

Model Name: GA-Z68MA-D2H-B3

Revision 1.3

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 1,2
08	DDR III CHANNEL B 1,2
09	PCH_FDI,DMI,USB,PCIE,NVRAM
10	PCH_DP
11	PCH_HOST,SATA,PCI
12	PCH_GPIO,CTRL,AUDIO
13	PCH_PWR,GND
14	PCI EXPRESS*16 SLOT
15	PCI EXPRESS*4 SLOT
16	PCI EXPRESS*8 SLOT
17	PCI EXPRESS*16 SWITCH
18	PCI EXPRESS*1 SLOT
19	ITE 8728 LPC IO
20	COM,KB_USB,USB_ESATA,-PROCHOT
21	HWM,FAN CTRL
22	DUAL BIOS
23	FP,FUSB,SPK,SATALED
24	ALC889
25	REAR AUDIO JACK
26	REALTEK RTL8111E
27	HDMI/DVI

SHEET

TITLE

28	USB3.0- EJ168
29	DISCRETE POWER
30	ATX,TPM
31	ISL95870_CPU_VTT
32	VCORE ISL6364_1
33	VCORE ISL6364_2
34	VCORE ISL6364_3

Gigabyte Technology

Cover Sheet

Size Custom	Document Number GA-Z68MA-D2H-B3	Rev 1.3
Date: Tuesday, July 26, 2011	Sheet 1 of 34	

Revision 1.3

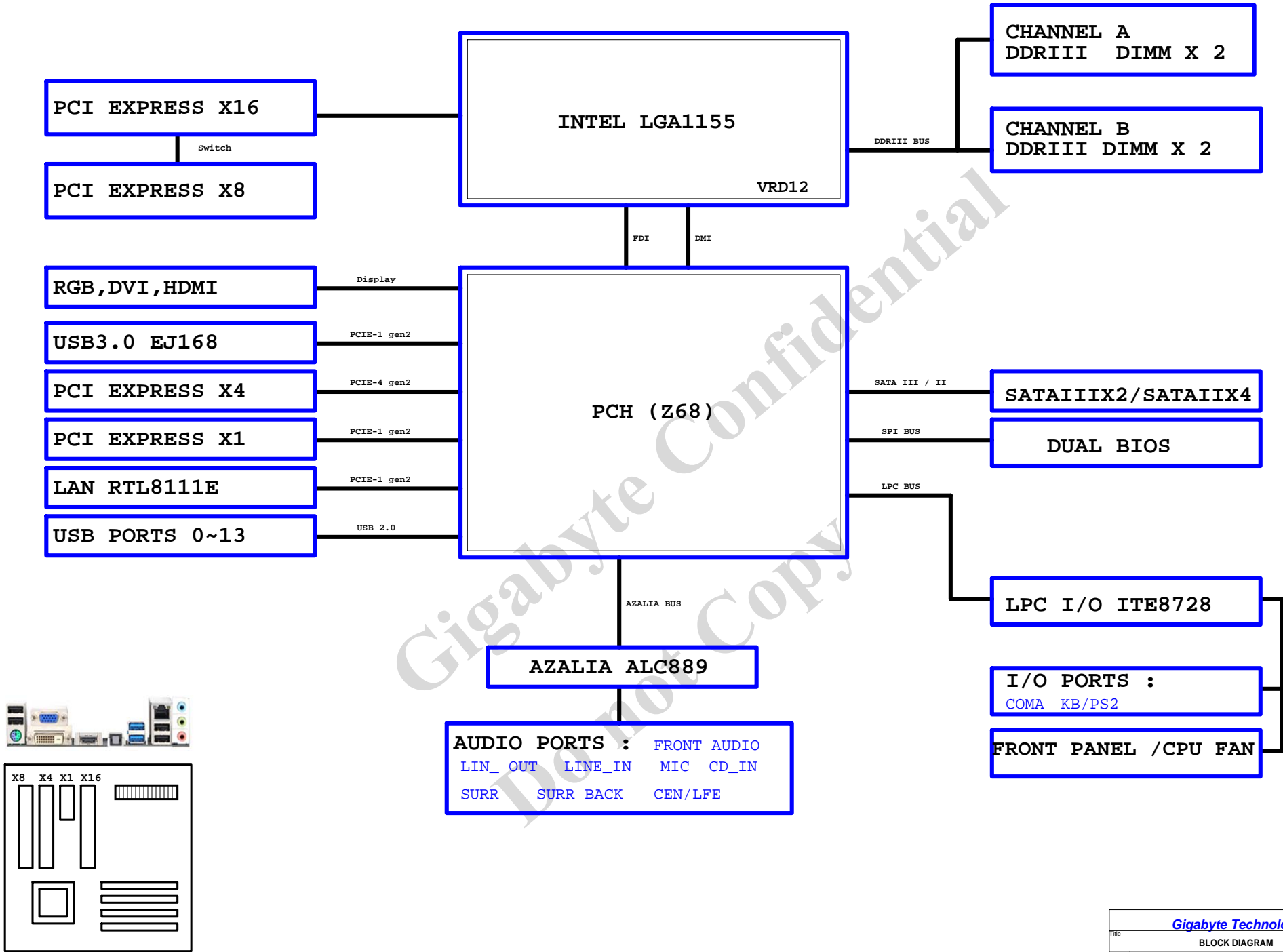
Circuit or PCB layout change

Component value change history

2011/07/26

[illegible][illegible]

BLOCK DIAGRAM



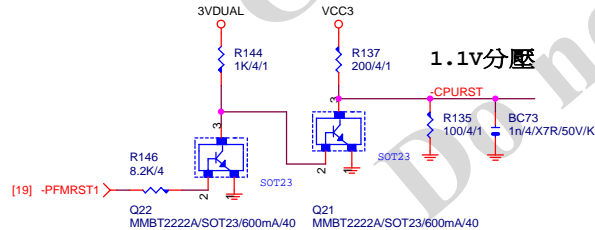
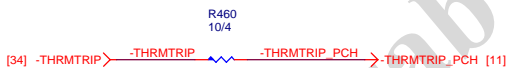
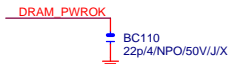
CFG5:1: 1X16 PEG
CFG5:0: 2X8 PEG

[16] -8X_EN

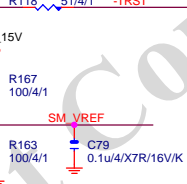
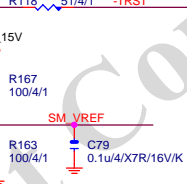
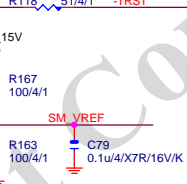
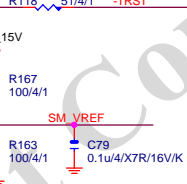
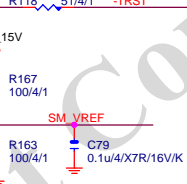
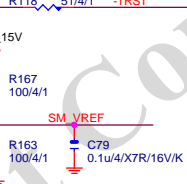
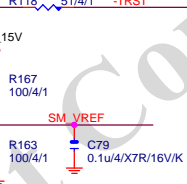
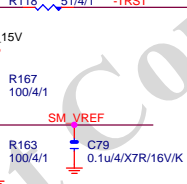
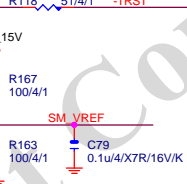
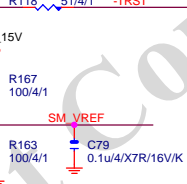
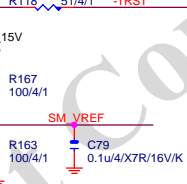
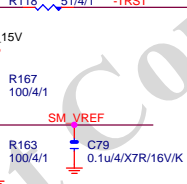
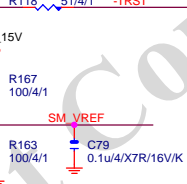
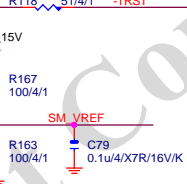
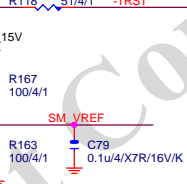
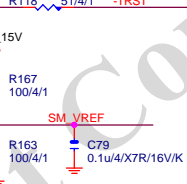
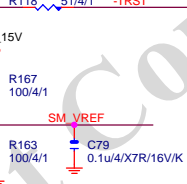
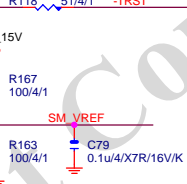
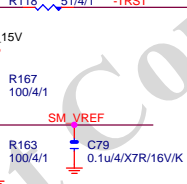
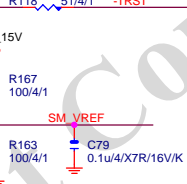
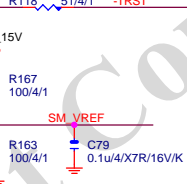
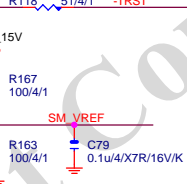
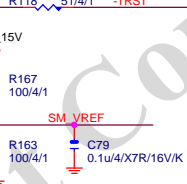
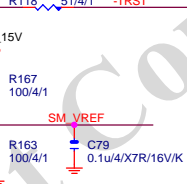
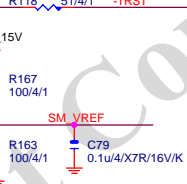
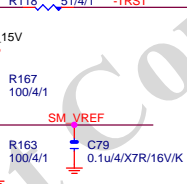
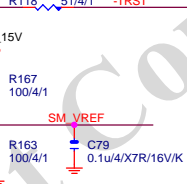
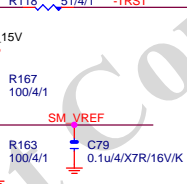
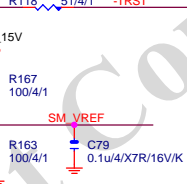
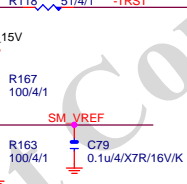
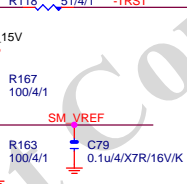
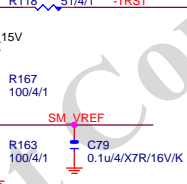
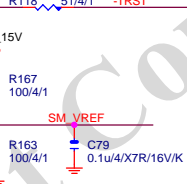
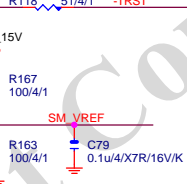
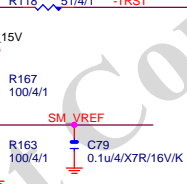
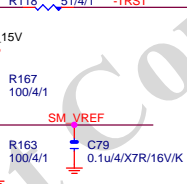
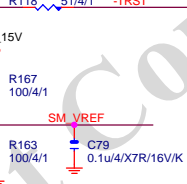
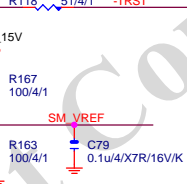
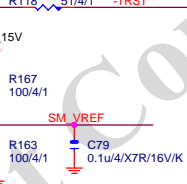
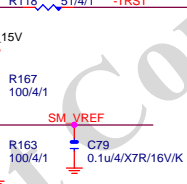
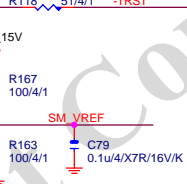
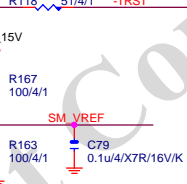
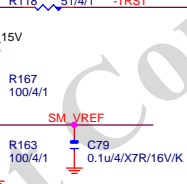
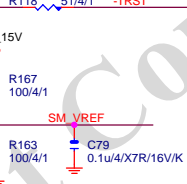
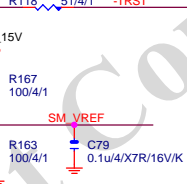
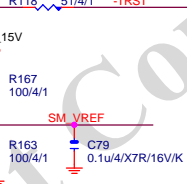
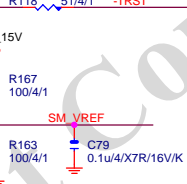
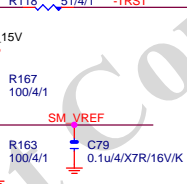
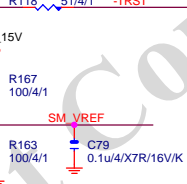
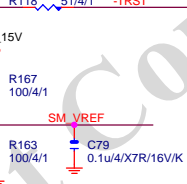
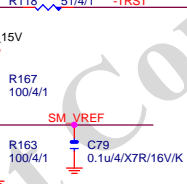
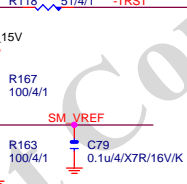
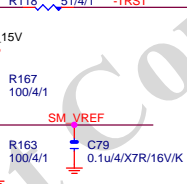
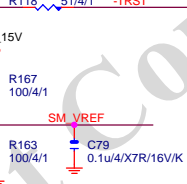
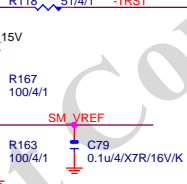
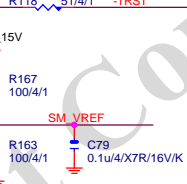
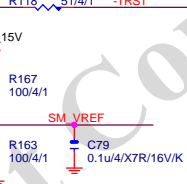
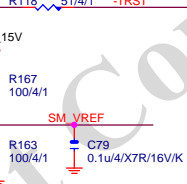
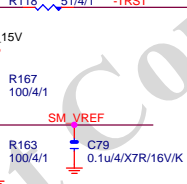
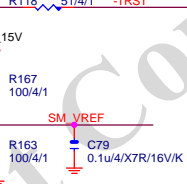
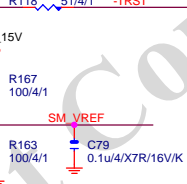
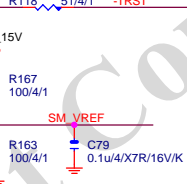
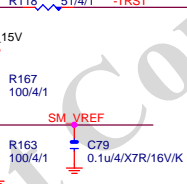
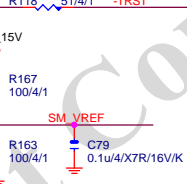
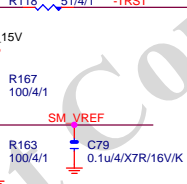
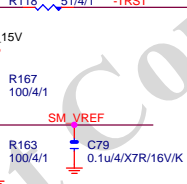
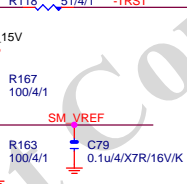
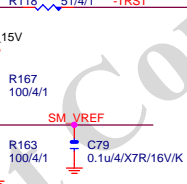
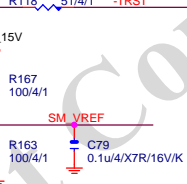
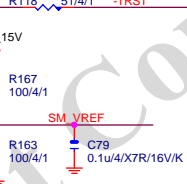
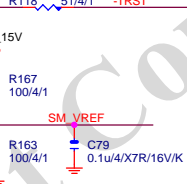
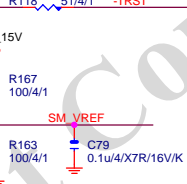
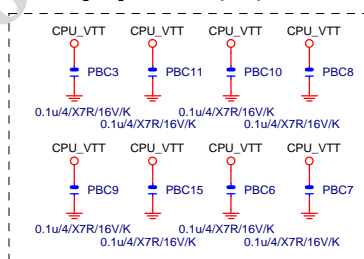
CFG	H	L	NOTE
0	RSVD	RSVD	RSVD
1	RSVD	RSVD	RSVD
2	NORM	Reverse	LANE REVERSAL[0], x16
3	RSVD	RSVD	RSVD
4	RSVD	RSVD	RSVD
7	RSVD	RSVD	RSVD
8	RSVD	RSVD	RSVD
9	RSVD	RSVD	RSVD
10	RSVD	RSVD	RSVD
11	RSVD	RSVD	RSVD
12	RSVD	RSVD	RSVD
13	RSVD	RSVD	RSVD
14	RSVD	RSVD	RSVD
15	RSVD	RSVD	RSVD
16	RSVD	RSVD	RSVD
17	RSVD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



