

Model Name: GA-Z97X-UD5H

SHEET

TITLE

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 EXPRESSx16 SLOT
15	PCI EXPRESSx8 SLOT
16	PCI EXPRESSx4 SLOT
17	PCI EXPRESSx16 x8 x4 Switch
18	PCI EXPRESSx1 Slot 1 & 2
19	ITE8892E PCIe to PCI Bridge
20	PCI SLOT 1 & 2
21	ALC1150 CODEC
22	REAR AUDIO JACK
23	ITE8620CX LPC IO
24	COM/KB_MS_USB/PROHOT/USB PROTECT
25	IR3563B
26	IR3598 VCORE Phase 1~6
27	IR3598 VCORE Phase 7~12
28	DISCRETE POWER
29	DUAL BIOS

30	FP,F_USB,BZ
31	ATX POWER CONNECTOR
32	H/W MONITOR,FAN CTRL
33	DVI
34	HDMI & USB30
35	ARTHEROS E2201 (Bigfoot)
36	M.2_SATA_EXPRESS
37	IR3570 DDR PWM
38	IR3598 DDR1.5V 2-Phase
39	Intel i217V GbE LAN
40	Marvell 9172 SATA6Gx2
41	uPD720210 USB3.0 Hub
42	uPD720210 USB3.0 Hub_Power
43	M3 Power
44	RST, PWR, CLR_CMOS Button
45	TABLE LIST

PH7 PH8 PH1 PH2 PH9 PH10 PH3

PH4

PH11

PH12

PH5

PH6

CPU SOCKET

2 oz PCB

Gigabyte Technology

Title		Cover Sheet		Rev
Size	Document Number	GA-Z97X-UD5H		1.0
Custom	Date	Thursday, April 24, 2014	Sheet	1 of 45

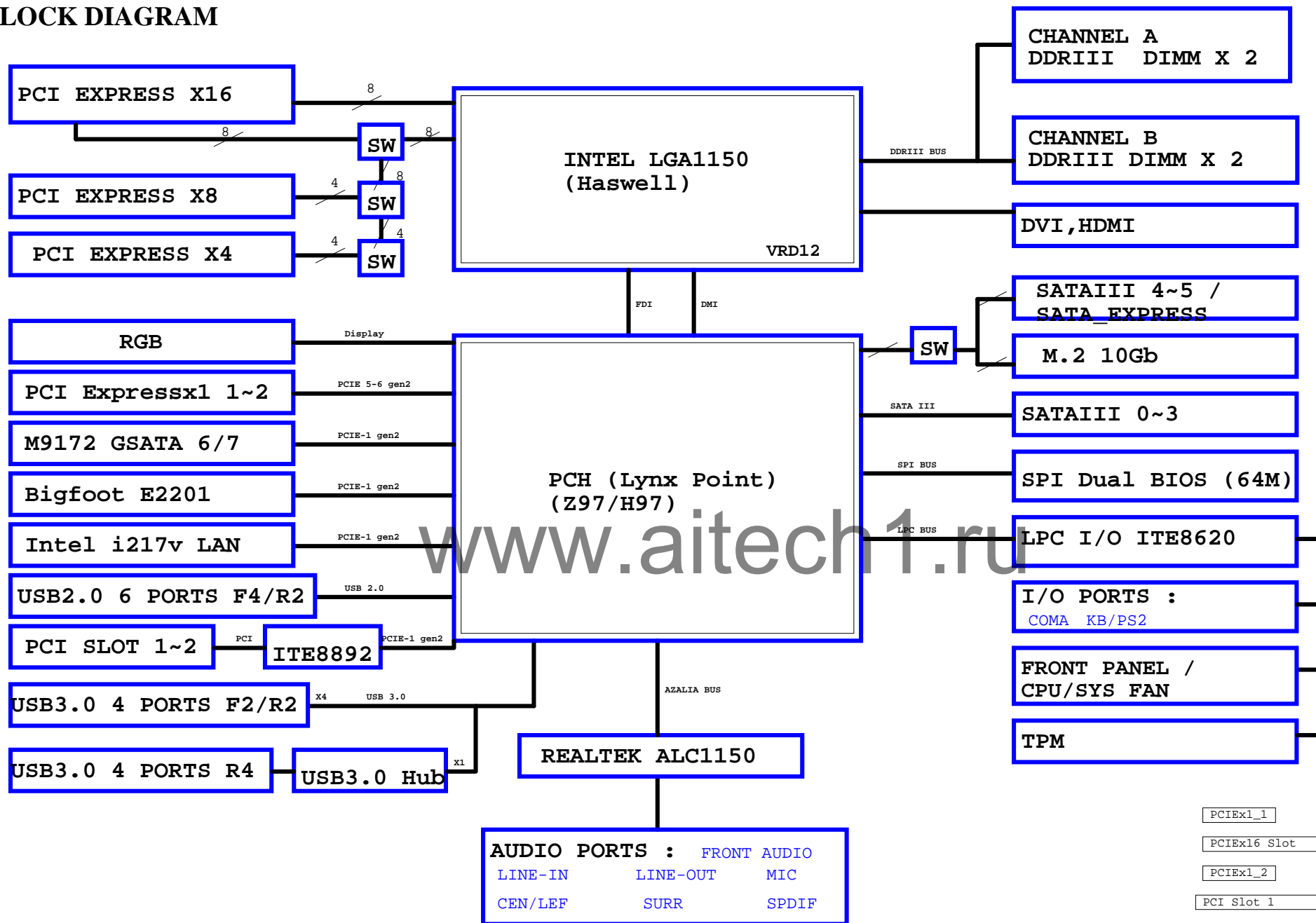
Component value change history

Circuit or PCB layout change

Gigabyte Technology

Title			
BOM & PCB MODIFY HISTORY			
Size	Document Number		Rev
Custom	GA-Z97X-UD5H		1.0
Date:	Thursday, April 24, 2014	Sheet	2 of 45

BLOCK DIAGRAM



PCIEx1_1

PCIEx16 Slot

PCIEx1_2

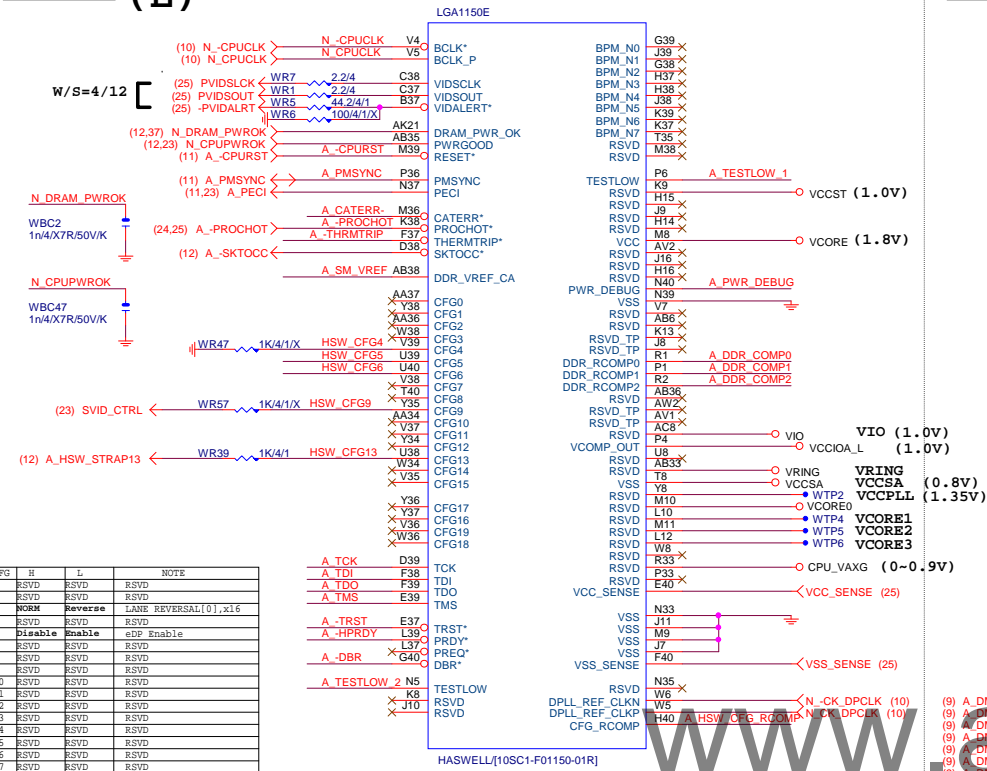
PCI Slot 1

PCIEx8

PCI Slot 2

PCIEx4

LGA1150 (E)

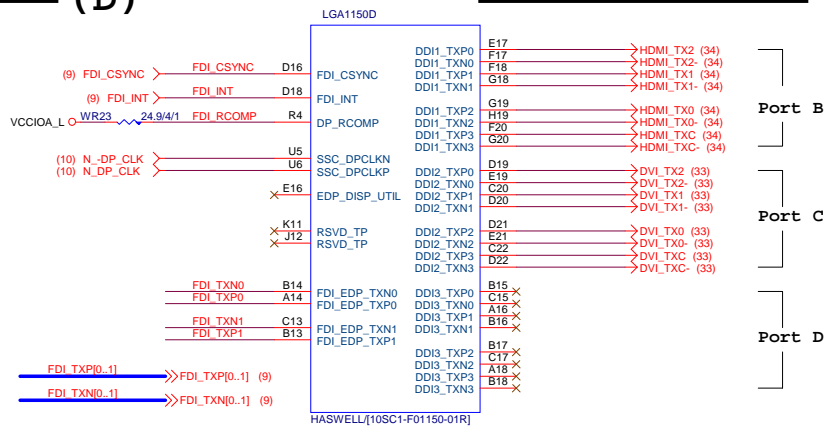


CFG	H	L	NOTE
0	RSVD	RSVD	RSVD
1	RSVD	RSVD	RSVD
2	RSVD	Reverse	CAVE REVERSAL[0..x16
3	RSVD	RSVD	RSVD
4	Disable	Enable	eDP Enable
7	RSVD	RSVD	RSVD
8	RSVD	RSVD	RSVD
9	RSVD	RSVD	RSVD
10	RSVD	RSVD	RSVD
11	RSVD	RSVD	RSVD
12	RSVD	RSVD	RSVD
13	RSVD	RSVD	RSVD
14	RSVD	RSVD	RSVD
15	RSVD	RSVD	RSVD
16	RSVD	RSVD	RSVD
17	RSVD	RSVD	RSVD

CFG6	CFG5	PCIE CONFIG
1	1	1x16 , Default
1	0	2x8
0	1	RSVD
0	0	1x8, 1x4, 1x2

CFG 0-17 all internal PULL-UP

LGA1150 (D)



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

DP/HDMI 4/4/4//20 FDI 4/4/4/12

Impedance=85 +- 15%

LGA1155 (C)



CPU PEG 5/5/5//20 Impedance=80 +- 15%

DMI 4/4/4//15 Impedance=85 +/- 15%

-CPURST

1.1V分壓

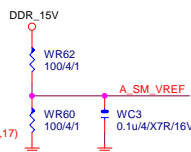
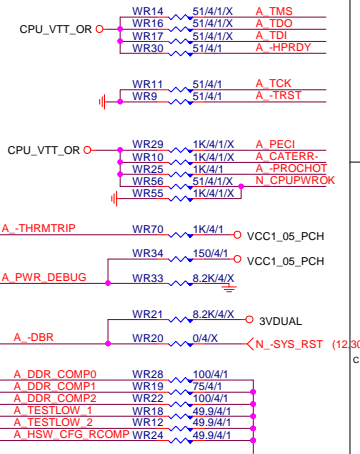
Remove分壓電阻

WBC3
1n4/X7R/50V/K

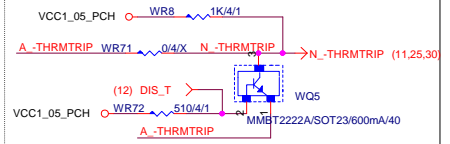
CPU SVID



CPU	PU/PD
-----	-------



THRMTRIP DISABLE FOR Z87 OVERCLOCK

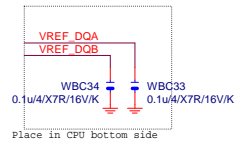


LGA1150 (A)

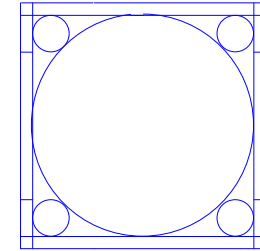
LGA1150A			
MAAA0	AU13	DDR0_MA0	DDR0_DQ0
MAAA1	AV16	DDR0_MA1	DDR0_DQ1
MAAA2	AU16	DDR0_MA2	DDR0_DQ2
MAAA3	AW17	DDR0_MA3	DDR0_DQ3
MAAA4	AU17	DDR0_MA4	DDR0_DQ4
MAAA5	AW18	DDR0_MA5	DDR0_DQ5
MAAA6	AV17	DDR0_MA6	DDR0_DQ6
MAAA7	AT18	DDR0_MA7	DDR0_DQ7
MAAA8	AU18	DDR0_MA8	DDR0_DQ8
MAAA9	AT19	DDR0_MA9	DDR0_DQ9
MAAA10	AW11	DDR0_MA10	DDR0_DQ10
MAAA11	AV19	DDR0_MA11	DDR0_DQ11
MAAA12	AU19	DDR0_MA12	DDR0_DQ12
MAAA13	AY10	DDR0_MA13	DDR0_DQ13
MAAA14	AT20	DDR0_MA14	DDR0_DQ14
MAAA15	AU21	DDR0_MA15	DDR0_DQ15
MODT_A0	AW10	DDR0_ODT0	DDR0_ODT0
MODT_A1	AY8	DDR0_ODT1	DDR0_ODT1
MODT_A2	AW9	DDR0_ODT2	DDR0_ODT2
MODT_A3	AU8	DDR0_ODT3	DDR0_ODT3
AW33		DDR0_ECC0	DDR0_ECC0
AV33		DDR0_ECC1	DDR0_ECC1
AU31		DDR0_ECC2	DDR0_ECC2
AV31		DDR0_ECC3	DDR0_ECC3
AT33		DDR0_ECC4	DDR0_ECC4
AU33		DDR0_ECC5	DDR0_ECC5
AT31		DDR0_ECC6	DDR0_ECC6
AW31		DDR0_ECC7	DDR0_ECC7
SBA00	SBA01	DDR0_BA0	DDR0_BA0
SBA01	SBA02	DDR0_BA1	DDR0_BA1
SBA02	AT21	DDR0_BA2	DDR0_BA2
CKEA0	AV22	DDR0_CKE0	DDR0_CKE0
CKEA1	AT23	DDR0_CKE1	DDR0_CKE1
CKEA2	AU22	DDR0_CKE2	DDR0_CKE2
CKEA3	AU23	DDR0_CKE3	DDR0_CKE3
CSA0	AU14	DDR0_CS_N0	DDR0_CS_N0
CSA1	AV9	DDR0_CS_N1	DDR0_CS_N1
CSA2	AU10	DDR0_CS_N2	DDR0_CS_N2
CSA3	AW8	DDR0_CS_N3	DDR0_CS_N3
DCLKA0	AY15	DDR0_CLK_P0	DDR0_CLK_P0
DCLKA0	AY16	DDR0_CLK_N0	DDR0_CLK_N0
DCLKA1	AW15	DDR0_CLK_P1	DDR0_CLK_P1
DCLKA1	AV15	DDR0_CLK_N1	DDR0_CLK_N1
DCLKA2	AW14	DDR0_CLK_P2	DDR0_CLK_P2
DCLKA2	AW14	DDR0_CLK_N2	DDR0_CLK_N2
DCLKA3	AW13	DDR0_CLK_P3	DDR0_CLK_P3
DCLKA3	AY13	DDR0_CLK_N3	DDR0_CLK_N3
AW12		RSVD	RSVD
SRASA	AU12	DDR0_RAS*	DDR0_RAS*
SWEA	AU11	DDR0_WE*	DDR0_WE*
AW20		RSVD	RSVD
AW27		RSVD	RSVD
SCASA	AU9	DDR0_CAS*	DDR0_CAS*
WR61	AK22	DDR_RESET	DDR_RESET
WC4		0.1u4/X7R/16V/KX	
HASWELL[10SC1-F01150-01R]			

LGA1150 (B)

