

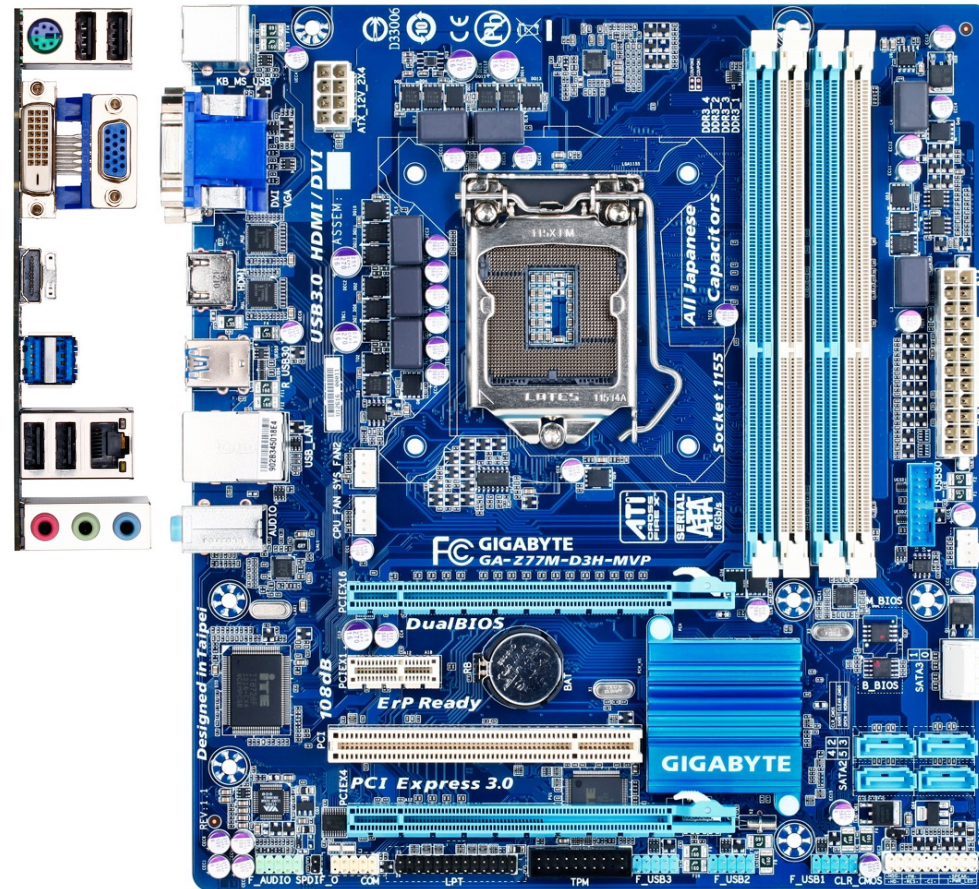
# Model Name: GA-Z77M-D3H-MVP

SHEET TITLE Revision 1.1

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,CLK BUFFER
11	PCH_HOST,SATA,PCI
12	PCH_GPIO,CTRL,AUDIO
13	PCH_PWR,GND
14	PCI EXPRESS*16 SLOT
15	PCI EXPRESS*1 SLOT
16	PCI EXPRESS*4 SLOT
17	PCI SLOT1
18	ITE 8728 LPC IO
19	COM,KB USB,R_USB30
20	HWM,FAN CTRL,OV,-PROCHOT
21	DUAL BIOS
22	FP,FUSB,SPK,SATALED
23	VIA VT2021
24	REAR AUDIO JACK
25	ARTHEROS AR8161/AR8151
26	DISCRETE POWER
27	ATX,CLK GEN

SHEET TITLE

28	RT8120_CPU_VTT
29	VCORE ISL95836_1
30	VCORE ISL95836_2
31	RT8120_DDR POWER
32	LPT,TPM
33	HDMI/DVI
34	IT8892E



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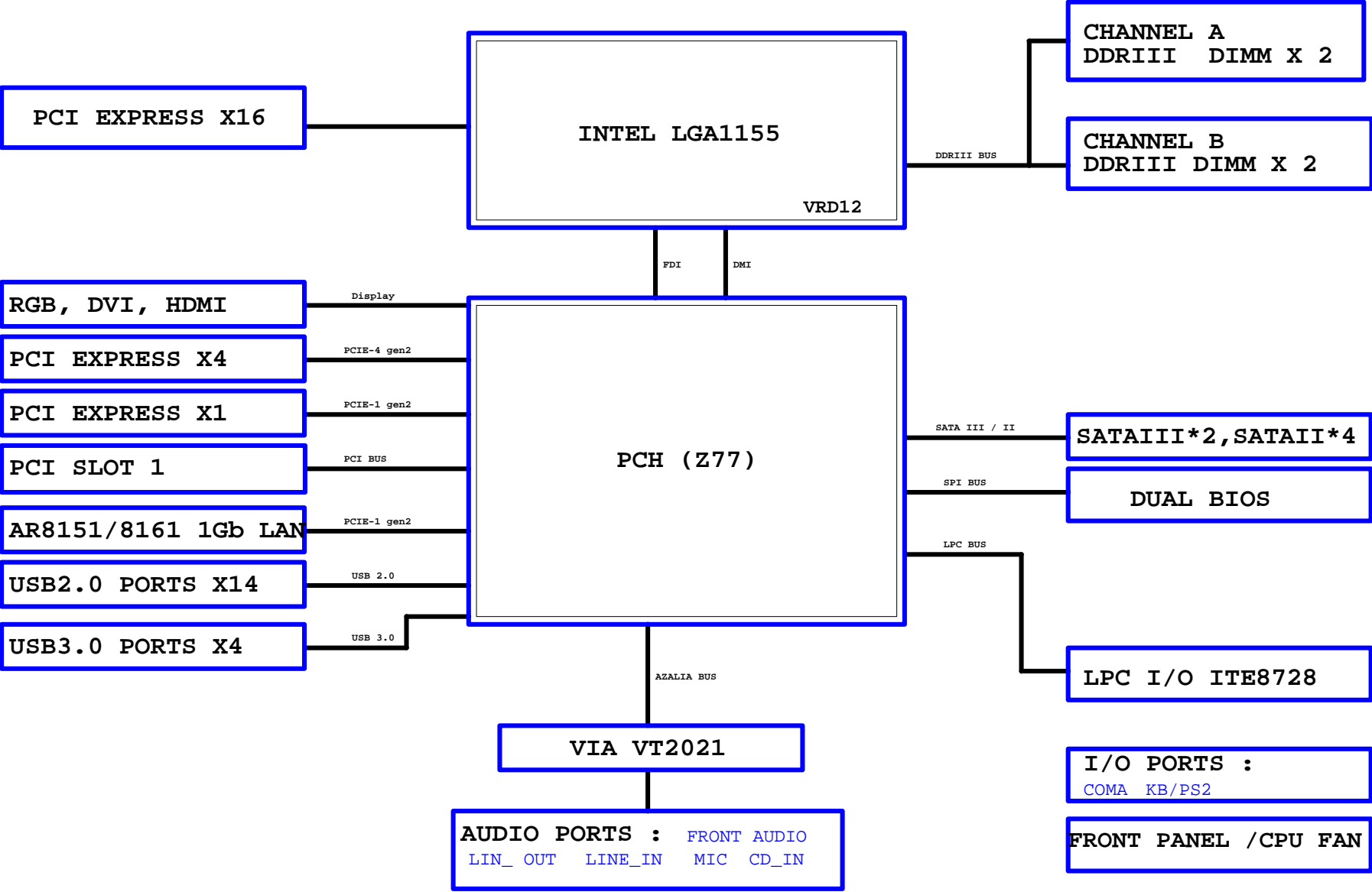
Title		Cover Sheet	
Size	Custom	Document Number	GA-Z77M-D3H-MVP
Date	Tuesday, July 17, 2012	Rev	1.1
Sheet		1 of 34	

## Revision 1.1

### Component value change history

[illegible][illegible]

BLOCK DIAGRAM



LGA1155E



LGA1155D



(c)



SM REF
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## LGA1155A

MAAA0	AV27	SA_MA[0]	SA_DQS[0]	AK3	DQSA0
MAAA1	AY24	SA_MA[1]	SA_DQS[0]	AK2	-DQSA0
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MAAA3	AW23	SA_MA[3]			
MAAA4	AV23	SA_MA[4]	SA_DQ[0]	AJ3	MDA0
MAAA5	AT24	SA_MA[5]	SA_DQ[1]	AJ4	MDA1
MAAA6	AT23	SA_MA[6]	SA_DQ[2]	AL3	MDA2
MAAA7	AU22	SA_MA[7]	SA_DQ[3]	AL4	MDA3
MAAA8	AV22	SA_MA[8]	SA_DQ[4]	AJ2	MDA4
MAAA9	AT22	SA_MA[9]	SA_DQ[5]	AJ1	MDA5
MAAA10	AU28	SA_MA[10]	SA_DQ[6]	AL2	MDA6
MAAA11	AU21	SA_MA[11]	SA_DQ[7]	AL1	MDA7
MAAA12	AT21	SA_MA[12]			
MAAA13	AW32	SA_MA[13]	SA_DQS[1]	AP3	DQSA1
MAAA14	AU20	SA_MA[14]	SA_DQS[1]	AP2	-DQSA1
MAAA15	AT20	SA_MA[15]			
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[7] -SCASA	AV30	SA_CAS#	SA_DQ[9]	AN4	MDA9
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[7] SBAA2	SBA2	SA_BS[2]	SA_DQ[13]	AR2	MDA14
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[7] -CSA2	AW28	SA_CS#			
[7] -CSA3	AW30	SA_CS#	SA_DQS[2]	AW4	DQSA2
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[7] CKEA0	AV19	SA_CKE[0]	SA_DQ[16]	AV2	MDA16
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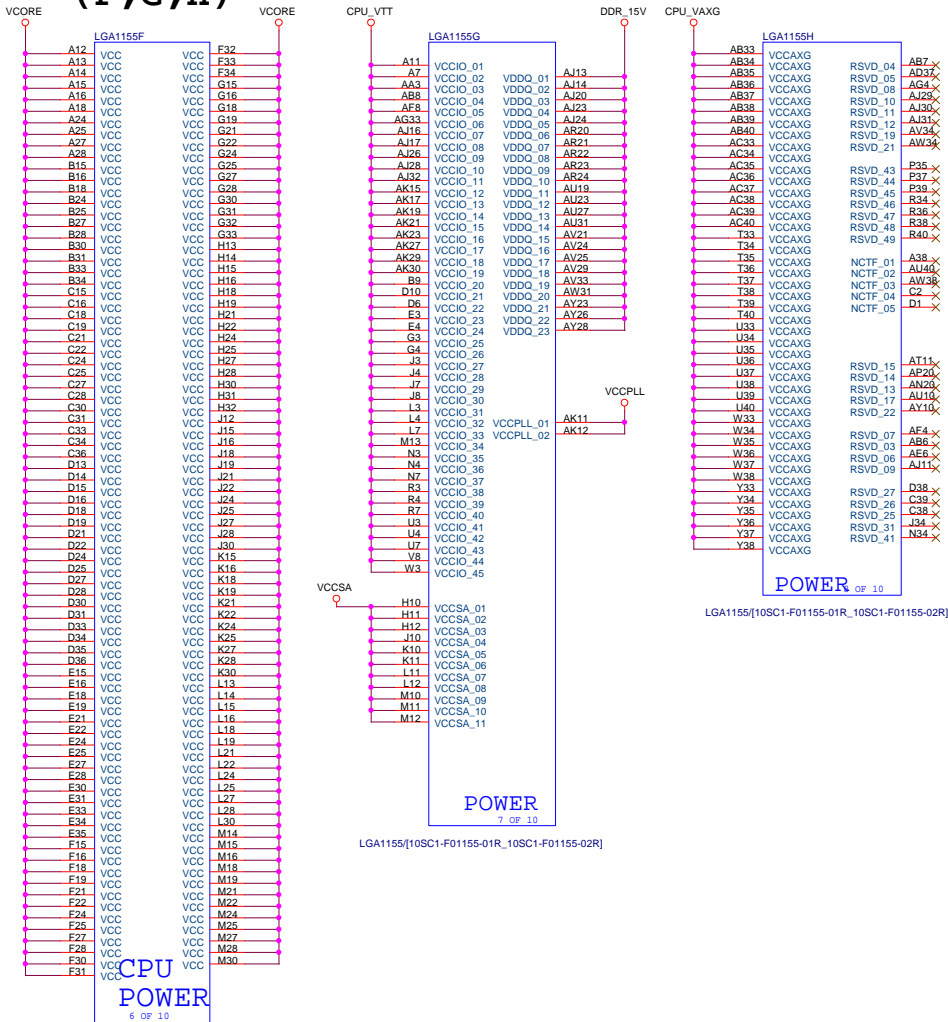
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MAAB6	AM18	SB_MA[6]	SB_DQ[2]	AJ9	MDB2
MAAB7	AL18	SB_MA[7]	SB_DQ[3]	AJ8	MDB3
MAAB8	AM18	SB_MA[8]	SB_DQ[4]	AG5	MDB4
MAAB9	AY17	SB_MA[9]	SB_DQ[5]	AG6	MDB5
MAAB10	AV23	SB_MA[10]	SB_DQ[6]	AJ6	MDB6
MAAB11	AU17	SB_MA[11]	SB_DQ[7]	AJ7	MDB7
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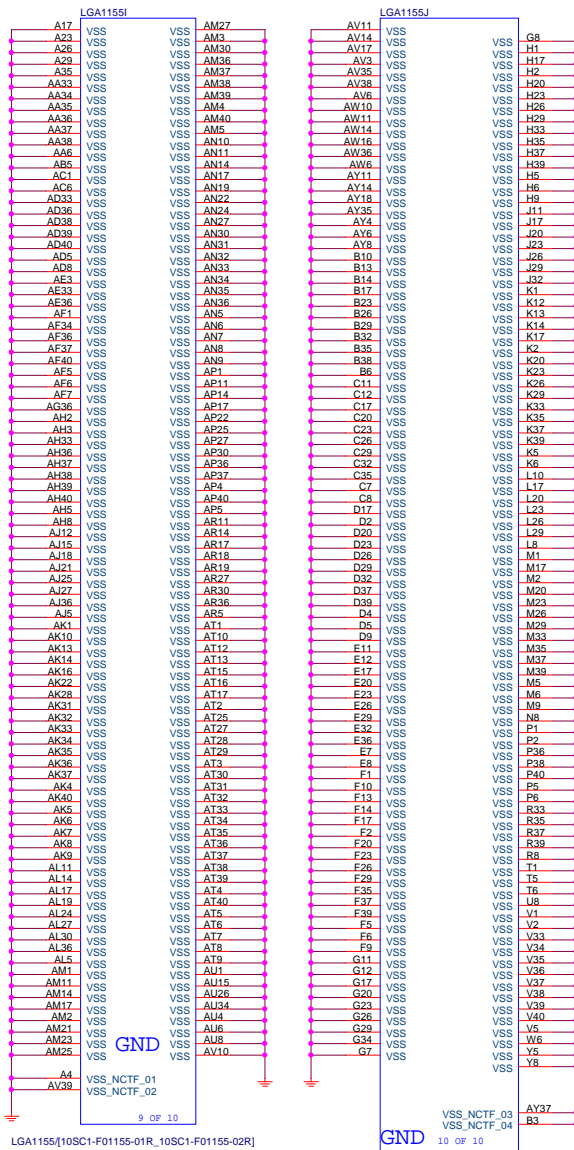
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(F, G, H)

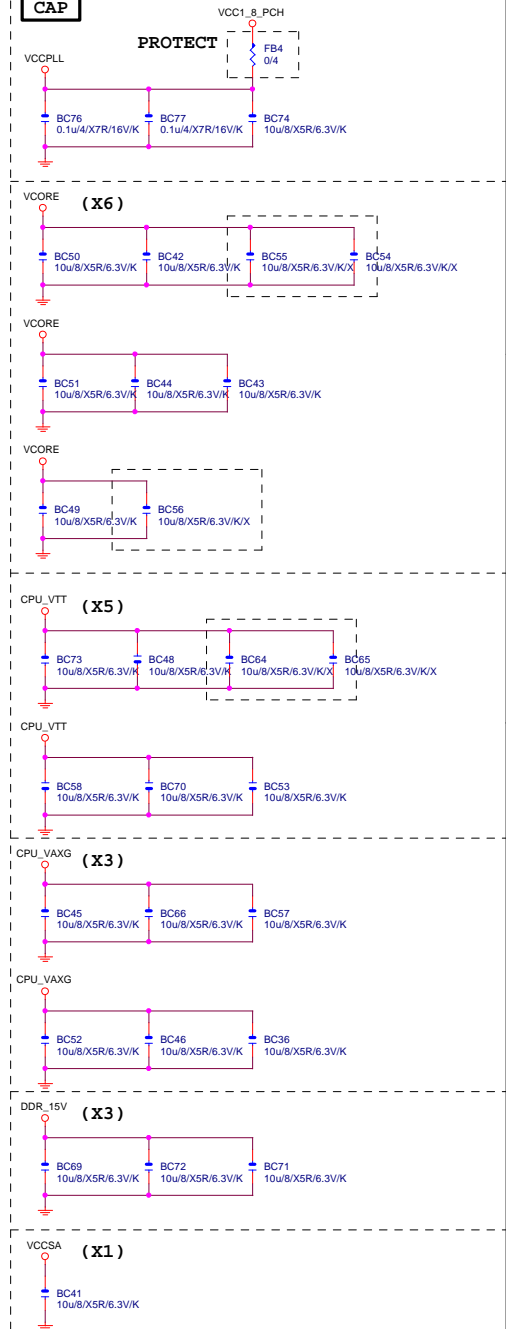


## LGA1155

(I, J)



## CAP



(A)



## DDR\_15V





**(B)**



(E)

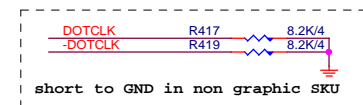
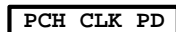


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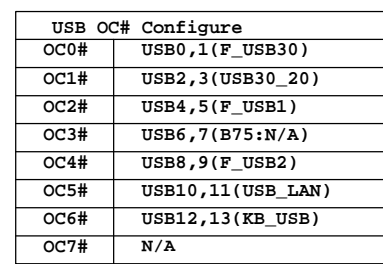
5 OF 11

