

# Model Name: GA-Z68X-UD3P-B3

SHEET

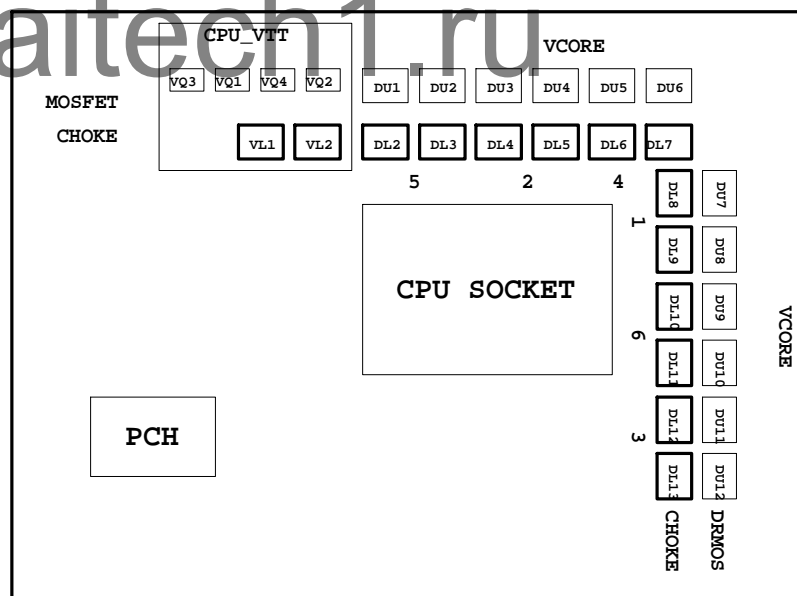
TITLE

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	IT8892
19	PCI SLOT 1&2
20	I/O ITE8728
21	COM, -PROHOT, ESATA CONNECT
22	Dual BIOS , TPM SLB9635TT
23	ALC899
24	REAR AUDIO JACK
25	VCORE PWM_ISL6366CRZ-1
26	VCORE PWM_ISL6366CRZ-2
27	VCORE PWM_ISL6366CRZ-3
28	N/A

SHEET

TITLE

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	VT6308P 1394
38	REAR ET168A USB3.0
39	FRONT EJ168A USB3.0
40	MARVELL 9172
41	N/A
40	TABLE LIST



Gigabyte Technology			
Title	Cover Sheet		
Size	Document Number	GA-Z68X-UD3P-B3	Rev
Custom			1.0
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### Component value change history

Data	Change Item	Reason
2011/02/21	9MP6XU3PB-00-01	P67X-UD3P-B3-01_20110221_1000_BOM.DSN
	EVT RELEASE	
2011/03/24	9MZ68XU3P-00-10A	
更換	MR23,316/4/1變更爲330/4/1	
	DR172,DR172,150K/4變更爲330K/4/1	
	DR168,VR52,1K/4/1變更爲499/4/1	
	DR220,25.5K/4/1變更爲40.2K/4/1	
	DR263,100K/4/1變更爲162K/4/1	
	DR259,200K/4/1變更爲324K/4/1	
	NR17,40.2K/4/1變更爲10K/4/1	
	R16,40.2K/4/1變更爲20K/4/1	
	MR22,NR197,20K/4/1變更爲4.99K/4/1	
	GSATA3_6_7,SATA/14/BK/H/OP/RA/D/2變更爲SATA/14/GR/H/OP/RA/D/2	
	PCH,BD82P67/B3/S變更爲BD82Z68/B3/S	
	R24,12K/4/1變更爲8.2K/4/1	
	UAFB1,UAFB2,UBF1,UBF2,SMD1206P300SLR/S變更爲SMD1812P350SLR/S/[10FF1-06350B-20R]	
	DR199,54.9K/4/1變更爲110K/4/1	
	DR262,49.9K/4/1變更爲80.6K/4/1	
	DR182,165K/4/1變更爲330K/4/1	
	VU1,ISL6322G/QFN48/[10TA1-606322-21R]變更爲ISL6322G/QFN48/[10TA1-606322-21R_10TA1	
	DR139,47K/4/1變更爲8.2K/4/1	
	MR10,MR11,MR12,MR13,MR15,MR16,MR4,MR5,MR6,MR7,499/4/1變更爲1K/4/1	
	UBC6,UBC7,1u/4/X5R/6.3V/K變更爲0.1u/4/X7R/16V/K	
	DR14,DR133,DR15,DR16,DR102,DR114,DR138,DR7,DR61,DR40,DR31,DR56,332/4/1變更爲475/4/1	
	DR202,DR196,5.49K/4/1變更爲10K/4/1	
增加	C16,1u/4/X5R/6.3V/K R66,R75,270K/4 OR7,R106,R112,8.2K/4 IBC14,C25,DC142,DC143,DC505,DC506,0.1u/4/X7R/16V/K R108,R111,220/6 Q28,Q33,Q40,2N7002/SOT23/25pF/5 DC504,22u/8/X5R/6.3V/M Q35,Q39,PMBT2907A/SOT23/-600mA/50 AD1,AZ2225-01L/SOD323 Q29,Q36,MMBT2222A/SOT23/600mA/40 R77,R110,2K/4 C29,DC501,DC502,1u/6/X7R/16V/K RAEC1,100u/OS/D/16V/66/30m NX2-SHT,SHW/D0.64*5.08*6.74 R127,1K/4/1	刪除 R1,LAR3,LABC25,RBR20,LAR14,0/4 DBC102,0.1u/4/X7R/16V/K R48,OR12,OR15,DR349,DR339,DR317,R52,8.2K/4 R56,R57,220/6 CESD1,CESD2,CESD3,CESD4,CESD5,AZ2025-04S/SOT23-5 NR28,33/4 Q27,DQ46,2N7002/SOT23/25pF/5 RABC21,22u/8/X5R/6.3V/M RARN1,0/8P4R/4 Q15,DQ43,Q14,PMBT2907A/SOT23/-600mA/50 DQ48,Q16,Q17,MMBT2222A/SOT23/600mA/40 R49,R51,R53,22K/4 NX3-SHT,SHW/D0.64*5.08*6.74 DR343,DR295,75K/4/1 DR320,DR344,DR326,1K/4/1

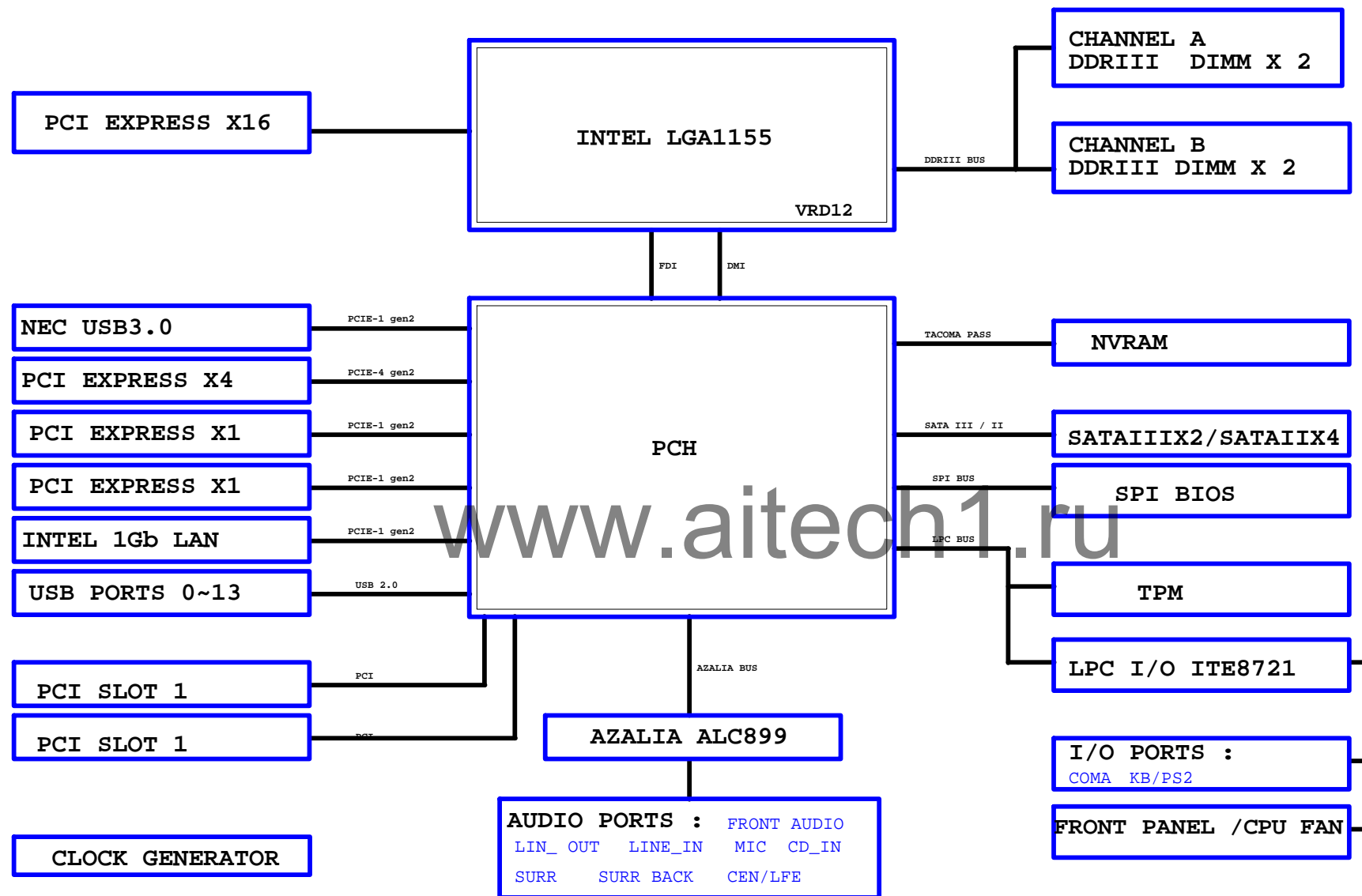
## Circuit or PCB layout change

DATE	Change Item	Reason
2011/02/18	Change from P67X-UD4-B3 Rev0.1	P67X-UD3P-B3-01_20110218_1000.DSN
Rev:0.1		
2011/03/09	Remove LAR11,LAR14,NR28	P67X-UD3P-B3-10A_20110308_1800.DSN
REV1.0	NX3-SHT --> NX2-SHT	
	CR44 --> R0603-RH	
	CESD1,CESD2,CESD3,CESD4,CESD5 --> SSOP5	
	CESD2標示PIN1	
	Add DR388,DR389,DR391	
	Remove DR371,DQ49,DR347	
	R1,LABC25,LAR3,RBR20 --> R0402-2-SHORT10-MASK	
	Remove LAR11,LAR14	
	Remove IU2	
	RAQ1 --> Q_TO223-MASK	
	RARN1 --> R8P4R-0402-SHORT	
	RAQ2,RAEC1下移40MIL	
2011/03/21	Model name change to GA-Z68X-UD3P-B3	
REV1.0	USB3.0 Fuse change to 1812 3.5A	
	CEC1-CEC10;RAEC1;UBEC2 change to EC6D8MM-RH-1	
2012-11R]	Add DC500,DC501,DC502,DC504,DC505,DC506,DC142,DC143	
	Add R130	
2011/03/24	9MZ68XU3P-00-10B	2011/03/30 9MZ68XU3P-00-10C
	1.PCIE 36P 改為11AC1-021036-B1R	1.Add C23,0.1u/4/X7R/16V/K
	2.MOS Heatsink改為用料一	2.Add C24,1u/4/X5R/6.3V/K
2011-01-012025-10R]		
	2011/03/24 9MZ68XU3P-00-10D	
	1.C14-->0.1u/6	
	2.R95-->22K/4	