LGA1150B			
MAAB0	AL19	DDR1_MA0	DDR1_MA0
MAAB1	AK23	DDR1_MA1	DDR1_MA1
MAAB2	AM22	DDR1_MA2	DDR1_MA2
MAAB3	AM23	DDR1_MA3	DDR1_MA3
MAAB4	AP23	DDR1_MA4	DDR1_MA4
MAAB5	AL23	DDR1_MA5	DDR1_MA5
MAAB6	AY24	DDR1_MA6	DDR1_MA6
MAAB7	AV25	DDR1_MA7	DDR1_MA7
MAAB8	AU26	DDR1_MA8	DDR1_MA8
MAAB9	AW25	DDR1_MA9	DDR1_MA9
MAAB10	AP18	DDR1_MA10	DDR1_MA10
MAAB11	AY25	DDR1_MA11	DDR1_MA11
MAAB12	AV26	DDR1_MA12	DDR1_MA12
MAAB13	AR15	DDR1_MA13	DDR1_MA13
MAAB14	AV27	DDR1_MA14	DDR1_MA14
MAAB15	AY28	DDR1_MA15	DDR1_MA15
MODT_B0	AM17	DDR1_ODT0	DDR1_ODT0
MODT_B1	AL18	DDR1_ODT1	DDR1_ODT1
MODT_B2	AM16	DDR1_ODT2	DDR1_ODT2
MODT_B3	AK15	DDR1_ODT3	DDR1_ODT3
AM26		DDR1_ECC0	DDR1_ECC0
AP25		DDR1_ECC1	DDR1_ECC1
AP26		DDR1_ECC2	DDR1_ECC2
AL26		DDR1_ECC3	DDR1_ECC3
AL25		DDR1_ECC4	DDR1_ECC4
AR26		DDR1_ECC5	DDR1_ECC5
AR25		DDR1_ECC6	DDR1_ECC6
AK17		DDR1_BA0	DDR1_BA0
SBA01	AL18	DDR1_BA1	DDR1_BA1
SBA02	AW28	DDR1_BA2	DDR1_BA2
CKEB0	AW29	DDR1_CKE0	DDR1_CKE0
CKEB1	AU29	DDR1_CKE1	DDR1_CKE1
CKEB2	AU28	DDR1_CKE2	DDR1_CKE2
CKEB3	AU29	DDR1_CKE3	DDR1_CKE3
CSB0	AP17	DDR1_CS_N0	DDR1_CS_N0
CSB1	AN15	DDR1_CS_N1	DDR1_CS_N1
CSB2	AN17	DDR1_CS_N2	DDR1_CS_N2
CSB3	AL15	DDR1_CS_N3	DDR1_CS_N3
DCLKB0	AM20	DDR1_CLK_P0	DDR1_CLK_P0
DCLKB0	AM21	DDR1_CLK_N0	DDR1_CLK_N0
DCLKB1	AP21	DDR1_CLK_P1	DDR1_CLK_P1
DCLKB1	AP21	DDR1_CLK_N1	DDR1_CLK_N1
DCLKB2	AN20	DDR1_CLK_P2	DDR1_CLK_P2
DCLKB2	AN21	DDR1_CLK_N2	DDR1_CLK_N2
DCLKB3	AP19	DDR1_CLK_P3	DDR1_CLK_P3
DCLKB3	AP20	DDR1_CLK_N3	DDR1_CLK_N3
SCASB	AP16	DDR1_CAS*	DDR1_CAS*
SRASB	AM18	RSVD	RSVD
SWEB	AK16	DDR1_RAS*	DDR1_RAS*
AB39		DDR1_WE*	DDR1_WE*
AB40		DDR_VREF_DQ0	DDR_VREF_DQ0
AB40		DDR_VREF_DQ1	DDR_VREF_DQ1
AE34	MD80	DDR1_DQ0	DDR1_DQ0
AE35	MD81	DDR1_DQ1	DDR1_DQ1
AG35	MD82	DDR1_DQ2	DDR1_DQ2
AG35	MD83	DDR1_DQ3	DDR1_DQ3
AG34	MD84	DDR1_DQ4	DDR1_DQ4
AG35	MD85	DDR1_DQ5	DDR1_DQ5
AG34	MD86	DDR1_DQ6	DDR1_DQ6
AG34	MD87	DDR1_DQ7	DDR1_DQ7
AG34	MD88	DDR1_DQ8	DDR1_DQ8
AG35	MD89	DDR1_DQ9	DDR1_DQ9
AK31	MD90	DDR1_DQ10	DDR1_DQ10
AK31	MD91	DDR1_DQ11	DDR1_DQ11
AK34	MD92	DDR1_DQ12	DDR1_DQ12
AK35	MD93	DDR1_DQ13	DDR1_DQ13
AK32	MD94	DDR1_DQ14	DDR1_DQ14
AL32	MD95	DDR1_DQ15	DDR1_DQ15
AN34	MD96	DDR1_DQ16	DDR1_DQ16
AP34	MD97	DDR1_DQ17	DDR1_DQ17
AN31	MD98	DDR1_DQ18	DDR1_DQ18
AN35	MD99	DDR1_DQ19	DDR1_DQ19
AP35	MD100	DDR1_DQ20	DDR1_DQ20
AN32	MD101	DDR1_DQ21	DDR1_DQ21
AP32	MD102	DDR1_DQ22	DDR1_DQ22
AM29	MD103	DDR1_DQ23	DDR1_DQ23
AM28	MD104	DDR1_DQ24	DDR1_DQ24
AR29	MD105	DDR1_DQ25	DDR1_DQ25
AR28	MD106	DDR1_DQ26	DDR1_DQ26
AL28	MD107	DDR1_DQ27	DDR1_DQ27
AL28	MD108	DDR1_DQ28	DDR1_DQ28
AP29	MD109	DDR1_DQ29	DDR1_DQ29
AP28	MD110	DDR1_DQ30	DDR1_DQ30
AR12	MD111	DDR1_DQ31	DDR1_DQ31
AP12	MD112	DDR1_DQ32	DDR1_DQ32
AL13	MD113	DDR1_DQ33	DDR1_DQ33
AL12	MD114	DDR1_DQ34	DDR1_DQ34
AK13	MD115	DDR1_DQ35	DDR1_DQ35
AP13	MD116	DDR1_DQ36	DDR1_DQ36
AM13	MD117	DDR1_DQ37	DDR1_DQ37
AM12	MD118	DDR1_DQ38	DDR1_DQ38
AR9	MD119	DDR1_DQ39	DDR1_DQ39
AP9	MD120	DDR1_DQ40	DDR1_DQ40
AR6	MD121	DDR1_DQ41	DDR1_DQ41
AP6	MD122	DDR1_DQ42	DDR1_DQ42
AR10	MD123	DDR1_DQ43	DDR1_DQ43
AP10	MD124	DDR1_DQ44	DDR1_DQ44
AR7	MD125	DDR1_DQ45	DDR1_DQ45
AP7	MD126	DDR1_DQ46	DDR1_DQ46
AM9	MD127	DDR1_DQ47	DDR1_DQ47
AL9	MD128	DDR1_DQ48	DDR1_DQ48
AL6	MD129	DDR1_DQ49	DDR1_DQ49
AL7	MD130	DDR1_DQ50	DDR1_DQ50
AM10	MD131	DDR1_DQ51	DDR1_DQ51
AL10	MD132	DDR1_DQ52	DDR1_DQ52
AM6	MD133	DDR1_DQ53	DDR1_DQ53
AM7	MD134	DDR1_DQ54	DDR1_DQ54
AH6	MD135	DDR1_DQ55	DDR1_DQ55
AH7	MD136	DDR1_DQ56	DDR1_DQ56
AE7	MD137	DDR1_DQ57	DDR1_DQ57
AE7	MD138	DDR1_DQ58	DDR1_DQ58
AJ6	MD139	DDR1_DQ59	DDR1_DQ59
AJ7	MD140	DDR1_DQ60	DDR1_DQ60
AF6	MD141	DDR1_DQ61	DDR1_DQ61
AF7	MD142	DDR1_DQ62	DDR1_DQ62
AF35	MD143	DDR1_DQ63	DDR1_DQ63
AL33	MD144	DDR1_DQ64	DDR1_DQ64
AP33	MD145	DDR1_DQ65	DDR1_DQ65
AN28	MD146	DDR1_DQ66	DDR1_DQ66
AN12	MD147	DDR1_DQ67	DDR1_DQ67
AP8	MD148	DDR1_DQ68	DDR1_DQ68
AL8	MD149	DDR1_DQ69	DDR1_DQ69
AG7	MD150	DDR1_DQ70	DDR1_DQ70
AN25	MD151	DDR1_DQ71	DDR1_DQ71
AF34	MD152	DDR1_DQ72	DDR1_DQ72
AK33	MD153	DDR1_DQ73	DDR1_DQ73
AN33	MD154	DDR1_DQ74	DDR1_DQ74
AN29	MD155	DDR1_DQ75	DDR1_DQ75
AN13	MD156	DDR1_DQ76	DDR1_DQ76
AR8	MD157	DDR1_DQ77	DDR1_DQ77
AM8	MD158	DDR1_DQ78	DDR1_DQ78
AG6	MD159	DDR1_DQ79	DDR1_DQ79
AN26	MD160	DDR1_DQ80	DDR1_DQ80
HASWELL[10SC1-F01150-01R]			



LGA1150 (CR)

LGA1150
ILM_BP_CR/115X/BKNI[12KRC-0F0001-61R]

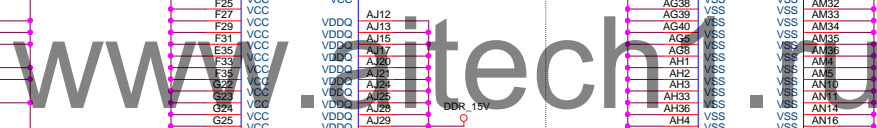
DDR BUS

(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]

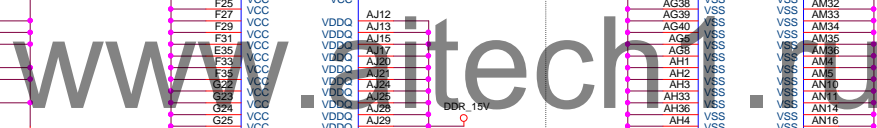
Gigabyte Technology

Title			CPU LGA1150-B
Size	Document Number	GA-Z97X-UD5H	
Custom			Rev 1.0
Date:	Thursday, April 24, 2014	Sheet	5 of 45

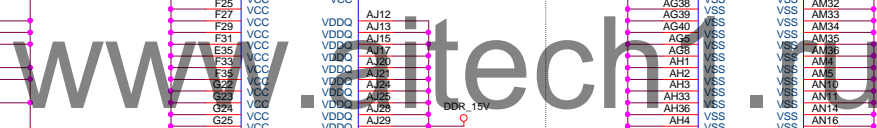
(F, J)



(G,H,I)

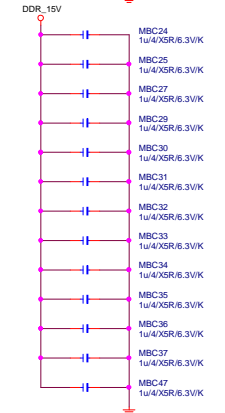
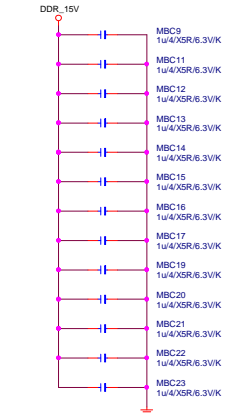
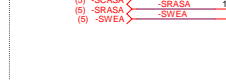


(X30)



(X15)

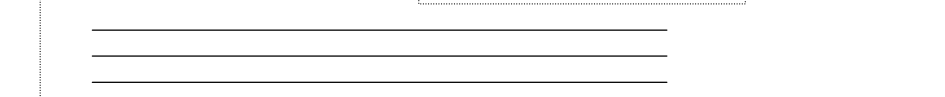




DMI:12/4/4/4/12(breakout min 8/4/4/4/8)
Impedance=85 +- 17.5%



(30) PCH_USB3_RXN0 >



Pin connection diagram for the 297/SI10HB1-030297-20R. The diagram shows a central component with pins on the left and right. Left pins are labeled AT1, AT41, AU1, AV1, AV2, AV40, AV41, AW2, AW40, B40, B41, C41, D1, and D41. Right pins are labeled TP22, TP23, TP21, TP20, TP14, TP15, TP12, TP10, TP11, TP9, TP3, TP4, TP1, TP2, TP5, TP6, TP7, TP8, AC31, AF3, and AV21. Connections are shown with lines and some pins are crossed out with an 'X'. A ground symbol is at the bottom left.

Left Pin	Right Pin	Connection
AT1	U11	Connected
AT41	U10	Connected
AU1	AJ14	Connected
AV1	AK14	Connected
AV2	K33	Connected
AV40	K34	Connected
AV41	TP14	Connected
AW2	TP15	Connected
AW40	TP12	Connected
B40	L16	Connected
B41	K16	Connected
C41	TP11	Connected
D1	AM34	Connected
D41	TP9	Connected
	TP3	Connected
	TP4	Connected
	TP1	Connected
	TP2	Connected
	TP5	Connected
	TP6	Connected
	TP7	Connected
	TP8	Connected
	AC31	Connected
	AF3	Connected
	AV21	Connected

297/SI10HB1-030297-20R

PCH_HS

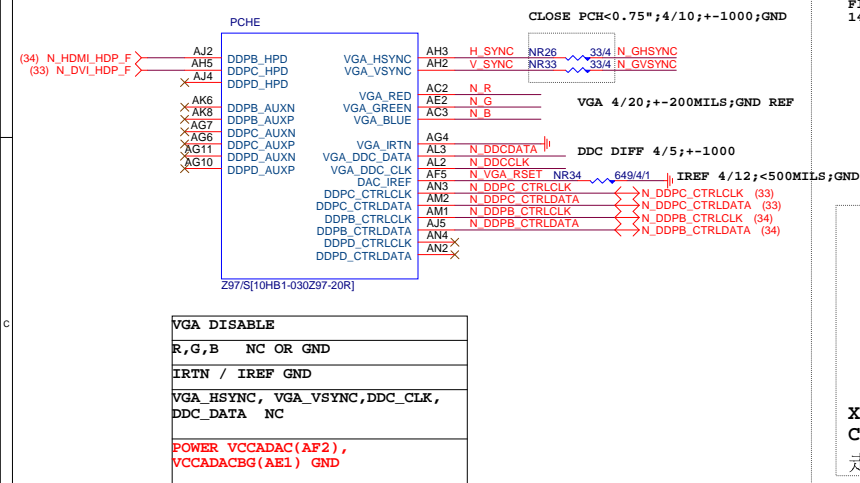
1X

X2

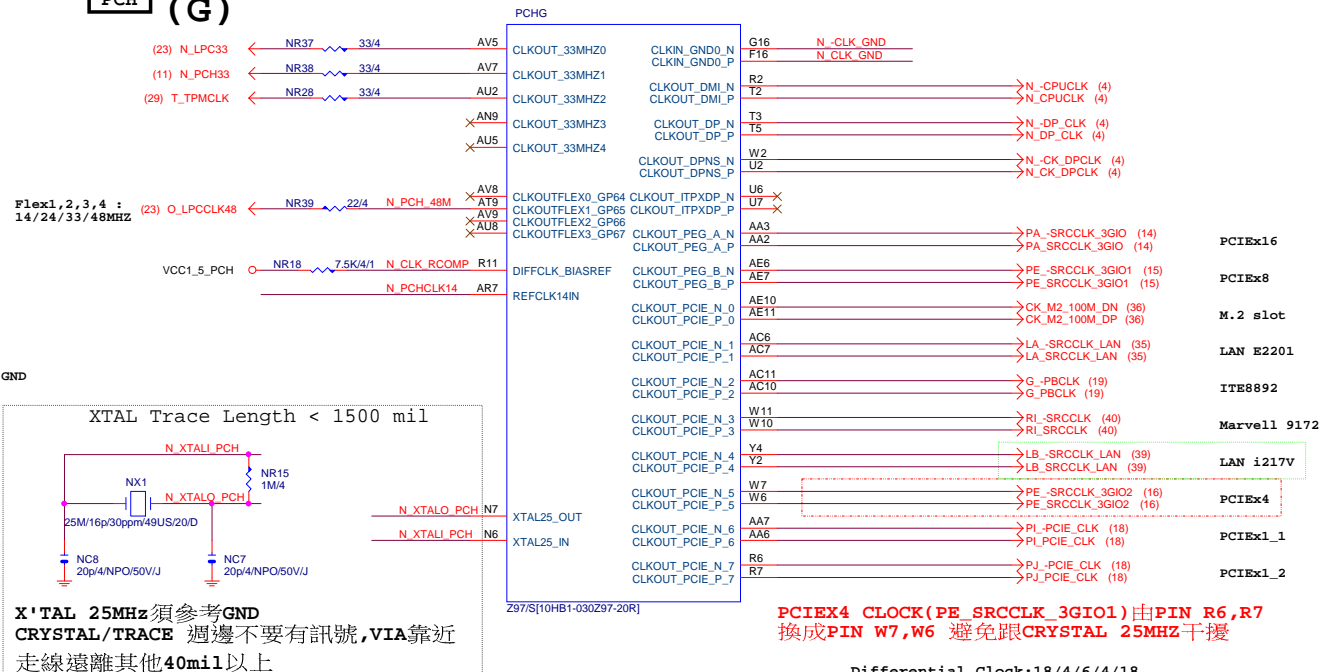
PCH_HSI12SP2-PTZ975-01R_12SP2-PTZ975-02R_12SP2-PTZ975-03R

USB Usage & OC# Configure			
OC0#	USB0_1	F_USB30	FUSEVCC_F1_F2
OC1#	USB2	USB3_LAN1	UC_FUSEVCC34
	(U3 Hub)	USB3_LAN2	UC_FUSEVCC12
	USB3	N/A	
OC2#	USB4_5	HDMI & R_USB3	FUSEVCC_R1_R2
OC3#	USB6_7	N/A	
OC4#	USB8_9	KB_MS_USB	FUSEVCC_R3_R4
OC5#	USB10_11	F_USB2	FUSEVCC_F5_F6
OC6#	USB12_13	F_USB1	FUSEVCC_F3_F4
OC7#	Not Use		

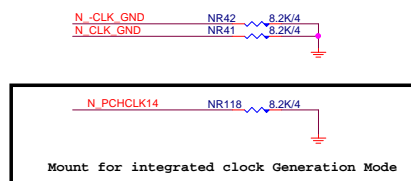
PCH (E)



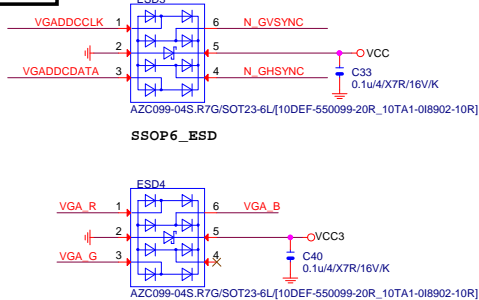
PCH (G)



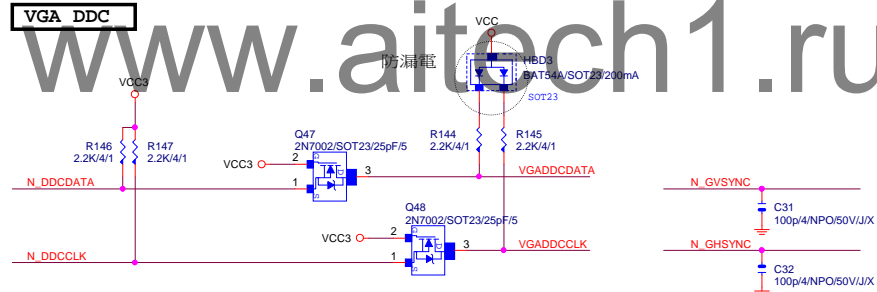
PCH CLK PD



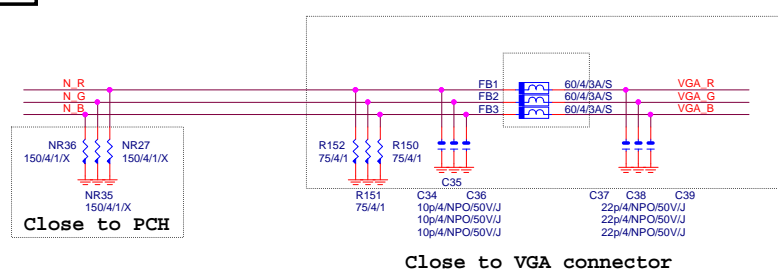
VGA ESD



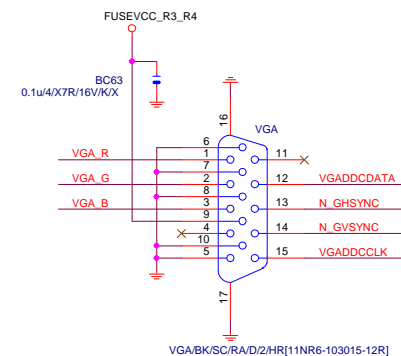
VGA DDC



VGA DDC



VGA CONNECTOR

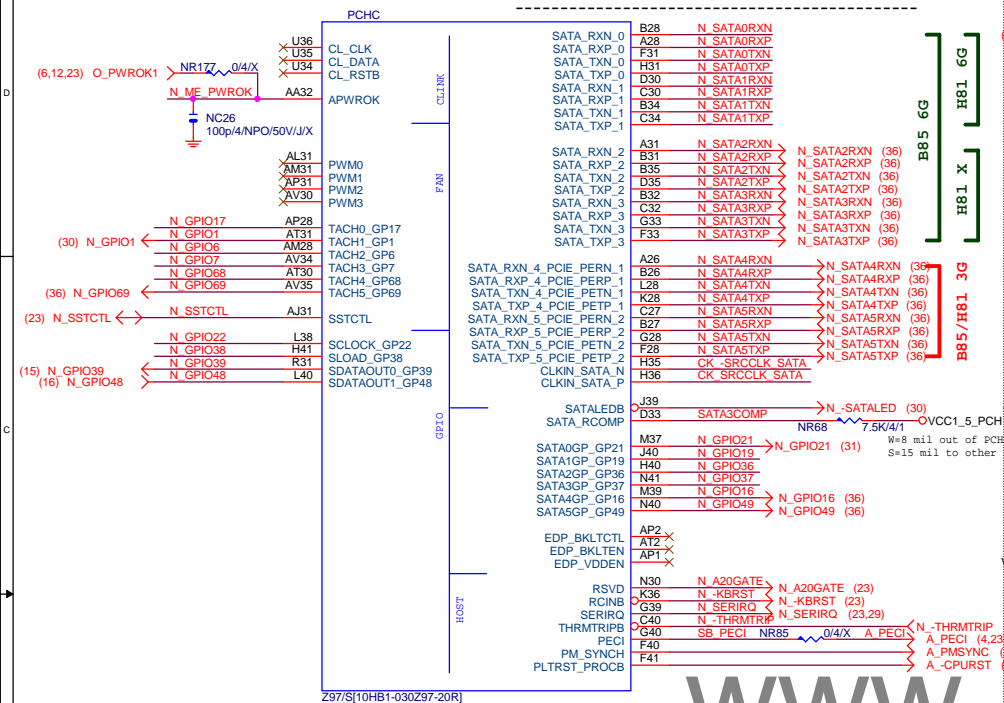


Gigabyte Technology

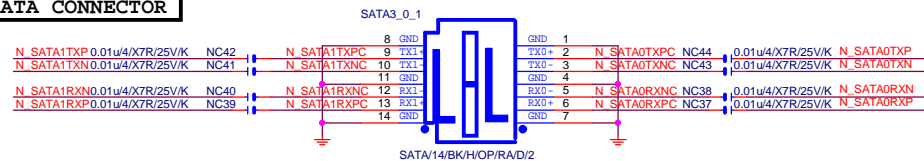
Title **PCH DISPLAY ,CLK BUFFER**

Size Custom	Document Number GA-Z97X-UD5H	Rev 1.0
Date: Thursday, April 24, 2014	Sheet 10 of 45	

