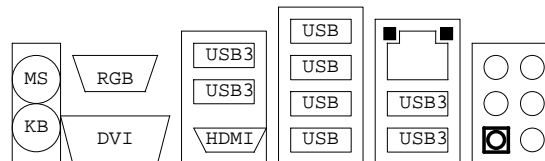
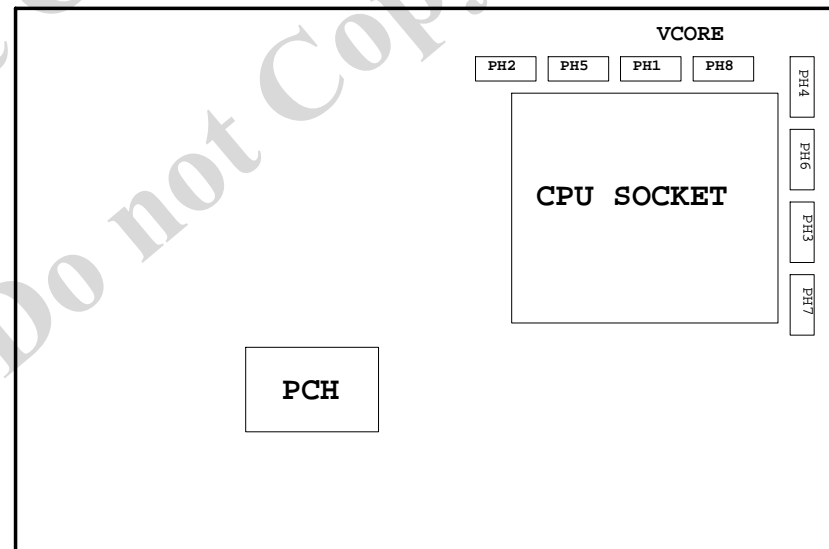


**1.02**

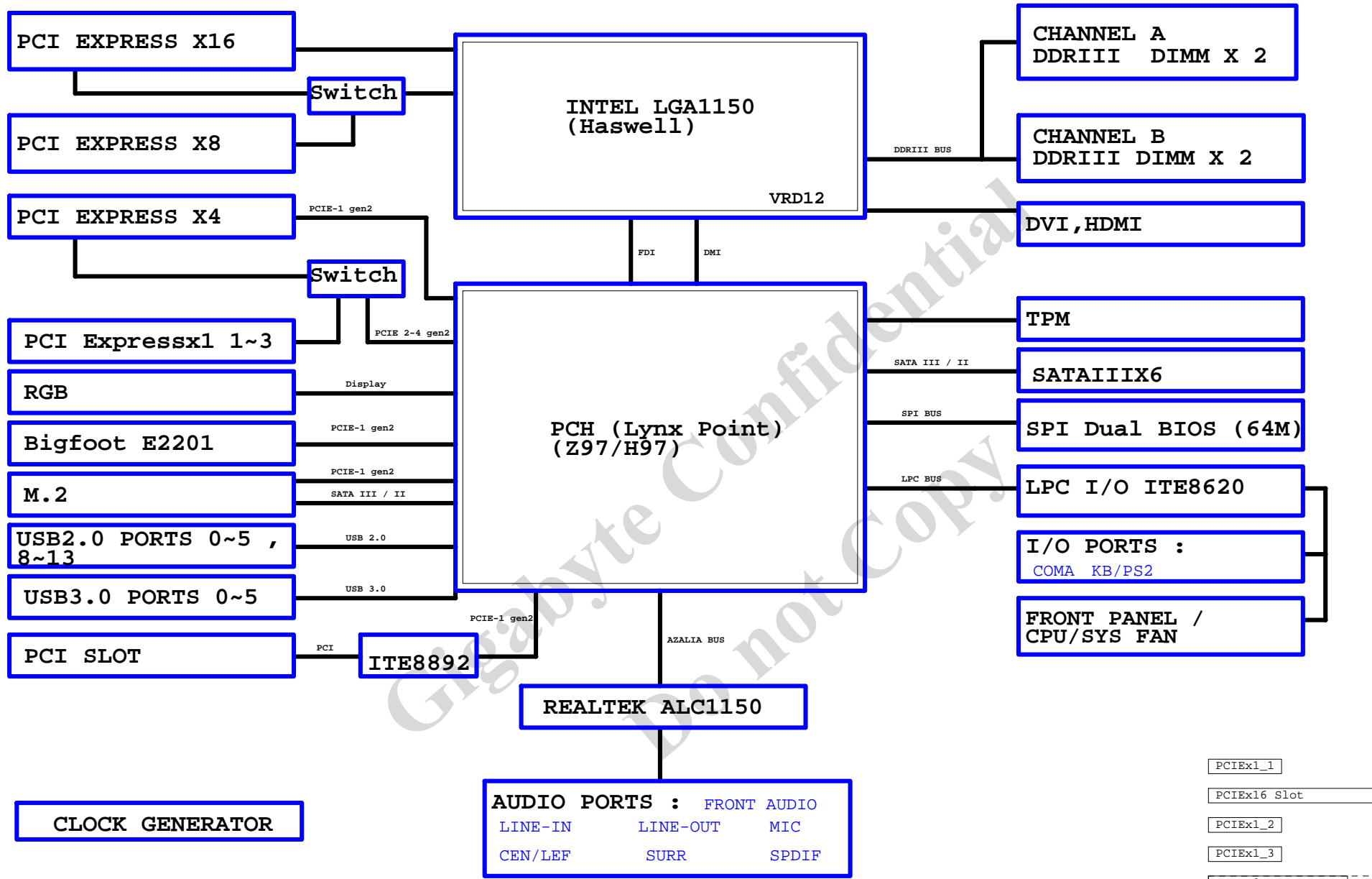
SHEET	TITLE
28	DISCRETE POWER
29	DUAL BIOS
30	FP,F_USB,USB PWR,BZ
31	ATX POWER CONNECTOR
32	H/W MONITOR,FAN CTRL
33	DVI
34	HDMI_USB30
35	ARTHEROS E2201
36	M.2_SATA_EXPRESS
37	TABLE LIST
38	IR3598 VCORE Phase 6, 8, 3, 7
39	
40	





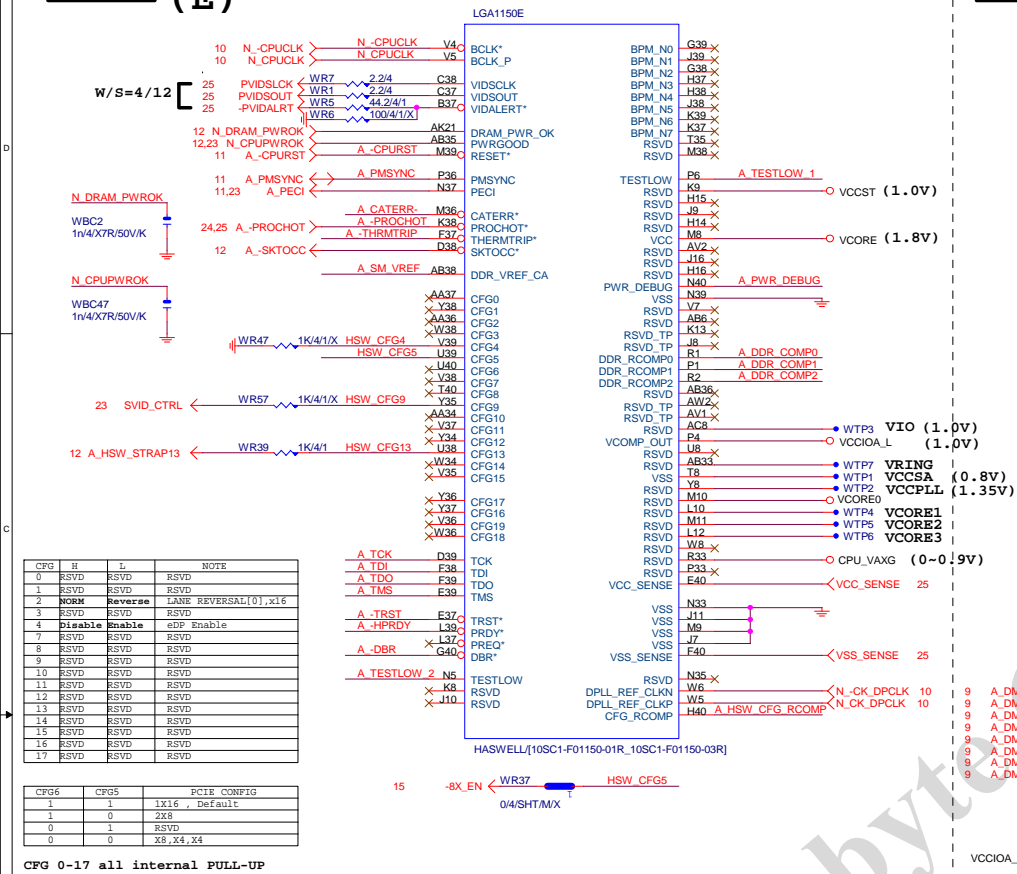
# BLOCK DIAGRAM

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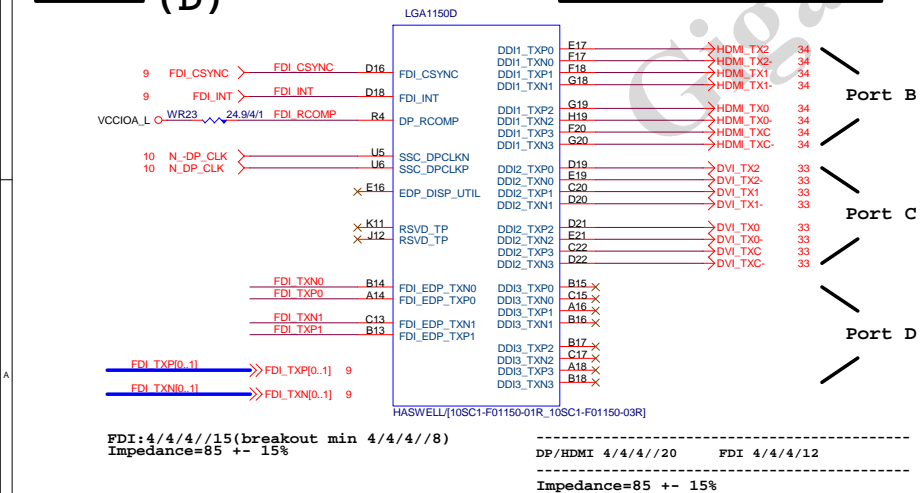


- PCIEx1\_1
- PCIEx16 Slot
- PCIEx1\_2
- PCIEx1\_3
- PCIEx8
- PCI Slot
- PCIEx4

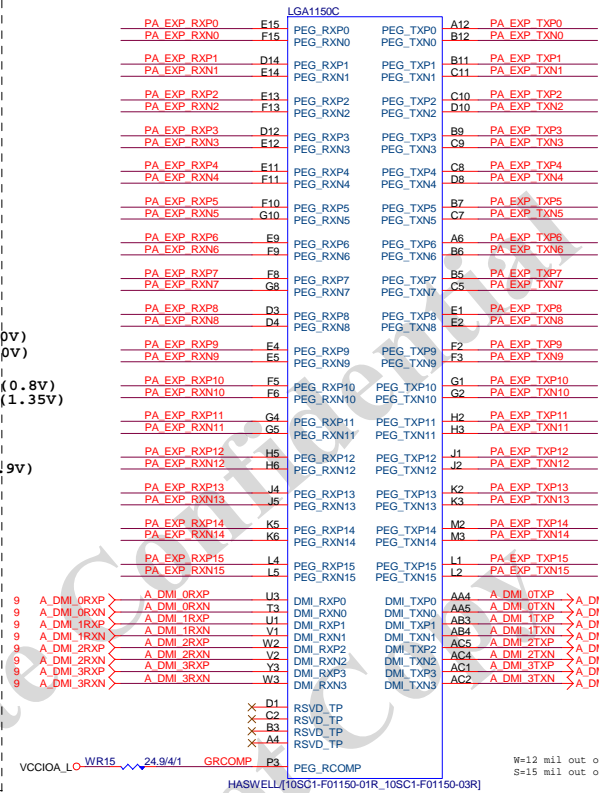
**LGA1150 (E)**



LGA1150 (D)



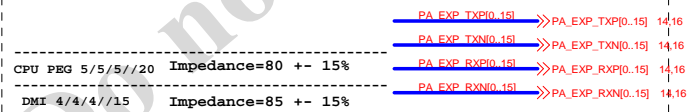
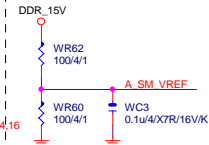
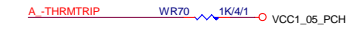
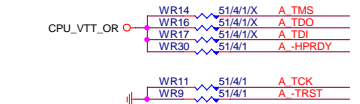
LGA1155 (C)



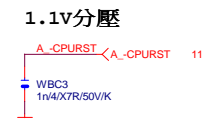
## CPU SVID



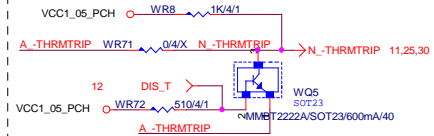
## CPU PU/PD



**-CPURST**



THRMTRIP DISABLE FOR Z87 OVERCLOCK



LGA1150

(A)

LGA1150

(B)

LGA1150

(CR)

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UGA BRGCR/115X/BKNU[12KRC-0F0001-61R\_12KRC-0F0001-62R]

LGA1150A

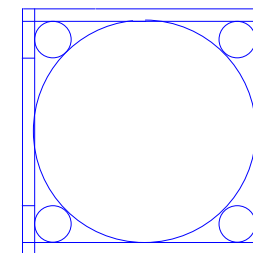
MAAA0	AU13	DDR0_MA0	DDR0_D00	AD38	MDA0
MAAA1	AV16	DDR0_MA1	DDR0_D01	AD39	MDA1
MAAA2	AU16	DDR0_MA2	DDR0_D02	AF38	MDA2
MAAA3	AW17	DDR0_MA3	DDR0_D03	AF39	MDA3
MAAA4	AU17	DDR0_MA4	DDR0_D04	AD37	MDA4
MAAA5	AW18	DDR0_MA5	DDR0_D05	AD40	MDA5
MAAA6	AV17	DDR0_MA6	DDR0_D06	AE37	MDA6
MAAA7	AT18	DDR0_MA7	DDR0_D07	AF40	MDA7
MAAA8	AU18	DDR0_MA8	DDR0_D08	AH40	MDA9
MAAA9	AT19	DDR0_MA9	DDR0_D09	AH39	MDA10
MAAA10	AW11	DDR0_MA10	DDR0_D10	AK38	MDA10
MAAA11	AV19	DDR0_MA11	DDR0_D11	AK39	MDA11
MAAA12	AU19	DDR0_MA12	DDR0_D12	AH37	MDA12
MAAA13	AY10	DDR0_MA13	DDR0_D13	AH38	MDA13
MAAA14	AT20	DDR0_MA14	DDR0_D14	AK37	MDA14
MAAA15	AU21	DDR0_MA15	DDR0_D15	AK40	MDA15
MODT_A0	AW10	DDR0_ODT0	DDR0_D16	AM40	MDA17
MODT_A1	AY8	DDR0_ODT1	DDR0_D17	AM39	MDA21
MODT_A2	AW9	DDR0_ODT2	DDR0_D18	AP38	MDA18
MODT_A3	AU8	DDR0_ODT3	DDR0_D19	AP39	MDA19
			DDR0_D20	AM37	MDA20
			DDR0_D21	AM38	MDA16
			DDR0_D22	AP37	MDA22
			DDR0_D23	AP40	MDA23
			DDR0_D24	AW37	MDA29
			DDR0_D25	AU35	MDA26
			DDR0_D26	AU35	MDA27
			DDR0_D27	AT37	MDA28
			DDR0_D28	AU37	MDA24
			DDR0_D29	AT35	MDA30
			DDR0_D30	AW35	MDA31
			DDR0_D31	AY6	MDA33
			DDR0_D32	AU6	MDA37
			DDR0_D33	AW4	MDA34
			DDR0_D34	AU4	MDA35
			DDR0_D35	AW6	MDA36
			DDR0_D36	AW6	MDA32
			DDR0_D37	AW4	MDA38
			DDR0_D38	AW4	MDA39
			DDR0_D39	AR1	MDA41
			DDR0_D40	AR4	MDA45
			DDR0_D41	AN3	MDA42
			DDR0_D42	AN4	MDA43
			DDR0_D43	AR2	MDA44
			DDR0_D44	AR3	MDA40
			DDR0_D45	AN2	MDA46
			DDR0_D46	AN1	MDA47
			DDR0_D47	AL1	MDA49
			DDR0_D48	AL4	MDA53
			DDR0_D49	AL4	MDA50
			DDR0_D50	AJ4	MDA51
			DDR0_D51	AJ2	MDA52
			DDR0_D52	AJ2	MDA48
			DDR0_D53	AJ2	MDA54
			DDR0_D54	AJ1	MDA55
			DDR0_D55	AG1	MDA57
			DDR0_D56	AG4	MDA61
			DDR0_D57	AE3	MDA58
			DDR0_D58	AE4	MDA59
			DDR0_D59	AG2	MDA60
			DDR0_D60	AG3	MDA56
			DDR0_D61	AE2	MDA62
			DDR0_D62	AE1	MDA63
			DDR0_D63	AE39	DQSA0
			DDR0_D64	AJ39	DQSA1
			DDR0_D65	AN39	DQSA2
			DDR0_D66	AV36	DQSA3
			DDR0_D67	AV5	DQSA4
			DDR0_D68	AP3	DQSA5
			DDR0_D69	AK3	DQSA6
			DDR0_D70	AF3	DQSA7
			DDR0_D71	AV32	DQSA8
			DDR0_D72	AE38	DQSA9
			DDR0_D73	AJ38	DQSA1
			DDR0_D74	AN38	DQSA2
			DDR0_D75	AJ36	DQSA3
			DDR0_D76	AW5	DQSA4
			DDR0_D77	AP2	DQSA5
			DDR0_D78	AK2	DQSA6
			DDR0_D79	AF2	DQSA7
			DDR0_D80	AU32	DQSA8

