

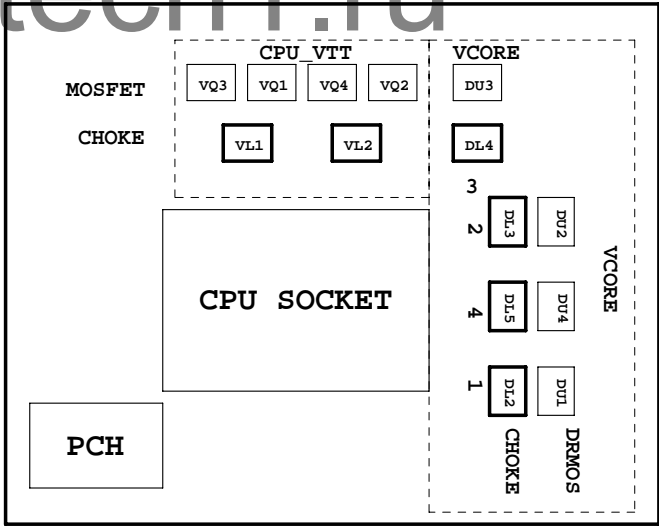
Model Name: GA-Z68X-UD3-B3 1.02

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 EXPRESS*8 SLOT
16	PCI EXPRESS*16/*8 SWITCH
17	PCI EXPRESS*1 SLOTS X3
18	PI7C9X113SL
19	PI7C9X113SL POWER
20	PCI SLOT 1&2
21	I/O ITE8728
22	COM, -PROHOT, ESATA CONNECT
23	Dual BIOS , TPM SLB9635TT
24	ALC892
25	REAR AUDIO JACK
26	VCORE PWM_ISL6366CRZ-1
27	VCORE PWM_ISL6366CRZ-2

SHEET TITLE

28	VCORE PWM_ISL6366CRZ-3
29	DISCRETE POWER I
30	DDR_15V & VCC1_05_PCH PWM_ISL6545CBZ
31	CPU_VTT PWM_ISL6322G
32	VCCSA POWER
33	F_PANEL , F_USB , FDD
34	ATX POWER, CLOCK GEN
35	HWM,KB/MS , FAN CTRL
36	REALTEK RTL8111E
37	ESATA SE9128
38	FRONT NEC USB3.0
39	REAR NEC USB3.0
40	TABLE LIST



Component value change history

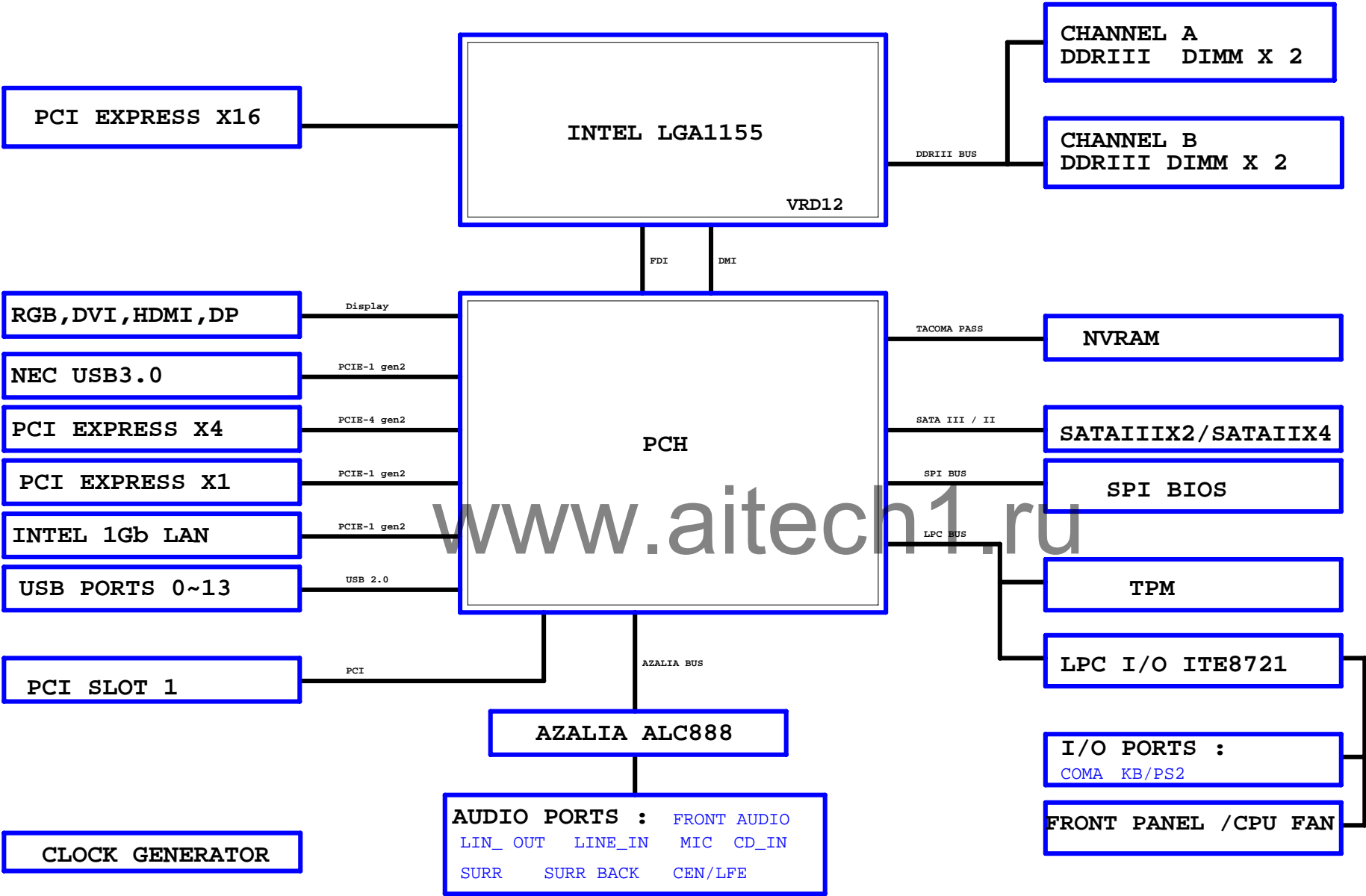
[illegible]

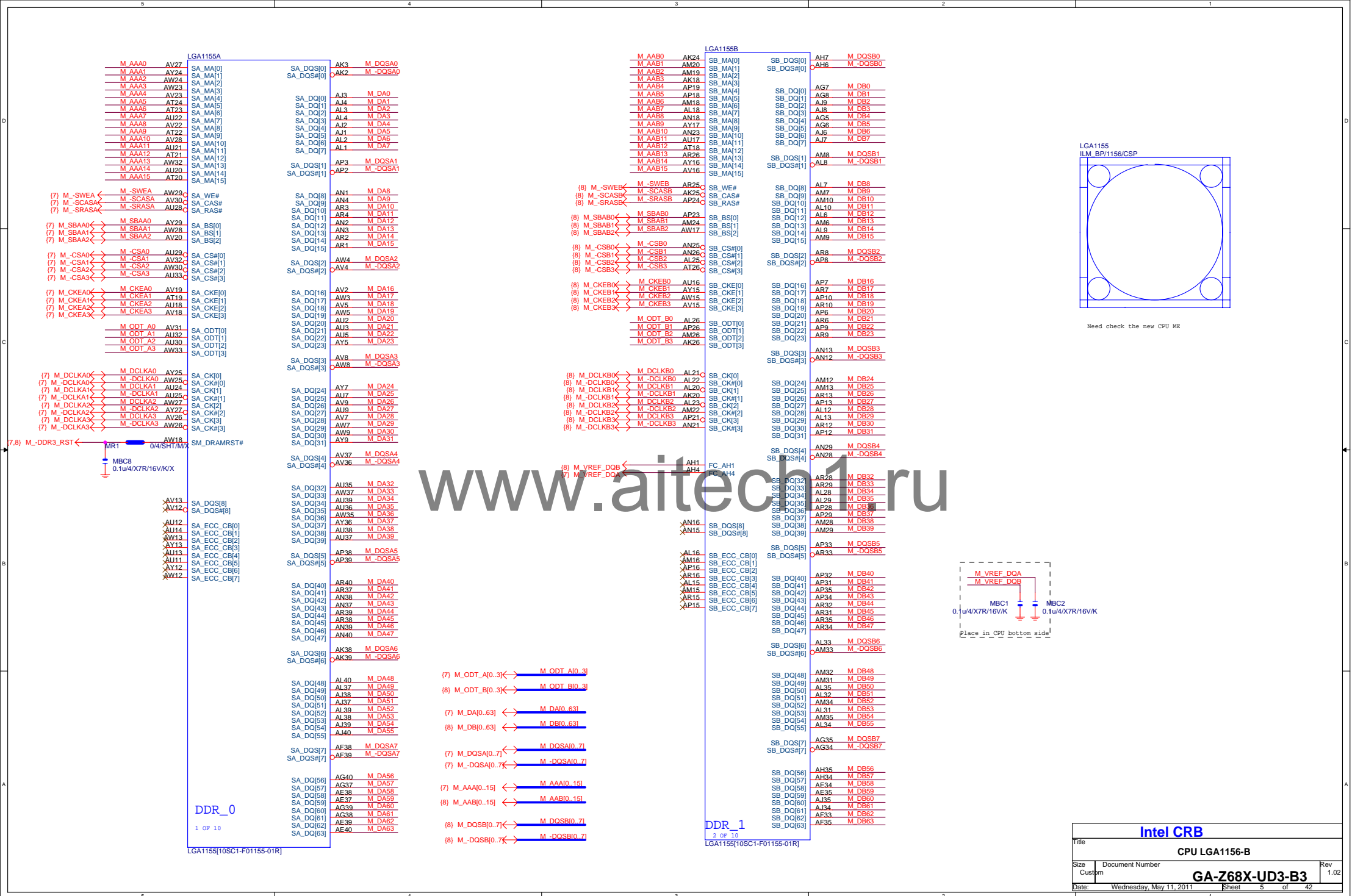
DATE	Change Item	Reason
P67X-UD3-B3 REV0.1	1. EVT Release	
	1. 移除LAR11 ,LAR14 , NR28 ,新增NTP11 2. 新增DR388,DR389,DR391 ; Remove DQ49,DR347,DR371 3. CR44改成R0603-RH 4. R1,LAR3,RBR20,LABC25 -->R0402-2-SHORT 5. RAQ1 --> Q_TO223-MASK 6. RARN1 --> R8P4R-0402-SHORT 7. CESD1-5 --> SSOP5 8. RAQ2,RAEC1一起往下移40mil 9. CESD2文字面要标pin1	
P67X-UD3-B3 1.0-0308	1. Add "Dolby" logo	
1.02	1. UAFB1,UAFB2,UBF1,UBF2 Footprint update 1206-->1812 2. Add "AD1" FOR 5VSB	
Z68X-UD3-B3 1.02	1. 文字面 : F67X-UD3-B3 --> Z68X-UD3-B3	

