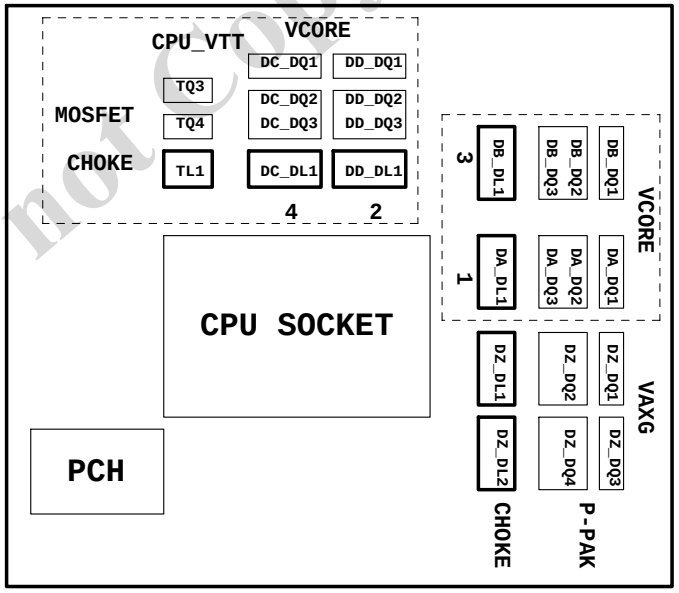
Model Name: GA-Z77-D3H

1.1

SHEET	TITLE
01	COVER SHEET
02	BOM & PCB MODIFY HISTORY
03	BLOCK DIAGRAM
04	CPU_LGA1155-A
05	CPU_LGA1155-B
06	CPU_LGA1155-C
07	DDR III CHANNEL A
08	DDR III CHANNEL B
09	PCH_FDI,DMI,USB,PCIE,NVRAM
10	PCH_DP,CLK BUFFER
11	PCH_HOST,SATA,PCI
12	PCH_GPIO,CTRL,AUDIO
13	PCH_PWR,GND
14	PCI EXPRESS*16 SLOT
15	PCIEX1*3 , PCIEX4 SLOT
16	ITE8892 PCI BRIDGE
17	PCI SLOT 1&2
18	I/O ITE8728
19	COM, -PROHOT, R_USB
20	Dual BIOS , TPM SLB9635TT
21	VT2021 CODEC
22	REAR AUDIO JACK
23	VCORE PWM_IR3564
24	VCORE PWM DRIVER IR3598
25	NCP3933 OVER VOLTAGE
26	DISCRETE POWER
27	DDR_15V & CPU_VTT PWM IR3570

SHEET	TITLE
28	DDR_15V & CPU_VTT PWM DRIVER CHL8550
29	VCCSA POWER
30	F_PANEL , F_USB2.0/3.0
31	ATX POWER, CLOCK GEN
32	HWM , KB/MS , FAN CTRL
33	LAN ATHEROS AR8151
34	N/A
35	M-SATA
36	DVI
37	HDMI , R_USB30
38	TABLE LIST
39	
40	



Gigabyte Technology

Title: Cover Sheet

Size: Custom | Document Number: GA-Z77-D3H | Rev: 1.1

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GA-Z77-D3H

Component value change history

Data	Change Item	Reason
0.1-1124	E-BOM	
02-1216	1. ADD PCH_HS & MOS_HS料號	
	2. PCIE gen2 switch PI3PCIE2415ZHE --> ASM1440	
	3. load-line DAR5=12K , DAR40=1.78K	
10A-0105	1. Z77料號更新	
	2. PWM Driver power vcc or +12v?	
	3. DART2 --> 47K/1/4/S , DAR44 --> 0 ohm	
10B-0113	1. Vcore & VAXG VSEN modify , DAR1,DAR51=100/4/1,DAR2,DAR54=0/4,DAC1,DAC24=3.3nF	
	2. 1.54K加替料:10RC4-001541-22R TA-I	
	1. Remove IR PWM 1X3 pin	
10C-0117	1. DA_DR11,DC_DR11,DZ_DR18 1ohm --> 0ohm	
10D-0119	1. Prochot R65 : 1.65K/4/1 --> 2.74K/4/1	
10E-EVT-0201	1. Modify choke=0.36uH , DRIVER=5V	
10F	1. IR3564要改用新料號03R	
	2. poochot change 100K	
10T	1. 0 OHM Short-pad	
	2. DDR3 FOR OC 2400MHz UP	
10G-1.01	0. PCB Rev1.0 --> ReV1.01 (DDR3 OC 2400MHz+)	
	1. RS_PWM相關線路移除 (若有上prochot pull up改100 ohm)	
	2. Add M/B ID for DDR3 OC	
	3. 固態電容區分100uF/6.3V & 100uF/16V	
10H-1.02	1. PCB Rev1.01 --> ReV1.02 (DDR3 OC 2800MHz+)	
	2. Add M/B ID for DDR3 OC	
	3. ADD DC79 FOR A_CPUPWROK	
	4. 100u 16V-->6.3V	
10I-0430	1. PWM IR3564 --> IR3564A	
	2. Remove DAESD1	
	3. RJK0393DPA 10IF9-040393-01R --> 10IF9-040393-11R	
11B-0703	1. EJ168 update料號:10HP2-800168-20R 1. VCC1_05_PCH 1.05 --> 1.1V	11C-0709 1. EJ168 10HP2-800168-20R --> 10HP2-800168-10R 2. PCIEX16 & PCIEX4 改成雙推式

Circuit or PCB layout change

DATE	Change Item	Reason
P67X-UD3-B3		
2011/02/18-0.1	1. 移除LAR11 ,LAR14 , NR28 ,新增NTP11	
2011/02/18-1.0	2. 新增DR388,DR389,DR391 ; Remove DQ49,DR347,DR371 3. CR44改成R0603-RH 4. R1,LAR3,RBR20,LABC25 -->R0402-2-SHORT 5. RAQ1 --> Q_TO223-MASK 6. RARN1 --> R8P4R-0402-SHORT 7. CESD1~5 --> SSOP5 8. RAQ2,RAEC1一起往下移40mil 9. CESD2文字面要標pin1	
2011/03/8-1.01	1. Add "Dolby" logo	
2011/03/8-1.02	1. UAFB1,UAFB2,UBF1,UBF2 Footprint update 1206-->1812 2. Add "AD1" FOR 5VSB	
Z68XP-D3		
1.0	1. update MINI_PCIE footprint 2. 文字面 : SLOT部分全對齊	
Z77-D3H-0.1	EVT	
0.2-1216	1. Remove SE9172 , Add VCC3 內層(注意其他內層power,跨切割) 2. SPDIF AGND --> GND 3. PCI SLOT & PCIEX1/X4 CAP COST DOWN 4. 0 ohm --> SHORT PAD 5. REMOVE SMBUS FROM COMP TO SOLDER SIDE IN DR POWER 6. SATA3 connect Change to 90 degree (記得SATA3訊號部分要做挖空) 7. Add "108dB"文字面 8. Remove VCC1_05_PCH & VCC1_8_PCH gate net 9. Add EJ168 R_USB30_1 & F_USB3 10. UAE1/UAE2 NET SWAP 11. 內層+12V要打VIA在COMA處 12. SPDIFO_HDMI走12mil	
1.0	1. SATA2~SATA3文字面要隱藏 2. DART2 移至 DC_DQ1左上方 3. Q7 & DAR31 NET Change	
1.01	1. 0 OHM SHORT PAD (LAN & AUDIO) 2. DDR3 2400MHz OC modify (DDR3 DQ 走T型)	
1.02	1. DDR3 2400MHz OC modify (縮小DDR3間距)	
1.1	1. F.B "FB0603-RH" change to "FB0402-RH" 2. ATX_12V_2X2 change to ATX_12V_2X4 3. AtherOS LAN AR8161 CO-layout 4. Add pwok R200,BC9 放在ATX 端 5. mSATA LAYOUT 龍華& FOXCONN CO-LAY(變更FOOTPRINT) 6. For USB3.0 eTron EJ168A 0.11um modify (UBU1 pin88/89/90 ' GND) 7. add VCC1_05_PCH over voltage control	

Gigabyte Technology

Title: BOM & PCB MODIFY HISTORY

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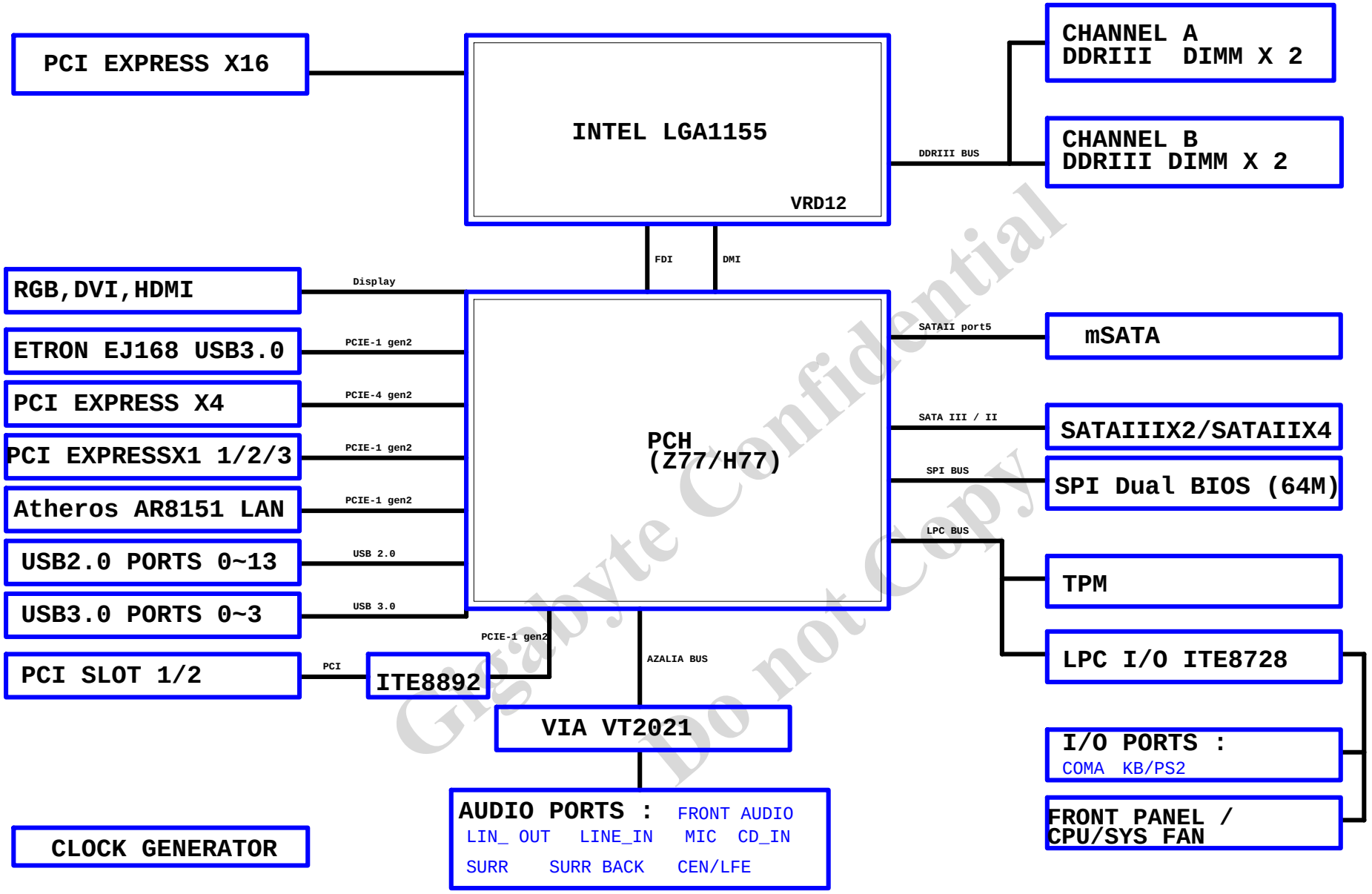
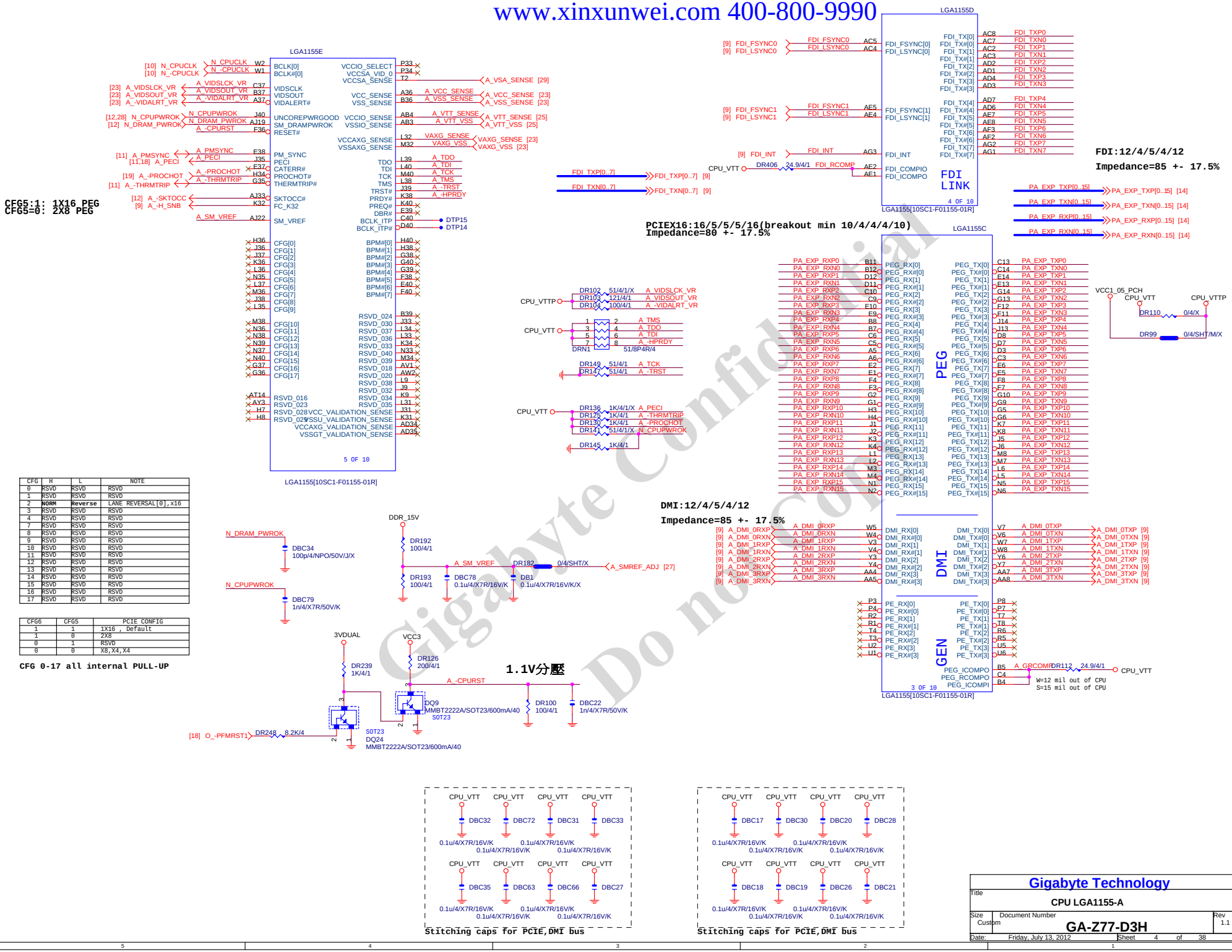
BLOCK DIAGRAM



Gigabyte Technology			
Title: BLOCK DIAGRAM			
Size: C	Document Number: GA-Z77-D3H		Rev: 1.1
Date: Friday, July 13, 2012	Sheet 3 of 38		



CFG	H	L	NOTE
0	RSVD	RSVD	RSVD
1	RSVD	RSVD	RSVD
2	**NORM**	**Reverse**	LANE REVERSAL[0],x16
3	RSVD	RSVD	RSVD
4	RSVD	RSVD	RSVD
7	RSVD	RSVD	RSVD
8	RSVD	RSVD	RSVD
9	RSVD	RSVD	RSVD
10	RSVD	RSVD	RSVD
11	RSVD	RSVD	RSVD
12	RSVD	RSVD	RSVD
13	RSVD	RSVD	RSVD
14	RSVD	RSVD	RSVD
15	RSVD	RSVD	RSVD
16	RSVD	RSVD	RSVD
17	RSVD	RSVD	RSVD

CFG6	CFG5	PCIE CONFIG
1	1	1X16 , Default
1	0	2X8
0	1	RSVD
0	0	X8,X4,X4

CFG 0-17 all internal PULL-UP

Title	CPU LGA1155-A
Size	Custom
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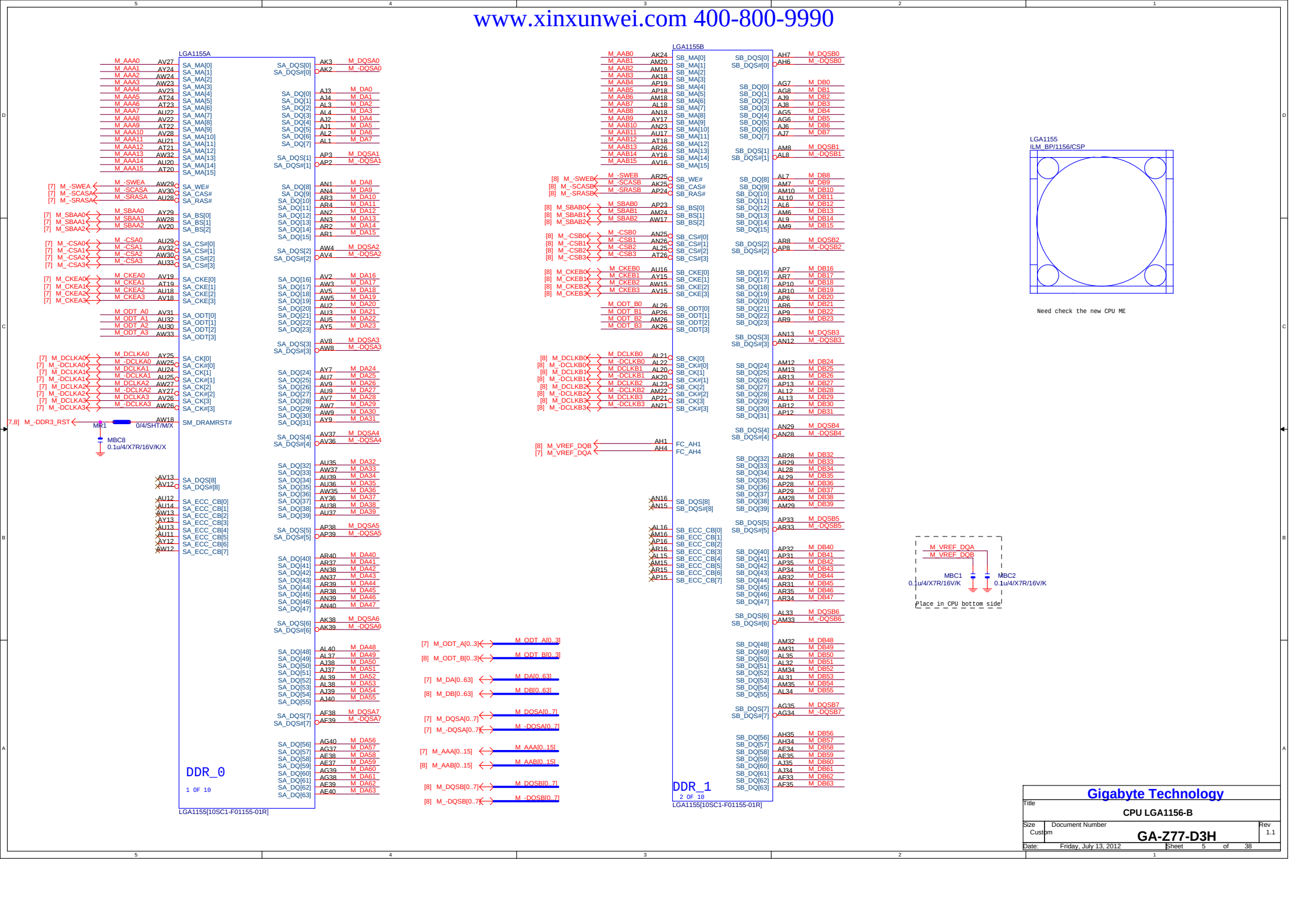

