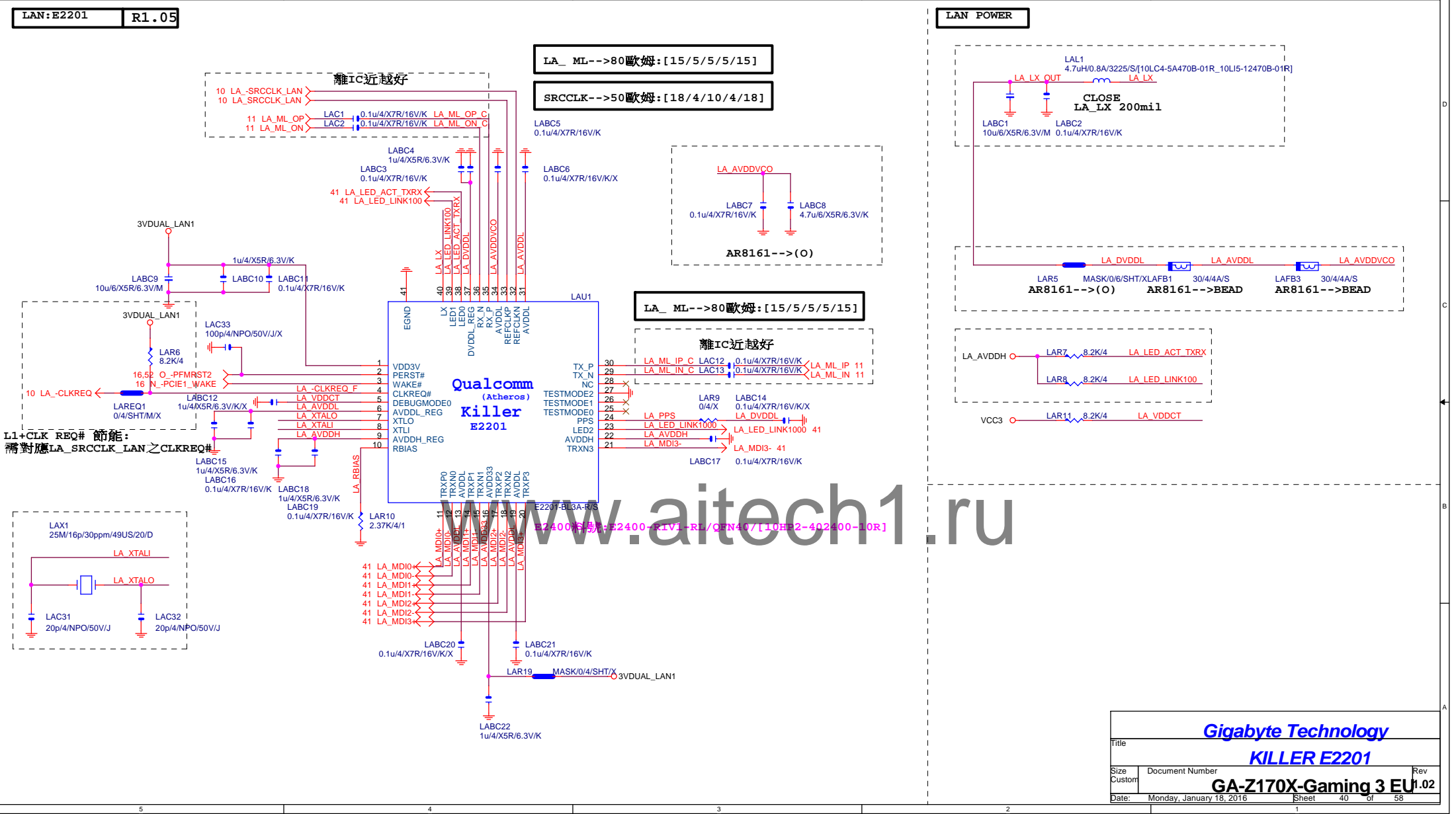
架高

Footprint:USB30_H

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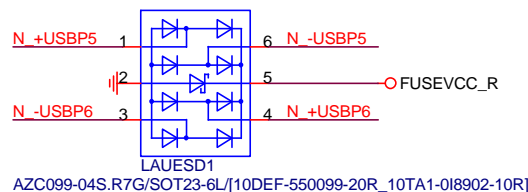
Title		Gigabyte Technology	
Size		R_USB30,F_USB30, USB_OC	
Date:		Monday, January 18, 2016	Sheet 39 of 58
Document Number		GA-Z170X-Gaming 3 EU	
Rev		1.02	



R1.04

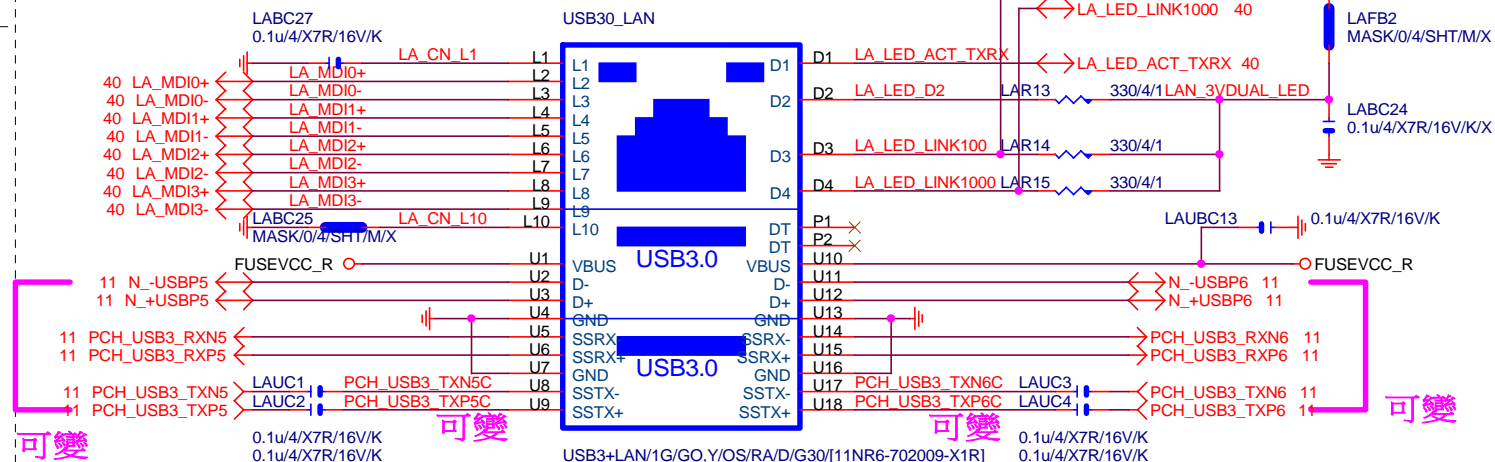
note:可變更USB NAME

可變



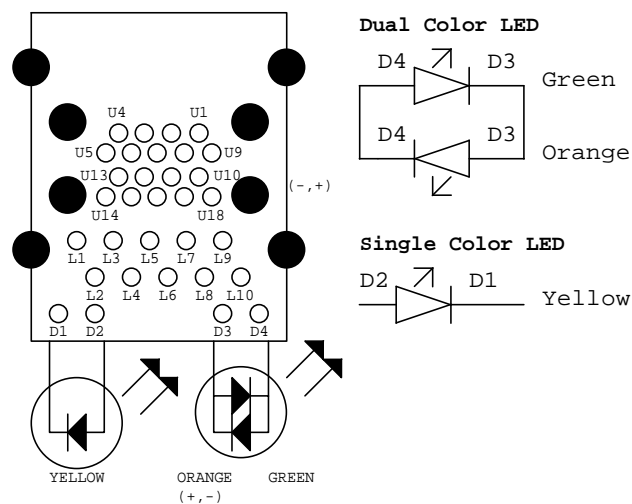
note:可變更USB NAME

[E2201]



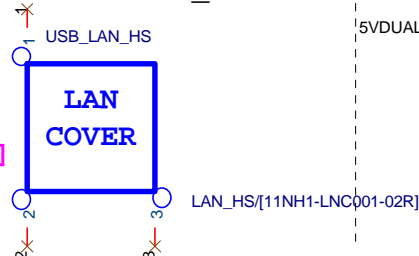
LA_MDI-->100歐姆:[20/4/8/4/20]

Dual Color LED



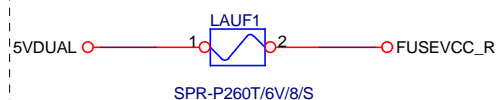
FOOT PRINT:LAN COVER

可變 [視SPEC需求]



note:可變更FUSE

可變

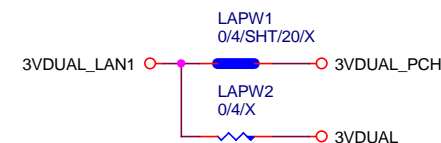


Close to connector
FUSE-0805

PS:視EMI需求

LAR24 MASK/0/4/SHT/M/X

可變



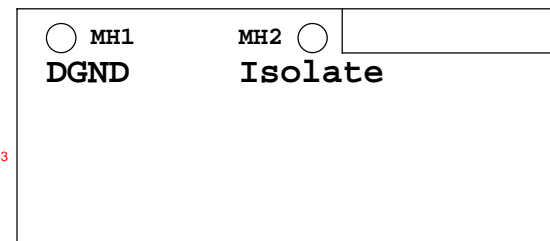
Gigabyte Technology

LAN CONNECTOR-E2201

Size Custom	Document Number GA-Z170X-Gaming 3 EU	Rev 1.02
Date: Monday, January 18, 2016	Sheet 41 of 58	

