

Model Name: GA-Q87M-D2H

SHEET TITLE

01	COVER SHEET
02	BOM & PCB MODIFY HISTORY
03	BLOCK DIAGRAM
04	CPU_LGA1150-A
05	CPU_LGA1150-B
06	CPU_LGA1150-C
07	DDR III CHANNEL A
08	DDR III CHANNEL B
09	PCH_FDI,DMI,USB,PCIE,NVRAM
10	PCH_DP,CLK BUFFER
11	PCH_HOST,SATA,PCI
12	PCH_GPIO,CTRL,AUDIO
13	PCH_PWR,GND
14	PCI EXPRESS*16 SLOT
15	PCI EXPRESSX4 / X1 SLOT
16	PCI SLOT
17	ITE 8728 LPC IO
18	KB_MS, R_USB
19	HWM,FAN CTRL,-PROCHOT
20	DUAL BIOS,TPM
21	FP,FUSB,SPK,SATALED
22	Realtek CODEC
23	REAR AUDIO JACK
24	INTEL i217 PHY
25	DISCRETE POWER
26	ATX, M3 POWER
27	VCORE ISL95820_1

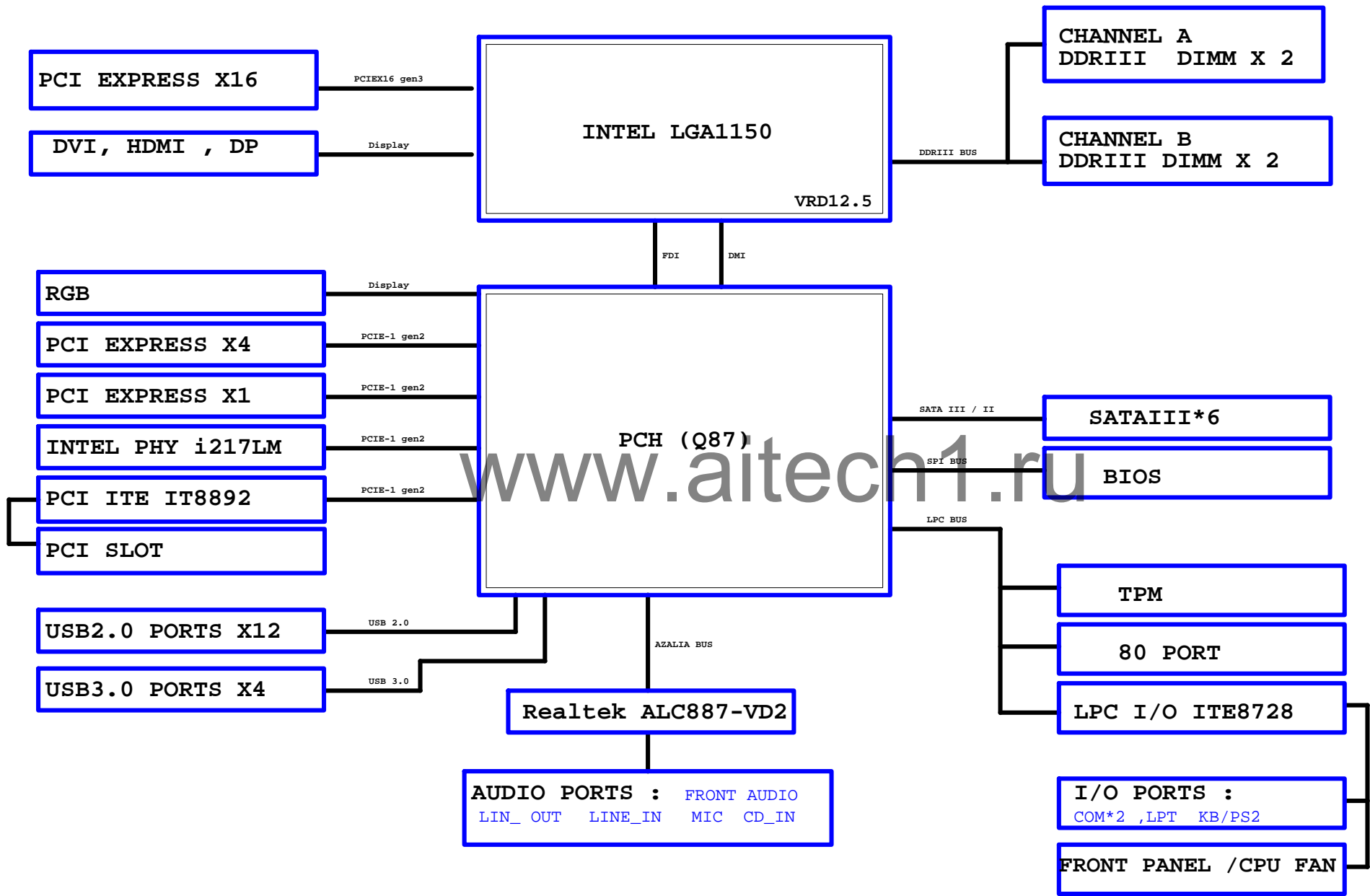
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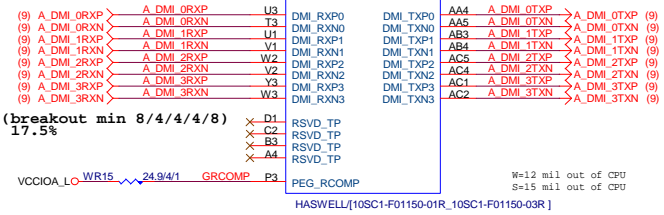
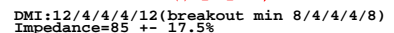
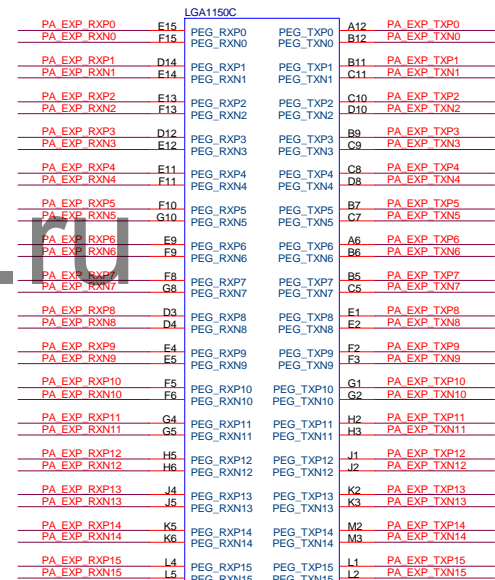
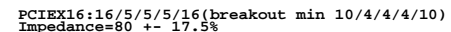
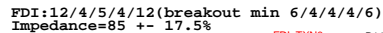
28	VCORE ISL95820_2
29	RT8120_DDR POWER
30	COM , LPT , 80PORT
31	DVI, HDMI ,DP
32	IT8892E PCI BRIDGE

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Cover Sheet		
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BLOCK DIAGRAM





CFG6	CFG5	PCIE CONFIG
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1	0	2x8
0	1	RSVD
0	0	x8 x4 x4

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Title		CPU LGA1150-A	
Size	Document Number	GA-Q87M-D2H	Rev
Custom			1.1
Date:	Monday, November 25, 2013	Sheet	4 of 32

LGA1150A

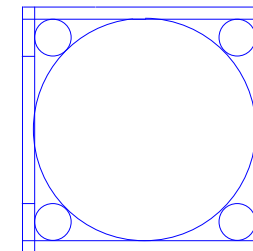
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			DDR0_DQ26	AV35	MDA27
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			DDR0_DQ29	AT35	MDA30
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HASWELL[10SC1-F01150-01R_10SC1-F01150-03R]

LGA1150B

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HASWELL[10SC1-F01150-01R_10SC1-F01150-03R]

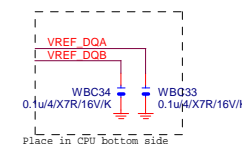
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CPU RETENTION/X

LGA1150



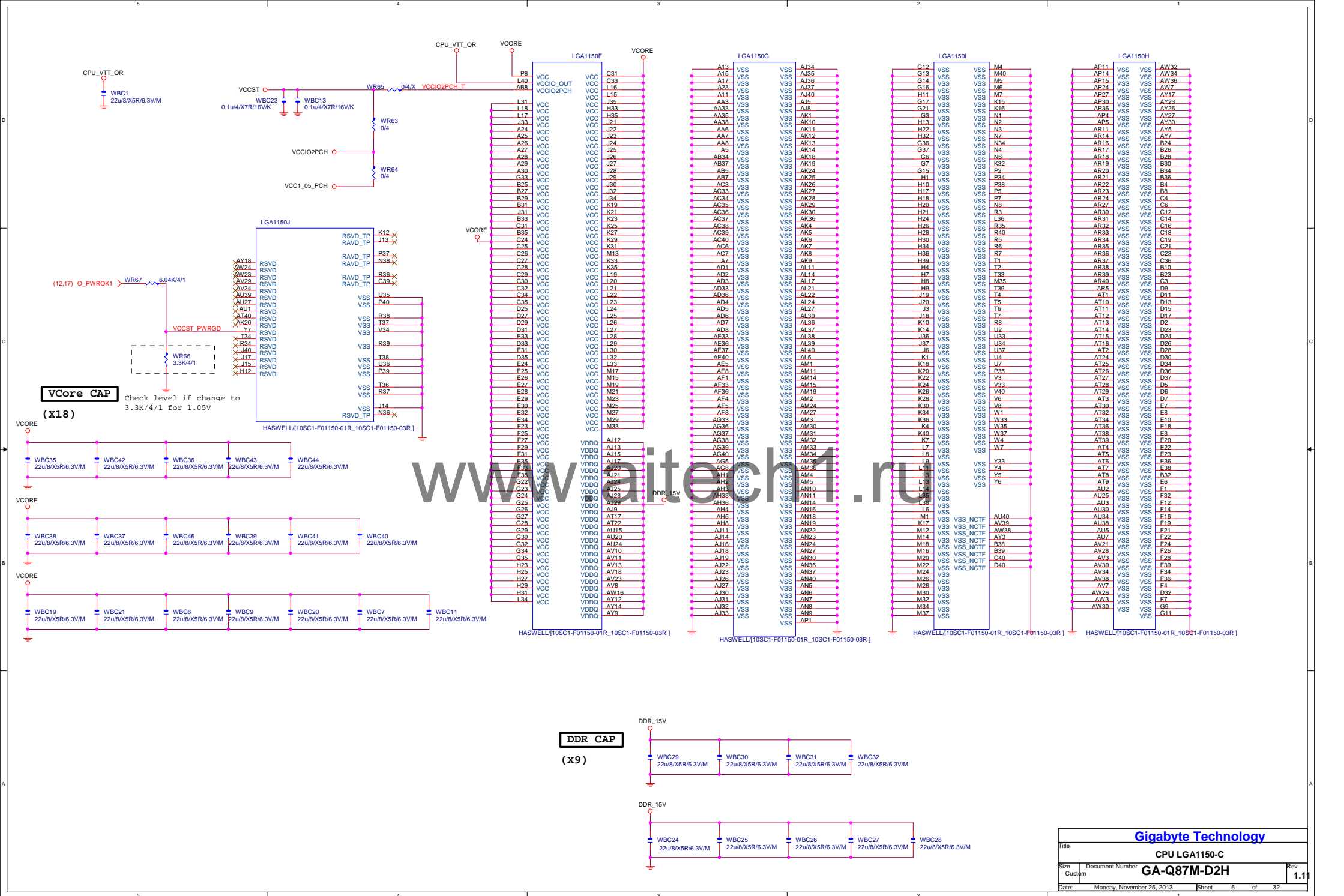
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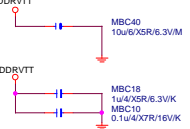
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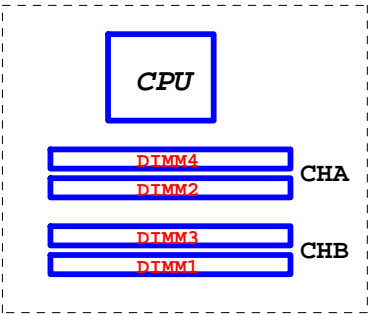


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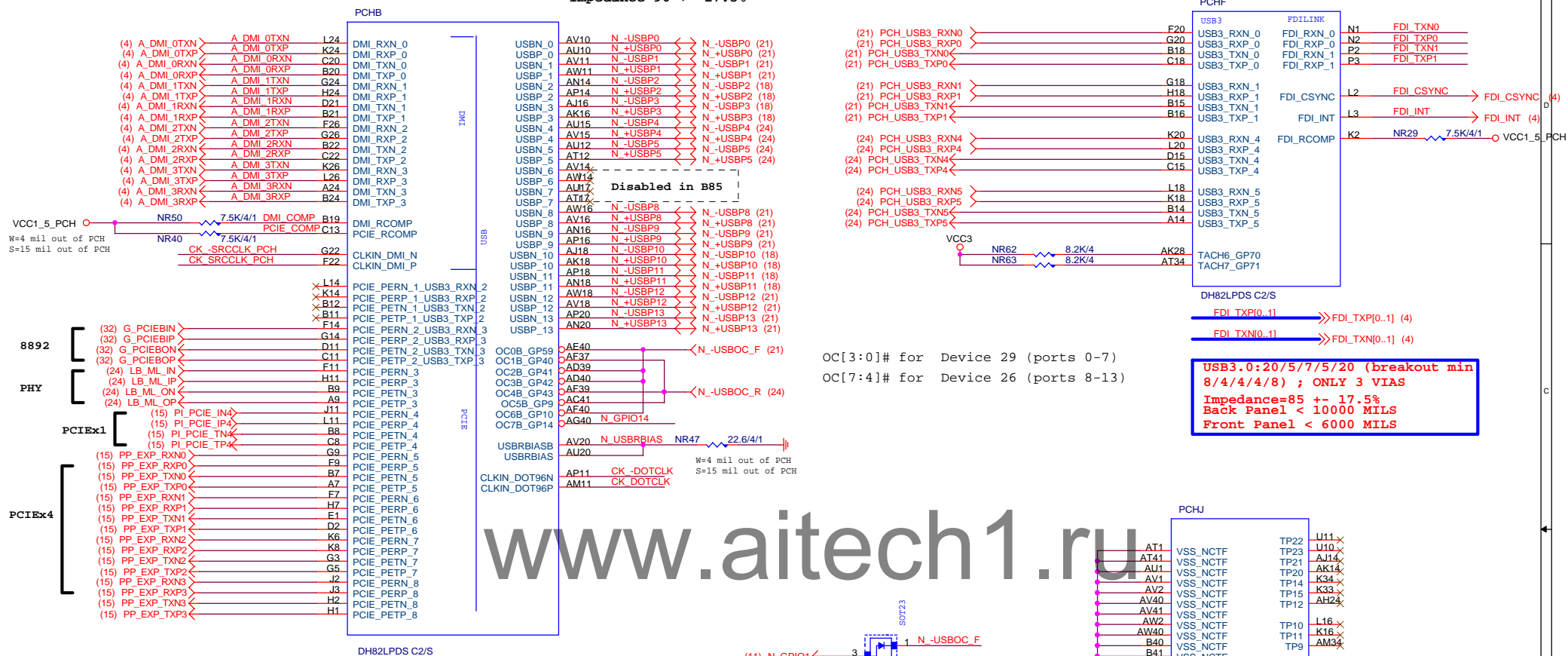
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Size			GA-Q87M-D2H		
Date:			Monday, November 25, 2013		
Sheet			5 of 32		



