

SHEET

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SHEET

TITLE

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PH7 PH8 PH1 PH2 PH9 PH10 PH3

PH4

PH11

PH12

PH5

PH6

CPU SOCKET

2 oz PCB

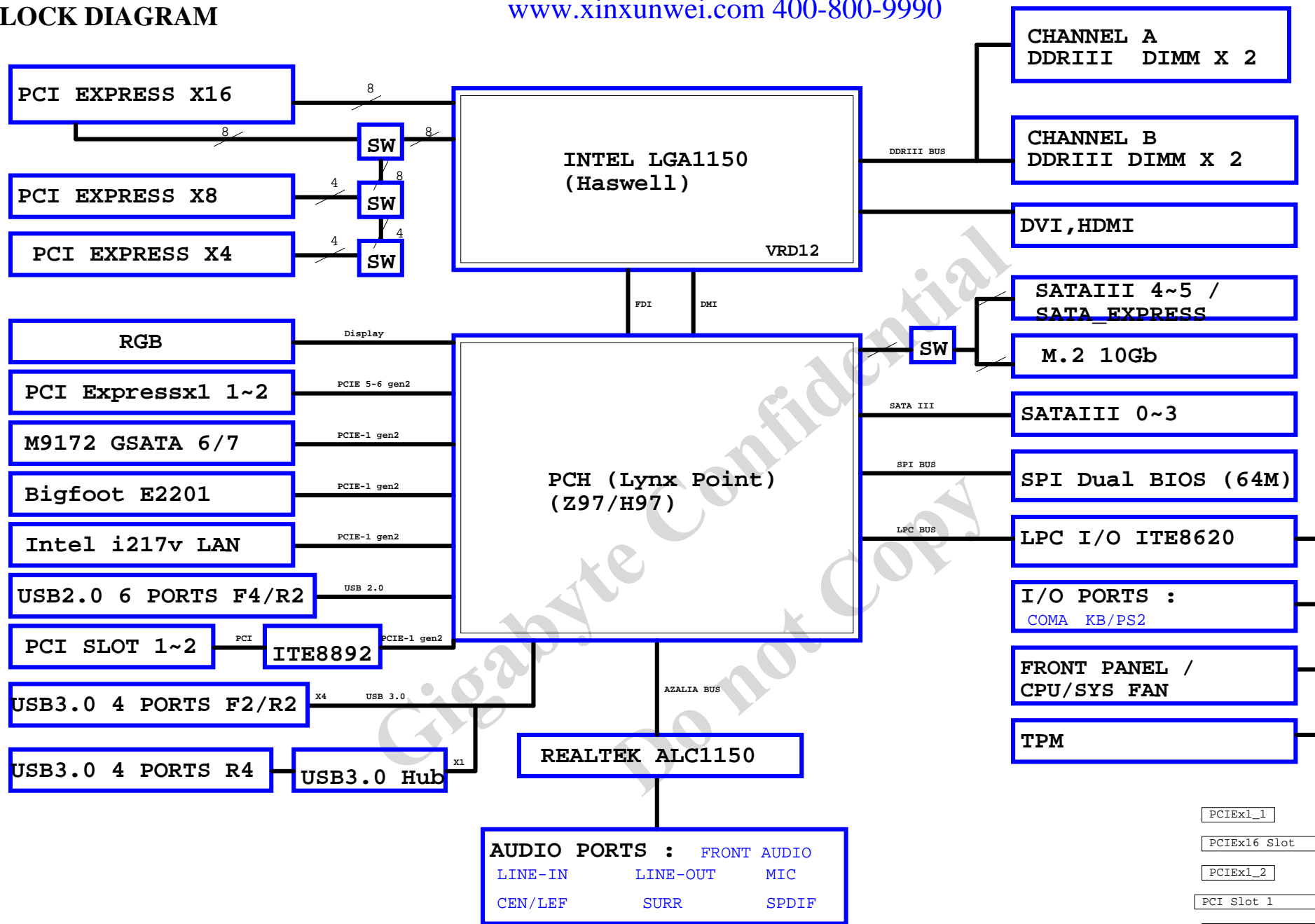
Gigabyte Technology

Title			
Cover Sheet			
Size	Document Number	GA-Z97X-UD5H	Rev 1.01
Custom			
Date	Monday, May 26, 2014	Sheet 1	of 45

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# BLOCK DIAGRAM

www.xinxunwei.com 400-800-9990



PCIEx1\_1

PCIEx16 Slot

PCIEx1\_2

PCI Slot 1

PCIEx8

PCI Slot 2

PCIEx4



LGA1150

(A)

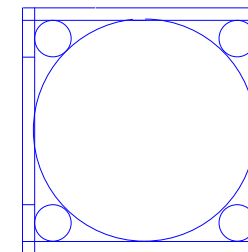
LGA1150

(B)

LGA1150

(CR)

www.xinxunwei.com 400-800-9990

LGA1150  
ILM\_BP\_CR/115X/BKNI[12KRC-0F0001-61R]

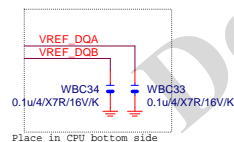
LGA1150B

MAAB0	AL19	DDR1_DQ0	AE34	MD80
MAAB1	AK23	DDR1_MA0	AE35	MD81
MAAB2	AM22	DDR1_MA1	AG35	MD82
MAAB3	AM23	DDR1_MA2	AH35	MD83
MAAB4	AP23	DDR1_MA3	AD34	MD84
MAAB5	AL23	DDR1_MA4	AD35	MD85
MAAB6	AY24	DDR1_MA5	AG34	MD86
MAAB7	AY25	DDR1_MA6	AH34	MD87
MAAB8	AD26	DDR1_MA7	AL34	MD88
MAAB9	AW25	DDR1_MA8	AL35	MD89
MAAB10	AP18	DDR1_MA9	AK31	MD90
MAAB11	AY25	DDR1_MA10	AL31	MD91
MAAB12	AY26	DDR1_MA11	AK34	MD92
MAAB13	AR15	DDR1_MA12	AK35	MD93
MAAB14	AY27	DDR1_MA13	AK32	MD94
MAAB15	AY28	DDR1_MA14	AL32	MD95
		DDR1_MA15	AL33	MD96
MODT_B0	AM17	DDR1_ODT0	AP34	MD97
MODT_B1	AL18	DDR1_ODT1	AN31	MD98
MODT_B2	AM16	DDR1_ODT2	AP31	MD99
MODT_B3	AK15	DDR1_ODT3	AN35	MD100
			AP35	MD101
			AN32	MD102
			AP32	MD103
			AM29	MD104
			AM28	MD105
			AR29	MD106
			AR28	MD107
			AL28	MD108
			AL25	MD109
			AL26	MD110
			AP29	MD111
			AP28	MD112
			AK12	MD113
			AP12	MD114
			AL13	MD115
			AL12	MD116
			AK13	MD117
			AP13	MD118
			AM13	MD119
			AM12	MD120
			AR9	MD121
			AP9	MD122
			AR6	MD123
			AP6	MD124
			AR10	MD125
			AP10	MD126
			AR7	MD127
			AP7	MD128
			AM9	MD129
			AL9	MD130
			AL6	MD131
			AL7	MD132
			AM10	MD133
			AL10	MD134
			AM6	MD135
			AM7	MD136
			AH6	MD137
			AH7	MD138
			AE6	MD139
			AJ6	MD140
			AJ7	MD141
			AF6	MD142
			AF7	MD143
			AF35	MD144
			AL33	MD145
			AP33	MD146
			AN28	MD147
			AN12	MD148
			AP8	MD149
			AL8	MD150
			AG7	MD151
			AN25	MD152
			AF34	MD153
			AK33	MD154
			AN33	MD155
			AN29	MD156
			AN13	MD157
			AR8	MD158
			AM8	MD159
			AG6	MD160
			AN26	MD161

HASWELL[10SC1-F01150-01R]

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]



Place in CPU bottom side

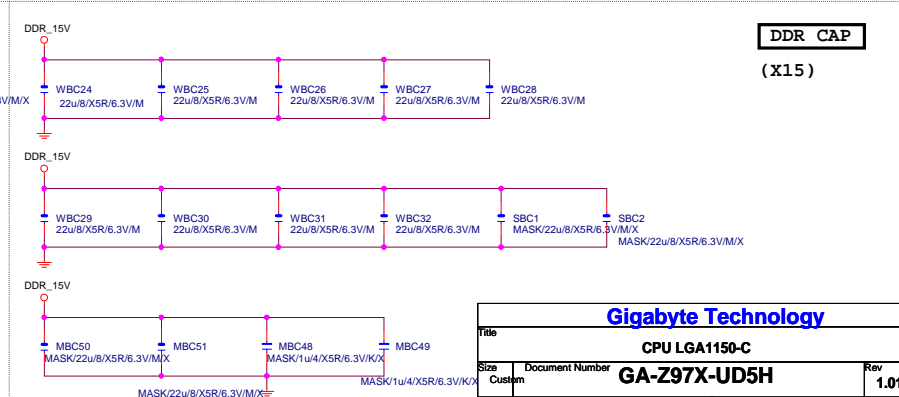
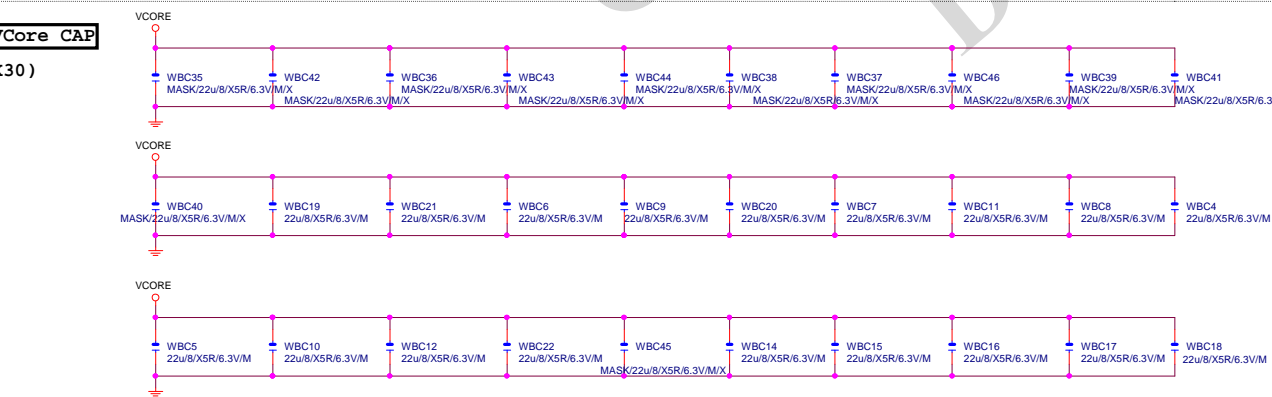
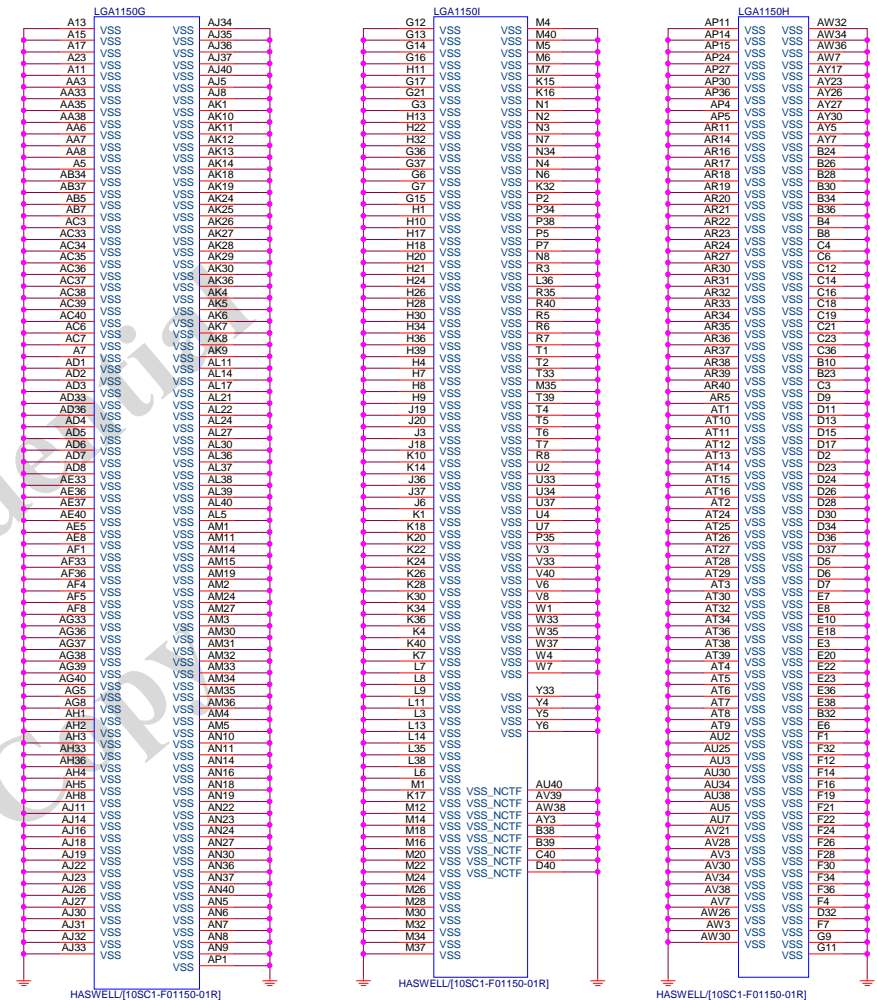
LGA1150A

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	AF37	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	AY10	DDR0_MA13	AK38	MDA8
MAAA14	AT20	DDR0_MA14	AK37	MDA14
MAAA15	AU21	DDR0_MA15	AK40	MDA15
		DDR0_MA16	AM40	MDA17
		DDR0_MA17	AP38	MDA21
		DDR0_MA18	AP39	MDA19
		DDR0_MA19	AM37	MDA20
		DDR0_MA20	AM38	MDA16
		DDR0_MA21	AP37	MDA22
		DDR0_MA22	AP40	MDA23
		DDR0_MA23	AV37	MDA25
		DDR0_MA24	AW37	MDA29
		DDR0_MA25	AU35	MDA28
		DDR0_MA26	AV35	MDA27
		DDR0_MA27	AT37	MDA28
		DDR0_MA28	AU37	MDA24
		DDR0_MA29	AT35	MDA30
		DDR0_MA30	AW35	MDA31
		DDR0_MA31	AY6	MDA33
		DDR0_MA32	AU6	MDA37
		DDR0_MA33	AV4	MDA34
		DDR0_MA34	AU4	MDA35
		DDR0_MA35	AW6	MDA36
		DDR0_MA36	AV6	MDA32
		DDR0_MA37	AW4	MDA38
		DDR0_MA38	AY4	MDA39
		DDR0_MA39	AR1	MDA41
		DDR0_MA40	AR4	MDA45
		DDR0_MA41	AN3	MDA42
		DDR0_MA42	AN4	MDA43
		DDR0_MA43	AR2	MDA44
		DDR0_MA44	AR3	MDA40
		DDR0_MA45	AN2	MDA46
		DDR0_MA46	AN1	MDA47
		DDR0_MA47	AL1	MDA49
		DDR0_MA48	AL4	MDA53
		DDR0_MA49	AJ3	MDA50
		DDR0_MA50	AJ4	MDA51
		DDR0_MA51	AL2	MDA52
		DDR0_MA52	AL3	MDA48
		DDR0_MA53	AJ2	MDA54
		DDR0_MA54	AJ1	MDA55
		DDR0_MA55	AG1	MDA57
		DDR0_MA56	AG4	MDA61
		DDR0_MA57	AE3	MDA58
		DDR0_MA58	AE4	MDA59
		DDR0_MA59	AG2	MDA60
		DDR0_MA60	AG3	MDA56
		DDR0_MA61	AE2	MDA62
		DDR0_MA62	AE1	MDA63
		DDR0_MA63	AE39	DQSA0
		DDR0_MA64	AJ39	DQSA1
		DDR0_MA65	AN39	DQSA2
		DDR0_MA66	AV36	DQSA3
		DDR0_MA67	AV5	DQSA4
		DDR0_MA68	AP3	DQSA5
		DDR0_MA69	AK3	DQSA6
		DDR0_MA70	AF3	DQSA7
		DDR0_MA71	AV32	DQSA0
		DDR0_MA72	AE38	DQSA1
		DDR0_MA73	AJ38	DQSA2
		DDR0_MA74	AN38	DQSA3
		DDR0_MA75	AJ36	DQSA4
		DDR0_MA76	AW5	DQSA5
		DDR0_MA77	AP2	DQSA6
		DDR0_MA78	AK2	DQSA7
		DDR0_MA79	AF2	DQSA7
		DDR0_MA80	AU32	

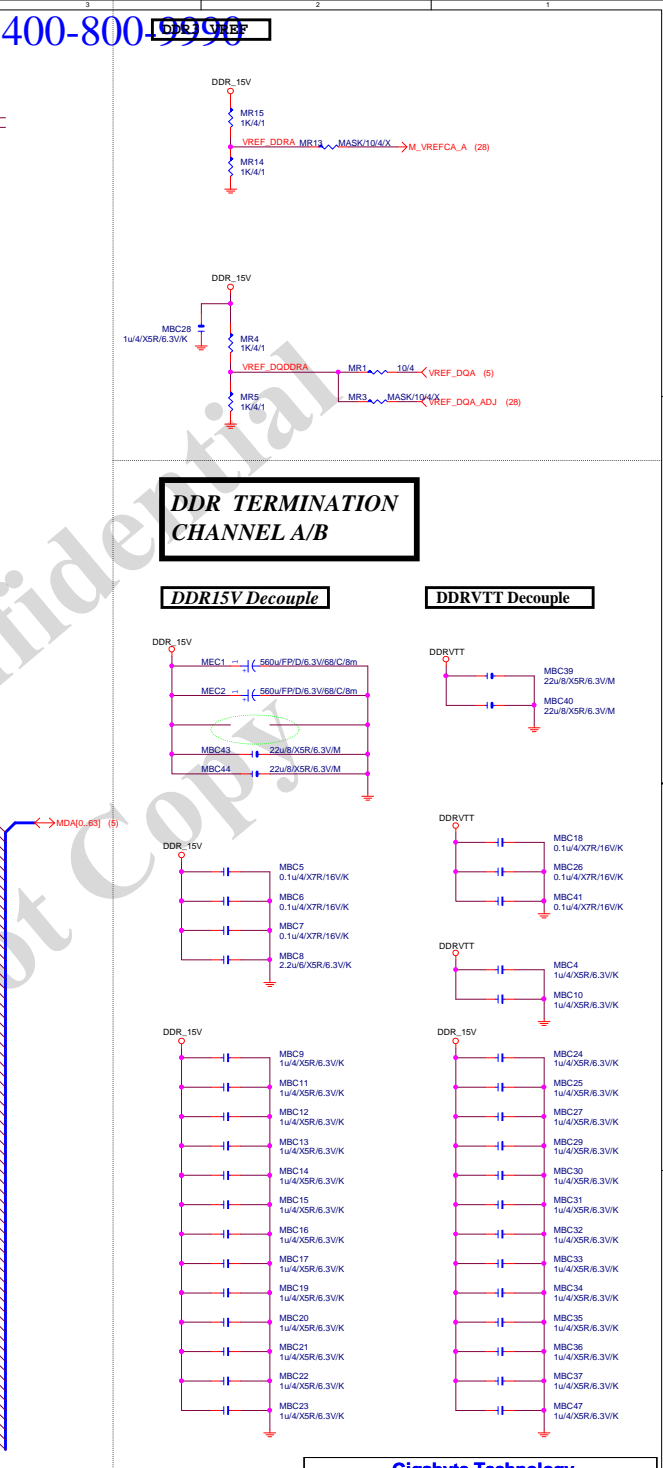
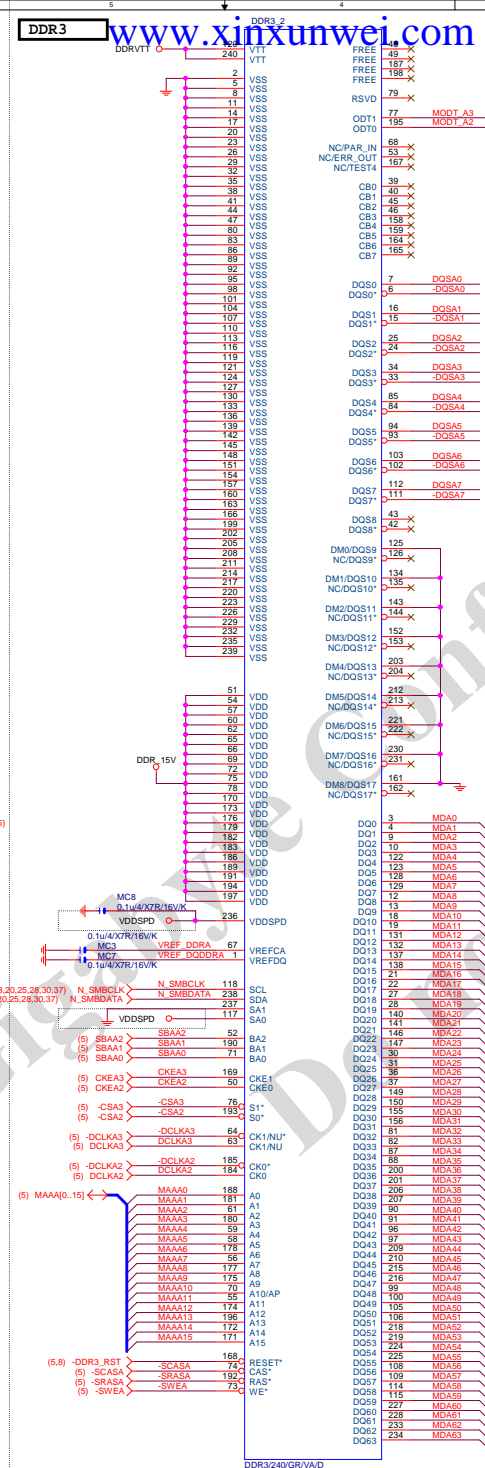
HASWELL[10SC1-F01150-01R]

