

SHEET

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09	DDR4 CHANNEL B 1,2
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31	RT8120_VPP

SHEET


TITLE

32	RT8120_PCH
33	DISCRETE POWER
34	NCT3933
35	ATX POWER , A_-PROCHOT
36	KB_MS_USB
37	NA
38	F_USB30
39	F_USB20
40	R_USB30
41	ALC1150
42	REAR AUDIO JACK
43	Audio Power
44	NA
45	KILLER E2201
46	USB30_LAN CONNECTOR-E2201
47	NA
48	IDT6V41510_CLK BUFFER
49	COM , TPM , THB , OC
50	F_PANEL
51	DVI CONN
52	N/A
53	N/A
54	N/A
55,56	PTN3356 - DP to VGA
57	EMI-ESD
58	POWER MAP
59	NA
60	TABLE LIST
61	NTC MAP
62,63	ALPINE RIDGE
64	HD3SS3212&TUSB321_A
65	HDMI CONN
66	POWER零件使用表

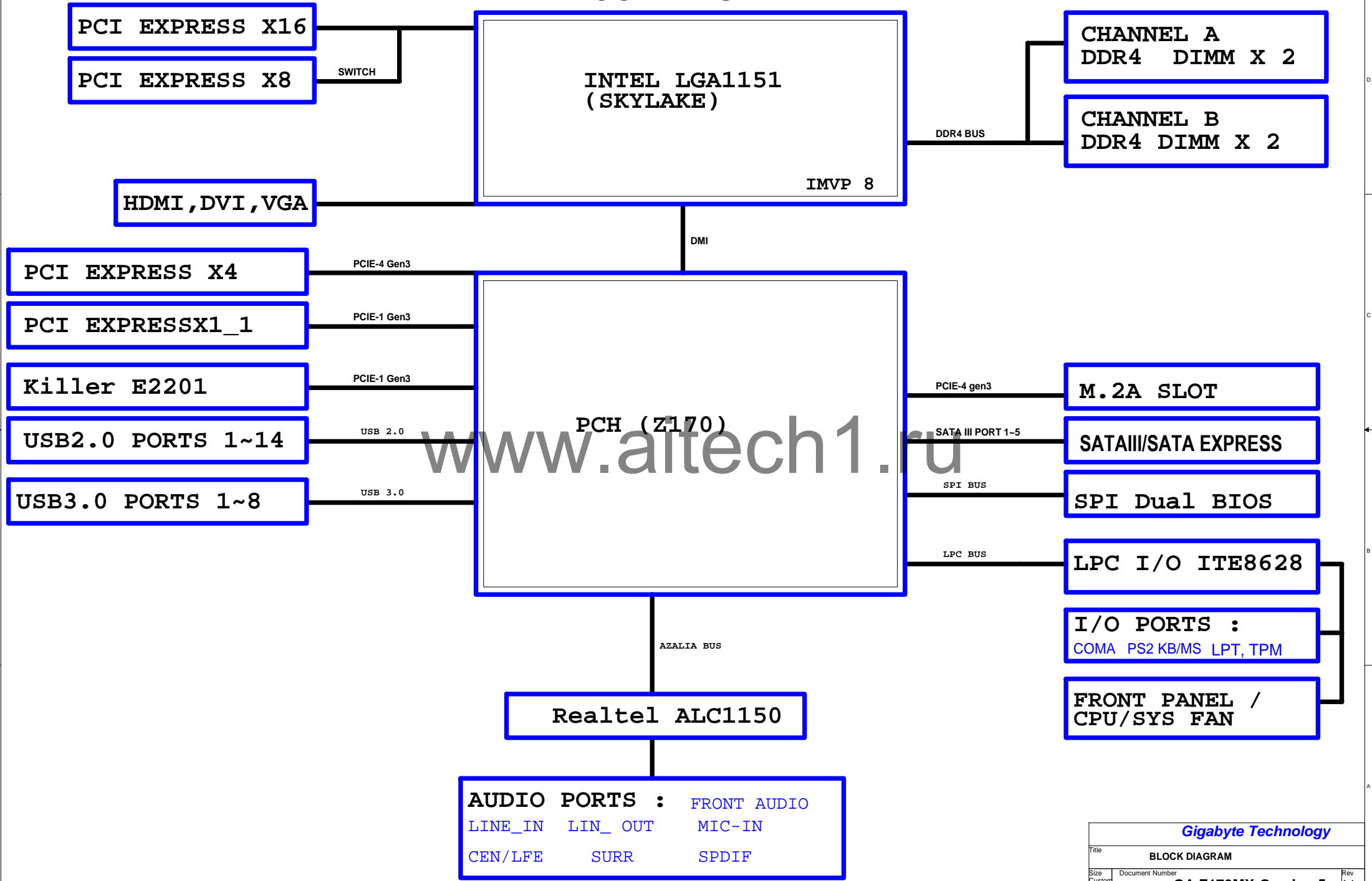
Component value change history

[illegible]

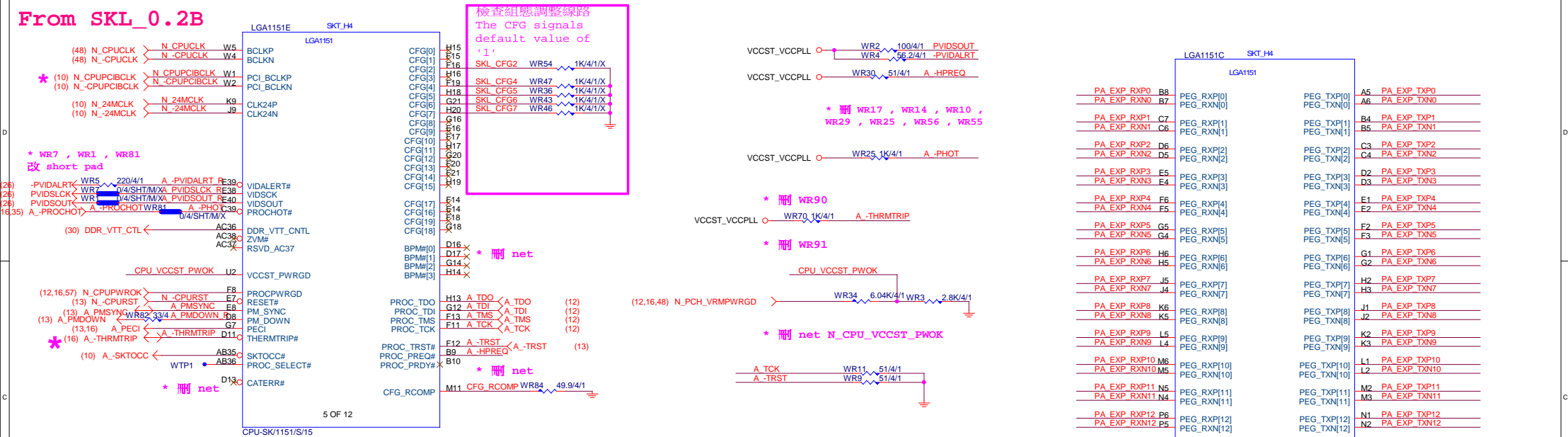
DATE	Change Item	Reason
2015/03/05 PCB:0.1	1.PCB first release 2.線路由GA-Z1704-GAMING 7-01B.DSN來修改	
2015/01/26 PCB:0.2	1. 移除 BOM:SEAR22,SECR22,SEDR20 2. MR22兩端走線50mils以上 (參考G7修改)	
2015/03/11 PCB:0.1	1.線路由Z1704X-GAMING 5-02.DSN來修改(0311) Z1704MX-Gaming 5 Rev 0.1 Layout request 1.由Z1704X-Gaming 5 Rev 0.1 來修改 2.CPU power由4+4 Hybrid digital+ 3 Hybrid digital 改為4 Hybrid digital (兩側分開擺90度)+ 3 Hybrid digital 3.PCIE由x4(CPU)+x8+x16改為1x16 / 2x8 4.PCIEx1由3個slot改為一個 5.Remove M.2B 6.Remove Intel i219V PHY 7.PCB改為mATX 244x244 or smaller 8.Remove 80 port 9.OC Turbo button改為onboard 4 pin header 10.Remove ECO button (power saving) 11.Add NXP DP-VGA	GA-Z170MX-Gaming 5 Rev 0.1
2015/05/20 PCB:0.2	1.A.R. PCH PCIE訊號統一改為PCIE1&PCIE2 2.F_USB30_2改接USB30_9&USB30_10 3.PCH_HS改為BGAHSINK-170M-D3H 4.MOS_HS改為MOSHESINK-Z170X-D3H 5.Add OR100 close to SIO 6.FNR5改為FUSE-0603-SHORT10 7.PCIE4改為PCIESLOT-64STH-1 8.M.2 螺絲孔文字改加"A" 9.Add VPP_25V 4顆電容 10.PCH power改+12V&5VDUAL INPUT 11.Q21改0 OHM SHORT PAD 12.ADD DVR21 CLOSE TO DVC14 13.TYPEC_1改為TYPEC 14.Update A.R. 最新線路 15.NX1 24MHz CRYSTAL請參考最新Layout方式 16.TCA_ESD11的pin 1請標△極性標示 17.VCORE_VS放在CPU下方 18.刪除WR100,WR101,NR300,NR301,NR302NR303,WR102,WR103 19.Remove LED_CON1 線路 20.Audio update a. CR44 update footprint "R0603-RH-SHORT30-MASK" b. MOATRL1/2/3/4 update footprint "R0402-2-SHORT20-MASK" 21.PCH Crystal 線路新增NR3 22.TYPEC 改為Ti solution(參考Z170XP-SLI Rev 0.2) 23.Remove RAU3EC1, LAEC1放在原來RAU3EC1的位置 24.TPM remove PIN 13&14 GPIO 25.Add OR171 26.HDMI改為CPU訓號+level shift 27.Add MA_DR9 close to MA_DQ2 or MA_DQ3 28.Add MA_DR10 close to MA_DC10 or MA_DR8 29.Add NPC10 close to NPL2 30.Add DFC3 close to CPU 31.Delete MR22,VDDSPD change to VPP_25V 32.WR94改為0 ohm	GA-Z170MX-Gaming 5 Rev 0.2
2015/07/29	1. BIOS_PH change to MASK	GA-Z170MX-Gaming 5 Rev 1.0
2016/05/25	1. 文字面改Rev 1.1	GA-Z170MX-Gaming 5 Rev 1.1

			
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BOM & PCB MODIFY HISTORY			
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BLOCK DIAGRAM




From SKL_0.2B

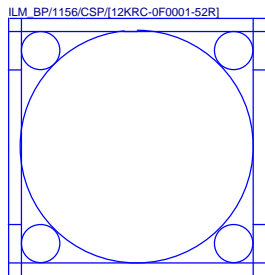


```
G-15u : (CPU-SK/1151/S/15)
10SC1-F01151-11R / 10SC1-F01151-12R
G-FL : (CPU-SK/1151/S/GF)
10SC1-F01151-21R / 10SC1-F01151-22R
```

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

			
Title			
CPU LGA1151-A			
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* 改DDR4 net



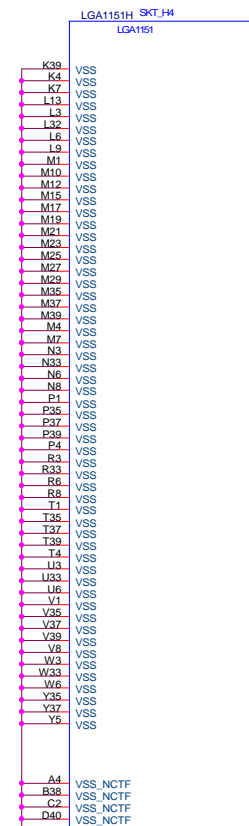
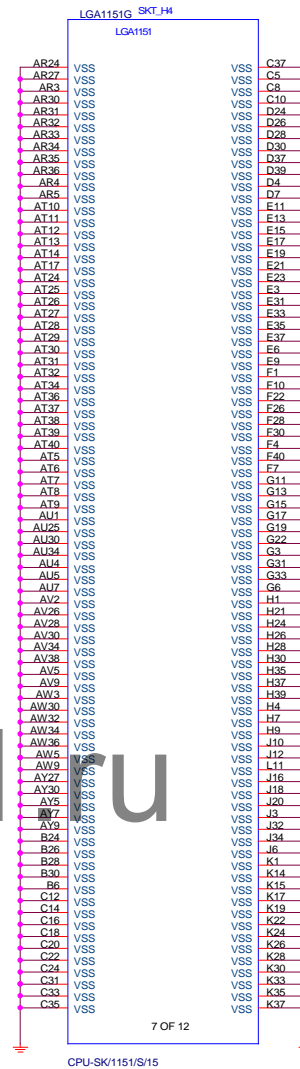
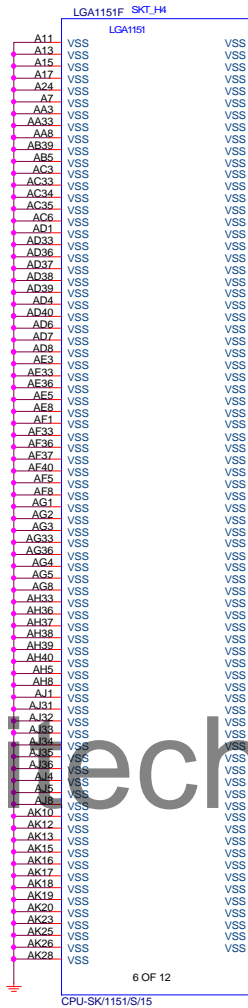
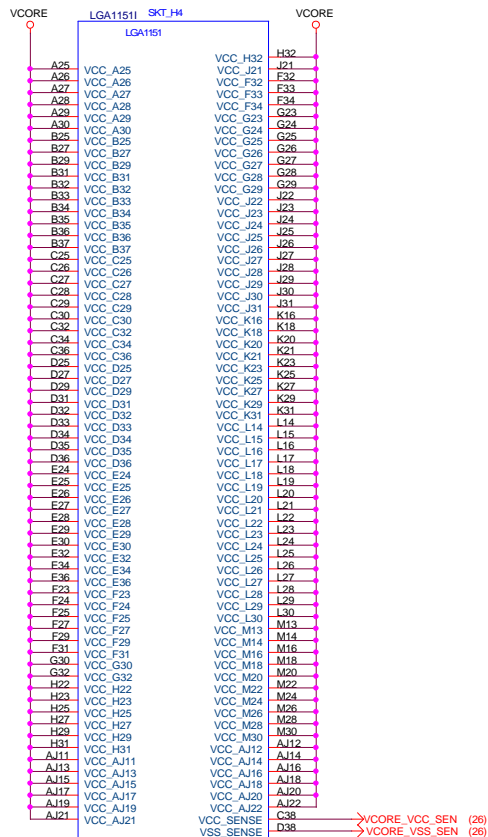
- (8) MODT_A[0..3] ↔ MODT_A10..31
- (9) MODT_B[0..3] ↔ MODT_B10..31
- (8) MDA[0..63] ↔ MDA10..631
- (9) MDB[0..63] ↔ MDB10..631
- (8) M_DQSA[0..7] ↔ M_DQSA10..71
- (8) M_-DQSA[0..7] ↔ M_-DQSA10..71
- (8) MAA[0..16] ↔ MAA10..161
- (9) MAB[0..16] ↔ MAB10..161
- (9) M_DQSB[0..7] ↔ M_DQSB10..71
- (9) M_-DQSB[0..7] ↔ M_-DQSB10..71

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Title: **CPU LGA1151-B**

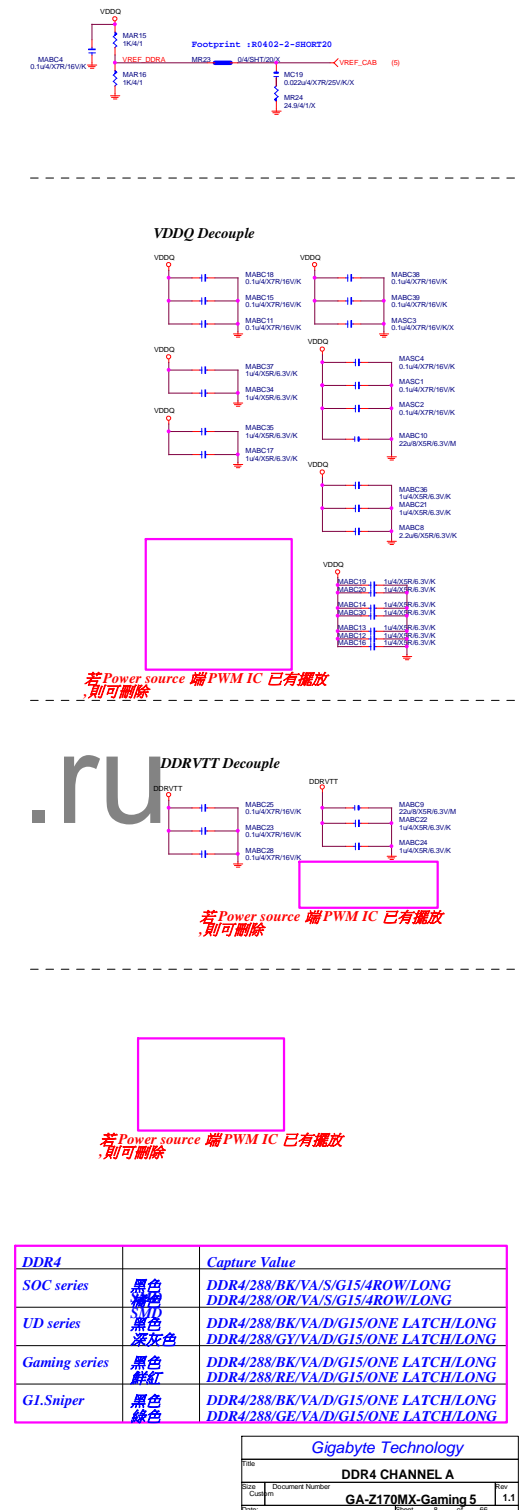
Size: Custom Document Number: **GA-Z170MX-Gaming 5** Rev: 1.1

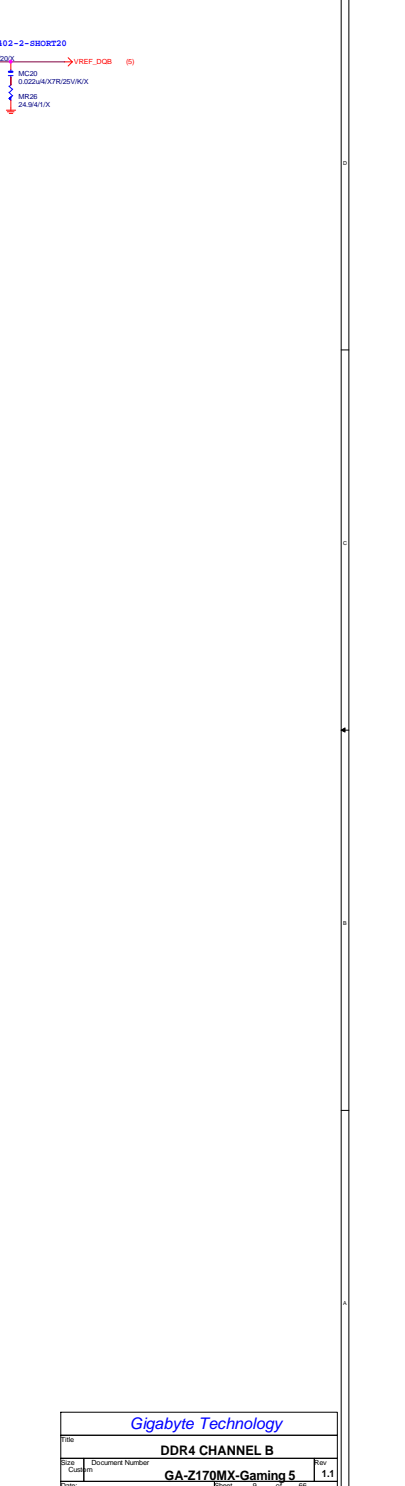
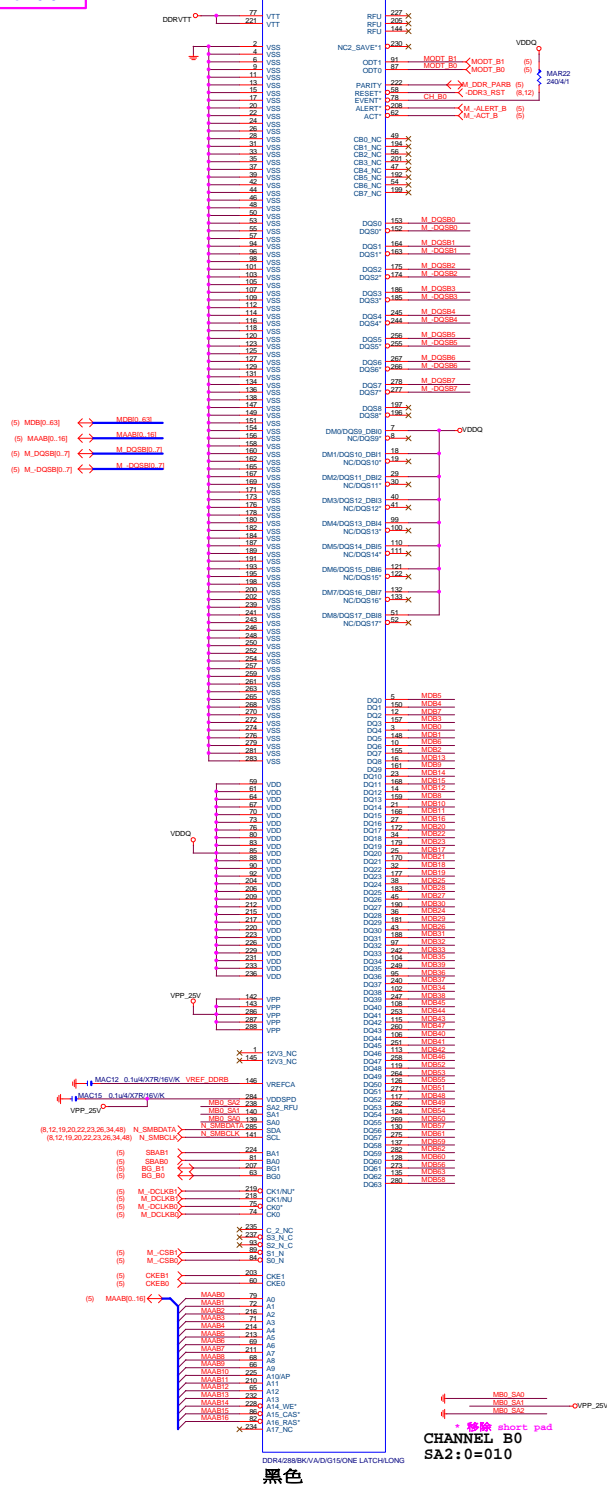
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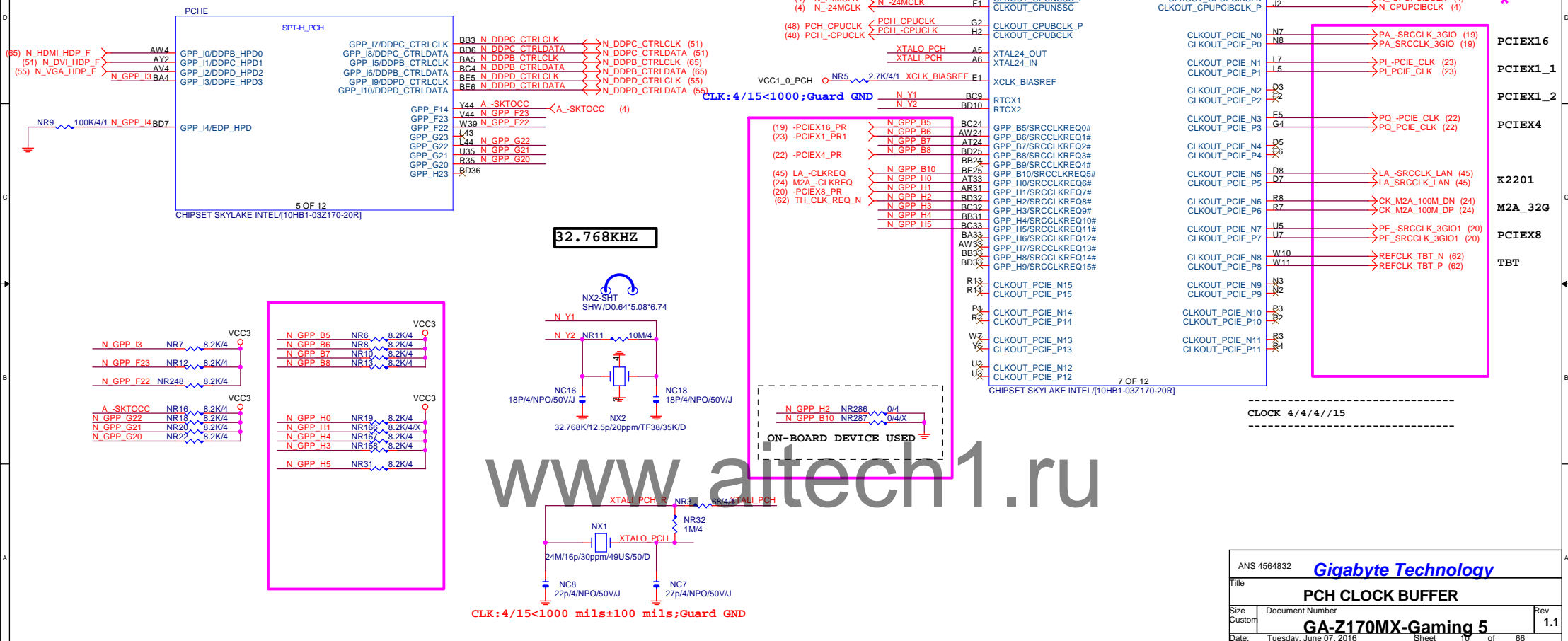
* 刪 Vcore 電容