Gigabyte Technology			
Title: CPU LGA1156-B			
Size: Custom	Document Number: GA-Z77-D3H		Rev: 1.1
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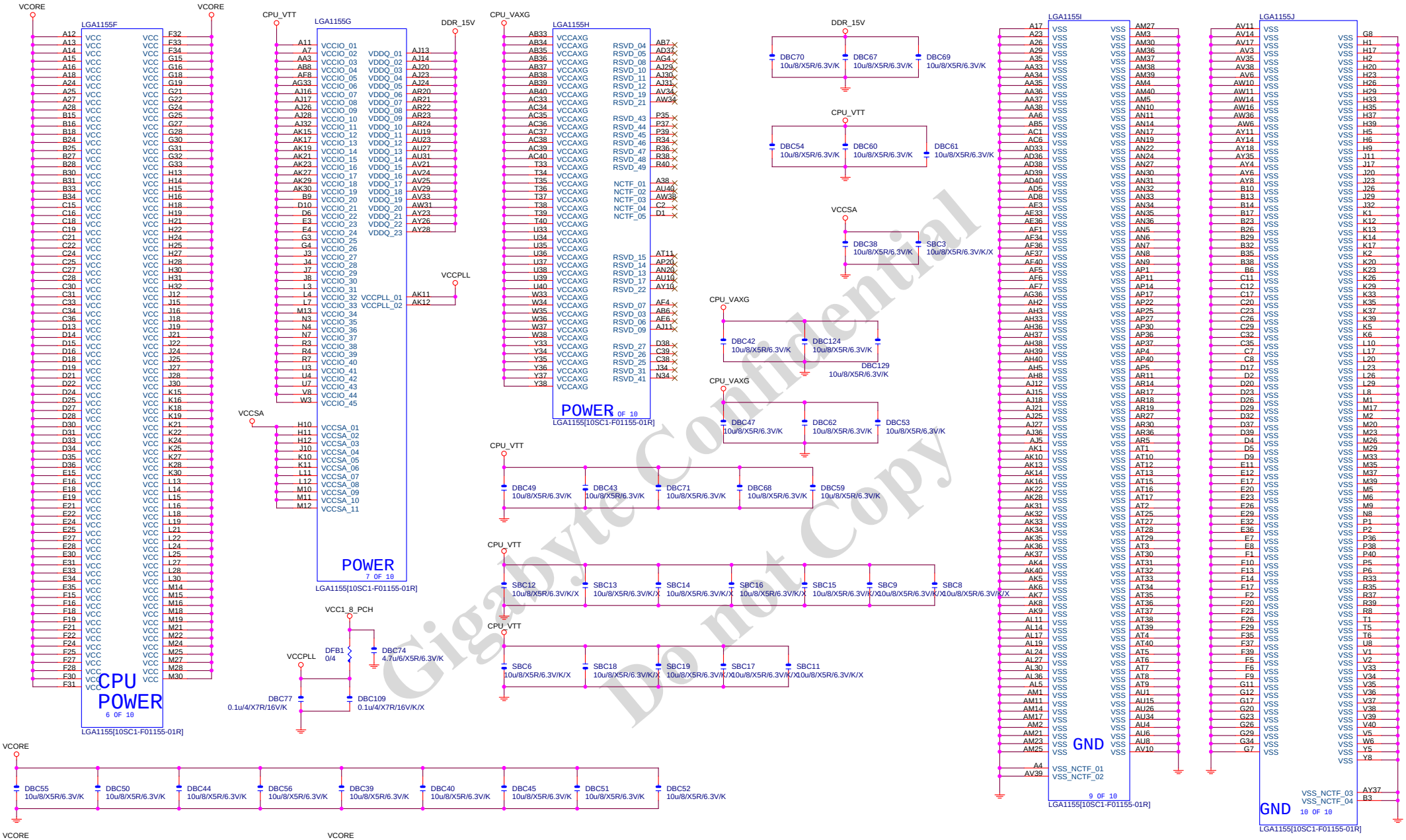
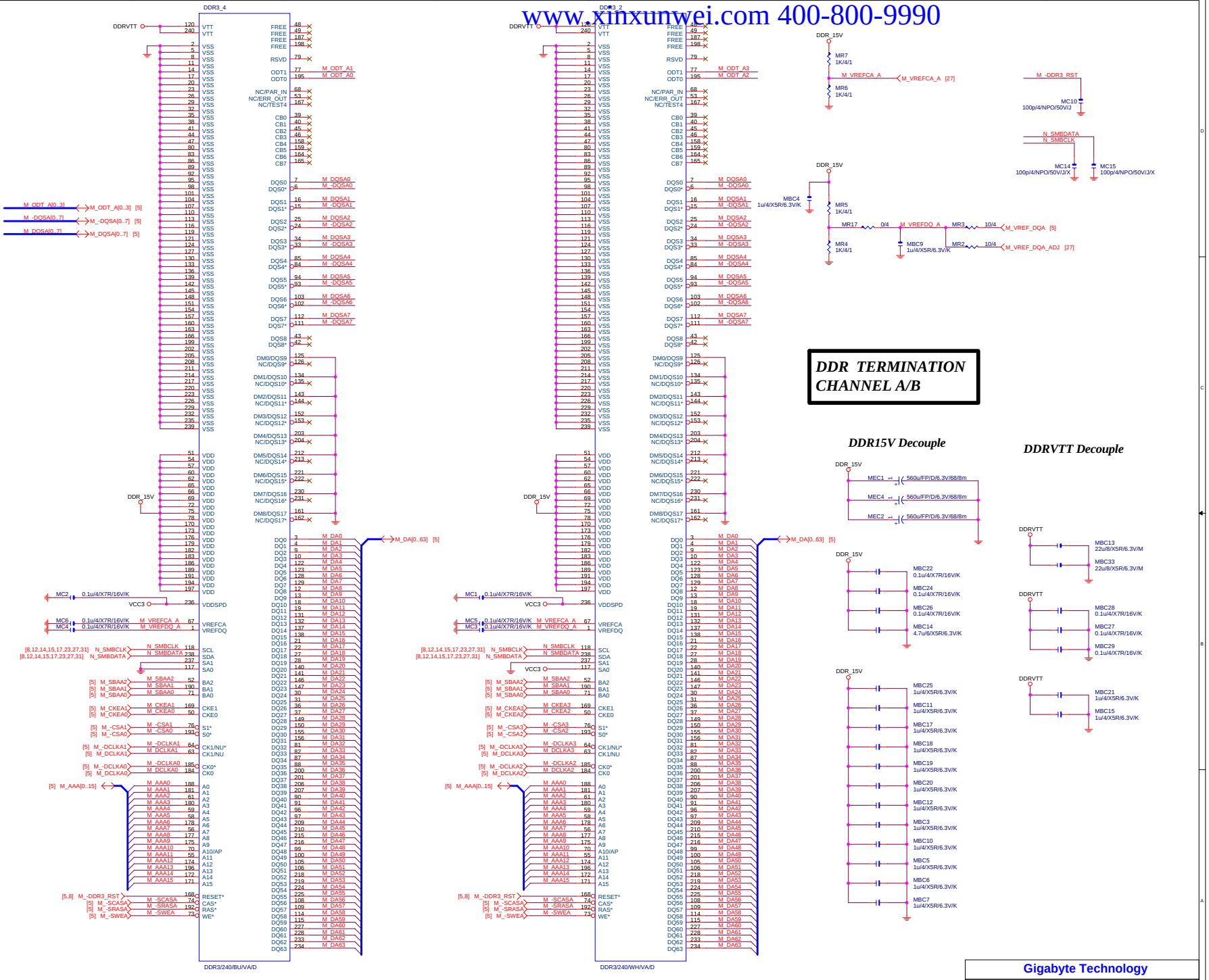


Gigabyte Technology		
Title: CPU LGA1156-C		
Size: Custom	Document Number: GA-Z77-D3H	Rev: 1.1
Date: Friday, July 13, 2012	Sheet 6 of 38	



Gigabyte Technology	
Title	DDRIII CHANNEL A
Size: Custom	Document Number: GA-Z77-D3H
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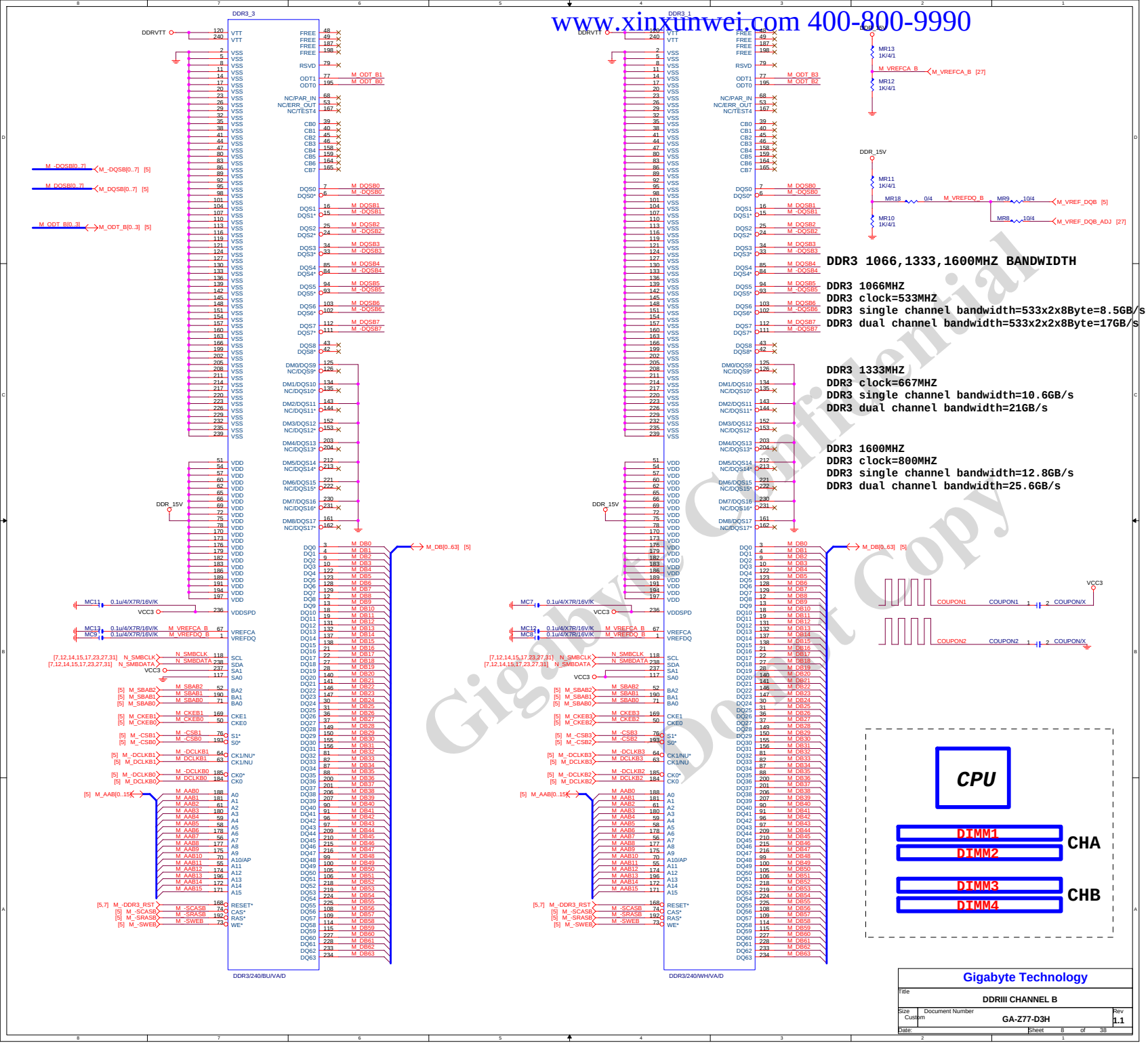
Date:	Sheet 7 of 38



Gigabyte Technology		
Title: DDRIII CHANNEL B		
Size: Custom	Document Number: GA-Z77-D3H	Rev: 1.1
Date:	Sheet 8 of 38	

USB3.0:10/5/7/5/20 (breakout min 8/4/4/4/8) ; ONLY 3 VIAS
Impedance=85 +- 17.5%
Back Panel < 10000 MILS
Front Panel < 6000 MILS

USB2.0 : 12/4.5/7.5/4.5/12 (breakout min 8/4/4/4/8)
Impedance=90 +- 17.5%

PCHB

DMI

USB

PCI-E

2 OF 11

BD82Z77/S

PCHG

FDILINK

7 OF 11

BD82Z77/S

FDI:12/4/5/4/12
Impedance=85 +- 17.5%

放靠近 Device & PCI-E Slot

PCIEX1:16/5/5/5/16 (breakout min 8/4/4/4/8)
Impedance=80 +- 17.5%

OC[3:0]# for Device 29 (ports 0-7)

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

USB OC# Configure	
OC0#	USB0,1
OC1#	USB2,3
OC2#	USB4,5
OC3#	USB6,7
OC4#	USB8,9
OC5#	USB10,11
OC6#	USB12,13
OC7#	Not Use

PCHE

NVRAM

5 OF 11

BD82Z77/S

PCH_HS

NPCH_HS/[12SP2-S05511-01R_12SP2-S05511-02R_12SP2-S05511-03R]

DMI /FDI termination voltage

Mount for integrated clock Generation Mode

R102 short to GND in non graphic SKU

Gigabyte Technology			
Title: PCH FDI,DMI,USB ,PCIE			
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PCHF

BD82Z77/S

6 OF 11

Pop 0/4 for non graphic skus

Flex0,2 : 33MHZ

Flex1,3 : 27/14/24/48/25MHZ

PCHH

BD82Z77/S

8 OF 11

120Mhz for DP

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

Mount for integrated clock Generation Mode

Check if NC for P67 non graphic chip

SSOP6_ESD

Close to PCH

Close to Filter

Gigabyte Technology			
Title: PCH DISPLAY ,CLK BUFFER			
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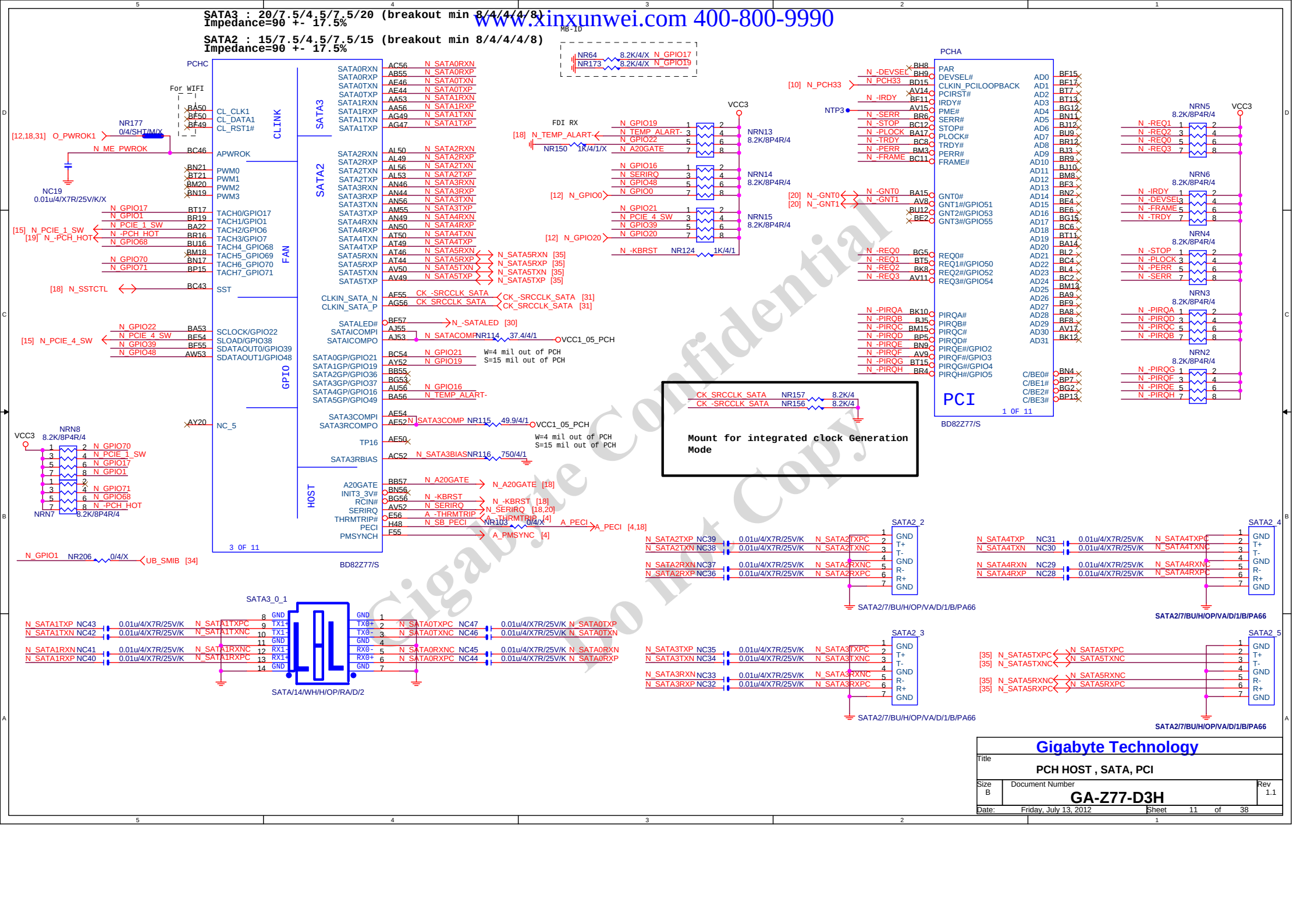
SATA3 : 20/7.5/4.5/7.5/20 (breakout min 8/4/4/4/8)
Impedance=90 +- 17.5%