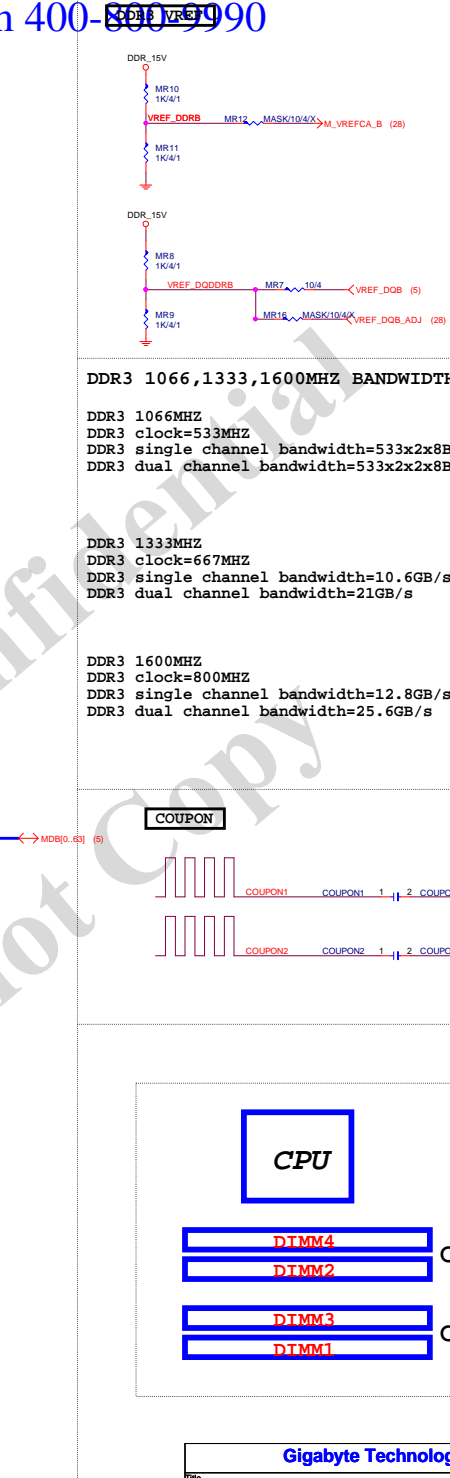
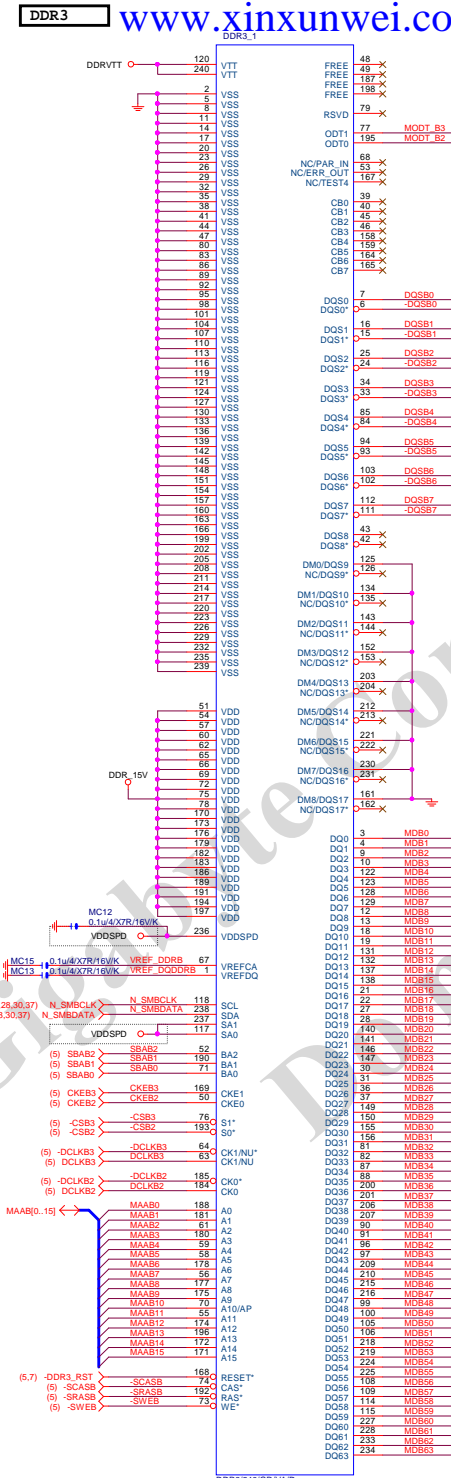
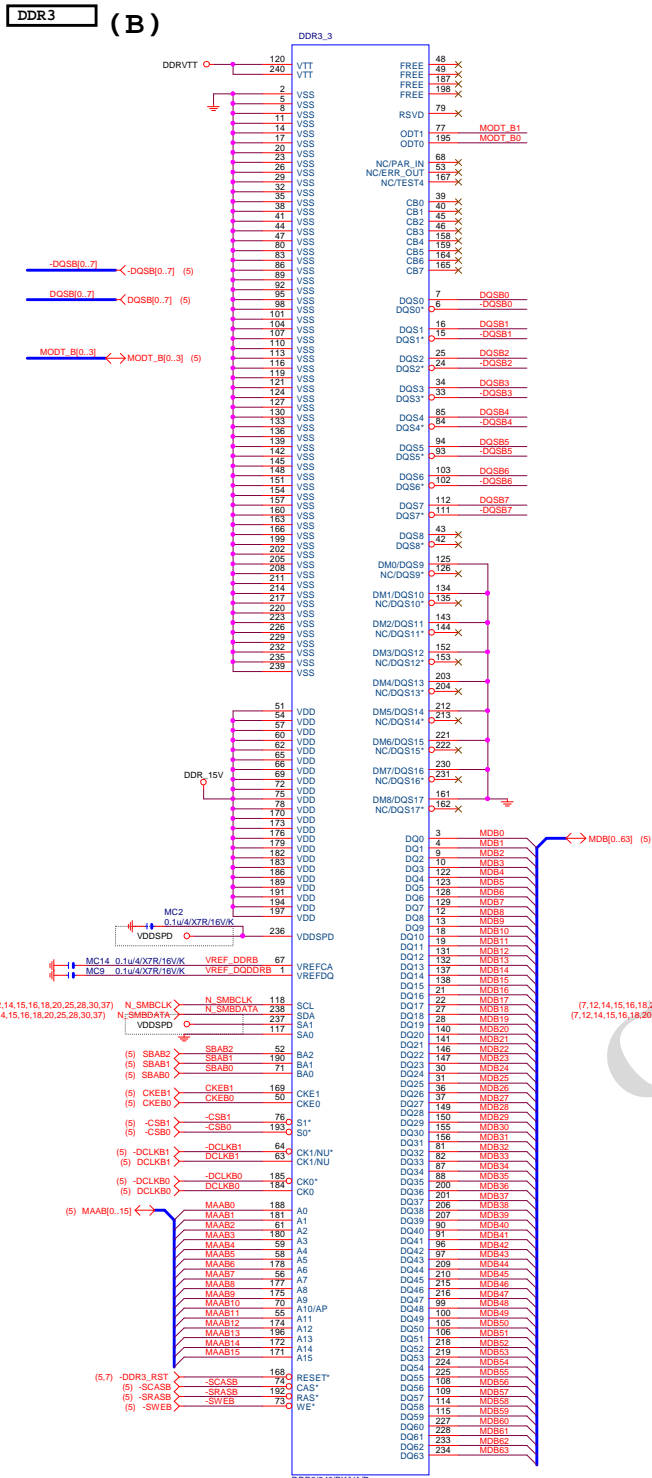
Gigabyte Technology

Title	CPU LGA1150-B	Rev	1.01
Size	Custom	Document Number	GA-Z97X-UD5H
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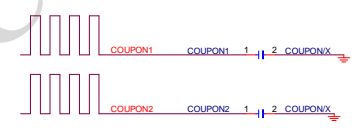
DDR3 1066,1333,1600MHZ BANDWIDTH

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

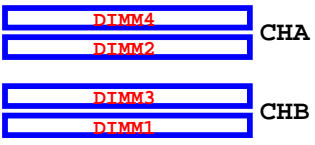
DDR3 1333MHZ  
DDR3 clock=667MHZ  
DDR3 single channel bandwidth=10.6GB/s  
DDR3 dual channel bandwidth=21GB/s

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

COUPON



CPU



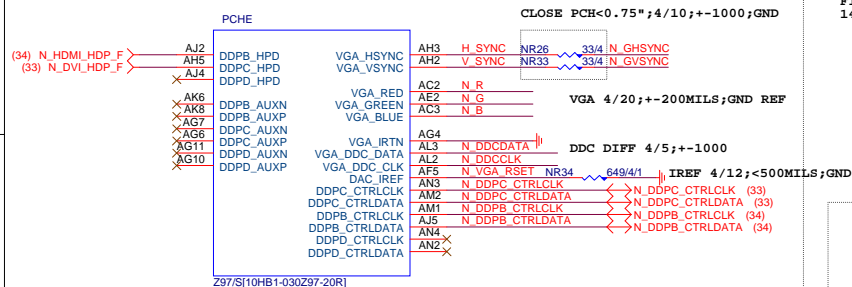
Gigabyte Technology

File		DDR3 CHANNEL B		Rev
Size	Document Number	GA-Z97X-UD5H		1.01
Custom	Date:			Sheet 8 of 45





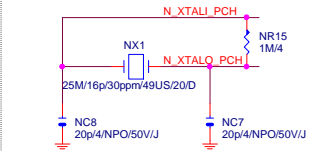
# PCH (E)



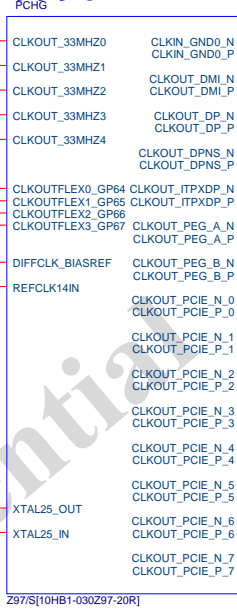
VGA DISABLE
R,G,B NC OR GND
IRTN / IREF GND
VGA_HSYNC, VGA_VSYNC, DDC_CLK, DDC_DATA NC
POWER VCCADAC(AF2), VCCADACBG(AE1) GND

Flex1,2,3,4 : 14/24/33/48MHZ

XTAL Trace Length < 1500 mil



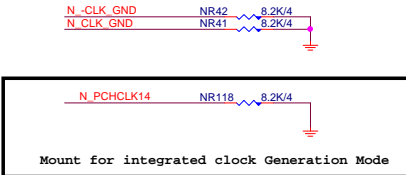
X'TAL 25MHz須參考GND  
CRYSTAL/TRACE 週邊不要有訊號,VIA靠近  
走線遠離其他40mil以上



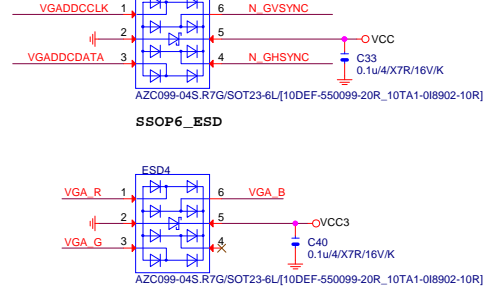
PCIE4 CLOCK(PE\_SRCCLK\_3GIO1)由PIN R6,R7  
換成PIN W7,W6 避免跟CRYSTAL 25MHZ干擾

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

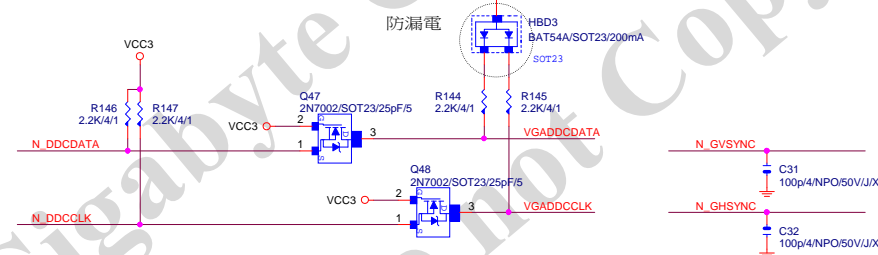
## PCH CLK PD



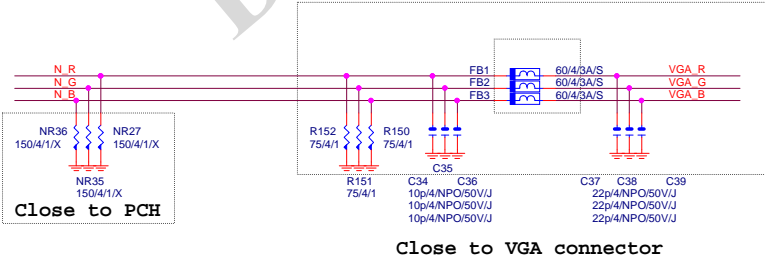
## VGA ESD



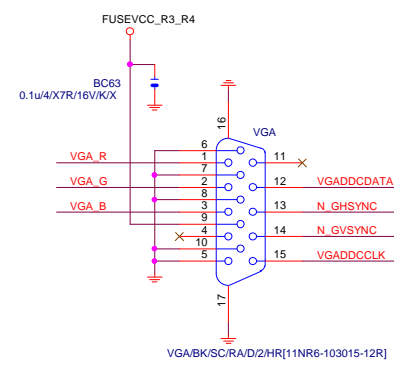
## VGA DDC



## VGA DDC



## VGA CONNECTOR



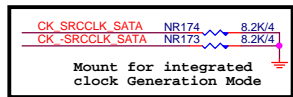
Gigabyte Technology		
Title PCH DISPLAY ,CLK BUFFER		
Size	Document Number	Rev
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PCH (C)

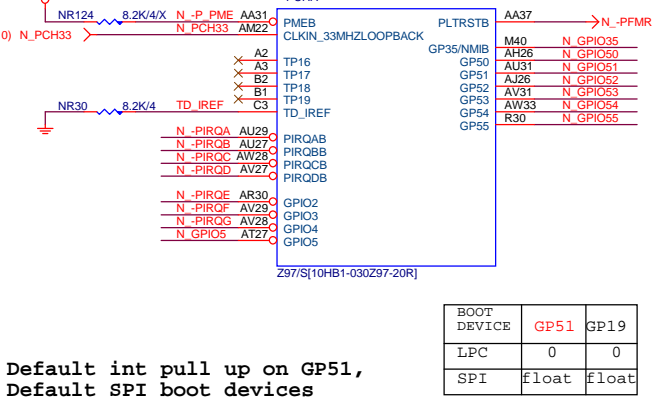
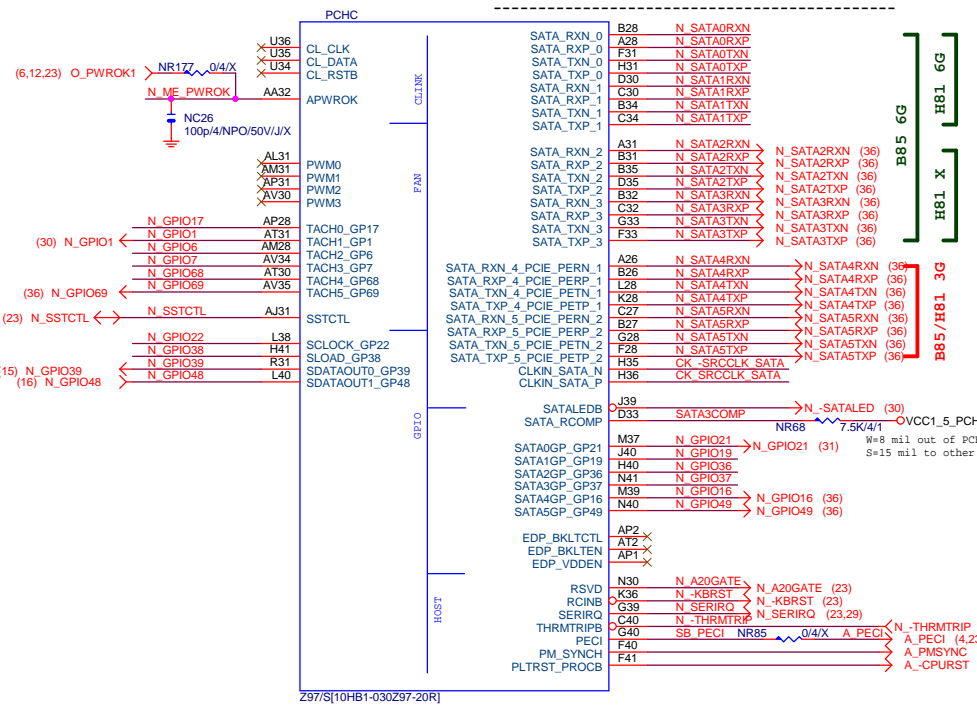
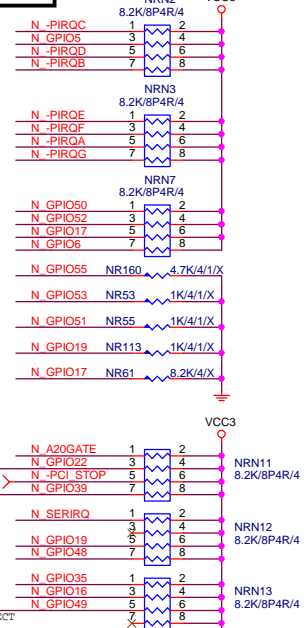
SATA3 : 20/4/4/20 (breakout pin 1/4/19)  
Impedance=85 +- 17.5%  
SATA2 4/4/4//15  
SATA1 4/4/4//20

PCH (A)

PCH CLK PD



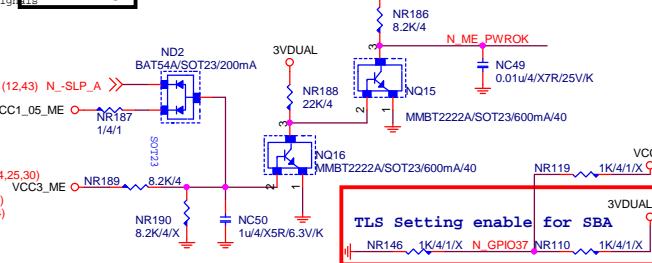
PCH PU/PD



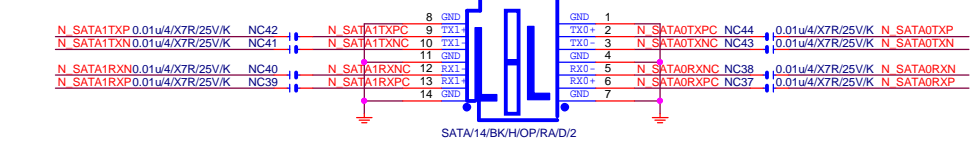
Default int pull up on GP51,  
Default SPI boot devices

