

# Model Name: GA-Z77-D3H

1.01

SHEET

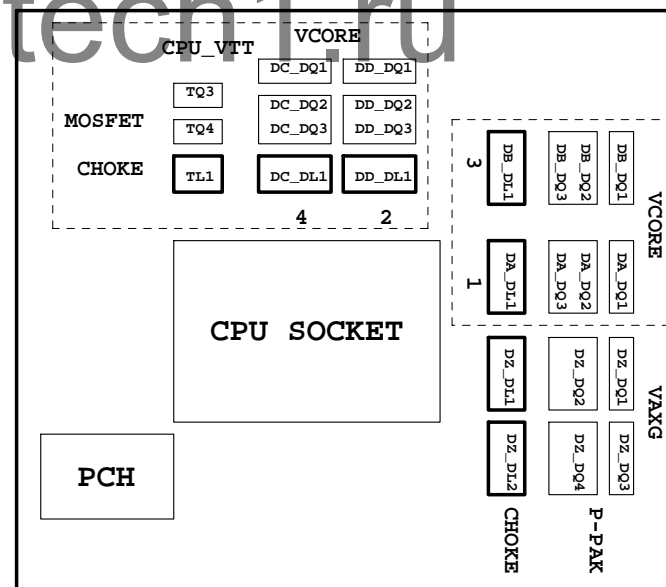
TITLE

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	PCIEX1*3 , PCIEX4 SLOT
16	ITE8892 PCI BRIDGE
17	PCI SLOT 1&2
18	I/O ITE8728
19	COM, -PROHOT, R_USB
20	Dual BIOS , TPM SLB9635TT
21	VT2021 CODEC
22	REAR AUDIO JACK
23	VCORE PWM_IR3564
24	VCORE PWM DRIVER IR3598
25	NCP3933 OVER VOLTAGE
26	DISCRETE POWER
27	DDR_15V & CPU_VTT PWM IR3570

SHEET

TITLE

28	DDR_15V & CPU_VTT PWM DRIVER CHL8550
29	VCCSA POWER
30	F_PANEL , F_USB2.0/3.0
31	ATX POWER, CLOCK GEN
32	HWM , KB/MS , FAN CTRL
33	LAN ATHEROS AR8151
34	N/A
35	M-SATA
36	DVI
37	HDMI , R_USB30
38	TABLE LIST
39	
40	



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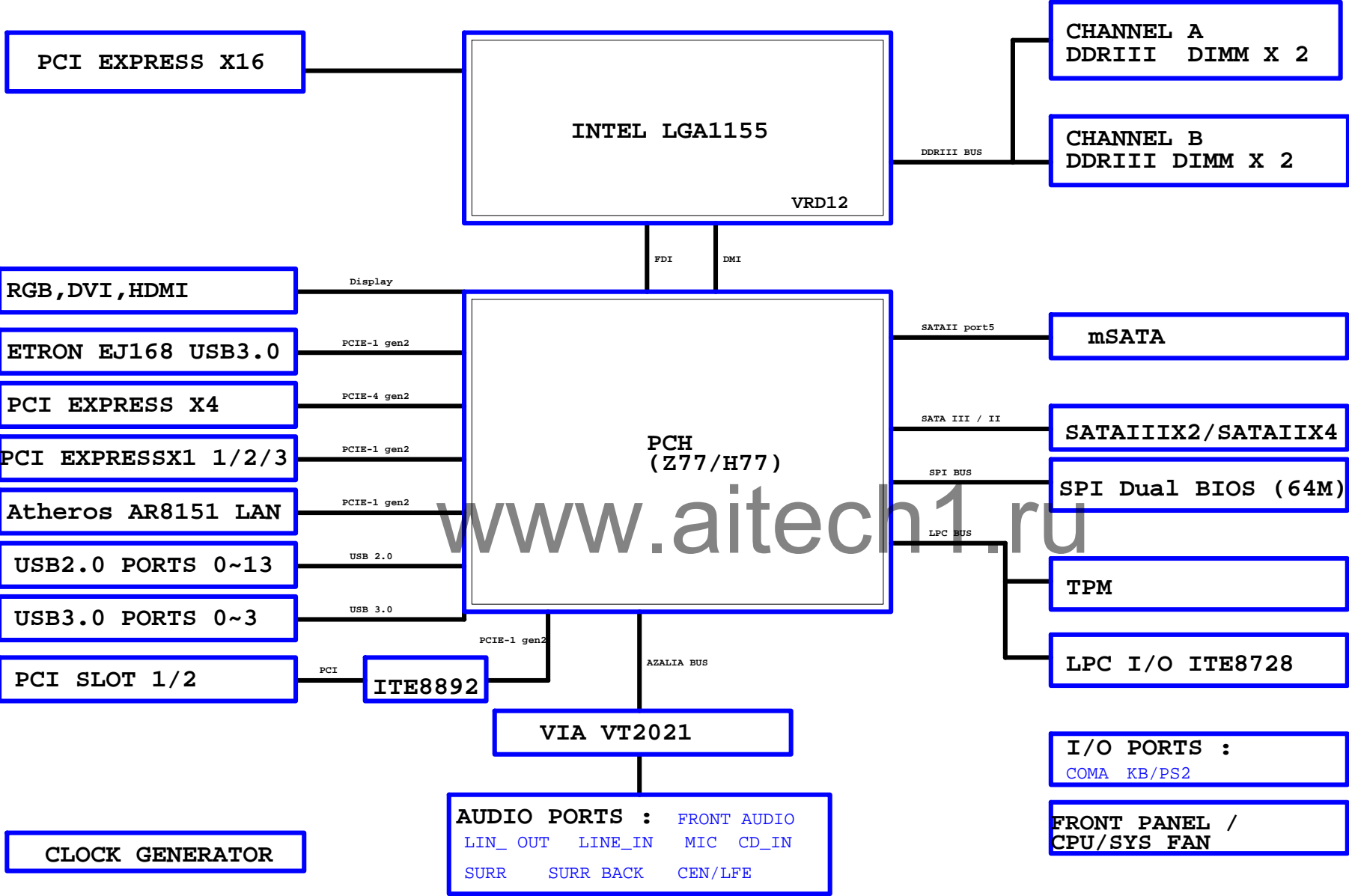
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Title		GA-Z77-D3H	
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Custom			
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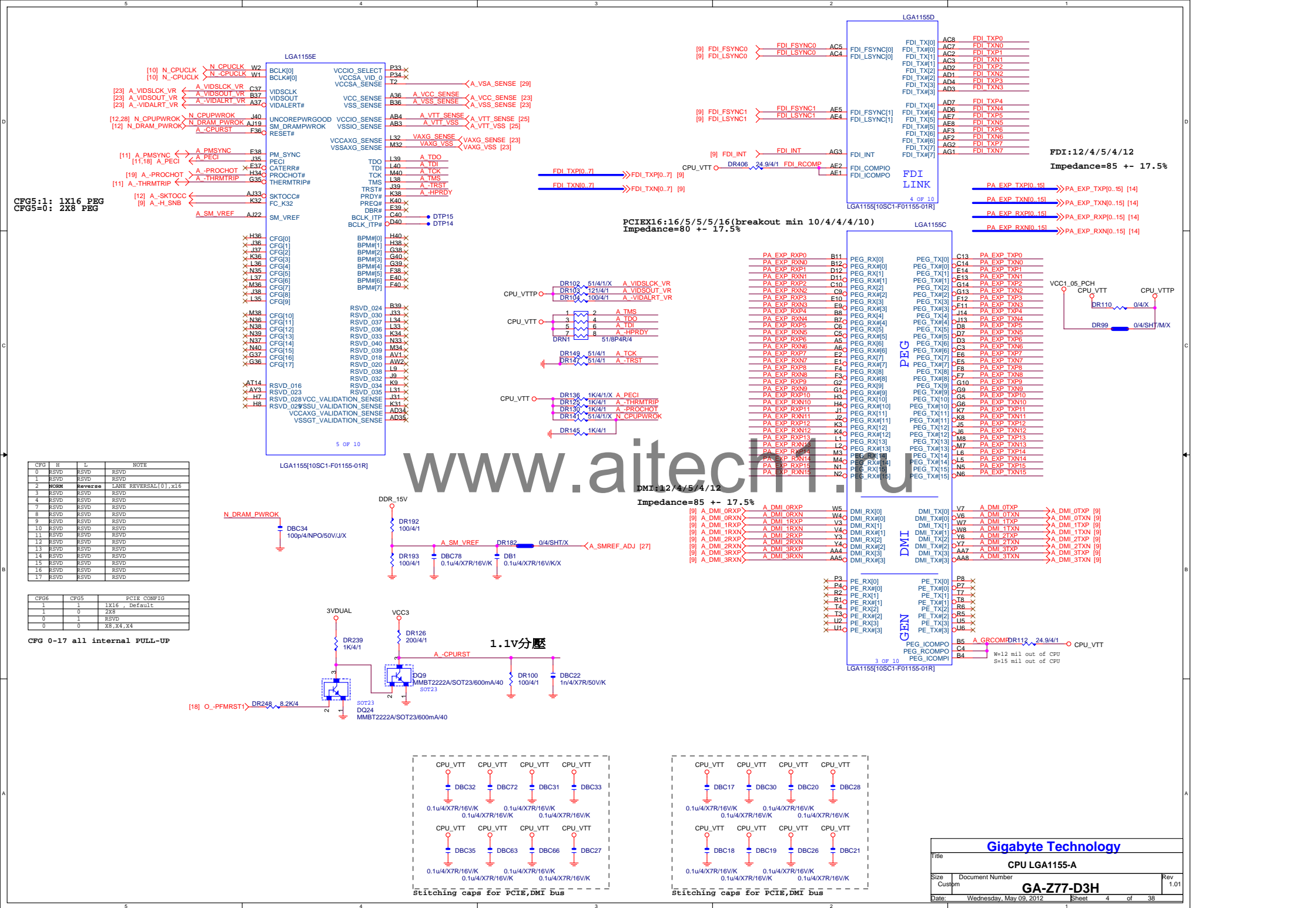
## Component value change history

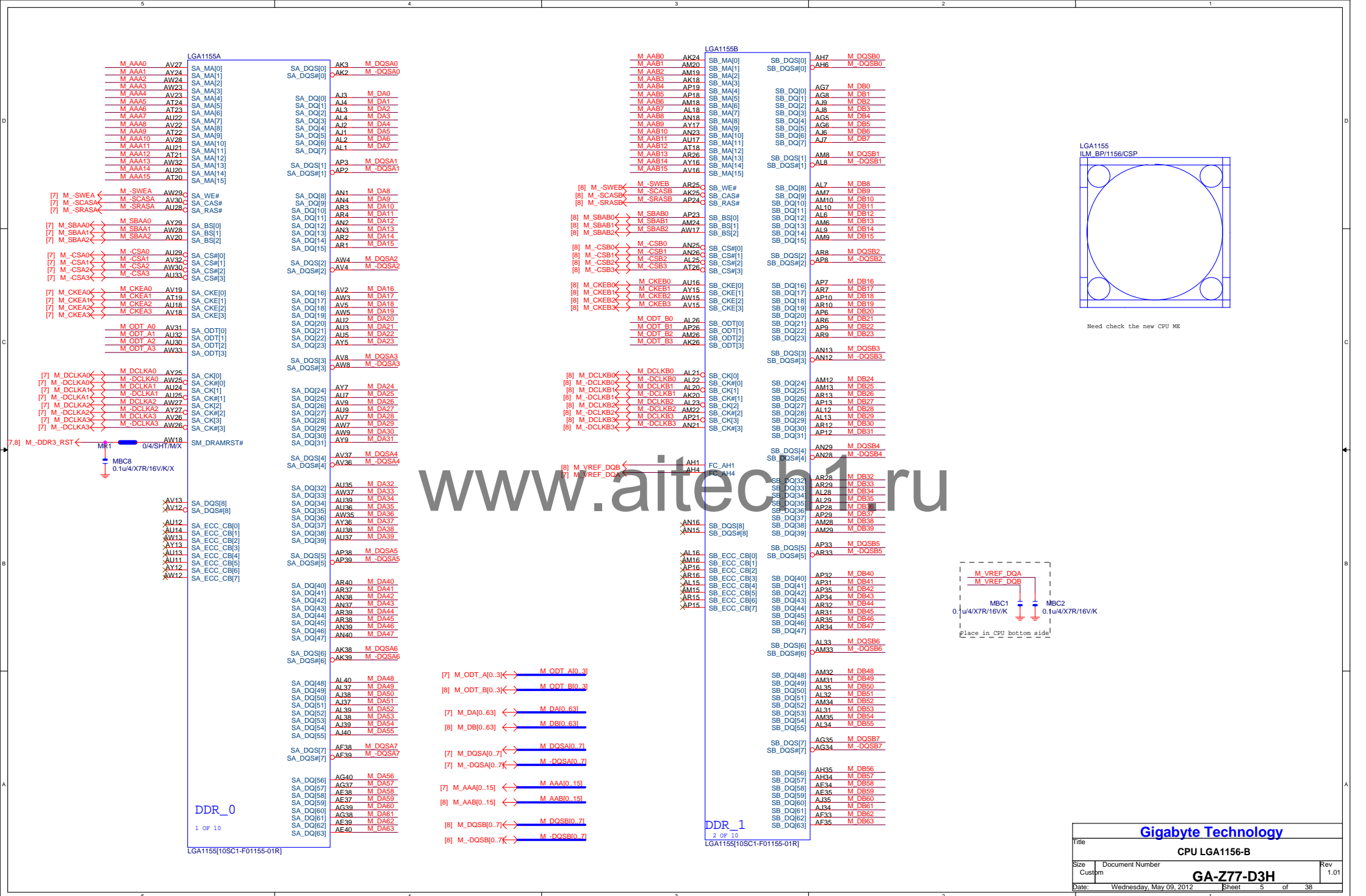
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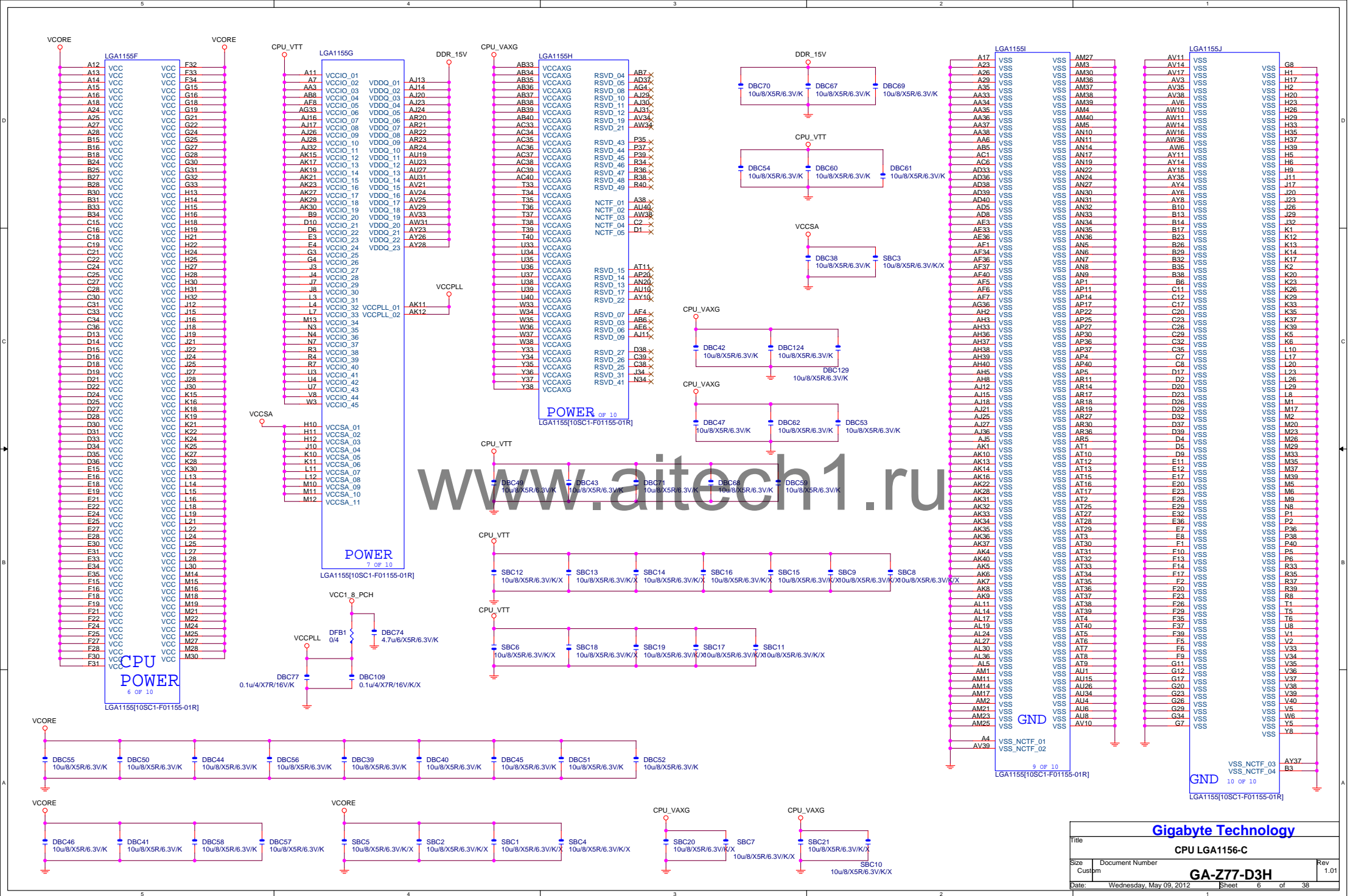
DATE	Change Item	Reason
P67X-UD3-B3		
2011/02/18-0.1	1. 移除LAR11 ,LAR14 , NR28 ,新增NTP11	
2011/02/18-1.0	2. 新增DR388,DR389,DR391 ; Remove DQ49,DR347,DR371 3. CR44改成R0603-RH 4. R1,LAR3,RBR20,LABC25 -->R0402-2-SHORT 5. RAQ1 --> Q_TO223-MASK 6. RARN1 --> R8P4R-0402-SHORT 7. CESD1-5 --> SSOP5 8. RAQ2,RAEC1一起往下移40mil 9. CESD2文字面要標pin1	
2011/03/8-1.01	1. Add "Dolby" logo	
2011/03/8-1.02	1. UAFB1,UAFB2,UBF1,UBF2 Footprint update 1206-->1812 2. Add "AD1" FOR 5VSB	
Z68XP-D3		
1.0	1. update MINI_PCIE footprint 2. 文字面 : SLOT部分全對齊	
Z77-D3H-0.1	EVT	
0.2-1216	1. Remove SE9172 , Add VCC3 內層(注意其他內層power,跨切割) 2. SPDIF AGND --> GND 3. PCI SLOT & PCIEX1/X4 CAP COST DOWN 4. 0 ohm --> SHORT PAD 5. REMOVE SMBUS FROM COMP TO SOLDER SIDE IN DR POWER 6. SATA3 connect Change to 90 degree (記得SATA3訊號部分要做挖空) 7. Add "108dB"文字面 8. Remove VCC1_05_PCH & VCC1_8_PCH gate net 9. Add EJ168 R_USB30_1 & F_USB3 10. UAE1/UAE2 NET SWAP 11. 內層+12V要打VIA在COMA處 12. SPDIFO_HDMI走12mil	
1.0	1. SATA2-SATA3文字面要隱藏 2. DART2 移至 DC_DQ1左上方 3. Q7 & DAR31 NET Change	
1.01	1. 0 OHM SHORT PAD (LAN & AUDIO) 2. DDR3 2400MHz OC modify	

