

Model Name: GA-H97M-D3H

www.xinxunwei.com 400-800-9990
Revision 1.01

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 1,2
08	DDR III CHANNEL B 1,2
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	PCI EXPRESS*4 SLOT
16	PCI SLOT1,2
17	ITE 8620 LPC IO
18	COM,KB_MS_USB,USB30_20
19	HWM,FAN CTRL,OV,-PROCHOT
20	DUAL BIOS
21	FP,FUSB,SPK,SATALED
22	Realtek ALC892-GR
23	REAR AUDIO JACK
24	REALTEK RTL8111F
25	DISCRETE POWER
26	ATX ,TPM
27	VCORE ISL95820_1

SHEET

TITLE

28	VCORE ISL95820_2
29	RT8120_DDR POWER
30	LPT, M3 POWER
31	DVI, HDMI
32	IT8892E

Gigabyte Technology

Cover Sheet

Size Custom	Document Number	GA-H97M-D3H	Rev 1.01
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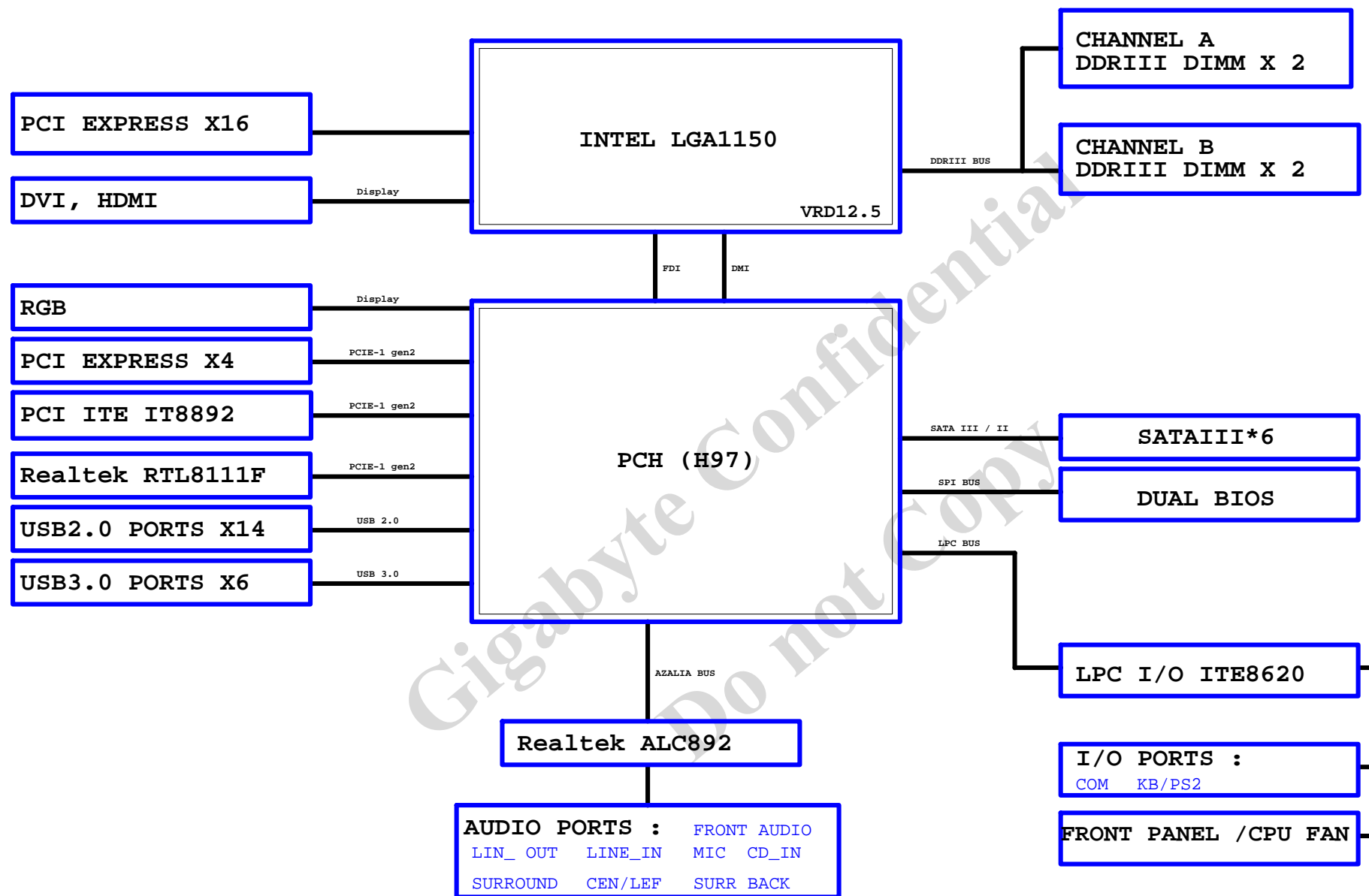
Circuit or PCB layout change

Component value change history

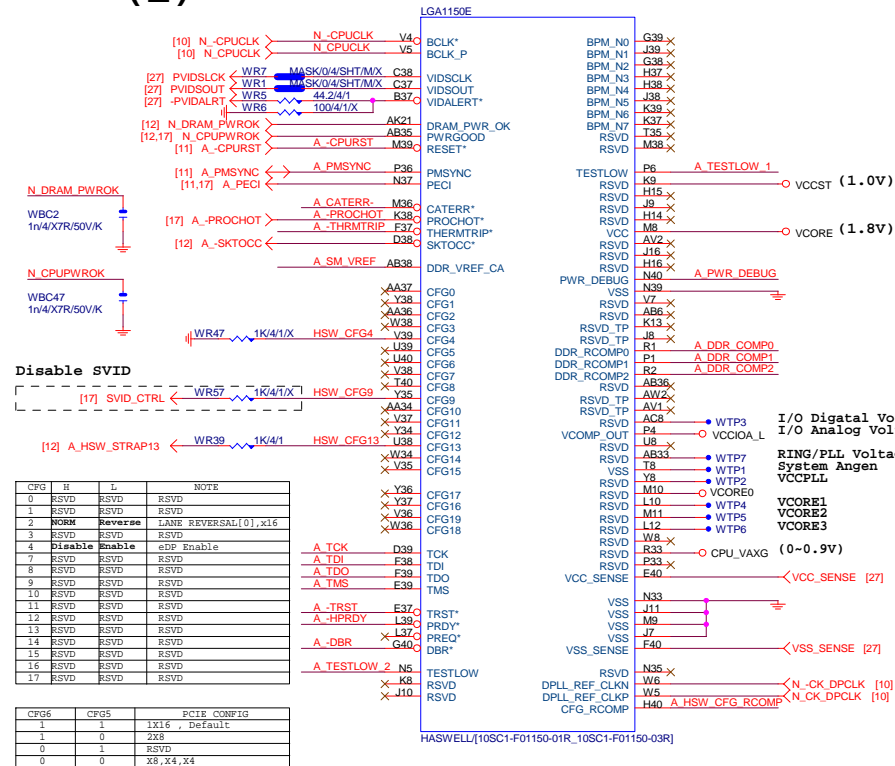
2014/06/20

Data	Change Item	Reason
2013/12/09	機構變更MOS_HS尺寸:長度大小由89修改為79mm,孔大小由D3mm修改為D4mm	
2013/12/11	MR.LIN:移除1 PORT 1 FUSE規格	
2013/12/12	MR.LIN:移除DVI LEVEL SHIFTER改成COSTDOWN設計方式	
2013/12/20	HDD LED/FUSB3.0 ESD PROTECTOR	
2013/12/24	MODIFY AP NOTE	
2013/12/26	MODIFY AP NOTE:USB防燒,IT8620斜插ISSUE	
2013/12/27	R0.1 GERBER OUT	
2014/1/13	AP NOTE:DVI LEVEL SHIFTER改回	
	PCH_HS,MOS_HS:9 SERIES	
	加回AP431 BOM VCC1_5_PCH_OV	
2014/1/16	AP NOTE(UATX):DVI LEVEL SHIFTER移除,BIOS DRIVING 800mV 2dB	
	BIOS_PH移除	
2014/1/27	COSTDOWN:5VDUAL-->FUSEVCC_R2,DEL UD7 BAT54A	
2014/1/28	AP NOTE:移除F_USB保護線路及AP431	
2014/2/10	CPU_FAN_PIN2增加C319 0.1U/4/X7R/16V/K	
	Q47,Q48:2N7002 GATE~VCC3	
	FOOT MASK	
2014/2/18	C136:0.1u/6/X7R/25V/K	
	H97 Vcore High /low side ON: 10IF9-584081-00R NTMFS4C08NT1G	
	Non-Vcore High /low side ON: 10IF9-070410-00R NTMFS4C10NT1G	
2014/2/19	R1.0 GERBER OUT	
2014/04/11	Update H97 Chipset 料號 [10HB1-030H97-20R]	
2014/04/25	Update DDR RC	PBOM: 9MH97MD3H-00-10C
	R396: 27K -> 20K	
	R657: 487 -> 680	
	R380: 2.26K -> 2.15K	
2014/06/20	Update to R1.01	
	Remove SATA MLCC	

BLOCK DIAGRAM



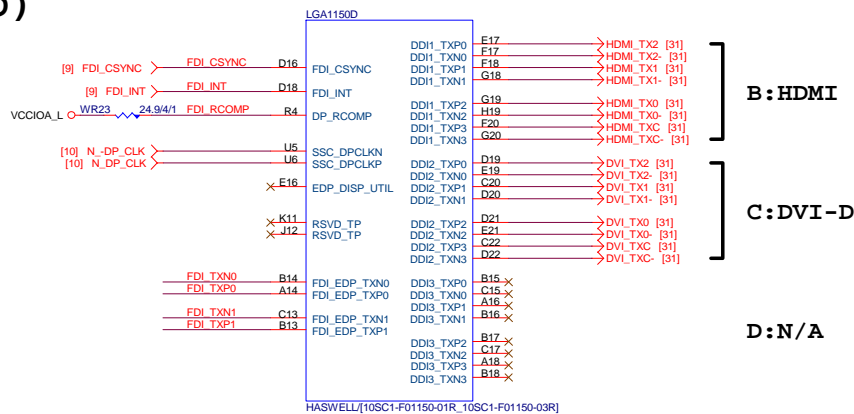
LGA1150 (E)



DVI-I + HDMI組態就是: DVI-I port B, HDMI port C
DVI-D + HDMI組態就是: DVI-D port C, HDMI port B

LGA1150

(D)

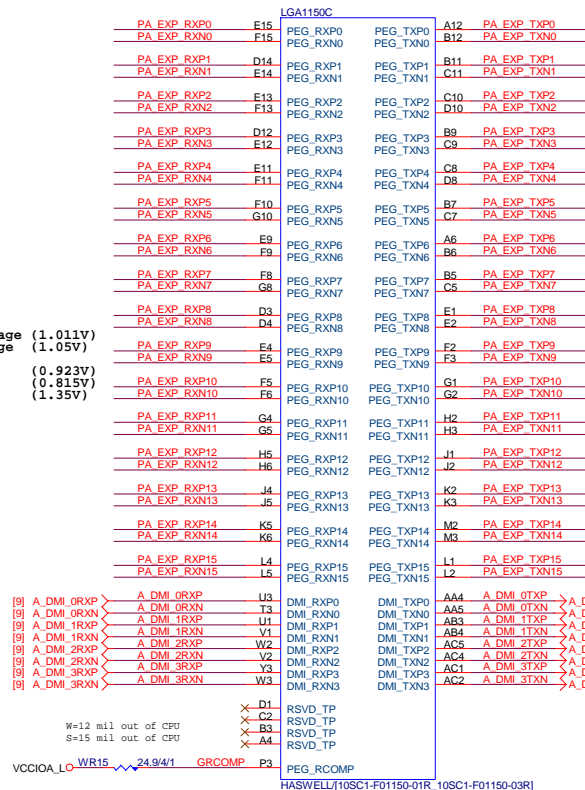


FDI:12/4/5/4/12(breakout min 6/4/4/4/6)
Impedance=85 +- 17.5%

FDI_TXP0_11 → FDI_TXP0_11 [9]
FDI_TXN0_11 → FDI_TXN0_11 [9]

LGA1150 (C)

PCIEX16:16/5/5/5/16(breakout min 10/4/4/4/10)
Impedance=80 +- 17.5%



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

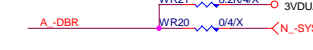
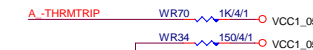
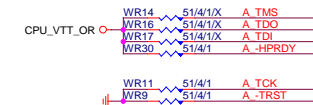
-CPURST

PA_EXP_TXP0_15 → PA_EXP_TXP0_15 [14]
PA_EXP_TXN0_15 → PA_EXP_TXN0_15 [14]
PA_EXP_RXP0_15 → PA_EXP_RXP0_15 [14]
PA_EXP_RXN0_15 → PA_EXP_RXN0_15 [14]

