

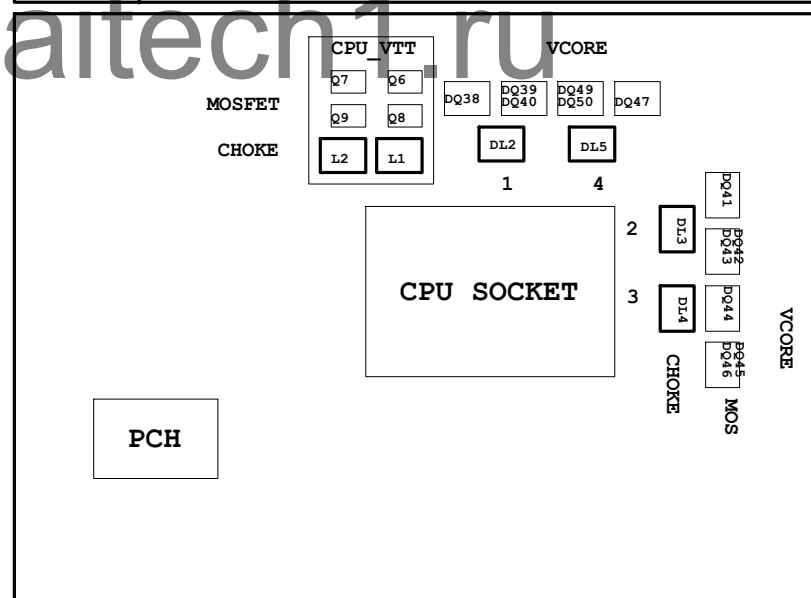
Model Name: GA-Z68A-D3-B3 1.0

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	PCI EXPRESSX4 SLOT / PCIE X1 SLOT
16	IT8892
17	PCI SLOT 1&2&3
18	I/O ITE8728
19	COM, LPT, TPM
20	Dual BIOS
21	ALC889
22	REAR AUDIO JACK
23	VCORE PWM ISL6364CRZ-1
24	VCORE PWM ISL6364CRZ-2
25	DISCRETE POWER
26	DDR 15V & VCC1 05 PCH PWM ISL6545CBZ
27	CPU VTT PWM ISL95870

SHEET TITLE

28	VCCSA POWER
29	F PANEL , F USB
30	ATX POWER, CLOCK GEN
31	HWM,KB/MS , FAN CTRL
32	REALTEK RTL8111E
33	ETRON 168A
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Gigabyte Technology			
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Component value change history

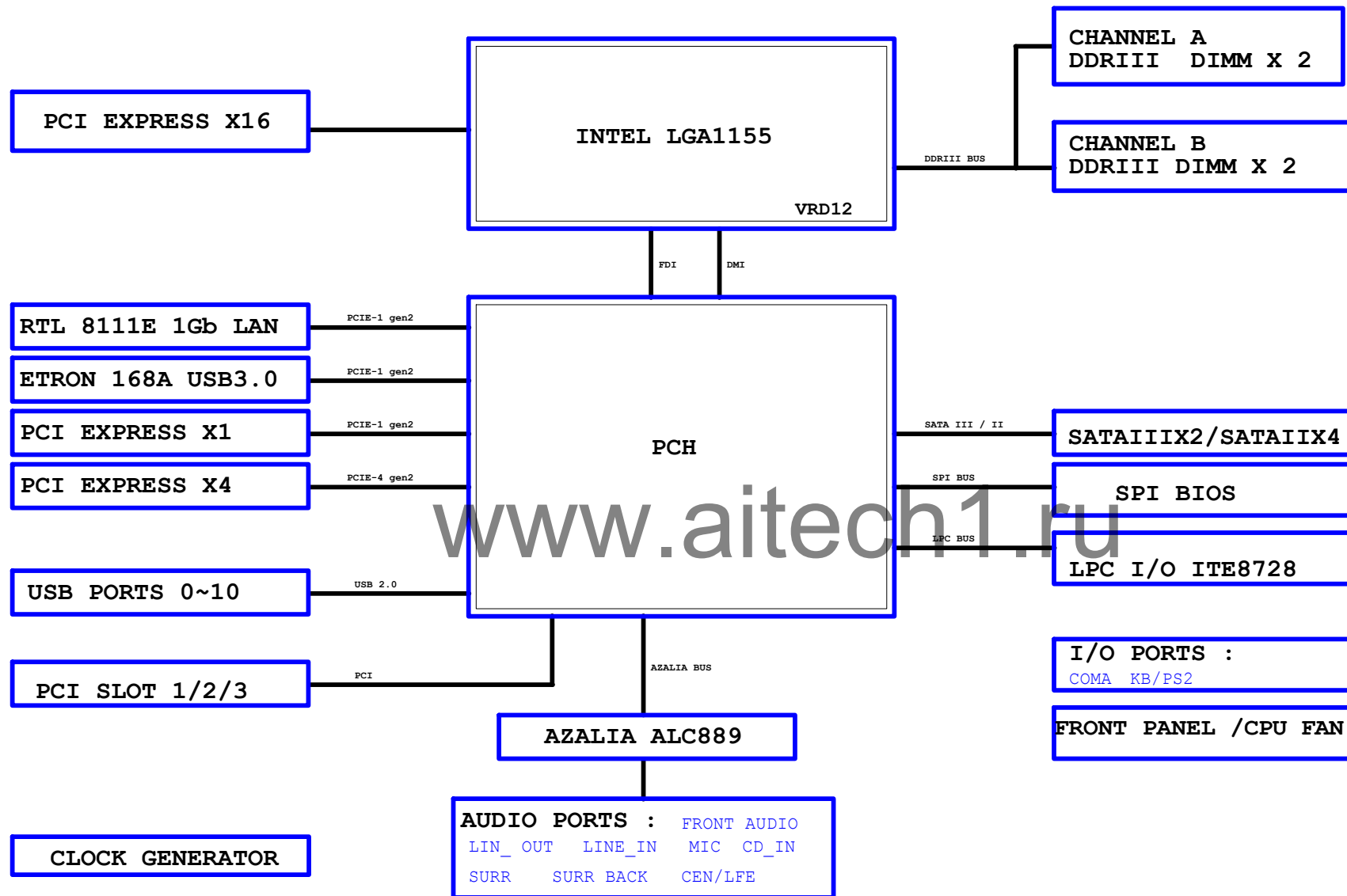
Data	Change Item	Reason
2010/11/11 EBOM:01	1. H61/P67 Mounting plan	
	2. ALC892 銅製程 & NEC Lo-power mounting plan	
	3. CHOKE mounting	
2010/11/11 EBOM:01	1. U8第一PIN標示與BC141重疊不易辨識	
	2. PCH_HS定位孔與RN9、RN10距離不足2mm	
PA65-D3-0.1	1. 注意改成電解電容時REC2應該是用100uF	
	2. Add RBC39 22u/8	
	3. MOSFET --> NEC+ON	
	4. Add 文字面 "108dB"	
	5. Add USB_LAN "11NR6-702009-93R"	
	6. VIN背板銷銅移除	
	7. 文字面 "DES"移除	
	8. F_AUDIO Connect 改成綠色	
	9. REMOVE SE9172 SPI FLASH	
PA65-D3-1.0	1. L01 RTL8111E-VL	
	2. 文字面 "Ultra Durable 2"	
	3. 0 OHM SHORT	
	DEL EC26,PEC3,EC10,DEC2	
2011/01/28 EBOM:02	e-bom for P67A-D3-0.2	
2011/02/10 EBOM:01	1.RENAME FOR P67A-D3-B3-0.1	
	2.CPU VCORE EC14,DEC4,DEC5,DEC6,TEC8電容移除	
	3.PCH VCC1_05 switch power----->linear power	
	4.PCH B2----->B3料號,R216 51 ---->1K	
2011/02/25 PBOM:10A	1.DR275 1K--->100K,R220 200 OHM---->1K 2.ADD TBC40,TBC41 FOR CPU VTT POWER RIPPLE	
2011/03/07 PBOM:10B	1.DEL R50 FOR 8278DX JP6 ISSUE	
	2.PCH HEATSINK換成有銘板消庫存	
2011/04/07 PBOM:10A	1.由P67A-D3-B3 10B BOM換Z68 CHIP,PCB及包材FOR EVT	
2011/04/11 PBOM:10B	1.Z68 CHIP由20R 換成21R(不同COST,function不變),PCH HEATSINK無銘板)	