SATA2 : 15/7.5/4.5/7.5/15 (breakout min 8/4/4/4/8)
Impedance=90 +- 17.5%



Title	PCH HOST , SATA, PCI
Size	B
Document Number	GA-Z77-D3H
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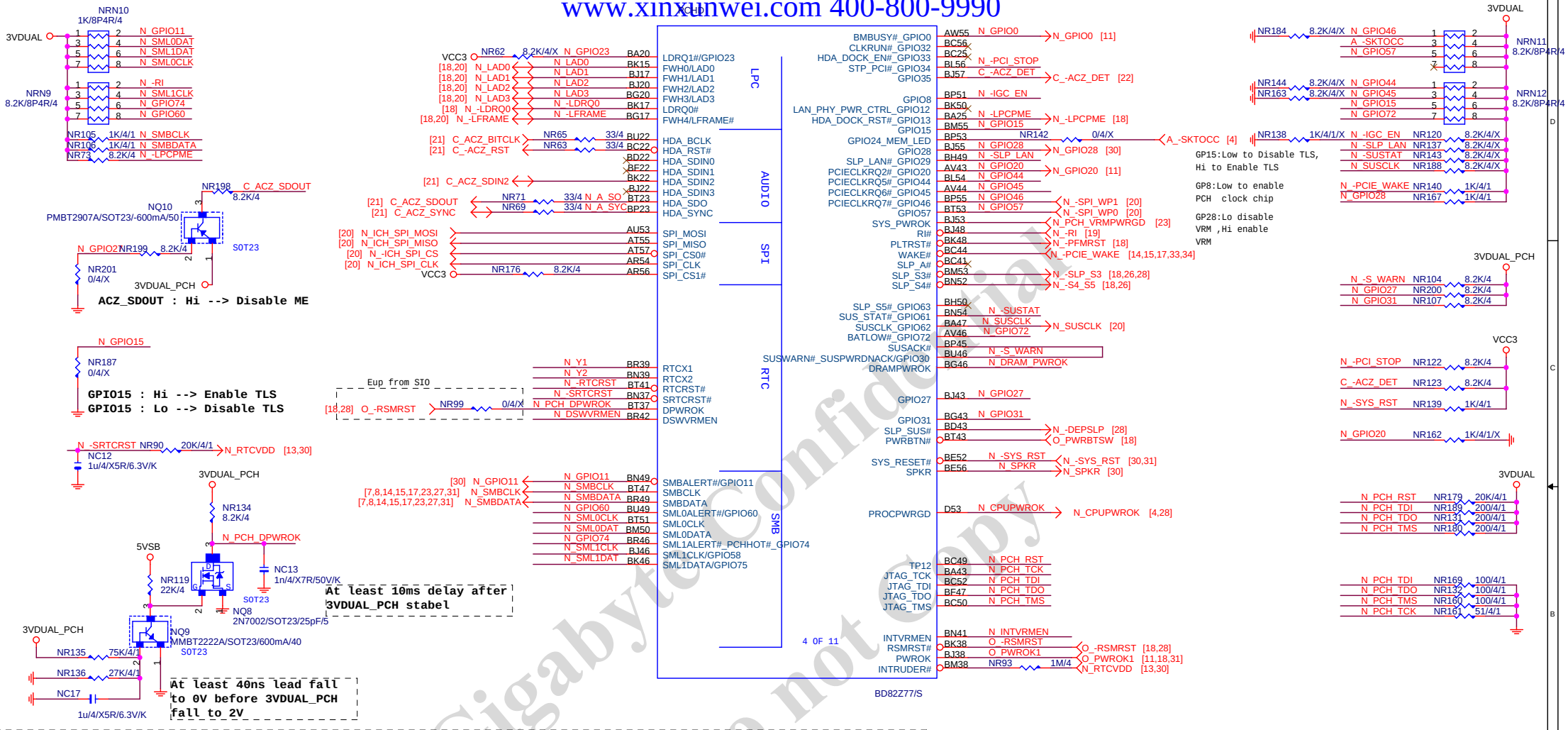
Gigabyte Technology



Gigabyte Technology		
Title: PCH GPIO , CTRL , AUDIO		
Size: B	Document Number: GA-Z77-D3H	Rev: 1.1
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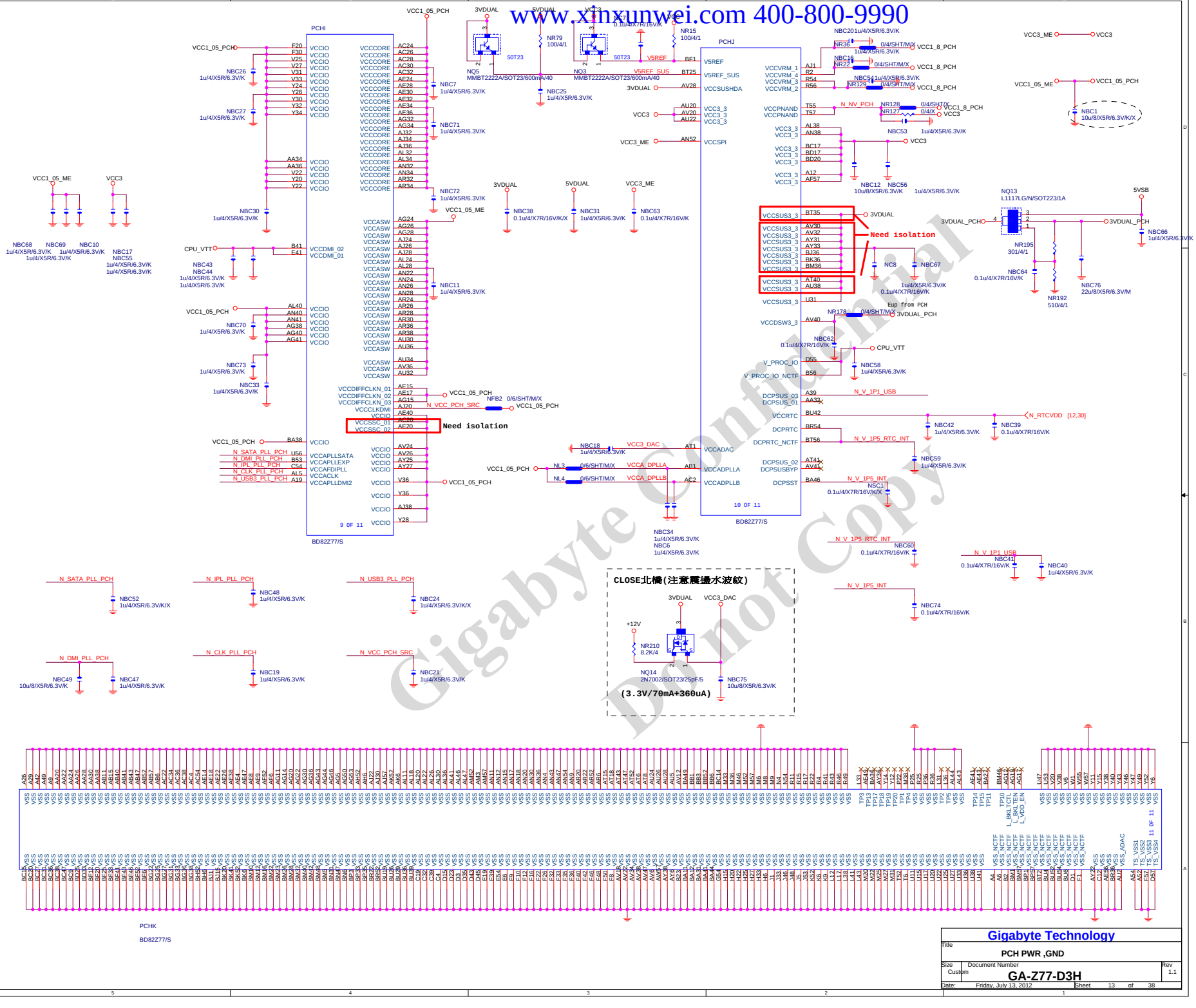

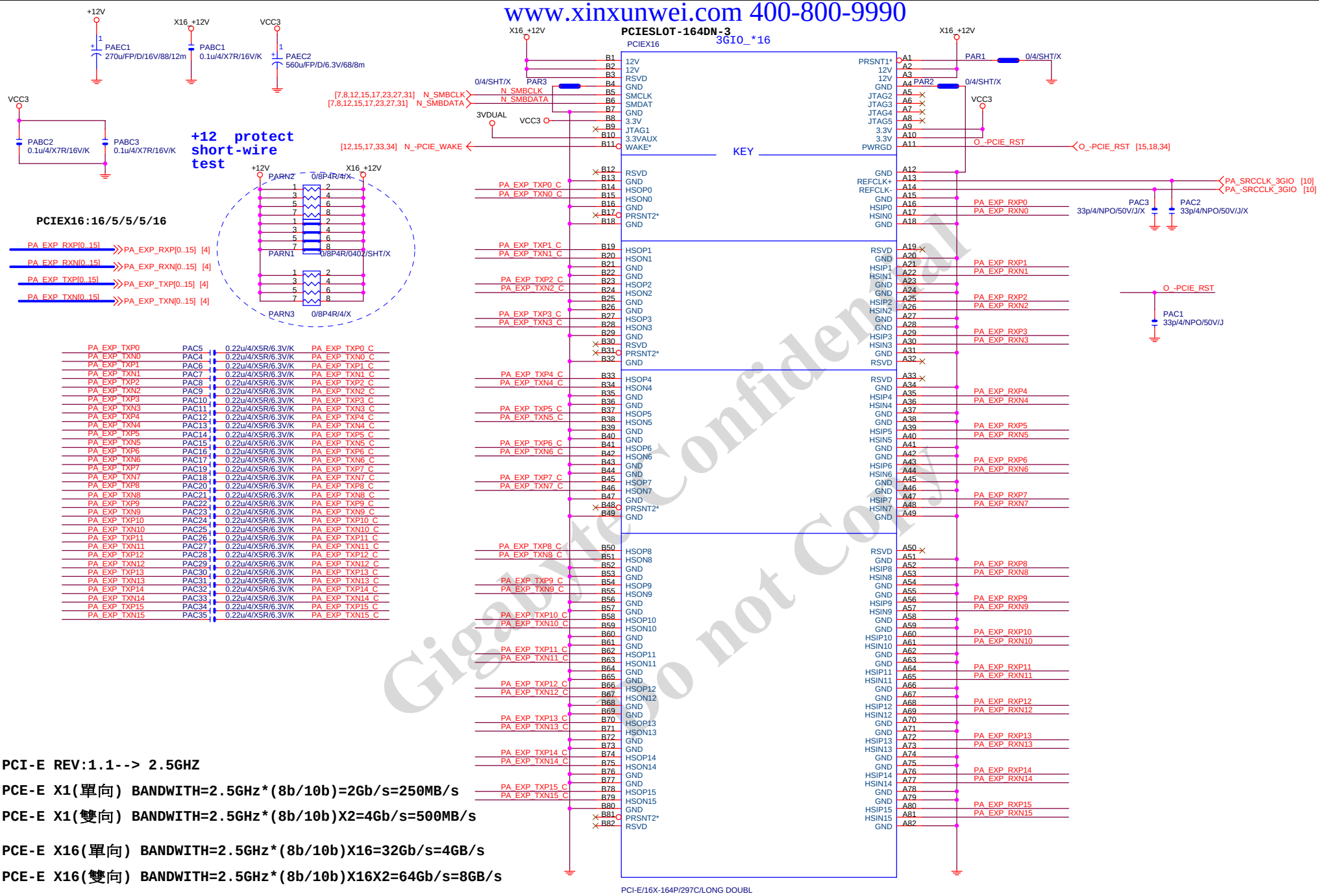

PCI-E REV:1.1--> 2.5GHZ

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

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

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

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

PCI-E REV:2.0--> 5GHZ

Gigabyte Technology	
Title	PCI EXPRESS * 16
Size: Custom	Document Number: GA-Z77-D3H
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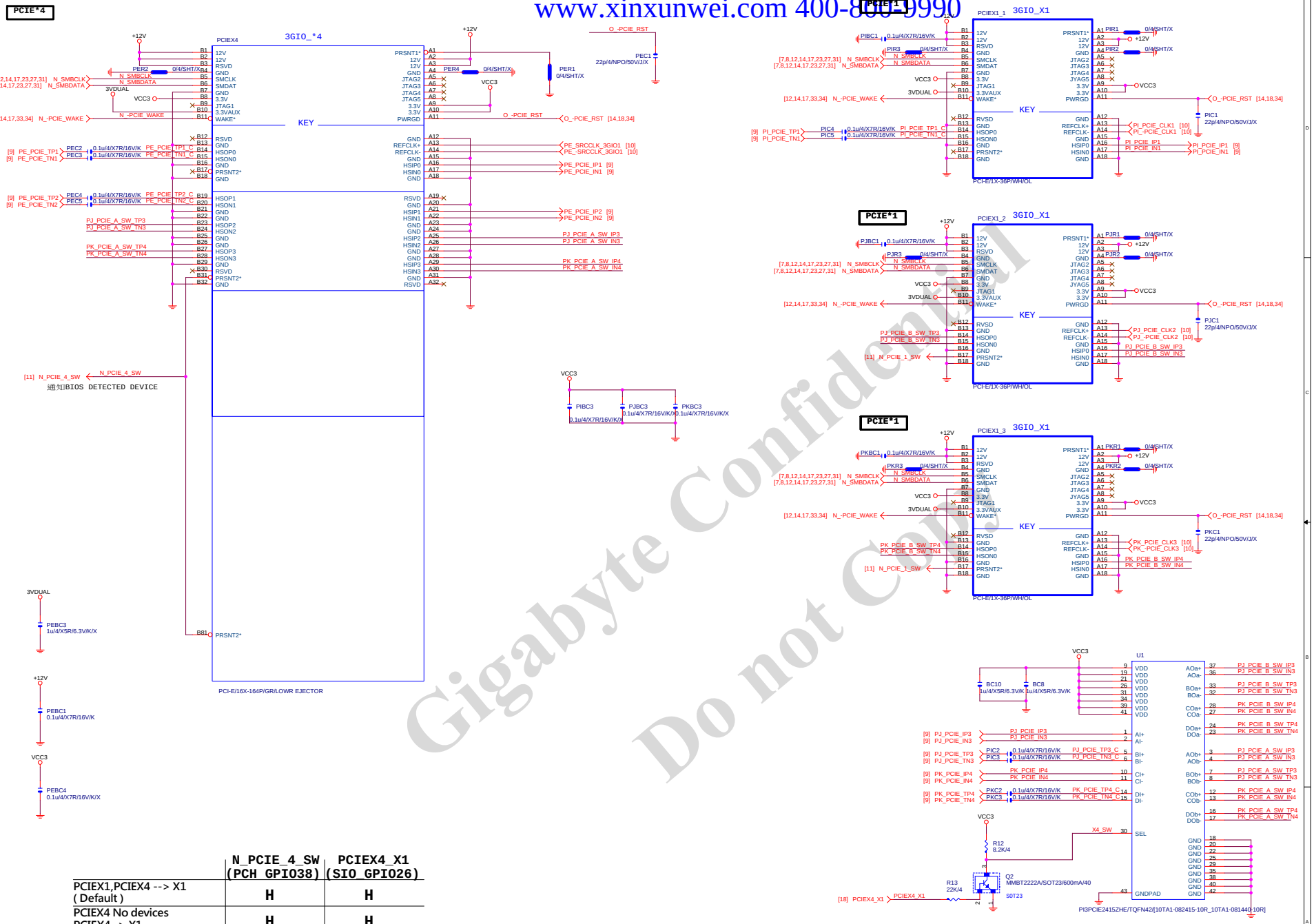

	N_PCIE_4_SW (PCH GPIO38)	PCIEX4_X1 (SIO_GPIO26)
PCIEX1,PCIEX4 --> X1 (Default)	H	H
PCIEX4 No devices PCIEX4 -> X1	H	H
PCIEX4 Have devices PCIEX4 -> X4 PCIEX1_2/PCIEX1_3 --> N/A	L	L

Function	SEL
xI--> xOa	L;PCIEX4 SLOT-->X1
xI--> xOb	H;PCIEX4 SLOT-->X4

Gigabyte Technology

Title: PCIE_X1 1,2

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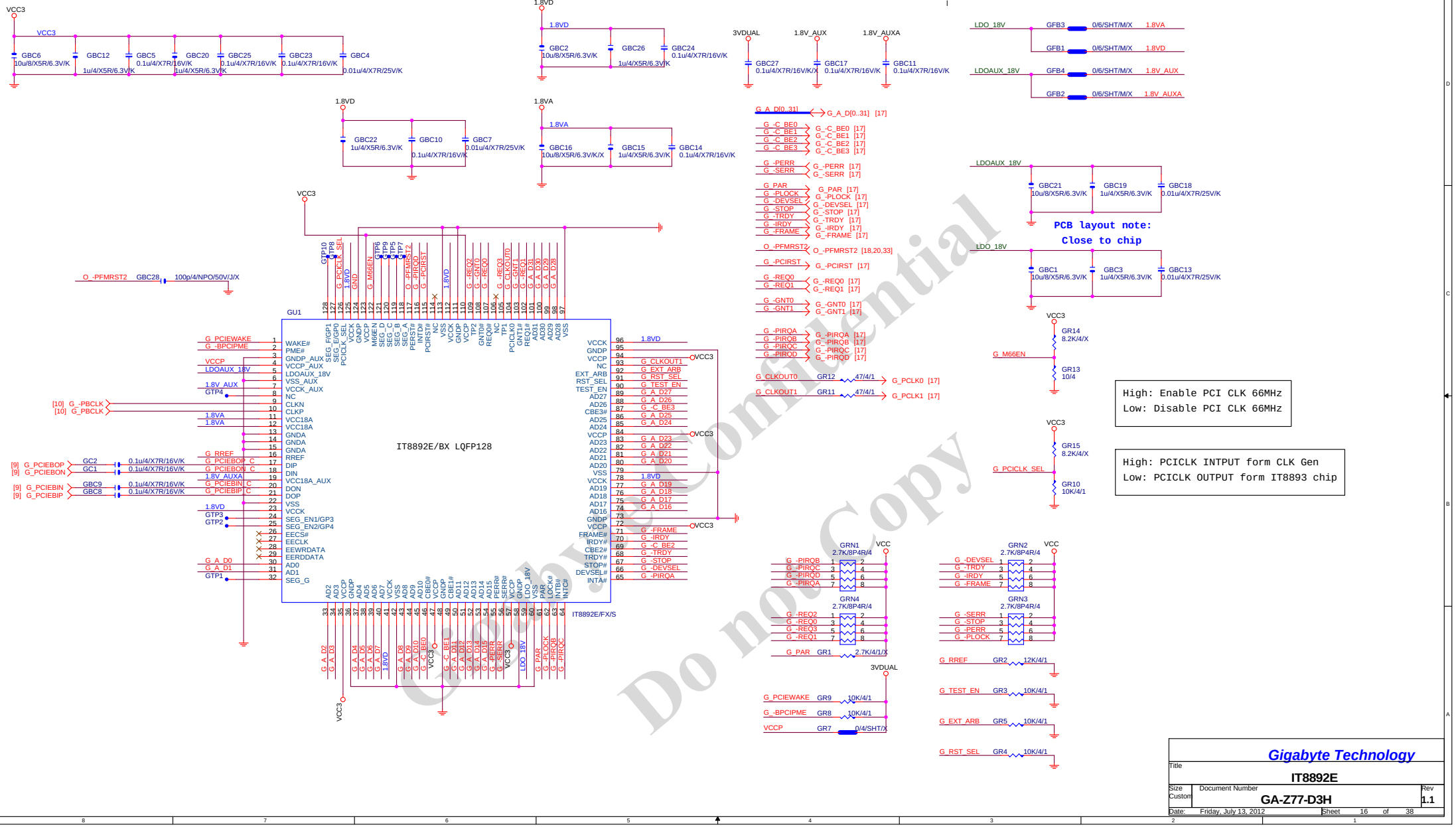

Gigabyte Technology			
Title: IT8892E			
Size: Custom	Document Number: GA-Z77-D3H		Rev: 1.1
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PCI SLOT 1

