

Model Name: GA-H97N

Revision 1.0

SHEET

TITLE

01	COVER SHEET
02	BOM & PCB MODIFY HISTORY
03	BLOCK DIAGRAM
04	CPU_LGA1150-A
05	CPU_LGA1150-B
06	CPU_LGA1150-C
07	DDR III CHANNEL A
08	DDR III CHANNEL B
09	PCH_FDI,DMI,USB,PCIE,NVRAM
10	PCH_DP,CLK BUFFER
11	PCH_HOST,SATA,PCI
12	PCH_GPIO,CTRL,AUDIO
13	PCH_PWR,GND
14	PCI EXPRESS*16 SLOT
15	ITE 8620 LPC IO
16	COM,KB_USB20
17	HWM,FAN CTRL,OV,-PROCHOT
18	DUAL BIOS
19	FP,FUSB,SPK,SATALED
20	Realtek ALC892-GR
21	REAR AUDIO JACK
22	INTEL LAN I217V(A)
23	ARTHEROS LAN AR8161B(B)
24	DISCRETE POWER
25	ATX
26	RT8120_DDR POWER,M3 POWER
27	VCORE ISL95820_1

SHEET

TITLE

28	VCORE ISL95820_2
29	DVI-I
30	HDMI*2
31	mSATA, Mini-PCIe

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Gigabyte Technology

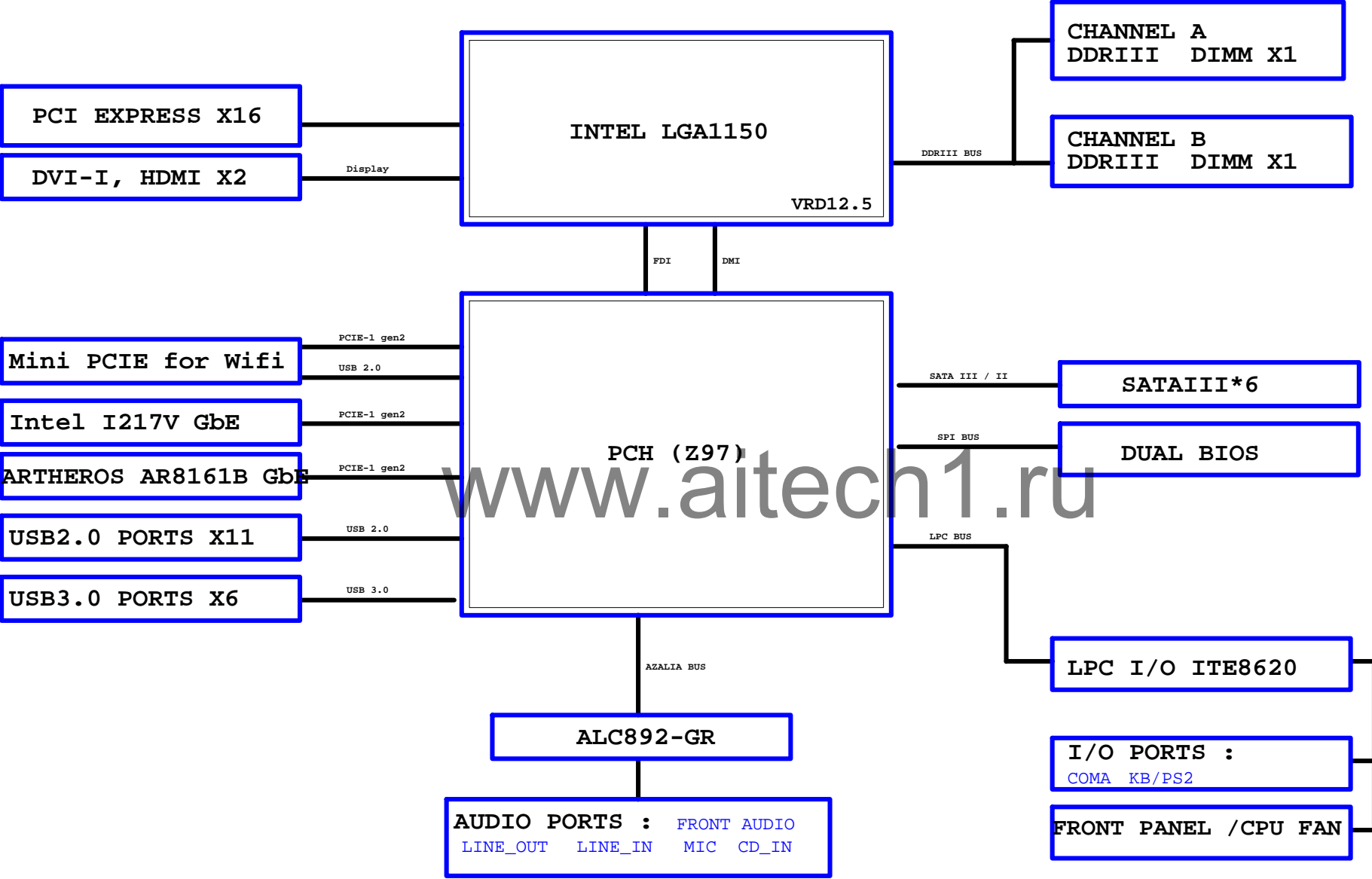
Cover Sheet

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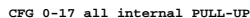
D

CD

BLOCK DIAGRAM

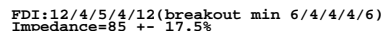


(E)



(D)

VCCIOA_L  WR23  24.9/4/1 FDI_RCOMP



D:HDMI-2

(c)

LGA1



PA EXP TXP[0..15] >> PA_EXP_TXP[0..15] [14]
PA EXP TXN[0..15] >> PA_EXP_TXN[0..15] [14]
PA EXP RXP[0..15] >> PA_EXP_RXP[0..15] [14]
PA EXP RXN[0..15] >> PA_EXP_RXN[0..15] [14]

A -CPURST

BC102
1n4/X7R/50V/K

CPU PU/PD

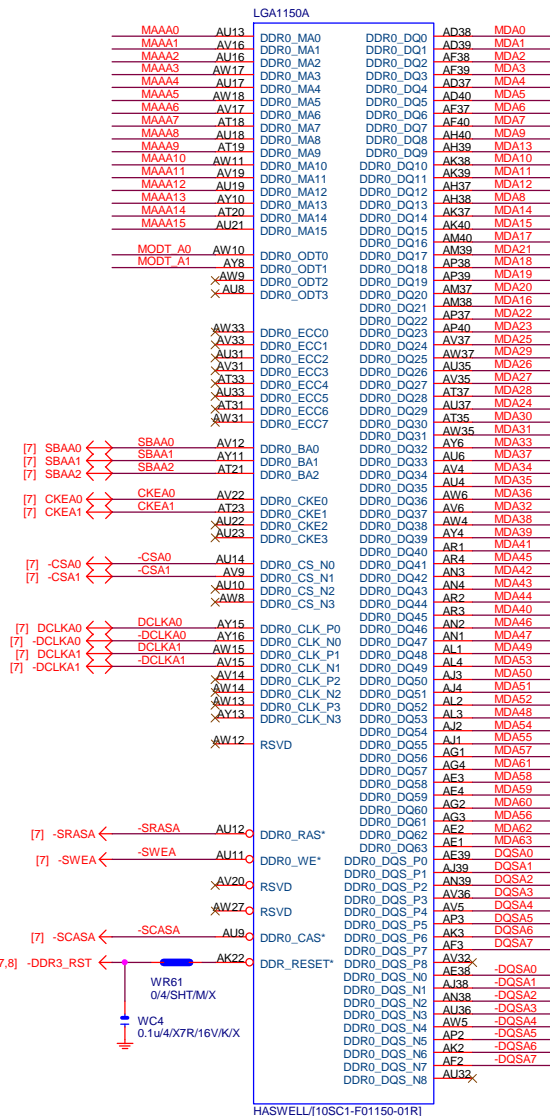


THRMTRIP DISABLE

CPU LGA1150-A

Size	Document Number	GA-H97N
Custom		

Rev
1.0

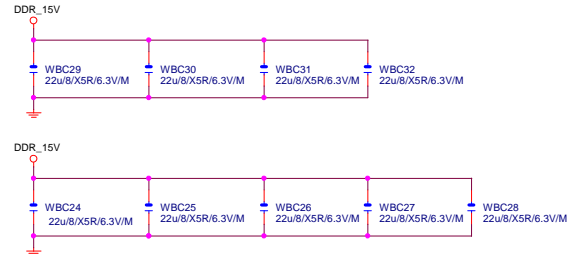


LGA1155 (G,H,I)



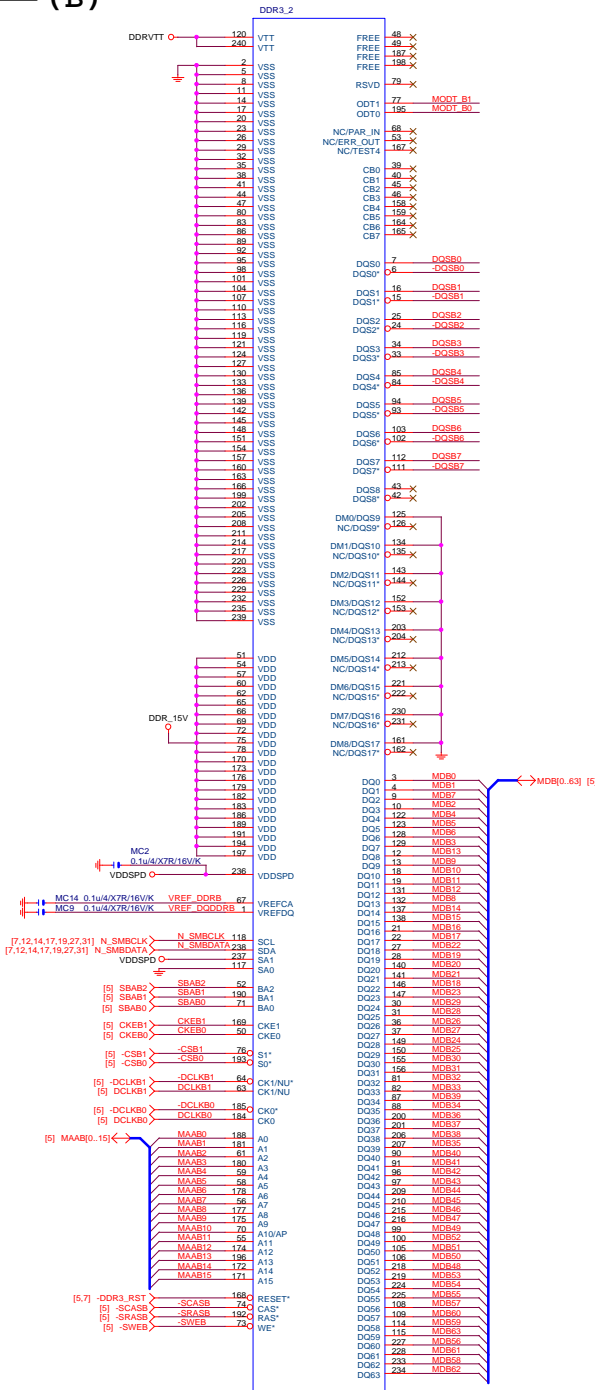
DDR CAP

(x9)



DDR3

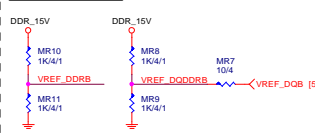
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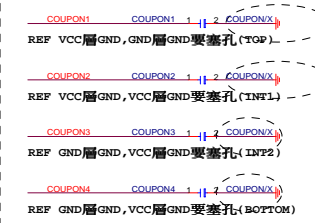
DDR3240/8KVA/DONE LATCH
BLACK CONNECTOR 單耳扣



DDR3 VREF



COUPON



CPU

DIMM1 CHA
DIMM2 CHB

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PCH

(B)

DMI:12/4/4/4/12(breakout min 8/4/4/4/8)
Impedance=85 +/- 17.5%

USB2.0 : 12/4.5/7.5/4.5/12 (breakout min 8/4/4/4/8)
Impedance=90 +/- 17.5%

PCHB

B85: Port 6/7 N/A

H81: Port 6/7/12/13 N/A

W=4 mil out of PCH

S=15 mil out of PCH

VCC1_5_PCH NR50 7.5K/4/1 DMI_COMP B19
NR40 7.5K/4/1 PCIE_COMP C13
CK -SRCCLK_PCH G22
CK SRCCLK_PCH F22

USB3.0

MINI AR8161B
PCI-E

PCIEX1:15/4/4/4/15 (breakout min 8/4/4/4/8)
Impedance=85 +/- 17.5%

CHIP DH82H97 A0 INTEL[10HB1-030H97-20R]

PCH

(J)