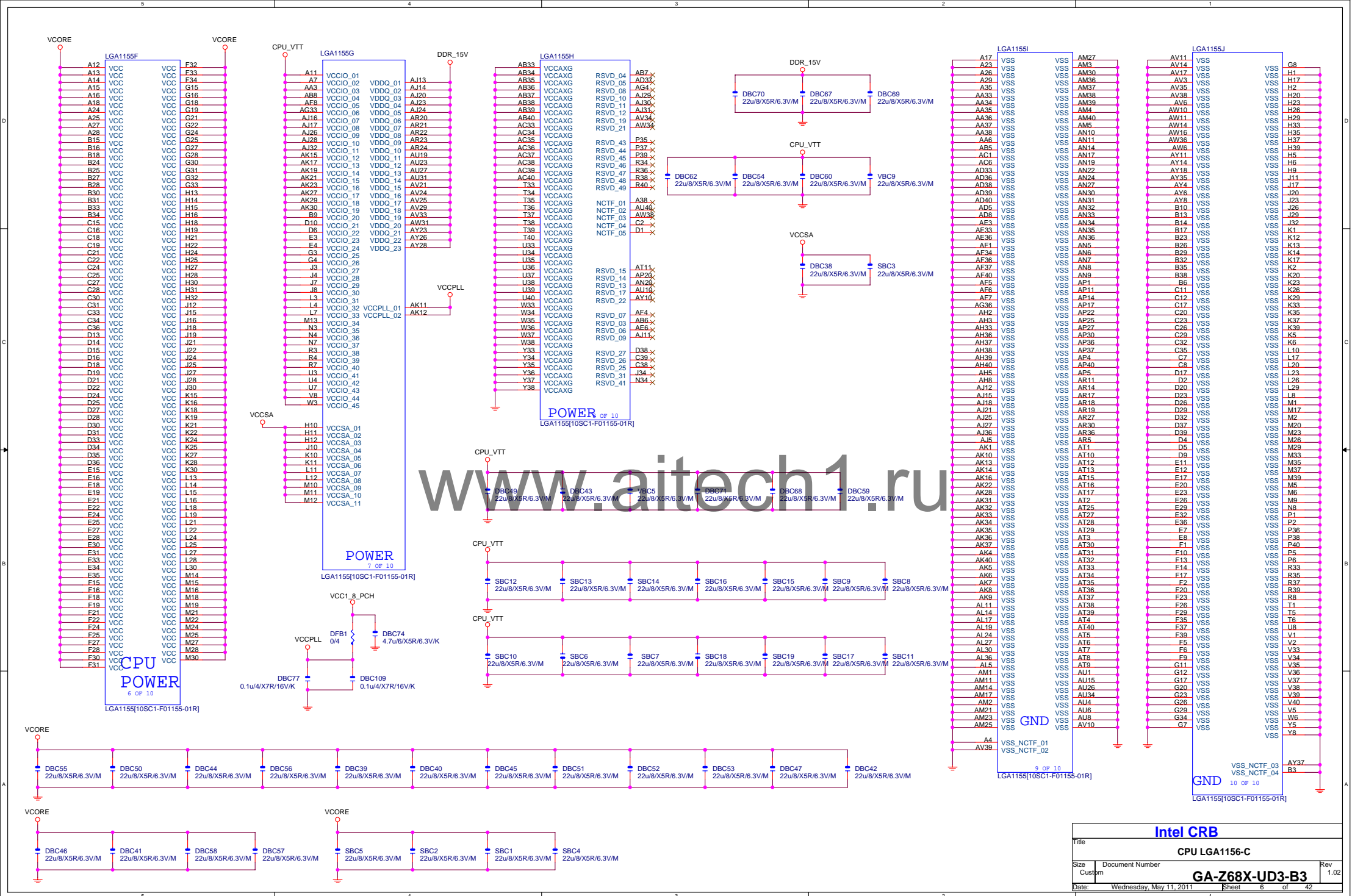
4. Add TM & TMS 0 ohm

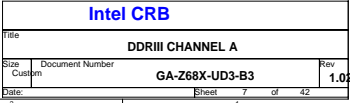
5. ITE8275_CLK CHANGE TO PCH.AW5

BLOCK DIAGRAM









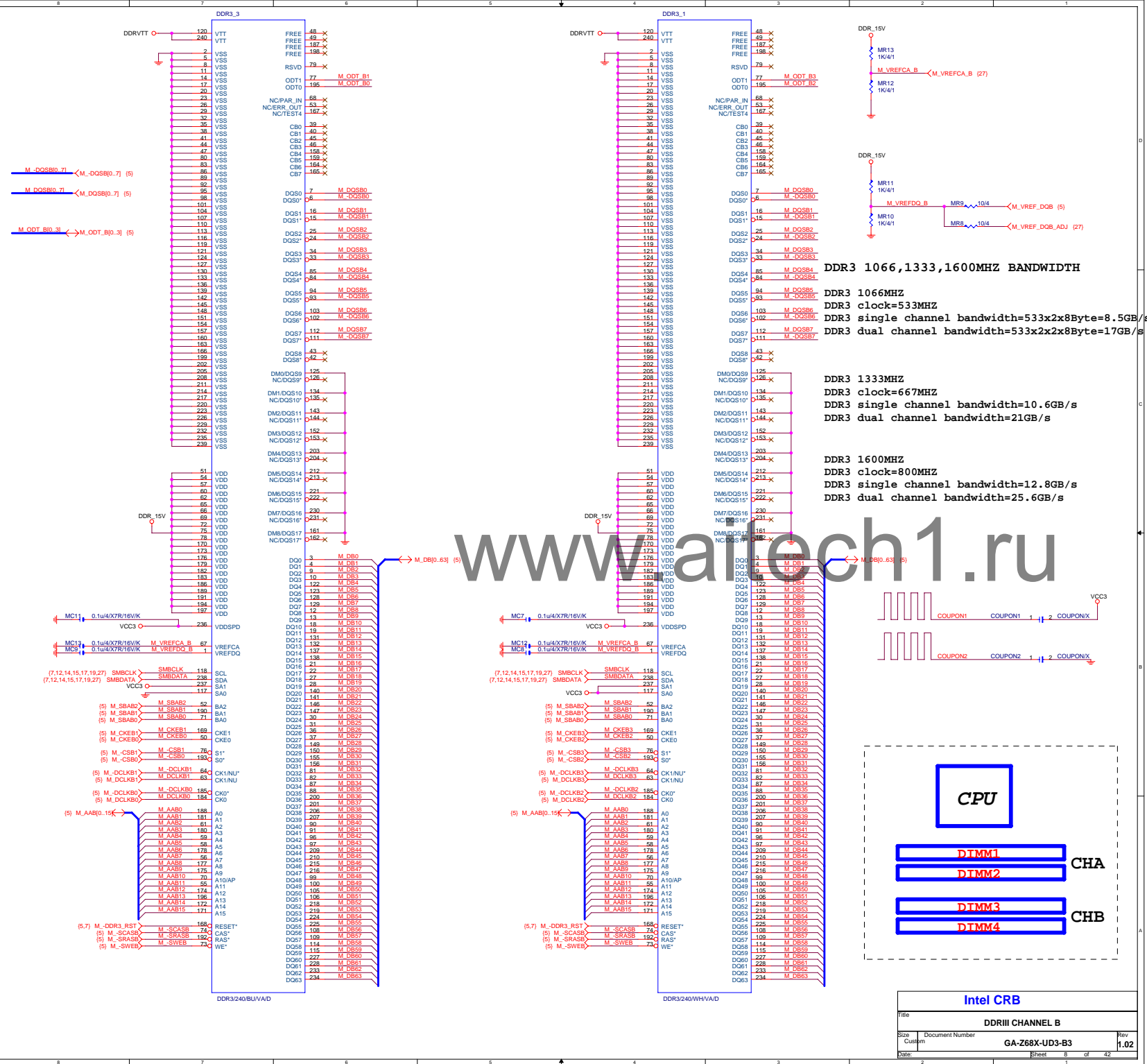
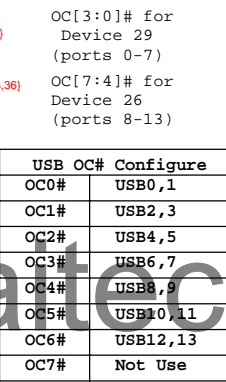
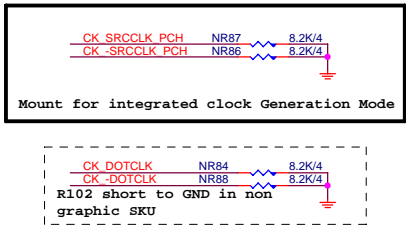
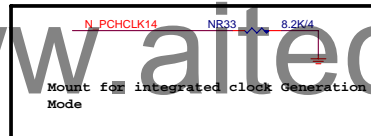


Diagram illustrating the NVSRAM memory structure. The array is organized into four 4x4 quadrants, each containing 16 memory cells (NV_00 through NV_1F). The array is connected to a 16-bit data bus (DB82268/B3/S[10H:B1-03D268-21R]) and a 16-bit address bus (PCHE). The array is also connected to a 16-bit data bus (DB82268/B3/S[10H:B1-03D268-21R]) and a 16-bit address bus (PCHE). The array is also connected to a 16-bit data bus (DB82268/B3/S[10H:B1-03D268-21R]) and a 16-bit address bus (PCHE).

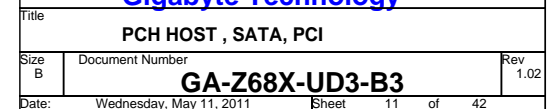


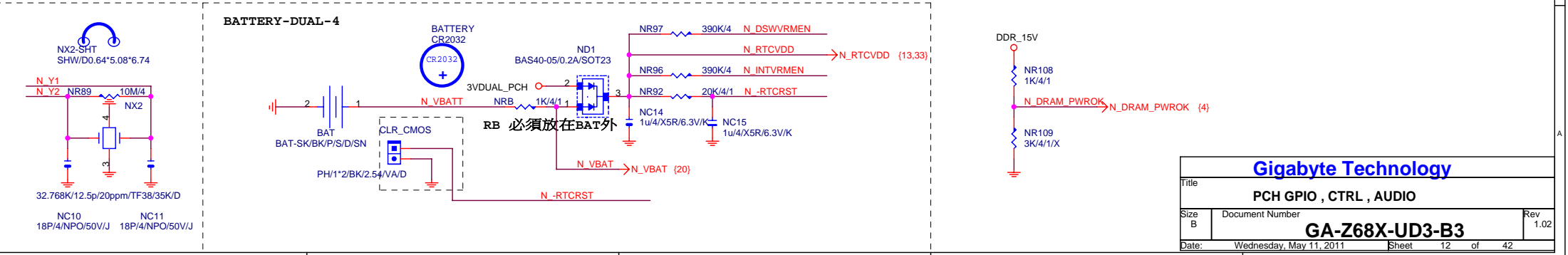
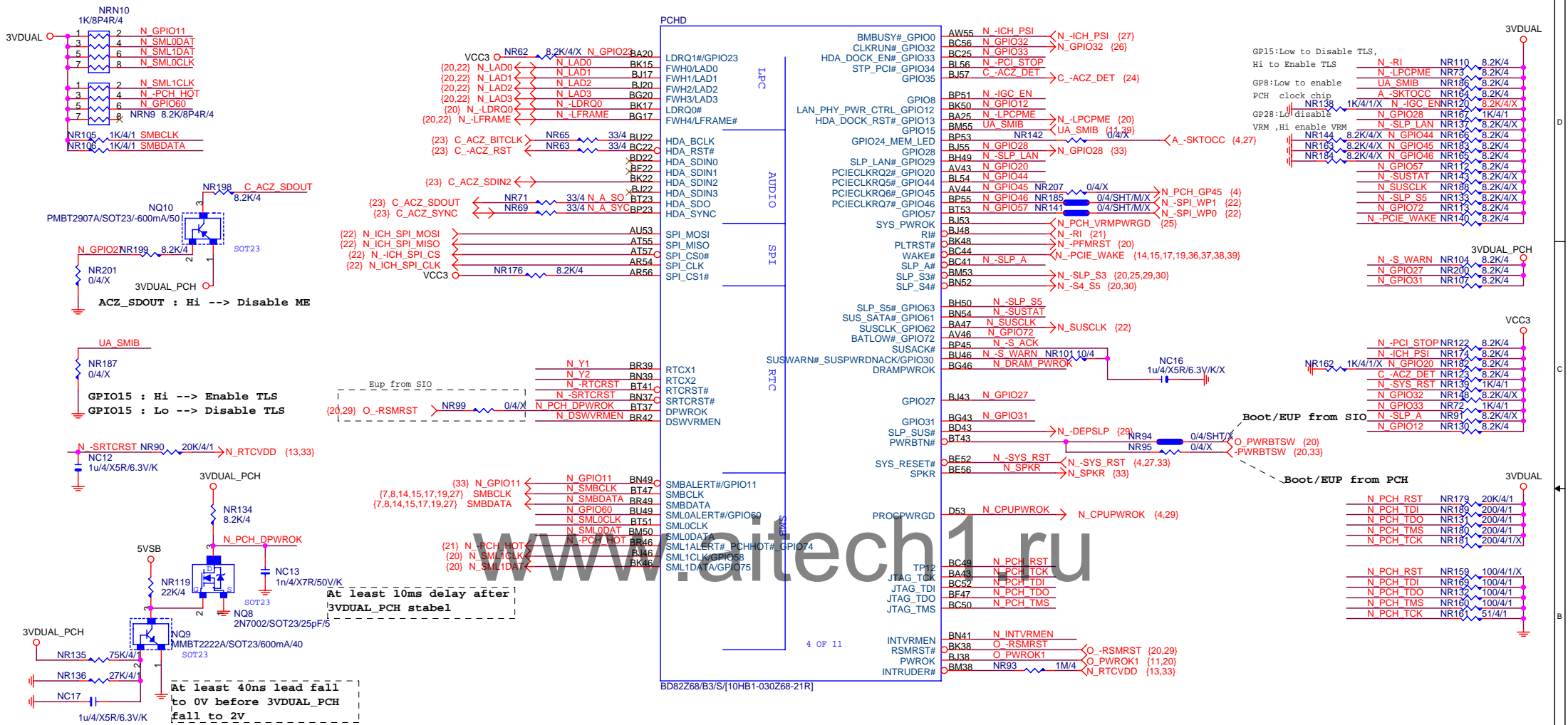
USB OC#	Configure
OC0#	USB0,1
OC1#	USB2,3
OC2#	USB4,5
OC3#	USB6,7
OC4#	USB8,9
OC5#	USB10,11
OC6#	USB12,13
OC7#	Not Use