PCI SLOT 2

-REQ0/-GNT0/A_D16

-REQ1/-GNT1/A_D17

Title	PCI SLOT 1&2
Size	Custom
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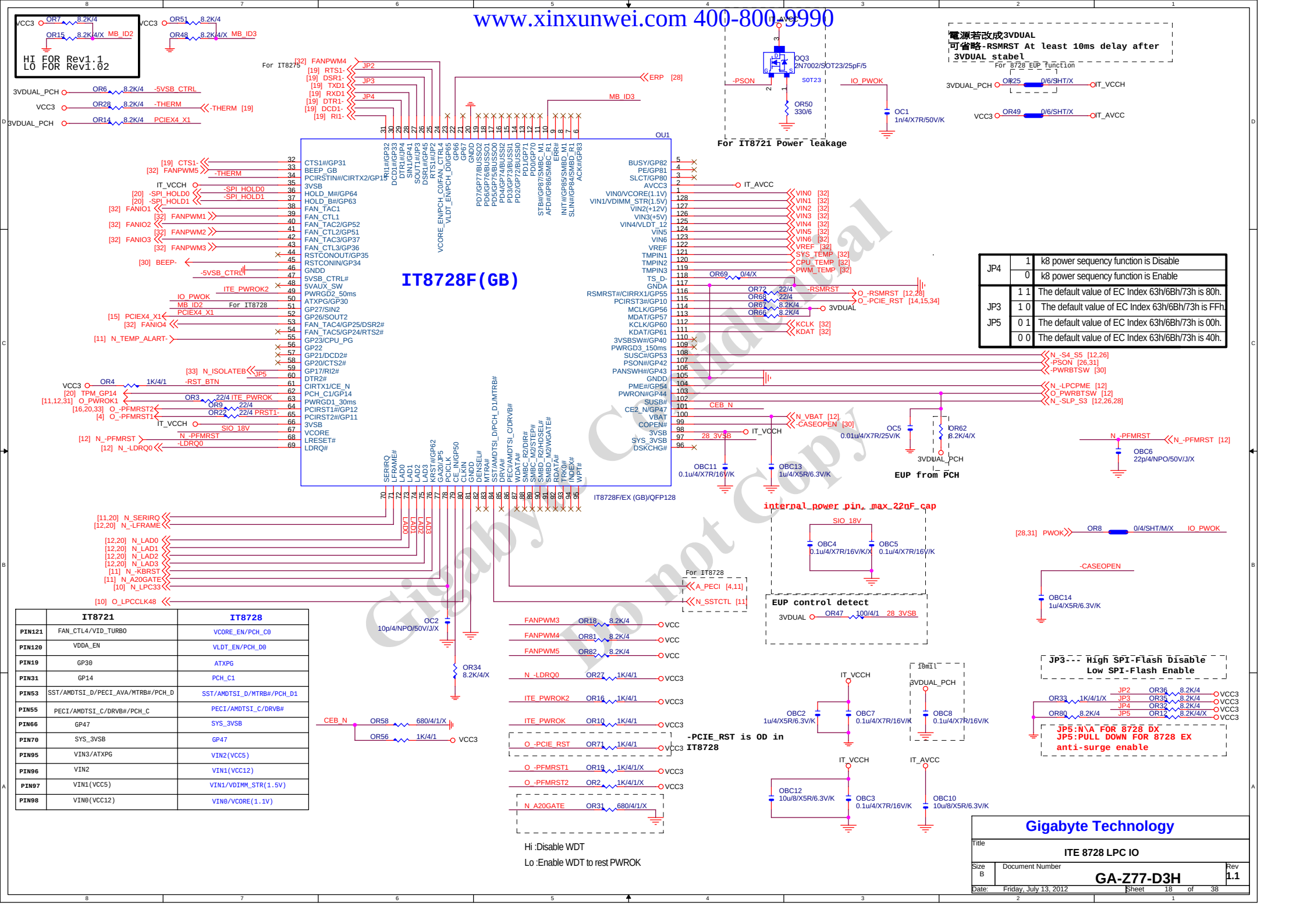

JP4	1	k8 power sequency function is Disable
	0	k8 power sequency function is Enable
JP3 JP5	1 1	The default value of EC Index 63h/6Bh/73h is 80h.
	1 0	The default value of EC Index 63h/6Bh/73h is FFh.
	0 1	The default value of EC Index 63h/6Bh/73h is 00h.
	0 0	The default value of EC Index 63h/6Bh/73h is 40h.

	IT8721	IT8728
PIN121	FAN_CTL4/VID_TURBO	VCORE_EN/PCH_C0
PIN120	VDDA_EN	VLDT_EN/PCH_D0
PIN19	GP30	ATXPG
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/ATXPG	VIN2(VCC5)
PIN96	VIN2	VIN1(VCC12)
PIN97	VIN1(VCC5)	VIN1/VDIMM_STR(1.5V)
PIN98	VIN0(VCC12)	VIN0/VCORE(1.1V)

Gigabyte Technology		
Title	ITE 8728 LPC IO	
Size B	Document Number GA-Z77-D3H	Rev 1.1
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COMA

OAU1
GD75232/TSSOP20
OABC1 0.1u/4/X7R/16V/K/X
OABC3 0.1u/4/X7R/16V/K/X
OABC2 0.1u/4/X7R/16V/K/X
-12V
VCC
+12V

COM R1

OAQ1 MMBT2222A/SOT23/600mA/40
OAD1 CD4148WP/1206/300mA
OAR1 75K/4/1
OAR2 8.2K/4
S0T23

COMA
BH/2*5K10/IV/2.54/VA/COM/PRT/TUR180
11NH3-000205-Y1R/Y2R
OACN1
OACN2
180P/8P4C/6/NPO/50V/K
180P/8P4C/6/NPO/50V/K

UBF5 SMD1812P350SLR/S
UBF6 SMD1812P350SLR/S
5VDUAL
UBEC3 100u/OS/D/6.3V/66/30m

UBR4 8.2K/4
UBR8 15K/4/1
UBR2 8.2K/4
UBR1 15K/4/1

Q21 BAT54A/SOT23/200mA
S0T23
R80 0/4/X

UBESD2
AZC009-04S/SOT23-6L

R_USB30_1
USB3.0/2.0
USB/18P/BU/OS/RA/D/2/1U/SB
UBBC3 0.1u/4/X7R/16V/K
UBBC4 0.1u/4/X7R/16V/K
UBC45 0.1u/4/X7R/16V/K
UBC46 0.1u/4/X7R/16V/K
UBC47 0.1u/4/X7R/16V/K
UBC48 0.1u/4/X7R/16V/K

Close to R_USB30
90歐姆:[20/4.5/7.5/4.5/20]
Close to R_USB30
90歐姆:[20/4.5/7.5/4.5/20]

-PROHOT

R29 10K/4/1
R65 1.5K/4/1
R59 100K/4/1
U6B LM324DR/SO14
RS1 100K/1/4/S
R61 1K/4/1
C6 0.1u/4/X7R/16V/K
112~126 degree
Q7 2N7002/SOT23/25pF/5
Q8 2N7002/SOT23/25pF/5/X
S0T23
-THERM
-THERM [18]

RS1 CLOSE CPU VR MOSFET
CLOSE PWM HOT MOSFET

UBE4
UBE3
AZ1045-04F/MSOP10
AZ1045-04F/MSOP10

Gigabyte Technology			
Title: COM & PROHOT/Dynamic O.C.			
Size: Custom	Document Number: GA-Z77-D3H		Rev: 1.1
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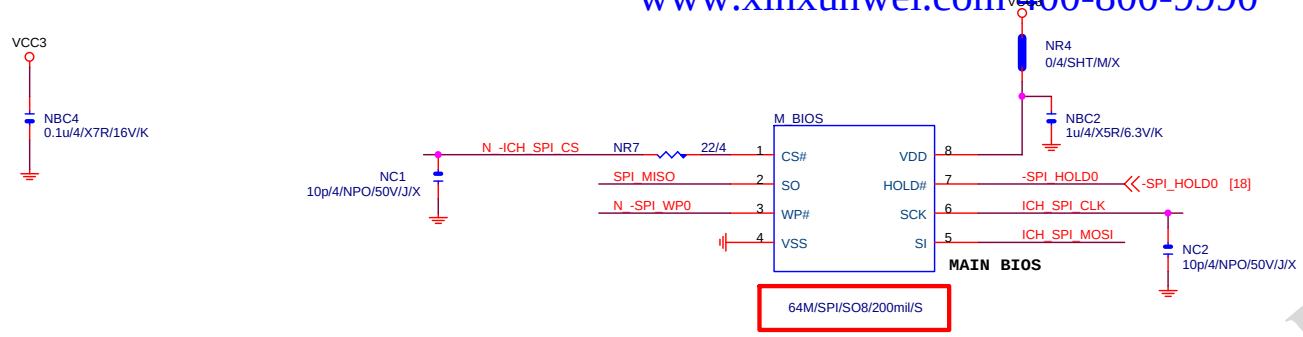
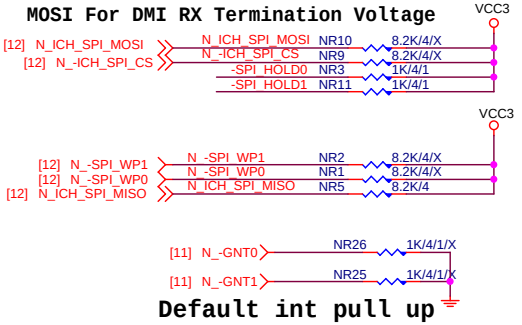
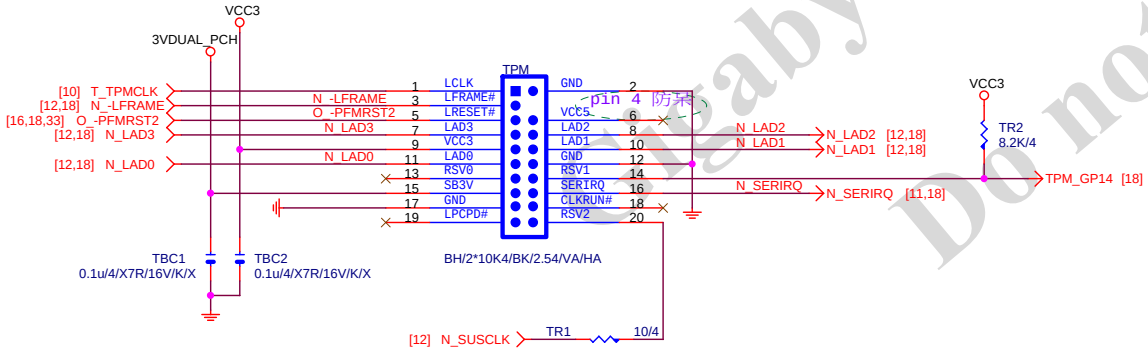




BOOT DEVICE	GNT0	GNT1
LPC	0	0
PCI	0	1
NAND	1	0
SPI	1	1

1 means floating
0 means PD 1K



Gigabyte Technology

Title: BIOS

Size: Custom | Document Number: GA-Z77-D3H | Rev: 1.1

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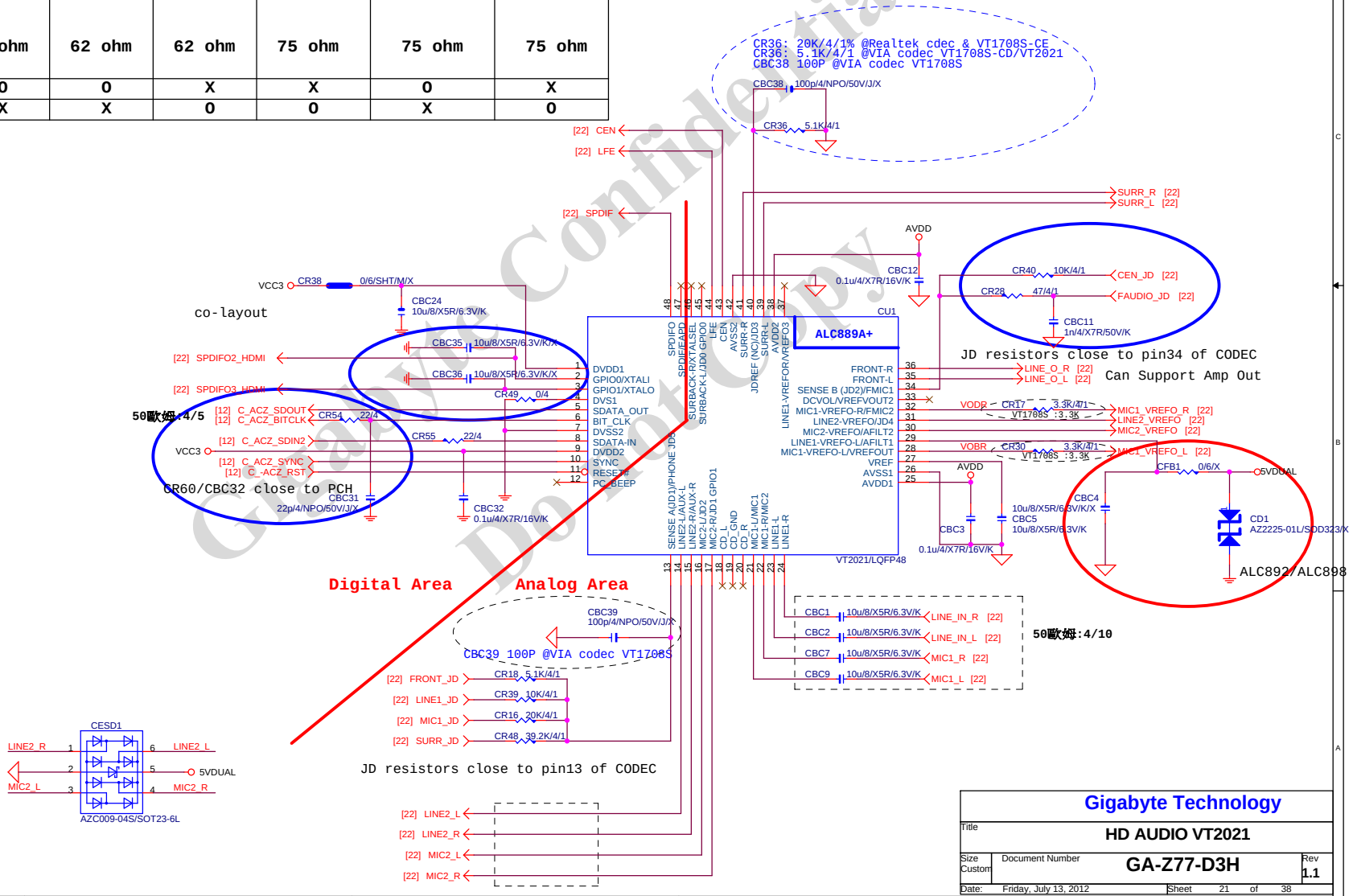
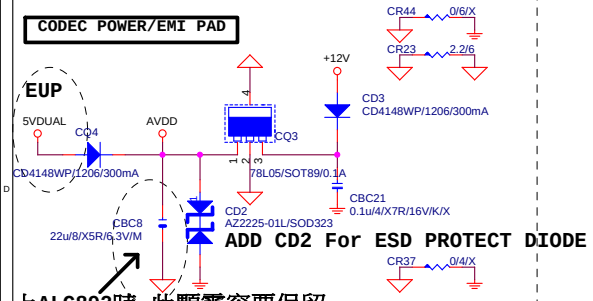
AZALIA CODEC *ALC662-VD0/ALC887-VD2/ALC892/ALC889/VT1708S-CD/VT1708S-CE/VT2021.codec*

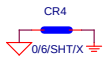
	ALC662	ALC887-VD2/ ALC892	ALC889	VT1708S-CD	VT1708S-CE/ VT1705CF	VT2021
CR49	X	X	O	O	X	O
CBC36	O	O	X	X	O	X
CR28/CBC11	47ohm+1nF	47ohm+1nF	47ohm+1nF	22ohm+100P	22ohm+100P	47ohm+1nF
CR52	X	O	O	O	O	O
CR57	O	X	X	X	X	X
CBC1/CBC2	10uF/X5R	10uF/X5R	22uF/X5R	10uF/X5R	10uF/X5R	10uF/X5R
CR36	20K/4/1	20K/4/1	20K/4/1	5.1K/4/1	20K/4/1	5.1K/4/1
CR17/CR30/ CR25/CR15/CR12/CR3/	8.2K/4	8.2K/4	8.2K/4	3.3K/4/1	3.3K/4/1	3.3K/4/1
CBC38/CBC39	X	X	X	100P/4	100P/4	X
CR10/CR8/CR20/CR45/ CR42/CR51/CR27/CR26	22K/4	22K/4	22K/4	10K/4/1	10K/4/1	10K/4/1
CR7/CR9/CR5/CR13/ CR29/CR32/CR46/CR19/ CR50/CR41/CR2/CR11/ CR14/CR24	62 ohm	62 ohm	62 ohm	75 ohm	75 ohm	75 ohm
CFB1/CD1/CBC4/CBC8	O	O	X	X	O	X
CD2/CD3/CQ3/CQ4	X	X	O	O	X	O

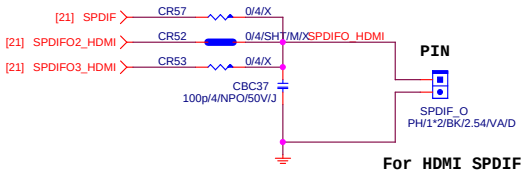


Gigabyte Technology	
Title	HD AUDIO VT2021
Size: Custom	Document Number: GA-Z77-D3H
Rev	1.1
Date: Friday, July 13, 2012	Sheet 21 of 38