HASWELL[10SC1-F01150-01R\_10SC1-F01150-03R]

LGA1150B

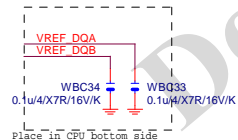
MAAB0	AL19	DDR1_MA0	AE34	MD80
MAAB1	AK23	DDR1_MA1	AE35	MD81
MAAB2	AM22	DDR1_MA2	AG35	MD82
MAAB3	AM23	DDR1_MA3	AH35	MD83
MAAB4	AP23	DDR1_MA4	AD34	MD84
MAAB5	AL23	DDR1_MA5	AD35	MD85
MAAB6	AY24	DDR1_MA6	AG34	MD86
MAAB7	AY25	DDR1_MA7	AH34	MD87
MAAB8	AU26	DDR1_MA8	AL34	MD88
MAAB9	AW25	DDR1_MA9	AL35	MD89
MAAB10	AP18	DDR1_MA10	AK31	MD810
MAAB11	AL31	DDR1_MA11	AL32	MD811
MAAB12	AY26	DDR1_MA12	AK34	MD812
MAAB13	AR15	DDR1_MA13	AK35	MD813
MAAB14	AV27	DDR1_MA14	AK32	MD814
MAAB15	AY28	DDR1_MA15	AL32	MD815
MODT_B0	AM17	DDR1_ODT0	AP34	MD817
MODT_B1	AL16	DDR1_ODT1	AN31	MD819
MODT_B2	AM16	DDR1_ODT2	AP31	MD823
MODT_B3	AK15	DDR1_ODT3	AP35	MD820
			AP35	MD816
			AN32	MD818
			AP32	MD822
			AM29	MD825
			AM28	MD828
			AR29	MD827
			AR28	MD830
			AL23	MD834
			AL28	MD829
			AP29	MD826
			AP28	MD831
			AR12	MD832
			AL13	MD834
			AL12	MD835
			AR13	MD836
			AP13	MD837
			AM13	MD838
			AM12	MD839
			AR9	MD845
			AP9	MD841
			AR6	MD847
			AP6	MD843
			AR10	MD844
			AP10	MD840
			AR7	MD846
			AP7	MD842
			AM9	MD852
			AL9	MD853
			AL6	MD850
			AL7	MD855
			AM10	MD848
			AL10	MD849
			AM6	MD854
			AM7	MD851
			AH6	MD861
			AH7	MD860
			AE6	MD859
			AE7	MD863
			AJ6	MD856
			AJ7	MD857
			AG6	MD858
			AF7	MD862
			AF35	DQSB0
			AL33	DQSB1
			AN28	DQSB2
			AN28	DQSB3
			AN12	DQSB4
			AP8	DQSB5
			AL8	DQSB6
			AG7	DQSB7
			AN25	DQSB8
			AK33	DQSB1
			AN33	DQSB2
			AN29	DQSB3
			AN13	DQSB4
			AR8	DQSB5
			AM8	DQSB6
			AG6	DQSB7
			AN26	DQSB8

HASWELL[10SC1-F01150-01R\_10SC1-F01150-03R]



DDR BUS

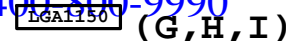
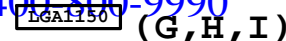
7	MODT_A[0..3]	MODT_A0..3
8	MODT_B[0..3]	MODT_B0..3
7	MDA[0..63]	MDA0..63
8	MDB[0..63]	MDB0..63
7	DQSA[0..7]	DQSA0..7
7	DQSA[0..7]	DQSA0..7
7	MAAA[0..15]	MAAA0..15
8	MAAB[0..15]	MAAB0..15
8	DQSB[0..7]	DQSB0..7
8	DQSB[0..7]	DQSB0..7



Gigabyte Technology

Title			CPU LGA1150-B	
Size	Document Number	GA-Z97X-GAMING 5		Rev
Custom				1.02
Date:	Monday, September 01, 2014	Sheet	5	of 38

**(F, J)**



(X30)

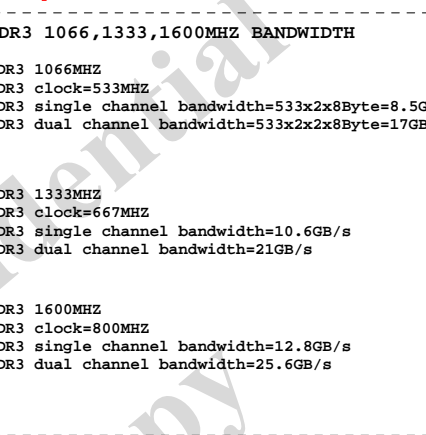
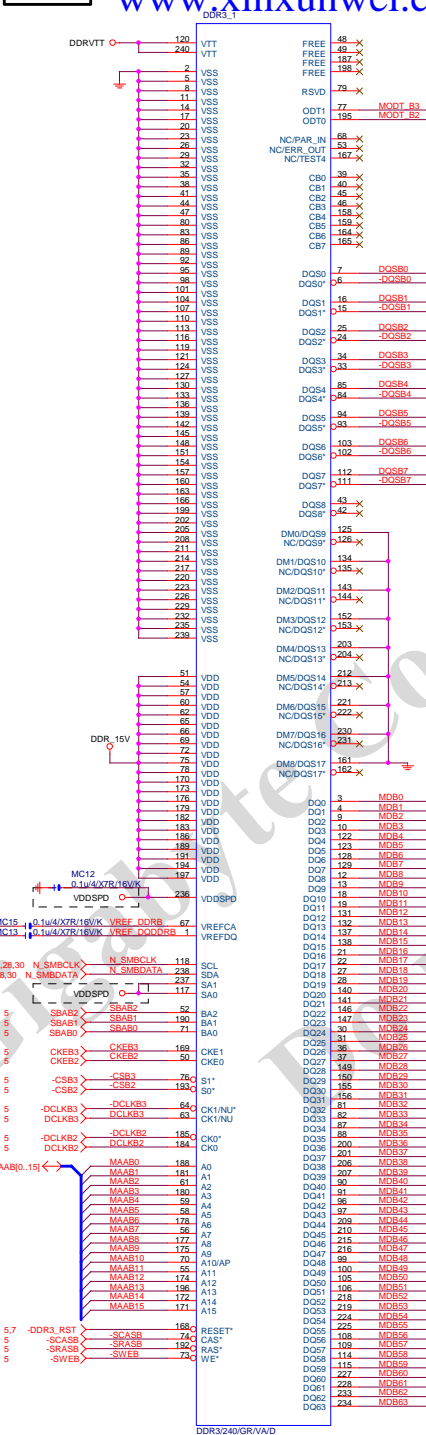


(X15)



Title				CPU LGA1150-C			
Size	Custom	Document Number					Rev
		GA-Z97X-GAMING 5					1.02
Date:	Monday, September 01, 2014			Sheet	6 of 38		

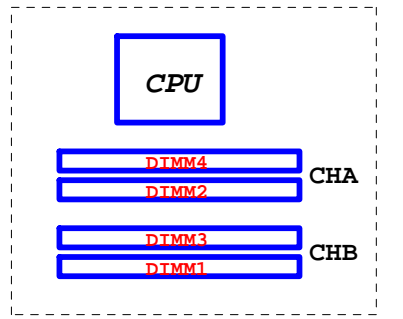
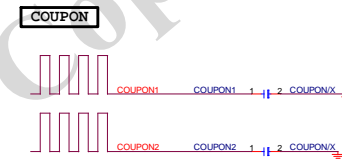




```
DDR3 1066MHZ
DDR3 clock=533MHZ
DDR3 single channel bandwidth=533x2x8Byte=8.5GB/s
DDR3 dual channel bandwidth=533x2x2x8Byte=17GB/s
```

```
| DDR3 1333MHZ
| DDR3 clock=667MHZ
| DDR3 single channel bandwidth=10.6GB/s
| DDR3 dual channel bandwidth=21GB/s
```

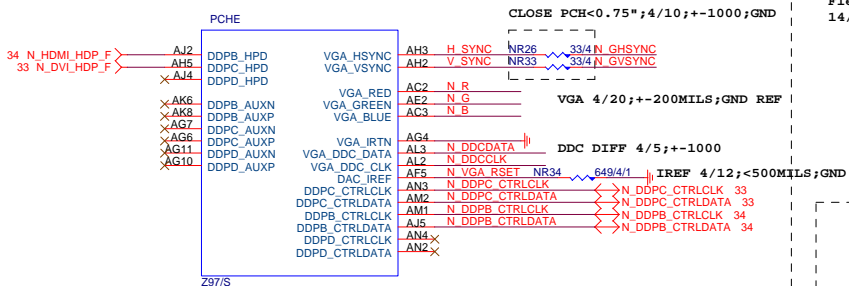
```
DDR3 1600MHZ
DDR3 clock=800MHZ
DDR3 single channel bandwidth=12.8GB/s
DDR3 dual channel bandwidth=25.6GB/s
```



<h1 style="text-align: center;">Gigabyte Technology</h1>			
Title <span style="float: right;">DDRIII CHANNEL B</span>			
Size Custom	Document Number <b>GA-Z97X-GAMING 5</b>		Rev <b>1.02</b>
Date	Sheet 8 of 38		



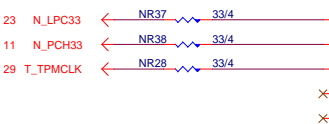
## PCH (E)



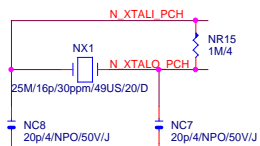
## VGA DISABLE

R,G,B NC OR GND

IRTN / IREF GND

VGA\_HSYNC, VGA\_VSYNC, DDC\_CLK,  
DDC\_DATA NCPOWER VCCADAC(AF2),  
VCCADACBG(AE1) GNDFlex1,2,3,4 :  
14/24/33/48MHZ

XTAL Trace Length &lt; 1500 mil

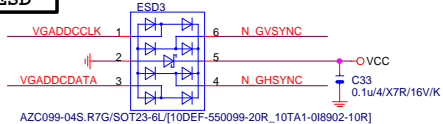
X'TAL 25MHz須參考GND  
CRYSTAL/TRACE 週邊不要有訊號,VIA靠近  
走線遠離其他40mil以上

## PCH CLK PD

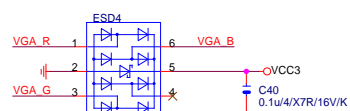


Mount for integrated clock Generation Mode

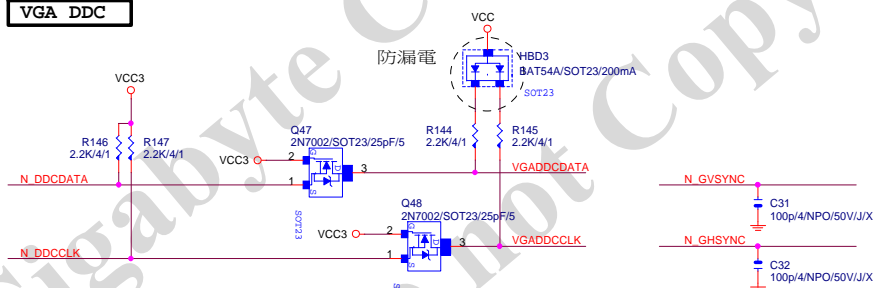
## VGA ESD



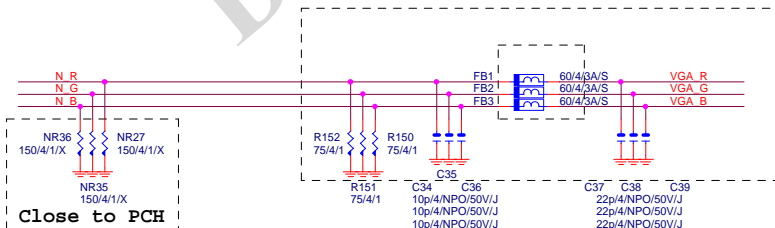
## SSOP6\_ESD



## VGA DDC

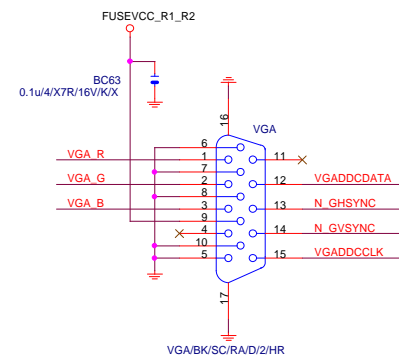


## VGA DDC



Close to VGA connector

## VGA CONNECTOR



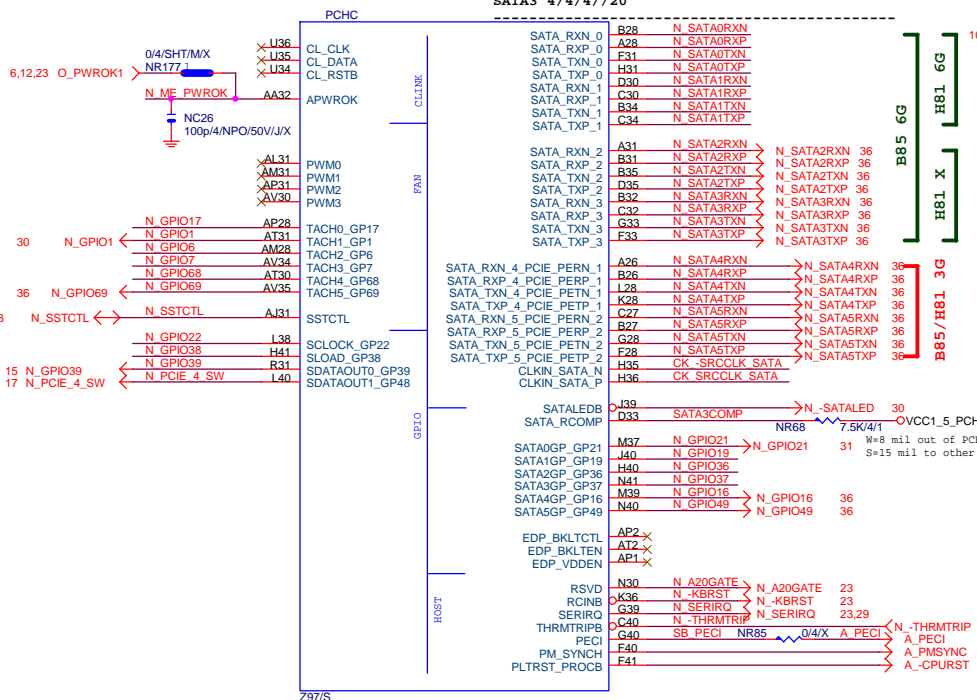
Gigabyte Technology

Title			
PCH DISPLAY_CLK BUFFER			
Size	Document Number	Rev	
Custom	GA-Z97X-GAMING 5	1.02	
Date:	Monday, September 01, 2014	Sheet	10 of 38

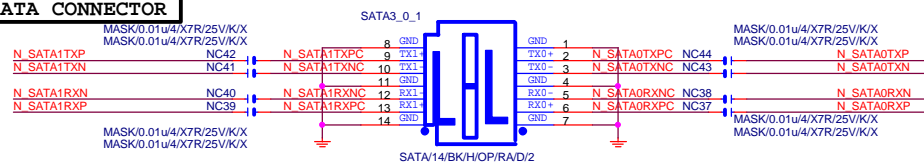
**PCH (C)**

SATA3 : 20/4/4/4/20 (breakout min 8/4/4/4/8)  
Impedance=85 +- 17.5%

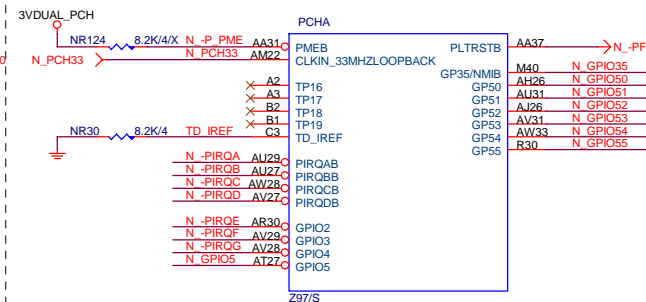
```
SATA2 4/4/4//15
SATA3 4/4/4//20
```



## SATA CONNECTOR



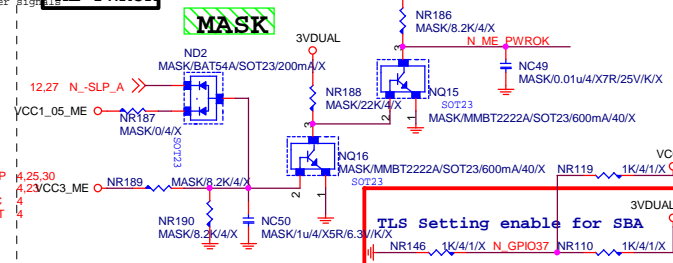
PCH (A)



```
Default int pull up on GP51,
Default SPI boot devices
```