Stitching caps for PCIE, DMI, FDI bus



LGA1155A

MAAA0	AV27	SA_MA[0]	SA_DSQ[0]	AK3	DQSA0
MAAA1	AY24	SA_MA[1]	SA_DSQ[0]	AK2	-DQSA0
MAAA2	AW24	SA_MA[2]			
MAAA3	AV23	SA_MA[3]			
MAAA4	AV23	SA_MA[3]			
MAAA5	AT24	SA_MA[4]	SA_DSQ[0]	AJ3	MDA0
MAAA6	AT23	SA_MA[5]	SA_DSQ[1]	AJ4	MDA1
MAAA7	AV22	SA_MA[6]	SA_DSQ[2]	AL3	MDA2
MAAA8	AU22	SA_MA[7]	SA_DSQ[3]	AL4	MDA3
MAAA9	AT22	SA_MA[8]	AJ2	MDA4	
MAAA10	AV28	SA_MA[9]	SA_DSQ[4]	AL1	MDA5
MAAA11	AU21	SA_MA[10]	SA_DSQ[5]	AL2	MDA6
MAAA12	AT21	SA_MA[11]	SA_DSQ[6]	AL1	MDA7
MAAA13	AW32	SA_MA[12]	SA_DSQ[11]	AP3	DQSA1
MAAA14	AU20	SA_MA[13]	SA_DSQ[11]	AP2	-DQSA1
MAAA15	AT20	SA_MA[15]			
[7] -SWEA	AW29	SA_WE#	SA_DSQ[8]	AN1	MDA8
[7] -SCASA	AV30	SA_CAS#	SA_DSQ[9]	AN4	MDA9
[7] -SRASA	AU28	SA_RAS#	SA_DSQ[10]	AR3	MDA10
			SA_DSQ[11]	AR4	MDA12
[7] SBAA0	SBAA0	SA_BS[0]	SA_DSQ[12]	AN2	MDA11
[7] SBAA1	SBAA1	SA_BS[1]	SA_DSQ[13]	AN3	MDA13
[7] SBAA2	SBAA2	SA_BS[2]	SA_DSQ[14]	AR2	MDA14
			SA_DSQ[15]	AR1	MDA15
[7] -CSA0	CSA0	SA_CS#	SA_DSQ[2]	AW4	DQSA2
[7] -CSA1	CSA1	SA_CS#	SA_DSQ[2]	AW4	-DQSA2
[7] -CSA2	CSA2	SA_CS#	SA_DSQ[3]		
[7] -CSA3	CSA3	SA_CS#			
[7] CKEA0	CKEA0	SA_CKE[0]	SA_DSQ[16]	AV2	MDA16
[7] CKEA1	CKEA1	SA_CKE[1]	SA_DSQ[17]	AW3	MDA17
[7] CKEA2	CKEA2	SA_CKE[2]	SA_DSQ[18]	AV5	MDA18
[7] CKEA3	CKEA3	SA_CKE[3]	SA_DSQ[19]	AW5	MDA19
			SA_DSQ[20]	AU2	MDA20
[7] MODT_A0	AV31	SA_ODT[0]	SA_DSQ[21]	AU3	MDA21
[7] MODT_A1	AU32	SA_ODT[1]	SA_DSQ[22]	AU5	MDA22
[7] MODT_A2	AU30	SA_ODT[2]	SA_DSQ[23]	AY5	MDA23
[7] MODT_A3	AW33	SA_ODT[3]			
			SA_DSQ[3]	AV8	DQSA3
			SA_DSQ[3]	AW8	-DQSA3
[7] -DCLKA0	DCLKA0	SA_CK[0]	SA_DSQ[24]	AY7	MDA24
[7] -DCLKA1	DCLKA1	SA_CK[1]	SA_DSQ[25]	AU7	MDA25
[7] -DCLKA2	DCLKA2	SA_CK[2]	SA_DSQ[26]	AV9	MDA26
[7] -DCLKA3	DCLKA3	SA_CK[3]	SA_DSQ[27]	AU9	MDA27
			SA_DSQ[28]	AV7	MDA28
			SA_DSQ[29]	AW7	MDA29
			SA_DSQ[30]	AW9	MDA30
			SA_DSQ[31]	AY9	MDA31
			SA_DSQ[4]	AV37	DQSA4
			SA_DSQ[4]	AV36	-DQSA4
			SA_DSQ[32]	AU35	MDA32
			SA_DSQ[33]	AW37	MDA33
			SA_DSQ[34]	AU39	MDA34
			SA_DSQ[35]	AU36	MDA35
			SA_DSQ[36]	AW35	MDA36
			SA_DSQ[37]	AY36	MDA37
			SA_DSQ[38]	AU38	MDA38
			SA_DSQ[39]	AU37	MDA39
			SA_DSQ[5]	AP38	DQSA5
			SA_DSQ[5]	AP39	-DQSA5
			SA_DSQ[40]	AR40	MDA40
			SA_DSQ[41]	AR37	MDA41
			SA_DSQ[42]	AN38	MDA42
			SA_DSQ[43]	AN37	MDA43
			SA_DSQ[44]	AR39	MDA44
			SA_DSQ[45]	AR38	MDA45
			SA_DSQ[46]	AN39	MDA46
			SA_DSQ[47]	AN40	MDA47
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DDR_0

1 OF 10

LGA1155[10SC1-F01155-01R_10SC1-F01155-02R]

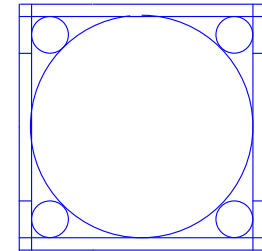
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MAAB3	AK18	SB_MA[3]			
MAAB4	AP19	SB_MA[4]	SB_DSQ[0]	AG7	MDB0
MAAB5	AP18	SB_MA[5]	SB_DSQ[1]	AG8	MDB1
MAAB6	AM18	SB_MA[6]	SB_DSQ[2]	AJ9	MDB2
MAAB7	AL18	SB_MA[7]	SB_DSQ[3]	AJ8	MDB3
MAAB8	AN18	SB_MA[8]	SB_DSQ[4]	AG5	MDB4
MAAB9	AY17	SB_MA[9]	SB_DSQ[5]	AG6	MDB5
MAAB10	AN23	SB_MA[10]	SB_DSQ[6]	AJ6	MDB6
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MAAB12	AT18	SB_MA[12]	SB_DSQ[11]	AM8	DQSB1
MAAB13	AR26	SB_MA[13]	SB_DSQ[11]	AL8	-DQSB1
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			SB_DSQ[15]		
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			SB_DSQ[20]	AP6	MDB20
			SB_DSQ[21]	AR6	MDB21
			SB_DSQ[22]	AP9	MDB22
			SB_DSQ[23]	AR9	MDB23
			SB_DSQ[3]	AN13	DQSB3
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VREF_DQA	AH4	FC_AH4			
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			SB_DSQ[36]	AP28	MDB36
			SB_DSQ[37]	AP29	MDB37
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AN15		SB_ECC_CB[1]			
AL16		SB_ECC_CB[2]			
AP16		SB_ECC_CB[3]			
AL15		SB_ECC_CB[4]			
AR15		SB_ECC_CB[5]			
AP15		SB_ECC_CB[6]			
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			SB_DSQ[41]	AP31	MDB41
			SB_DSQ[42]	AP35	MDB42
			SB_DSQ[43]	AP34	MDB43
			SB_DSQ[44]	AR32	MDB44
			SB_DSQ[45]	AR31	MDB45
			SB_DSQ[46]	AR35	MDB46
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			SB_DSQ[49]	AM31	MDB49
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			SB_DSQ[51]	AL32	MDB51
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			SB_DSQ[61]	AJ34	MDB61
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DDR_1

2 OF 10

LGA1155[10SC1-F01155-01R_10SC1-F01155-02R]

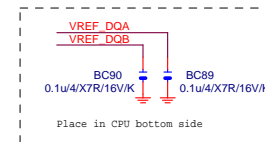
CR
CPU RETENTIONX

Need check the new CPU ME

LGA1155_P

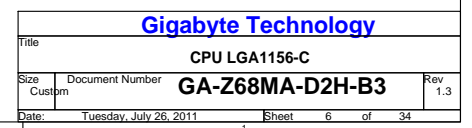


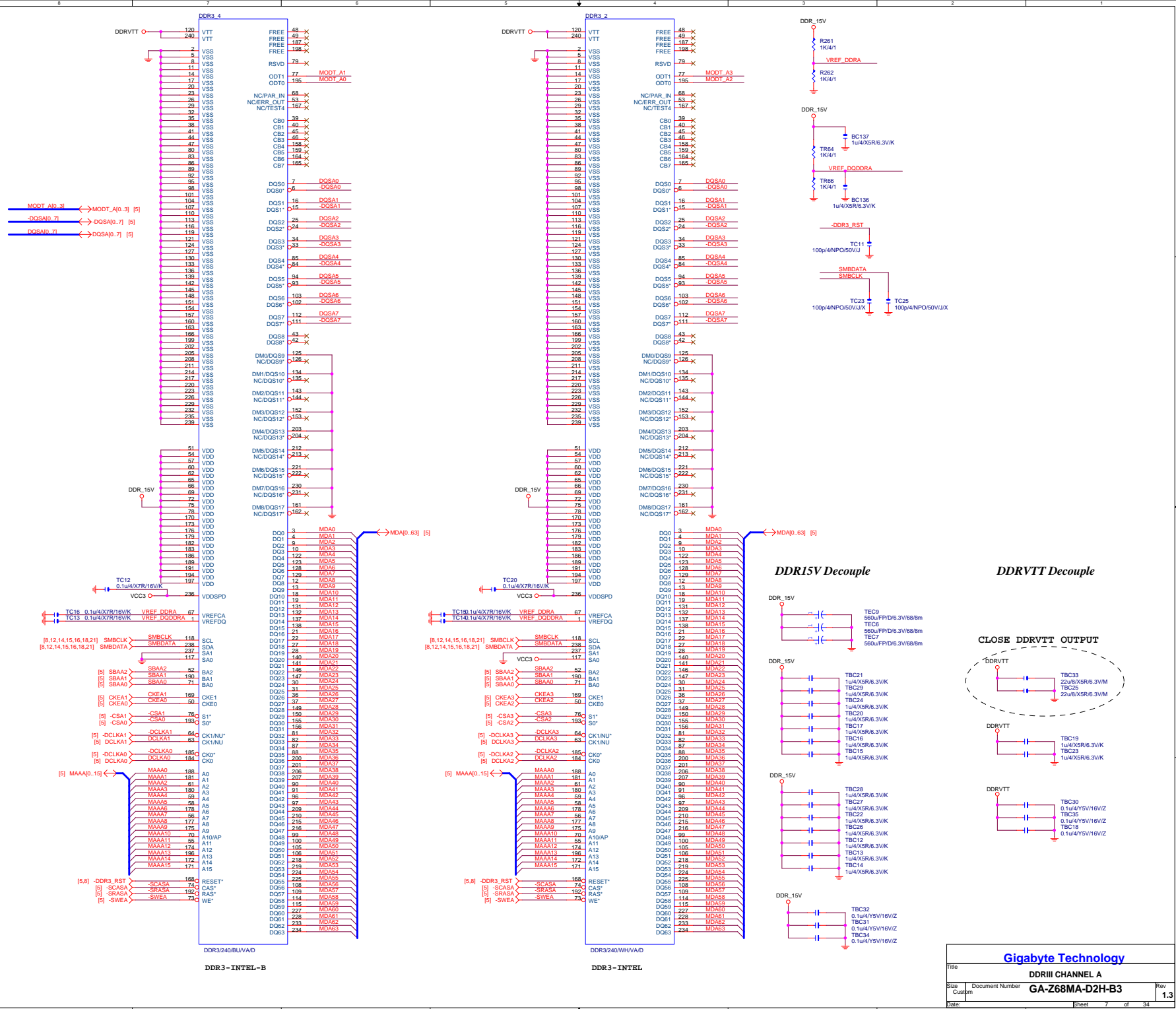
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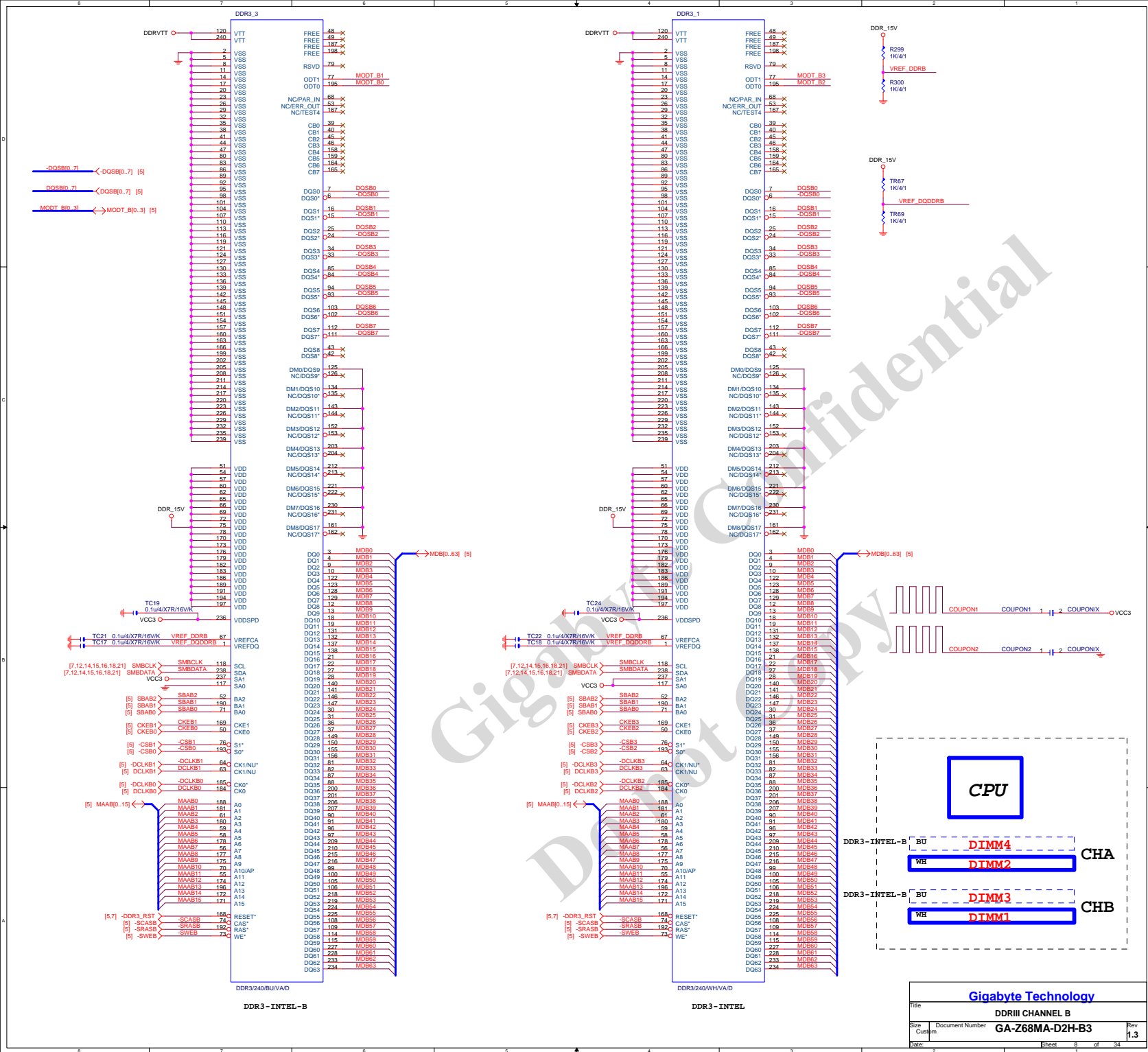


