

Model Name: GA-X79-UP4 Rev 1.01

SHEET TITLE

01	COVER SHEET
02	BOM & PCB MODIFY HISTORY
03	BLOCK DIAGRAM
04	CPU_LGA2011-DDR
05	CPU_LGA2011-CTRL_PCIE_DMI
06	CPU_LGA2011-PWR
07-08	DDR III CHANNEL A/B
09-10	DDR III CHANNEL C/D
11	PCH_SATA_GPIO_AUDIO
12	PCH_DMI_USB_PCIE_PCI
13	PCH_PWR_GND
14	PCI EXPRESS X16 SLOT_1
15	PCI EXPRESS X16 SLOT 2
16-18	PCI EXPRESS X8 SLOT 1/2
19	PCI EXPRESS X1 & PCI SLOT
20	ITE 8728 SIO
21	DUAL BIOS , TPM
22	-PROHOT,KB/MS,RUSB,COMA
23-25	VCORE IR3567
26-28	DDR CH A/B & CPUVTT IR3570*2
29	PBG CORE POWER RT8120
30-31	DISCRETE POWER
32	FP ,FUSB
33	ATX , OC
34-35	ALC898 & AUDIO JACK
36	HWM ,FAN CTRL
37	CLOCK GEN & BUFFER

SHEET TITLE

38	F_USB3_FL1009
39	R_USB3_FL1009
40	Gb LAN-INTEL 82579V
41-42	Marvell 9172 SATA 3.0-A/B
43	Marvell 9172 eSATA
44	PCH GPIO LIST

www.aitech1.ru

Gigabyte Technology		
Title		
Cover Sheet		
Size	Document Number	Rev
Custom	GA-X79-UP4	1.01
Date:	Friday, August 03, 2012	Sheet 1 of 44

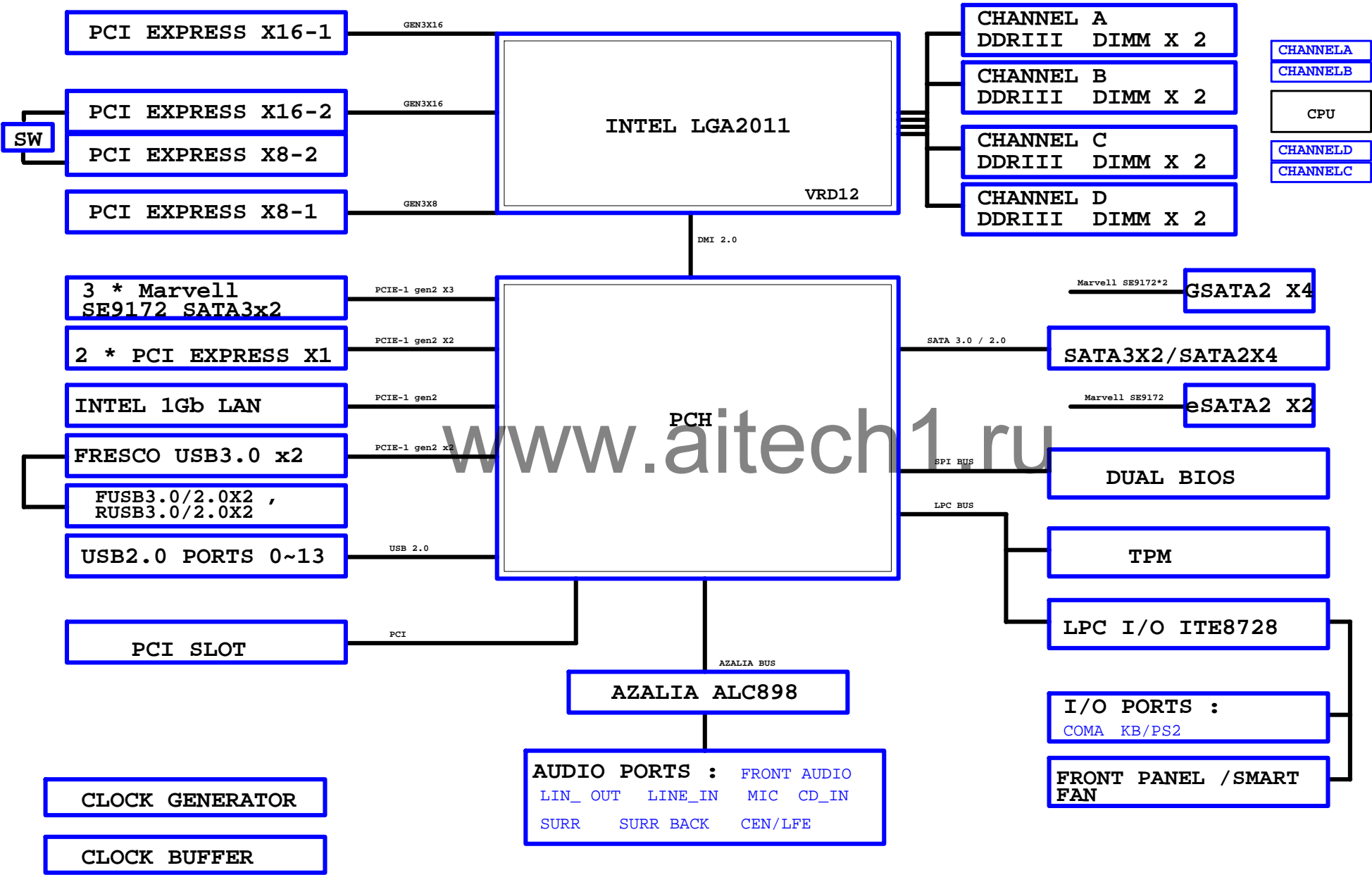
## Component value change history

[illegible]

## Circuit or PCB layout change

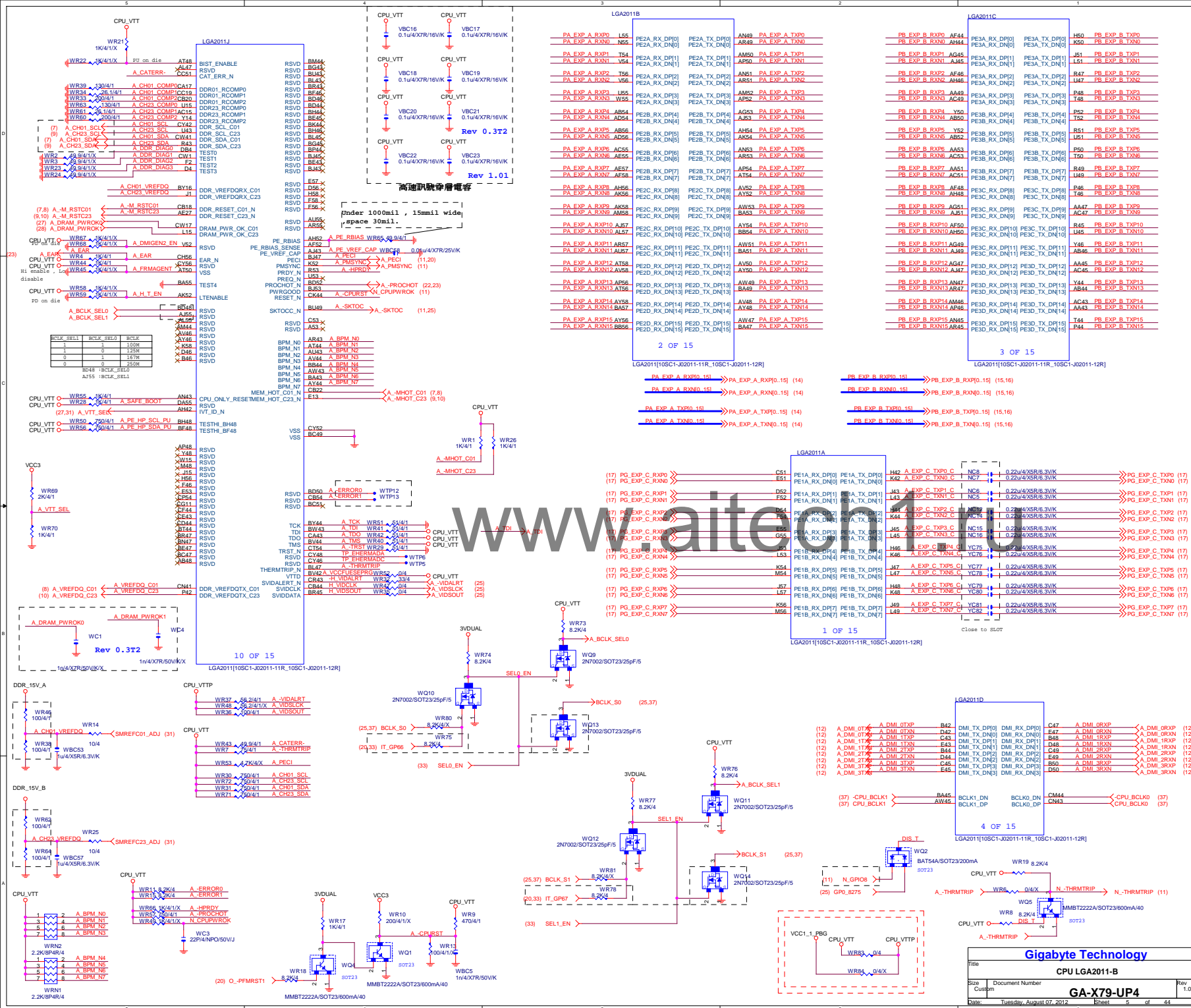
[illegible]