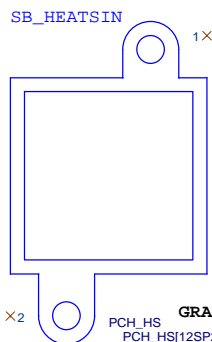




USB2.0 : 12/4.5/7.5/4.5/12 (breakout min 8/4/4/4/8)
Impedance=90 +- 17.5%

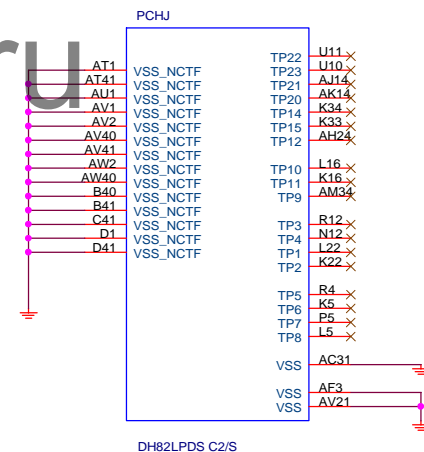
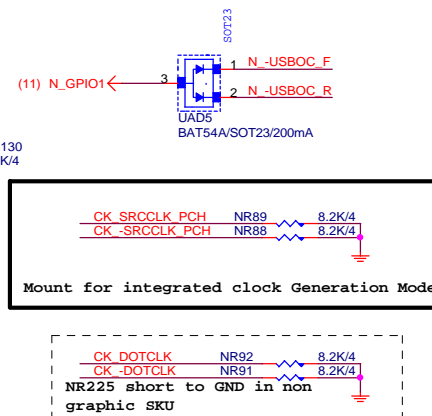


LOW COST ICH7 HEATSINK

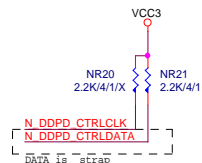
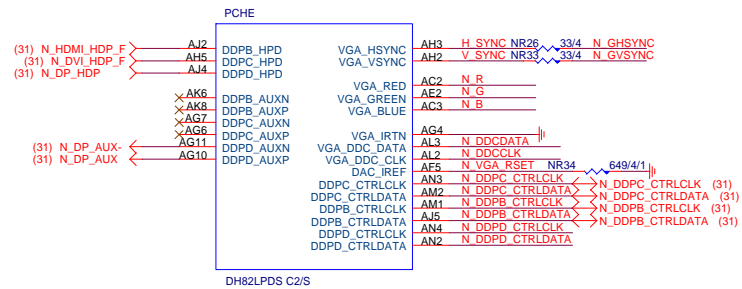




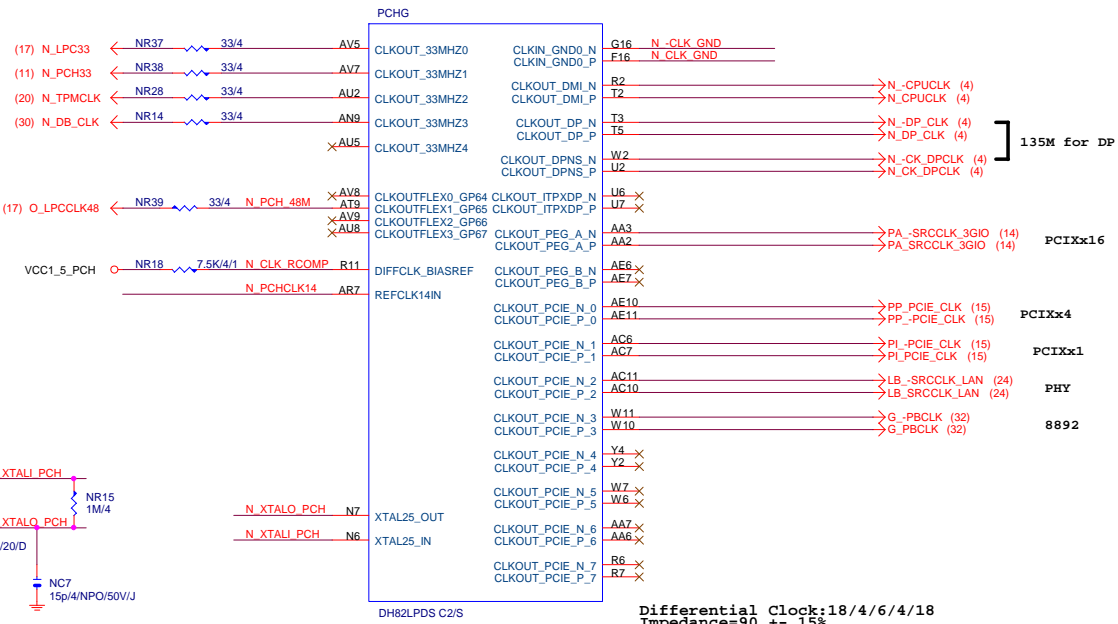
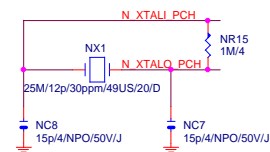
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Title PCH FDI,DMI,USB ,PCIE,NVRAM			
Size	Document Number	Rev	
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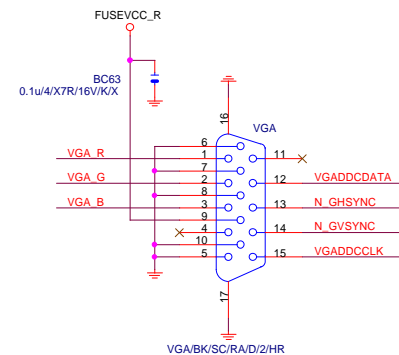
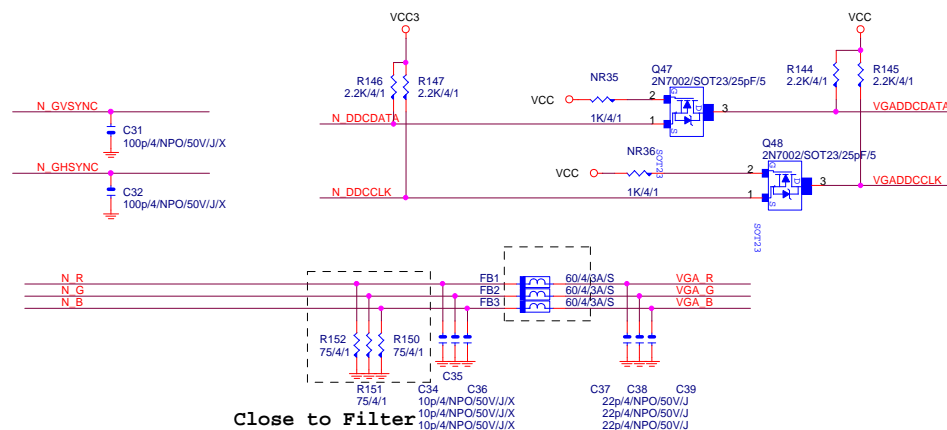
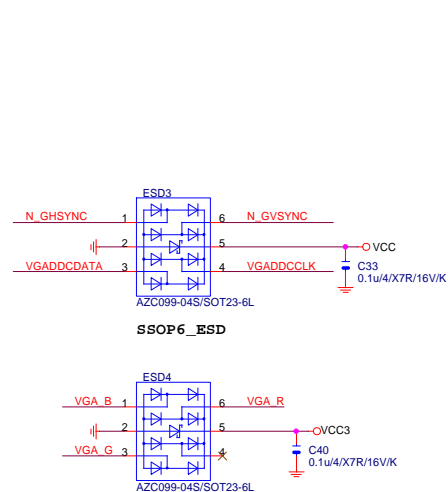


Flex1,2,3,4 : (17) O_LPCCLK48
14/24/33/48MHZ



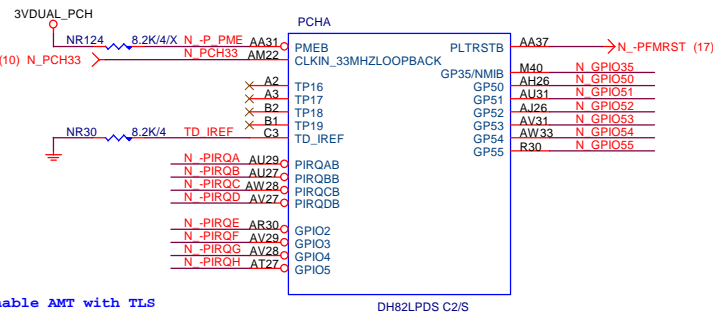
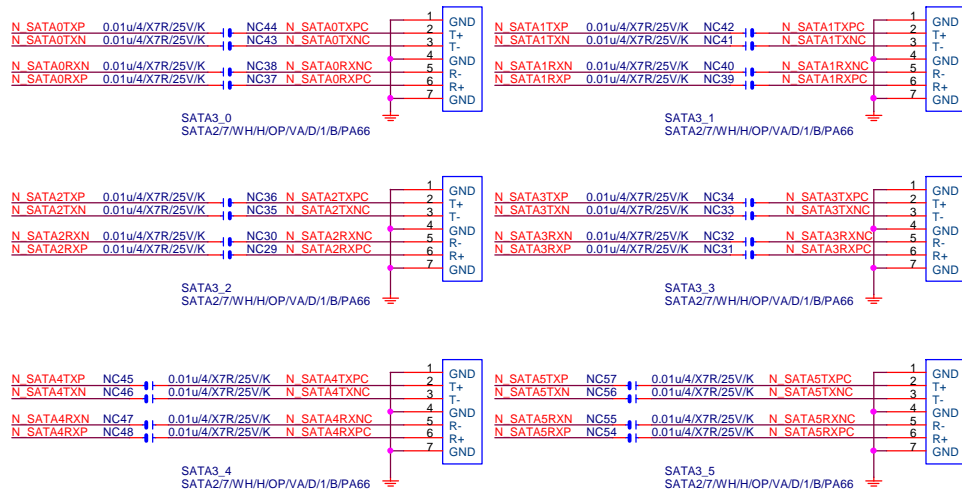
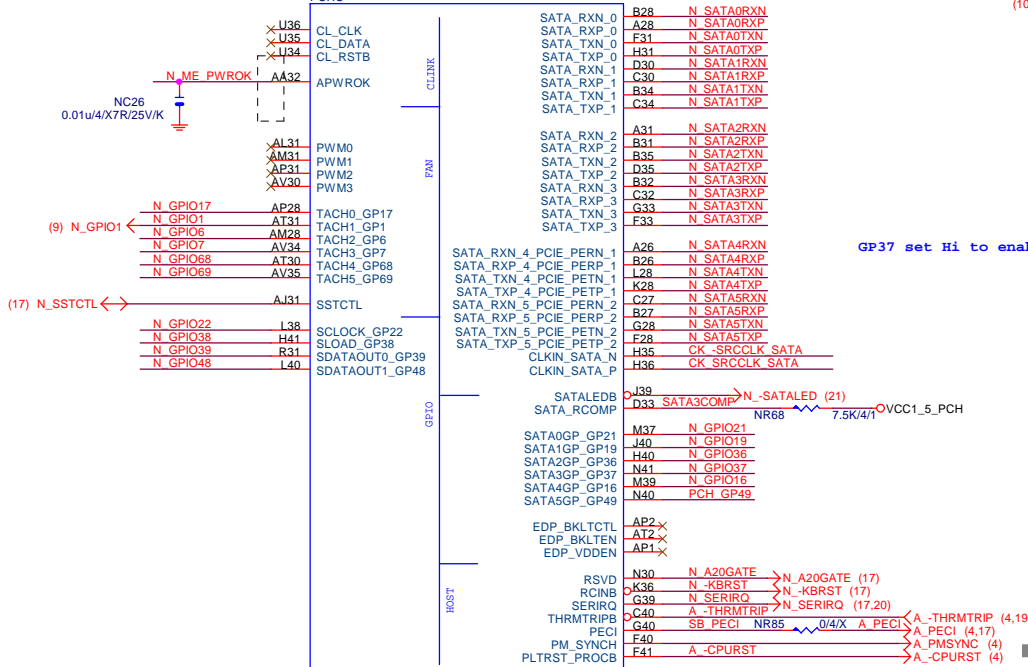
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Mount for integrated clock Generation Mode