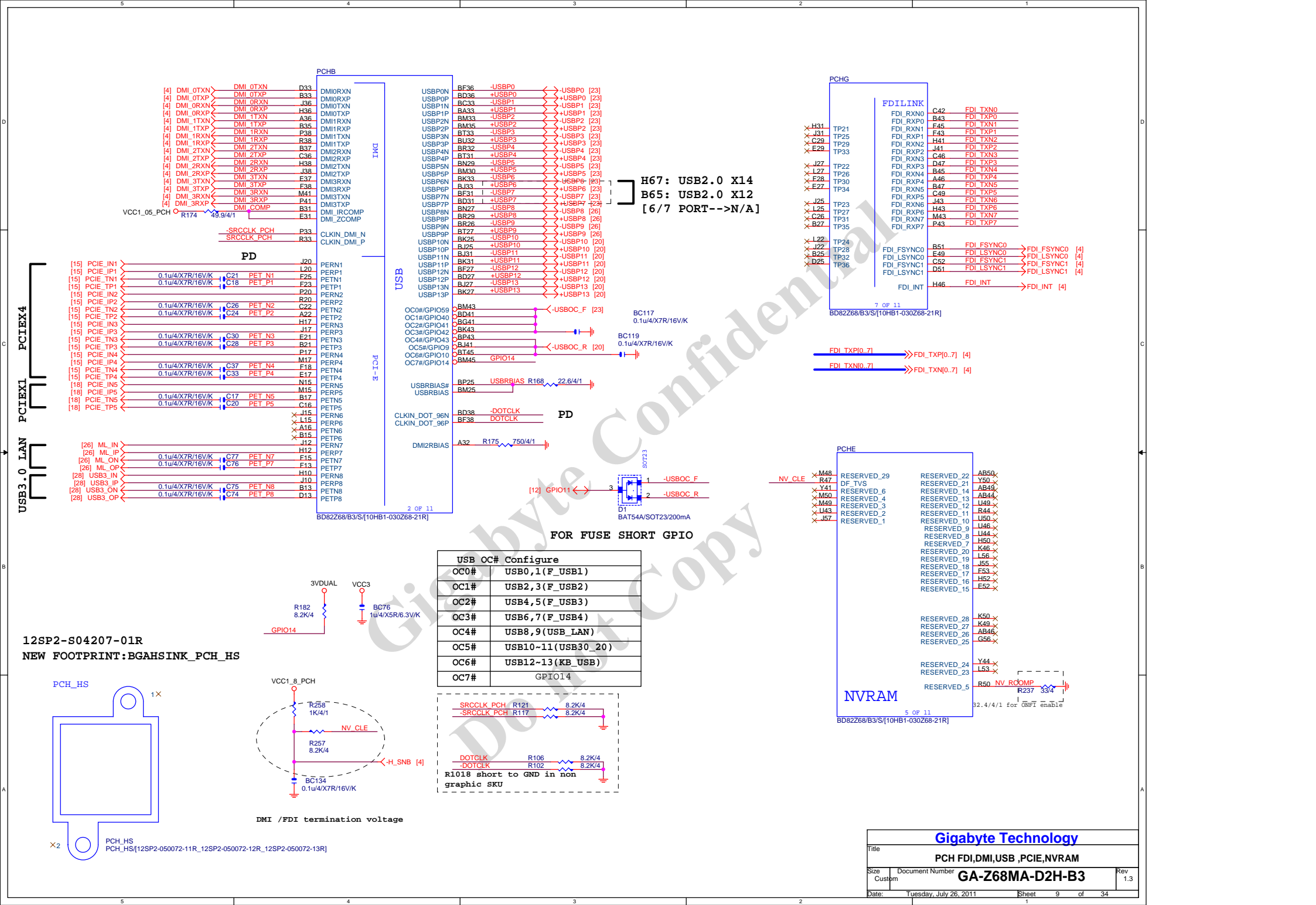
Gigabyte Technology

Title			CPU LGA1156-B	
Size			Document Number	
Custom			GA-Z68MA-D2H-B3	
Date:			Tuesday, July 26, 2011	Sheet 5 of 34
			Rev 1.3	

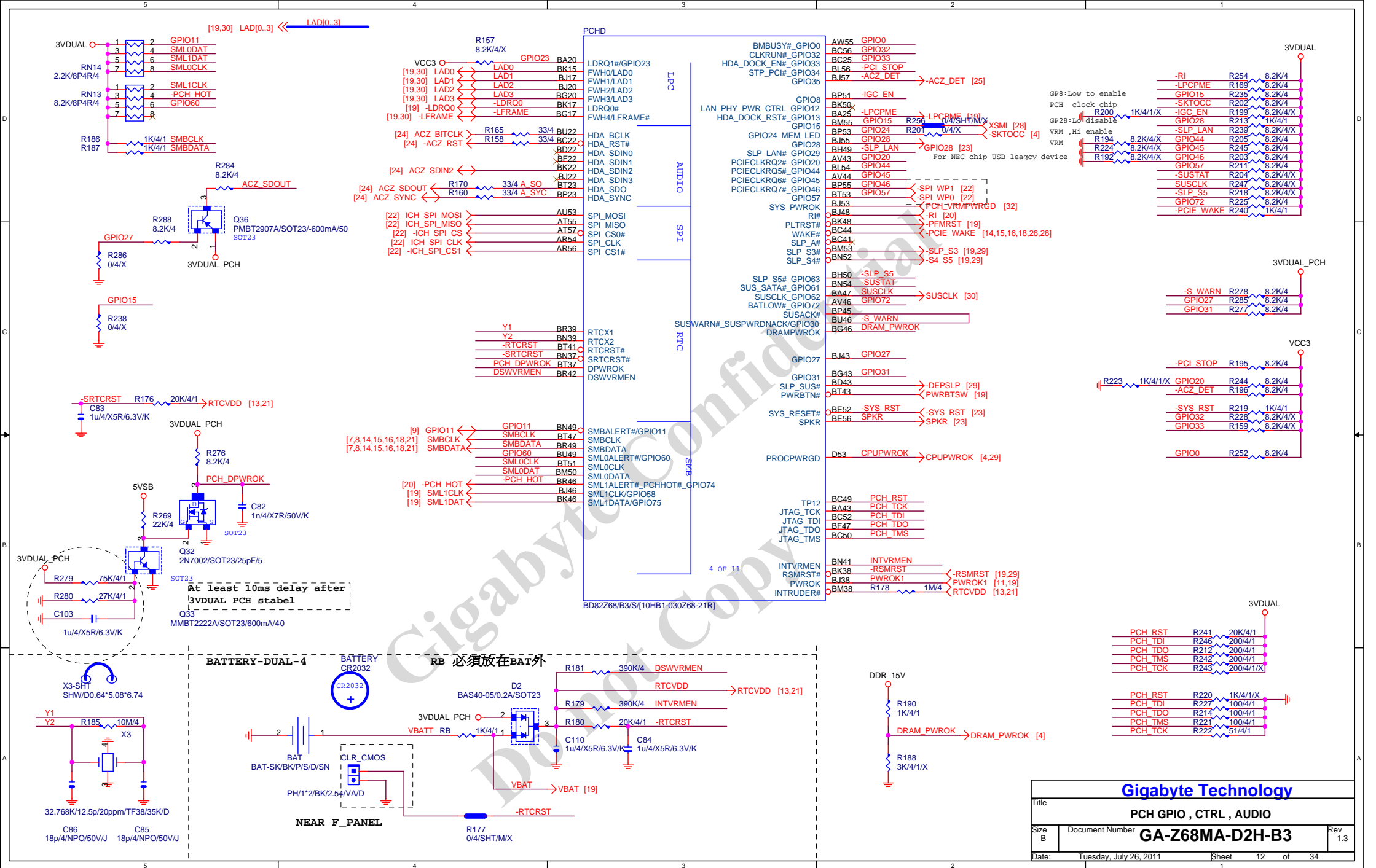


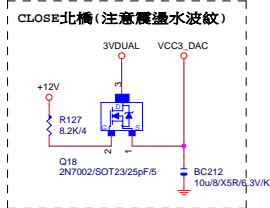
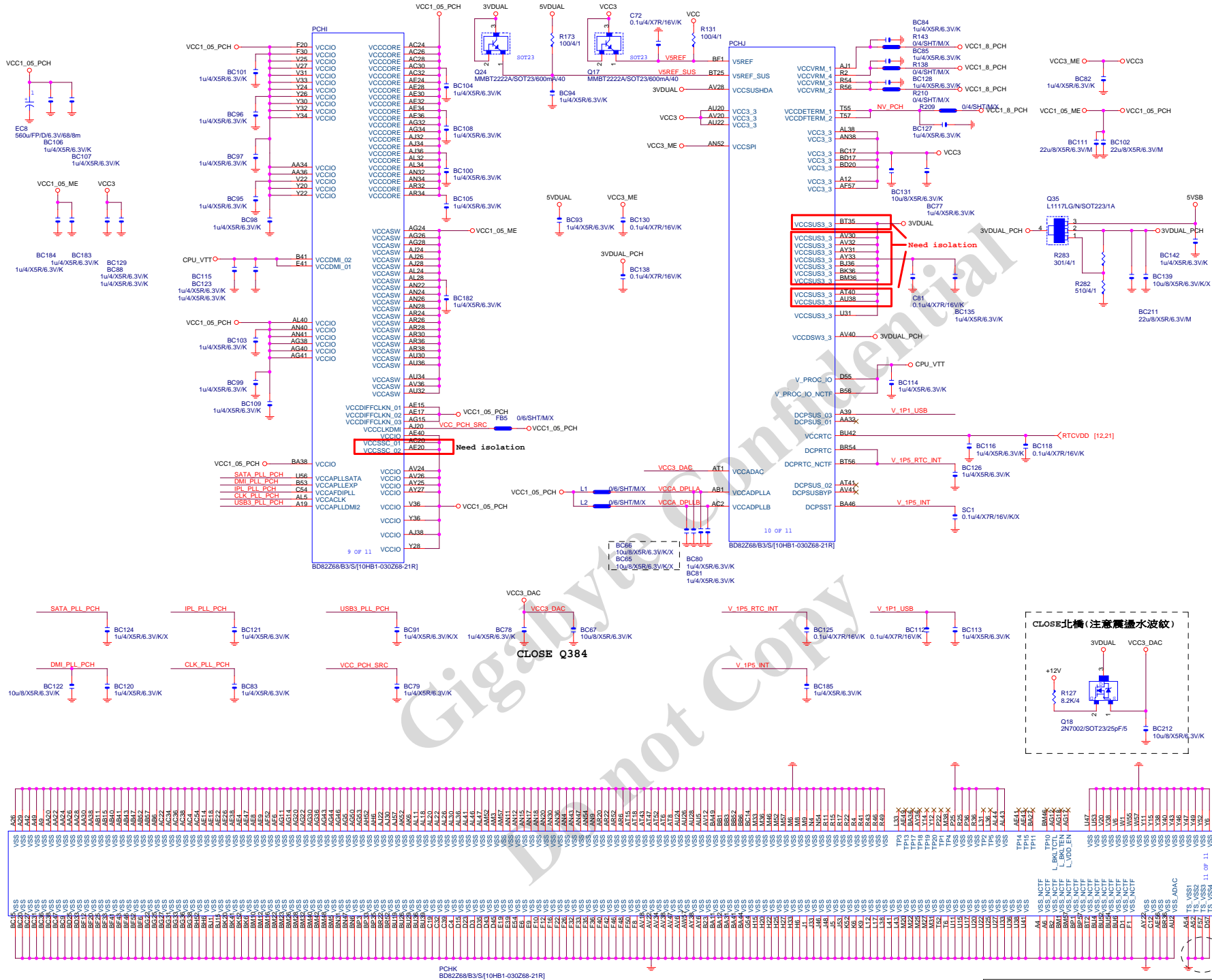


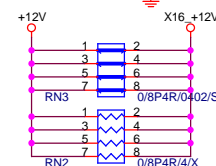
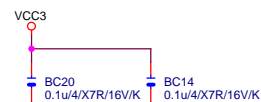
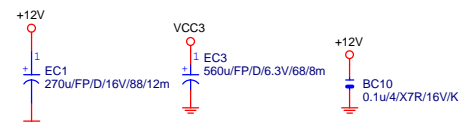




[illegible]







EXP A RXP0[0..15] >> EXP_A_RXP[0..15] [4,17]
EXP A RXN0[0..15] >> EXP_A_RXN[0..15] [4,17]
EXP A TXP0[0..15] >> EXP_A_TXP[0..15] [4,17]
EXP A TXN0[0..15] >> EXP_A_TXN[0..15] [4,17]

EXP A TXP0	C22	0.22u/4/X5R6.3V/K	EXP A TXP0C
EXP A TXN0	C23	0.22u/4/X5R6.3V/K	EXP A TXN0C
EXP A TXP1	C25	0.22u/4/X5R6.3V/K	EXP A TXP1C
EXP A TXN1	C27	0.22u/4/X5R6.3V/K	EXP A TXN1C
EXP A TXP2	C29	0.22u/4/X5R6.3V/K	EXP A TXP2C
EXP A TXN2	C31	0.22u/4/X5R6.3V/K	EXP A TXN2C
EXP A TXP3	C34	0.22u/4/X5R6.3V/K	EXP A TXP3C
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EXP A TXP4	C39	0.22u/4/X5R6.3V/K	EXP A TXP4C
EXP A TXN4	C41	0.22u/4/X5R6.3V/K	EXP A TXN4C
EXP A TXP5	C42	0.22u/4/X5R6.3V/K	EXP A TXP5C
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EXP A TXP6	C44	0.22u/4/X5R6.3V/K	EXP A TXP6C
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EXP A TXP7	C46	0.22u/4/X5R6.3V/K	EXP A TXP7C
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EXP A SW TXN13	C67	0.22u/4/X5R6.3V/K	EXP A SW TXN13C
EXP A SW TXP14	C69	0.22u/4/X5R6.3V/K	EXP A SW TXP14C
EXP A SW TXN14	C68	0.22u/4/X5R6.3V/K	EXP A SW TXN14C
EXP A SW TXP15	C70	0.22u/4/X5R6.3V/K	EXP A SW TXP15C
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EXP A SW TXN8[0..15] >> EXP_A_SW_TXN[8..15] [17]

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

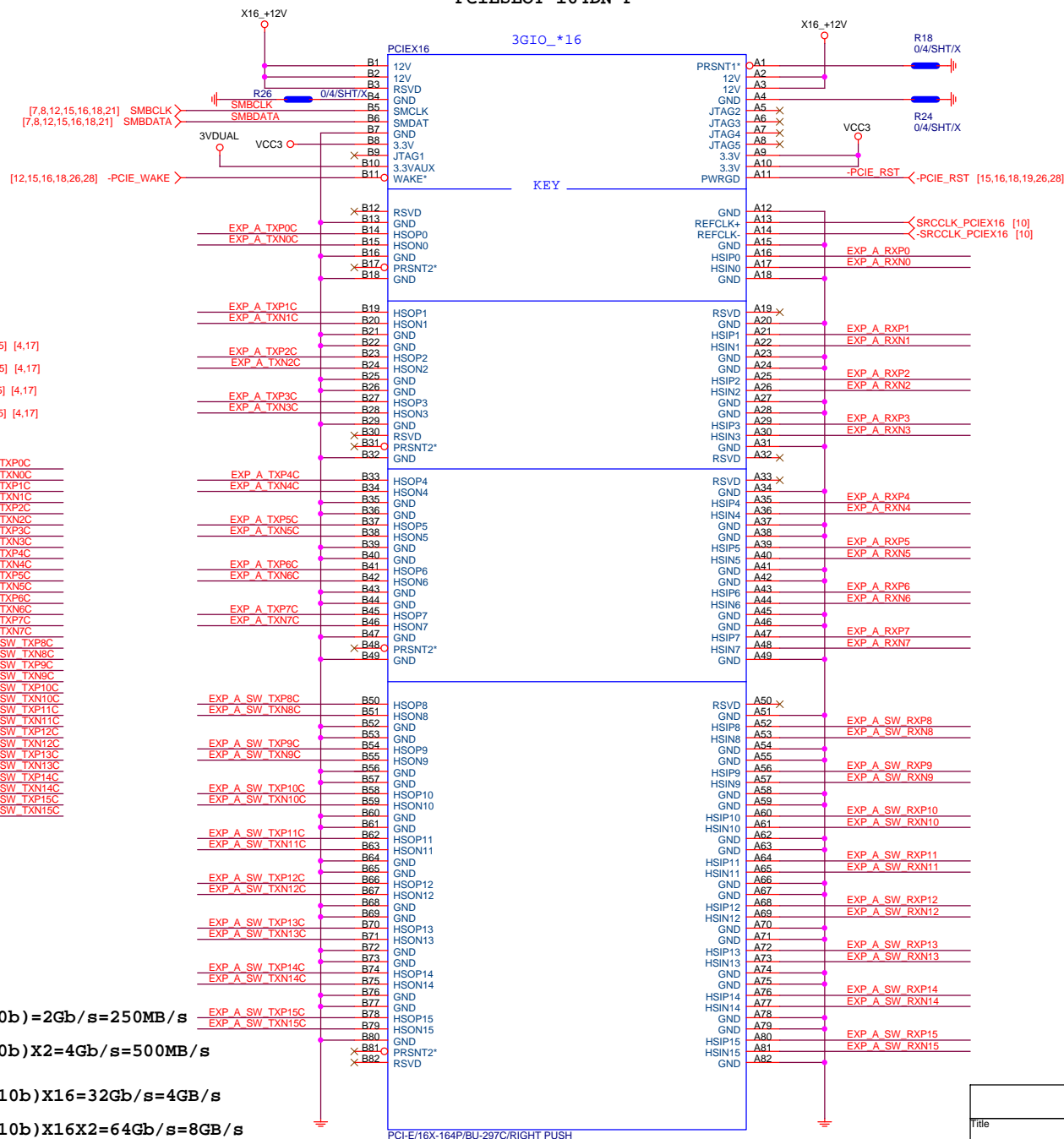
PCE-E X1(雙向) BANDWIDTH=2.5GHz*(8b/10b)X2=4Gb/s=500MB/s

