

## Model Name: GA-Z170-Gaming K3 EU

SHEET

TITLE

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02	BOM & PCB MODIFY HISTORY
03	BLOCK DIAGRAM
04	CPU_LGA1150-A
05	CPU_LGA1150-B_DDR4
06	CPU_LGA1150-C
07	CPU_LGA1150-D
08	DDR4 CHANNEL A 1,2
09	DDR4 CHANNEL B 1,2
10	PCH_RGB,CLK BUFFER
11	PCH DMI,USB,PCIE
12	PCH MISC
13	PCH SATA,PCIE,SATA_EXPRESS
14	PCH_PWR,GND
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16	ITE 8628 LPC IO
17	HMW
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19	PCI EXPRESS X16 SLOT
20	PCI EXPRESS X4 SLOT(PCH)
21	PCI EXPRESS X1 SLOTS/SWITCH
22	PCI EXPRESS X1 SLOTS
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25	ISL95856 PWM
26	ISL95856 MOS_VCORE ASM1803
27	ISL95856 MOS_VCCGT PCI SLOT 1&2
28	VCCSA_VCCIO_VCCPLL ASM1083 POWER
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30	RT8120_VPP
31	RT8120_PCH
32	DISCRETE POWER

SHEET

TITLE

Rev 1.01

33	NCT3933
34	ATX POWER , A_-PROCHOT
35	KB_MS_USB
36	DVI CONN
37	HDMI CONN
38	ASM1142 USB31A
39	R_USB30
40	KILLER E2400
41	USB30_LAN CONNECTOR-E2400
42	Realtek ALC1150
43	REAR AUDIO JACK
44	Audio Power
45	PCB LED
46	F_USB30
47	F_USB BOX Header
48	COM,LPT,TPM ,THB
49	F_PANEL
50	TABLE LIST
51	EMI-ESD
52	POWER零件使用表
53	NTC MAP

Gigabyte Technology

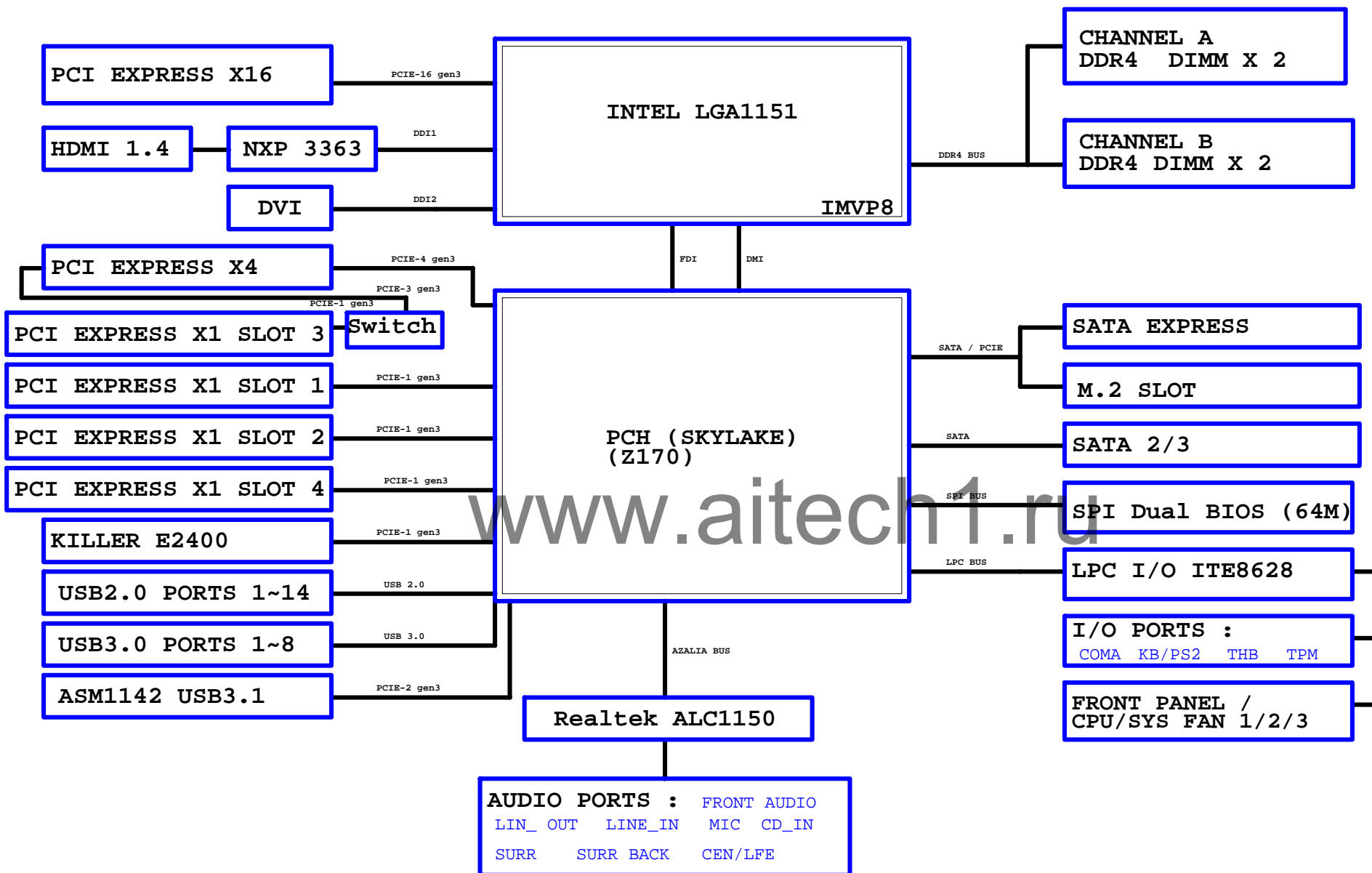
Title		Cover Sheet	GIGABYTE
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Custom			
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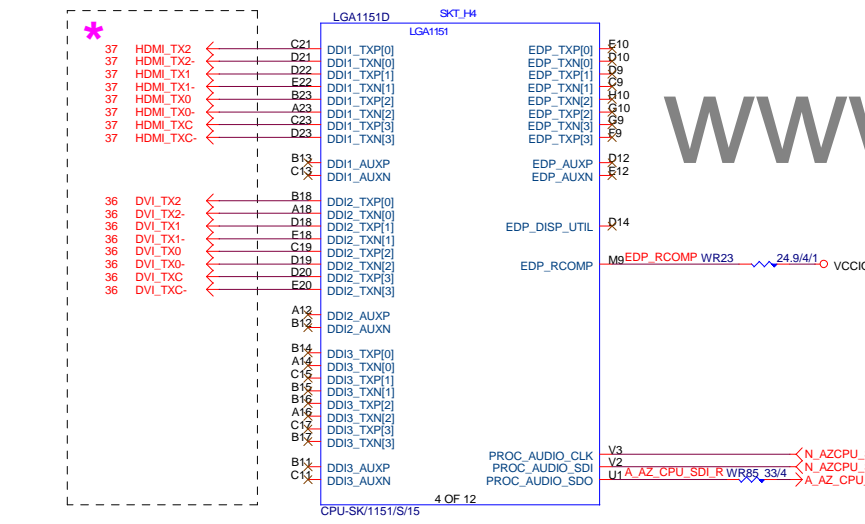
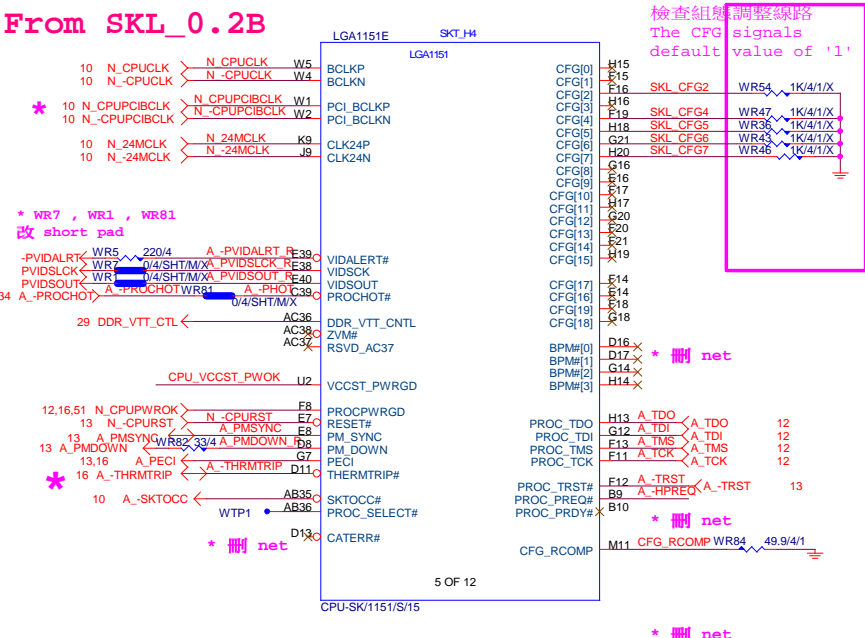
## Component value change history

[illegible][illegible]

# BLOCK DIAGRAM

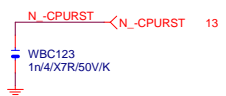


From SKL\_0.2B



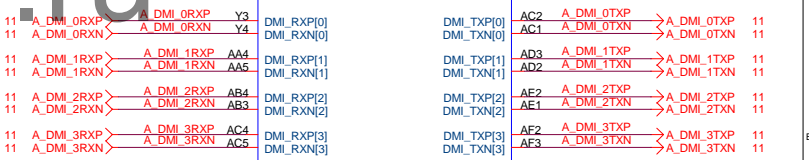
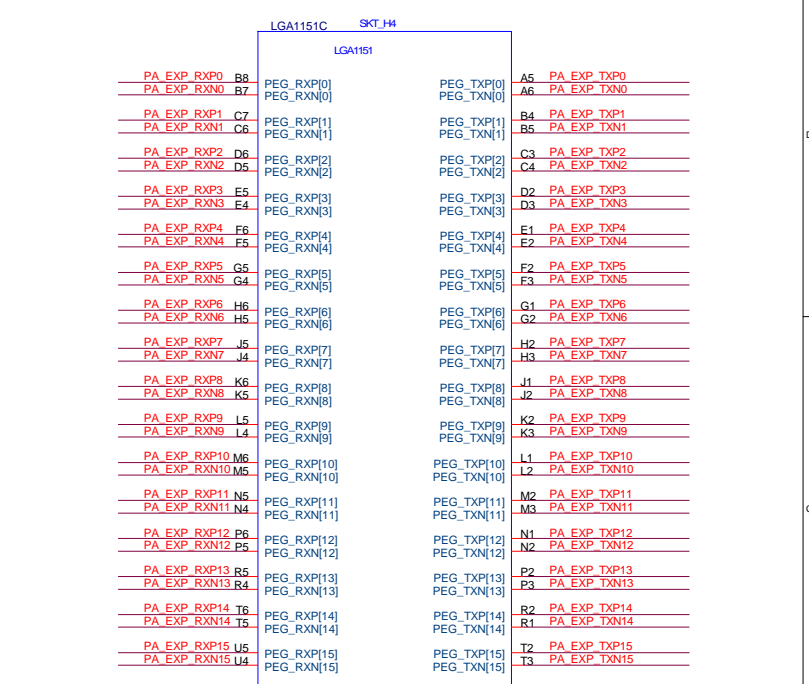
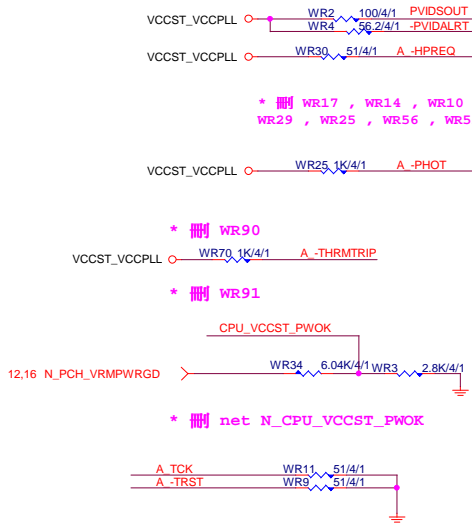
G-15u : (CPU-SK/1151/S/15)  
10SC1-F01151-11R / 10SC1-F01151-12R  
G-FL : (CPU-SK/1151/S/GF)  
10SC1-F01151-21R / 10SC1-F01151-22R

-CPURST



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

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

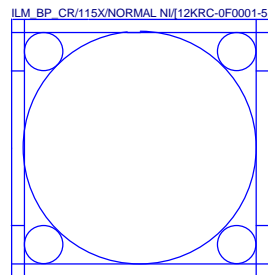


PA EXP TXP[0..15] >>> PA\_EXP\_TXP[0..15] 19  
PA EXP TXN[0..15] >>> PA\_EXP\_TXN[0..15] 19  
PA EXP RXP[0..15] >>> PA\_EXP\_RXP[0..15] 19  
PA EXP RXN[0..15] >>> PA\_EXP\_RXN[0..15] 19

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

Intel CRB		
CPU LGA1151-A		
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\* 改DDR4 net



Need check the new CPU ME



8 MODT\_A[0..3] ↔ MODT\_A[0..3]

9 MODT\_B[0..3] ↔ MODT\_B[0..3]

8 MDA[0..63] ↔ MDA[0..63]

9 MDB[0..63] ↔ MDB[0..63]

8 M\_DQSA[0..7] ↔ M\_DQSA[0..7]


8 M\_-DQSA[0..7] ↔ M\_-DQSA[0..7]

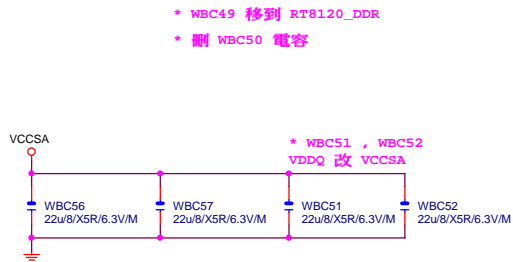
9 MAA[0..16] ↔ MAA[0..16]

9 MAAB[0..16] ↔ MAAB[0..16]

9 M\_DQSB[0..7] ↔ M\_DQSB[0..7]

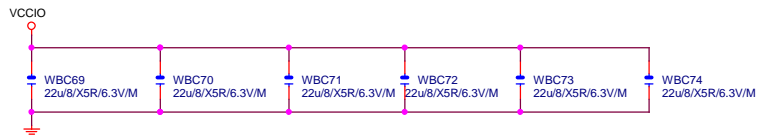
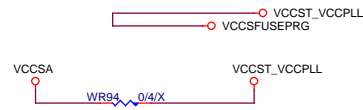
9 M\_-DQSB[0..7] ↔ M\_-DQSB[0..7]

<div style="text-align: center;">  <h1 style="margin: 0;">Intel CRB</h1> </div>			
<div style="text-align: center;"> <h2 style="margin: 0;">CPU LGA1151-B</h2> </div>			
Size Custom	Document Number		Rev
	<h1 style="margin: 0;">GA-Z170-Gaming K3 EU</h1>		1.0
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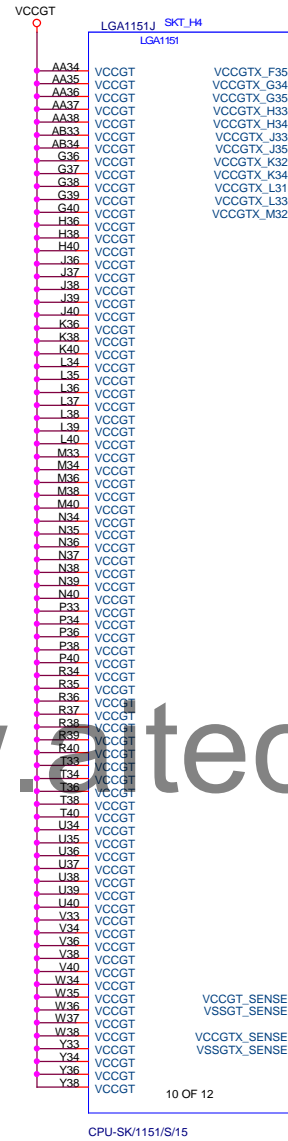


\* 刪 WBC124, WBC125, WBC126, WBC127 電容

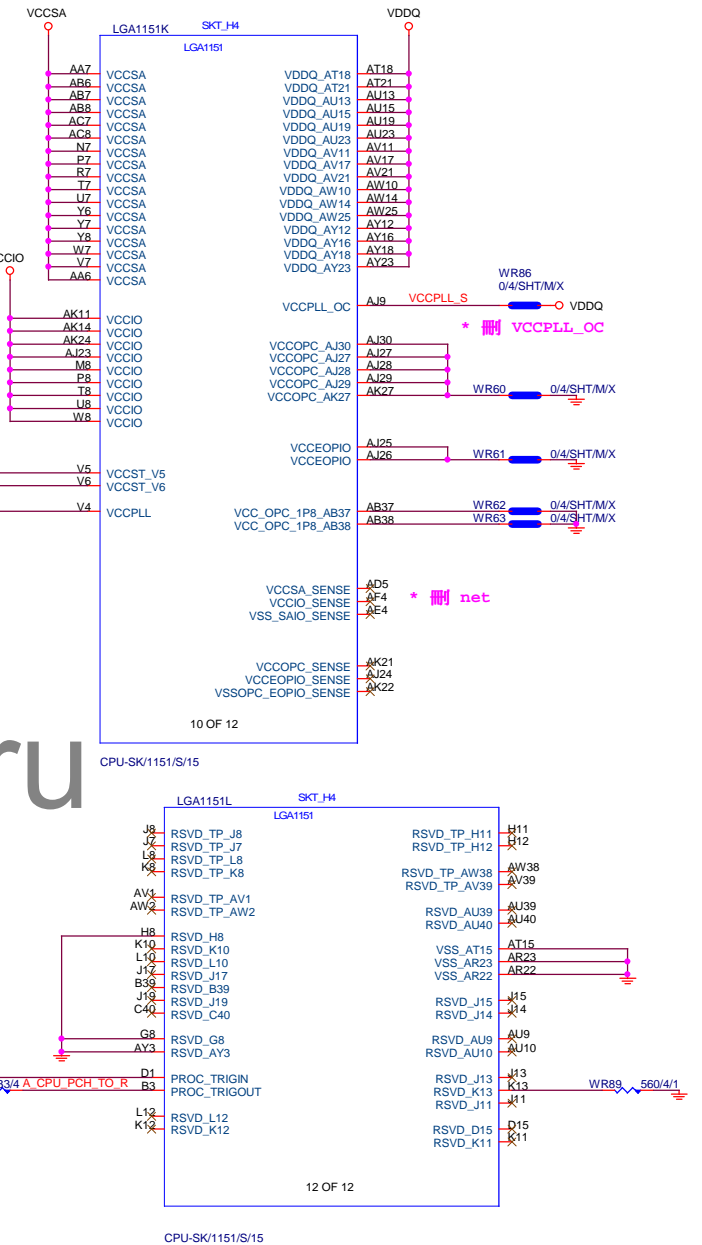
\* WR94, WR59, WR86, WR60,  
WR61, WR62, WR63 改 short  
pad