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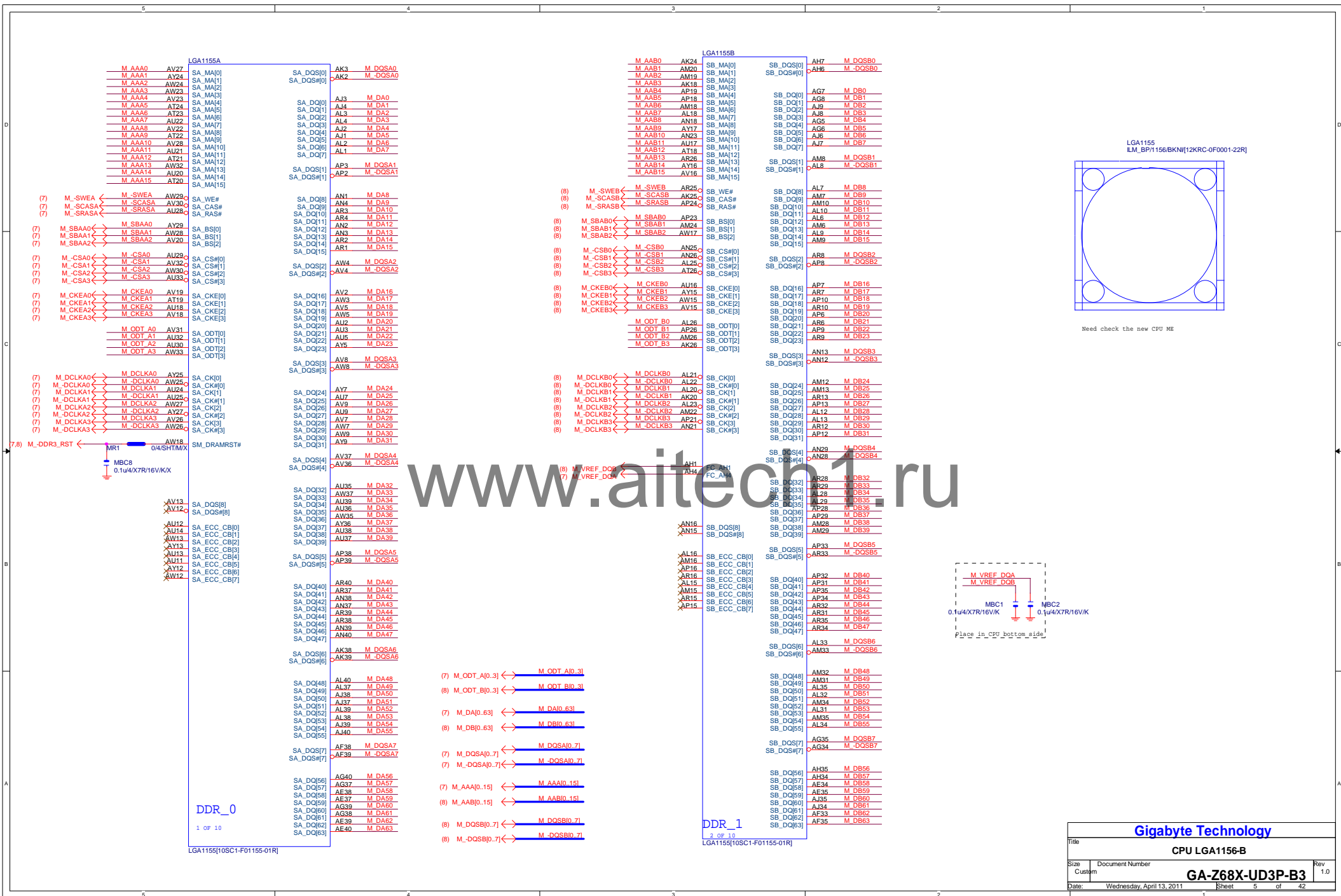
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BOM & PCB MODIFY HISTORY			
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# BLOCK DIAGRAM



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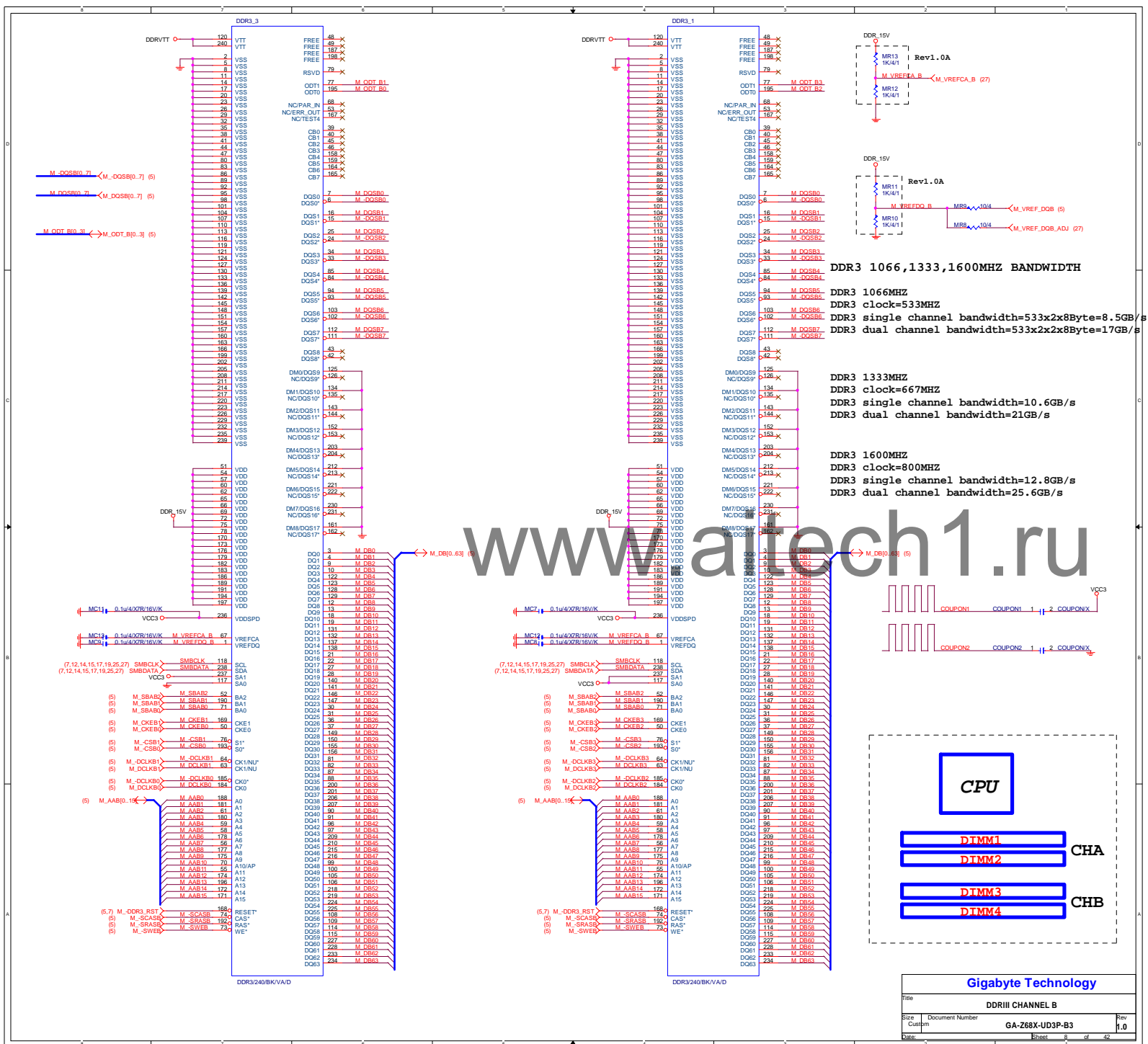




