

Model Name: GA-Z87X-UD4H

Rev 1.01

www.xinxunwei.com 400-800-9990

SHEET

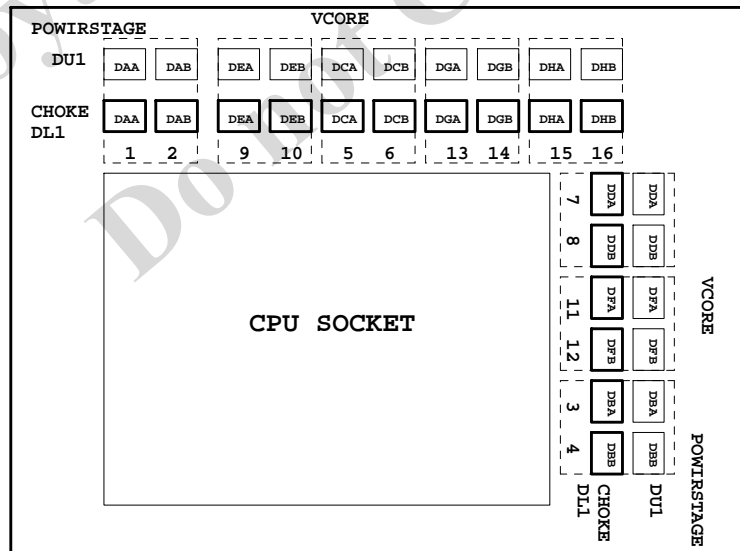
TITLE

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_DP,CLK BUFFER
11	PCH_HOST,SATA,PCI
12	PCH_GPIO,CTRL,AUDIO
13	PCH_PWR,GND
14	DP / DVI / HDMI
15	PCI EXPRESS*16/*8 SWITCH
16	PCI EXPRESS*16 SLOT
17	PCI EXPRESS*8 SLOT
18	PCI EXPRESS*4 SLOT
19	PCI EXPRESS*1 SLOTS X3
20	ITE 8892
21	PCI SLOT 1
22	SATA3 SWITCH
23	USB3_eSATA, KB_USB3
24	Marvell 9172
25	ALC898
26	REAR AUDIO JACK
27	Headphone Audio Amplifier
28	IR3563B PWM Controller
29	IR3553 Power Stage PH_01-04
30	IR3553 Power Stage PH_05-08
31	IR3553 Power Stage PH_09-12
32	IR3553 Power Stage PH_13-16
33	IR3570_DDR PWM Controller
34	IR3598-DDR Driver

SHEET

TITLE

35	DISCRETE POWER I
36	DISCRETE POWER II
37	INTEL LAN I217
38	uPD720210 USB3 4Ports Hub-1A
39	uPD720210 USB3 4Ports Hub-1B
40	F_USB 3.0 from PCH
41	F_USB 2.0
42	Dual BIOS
43	ITE8728 LPC I/O
44	FAN CTRL, H/W Monitor
45	F_PANEL , COM, PROCHOT#
46	Port80, O.V., Voltage Measure
47	ATX POWER, CLOCK GEN
48	TABLE LIST
49	uPD720210 USB3 4Ports Hub-2A
50	uPD720210 USB3 4Ports Hub-2b
51	VCC1_05_ME, VCC3_ME

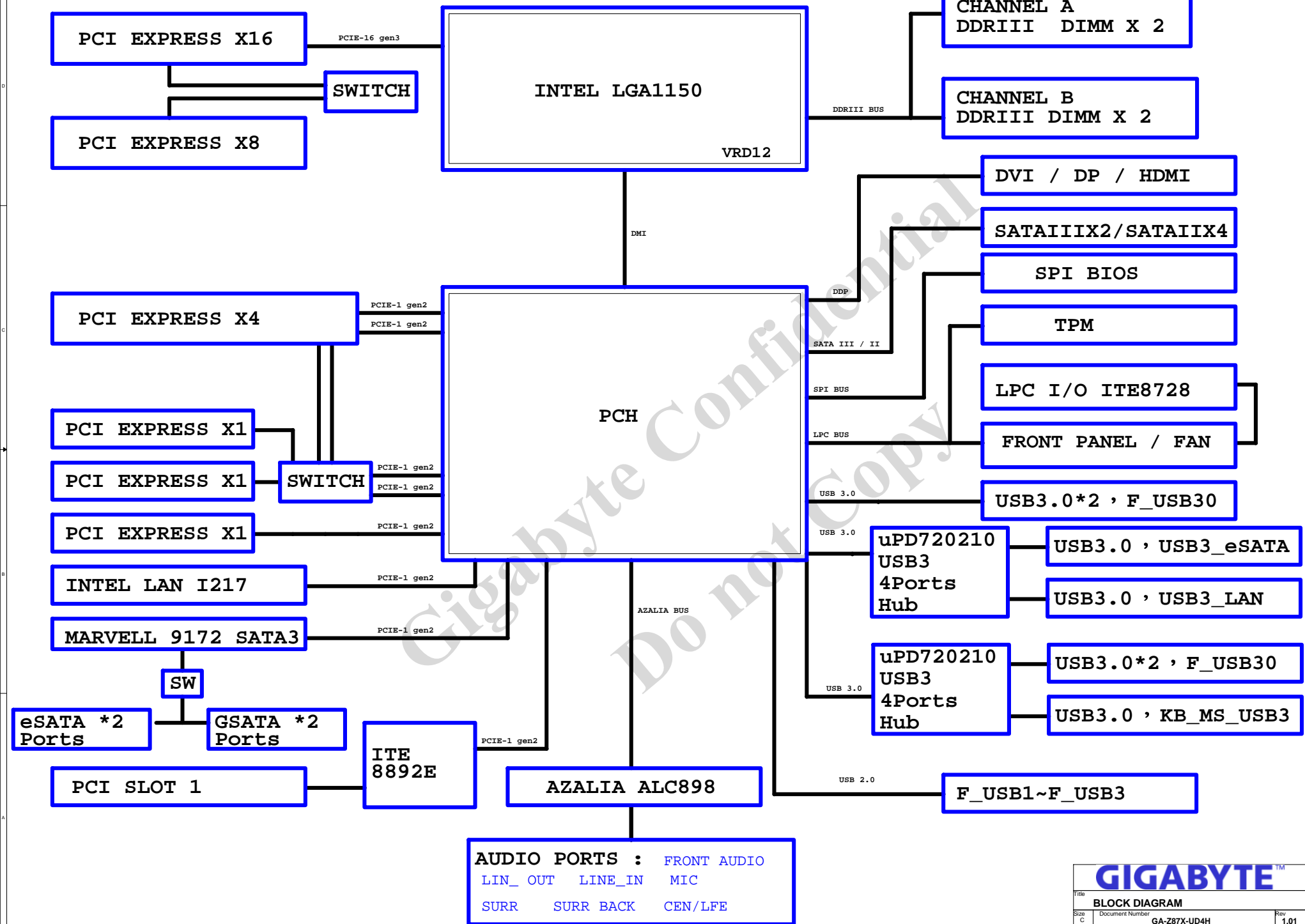


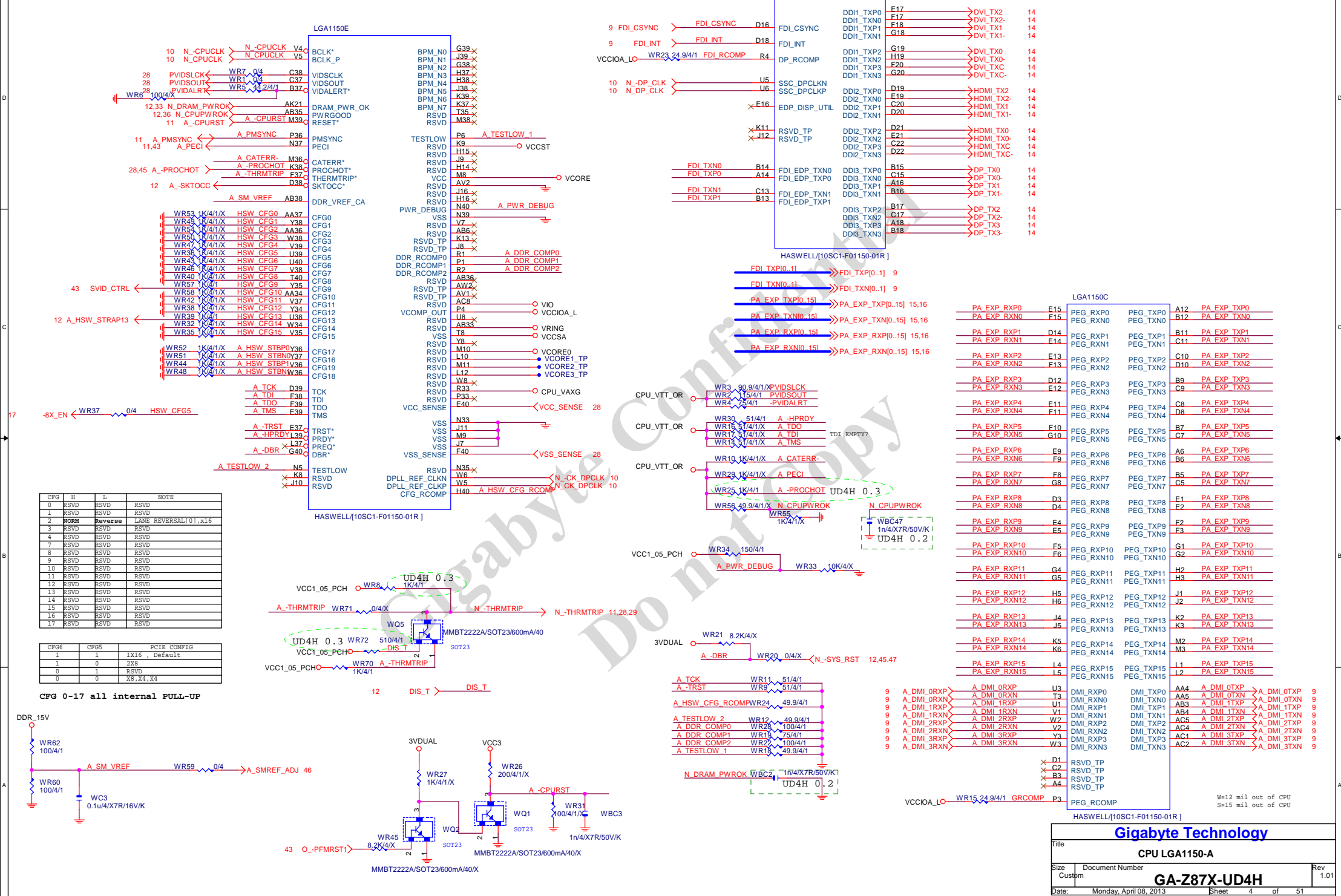
Gigabyte Technology

Title		
Cover Sheet		
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Date	Monday, April 08, 2013	Sheet 1 of 51

BLOCK DIAGRAM

www.xinxunwei.com 400-800-9990





LGA1150A

MAAA0	AU13	DDR0_MA0	DDR0_DQ0	AD38	MDA0
MAAA1	AV16	DDR0_MA1	DDR0_DQ1	AD39	MDA1
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MAAA3	AW17	DDR0_MA3	DDR0_DQ3	AF39	MDA3
MAAA4	AU17	DDR0_MA3	DDR0_DQ3	AD37	MDA4
MAAA5	AW18	DDR0_MA4	DDR0_DQ4	AD40	MDA5
MAAA6	AV17	DDR0_MA5	DDR0_DQ5	AF37	MDA6
MAAA7	AT18	DDR0_MA6	DDR0_DQ6	AF40	MDA7
MAAA8	AU18	DDR0_MA7	DDR0_DQ7	AF40	MDA9
MAAA9	AT19	DDR0_MA8	DDR0_DQ8	AH39	MDA13
MAAA10	AW11	DDR0_MA9	DDR0_DQ9	AK38	MDA10
MAAA11	AV19	DDR0_MA10	DDR0_DQ10	AK39	MDA11
MAAA12	AU19	DDR0_MA11	DDR0_DQ11	AH37	MDA12
MAAA13	AY10	DDR0_MA12	DDR0_DQ12	AH38	MDA8
MAAA14	AT20	DDR0_MA13	DDR0_DQ13	AK37	MDA14
MAAA15	AU21	DDR0_MA14	DDR0_DQ14	AK40	MDA15
		DDR0_MA15	DDR0_DQ15	AK40	MDA17
MODT_A0	AW10	DDR0_ODT0	DDR0_DQ16	AM40	MDA17
MODT_A1	AY8	DDR0_ODT1	DDR0_DQ17	AM39	MDA21
MODT_A2	AW9	DDR0_ODT2	DDR0_DQ18	AP38	MDA18
MODT_A3	AU8	DDR0_ODT3	DDR0_DQ19	AP39	MDA19
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			DDR0_DQ27	AV35	MDA27
			DDR0_DQ28	AT37	MDA28
			DDR0_DQ29	AU37	MDA24
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			DDR0_DQ37	AV6	MDA32
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			DDR0_DQ45	AR3	MDA40
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			DDR0_DQ48	AL1	MDA49
			DDR0_DQ49	AL4	MDA53
			DDR0_DQ50	AJ3	MDA50
			DDR0_DQ51	AJ4	MDA51
			DDR0_DQ52	AL3	MDA48
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			DDR0_DQ55	AG1	MDA57
			DDR0_DQ56	AG4	MDA61
			DDR0_DQ57	AE3	MDA58
			DDR0_DQ58	AE4	MDA59
			DDR0_DQ59	AG2	MDA60
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			DDR0_DQ62	AE1	MDA63
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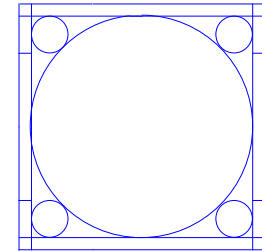
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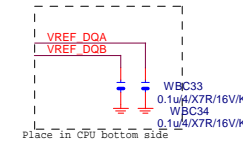
LGA1150B

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MAAB3	AM23	DDR1_MA3	DDR1_DQ3	AH35	MDB3
MAAB4	AP23	DDR1_MA4	DDR1_DQ4	AD34	MDB4
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MAAB6	AY24	DDR1_MA6	DDR1_DQ6	AG34	MDB6
MAAB7	AV25	DDR1_MA7	DDR1_DQ7	AH34	MDB7
MAAB8	AU25	DDR1_MA8	DDR1_DQ8	AL34	MDB8
MAAB9	AW25	DDR1_MA9	DDR1_DQ9	AK35	MDB9
MAAB10	AP18	DDR1_MA10	DDR1_DQ10	AL31	MDB10
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			DDR1_DQ68	AN12	DQSB4
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			DDR1_DQ70	AL8	DQSB6
			DDR1_DQ71	AG7	DQSB7
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			DDR1_DQ73	AF34	DQSB0
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			DDR1_DQ76	AN29	DQSB3
			DDR1_DQ77	AN13	DQSB4
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LGA1150
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Need check the new CPU ME



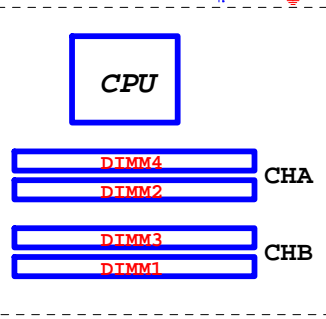
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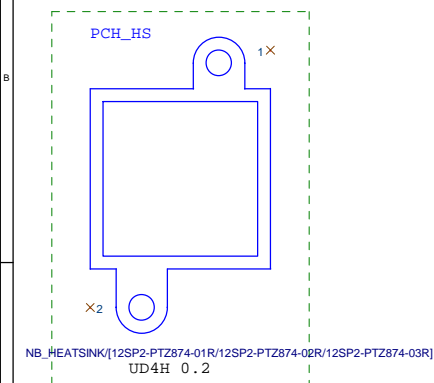
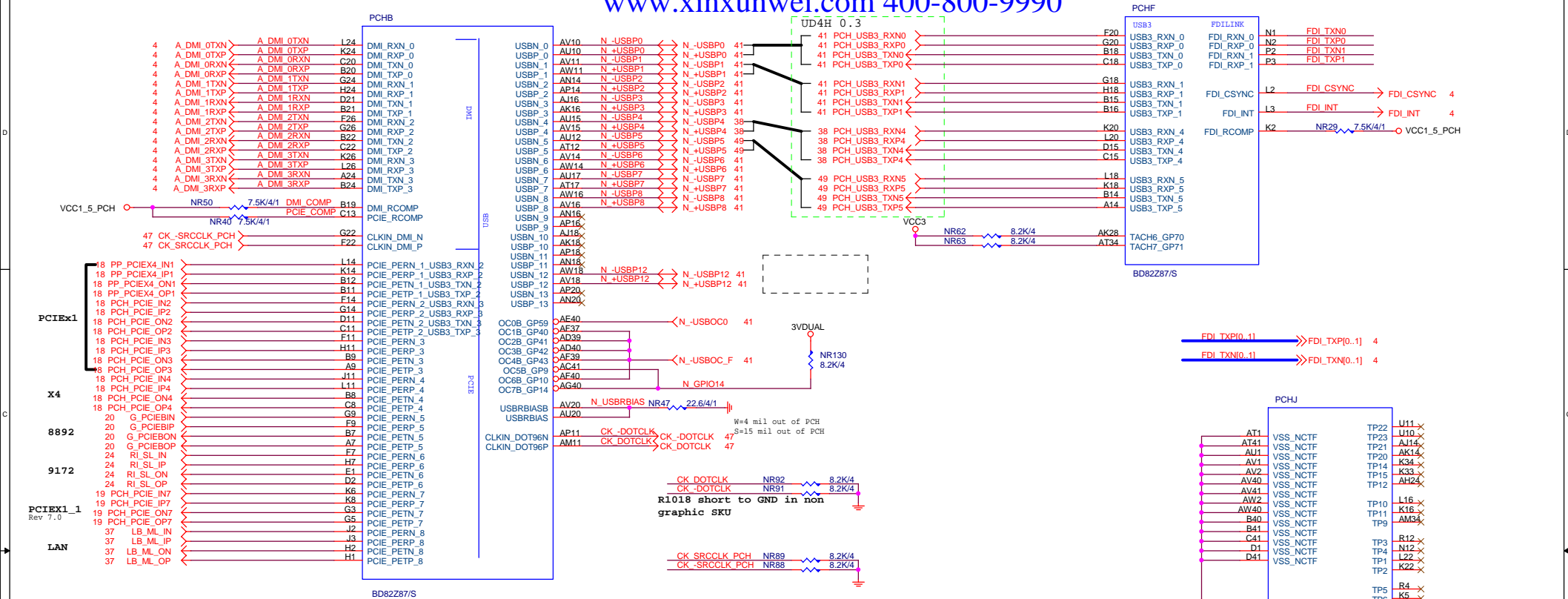
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Title			
DDRIII CHANNEL A			
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PCH & Hub USB3.0 Distribution

Port0 : F_USB30_2 (Left)

Port1 : F_USB30_2 (Right)

Port4 : uPD720210 Hub (HAU1)