BD82Z77/S/[10HB1-030Z77-10R]

**(G)**



## USB TABLE



## Gigabyte Technology

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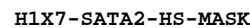
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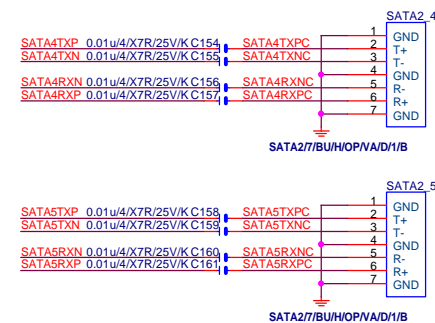
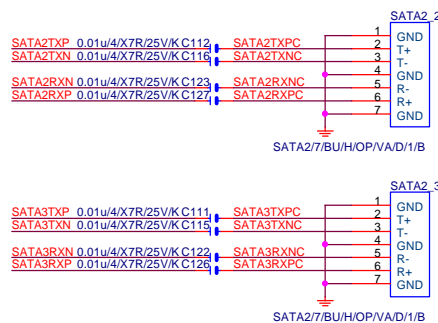
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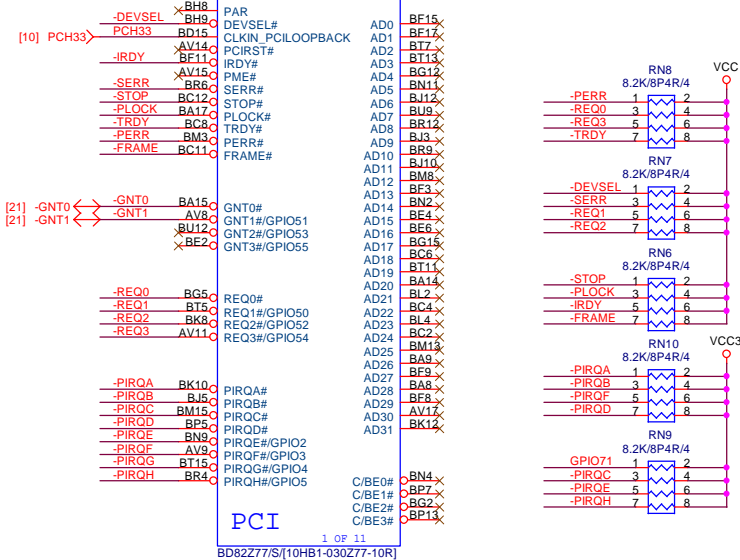
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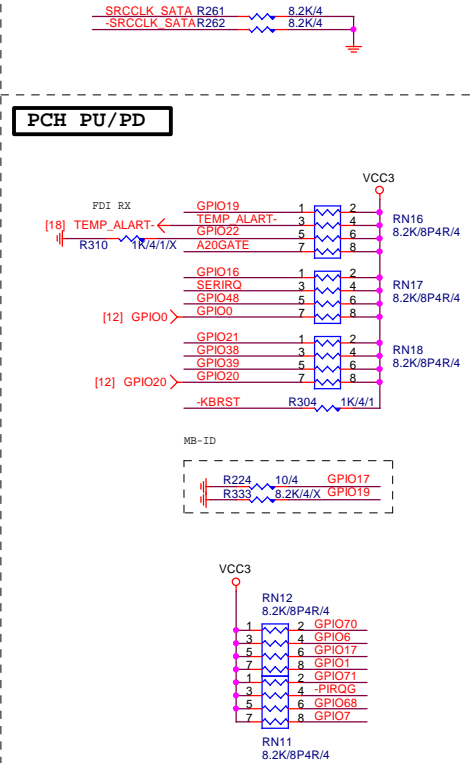


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PCHA



PCH CLK PD



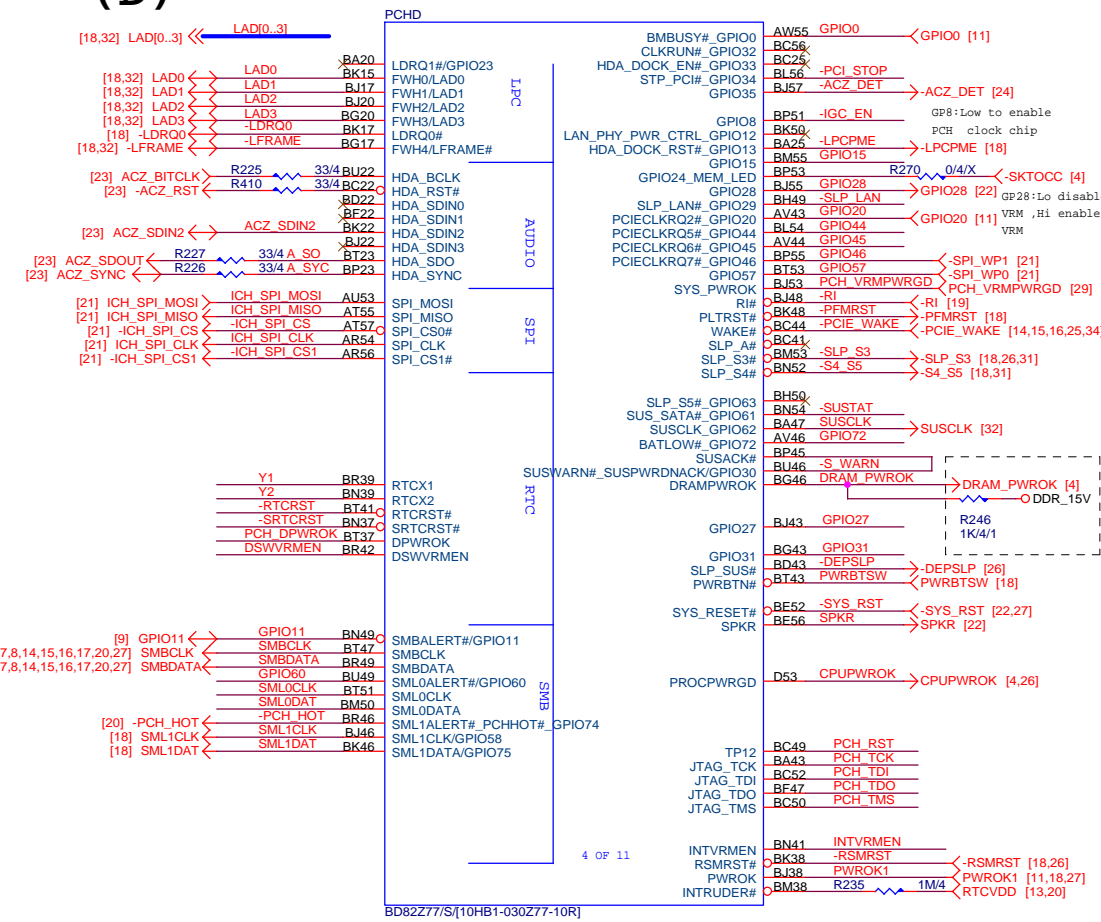
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## Gigabyte Technology

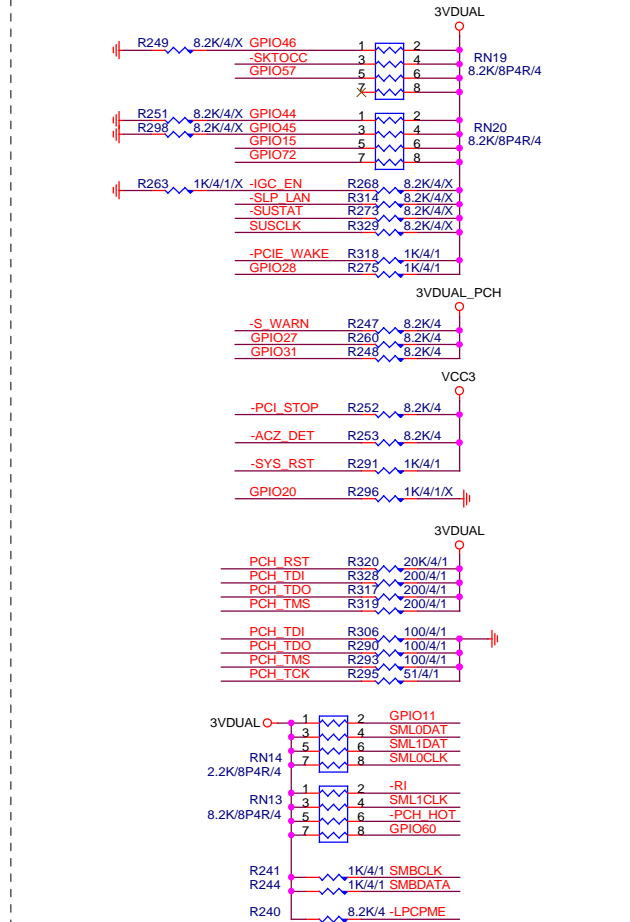
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Date:	Tuesday, July 17, 2012	Sheet	11 of 34

PCH

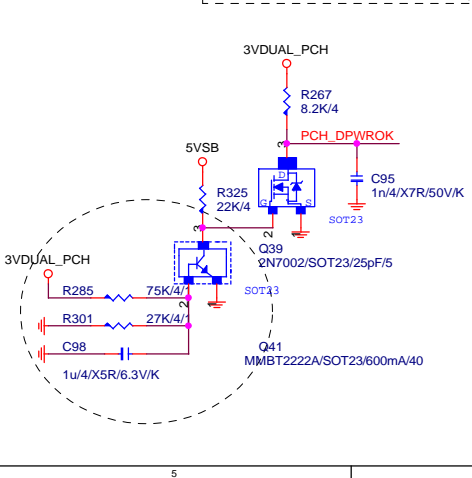
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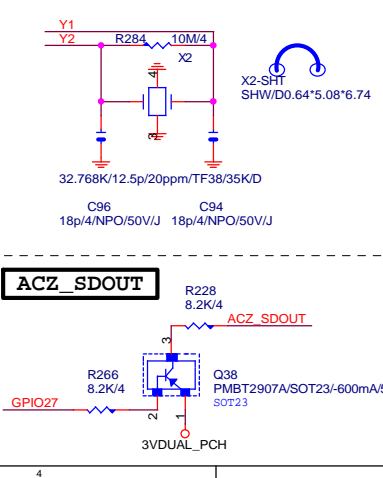
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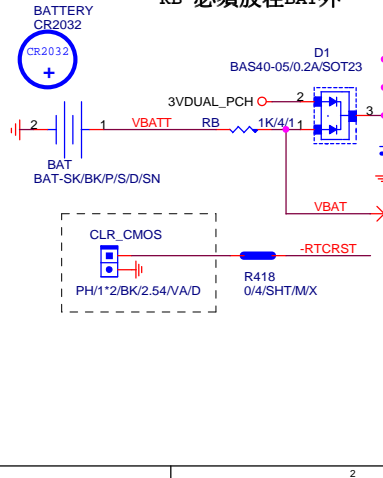
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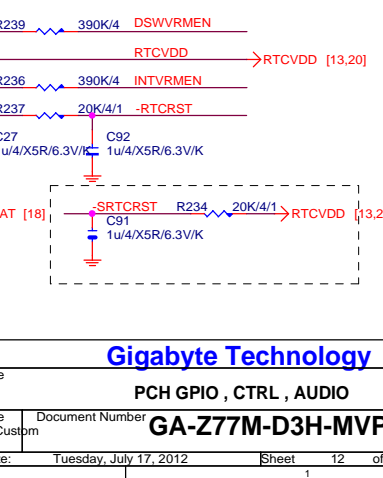
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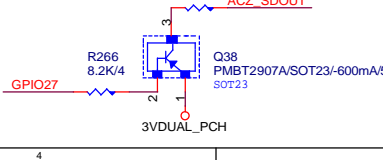
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BATTERY-DUAL-4

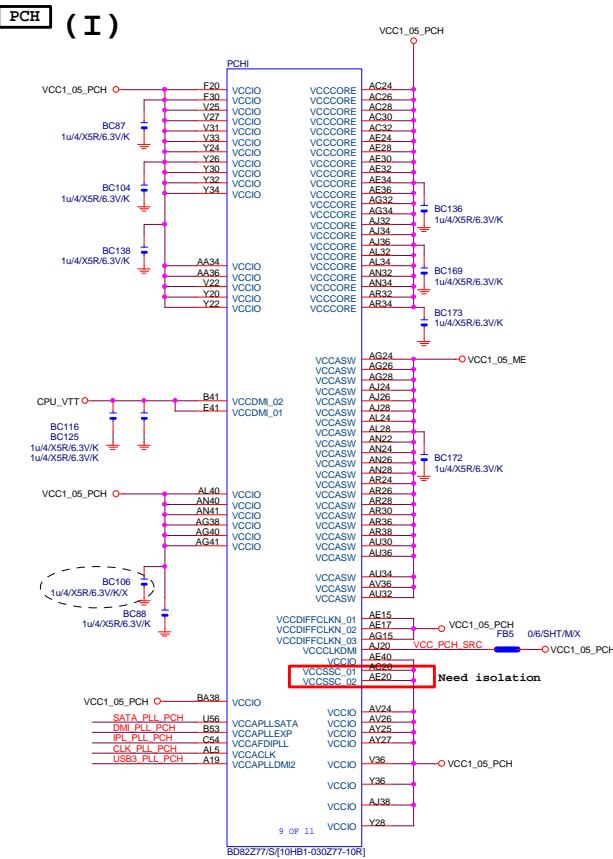


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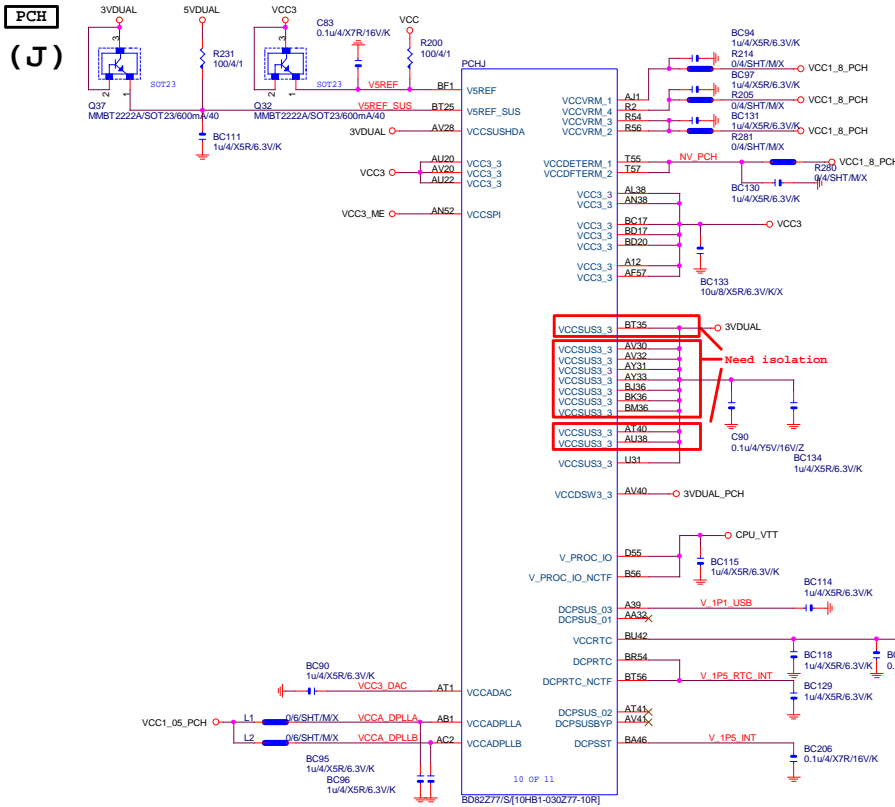


Gigabyte Technology		
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Size	Document Number	Rev
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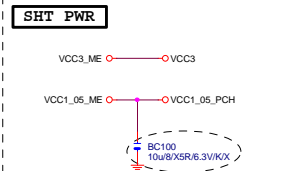
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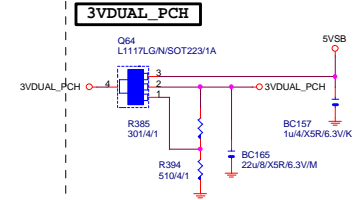
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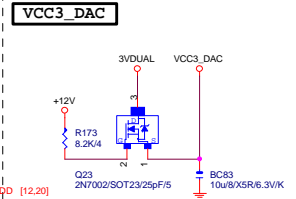
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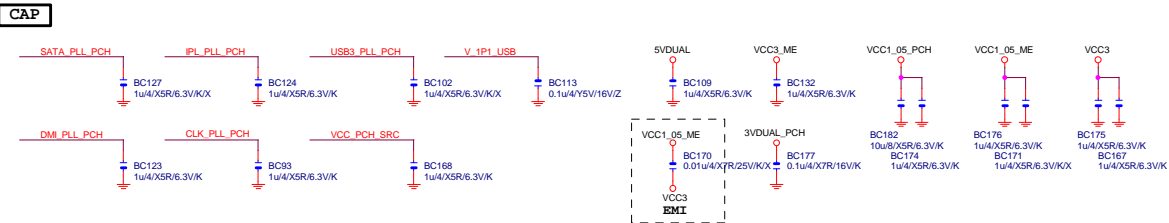


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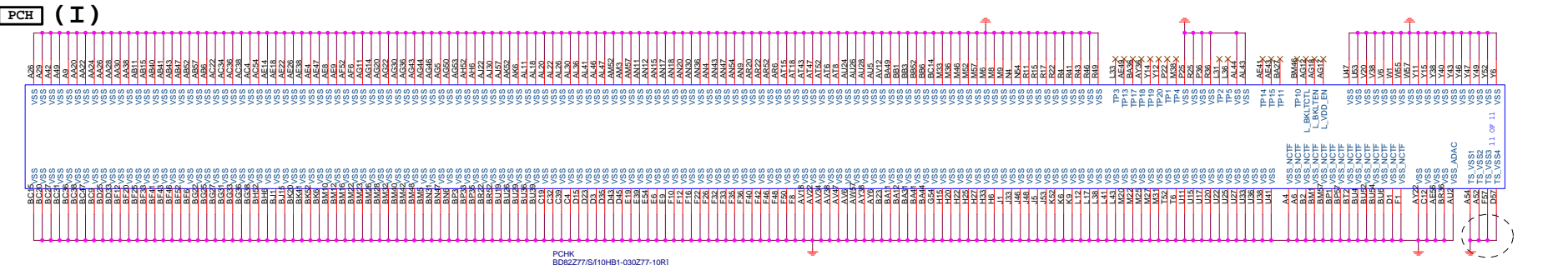