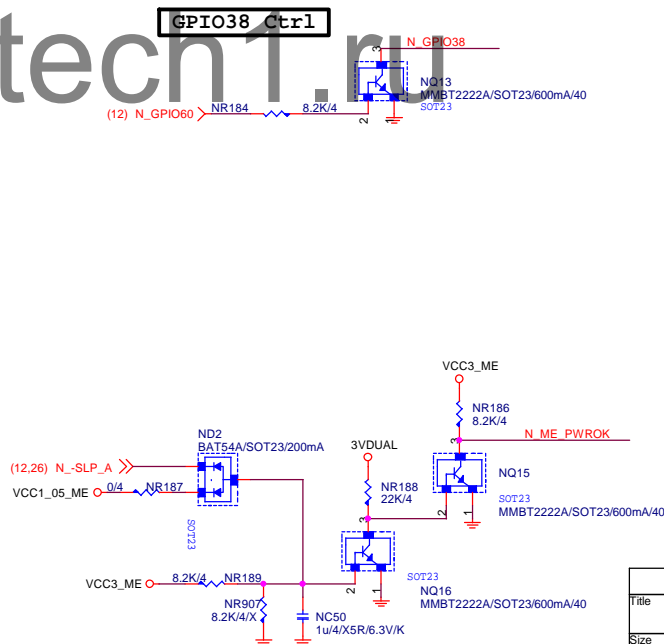
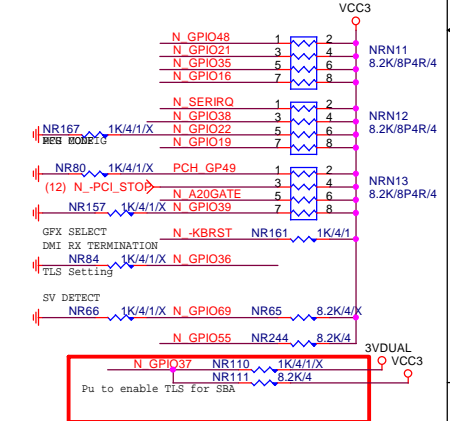
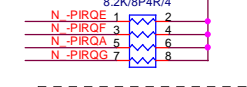
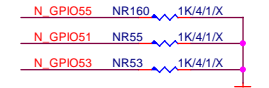
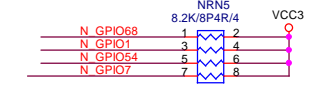
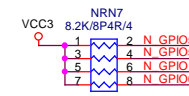
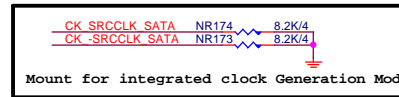


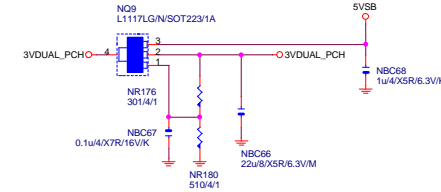
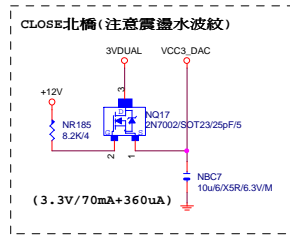
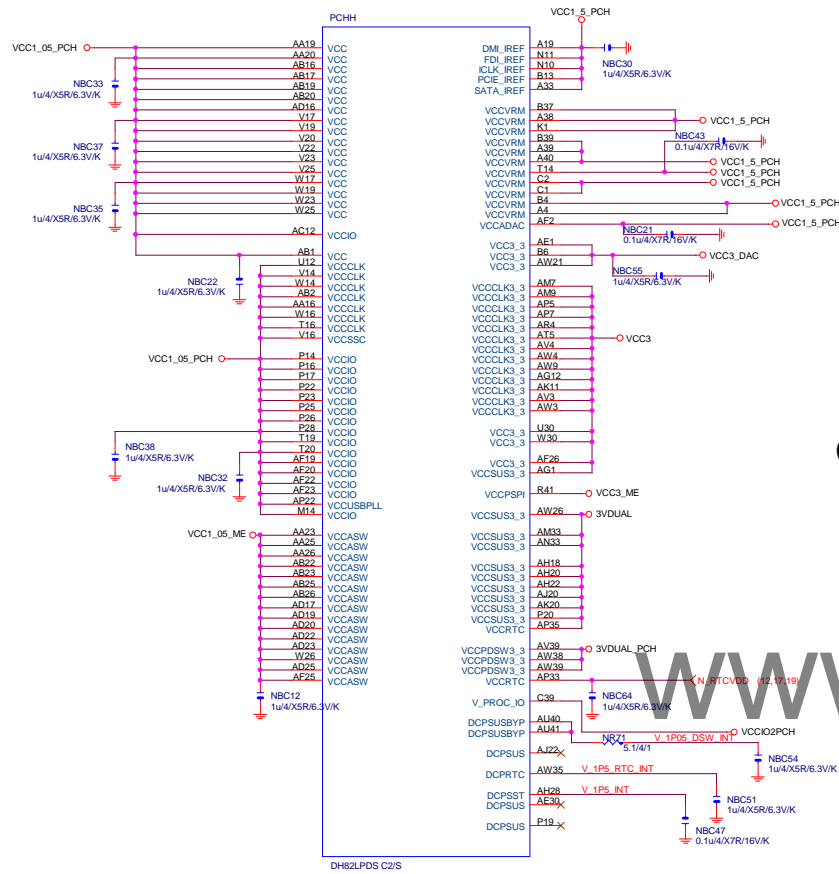
Gigabyte Technology			
Title PCH DISPLAY_CLK BUFFER			
Size Custom	Document Number GA-Q87M-D2H	Rev 1.11	
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SATA3 : 20/7.5/4.5/7.5/20 (breakout min 8/4/4/4/8)
Impedance=90 +- 17.5%
SATA2 : 15/7.5/4.5/7.5/15 (breakout min 8/4/4/4/8)
Impedance=90 +- 17.5%
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GP37 set Hi to enable AMT with TLS
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(3.3V) (X6)

(1.05V) (X5)

(1.05V) (X6)

(1.5V) (X10)

(1.05V) (X2)

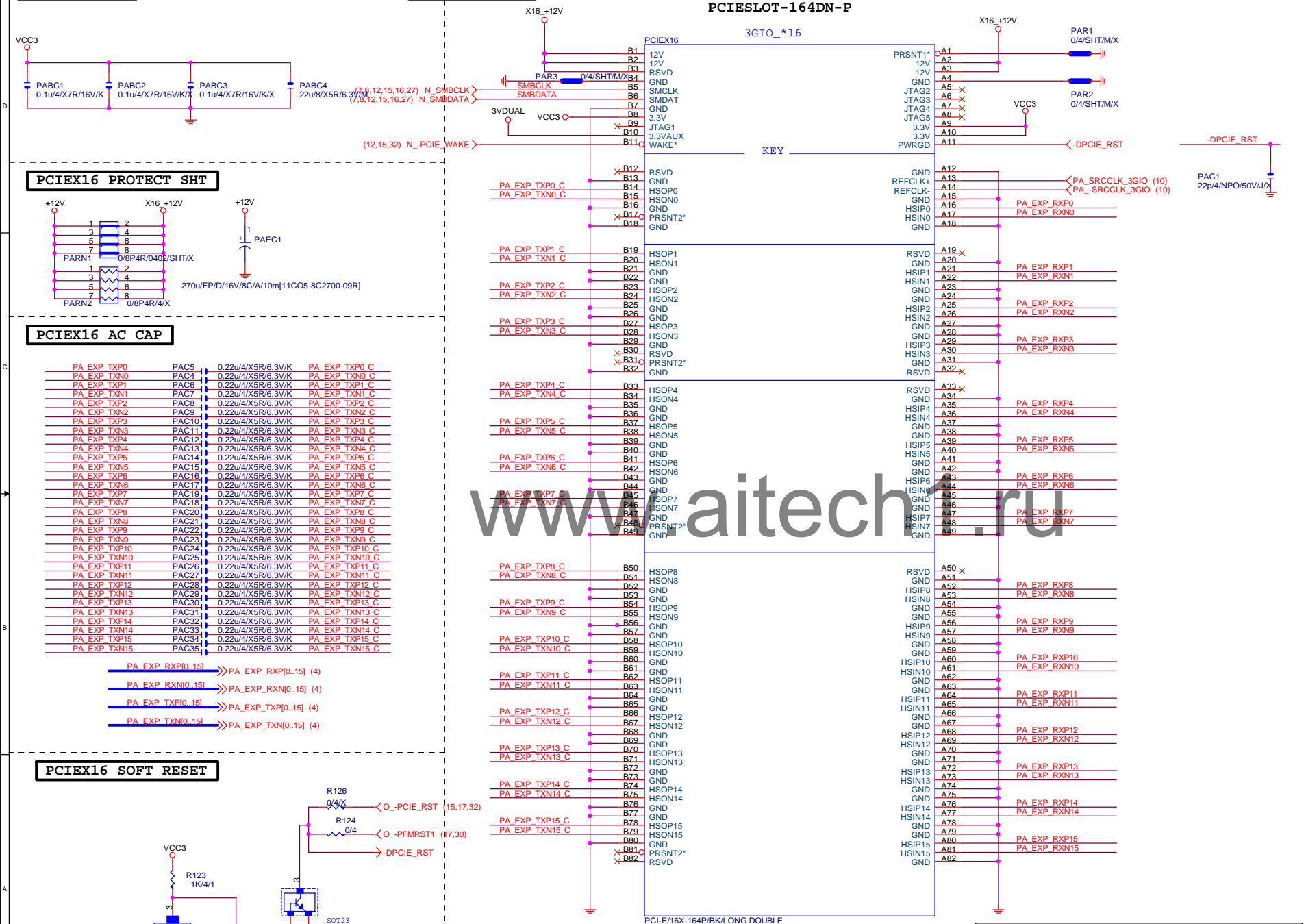
(3.3V) (X2)



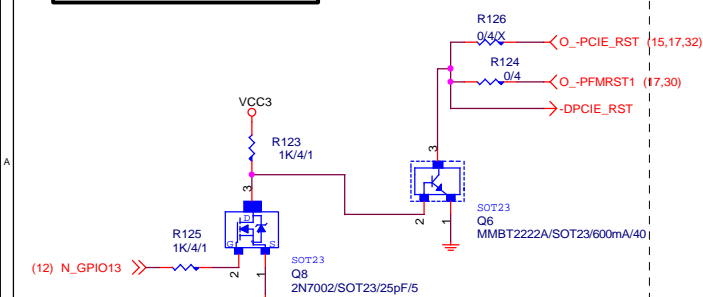
PCIEX16 CAP

PCIEX16	SLOT
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PCIESLOT-164DN-P



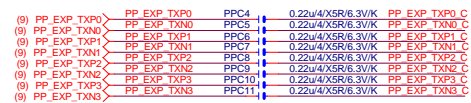
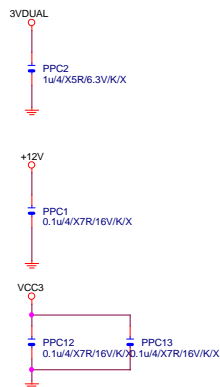
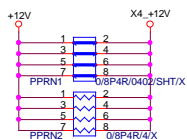
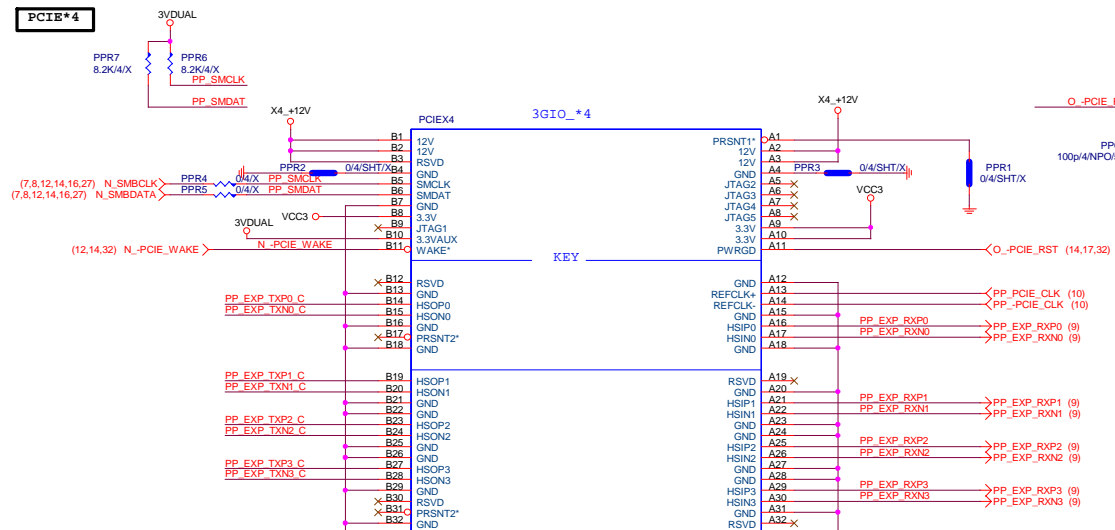
PCIEX16 SOFT RESET



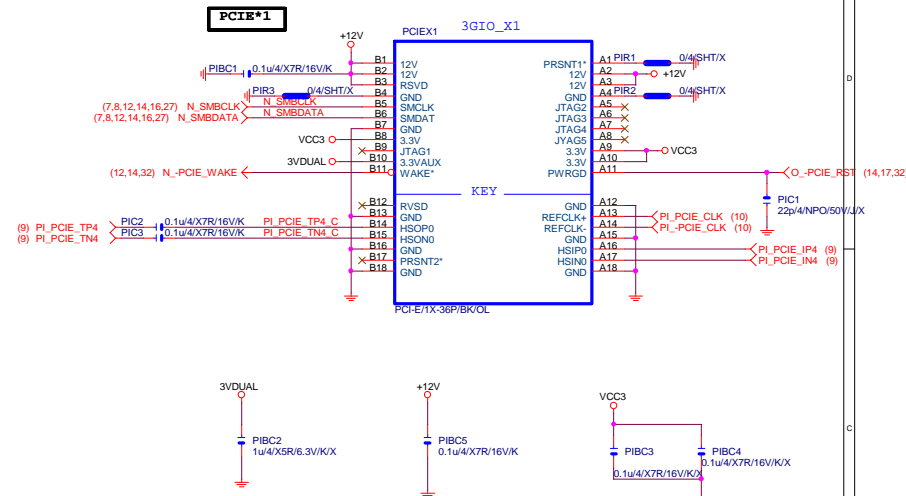
Gigabyte Technology

Title			
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Size Custom	Document Number		Rev
	GA-Q87M-D2H		1.11
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PCIE*4