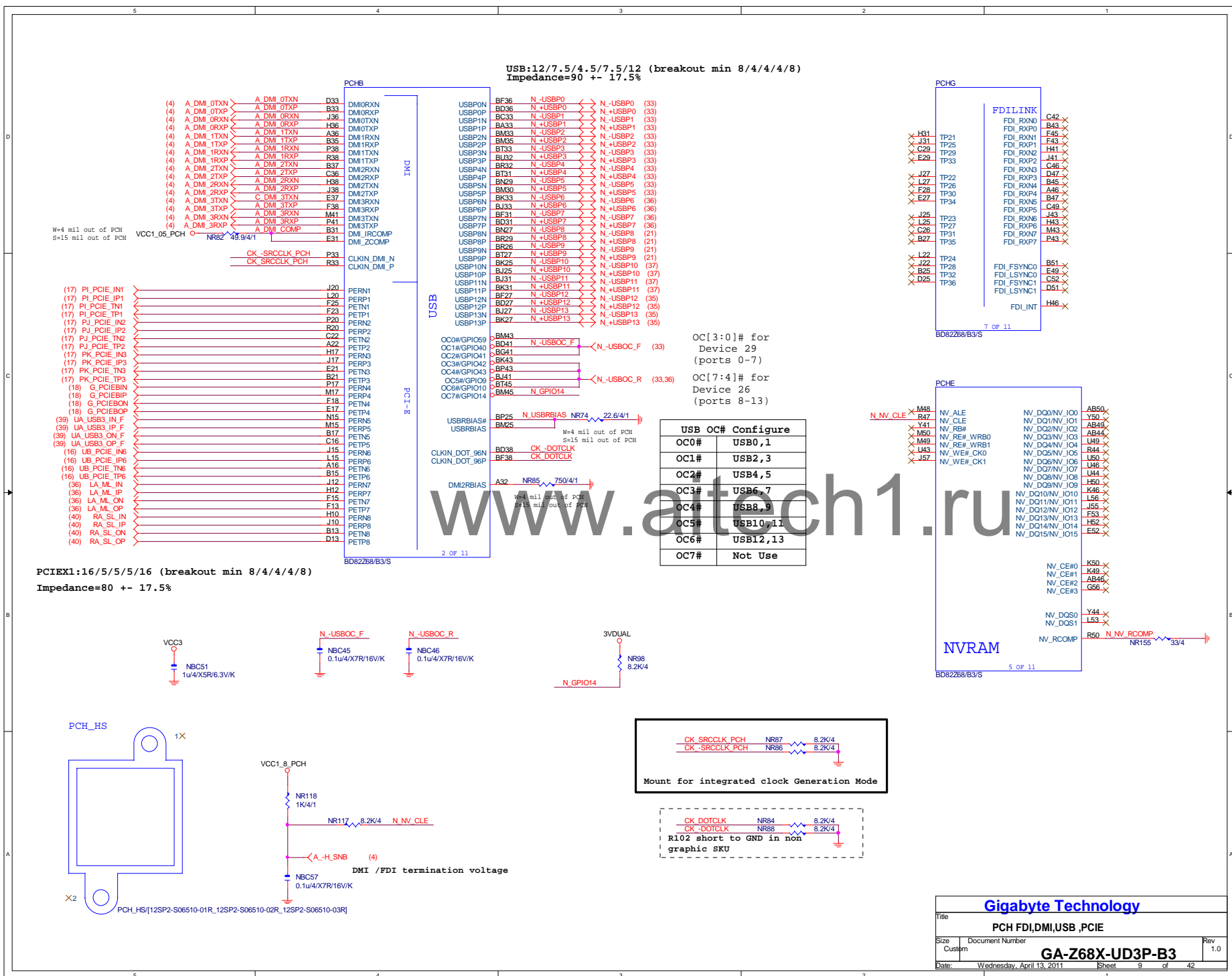








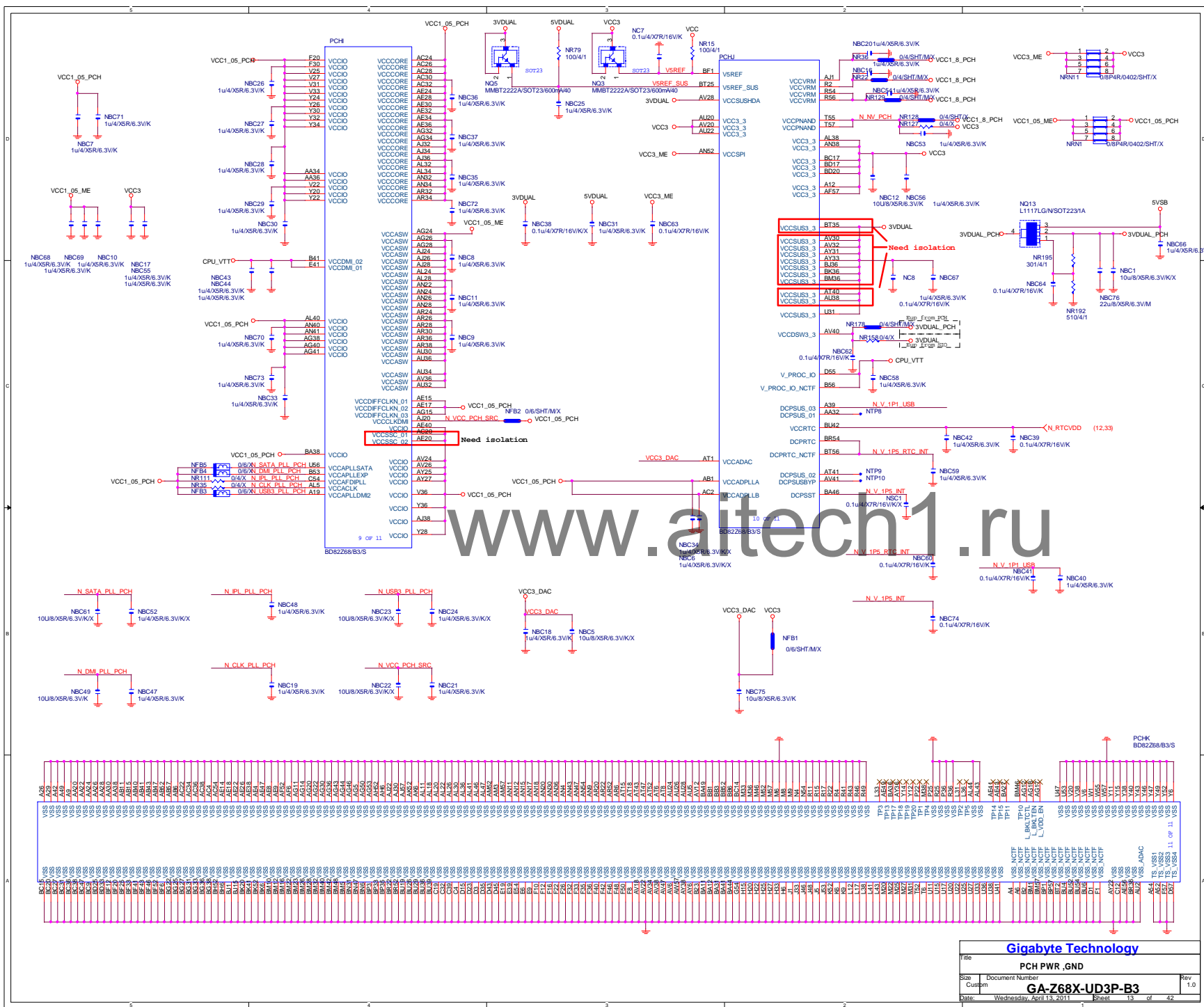




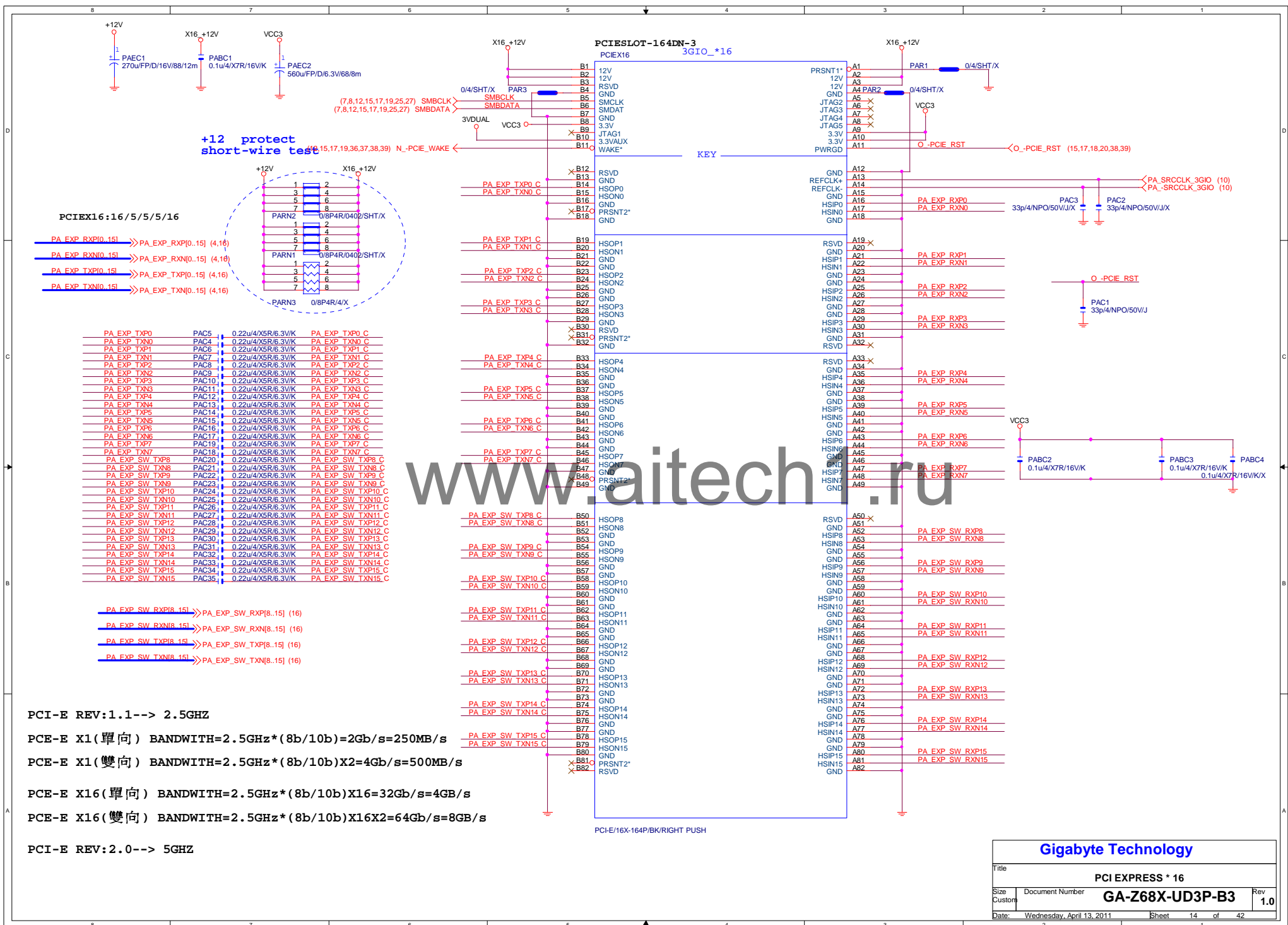




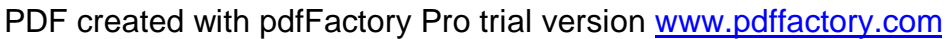


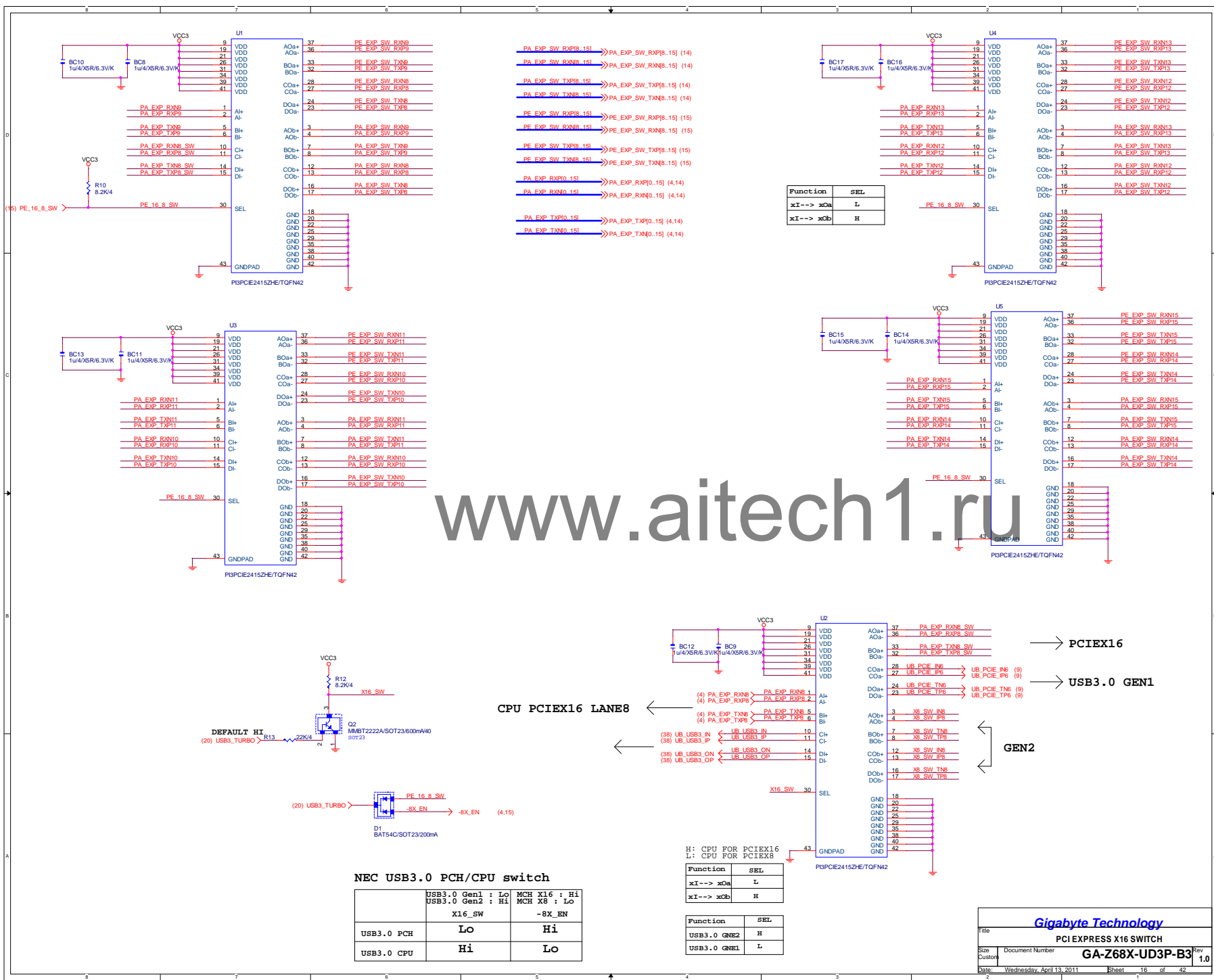




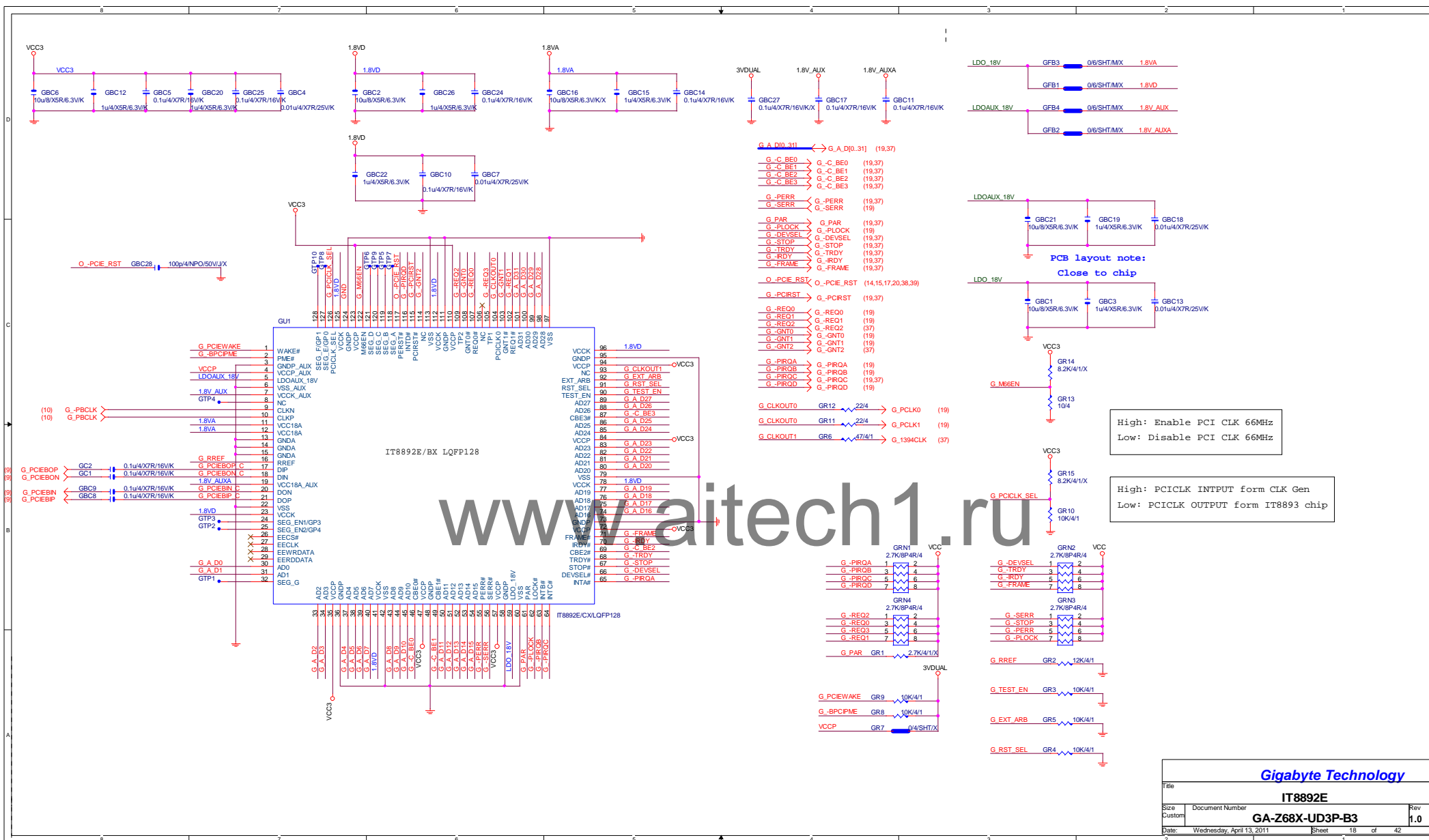