BOOT	GP51	GP19
DEVICE	0	0
LPC	float	float
SPI	float	float

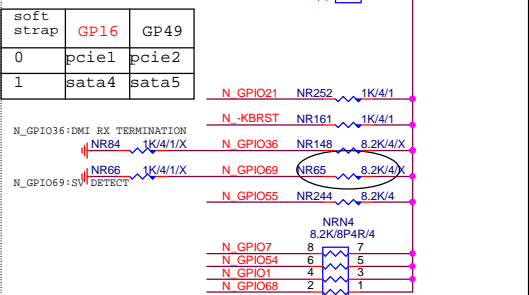
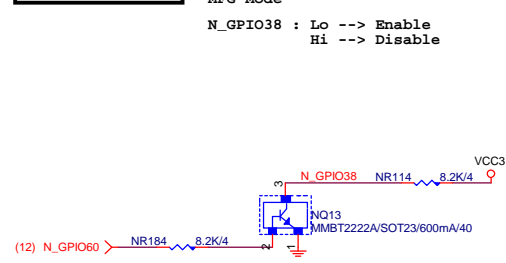
ME PWROK



SATA CONNECTOR

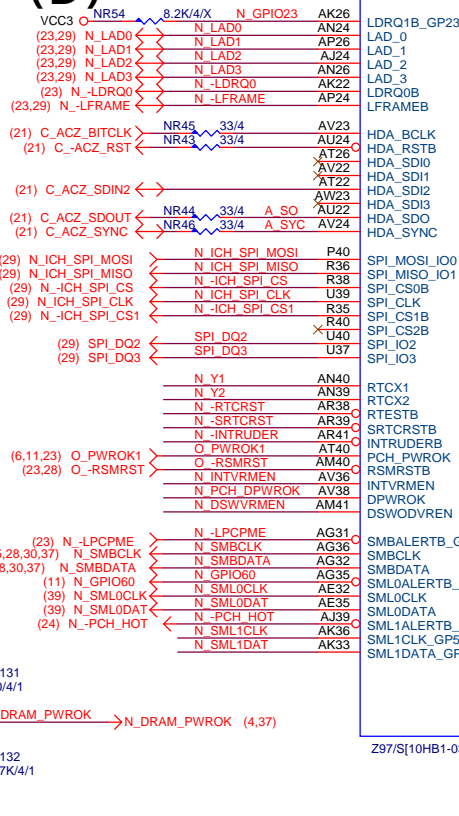


GPIO38 Ctrl

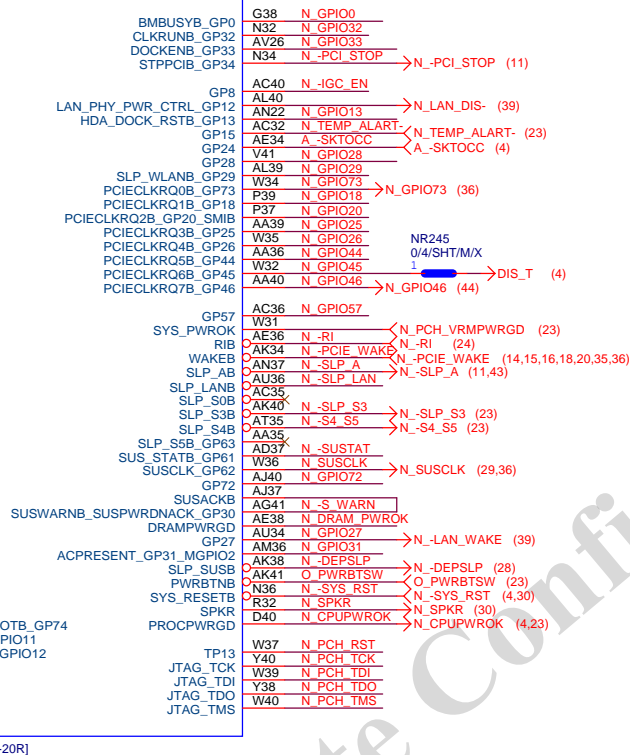


PCH

(D)



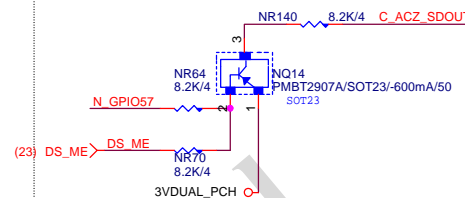
PCHD



## ACZ\_SDOUT

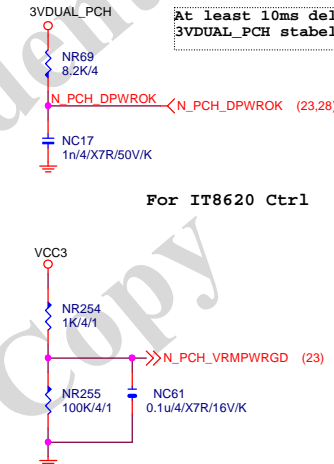
```
C_ACZ_SDOUT : HI --> ME Enable
              Lo --> ME Disable

HI:disable ME and override SPI Flash Access
Permissions
```



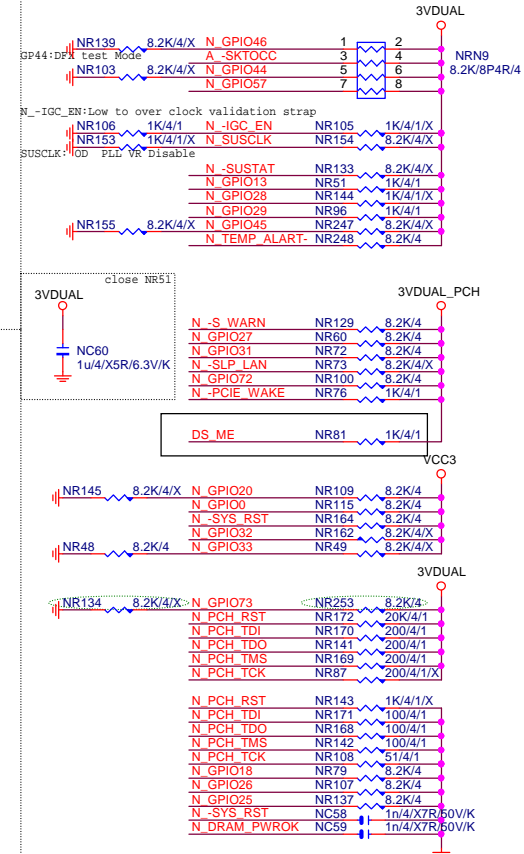
## PCH\_DPWROK

```
At least 10ms delay after
3VDUAL PCH stabel
```

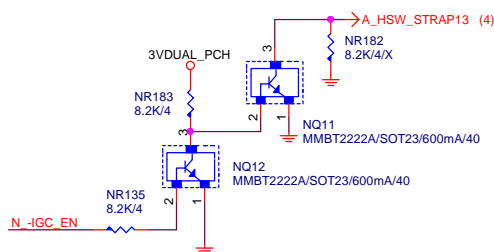


For IT8620 Ctrl

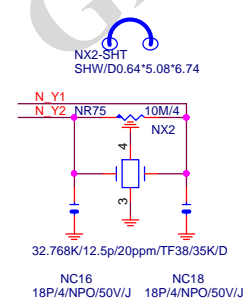
PCH	PU/PD
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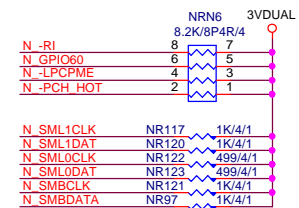
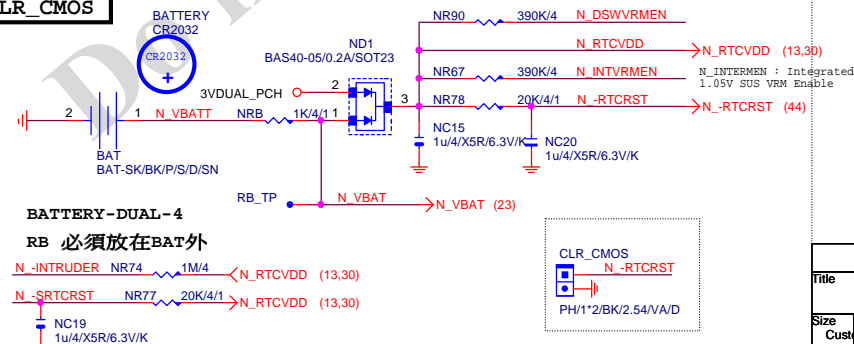
## HSW\_STRAP13

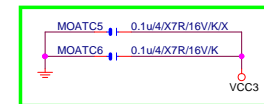
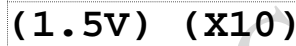
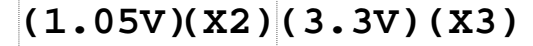


32.768KHZ



## CLR\_CMOS



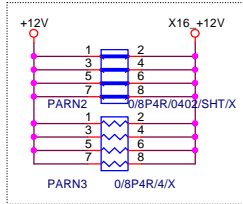




+12 protect  
short-wire test

PCIEX16:16/5/5/16

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

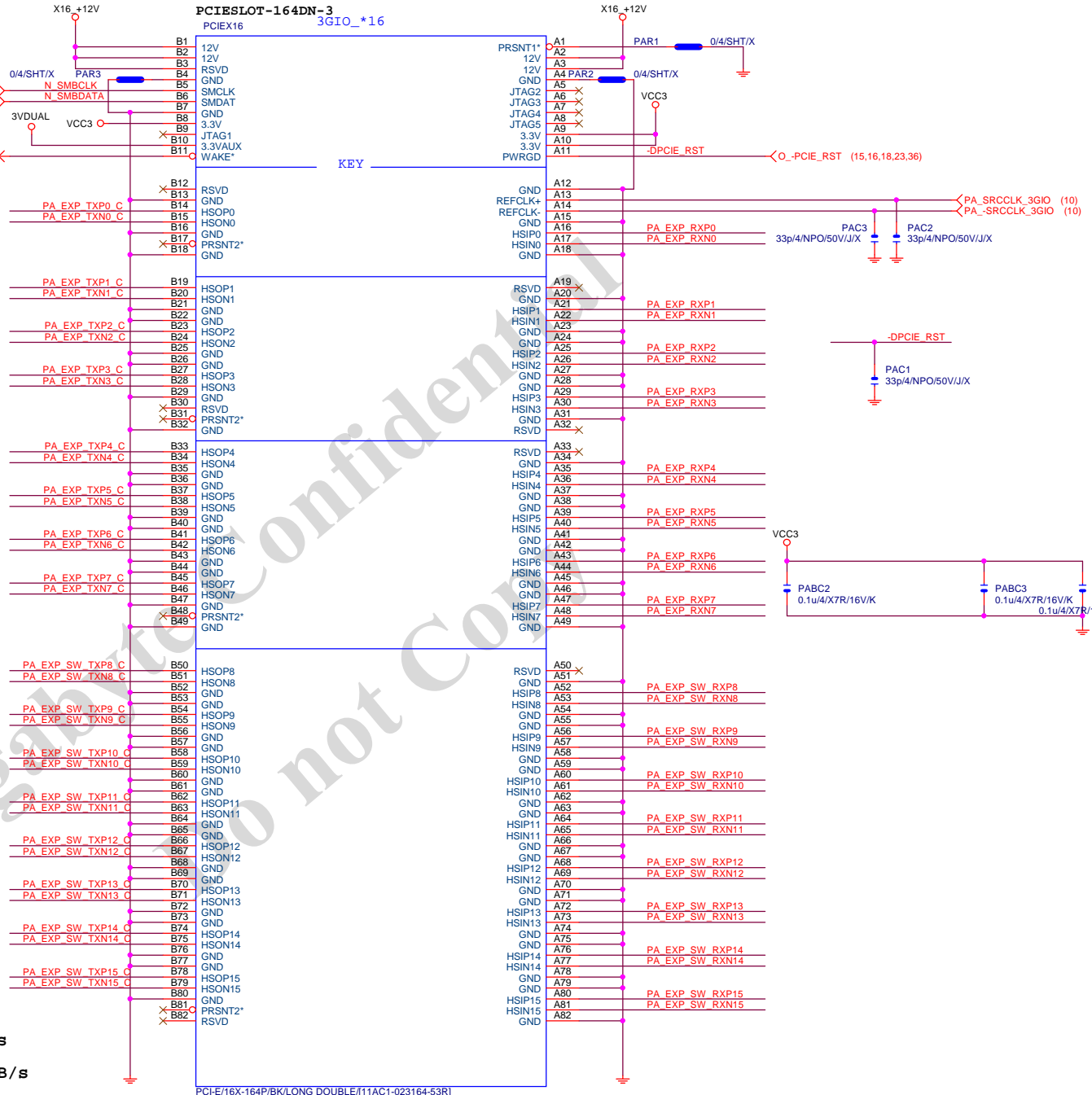
PCE-E X1(單向) BANDWIDTH=2.5GHz\*(8b/10b)=2Gb/s=250MB/s

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

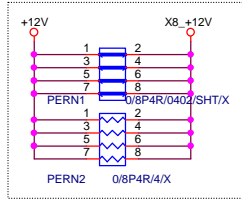
PCE-E X16(雙向) BANDWIDTH=2.5GHz\*(8b/10b)X16X2=64Gb/s=8GB/s

PCI-E REV:2.0--> 5GHZ

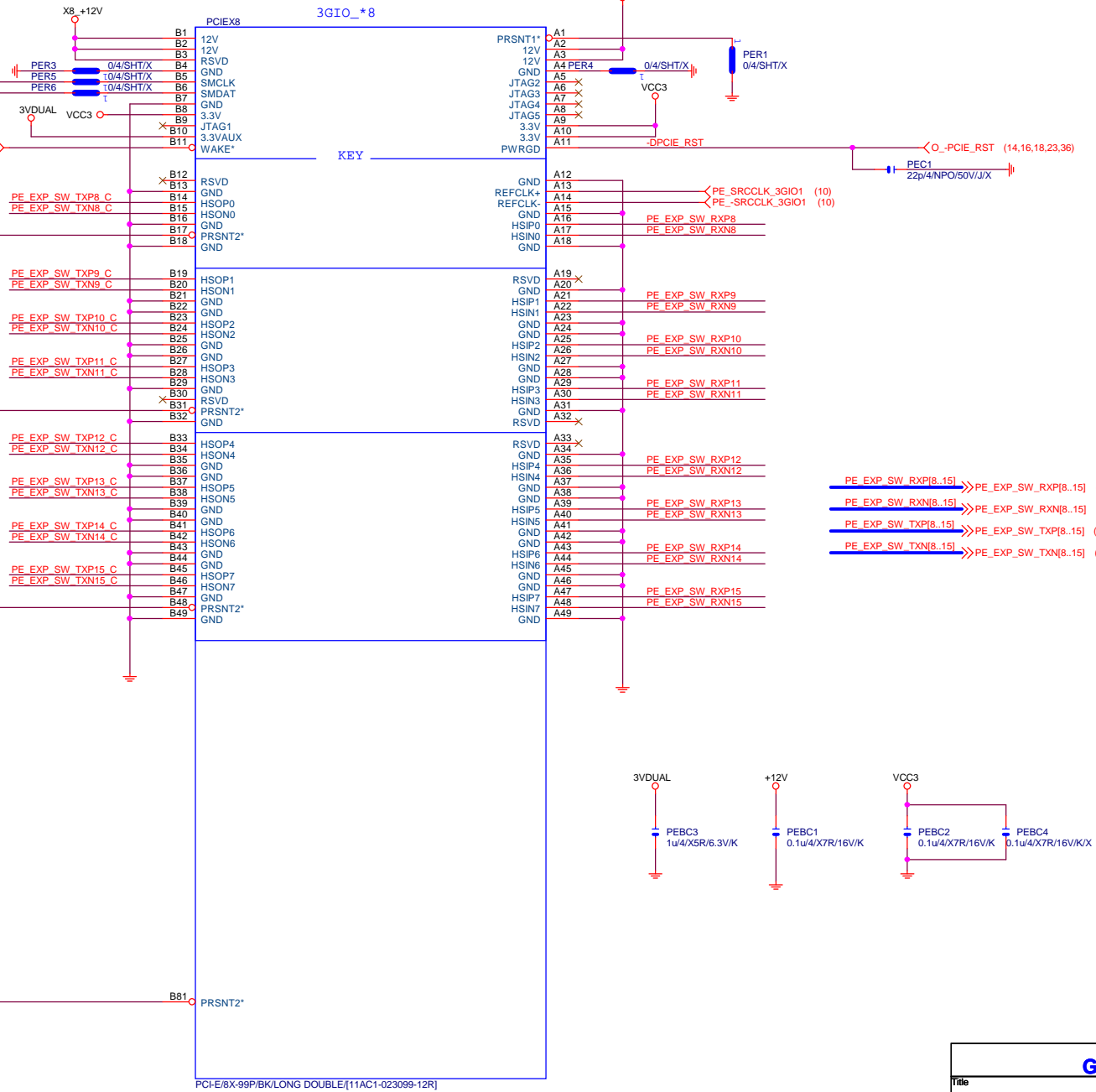
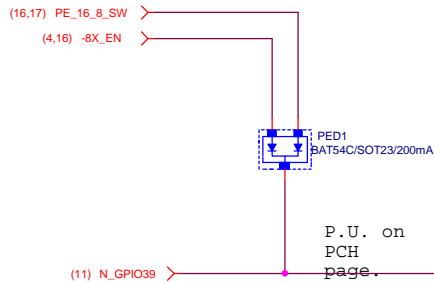