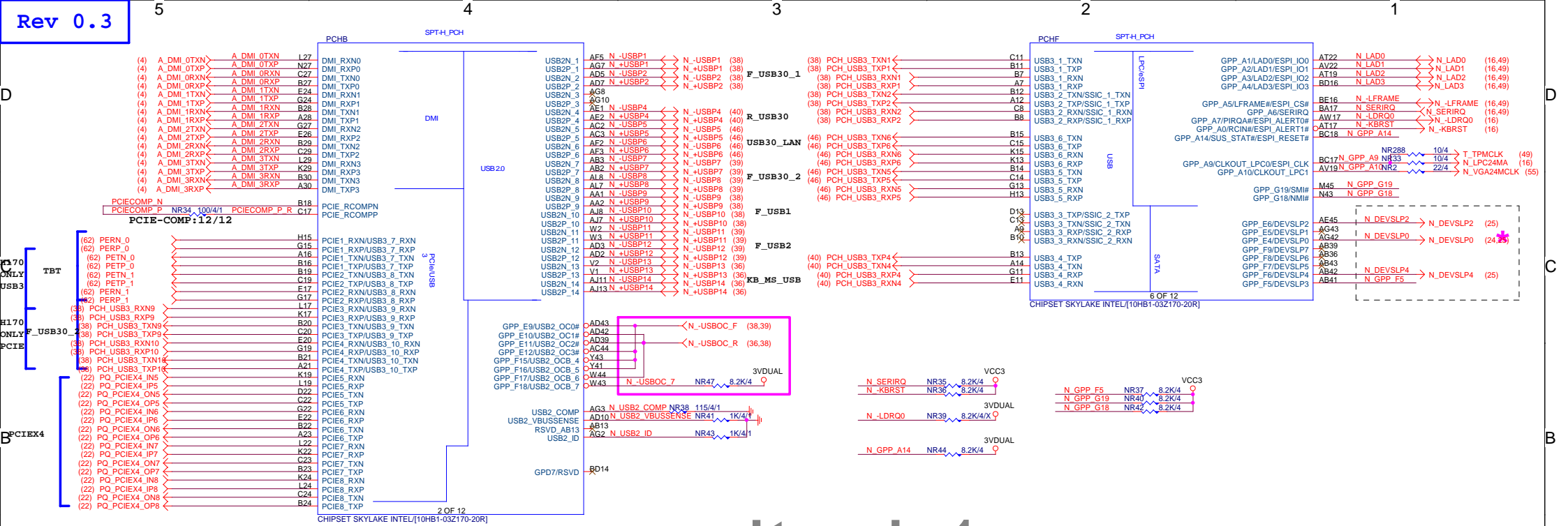
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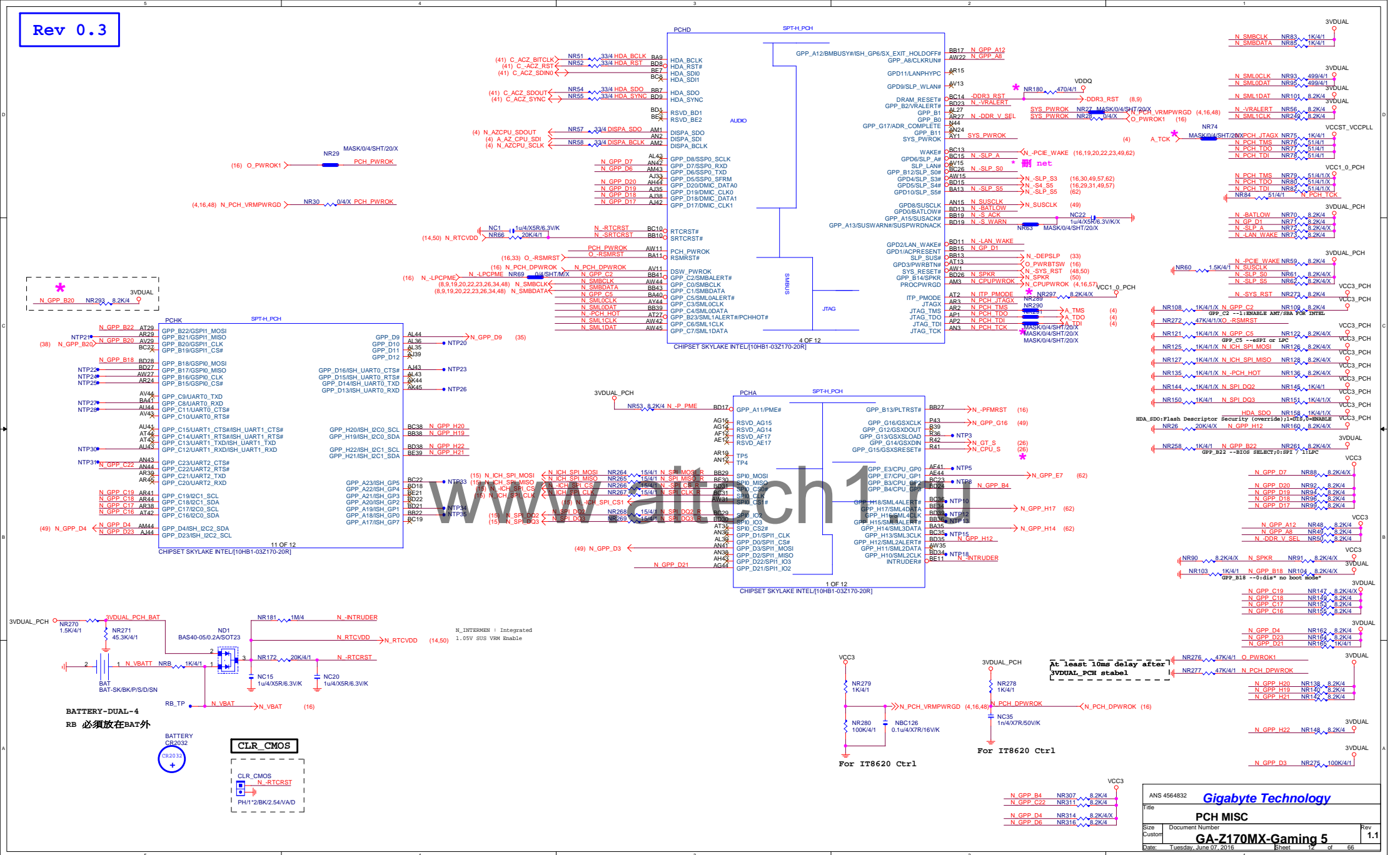
Rev 0.3



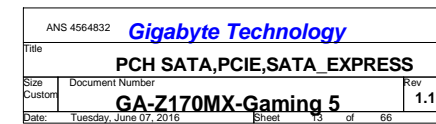


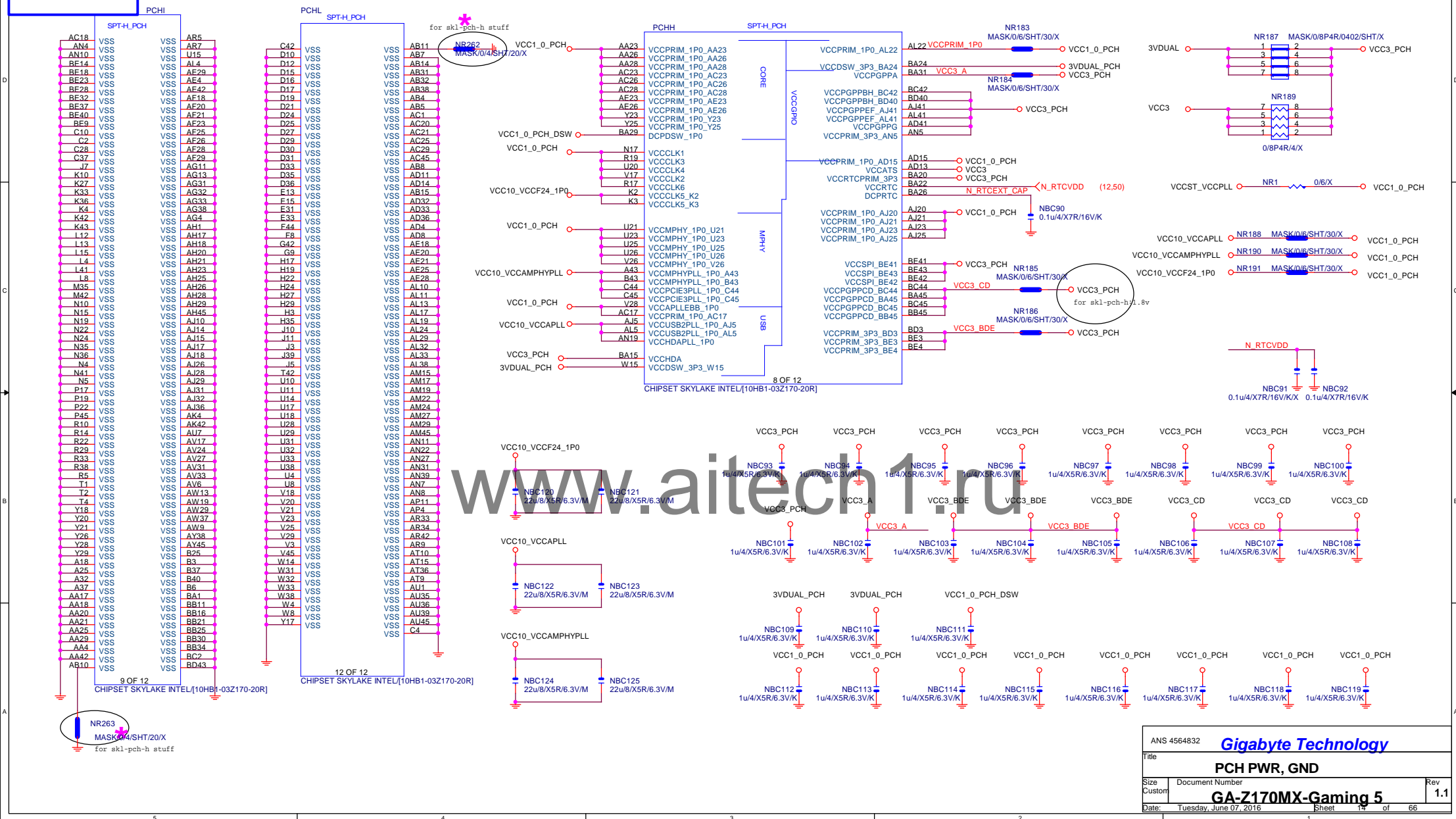
www.aitech1.ru

ANS 4564832		Gigabyte Technology	
Title			
PCH DMI,USB,PCIE			
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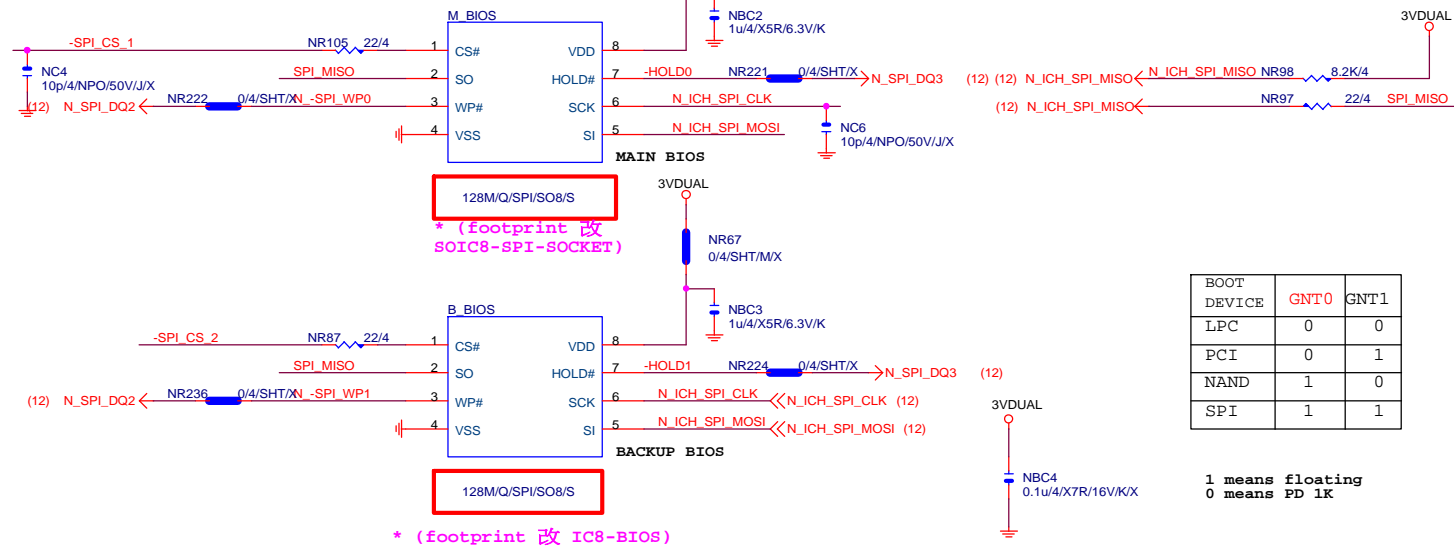


DUAL BIOS

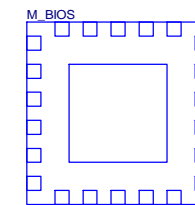
MOSI For DMI RX Termination Voltage

指定用DII

指定用DII



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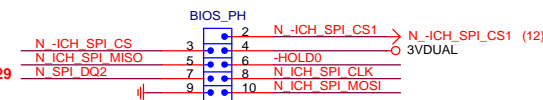


LCP/G-FL/1.27mm/200MIL/WHITE[10SL2-000008-31R]X

* 試産先上, PVT 移除

BIOS_PH

★Update 2015-01.29



MASK/PH/2*5K10/BK/2.54/VA/D/X

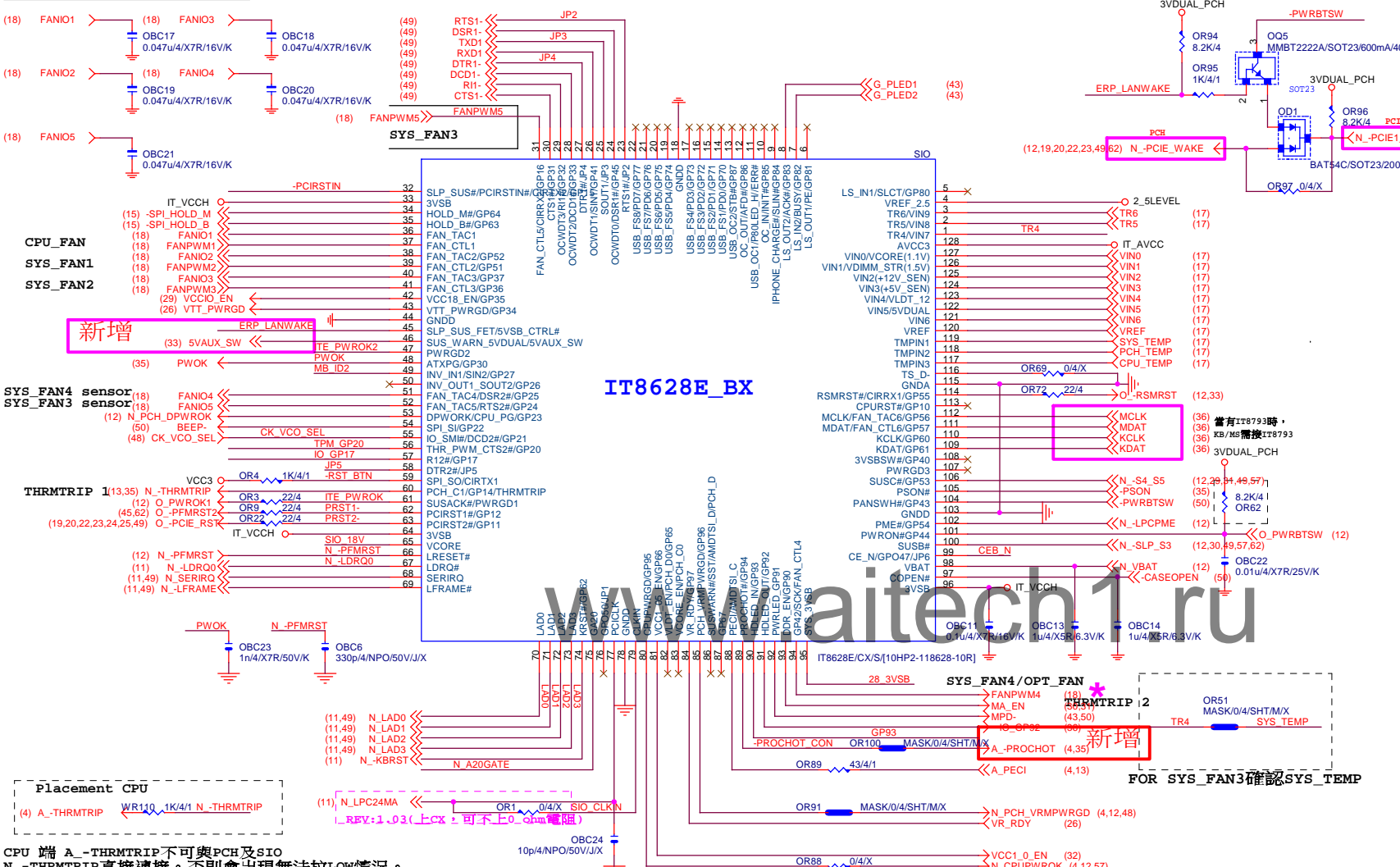
Footprint the same, confirmed by Graceing.

Use COM port pin header part.