Circuit or PCB layout change

DATE	Change Item	Reason
2010/07/05 PCB:0.1	1.NEW MODEL: P67A-D3-0.1	
2010/08/18 PCB:0.2	由GA-P67A-D3-0.1 rename GA-P67A-UD3-0.2	
	1.update MOS_HS footprint 2.20z copper pcb	
2010/10/05 PCB:0.1	由GA-P67A-UD3-0.2 修改	
2010/10/18 PCB:0.2	1.確認SATA 6GB PORT0 OR PORT1???	
	2.NO TURBO USB3.0 ,SUR1-SUR8 ----->SHORT WIRE	
2011/01/10 PCB:0.2	1.NEW MODEL: P67A-D3-0.2 由 P65A-D3-0.2修改	
	1.co-lay 電容移除	
	2.CPU VCORE 電容多留不用的MASK起來	
	3.0 OHM---->SHORT-WIRE	
2011/02/08 PCB:0.1	由0.2修改---->RENAME GA-P67A-D3-B3	
	1.co-lay 電容移除	
	2.CPU VCORE EC14,DEC4,DEC5,DEC6,TEC8電容移除;調整MOS_HS與CHOKE及電容的位置避免撞件	
	3.PCH VCC1_05 switch power----->linear power	
2011/02/24 PCB:1.0	1.CR49,CR50 short-wire ----->open,add LR15 FOR AUDIO line out SNR issue	
	2.DR290,DR293,DR312,DR333,DR351,R264,CR31 0 OHM---->SHORT-WIRE	
	3.背面電容mask	
	4.ADD TBC40,TBC41 to reduce CPU VTT power ripple	
2011/04/06 PCB:1.0	由1.0修改---->RENAME GA-Z68A-D3-B3	

Gigabyte Technology			
BOM & PCB MODIFY HISTORY			
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BLOCK DIAGRAM



Gigabyte Technology			
Title BLOCK DIAGRAM			
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LGA1155A

MAAA0 AV27
MAAA1 AV24
MAAA2 AW24
MAAA3 AW23
MAAA4 AV23
MAAA5 AV23
MAAA6 AT24
MAAA7 AU22
MAAA8 AV22
MAAA9 AT22
MAAA10 AV28
MAAA11 AU21
MAAA12 AT21
MAAA13 AW32
MAAA14 AU20
MAAA15 AT20

7 -SWEA <- -SWEA AV29
7 -SCASA <- -SCASA AV30
7 -SRASA <- -SRASA AU28

7 SBAA0 <- SBAA0 AY29
7 SBAA1 <- SBAA1 AW28
7 SBAA2 <- SBAA2 AV20

7 -CSA0 <- -CSA0 AU29
7 -CSA1 <- -CSA1 AV32
7 -CSA2 <- -CSA2 AW30
7 -CSA3 <- -CSA3 AU33

7 CKEA0 <- CKEA0 AV19
7 CKEA1 <- CKEA1 AT19
7 CKEA2 <- CKEA2 AU18
7 CKEA3 <- CKEA3 AV18

MODT_A0 AV31
MODT_A1 AU32
MODT_A2 AU30
MODT_A3 AW33

7 DCLKA0 <- DCLKA0 AY25
7 -DCLKA0 <- -DCLKA0 AW25
7 -DCLKA1 <- -DCLKA1 AU24
7 -DCLKA1 <- -DCLKA1 AU25
7 -DCLKA2 <- -DCLKA2 AW27
7 -DCLKA2 <- -DCLKA2 AY27
7 DCLKA3 <- DCLKA3 AV26
7 -DCLKA3 <- -DCLKA3 AW26

7,8 -DDR3_RST <- TR1
0.1u4/X7R/16V/K/X
TBC9
0.1u4/X7R/16V/K/X

AV13
AV12
AU12
AU14
AU13
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AU11
AU12
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DDR_0

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SA_DQ[519]

SA_DQS[65]
SA_DQS#65]

SA_DQ[520]
SA_DQ[521]
SA_DQ[522]
SA_DQ[523]
SA_DQ[524]
SA_DQ[525]
SA_DQ[526]
SA_DQ[527]

SA_DQS[66]
SA_DQS#66]

SA_DQ[528]
SA_DQ[529]
SA_DQ[530]
SA_DQ[531]
SA_DQ[532]
SA_DQ[533]
SA_DQ[534]
SA_DQ[535]

SA_DQS[67]
SA_DQS#67]

SA_DQ[536]
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SA_DQ[540]
SA_DQ[541]
SA_DQ[542]
SA_DQ[543]

SA_DQS[68]
SA_DQS#68]

SA_DQ[544]
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SA_DQ[551]

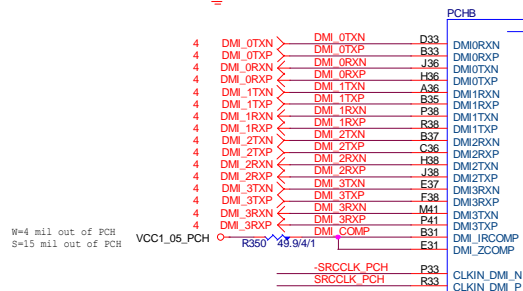
SA_DQS[69]
SA_DQS#69]

SA_DQ[552]
SA_DQ[5

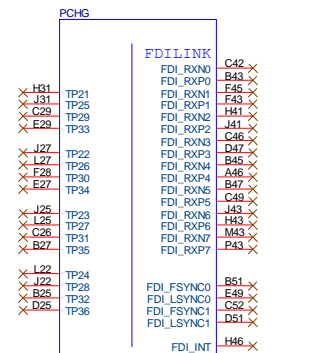




USB:12/7.5/4.5/7.5/12 (breakout min 8/4/4/4/8)
Impedance=90 +/- 17.5%



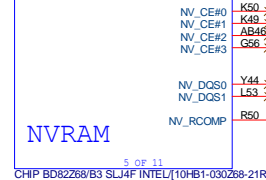
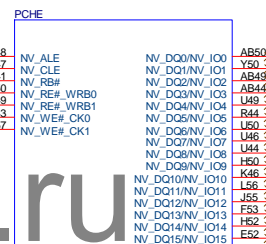
H61 CHIP USB PORT 6/7
are Disable



7 OF 11
CHIP BD82268/B3 SLJ4F INTEL[10H61-030268-21R]

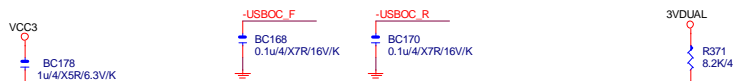
OC[3:0]# for
Device 29
(ports 0-7)
OC[7:4]# for
Device 26
(ports 8-13)

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



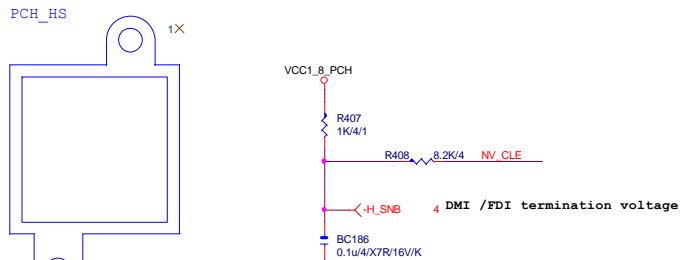
5 OF 11
CHIP BD82268/B3 SLJ4F INTEL[10H61-030268-21R]

放靠近 Device & PCI-E Slot
PCIEX1:16/5/5/16 (breakout min 8/4/4/8)
Impedance=80 +/- 17.5%



