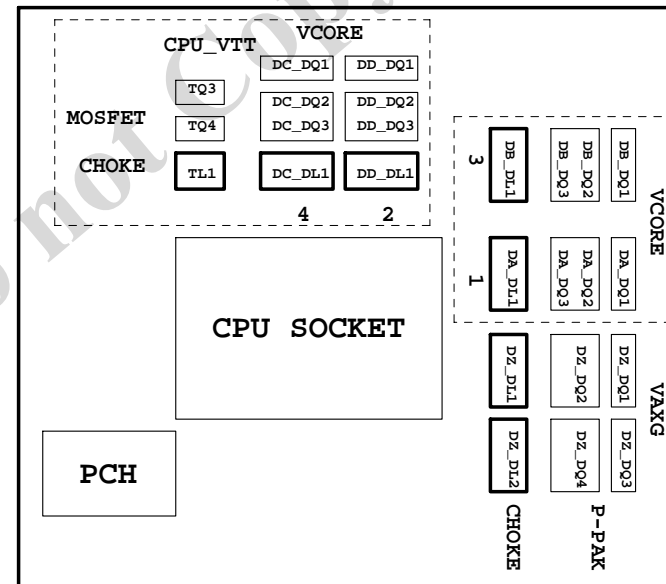


1.1

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	



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	

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. ACHS105 LAN ARS161 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) 7. add VCC1_05_PCH over voltage control	

Size

Custom

Title

BOM & PCB MODIFY HISTORY

Document Number

GA-Z77-D3H

Date

Friday, July 13, 2012

Sheet

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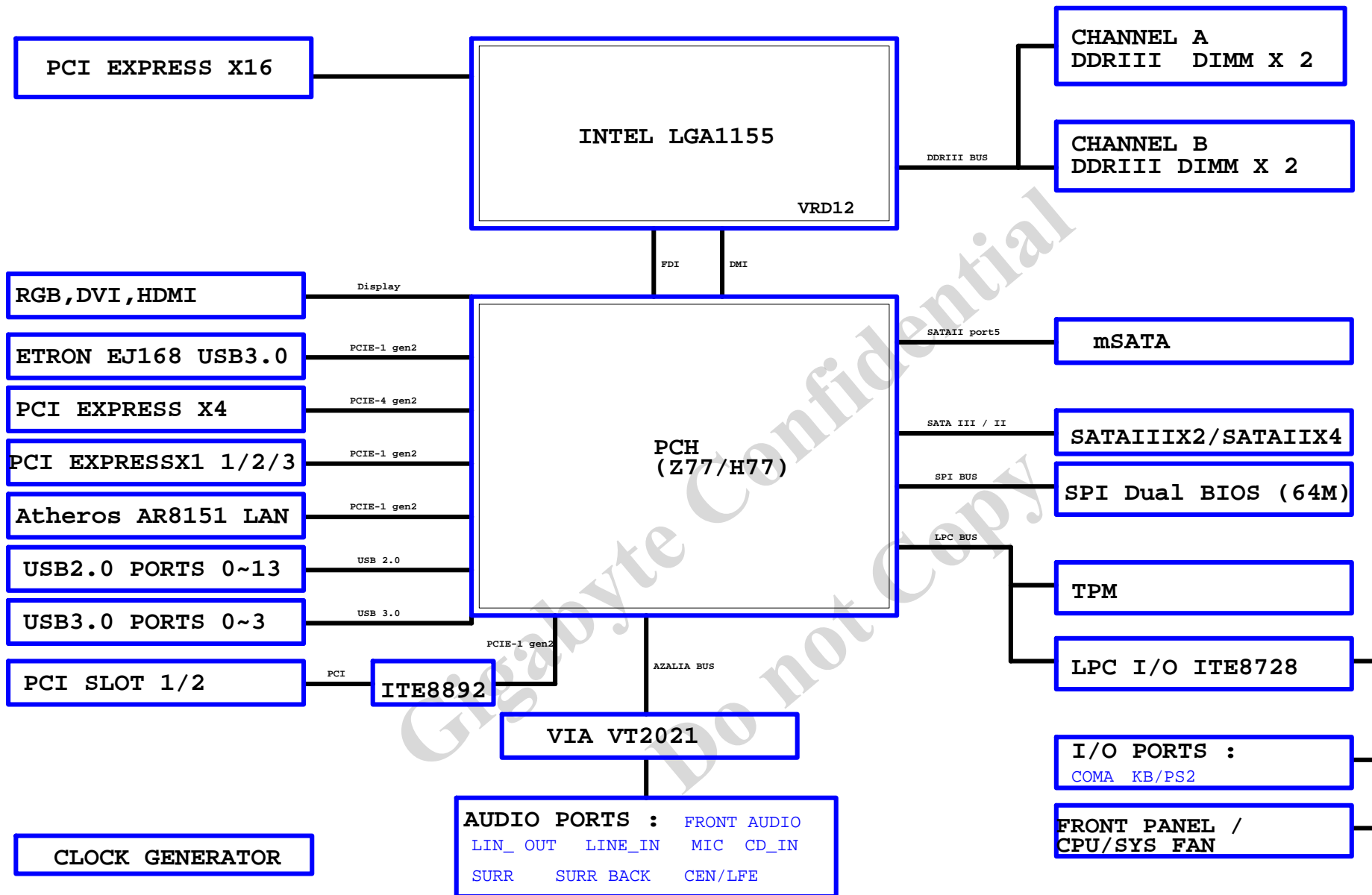
Rev

1.1

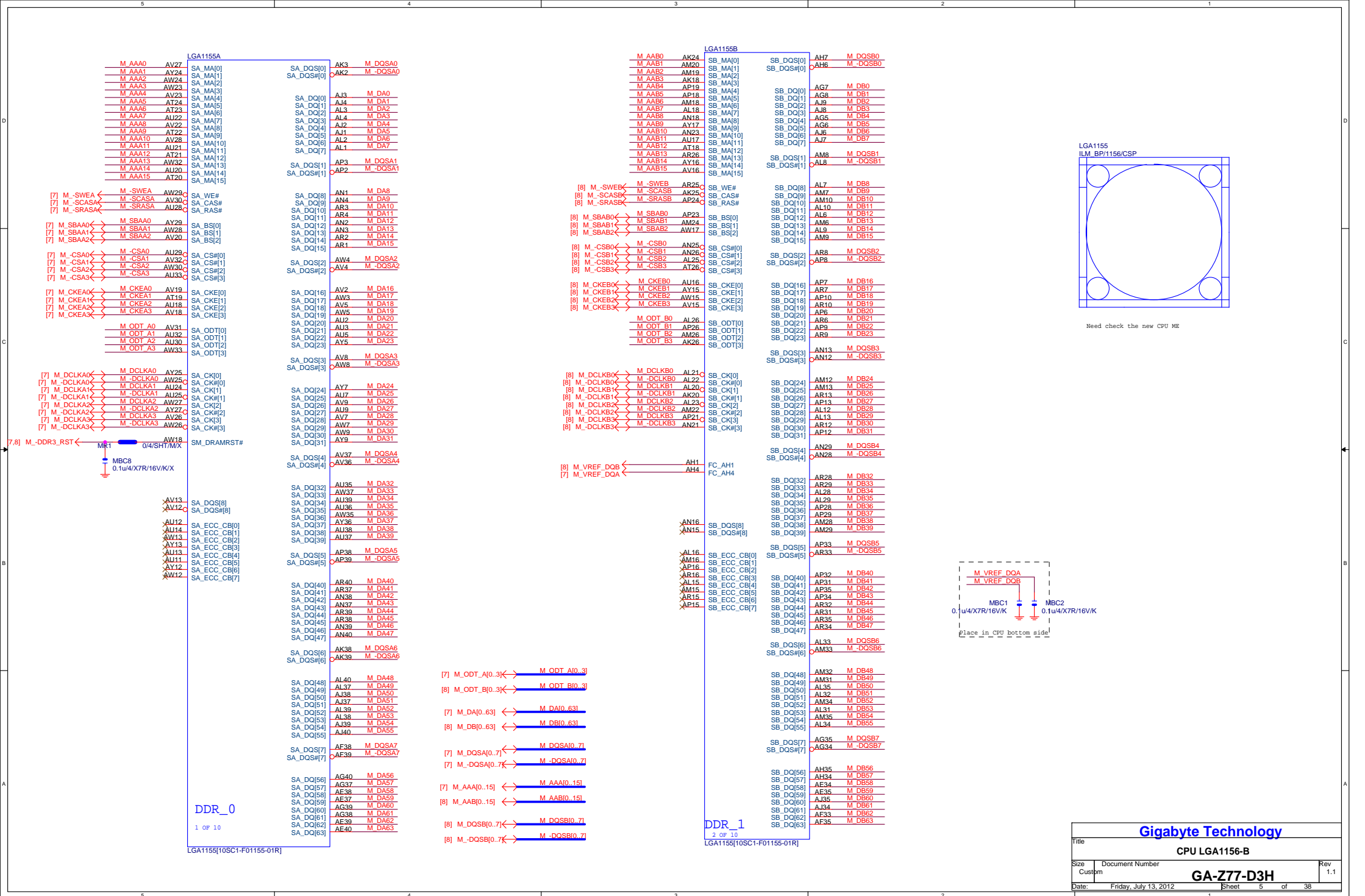
Gigabyte Technology

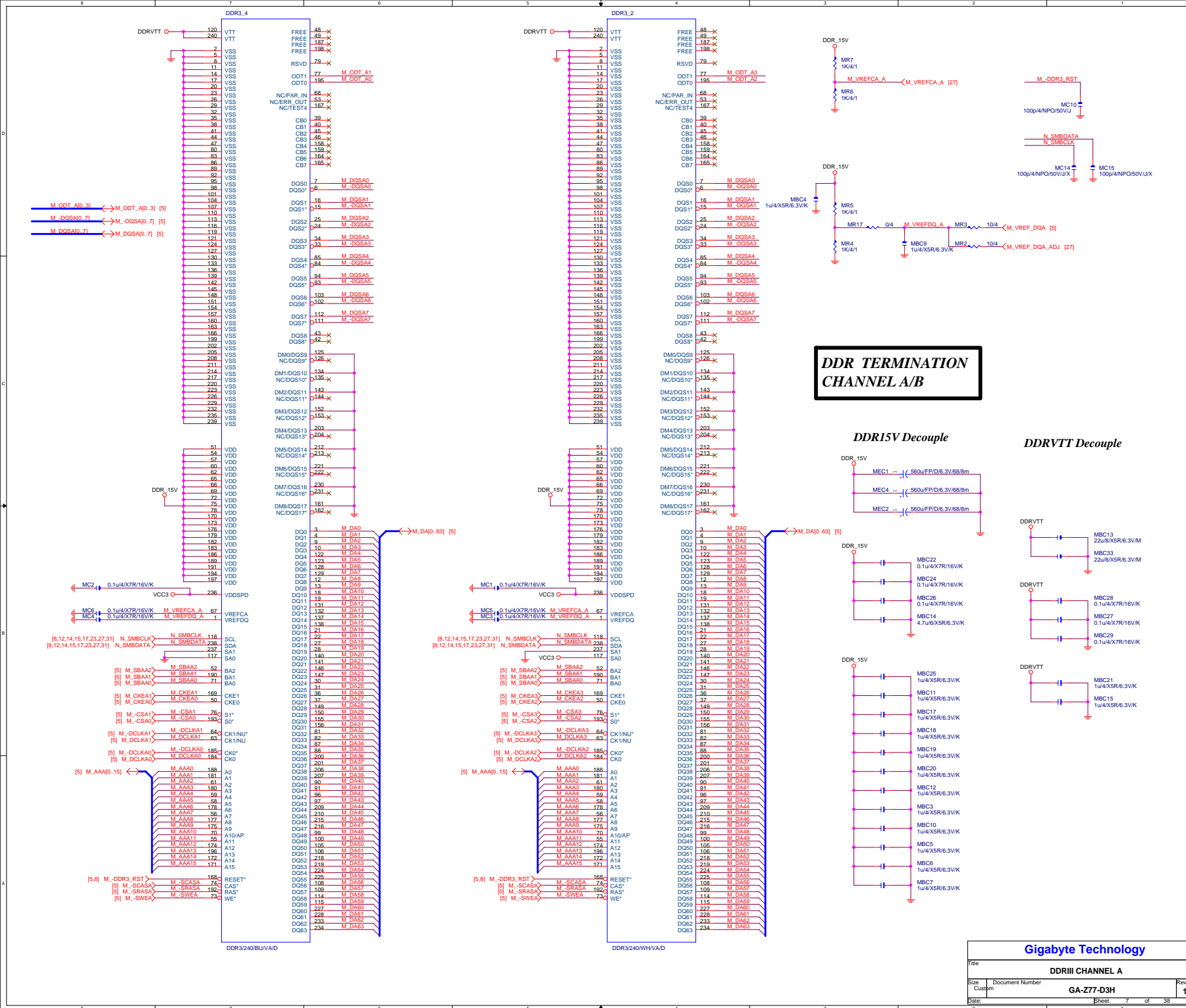
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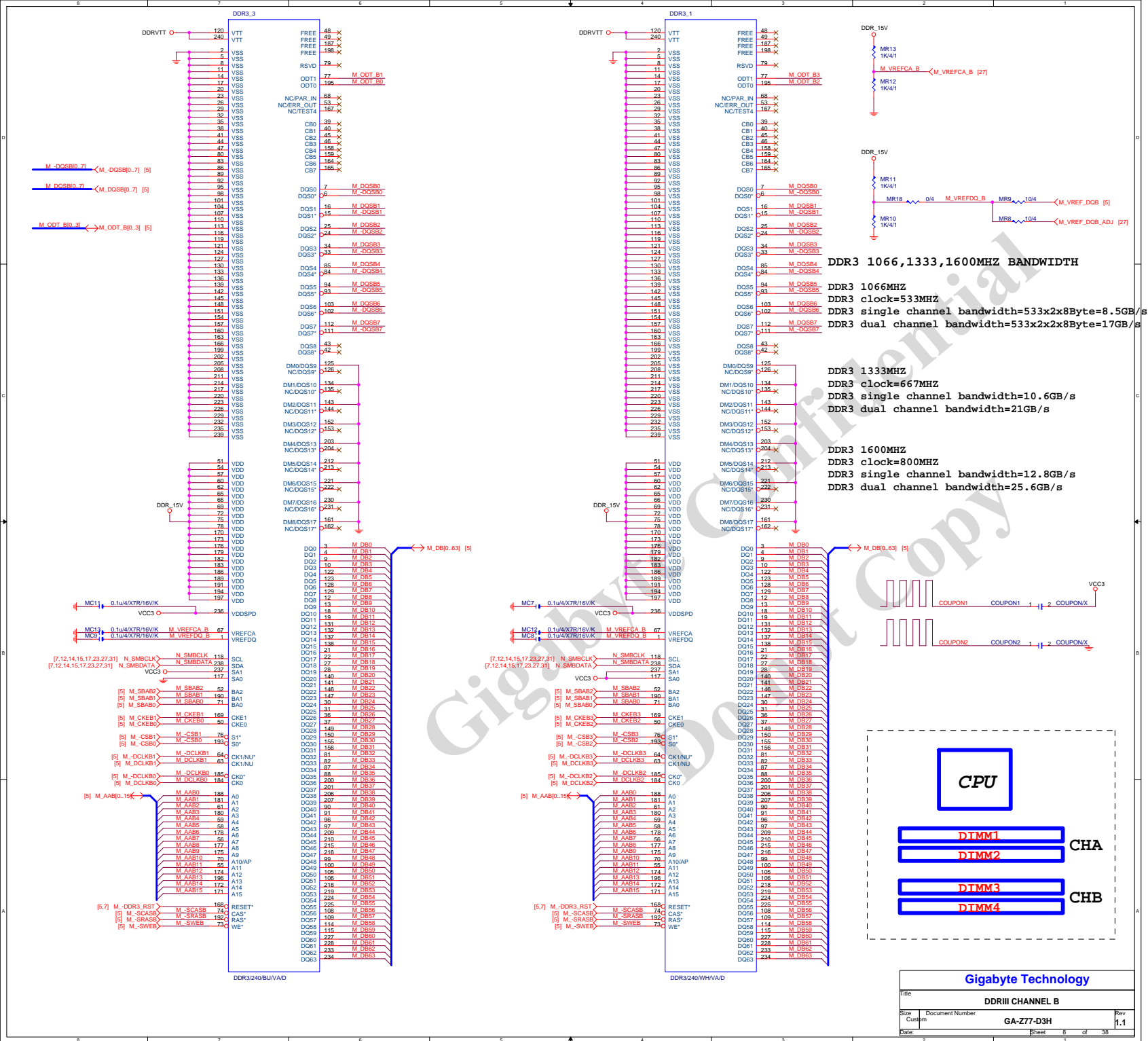
BLOCK DIAGRAM



www.vinafix.com







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

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

PCHB

PCHG

FDILINK

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

PCHE

NVRAM

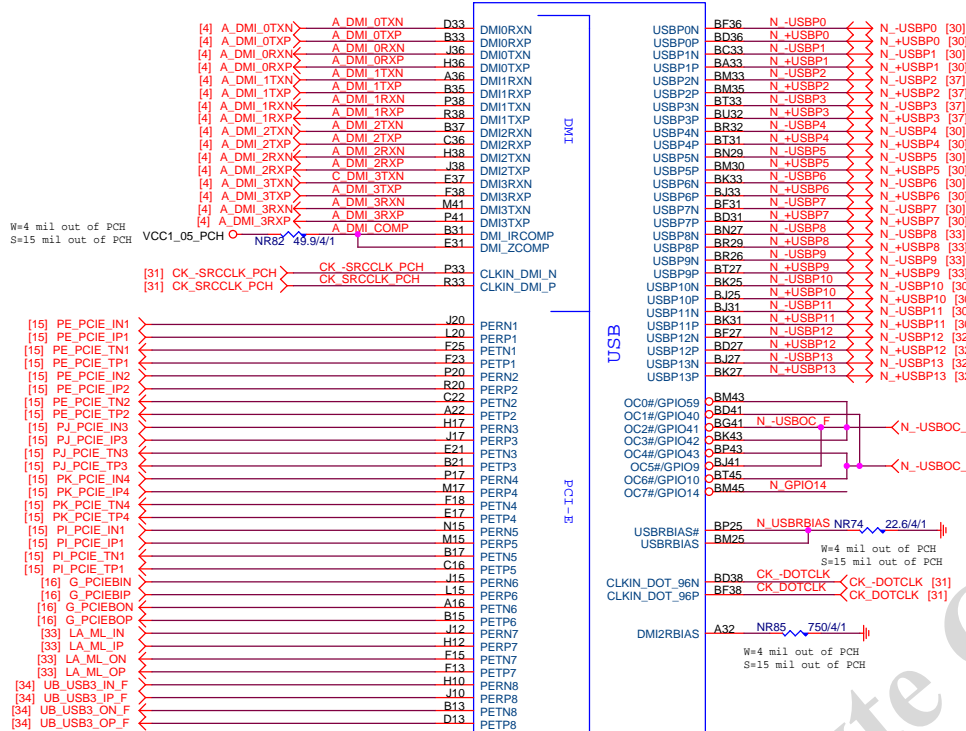
USB OC# Configure	
OC0#	USB0,1
OC1#	USB2,3
OC2#	USB4,5
OC3#	USB6,7
OC4#	USB8,9
OC5#	USB10,11
OC6#	USB12,13
OC7#	Not Use

