

SHEET	TITLE
01	COVER SHEET
02	BOM & PCB MODIFY HISTORY
03	BLOCK DIAGRAM
04	LGA1151_A
05	LGA1151_B-DDR4
06	LGA1151_C
07	LGA1151_D
08	DDR4 CHANNEL A 1,2
09	DDR4 CHANNEL B 1,2
10	PCH CLOCK 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	HWM
18	FAN CTRL--SIO
19	PCI EXPRESS X16 SLOT
20	PCI EXPRESS X4 SLOT
21	PCI EXPRESS X1 SLOTS
22	PCI EXPRESS X8 SLOT
23	PCI EXPRESS X16 SWITCH
24	M.2(H) X4
25	SATA EXPRESS
26	IR35201 PWM-CPU VCORE
27	IR3553_MOS_1-CPU VCORE
28	IR3553_MOS_2-CPU VCORE
29	VCCPLL
30	RT8120_DDR_CHOKE
31	RT8120_VPP_CHOKE
32	RT8120_PCH-CHOKE
33	DISCRETE POWER
34	NCT3933

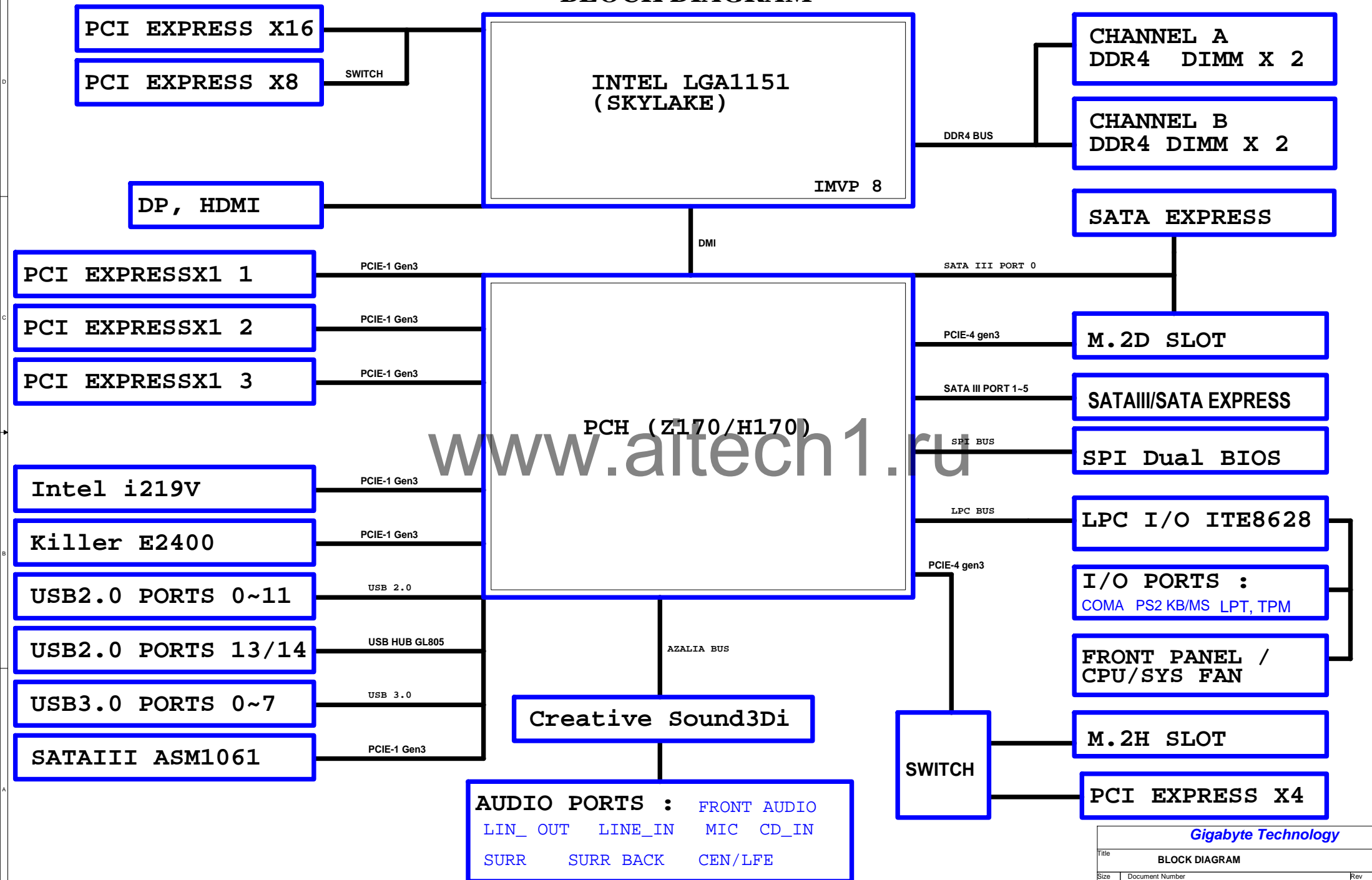
SHEET	TITLE
35	IR35201 PWM-VCCGT
36	IR3553_MOS_1-VCCGT
37	IR3570 PWM-VCCSA/IO
38	IR3553-VCCSA
39	IR3553-VCCIO
40	OC BUTTON
41	Creative Sound3Di
42	Audio Amp
43	Audio Power
44	AUDIO Connect
45	DUAL LAN-A~KILLER E2400
46	DUAL LAN-B~I219
47	DUAL USB30_LAN-I219/E2400
48	IDT6V41510_CLK BUFFER
49	COM , LPT , TPM
50	F_PANEL
51	ASM1061
52	HDMI 20_MCDP2800-BA
53	IT8951
54	IT8792
55	D720210 4port Hub-FRONT
56	D720210 4port Hub (Power)
57	DP PORT
58	M.2(D) X4-3
59	M2_SW_3
60	ATX POWER , A_-PROCHOT
61	KB_MS_USB
62	R_USB30
63	F_USB30
64	F_USB20
65	ALPINE RIDGE CIO & DP
66	ALPINE RIDGE POWER
67	TBT TYPE C PORT A
68	U3.1 Type A PORT B

SHEET	TITLE
69	TBT HDMI 2.0
70	BLOCK DIAGRAM
71	EMI-ESD
72	POWER MAP
73	POWER零件使用表
74	TABLE LIST
75	NTC MAP
76	
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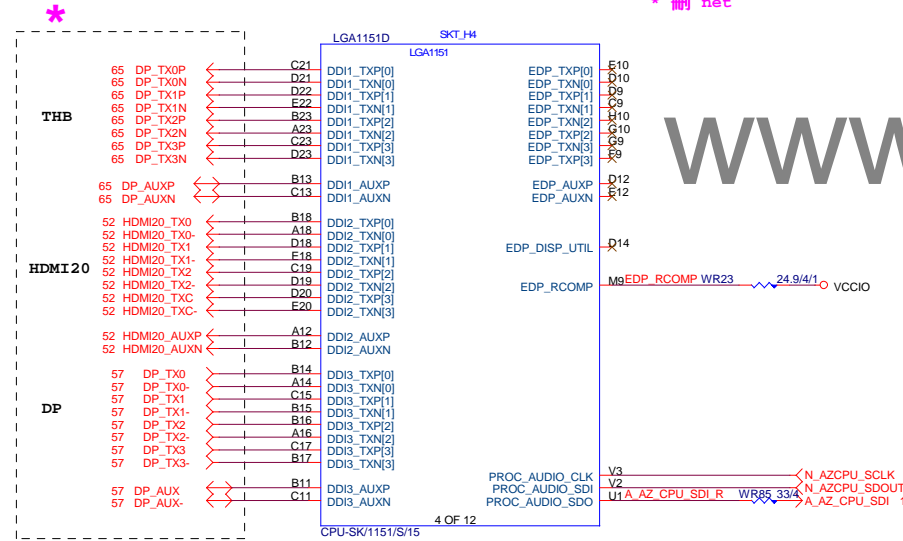
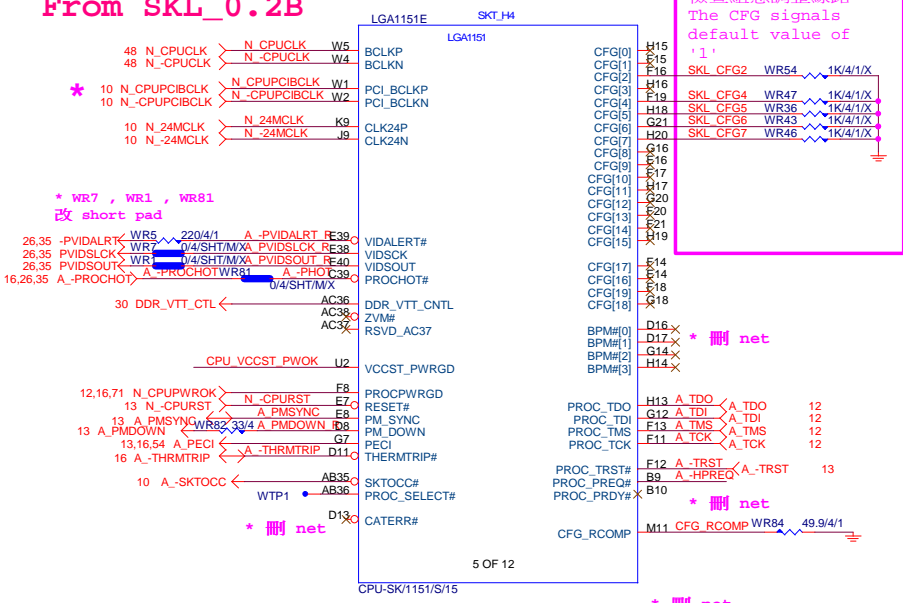
Component value change history

[illegible][illegible]

BLOCK DIAGRAM

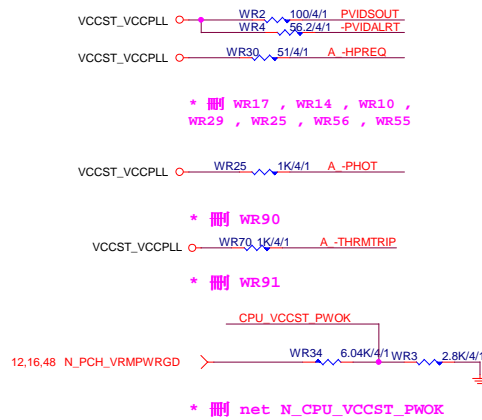


From SKL_0.2B



```
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
```

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



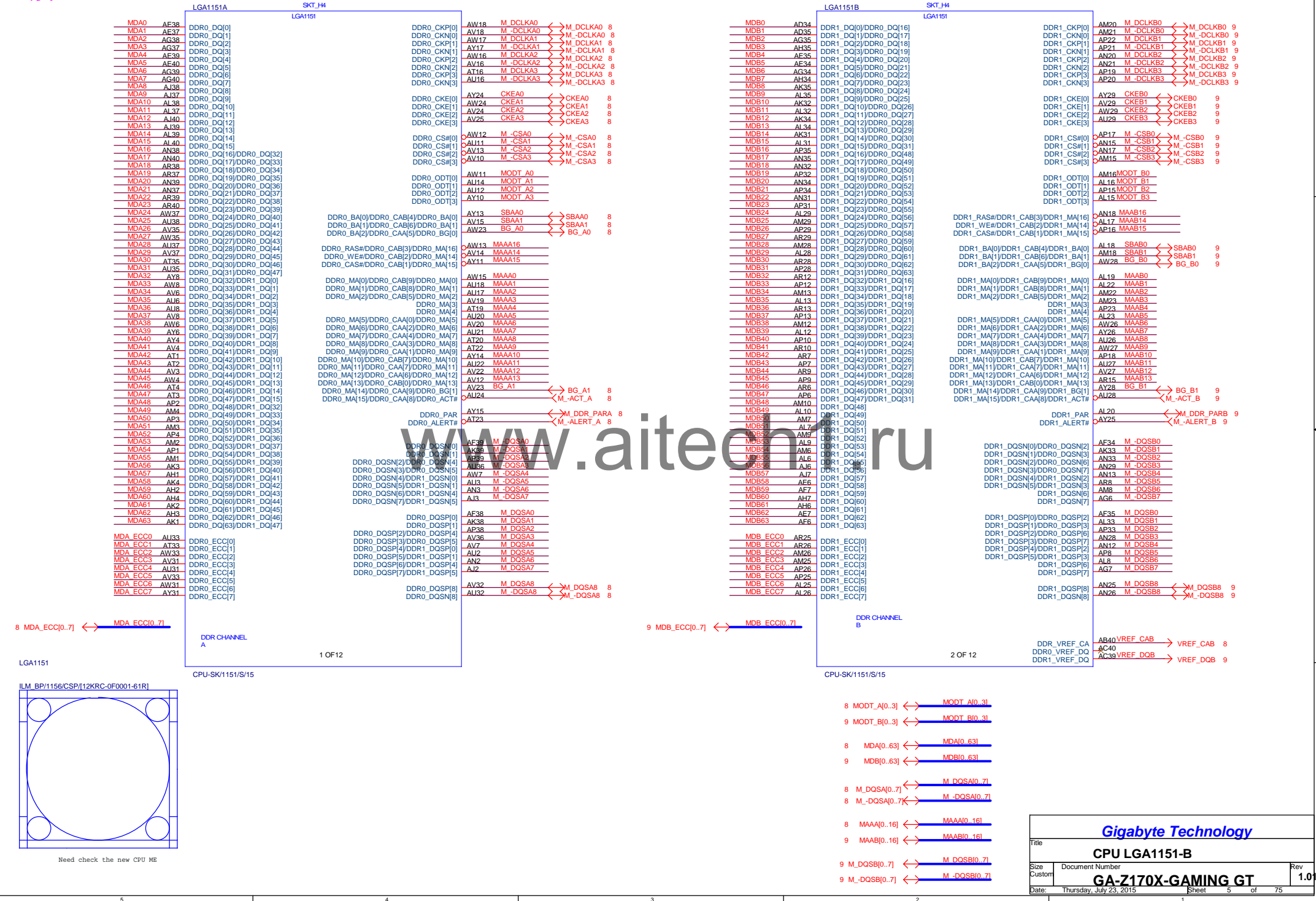
```
CFG[2]:x16 Lane Numbering
Reversal. 1=
NORMAL;0=reversal
CFG[4]: eDP
enable;1:disable/0=enable
CFG[6:5]:PCI Express* Bifurcation; 11=
1 x16 PCI Express;10=2x8 PCI Express
CFG[7]: PEG Training;1=(default) PEG Train
immediately following RESET#;0=PEG Wait
for BIOS
```

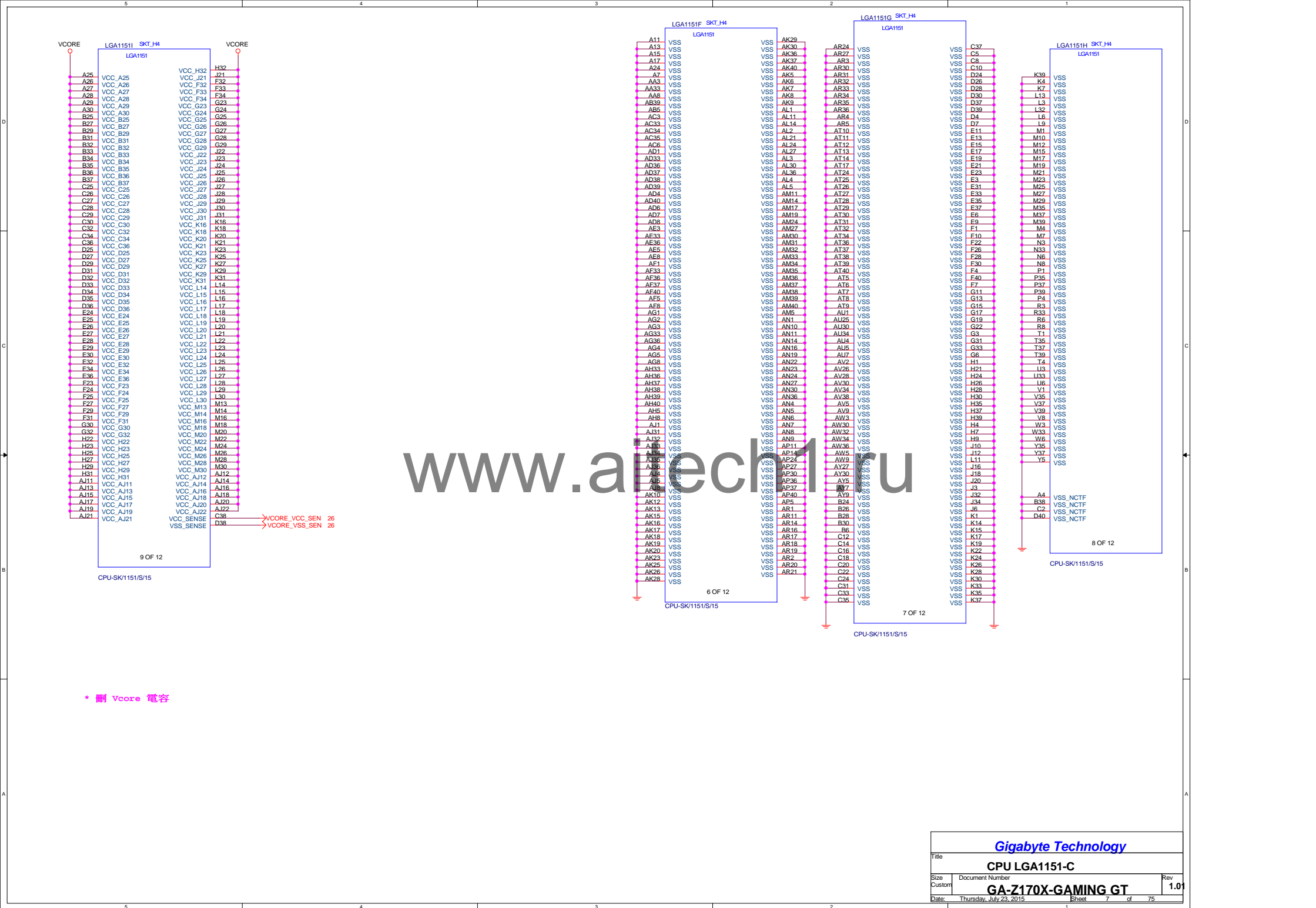
22 -8X EN ← WR37 MASK/0/4/SHT/X SKL CFG5

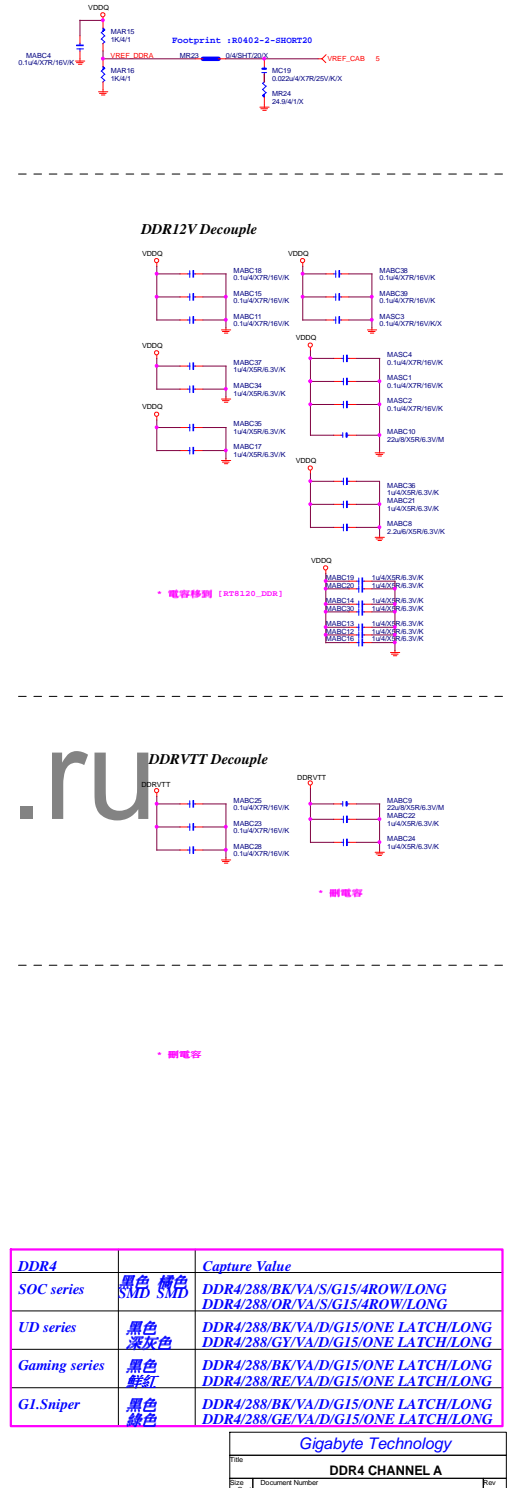
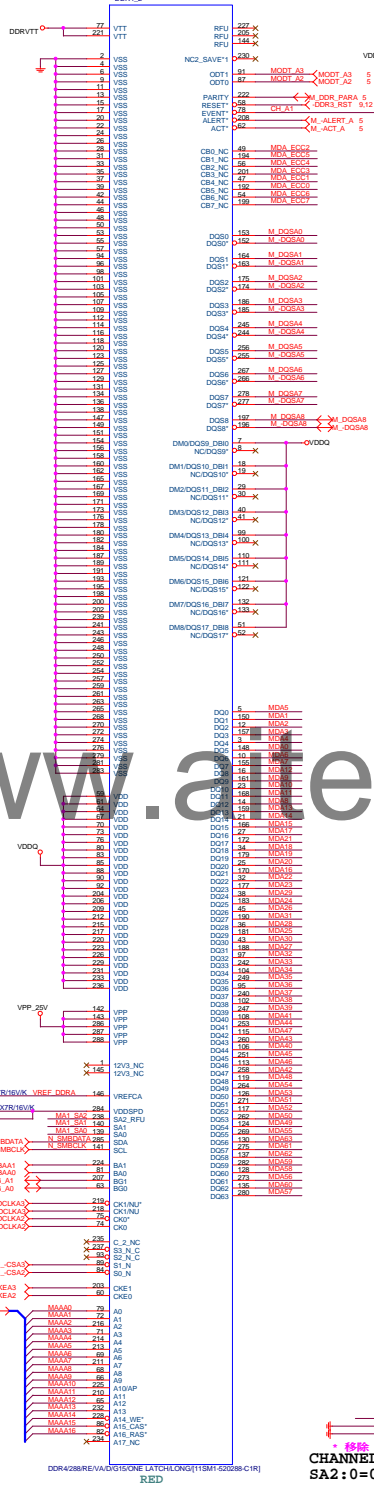
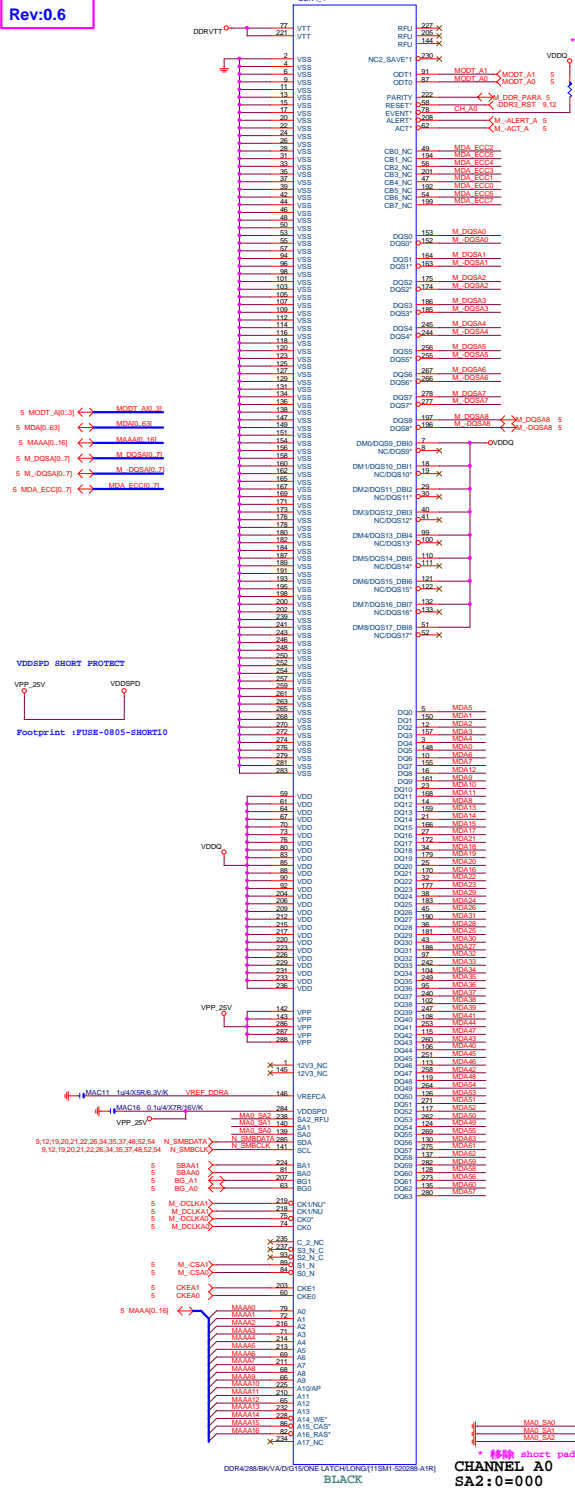
Bifurcation Config.	Signals Lanes		
	CFG[6]	CFG[5]	CFG[2]
1x16	1	1	1
1x16 Reversed	1	1	0
2x8	1	0	1
2x8 Reversed	1	0	0
1x8+2x4	0	0	1
1x8+2x4 Reversed	0	0	0

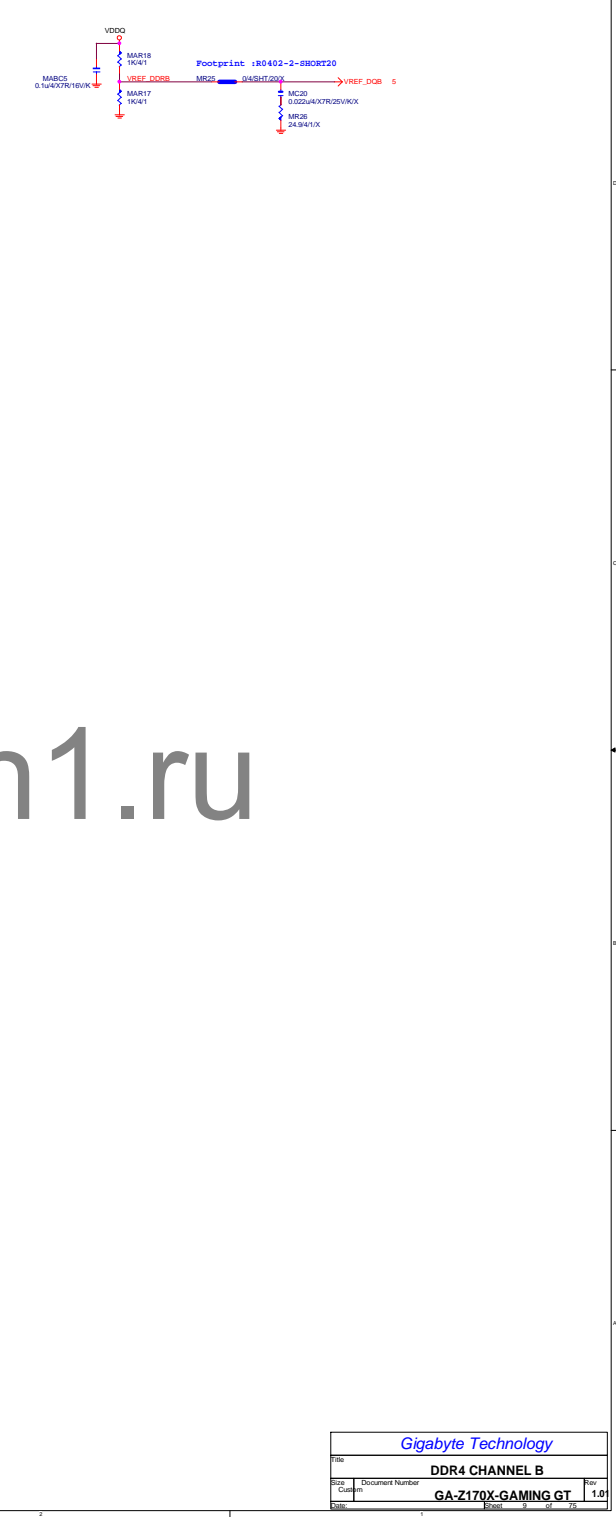
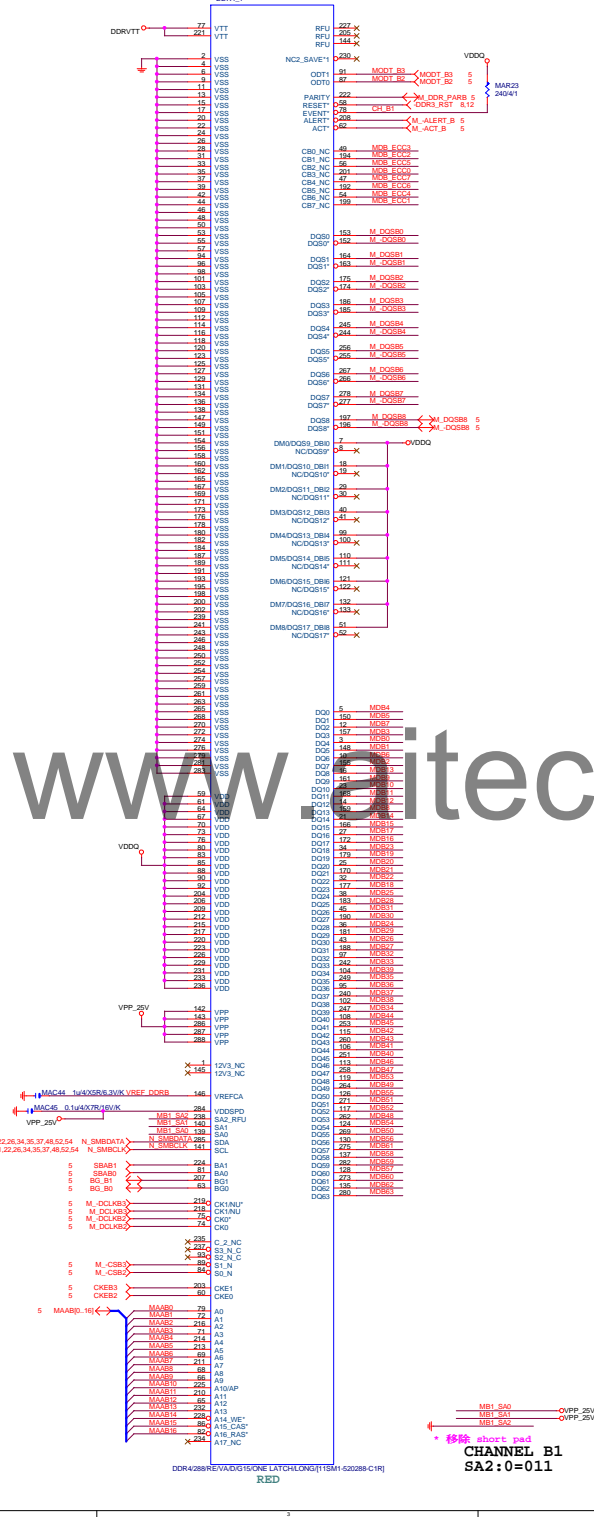
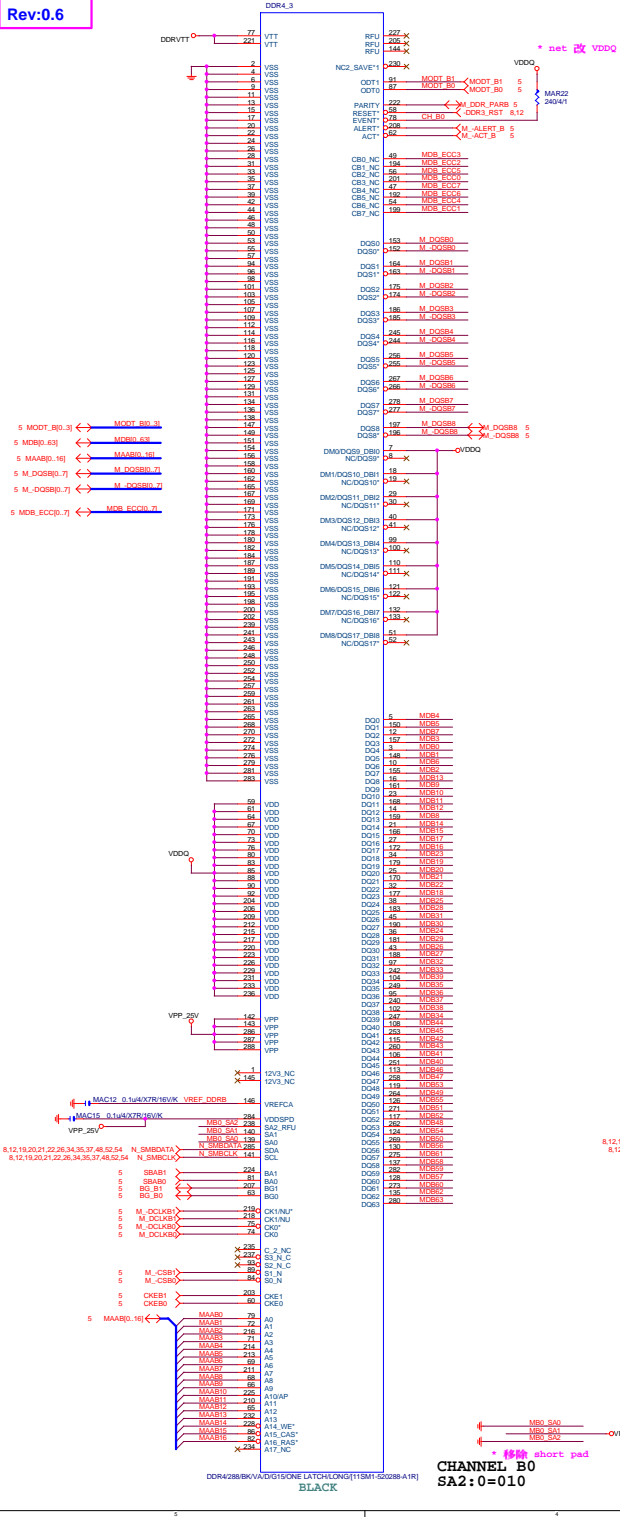
W=12 mil out of CPU
S=15 mil out of CPU