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SIO IT8628BX REV:1.06



PWR SHT

For 8728 BUP function

3VDUAL_PCH O-OR25 0.6/SHT/X O-IT_VCCH

SIO PU

新增

-PCIRSTIN OR26 8.2K/4 VCC3

IO GP17 OR84 1K/4/1X 3VDUAL_PCH

TPM GP20 OR170 8.2K/4/X VCC3

N -LDRO0 OR27 1K/4/1 VCC3

ITE PWROK2 OR16 1K/4/1 VCC3

ITE PWROK OR10 1K/4/1 VCC3

-PROCHOT CON OR29 8.2K/4 VCC3

N A2OGATE OR31 8.2K/4

GP93 OR171 8.2K/4 VCC3

REV:1.08(使用GP92時, 需pull high), 未使用可省略。

SIO STRAP

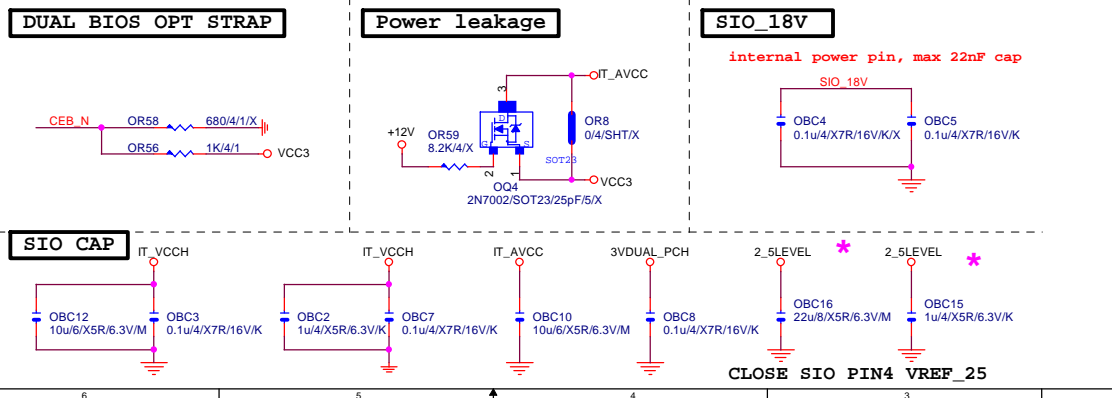
EUP control detect

3VDUAL O-OR47 100/4/1 28.3VSB

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

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問題演繹	
PIN 50	GP26-第一次接上POWER時會拉 LO
PIN 90/91	DEFAULT為HIDLED 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, 若低於按部分COM PORT及LPT裝置線端器會異常動作。



MB ID

VCC3 O-OR7 8.2K/4/X

OR15 8.2K/4

MB_ID2

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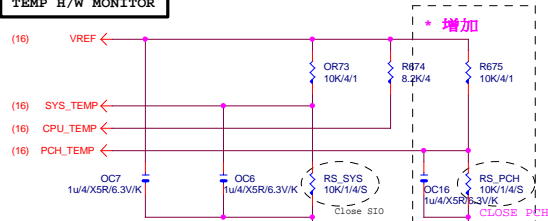
ITE 8620 LPC IO

GA-Z170MX-Gaming 5

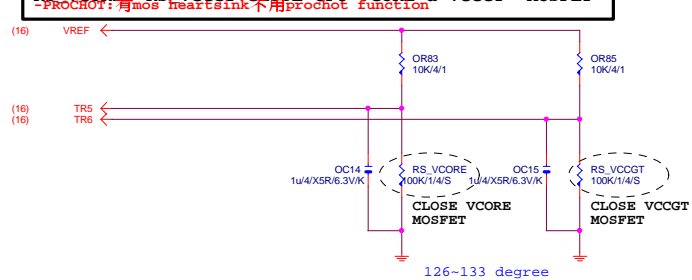
Rev 1.1

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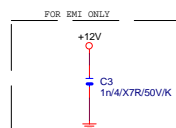
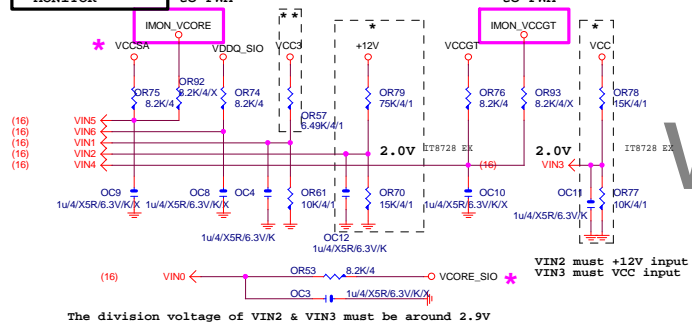
TEMP H/W MONITOR



RS_VCORE、RS_VCCGT、CLOSE CPU_VCORE & VCCGT MOSFET



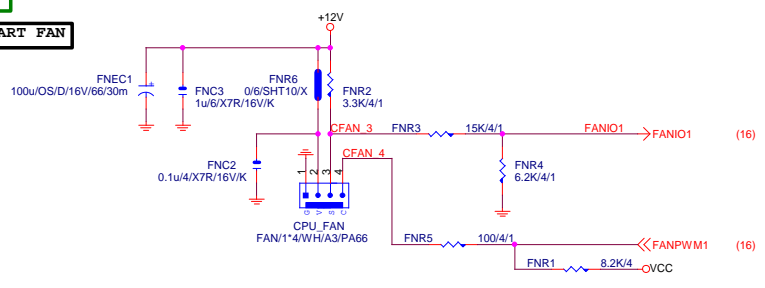
VOLTAGE-- H/W MONITOR



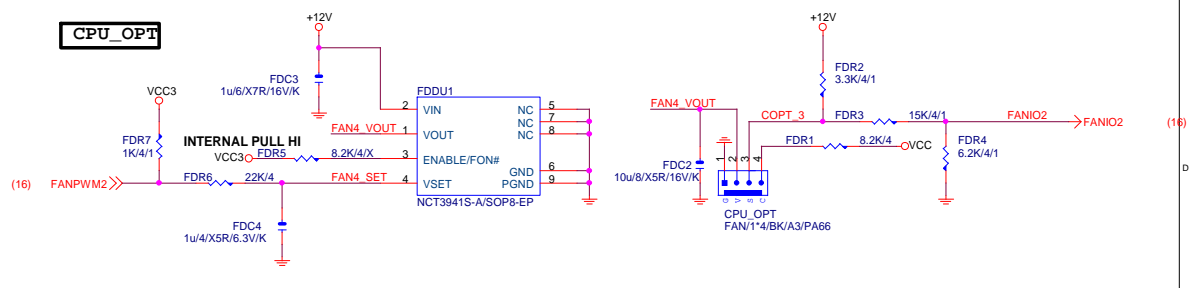
Gigabyte Technology

Title			HWM.KB/MS, FAN CTRL
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CPU SMART FAN

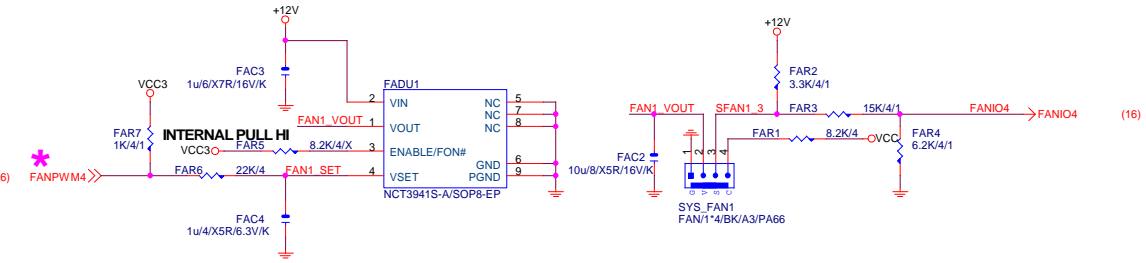


CPU_OPT

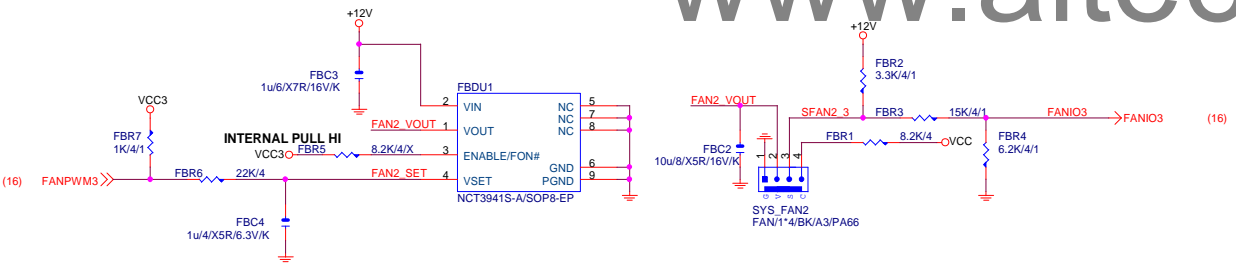


SYSTEM FAN1

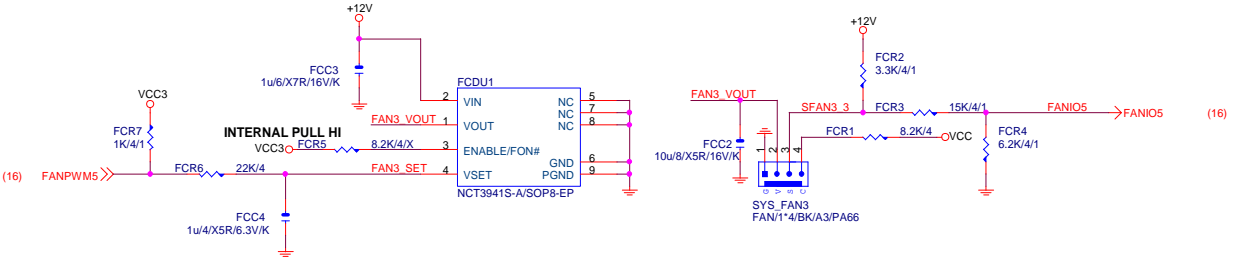
Linear SYS_FAN
Enable Function (NCT3941S)
Full Turn On Function (NCT3941S-A)



SYSTEM FAN2



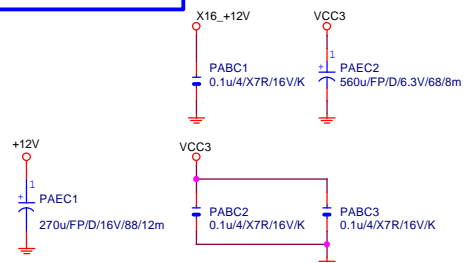
SYSTEM FAN2



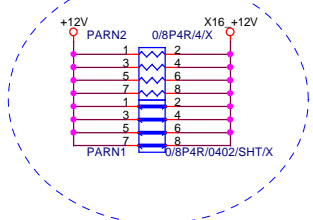
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Rev 0.3

PCIEX16 AC 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) BANDWIDTH=2.5GHz*(8b/10b)=2Gb/s=250MB/s

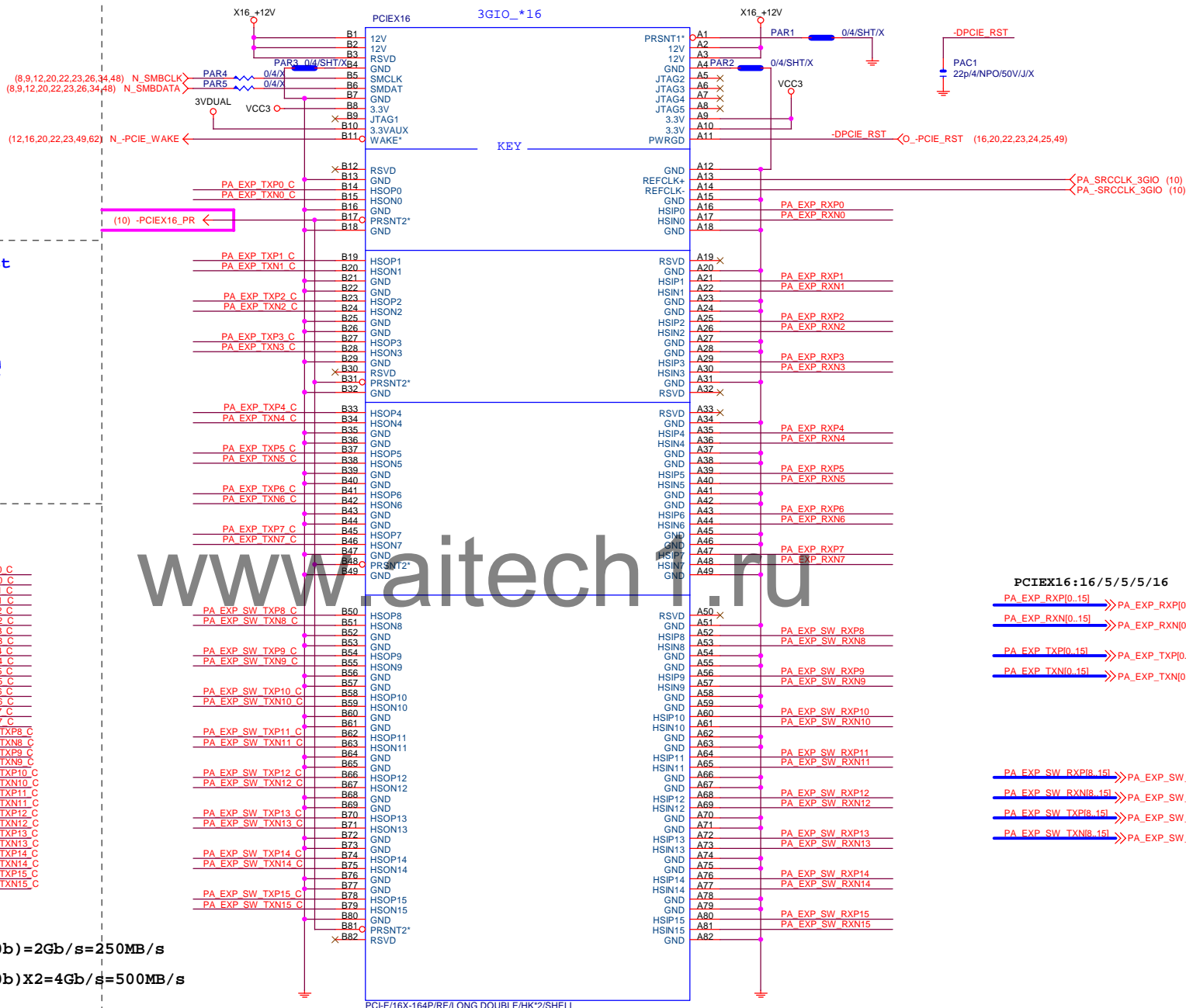
PCE-E X1(雙向) BANDWIDTH=2.5GHz*(8b/10b)X2=4Gb/s=500MB/s

PCE-E X16(單向) BANDWIDTH=2.5GHz*(8b/10b)X16=32Gb/s=4GB/s

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

PCI-E REV:2.0--> 5GHZ

PCIEX16 SLOT



PCIEX16:16/5/5/5/16

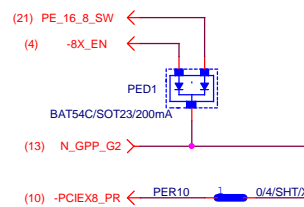
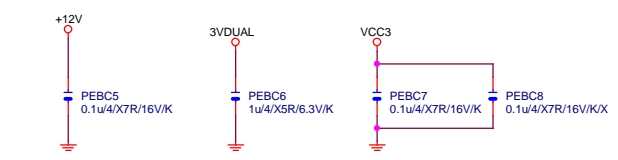
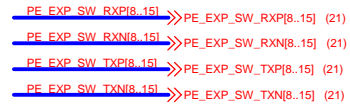
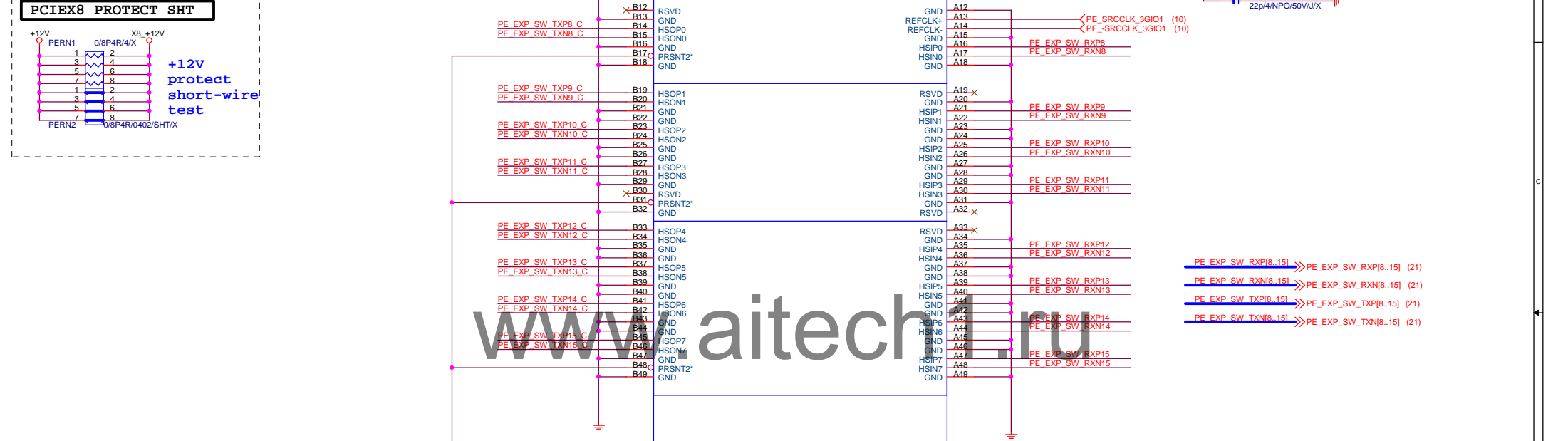
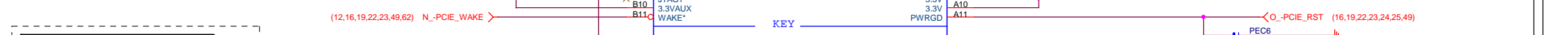
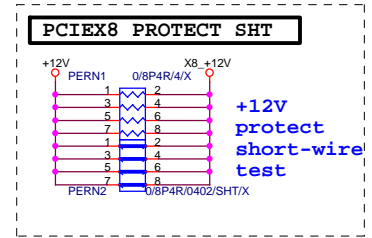
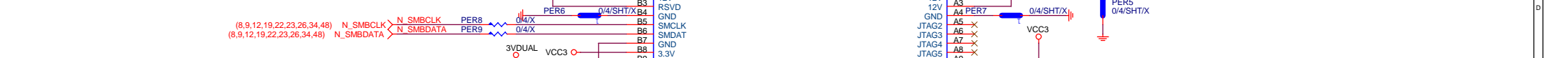
PA EXP_RXP[0..15]	>>>PA_EXP_RXP[0..15] (4,21)
PA EXP_RXN[0..15]	>>>PA_EXP_RXN[0..15] (4,21)
PA EXP_TXP[0..15]	>>>PA_EXP_TXP[0..15] (4,21)
PA EXP_TXN[0..15]	>>>PA_EXP_TXN[0..15] (4,21)
PA EXP_SW_RXP[8..15]	>>>PA_EXP_SW_RXP[8..15] (21)
PA EXP_SW_RXN[8..15]	>>>PA_EXP_SW_RXN[8..15] (21)
PA EXP_SW_TXP[8..15]	>>>PA_EXP_SW_TXP[8..15] (21)
PA EXP_SW_TXN[8..15]	>>>PA_EXP_SW_TXN[8..15] (21)

Gigabyte Technology

PCI EXPRESS * 16

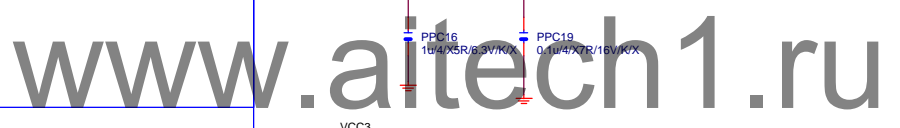
Size	Document Number	Rev
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Rev 0.3



PE EXP SW TXP8	PEC7	0.22u4/X5VR6.3V/K	PE EXP SW TXP8 C
PE EXP SW TXN9	PEC8	0.22u4/X5VR6.3V/K	PE EXP SW TXN9 C
PE EXP SW TXP9	PEC9	0.22u4/X5VR6.3V/K	PE EXP SW TXP9 C
PE EXP SW TXN9	PEC10	0.22u4/X5VR6.3V/K	PE EXP SW TXN9 C
PE EXP SW TXP10	PEC11	0.22u4/X5VR6.3V/K	PE EXP SW TXP10 C
PE EXP SW TXN10	PEC12	0.22u4/X5VR6.3V/K	PE EXP SW TXN10 C
PE EXP SW TXP11	PEC13	0.22u4/X5VR6.3V/K	PE EXP SW TXP11 C
PE EXP SW TXN11	PEC14	0.22u4/X5VR6.3V/K	PE EXP SW TXN11 C
PE EXP SW TXP12	PEC15	0.22u4/X5VR6.3V/K	PE EXP SW TXP12 C
PE EXP SW TXN12	PEC16	0.22u4/X5VR6.3V/K	PE EXP SW TXN12 C
PE EXP SW TXP13	PEC17	0.22u4/X5VR6.3V/K	PE EXP SW TXP13 C
PE EXP SW TXN13	PEC18	0.22u4/X5VR6.3V/K	PE EXP SW TXN13 C
PE EXP SW TXP14	PEC19	0.22u4/X5VR6.3V/K	PE EXP SW TXP14 C
PE EXP SW TXN14	PEC20	0.22u4/X5VR6.3V/K	PE EXP SW TXN14 C
PE EXP SW TXP15	PEC21	0.22u4/X5VR6.3V/K	PE EXP SW TXP15 C
PE EXP SW TXN15	PEC22	0.22u4/X5VR6.3V/K	PE EXP SW TXN15 C

PCIE*4

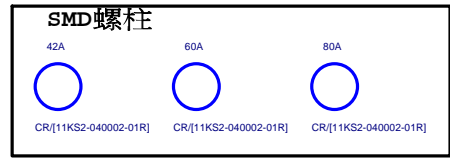
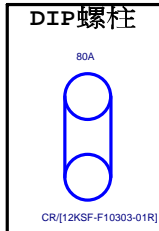
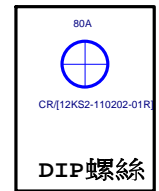
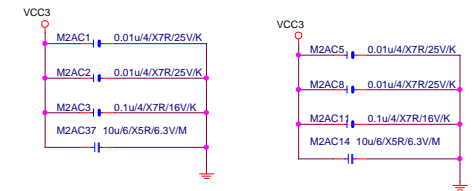
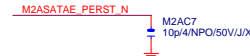
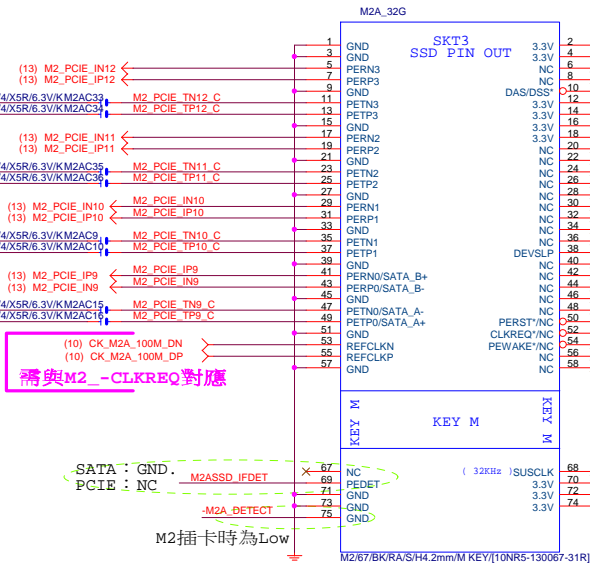
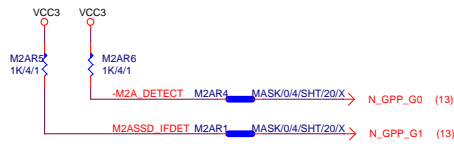


(10) -PCIEX4_PR ←

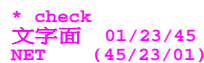
PCI-E/4X-66P/RE/LONG DOUBLE/HK*2/SHELL

Title			
PCIE X4			
Size Custom	Document Number		Rev
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支援SATA and M.2 function