BLOCK DIAGRAM





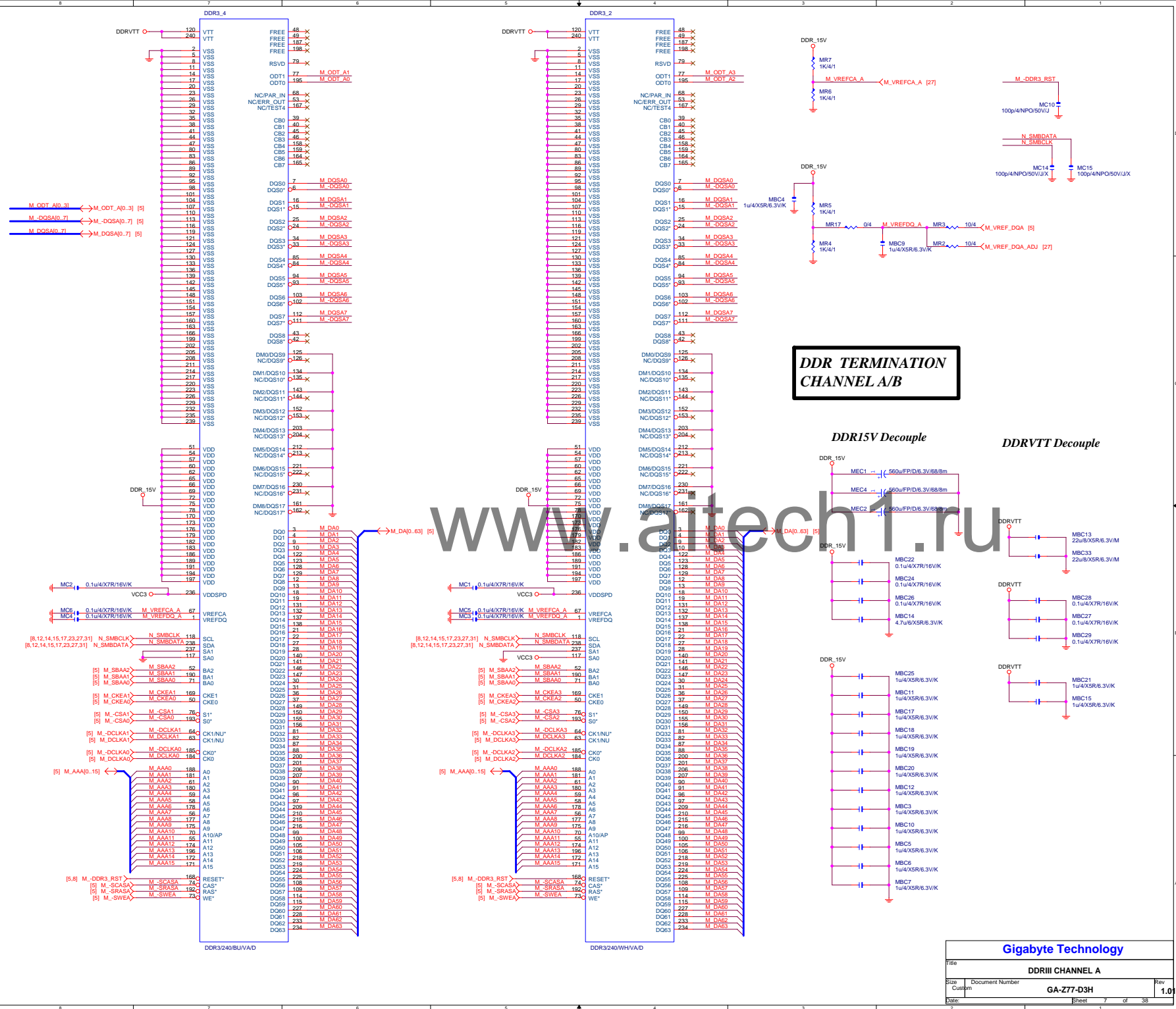


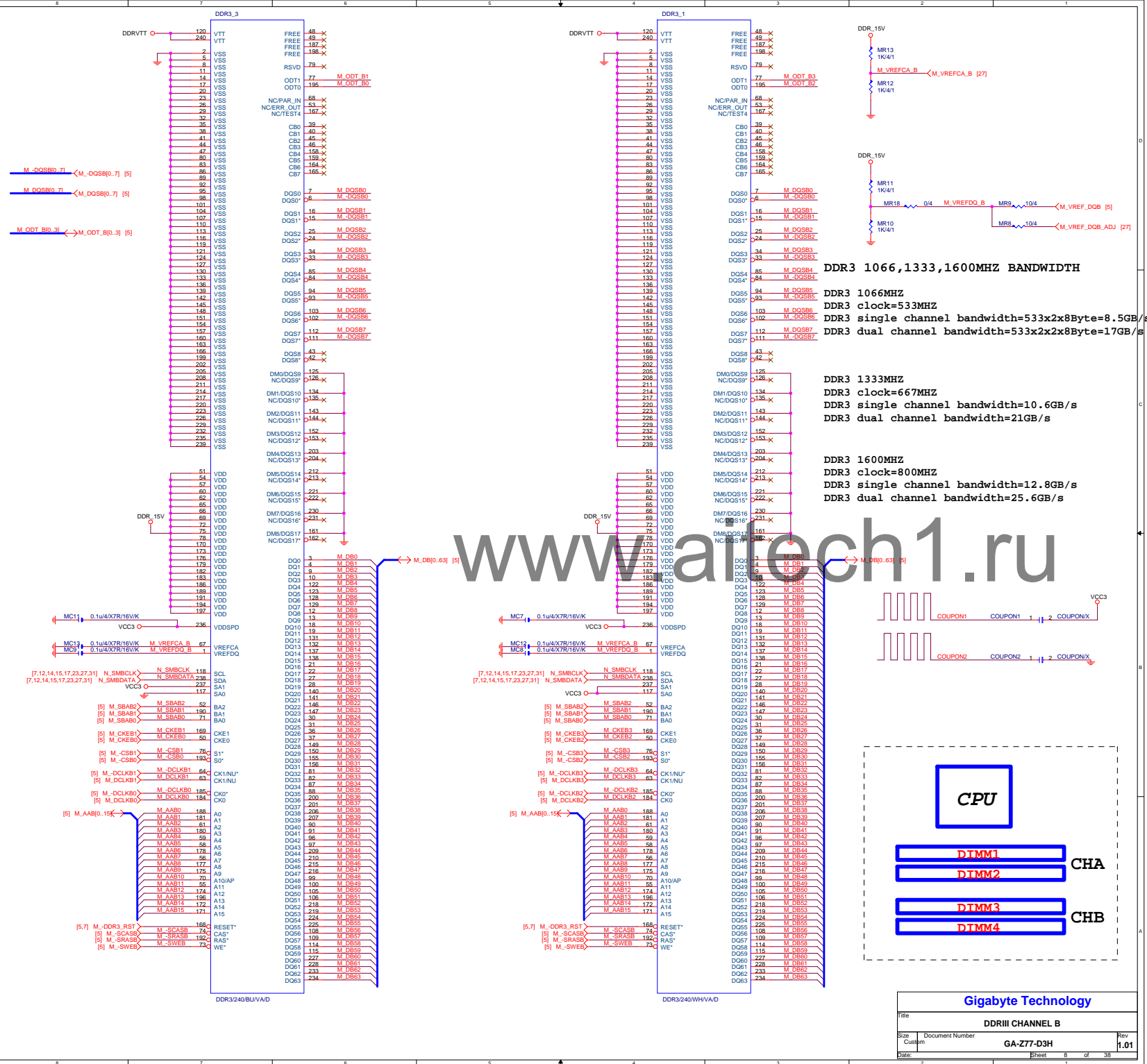


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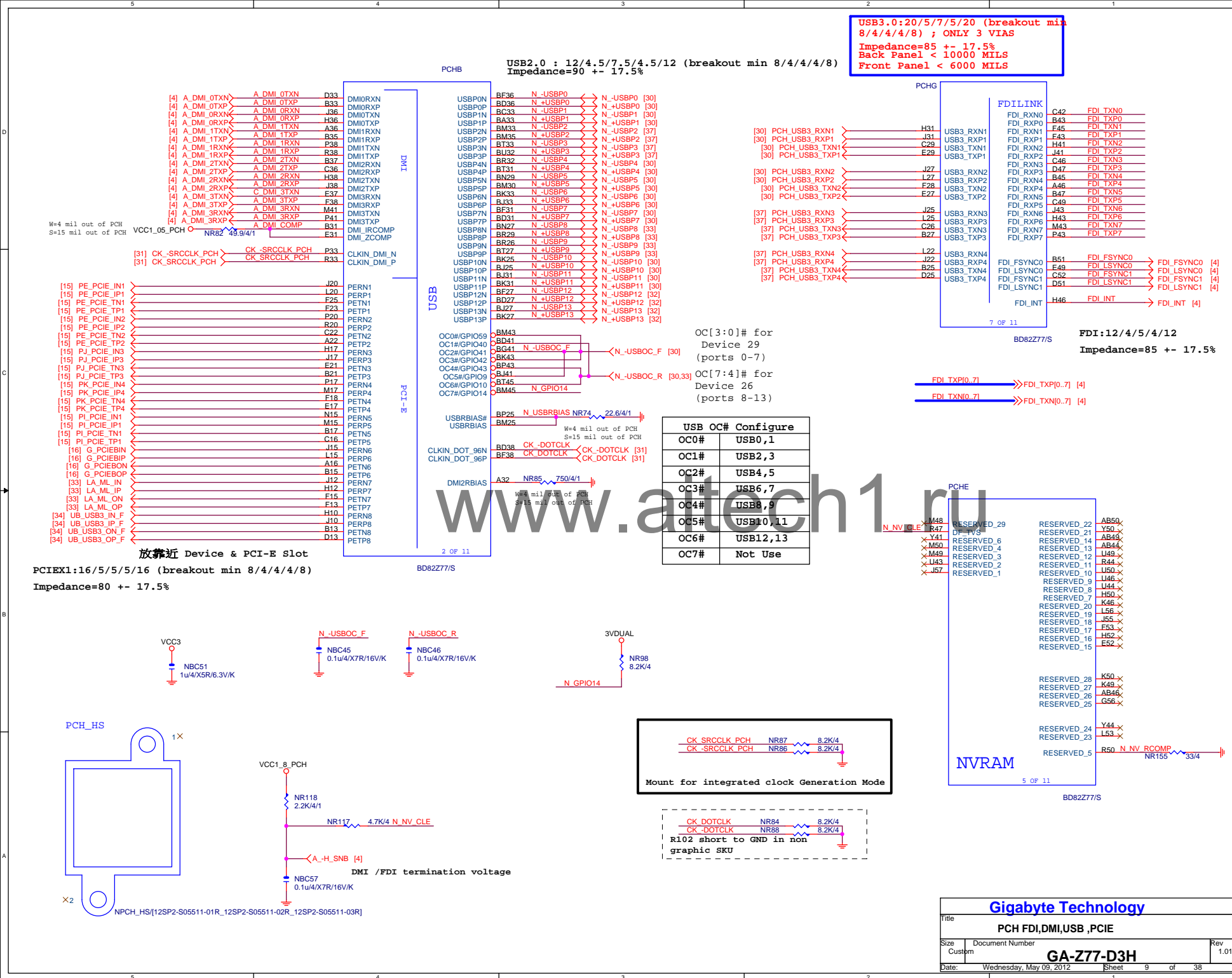
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		GA-Z77-D3H	
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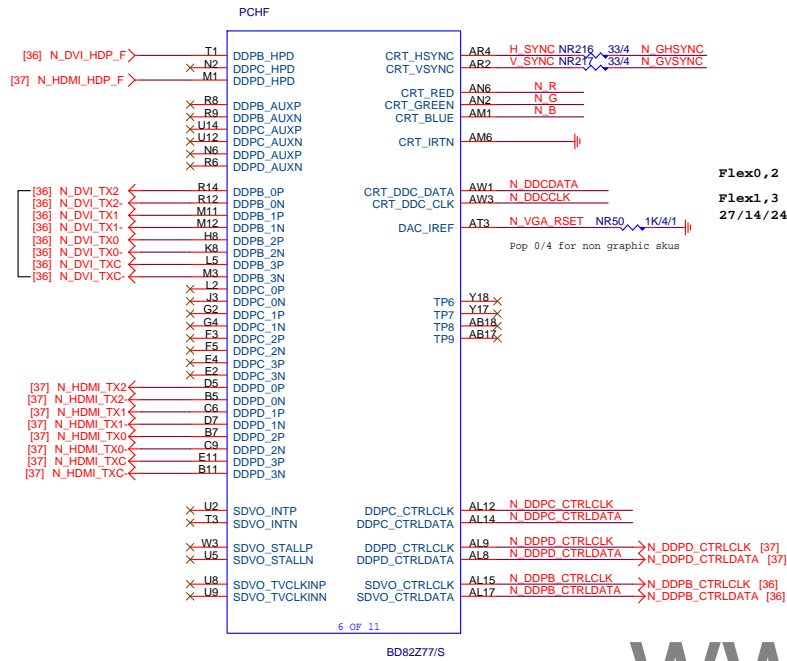