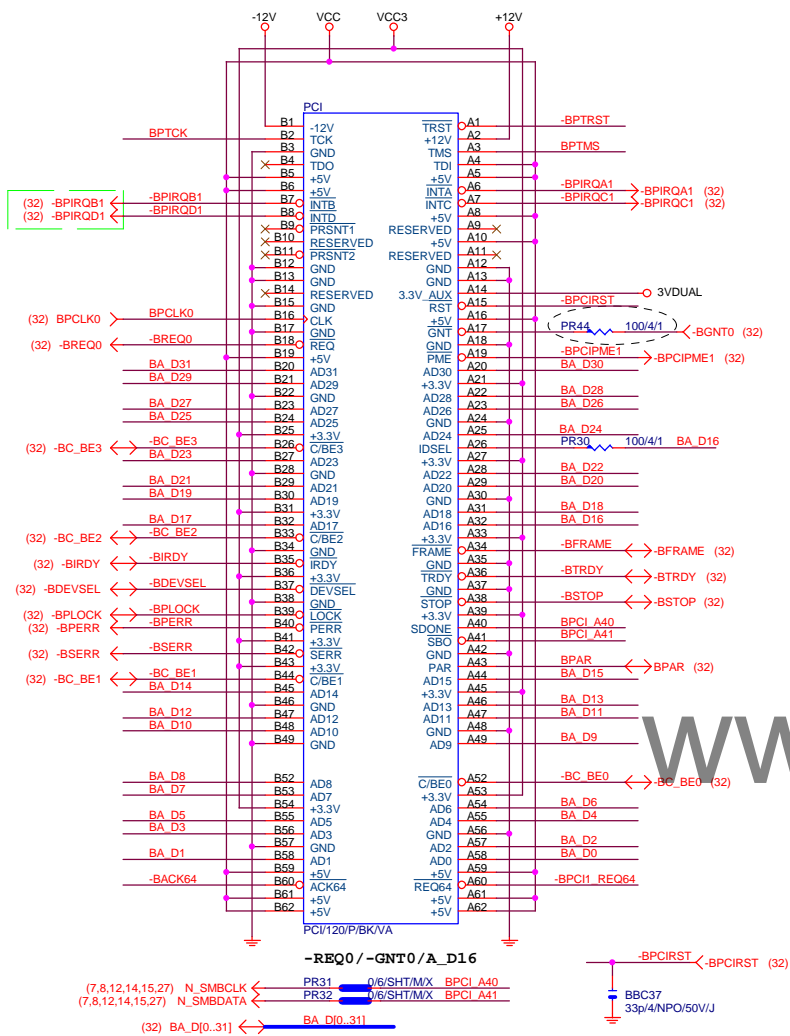
PCIE*1



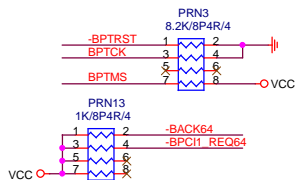
www.aitech1.ru

Gigabyte Technology			
PCI EXPRESS X 1 PORT			
Size	Document Number	Rev	
Custom	GA-Q87M-D2H	1.11	
Date:	Monday, November 25, 2013	Sheet	15 of 32

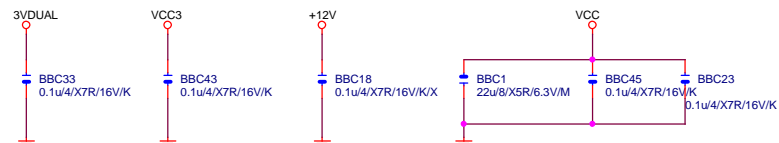
PCI SLOT



PCI	PU
-----	----



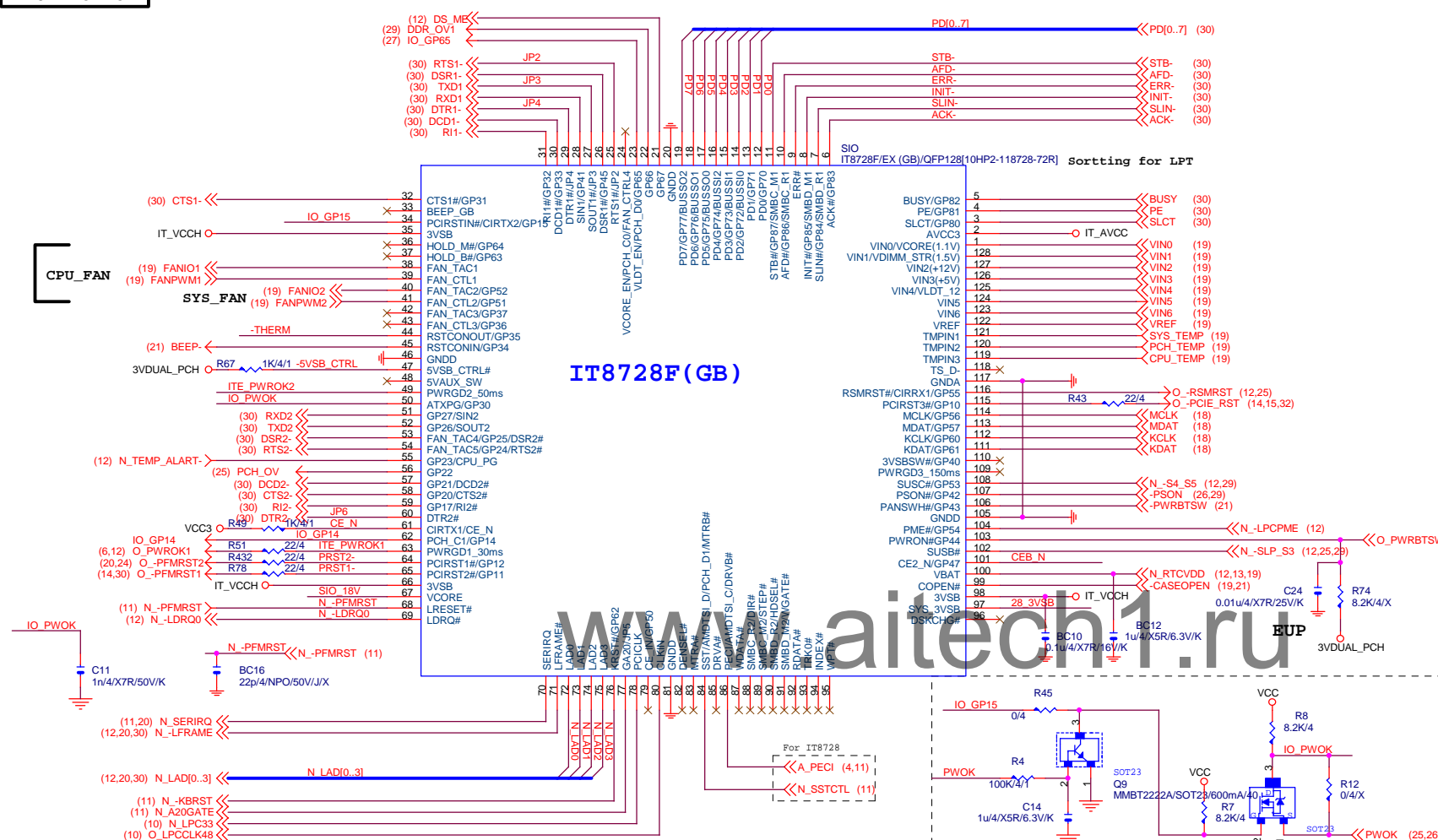
PCI CAP



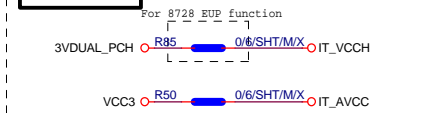
Gigabyte Technology

Title			
PCI SLOT 1&2			
Size Custom	Document Number	GA-Q87M-D2H	Rev 1.11
Date:	Monday, November 25, 2013	Sheet 16 of 32	

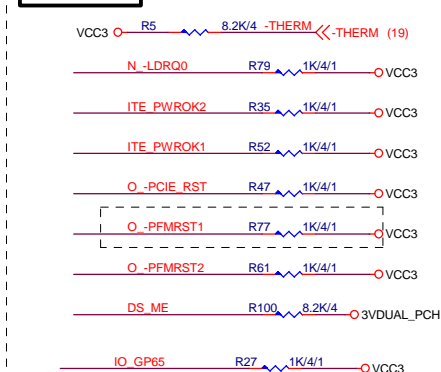
SIO IT8728F



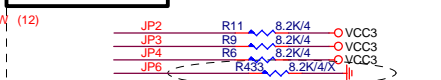
PWR	SHT
-----	-----



SIO PU



SIO STRAP



IT8728-EX
PULL DOWN ENABLE FORCE OVP

EUP control by PCH

```

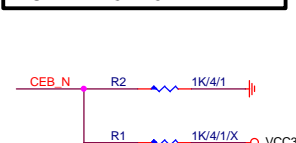
JP3--- High SPI-Flash Disable
      Low SPI-Flash Enable

```

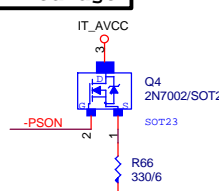
IT8728F NOTE

	IT8728
PIN121	VCORE_EN/PCH_C0
PIN120	VLDT_EN/PCH_D0
PIN19	ATXPG
PIN31	PCH_C1
PIN53	SST/AMDTSI_D/MTRB#/PCH_D1
PIN55	PECI/AMDTSI_C/DRV#
PIN66	SYS_3V5B
PIN70	GP47
PIN95	VIN2(VCC5)
PIN96	VIN1(VCC12)
PIN97	VIN1/VDIMM_STR(1.5V)
PIN98	VIN0/VCORE(1.1V)/NC

DUAL BIOS OPT STRAP

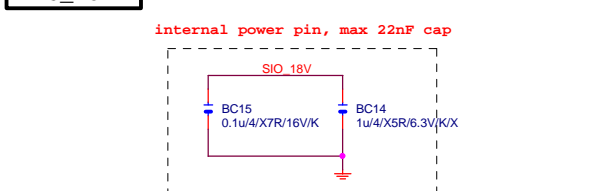


Power leakage



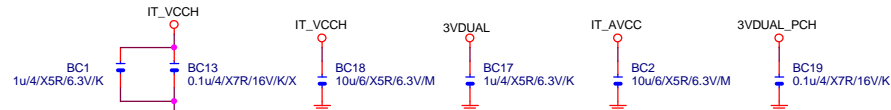
For IT8721 Power leakage

SIO 18V



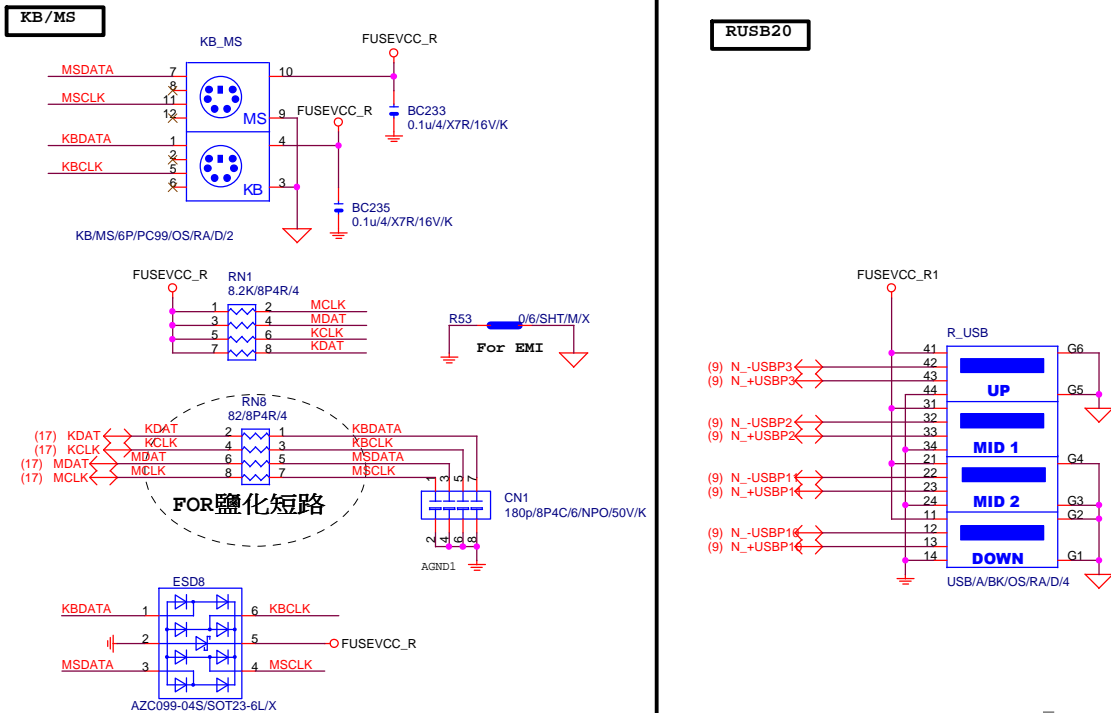
FOR LOW TEMP POWER ON INTO TEST MODE ISSUE