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

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

PCI-E REV:2.0--> 5GHZ

PCIESLOT-164DN-P

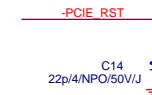
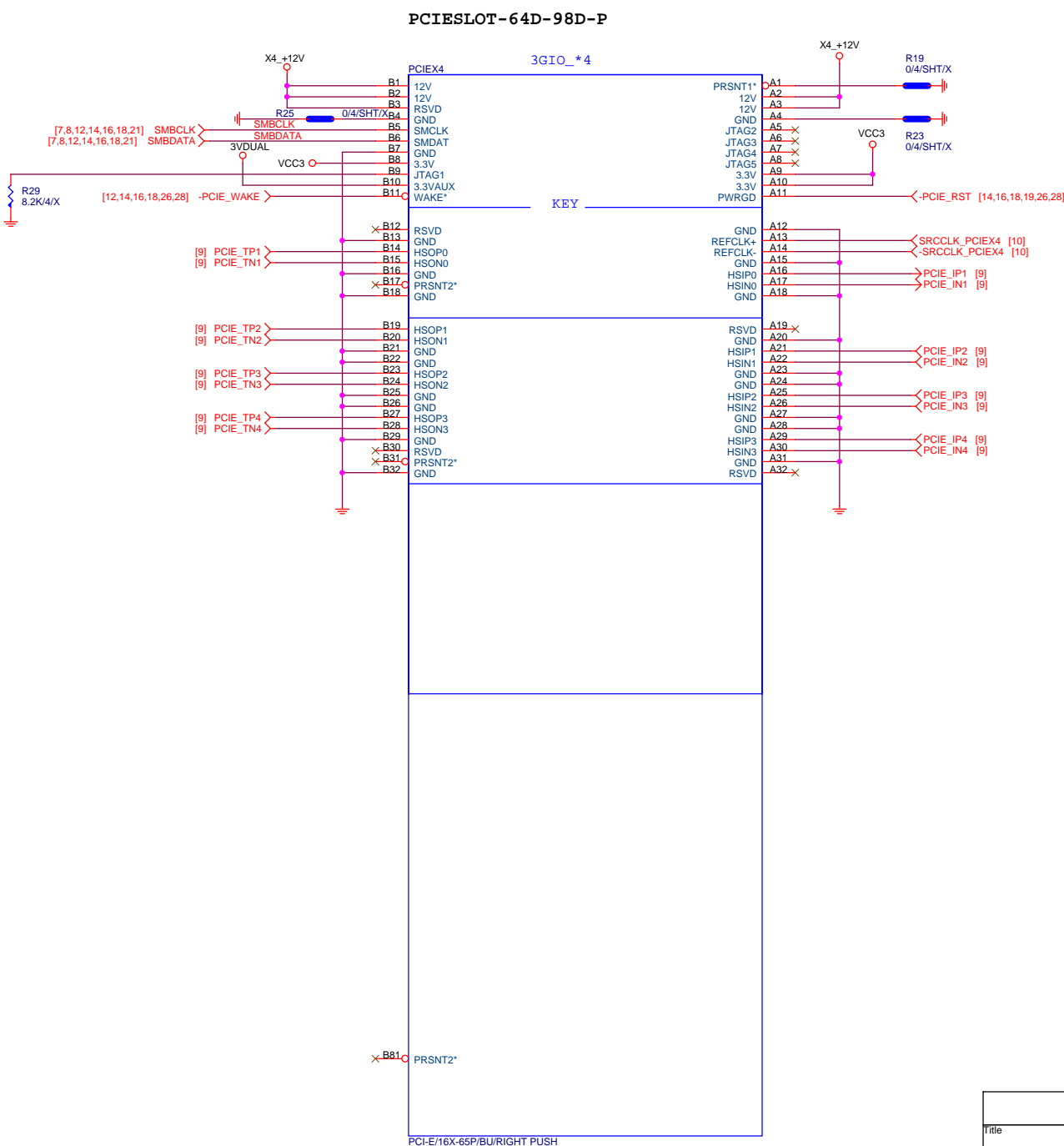
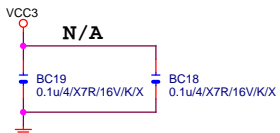
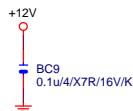
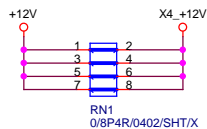


PCI-E/16X-164P/BU-297C/RIGHT PUSH

Gigabyte Technology

PCI EXPRESS * 16

Title	Document Number	Rev
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Date:	Tuesday, July 26, 2011	Sheet 14 of 34

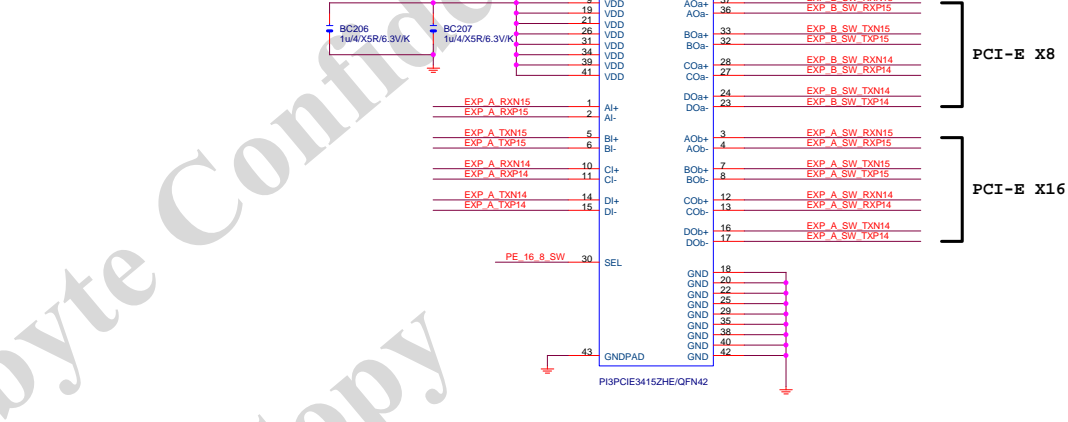
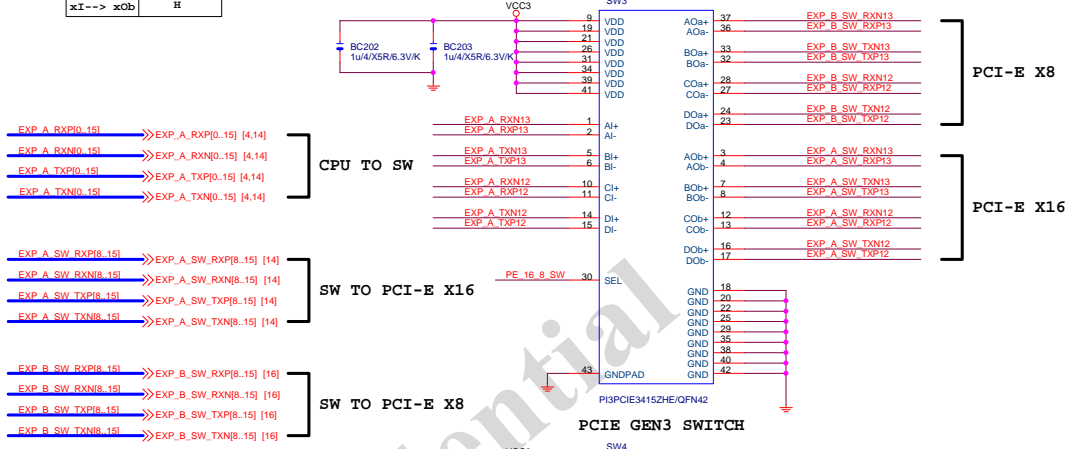
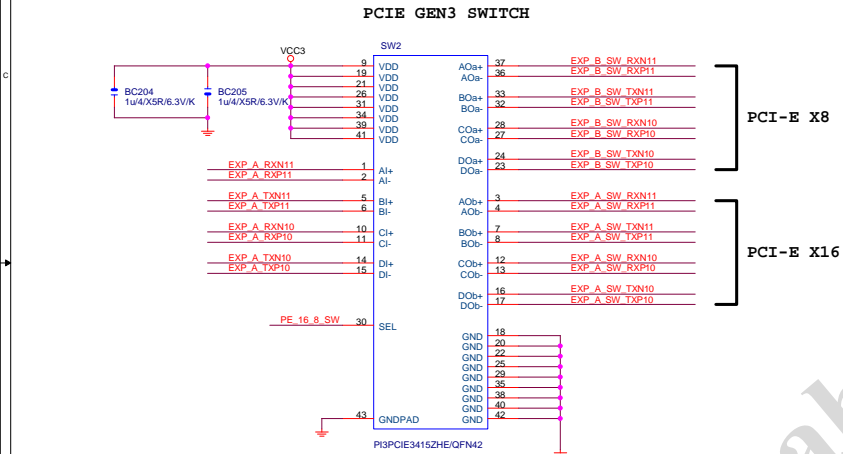
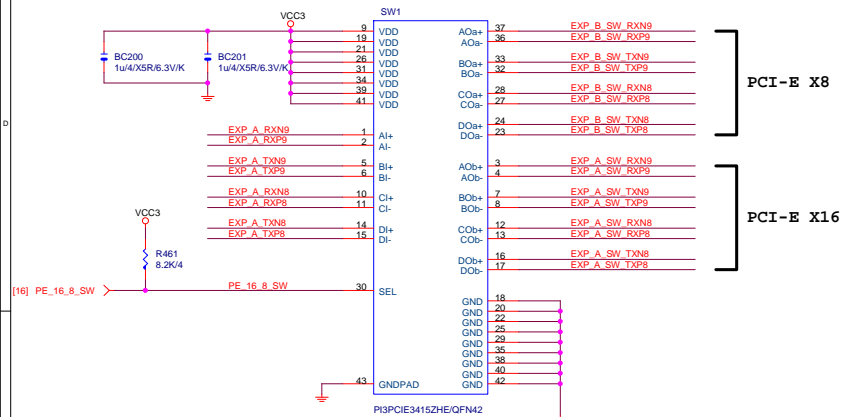


× B81

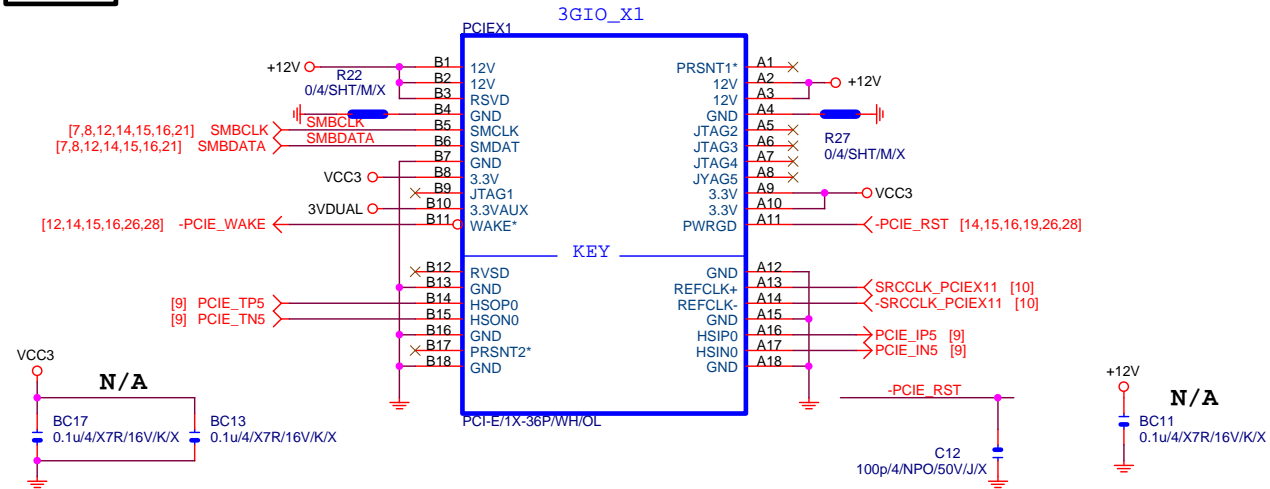
PCI-E/16X-65P/BU/RIGHT PUSH

Gigabyte Technology			
PCI EXPRESS X 4 PORT			
Title	Document Number		
Size	GA-Z68MA-D2H-B3		
Custom	Rev		
Date:	Tuesday, July 26, 2011	Sheet	15 of 34
2	1		