* 改DDR4 net

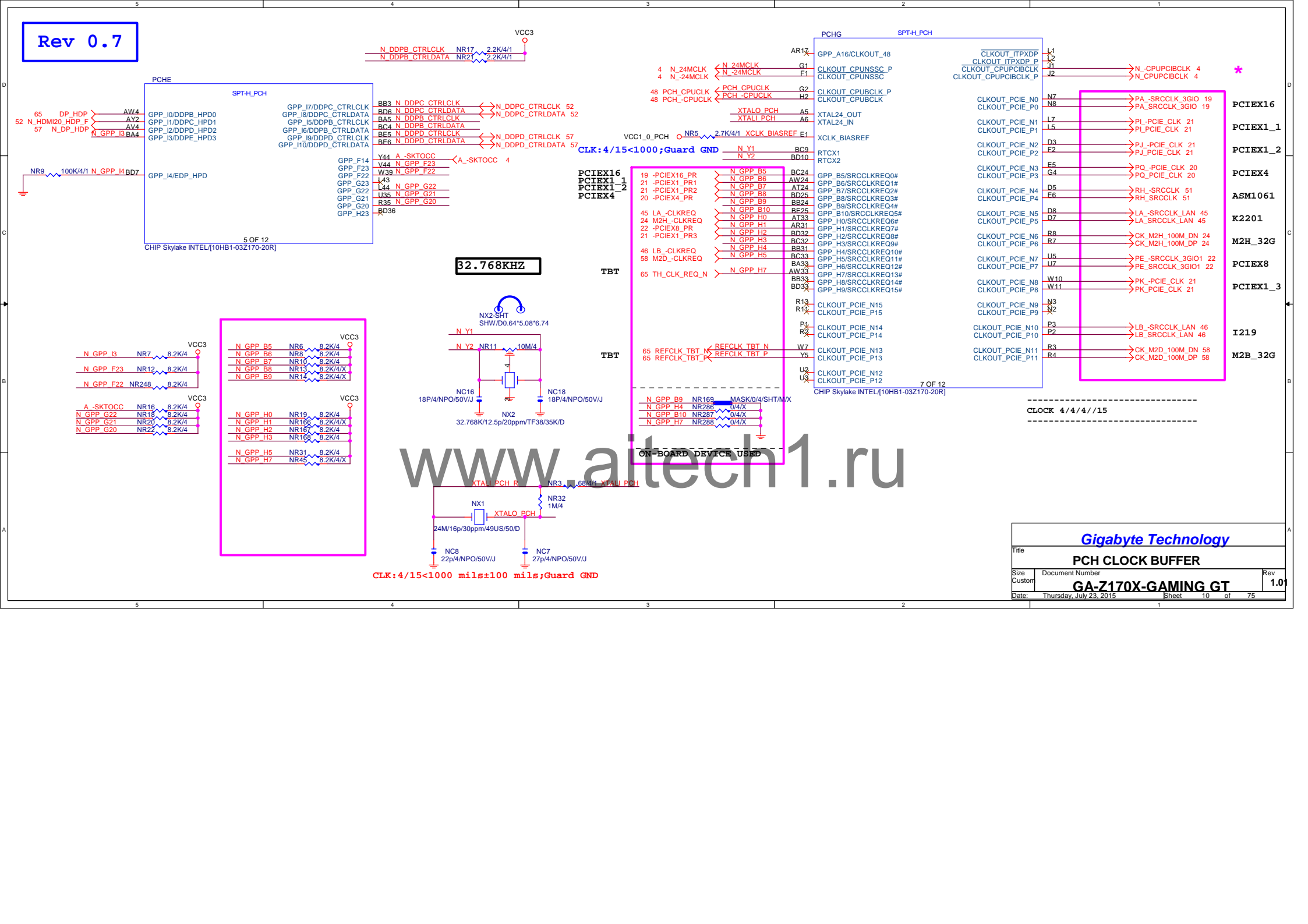




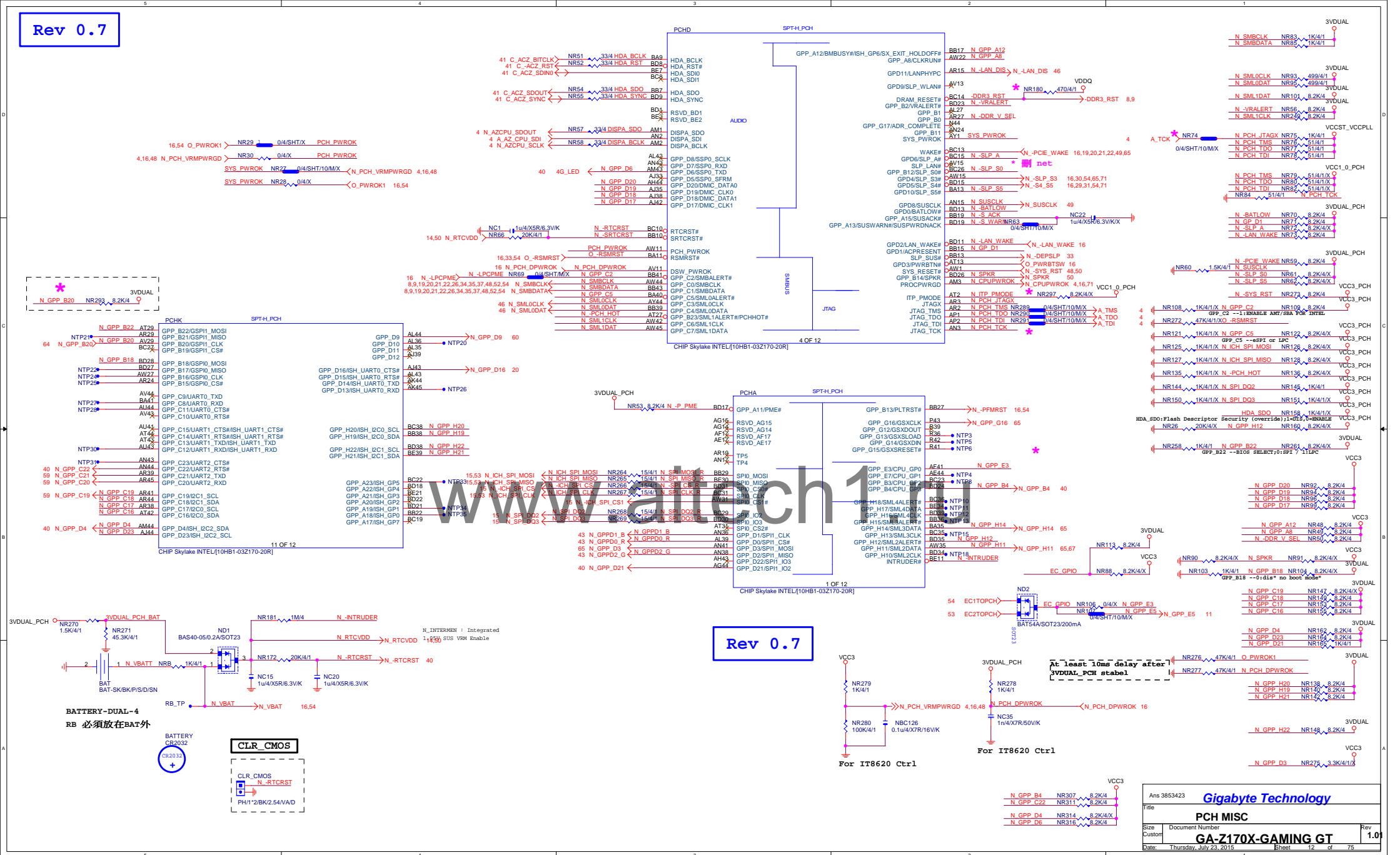




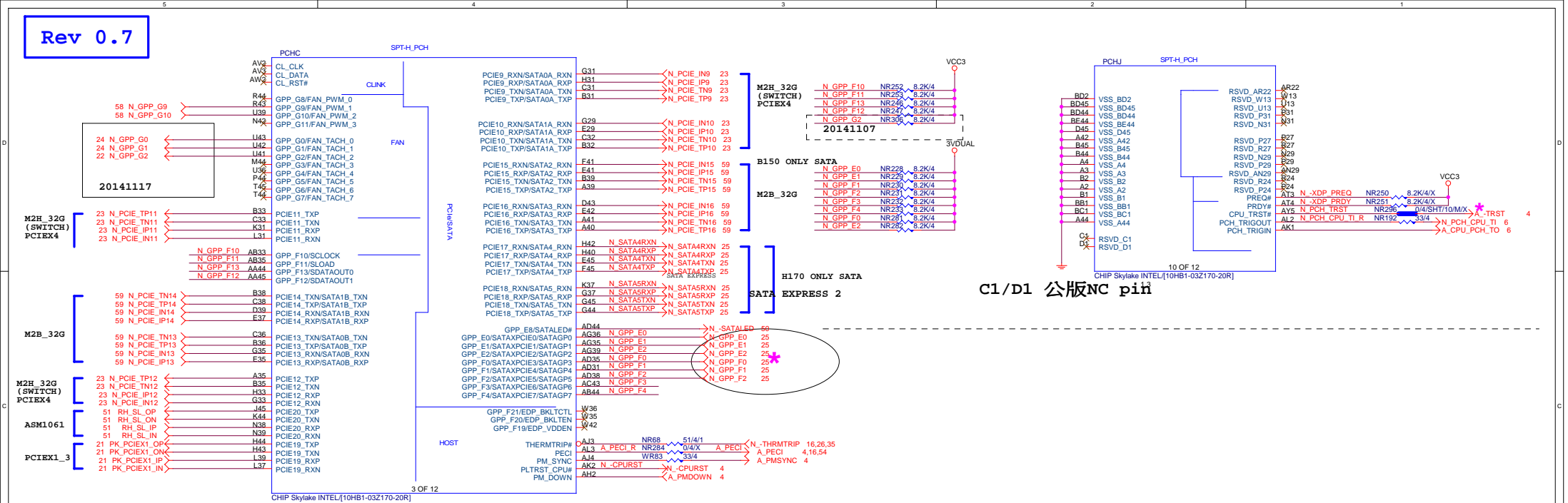
Rev 0.7



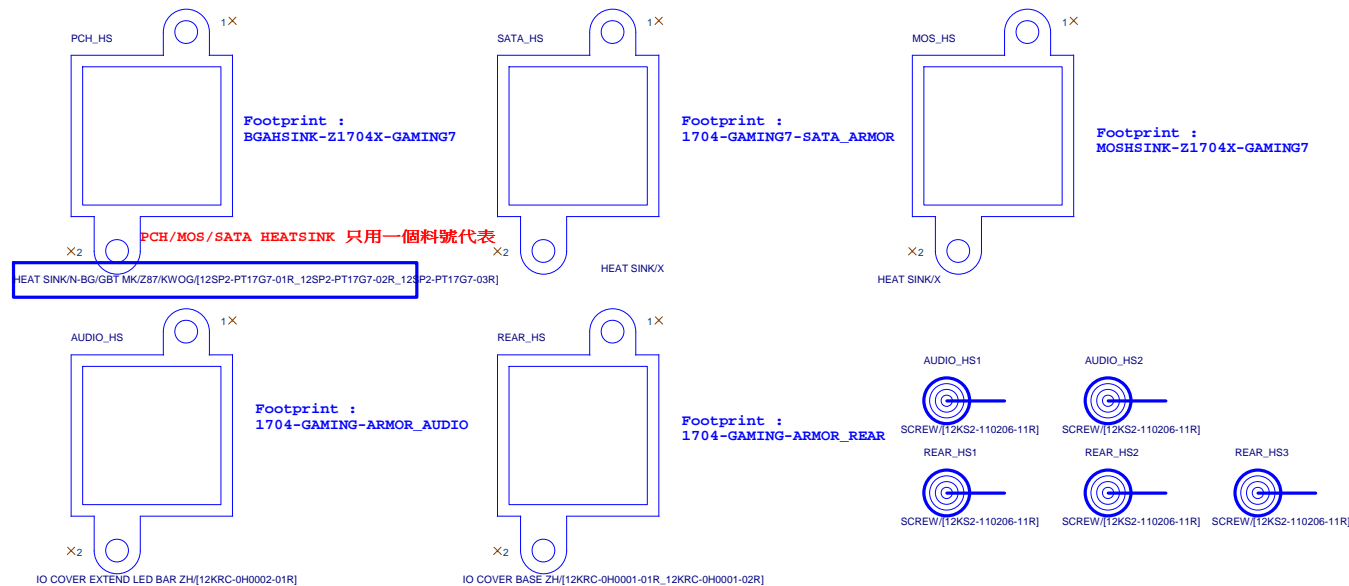


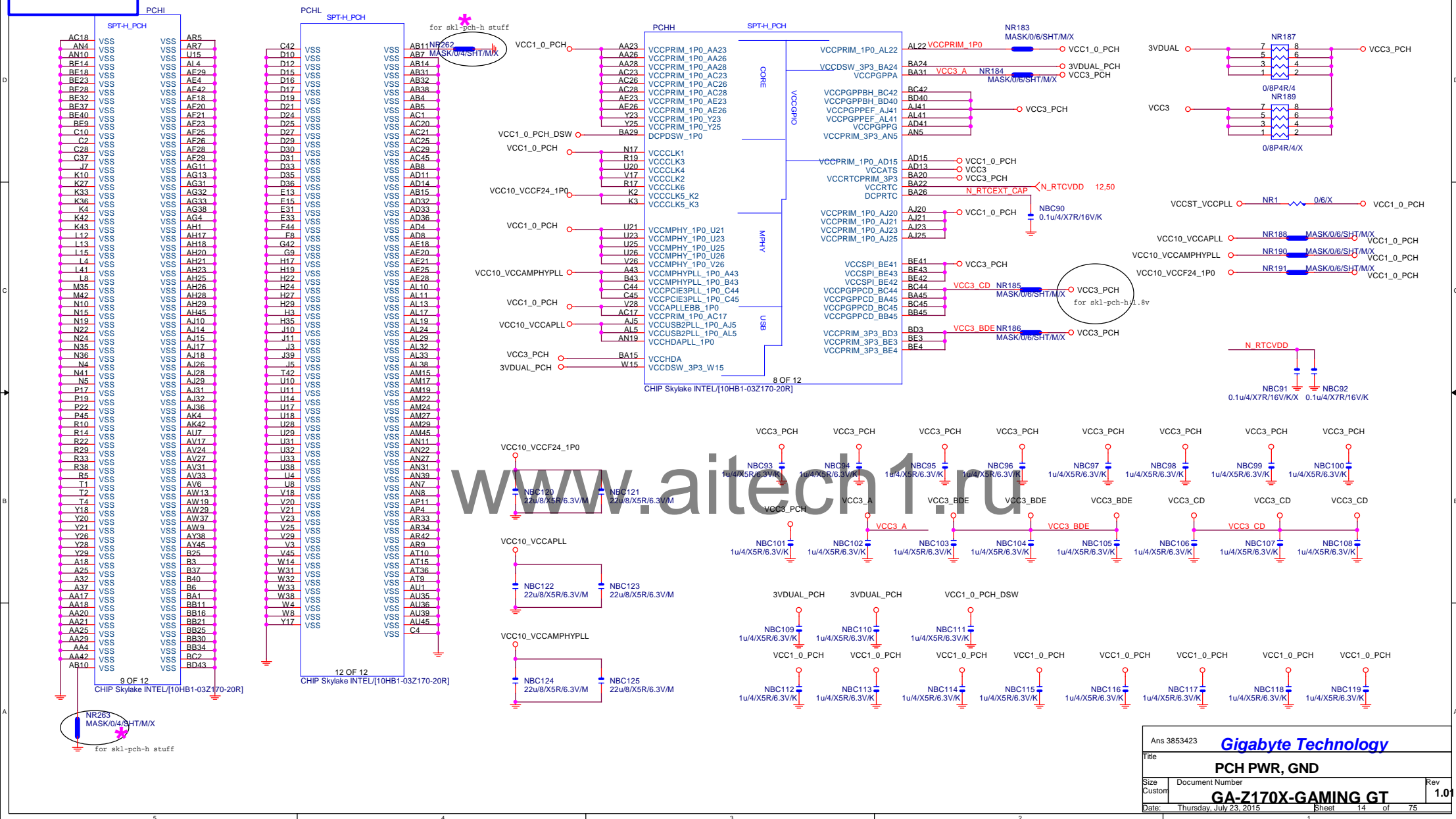


Rev 0.7

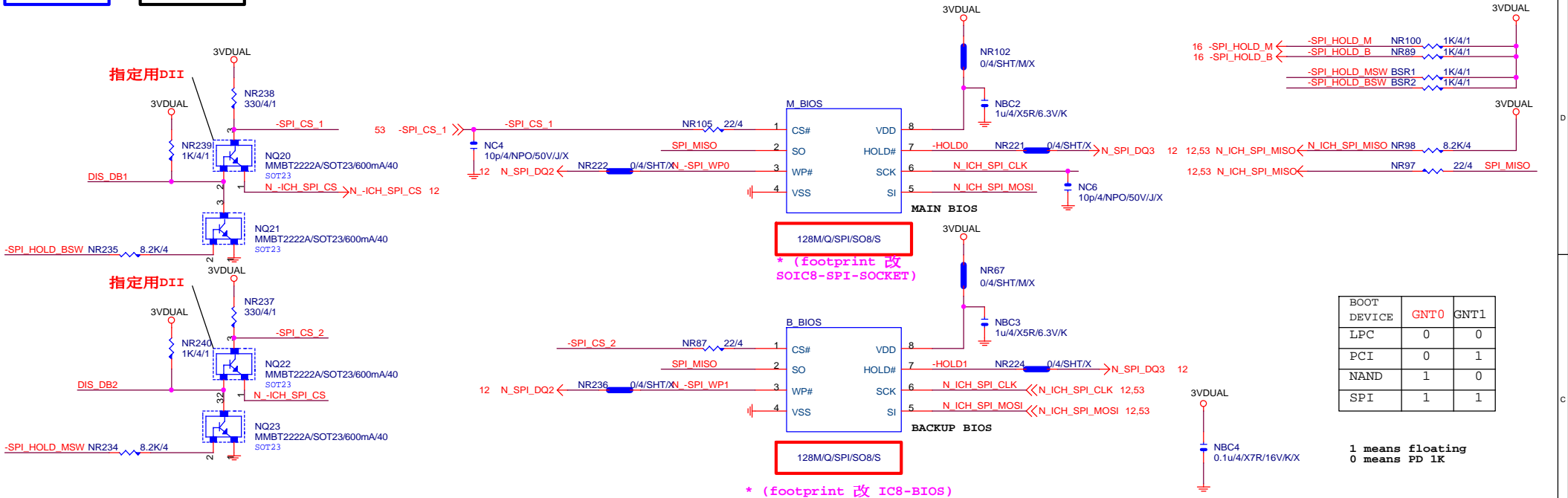


裝甲HEATSINK 分成五大部份

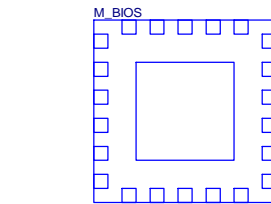
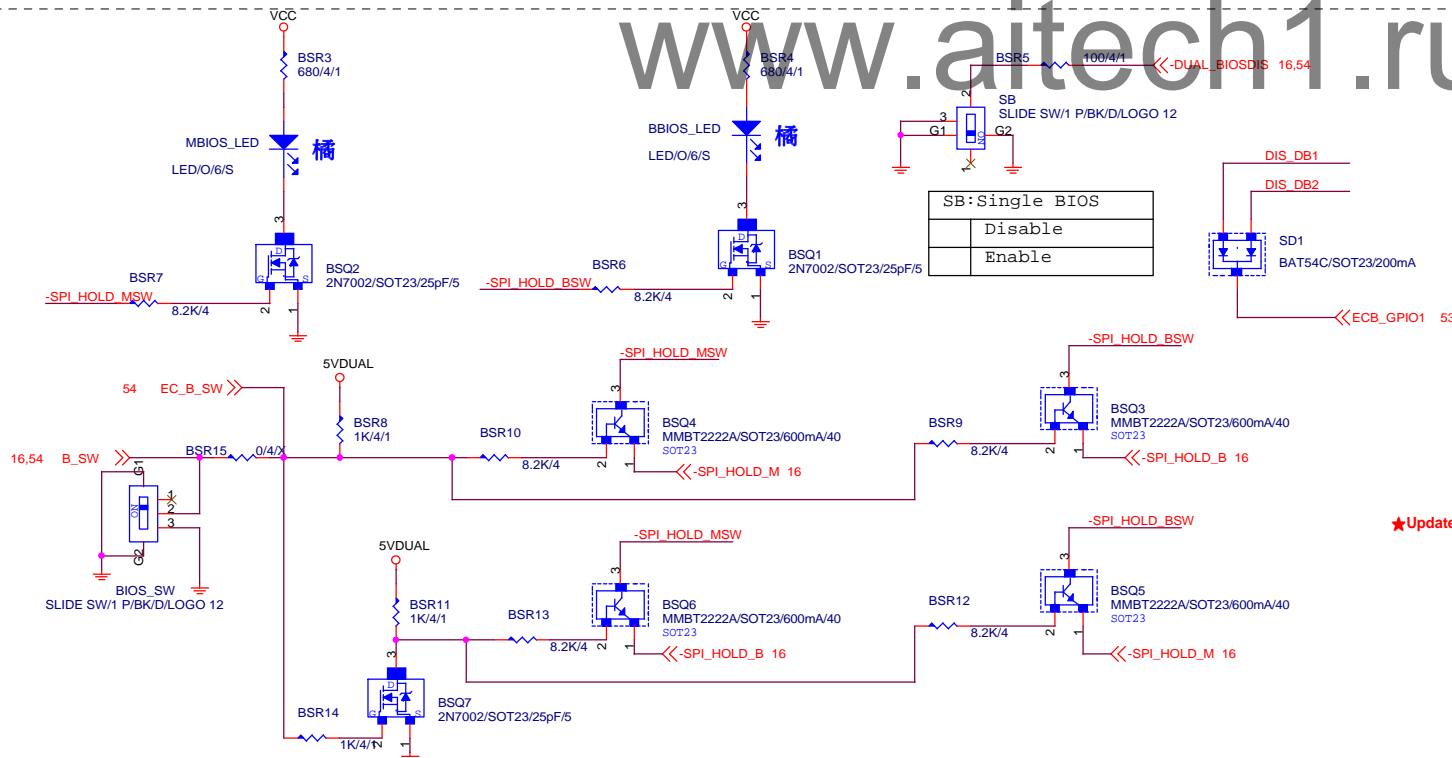




指定用DII



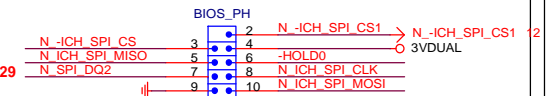
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LCP/G-FL/1.27mm/200ML/WHITE[10SL2-000008-31R]X

* 試産先上, PVT 移除

BIOS_PH



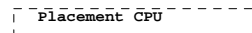
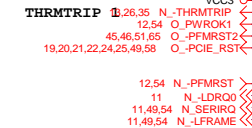
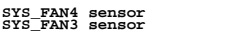
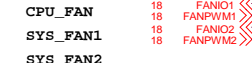
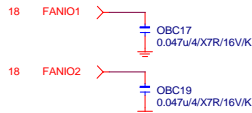
Mask/PH/2*5K10/BK/2.54/A/D/X

Footprint the same, confirmed by Graceing.

Use COM port pin header part.

Gigabyte Technology		
Title	BIOS	
Size	Document Number	GA-Z170X-GAMING GT
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Date:	Thursday, July 23, 2015	Sheet 15 of 75

SIO IT8628BX REV:1.07

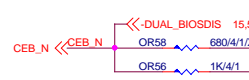


CPU 端 A-THRMTRIP不可與PCH及SIO N-THRMTRIP直接連接。否則會出現無法拉Low情況。

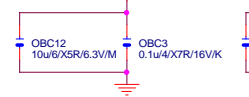
FAN TABLE	
CPU_FAN	FAN_CTL1 FAN_TAC1
SYS_FAN1	FAN_CTL2 FAN_TAC2
SYS_FAN2	FAN_CTL3 FAN_TAC3
SYS_FAN3	FAN_CTL4 FAN_TAC4
OPT FAN or SYS_FAN4	FAN_CTL5 FAN_TAC5
THRMTRIP1	YES PIN56

IT8620E GPIO問題匯整	
PIN 50	GP26-第一次接上POWER時會拉 Lo
PIN 90/91	DEFAULT為HDLed FUNCTION GP93 BYPASS TO GP92 高溫時 GP92 會被拉Lo(ITE BUG)
PIN 108	GP40--- POWER ON 時會拉 Lo
PIN 111/112	MOUSE 跟FAN6 FUNCTION 擇一使用,不然會互相干擾
PIN 22	PIN22, 需高於3V, 若低於 接部分COM PORT及裝置 線端會異常動作。

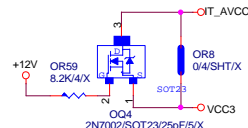
DUAL BIOS OPT STRAP



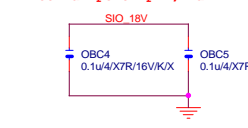
SIO CAP



Power leakage



SIO_18V



CLOSE SIO PIN4 VREF_25

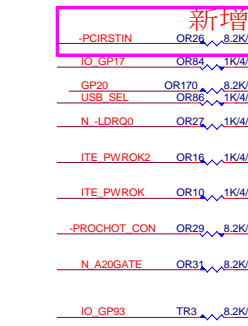
MB ID



PWR SHT

For 8728 EUP function

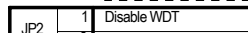
SIO PU



SIO STRAP

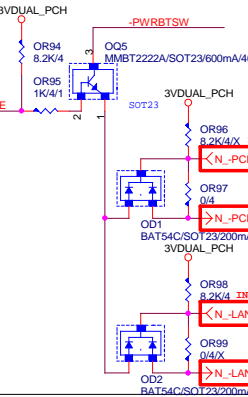


EUP control detect



JP2	1	Disable WDT
JP2	0	Enable WDT to rest PWROK
JP3	1	Dual BIOS CS PIN Disable
JP3	0	Dual BIOS CS PIN Enable
JP4	1	k8 power sequency function is Disable
JP4	0	k8 power sequency function is Enable
JP5	1	anti-surge Disable
JP5	0	anti-surge Enable
JP3	1 1	The default value of EC Index 63h/6Bh/73h is 80h.
JP3	1 0	The default value of EC Index 63h/6Bh/73h is FFh.
JP5	0 1	The default value of EC Index 63h/6Bh/73h is 00h.
JP5	0 0	The default value of EC Index 63h/6Bh/73h is 40h.