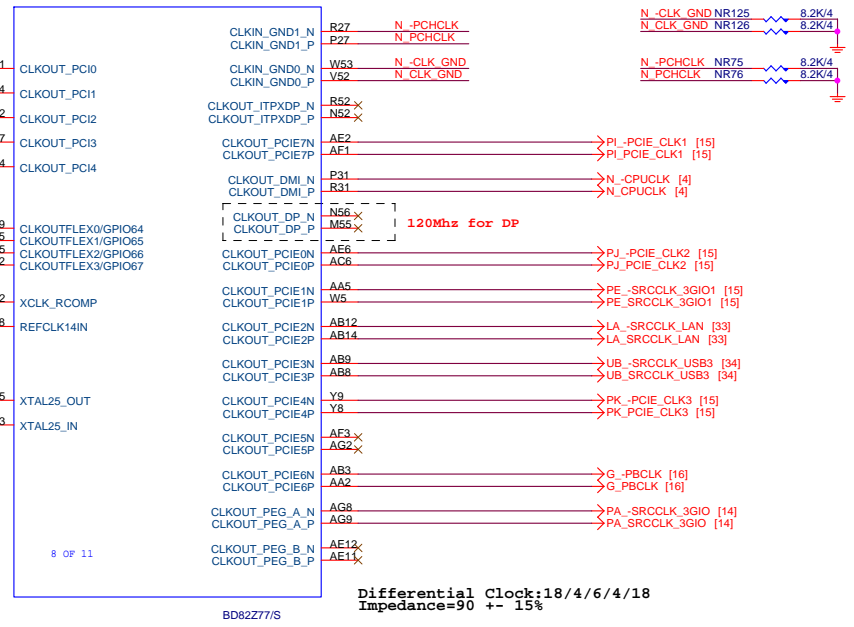
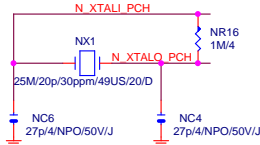








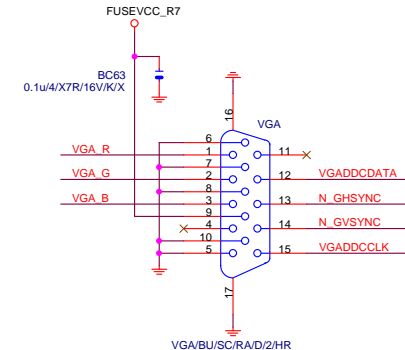
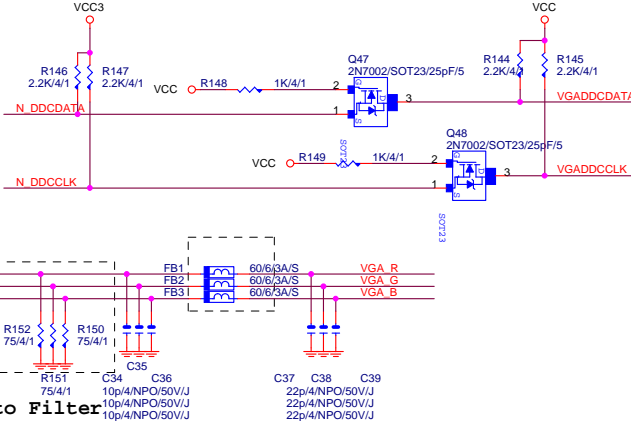
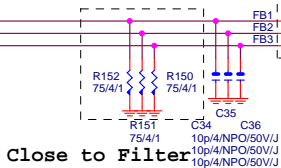
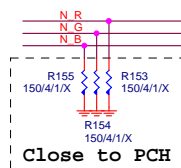
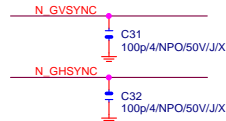
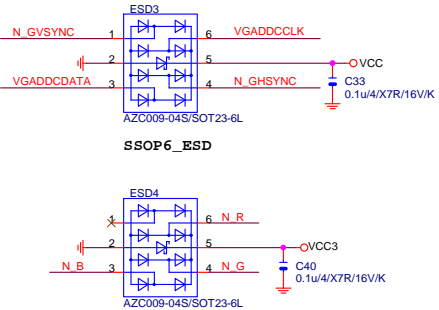
Flex0,2 : 33MHZ  
Flex1,3 :  
27/14/24/48/25MHZ



Differential Clock:18/4/6/4/18  
Impedance=90 +- 15%

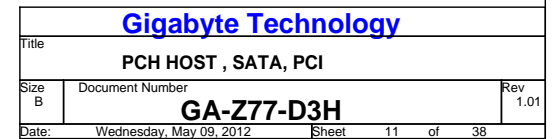
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Check if NC for P67 non graphic chip

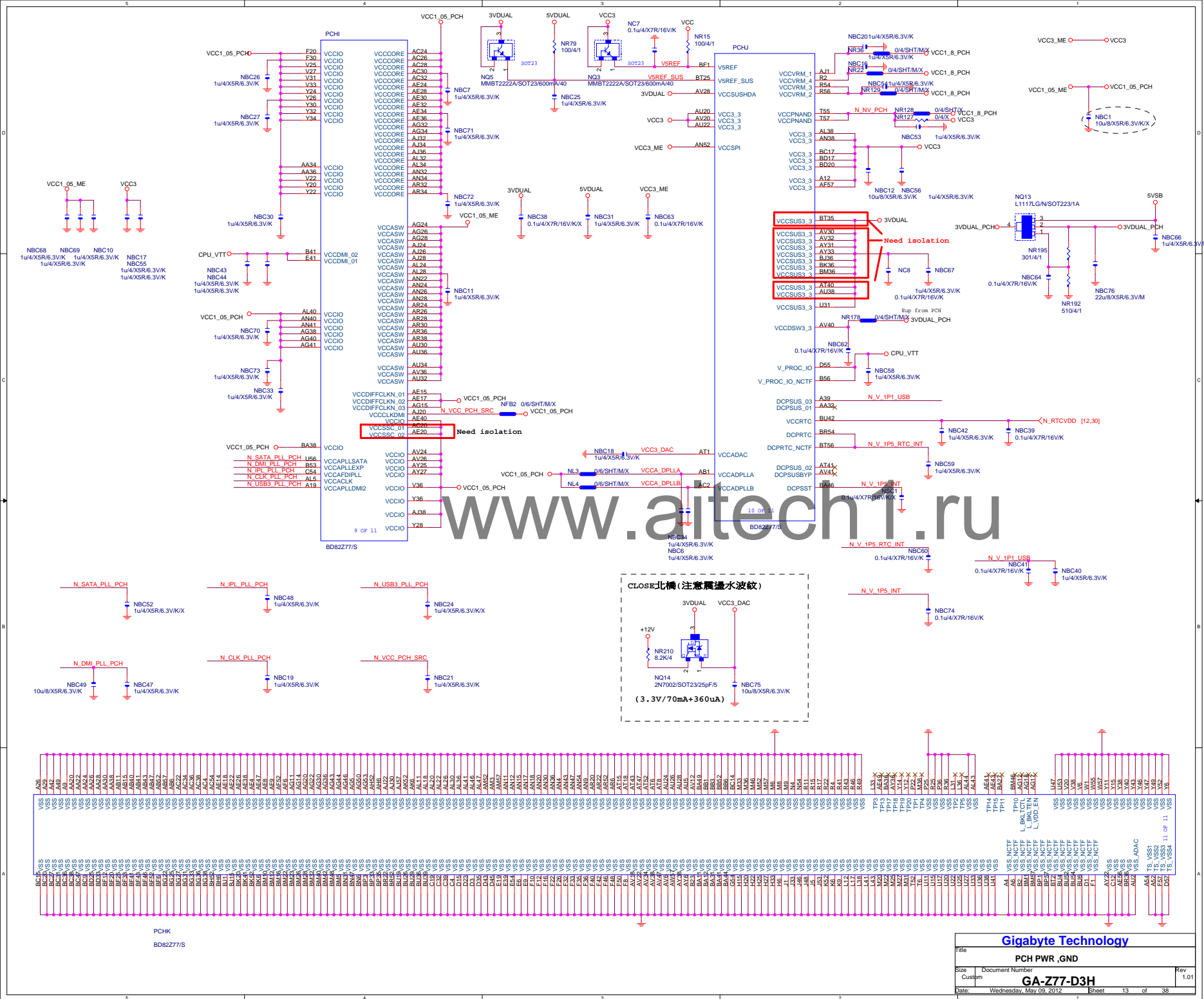


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Title			
PCH DISPLAY ,CLK BUFFER			
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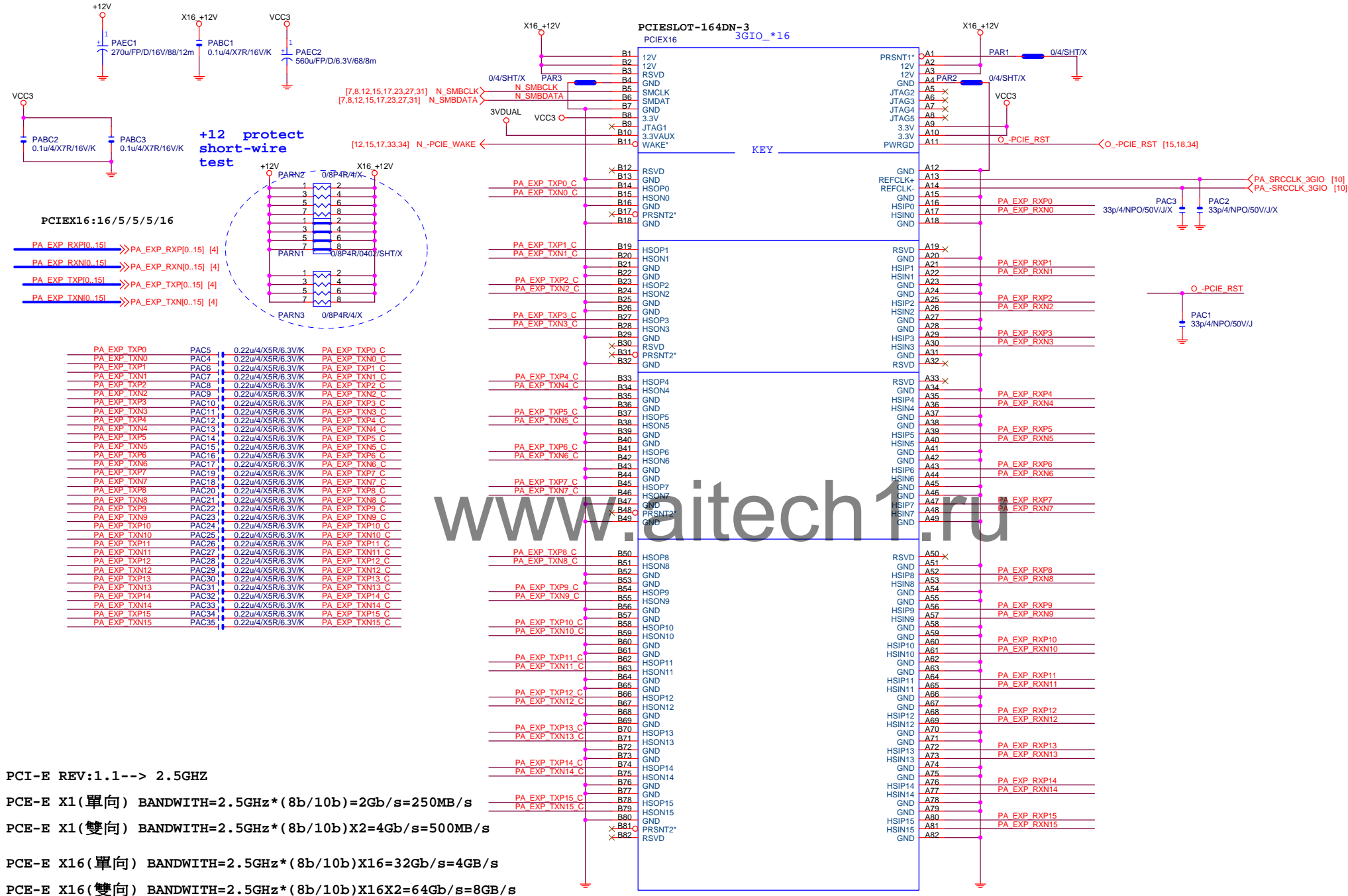
SATA2 : 15/7.5/4.5/7.5/15 (breakout min 8/4/4/4/8)  
Impedance=90 +- 17.5%