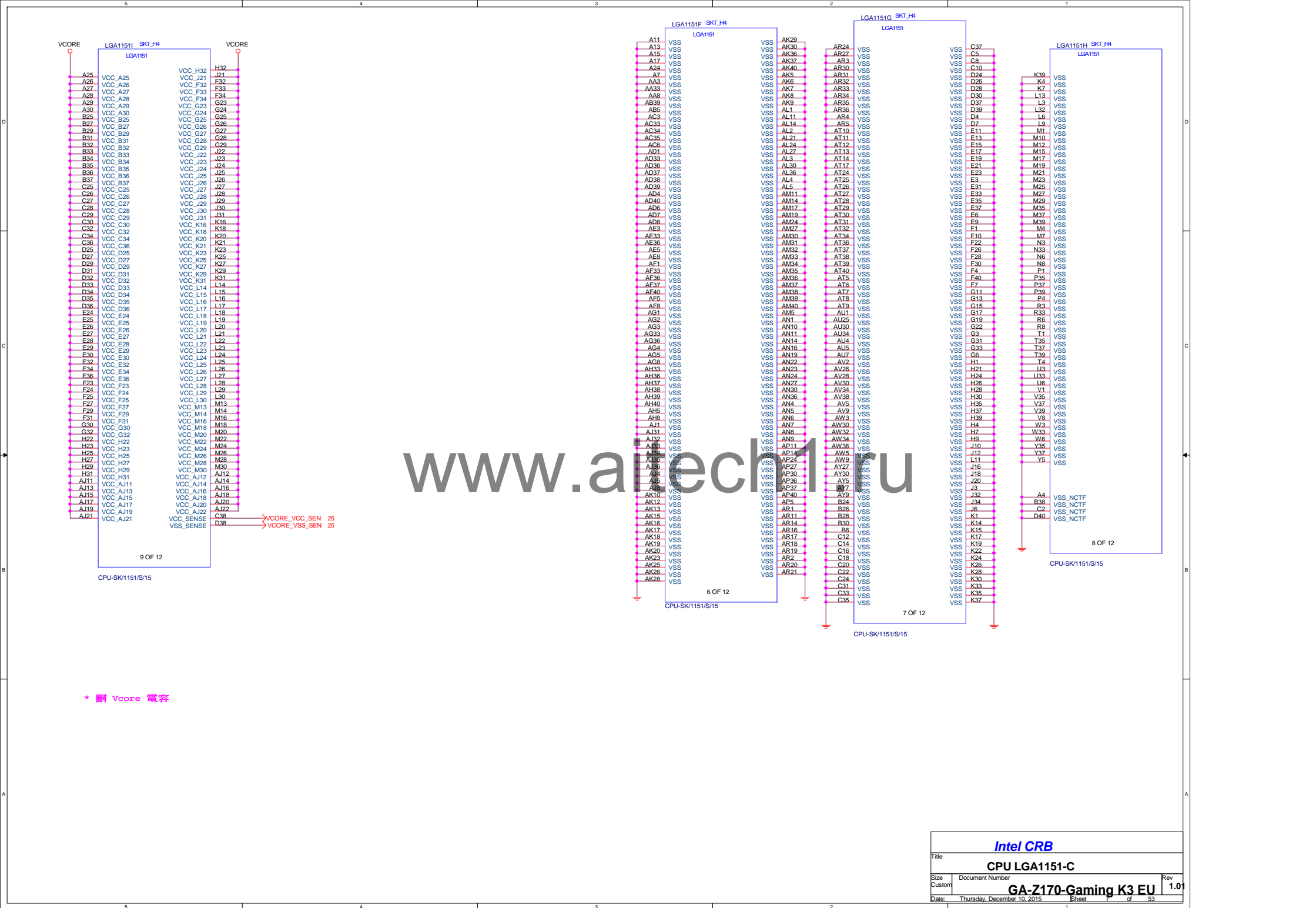
\* 刪 VCCGT 電容



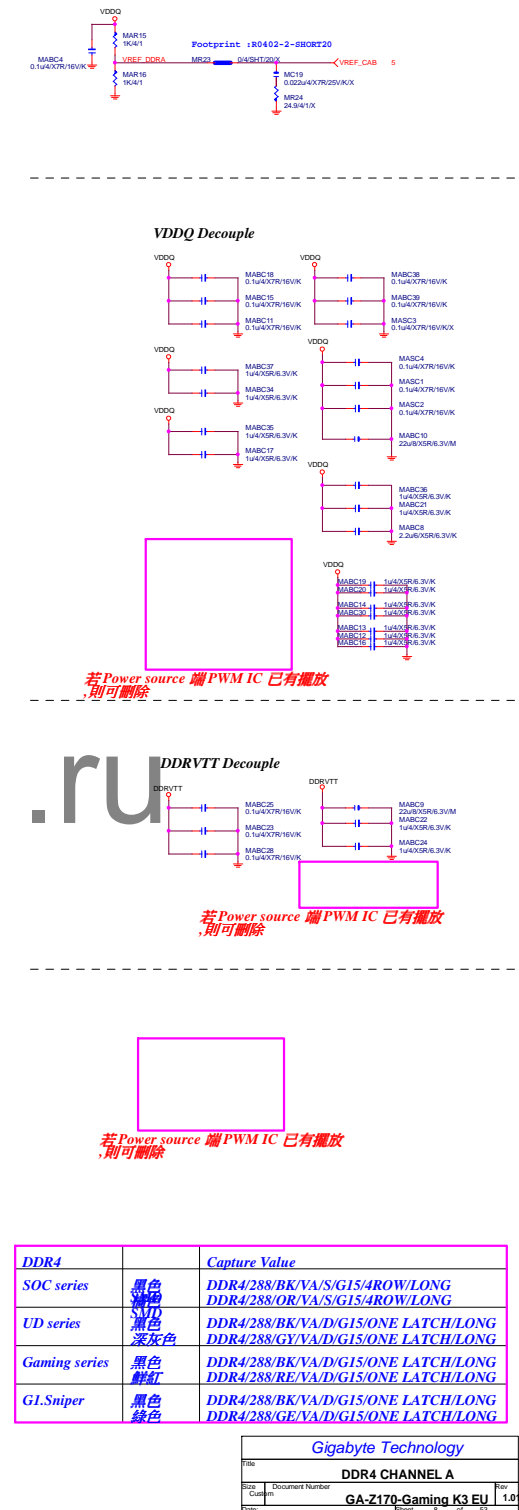
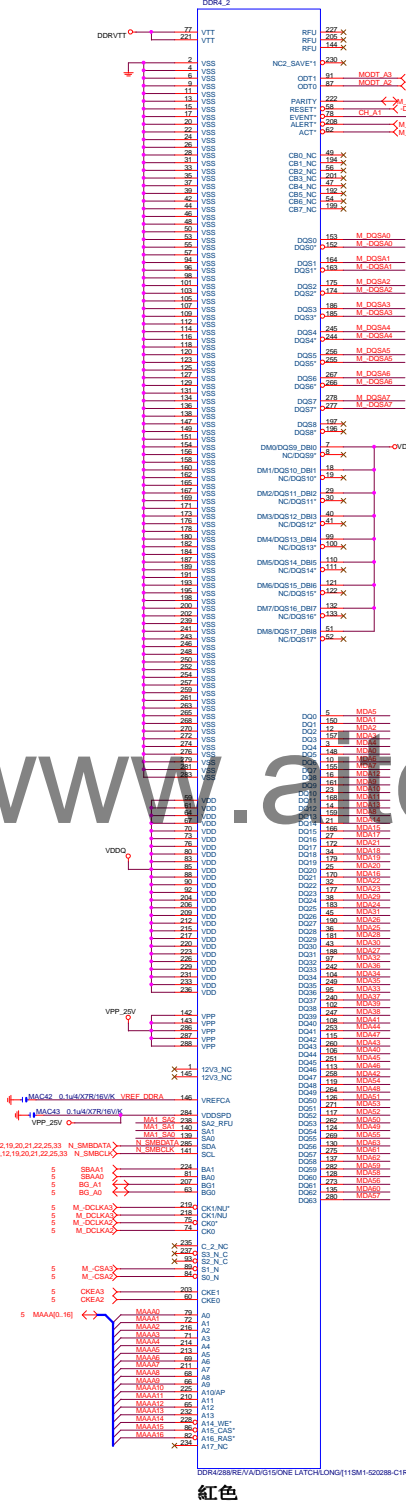
F39 → VCCGT\_SENSE 25  
F38 → VSSGT\_SENSE 25  
F37 →  
F36 →  
13 N\_PCH\_CPU\_T1 → WR88 33/4 A\_CPU\_PCH\_TO\_R  
13 A\_CPU\_PCH\_TO →



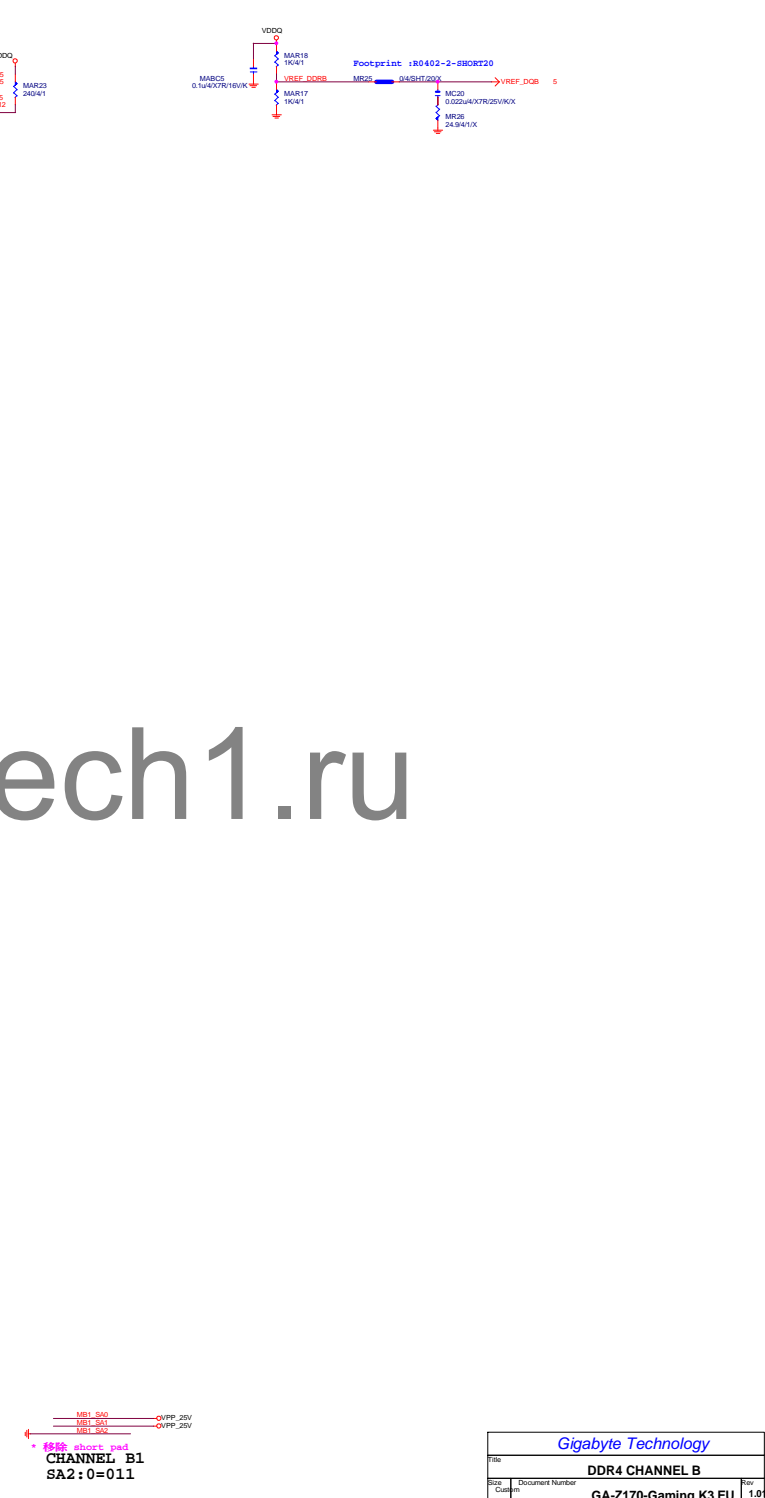
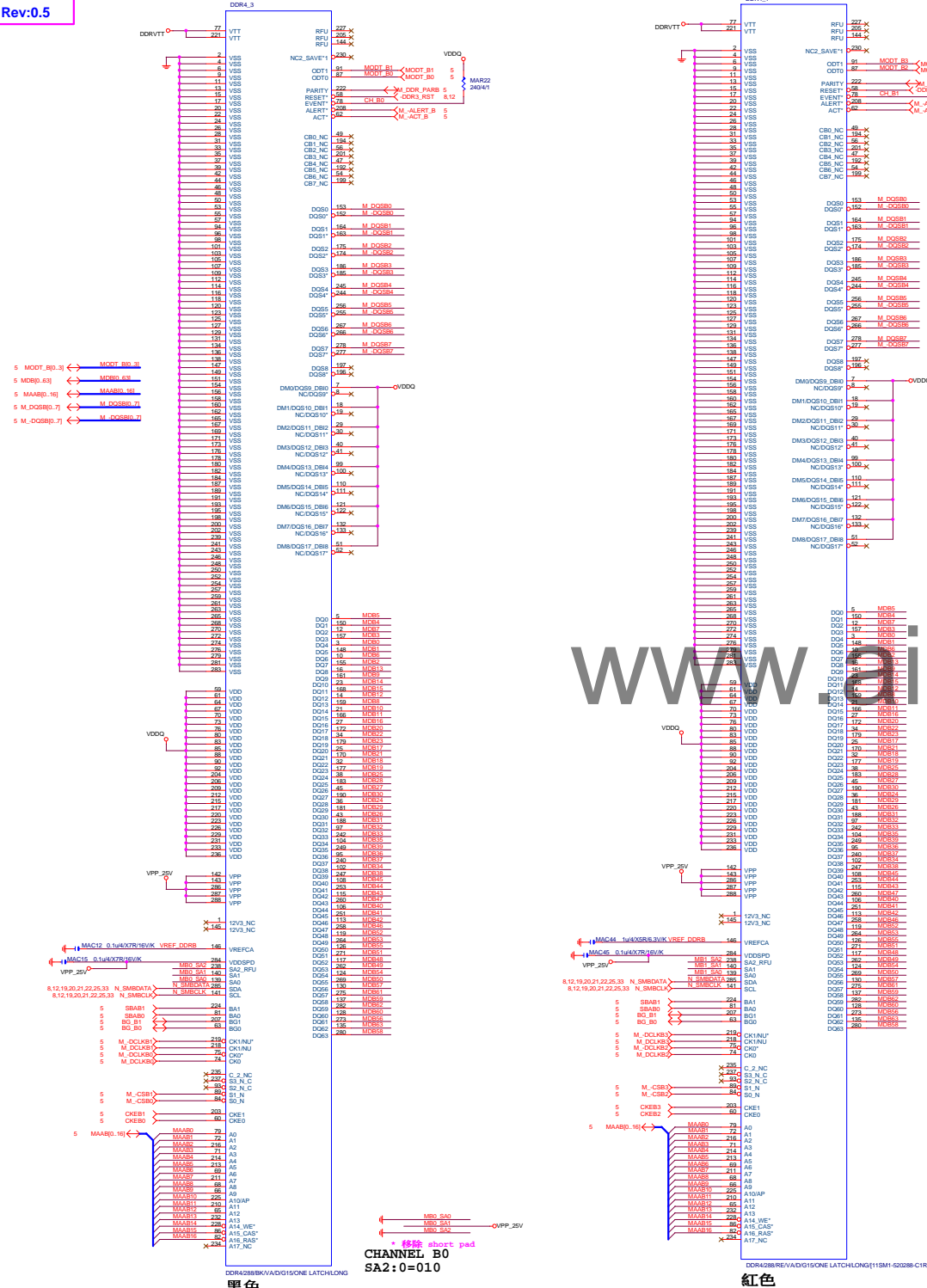
Intel CRB			
Title			
CPU LGA1151-C			
Size	Document Number	Rev	
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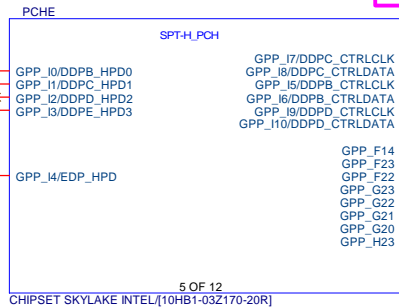




Rev 0.7

## 放置PCH端

N DDPD\_CTRLCLK NR307 2.2K/4/1/X  
N DDPD\_CTRLDATA NR4 2.2K/4/1/X



37 N\_HDMI\_HDP\_F  
36 N\_DVI\_HDP\_F

AW4  
AY2  
AV4  
N\_GPP\_I3 BA4

NR9 100K/4/N GPP\_I4 BD7

N\_GPP\_I3 NR7 8.2K/4  
N\_GPP\_F23 NR12 8.2K/4  
N\_GPP\_F22 NR248 8.2K/4

VCC3

N\_GPP\_I3 NR7 8.2K/4  
N\_GPP\_F23 NR12 8.2K/4  
N\_GPP\_F22 NR248 8.2K/4

VCC3

A\_SKT0CC NR16 8.2K/4  
N\_GPP\_G22 NR18 8.2K/4  
N\_GPP\_G21 NR20 8.2K/4  
N\_GPP\_G20 NR22 8.2K/4

N\_GPP\_B5 NR6 8.2K/4  
N\_GPP\_B6 NR8 8.2K/4  
N\_GPP\_B7 NR10 8.2K/4  
N\_GPP\_B8 NR13 8.2K/4  
N\_GPP\_B9 NR15 8.2K/4

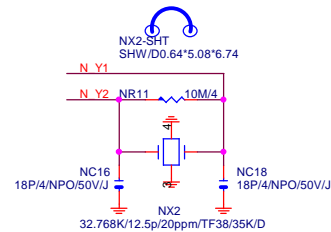
VCC3

N\_GPP\_B5 NR6 8.2K/4  
N\_GPP\_B6 NR8 8.2K/4  
N\_GPP\_B7 NR10 8.2K/4  
N\_GPP\_B8 NR13 8.2K/4  
N\_GPP\_B9 NR15 8.2K/4

VCC3

N\_GPP\_B10 NR17 8.2K/4  
N\_GPP\_H0 NR19 8.2K/4

32.768KHZ



CLK: 4/15&lt;1000;Guard GND

ON-BOARD DEVICE USED

CLK: 4/15&lt;1000 mils±100 mils;Guard GND

PCHG SPT-H\_PCH

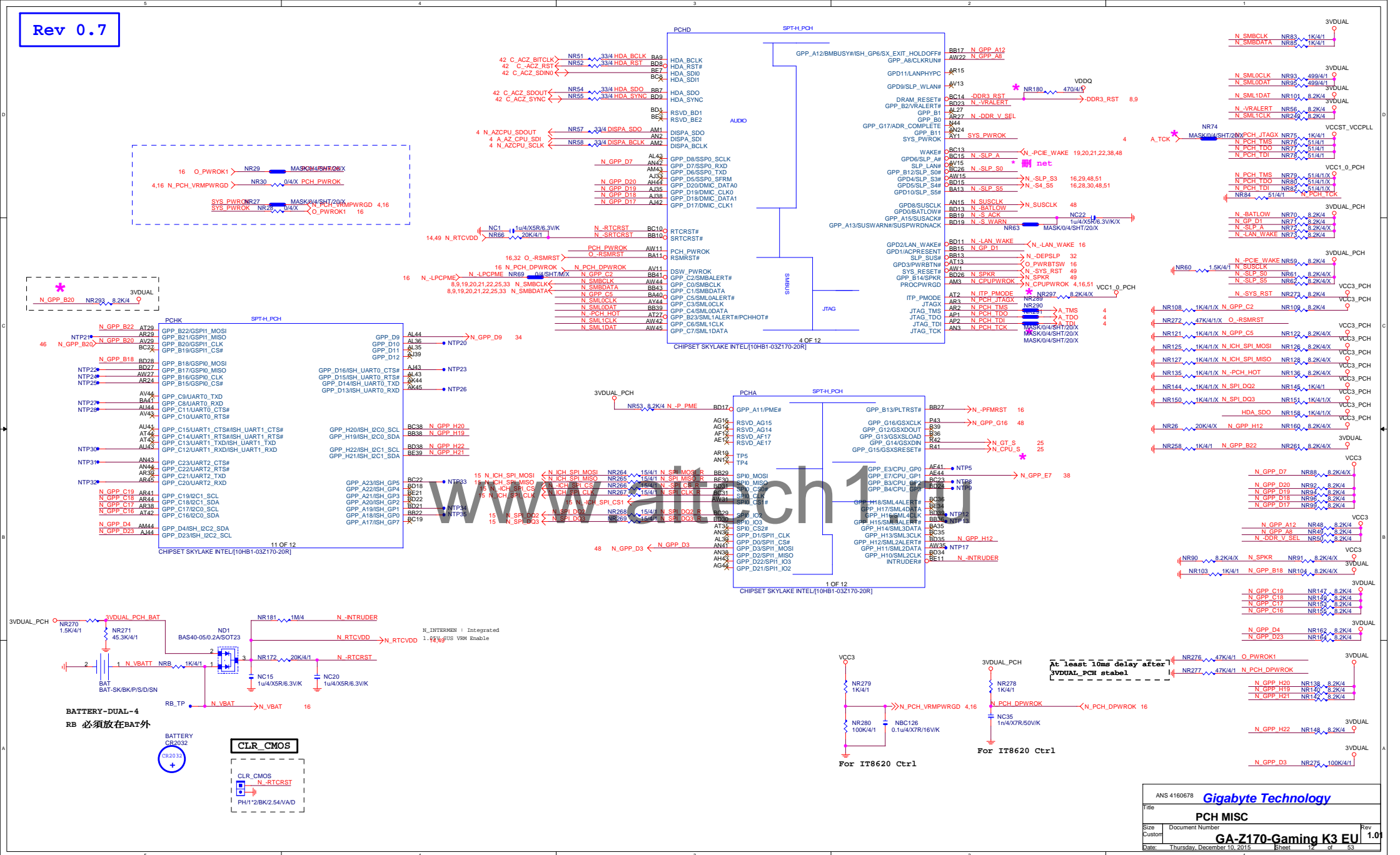
AR1X  
GPP\_A16/CLKOUT\_48  
CLKOUT\_CPUNSSC P  
CLKOUT\_CPUNSSC  
CLKOUT\_CPBCLK P  
CLKOUT\_CPBCLK  
XTAL24\_OUT  
XTAL24\_IN  
XCLK\_BIASREF  
RTCX1  
RTCX2  
BC24  
GPP\_B5/SRCCLKREQ0#  
GPP\_B6/SRCCLKREQ1#  
GPP\_B7/SRCCLKREQ2#  
GPP\_B8/SRCCLKREQ3#  
GPP\_B9/SRCCLKREQ4#  
GPP\_B10/SRCCLKREQ5#  
GPP\_H0/SRCCLKREQ6#  
GPP\_H1/SRCCLKREQ7#  
GPP\_H2/SRCCLKREQ8#  
GPP\_H3/SRCCLKREQ9#  
GPP\_H4/SRCCLKREQ10#  
GPP\_H5/SRCCLKREQ11#  
GPP\_H6/SRCCLKREQ12#  
GPP\_H7/SRCCLKREQ13#  
GPP\_H8/SRCCLKREQ14#  
GPP\_H9/SRCCLKREQ15#  
R13  
R1X  
P1  
R2  
WZ  
Y5  
U3  
U3X  
CLKOUT\_PCIE\_N15  
CLKOUT\_PCIE\_P15  
CLKOUT\_PCIE\_N14  
CLKOUT\_PCIE\_P14  
CLKOUT\_PCIE\_N13  
CLKOUT\_PCIE\_P13  
CLKOUT\_PCIE\_N12  
CLKOUT\_PCIE\_P12

CLKOUT\_ITPXDP  
CLKOUT\_ITPXDP P  
CLKOUT\_CPUPCIBCLK  
CLKOUT\_CPUPCIBCLK P  
N\_CPUPCIBCLK 4  
N\_CPUPCIBCLK 4  
CLKOUT\_PCIE\_N0  
CLKOUT\_PCIE\_P0  
PA\_SRCCLK\_3GIO 19  
PA\_SRCCLK\_3GIO 19  
CLKOUT\_PCIE\_N1  
CLKOUT\_PCIE\_P1  
PI\_PCIE\_CLK 22  
PI\_PCIE\_CLK 22  
CLKOUT\_PCIE\_N2  
CLKOUT\_PCIE\_P2  
PJ\_PCIE\_CLK 21  
PJ\_PCIE\_CLK 21  
CLKOUT\_PCIE\_N3  
CLKOUT\_PCIE\_P3  
PQ\_PCIE\_CLK 20  
PQ\_PCIE\_CLK 20  
CLKOUT\_PCIE\_N4  
CLKOUT\_PCIE\_P4  
PK\_PCIE\_CLK 22  
PK\_PCIE\_CLK 22  
CLKOUT\_PCIE\_N5  
CLKOUT\_PCIE\_P5  
LA\_SRCCLK\_LAN 40  
LA\_SRCCLK\_LAN 40  
CLKOUT\_PCIE\_N6  
CLKOUT\_PCIE\_P6  
CK\_M2A\_100M\_DN 23  
CK\_M2A\_100M\_DP 23  
CLKOUT\_PCIE\_N7  
CLKOUT\_PCIE\_P7  
PL\_PCIE\_CLK 22  
PL\_PCIE\_CLK 22  
CLKOUT\_PCIE\_N8  
CLKOUT\_PCIE\_P8  
SRCLK\_USB31A 38  
SRCLK\_USB31A 38  
CLKOUT\_PCIE\_N9  
CLKOUT\_PCIE\_P9  
CLKOUT\_PCIE\_N10  
CLKOUT\_PCIE\_P10  
CLKOUT\_PCIE\_N11  
CLKOUT\_PCIE\_P11  
N3  
N2  
B3  
B2  
B3  
U2  
U3X