SIO CAP

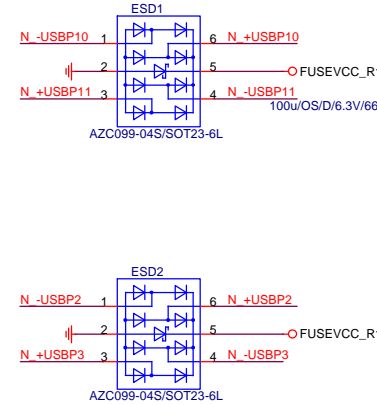


Gigabyte Technology

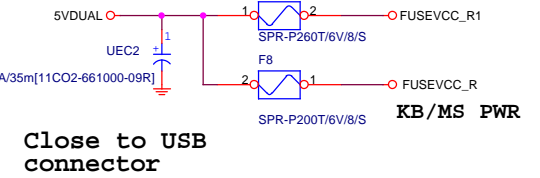
Title			
ITE 8728 LPC IO			
Size	Document Number		Rev
Custom	GA-Q87M-D2H		1.11
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USB2.0 ESD

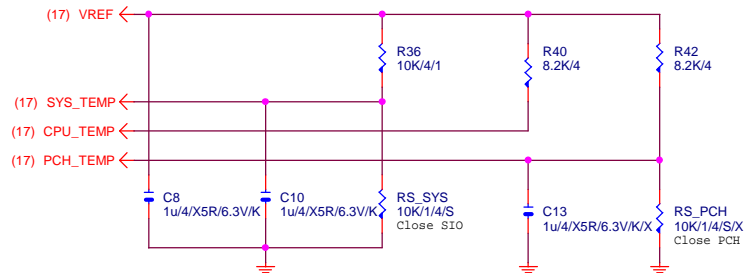


USB2.0 PWR

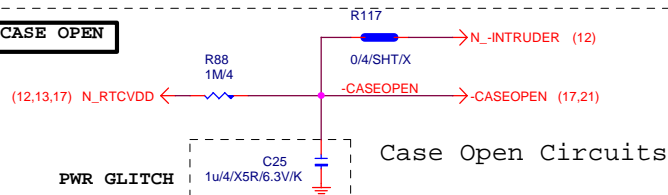


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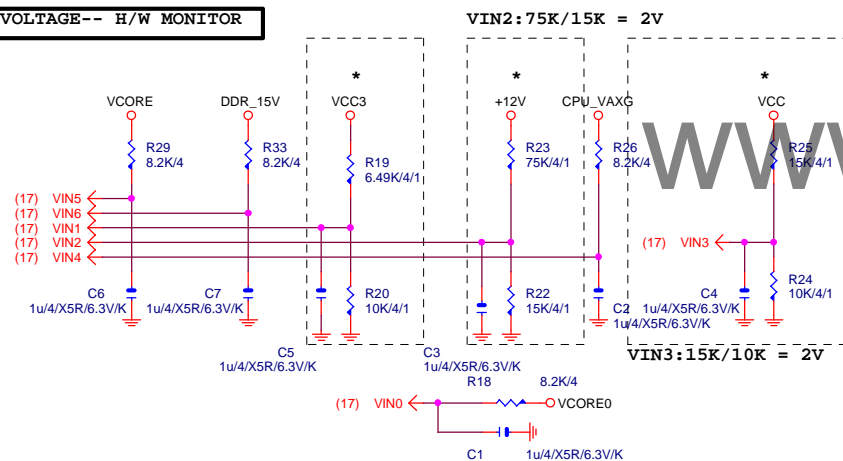
TEMP H/W MONITOR



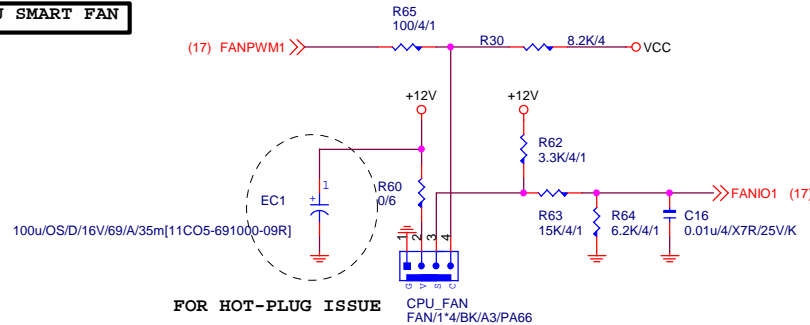
CASE OPEN



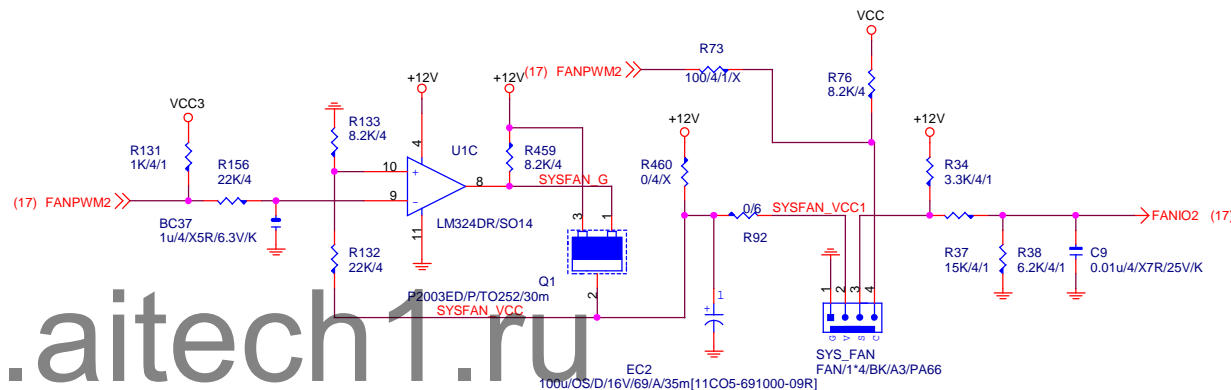
VOLTAGE-- H/W MONITOR



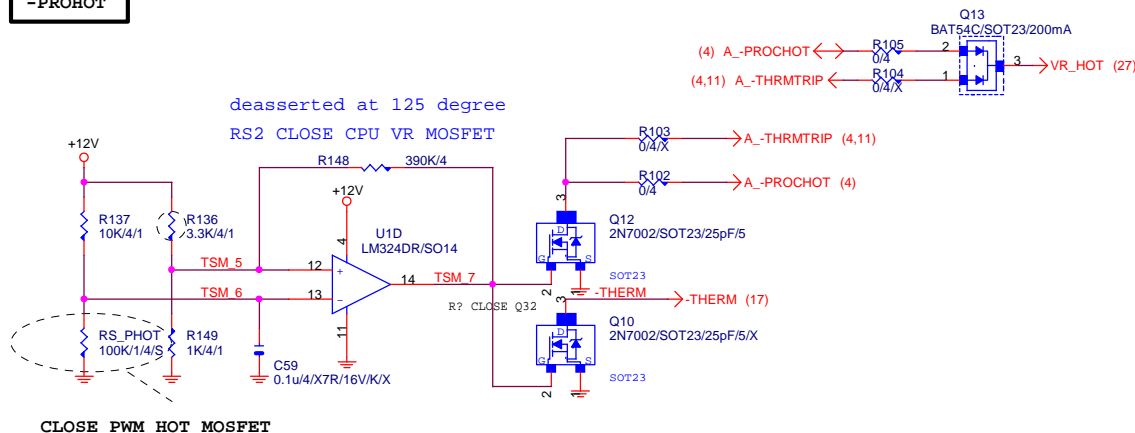
CPU SMART FAN



SYS SMART FAN



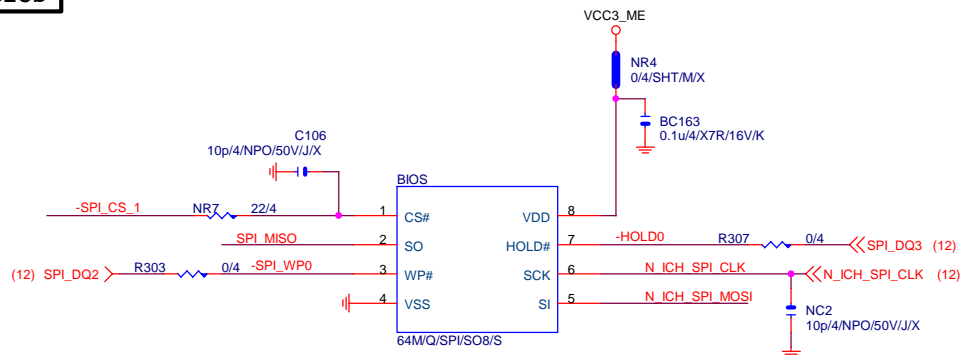
-PROHOT



Gigabyte Technology

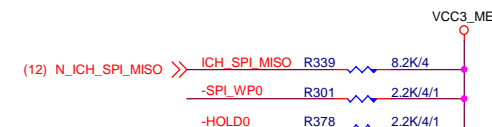
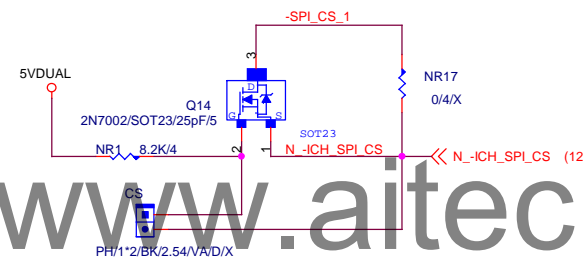
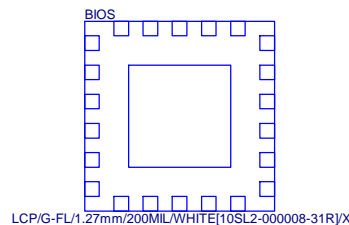
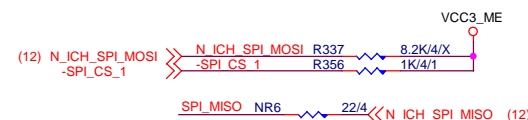
Title			
HWM,FAN CTRL,OV			
Size	Document Number	Rev	
Custom	GA-Q87M-D2H	1.11	
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BIOS

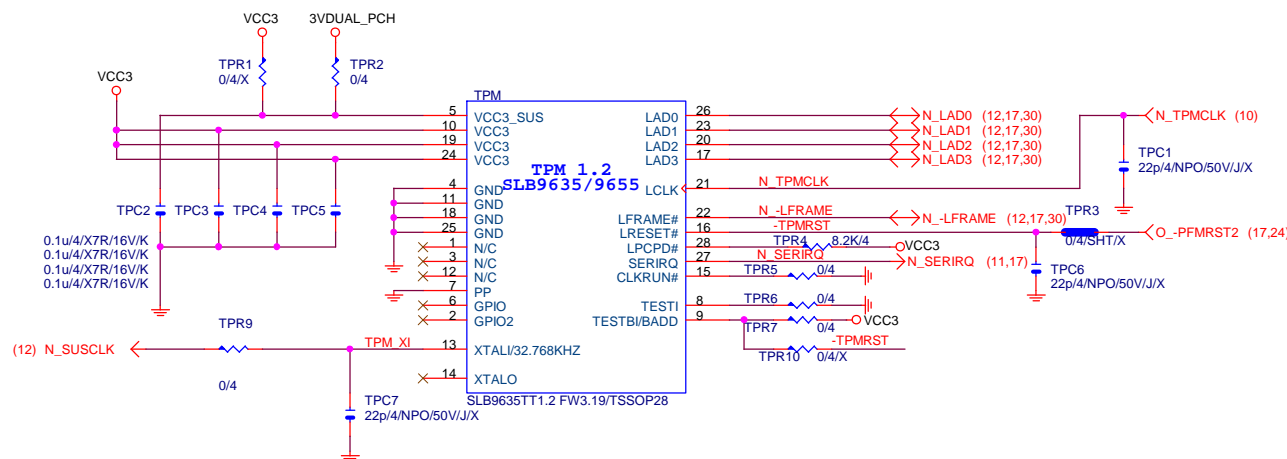


BOOT DEVICE	GP51	GP19
LPC	0	0
SPI	1	1

1 means internal PU
0 means PD 1K



TPM

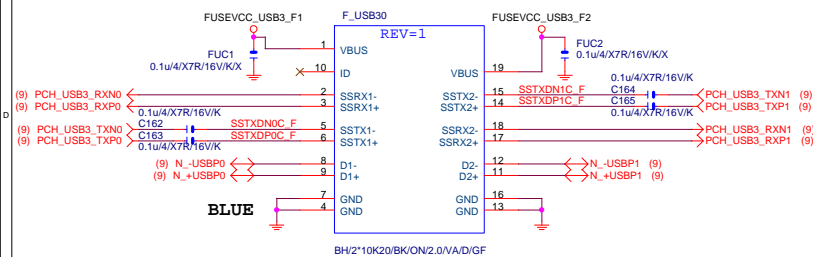


	SLB9635	SLB9655
TPR2, TPR4, TPR5, TPR6, TPR7, TPR9	MOUNT	N/A
TPR1, TPR10	N/A	MOUNT

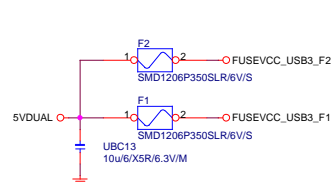
Gigabyte Technology

Title		
BIOS ,TPM		
Size	Document Number	Rev
B	GA-Q87M-D2H	1.11
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F_USB30

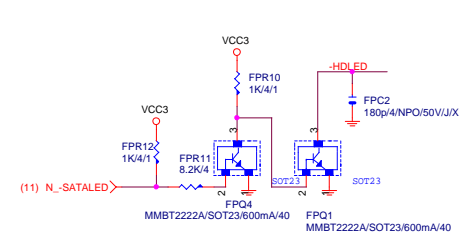


F_USB30 PWR

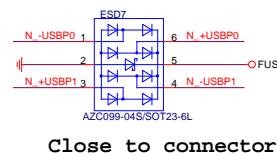
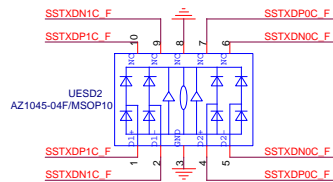
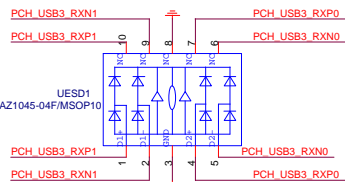