CLOSE北橋(注意震盪水波紋)

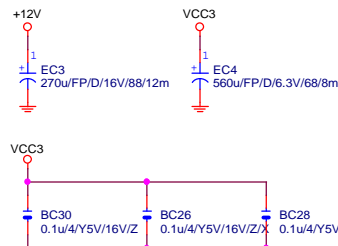
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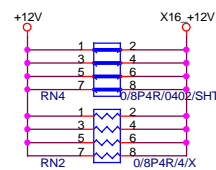
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# PCIEX16 CAP



# PCIEX16 PROTECT SHT

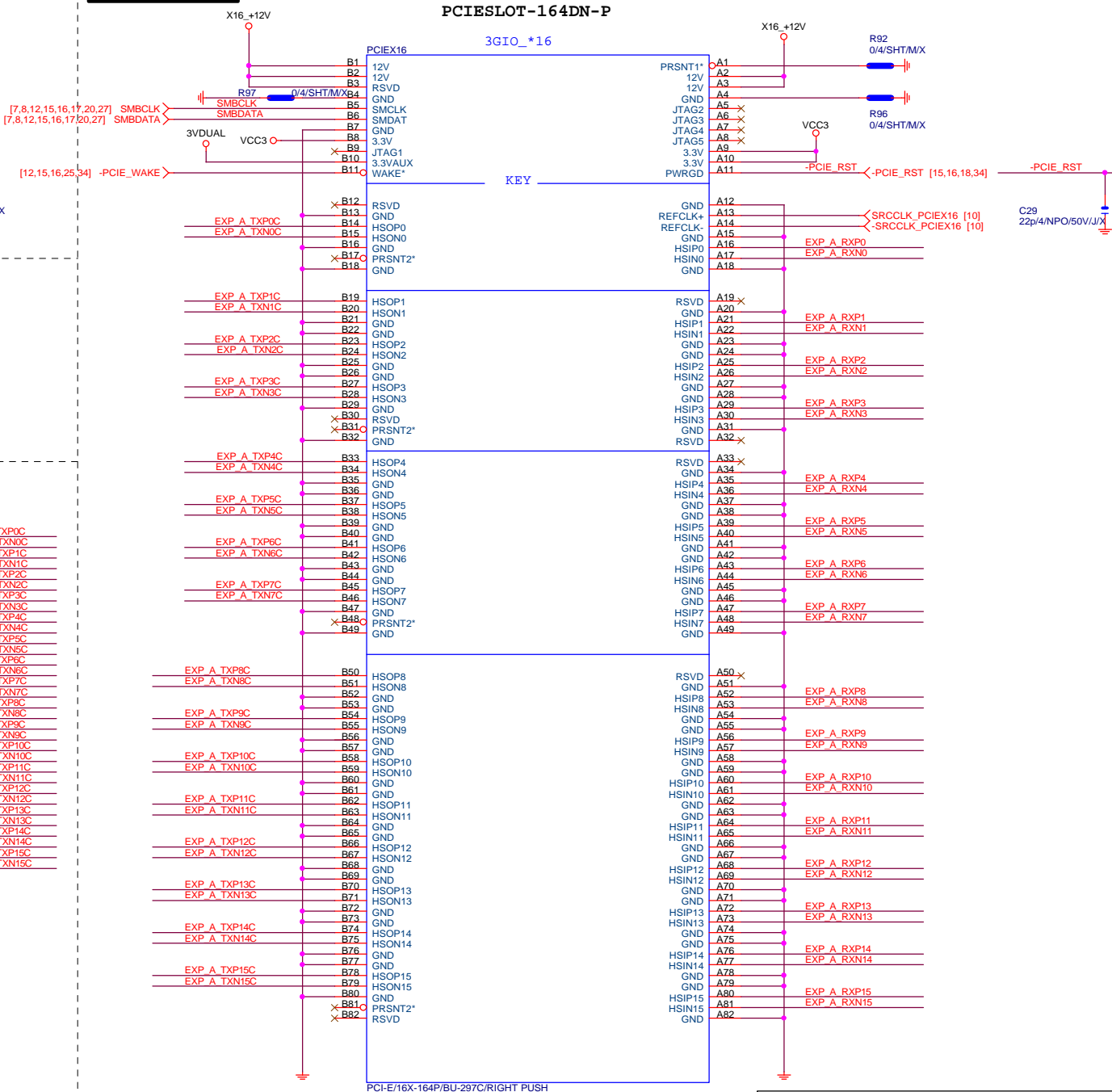


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EXP A TXP1	C35	0.22u/4X5R/6.3V/K	EXP A TXP1C
EXP A TXN1	C37	0.22u/4X5R/6.3V/K	EXP A TXN1C
EXP A TXP2	C39	0.22u/4X5R/6.3V/K	EXP A TXP2C
EXP A TXN2	C41	0.22u/4X5R/6.3V/K	EXP A TXN2C
EXP A TXP3	C43	0.22u/4X5R/6.3V/K	EXP A TXP3C
EXP A TXN3	C45	0.22u/4X5R/6.3V/K	EXP A TXN3C
EXP A TXP4	C46	0.22u/4X5R/6.3V/K	EXP A TXP4C
EXP A TXN4	C49	0.22u/4X5R/6.3V/K	EXP A TXN4C
EXP A TXP5	C50	0.22u/4X5R/6.3V/K	EXP A TXP5C
EXP A TXN5	C51	0.22u/4X5R/6.3V/K	EXP A TXN5C
EXP A TXP6	C52	0.22u/4X5R/6.3V/K	EXP A TXP6C
EXP A TXN6	C54	0.22u/4X5R/6.3V/K	EXP A TXN6C
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EXP A TXN7	C58	0.22u/4X5R/6.3V/K	EXP A TXN7C
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EXP A TXN9	C63	0.22u/4X5R/6.3V/K	EXP A TXN9C
EXP A TXP10	C64	0.22u/4X5R/6.3V/K	EXP A TXP10C
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EXP A TXN13	C73	0.22u/4X5R/6.3V/K	EXP A TXN13C
EXP A TXP14	C74	0.22u/4X5R/6.3V/K	EXP A TXP14C
EXP A TXN14	C75	0.22u/4X5R/6.3V/K	EXP A TXN14C
EXP A TXP15	C77	0.22u/4X5R/6.3V/K	EXP A TXP15C
EXP A TXN15	C78	0.22u/4X5R/6.3V/K	EXP A TXN15C

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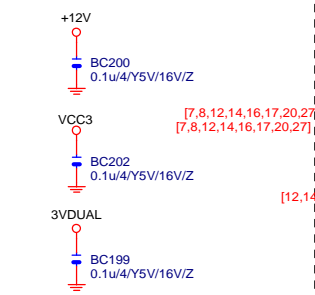
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Gigabyte Technology

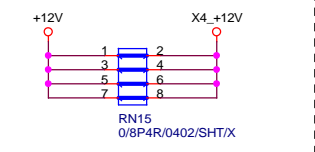
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PCIEX4 CAP

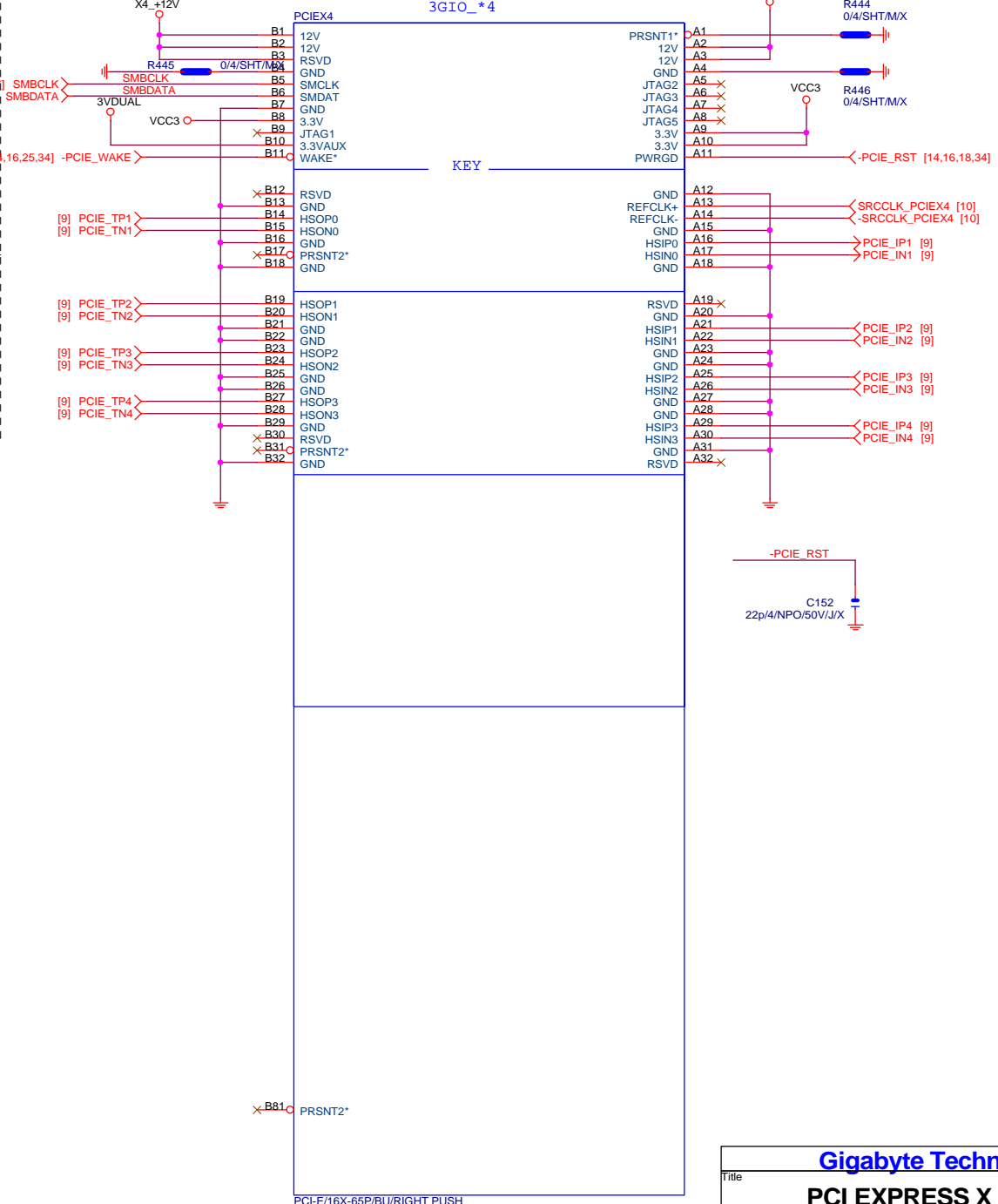


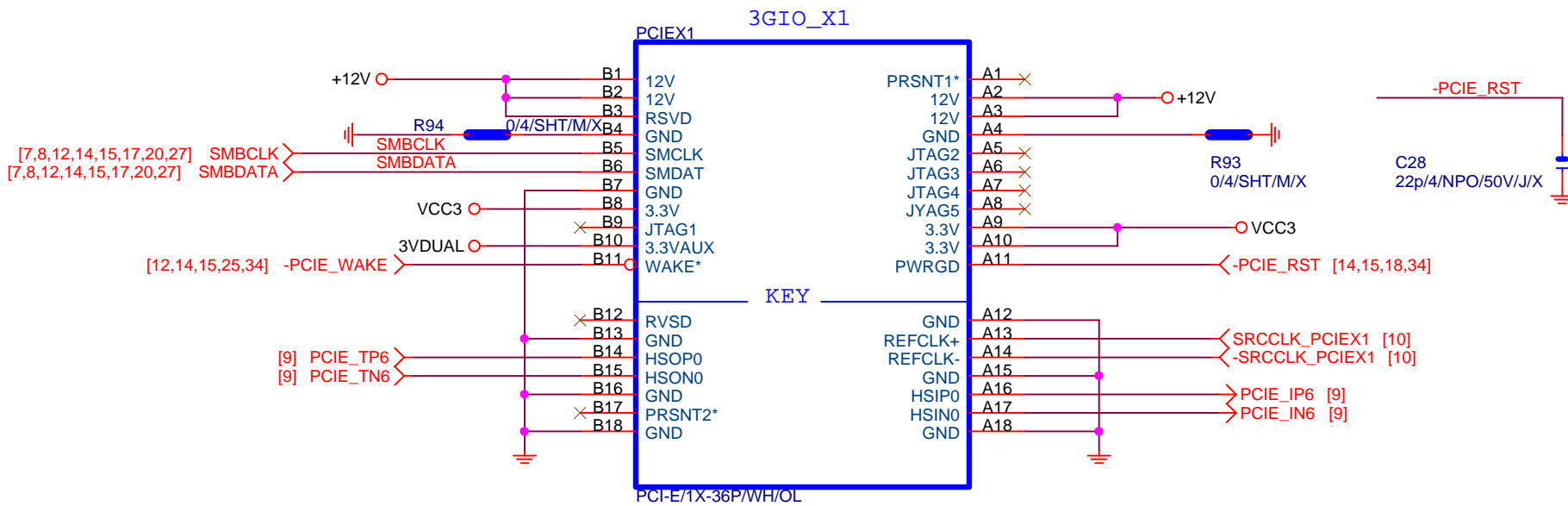
PCIEX4 SLOT

PCIEX16 PROTECT SHT



PCIESLOT-64D-98D-P





PCIEX1 CAP

3VDUAL

+12V

VCC3



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BC23  
0.1u/4/Y5V/16V/Z/X



BC25  
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Gigabyte Technology

PCI EXPRESS X 1 PORT

GA-Z77M-D3H-MVP

Rev  
1.1

Title

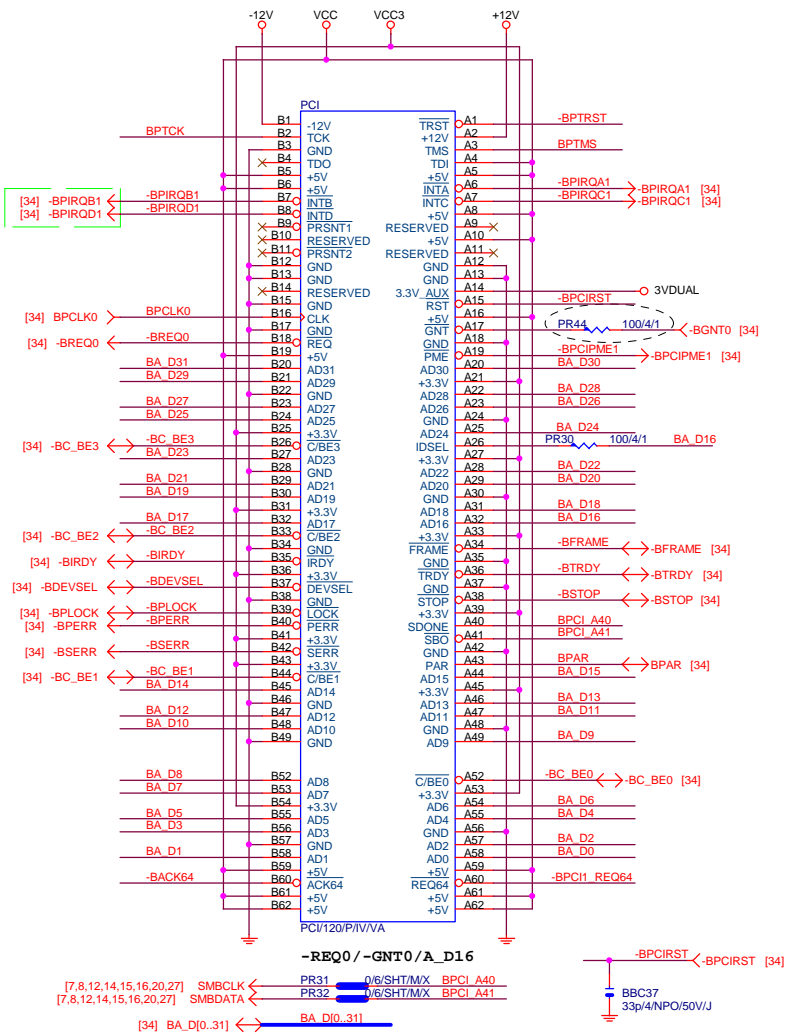
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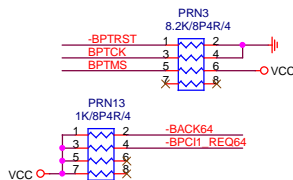
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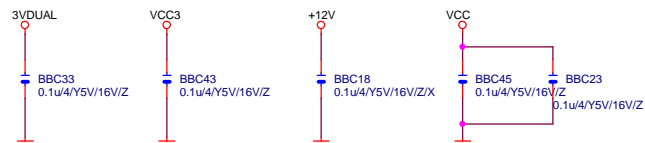
PCI SLOT