ALC1150 五孔+SPDIF
AUDIO JACK

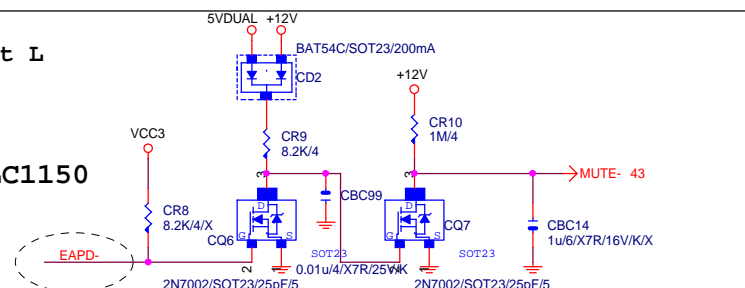
1. MH1空間夠,下DGND
空間不夠,改為Isolate
2. MH2一律改為Isolate
3. Codec下方,第二層必須參考GND



音效區域印刷



Close to ALC1150

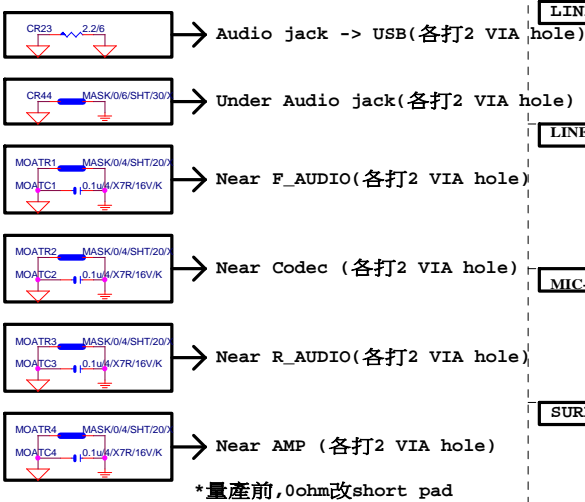
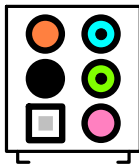


Gigabyte Technology

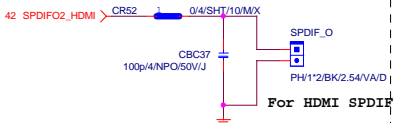
Title		ALC1150	
Size Custom	Document Number	GA-Z170X-Gaming 3 EU	
Date:	Monday, January 18, 2016	Sheet	42 of 58

Rev 0.94

AZALIA JACK

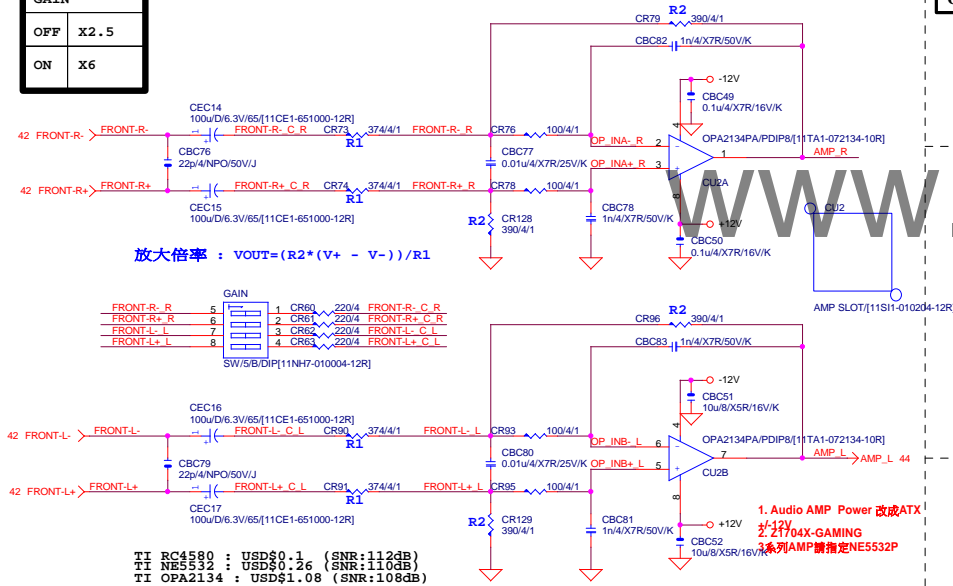


SPDIF OUT

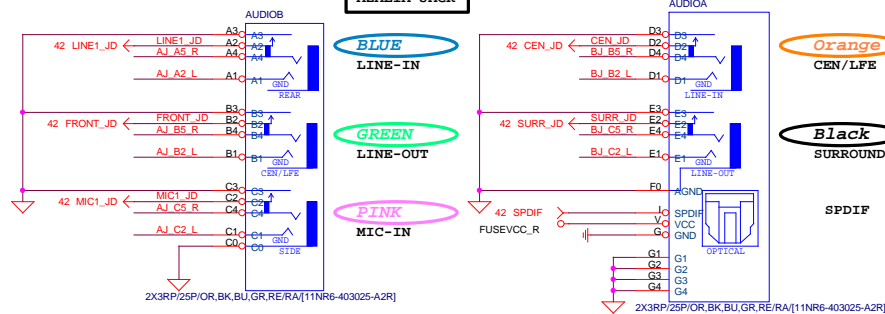


GAIN	
OFF	X2.5
ON	X6

Differential to Single-End AMPLIFIED



AZALIA JACK



LINE-OUT

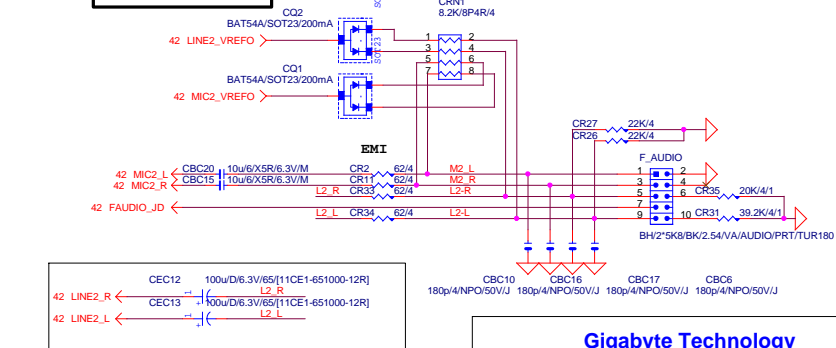
LINE-IN

MIC-IN

SURROUND

CEN/LFE

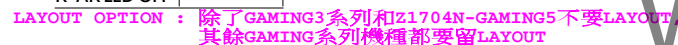
AZALIA FRONT PANEL



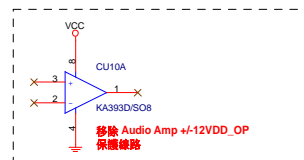
Gigabyte Technology

File	AUDIO JACK	
Size	Document Number	GA-Z170X-Gaming 3 E
Custom		02
Date	Monday, January 18, 2016	Sheet 43 of 58

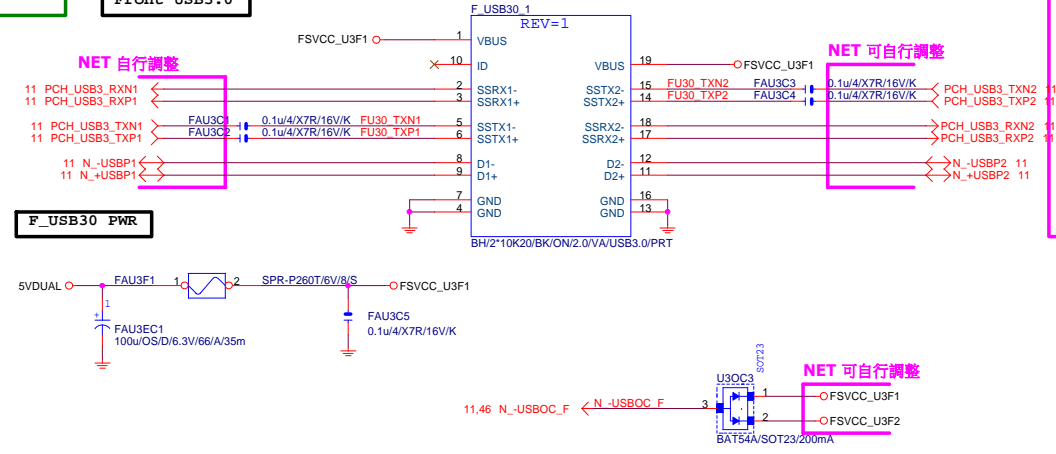
[GAMING系列--> 紅光LED(紅色):LED/R/H/0603/S]

[illegible]