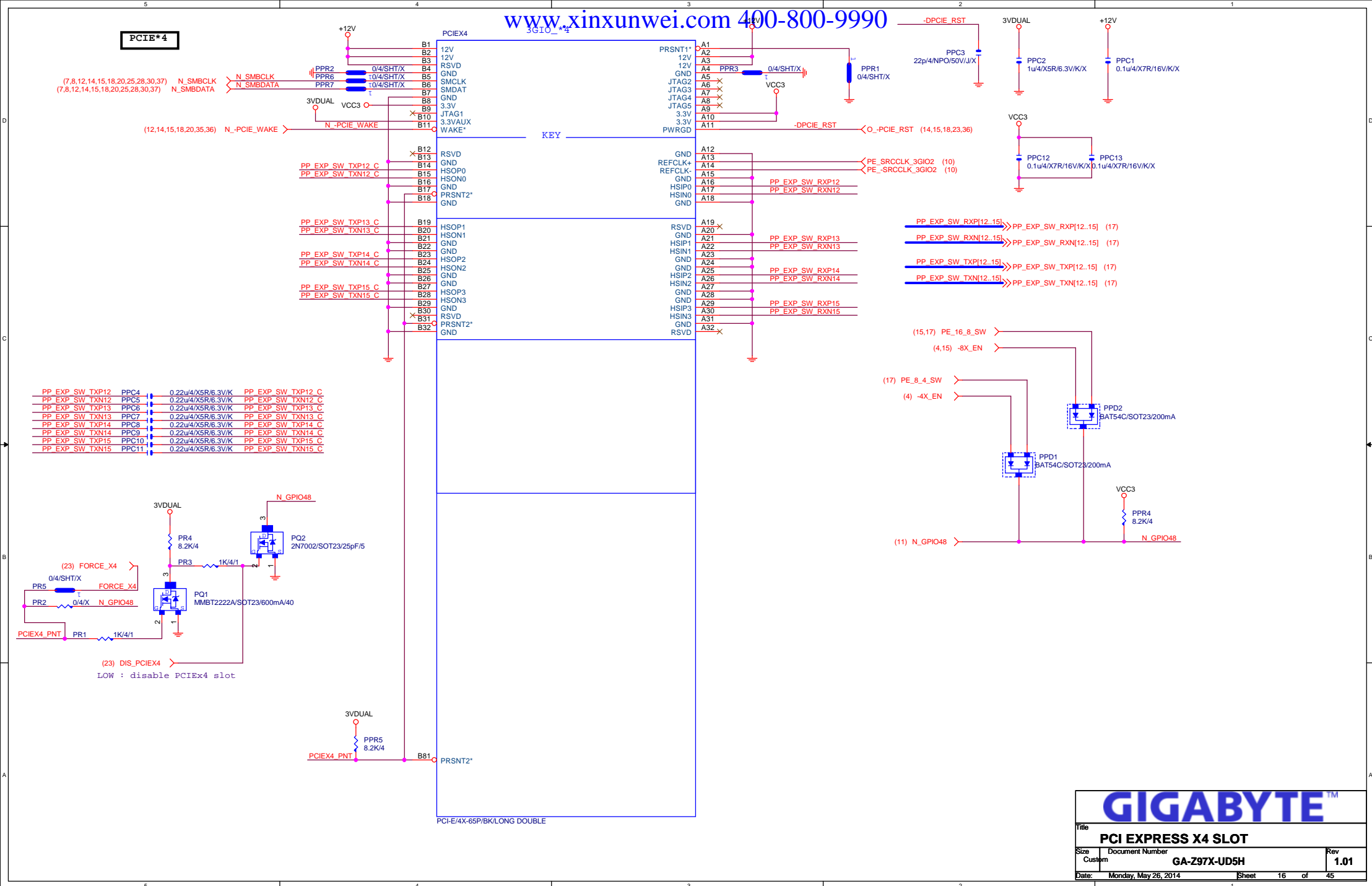
Gigabyte Technology

Title			PCI EXPRESS * 16
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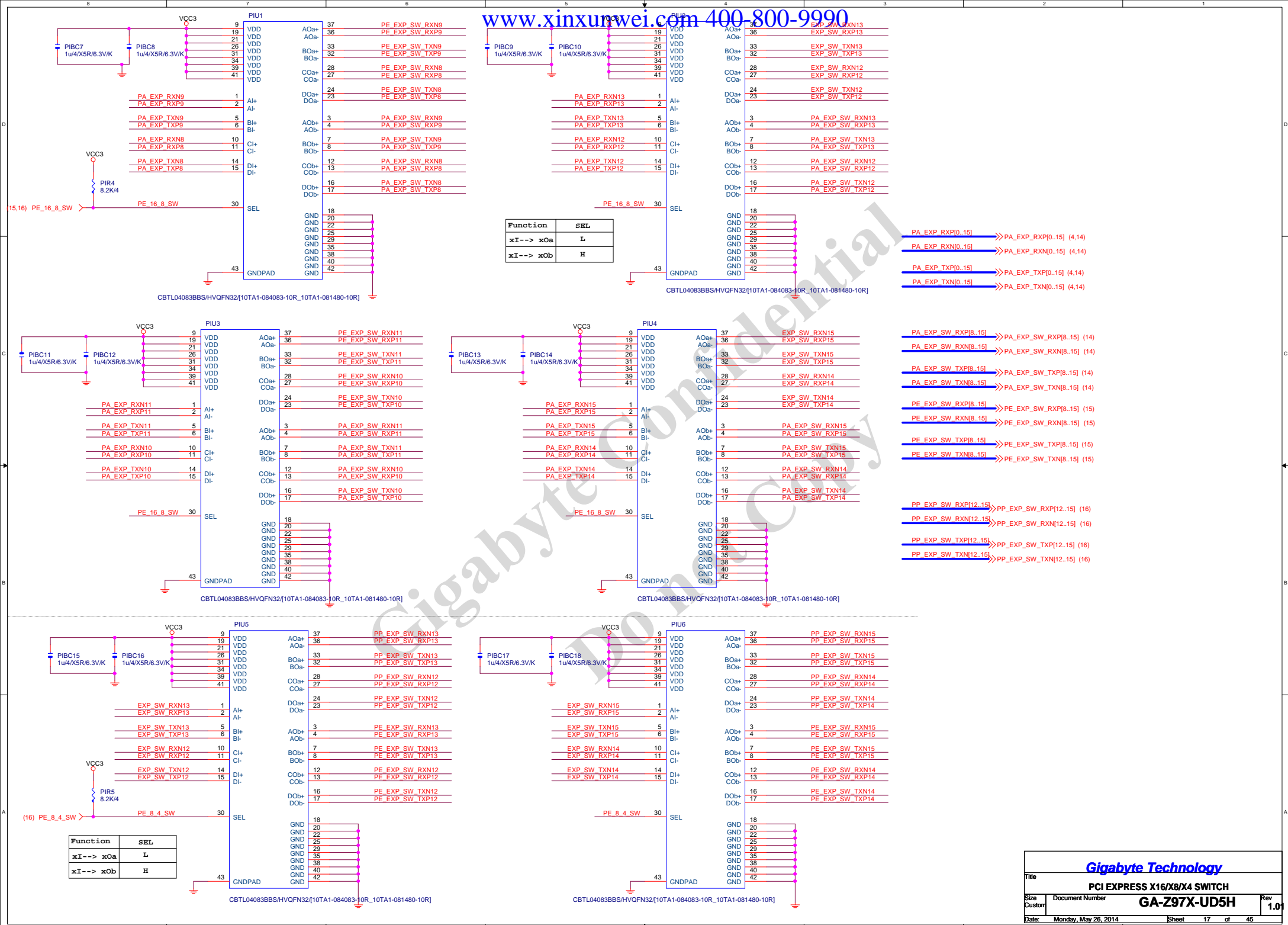


PE EXP SW TXP8	PEC2	0.22u4/5X5R6.3V/K	PE EXP SW TXP8 C
PE EXP SW TXN8	PEC3	0.22u4/5X5R6.3V/K	PE EXP SW TXN8 C
PE EXP SW TXP9	PEC4	0.22u4/5X5R6.3V/K	PE EXP SW TXP9 C
PE EXP SW TXN9	PEC5	0.22u4/5X5R6.3V/K	PE EXP SW TXN9 C
PE EXP SW TXP10	PEC6	0.22u4/5X5R6.3V/K	PE EXP SW TXP10 C
PE EXP SW TXN10	PEC7	0.22u4/5X5R6.3V/K	PE EXP SW TXN10 C
PE EXP SW TXP11	PEC8	0.22u4/5X5R6.3V/K	PE EXP SW TXP11 C
PE EXP SW TXN11	PEC9	0.22u4/5X5R6.3V/K	PE EXP SW TXN11 C
PE EXP SW TXP12	PEC10	0.22u4/5X5R6.3V/K	PE EXP SW TXP12 C
PE EXP SW TXN12	PEC11	0.22u4/5X5R6.3V/K	PE EXP SW TXN12 C
PE EXP SW TXP13	PEC12	0.22u4/5X5R6.3V/K	PE EXP SW TXP13 C
PE EXP SW TXN13	PEC13	0.22u4/5X5R6.3V/K	PE EXP SW TXN13 C
PE EXP SW TXP14	PEC14	0.22u4/5X5R6.3V/K	PE EXP SW TXP14 C
PE EXP SW TXN14	PEC15	0.22u4/5X5R6.3V/K	PE EXP SW TXN14 C
PE EXP SW TXP15	PEC16	0.22u4/5X5R6.3V/K	PE EXP SW TXP15 C
PE EXP SW TXN15	PEC17	0.22u4/5X5R6.3V/K	PE EXP SW TXN15 C



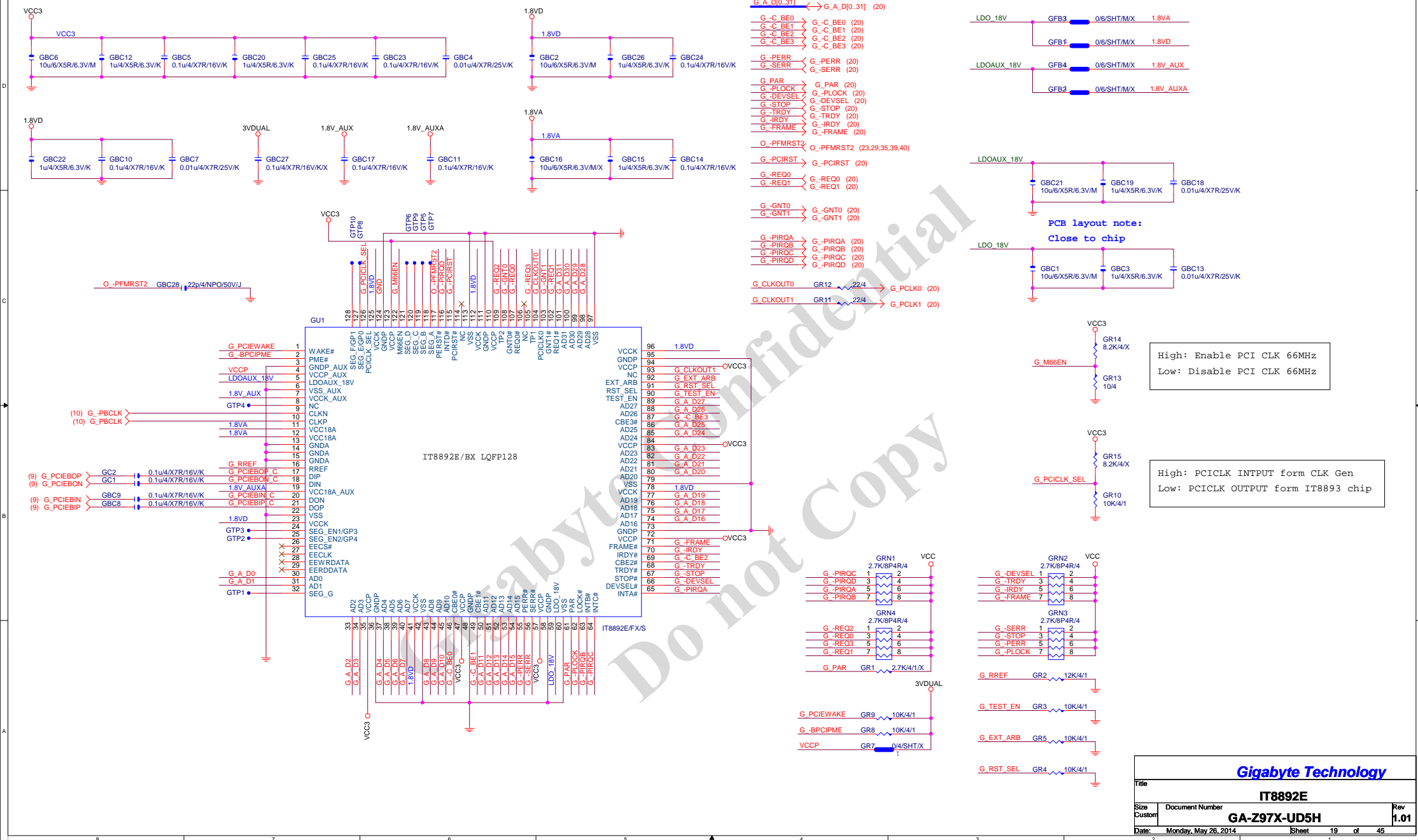


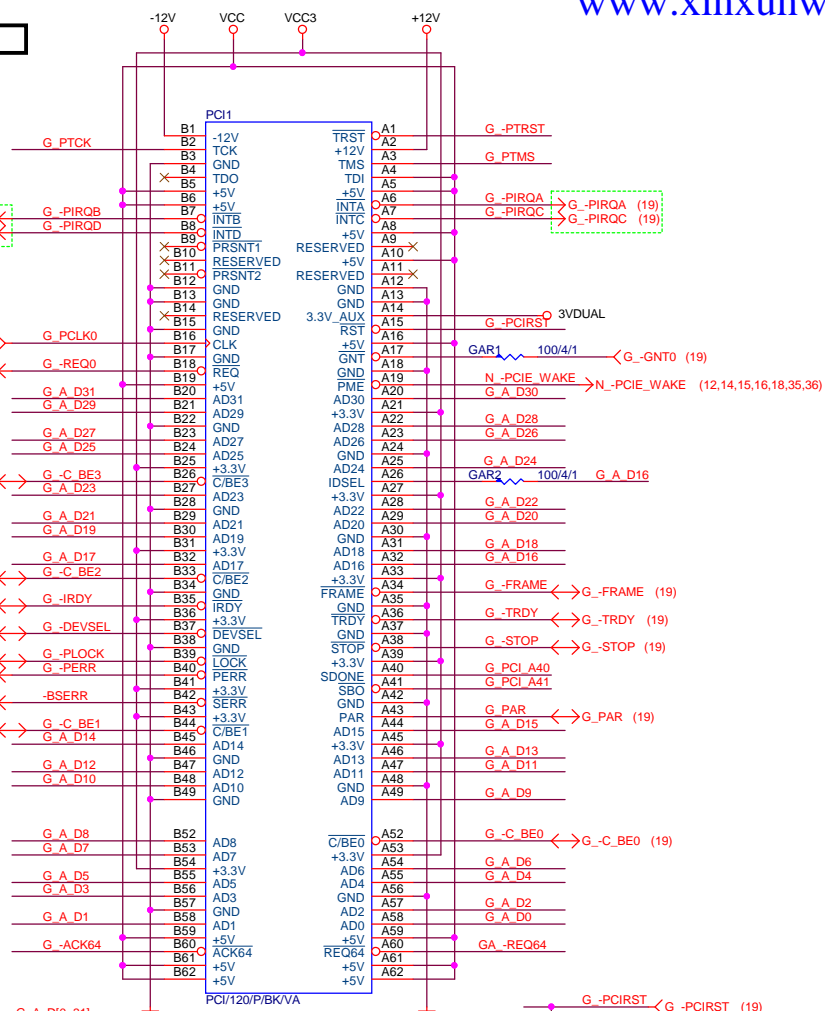
Function	SEL
xI--> xOa	L
xI--> xOb	H





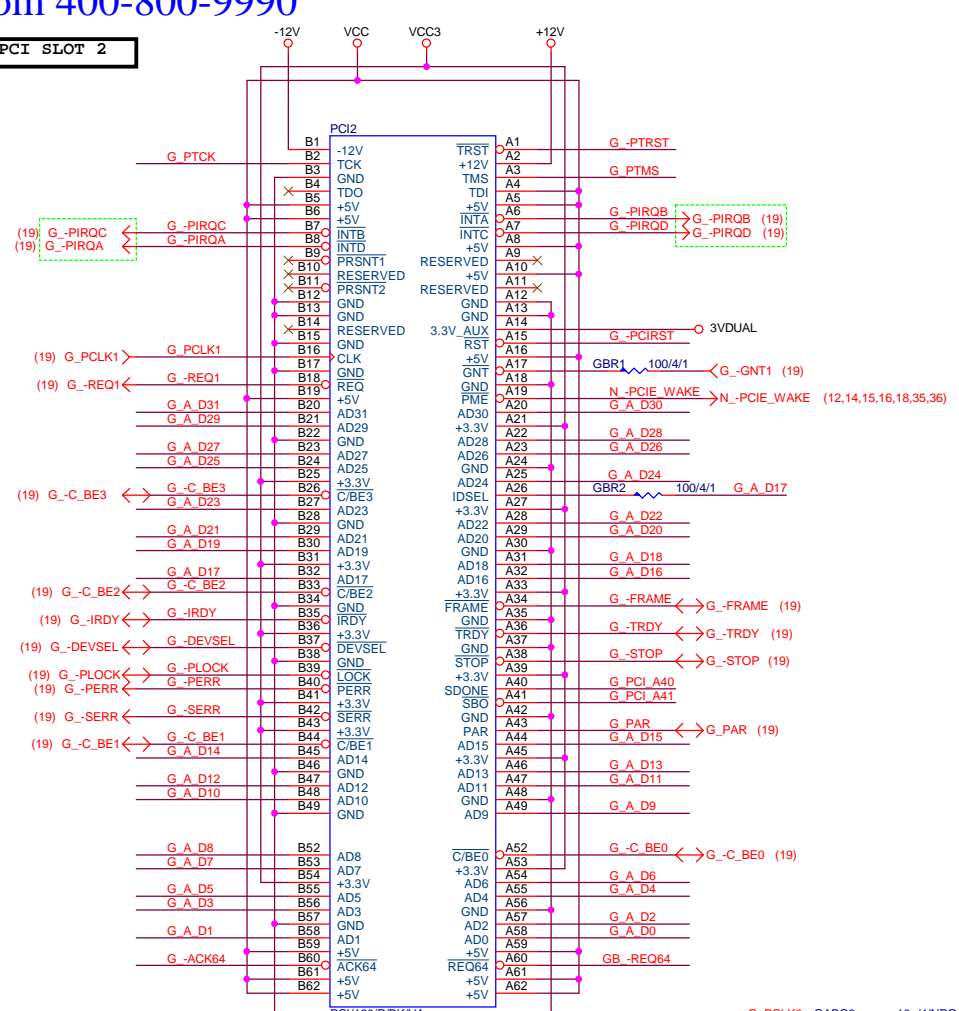






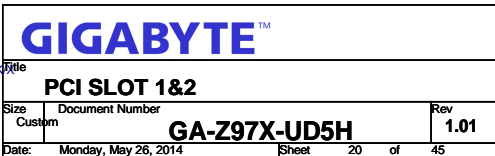
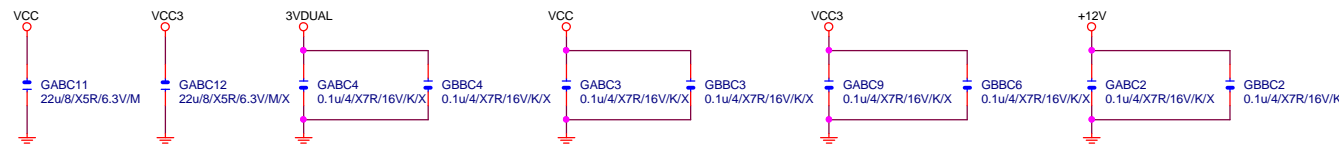
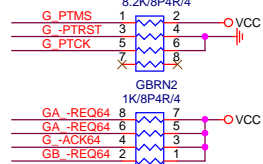
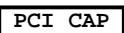
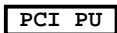
-REQ0/-GNT0/A\_D16

(7,8,12,14,15,16,18,25,28,30,37) N\_SMBCLK ← GBR3 0/6/SHT/X G PCI A40  
(7,8,12,14,15,16,18,25,28,30,37) N\_SMBDATA ← GBR4 0/6/SHT/X G PCI A41



-REQ1 / -GNT1 / A\_D17

G\_PCLK0 GABC6 10p/4/NPO/50V/J/X  
G\_PCLK1 GBBC7 10p/4/NPO/50V/J/X



## AZALIA CODEC

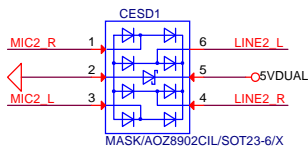
Thermal pad is DGND

Thermal pad is DGND

## Digital Area

~~Analog Area~~ <sup>13</sup>

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

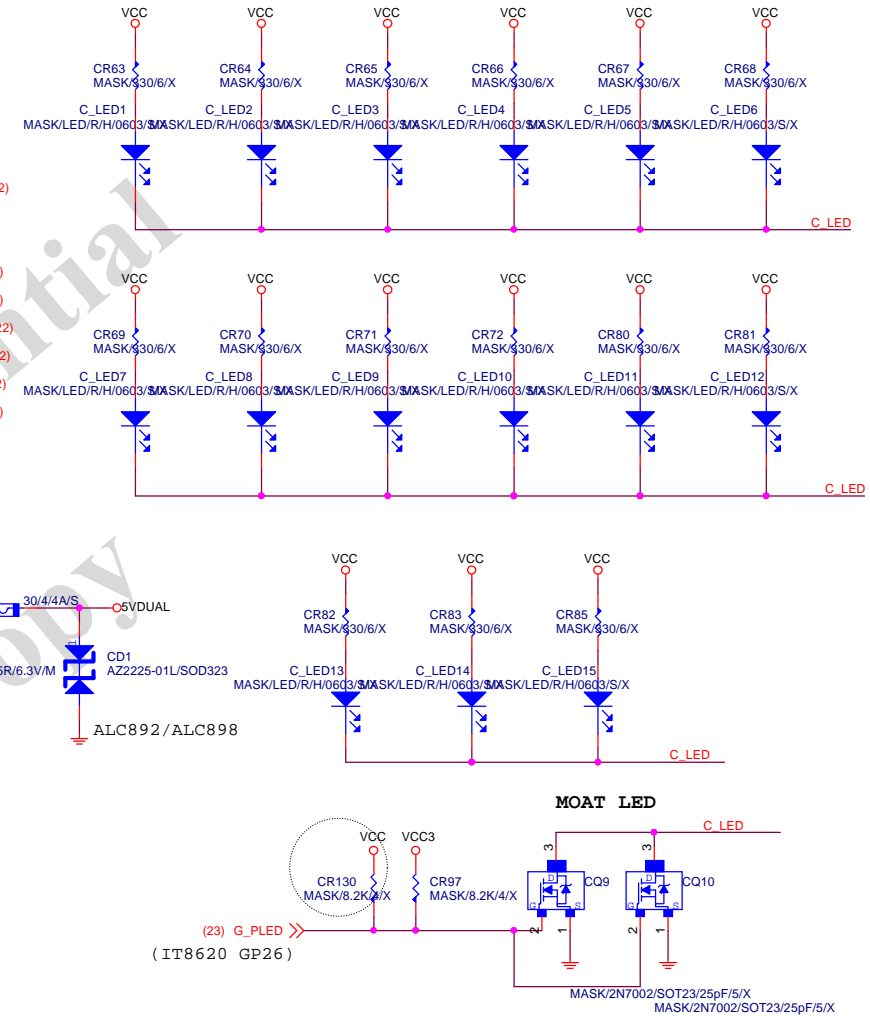


JD resistors close CODEC

(22) FAUDIO\_JD  CR28 47/4/1

Close to ALC1150

UD5H不上金屬罩&LED



## Gigabyte Technology

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<b>HD AUDIO ALC887B-VD2/VT1708S/VT202</b>			
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## AZALIA JACK