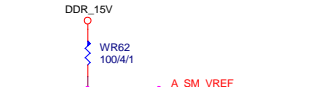
CPU SVID



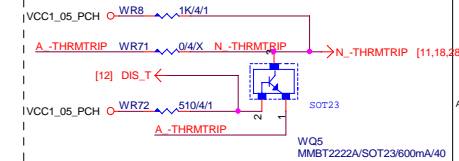
CPU PU/PD



SM REF



THRMTRIP DISABLE

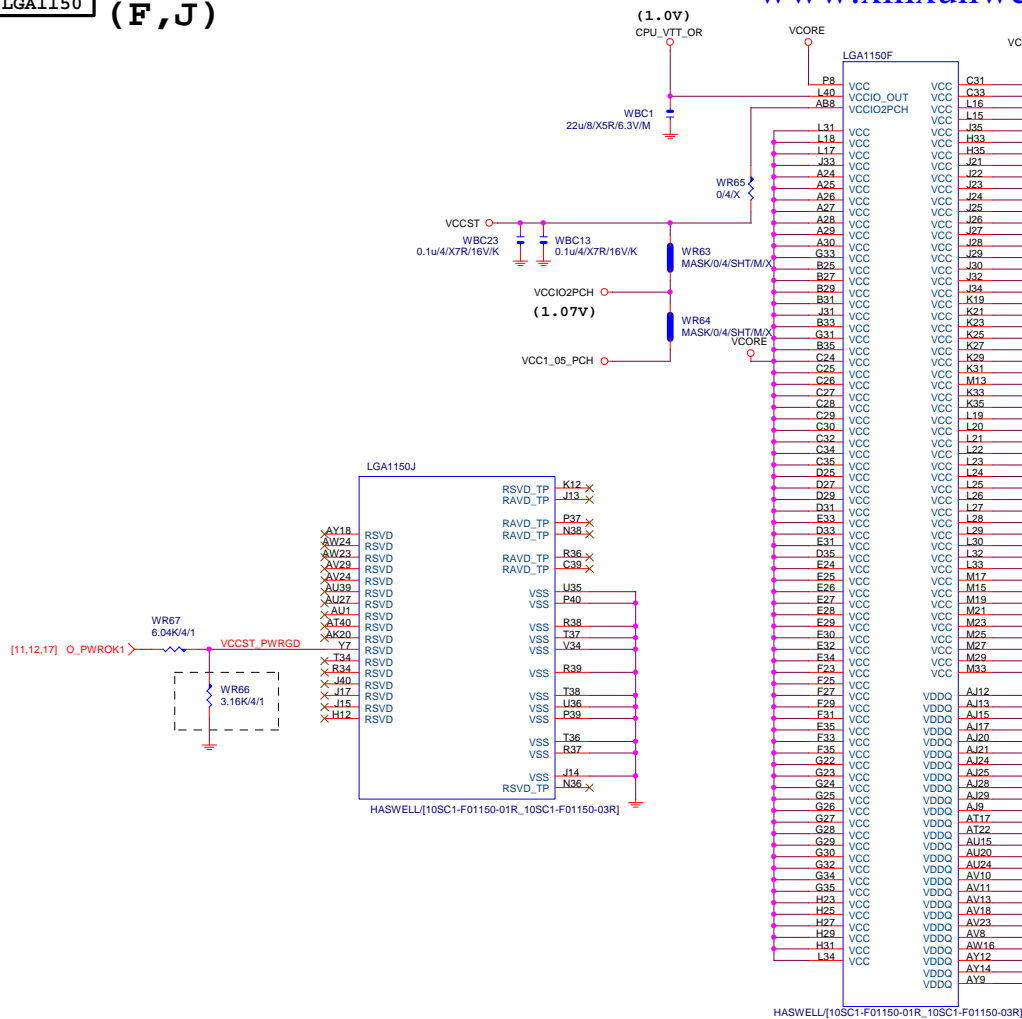


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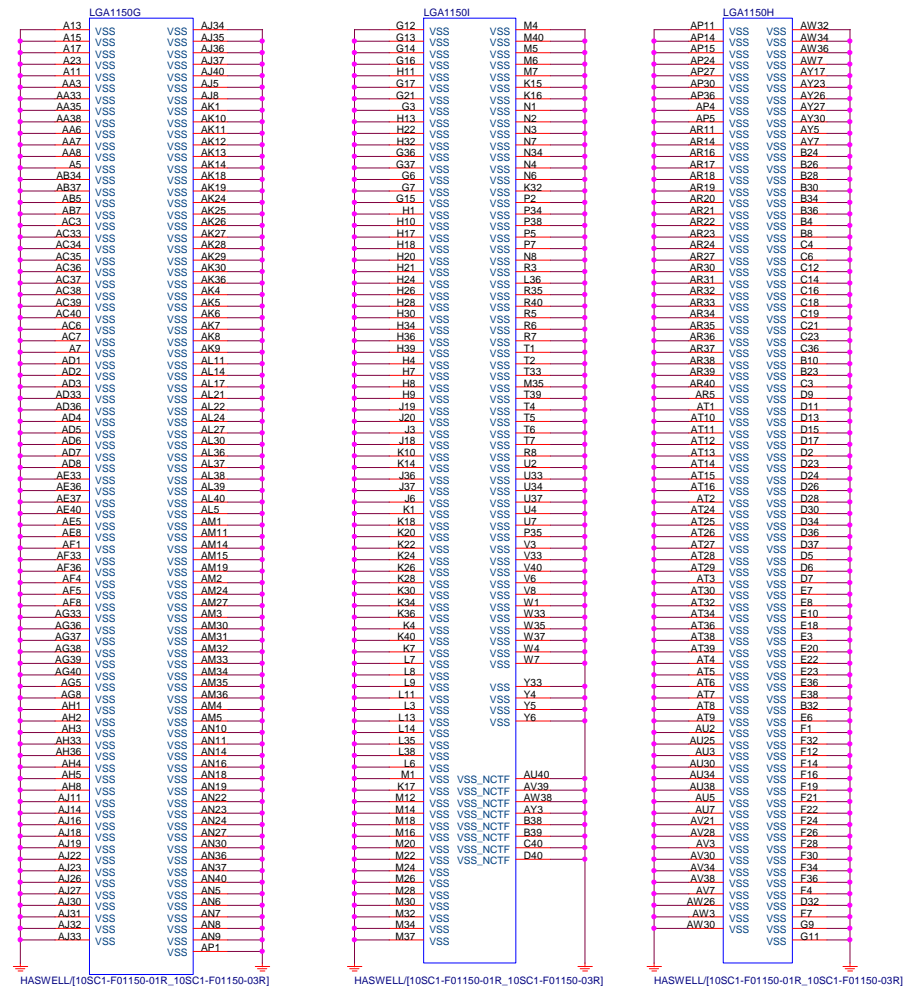
LGA1150

(F, J)



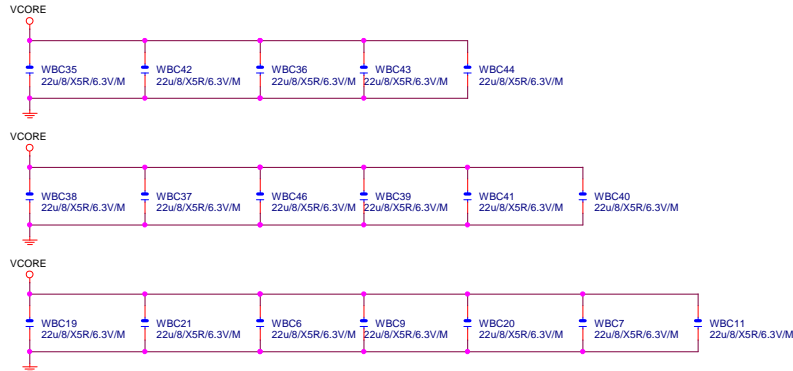
LGA1150

(G, H, I)



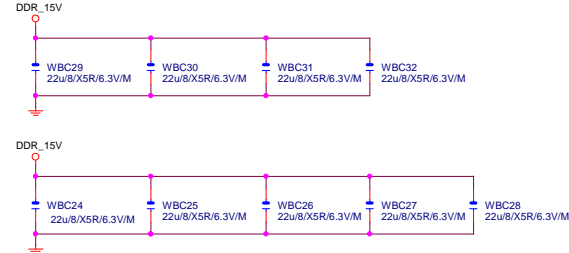
VCore CAP

(X18)



DDR CAP

(X9)



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Title	CPU LGA1150-C		
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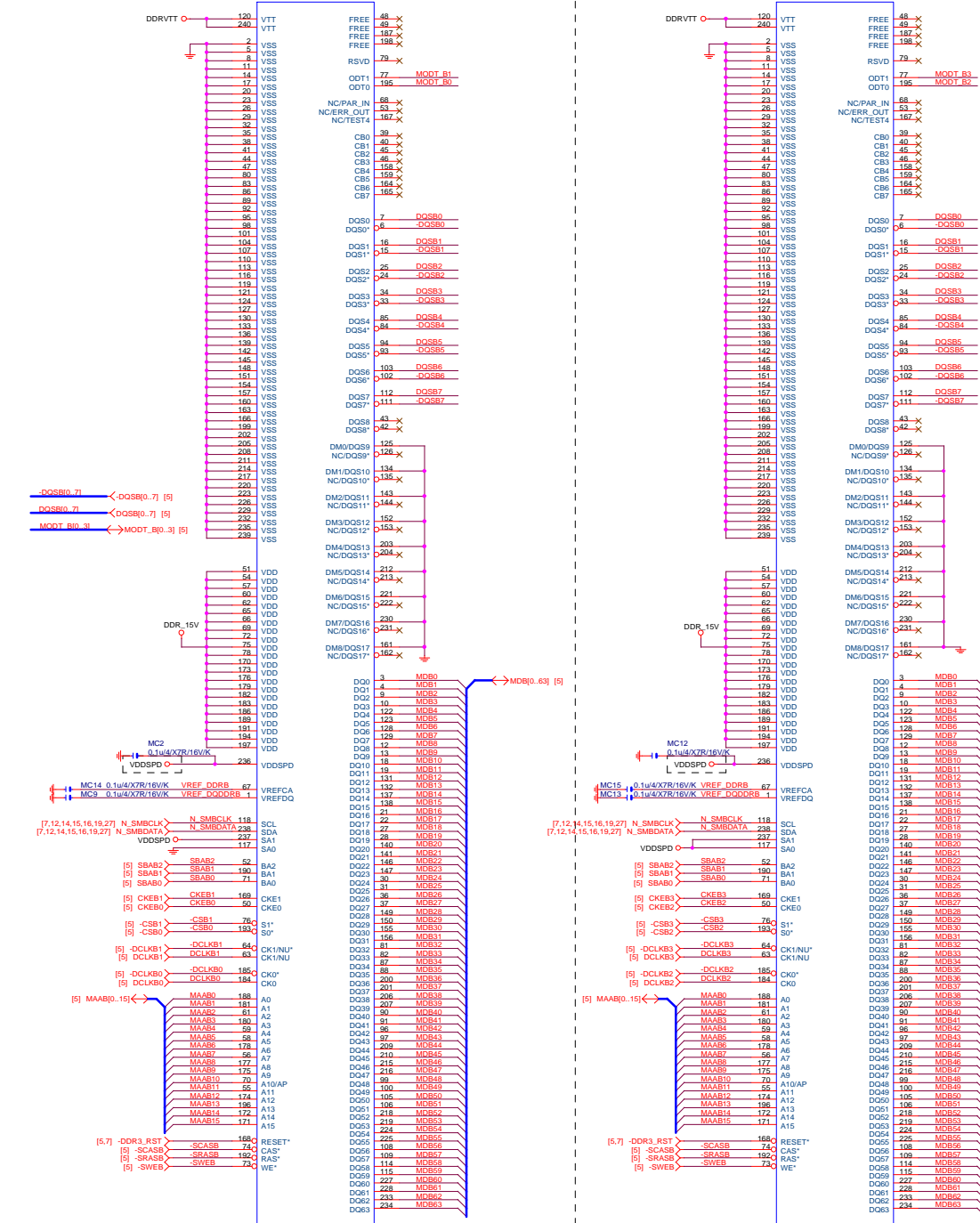
Rev 1.01

DDR3

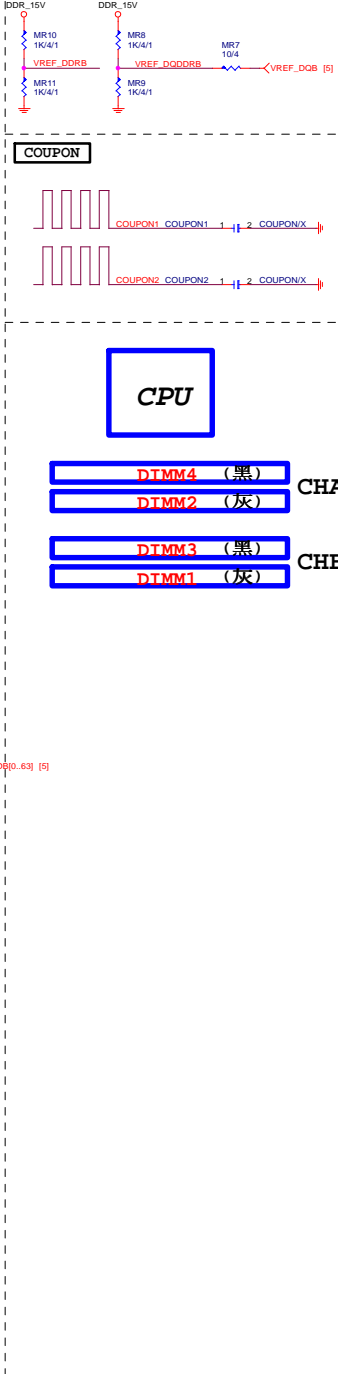
(B)