Mount for integrated clock Generation Mode

R102 short to GND in non graphic SKU

Gigabyte Technology

Title		
PCH FDI,DMI,USB,PCIE		
Size	Document Number	Rev
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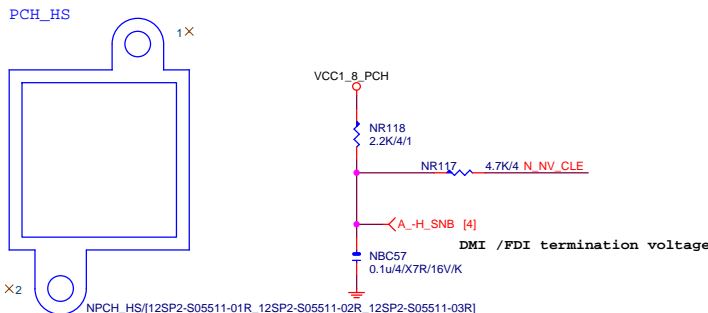


放靠近 Device & PCI-E Slot

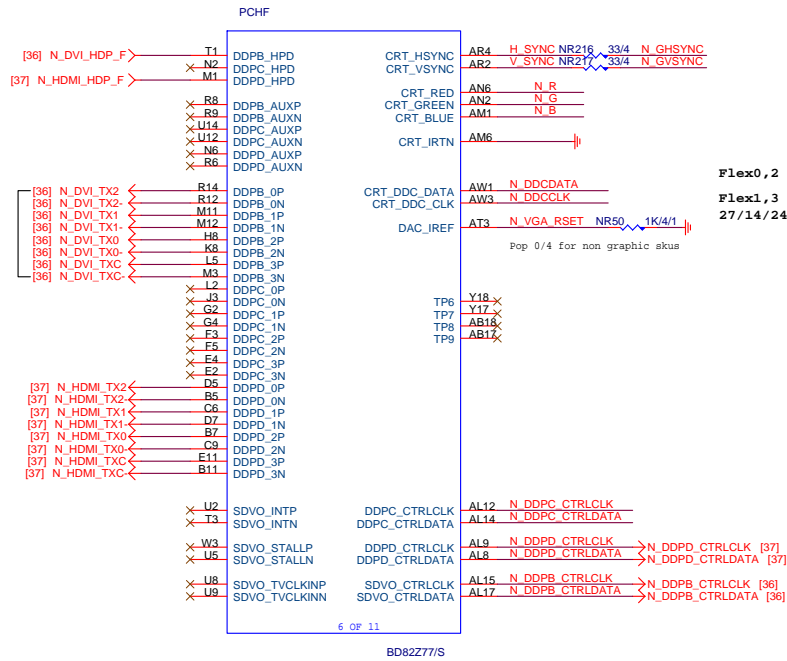
PCIEX1:16/5/5/5/16 (breakout min 8/4/4/4/8)

Impedance=80 +- 17.5%

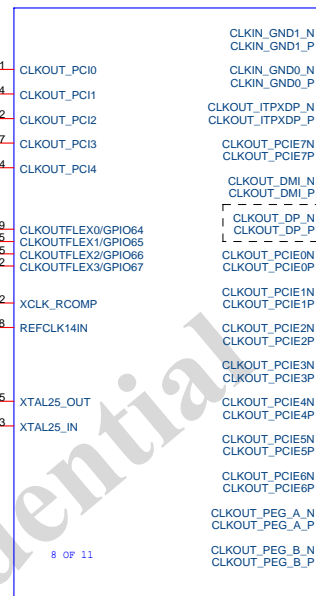
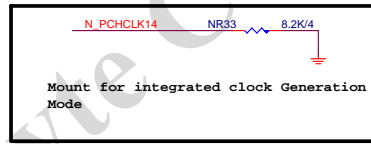
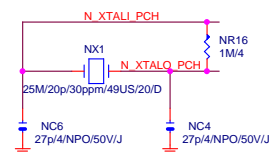
PCH_HS



DMI / FDI termination voltage

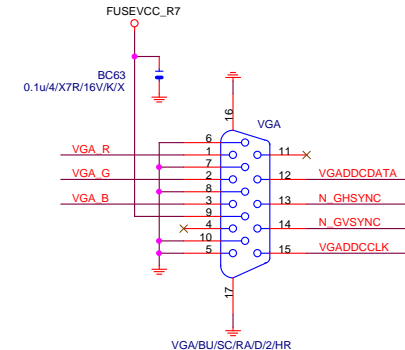
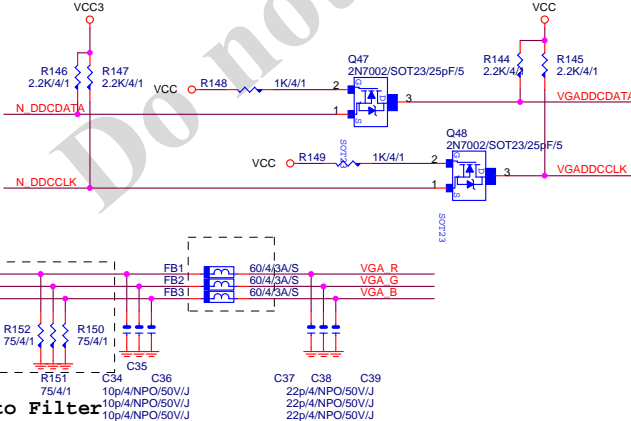
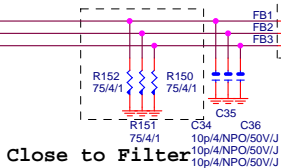
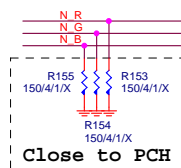
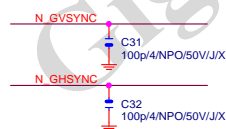
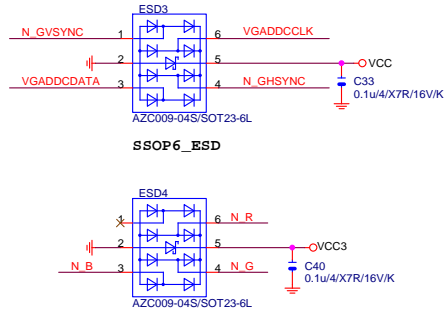


Flex0,2 : 33MHz
Flex1,3 : 27/14/24/48/25MHz



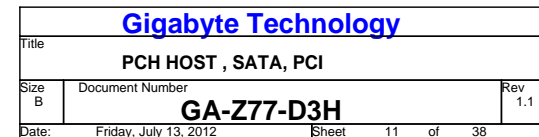
Differential Clock:18/4/6/4/18
Impedance=90 +- 15%

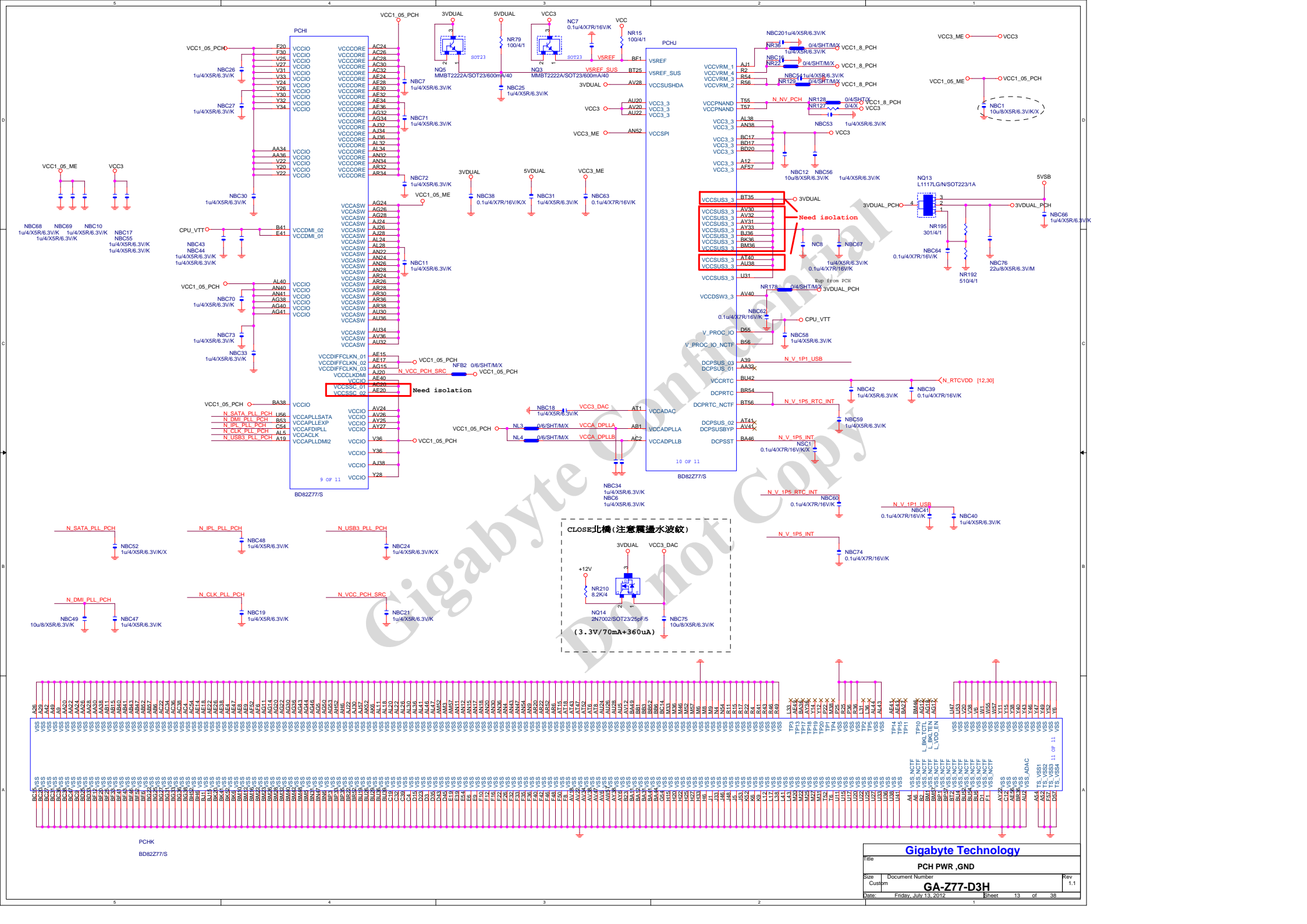
Check if NC for P67 non graphic chip

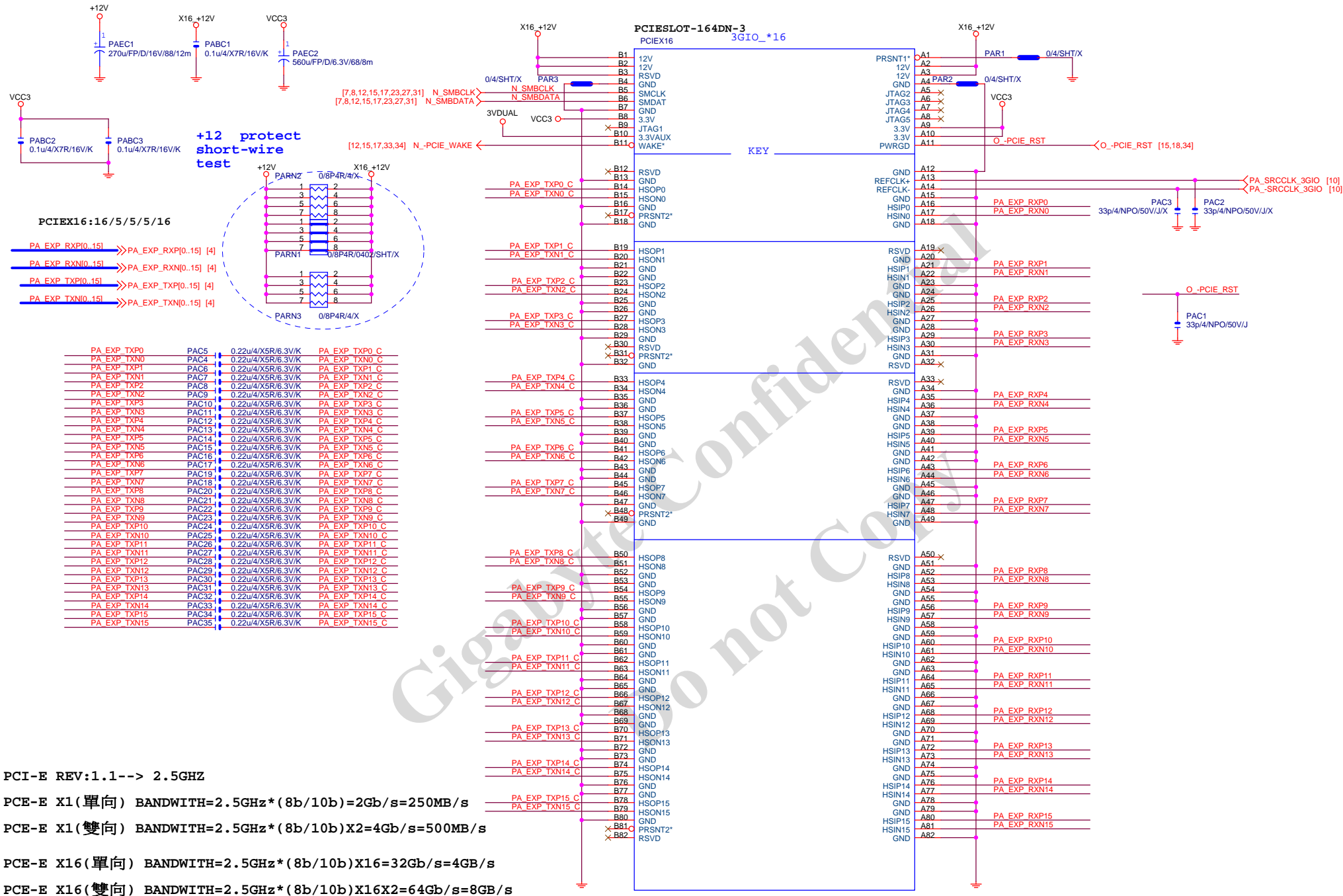


Gigabyte Technology			
Title			
PCH DISPLAY ,CLK BUFFER			
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SATA2 : 15/7.5/4.5/7.5/15 (breakout min 8/4/4/4/8)
Impedance=90 +- 17.5%







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

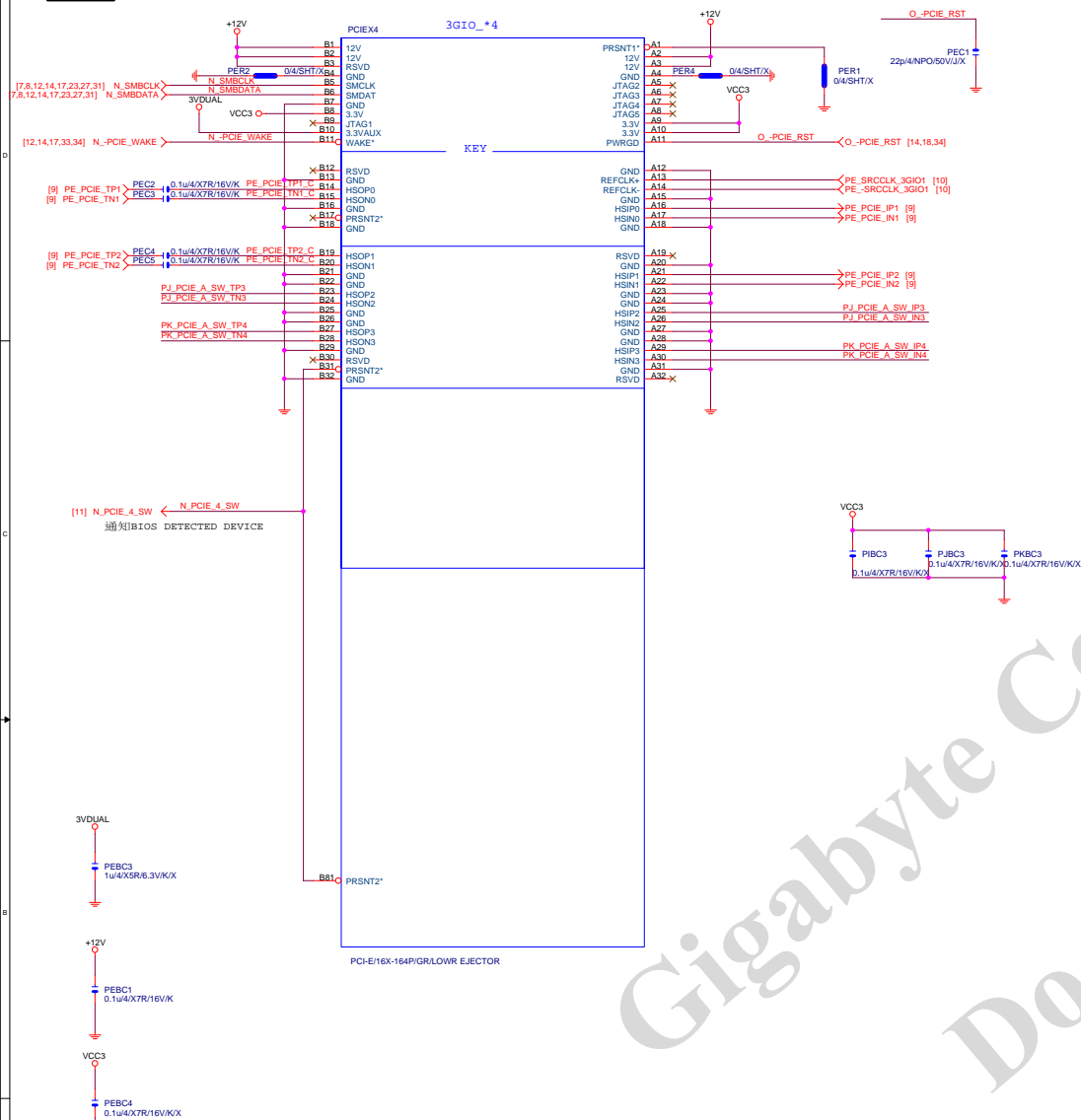
PCE-E X16(單向) BANDWITH=2.5GHz*(8b/10b)X16=32Gb/s=4GB/s