BOOT DEVICE	GP51	GP19
LPC	0	0
SPI	float	float

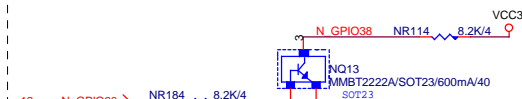
ME PWROK



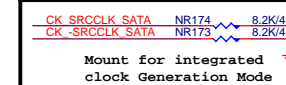
GPIO38 Ctrl

MFG Mode

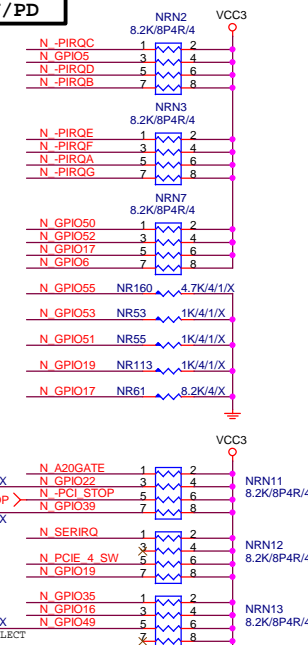
```
N_GPIO38 : Lo --> Enable
           Hi --> Disable
```



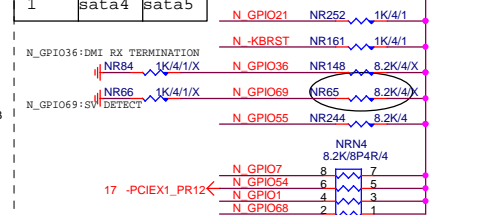
## PCH CLK PD



## PCH PU/PD



soft strap	GP16	GP49
0	pcie1	pcie2
1	sata4	sata5

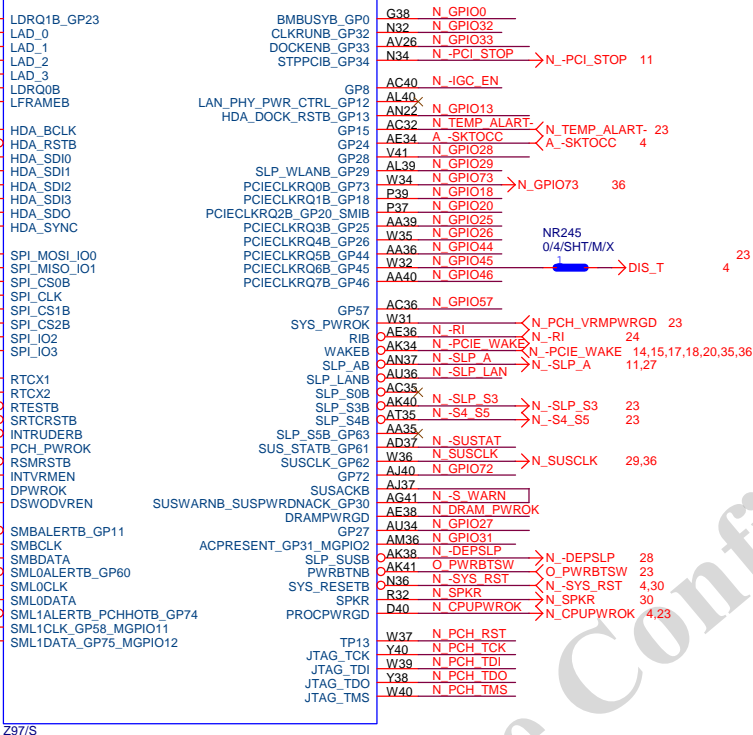
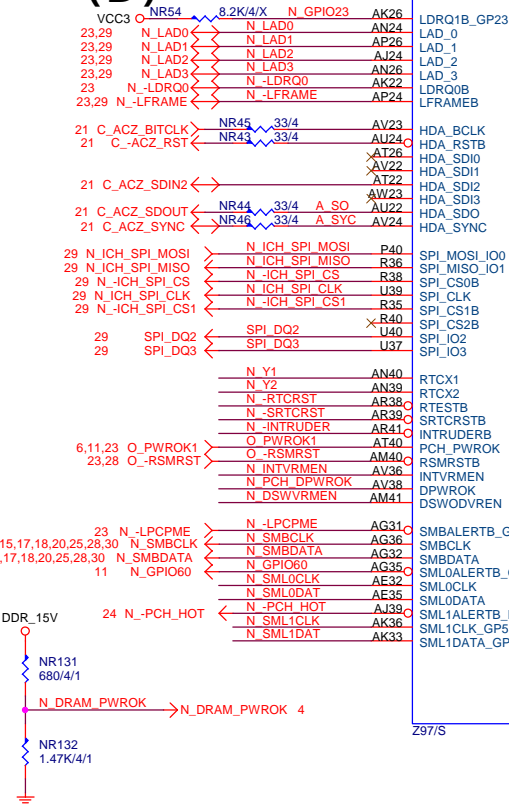


## Gigabyte Technology

Title			
PCH HOST , SATA, PCI			
Size	Document Number		Rev
Custom	GA-Z97X-GAMING 5		1.02
Date:	Monday, September 01, 2014	Sheet	11 of 38

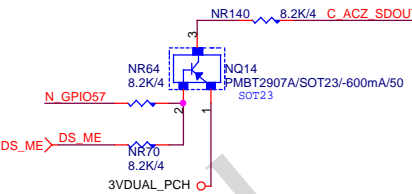
PCH

(D)



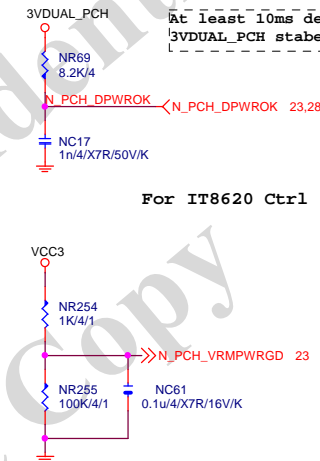
## ACZ\_SDOUT

```
C_ACZ_SDOUT : HI --> ME Enable
              Lo --> ME Disable
HI:disable ME and override SPI Flash Access
Permissions
```



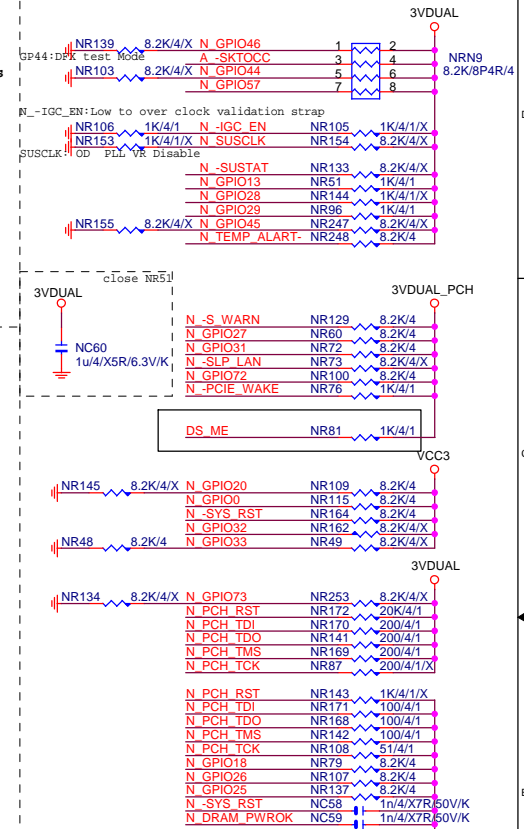
## PCH\_DPWROK

```
At least 10ms delay after
3VDUAL_PCH stabel
```

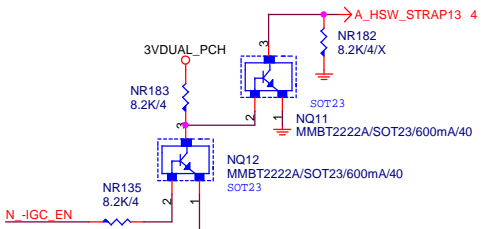


For IT8620 Ctrl

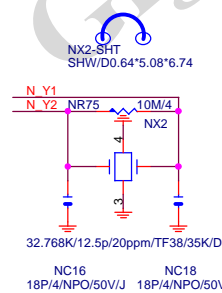
PCH	PU/PD
-----	-------



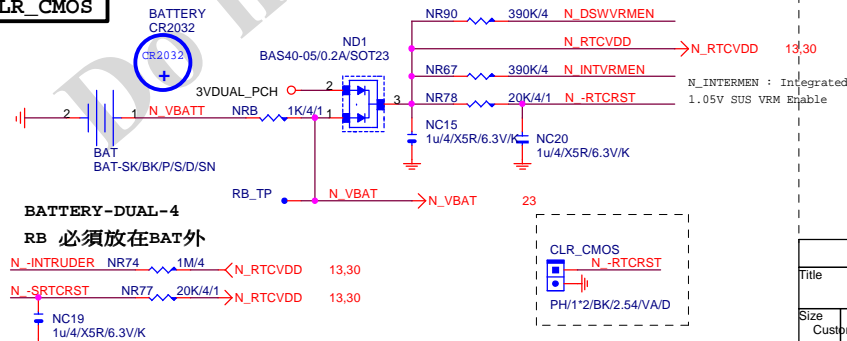
## HSW\_STRAP13



32.768KHZ



## CLR\_CMOS



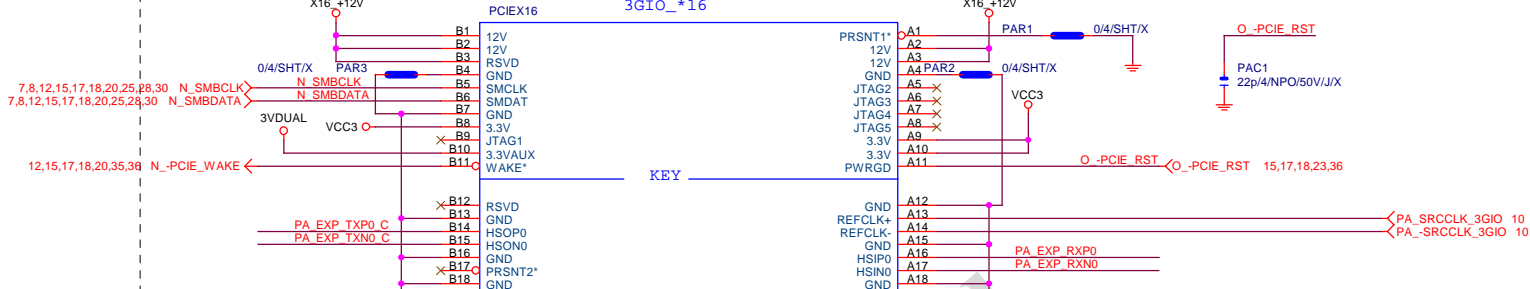
Pin	Signal	Pin	Signal
NR6	3V/DUAL	NR117	1K/4/1
8	8.2K/8P4R/4	NR120	1K/4/1
5		NR122	499/4/1
7		NR123	499/4/1
4		NR121	1K/4/1
3		NR97	1K/4/1
1			

## Gigabyte Technology

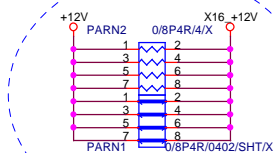
Title			
PCH GPIO , CTRL , AUDIO			
Size	Document Number	Rev	
Custom	GA-Z97X-GAMING 5	1.02	
Date:	Monday, September 01, 2014	Sheet	12 of 38