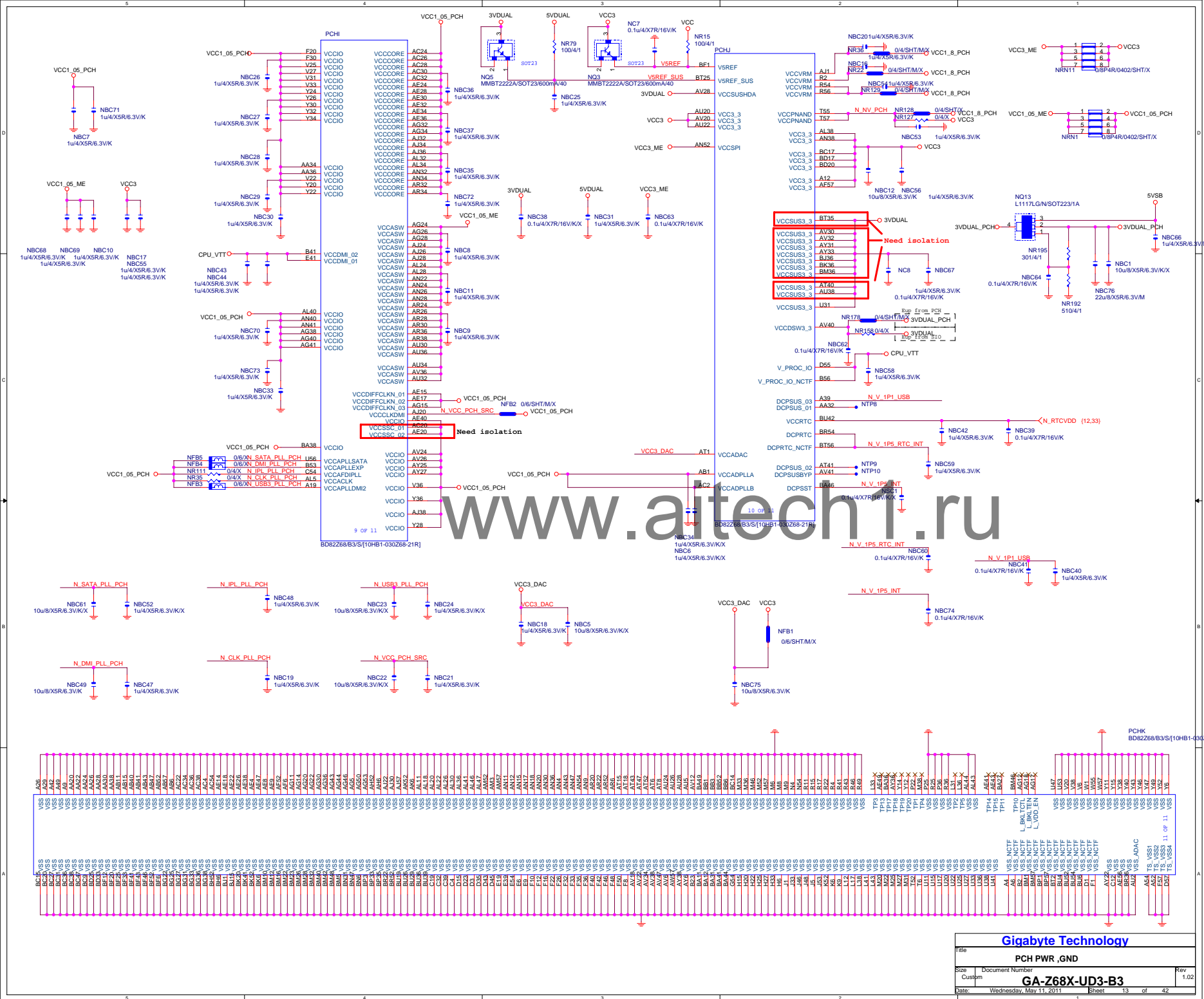


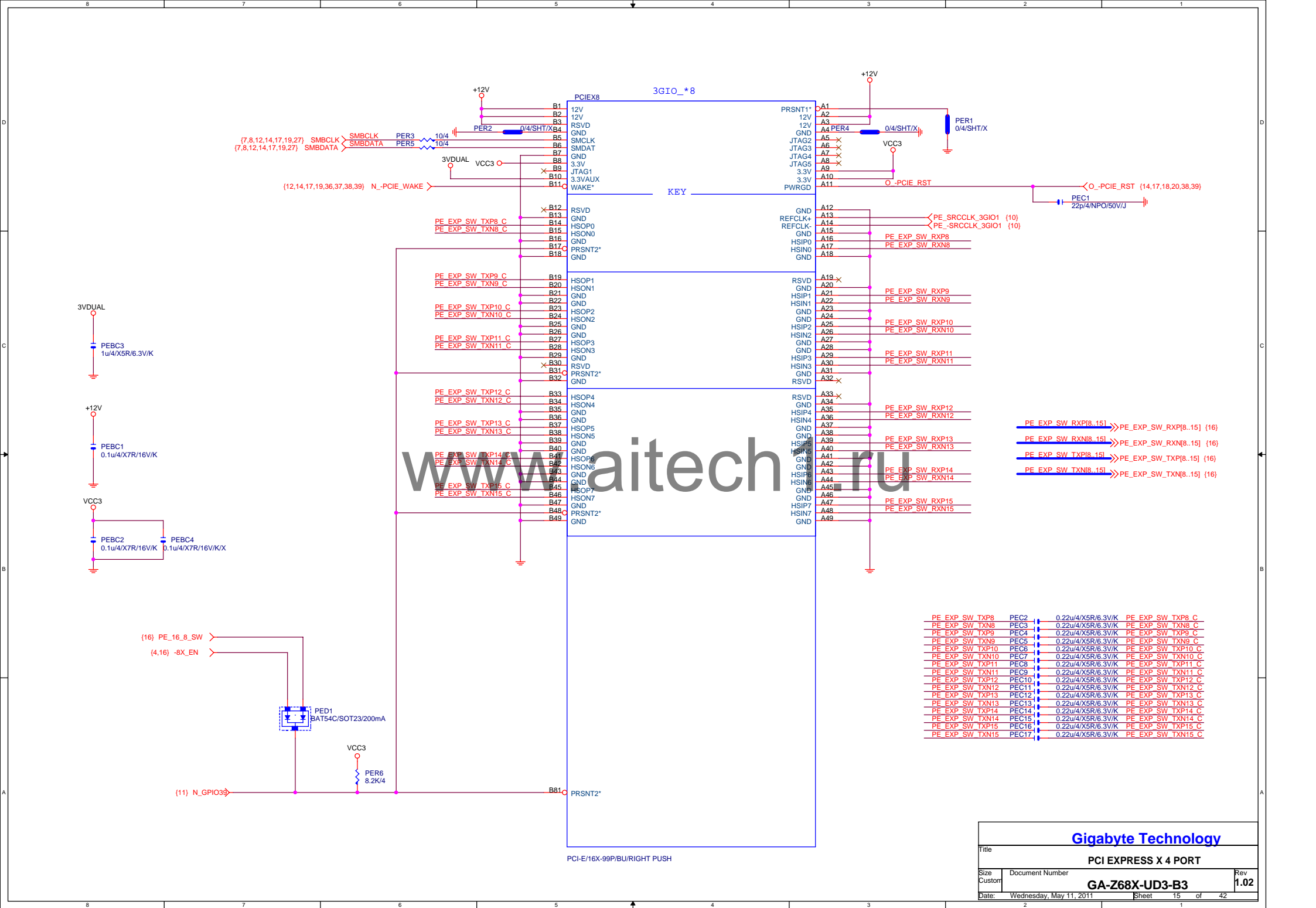


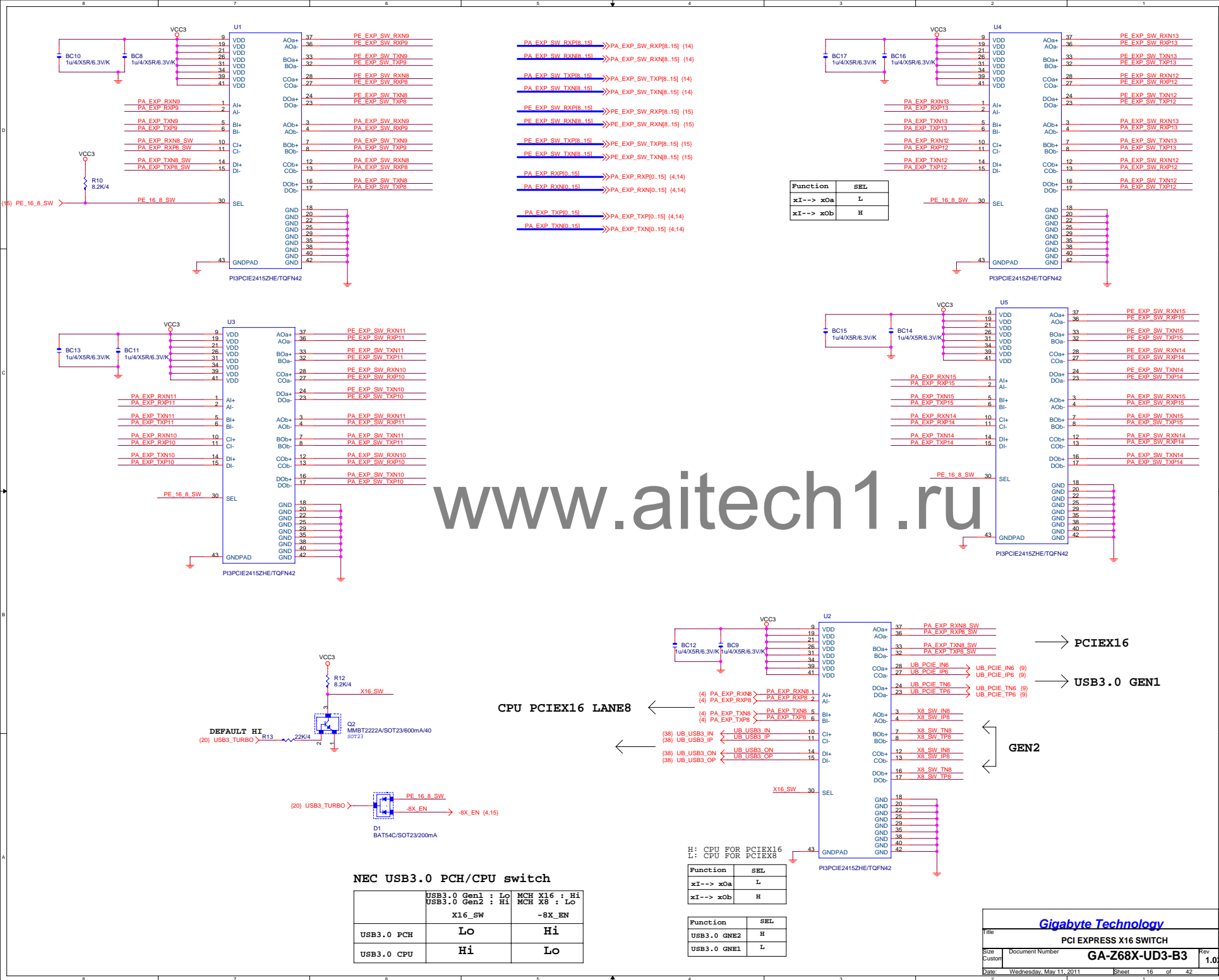
PCHC

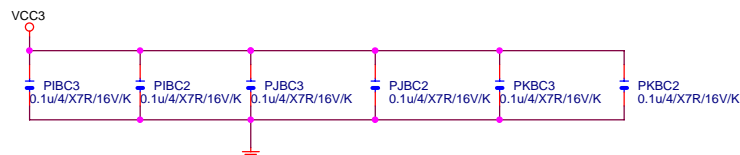
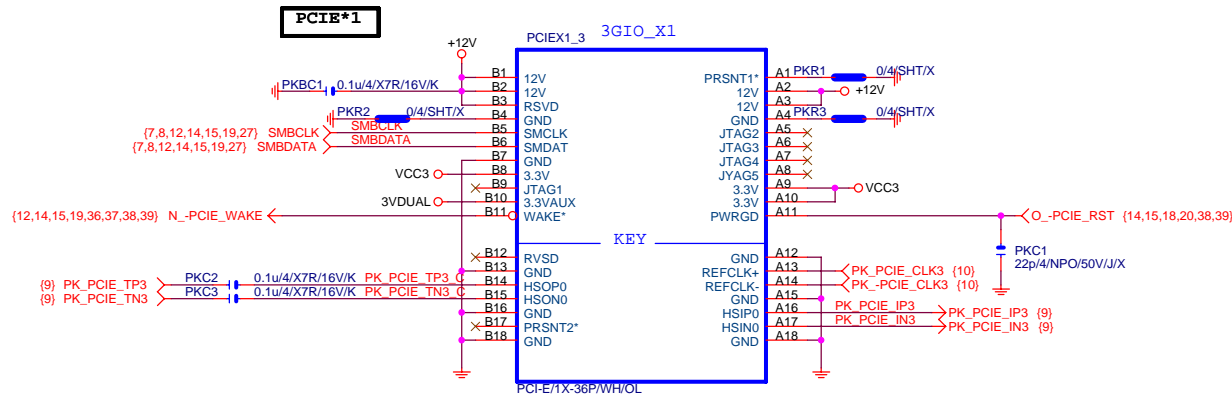
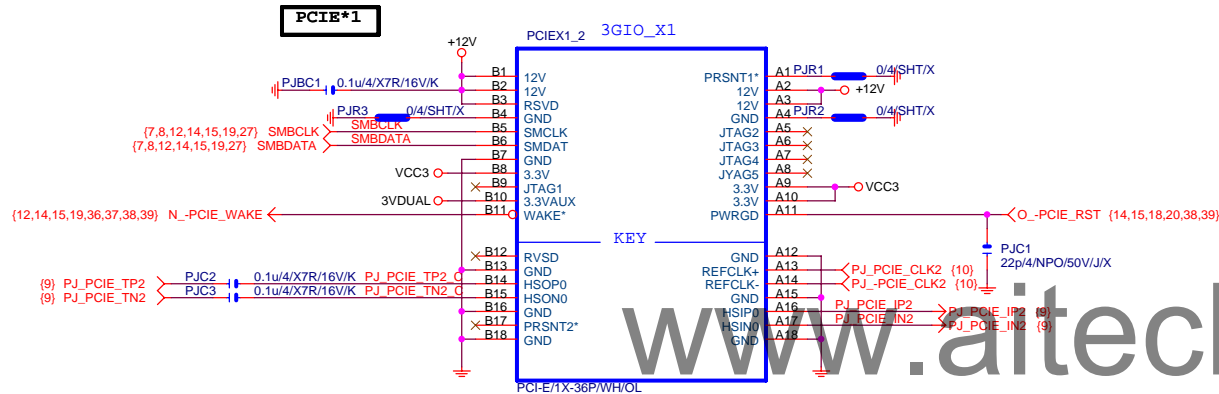
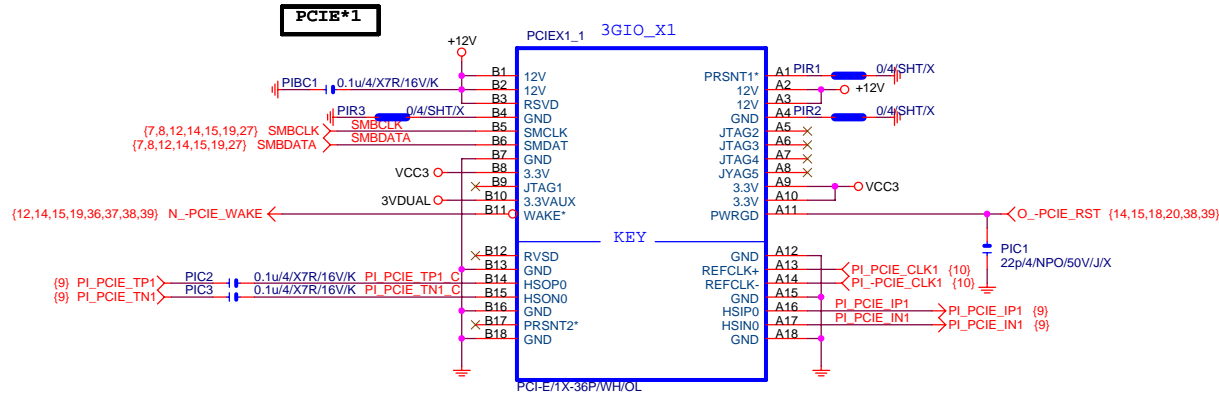






