

# Model Name: Q87M-D2HM MS

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

SHEET TITLE

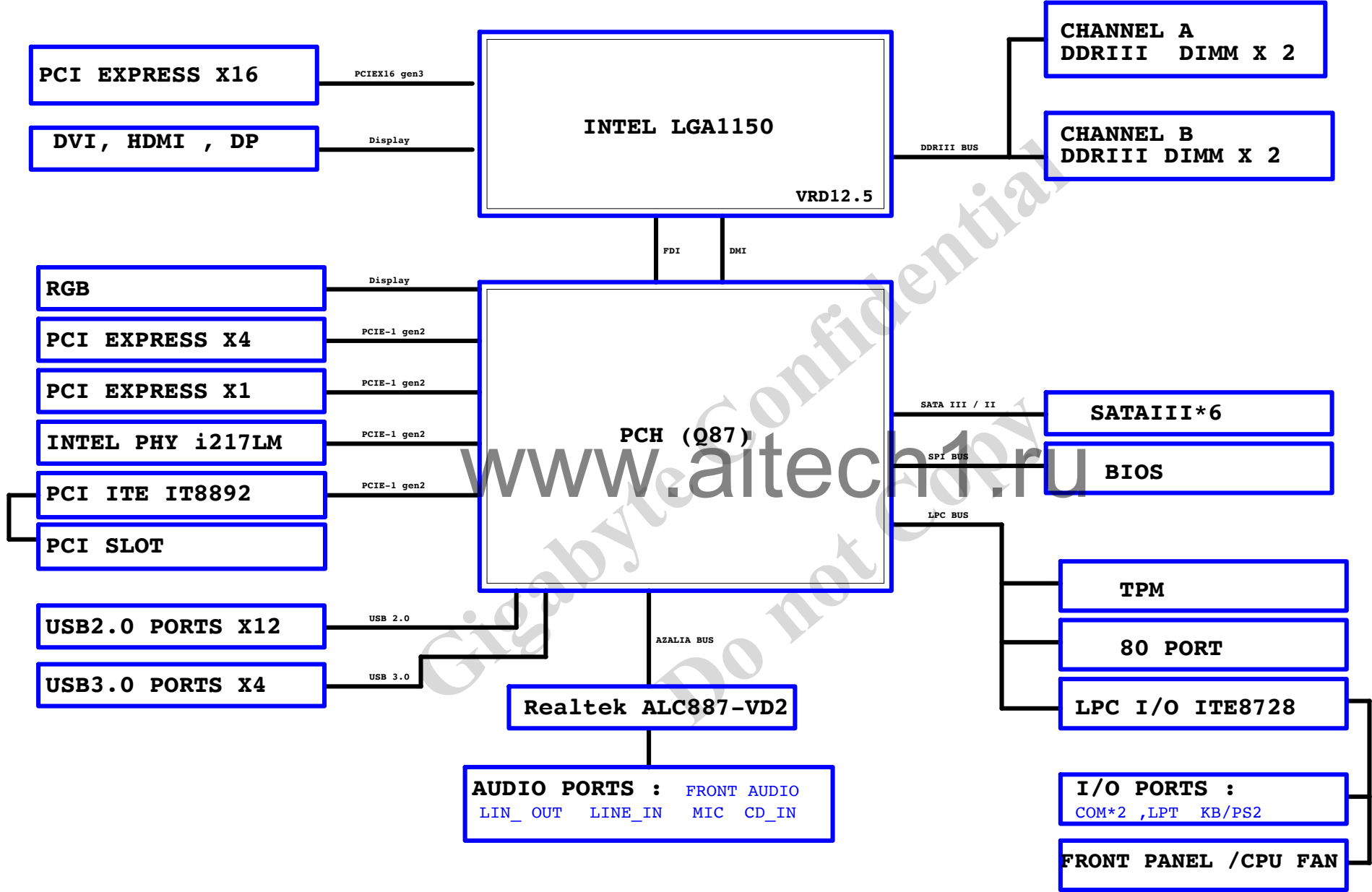
28	VCORE ISL95820_2
29	RT8120_DDR POWER
30	COM , LPT , 80PORT
31	DVI, HDMI ,DP
32	IT8892E PCI BRIDGE

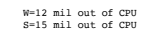
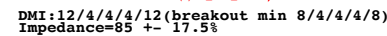
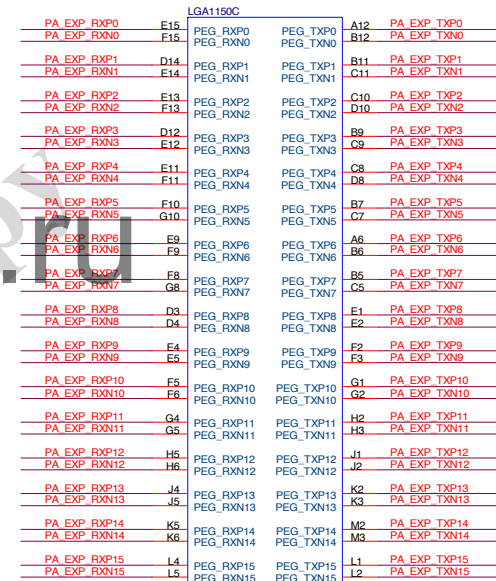
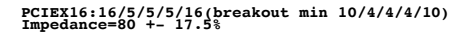
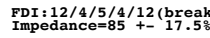
Gigabyte Technology		
Cover Sheet		
Size Custom	Document Number Q87M-D2HM	Rev 1.11
Date: Monday, November 25, 2013	Sheet 1 of 32	

### Component value change history

[illegible][illegible]

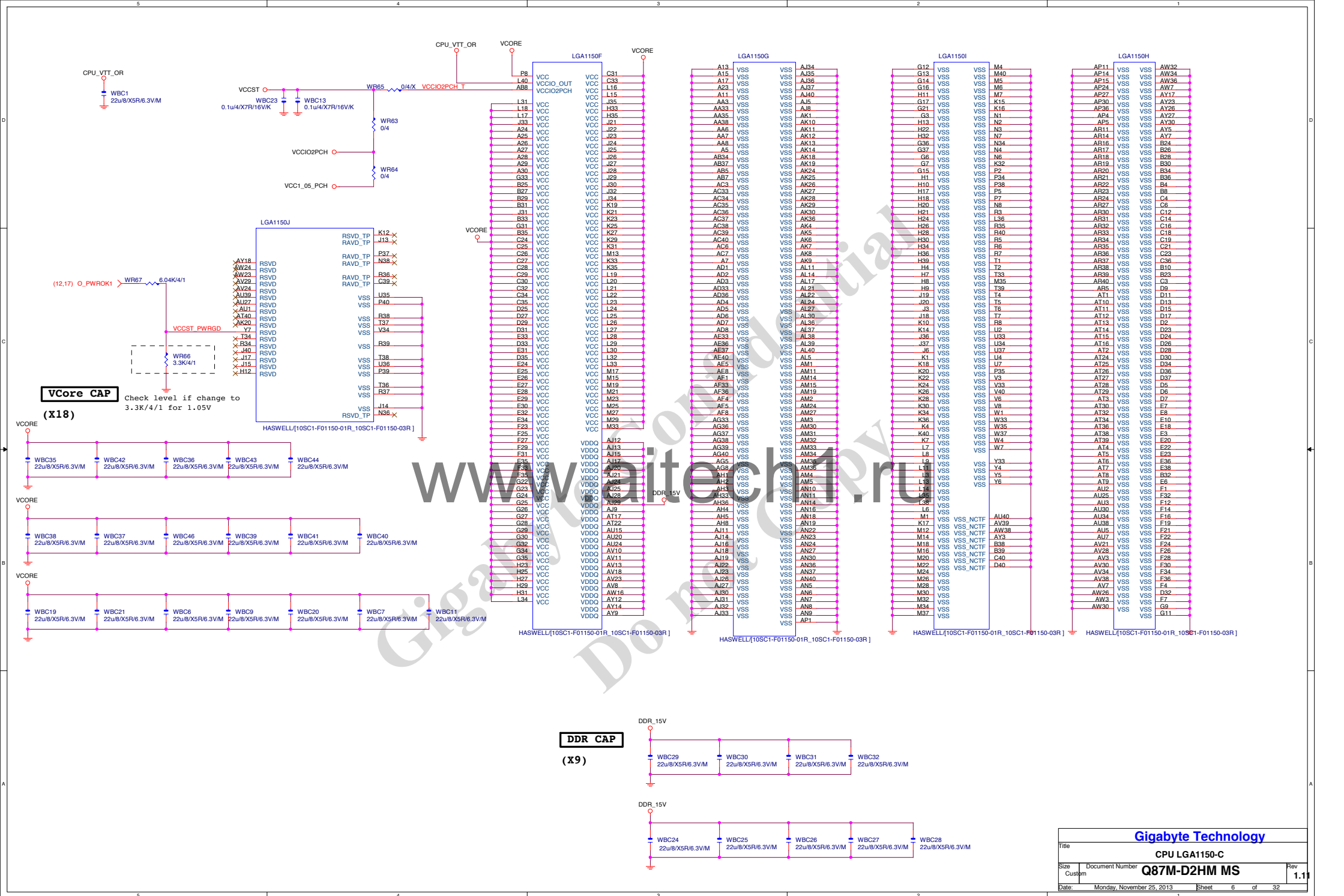
BLOCK DIAGRAM

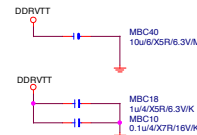
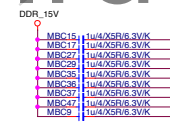
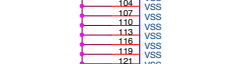