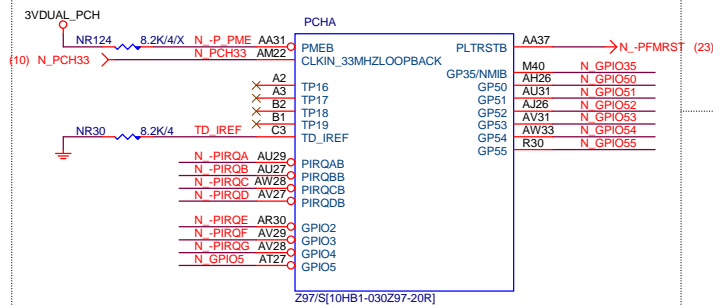
PCH (C)



SATA CONNECTOR



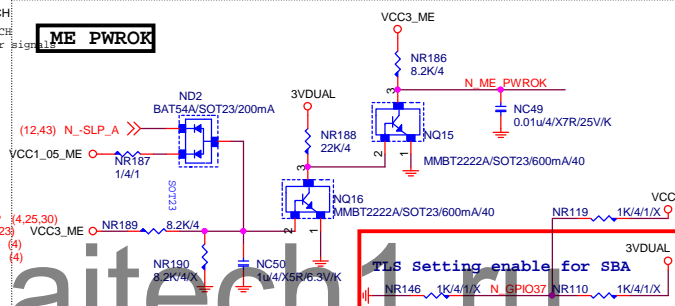
PCH (A)



Default int pull up on GP51,
Default SPI boot devices

BOOT DEVICE	GP51	GP19
LPC	0	0
SPI	float	float

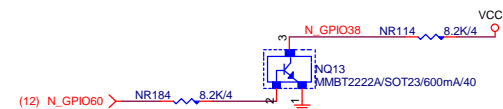
ME PWROK



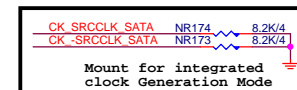
GPIO38 Ctrl

MFG Mode

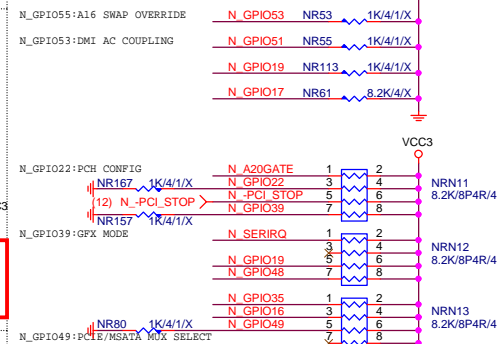
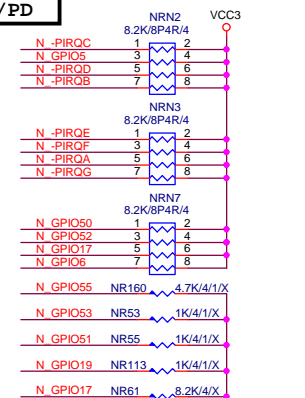
```
N_GPIO38 : Lo --> Enable
           Hi --> Disable
```



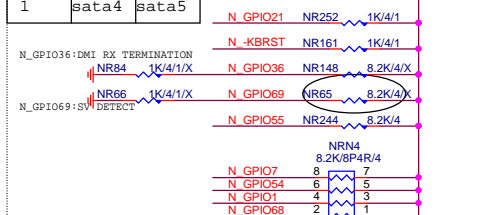
PCH CLK PD



PCH PU/PD



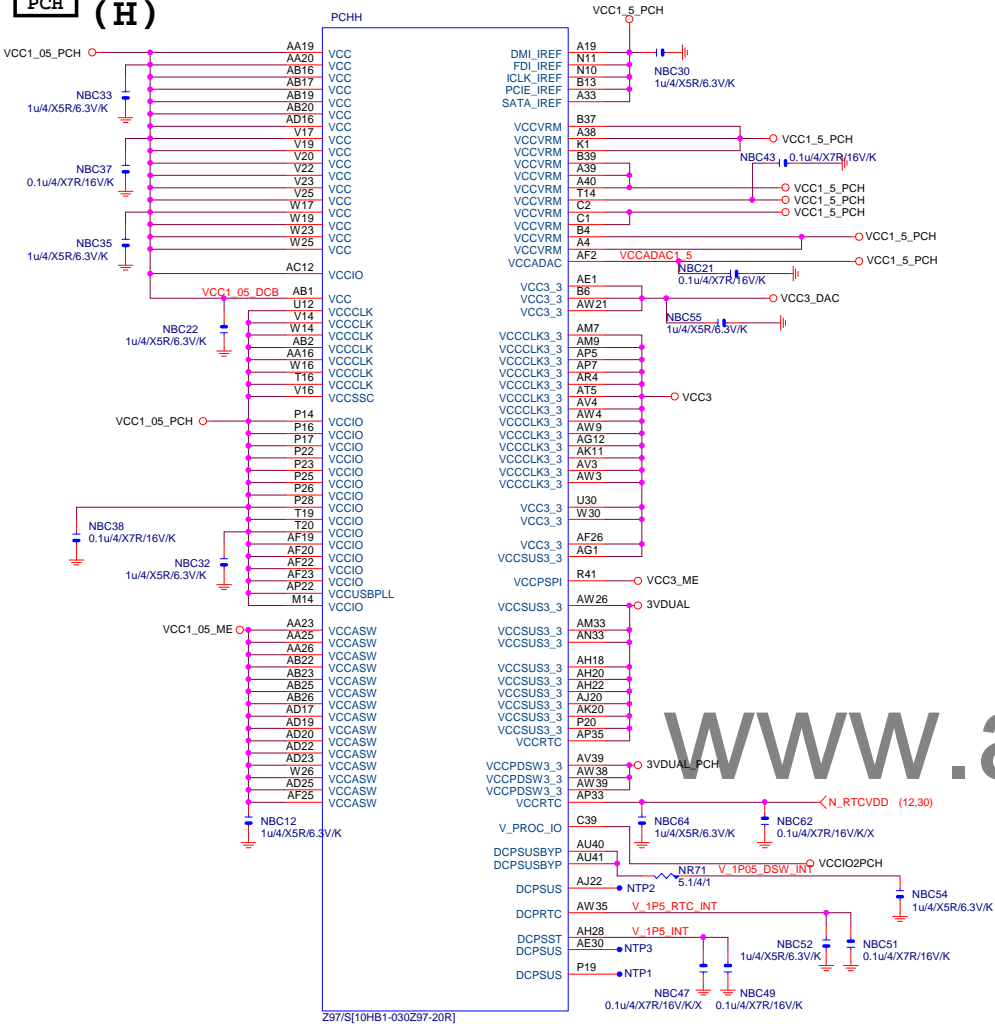
soft strap	GP16	GP49
0	pci1	pci2
1	sata4	sata5



Gigabyte Technology

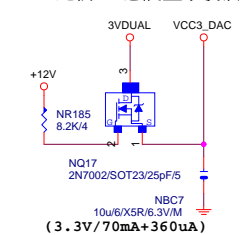
Title			
PCH HOST , SATA, PCI			
Size	Document Number	Rev	
Custom	GA-Z97X-UD5H	1.0	
Date:	Thursday, April 24, 2014	Sheet	11 of 45

PCH (H)

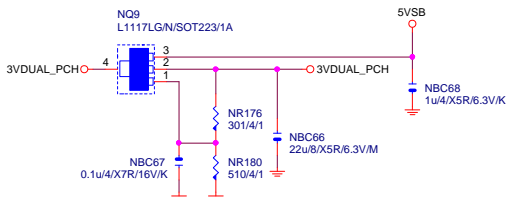


VCC3_DAC

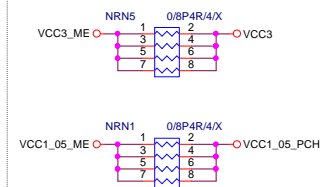
CLOSE北橋(注意震盪水波紋)



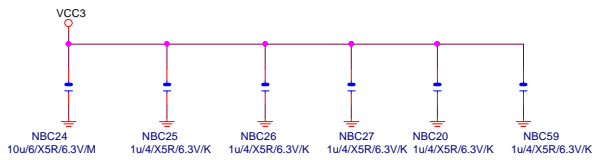
3VDUAL_PCH



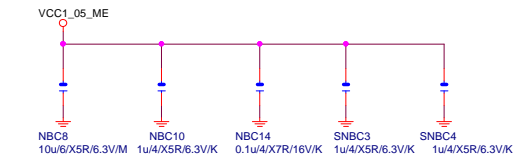
SHT_PWR



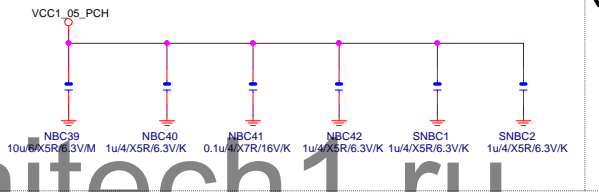
(3.3V) (X6)



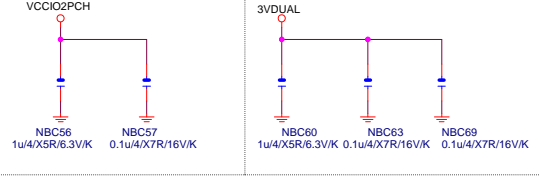
(1.05V) (X5)



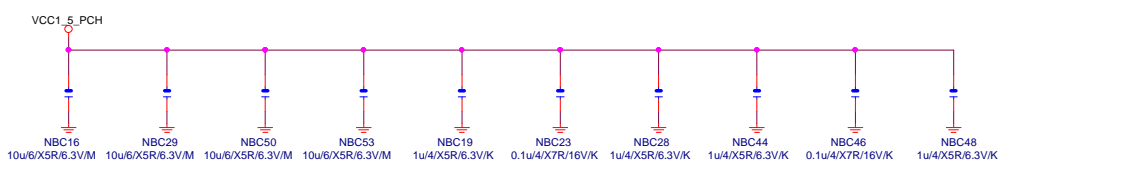
(1.05V) (X6)



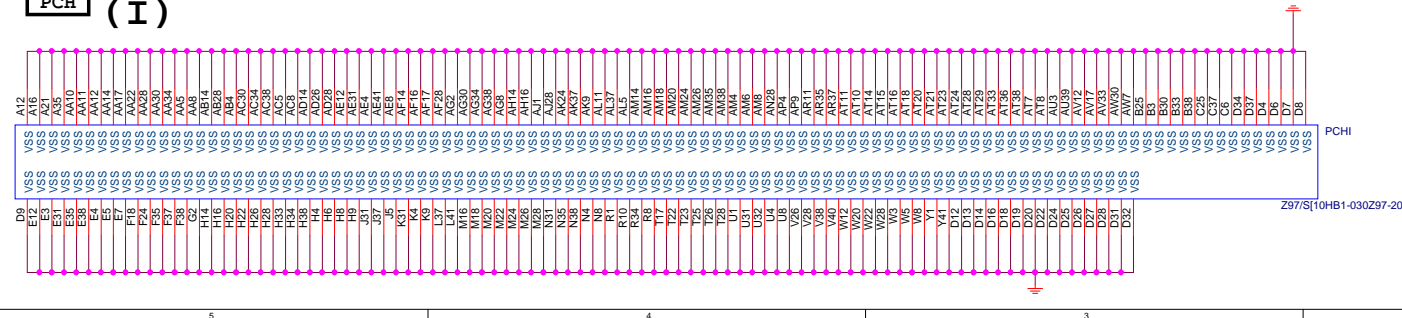
(1.05V)(X2) (3.3V) (X3)



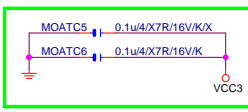
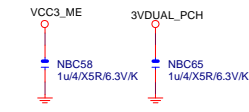
(1.5V) (X10)



PCH (I)

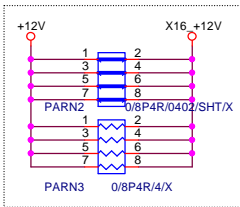


CAP



Gigabyte Technology			
Title			
PCH PWR ,GND			
Size			
Document Number			
GA-Z97X-UD5H			
Rev			
1.0			
Date:			
Thursday, April 24, 2014			
Sheet			
13 of 45			

+12 protect
short-wire test



PCIEXP16:16/5/5/16

PA EXP RXP0 [15] >> PA_EXP_RXP0[15] (4,17)
PA EXP RXN0 [15] >> PA_EXP_RXN0[15] (4,17)
PA EXP TXP0 [15] >> PA_EXP_TXP0[15] (4,17)
PA EXP TXN0 [15] >> PA_EXP_TXN0[15] (4,17)

PA EXP TXP0	PAC5	0.22u4/X5R/6.3V/K	PA EXP TXP0 C
PA EXP TXN0	PAC6	0.22u4/X5R/6.3V/K	PA EXP TXN0 C
PA EXP TXP1	PAC7	0.22u4/X5R/6.3V/K	PA EXP TXP1 C
PA EXP TXN1	PAC8	0.22u4/X5R/6.3V/K	PA EXP TXN1 C
PA EXP TXP2	PAC9	0.22u4/X5R/6.3V/K	PA EXP TXP2 C
PA EXP TXN2	PAC10	0.22u4/X5R/6.3V/K	PA EXP TXN2 C
PA EXP TXP3	PAC11	0.22u4/X5R/6.3V/K	PA EXP TXP3 C
PA EXP TXN3	PAC12	0.22u4/X5R/6.3V/K	PA EXP TXN3 C
PA EXP TXP4	PAC13	0.22u4/X5R/6.3V/K	PA EXP TXP4 C
PA EXP TXN4	PAC14	0.22u4/X5R/6.3V/K	PA EXP TXN4 C
PA EXP TXP5	PAC15	0.22u4/X5R/6.3V/K	PA EXP TXP5 C
PA EXP TXN5	PAC16	0.22u4/X5R/6.3V/K	PA EXP TXN5 C
PA EXP TXP6	PAC17	0.22u4/X5R/6.3V/K	PA EXP TXP6 C
PA EXP TXN6	PAC18	0.22u4/X5R/6.3V/K	PA EXP TXN6 C
PA EXP TXP7	PAC19	0.22u4/X5R/6.3V/K	PA EXP TXP7 C
PA EXP TXN7	PAC20	0.22u4/X5R/6.3V/K	PA EXP TXN7 C
PA EXP SW TXP8	PAC21	0.22u4/X5R/6.3V/K	PA EXP SW TXP8 C
PA EXP SW TXN8	PAC22	0.22u4/X5R/6.3V/K	PA EXP SW TXN8 C
PA EXP SW TXP9	PAC23	0.22u4/X5R/6.3V/K	PA EXP SW TXP9 C
PA EXP SW TXN9	PAC24	0.22u4/X5R/6.3V/K	PA EXP SW TXN9 C
PA EXP SW TXP10	PAC25	0.22u4/X5R/6.3V/K	PA EXP SW TXP10 C
PA EXP SW TXN10	PAC26	0.22u4/X5R/6.3V/K	PA EXP SW TXN10 C
PA EXP SW TXP11	PAC27	0.22u4/X5R/6.3V/K	PA EXP SW TXP11 C
PA EXP SW TXN11	PAC28	0.22u4/X5R/6.3V/K	PA EXP SW TXN11 C
PA EXP SW TXP12	PAC29	0.22u4/X5R/6.3V/K	PA EXP SW TXP12 C
PA EXP SW TXN12	PAC30	0.22u4/X5R/6.3V/K	PA EXP SW TXN12 C
PA EXP SW TXP13	PAC31	0.22u4/X5R/6.3V/K	PA EXP SW TXP13 C
PA EXP SW TXN13	PAC32	0.22u4/X5R/6.3V/K	PA EXP SW TXN13 C
PA EXP SW TXP14	PAC33	0.22u4/X5R/6.3V/K	PA EXP SW TXP14 C
PA EXP SW TXN14	PAC34	0.22u4/X5R/6.3V/K	PA EXP SW TXN14 C
PA EXP SW TXP15	PAC35	0.22u4/X5R/6.3V/K	PA EXP SW TXP15 C
PA EXP SW TXN15	PAC36	0.22u4/X5R/6.3V/K	PA EXP SW TXN15 C

PA EXP SW RXP8 [15] >> PA_EXP_SW_RXP8[15] (17)
PA EXP SW RXN8 [15] >> PA_EXP_SW_RXN8[15] (17)
PA EXP SW TXP8 [15] >> PA_EXP_SW_TXP8[15] (17)
PA EXP SW TXN8 [15] >> PA_EXP_SW_TXN8[15] (17)

PCI-E REV:1.1--> 2.5GHZ

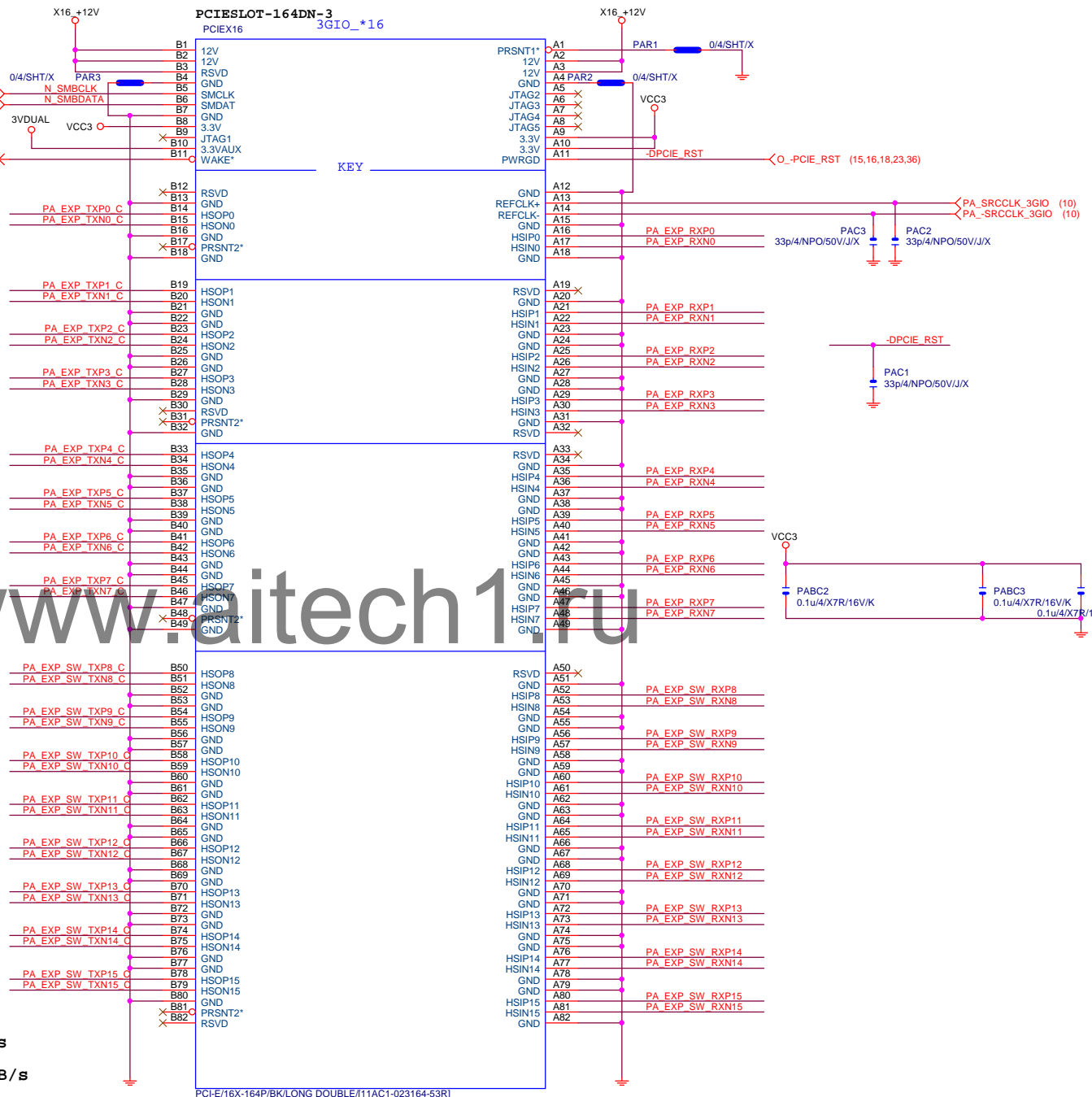
PCE-E X1(單向) BANDWIDTH=2.5GHz*(8b/10b)=2Gb/s=250MB/s