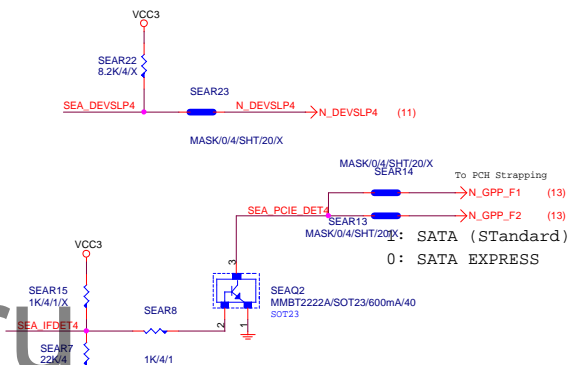
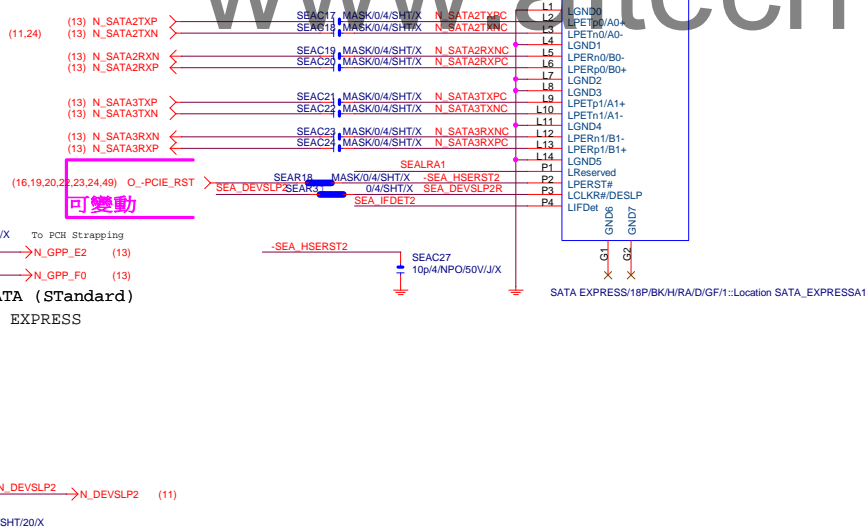
M.2 有插卡 /沒插卡 GPP_G0	M.2插何種卡？ GPP_G1	SATA Express 插何種硬碟？ GPP_E0/E2/F1	I/O15 (S0)	I/O16 (S1)	I/O17	I/O18	I/O19 (S0)	I/O20 (S1)
有插卡 (Low)	SATA Mode (Low)	SATA (Hi)	SATA (M.2)	PCIe x1	PCIe x1	PCIe x1	PCIe x1	SATA
		SATA Express (Low)	SATA (M.2)	PCIe x1	PCIe x1	PCIe x1	SATA Express	
	PCIe Mode (Hi)	SATA (Hi)	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	



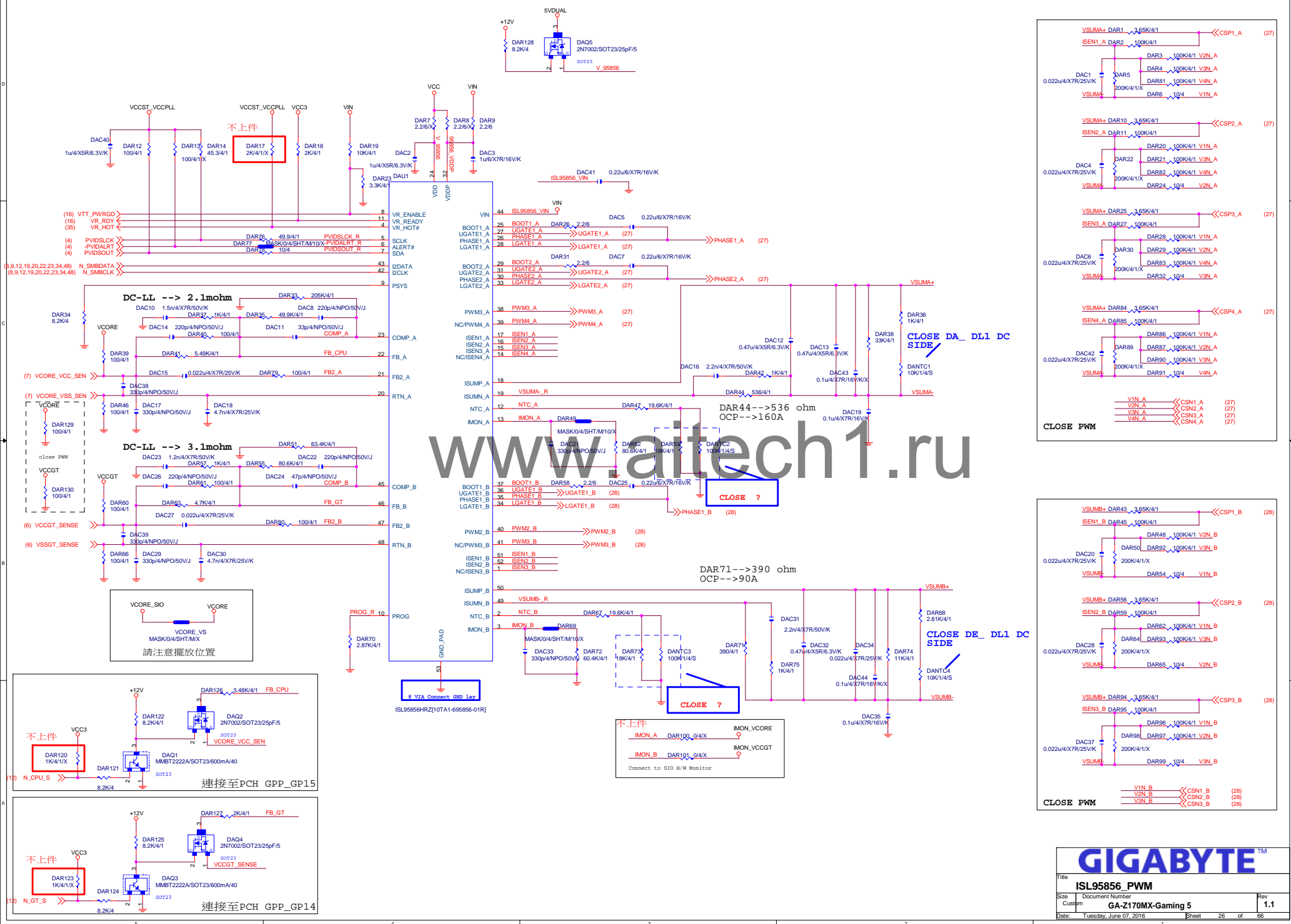
雙層:11NR6-C10236-11R

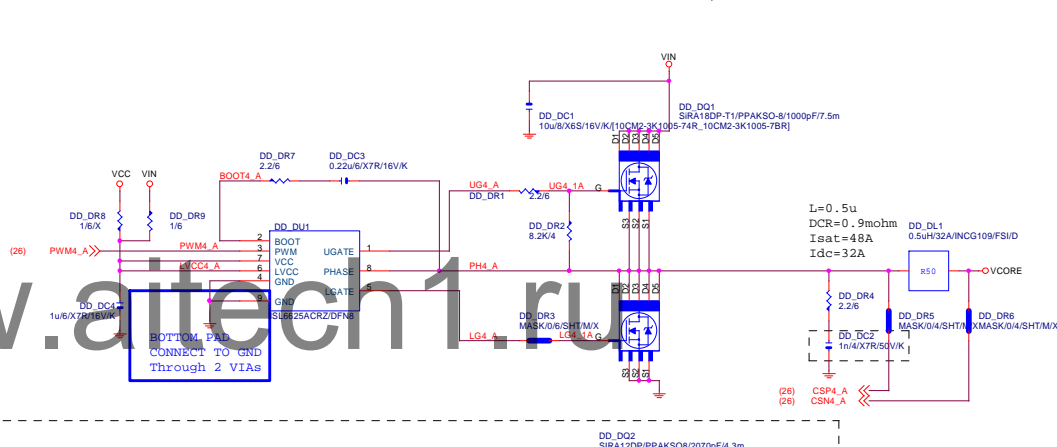
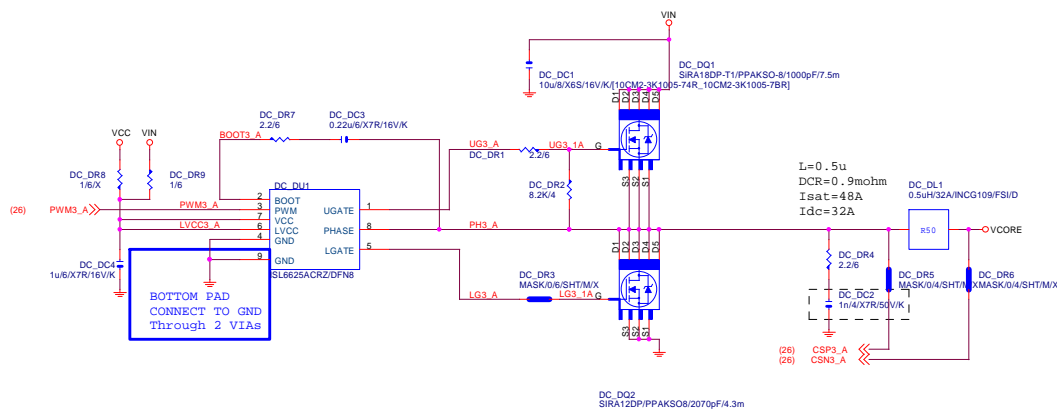
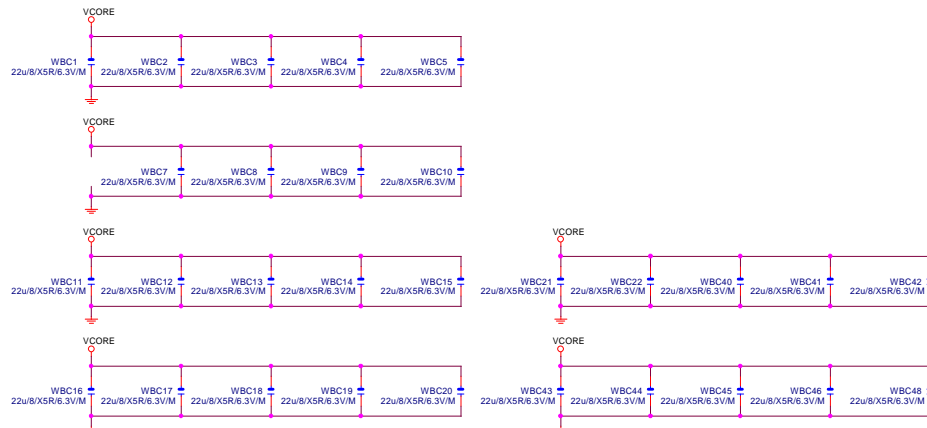
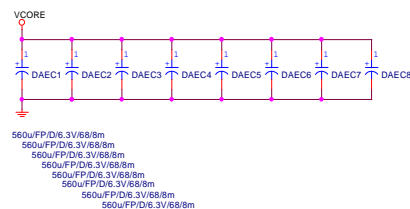
單層+2SATA:TBD

單層:11NR6-C10118-31R

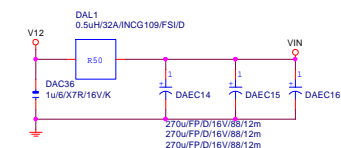


SATA 5	(文字面寫SATA 1)
SATA 4	(文字面寫SATA 0)
SATA 3	
SATA 2	
SATA 1	(文字面寫SATA 5)
SATA 0	(文字面寫SATA 4)



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

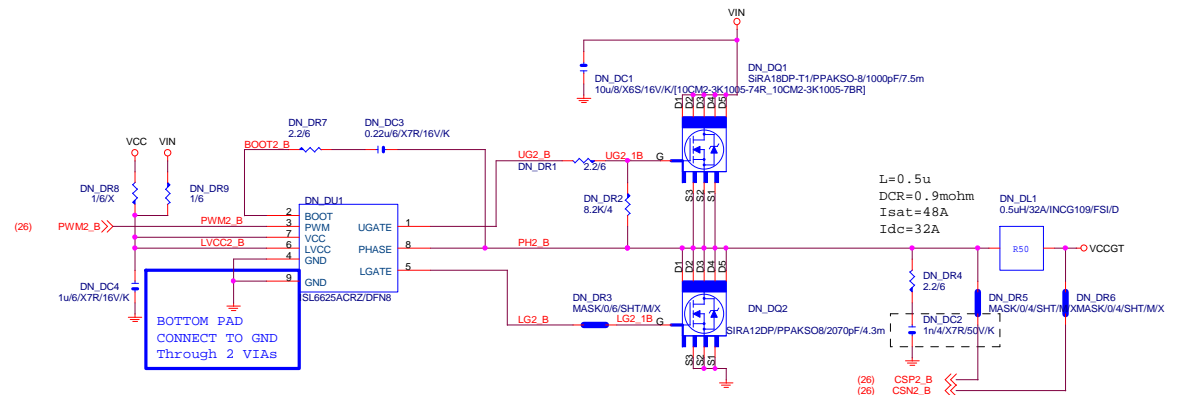
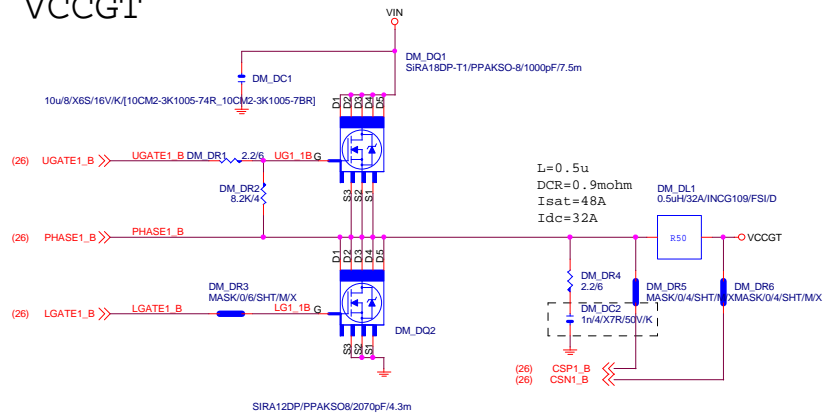
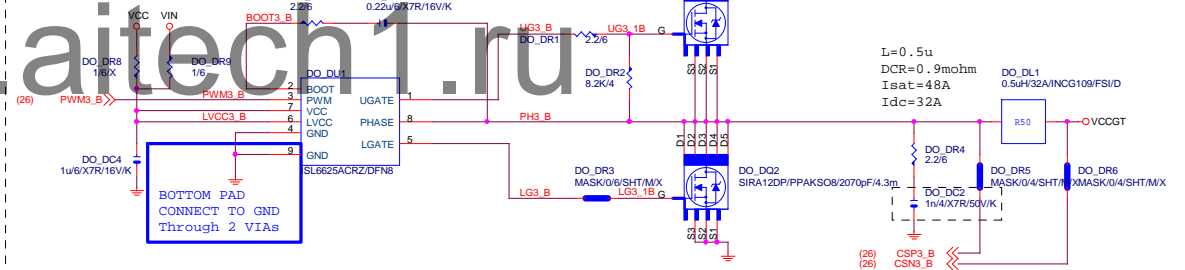
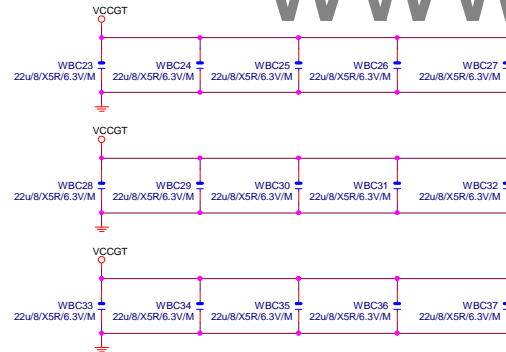
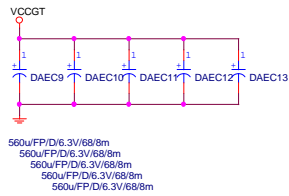
VIN CAP 270u*3PCS



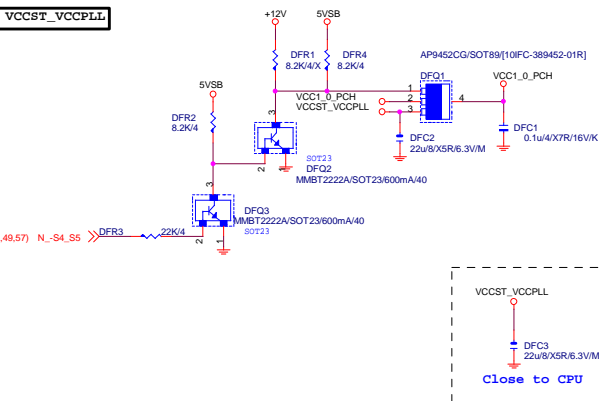
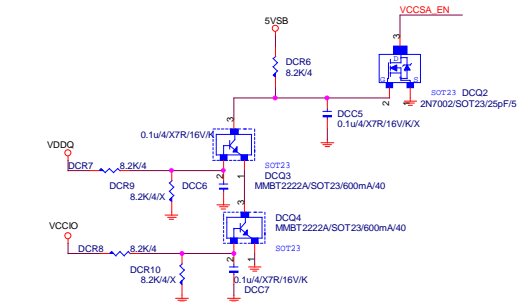
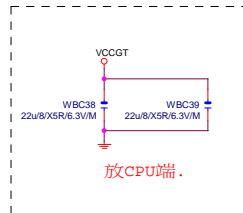
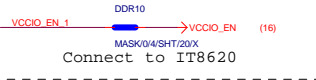
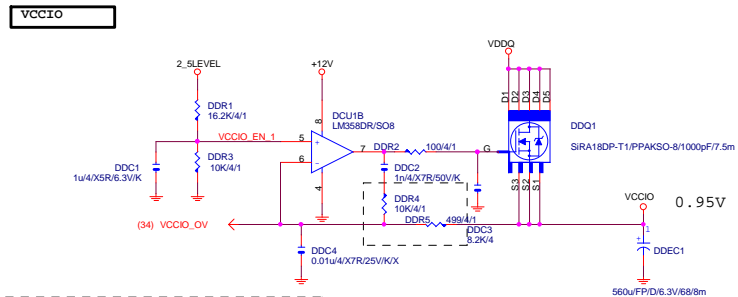
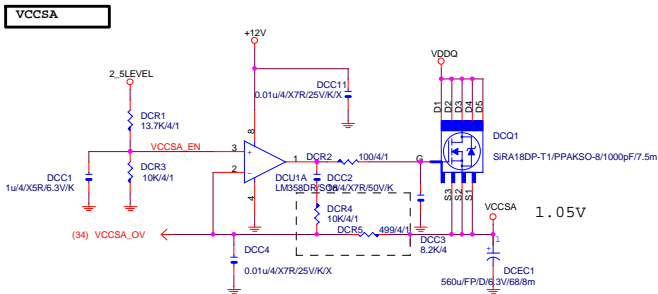
GIGABYTE

Title			
ISL95856_MOS			
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VCCGT

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

GIGABYTE™			
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ISL95856 MOS			
Size	Document Number	Rev	
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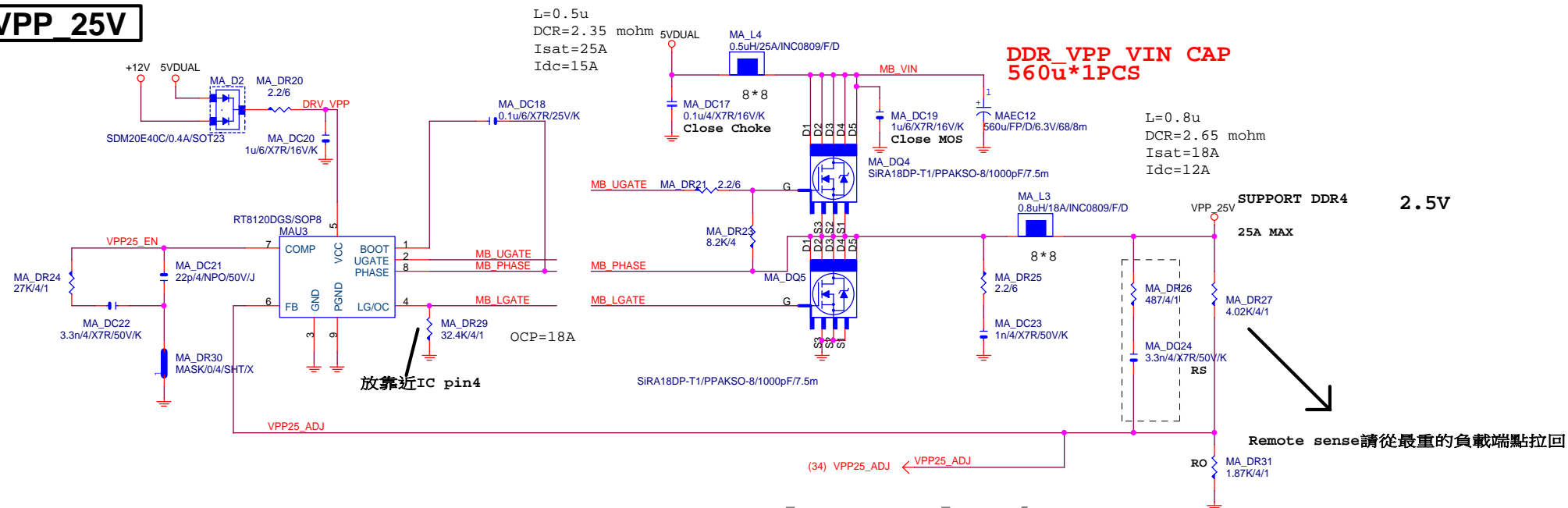


Title			
RT8120_DDR4 POWER			
Size	Document Number	Rev	
Custom	GA-Z170MX-Gaming 5	1.1	
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REV: 0.86