CODEC POWER/EMI PAD

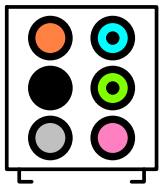




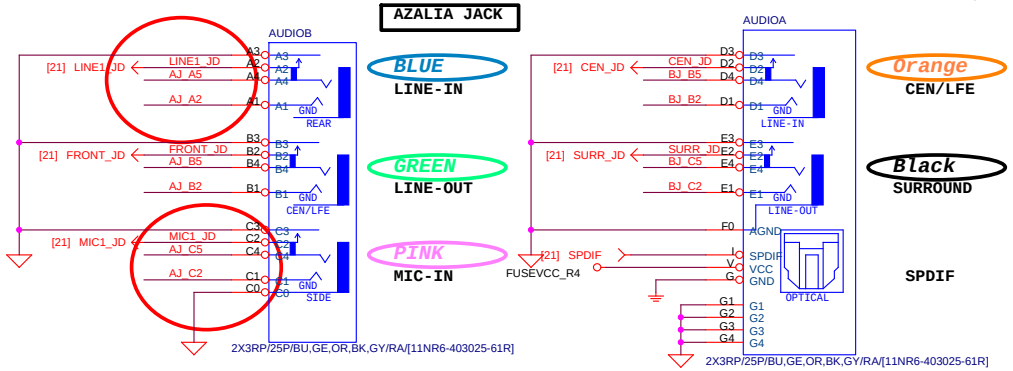


AZALIA JACK

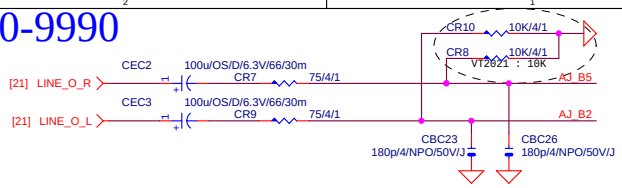
BTX AZALIA CONNECTOR



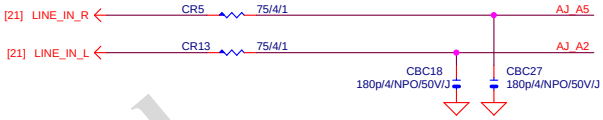
11NR6-403007-21R



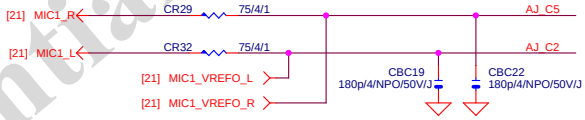
LINE-OUT



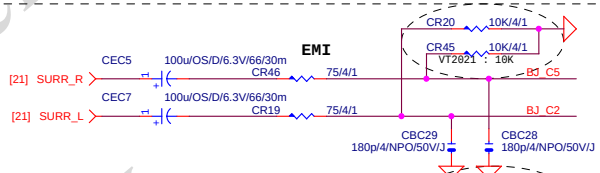
LINE-IN



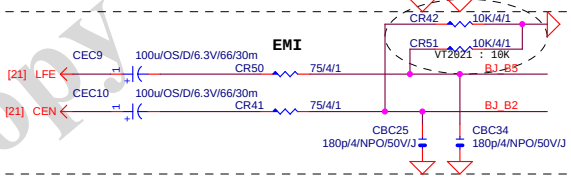
MIC-IN



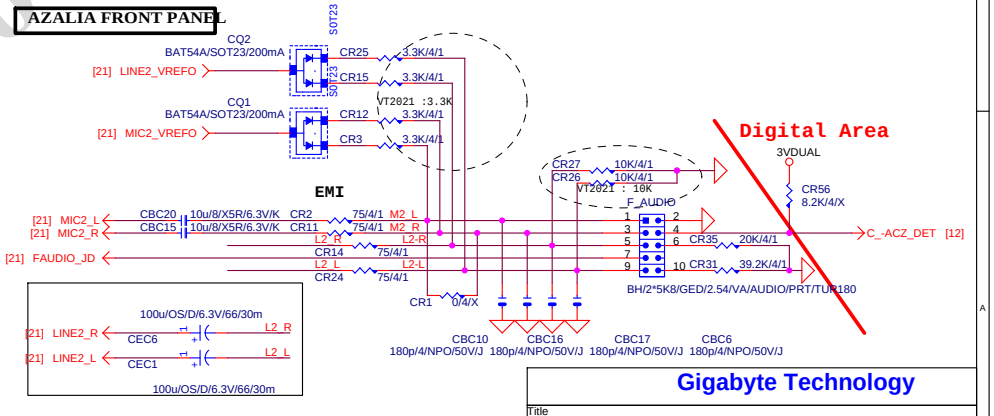
SURROUND



CEN/LFE



AZALIA FRONT PANEL



Gigabyte Technology

Title: AUDIO JACK

Size: Custom | Document Number: GA-Z77-D3H | Rev: 1.1

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need 0.1Amp , check trace width

Value need check with Vendor

Close to VSA output inductor

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

Close to Vcore output inductor

Value need check with Vendor

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

To 3931 for current DAC

To CPU pin AB3,AB4

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

Close to Vcore MOS DC_DQ1

To CPU pin L32,M32

Debug Port

To system SMBUS

I2C address=70h

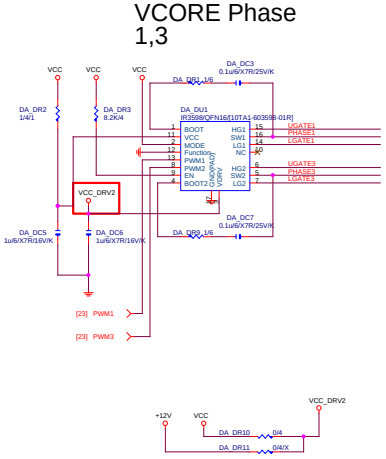
IR3564

To CPU side SVID Bus

OUP/UVP=250mV
OCP=200A
VRHOT=125 Degree
OTP=130 Degree

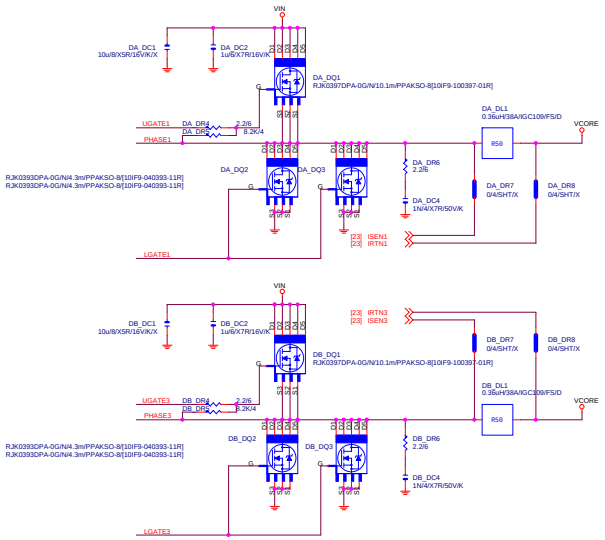
Gigabyte Technology	
Title	IR3567 for VR12 DT
Size: Custom	Document Number: GA-Z77-D3H
Rev	1.1
Date: Friday, July 13, 2012	Sheet 23 of 38

VCORE Phase 1,3

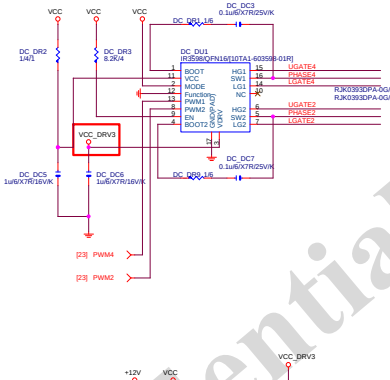


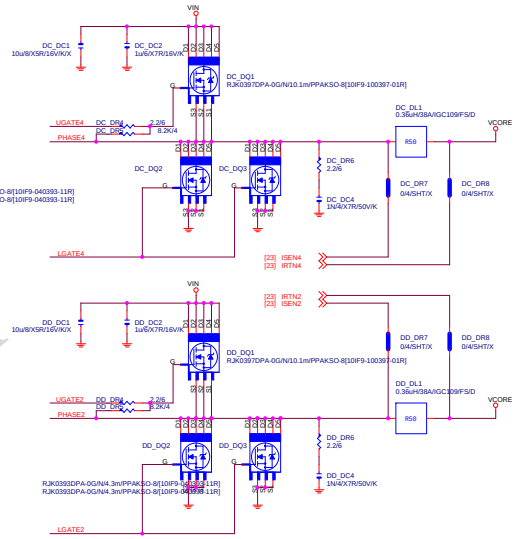
FUNCTION	MODE	PWM MODE	PHASE MODE
0	1	IR ATL	DUAL
1	1	IR ATL	Doubler
0	0	Tri-State	DUAL
1	0	Tri-State	Doubler
OPEN	0	Tri-State	Quad
OPEN	1	IR ATL	Quad

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

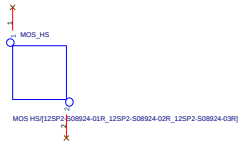


VCORE Phase 4,2

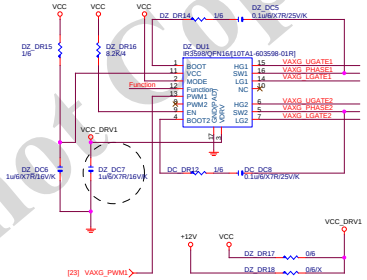


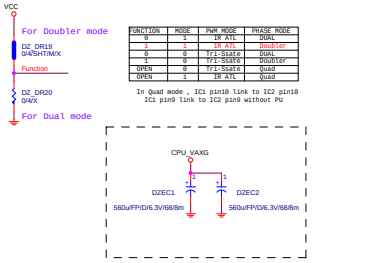


MOS HEATSINK



VAXG PHASE 1,2

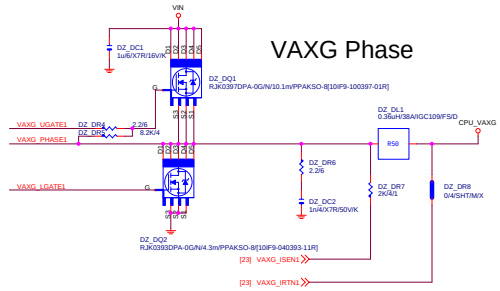


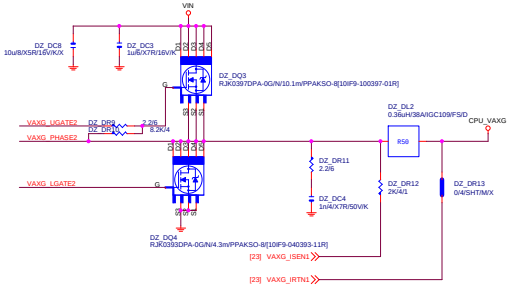


FUNCTION	MODE	PWM MODE	PHASE MODE
0	1	IR ATL	DUAL
1	1	IR ATL	Doubler
0	0	Tri-State	DUAL
1	0	Tri-State	Doubler
OPEN	0	Tri-State	Quad
OPEN	1	IR ATL	Quad

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

VAXG Phase

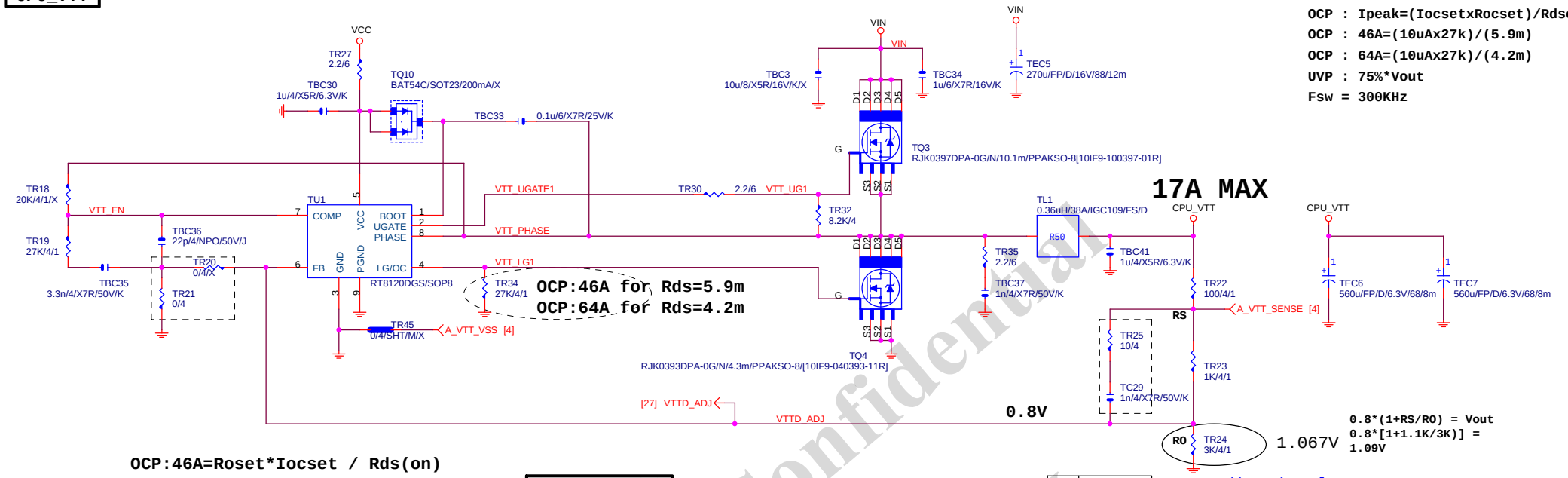




Gigabyte Technology		
Title: CPU CORE VR		
Size: Custom	Document Number: GA-Z77-D3H	Rev: 1.1
Date: Friday, July 13, 2012	Sheet 24 of 38	

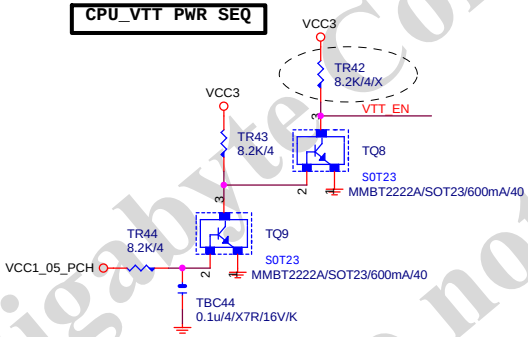
CPU_VTT

Iocset=10uA , Rocset=22k
OCP : Ipeak=(IocsetxRocset)/Rdson
OCP : 46A=(10uAx27k)/(5.9m)
OCP : 64A=(10uAx27k)/(4.2m)
UVP : 75%*Vout
Fsw = 300KHz



OCP:46A=Roset*Iocset / Rds(on)
=27K*10uA / 5.9m

CPU_VTT PWR SEQ

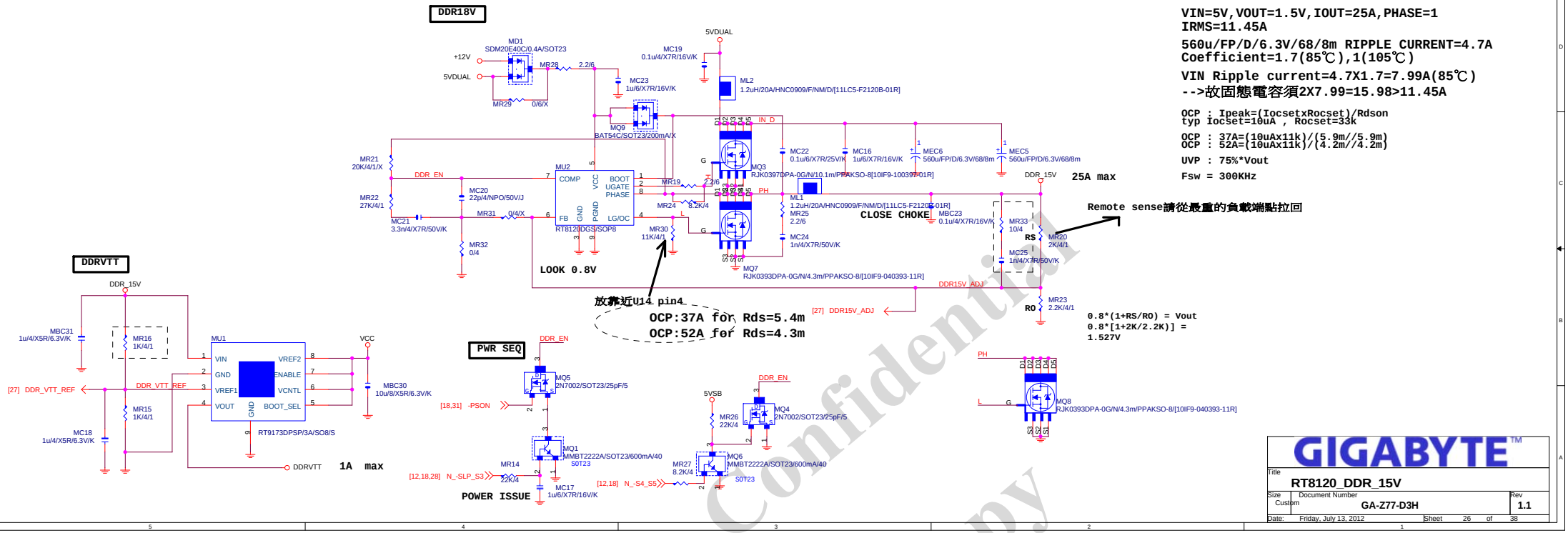


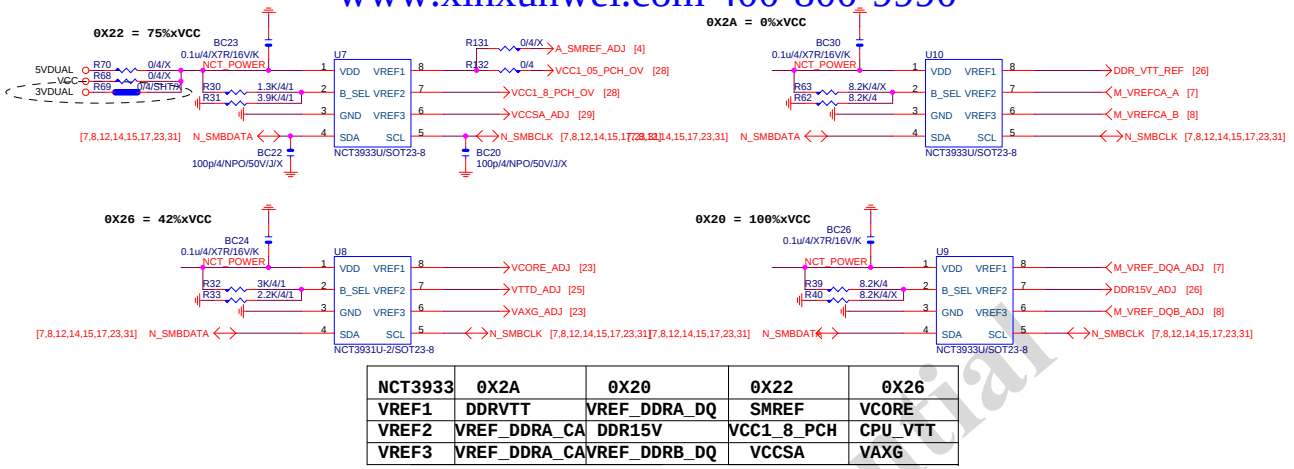
	VTT_SEL
HI	1.05V
LO	1.0V

According intel
CDI/IBP#476733,固定1.05V

GIGABYTE

Title: RT8120_CPU_VTT		
Size: Custom	Document Number: GA-Z77-D3H	Rev: 1.1
Date: Friday, July 13, 2012	Sheet 25 of 38	





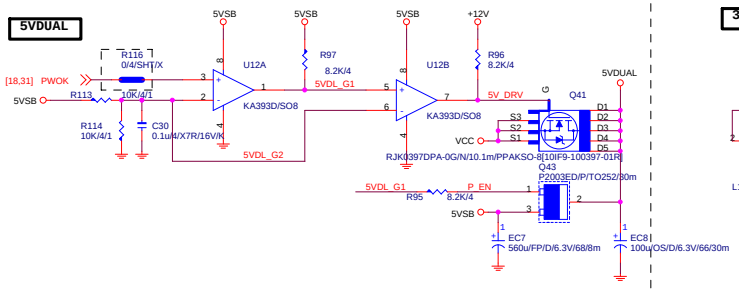
NCT3933	0X2A	0X20	0X22	0X26
VREF1	DDRVTT	VREF_DDRA_DQ	SMREF	VCORE
VREF2	VREF_DDRA_CA	DDR15V	VCC1_8_PCH	CPU_VTT
VREF3	VREF_DDRA_CA	VREF_DDRB_DQ	VCCSA	VAXG