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

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

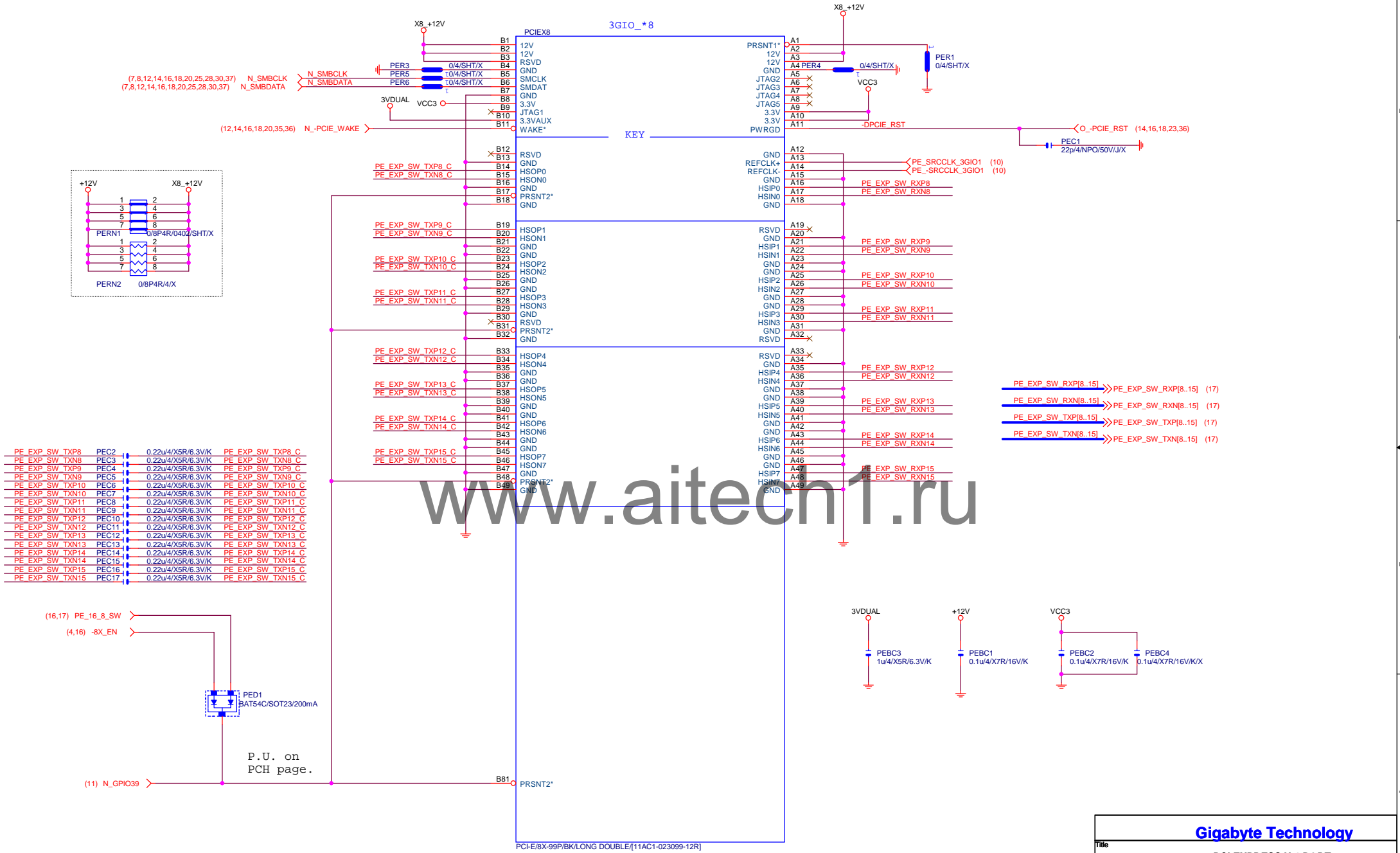
PCE-E X16(雙向) BANDWIDTH=2.5GHz*(8b/10b)X16X2=64Gb/s=8GB/s

PCI-E REV:2.0--> 5GHZ



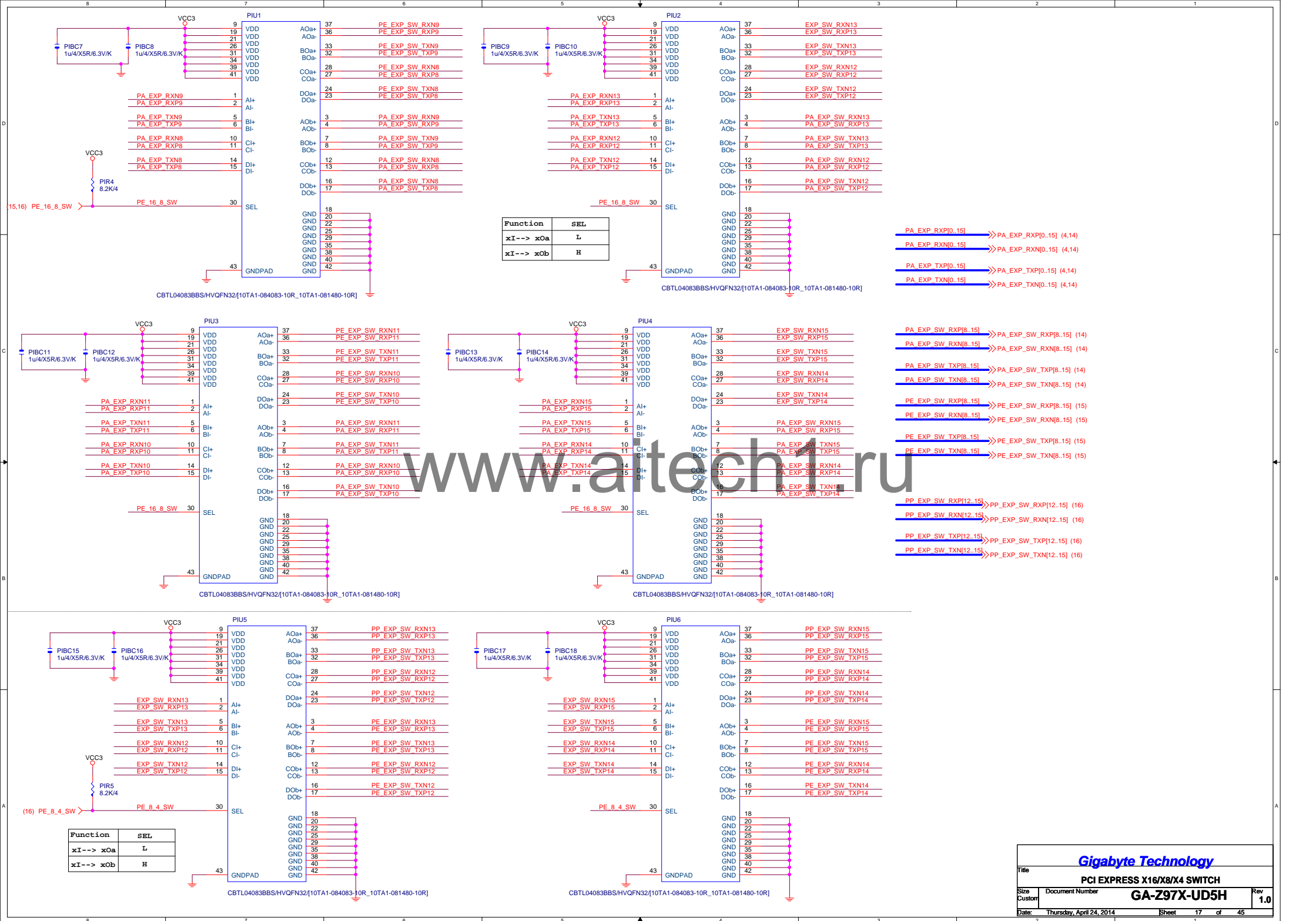
Gigabyte Technology

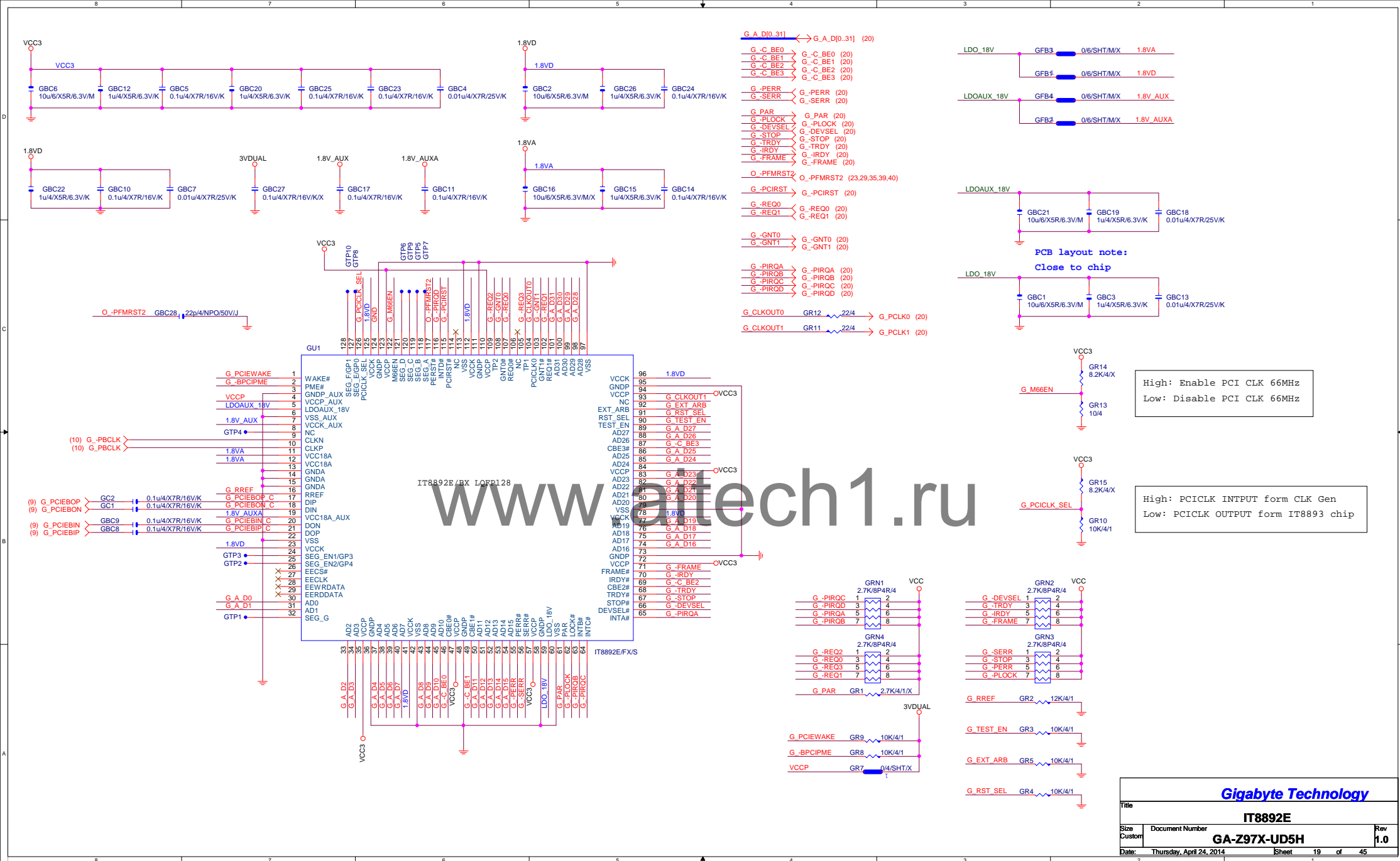
Title			
PCI EXPRESS * 16			
Size	Document Number		Rev
Custom	GA-Z97X-UD5H		1.0
Date:	Thursday, April 24, 2014	Sheet	14 of 45

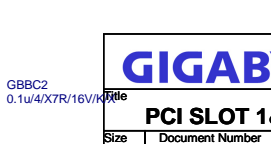
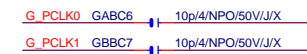
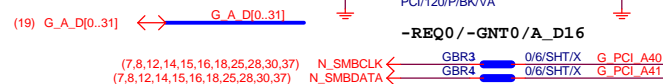


PE_EXP_SW_TXP8_C	PEC2	0.22u/4/X5R/6.3V/K	PE_EXP_SW_TXP8_C
PE_EXP_SW_TXN8_C	PEC3	0.22u/4/X5R/6.3V/K	PE_EXP_SW_TXN8_C
PE_EXP_SW_TXP9_C	PEC4	0.22u/4/X5R/6.3V/K	PE_EXP_SW_TXP9_C
PE_EXP_SW_TXN9_C	PEC5	0.22u/4/X5R/6.3V/K	PE_EXP_SW_TXN9_C
PE_EXP_SW_TXP10_C	PEC6	0.22u/4/X5R/6.3V/K	PE_EXP_SW_TXP10_C
PE_EXP_SW_TXN10_C	PEC7	0.22u/4/X5R/6.3V/K	PE_EXP_SW_TXN10_C
PE_EXP_SW_TXP11_C	PEC8	0.22u/4/X5R/6.3V/K	PE_EXP_SW_TXP11_C
PE_EXP_SW_TXN11_C	PEC9	0.22u/4/X5R/6.3V/K	PE_EXP_SW_TXN11_C
PE_EXP_SW_TXP12_C	PEC10	0.22u/4/X5R/6.3V/K	PE_EXP_SW_TXP12_C
PE_EXP_SW_TXN12_C	PEC11	0.22u/4/X5R/6.3V/K	PE_EXP_SW_TXN12_C
PE_EXP_SW_TXP13_C	PEC12	0.22u/4/X5R/6.3V/K	PE_EXP_SW_TXP13_C
PE_EXP_SW_TXN13_C	PEC13	0.22u/4/X5R/6.3V/K	PE_EXP_SW_TXN13_C
PE_EXP_SW_TXP14_C	PEC14	0.22u/4/X5R/6.3V/K	PE_EXP_SW_TXP14_C
PE_EXP_SW_TXN14_C	PEC15	0.22u/4/X5R/6.3V/K	PE_EXP_SW_TXN14_C
PE_EXP_SW_TXP15_C	PEC16	0.22u/4/X5R/6.3V/K	PE_EXP_SW_TXP15_C
PE_EXP_SW_TXN15_C	PEC17	0.22u/4/X5R/6.3V/K	PE_EXP_SW_TXN15_C

Gigabyte Technology			
PCI EXPRESS X 4 PORT			
Size	Document Number	Rev	
Custom	GA-Z97X-UD5H	1.0	
Date:	Thursday, April 24, 2014	Sheet	15 of 45







PCI SLOT 1&2			
Size	Document Number		Rev
Custom	GA-Z97X-UD5H		1.0
Date:	Thursday, April 24, 2014	Sheet	20 of 45

AZALIA CODEC

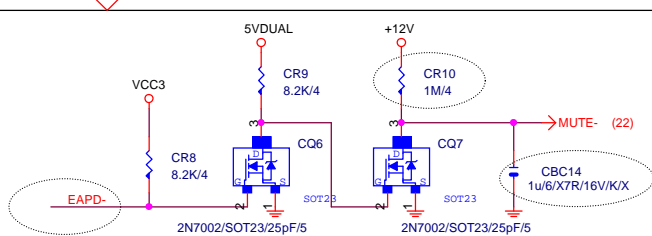
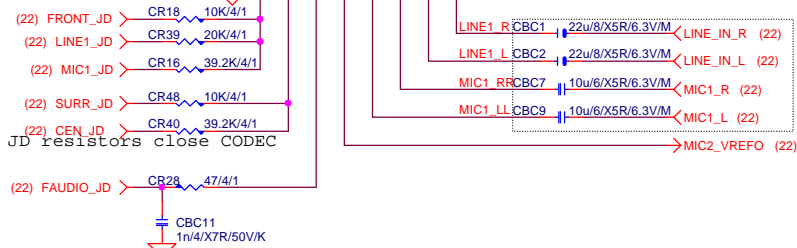
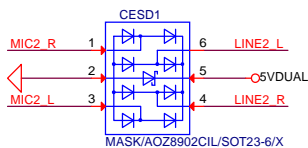
Thermal pad is DGND