PCI	PU
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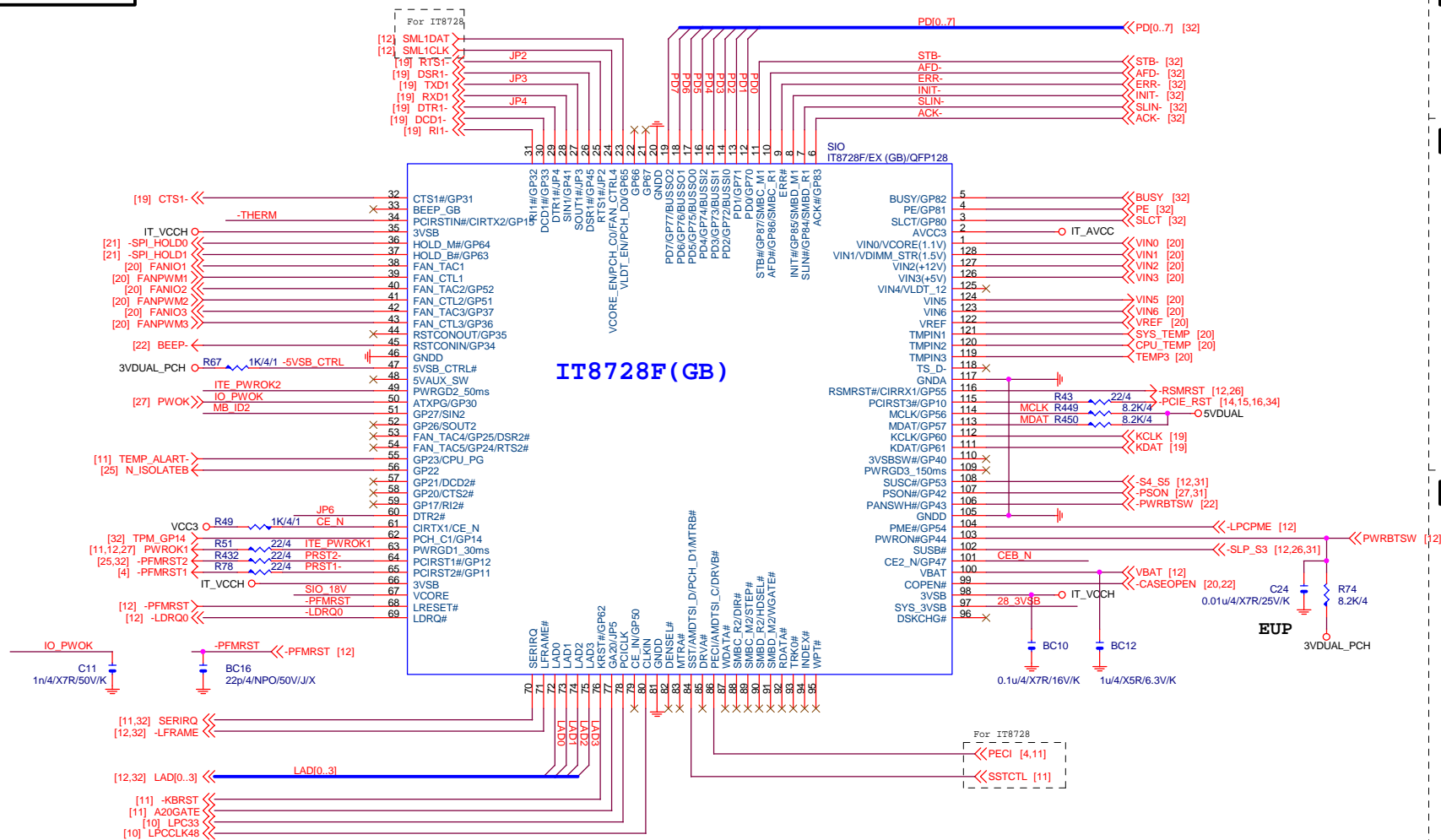
## PCI CAP



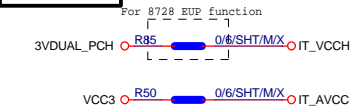
## Gigabyte Technology

Title				PCI SLOT 1&2				Rev	
Size Custom		Document Number		GA-Z77M-D3H-MVP				1.1	
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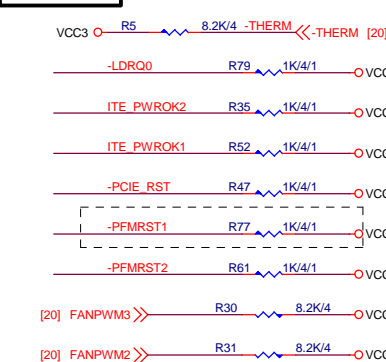
## SIO IT8728F



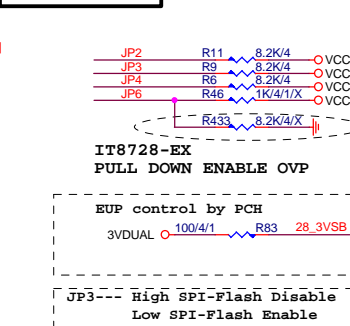
PWR	SHT
-----	-----



## SIO PU



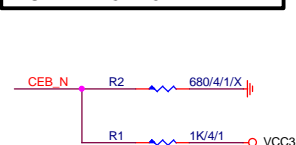
## SIO STRAP



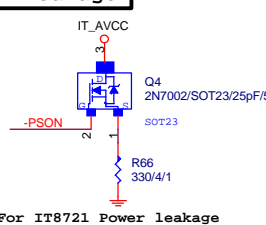
## IT8728F NOTE

	IT8728
PIN121	VCORE_EN/PCF_C0
PIN120	VLINT_EN/PCF_D0
PIN19	ATXPG
PIN31	PCF_C1
PIN53	SST/AMDTSI_D_MTRB#/PCF_D1
PIN55	PECI/AMDTSI_C/DRV#
PIN66	SYS_3VSB
PIN70	GP47
PIN95	VIN2(VCC5)
PIN96	VIM1(VCC12)
PIN97	VIN1/VDIMM_STR(1.5V)
PIN98	VINO/VCORE(1.1V)/NC

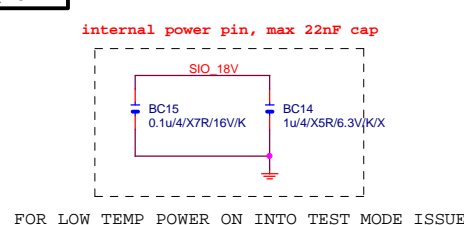
## DUAL BIOS OPT STRAP



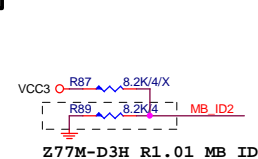
## Power leakage



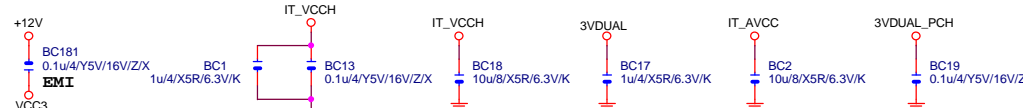
## SIO 18V



## MB ID

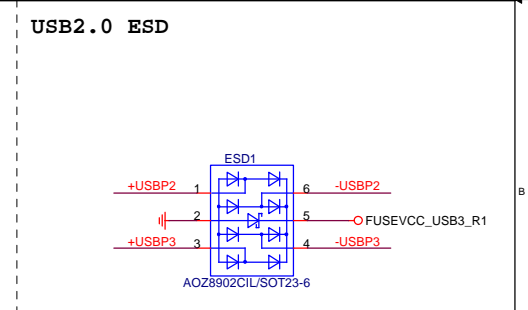
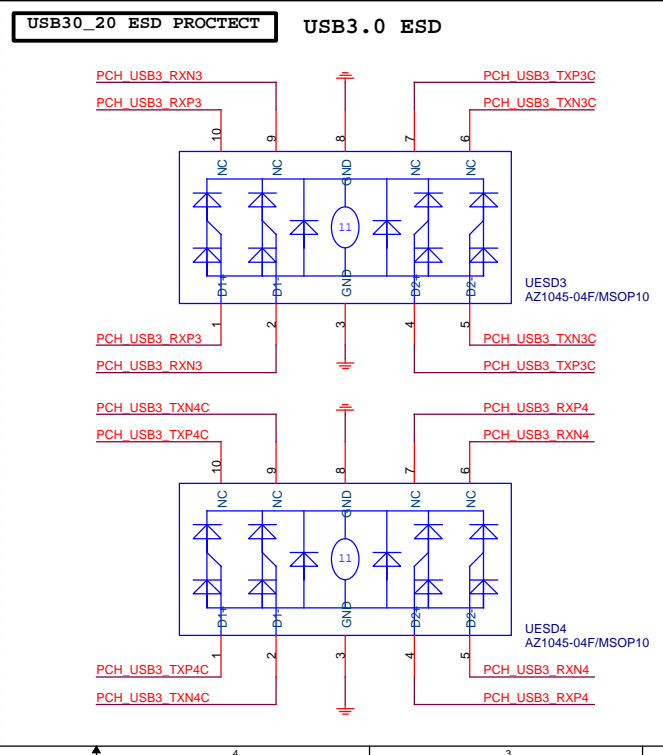
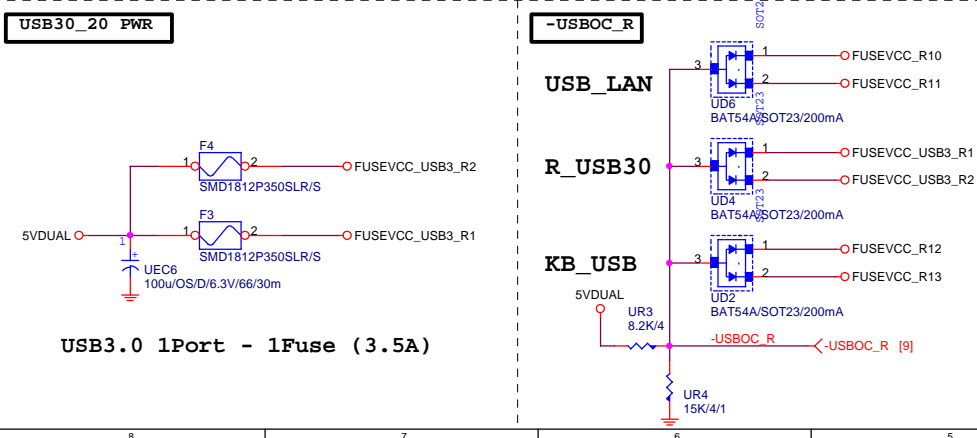
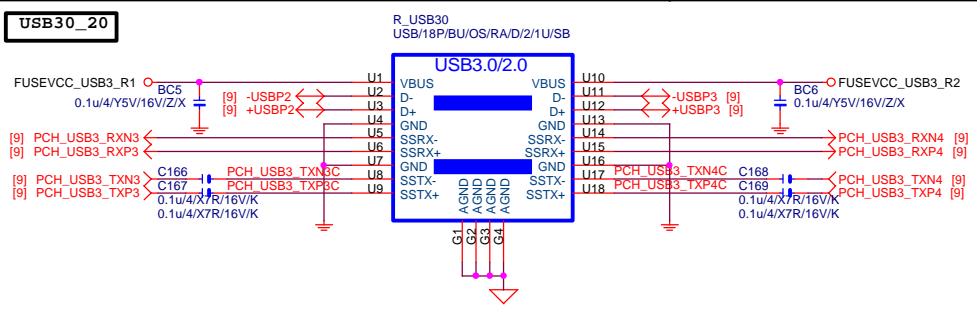
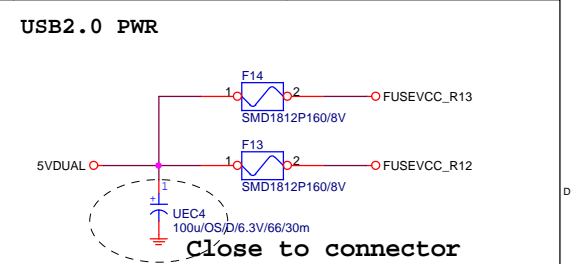
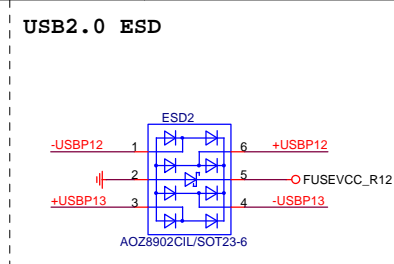
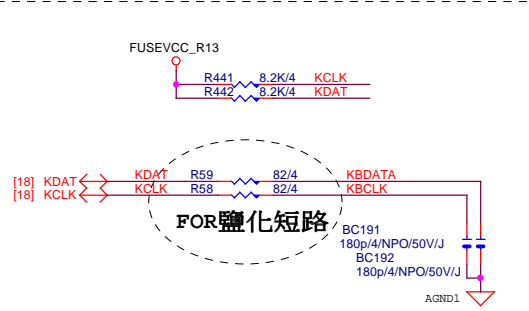
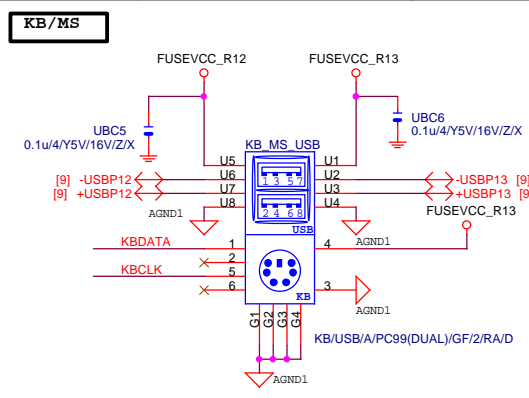
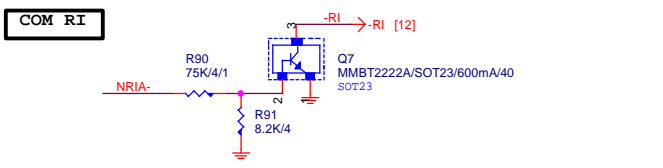
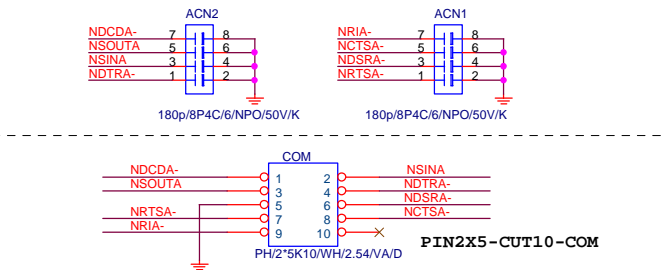
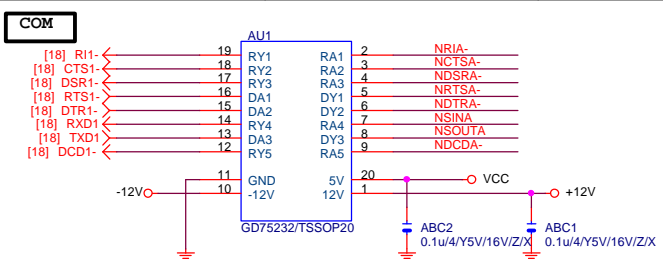


## SIO CAP

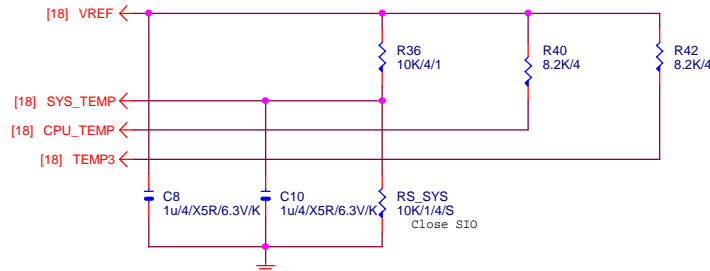


## Gigabyte Technology

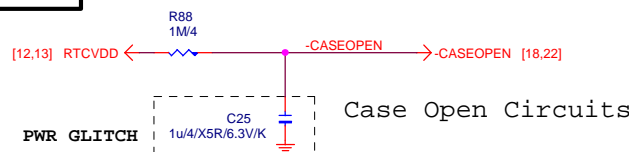
Title				ITE 8728 LPC IO			
Size	Custom	Document Number	GA-Z77M-D3H-MVP				Rev
							1.1
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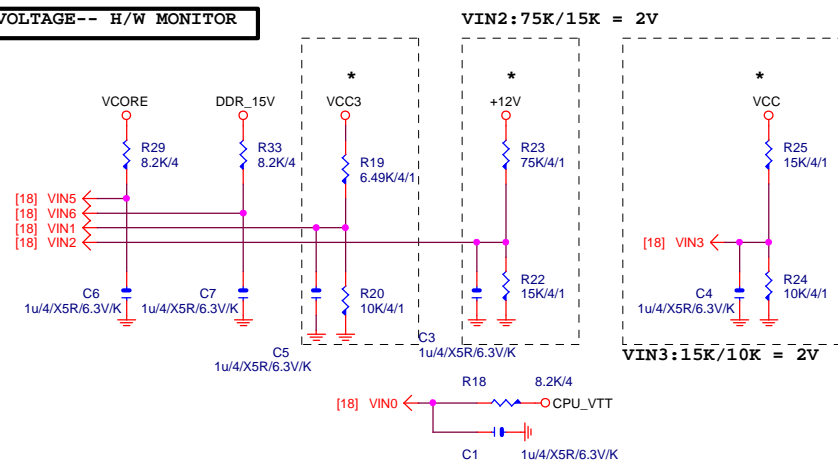
# TEMP H/W MONITOR