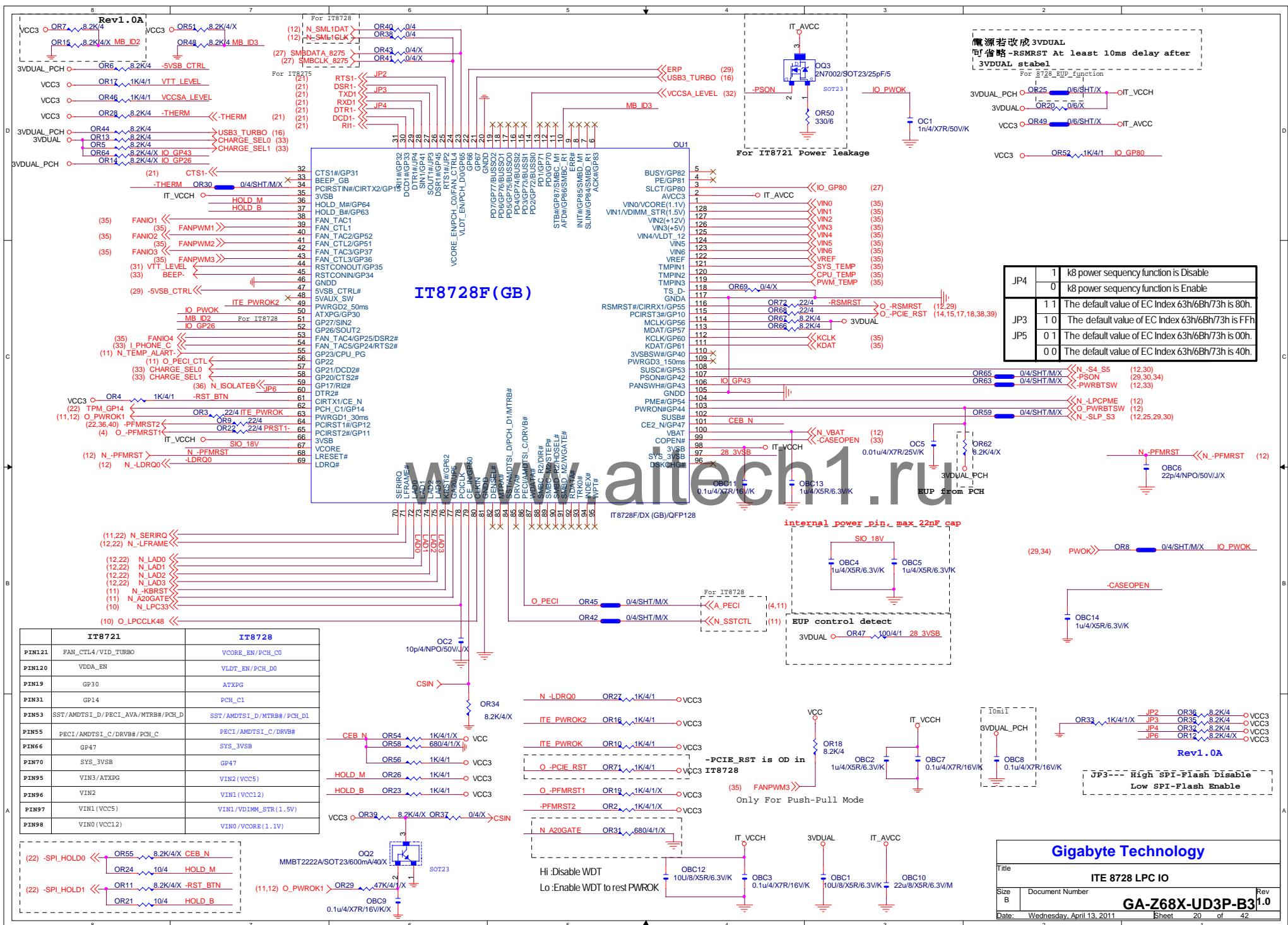




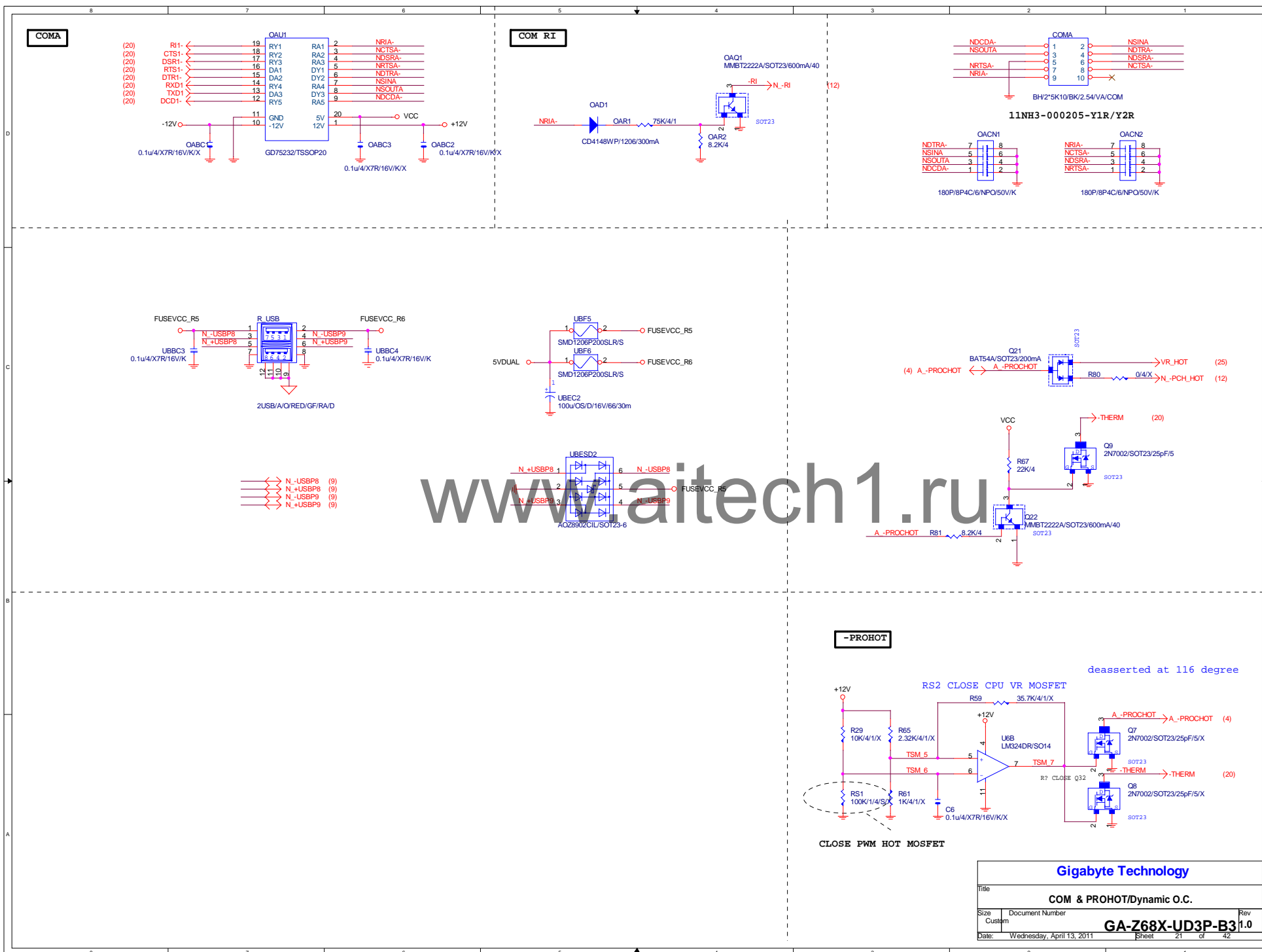


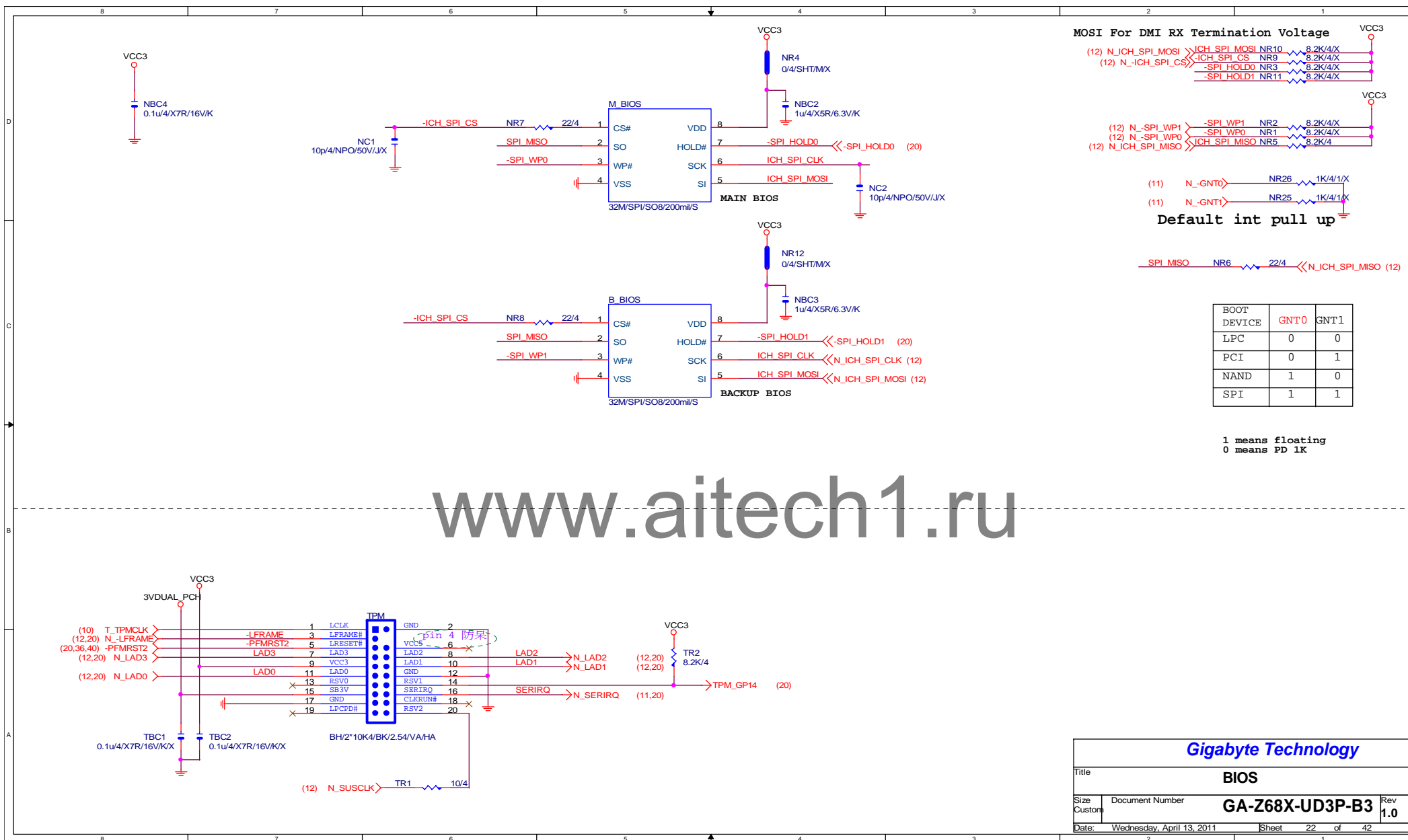




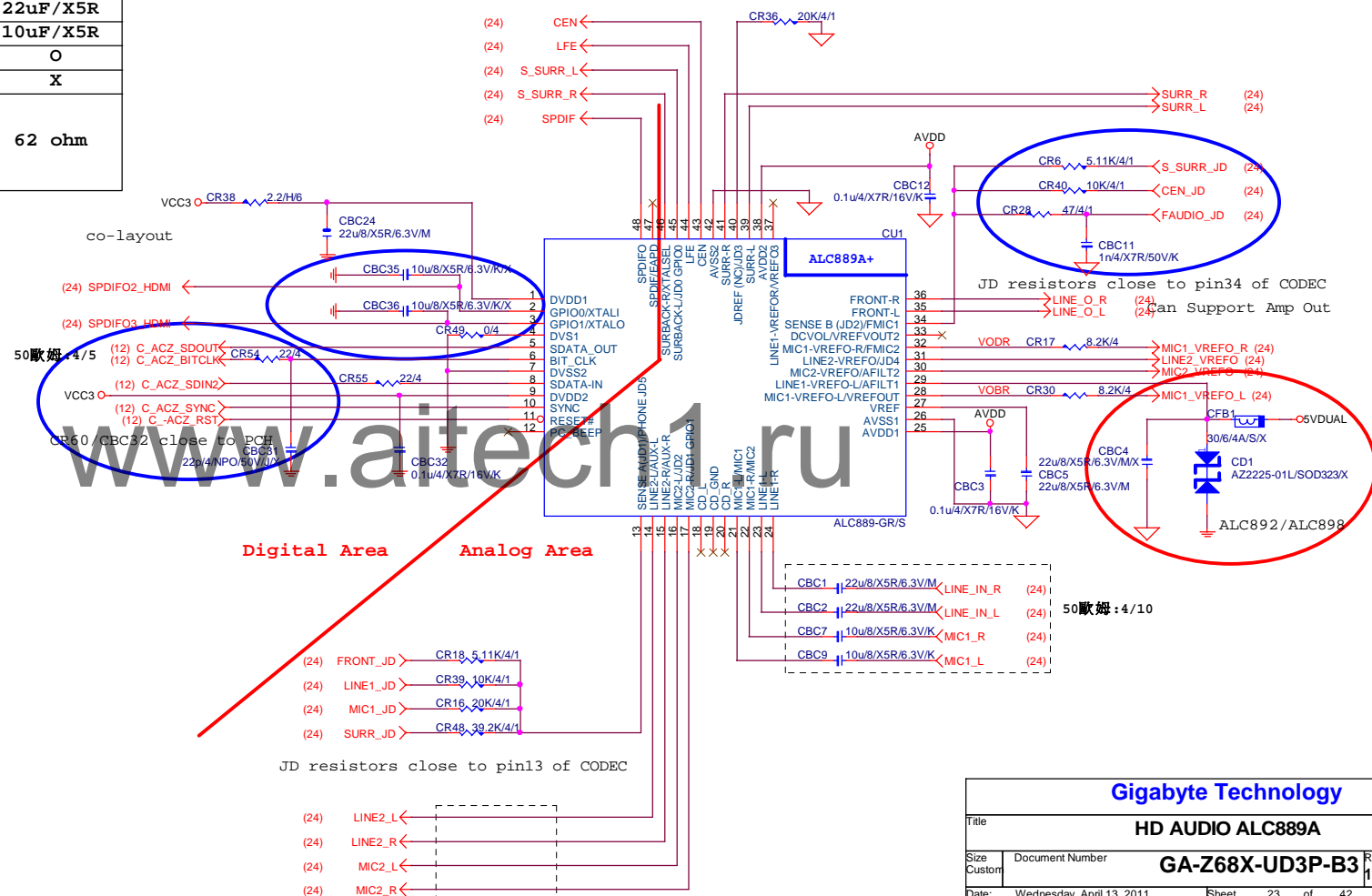








	ALC889	ALC889B	ALC898/ALC892
CR49	O	O	X
CBC36	X	X	10uF/X5R
CBC35	X	10uF/X5R	X
CR52	O	X	O
CR53	X	O	X
CBC1/CBC2	22uF/X5R	22uF/X5R	22uF/X5R
CBC7/CBC9/CBC20/CBC15	10uF/X5R	10uF/X5R	10uF/X5R
CFB1/CD1/CBC4	X	X	O
CD2/CD3/CQ3/CQ4	O	O	X
CR7/CR9/CR5/CR13/ CR29/CR32/CR46/CR19/ CR50/CR41/CR21/CR47/ CR2/CR11/CR14/CR24	62 ohm	62 ohm	62 ohm