VCC1_05_PCH R244 8.2K/4/X DOTCLK
Mount for non-graphics skus

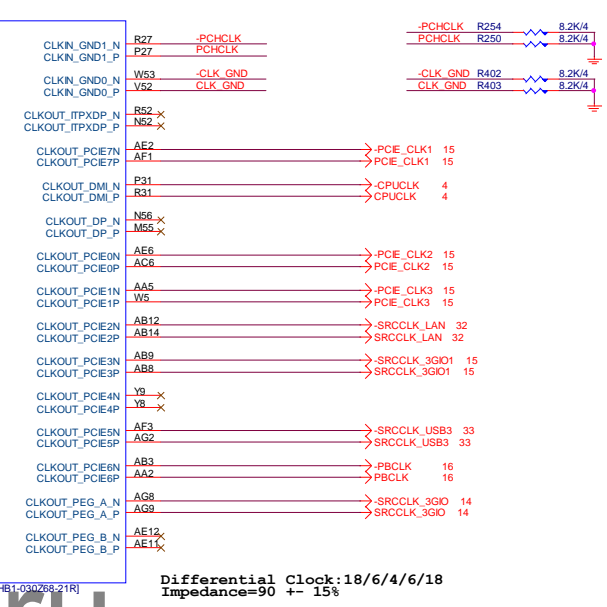
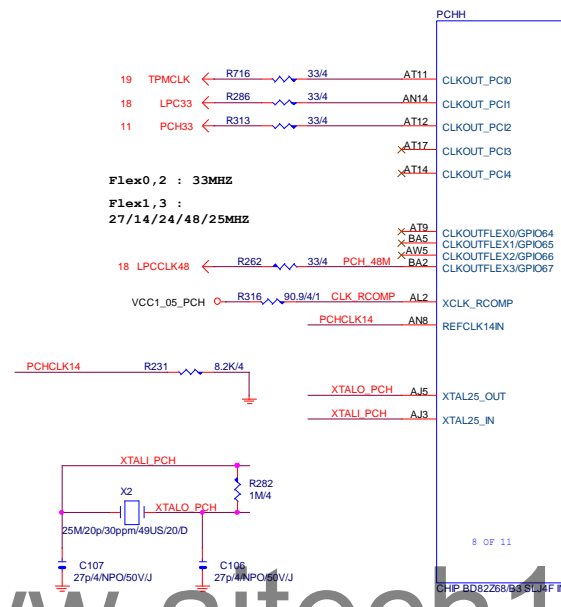
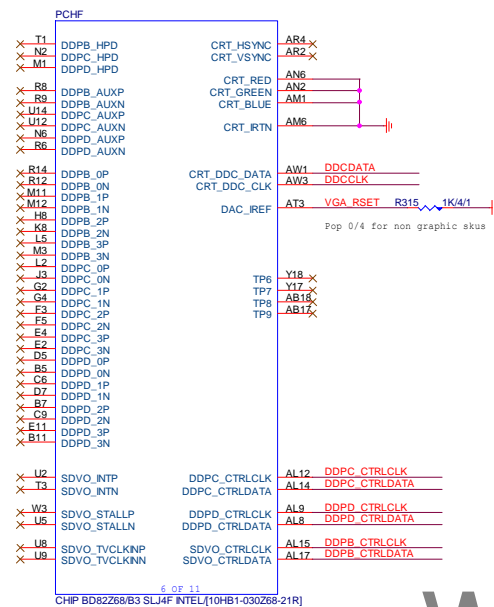
DOTCLK R246 8.2K/4
-DOTCLK R251 8.2K/4
R102 short to GND in non graphic SKU



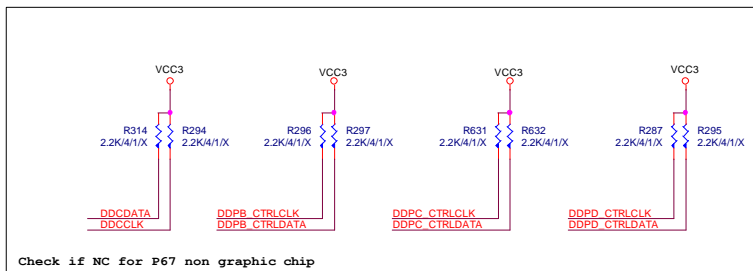
HEAT SINK/H67MA-D2H/PCH/KW/GER[12SP2-050072-11R_12SP2-050072-12R_12SP2-050072-13R]

Gigabyte Technology

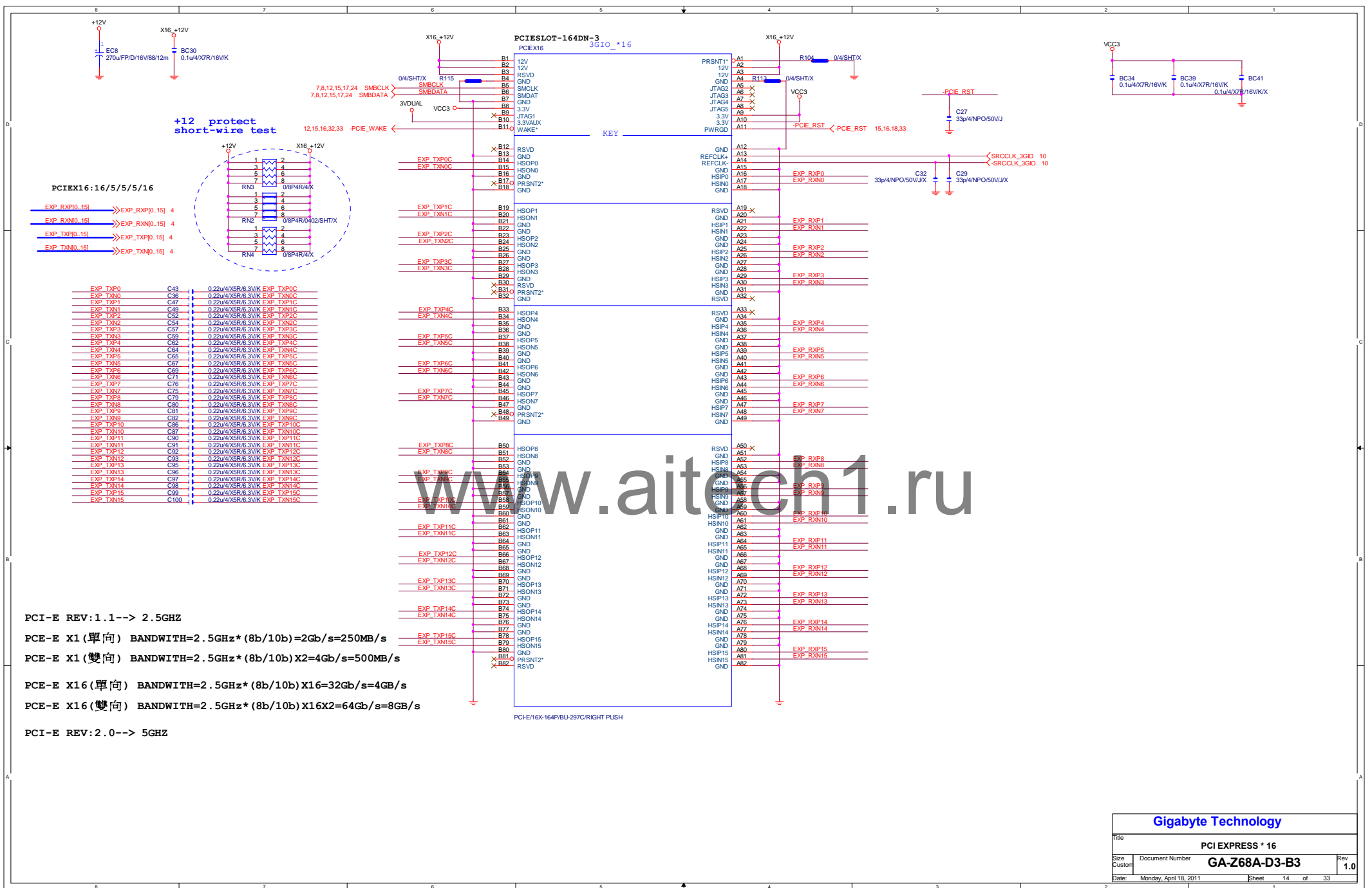
Title			PCH FDI,DMI,USB ,PCIE
Size	Document Number	Rev	
Custom	GA-Z68A-D3-B3	1.0	
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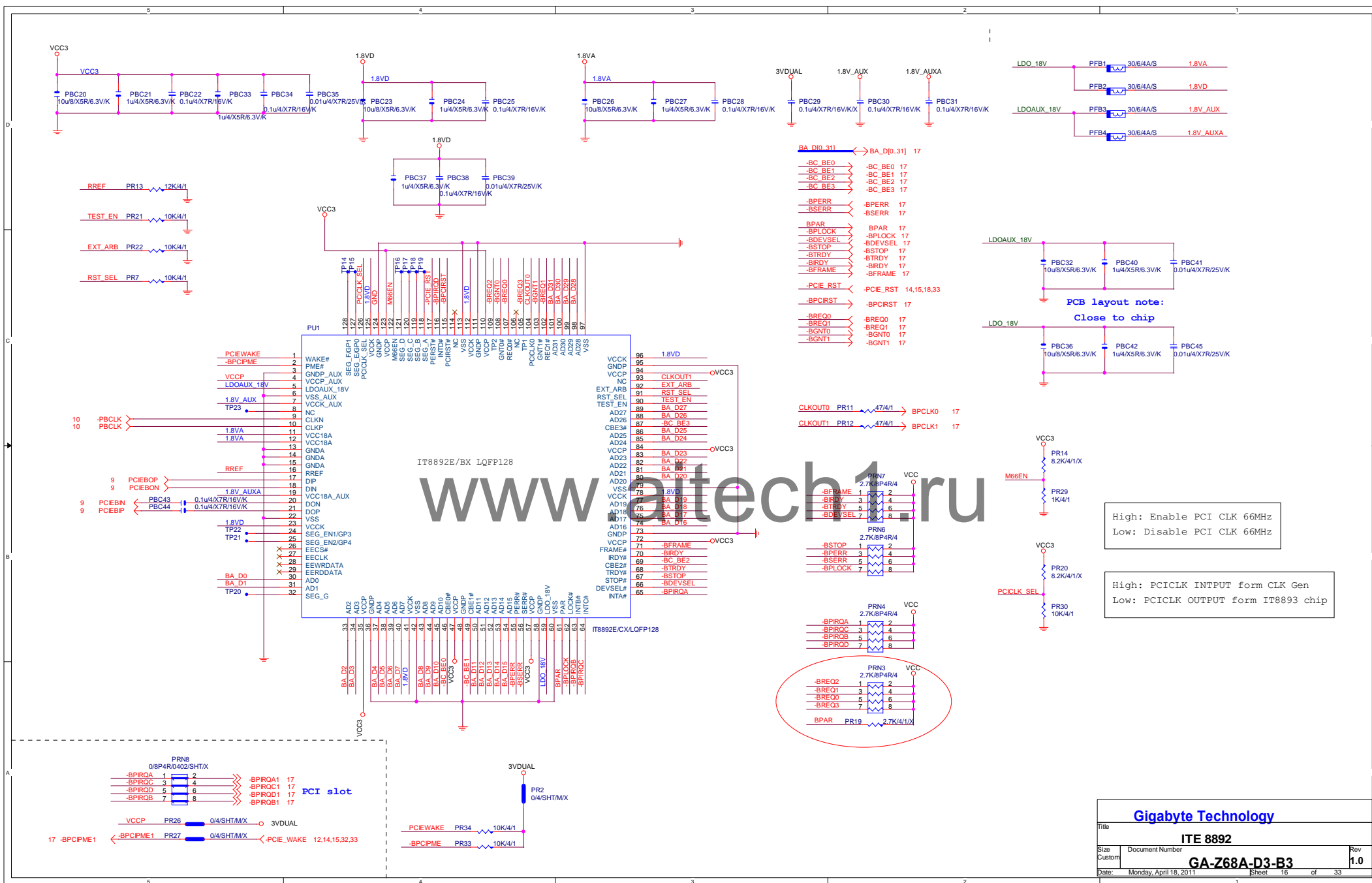
Differential Clock:18/6/4/6/18
Impedance=90 +- 15%