PCH PCIE ,DMI 15/4/4/4/15

usb2.0 12/5/7/5/12

usb3.0 20/5/7/5/20

PCHJ

AT1 VSS_NCTF TP22 U11
AT41 VSS_NCTF TP23 U10
AU1 VSS_NCTF TP21 AJ14
AV1 VSS_NCTF TP20 AK14
AV2 VSS_NCTF TP14 K34
AV40 VSS_NCTF TP15 K33
AV41 VSS_NCTF TP12 AH24
AW2 VSS_NCTF TP10 L16
AW40 VSS_NCTF TP11 K16
B40 VSS_NCTF TP9 AM34
B41 VSS_NCTF TP3 R12
C41 VSS_NCTF TP4 N12
D1 VSS_NCTF TP1 L22
D41 VSS_NCTF TP2 K22
VSS AC31
VSS AF3
VSS AV21

CHIP DH82H97 A0 INTEL[10HB1-030H97-20R]

PCH

(F)

USB2.0/3.0 PORT要對應

USB20 1/9 debug Capability Test 一定要拉出來

PCHF

USB3 FDI LINK
USB3 RXN_0 FDI_RXN_0 N1 FDI_TXN0
USB3 RXP_0 FDI_RXP_0 N2 FDI_TXP0
USB3 TXN_0 FDI_TXN_0 P2 FDI_TXN1
USB3 TXP_0 FDI_TXP_0 P3 FDI_TXP1
FDI_CSXNC
FDI_CSXNC L2 FDI_CSXNC [4]
FDI_INT
FDI_INT L3 FDI_INT [4]
FDI_RCOMP
FDI_RCOMP K2 NR29 7.5K/4/1 VCC1_5_PCH
USB3_RXN_1 G18
USB3-RXP_1 H18
USB3-TXN_1 B15
USB3-TXP_1 B16
USB3_RXN_4 K20
USB3-RXP_4 L20
USB3-TXN_4 D15
USB3-TXP_4 C15
USB3_RXN_5 L18
USB3-RXP_5 K18
USB3-TXN_5 B14
USB3-TXP_5 A14
TACH6_GP70
TACH7_GP71

CHIP DH82H97 A0 INTEL[10HB1-030H97-20R]

FDI_TXP0..11 >>> FDI_TXP0..11 [4]

FDI_TXN0..11 >>> FDI_TXN0..11 [4]

USB3.0:20/5/7/5/20 (breakout min
8/4/4/4/8) ; ONLY 3 VIAS

Impedance=85 +/- 17.5%

Back Panel < 10000 MILS

Front Panel < 6000 MILS

PCH CLK PD

Mount for integrated clock Generation Mode

CK SRCCLK_PCH NR89 8.2K/4
CK -SRCCLK_PCH NR88 8.2K/4
CK DOTCLK NR92 8.2K/4
CK -DOTCLK NR91 8.2K/4
NR225 short to GND in non
graphic SKU

PCH H/S

SB_HEATSIN

1X

GRAY HS

X2

PCH_HS
PCH_HS[12SP2-S03507-01R_12SP2-S03507-02R]

USB TABLE

OC[3:0]# for Device 29 (ports 0-7)

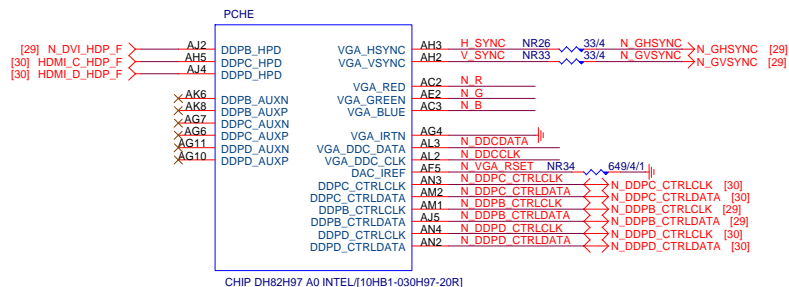
OC[7:4]# for Device 26 (ports 8-13)

USB OC#	Configure
OC0#	F_USB30
OC1#	USB30_LAN2
OC2#	USB30_LAN1
OC3#	N/A
OC4#	F_USB20
OC5#	KB_MS_USB
OC6#	MINI_PCIE
OC7#	Not Use

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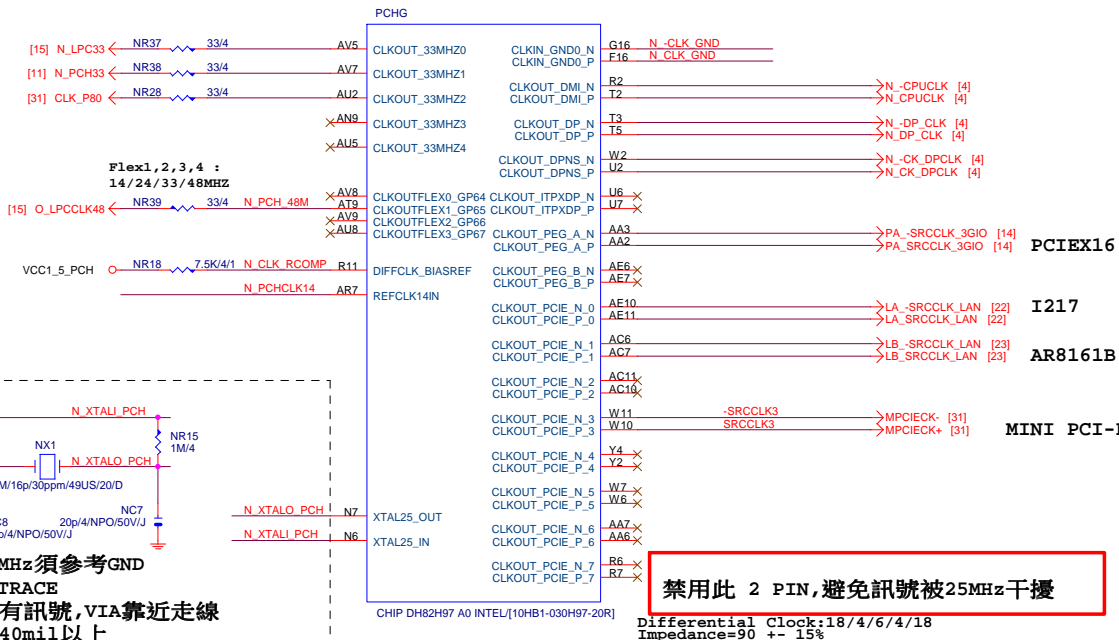
Title	PCH FDI,DMI,USB ,PCIE,NVRAM		
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PCH (E)



VGA DISABLE	
R,G,B	NC OR GND
IRTN / IREF	GND
VGA_HSYNC, VGA_VSYNC, DDC_CLK, DDC_DATA	NC
POWER	VCCADAC(AF2), VCCADACBG(AE1) GND

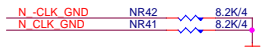
PCH (G)



禁用此 2 PIN, 避免訊號被25MHz干擾

Differential Clock:18/4/6/4/18
 Impedance=90 +- 15%

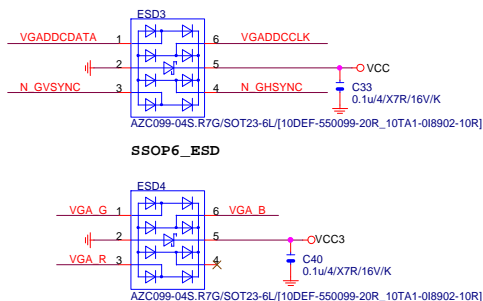
PCH CLK PD



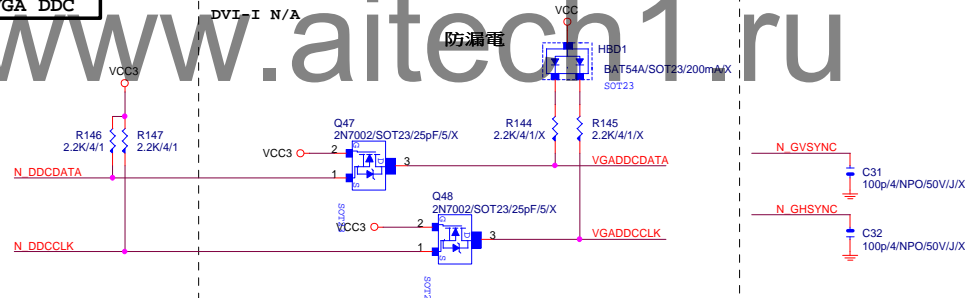
Mount for integrated clock Generation Mode



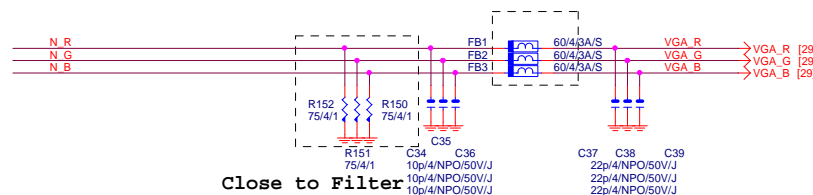
VGA ESD



VGA DDC



VGA SIGNAL



Close to Filter

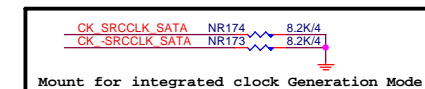
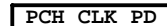
Gigabyte Technology

PCH DISPLAY, CLK BUFFER

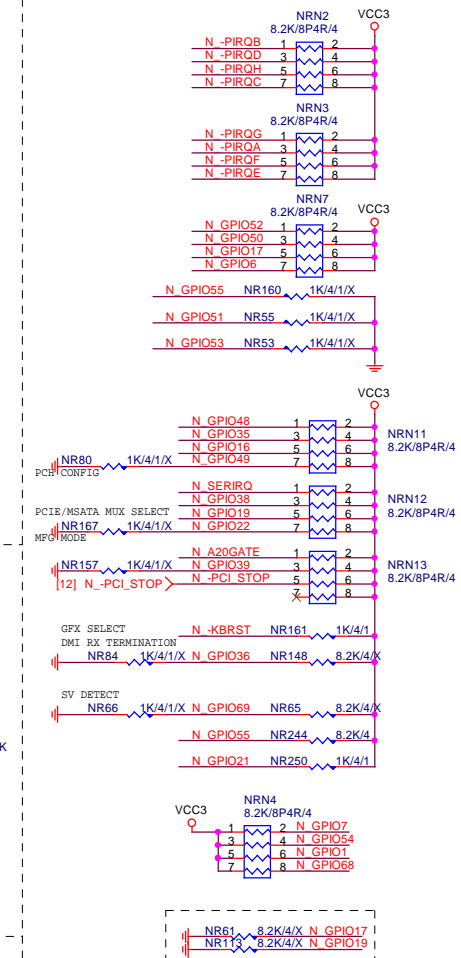
GA-H97N

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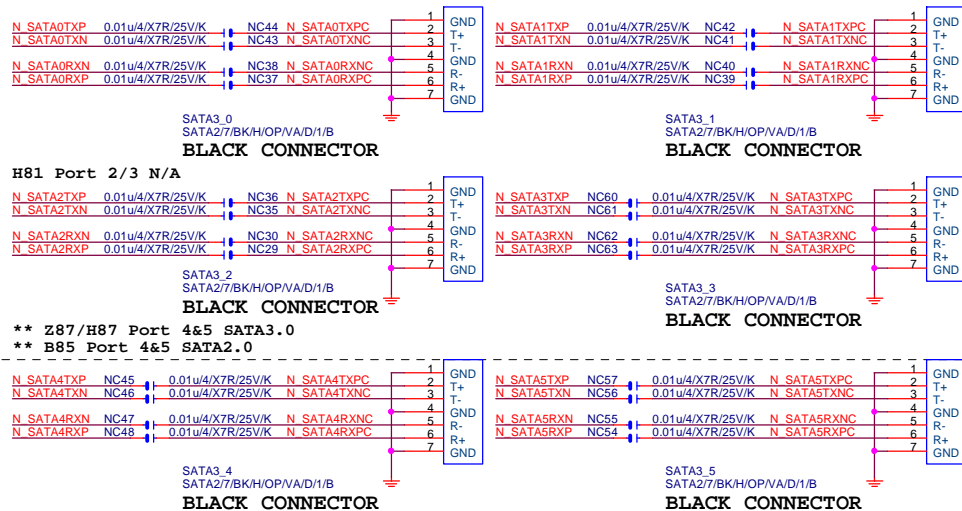
SATA3 : 20/7.5/4.5/7.5/20 (breakout min 8/4/4/4/8)
Impedance=90 +- 17.5%
SATA2 : 15/7.5/4.5/7.5/15 (breakout min 8/4/4/4/8)
Impedance=90 +- 17.5%



PCH	PU/PD
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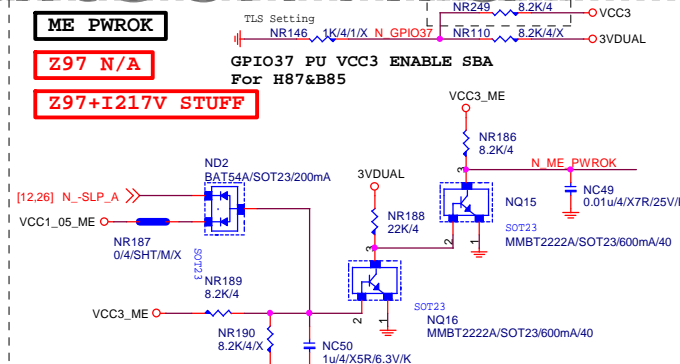
SATA CONNECTOR