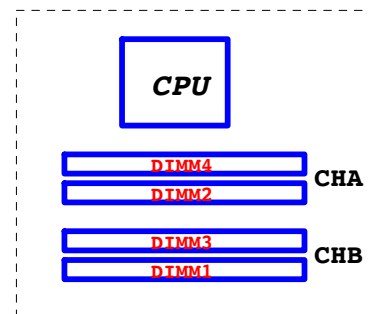
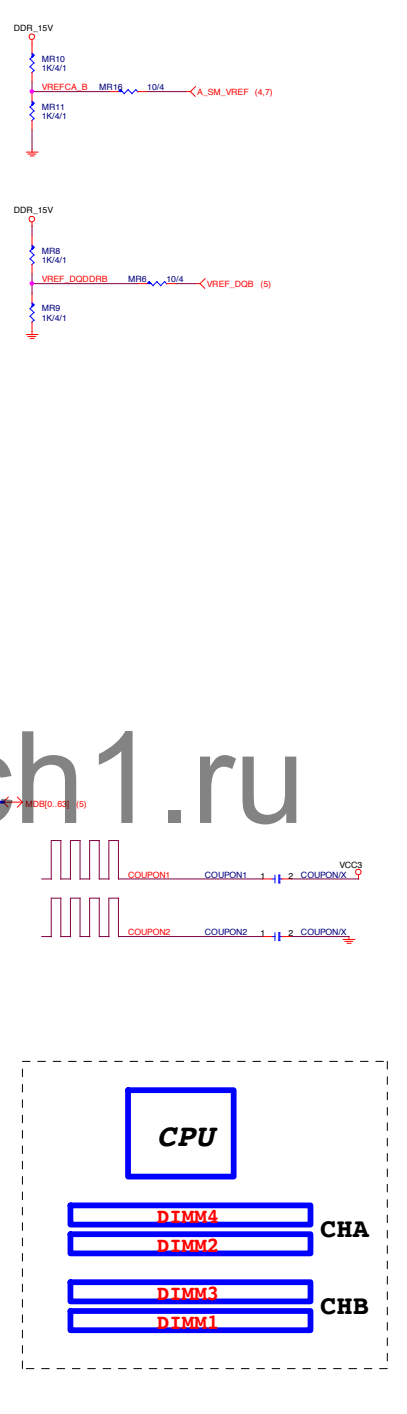
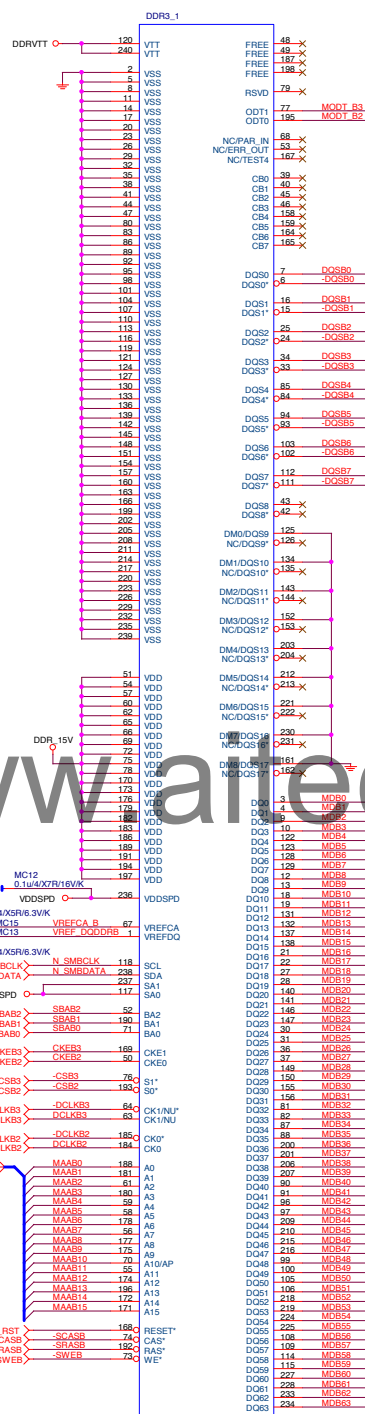
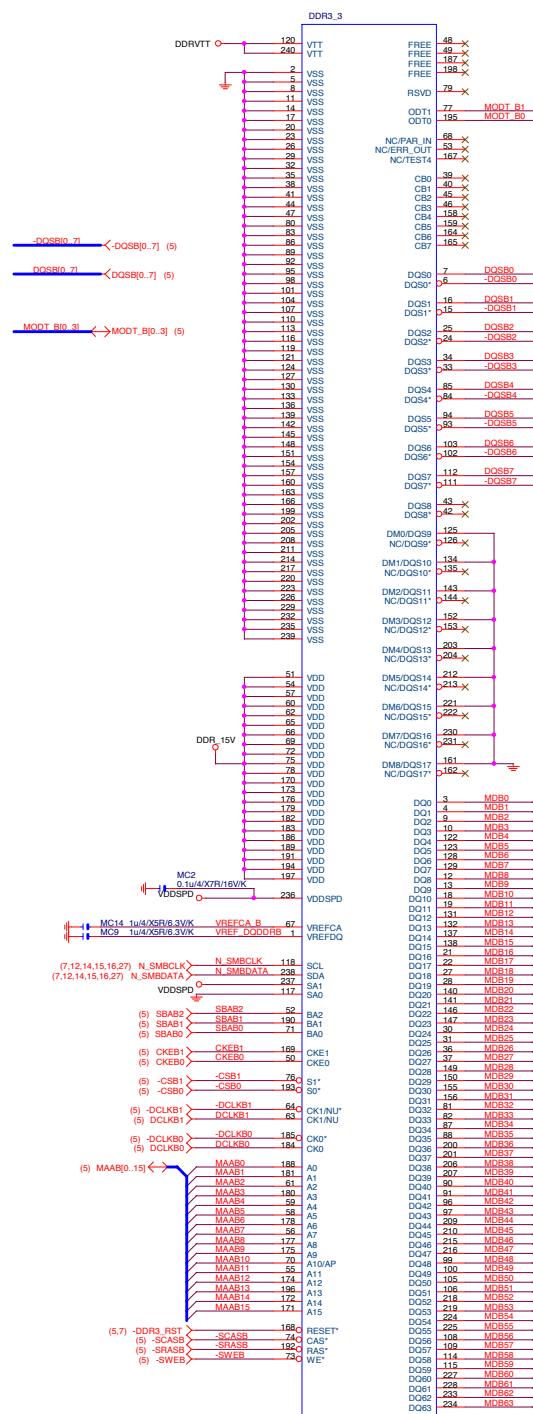
CFG 0-17 all internal PULL-UP





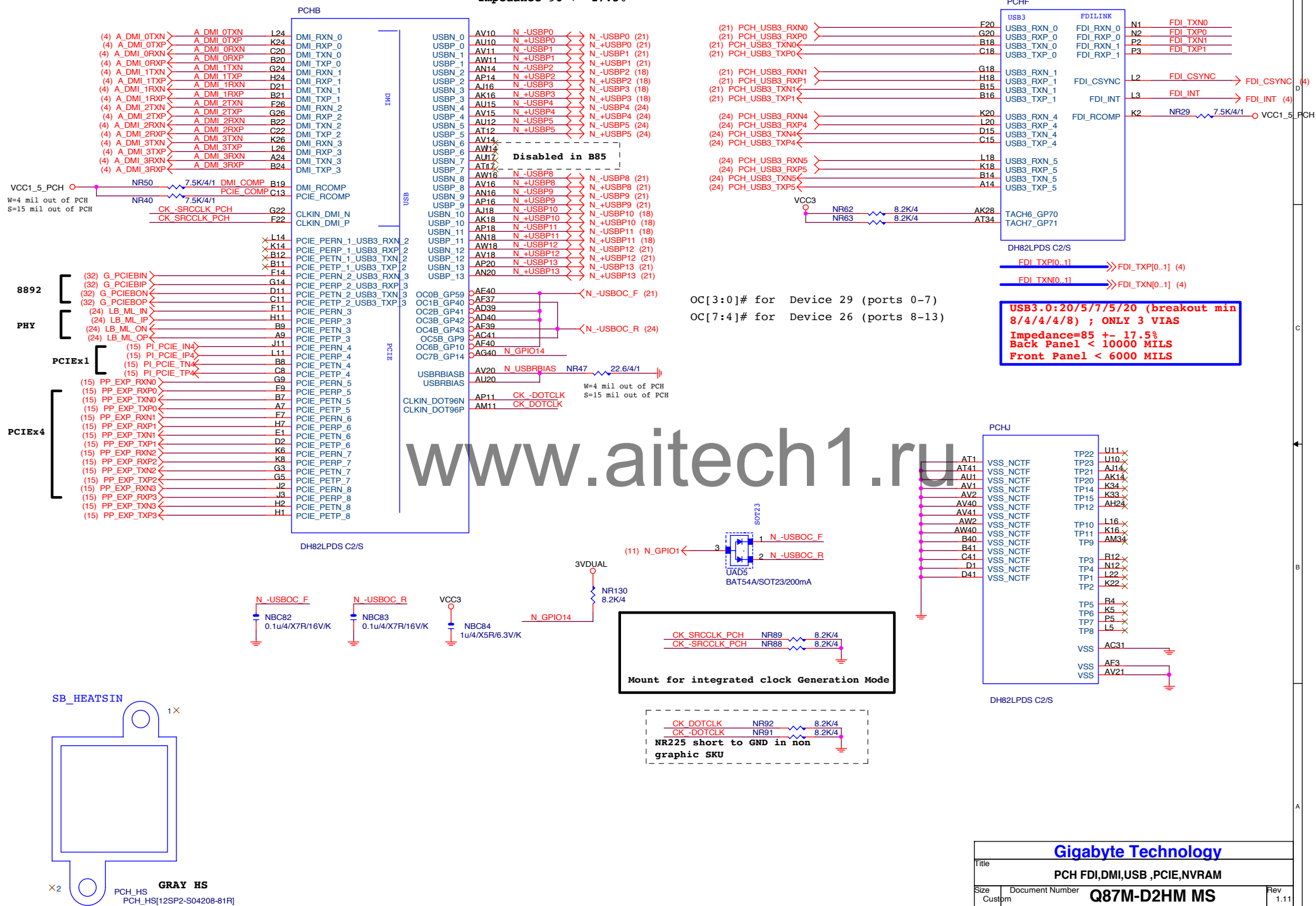


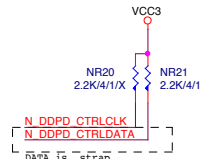
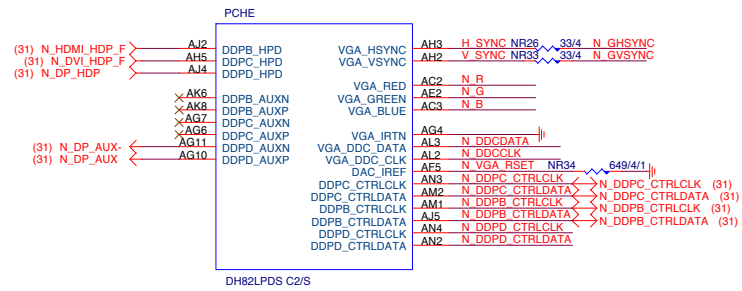




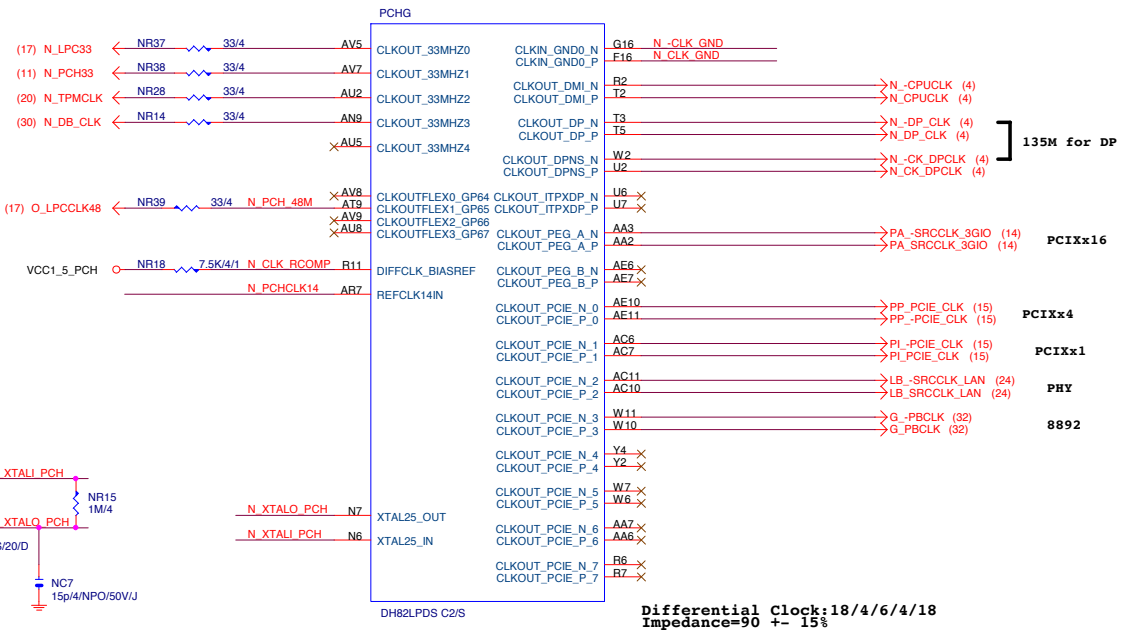
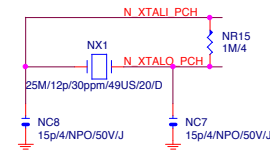