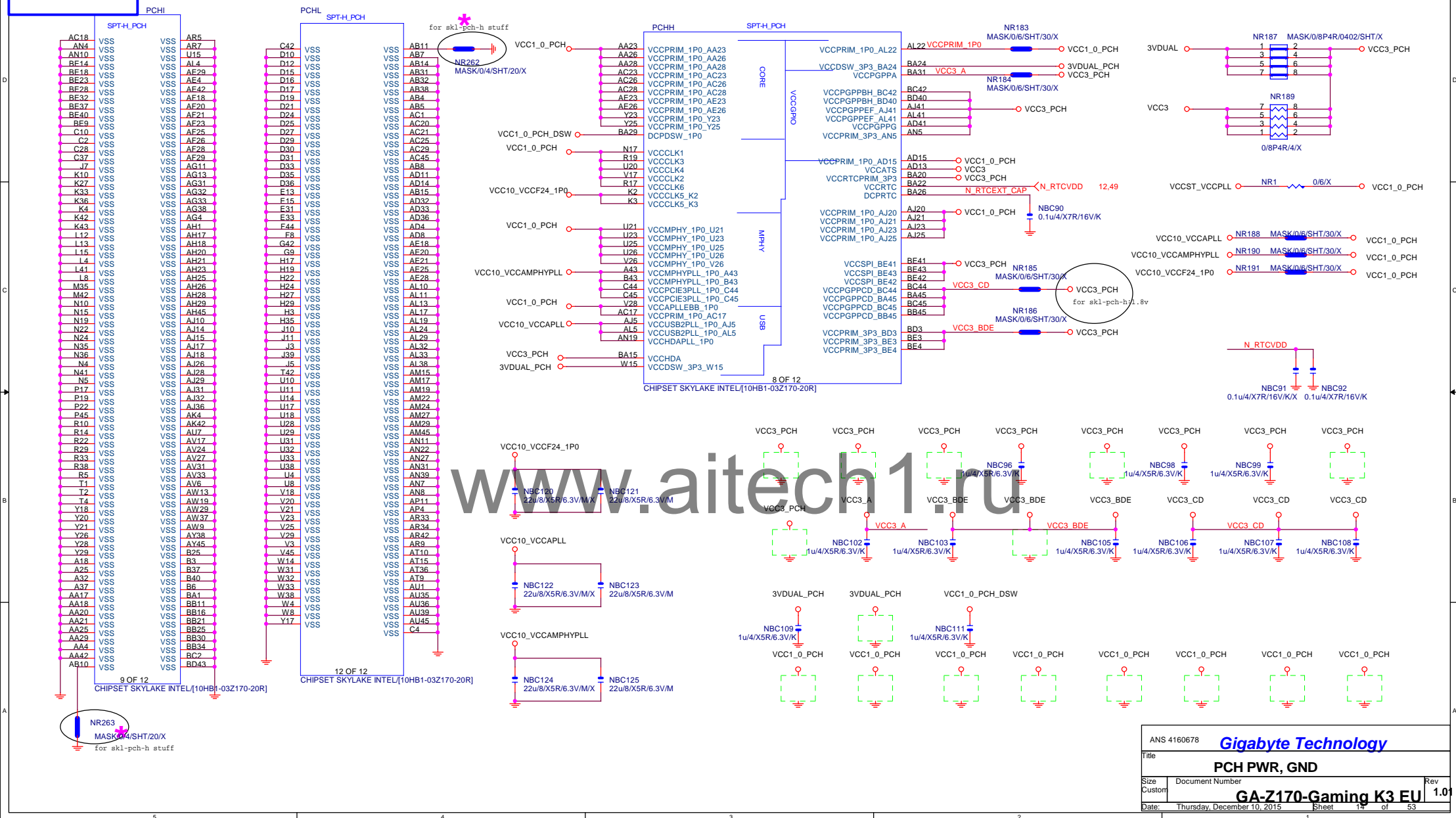
CLOCK 4/4/4/15

ANS 4160678		<b>Gigabyte Technology</b>	
Title			
<b>PCH CLOCK BUFFER</b>			
Size Custom	Document Number		Rev 1.0
<b>GA-Z170-Gaming K3 EU</b>			
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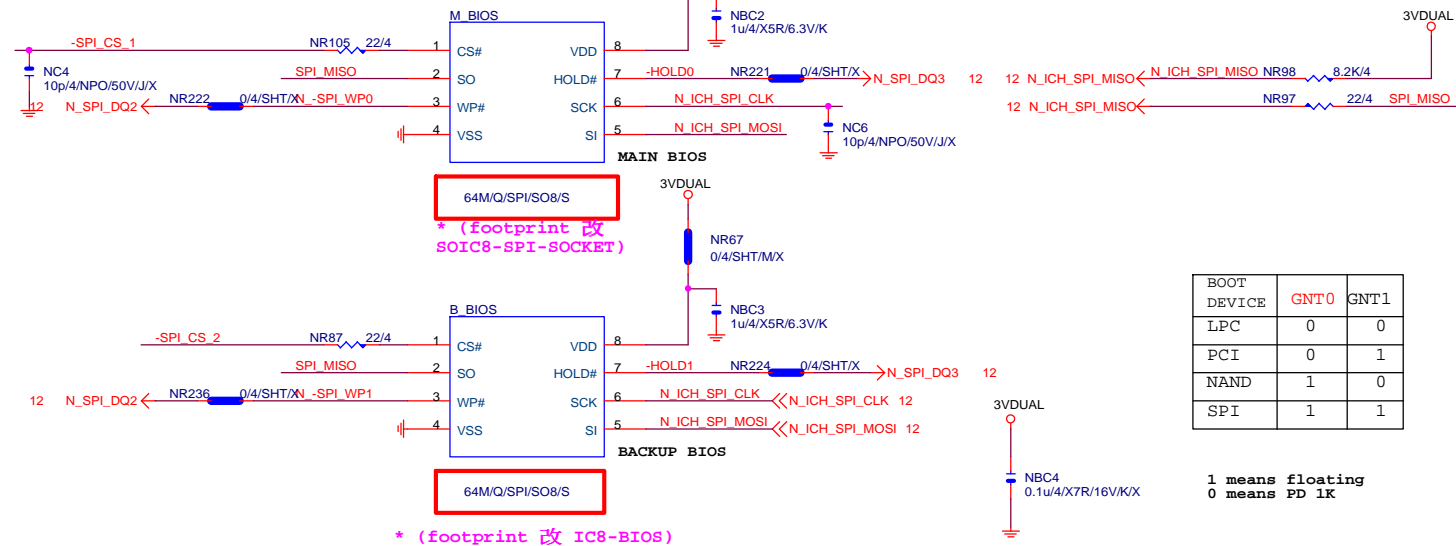


# DUAL BIOS

# MOSI For DMI RX Termination Voltage

指定用DII

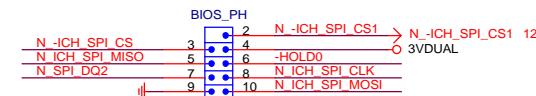
指定用DII



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## BIOS\_PH

★Update  
2015-01.29

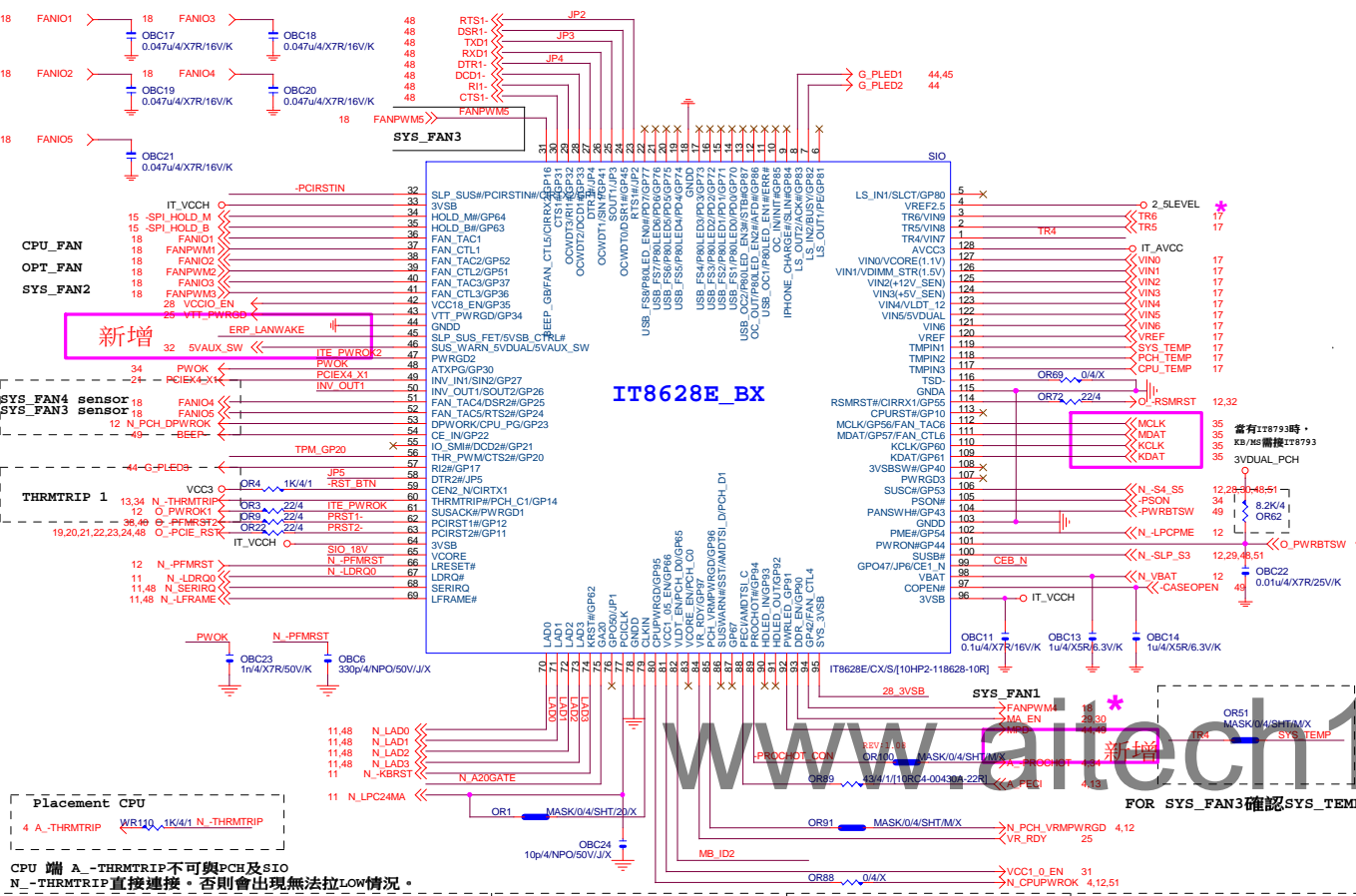


PH/2\*5K10/BK/2.54/VA/D/X  
Footprint the same, confirmed by Graceing.  
Use COM port pin header part.

Gigabyte Technology

Title			BIOS
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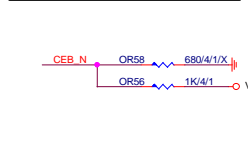




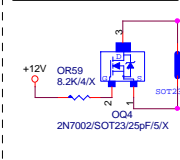
FAN TABLE	
CPU_FAN	FAN_CTL1 FAN_TAC1
SYS_FAN1	FAN_CTL4 FAN_TAC4
SYS_FAN2	FAN_CTL3 FAN_TAC3
SYS_FAN3	FAN_CTL5 FAN_TAC5
OPT_FAN	FAN_CTL2 FAN_TAC2
THRMTrip1	YES PIN60

IT8628E 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 高運時 GP92 會被拉Lo(ITE BUG)
PIN 108	GP40--- POWER ON 時會拉 LO
PIN 111/112	MOUSE 跟PAN6 FUNCTION 擇一使用, 不然會互相干擾
PIN 22	PIN22-, 需高於3V-, 若低於此部分COM PORT及LPT裝置 蜂鳴器會異常動作。

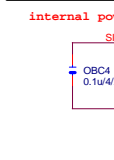
DUAL BIOS OPT STRAP



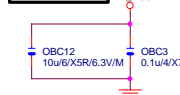
Power leakage



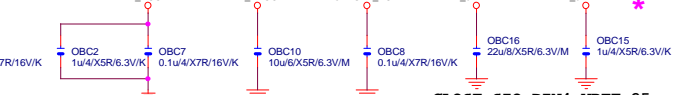
SIO\_18V



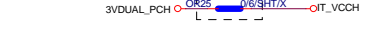
SIO CAP



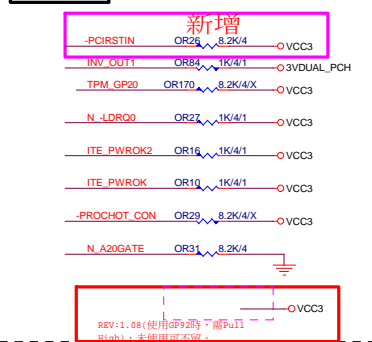
CLOSE SIO PIN4 VREF\_25



PWR SHT



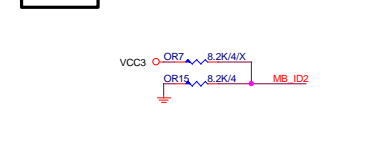
SIO PU



SIO STRAP

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
JP5	1 1	The default value of EC Index 63h/6Bh/73h is 80h.
JP5	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.

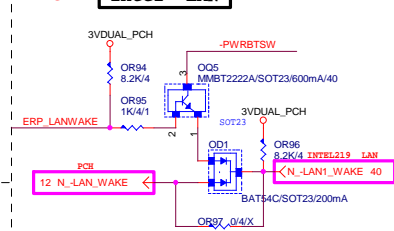
MB ID



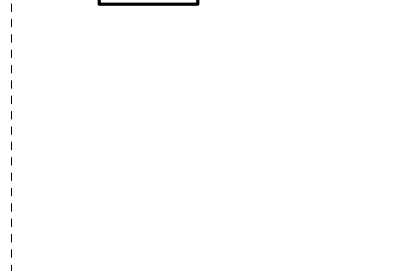
ERP WAKE on LAN (依LAN組態選擇)

(組態一) Realtek/ATHEROS LAN

(組態二) Intel LAN



(組態三) Dual LAN



ERP Wake on LAN		
Single LAN	Realtek	組態一
	Atheros	組態一
Dual LAN	Intel 219	組態二
	Atheros+Athertos	組態一
No Support ERP	Intel 219+Athertos	組態一
	Intel 219+Intel 210	組態三
BOM不上		N/A

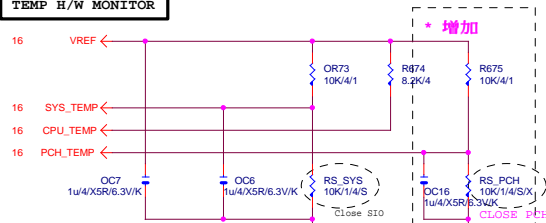
Gigabyte Technology

ITE 8620 LPC IO

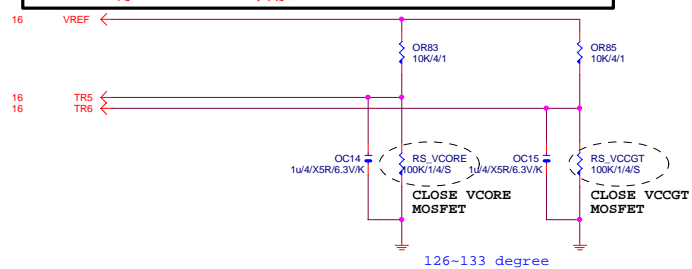
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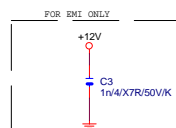
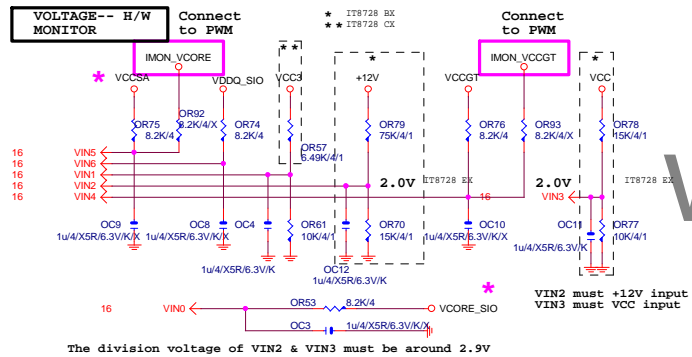
## TEMP H/W MONITOR



## RS\_VCORE、RS\_VCCGT、CLOSE CPU\_VCORE &amp; VCCGT MOSFET

~~PROCHOT:有mos heat sink不用prochot function~~

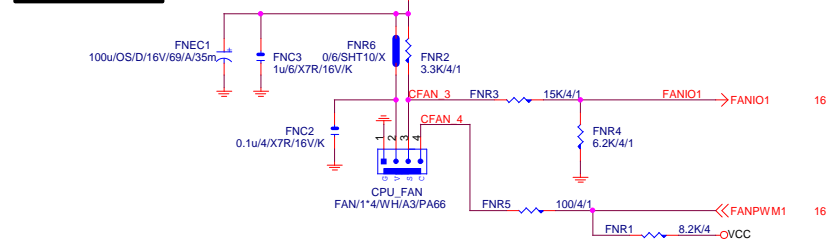
## VOLTAGE-- H/W MONITOR



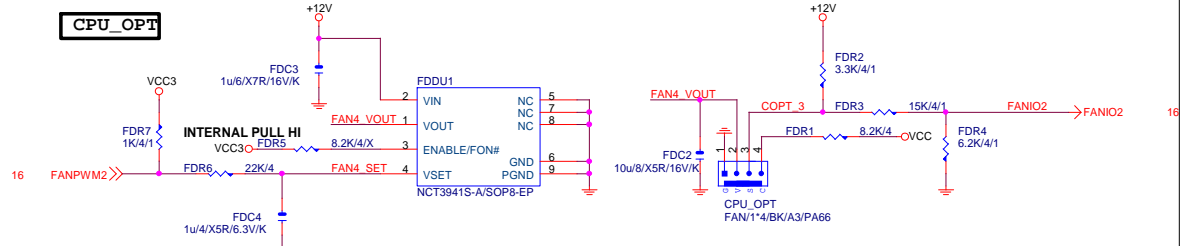
Gigabyte Technology

Title			HWM,KB/MS, FAN CTRL
Size	Document Number	Rev	
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CPU SMART FAN

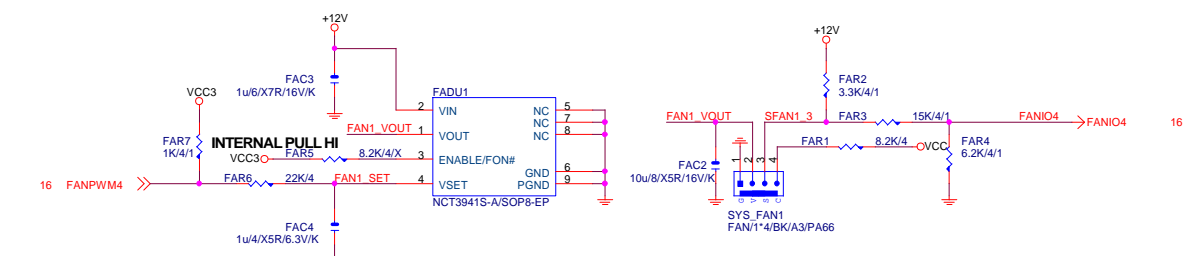


CPU\_OPT

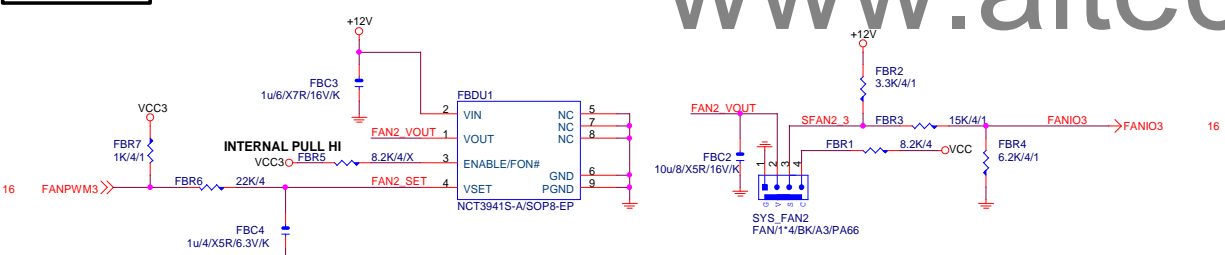


SYSTEM FAN1

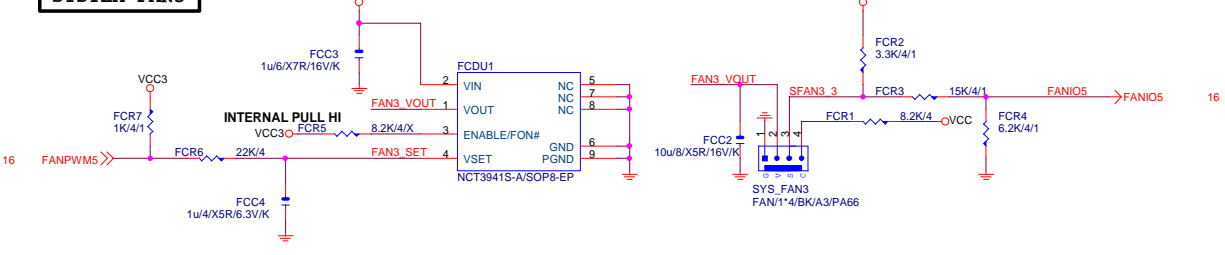
Linear SYS\_FAN  
Enable Function (NCT3941S)  
Full Turn On Function (NCT3941S-A)



SYSTEM FAN2



SYSTEM FAN3

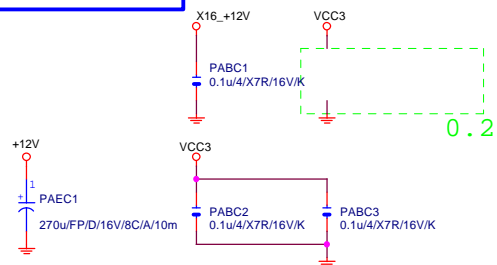


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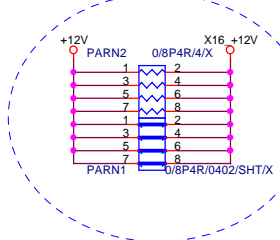
GIGABYTE			
Title			
HWM,KB/MS, FAN CTRL			
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Rev 0.3