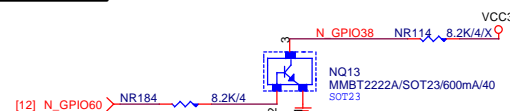
ME PWROK

Z97 N/A

Z97+I217V STUFF



GPIO38 Ctrl



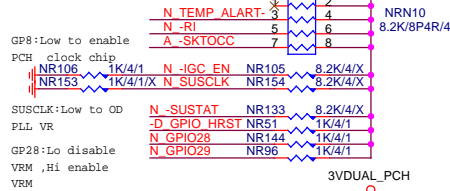
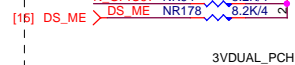
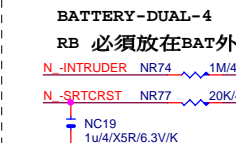
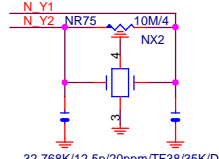
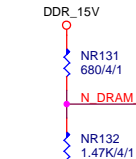
Gigabyte Technology

PCH HOST , SATA, PCI

GA-H97N

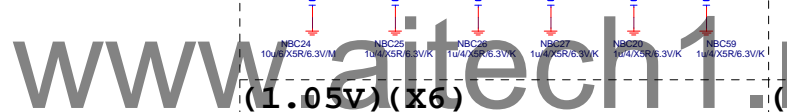
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PCH HOST , SATA, PCI			
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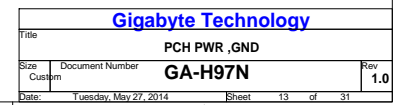


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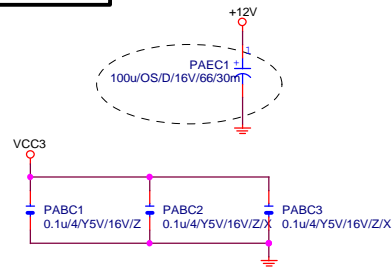
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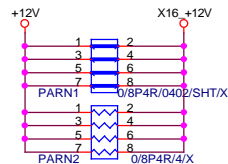
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PCIEX16 CAP



PCIEX16 PROTECT SHT

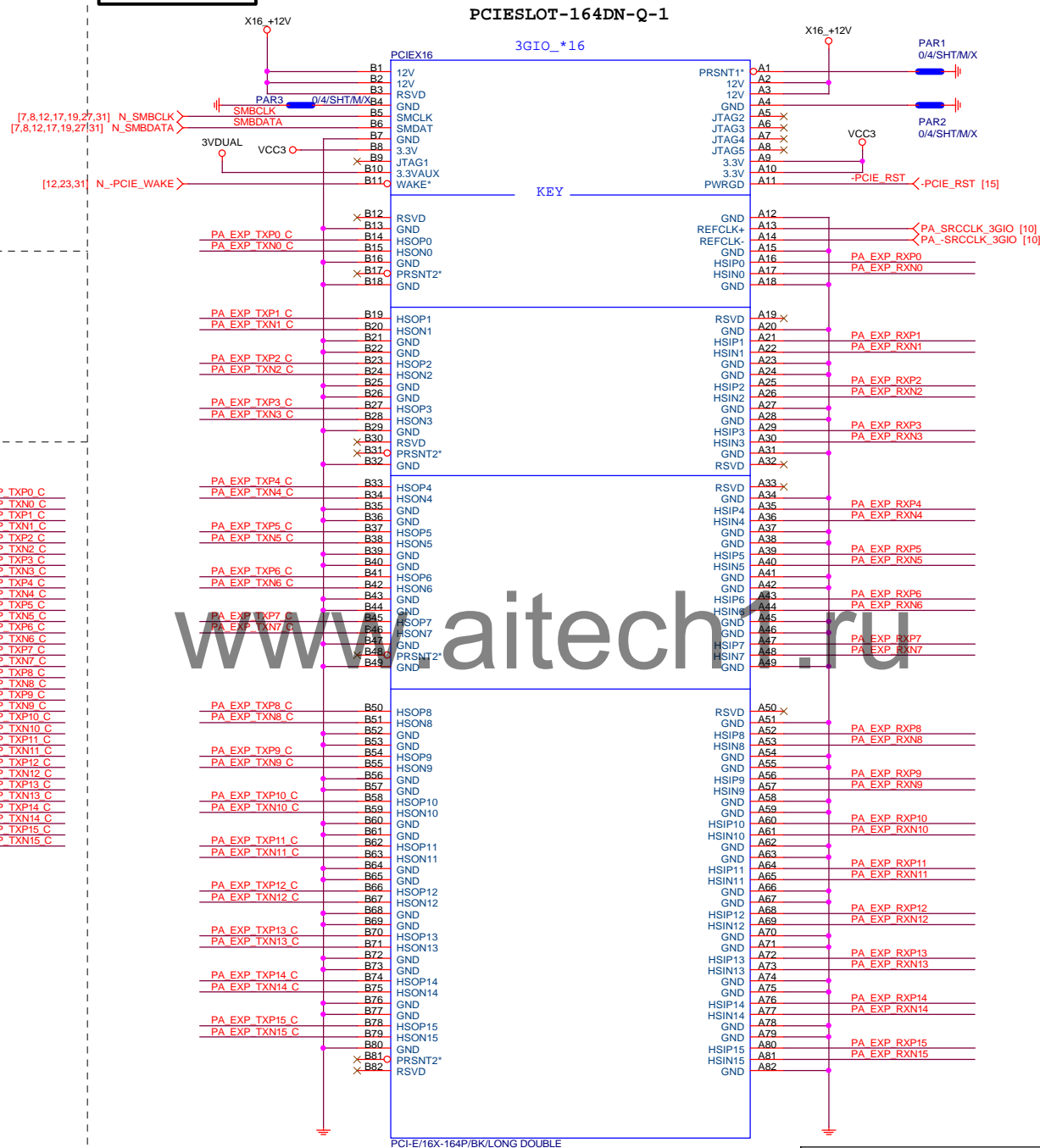


PCIEX16 AC CAP

PA EXP TXP0	PAC5	0.22u4/X5R/6.3V/K	PA EXP TXP0 C
PA EXP TXN0	PAC4	0.22u4/X5R/6.3V/K	PA EXP TXN0 C
PA EXP TXP1	PAC6	0.22u4/X5R/6.3V/K	PA EXP TXP1 C
PA EXP TXN1	PAC7	0.22u4/X5R/6.3V/K	PA EXP TXN1 C
PA EXP TXP2	PAC8	0.22u4/X5R/6.3V/K	PA EXP TXP2 C
PA EXP TXN2	PAC9	0.22u4/X5R/6.3V/K	PA EXP TXN2 C
PA EXP TXP3	PAC10	0.22u4/X5R/6.3V/K	PA EXP TXP3 C
PA EXP TXN3	PAC11	0.22u4/X5R/6.3V/K	PA EXP TXN3 C
PA EXP TXP4	PAC12	0.22u4/X5R/6.3V/K	PA EXP TXP4 C
PA EXP TXN4	PAC13	0.22u4/X5R/6.3V/K	PA EXP TXN4 C
PA EXP TXP5	PAC14	0.22u4/X5R/6.3V/K	PA EXP TXP5 C
PA EXP TXN5	PAC15	0.22u4/X5R/6.3V/K	PA EXP TXN5 C
PA EXP TXP6	PAC16	0.22u4/X5R/6.3V/K	PA EXP TXP6 C
PA EXP TXN6	PAC17	0.22u4/X5R/6.3V/K	PA EXP TXN6 C
PA EXP TXP7	PAC19	0.22u4/X5R/6.3V/K	PA EXP TXP7 C
PA EXP TXN7	PAC18	0.22u4/X5R/6.3V/K	PA EXP TXN7 C
PA EXP TXP8	PAC20	0.22u4/X5R/6.3V/K	PA EXP TXP8 C
PA EXP TXN8	PAC21	0.22u4/X5R/6.3V/K	PA EXP TXN8 C
PA EXP TXP9	PAC22	0.22u4/X5R/6.3V/K	PA EXP TXP9 C
PA EXP TXN9	PAC23	0.22u4/X5R/6.3V/K	PA EXP TXN9 C
PA EXP TXP10	PAC24	0.22u4/X5R/6.3V/K	PA EXP TXP10 C
PA EXP TXN10	PAC25	0.22u4/X5R/6.3V/K	PA EXP TXN10 C
PA EXP TXP11	PAC26	0.22u4/X5R/6.3V/K	PA EXP TXP11 C
PA EXP TXN11	PAC27	0.22u4/X5R/6.3V/K	PA EXP TXN11 C
PA EXP TXP12	PAC28	0.22u4/X5R/6.3V/K	PA EXP TXP12 C
PA EXP TXN12	PAC29	0.22u4/X5R/6.3V/K	PA EXP TXN12 C
PA EXP TXP13	PAC30	0.22u4/X5R/6.3V/K	PA EXP TXP13 C
PA EXP TXN13	PAC31	0.22u4/X5R/6.3V/K	PA EXP TXN13 C
PA EXP TXP14	PAC32	0.22u4/X5R/6.3V/K	PA EXP TXP14 C
PA EXP TXN14	PAC33	0.22u4/X5R/6.3V/K	PA EXP TXN14 C
PA EXP TXP15	PAC34	0.22u4/X5R/6.3V/K	PA EXP TXP15 C
PA EXP TXN15	PAC35	0.22u4/X5R/6.3V/K	PA EXP TXN15 C

PA EXP RXP0.15] >>> PA_EXP_RXP[0.15] [4]
PA EXP RXN0.15] >>> PA_EXP_RXN[0.15] [4]
PA EXP TXP0.15] >>> PA_EXP_TXP[0.15] [4]
PA EXP TXN0.15] >>> PA_EXP_TXN[0.15] [4]

PCIEX16 SLOT



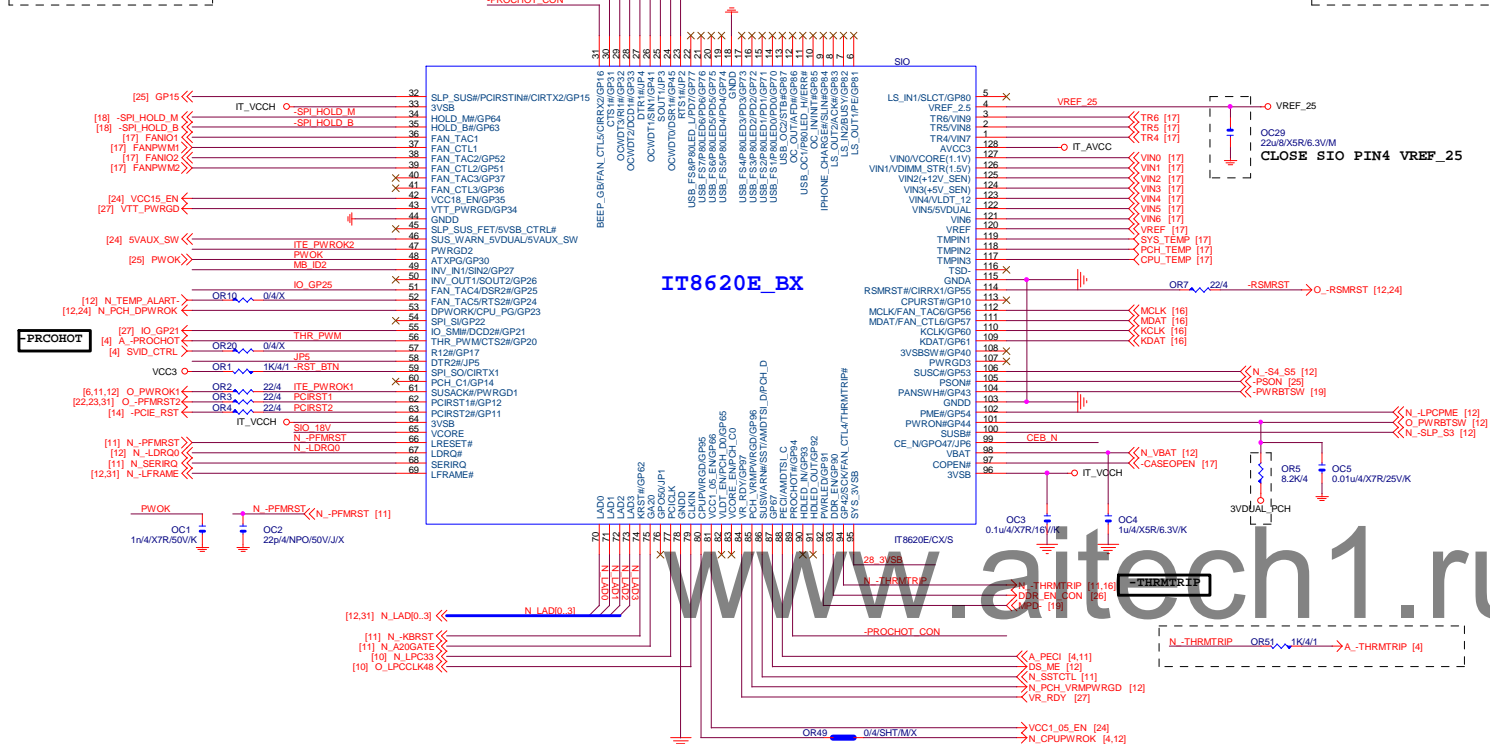
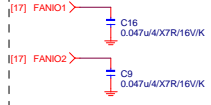
BLACK CONNECTOR

