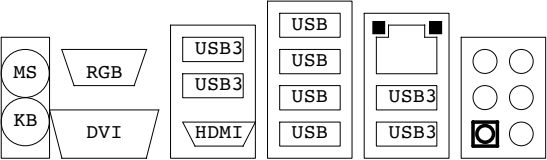
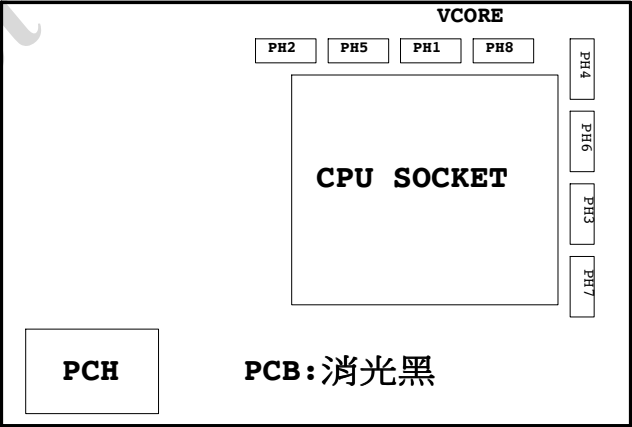


SHEET TITLE

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
10	PCH_RGB,CLK BUFFER
11	PCH_HOST,SATA,PCI
12	PCH_GPIO,CTRL,AUDIO
13	PCH_PWR,GND
14	PCI EXPRESS*16 SLOT
15	PCI EXPRESS*8 SLOT
16	PCI EXPRESS*16 SWITCH
17	PCI EXPRESS*4 SLOT
18	PCI EXPRESS*1 1,2,3 SLOT
19	ITE8892E
20	PCI SLOT
21	ALC1150 CODEC
22	REAR AUDIO JACK
23	ITE8620
24	COM/KB_MS/R_USB/PROHOT/USB PROTECT
25	IR3563B
26	IR3598 VCORE Phase 1, 4, 2, 5
27	DDR POWER

SHEET TITLE

28	DISCRETE POWER,NCT3933
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	IR3570_DDR PWM
40	IR 3598-DDR 2-Phase
41	Marvell 9172
42	RST,PWR,CLR_CMOS



**Model Name: GA-Z97X-GAMING 7**

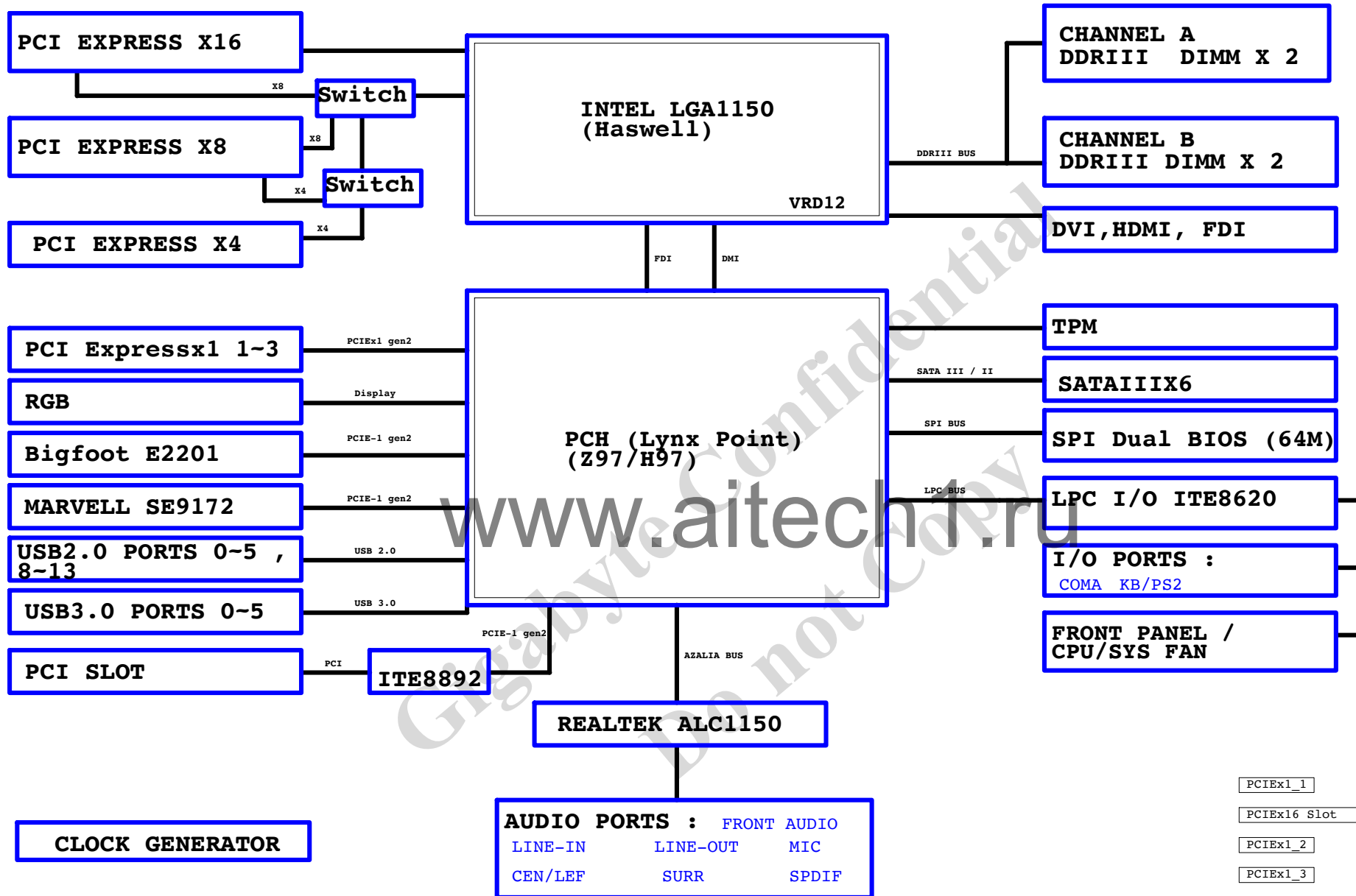
## Component value change history

[illegible]

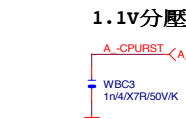
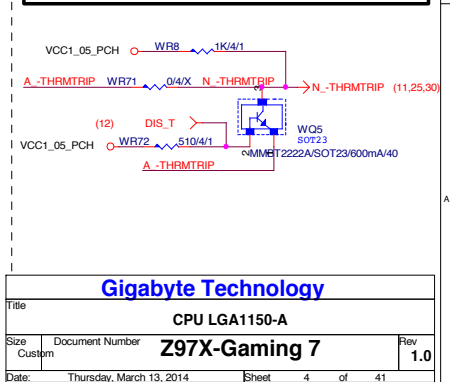
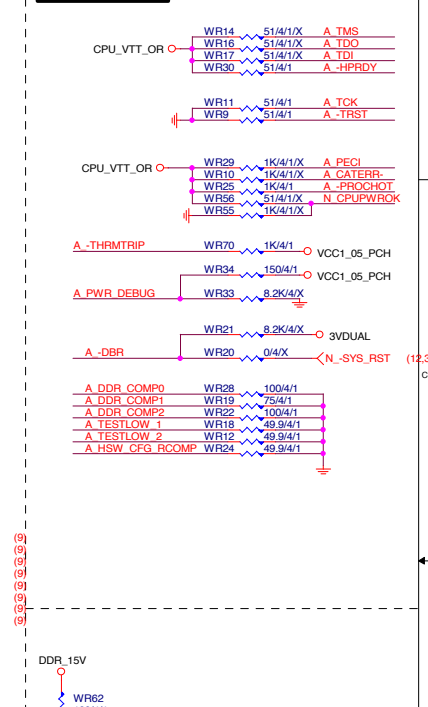
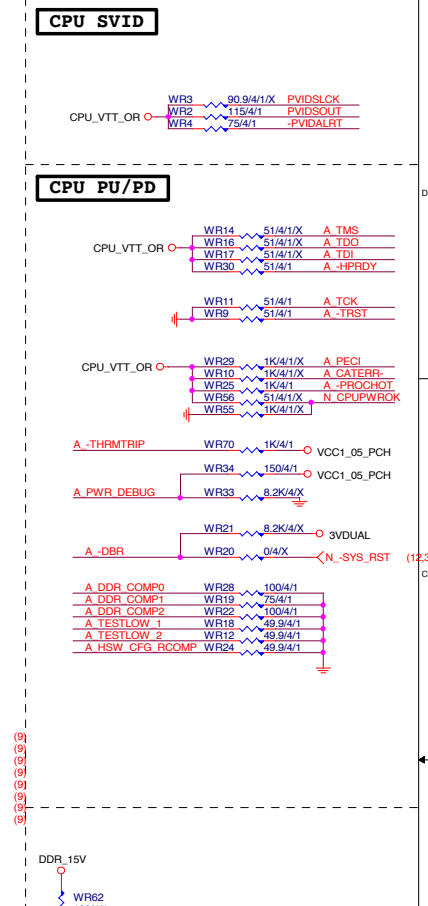
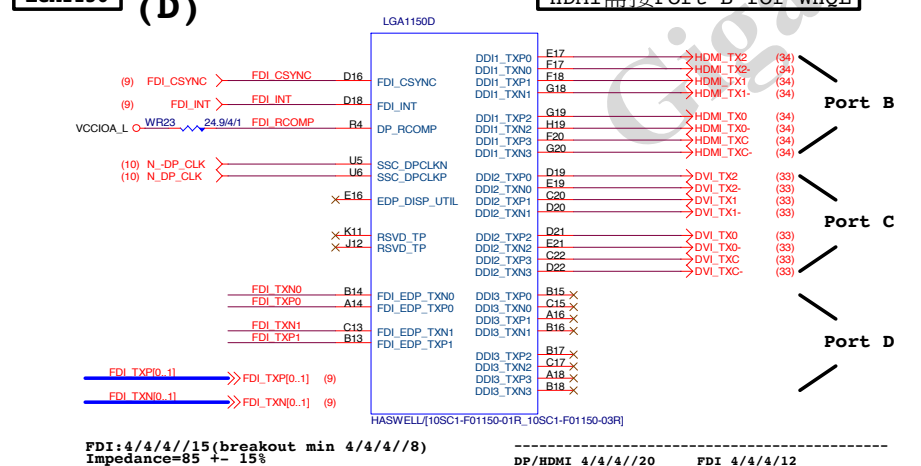
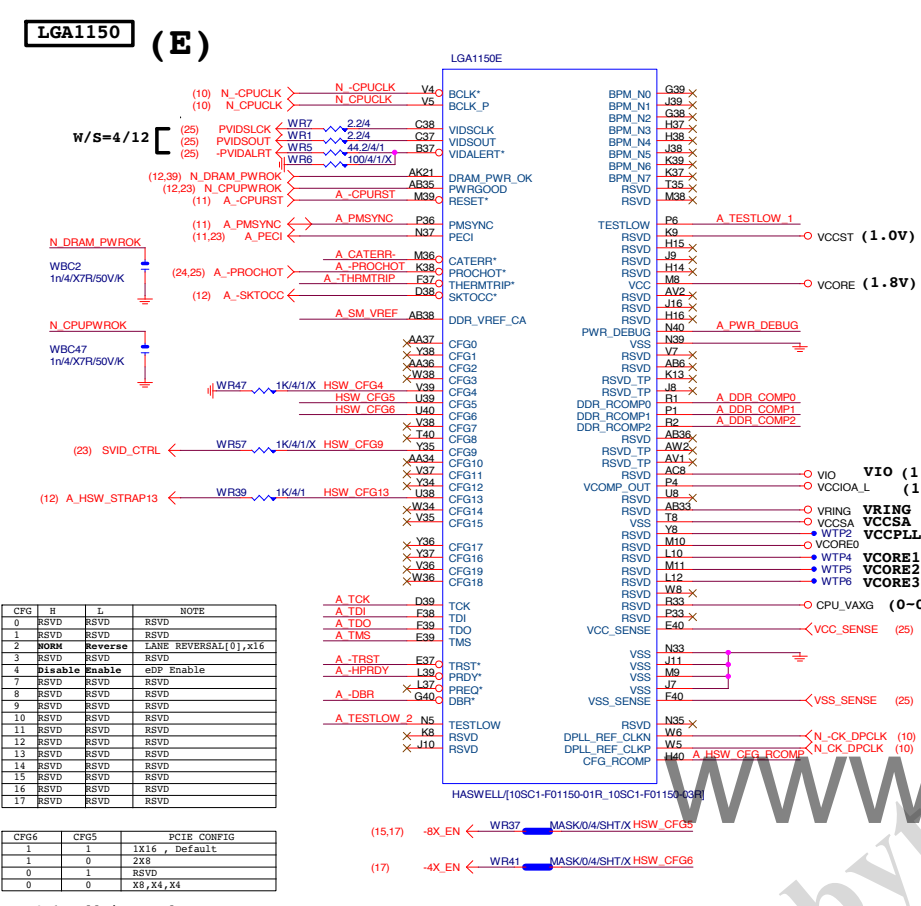
## Circuit or PCB layout change

[illegible]

# BLOCK DIAGRAM

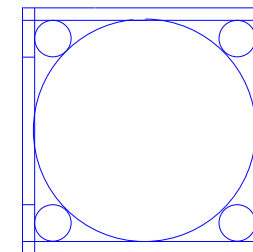


PCIEx1_1
PCIEx16 Slot
PCIEx1_2
PCIEx1_3
PCIEx8
PCI Slot
PCIEx4





LGA1150 CR/115X/BKNI[12KRC-0F0001-61R\_12KRC-0F0001-62R]



LGA1150A			
MAAA0	AU13	DDR0_MA0	AD38 MDA0
MAAA1	AV16	DDR0_MA1	AD39 MDA1
MAAA2	AU16	DDR0_MA2	AF38 MDA2
MAAA3	AW17	DDR0_MA3	AF39 MDA3
MAAA4	AU17	DDR0_MA4	AD37 MDA4
MAAA5	AW18	DDR0_MA5	AD40 MDA5
MAAA6	AV17	DDR0_MA6	AE37 MDA6
MAAA7	AT18	DDR0_MA7	AF40 MDA7
MAAA8	AU18	DDR0_MA8	AH40 MDA9
MAAA9	AT19	DDR0_MA9	AH39 MDA10
MAAA10	AW11	DDR0_MA10	AK38 MDA10
MAAA11	AV19	DDR0_MA11	AK39 MDA11
MAAA12	AU19	DDR0_MA12	AH37 MDA12
MAAA13	AT20	DDR0_MA13	AH38 MDA13
MAAA14	AT20	DDR0_MA14	AK37 MDA14
MAAA15	AU21	DDR0_MA15	AK40 MDA15
MODT_A0	AW10	DDR0_ODT0	AM40 MDA17
MODT_A1	AV8	DDR0_ODT1	AM39 MDA21
MODT_A2	AW9	DDR0_ODT2	AP38 MDA18
MODT_A3	AU8	DDR0_ODT3	AP39 MDA19
		DDR0_ODT4	AM37 MDA20
		DDR0_ODT5	AM38 MDA16
		DDR0_ODT6	AP37 MDA22
		DDR0_ODT7	AP40 MDA23
		DDR0_ODT8	AV37 MDA25
		DDR0_ODT9	AW37 MDA29
		DDR0_ODT10	AU35 MDA26
		DDR0_ODT11	AV35 MDA27
		DDR0_ODT12	AT37 MDA28
		DDR0_ODT13	AU37 MDA24
		DDR0_ODT14	AT35 MDA30
		DDR0_ODT15	AW35 MDA31
		DDR0_ODT16	AW6 MDA33
		DDR0_ODT17	AU6 MDA37
		DDR0_ODT18	AV4 MDA34
		DDR0_ODT19	AW4 MDA35
		DDR0_ODT20	AW6 MDA32
		DDR0_ODT21	AW4 MDA38
		DDR0_ODT22	AW4 MDA39
		DDR0_ODT23	AR1 MDA41
		DDR0_ODT24	AR4 MDA45
		DDR0_ODT25	AN3 MDA42
		DDR0_ODT26	AN4 MDA43
		DDR0_ODT27	AR2 MDA44
		DDR0_ODT28	AR3 MDA40
		DDR0_ODT29	AN2 MDA46
		DDR0_ODT30	AN1 MDA47
		DDR0_ODT31	AL1 MDA49
		DDR0_ODT32	AL4 MDA53
		DDR0_ODT33	AL4 MDA50
		DDR0_ODT34	AL4 MDA51
		DDR0_ODT35	AL2 MDA52
		DDR0_ODT36	AL3 MDA48
		DDR0_ODT37	AJ2 MDA54
		DDR0_ODT38	AJ1 MDA55
		DDR0_ODT39	AG1 MDA57
		DDR0_ODT40	AG4 MDA61
		DDR0_ODT41	AE3 MDA58
		DDR0_ODT42	AE4 MDA59
		DDR0_ODT43	AG2 MDA60
		DDR0_ODT44	AG3 MDA56
		DDR0_ODT45	AE2 MDA62
		DDR0_ODT46	AE1 MDA63
		DDR0_ODT47	AE39 DQSA0
		DDR0_ODT48	AJ39 DQSA1
		DDR0_ODT49	AN39 DQSA2
		DDR0_ODT50	AV36 DQSA3
		DDR0_ODT51	AV5 DQSA4
		DDR0_ODT52	AP3 DQSA5
		DDR0_ODT53	AK3 DQSA6
		DDR0_ODT54	AF3 DQSA7
		DDR0_ODT55	AV32 DQSA0
		DDR0_ODT56	AE38 DQSA1
		DDR0_ODT57	AJ38 DQSA2
		DDR0_ODT58	AN38 DQSA3
		DDR0_ODT59	AJ36 DQSA4
		DDR0_ODT60	AW5 DQSA5
		DDR0_ODT61	AP2 DQSA6
		DDR0_ODT62	AK2 DQSA7
		DDR0_ODT63	AF2 DQSA8
		DDR0_ODT64	AJ32