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└─Port4 : USB3_ESATA (R)
```

Port3 : USB3_ESATA(L)

|—Port2 : USB30_LAN (R)

Port1 : USB30_LAN (L)

Port5 : uPD720210 Hub (HCU1)

Port4B : KB_MS_USB3 (R)

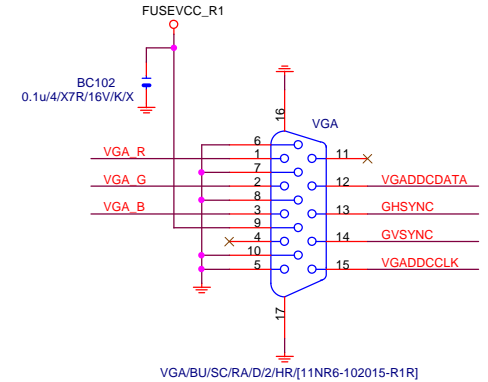
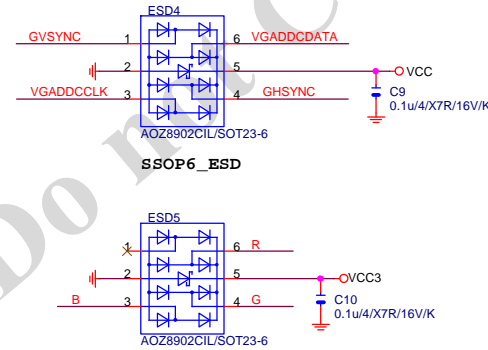
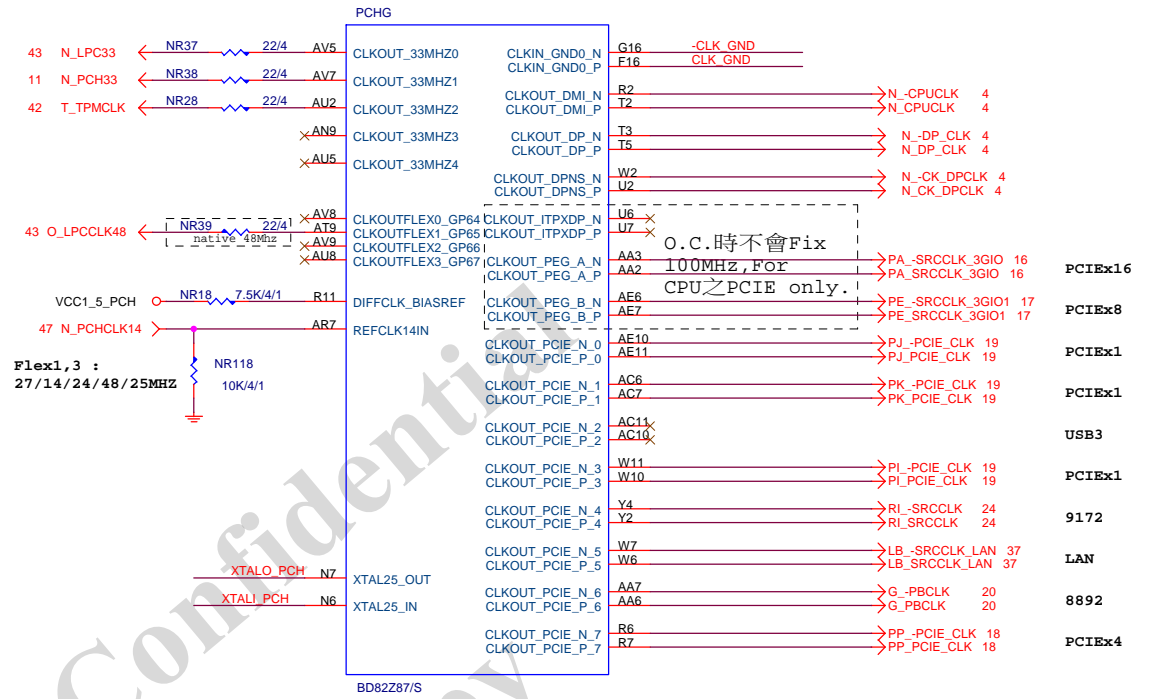
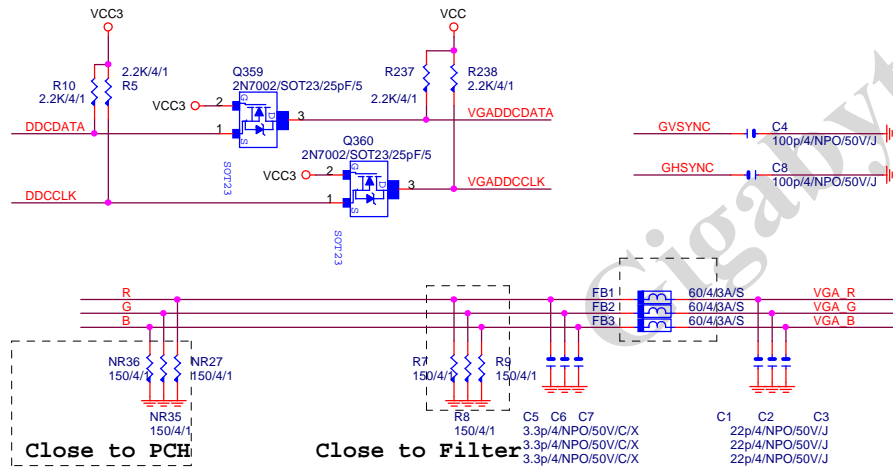
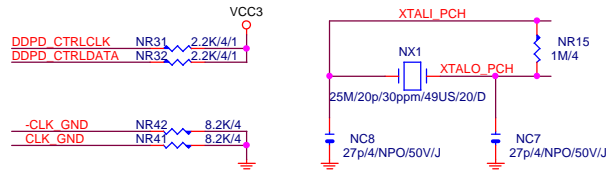
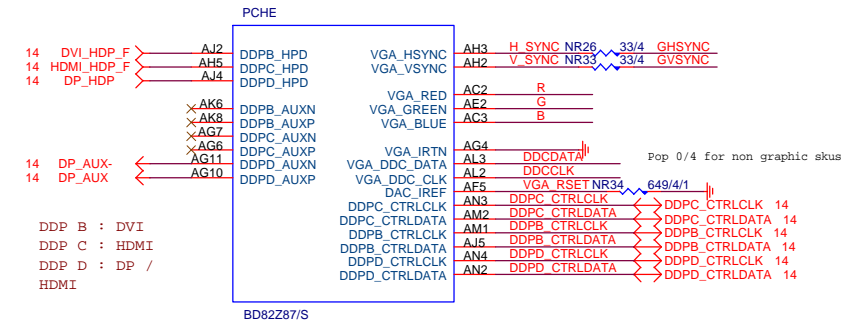
Port3B : KB_MS_USB3 (L)

Port2B : F_USB30_1 (R)

Port1B : F_USB30_1 (L)

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OC[3:0]# for Device 29 (ports 0-7)
OC[7:4]# for Device 26 (ports
8-13)
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USB2	00 01	12 13 10 11	02 03 08 09	04 05 06 07
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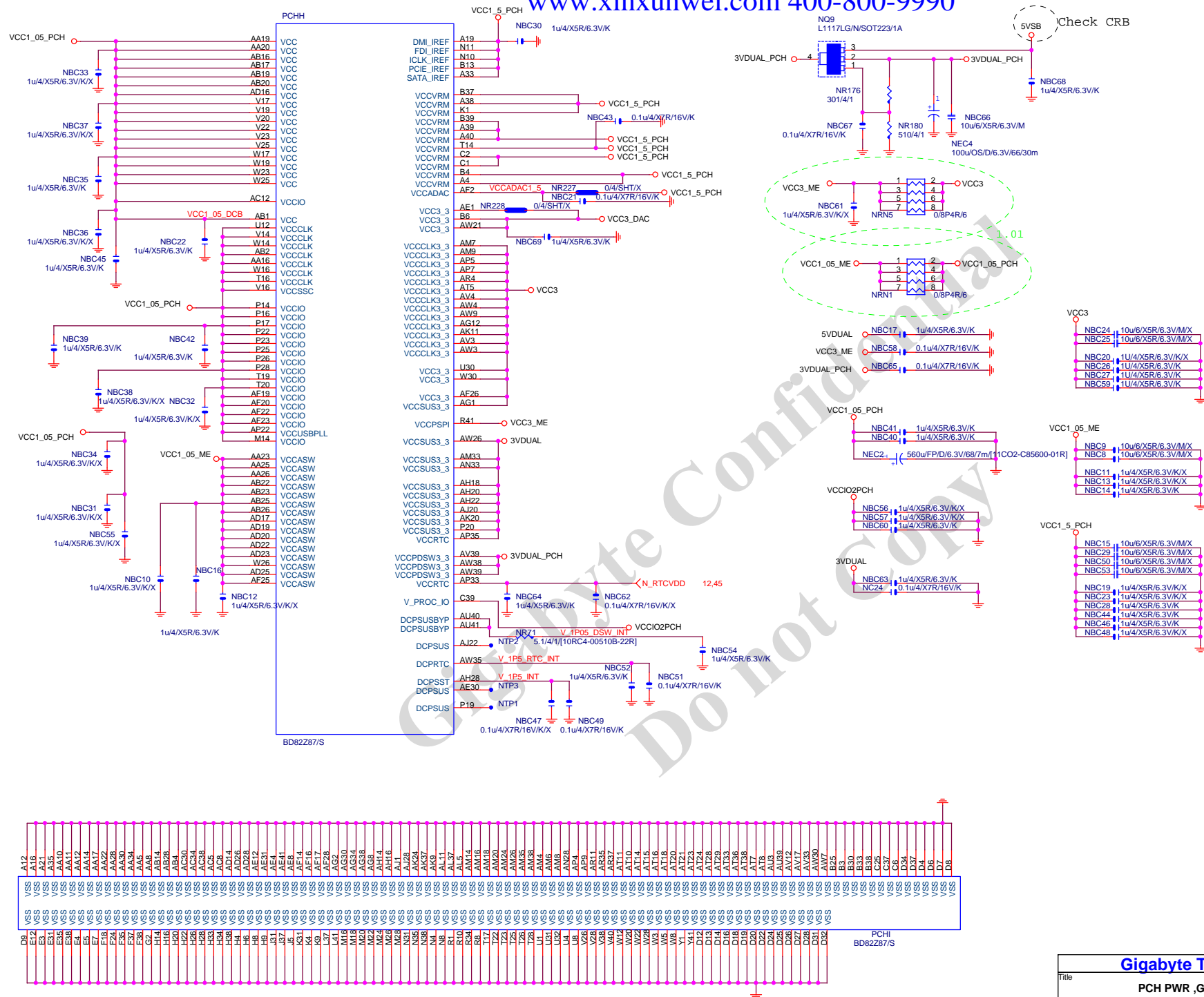
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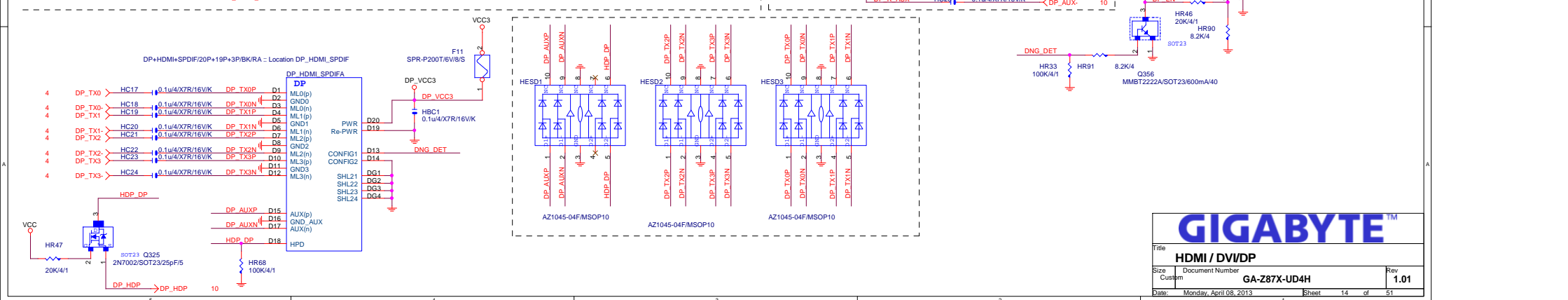
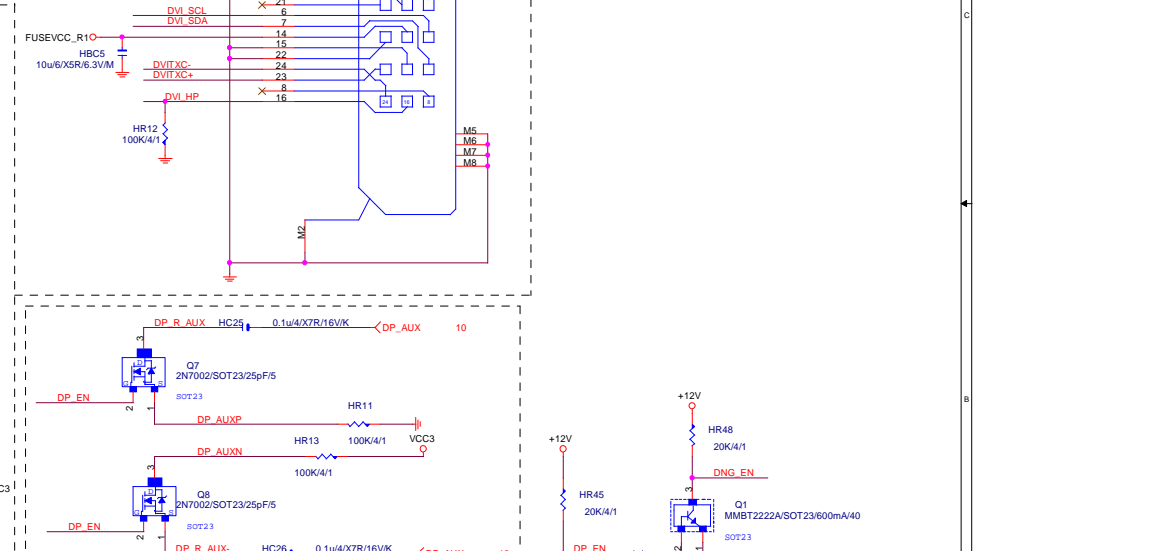
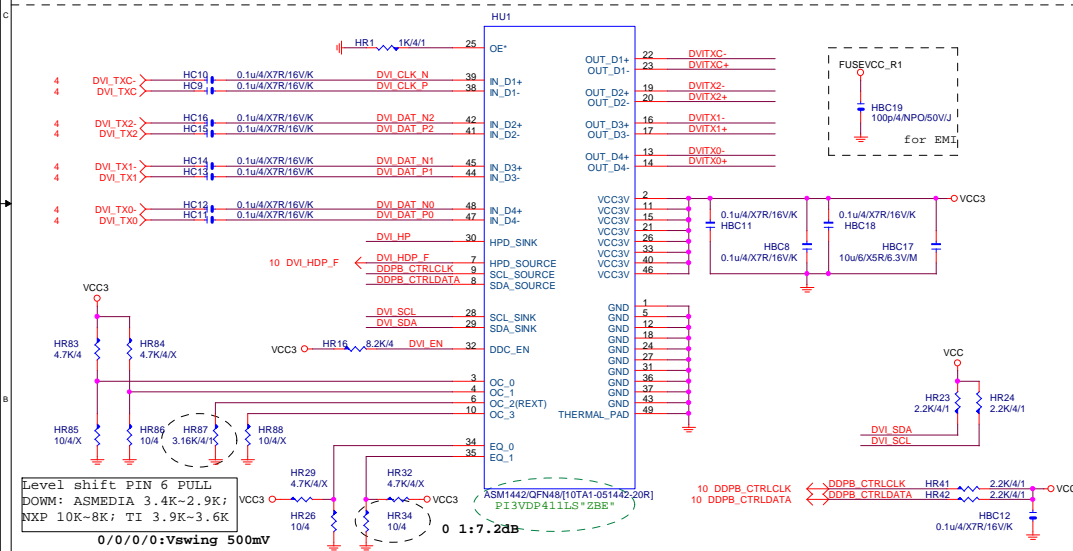
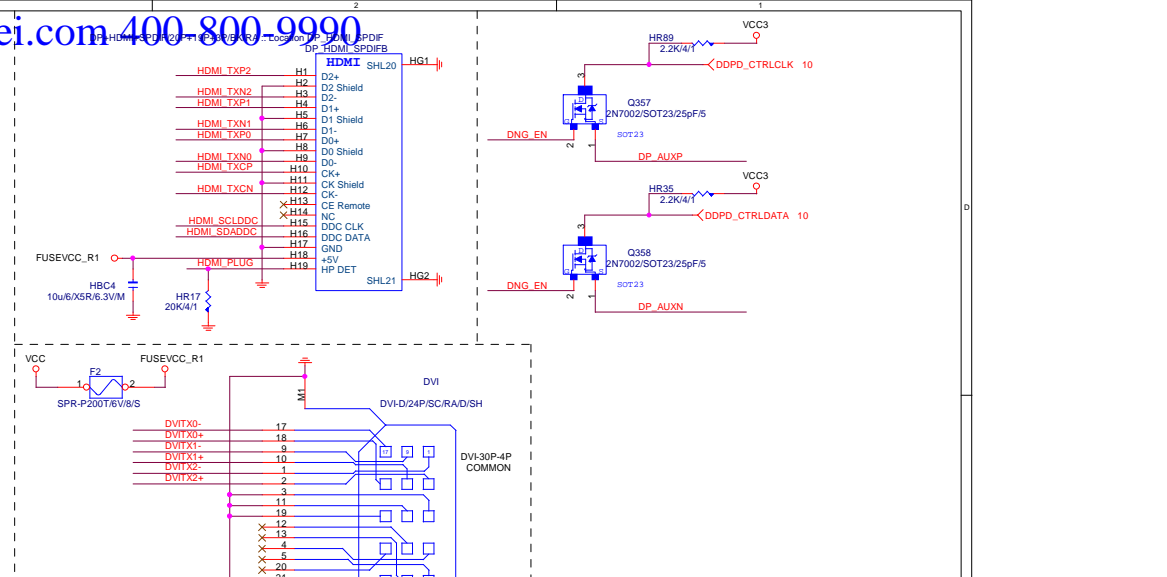
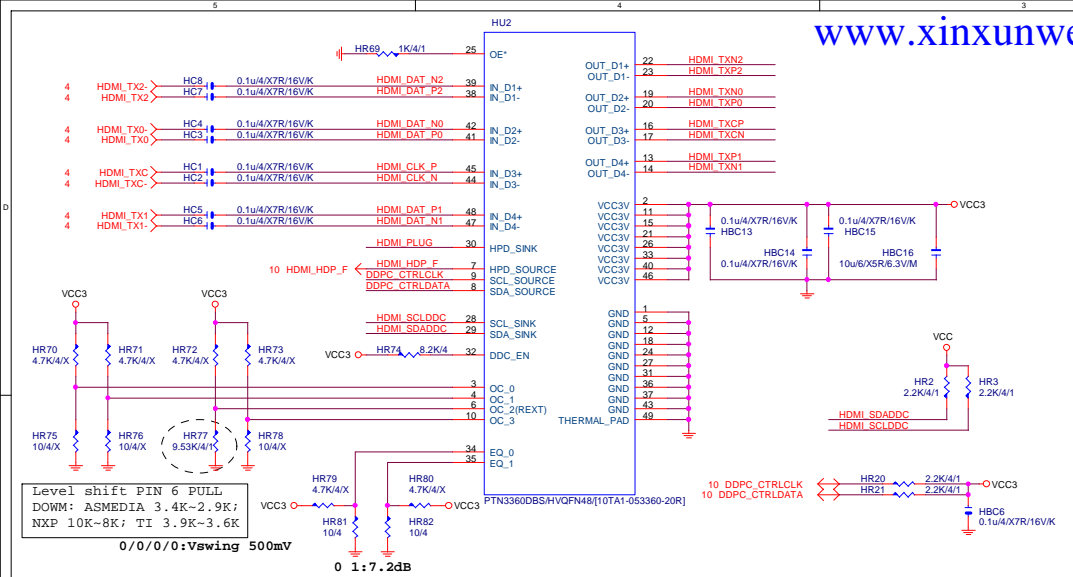
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Size	Document Number	Rev
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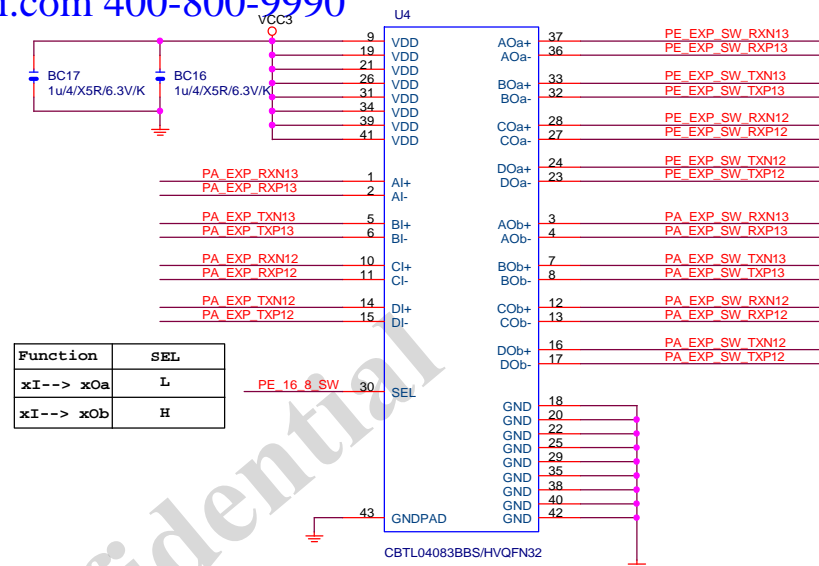
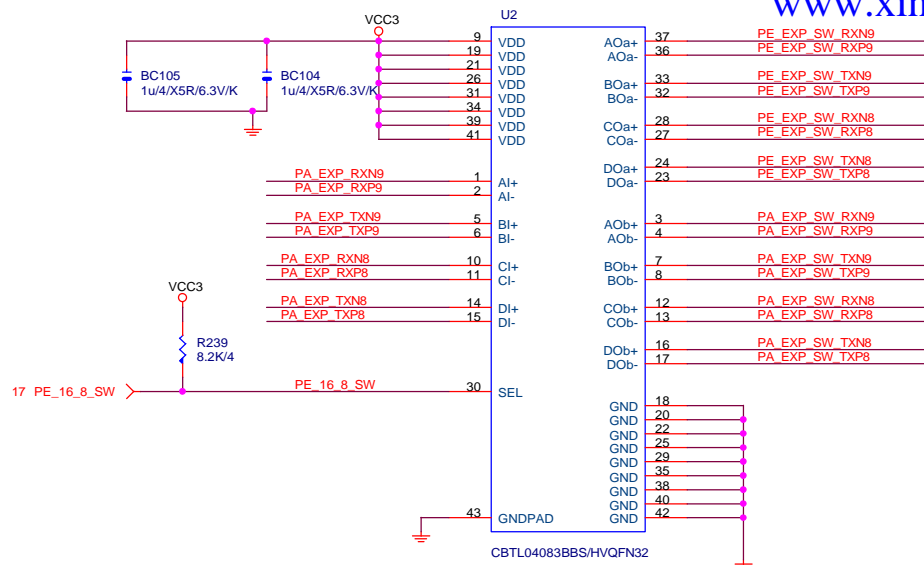


PCH HOST , SATA, PCI

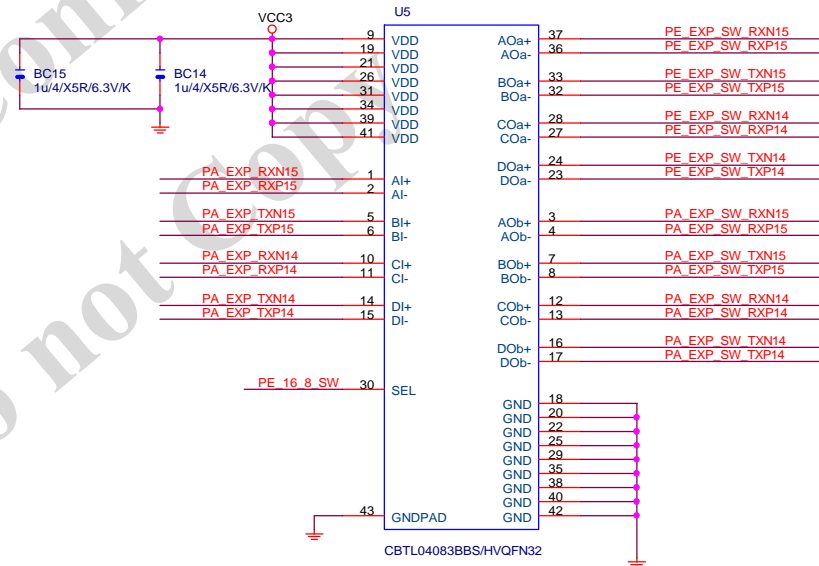
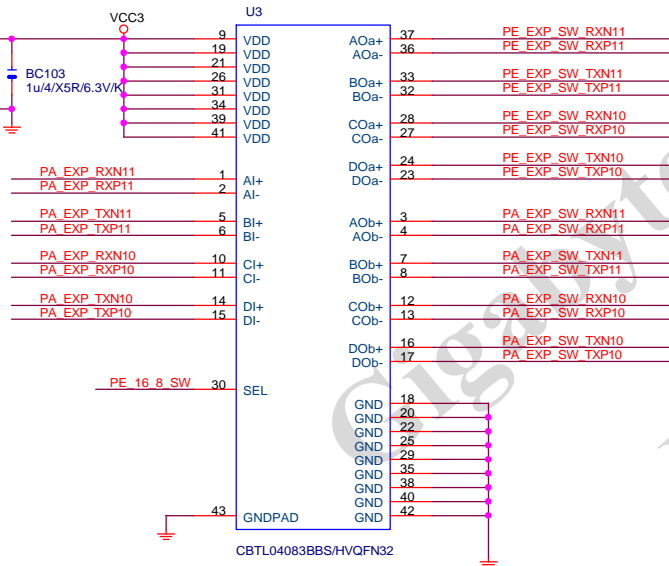
Size Custom	Document Number GA-Z87X-UD4H	Rev 1.01
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Function	SEL
xI--> xOa	L
xI--> xOb	H



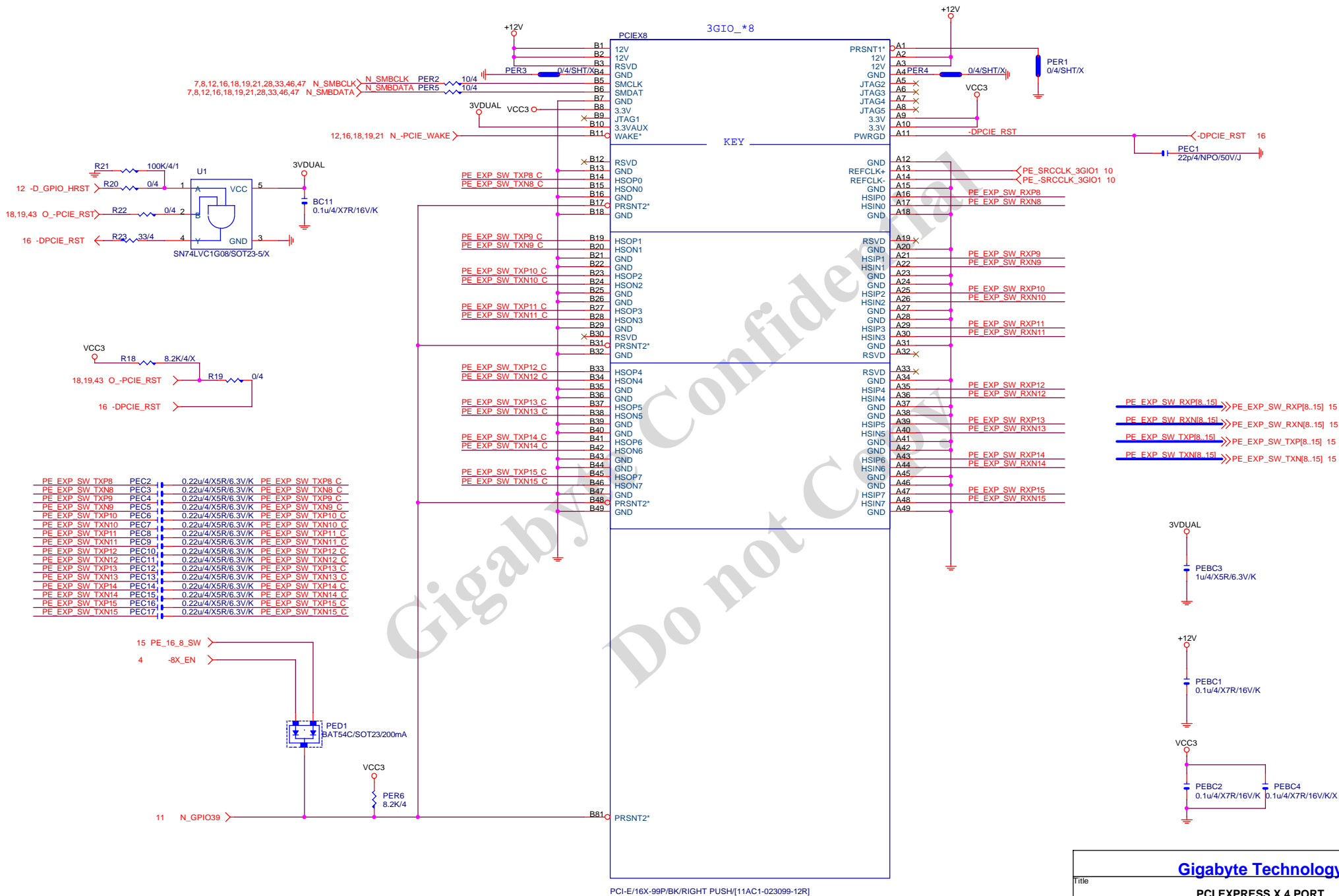
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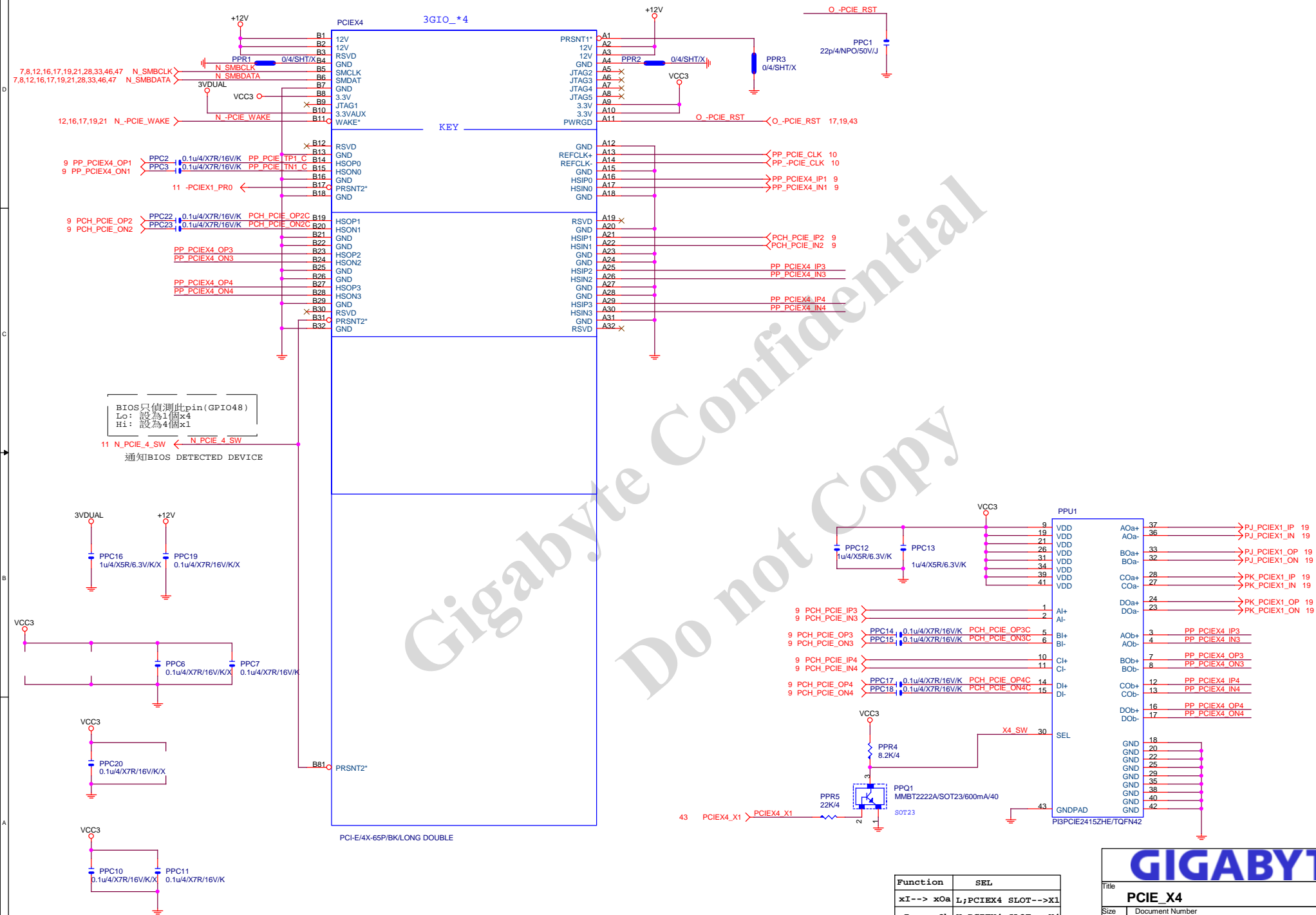
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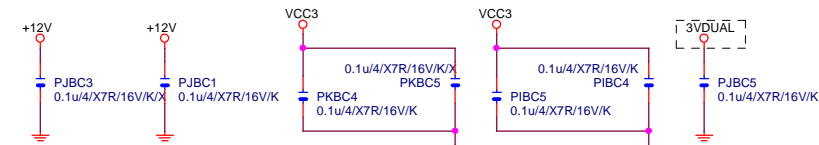
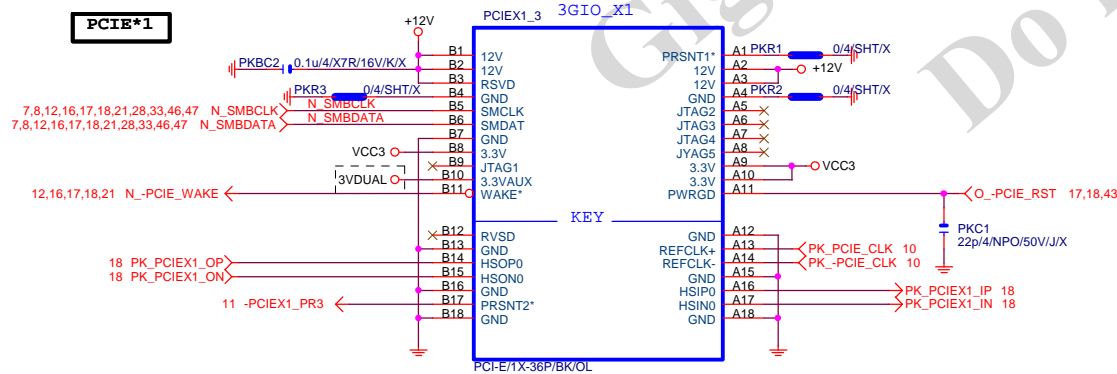
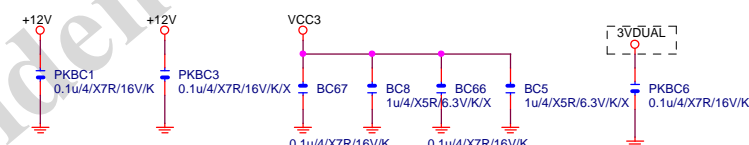
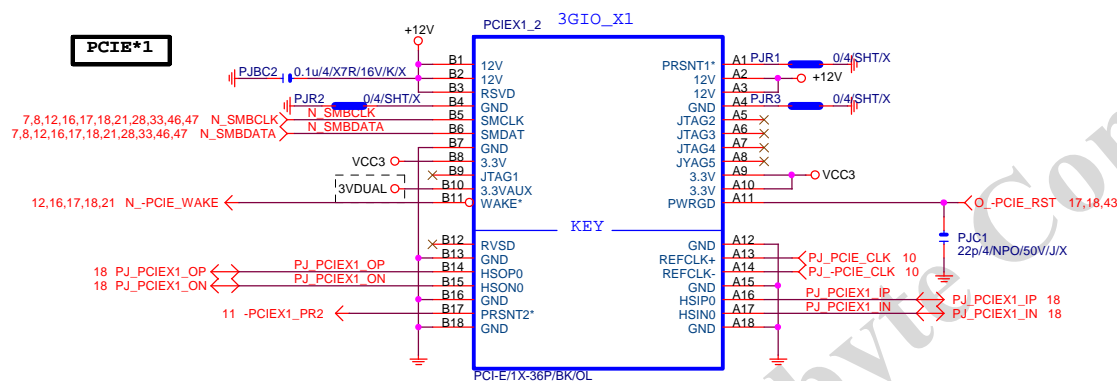
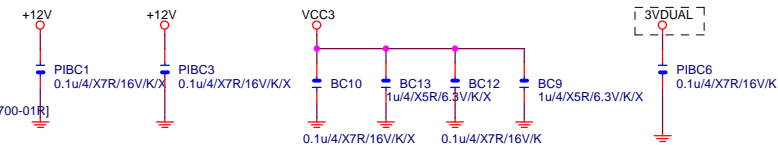
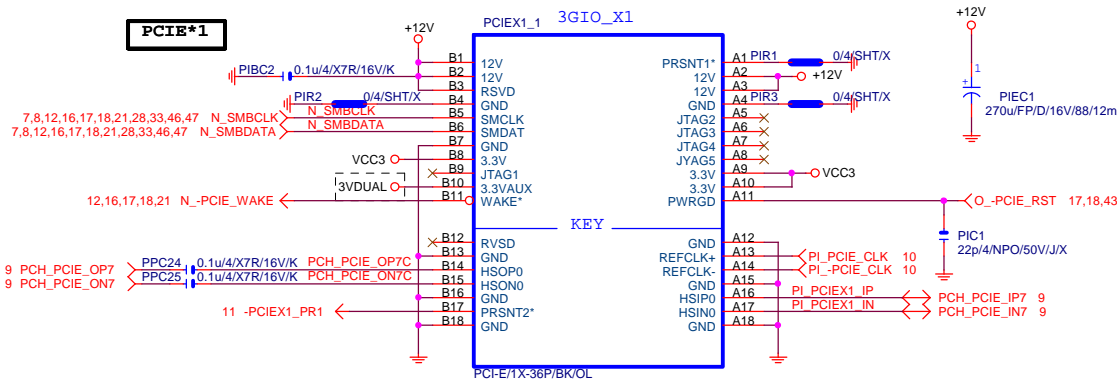
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Size			Document Number	