USB2.0 : 12/4.5/7.5/4.5/12 (breakout min 8/4/4/4/8)  
Impedance=90 +- 17.5%



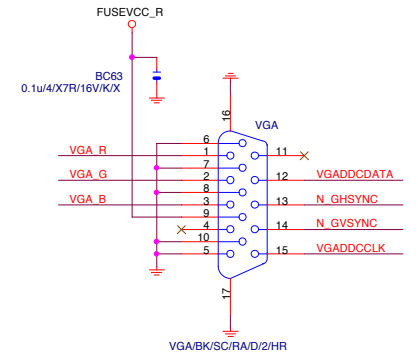
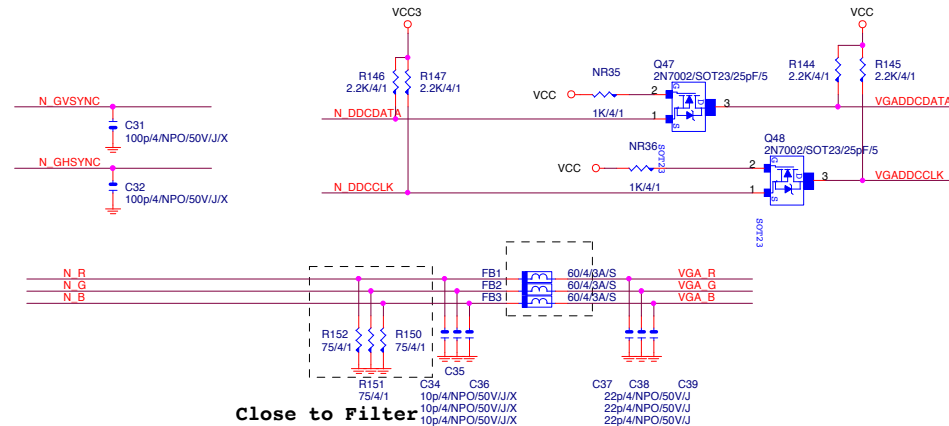
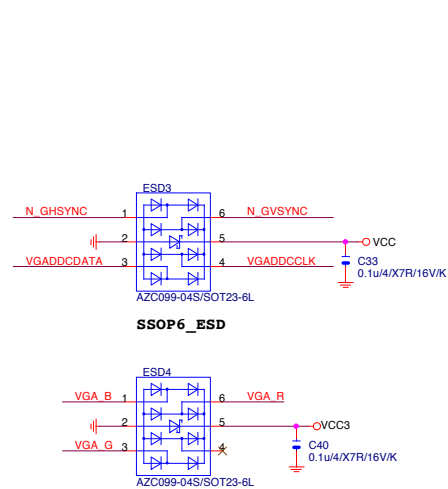


Flex1,2,3,4 :  
14/24/33/48MHZ



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Mount for integrated clock Generation Mode



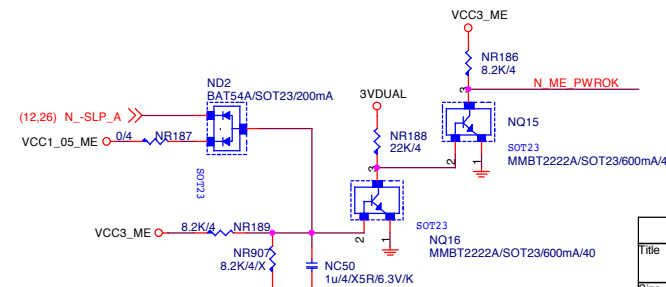
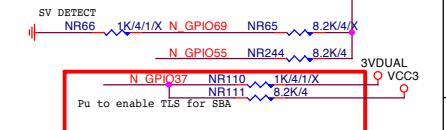
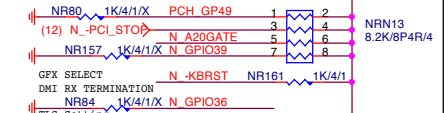
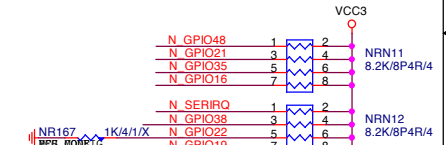
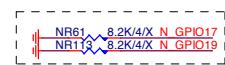
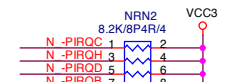
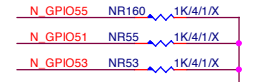
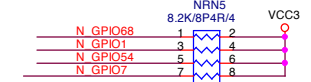
Gigabyte Technology			
Title			
PCH DISPLAY_CLK BUFFER			
Size	Document Number	Rev	
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enable AMT with TLS

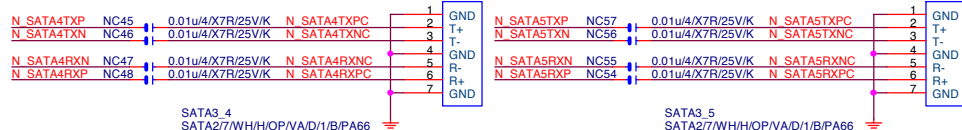
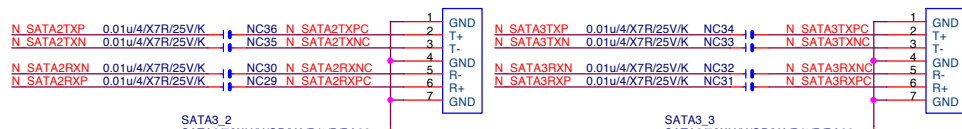
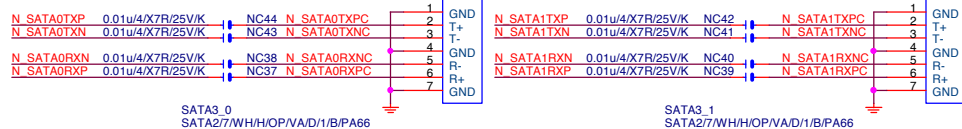
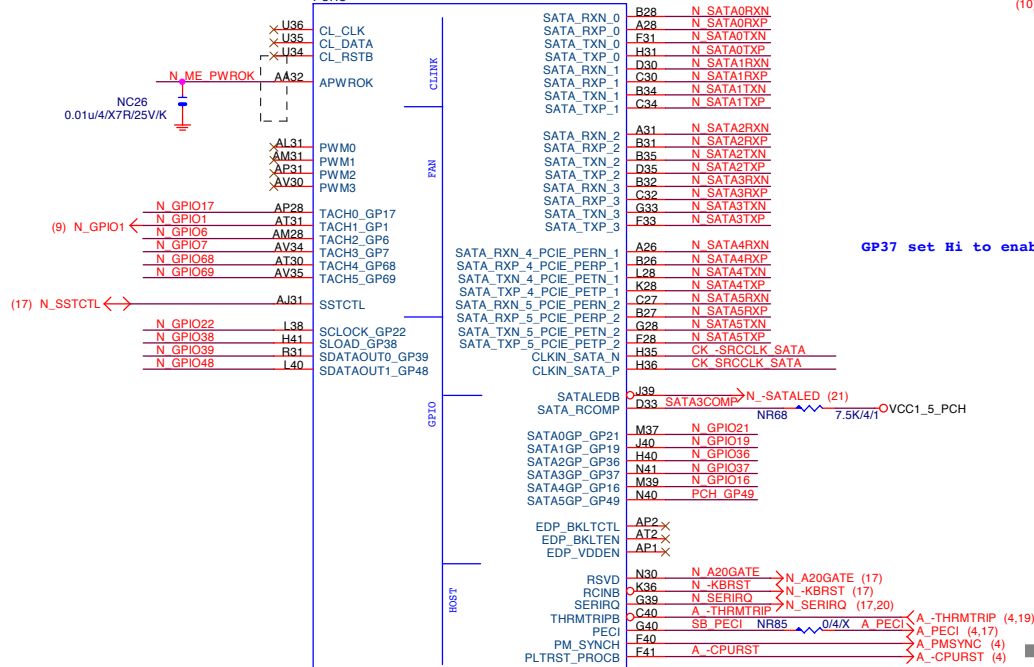
DH82LPDS C2/S

CK SRCCLK SATA NR174 8.2K/4  
CK -SRCCLK SATA NR173 8.2K/4

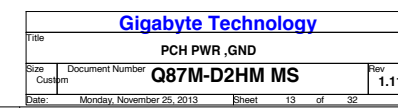
Mount for integrated clock Generation Mod



<b>Gigabyte Technology</b>			
Title			
<b>PCH HOST , SATA, PCI</b>			
Size	Document Number	<b>Q87M-D2HM MS</b>	Rev
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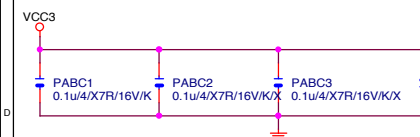




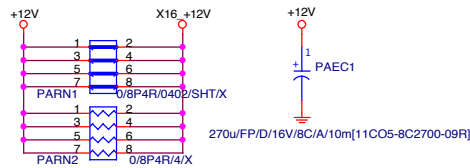
## PCIEX16 CAP

## PCIEX16 SLOT

## PCIESLOT-164DN-P



## PCIEX16 PROTECT SHT



## PCIEX16 AC CAP

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PA EXP TXN0	PAC4	0.22u/4X5R/6.3V/K	PA EXP TXN9 C
PA EXP TXP1	PAC6	0.22u/4X5R/6.3V/K	PA EXP TXP1 C
PA EXP TXN1	PAC7	0.22u/4X5R/6.3V/K	PA EXP TXN1 C
PA EXP TXP2	PAC8	0.22u/4X5R/6.3V/K	PA EXP TXP2 C
PA EXP TXN2	PAC9	0.22u/4X5R/6.3V/K	PA EXP TXN2 C
PA EXP TXP3	PAC10	0.22u/4X5R/6.3V/K	PA EXP TXP3 C
PA EXP TXN3	PAC11	0.22u/4X5R/6.3V/K	PA EXP TXN3 C
PA EXP TXP4	PAC12	0.22u/4X5R/6.3V/K	PA EXP TXP4 C
PA EXP TXN4	PAC13	0.22u/4X5R/6.3V/K	PA EXP TXN4 C
PA EXP TXP5	PAC14	0.22u/4X5R/6.3V/K	PA EXP TXP5 C
PA EXP TXN5	PAC15	0.22u/4X5R/6.3V/K	PA EXP TXN5 C
PA EXP TXP6	PAC16	0.22u/4X5R/6.3V/K	PA EXP TXP6 C
PA EXP TXN6	PAC17	0.22u/4X5R/6.3V/K	PA EXP TXN6 C
PA EXP TXP7	PAC18	0.22u/4X5R/6.3V/K	PA EXP TXP7 C
PA EXP TXN7	PAC19	0.22u/4X5R/6.3V/K	PA EXP TXN7 C
PA EXP TXP8	PAC20	0.22u/4X5R/6.3V/K	PA EXP TXP8 C
PA EXP TXN8	PAC21	0.22u/4X5R/6.3V/K	PA EXP TXN8 C
PA EXP TXP9	PAC22	0.22u/4X5R/6.3V/K	PA EXP TXP9 C
PA EXP TXN9	PAC23	0.22u/4X5R/6.3V/K	PA EXP TXN9 C
PA EXP TXP10	PAC24	0.22u/4X5R/6.3V/K	PA EXP TXP10 C
PA EXP TXN10	PAC25	0.22u/4X5R/6.3V/K	PA EXP TXN10 C
PA EXP TXP11	PAC26	0.22u/4X5R/6.3V/K	PA EXP TXP11 C
PA EXP TXN11	PAC27	0.22u/4X5R/6.3V/K	PA EXP TXN11 C
PA EXP TXP12	PAC28	0.22u/4X5R/6.3V/K	PA EXP TXP12 C
PA EXP TXN12	PAC29	0.22u/4X5R/6.3V/K	PA EXP TXN12 C
PA EXP TXP13	PAC30	0.22u/4X5R/6.3V/K	PA EXP TXP13 C
PA EXP TXN13	PAC31	0.22u/4X5R/6.3V/K	PA EXP TXN13 C
PA EXP TXP14	PAC32	0.22u/4X5R/6.3V/K	PA EXP TXP14 C
PA EXP TXN14	PAC33	0.22u/4X5R/6.3V/K	PA EXP TXN14 C
PA EXP TXP15	PAC34	0.22u/4X5R/6.3V/K	PA EXP TXP15 C
PA EXP TXN15	PAC35	0.22u/4X5R/6.3V/K	PA EXP TXN15 C