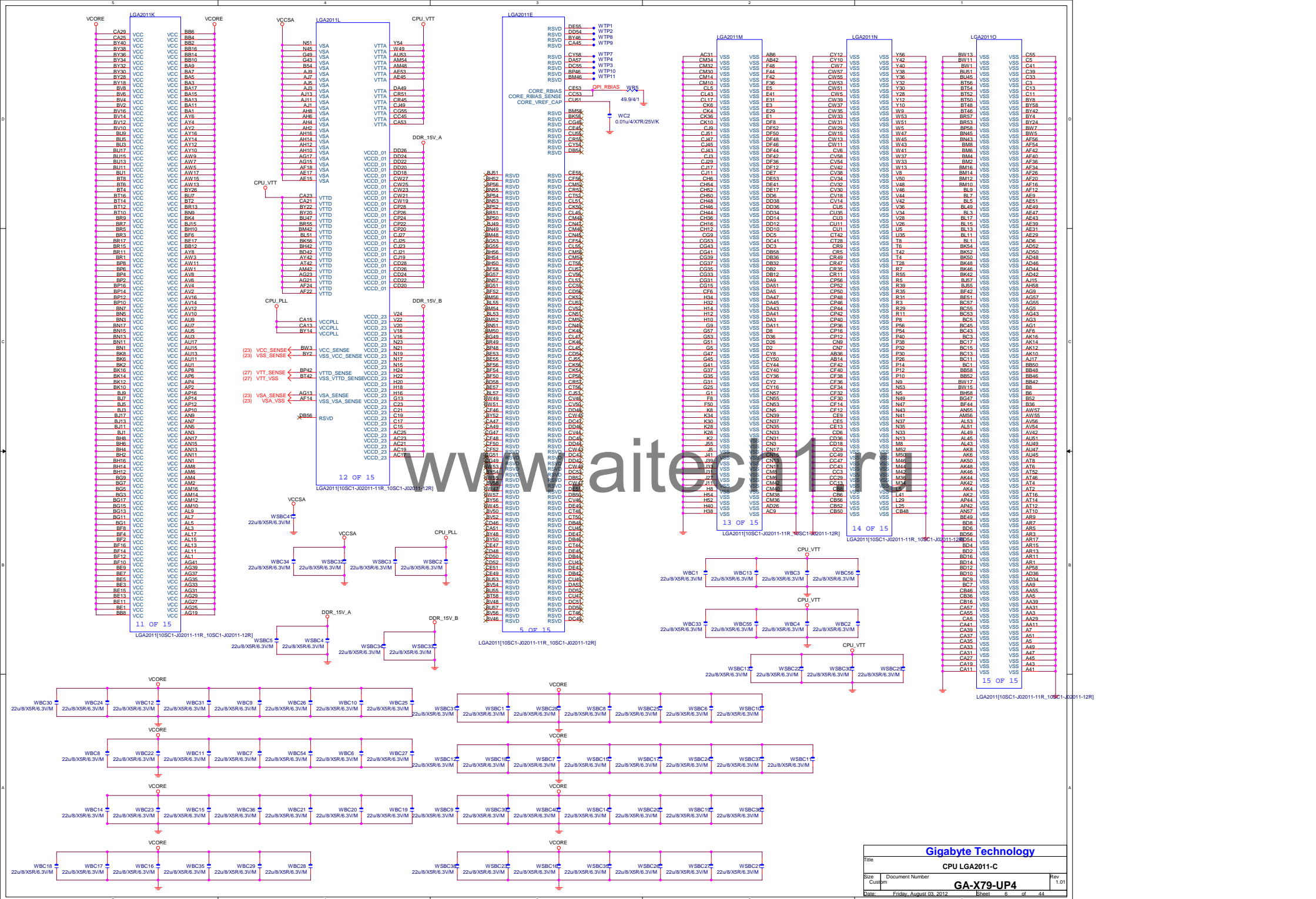
BLOCK DIAGRAM

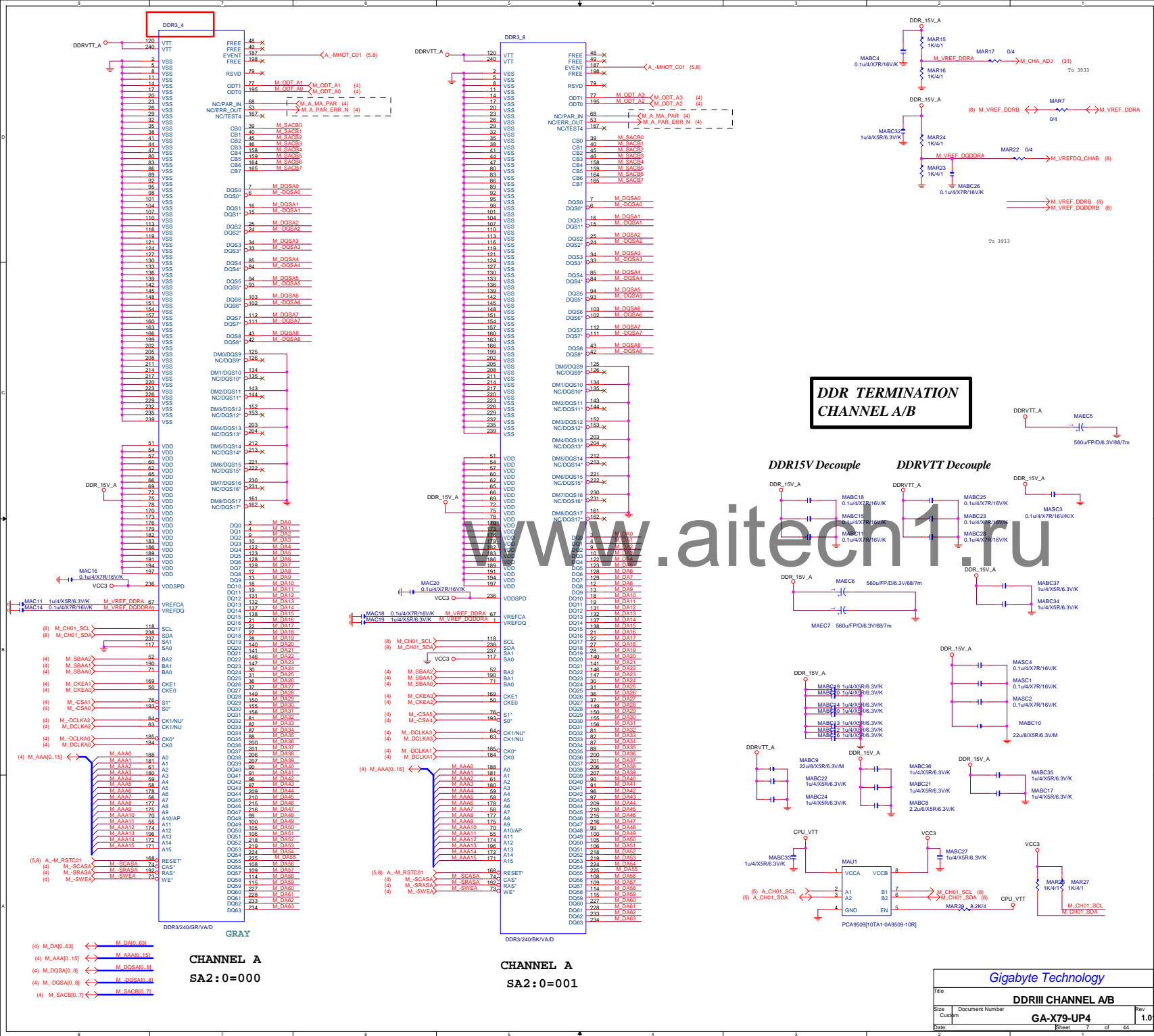












DDR TERMINATION  
CHANNEL A/B

DDR15V Decouple

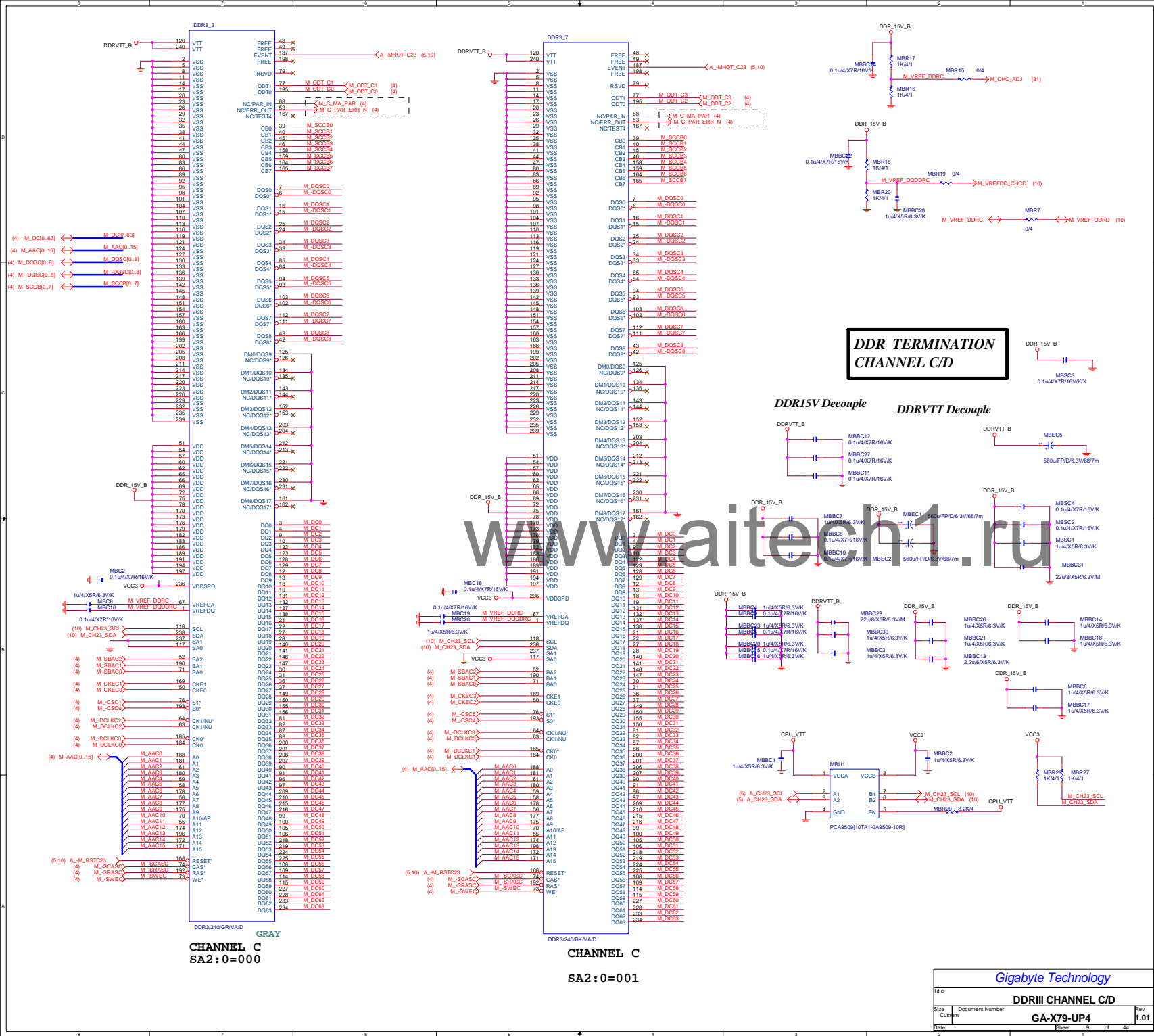
DDRVTT Decouple

Gigabyte Technology

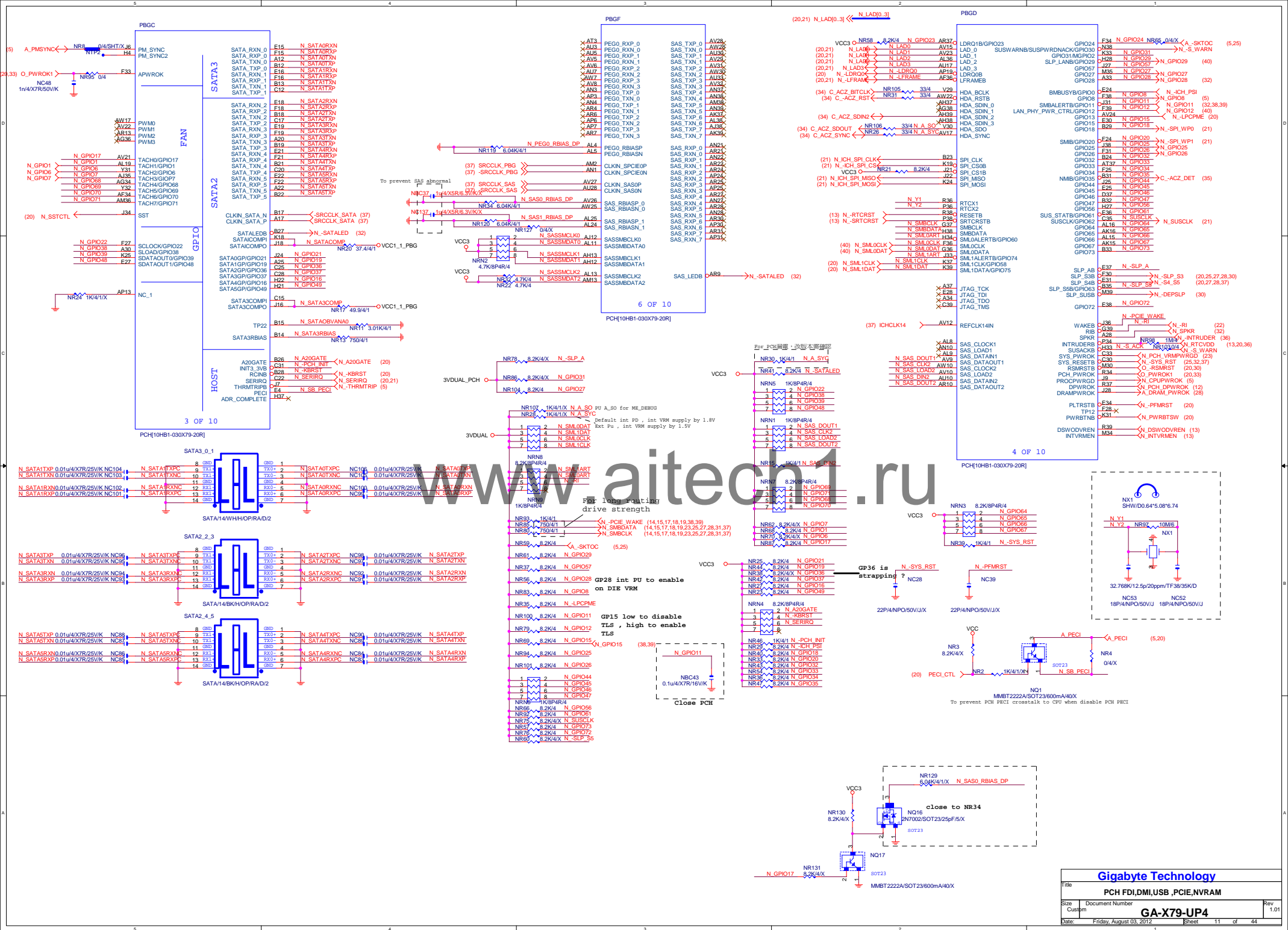
Title	DDR3 CHANNEL A/B	Rev	1.01
Size	Document Number		
Custom	GA-X79-UP4		
Date	Sheet 7 of 44		





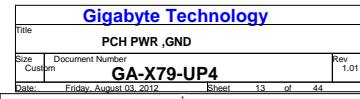




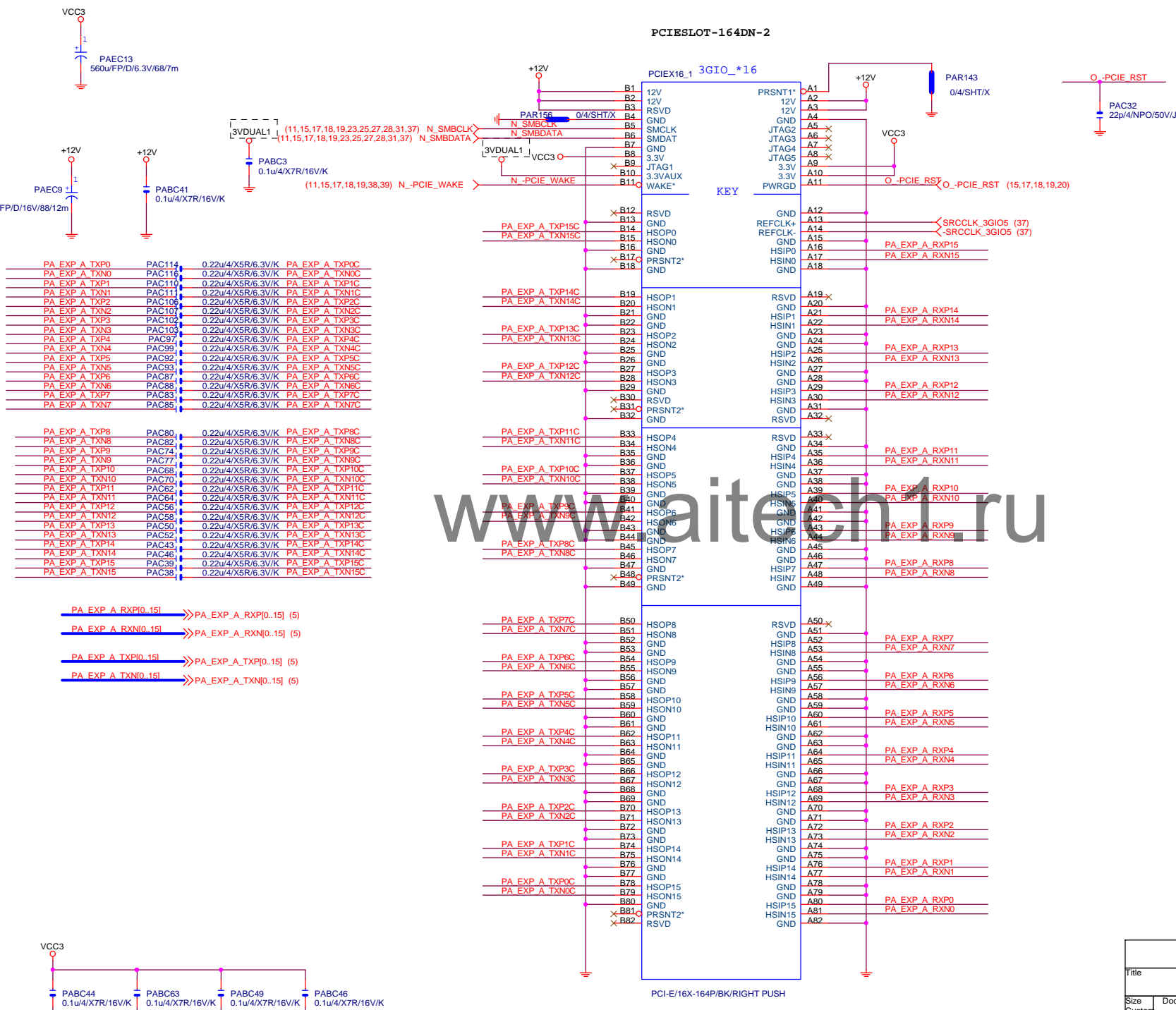








## PCIESLOT-164DN-2

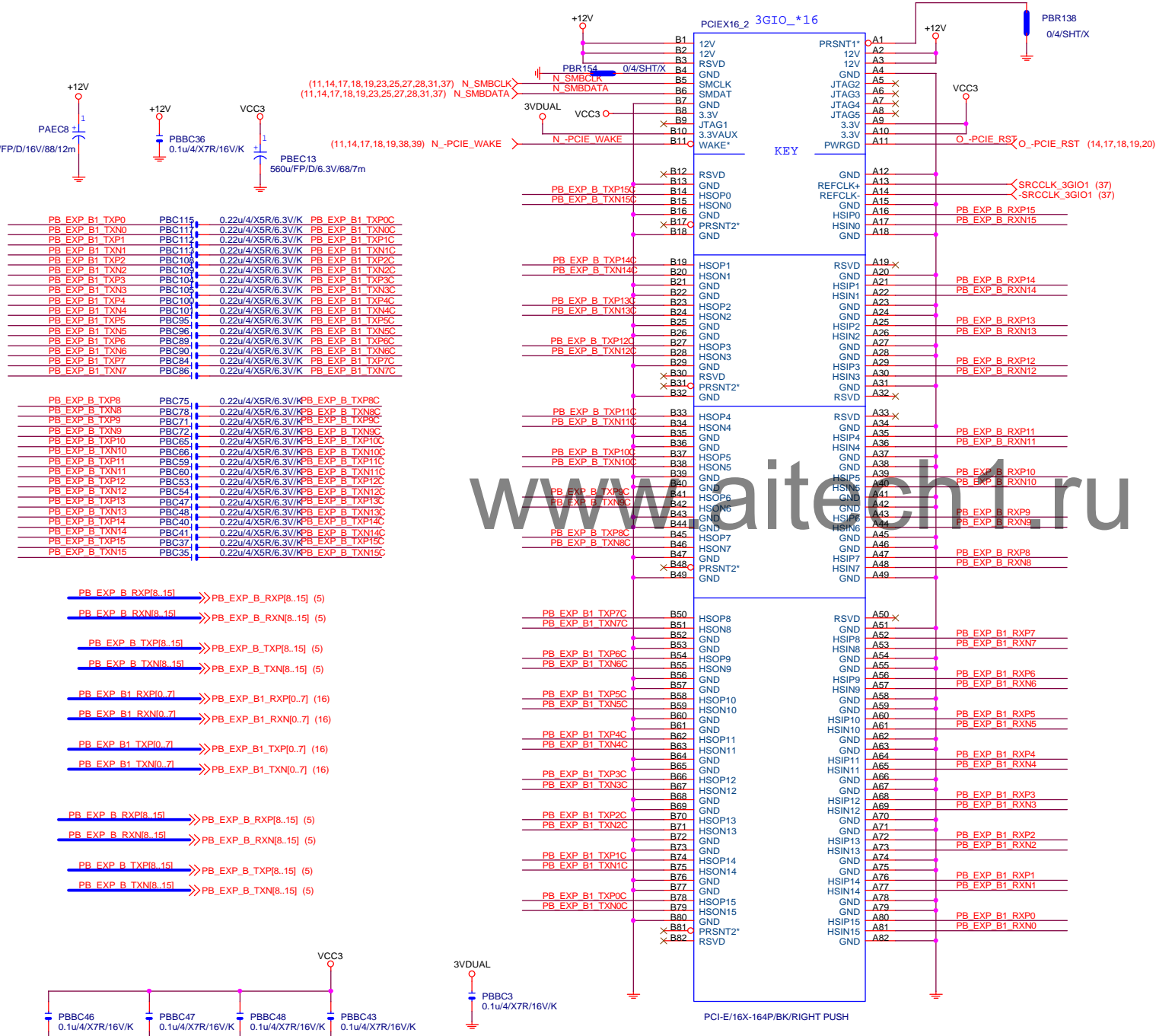


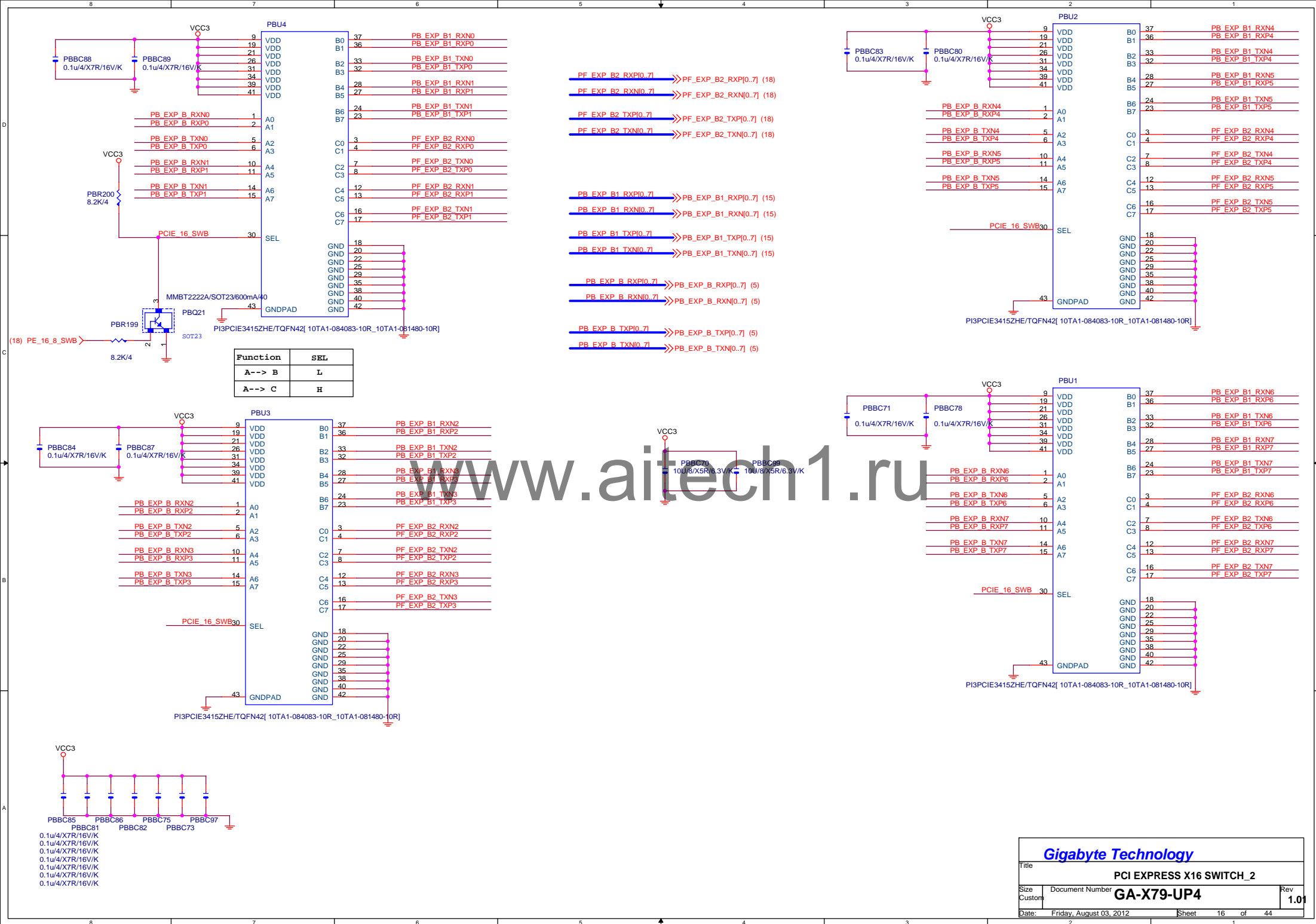
Gigabyte Technology

Title				PCI EXPRESS X16 PORT_1	
Size				Document Number	
Custom				GA-X79-UP4	
Date:				Friday, August 03, 2012	Sheet 14 of 44
				2	1