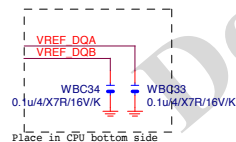
HASWELL[10SC1-F01150-01R\_10SC1-F01150-03R]

LGA1150B			
MAAB0	AL19	DDR1_MA0	AE34 MDB0
MAAB1	AK23	DDR1_MA1	AE35 MDB1
MAAB2	AM22	DDR1_MA2	AG35 MDB2
MAAB3	AM23	DDR1_MA3	AH35 MDB3
MAAB4	AP23	DDR1_MA4	AD34 MDB4
MAAB5	AL23	DDR1_MA5	AD35 MDB5
MAAB6	AY24	DDR1_MA6	AG34 MDB6
MAAB7	AV25	DDR1_MA7	AH34 MDB7
MAAB8	AU26	DDR1_MA8	AL34 MDB8
MAAB9	AW25	DDR1_MA9	AL35 MDB9
MAAB10	AE18	DDR1_MA10	AK31 MDB10
MAAB11	AY25	DDR1_MA11	AL31 MDB11
MAAB12	AV26	DDR1_MA12	AK34 MDB12
MAAB13	AR15	DDR1_MA13	AK35 MDB13
MAAB14	AV27	DDR1_MA14	AK32 MDB14
MAAB15	AY28	DDR1_MA15	AL32 MDB15
MODT_B0	AM17	DDR1_ODT0	AP34 MDB17
MODT_B1	AL18	DDR1_ODT1	AN31 MDB19
MODT_B2	AM18	DDR1_ODT2	AP31 MDB23
MODT_B3	AK15	DDR1_ODT3	AP35 MDB20
		DDR1_ODT4	AP35 MDB16
		DDR1_ODT5	AN32 MDB18
		DDR1_ODT6	AP32 MDB22
		DDR1_ODT7	AM29 MDB25
		DDR1_ODT8	AM28 MDB28
		DDR1_ODT9	AR29 MDB27
		DDR1_ODT10	AR28 MDB30
		DDR1_ODT11	AL23 MDB34
		DDR1_ODT12	AL28 MDB29
		DDR1_ODT13	AP29 MDB26
		DDR1_ODT14	AP28 MDB31
		DDR1_ODT15	AR12 MDB32
		DDR1_ODT16	AL13 MDB33
		DDR1_ODT17	AL12 MDB35
		DDR1_ODT18	AR13 MDB36
		DDR1_ODT19	AP13 MDB37
		DDR1_ODT20	AM13 MDB38
		DDR1_ODT21	AM12 MDB39
		DDR1_ODT22	AR9 MDB45
		DDR1_ODT23	AP9 MDB41
		DDR1_ODT24	AR6 MDB47
		DDR1_ODT25	AP6 MDB43
		DDR1_ODT26	AR10 MDB44
		DDR1_ODT27	AP10 MDB40
		DDR1_ODT28	AR7 MDB46
		DDR1_ODT29	AP7 MDB42
		DDR1_ODT30	AM9 MDB52
		DDR1_ODT31	AL9 MDB53
		DDR1_ODT32	AL6 MDB50
		DDR1_ODT33	AL7 MDB55
		DDR1_ODT34	AM10 MDB48
		DDR1_ODT35	AL10 MDB49
		DDR1_ODT36	AM6 MDB54
		DDR1_ODT37	AM2 MDB51
		DDR1_ODT38	AH6 MDB61
		DDR1_ODT39	AH7 MDB60
		DDR1_ODT40	AE6 MDB59
		DDR1_ODT41	AE7 MDB63
		DDR1_ODT42	AJ6 MDB56
		DDR1_ODT43	AJ7 MDB57
		DDR1_ODT44	AG6 MDB58
		DDR1_ODT45	AF7 MDB62
		DDR1_ODT46	AF35 DQSB0
		DDR1_ODT47	AL33 DQSB1
		DDR1_ODT48	AP33 DQSB2
		DDR1_ODT49	AN28 DQSB3
		DDR1_ODT50	AN12 DQSB4
		DDR1_ODT51	AP8 DQSB5
		DDR1_ODT52	AL8 DQSB6
		DDR1_ODT53	AG7 DQSB7
		DDR1_ODT54	AN25 DQSB0
		DDR1_ODT55	AK33 DQSB1
		DDR1_ODT56	AN33 DQSB2
		DDR1_ODT57	AN29 DQSB3
		DDR1_ODT58	AL13 DQSB4
		DDR1_ODT59	AR8 DQSB5
		DDR1_ODT60	AM8 DQSB6
		DDR1_ODT61	AG6 DQSB7
		DDR1_ODT62	AN26

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

DDR BUS

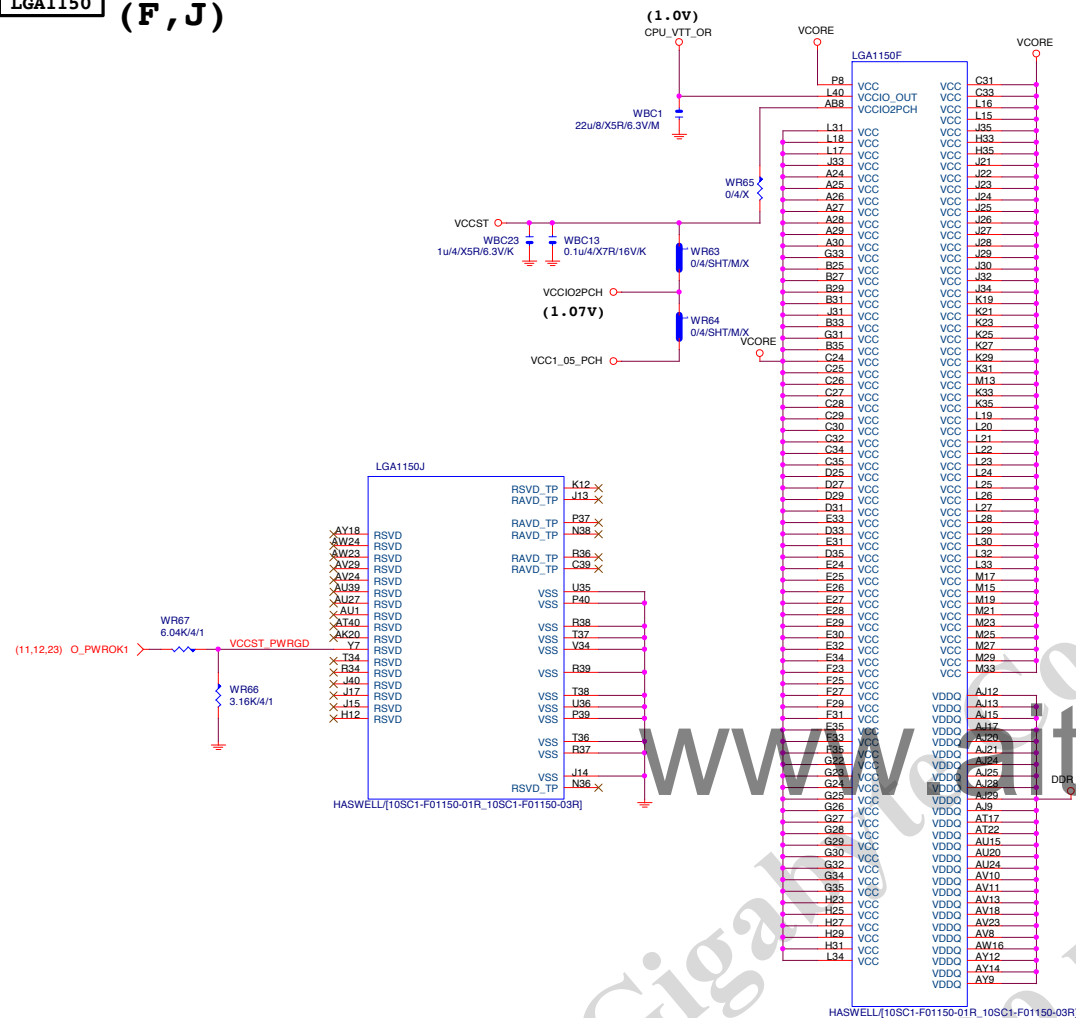
(7) MODT_A[0..3]	MODT_A[0..3]
(8) MODT_B[0..3]	MODT_B[0..3]
(7) MDA[0..63]	MDA[0..63]
(8) MDB[0..63]	MDB[0..63]
(7) DQSA[0..7]	DQSA[0..7]
(7) -DQSA[0..7]	-DQSA[0..7]
(7) MAA[0..15]	MAA[0..15]
(8) MAB[0..15]	MAB[0..15]
(8) DQSB[0..7]	DQSB[0..7]
(8) -DQSB[0..7]	-DQSB[0..7]



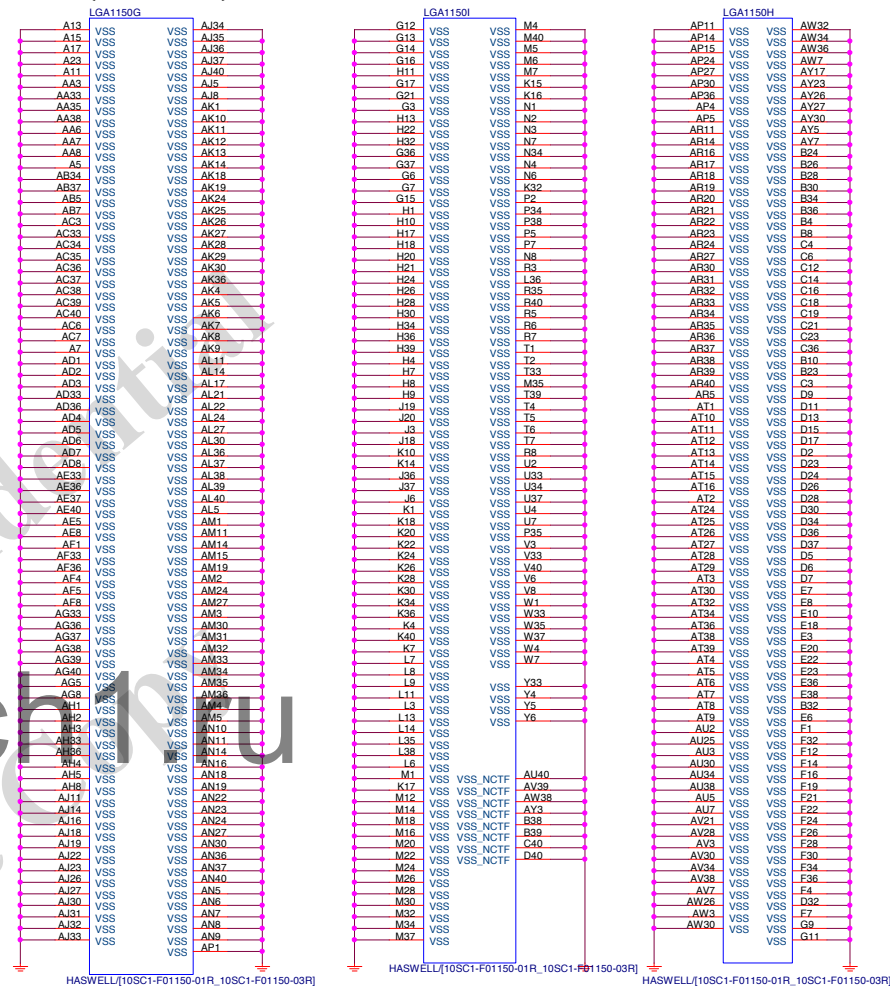
Gigabyte Technology

Title		CPU LGA1150-B	
Size	Document Number	Z97X-Gaming 7	
Custom			Rev 1.0
Date:	Thursday, March 13, 2014	Sheet	5 of 41

# LGA1150 (F, J)

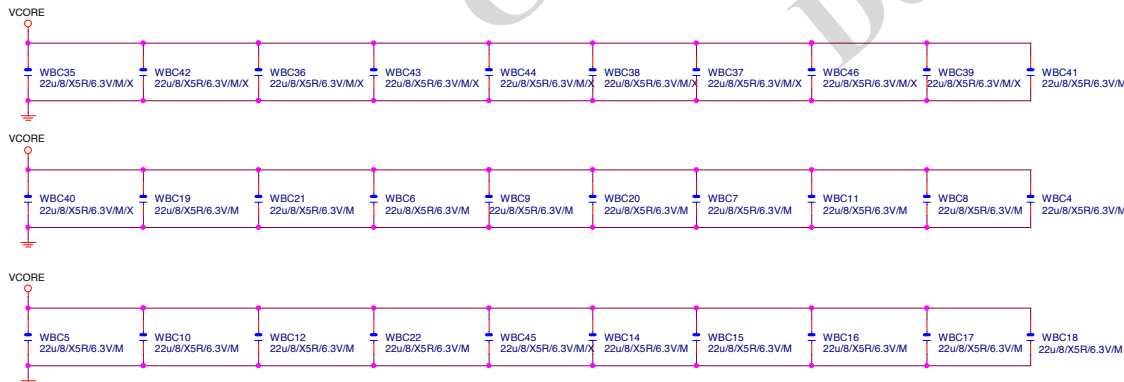


# LGA1150 (G, H, I)



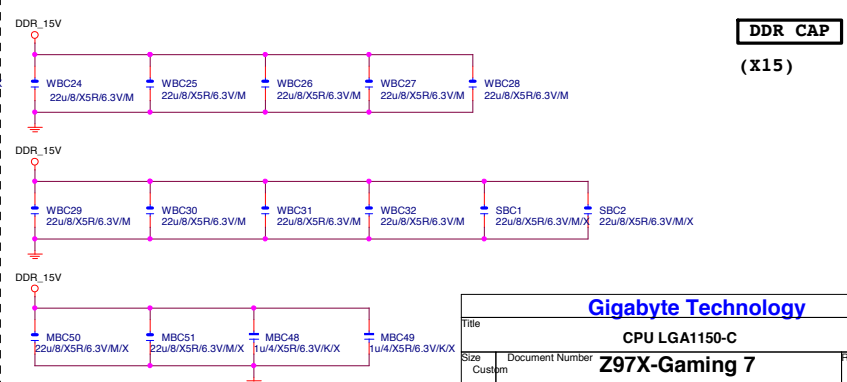
## VCore CAP

(X30)



## DDR CAP

(X15)



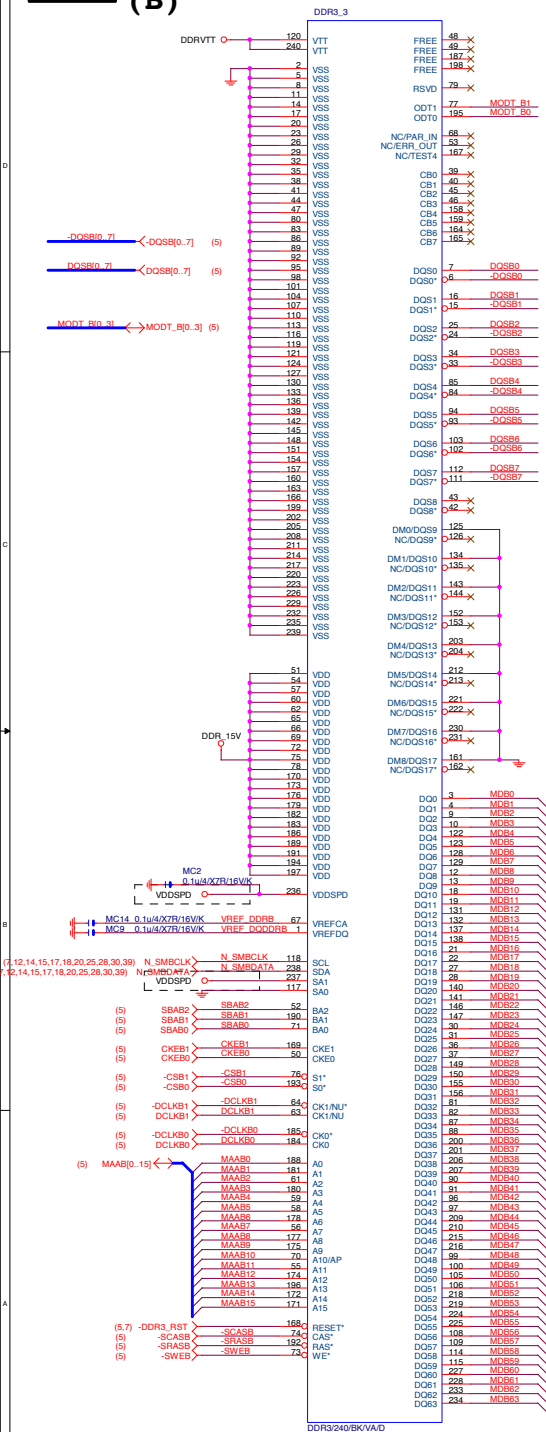
Gigabyte Technology

Title		CPU LGA1150-C		Rev 1.0
Size	Document Number	Z97X-Gaming 7		
Custom				
Date:	Thursday, March 13, 2014	Sheet	6 of 41	