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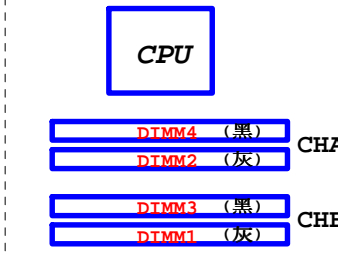
DDR3 VREF

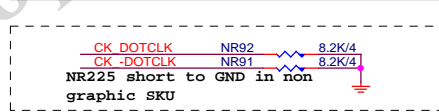
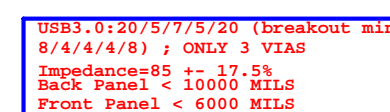
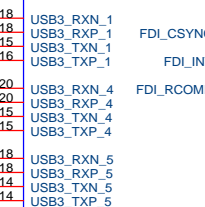


DDR3 240/BK/VA/D
BLACK CONNECTOR



DDR3 240/GR/VA/D
GRAY CONNECTOR



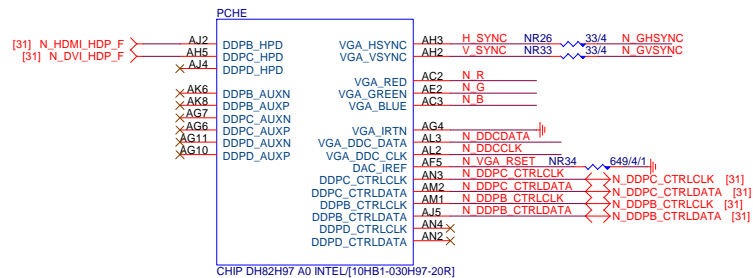


PCH

(E)

PCH

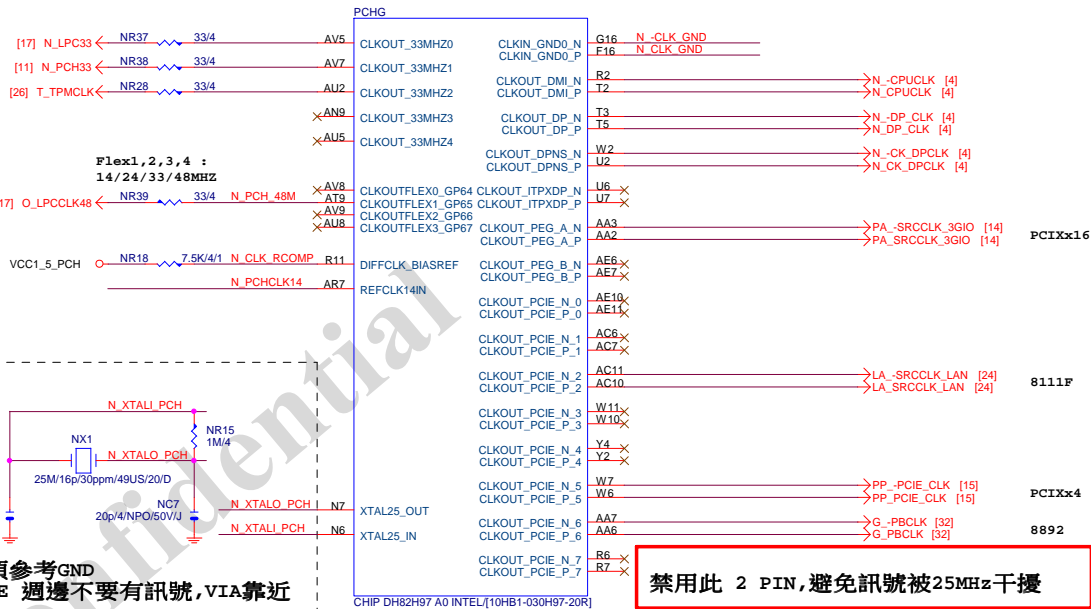
(G)



VGA DISABLE

R,G,B NC OR GND

IRTN / IREF GND

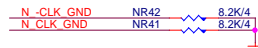
VGA_HSYNC, VGA_VSYNC, DDC_CLK,
DDC_DATA NCPOWER VCCADAC(AF2),
VCCADACBG(AE1) GND

X'TAL 25MHz須參考GND
CRYSTAL/TRACE 週邊不要有訊號,VIA靠近
走線遠離其他40mil以上

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

禁用此 2 PIN,避免訊號被25MHz干擾

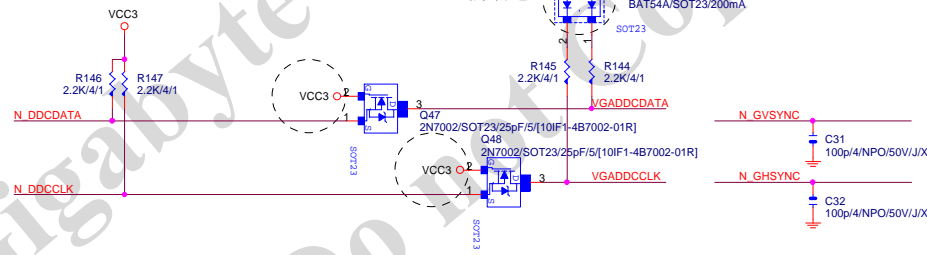
PCH CLK PD



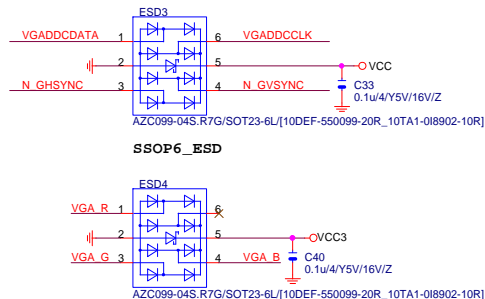
Mount for integrated clock Generation
Mode



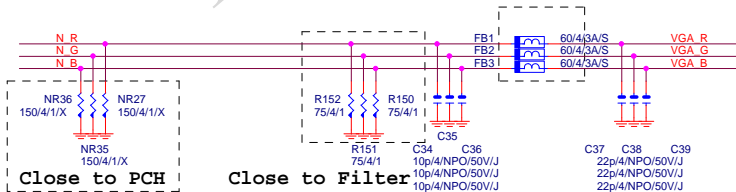
VGA DDC



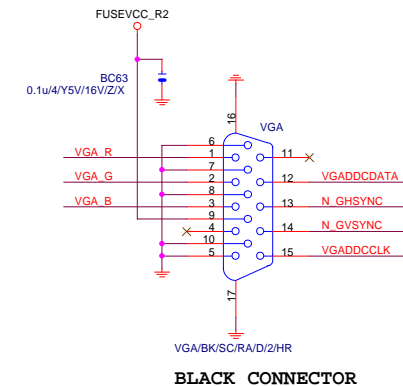
VGA ESD



VGA DDC



VGA CONNECTOR

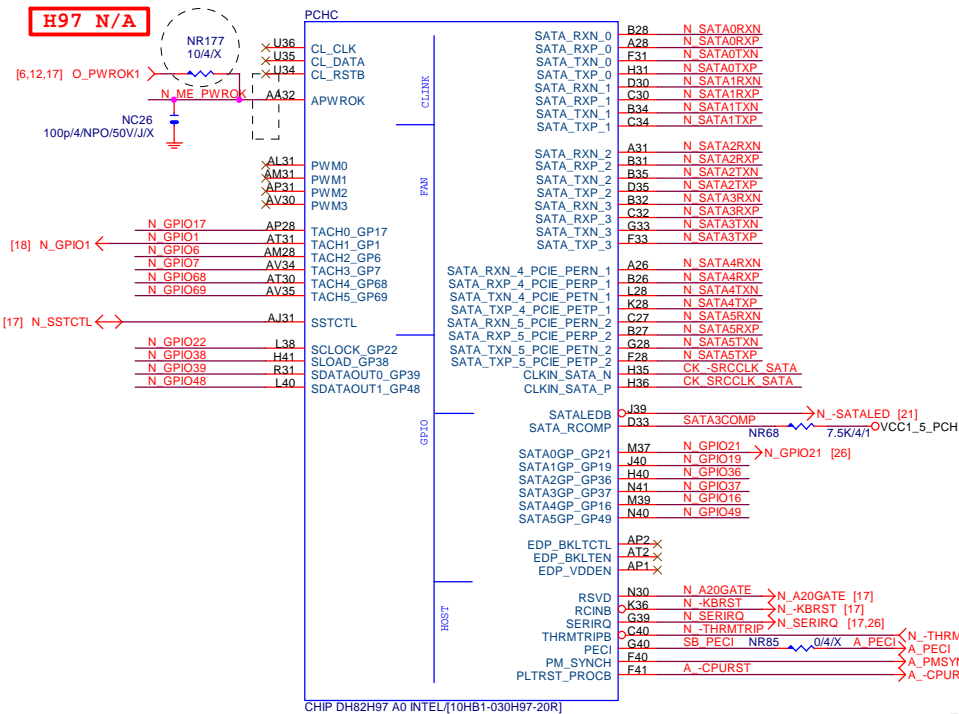


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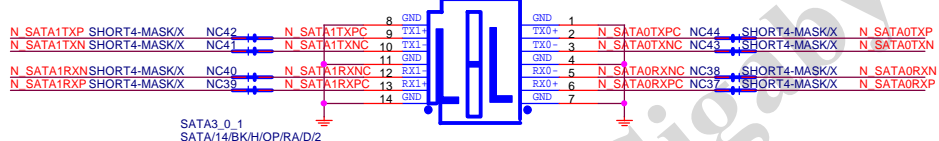
Title		
PCH DISPLAY, CLK BUFFER		
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PCH (C)

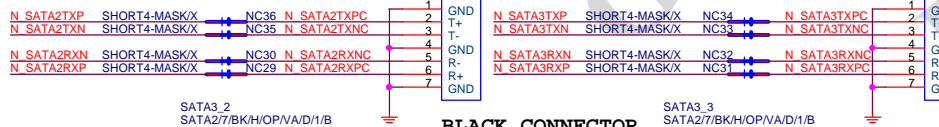
H97 N/A



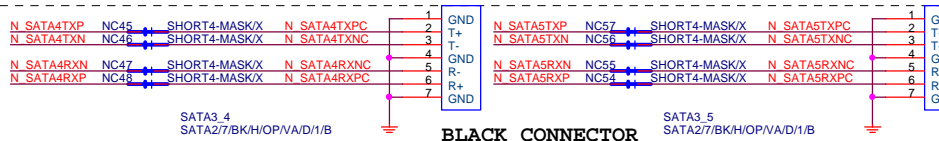
SATA CONNECTOR



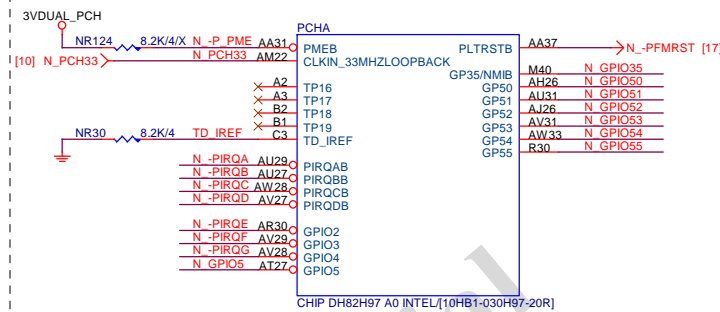
H81 Port 2/3 N/A



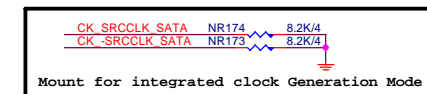
** Z87/H87 Port 4&5 SATA3.0 ** B85 Port 4&5 SATA2.0



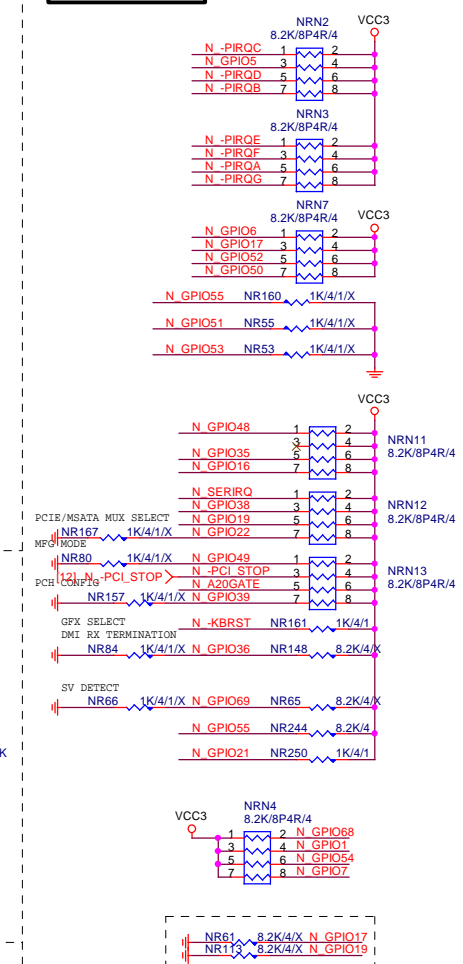
PCH (A)