## PCIEX16 SLOT

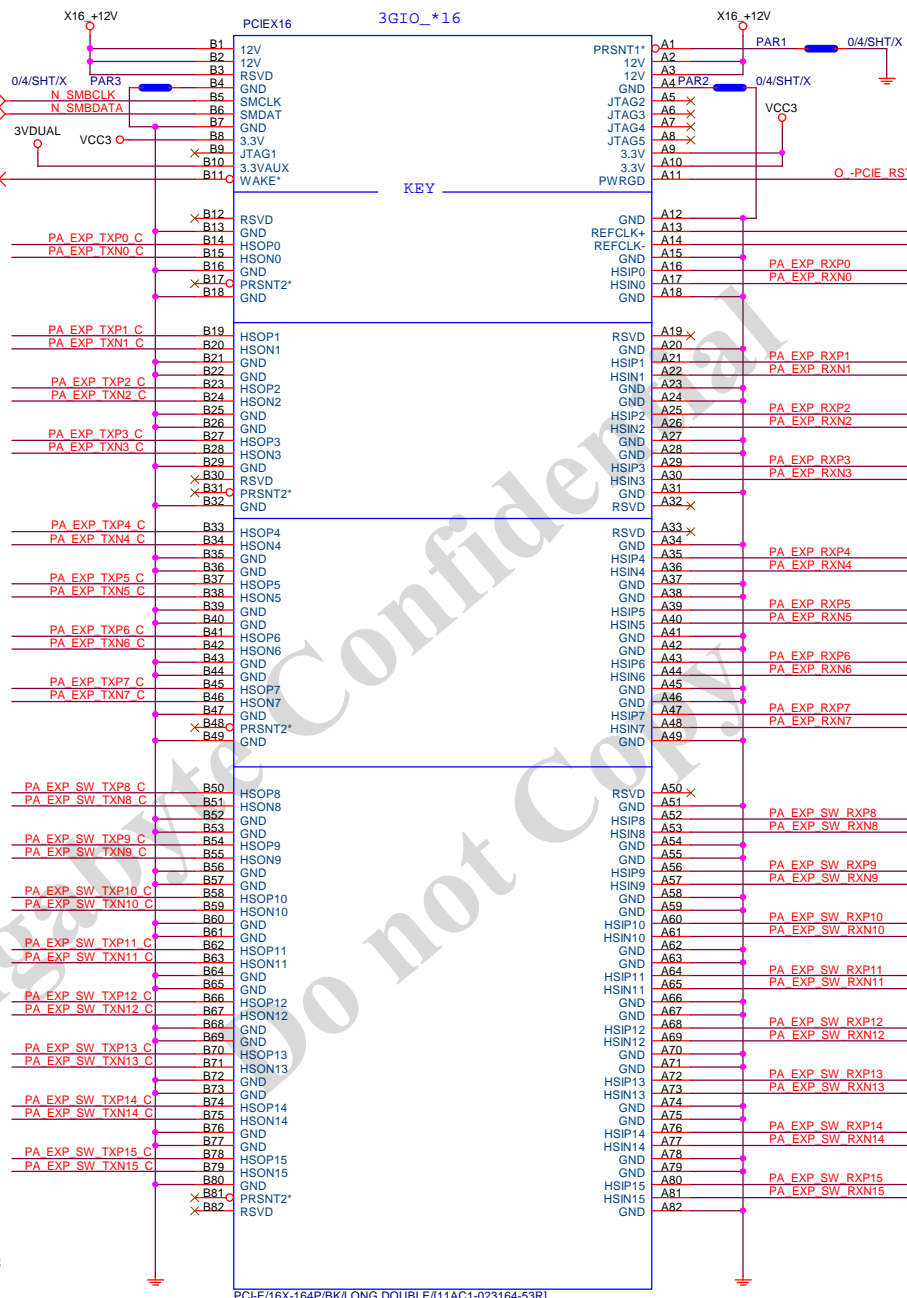


```
+12 protect
short-wire test
```



PA EXP TXP0	PAC5	0.22u4/X5R6.3V/K	PA EXP TXP0 C
PA EXP TXN0	PAC4	0.22u4/X5R6.3V/K	PA EXP TXN0 C
PA EXP TXP1	PAC6	0.22u4/X5R6.3V/K	PA EXP TXP1 C
PA EXP TXN1	PAC7	0.22u4/X5R6.3V/K	PA EXP TXN1 C
PA EXP TXP2	PAC8	0.22u4/X5R6.3V/K	PA EXP TXP2 C
PA EXP TXN3	PAC9	0.22u4/X5R6.3V/K	PA EXP TXN3 C
PA EXP TXP3	PAC10	0.22u4/X5R6.3V/K	PA EXP TXP3 C
PA EXP TXN3	PAC11	0.22u4/X5R6.3V/K	PA EXP TXN3 C
PA EXP TXP4	PAC12	0.22u4/X5R6.3V/K	PA EXP TXP4 C
PA EXP TXN4	PAC13	0.22u4/X5R6.3V/K	PA EXP TXN4 C
PA EXP TXP5	PAC14	0.22u4/X5R6.3V/K	PA EXP TXP5 C
PA EXP TXN5	PAC15	0.22u4/X5R6.3V/K	PA EXP TXN5 C
PA EXP TXP6	PAC16	0.22u4/X5R6.3V/K	PA EXP TXP6 C
PA EXP TXN6	PAC17	0.22u4/X5R6.3V/K	PA EXP TXN6 C
PA EXP TXP7	PAC18	0.22u4/X5R6.3V/K	PA EXP TXP7 C
PA EXP TXN7	PAC19	0.22u4/X5R6.3V/K	PA EXP TXN7 C
PA EXP SW TXP8	PAC21	0.22u4/X5R6.3V/K	PA EXP SW TXP8 C
PA EXP SW TXN8	PAC20	0.22u4/X5R6.3V/K	PA EXP SW TXN8 C
PA EXP SW TXP9	PAC22	0.22u4/X5R6.3V/K	PA EXP SW TXP9 C
PA EXP SW TXN9	PAC23	0.22u4/X5R6.3V/K	PA EXP SW TXN9 C
PA EXP SW TXP10	PAC24	0.22u4/X5R6.3V/K	PA EXP SW TXP10 C
PA EXP SW TXN10	PAC25	0.22u4/X5R6.3V/K	PA EXP SW TXN10 C
PA EXP SW TXP11	PAC26	0.22u4/X5R6.3V/K	PA EXP SW TXP11 C
PA EXP SW TXN11	PAC27	0.22u4/X5R6.3V/K	PA EXP SW TXN11 C
PA EXP SW TXP12	PAC28	0.22u4/X5R6.3V/K	PA EXP SW TXP12 C
PA EXP SW TXN12	PAC29	0.22u4/X5R6.3V/K	PA EXP SW TXN12 C
PA EXP SW TXP13	PAC30	0.22u4/X5R6.3V/K	PA EXP SW TXP13 C
PA EXP SW TXN13	PAC31	0.22u4/X5R6.3V/K	PA EXP SW TXN13 C
PA EXP SW TXP14	PAC32	0.22u4/X5R6.3V/K	PA EXP SW TXP14 C
PA EXP SW TXN14	PAC33	0.22u4/X5R6.3V/K	PA EXP SW TXN14 C
PA EXP SW TXP15	PAC34	0.22u4/X5R6.3V/K	PA EXP SW TXP15 C
PA EXP SW TXN15	PAC35	0.22u4/X5R6.3V/K	PA EXP SW TXN15 C

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



PCIEX16:16/5/5/5/16

PA\_EXP\_RXP[0..15] &gt;&gt; PA\_EXP\_RXP[0..15]

PA\_EXP\_RXN[0..15] >> PA\_EXP\_RXN[0..15] 4.16

PA EXP TXP[0..15] >> PA EXP TXP[0..15] 4.16

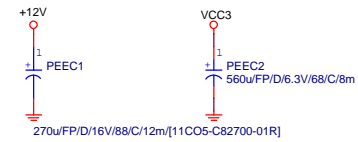
PA\_EXP\_TXN[0..15] >> PA\_EXP\_TXN[0..15] 4,16

PA EXP SW RXP[8..15] >> PA EXP SW RXP[8..15] 16

PA\_EXP\_SW\_RXN[8..15] >> PA\_EXP\_SW\_RXN[8..15] 16

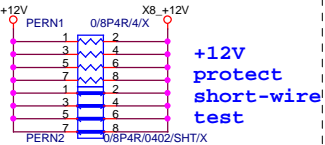
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PA EXP SW TXN[8..15] >>PA EXP SW TXN[8..15] 16



7,8,12,14,17,18,20,25,28,30 N\_SMBCLK PER8  
7,8,12,14,17,18,20,25,28,30 N\_SMBDATA PER9

### PCIEX8 PROTECT SHT



12,14,17,18,20,35,36 N\_-PCIE\_WAKE

PE\_EXP\_SW\_TXP8\_C  
PE\_EXP\_SW\_TXN8\_C

PE\_EXP\_SW\_TXP9\_C  
PE\_EXP\_SW\_TXN9\_C

PE\_EXP\_SW\_TXP10\_C  
PE\_EXP\_SW\_TXN10\_C

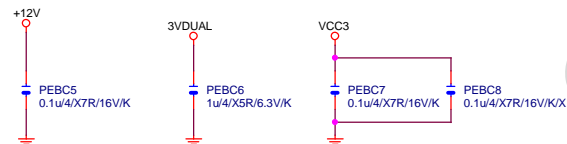
PE\_EXP\_SW\_TXP11\_C  
PE\_EXP\_SW\_TXN11\_C

PE\_EXP\_SW\_TXP12\_C  
PE\_EXP\_SW\_TXN12\_C

PE\_EXP\_SW\_TXP13\_C  
PE\_EXP\_SW\_TXN13\_C

PE\_EXP\_SW\_TXP14\_C  
PE\_EXP\_SW\_TXN14\_C

PE\_EXP\_SW\_TXP15\_C  
PE\_EXP\_SW\_TXN15\_C



16 PE\_16\_8\_SW

4 -8X\_EN

BAT54C/SOT23/200mA

11 N\_GPIO39

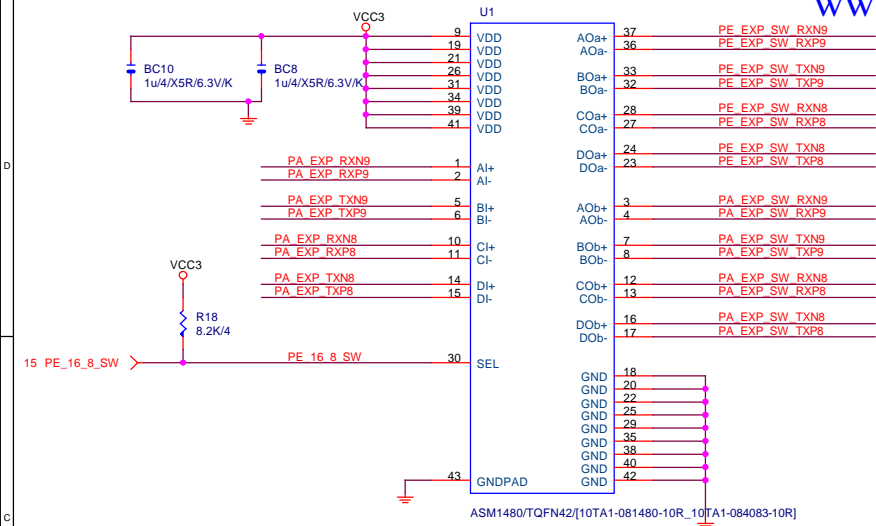
P.U. 在PCH page

PCI-E/16X-99P/BK/RIGHT PUSH(11AC1-023099-12R)

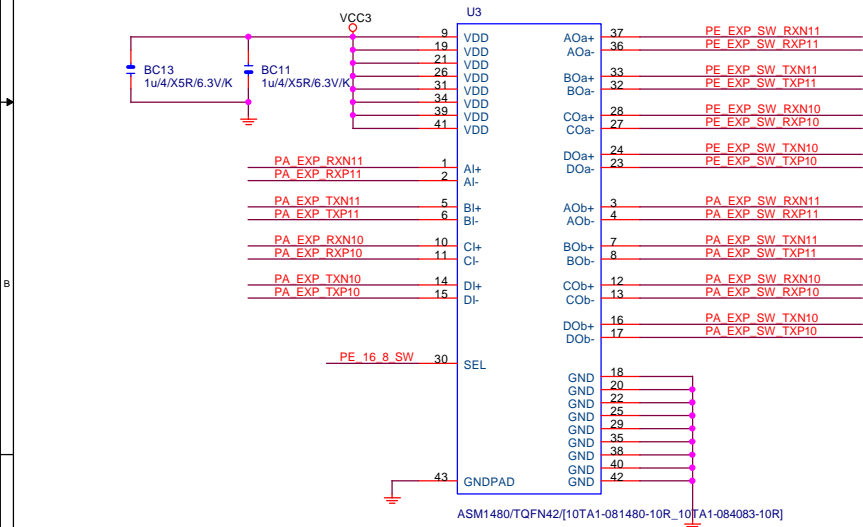
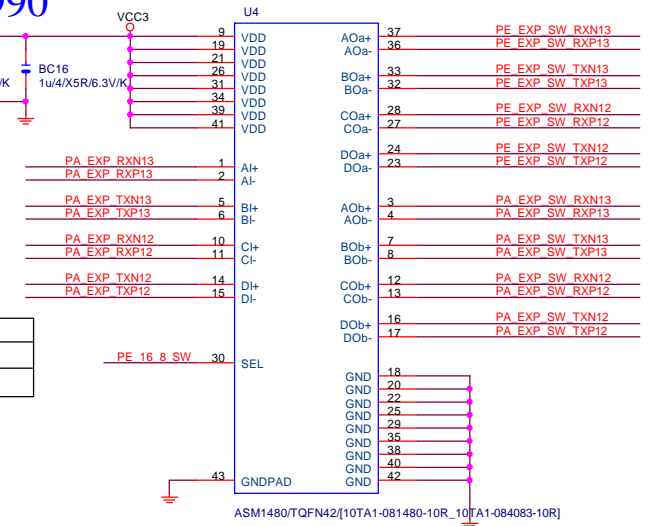
PE_EXP_SW_TXP8	PEC7	0.22u4/X5R/6.3V/K	PE_EXP_SW_TXP8_C
PE_EXP_SW_TXN8	PEC8	0.22u4/X5R/6.3V/K	PE_EXP_SW_TXN8_C
PE_EXP_SW_TXP9	PEC9	0.22u4/X5R/6.3V/K	PE_EXP_SW_TXP9_C
PE_EXP_SW_TXN9	PEC10	0.22u4/X5R/6.3V/K	PE_EXP_SW_TXN9_C
PE_EXP_SW_TXP10	PEC11	0.22u4/X5R/6.3V/K	PE_EXP_SW_TXP10_C
PE_EXP_SW_TXN10	PEC12	0.22u4/X5R/6.3V/K	PE_EXP_SW_TXN10_C
PE_EXP_SW_TXP11	PEC13	0.22u4/X5R/6.3V/K	PE_EXP_SW_TXP11_C
PE_EXP_SW_TXN11	PEC14	0.22u4/X5R/6.3V/K	PE_EXP_SW_TXN11_C
PE_EXP_SW_TXP12	PEC15	0.22u4/X5R/6.3V/K	PE_EXP_SW_TXP12_C
PE_EXP_SW_TXN12	PEC16	0.22u4/X5R/6.3V/K	PE_EXP_SW_TXN12_C
PE_EXP_SW_TXP13	PEC17	0.22u4/X5R/6.3V/K	PE_EXP_SW_TXP13_C
PE_EXP_SW_TXN13	PEC18	0.22u4/X5R/6.3V/K	PE_EXP_SW_TXN13_C
PE_EXP_SW_TXP14	PEC19	0.22u4/X5R/6.3V/K	PE_EXP_SW_TXP14_C
PE_EXP_SW_TXN14	PEC20	0.22u4/X5R/6.3V/K	PE_EXP_SW_TXN14_C
PE_EXP_SW_TXP15	PEC21	0.22u4/X5R/6.3V/K	PE_EXP_SW_TXP15_C
PE_EXP_SW_TXN15	PEC22	0.22u4/X5R/6.3V/K	PE_EXP_SW_TXN15_C

### Gigabyte Technology

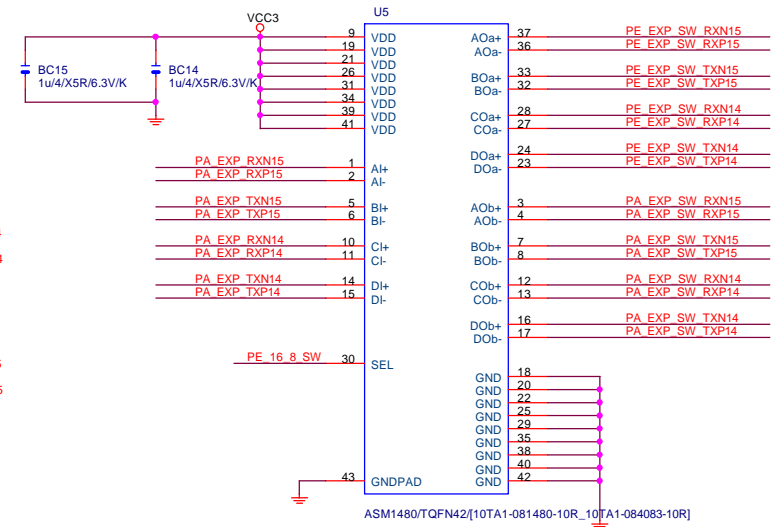
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PCI EXPRESS X8			
Size	Document Number	Rev	
Custom	GA-Z97X-GAMING 5	1.02	
Date:	Monday, September 01, 2014	Sheet	15 of 38

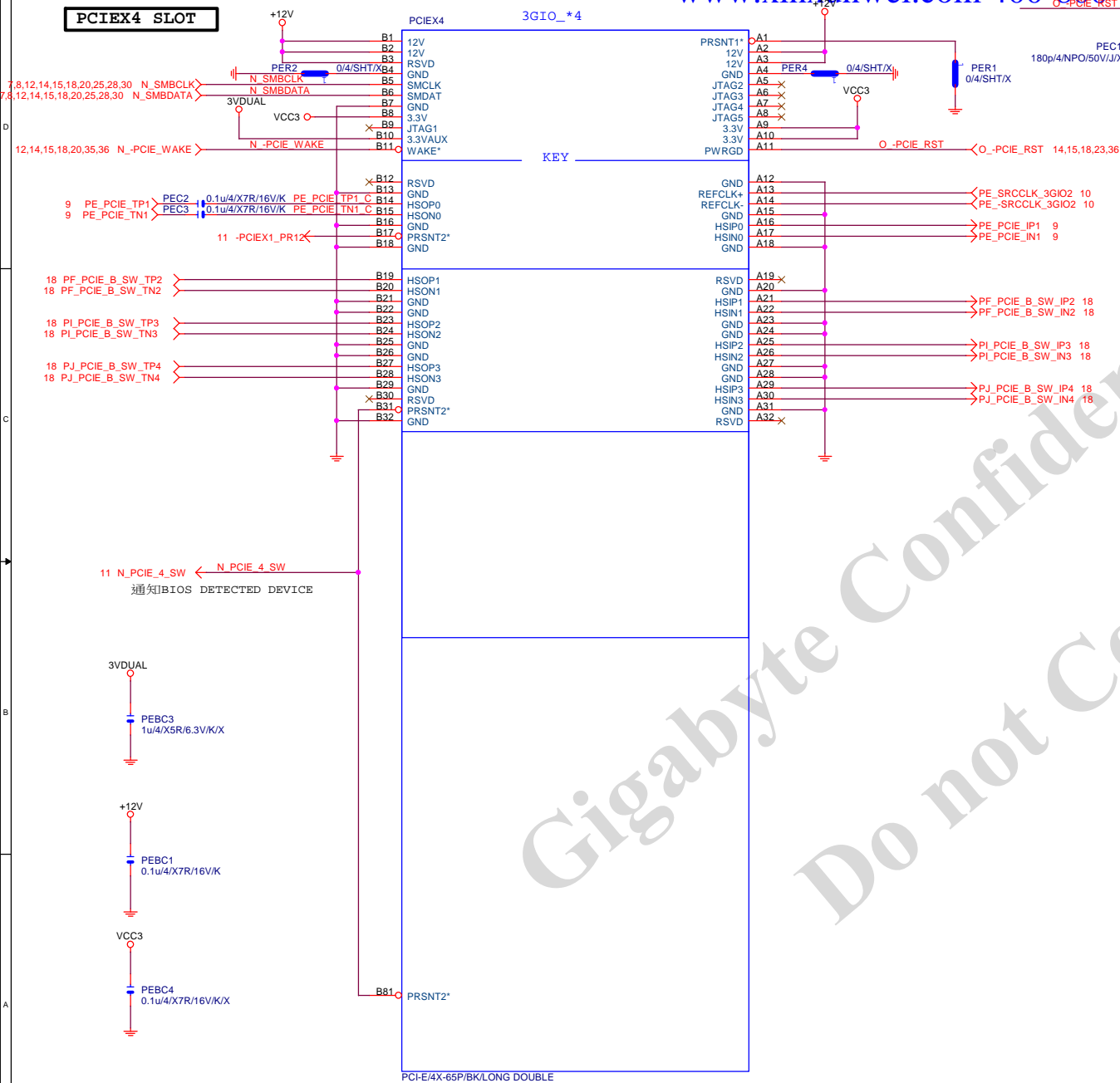


Function	SEL
xI--> xOa	L
xI--> xOb	H



PA\_EXP\_SW\_RXP[8..15] >> PA\_EXP\_SW\_RXP[8..15] 14  
PA\_EXP\_SW\_RXN[8..15] >> PA\_EXP\_SW\_RXN[8..15] 14  
PA\_EXP\_SW\_TXP[8..15] >> PA\_EXP\_SW\_TXP[8..15] 14  
PA\_EXP\_SW\_TXN[8..15] >> PA\_EXP\_SW\_TXN[8..15] 14  
PE\_EXP\_SW\_RXP[8..15] >> PE\_EXP\_SW\_RXP[8..15] 15  
PE\_EXP\_SW\_RXN[8..15] >> PE\_EXP\_SW\_RXN[8..15] 15  
PE\_EXP\_SW\_TXP[8..15] >> PE\_EXP\_SW\_TXP[8..15] 15  
PE\_EXP\_SW\_TXN[8..15] >> PE\_EXP\_SW\_TXN[8..15] 15  
PA\_EXP\_RXP[0..15] >> PA\_EXP\_RXP[0..15] 4,14  
PA\_EXP\_RXN[0..15] >> PA\_EXP\_RXN[0..15] 4,14  
PA\_EXP\_TXP[0..15] >> PA\_EXP\_TXP[0..15] 4,14  
PA\_EXP\_TXN[0..15] >> PA\_EXP\_TXN[0..15] 4,14