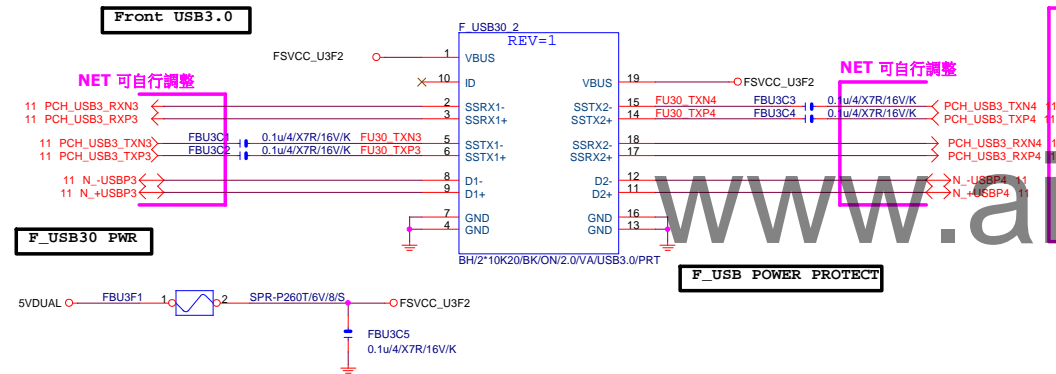
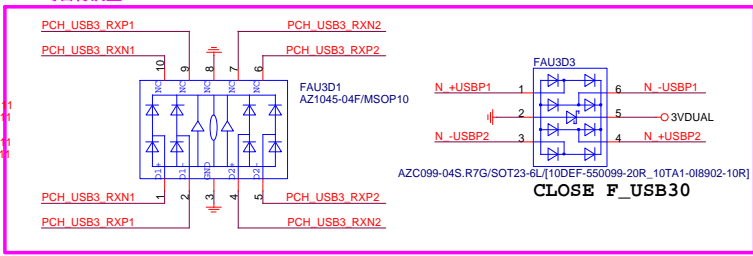
	IO GP82	IO GP83	IO GP91
Sleep Mode	L	H	L
OFF Mode	L	L	L
Pulse Mode	L	H	BREATH
Beat Mode	OD	H	L



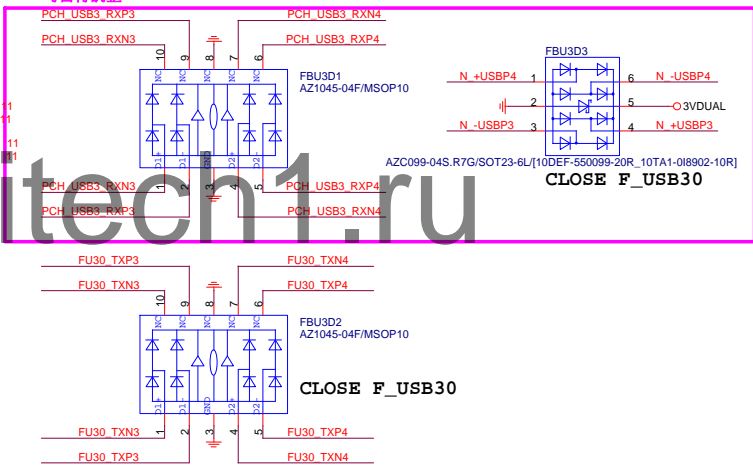
Front USB3.0



NET 可自行調整

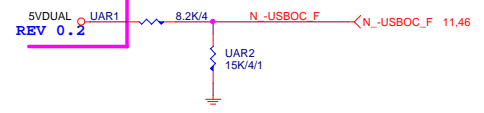


NET 可自行調整



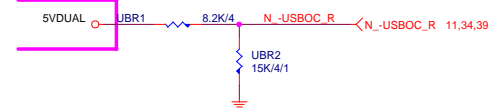
-USBOC_F

POWER 可自行調整

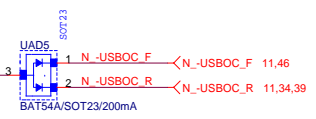


-USBOC_R

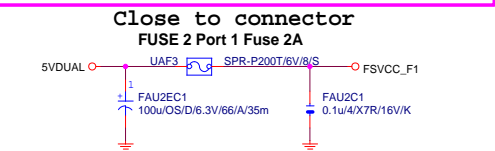
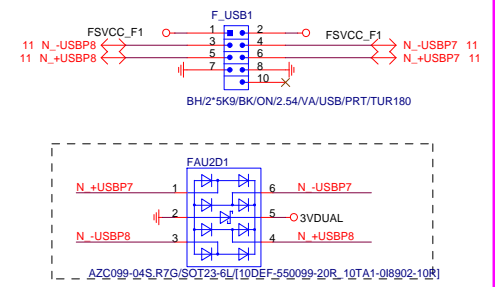
POWER 可自行調整



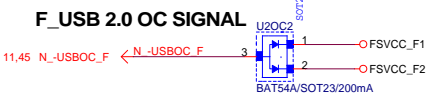
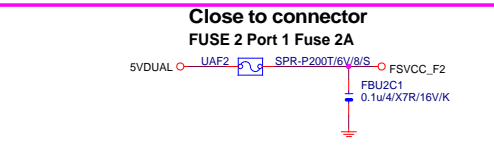
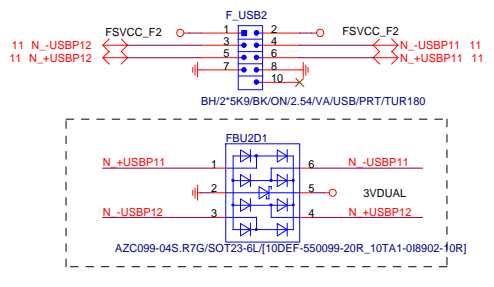
* 接 PCH
N_GPP_B20 (SMI) &
PCH PU 3Vdual



NET 可變



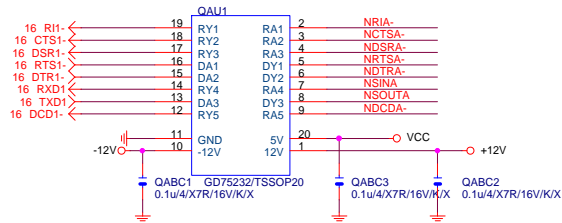
NET 可變



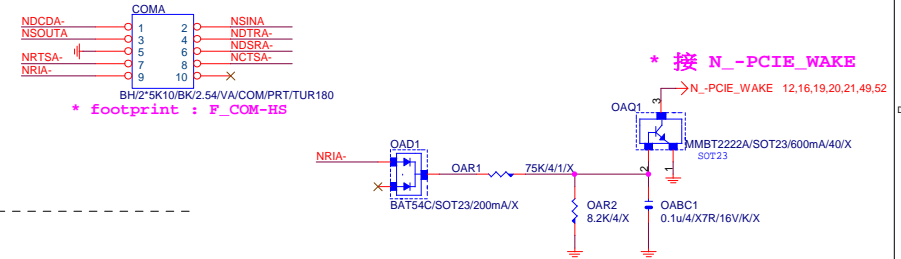
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Rev: 0.7

COM PORT



COMA



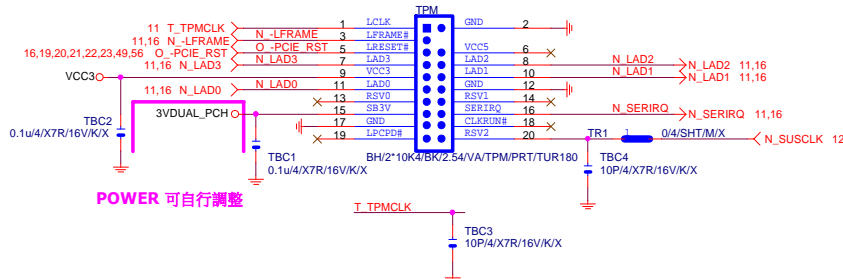
Rev: 0.3

TURBO KEY

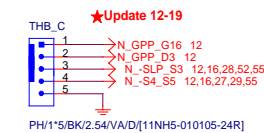
LPT PORT

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TPM CONNECT



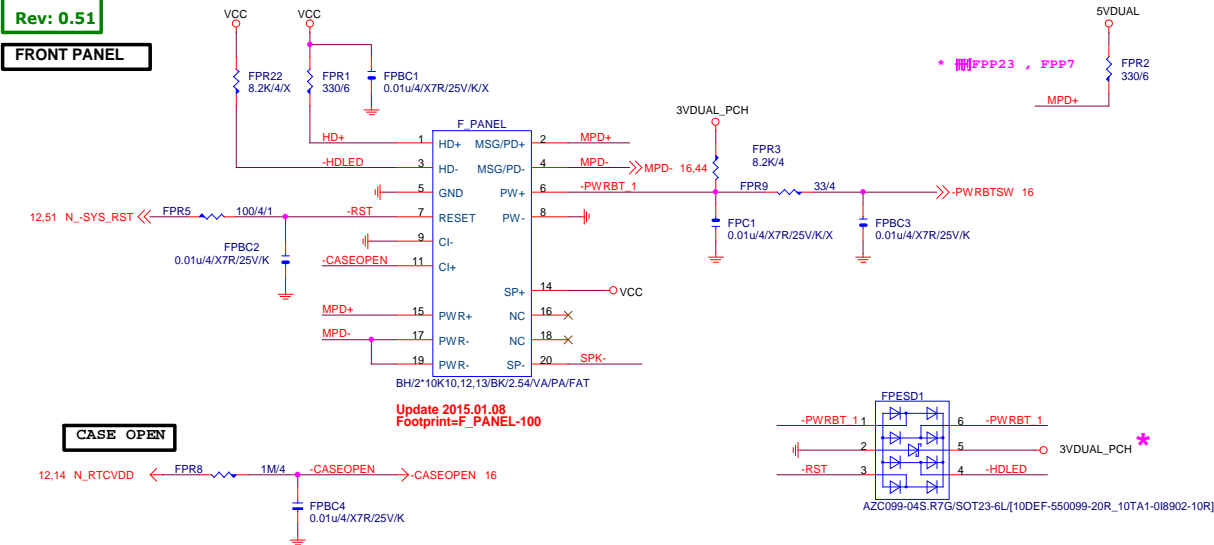
Thunderbolt



Gigabyte Technology			
Title			
COM,TPM,THB			
Size	Document Number	GA-Z170X-Gaming 3 EU	
Custom		Rev	1.02
Date:	Monday, January 18, 2016	Sheet	47 of 58