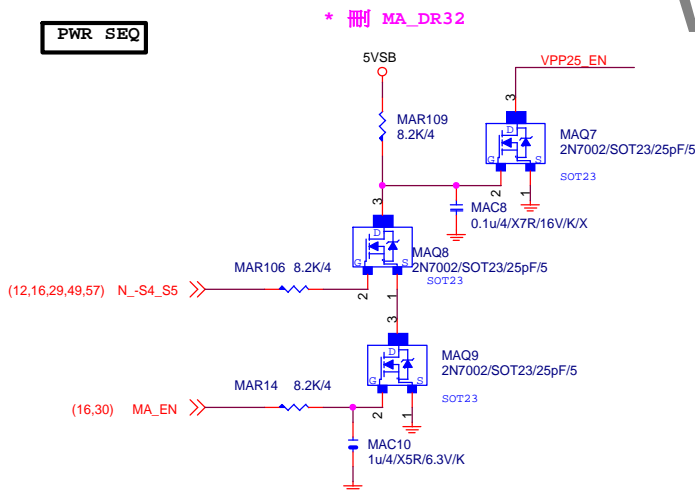
VPP_25V

CHOKES與CAP料號可變

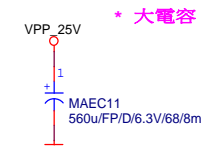


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PWR SEQ

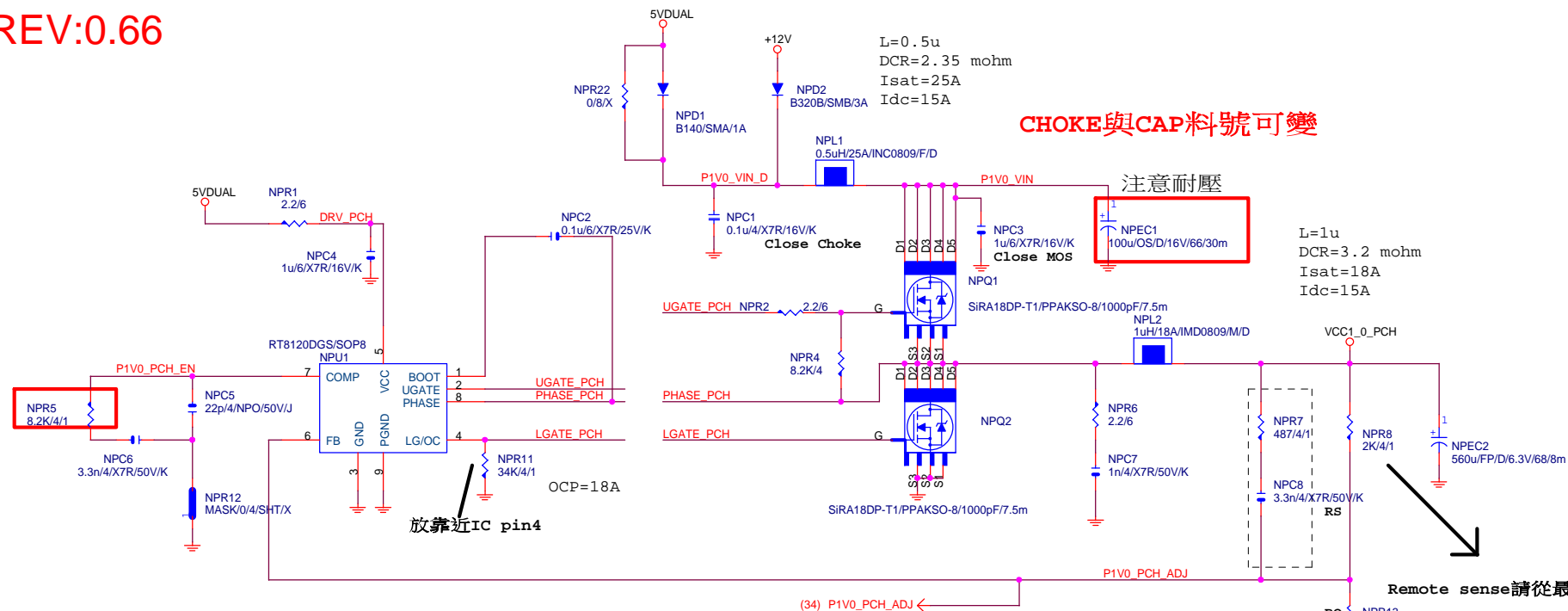


VPP CAP 560u*1PCS

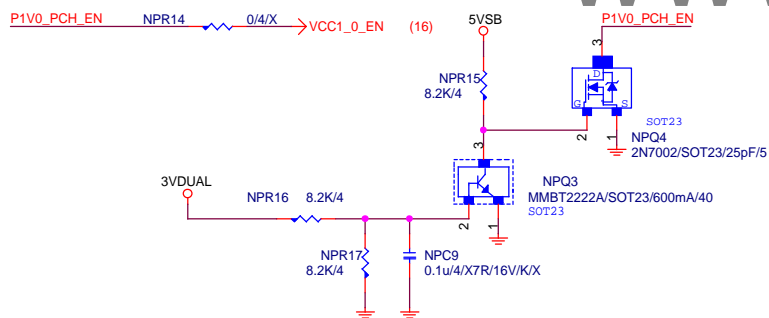
**GIGABYTE™**

Title				RT8120_VPP25 POWER			
Size		Document Number				Rev	
Custom		GA-Z170MX-Gaming 5				1.1	
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REV:0.66



PWR_SEQ

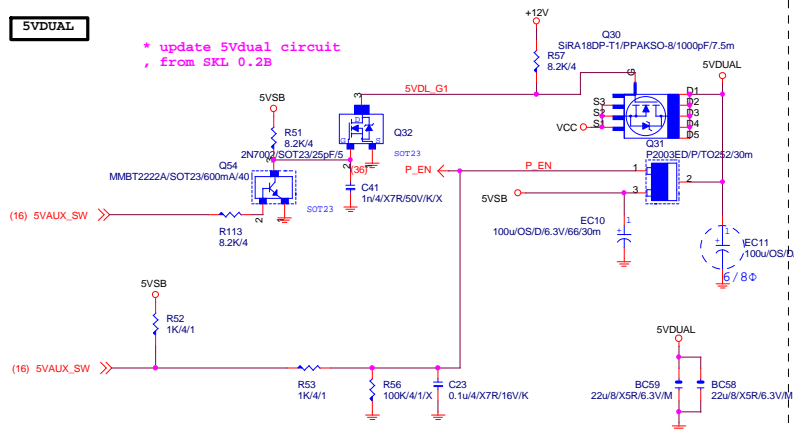


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GIGABYTE™			
Title			
RT8120_PCH POWER			
Size	Document Number	Rev	
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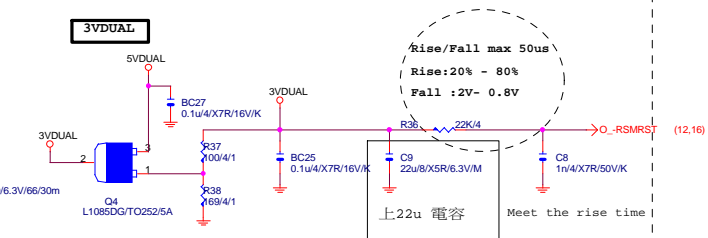
5VDUAL

* update 5Vdual circuit
from SKL 0.2B



3VDUAL_PCH

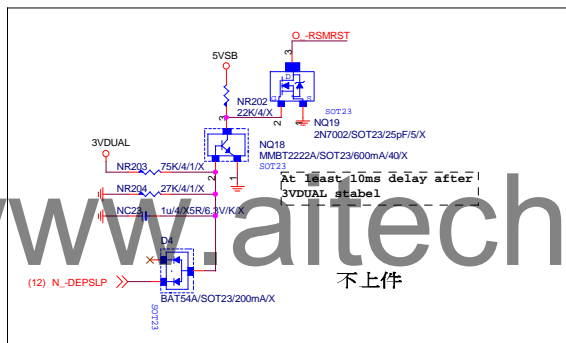
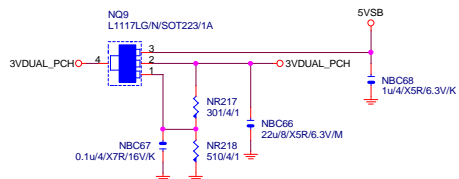
3VDUAL



Rise/Fall max 50us
Rise:20% - 80%
Fall :2V- 0.8V

上22u 电容
Meet the rise time

3VDUAL



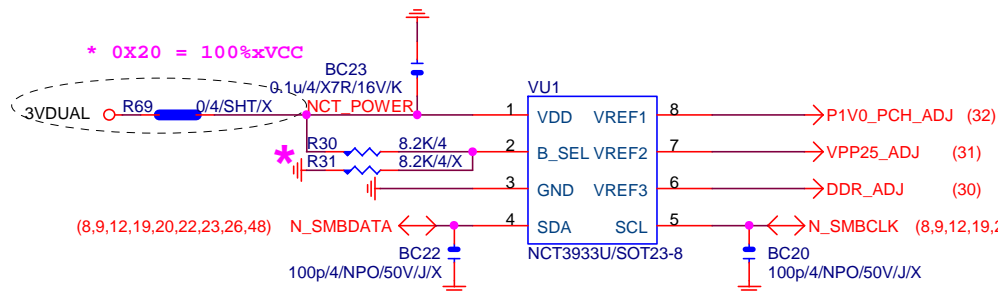
At least 10ms delay after
3VDUAL stable

不上件

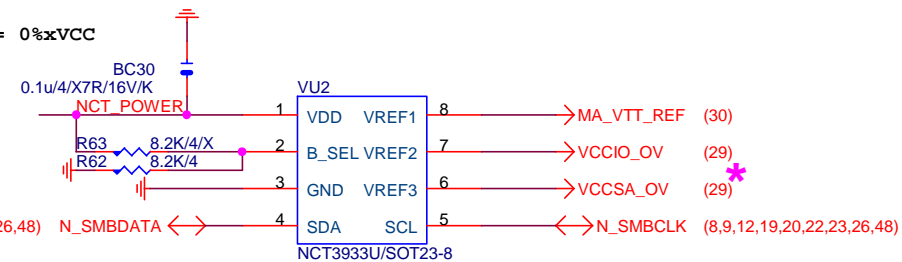
Gigabyte Technology

Title	DISCRETE POWER
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OVER VOLTAGE



0X2A = 0%xVCC



0X22 = 75%xVCC

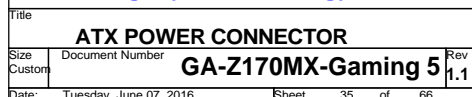
* 删除 OVU3

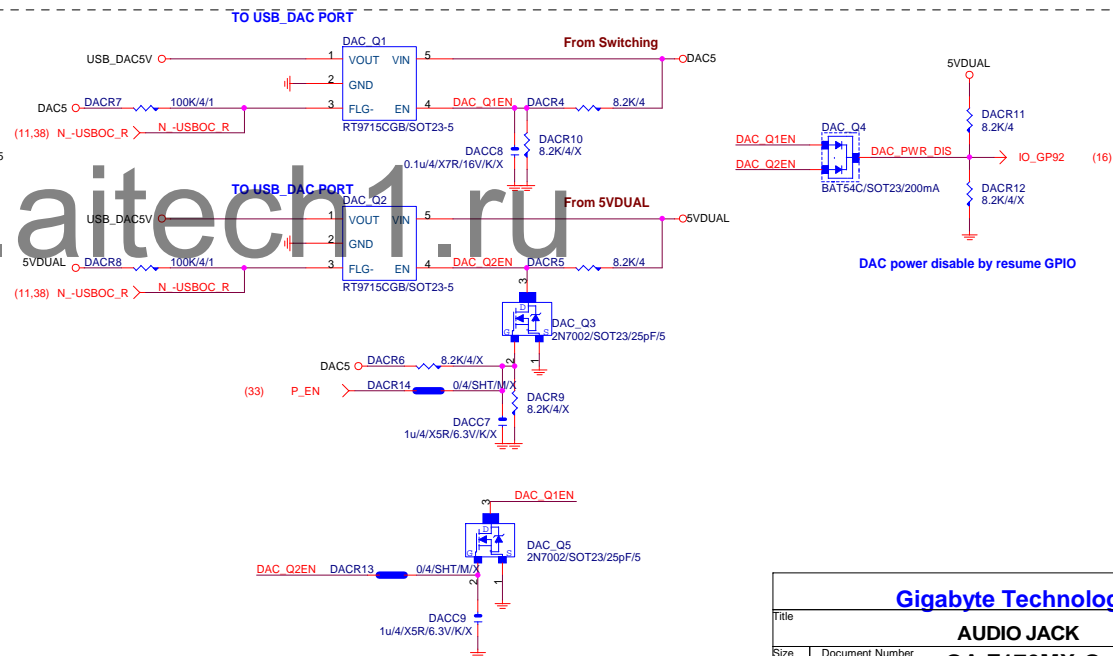
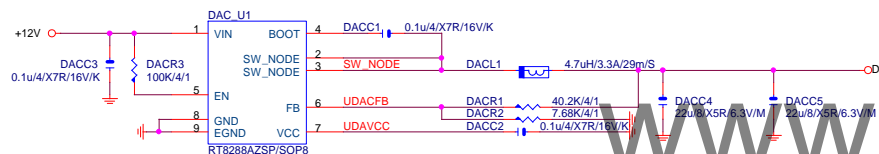
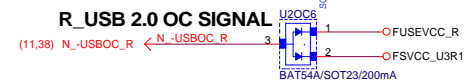
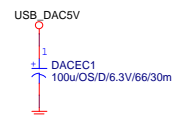
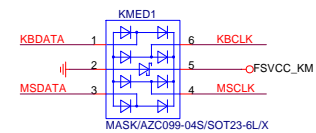
NCT3933	0X2A	0X20	0X22
VREF1	DDRVTT	VREF_DDRA_DQ	PCH Core
VREF2	VREF_DDRA_CA	N/A	VCC1_5_PCH
VREF3	VREF_DDRA_CA	VREF_DDRB_DQ	SMREF

Gigabyte Technology

Title		CPU CORE VR-2	
Size	Document Number	GA-Z170MX-Gaming 5	
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ATXX4 POWER CONNECTOR



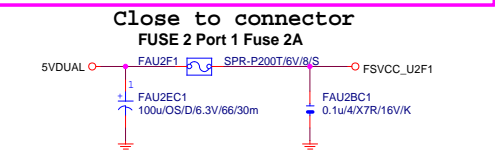
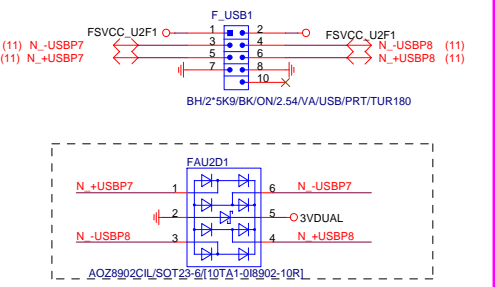


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Gigabyte Technology			
Title			
OC BUTTOM			
Size	Document Number		Rev
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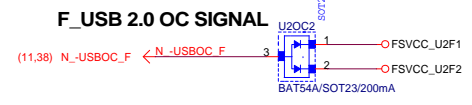
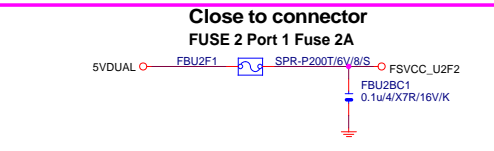
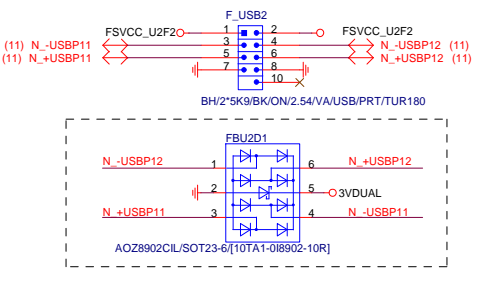
FRONT USB1

NET 可變



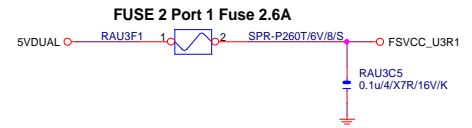
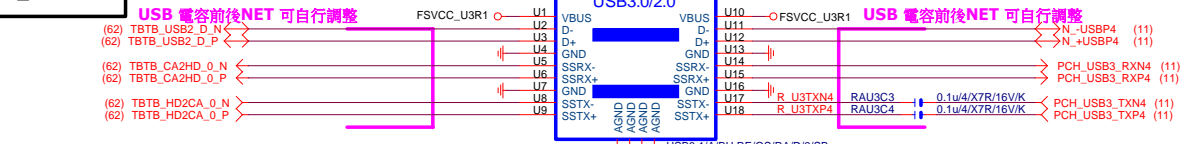
FRONT USB2

NET 可變



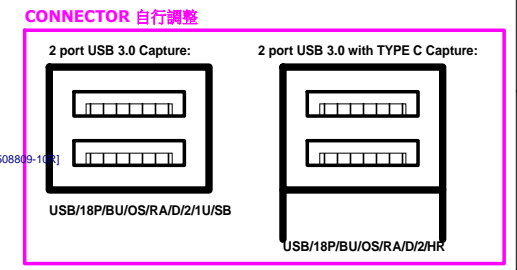
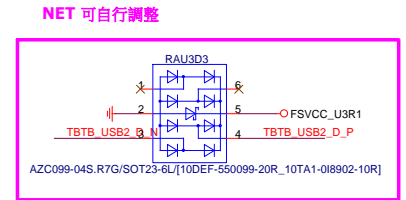
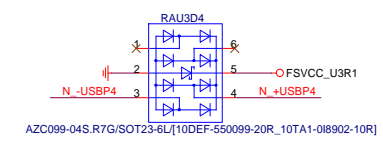
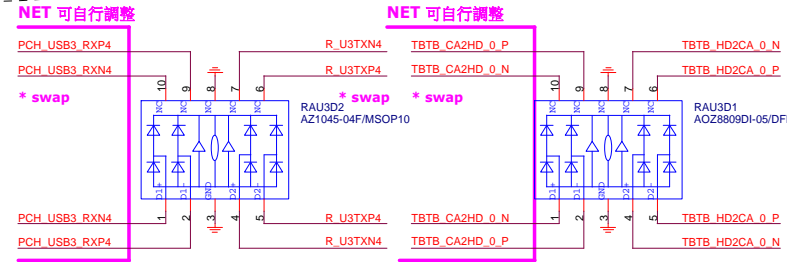
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R_USB30



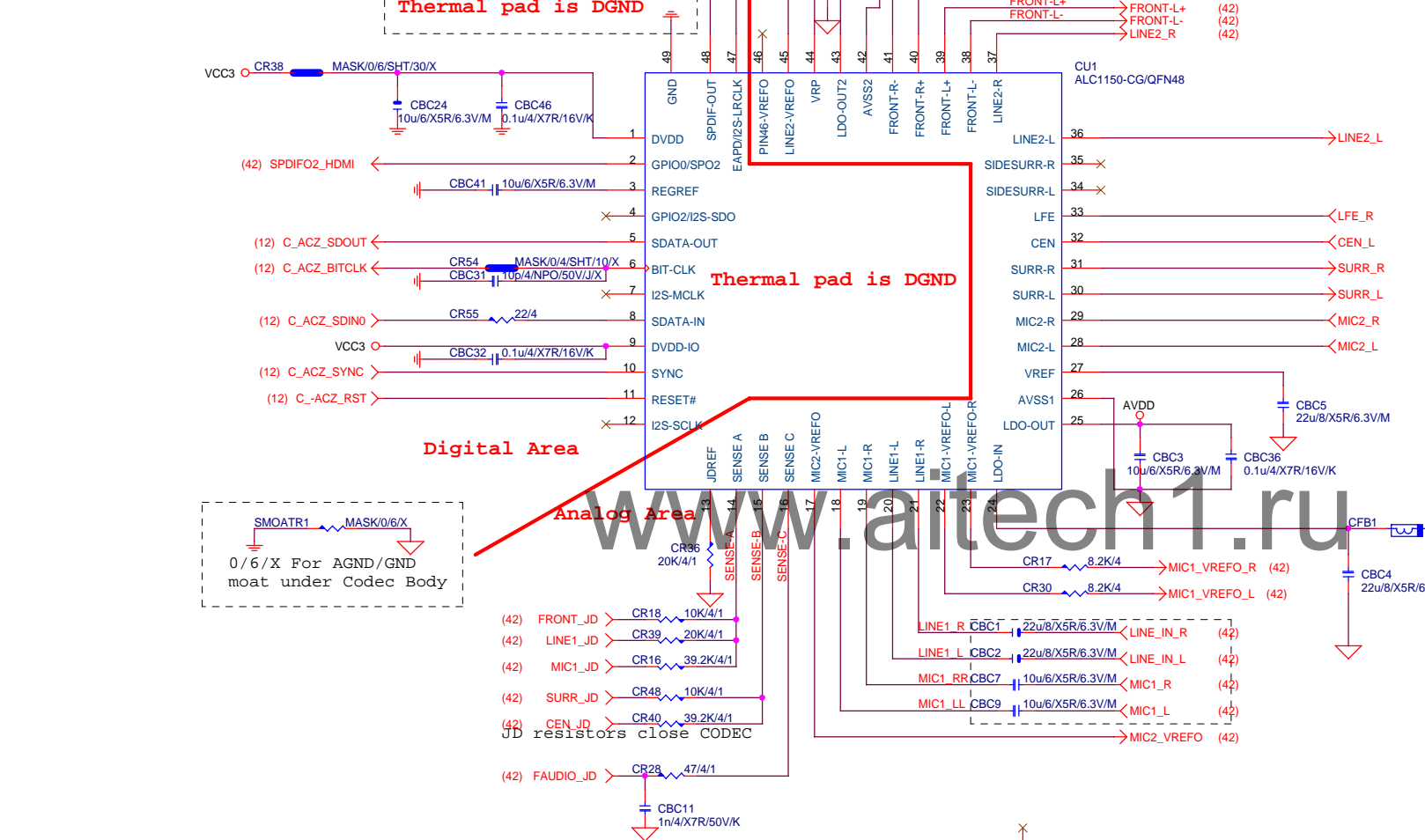
配合HDMI20,改成DGND

2 port USB 3.0 架高with TYPE C Capture:



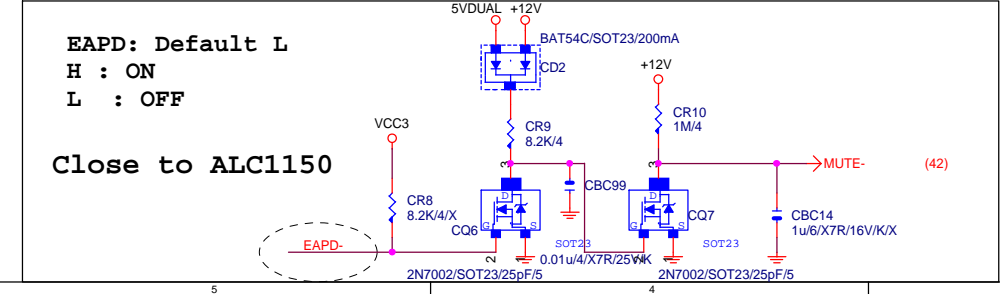
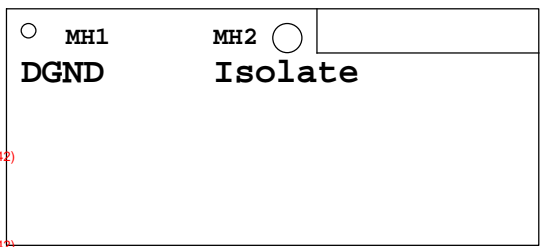
Gigabyte Technology			
Title	KB_MS_USB3, R_USB30		
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ALC1150 五孔+SPDIF AUDIO JACK



LAYOUT注意: 螺絲孔下GND方式

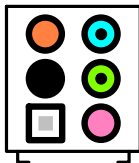
1. MH1空間夠, 下DGND
空間不夠, 才改為Isolate
2. MH2一律改為Isolate
3. Codec下方, 第二層必須參考GND