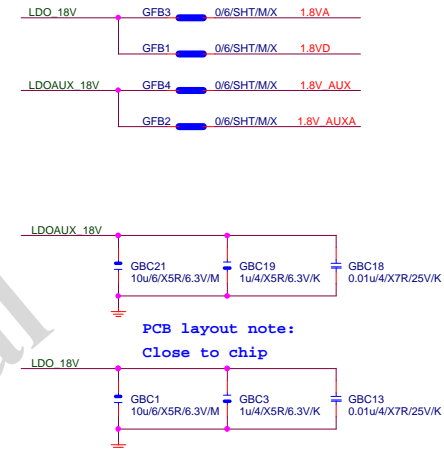
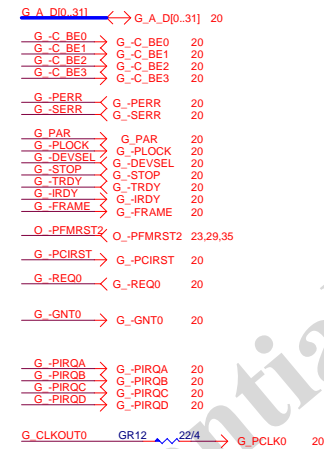


	N_PCIE_4_SW (PCH_GPIO48)	PCIEX4_X1 (SIO_GPIO27)
PCIEX1,PCIEX4 --> X1 (Default)	H	H
PCIEX4 No devices PCIEX4 -> X1	H	H
PCIEX4 Have devices PCIEX4 -> X4 PCIEX1_1/2 --> N/A	L	L

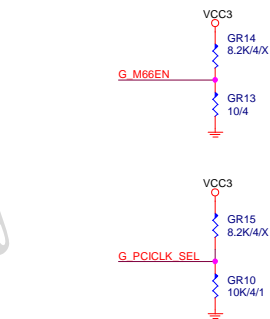
## Gigabyte Technology

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Size	Document Number	Rev
Custom	GA-Z97X-GAMING 5	1.02
Date:	Monday, September 01, 2014	Sheet 17 of 38

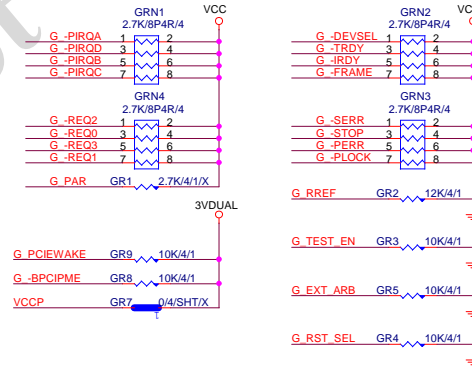


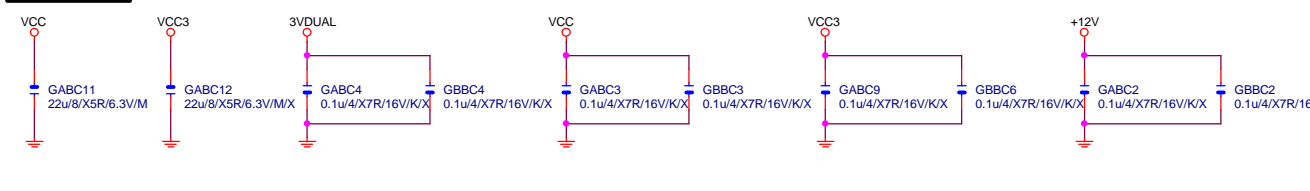
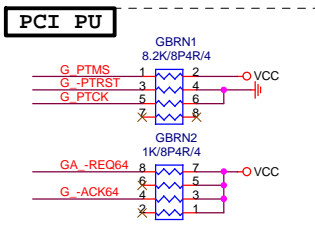


A horizontal number line is shown with tick marks at intervals of 1, labeled from 0 to 10. A pink dot is placed at the number 5. A vertical line segment is drawn from the 0 mark on the number line up to the pink dot at 5.



High: PCICLK INPUT form CLK Gen  
Low: PCICLK OUTPUT form IT8893 chip

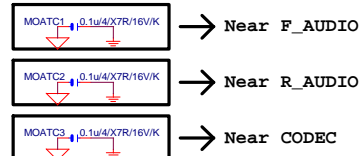
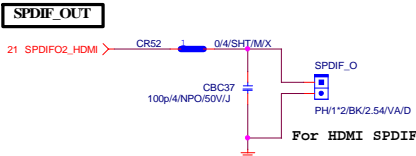
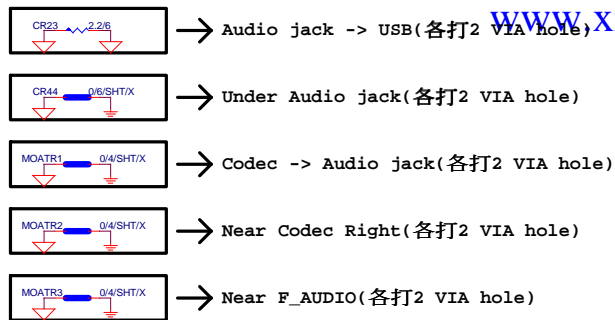






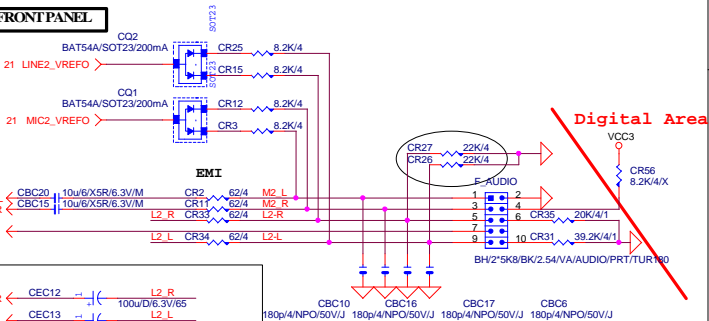
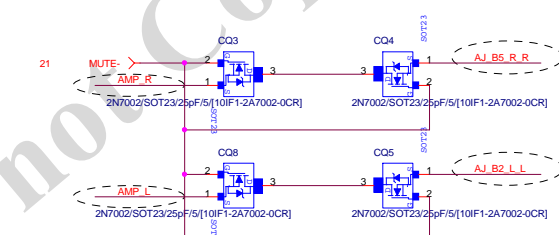
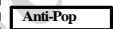
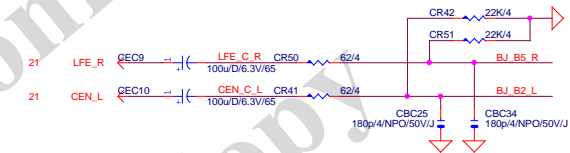
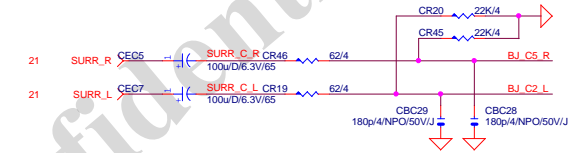
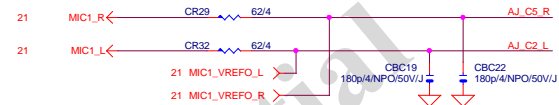
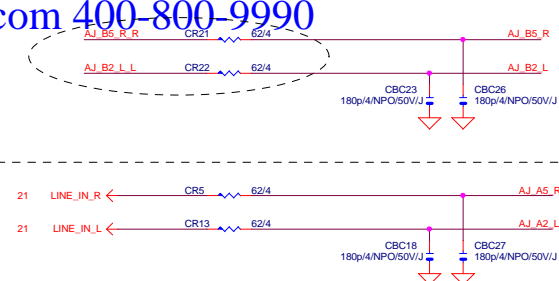
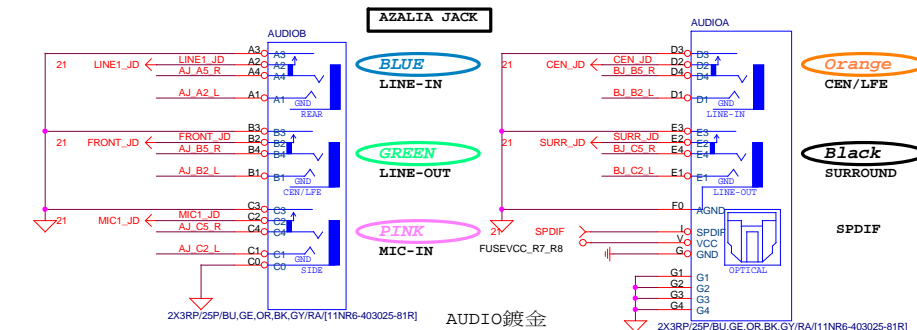
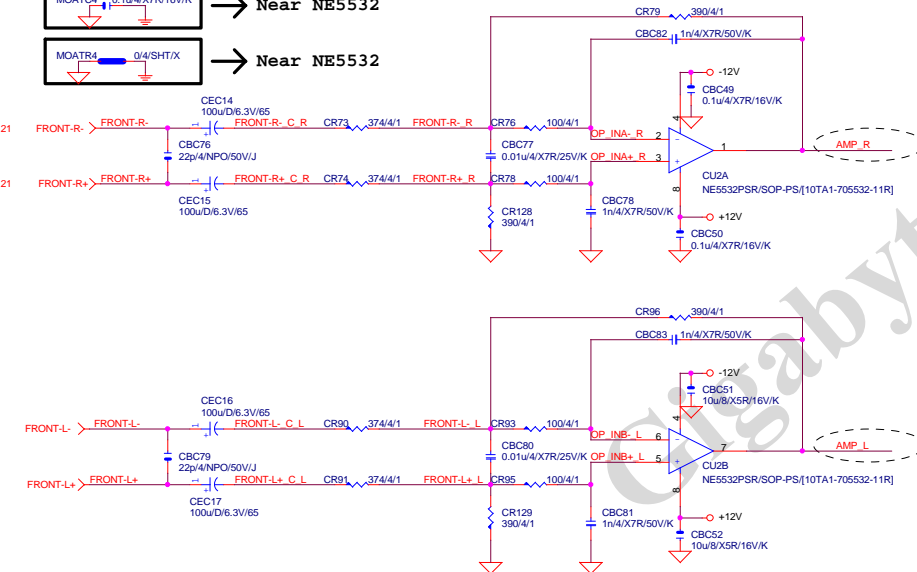
Size Custom	Document Number	<b>GA-Z97X-GAMING 5</b>	Rev 1.02
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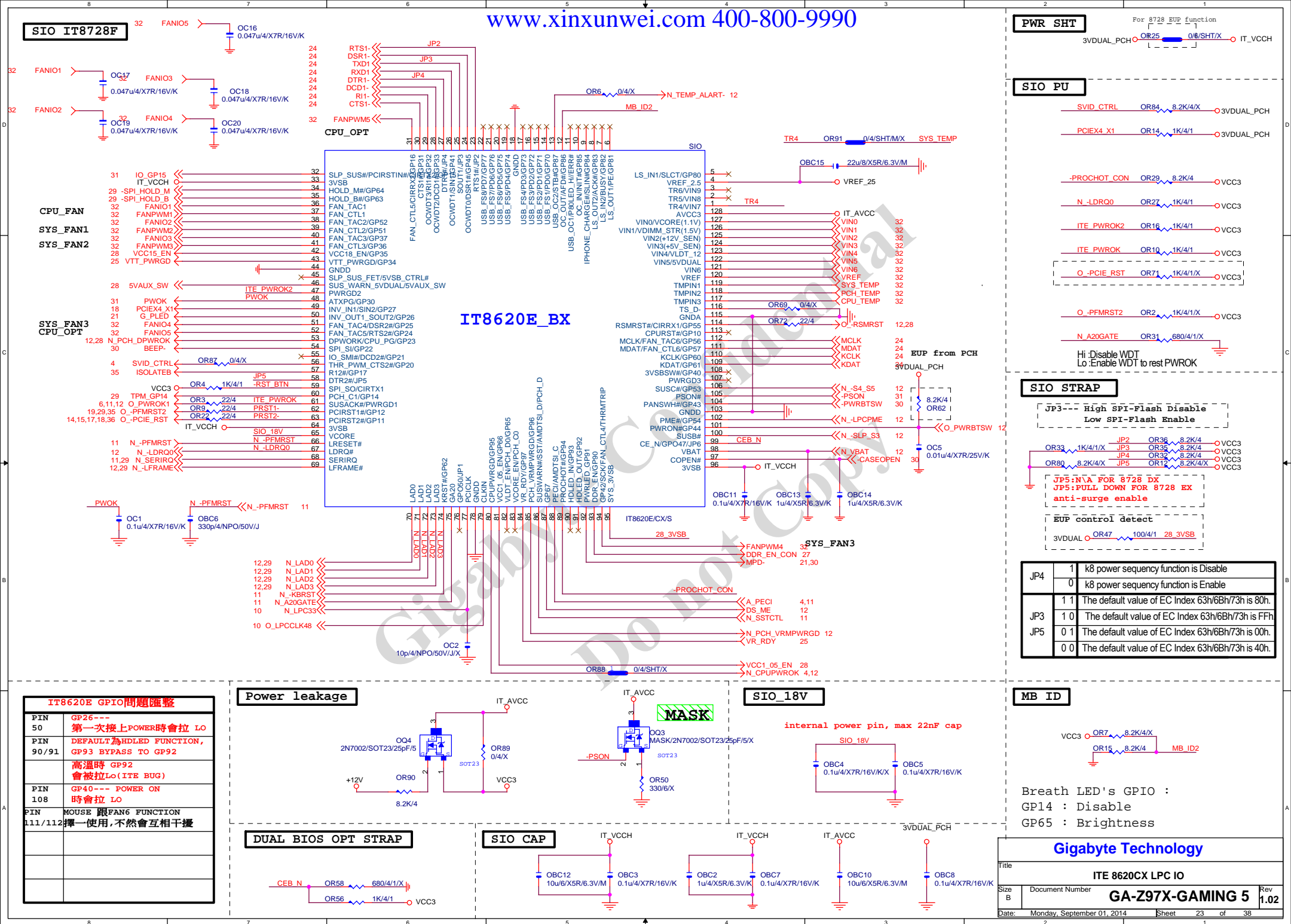
Date: Monday, September 01, 2014 Sheet 21 of 38

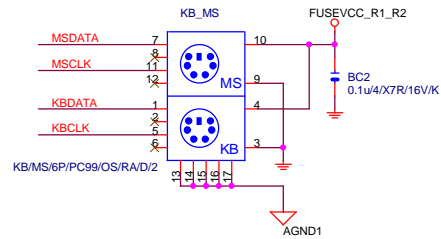
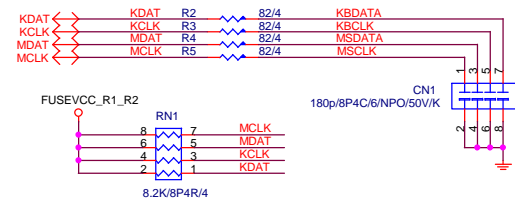
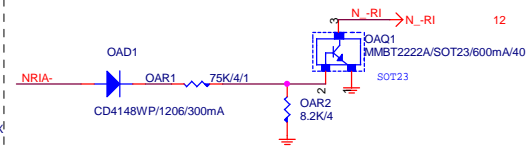


MOATC4 0.1u4/X7R/16V/K → Near NE5532

MOATR4 0/4/SHT/X → Near NE5532

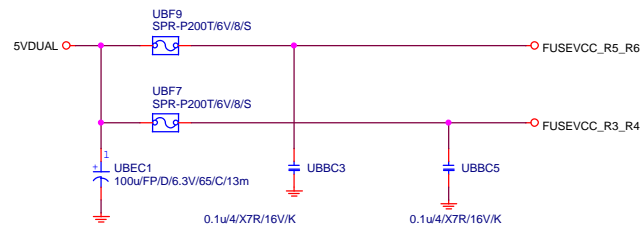
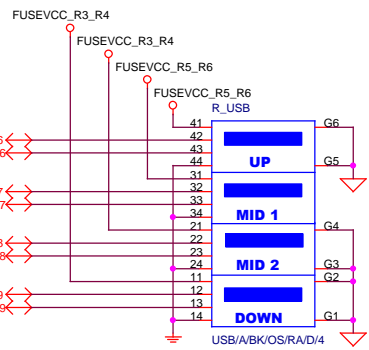