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

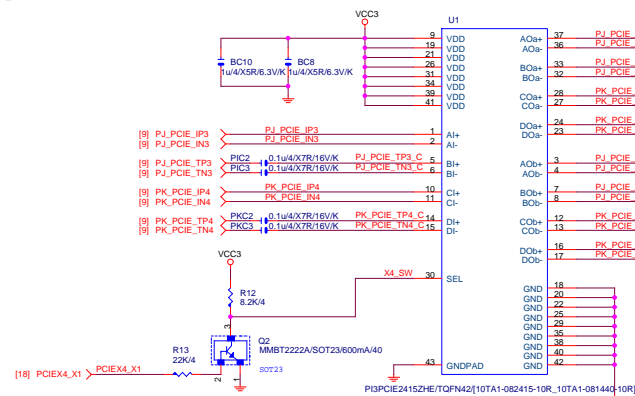
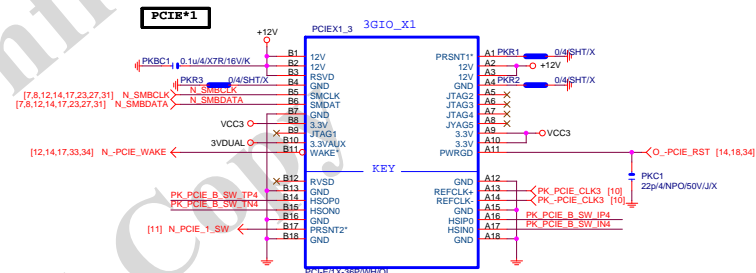
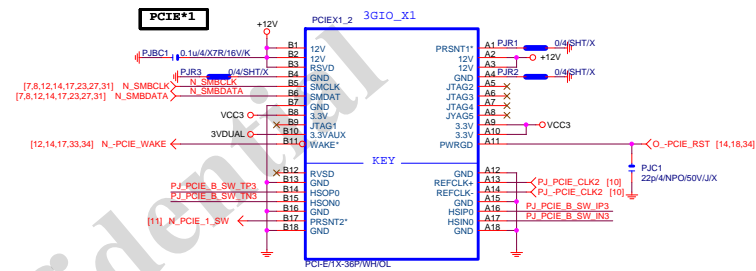
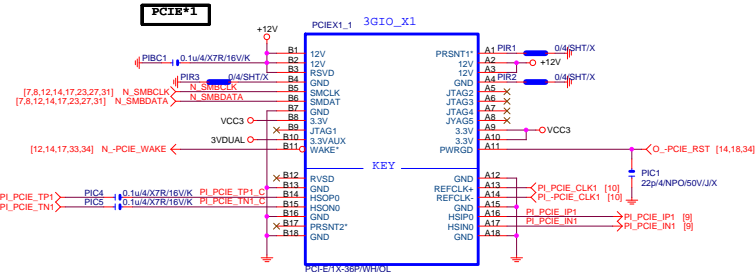
PCI-E REV:2.0--> 5GHZ

Gigabyte Technology			
Title			
PCI EXPRESS * 16			
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Custom	GA-Z77-D3H	1.1	
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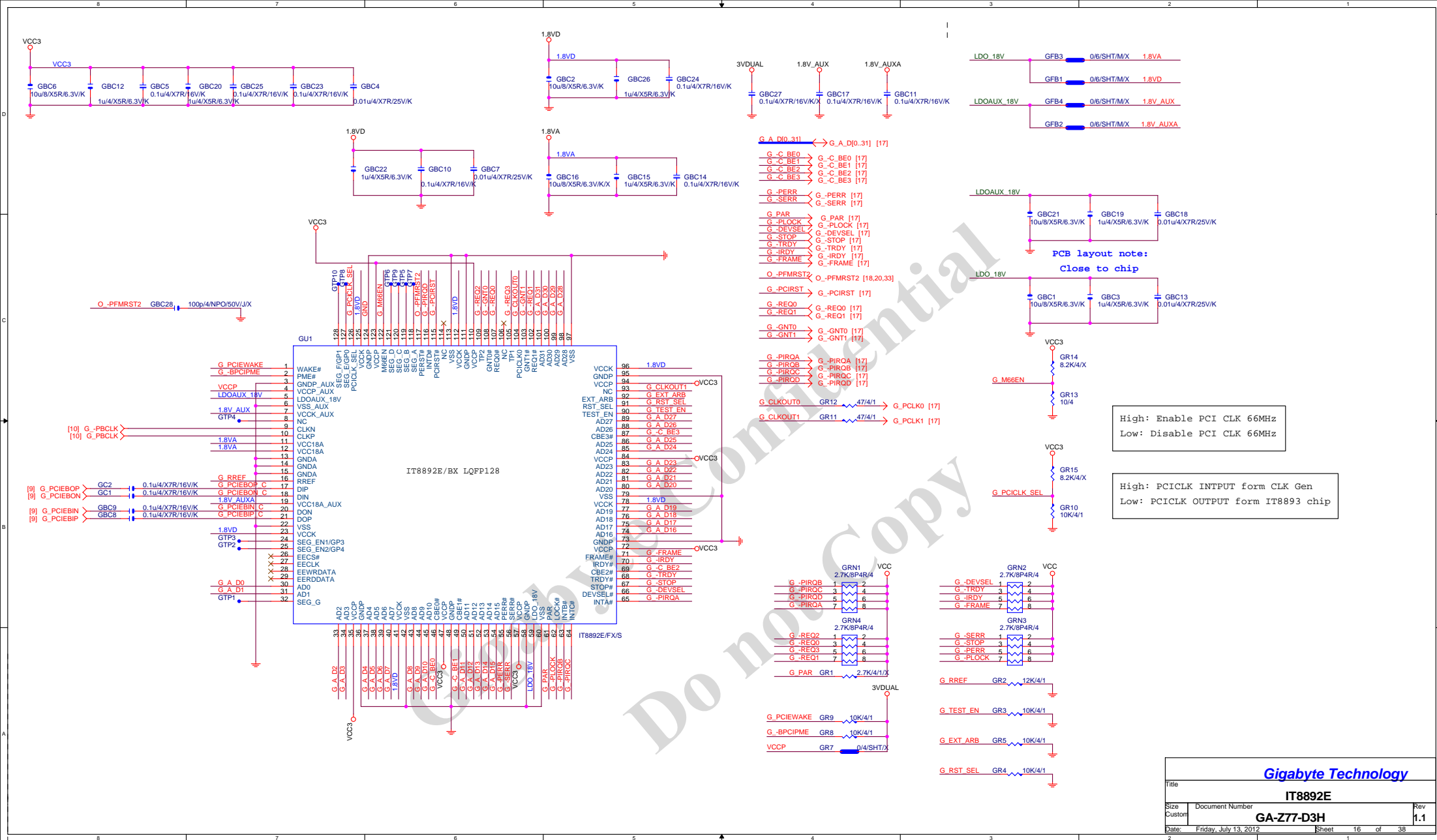
PCIE*4

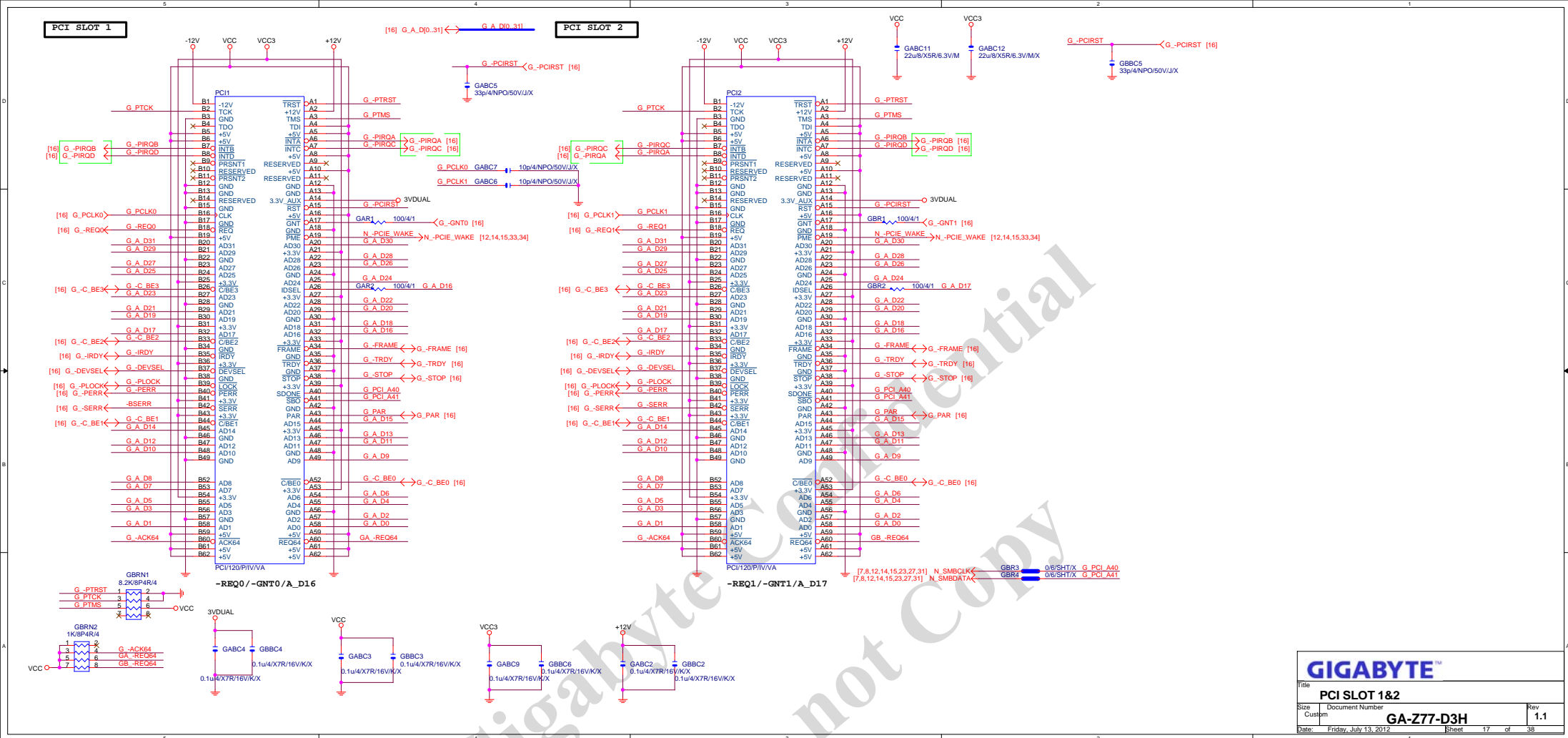


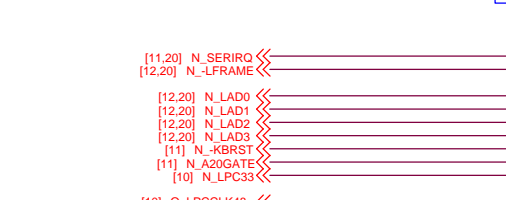
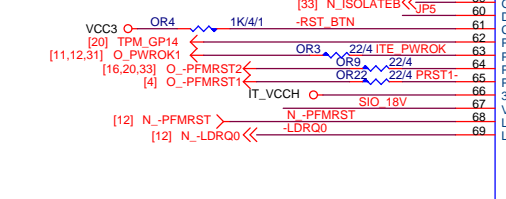
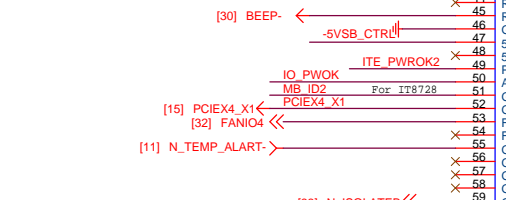
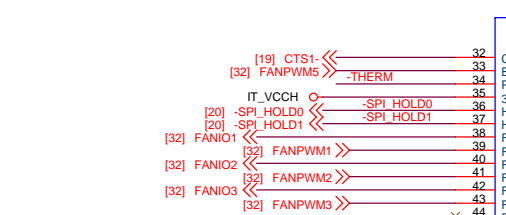
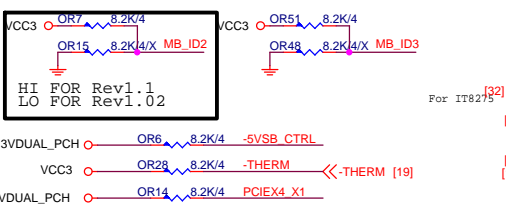
	N_PCIE_4_SW (PCH GPIO38)	PCIEX4_X1 (SIO GPIO26)
PCIEX1,PCIEX4 --> X1 (Default)	H	H
PCIEX4 No devices PCIEX4 -> X1	H	H
PCIEX4 Have devices PCIEX4 -> X4 PCIEX1_2/PCIEX1_3 --> N/A	L	L



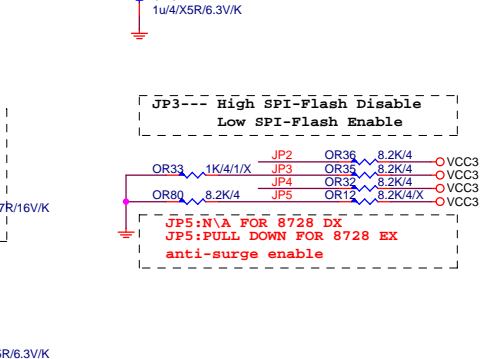
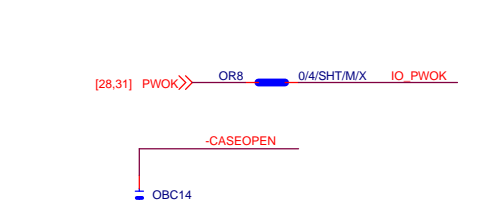
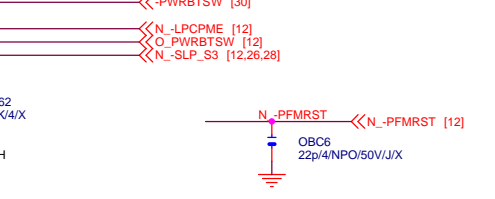
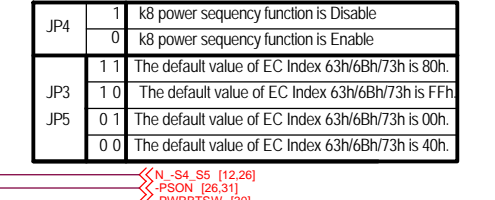
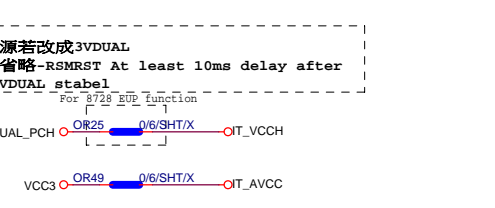
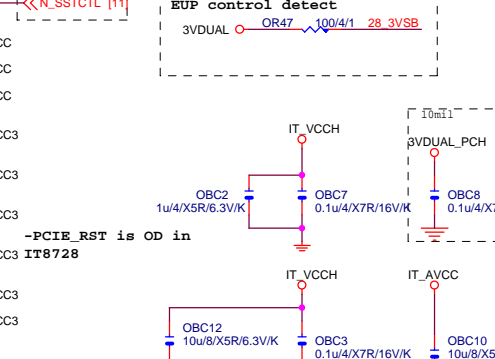
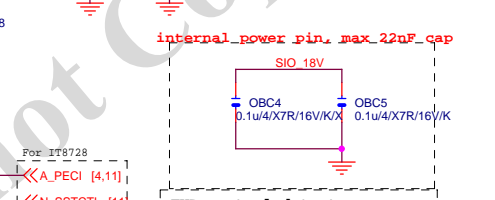
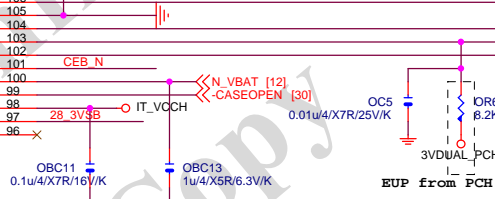
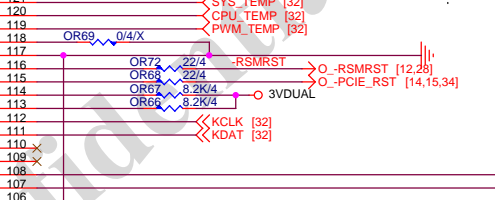
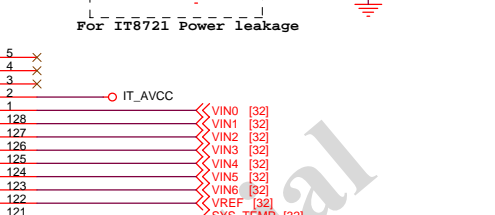
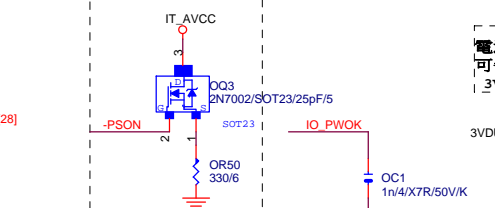
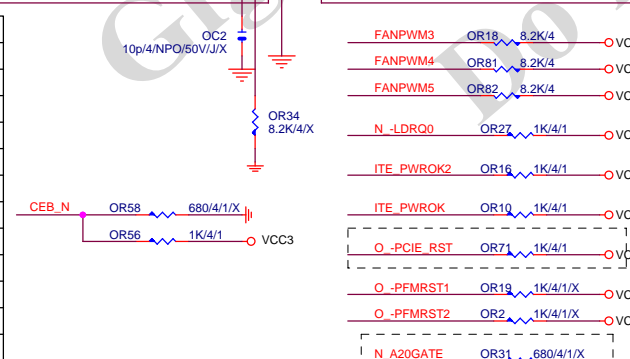
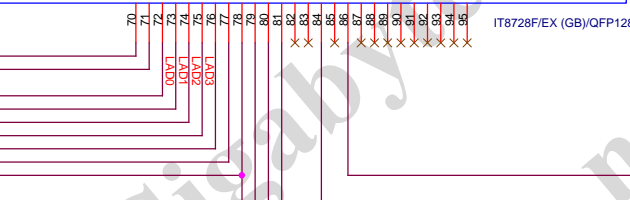
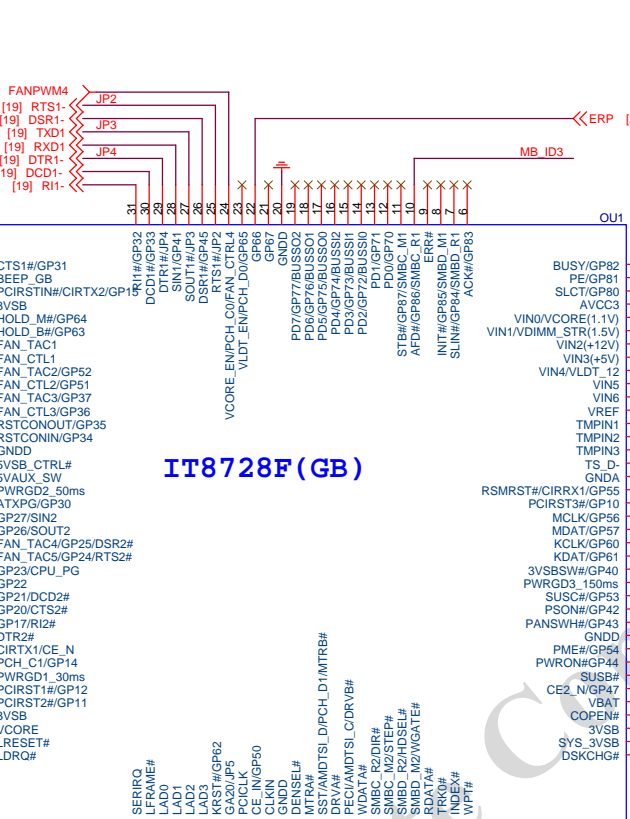
Function	SEL
xI--> x0a	L;PCIEX4 SLOT-->X1
xI--> x0b	H;PCIEX4 SLOT-->X4