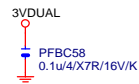
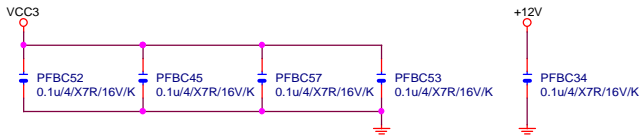
Rev  
1.01

## PCIESLOT-164DN-2







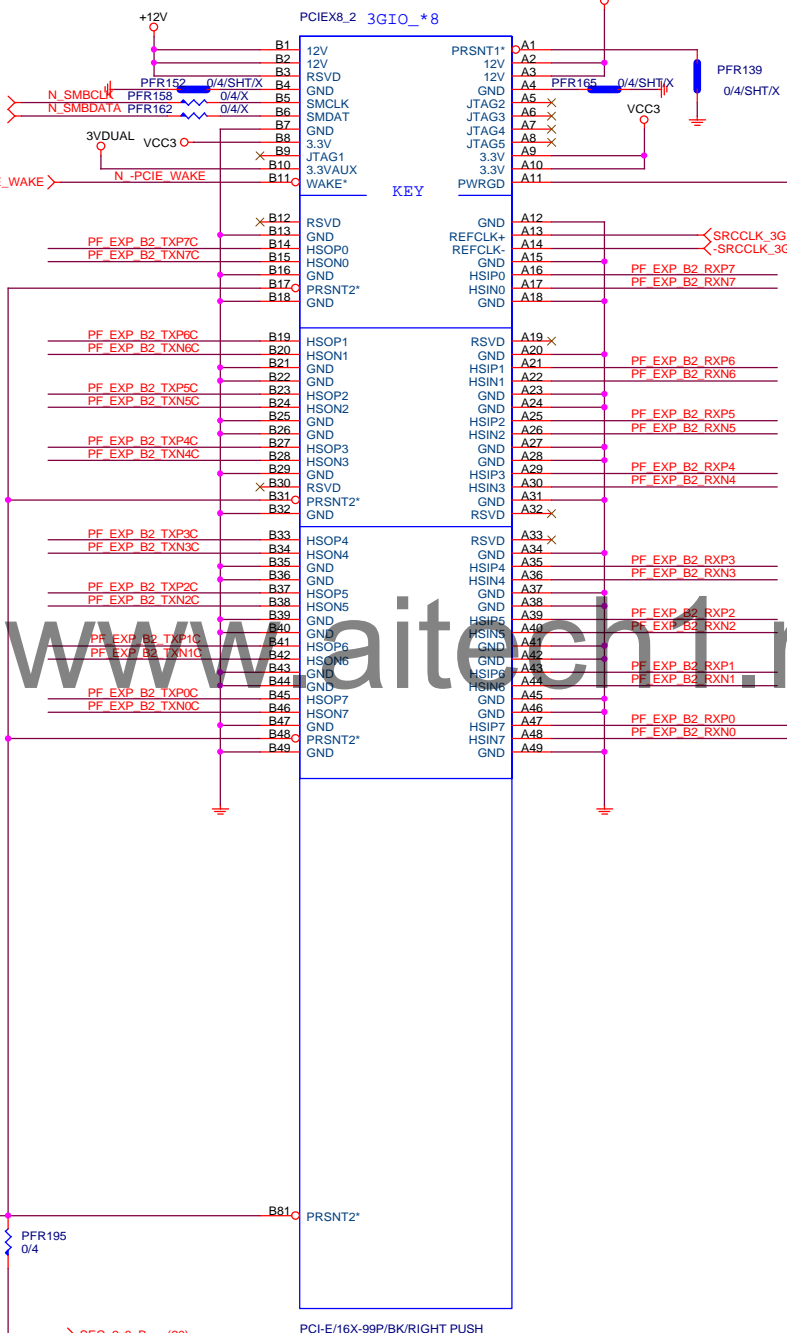


(11,14,15,17,19,23,25,27,28,31,37) N\_SMBCLK  
(11,14,15,17,19,23,25,27,28,31,37) N\_SMBDATA

(11,14,15,17,19,38,39) N\_-PCIE\_WAKE

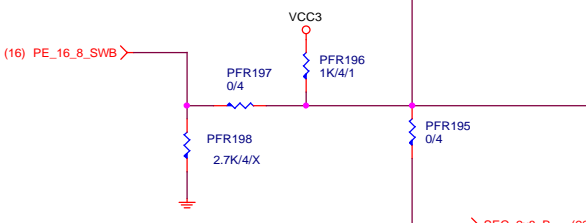
PF\_EXP\_B2\_TXP0.7I >> PF\_EXP\_B2\_TXP[0..7] (16)  
PF\_EXP\_B2\_TXN0.7I >> PF\_EXP\_B2\_TXN[0..7] (16)

PF_EXP_B2_TXP0	PFC79	0.22u/4/X5R/6.3V/K	PF_EXP_B2_TXP0C
PF_EXP_B2_TXN0	PFC81	0.22u/4/X5R/6.3V/K	PF_EXP_B2_TXN0C
PF_EXP_B2_TXP1	PFC73	0.22u/4/X5R/6.3V/K	PF_EXP_B2_TXP1C
PF_EXP_B2_TXN1	PFC76	0.22u/4/X5R/6.3V/K	PF_EXP_B2_TXN1C
PF_EXP_B2_TXP2	PFC67	0.22u/4/X5R/6.3V/K	PF_EXP_B2_TXP2C
PF_EXP_B2_TXN2	PFC69	0.22u/4/X5R/6.3V/K	PF_EXP_B2_TXN2C
PF_EXP_B2_TXP3	PFC61	0.22u/4/X5R/6.3V/K	PF_EXP_B2_TXP3C
PF_EXP_B2_TXN3	PFC63	0.22u/4/X5R/6.3V/K	PF_EXP_B2_TXN3C
PF_EXP_B2_TXP4	PFC55	0.22u/4/X5R/6.3V/K	PF_EXP_B2_TXP4C
PF_EXP_B2_TXN4	PFC57	0.22u/4/X5R/6.3V/K	PF_EXP_B2_TXN4C
PF_EXP_B2_TXP5	PFC49	0.22u/4/X5R/6.3V/K	PF_EXP_B2_TXP5C
PF_EXP_B2_TXN5	PFC51	0.22u/4/X5R/6.3V/K	PF_EXP_B2_TXN5C
PF_EXP_B2_TXP6	PFC42	0.22u/4/X5R/6.3V/K	PF_EXP_B2_TXP6C
PF_EXP_B2_TXN6	PFC45	0.22u/4/X5R/6.3V/K	PF_EXP_B2_TXN6C
PF_EXP_B2_TXP7	PFC34	0.22u/4/X5R/6.3V/K	PF_EXP_B2_TXP7C
PF_EXP_B2_TXN7	PFC36	0.22u/4/X5R/6.3V/K	PF_EXP_B2_TXN7C



O\_-PCIE\_RST <- O\_-PCIE\_RST (14,15,17,19,20)  
PFC28 22P/4/NPO/50V/J

PF\_EXP\_B2\_RXP0.7I >> PF\_EXP\_B2\_RXP[0..7] (16)  
PF\_EXP\_B2\_RXN0.7I >> PF\_EXP\_B2\_RXN[0..7] (16)

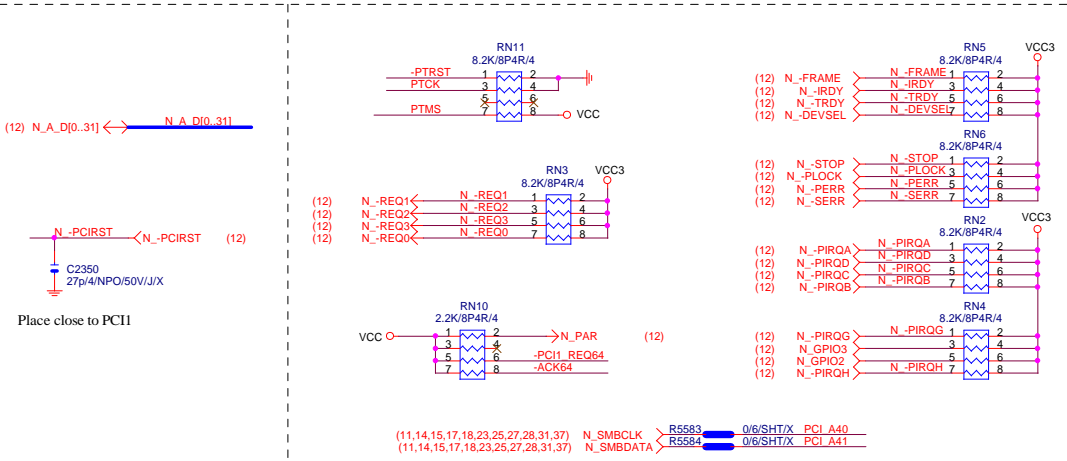
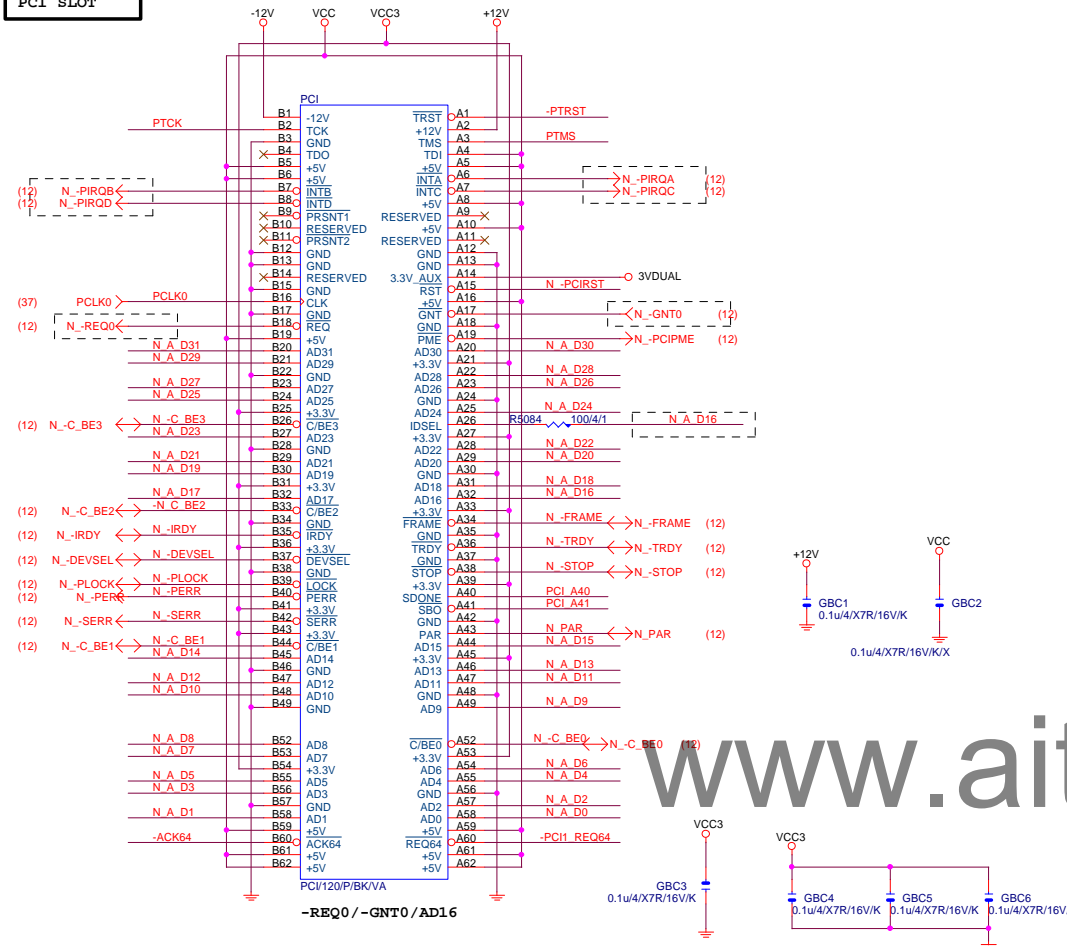


SEC\_2x8\_B (20)

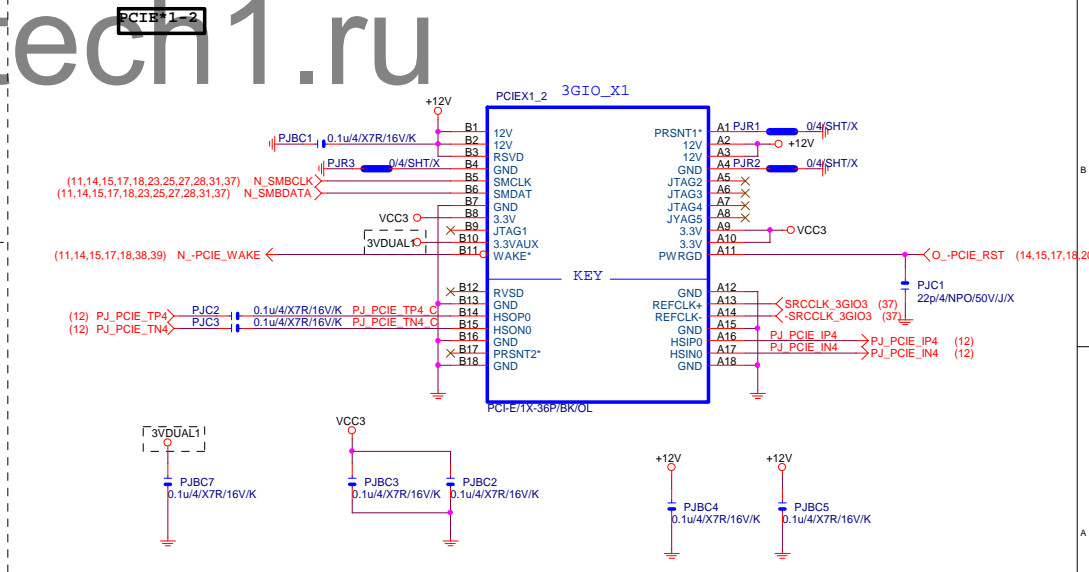
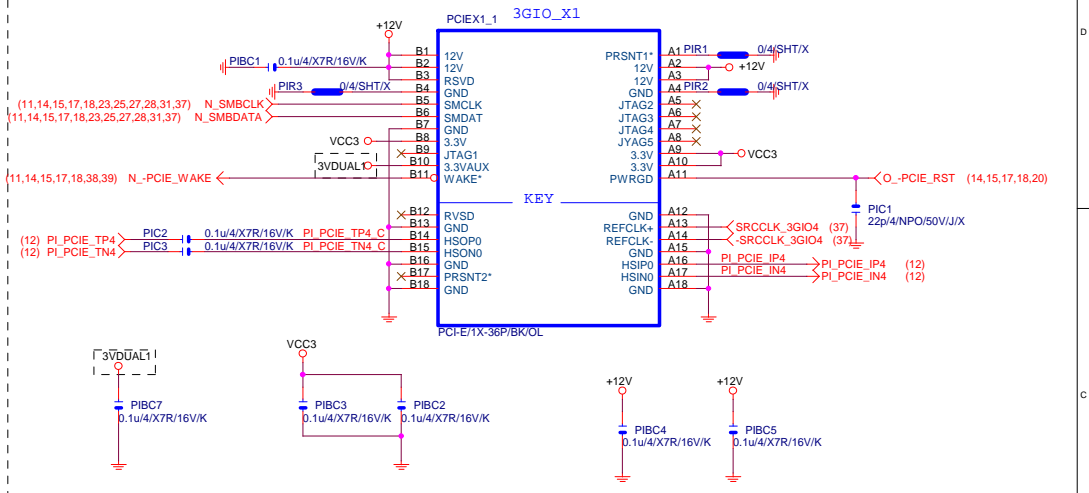
Gigabyte Technology			
Title PCI EXPRESS X8_2			
Size Custom	Document Number GA-X79-UP4	Rev 1.01	
Date: Friday, August 03, 2012	Sheet 18	of 44	