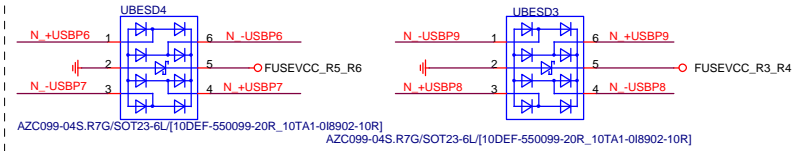


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USB20 FUSE



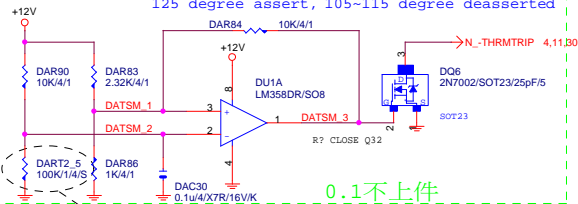
USB20 ESD PROTECT



Title			
COM/ PROHOT/ R_USB			
Size	Document Number		Rev
Custom	<b>GA-Z97X-GAMING 5</b>		<b>1.02</b>
Date:	Monday, September 01, 2014	Sheet	24 of 38

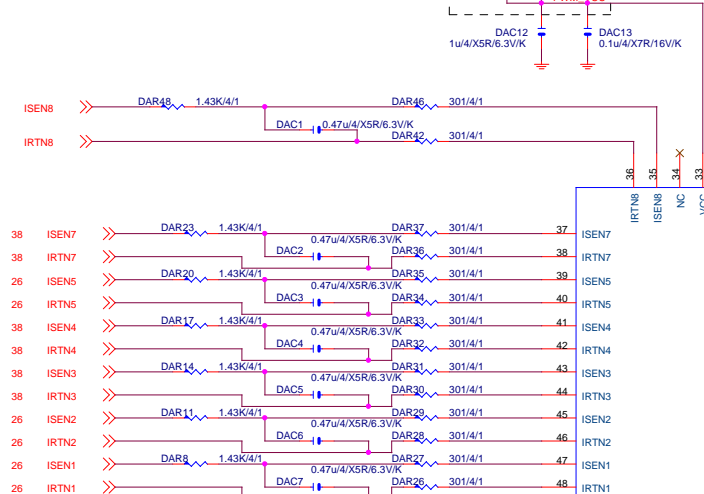
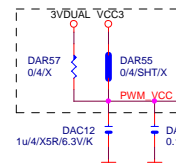
-PROHOT

OTP:132度 / PCB THERMAL TRIP:122 度  
125 degree assert, 105~115 degree deasserted

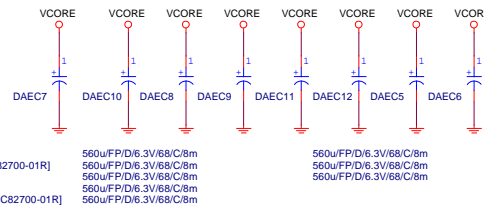
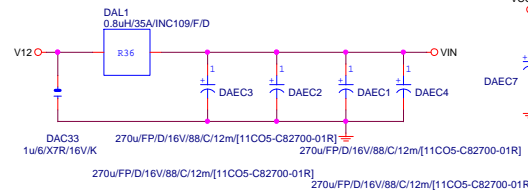
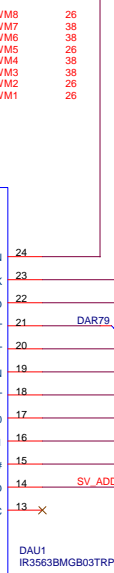


CLOSE Vcore PWM UPPER MOSFET

0.1不上件  
0.2上件

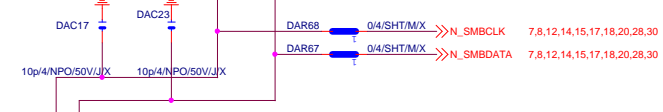
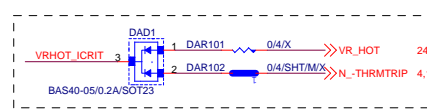


IR3563B



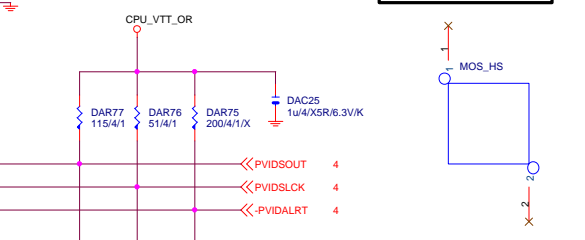
Debug Only

Remove  
PinHeader in  
modify PBOM



Addr: 70h

MOS HEATSINK



MOS\_HS

MOS\_HS2

MOS\_HS

MOS\_HS2

MOS\_HS

MOS\_HS2

MOS\_HS

MOS\_HS2

MOS\_HS

MOS\_HS2

MOS\_HS

MOS\_HS2

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MOS\_HS

MOS\_HS2

Gigabyte Technology

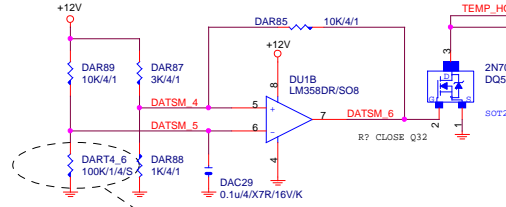
IR 3563A

GA-Z97X-GAMING 5

Rev 1.02

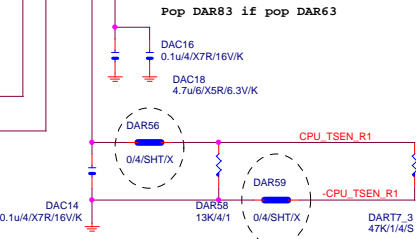
Title	Document Number	Rev
Size	Custom	Monday, September 01, 2014
Date:	Monday, September 01, 2014	Sheet 25 of 38

125 degree assert, 105~115 degree deasserted

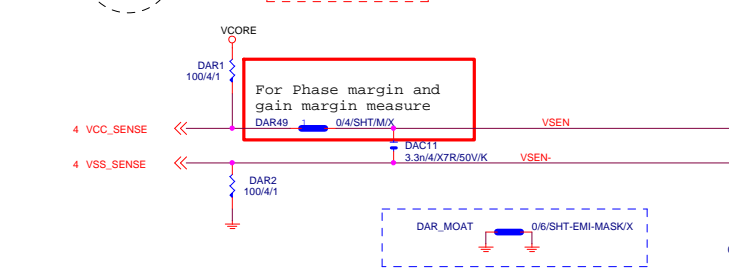


CLOSE Vcore PWM LOWER MOSFET

Pop DAR83 if pop DAR63



Close to  
Vcore  
output  
inductor



4 VCC\_SENSE

4 VSS\_SENSE

4 VCC\_SENSE

4 VSS\_SENSE

4 VCC\_SENSE

4 VSS\_SENSE

4 VCC\_SENSE

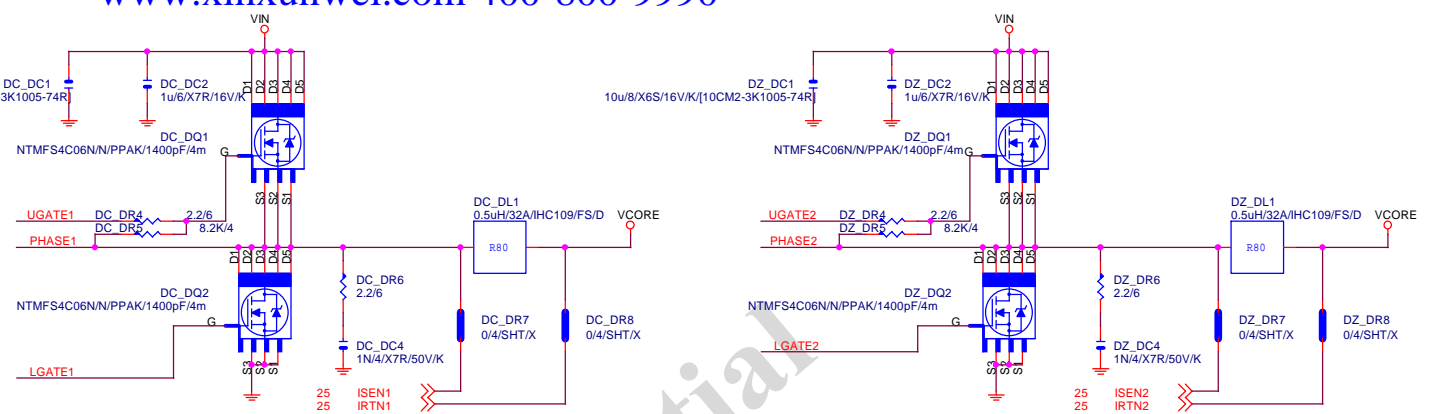
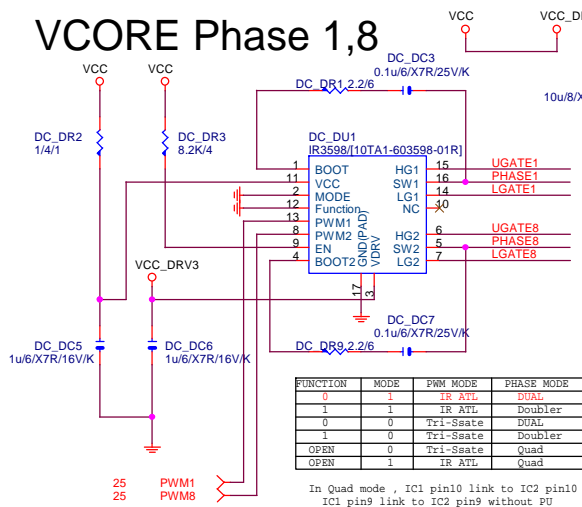
4 VSS\_SENSE

4 VCC\_SENSE

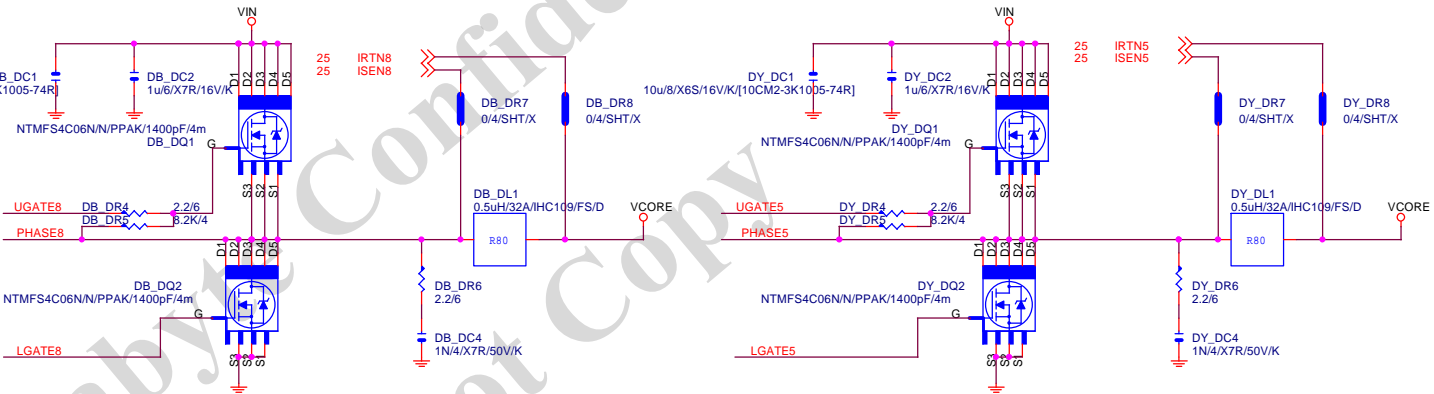
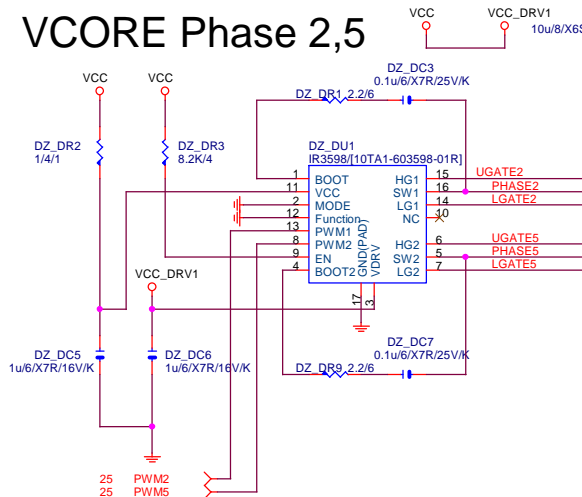
4 VSS\_SENSE

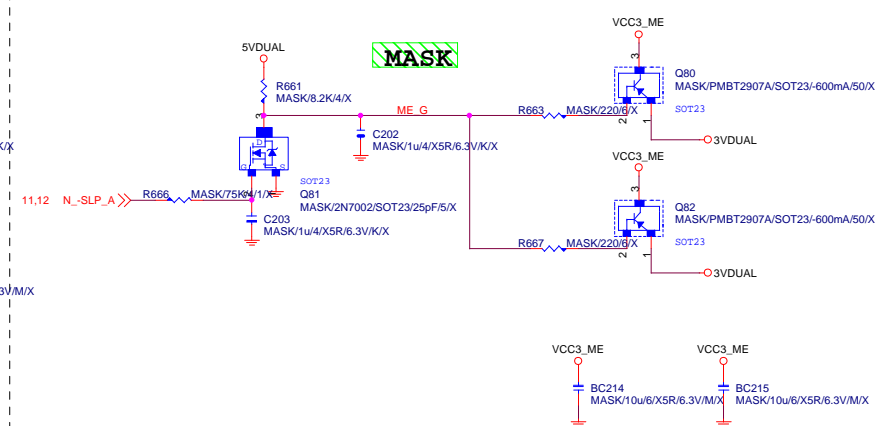
4 VCC\_SENSE

## VCORE Phase 1,8

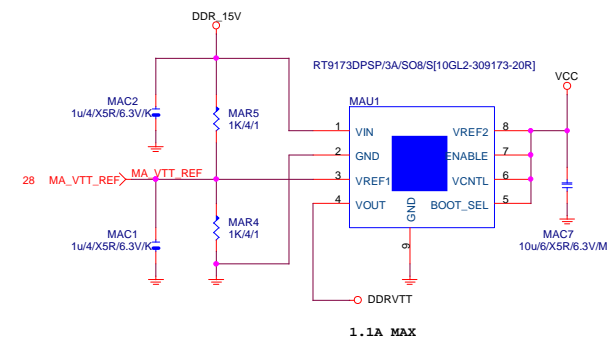


## VCORE Phase 2,5





DDRVTT

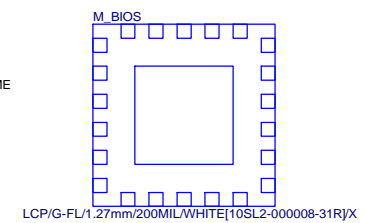
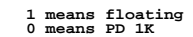


Remote sense請從最重的負載端點拉回

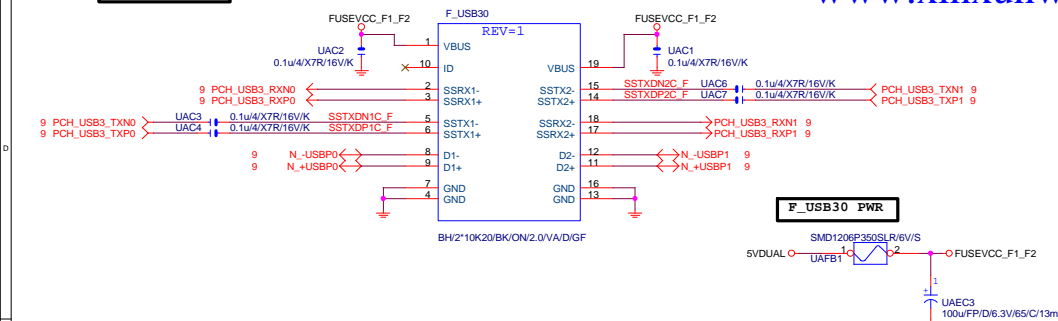
$$0.8 \cdot [1 + 2K / 2.2K] = 1.527V$$
$$0.8 \cdot [1 + 2K / 2.2K] = 1.527V$$
$$0.8 \cdot [1 + 2K / 2.2K] = 1.527V$$

<b>Gigabyte Technology</b>			
Title <b>DDR15V/M3 POWER</b>			
Size	Document Number		Rev
Custom	<b>GA-Z97X-GAMING 5</b>		<b>1.02</b>
Date:	Monday, September 01, 2014	Sheet	27 of 38