PCI-E REV:1.1--> 2.5GHZ

PCE-E X1(單向) BANDWITH=2.5GHz\*(8b/10b)=2Gb/s=250MB/s

PCE-E X1(雙向) BANDWITH=2.5GHz\*(8b/10b)X2=4Gb/s=500MB/s

PCE-E X16(單向) BANDWITH=2.5GHz\*(8b/10b)X16=32Gb/s=4GB/s

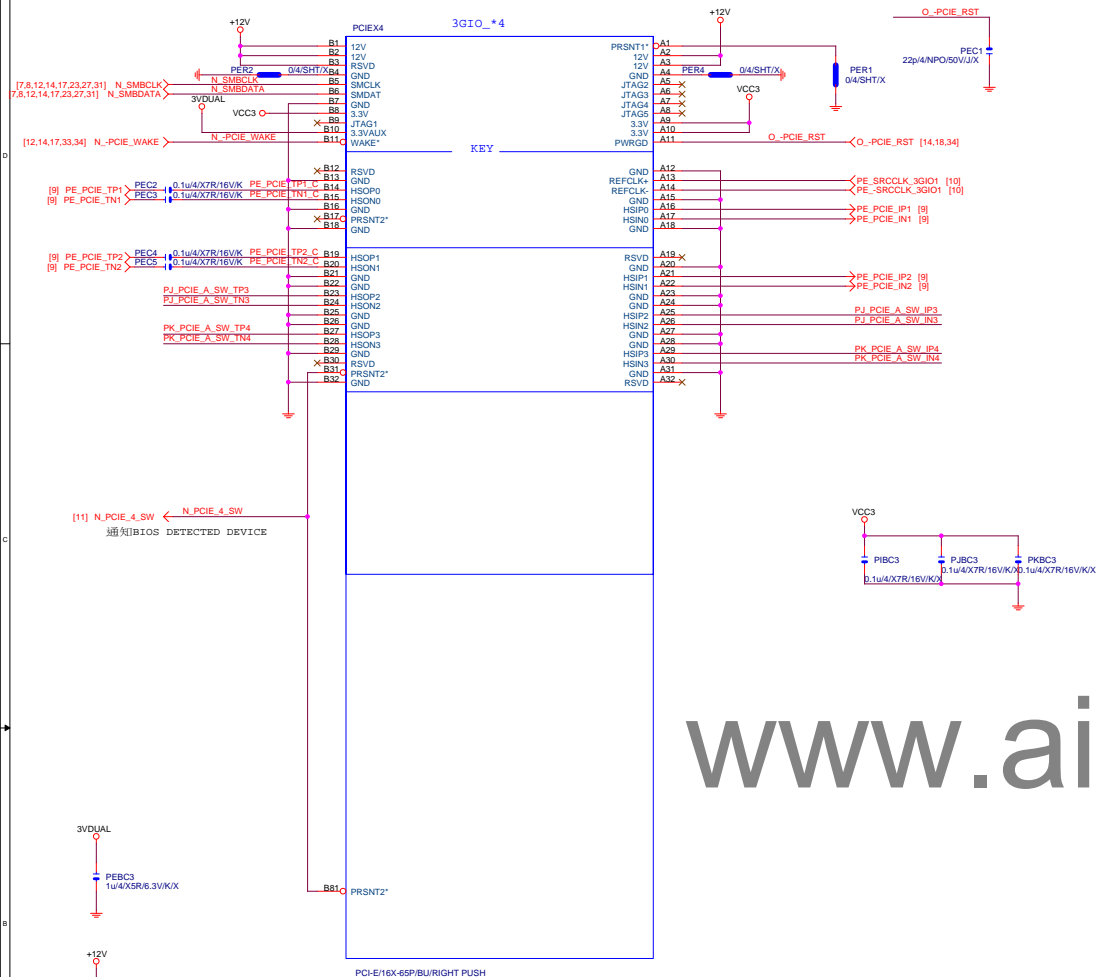
PCE-E X16(雙向) BANDWITH=2.5GHz\*(8b/10b)X16X2=64Gb/s=8GB/s

PCI-E REV:2.0--> 5GHZ

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PCI EXPRESS * 16			
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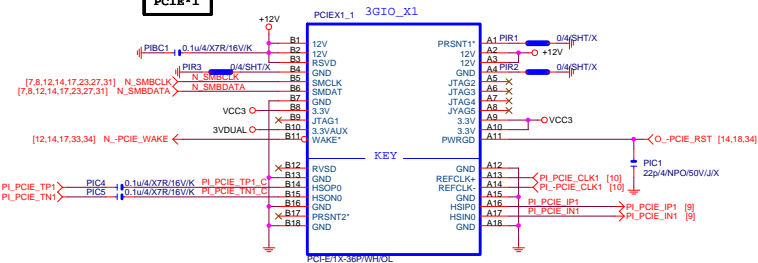


PCIE\*4

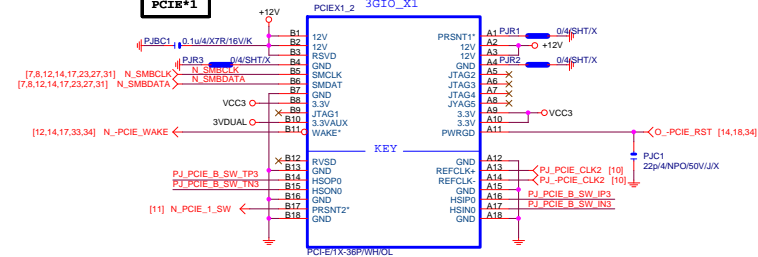


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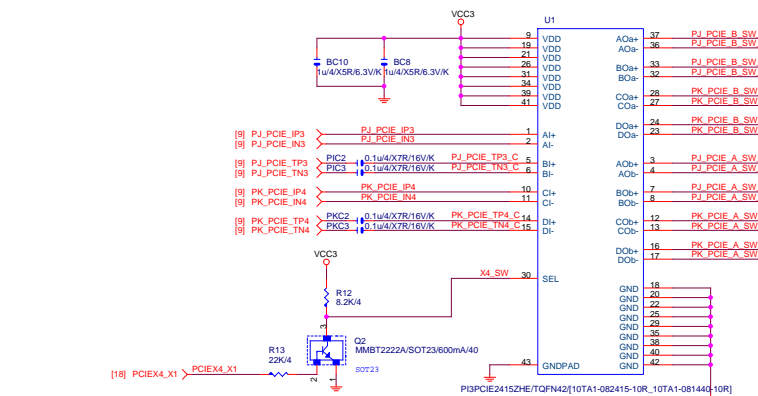
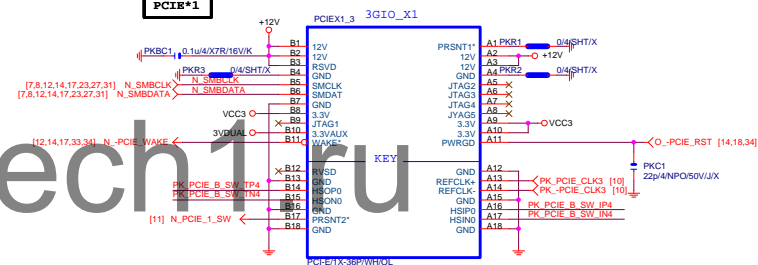
PCIE\*1



PCIE\*1



PCIE\*1

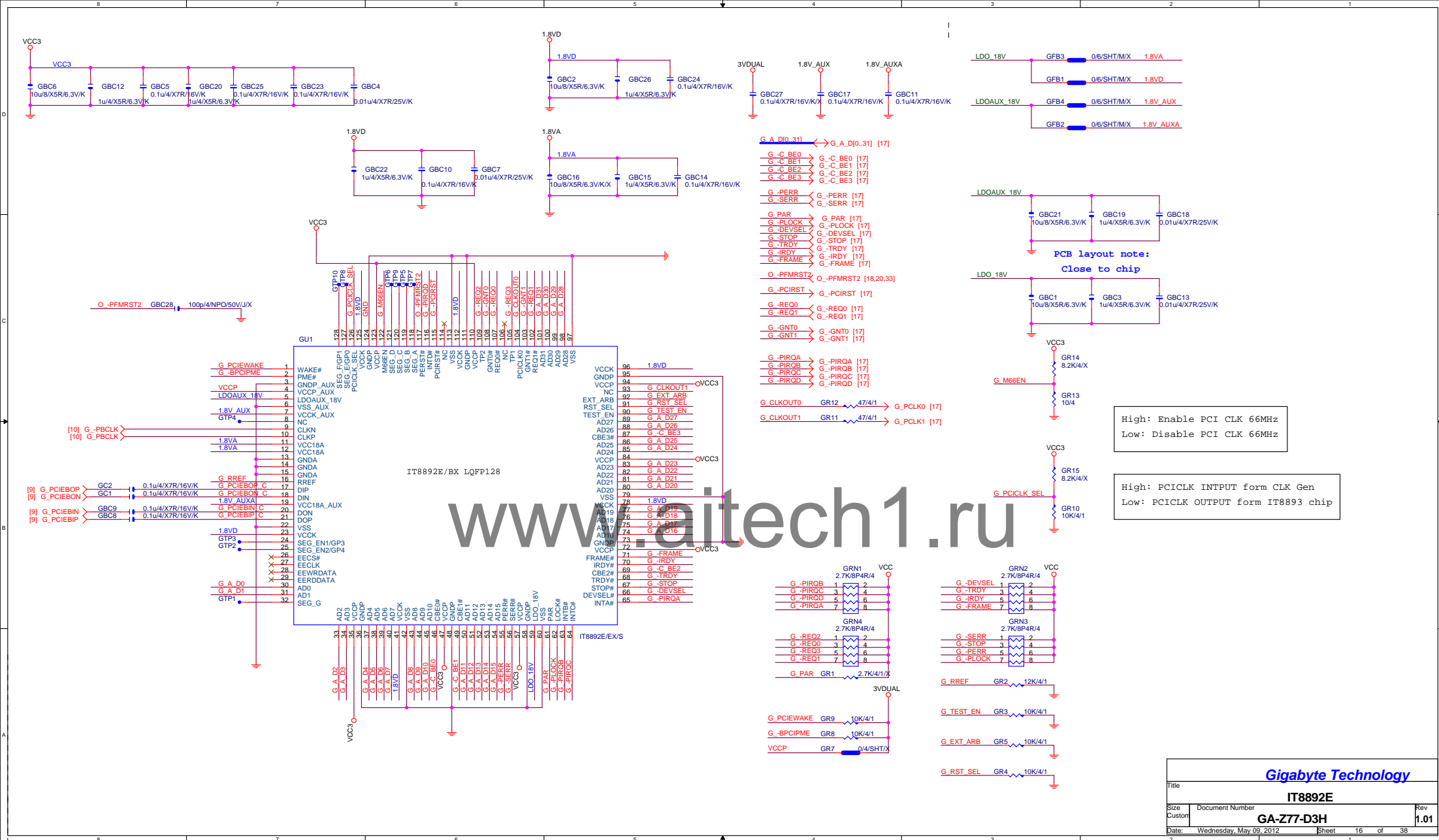


	N_PCIE_4_SW (PCH GPIO38)	PCIE_X1 (SIO_GPIO26)
PCIE_X1, PCIE_X4 --> X1 (Default)	H	H
PCIE_X1_2/PCIE_X1_3 Have devices	H	H
PCIE_X4 -> X1		
PCIE_X1_2/PCIE_X1_3 No devices	L	L
PCIE_X4 Have devices		
PCIE_X4 -> X4		

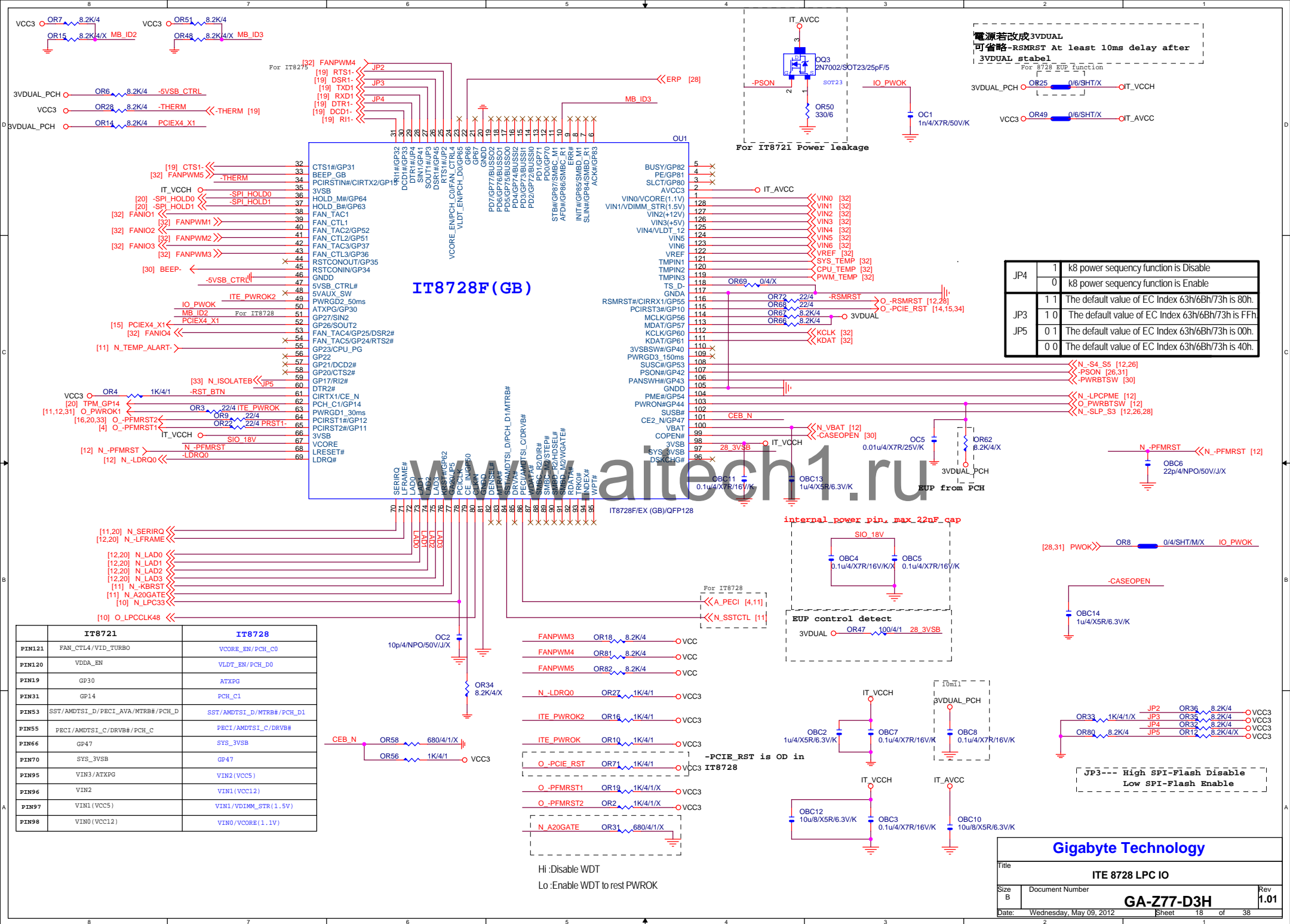
Function	SEL
X1--> x0a	L <sub>1</sub> PCIE_X4 SLOT-->X1
X1--> x0b	H <sub>1</sub> PCIE_X4 SLOT-->X4