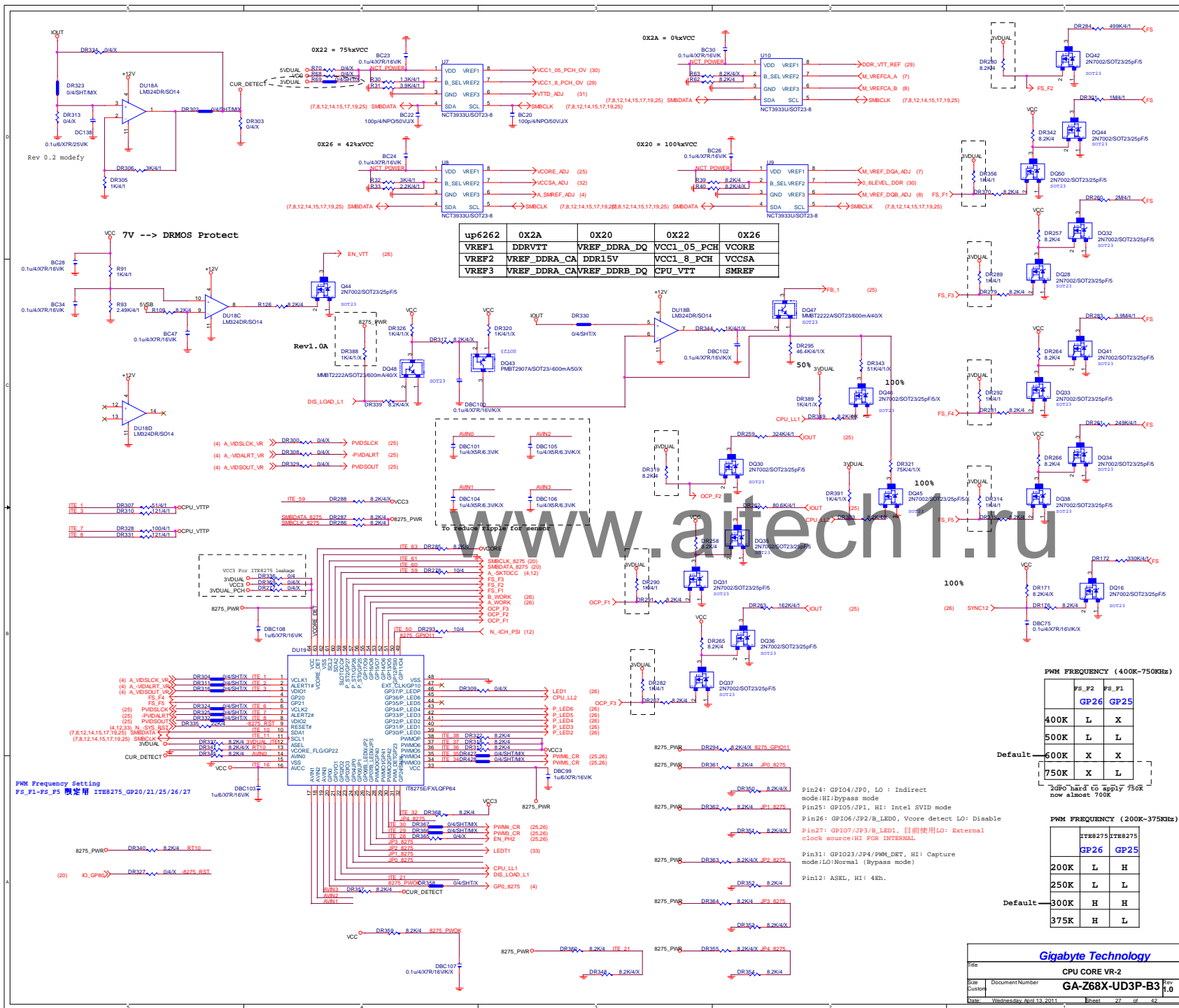








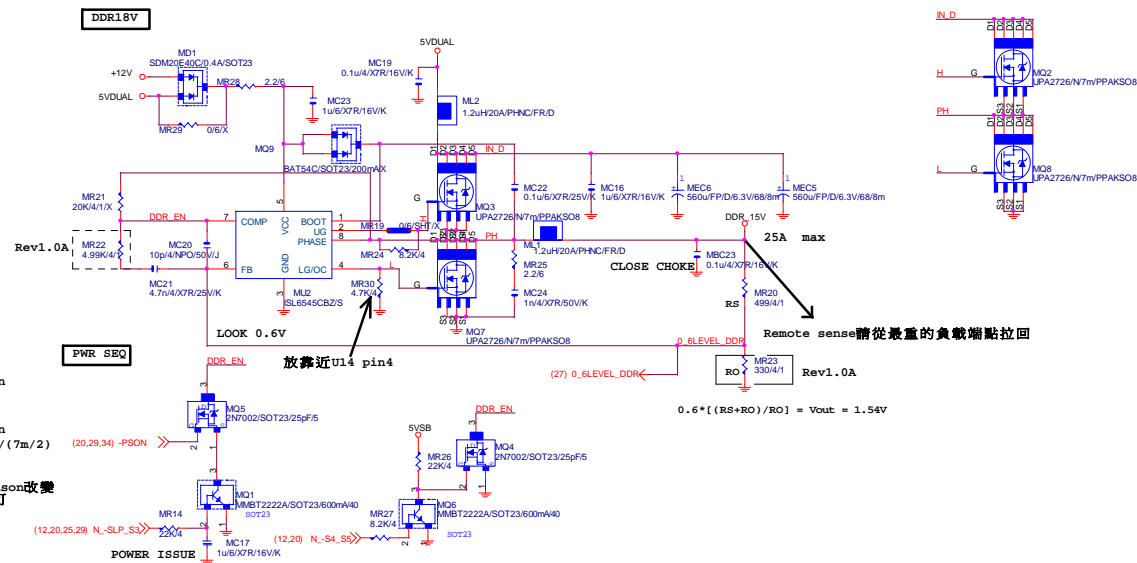




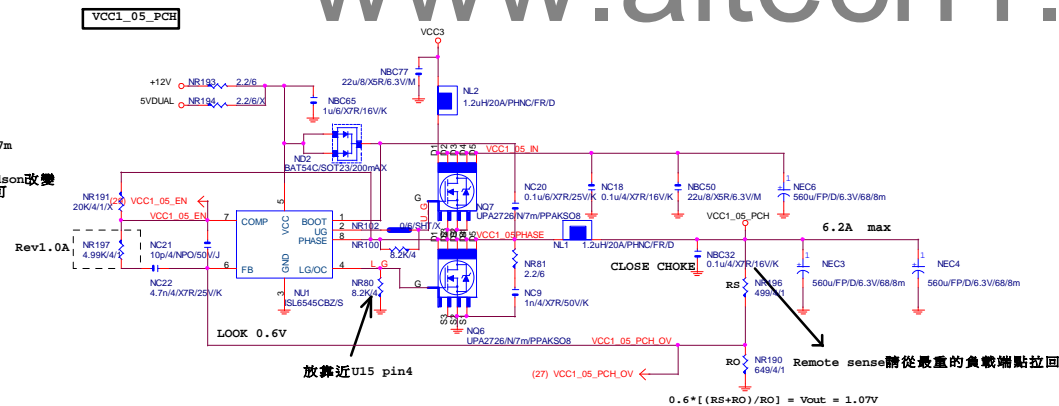
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<b>GIGABYTE™</b>			
Title <b>VCORE PHASE GEAR 4</b>			
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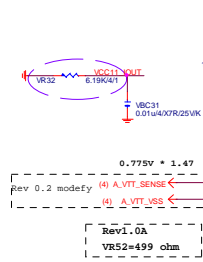
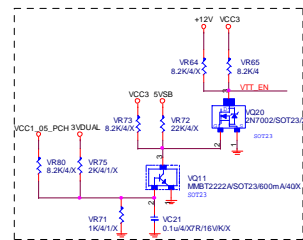




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File	DDR 15V		
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VCC VR16 242K/41X GMCH\_SS  
Pu for 6322 type2 SMBus address  
address 1000\_111x  
VCC VR17 8.2K/41X DRSL\_E

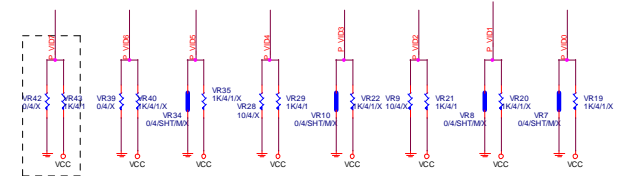
OCF點做在120A  
Isens+ R176阻值做在432ohm  
Iocp=(IsensxRisenxPhase)/DCR  
= (120uAx432K)/0.85m=120A  
L/DCR=4°C  
L=0.8uH DCR=0.85 mohm , 0.8uH/0.85mohm=4.3KX0.22uF  
Risen R175阻值=4.3k ohm, cIsen BC51=0.22u  
Rt=10\*[0.61-(1.035Xlog(FS))] Rt=R301=158 kohm , FS=170KHz  
OVP=Vdac+225mV

VTT_SEL	
HI	1.05V
LO	1.00V

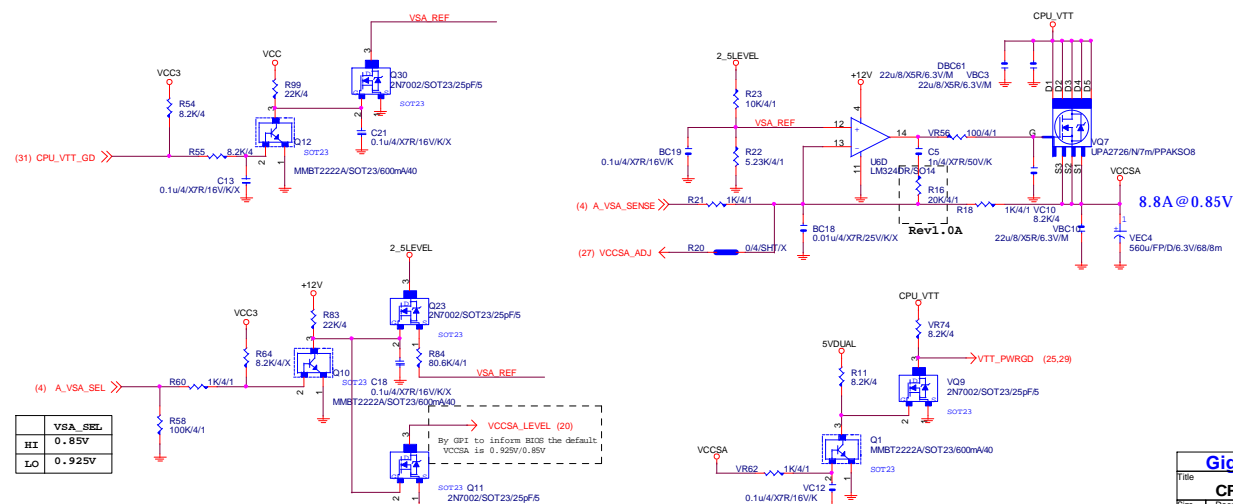
Bit 7 Pull High  
for AMD 6bit  
mode

Receive Bit6  
when use AMD  
mode

AMD 6bit mode  
SET 1.05V  
[1x010100]



VCC\_SA

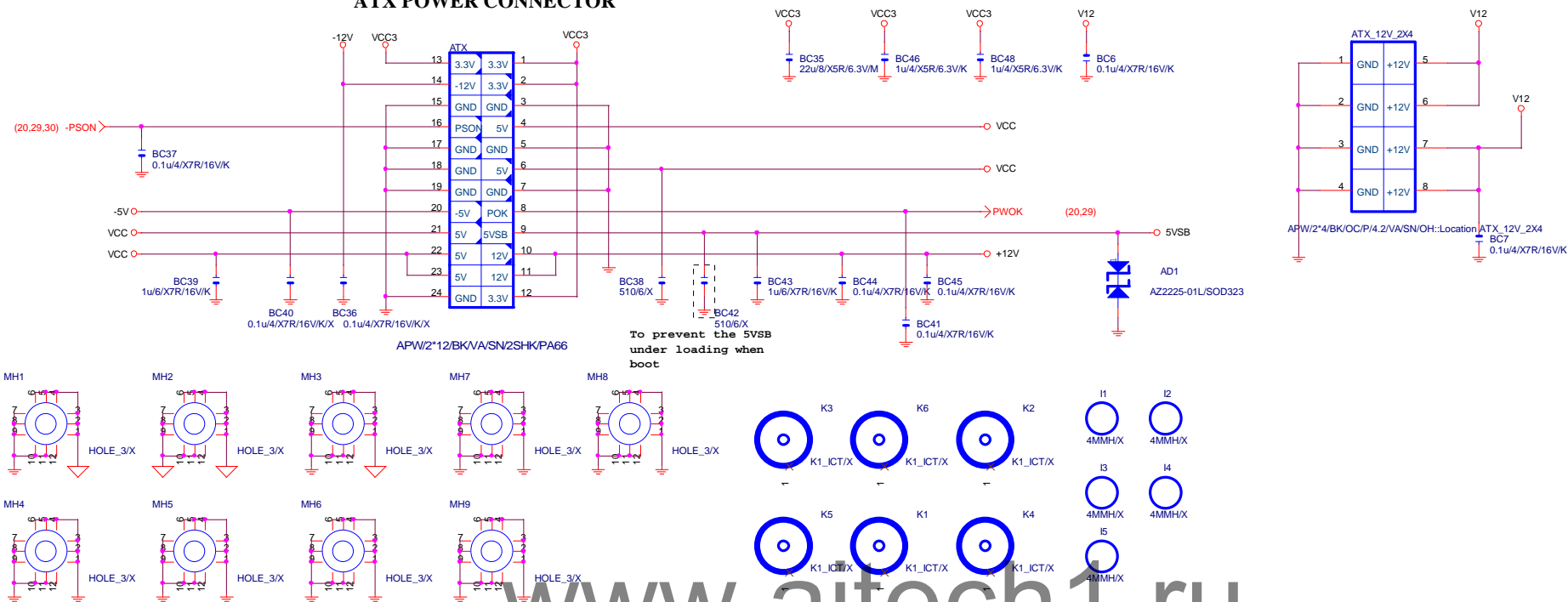


<b>Gigabyte Technology</b>			
Title <b>CPU VTT PWM_ISL6312</b>			
Size C	Document Number <b>GA-Z68X-UD3P-B3</b>		Rev <b>1.0</b>
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# ATX POWER CONNECTOR