USB3.0 1Port - 1Fuse (3.5A)

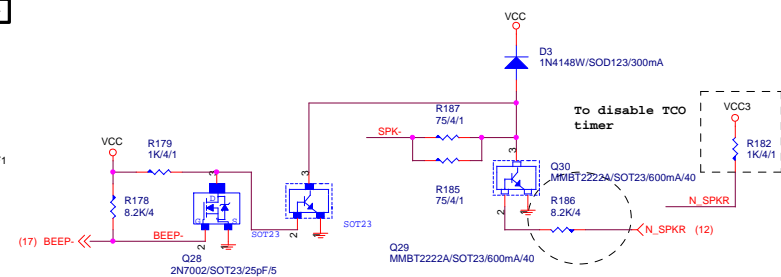
SATA LED



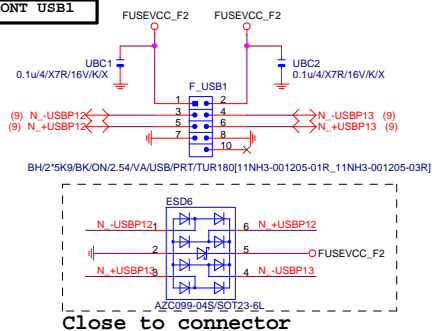
F_USB30 ESD PROTECT



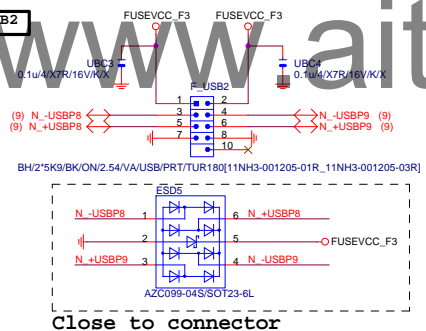
SPKR



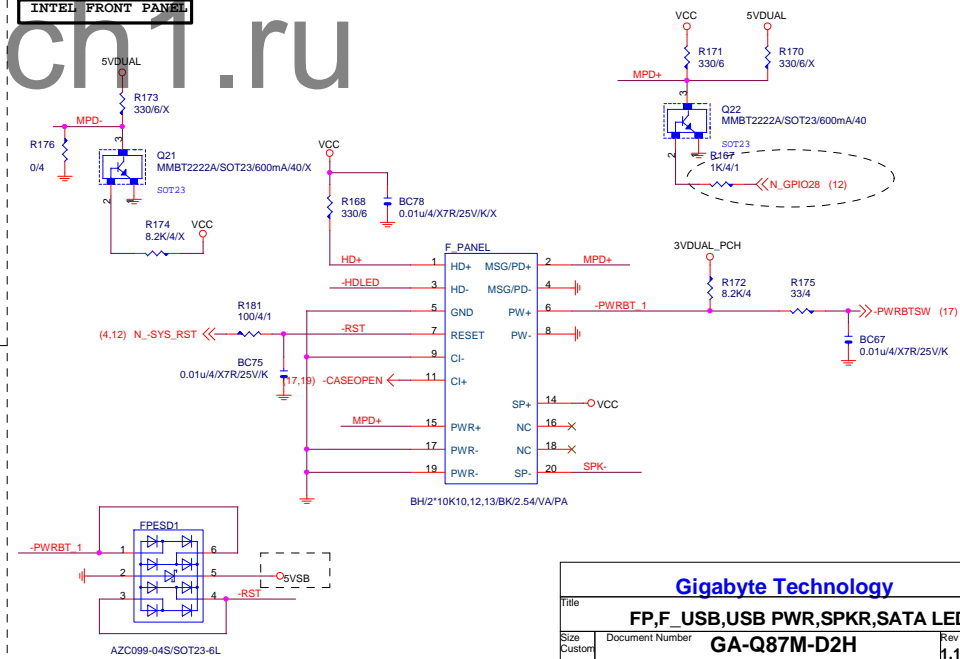
FRONT USB1



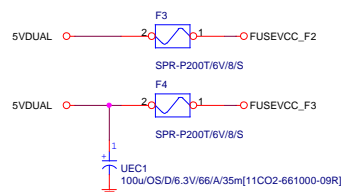
FRONT USB2



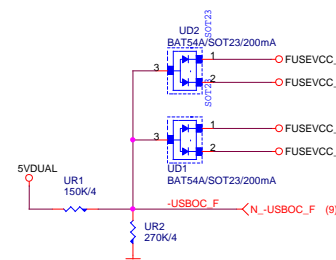
INTEL FRONT PANEL



FUSEVCC_F

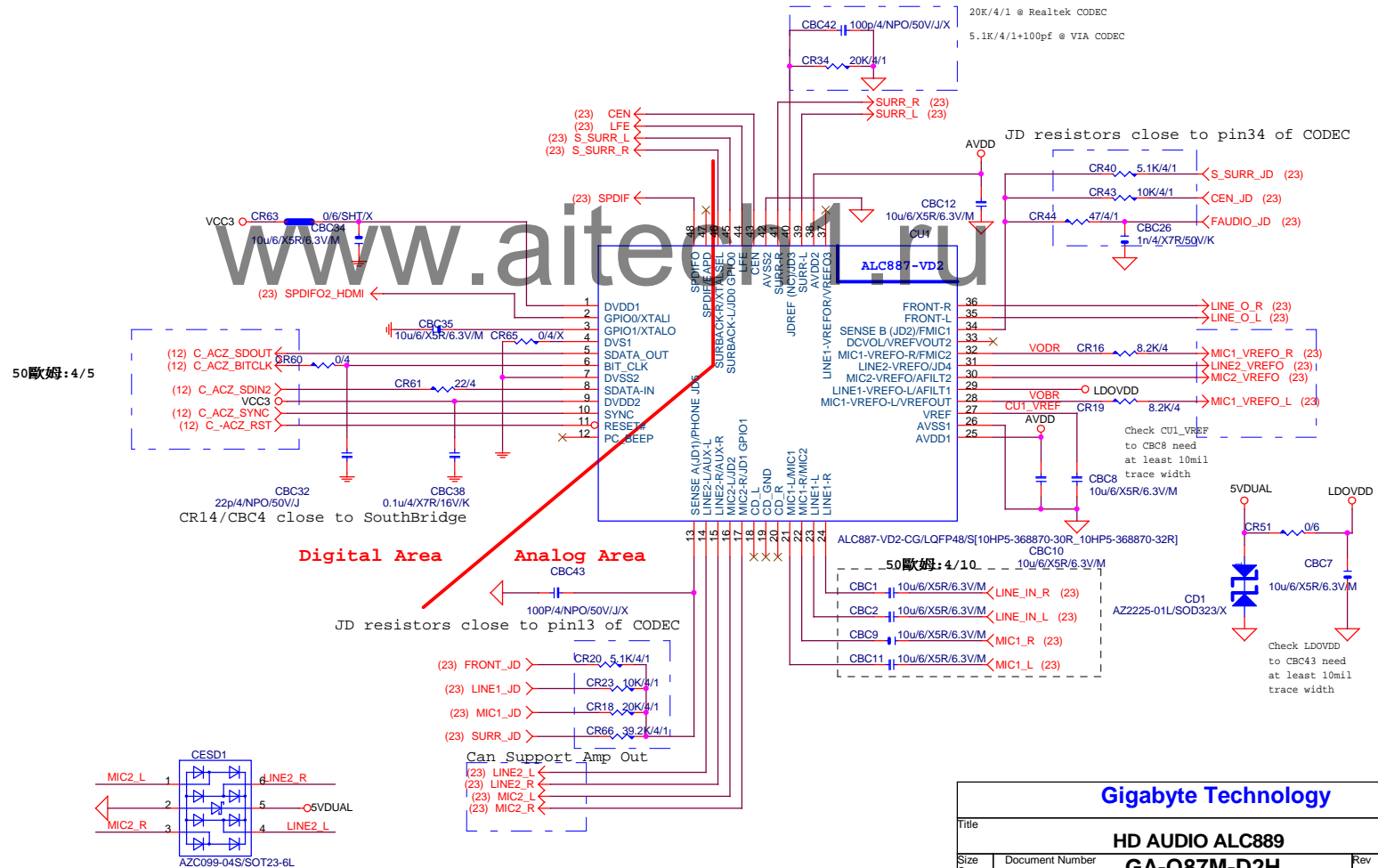


-USB30_F

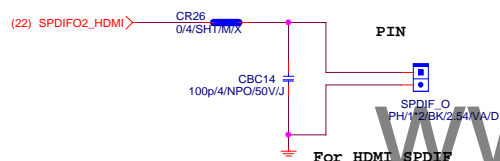
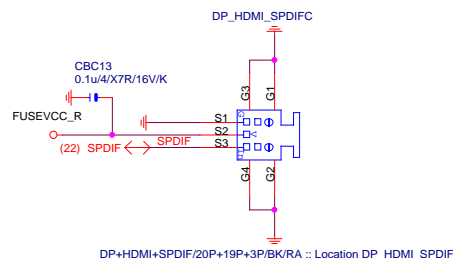
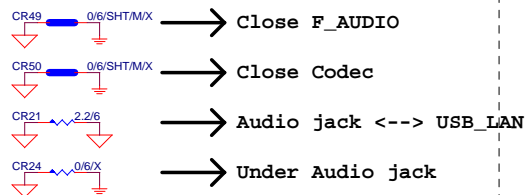


Gigabyte Technology			
Title	FP,F_USB,USB PWR,SPKR,SATA LED		
Size	Custom	Document Number	GA-Q87M-D2H
Date	Monday, November 25, 2013	Sheet	21 of 32
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	ALC892	ALC887-VD2	VT1708S-CE
CR44/CBC26	47ohm+1nF	47ohm+1nF	22ohm+100P
CBC42/CBC43	X	X	100P/4
CR6/CR7/CR58/CR54/ CR67/CR68/CR69/CR70/ CR2/CR4	22K/4	22K/4	10K/4/1
CR5/CR8/CR1/CR14/ CR17/CR22/CR73/CR74/ CR13/CR11/CR57/CR53/ CR75/CR76/CR27/CR29	62 ohm	62 ohm	75 ohm
CR16/CR19	8.2K/4	8.2K/4	3.3K/4
CESD1	O	O	O

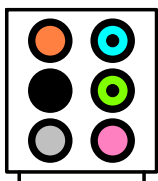


CODEC POWER/EMI PAD

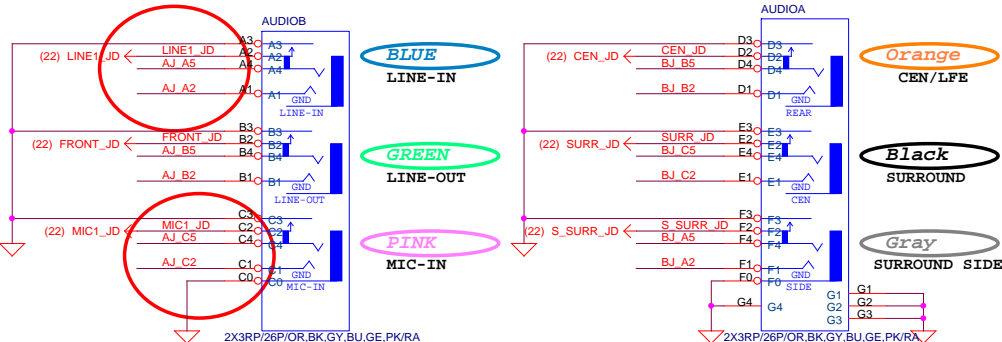


AZALIA JACK

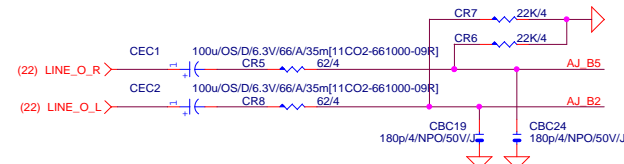
BTX AZALIA CONNECTOR



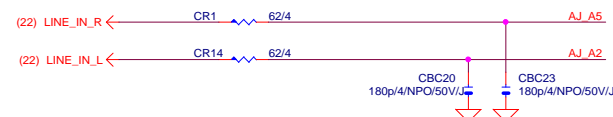
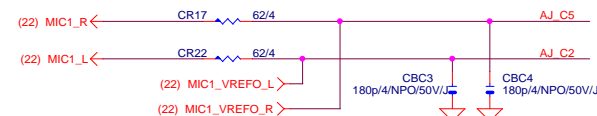
11NR6-403007-21R



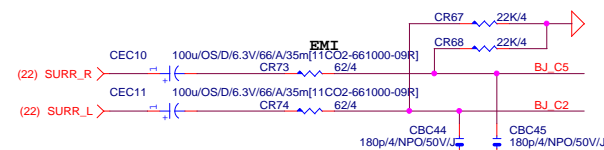
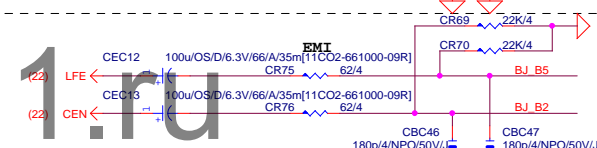
LINE-OUT