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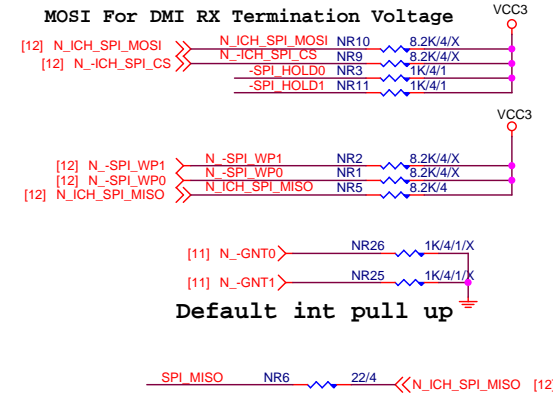
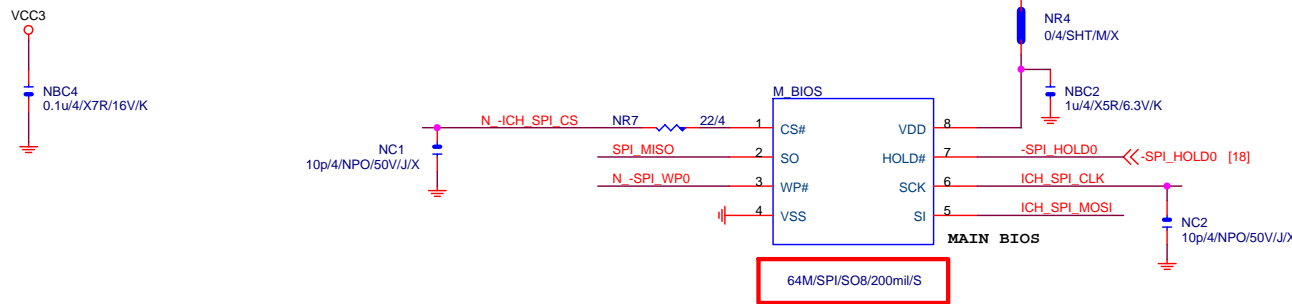
PCIE X1 1.2		
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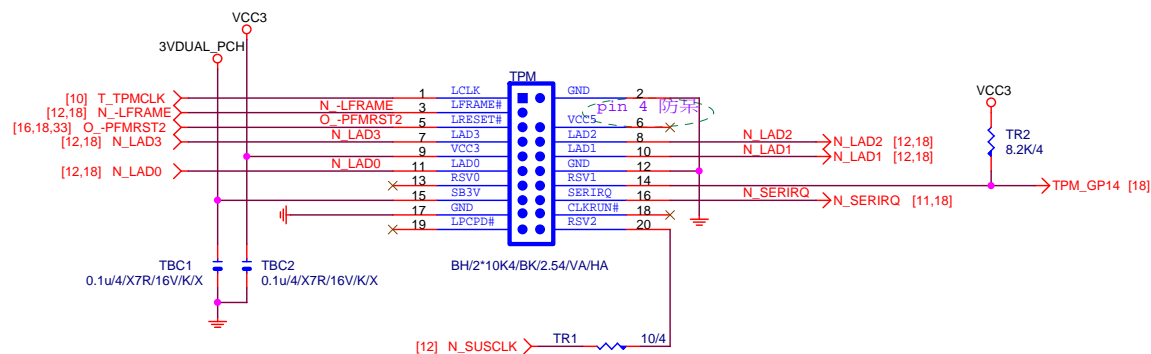




BOOT DEVICE	GNT0	GNT1
LPC	0	0
PCI	0	1
NAND	1	0
SPI	1	1

1 means floating  
 0 means PD 1K

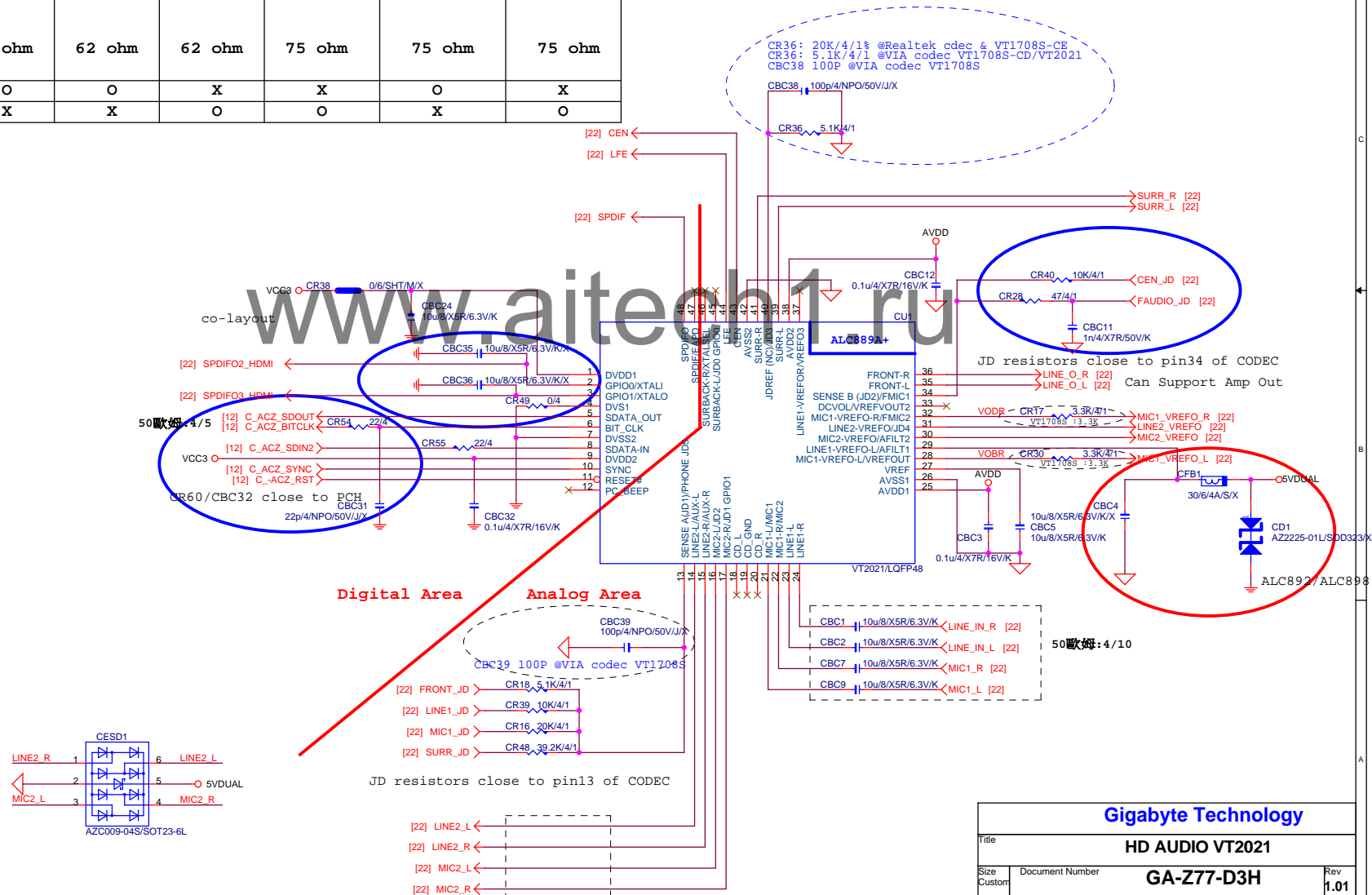
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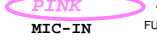
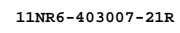


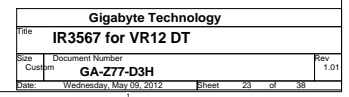
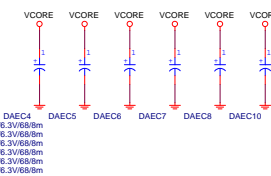
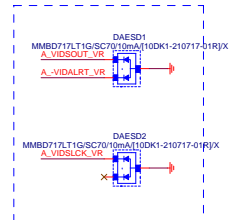
	ALC662	ALC887-VD2	ALC889	VT1708S-CD	VT1708S-CE/ VT1705CF	VT2021
CR49	X	X	O	O	X	O
CBC36	O	O	X	X	O	X
CR28/CBC11	47ohm+1nF	47ohm+1nF	47ohm+1nF	22ohm+100P	22ohm+100P	47ohm+1nF
CR52	X	O	O	O	O	O
CR57	O	X	X	X	X	X
CBC1/CBC2	10uF/X5R	10uF/X5R	22uF/X5R	10uF/X5R	10uF/X5R	10uF/X5R
CR36	20K/4/1	20K/4/1	20K/4/1	5.1K/4/1	20K/4/1	5.1K/4/1
CR17/CR30/ CR25/CR15/CR12/CR3/	8.2K/4	8.2K/4	8.2K/4	3.3K/4/1	3.3K/4/1	3.3K/4/1
CBC38/CBC39	X	X	X	100P/4	100P/4	X
CR10/CR8/CR20/CR45/ CR42/CR51/CR27/CR26	22K/4	22K/4	22K/4	10K/4/1	10K/4/1	10K/4/1
CR7/CR9/CR5/CR13/ CR29/CR32/CR46/CR19/ CR50/CR41/CR2/CR11/ CR14/CR24	62 ohm	62 ohm	62 ohm	75 ohm	75 ohm	75 ohm
CFB1/CD1/CBC4/CBC8	O	O	X	X	O	X
CD2/CD3/CQ3/CQ4	X	X	O	O	X	O



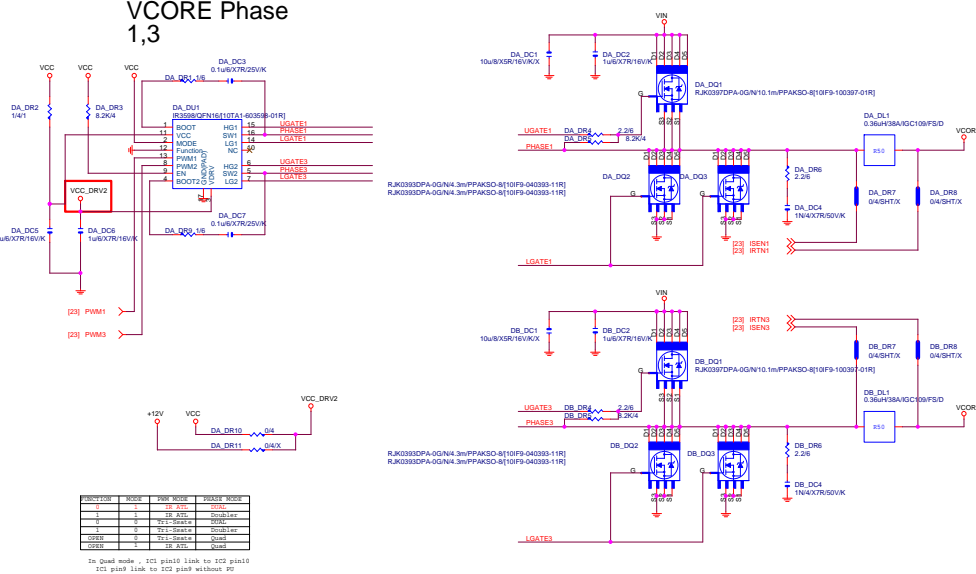
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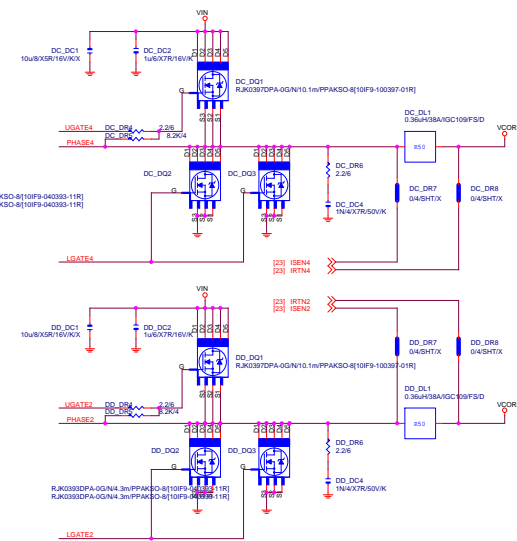
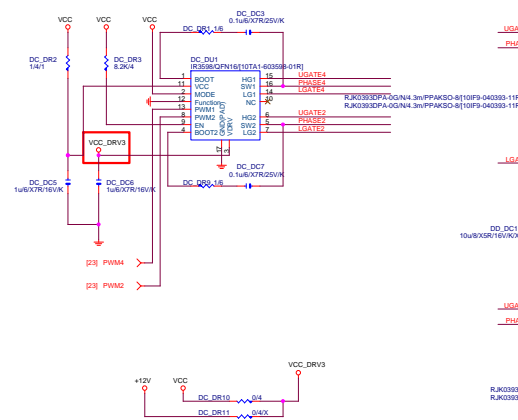




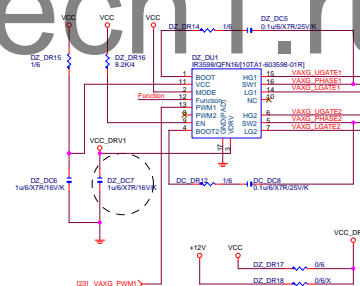
## VCORE Phase 1,3



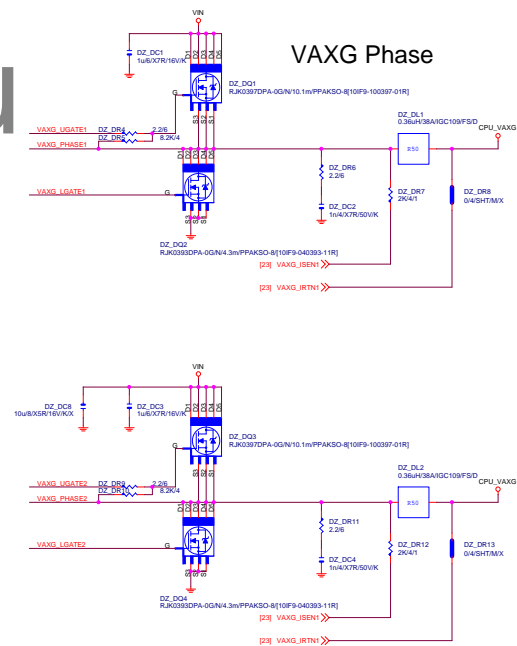
## VCORE Phase 4,2



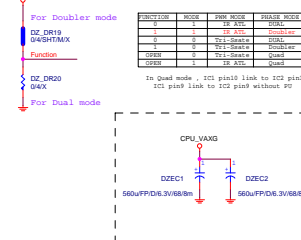
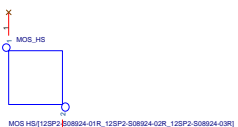
## VAXG PHASE 1,2