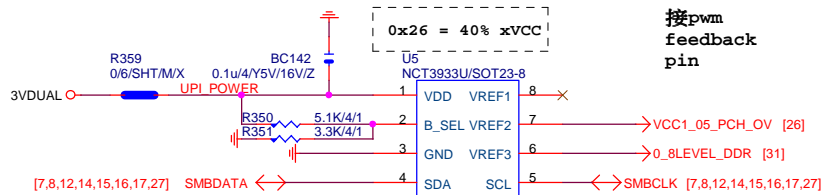
# CASE OPEN



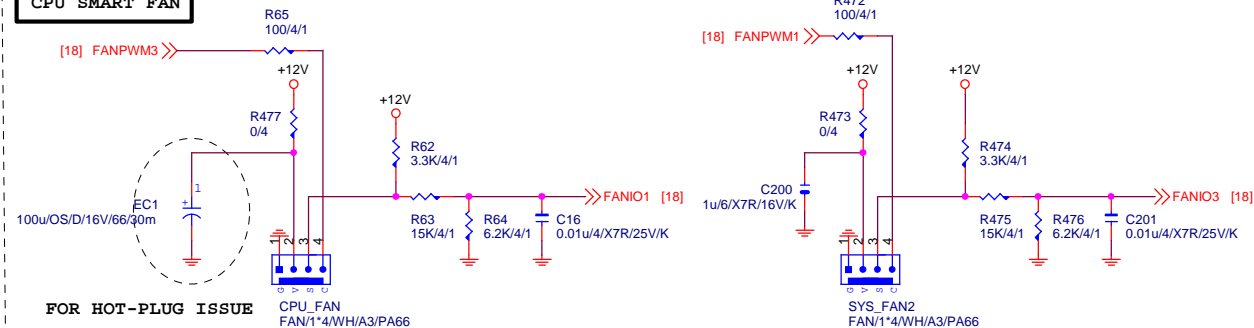
# VOLTAGE-- H/W MONITOR



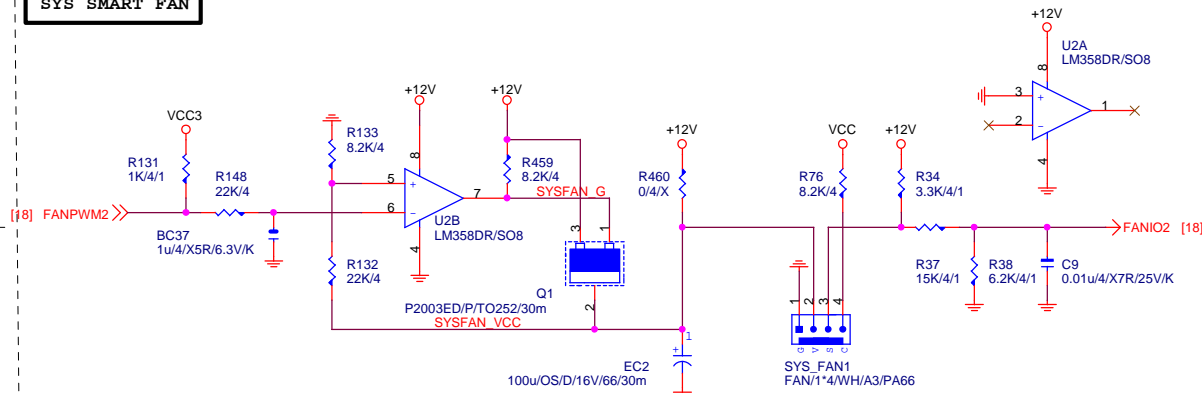
# OV NCT3933



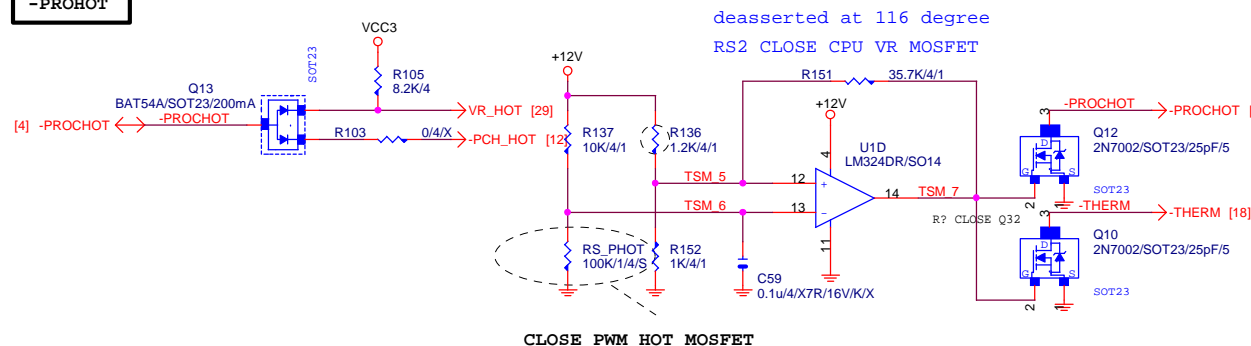
# CPU SMART FAN



# SYS SMART FAN



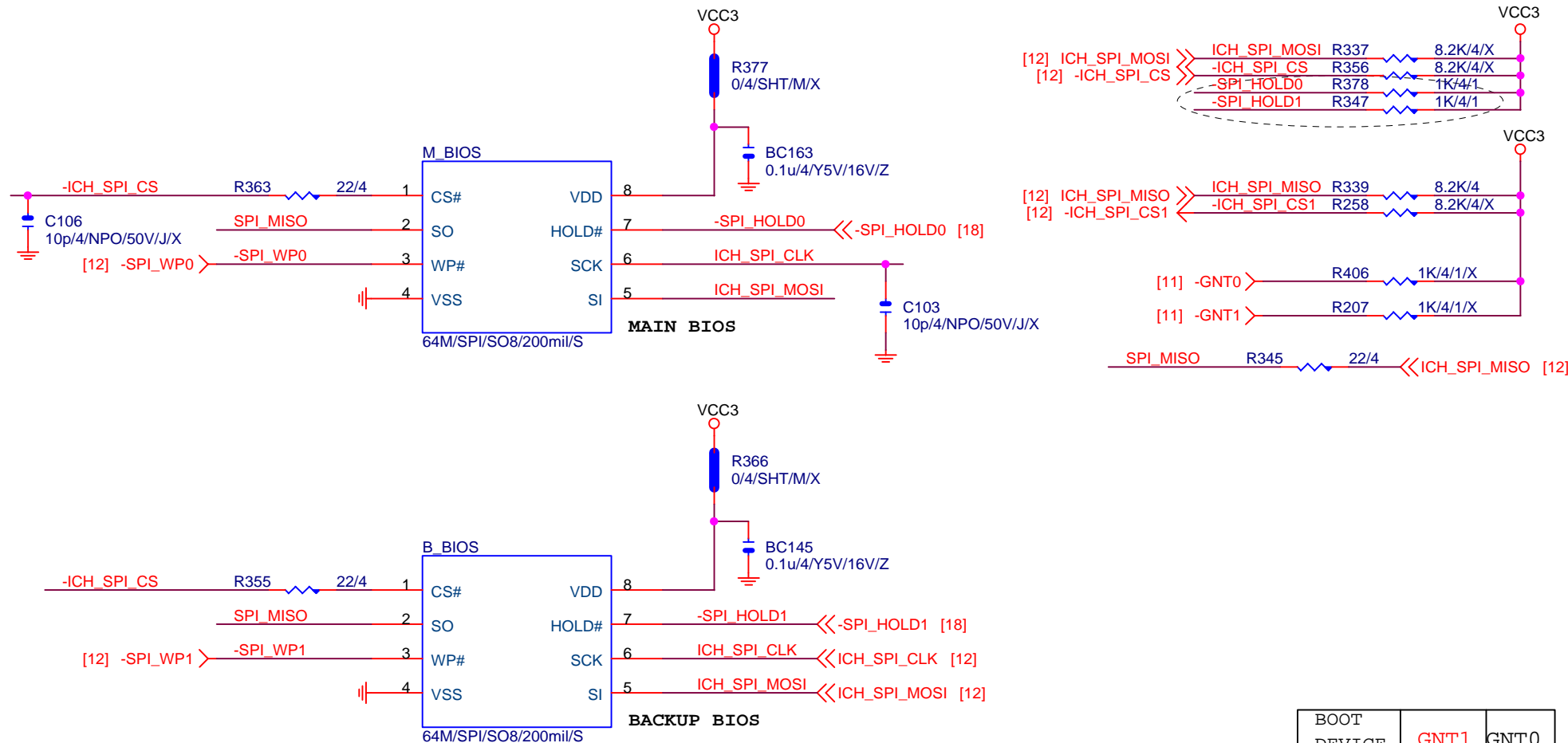
# -PROHOT



Gigabyte Technology

Title		HWM,FAN CTRL,OV	
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# DUAL BIOS



B65使用64M BIOS  
使用H67暫用32M  
H61使用32M BIOS

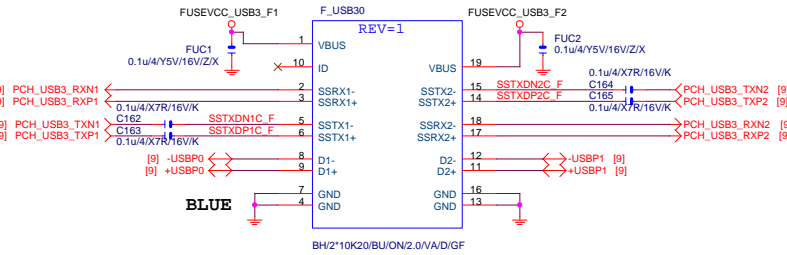
BOOT DEVICE	GNT1	GNT0
LPC	0	0
PCI	0	1
SPI	1	1

1 means floating  
0 means PD 1K

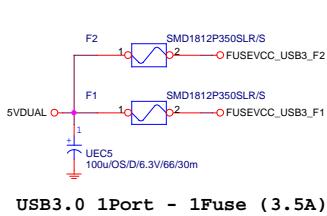
**Gigabyte Technology**

Title		
DUAL BIOS		
Size A	Document Number <b>GA-Z77M-D3H-MVP</b>	Rev <b>1.1</b>
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# F\_USB30



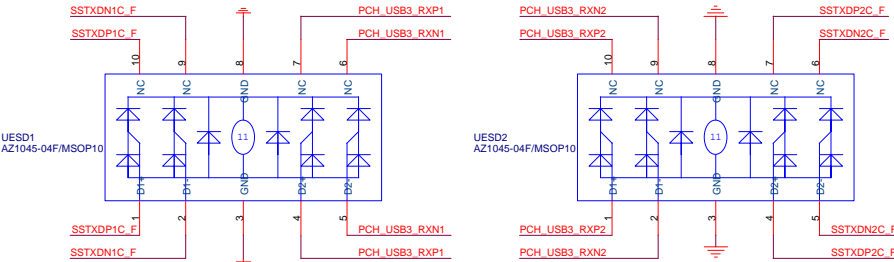
# F\_USB30 PWR



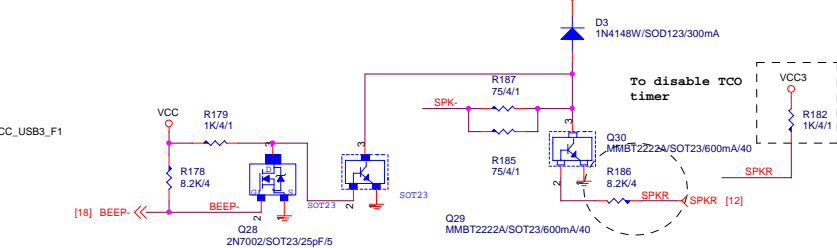
# SATA LED



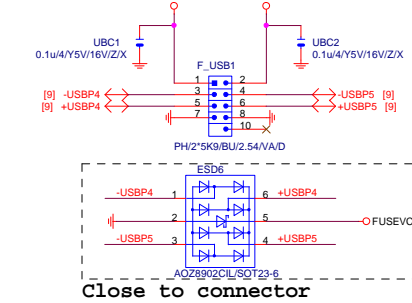
# F\_USB30 ESD PROTECT



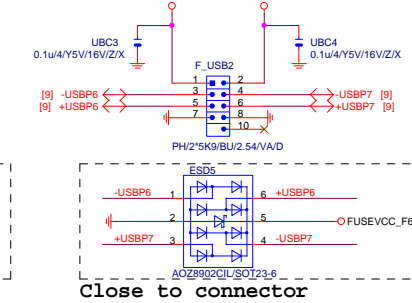
# SPKR



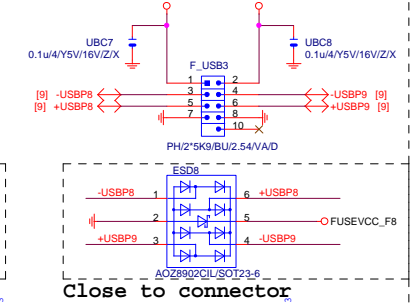
# FRONT USB1



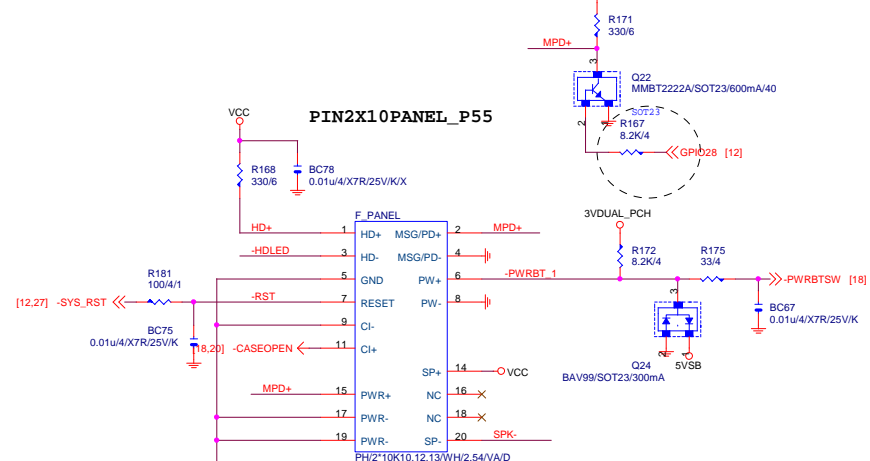
# FRONT USB2



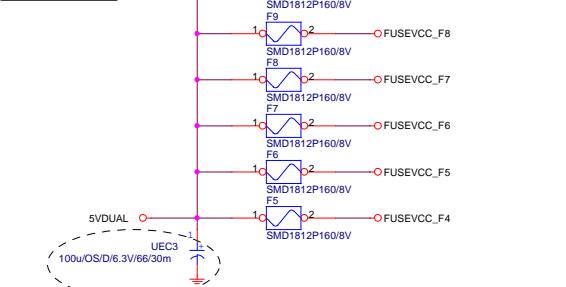
# FRONT USB3



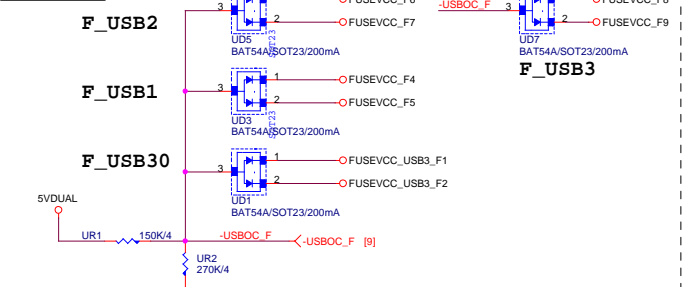
# INTEL FRONT PANEL



# FUSEVCC\_F



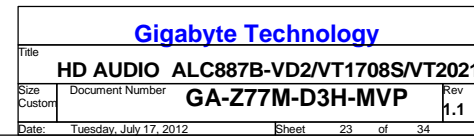
# -USBOC\_F

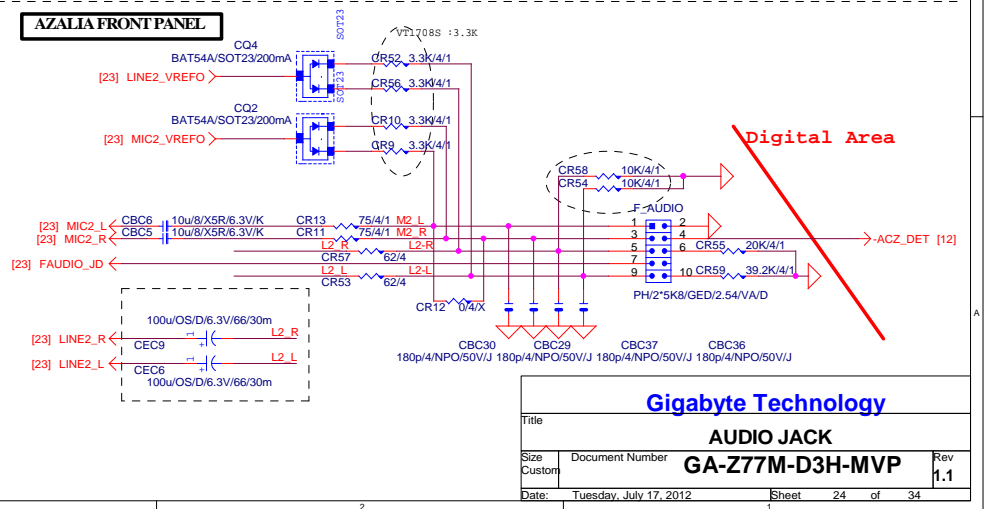
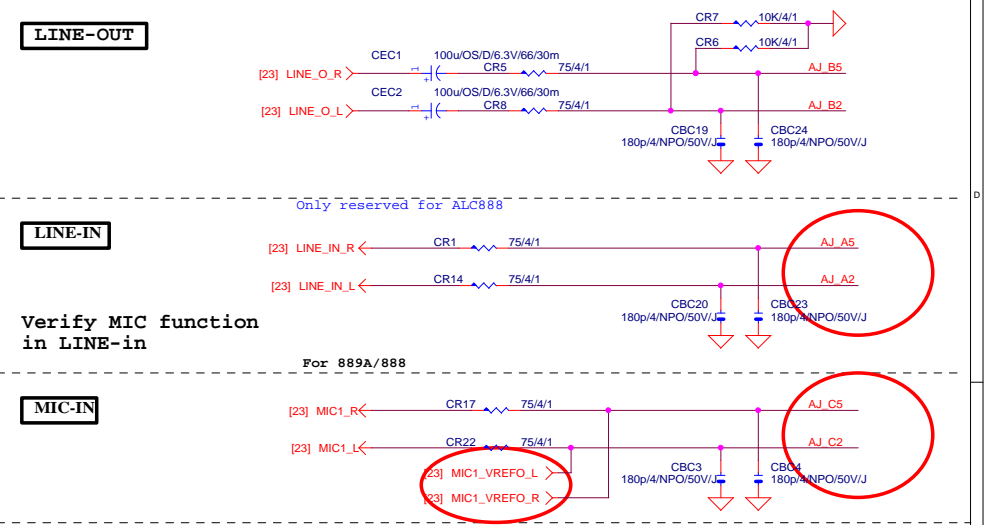
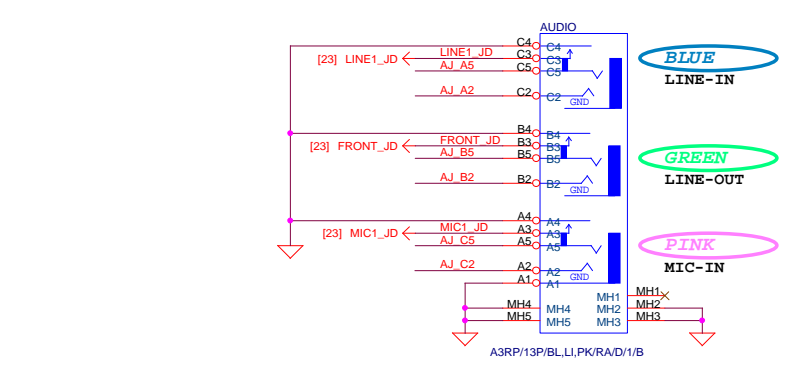
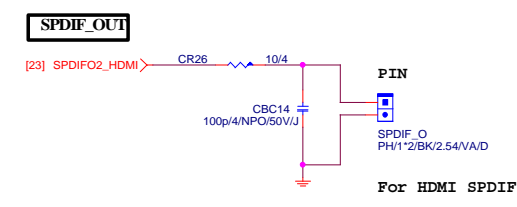
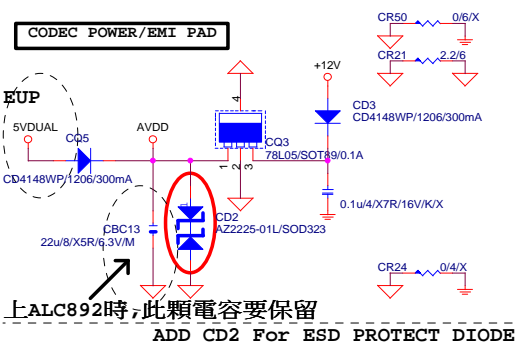