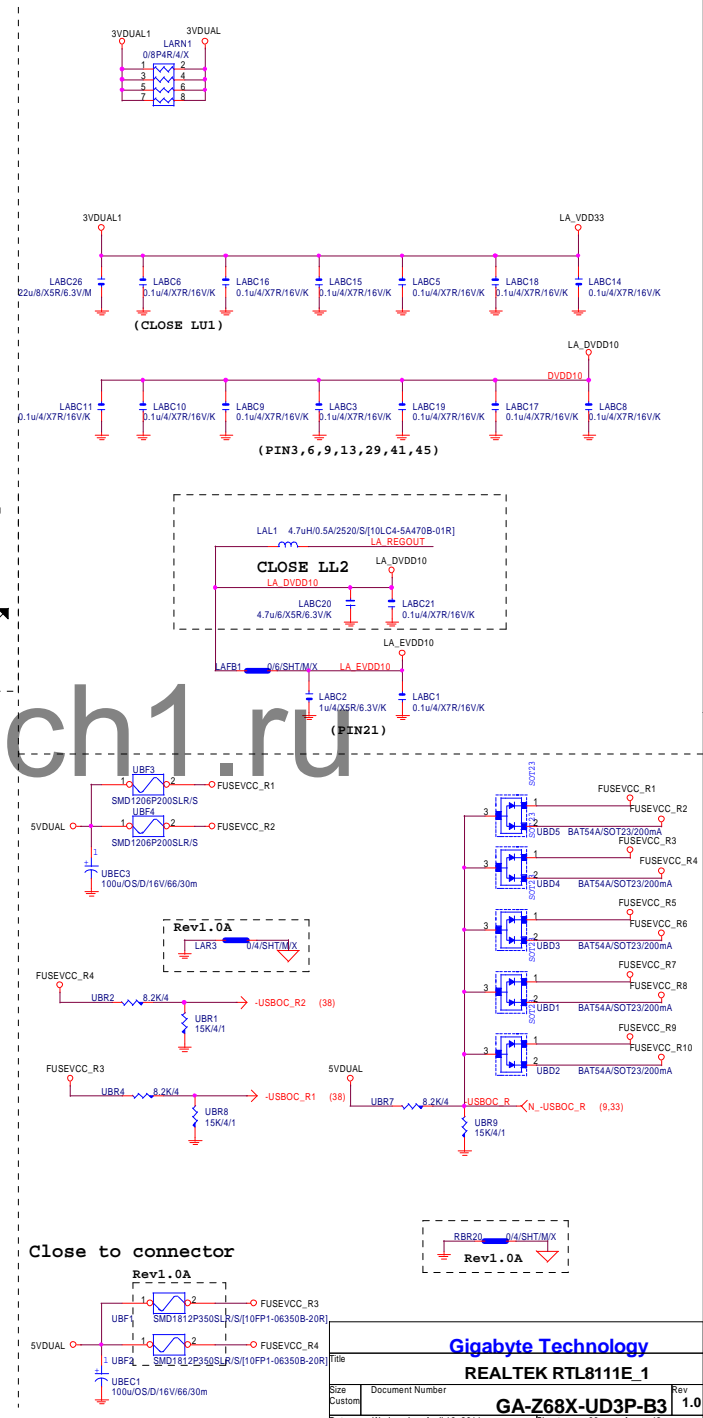
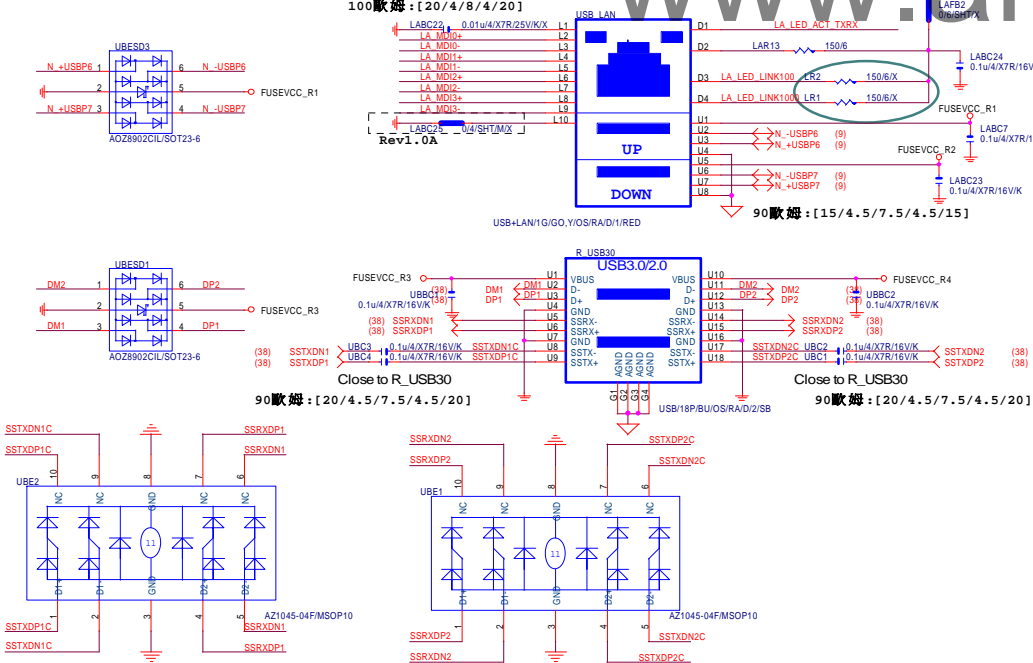
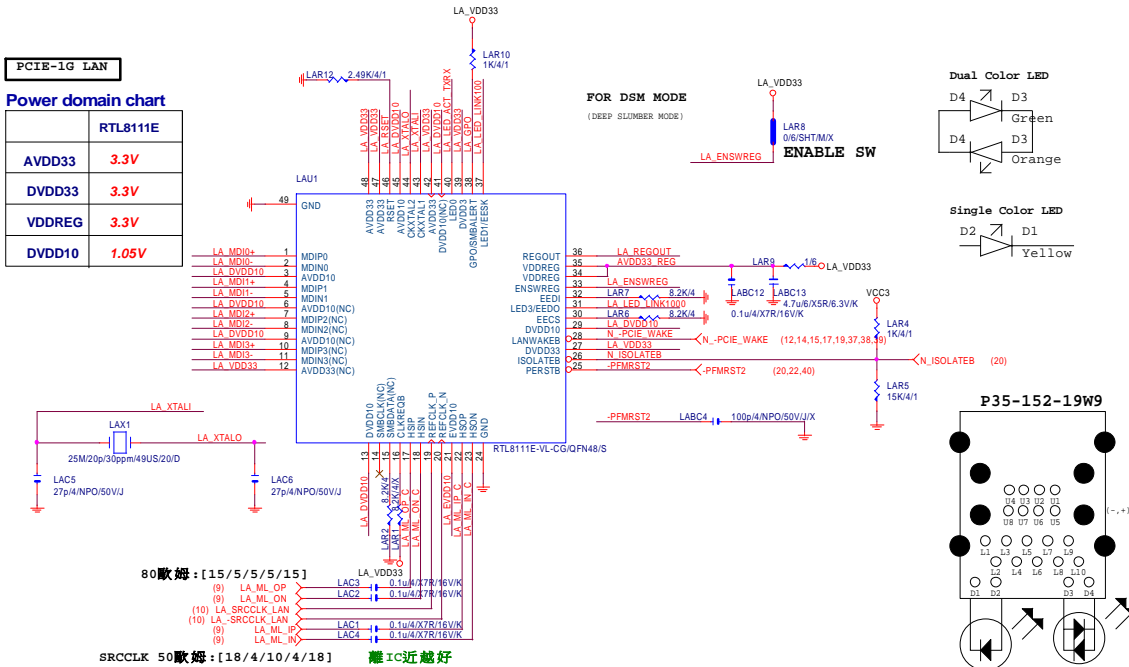
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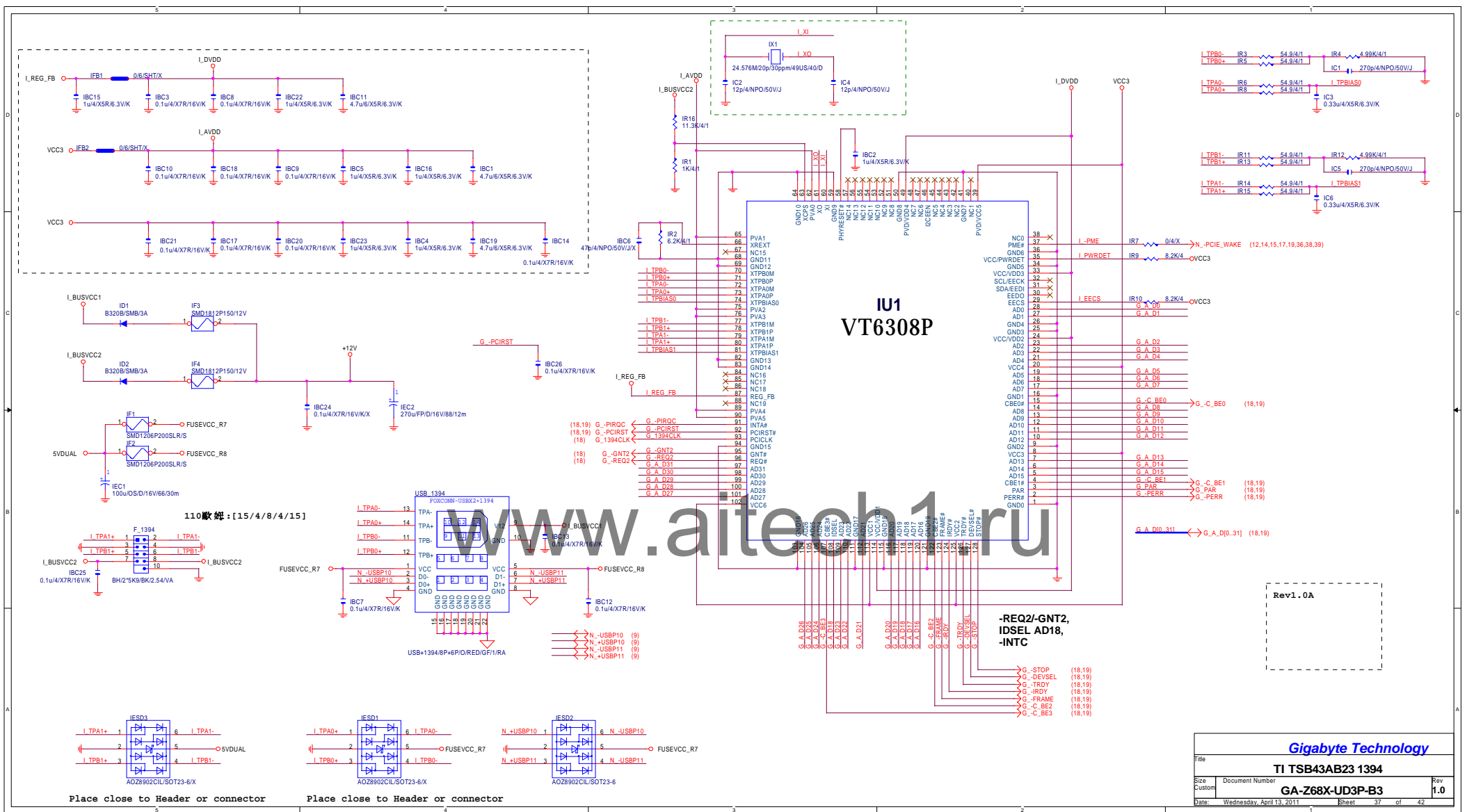
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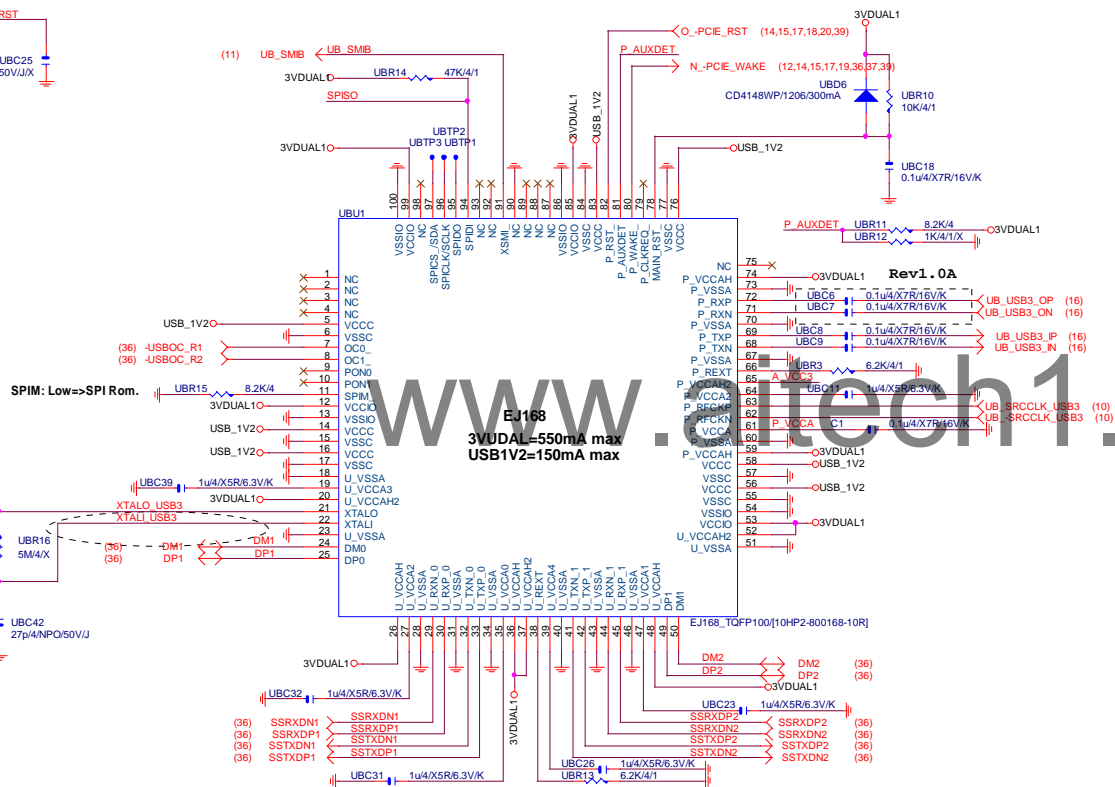
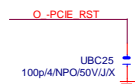
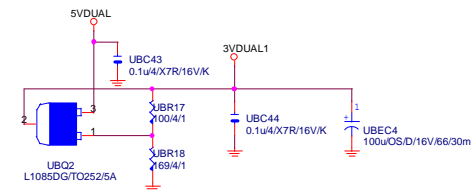
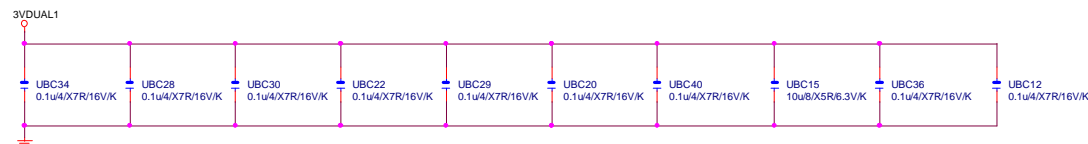