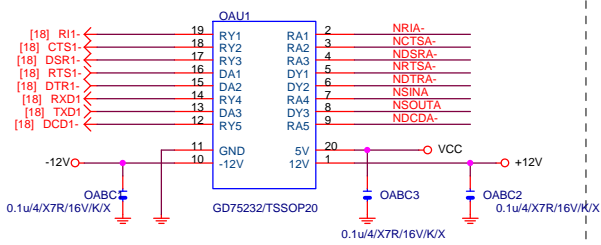


	IT8721	IT8728
PIN121	FAN_CTL4/VID_TURBO	VCORE_EN/PCH_C0
PIN120	VDDA_EN	VLDTO_EN/PCH_D0
PIN19	GP30	ATXPG
PIN31	GP14	PCH_C1
PIN53	SST/AMDTSI_D/PECI_AVA/MTRB#/PCH_D	SST/AMDTSI_D/MTRB#/PCH_D1
PIN55	PECI/AMDTSI_C/DRVB#/PCH_C	PECI/AMDTSI_C/DRVB#
PIN66	GP47	SYS_3VSB
PIN70	SYS_3VSB	GP47
PIN95	VIN3/ATXPG	VIN2(VCC5)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

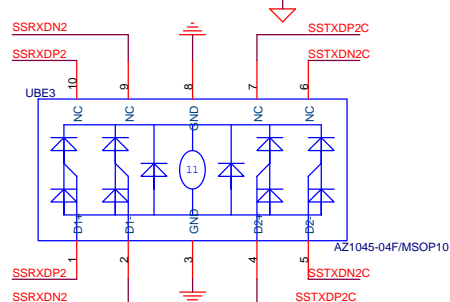
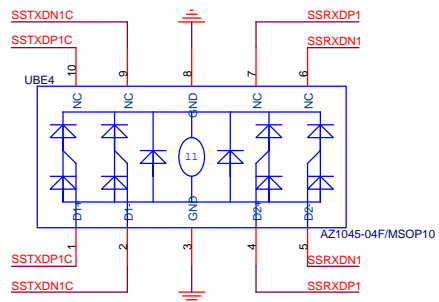
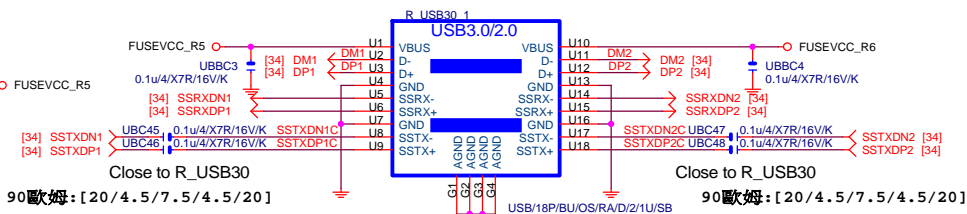
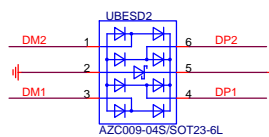
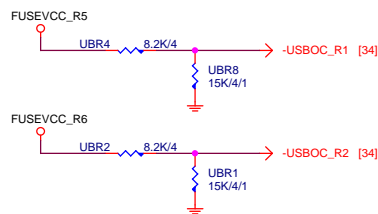
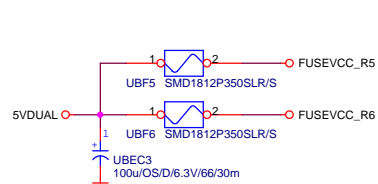
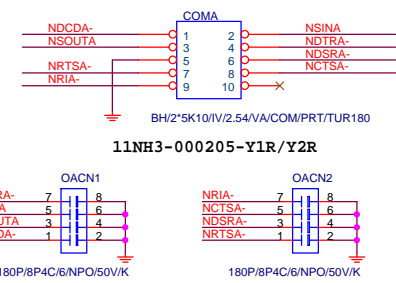
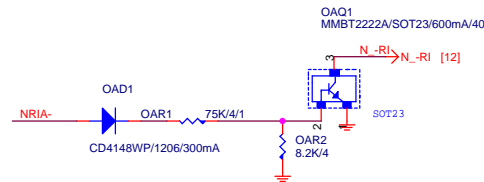


Gigabyte Technology			
Title			
ITE 8728 LPC IO			
Size	Document Number	Rev	
B		1.1	
Date:	Friday, July 13, 2012	Sheet	18 of 38

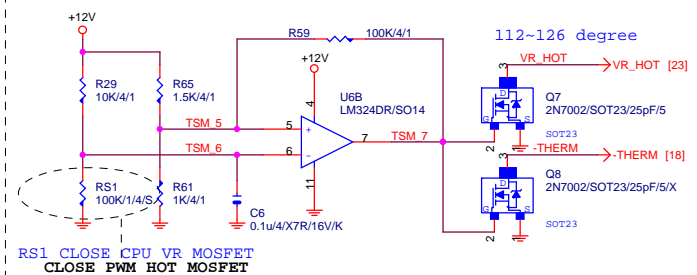
COMA



COM RI

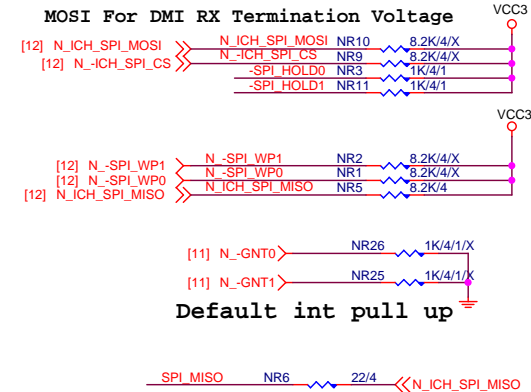
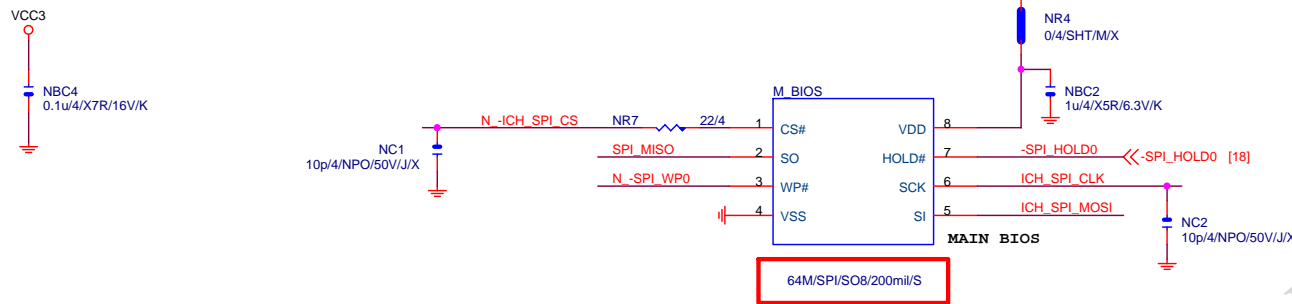


-PROHOT



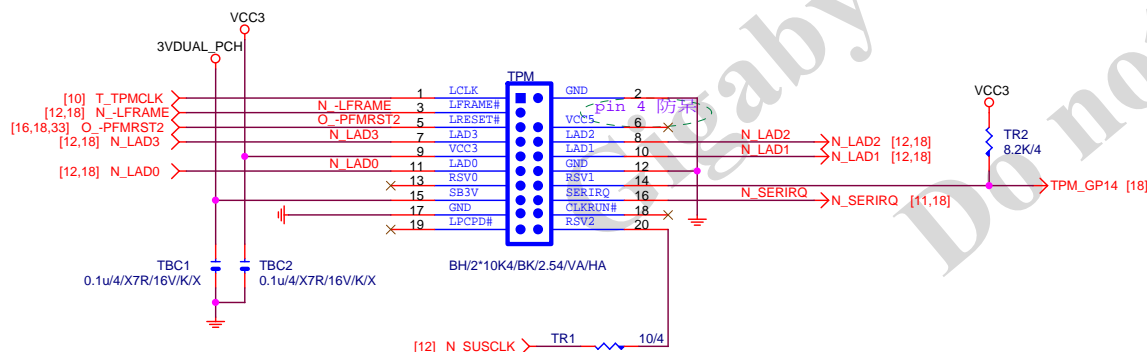
Gigabyte Technology

Title			
COM & PROHOT/Dynamic O.C.			
Size	Document Number	Rev	
Custom		1.1	
Date:	Friday, July 13, 2012	Sheet	19 of 38



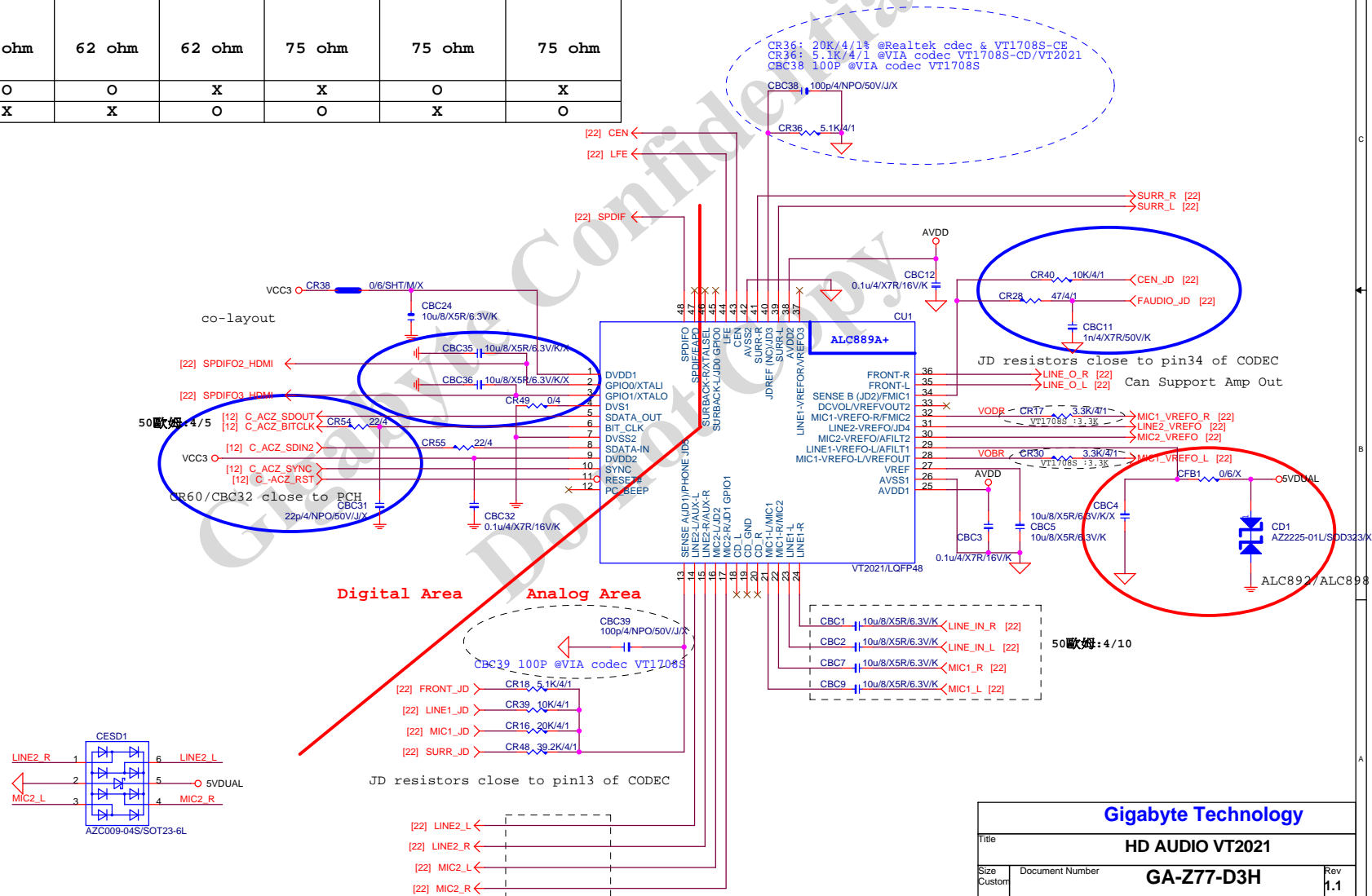
BOOT DEVICE	GNT0	GNT1
LPC	0	0
PCI	0	1
NAND	1	0
SPI	1	1

1 means floating
 0 means PD 1K



Gigabyte Technology			
Title		BIOS	
Size	Document Number	GA-Z77-D3H	
Custom			Rev 1.1
Date:	Friday, July 13, 2012	Sheet 20	of 38

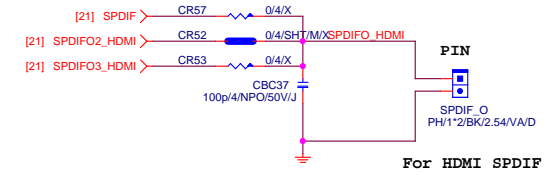
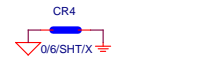
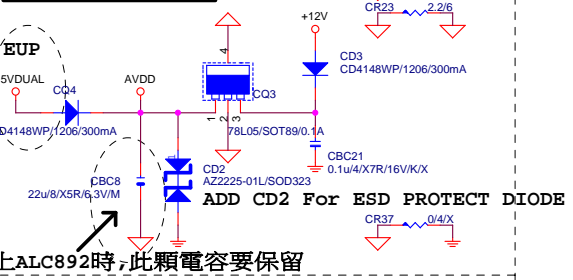
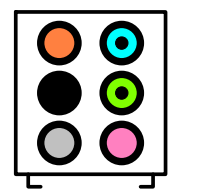
	ALC662	ALC887-VD2/ ALC892	ALC889	VT1708S-CD	VT1708S-CE/ VT1705CF	VT2021
CR49	X	X	O	O	X	O
CBC36	O	O	X	X	O	X
CR28/CBC11	47ohm+1nF	47ohm+1nF	47ohm+1nF	22ohm+100P	22ohm+100P	47ohm+1nF
CR52	X	O	O	O	O	O
CR57	O	X	X	X	X	X
CBC1/CBC2	10uF/X5R	10uF/X5R	22uF/X5R	10uF/X5R	10uF/X5R	10uF/X5R
CR36	20K/4/1	20K/4/1	20K/4/1	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