Custom			GA-Z87X-UD4H	
Date:			Monday, April 08, 2013	Sheet 17 of 51
			2	1
			Rev 1.01	

PCIE*4



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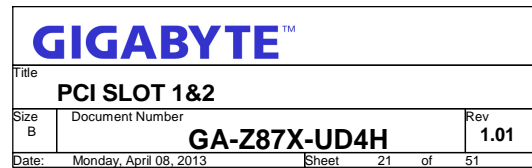
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Size Custom	Document Number GA-Z87X-UD4H	Rev 1.01
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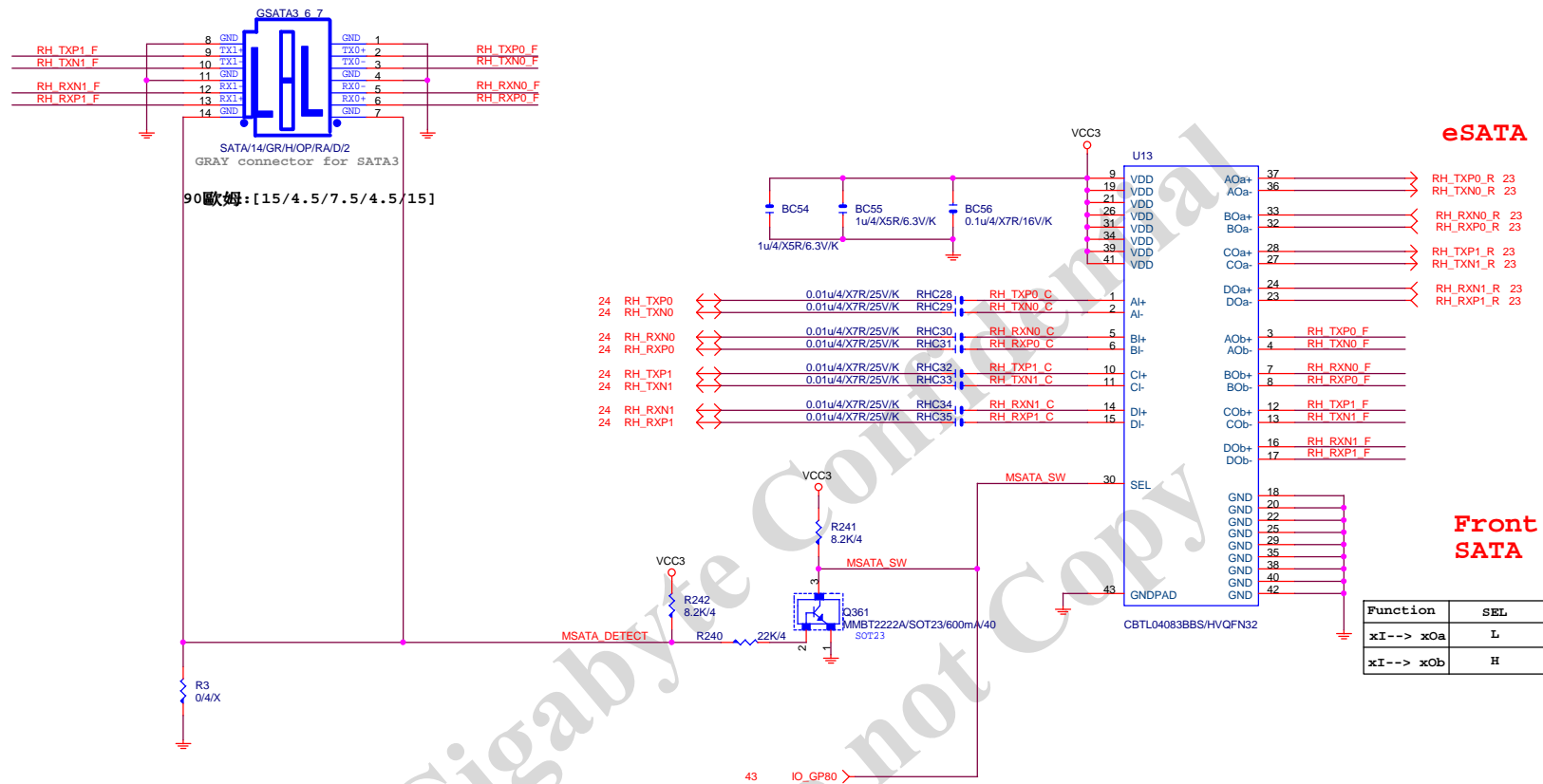


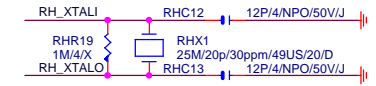
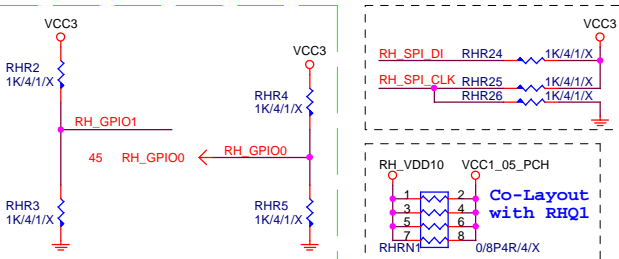
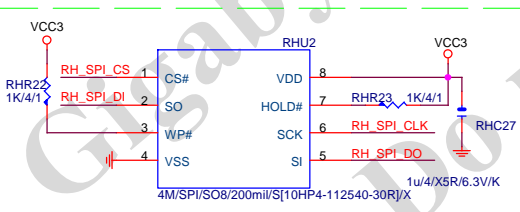
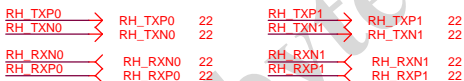
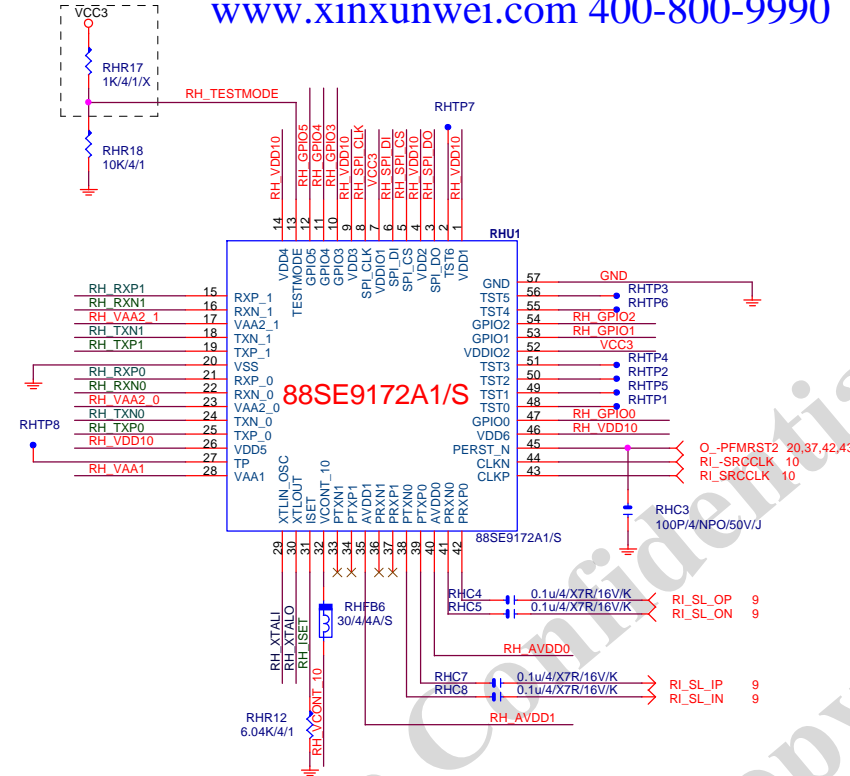
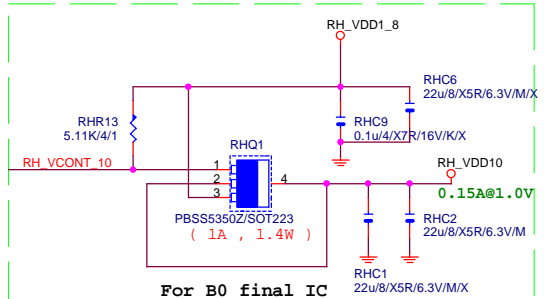
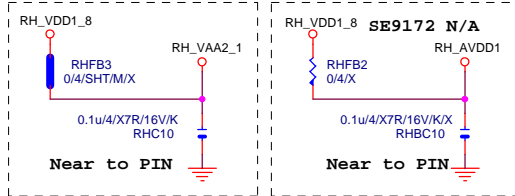
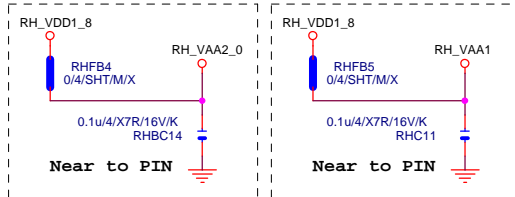
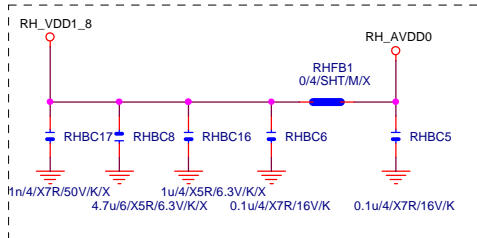
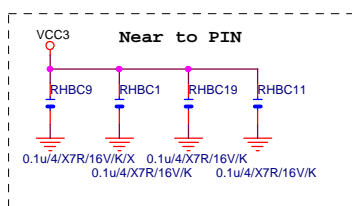
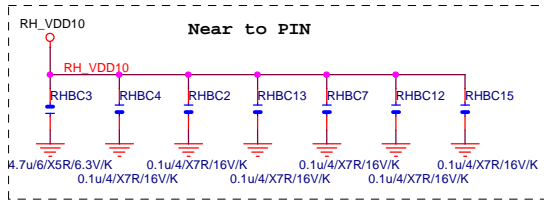


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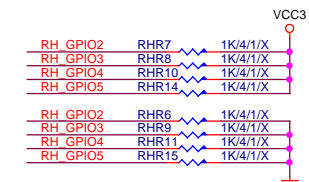
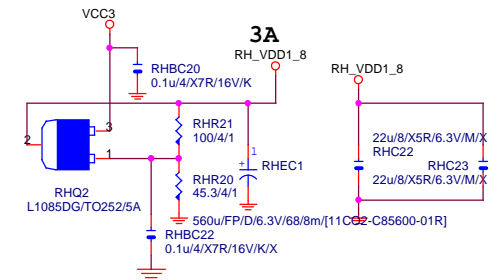
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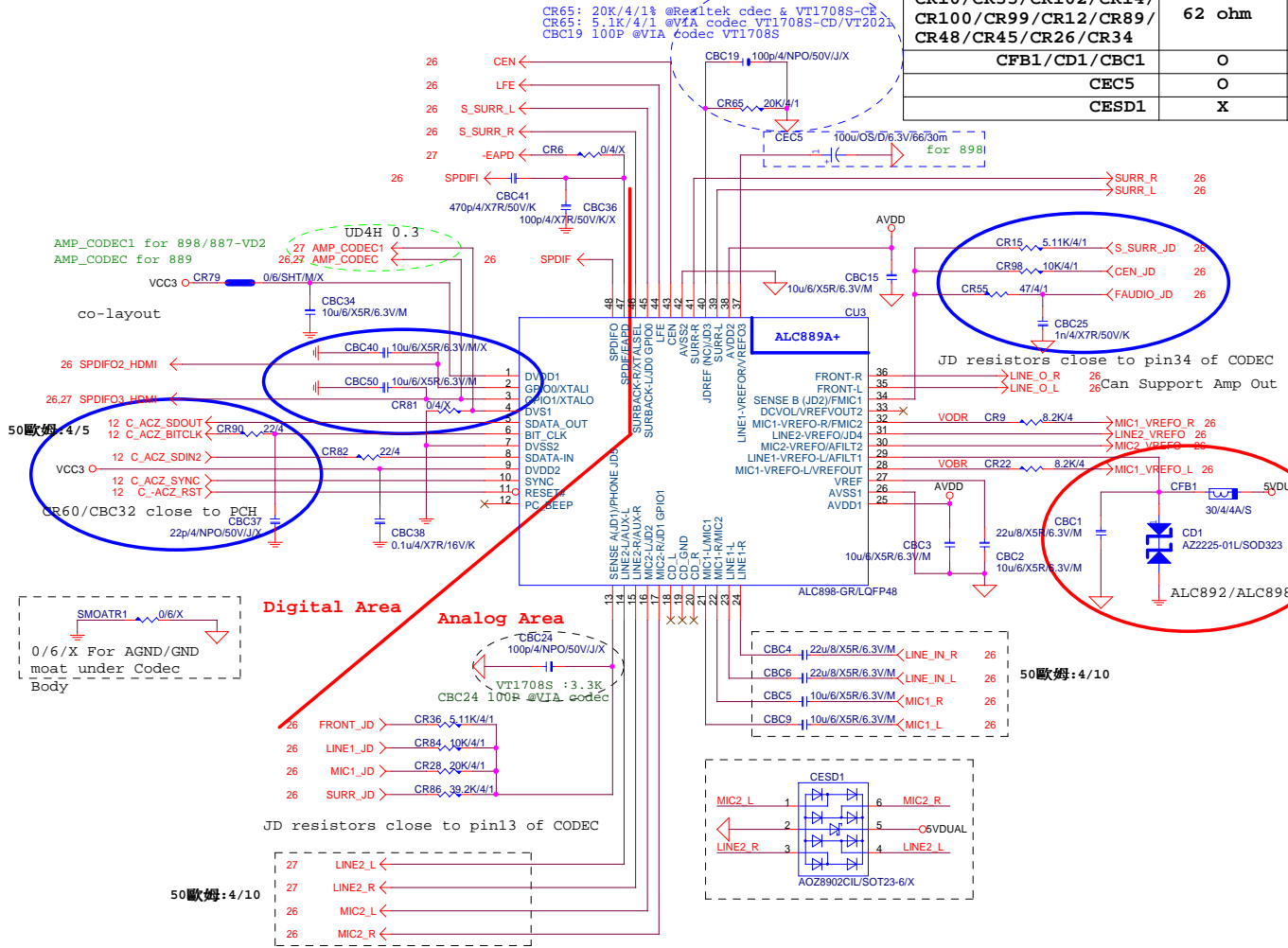




Marvell 9172 Power Requirements
Analog 1.8V 230mA
Core 1.0V 900mA
I/O 3.3V 50mA

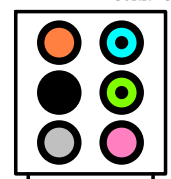


	ALC898	ALC887-VD2	ALC892	VT1708S-CD	VT1708S-CE	VT2021
CR81	X	X	X	O	X	O
CBC50	O	O	O	X	O	X
CR55/CBC25	47ohm+1nF	47ohm+1nF	47ohm+1nF	22ohm+100P	22ohm+100P	47ohm+1nF
CR80	O	O	O	O	O	O
CR83	X	X	X	X	X	X
CBC3/CBC15	22uF/X5R	10uF/X5R	10uF/X5R	10uF/X5R	10uF/X5R	10uF/X5R
CR65	20K/4/1	20K/4/1	20K/4/1	5.1K/4/1	20K/4/1	5.1K/4/1
CR9/CR22/ CR56/CR57/CR49/CR46/	8.2K/4	8.2K/4	8.2K/4	3.3K/4/1	3.3K/4/1	3.3K/4/1
CBC19/CBC24	X	X	X	100P/4	100P/4	X
CR66/CR18/CR13/CR88/ CR87/CR101/CR97/CR11	22K/4	22K/4	22K/4	10K/4/1	10K/4/1	10K/4/1
CR53/CR62/CR20/CR21/ CR10/CR33/CR102/CR14/ CR100/CR99/CR12/CR89/ CR48/CR45/CR26/CR34	62 ohm	62 ohm	62 ohm	75 ohm	75 ohm	75 ohm
CFB1/CD1/CBC1	O	O	X	X	O	X
CEC5	O	X	X	X	X	X
CESD1	X	O	X	O	O	X



Gigabyte Technology

Title			HD AUDIO ALC898
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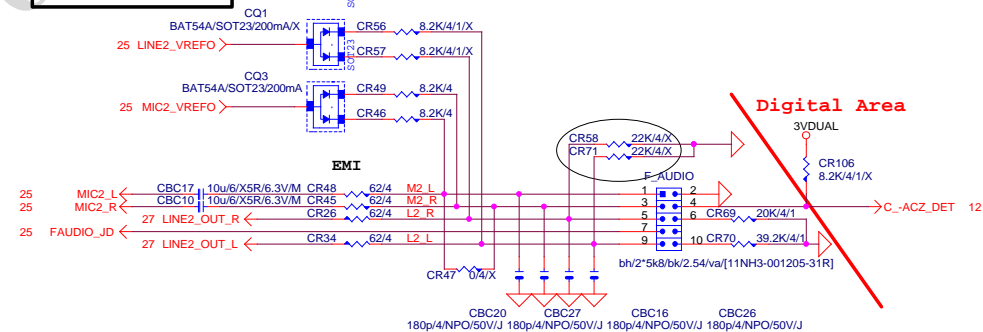