Thermal pad is DGND

Digital Area

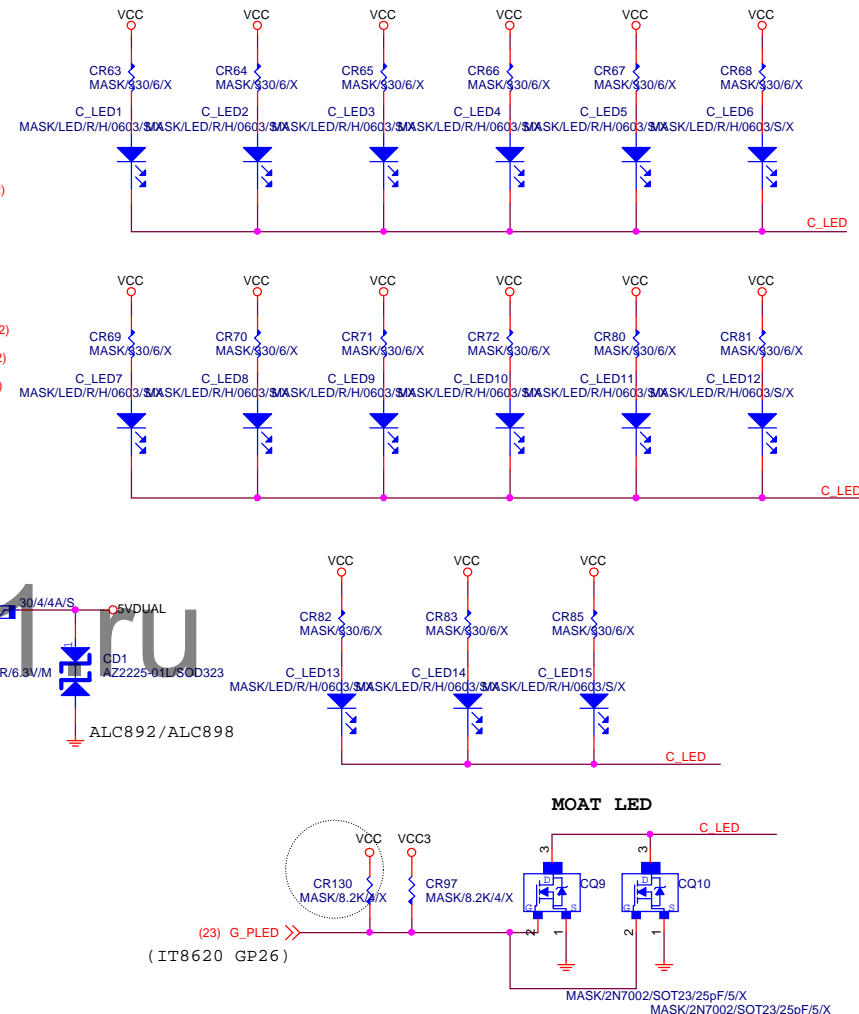
Analog Area

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

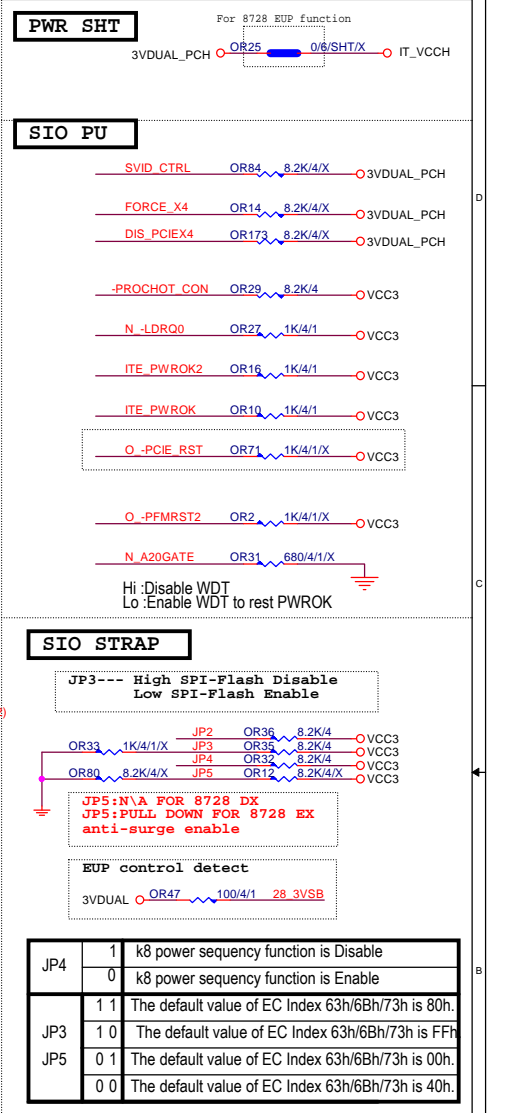
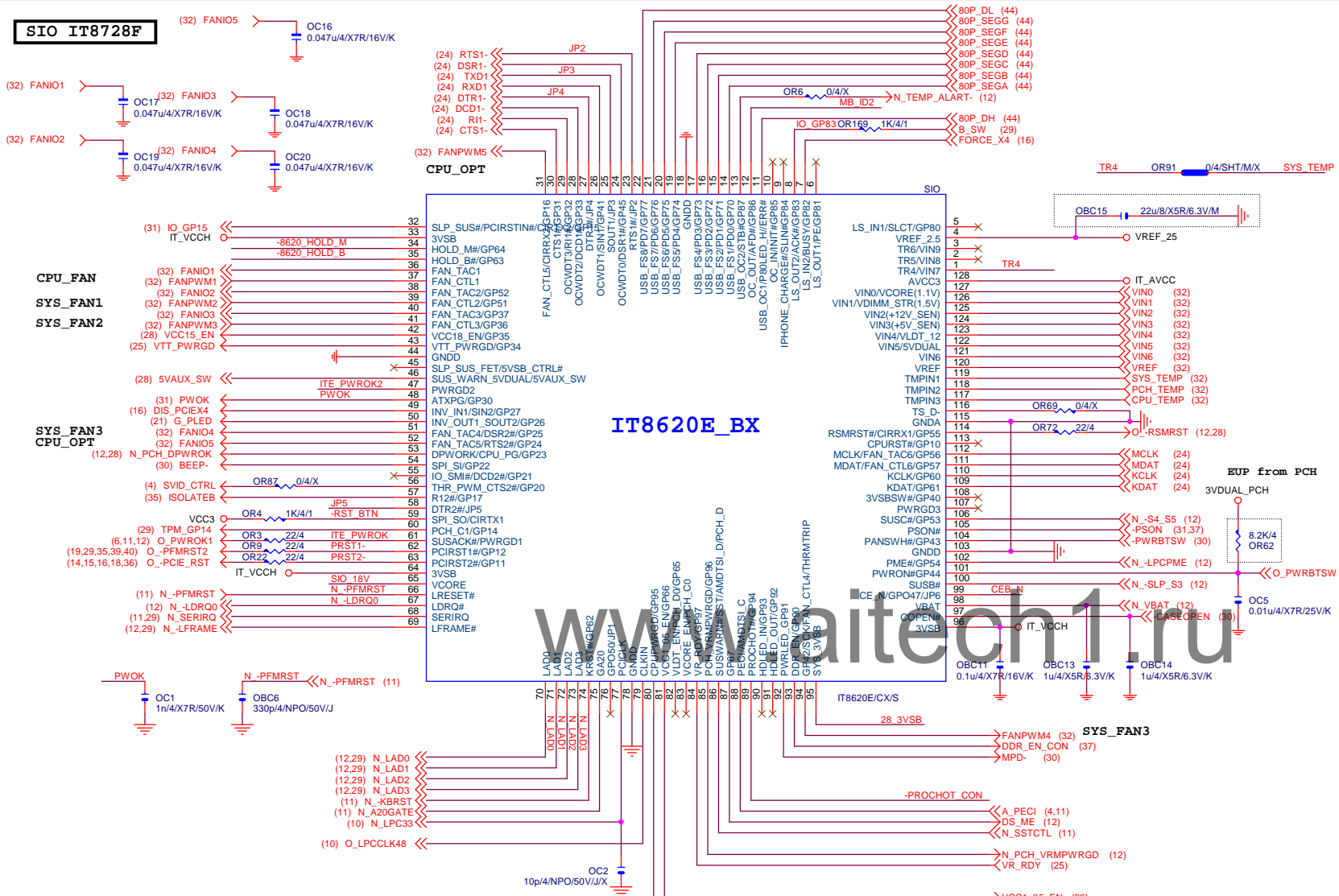


Close to ALC1150

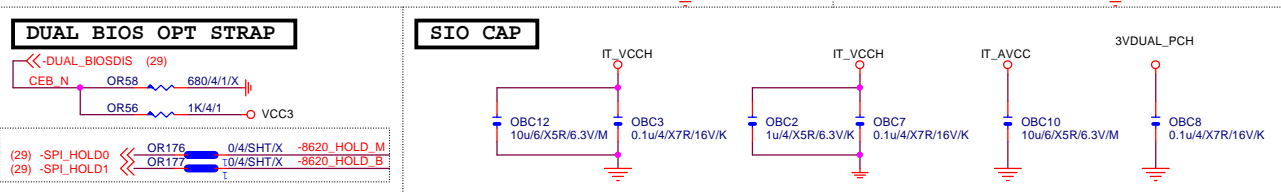
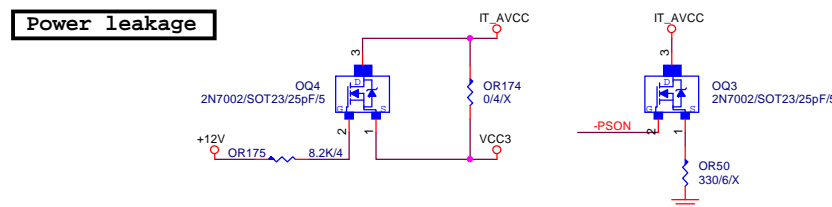
UD5H不上金屬罩&LED



Gigabyte Technology			
Title	HD AUDIO ALC887B-VD2/VT1708S/VT2021		
Size	Document Number	GA-Z97X-UD5H	
Custom			Rev 1.0
Date:	Thursday, April 24, 2014	Sheet	21 of 45



IT8620E GPIO問題匯整	
PIN 50	GP26--- 第一次接上POWER時會拉 LO
PIN 90/91	DEFAULT為HLED FUNCTION, GP93 BYPASS TO GP92 高溫時 會被拉Lo(ITE BUG)
PIN 108	GP40--- POWER ON 時會拉 LO
PIN 111/112	MOUSE 跟FAN6 FUNCTION 擇一使用,不然會互相干擾

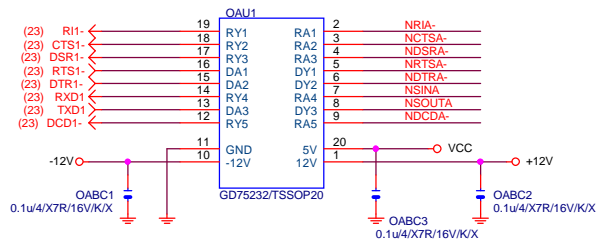


MB ID

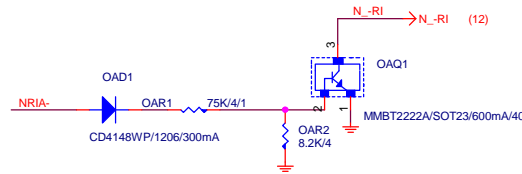
Breath LED's GPIO :
GP14 : Disable
GP65 : Brightness

Gigabyte Technology	
Title	
ITE 8620CX LPC IO	
Size B	Document Number
GA-Z97X-UD5H	
Rev 1.0	
Date: Thursday, April 24, 2014	Sheet 23 of 45

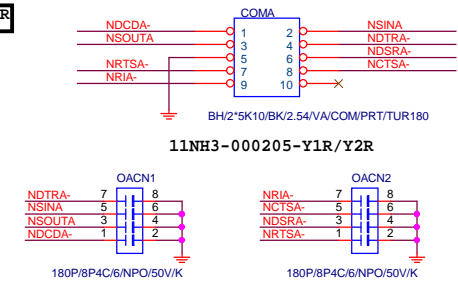
COMA



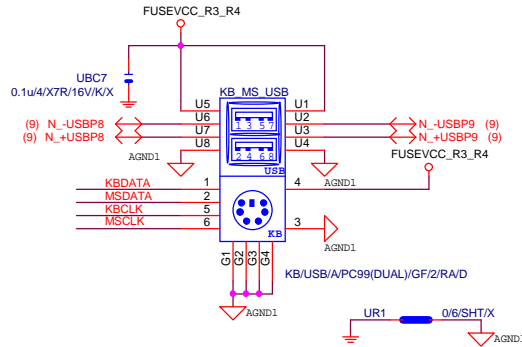
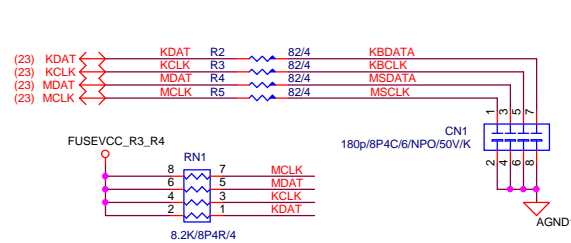
COM RI



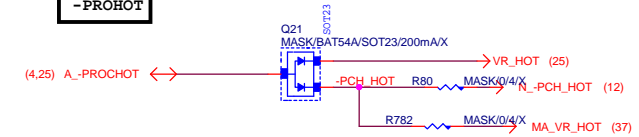
COM BUFFER



KB/MS/USB



-PROHOT

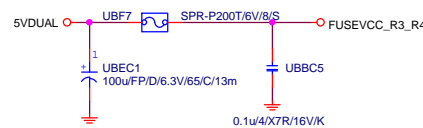


Thunderbolt pin header

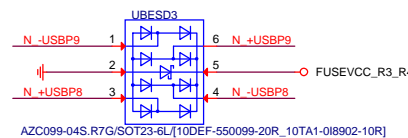
Removed

R_USB

USB20 FUSE

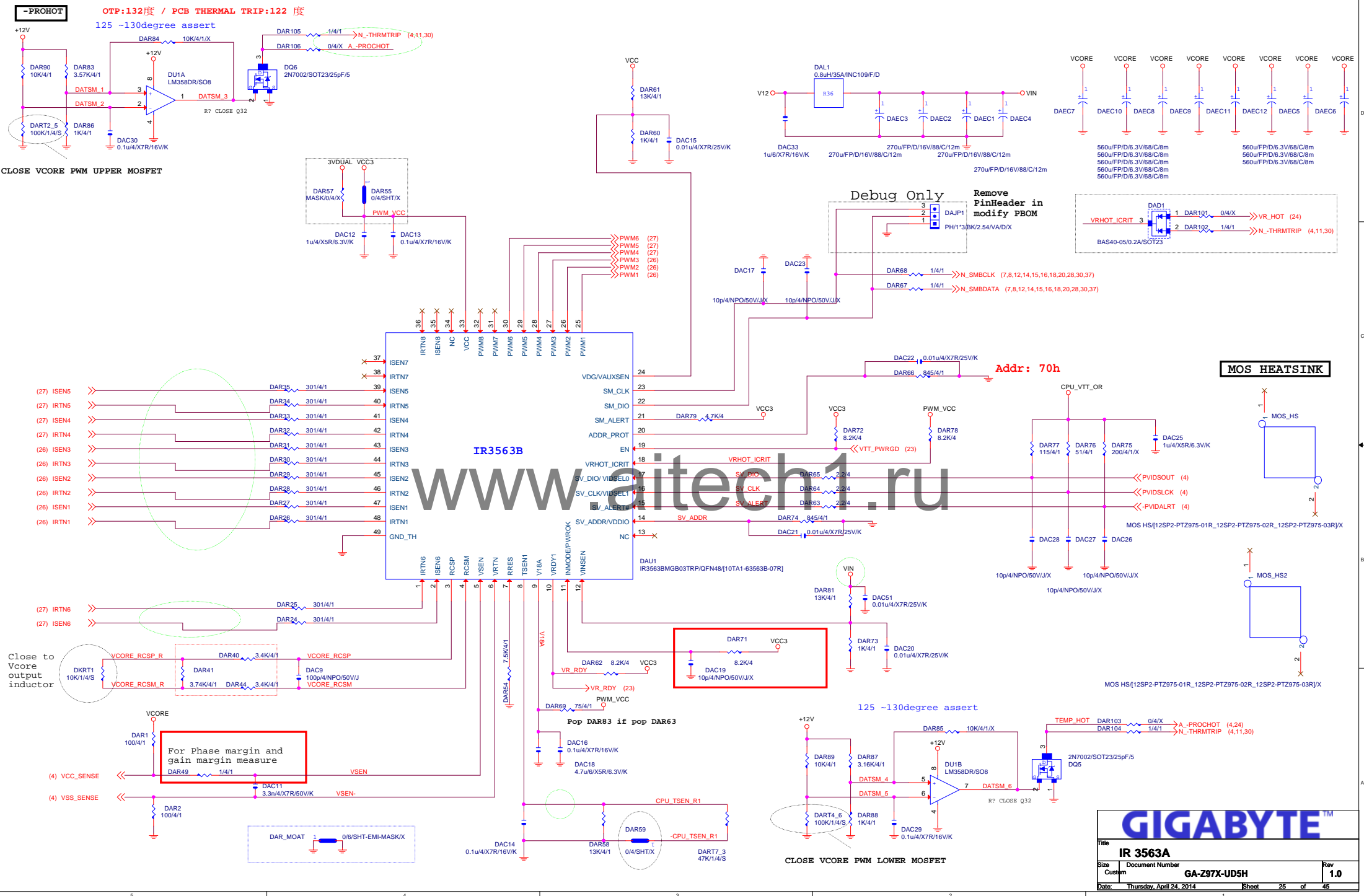



USB20 ESD PROTECT



Gigabyte Technology

COM/ PROHOT/ R_USB			
Size	Document Number	Rev	
Custom	GA-Z97X-UD5H	1.0	
Date:	Thursday, April 24, 2014	Sheet	24 of 45

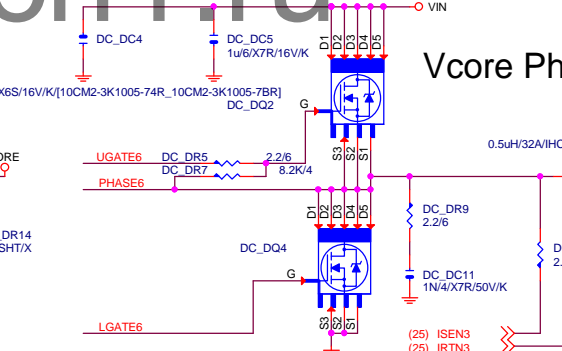
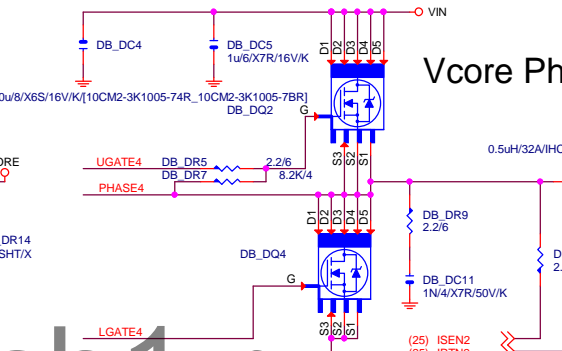
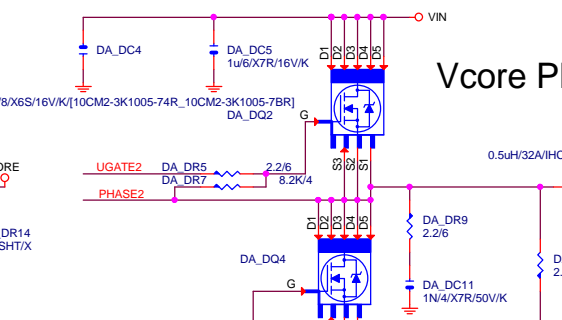
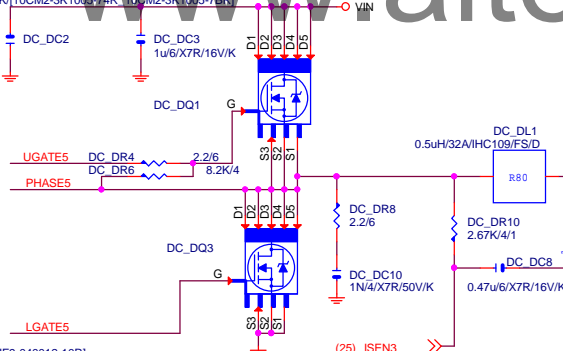
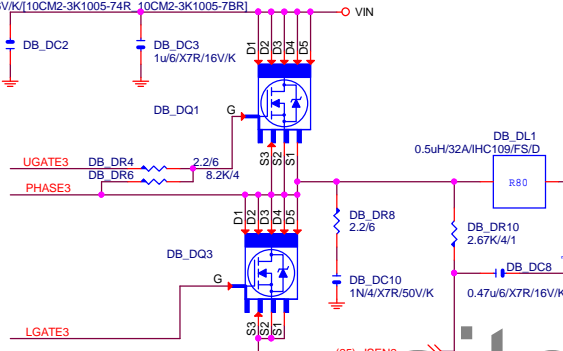
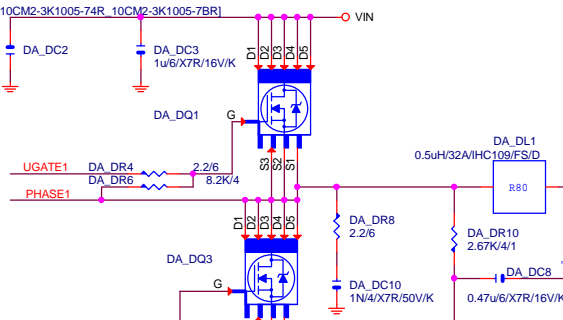
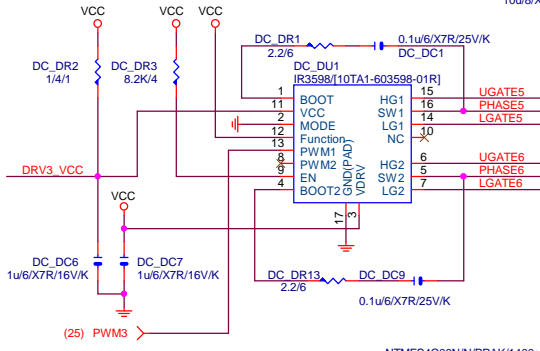
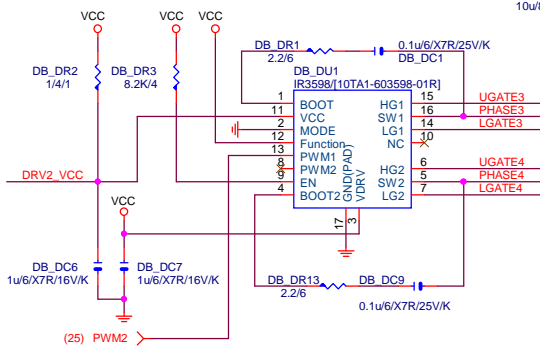
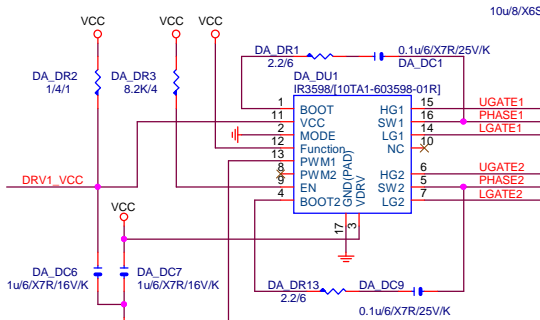