Dual LAN (組態三)



Gigabyte Technology

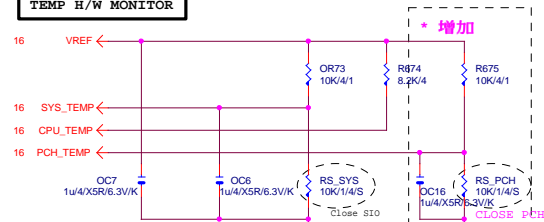
ITE 8620 LPC IO

GA-Z170X-GAMING

Thursday, July 23, 2015

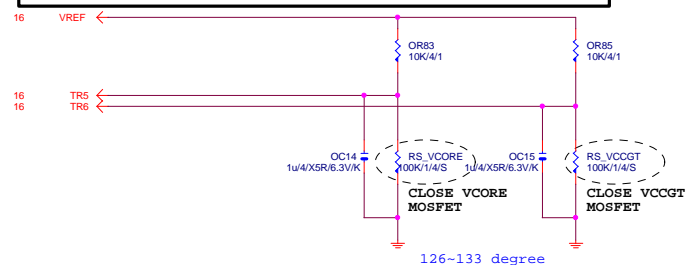
Sheet 16 of 75

TEMP H/W MONITOR

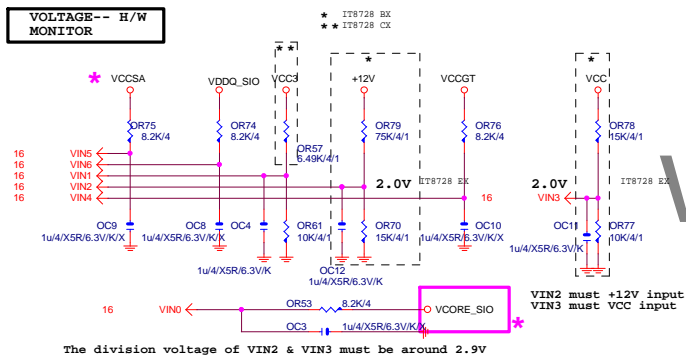


RS_VCORE、RS_VCCGT、CLOSE CPU_VCORE & VCCGT MOSFET

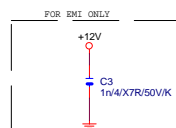
-PROCHOT:有mos heartsink不用prochot function



VOLTAGE-- H/W MONITOR

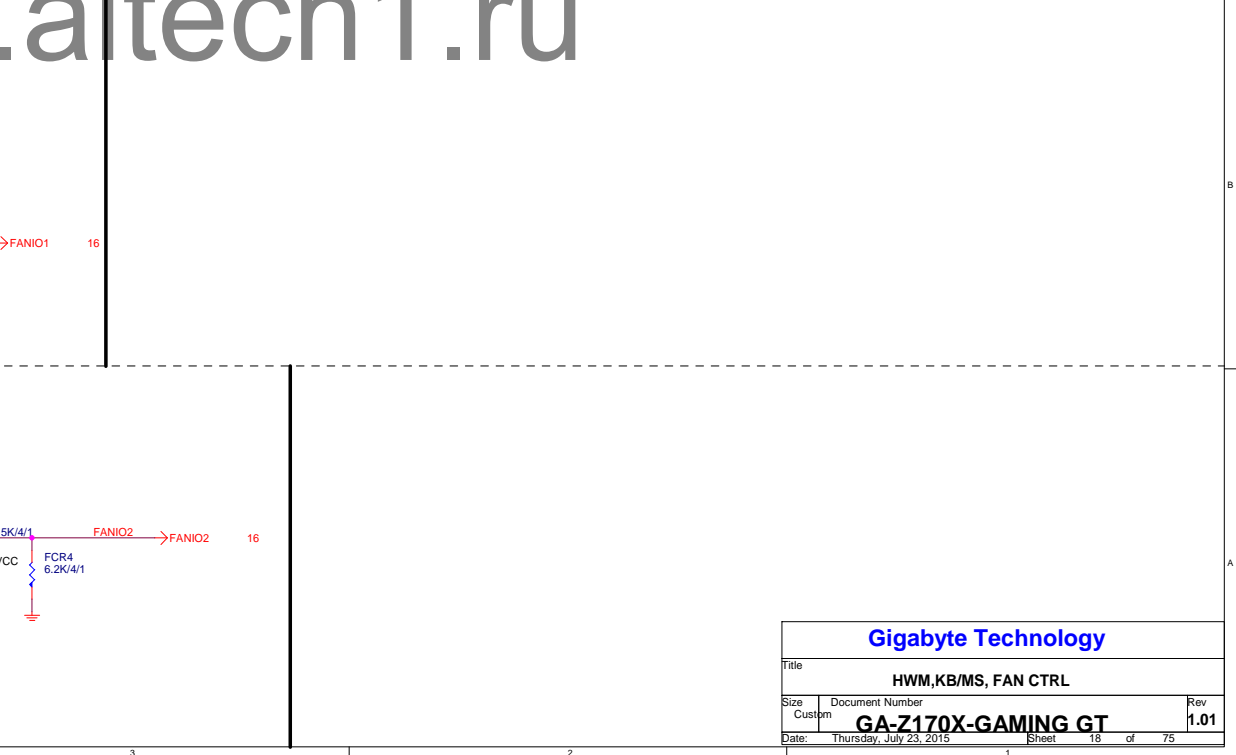
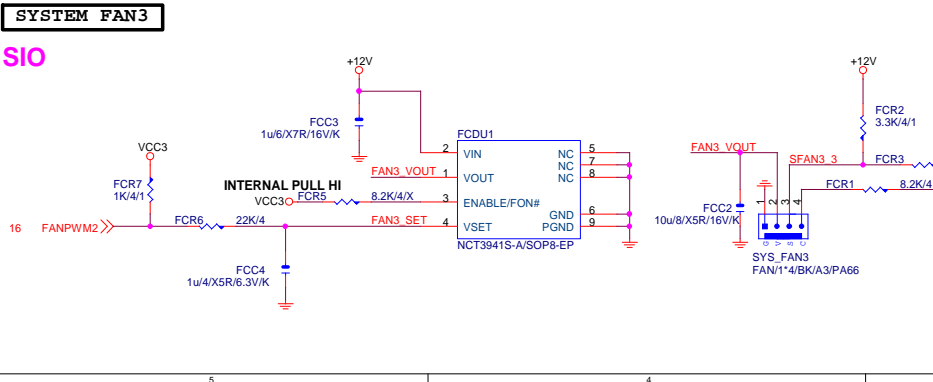
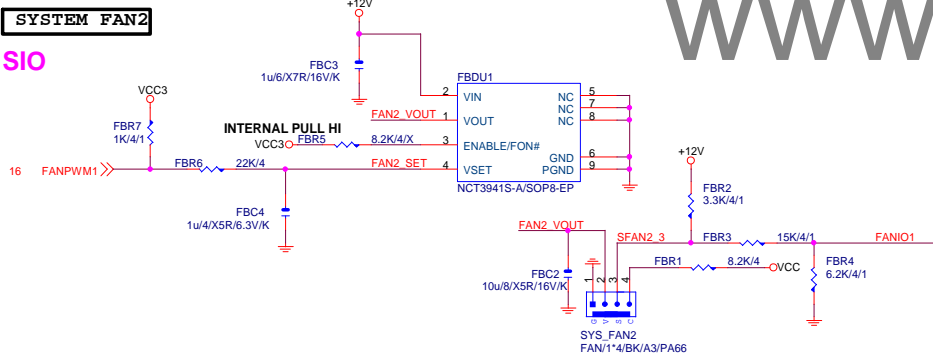
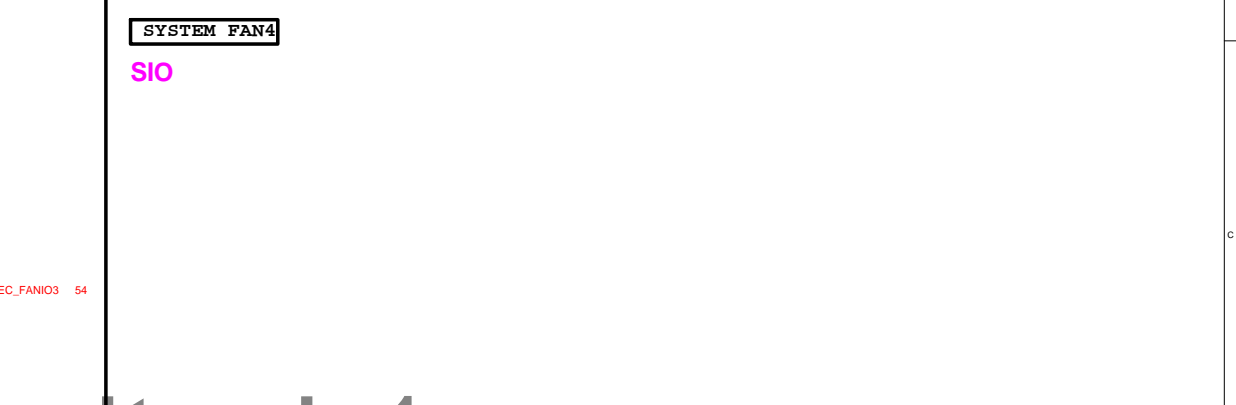
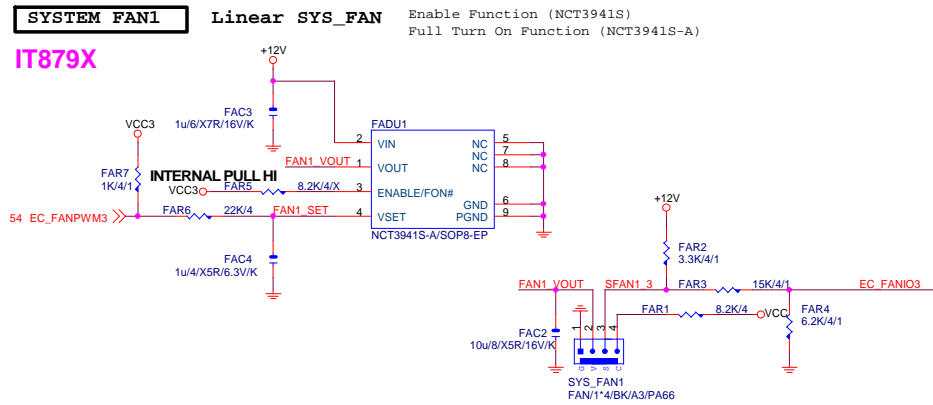
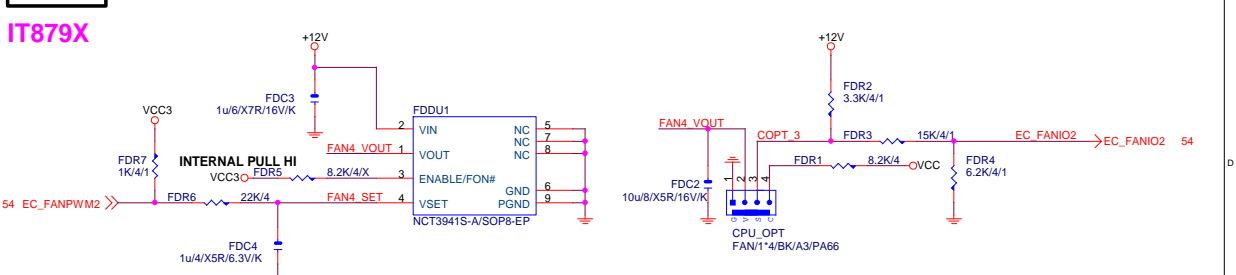
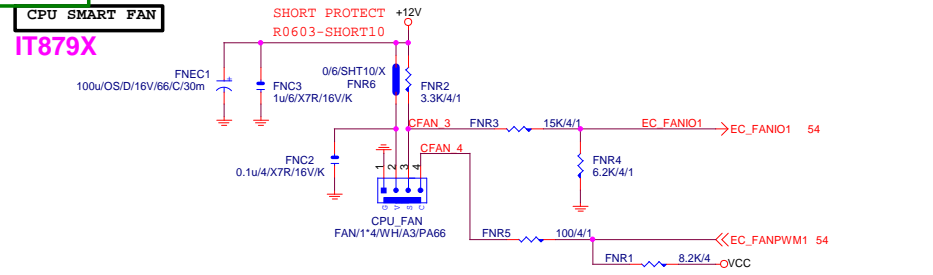


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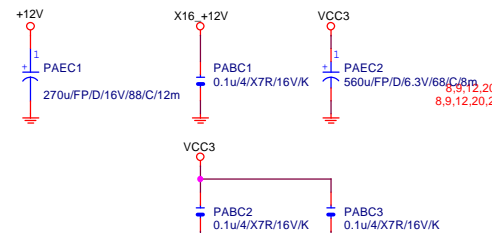
Gigabyte Technology

Title			HWM,KB/MS, FAN CTRL
Size	Document Number		
Custom		GA-Z170X-GAMING GT	
Date:	Thursday, July 23, 2015	Sheet	17 of 75
	2		1



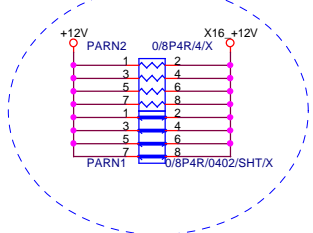
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PCIEX16 CAP



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

PCI-E REV:1.1--> 2.5GHZ

PCE-E X1(單向) BANDWITH=2.5GHZ*(8b/10b)=2Gb/s=250MB/s

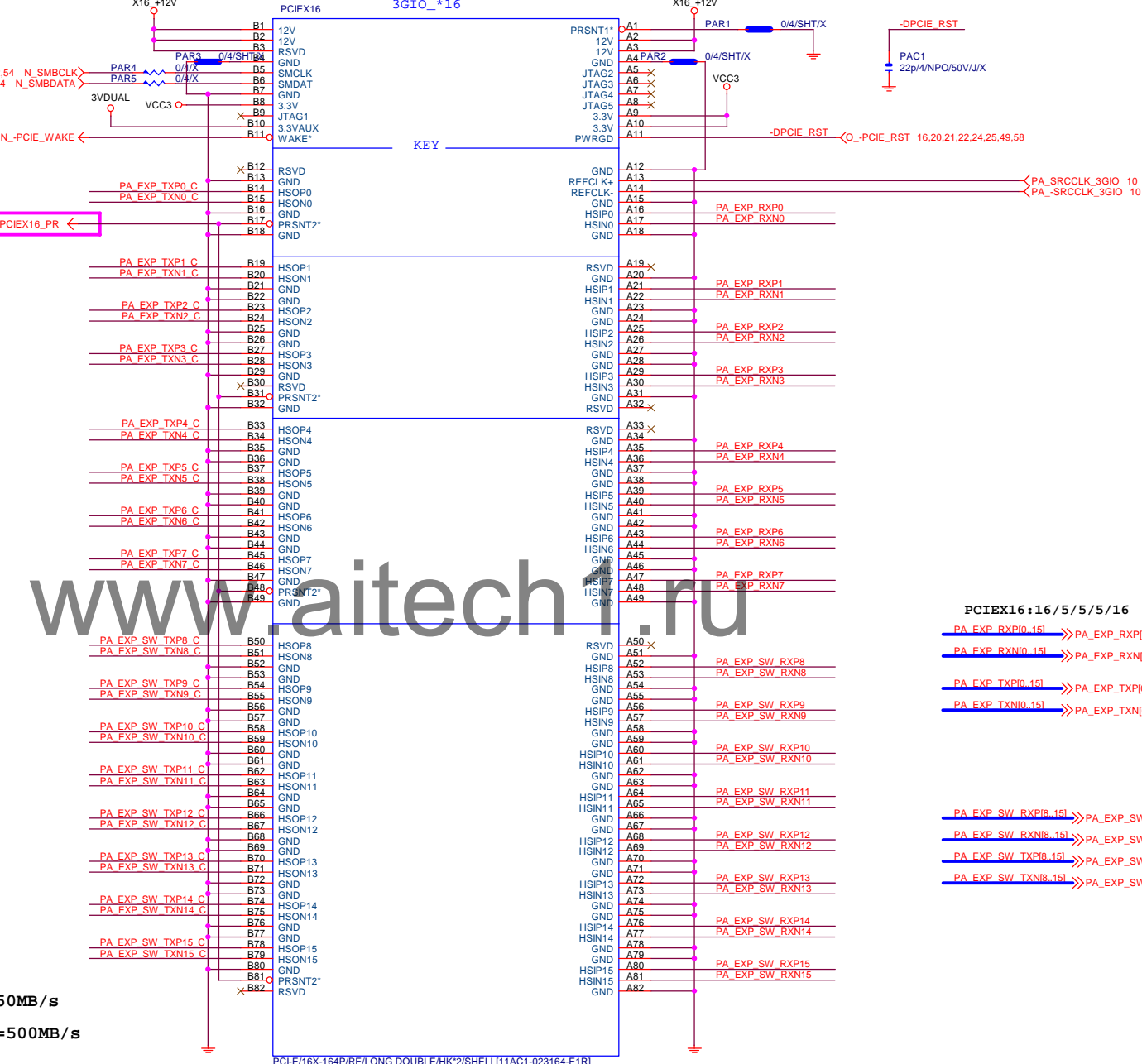
PCE-E X1(雙向) BANDWITH=2.5GHZ*(8b/10b)X2=4Gb/s=500MB/s

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

PCIEX16 SLOT



PCI-E/16X-164P/RE/LONG DOUBLE/HK*2/SHELL(11AC1-023164-E1R)

紅色

PCIEX16:16/5/5/5/16

PA EXP RXP0.15] >>> PA_EXP_RXP0[0.15] 4,23

PA EXP RXN0.15] >>> PA_EXP_RXN0[0.15] 4,23

PA EXP TXP0.15] >>> PA_EXP_TXP0[0.15] 4,23

PA EXP TXN0.15] >>> PA_EXP_TXN0[0.15] 4,23

PA EXP SW RXP8.15] >>> PA_EXP_SW_RXP8[8.15] 23

PA EXP SW RXN8.15] >>> PA_EXP_SW_RXN8[8.15] 23

PA EXP SW TXP8.15] >>> PA_EXP_SW_TXP8[8.15] 23

PA EXP SW TXN8.15] >>> PA_EXP_SW_TXN8[8.15] 23

Gigabyte Technology

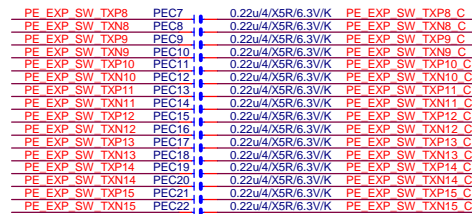
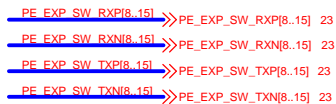
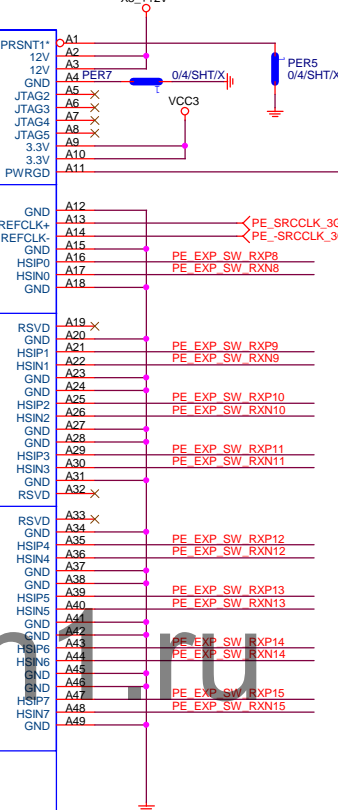
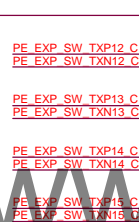
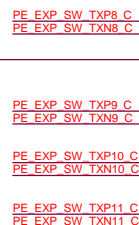
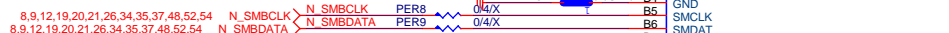
PCI EXPRESS * 16

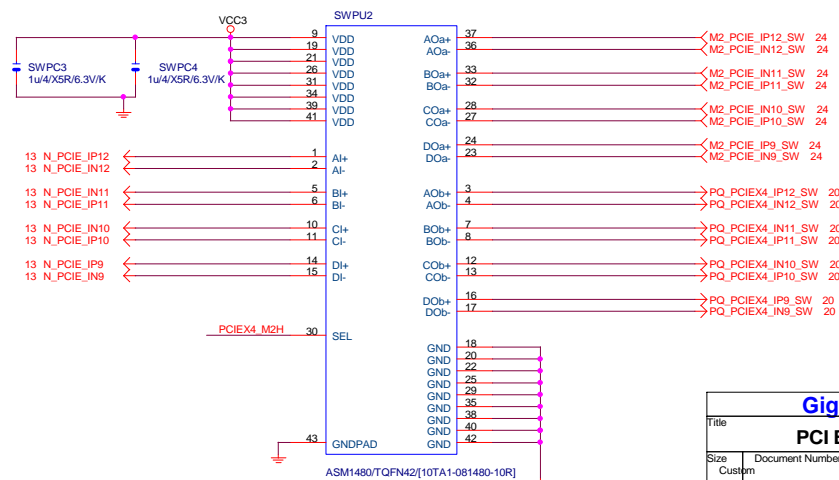
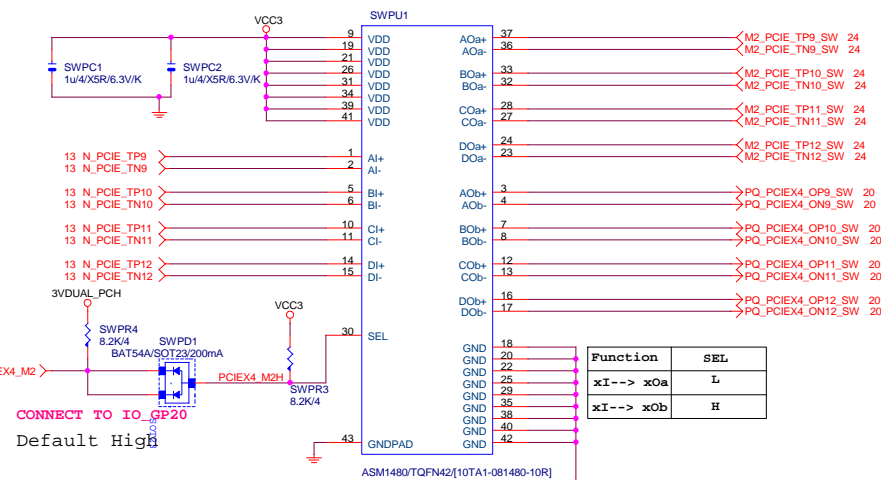
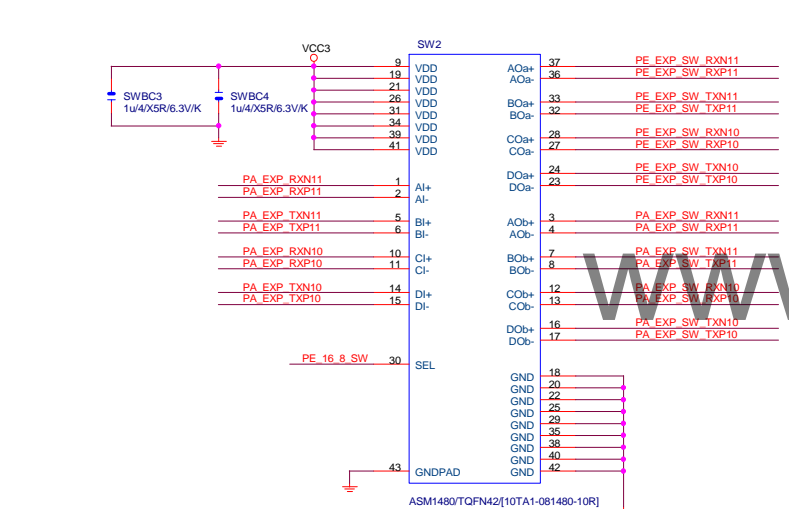
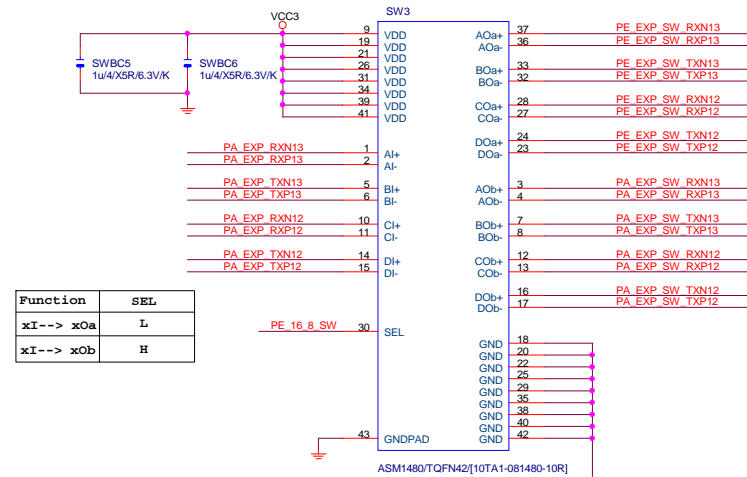
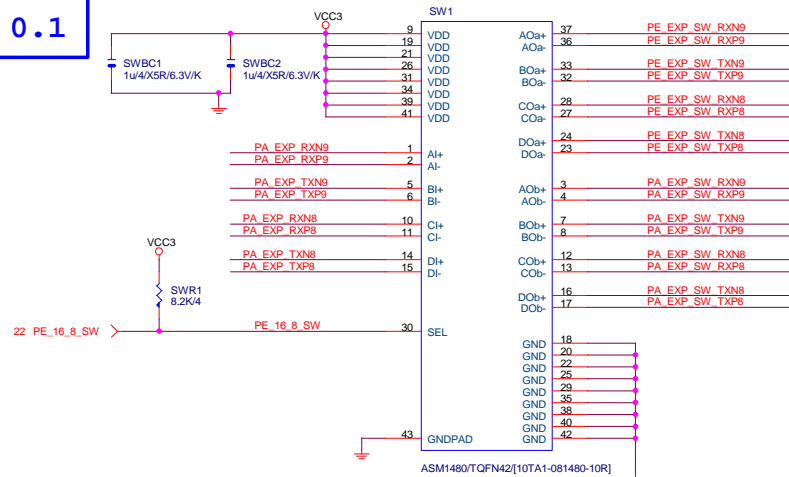
Title	Document Number	Rev
	GA-Z170X-GAMING G1.01	
Date:	Thursday, July 23, 2015	Sheet 19 of 75

The schematic diagram illustrates the internal wiring and components for the PCIe X1 1, 2, and 3 connectors on the Gigabyte Z170X-Gaming GT motherboard. Each connector section (PCIEX1_1, PCIEX1_2, and PCIEX1_3) shows a 3GIO_X1 header with pins B1 through B18. The diagram includes signal traces for various functions such as N_SMBCLK, N_SMBDATA, N_-PCIE_WAKE, and N_-PCIE_RST. It also shows the connection of various components like resistors (e.g., 0.1u/4/X7R/16V/K), capacitors (e.g., 22p/4/NPO/50V/J/X), and integrated circuits (e.g., PIC1, PKC1, PJC1). A large watermark 'www.aitech1.ru' is overlaid on the bottom half of the image.

Gigabyte Technology			
Title			
PCIE_X1 1,2			
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Title			
PCIE_X1 1,2			
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Gigabyte Technology

PCI EXPRESS X16 SWITCH

Size Custom Document Number GA-Z170X-GAMING GT 1.0

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M.2 Lane4 from PCH port18

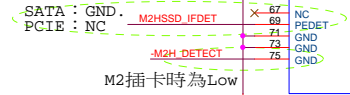
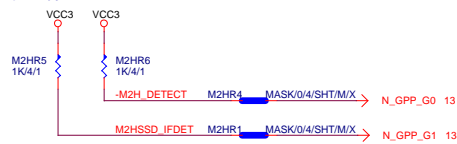
M.2 Lane3 from PCH port17

M.2 Lane2 from PCH port16

M.2 Lane2 from PCH port15

需與M2 -CLKREQ對應

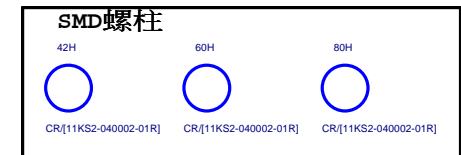
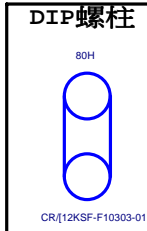
支援SATA and M.2 function