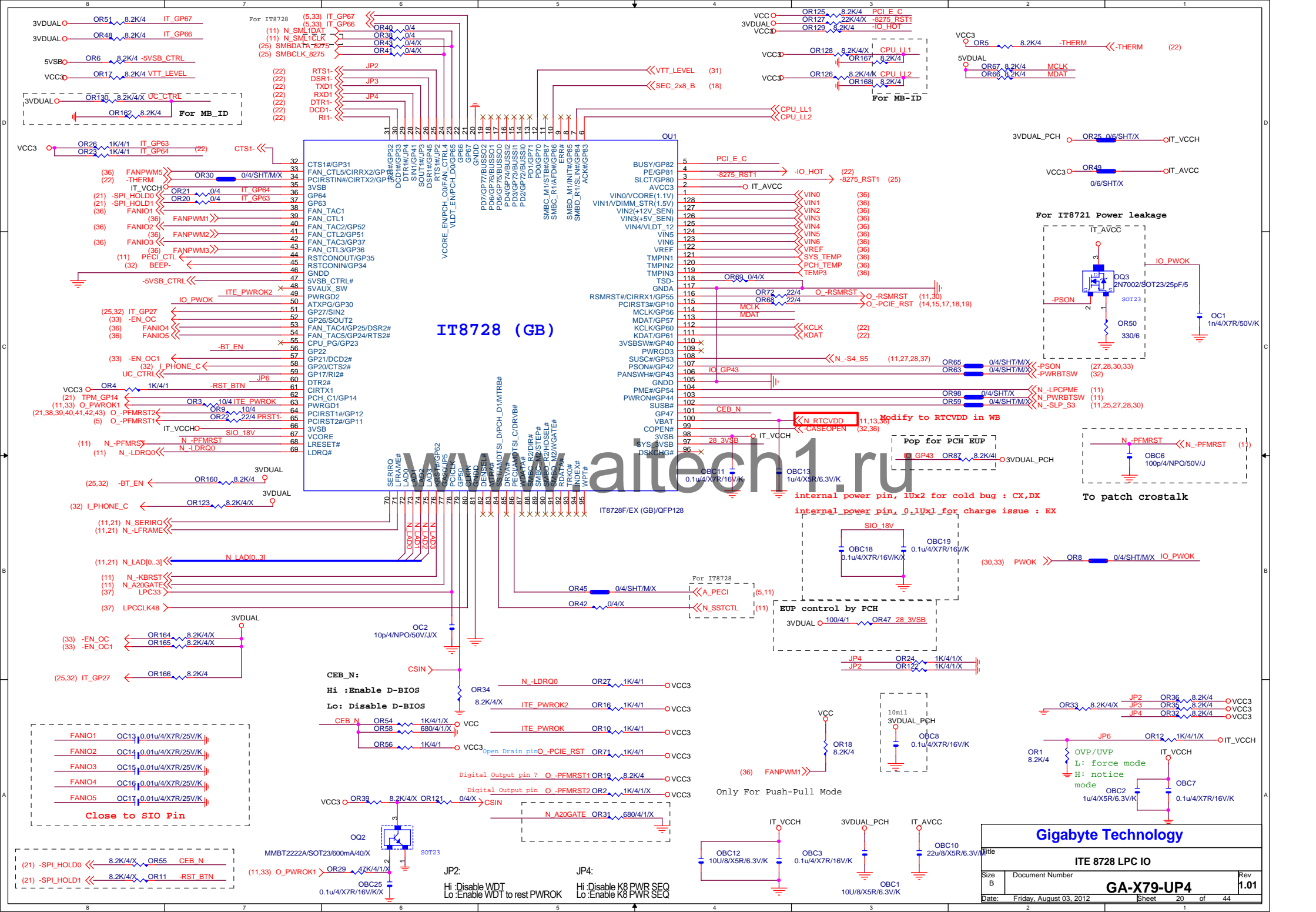
# PCI SLOT



# PCIE\*1-1

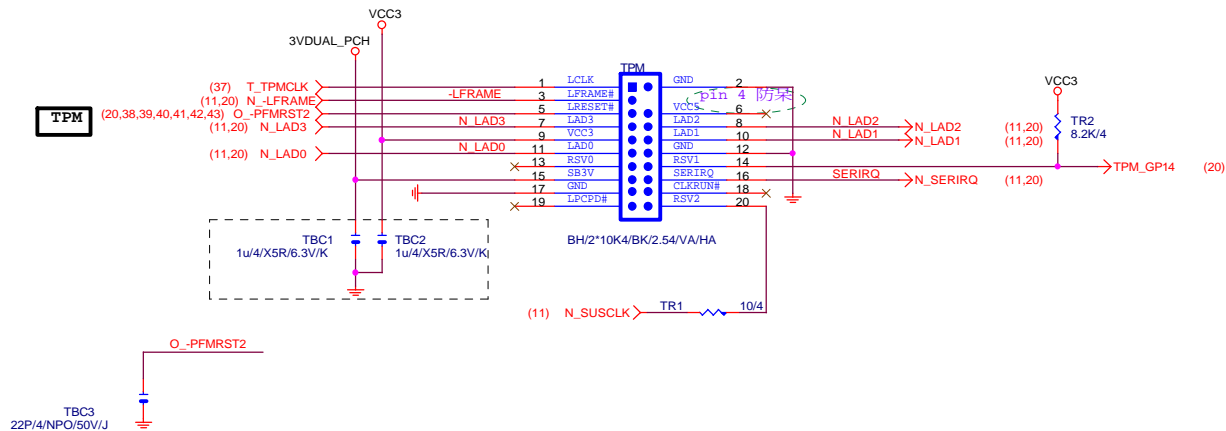
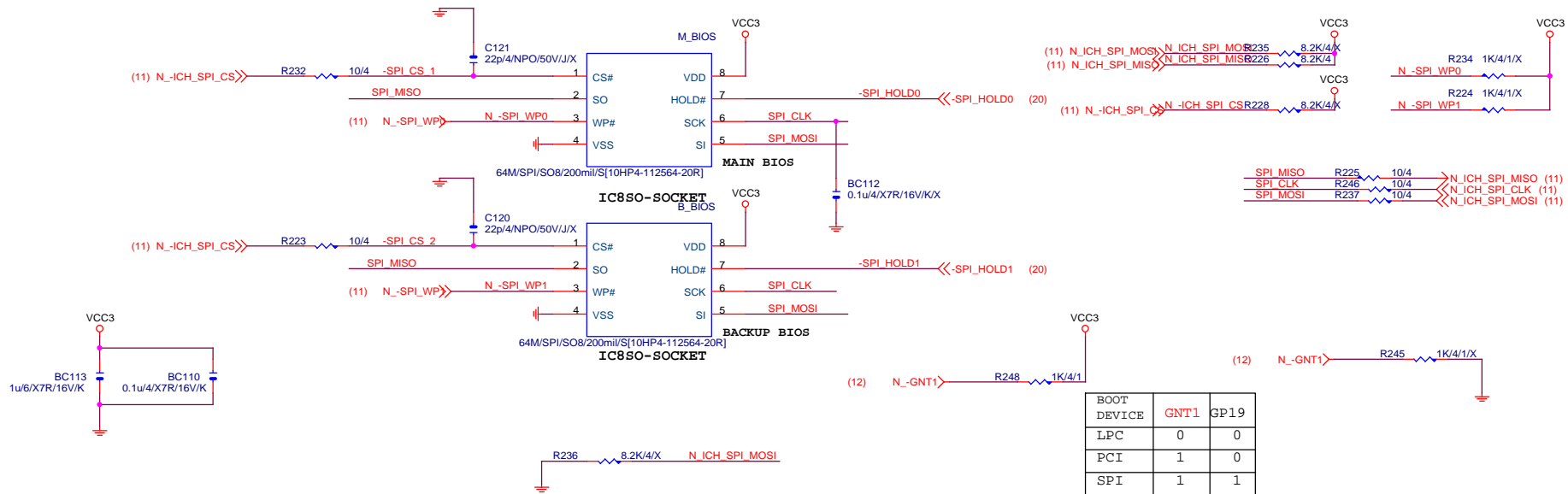


<b>Gigabyte Technology</b>			
Title			
<b>PCIEX1,PCI SLOT</b>			
Size Custom	Document Number	<b>GA-X79-UP4</b>	Rev <b>1.01</b>
Date:	Friday, August 03, 2012	Sheet 19 of 44	

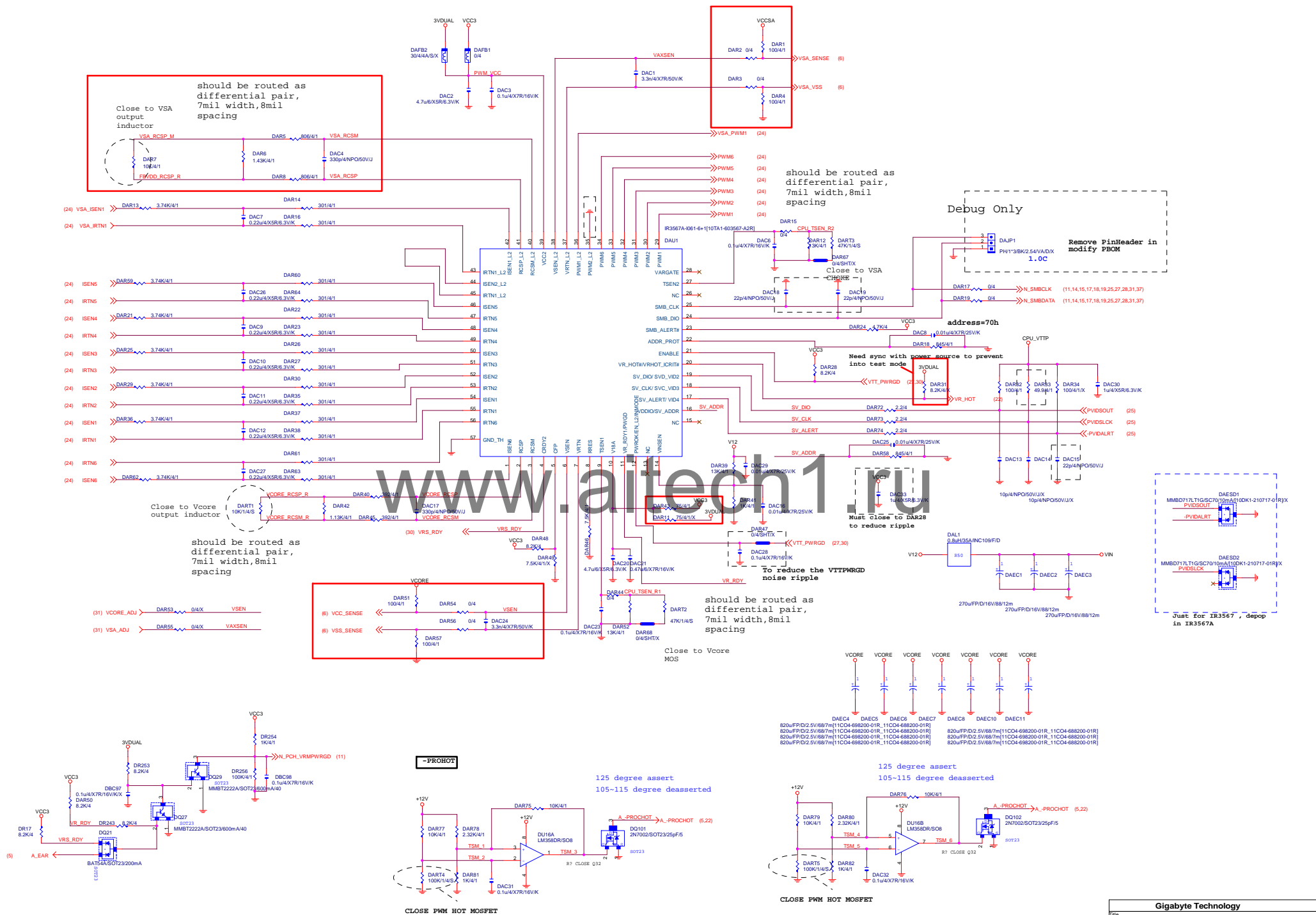




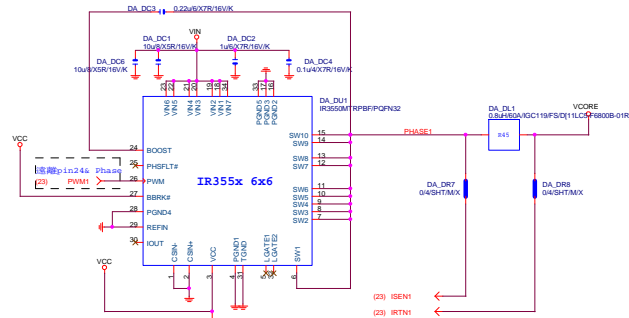
www.aitech1.ru



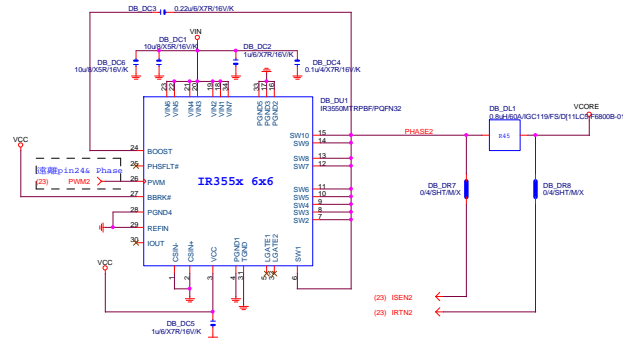




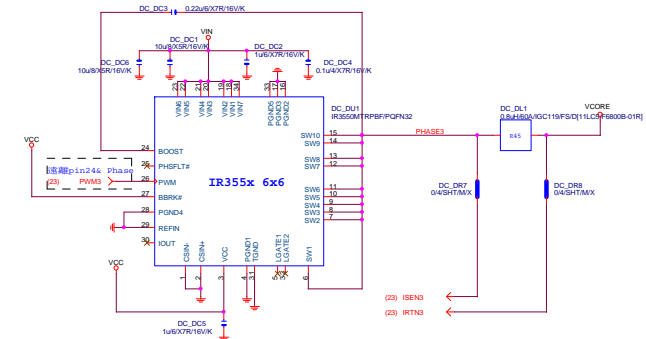
## VCORE-PHASE1



## VCORE-PHASE2

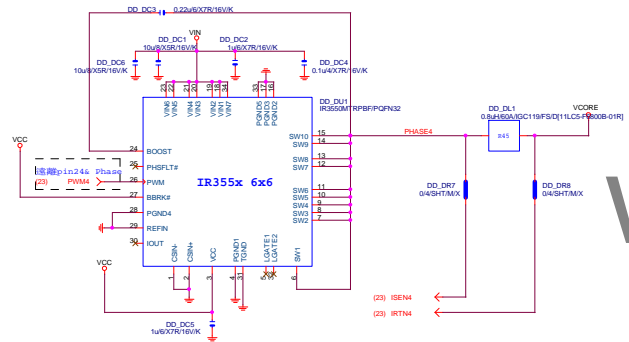


## VCORE-PHASE3

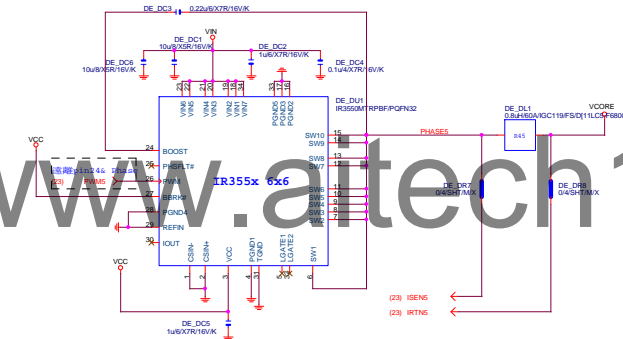


Choke need change to correct parts : 0.8u/60A

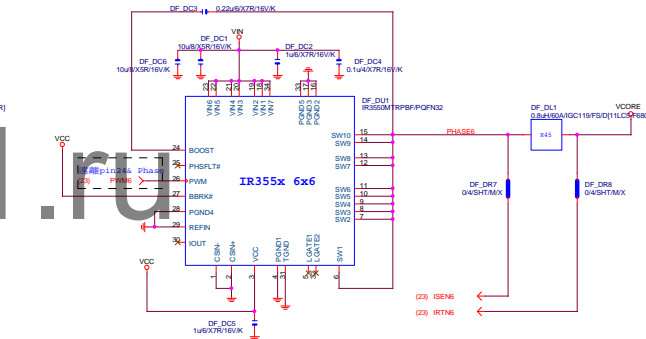
## VCORE-PHASE4



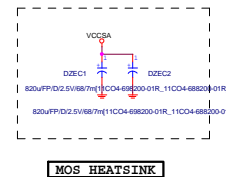
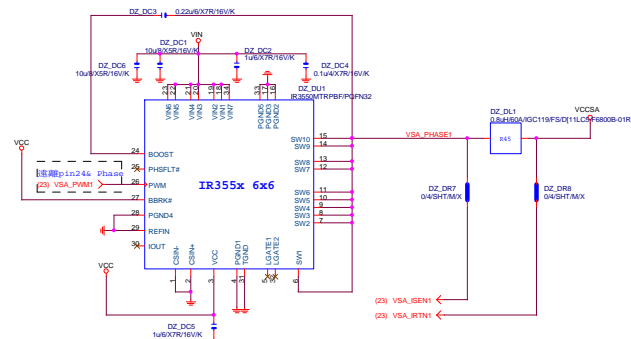
## VCORE-PHASE5