**LAYOUT注意: 要加
GND切割線**

音效區域印刷

AZALIA JACK



(41) SPDIF02_HDMI

CR52

MASK04/SHT10/X

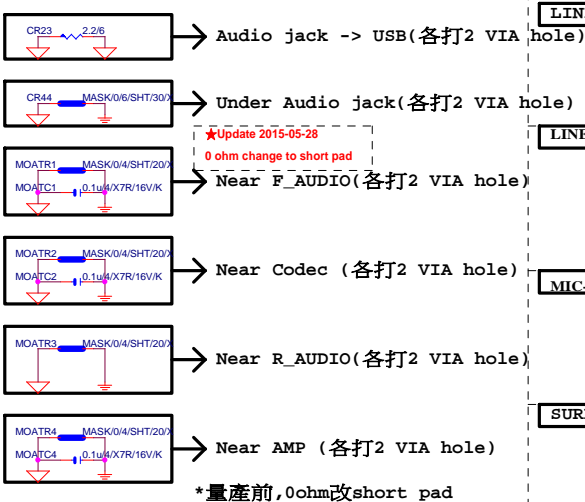
SPDIF_O

CBC37

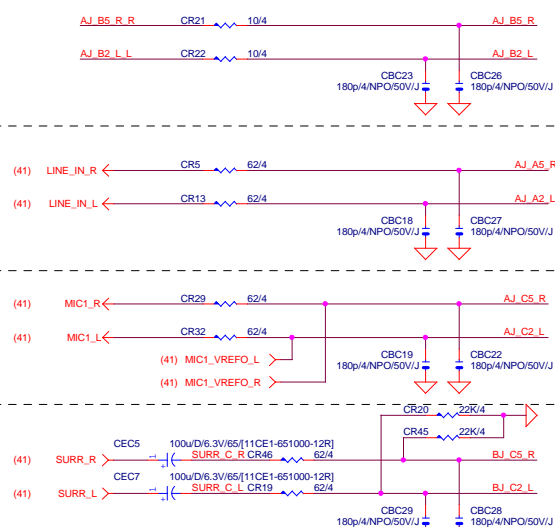
100pF/4/NPO/50V/J

PH*12/BK/2.54/VA/D

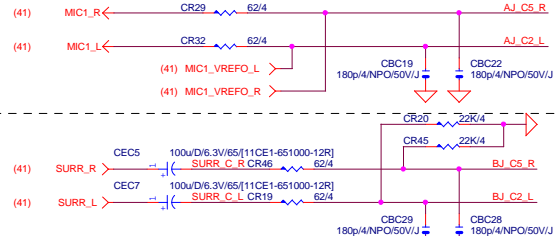
For HDMI SPDIF



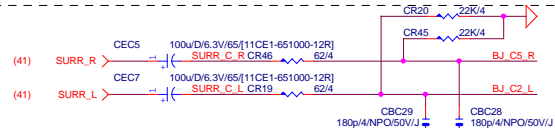
LINE-IN



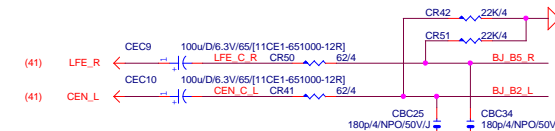
MIC-IN



SURROUND

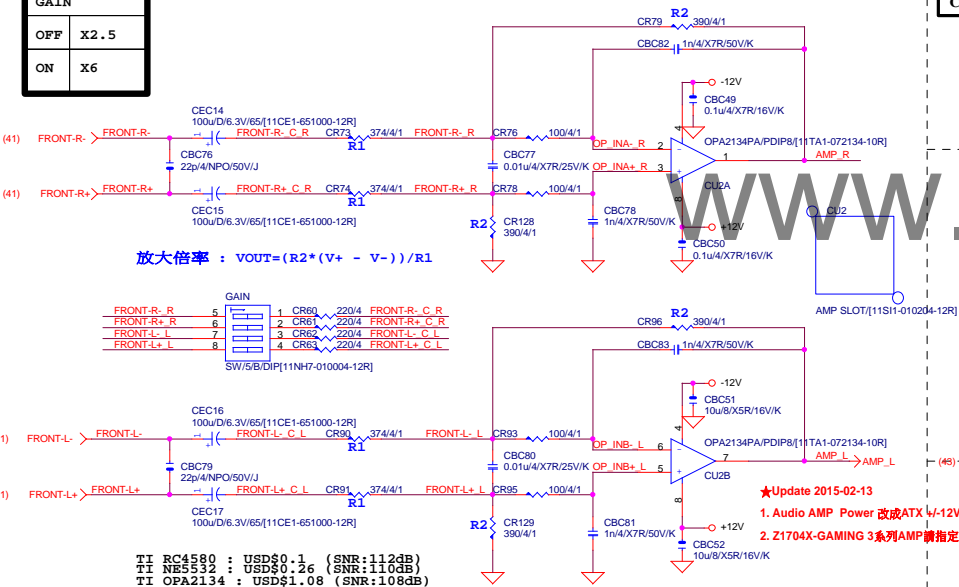
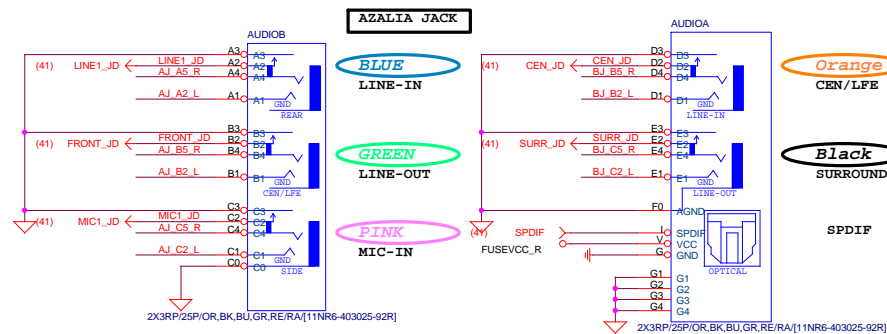
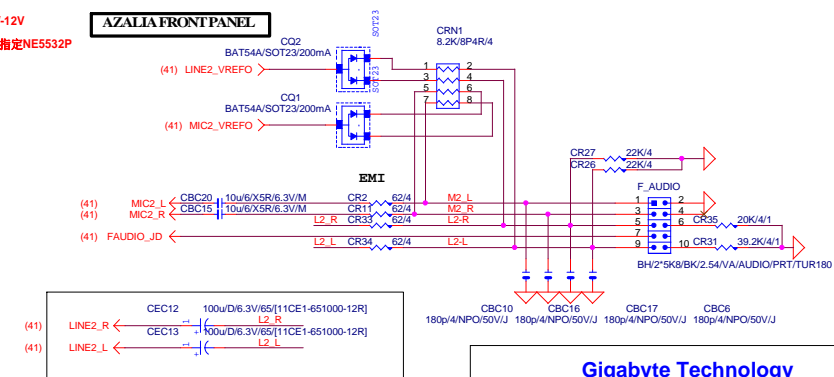


CEN/LFE



GAIN	
OFF	X2.5
ON	X6

Differential to Single-End AMPLIFIED

**AZALIA FRONT PANEL**

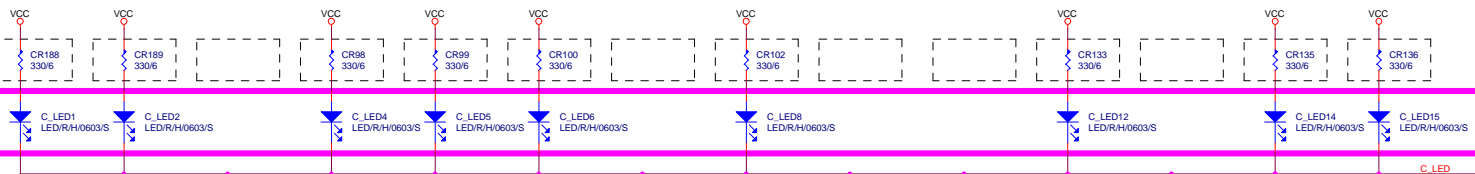
Gigabyte Technology

AUDIO JACK

GA-Z170MX-Gaming 5

Re

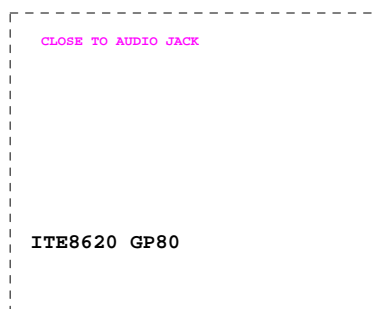
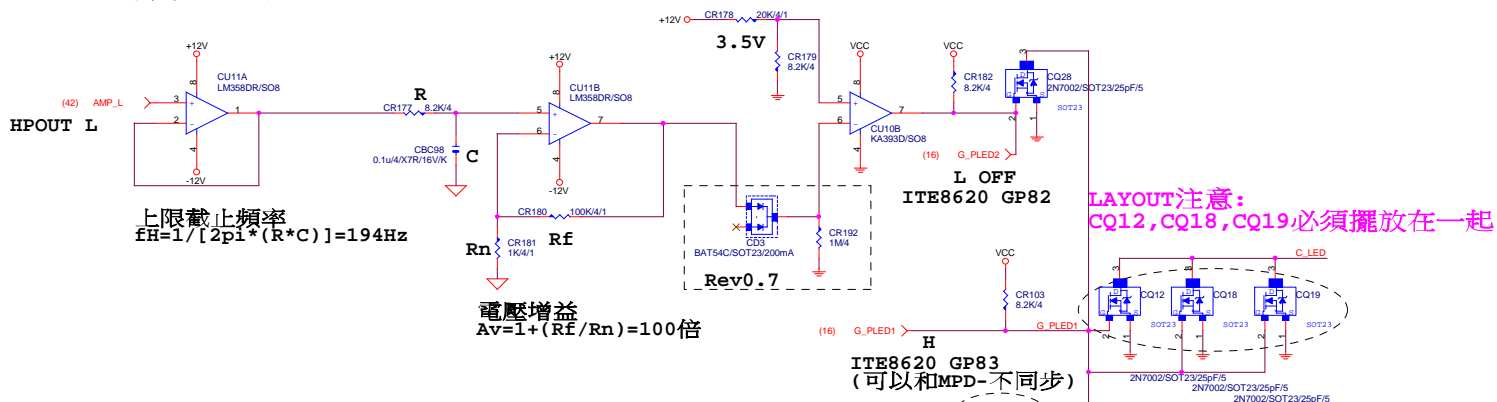
Title				AUDIO JACK				Revision	
Size		Document Number		GA-Z170MX-Gaming 5				Rev. 1.	
Date: Tuesday, June 07, 2016				Sheet		42		of 66	



VALUE可變,LED顏色請自行修改

[UD/SOC系列--> 白光LED(黃色):LED/W/6/S]

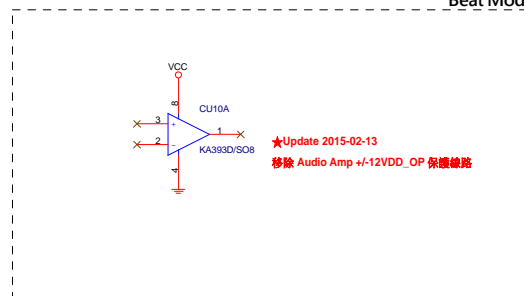
[GAMING系列--> 紅光LED(紅色):LED/R/H/0603/S]



Rear Panel LED ON/OFF

	IO_GP80
REAR LED ON	H
REAR LED OFF	L

LAYOUT OPTION : 除了GAMING3/5系列和Z1704N-GAMING5不要LAYOUT, 其餘GAMING系列機種都要留LAYOUT



AUDIO LED Control (沒有LPT model)

	IO_GP82	IO_GP83	IO_GP91
Still Mode	L	H	L
OFF Mode	L	L	L
Pluse Mode	L	H	BREATH
Beat Mode	OD	H	L

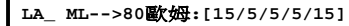
AUDIO LED Control (有LPT model)

	IO_GP92	IO_GP17	IO_GP91
Still Mode	L	H	L
OFF Mode	L	L	L
Pluse Mode	L	H	BREATH
Beat Mode	OD	H	L

* Rev0.11

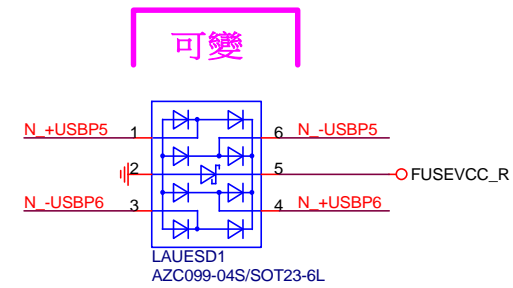
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GIGABYTE™		
Title		
EMI/ESD		
Size	Document Number	Rev
B	GA-Z170MX-Gaming 5	1.1
Date:	Tuesday, June 07, 2016	Sheet 44 of 66

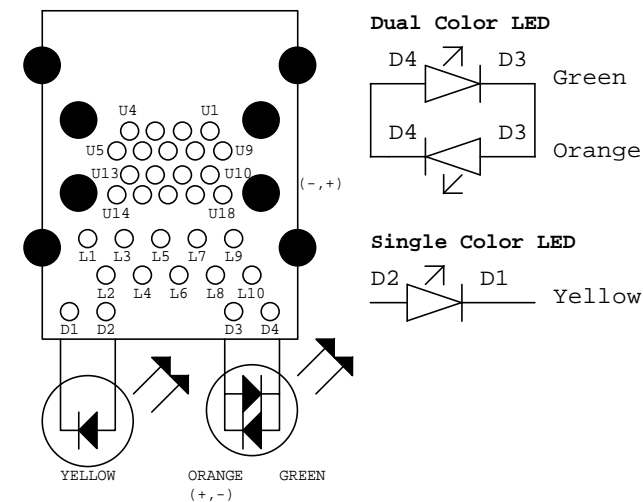


USB_LAN CONNECTOR R1.04

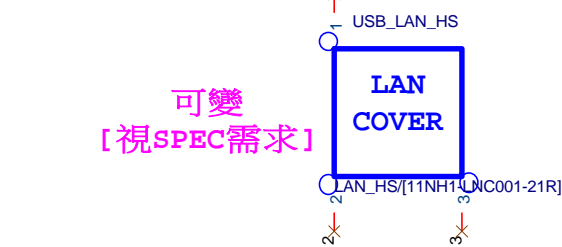
RMA ESD PROTECT note:可變更USB NAME



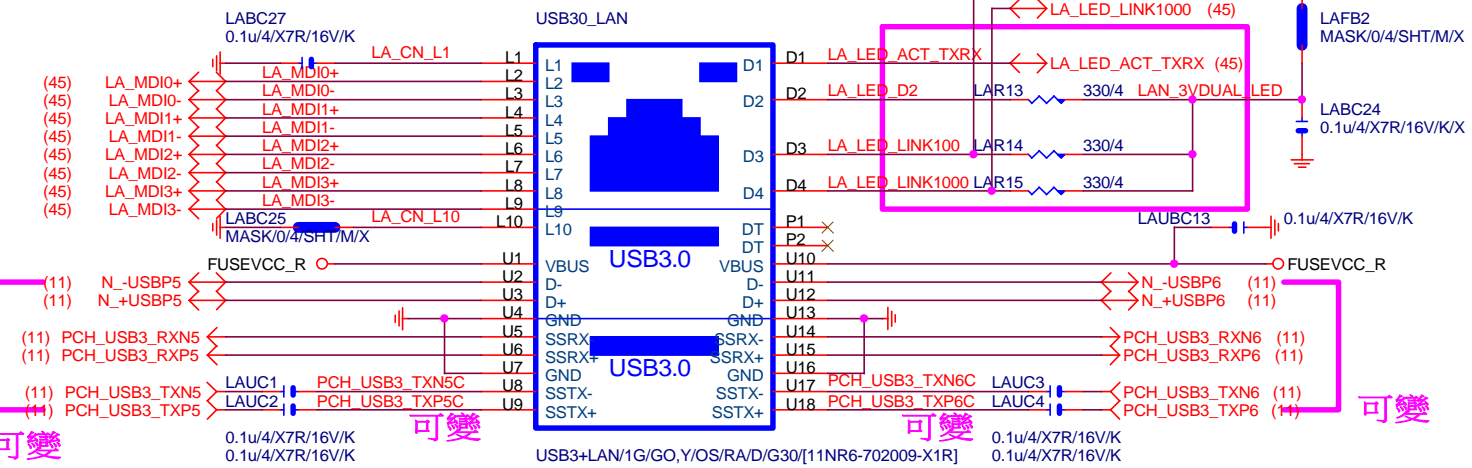
USB30 LAN LAYOUT示意圖



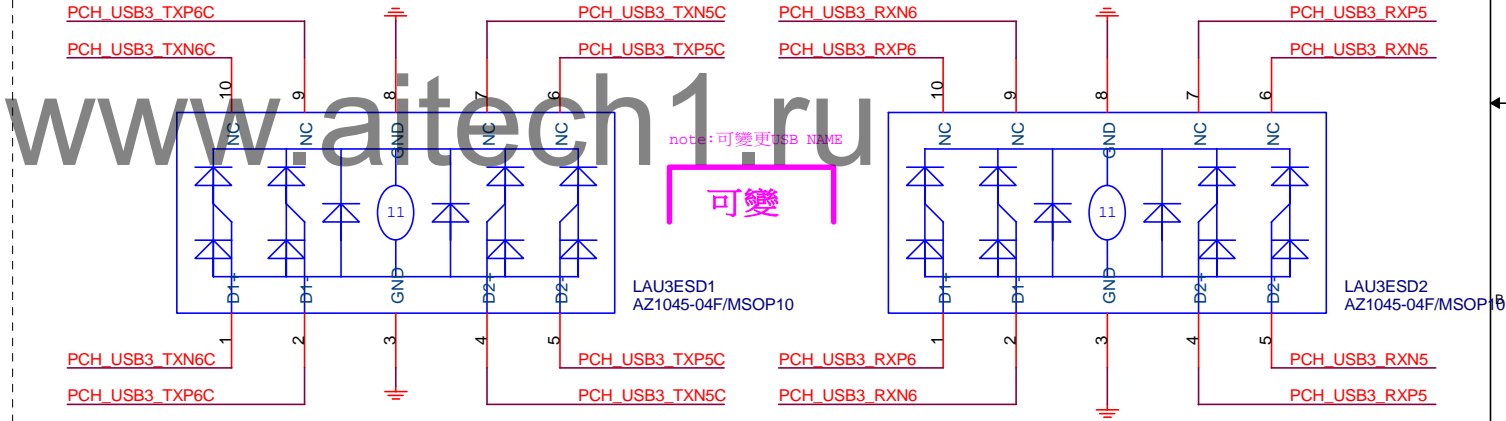
LAN_COVER FOOT PRINT:LAN_COVER



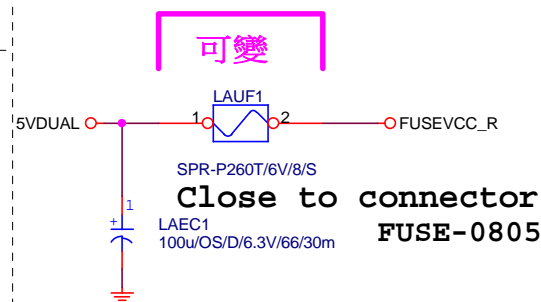
USB_LAN CONNECTOR [E2201] note:可變更USB NAME



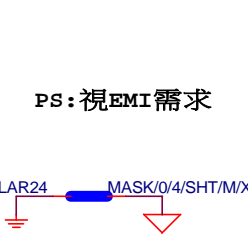
LA_MDI-->100歐姆:[20/4/8/4/20]



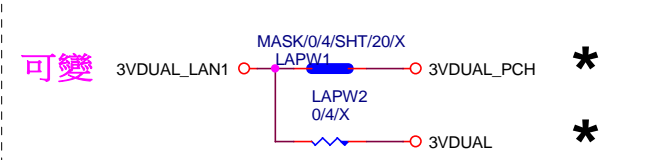
USB POWER note:可變更FUSE



EMI SHORT PAD PS:視EMI需求



LAN POWER



Gigabyte Technology			
LAN CONNECTOR-E2201			
Size	Custom	Document Number	Rev 1.1
GA-Z170MX-Gaming 5			
Date:	Tuesday, June 07, 2016	Sheet	46 of 66

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GIGABYTE™

Title

Etron EJ179V

Size

Custom

GA-Z170MX-Gaming 5

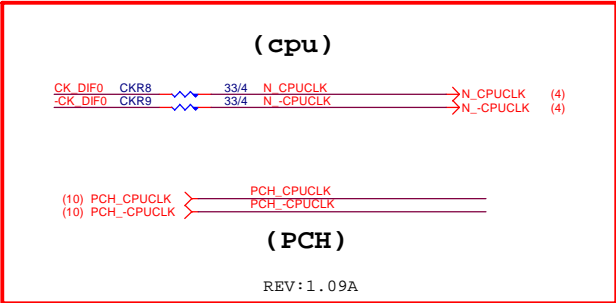
Rev

1.1

Date: Tuesday, June 07, 2016

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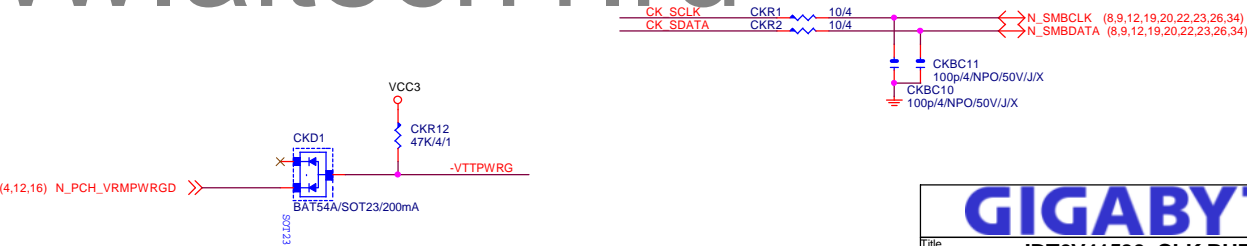
IDT6V41530




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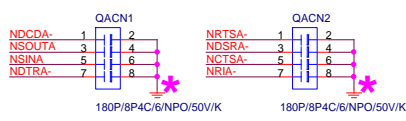
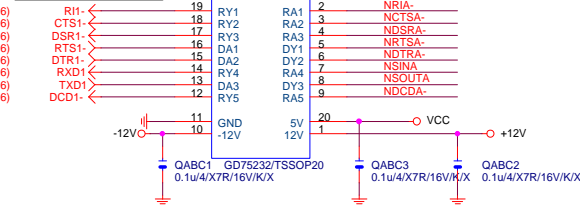
INP_SEL	Input
0	Crystal
1	CLK_INP/M

CK_VCO_SEL	VCO
0	400M
1	1200M

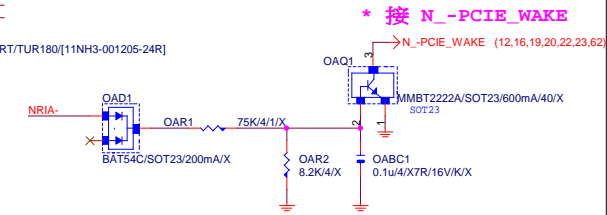
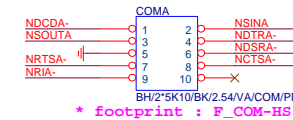


			
Title IDT6V41530_CLK BUFFER			
Size Custom	Document Number GA-Z170MX-Gaming 5		Rev 1.1
Date: Tuesday, June 07, 2016	Sheet 48	of 66	