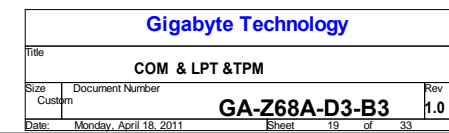
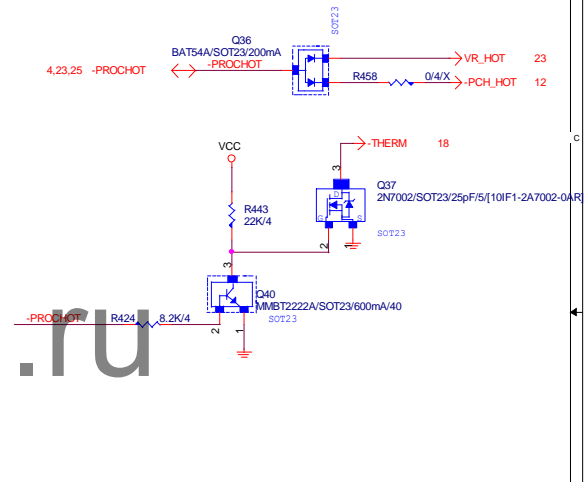
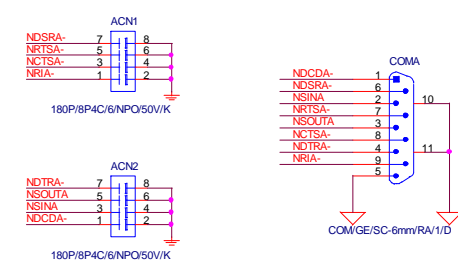
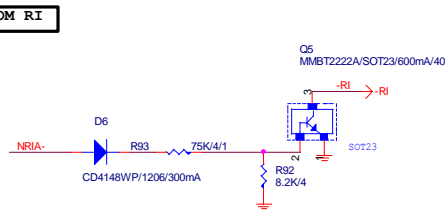


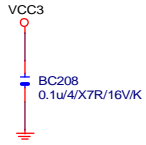
Gigabyte Technology			
Title			
PCH DISPLAY ,CLK BUFFER			
Size	Document Number	Rev	
Custom	GA-Z68A-D3-B3	1.0	
Date:	Monday, April 18, 2011	Sheet	10 of 33