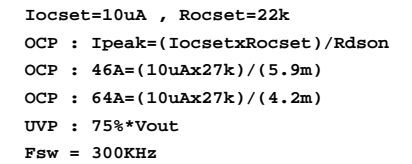
## VAXG Phase



## MOS HEATSINK

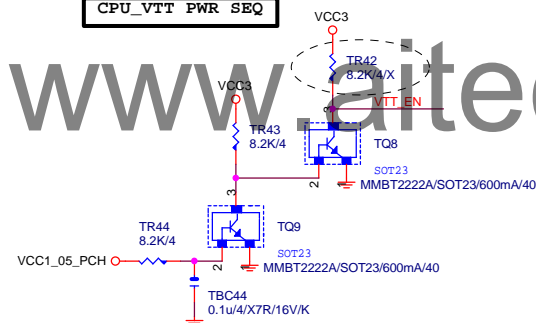


## CPU\_VTT



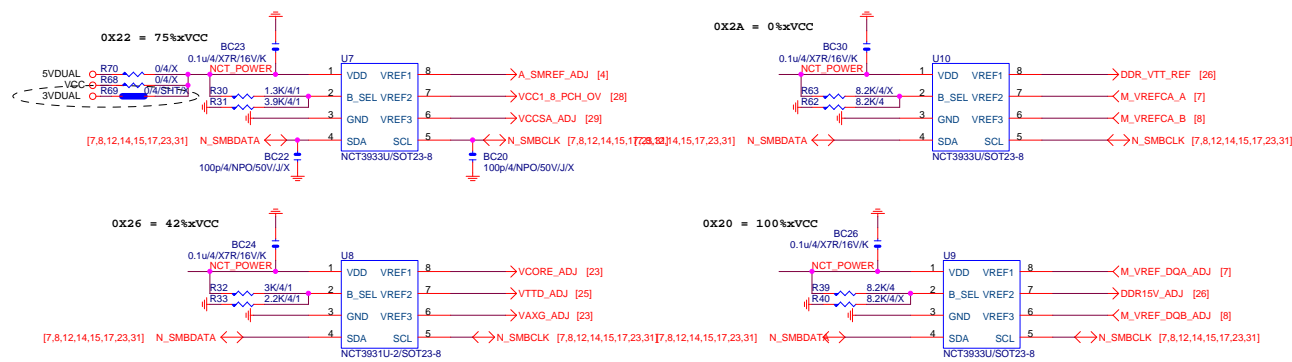
CPU\_VTT PWR SEQ

	VTT_SEL
HI	1.05V
LO	1.0V

$$V_{out} = 0.8 * (1 + R_S / R_O) = 0.8 * [1 + 1.1K / 3K] = 1.09V$$








NCT3933	0X2A	0X20	0X22	0X26
VREF1	DDR_VTT	VREF_DDRA_DQ	SMREF	VCORE
VREF2	VREF_DDRA_CA	DDR15V	VCC1_8_PCH	CPU_VTT
VREF3	VREF_DDRA_CA	VREF_DDRB_DQ	VCCSA	VAXG

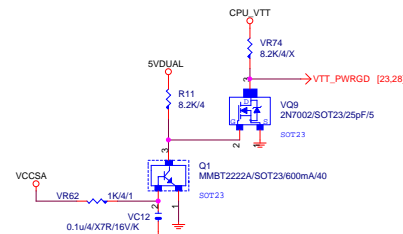
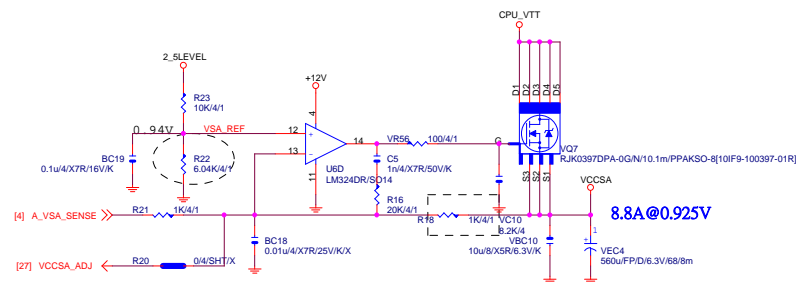
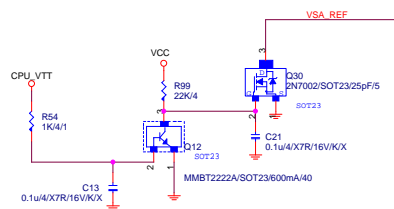
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CPU CORE VR-2		
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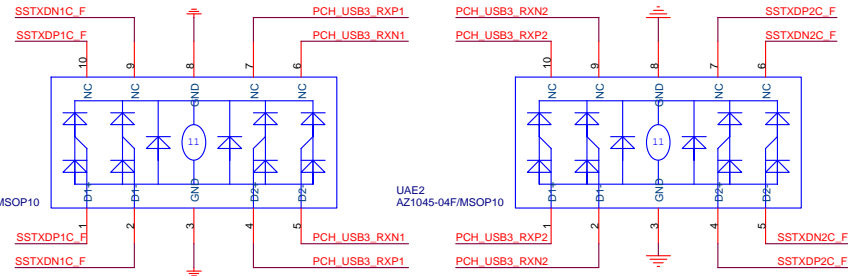
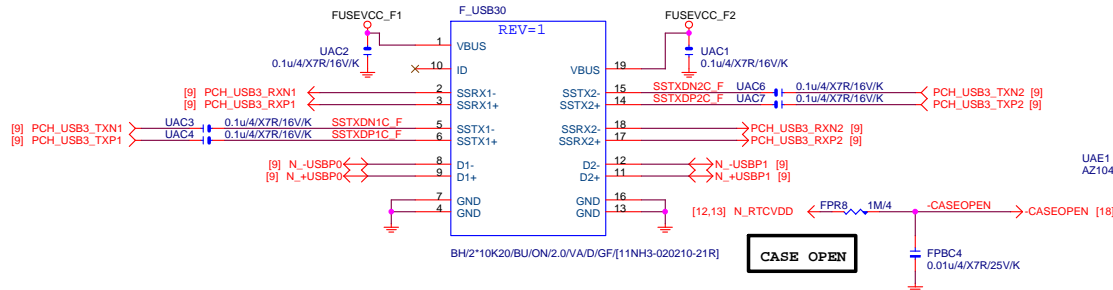
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VCC\_SA

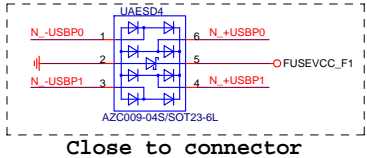


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CPU VTT PWM_ISL6312			
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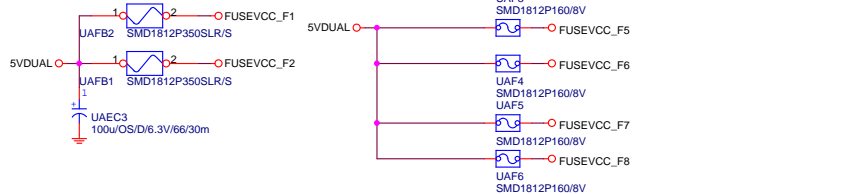
# Front USB3.0



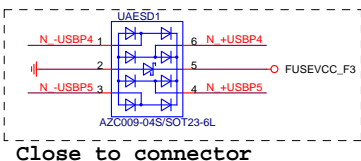
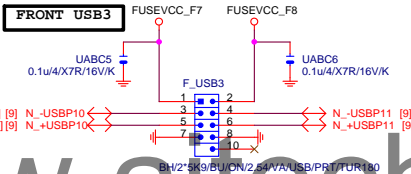
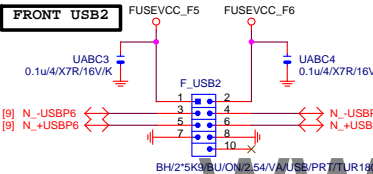
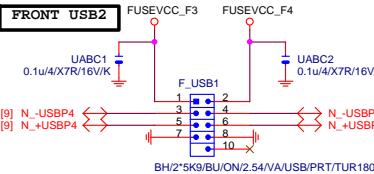
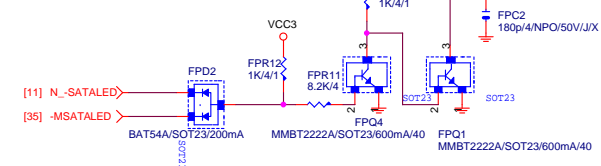
## BLUE



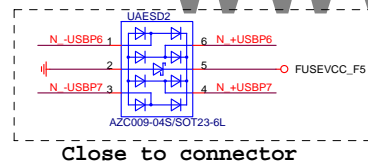
Close to connector



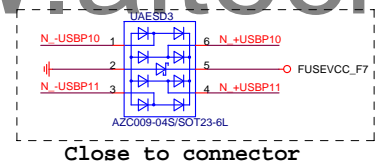
## SATA LED



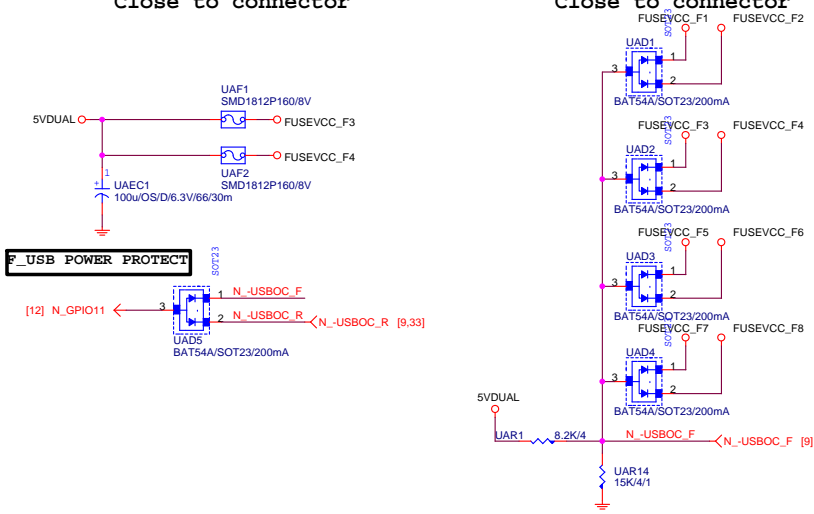
Close to connector



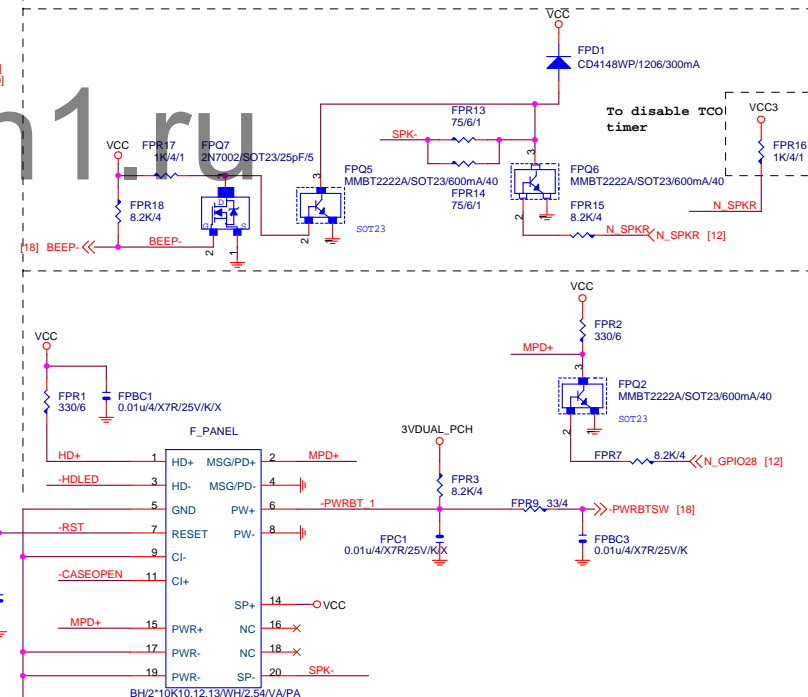
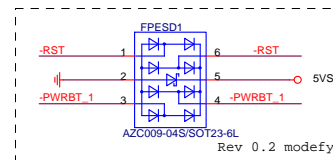
Close to connector



Close to connector



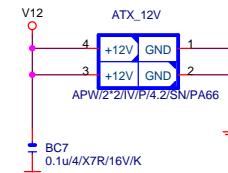
## INTEL FRONT PANEL



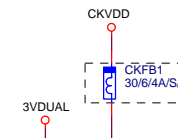
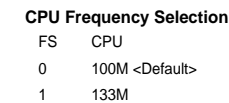
## Gigabyte Technology

Title		FP,F_USB,USB PWR,FDD,BZ	
Size		GA-Z77-D3H	
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## ATX POWER CONNECTOR



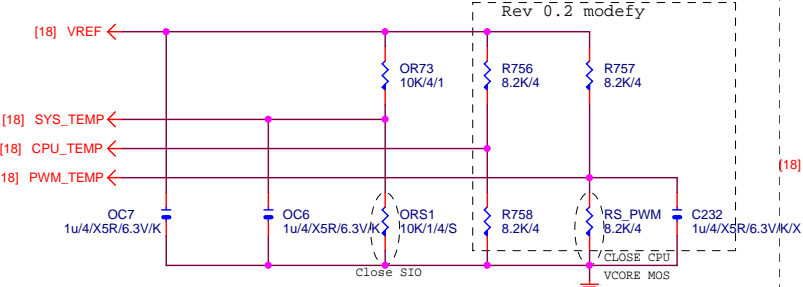
## CLK GEN



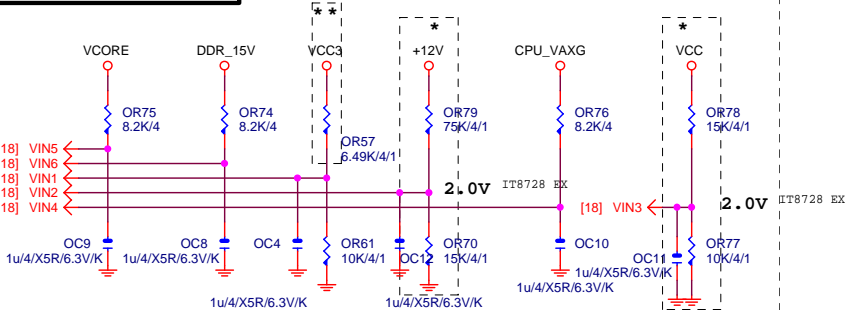
## Gigabyte Technology

Title			
<b>ATX POWER CONNECTOR</b>			
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TEMP H/W MONITOR