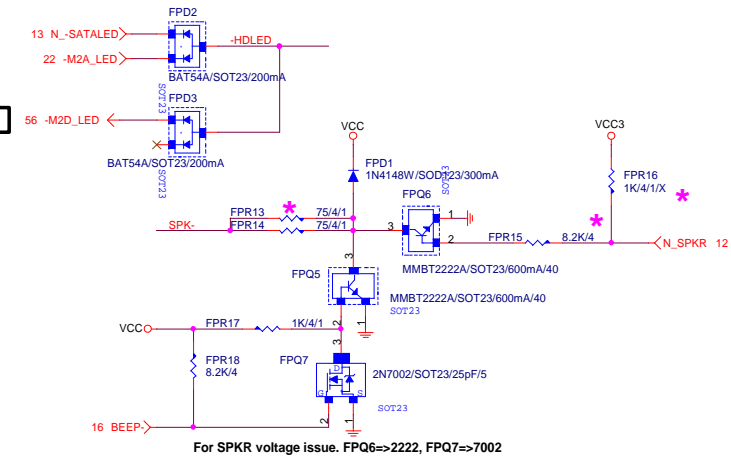
Rev: 0.51

FRONT PANEL



SATA LED

SPKR

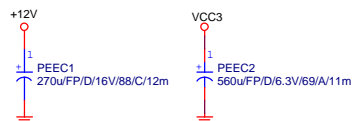


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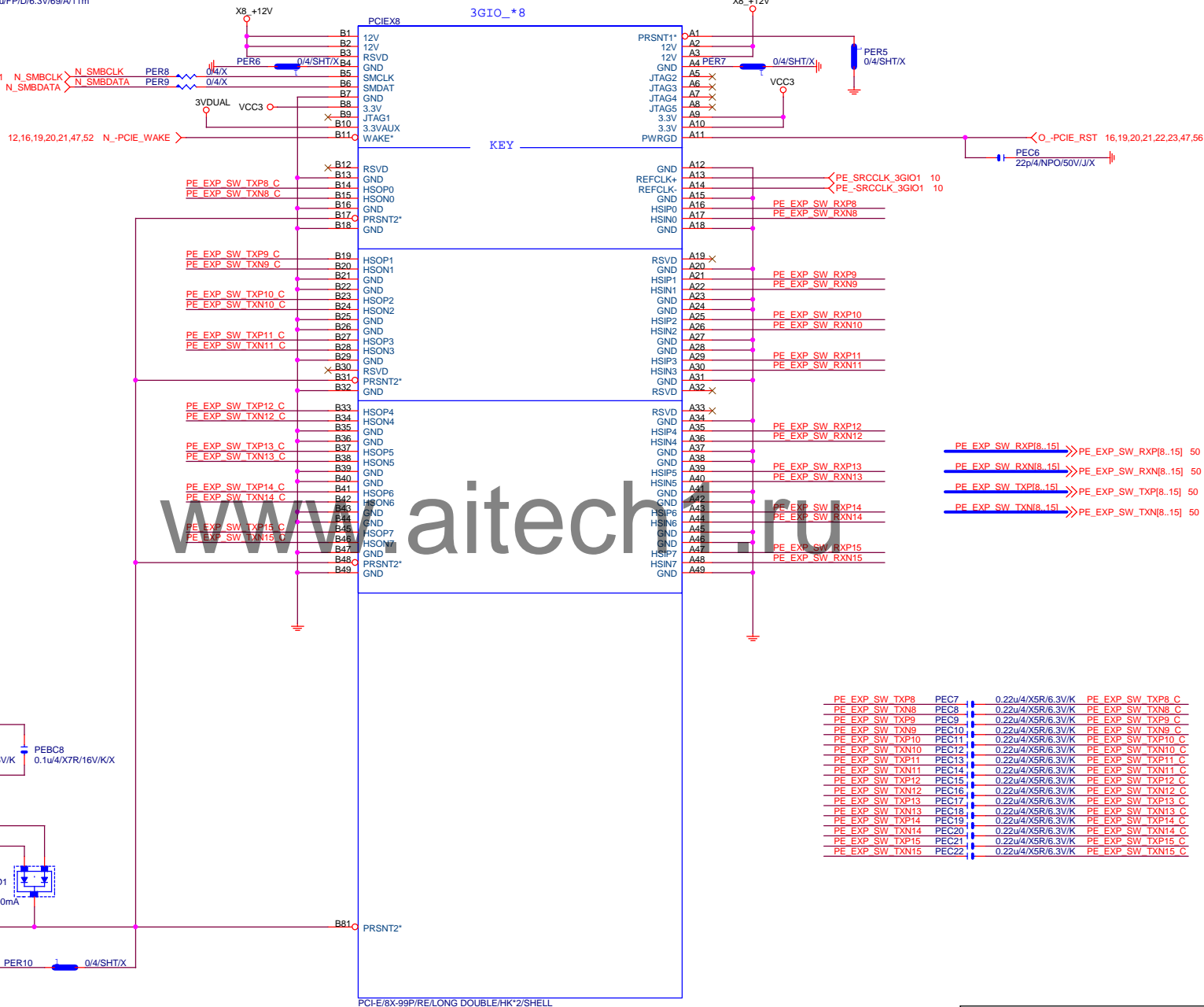
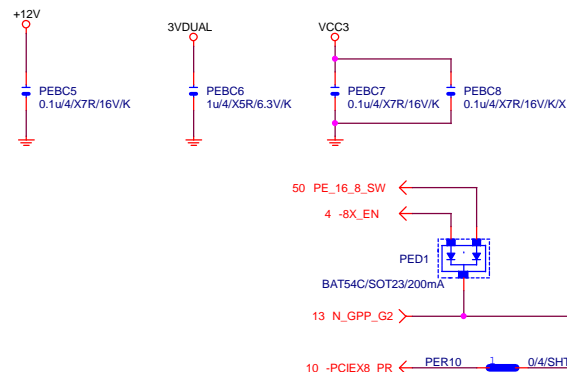
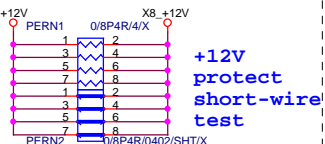
Gigabyte Technology

Title		FRONT PANEL	
Size	Document Number	GA-Z170X-Gaming 3 EU	
Date:	Monday, January 18, 2016	Sheet	48 of 58