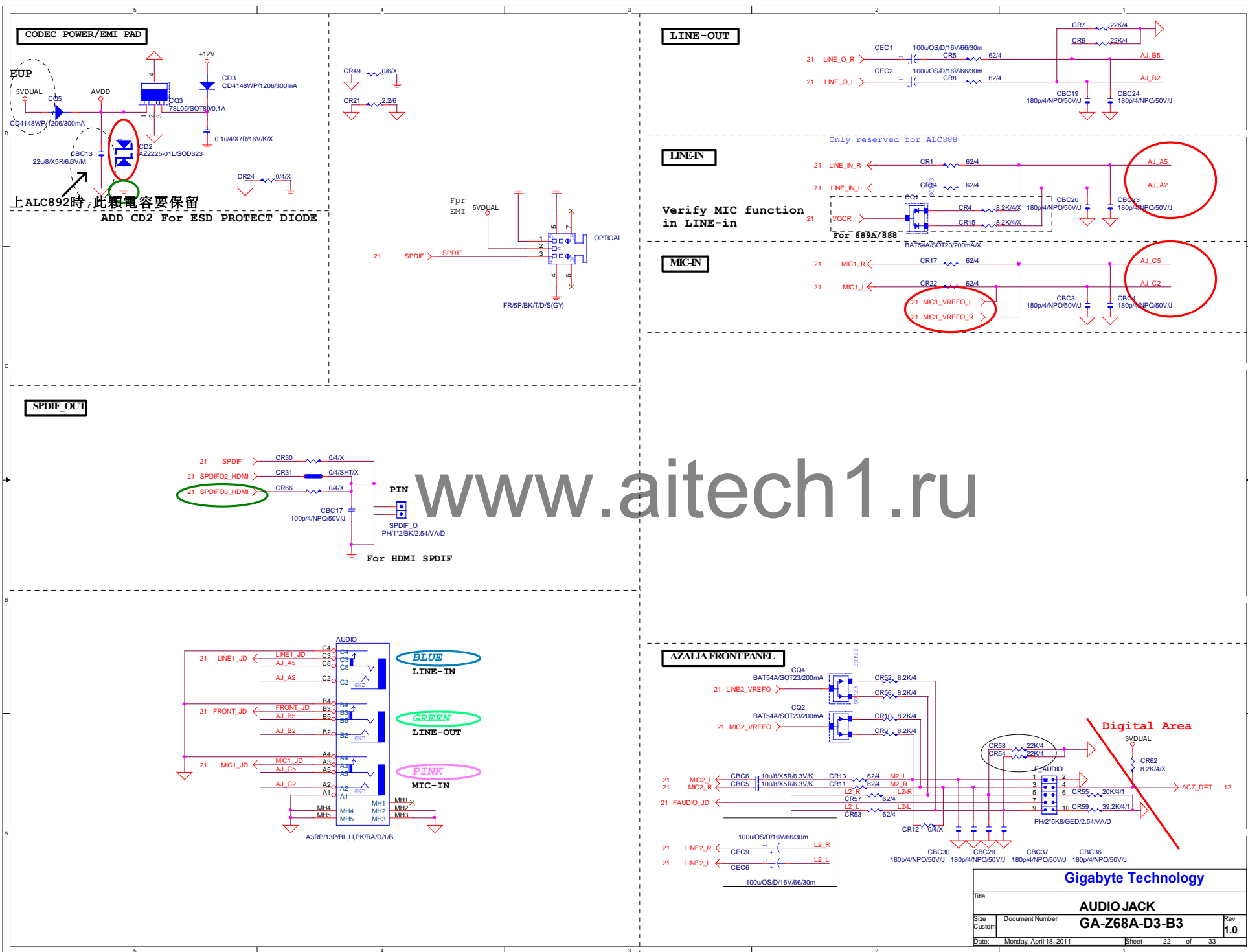




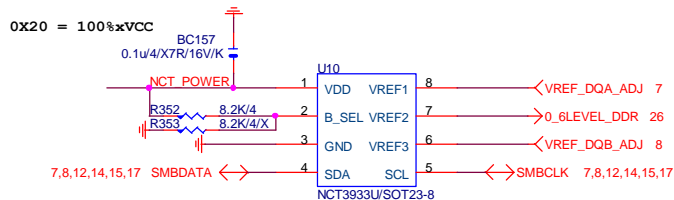
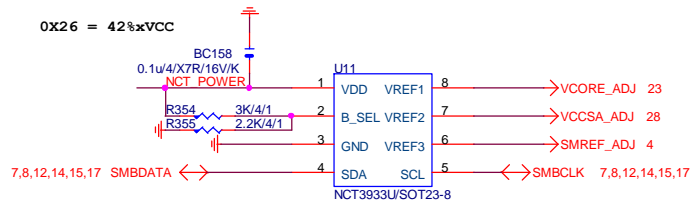
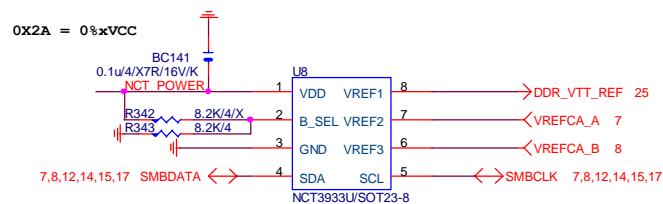
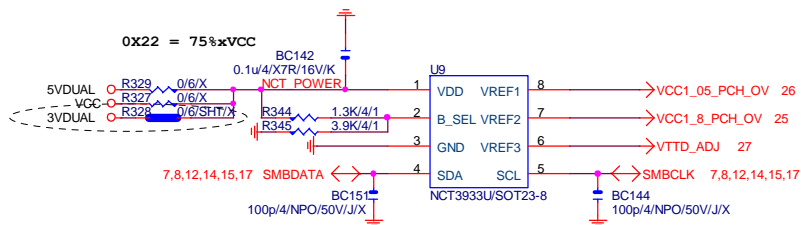


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Gigabyte Technology			
Title		BIOS	
Size	Document Number	GA-Z68A-D3-B3	Rev
Custom			1.0
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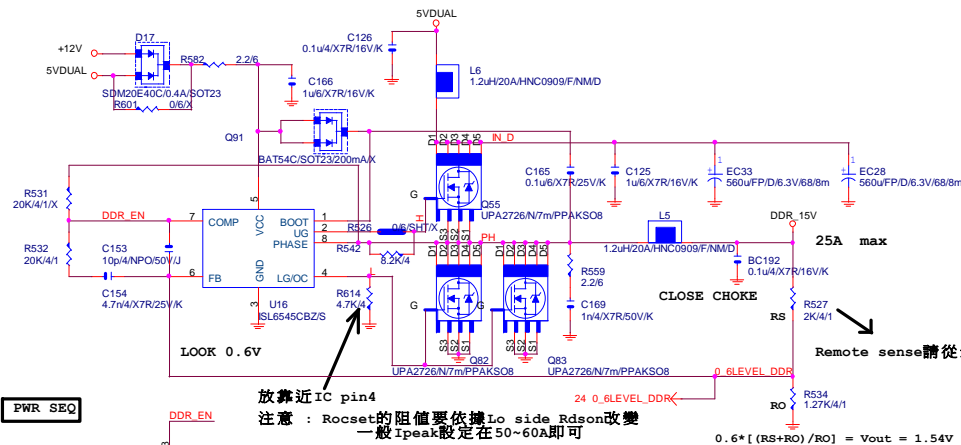
up6262	0X2A	0X20	0X22	0X26
VREF1	DDR_VTT	VREF_DDRA_DQ	VCC1_05_PCH	VCORE
VREF2	VREF_DDRA_CA	DDR15V	VCC1_8_PCH	VCCSA
VREF3	VREF_DDRA_CAV	VREF_DDRB_DQ	CPU_VTT	SMREF

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Gigabyte Technology			
Title CPU CORE VR-2			
Size Custom	Document Number	Rev 1.0	
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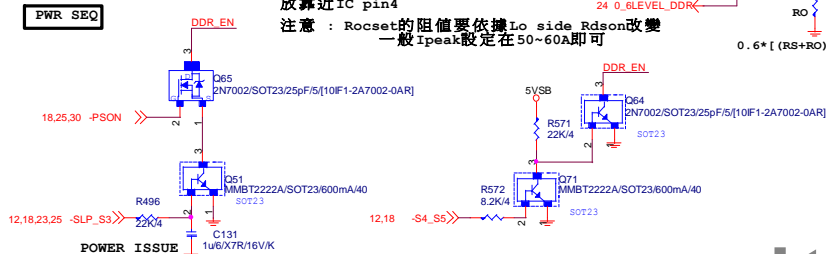
DDR18V



VIN=5V, VOUT=1.5V, IOUT=25A, PHASE=1
 IRMS=11.45A
 560uF/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