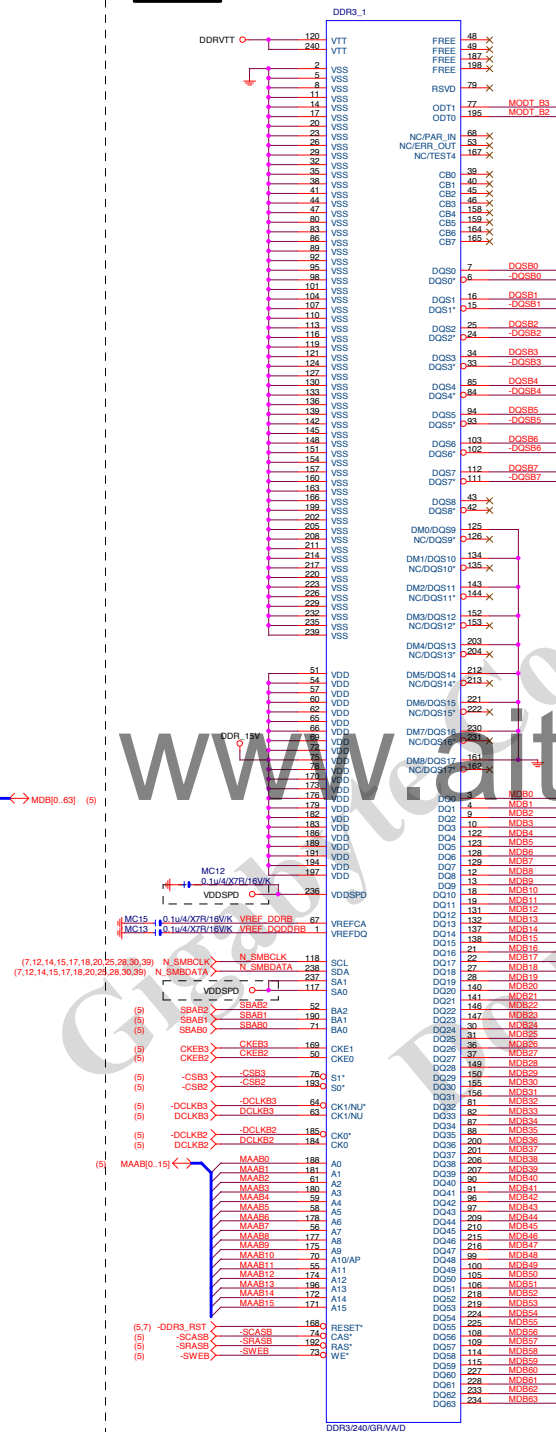


DDR3

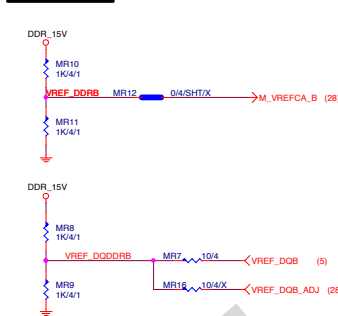
(B)



DDR3



DDR3 VREF



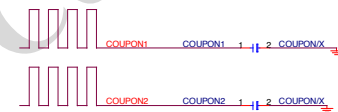
DDR3 1066,1333,1600MHZ BANDWIDTH

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

COUPON



CPU

DTMM4

DTMM2

DTMM3

DTMM1

CHA

CHB

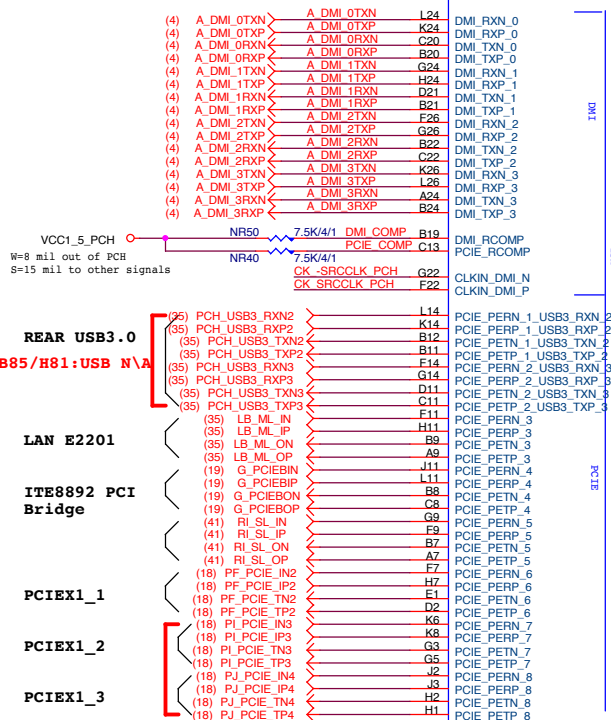
Gigabyte Technology

Title		DDR3 CHANNEL B	
Size		Document Number	
Custom		Z97X-Gaming 7	
Date		Rev	
		1.0	



PCH

(B)

DMI:12/4/4/12(breakout min 8/4/4/4/8)  
Impedance=85 +/- 17.5%USB2.0 : 12/5/7/5/12 (breakout min 8/4/4/4/8)  
Impedance=85 +/- 15%

電容放靠近 Device &amp; PCI-E Slot

Z97/S

PCH PCIE ,DMI 4/4/4/15 Impedance=85 +/- 15%

usb2.0 5/7/5/12 Impedance=85 +/- 15%  
usb3.0 5/7/5/20

PCH

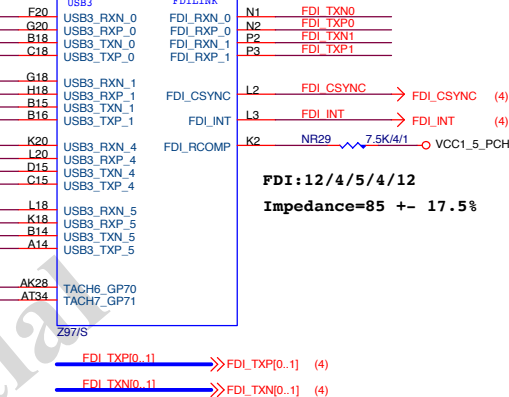
(F)

Port要對應

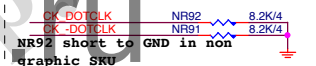
B85/H81: 5/7 N/A  
H81:USB3.0 N/A  
H81:12/13 N/APort1 & 9為Debug Port ,  
一定要拉到Connector .

PCHF

FDILINK

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

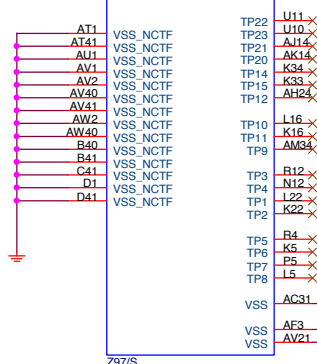
Mount for integrated clock Generation Mode



PCH

(J)

PCHJ



PCH H/S

PCH\_HS

1X

2X

PCH\_HS[12SP2-SG6080-01R\_12SP2-SG6080-02R\_12SP2-SG6080-03R]

USB TABLE

OC[3:0]# for Device 29 (ports 0-7)  
OC[7:4]# for Device 26 (ports 8-13)

USB Usage & OC# Configure			
OC0#	USB0,1	F_USB30	FUSEVCC_F1_F2
OC1#	USB2,3	USB30_LAN	FUSEVCC_R7_R8
OC2#	USB4,5	HDMI & R_USB3	FUSEVCC_R1_R2
OC3#	USB6,7	4 Ports R_USB (Up)	FUSEVCC_R5_R6
OC4#	USB8,9	4 Ports R_USB (Down)	FUSEVCC_R3_R4
OC5#	USB10,11	F_USB2	FUSEVCC_F5_F6
OC6#	USB12,13	F_USB1	FUSEVCC_F3_F4
OC7#	Not Use		

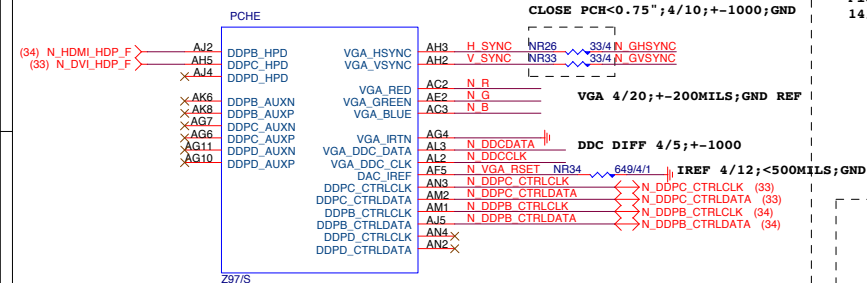
Gigabyte Technology

Title			
PCH FDI,DMI,USB ,PCIE			
Size	Document Number	Z97X-Gaming 7	
Custom			Rev 1.0
Date:	Thursday, March 13, 2014	Sheet 9	of 41

# PCH (E)

# PCH (G)

# PCHG



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

Flex1,2,3,4 : (23) O\_LPCCLK48

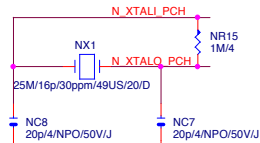
14/24/33/48MHz

VCC1\_5\_PCH

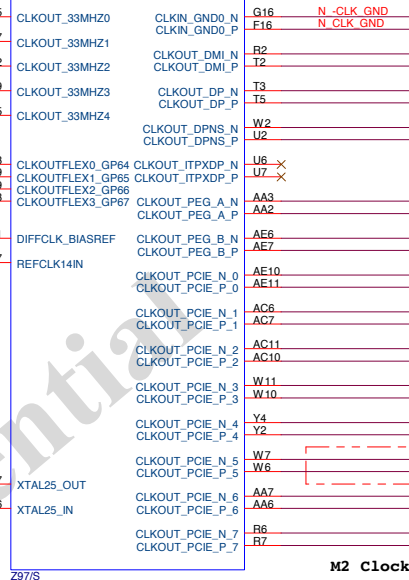
NR18 7.5K/4/1 N\_CLK\_RCOMP

N\_PCHCLK14

XTAL Trace Length < 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

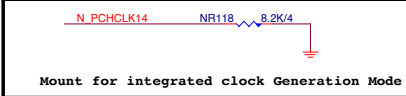


M2 Clock需接Clock#0

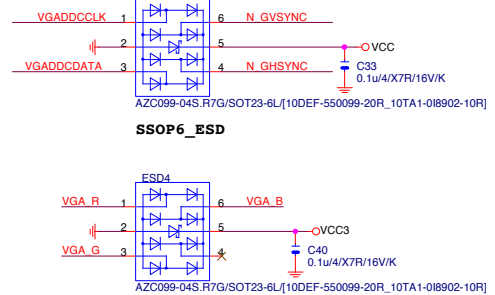
PCIEX4 CLOCK(PE\_SRCCLK\_3GIO1)由PIN R6,R7  
換成PIN W7,W6 避免跟CRYSTAL 25MHz干擾

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

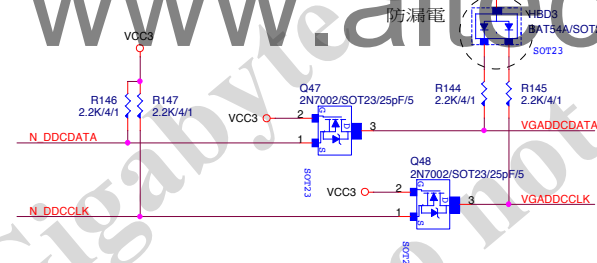
# PCH CLK PD



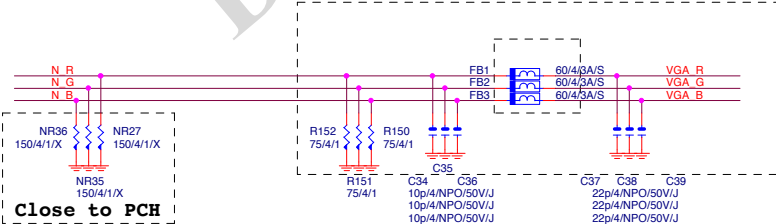
# VGA ESD



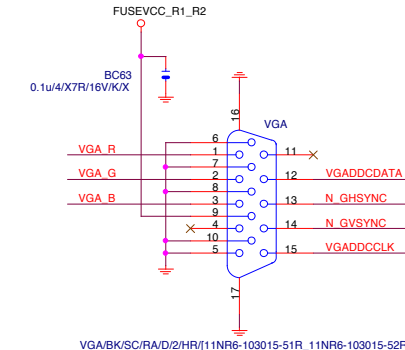
# VGA DDC



# VGA DDC



# VGA CONNECTOR



Gigabyte Technology			
Title			
PCH DISPLAY_CLK BUFFER			
Size	Document Number	Rev	
Custom	Z97X-Gaming 7	1.0	
Date:	Thursday, March 13, 2014	Sheet	10 of 41

**PCH (C)**

SATA3 : 20/4/4/4/20 (breakout min 8/4/4/4/8)

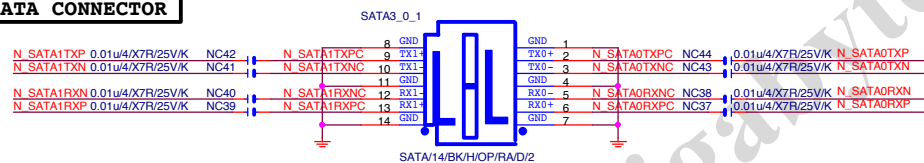
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**SATA2 4/4/4//15**

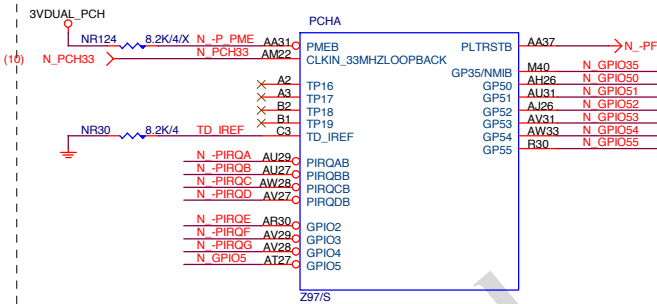
**SATA3 4/4/4//20**



## SATA CONNECTOR



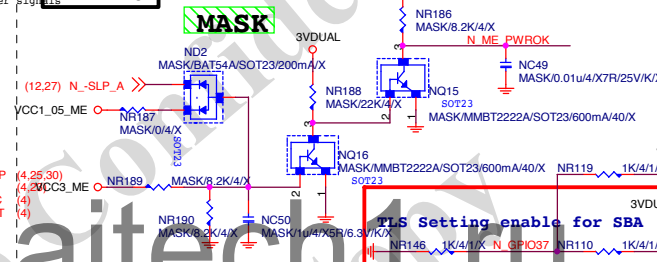
**PCH (A)**



Default int pull up on GP51,  
Default SPI boot devices

BOOT DEVICE	GP51	GP19
LPC	0	0
SPI	float	float

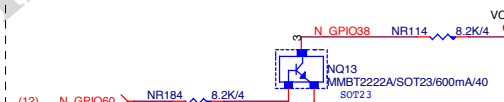
**ME PWROK**



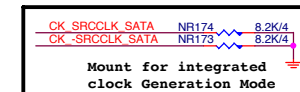
GPI038 Ctrl

**MFG Mode**

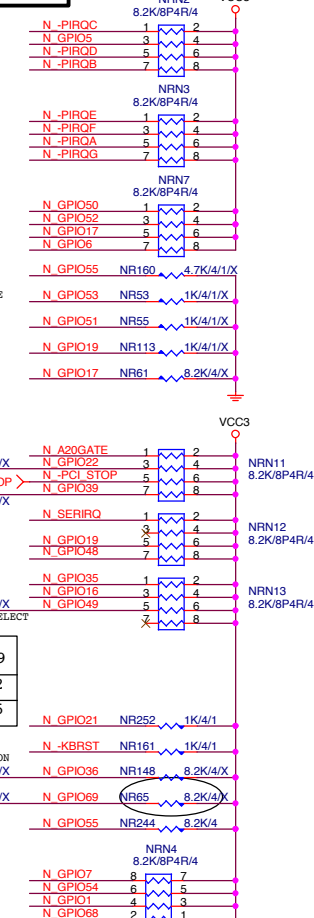
```
N_GPIO38 : Lo --> Enable
           Hi --> Disable
```



PCH CLK PD



**PCH PU/PD**



soft strap	GP16	GP49
0	pcie1	pcie2
1	sata4	sata5

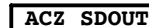
Timing diagram showing NR65 signal transitions. The diagram includes signals N\_GPIO36:DMI RX TERMINATION, N\_GPIO36, N\_GPIO69:SV DETECT, and NR65. NR65 shows a transition from high to low, labeled with NR65, 8.2K/4/X, and a circled NR65.