IR 3563A

Size	Document Number	Rev
Custom	GA-Z97X-UD5H	1.0

Date: Thursday, April 24, 2014 Sheet 25 of 45



Vcore Phase 1,2

Vcore Phase 3,4

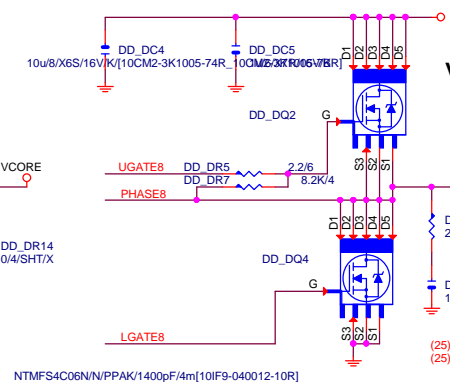
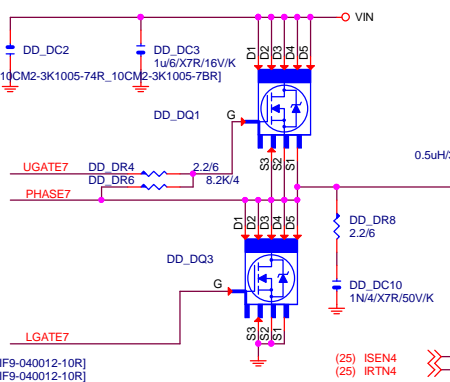
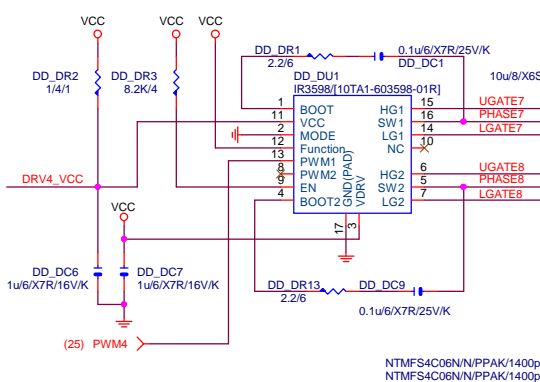
Vcore Phase 5,6

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

function = 0 --> Quad mode
function = 1 --> Doubled mode

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

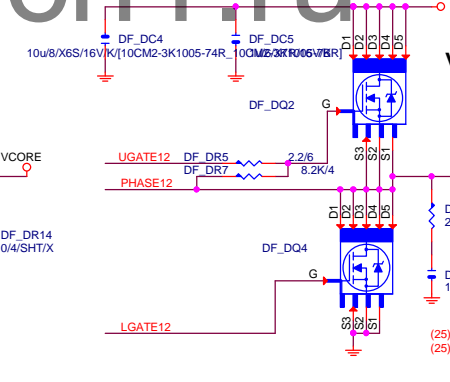
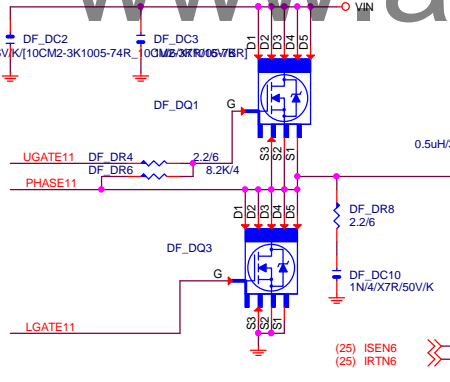
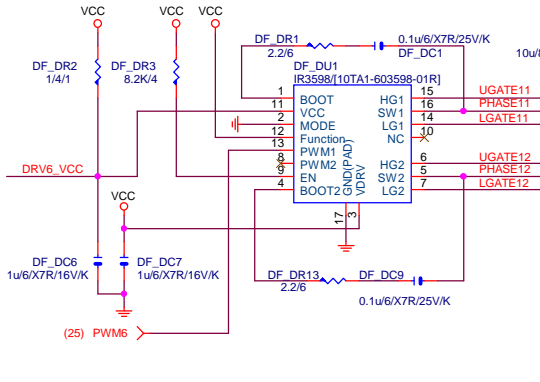
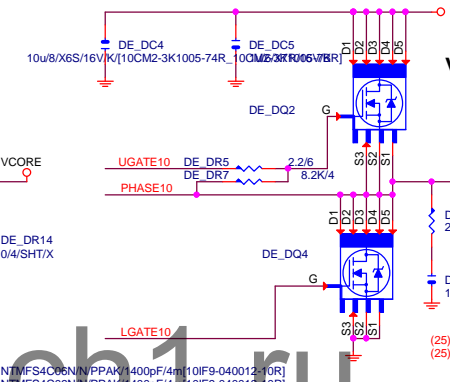
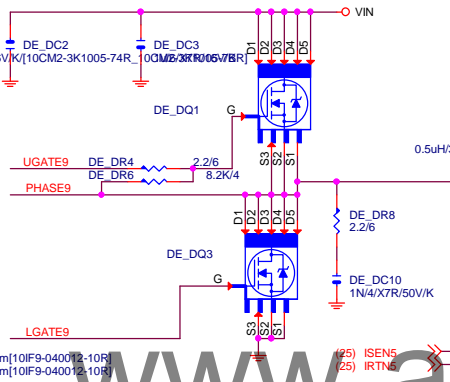
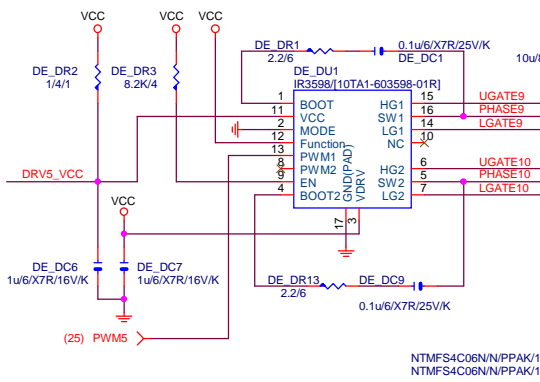
GIGABYTE TECHNOLOGY			
Title CPU CORE_IR3563B			
Size	Document Number	Rev	
Custom	GA-Z97X-UD5H	1.0	
Date:	Thursday, April 24, 2014	Sheet	26 of 45



Vcore Phase 7,8

Vcore Phase 9,10

Vcore Phase 11,12



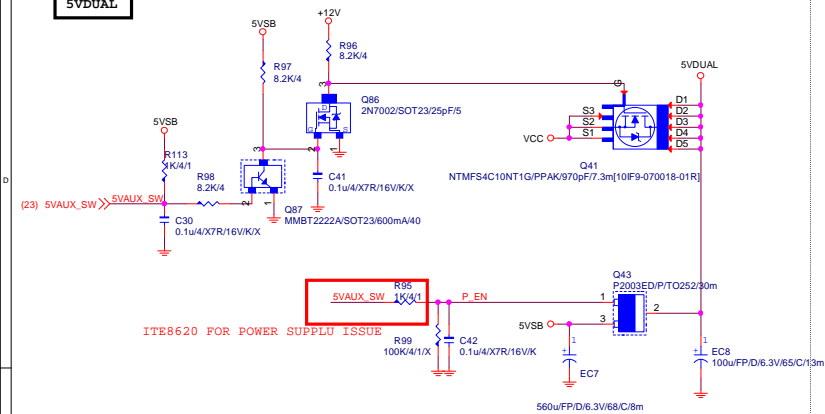
FUNCTION	MODE	PWM MODE	PHASE MODE
0	1	IR ATL	DUAL
1	1	IR ATL	Doublier
0	0	Tri-Sate	DUAL
1	0	Tri-Sate	Doublier
OPEN	0	Tri-Sate	Quad
OPEN	1	IR ATL	Quad

function = 0 --> Quad mode
function = 1 --> Doubled mode

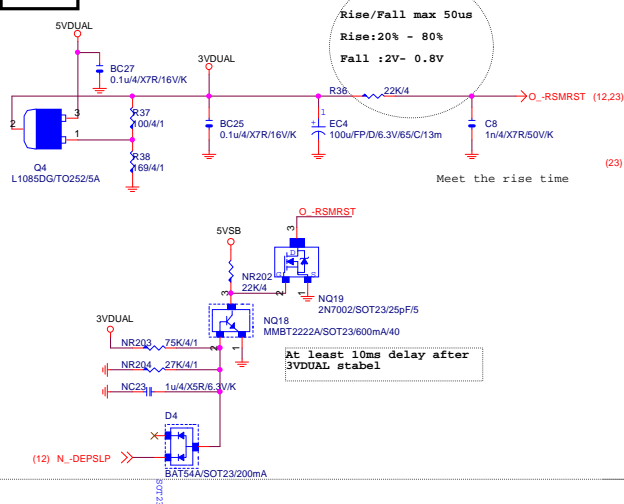
In Quad mode , IC1 pin10 link to IC2 pin10
IC1 pin9 link to IC2 pin9 without PU

GIGABYTE TECHNOLOGY			
Title CPU CORE_IR3563B			
Size	Document Number	Rev	
Custom	GA-Z97X-UD5H	1.0	
Date:	Thursday, April 24, 2014	Sheet	27 of 45

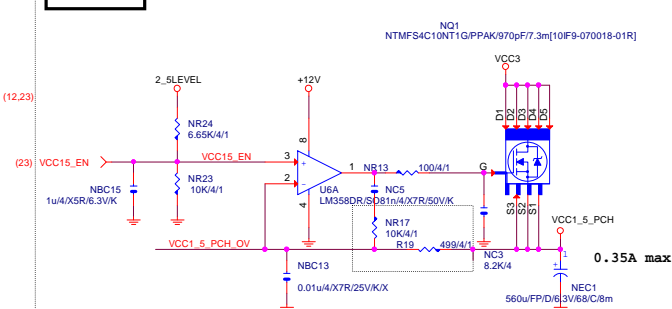
5VDUAL



3VDUAL

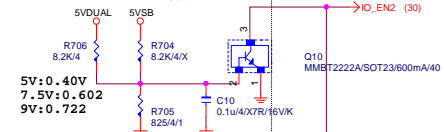


VCC1_5_PCH

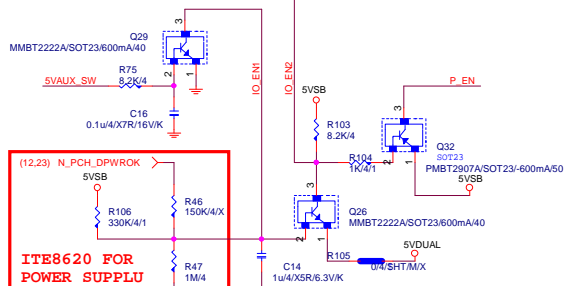


5VSB OVP:7.5V protection

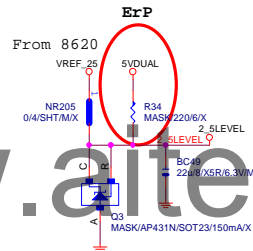
NOTE 82:改5VDUAL 6v保護



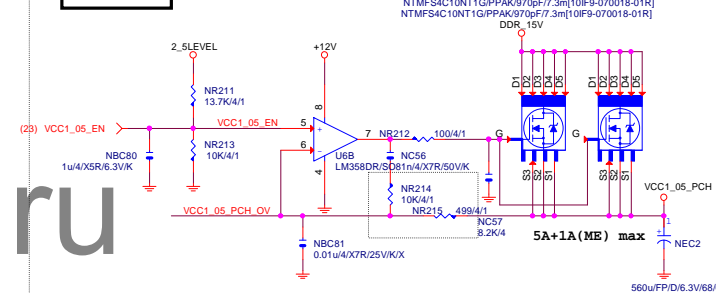
5VDUAL SHORT PROTECT



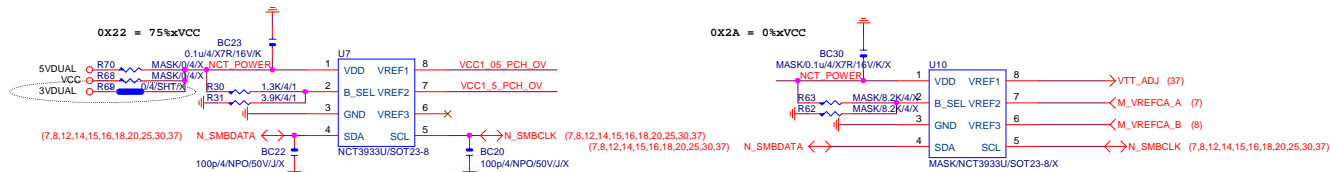
2_5LEVEL



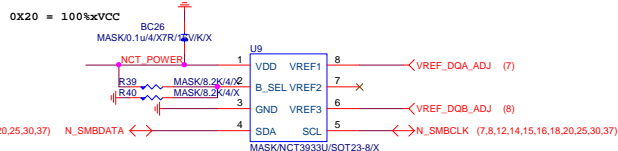
VCC1_05_PCH



OVER VOLTAGE



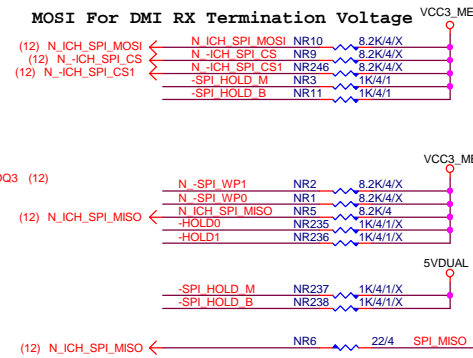
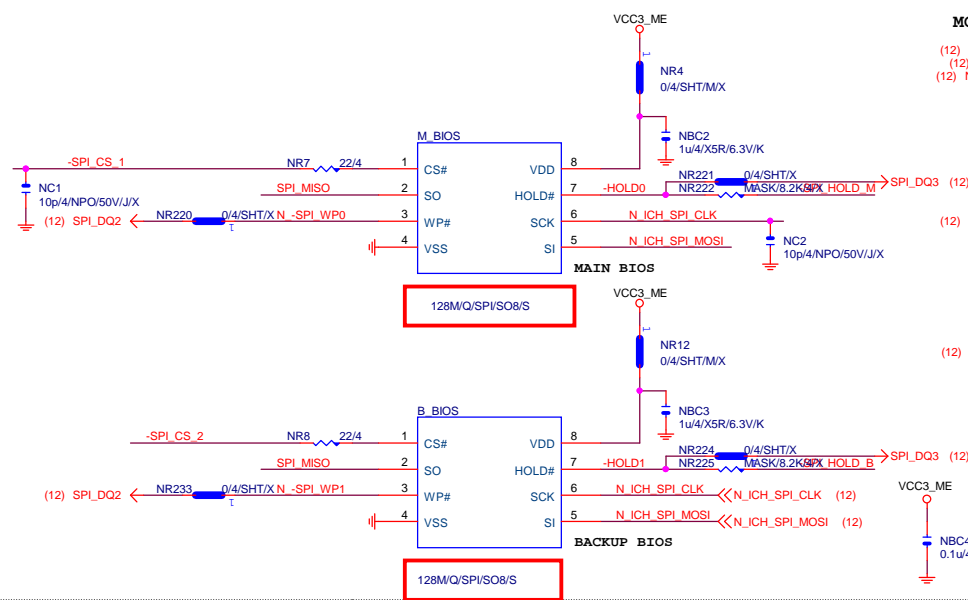
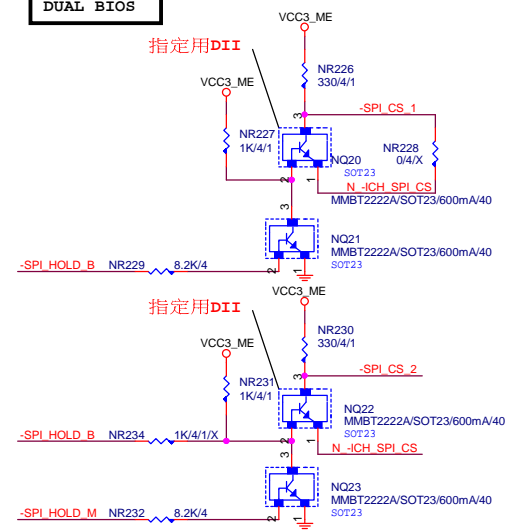
NCT3933	0X2A	0X20	0X22
VREF1	DDRVT	VREF_DDRA_DQ	PCH Core
VREF2	VREF_DDRA_CA	N/A	VCC1_5_PCH
VREF3	VREF_DDRA_CA	VREF_DDBR_DQ	SMREF



Gigabyte Technology

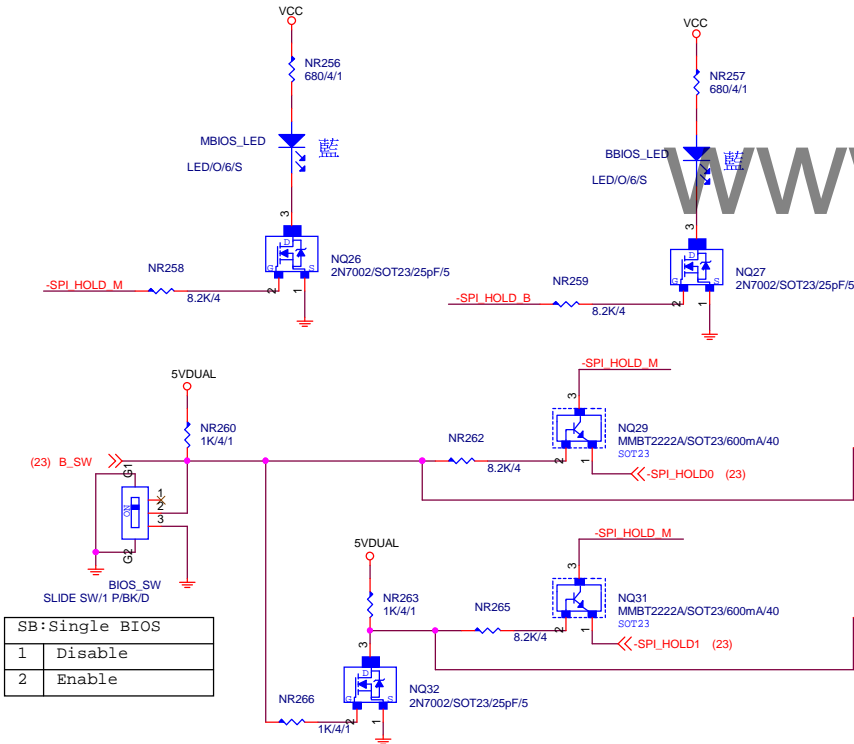
Title			
DISCRETE POWER			
Size	Document Number	Rev	
Custom	GA-Z97X-UD5H	1.0	
Date:	Thursday, April 24, 2014	Sheet	28 of 45