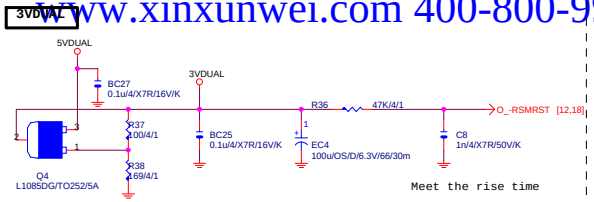
Gigabyte Technology

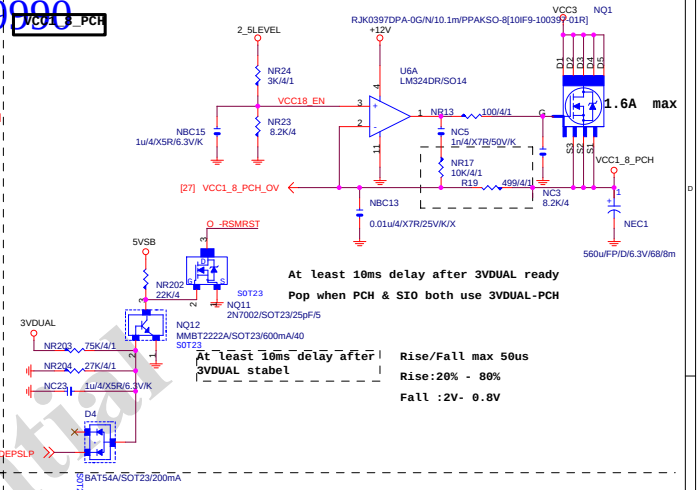
Title: CPU CORE VR-2

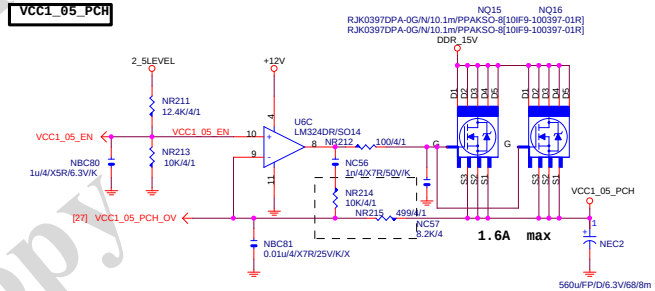
Size: Custom | Document Number: GA-Z77-D3H | Rev: 1.1

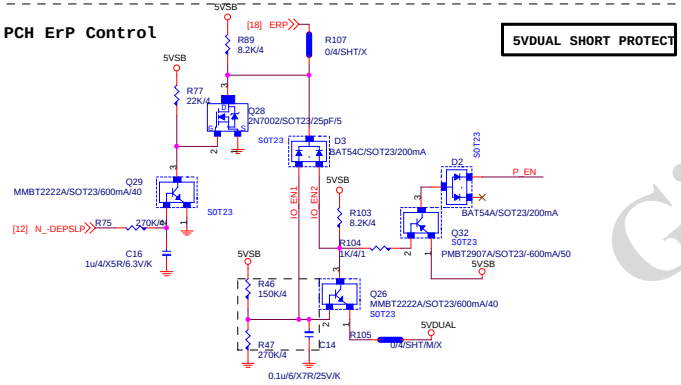
Date: Friday, July 13, 2012 | Sheet 27 of 38

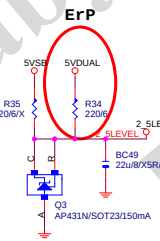


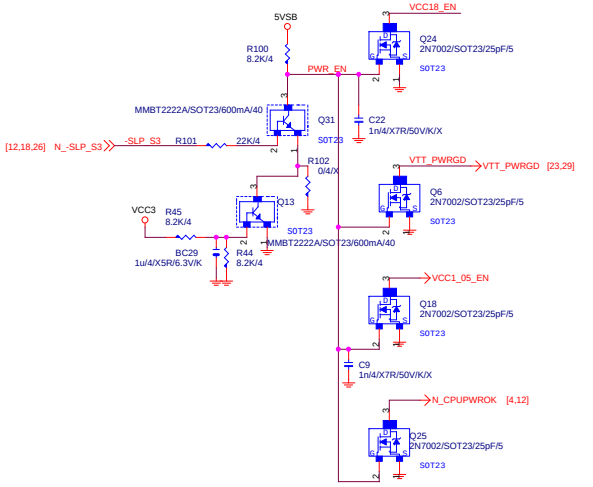


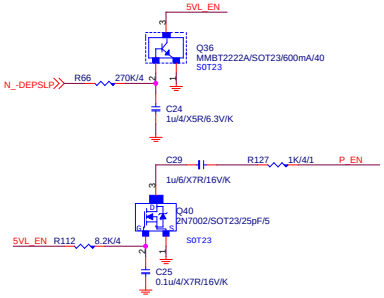


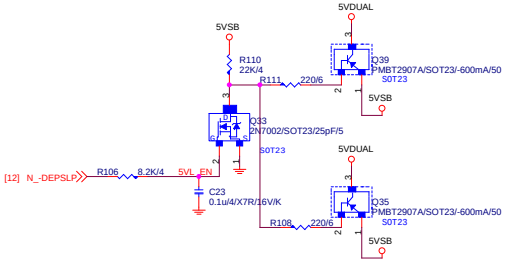












Gigabyte Technology			
Title: DISCRETE POWER			
Size: C	Document Number: GA-Z77-D3H		Rev: 1.1
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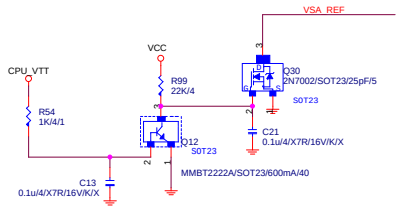
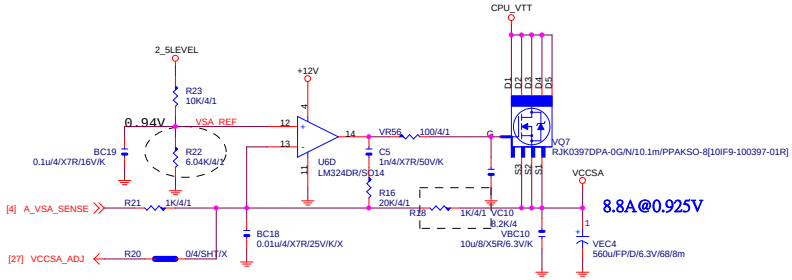
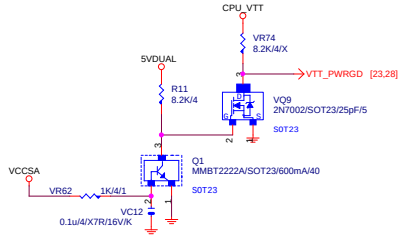
VCC_SA

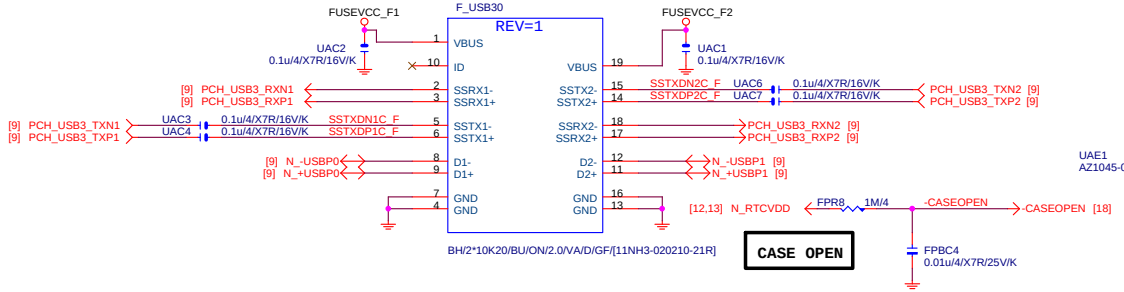




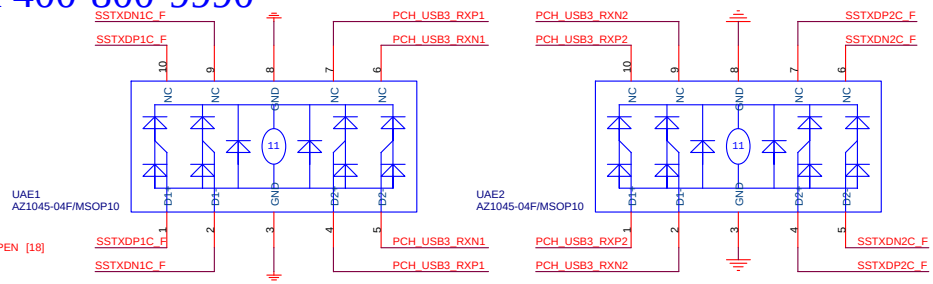


Gigabyte Technology		
Title: CPU VTT PWM_ISL6312		
Size: C	Document Number: GA-Z77-D3H	Rev: 1.1
Date: Friday, July 13, 2012	Sheet 29 of 38	

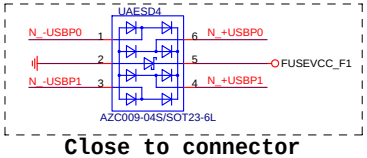
Front USB3.0



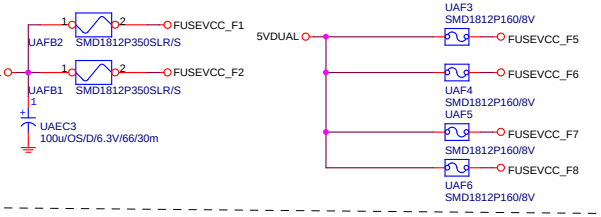
CASE OPEN



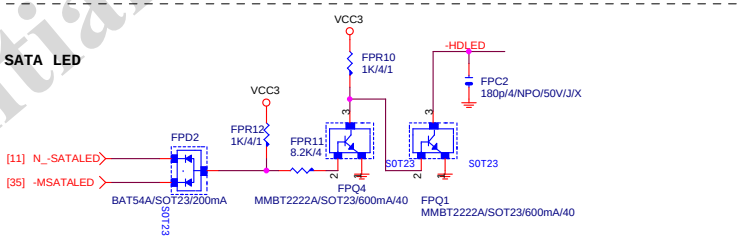
BLUE



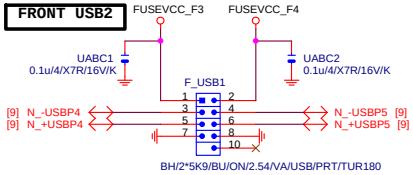
Close to connector



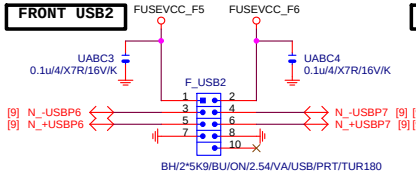
SATA LED



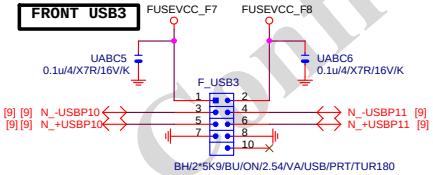
FRONT USB2

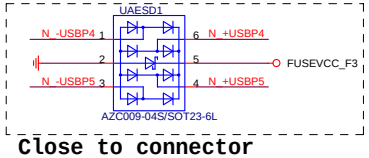


FRONT USB2

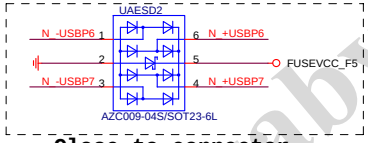


FRONT USB3

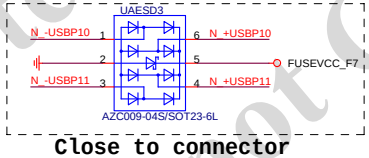




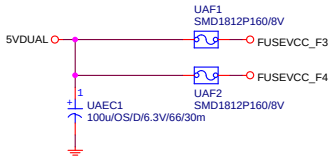
Close to connector

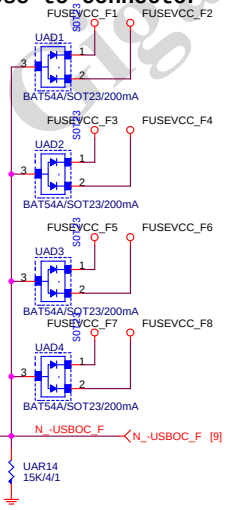


Close to connector

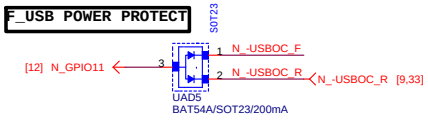


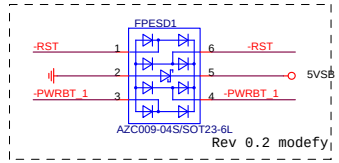
Close to connector



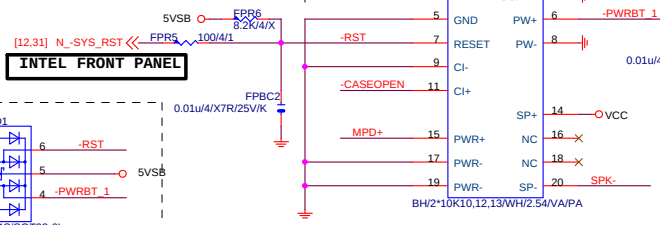


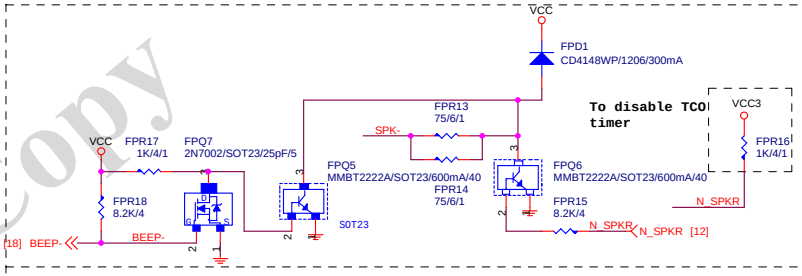
F_USB POWER PROTECT





INTEL FRONT PANEL





Gigabyte Technology		
Title: FP,F_USB,USB PWR,FDD,BZ		
Size: Custom	Document Number: GA-Z77-D3H	Rev: 1.1
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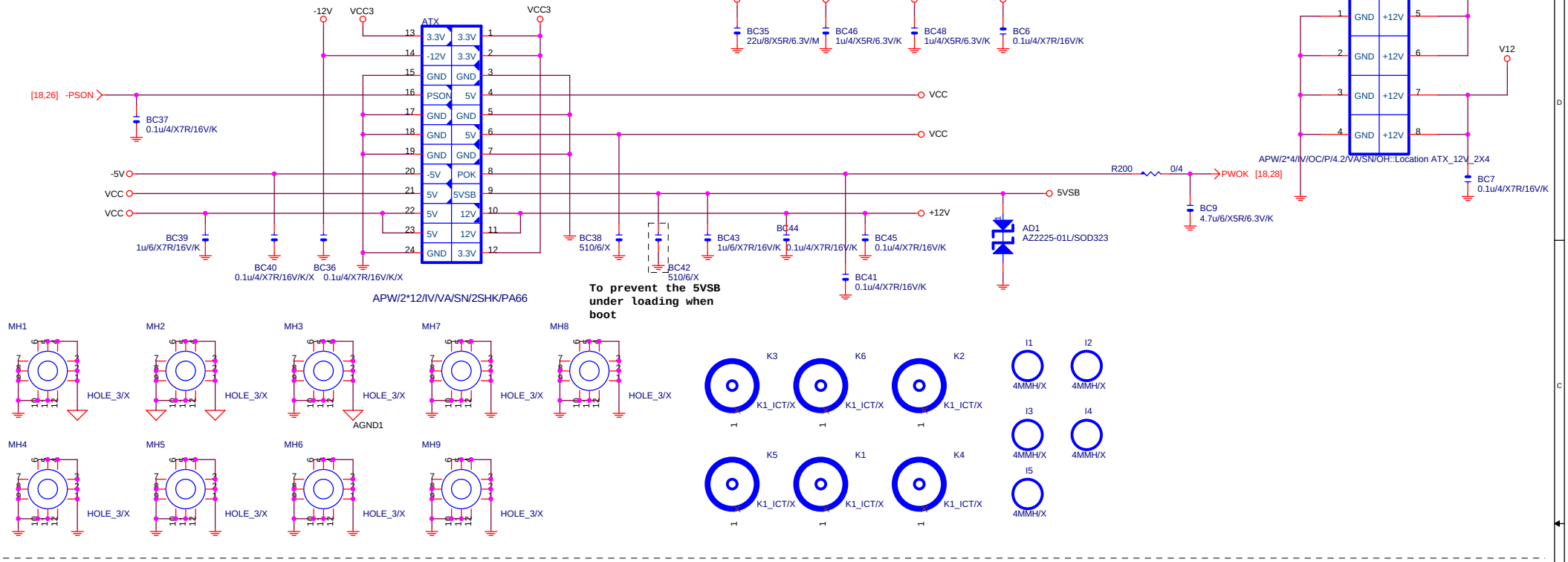
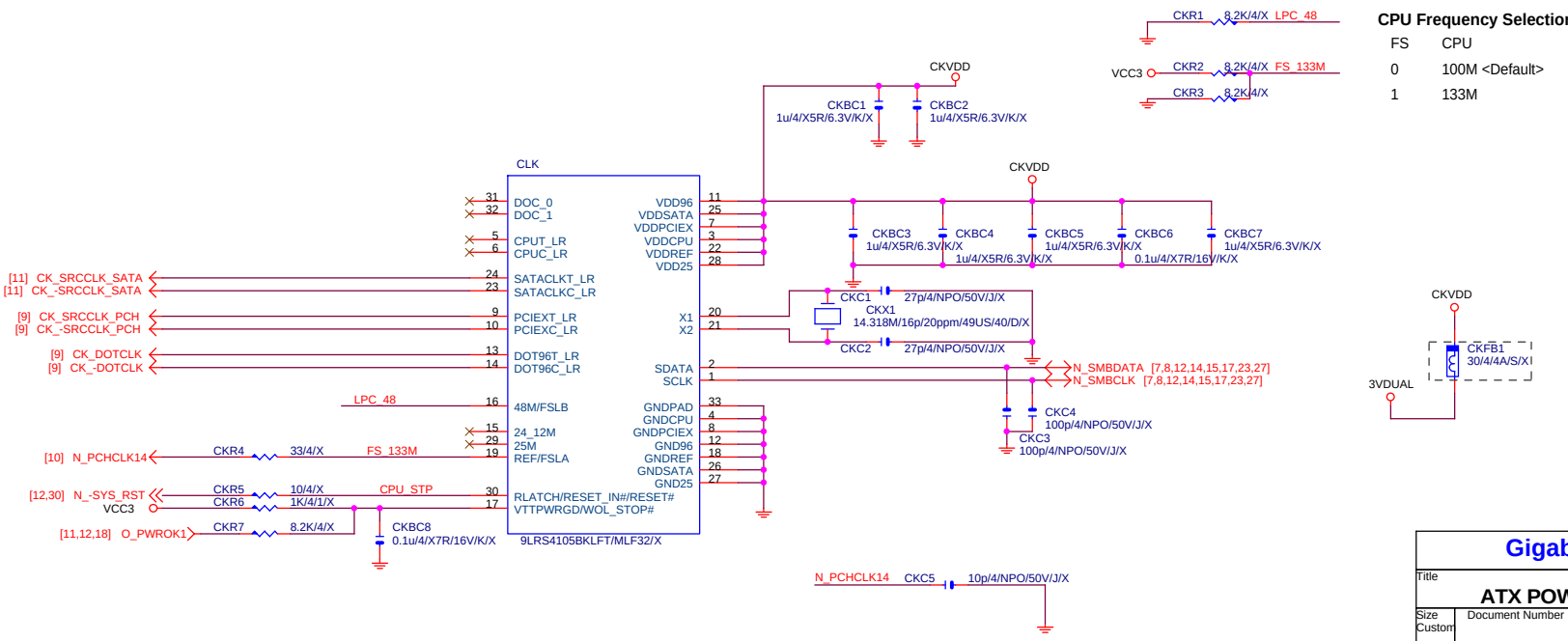
ATX POWER CONNECTOR