## Gigabyte Technology

Title			
PCH HOST , SATA, PCI			
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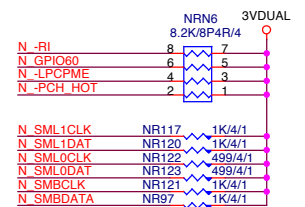
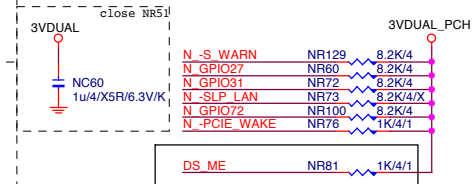
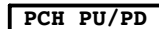
(D)



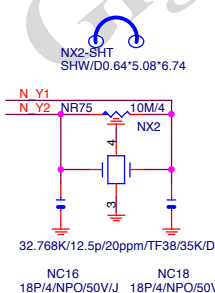
NR140 8.2K/4 C ACZ SDOUT



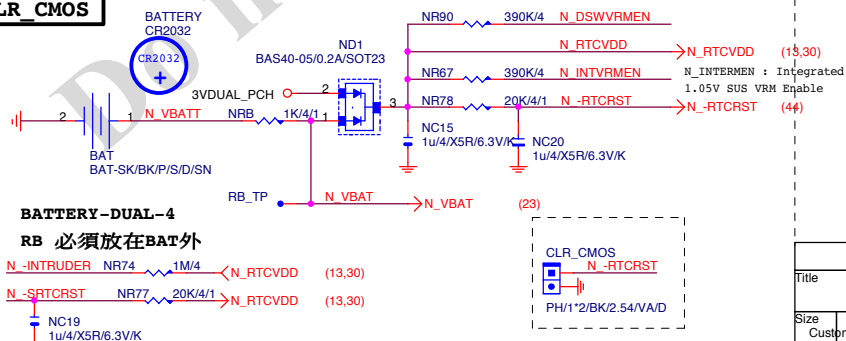
For IT8620 Ctrl



32.768KHZ



CLR	CMOS
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## Gigabyte Technology

## PCH GPIO , CTRL , AUDIO

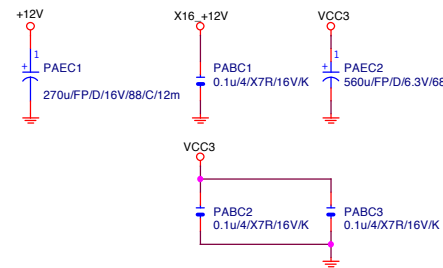
## Z97X-Gaming 7

Rev	1.0
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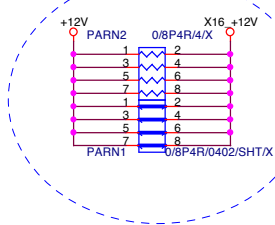


## PCIEX16 CAP



## PCIEX16 PROTECT SHT

+12 protect short-wire test



## PCIEX16 AC CAP

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

PCI-E REV:1.1--> 2.5GHZ

PCE-E X1(單向) BANDWITH=2.5GHZ\*(8b/10b)=2Gb/s=250MB/s

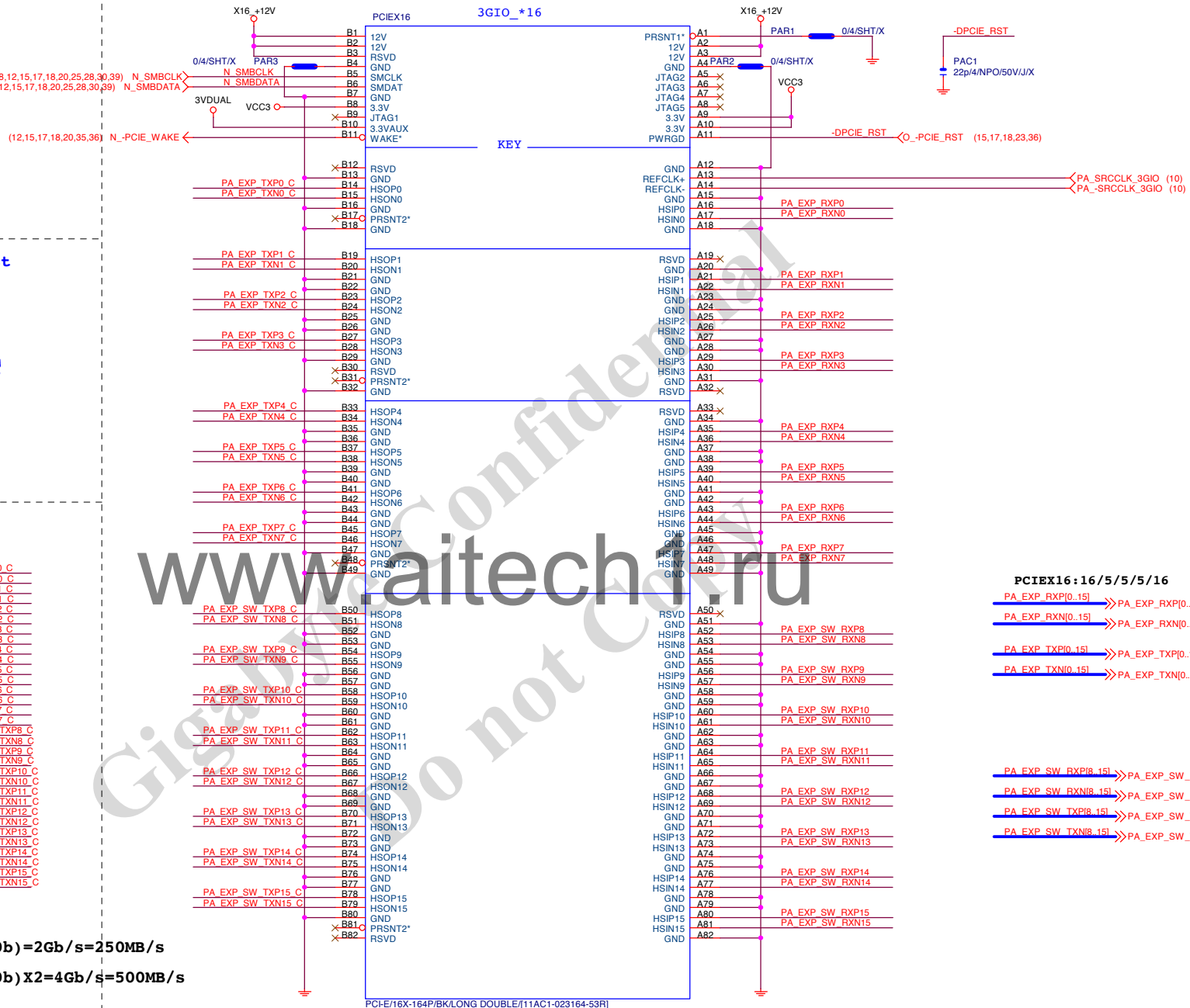
PCE-E X1(雙向) BANDWITH=2.5GHZ\*(8b/10b)X2=4Gb/s=500MB/s

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

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

PCI-E REV:2.0--> 5GHZ

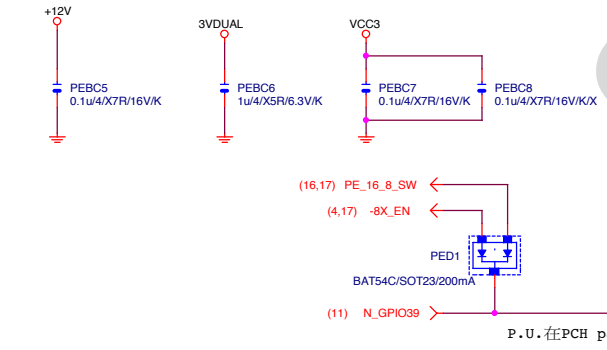
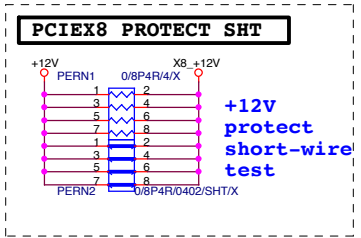
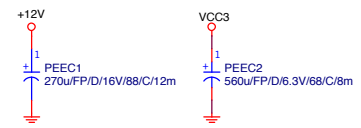
## PCIEX16 SLOT



## PCIEX16:16/5/5/5/16

PA EXP RXP[0..15]	>>>PA_EXP_RXP[0..15] (4,16)
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)
PA EXP SW TXP[8..15]	>>>PA_EXP_SW_TXP[8..15] (16)
PA EXP SW TXN[8..15]	>>>PA_EXP_SW_TXN[8..15] (16)

Gigabyte Technology			
PCI EXPRESS * 16			
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P.U.在PCH page

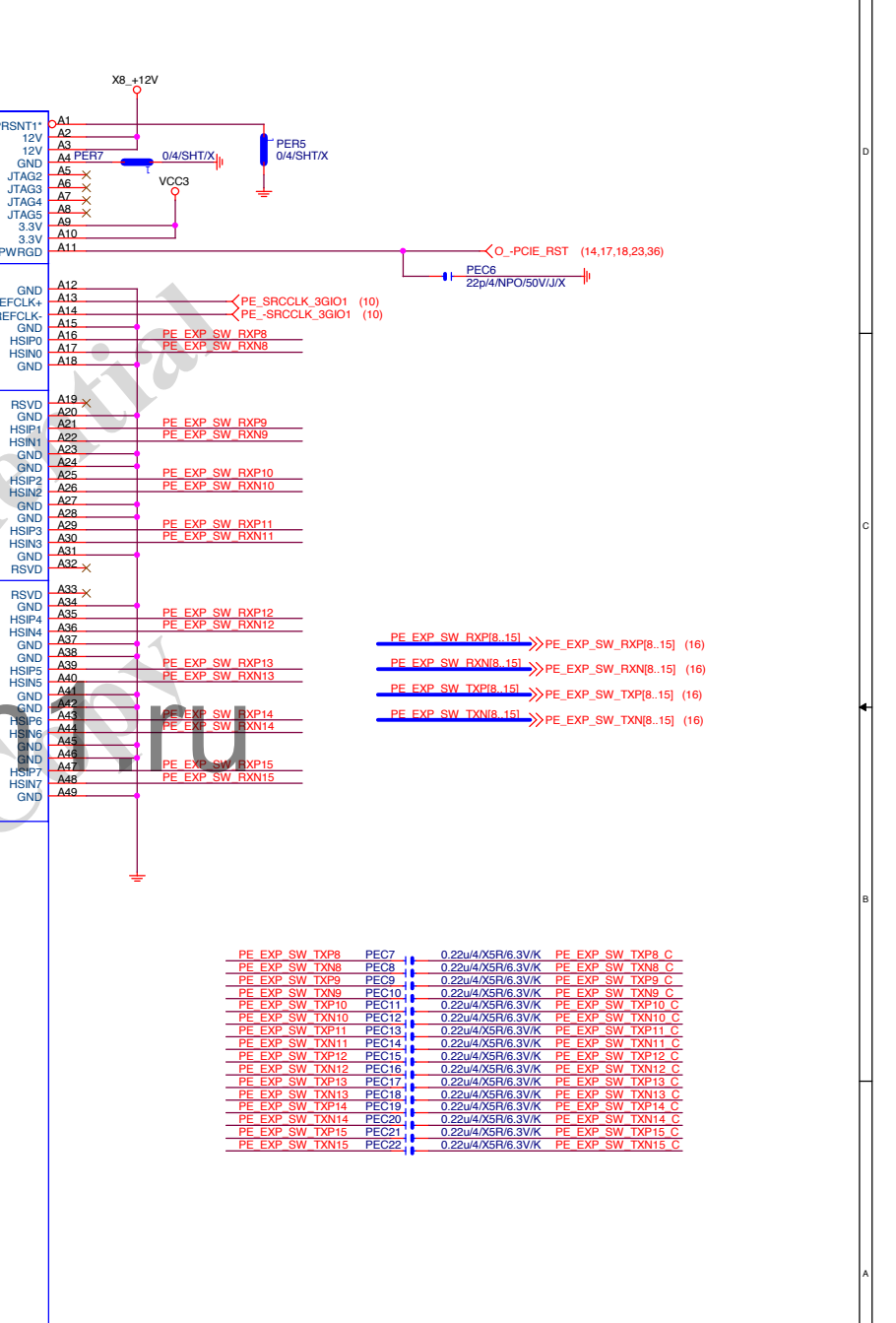
PCI-E/16X-99P/BK/RIGHT PUSH(11AC1-023099-12R)

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Do not

Confidential

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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

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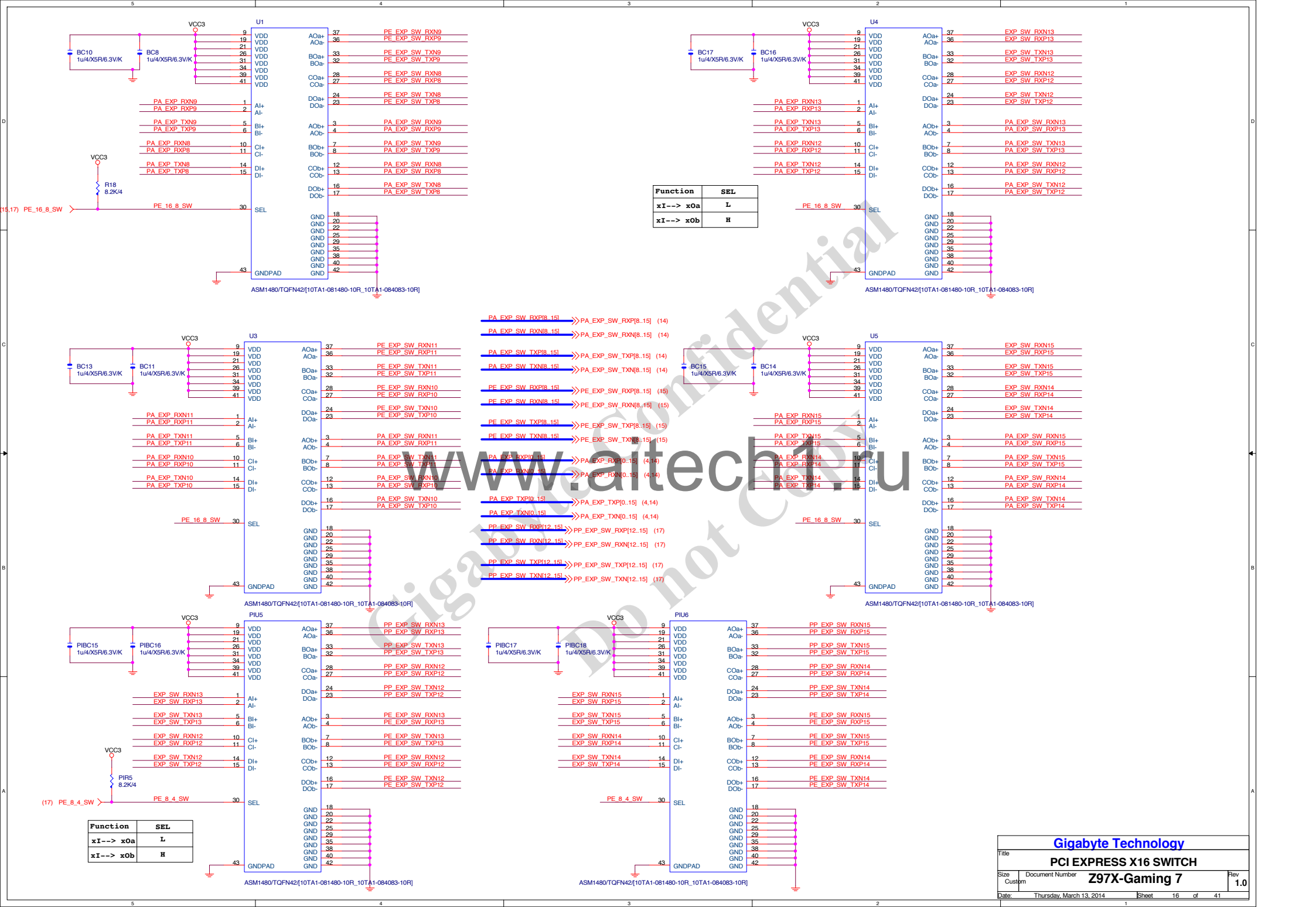
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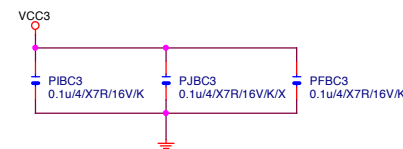
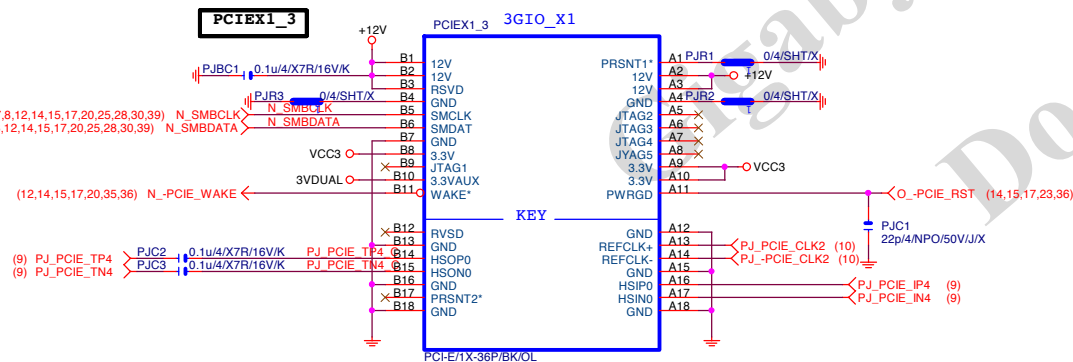
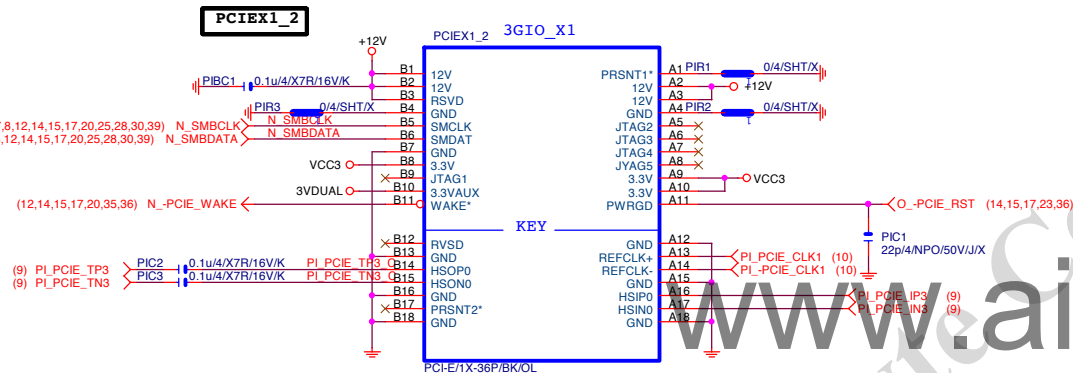
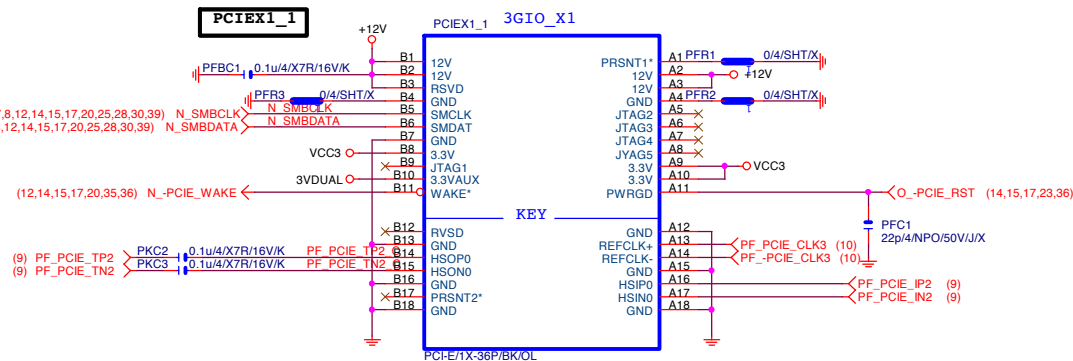
PE EXP SW TXP14