CR23 2 2/6 → Audio jack -> USB(各打2 VIA hole)

CR44 0/6/SHT/X → Under Audio jack(各打2 VIA hole)

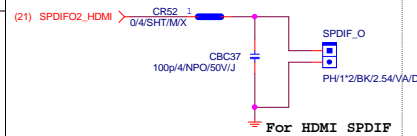
MOATR1 0/4/SHT/M/X  
MOATC1 0.1u4/X7R/16V/K → Near F\_AUDIO(各打2 VIA hole) **LINE-IN**

MOATR2 0/4/SHT/M/X  
MOATC2 0.1u4/X7R/16V/K → Near Codec (各打2 VIA hole)

MOATR3 0/4/SHT/M/X  
MOATC3 0.1u4/X7R/16V/K → Near R\_AUDIO(各打2 VIA hole) **MIC-IN**

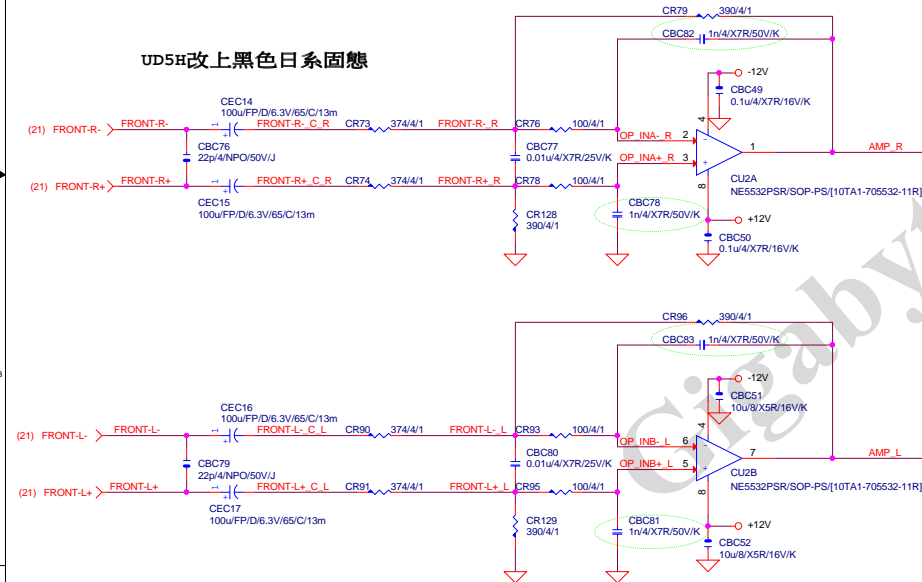
MOATR4 0/4/SHT/M/X  
MOATC4 0.1u4/X7R/16V/K → Near AMP (各打2 VIA hole)

## SPDIF\_OUT

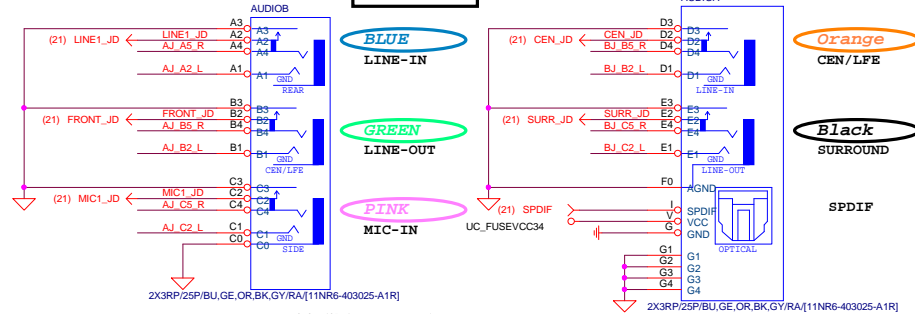


## Differential to Single-End AMPLIFIED

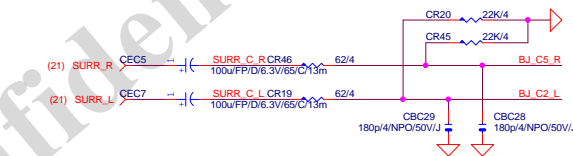
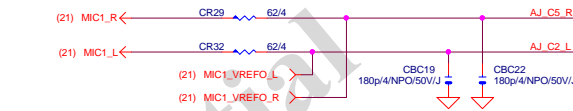
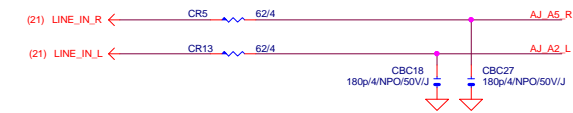
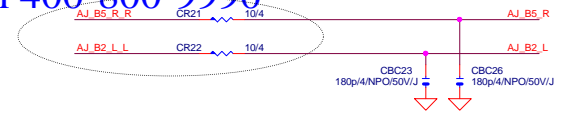
## UD5H改上黑色日系固態



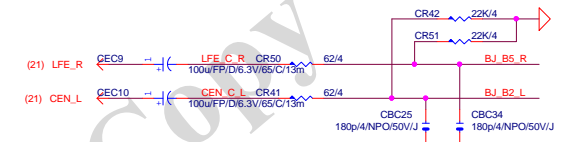
## AZALIA JACK



## LINE-OUT

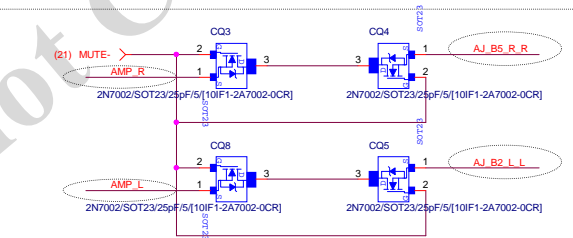


## SURROUND

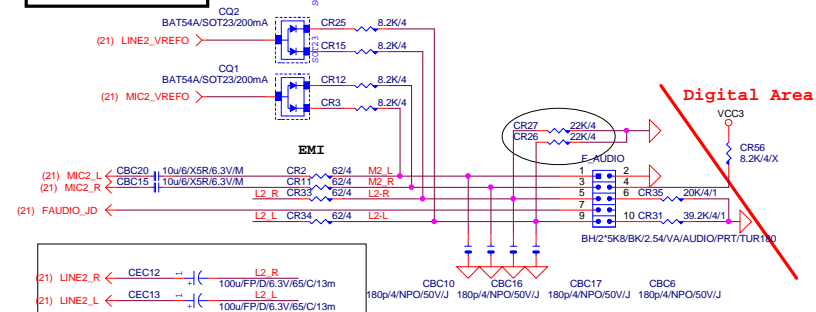


## CEN/LFE

## Anti Pop



## AZALIA FRONT PANEL



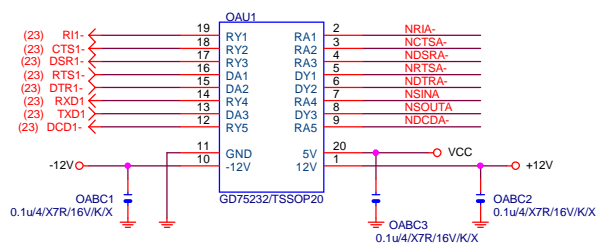
## Gigabyte Technology

File		
AUDIO JACK		
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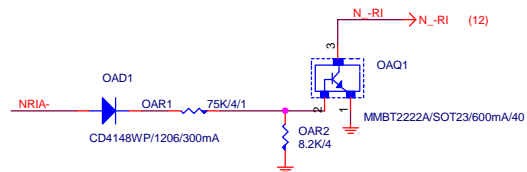




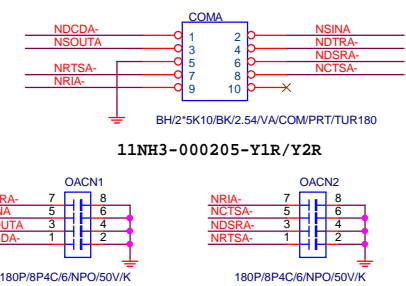
## COMA



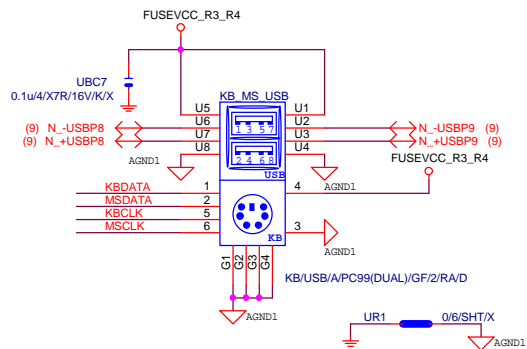
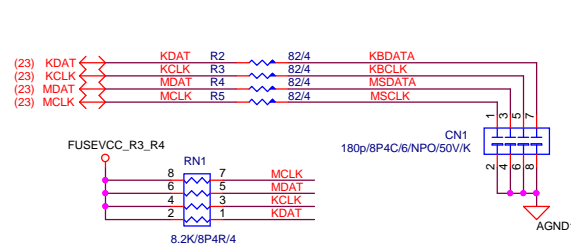
## COM RI



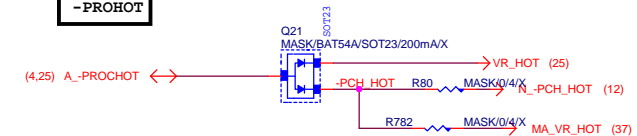
## COM BUFFER



## KB/MS/USB



## -PROHOT

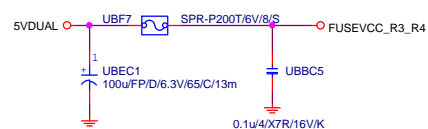


## Thunderbolt pin header

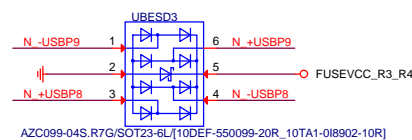
Removed

## R\_USB

## USB20 FUSE

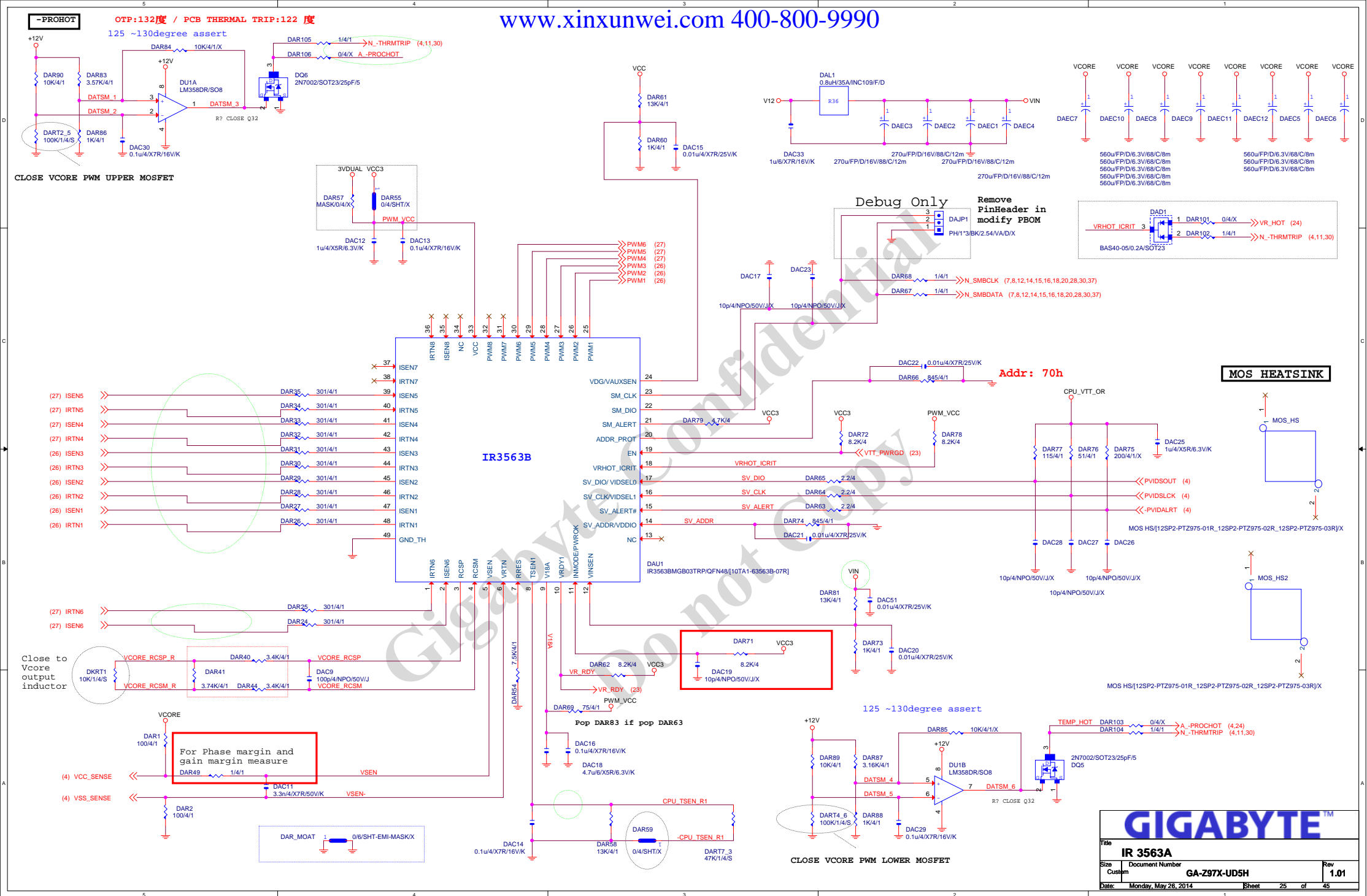


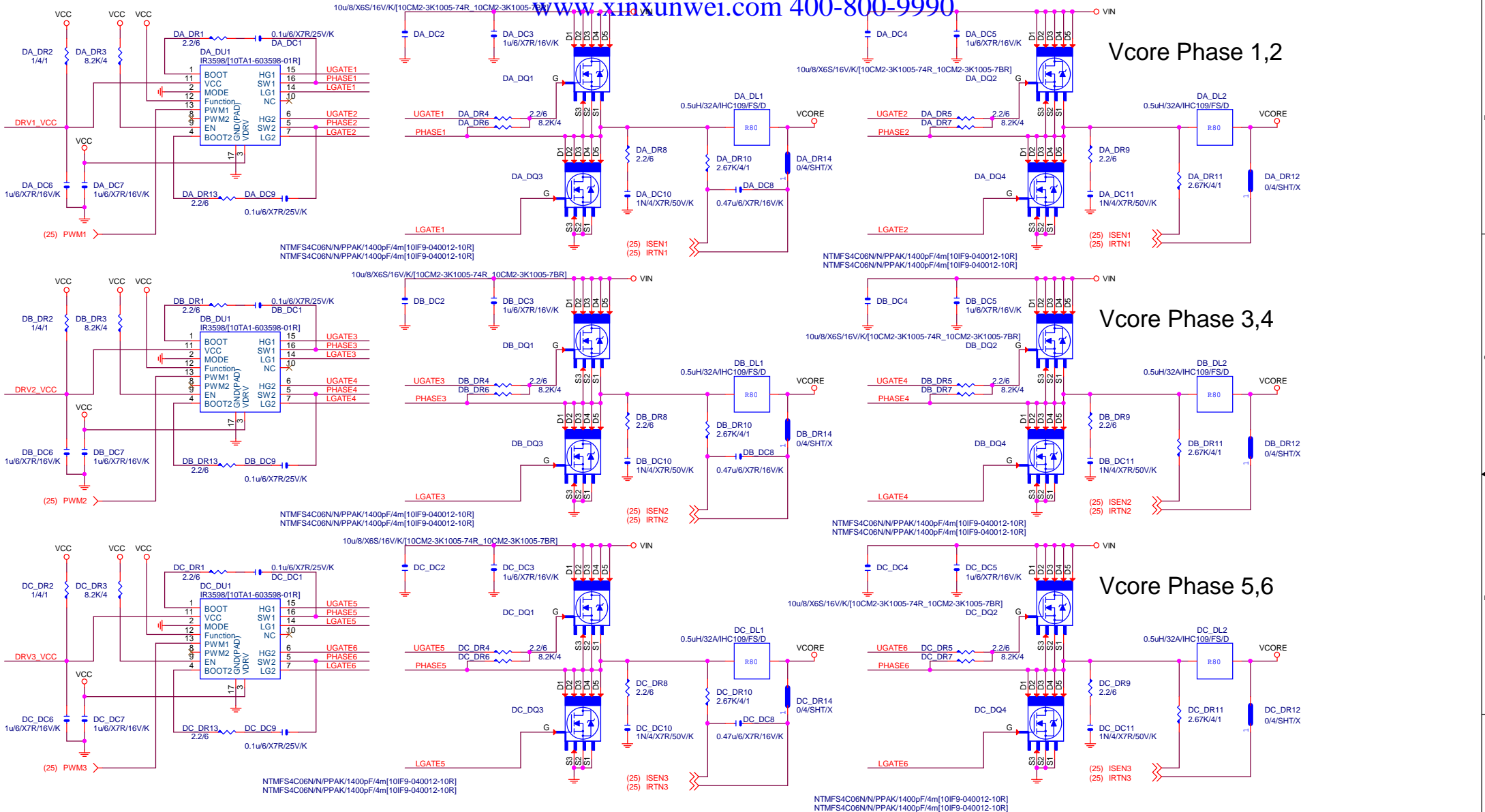
## USB20 ESD PROTECT



Gigabyte Technology

File			
COM/ PROHOT/ R_USB			
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Vcore Phase 1,2