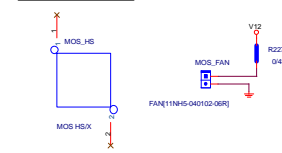
## VCORE-PHASE6



## VSA-PHASE

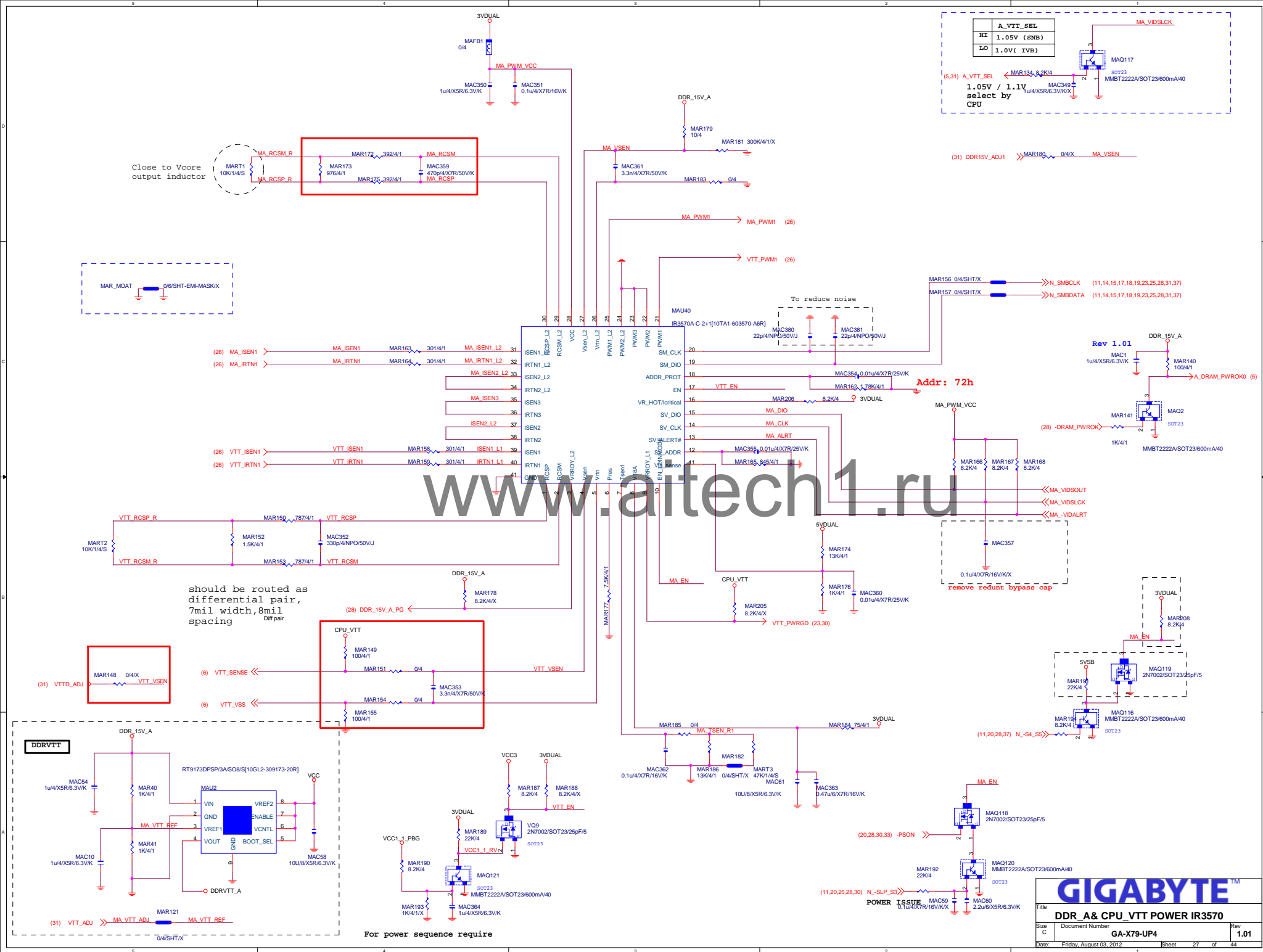


## MOS HEATSINK













PBG\_1.1V

(30) V\_PCH\_EN

VCC1\_05PHASE

NR132  
20K/4/1/X

NR118  
13K/4/1

NC58  
3.3n/4/X7R/50V/K

NC57  
22p/4/NPO/50V/J

NR133  
0/4/X

NR134  
0/4

VREF IS 0.8V

NR117  
0/4S/X

VCC1\_05\_PCH\_ADJ (31)

NR115  
2.2/6/X

NR116  
2.2/6

+12VO

NBC34  
1u/6/X7R/16V/K

NQ18  
BAT54C/SOT23/200mA/X

RT8120DGS/SOP8

NR64  
2.2/6

VCC1\_05U\_G

VCC1\_05L\_G

NR96  
8.2K/4/1

OCP: 26A

OCP :  
 $Rocset = (Iocp * Lgate, rdson) / Iocset$   
Iocset=10uA

NC51  
0.1u/6/X7R/25V/K

NR71  
2.2/6

NC44  
2.2n/4/X7R/50V/K

CLOSE CHOKE

NL9  
1.2uH/20A/HNC0909/F/NM/D

NBC20  
0.1u/4/Y5V/16V/Z

VCC1\_1\_PBG

DEF=1.1V

NR135  
470/4/1

NBC31  
33p/4/NPO/50V/J

NRF\_PCH1  
499/4/1

NRF\_PCH2  
1.3K/4/1

VCC3

NEC7  
560u/FP/D/6.3V/68/7m

NL12  
1.2uH/20A/HNC0909/F/NM/D

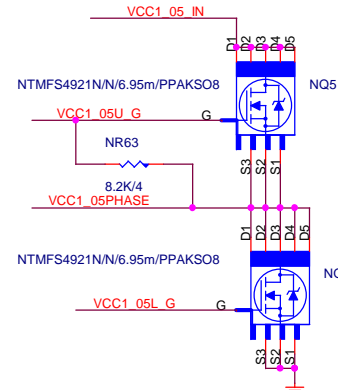
NC41  
1u/6/X7R/16V/K

VCC1\_05\_IN

NBC21  
22u/8/X5R/6.3V/M

NC32  
0.1u/4/X7R/16V/K

NEC2  
560u/FP/D/6.3V/68/7m



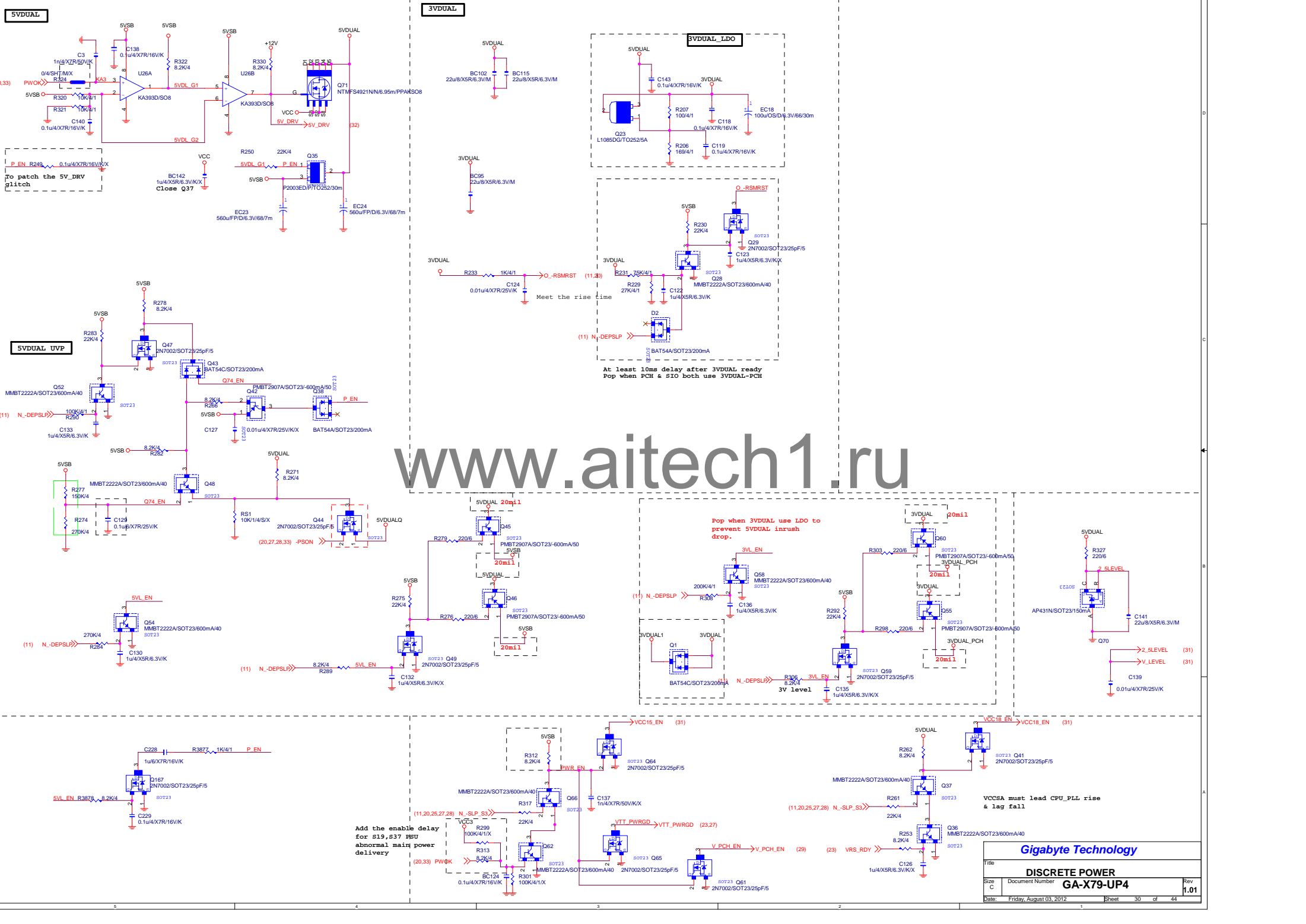
VCC1\_1\_PBG 20Amp

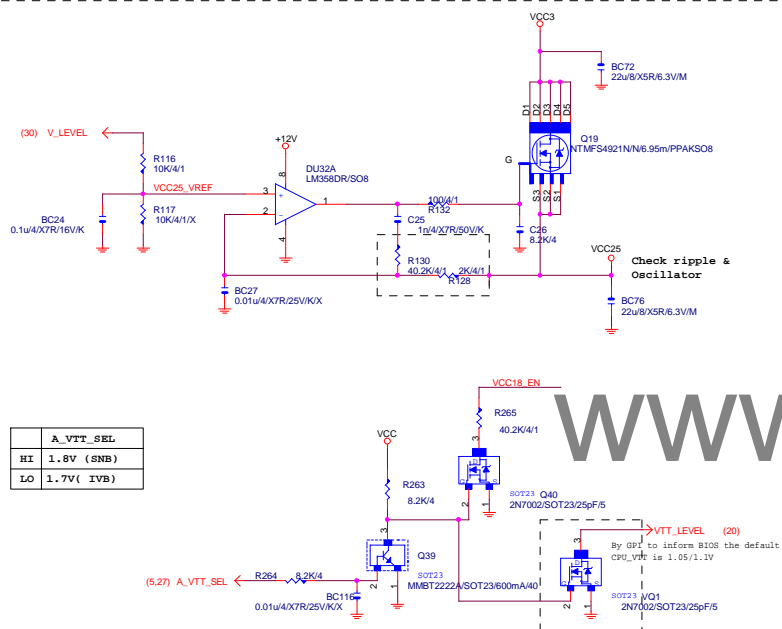
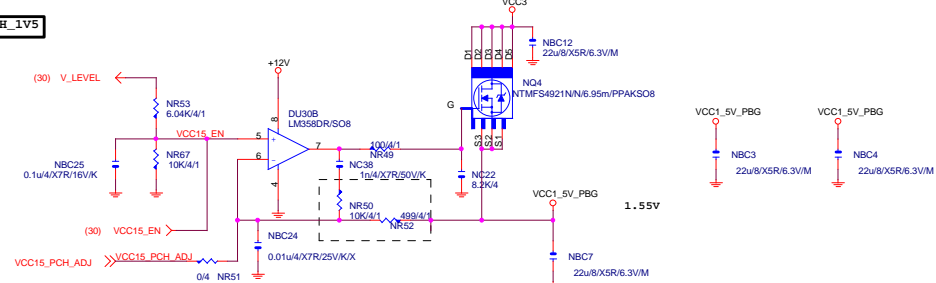
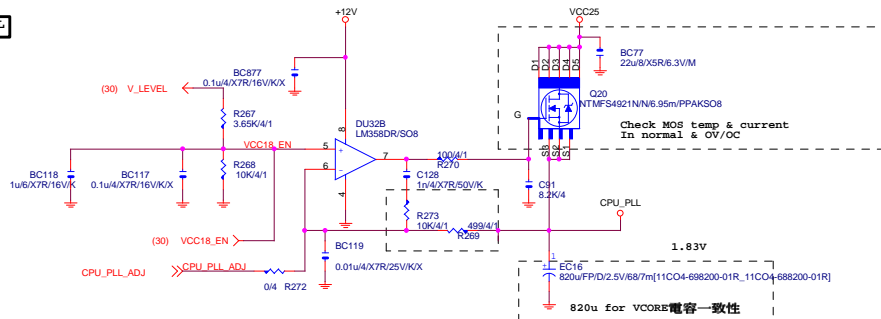
NEC5  
560u/FP/D/6.3V/68/7m

NEC1  
560u/FP/D/6.3V/68/7m

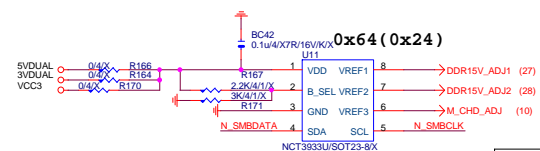
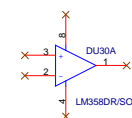
Gigabyte Technology

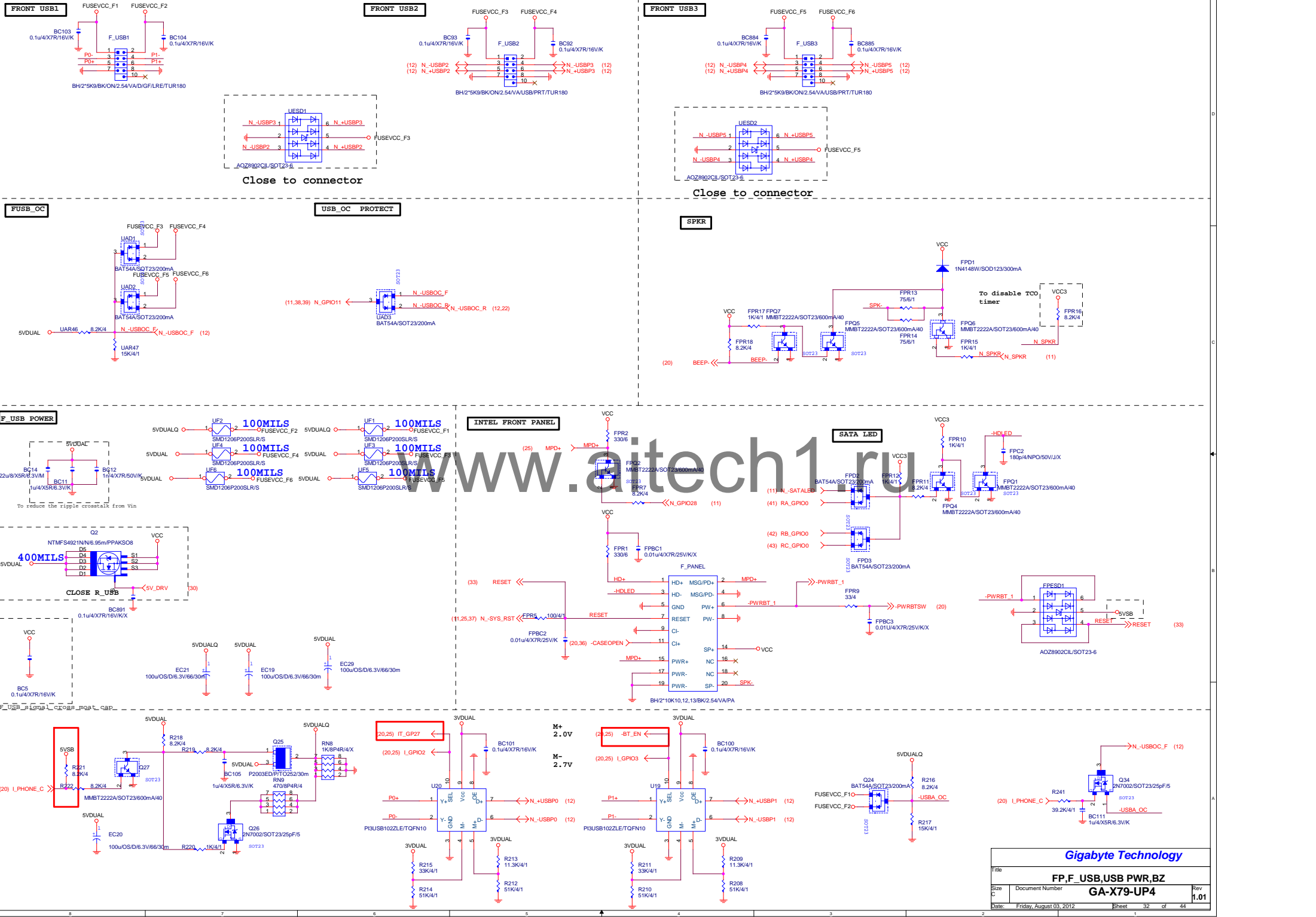
Title		
ISL6545 PCH		
Size B	Document Number	Rev 1.01
GA-X79-UP4		
Date:	Friday, August 03, 2012	Sheet 29 of 44