COM PORT



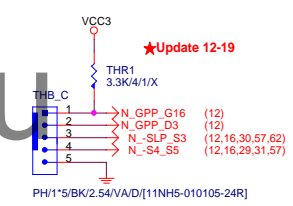
COMA



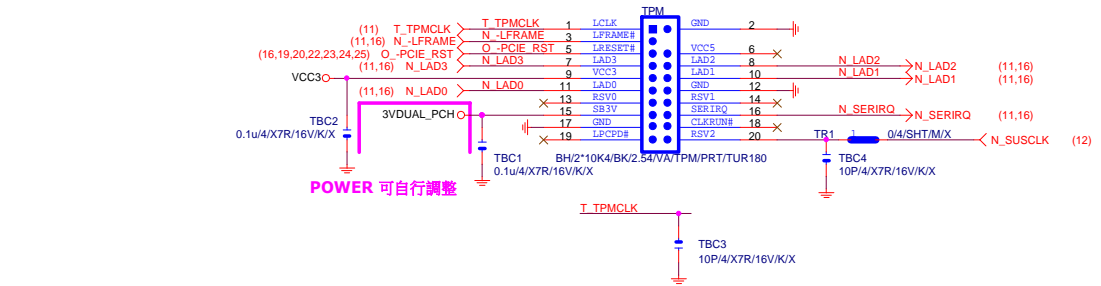
80 PORT

www.aitech1.ru

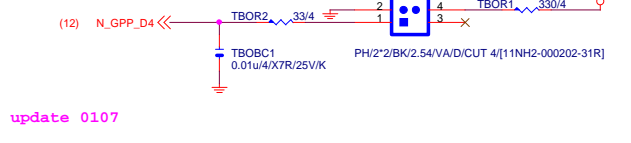
Thunderbolt



TPM CONNECT

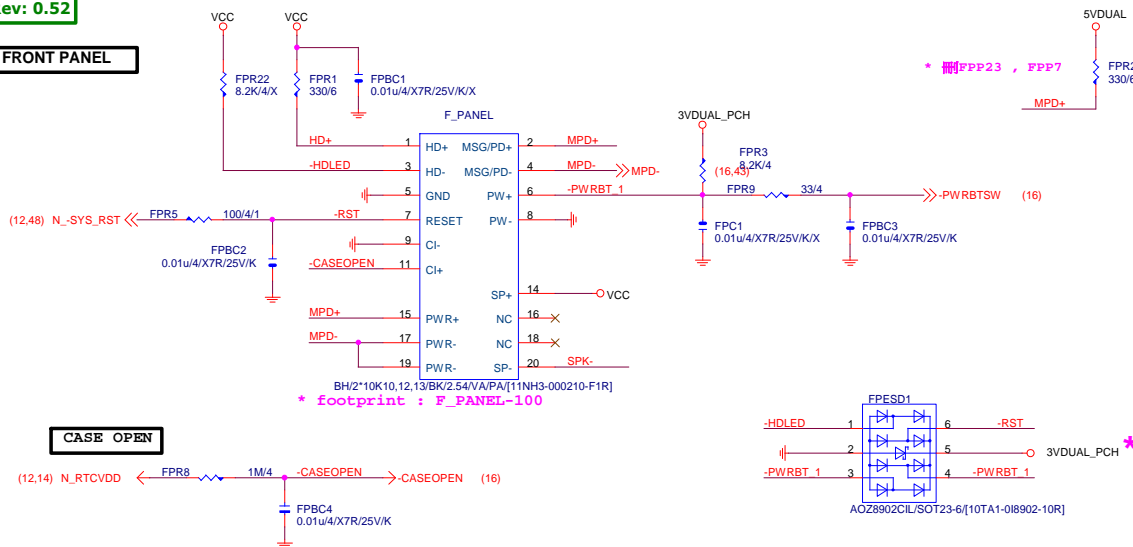


PCH:GPP_D4



Rev: 0.52

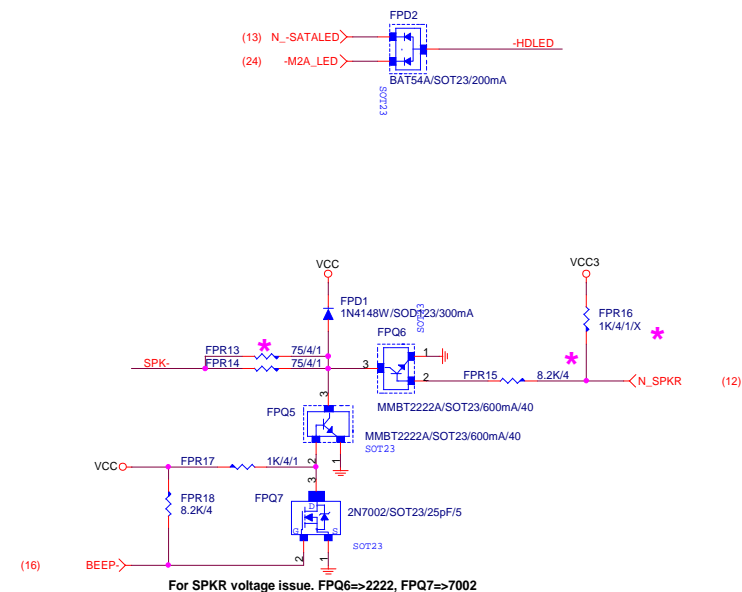
FRONT PANEL



SATA LED

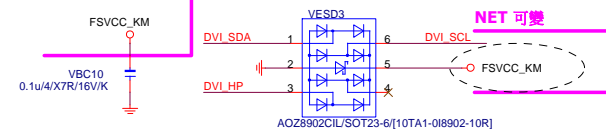
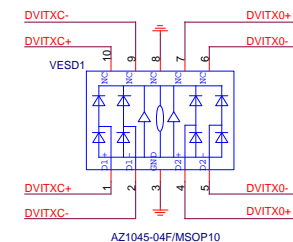
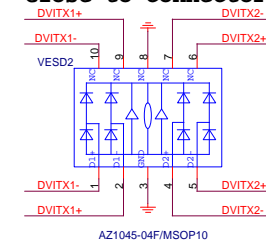
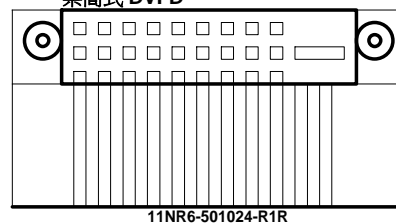
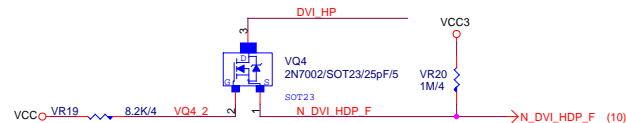
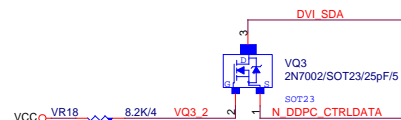
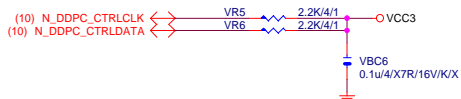
SATA LED SATALED# signal open-collector, pull-up (8.2 kΩ to 10 kΩ) to Vcc3_3

SPKR



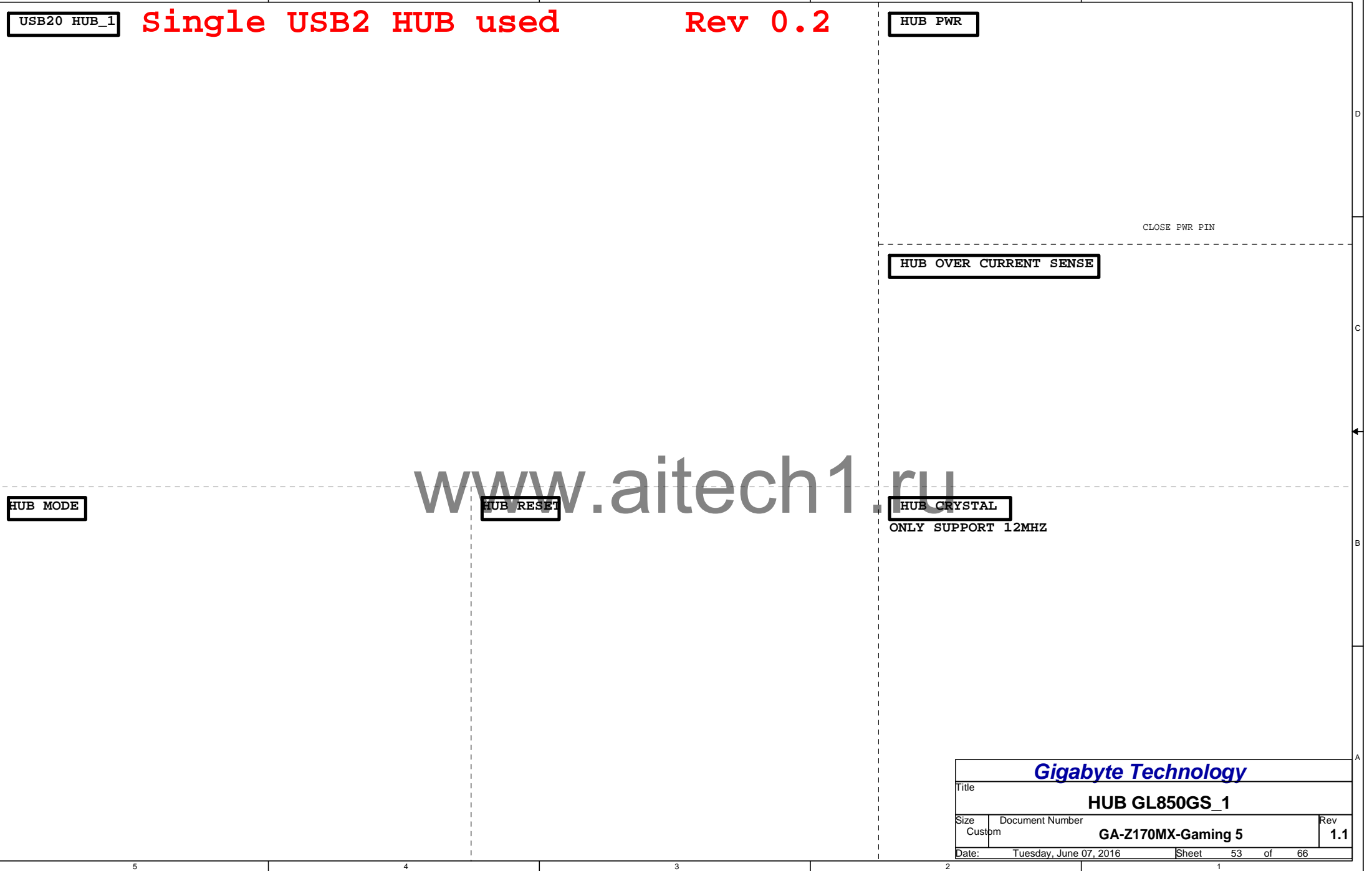
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Gigabyte Technology		
Title		
HDMI20 MCDP2800-BA		
Size	Document Number	Rev
C	GA-Z170MX-Gaming 5	1.1
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HUB MODE

HUB RESET

HUB CRYSTAL

ONLY SUPPORT 12MHZ

HUB OVER CURRENT SENSE

CLOSE PWR PIN

HUB PWR

USB20 HUB_1

Single USB2 HUB used Rev 0.2

Gigabyte Technology			
Title			
HUB GL850GS_1			
Size	Document Number		Rev
Custom	GA-Z170MX-Gaming 5		1.1
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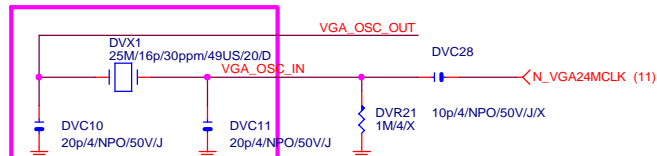
www.aitech1.ru

GIGABYTE			
Title			
DP PORT			
Size	Document Number		Rev
Custom	GA-Z170MX-Gaming 5		1.1
Date:	Tuesday, June 07, 2016		
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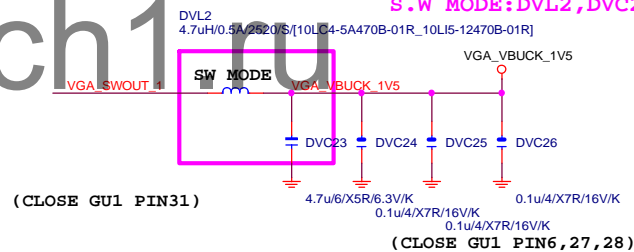
ROM PART: PTN3356R1BS/[10HQ5-A23356-10R]
FLASH PART: PTN3356F1BS/[10HQ5-A23356-20R]

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

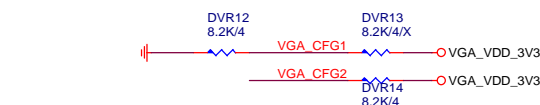
2. 刪除:
DVC1 [25M/16p/30ppm/49US/20/D]
DVC10 [20p/4/NPO/50V/J]
DVR9 [8.2K/4]



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

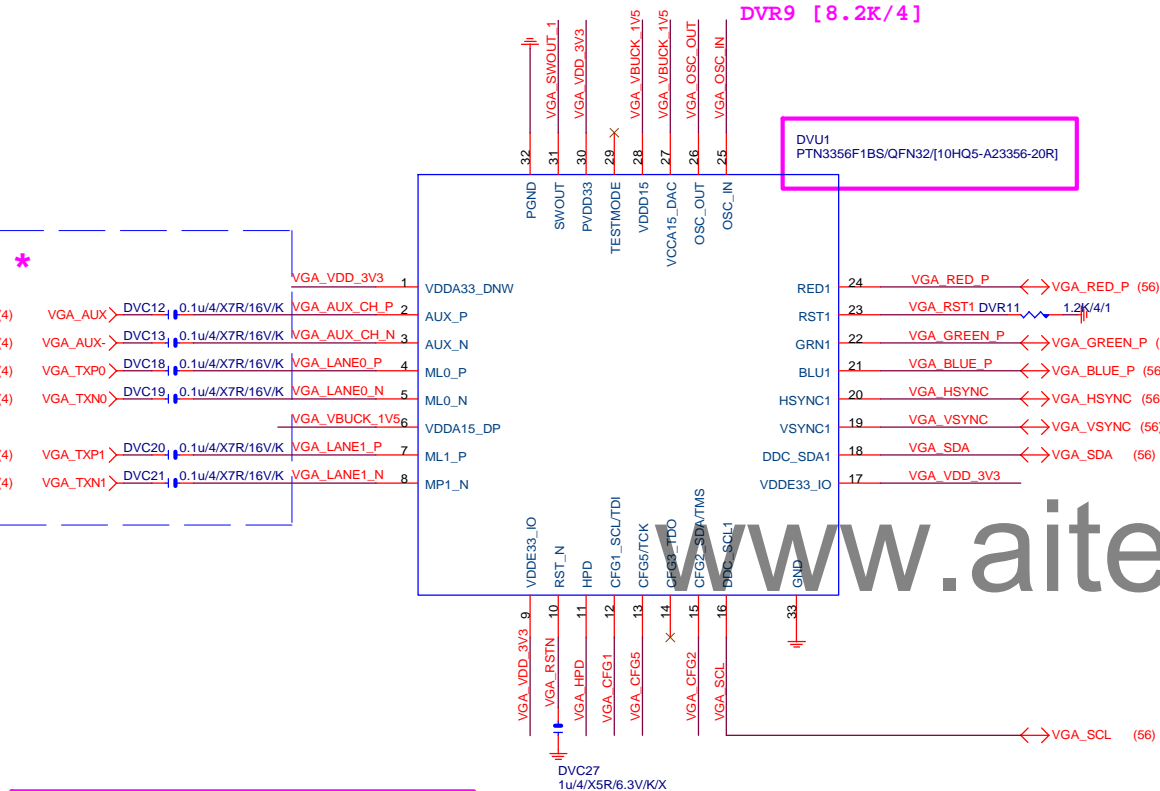


Non-Compliant



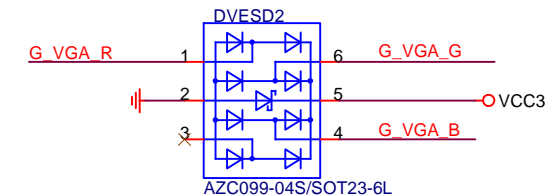
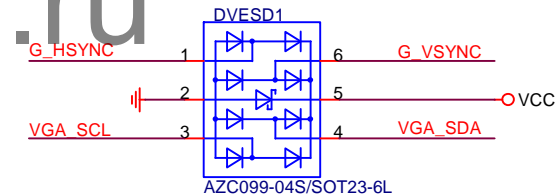
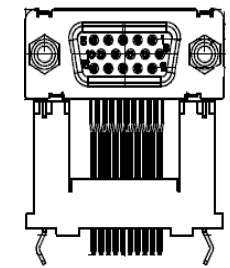
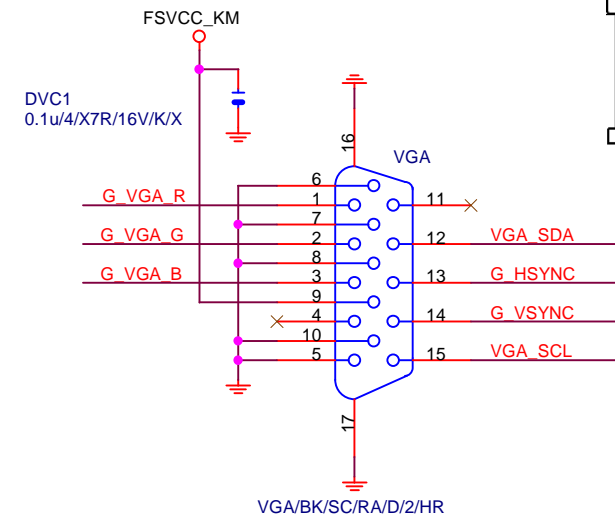
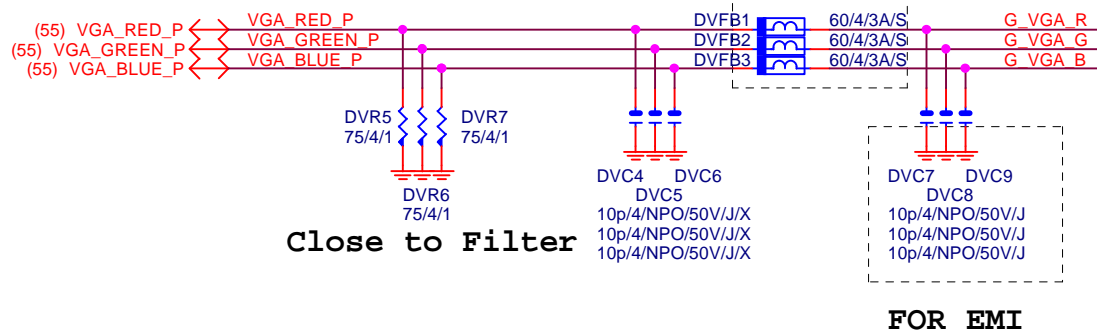
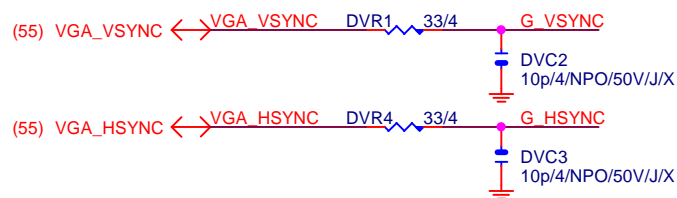
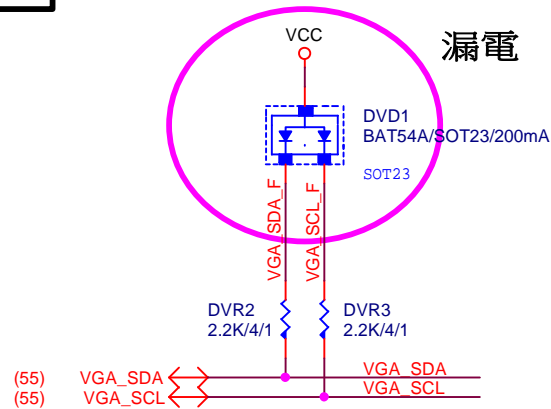
Gigabyte Technology
NXP-PTN3356

Size Custom	Document Number GA-Z170MX-Gaming 5	Rev 1.1
Date: Tuesday, June 07, 2016	Sheet 55 of 66	

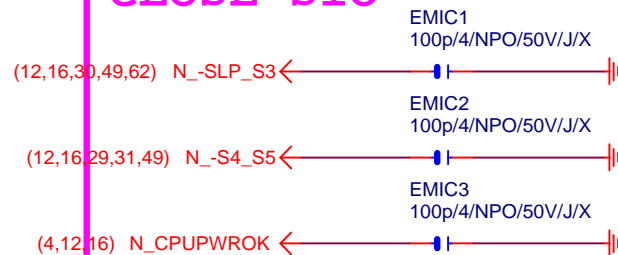


放置PCH端





CLOSE SIO



CLOSE PCH



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GIGABYTE™

Title

EMI/ESD

Size
A

Document Number

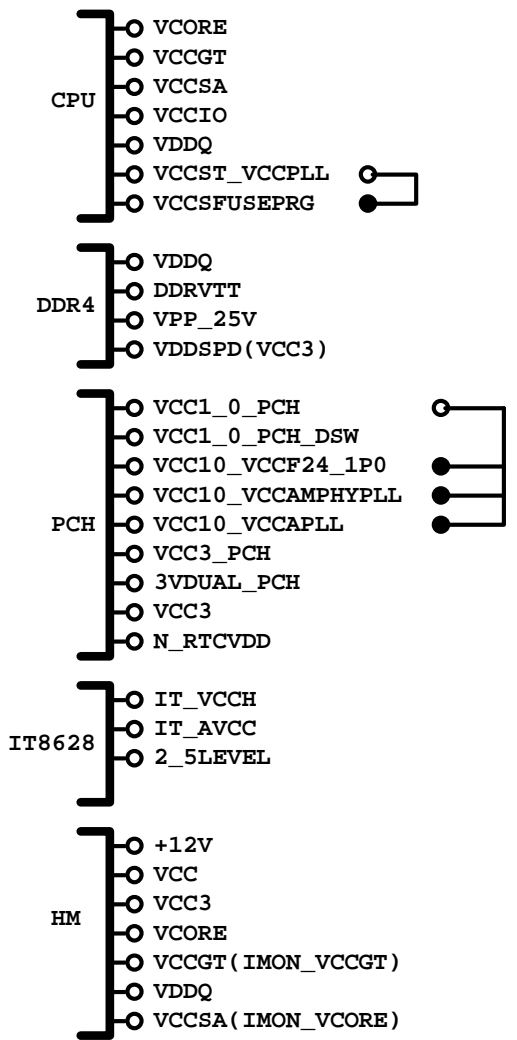
GA-Z170MX-Gaming 5

Rev
1.1

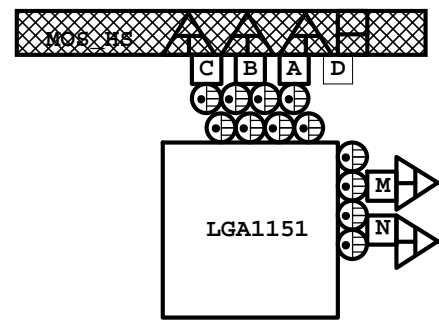
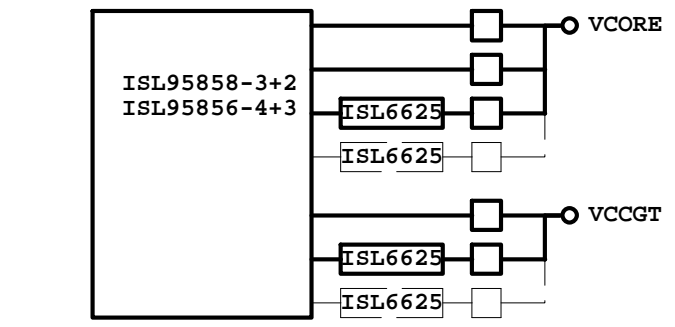
Date: Tuesday, June 07, 2016