PCIEX16 CAP



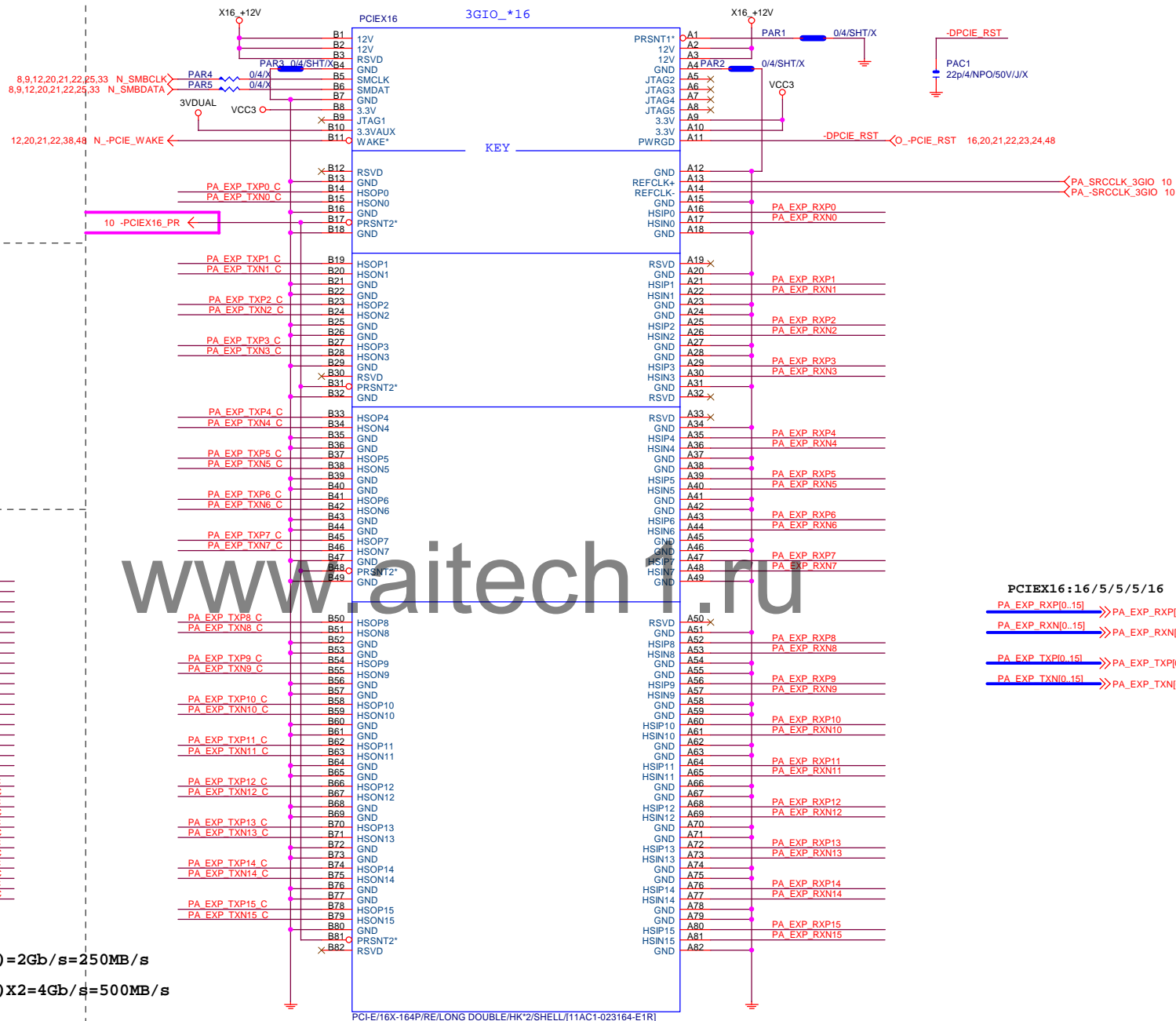
PCIEX16 PROTECT SHT

+12 protect  
short-wire test

PCIEX16 AC CAP

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

PCIEX16 SLOT



PCIEX16:16/5/5/5/16

PA EXP_RXP[0..15]	>>PA_EXP_RXP[0..15] 4
PA EXP_RXN[0..15]	>>PA_EXP_RXN[0..15] 4
PA EXP_TXP[0..15]	>>PA_EXP_TXP[0..15] 4
PA EXP_TXN[0..15]	>>PA_EXP_TXN[0..15] 4

PCI-E REV:1.1--&gt; 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

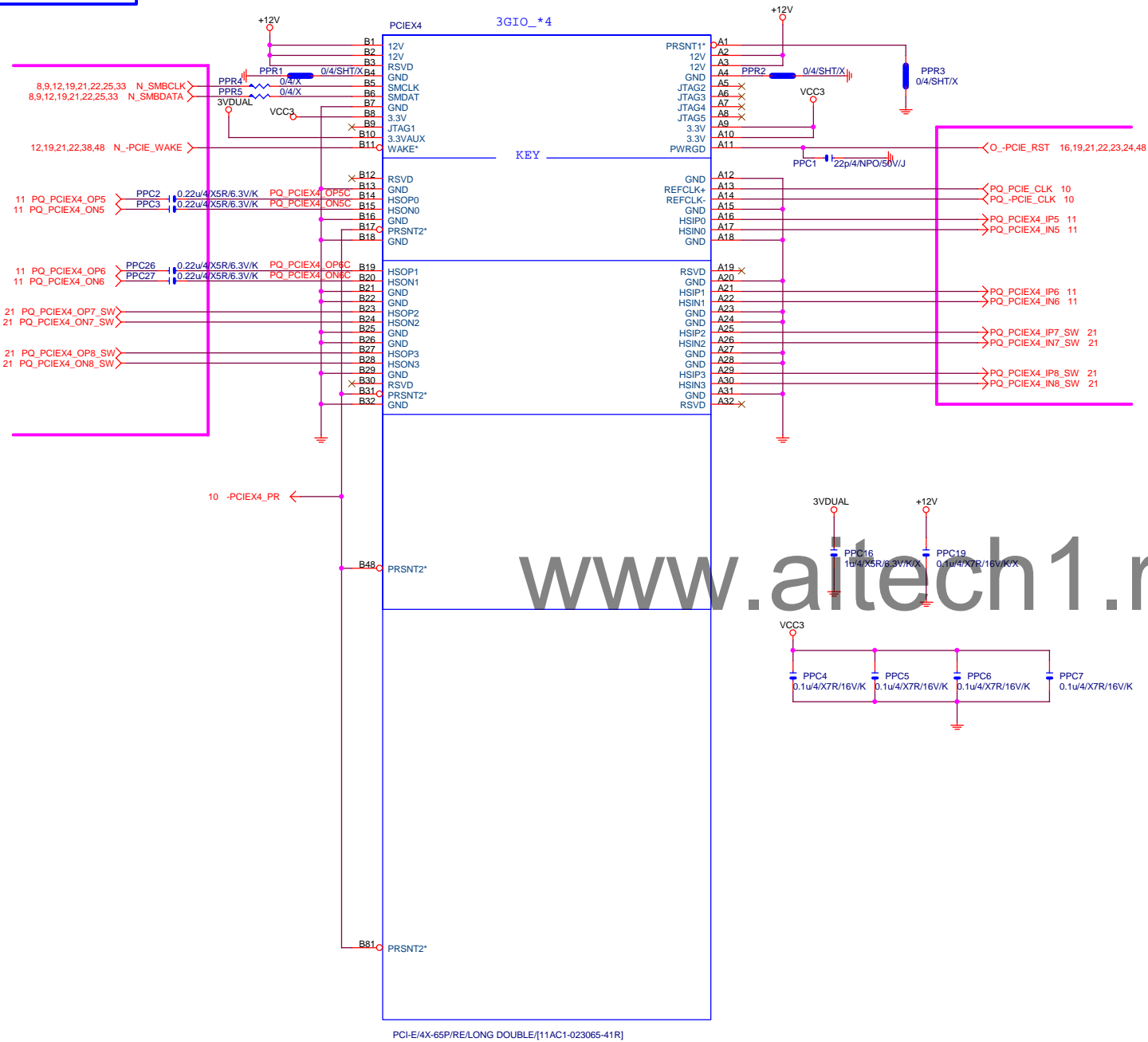
PCE-E X16(單向) BANDWITH=2.5GHz\*(8b/10b)X16=32Gb/s=4GB/s

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

PCI-E REV:2.0--&gt; 5GHZ

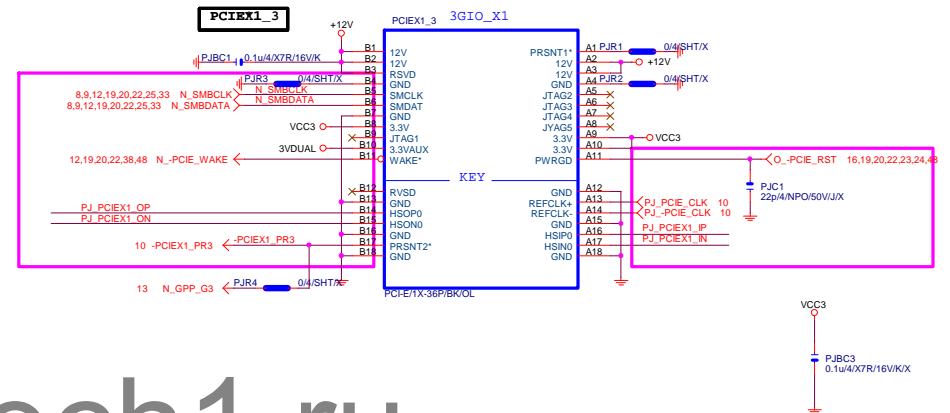
Gigabyte Technology

Title				
PCI EXPRESS * 16				
Size	Document Number			Rev
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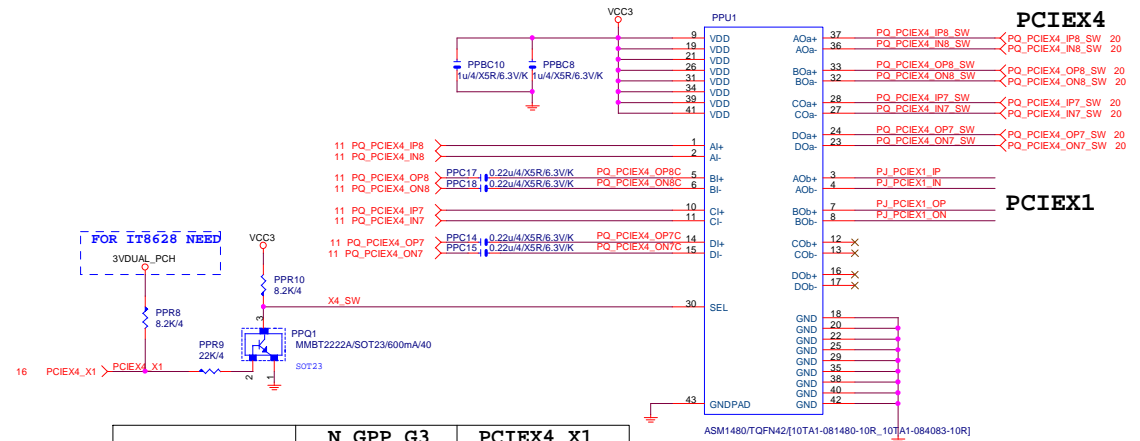


GIGABYTE

Title		
PCIE_X4		
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## PCIEX4/X1 SWITCH



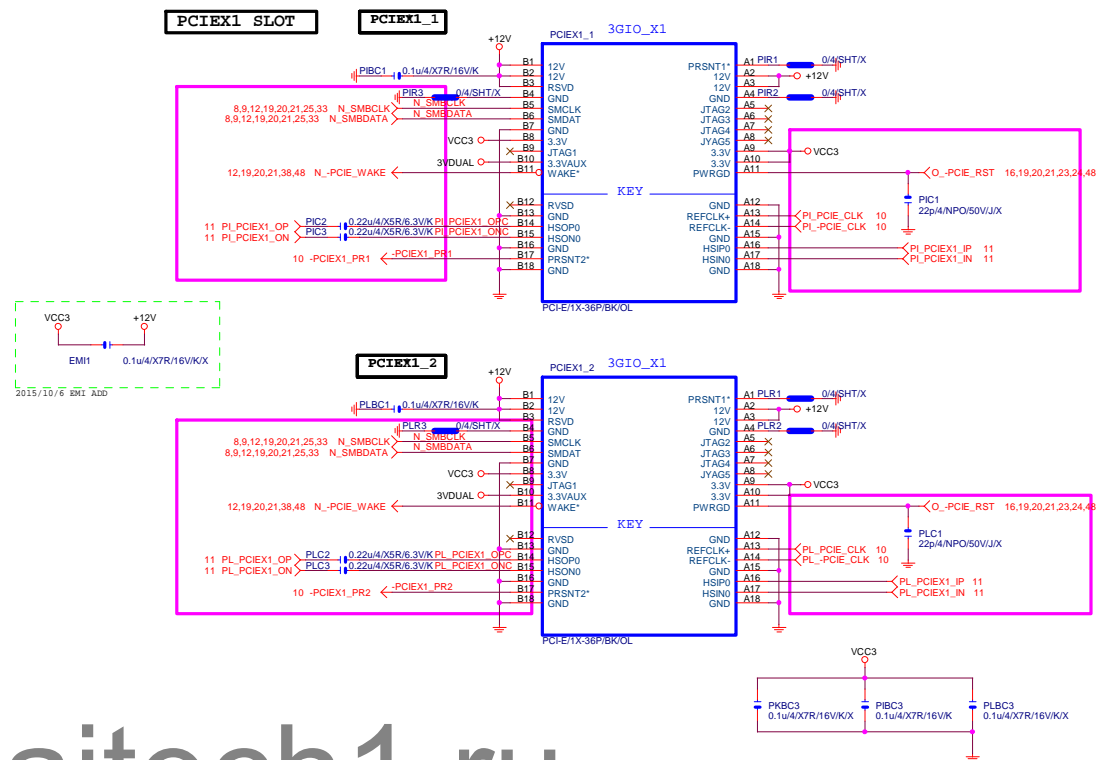
	N_GPP_G3 (PCH GPP_G3)	PCIEX4_X1 (SIO_GPIO27)
PCIEX4 -> X4 M2_WIFI -> N/A PCIEX1_1/2 --> N/A ( Default )	H	H
PCIEX4 -> X1 M2_WIFI -> X1 PCIEX1_1/2 --> X1	L	L

Function	SEL
xI--> x0h	L;PCIEX4 SLOT-->X4
xI--> x0h	H;PCIEX4 SLOT-->X1

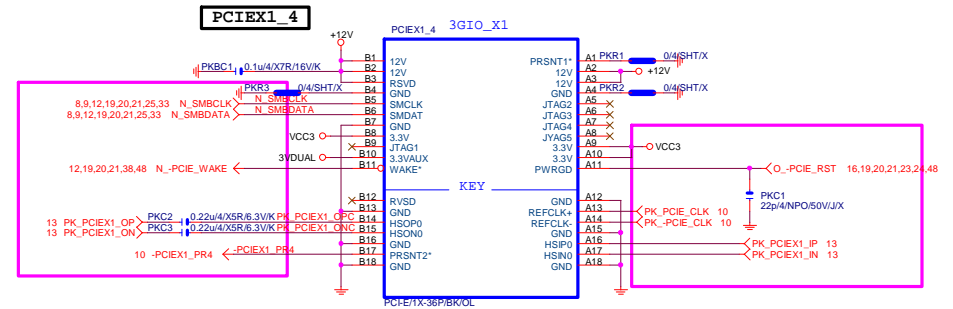
## Gigabyte Technology

File	PCIEX1 1,2	Rev	1.01
Size	Document Number	Date	Thursday, December 10, 2015
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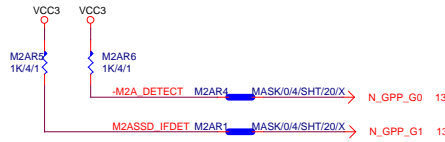


Gigabyte Technology

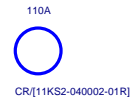
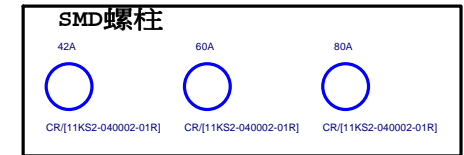
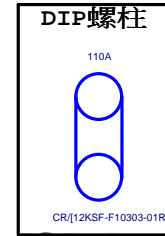
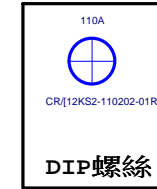
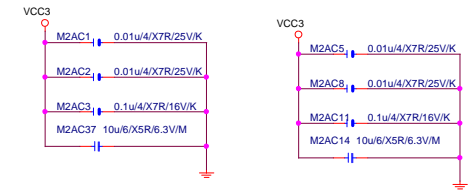
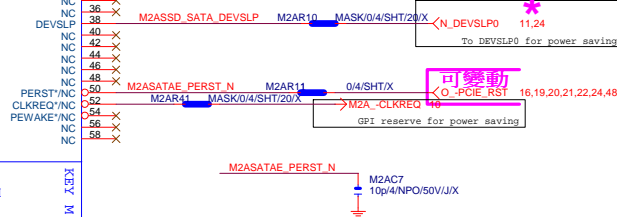
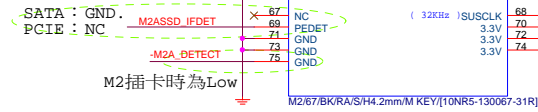
Title			PCIE X1 1,2
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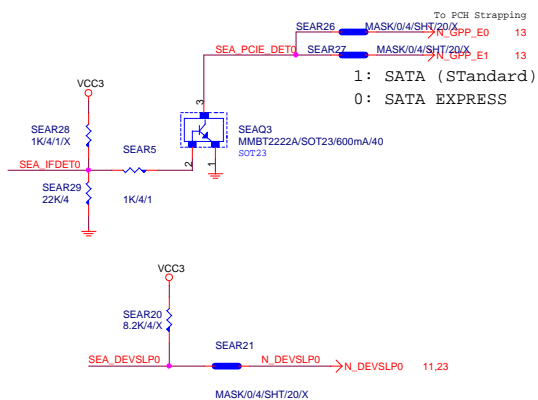
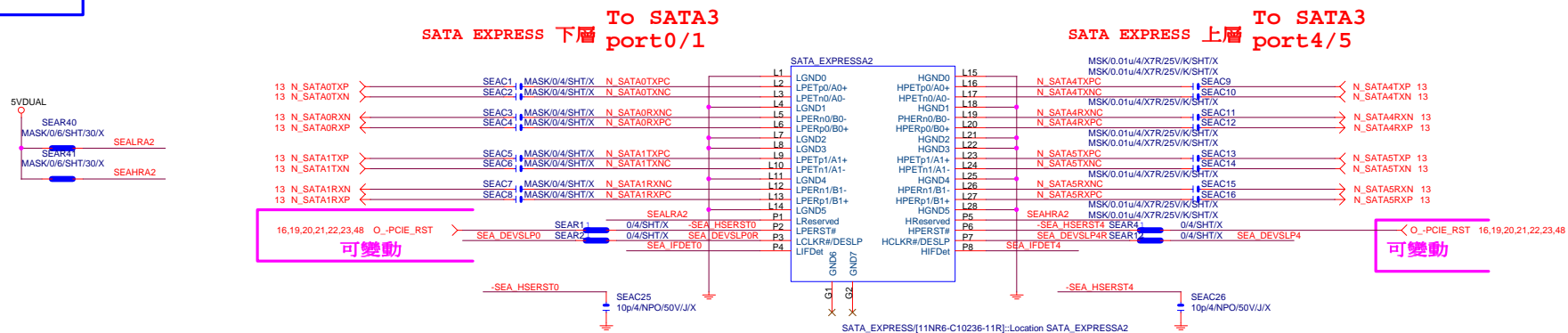
支援SATA and M.2 function



**需與M2\_-CLKREQ對應**



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	I015 (S0)	I016 (S1)	I017	I018	I019 (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	

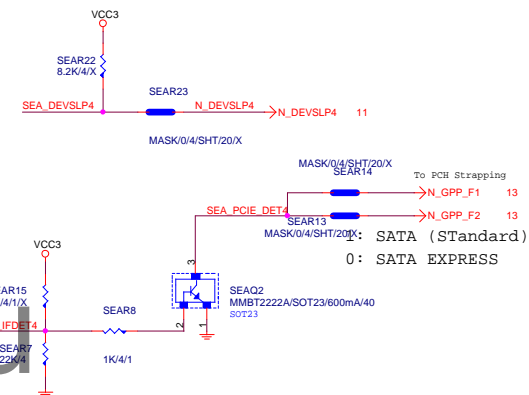


SATA EXPRESS料號

雙層:TBD

單層+2SATA:11NR6-C10236-03R

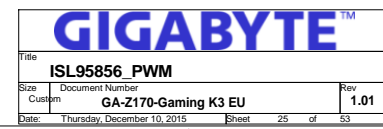
單層: 11NR6-C10118-03R



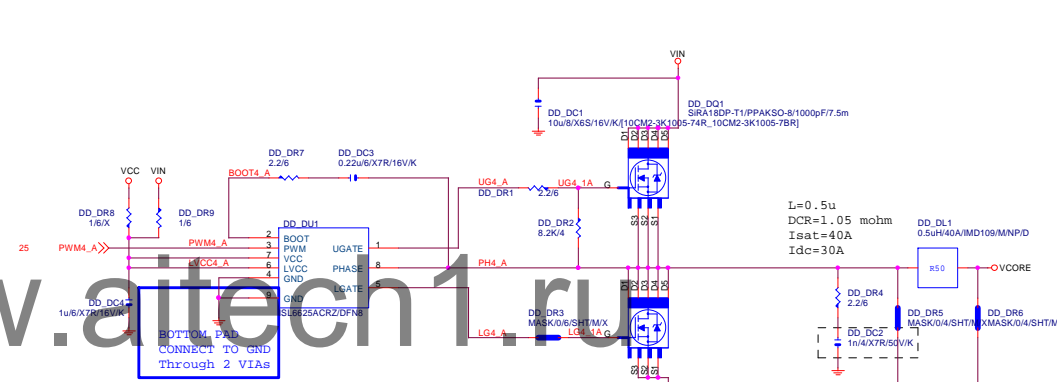
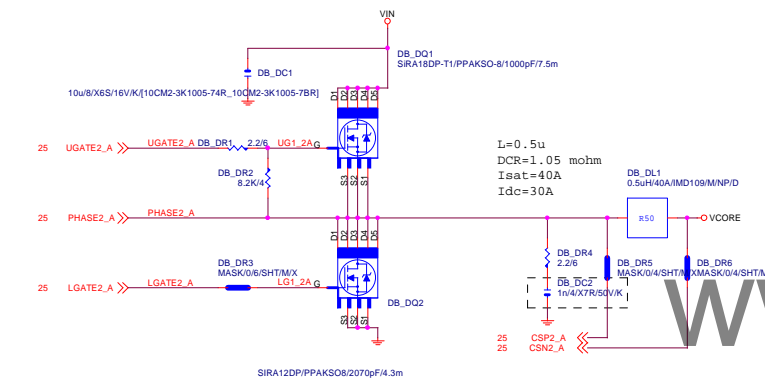
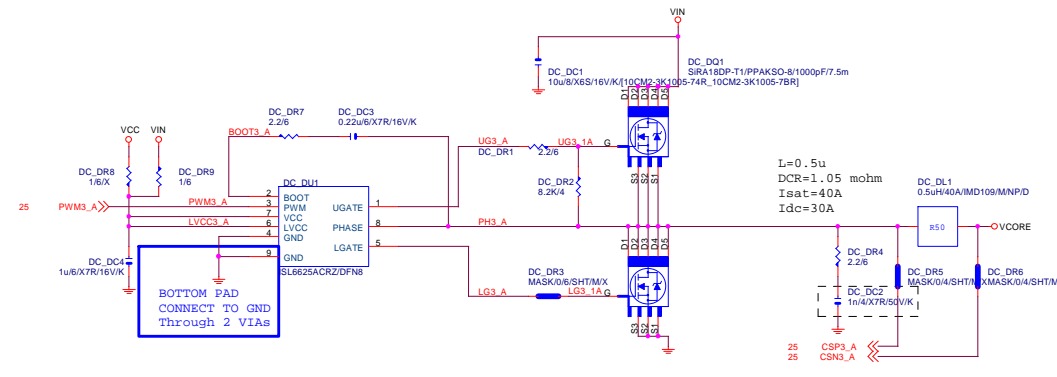
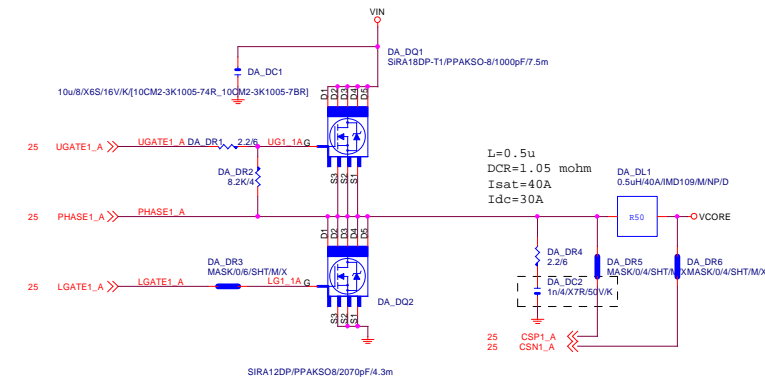
To SATA3  
port 2/3