Rev 0.3



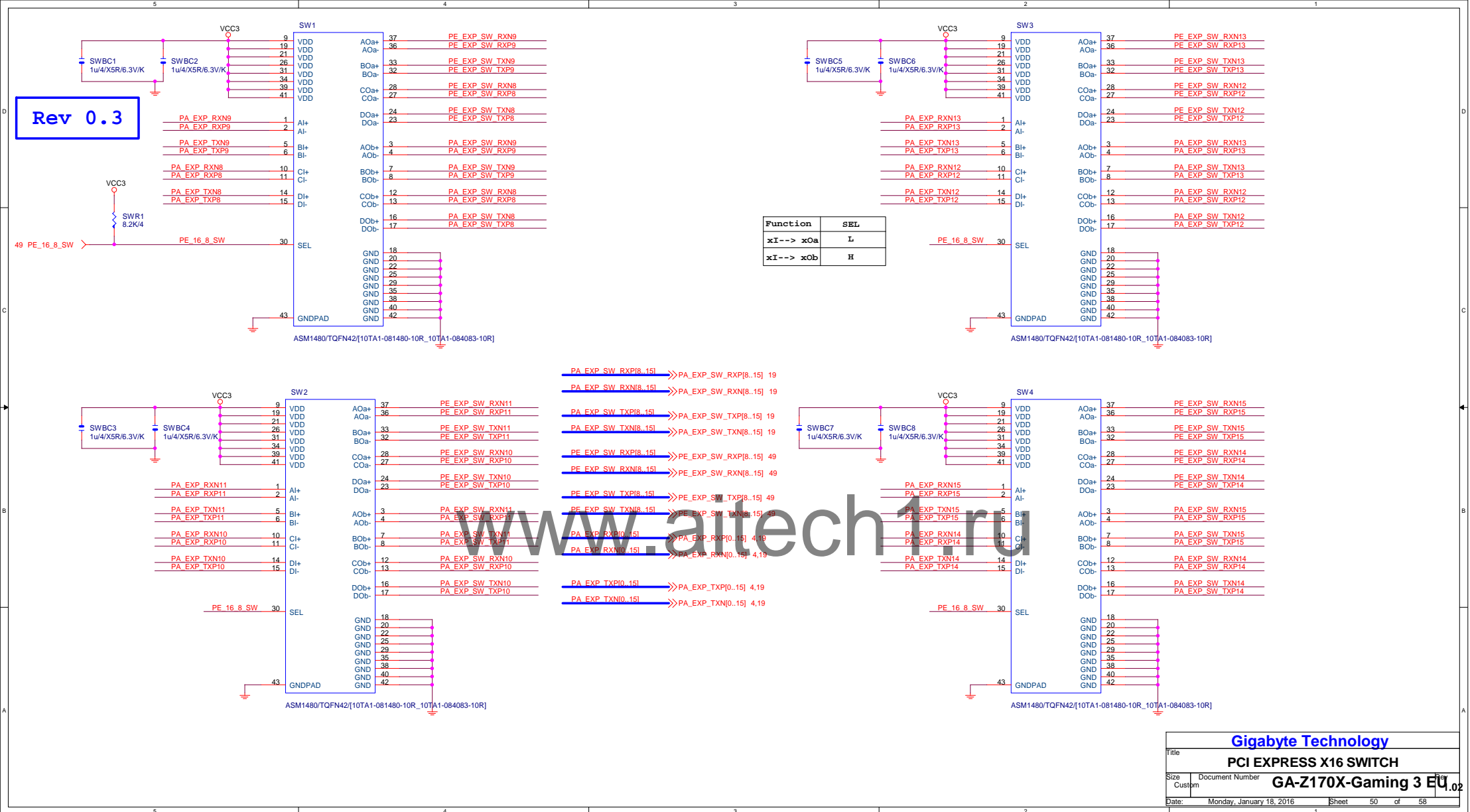
PCIEX8 PROTECT SHT



PE EXP SW TXP8	PEC7	0.22u4/X5R/6.3V/K	PE EXP SW TXP8 C
PE EXP SW TXN8	PEC8	0.22u4/X5R/6.3V/K	PE EXP SW TXN8 C
PE EXP SW TXP9	PEC9	0.22u4/X5R/6.3V/K	PE EXP SW TXP9 C
PE EXP SW TXN9	PEC10	0.22u4/X5R/6.3V/K	PE EXP SW TXN9 C
PE EXP SW TXP10	PEC11	0.22u4/X5R/6.3V/K	PE EXP SW TXP10 C
PE EXP SW TXN10	PEC12	0.22u4/X5R/6.3V/K	PE EXP SW TXN10 C
PE EXP SW TXP11	PEC13	0.22u4/X5R/6.3V/K	PE EXP SW TXP11 C
PE EXP SW TXN11	PEC14	0.22u4/X5R/6.3V/K	PE EXP SW TXN11 C
PE EXP SW TXP12	PEC15	0.22u4/X5R/6.3V/K	PE EXP SW TXP12 C
PE EXP SW TXN12	PEC16	0.22u4/X5R/6.3V/K	PE EXP SW TXN12 C
PE EXP SW TXP13	PEC17	0.22u4/X5R/6.3V/K	PE EXP SW TXP13 C
PE EXP SW TXN13	PEC18	0.22u4/X5R/6.3V/K	PE EXP SW TXN13 C
PE EXP SW TXP14	PEC19	0.22u4/X5R/6.3V/K	PE EXP SW TXP14 C
PE EXP SW TXN14	PEC20	0.22u4/X5R/6.3V/K	PE EXP SW TXN14 C
PE EXP SW TXP15	PEC21	0.22u4/X5R/6.3V/K	PE EXP SW TXP15 C
PE EXP SW TXN15	PEC22	0.22u4/X5R/6.3V/K	PE EXP SW TXN15 C

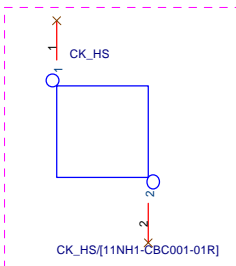
Gigabyte Technology

Title		PCI EXPRESS X8	
Size		Document Number	
Custom		GA-Z170X-Gaming 3 EU	
Date:	Monday, January 18, 2016	Sheet	49 of 58

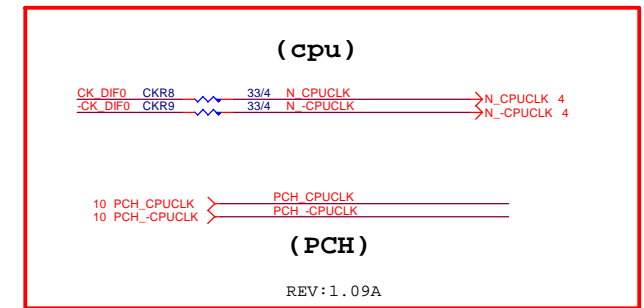
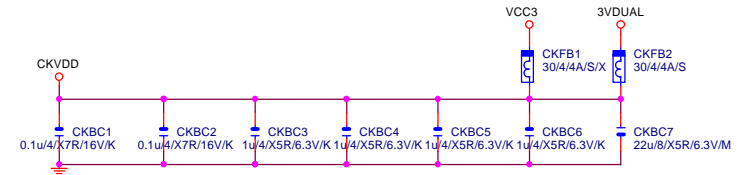
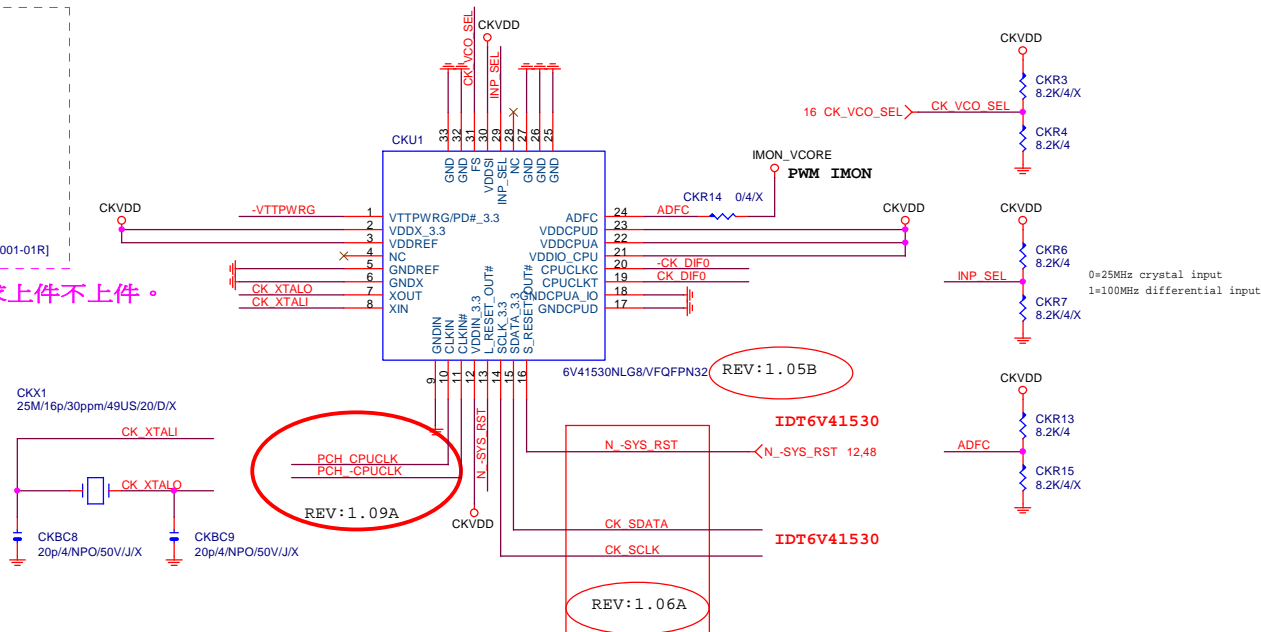


REV:1.10A

IDT6V41530



*可變, 依需求上件不上件。



請依使用情況(0 ohm 請修改為short Pad)

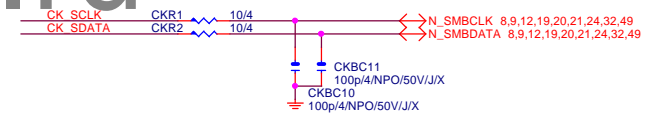
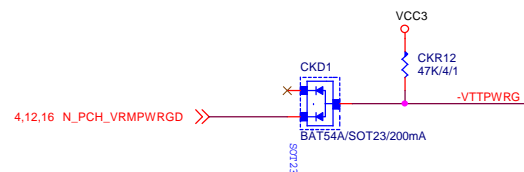
INP_SEL	Intput
0	Crystal
1	CLK_INP/N

CK_VCO_SEL	VCO
0	400M
1	1200M

Location	CLK BUFFER	PCH CLK
WR100	MOUNT	N/A
WR101	MOUNT	N/A
NR302	MOUNT	N/A
NR303	MOUNT	N/A
WR102	N/A	MOUNT
WR103	N/A	MOUNT
NR300	N/A	MOUNT
NR301	N/A	MOUNT