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

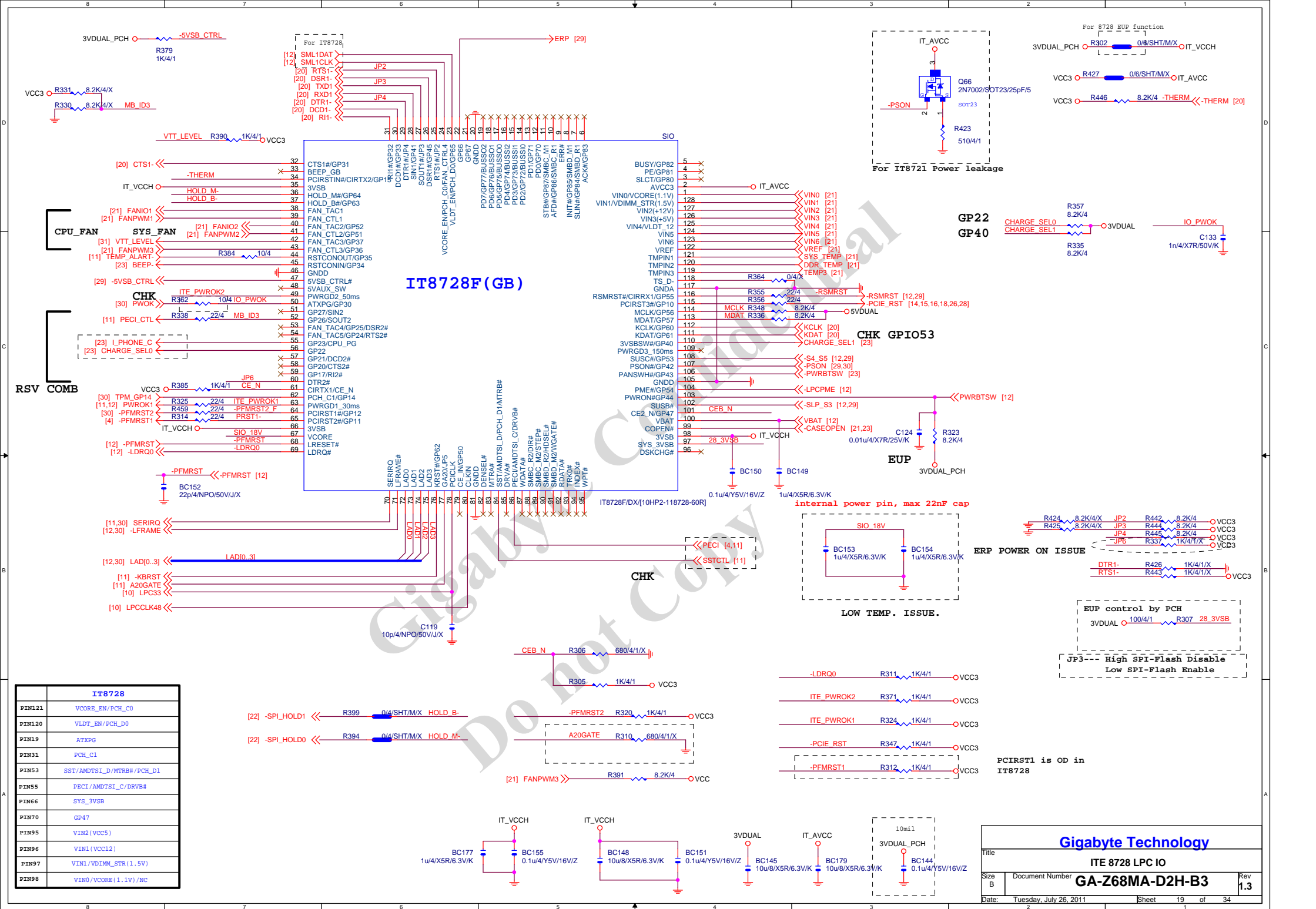


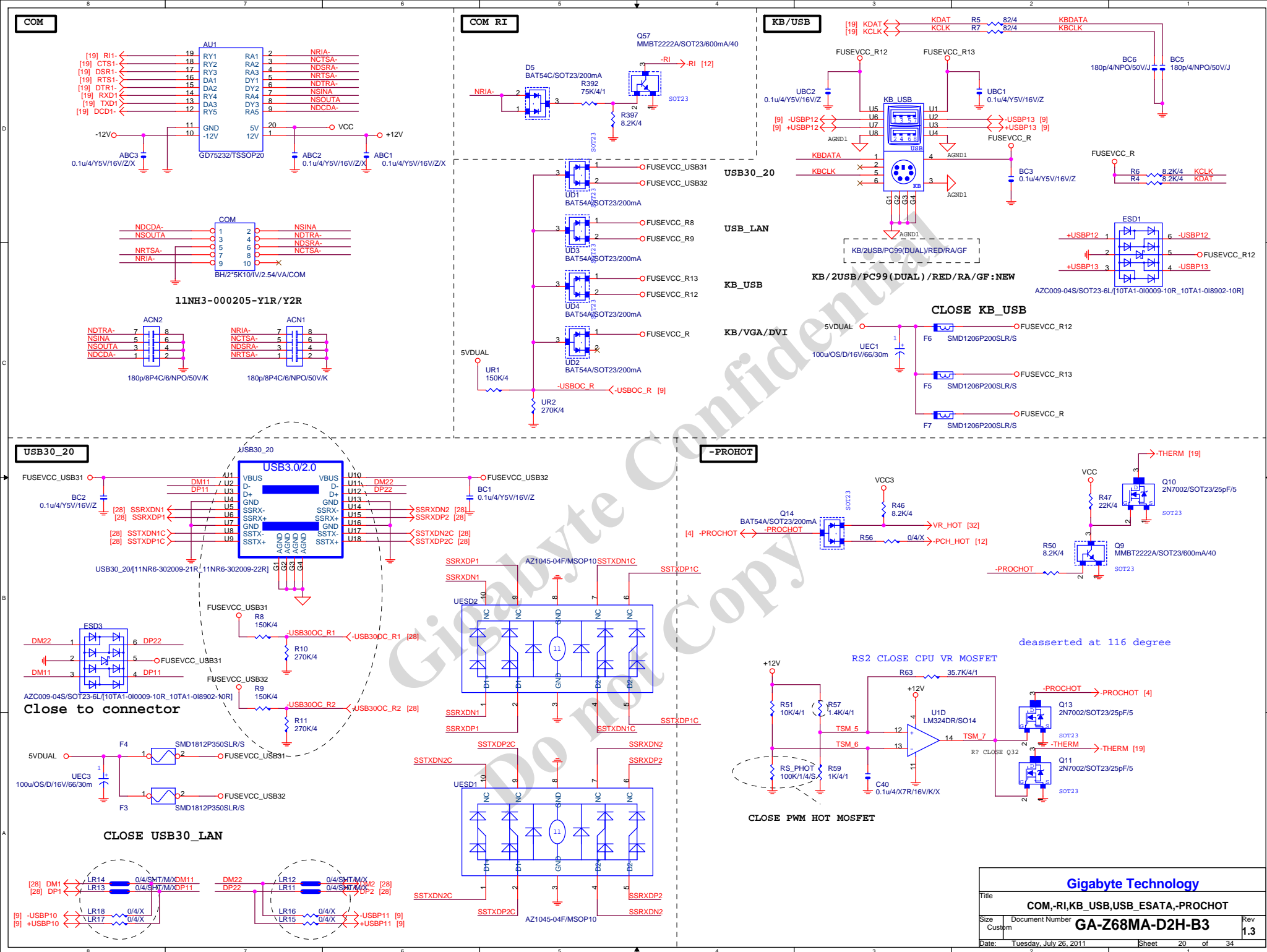
PCIEX*1



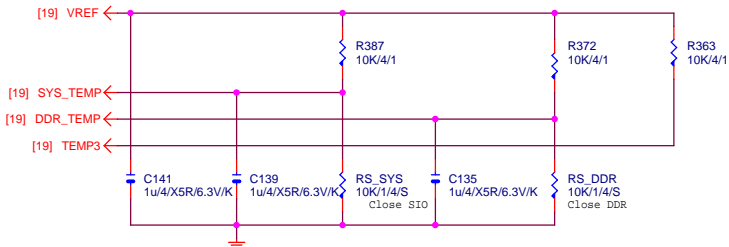
CLK GEN CK505

Gigabyte Technology		
Title		
PCIEX1		
Size	Document Number	Rev
Custom	GA-Z68MA-D2H-B3	1.3
Date: Tuesday, July 26, 2011		Sheet 18 of 34
2		1

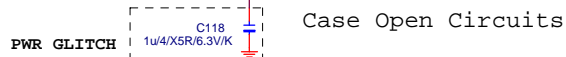




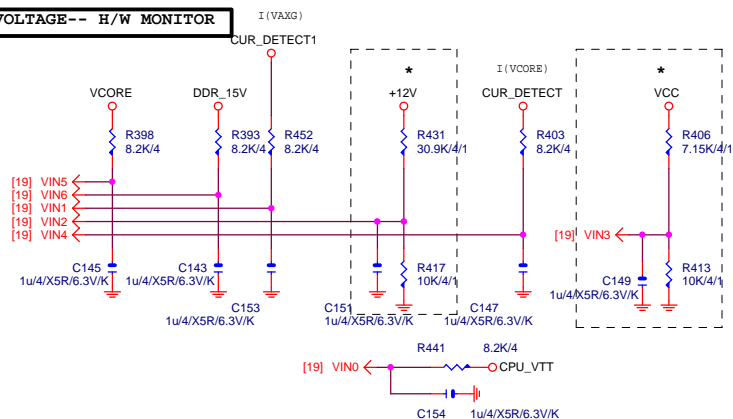
TEMP H/W MONITOR



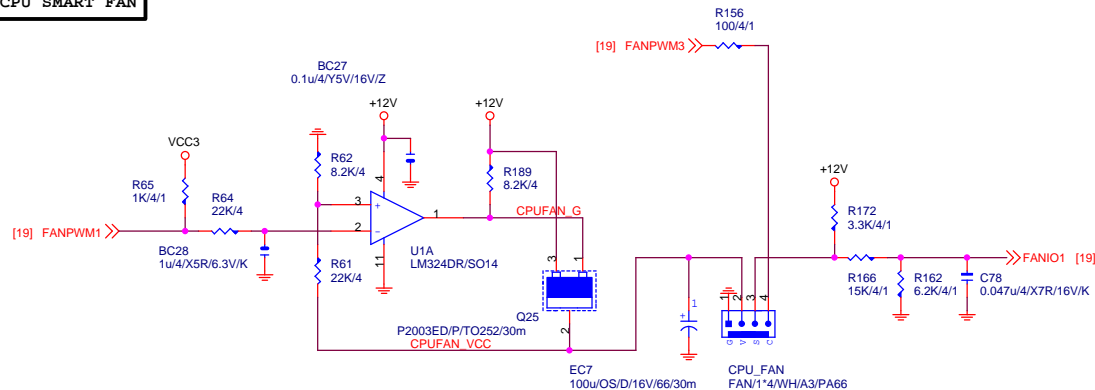
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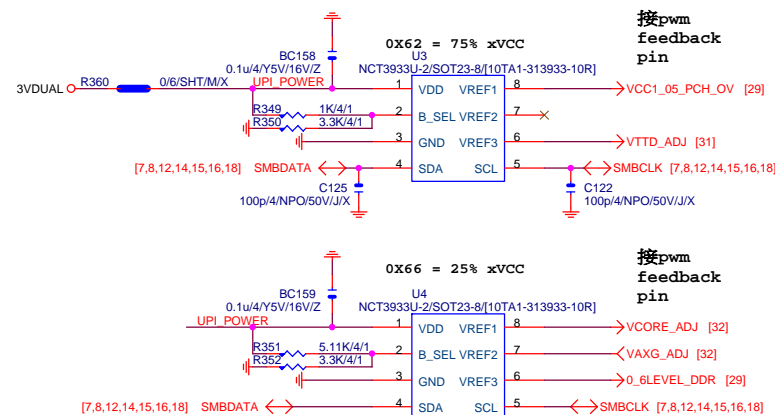
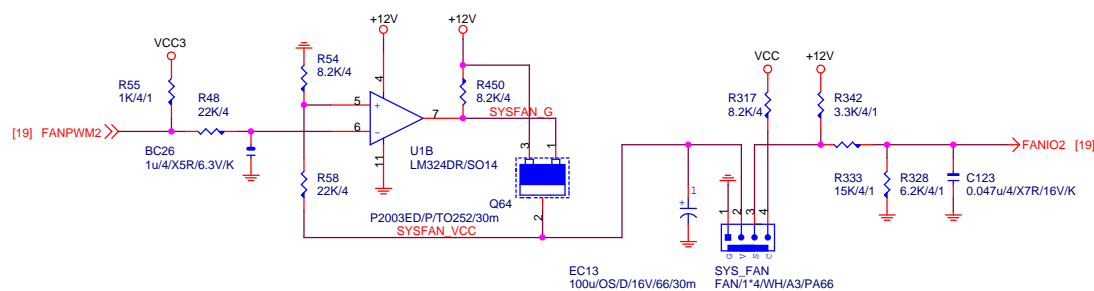
VOLTAGE-- H/W MONITOR



CPU SMART FAN



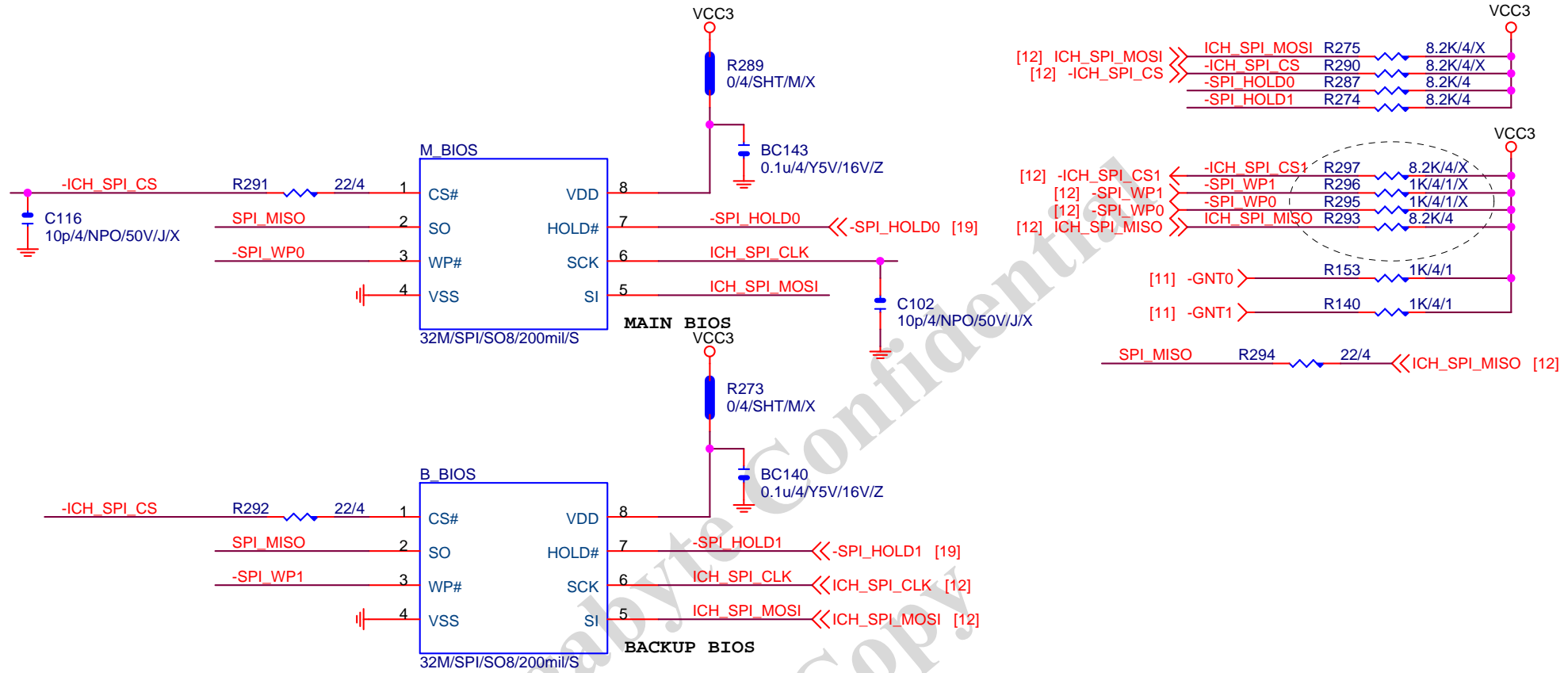
SYS SMART FAN



Gigabyte Technology

Title			HWM,FAN CTRL,OV
Size			Custom
Document Number			GA-Z68MA-D2H-B3
Date:			Tuesday, July 26, 2011
Sheet			21 of 34
Rev			1.3

DUAL BIOS



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

1 means floating
0 means PD 1K

Gigabyte Technology

DUAL BIOS

Title

Size
A

Document Number

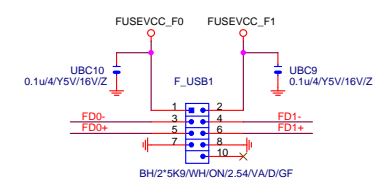
GA-Z68MA-D2H-B3

Rev
1.3

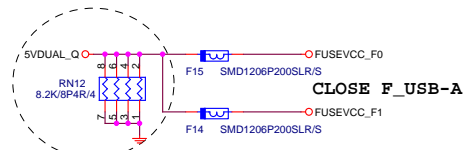
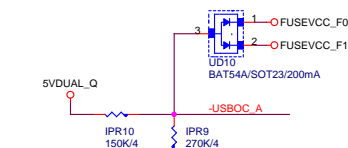
Date: Tuesday, July 26, 2011

Sheet 22 of 34

FRONT USB1

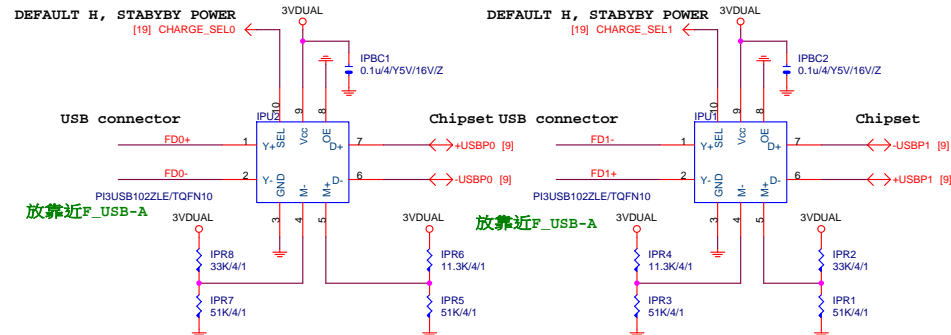


WHITE COLOR



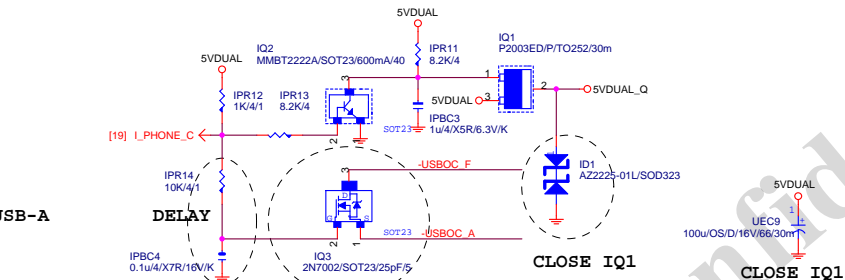
i_phone charger circuit

DEFAULT H, STABYBY POWER
[19] CHARGE_SEL0



放靠近F_USB-A

放靠近F_USB-A

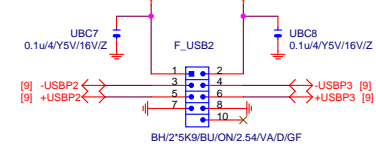


[19] I_PHONE_C ←

CLOSE IQ1

CLOSE IO1

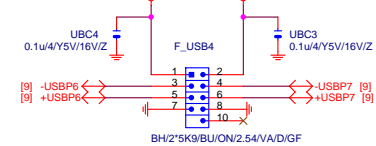
FRONT USB2



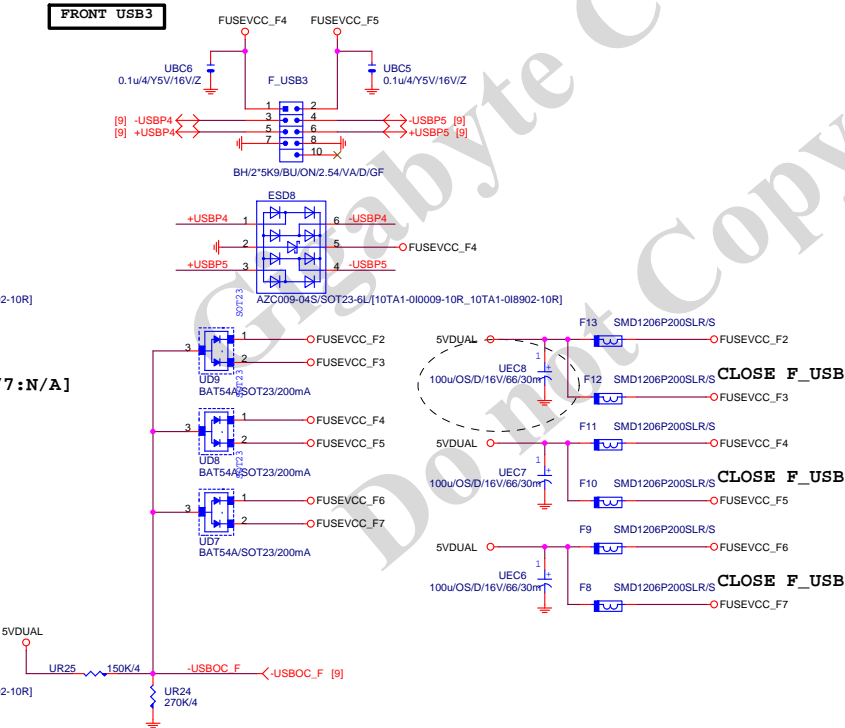
Close to connector

FRONT USB4

因B65[6/7:N/A]