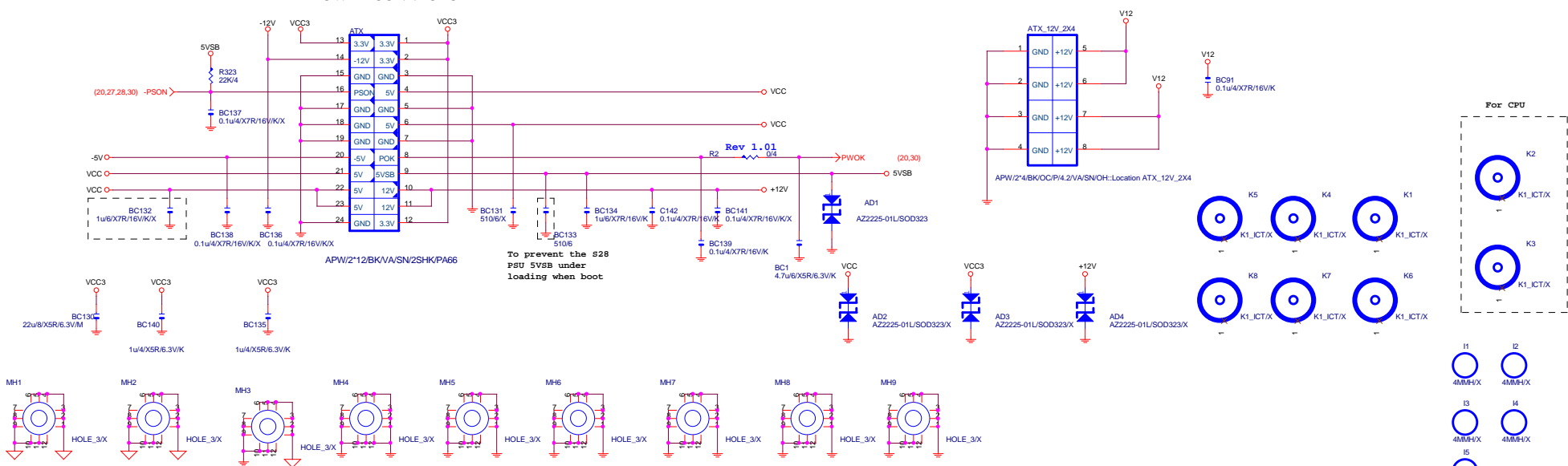


	A_VTT_SEL
HI	1.8V (SNB)
LO	1.7V( IVB)

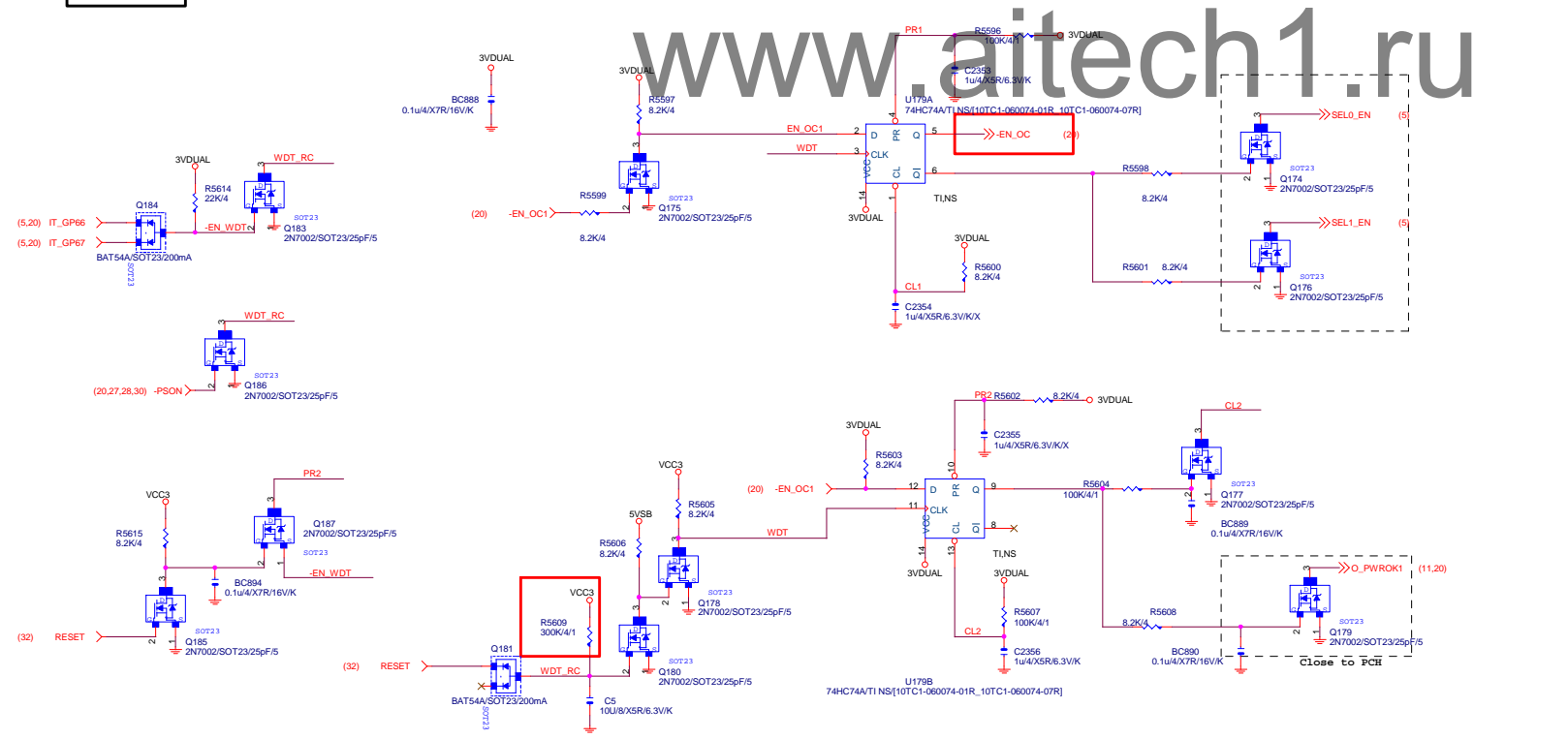




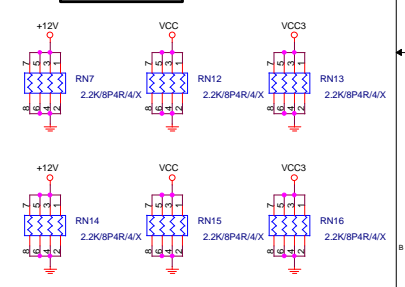
# ATX POWER CONNECTOR



## OVER CLOCKING

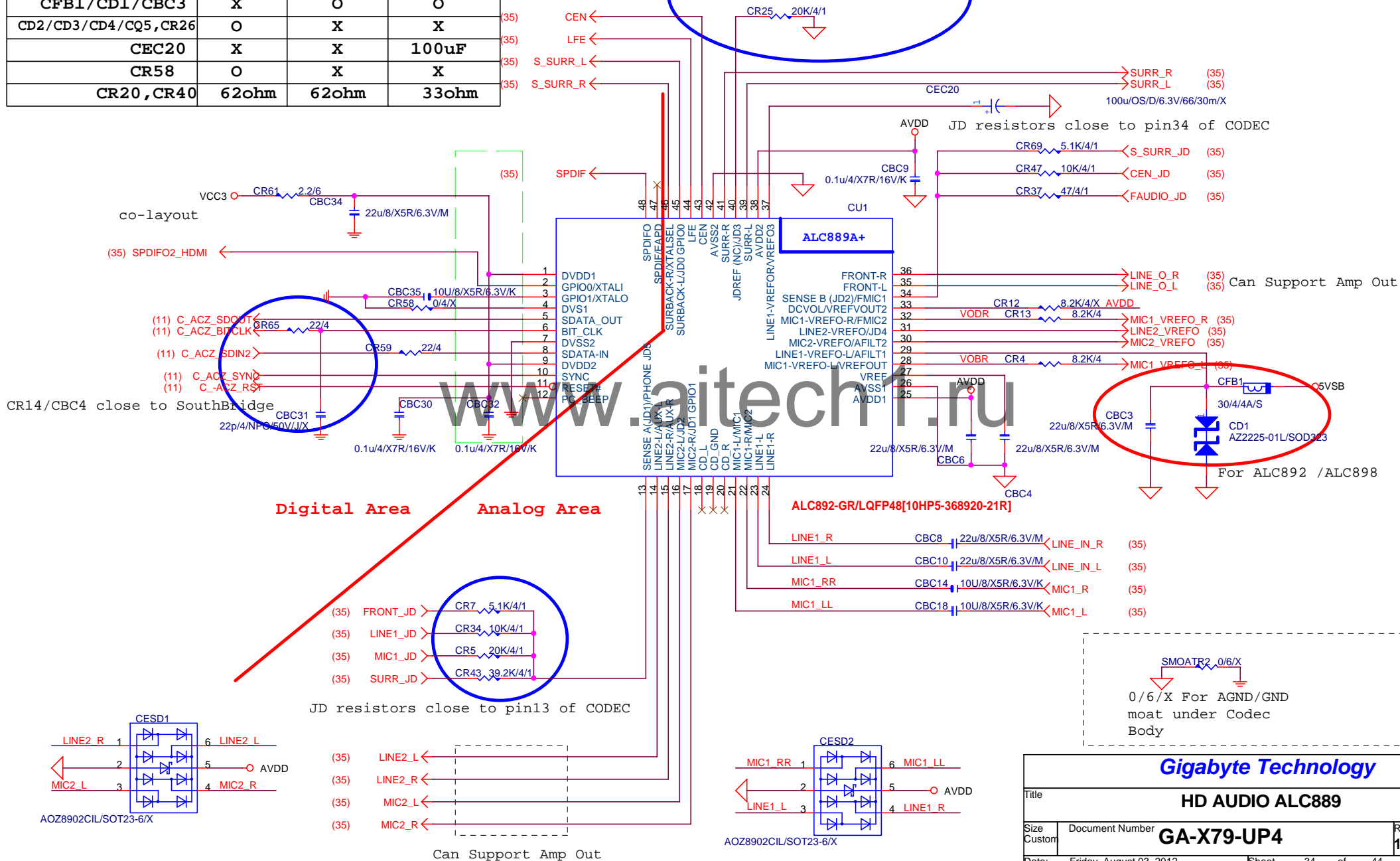


## OVER CLOCKING



INPUT		CLOCK		DATA		OUTPUT	
PR	CL	CLOCK	DATA	Q	-Q	Q	-Q
L	H	X	X	H	L	H	L
H	L	X	X	L	H	L	H
L	L	X	X	H	H	H	H
H	H	X	X	L	L	L	L
H	H	Rising	X	H	H	H	H
H	H	Rising	L	L	L	L	L
H	H	L	X	No Change	No Change	No Change	No Change
H	H	Falling	X	No Change	No Change	No Change	No Change

	ALC889	ALC892	ALC898
CBC35	X	10uF/X5R	10uF/X5R
CFB1/CD1/CBC3	X	O	O
CD2/CD3/CD4/CQ5,CR26	O	X	X
CEC20	X	X	100uF
CR58	O	X	X
CR20,CR40	62ohm	62ohm	33ohm

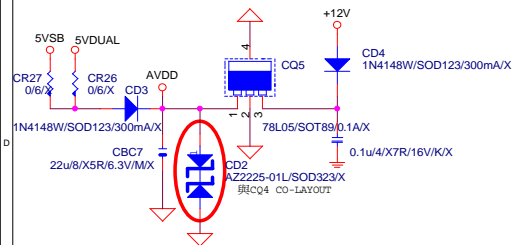


Gigabyte Technology

HD AUDIO ALC889

Title	Document Number	Rev
	GA-X79-UP4	1.01
Date:	Friday, August 03, 2012	Sheet 34 of 44

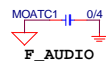
## CODEC POWER/EMI PAD



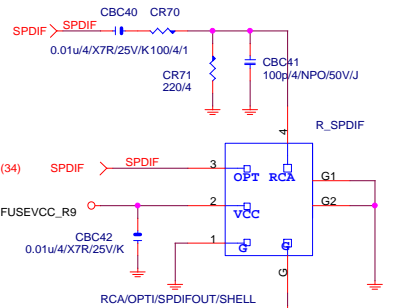
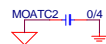
5VSB

CBC16  
1u4/X5R/6.3V/K

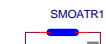
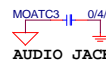
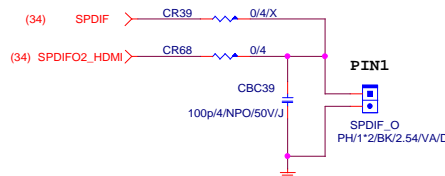
## MOAT CAP.



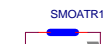
Codec to AUDIO JACK



For HDMI SPDIF

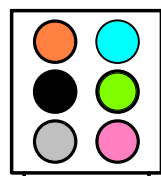


AUDIO JACK to USB

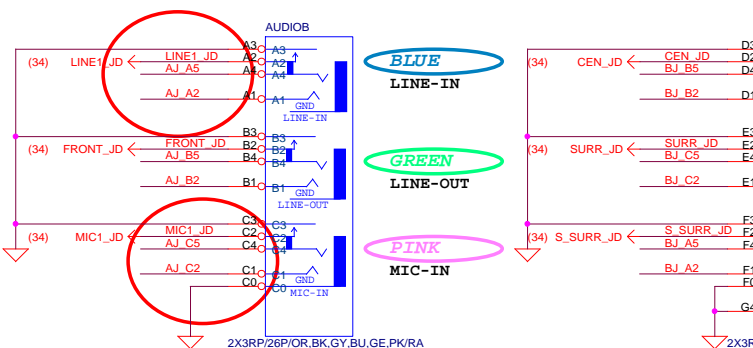
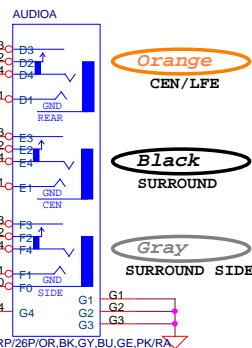