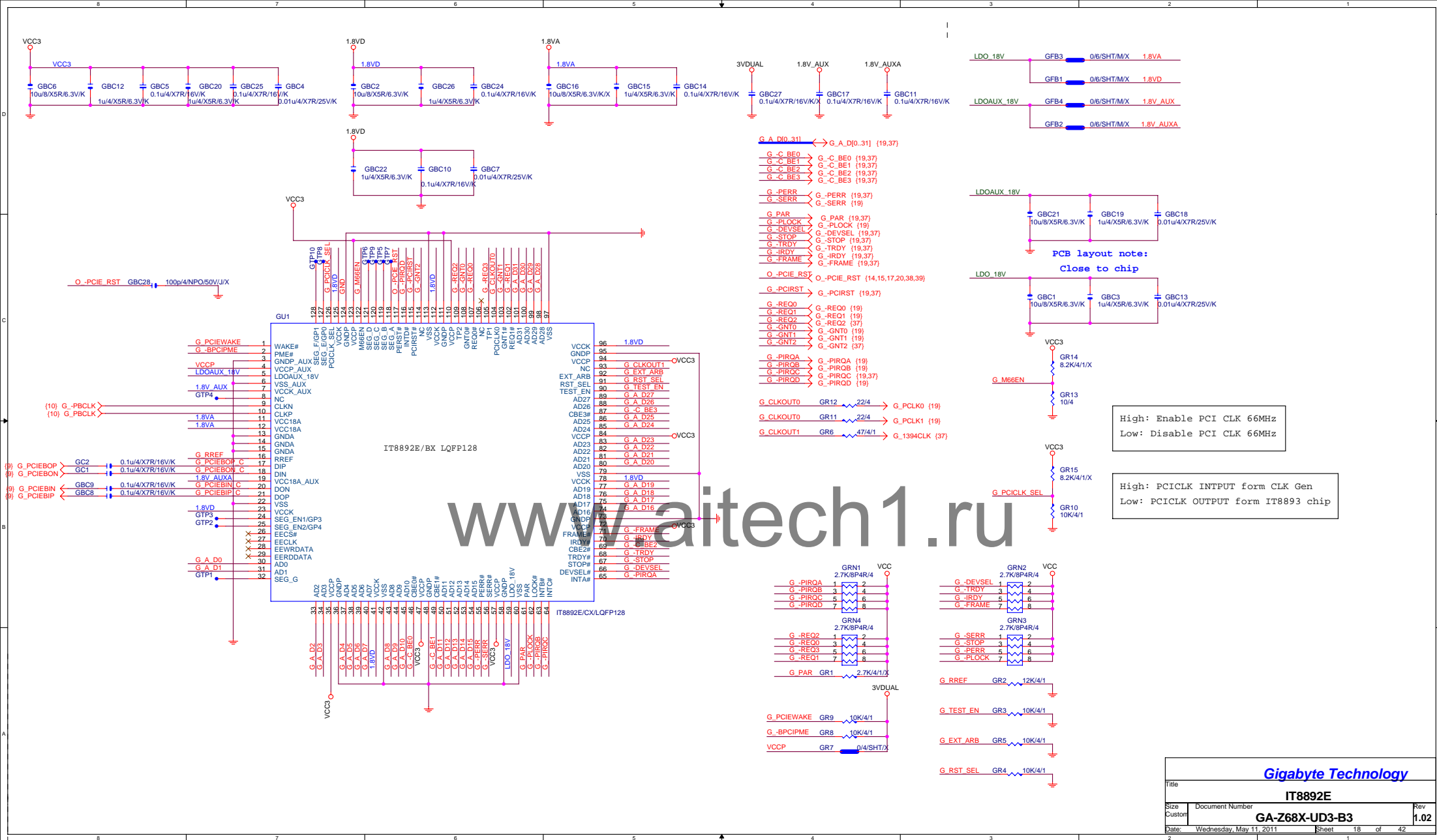






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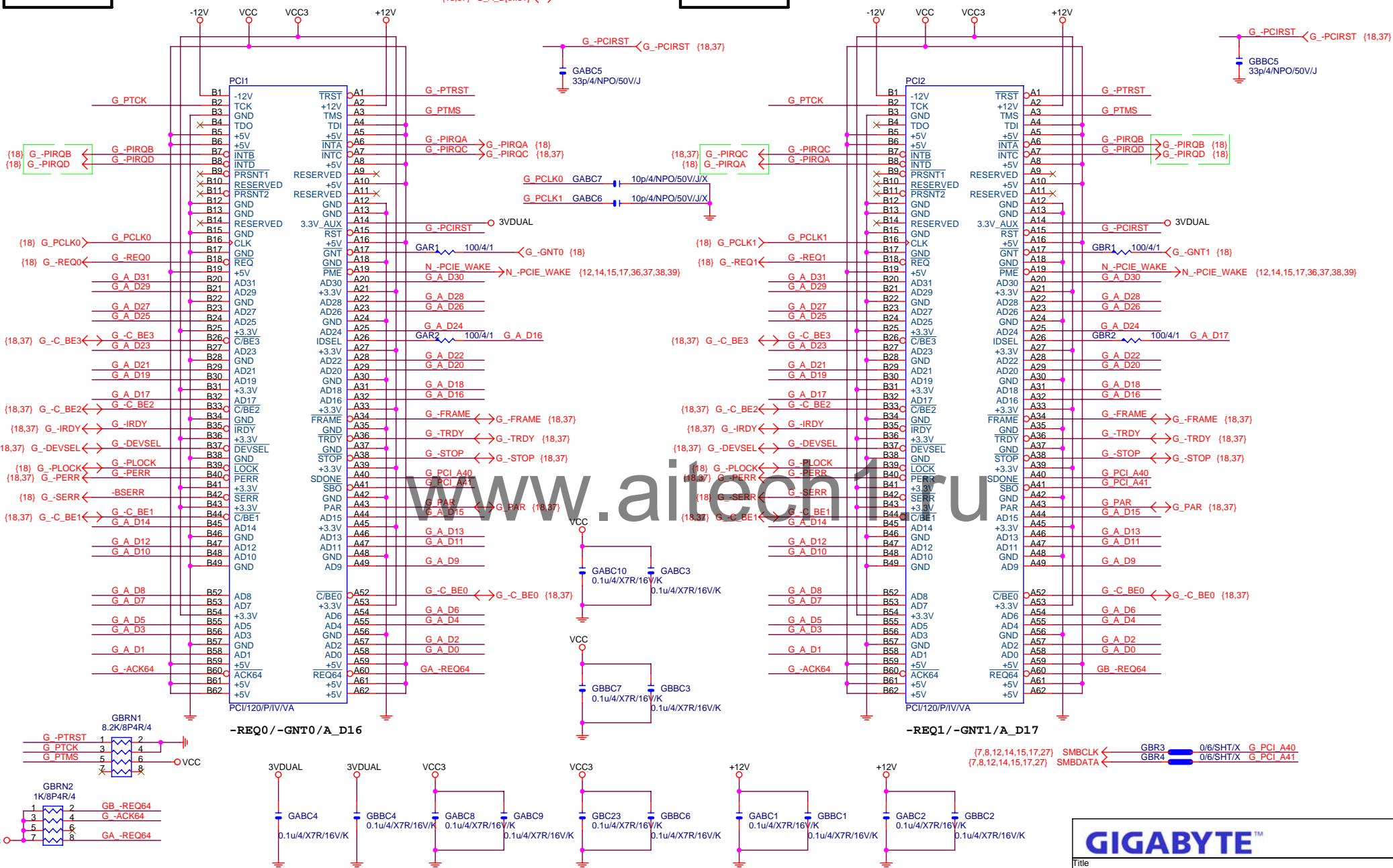
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PCIE X1 1,2		
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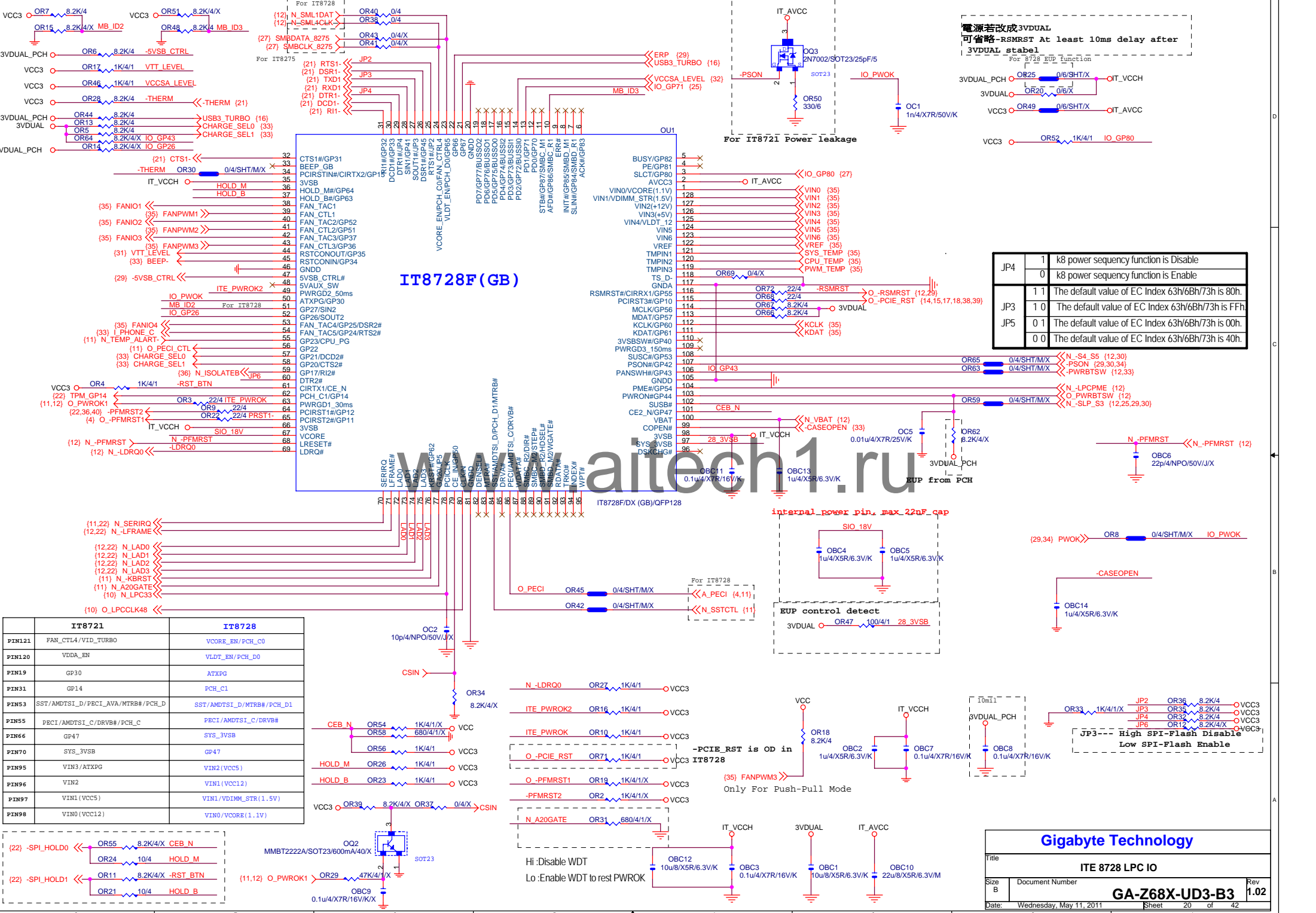


PCI SLOT 1

(18,37) G_A_D[0..31] ↔ G_A_D[0..31]

PCI SLOT 2



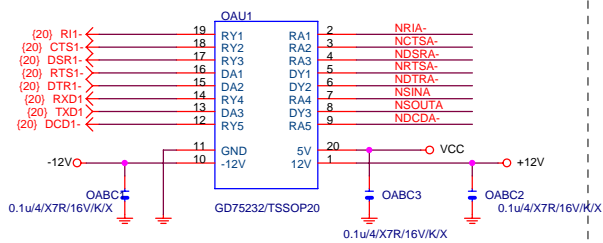


電源若改成3VDUAL
可省略-RSMRST At least 10ms delay after
3VDUAL stable

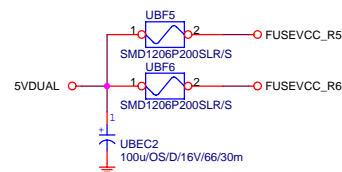
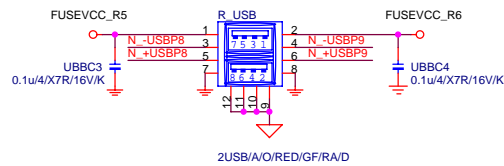
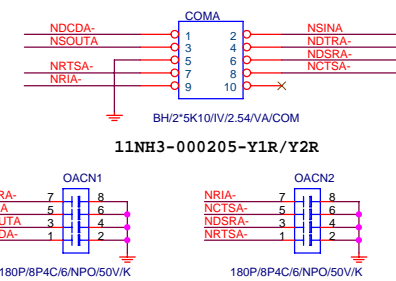
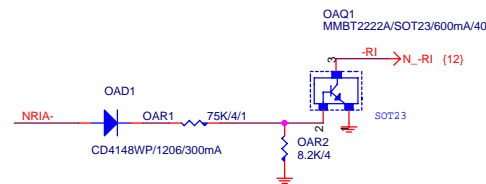
JP4	1	k8 power sequency function is Disable
	0	k8 power sequency function is Enable
JP3	1 1	The default value of EC Index 63h/6Bh/73h is 80h.
	1 0	The default value of EC Index 63h/6Bh/73h is FFh
JP5	0 1	The default value of EC Index 63h/6Bh/73h is 00h.
	0 0	The default value of EC Index 63h/6Bh/73h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

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

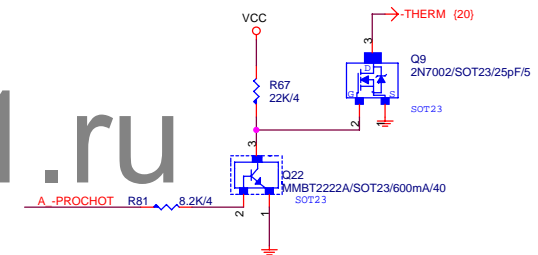
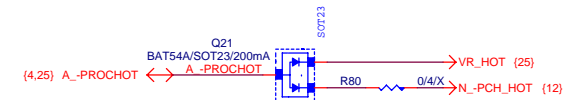
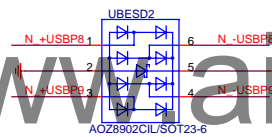
COMA



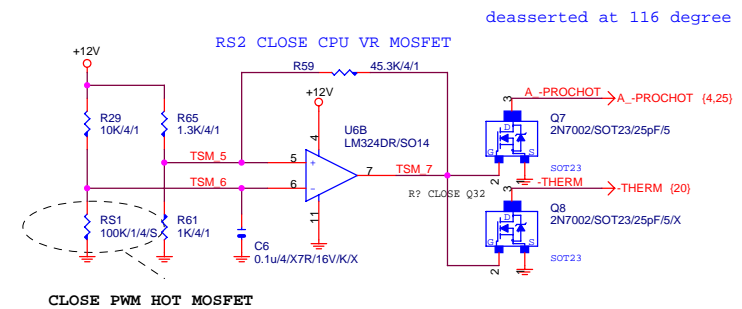
COM RI



N_-USBP8 (9)
N_-USBP8 (9)
N_-USBP9 (9)
N_-USBP9 (9)

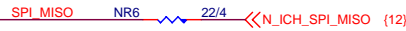
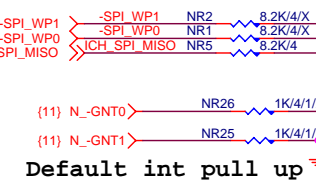
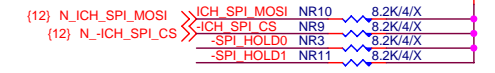


-PROHOT



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Title			
COM & PROHOT/Dynamic O.C.			
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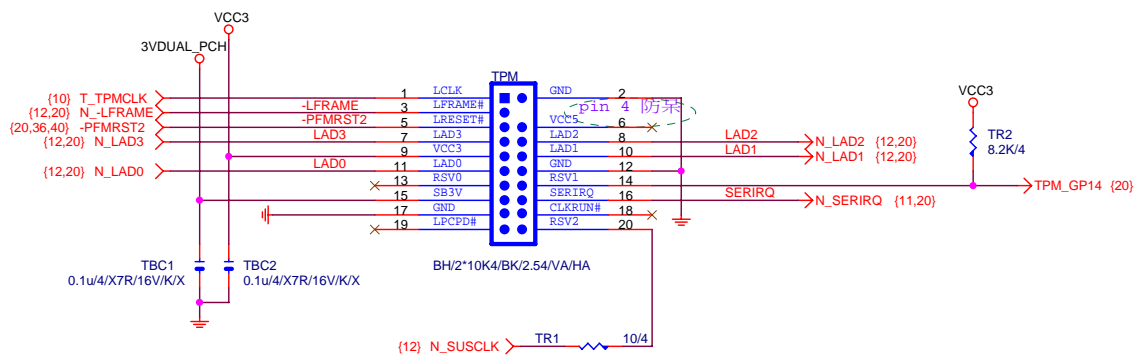
MOSI For DMI RX Termination Voltage



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

1 means floating
0 means PD 1K

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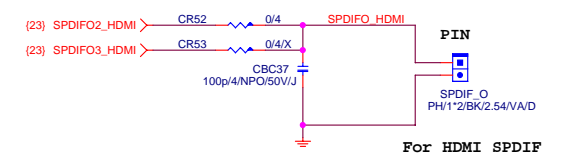
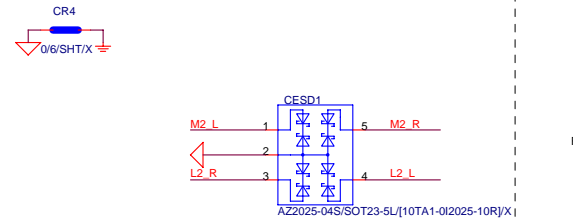
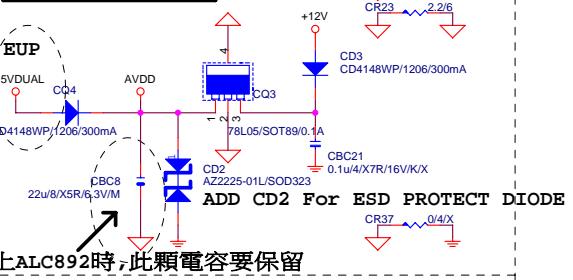
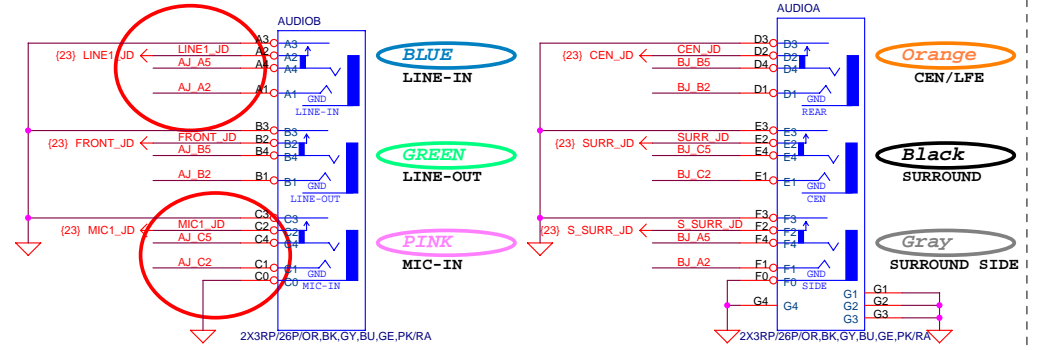
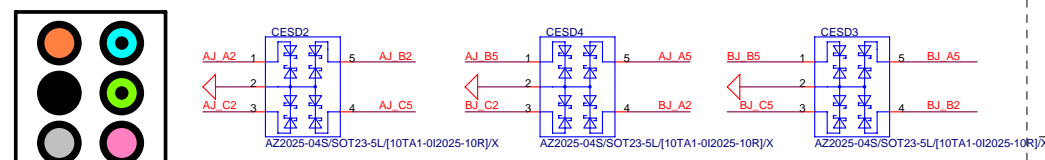


Gigabyte Technology			
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Size	Document Number	GA-Z68X-UD3-B3	
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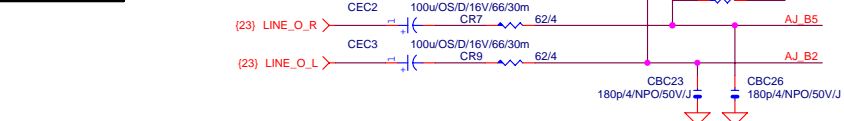
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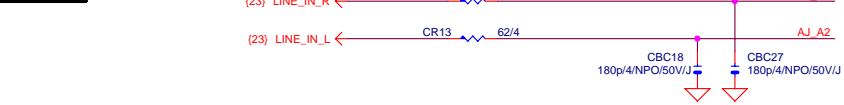
CODEC POWER/EMI PAD