CR34: 20K/4/1% @Realtek cdec  
CR34: 5.1K/4/1 %@VIA cdec  
CBC39 100P @VIA codec

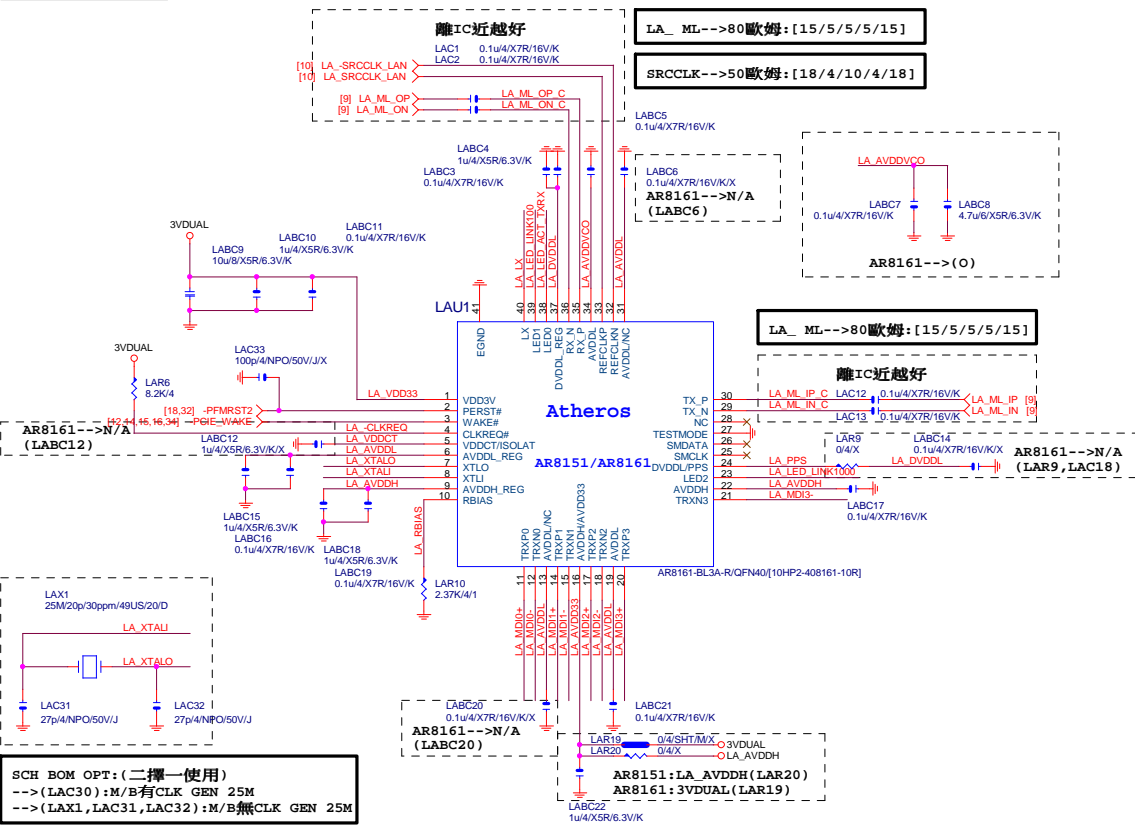
CR34 5.1K/4/1

CBC42 100p/4/NPO/50V/J/X

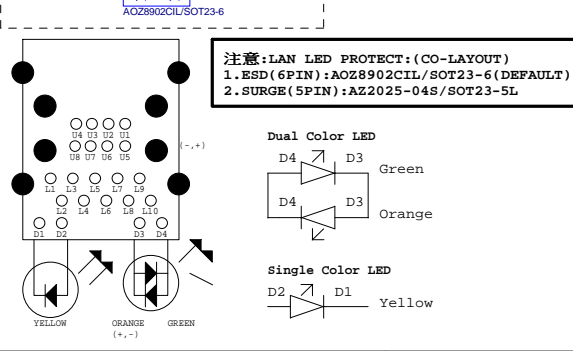
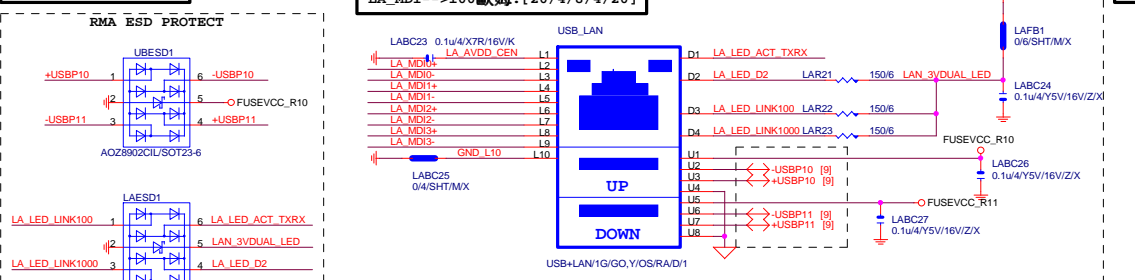




# LAN:AR8151/AR8161



# USB LAN CONNECTOR

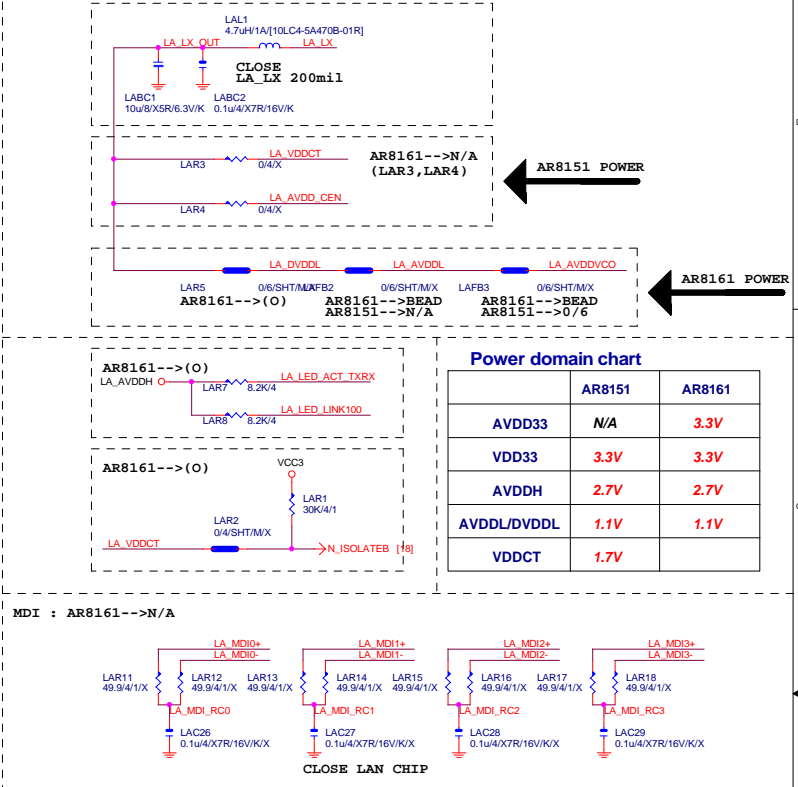


料號	規格	廠商
11NR6-702009-0ER	1G LAN (12core)	UDE
11NR6-702009-91R	1G LAN (8 core)	FOXCONN
11NR6-702009-92R	1G LAN (8 core)	UDE
11NR6-702009-11R	1G LAN (12core/RED)	UDE
11NR6-702009-12R	1G LAN (8 core/RED)	FOXCONN

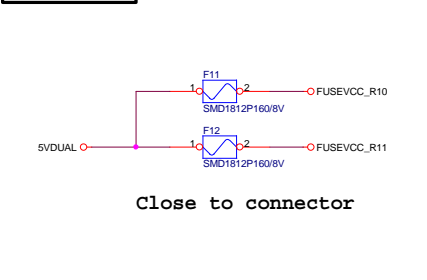
USB LAN BOM 區分:

- (紅色/12CORE/三倍): USB+LAN/1G/GO, Y/OS/RA/D/1/RED
- (黑色/12CORE): USB+LAN/1G/GO, Y/OS/RA/D/1
- (黑色/8CORE): USB+LAN/1G/GO, Y/OS/RA/D/8C

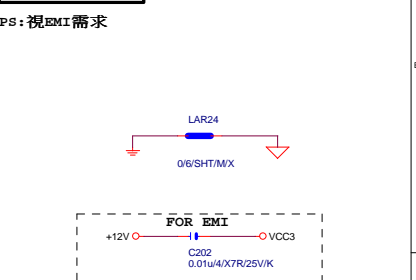
# LAN POWER



# USB X3 POWER

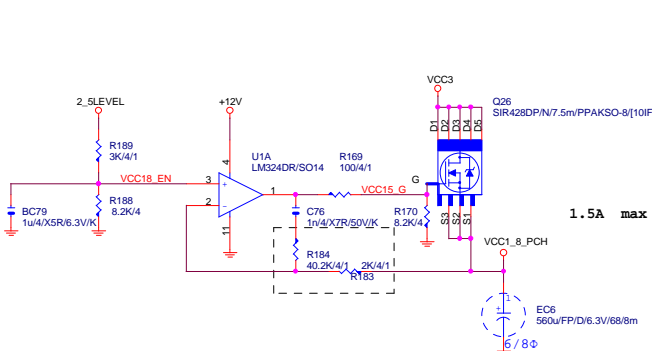


# EMI SHORT PAD

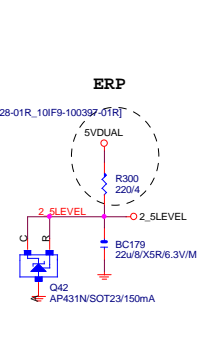


Gigabyte Technology			
File			
ARTHEROS AR8151/AR8161			
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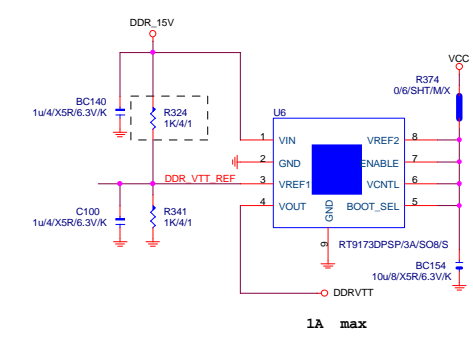
VCC1\_8\_PCH



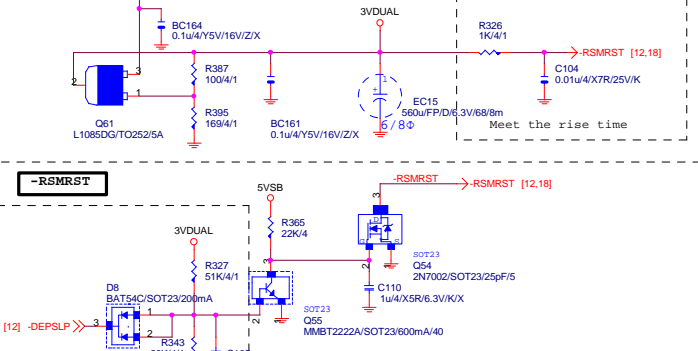
2\_5LEVEL



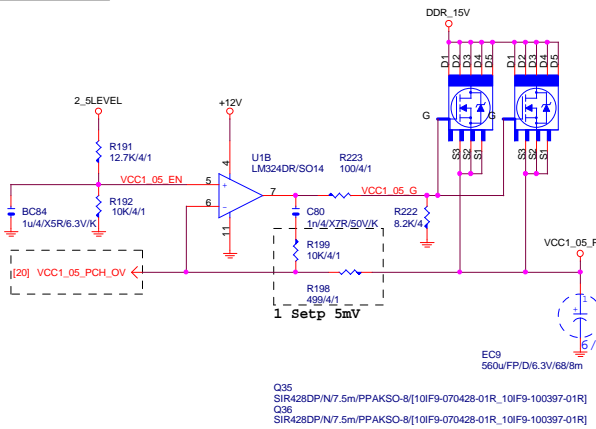
DDRVTT



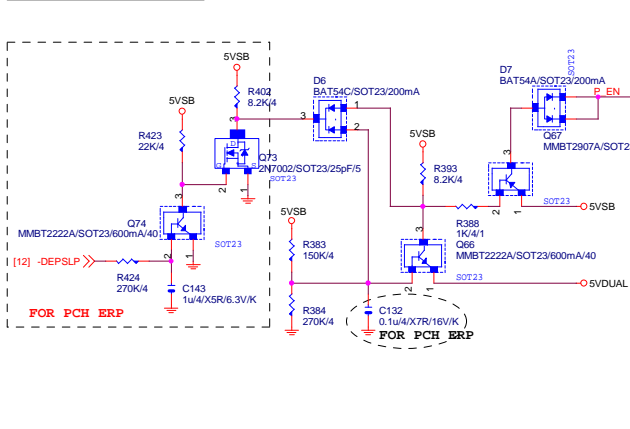
3VDUAL



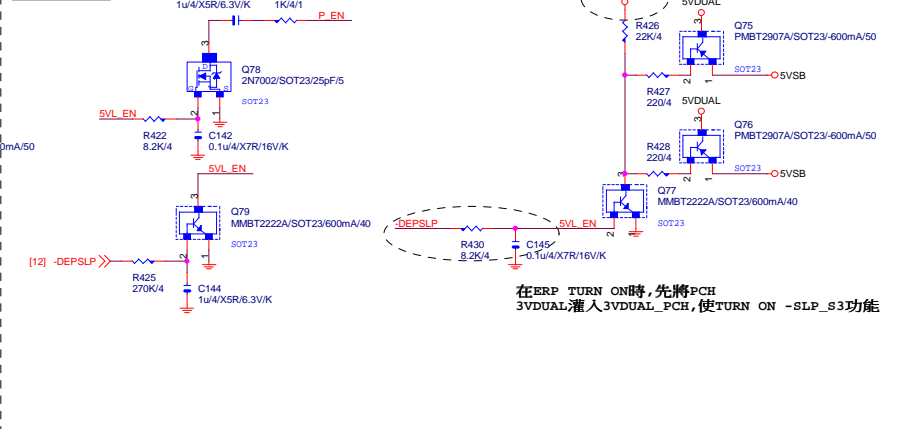
VCC1\_05\_PCH



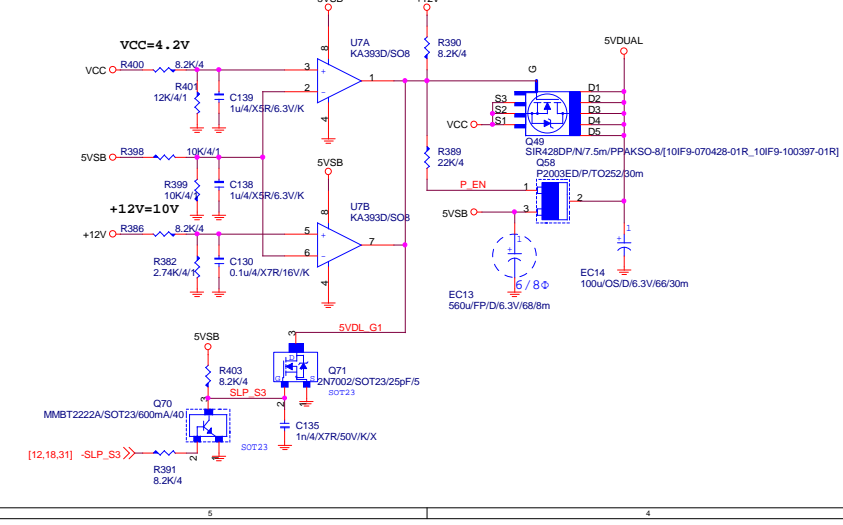
5VDUAL SHORT PROTECT



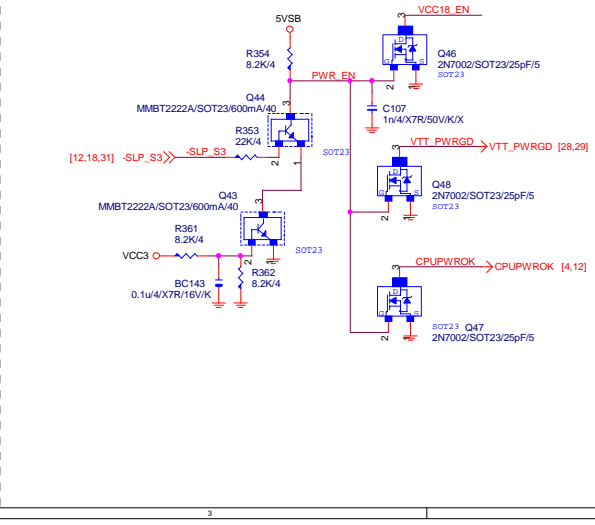
PCH ERP



5VDUAL

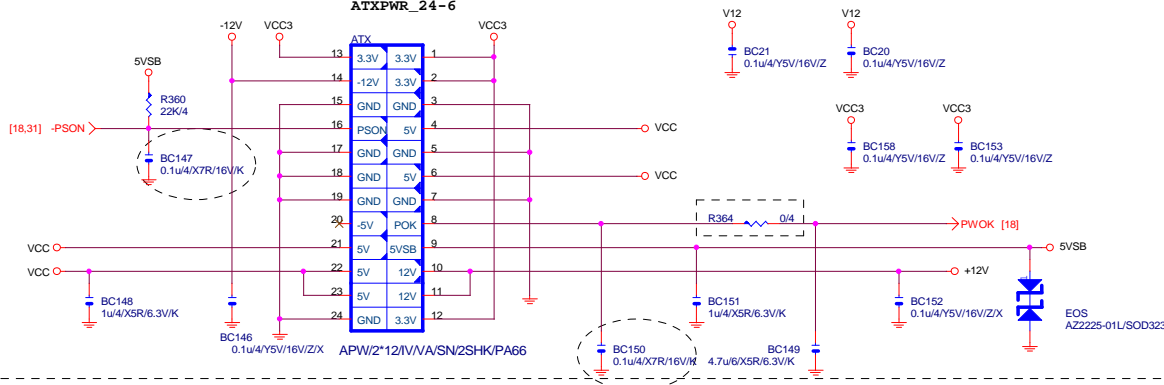


PWR SEQ

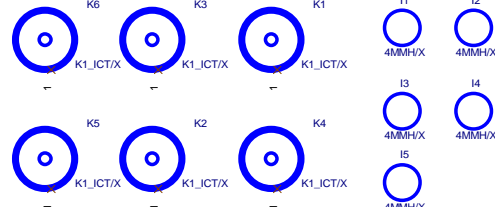
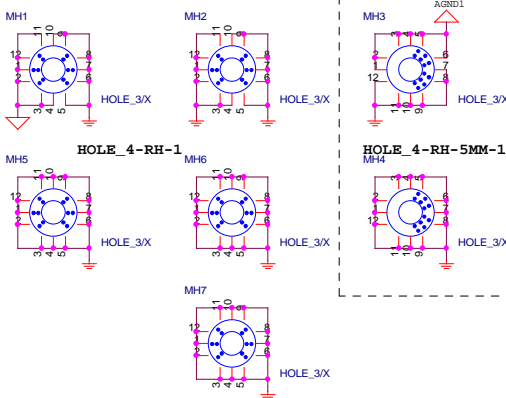
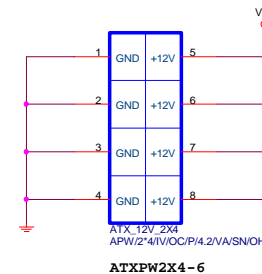