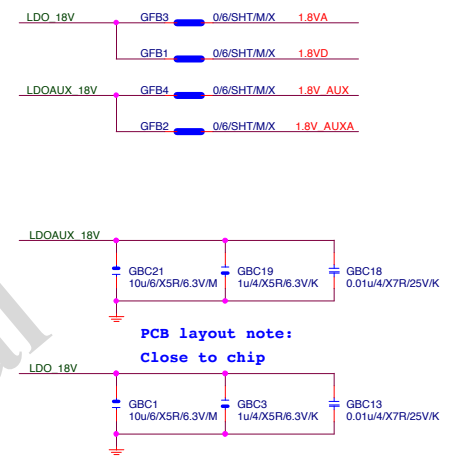
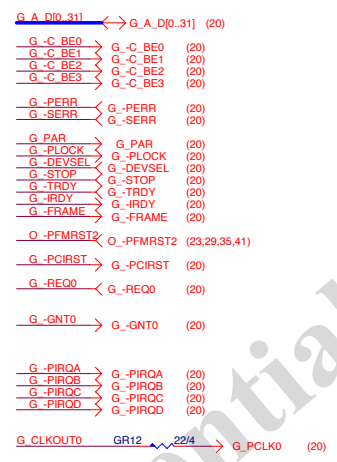
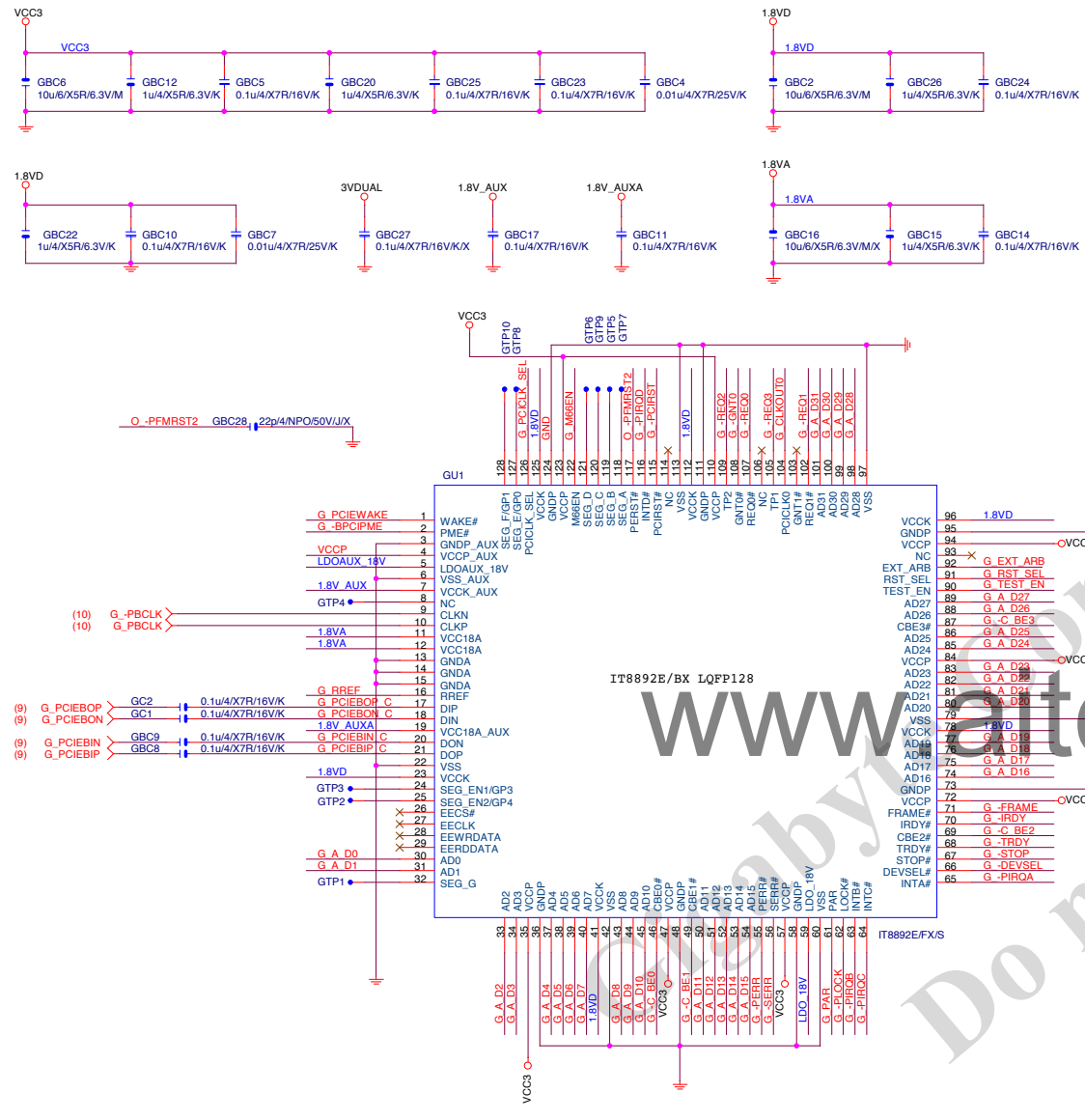


# PCIEX1 SLOT



Gigabyte Technology			
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Size	Document Number	Z97X-Gaming 7	
Custom			Rev 1.0
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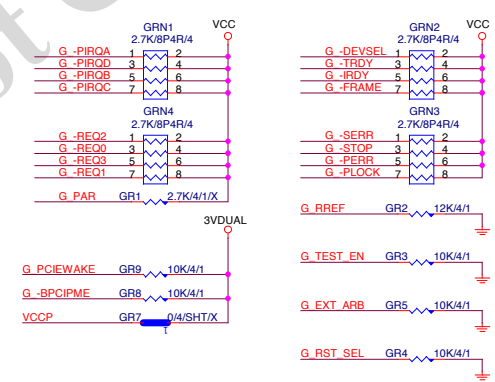




PCB layout note:  
Close to chip

High: Enable PCI CLK 66MHz  
Low: Disable PCI CLK 66MHz

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



Gigabyte Technology			
Title			
IT8892E			
Z97X-Gaming 7			
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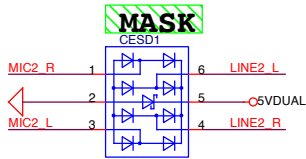


Thermal pad is DGND

Thermal pad is DGND

Digital Area

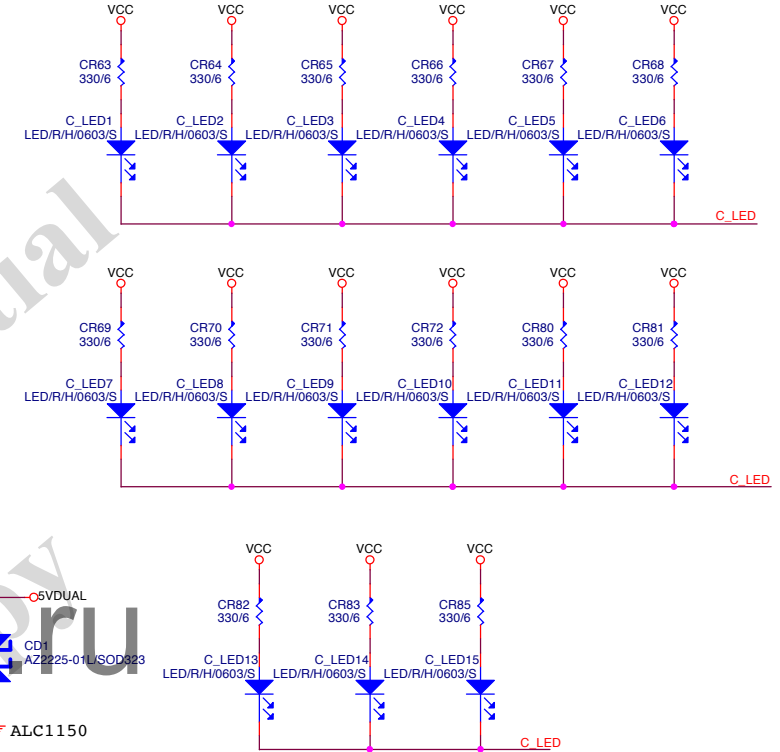
Analog Area

0/6/X For AGND/GND  
moat under Codec  
Body

EAPD: Default L  
H : ON  
L : OFF

Close to ALC1150

AUDIO\_HS[11NH1-00297S-01R]

金屬外罩+  
GND切割

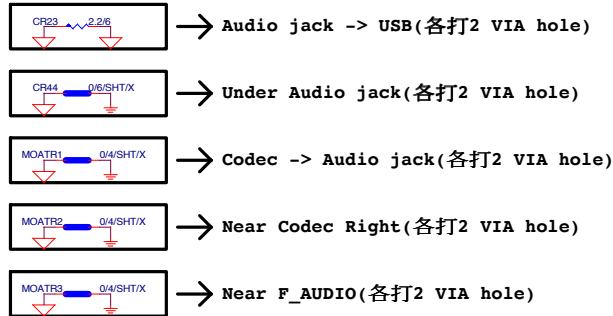
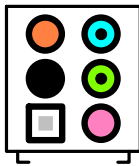
Gigabyte Technology

Title HD AUDIO ALC887B-VD2/VT1708SVT2021

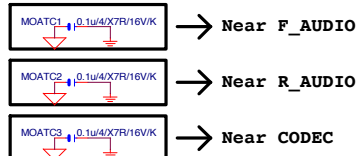
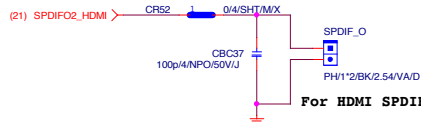
Size Custom Document Number Z97X-Gaming 7 Rev 1.0

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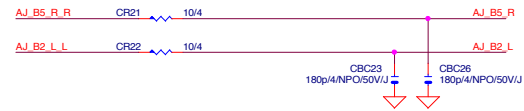
# AZALIA JACK



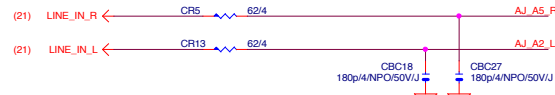
## SPDIF OUT



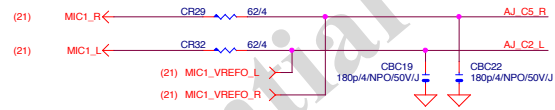
## LINE-OUT



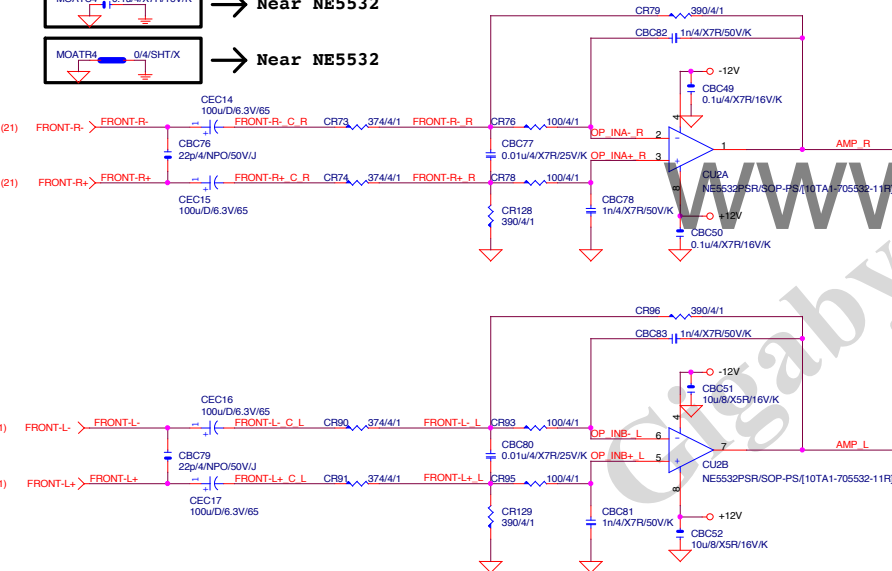
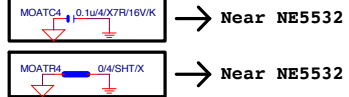
## LINE-IN



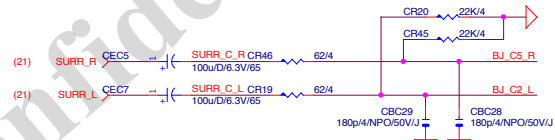
## MIC-IN



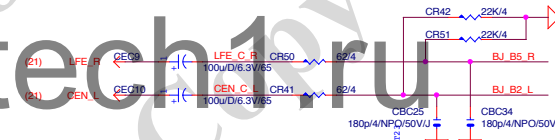
## Differential to Single-End AMPLIFIED



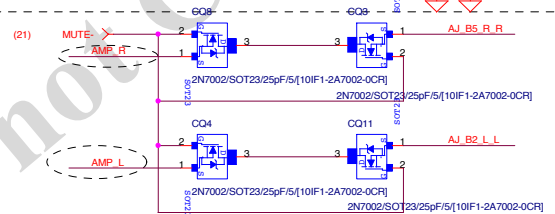
## SURROUND



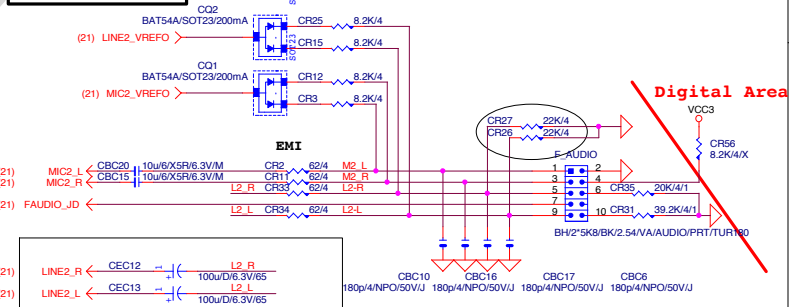
## CEN/LFE



## SURRBACK



## AZALIA FRONT PANEL



## AZALIA JACK

BLUE LINE-IN

GREEN LINE-OUT

PINK MIC-IN

Orange CEN/LFE

Black SURROUND

SPDIF

AUDIO鍍金

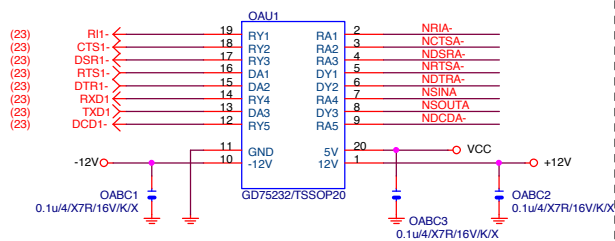
2X3RP/25P/BU,GE,OR,BK,GY/RA[11NR6-403025-81R]

Gigabyte Technology

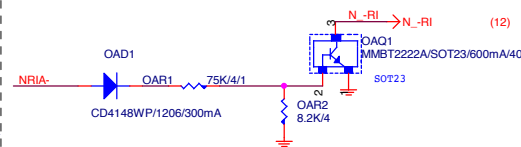
Title		
AUDIO JACK		
Size	Document Number	Rev
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Date:	Thursday, March 13, 2014	Sheet 22 of 41



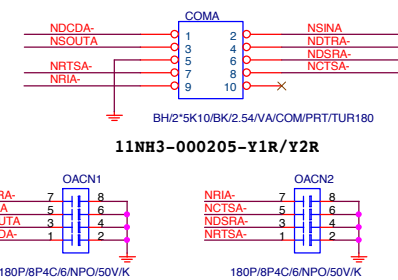
## COMA



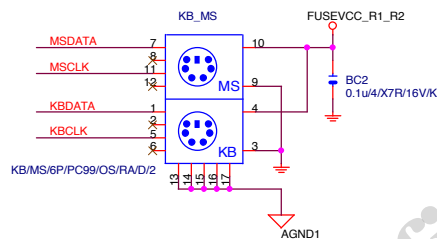
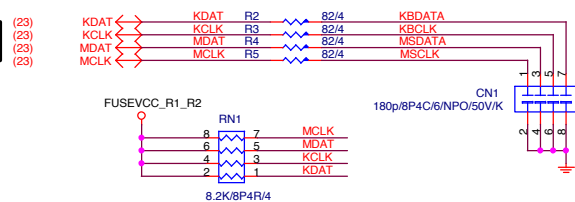
## COM RI