PCH CLK PD

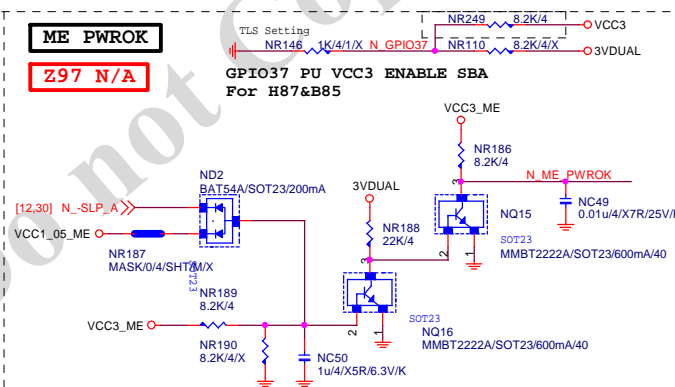


PCH PU/PD

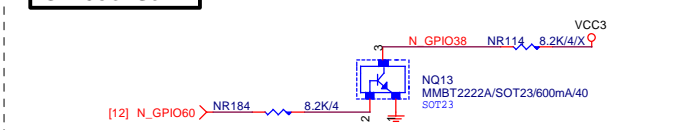


ME PWROK

Z97 N/A



GPIO38 Ctrl



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PCH (H)

VCC3_DAC

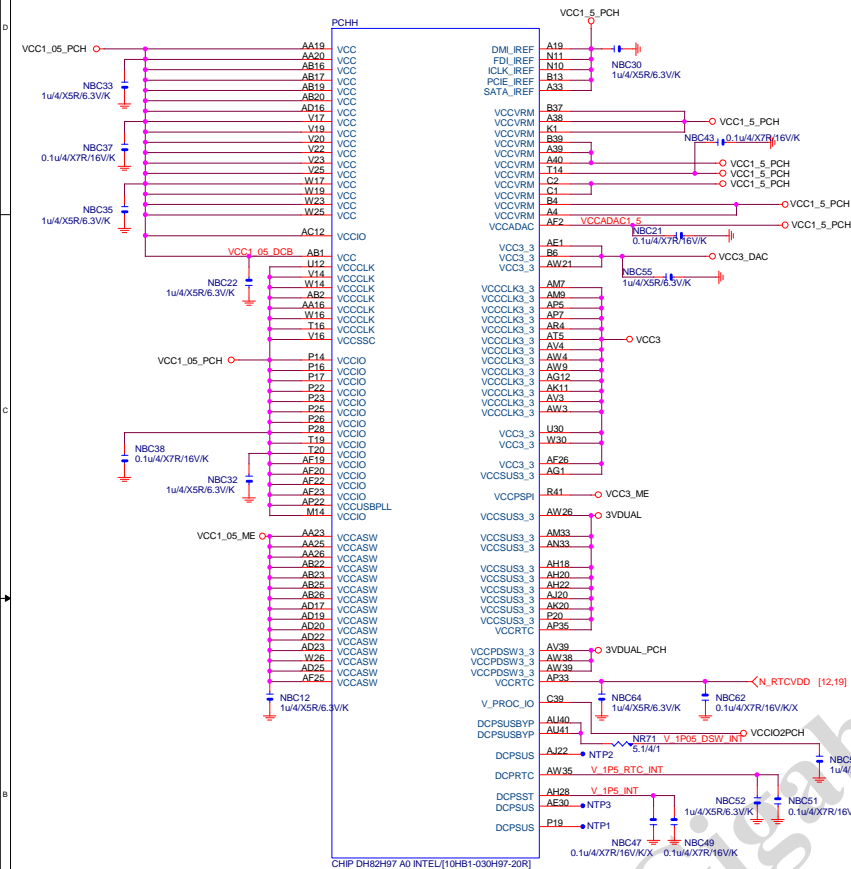
3VDUAL_PCH

SHT_PWR

H97 N/A

MASK FOOT

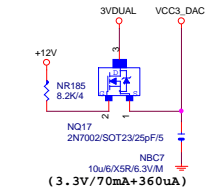
MASK



CLOSE北橋(注意震盪水波紋)

VCC3_DAC

3VDUAL_PCH



CAP

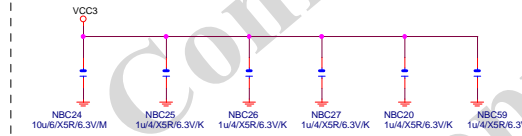
VCC3_ME

3VDUAL_PCH



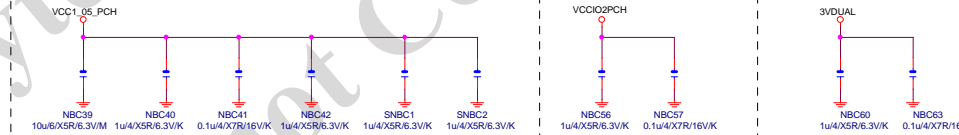
(3.3V)(X6)

(1.05V)(X5)

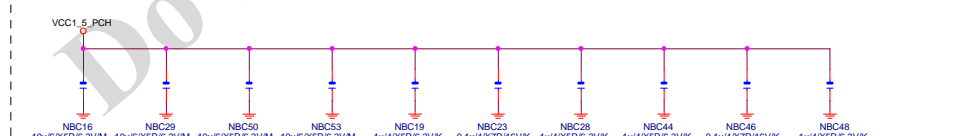


(1.05V)(X6)

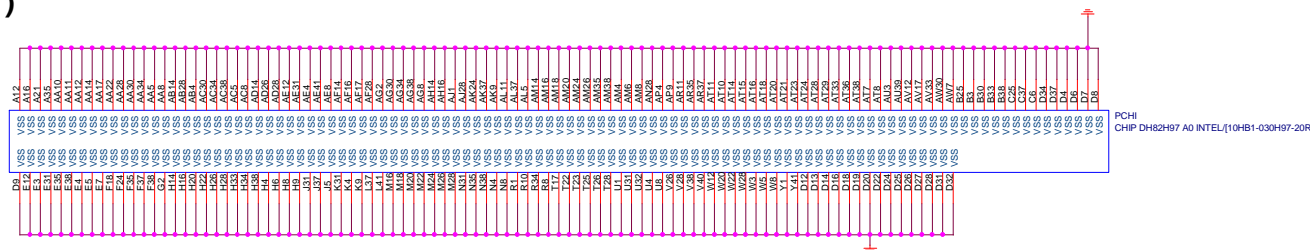
(1.05V)(X2)(3.3V)(X2)



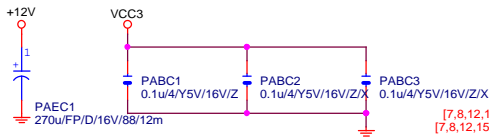
(1.05V)(X10)



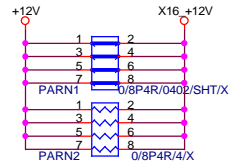
PCH (I)



PCIEX16 CAP



PCIEX16 PROTECT SHT

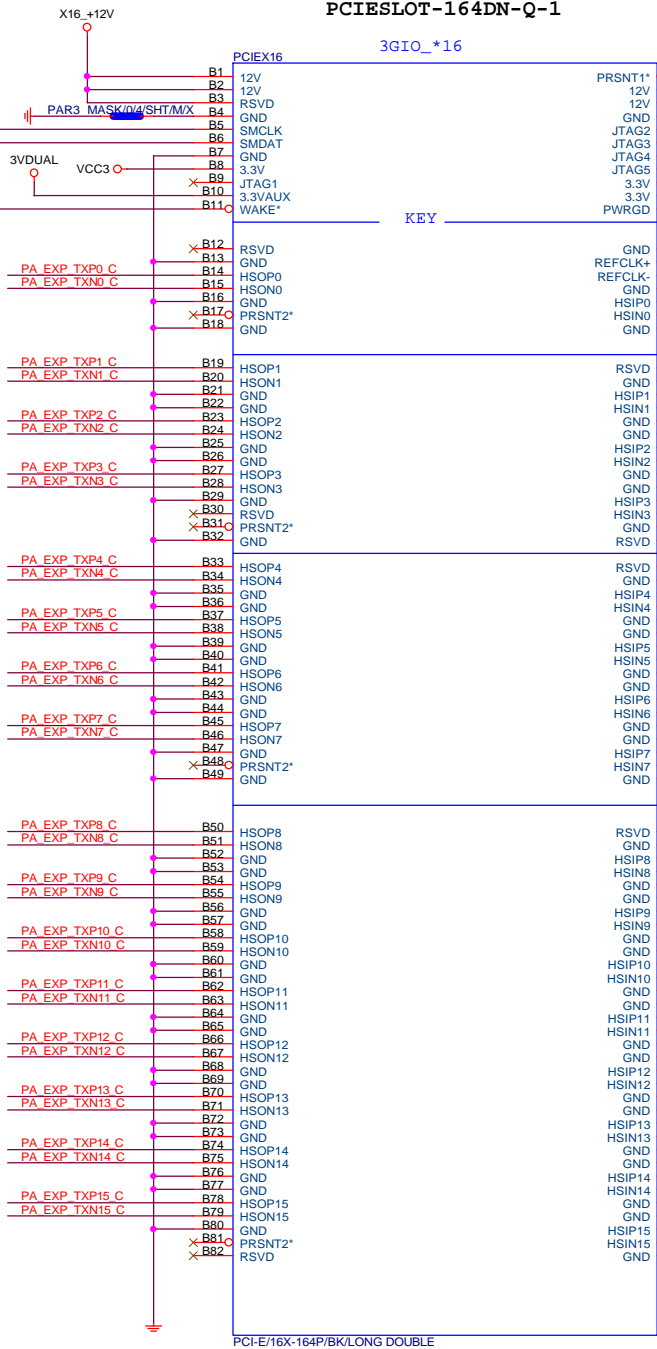


PCIEX16 AC CAP

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	PAC18	0.22u4/X5R/6.3V/K	PA EXP TXP7 C
PA EXP TXN7	PAC19	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
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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_RXP0.15] [4]
 PA EXP RXN0.15] >>> PA_EXP_RXN0.15] [4]
 PA EXP TXP0.15] >>> PA_EXP_TXP0.15] [4]
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PCIEX16 SLOT



BLACK CONNECTOR

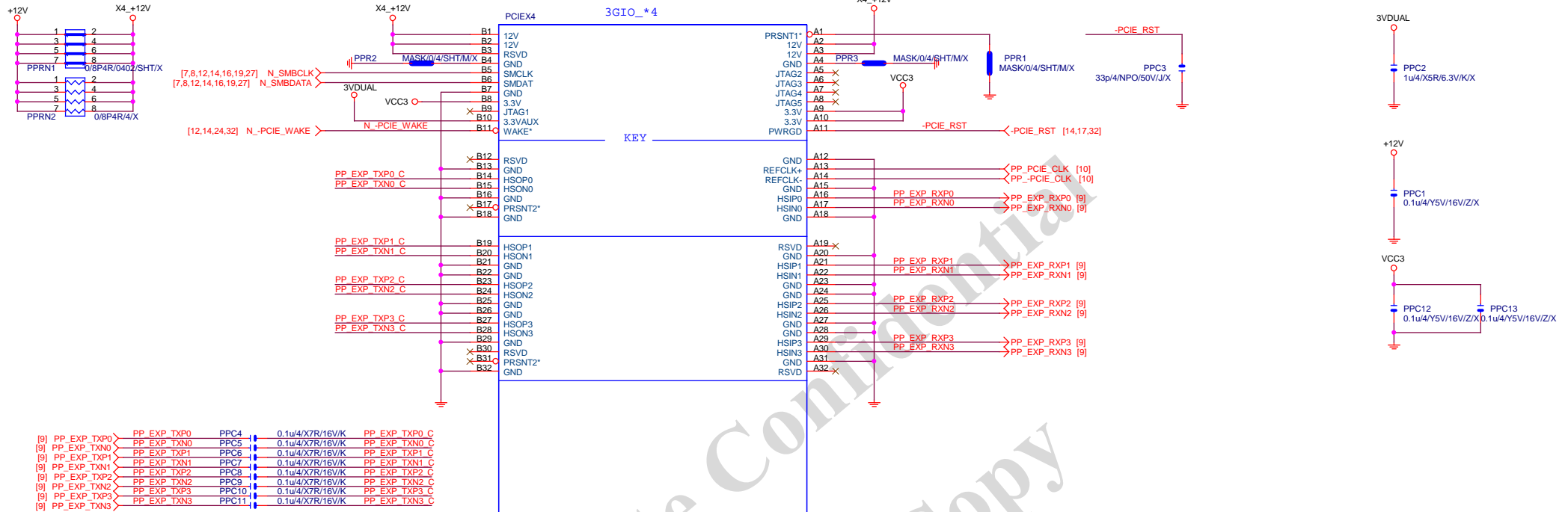
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PCIESLOT-164DN-Q-1