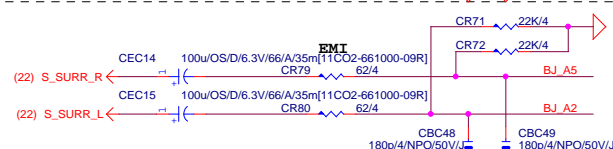
LINE-IN

**MIC-IN**

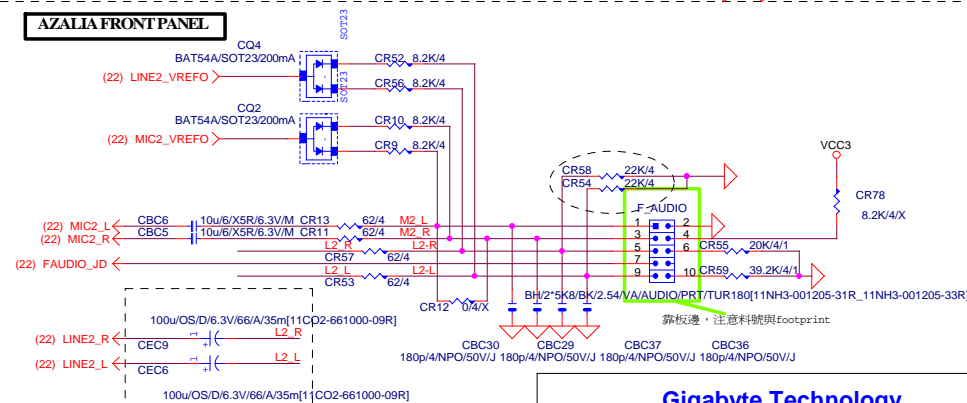
SURROUND

**CEN/LFE**

SURR BACK

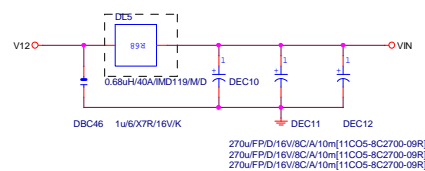
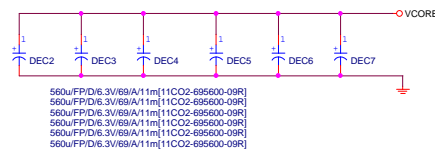
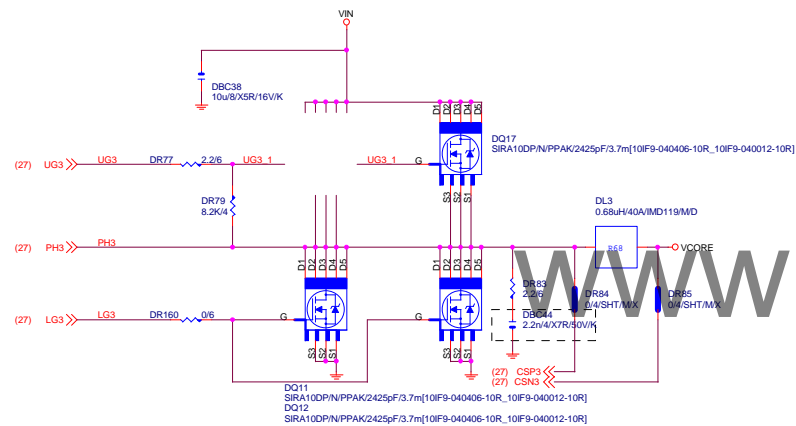
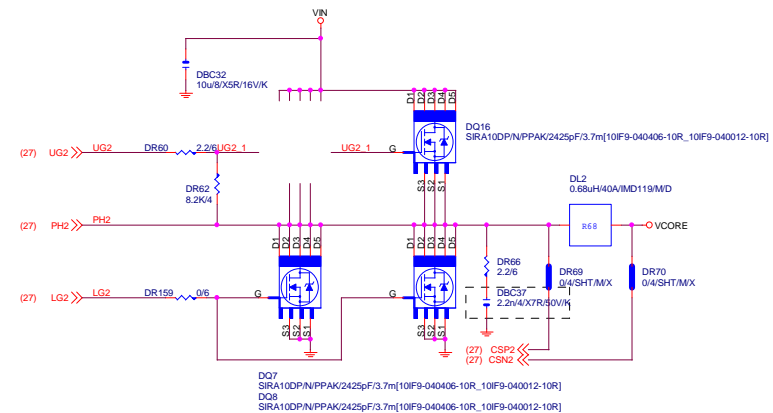
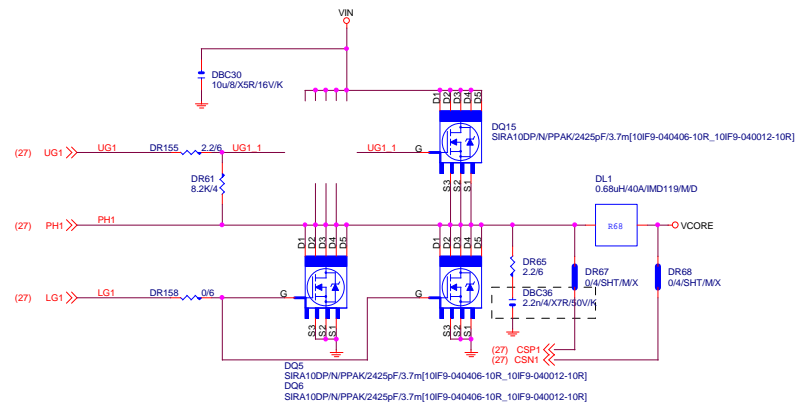


AZALIA FRONT PANEL



Gigabyte Technology

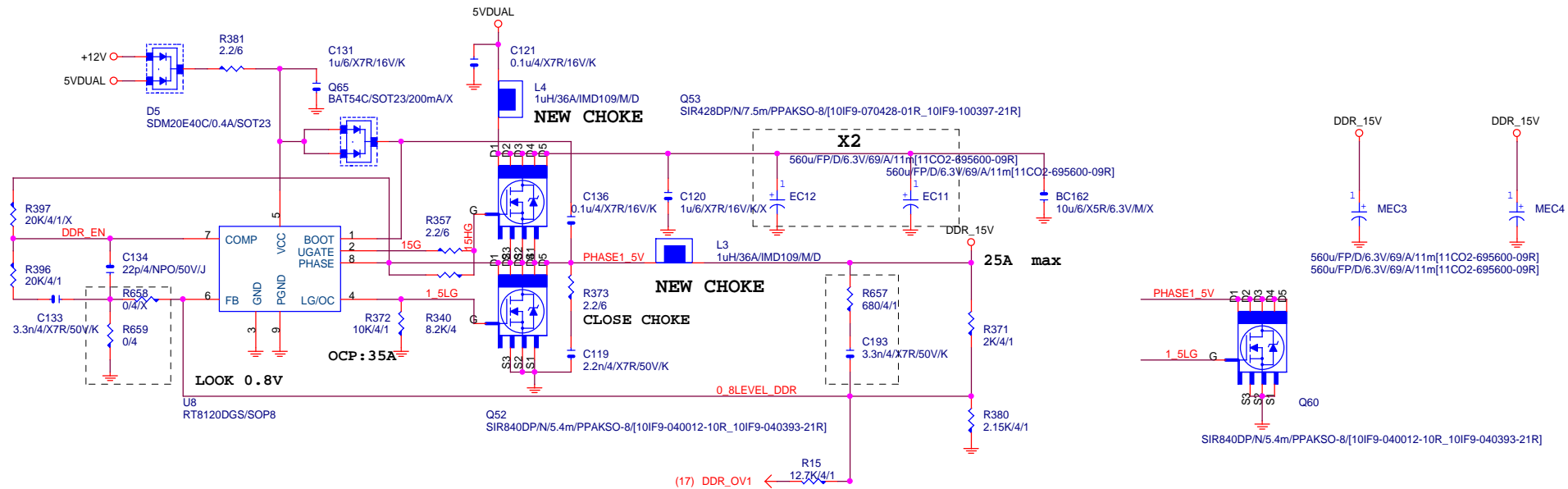
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Size Custom		Document Number				GA-Q87M-D2H		1.1	
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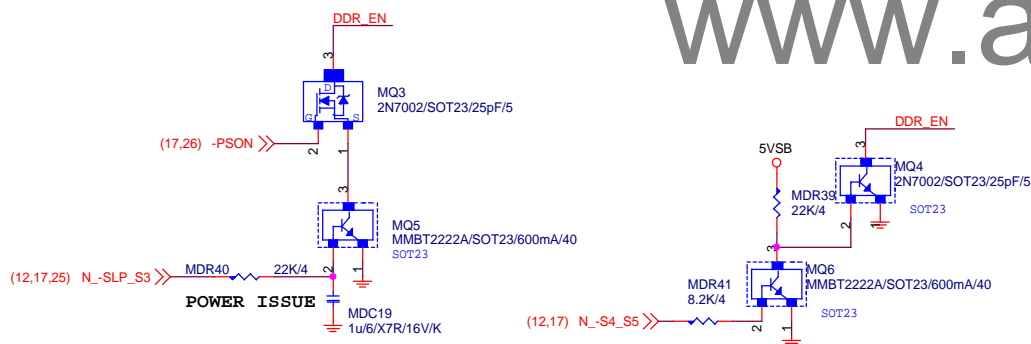
Gigabyte Technology

Title			CPU CORE VR-2
Size	Document Number	GA-Q87M-D2H	
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DDR15V



PWR_SEQ



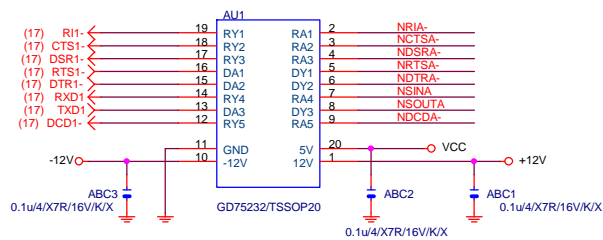
VIN=5V, VOUT=1.5V, IOUT=25A, PHASE=1
 IRMS=11.45A
 560uF/6.3V/68/8m RIPPLE CURRENT=4.7A
 Coefficient=1.7(85°C), 1(105°C)
 VIN Ripple current=4.7X1.7=7.99A(85°C)
 -->故固態電容須2X7.99=15.98>11.45A

Rocset=(Iocp*Lgate,rdson)/Iocset
 Rocset=(45A*6.7mOhm)/10uA = 30K
 Iocset=10uA

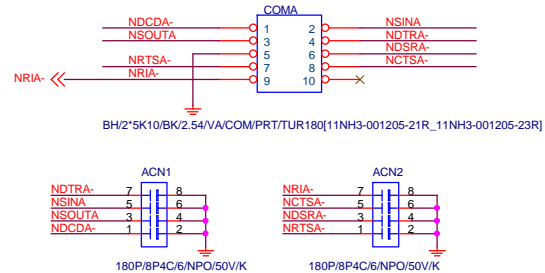
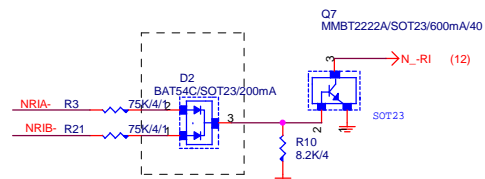
Gigabyte Technology

Title		
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Size	Document Number	Rev
Custom	GA-Q87M-D2H	1.11
Date:	Monday, November 25, 2013	Sheet 29 of 32

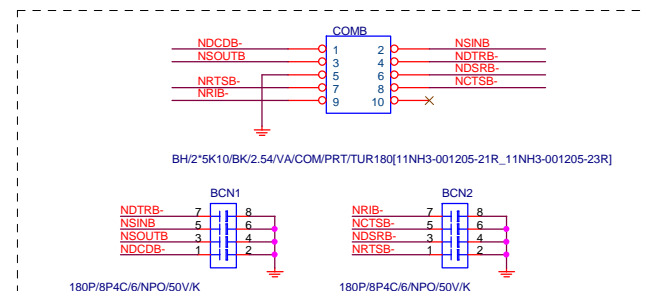
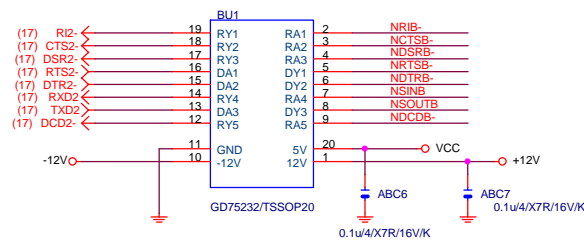
COMA



COM RI

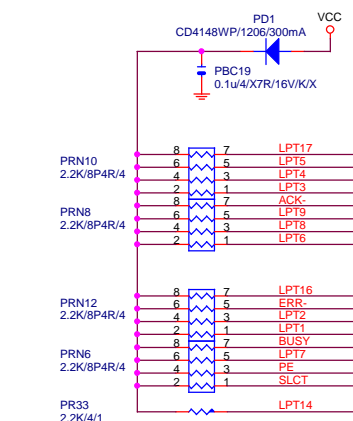
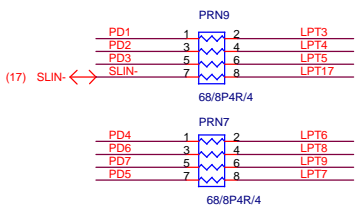
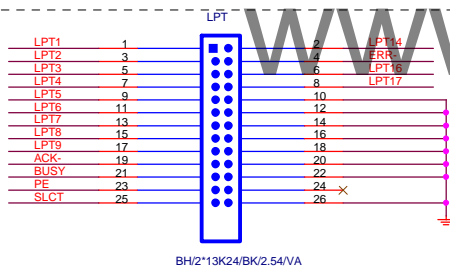
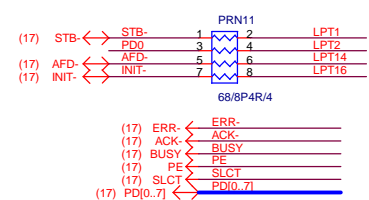