Gigabyte Technology

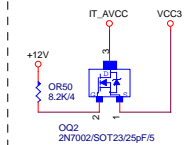
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PCI EXPRESS * 16		
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SIO IT8620

┌ FANIO CAP 1~2



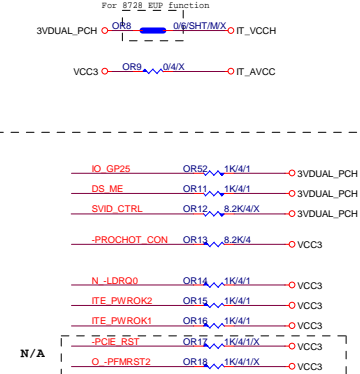
FIX ATX 插拔漏電



PWR	SHT
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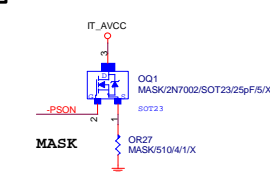
SIO PU



SIO STRAP



Power leakage

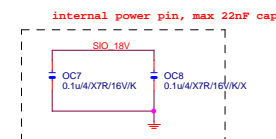


IT8620E GPIO問題調整	
PIN 50	GP26--- 第一次接上POWER時會拉 LO
PIN 90/91	DEFAULT為HIDLED FUNCTION, GP93 BYPASS TO GP92
	高溫時 GP92 會被拉LO(ITE)
PIN 108	8948--- POWER ON 時會拉 LO
PIN 111/112	MOUSE跟PAN6 FUNCTION 擇一使用，不然會互相干擾

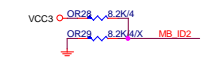
DUAL BIOS OPT STRAP



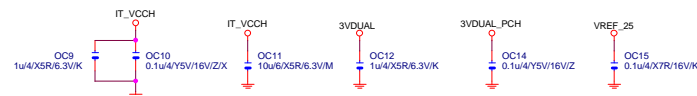
SIO_18V



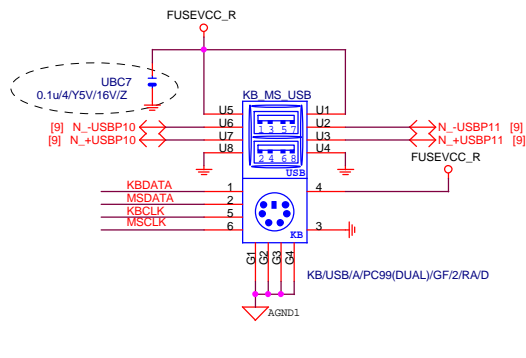
MB ID



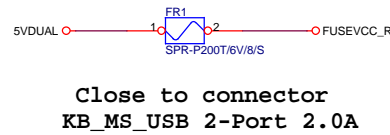
SIO CAP



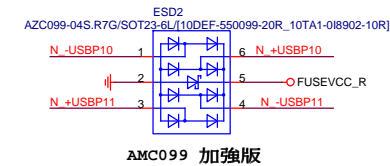
KB/MS



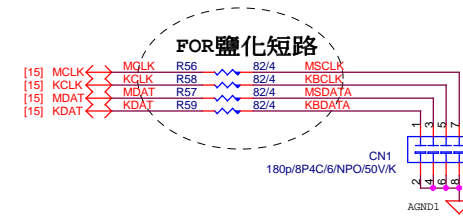
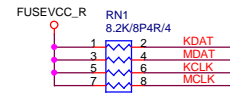
USB2.0 PWR



USB2.0 ESD

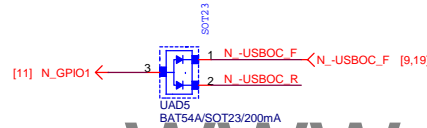
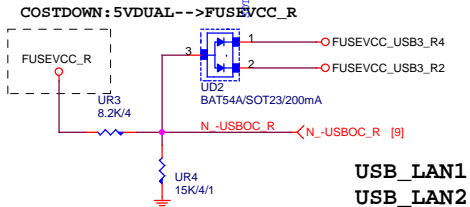


KB_MS



-USBOC_R

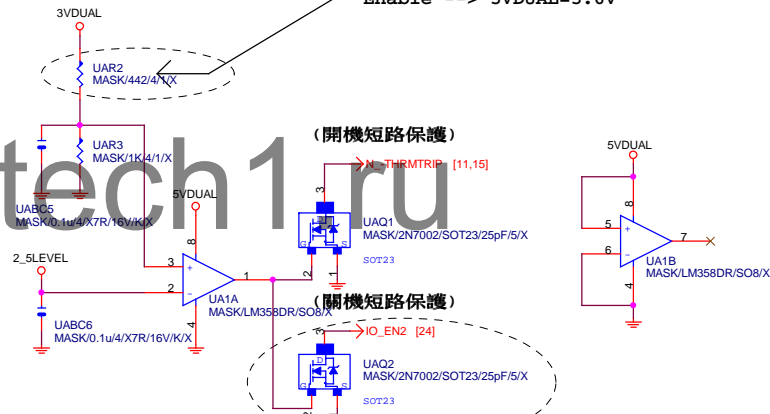
USB POWER PROTECT



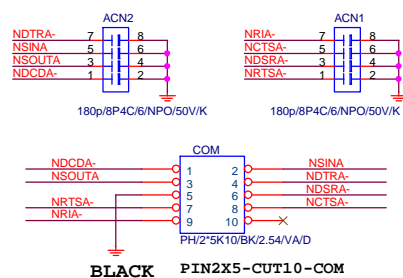
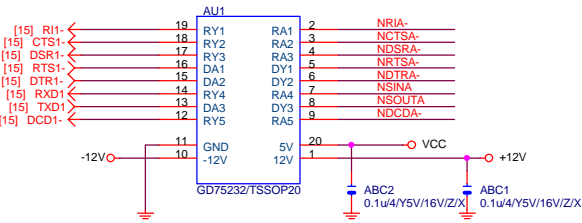
USB2.0 Short Power Protection

N/A

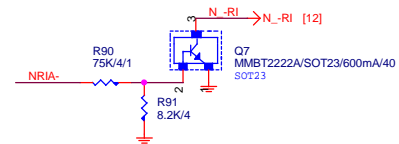
USB2.0 Signal & power short protection
USB2.0 Signal > 4.85V
Enable --> 3VDUAL=3.6V



COM

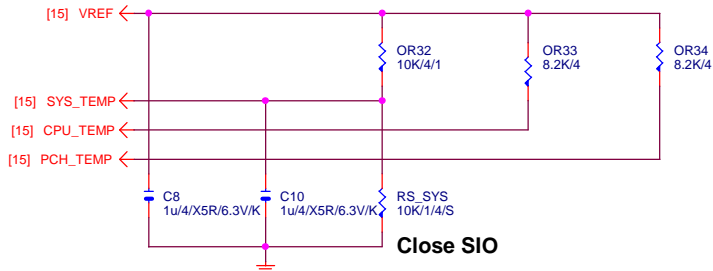


COM RI

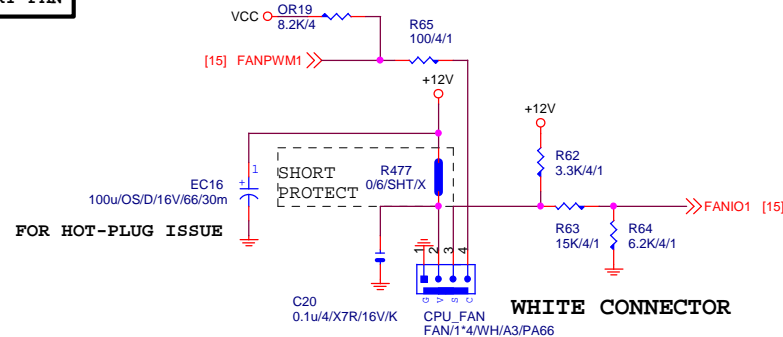


Gigabyte Technology			
Title			
COM-RI,KB_USB,USB_ESATA,-PROCHOT			
Size	Document Number	Rev	
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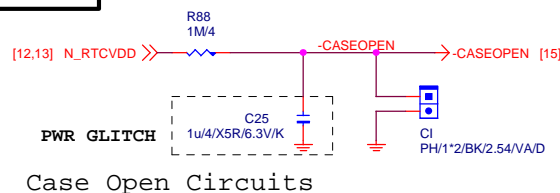
TEMP H/W MONITOR