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PCI EXPRESS * 16		
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3GIO_*4



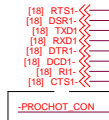
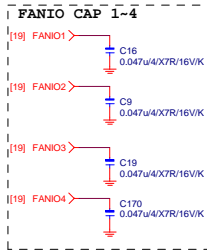
PCI-E/4X-65P/BK/LONG DOUBLE

BLACK CONNECTOR

Gigabyte Technology

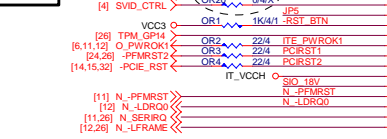
Title			PCI EXPRESS X 1 PORT
Size			GA-H97M-D3H
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SIO IT8620



IT8620E

PROCHOT



IT8620E GPIO問題匯整	
PIN 50	第一次上POWER時會拉 LO
PIN 90/91	DEFAULT為HDL FUNCTION, GP93 BYPASS TO GP92
PIN 108	高溫時 GP92 會被拉 Lo (VBE 85°C) — POWER ON 時會拉 LO
PIN 111/112	MOUSE 與 FANS FUNCTION 擇一使用, 不然會互相干擾

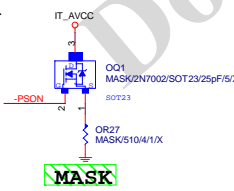
DUAL BIOS OPT STRAP



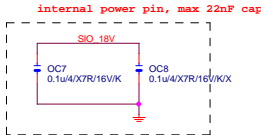
SIO CAP



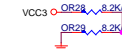
Power leakage N/A



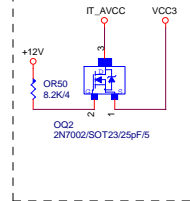
SIO_18V



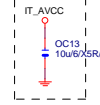
MB ID



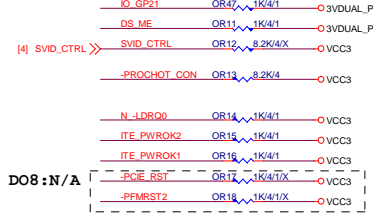
FIX MAX 插拔漏電



PWR_SHT

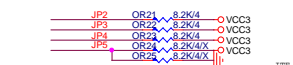


SIO_PU



DO8:N/A

SIO STRAP

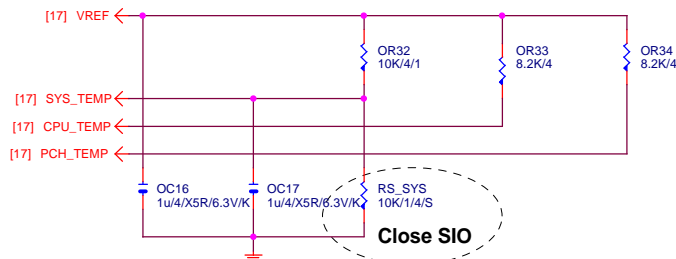


JP4	1	k8 power sequency function is Disable
JP4	0	k8 power sequency function is Enable
JP3	1	The default value of EC Index 63h/6Bh/73h is 80h.
JP3	0	The default value of EC Index 63h/6Bh/73h is FFh.
JP5	0	The default value of EC Index 63h/6Bh/73h is 00h.
JP5	1	The default value of EC Index 63h/6Bh/73h is 40h.

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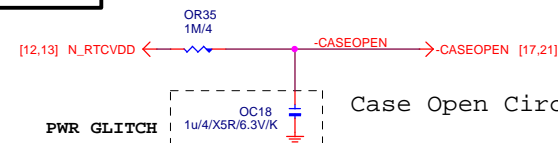
File		ITE 8728 LPC IO	
Size	Document Number	GA-H97M-D3H	
C		Rev 1.01	
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TEMP H/W MONITOR



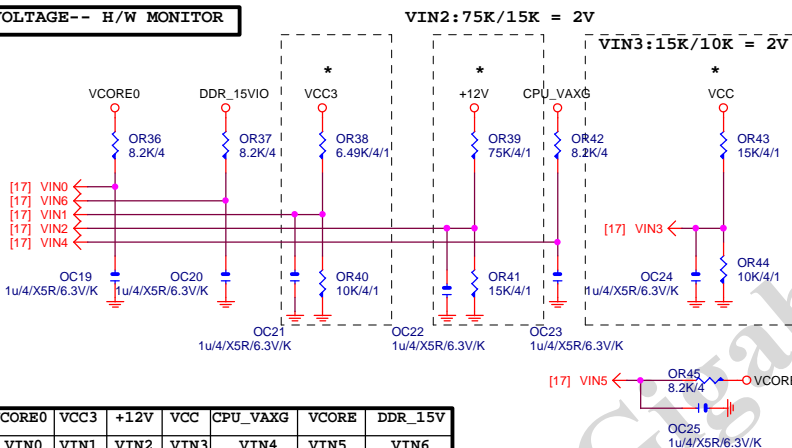
Close SIO

CASE OPEN

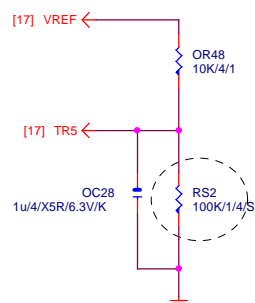


Case Open Circuits

VOLTAGE-- H/W MONITOR



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

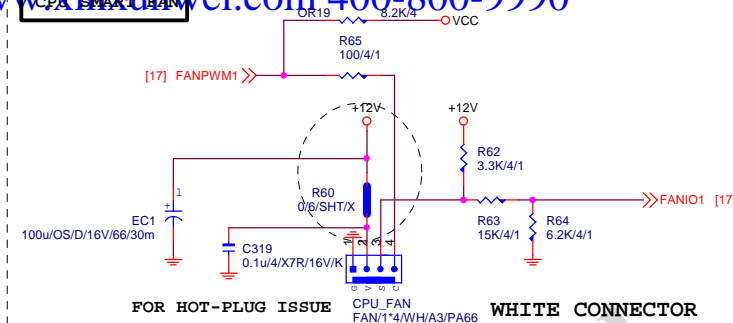


RS2 CLOSE CPU VR MOSFET

RS2 CLOSE MOSFET(VIN): DCQ1

www.gigabyte.com 400-800-9990

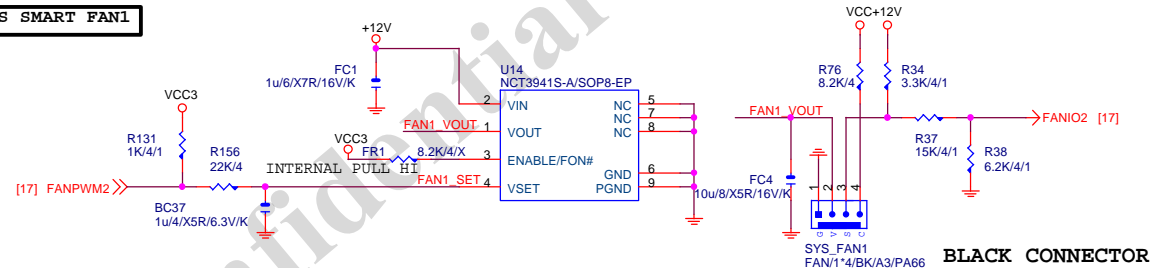
CPU START FAN



FOR HOT-PLUG ISSUE

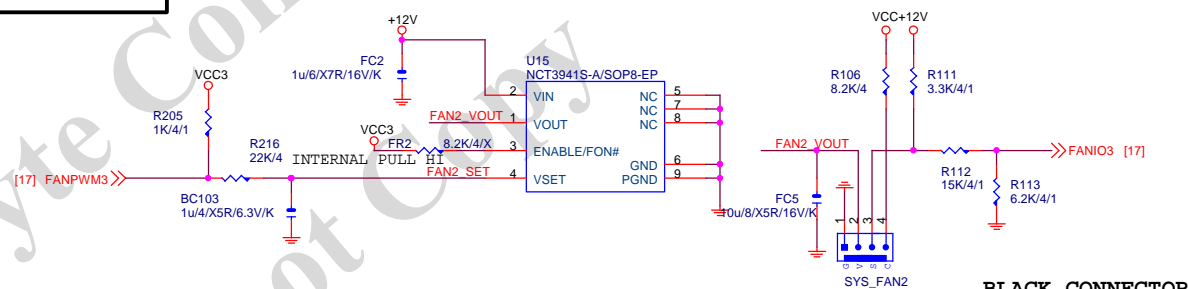
WHITE CONNECTOR

SYS SMART FAN1



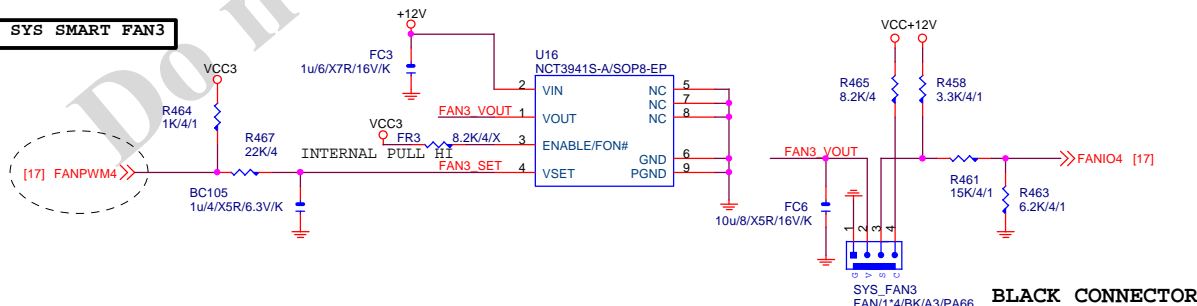
BLACK CONNECTOR

SYS SMART FAN2



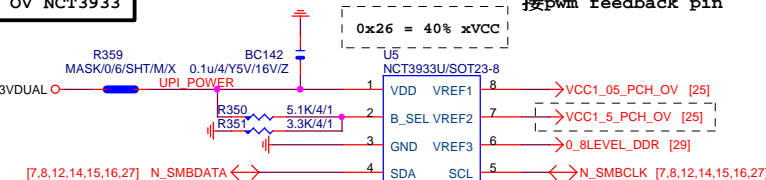
BLACK CONNECTOR

SYS SMART FAN3



BLACK CONNECTOR

OV NCT3933



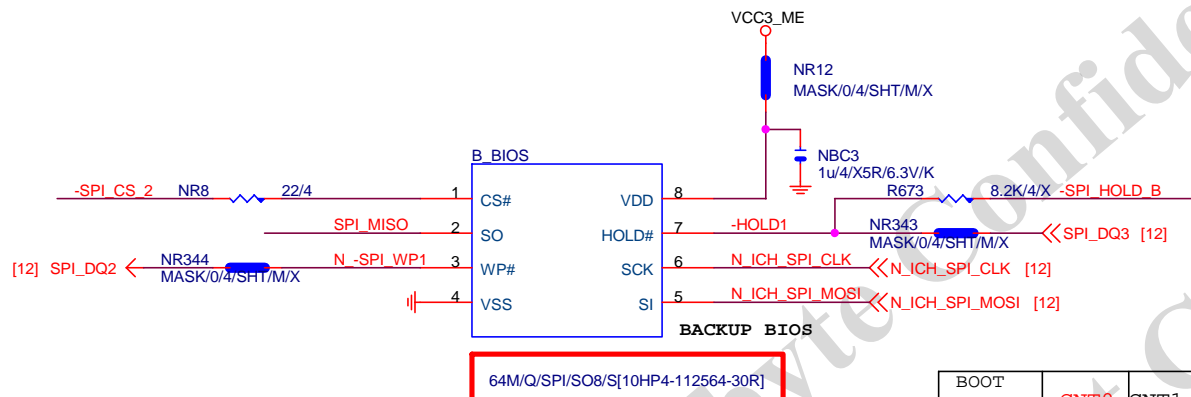
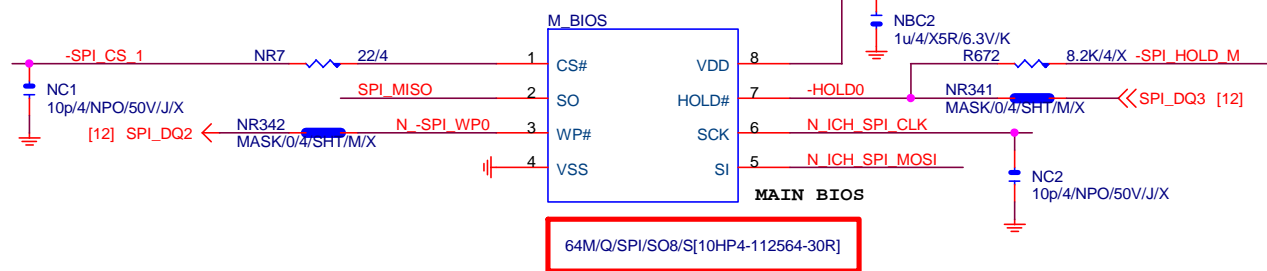
接pwm feedback pin