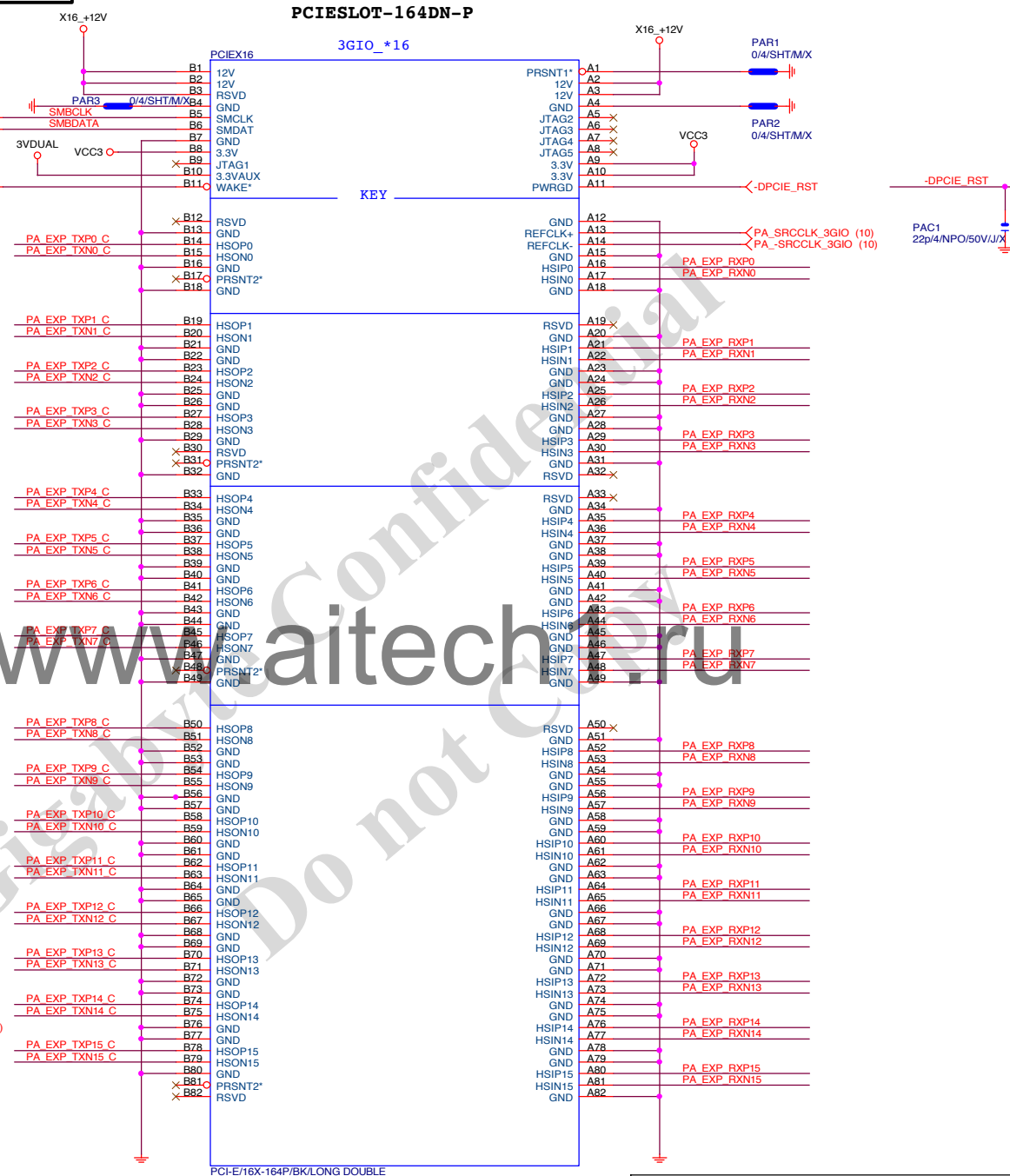
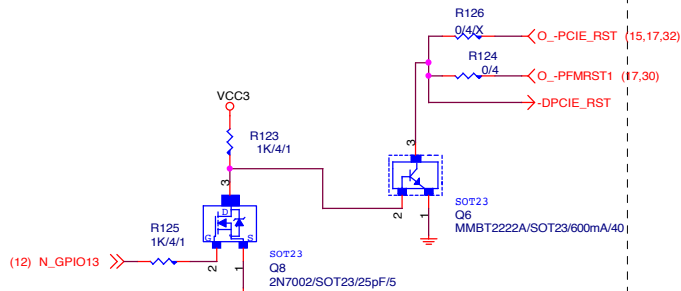
PA EXP RXP10\_15I >>> PA\_EXP\_RXP[0..15] (4)

PA EXP RXN10\_15I >>> PA\_EXP\_RXN[0..15] (4)

PA EXP TXP10\_15I >>> PA\_EXP\_TXP[0..15] (4)

PA EXP TXN10\_15I >>> PA\_EXP\_TXN[0..15] (4)

## PCIEX16 SOFT RESET

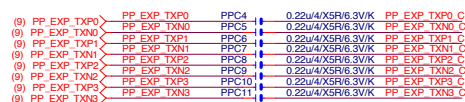
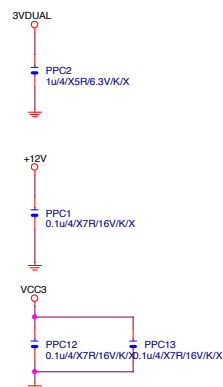
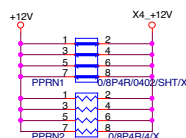
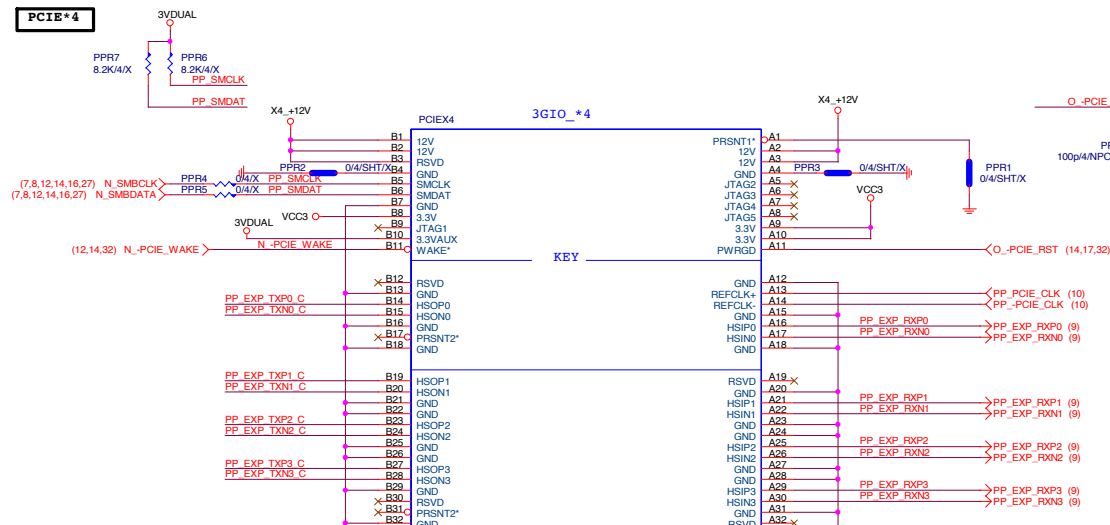


Gigabyte Technology

Title		
PCI EXPRESS * 16		
Size	Document Number	Rev
Custom	Q87M-D2HM MS	1.11
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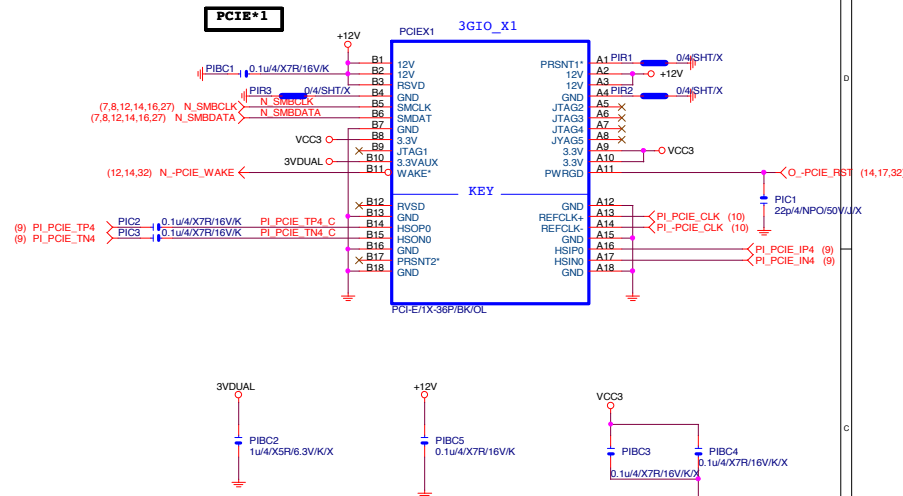


# PCIE\*4



PCI-E/4X-65P/BK/LONG DOUBLE

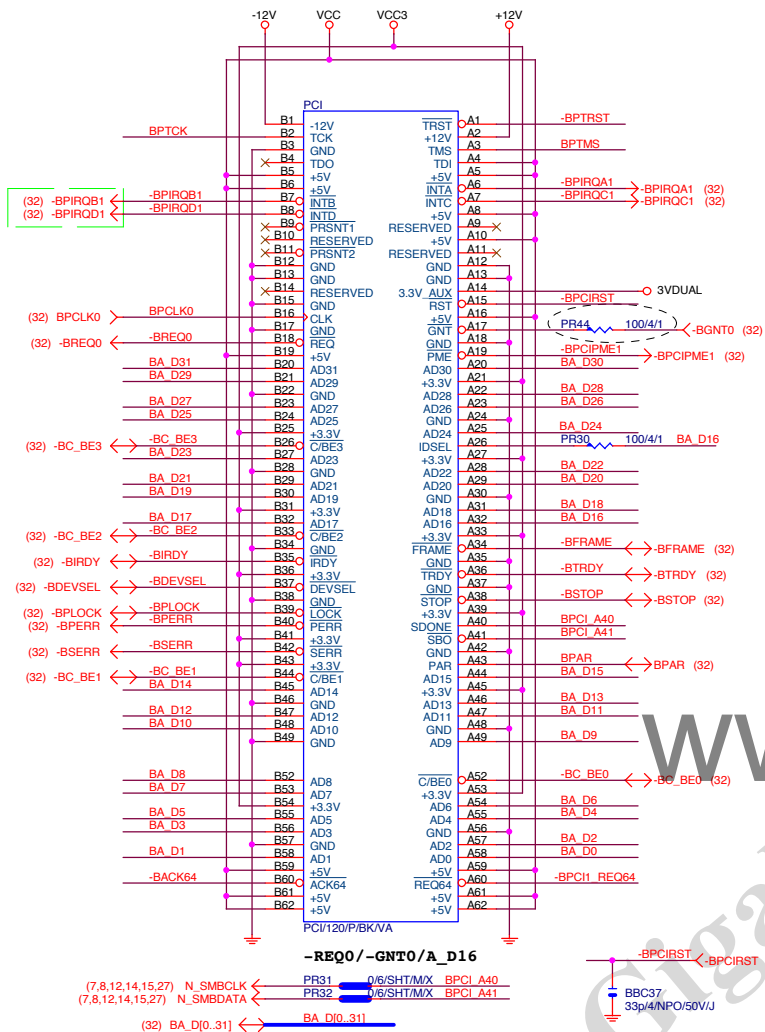
# PCIE\*1



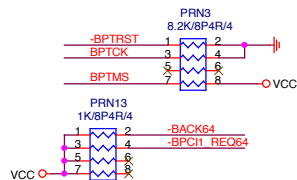
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Gigabyte Technology			
PCI EXPRESS X 1 PORT			
Size	Document Number	Rev	
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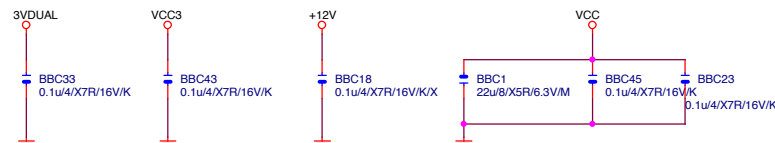
PCI SLOT