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

PWR SEQ

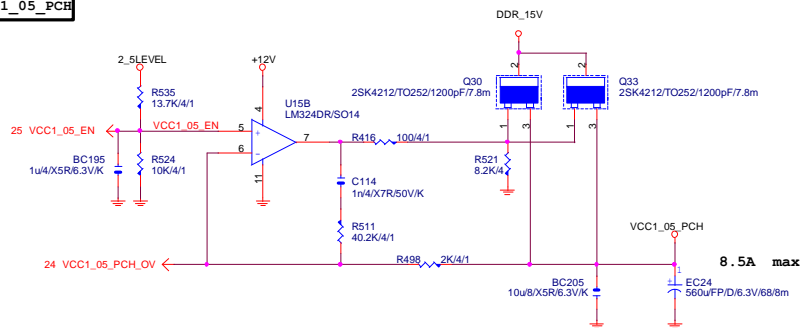


放靠近IC pin4
 注意 : Rocset的阻值要依據Lo side Rdsen改變
 一般Ipeak設定在50~60A即可

$$0.6 * [(RS + RO) / RO] = V_{out} = 1.54V$$

Remote sense請從最重的負載端點拉回

VCC1_05_PCH

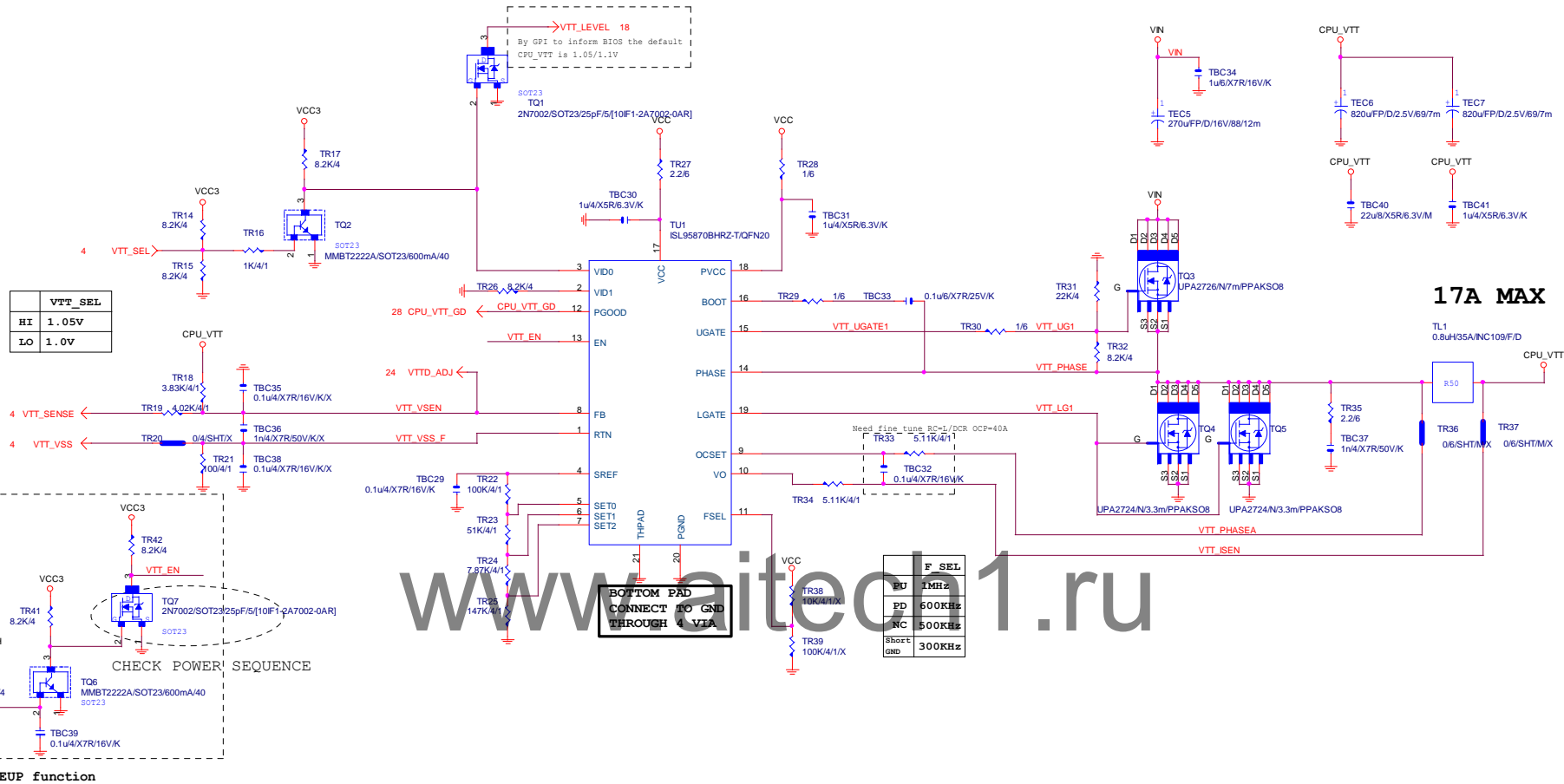


VIN=3.3V, VOUT=1.05V, IOUT=8.5A, PHASE=1
 IRMS=3.959A
 560uF/D/6.3V/68/8m RIPPLE CURRENT=4.7A
 Coefficient=1.7 (85°C), 1 (105°C)
 VIN Ripple current=4.7X1.7=7.99A (85°C)
 -->故固態電容須2X7.99=15.98>11.45A

OCF : $I_{peak} = (2 \times I_{ocset} \times R_{ocset}) / R_{dson}$
 typ $I_{ocset} = 20\mu A$, $R_{ocset} = 8.2k$
 OCF : $46.86A = (2 \times 20\mu A \times 8.2k) / 7m$

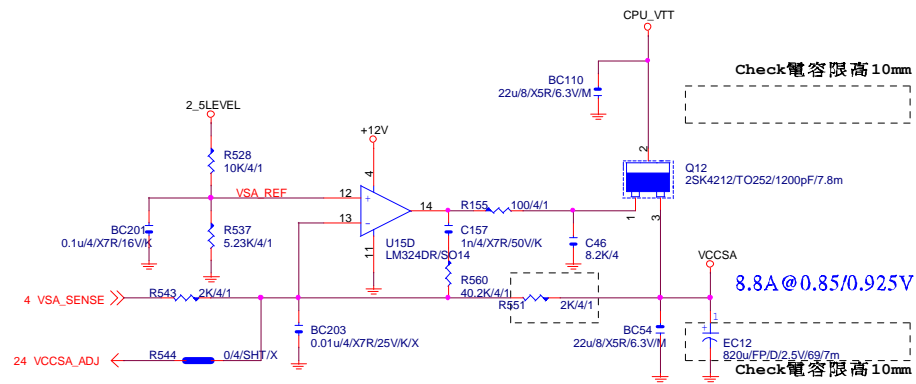
Gigabyte Technology			
Title	DDR_15V		
Size	Custom	Document Number	Rev
GA-Z68A-D3-B3			1.0
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CPU VTT

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Title			
CPU_VTT PWM_ISL95870			
Size	Document Number	Rev	
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VCC_SA

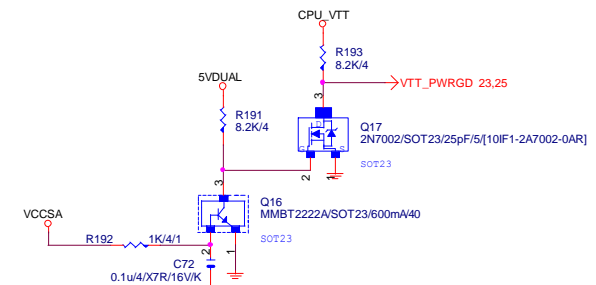
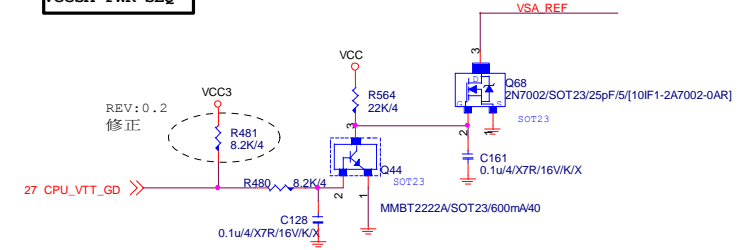