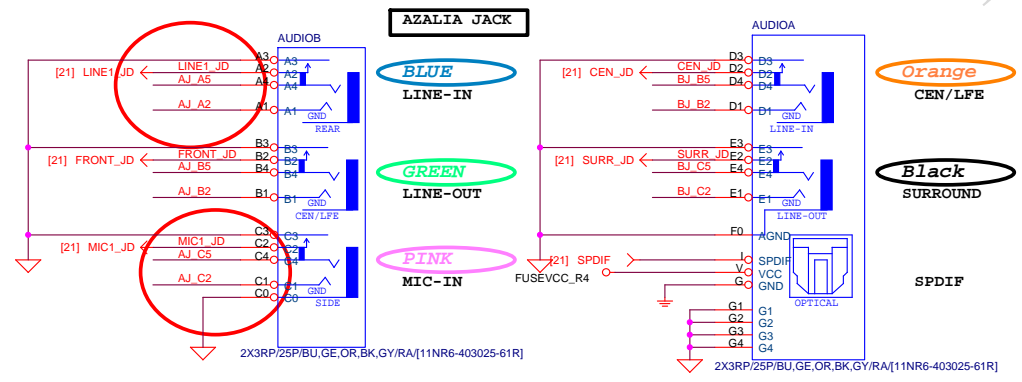
Gigabyte Technology

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

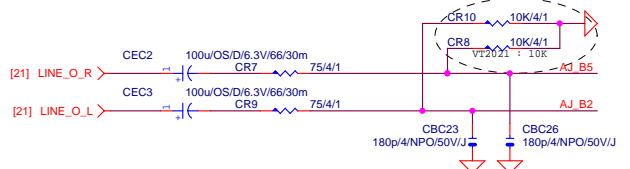
CODEC POWER/EMI PAD

AZALIA JACK
BTX AZALIA CONNECTOR

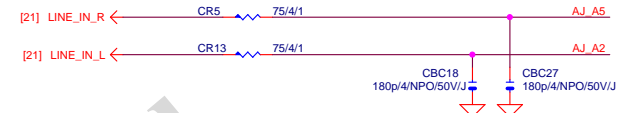
11NR6-403007-21R



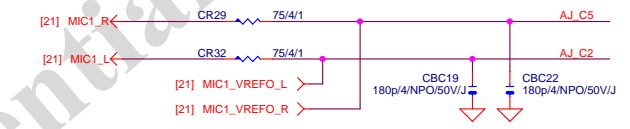
LINE-OUT



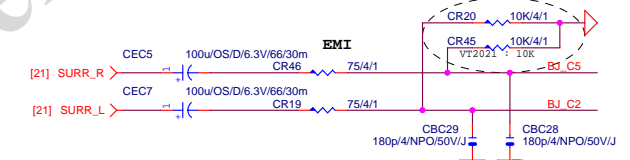
LINE-IN



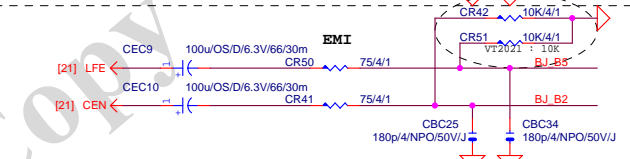
MIC-IN



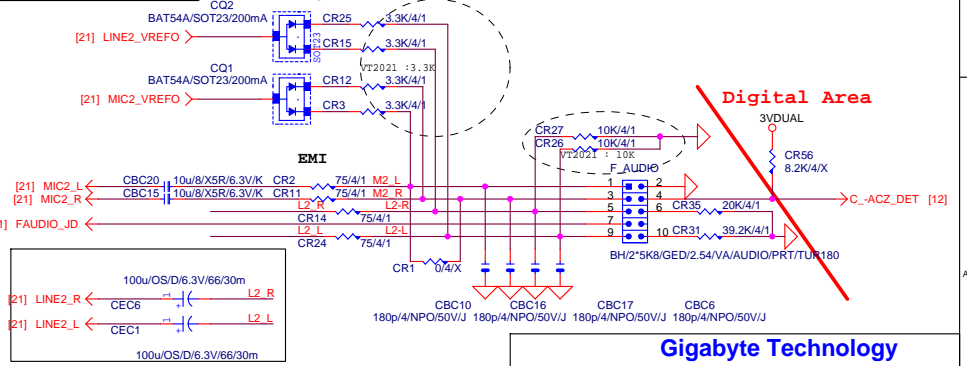
SURROUND



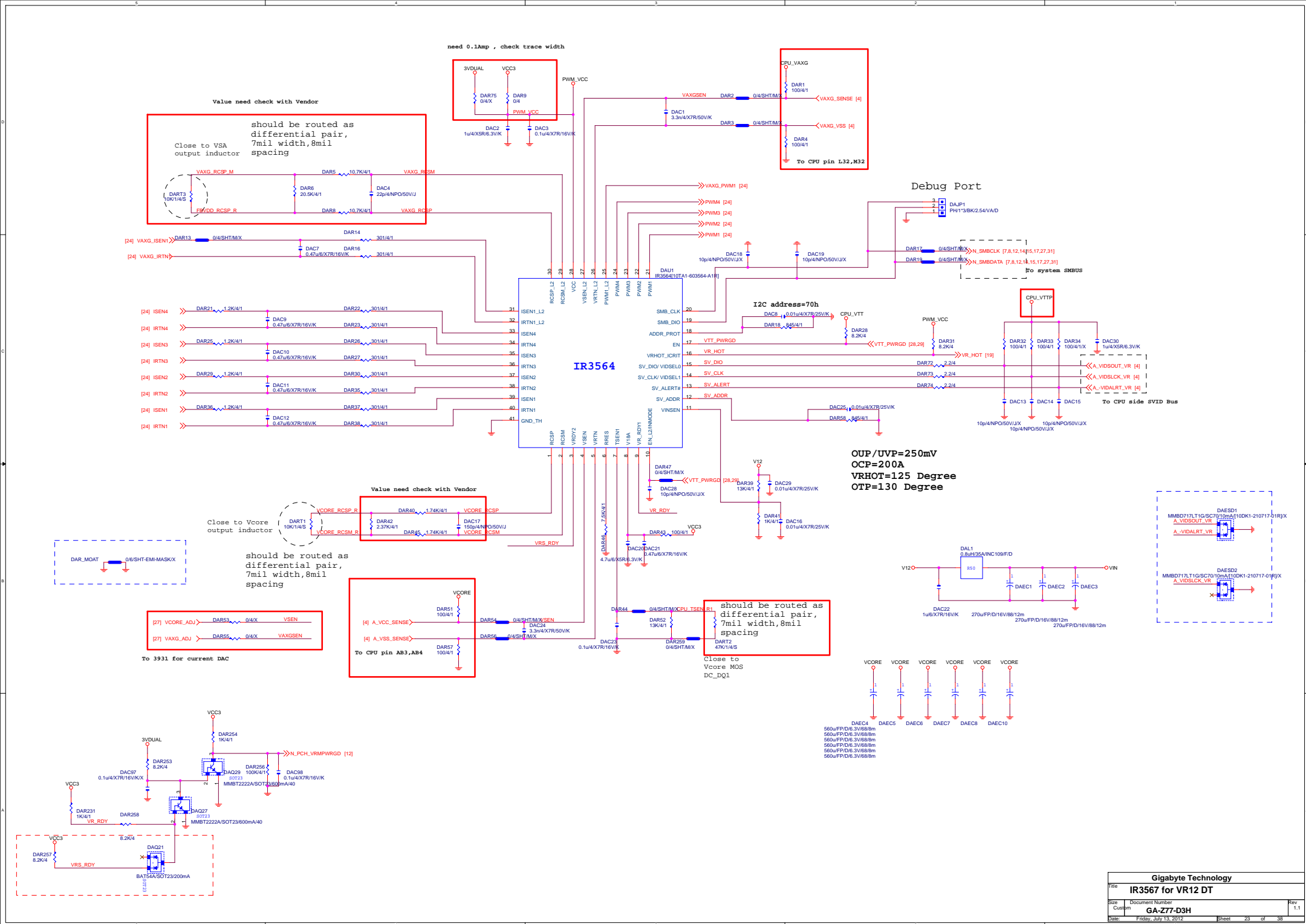
CEN/LFE



AZALIA FRONT PANEL



Gigabyte Technology			
Title			
AUDIO JACK			
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1.1			



VCORE Phase 1,3

Pin	Mode	IC	Mode
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4
5	5	5	5
6	6	6	6
7	7	7	7
8	8	8	8
9	9	9	9
10	10	10	10
11	11	11	11
12	12	12	12
13	13	13	13
14	14	14	14
15	15	15	15
16	16	16	16
17	17	17	17
18	18	18	18
19	19	19	19
20	20	20	20
21	21	21	21
22	22	22	22
23	23	23	23
24	24	24	24
25	25	25	25
26	26	26	26
27	27	27	27
28	28	28	28
29	29	29	29
30	30	30	30
31	31	31	31
32	32	32	32
33	33	33	33
34	34	34	34
35	35	35	35
36	36	36	36
37	37	37	37
38	38	38	38
39	39	39	39
40	40	40	40
41	41	41	41
42	42	42	42
43	43	43	43
44	44	44	44
45	45	45	45
46	46	46	46
47	47	47	47
48	48	48	48
49	49	49	49
50	50	50	50
51	51	51	51
52	52	52	52
53			

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

MOS_HS

MOS_HS[12SP2-S08924-01R_12SP2-S08924-02R_12SP2-S08924-03R]

The schematic diagram illustrates the internal circuitry of the R30393DPA04G N4.3m PPAKSO-8 package. It shows the connections between the device pins and the internal logic blocks. The diagram is labeled 'DC_DR1' and 'DC_DR2'.

DC_DR1 Pin Connections:

- Pin 1: BOOT
- Pin 2: MODE
- Pin 3: PWRM1
- Pin 4: PWRM2
- Pin 5: EN
- Pin 6: SW2
- Pin 7: SW1
- Pin 8: SW2
- Pin 9: SW1
- Pin 10: SW2
- Pin 11: SW1
- Pin 12: SW2
- Pin 13: SW1
- Pin 14: SW2
- Pin 15: SW1
- Pin 16: SW2
- Pin 17: SW1
- Pin 18: SW2
- Pin 19: SW1
- Pin 20: SW2
- Pin 21: SW1
- Pin 22: SW2
- Pin 23: SW1
- Pin 24: SW2
- Pin 25: SW1
- Pin 26: SW2
- Pin 27: SW1
- Pin 28: SW2
- Pin 29: SW1
- Pin 30: SW2
- Pin 31: SW1
- Pin 32: SW2
- Pin 33: SW1
- Pin 34: SW2
- Pin 35: SW1
- Pin 36: SW2
- Pin 37: SW1
- Pin 38: SW2
- Pin 39: SW1
- Pin 40: SW2
- Pin 41: SW1
- Pin 42: SW2
- Pin 43: SW1
- Pin 44: SW2
- Pin 45: SW1
- Pin 46: SW2
- Pin 47: SW1
- Pin 48: SW2
- Pin 49: SW1
- Pin 50: SW2
- Pin 51: SW1
- Pin 52: SW2
- Pin 53: SW1
- Pin 54: SW2
- Pin 55: SW1
- Pin 56: SW2
- Pin 57: SW1
- Pin 58: SW2
- Pin 59: SW1
- Pin 60: SW2
- Pin 61: SW1
- Pin 62: SW2
- Pin 63: SW1
- Pin 64: SW2
- Pin 65: SW1
- Pin 66: SW2
- Pin 67: SW1
- Pin 68: SW2
- Pin 69: SW1
- Pin 70: SW2
- Pin 71: SW1
- Pin 72: SW2
- Pin 73: SW1
- Pin 74: SW2
- Pin 75: SW1
- Pin 76: SW2
- Pin 77: SW1
- Pin 78: SW2
- Pin 79: SW1
- Pin 80: SW2
- Pin 81: SW1
- Pin 82: SW2
- Pin 83: SW1
- Pin 84: SW2
- Pin 85: SW1
- Pin 86: SW2
- Pin 87: SW1
- Pin 88: SW2
- Pin 89: SW1
- Pin 90: SW2
- Pin 91: SW1
- Pin 92: SW2
- Pin 93: SW1
- Pin 94: SW2
- Pin 95: SW1
- Pin 96: SW2
- Pin 97: SW1
- Pin 98: SW2
- Pin 99: SW1
- Pin 100: SW2

DC_DR2 Pin Connections:

- Pin 1: BOOT
- Pin 2: MODE
- Pin 3: PWRM1
- Pin 4: PWRM2
- Pin 5: EN
- Pin 6: SW2
- Pin 7: SW1
- Pin 8: SW2
- Pin 9: SW1
- Pin 10: SW2
- Pin 11: SW1
- Pin 12: SW2
- Pin 13: SW1
- Pin 14: SW2
- Pin 15: SW1
- Pin 16: SW2
- Pin 17: SW1
- Pin 18: SW2
- Pin 19: SW1
- Pin 20: SW2
- Pin 21: SW1
- Pin 22: SW2
- Pin 23: SW1
- Pin 24: SW2
- Pin 25: SW1
- Pin 26: SW2
- Pin 27: SW1
- Pin 28: SW2
- Pin 29: SW1
- Pin 30: SW2
- Pin 31: SW1
- Pin 32: SW2
- Pin 33: SW1
- Pin 34: SW2
- Pin 35: SW1
- Pin 36: SW2
- Pin 37: SW1
- Pin 38: SW2
- Pin 39: SW1
- Pin 40: SW2
- Pin 41: SW1
- Pin 42: SW2
- Pin 43: SW1
- Pin 44: SW2
- Pin 45: SW1
- Pin 46: SW2
- Pin 47: SW1
- Pin 48: SW2
- Pin 49: SW1
- Pin 50: SW2
- Pin 51: SW1
- Pin 52: SW2
- Pin 53: SW1
- Pin 54: SW2
- Pin 55: SW1
- Pin 56: SW2
- Pin 57: SW1
- Pin 58: SW2
- Pin 59: SW1
- Pin 60: SW2
- Pin 61: SW1
- Pin 62: SW2
- Pin 63: SW1
- Pin 64: SW2
- Pin 65: SW1
- Pin 66: SW2
- Pin 67: SW1
- Pin 68: SW2
- Pin 69: SW1
- Pin 70: SW2
- Pin 71: SW1
- Pin 72: SW2
- Pin 73: SW1
- Pin 74: SW2
- Pin 75: SW1
- Pin 76: SW2
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- Pin 79: SW1
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- Pin 90: SW2
- Pin 91: SW1
- Pin 92: SW2
- Pin 93: SW1
- Pin 94: SW2
- Pin 95: SW1
- Pin 96: SW2
- Pin 97: SW1
- Pin 98: SW2
- Pin 99: SW1
- Pin 100: SW2

DC_DR3 Pin Connections:

- Pin 1: BOOT
- Pin 2: MODE
- Pin 3: PWRM1
- Pin 4: PWRM2
- Pin 5: EN
- Pin 6: SW2
- Pin 7: SW1
- Pin 8: SW2
- Pin 9: SW1
- Pin 10: SW2
- Pin 11: SW1
- Pin 12: SW2
- Pin 13: SW1
- Pin 14: SW2
- Pin 15: SW1
- Pin 16: SW2
- Pin 17: SW1
- Pin 18: SW2
- Pin 19: SW1
- Pin 20: SW2
- Pin 21: SW1
- Pin 22: SW2
- Pin 23: SW1
- Pin 24: SW2
- Pin 25: SW1
- Pin 26: SW2
- Pin 27: SW1
- Pin 28: SW2
- Pin 29: SW1
- Pin 30: SW2
- Pin 31: SW1
- Pin 32: SW2
- Pin 33: SW1
- Pin 34: SW2
- Pin 35: SW1
- Pin 36: SW2
- Pin 37: SW1
- Pin 38: SW2
- Pin 39: SW1
- Pin 40: SW2
- Pin 41: SW1
- Pin 42: SW2
- Pin 43: SW1
- Pin 44: SW2
- Pin 45: SW1
- Pin 46: SW2
- Pin 47: SW1
- Pin 48: SW2
- Pin 49: SW1
- Pin 50: SW2
- Pin 51: SW1
- Pin 52: SW2
- Pin 53: SW1
- Pin 54: SW2
- Pin 55: SW1
- Pin 56: SW2
- Pin 57: SW1
- Pin 58: SW2
- Pin 59: SW1
- Pin 60: SW2
- Pin 61: SW1
- Pin 62: SW2
- Pin 63: SW1
- Pin 64: SW2
- Pin 65: SW1
- Pin 66: SW2
- Pin 67: SW1
- Pin 68: SW2
- Pin 69: SW1
- Pin 70: SW2
- Pin 71: SW1
- Pin 72: SW2
- Pin 73: SW1
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- Pin 75: SW1
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- Pin 87: SW1
- Pin 88: SW2
- Pin 89: SW1
- Pin 90: SW2
- Pin 91: SW1
- Pin 92: SW2
- Pin 93: SW1
- Pin 94: SW2
- Pin 95: SW1
- Pin 96: SW2

DZ-D018 100W 12VDC to 12VDC

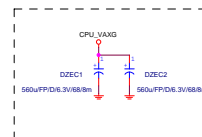
Pinout:

Pin	Function
1	VCC
2	DZ-D018
3	DZ-D018
4	DZ-D018
5	DZ-D018
6	DZ-D018
7	DZ-D018
8	DZ-D018
9	DZ-D018
10	DZ-D018
11	DZ-D018
12	DZ-D018
13	DZ-D018
14	DZ-D018
15	DZ-D018
16	DZ-D018
17	DZ-D018
18	DZ-D018
19	DZ-D018
20	DZ-D018
21	DZ-D018
22	DZ-D018
23	DZ-D018
24	DZ-D018
25	DZ-D018
26	DZ-D018
27	DZ-D018
28	DZ-D018
29	DZ-D018
30	DZ-D018
31	DZ-D018
32	DZ-D018
33	DZ-D018
34	DZ-D018
35	DZ-D018
36	DZ-D018
37	DZ-D018
38	DZ-D018
39	DZ-D018
40	DZ-D018
41	DZ-D018
42	DZ-D018
43	DZ-D018
44	DZ-D018
45	DZ-D018
46	DZ-D018
47	DZ-D018
48	DZ-D018
49	DZ-D018
50	DZ-D018
51	DZ-D018
52	DZ-D018
53	DZ-D018
54	DZ-D018
55	DZ-D018
56	DZ-D018
57	DZ-D018
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62	DZ-D018
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65	DZ-D018
66	DZ-D018
67	DZ-D018
68	DZ-D018
69	DZ-D018
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81	DZ-D018
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89	DZ-D018
90	DZ-D018
91	DZ-D018
92	DZ-D018
93	DZ-D018
94	DZ-D018
95	DZ-D018
96	DZ-D018
97	DZ-D018
98	DZ-D018
99	DZ-D018
100	DZ-D018

Notes:

- 1. In Quad mode, 12V pin1 link to 12V pin10
- 2. 12V pin10 link to 12V pin1 without 100k

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



VAXG Phase

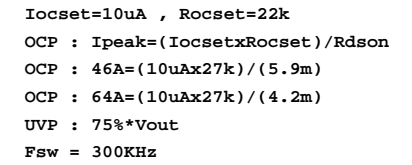
Top Diagram:

- VN
- DZ_DC1 10uB/ASB170V/VK
- DZ_DC2 2.2k
- DZ_DC3 10k
- DZ_DC4 10k
- DZ_DL1 0.36uF/35VAC/109FSD
- DZ_DR6 2.2k
- DZ_DR7 20k/41
- DZ_DR8 0.4/5HTMAX
- DZ_DR9 0.4/5HTMAX
- VAXG_PHASE1
- VAXG_LOATE1
- R_KJ0337DPA-0G/N/1.1m/PPAKSO-[E10F9-100337-01R]
- R_KJ0337DPA-0G/N/4.3m/PPAKSO-[E10F9-040333-11R]
- [Z] VAXG_ISEN1
- [Z] VAXG_IRTN1