COMB

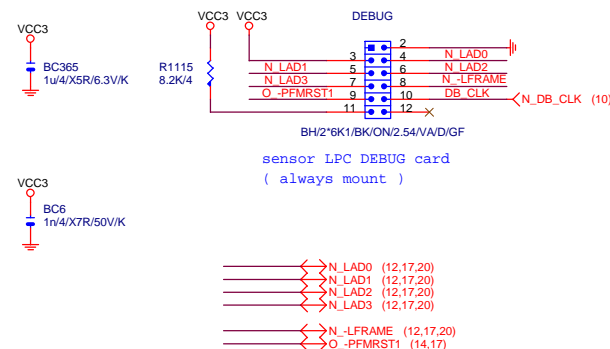


PLACE NEAR COM CONNECTOR

LPT PORT



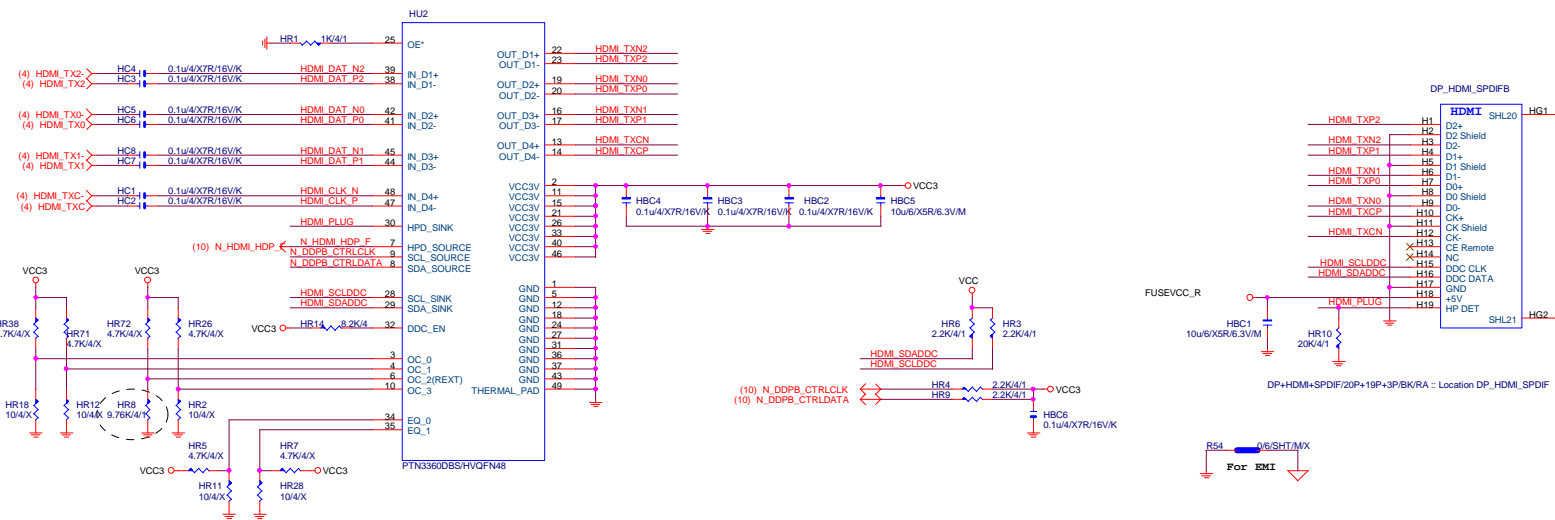
80 PORT



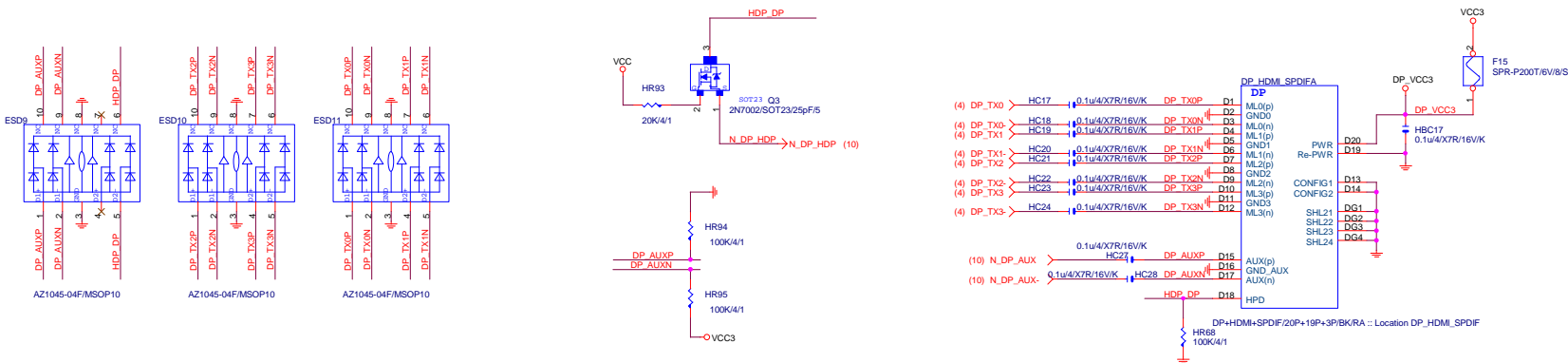
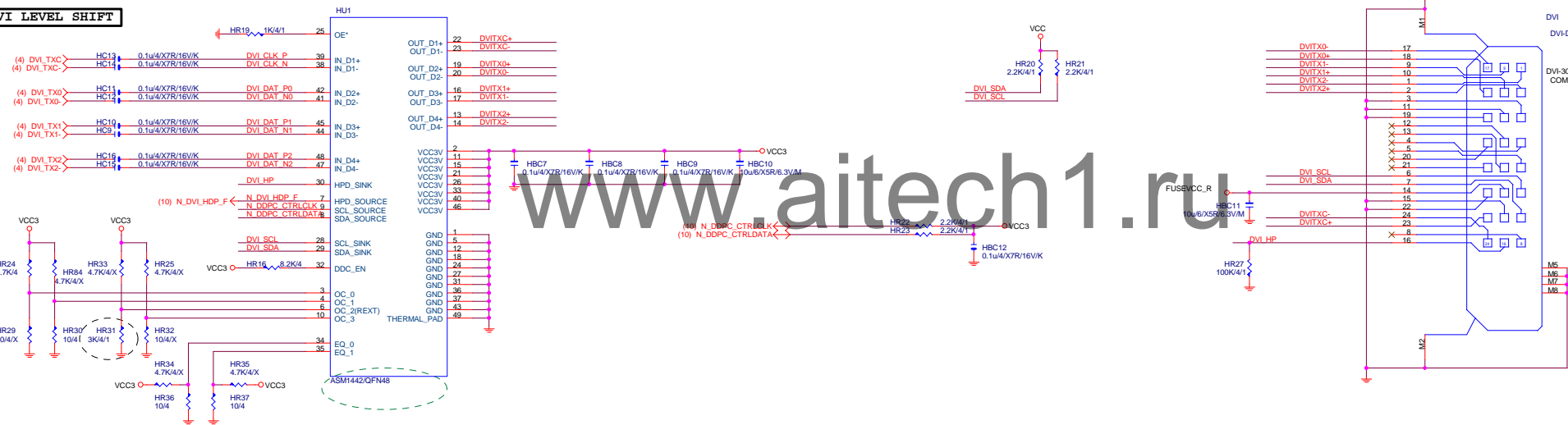
Gigabyte Technology

Title			
COM A/B & LPT & 80 PORT			
Size	Document Number	Rev	
Custom			
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HDMI LEVEL SHIFT

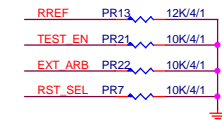
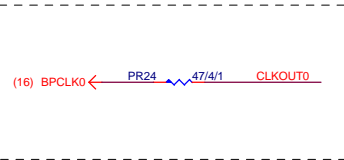
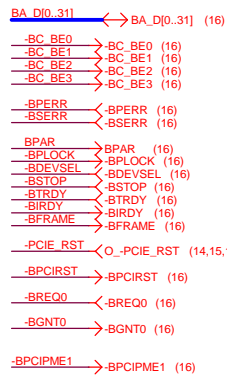


DVI LEVEL SHIFT



PCIE TO PCI

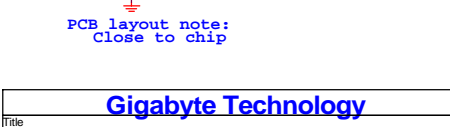
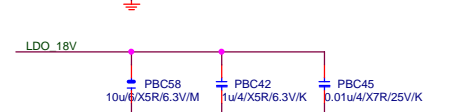
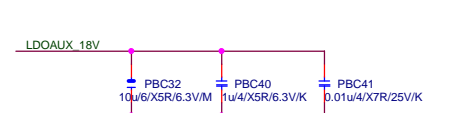
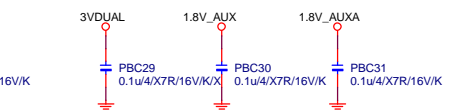
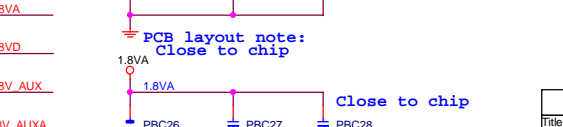
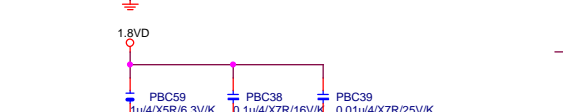
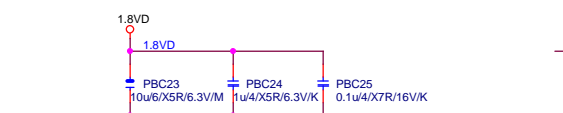
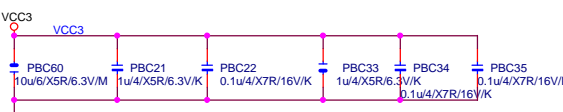
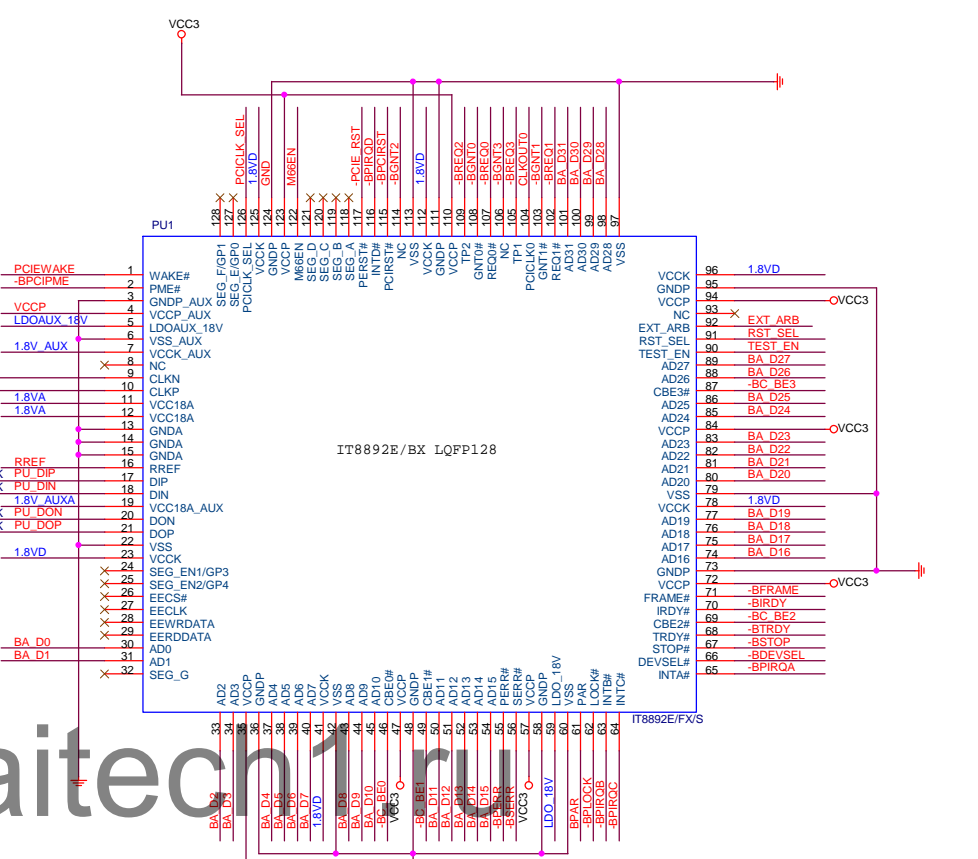
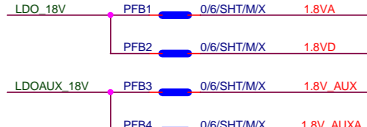
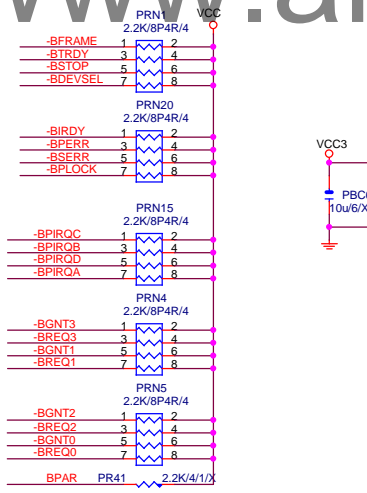
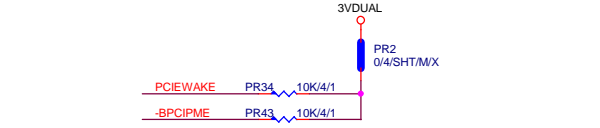
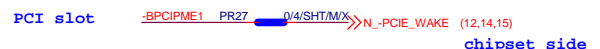
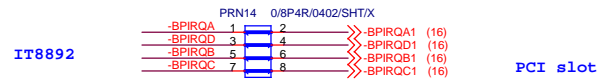
PCI:5/4/5 Impedance=50 +- 15%



High: Enable PCI CLK 66MHz
Low: Disable PCI CLK 66MHz



High: PCICLK INPUT form CLK Gen
Low: PCICLK OUTPUT form IT8893 chip



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