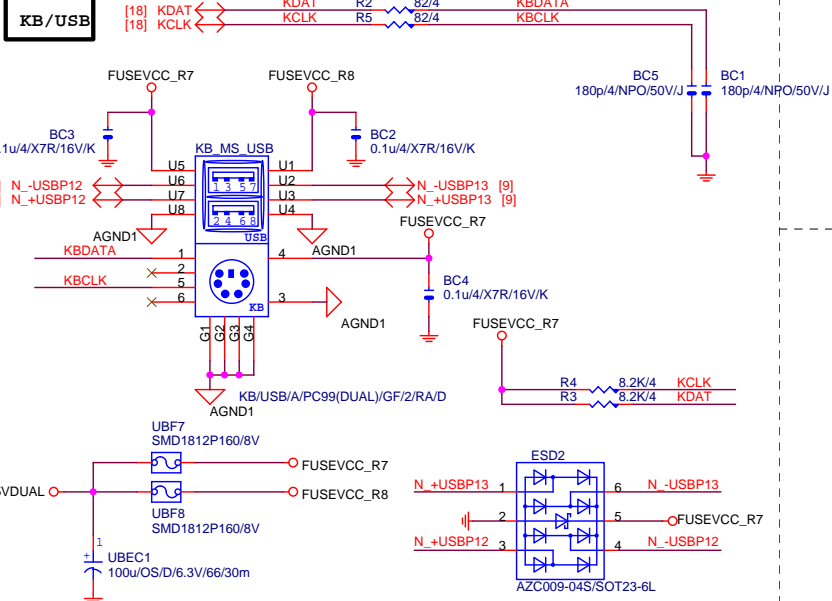


VOLTAGE-- H/W MONITOR

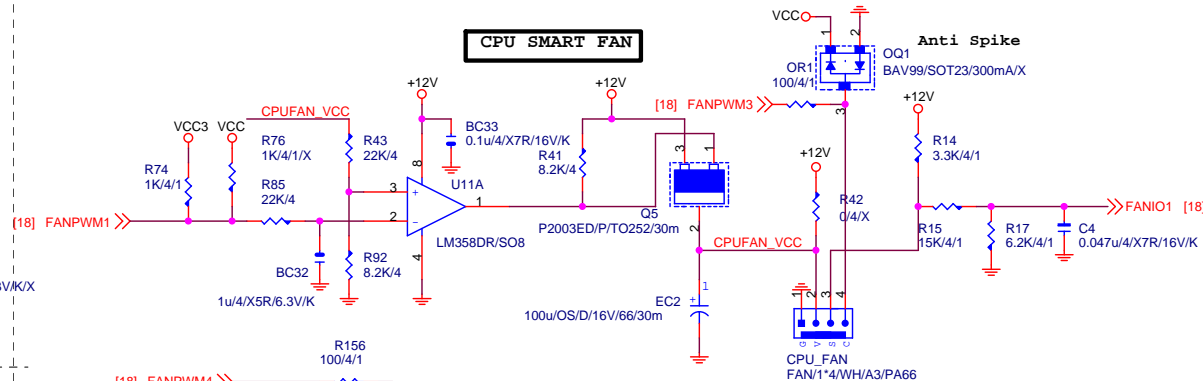


The division voltage of VIN2 & VIN3 must be around 2.9V

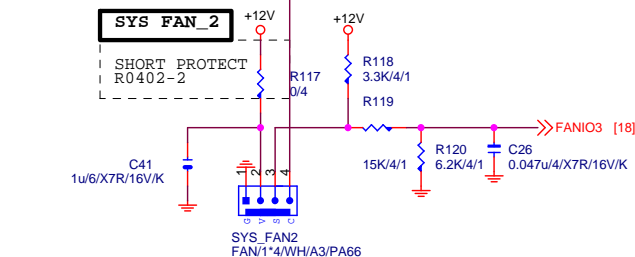
## KB/USB



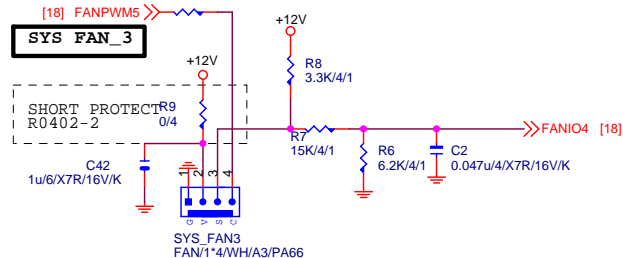
## CPU SMART FAN



## SYS FAN\_2

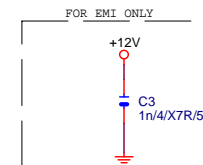
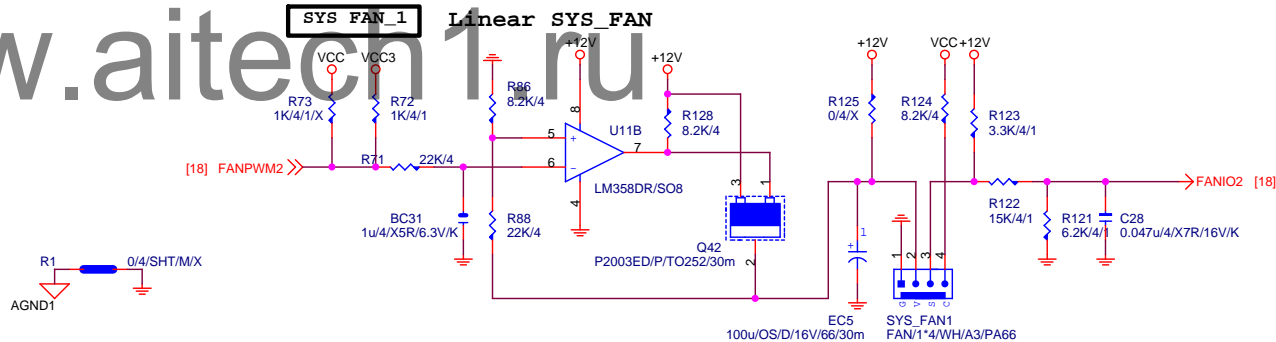


## SYS FAN\_3



## SYS FAN\_1

## Linear SYS FAN



## Gigabyte Technology

HWM,KB/MS, FAN CTRL

Size	Document Number
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GA-Z77-D3H

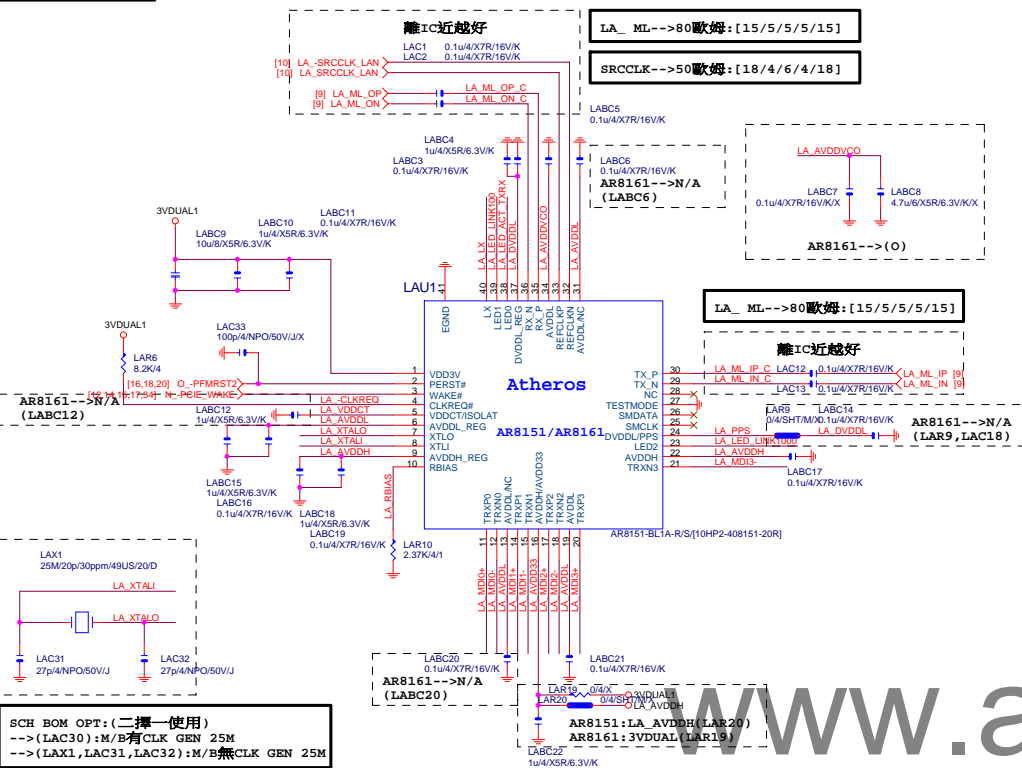
Date: Wednesday, May 09, 2012

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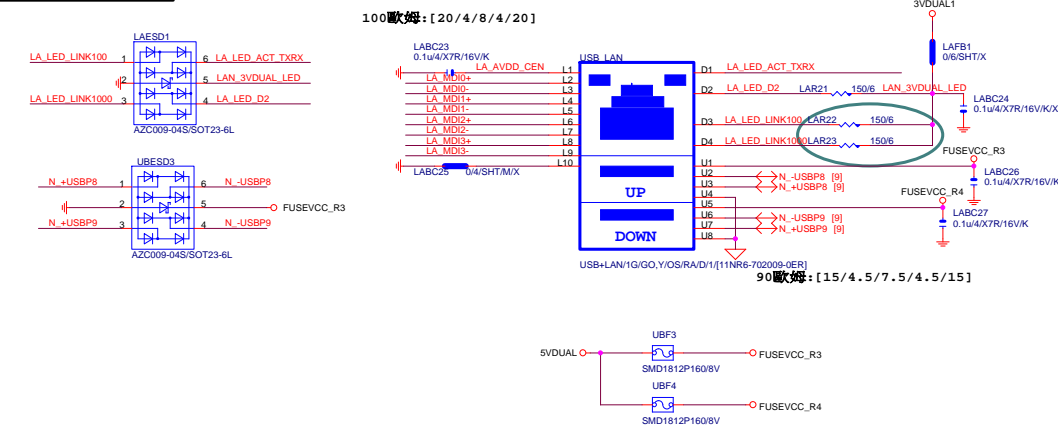
1.01



LAN:AR8151/AR8161

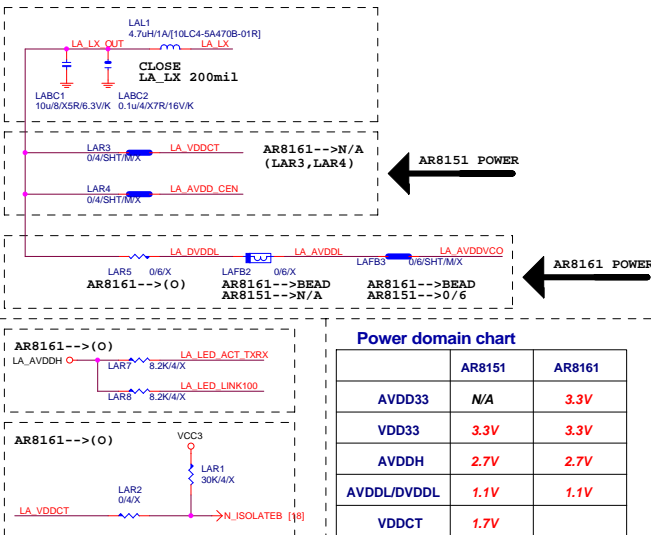


## USB30\_LAN CONNECTOR

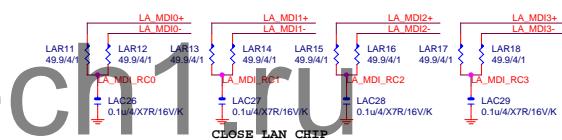


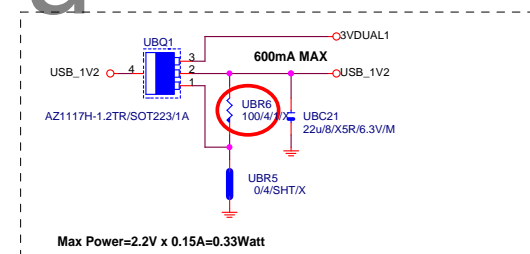
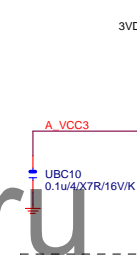
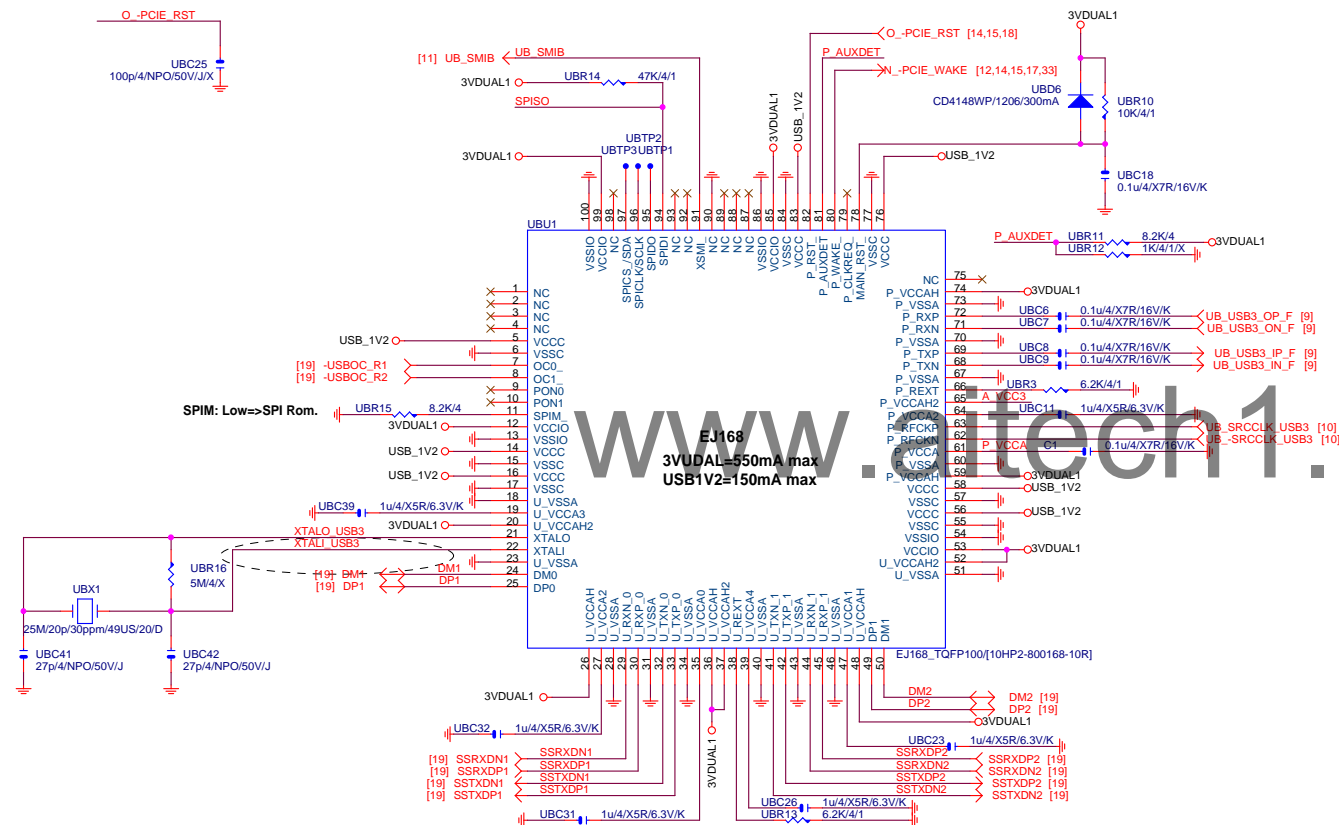
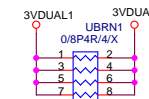
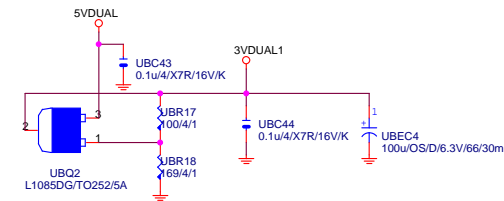
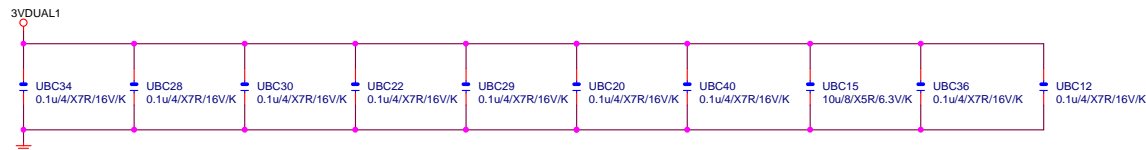
## LAN POWER

```
NEW DESIGN ONLY FOR INTERNAL SWR
AR8151:LAR3(O),LAR5(X)
AR8161:LAR5(O),LAR3/LAR4(X)
```