AUDIO JACK to USB

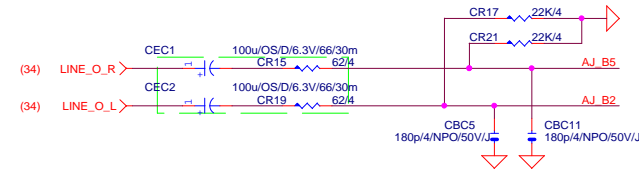
For HDMI SPDIF AZALIA CONNECTOR



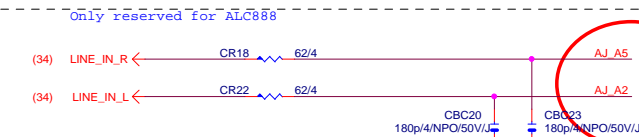
11NR6-403007-21R



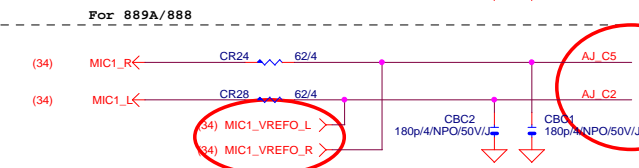
## LINE-OUT



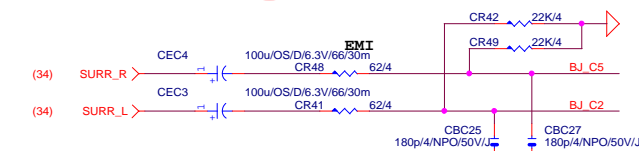
## LINE-IN



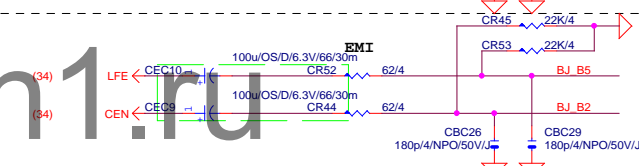
## MIC-IN



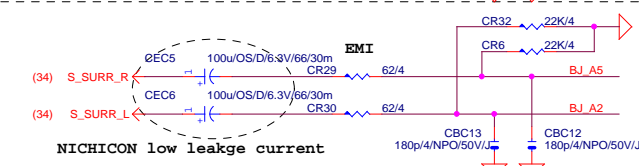
## SURROUND



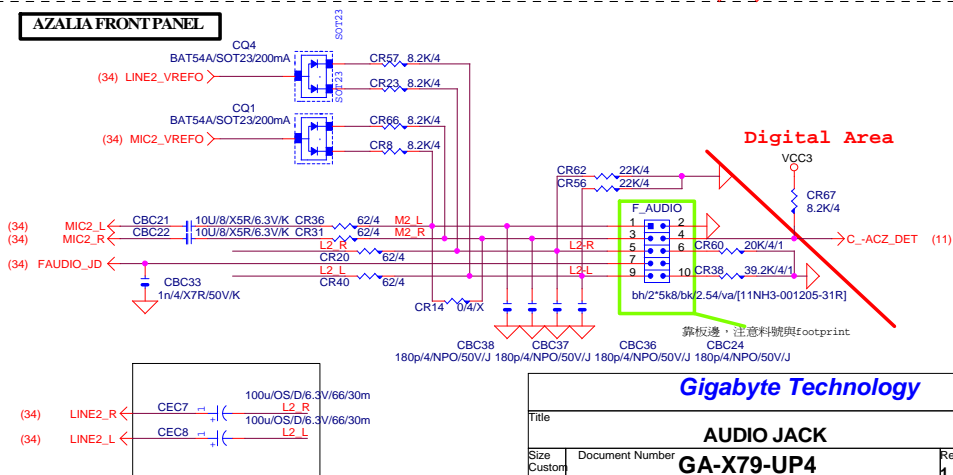
## CEN/LFE



## SURRBACK

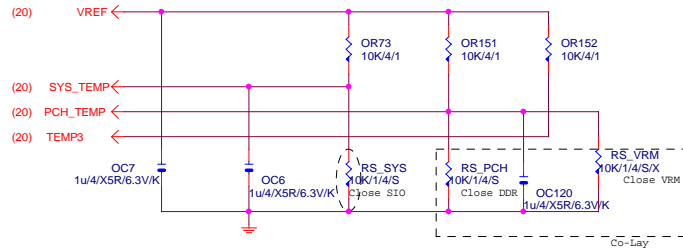


## AZALIA FRONT PANEL

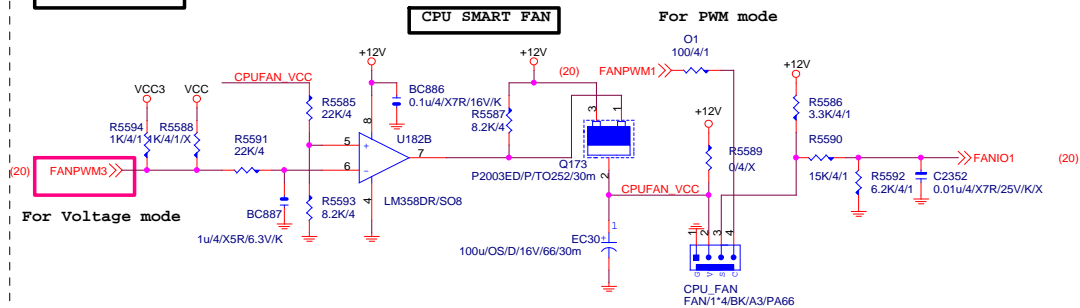


Gigabyte Technology		
Title		
AUDIO JACK		
Size Custom		
Document Number		
GA-X79-UP4		
Date		
Friday, August 03, 2012		
Sheet		
35 of 44		
Rev		
1.01		

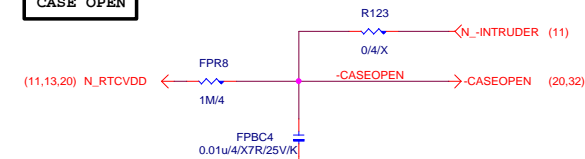
# TEMP H/W MONITOR



# CPU SMART FAN

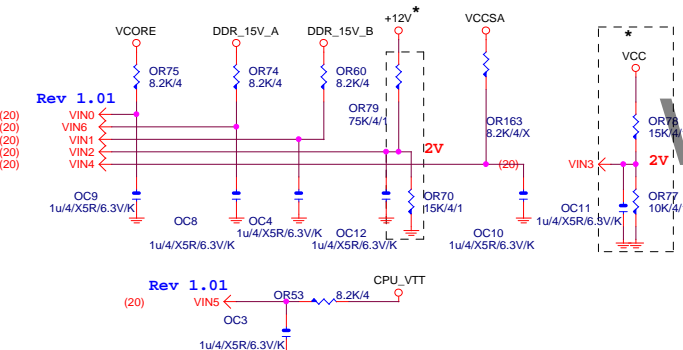


# CASE OPEN

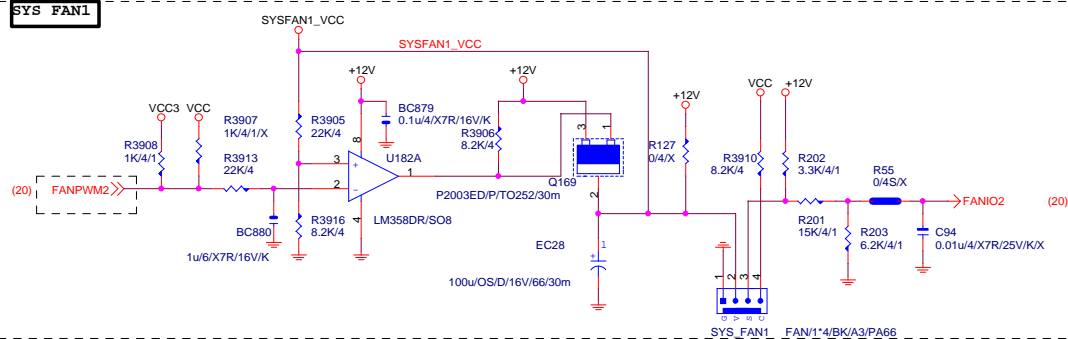


# VOLTAGE-- H/W MONITOR

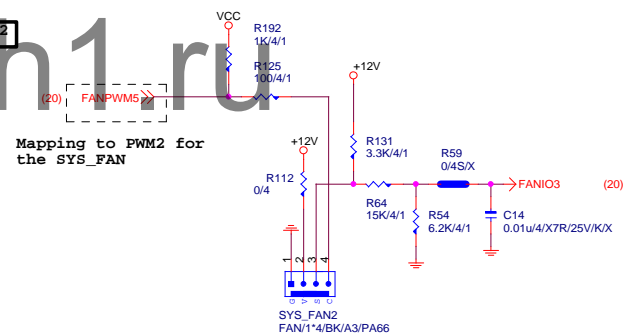
VIN2 must +12V input  
VIN3 must VCC input



# SYS FAN1

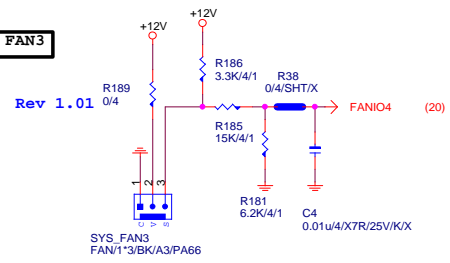


# SYS FAN2

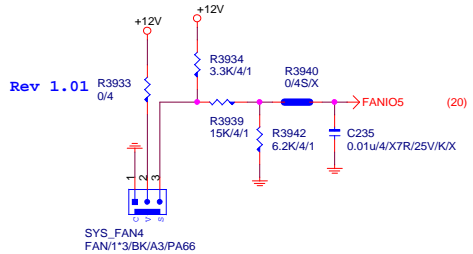


Mapping to PWM2 for the SYS\_FAN

# SYS FAN3

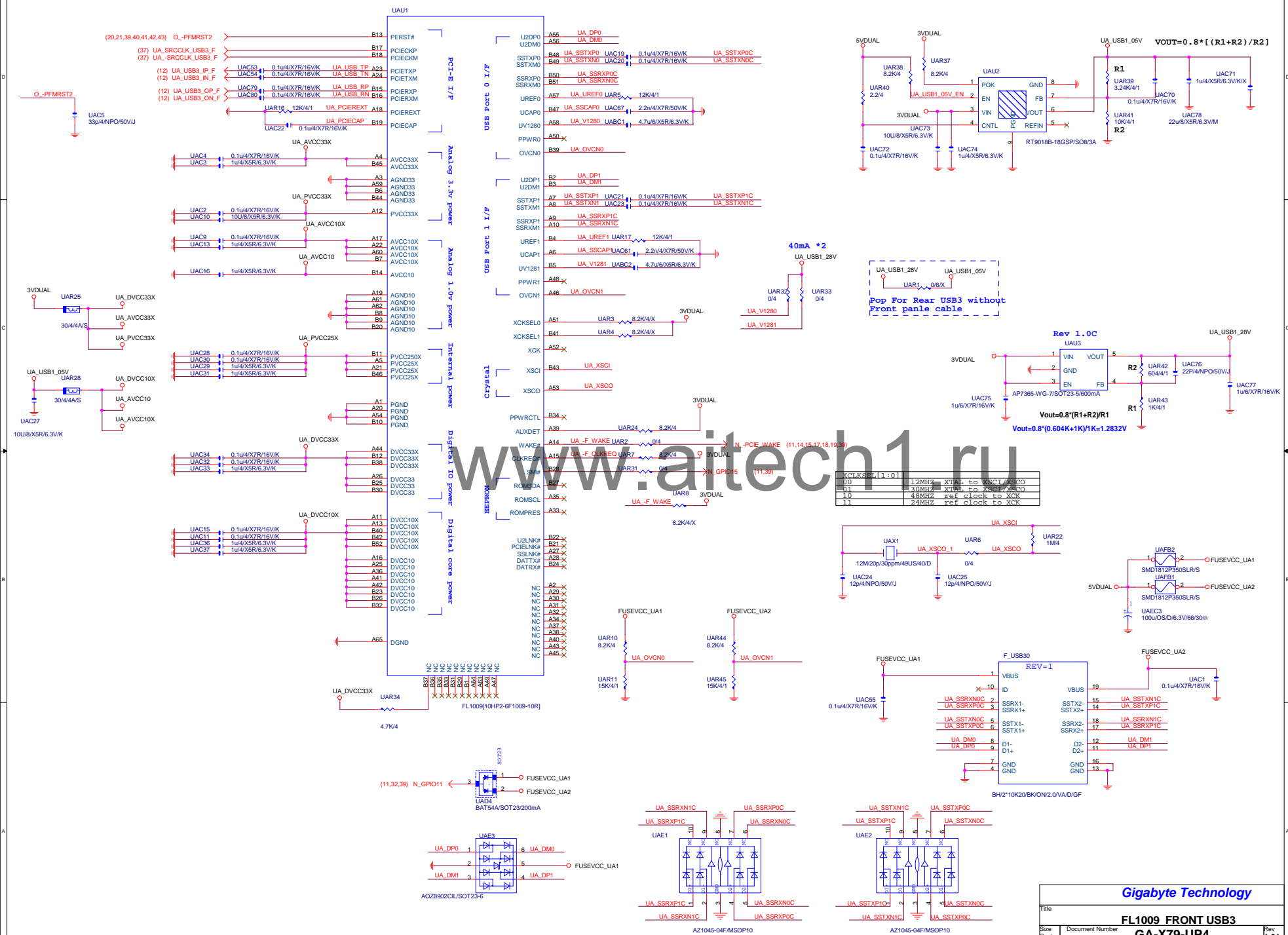


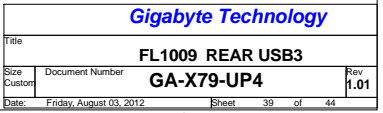
# SYS FAN4

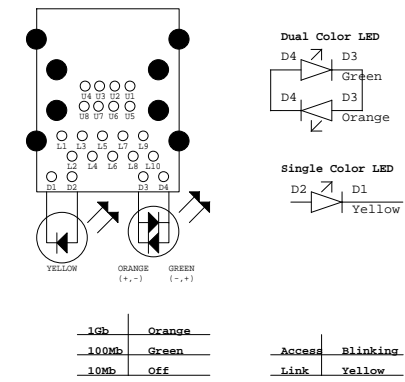
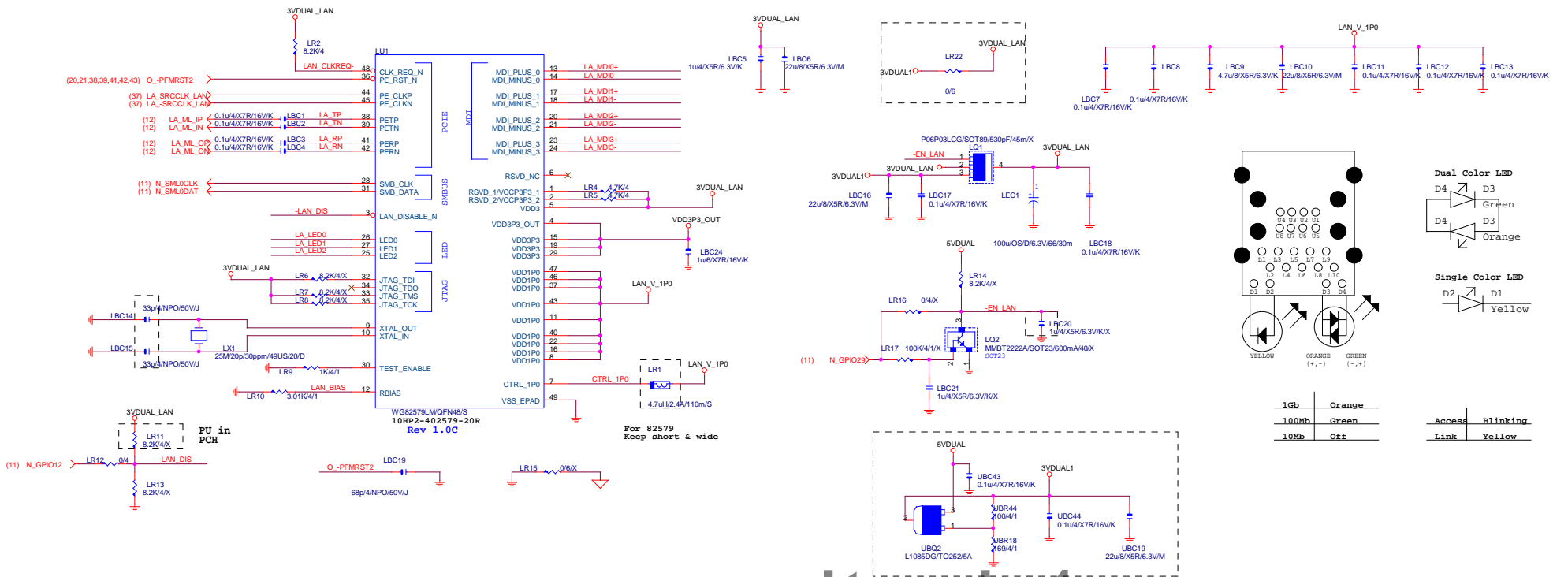