DUAL BIOS

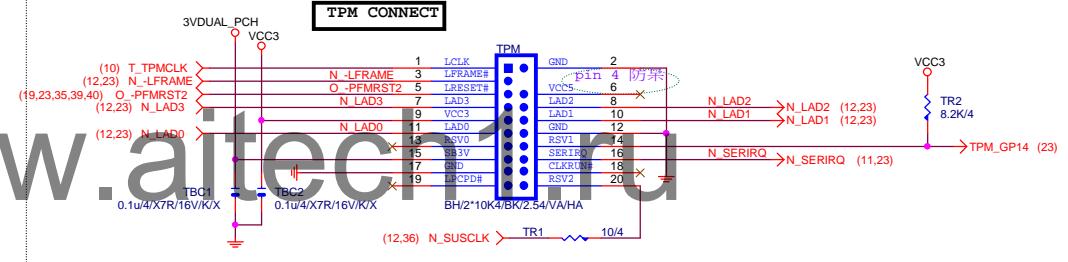


BOOT DEVICE	GNT0	GNT1
LPC	0	0
PCI	0	1
NAND	1	0
SPI	1	1

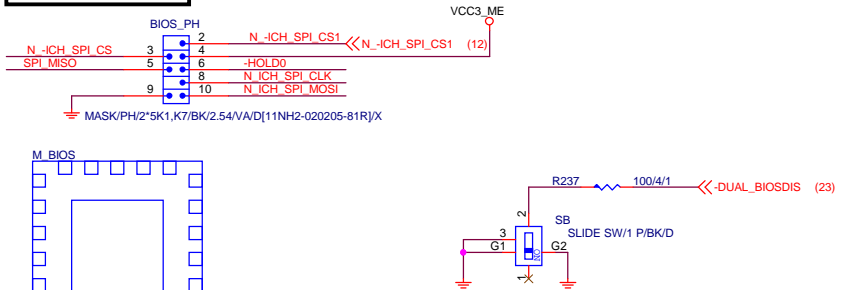
1 means floating
0 means PD 1K



TPM CONNECT



BIOS Debug port



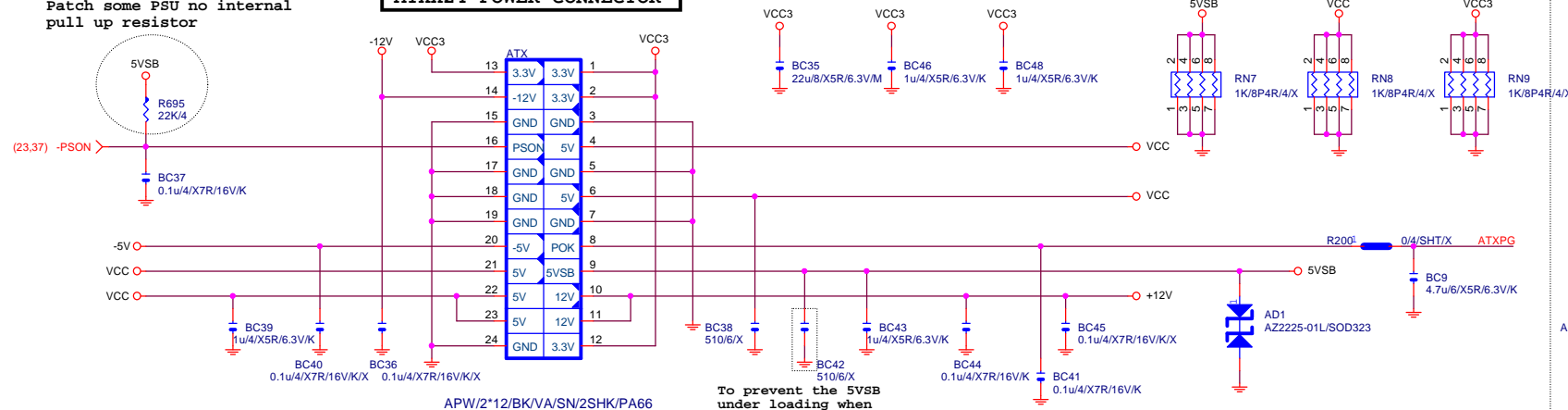
SB:Single BIOS	
1	Disable
2	Enable

Gigabyte Technology

Title		DUAL BIOS, TPM	
Size	Document Number	GA-Z97X-UD5H	Rev
Custom			1.0
Date:	Thursday, April 24, 2014	Sheet	29 of 45

Patch some PSU no internal pull up resistor

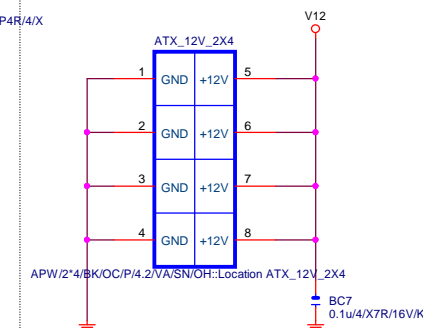
ATXX24 POWER CONNECTOR



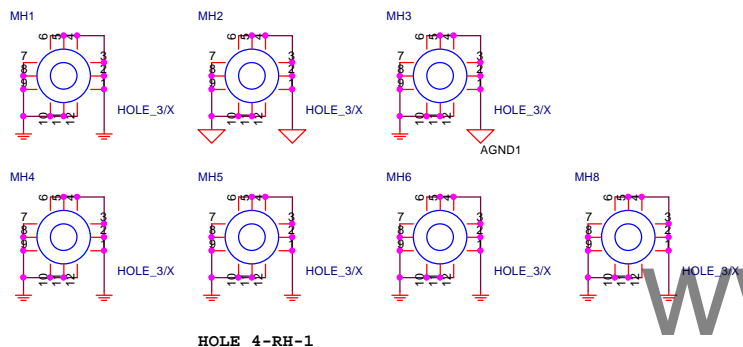
APW/2*12/BK/VA/SN/2SHK/PA66

To prevent the 5VSB under loading when boot

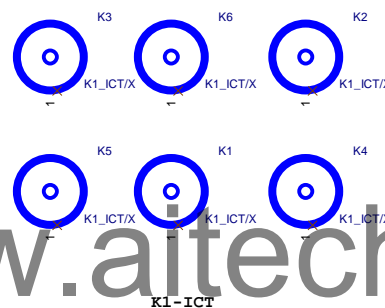
ATXX4 POWER CONNECTOR



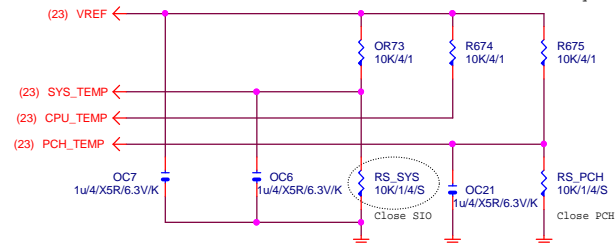
APW/2*4/BK/OC/P/4.2VA/SN/OH:Location ATX_12V_2X4



HOLE_4-RH-1



Rev 0.2 modify



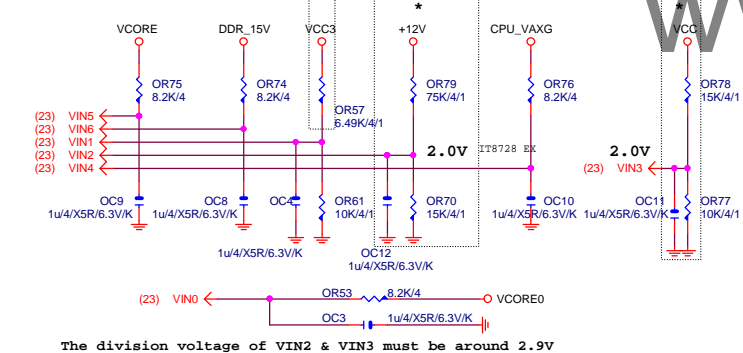
Thrmtrip#改用LM358做

VOLTAGE-- H/W MONITOR

* IT8728 BX
* * IT8728 CX

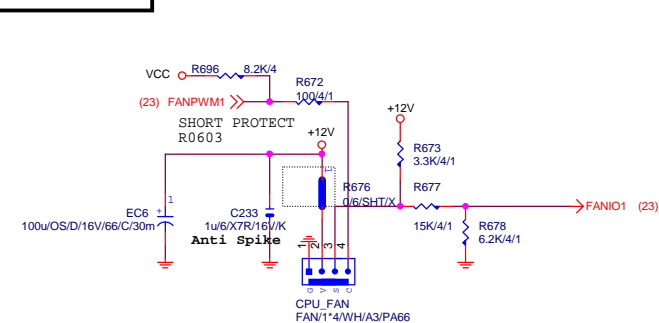
VIN2 must +12V input
VIN3 must VCC input

1000000



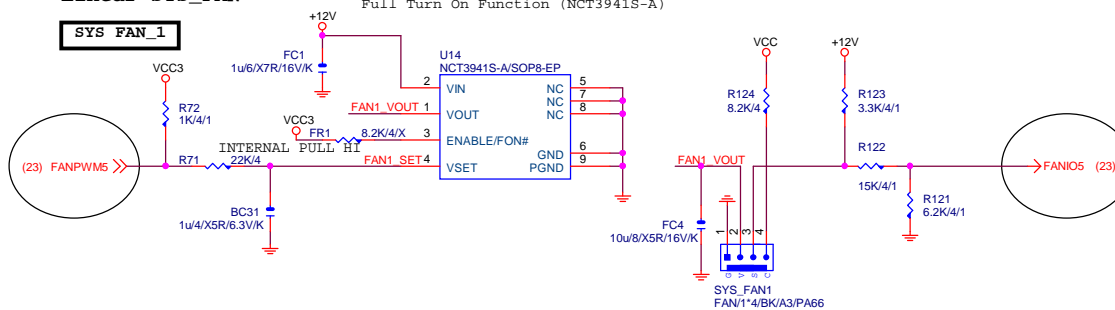
The division voltage of VIN2 & VIN3 must be around 2.9V

CPU SMART FAN

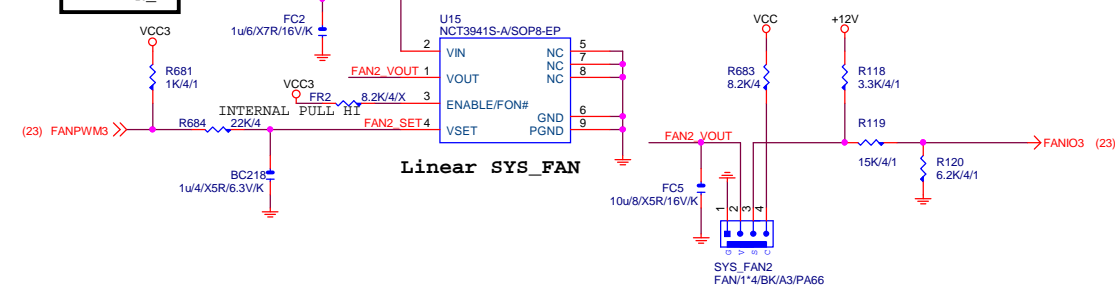


Linear SYS FAN

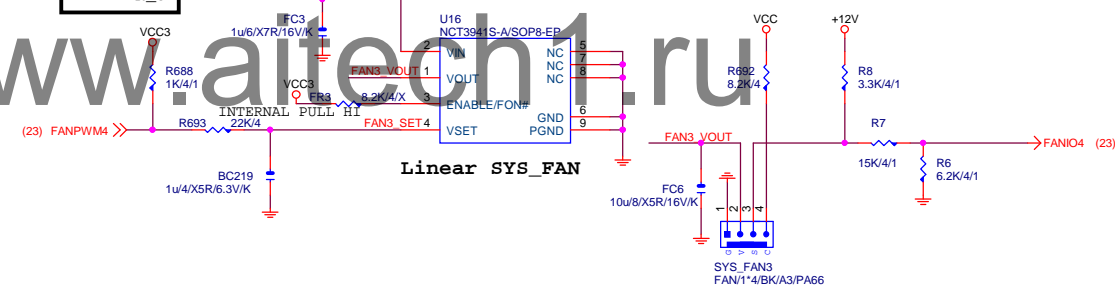
Enable Function (NCT3941S)
Full Turn On Function (NCT3941S-A)



SYS FAN_2

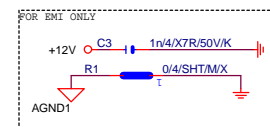
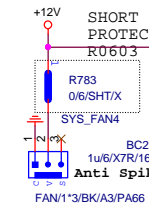
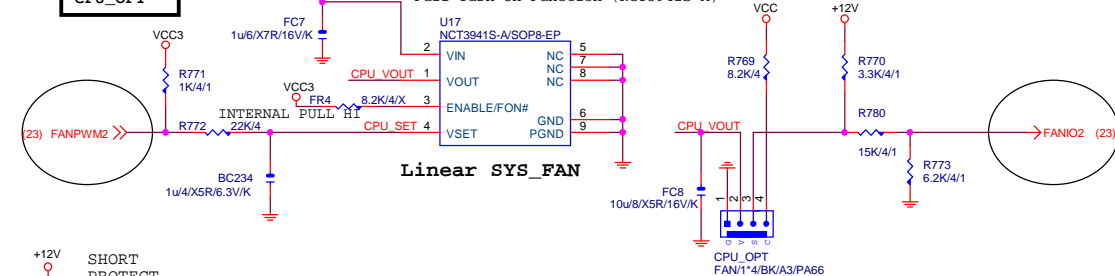


SYS FAN_3



CPU_OPT

Enable Function (NCT3941S)
Full Turn On Function (NCT3941S-A)

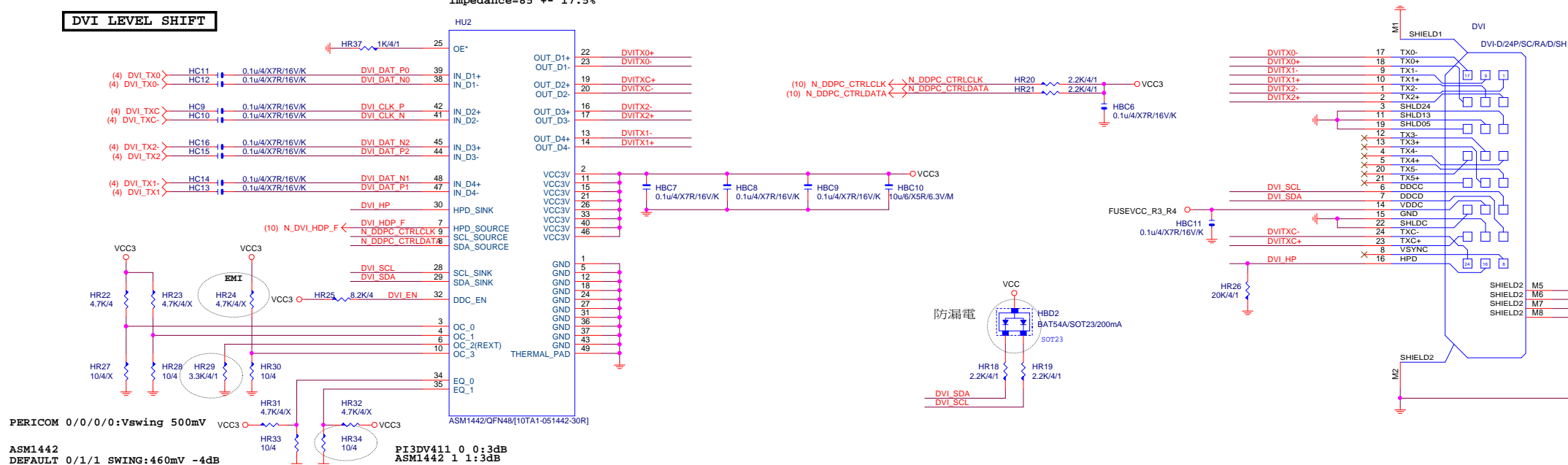


Gigabyte Technology

Title				HWM,KB/MS, FAN CTRL			
Size	Document Number			Rev			
Custom	GA-Z97X-UD5H			1.0			
Date:	Thursday, April 24, 2014			Sheet	32	of	45

DVI LEVEL SHIFT

DVI:15/4/4/4/15
Impedance=85 +- 17.5%

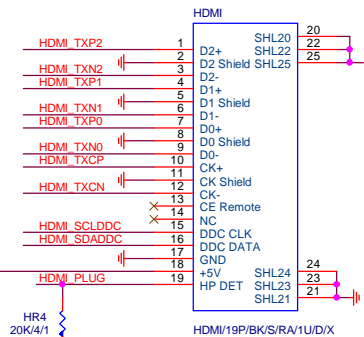
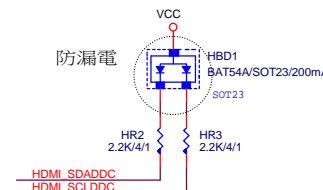
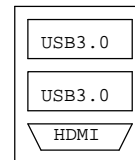
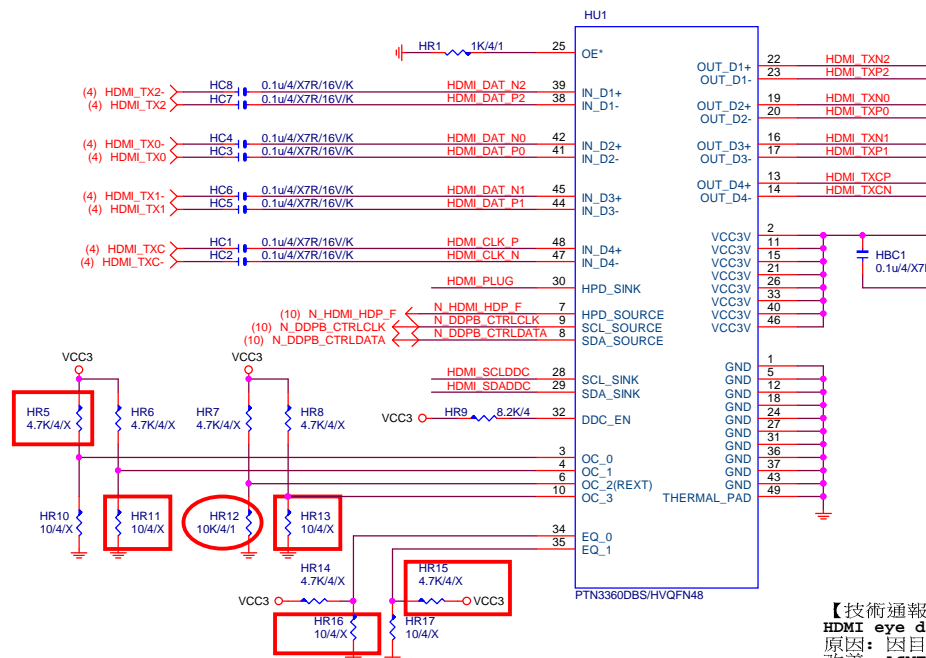


www.aitech1.ru

Gigabyte Technology			
DVI			
Size	Document Number	Rev	
Custom	GA-Z97X-UD5H	1.0	
Date:	Thursday, April 24, 2014	Sheet	33 of 45

HDMI LEVEL SHIFT

HDMI:20/4/6/4/20
Impedance=85 +- 17.5%



HDMI與R_USB共用一個料件

【技術通報R&D技術通報150】

HDMI eye diagram 1.4版(deep color)會fail

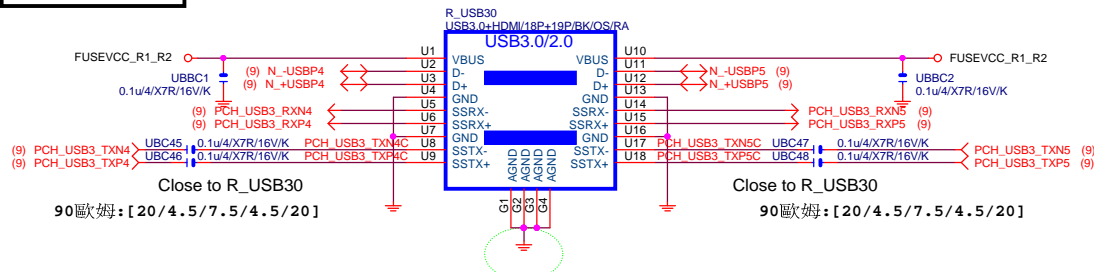
原因: 因目前的HDMI訊號過長,造成RISING TIME過慢,而會壓到eye diagram

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

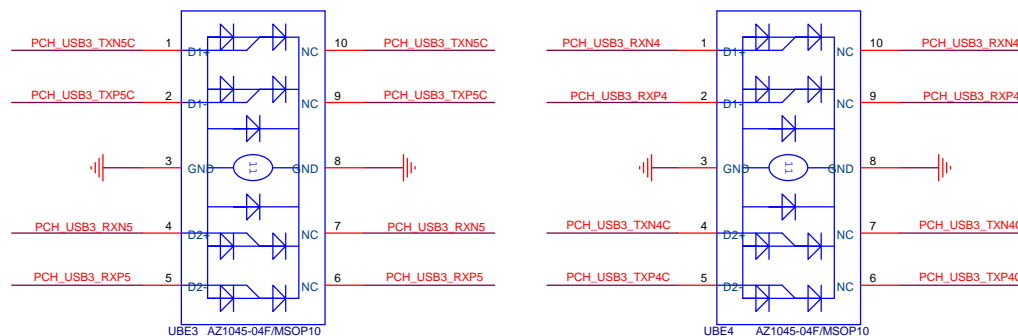
PTN3360:PIN 4/10/34/35 NC PIN,都不上值;只上HR12:10K