Close to connector



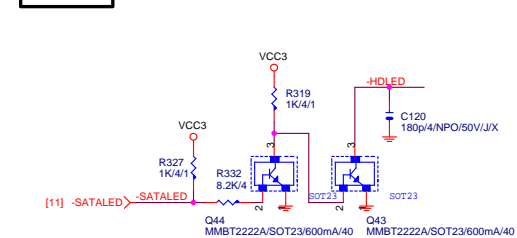
[9] -USBP4 ↔

8 30m E12 SMD

```
close F_USB3
```

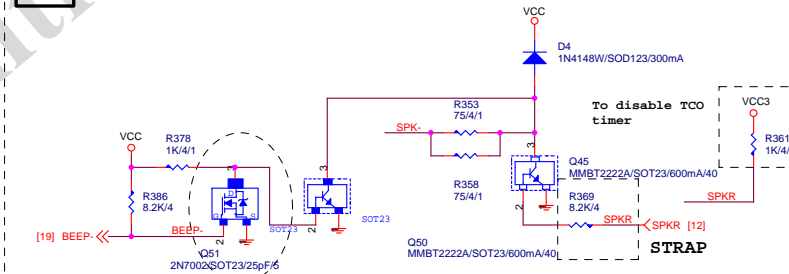
FR SMD1206R200SI R/S CLOSE F_USB4

SATA LED



[11] -SATALED

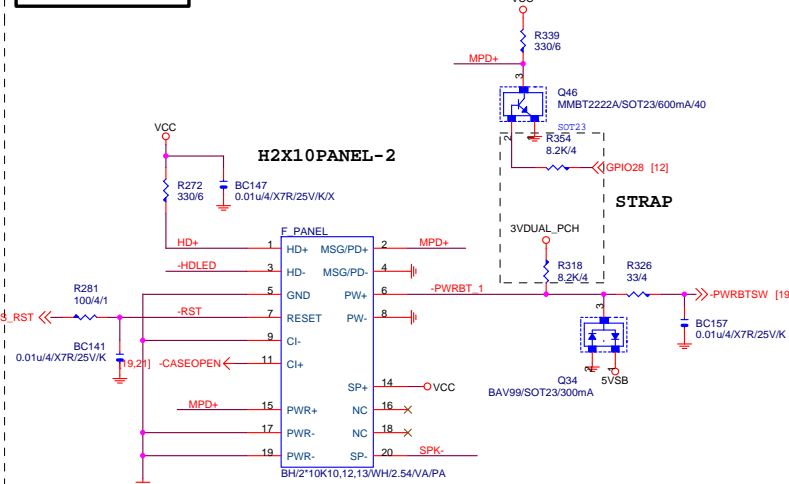
SPKR



[19] BEEP- \llcorner

STRAP

INTEL FRONT PANEL



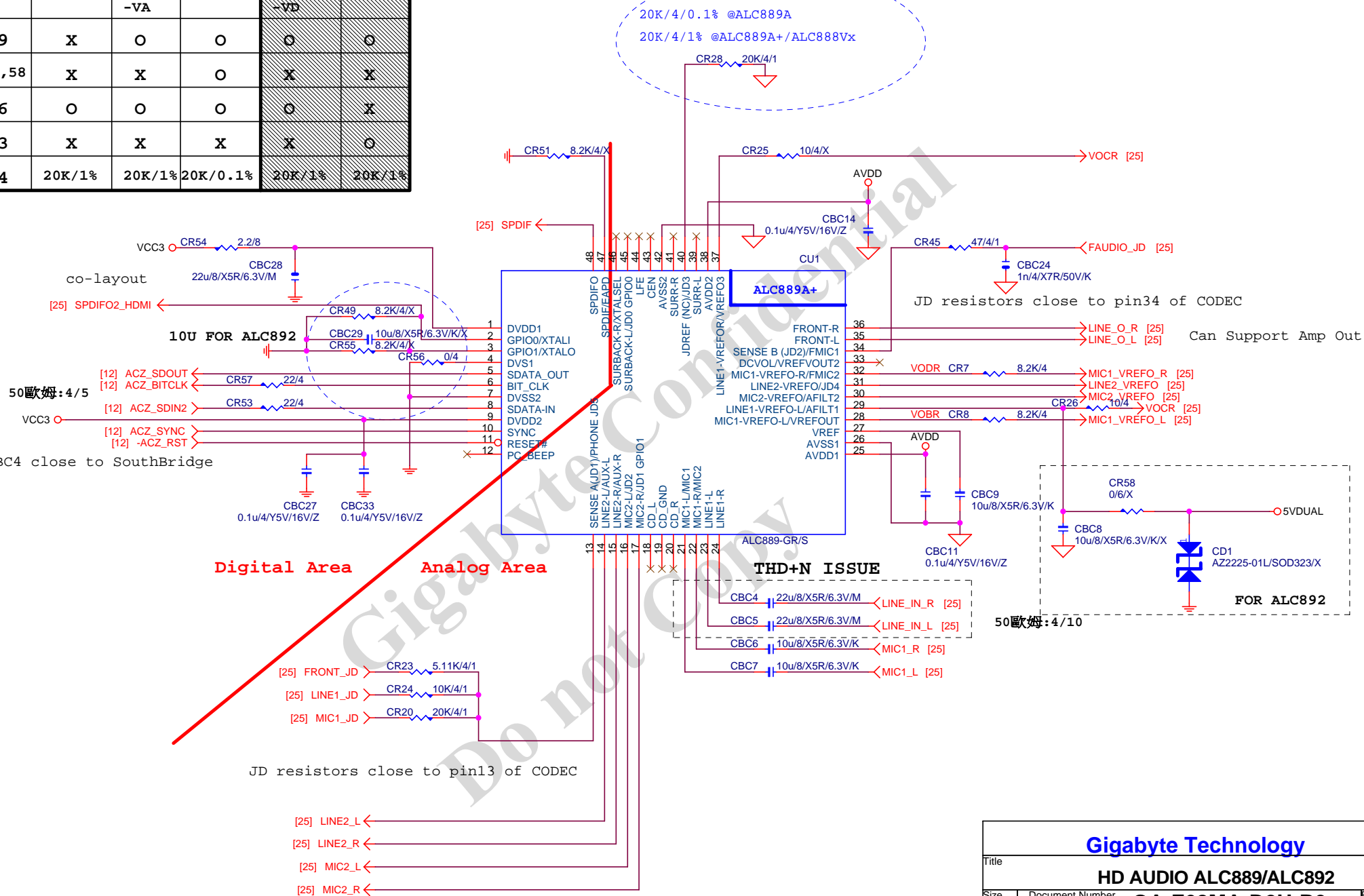
H2X10PANEL-2

STRAP

Gigabyte Technology

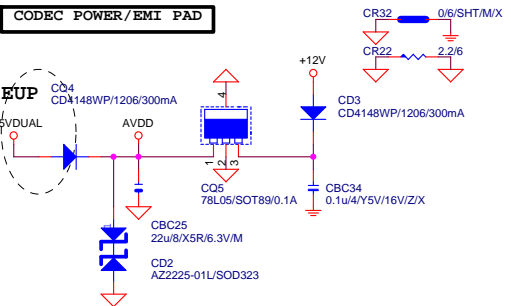
Title			
FP,F_USB,USB PWR,SPKR,SATA LED			
Size	Document Number	Rev	
Custom	GA-Z68MA-D2H-B3	1.3	
Date:	Tuesday, July 26, 2011	Sheet	23 of 34

	ALC888B	ALC888 -VA	ALC889A	ALC888 -VD	ALC892
CR59	X	O	O	O	O
CR53,58	X	X	O	X	X
CR56	O	O	O	O	X
CR63	X	X	X	X	O
CR34	20K/1%	20K/1%	20K/0.1%	20K/1%	20K/1%

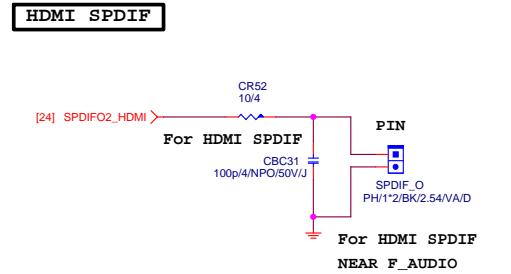


Can Support Amp Out

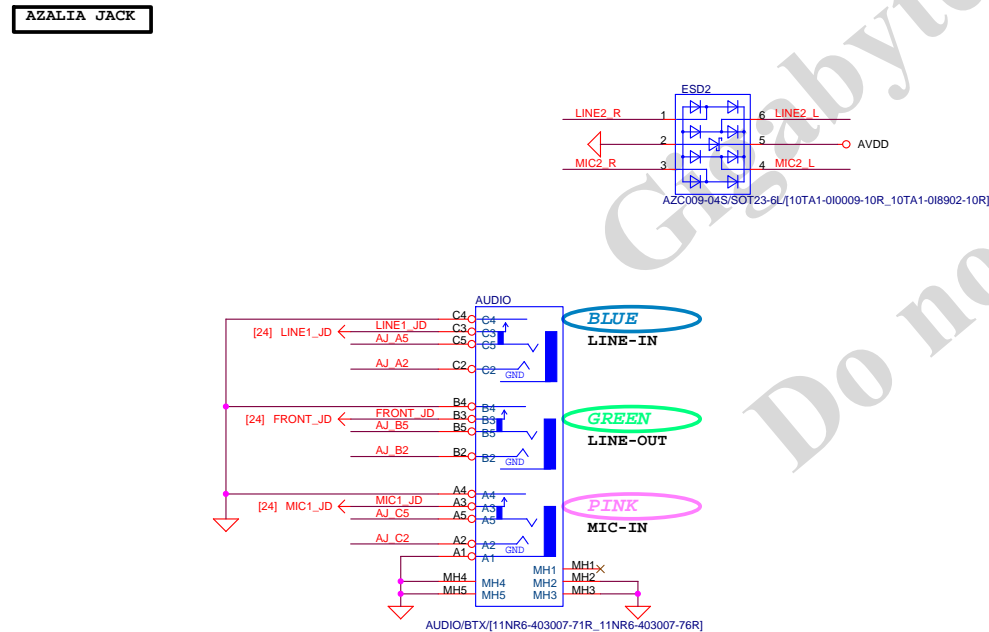
CODEC POWER/EMI PAD



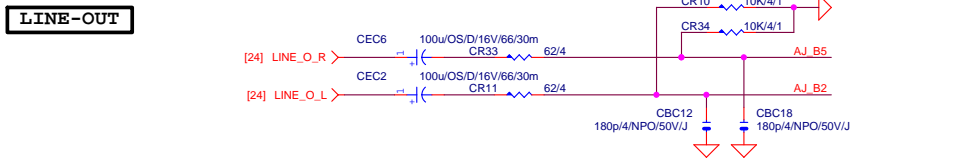
HDMI SPDIF

**SPDIF_IN**

AZALIA JACK

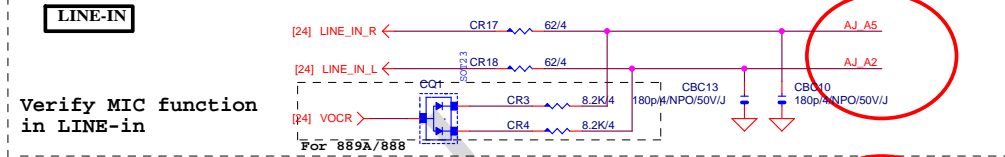


LINE-OUT

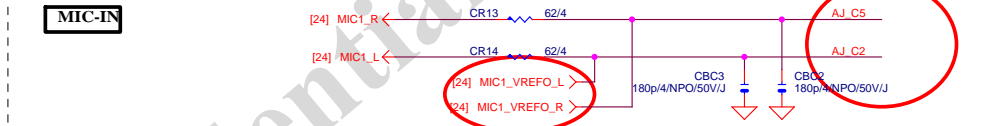
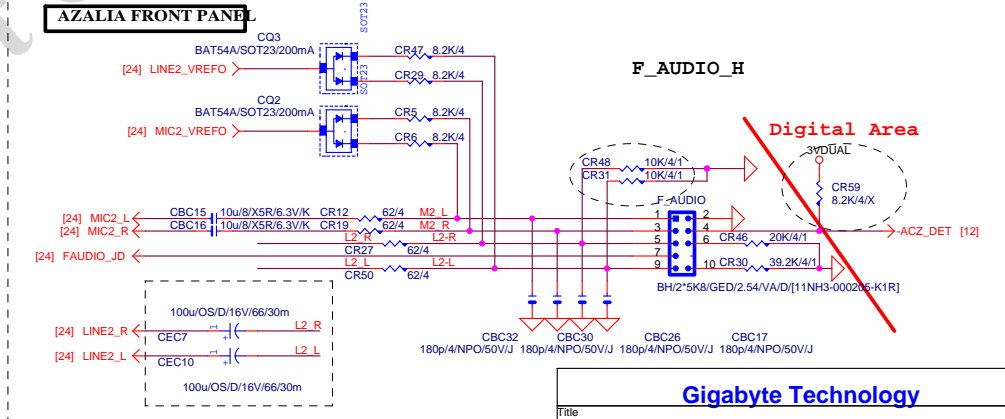


LINE-IN

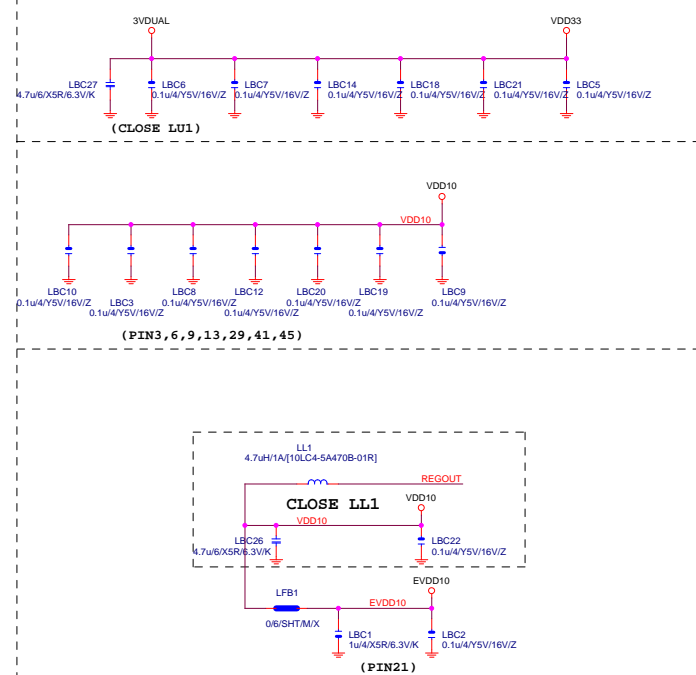
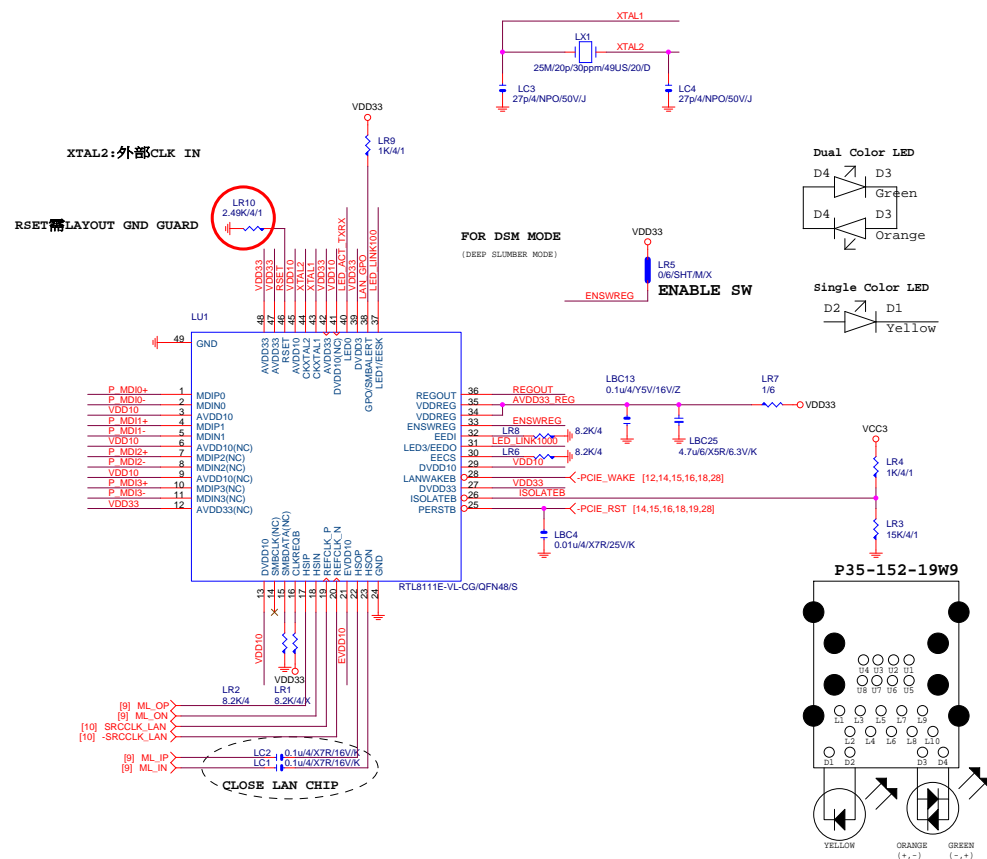
```
Verify MIC function
in LINE-in
```