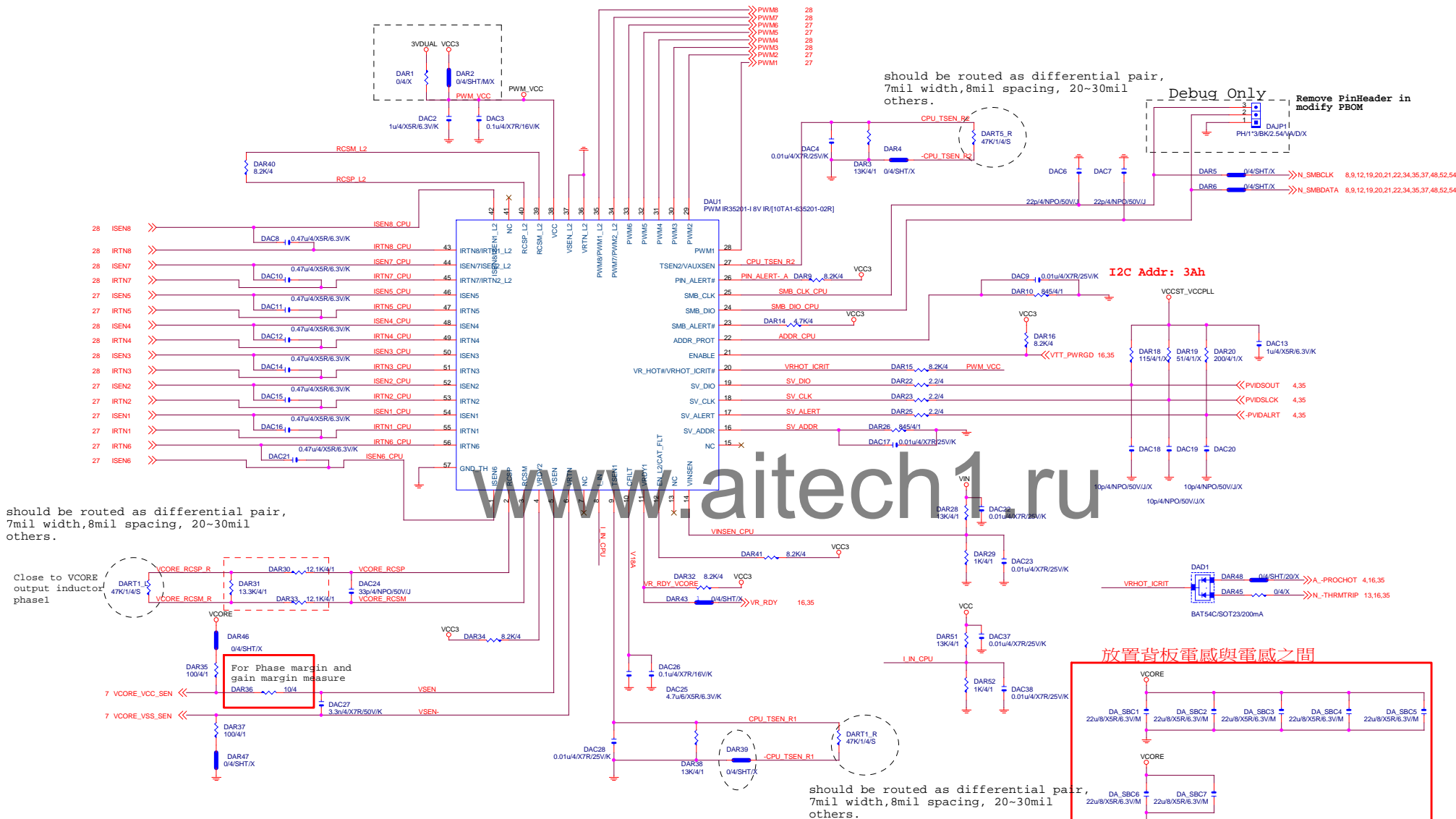


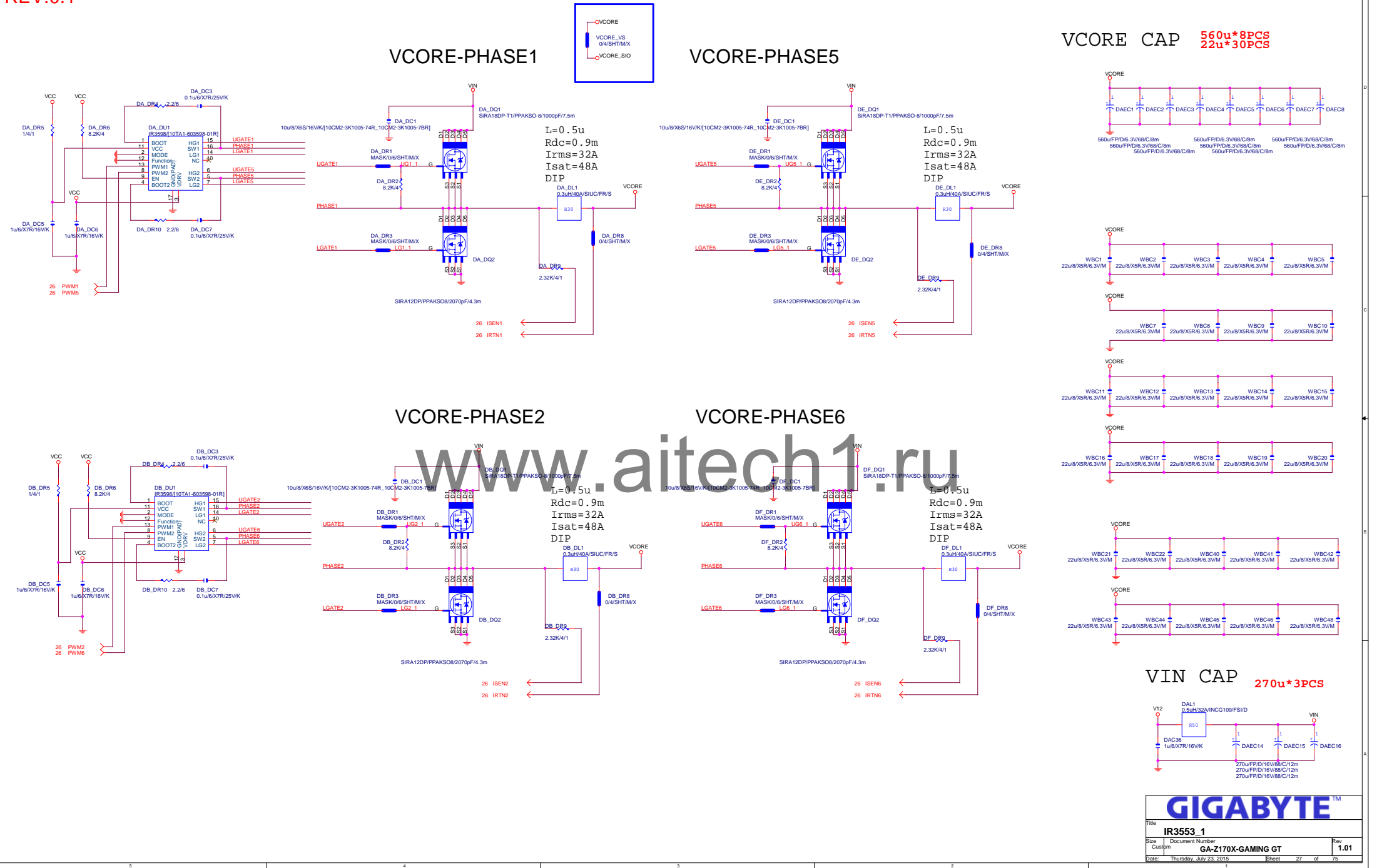
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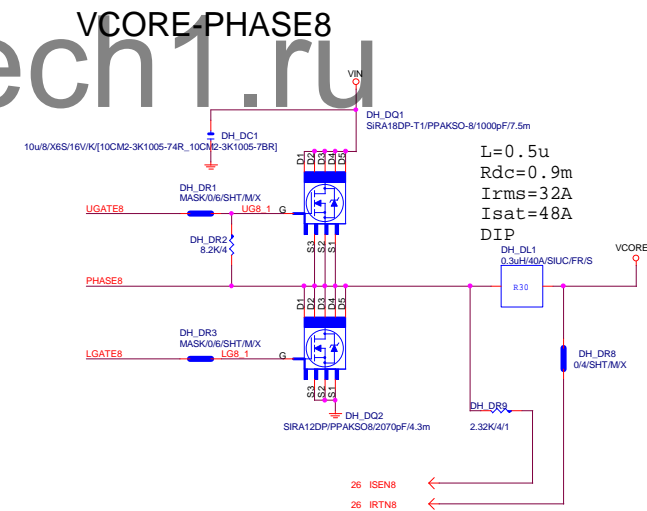
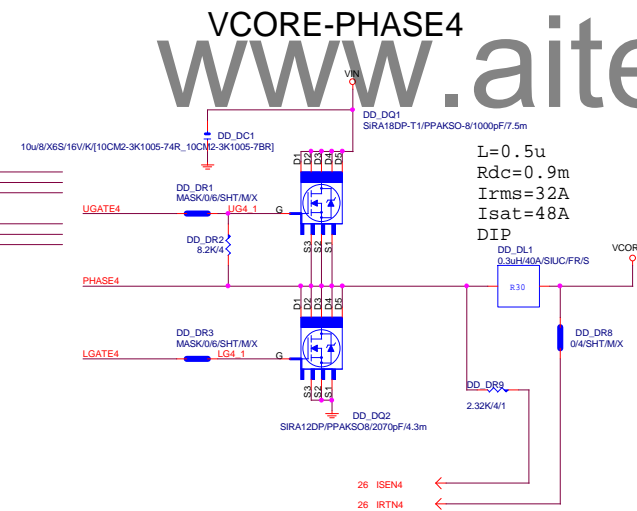
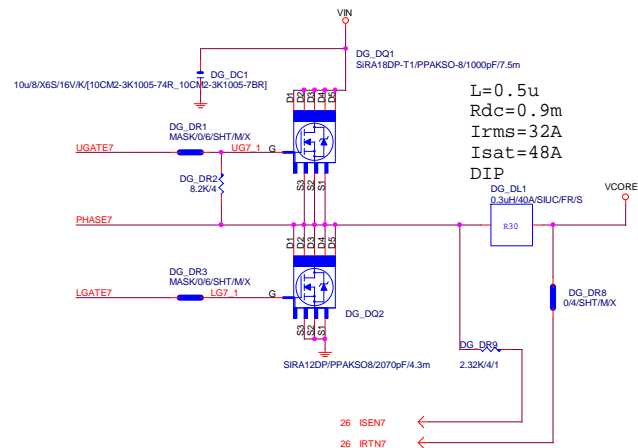
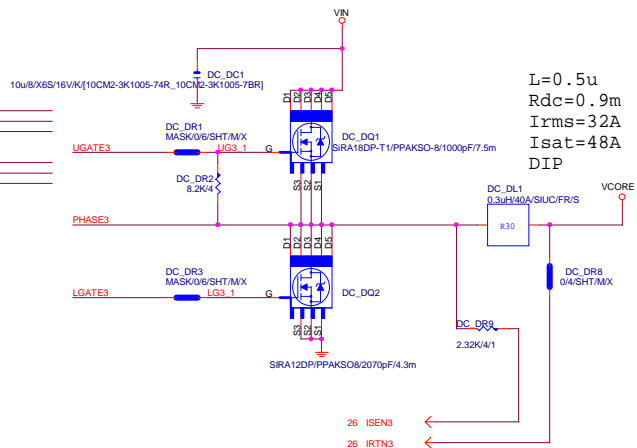
M.2 有插卡 /沒插卡 GPP_G0	M.2插何種卡? GPP_G1	SATA Express 插何種硬碟? GPP_E0/E2/F1	IO15 (S0)	IO16 (S1)	IO17	IO18	IO19 (S0)	IP20 (S1)
有插卡 (Low)	SATA Mode (Low)	SATA (Hi)	SATA (M.2)	PCIE x1	PCIE x1	PCIE x1	PCIE x1	SATA
		SATA Express (Low)	SATA (M.2)	PCIE x1	PCIE x1	PCIE x1	SATA Express	
	PCIE Mode (Hi)	SATA (Hi)	PCIE 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	

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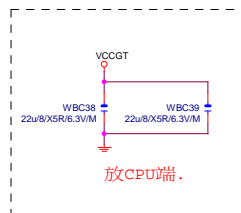
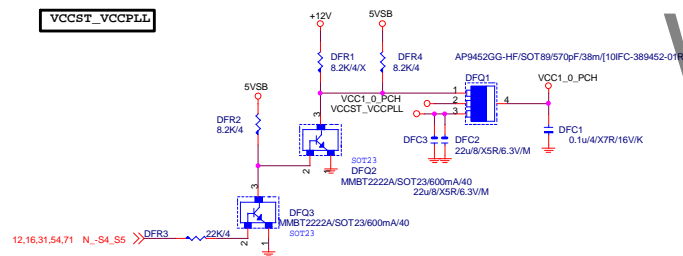




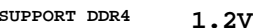


REV:0.2

VCCST_VCCPLL

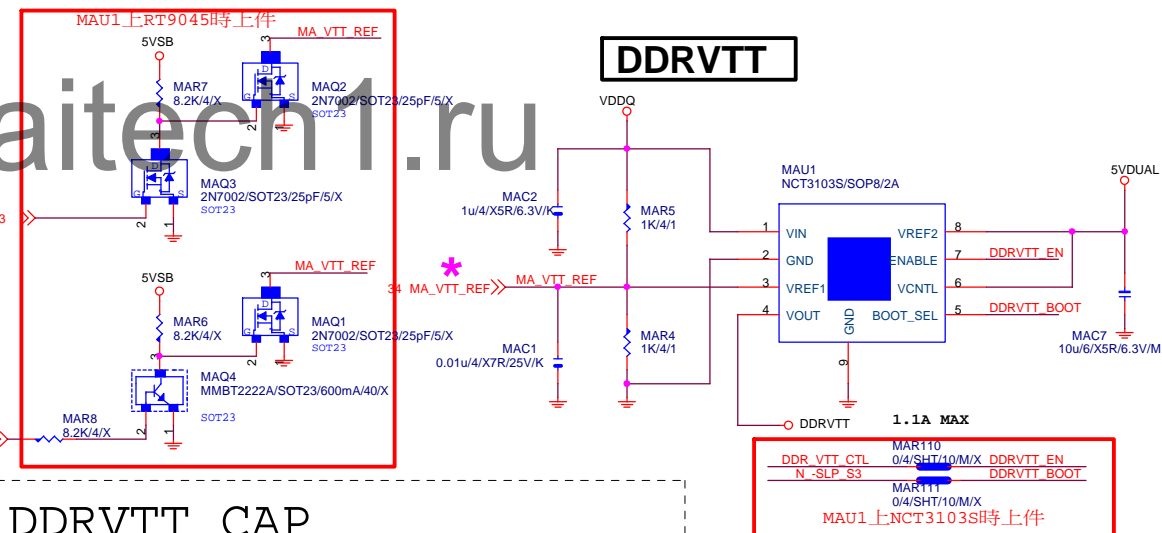
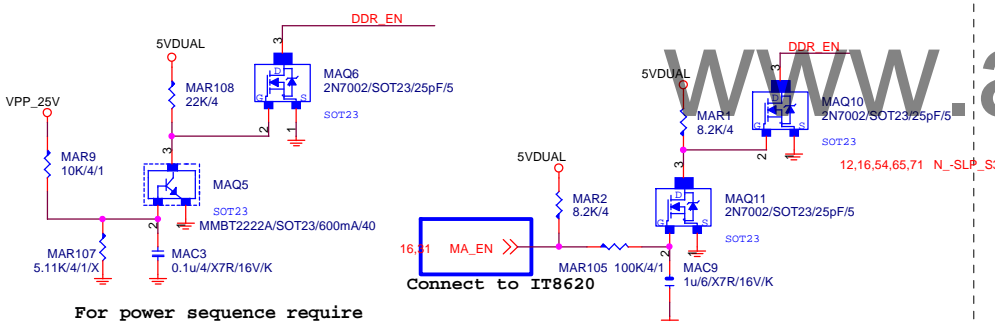


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25A MAX L=0.5u
DCR=1.05 mohm
Isat=40A
MA DR13 Idc=30A

Remote sense請從最重的負載端點拉回



GIGABYTE™

RT8120 DDR4 POWER

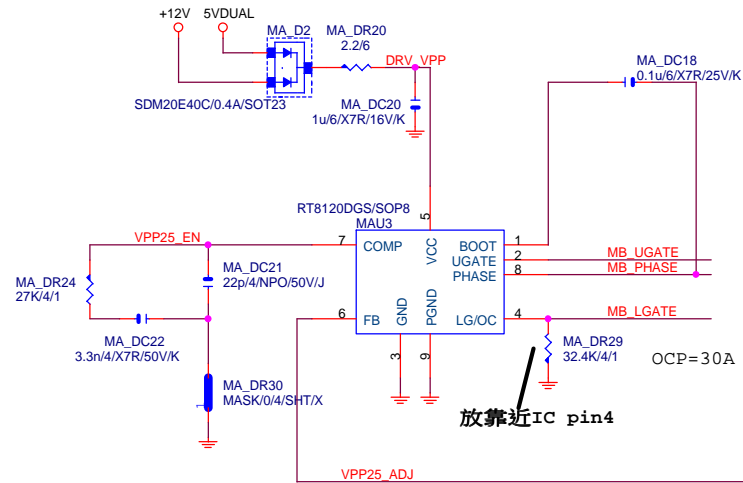
Document Number	GA-Z170X-GAMING GT
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REV:0.88

VPP_25V



放靠近IC pin4

OCP=30A

VPP25_ADJ

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

CHOKE與CAP料號可變

DDR_VPP VIN CAP
560u*1PCS

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

SUPPORT DDR4 2.5V

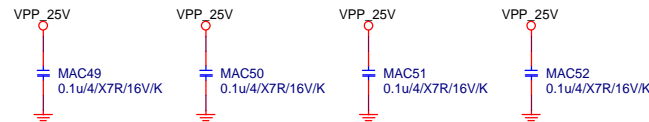
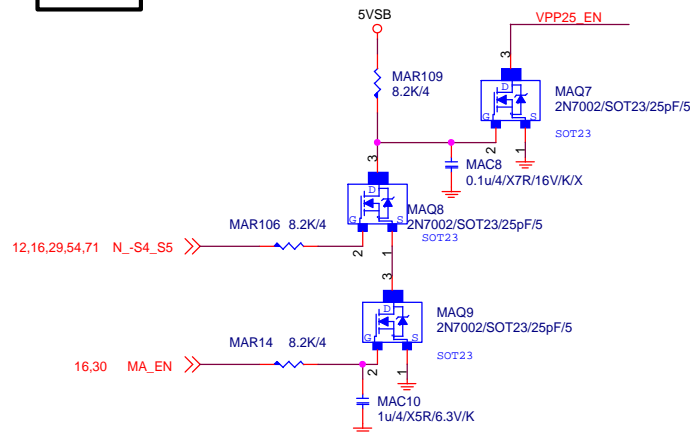
25A MAX

Remote sense請從最重的負載端點拉回

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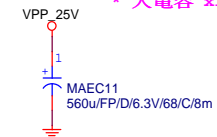
PWR_SEQ

* 刪 MA_DR32



VPP CAP 560u*1PCS

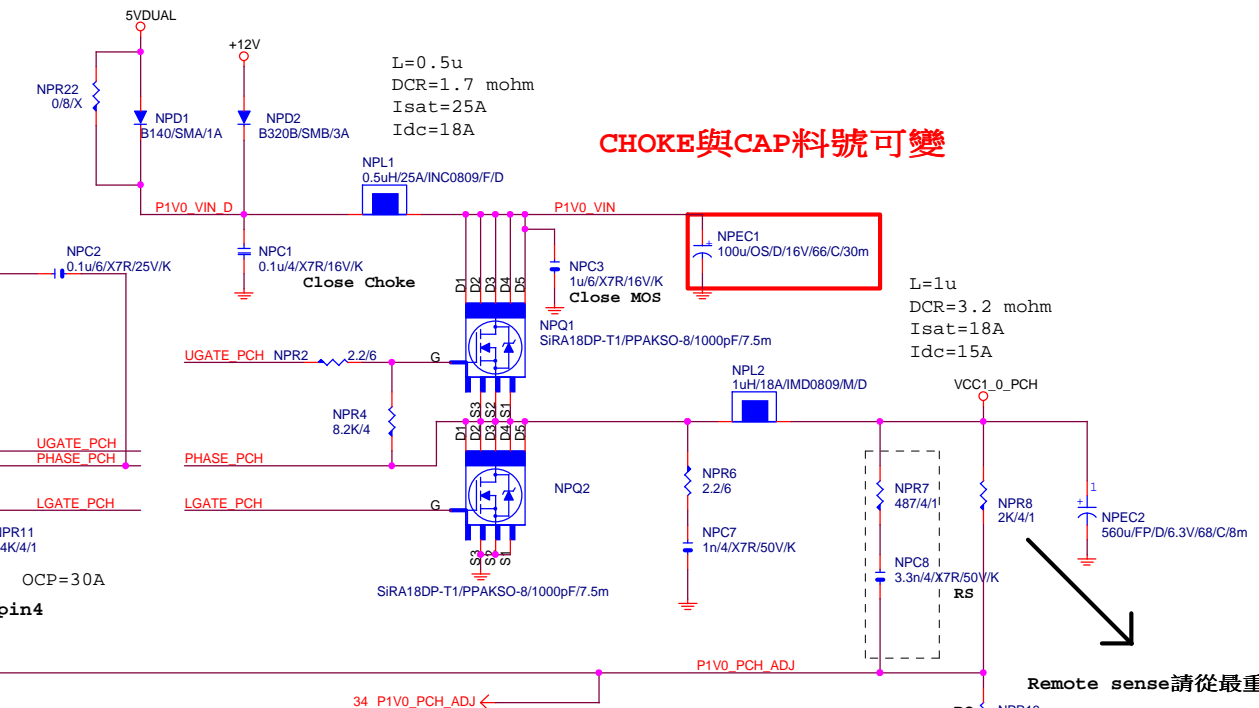
* 大電容 x1



GIGABYTE™

Title RT8120_VPP25 POWER		
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REV:0.67



CHOKE與CAP料號可變

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

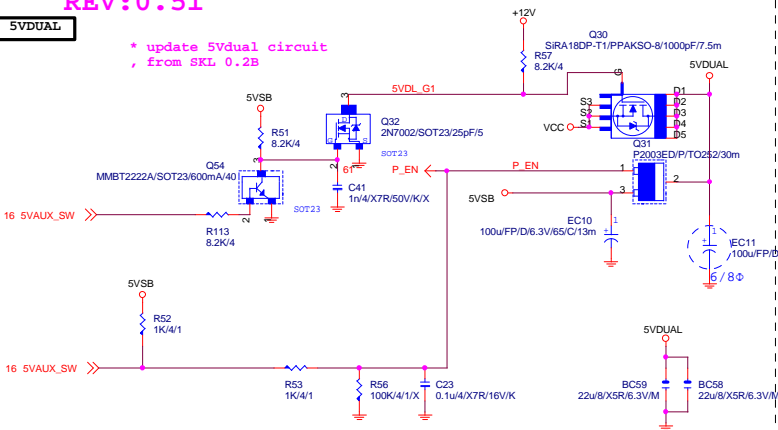
www.aitech1.ru

GIGABYTE™		
Title RT8120_PCH POWER		
Size Custom	Document Number GA-Z170X-GAMING GT	Rev 1.01
Date: Thursday, July 23, 2015	Sheet 32	of 75

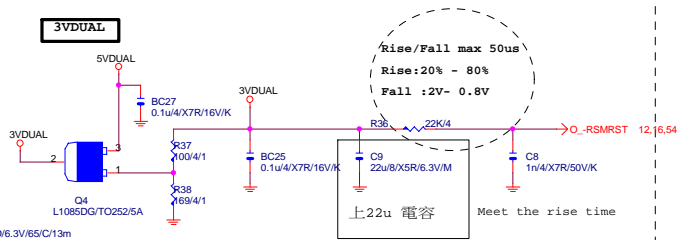
REV:0.51

5VDUAL

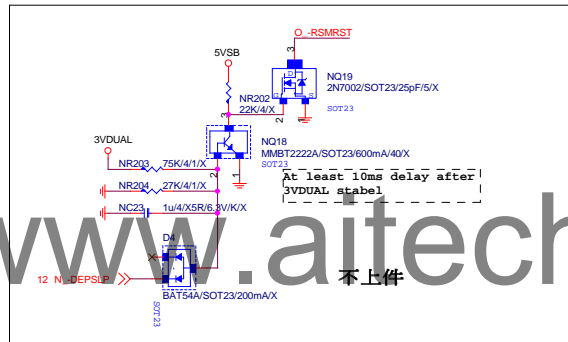
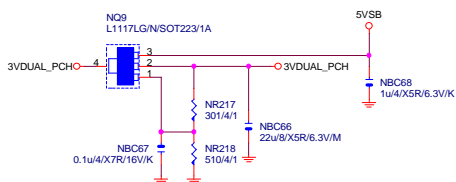
* update 5Vdual circuit
from SKL 0.2B



3VDUAL



3VDUAL_PCH

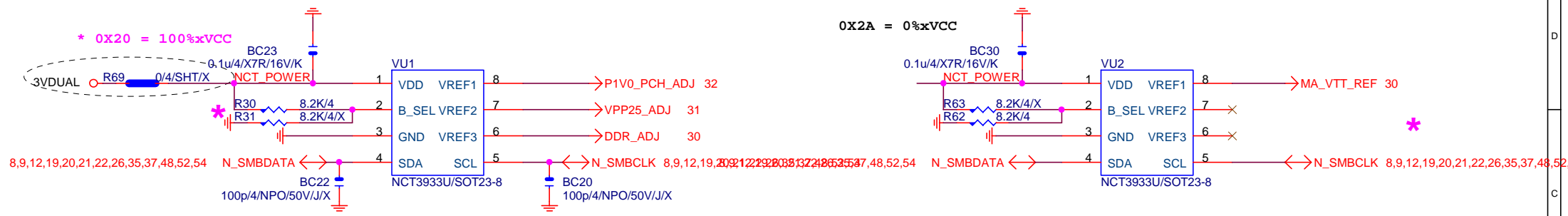


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Gigabyte Technology

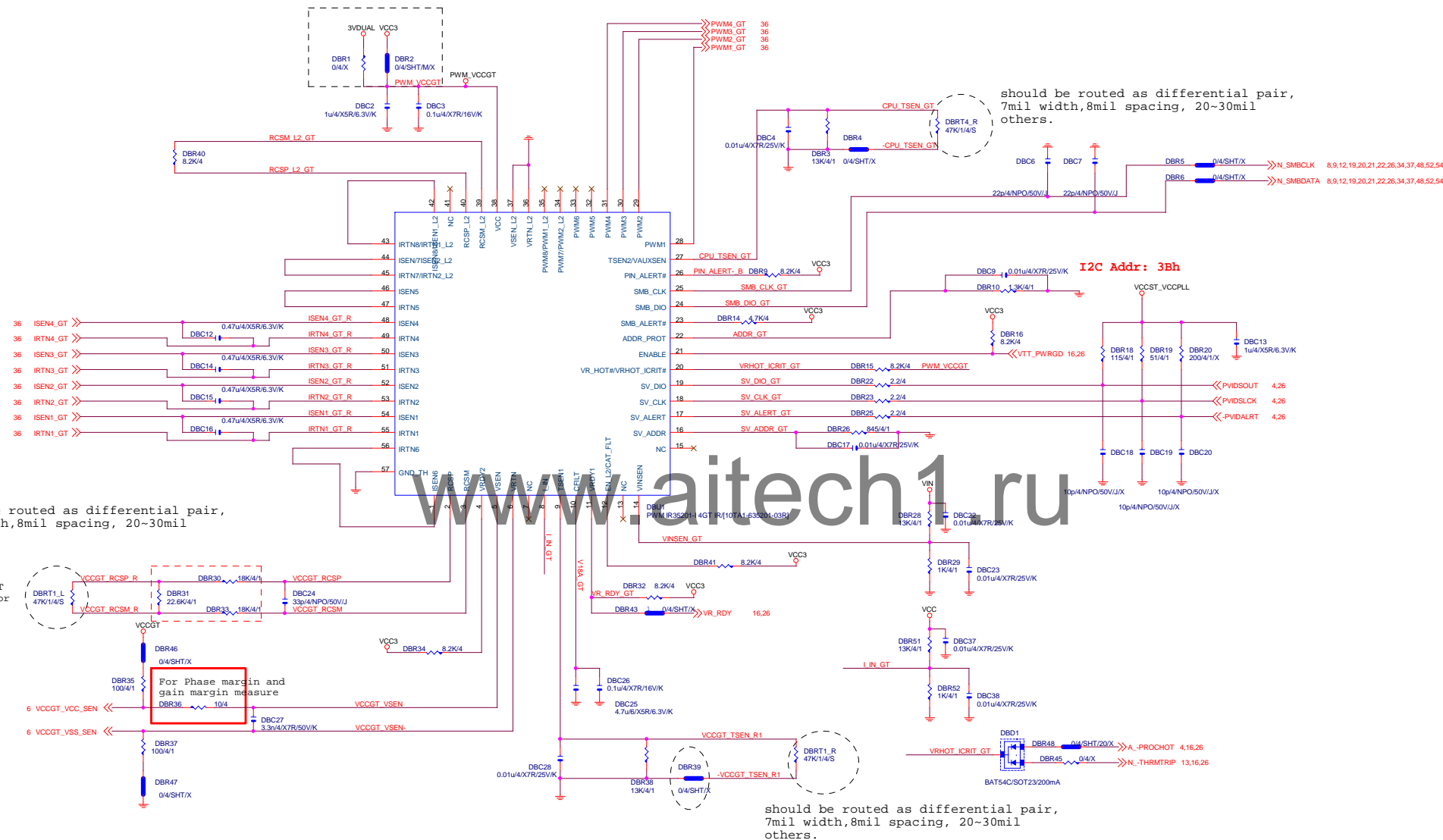
Title	DISCRETE POWER
Size	Custom
Document Number	GA-Z170X-GAMING GT
Date	Thursday, July 23, 2015
Sheet	33 of 75
Rev	1.01

OVER VOLTAGE

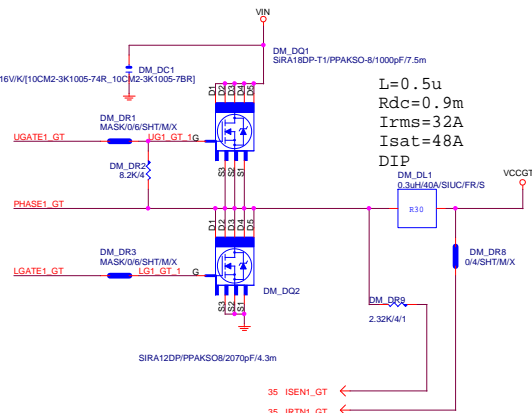


NCT3933	0X2A	0X20	0X22
VREF1	DDRVTT	VREF_DDRA_DQ	PCH Core
VREF2	VREF_DDRA_CA	N/A	VCCL_5_PCH
VREF3	VREF_DDRA_CA	VREF_DDRB_DQ	SMREF

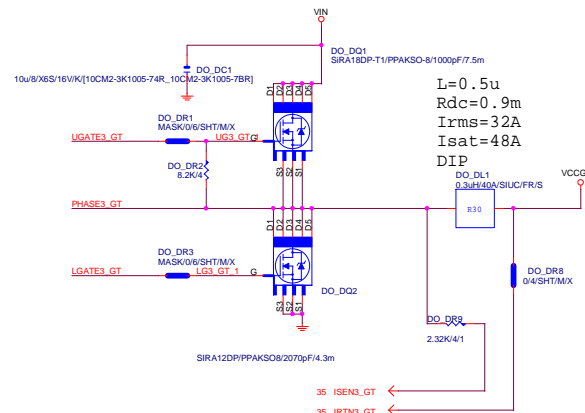
Gigabyte Technology			
CPU CORE VR-2			
Size Custom	Document Number	GA-Z170X-GAMING GT	
Date: Thursday, July 23, 2015		Sheet 34 of 75	Rev 1.01



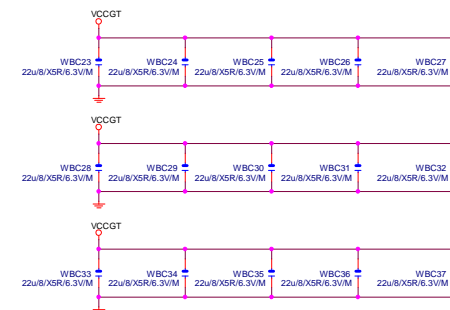
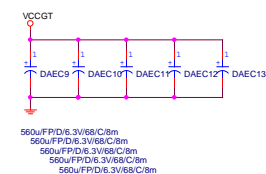
VCCGT-PHASE1



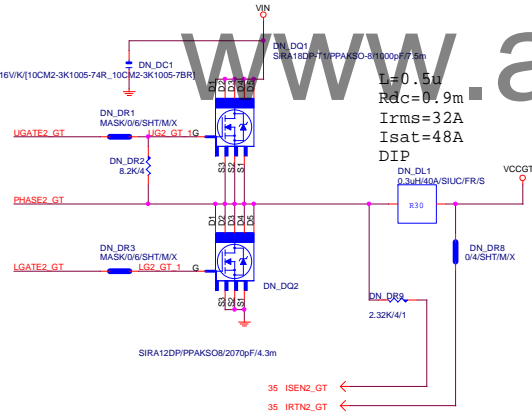
VCCGT-PHASE3



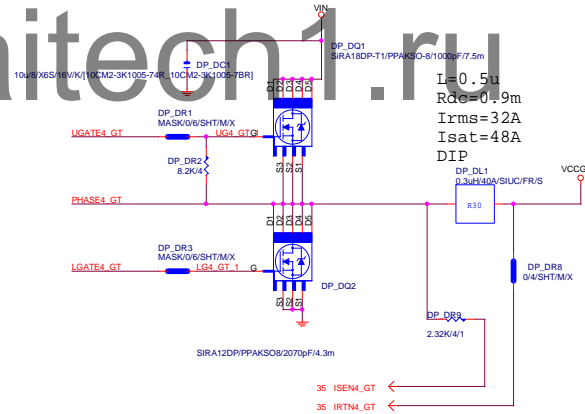
VCCGT CAP 560u*5PCS
22u*15PCS



VCCGT-PHASE2



VCCGT-PHASE4



39 VIO_ISEN1 > 0.47µs/4XSR/6.3V/K DCC8 DCR46 3014/1 DC ISEN1 L2 3

39 VIO_IRTN1 > 0.47µs/4XSR/6.3V/K DCC8 DCR45 3014/1 DC IRTN1 L2 3

DC ISEN2 L2 3

DC ISEN3 L1 3

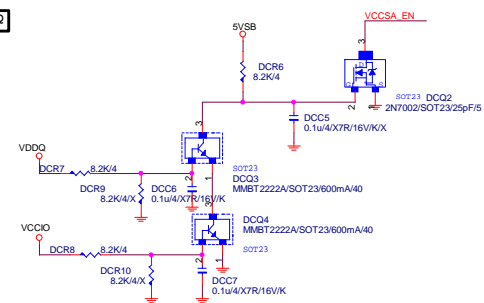
DC ISEN2 L1 3

VSA_ISEN1 > 0.47µs/4XSR/6.3V/K DCC9 DCR47 3014/1 DC ISEN1 L1 9

VSA_IRTN1 > 0.47µs/4XSR/6.3V/K DCC9 DCR48 3014/1 DC IRTN1 L1 4

should be routed as differential pair,
7mil width, 8mil spacing, 20-30mil
others.

should be routed as differential pair,
7mil width, 8mil spacing, 20~30mil
others.