11NR6-403007-21R



GREEN
LINE-OUT

PINK
MIC-IN

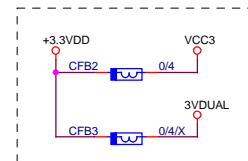
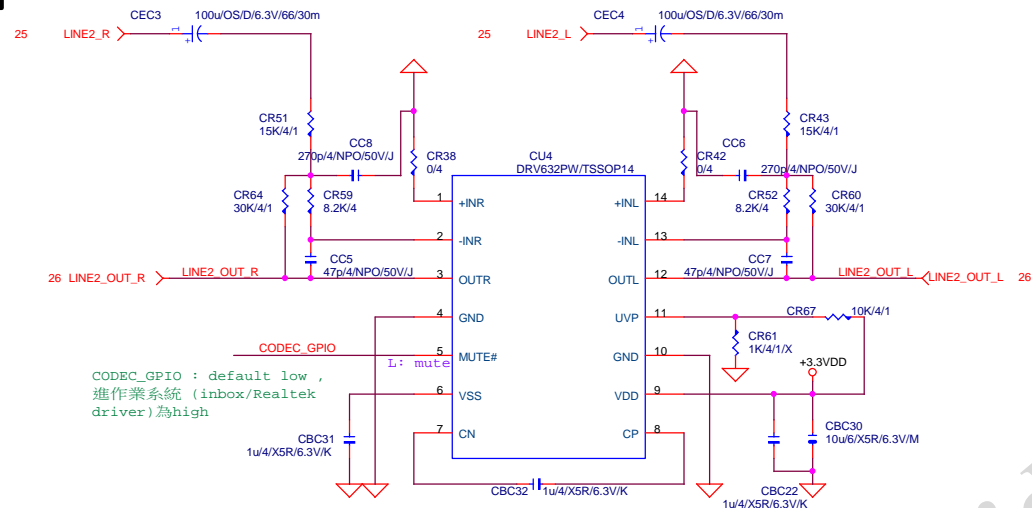


Digital Area

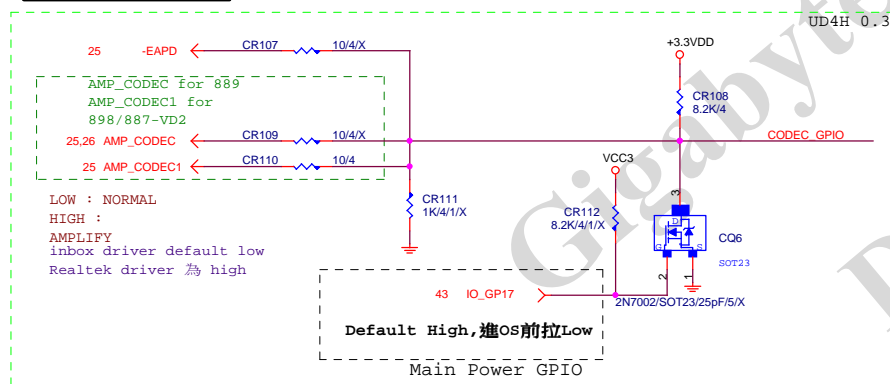
Gigabyte Technology

Title				AUDIO JACK			
Size	Document Number			GA-Z87X-UD4H			Rev
Custom							1.0
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HEADPHONE



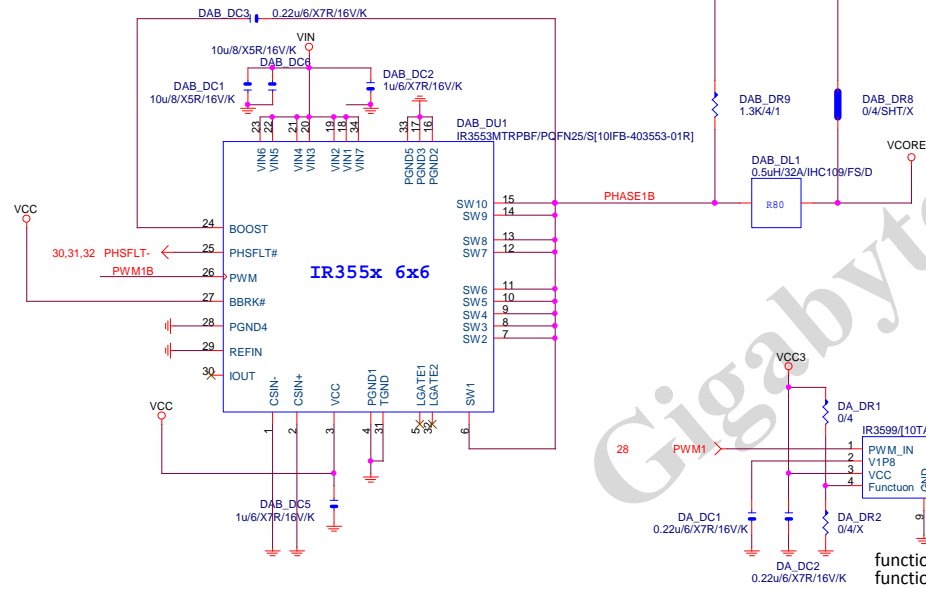
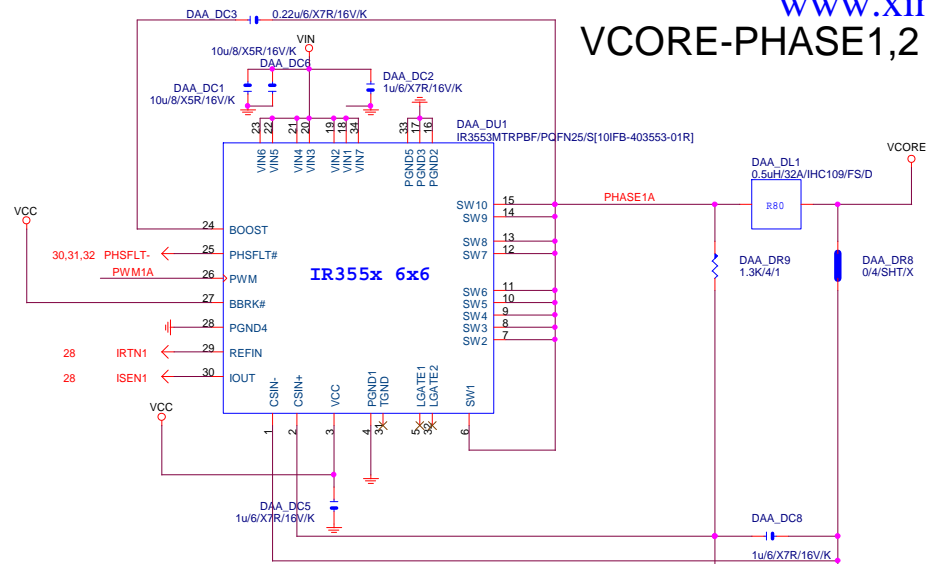
For Pop Noise



Gigabyte Technology

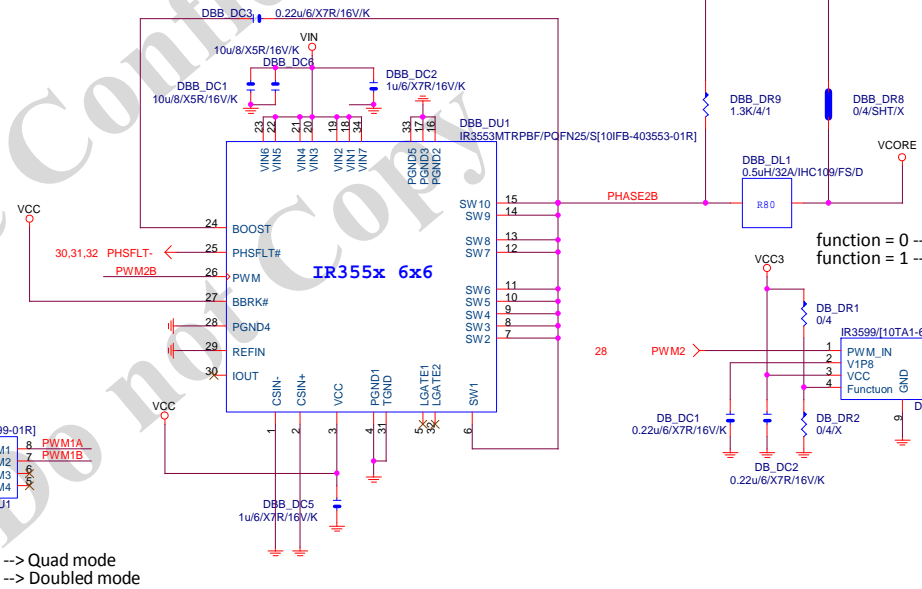
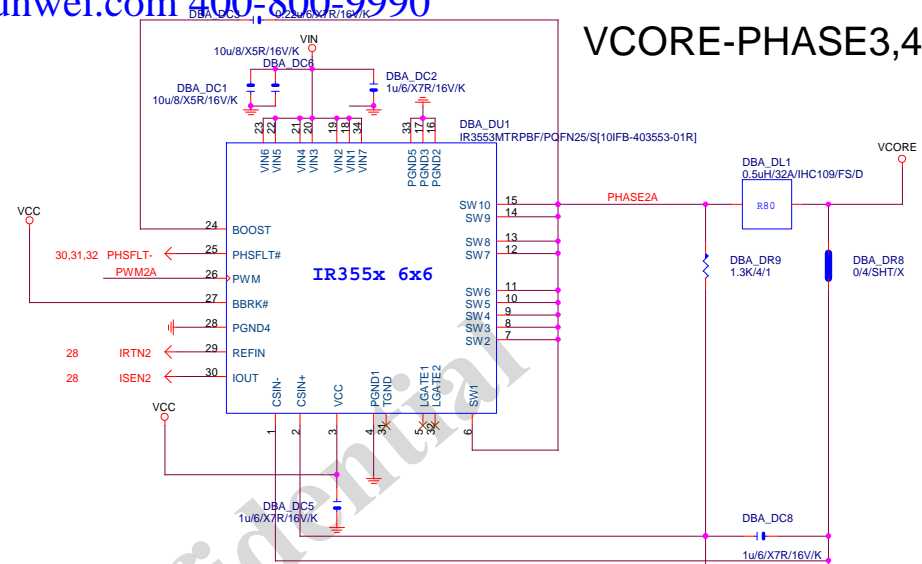
Title			
8-CH DAC & Anti-Pop / Mute			
Size	Document Number	GA-Z87X-UD4H	
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VCORE-PHASE1,2

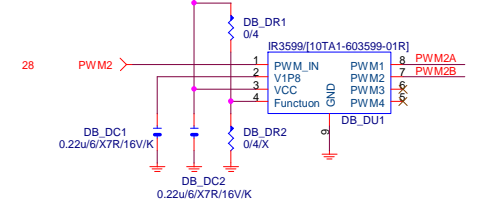


Add MOSFET Anti-Burn
4.11.28 N_THRMTRIP ← DAR109 0/4 PHSFLT- UD4H 0.3 VCC
6.2K/4/X

VCORE-PHASE3,4



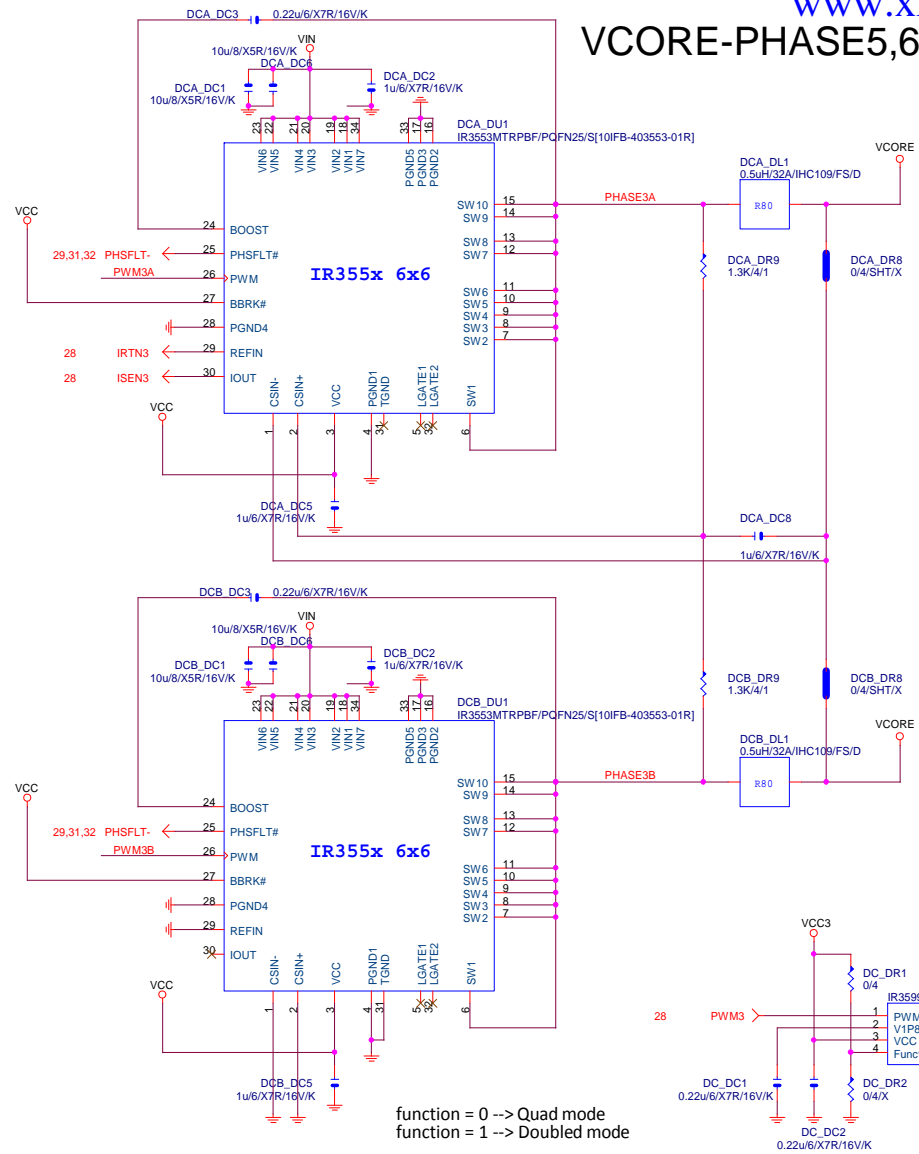
function = 0 --> Quad mode
function = 1 --> Doubled mode



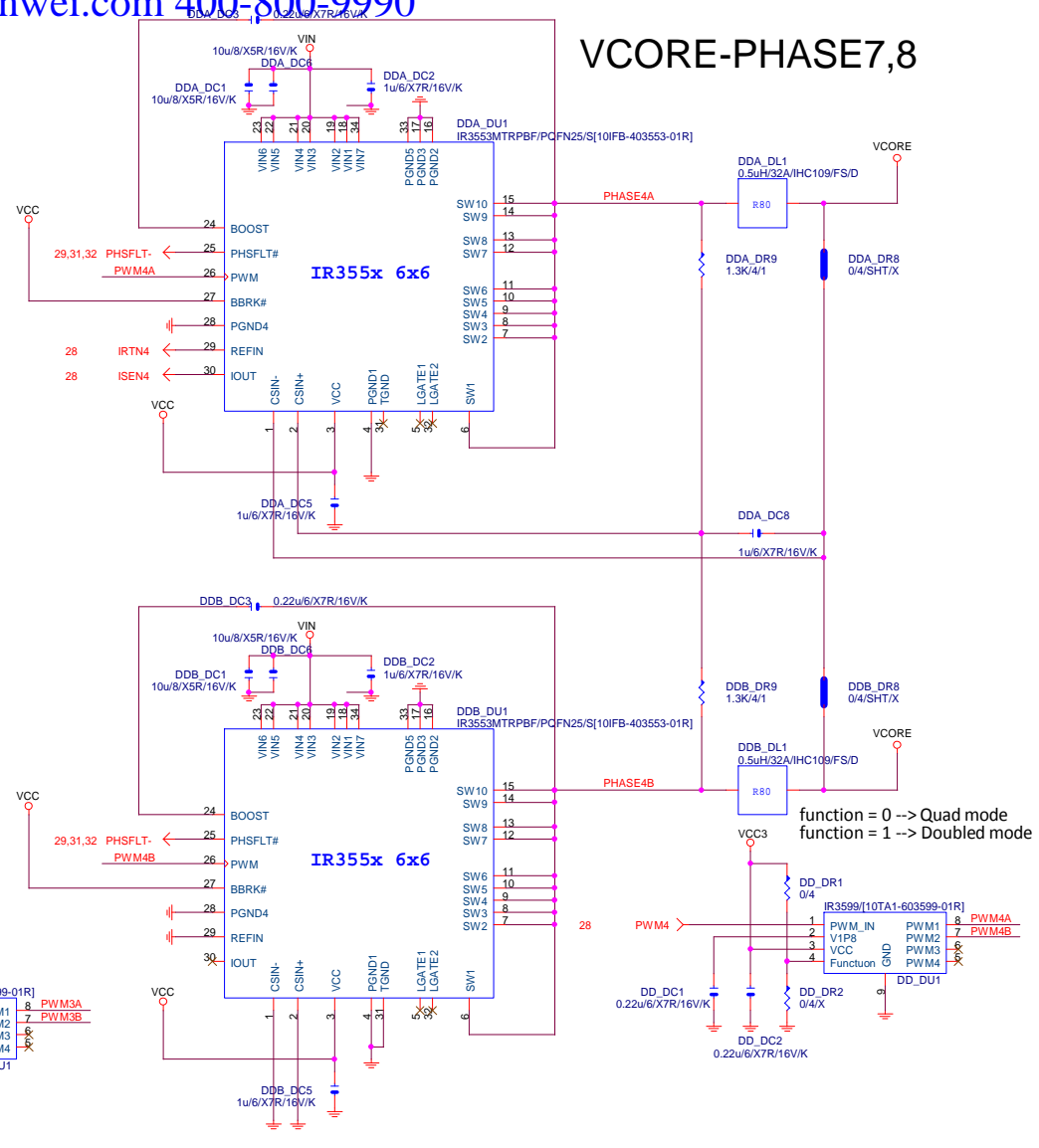
Gigabyte Technology

Title			
CPU CORE VR			
Size	Document Number	GA-Z87X-UD4H	
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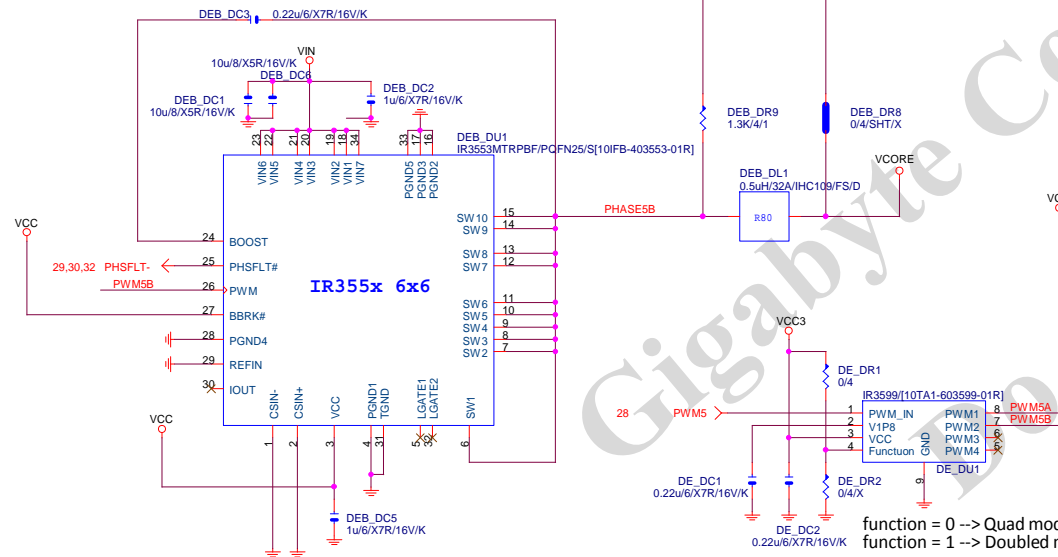
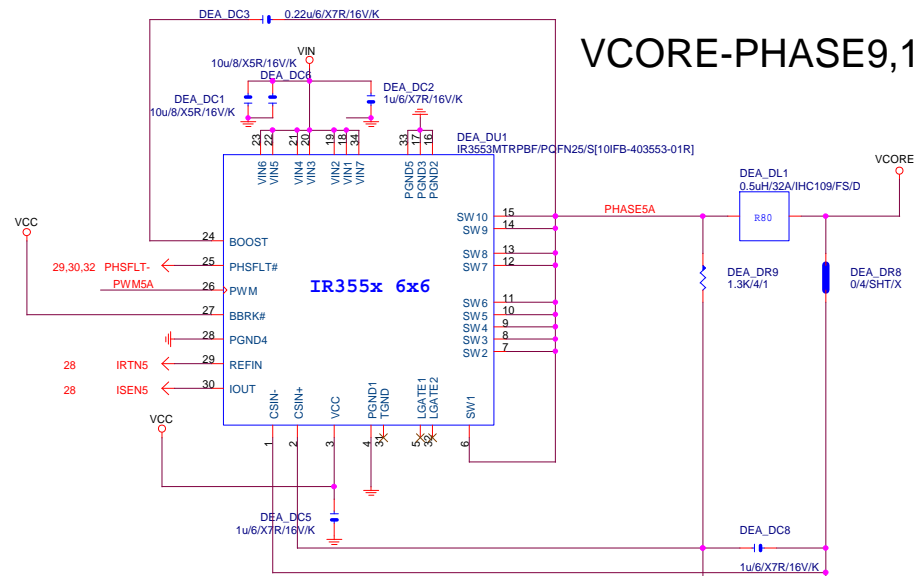
VCORE-PHASE5,6



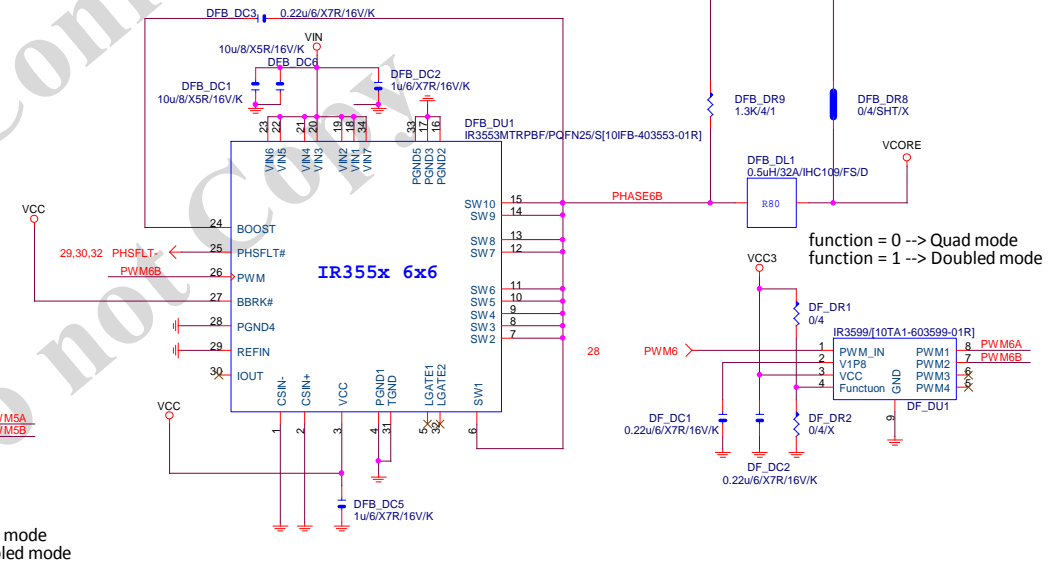
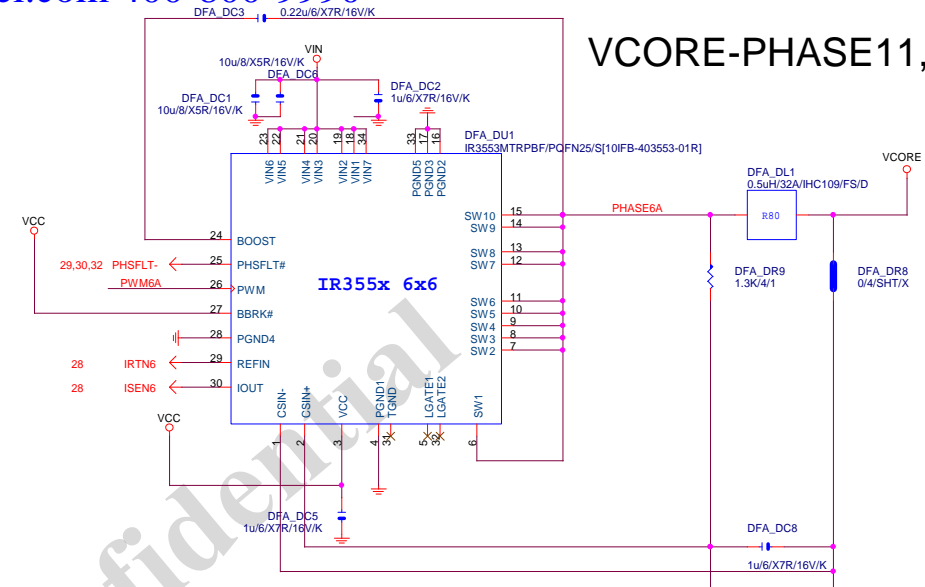
VCORE-PHASE7,8



VCORE-PHASE9,10



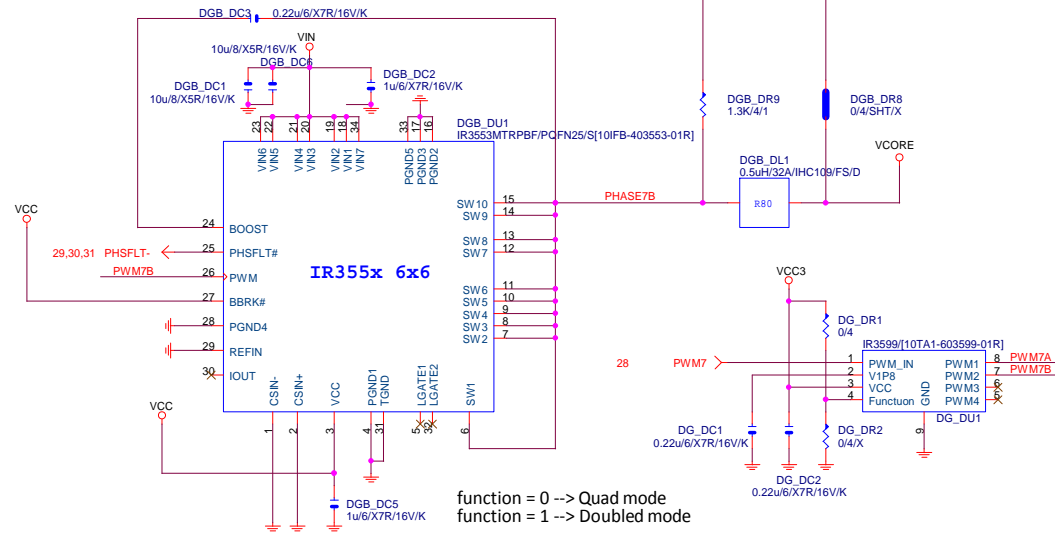
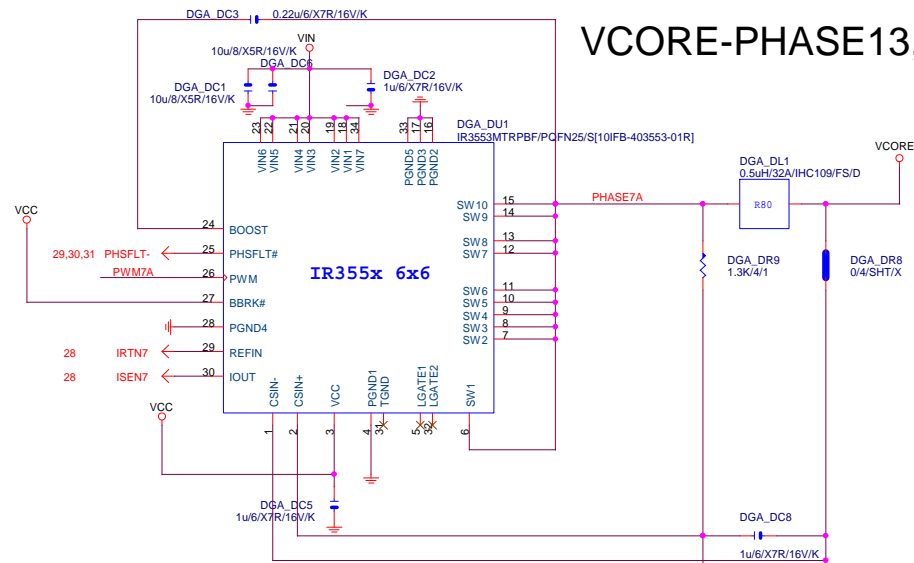
VCORE-PHASE11,12



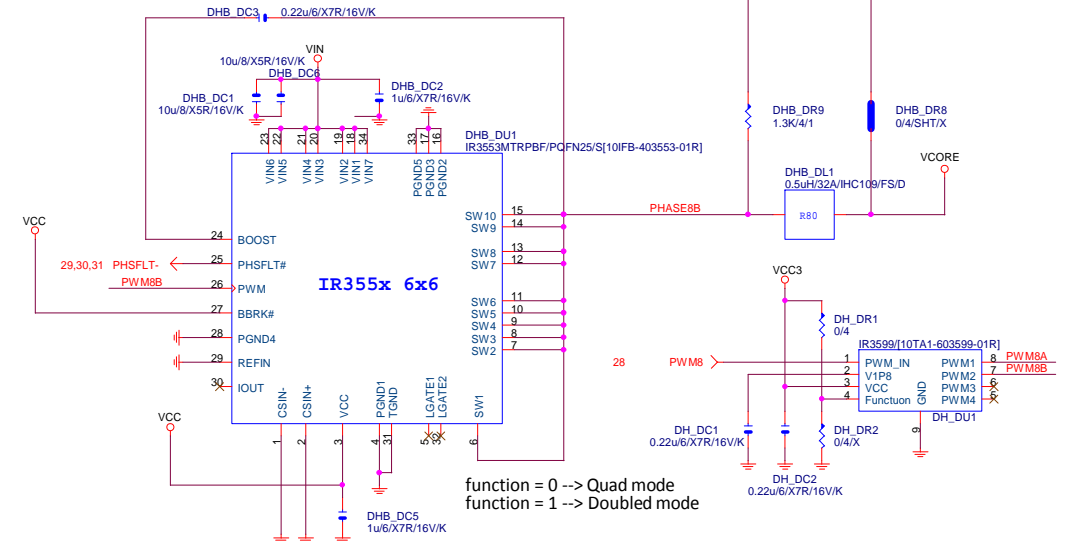
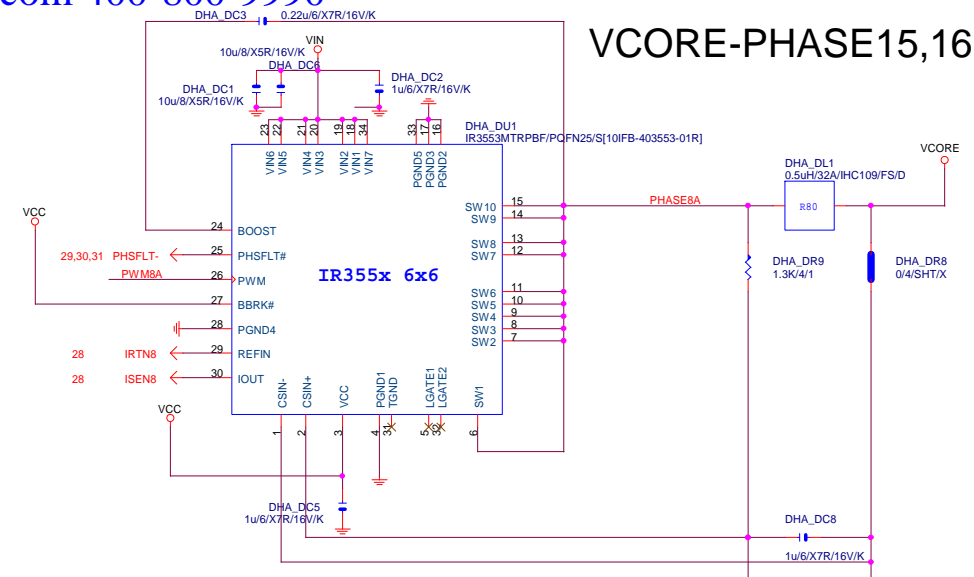
Gigabyte Technology

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VCORE-PHASE13,14

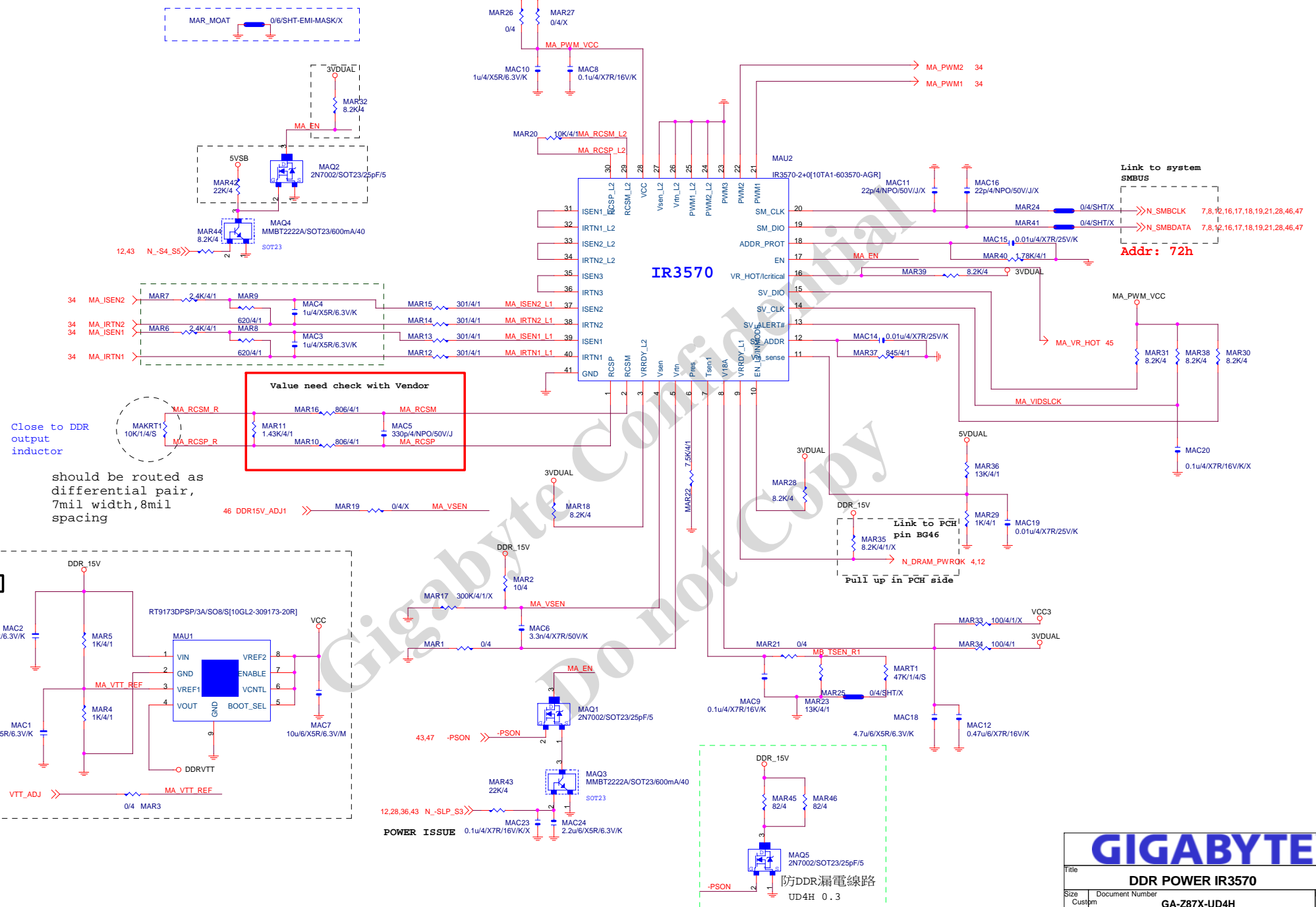


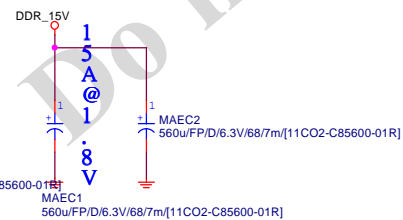
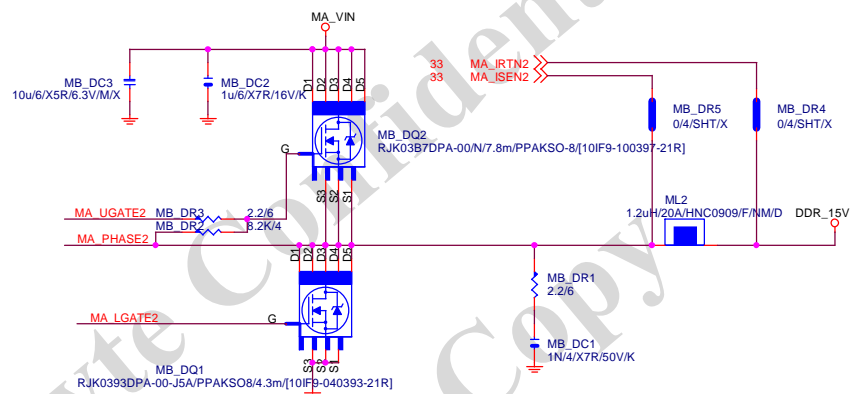
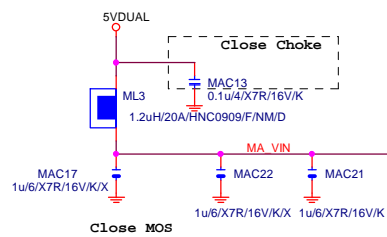
VCORE-PHASE15,16

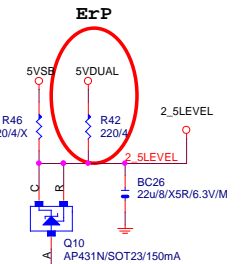
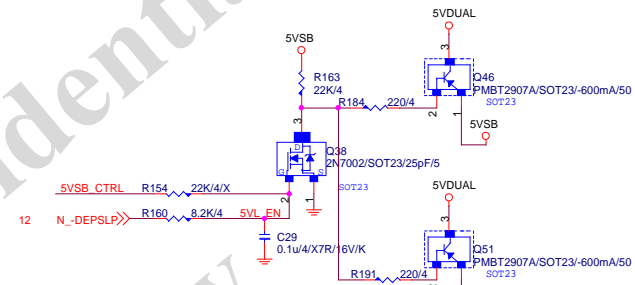
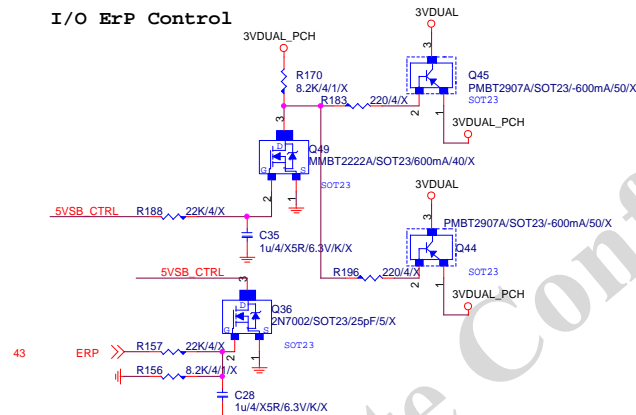
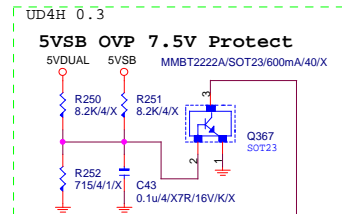
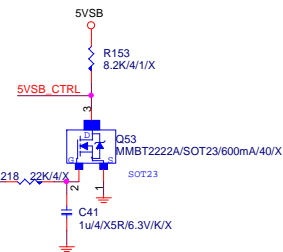