MIC-IN

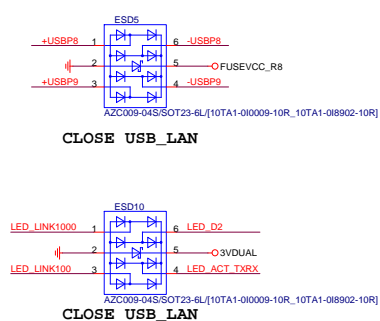
**AZALIA FRONT PANEL**

PCIE-1G LAN



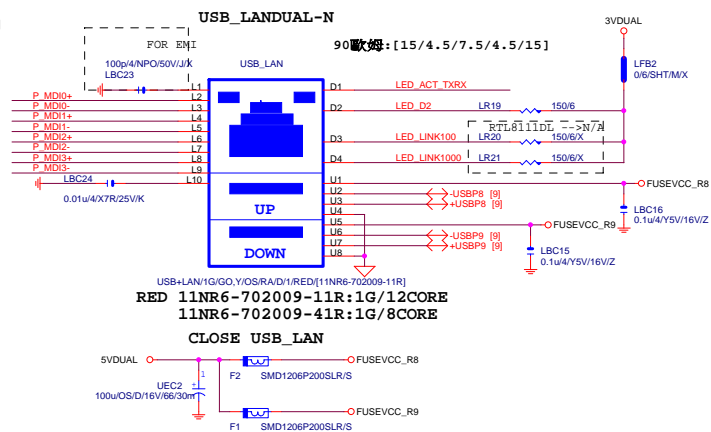
USB_LAN CONNECTOR

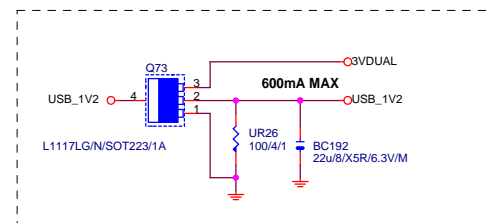
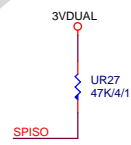
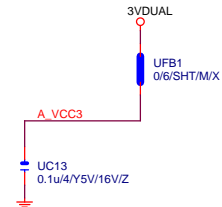
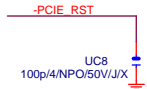
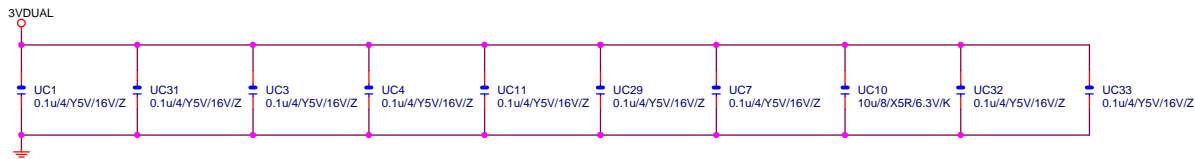
90歐姆:[20/4/8/4/20]



USB LANDUAL-N

90 歐姆:[15/4.5/7.5/4.5/15]

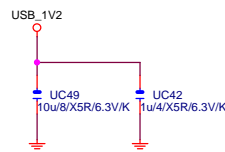
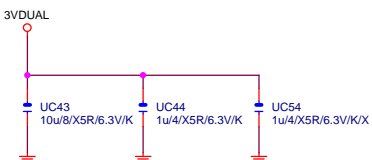
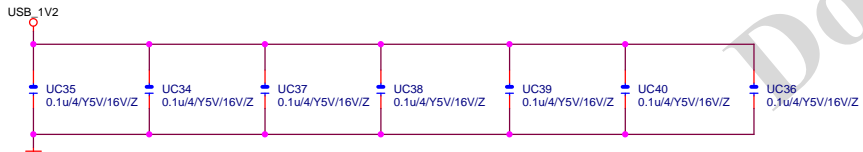




Max Power=2.2V x 0.15A=0.33Watt

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

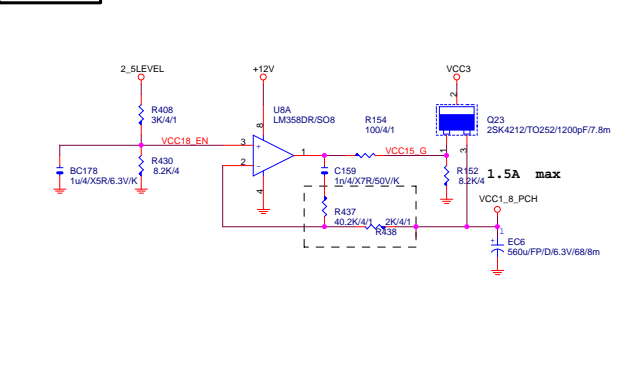
L1117LG/N/SOT223/1A-->UR17:0/4 ,UR16:100/4/1 [1.25V]



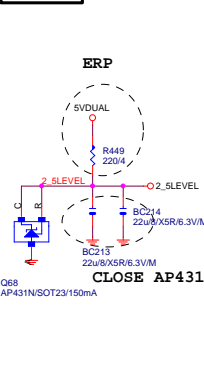
GIGABYTE™

Title			
USB3.0 EJ168			
Size	Document Number	Rev	
Custom	GA-Z68MA-D2H-B3	1.3	
Date:	Tuesday, July 26, 2011	Sheet	28 of 34

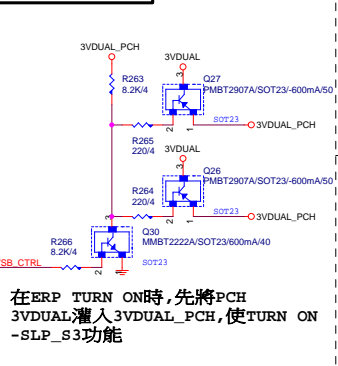
VCC1_8_PCH



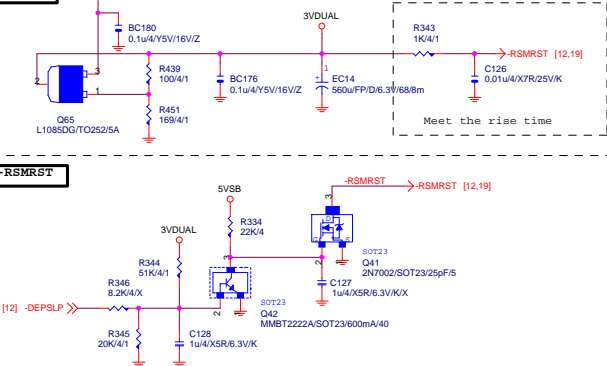
2_5LEVEL



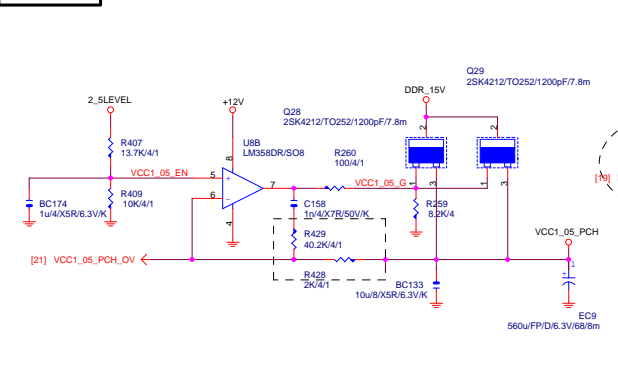
FIX ERP 5VSB DROP



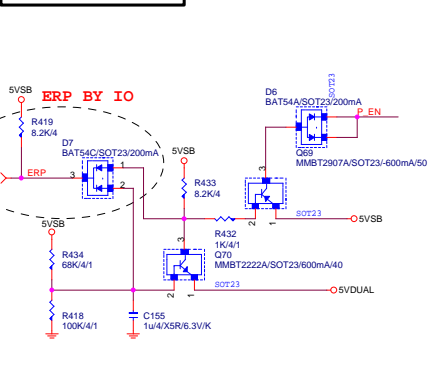
3VDUAL



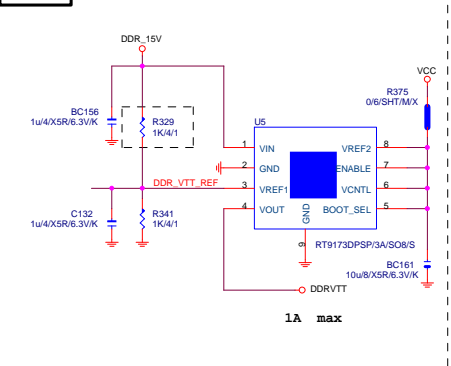
VCC1_05_PCH



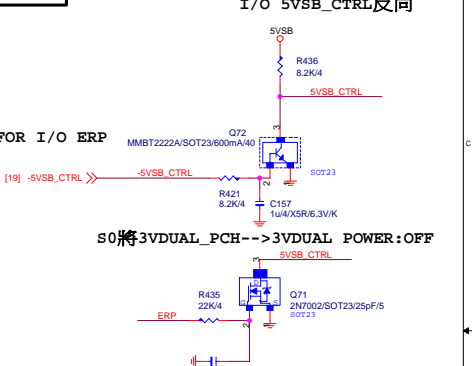
5VDUAL SHORT PROTECT



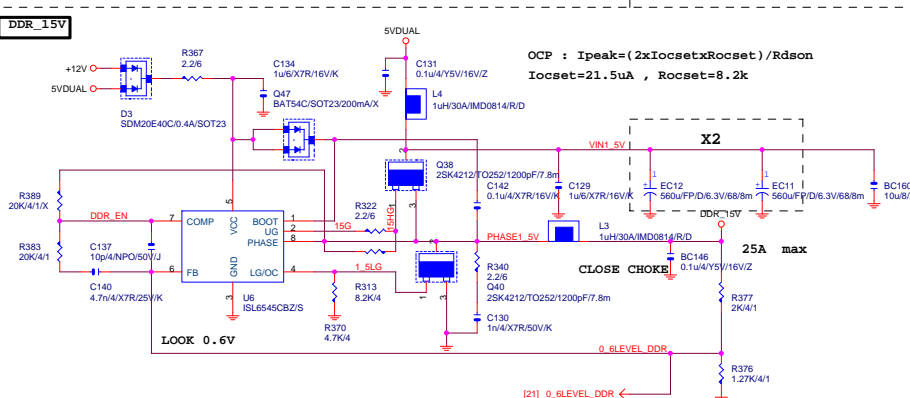
DDR_VTT



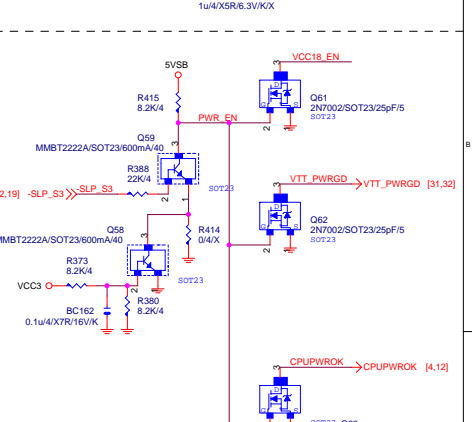
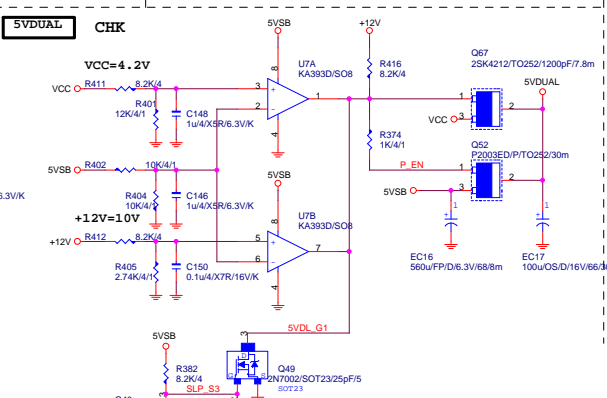
PWR_SEQ



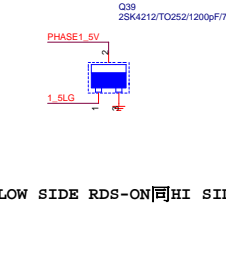
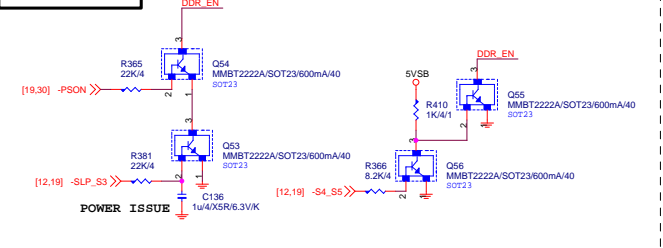
DDR_15V



5VDUAL_CHK

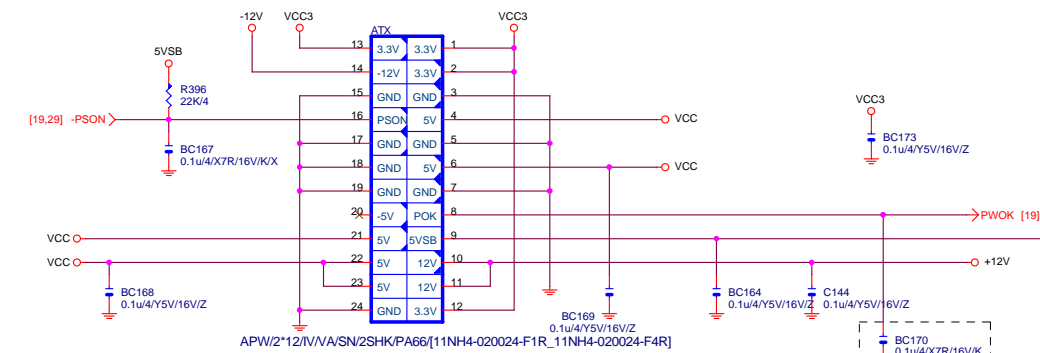


DDR_15V_PWR_SEQ

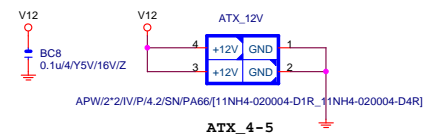


LOW SIDE RDS-ON同HI SIDE, 否則太低, ISL6545過燙

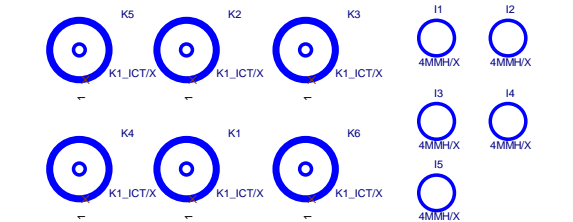
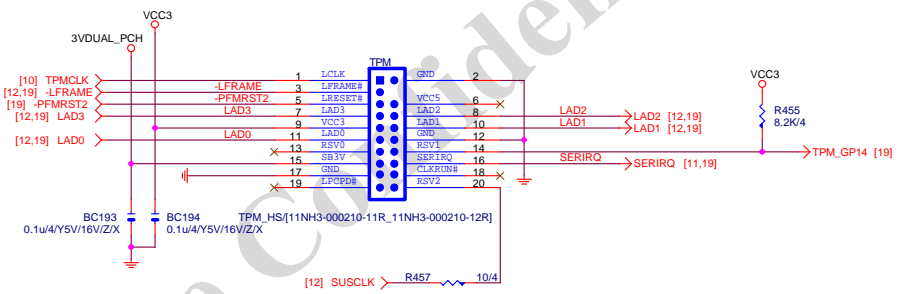
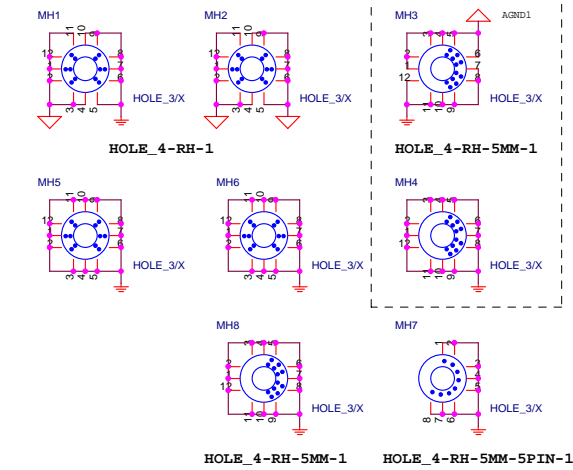
ATXX24 POWER CONNECTOR