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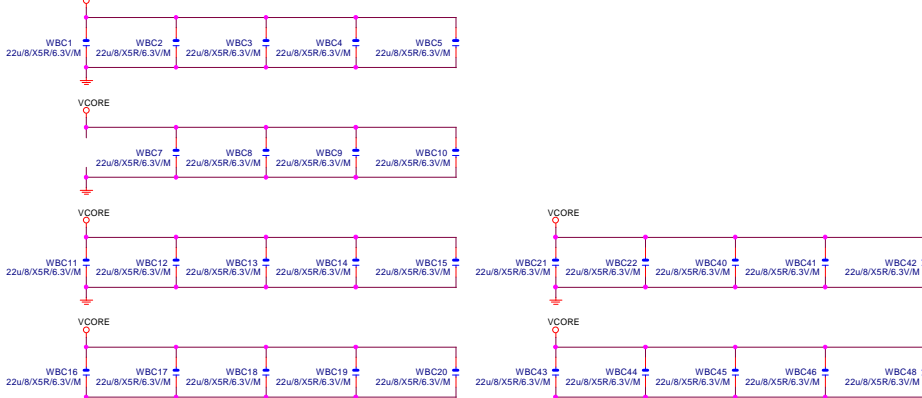
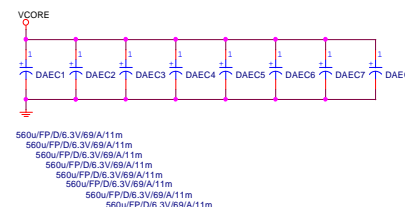
SATA 5	(文字面寫SATA 1)
SATA 4	(文字面寫SATA 0)
SATA 3	
SATA 2	
SATA 1	(文字面寫SATA 5)
SATA 0	(文字面寫SATA 4)



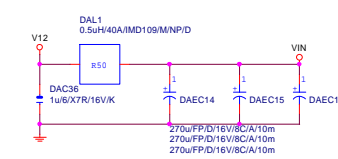
VCORE



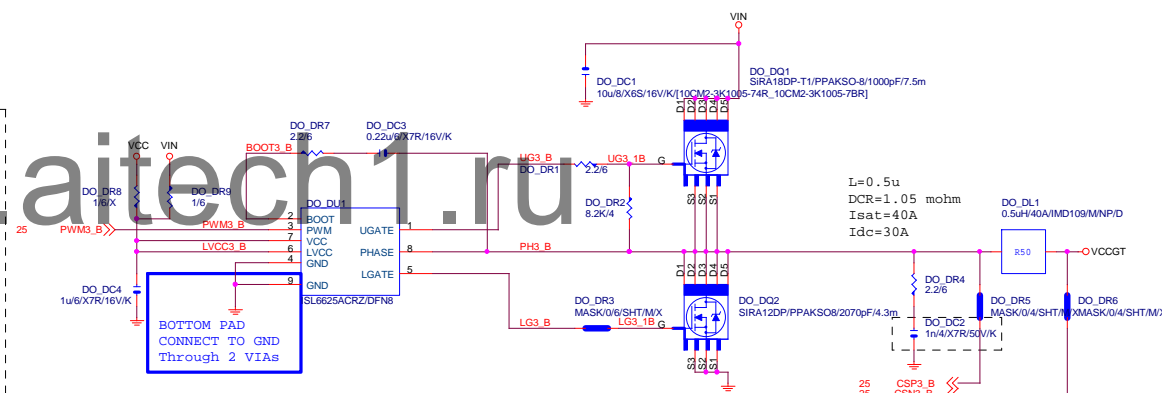
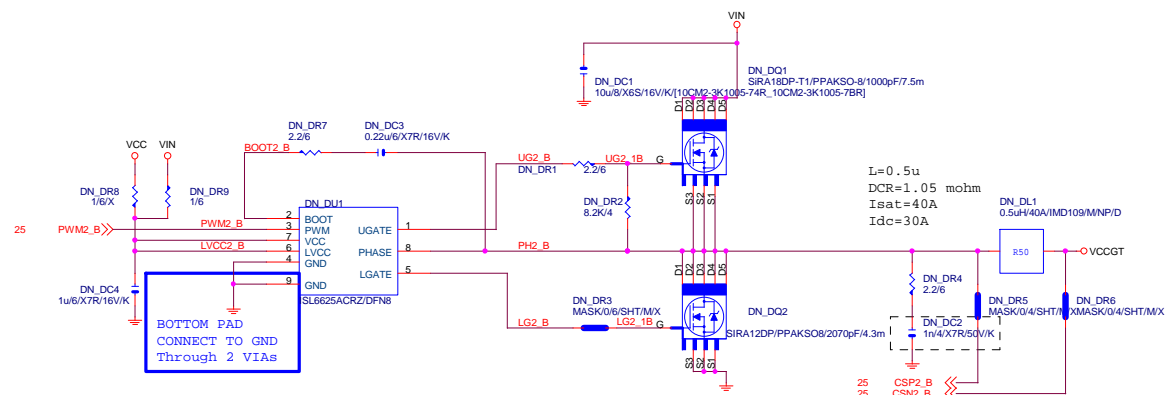
VCORE CAP 560u\*8PCS 22u\*29PCS



VIN CAP 270u\*3PCS




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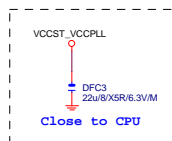
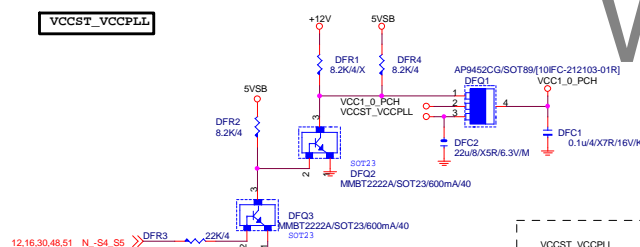
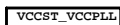
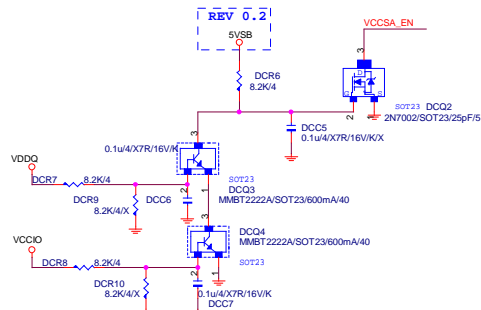
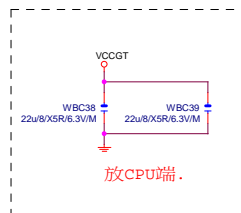
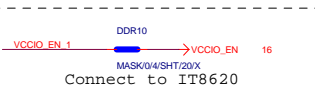
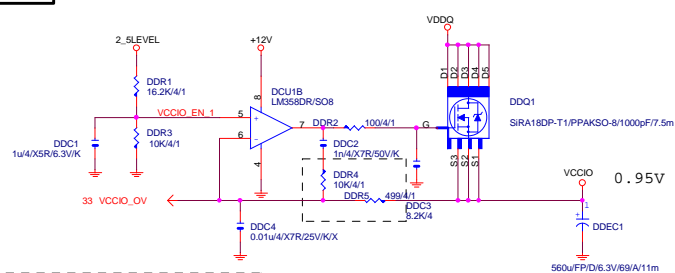
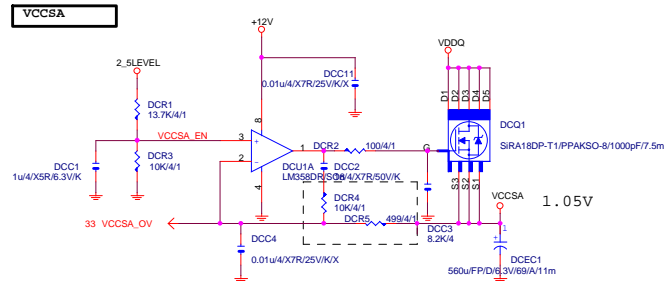
VCCGT

DAEC9 DAEC10 DAEC1 DAEC12 DAEC13

560uF/PP/D/6.3V/69A/11m  
 560uF/PP/D/6.3V/69A/11m  
 560uF/PP/D/6.3V/69A/11m  
 560uF/PP/D/6.3V/69A/11m  
 560uF/PP/D/6.3V/69A/11m

				
Title				
ISL95856_MOS				
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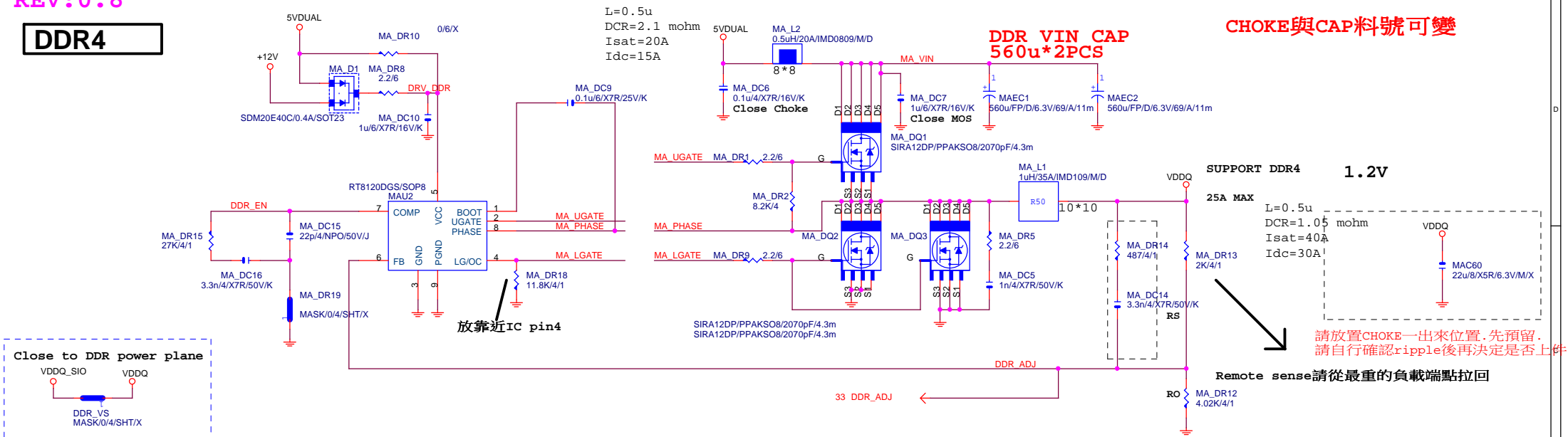
VCCSA



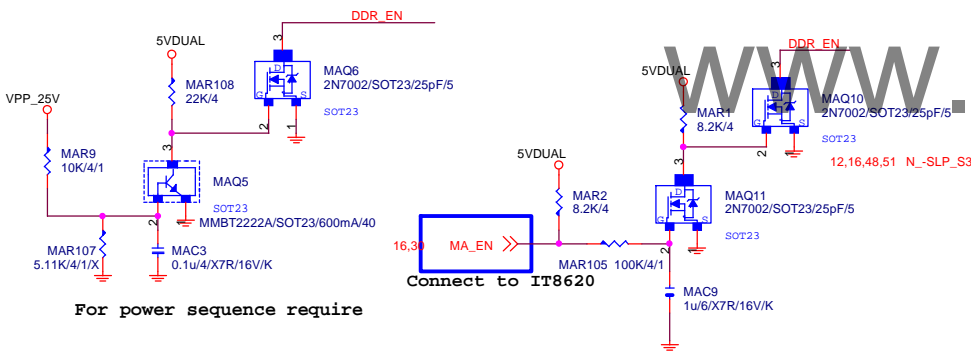
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REV:0.8

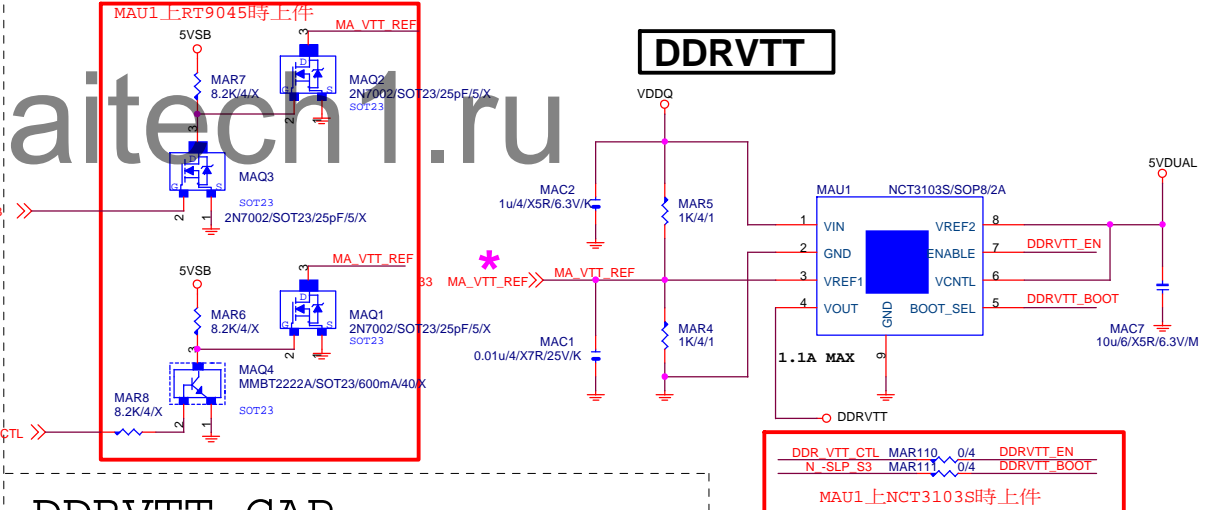
DDR4



PWR SEQ

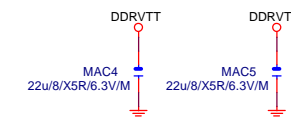


DDRVTT



DDRVTT CAP

\* 大電容 x0



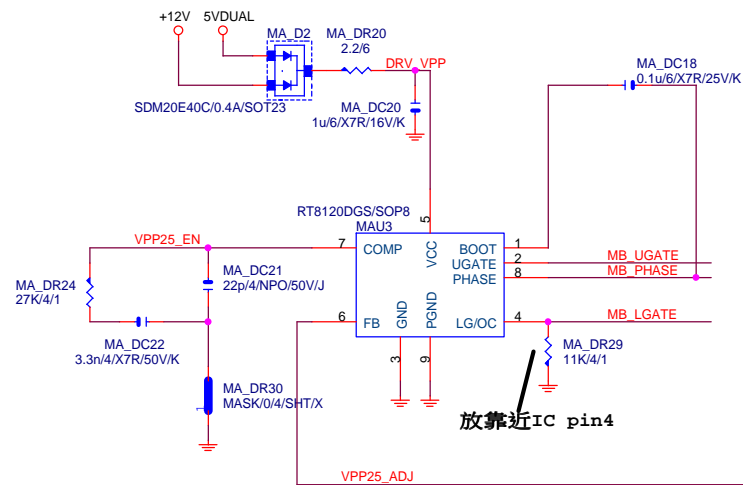
GIGABYTE™

RT8120_DDR4 POWER		
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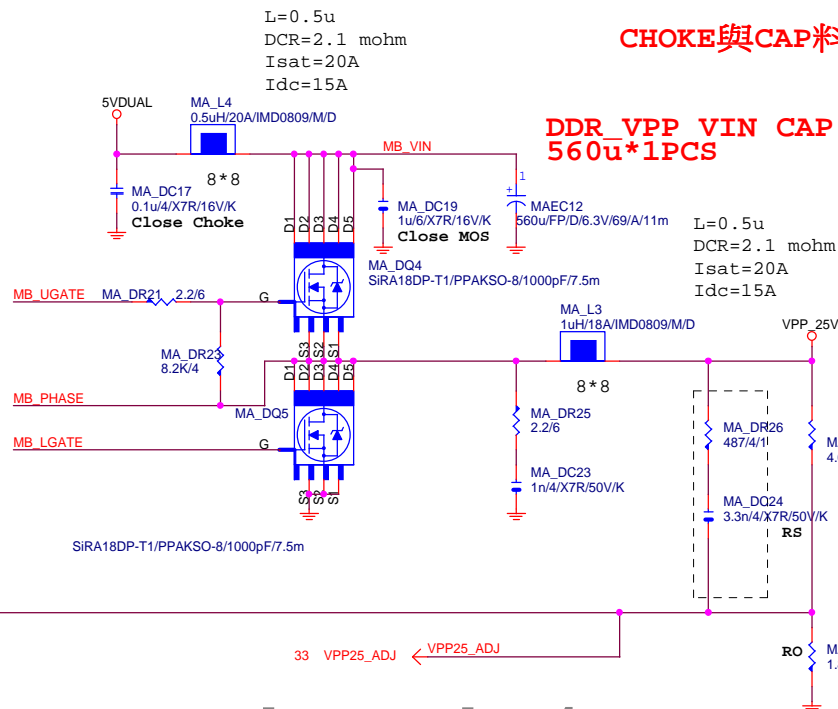
REV:0.83

VPP\_25V



放靠近IC pin4

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

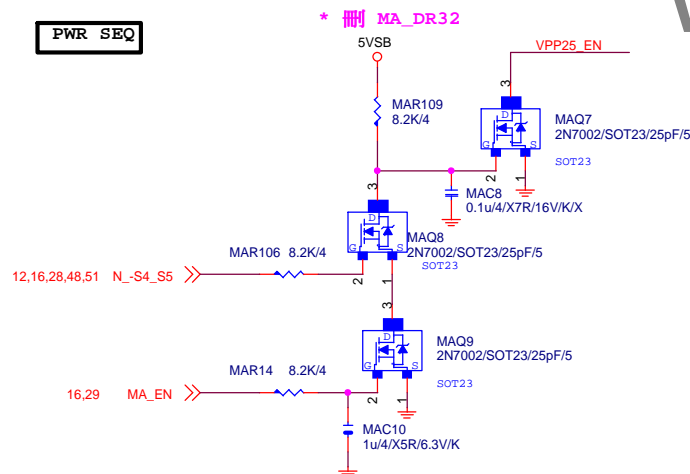
25A MAX

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

Remote sense請從最重的負載端點拉回

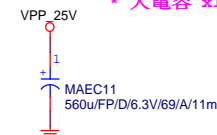
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PWR\_SEQ



VPP CAP 560u\*1PCS

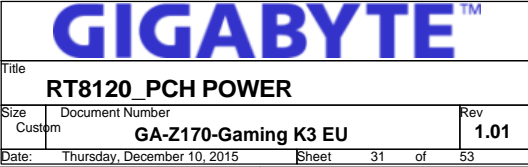
\* 大電容 x1



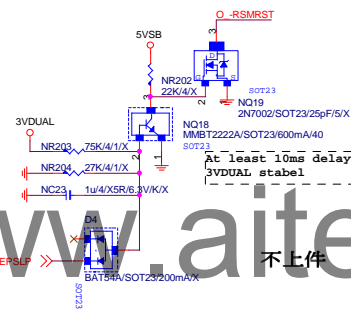
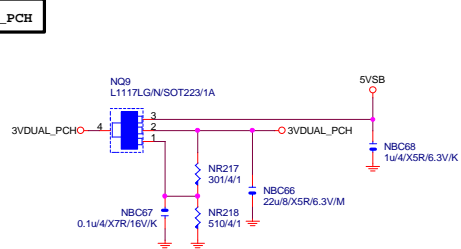
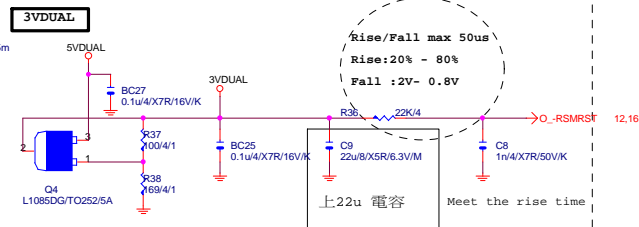
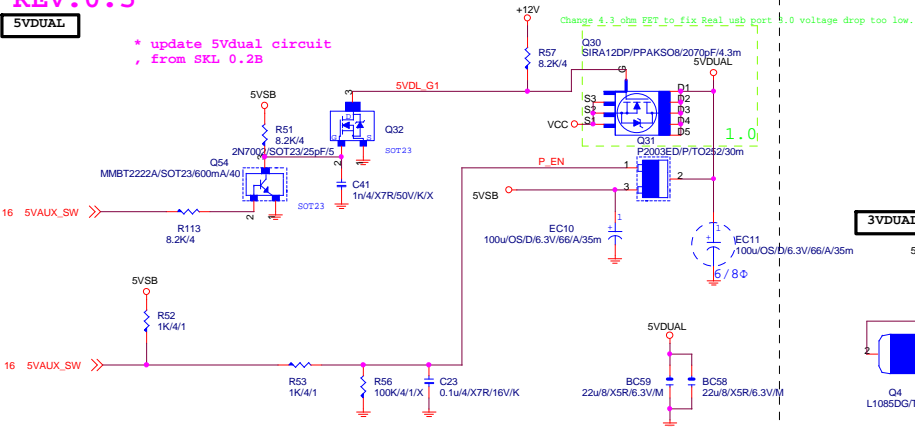
GIGABYTE™