CLK GEN

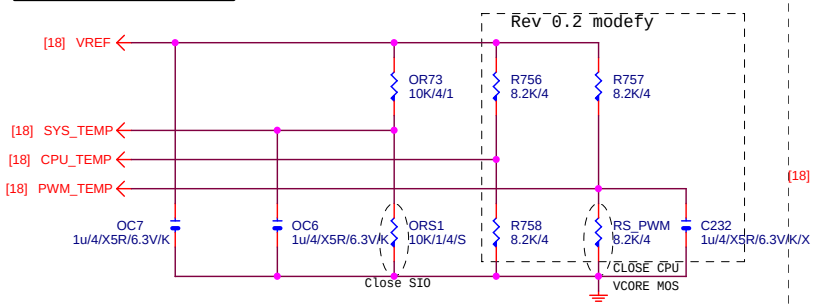


CPU Frequency Selection

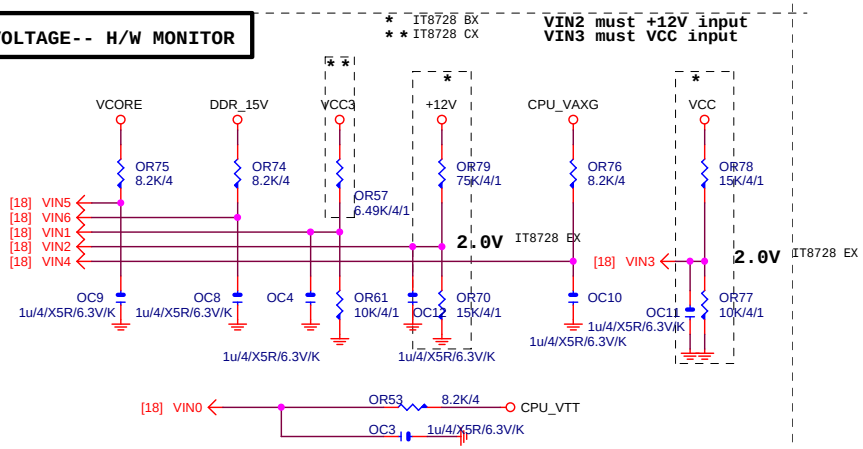
FS	CPU
0	100M <Default>
1	133M

Gigabyte Technology			
Title: ATX POWER CONNECTOR			
Size: Custom	Document Number: GA-Z77-D3H		Rev: 1.1
Date: Friday, July 13, 2012		Sheet 31 of 38	

TEMP H/W MONITOR

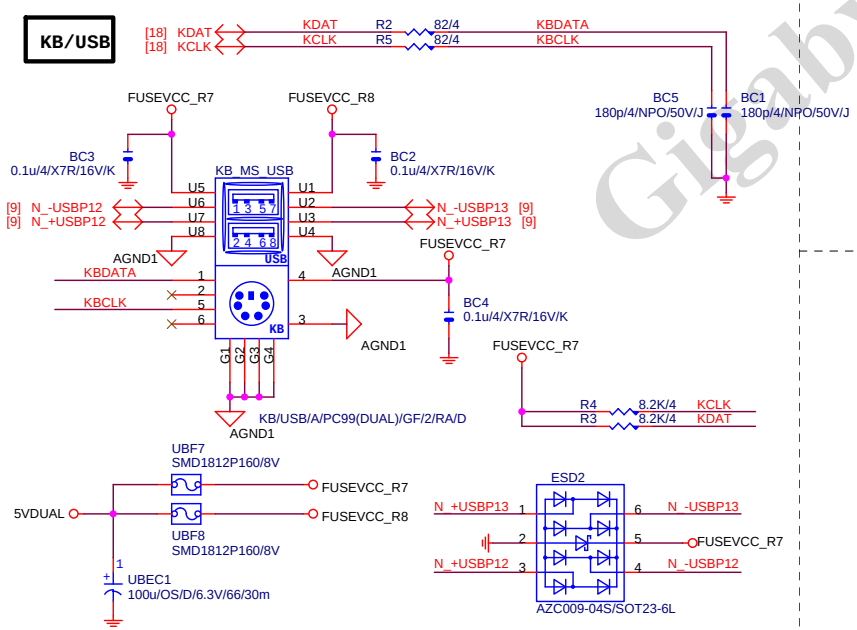


VOLTAGE-- H/W MONITOR

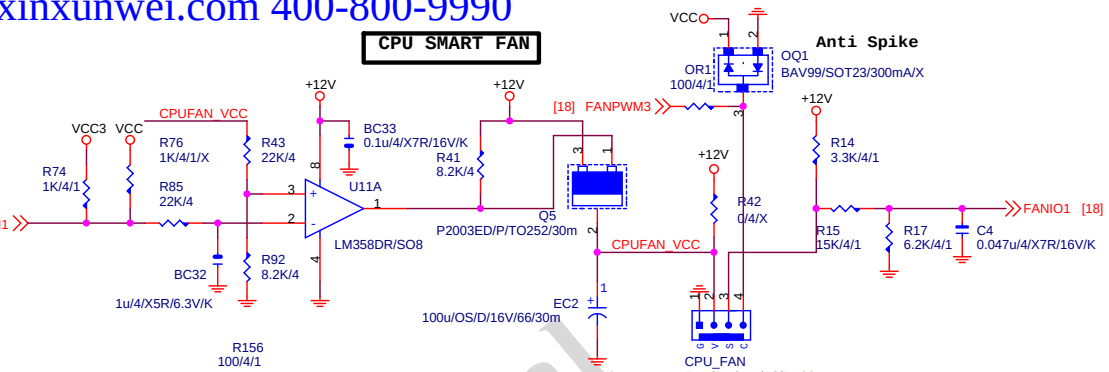


The division voltage of VIN2 & VIN3 must be around 2.9V

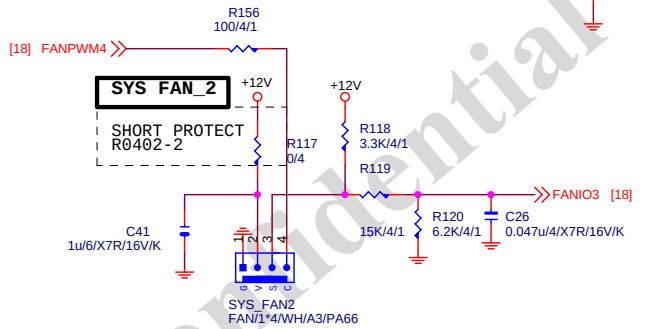
KB/USB



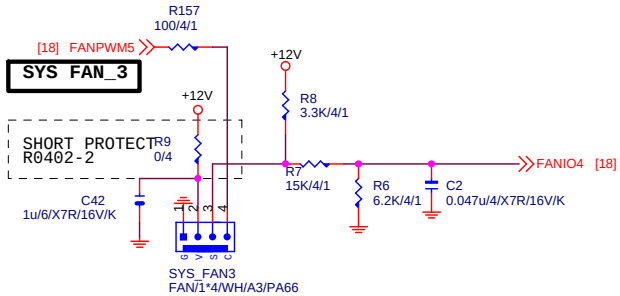
CPU SMART FAN



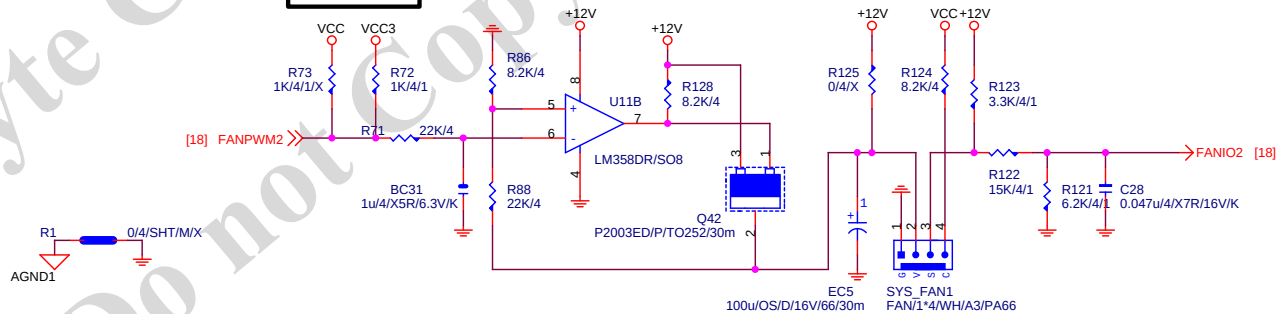
SYS FAN_2

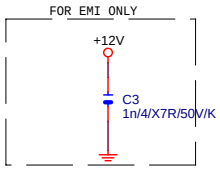


SYS FAN_3



SYS FAN_1 — Linear SYS_FAN





Gigabyte Technology		
Title: HWM,KB/MS, FAN CTRL		
Size: Custom	Document Number: GA-Z77-D3H	Rev: 1.1
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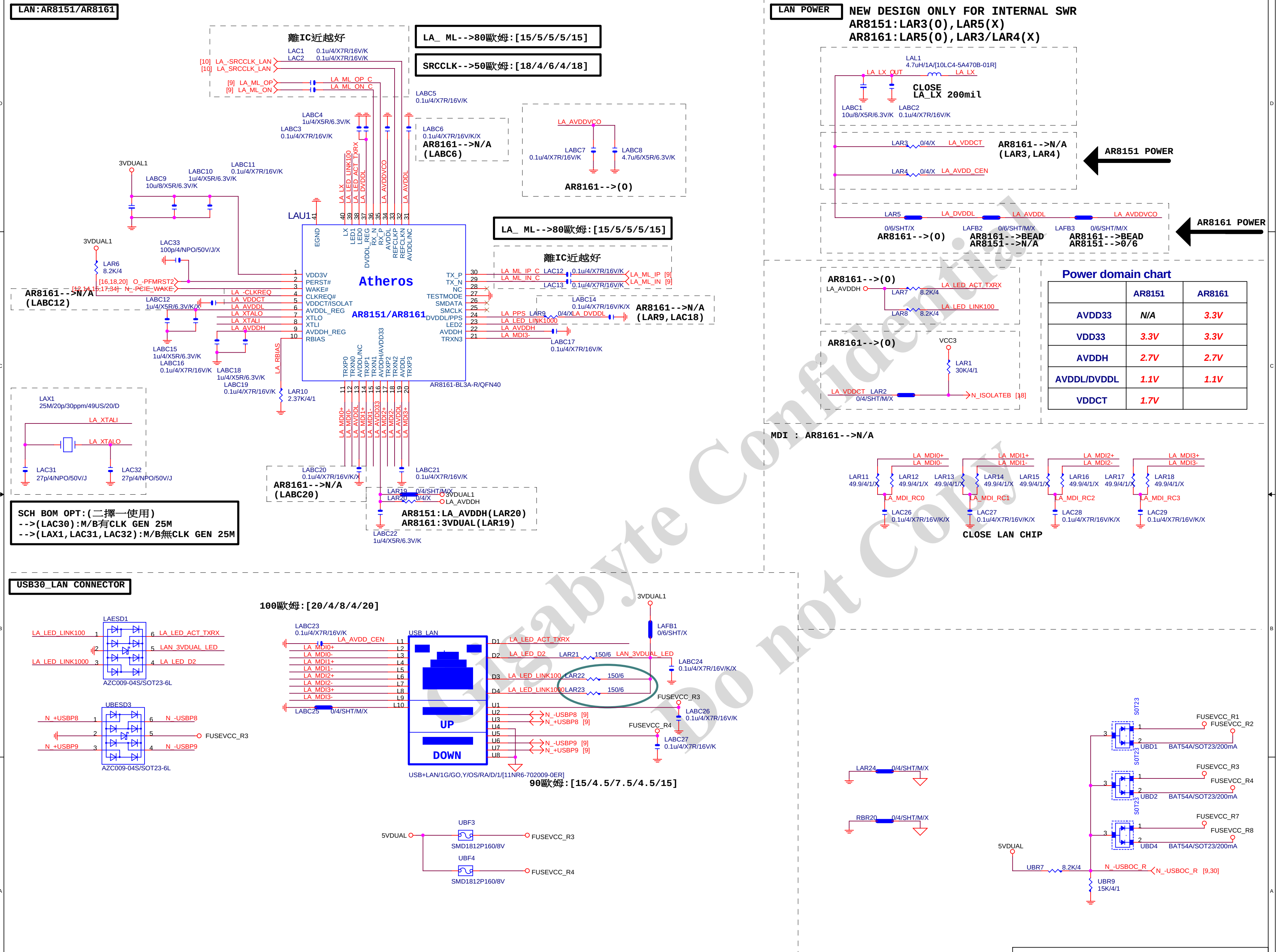

Power domain chart

	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	

Gigabyte Technology

Title: REALTEK RTL8111E_1

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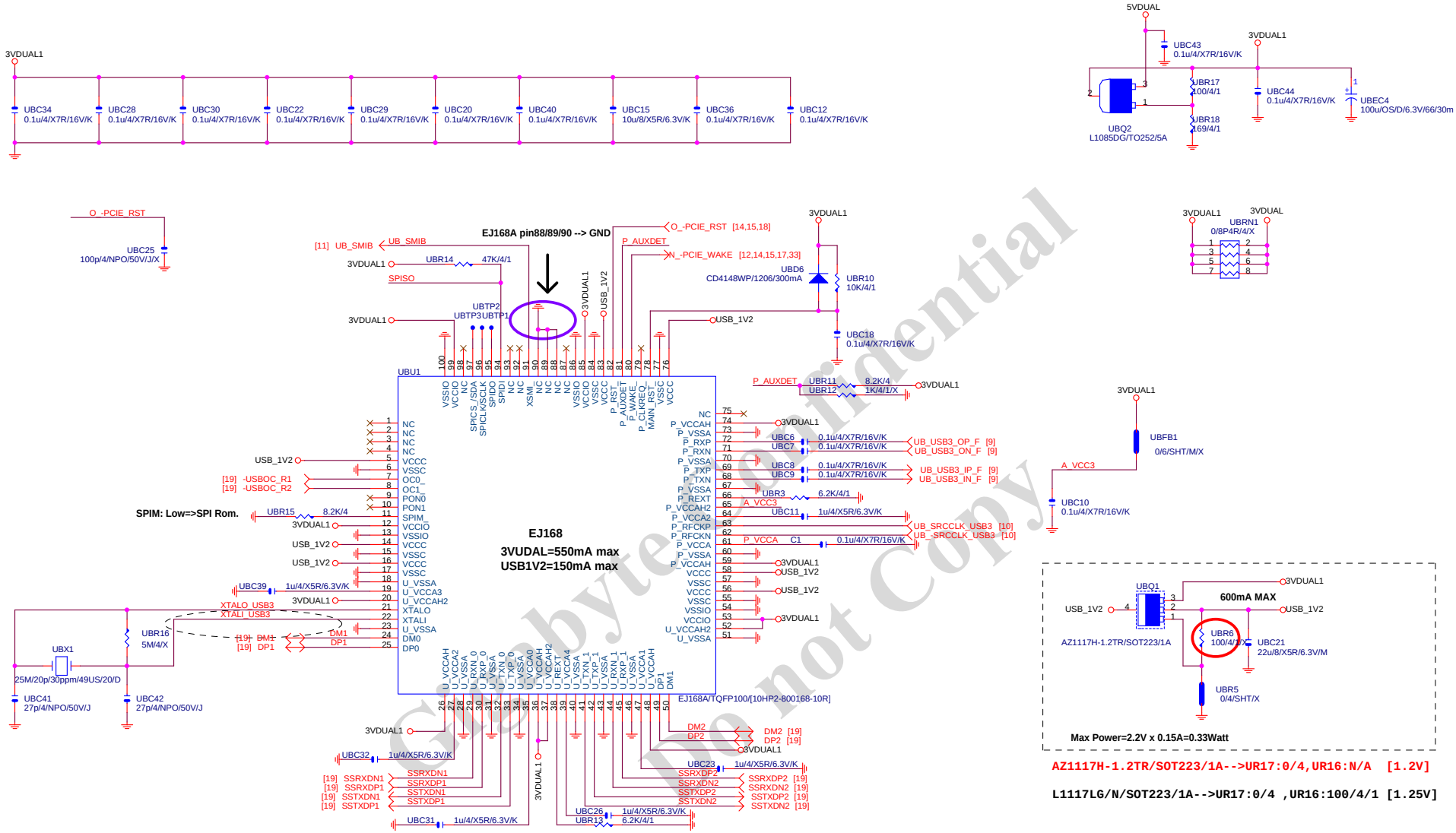

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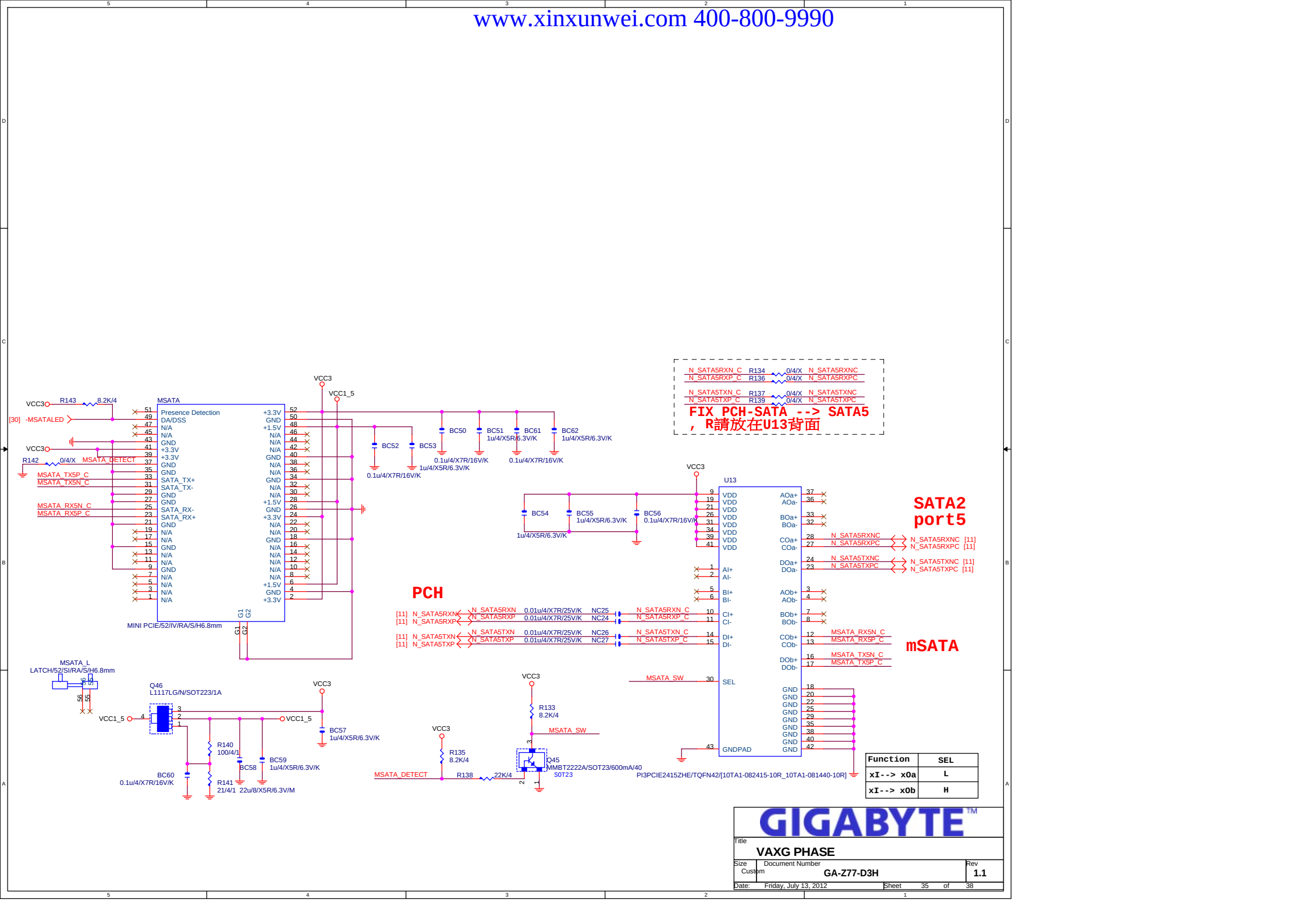
Title: E-TRON EJ168		
Size: Custom	Document Number: GA-Z77-D3H	Rev: 1.1
Date: Friday, July 13, 2012	Sheet 34 of 38	