ATXX4 POWER CONNECTOR

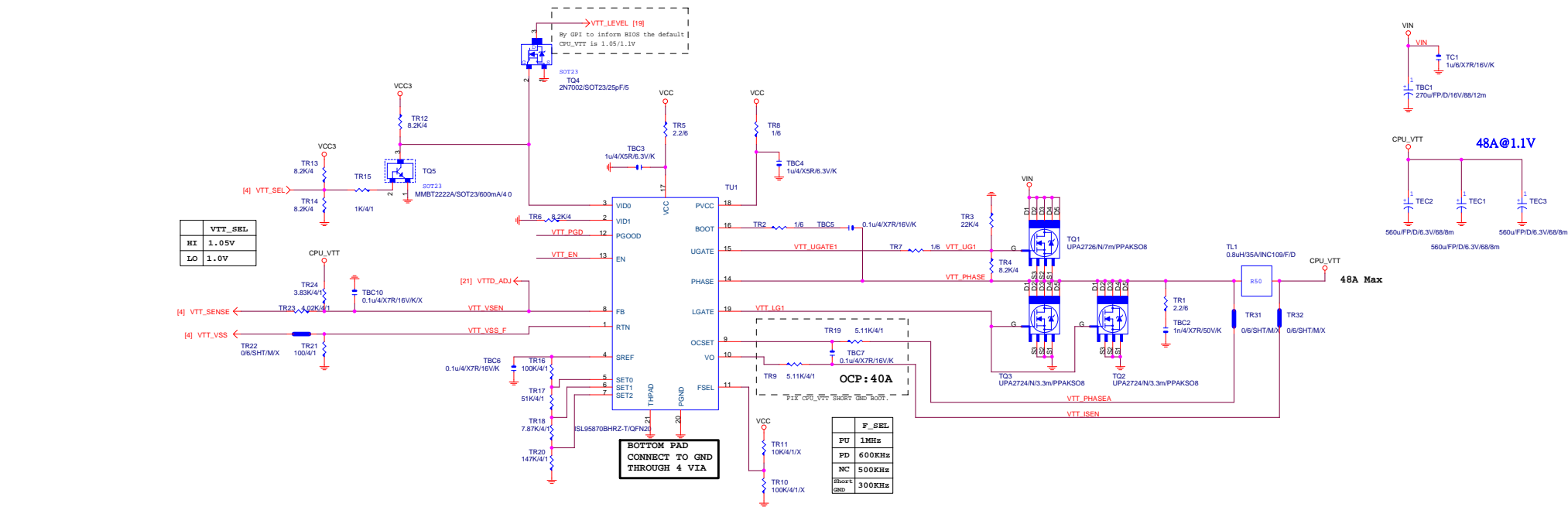


TPM



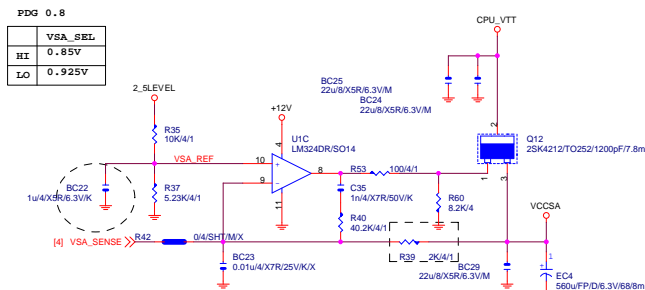
To prevent the 5VSB under loading when boot

CPU_VTT

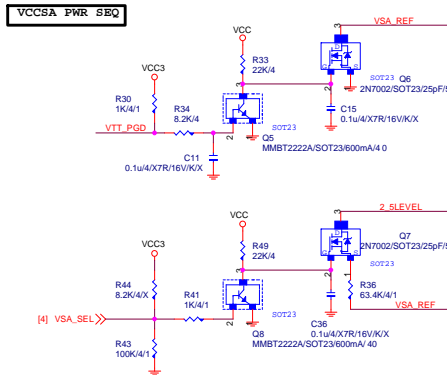


VCCSA

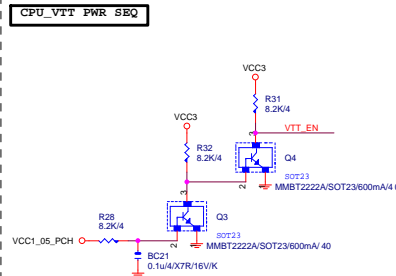
	VSA_SEL
HI	0.85V
LO	0.925V



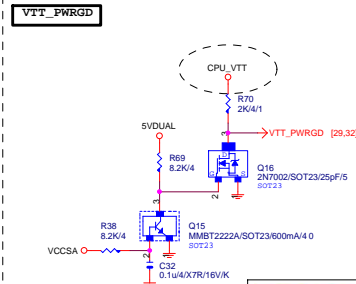
VCCSA	PWR	SEQ
-------	-----	-----



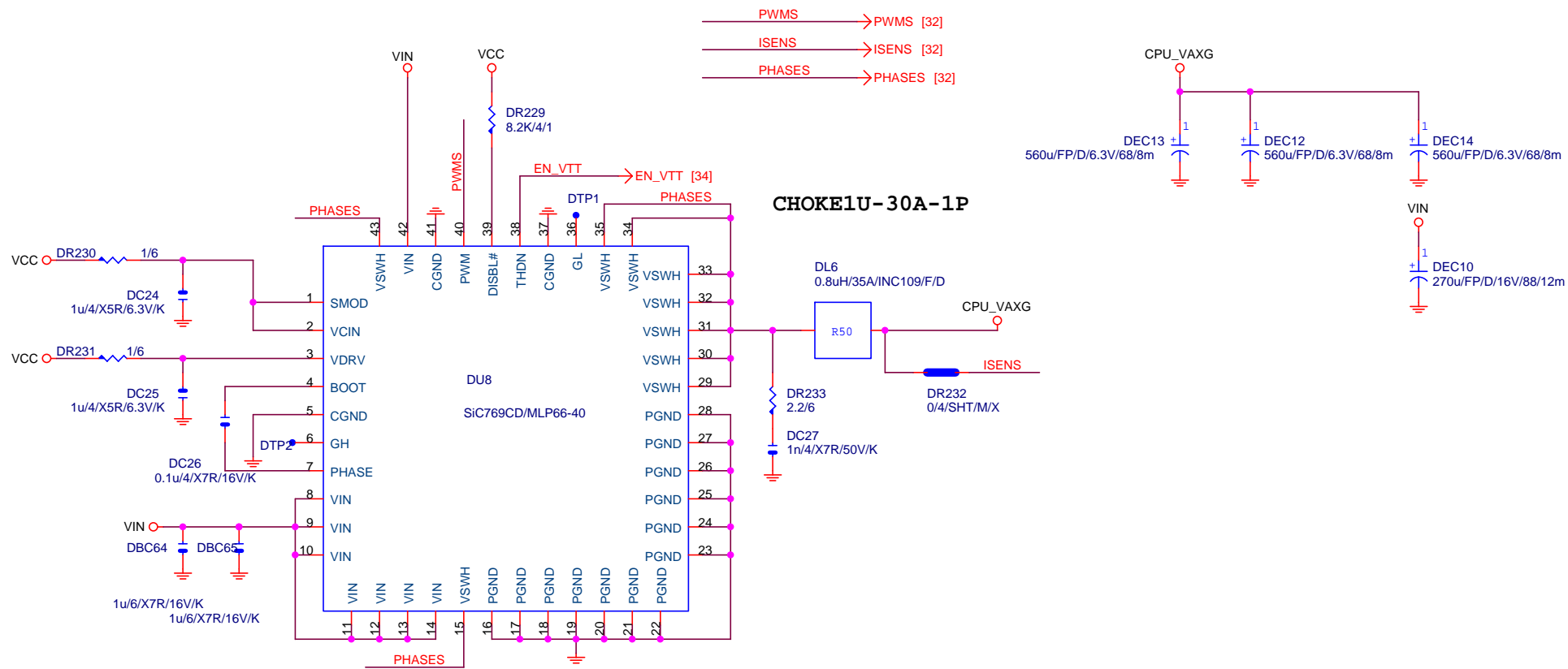
CPU_VTT	PWR	SEQ
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0	0	8
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0	0	11
0	0	12
0	0	13
0	0	14
0	0	15
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VTT_PWRGD

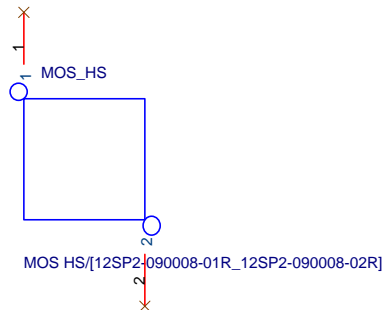


VAXG



MOS HEATSINK

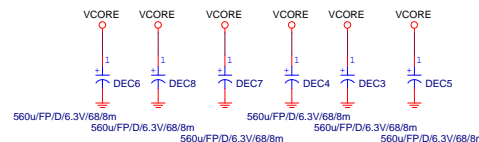
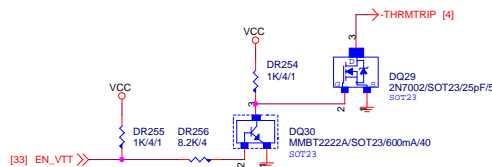
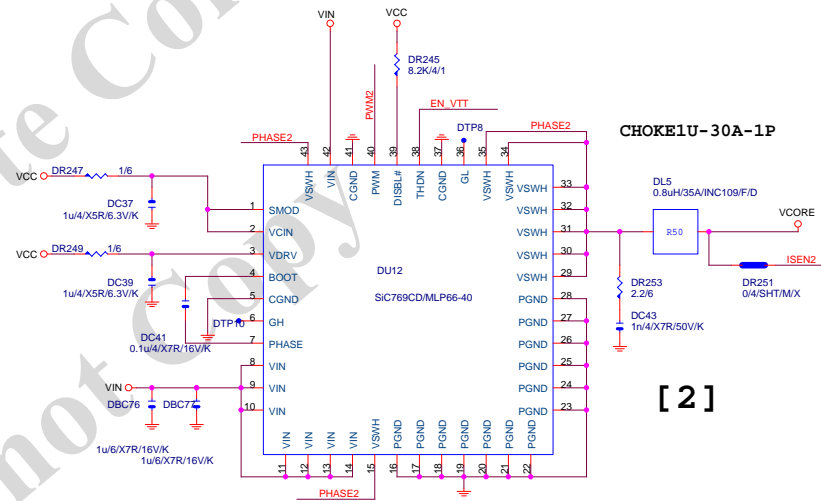
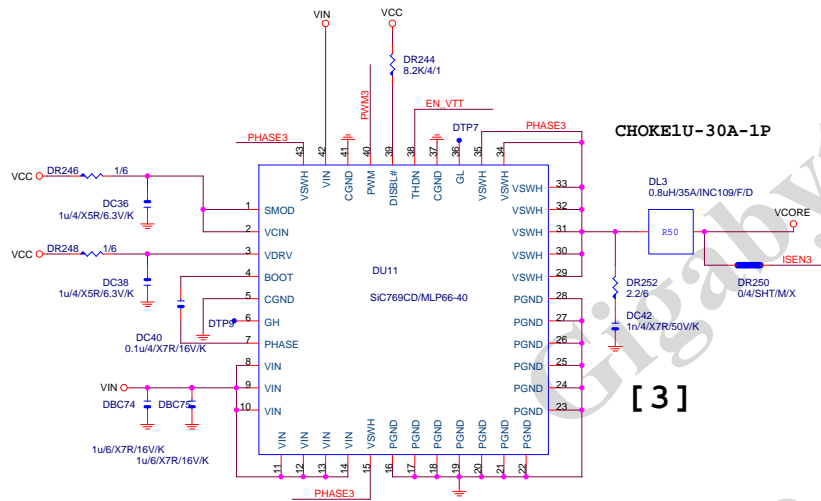
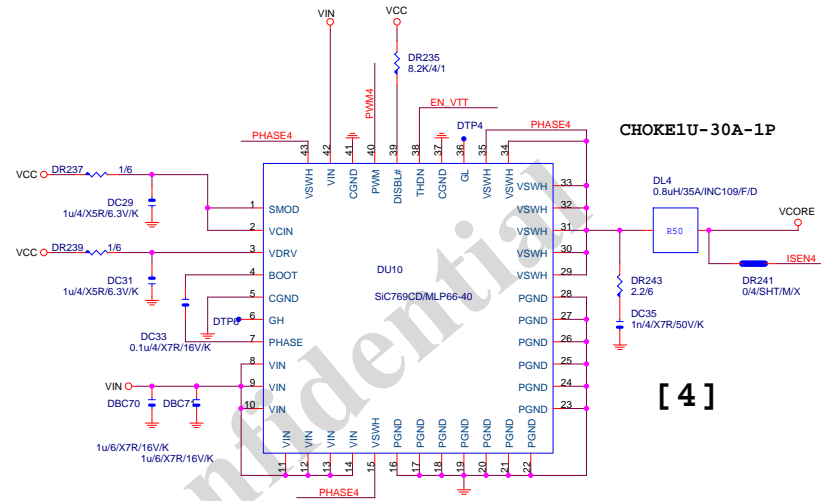
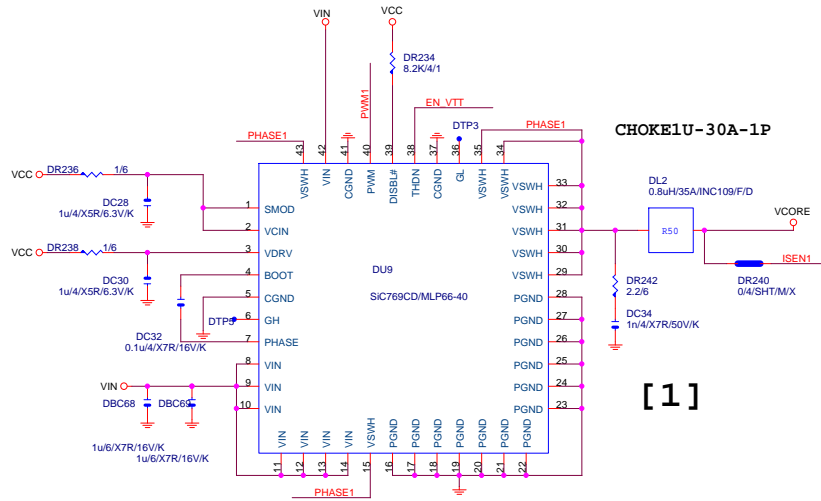
MOSHSINK-P67A-D3



PWM1 → PWM1 [32]
 PWM2 → PWM2 [32]
 PWM3 → PWM3 [32]
 PWM4 → PWM4 [32]

ISEN1 → ISEN1 [32]
 ISEN2 → ISEN2 [32]
 ISEN3 → ISEN3 [32]
 ISEN4 → ISEN4 [32]

PHASE1 → PHASE1 [32]
 PHASE2 → PHASE2 [32]
 PHASE3 → PHASE3 [32]
 PHASE4 → PHASE4 [32]



Gigabyte Technology			
File			
CPU CORE VR-3			
Size	Document Number	GA-Z68MA-D2H-B3	
Custom		Rev 1.3	
Date:	Tuesday, July 26, 2011	Sheet	34 of 34