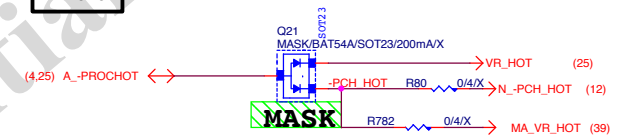
## COM BUFFER



## KB/USB



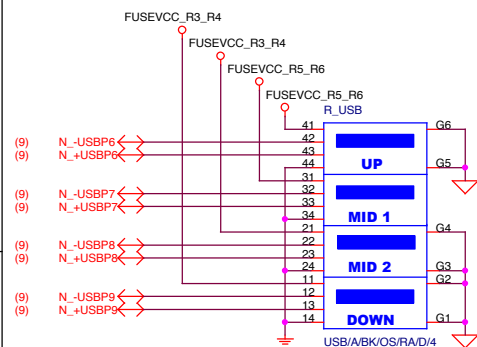
## -PROHOT



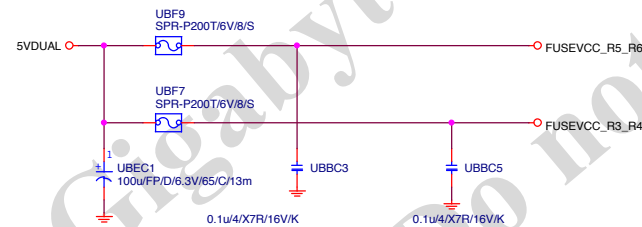
## Thunderbolt pin header

Removed

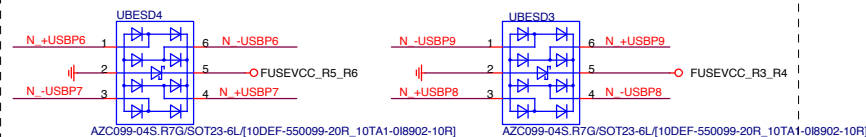
## R\_USB



## USB20 FUSE



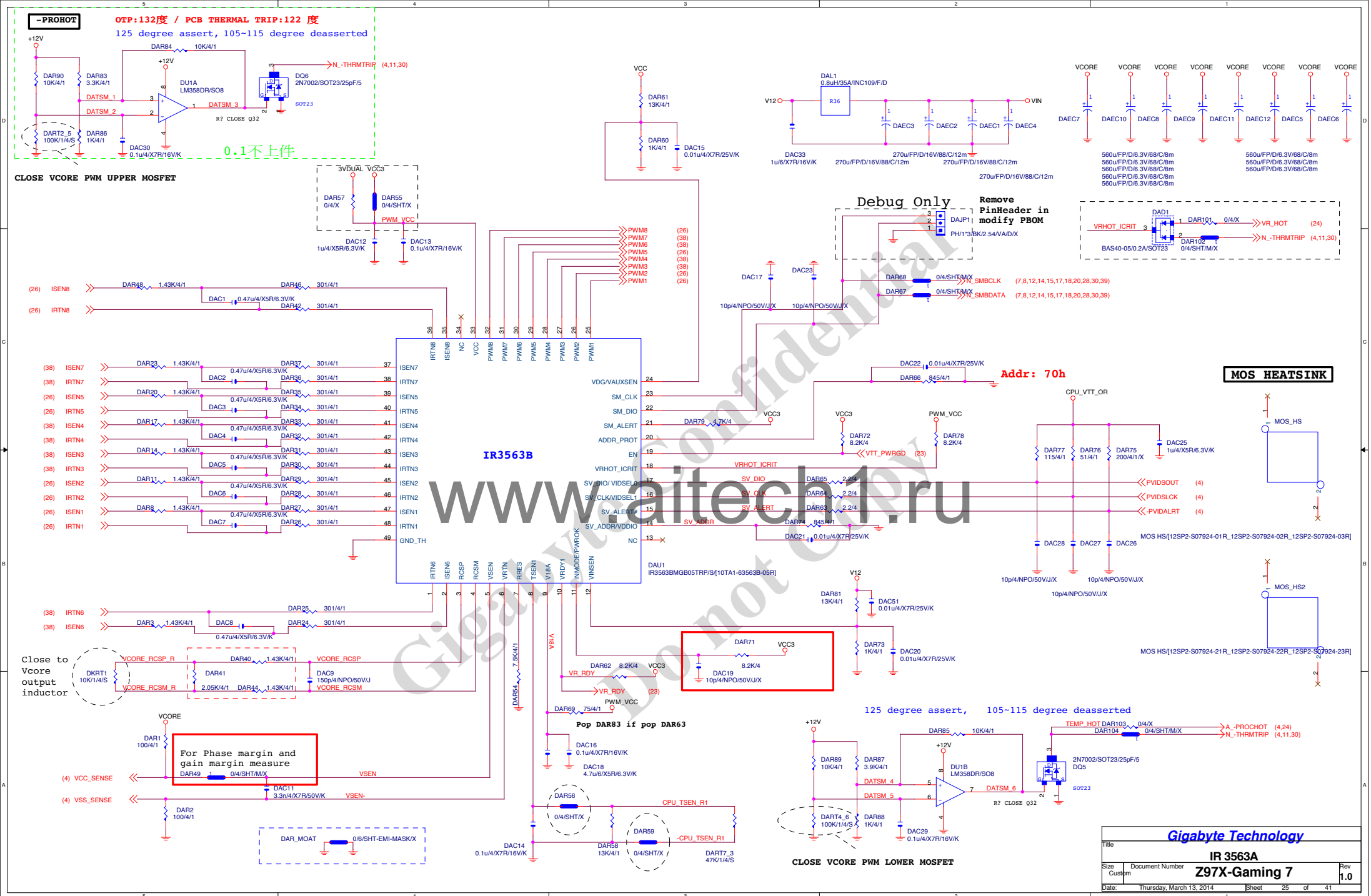
## USB20 ESD PROTECT



## Gigabyte Technology

Title			
COM/ PROHOT/ R_USB			
Size	Document Number	Rev	
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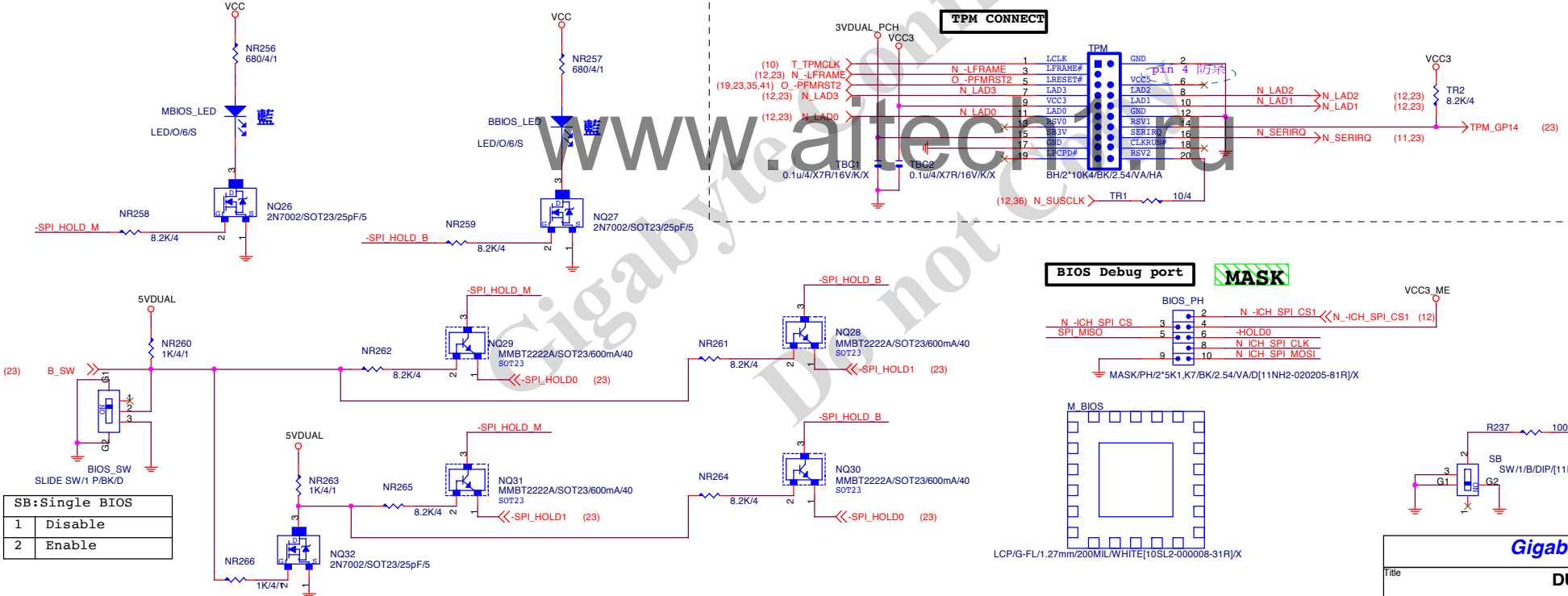
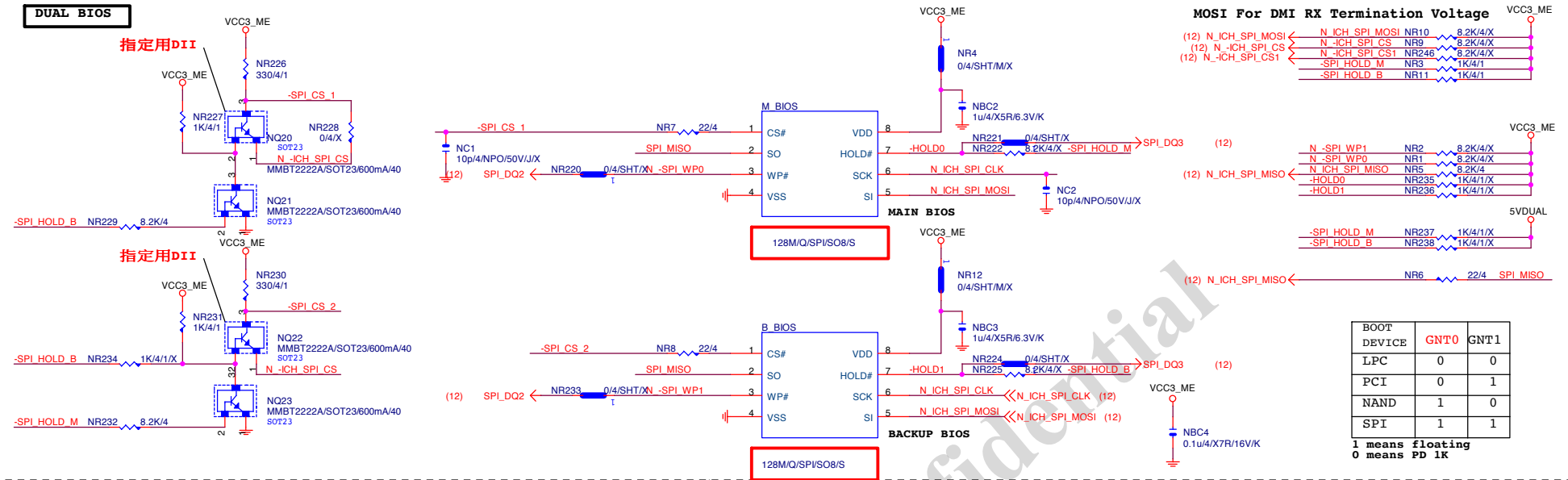
[illegible][illegible]

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DDRVTT



**DUAL BIOS**

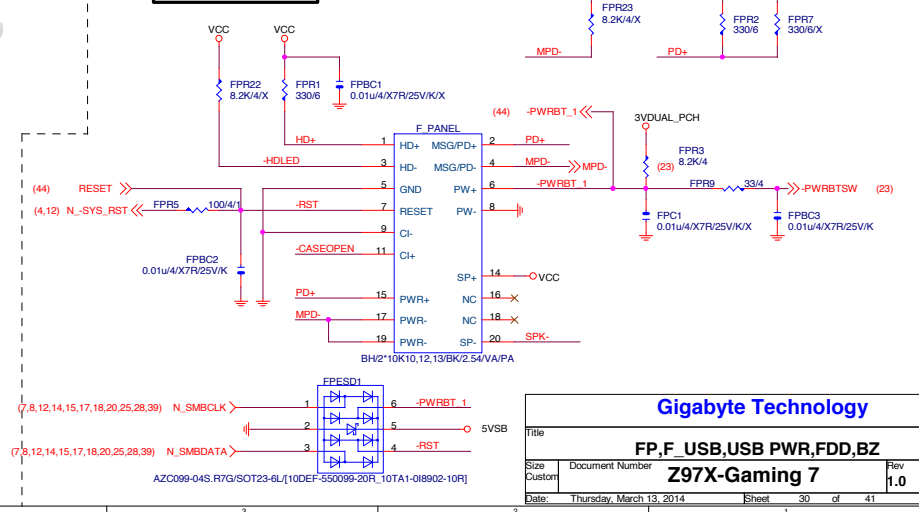
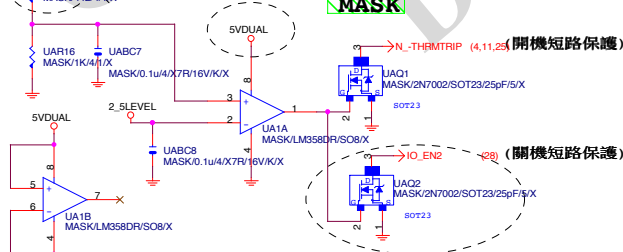
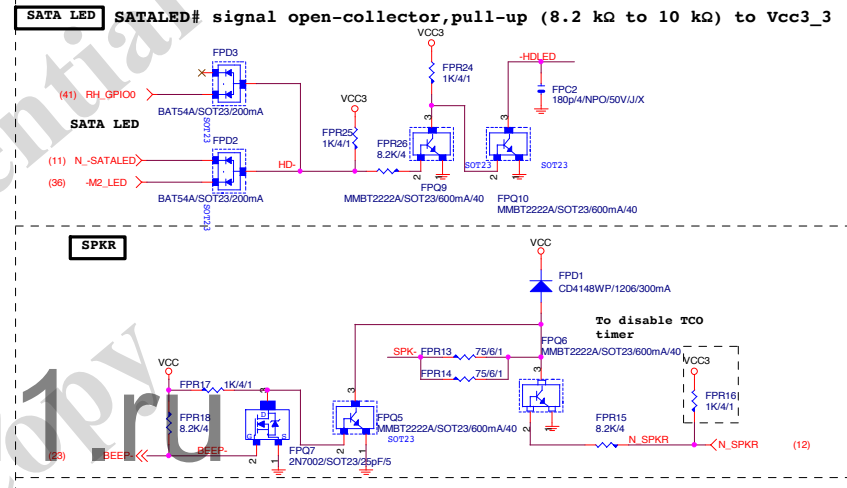
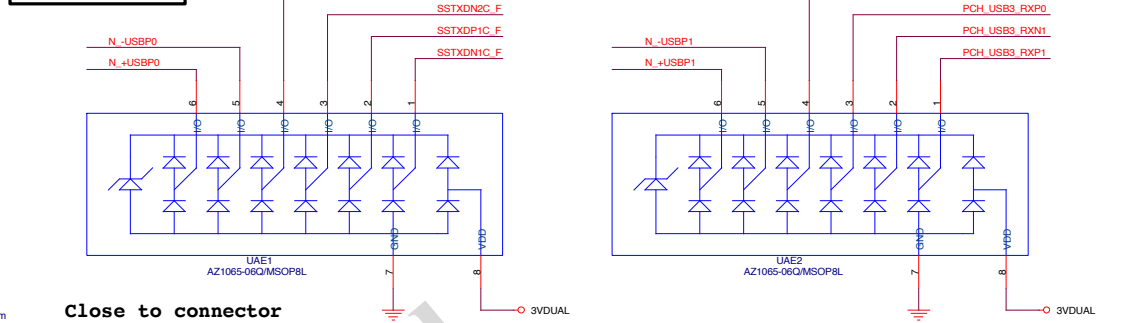
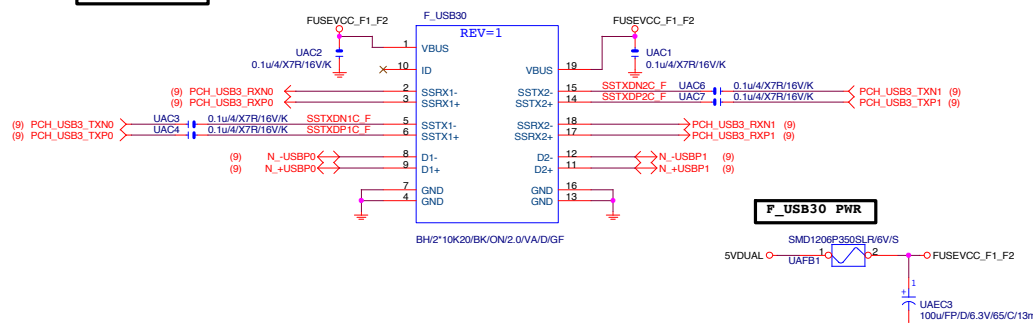