Vcore Phase 3,4

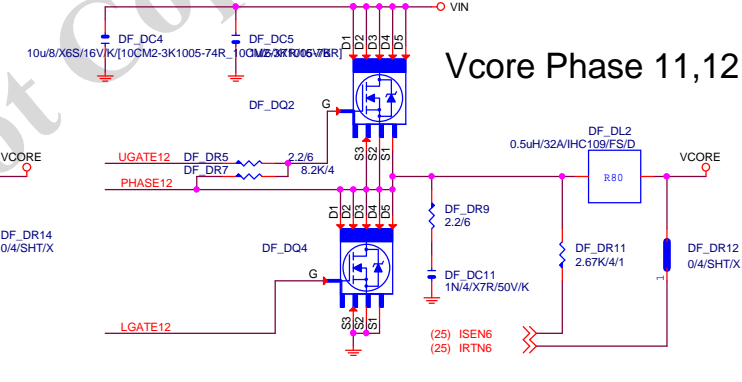
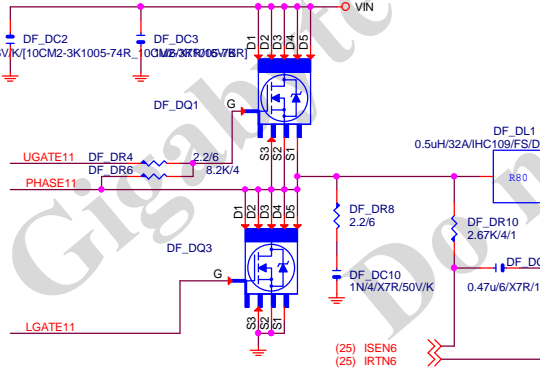
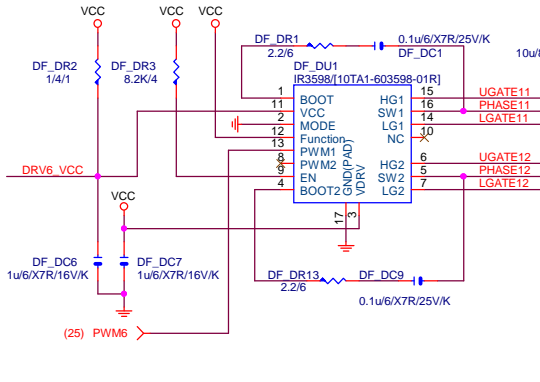
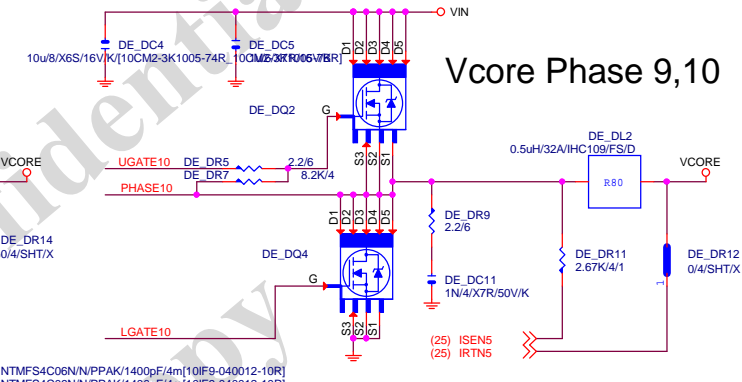
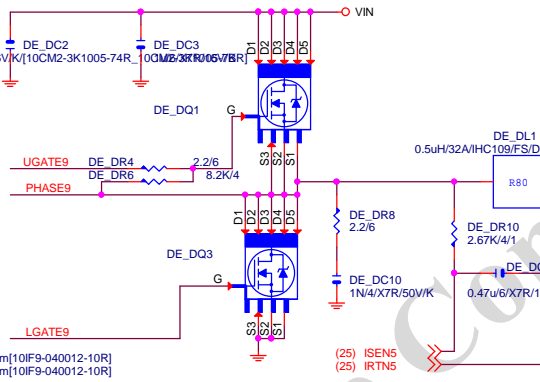
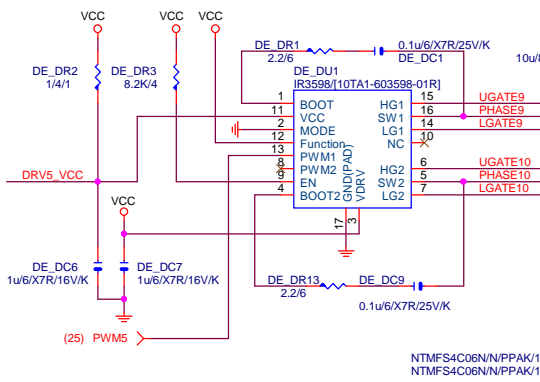
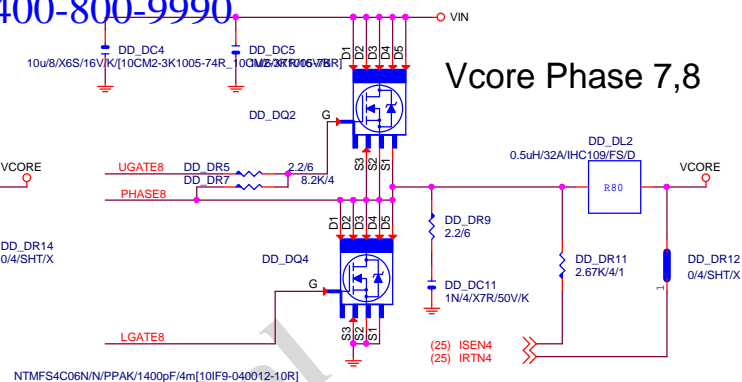
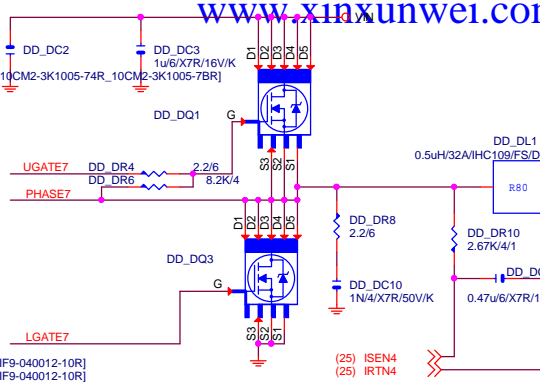
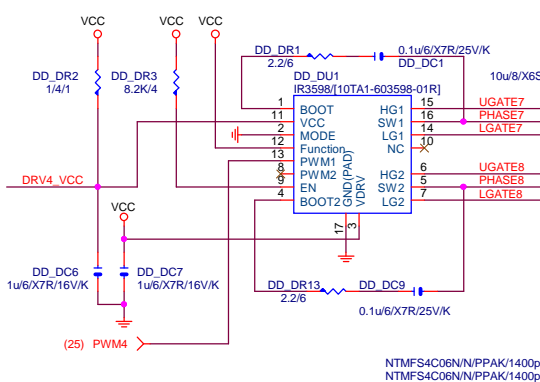
Vcore Phase 5,6

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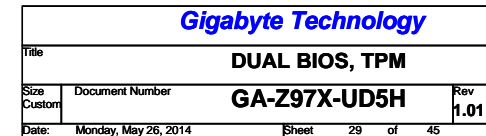
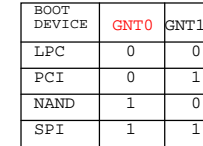
FUNCTION	MODE	PWM MODE	PHASE MODE
0	1	IR ATL	DUAL
1	1	IR ATL	Doubler
0	0	Tri-Sate	DUAL
1	0	Tri-Sate	Doubler
OPEN	0	Tri-Sate	Quad
OPEN	1	IR ATL	Quad

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	
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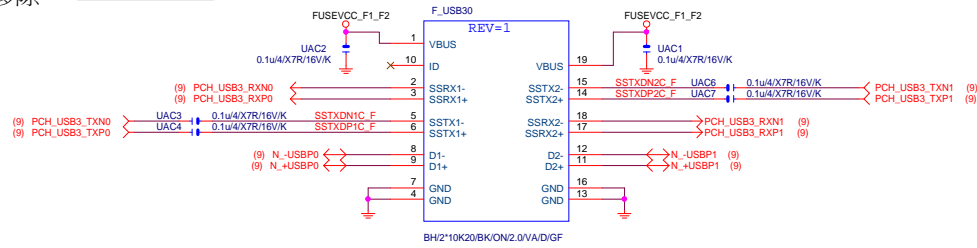




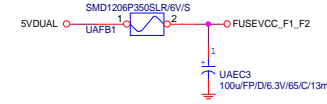


0.2  
移除

### Front USB3.0

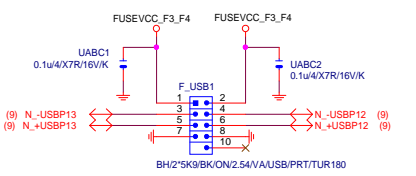


### F\_USB30 PWR

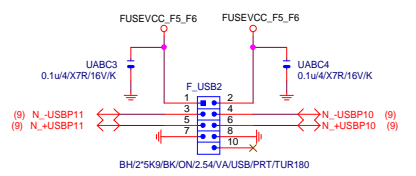


Close to connector

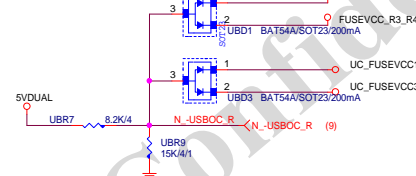
### FRONT USB1



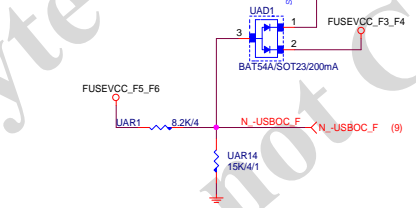
### FRONT USB2



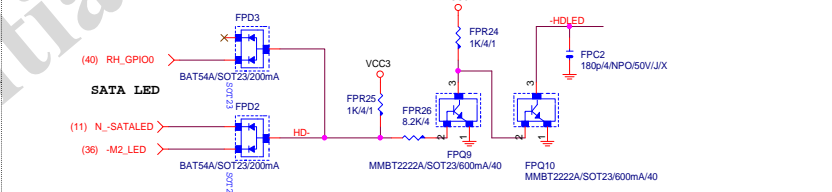
### -USBOC\_R



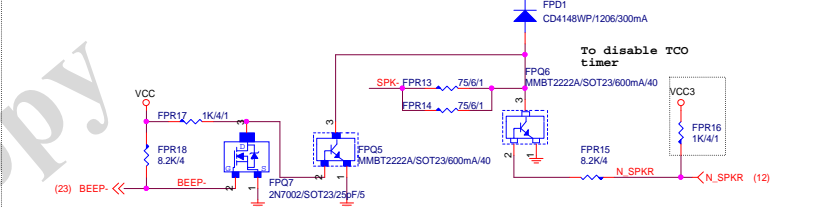
### -USBOC\_F



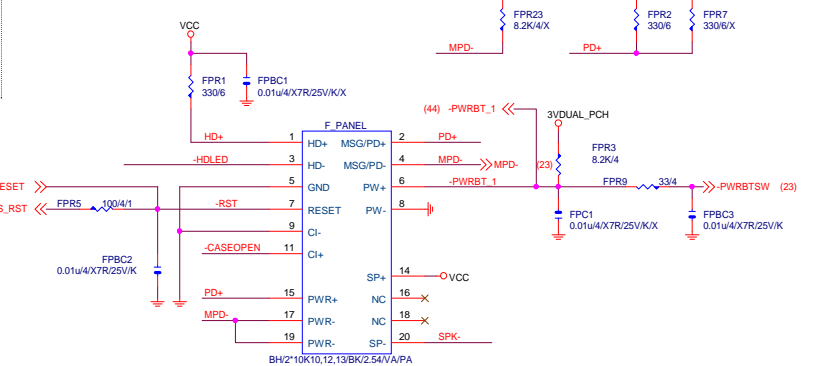
SATA LED SATALED# signal open-collector, pull-up (8.2 kΩ to 10 kΩ) to Vcc3\_3



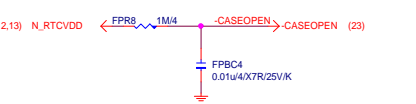
### SPKR



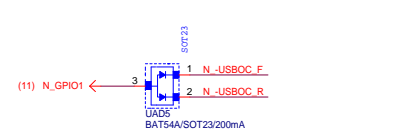
### INTEL FRONT PANEL



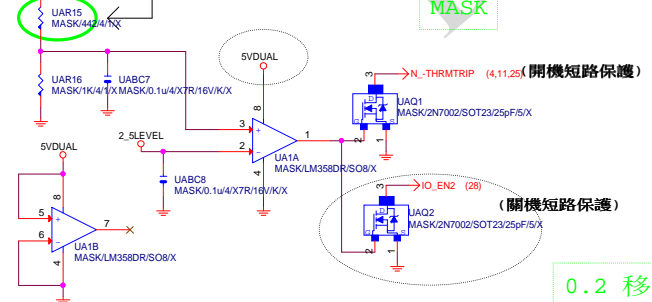
### CASE OPEN



### F\_USB POWER PROTECT



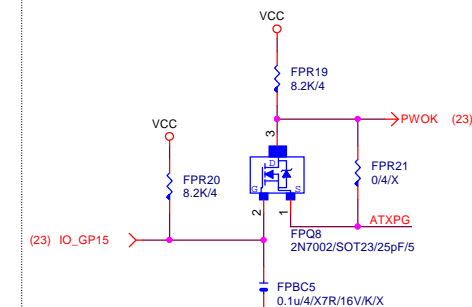
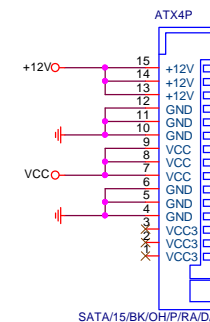
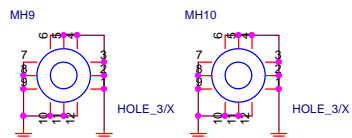
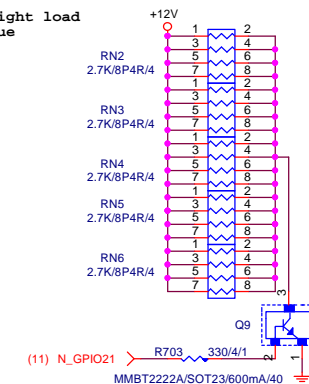
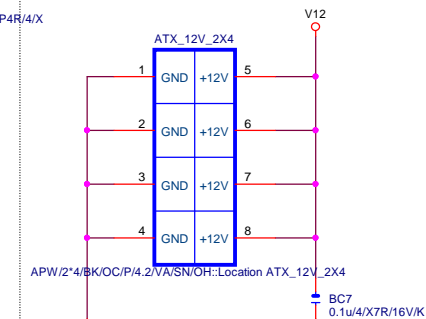
USB2.0 Signal & power short protection  
USB2.0 Signal > 4.85V  
Enable --> 3VDUAL=3.6V



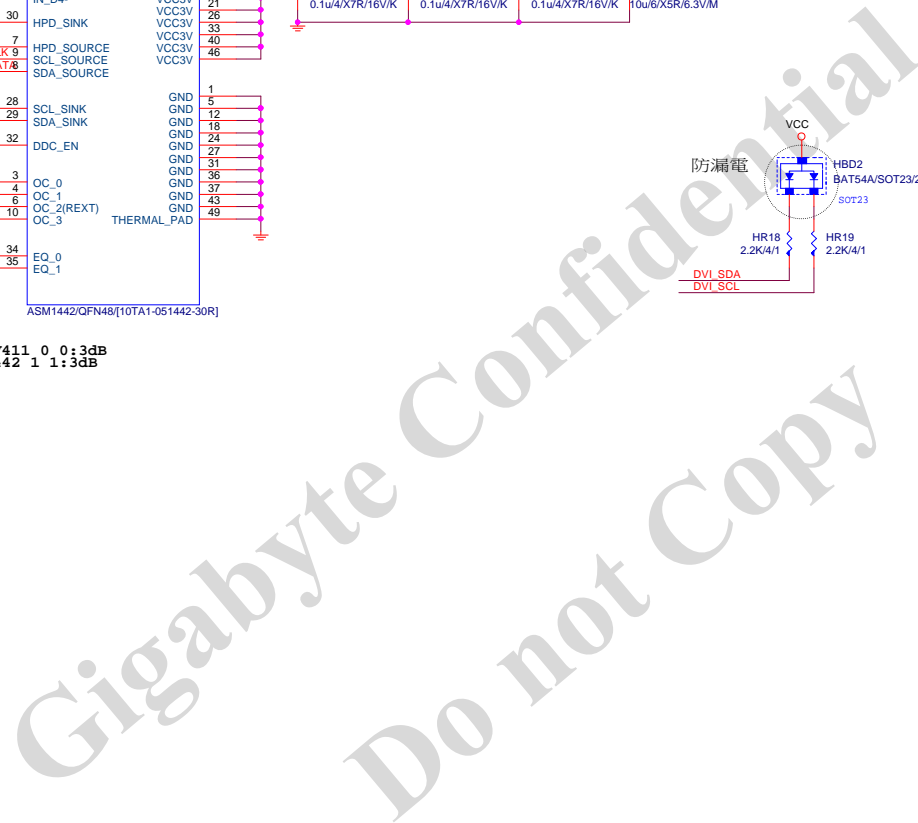
MASK

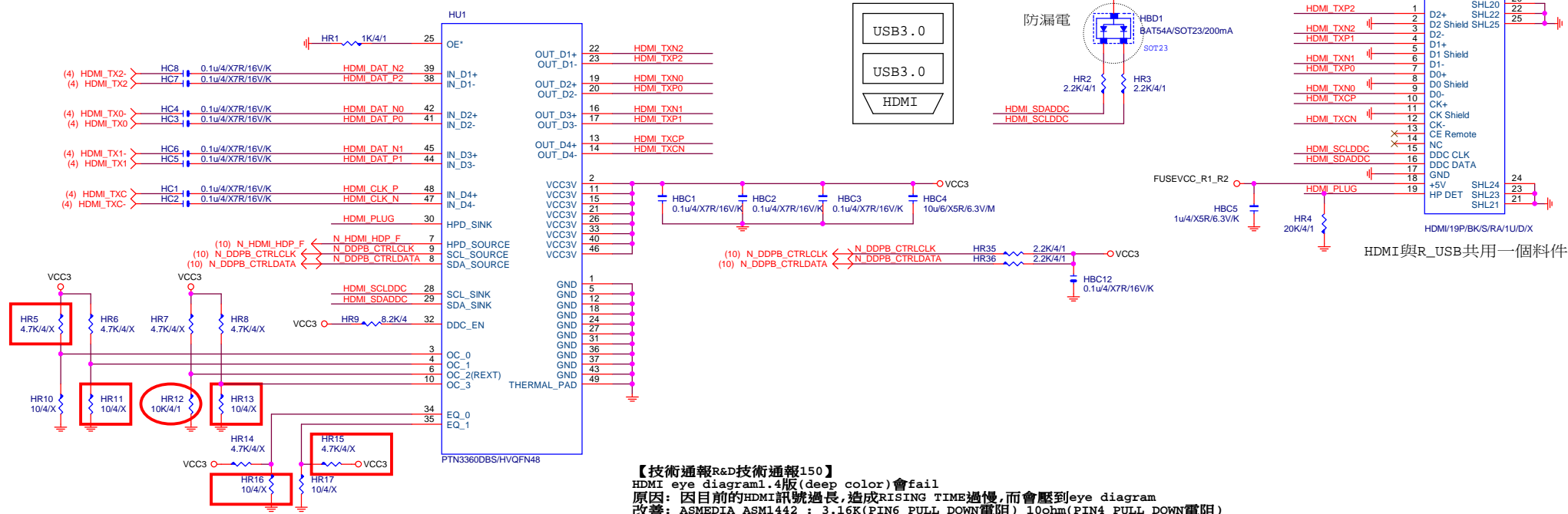
0.2 移除

Gigabyte Technology			
FP,F_USB,USB PWR,FDD,BZ			
GA-Z97X-UD5H			
Rev	1.01		
Date	Monday, May 26, 2014	Sheet	30 of 45