CPU SMART FAN

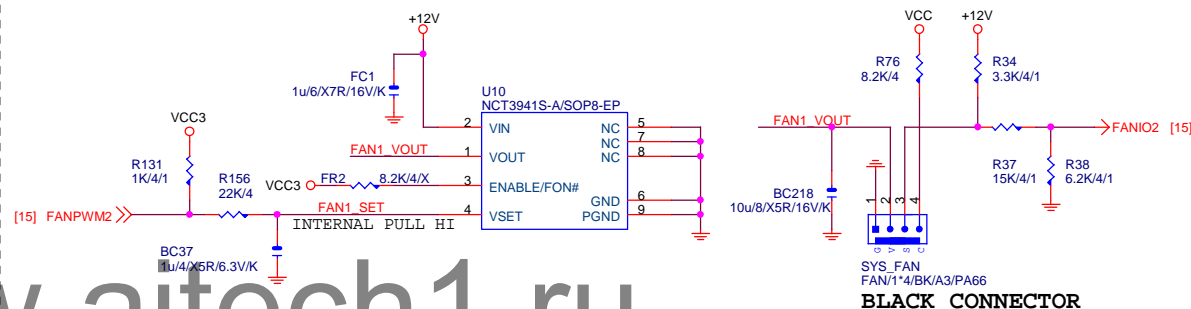


CASE OPEN



SYS SMART FAN

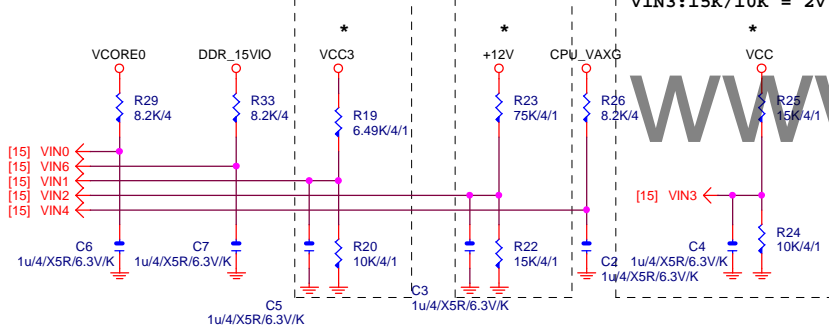
Linear SYS_FAN



VOLTAGE-- H/W MONITOR

VIN2:75K/15K = 2V

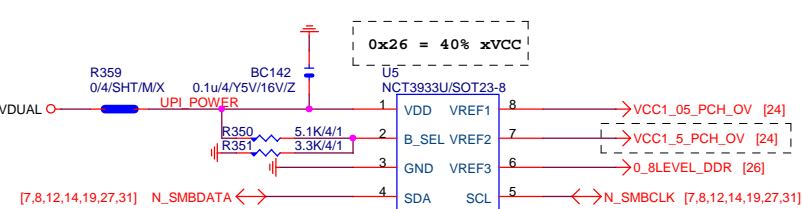
VIN3:15K/10K = 2V



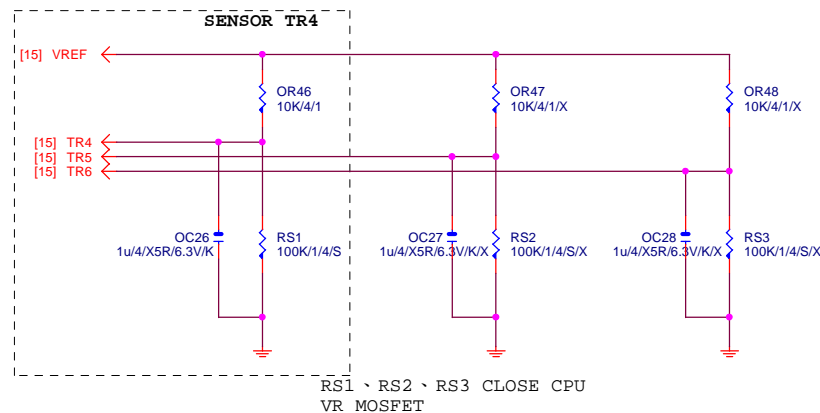
VCORE0	VCC3	+12V	VCC	CPU_VAXG	VCORE	DDR_15V
VIN0	VIN1	VIN2	VIN3	VIN4	VIN5	VIN6

OV NCT3933

接pwm feedback pin

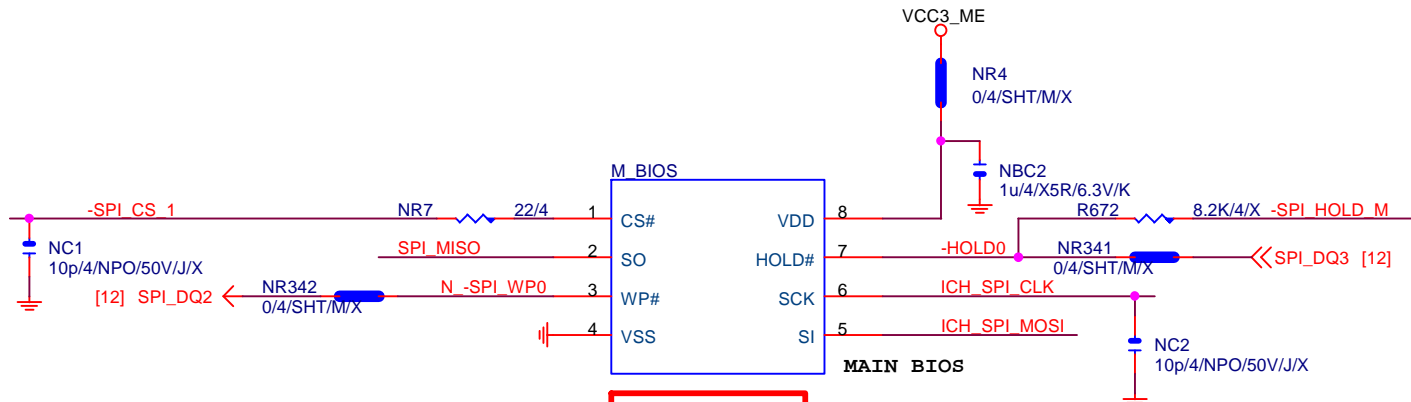


-PROHOT



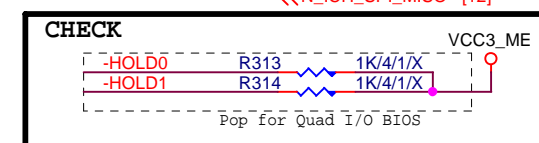
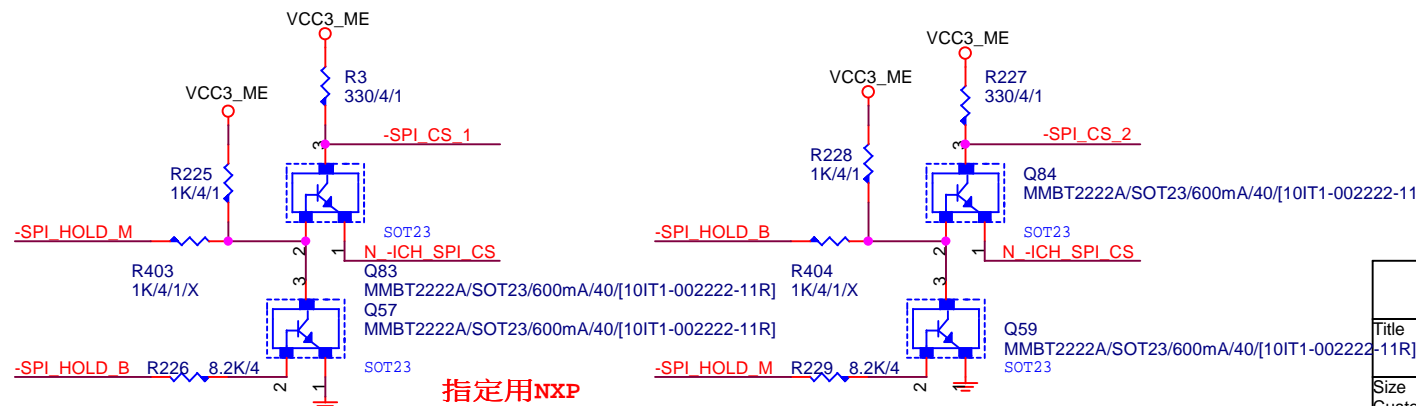
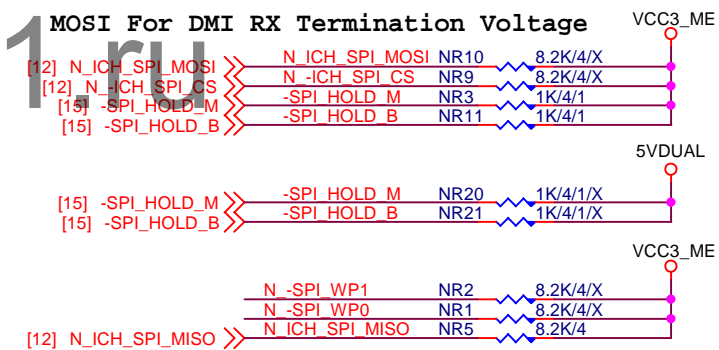
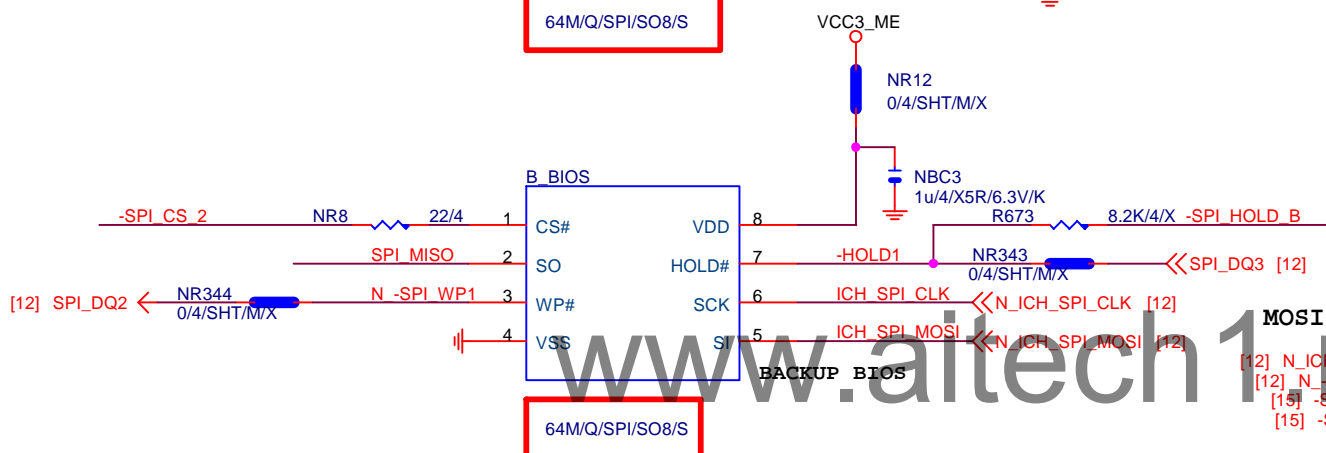
Gigabyte Technology

Title			HWM,FAN CTRL,OV
Size	Document Number	Rev	
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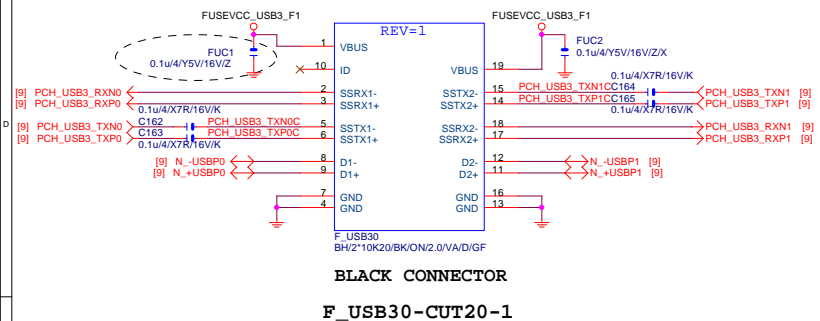


BOOT DEVICE	GNT0	GNT1
LPC	0	0
PCI	0	1
NAND	1	0
SPI	1	1

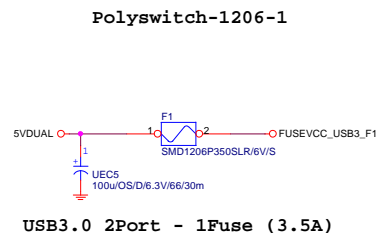
1 means floating
0 means PD 1K



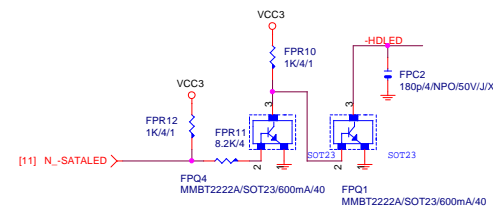
F_USB30



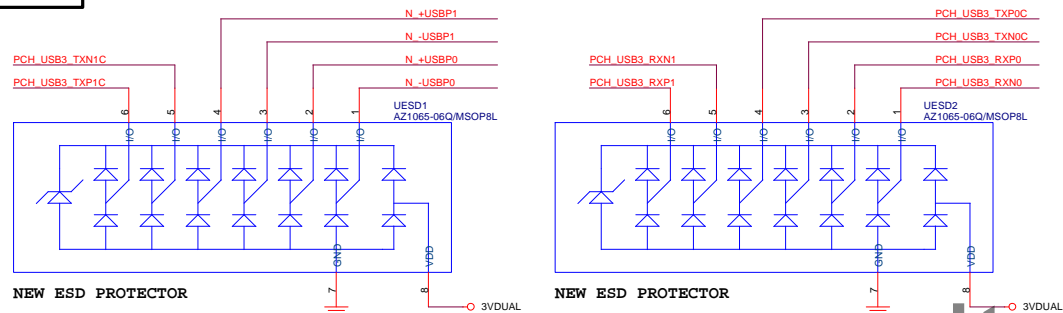
F_USB30 PWR



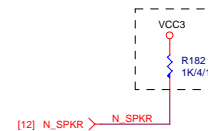
SATA LED



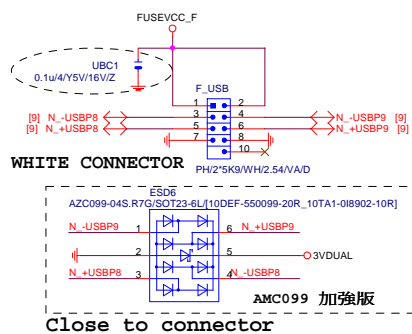
F_USB30 ESD PROTECT



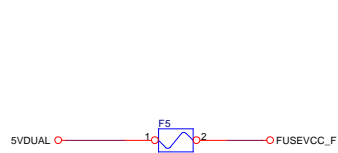
SPKR



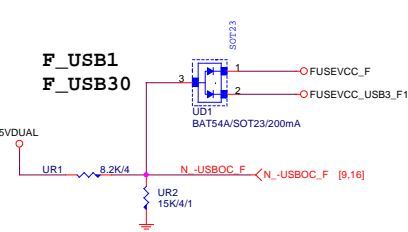
FRONT USB20



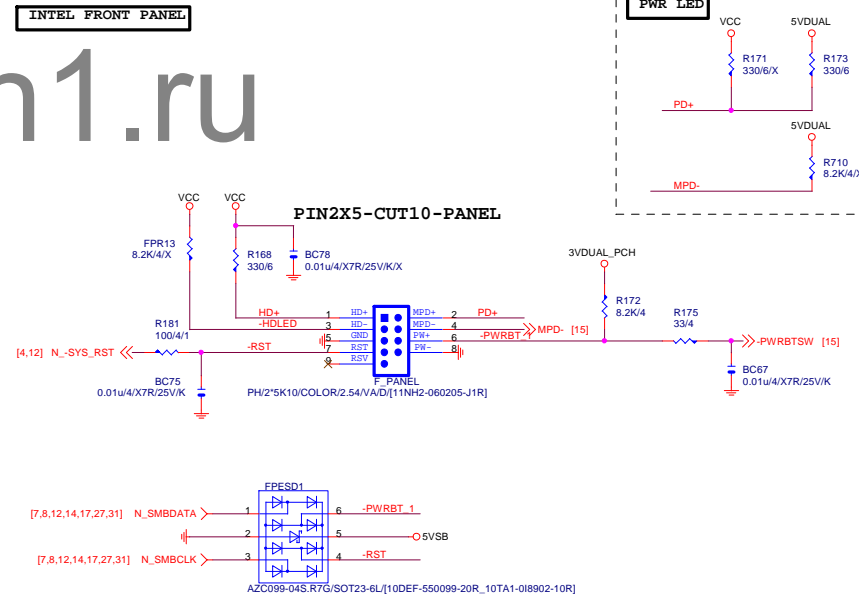
FUSEVCC_F



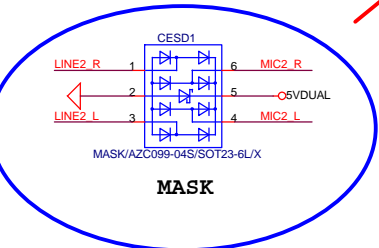
-USB0C_F



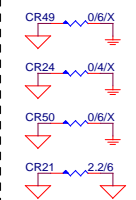
INTEL FRONT PANEL



CR5/CR8/CR11/CR4/ CR17/CR22/CR45/CR33/ CR47/CR40/CR26/CR37/ CR13/CR11/CR57/CR53	62 ohm	62 ohm	62 ohm	75 ohm	75 ohm
CR51/CD1/CBC7	O	O	X	X	O
CD2/CD3/CQ3/CQ5	X	X	O	O	X
CR1/CR14/CR17/CR22	62 ohm	62 ohm	62 ohm	75 ohm	1K ohm