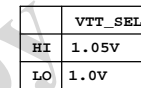
Bottom Diagram:

- VN
- 10uB/ASB170V/VK
- DZ_DC1 10uB/ASB170V/VK
- DZ_DC2 2.2k
- DZ_DC3 10k
- DZ_DC4 10k
- DZ_DL2 0.36uF/35VAC/109FSD
- DZ_DR11 2.2k
- DZ_DR12 20k/41
- DZ_DR13 0.4/5HTMAX
- DZ_DR14 0.4/5HTMAX
- VAXG_PHASE2
- VAXG_LOATE2
- R_KJ0337DPA-0G/N/1.1m/PPAKSO-[E10F9-100337-01R]
- R_KJ0337DPA-0G/N/4.3m/PPAKSO-[E10F9-040333-11R]
- [Z] VAXG_ISEN1
- [Z] VAXG_IRTN1

CPU_VTT

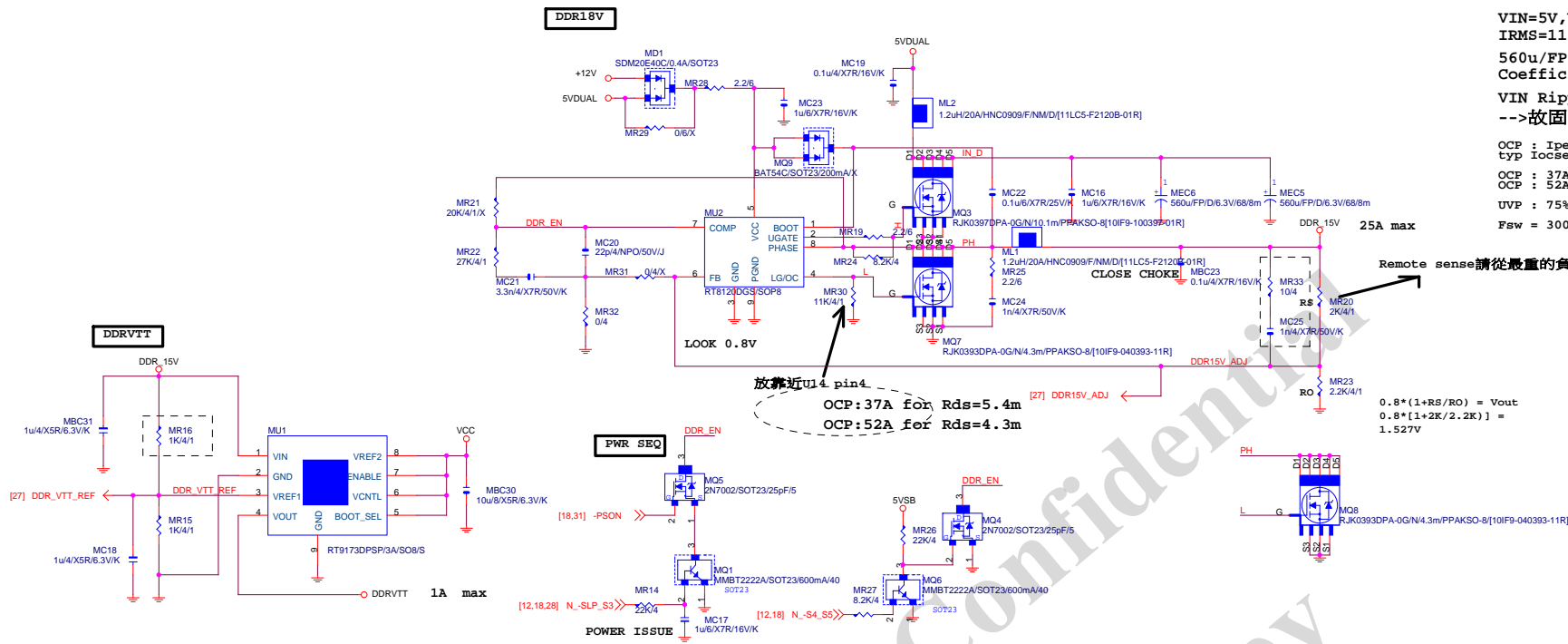


CPU_VTT	PWR	SEQ
0	0	0
0	0	1
0	0	2
0	0	3
0	0	4
0	0	5
0	0	6
0	0	7
0	0	8
0	0	9
0	0	10
0	0	11
0	0	12
0	0	13
0	0	14
0	0	15
0	0	16
0	0	17
0	0	18
0	0	19
0	0	20
0	0	21
0	0	22
0	0	23
0	0	24
0	0	25
0	0	26
0	0	27
0	0	28
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0	0	128
0	0	129
0	0	130
0	0	131
0	0	132
0	0	133
0	0	134
0	0	135
0	0	136
0	0	137
0	0	1


$$0.8 \cdot (1 + R_S/R_O) = V_{out}$$

$$0.8 \cdot [1 + 1.1K/3K] =$$

$$1.09V$$



VIN=5V, VOUT=1.5V, IOUT=25A, PHASE=1
IRMS=11.45A
560u/FP/D/6.3V/68/8m RIPPLE CURRENT=4.7A
Coefficient=1.7(85°C), 1(105°C)
VIN Ripple current=4.7X1.7=7.99A(85°C)
-->故固態電容須2X7.99=15.98>11.45A

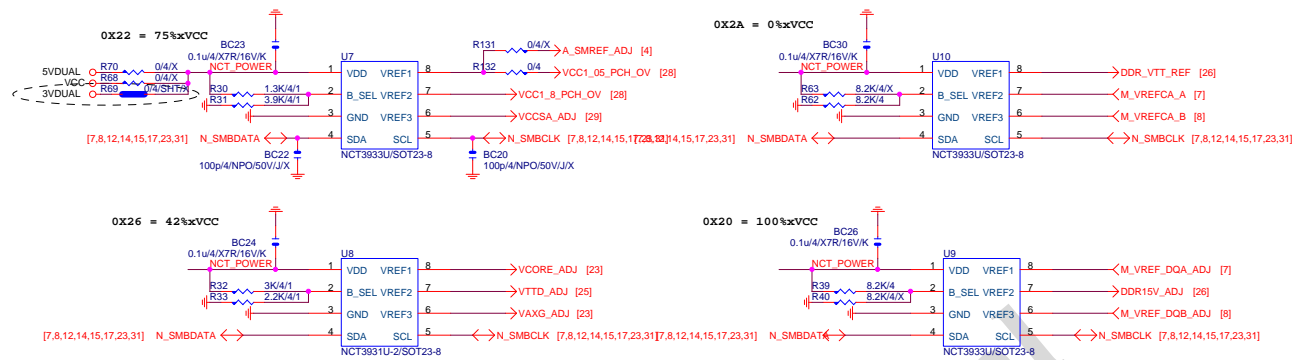
OCp : $I_{peak} = (I_{ocset} \times R_{ocset}) / R_{dson}$
typ $I_{ocset} = 10\mu A$, $R_{ocset} = 33k$
OCp : $37A = (10\mu A \times 11k) / (5.9m / 5.9m)$
OCp : $52A = (10\mu A \times 11k) / (4.2m / 4.2m)$
UVP : $75\% \times V_{out}$
Fsw = 300KHz

Remote sense請從最重的負載端點拉回

放靠近U1 pin4
OCp: 37A for $R_{ds} = 5.4m$
OCp: 52A for $R_{ds} = 4.3m$

$0.8 \times (1 + RS/RO) = V_{out}$
 $0.8 \times [1 + 2K/2.2K] = 1.527V$

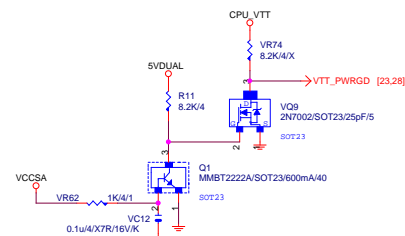
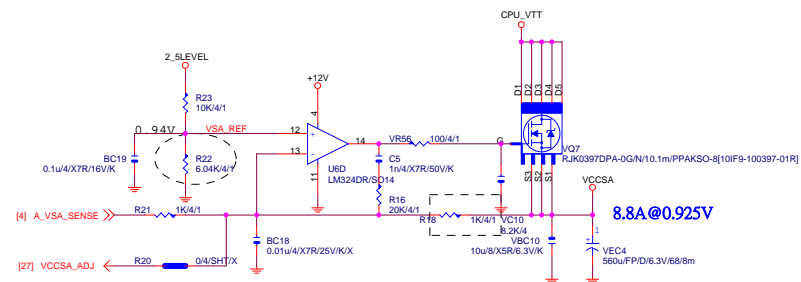
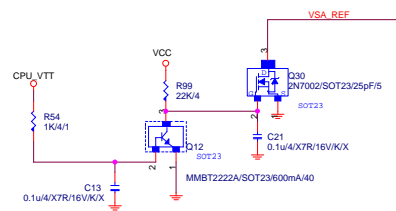
GIGABYTE™			
Title			
RT8120 DDR 15V			
Size	Document Number	Rev	
Custpm	GA-Z77-D3H	1.1	
Date:	Friday, July 13, 2012	Sheet	26 of 38



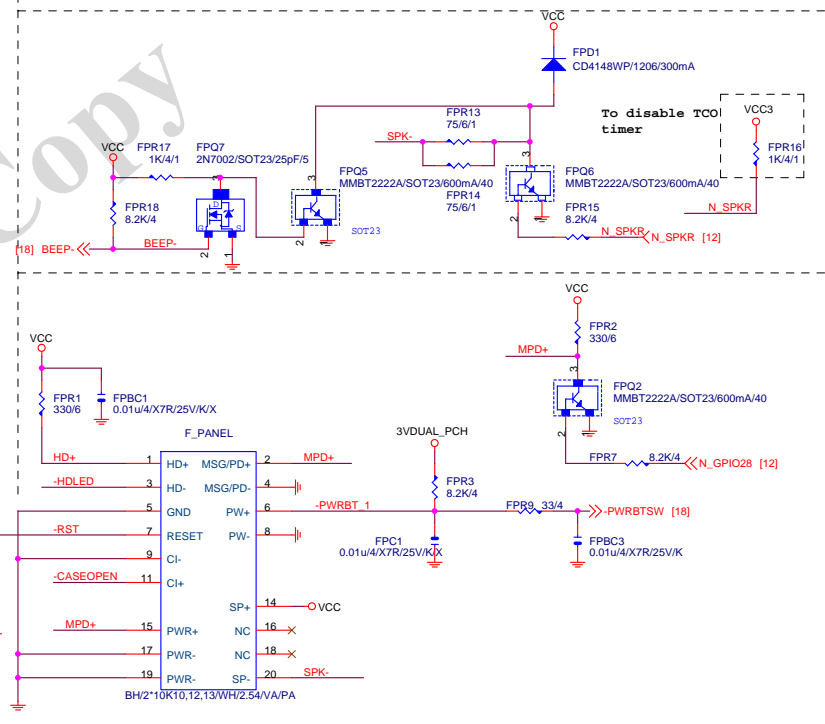
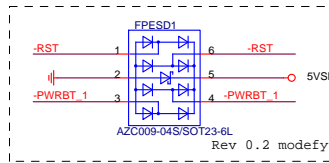
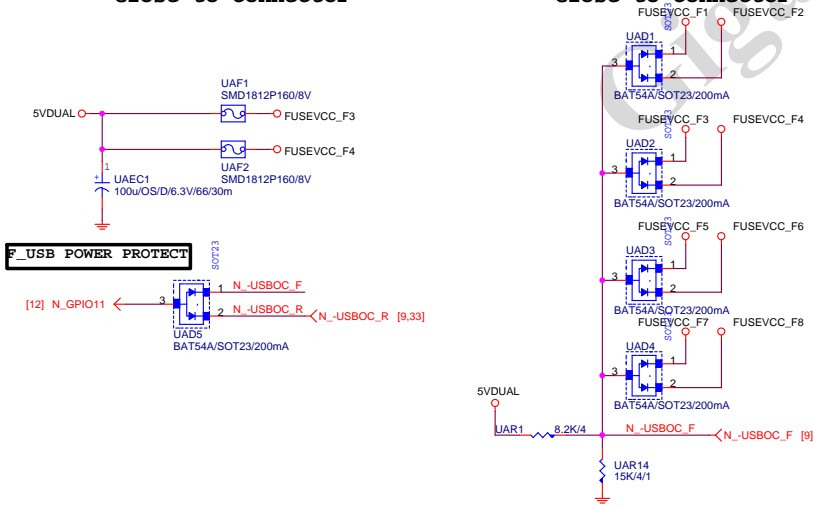
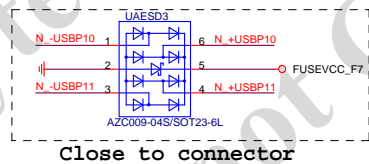
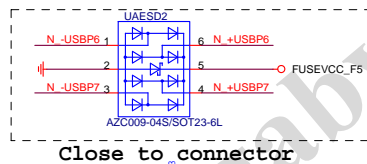
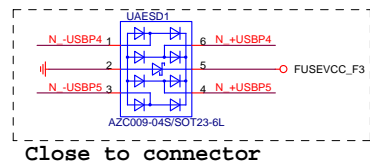
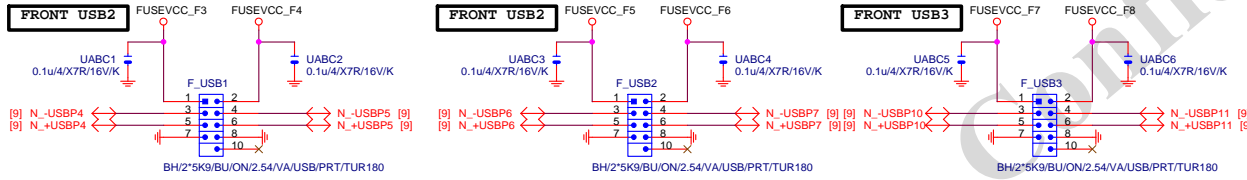
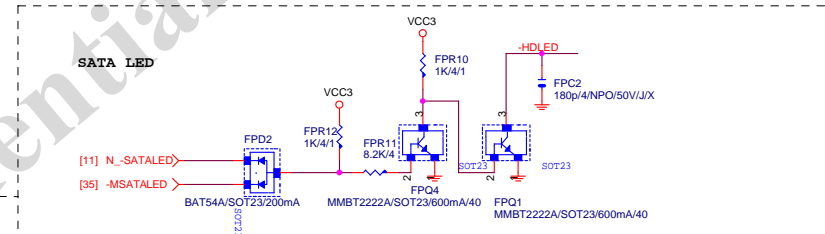
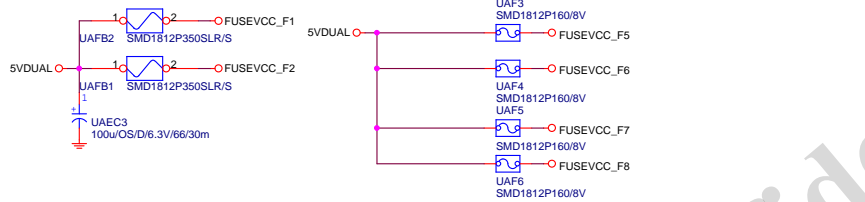
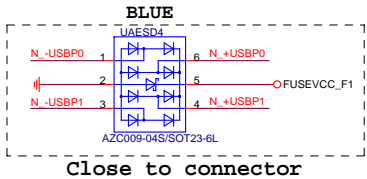
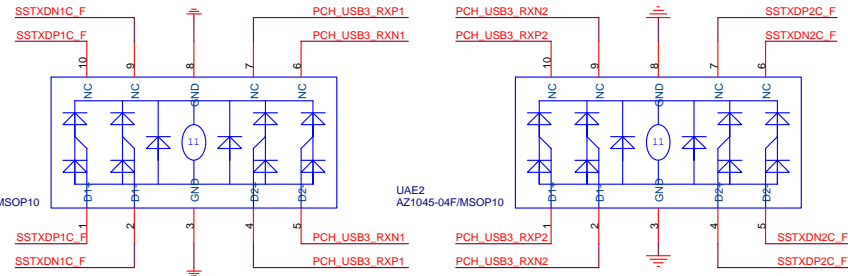
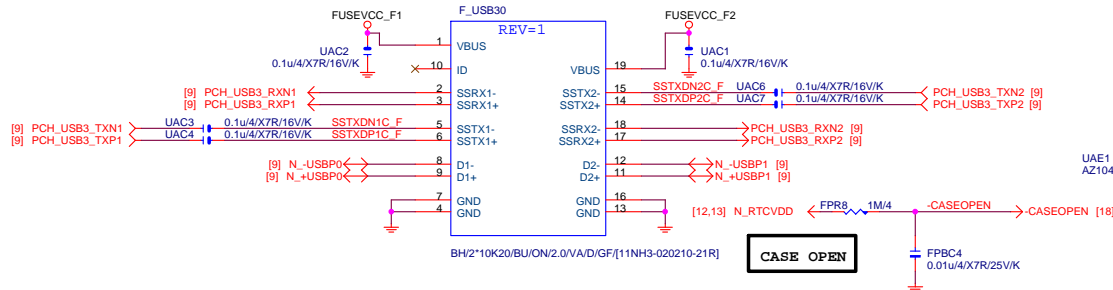
NCT3933	0X2A	0X20	0X22	0X26
VREF1	DDRVTT	VREF_DDRA_DQ	SMREF	VCORE
VREF2	VREF_DDRA_CA	DDR15V	VCC1_8_PCH	CPU_VTT
VREF3	VREF_DDRA_CA	VREF_DDRB_DQ	VCCSA	VAXG