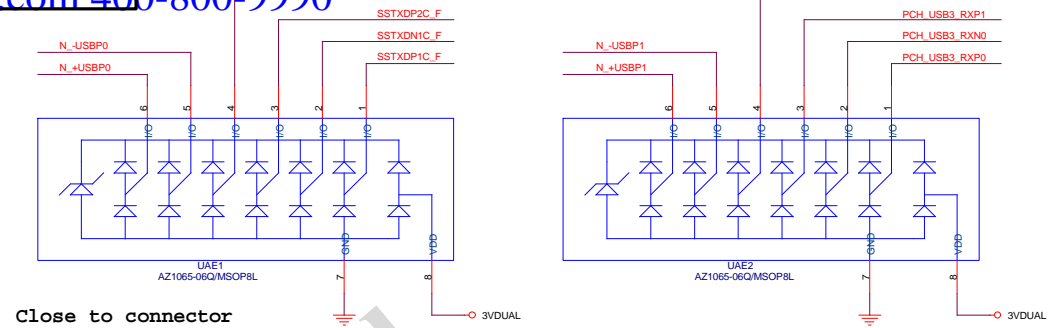




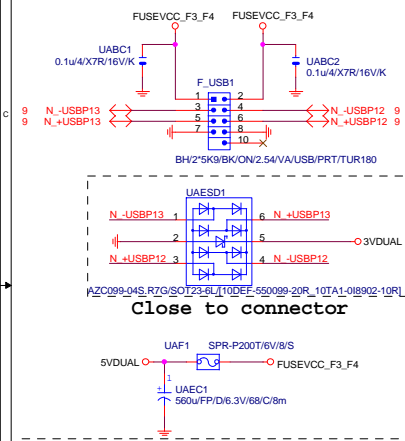
## Front USB3.0



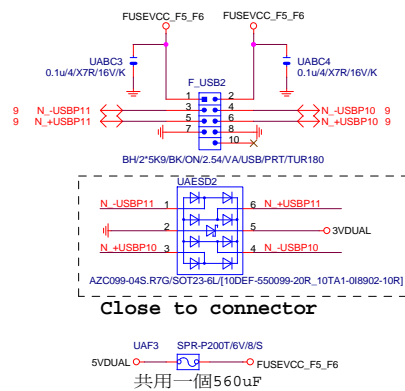
Close to connector



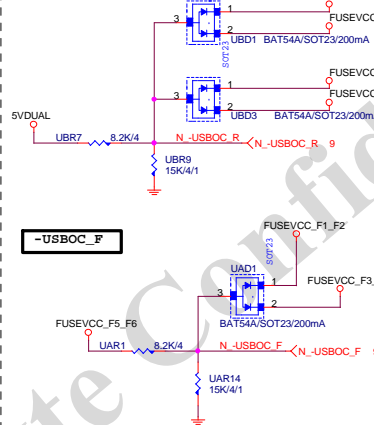
## FRONT USB1



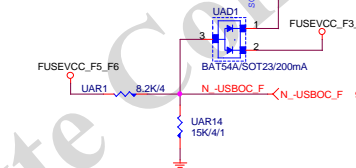
## FRONT USB2



## -USBOC\_R

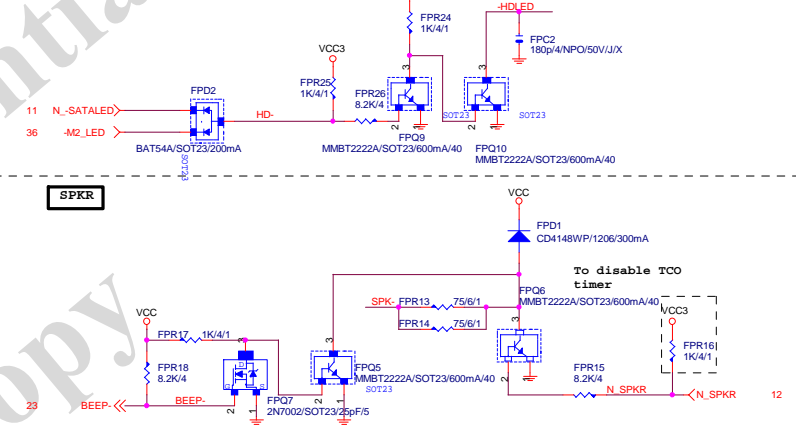


## -USBOC\_F

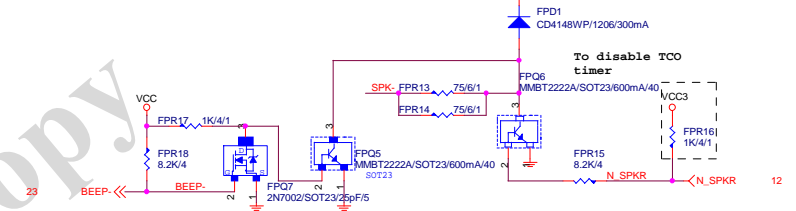


## SATA LED

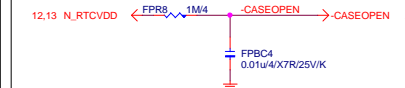
SATALED# signal open-collector, pull-up (8.2 kΩ to 10 kΩ) to Vcc3\_3



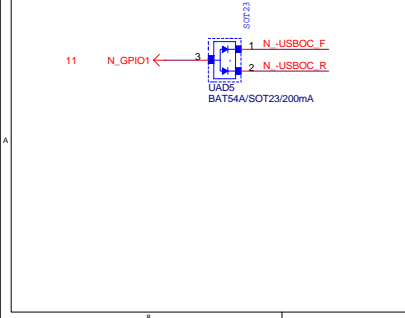
## SPKR



## CASE OPEN



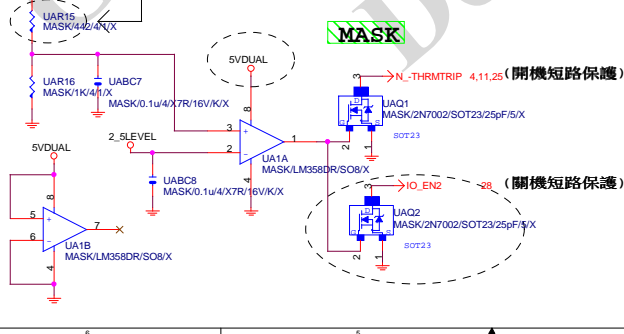
## F\_USB POWER PROTECT



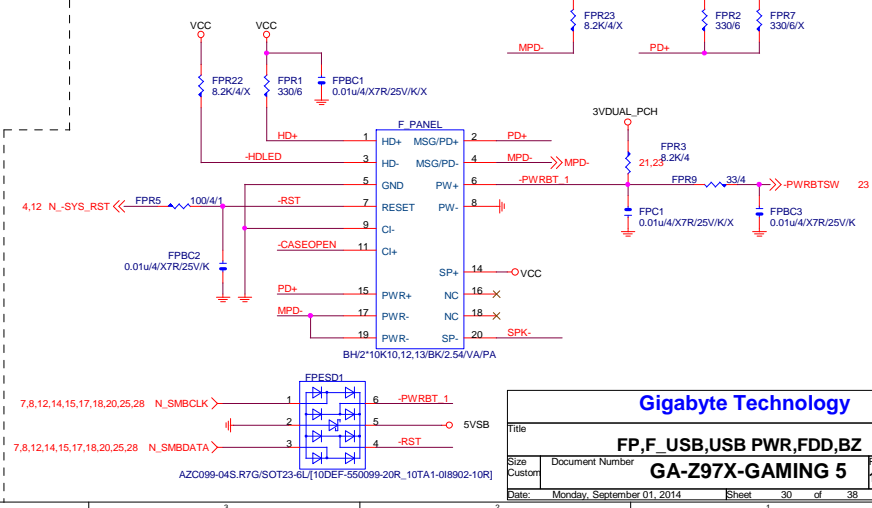
## USB2.0 Signal &amp; power short protection

USB2.0 Signal &gt; 4.85V

Enable --&gt; 3VDUAL=3.5V



## INTEL FRONT PANEL

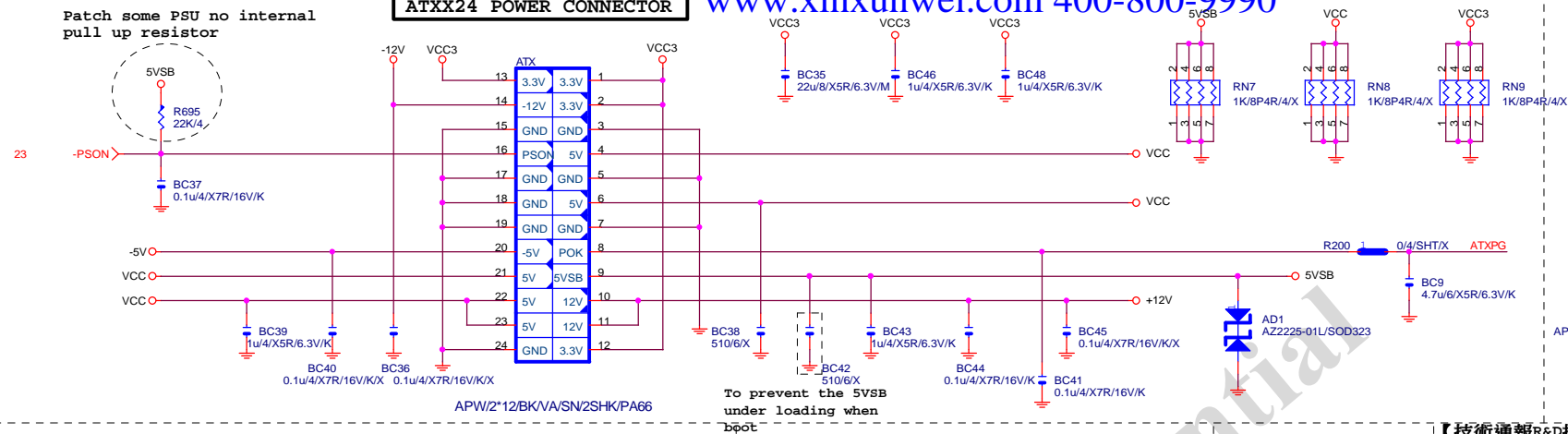


Gigabyte Technology

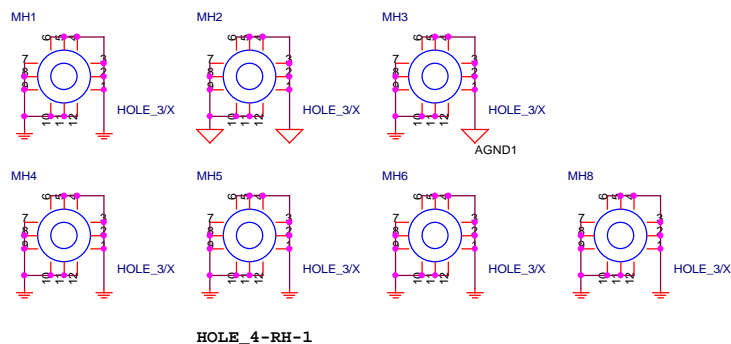
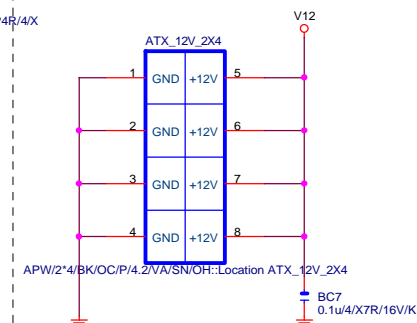
FP,F_USB,USB PWR,FDD,BZ			
Title	Document Number	Rev	1.02
Size	Custom		
Date: Monday, September 01, 2014	Sheet	30	of 38

## ATXX24 POWER CONNECTOR

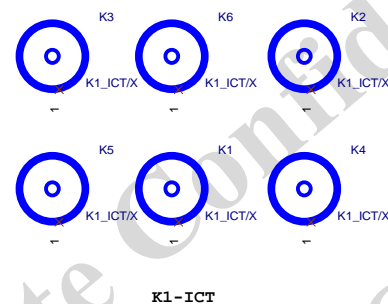
Patch some PSU no internal pull up resistor



## ATXX4 POWER CONNECTOR

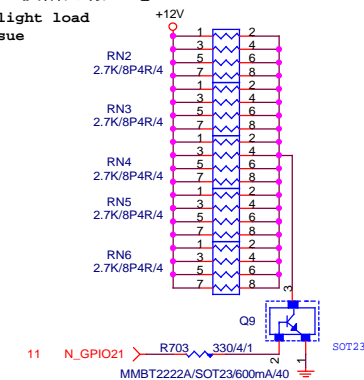


To prevent the 5VSB under loading when boot



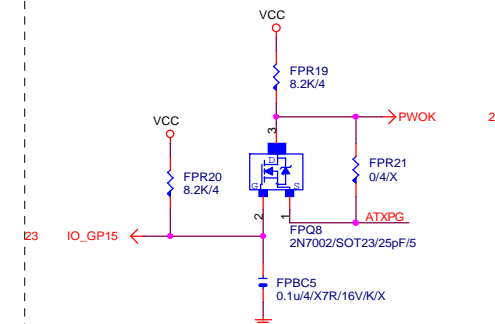
## 【技術通報R&amp;D技術通報153】

To fix 12V light load abnormal issue



## PWOK PATCH

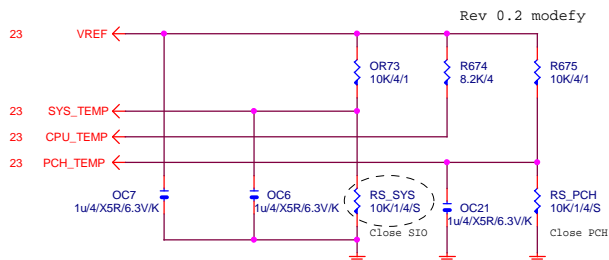
## 【技術通報R&amp;D技術通報154】



Gigabyte Technology

Title			ATX POWER CONNECTOR	
Size			Document Number	
Custom			GA-Z97X-GAMING 5	
Date:			Monday, September 01, 2014	Sheet 31 of 38
			2	1

Rev 1.02

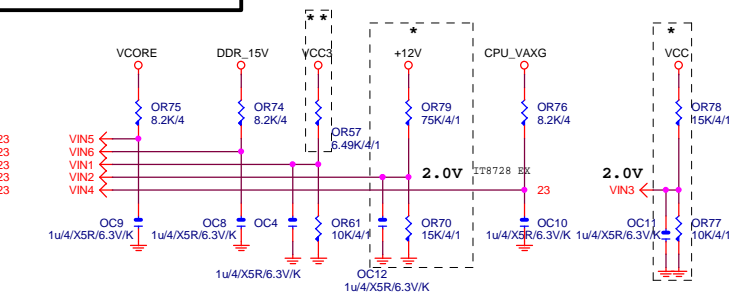


Thrmtrip#改用LM358做

VOLTAGE-- H/W MONITOR

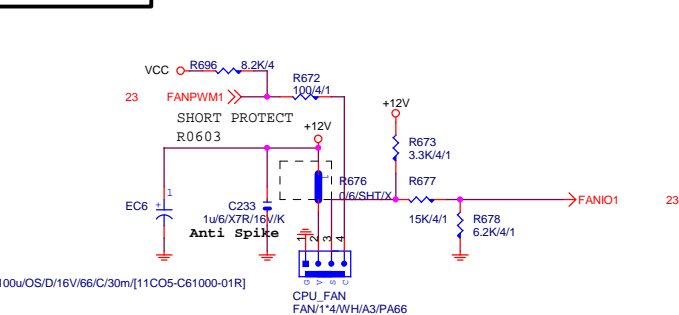
\* IT8728 BX  
\* \* IT8728 CX

VIN2 must +12V input  
VIN3 must VCC input



The division voltage of VIN2 & VIN3 must be around 2.9V

## CPU SMART FAN

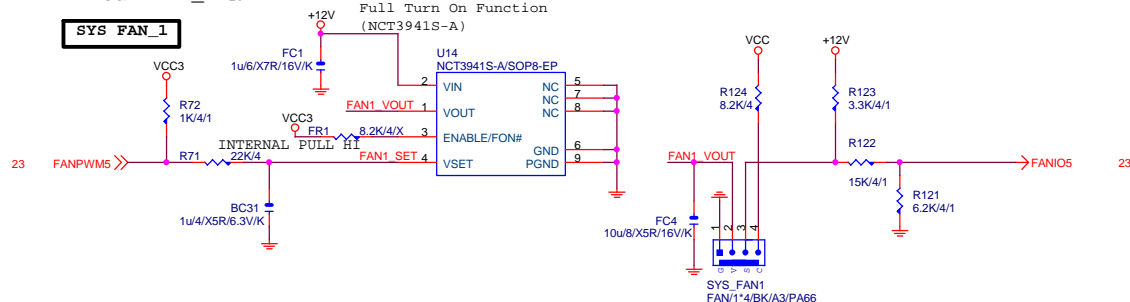


Linear SYS FAN

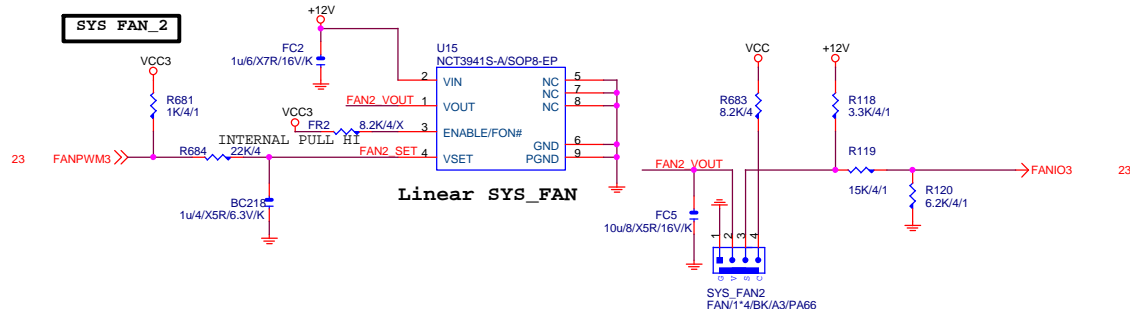
Enable Function (NCT3941S)