PDG 1.01

VSA_SEL	
HI	0.85V
LO	0.925V

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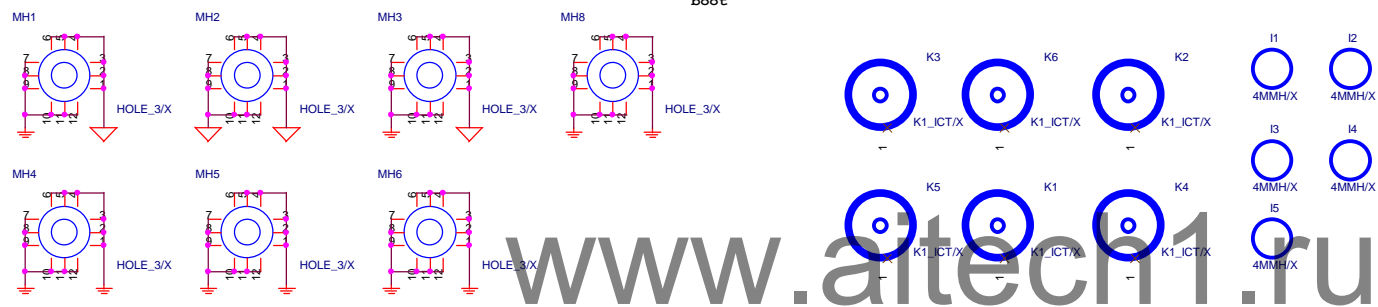
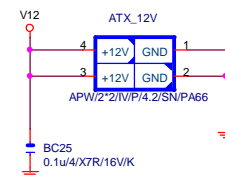
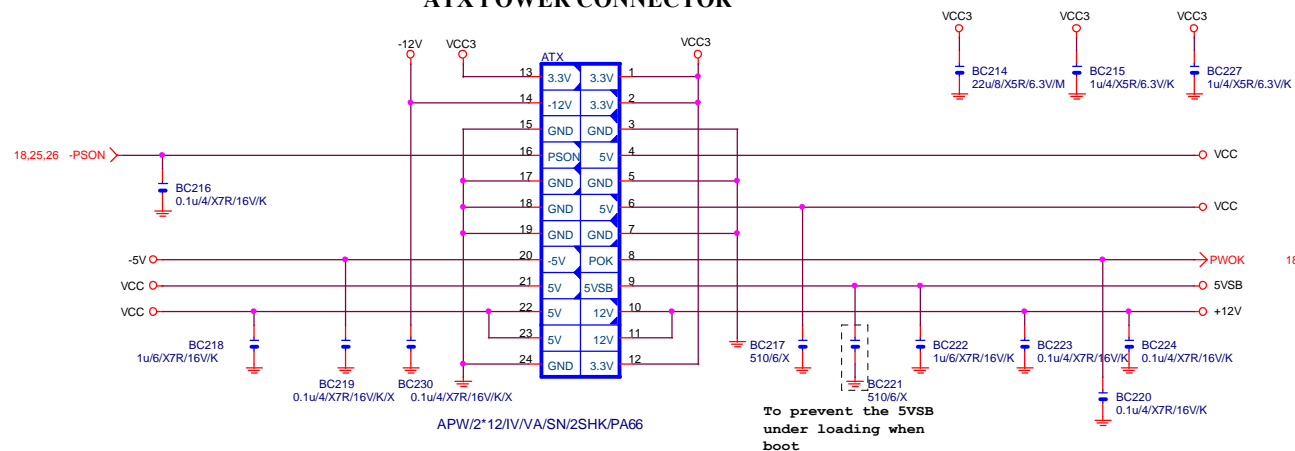
VCCSA PWR SEQ



Gigabyte Technology

Title			
CPU VTT PWM_ISL6312			
Size	Document Number		Rev
Custom	GA-Z68A-D3-B3		1.0
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ATX POWER CONNECTOR

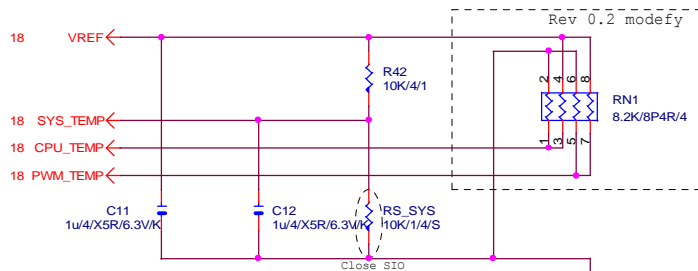


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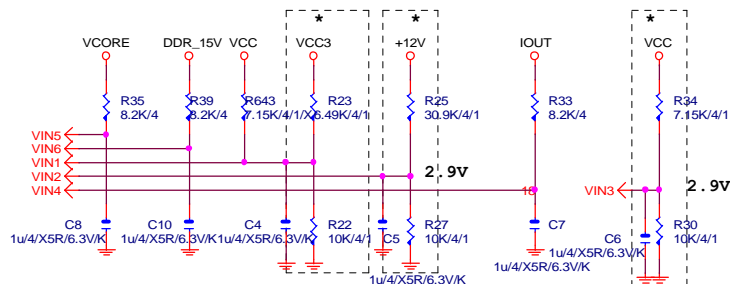
Gigabyte Technology

Title			
ATX POWER CONNECTOR			
Size	Document Number		Rev
Custom	GA-Z68A-D3-B3		1.0
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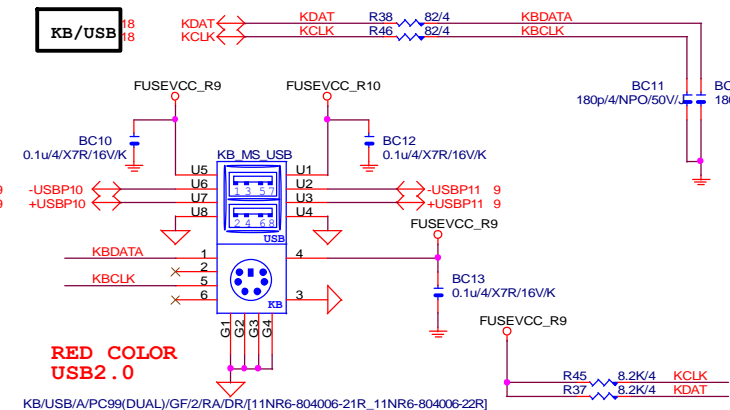
TEMP H/W MONITOR



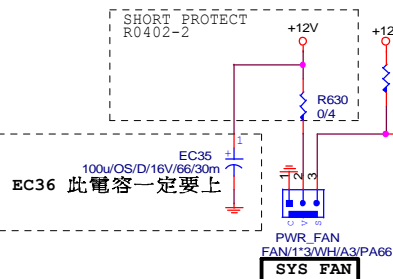
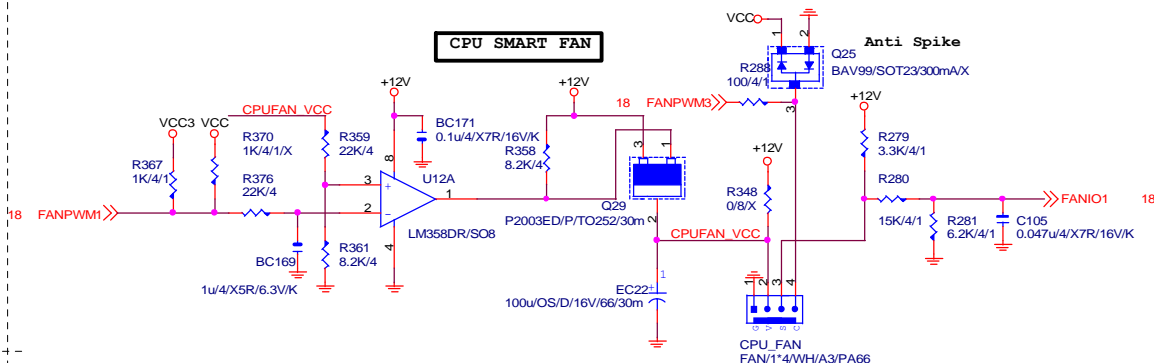
VOLTAGE-- H/W MONITOR