Gigabyte Technology		
Title CPU CORE VR-2		
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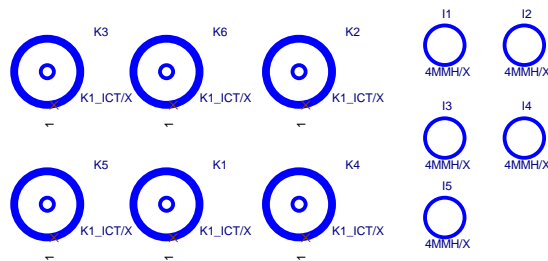
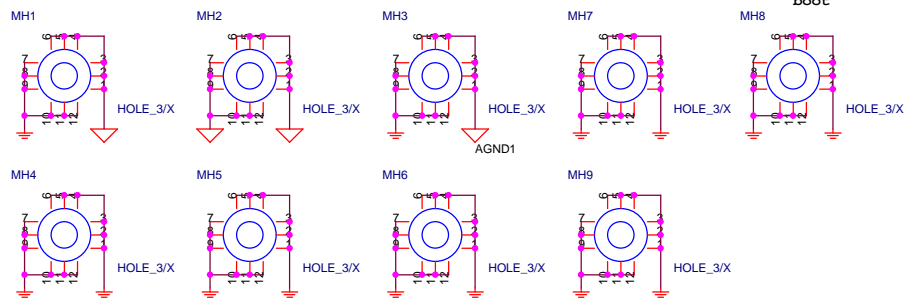
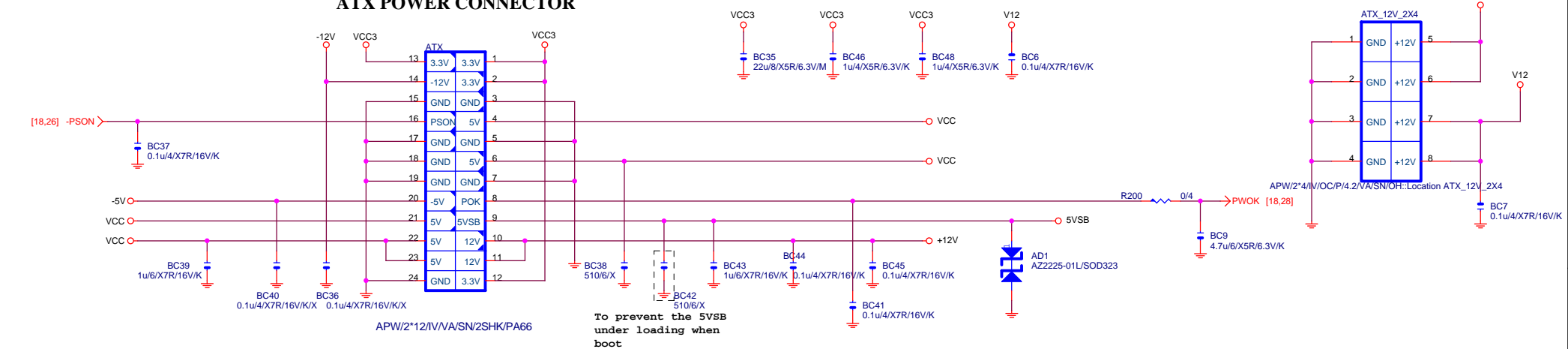
VCC_SA



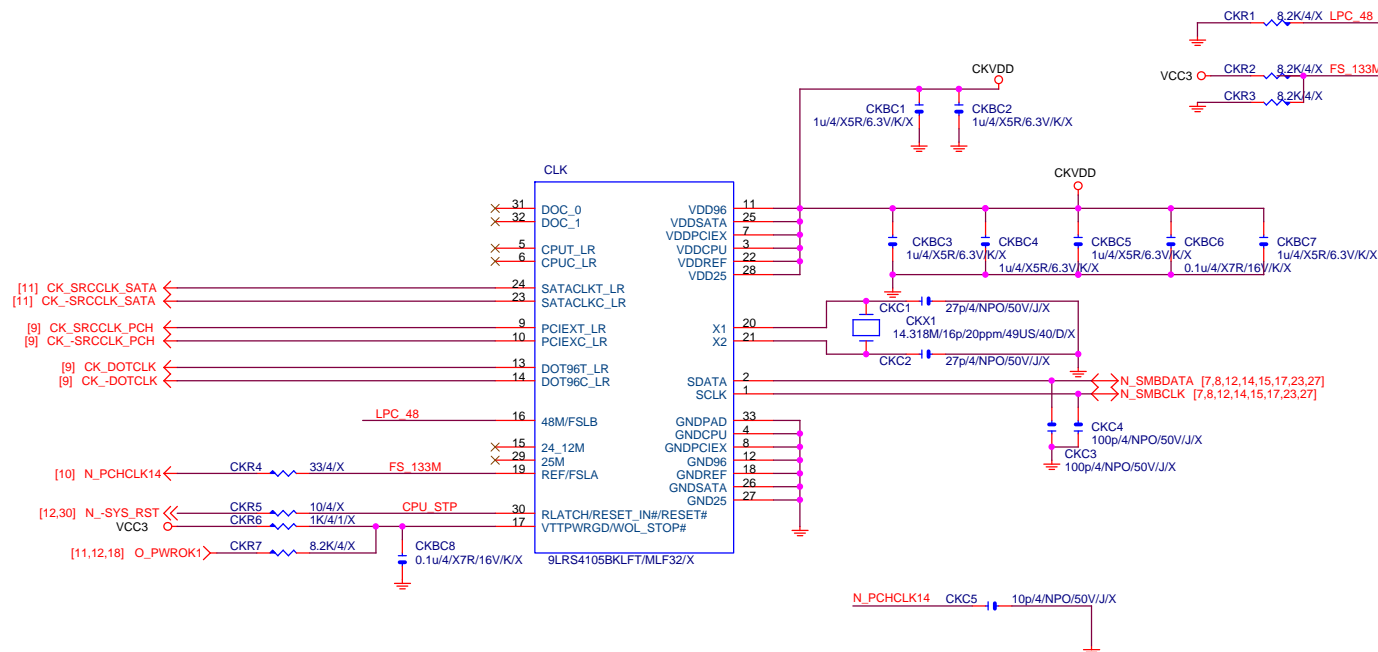
Front USB3.0



ATX POWER CONNECTOR

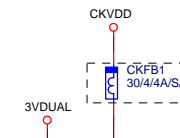


CLK GEN



CPU Frequency Selection

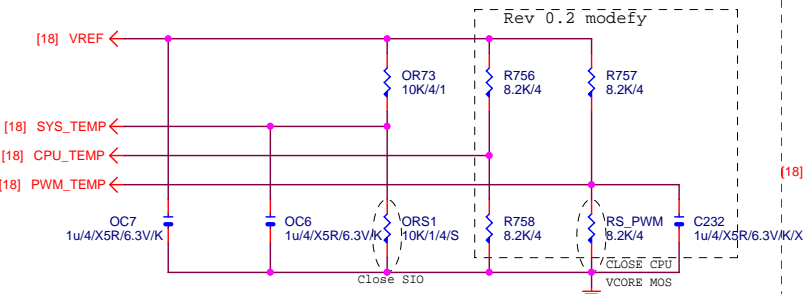
FS	CPU
0	100M <Default>
1	133M



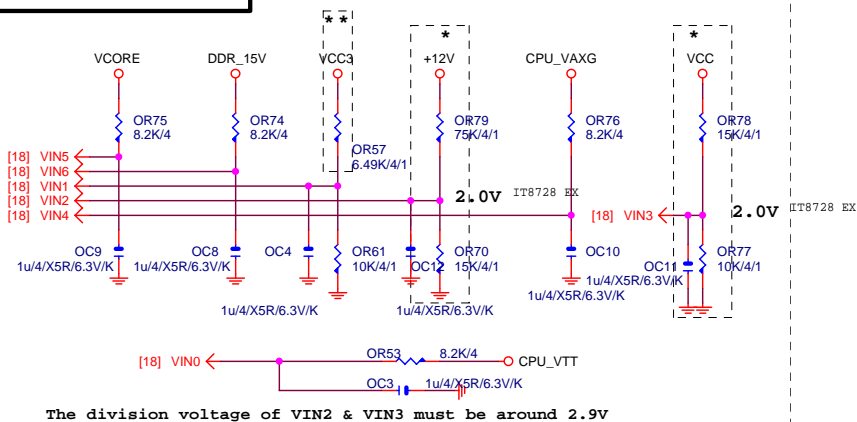
Gigabyte Technology

Title			ATX POWER CONNECTOR
Size	Document Number	GA-Z77-D3H	
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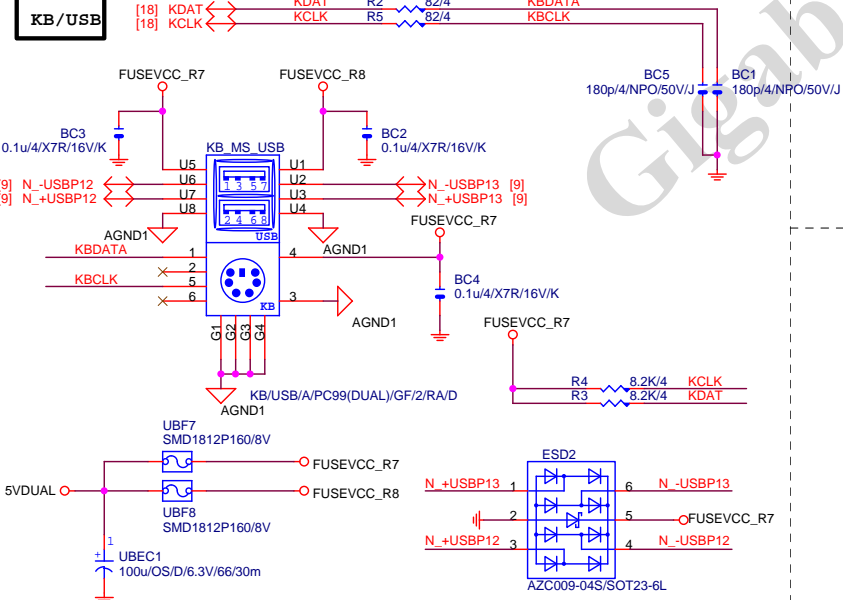
TEMP H/W MONITOR



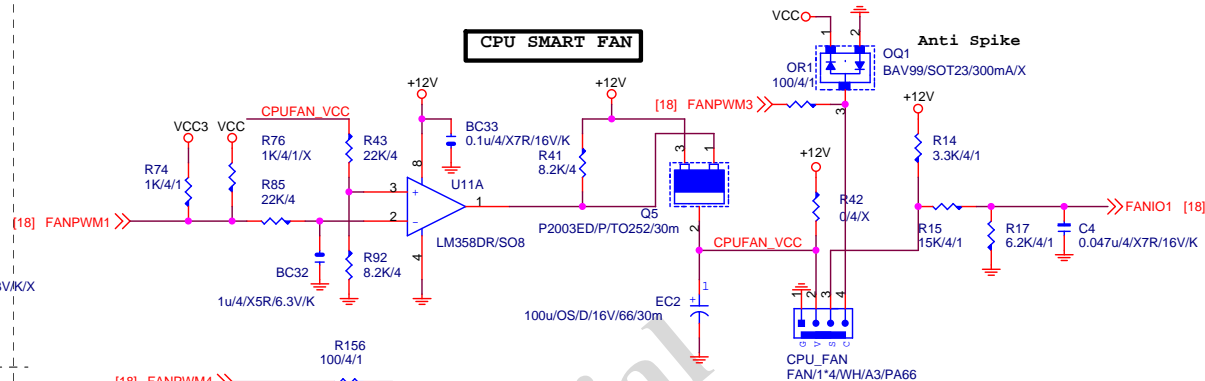
VOLTAGE-- H/W MONITOR



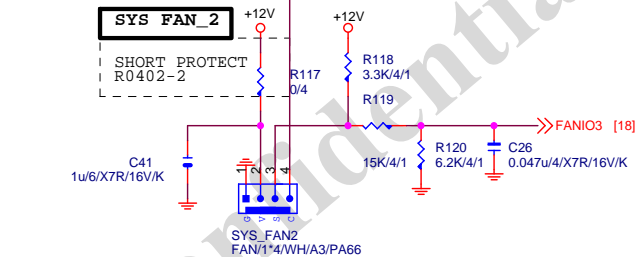
KB/USB



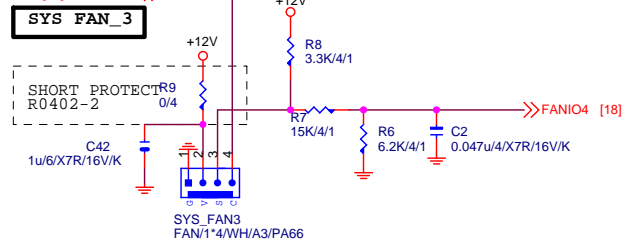
CPU SMART FAN



SYS FAN_2

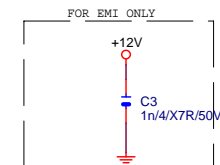
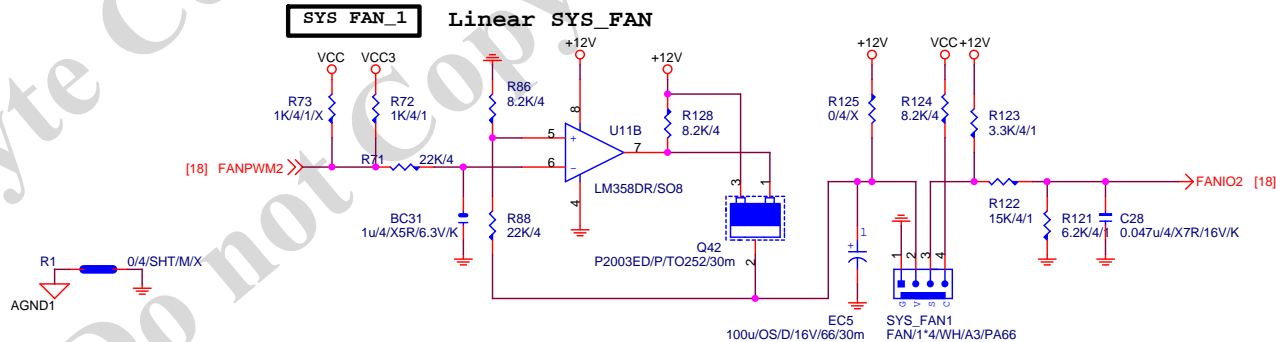


SYS FAN_3



SYS FAN_1

Linear SYS_FAN



Gigabyte Technology

HWM,KB/MS, FAN CTRL

Size	Document Number
Custom	

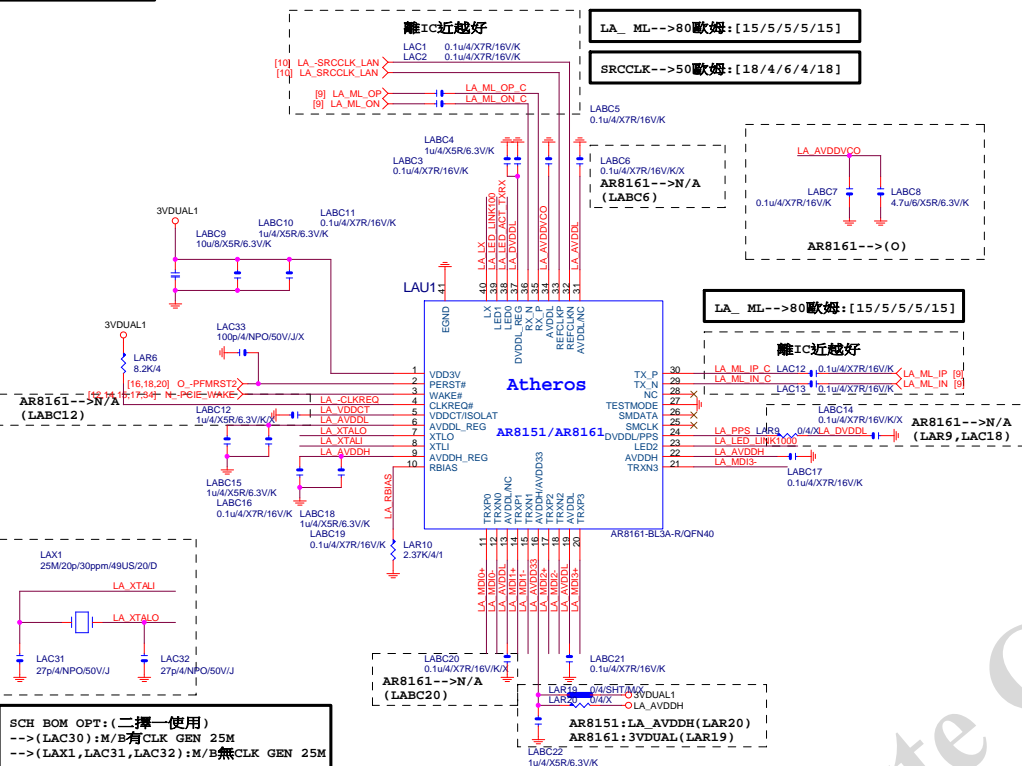
GA-Z77-D3H

Date: Friday, July 13, 2012

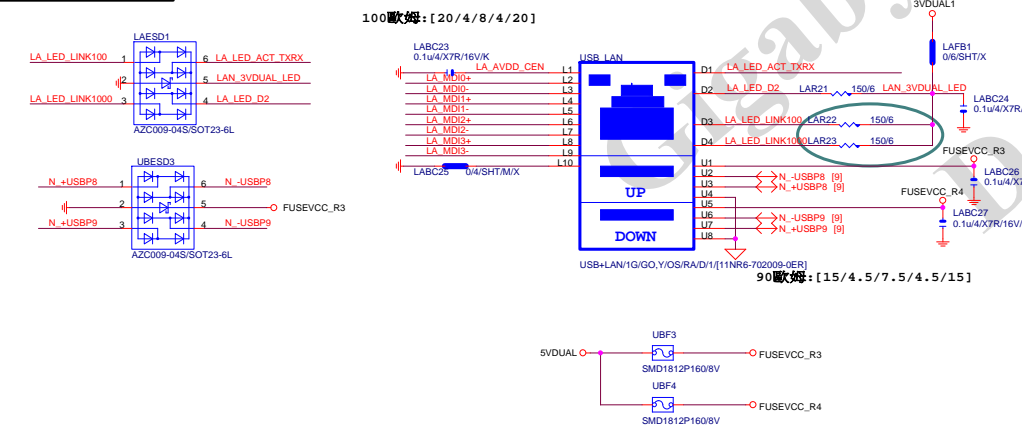
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Rev