Gigabyte Technology

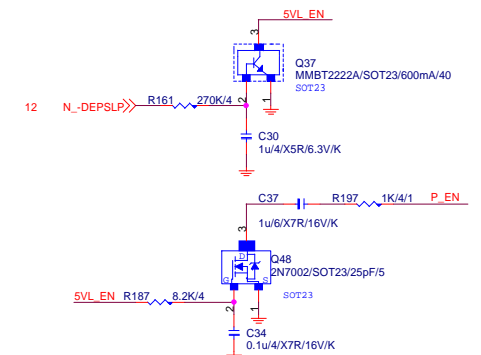
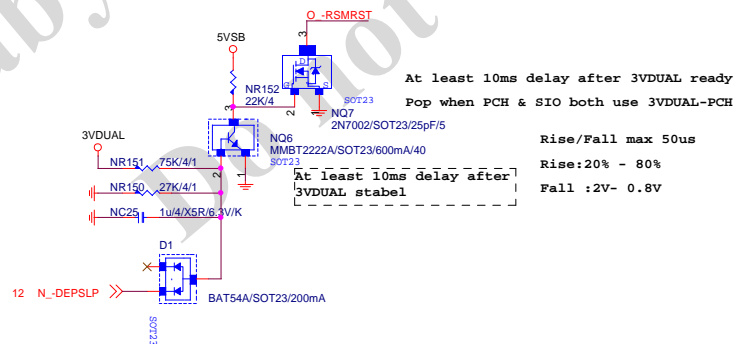
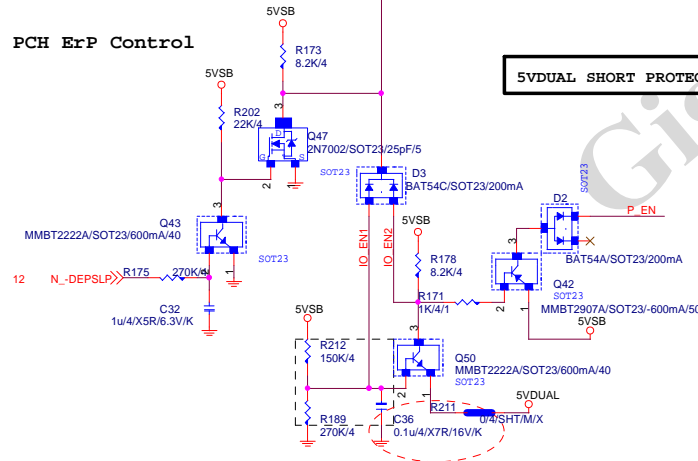
Title			IR3553-VCORE
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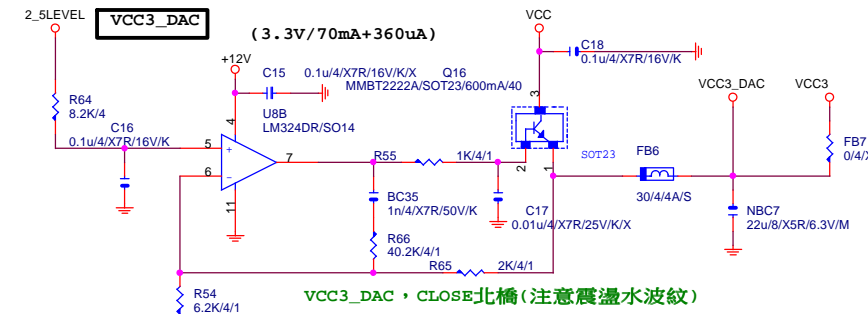
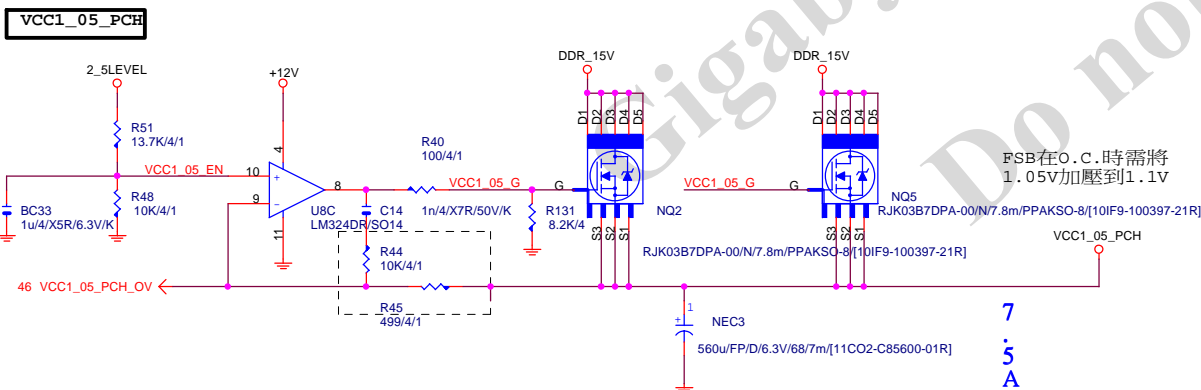
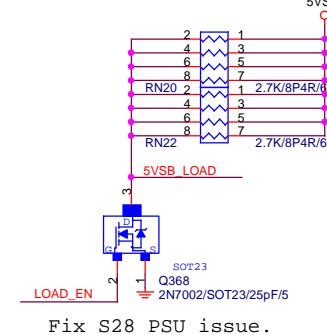


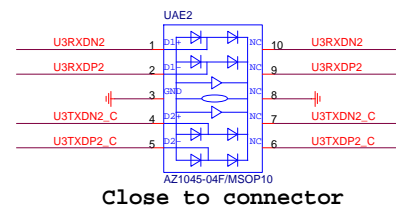
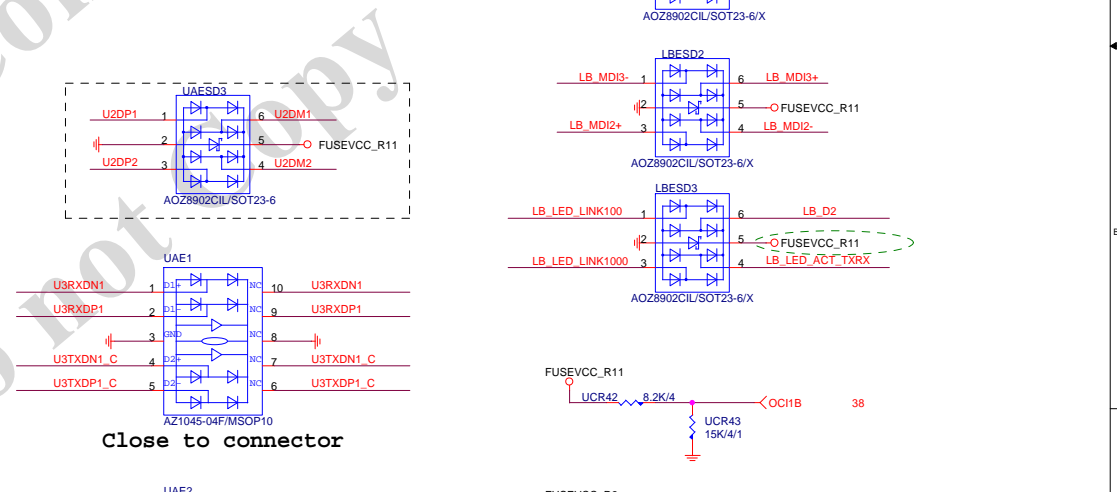
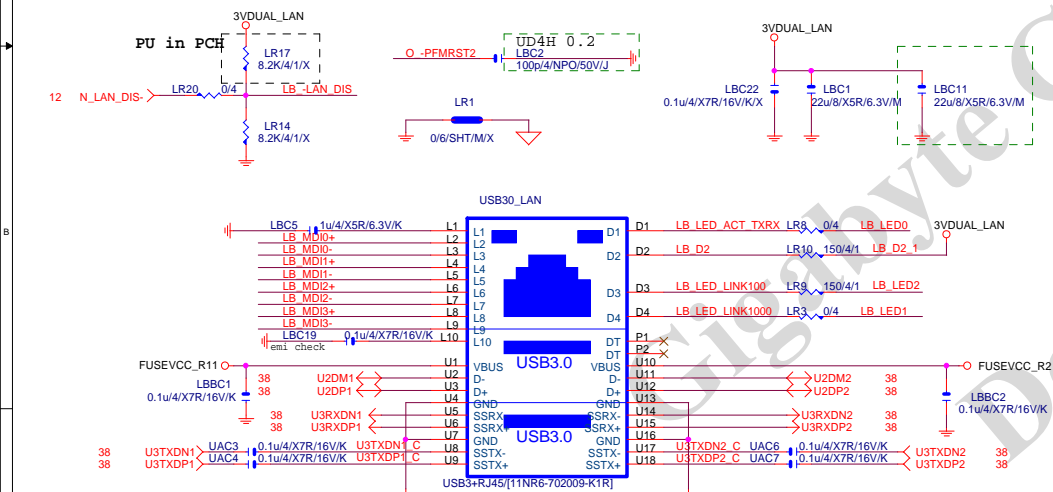
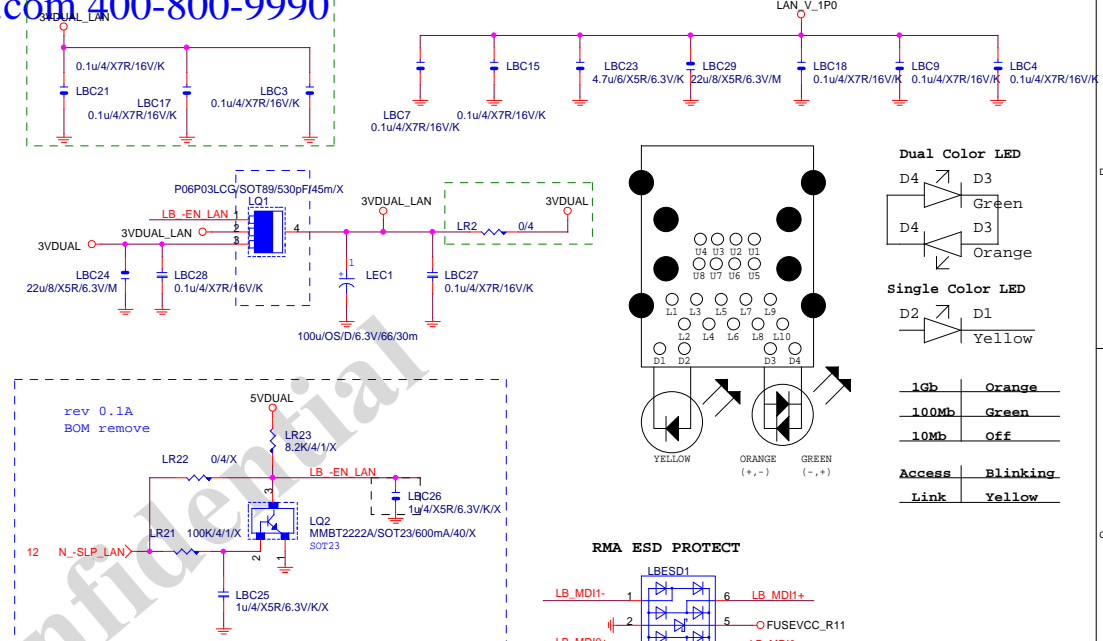
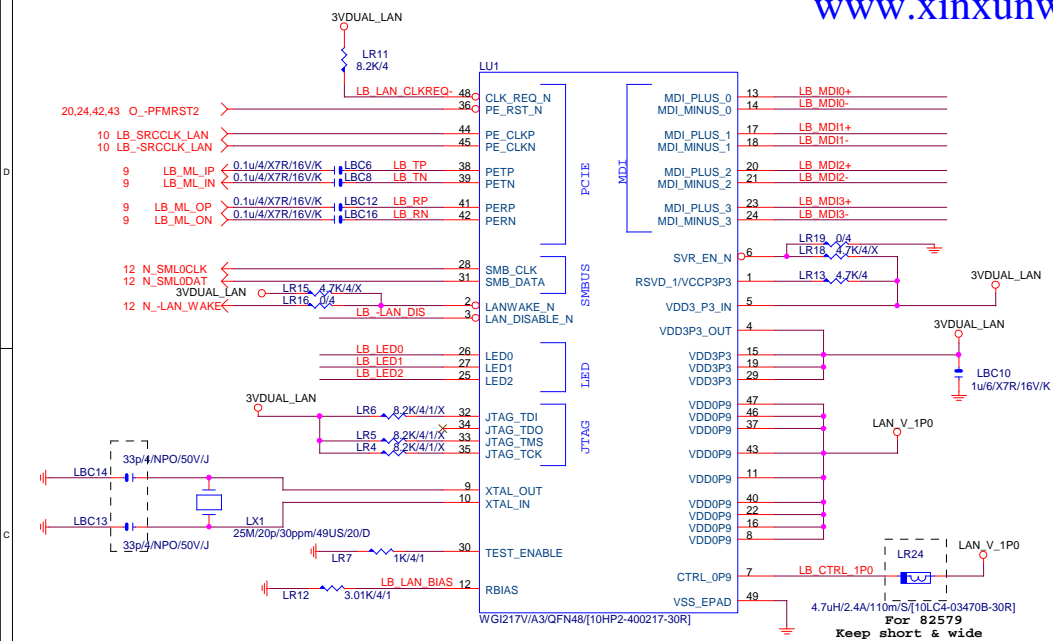




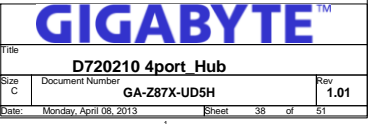
5VDUAL SHORT PROTECT

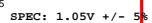
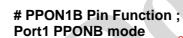
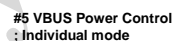
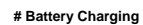


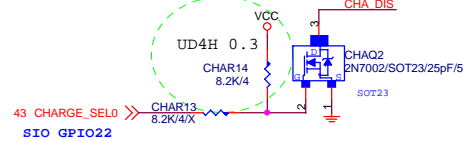
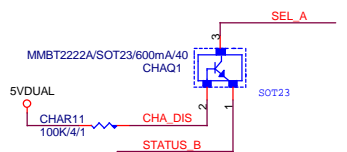
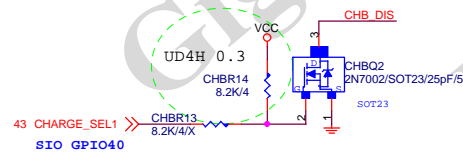
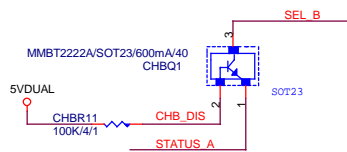
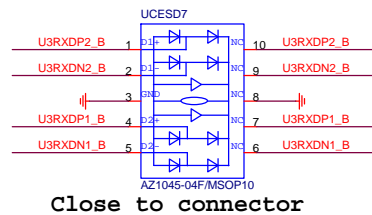
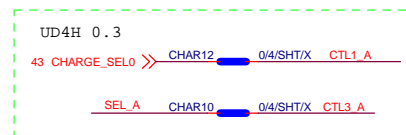
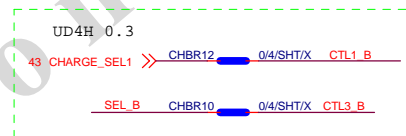
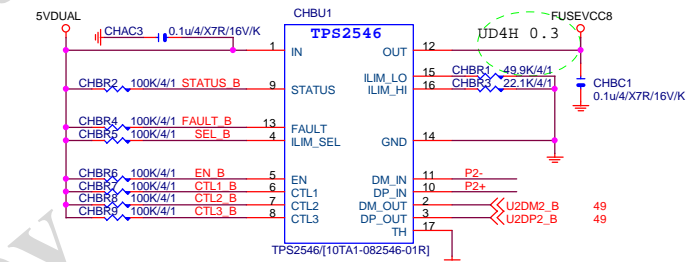


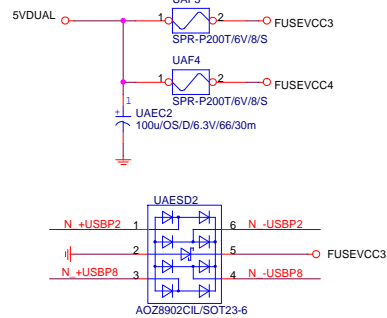
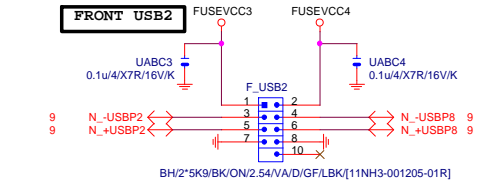
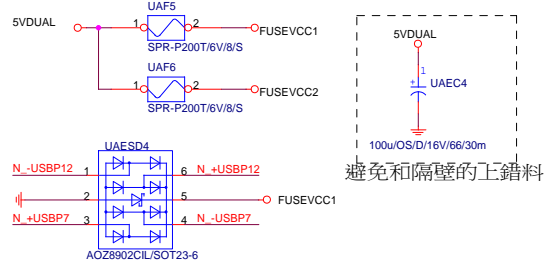
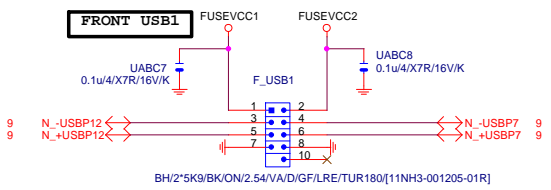


Title			
INTEL LAN i217V			
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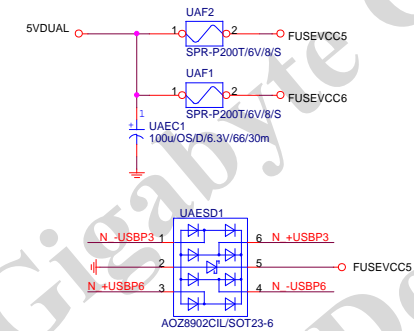
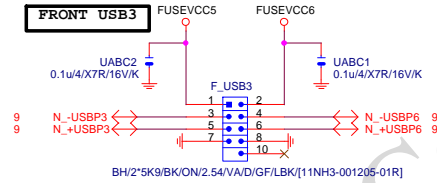
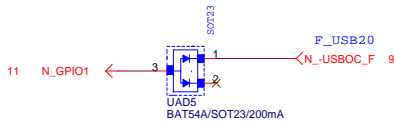




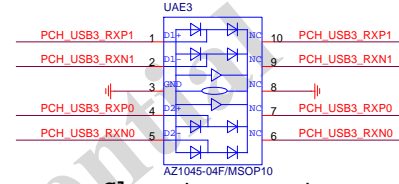
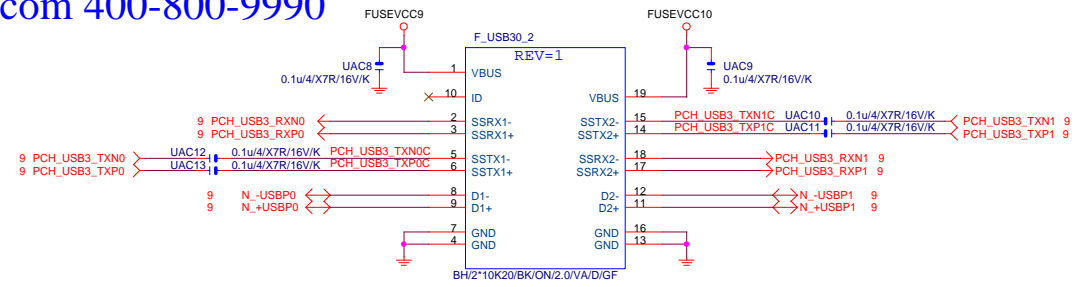
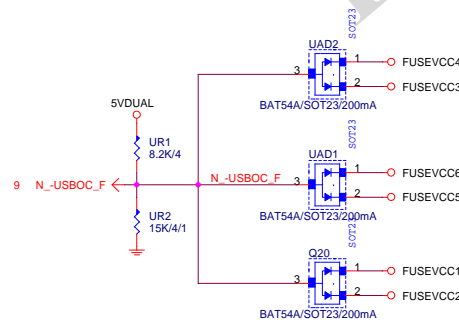




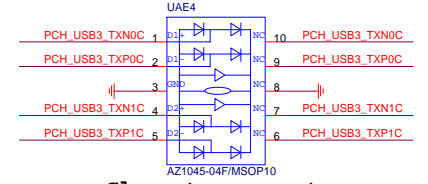
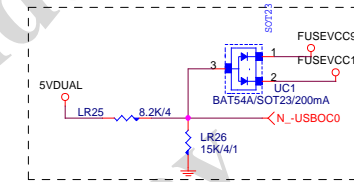
Close to connector



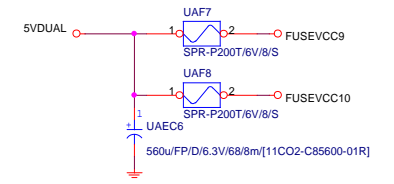
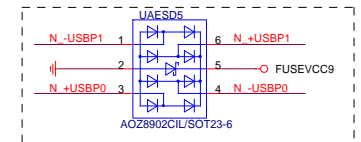
Close to connector



Close to connector



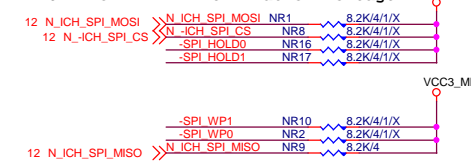
Close to connector



GIGABYTE

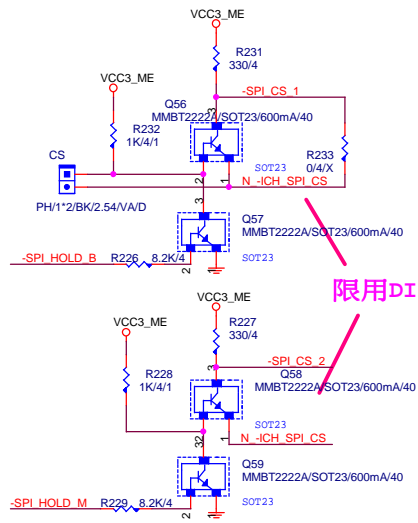
Title	FRONT USB 2.0, F_USB30_2		
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MOSI For DMI RX Termination Voltage