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

GIGABYTE™

Title: VAXG PHASE

Size: Custom | Document Number: GA-Z77-D3H | Rev: 1.1

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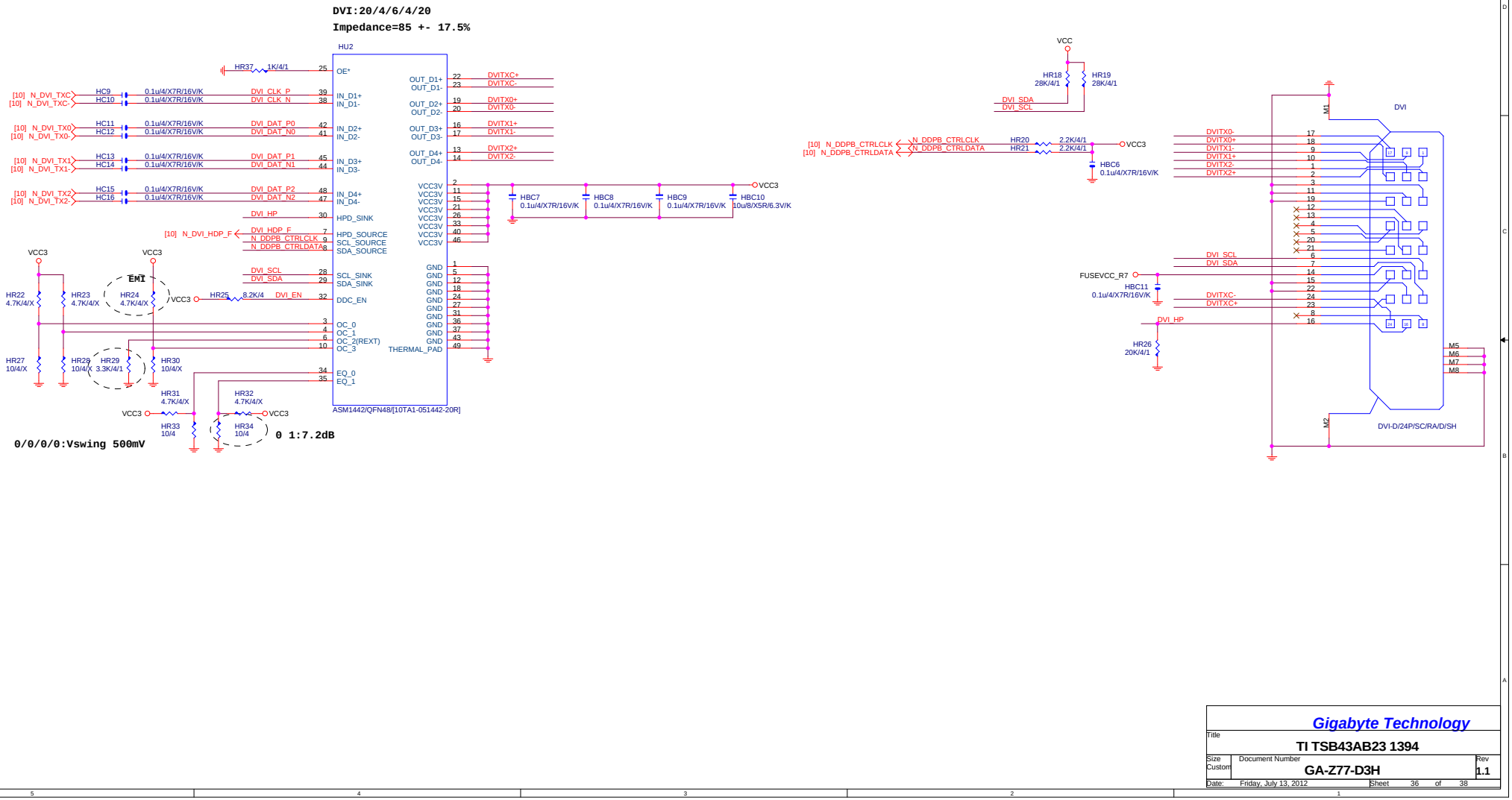
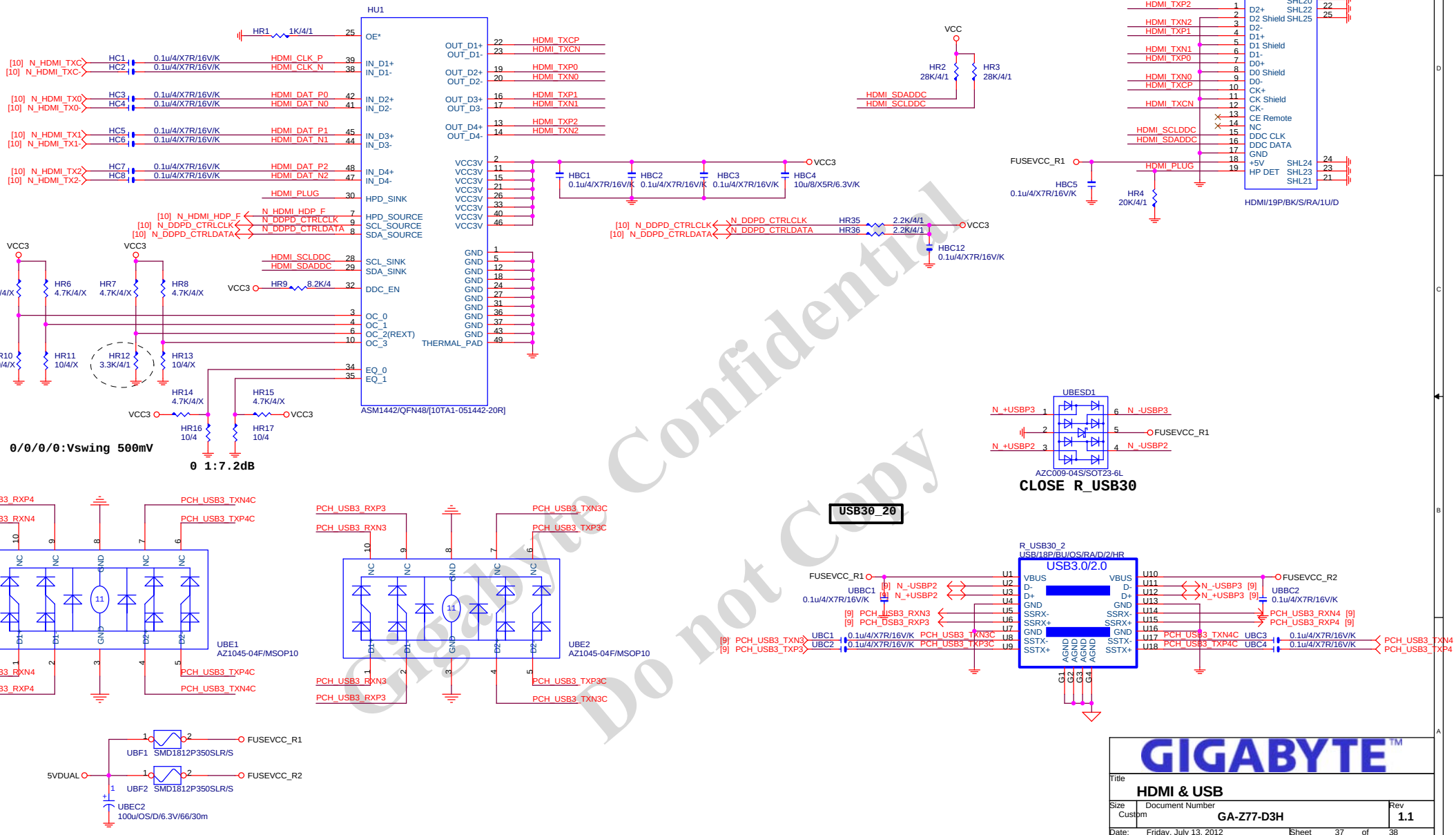


HDMI:20/4/6/4/20

Impedance=85 +- 17.5%



GIGABYTE™

Title: HDMI & USB		
Size: Custom	Document Number: GA-Z77-D3H	Rev: 1.1
Date: Friday, July 13, 2012	Sheet 37 of 38	

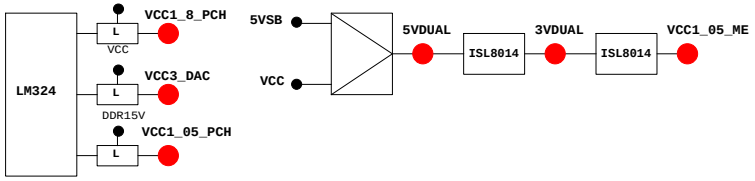
PCH GPIO LIST TABLE

PIN NAME	PWR	AFTER/PLTRST	Default	USAGE	NOTE
GP0	MAIN	H-Z	GPI	GPIO0	N/A
GP1/TACH1	MAIN		GPI	GPIO1	N/A
GP2/PIRQE#	MAIN		GPI	-PIRQE	P/U 8.2K VCC3
GP3/PIRQF#	MAIN		GPI	-PIRQF	P/U 8.2K VCC3
GP4/PIRQG#	MAIN		GPI	-PIRQG	P/U 8.2K VCC3
GP5/PIRQH#	MAIN		GPI	-PIRQH	P/U 8.2K VCC3
GP6/TACH2	MAIN		GPI	PCIEX1 Detect	P/U 8.2K VCC3
GP7/TACH3	MAIN		GPI	GPIO7	P/U 8.2K VCC3
GP8	STBY	H	GPI	GPIO8	N/A
GP9/OC5#	STBY		NATIVE	USB OC5#	N/A
GP10/OC6#	STBY		NATIVE	USB OC6#	N/A
GP11/SMBALERT#	STBY		NATIVE	USB PWR protect	P/U 8.2K 3VDUAL
GP12	STBY	L	GPI	GPIO12	N/A
GP13	STBY	L	GPI	LPCPME#	P/U 8.2K 3VDUAL
GP14/OC7#	STBY		NATIVE	USB OC7#	N/A
GP15	STBY	L	GPI	GPIO15(TLS Enable)	P/U 8.2K 3VDUAL
GP16	MAIN		GPI	GPIO16	P/U 8.2K VCC3
GP17/TACH0	MAIN		GPI	GPIO17	P/U 8.2K VCC3
GP18	MAIN		GPI	Mobile Only	N/A
GP19	MAIN		GPI	GPIO19	P/U 8.2K VCC3
GP20	MAIN		GPI	GPIO20	P/U 8.2K VCC3
GP21	MAIN		GPI	GPIO21	P/U 8.2K VCC3
GP22	MAIN	H-Z	GPI	GPIO22	P/U 8.2K VCC3
GP23	MAIN		GPI	GPIO23	N/A
GP24	STBY	L	GPI	SKTOCC#	N/A
GP25	STBY			Mobile Only	N/A
GP26	STBY			Mobile Only	N/A
GP27	STBY	H	GPO	GPIO27	P/U 8.2K 3VDUAL
GP28	STBY	H	GPO	PWR LED	P/U 8.2K 3VDUAL
GP29	STBY	L	GPI	GPIO29	N/A
GP30	STBY	H-Z	GPI	Mobile Only	N/A
GP31	STBY	H-Z	GPI	Mobile Only	N/A
GP32	MAIN	H	GPO	N/A	N/A
GP33	MAIN	H	GPO	N/A	N/A
GP34	MAIN	H-Z	GPI	-PCI_STOP	P/U 8.2K VCC3
GP35	MAIN	L	GPO	-ACZ_DET	P/U 8.2K VCC3
GP36	MAIN		GPI	N/A	N/A
GP37	MAIN		GPI	N/A	N/A
GP38	MAIN	H-Z	GPI	PCIEX4 Detect	P/U 8.2K VCC3
GP39	MAIN	H-Z	GPI	GPIO39	P/U 8.2K VCC3
GP40	STBY		NATIVE	USB OC1#	N/A
GP41	STBY		NATIVE	USB OC2#	N/A
GP42	STBY		NATIVE	USB OC3#	N/A
GP43	STBY		NATIVE	USB OC4#	N/A
GP44	STBY	L	NATIVE	GPIO44	P/U 8.2K 3VDUAL
GP45	STBY		NATIVE	GPIO45	P/U 8.2K 3VDUAL
GP46	STBY	L	NATIVE	GPIO46	P/U 8.2K 3VDUAL
GP47	STBY			Mobile Only	N/A
GP48	MAIN	H-Z	IN	GPIO48	P/U 8.2K 3VDUAL
GP49	MAIN	H-Z	IN	GPIO49	P/U 8.2K 3VDUAL
GP50	MAIN		NATIVE	-REQ1	P/U 2.2K VCC
GP51	MAIN	H	NATIVE	-GNT1	N/A
GP52	MAIN		NATIVE	-REQ2	P/U 2.2K VCC
GP53	MAIN	H	NATIVE	-GNT2	N/A
GP54	MAIN		NATIVE	-REQ3	P/U 2.2K VCC
GP55	MAIN	H	NATIVE	-GNT3	N/A
GP56	STBY		NATIVE	Mobile Only	N/A
GP57	STBY	H-Z	IN	VCORE_OV1	P/U 8.2K 3VDUAL
GP58	STBY	H-Z	NATIVE	F_USB_OC	P/U 8.2K 3VDUAL
GP59	STBY		NATIVE	USB_OC0#	N/A
GP60	STBY	H-Z	NATIVE	N/A(Reverse)	P/U 8.2K 3VDUAL
GP61	STBY	L	NATIVE	-SUSTAT	N/A
GP62	STBY	L	NATIVE	SUSCLK	N/A
GP63	STBY	L	NATIVE	GPIO63	N/A
GP64	MAIN	L	NATIVE	CLKOUTFLEX0	N/A
GP65	MAIN	L	NATIVE	CLKOUTFLEX1	N/A
GP66	MAIN	L	NATIVE	CLKOUTFLEX2	N/A
GP67	MAIN	L	NATIVE	CLKOUTFLEX3	N/A
GP72	STBY	H-Z	NATIVE	VCORE_OV4	P/U 8.2K 3VDUAL
GP73	STBY			Mobile Only	N/A
GP74	STBY	H-Z	NATIVE	1_05V_OV2	P/U 8.2K 3VDUAL
GP75	STBY	H-Z	NATIVE	N/A(Reverse)	P/U 8.2K 3VDUAL

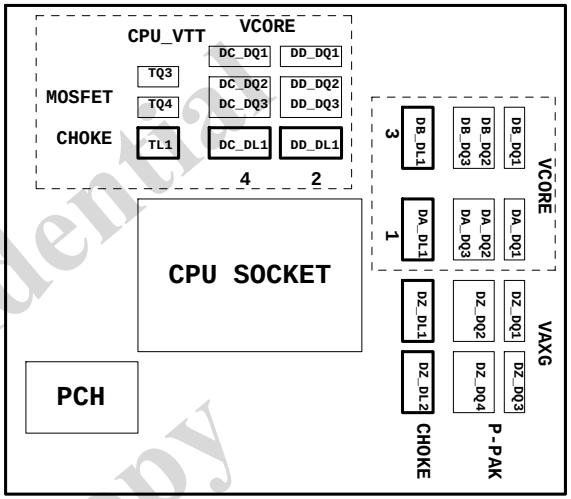
Super I/O ITE8720 GPIO Table

PIN NAME	USAGE	NOTE
SVC/PECI_RQT/GP14	-PECI_REQ	
PWROK1/GP13	PWROK1/ITE_PWROK	
KRST#/GP62	-KBRST	
SO/GP50	-ICH_SPI_CS	
IRTX/GP47/CE2_N/JP7	CEB_N	
GP46/IRRX	-LAN2_DSM	
PSION#/GP42	-PSON	
PWROK2#/GP41	PECI_CTL	
PCIRST3#/GP10/VDIMM_STR_EN	-PCIE_RST	
RSMRST#CIRRX1/GP55	-RSMRST	
PME#/GP54	-LPCPME	
PD5/GP75/BUSSO0	N/A	

PIN NAME	USAGE	NOTE
FAN_TAC2/GP52	FANIO2	
FAN_TAC3/GP37	FANIO3	
VIDO3/FAN_TAC4/GP25/DSR2#	FANIO4	
FAN_CTL2/GP51	FANPWM2	
FAN_CTL3/GP36	FANPWM3	
VID4/GP34	BEEP-	
VID3/GP33	TURBO1	
VID2/GP32	TURBO0	
VCORE_GOOD/VID6/GP63	CPUT_LED1_C	
VID5/GP35	CPUT_LED2_C	
VID1/GP31	CPUT_LED3_C	
VID0/GP30	-LAN1_DSM	NBT_LED1_C
SLCT/GP80	CPU_LED1_C	
PE/GP81	CPU_LED2_C	
BUSY/GP82	CPU_LED3_C	
PD3/GP73/BUSSI1	SB_LED1_C	
PD4/GP74/BUSSI2	SB_LED2_C	
VCORE_EN/VID7/GP64	IT_GP64	SB_LED3_C
PD0/GP70	NB_LED1_C	
PD1/GP71	NB_LED2_C	
PD2/GP72/BUSSI0	NB_LED3_C	
GP22/SCK	LOW_PWR_1	
VIDO5/GP27/SIN2	LOW_PWR_2	
PCIRST2#/GP11	-PFMRST1	
PCIRST1#/GP12	-PFMRST2	
3VSBSW#/GP40	CSI_F0	BSEL166_1
SUSC#/GP53	CSI_F1	BSEL166_2
GP23/SI	BSEL166_3/CSISBSL	
VIDO0/GP20/CTS2#	CPUT_LED1_C	BSEL166_4
GP65/VDDA_EN/GB_01	MB_ID2	
PD6/GP76/BUSSO1	MB_ID3	
PD7/GP77/BUSSO2	MB_ID4	
AFD#/GP86/SMBC_R	空 PIN	FST_2X8
INIT#/GP85/SMBD_M	SEC_2x8	GTLREF_AD2
ACK#/GP83	DDR_LED1_C	
VIDO1/GP21/DCD2#	DDR_LED2_C	
STB#/GP87/SMBC_M	DDR_LED3_C	
PWRON#GP44	VCORE_OV1	
PANSWH#/GP43	PWRBTSW	
KDAT/GP61	-PWRBTSW	
KCLK/GP60	KDAT	
MDAT/GP57	KCLK	
MACL/GP56	MDAT	
GP66/VLDT_EN/GB_02	NBT_LED1_C	MCLK
SVD/PCIRSTIN#/CIRTX/GP15	PWM2_CR	
KDAT/GP61	PWM2_CR	
GP67/CPU_PG/GB_03	EN_LOADLINE	IT_GP67/-EN_PWM2
SLIN#/GP84/SMBD_R	-EN_PWM2	
PSI_L/FAN_CLT5/CIRRX2/GP16	-THERM	
VIDO4/GP26/SOUT2	DDR18V_PH2_EN	
VIDO2/FAN_TAC5/GP24/DSR2#	DDR18V_LED	
VIDO6/GP17/RI2#	1_1V_PH_EN	
VIDO7/JP6/DTR2#	JP6	
PD5/GP75/BUSSO0	SB_LED3_C	



PWM各相位的擺法如下：



BIOS超電壓對應表：

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

散熱模組料號：

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

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

Gigabyte Technology
Title: TABLE LIST
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