LAN:AR8151/AR8161

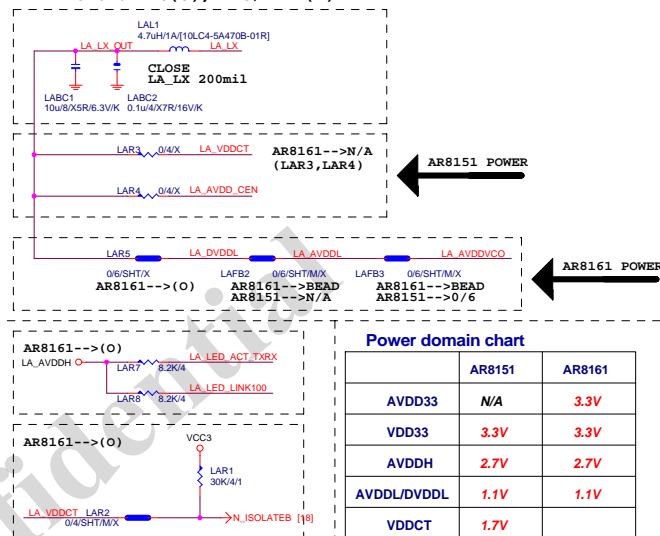


USB30_LAN CONNECTOR

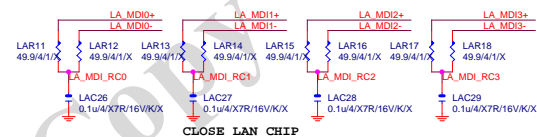


LAN POWER

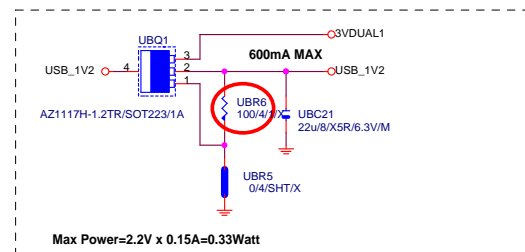
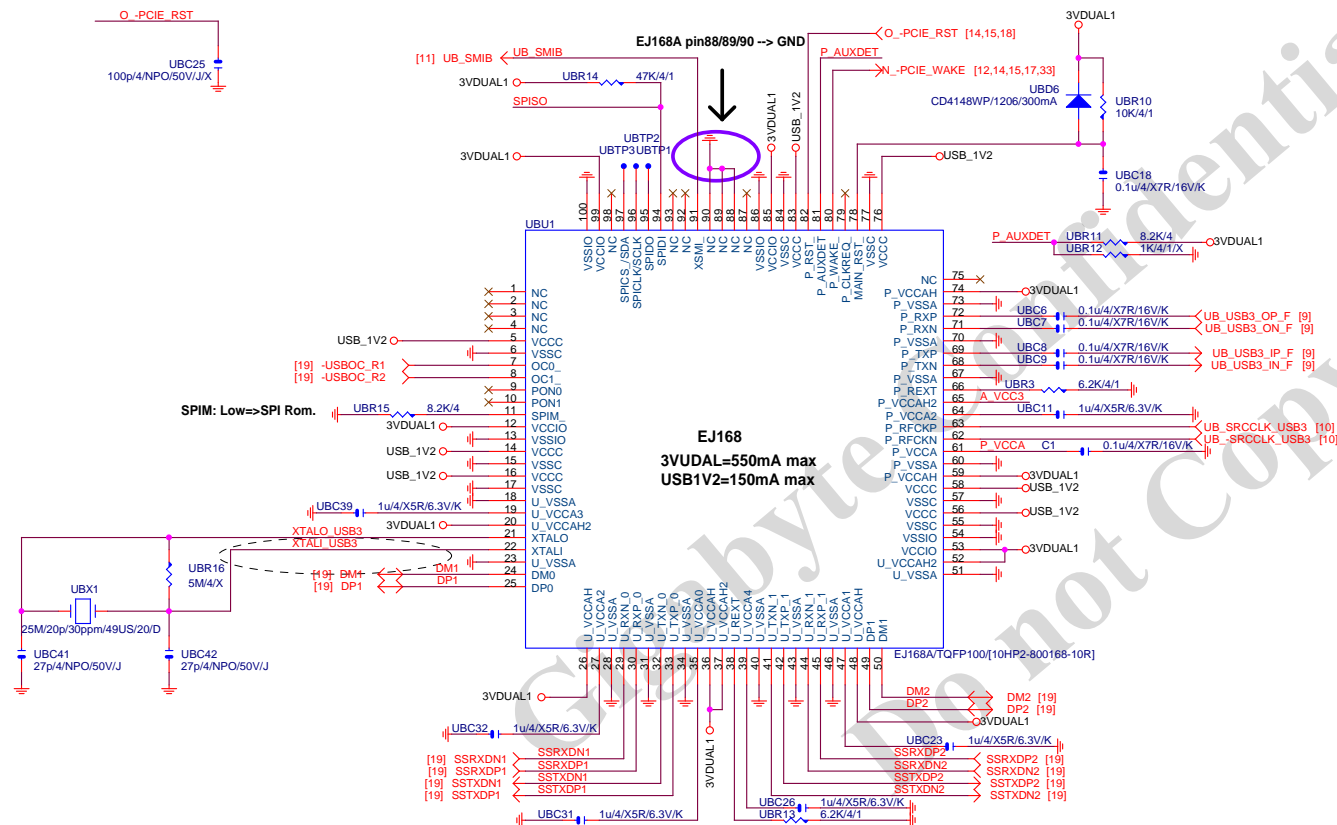
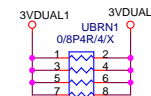
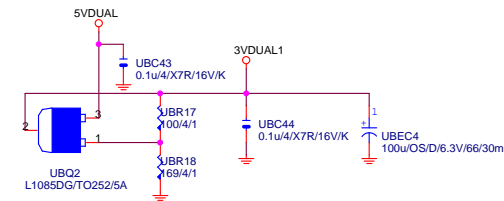
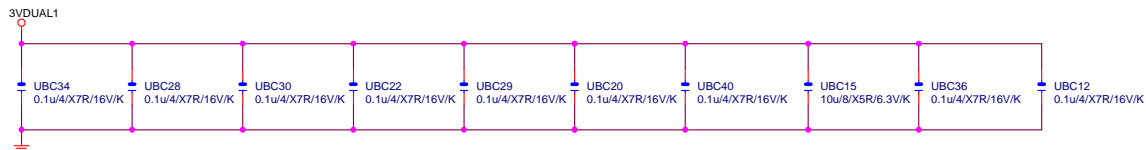
NEW DESIGN ONLY FOR INTERNAL SWR
AR8151: LAR3(O), LAR5(X)
AR8161: LAR5(O), LAR3/LAR4(X)



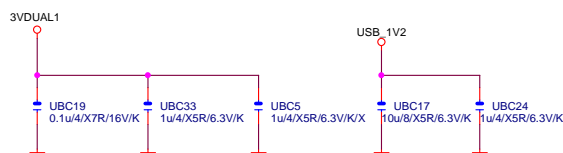
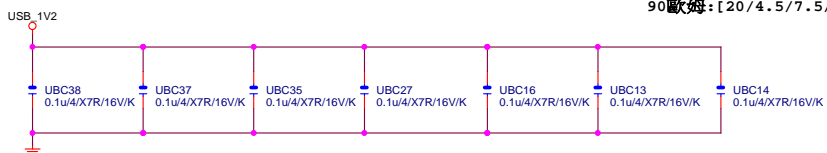
MDI : AR8161-->N/A



	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	

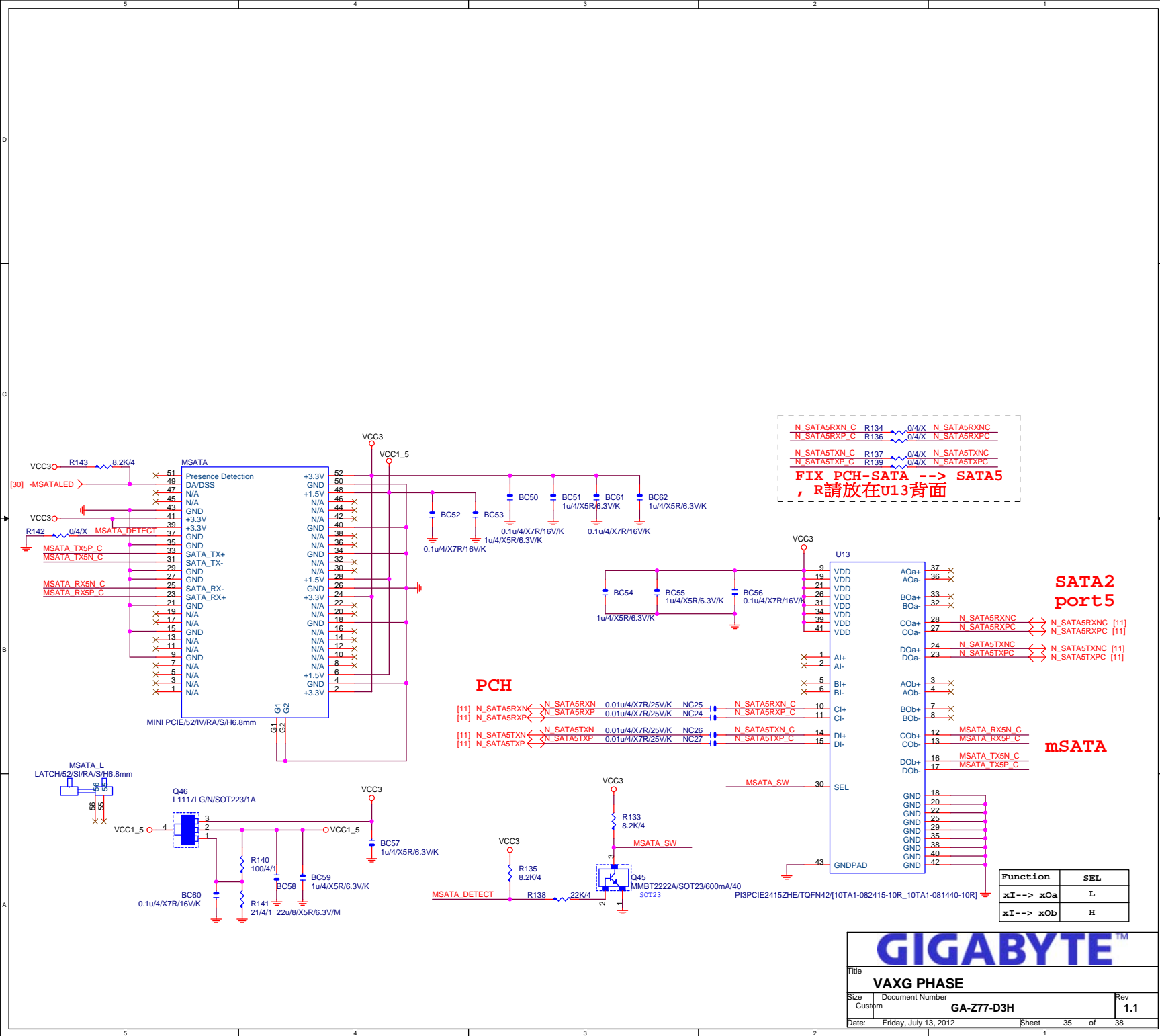


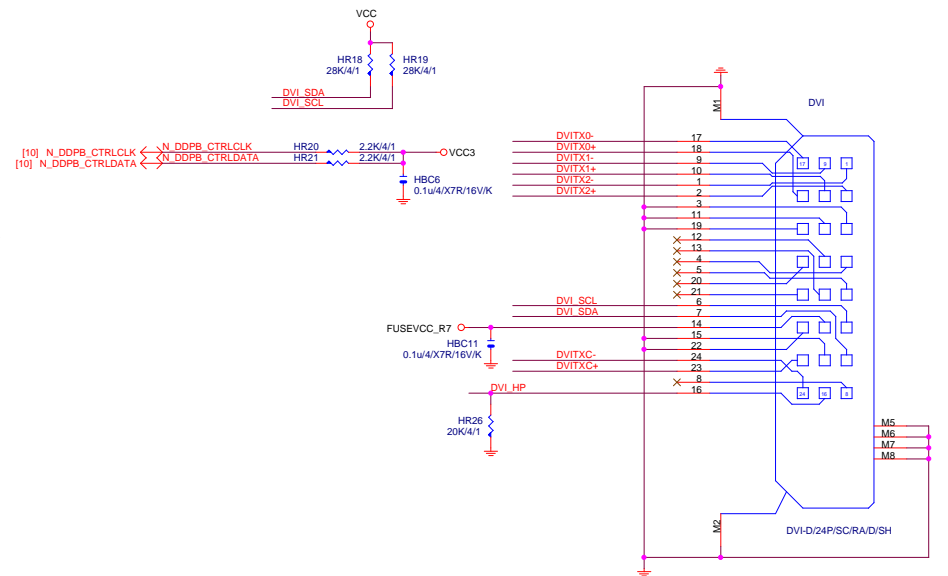
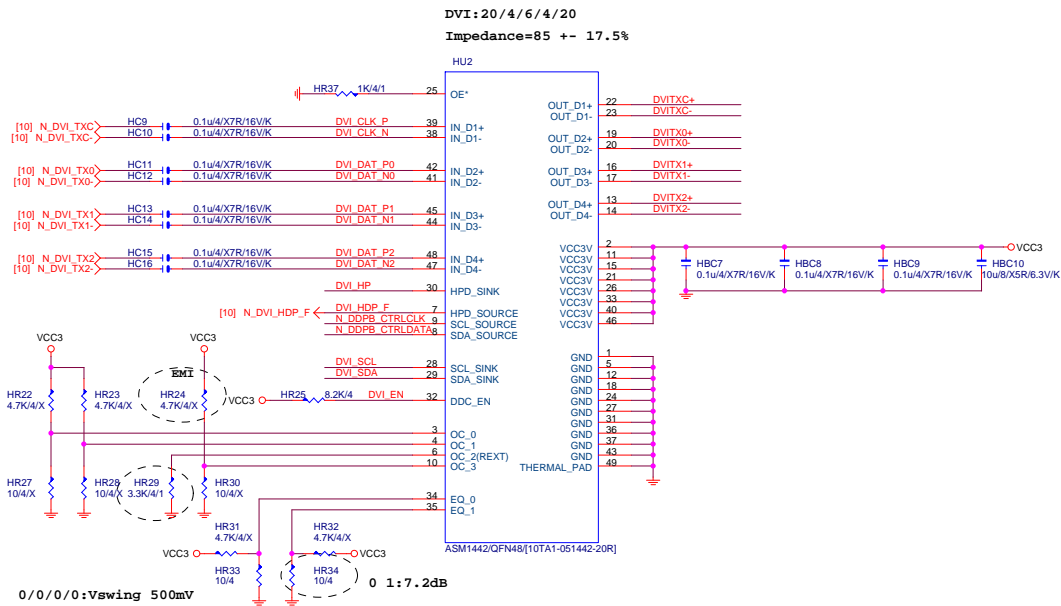
AZ1117H-1.2TR/SOT223/1A-->UR17:0/4,UR16:N/A [1.2V]
L1117LG/N/SOT223/1A-->UR17:0/4,UR16:100/4/1 [1.25V]



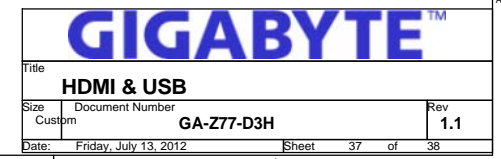
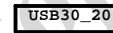
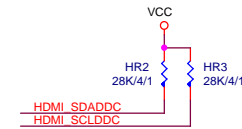
USB3.0 --> 5GHz
BANDWITH=5GHz*(8b/10b)=4Gb/s=500MB/s

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





Gigabyte Technology			
Title			
TI TSB43AB23 1394			
Size	Document Number	Rev	
Custom	GA-Z77-D3H	1.1	
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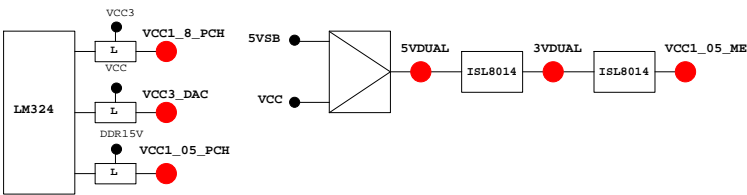


PCH GPIO LIST TABLE					
PIN NAME	PWR	Default	USAG	NOTE	
GP0	MAIN	H-Z	GPI	GPIO0	N/A
GP1/TACH1	MAIN		GPI	GPIO1	N/A
GP2/PIRQE#	MAIN		GPI	-PIRQE	P/U 8.2K VCC3
GP3/PIRQF#	MAIN		GPI	-PIRQF	P/U 8.2K VCC3
GP4/PIRQG#	MAIN		GPI	-PIRQG	P/U 8.2K VCC3
GP5/PIRQH#	MAIN		GPI	-PIRQH	P/U 8.2K VCC3
GP6/TACH2	MAIN		GPI	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

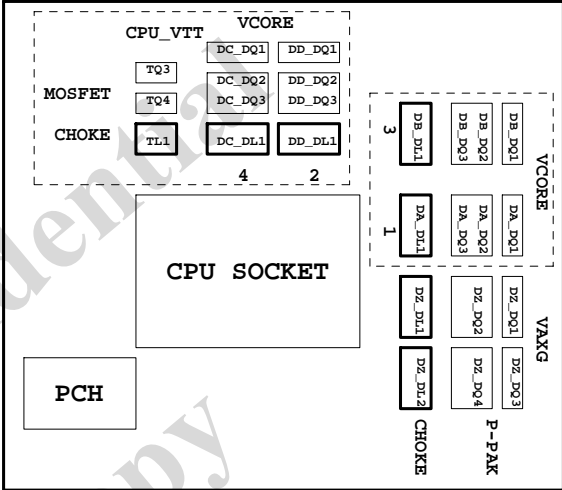
Super I/O ITE8720 GPIO Table

PIN NAME	USAG	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	USAG	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	
3VBSBW#/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/BUSS01	MB_ID3	
PD7/GP77/BUSS02	MB_ID4	
AFD#/GP86/SMB_C_R	2V_PIN	FST_2X8
INIT#/GP85/SMB_D_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#/CIRTX/GP15	PWM2_CR	
KDAT/GP61	PWM2_CR	
GP67/CPU_PG/GB_03	EN_LOADLINE	IT_GP67/-EN_PWM2
SLIN#/GP84/SMB_D_R	-EN_PWM2	
PSI_L/FAN_CLT5/CIRRX2/GP16	-THERM	
VIDO4/GP26/SCUT2	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 Termination
VREF_CA_A/VREF_CA_B	DRAM Address Ref
VREF_DQ_A/VREF_DQ_B	DRAM Data Ref

散熱模組料號：

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

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

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