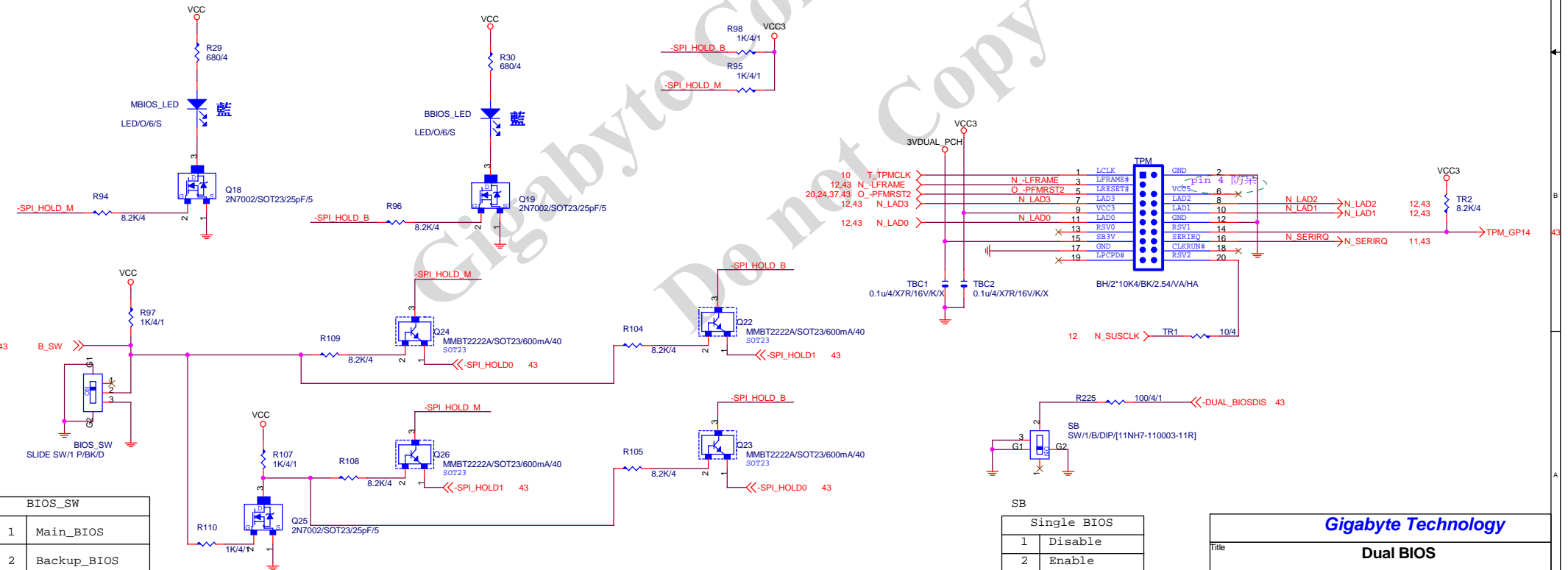
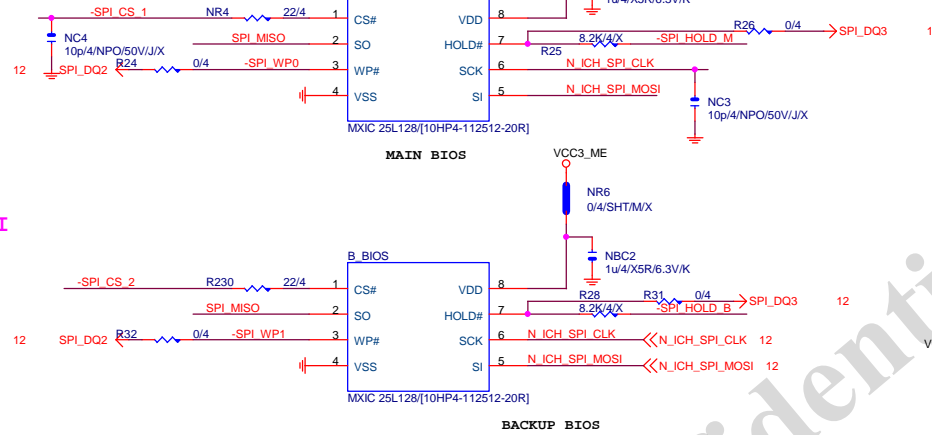


1 means floating
0 means PD 1K

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



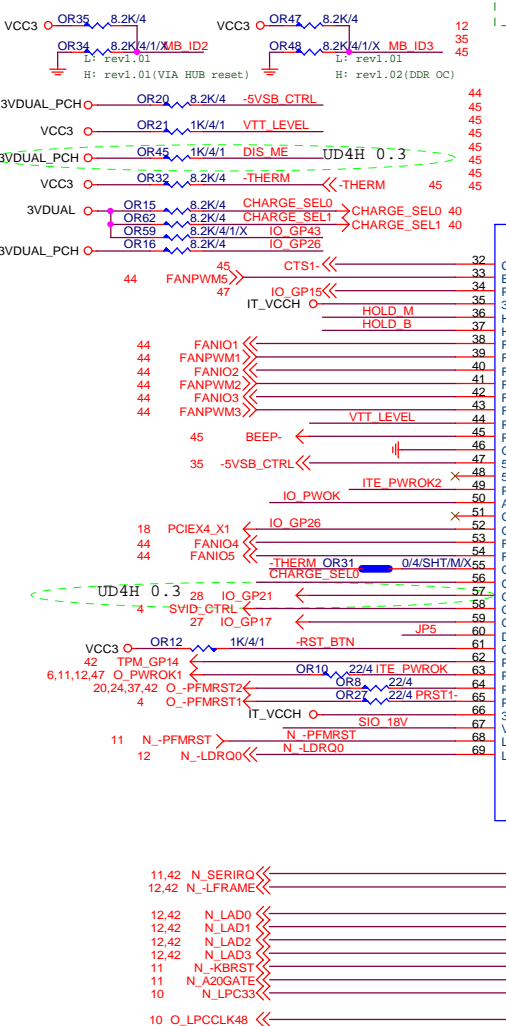
限用DII



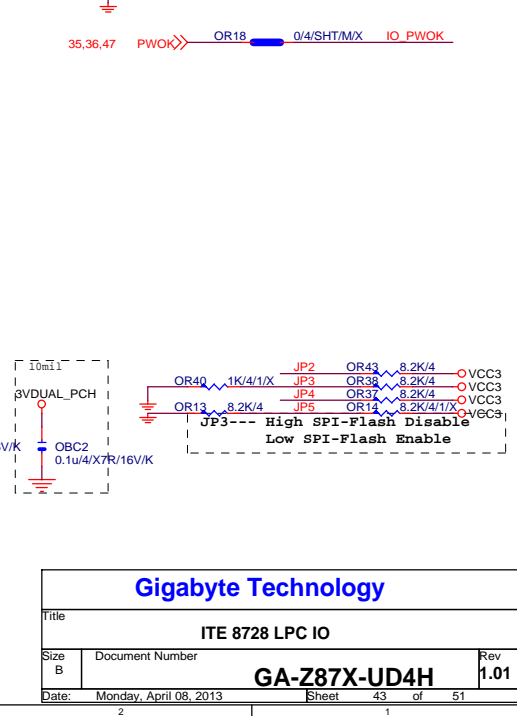
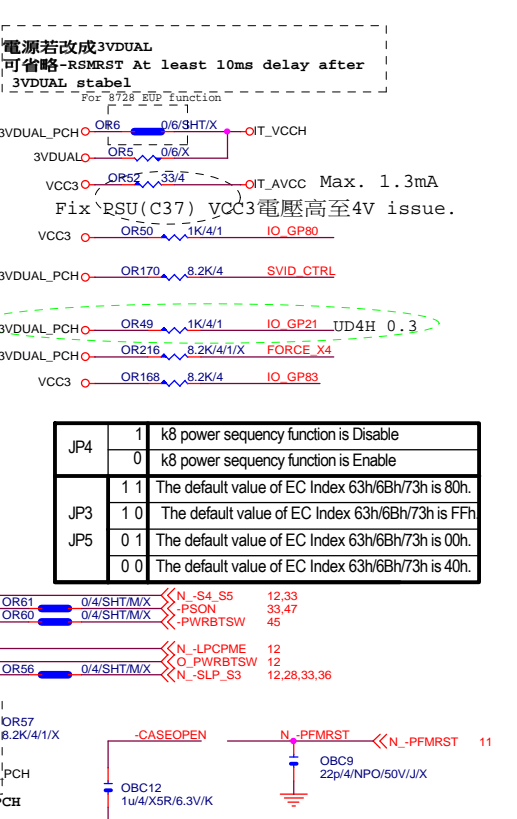
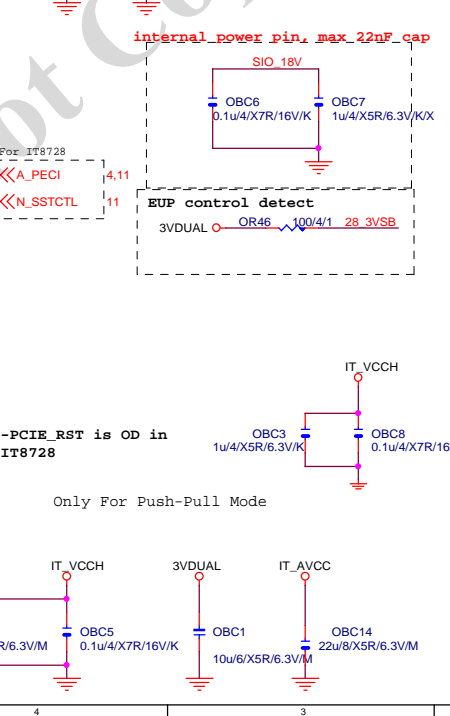
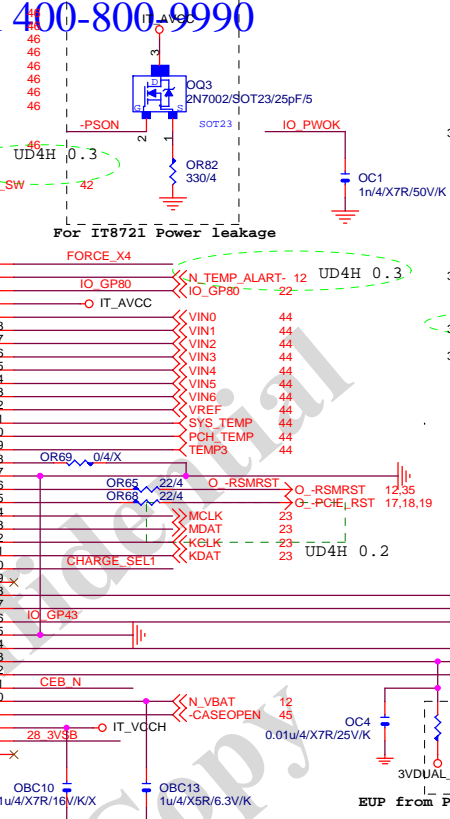
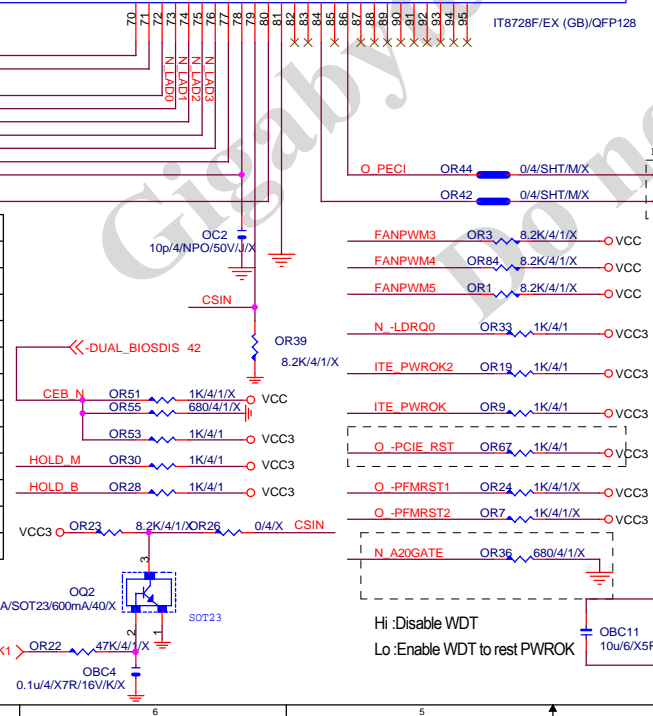
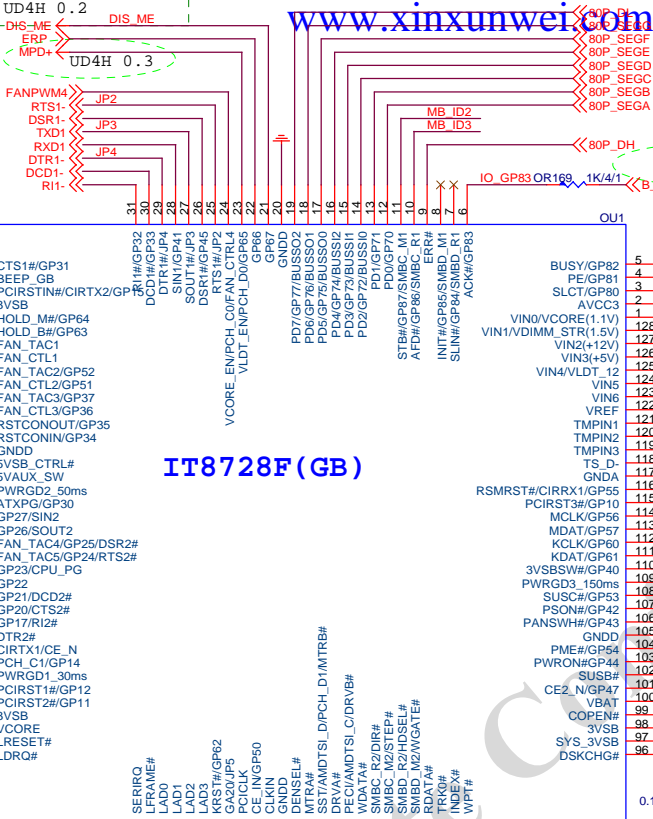
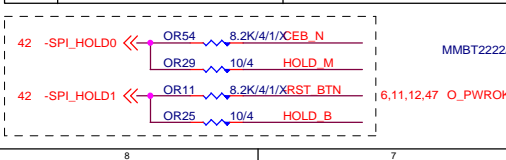
BIOS_SW	
1	Main_BIOS
2	Backup_BIOS

SB	
1	Disable
2	Enable

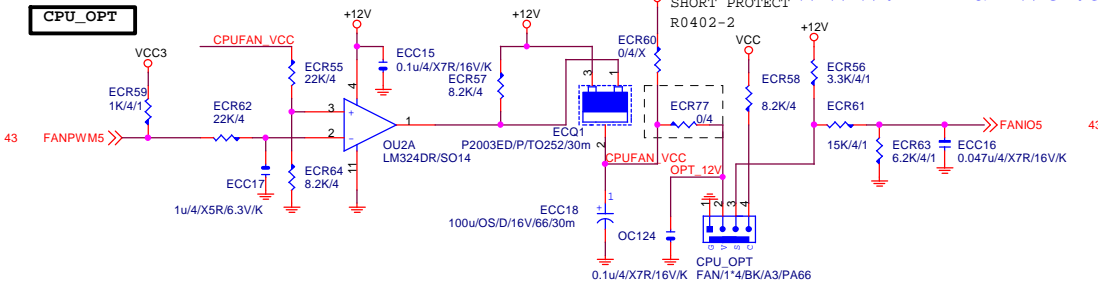
Gigabyte Technology		
Title		
Dual BIOS		
Size	Document Number	Rev
Custom	GA-Z87X-UD4H	1.01
Date:	Monday, April 08, 2013	Sheet 42 of 51



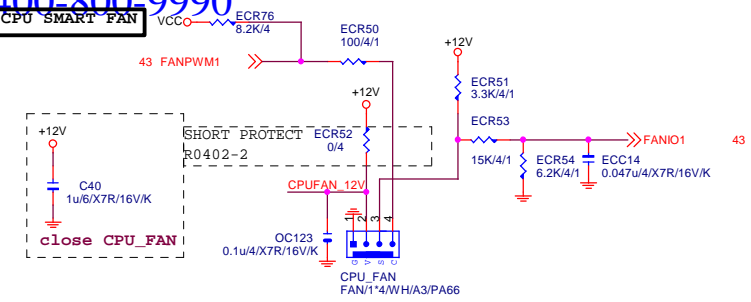
	IT8721	IT8728
PIN121	FAN_CTL4/VID_TURBO	VCORE_EN/PCH_C0
PIN120	VDDA_EN	VLDI_EN/PCH_D0
PIN19	GP30	ATXP_G
PIN31	GP14	PCH_C1
PIN53	SST/AMDTSI_D/PECI_AVA/MTRB#/PCH_D	SST/AMDTSI_D/MTRB#/PCH_D1
PIN55	PECI/AMDTSI_C/DRVB#/PCH_C	PECI/AMDTSI_C/DRVB#
PIN66	GP47	SYS_3VSB
PIN70	SYS_3VSB	GP47
PIN95	VIN3/ATXP_G	VIN2(VCC5)
PIN96	VIN2	VIN1(VCC12)
PIN97	VIN1(VCC5)	VIN1/VDIMM_STR(1.5V)
PIN98	VIN0(VCC12)	VIN0/VCORE(1.1V)



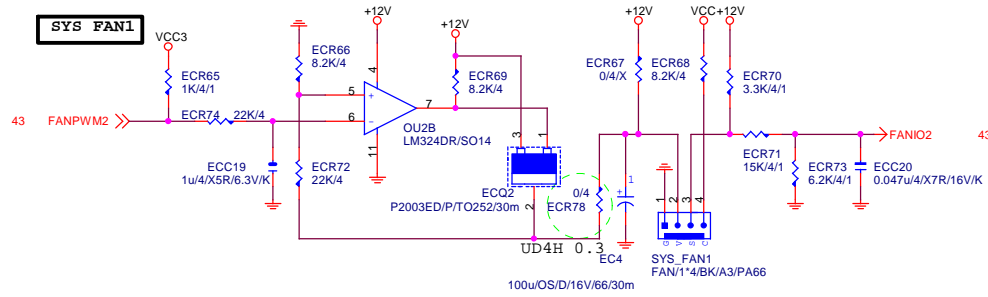
CPU_OPT



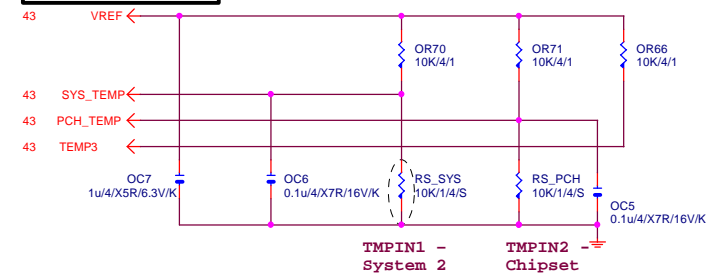
CPU SMART_FAN



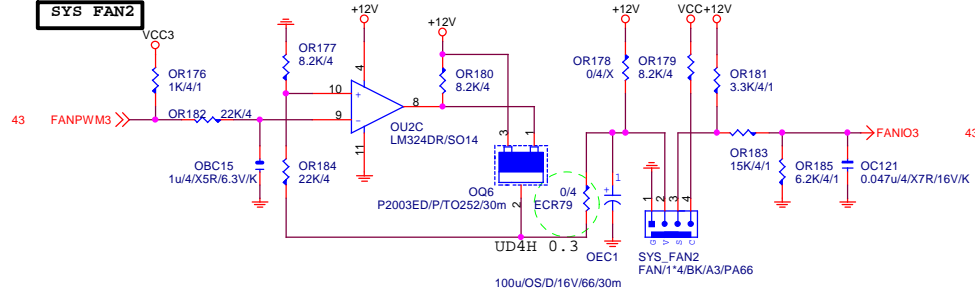
SYS_FAN1



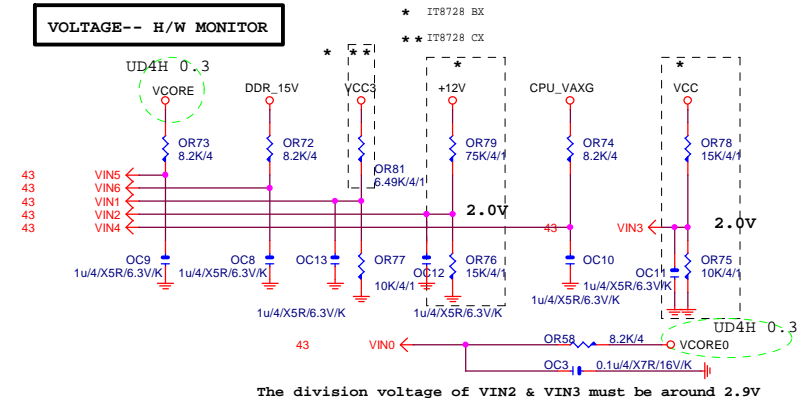
TEMP H/W MONITOR



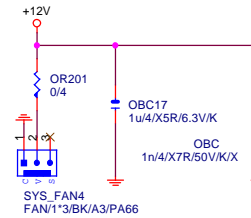
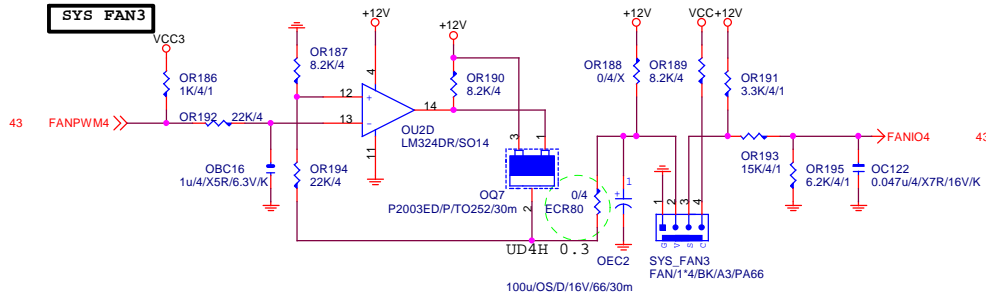
SYS_FAN2



VOLTAGE-- H/W MONITOR



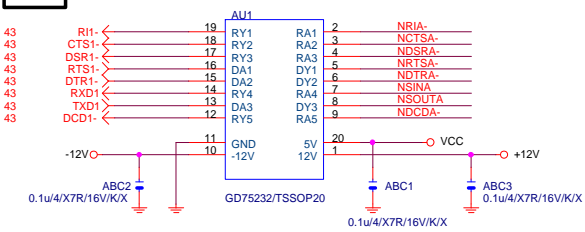
SYS_FAN3



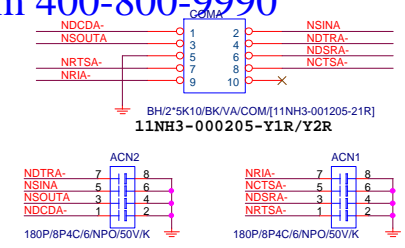
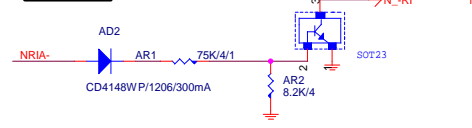
Gigabyte Technology

Title			HWM,KB/MS, FAN CTRL
Size	Document Number	Rev	
Custpm	GA-Z87X-UD4H	1.01	
Date:	Monday, April 08, 2013	Sheet	44 of 51

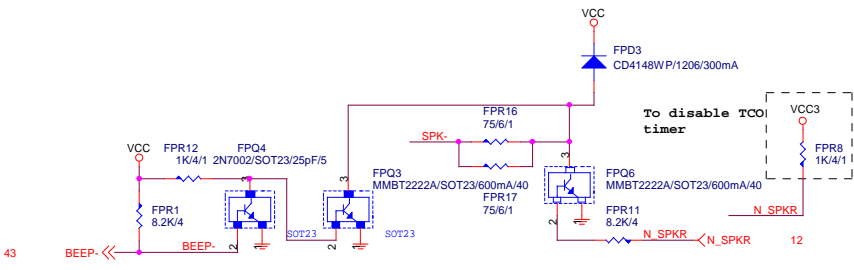
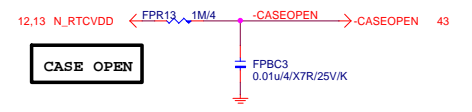
COMA



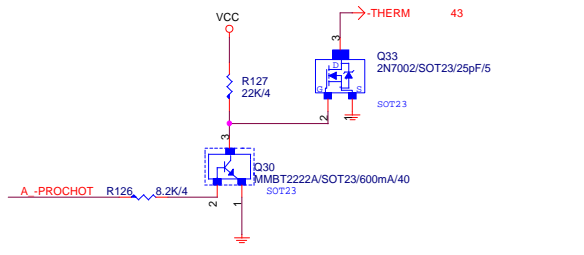
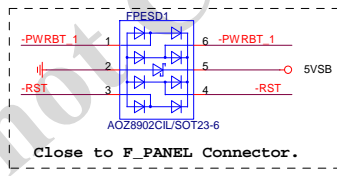