MDI : AR8161--&gt;N/A

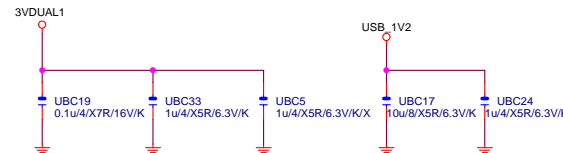
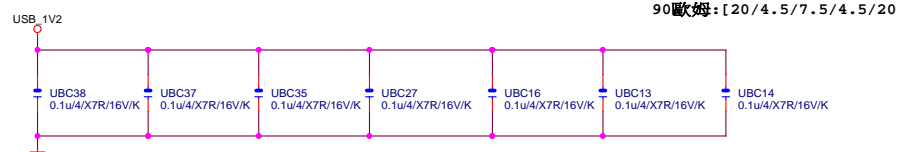




Max Power=2.2V x 0.15A=0.33Watt

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

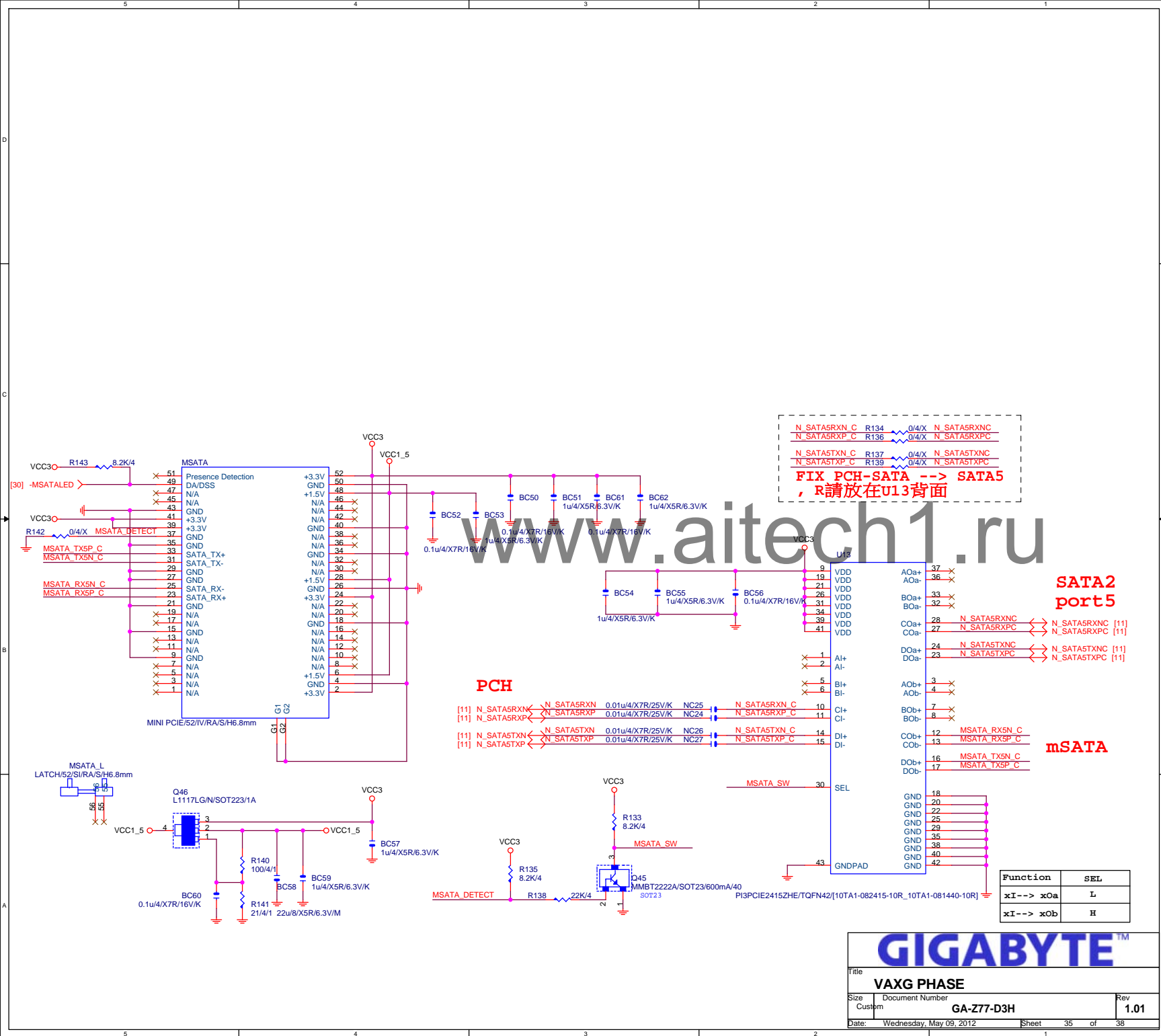
L1117LG/N/SOT223/1A-->UR17:0/4,UR16:100/4/1 [1.25V]

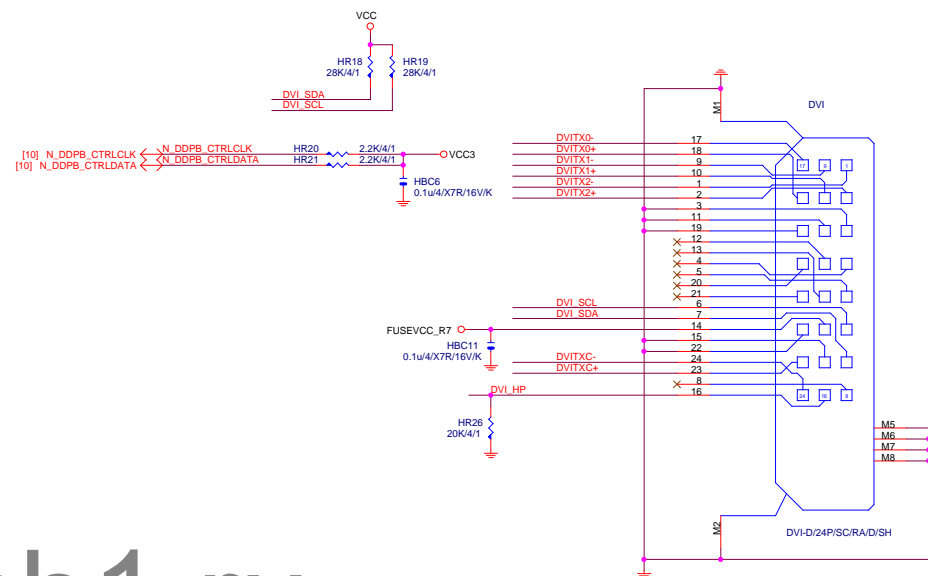


USB3.0 --> 5GHz


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

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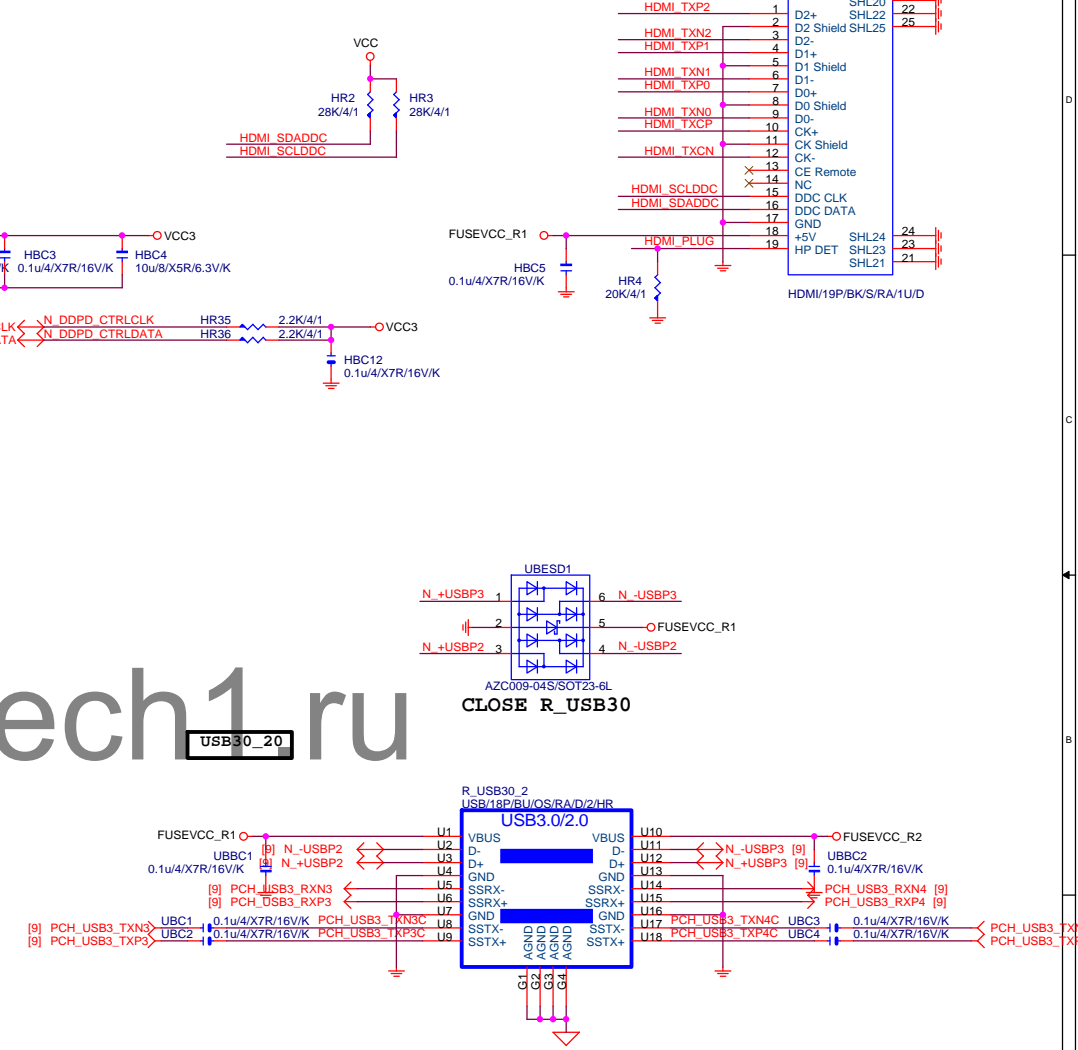
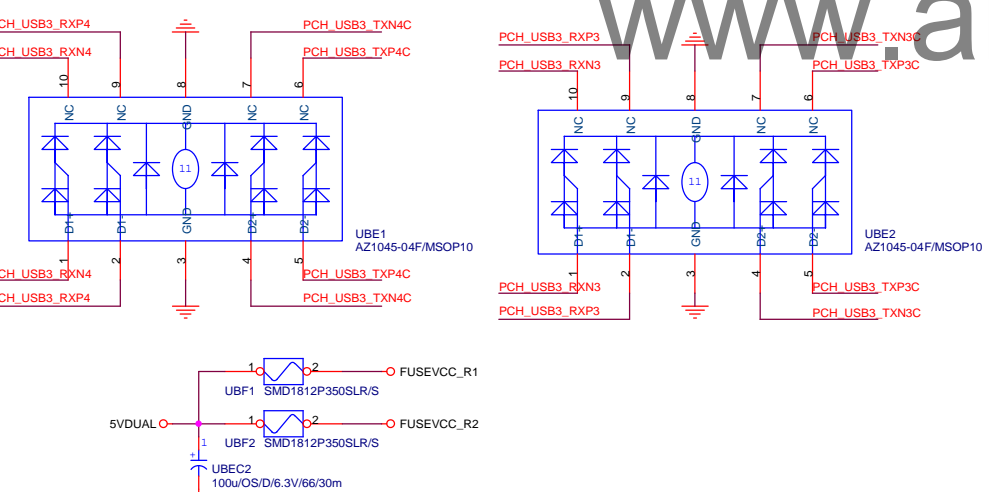
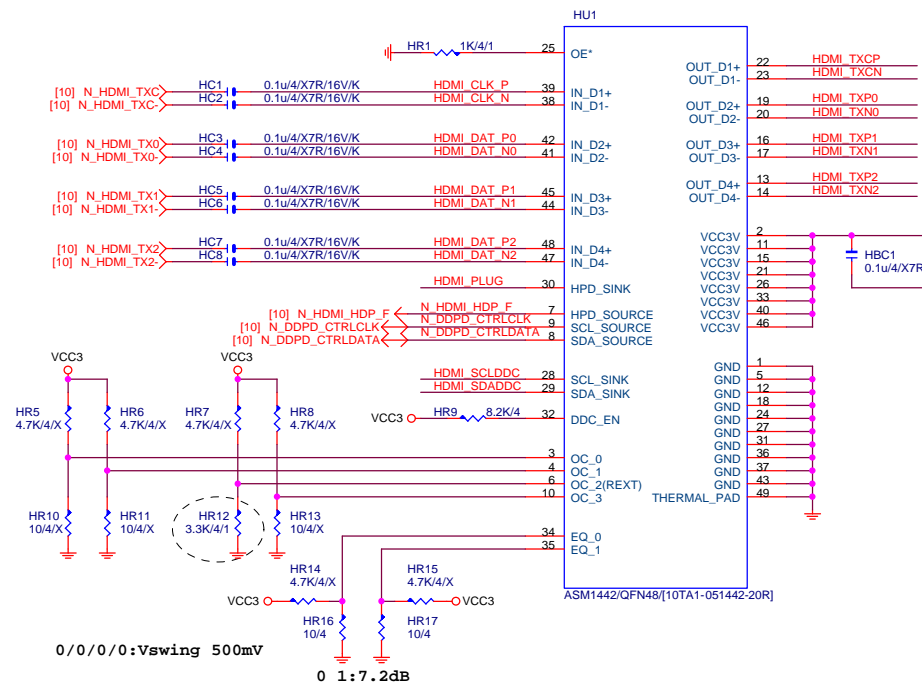




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HDMI:20/4/6/4/20  
Impedance=85 +- 17.5%



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HDMI & USB			
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