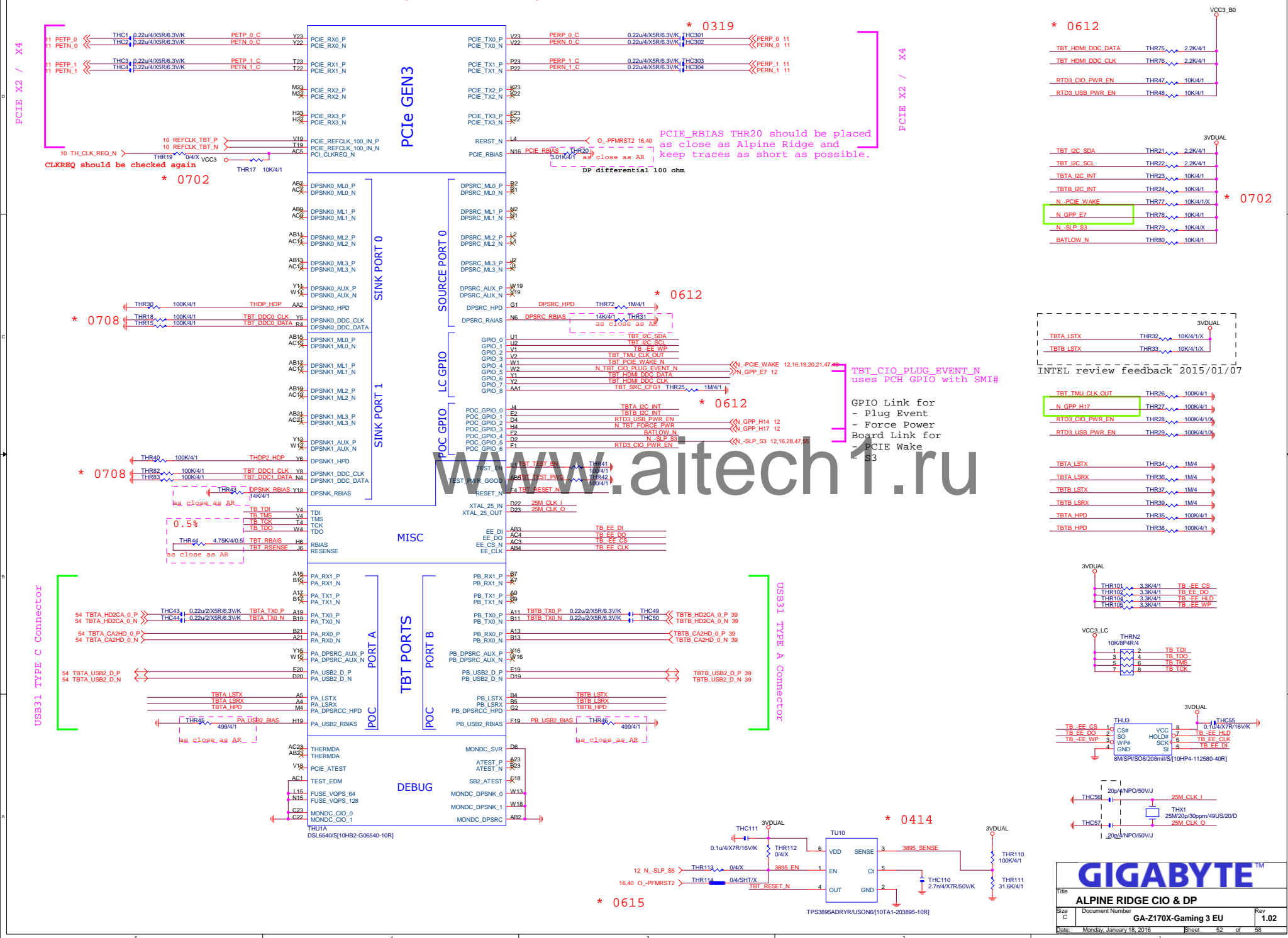
CLK BUFFER 未上件時, 零件FOOTPRINT需修改為IC32QFN-SL-MASK

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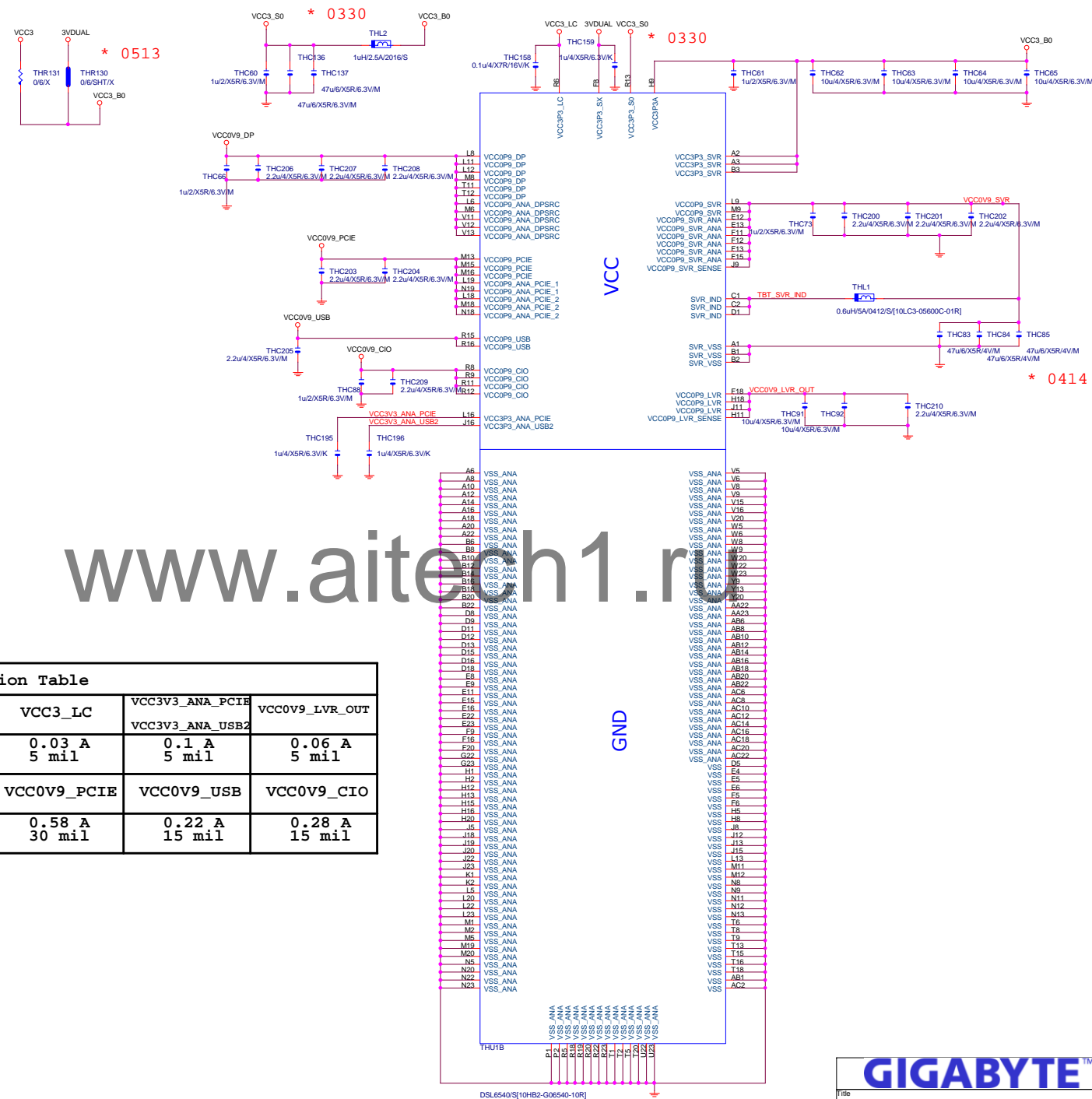


GIGABYTE™			
Title IDT6V41530_CLK BUFFER			
Size	Document Number	Rev	
Custm	GA-Z170X-Gaming 3 EU	1.02	
Date:	Monday, January 18, 2016	Sheet	51 of 58

INTEL AR USB31 module SCH 0.63 (2015/07/08)

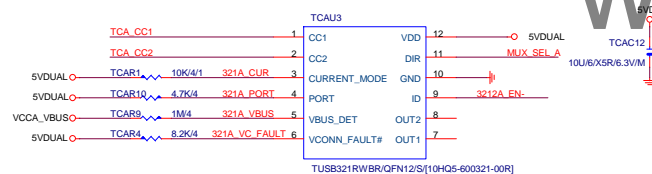
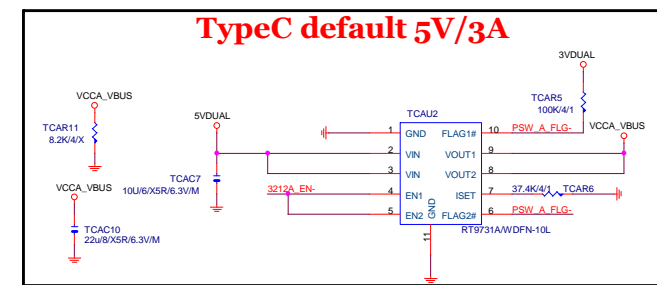


INTEL AR USB31 module SCH 0.63 (2015/07/08)



Power Consumption Table					
	VCC3	3VDUAL	VCC3_LC	VCC3V3_ANA_PCIE VCC3V3_ANA_USB2	VCC0V9_LVR_OUT
Max Current(A)	1.05 A 40 mil	0.19 A 10 mil	0.03 A 5 mil	0.1 A 5 mil	0.06 A 5 mil
	VCC0V9_SVR	VCC0V9_DP	VCC0V9_PCIE	VCC0V9_USB	VCC0V9_CIO
Max Current(A)	1.83 A 80 mil	0.7 A 30 mil	0.58 A 30 mil	0.22 A 15 mil	0.28 A 15 mil