REV:0.1

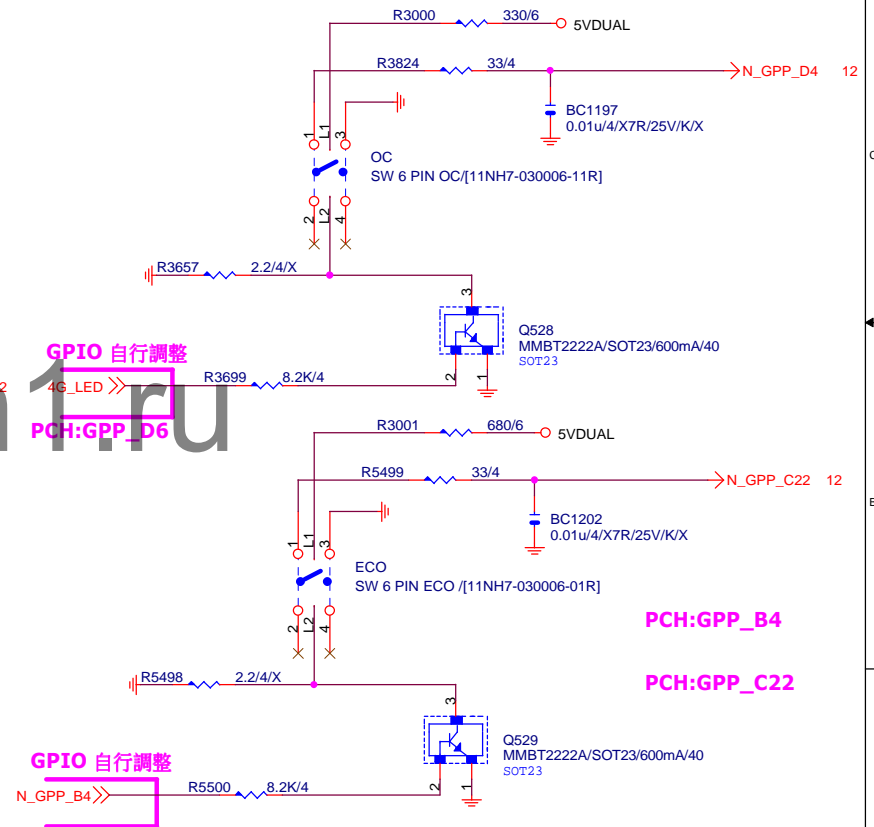
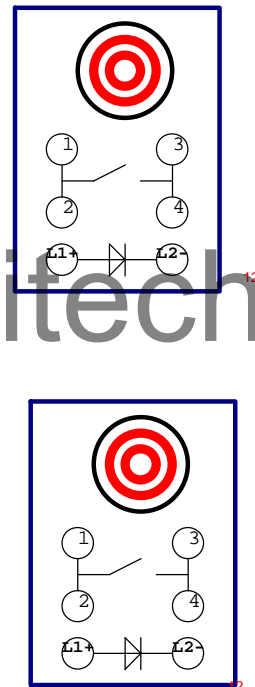
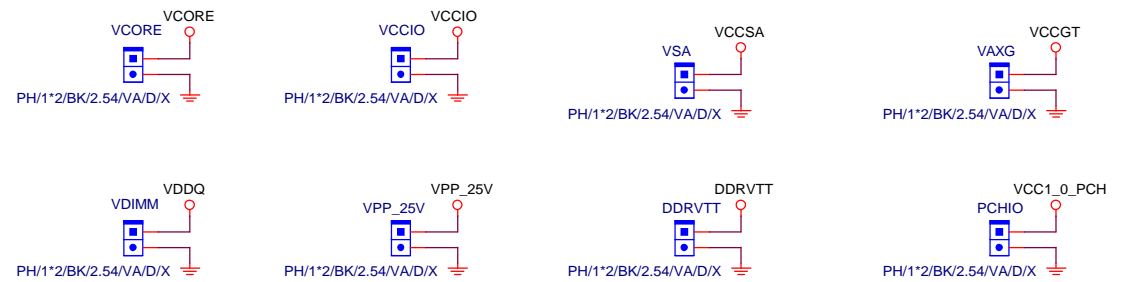


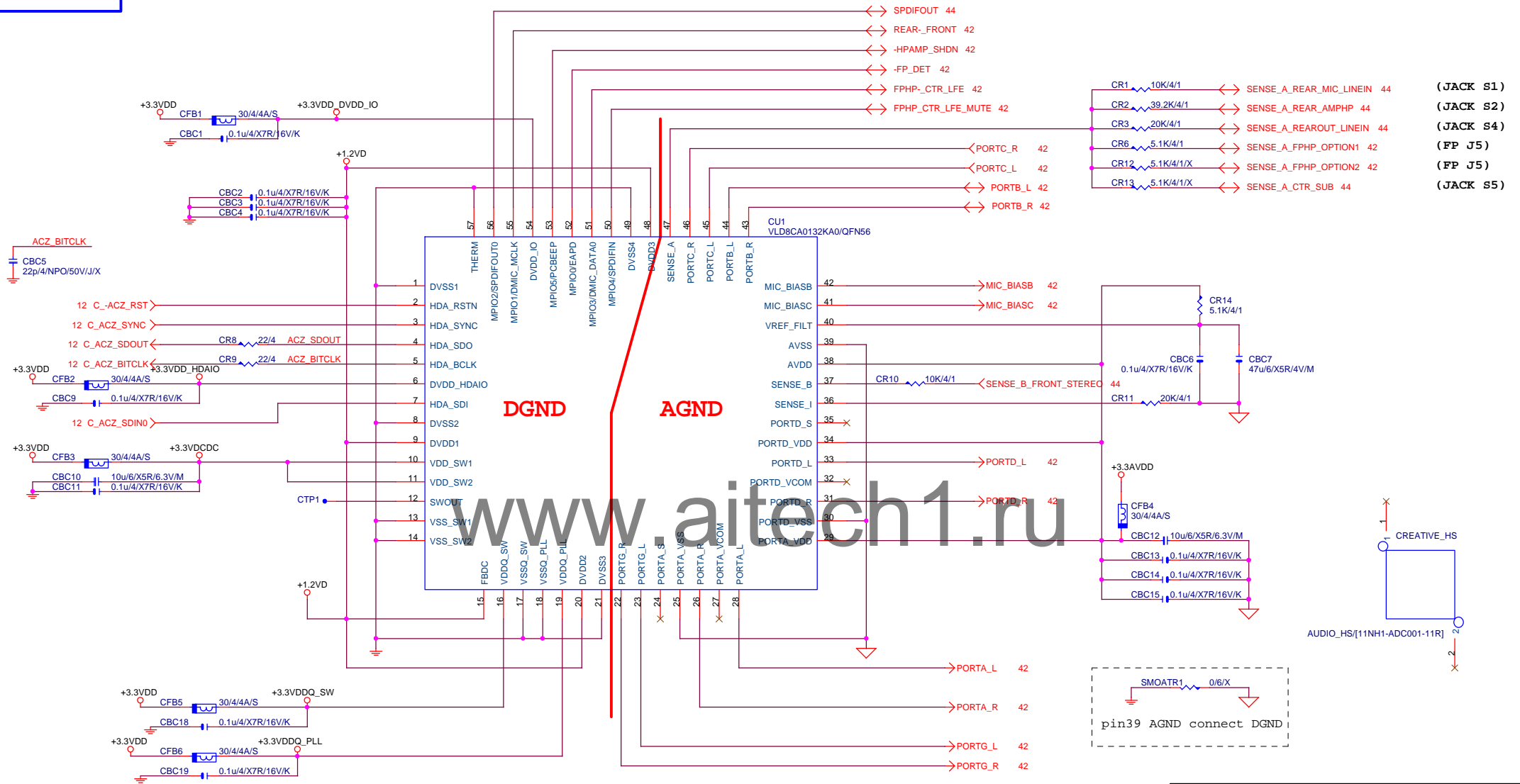
VCCSA

1

DUEC1
560uF/D/6.3V/68/C/8m

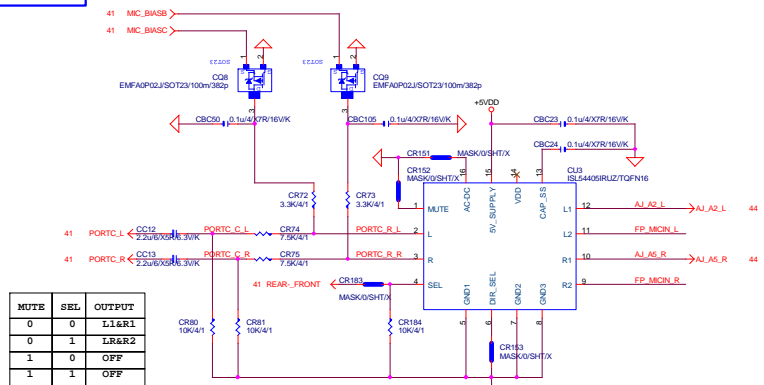
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<p align="center">VCCSA MOS_IR3553</p>			
Size Custom	Document Number		Rev 1.01
<p align="center">GA-Z170X-GAMING GT</p>			
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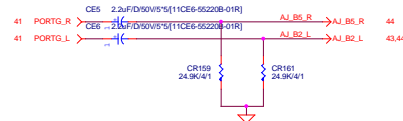


GIGABYTE™			
Creative Sound3Di			
Title	GA-Z170X-GAMING GT		
Size	Document Number	Rev	
Custom		1.01	
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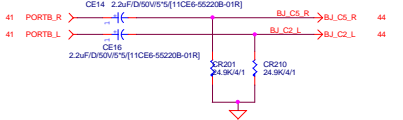
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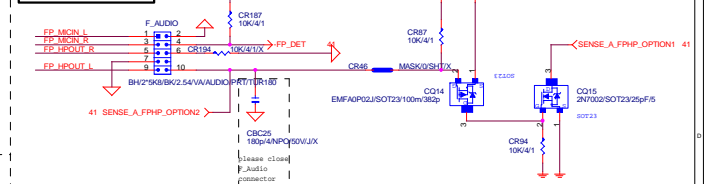
Line-Out



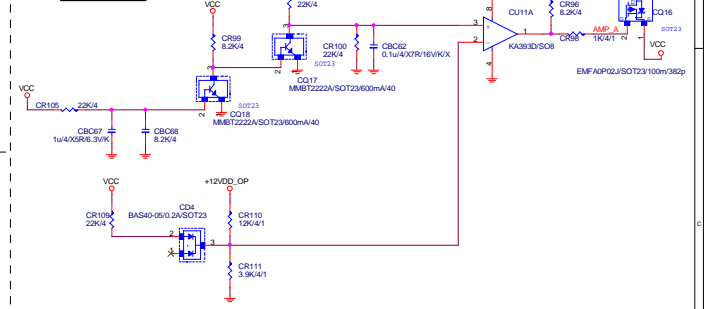
Rear



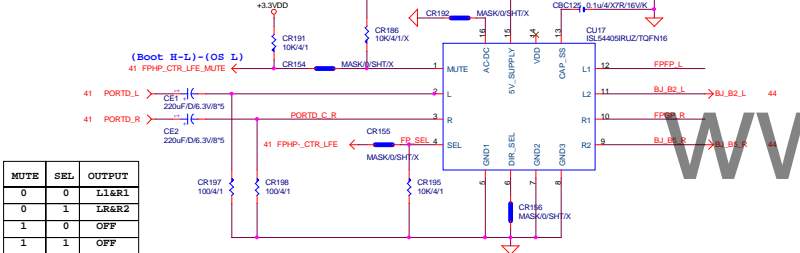
HD Audio FRONT PANEL



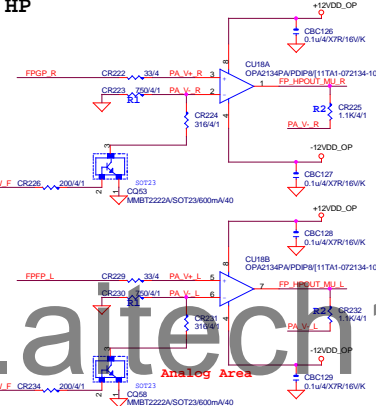
OP反插防燒



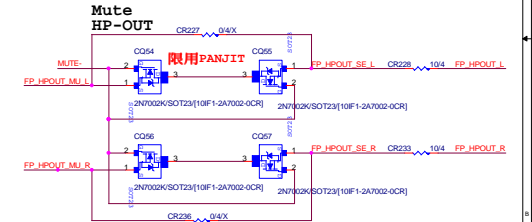
Rear CTR/SUB & FP HP-Out



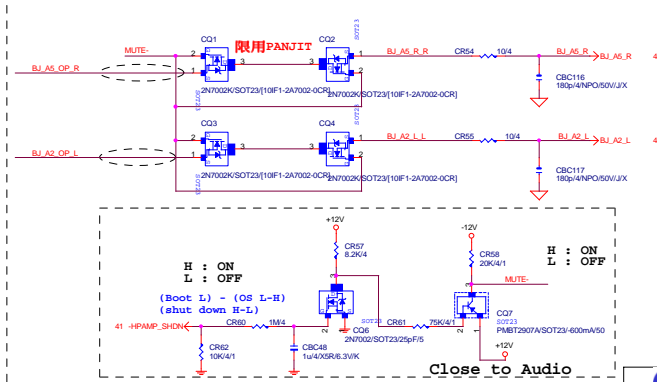
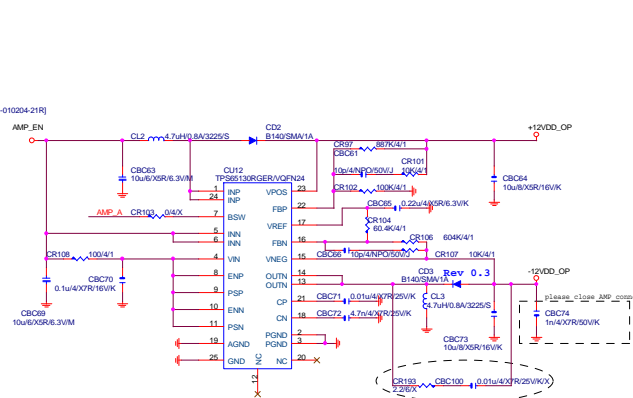
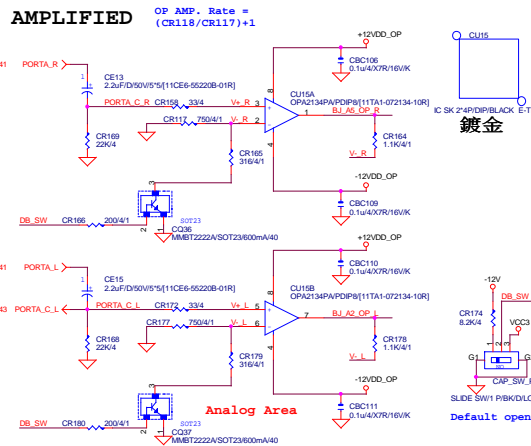
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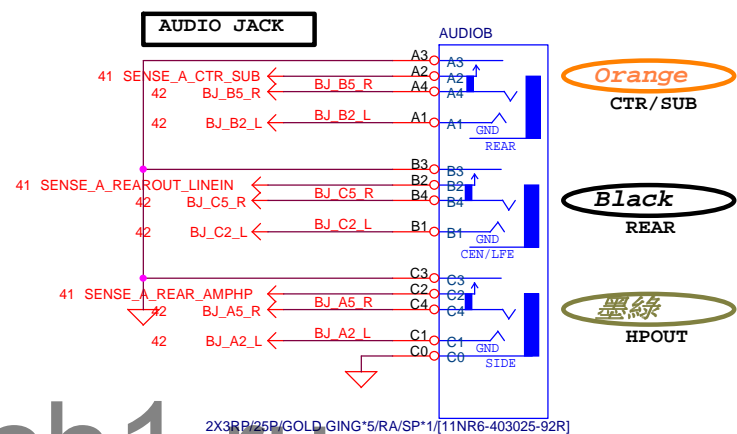
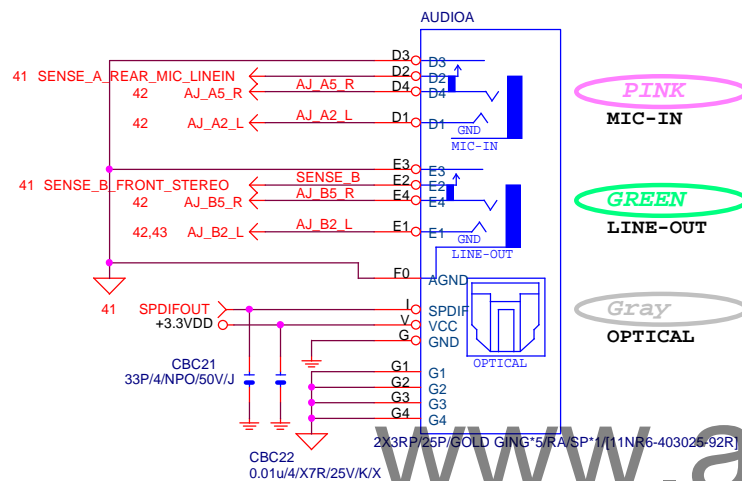


鍍金



AMPLIFIED OP AMP. Rate = (R2/R1)+1



**Gigabyte Technology**

Title

Creative Sound3Di ZxR

Size

Document Number

GA-Z170X-GAMING GT

Rev

1.01

Date:

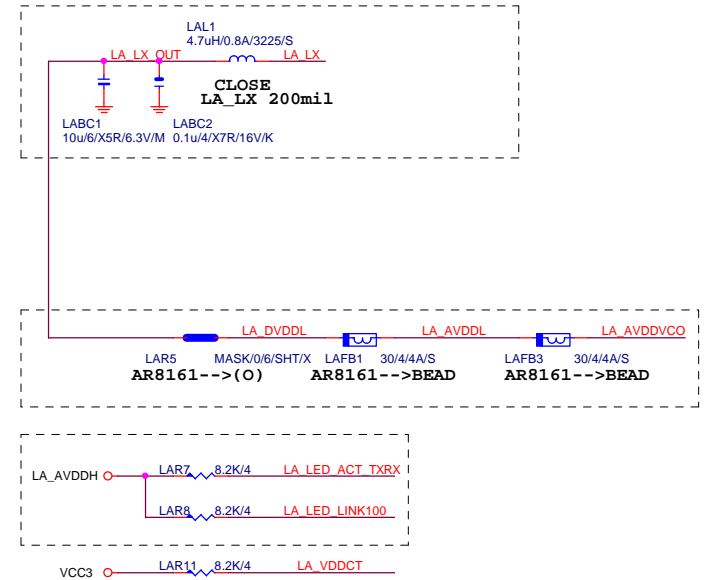
Thursday, July 23, 2015

Sheet

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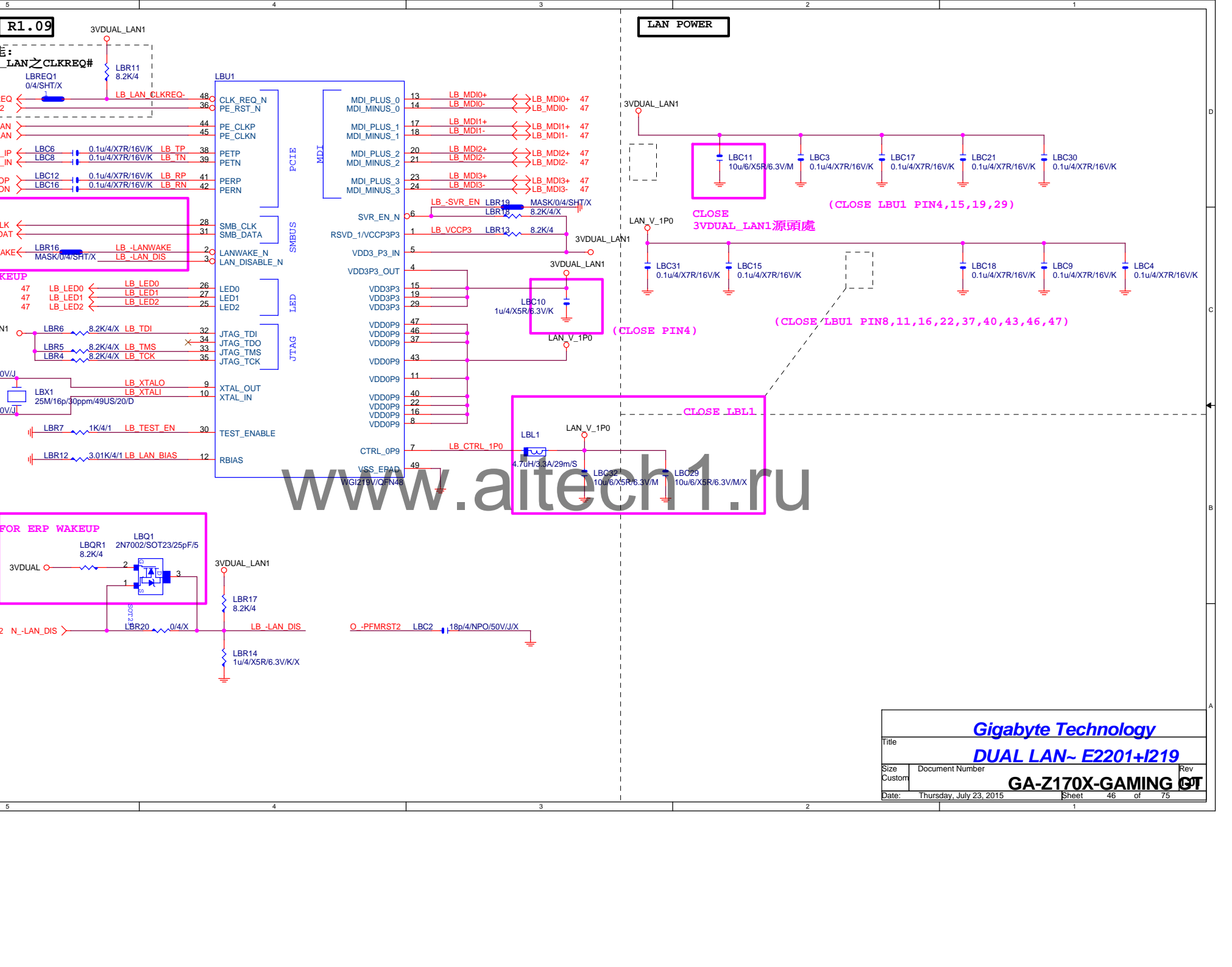
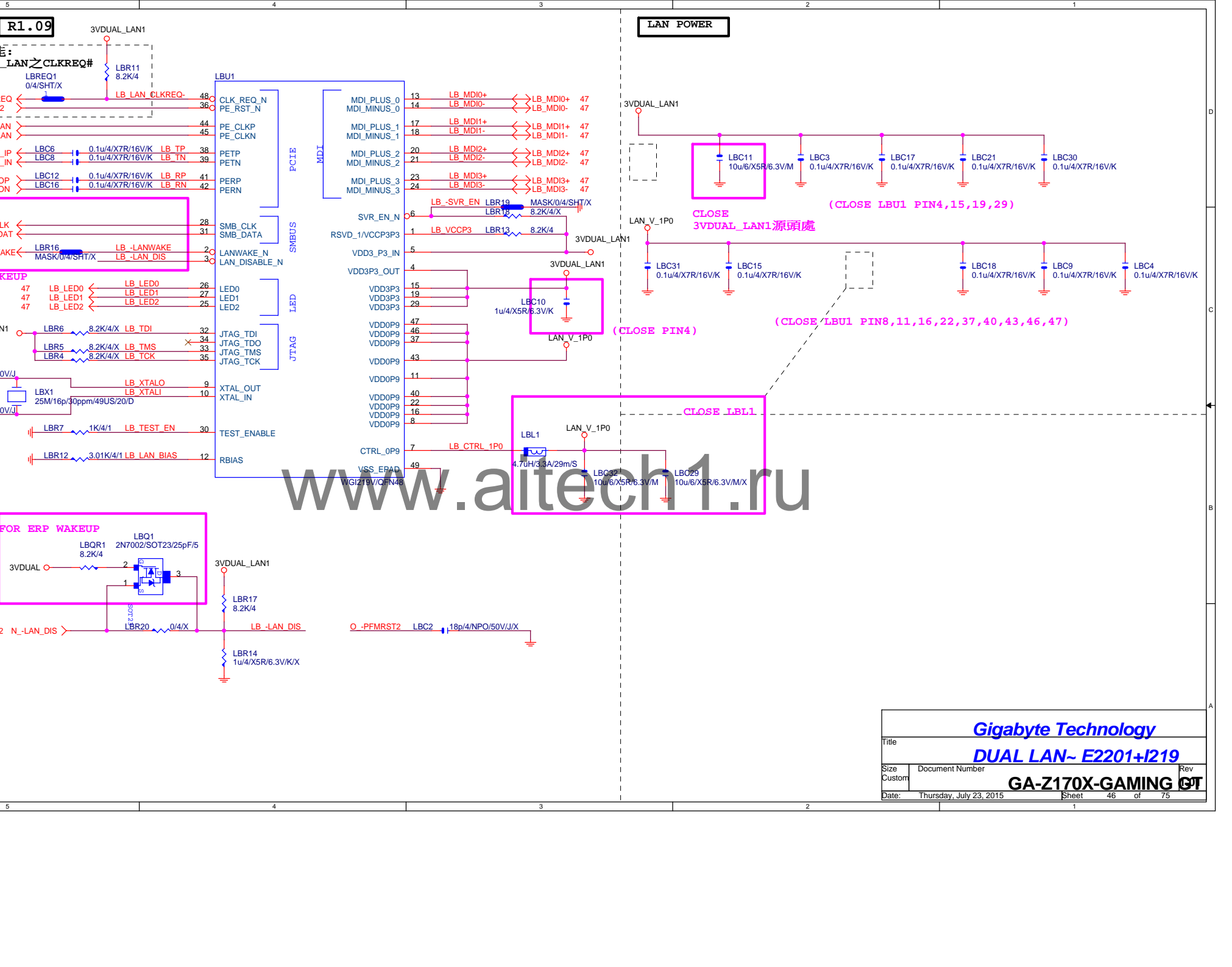
of

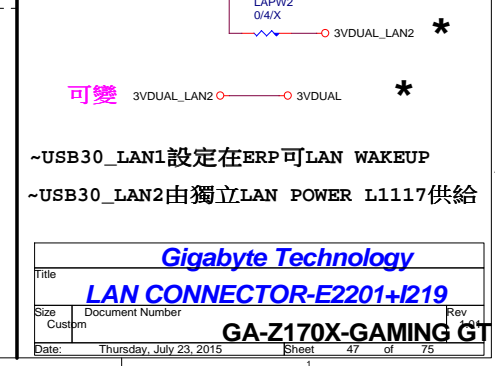
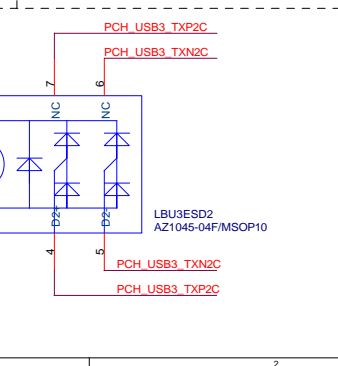
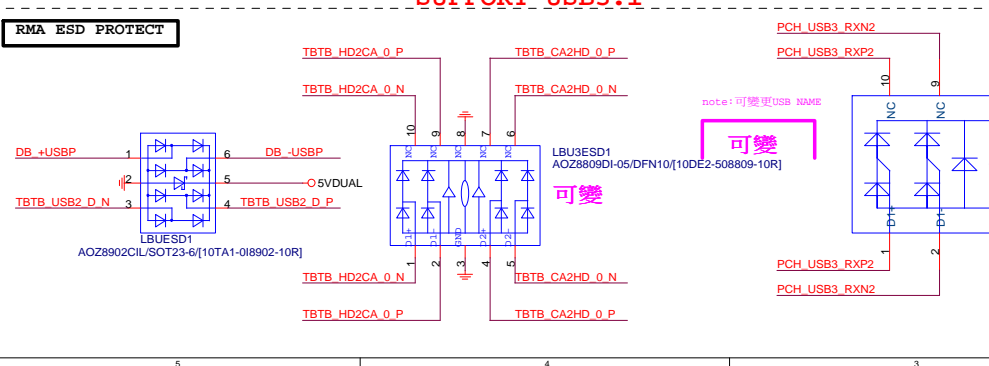
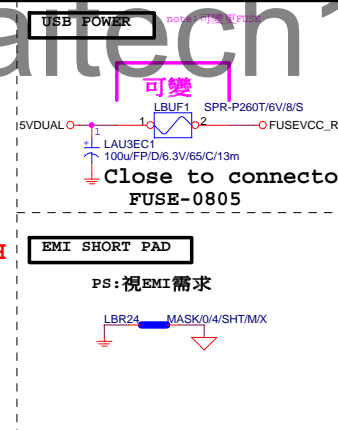
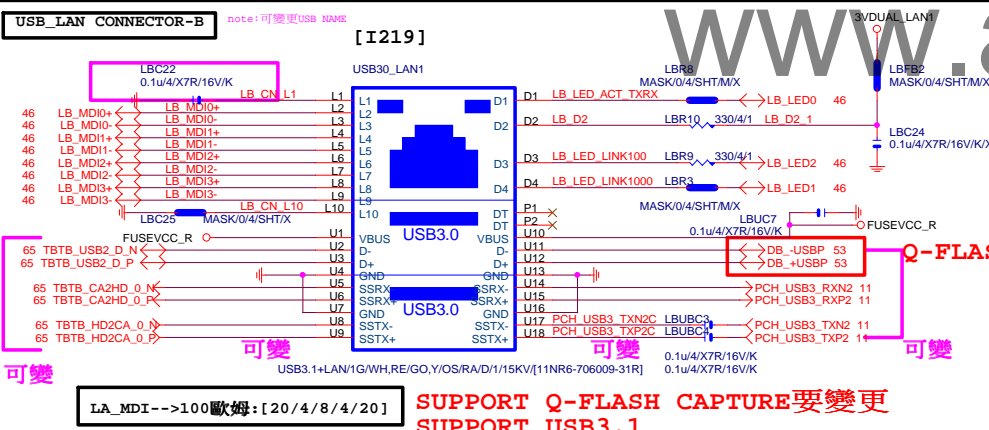
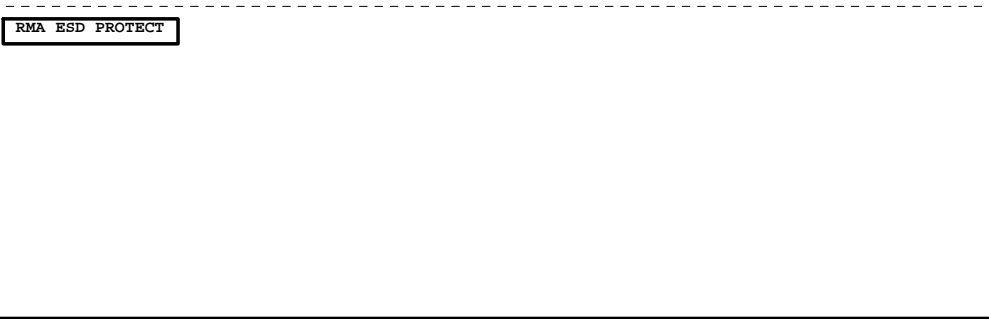
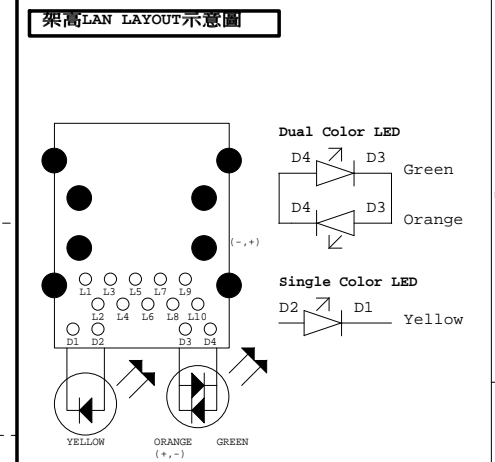
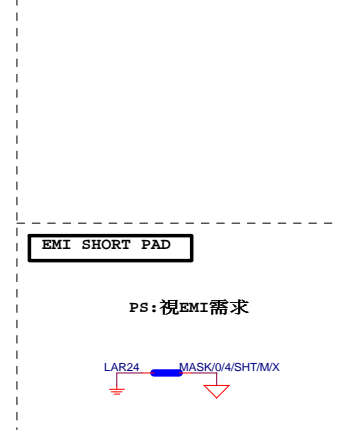
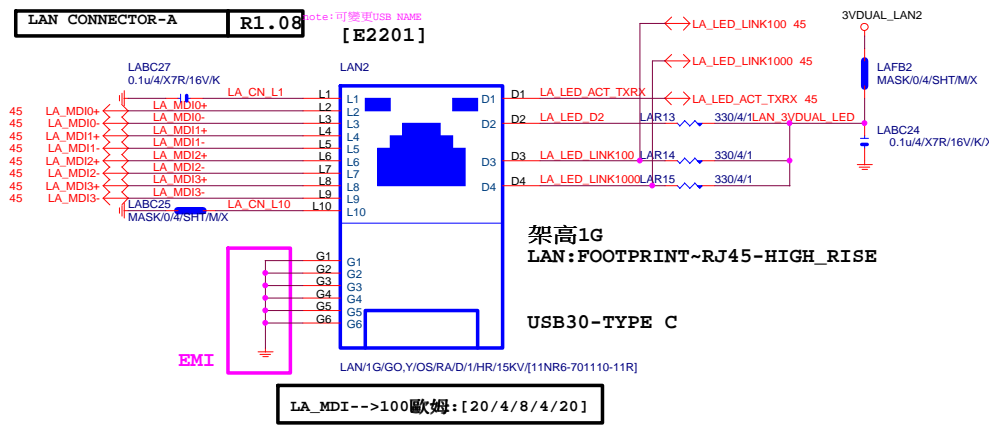
75