AZALIA JACK
BTX AZALIA CONNECTOR

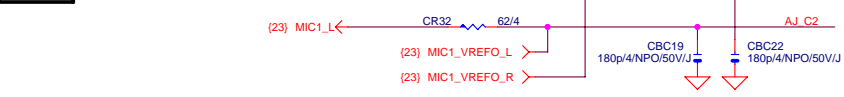
LINE-OUT



LINE-IN



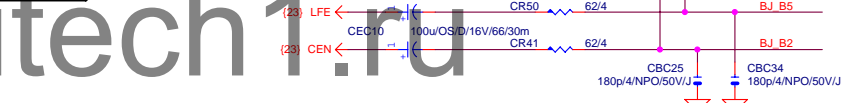
MIC-IN



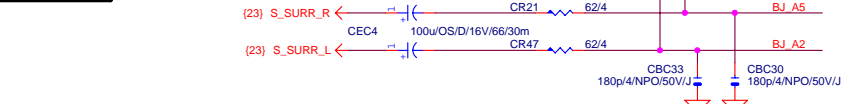
SURROUND



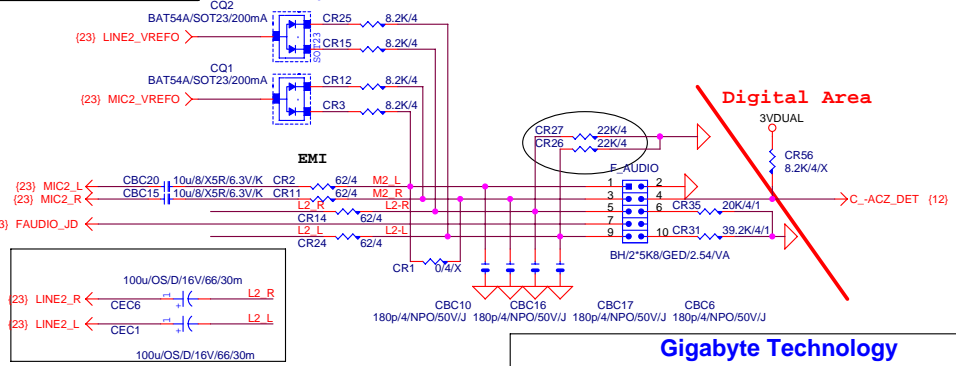
CEN/LFE



SURR BACK

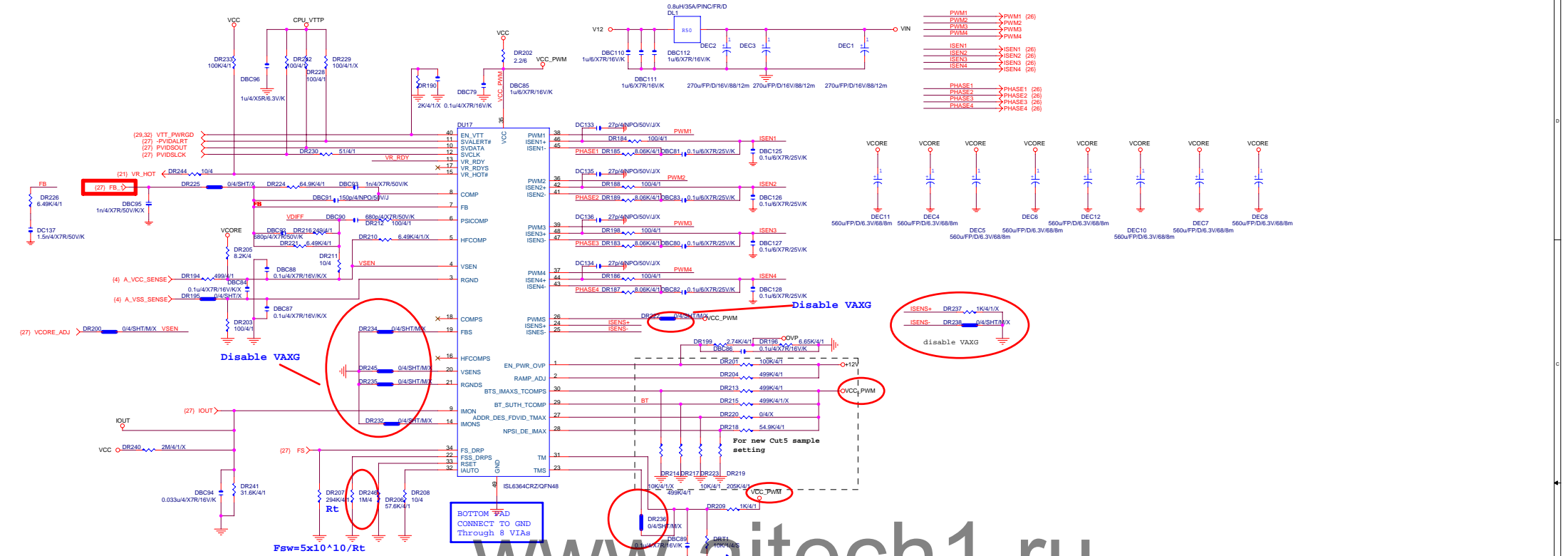


AZALIA FRONT PANEL



Gigabyte Technology

Title			AUDIO JACK
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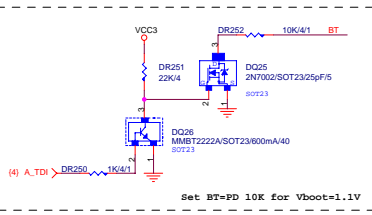


Fast DVID=10mV/us [T=400mV/(10mV/us)=40us]
Q = C*V = I*T
6000uF*400mV = I*40us
I = 60A

Fast DVID=20mV/us [T=400mV/(20mV/us)=20us]
Q = C*V = I*T
6000uF*400mV = I*20us
I = 120A

OCF點做在240A
L=0.8uH/0.85m ohm
L/DCR=RC* 0.8u/0.85m=RX0.1u R=9.4K
DR185-DR187=9.4K*1.2=11.3K
Risen=(load/phase)*DCR/Isen
=[(240A/4)*X0.85m]/50uA=1k ohm
Rset=57.6k (ISL6366 set range 3.84k-115.2k)
57.6k/64=0.9K, 0.9K + 100ohm(Risen)=1k
Isens+ DR184-DR186阻值100ohm
Vmon=(Rimon/N)*(DCR/Risen)*Iout
1.085=(29.7k/4)*(0.85/1000)*Iout
Iout=170A, Rmon=DR241=29.7K
Fsw=5*(10^10)/(Rt)=230KHz, Rt=216k

VIN=12V, IF
VOUT=1.2V, IOUT=112A(VCORE)+17A(VTT)+8.8A(VSSA)=137.8A, PHASE=5
IRMS=13.78A
270uF/FP/D/16V/88/12m RIPPLE CURRENT=5A(105°C)
Coefficient=1.7(85°C)
-->故min 固態電容須3X5=>15A>13.78A(105°C)

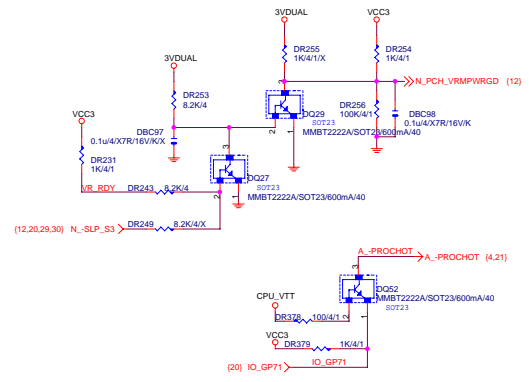
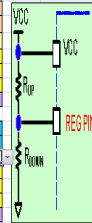


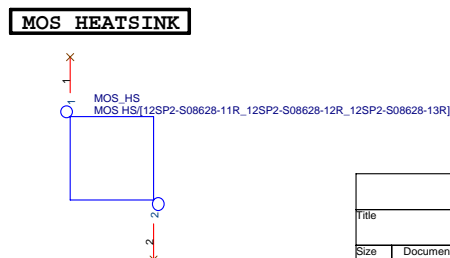
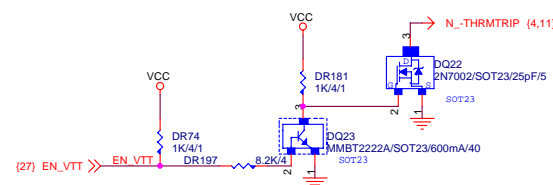
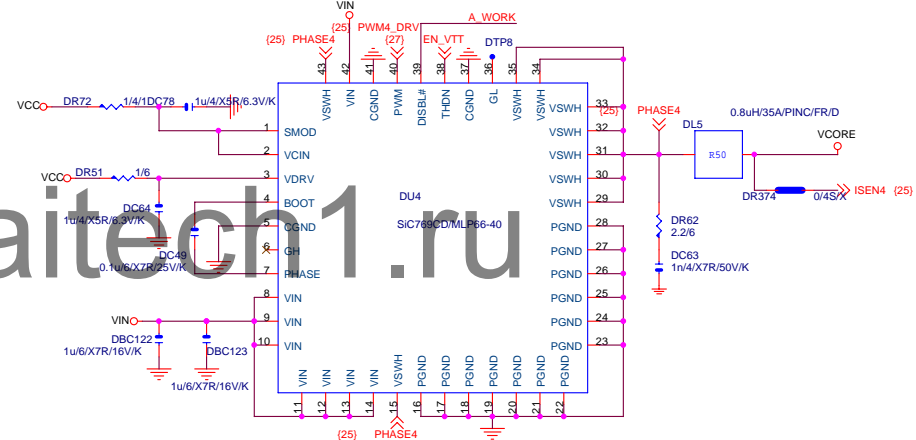
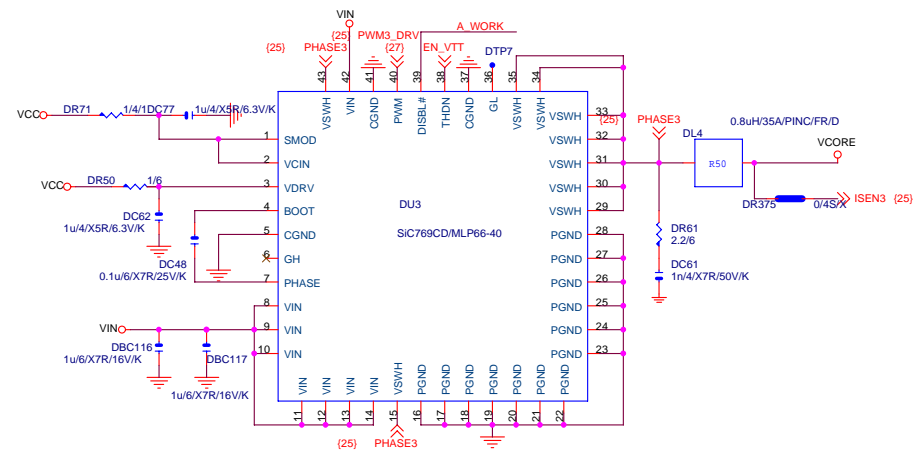
IC	ADDR	IMAXS	TMAX (°C)
SELECT VALUE	01	35	100
R _{up}	OPEN	kOhm	R# on Sch
R _{down}	10	kOhm	R35
Getreg (OC)	0h	OR	N/A

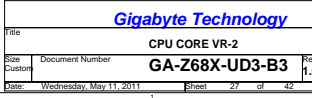
IC	BTS (V)	DES	TCOMP (°C)	SMADDR
SELECT VALUE	0	DISABLED	29.7	N/A
R _{up}	499	kOhm	R29	
R _{down}	OPEN	kOhm	R30	
Getreg (OD)	Dfh	OR	Dfh	

IC	BT (V)	FDVID (mV/us)	TCOMP (°C)
SELECT VALUE	0	10	29.7
R _{up}	OPEN	kOhm	R31
R _{down}	499	kOhm	R32
Getreg (OE)	Cth	OR	Cth

IC	NPSI	DE	IMAX (A)
SELECT VALUE	S11	DISABLED	200
R _{up}	75	kOhm	R34
R _{down}	100	kOhm	R33
Getreg (OF)	54h	OR	54h



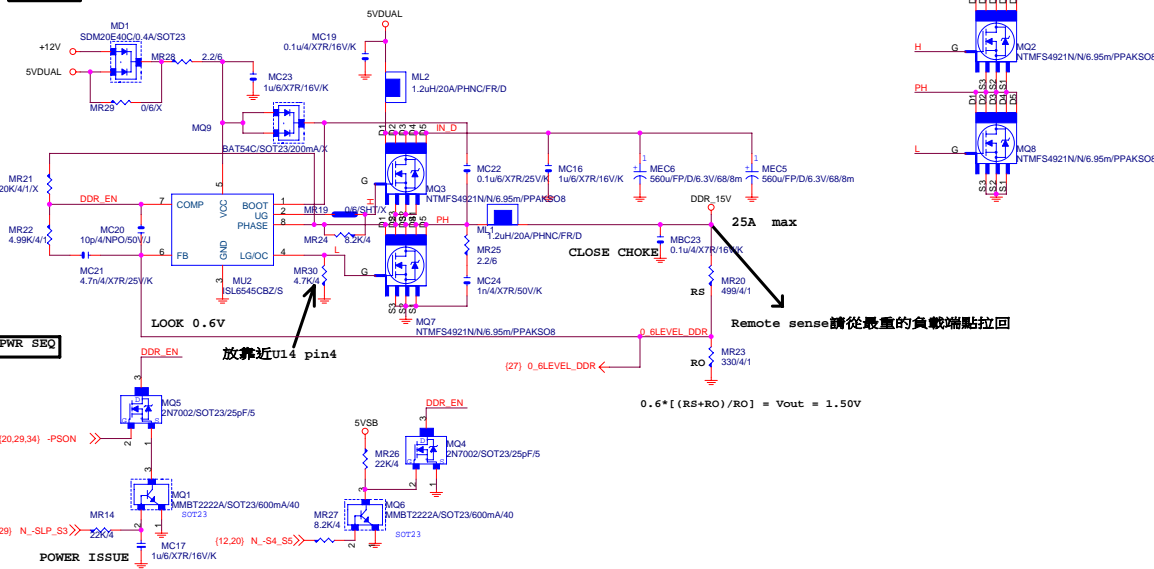




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GIGABYTE™			
Title VCORE PHASE GEAR 4			
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DDR18V

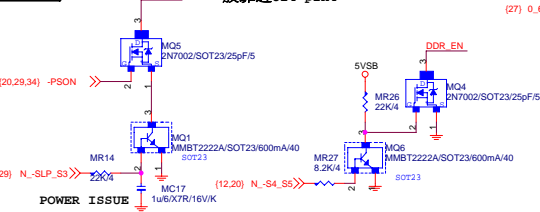


OCP : $I_{peak} = (2 \times I_{ocset} \times R_{ocset}) / R_{dson}$
 $I_{ocset} = 21.5\mu A$, $R_{ocset} = 4.7k$

OCP : $I_{peak} = (2 \times I_{ocset} \times R_{ocset}) / R_{dson}$
 $= (2 \times 21.5\mu A \times 4.7k) / (7m/2)$
 $= 57.74A$

注意 : R_{ocset} 的阻值要依據Lo side R_{dson} 改變
 一般 I_{peak} 設定在50~60A即可

PWR SEQ

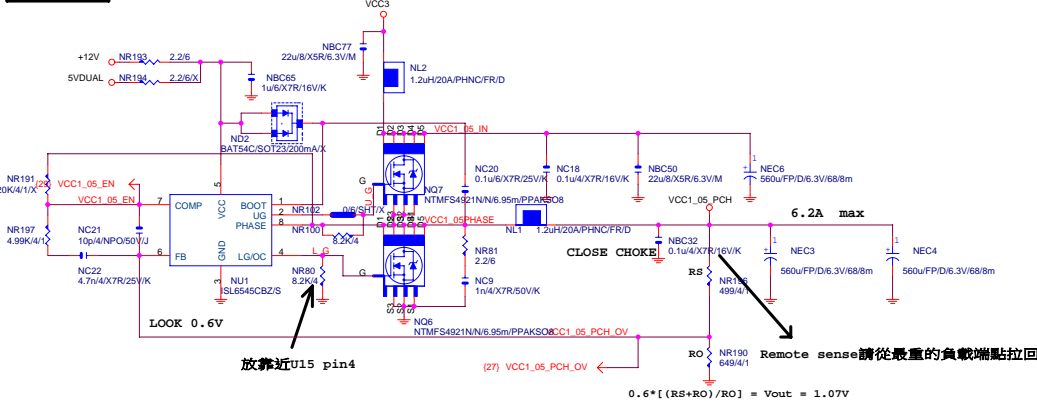


OCP : $I_{peak} = (2 \times I_{ocset} \times R_{ocset}) / R_{dson}$
 $I_{ocset} = 21.5\mu A$, $R_{ocset} = 8.2k$

OCP : $I_{peak} = (2 \times I_{ocset} \times R_{ocset}) / R_{dson}$
 $= (2 \times 21.5\mu A \times 8.2k) / 7m$
 $= 50.37A$