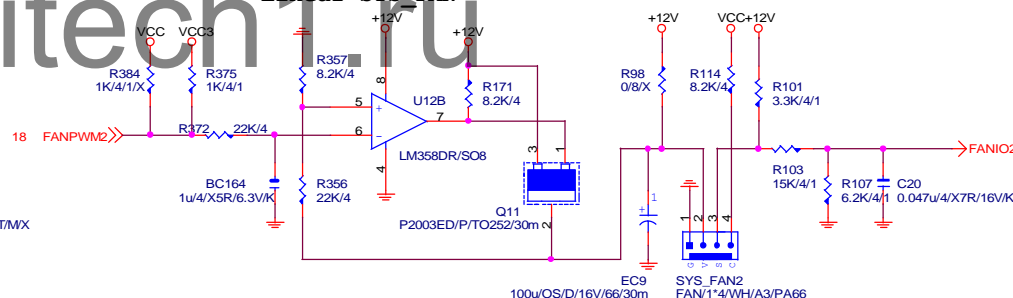
KB/USB



CPU SMART FAN



Linear SYS FAN



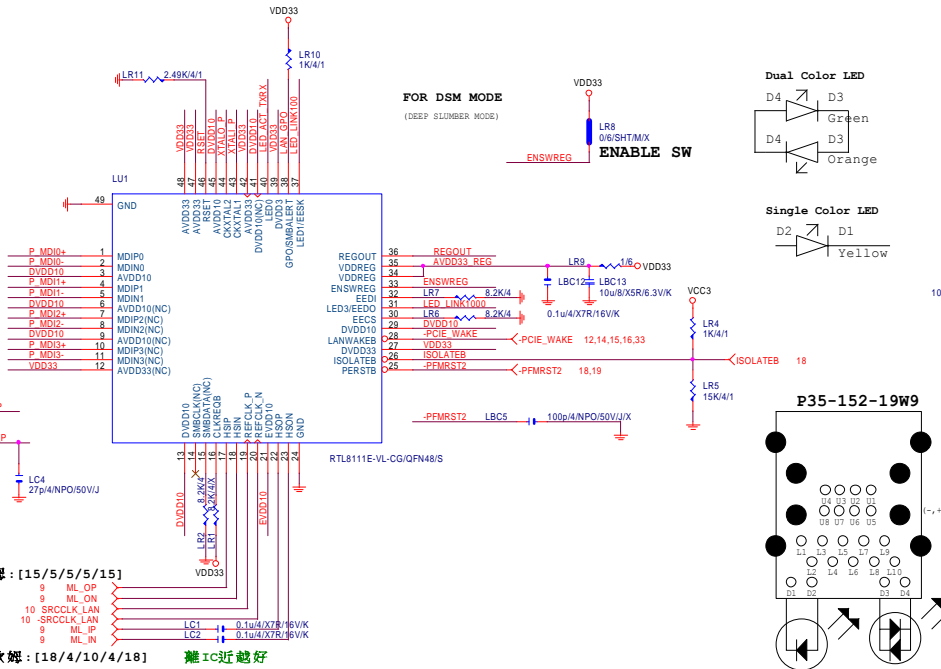
Gigabyte Technology

Title			HWM,KB/MS, FAN CTRL
Size	Document Number	Rev	
Custm	GA-Z68A-D3-B3	1.0	
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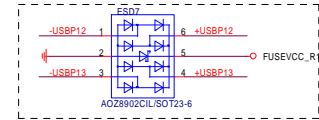
PCIE-1G LAN

Power domain chart

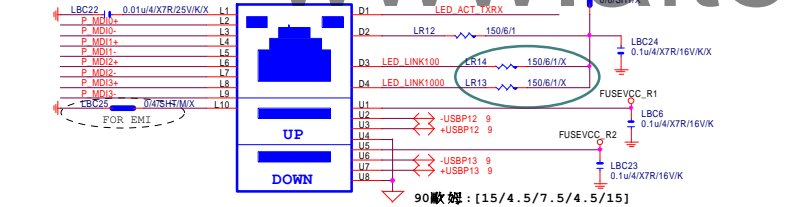
AVDD33	3.3V
DVDD33	3.3V
VDDREG	3.3V
DVDD10	1.05V



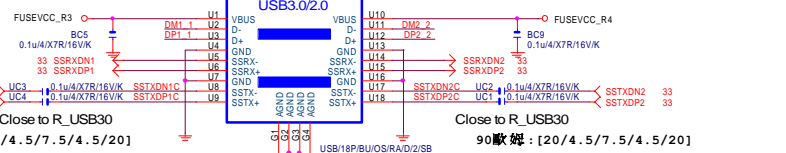
USB30_LAN CONNECTOR



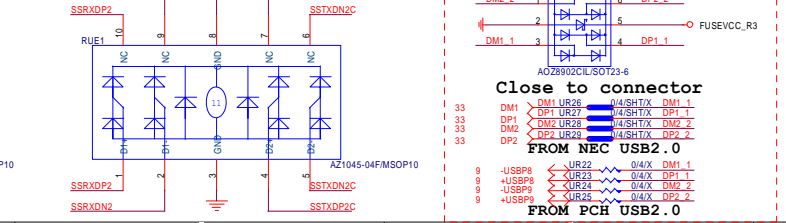
100 歐姆: [20/4/8/4/20]



90 歐姆: [15/4.5/7.5/4.5/15]



90 歐姆: [20/4.5/7.5/4.5/20]



90 歐姆: [20/4.5/7.5/4.5/20]



90 歐姆: [20/4.5/7.5/4.5/20]

90 歐姆: [20/4.5/7.5/4.5/20]

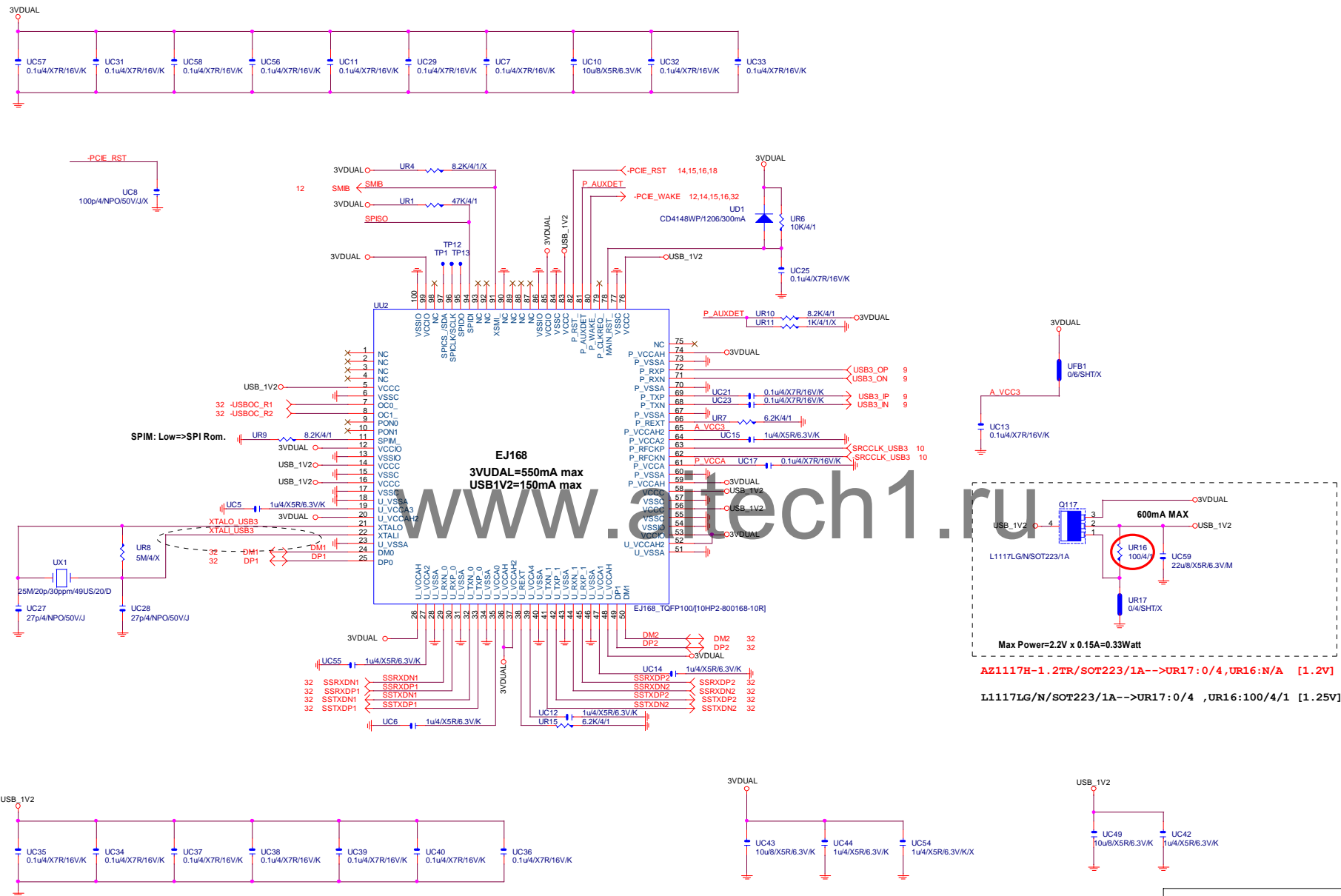
90 歐姆: [20/4.5/7.5/4.5/20]

90 歐姆: [20/4.5/7.5/4.5/20]

90 歐姆: [20/4.5/7.5/4.5/20]

90 歐姆: [20/4.5/7.5/4.5/20]

90 歐姆: [20/4.5/7.5/4.5/20]



GIGABYTE™		
Title EJ168		
Size Custom	Document Number GA-Z68A-D3-B3	Rev 1.0
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