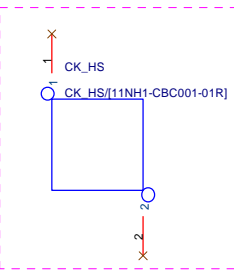
E2400-R1V1-RL/DFN40

E2400S50: E2400-R1V1-RL/DFN40/[10HP2-402400-10R]

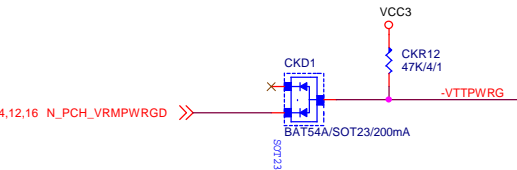
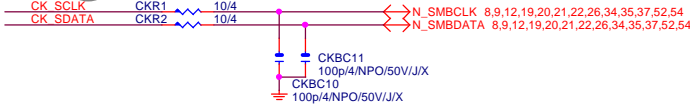
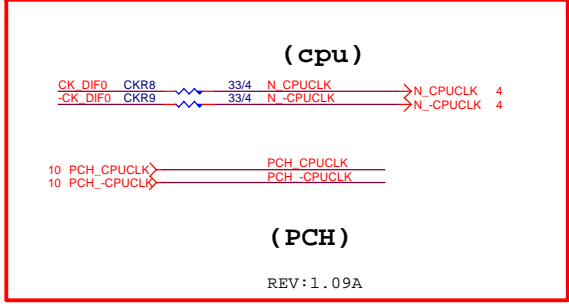
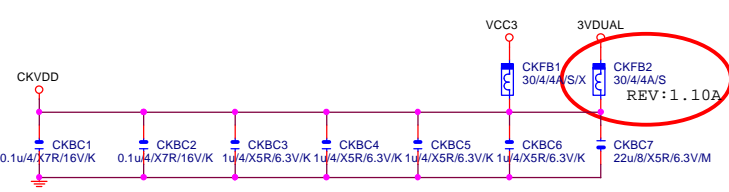
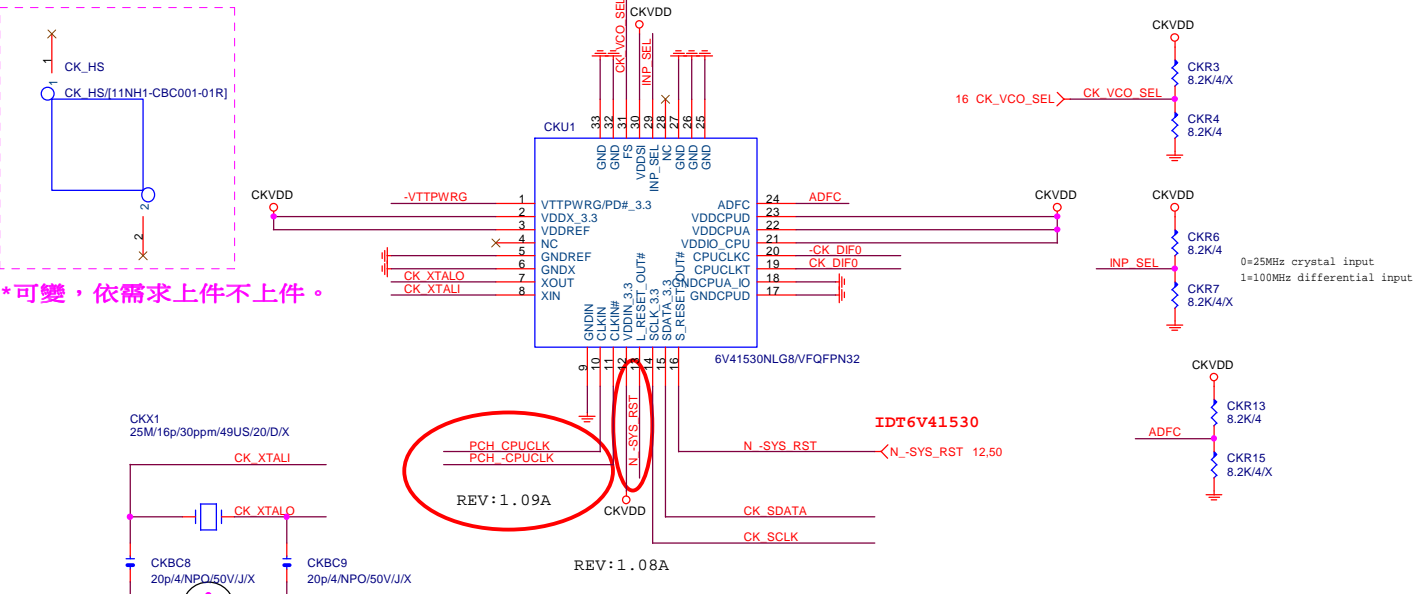
[illegible]



IDT6V41530




*可變，依需求上件不上件。



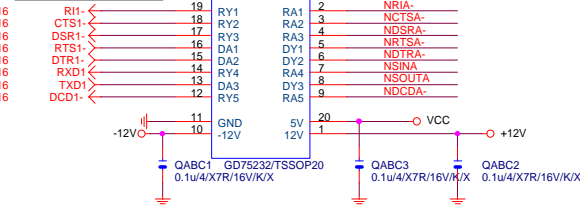
INP_SEL	Intput
0	Crystal
1	CLK_INP/M

CK_VCO_SEL	VCO
0	400M
1	1200M

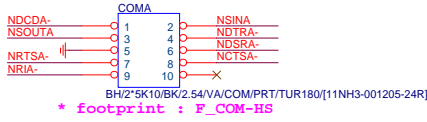
			
Title IDT6V41510_CLK BUFFER			
Size Custom	Document Number GA-Z170X-GAMING GT		Rev 1.01
Date: Thursday, July 23, 2015	Sheet 48	of 75	

www.aitech1.ru

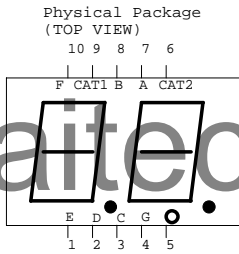
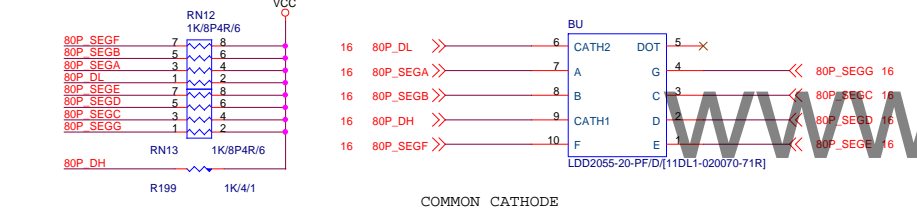
COM PORT



COMA

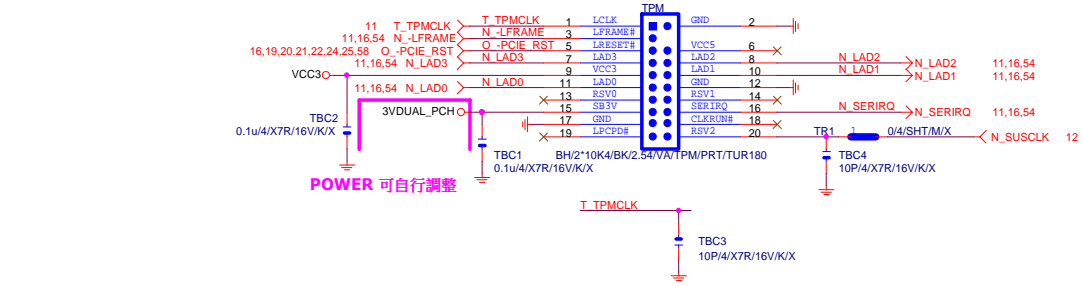


80 PORT

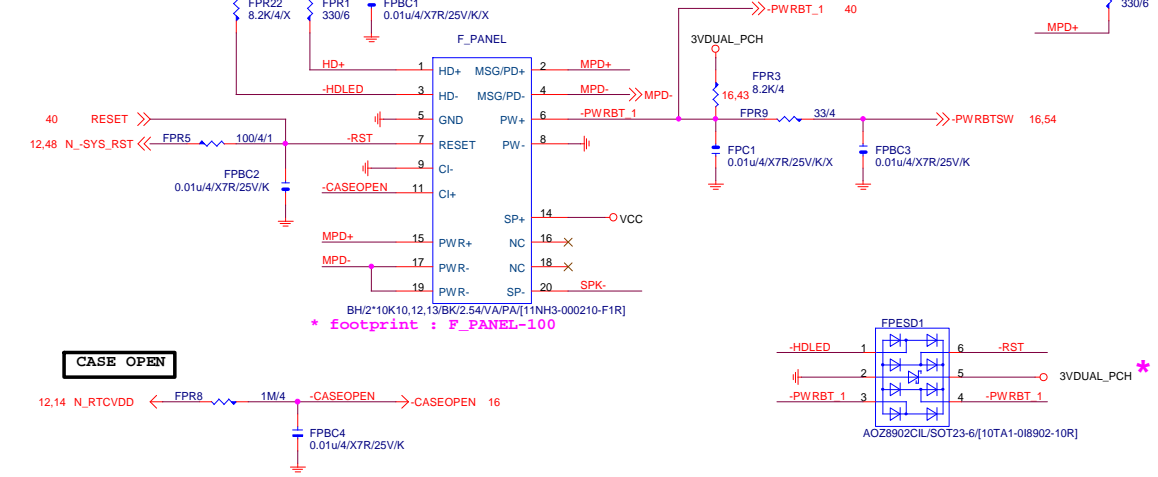


Thunderbolt

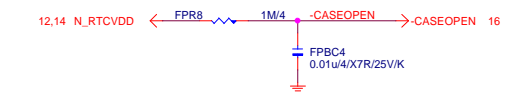
TPM CONNECT



FRONT PANEL

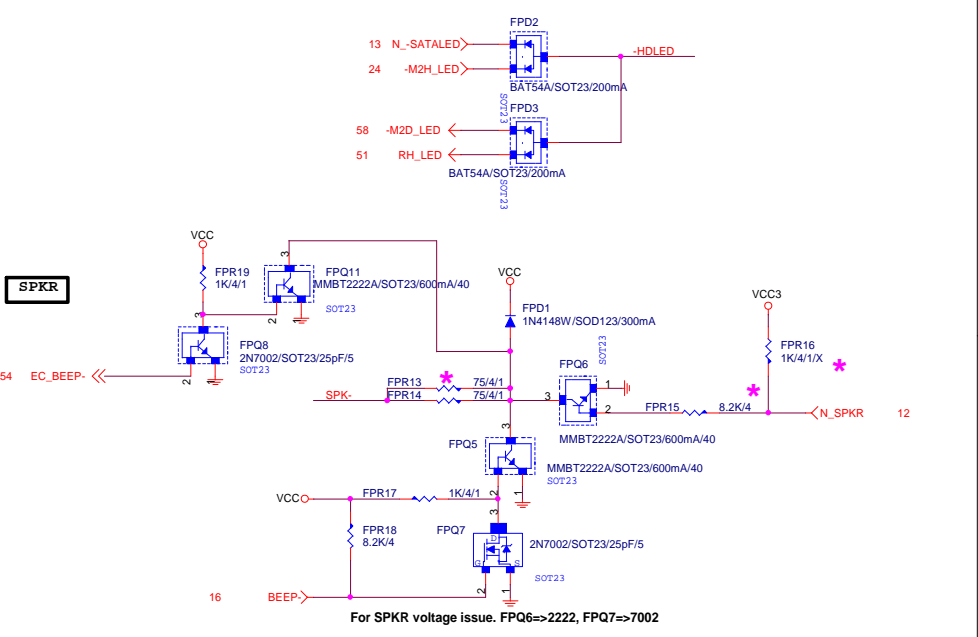


CASE OPEN

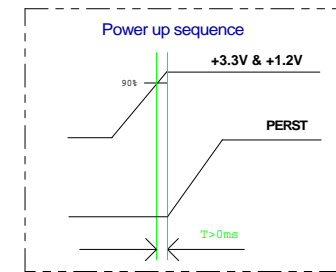
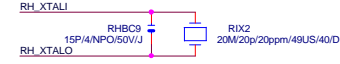
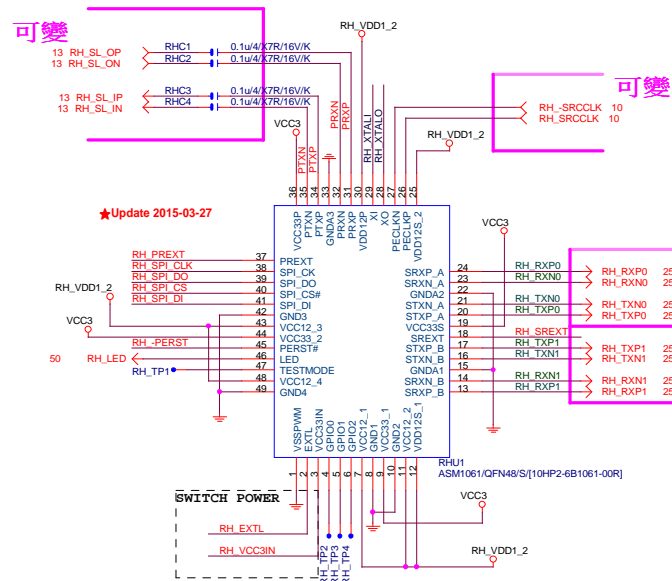
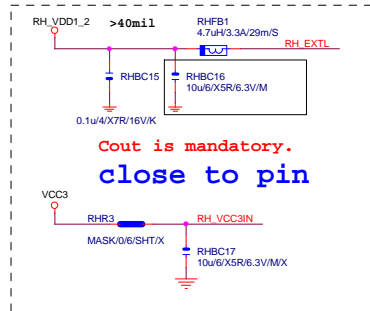
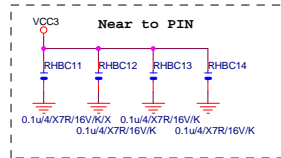
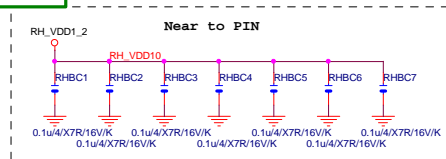


SATA LED

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



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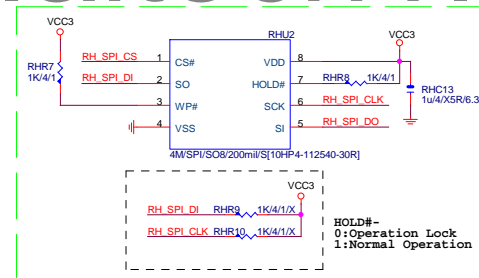


(驗證完畢可移除)

可變動

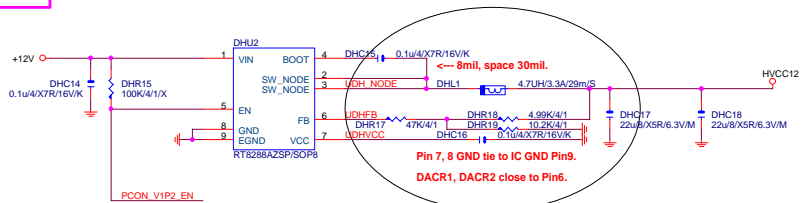
★Update 2015-03-27
移除RH_VDD1_2 external power

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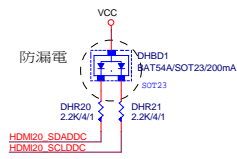
GIGABYTE™			
Title			
ASM1061			
Size	Document Number	Rev	
Custom	GA-Z170X-GAMING GT	1.01	
Date:	Thursday, July 23, 2015	Sheet	51 of 75

Rev:1.09

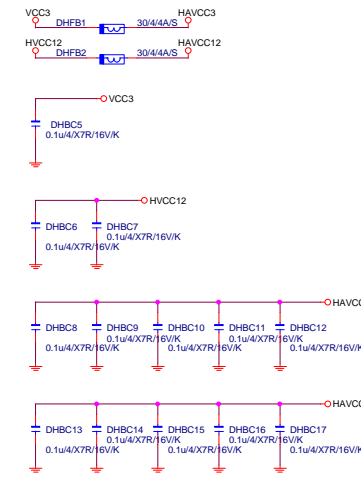
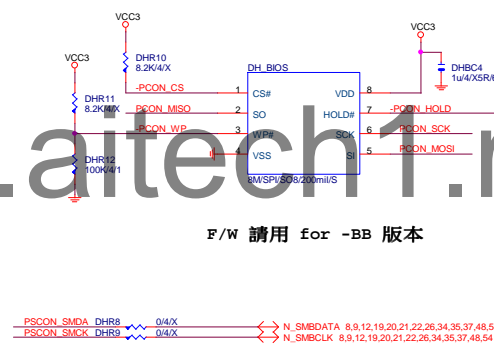
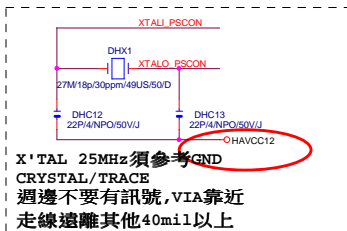
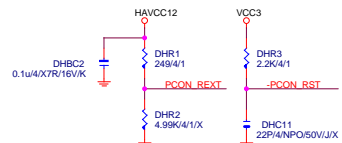
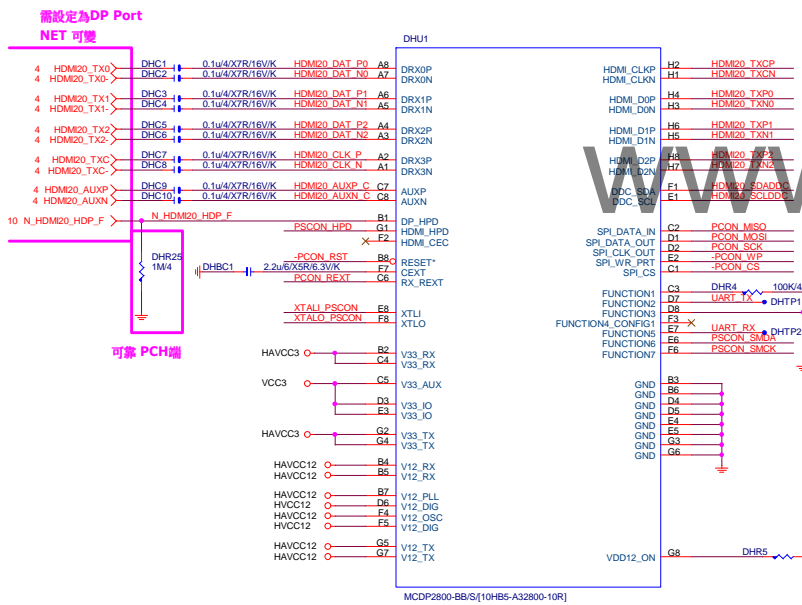
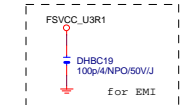
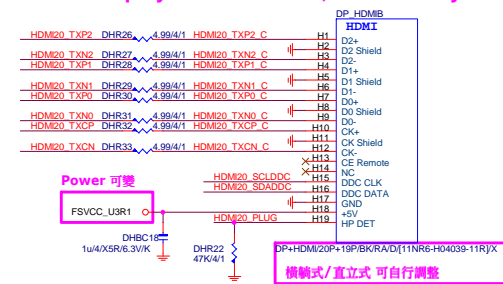


PCH端

10 N_DOPC_CTRLCLK <--> N_DOPC_CTRLCLK DHR23 2.2K/4/1 VCC3
10 N_DOPC_CTRLDATA <--> N_DOPC_CTRLDATA DHR24 2.2K/4/1

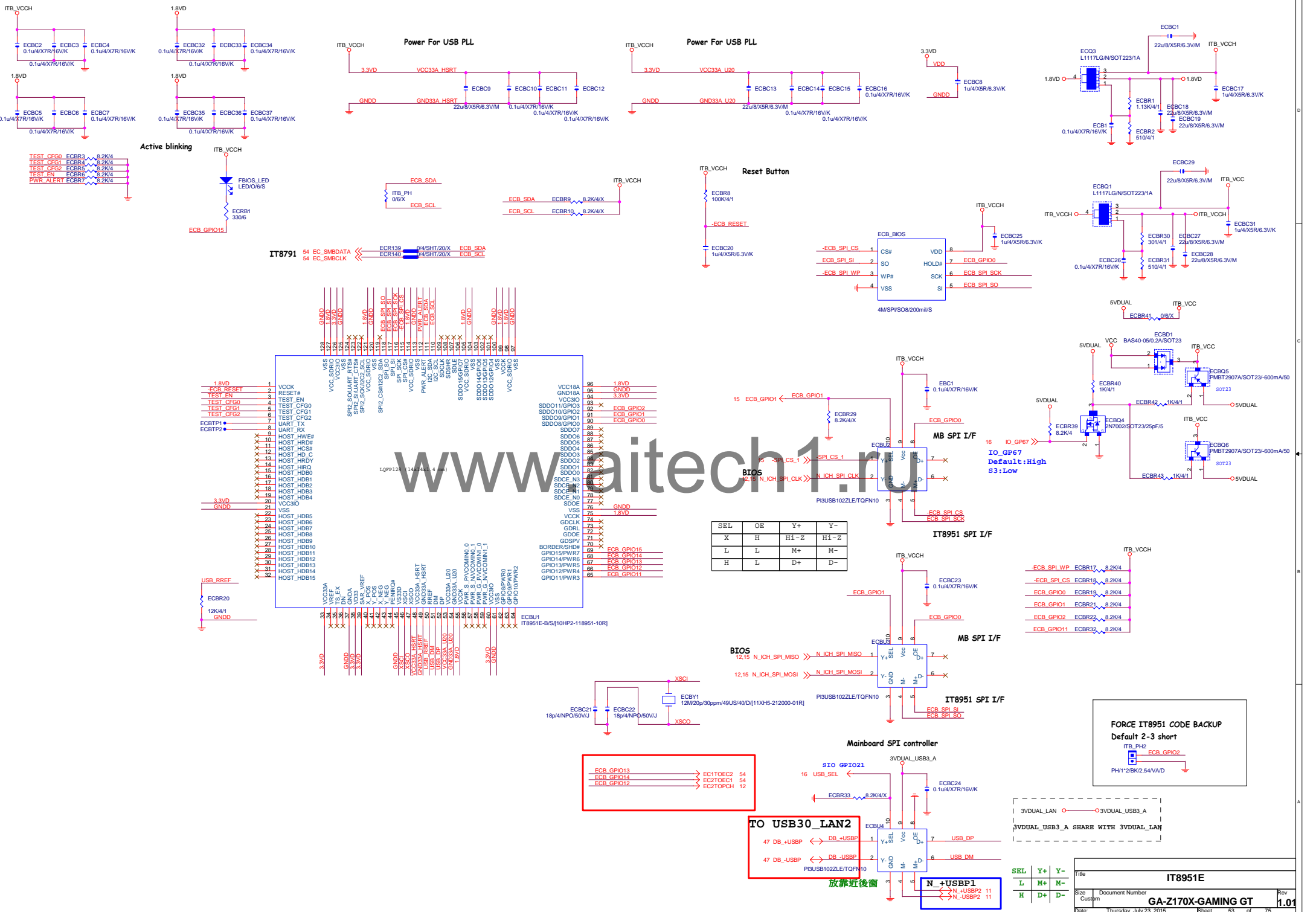


Display Port with HDMI, or HDMI only.



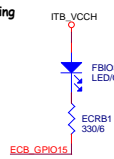
Gigabyte Technology

HDMI20 MCPDP2800-BA		
Size	Document Number	Rev
C	GA-Z170X-GAMING GT	1.01
Date:	Thursday, July 23, 2015	Sheet 52 of 75



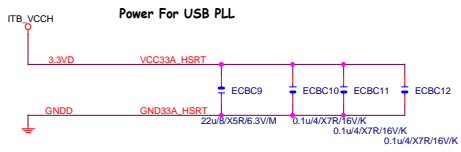
TEST_CFG0 ECCR3 8.2K/4
TEST_CFG1 ECCR4 8.2K/4
TEST_CFG2 ECCR5 8.2K/4
TEST_CFG3 ECCR6 8.2K/4
PWR_ALERT ECCR7 8.2K/4

Active blinking

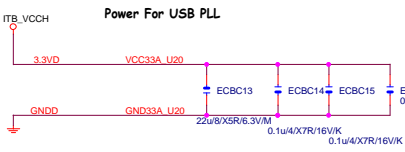


IT8791 54 EC_SMBDATA << ECR139 1/4/SH7/20/X ECR SDA
54 EC_SMBCLK << ECR140 1/4/SH7/20/X ECR SCL

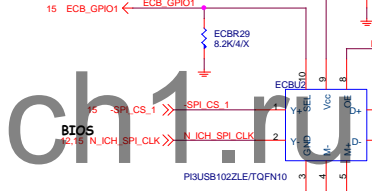
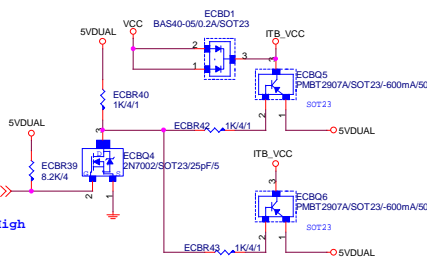
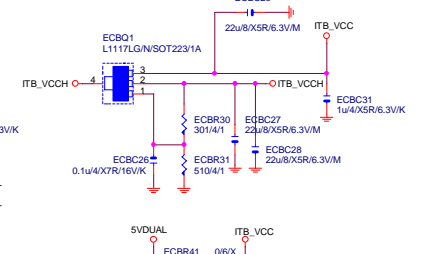
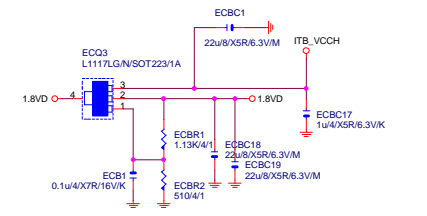
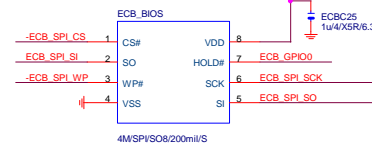
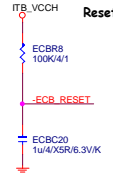
Power For USB PLL



Power For USB PLL

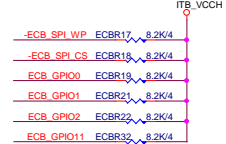
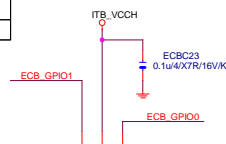


Reset Button



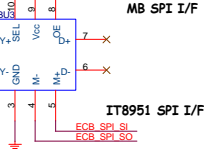
SEL	OE	Y+	Y-
X	H	H1-Z	H1-Z
L	L	M+	M-
H	L	D+	D-

IT8951 SPI I/F



BIOS

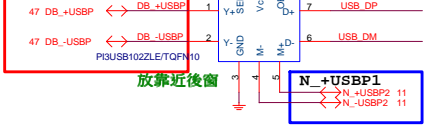
12.15 N_I_CH_SPI_MISO >> N_I_CH_SPI_MISO
12.15 N_I_CH_SPI_MOSI >> N_I_CH_SPI_MOSI



IT8951 SPI I/F

Mainboard SPI controller

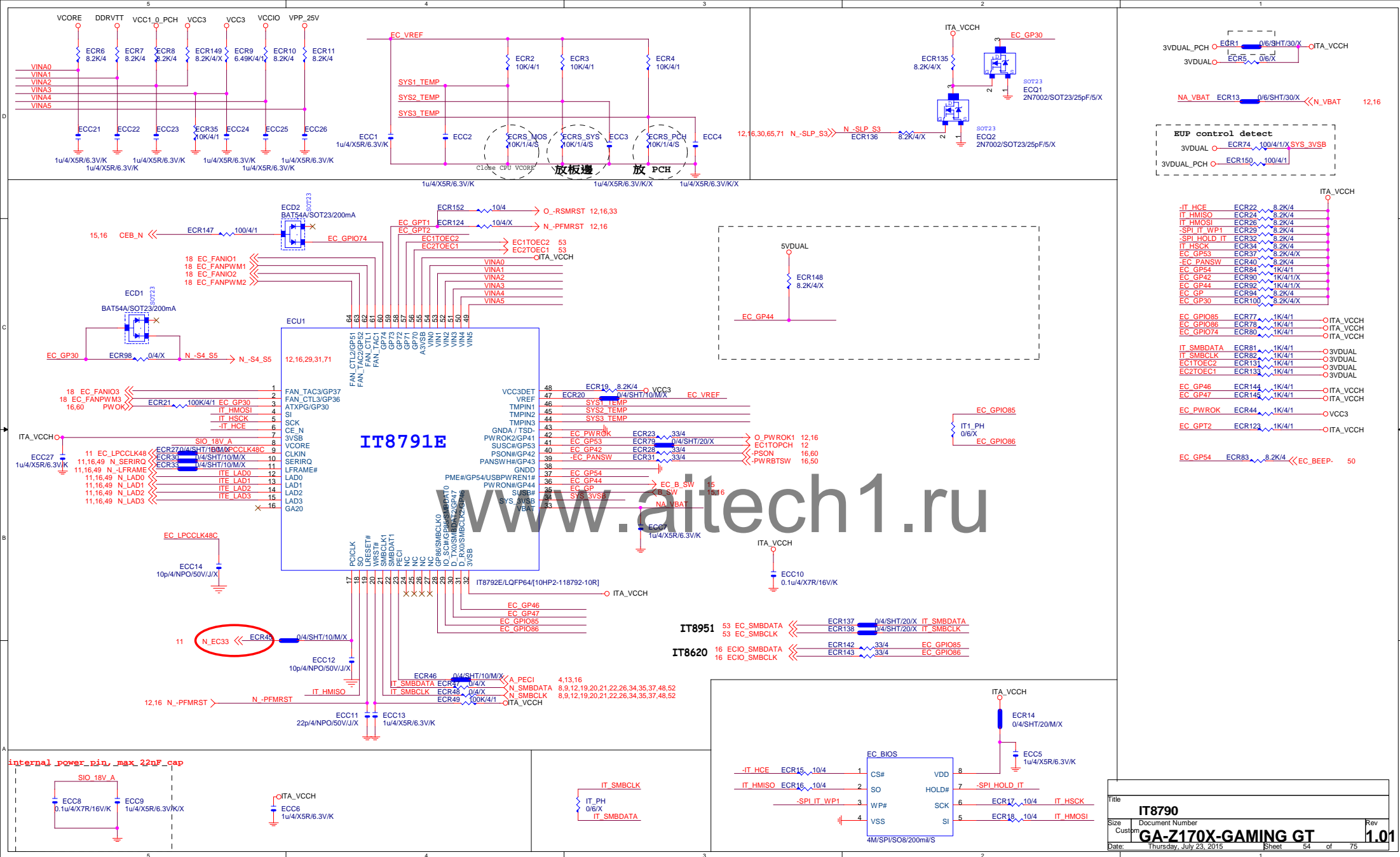
TO USB30_LAN2



3VDUAL_LAN << 3VDUAL_USB3_A
3VDUAL_USB3_A SHARE WITH 3VDUAL_LAN

FORCE IT8951 CODE BACKUP

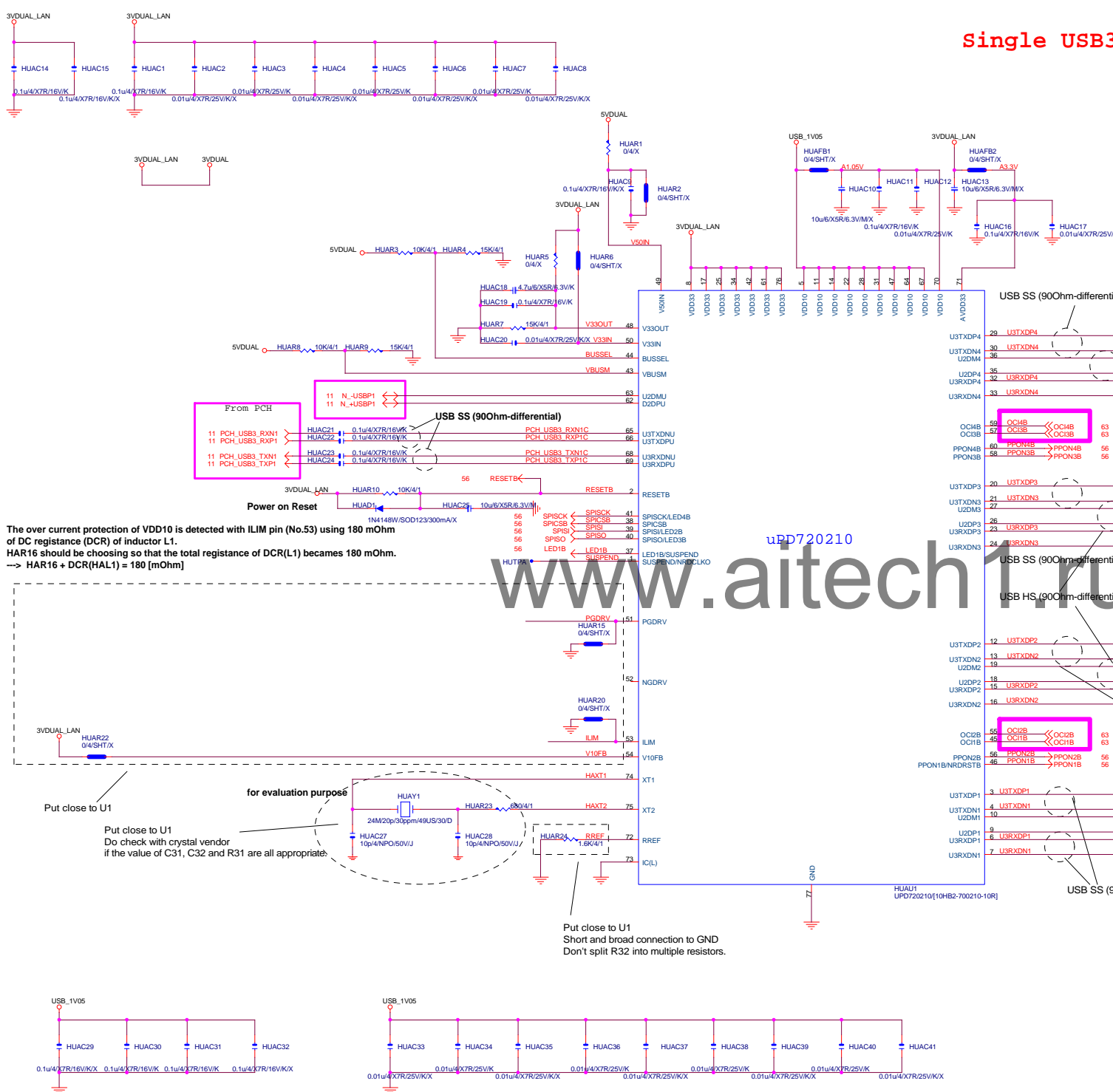
Default 2-3 short
ITB_PH2 << ECB_GPIO2
PH1*2/BK2.54/A/D