BOOT DEVICE	GNT0	GNT1
LPC	0	0
PCI	0	1
NAND	1	0
SPI	1	1

1 means floating  
0 means PD 1K

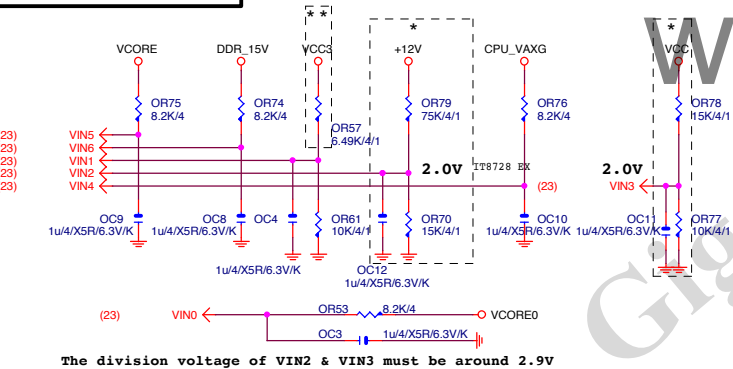
SB:Single BIOS	
1	Disable
2	Enable

<b><i>Gigabyte Technology</i></b>			
Title		<b>DUAL BIOS, TPM</b>	
Size Custom	Document Number	<b>GA-Z97X-UD5H</b>	Rev <b>1.0</b>
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2		1	

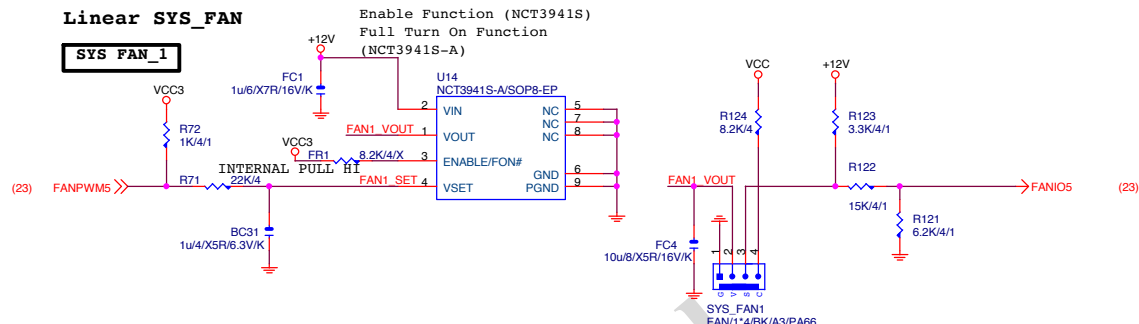


Title			
<b>ATX POWER CONNECTOR</b>			
Size Custom	Document Number	<b>Z97X-Gaming 7</b>	Rev <b>1.0</b>
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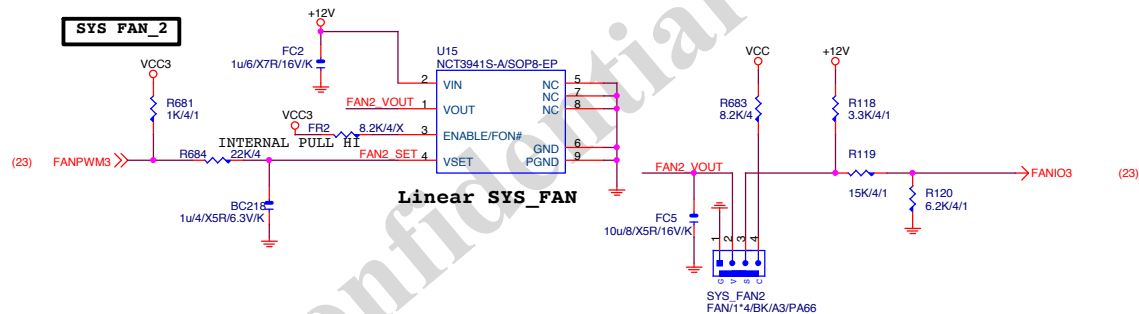
VOLTAGE-- H/W MONITOR

[illegible]

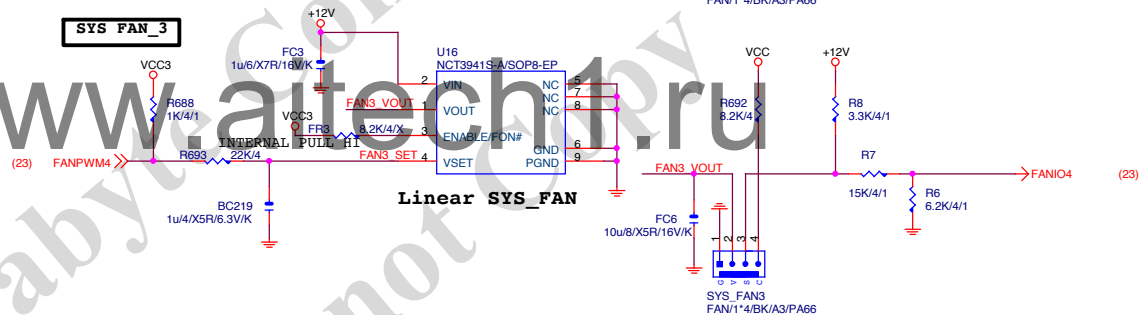
## SYS FAN\_1



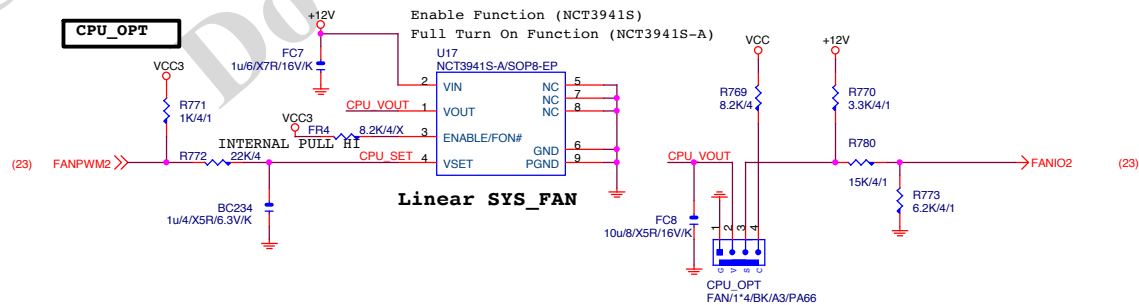
## SYS FAN\_2



## SYS FAN\_3



## CPU\_OPT



FOR EMI ONLY

+12V

C3  
1n4/X7R/50V/K

The diagram shows a vertical circuit trace. At the top, a red circle represents a +12V supply. Below it, a blue capacitor symbol is labeled 'C3' and '1n4/X7R/50V/K'. At the bottom, a red ground symbol is shown. The text 'FOR EMI ONLY' is printed to the left of the trace.

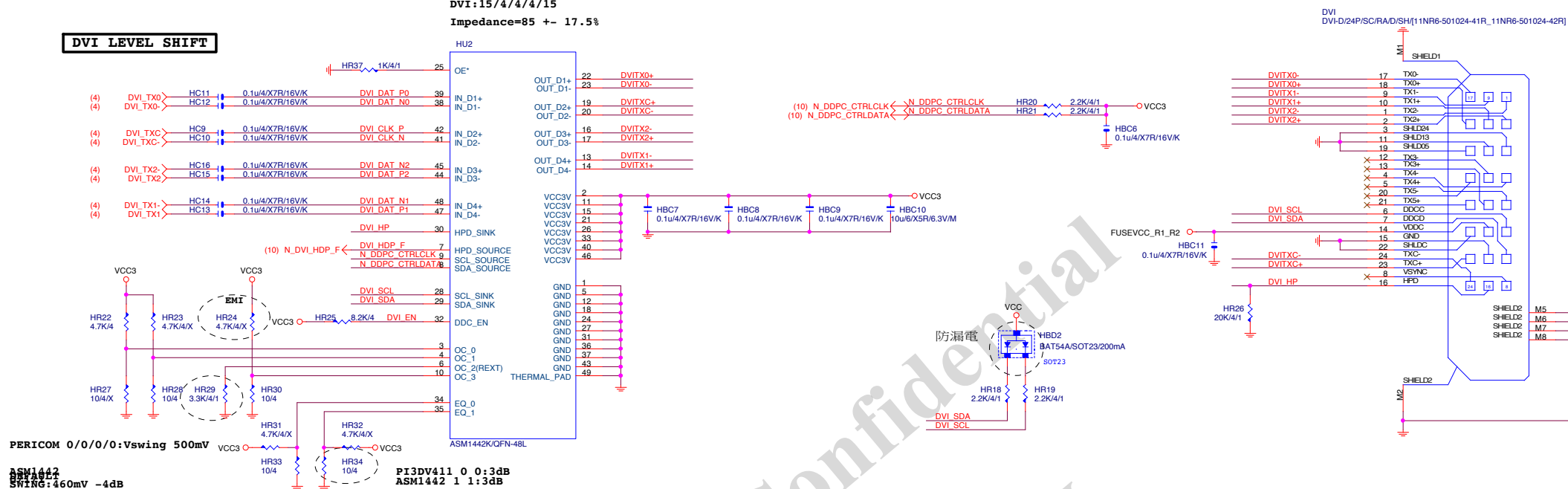
The schematic shows a component labeled '0/6/SHT/MX' in a blue oval. It is connected to a red triangle symbol labeled 'AGND1' on the left and a standard ground symbol on the right.

## Gigabyte Technology

Title				HWM,KB/MS, FAN CTRL			
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							1.0
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**DVI:15/4/4/4/15**  
**Impedance=85 +- 17.5%**

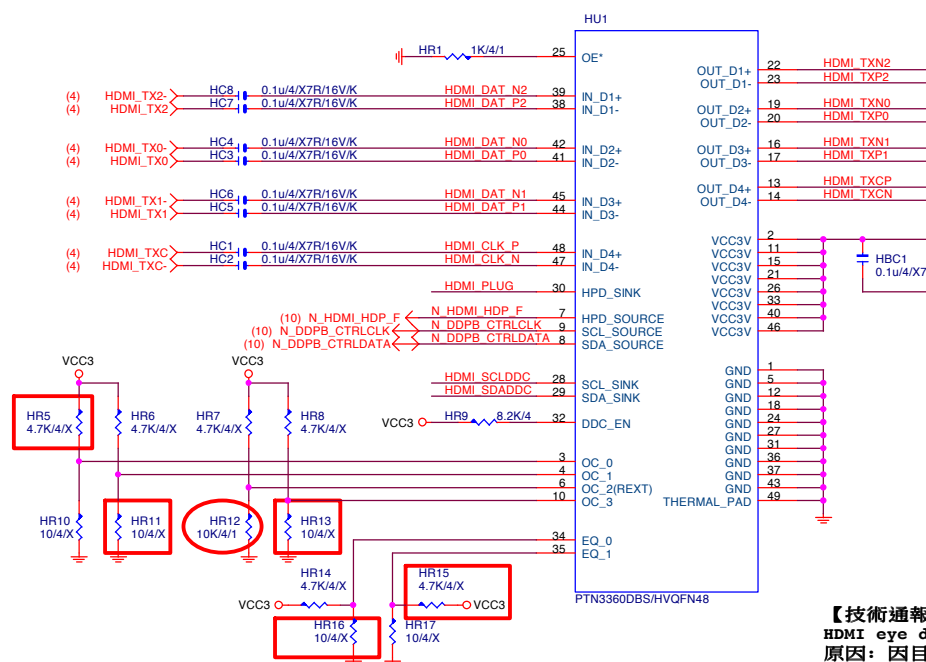


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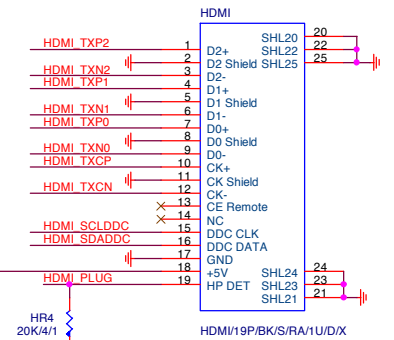
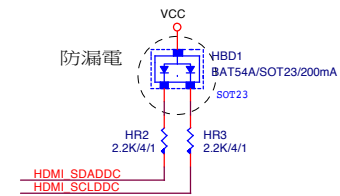
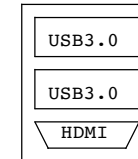
## HDMI LEVEL SHIFT

**HDMI : 20/4/6/4/20**

Impedance=85 +- 17.5%



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



## HDMI與R\_USB共用一個料件

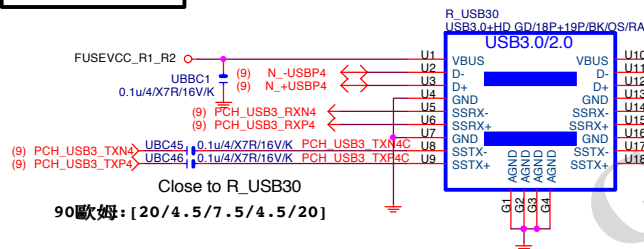
【技術通報R&amp;D技術通報150】

HDMI eye diagram1.4版(deep color)會fail

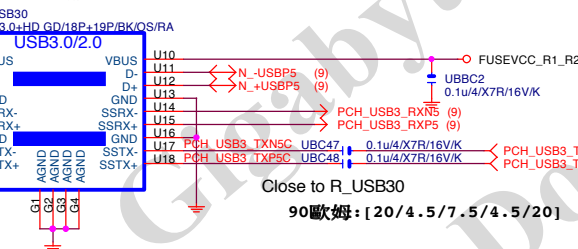
原因：因目前的HDMI訊號過長，造成RISING TIME過慢，而會壓到eye diagram

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

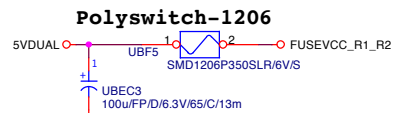
**USB30\_20 CONNECT**



## HDMI鍍金

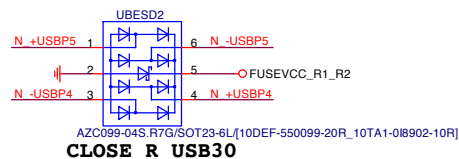


**USB30 PWR**

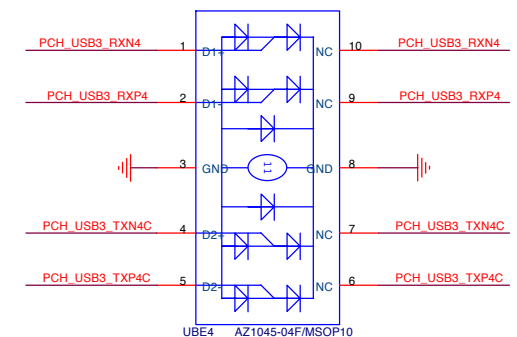
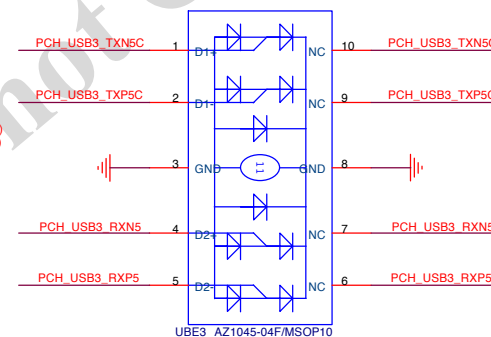


**USB3.0 1Port - 1Fuse (3.5A)**


USB20 ESD PROTECT



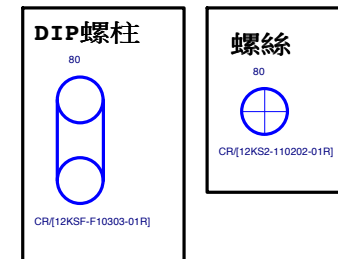
## USB30 ESD PROTECT



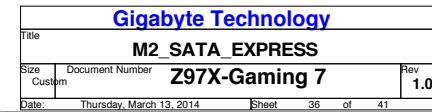
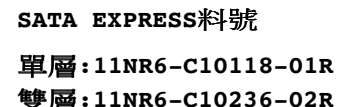
## Gigabyte Technology

<div style="text-align: center;">  </div>			
Title			
HDMI			
Size	Document Number	Rev	
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31R  
32R