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Title		HWM,FAN CTRL,OV	
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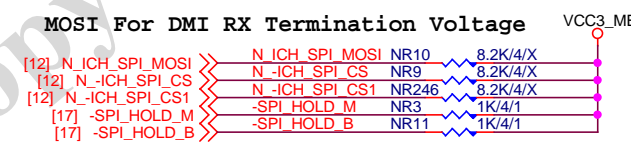
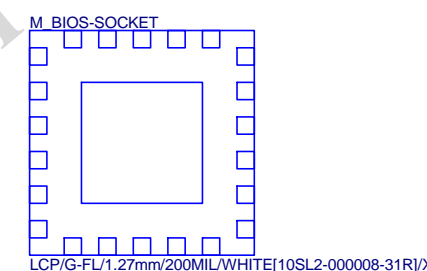
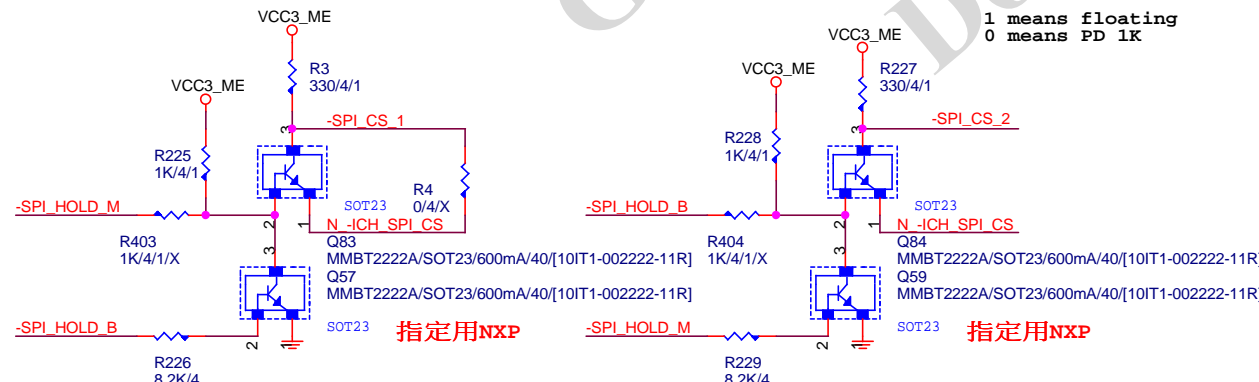
BIOS DEBUG PORT

BIOS_PH R1.0 移除



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

1 means floating
0 means PD 1K



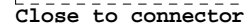
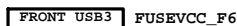
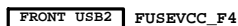
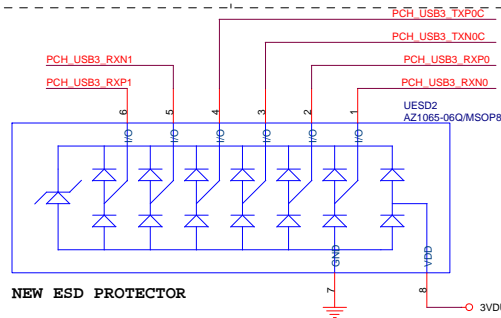
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DUAL BIOS

GA-H97M-D3H

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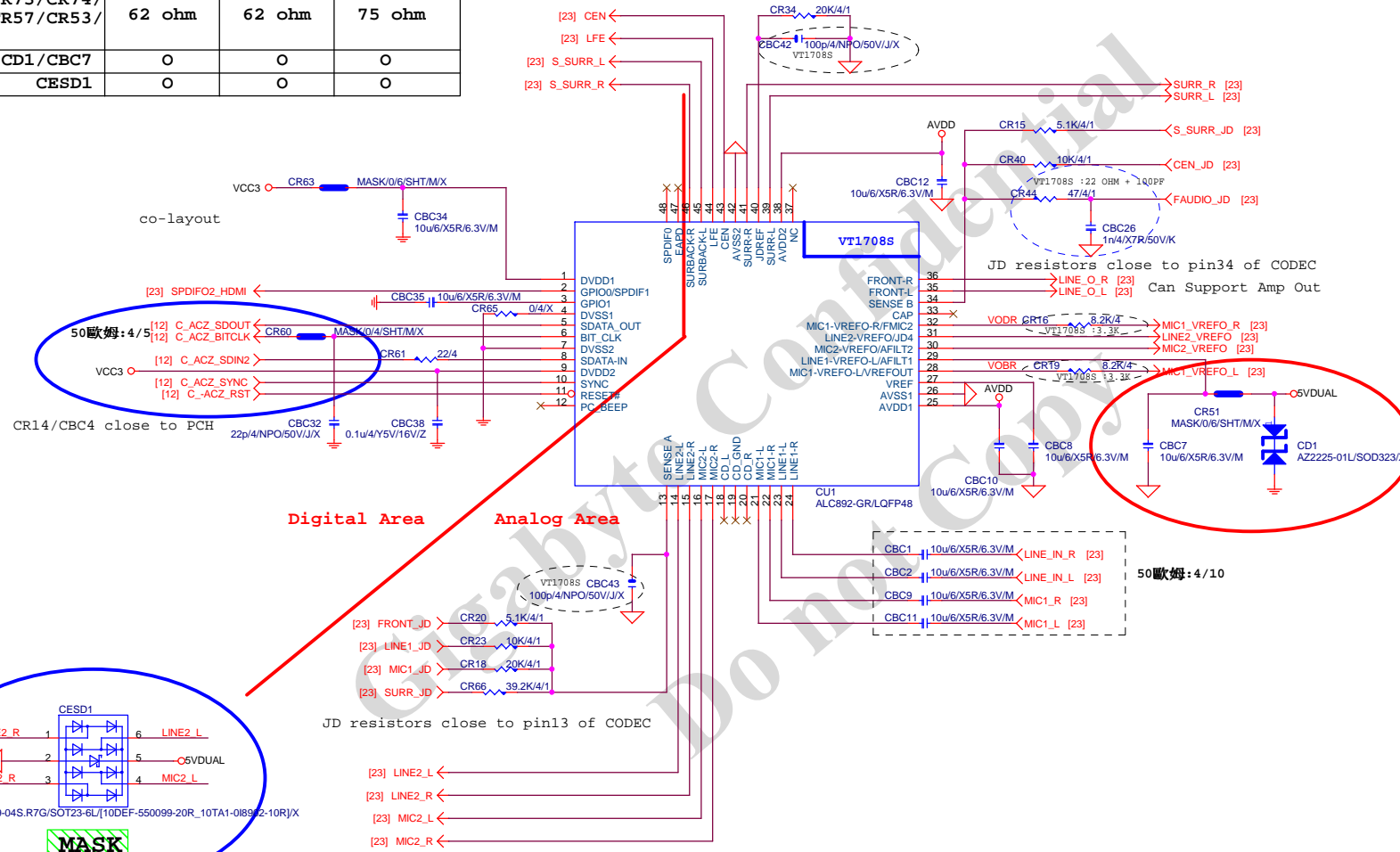
Date: Thursday, June 19, 2014 Sheet 20 of 32



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AZALIA CODEC **ALC892/ALC887-VD2/VT1708-CE Colay**

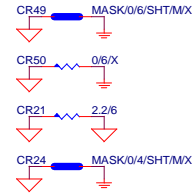
	ALC892	ALC887-VD2	VT1708S-CE
CR44/CBC26	47ohm+1nF	47ohm+1nF	22ohm+100P
CBC42/CBC43	X	X	100P/4
CR6/CR7/CR58/CR54/ CR67/CR68/CR69/CR70	22K/4	22K/4	10K/4/1
CR5/CR8/CR1/CR14/ CR17/CR22/CR73/CR74/ CR13/CR11/CR57/CR53/ CR75/CR76	62 ohm	62 ohm	75 ohm
CR51/CD1/CBC7	O	O	O
CESD1	O	O	O



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Title	HD AUDIO ALC887B-VD2/VT1708S/VT2021		
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LINE-OUT



LINE-IN

Verify MIC function
in LINE-in

MIC-IN

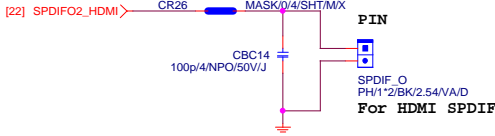
SURROUND

CEN/LFE

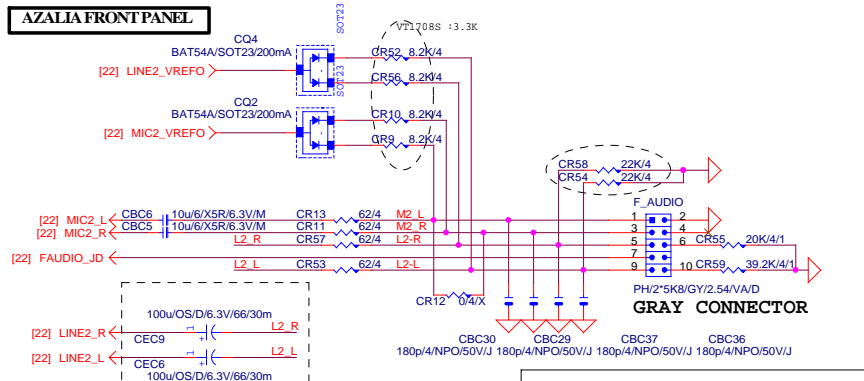
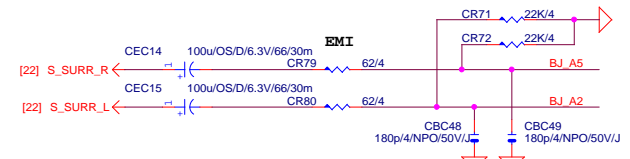
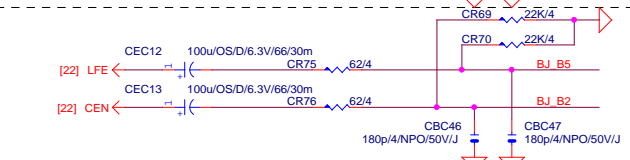
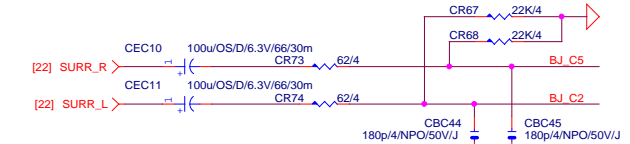
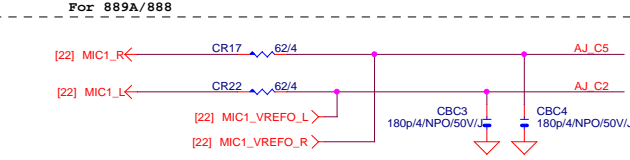
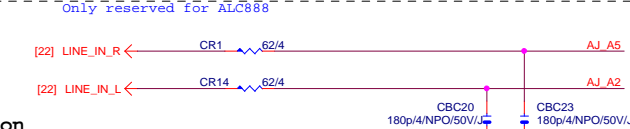
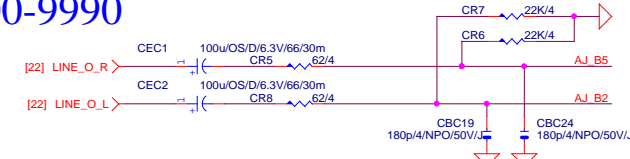
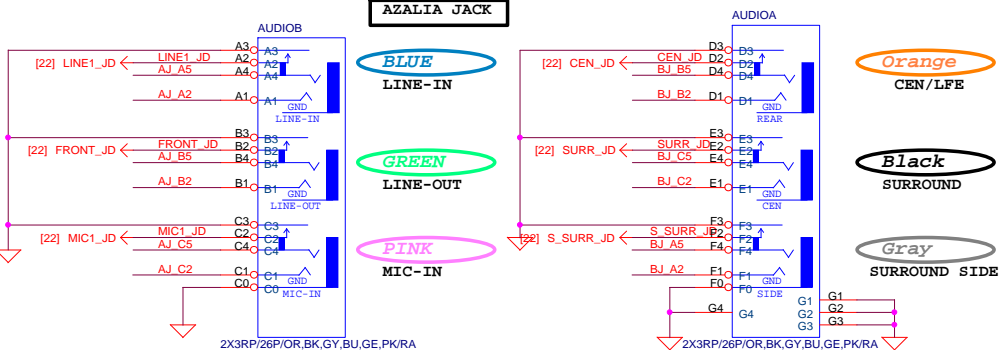
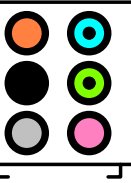
SURRBACK