Single USB HUB used

Rev 0.3

Link to Connectors and OC circuits



uPD720210

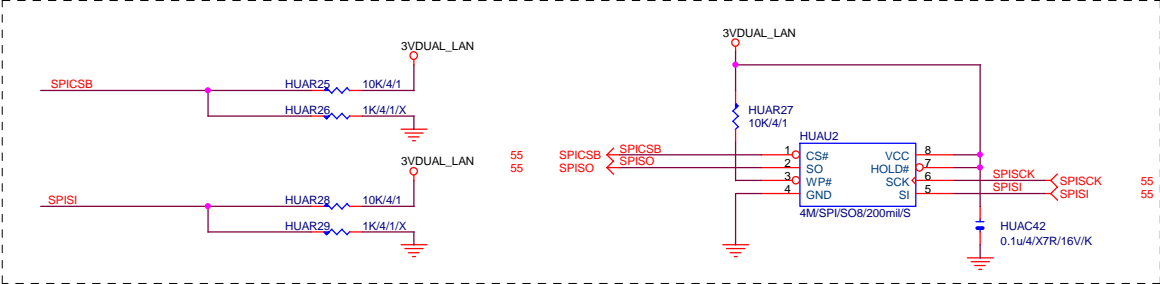
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F_USB30_1

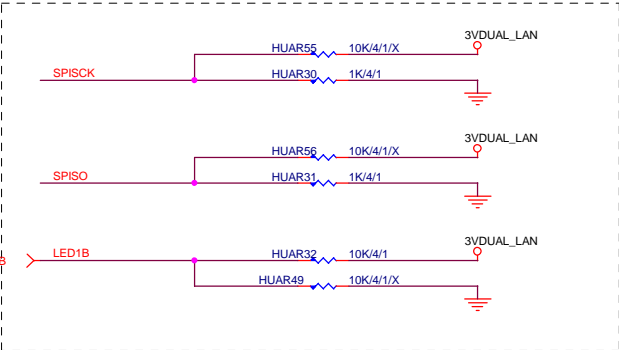
F_USB30_2

Single USB3 HUB used

External SPI ROM ; SPI ROM attached mode

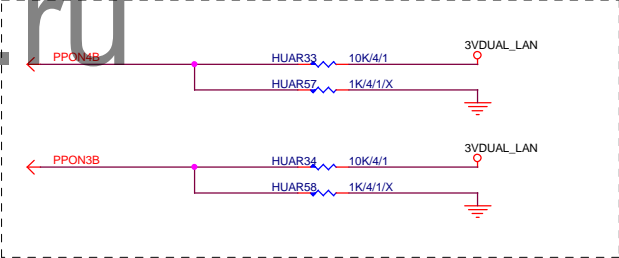


Battery Charging

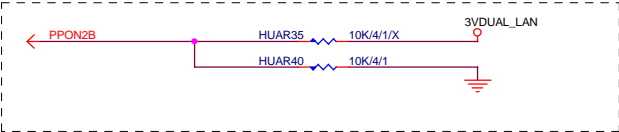


Number of Ports ; 4Ports mode

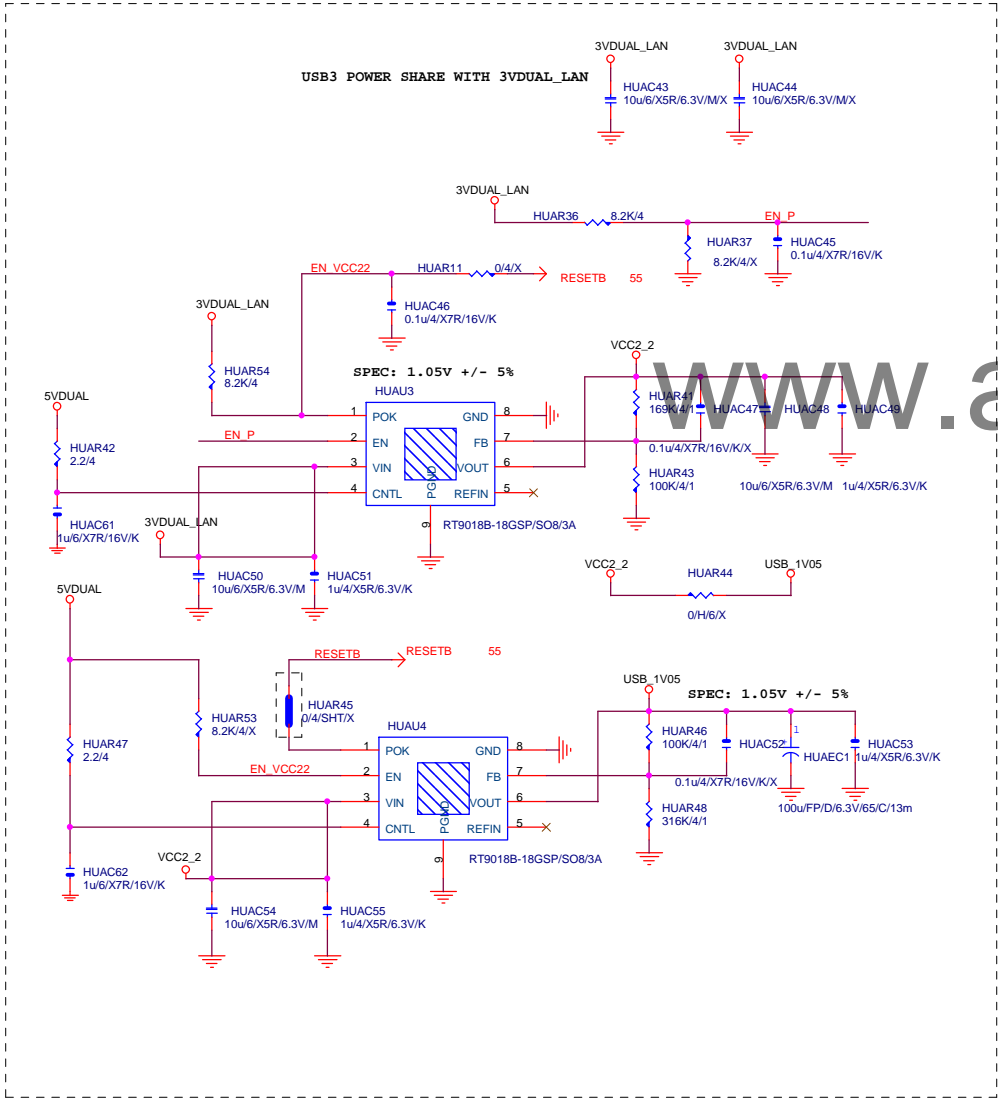
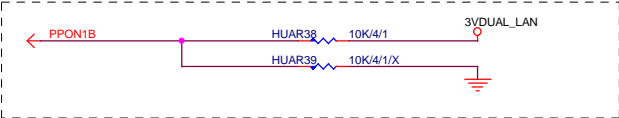
PPON3B / PPN4B : H / H (4 port)
PPON3B / PPN4B : L / L (2 port)

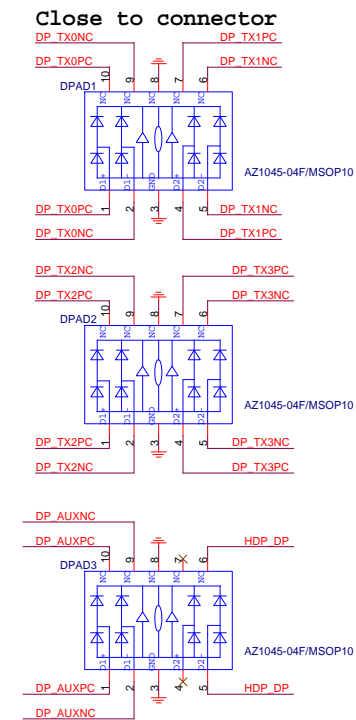
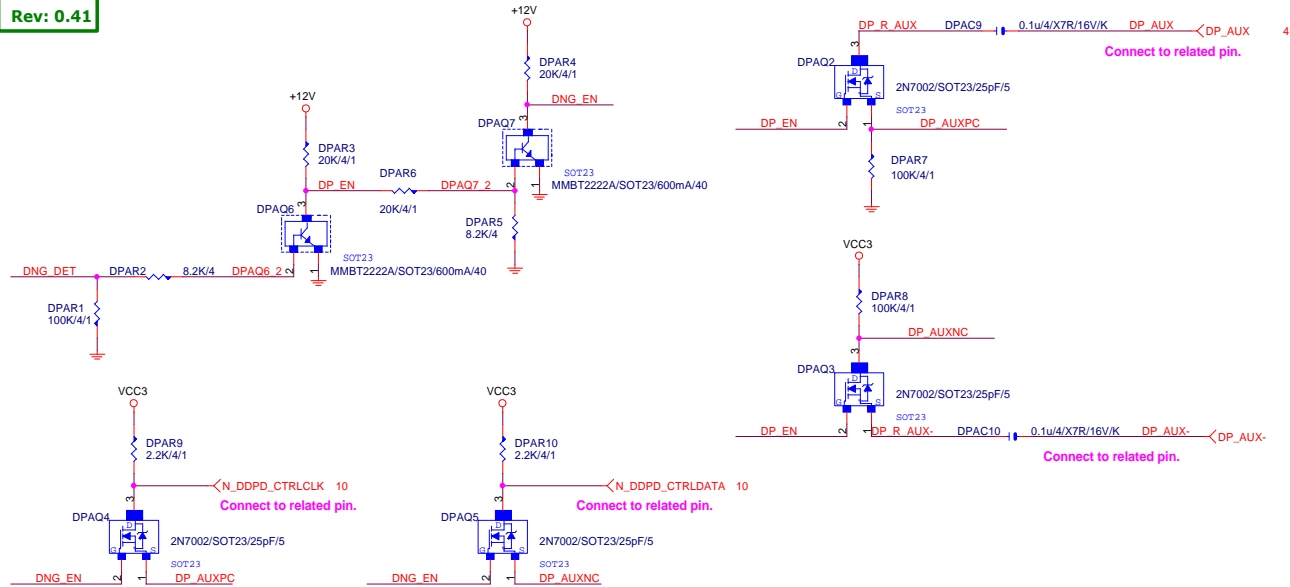


#5 VBUS Power Control ; Individual mode



PPON1B Pin Function ; Port1 PPONB mode

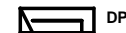
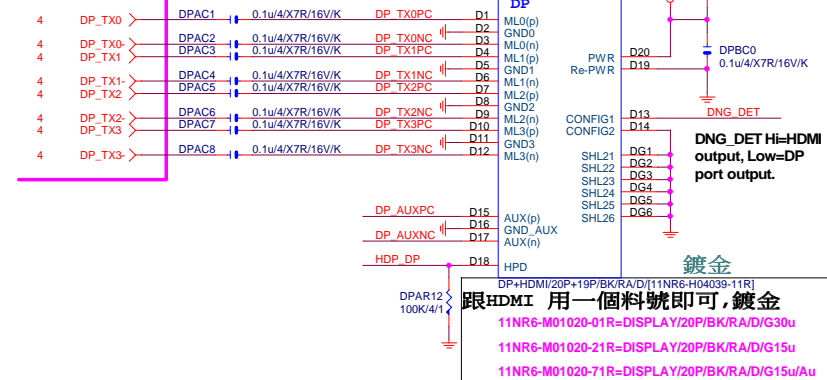




SINGLE Display Port

Display Port with HDMI, or HDMI only.

NET FROM CPU 可變

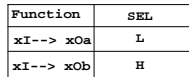
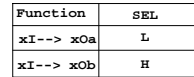
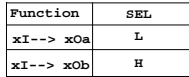


DP

GIGABYTE Technology

DP PORT

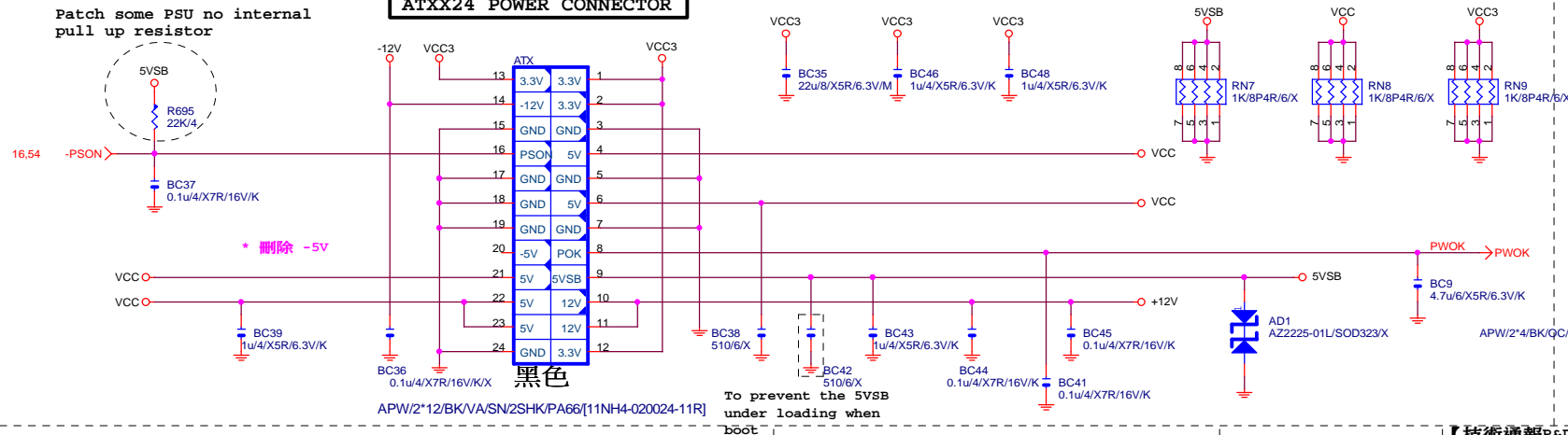
Title	Document Number	Rev
Size	GA-Z170X-GAMING GT	1.01
Date:	Thursday, July 23, 2015	Sheet 57 of 75



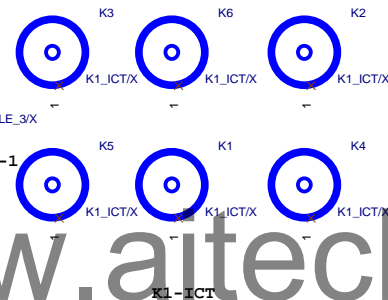
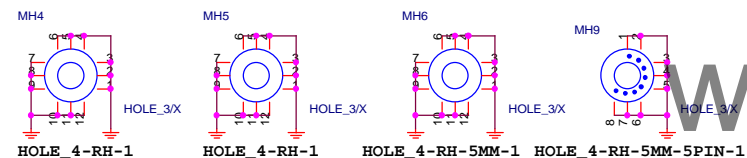
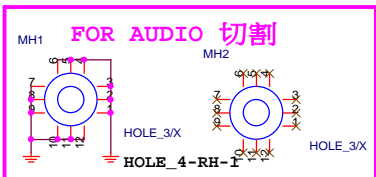
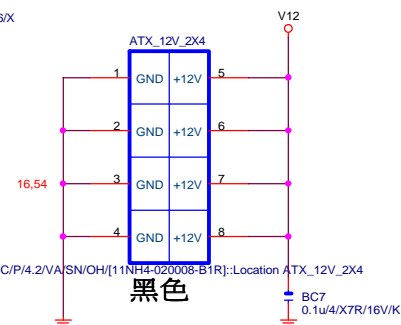
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Patch some PSU no internal pull up resistor

ATXX24 POWER CONNECTOR

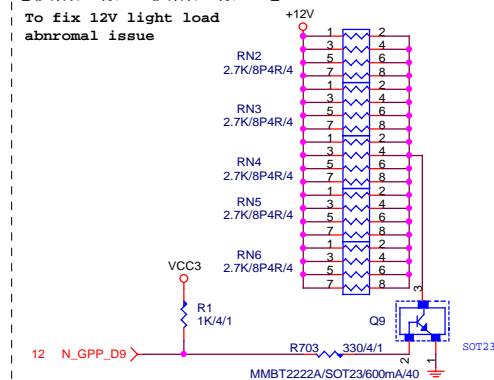


ATXX4 POWER CONNECTOR



【技術通報R&D技術通報153】

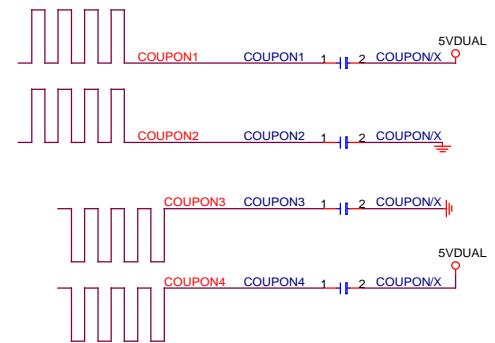
To fix 12V light load abnormal issue



-PROHOT

OTP:132度 / PCB THERMAL TRIP:122 度

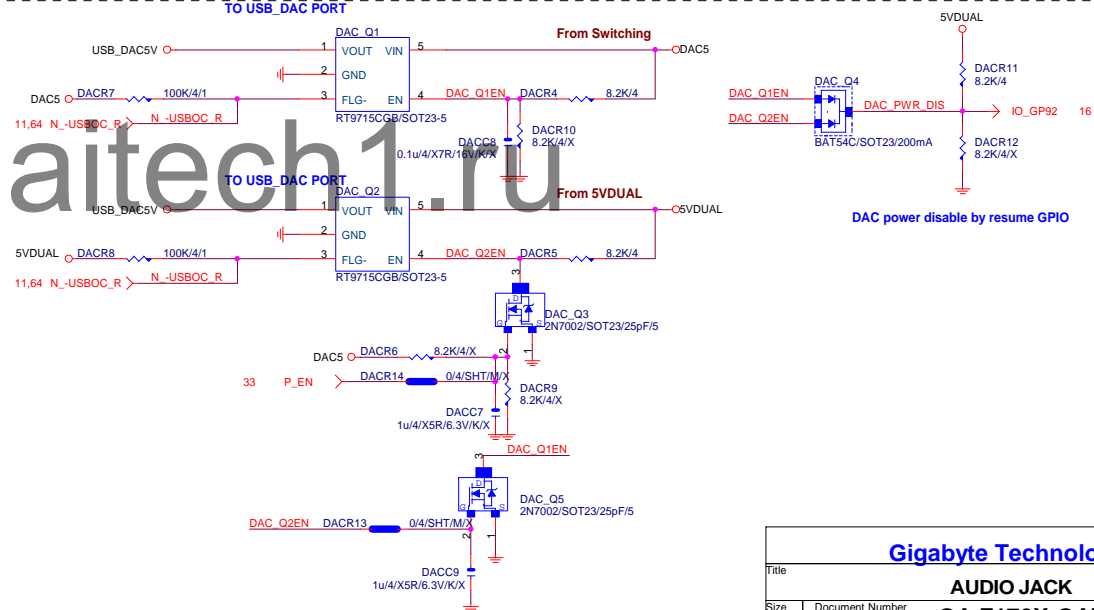
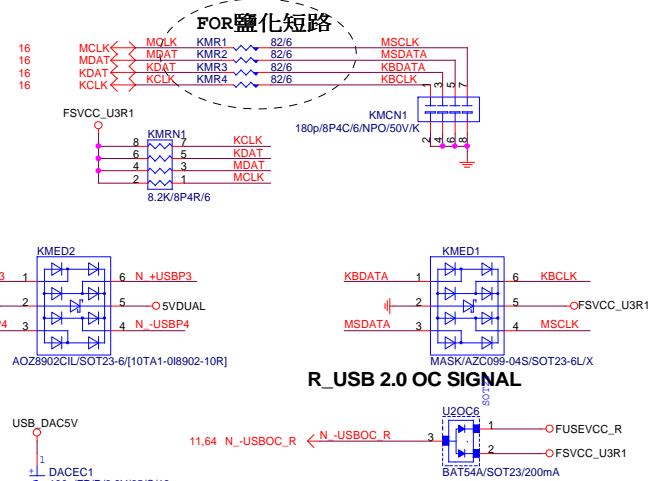
-PROHOT * 保留 ?



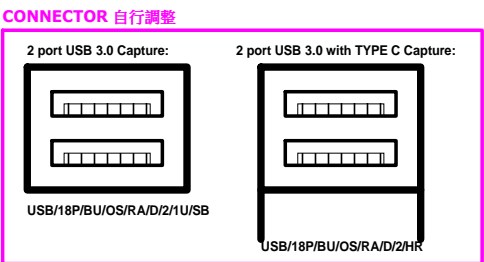
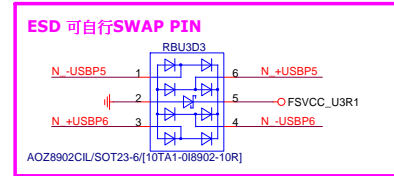
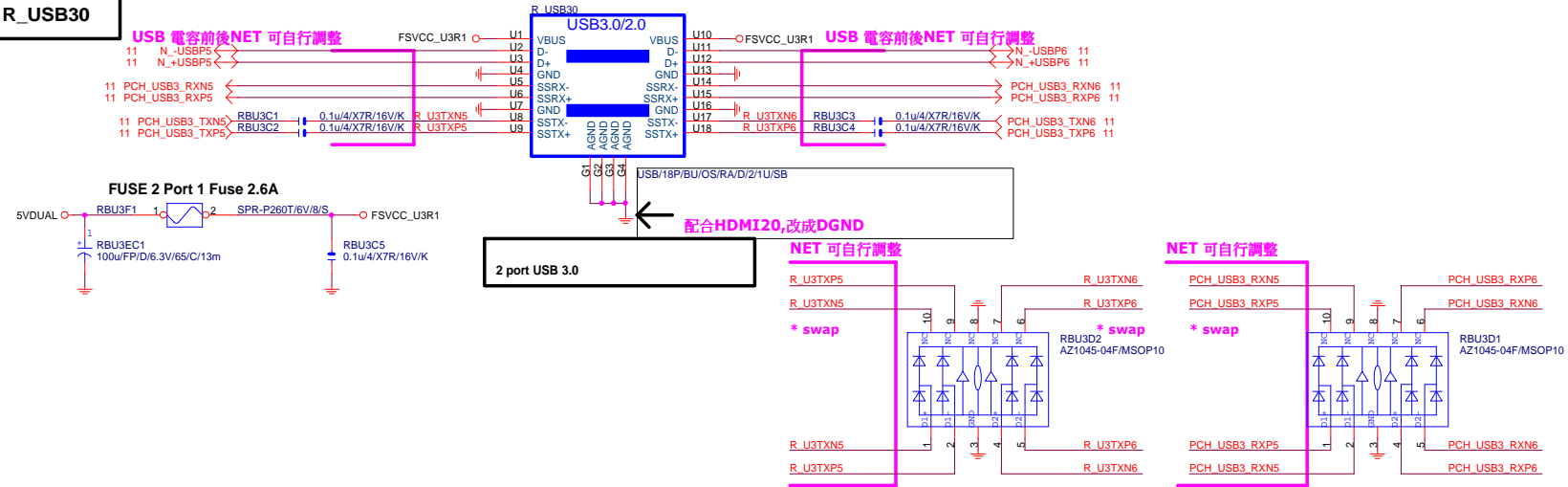
Gigabyte Technology

Title			
ATX POWER CONNECTOR			
Size	Document Number	Rev	
Custom	GA-Z170X-GAMING G1	1.01	
Date:	Thursday, July 23, 2015	Sheet	60 of 75

CLOSE VCCGT PWM UPPER MOSFET

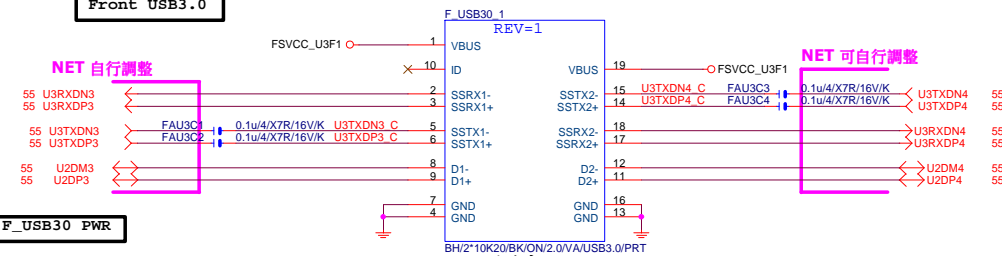


R_USB30

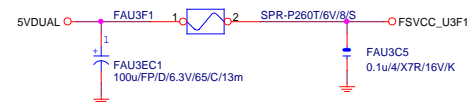


Gigabyte Technology			
Title		KB_MS_USB3, R_USB30	
Size	Document Number	GA-Z170X-GAMING GT	
Custom		1.01	
Date:	Thursday, July 23, 2015	Sheet	62 of 75

Front USB3.0

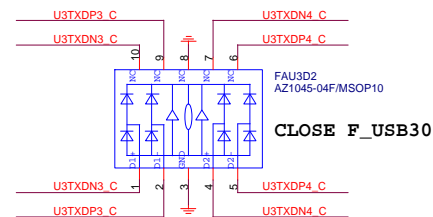
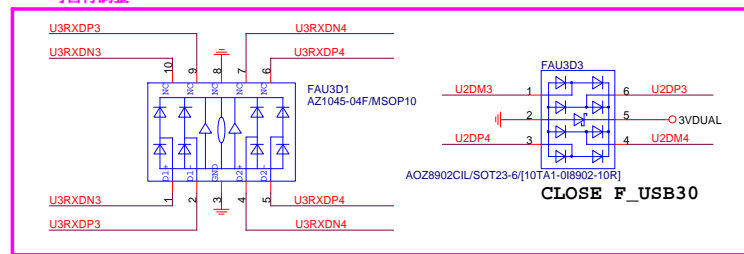


F_USB30_PWR

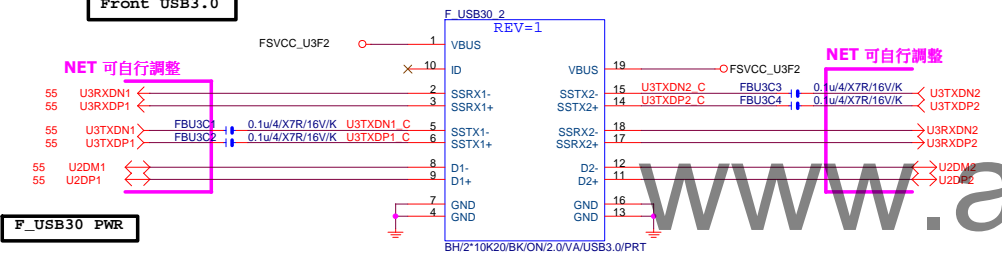


黑色

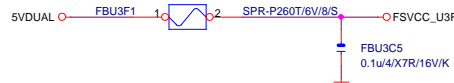
NET 可自行調整



Front USB3.0

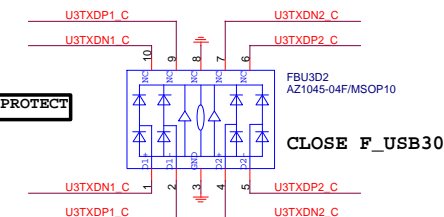
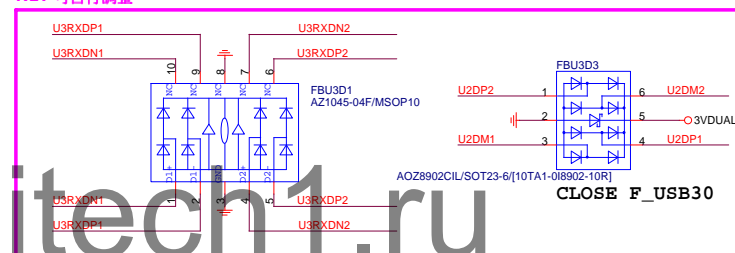