### Full Turn On Function

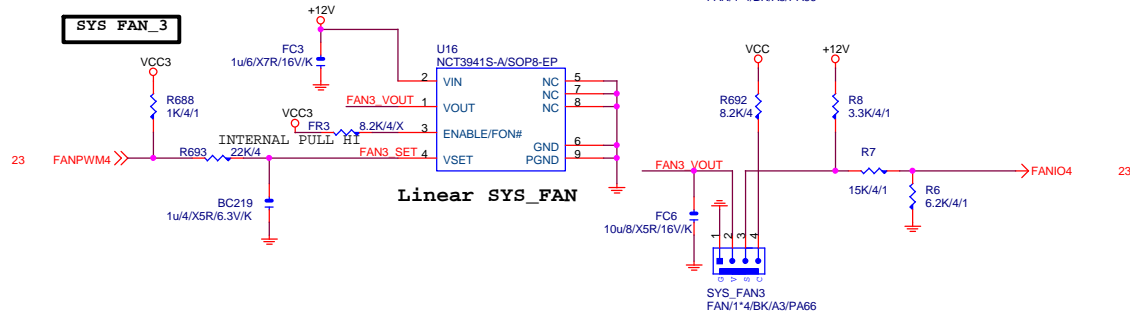
(NCT3941S-A)



## SYS FAN\_2



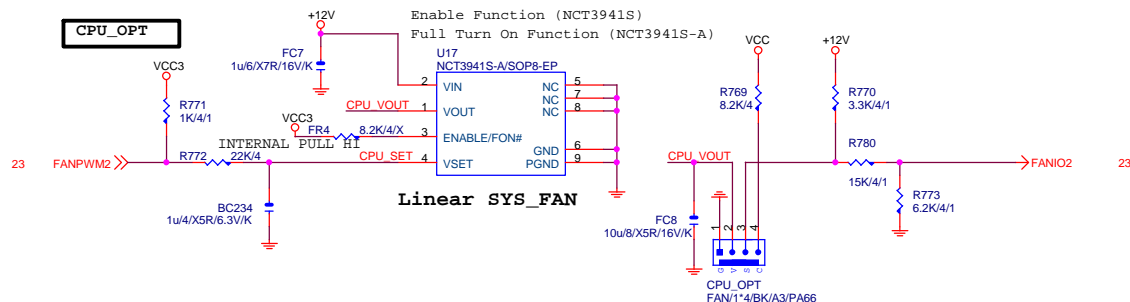
## SYS\_FAN\_3



## CPU\_OPT

Enable Function (NCT3941S)


Full Turn On Function (NCT3941S-A)



FOR EMI ONLY

+12V

C3  
1n4/X7R/50V/K



## Gigabyte Technology

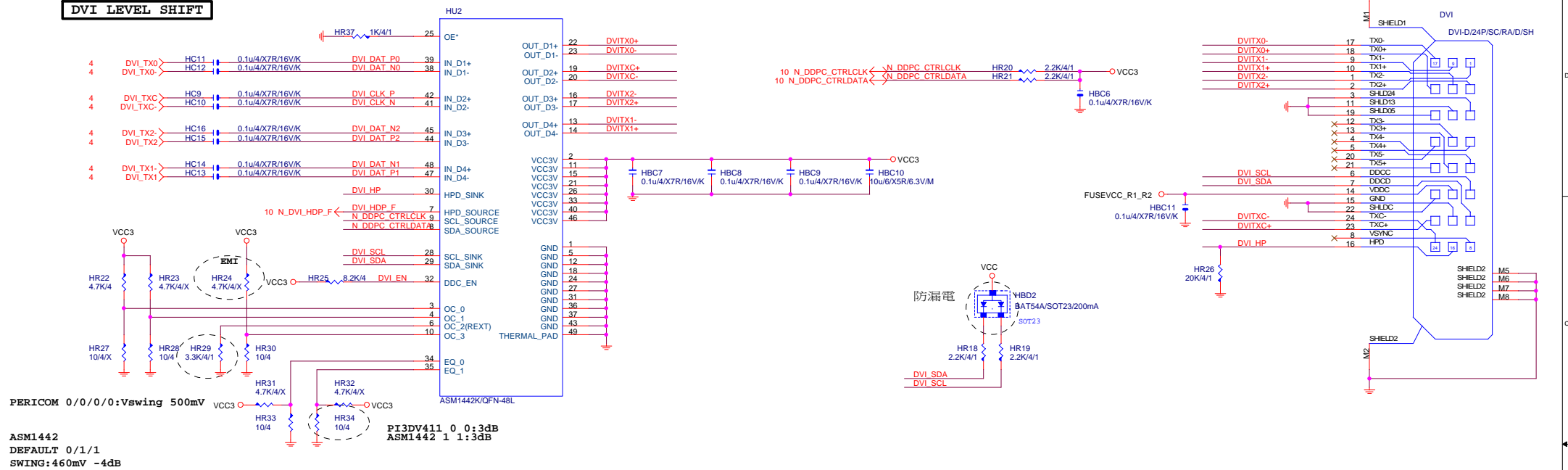
Title				HWM,KB/MS, FAN CTRL			
Size	Document Number	GA-Z97X-GAMING 5				Rev	1.02
Custom							
Date:	Monday, September 01, 2014		Sheet	32	of	38	

DVI:15/4/4/15

Impedance=85 +- 17.5%

www.xinxunwei.com 400-800-9990

# DVI LEVEL SHIFT



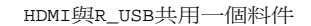
Gigabyte Technology

DVI

GA-Z97X-GAMING 5

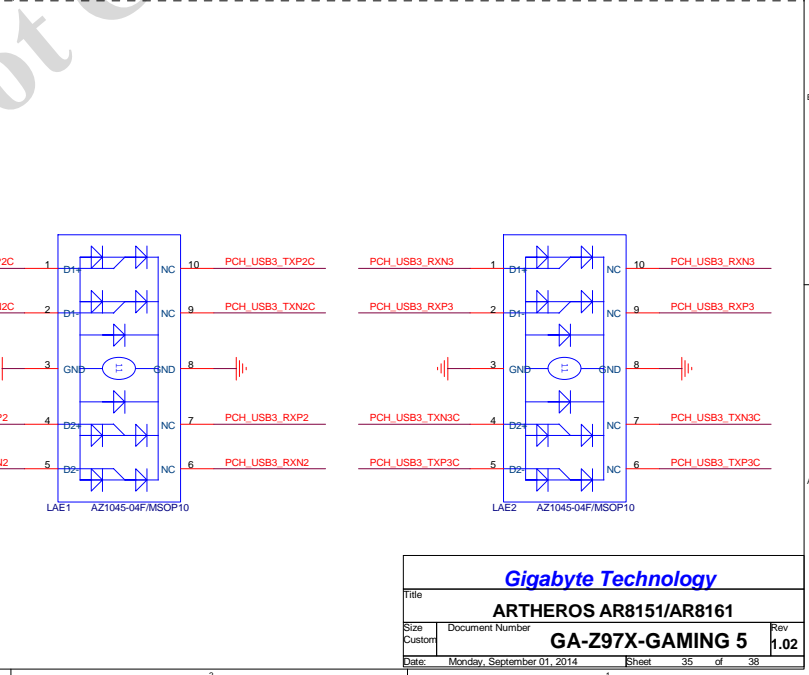
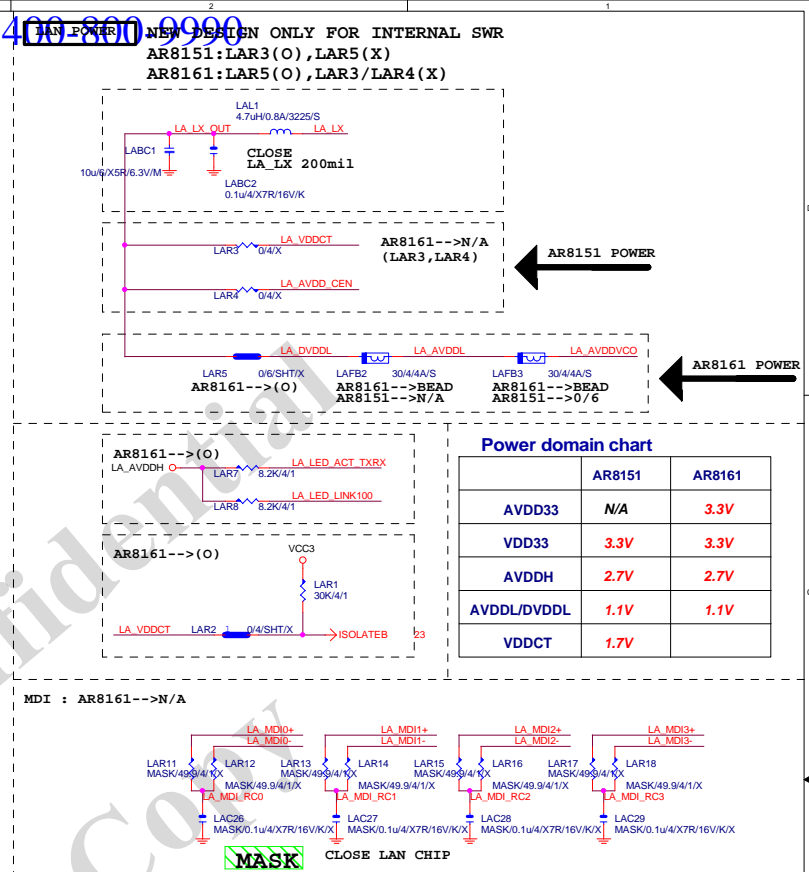
Rev 1.02

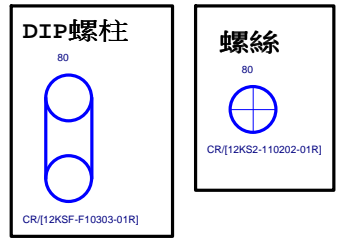
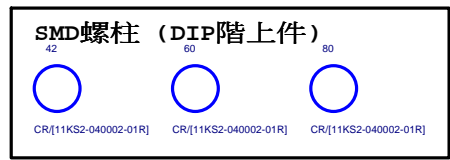
Date: Monday, September 01, 2014 Sheet 33 of 38



改善: ASMEDIA ASM1442 : 3.16K(PIN6 PULL DOWN電阻) 10ohm(PIN4 PULL DOWN電阻)

<b>Gigabyte Technology</b>			
Title			
<b>HDMI</b>			
Size	Document Number	Rev	
Custom	<b>GA-Z97X-GAMING 5</b>	<b>1.02</b>	
Date:	Monday, September 01, 2014	Sheet	34 of 38



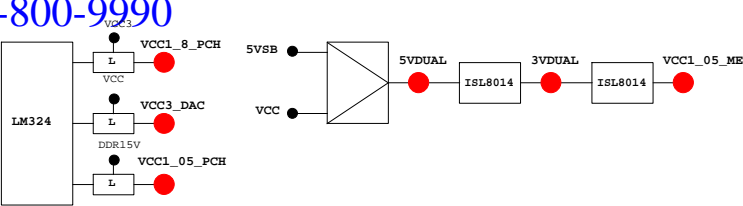


Function	SEL
xI--> x0a	L
xI--> x0b	H

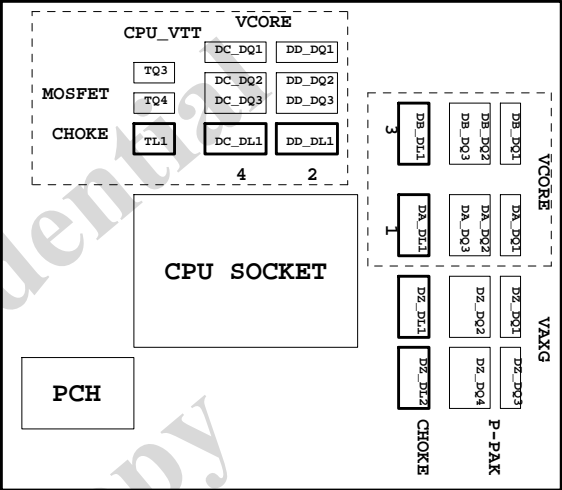
PCH GPIO LIST TABLE					
PIN NAME	PWR	Default	USAGE	NOTE	
GP0	MAIN	H-Z	GPI	GPIO0	N/A
GP1/TACH1	MAIN		GPI	GPIO1	N/A
GP2/PIRQ#	MAIN		GPI	-PIRQE	P/U 8.2K VCC3
GP3/PIRQF#	MAIN		GPI	-PIRQF	P/U 8.2K VCC3
GP4/PIRQG#	MAIN		GPI	-PIRQG	P/U 8.2K VCC3
GP5/PIRQH#	MAIN		GPI	-PIRQH	P/U 8.2K VCC3
GP6/TACH2	MAIN		GPI	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	-PCIE_RST	
RSMRST#CIRRXL/GP55	-RSMRST	
PME#/GP54	-LPCPME	
PD5/GP75/BUSS00	N/A	

PIN NAME	USAGE	NOTE
FAN_TAC2/GP52	FANIO2	
FAN_TAC3/GP37	FANIO3	
VIDO3/FAN_TAC4/GP25/DSR2#	FANIO4	
FAN_CTL2/GP51	FANPWM2	
FAN_CTL3/GP36	FANPWM3	
VID4/GP34	BEEP-	
VID3/GP33	TURBO1	
VID2/GP32	TURBO0	
VCORE_GOOD/VID6/GP63	CPUT_LED1_C	
VID5/GP35	CPUT_LED2_C	
VID1/GP31	CPUT_LED3_C	
VID0/GP30	-LAN1_DSM	NBT_LED1_C
SLCT/GP80	CPU_LED1_C	
PE/GP81	CPU_LED2_C	
BUSY/GP82	CPU_LED3_C	
PD3/GP73/BUSSI1	SB_LED1_C	
PD4/GP74/BUSSI2	SB_LED2_C	
VCORE_EN/VID7/GP64	IT_GP64	SB_LED3_C
PD0/GP70	NB_LED1_C	
PD1/GP71	NB_LED2_C	
PD2/GP72/BUSSI0	NB_LED3_C	
GP22/SCK	LOW_PWR_1	
VID05/GP27/SIN2	LOW_PWR_2	
PCIRST2#/GP11	-PFMRST1	
PCIRST1#/GP12	-PFMRST2	
3VBSBW#/GP40	CSI_F0	BSEL166_1
SUSC#/GP53	CSI_F1	BSEL166_2
GP23/SI	BSEL166_3/CSISBSL	
VIDO0/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/CIRRX2/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

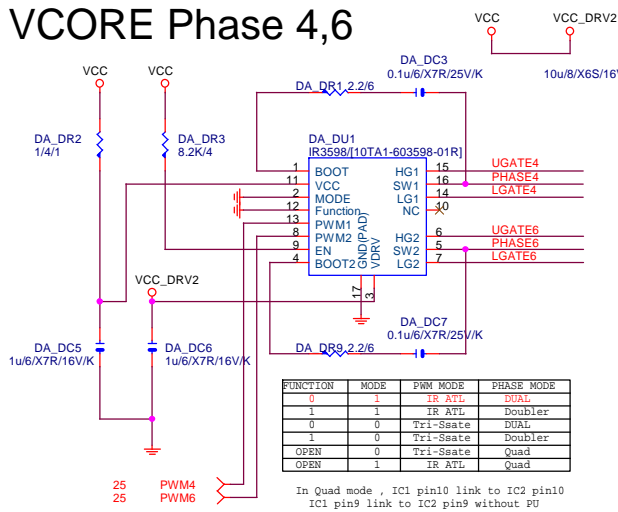
散熱模組料號：

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

Gigabyte Technology			
Title	TABLE LIST		
Size C	Document Number	GA-Z97X-GAMING 5	Rev 1.02
Date:	Monday, September 01, 2014	Sheet 37	of 38

## VCORE Phase 4,6



## VCORE Phase 3,7