AZALIA FRONT PANEL

SPDIF_OUT



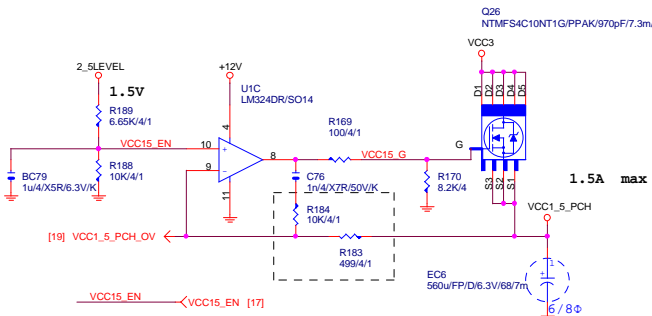
AZALIA JACK



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Title			
AUDIO JACK			
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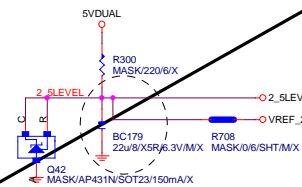
VCC1_5_PCH



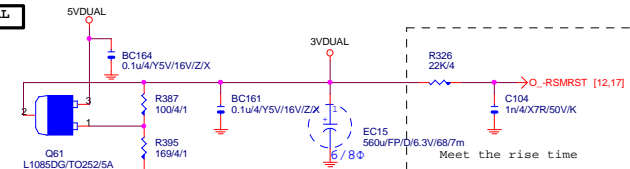
2_5LEVEL

FOOT MASK

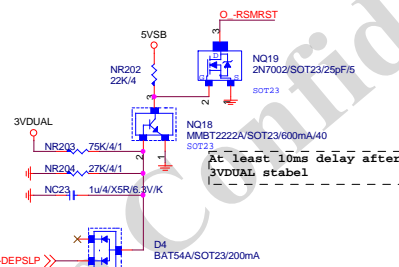
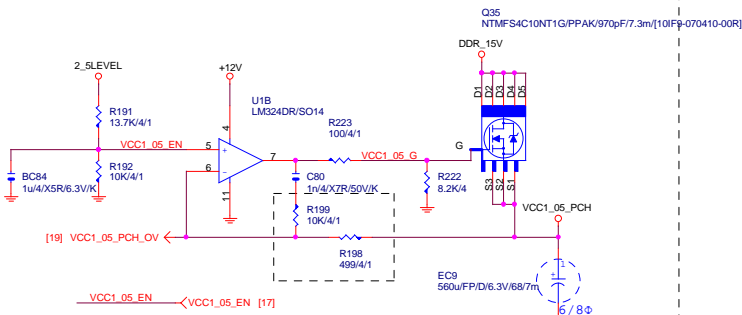
MASK



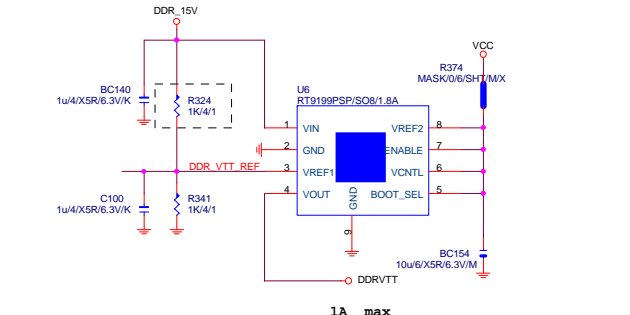
3VDUAL



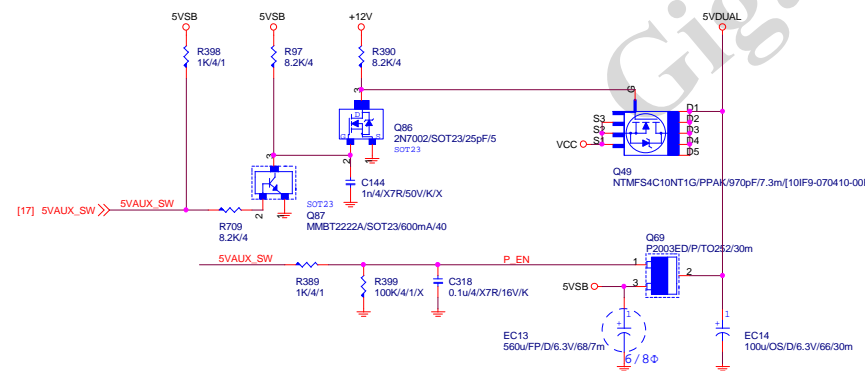
VCC1_05_PCH



DDR_VTT



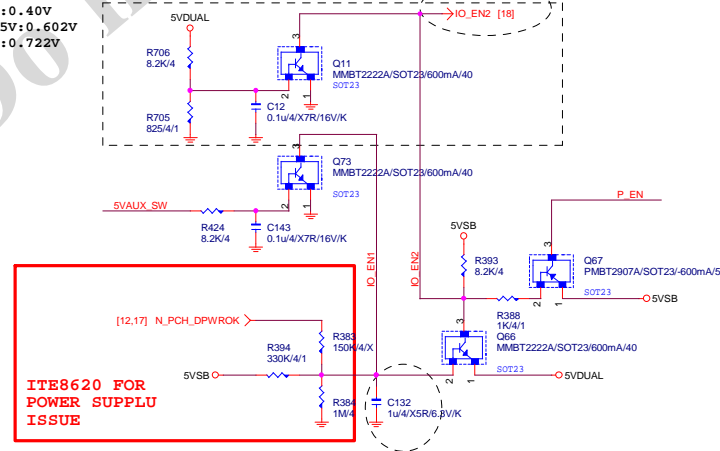
5VDUAL

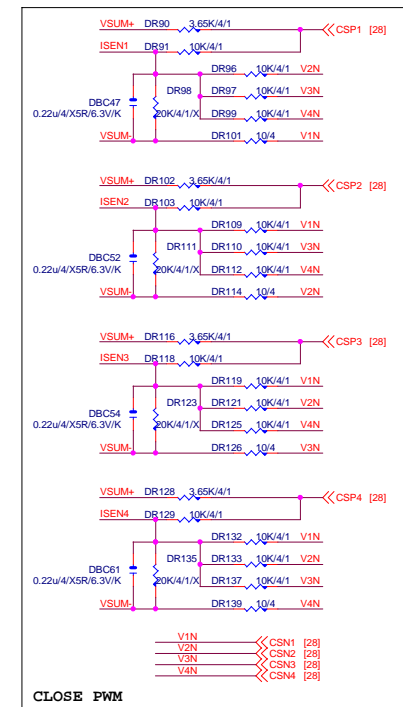
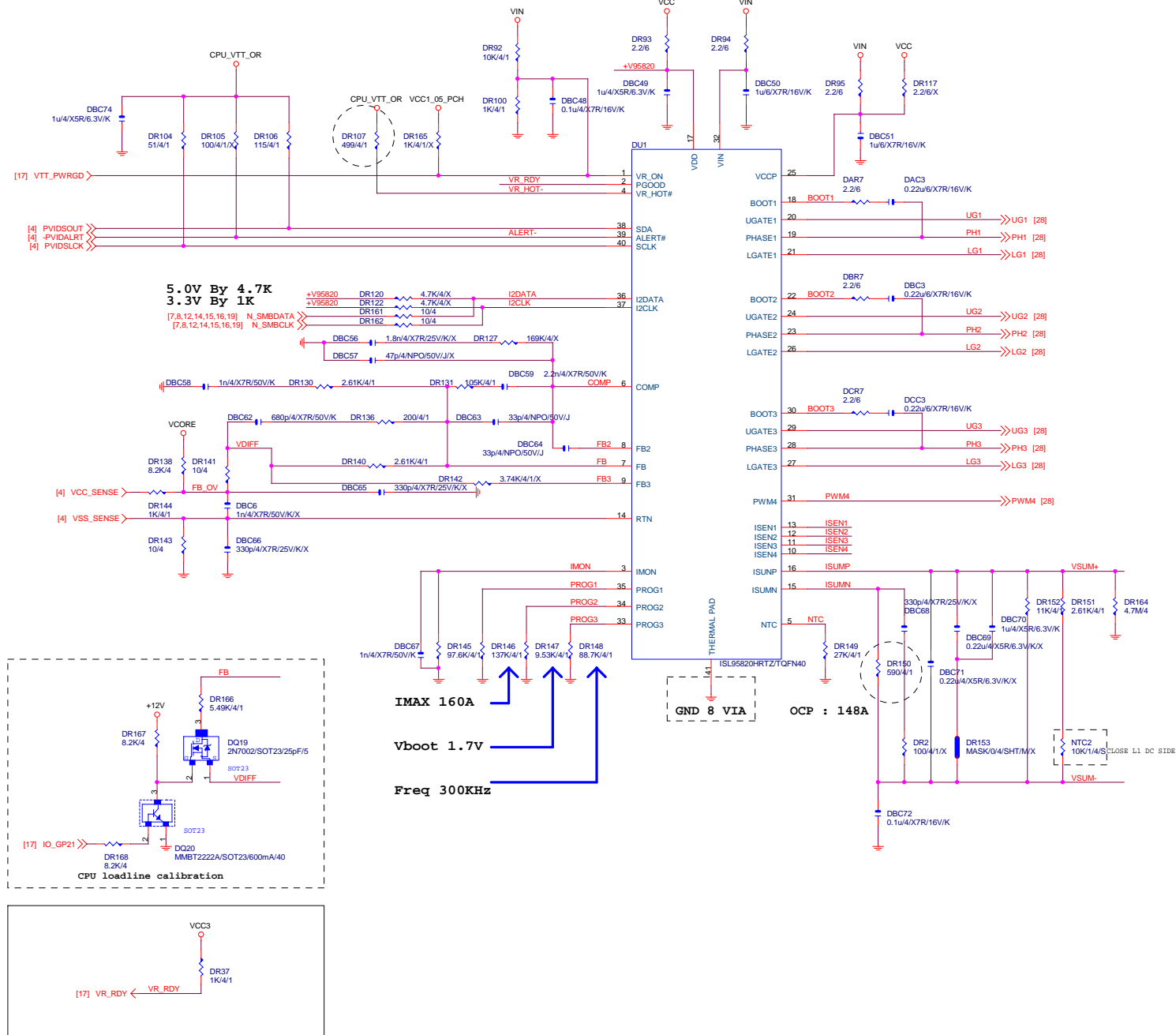


5VDUAL SHORT PROTECT

5V: 0.40V
7.5V: 0.602V
9V: 0.722V

5VSB OVP: 7.5V protection

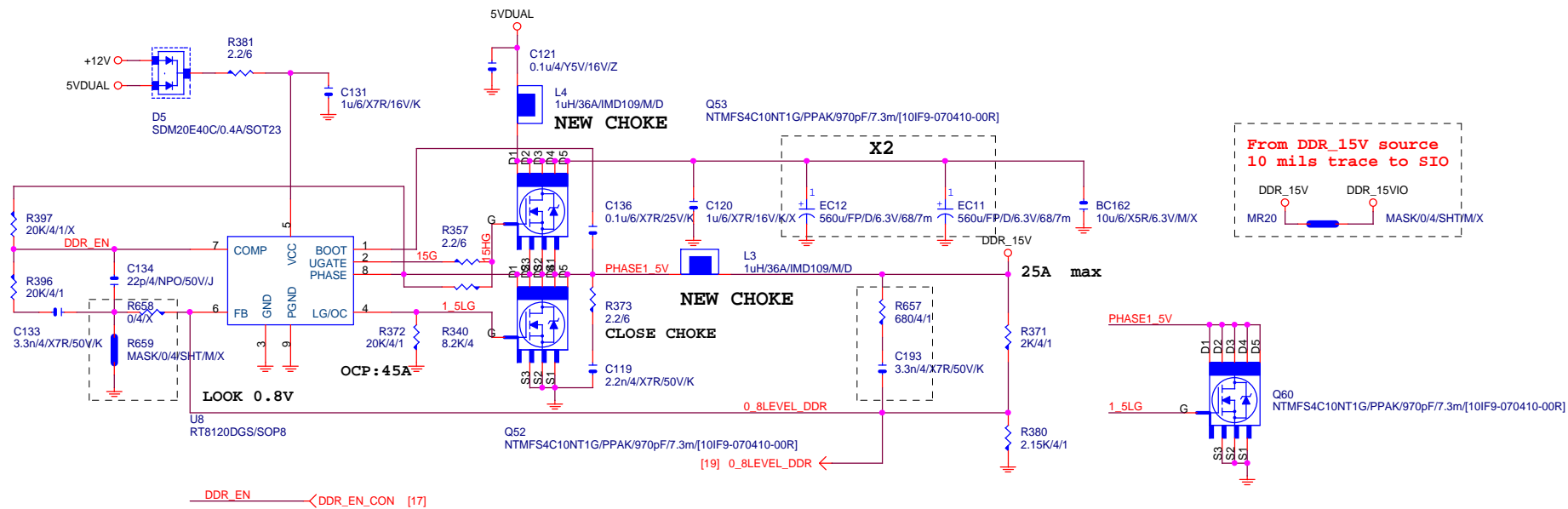




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DDR15V



PWR_SEQ

VIN=5V, VOUT=1.5V, IOUT=25A, PHASE=1
 IRMS=11.45A
 560u/FP/D/6.3V/68/8m RIPPLE CURRENT=4.7A
 Coefficient=1.7(85°C), 1(105°C)
 VIN Ripple current=4.7X1.7=7.99A(85°C)
 -->故固態電容須2X7.99=15.98>11.45A