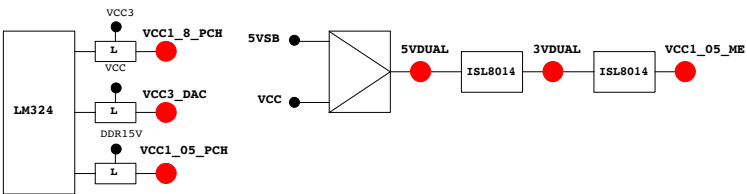
Function	SEL
xI--> x0a	L
xI--> x0b	H

## Super I/O ITE8720 GPIO Table

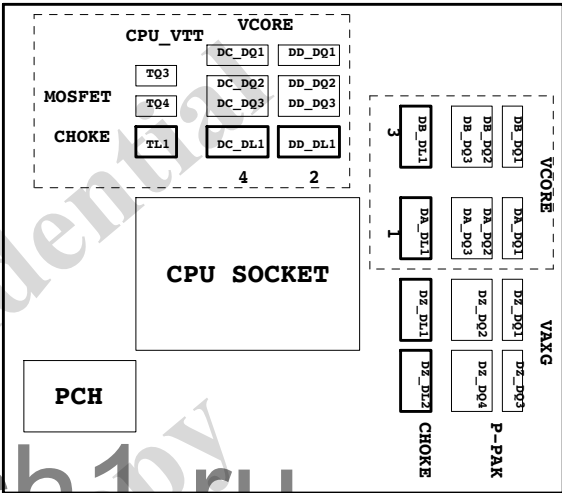
PIN	NAME	PWR	AFTER POWER- DOWN	Default	USAGE	NOTE
GP0	MAIN	H	-2	GPI	GPIO0	N/A
GP1/TACH1	MAIN			GPI	GPIO1	N/A
GP2/PIRQE#	MAIN			GPI	-PIRQE	P/U 8.2K VCC3
GP3/PIRQF#	MAIN			GPI	-PIRQF	P/U 8.2K VCC3
GP4/PIRQG#	MAIN			GPI	-PIRQG	P/U 8.2K VCC3
GP5/PIRQH#	MAIN			GPI	-PIRQH	P/U 8.2K VCC3
GP6/TACH2	MAIN			GPI	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	-2	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	-2	GPI	Mobile Only	N/A
GP31	STBY	H	-2	GPI	Mobile Only	N/A
GP32	MAIN	H		GPO	N/A	N/A
GP33	MAIN	H		GPO	N/A	N/A
GP34	MAIN	H	-2	GPI	-PCI_STOP	P/U 8.2K VCC3
GP35	MAIN	L		GPO	-AC2_DET	P/U 8.2K VCC3
GP36	MAIN			GPI	N/A	N/A
GP37	MAIN			GPI	N/A	N/A
GP38	MAIN	H	-2	GPI	PCIEX4 Detect	P/U 8.2K VCC3
GP39	MAIN	H	-2	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	-2	IN	GPIO48	P/U 8.2K 3VDUAL
GP49	MAIN	H	-2	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	H		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	-2	IN	VCORE_OV1	P/U 8.2K 3VDUAL
GP58	STBY	H	-2	NATIVE	F_USB_OC	P/U 8.2K 3VDUAL
GP59	STBY			NATIVE	USB_OC0#	N/A
GP60	STBY	H	-2	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	-2	NATIVE	VCORE_OV4	P/U 8.2K 3VDUAL
GP73	STBY				Mobile Only	N/A
GP74	STBY	H	-2	NATIVE	1_05V_OV2	P/U 8.2K 3VDUAL
GP75	STBY	H	-2	NATIVE	N/A(Reverse)	P/U 8.2K 3VDUAL

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#CIRRX1/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	
FE/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/BUSSIO	NB_LED3_C	
GP22/SCK	LOW_PWR_1	
VIDO5/GP27/SIN2	LOW_PWR_2	
PCIRST2#/GP11	-PFWRS1T	
PCIRST1#/GP12	-PFWRS1T2	
3VBSW#/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/BUSSO1	MB_ID3	
PD7/GP77/BUSSO2	MB_ID4	
AFD#/GP86/SMBC_R	PS PIN	FST_2X8
INIT#/GP85/SMBD_M	SEC_2x8	GTLREF_AD2
ACK#/GP83	DDR_LED1_C	
VIDO1/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	
VIDO4/GP26/SOUT2	DDR18V_PH2_EN	
VIDO2/FAN_TAC5/GP24/DSR2#	DDR18V_LED	
VIDO6/GP17/RI2#	1_1V_PH_EN	
VIDO7/JP6/DTR2#	JP6	
PD5/GP75/BUSSO0	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 Termination
VREF_CA_A/VREF_CA_B	DRAM Address Ref
VREF_DQ_A/VREF_DQ_B	DRAM Data Ref

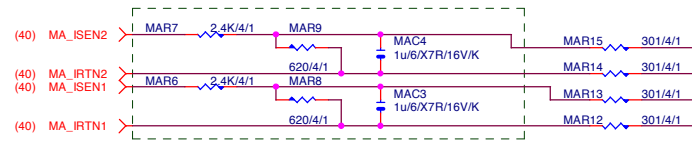
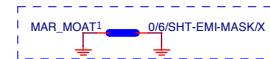
**散熱模組料號:**

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

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

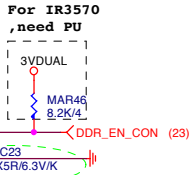
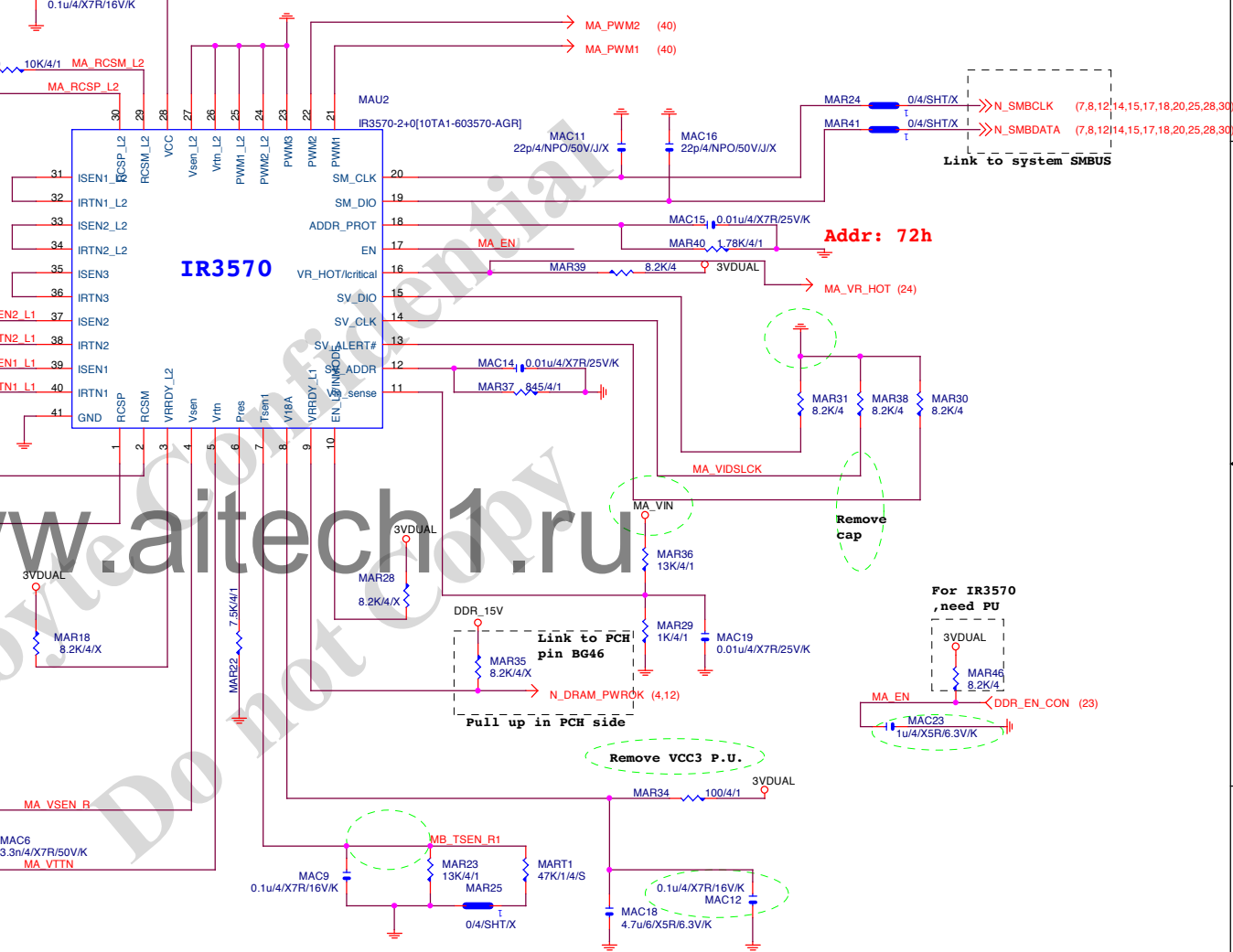
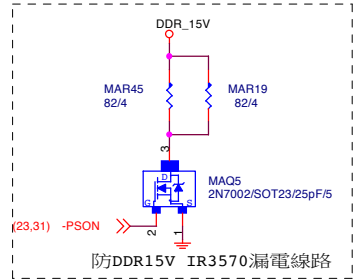




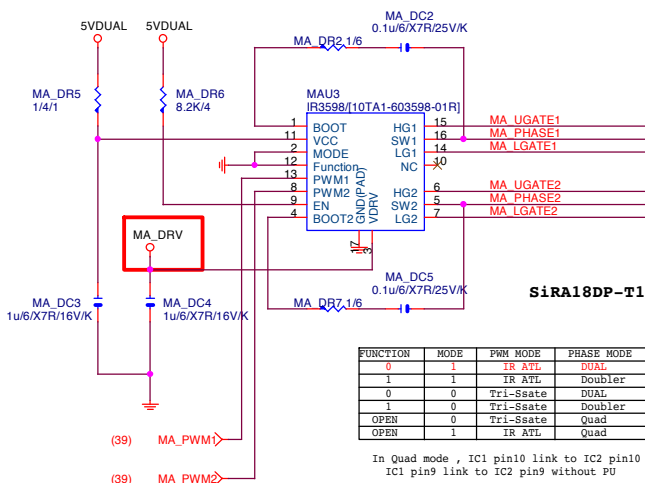


Close to DDR  
output inductor

should be routed as differential pair,  
7mil width, 8mil spacing

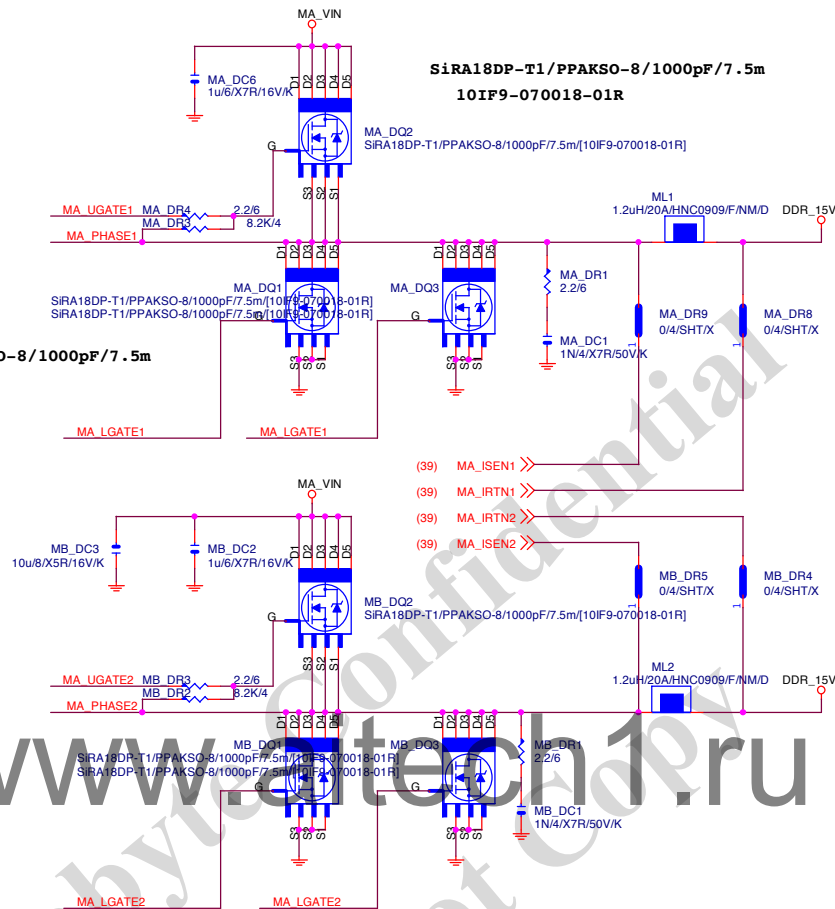
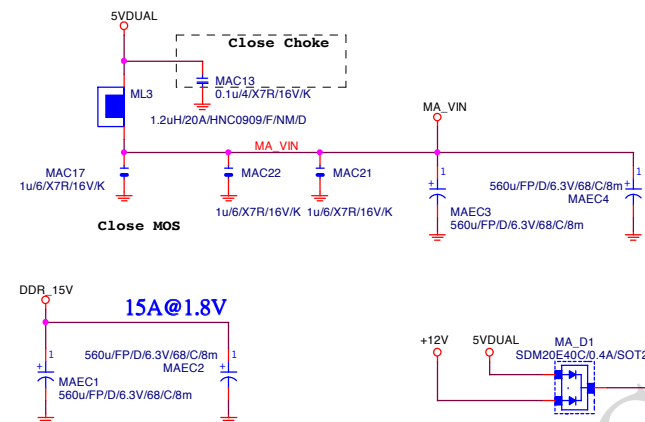


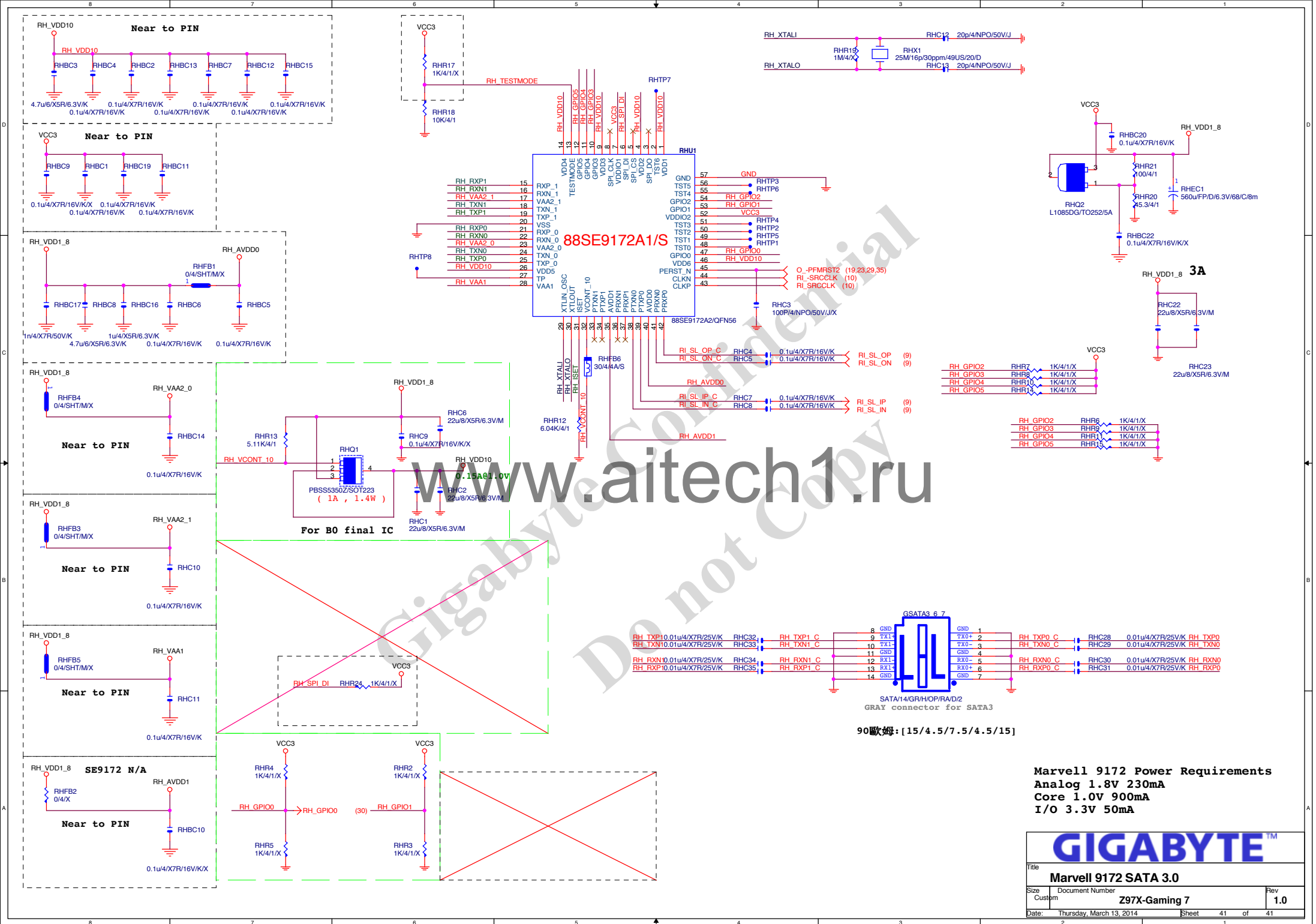
# DDR\_15V

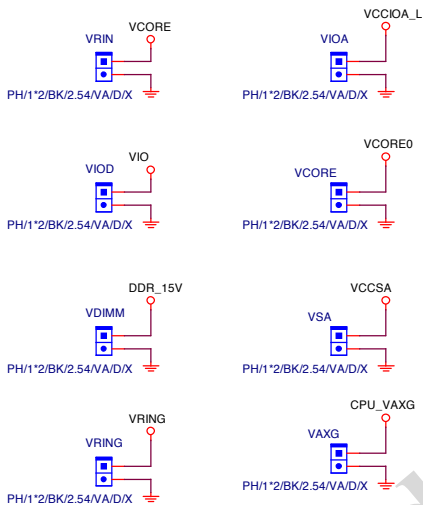


FUNCTION	MODE	PWM MODE	PHASE MODE
0	1	IR ATL	DUAL
1	1	IR ATL	Doubler
0	0	Tri-Sate	DUAL
1	0	Tri-Sate	Doubler
OPEN	0	Tri-Sate	Quad
OPEN	1	IR ATL	Quad

In Quad mode, IC1 pin10 link to IC2 pin10  
IC1 pin9 link to IC2 pin9 without PU





Physical Package  
(TOP VIEW)