Title RT8120_VPP25 POWER		
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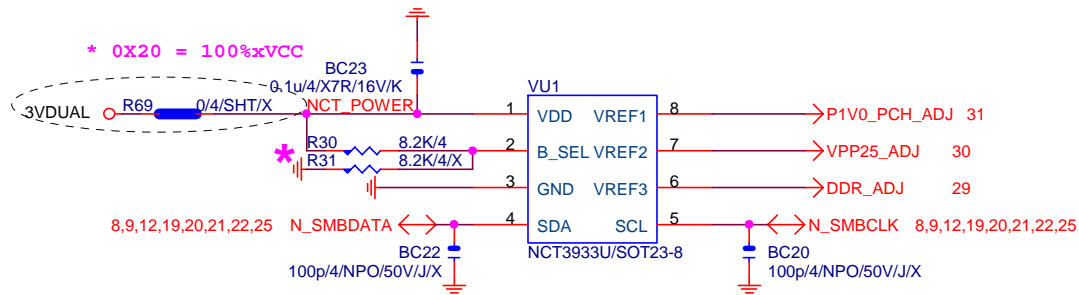


## 5VDUAL

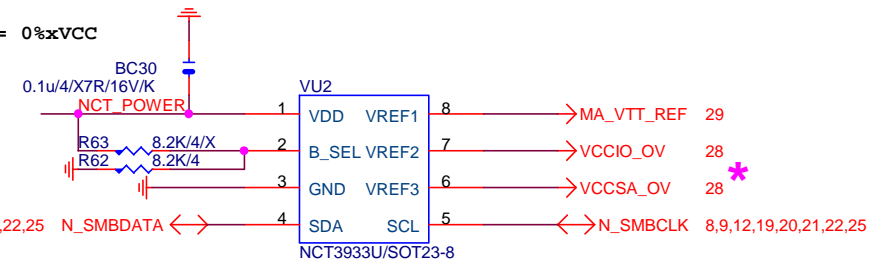


不上件

# OVER VOLTAGE



0X2A = 0%xVCC



0X22 = 75%xVCC

\* 删除 OVU3

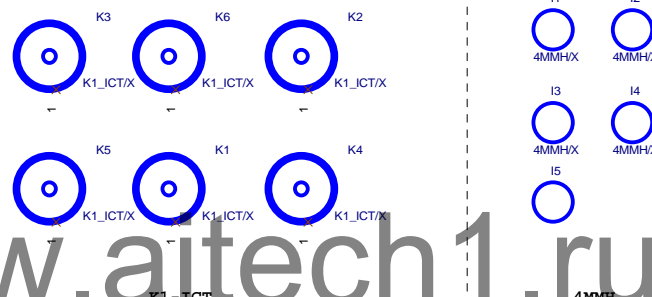
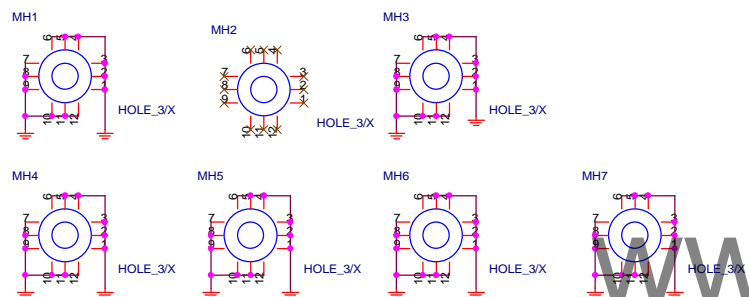
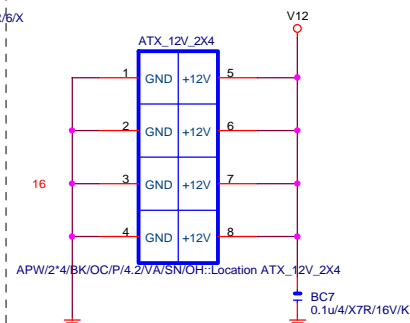
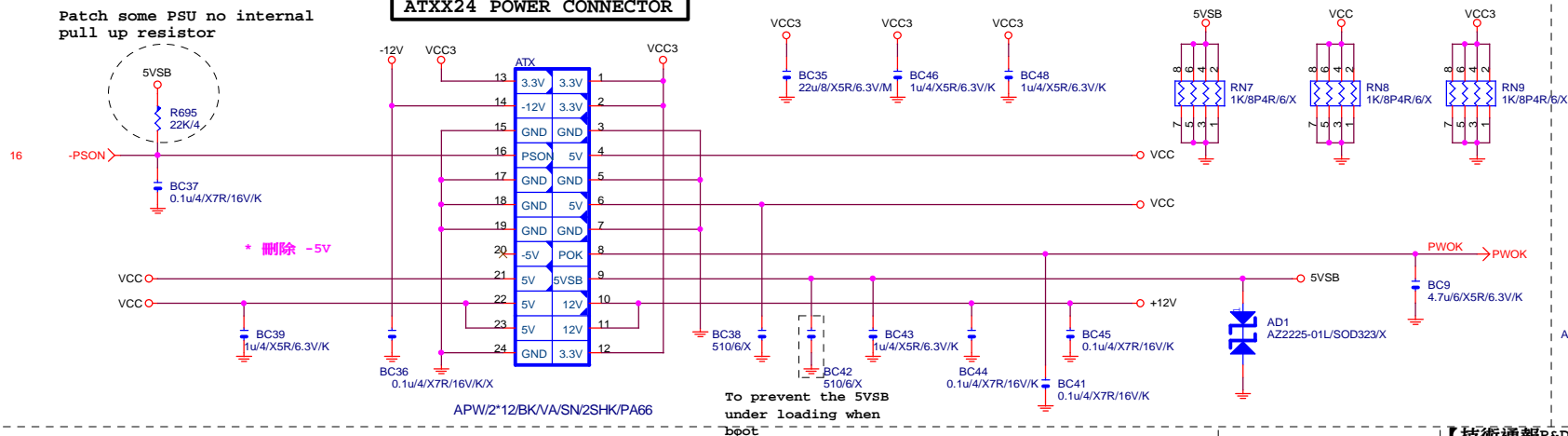
NCT3933	0X2A	0X20	0X22
VREF1	DDRVTT	VREF_DDRA_DQ	PCH Core
VREF2	VREF_DDRA_CA	N/A	VCCL_5_PCH
VREF3	VREF_DDRA_CA	VREF_DDRB_DQ	SMREF

Gigabyte Technology

CPU CORE VR-2

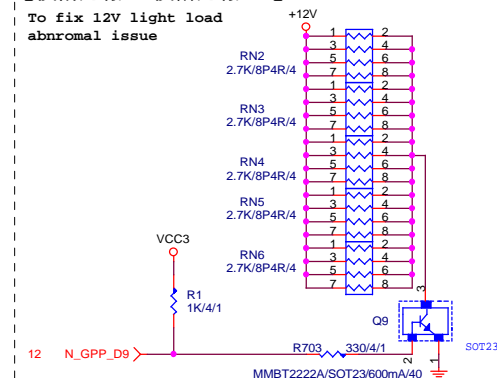
Size	Document Number	Rev
Custom		1.01
Date:	Thursday, December 10, 2015	Sheet 33 of 53

GA-Z170-Gaming K3 EU



## 【技術通報R&amp;D技術通報153】

To fix 12V light load  
abnromal issue

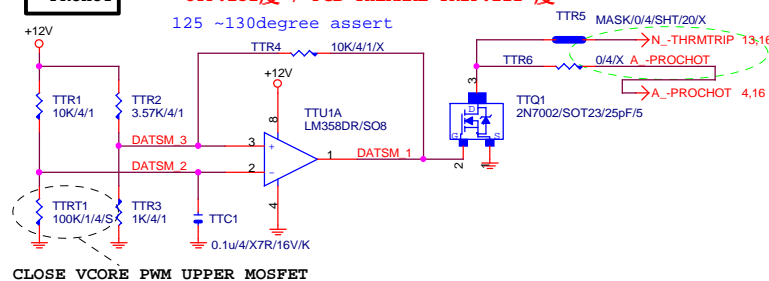


**-PROHOT** \* 保留 ?

4,16 A -PROCHOT ← A -PROCHOT R2 0/4/SHT/X → VR\_HOT 25

-PROHOT

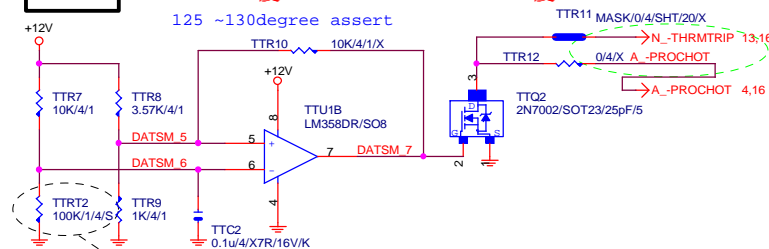
```
OTP:132度 / PCB THERMAL TRIP:122 度
125 ~130degree assert
```



CLOSE VCORE PWM UPPER MOSFET

**-PROHOT**

OTP:132度 / PCB THERMAL TRIP:122 度  
125 ~130degree assert



CLOSE VCCGT PWM UPPER MOSFET



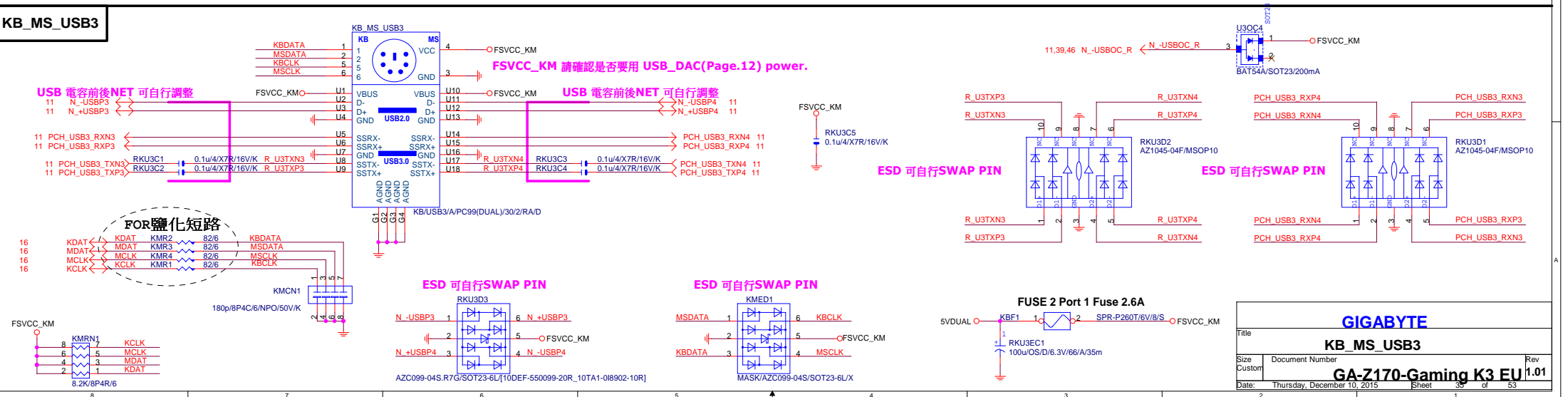
## Gigabyte Technology

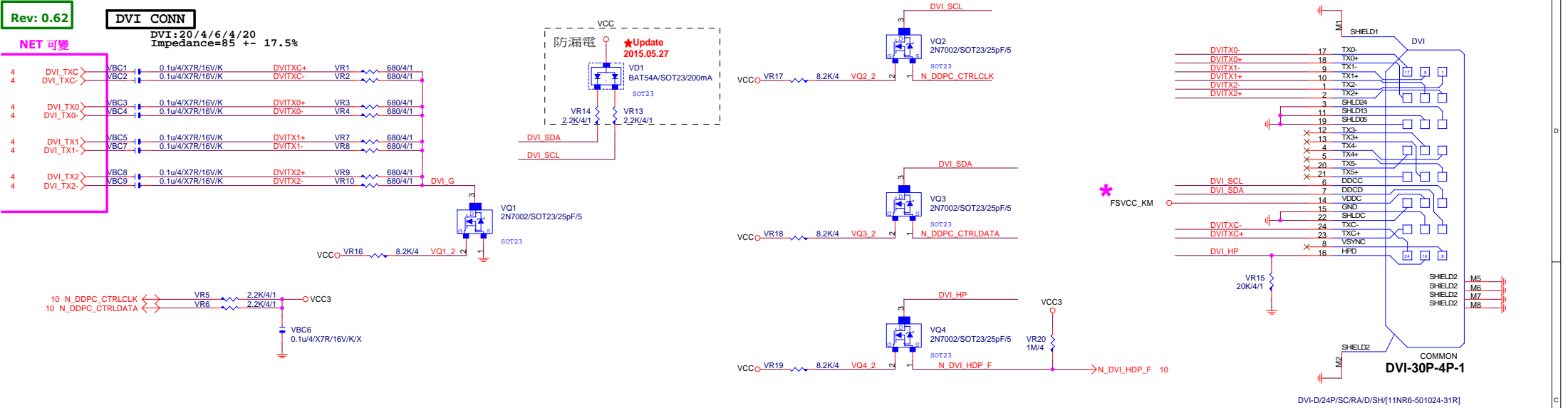
Title			
ATX POWER CONNECTOR			
Size	Document Number		Rev
Custom		GA-Z170-Gaming K3 EU	1.01
Date:	Thursday, December 10, 2015	Sheet 34 of 53	

R\_USB30\_2

www.aitech1.ru

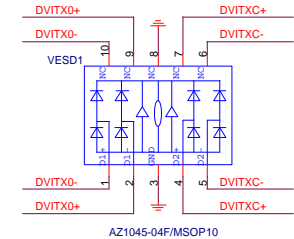
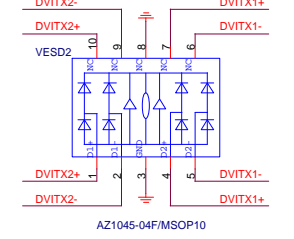
KB\_MS\_USB3



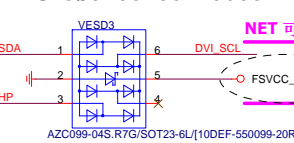


www.aitech1.ru

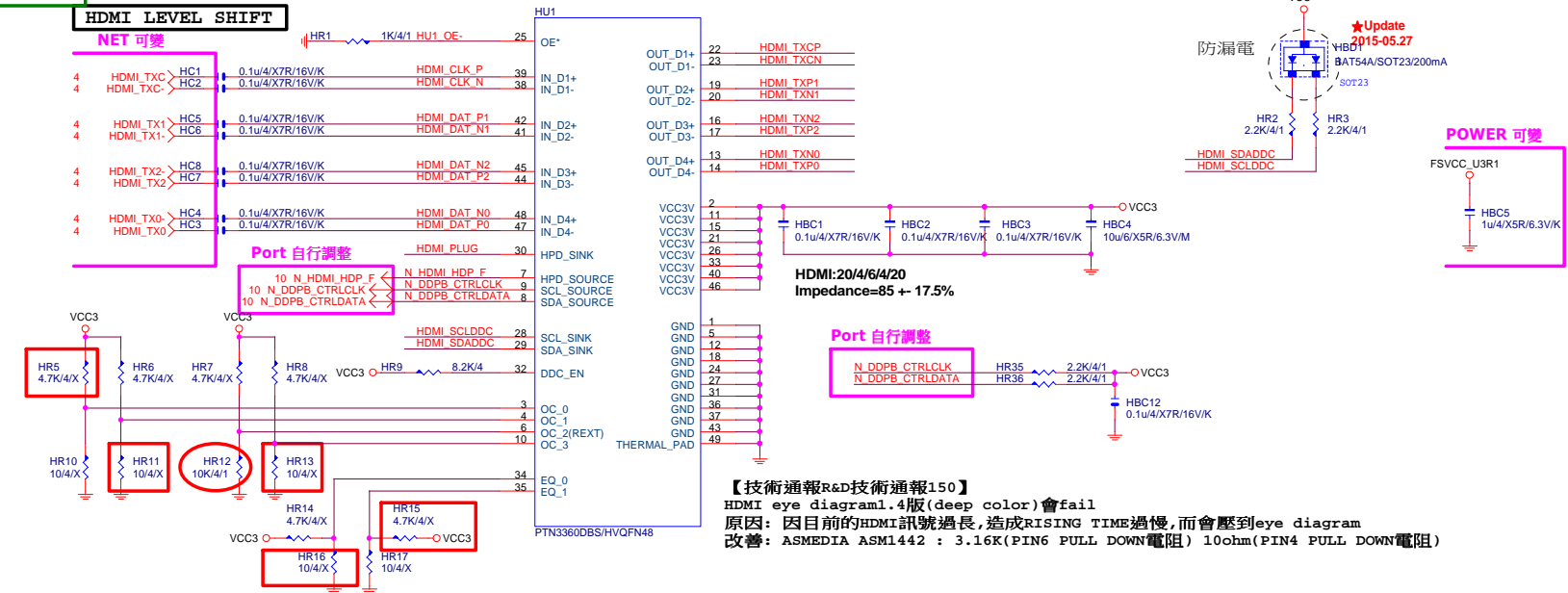
Close to connector



Close to connector

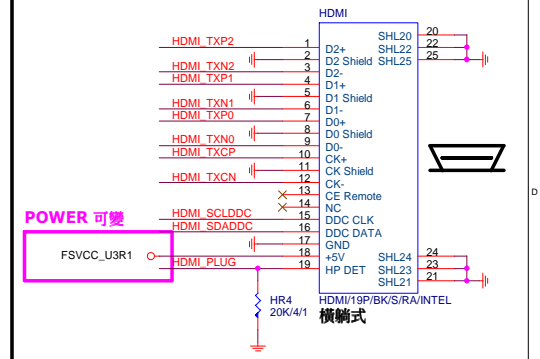






PTN3360: PIN 4/10/34/35 NC, PIN 都不上值; 只上 HR12: 10K  
ASM1442: 紅色框要上, HR12: 3.16K

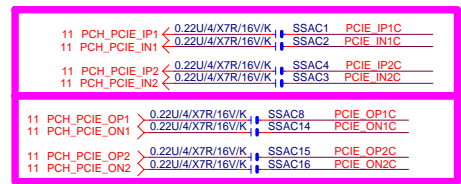
www.aitech1.ru



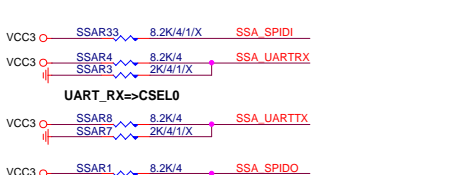
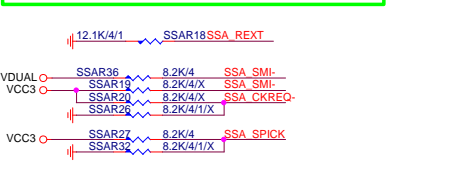
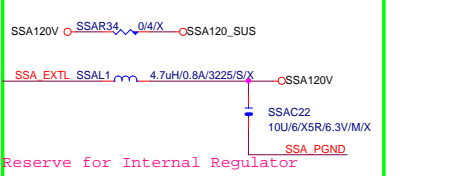
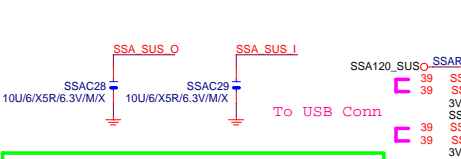
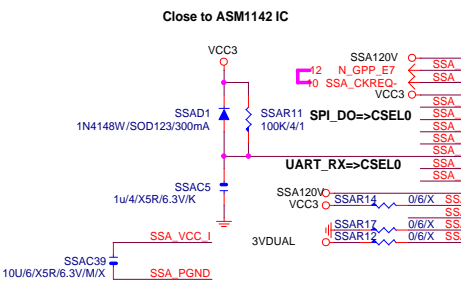
直立式  
P/N: 11NR6-H01019-K1R

ASM1142 USB3 Host Rev0.6

PCIE Gen3 X1 or PCIE Gen2 X2  
To PCIE host.



From PCIE host.