PCI	PU
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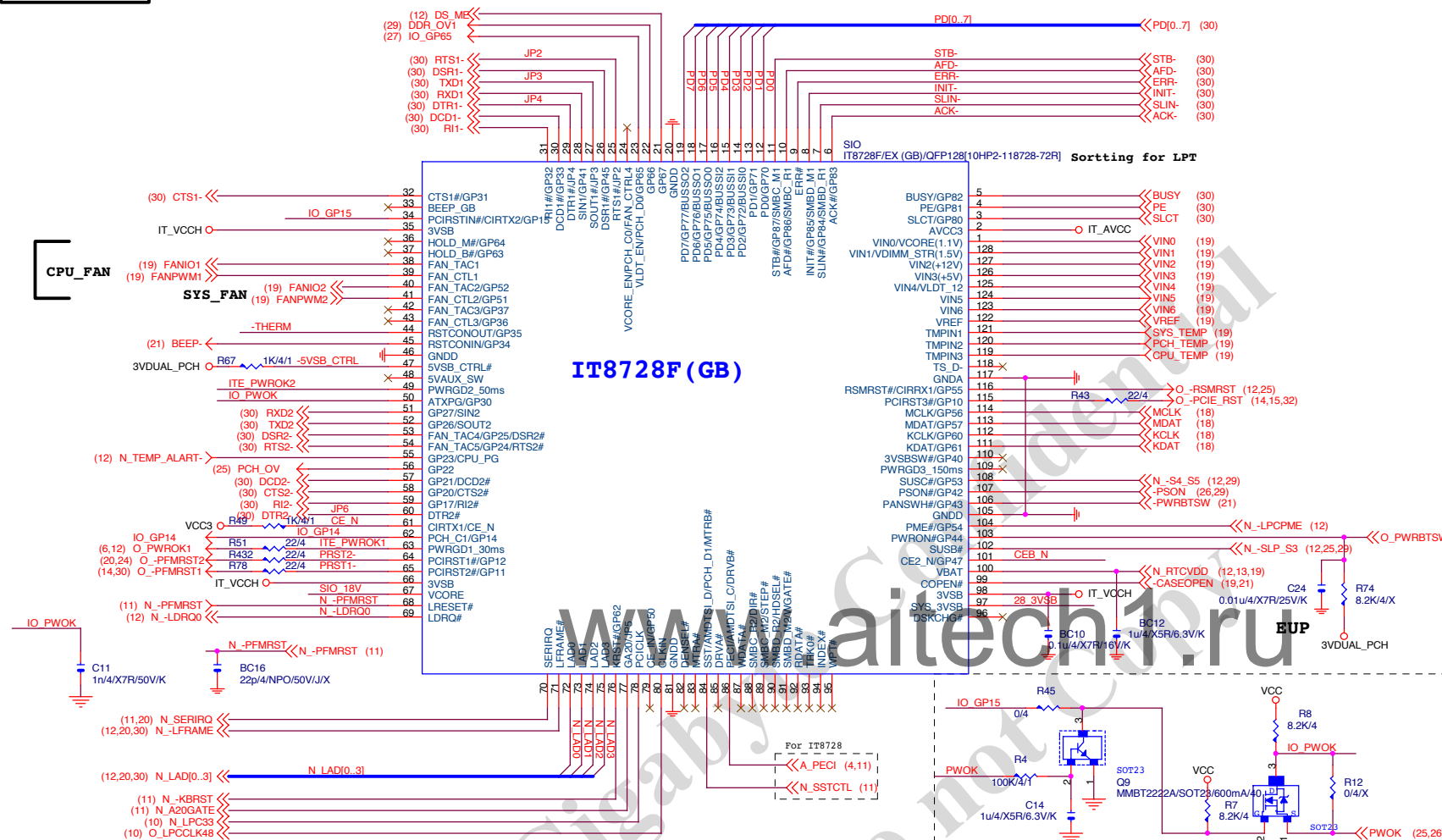
**PCI CAP**



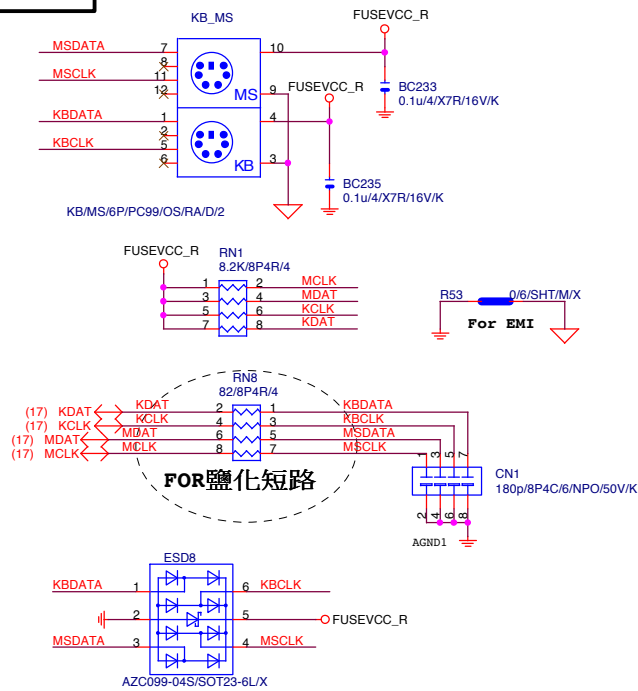
## Gigabyte Technology

Title			
PCI SLOT 1&2			
Size Custom	Document Number	Q87M-D2HM	Rev 1.11
Date:	Monday, November 25, 2013	Sheet 16 of 32	

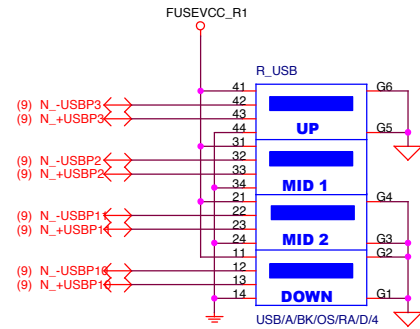
## SIO IT8728F



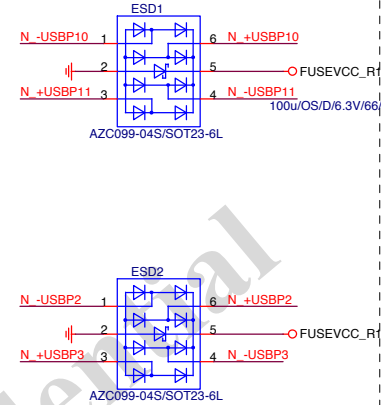
## KB/MS



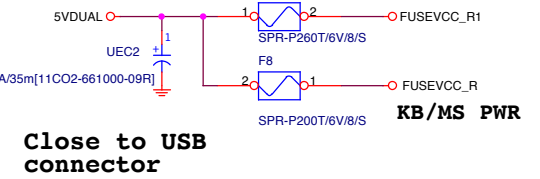
## RUSB20



## USB2.0 ESD



## USB2.0 PWR

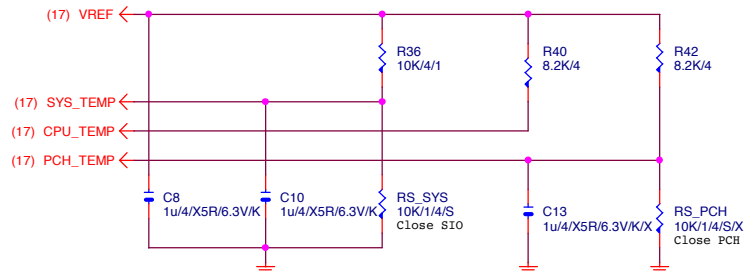


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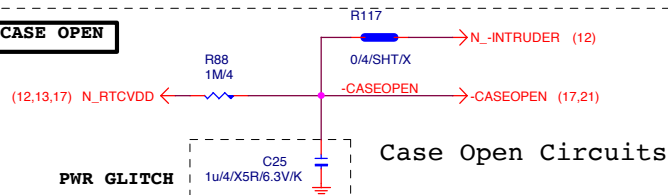
Gigabyte Technology

Title			
KB/MS,RUSB			
Size	Document Number	Rev	
Custom		Q87M-D2HM MS	
Date:		Monday, November 25, 2013	Sheet 18 of 32

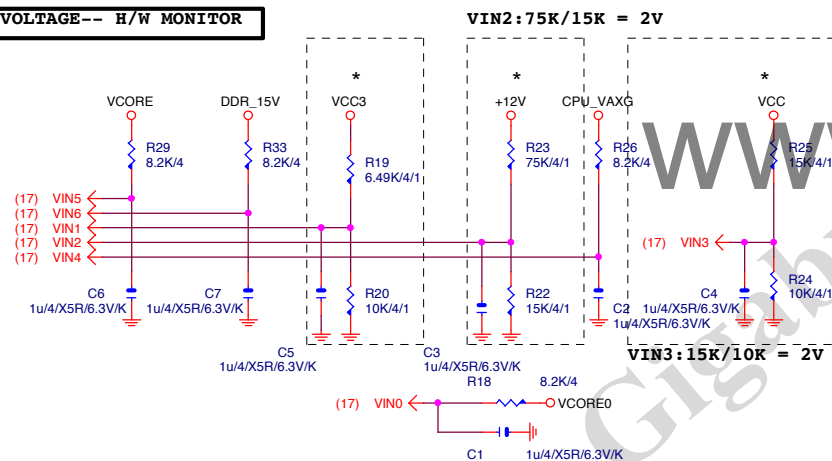
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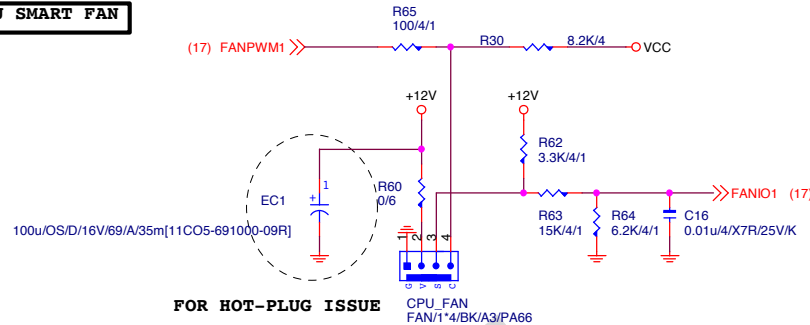
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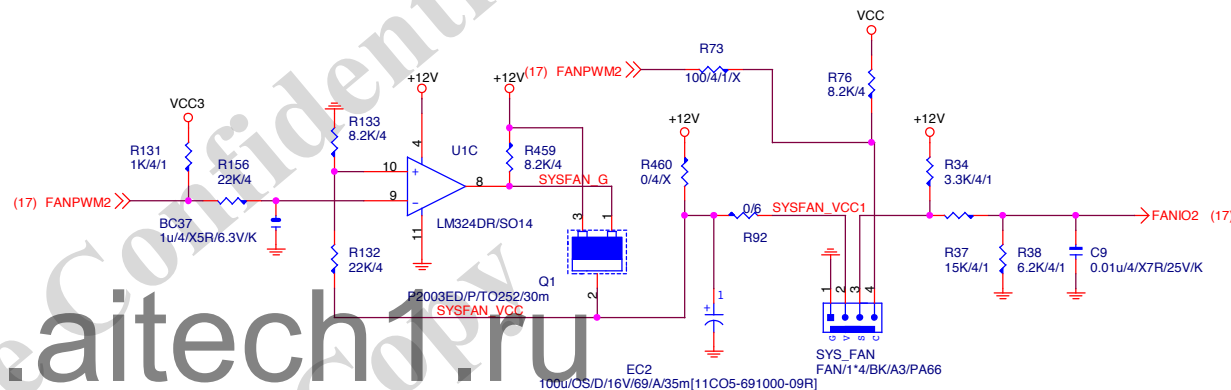
# VOLTAGE-- H/W MONITOR