$Rocset = (Iocp * Lgate, rdson) / Iocset$
 $Rocset = (45A * 6.7mOhm) / 10uA = 30K$
 $Iocset = 10uA$

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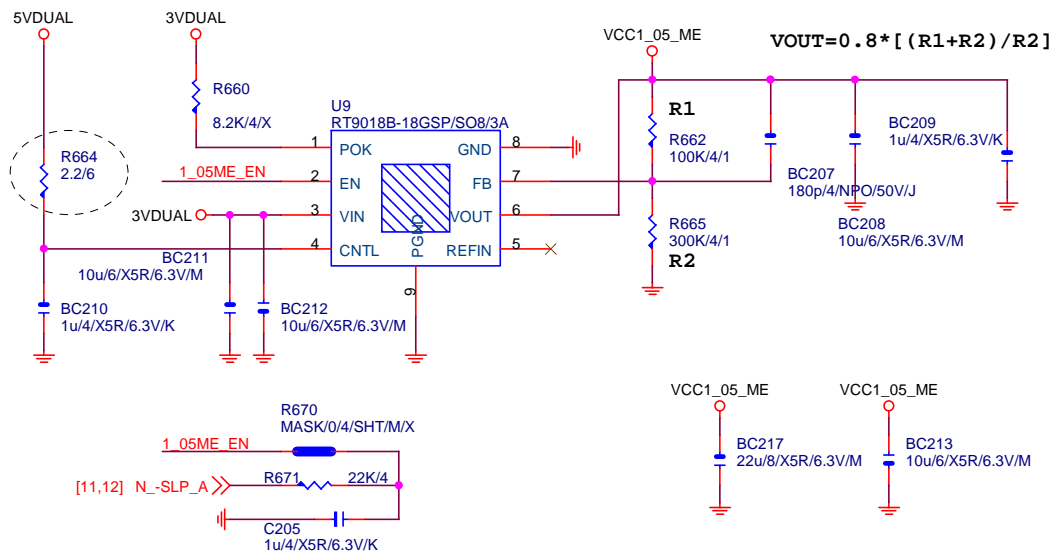
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DDR POWER		
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VCC1_05_ME

【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

Z97 N/A



Second source

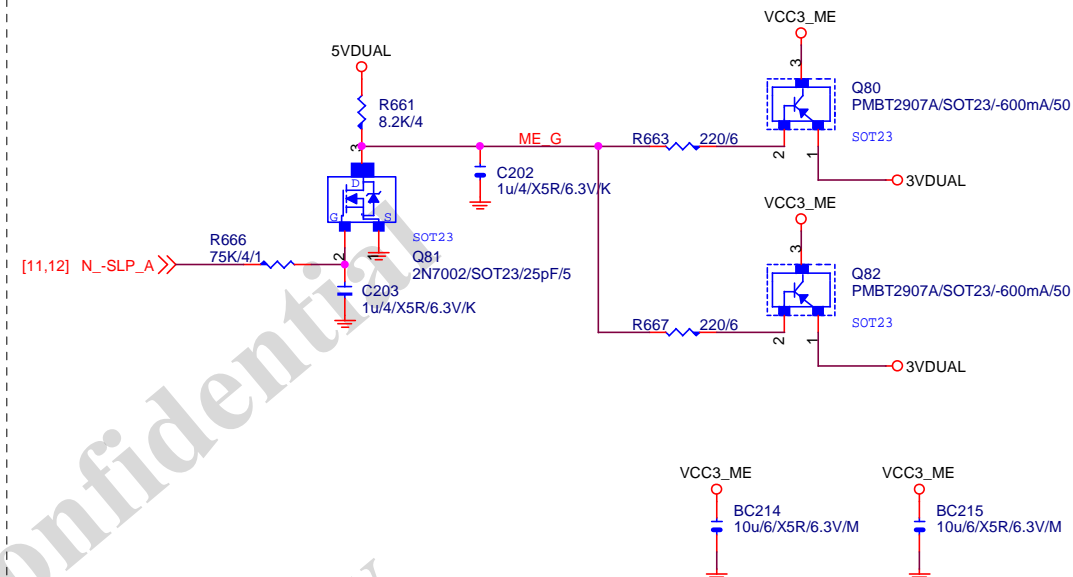
EM5103 - 10GL2-305103-01R

NCT3730S -

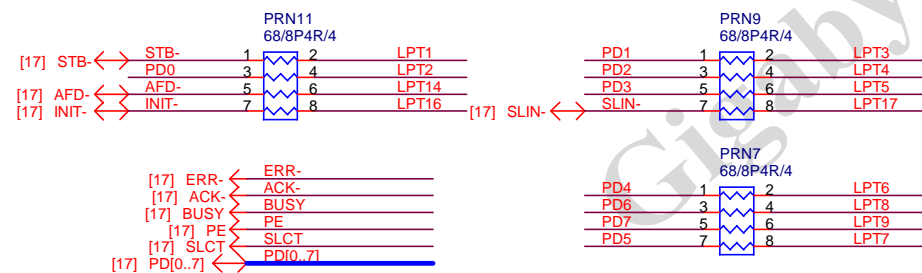
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VCC3_ME

Z97 N/A

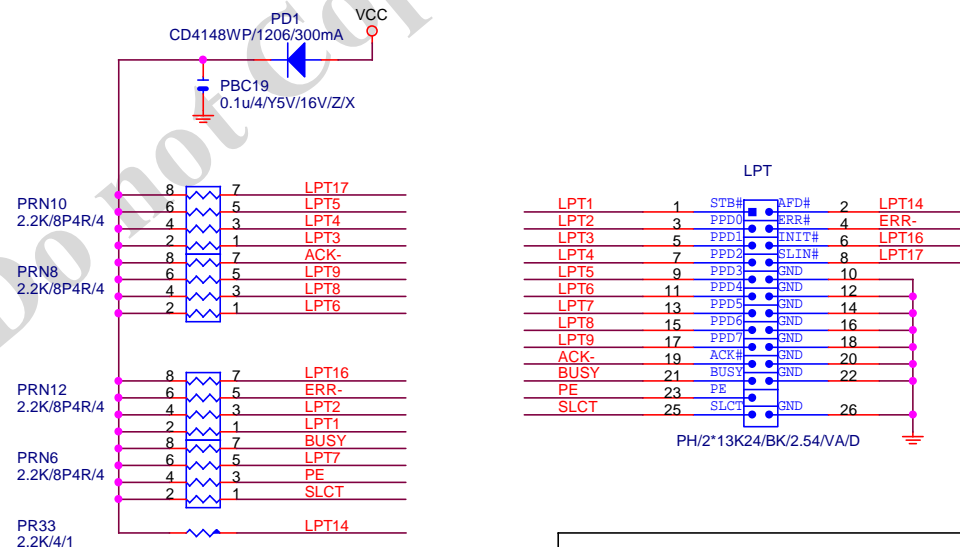


LPT PORT



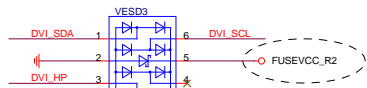
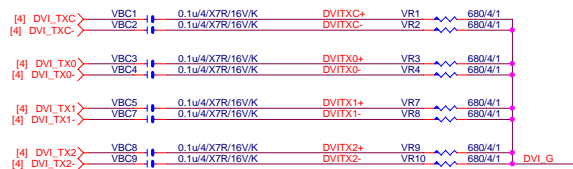
【技術通報R&D技術通報151】

33ohm Change to 68ohm

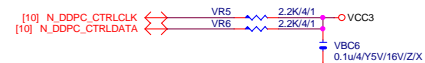


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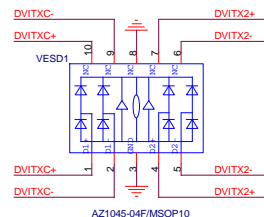
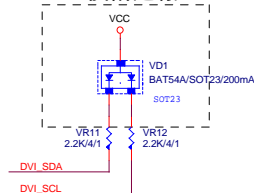
Title			
LPT			
Size Custom	Document Number	GA-H97M-D3H	
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DVI LEVEL SHIFT

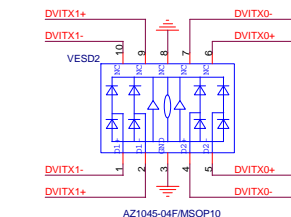
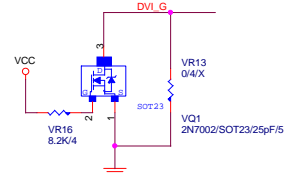
Close to connector



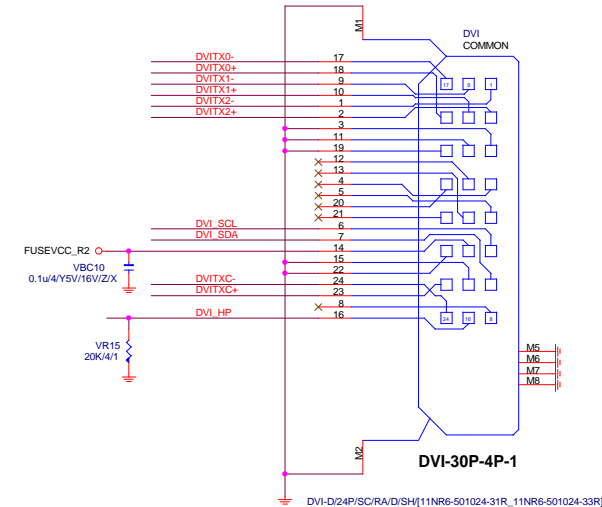
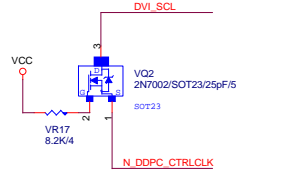
R&D技術通報 162



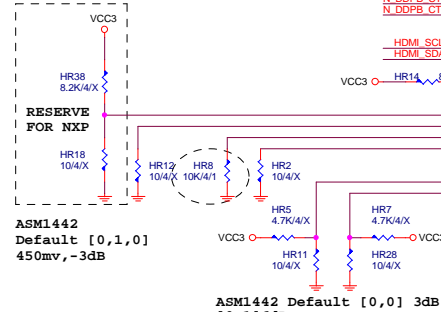
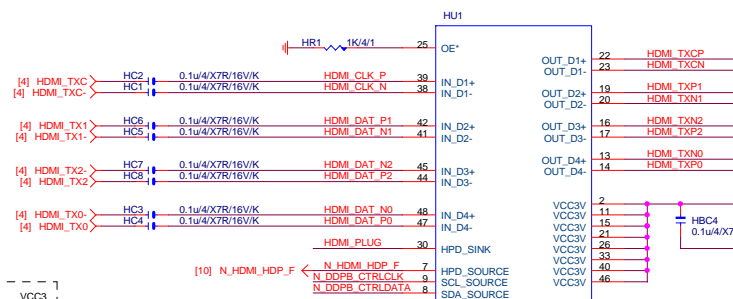
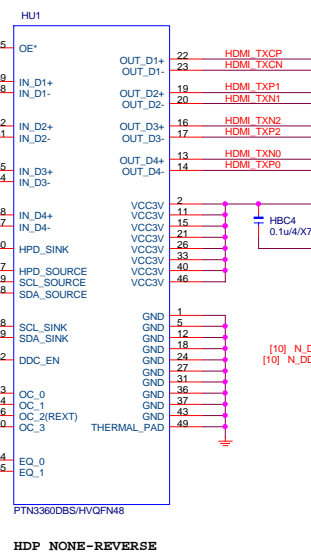
Close to connector



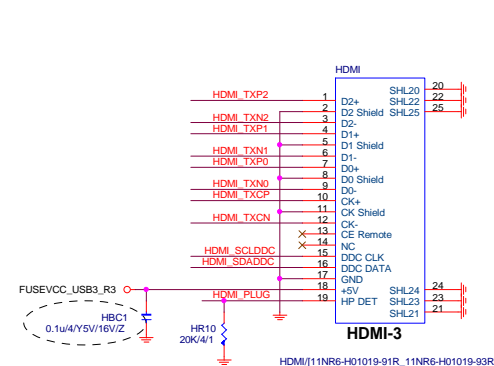
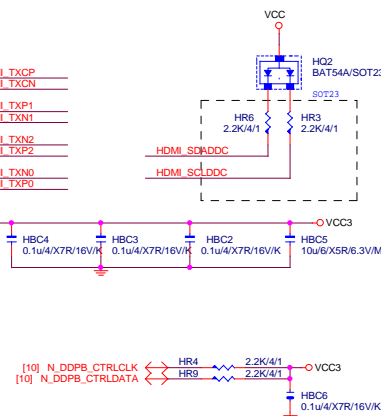
Close to connector



DVI-30P-4P-1

HDMI LEVEL SHIFTAS1442
Default [0,1,0]
450mv, -3dBAS1442 Default [0,0] 3dB
[0,1]6dB

HDP NONE-REVERSE



HDMI-3

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