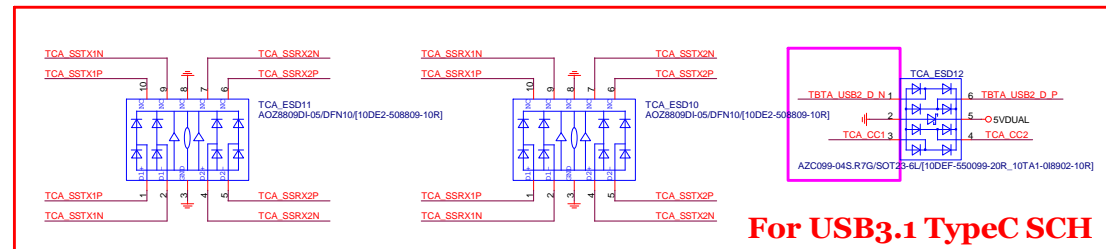
* 0612



MUX_SEL
H - TypeC plug position 2
L - TypeC plug position 1

PORT

H - HOST
L - Device
NC - Dual Role

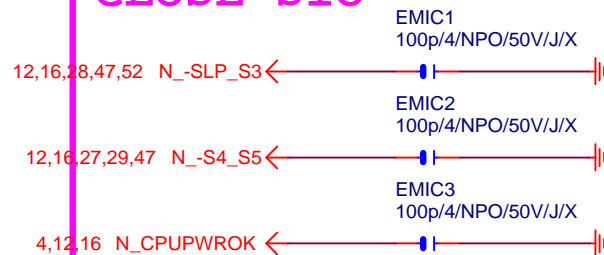


For USB3.1 TypeC SCH

Color markers can be changed by model

			
Title			
TI TUSB321			
Size C	Document Number GA-Z170X-Gaming 3 EU		Rev 1.02
Date	Monday, January 18, 2016	Sheet 54 of 58	

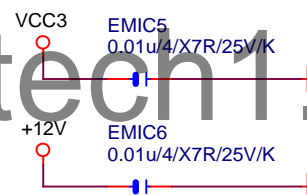
CLOSE SIO



CLOSE PCH



EMI Alain 2015/03/04 modify

**GIGABYTE™**

Title

EMI/ESDSize
A

Document Number

GA-Z170X-Gaming 3 EU

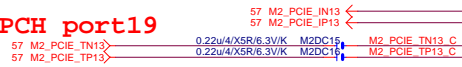
Rev

1.02

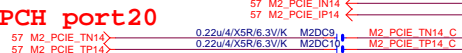
Date: Monday, January 18, 2016

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M.2 Lane2 from PCH port19



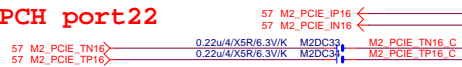
M.2 Lane2 from PCH port20



M.2 Lane3 from PCH port21

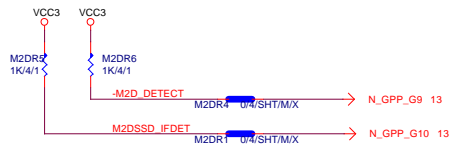


M.2 Lane4 from PCH port22



10 CK_M2D_100M_DN
10 CK_M2D_100M_DP
需與M2-CLKREQ對應

支援SATA and M.2 function



M.2 有插卡 / 沒插卡	M.2插何種卡? GPP_G10	SATA Express 插何種硬碟? GPP_E0/E1/E2/F0	IO19 (S0)	IO20 (S1)	IO21 (S2)	IO22 (S3)
有插卡 (Low)	SATA Mode (Low)	SATA (Hi)	SATA	SATA	SATA	SATA (For M2)
		SATA Express (Low)	SATA	SATA	SATA	SATA (For M2)
	PCIe Mode (Hi)	SATA (Hi)	PCIEx4 (For M.2)			
		SATA Express (Low)	PCIEx4 (For M.2)			
沒插卡 (Hi)	Don't Care (Hi)	SATA (Hi)	SATA (S0)	SATA (S1)	SATA (S2)	SATA (S3)
		SATA Express (Low)	SATA Express (For S.E.0)		SATA Express (For S.E.1)	

M.2-SATA+SATA S0~2

WHEN	PCH GPIO	SETUP	SWITCH
GPP_G7	L	GPP_C20	L
GPP_G8	L	GPP_C19	L
GPP_F1/F2	H (SATA)	GPP_C21	H

M.2-SATA+S.E.D

WHEN	PCH GPIO	SETUP	SWITCH
GPP_G7	L	GPP_C20	L
GPP_G8	L	GPP_C19	L
GPP_F1/F2	L (S.E.)	GPP_C21	H

M.2X4

WHEN	PCH GPIO	SETUP	SWITCH
GPP_G7	L	GPP_C20	H
GPP_G8	H	GPP_C19	H
GPP_F1/F2	H	GPP_C21	H

M.2X2+S.E.

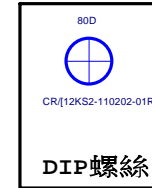
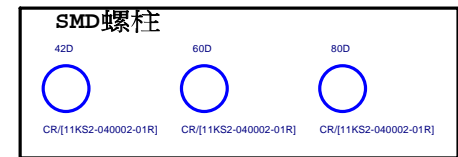
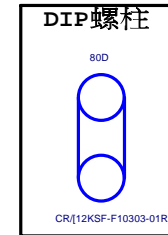
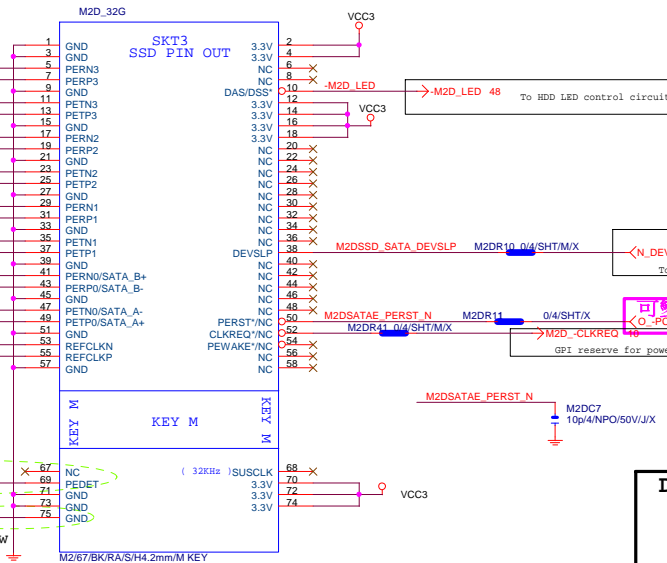
WHEN	PCH GPIO	SETUP	SWITCH
GPP_G7	L	GPP_C20	H
GPP_G8	H	GPP_C19	H
GPP_F1/F2	L	GPP_C21	H

M.2沒插卡+SATA S0~3

WHEN	PCH GPIO	SETUP	SWITCH
GPP_G7	H	GPP_C20	L
GPP_G8	H	GPP_C19	L
GPP_F1/F2	H	GPP_C21	L

M.2沒插卡+S.E.C&S.E.D

WHEN	PCH GPIO	SETUP	SWITCH
GPP_G7	H	GPP_C20	L
GPP_G8	H	GPP_C19	L
GPP_F1/F2	L	GPP_C21	L



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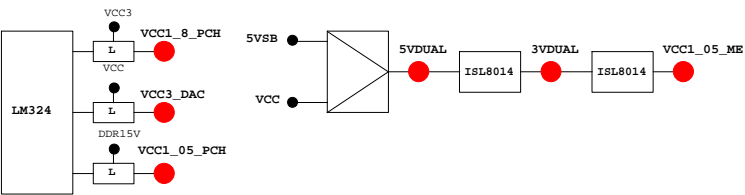
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Size	Custom
Document Number	GA-Z170X-Gaming 3 EU
Date:	Monday, January 18, 2016
Sheet	55 of 58
Rev	1.02