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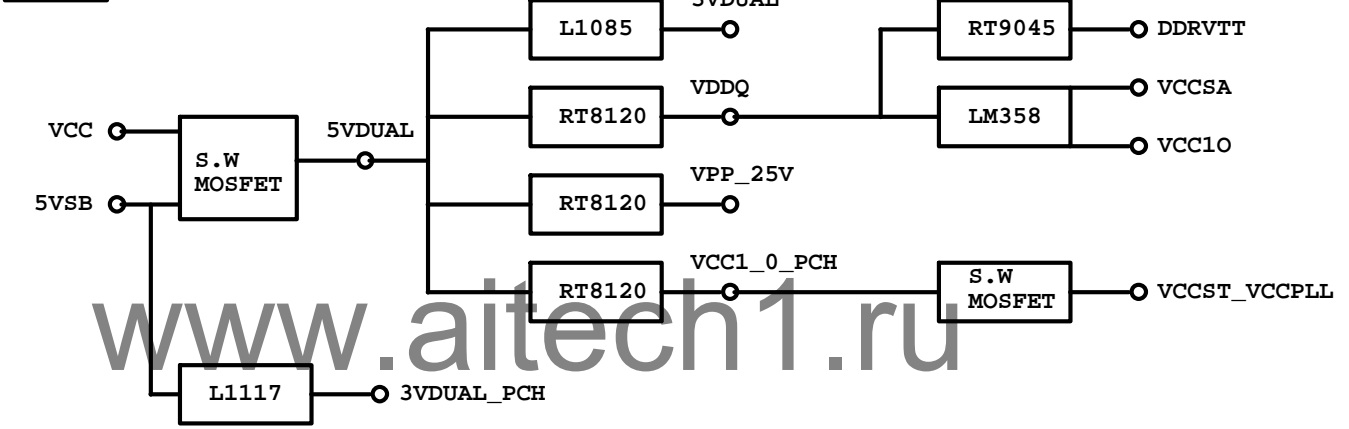
POWER BLOCK MAP



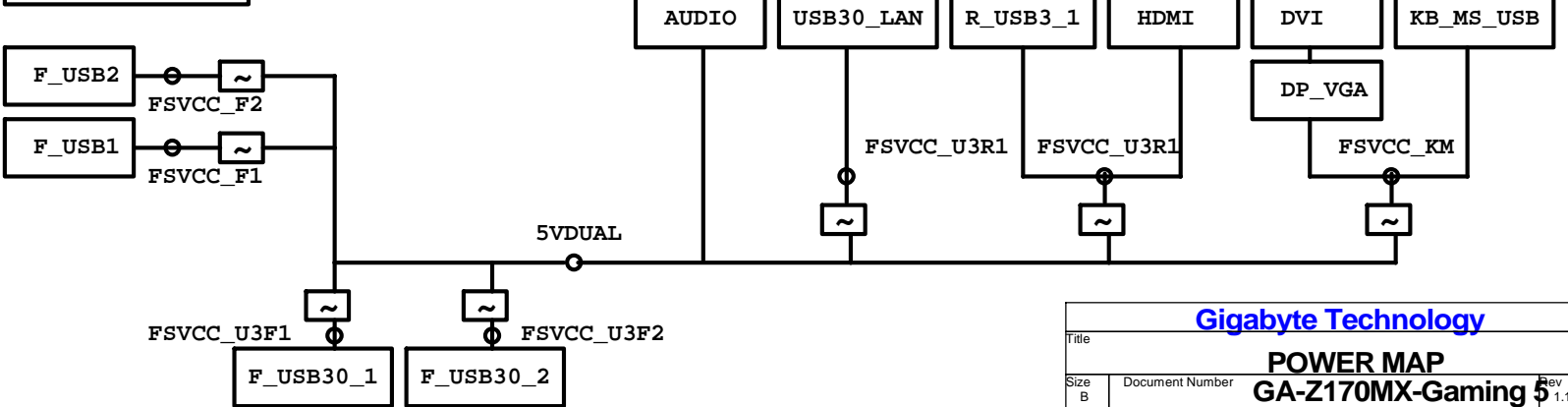
VCORE/VCCGT



POWER



FUSE POWER F/R



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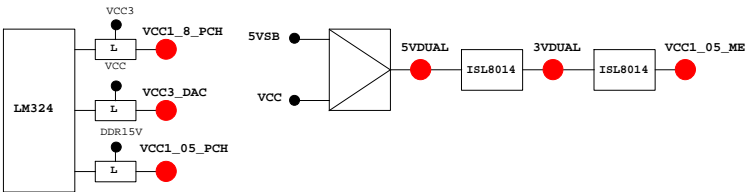
GIGABYTE™			
Title RT8120_DDR4 POWER			
Size	Document Number		Rev
Custom	GA-Z170MX-Gaming 5		1.1
Date:	Tuesday, June 07, 2016	Sheet 59 of 66	

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	PCIE1 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

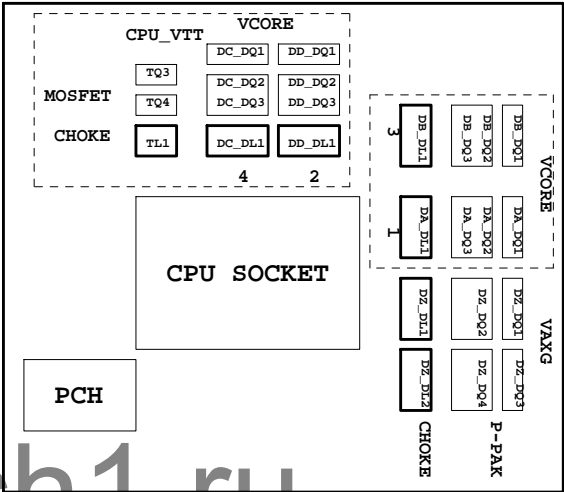
Super I/O ITE8720 GPIO Table

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/SCK	LOW_PWR_1	
VID05/GP27/SIN2	LOW_PWR_2	
PCIRST2#/GP11	-PWRST1	
PCIRST1#/GP12	-PWRST2	
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/CIRRXL/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：



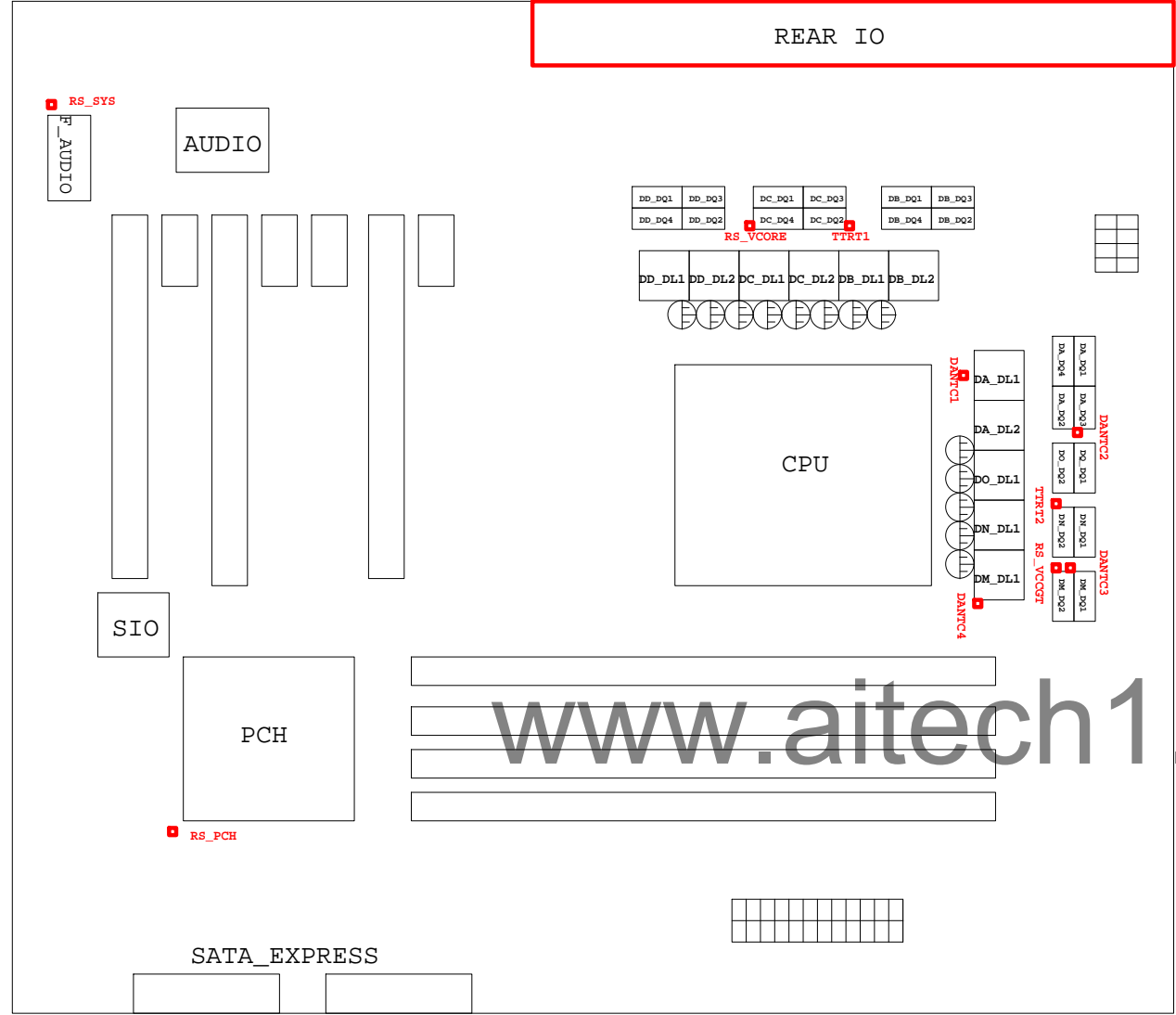
BIOS超電壓對應表：

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：

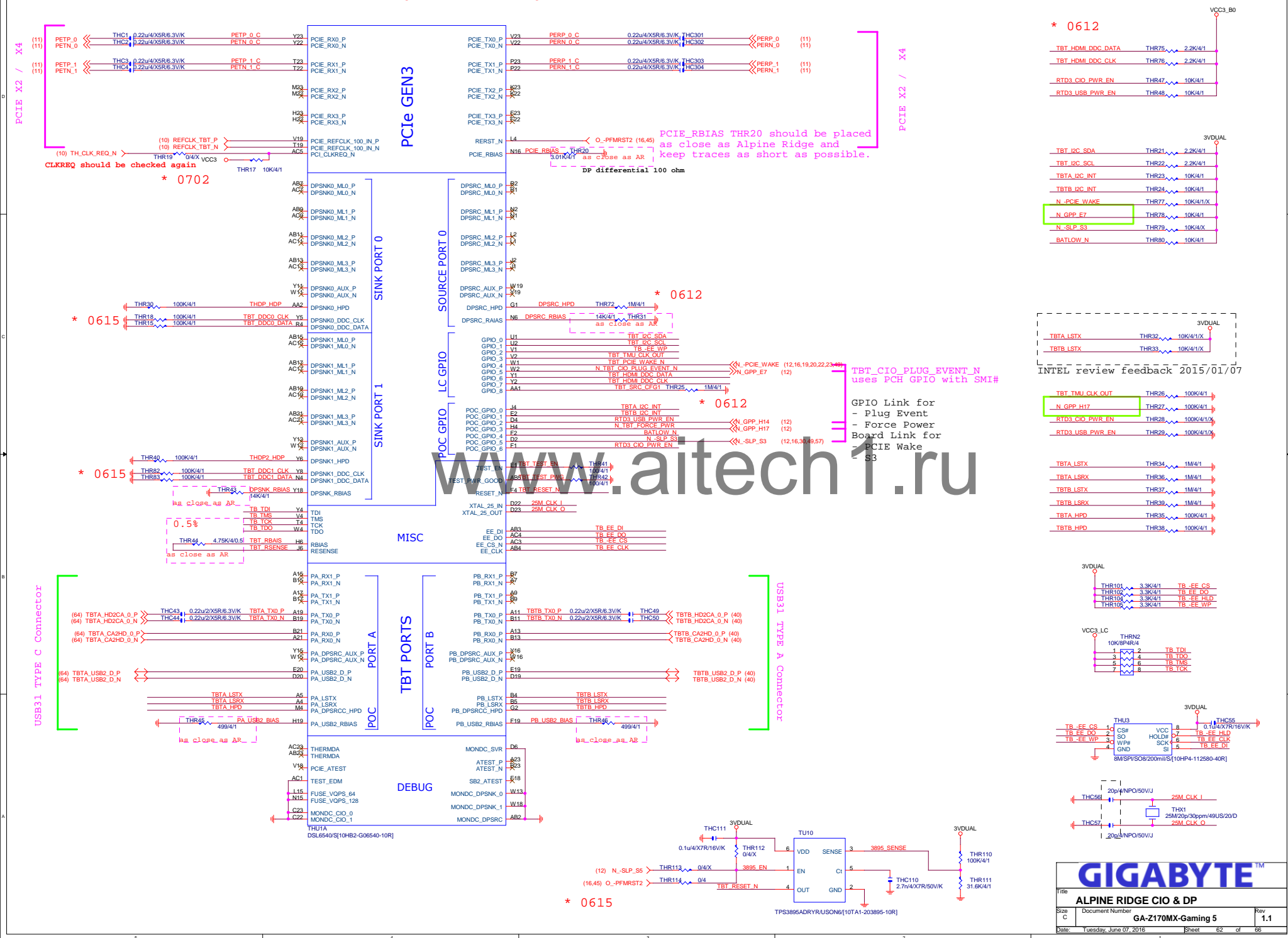
Z77-D3H :
PCH :
12SP2-S05511-01R/02R/03R
MOSFET :
12SP2-S08924-01R/02R/03R

	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



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

INTEL AR USB31 module SCH 0.61 (2015/06/15)

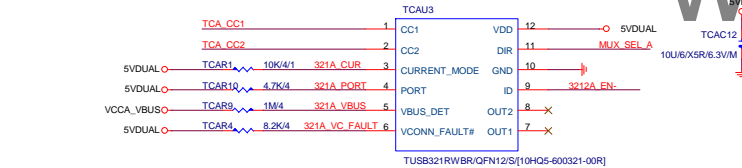
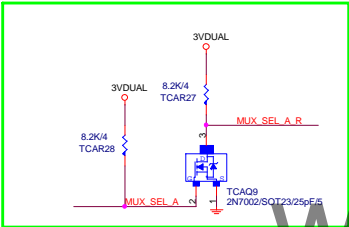
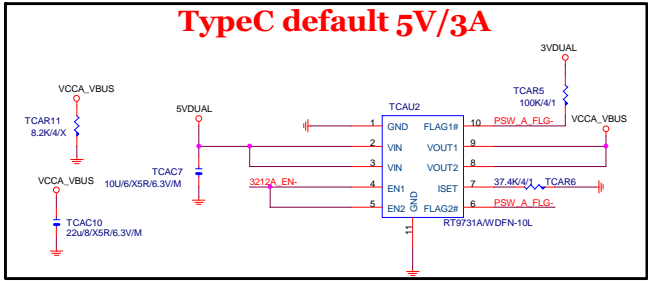
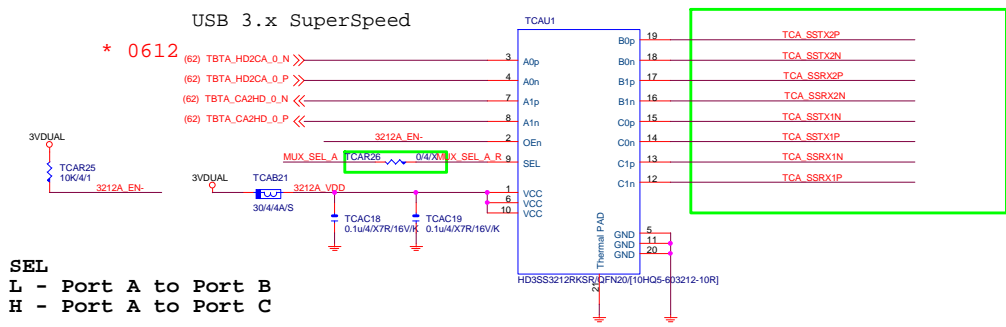


[illegible]

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

INTEL AR USB31 module SCH 0.61 (2015/06/15)

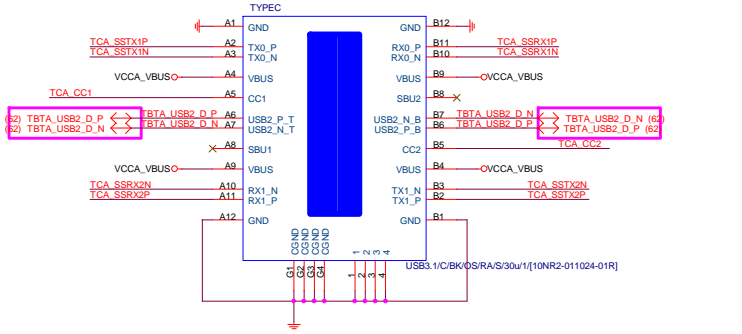
* 0612



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

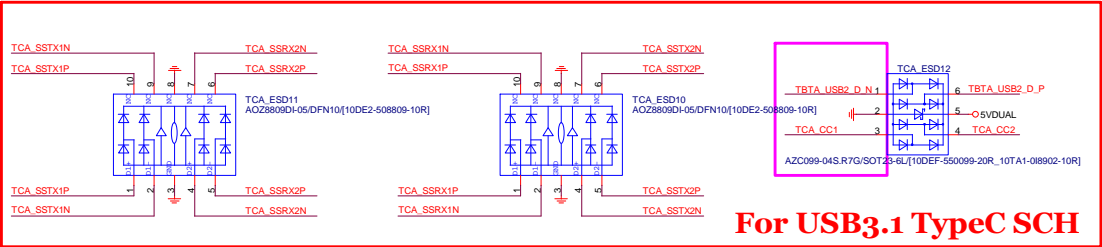
CURRENT MODE
L - Default current / Pull down to GND or NC
M - Medium (1.5A) current / Pull up to VDD 500K
H - High (3.0A) current / Pull up to VDD 10K

PORT
H - HOST
L - Device
NC - Dual Role



USB2.0 can be used the same source

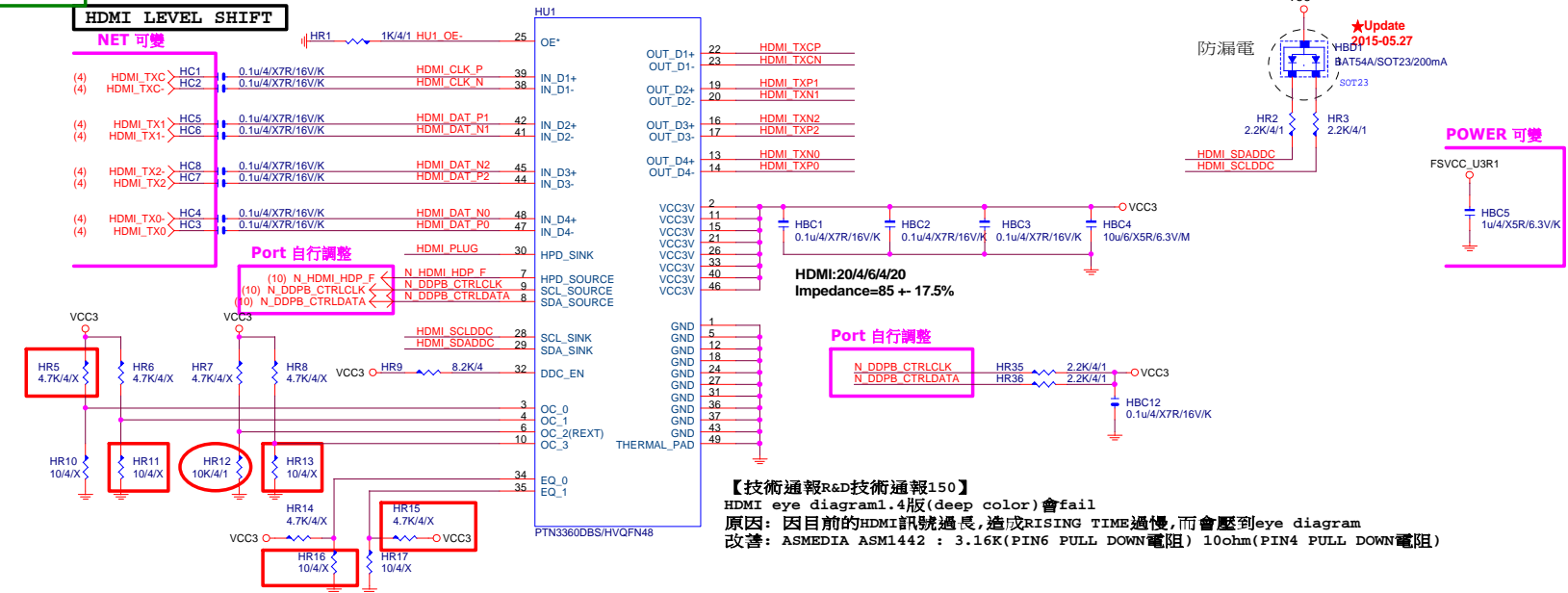
www.aitech1.ru



For USB3.1 TypeC SCH

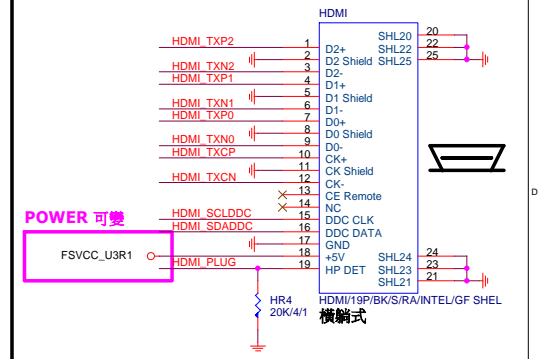
Color markers can be changed by model

GIGABYTE™		
TI TUSB321		
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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

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直立式
P/N:11NR6-H01019-K1R

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

	料號	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-EPSOIC

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