F_USB30_PWR



黑色

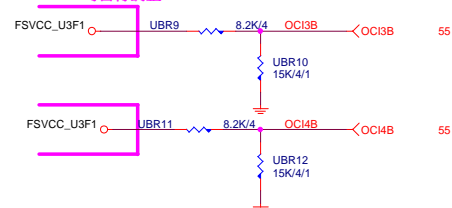
NET 可自行調整



F_USB POWER PROTECT

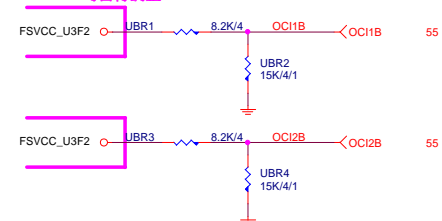
-USBOC_F

POWER 可自行調整



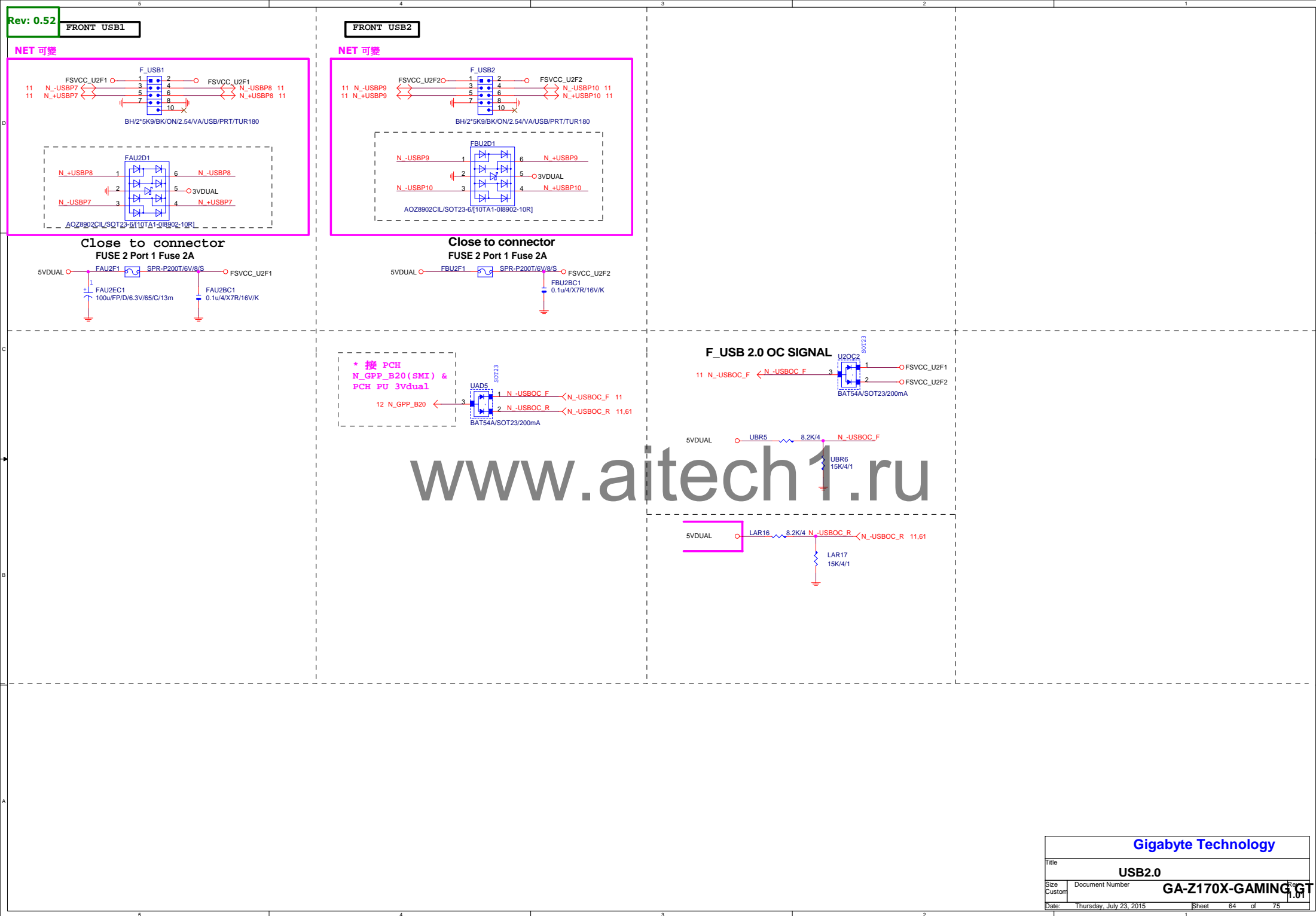
-USBOC_R

POWER 可自行調整



Gigabyte Technology

Title		R_USB30,F_USB30, USB_OC	
Size	Custom	Document Number	GA-Z170X-GAMING
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Gigabyte Technology

USB2.0

Title

Size

Custom

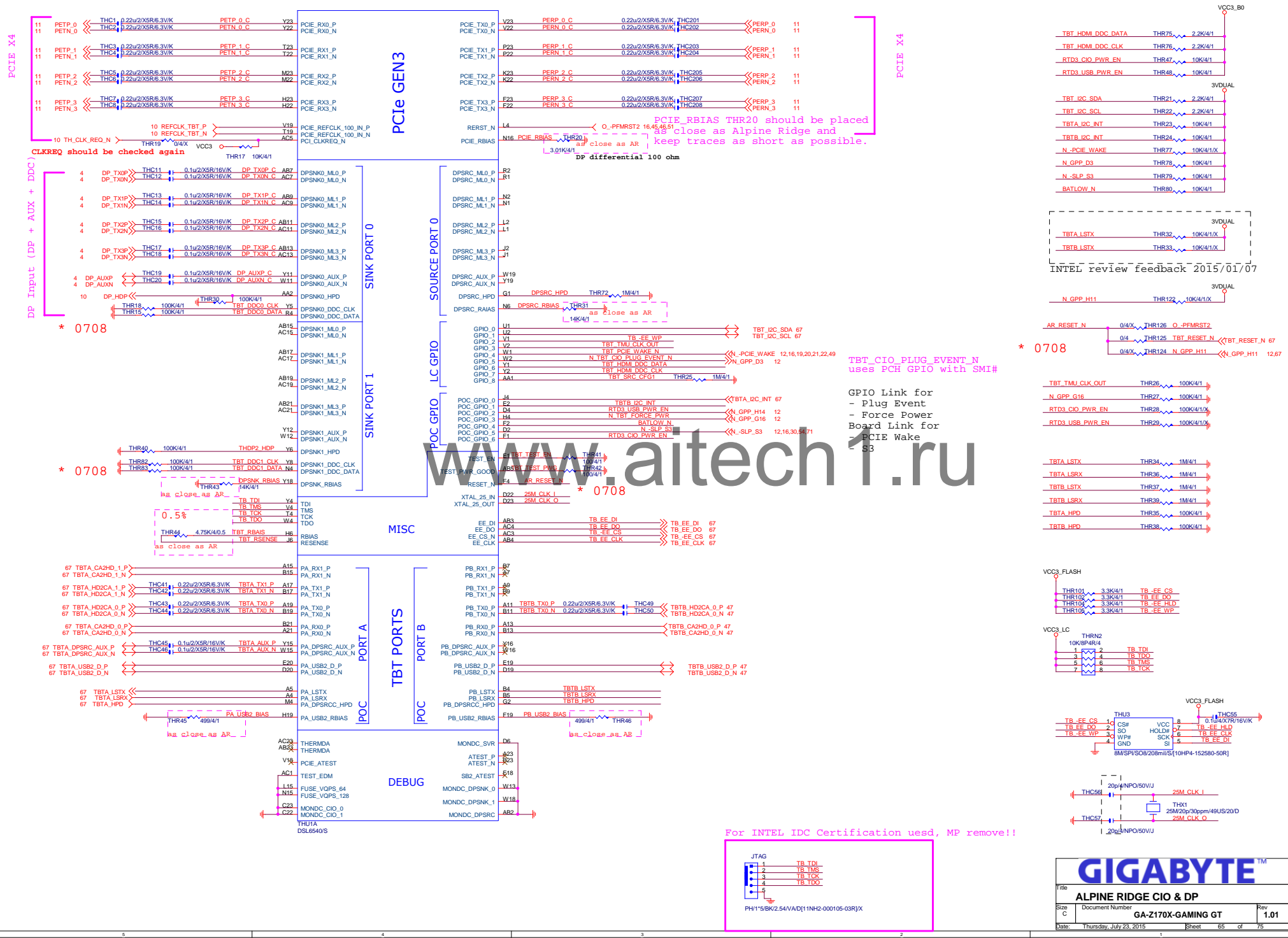
Date:

Document Number

Thursday, July 23, 2015

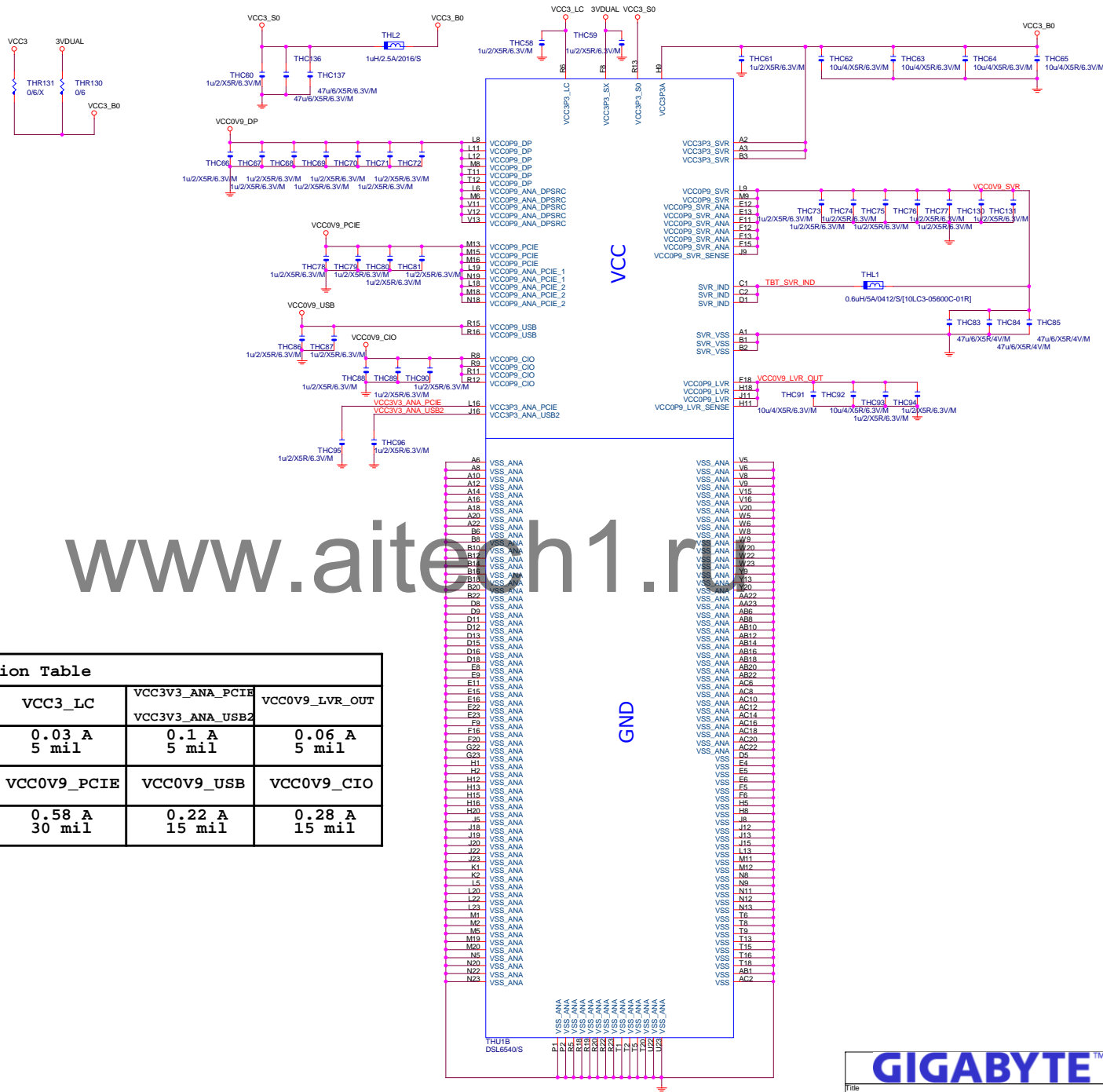
GA-Z170X-GAMING

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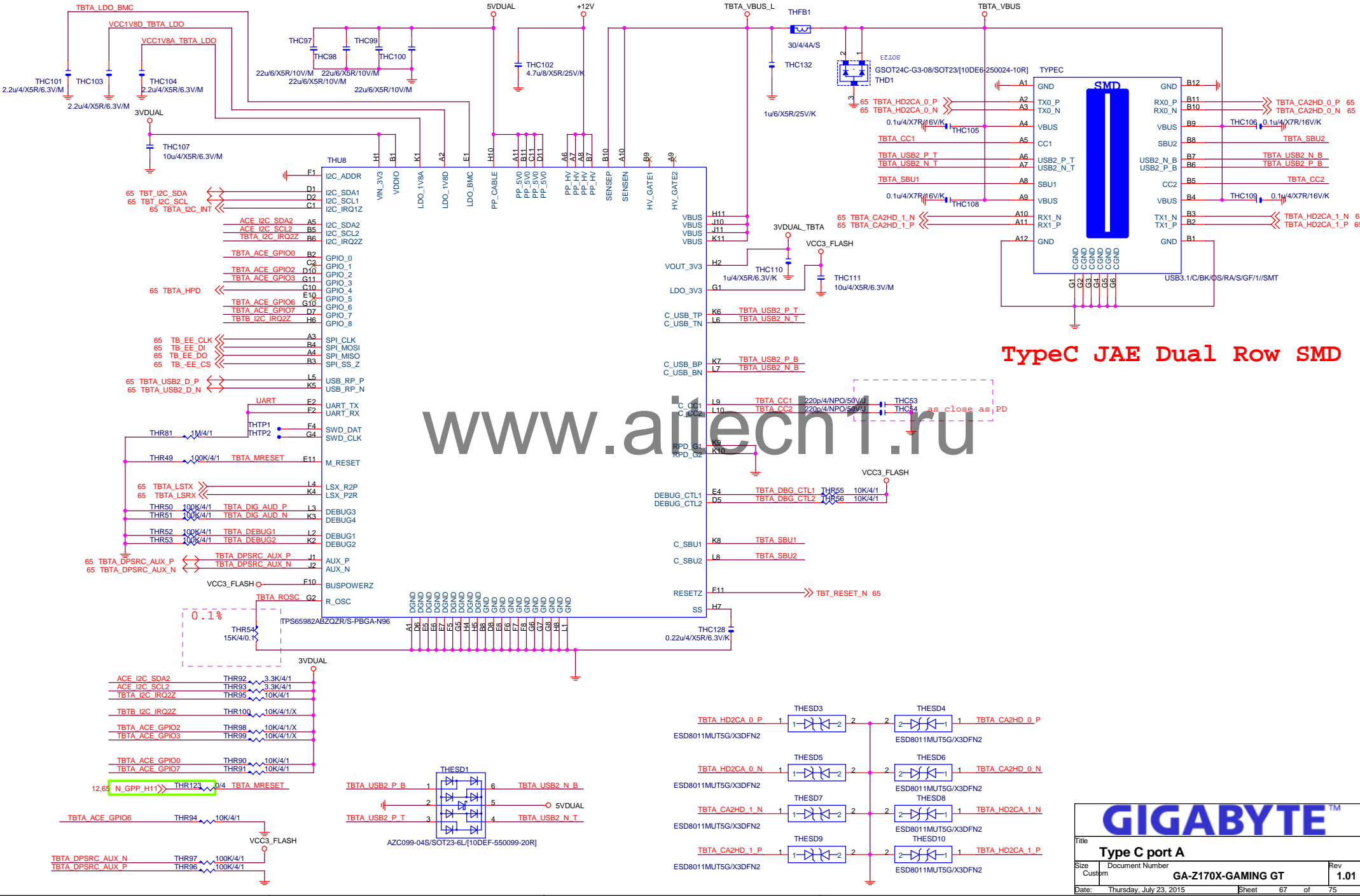


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For INTEL IDC Certification used, MP remove!!




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



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Title			
TBT _ HDMI 2.0			
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3顆SW IC,

當使用M.2 (X2),
SATA EXPRESS只可限定使用
S0&S1

ABC的切換方式:

下下下 : SE1+SE0

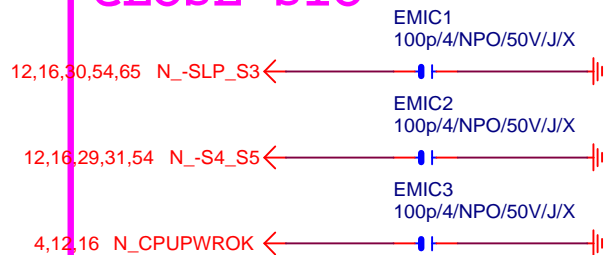
上上上 : M.2 X4

下上上 : M.2x2 + SE S0/S1

下下下上 : M.2 X1 + SE
S0/S1/S2

Title			
BLOCK DIAGRAM			
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	3	2	1

CLOSE SIO



CLOSE PCH



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GIGABYTE™

Title

EMI/ESD

Size
A

Document Number

GA-Z170X-GAMING GT

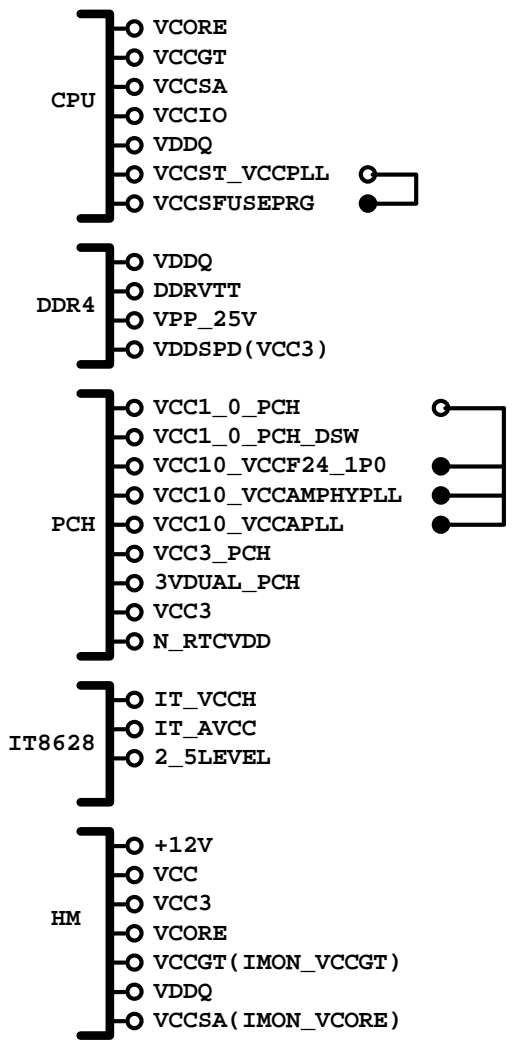
Rev

1.01

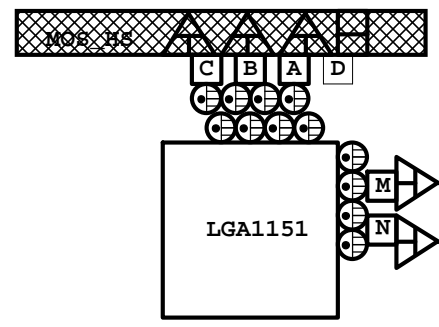
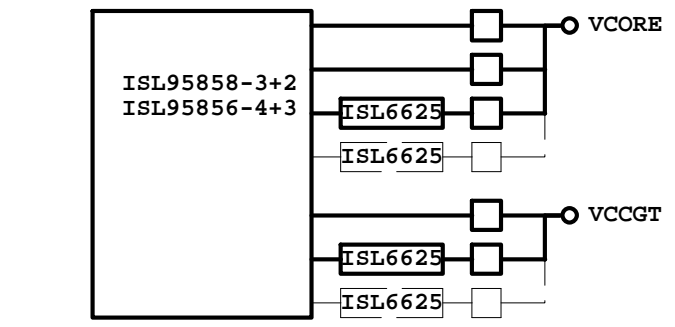
Date: Thursday, July 23, 2015

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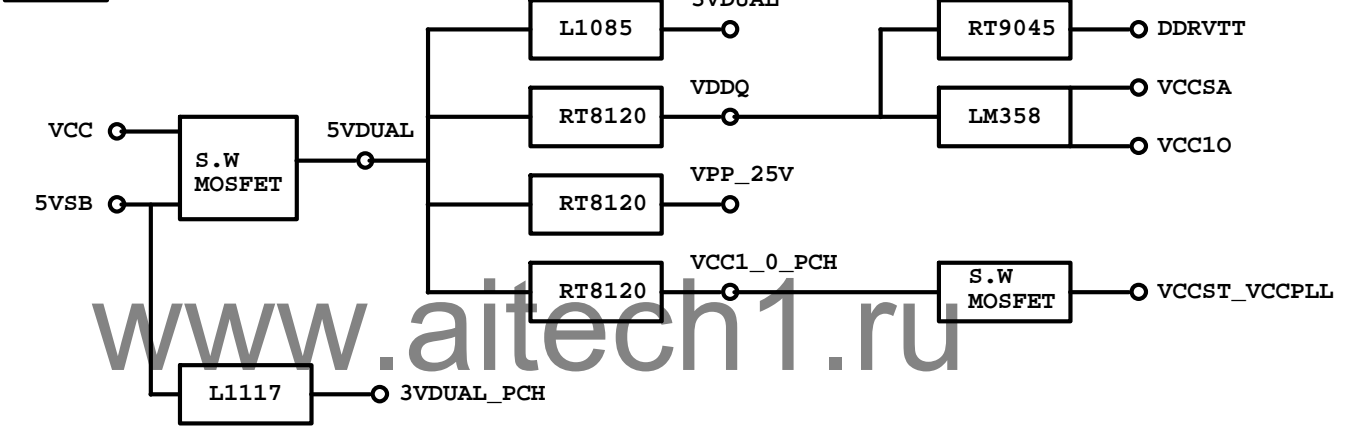
POWER BLOCK MAP



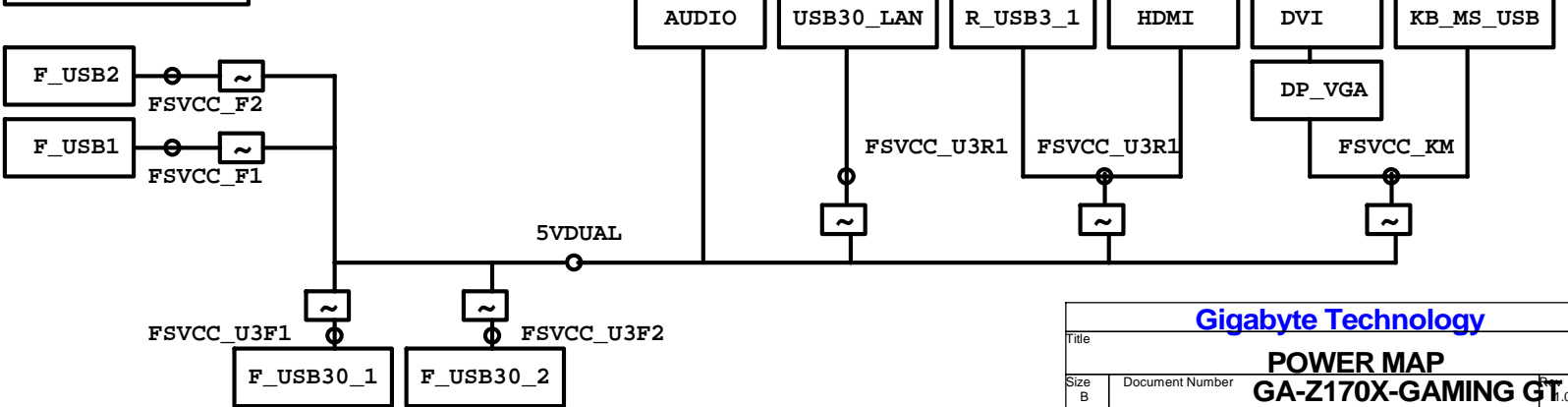
VCORE/VCCGT



POWER



FUSE POWER F/R



固態電容料號.請自行修改

日系黑色固態	Capture Value
11C02-C85600-01R	560u/FP/D/6.3V/68/C/8m
11C05-C82700-01R	270u/FP/D/16V/88/C/12m
11C05-C61000-01R	100u/OS/D/16V/66/C/30m
11C02-C51000-01R	100u/FP/D/6.3V/65/C/13m

日系一般固態	Capture Value
11CO2-685600-01R	560u/FP/D/6.3V/68/8m
11CO5-882700-01R	270u/FP/D/16V/88/12m
11CO5-661000-03R	100u/OS/D/16V/66/30m
11CO2-651000-02R	100u/OS/D/6.3V/66/30m

台系固態	Capture Value
11CO2-661000-09R	100u/OS/D/6.3V/66/A/35m
11CO5-691000-09R	100u/OS/D/16V/69/A/35m
11CO5-8C2700-09R	270u/FP/D/16V/8C/A/10m
11CO2-695600-09R	560u/FP/D/6.3V/69/A/11m

IRON CHOKE

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

Skylake Iron Choke閃電P導入機種如下：

- [1] Z170/H170 機種全部導入
- [2] B150/H110Gaming機種導入，其餘不導入

Ferrite

	料號	Capture Value	SIZE	Footprint
DIP	11LC5-F3500C-11R	0.5uH/32A/INCG109/FSI/D	10*10	CHOKE05U-40A-1PQ-3
DIP	11LC5-F2500C-11R	0.5uH/25A/INC0809/F/D	8*8	CHOKE1U-R50M-IF
SMD	10LC5-F4300C-01R	0.3uH/40A/SIUC/FR/S	10*7	CHOKE11X8MM-SMD

BEAD


	料號	Capture Value	SIZE	Footprint
DIP	10LFB-15470A-01R	47/4030/15A/S	4*3	BEADC8B-BPH_SMD

PWM料號

		料號	Capture Value	Footprint
PWM	ISL95856	10TA1-695856-01R		IC52QFN-6x6-G
PWM	ISL95858	10TA1-695858-01R		IC52QFN-6x6-G
PWM	IR35201	10TA1-635201-00R		IC56QFN-9VRS4339
PWM	IR3570	10TA1-603570-00R		IC40MLFP-ISL95835
PWM	RT8237C/D	10TA1-608237-01R		IC10DFN-NIS5132

REGULATOR

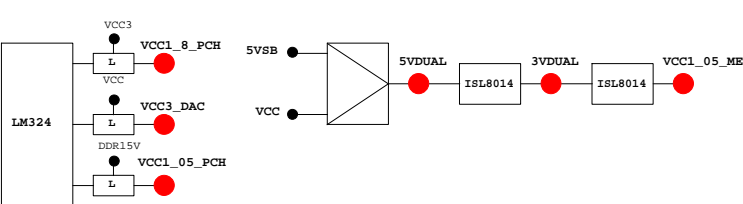
		料號	Capture Value	Footprint
	NCT3103S	10GL2-203103-01R	NCT3103S/SOP8/2A	IC8-EPSONIC

			
Title			
RT8120_DDR4 POWER			
Size	Document Number	Rev	
Custom	GA-Z170X-GAMING GT	1.01	
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2		1	

PIN	NAME	PWR	AFTER S4728	Default	USAGE	NOTE
GP0	MAIN	H-Z	GPI	GPIO0		N/A
GP1/TACH1	MAIN		GPI	GPIO1		N/A
GP2/PIRQE#	MAIN		GPI	-PIRQE		P/U 8.2K VCC3
GP3/PIRQF#	MAIN		GPI	-PIRQF		P/U 8.2K VCC3
GP4/PIRQG#	MAIN		GPI	-PIRQG		P/U 8.2K VCC3
GP5/PIRQH#	MAIN		GPI	-PIRQH		P/U 8.2K VCC3
GP6/TACH2	MAIN		GPI	PCIEX1 Detect		P/U 8.2K VCC3
GP7/TACH3	MAIN		GPI	GPIO7		P/U 8.2K VCC3
GP8	STBY	H	GPI	GPIO8		N/A
GP9/OC5#	STBY		NATIVE	USB OC5#		N/A
GP10/OC6#	STBY		NATIVE	USB OC6#		N/A
GP11/SMBALERT#	STBY		NATIVE	USB PWR protect		P/U 8.2K 3VDUAL
GP12	STBY	L	GPI	GPIO12		N/A
GP13	STBY	L	GPI	LPCPM#		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

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#CIRRX1/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/BUGSIO	NB_LED3_C	
GP22/SCK	LOW_PWR_1	
VIDO5/GP27/SIN2	LOW_PWR_2	
PCIRST2#/GP11	-PFMRST1	
PCIRST1#/GP12	-PFMRST2	
3VSB5W#/GP40	CSI_F0	BSEL166_1
SUSC#/GP53	CSI_F1	BSEL166_2
GP23/SI	BSEL166_3/CISISBSL	
VIDO0/GP20/CTS2#	CPUT_LED1_C	BSEL166_4
GP65/VDDA_EN/GB_01	MB_ID2	
PD6/GP76/BUSSO1	MB_ID3	
PD7/GP77/BUSSO2	MB_ID4	
AFD#/GP86/SMBC_R	⚡ PIN	FST_2X8
INIT#/GP85/SMBD_M	SEC_2x8	GTLREF_AD2
ACK#/GP83	DDR_LED1_C	
VIDO1/GP21/DCD2#	DDR_LED2_C	
STB#/GP87/SMBC_M	DDR_LED3_C	
PWRON#GP44	VCORE_OV1	
PANSWH#/GP43	PWRBTSW	
KDAT/GP61	-PWRBTSW	
KCLK/GP60	KDAT	
MDAT/GP57	KCLK	
MACL/GP56	MDAT	
GP66/VLDT_EN/GB_02	NBT_LED1_C	MCLK
SVD/PCIRSTIN#/CIRTX/GP15	PWM2_CR	
KDAT/GP61	PWM2_CR	
GP67/CPU_PG/GB_03	EN_LOADLINE	IT_GP67/-EN_PWM2
SLIN#/GP84/SMBD_R	-EN_PWM2	
PSI_L/FAN_CLT5/CIRRX2/GP16	-THERM	
VIDO4/GP26/SOUT2	DDR18V_PH2_EN	
VIDO2/FAN_TAC5/GP24/DSR2#	DDR18V_LED	
VIDO6/GP17/RI2#	1_1V_PH_EN	
VIDO7/JP6/DTR2#	JP6	
PD5/GP75/BUSSO0	SB_LED3_C	

[illegible]

散熱模組料號:

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 Termination
VREF_CA_A/VREF_CA_B	DRAM Address Ref
VREF_DQ_A/VREF_DQ_B	DRAM Data Ref

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

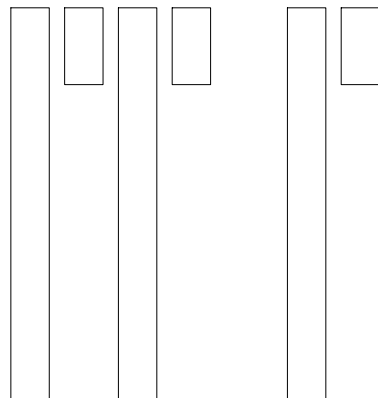
	3 pin FAN control	4 pin FAN control	FAN speed	Controller
CPU FAN	FANPWM1	FANPWM3	FANIO1	IT8720
	ICH_FAN_PWM2	ICH_FAN_PWM0	ICH_FAN_TACH0	PCH
SYS FAN	FANPWM2	N/A	FANIO2	IT8720
	ICH_FAN_PWM1	N/A	ICH_FAN_TACH1	PCH
PWR FAN	N/A	N/A	FANIO3	IT8720
			ICH_FAN_TACH2	PCH

REAR IO

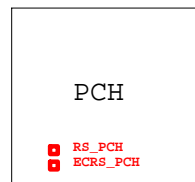
RS_SYS

F_AUDIO

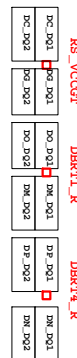
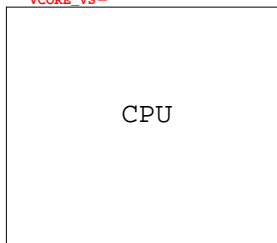
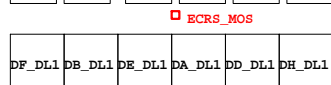
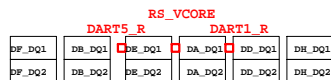
AUDIO



SIO



SATA_EXPRESS



DDR_VS
DDR OUTPUT CAP



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