ASM1442:紅色框要上,HR12:3.16K

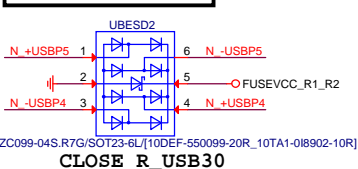
USB30_20 CONNECT



USB30 ESD PROTECT

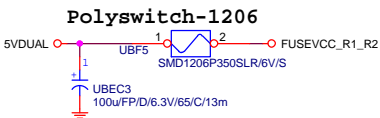


USB20 ESD PROTECT



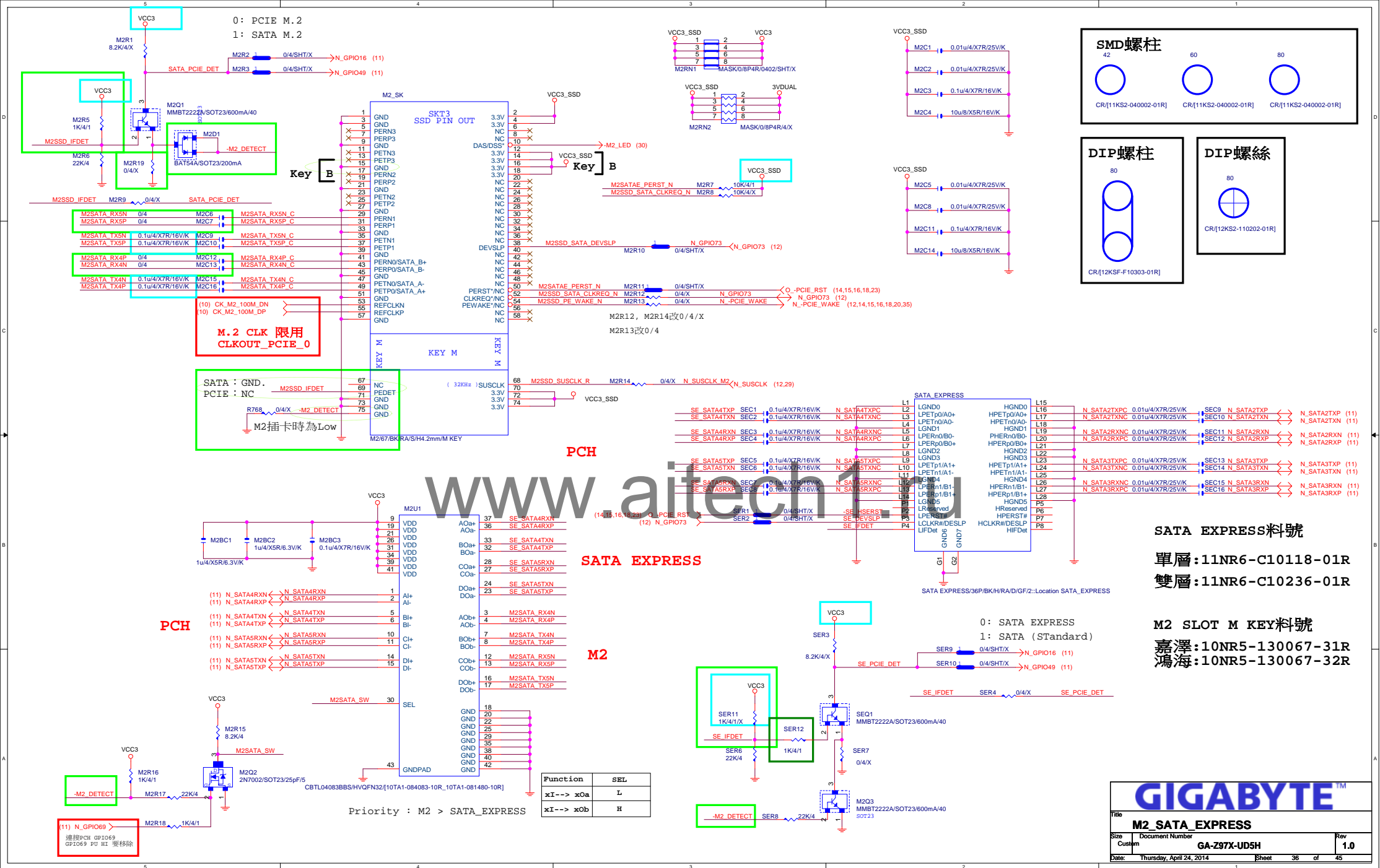
CLOSE R_USB30

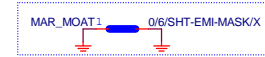
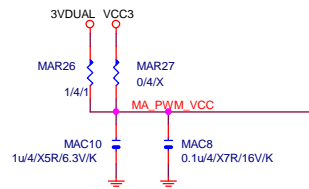
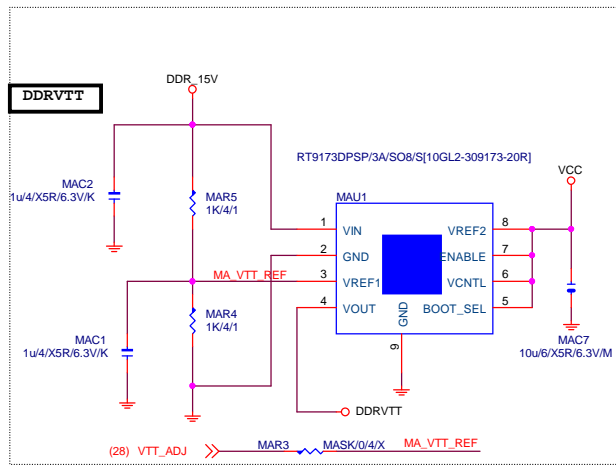
USB30 PWR



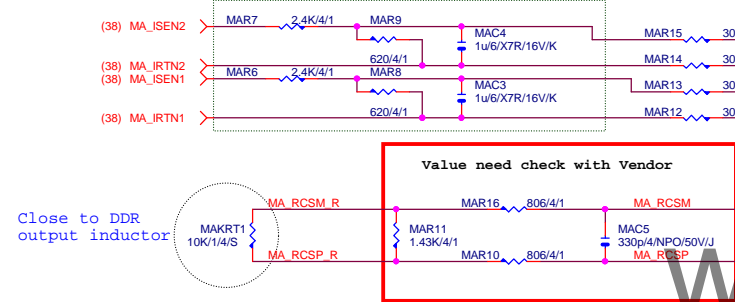
USB3.0 1Port - 1Fuse (3.5A)

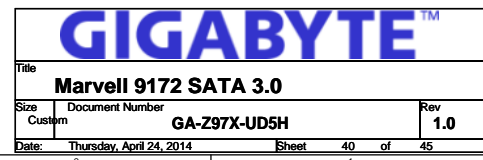
GIGABYTE™			
Title			
HDMI			
Size	Document Number	Rev	
Custom	GA-Z97X-UD5H	1.0	
Date:	Thursday, April 24, 2014	Sheet	34 of 45





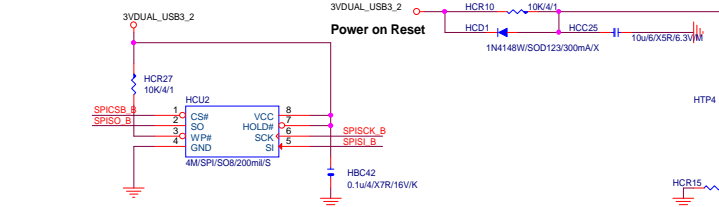
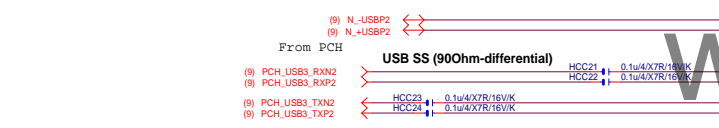
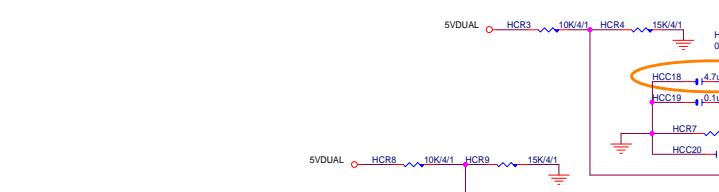
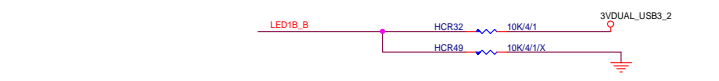
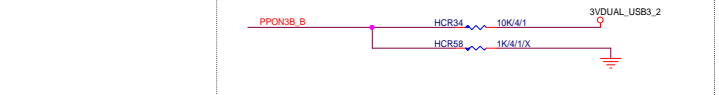
IR3570



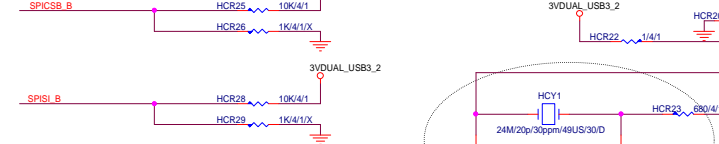


Number of Ports ; 4Ports mode

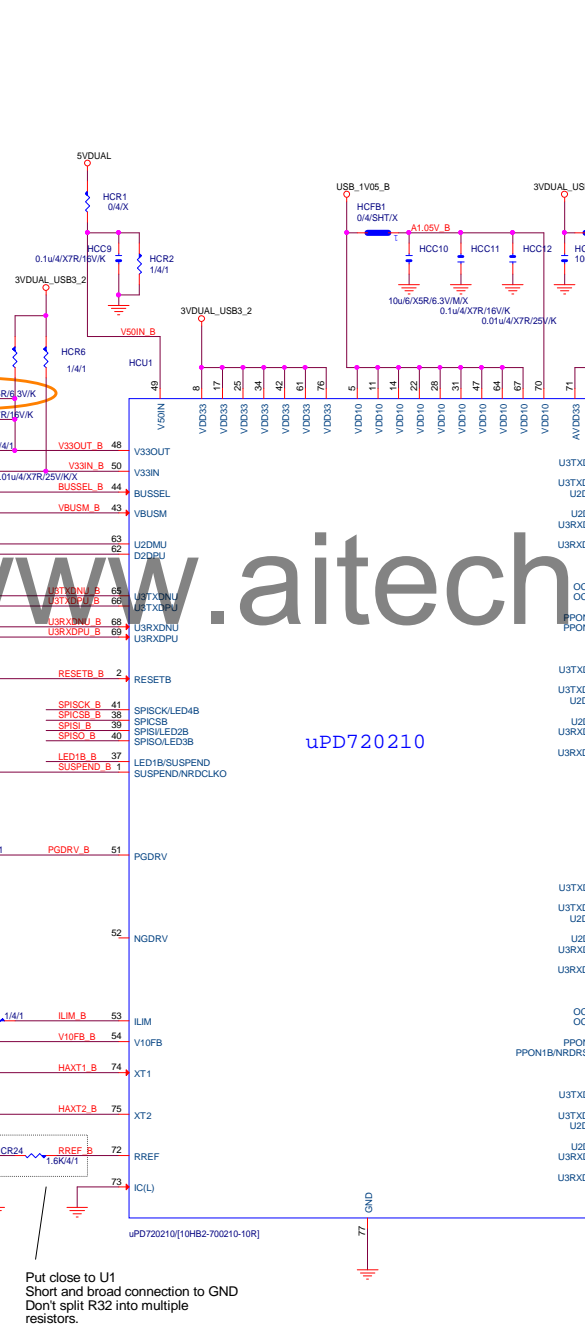
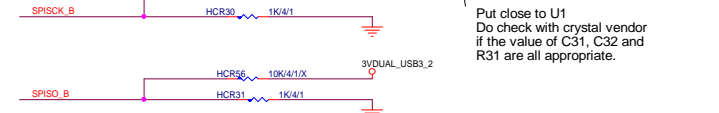
PPON3B / PPON4B : H / H (4 port)
PPON3B / PPON4B : L / L (2 port)



External SPI ROM ; SPI ROM attached mode



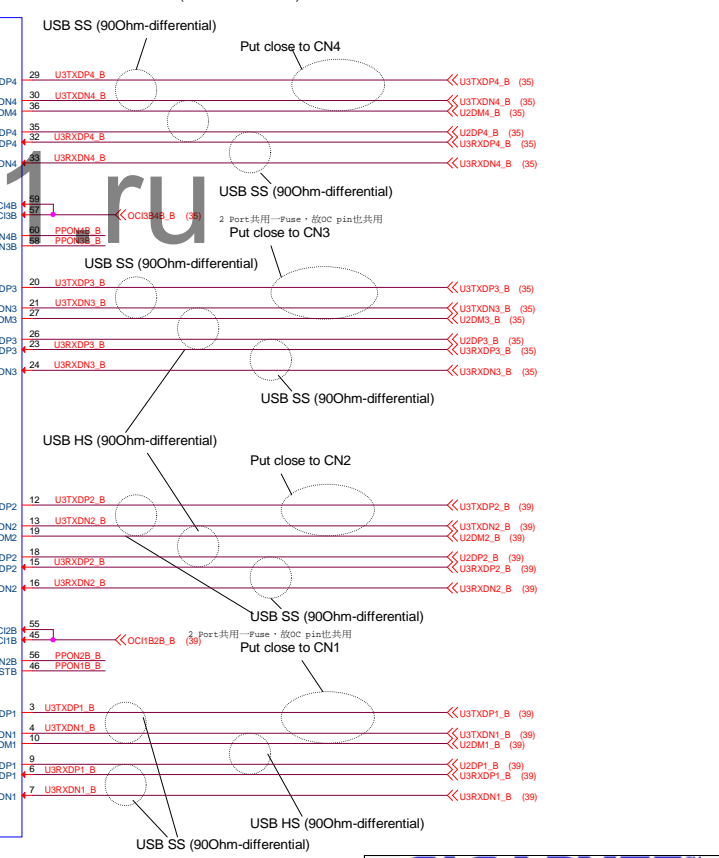
Battery Charging

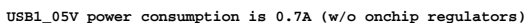


#5 VBUS Power Control ; Individual mode

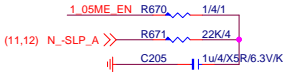
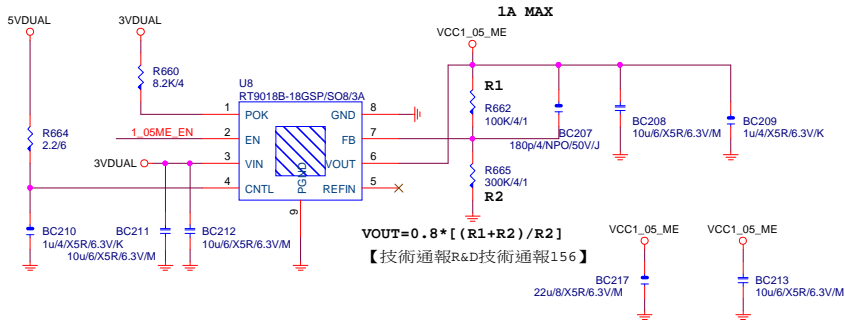


PPON1B Pin Function ; Port1 PPONB mode

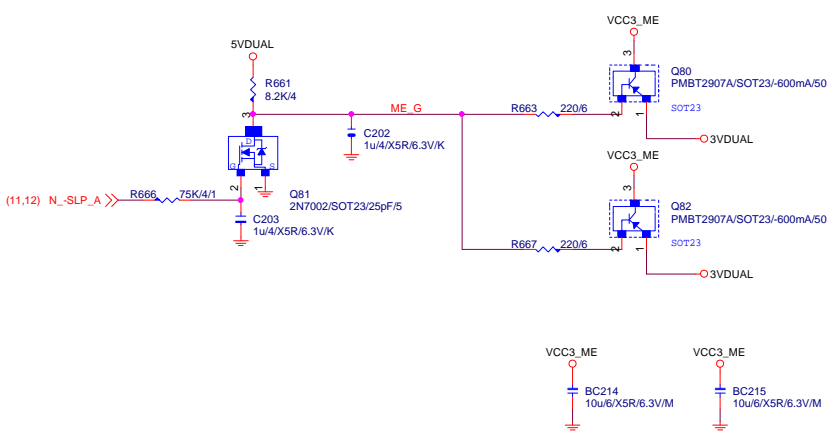




VCC1_05_ME



VCC3_ME

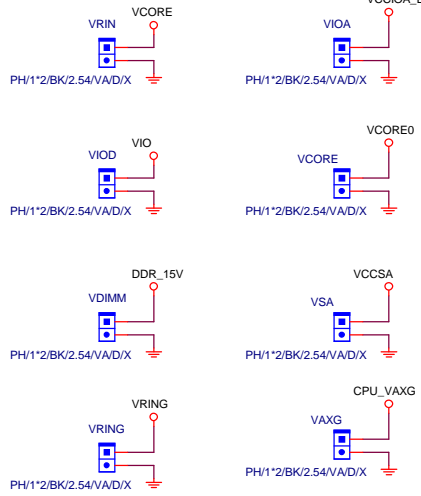
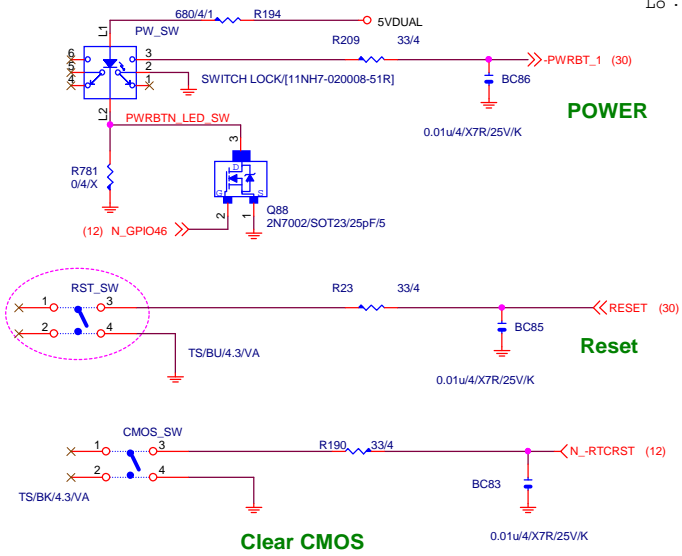


www.aitech1.ru

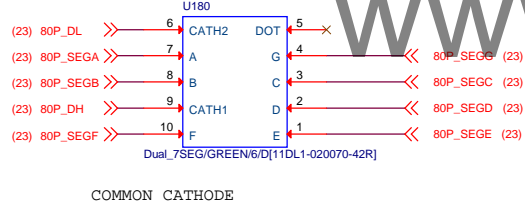
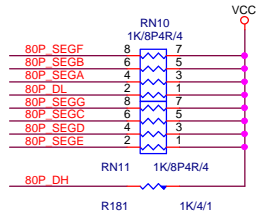
GIGABYTE™

Title		
DDR15V / M3 POWER		
Size	Document Number	Rev
Custom	GA-Z97X-UD5H	1.0
Date:	Thursday, April 24, 2014	Sheet 43 of 45

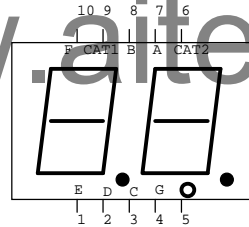
Hi : Button's LED ON
Lo : Button's LED OFF



80 PORT



Physical Package
(TOP VIEW)



5

Super I/O ITE8720 GPIO Table

3

PWM各相位的擺法如下：



散熱模組料號:

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

Gigabyte Technology			
TABLE LIST			
Document Number	GA-Z97X-UD5H		Rev 1.0
Thursday, April 24, 2014	Sheet	45	of 45