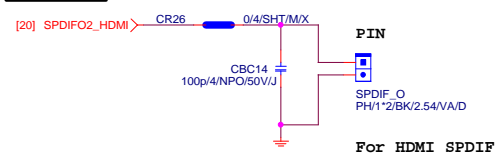


CODEC POWER/EMI PAD

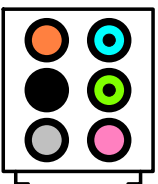


ADD CD2 For ESD PROTECT DIODE

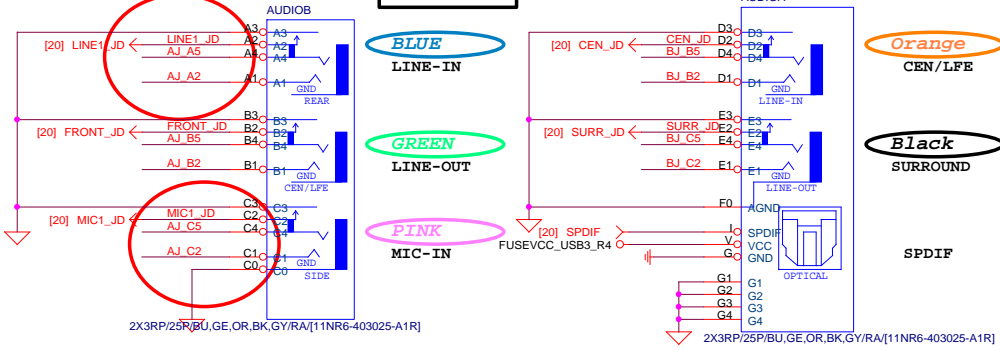
SPDIF_OUT



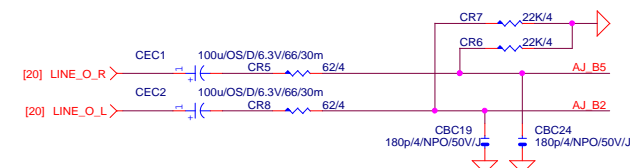
AZALIA JACK



AZALIA JACK

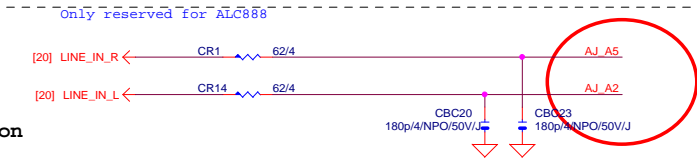


LINE-OUT

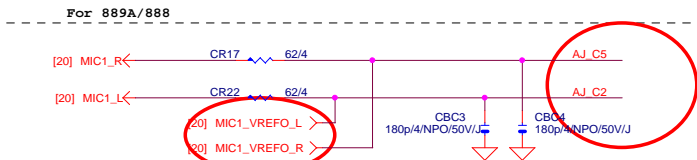


LINE-IN

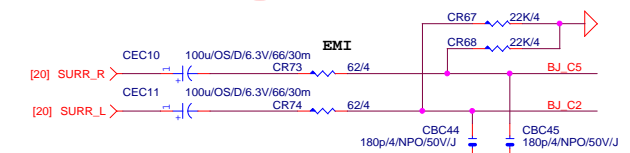
Verify MIC function in LINE-in



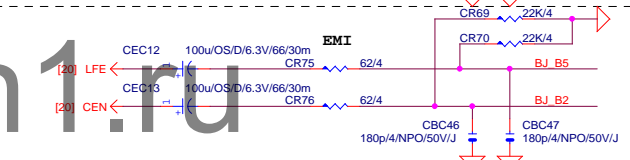
MIC-IN



SURROUND

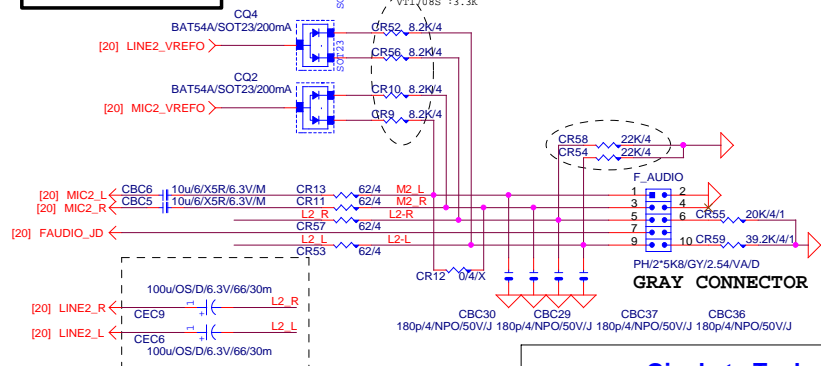


CEN/LFE



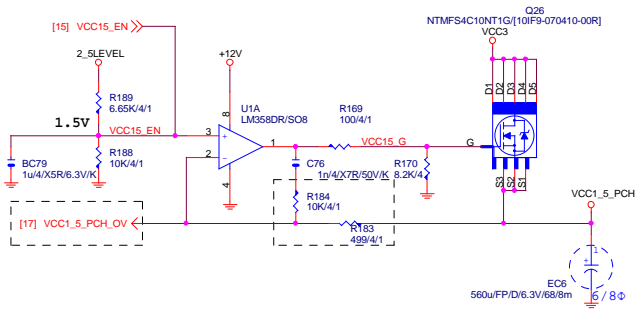
SURRBACK

AZALIA FRONT PANEL

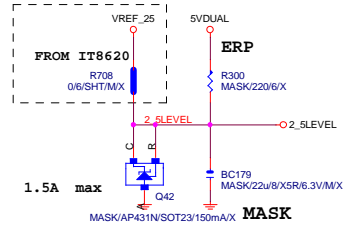


Gigabyte Technology			
Title			
AUDIO JACK			
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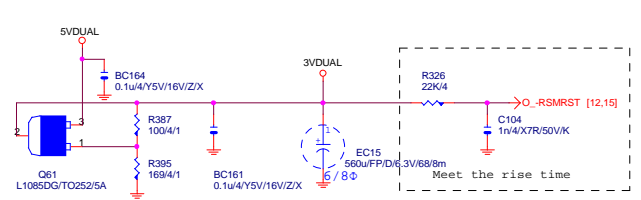
VCC1_5_PCH