# ATXX24 POWER CONNECTOR

ATXPWR\_24-6

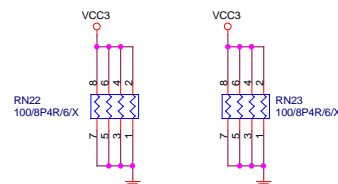


# ATXX4 POWER CONNECTOR

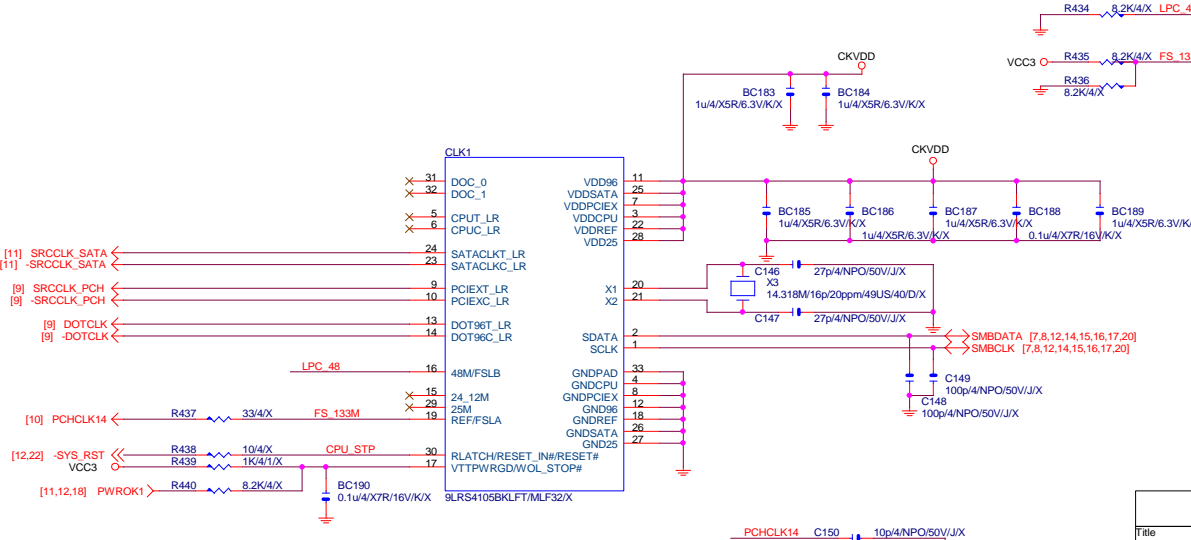


To prevent the 5VSB under loading when boot

FIX PWR MINMUN LOAD

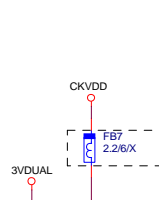


# CLK GEN



CPU Frequency Selection

FS	CPU
0	100M <Default>
1	133M



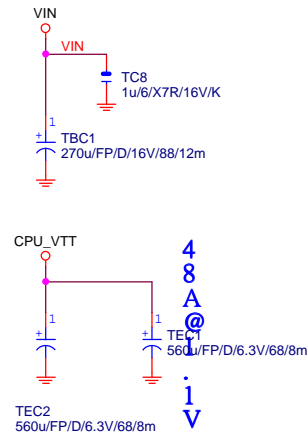
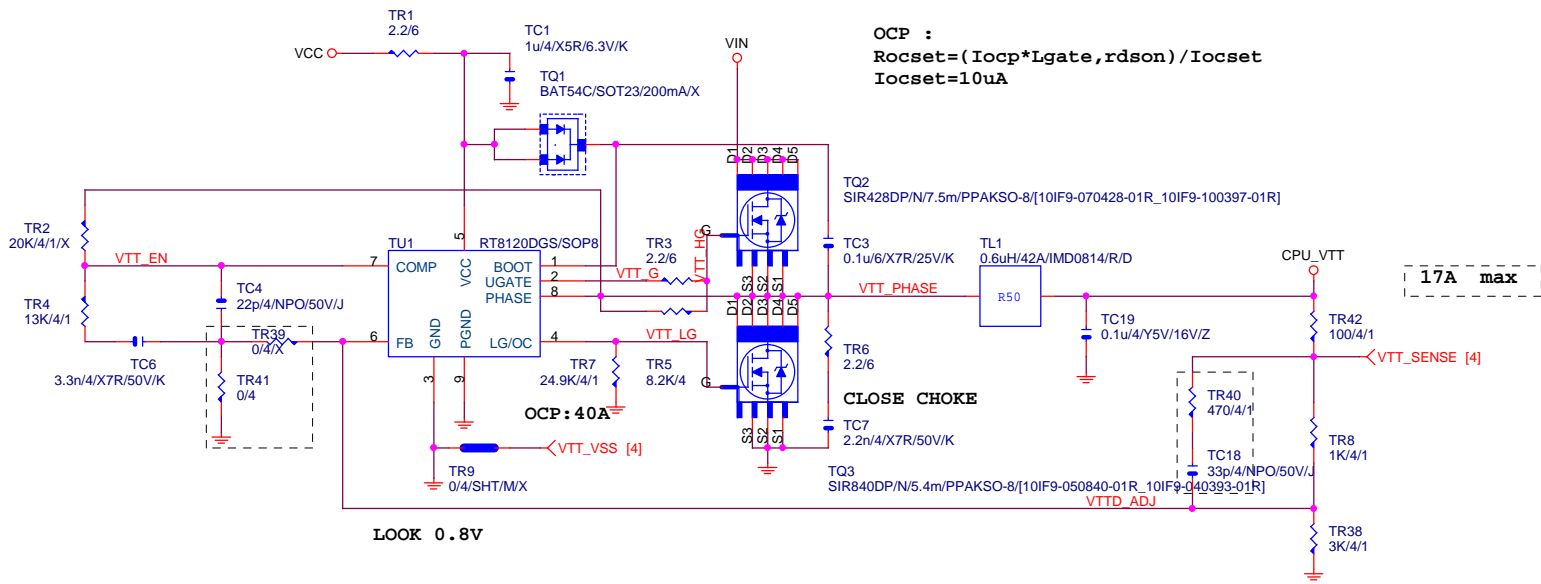
Gigabyte Technology

ATX CONNECTOR

GA-Z77M-D3H-MVP

Rev 1.1

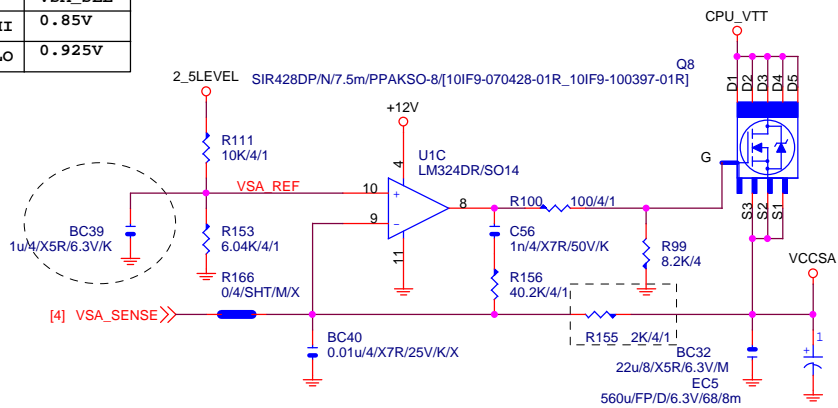
# CPU\_VTT



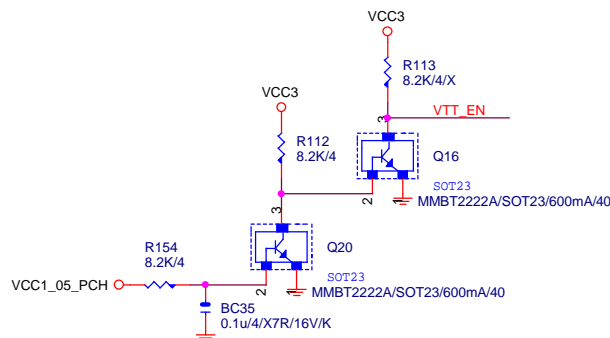
# VCCSA

PDG 0.8

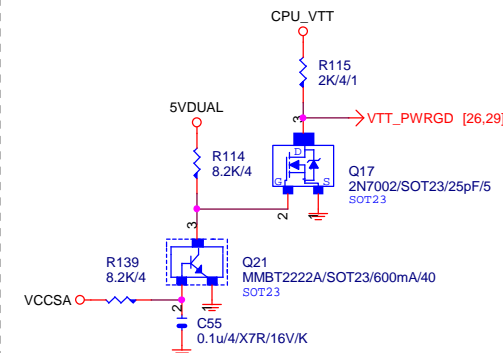
	VSA_SEL
HI	0.85V
LO	0.925V



# CPU\_VTT PWR SEQ

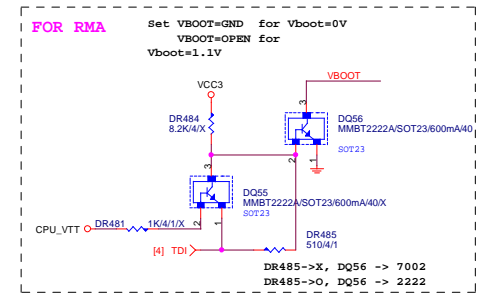
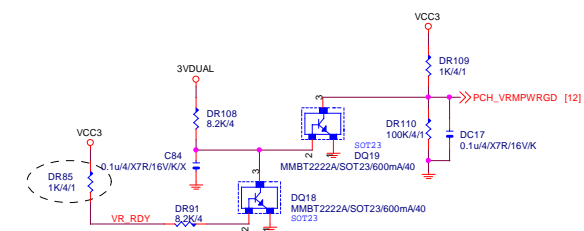
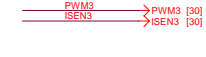
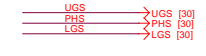
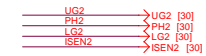
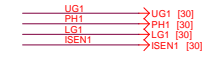
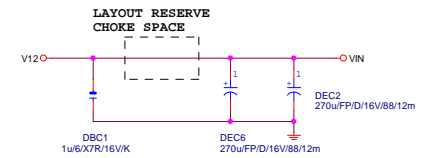
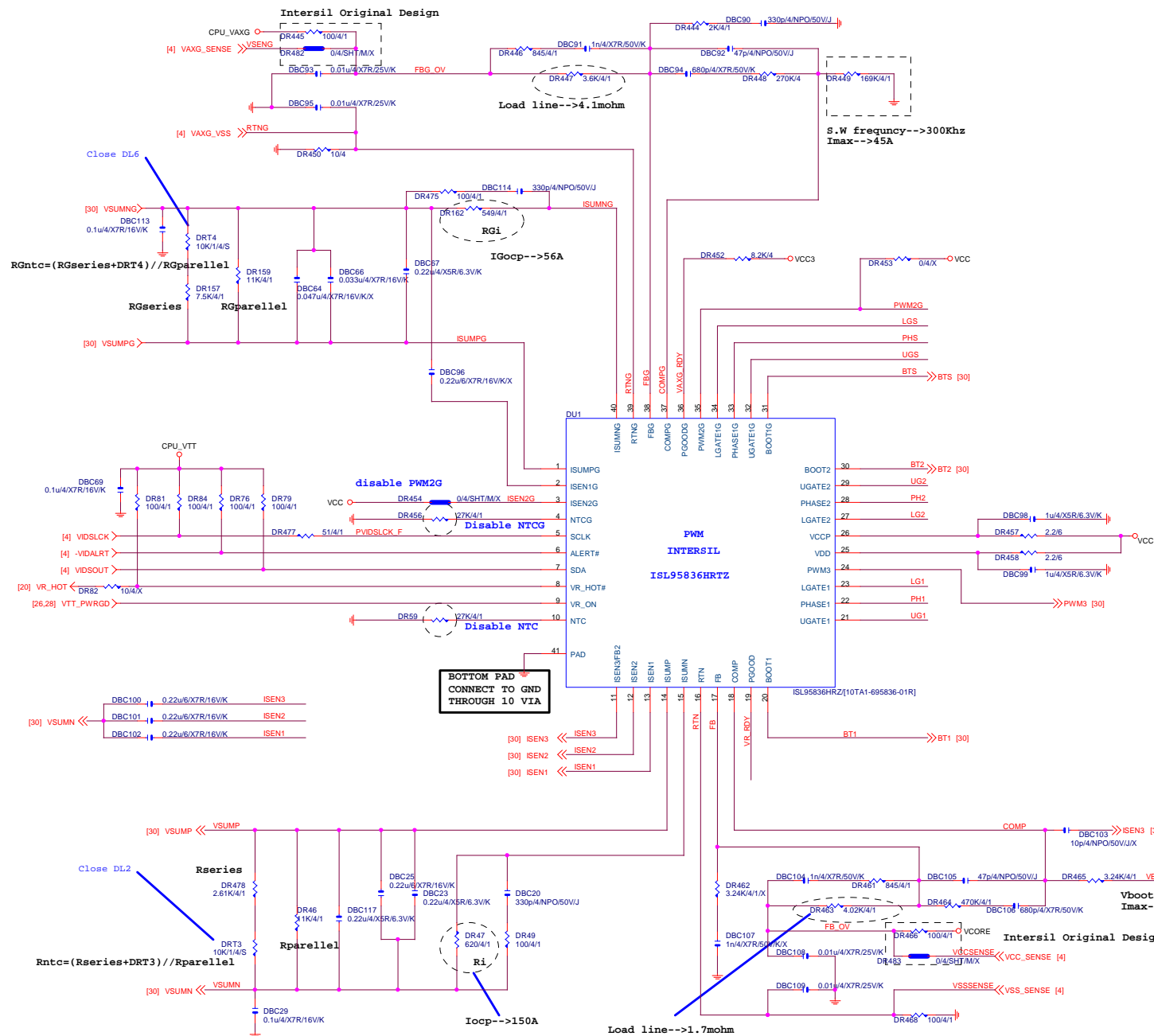


# VTT\_PWRGD



**GIGABYTE™**

Title		
CPU_VTT PWM_ISL95870CRZ		
Size	Document Number	Rev
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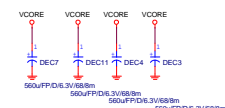
PHASE 1