注意 : R_{ocset} 的阻值要依據Lo side R_{dson} 改變
 一般 I_{peak} 設定在50~60A即可

VCC1_05_PCH



OCP : $I_{peak} = (2 \times I_{ocset} \times R_{ocset}) / R_{dson}$
 $I_{ocset} = 21.5\mu A$, $R_{ocset} = 8.2k$

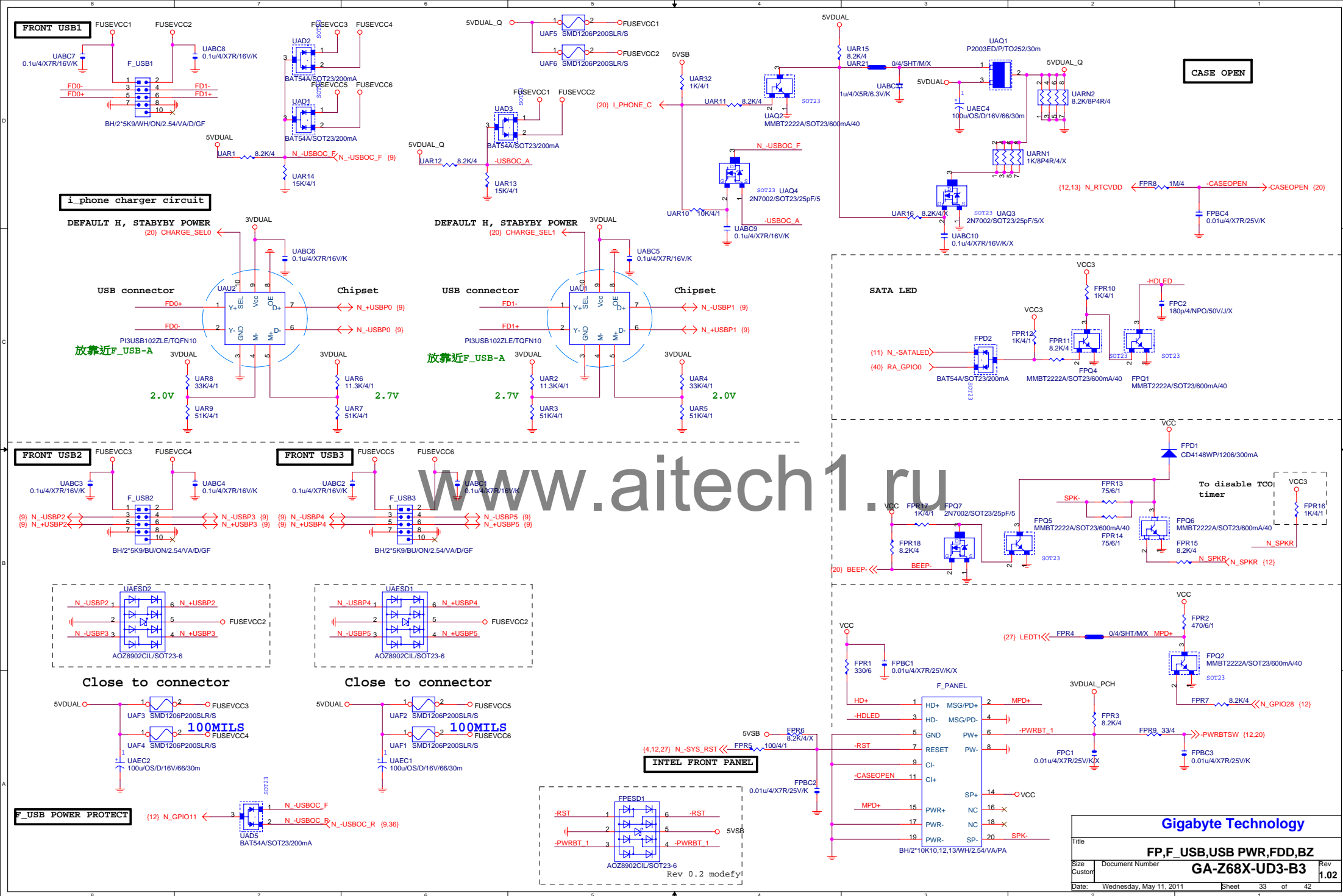
OCP : $I_{peak} = (2 \times I_{ocset} \times R_{ocset}) / R_{dson}$
 $= (2 \times 21.5\mu A \times 8.2k) / 7m$
 $= 50.37A$

注意 : R_{ocset} 的阻值要依據Lo side R_{dson} 改變
 一般 I_{peak} 設定在50~60A即可

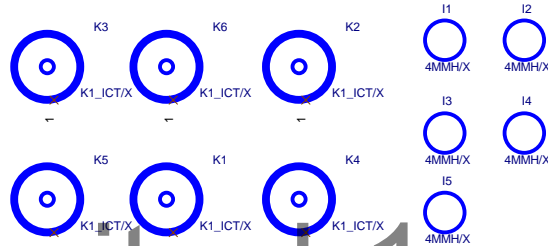
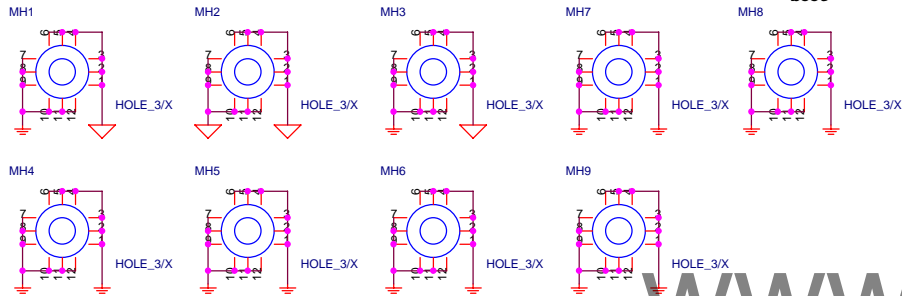
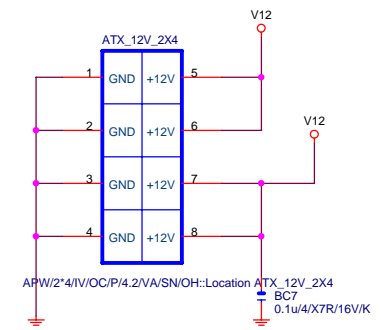
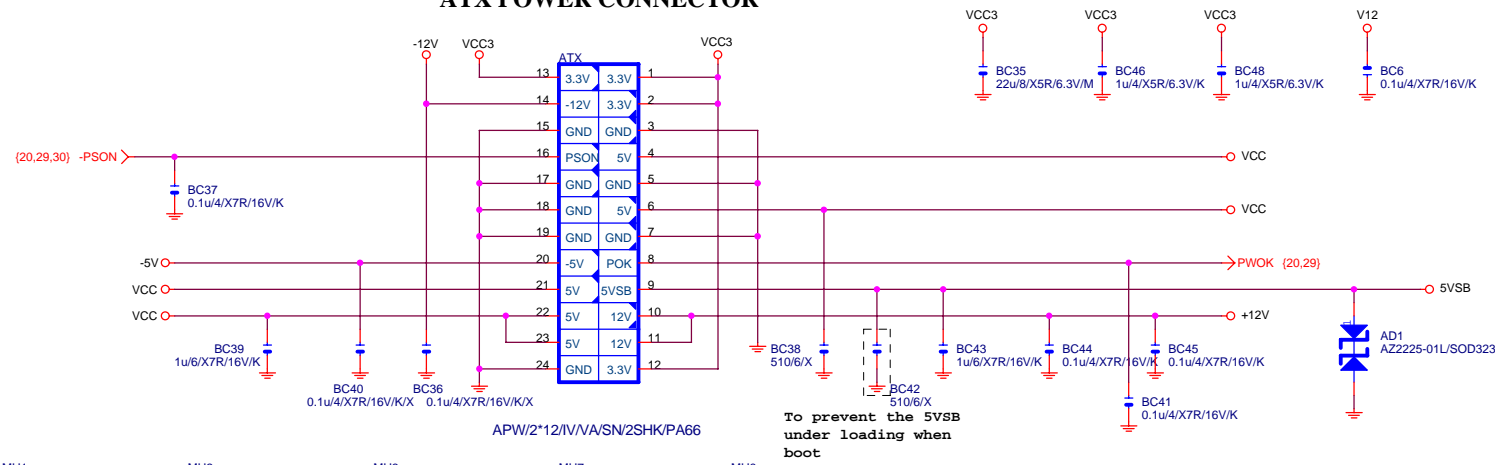
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ATX POWER CONNECTOR

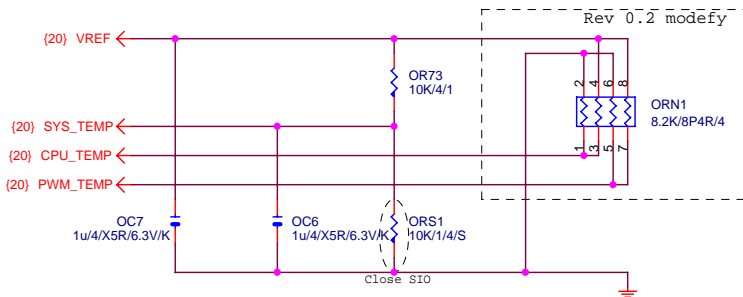


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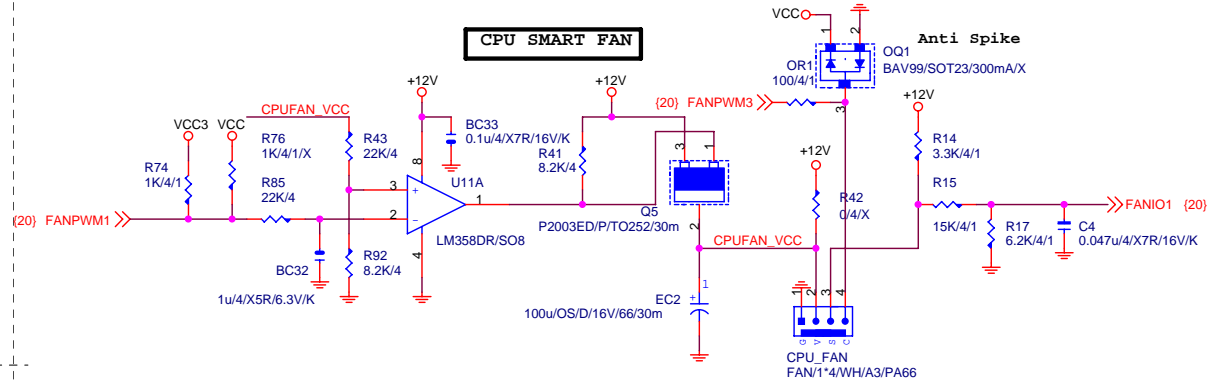
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Title			
ATX POWER CONNECTOR			
Size	Document Number	Rev	
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Date:	Wednesday, May 11, 2011	Sheet	34 of 42

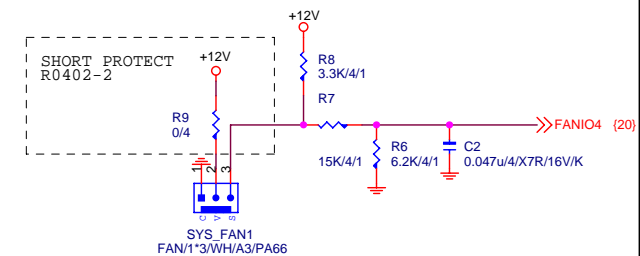
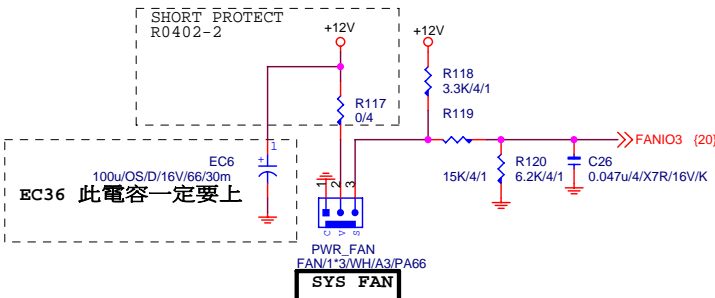
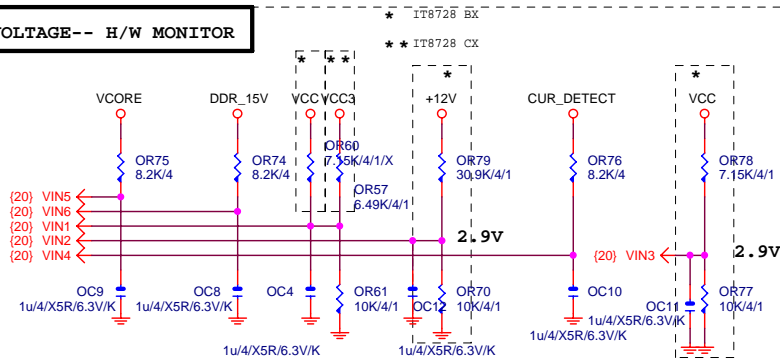
TEMP H/W MONITOR



CPU SMART FAN

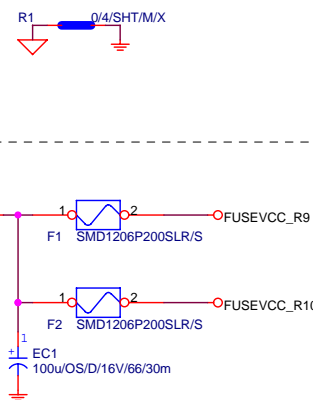
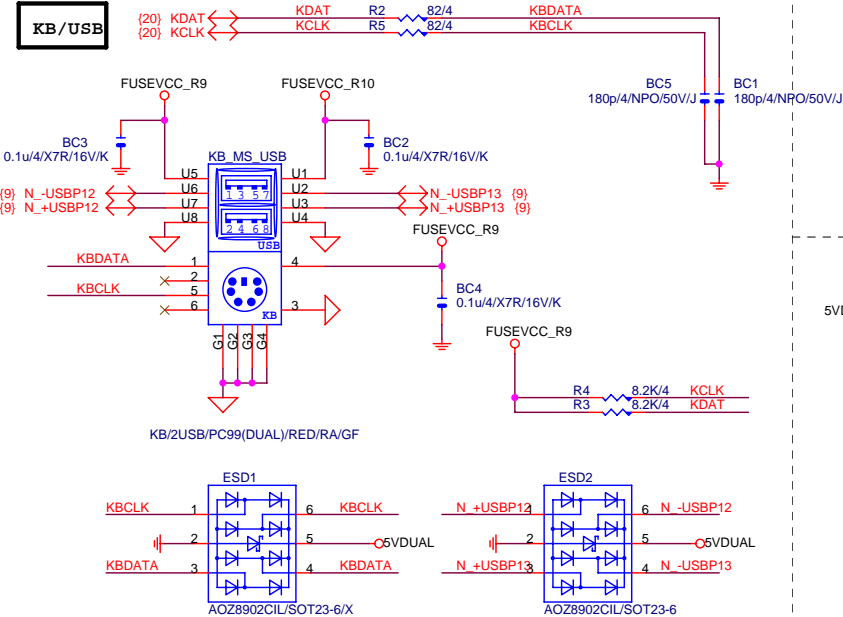