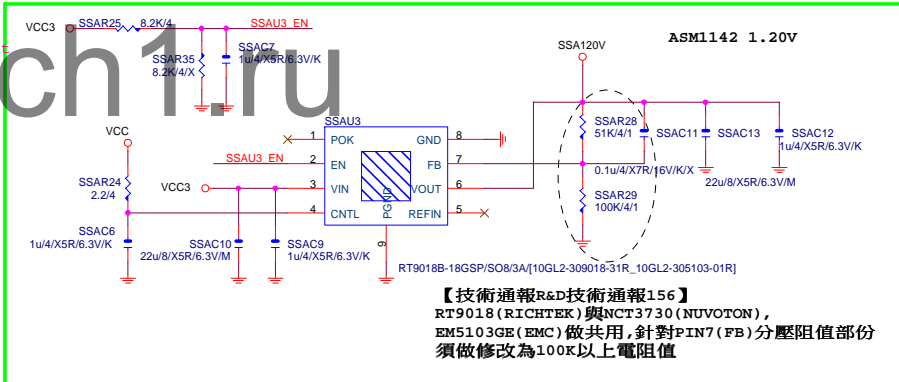
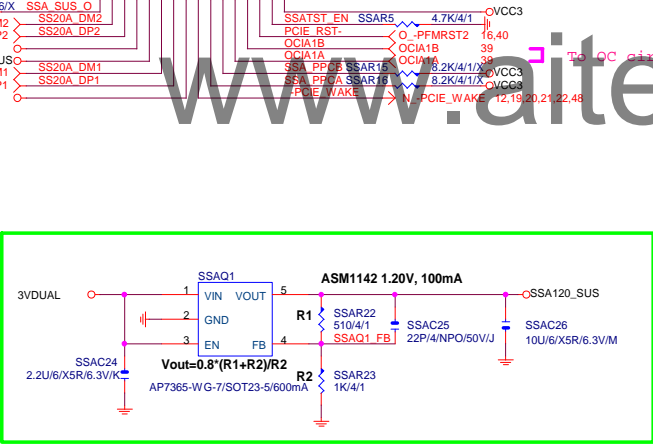
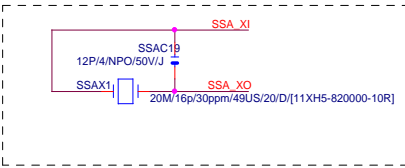
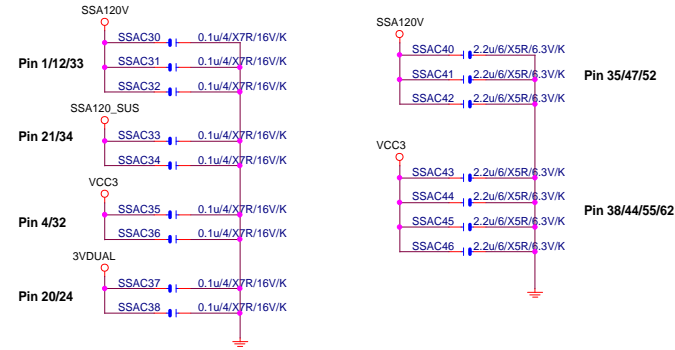


CSEL1	CSEL0	
1	1	External 20MHz Crystal (Asynchronous)
0	1	48MHz clock input (Synchronous)
X	0	Reserved for Test

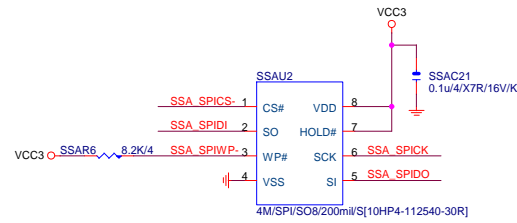
Color markers can be changed by model

ASM1142 USB3.1

Base on ASM1142 0.3 Reference SCH

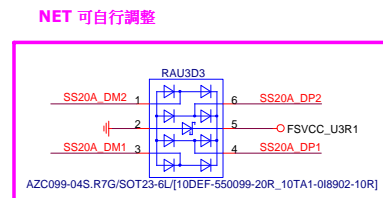


【技術通報R&D技術通報156】  
RT9018 (RICHTEK) 與NCT3730 (NUVOTON),  
EM5103GE (EMC) 做共用, 針對PIN7 (FB) 分壓阻值部份  
須做修改為100K以上電阻值



GIGABYTE™			
Title ASM1142 USB3.1A			
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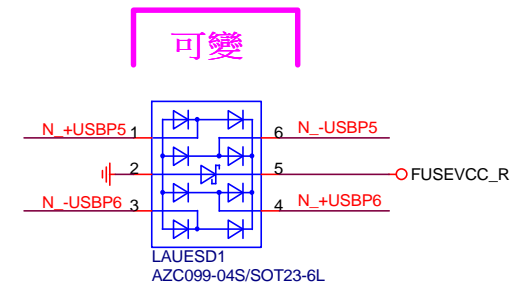
R\_USB30\_1



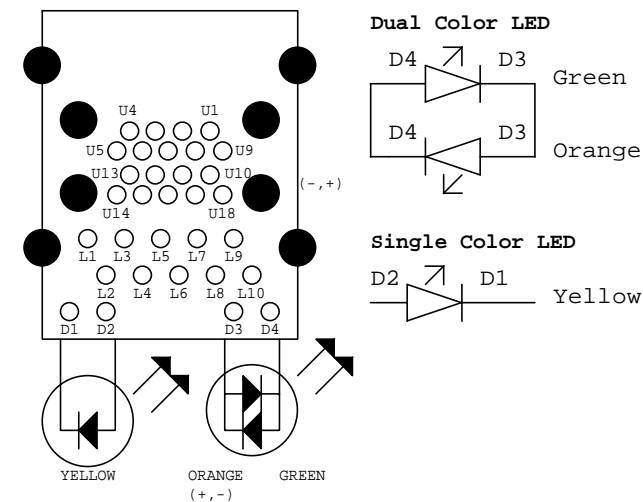


# USB\_LAN CONNECTOR R1.05

## RMA ESD PROTECT note:可變更USB NAME



## USB30 LAN LAYOUT示意圖



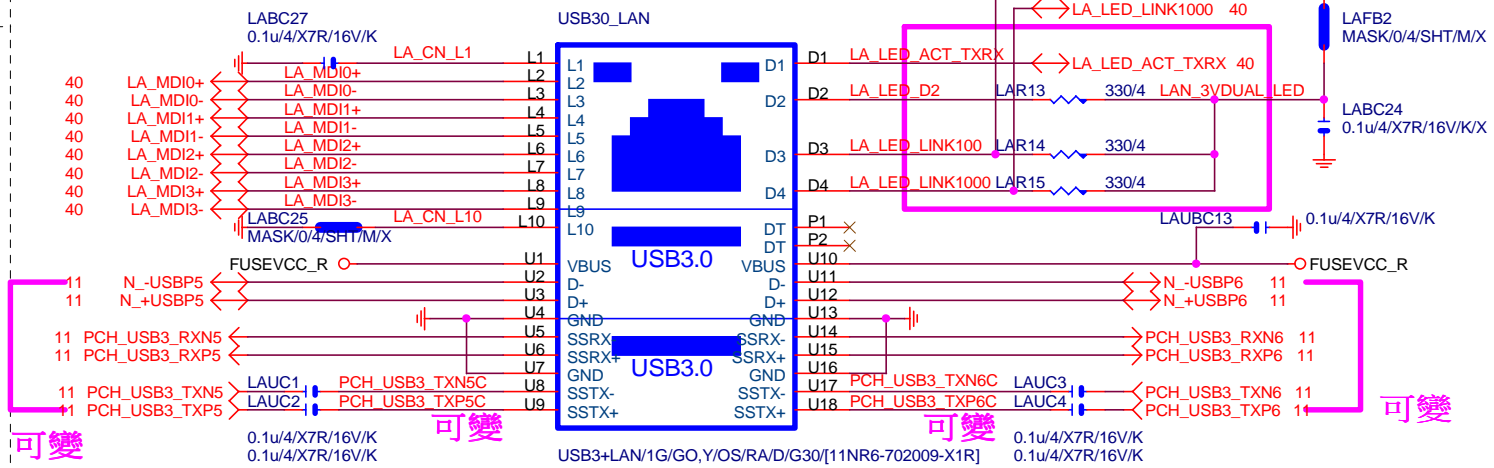
## LAN\_COVER FOOT PRINT:LAN\_COVER

可變  
[視SPEC需求]

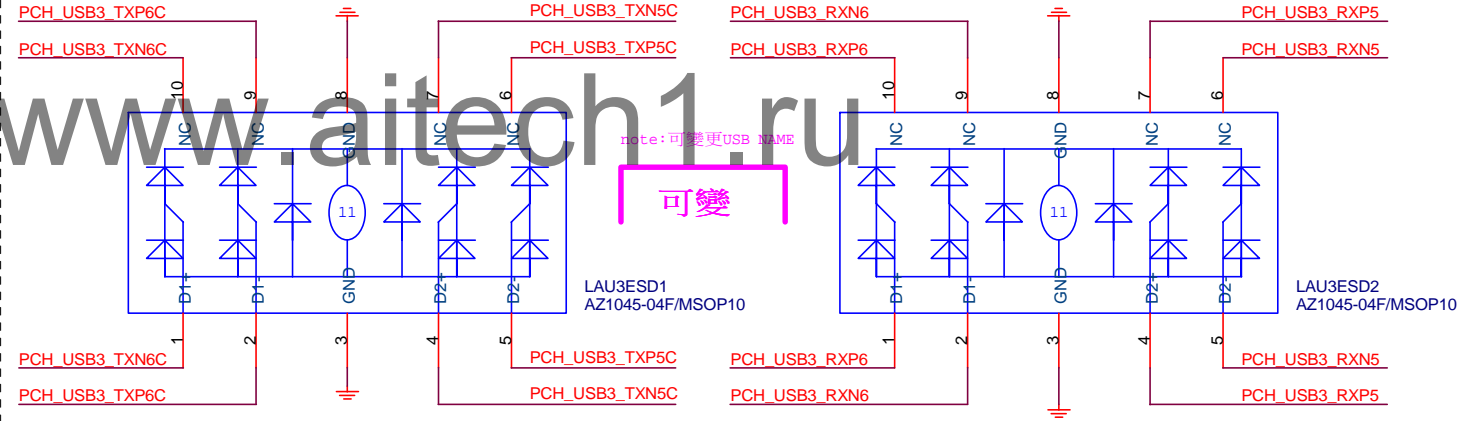
# USB\_LAN CONNECTOR

note:可變更USB NAME

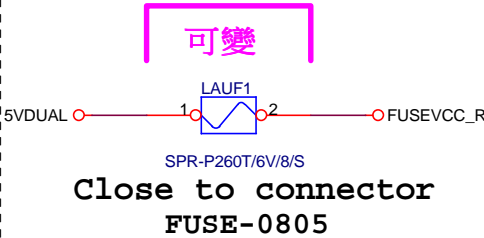
## [E2201]



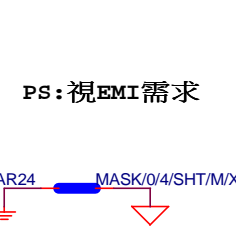
LA\_MDI-->100歐姆:[20/4/8/4/20]



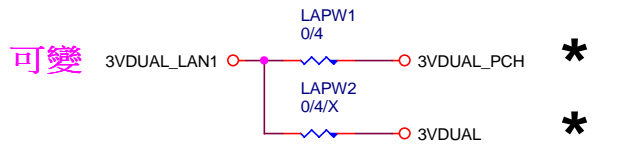
## USB POWER note:可變更FUSE



## EMI SHORT PAD



## LAN POWER



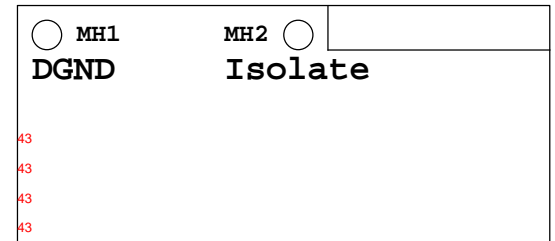
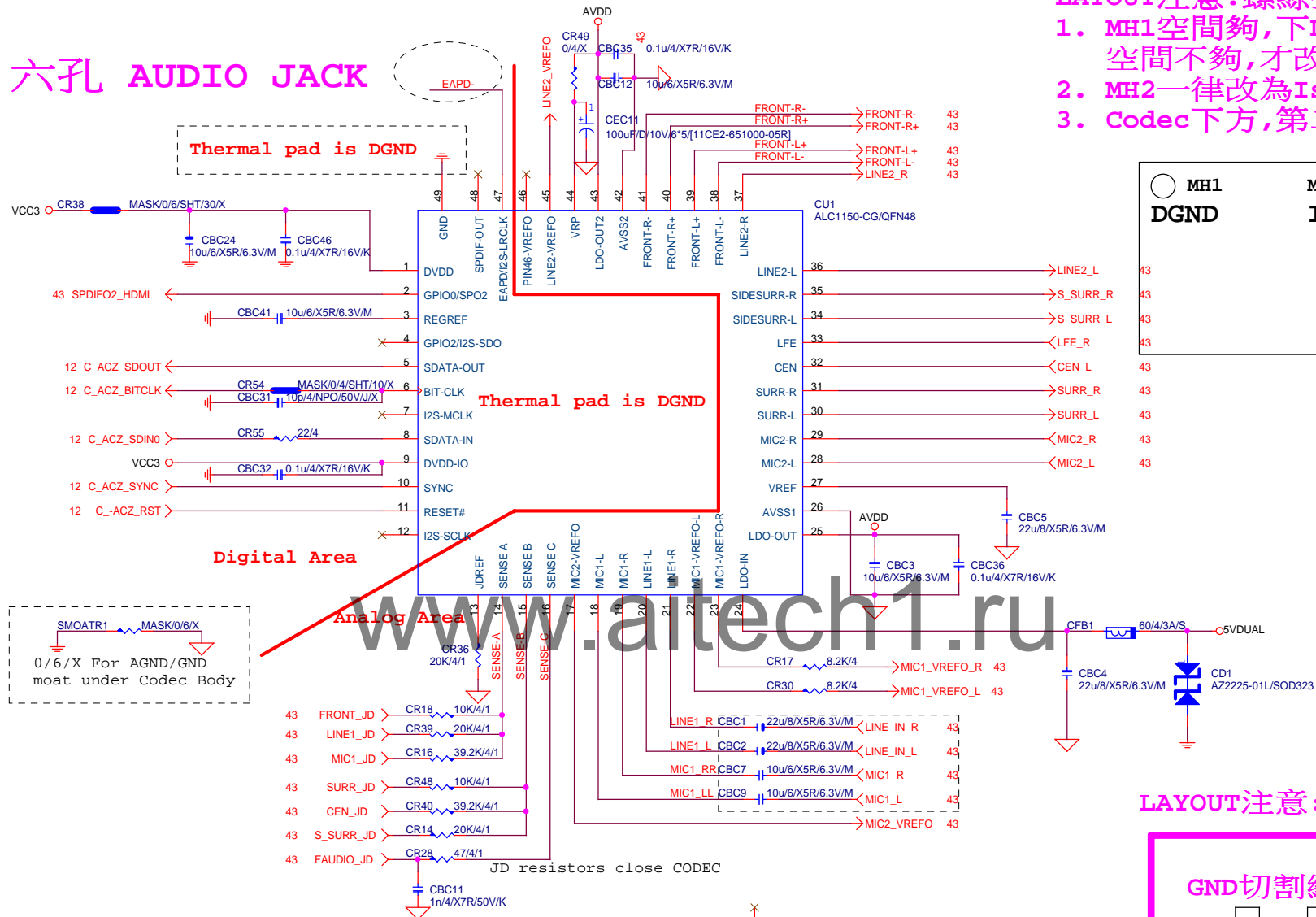
Gigabyte Technology			
LAN CONNECTOR-E2201			
Size	Document Number	Rev	
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Rev 0.93

# ALC1150 六孔 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

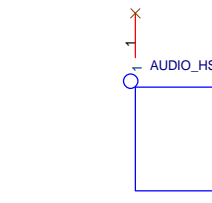
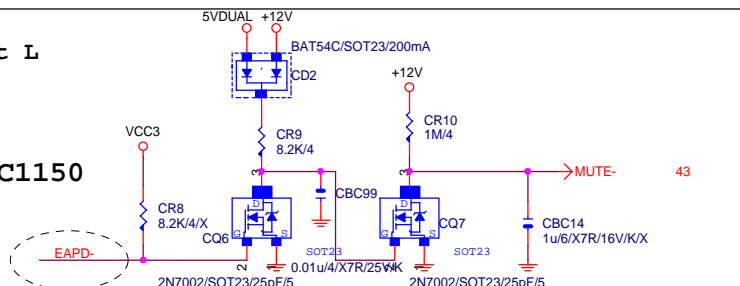


音效區域印刷



EAPD: Default L  
H : ON  
L : OFF

Close to ALC1150



AUDIO\_HS[11NH1-ADC001-21R]  
★Update 2015-03-06  
更新AUDIO\_HS料號:11NH1-ADC001-21R

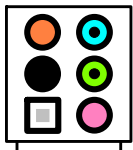
Gigabyte Technology

ALC1150

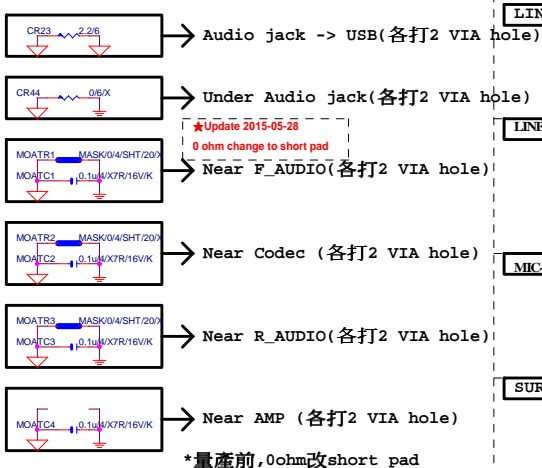
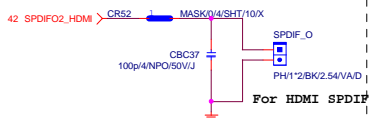
Title	Document Number	Rev
Size Custom	GA-Z170-Gaming K3 EU	1.01
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Rev 0.93

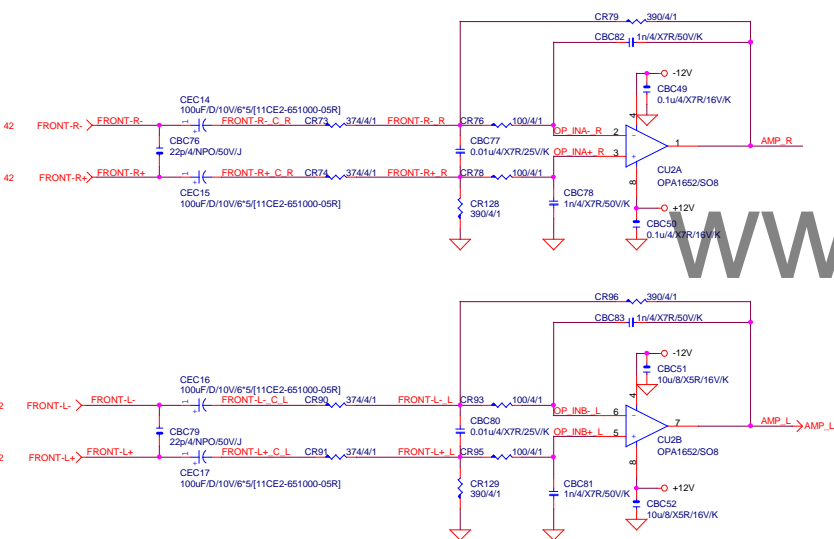
AZALIA JACK



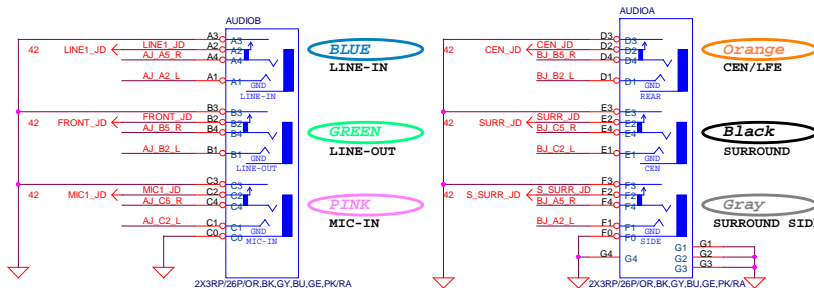
SPDIF\_OUT



## Differential to Single-End AMPLIFIED



AZALIA JACK



LINE-OUT

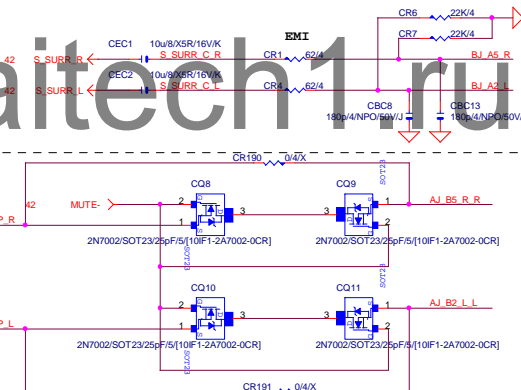
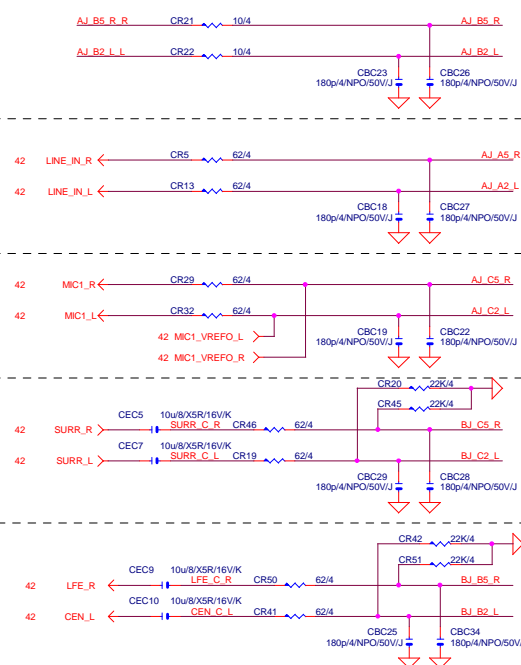
LINE-IN

MIC-IN

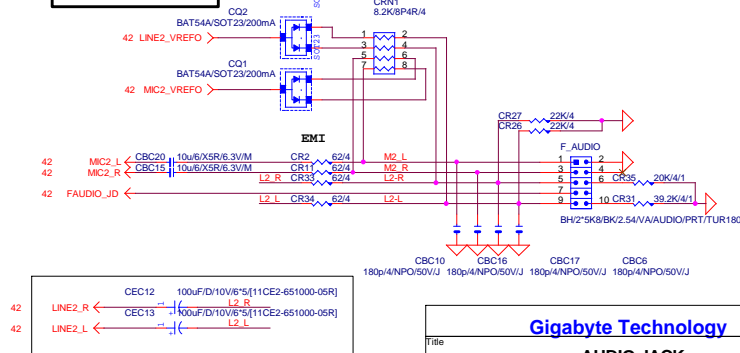
SURROUND

CEN/LFE

SURR BACK



AZALIA FRONT PANEL



Gigabyte Technology

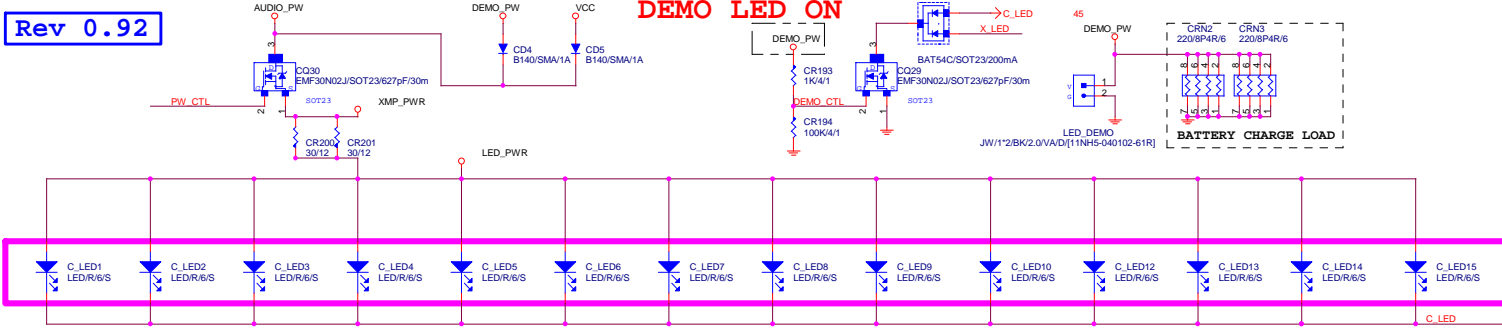
AUDIO JACK

Title	Document Number	Rev
GA-Z170-Gaming K3 EU	1.01	
Date	Thursday, December 10, 2015	Sheet 45 of 53