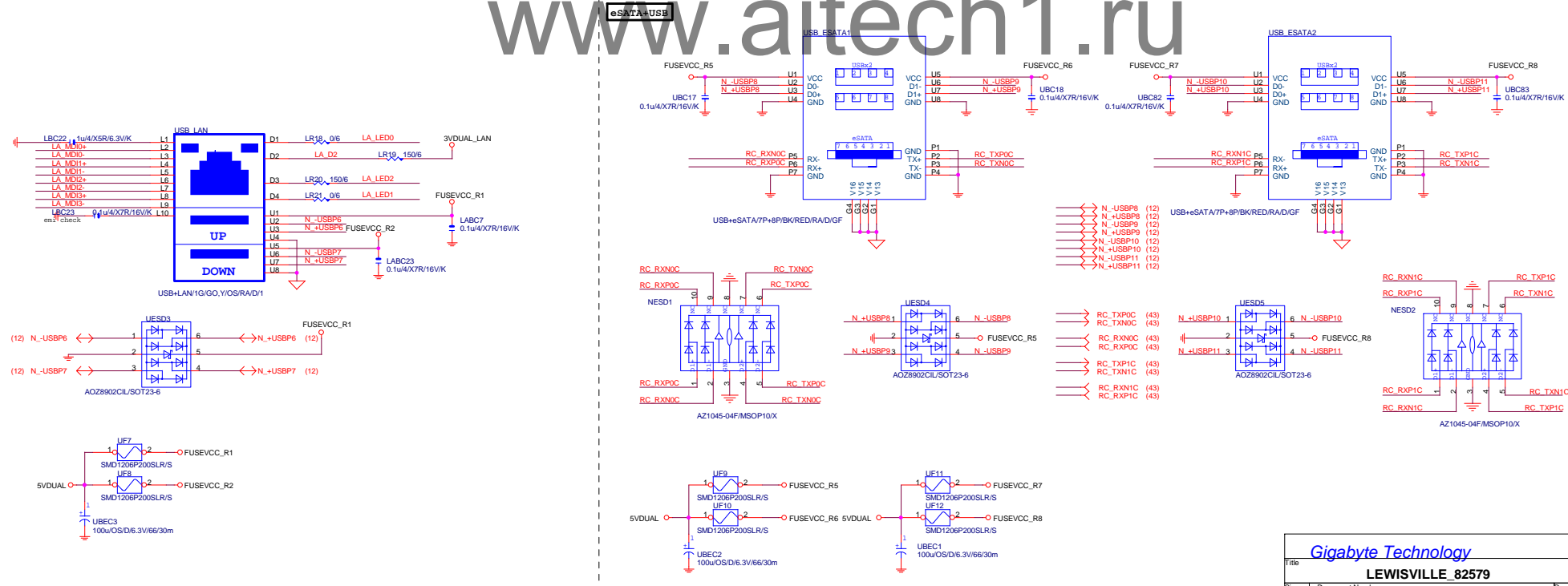




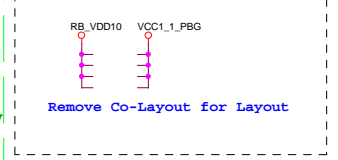
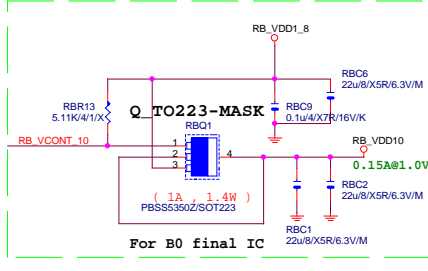
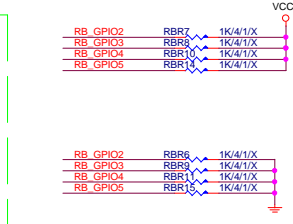
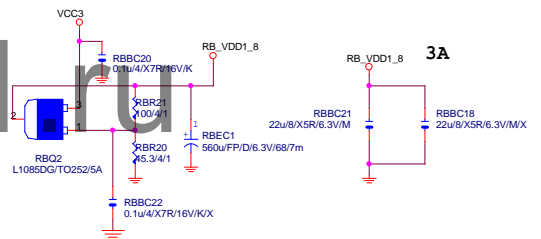
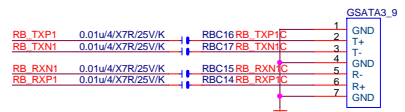
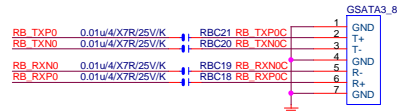
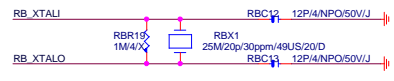
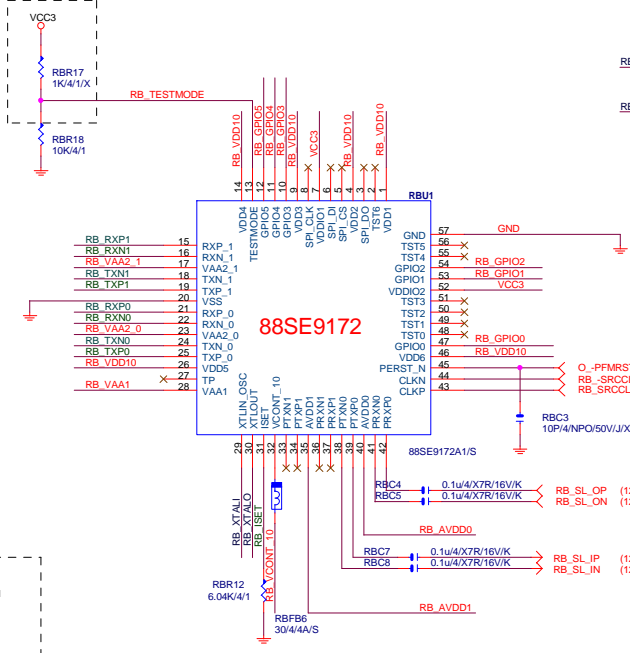
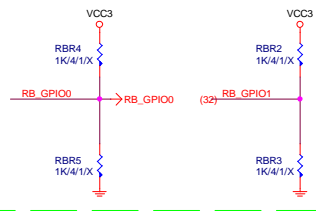
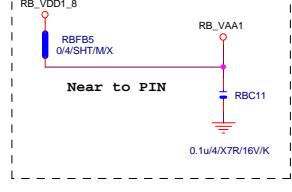
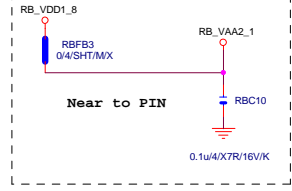
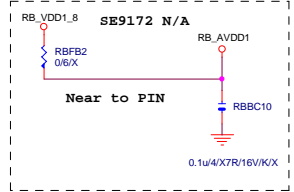
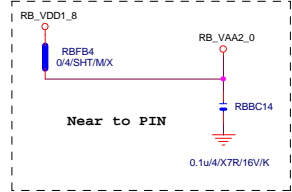
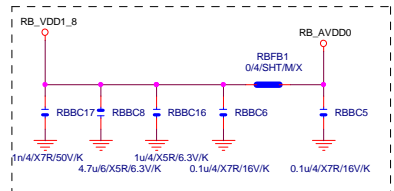
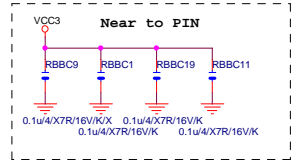
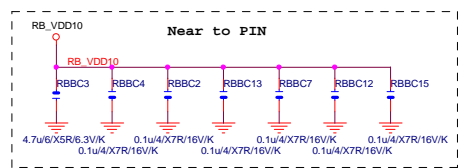




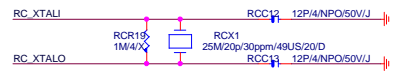
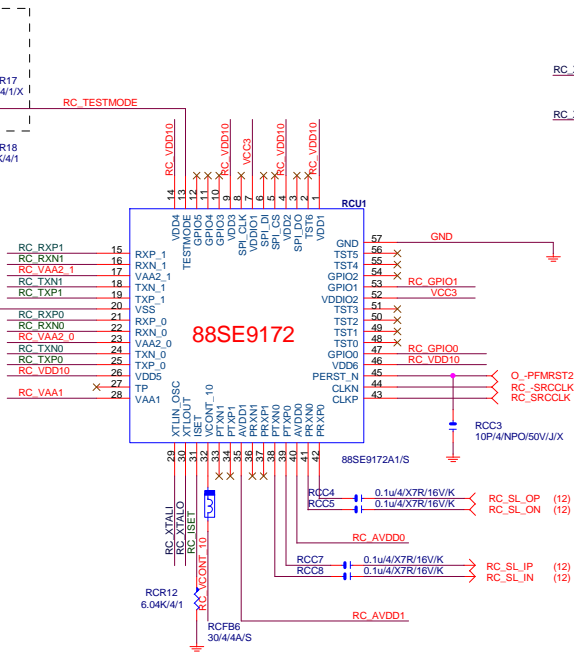
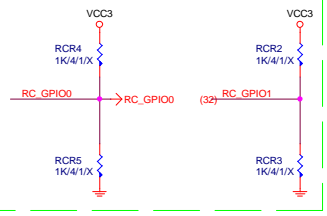
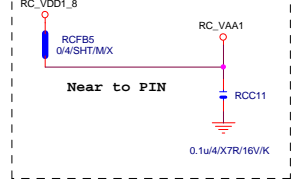
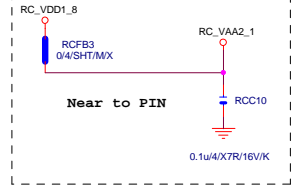
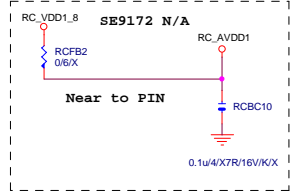
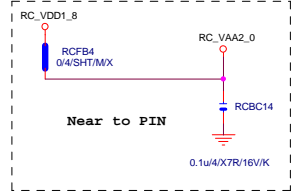
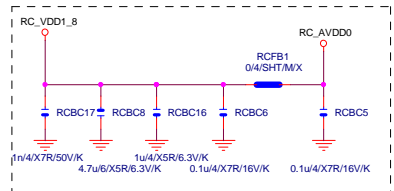
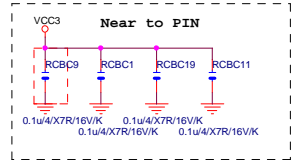
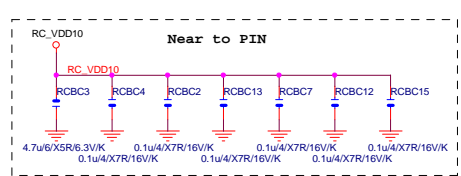
www.aitech1.ru



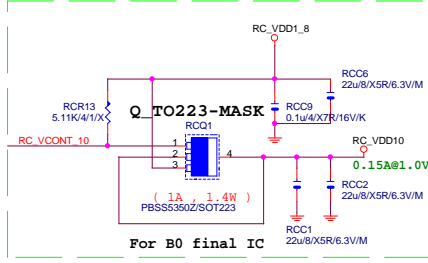
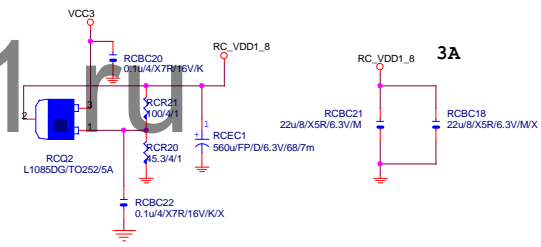




www.aitech1.ru



- |                           |                |          |               |
|---------------------------|----------------|----------|---------------|
| RC_TXP0 0.01uF/4X7R/25V/K | RCC21 RC_TXP0C | RC_TXP0C | RC_TXP0C (40) |
| RC_TXN0 0.01uF/4X7R/25V/K | RCC20 RC_TXN0C | RC_TXN0C | RC_TXN0C (40) |
| RC_RXN0 0.01uF/4X7R/25V/K | RCC19 RC_RXN0C | RC_RXN0C | RC_RXN0C (40) |
| RC_RXP0 0.01uF/4X7R/25V/K | RCC18 RC_RXP0C | RC_RXP0C | RC_RXP0C (40) |
| RC_TXP1 0.01uF/4X7R/25V/K | RCC16 RC_TXP1C | RC_TXP1C | RC_TXP1C (40) |
| RC_TXN1 0.01uF/4X7R/25V/K | RCC17 RC_TXN1C | RC_TXN1C | RC_TXN1C (40) |
| RC_RXN1 0.01uF/4X7R/25V/K | RCC15 RC_RXN1C | RC_RXN1C | RC_RXN1C (40) |
| RC_RXP1 0.01uF/4X7R/25V/K | RCC14 RC_RXP1C | RC_RXP1C | RC_RXP1C (40) |



Remove Co-Layout for Layout



# PCH GPIO

PIN NAME	POWER WELL	USAGE	AFTER PLTRST	S3/S5	NOTES
GP[0]	VCC3	-ICH_PSI	IN		8.2K P/U TO VCC3
GP[1]	VCC3	SPARE	IN		8.2K P/U TO VCC3
GP[2]	VCC3	-PIRQE	IN		8.2K P/U TO VCC3
GP[3]	VCC3	-PIRQF	IN		8.2K P/U TO VCC3
GP[4]	VCC3	-PIRQG	IN		8.2K P/U TO VCC3
GP[5]	VCC3	-PIRQH	IN		8.2K P/U TO VCC3
GP[6]	VCC3	GPIO6	IN		8.2K P/U TO VCC3
GP[7]	VCC3	GPIO7	IN		8.2K P/U TO VCC3
GP[8]	3VDUAL	GPIO8	OUT		8.2K P/U TO 3VDUAL
GP[9]	3VDUAL	-USBOC5	IN		USB OVER-CURRENT
GP[10]	3VDUAL	-USBOC6	IN		USB OVER-CURRENT
GP[11]	3VDUAL	GPIO11	IN		8.2K P/U TO 3VDUAL
GP[12]	3VDUAL	GPIO12	OUT		8.2K P/U TO 3VDUAL
GP[13]	3VDUAL	-LPCPME	IN		8.2K P/U TO 3VDUAL
GP[14]	3VDUAL	GPIO14	IN		8.2K P/U TO 3VDUAL
GP[15]	3VDUAL	SPARE	OUT		8.2K P/U TO 3VDUAL (N/A)
GP[16]	VCC3	SPARE	IN		8.2K P/U TO VCC3
GP[17]	VCC3	SPARE	IN		8.2K P/U TO VCC3
GP[18]	VCC3	-SPI_WP0	OUT		8.2K P/U TO VCC3
GP[19]	VCC3	SPARE	OUT		8.2K P/U TO VCC3
GP[20]	VCC3	-SPI_WP1	OUT		8.2K P/U TO VCC3
GP[21]	VCC3	SPARE	IN		8.2K P/U TO VCC3
GP[22]	VCC3	SPARE	IN		1K P/U TO VCC3
GP[23]	VCC3	SPARE	IN		8.2K P/U TO VCC3
GP[24]	3VDUAL	-SKTOC	IN		8.2K P/U TO 3VDUAL (N/A)
GP[25]	3VDUAL	GPIO25	OUT		8.2K P/U TO 3VDUAL
GP[26]	3VDUAL	SPARE	OUT		8.2K P/U TO 3VDUAL
GP[27]	3VDUAL_PCH	SPARE	OUT		8.2K P/U TO 3VDUAL_PCH
GP[28]	3VDUAL	GPIO28	OUT		8.2K P/U TO 3VDUAL
GP[29]	3VDUAL	SPARE	OUT		8.2K P/U TO 3VDUAL (N/A)
GP[30]	3VDUAL	-S_WARN	OUT		CONNECT TO -S_ACK
GP[31]	3VDUAL_PCH	SPARE	IN		8.2K P/U TO 3VDUAL_PCH(N/A)
GP[32]	VCC3	SPARE	OUT		8.2K P/U TO VCC3
GP[33]	VCC3	SPARE	OUT		8.2K P/U TO VCC3
GP[34]	VCC3	SPARE	IN		8.2K P/U TO VCC3
GP[35]	VCC3	-ACZ_DET	OUT		8.2K P/U TO VCC3
GP[36]	VCC3	SPARE	IN		8.2K P/U TO VCC3(N/A)
GP[37]	VCC3	SPARE	IN		8.2K P/U TO VCC3
GP[38]	VCC3	SPARE	IN		1K P/U TO VCC3

PIN NAME	POWER WELL	USAGE	AFTER PLTRST	S3/S5	NOTES
GP[39]	VCC3	SPARE	IN		1K P/U TO VCC3
GP[40]	3VDUAL	-USBOC1	IN		USB OVER-CURRENT
GP[41]	3VDUAL	-USBOC2	IN		USB OVER-CURRENT
GP[42]	3VDUAL	-USBOC3	IN		USB OVER-CURRENT
GP[43]	3VDUAL	-USBOC4	IN		USB OVER-CURRENT
GP[44]	3VDUAL	SPARE	IN		1K P/U TO 3VDUAL
GP[45]	3VDUAL	SPARE	IN		1K P/U TO 3VDUAL
GP[46]	3VDUAL	SPARE	IN		1K P/U TO 3VDUAL
GP[47]	3VDUAL	SPARE	IN		1K P/U TO 3VDUAL
GP[48]	VCC3	SPARE	IN		1K P/U TO VCC3
GP[49]	VCC3	SPARE	IN		8.2K P/U TO VCC3
GP[50]	VCC3	-REQ1	OUT		8.2K P/U TO VCC3
GP[51]	VCC3	-GNT1	OUT		1K P/U TO VCC3
GP[52]	VCC3	-REQ2	OUT		8.2K P/U TO VCC3
GP[53]	VCC3	-GNT2	IN		8.2K P/U TO VCC3(N/A)
GP[54]	VCC3	-REQ3	IN		8.2K P/U TO VCC3
GP[55]	VCC3	-GNT3	IN		8.2K P/U TO VCC3(N/A)
GP[56]	3VDUAL	SPARE	IN		8.2K P/U TO 3VDUAL
GP[57]	3VDUAL	SPARE	IN		8.2K P/U TO 3VDUAL
GP[58]	3VDUAL	SML1CLK	OUT		8.2K P/U TO 3VDUAL
GP[59]	3VDUAL	-USBOC0	IN		USB OVER-CURRENT
GP[60]	3VDUAL	SML0ART	OUT		1K P/U TO 3VDUAL
GP[61]	3VDUAL	SPARE	OUT		8.2K P/U TO 3VDUAL
GP[62]	3VDUAL	SUSCLK	OUT		8.2K P/U TO 3VDUAL(N/A)
GP[63]	3VDUAL	-SLP_S5	OUT		8.2K P/U TO 3VDUAL(N/A)
GP[64]	VCC3	SPARE	OUT		8.2K P/U TO VCC3
GP[65]	VCC3	SPARE	OUT		8.2K P/U TO VCC3
GP[66]	VCC3	SPARE	OUT		8.2K P/U TO VCC3
GP[67]	VCC3	SPARE	OUT		8.2K P/U TO VCC3
GP[68]	VCC3	SPARE	OUT		8.2K P/U TO VCC3
GP[69]	VCC3	SPARE	OUT		8.2K P/U TO VCC3
GP[70]	VCC3	SPARE	OUT		8.2K P/U TO VCC3
GP[71]	VCC3	SPARE	OUT		8.2K P/U TO VCC3
GP[72]	3VDUAL	SPARE	OUT		8.2K P/U TO 3VDUAL
GP[73]	3VDUAL	SPARE	OUT		8.2K P/U TO 3VDUAL
GP[74]	3VDUAL	SML1ART	OUT		1K P/U TO 3VDUAL
GP[75]	3VDUAL	SML1DAT	IN/OUT		8.2K P/U TO 3VDUAL

Gigabyte Technology			
Title			
PCH GPIO LIST			
Size	Document Number	Rev	
Custom	GA-X79-UP4	1.01	
Date:	Friday, August 03, 2012	Sheet	44 of 44