VOLTAGE-- H/W MONITOR

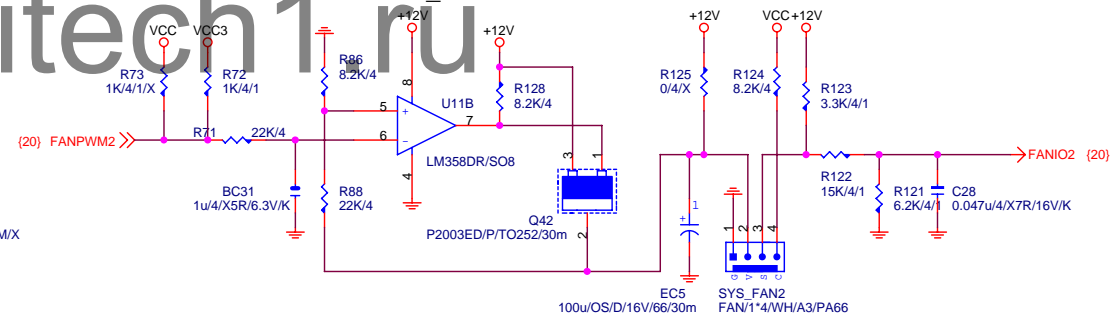


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KB/USB



Linear SYS_FAN

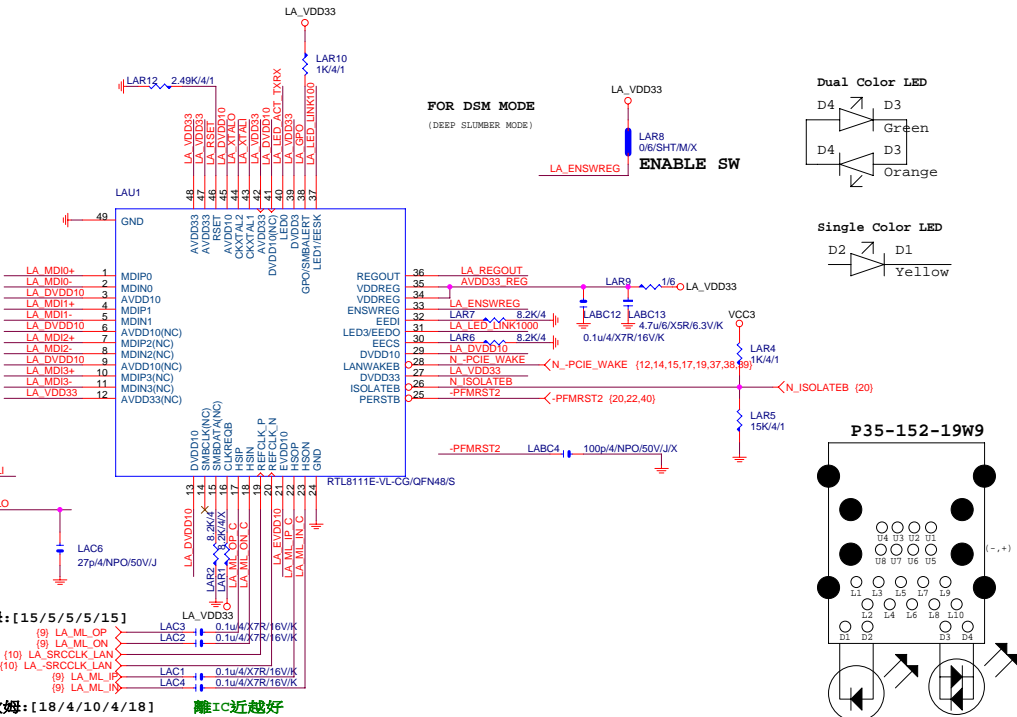


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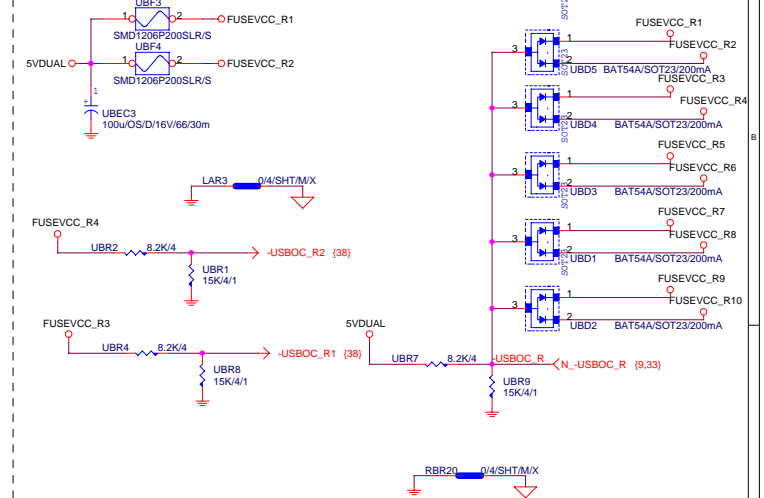
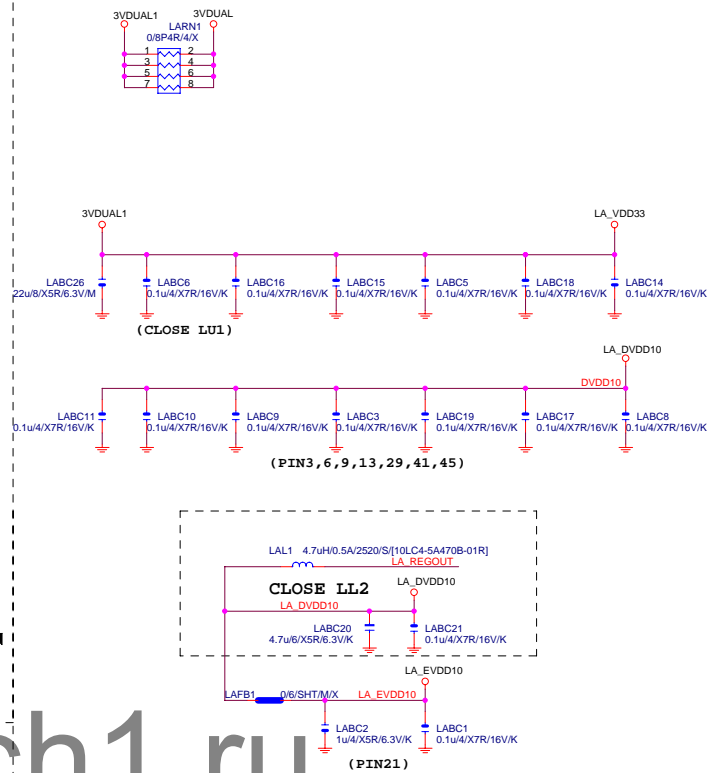
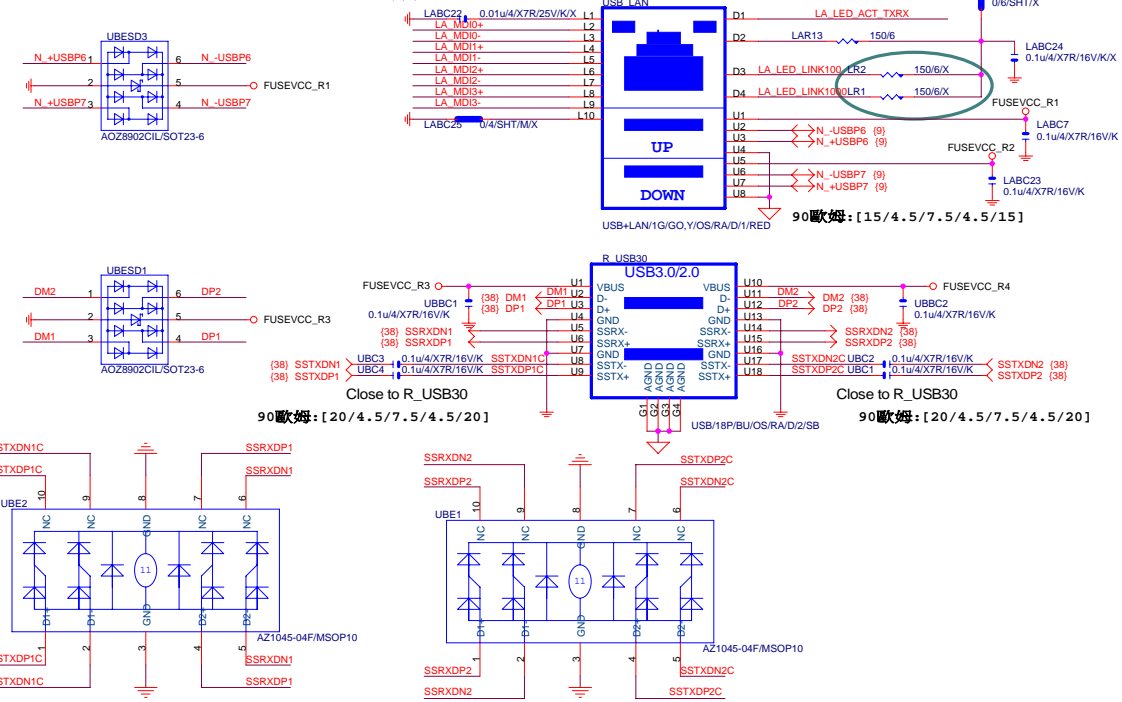
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HWM,KB/MS, FAN CTRL		
Size	Document Number	Rev
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Power domain chart

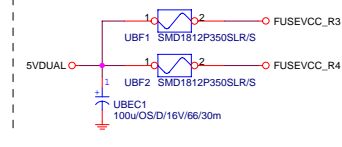
	RTL8111E
AVDD33	3.3V
DVDD33	3.3V
VDDREG	3.3V
DVDD10	1.05V

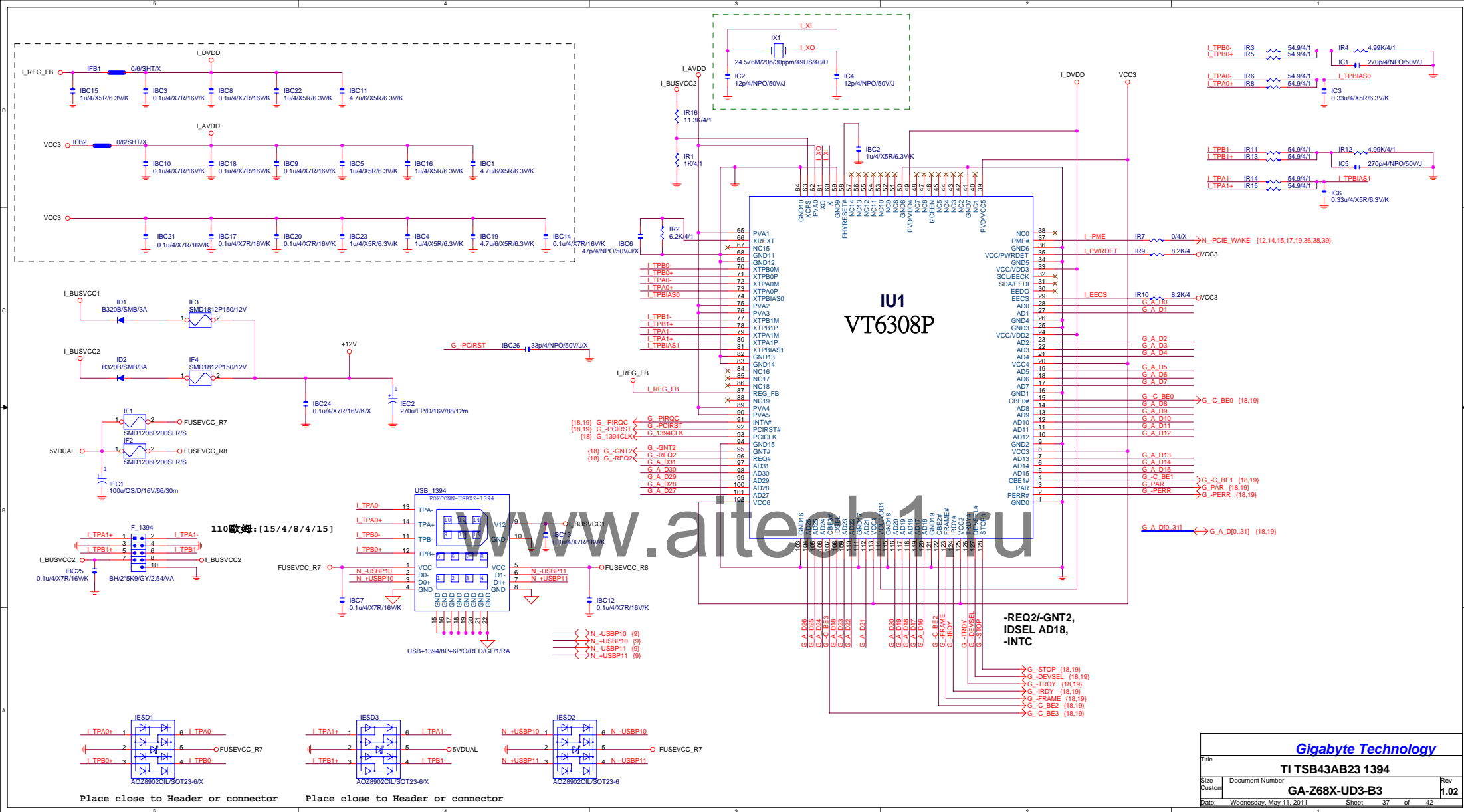


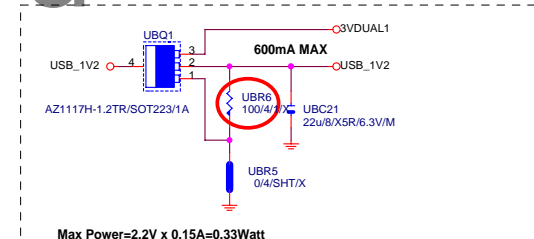
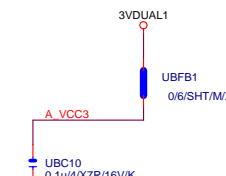
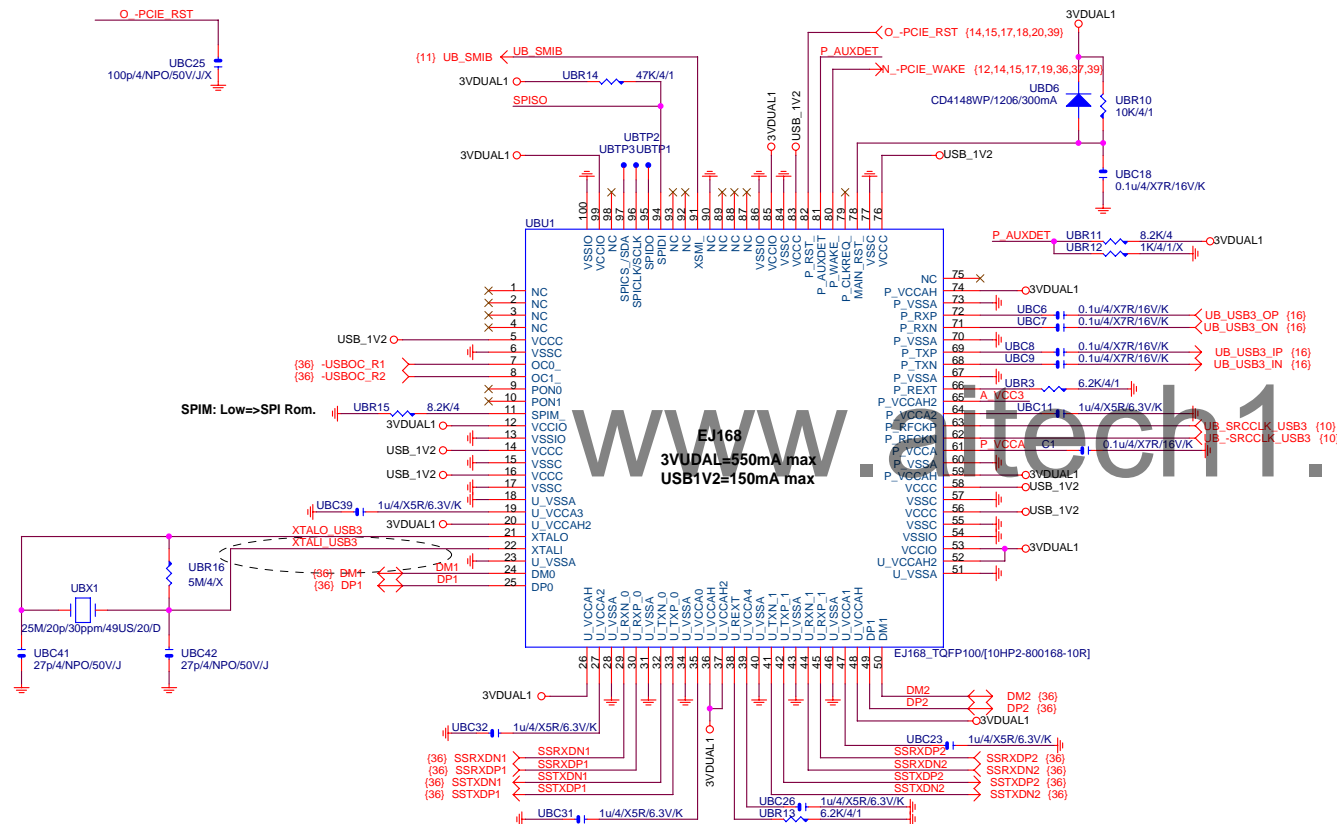
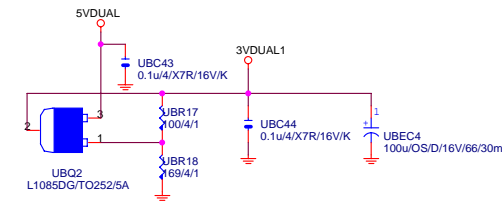
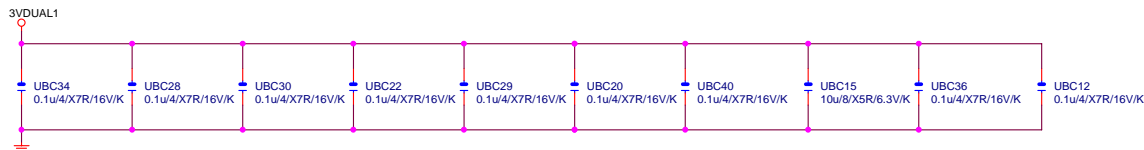
100 欧姆:[20/4/8/4/20]



| Close to connector



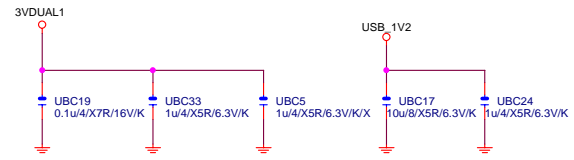
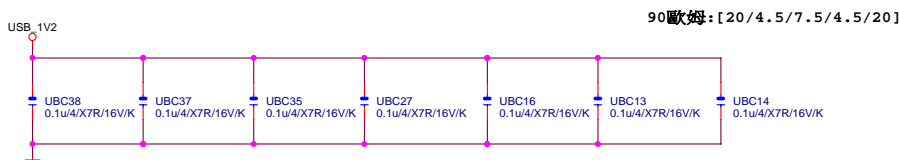