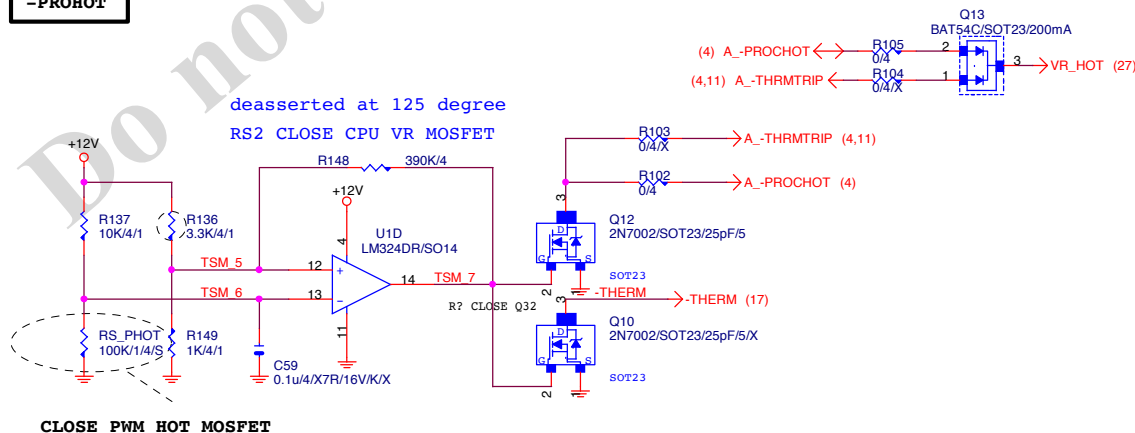
# CPU SMART FAN



# SYS SMART FAN



# -PROHOT

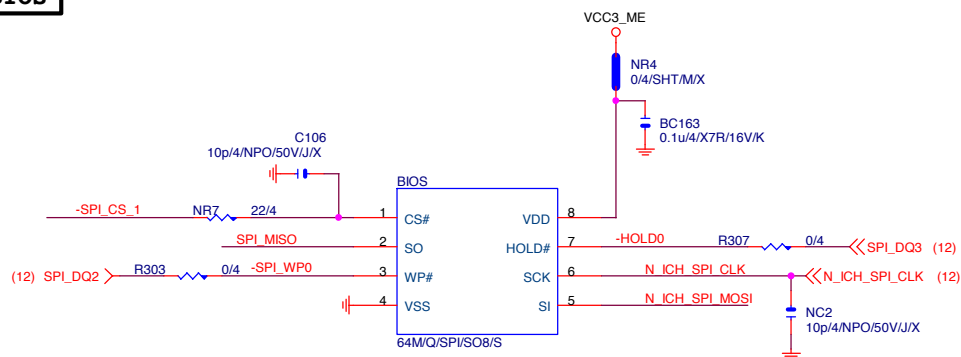


CLOSE PWM HOT MOSFET

Gigabyte Technology

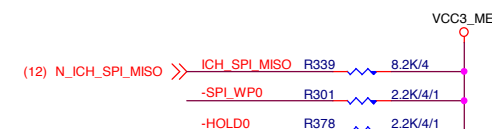
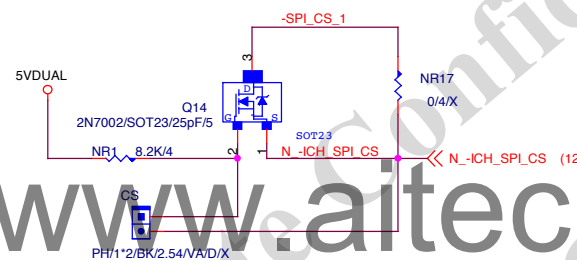
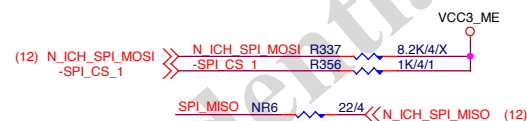
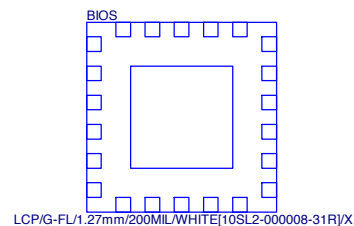
Title				
HWM,FAN CTRL,OV				
Size	Document Number			Rev
Custom	Q87M-D2HM MS			1.11
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## BIOS

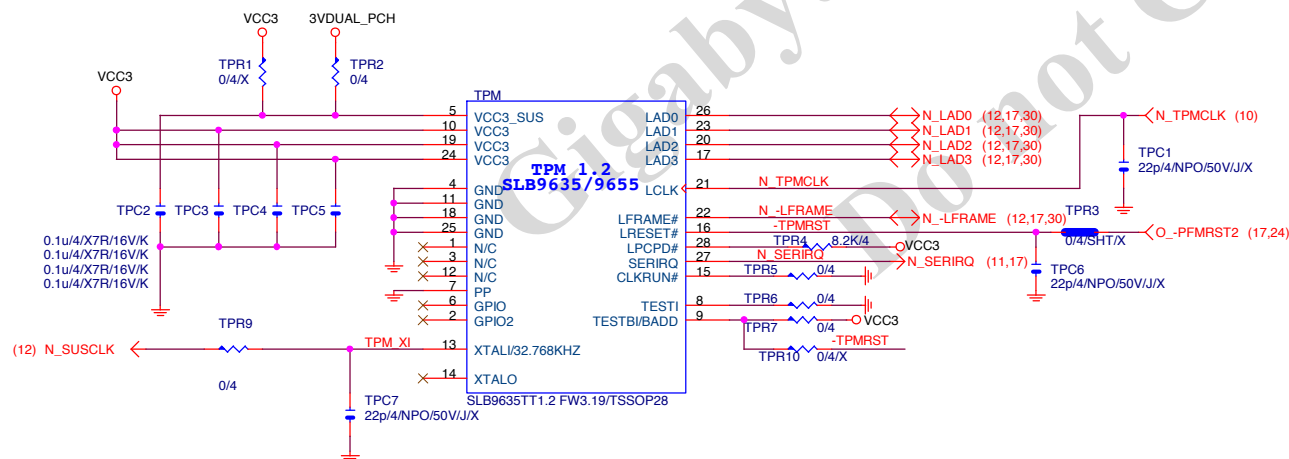


BOOT DEVICE	GP51	GP19
LPC	0	0
SPI	1	1

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 B	Document Number	Q87M-D2HM MS	Rev 1.11
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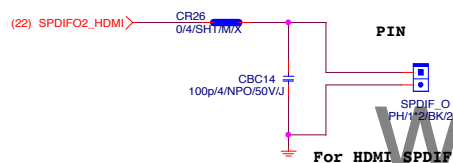
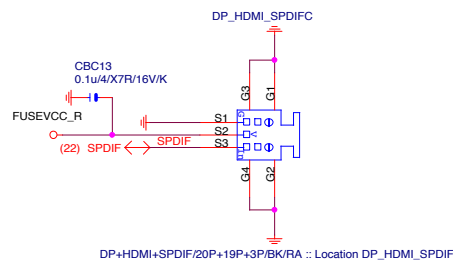
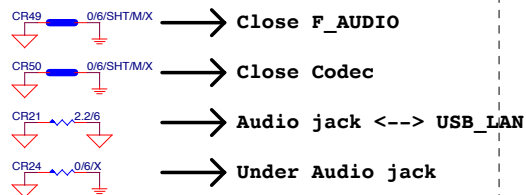




Circuit diagram of the CSD1 pin configuration for the AZC099-04S/SOT23-6L. The diagram shows a 6-pin package with pins 1, 2, and 3 labeled MIC2\_L, MIC2\_R, and MIC2\_L respectively. Pins 4, 5, and 6 are labeled LINE2\_L, 5VDUAL, and LINE2\_R respectively. The internal circuitry shows a bridge-like structure with diodes and transistors.