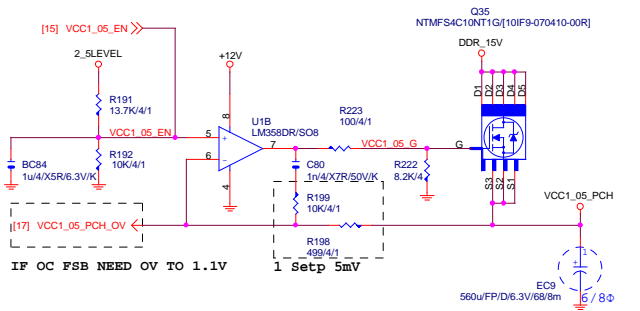
2_SLEVEL



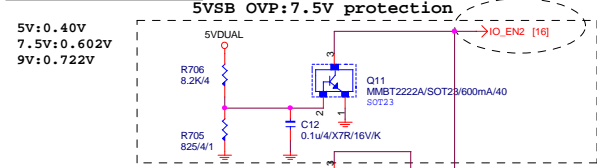
3VDUAL



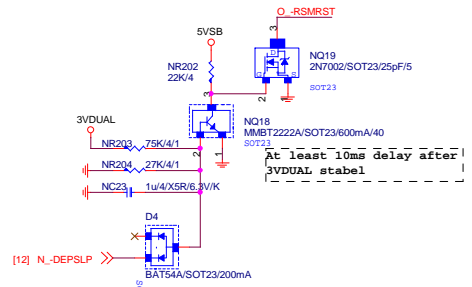
VCC1_05_PCH



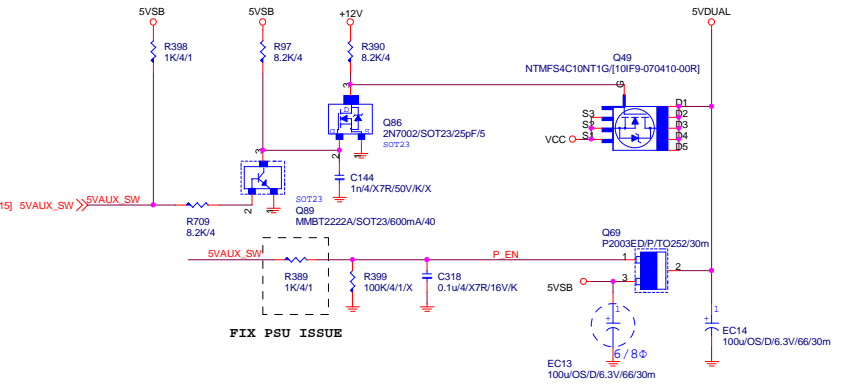
5VDUAL SHORT PROTECT



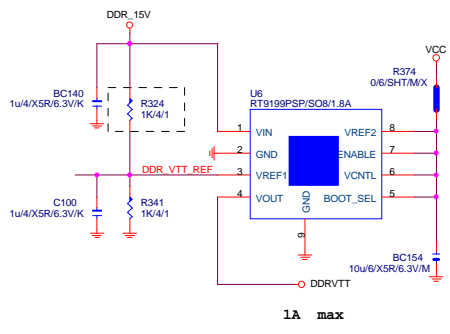
-RSMRST



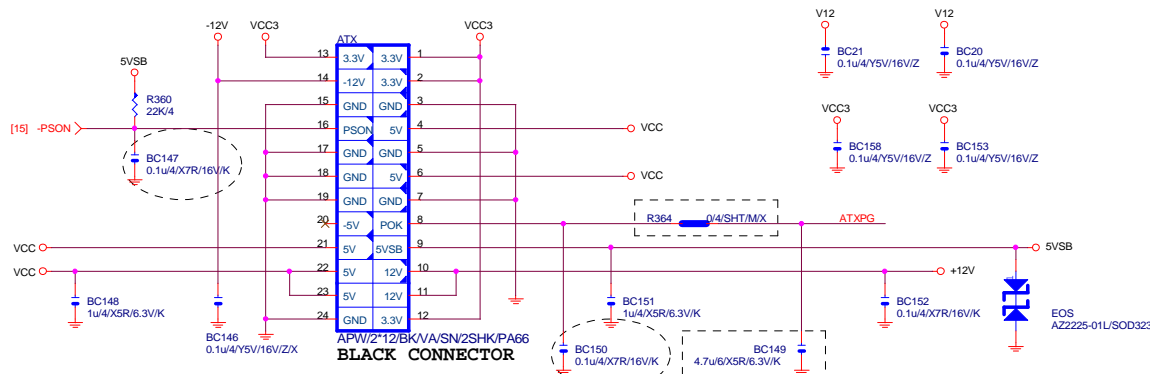
5VDUAL



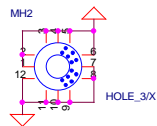
DDR_VTT



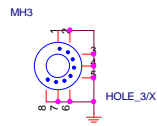
ATXX24 POWER CONNECTOR



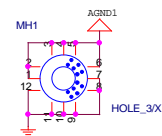
MB LOCATION



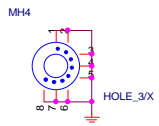
HOLE_4-RH-5MM-1



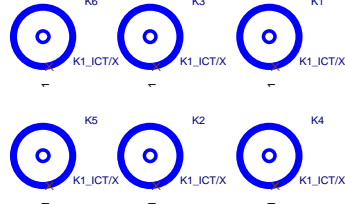
HOLE_4-RH-5MM-5PIN-1



HOLE_4-RH-5MM-1

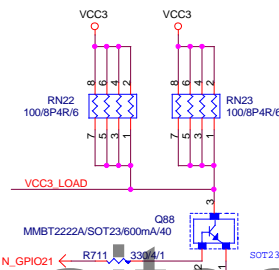


HOLE_4-RH-5MM-5PIN-1

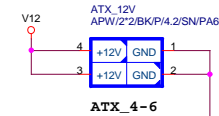


To prevent the 5VSB under loading when boot

FIX PWR MINMUN LOAD



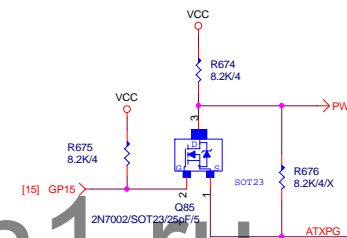
ATXX4 POWER CONNECTOR



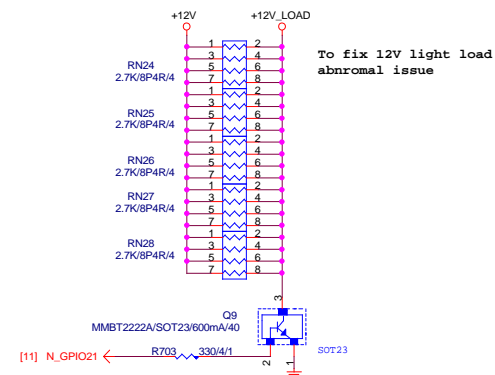
BLACK CONNECTOR

PWOK PATCH

【技術通報R&D技術通報154】



【技術通報R&D技術通報153】



To fix 12V light load abnormal issue

CLK GEN

N/A

Gigabyte Technology

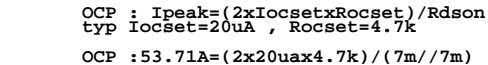
ATX CONNECTOR

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DDR15V



-->故固態電容須 $2 \times 7.99 = 15.98 > 11.45 \text{A}$

PWR	SEQ
-----	-----

[15] DDR_EN_CON >> DDR_EN

From DDR_15V source
10 mils trace to SIO

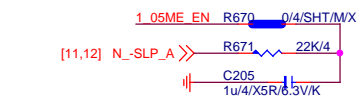
DDR_15V DDR_15VIO

VCC1_05_ME

Z97 N/A

Z97+I217V STUFF

【技術通報R&D技術通報156】
(RICHTER), (NUVOTON), (EMC)做共用
PIN7分壓阻值須做修改為100K以上電阻值

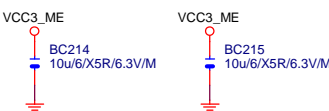


$$V_{OUT} = 0.8 * [(R1 + R2) / R2]$$

VCC3_ME

Z97 N/A

Z97+I217V STUFF



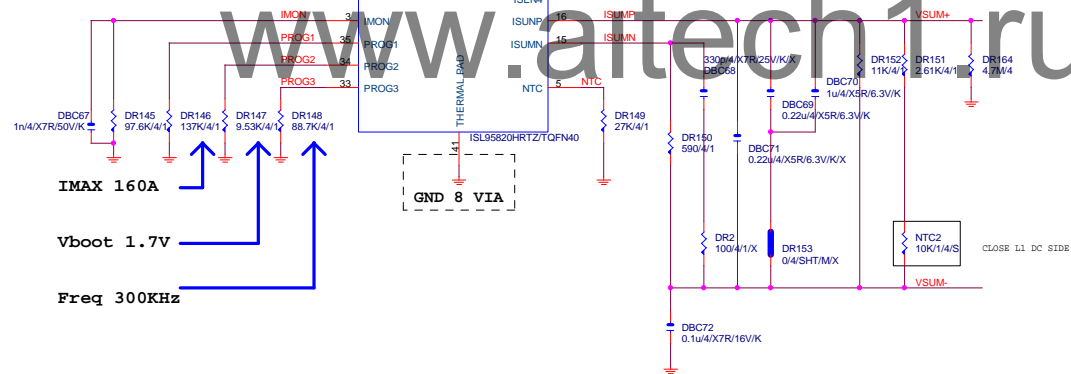
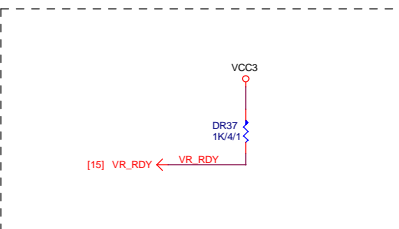
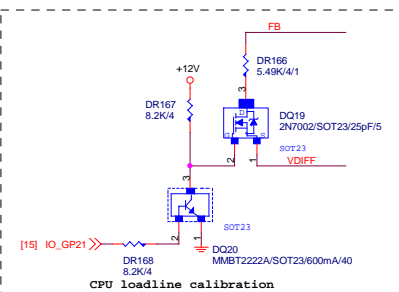
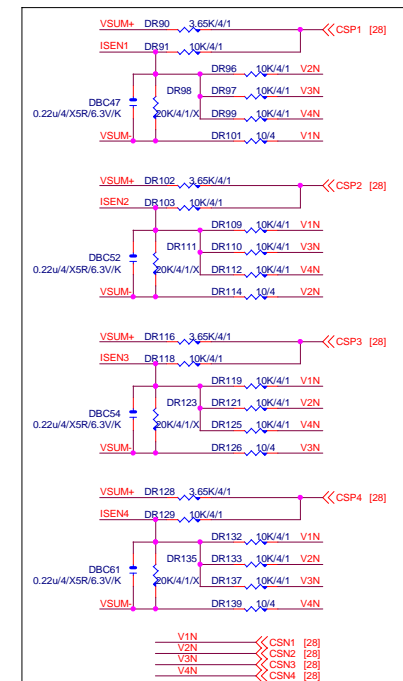
Gigabyte Technology

Title	DDR & M3 POWER
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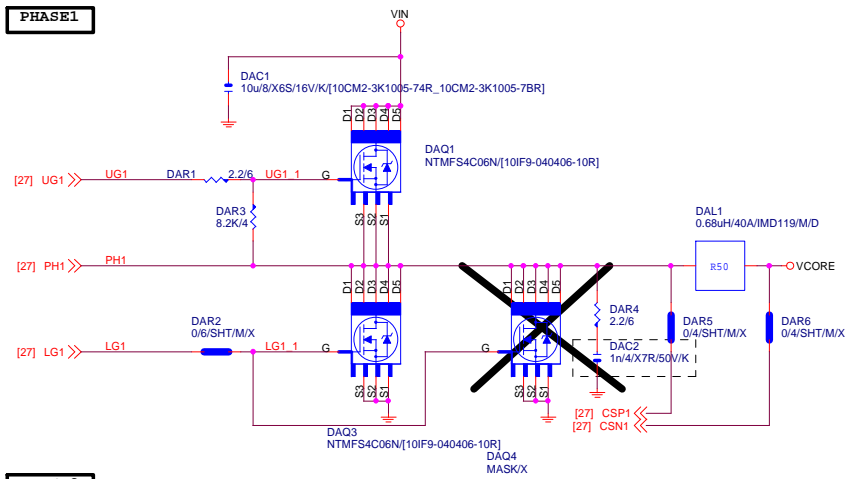
Size B	Document Number GA-H97N
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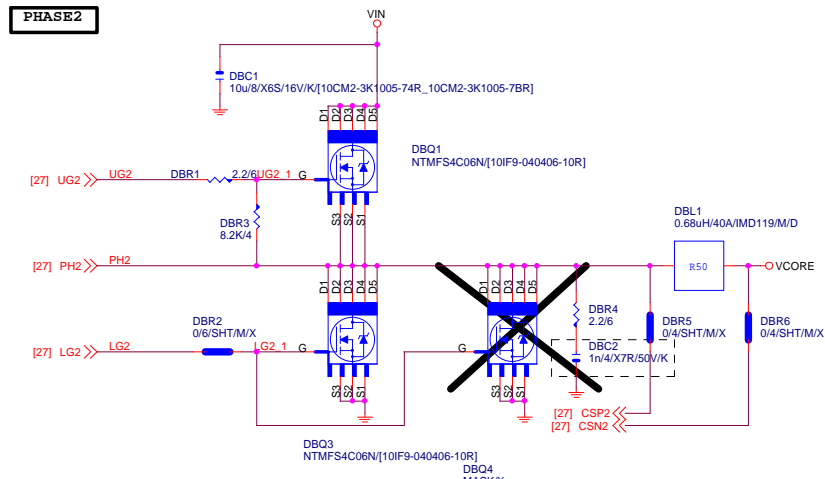
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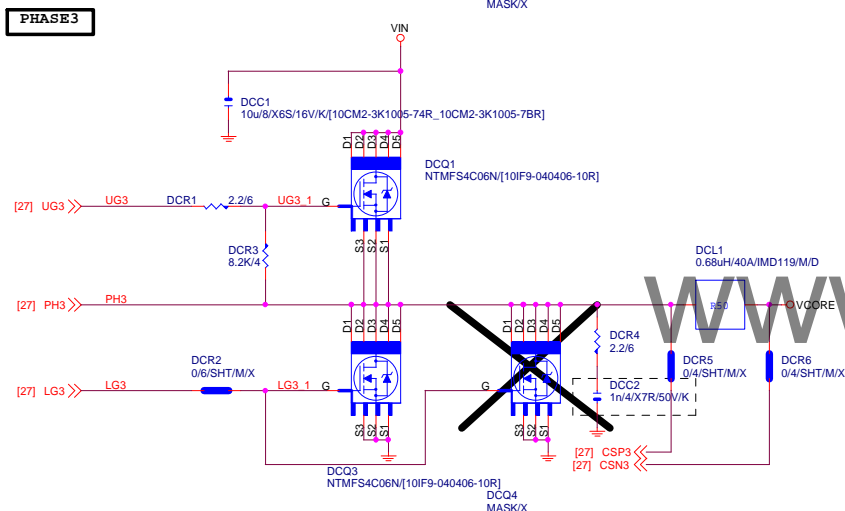
PHASE1



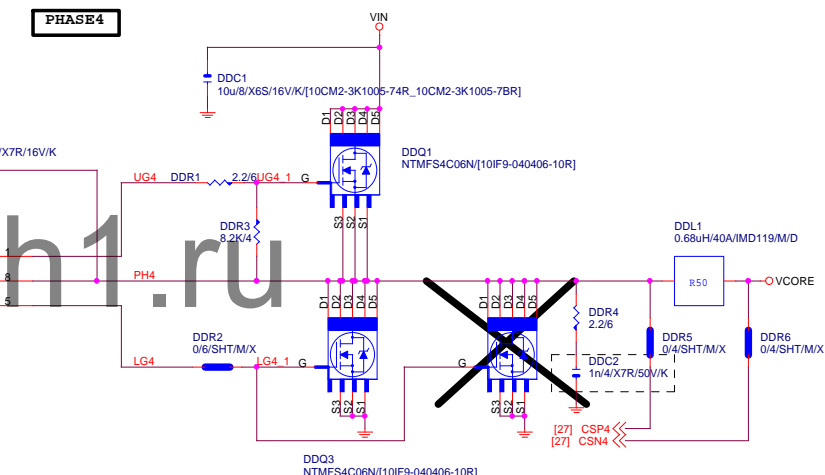
PHASE2



PHASE3

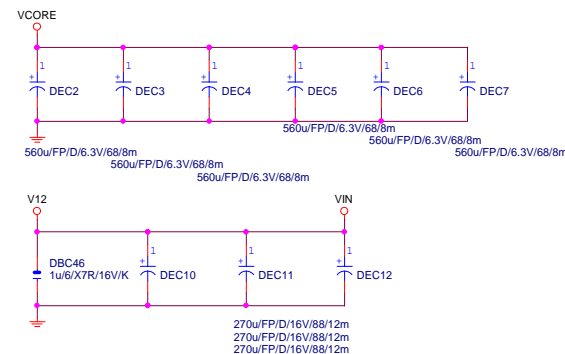


PHASE4



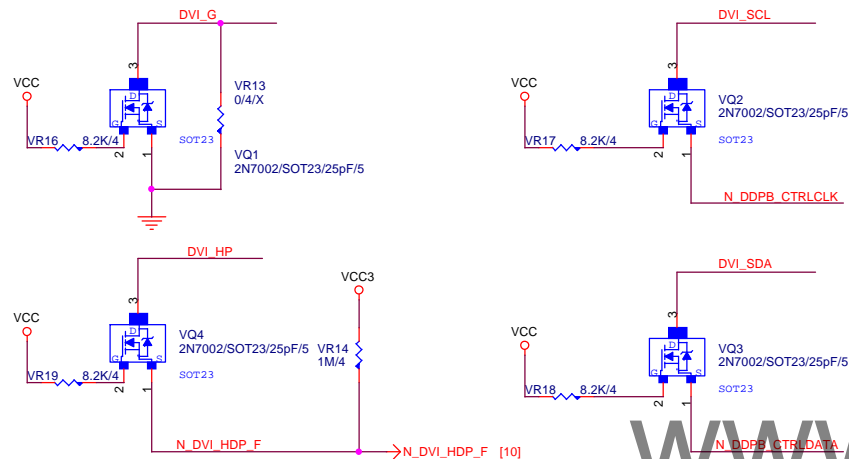
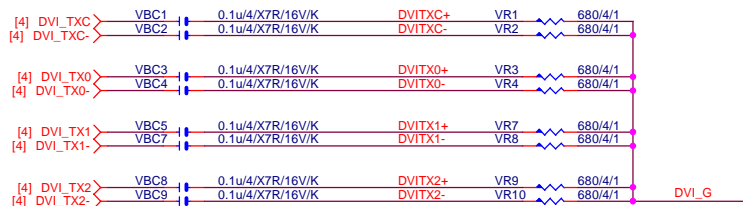
MOS HEATSINK