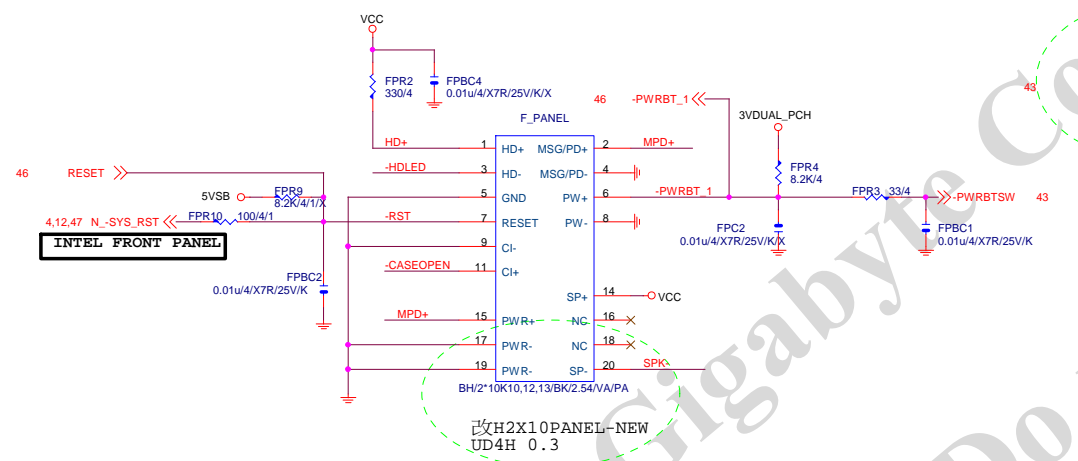
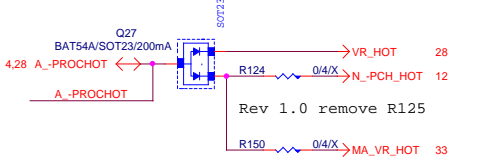
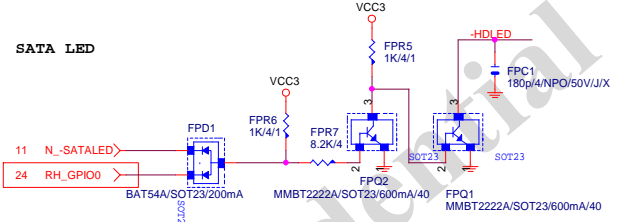
COM RI

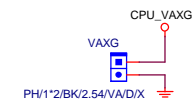
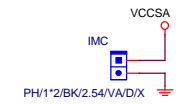
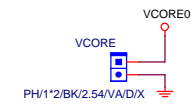
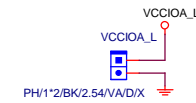
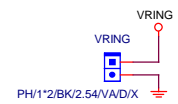
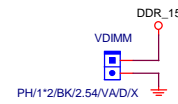
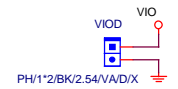
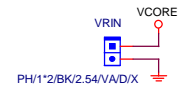
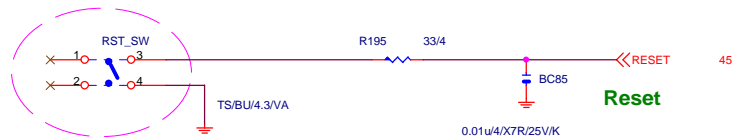
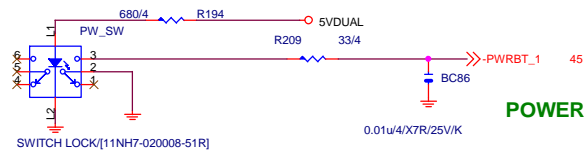
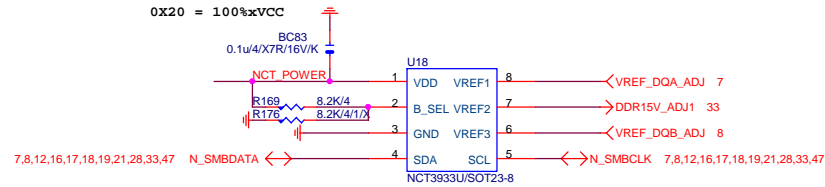
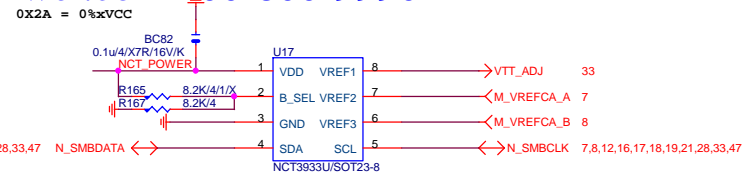
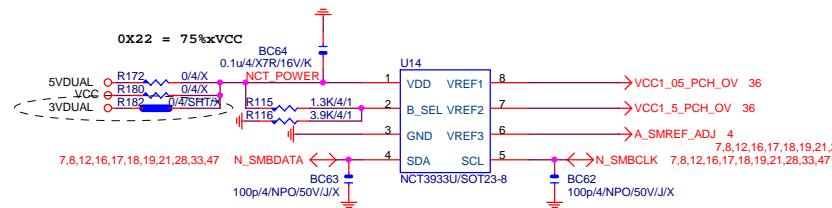


CASE OPEN

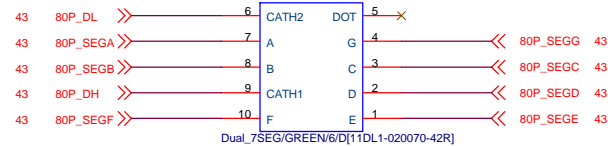
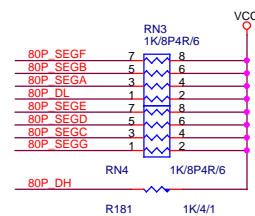


SATA LED

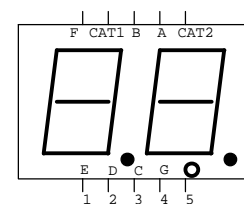




80 PORT

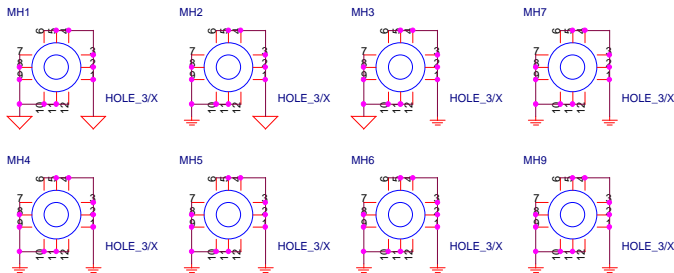
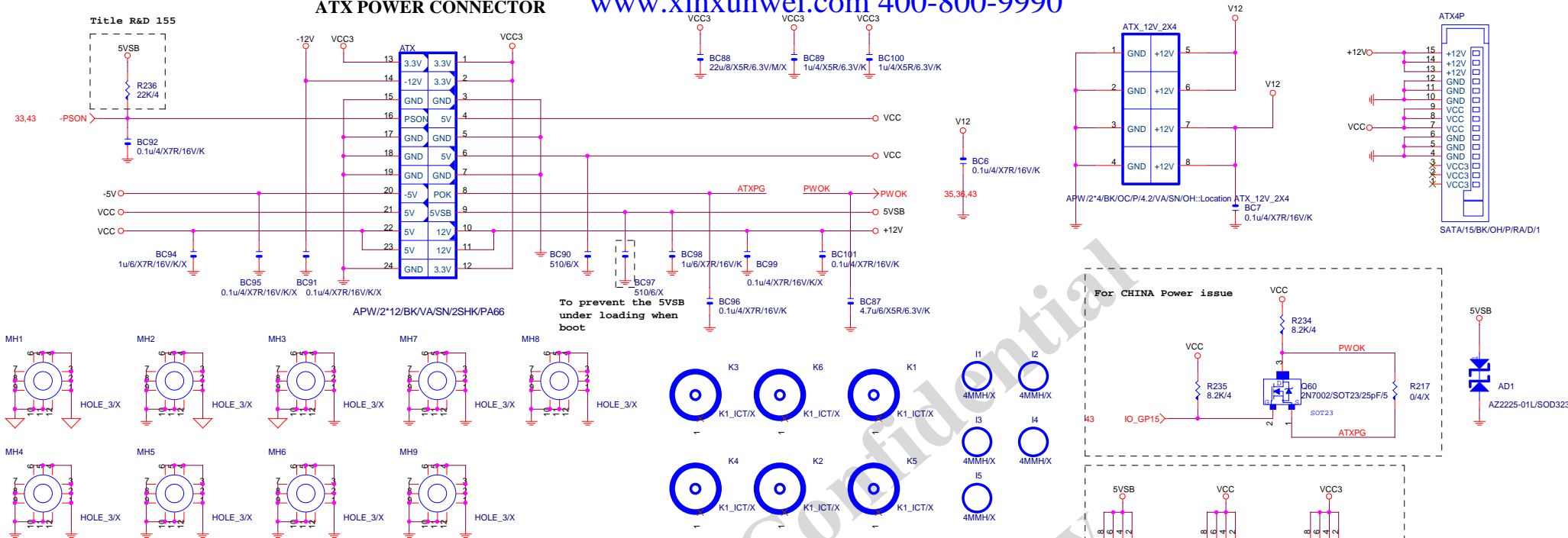


COMMON CATHODE

Physical Package
(TOP VIEW)

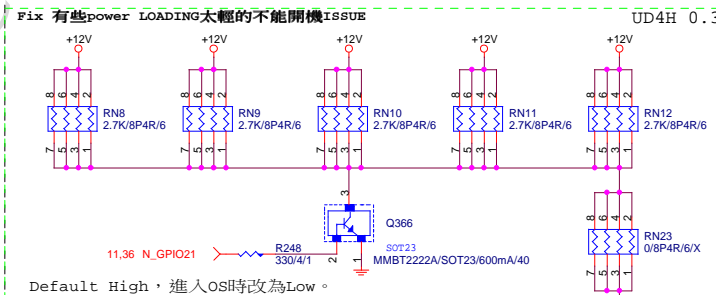
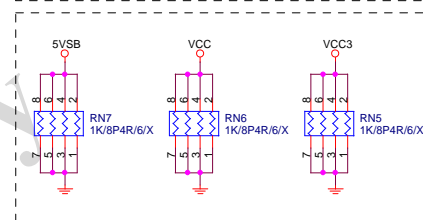
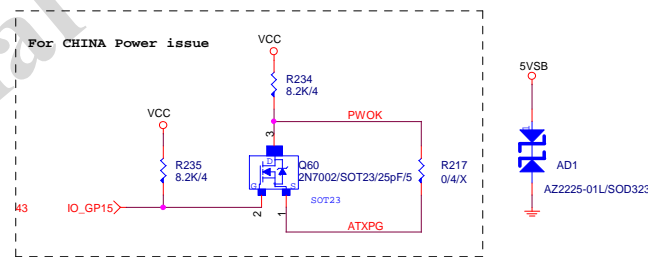
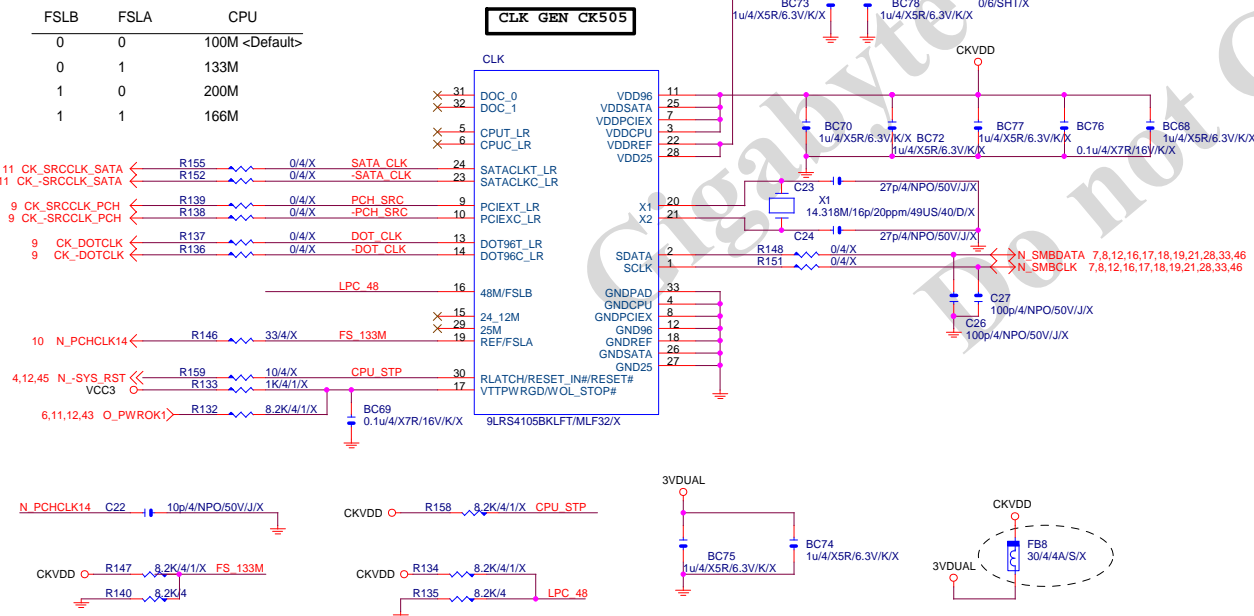
ATX POWER CONNECTOR

Title R&D 155



CPU Frequency Selection

FSLB	FSLA	CPU
0	0	100M <Default>
0	1	133M
1	0	200M
1	1	166M



Gigabyte Technology

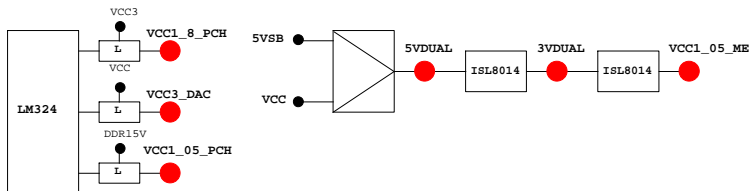
Title			ATX POWER CONNECTOR
Size	Custom	Document Number	GA-Z87X-UD4H
Date:	Monday, April 08, 2013	Sheet	47 of 51

Rev 1.01

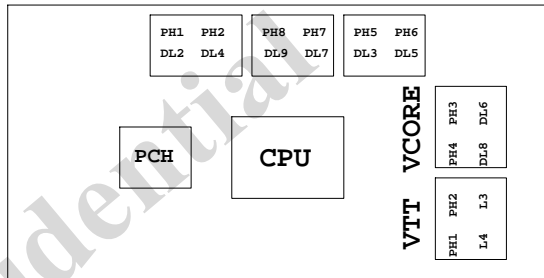
Super I/O ITE8720 GPIO Table

PIN NAME	USAGE	NOTE
SVC/PECI_RQT/GP14	-PECI_REQ	
PWROK1/GP13	PWROK1/ITE_PWROK	
KRST#/GP62	-KBRST	
SO/GP50	-ICH_SPI_CS	
IRTX/GP47/CE2_N/JF7	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/BUSSI1	SB_LED1_C	
PD4/GP74/BUSSI2	SB_LED2_C	
VCORE_EN/VID7/GP64	IT_GP64	GB_LED3_C
PD0/GP70	NB_LED1_C	
PD1/GP71	NB_LED2_C	
PD2/GP72/BUSSI0	NB_LED3_C	
GP22/SCK	LOW_PWR_1	
VIDO5/GP27/SIN2	LOW_PWR_2	
PCIRST2#/GP11	-PFMRST1	
PCIRST1#/GP12	-PFMRST2	
3VBSBW#/GP40	CSI_F0	BSEL166_1
SCS#G/GP53	CSI_F1	BSEL166_2
GP23/SI	BSEL166_3/CSISBSL	
VIDO0/GP20/CTS2#	CPUT_LED1_C	BSEL166_4