PCH GPIO LIST TABLE					
PIN NAME	PWR	Default	USAGE	NOTE	
GP0	MAIN	H-Z	GPI	GPIO0	N/A
GP1/TACH1	MAIN		GPI	GPIO1	N/A
GP2/PIRQ#	MAIN		GPI	-PIRQE	P/U 8.2K VCC3
GP3/PIRQF#	MAIN		GPI	-PIRQF	P/U 8.2K VCC3
GP4/PIRQG#	MAIN		GPI	-PIRQG	P/U 8.2K VCC3
GP5/PIRQH#	MAIN		GPI	-PIRQH	P/U 8.2K VCC3
GP6/TACH2	MAIN		GPI	PCIEX1 Detect	P/U 8.2K VCC3
GP7/TACH3	MAIN		GPI	GPIO7	P/U 8.2K VCC3
GP8	STBY	H	GPI	GPIO8	N/A
GP9/OC5#	STBY		NATIVE	USB OC5#	N/A
GP10/OC6#	STBY		NATIVE	USB OC6#	N/A
GP11/SMBALERT#	STBY		NATIVE	USB PWR protect	P/U 8.2K 3VDUAL
GP12	STBY	L	GPI	GPIO12	N/A
GP13	STBY	L	GPI	LPCPME#	P/U 8.2K 3VDUAL
GP14/OC7#	STBY		NATIVE	USB OC7#	N/A
GP15	STBY	L	GPI	GPIO15(TLS Enable)	P/U 8.2K 3VDUAL
GP16	MAIN		GPI	GPIO16	P/U 8.2K VCC3
GP17/TACH0	MAIN		GPI	GPIO17	P/U 8.2K VCC3
GP18	MAIN		GPI	Mobile Only	N/A
GP19	MAIN		GPI	GPIO19	P/U 8.2K VCC3
GP20	MAIN		GPI	GPIO20	P/U 8.2K VCC3
GP21	MAIN		GPI	GPIO21	P/U 8.2K VCC3
GP22	MAIN	H-Z	GPI	GPIO22	P/U 8.2K VCC3
GP23	MAIN		GPI	GPIO23	N/A
GP24	STBY	L	GPI	SKTOCC#	N/A
GP25	STBY			Mobile Only	N/A
GP26	STBY			Mobile Only	N/A
GP27	STBY	H	GPO	GPIO27	P/U 8.2K 3VDUAL
GP28	STBY	H	GPO	PWR LED	P/U 8.2K 3VDUAL
GP29	STBY	L	GPI	GPIO29	N/A
GP30	STBY	H-Z	GPI	Mobile Only	N/A
GP31	STBY	H-Z	GPI	Mobile Only	N/A
GP32	MAIN	H	GPO	N/A	N/A
GP33	MAIN	H	GPO	N/A	N/A
GP34	MAIN	H-Z	GPI	-PCI_STOP	P/U 8.2K VCC3
GP35	MAIN	L	GPO	-ACZ_DET	P/U 8.2K VCC3
GP36	MAIN		GPI	N/A	N/A
GP37	MAIN		GPI	N/A	N/A
GP38	MAIN	H-Z	GPI	PCIEX4 Detect	P/U 8.2K VCC3
GP39	MAIN	H-Z	GPI	GPIO39	P/U 8.2K VCC3
GP40	STBY		NATIVE	USB OC1#	N/A
GP41	STBY		NATIVE	USB OC2#	N/A
GP42	STBY		NATIVE	USB OC3#	N/A
GP43	STBY		NATIVE	USB OC4#	N/A
GP44	STBY	L	NATIVE	GPIO44	P/U 8.2K 3VDUAL
GP45	STBY		NATIVE	GPIO45	P/U 8.2K 3VDUAL
GP46	STBY	L	NATIVE	GPIO46	P/U 8.2K 3VDUAL
GP47	STBY			Mobile Only	N/A
GP48	MAIN	H-Z	IN	GPIO48	P/U 8.2K 3VDUAL
GP49	MAIN	H-Z	IN	GPIO49	P/U 8.2K 3VDUAL
GP50	MAIN		NATIVE	-REQ1	P/U 2.2K VCC
GP51	MAIN	H	NATIVE	-GNT1	N/A
GP52	MAIN		NATIVE	-REQ2	P/U 2.2K VCC
GP53	MAIN	H	NATIVE	-GNT2	N/A
GP54	MAIN		NATIVE	-REQ3	P/U 2.2K VCC
GP55	MAIN	H	NATIVE	-GNT3	N/A
GP56	STBY		NATIVE	Mobile Only	N/A
GP57	STBY	H-Z	IN	VCORE_OV1	P/U 8.2K 3VDUAL
GP58	STBY	H-Z	NATIVE	F_USB_OC	P/U 8.2K 3VDUAL
GP59	STBY		NATIVE	USB_OC0#	N/A
GP60	STBY	H-Z	NATIVE	N/A(Reverse)	P/U 8.2K 3VDUAL
GP61	STBY	L	NATIVE	-SUSTAT	N/A
GP62	STBY	L	NATIVE	SUSCLK	N/A
GP63	STBY	L	NATIVE	GPIO63	N/A
GP64	MAIN	L	NATIVE	CLKOUTFLEX0	N/A
GP65	MAIN	L	NATIVE	CLKOUTFLEX1	N/A
GP66	MAIN	L	NATIVE	CLKOUTFLEX2	N/A
GP67	MAIN	L	NATIVE	CLKOUTFLEX3	N/A
GP72	STBY	H-Z	NATIVE	VCORE_OV4	P/U 8.2K 3VDUAL
GP73	STBY			Mobile Only	N/A
GP74	STBY	H-Z	NATIVE	1_05V_OV2	P/U 8.2K 3VDUAL
GP75	STBY	H-Z	NATIVE	N/A(Reverse)	P/U 8.2K 3VDUAL

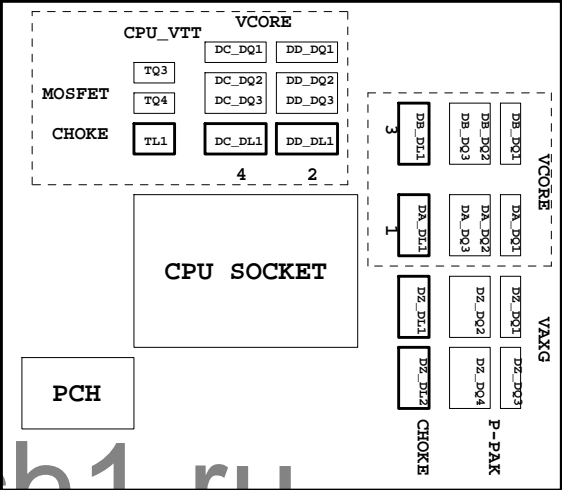
Super I/O ITE8720 GPIO Table

PIN NAME	USAGE	NOTE
SVC/PECI_RQT/GP14	-PECI_REQ	
PWROK1/GP13	PWROK1/ITE_PWROK	
KRST#/GP62	-KBRST	
SO/GP50	-ICH_SPI_CS	
IRTX/GP47/CE2_N/JP7	CEB_N	
GP46/IRRX	-LAN2_DSM	
PSION#/GP42	-PSON	
PWROK2#/GP41	PECI_CTL	
PCIRST3#/GP10/VDIMM_STR_EN	-PCIE_RST	
RSMRST#CIRRXL/GP55	-RSMRST	
PME#/GP54	-LPCPME	
PD5/GP75/BUSS00	N/A	

PIN NAME	USAGE	NOTE
FAN_TAC2/GP52	FANIO2	
FAN_TAC3/GP37	FANIO3	
VIDO3/FAN_TAC4/GP25/DSR2#	FANIO4	
FAN_CTL2/GP51	FANPWM2	
FAN_CTL3/GP36	FANPWM3	
VID4/GP34	BEEP-	
VID3/GP33	TURBO1	
VID2/GP32	TURBO0	
VCORE_GOOD/VID6/GP63	CPUT_LED1_C	
VID5/GP35	CPUT_LED2_C	
VID1/GP31	CPUT_LED3_C	
VID0/GP30	-LAN1_DSM	NBT_LED1_C
SLCT/GP80	CPU_LED1_C	
PE/GP81	CPU_LED2_C	
BUSY/GP82	CPU_LED3_C	
PD3/GP73/BUSSI1	SB_LED1_C	
PD4/GP74/BUSSI2	SB_LED2_C	
VCORE_EN/VID7/GP64	IT_GP64	SB_LED3_C
PD0/GP70	NB_LED1_C	
PD1/GP71	NB_LED2_C	
PD2/GP72/BUSSI0	NB_LED3_C	
GP22/SCX	LOW_PWR_1	
VID05/GP27/SIN2	LOW_PWR_2	
PCIRST2#/GP11	-PFMRST1	
PCIRST1#/GP12	-PFMRST2	
3VBSBW#/GP40	CSI_F0	BSEL166_1
SUSC#/GP53	CSI_F1	BSEL166_2
GP23/SI	BSEL166_3/CSISBSL	
VID00/GP20/CTS2#	CPUT_LED1_C	BSEL166_4
GP65/VDDA_EN/GB_01	MB_ID2	
PD6/GP76/BUSS01	MB_ID3	
PD7/GP77/BUSS02	MB_ID4	
AFD#/GP86/SMBC_R	SEC_PIN	FST_2X8
INIT#/GP85/SMBD_M	SEC_2x8	GTLREF_AD2
ACK#/GP83	DDR_LED1_C	
VID01/GP21/DCD2#	DDR_LED2_C	
STB#/GP87/SMBC_M	DDR_LED3_C	
PWRON#/GP44	VCORE_OV1	
PANSWH#/GP43	PWRBTSW	
KDAT/GP61	-PWRBTSW	
KCLK/GP60	KDAT	
MDAT/GP57	KCLK	
MACL/GP56	MDAT	
GP66/VLDT_EN/GB_02	NBT_LED1_C	MCLK
SVD/PCIRSTIN#/CIRTX/GP15	PWM2_CR	
KDAT/GP61	PWM2_CR	
GP67/CPU_PG/GB_03	EN_LOADLINE	IT_GP67/-EN_PWM2
SLIN#/GP84/SMBD_R	-EN_PWM2	
PSI_L/FAN_CLT5/CIRRXL2/GP16	-THERM	
VID04/GP26/SOUT2	DDR18V_PH2_EN	
VID02/FAN_TAC5/GP24/DSR2#	DDR18V_LED	
VID06/GP17/RI2#	1_1V_PH_EN	
VID07/JP6/DTR2#	JP6	
PD5/GP75/BUSS00	SB_LED3_C	



PWM各相位的擺法如下：



BIOS超電壓對應表：

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

散熱模組料號：

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

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