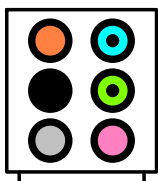


## CODEC POWER/EMI PAD

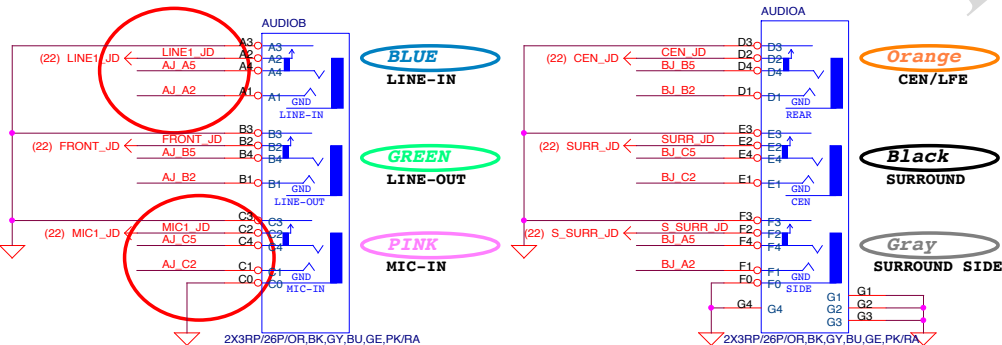


## AZALIA JACK

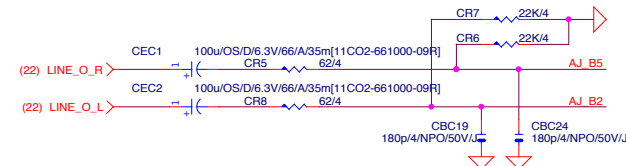
BTX AZALIA CONNECTOR



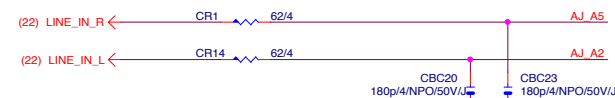
11NR6-403007-21R



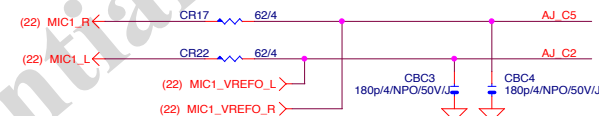
## LINE-OUT



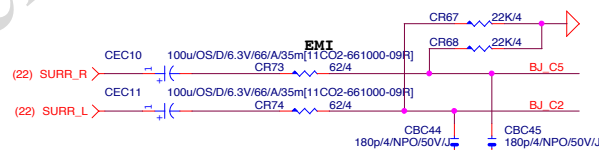
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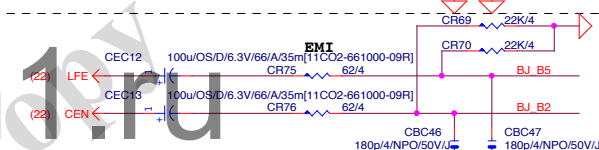
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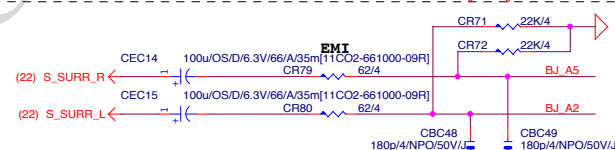
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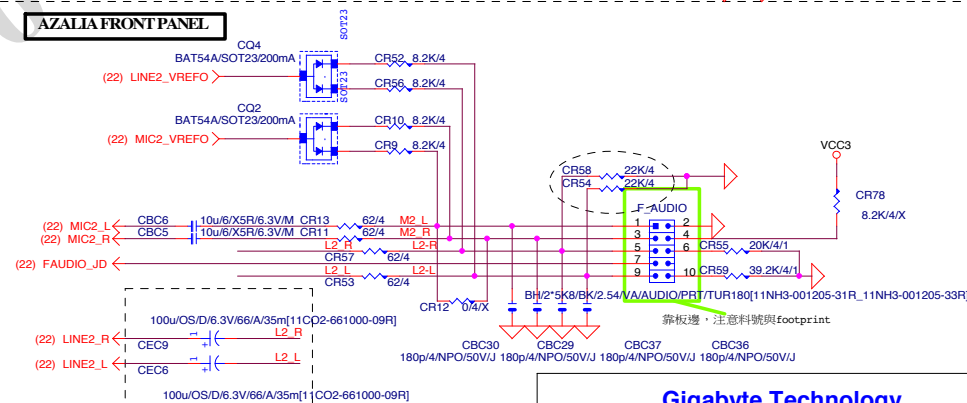
## CEN/LFE



## SURRBACK

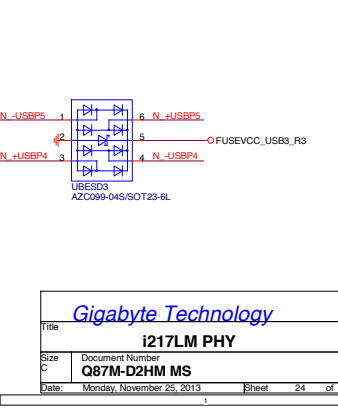
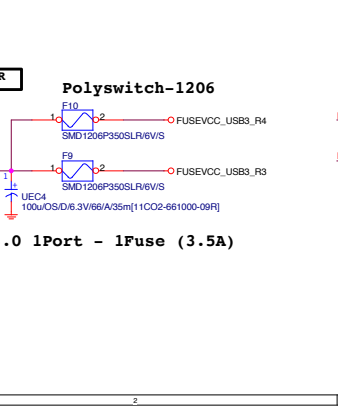
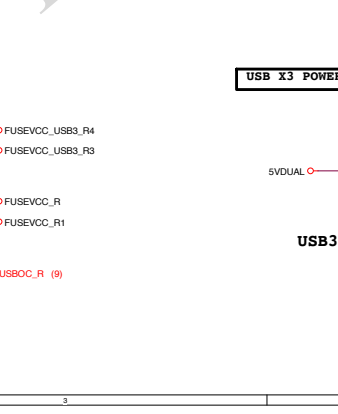
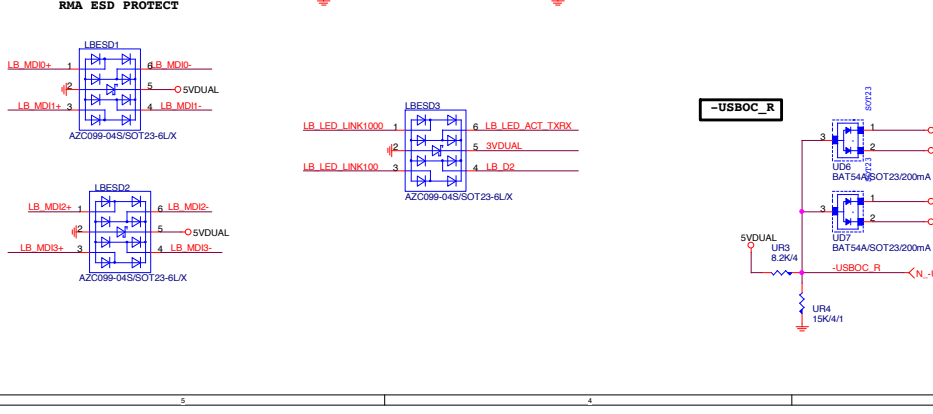
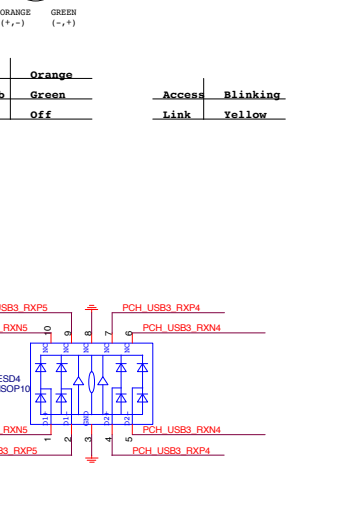
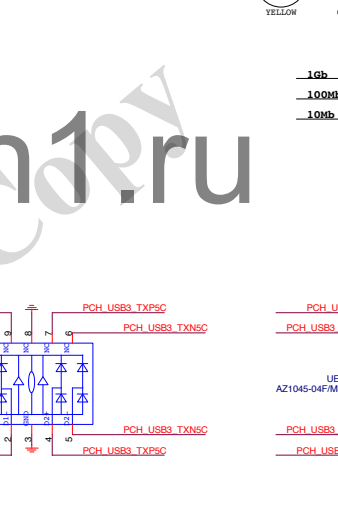
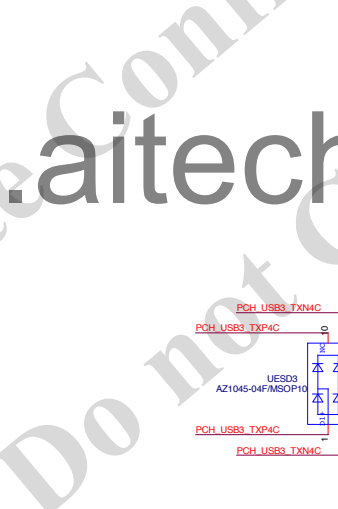
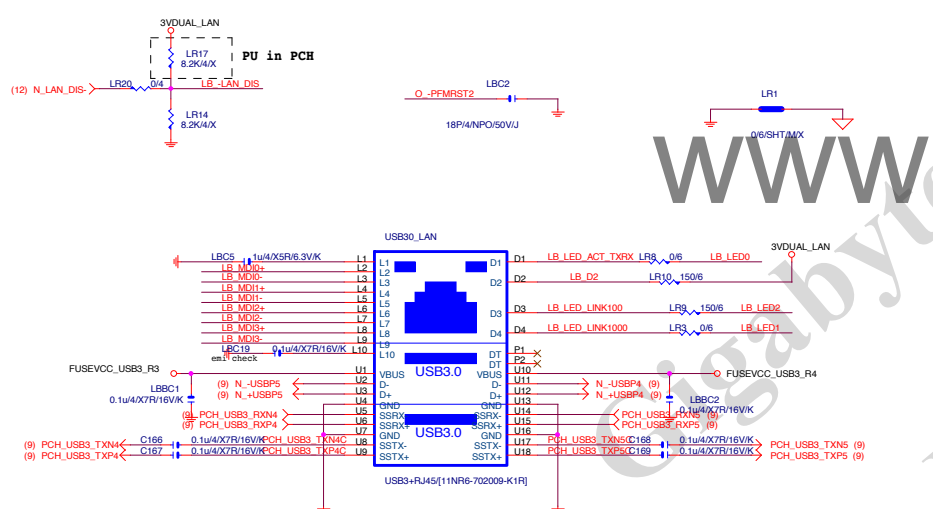
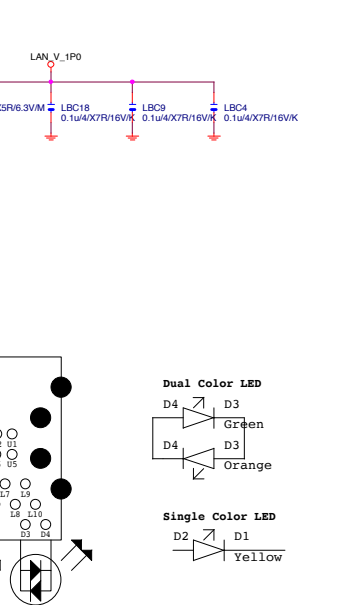
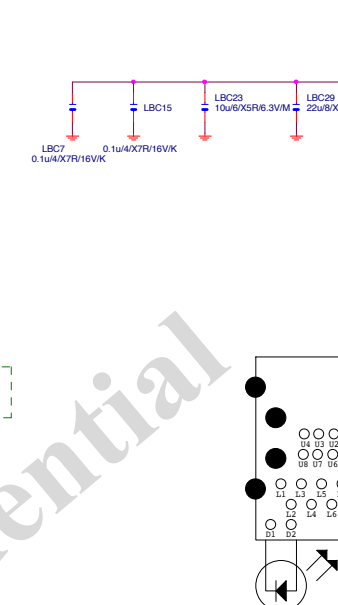
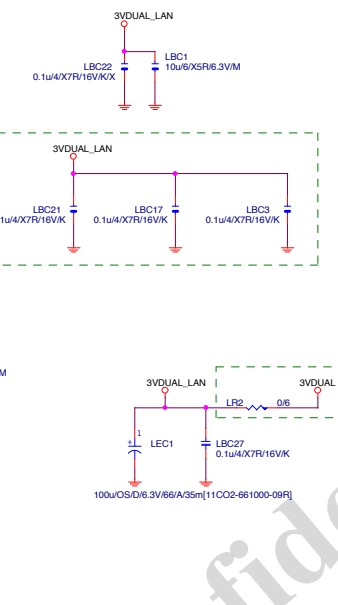
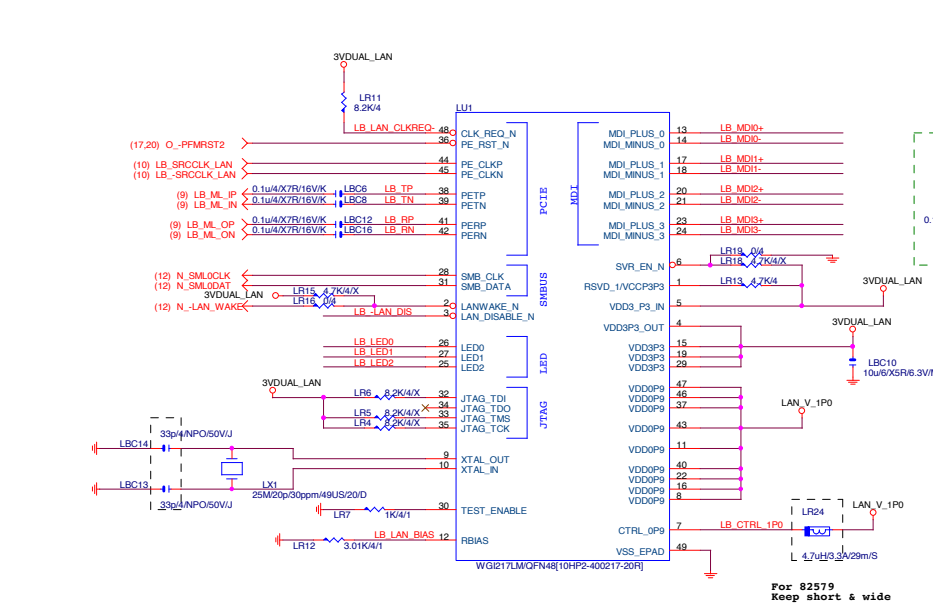