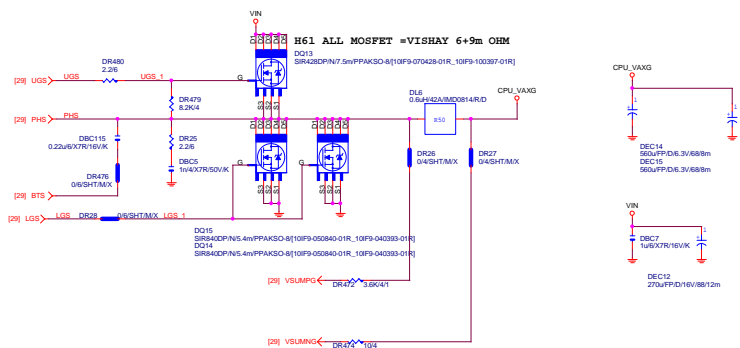
**PHASE 3**



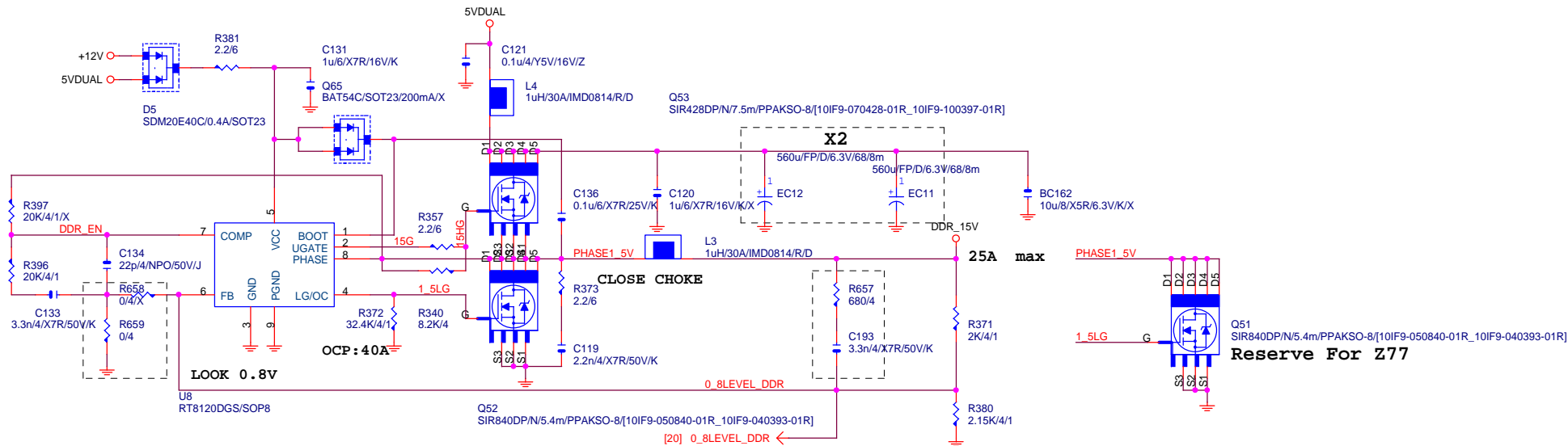
**PHASE 2**



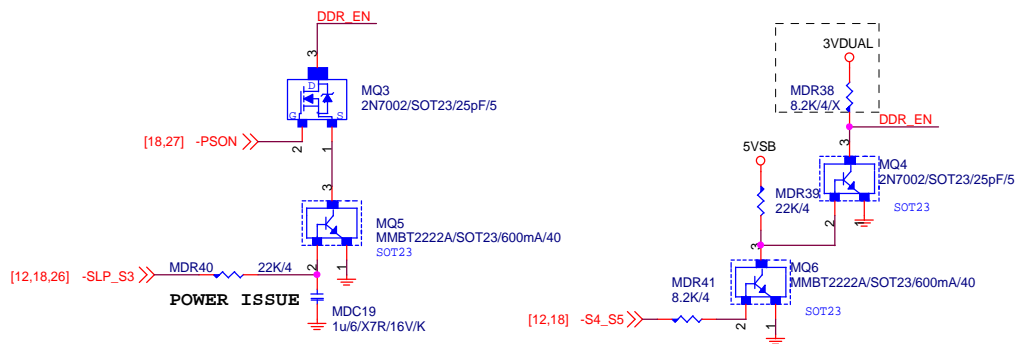
## VAXG



# DDR1.5V



# PWR\_SEQ



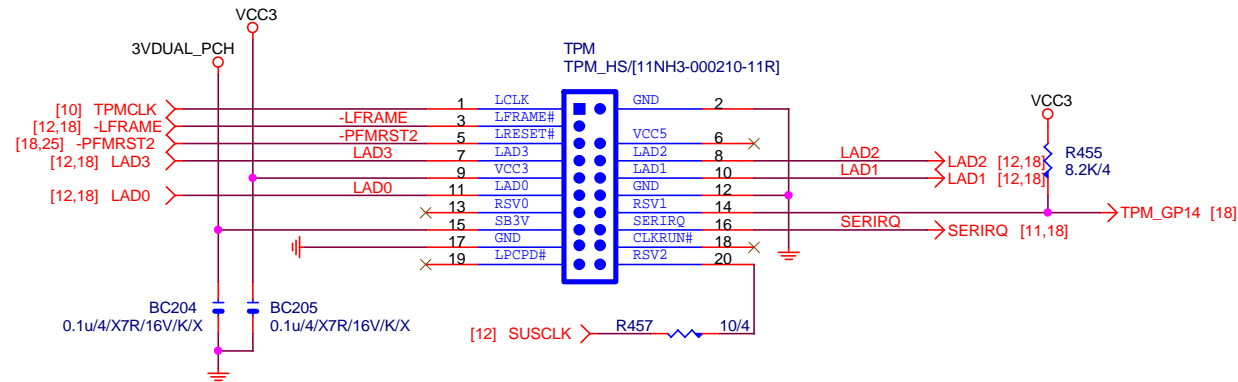
VIN=5V, VOUT=1.5V, IOUT=25A, PHASE=1  
 IRMS=11.45A  
 560u/FP/D/6.3V/68/8m RIPPLE CURRENT=4.7A  
 Coefficient=1.7(85°C), 1(105°C)  
 VIN Ripple current=4.7X1.7=7.99A(85°C)  
 -->故固態電容須2X7.99=15.98>11.45A

OCP :  $I_{peak} = (2 \times I_{ocset} \times R_{ocset}) / R_{dson}$   
 typ  $I_{ocset} = 20\mu A$ ,  $R_{ocset} = 4.7k$   
 OCP :  $53.71A = (2 \times 20\mu A \times 4.7k) / (7m / 7m)$

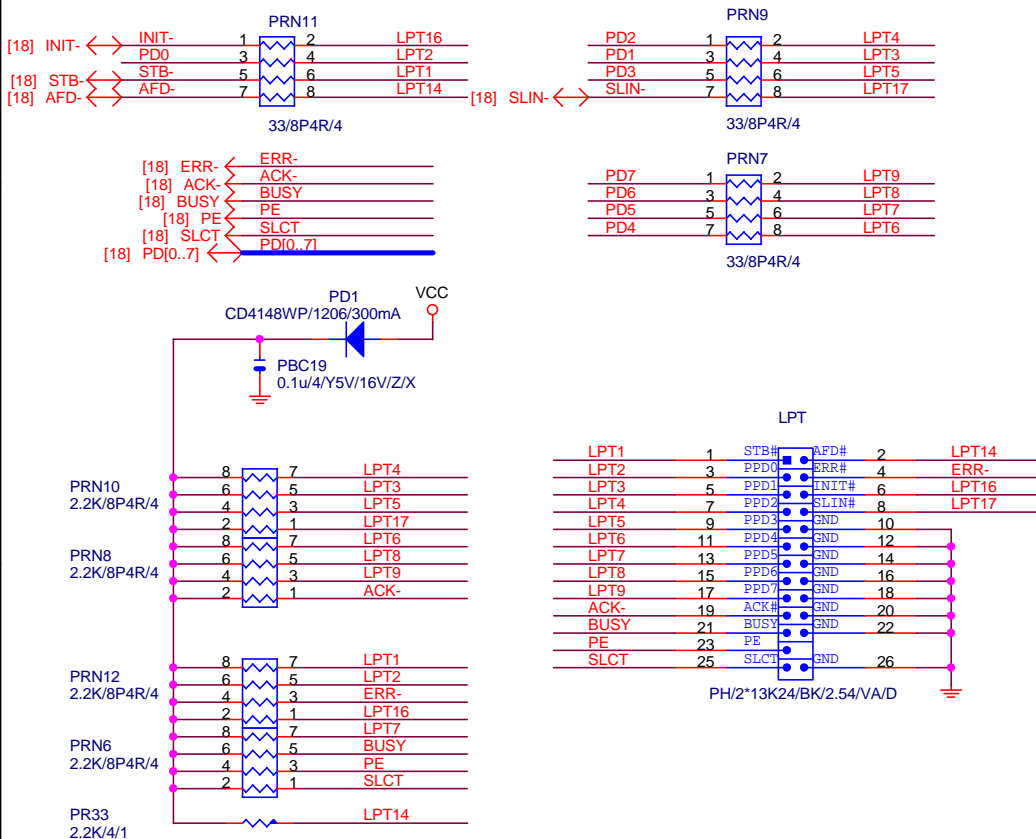
Gigabyte Technology

Title			
DDR POWER			
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## TPM



## LPT PORT



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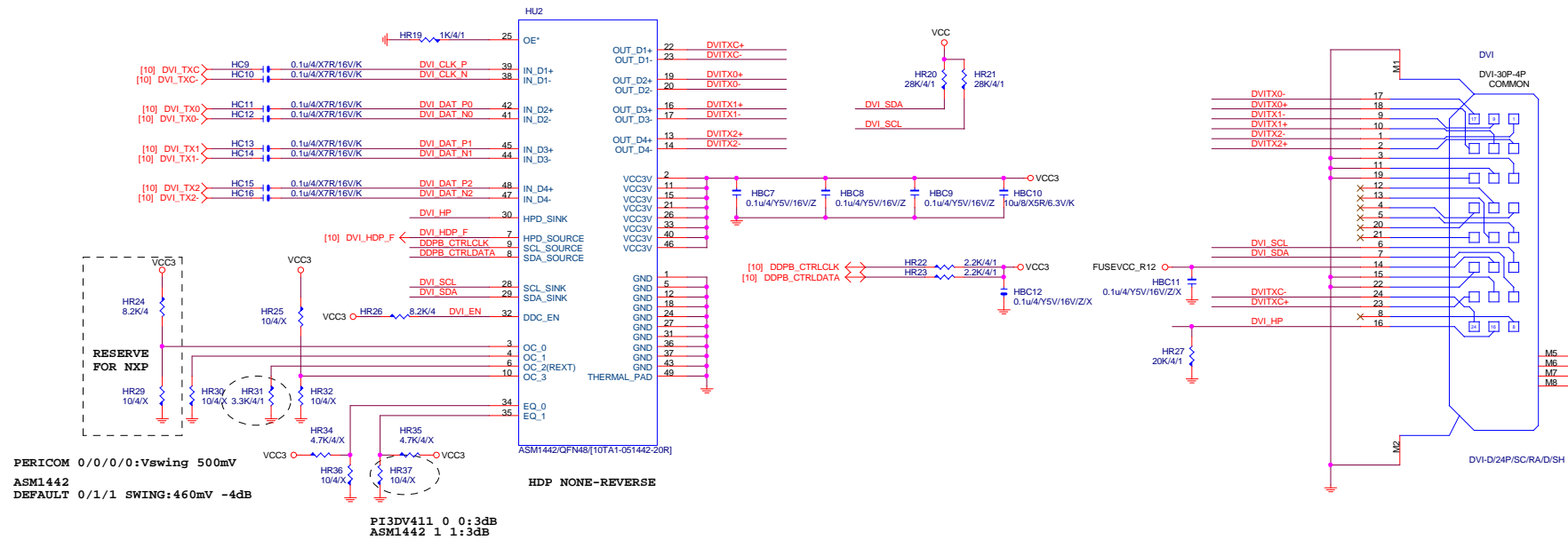
LPT

GA-Z77M-D3H-MVP

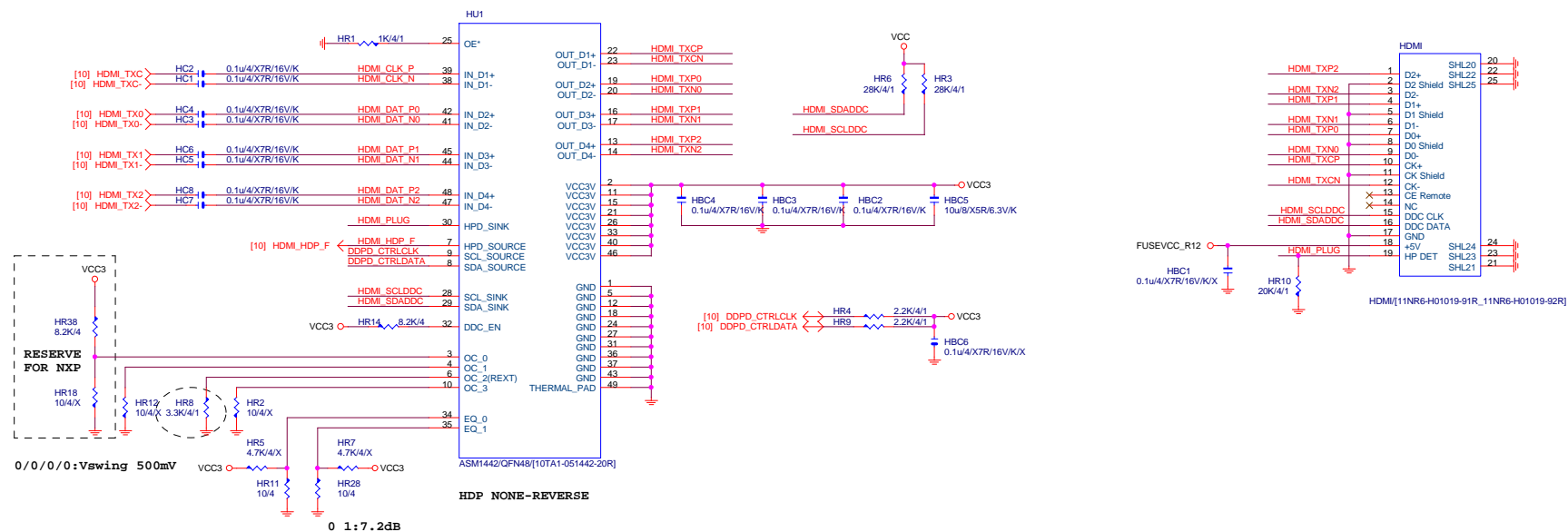
Rev  
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## DVI LEVEL SHIFT

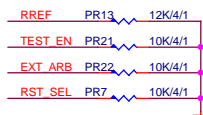
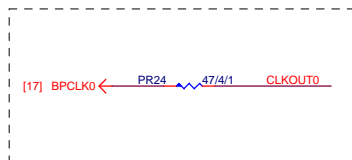
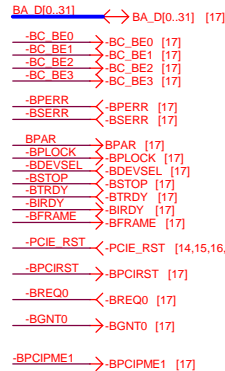


## HDMI LEVEL SHIFT



## PCIE TO PCI

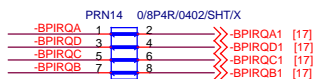
PCI:5/4/5 Impedance=50 +- 15%



```
High: Enable PCI CLK 66MHz
Low: Disable PCI CLK 66MHz
```



High: PCICLK INPUT form CLK Gen  
Low: PCICLK OUTPUT form IT8893 chip

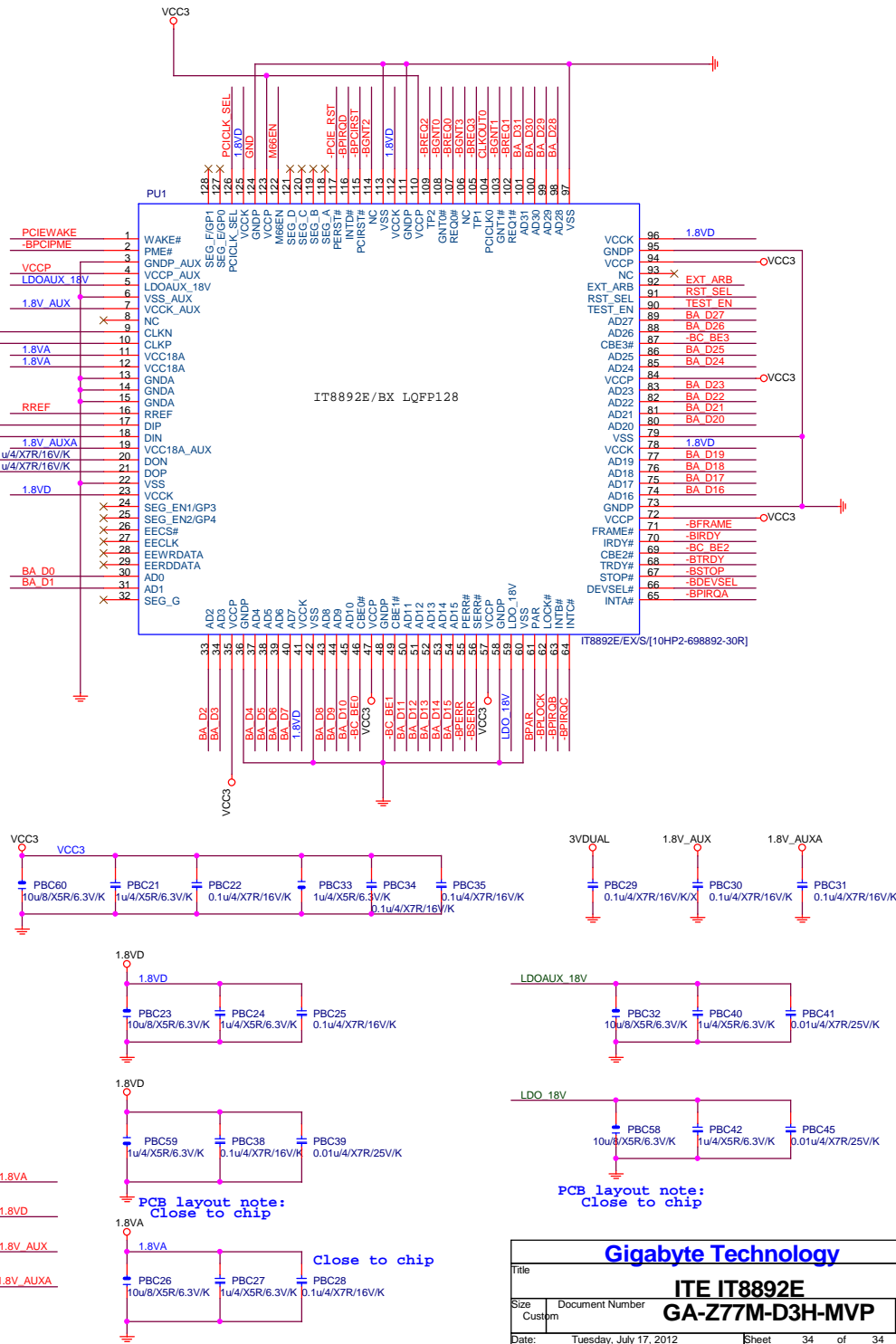
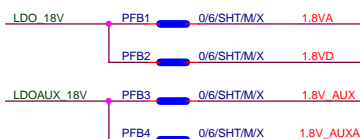
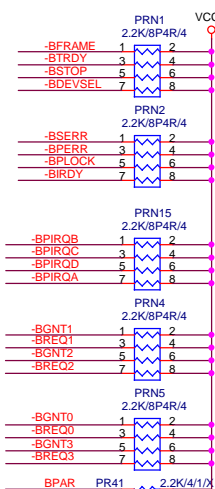
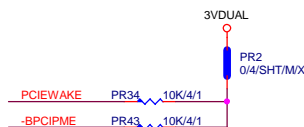


PCI slot

PCI slot

-BPCIPME1 PR27 0/4/SHT/M/X \ \ -PCIE WAKE [12 14 15 16 25

chipset side



PCB layout note:  
Close to chip

## Gigabyte Technology

**ITE IT8892E**

GA-Z77M-D3H-MVP

## 1.1