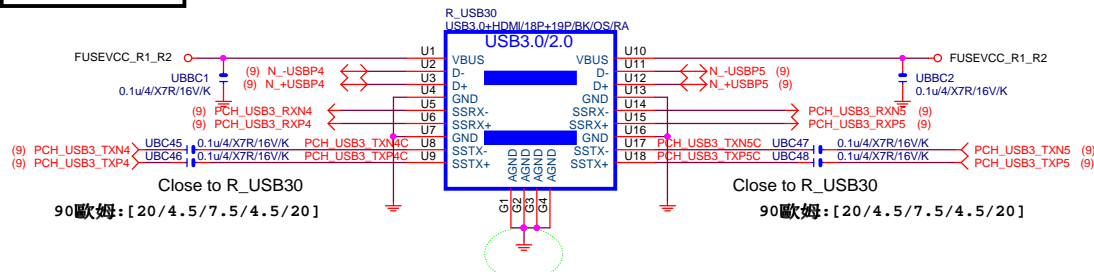




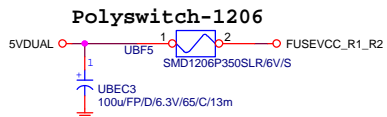


PTN3360:PIN 4/10/34/35 NC PIN,都不上值;只上HR12:10K  
ASM1442:紅色框要上,HR12:3.16K

USB30\_20 CONNECT

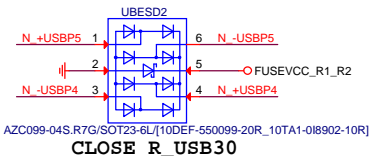


USB30	PWR
-------	-----

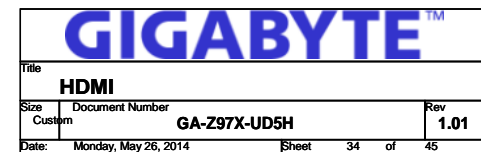
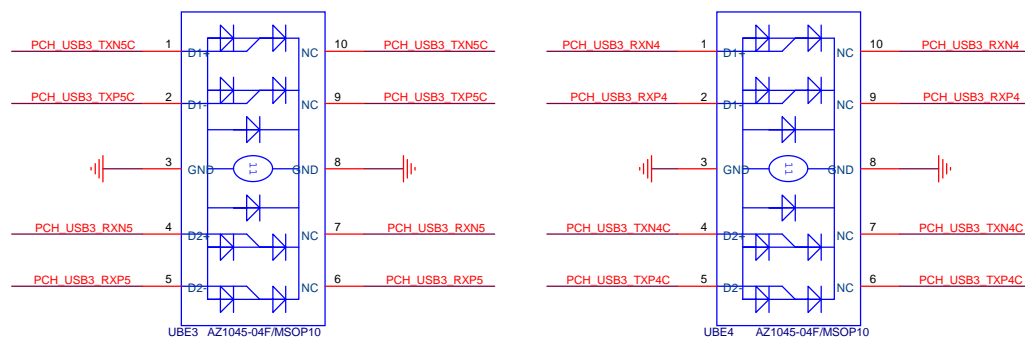


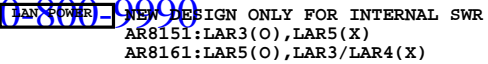
USB3.0 1Port - 1Fuse (3.5A)

## USB20 ESD PROTECT



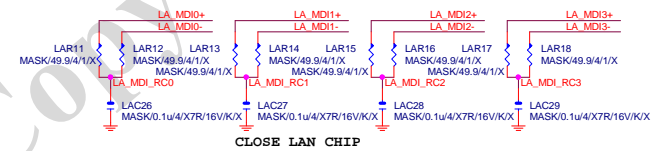
## USB30 ESD PROTECT



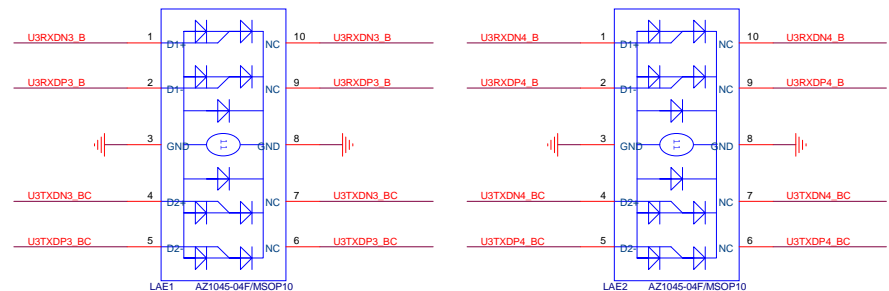
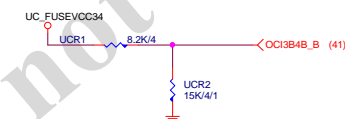


	AR8151	AR8161
AVDD33	N/A	3.3V
VDD33	3.3V	3.3V
AVDDH	2.7V	2.7V
AVDDL/DVDDL	1.1V	1.1V
VDDCT	1.7V	

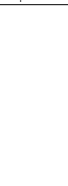
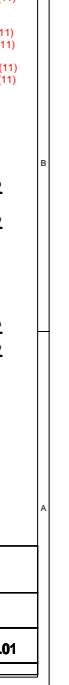
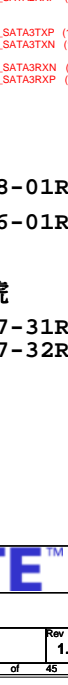
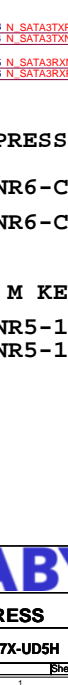
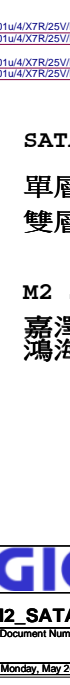
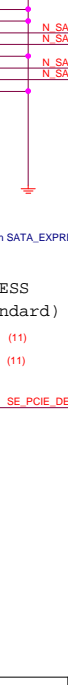
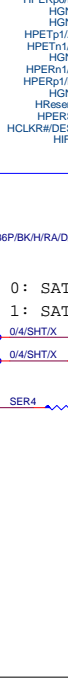
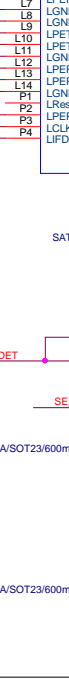
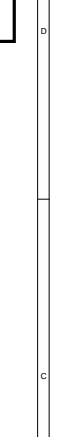
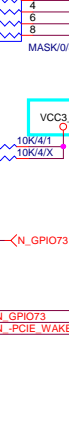
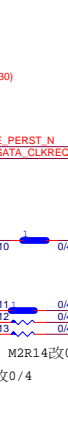
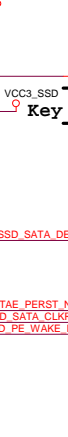
MDI : AR8161--&gt;N/A





Close to connector







DIP 螺柱	DIP 螺絲
 <p>80</p>	 <p>80</p>
CR[12KSF-F10303-01R]	CR[12KSS-110202-01R]

Timing diagram for SATA2RXN and SATA2TXP signals. The diagram shows two signal traces, N\_SATA2TXP (red) and N\_SATA2RXN (blue), with their respective setup and hold times relative to a clock signal. The clock signal is shown as a series of pulses. The setup time (SEC9) for N\_SATA2TXP is 0.01u/4/X7R/25V/K. The hold time (SEC10) for N\_SATA2TXP is 0.01u/4/X7R/25V/K. The setup time (SEC11) for N\_SATA2RXN is 0.01u/4/X7R/25V/K. The hold time (SEC12) for N\_SATA2RXN is 0.01u/4/X7R/25V/K. The diagram also shows the relationship between the signals and the clock, with arrows indicating the direction of data flow.

Diagram illustrating the SATA Express pinout connections:

- N\_SATA3TXPC (0.01u4/X7R/25V/K) connects to SEC13 N\_SATA3TXP (11).
- N\_SATA3TXNC (0.01u4/X7R/25V/K) connects to SEC14 N\_SATA3TXN (11).
- N\_SATA3RXNC (0.01u4/X7R/25V/K) connects to SEC15 N\_SATA3RXN (11).
- N\_SATA3RXPC (0.01u4/X7R/25V/K) connects to SEC16 N\_SATA3RXP (11).


Common ground connection is shown at the bottom.

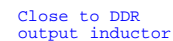
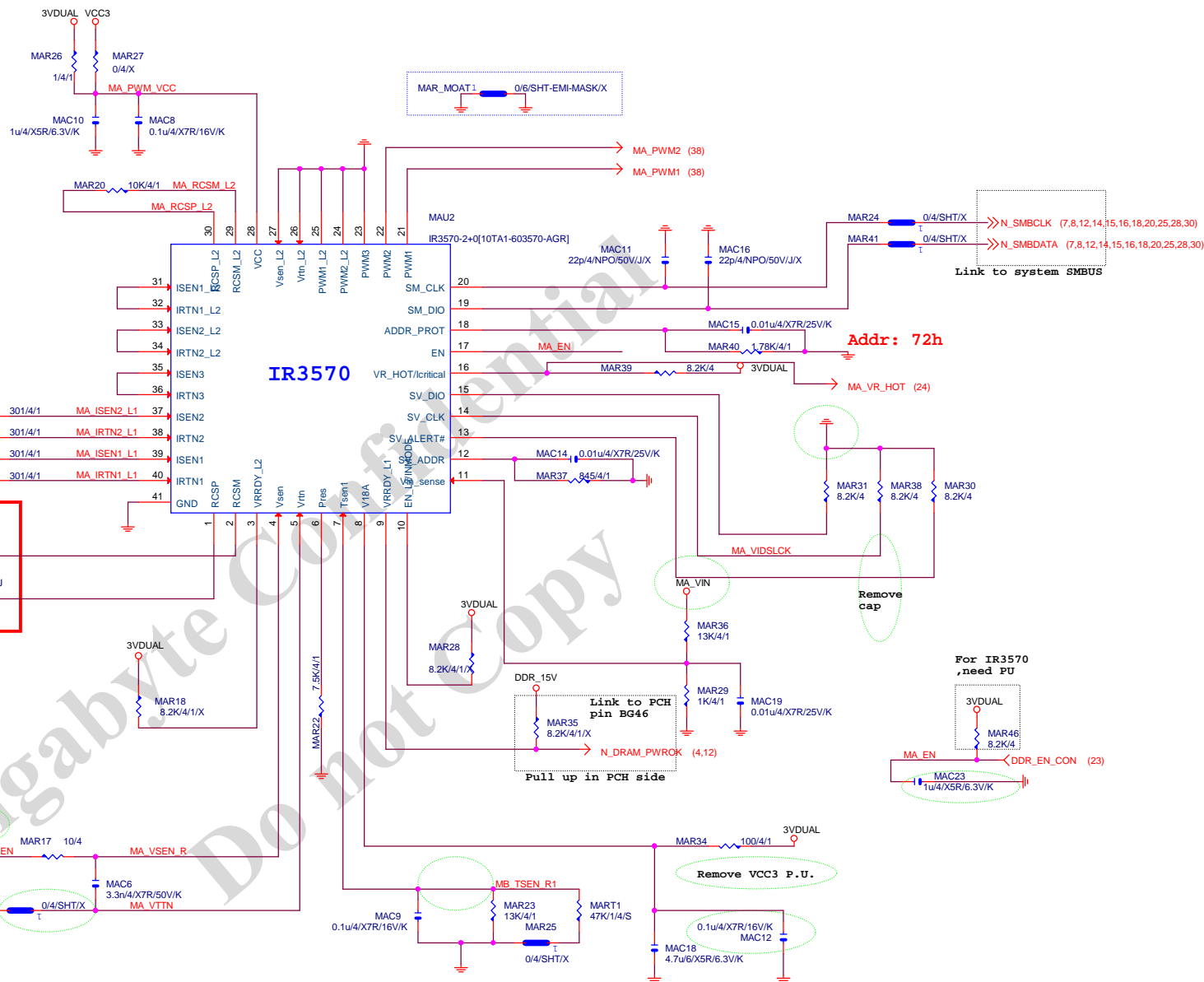
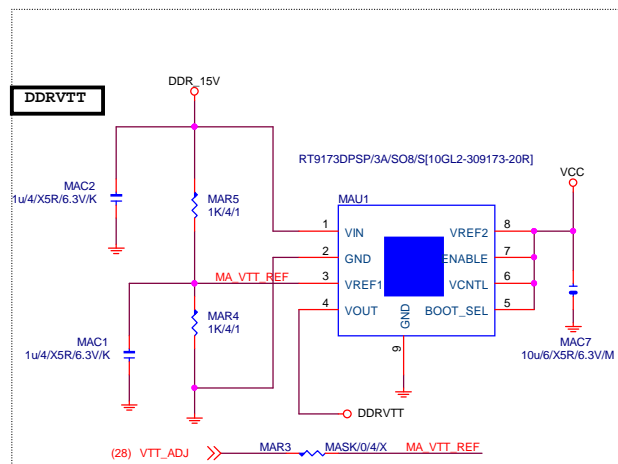
**SATA EXPRESS料號**

**單層: 11NR6-C10118-01R**

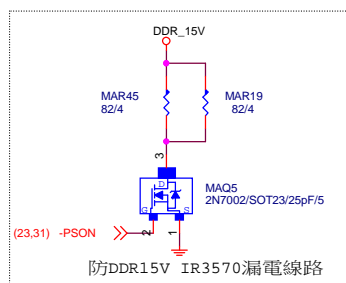
**雙層: 11NR6-C10236-01R**

M2 SLOT M KEY料號  
嘉澤:10NR5-130067-31R  
鴻海:10NR5-130067-32R

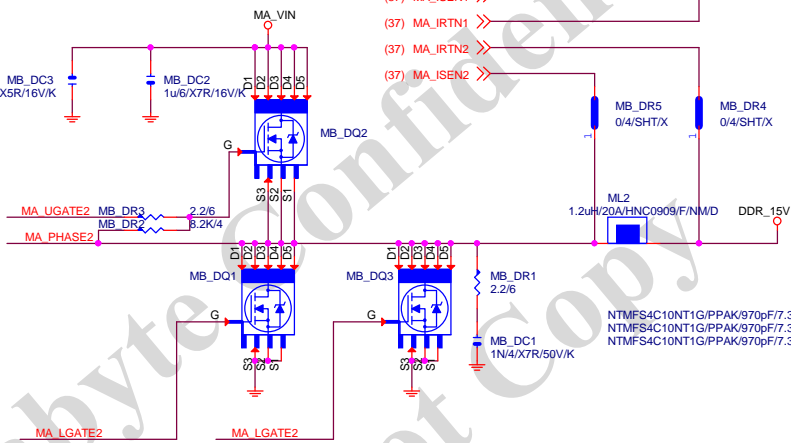
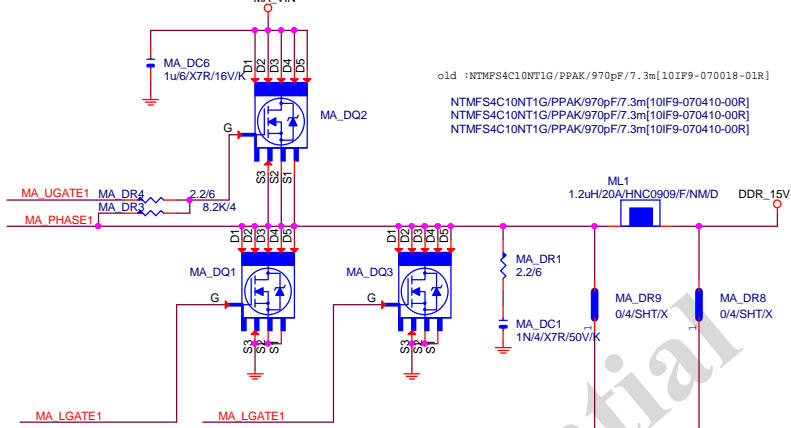
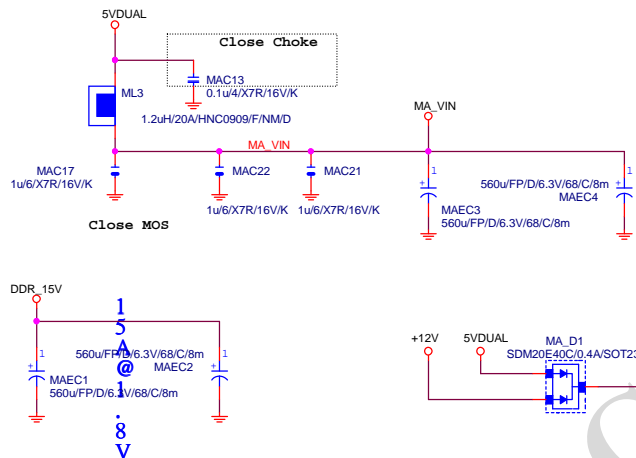
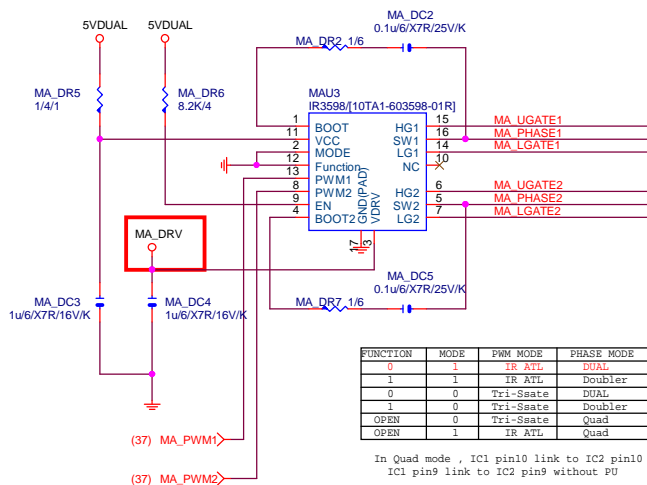
			
Title: <b>M2_SATA_EXPRESS</b>			
Size	Document Number		Rev
Custom	<b>GA-Z97X-UD5H</b>		<b>1.01</b>
Date:	Monday, May 26, 2014	Sheet	36 of 45

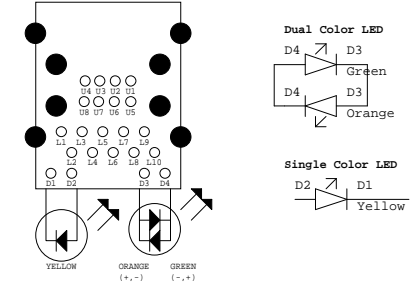
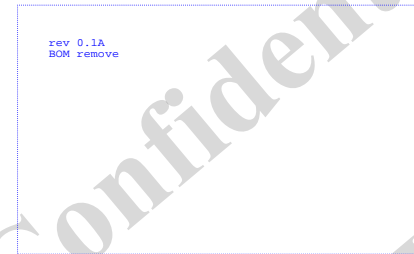
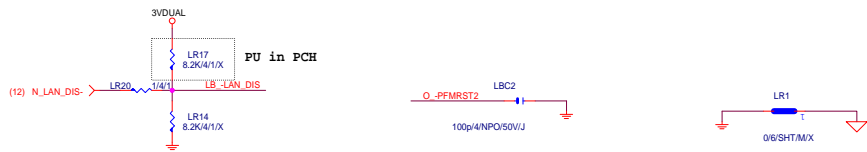
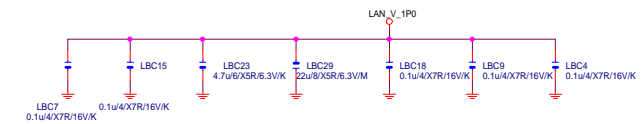
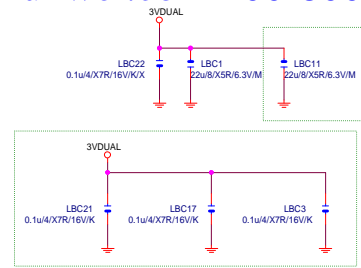
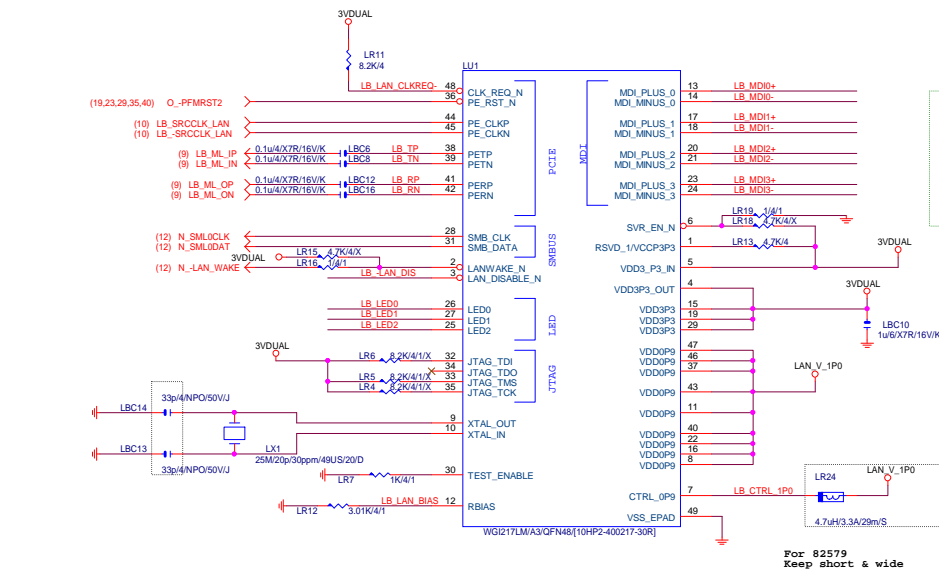


should be routed as differential pair,  
7mil width, 8mil spacing



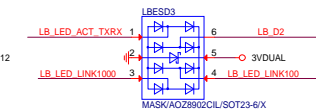
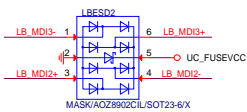
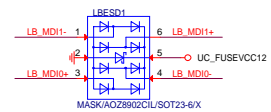
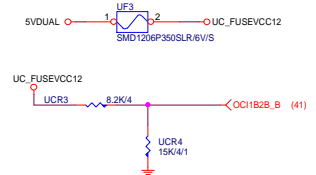
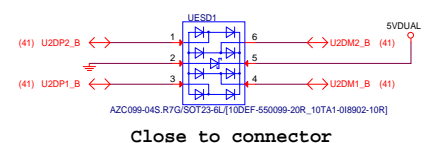
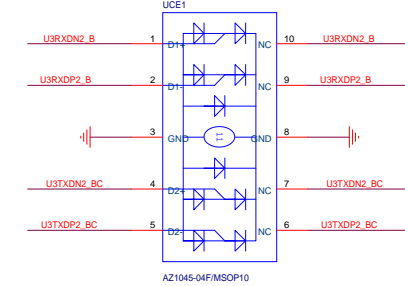
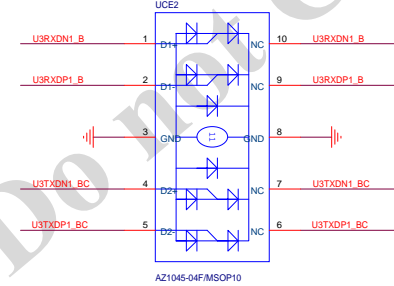
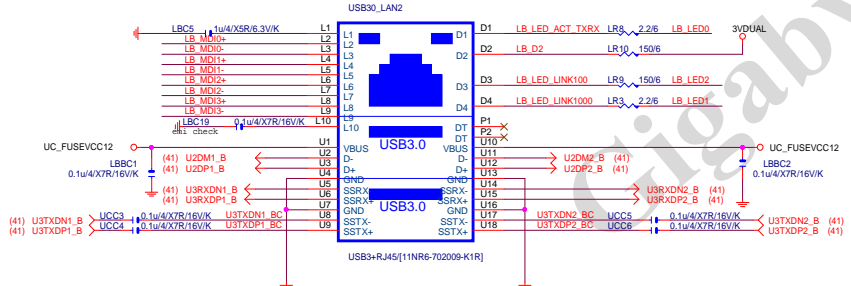
## DDR\_15V