### Power domain chart

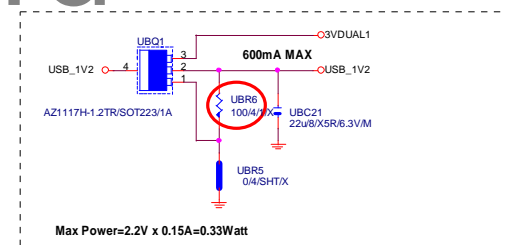
	RTL8111E
AVDD33	3.3V
DVDD33	3.3V
VDDREG	3.3V
DVDD10	1.05V



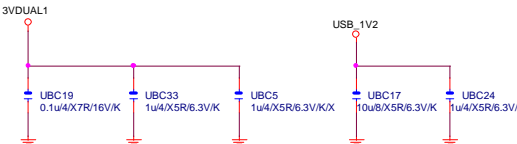
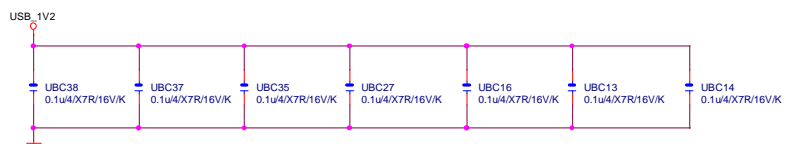




Rev1.0A



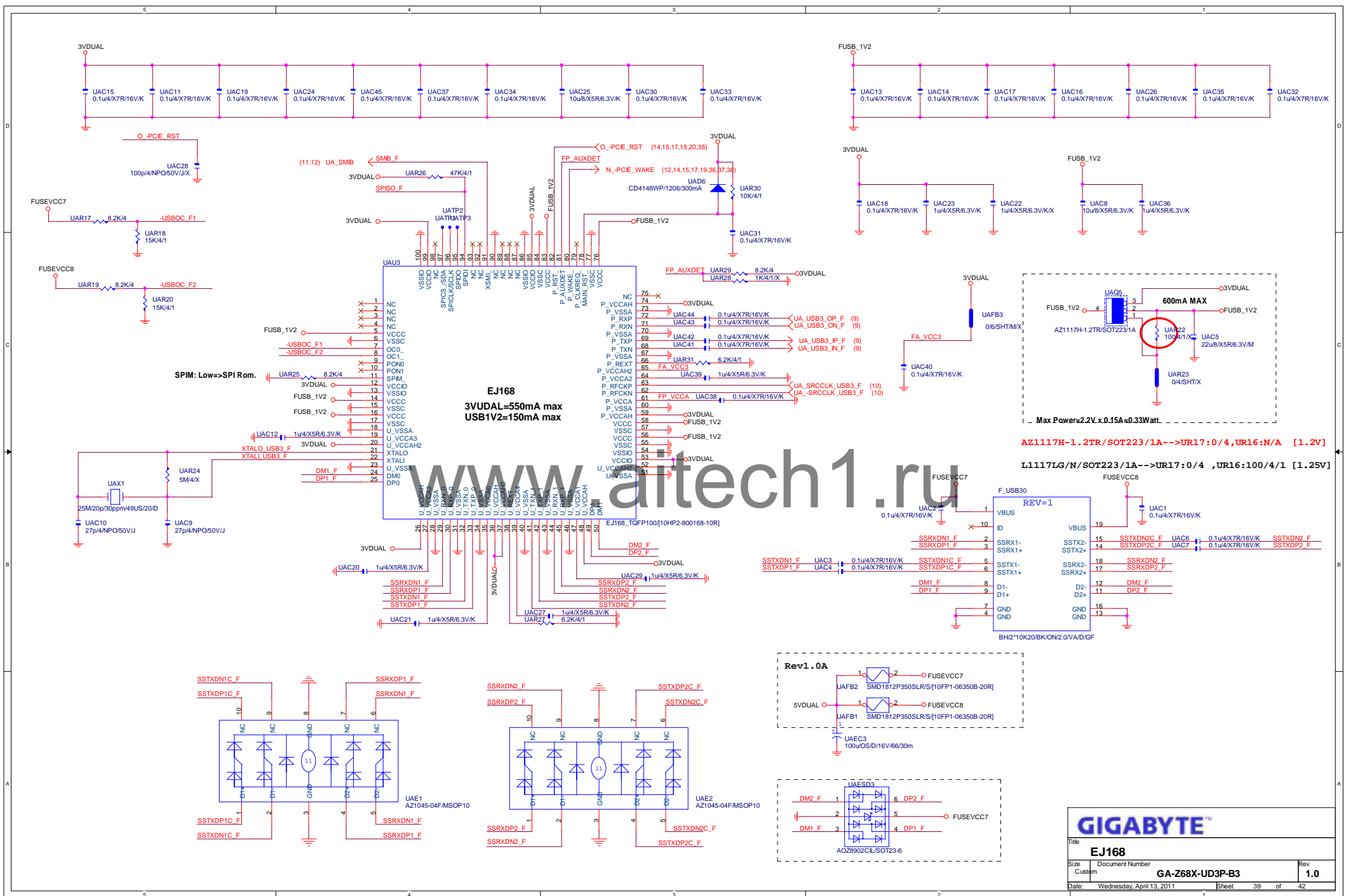
AZ1117H-1.2TR/SOT223/1A-->UR17:0/4,UR16:N/A [1.2V]  
L1117LG/N/SOT223/1A-->UR17:0/4,UR16:100/4/1 [1.25V]



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

<b>GIGABYTE™</b>			
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File			
Marvell 9172			
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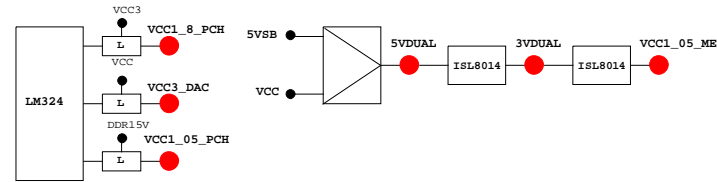
PCH GPIO LIST TABLE

PIN NAME	PWR	Default	USAG	NOTE
GP0	MAIN	H-Z	GPI	-PECI_REQ
GP1/TACH1	MAIN		GPI	ICH_FAN_TACH1
GP2/PIRQE#	MAIN		GPI	-PIRQE
GP3/PIRQF#	MAIN		GPI	-PIRQF
GP4/PIRQG#	MAIN		GPI	-PIRQG
GP5/PIRQH#	MAIN		GPI	-PIRQH
GP6/TACH2	MAIN		GPI	ICH_FAN_TACH2
GP7/TACH3	MAIN		GPI	ICH_FAN_TACH3
GP8	STBY	H	GPO	GPIO8
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_OCO#
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)

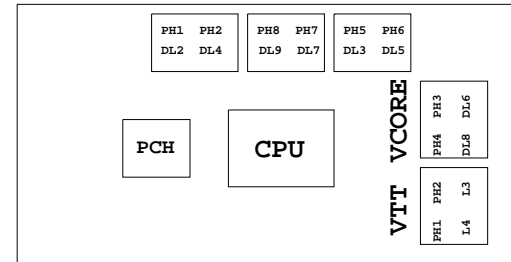
Super I/O ITE8720 GPIO Table

PIN NAME	USAG	NOTE
SVC/PECI_RQT/GP14	-PECI_REQ	
PWROK1/GP13	PWROK1/ITE_PWROK	
KRST#/GP62	-KBRST	
SO/GP50	-ICH_SPI_CS	
IRTX/GP47/CE2_N/JP7	CEB_N	
GP46/IRRX	-LAN2_DSM	
PSION#/GP42	-PSON	
PWROK2#/GP41	PECI_CTL	
PCIRST3#/GP10/VDIMM_STR_EN	-PCIE_RST	
RSMRST#CIRRX1/GP55	-RSMRST	
PME#/GP54	-LPCPME	
PD5/GP75/BUSS00	N/A	

PIN NAME	USAG	NOTE
FAN_TAC2/GP52	FANIO2	
FAN_TAC3/GP37	FANIO3	
VIDO3/FAN_TAC4/GP25/DSR2#	FANIO4	
FAN_CTL2/GP51	FANPWM2	
FAN_CTL3/GP36	FANPWM3	
VID4/GP34	BEEP-	
VID3/GP33	TURBO1	
VID2/GP32	TURBO0	
VCORE_GOOD/VID6/GP63	CPUT_LED1_C	
VID5/GP35	CPUT_LED2_C	
VID1/GP31	CPUT_LED3_C	
VID0/GP30	-LAN1_DSM	NBT_LED1_C
SLCT/GP80	CPU_LED1_C	
PE/GP81	CPU_LED2_C	
BUSY/GP82	CPU_LED3_C	
PD3/GP73/BUSSI1	SB_LED1_C	
PD4/GP74/BUSSI2	SB_LED2_C	
VCORE_EN/VID7/GP64	IT_GP64	SB_LED3_C
PD0/GP70	NB_LED1_C	
PD1/GP71	NB_LED2_C	
PD2/GP72/BUSSI0	NB_LED3_C	
GP22/SCK	LOW_PWR_1	
VIDO5/GP27/SIN2	LOW_PWR_2	
PCIRST2#/GP11	-PFMRST1	
PCIRST1#/GP12	-PFMRST2	
3VSB5W#/GP40	CSI_F0	BSEL166_1
SUSCH/GP53	CSI_F1	BSEL166_2
GP23/SI	BSEL166_3/CSISBSL	
VIDO0/GP20/CTS2#	CPUT_LED1_C	BSEL166_4
GP65/VDDA_EN/GB_01	MB_ID2	
PD6/GP76/BUSS01	MB_ID3	
PD7/GP77/BUSS02	MB_ID4	
AFD#/GP86/SMB_C_R	SEC_PIN	FST_2X8
INIT#/GP85/SMBD_M	SEC_2x8	GTLREF_AD2
ACK#/GP83	DDR_LED1_C	
VIDO1/GP21/DCD2#	DDR_LED2_C	
STB#/GP87/SMB_C_M	DDR_LED3_C	
PWRON#/GP44	VCORE_OV1	
PANSWH#/GP43	PWRBTW	
KDAT/GP61	-PWRBTW	
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/SMBD_R	-EN_PWM2	
PSI_L/FAN_CLT5/CIRRX2/GP16	-THERM	
VIDO4/GP26/SOUT2	DDR18V_PH2_EN	
VIDO2/FAN_TAC5/GP24/DSR2#	DDR18V_LED	
VIDO6/GP17/RI2#	1_1V_PH_EN	
VIDO7/JP6/DTR2#	JP6	
PD5/GP75/BUSS00	SB_LED3_C	



PWM各相位的擺法如下:



BIOS超電壓對應表:

散熱模組料號:

8IBP:

1.12SP2-01A001-Y1R/Y2R

2.12SP2-01A001-Z1R/Z2R

(HIBRID模組)包材階

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

	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	Document Number	Rev	
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