GP65/VDDA_EN/GB_01	MB_ID2	
PD6/GP76/BUSSO1	MB_ID3	
PD7/GP77/BUSSO2	MB_ID4	
AFD#/GP86/SMB_C	PSI_FIN	FST_2X8
INIT#/GP85/SMB_D	SEC_2x8	GT1REF_AD2
ACK#/GP83	DDR_LED1_C	
VIDO1/GP21/DCD2#	DDR_LED2_C	
STB#/GP87/SMB_C	DDR_LED3_C	
PWRON#GP44	VCORE_OV1	
PANSWH#/GP43	PWRBTSW	
KDAT/GP61	-PWRBTSW	
KCLK/GP60	KDAT	
MDAT/GP57	KCLK	
MACL/GP56	MDAT	
GP66/VLDT_EN/GB_02	NBT_LED1_C	MCLK
SVD/PCIRSTIN#/CIRTX/GP15	PWM2_CR	
KDAT/GP61	PWM2_CR	
GP67/CPU_PG/GB_03	EN_LOADLINE	IT_GP67/-EN_PWM2
SLIN#/GP84/SMBD_R	-EN_PWM2	
PSI_L/FAN_CLT5/CIRRX2/GP16	-THERM	
VIDO4/GP26/SOUT2	DDR18V_PH2_EN	
VIDO2/FAN_TAC5/GP24/DSR2#	DDR18V_LED	
VIDO6/GP17/RI2#	1_1V_PH_EN	
VIDO7/JP6/DTR2#	JF6	
PD5/GP75/BUSSO0	SB_LED3_C	



PWM各相位的擺法如下：



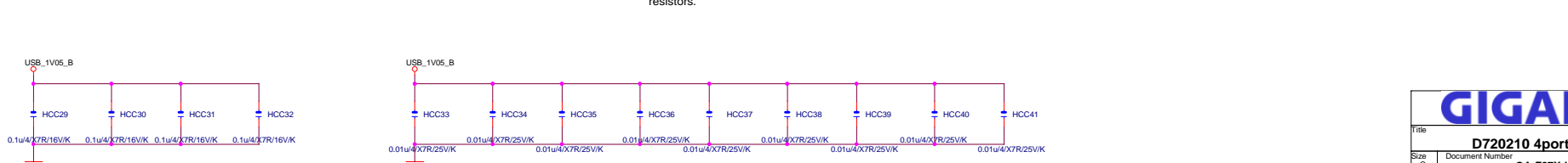
BIOS超電壓對應表：

散熱模組料號:

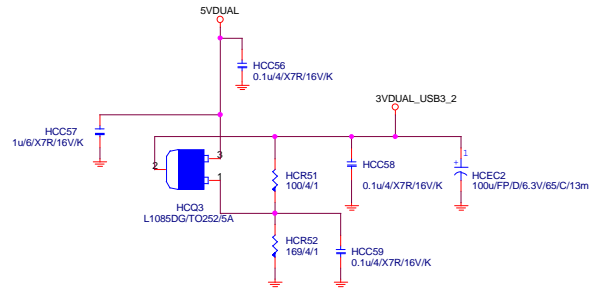
線路圖名稱	BIOS選項
Vcore	CPU Vcore
CPU_VTT	CPU Termination
CPU_VAXG	CPU Graphic Core
VCC1_8_PCH	CPU PLL
VCC1_05_PCH	PCH core
3VDUAL	3VDUAL
DDR15V	DRAM voltage
DDRVTT	DRAM Termination
VREF_CA_A/VREF_CA_B	DRAM Address Ref
VREF_DQ_A/VREF_DQ_B	DRAM Data Ref

	3 pin FAN control	4 pin FAN control	FAN speed	Controller
CPU FAN	FANPWM1	FANPWM3	FANIO1	IT8270
	ICH_FAN_PWM2	ICH_FAN_PWM0	ICH_FAN_TACH0	PCH
SYS FAN	FANPWM2	N/A	FANIO2	IT8270
	ICH_FAN_PWM1	N/A	ICH_FAN_TACH1	PCH
PWR FAN	N/A	N/A	FANIO3	IT8270
			ICH_FAN_TACH2	PCH

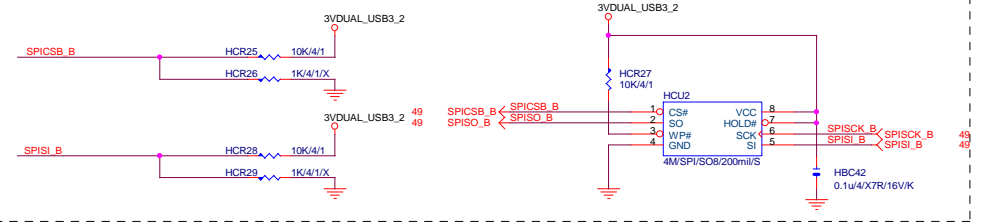
Gigabyte Technology			
Title			
TABLE LIST			
Size C	Document Number GA-Z87X-UD4H		Rev 1.01
Date:	Monday, April 08, 2013	Sheet 48 of 51	



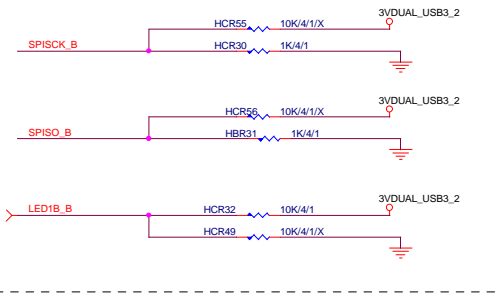
3VDUAL_USB



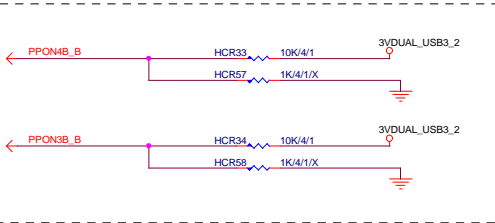
External SPI ROM ; SPI ROM attached mode



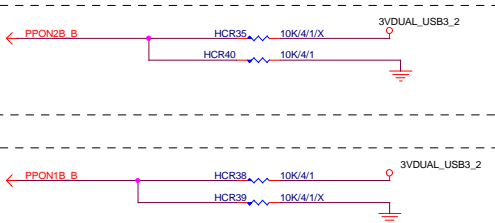
Battery Charging



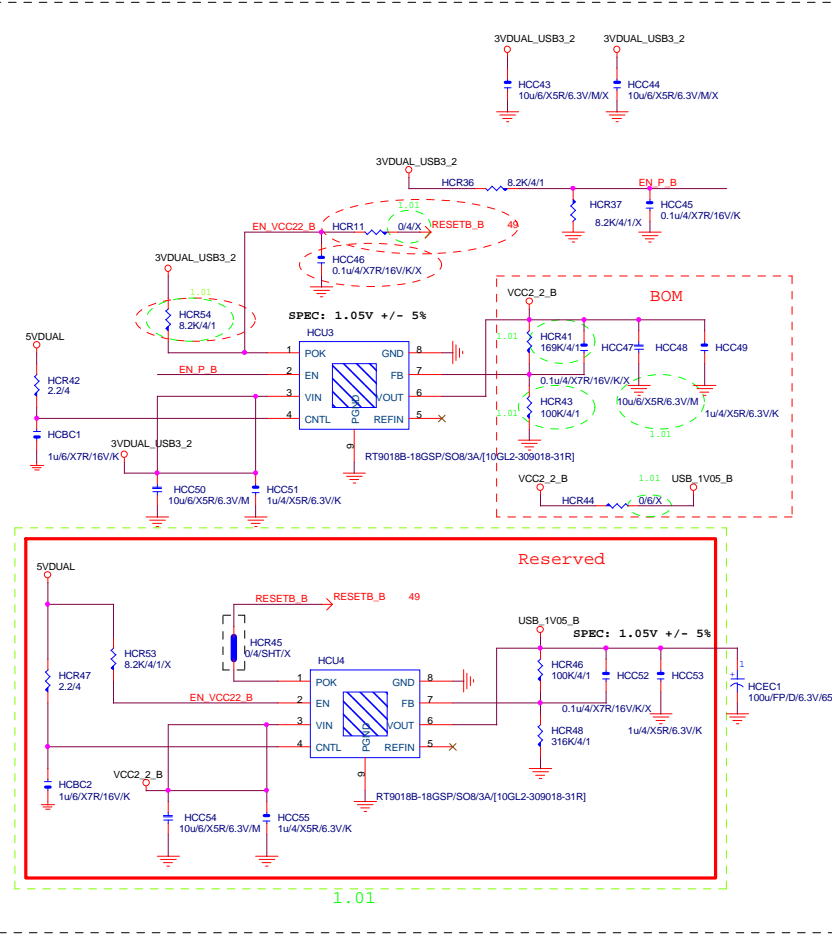
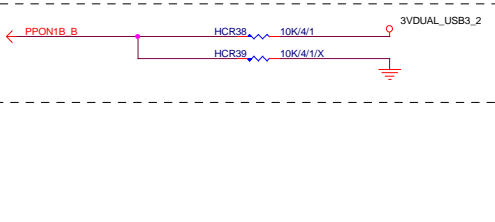
Number of Ports ; 4Ports mode

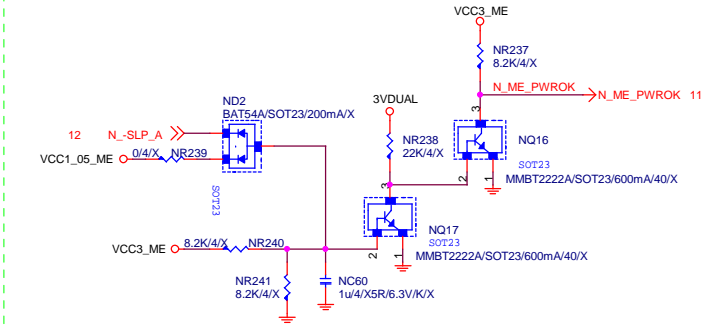
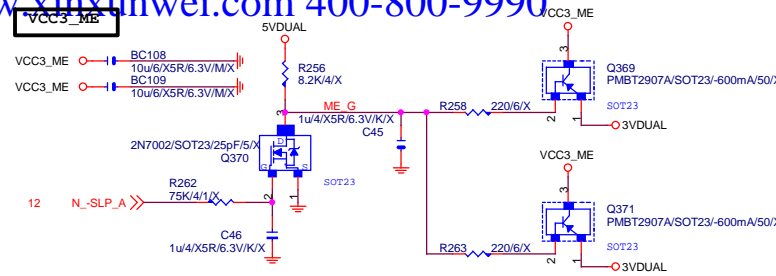
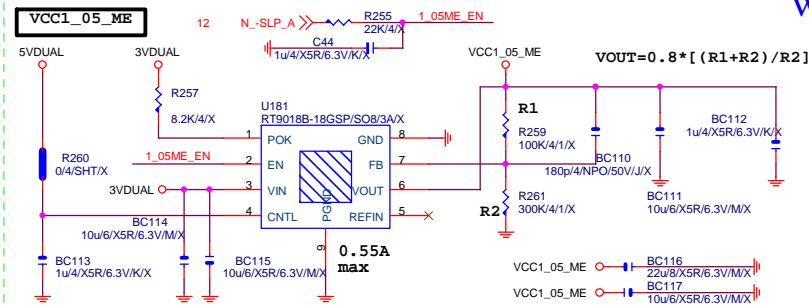


#5 VBUS Power Control ; Individual mode



PPON1B Pin Function ; Port1 PPONB mode





1.01 remove