N/A

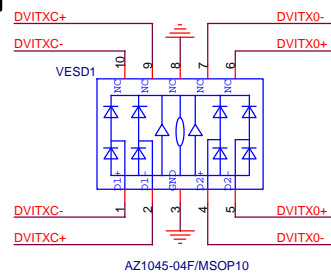


Gigabyte Technology			
Title			
CPU CORE VR-2			
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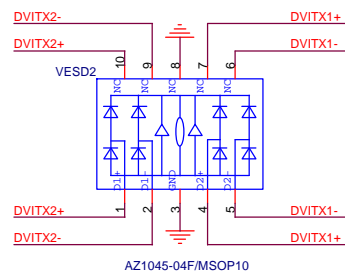
DVI NON LEVEL SHIFT



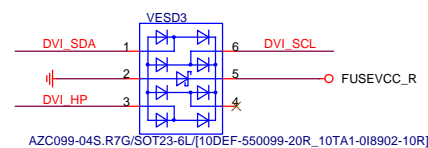
DVI ESD



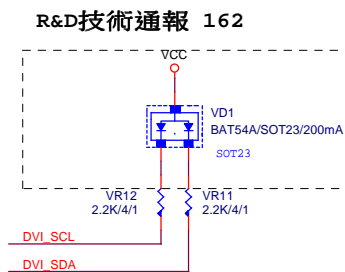
Close to connector



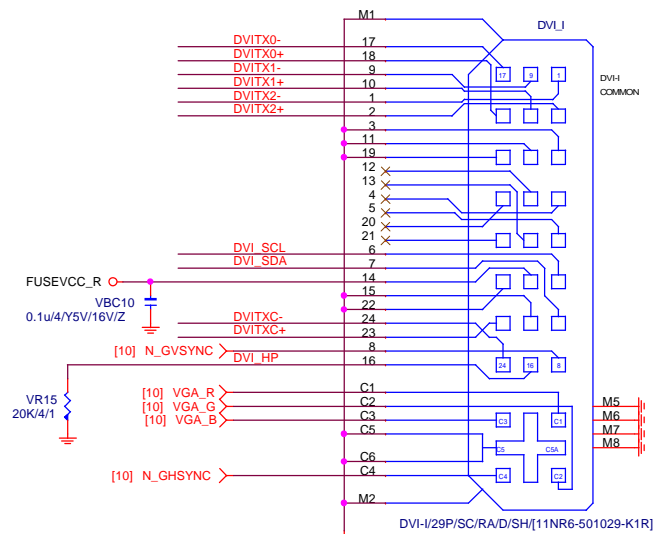
Close to connector



DVI-I PH/PD



DVI-I CONNECTOR



```
| INSERT TRANSFER CONNECTOR
| TO DISABLE DDC_EN FOR VGA
| CSM FAIL.
```

Gigabyte Technology

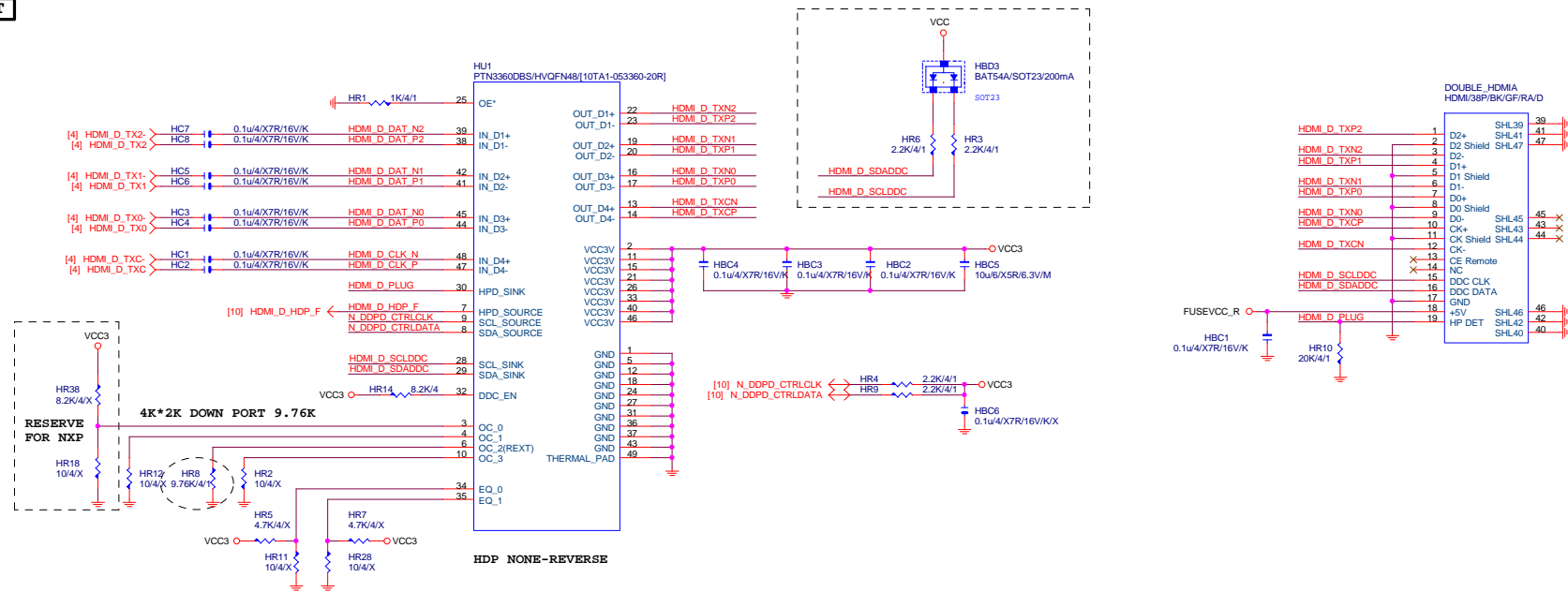
DVI-I

GA-H97N

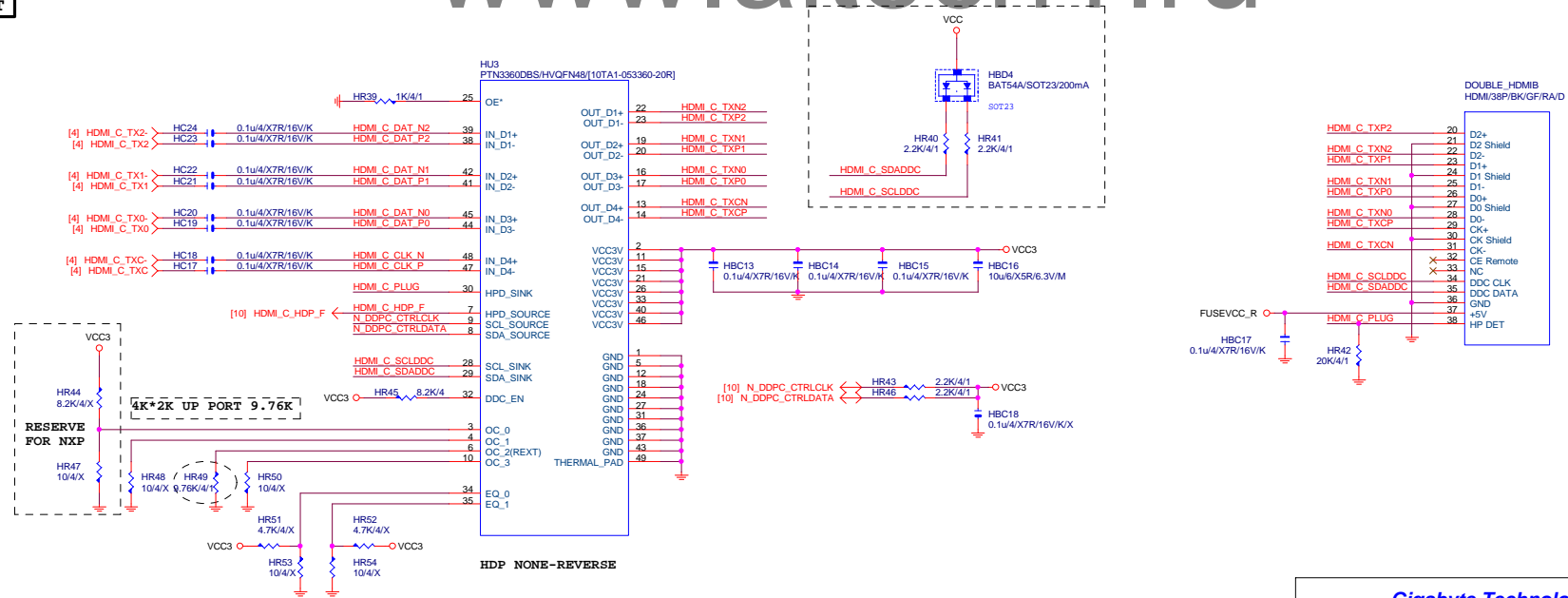
Rev
1.0

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HDMI LEVEL SHIFT



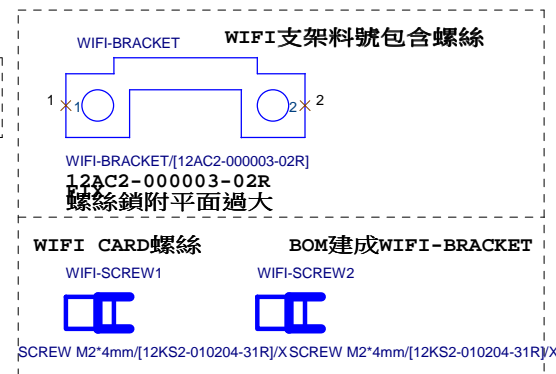
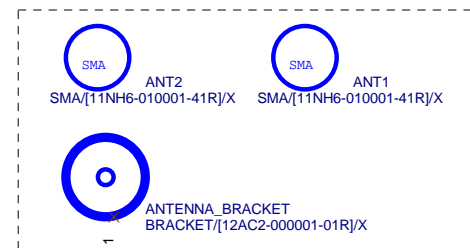
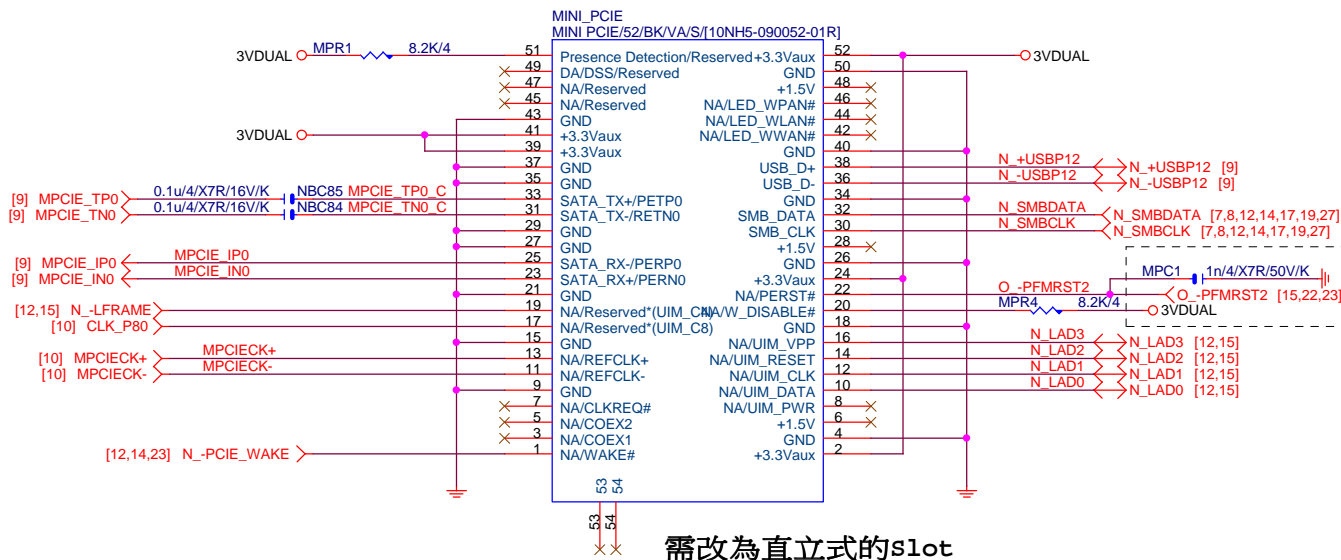
HDMI LEVEL SHIFT



Gigabyte Technology

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Mini PCIE



mSATA Slot

N/A

www.aitech1.ru

Gigabyte Technology

Title			MINI PCIE	
Size	Document Number	GA-H97N		Rev
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