Max Power=2.2V x 0.15A=0.33Watt

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

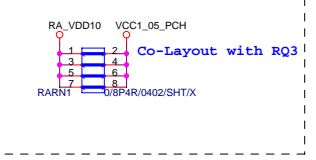
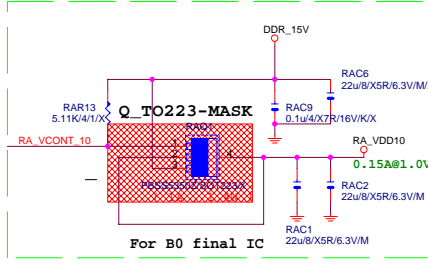
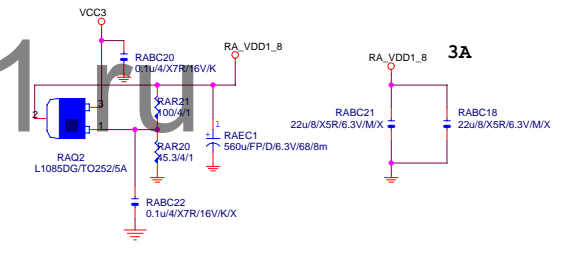
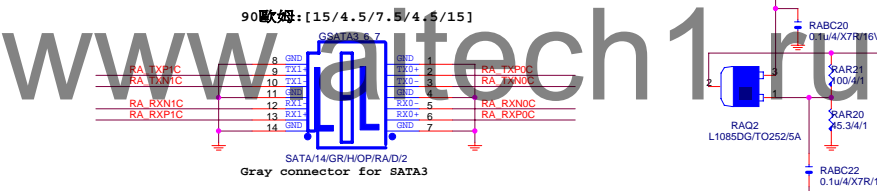
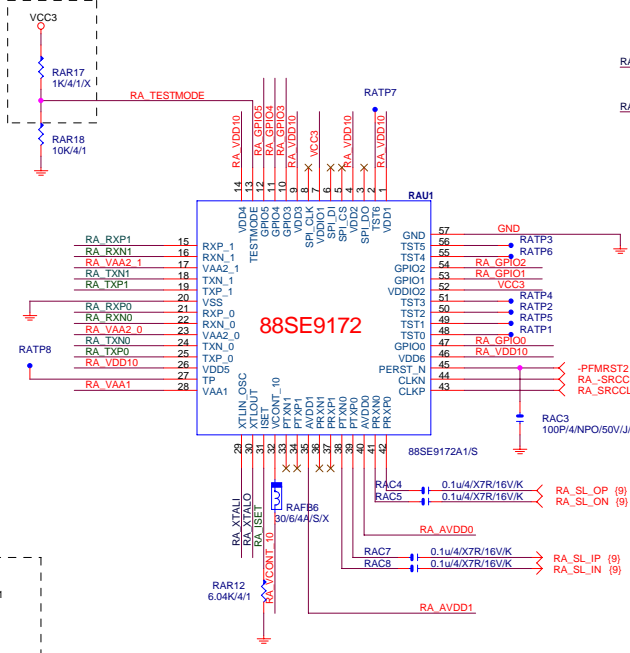
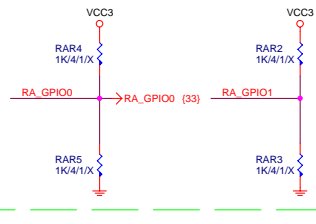
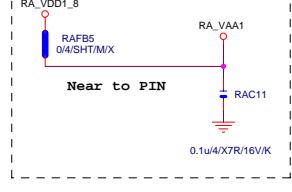
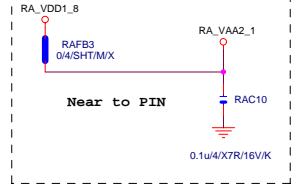
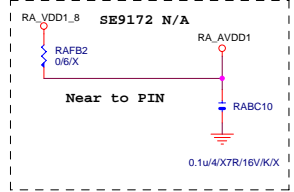
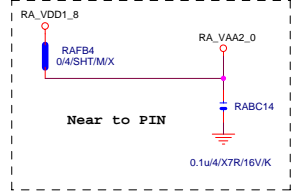
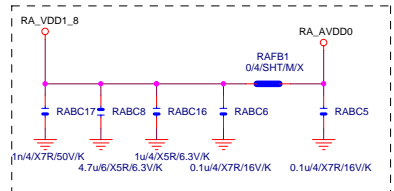
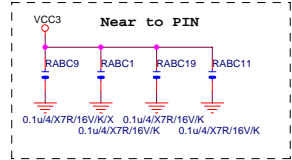
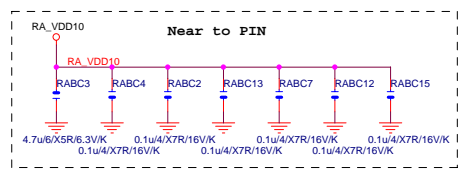
L1117LG/N/SOT223/1A-->UR17:0/4,UR16:100/4/1 [1.25V]



USB3.0 --> 5GHz

BANDWITH=5GHz*(8b/10b)=4Gb/s=500MB/s

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Title			
Marvell 9172			
Size	Document Number		Rev
Custom	GA-Z68X-UD3-B3		1.02
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2			1

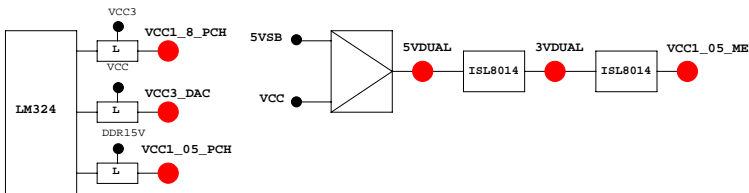
PCH GPIO LIST TABLE

PIN NAME	PWR	Default	USAGE	NOTE
GP0	MAIN	H-Z	-PECI_REQ	N/A
GP1/TACH1	MAIN		ICH_FAN_TACH1	N/A
GP2/PIRQE#	MAIN		-PIRQE	P/U 8.2K VCC3
GP3/PIRQF#	MAIN		-PIRQF	P/U 8.2K VCC3
GP4/PIRQG#	MAIN		-PIRQG	P/U 8.2K VCC3
GP5/PIRQH#	MAIN		-PIRQH	P/U 8.2K VCC3
GP6/TACH2	MAIN		ICH_FAN_TACH2	N/A
GP7/TACH3	MAIN		ICH_FAN_TACH3	N/A
GP8	STBY	H	GPO	P/U 8.2K 3VDUAL
GP9/OC5#	STBY		NATIVE	OC5#
GP10/OC6#	STBY		NATIVE	OC6#
GP11/SMBALERT#	STBY		NATIVE	-SMBALERT
GP12	STBY	L	GPI	LAN_PHY_PWR_CTRL
GP13	STBY	L	GPI	GPIO13
GP14/OC7#	STBY		NATIVE	OC7#
GP15	STBY	L	GPO	GPIO15
GP16	MAIN		GPI	-SKTOCC
GP17/TACH0	MAIN		GPI	ICH_FAN_TACH0
GP18	MAIN		NATIVE	MB_ID0
GP19	MAIN		GPI	-LAN1_ISO
GP20	MAIN		NATIVE	LED_CTL
GP21	MAIN		GPI	VCC18_PCH_OV2
GP22	MAIN	H-Z	GPI	VCORE_OV3
GP23	MAIN		NATIVE	-LDRQ1
GP24	STBY	L	GPO	TLS
GP25	STBY		NATIVE	-CPU_STOP
GP26	STBY		NATIVE	-ACZ_DET
GP27	STBY	H	GPO	GPIO27
GP28	STBY	H	GPO	GPIO28
GP29	STBY	L	GPI	GPIO29
GP30	STBY	H-Z	GPI	S_PWR_ACK
GP31	STBY	H-Z	GPI	N/A(Reverse)
GP32	MAIN	H	GPO	MB_ID1
GP33	MAIN	H	GPO	LOAD-LINE
GP34	MAIN	H-Z	GPI	-PCI_STOP
GP35	MAIN	L	GPO	GPIO35
GP36	MAIN		GPI	-LAN1_DSM
GP37	MAIN		GPI	N/A
GP38	MAIN	H-Z	GPI	VCORE_OV2
GP39	MAIN	H-Z	GPI	-LAN_DSM
GP40	STBY		NATIVE	OC1#
GP41	STBY		NATIVE	OC2#
GP42	STBY		NATIVE	OC3#
GP43	STBY		NATIVE	OC4#
GP44	STBY	L	NATIVE	N/A
GP45	STBY		NATIVE	-LPCPME
GP46	STBY	L	NATIVE	PWR_LED
GP47	STBY		NATIVE	PSI_LED
GP48	MAIN	H-Z	IN	EN_PWM
GP49	MAIN	H-Z	IN	VCC18_OV1
GP50	MAIN		NATIVE	-REQ1
GP51	MAIN	H	NATIVE	-GNT1
GP52	MAIN		NATIVE	-REQ2
GP53	MAIN	H	NATIVE	-GNT2
GP54	MAIN		NATIVE	-REQ3
GP55	MAIN	H	NATIVE	-GNT3
GP56	STBY		NATIVE	N/A(Reverse)
GP57	STBY	H-Z	IN	VCORE_OV1
GP58	STBY	H-Z	NATIVE	F_USB_OC
GP59	STBY		NATIVE	USB_OC0#
GP60	STBY	H-Z	NATIVE	N/A(Reverse)
GP61	STBY	L	NATIVE	-SUSTAT
GP62	STBY	L	NATIVE	SUSCLK
GP63	STBY	L	NATIVE	GPIO63
GP64	MAIN	L	NATIVE	CLKOUTFLEX0
GP65	MAIN	L	NATIVE	CLKOUTFLEX1
GP66	MAIN	L	NATIVE	CLKOUTFLEX2
GP67	MAIN	L	NATIVE	CLKOUTFLEX3
GP72	STBY	H-Z	NATIVE	VCORE_OV4
GP73	STBY		NATIVE	1_05V_OV1
GP74	STBY	H-Z	NATIVE	1_05V_OV2
GP75	STBY	H-Z	NATIVE	N/A(Reverse)

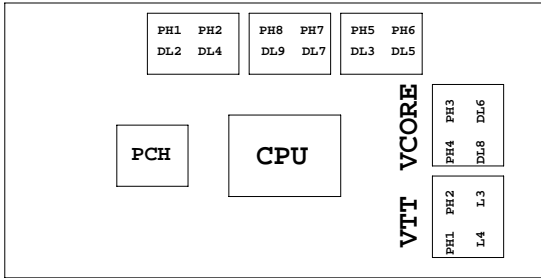
Super I/O ITE8720 GPIO Table

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

PIN NAME	USAGE	NOTE
FAN_TAC2/GP52	FANIO2	
FAN_TAC3/GP37	FANIO3	
VIDO3/FAN_TAC4/GP25/DSR2#	FANIO4	
FAN_CTL2/GP51	FANPWM2	
FAN_CTL3/GP36	FANPWM3	
VID4/GP34	BEEP-	
VID3/GP33	TURBO1	
VID2/GP32	TURBO0	
VCORE_GOOD/VID6/GP63	CPUT_LED1_C	
VID5/GP35	CPUT_LED2_C	
VID1/GP31	CPUT_LED3_C	
VID0/GP30	-LAN1_DSM	NBT_LED1_C
SLCT/GP80	CPU_LED1_C	
PE/GP81	CPU_LED2_C	
BUSY/GP82	CPU_LED3_C	
PD3/GP73/BUSS11	SB_LED1_C	
PD4/GP74/BUSS12	SB_LED2_C	
VCORE_EN/VID7/GP64	IT_GP64	SB_LED3_C
PD0/GP70	NB_LED1_C	
PD1/GP71	NB_LED2_C	
PD2/GP72/BUSS10	NB_LED3_C	
GP22/SCX	LOW_PWR_1	
VID05/GP27/SIN2	LOW_PWR_2	
PCIRST2#/GP11	-PWRST1	
PCIRST1#/GP12	-PFMRST2	
3VSBSW#/GP40	CSI_F0	BSEL166_1
SUSC#/GP53	CSI_F1	BSEL166_2
GP23/SI	BSEL166_3/CSISBSL	
VIDO0/GP20/CTS2#	CPUT_LED1_C	BSEL166_4
GP65/VDDA_EN/GB_01	MB_ID2	
PD6/GP76/BUSS01	MB_ID3	
PD7/GP77/BUSS02	MB_ID4	
AFD#/GP86/SMBC_R	2V PIN	FST_2X8
INIT#/GP85/SMBC_M	SEC_2x8	GTLREF_AD2
ACK#/GP83	DDR_LED1_C	
VID01/GP21/DCD2#	DDR_LED2_C	
STB#/GP87/SMBC_M	DDR_LED3_C	
PWRON#GP44	VCORE_OV1	
PANSWH#/GP43	PWRBTSW	
KDAT/GP61	-PWRBTSW	
KCLK/GP60	KDAT	
MDAT/GP57	KCLK	
MACL/GP56	MDAT	
GP66/VLDT_EN/GB_02	NBT_LED1_C	MCLK
SVD/PCIRSTIN#/CIRTX/GP15	PWM2_CR	
KDAT/GP61	PWM2_CR	
GP67/CPU_PG/GB_03	EN_LOADLINE	IT_GP67/-EN_PWM2
SLIN#/GP84/SMBC_R	-EN_PWM2	
PSI_L/FAN_CLT5/CIRRXL/GP16	-THERM	
VIDO4/GP26/SOUT2	DDR18V_PH2_EN	
VIDO2/FAN_TAC5/GP24/DSR2#	DDR18V_LED	
VID06/GP17/RI2#	1_1V_PH_EN	
VID07/JP6/DTR2#	JP6	
PD5/GP75/BUSS00	SB_LED3_C	



PWM各相位的擺法如下：



BIOS超電壓對應表：

散熱模組料號：

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

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

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TABLE LIST			
Size C	Document Number	Rev	
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