1Gb	Orange
100Mb	Green
10Mb	Off

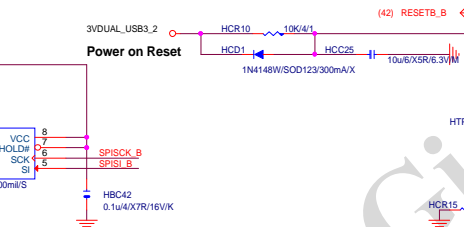
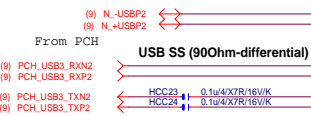
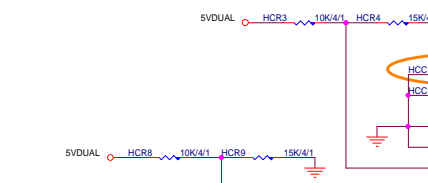
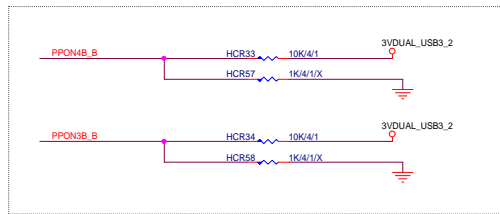
Access	Blinking
Link	Yellow



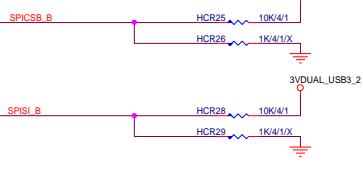
<b>GIGABYTE™</b>			
Title <b>Marvell 9172 SATA 3.0</b>			
Size	Document Number		Rev
Custom	<b>GA-Z97X-UD5H</b>		<b>1.01</b>
Date:	<b>Monday, May 26, 2014</b>	Sheet	<b>40 of 45</b>

## # Number of Ports ; 4Ports mode

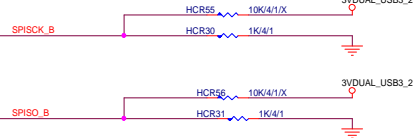
PPON3B / PPON4B : H / H ( 4 port )  
PPON3B / PPON4B : L / L ( 2 port )



## # External SPI ROM ; SPI ROM attached mode



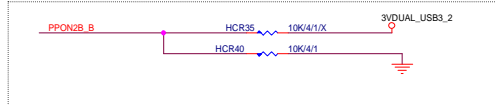
## # Battery Charging



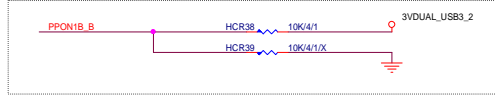
Put close to U1  
Do check with crystal vendor  
if the value of C31, C32 and R31 are all appropriate.

Put close to U1  
Short and broad connection to GND  
Don't split R32 into multiple resistors.

## #5 VBUS Power Control ; Individual mode



## # PPON1B Pin Function ; Port1 PPONB mode

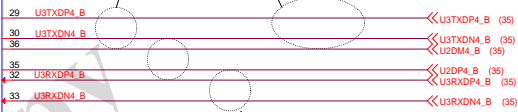


uPD720210

## USB HS (90Ohm-differential)

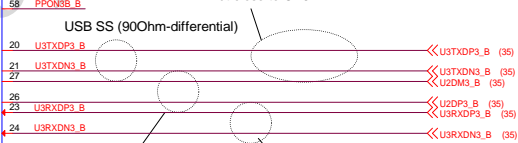
## USB SS (90Ohm-differential)

Put close to CN4



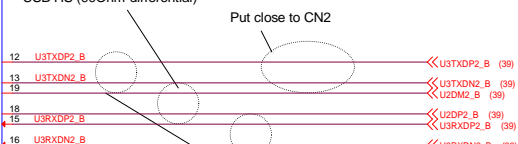
## USB SS (90Ohm-differential)

Put close to CN3



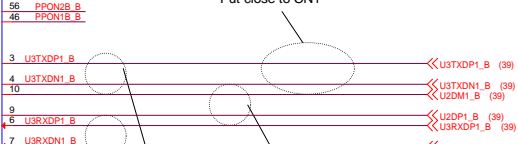
## USB SS (90Ohm-differential)

Put close to CN2



## USB HS (90Ohm-differential)

Put close to CN1



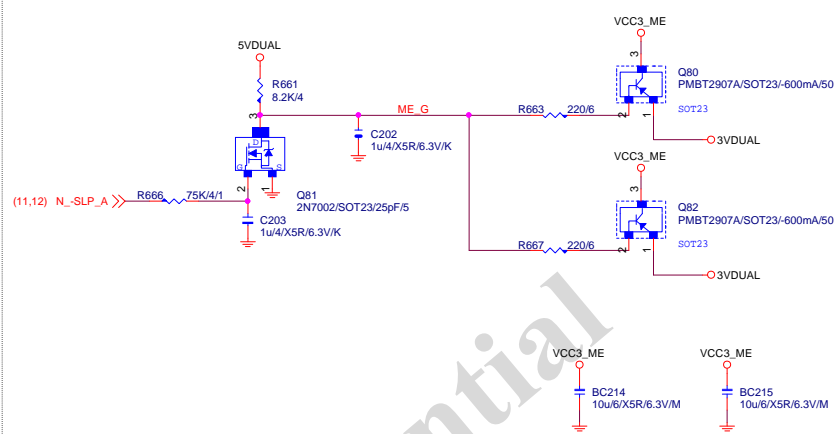
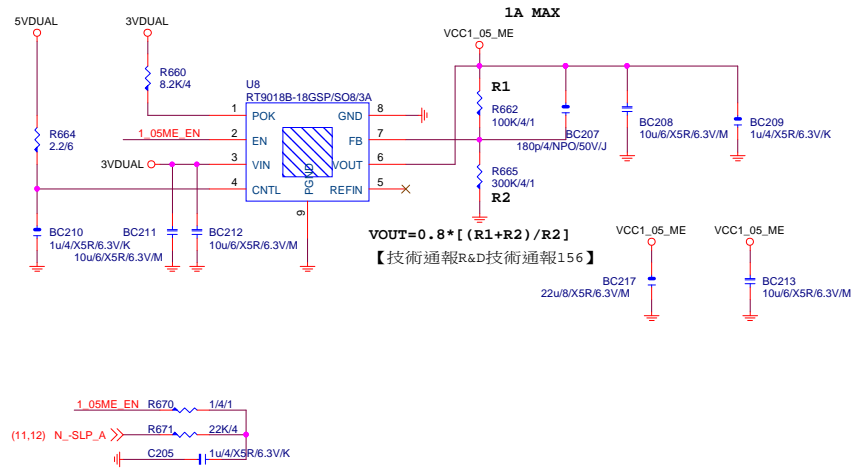
## USB SS (90Ohm-differential)

GIGABYTE™			
Title			
D720210 4port Hub B			
Size	Document Number	Rev	
C	GA-Z97X-UD5H	1.01	
Date	Monday, May 26, 2014	Sheet	41 of 45





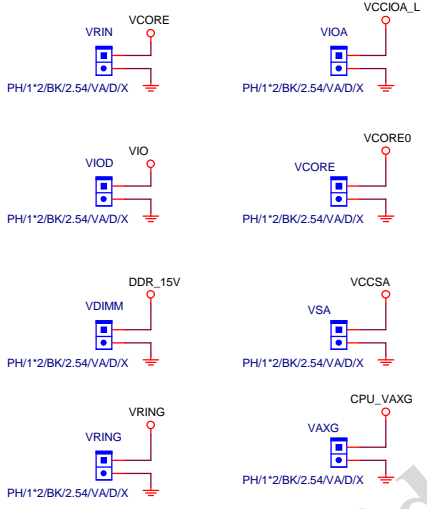
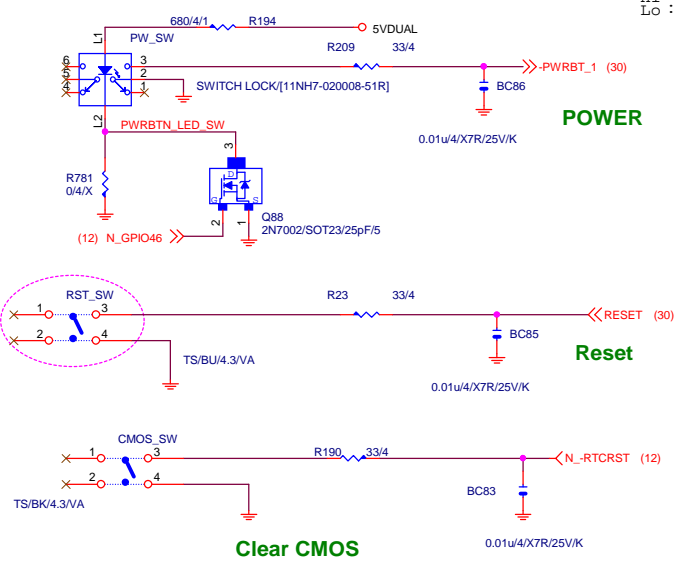
VCC1\_05\_ME



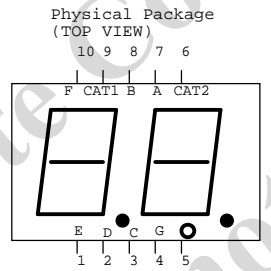
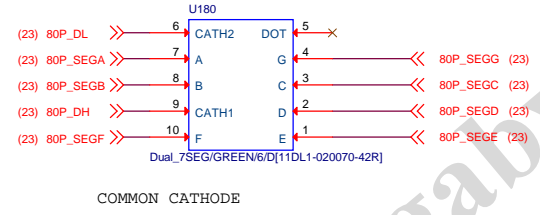
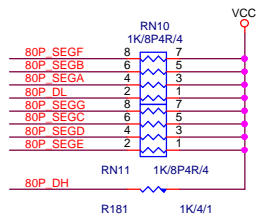
Gigabyte Confidential

Do not Copy

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



80 PORT



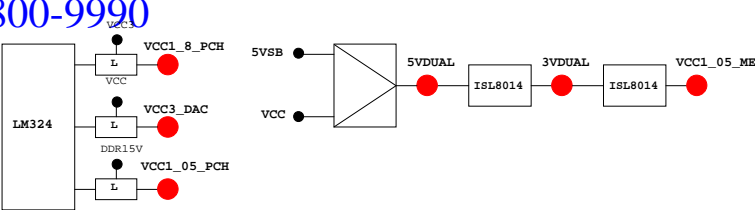
PCB GPIO LIST TABLE

PIN NAME	PWR	Default	USAGE	NOTE
GP0	MAIN	H-Z	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	MAIN	GPIO7	P/U 8.2K VCC3
GP8	STBY	H	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	GPIO12	N/A
GP13	STBY	L	LPCPME#	P/U 8.2K 3VDUAL
GP14/OC7#	STBY	NATIVE	USB OC7#	N/A
GP15	STBY	L	GPIO15(TLS Enable)	P/U 8.2K 3VDUAL
GP16	MAIN	GPI	GPIO16	P/U 8.2K VCC3
GP17/TACH0	MAIN	GPI	GPIO17	P/U 8.2K VCC3
GP18	MAIN	GPI	Mobile Only	N/A
GP19	MAIN	GPI	GPIO19	P/U 8.2K VCC3
GP20	MAIN	GPI	GPIO20	P/U 8.2K VCC3
GP21	MAIN	GPI	GPIO21	P/U 8.2K VCC3
GP22	MAIN	H-Z	GPIO22	P/U 8.2K VCC3
GP23	MAIN	GPI	GPIO23	N/A
GP24	STBY	L	SKTOCC#	N/A
GP25	STBY		Mobile Only	N/A
GP26	STBY		Mobile Only	N/A
GP27	STBY	H	GPO	GPIO27
GP28	STBY	H	GPO	PWR LED
GP29	STBY	L	GPI	GPIO29
GP30	STBY	H-Z	GPI	Mobile Only
GP31	STBY	H-Z	GPI	Mobile Only
GP32	MAIN	H	GPO	N/A
GP33	MAIN	H	GPO	N/A
GP34	MAIN	H-Z	GPI	-PCI_STOP
GP35	MAIN	L	GPO	-ACZ_DET
GP36	MAIN	GPI	N/A	N/A
GP37	MAIN	GPI	N/A	N/A
GP38	MAIN	H-Z	GPI	PCIEX4 Detect
GP39	MAIN	H-Z	GPI	GPIO39
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
GP45	STBY	NATIVE	GPIO45	P/U 8.2K 3VDUAL
GP46	STBY	L	NATIVE	GPIO46
GP47	STBY		Mobile Only	N/A
GP48	MAIN	H-Z	IN	GPIO48
GP49	MAIN	H-Z	IN	GPIO49
GP50	MAIN	NATIVE	-REQ1	P/U 2.2K VCC
GP51	MAIN	H	NATIVE	-GNT1
GP52	MAIN	NATIVE	-REQ2	P/U 2.2K VCC
GP53	MAIN	H	NATIVE	-GNT2
GP54	MAIN	NATIVE	-REQ3	P/U 2.2K VCC
GP55	MAIN	H	NATIVE	-GNT3
GP56	STBY	NATIVE	Mobile Only	N/A
GP57	STBY	H-Z	IN	VCORE_OV1
GP58	STBY	H-Z	NATIVE	F_USB_OC
GP59	STBY	NATIVE	USB_OC0#	N/A
GP60	STBY	H-Z	NATIVE	N/A(Reverse)
GP61	STBY	L	NATIVE	-SUSTAT
GP62	STBY	L	NATIVE	SUSCLK
GP63	STBY	L	NATIVE	GPIO63
GP64	MAIN	L	NATIVE	CLKOUTFLEX0
GP65	MAIN	L	NATIVE	CLKOUTFLEX1
GP66	MAIN	L	NATIVE	CLKOUTFLEX2
GP67	MAIN	L	NATIVE	CLKOUTFLEX3
GP72	STBY	H-Z	NATIVE	VCORE_OV4
GP73	STBY		Mobile Only	N/A
GP74	STBY	H-Z	NATIVE	1_05V_OV2
GP75	STBY	H-Z	NATIVE	N/A(Reverse)

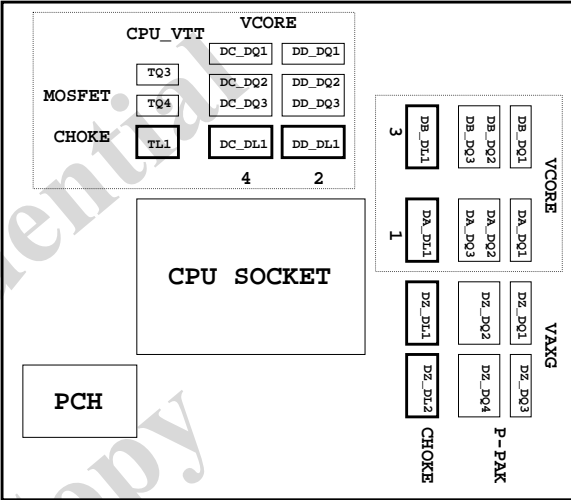
Super I/O ITE8720 GPIO Table

PIN NAME	USAGE	NOTE
SVC/PECI_RQT/GP14	-PECI_REQ	
PWROK1/GP13	PWROK1/ITE_PWROK	
KRST#/GP62	-KRST	
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	
PE/GP81	CPU_LED2_C	
BUSY/GP82	CPU_LED3_C	
PD3/GP73/BUSS11	SB_LED1_C	
PD4/GP74/BUSS12	SB_LED2_C	
VCORE_EN/VID7/GP64	IT_GP64	SB_LED3_C
PD0/GP70	NB_LED1_C	
PD1/GP71	NB_LED2_C	
PD2/GP72/BUSS10	NB_LED3_C	
GP22/SCK	LOW_PWR_1	
VIDO5/GP27/SIN2	LOW_PWR_2	
PCIRST2#/GP11	-PFMRST1	
PCIRST1#/GP12	-PFMRST2	
3VSB5W#/GP40	CSI_F0	BSEL166_1
SUSCH#/GP53	CSI_F1	BSEL166_2
GP23/SI	BSEL166_3/CSISBSL	
VIDO0/GP20/CTS2#	CPUT_LED1_C	BSEL166_4
GP65/VDDA_EN/GB_01	MB_ID2	
PD6/GP76/BUSS01	MB_ID3	
PD7/GP77/BUSS02	MB_ID4	
AFD#/GP86/SMB_C_R	2X PIN	FST_2X8
INIT#/GP85/SMBD_M	SEC_2x8	GTLREF_AD2
ACK#/GP83	DDR_LED1_C	
VID01/GP21/DCD2#	DDR_LED2_C	
STB#/GP87/SMB_C_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#/CIRT2X/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/BUSS00	SB_LED3_C	



PWM各相位的擺法如下：



BIOS超電壓對應表：

線路圖名稱	BIOS選項
Vcore	CPU Vcore
CPU_VTT	CPU Termination
CPU_VAXG	CPU Graphic Core
VCC1_8_PCH	CPU PLL
VCC1_05_PCH	PCH core
3VDUAL	3VDUAL
DDR15V	DRAM voltage
DDRVTT	DRAM Terminatio
VREF_CA_A/VREF_CA_B	DRAM Address Ref
VREF_DQ_A/VREF_DQ_B	DRAM Data Ref

	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

散熱模組料號：

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

Gigabyte Technology			
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