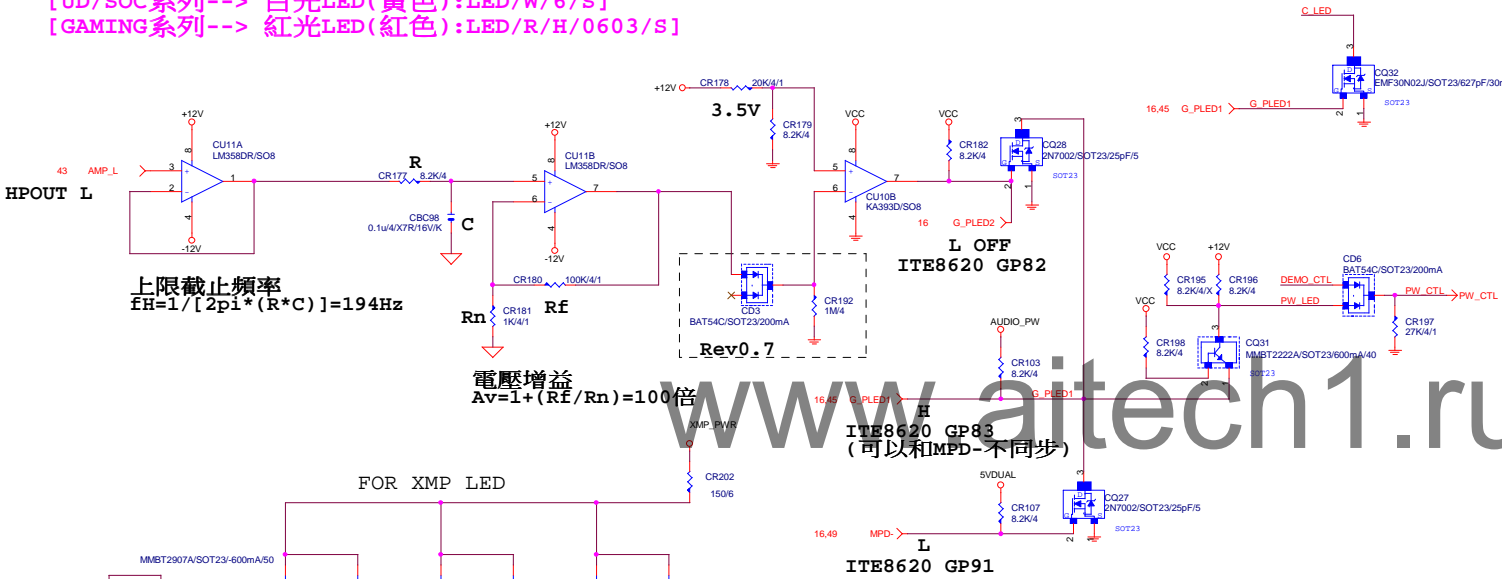


Rev 0.92

# DEMO LED ON



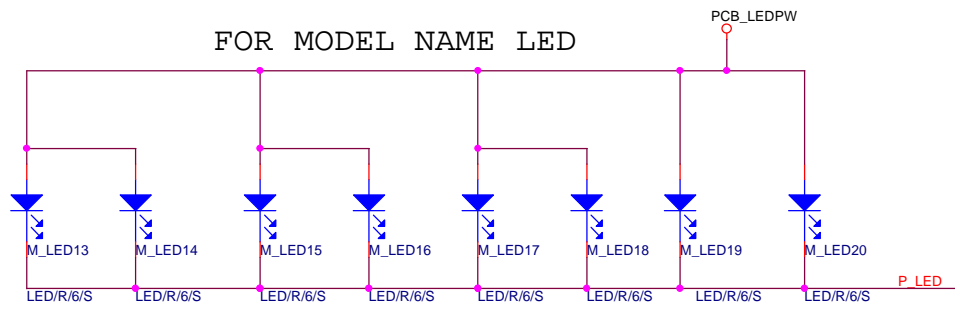
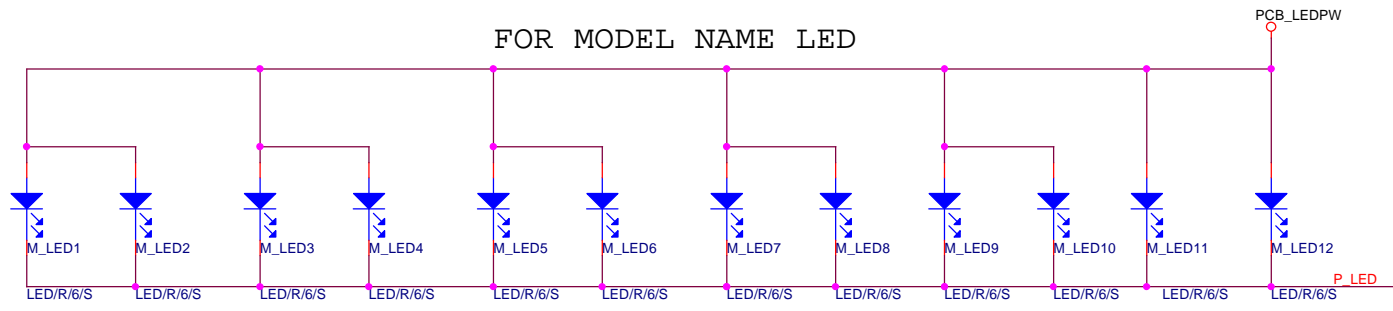
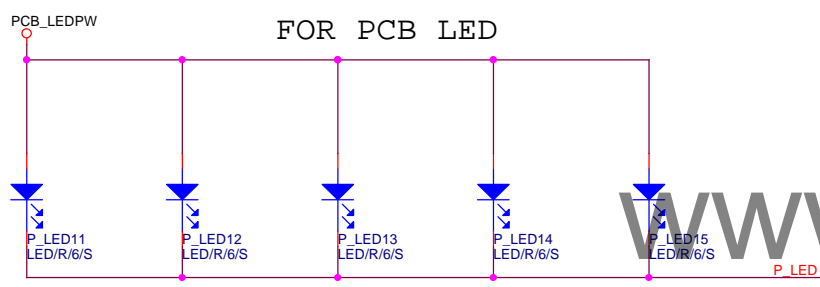
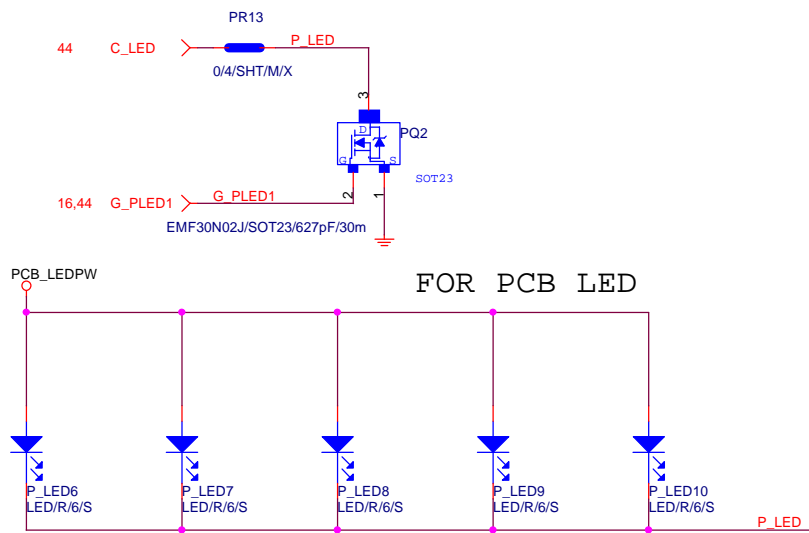
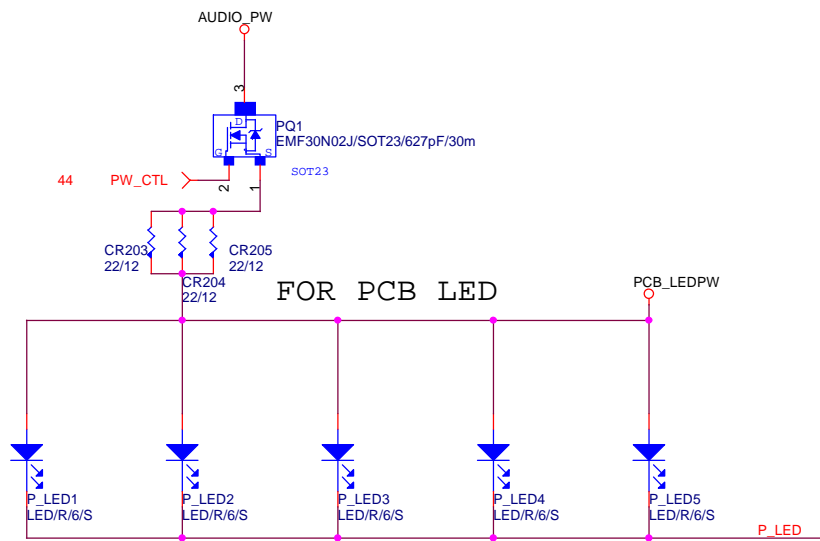
VALUE可變,LED顏色請自行修改  
 [UD/SOC系列--> 白光LED(黃色):LED/W/6/S]  
 [GAMING系列--> 紅光LED(紅色):LED/R/H/0603/S]



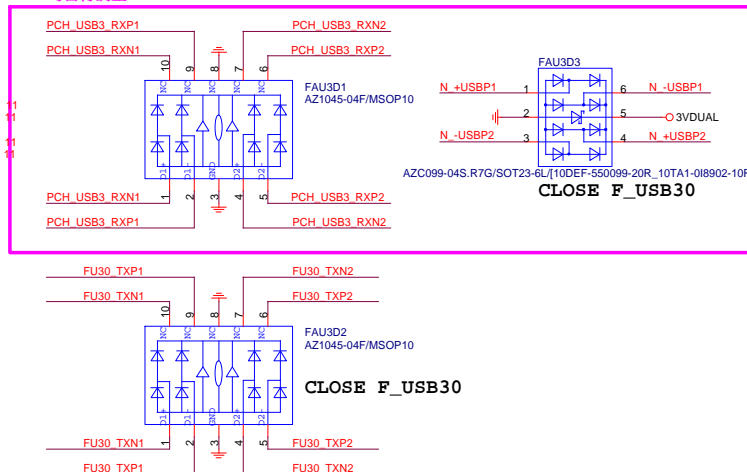
## AUDIO LED Control

	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

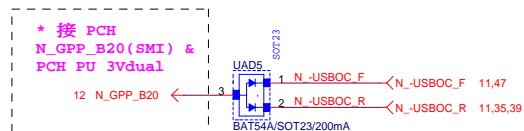
★Update 2015-02-13  
 移除 Audio Amp +/-12VDD\_OP 保護線路



Title			
MODEL NAME LED			
Size	Document Number		Rev
Custom	GA-Z170-Gaming K3 EU		1.01
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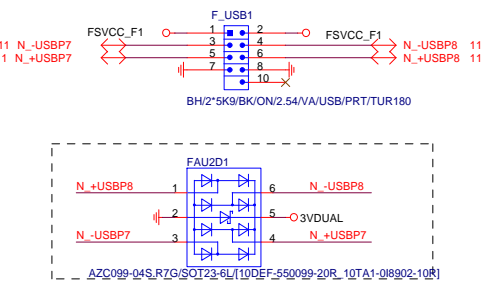


[www.aitech1.ru](http://www.aitech1.ru)

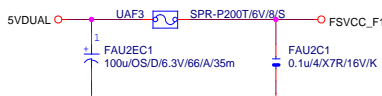


FRONT USB1

NET 可變

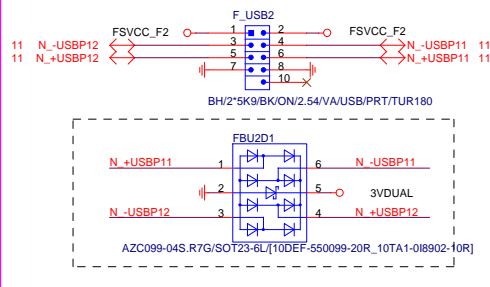


Close to connector  
FUSE 2 Port 1 Fuse 2A

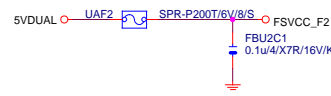


FRONT USB2

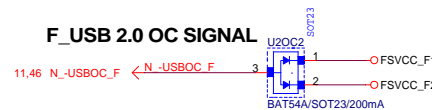
NET 可變



Close to connector  
FUSE 2 Port 1 Fuse 2A



F\_USB 2.0 OC SIGNAL



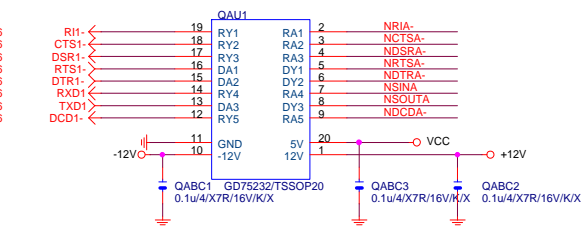
www.aitech1.ru

Gigabyte Technology

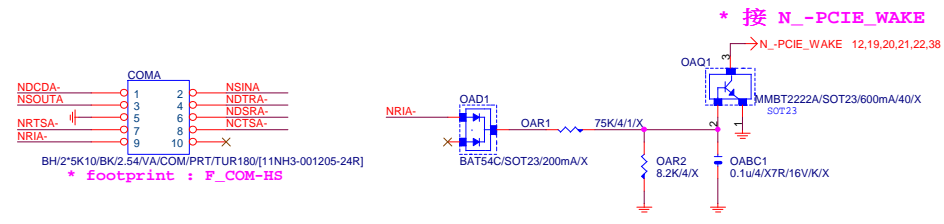
Title			USB2.0
Size	Document Number	Rev	1.01
Custom	GA-Z170-Gaming K3 EU		
Date:	Thursday, December 10, 2015	Sheet	47 of 53

Rev: 0.41

COM PORT



COMA

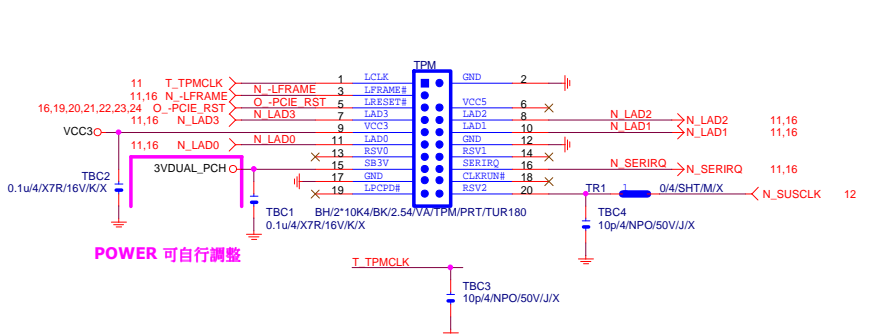


Rev: 0.3

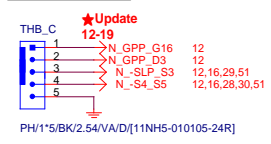
LPT PORT

www.aitech1.ru

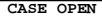
TPM CONNECT



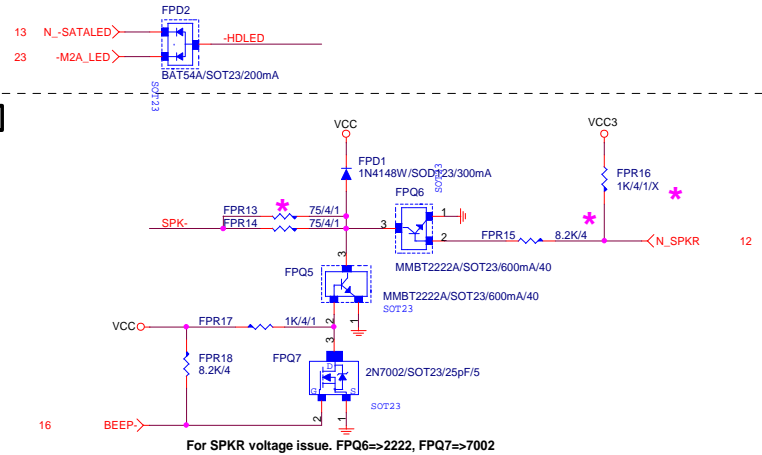
Thunderbolt



## FRONT PANEL



**SATA LED** SATALED# signal open-collector, pull-up (8.2 k $\Omega$  to 10 k $\Omega$ ) to Vcc3\_3



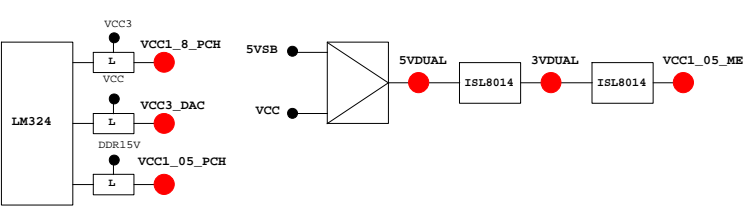
[www.aitech1.ru](http://www.aitech1.ru)

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

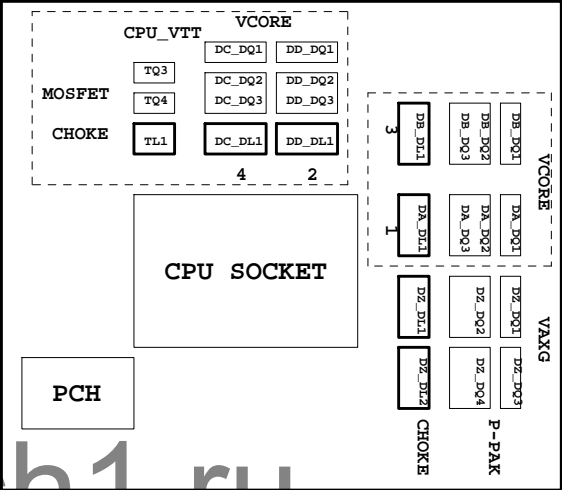
Super I/O ITE8720 GPIO Table

PIN NAME	USAGE	NOTE
SVC/PECI_RQT/GP14	-PECI_REQ	
PWROK1/GP13	PWROK1/ITE_PWROK	
KRST#/GP62	-KBRST	
SO/GP50	-ICH_SPI_CS	
IRTX/GP47/CE2_N/JP7	CEB_N	
GP46/IRRX	-LAN2_DSM	
PSION#/GP42	-PSON	
PWROK2#/GP41	PECI_CTL	
PCIRST3#/GP10/VDIMM_STR_EN	-PCI_E_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/CIRRXL2/GP16	-THERM	
VID04/GP26/SOUT2	DDR18V_PH2_EN	
VID02/FAN_TAC5/GP24/DSR2#	DDR18V_LED	
VID06/GP17/RI2#	1_1V_PH_EN	
VID07/JP6/DTR2#	JP6	
PD5/GP75/BUSS00	SB_LED3_C	



PWM各相位的擺法如下：



BIOS超電壓對應表：

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

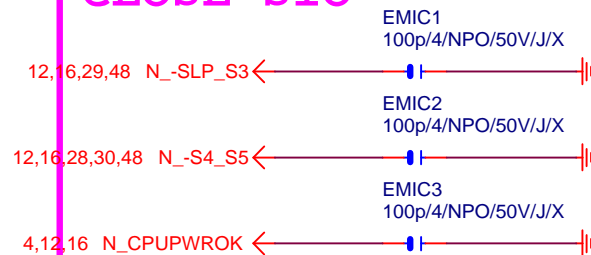
散熱模組料號：

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

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



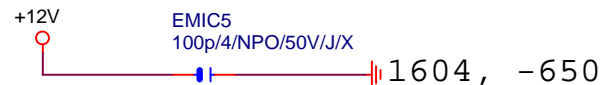
## CLOSE SIO



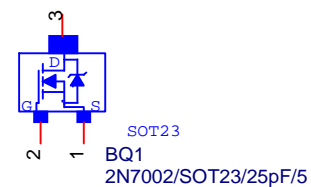
## CLOSE PCH



## CLOSE AUDIO



## BALANCE MOS HS

**GIGABYTE™**

Title

**EMI/ESD**Size  
A

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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
11C02-685600-01R	560u/FP/D/6.3V/68/8m
11C05-882700-01R	270u/FP/D/16V/88/12m
11C05-661000-03R	100u/OS/D/16V/66/30m
11C02-651000-02R	100u/OS/D/6.3V/66/30m

台系固態	Capture Value
11C02-661000-09R	100u/OS/D/6.3V/66/A/35m
11C05-691000-09R	100u/OS/D/16V/69/A/35m
11C05-8C2700-09R	270u/FP/D/16V/8C/A/10m
11C02-695600-09R	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
DIP	11LC5-M2500C-01R	0.5uH/20A/IMD0809/M/D	8*8	CHOKE1U-R50M-IF

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	未建(SIUC1007-R30M-JJ1W)		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

GIGABYTE™

Title

RT8120\_DDR4 POWER

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REAR IO

RS\_SYS

F\_AUDIO

AUDIO

DD\_DQ2 DD\_DQ1 DC\_DQ2 DC\_DQ1 DB\_DQ2 DB\_DQ1

RS\_VCORE

TTRT1

DD\_DL1 DC\_DL1 DB\_DL1

CPU

DA\_DL1  
DO\_DL1  
DN\_DL1  
DM\_DL1

DA\_DQ1 DA\_DQ2  
DO\_DQ1 DO\_DQ2  
DN\_DQ1 DN\_DQ2  
DM\_DQ1 DM\_DQ2

DANTC2

DANTC3

RS\_VCCGT TTRT2

DANTC4

SIO

PCH

RS\_PCH

SATA\_EXPRESS

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

Gigabyte Technology			
File			
NTC MAP			
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