## AZALIA FRONT PANEL

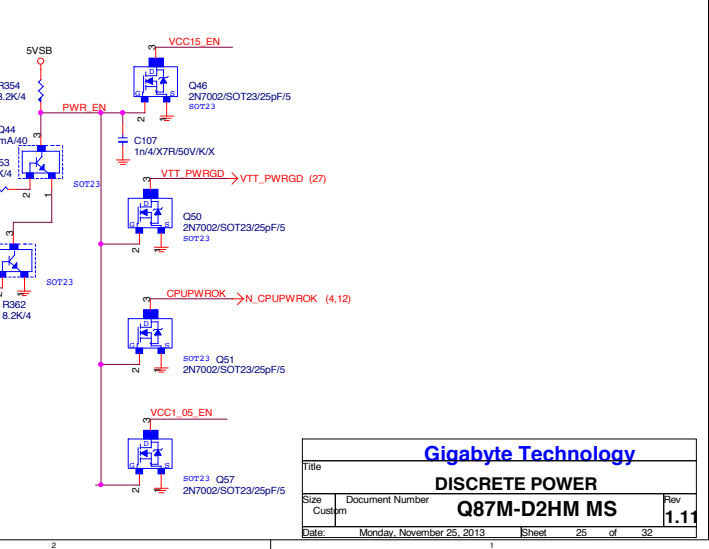
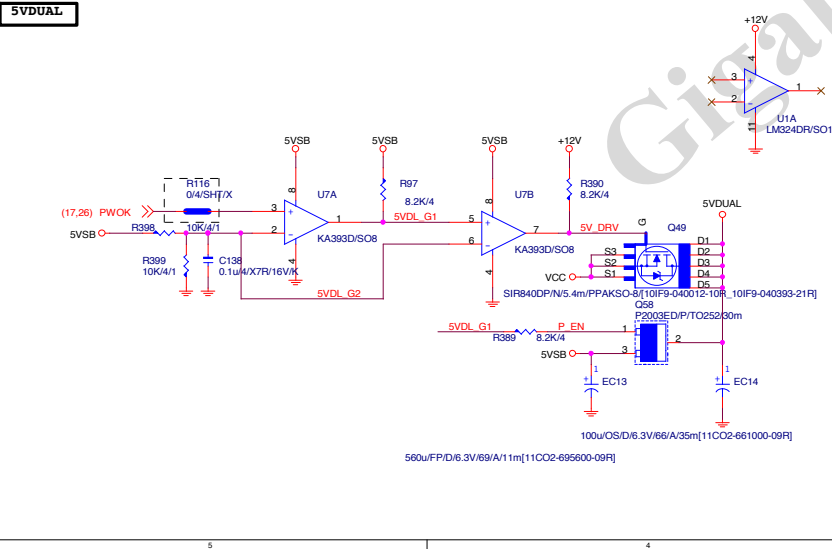
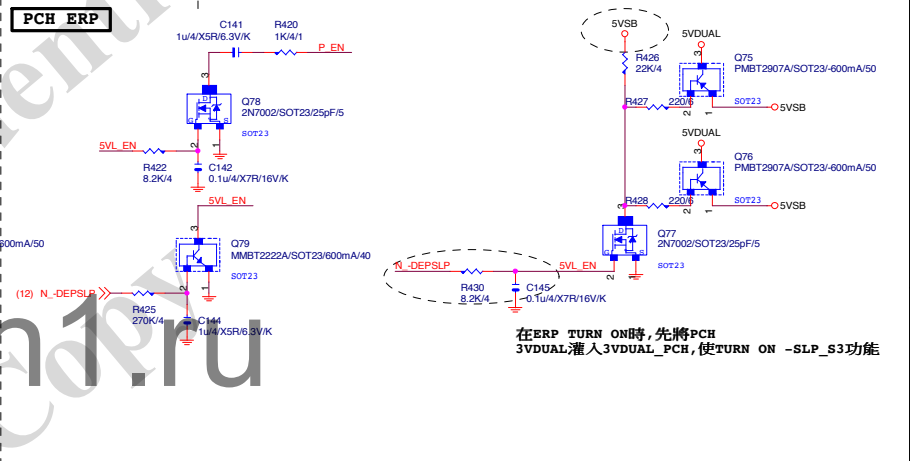
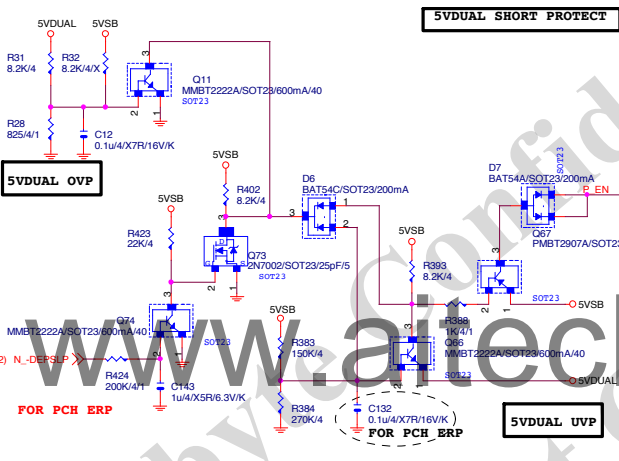
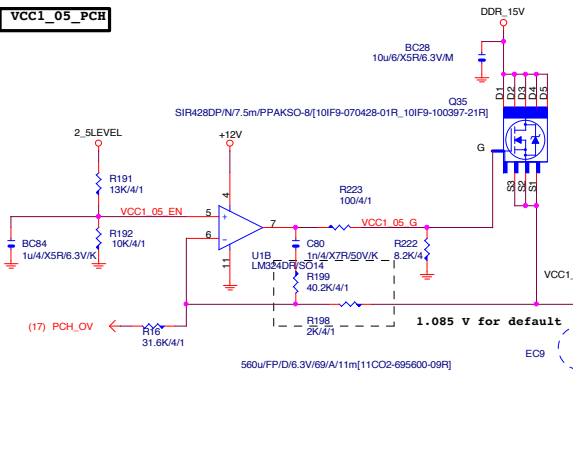
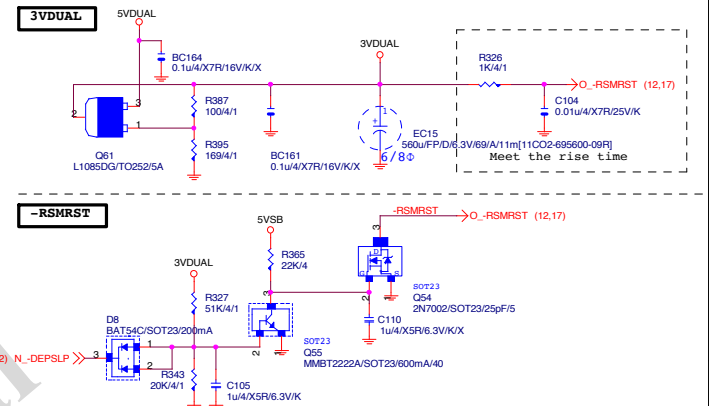
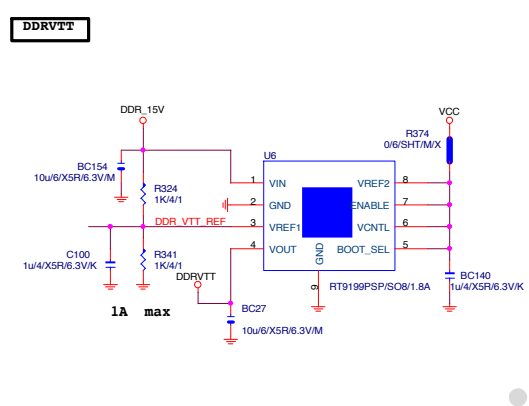
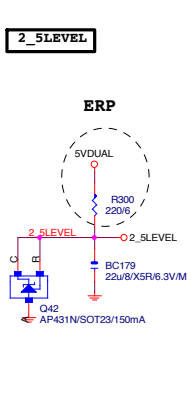
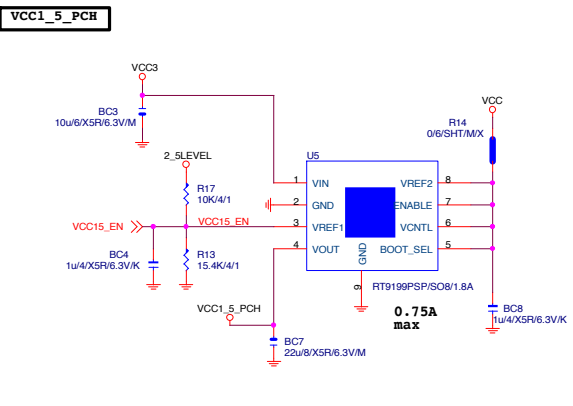


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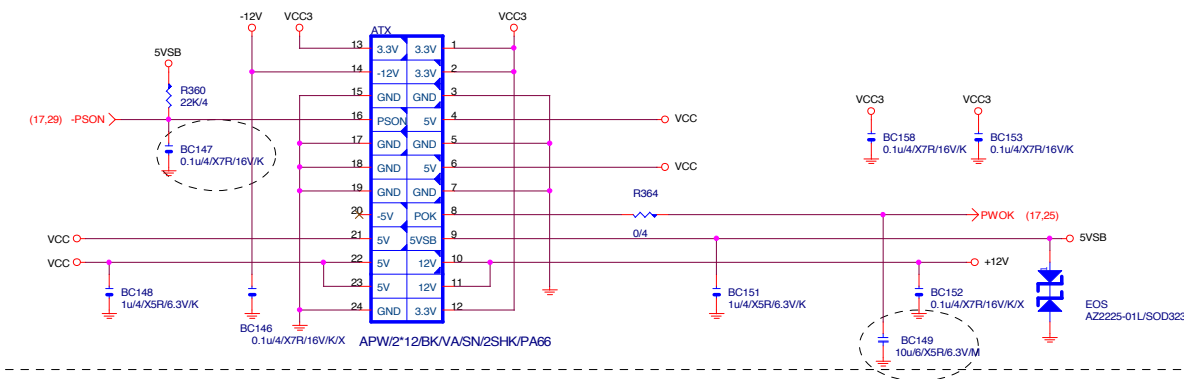
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AUDIO JACK		
Size	Document Number	Rev
Custom	Q87M-D2HM MS	1.11
Date:	Monday, November 25, 2013	Sheet 23 of 32



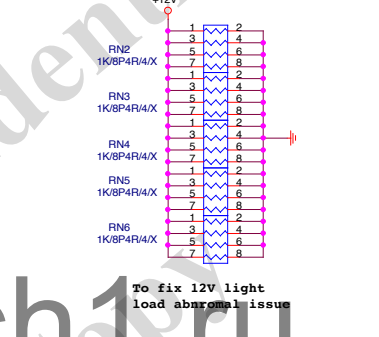
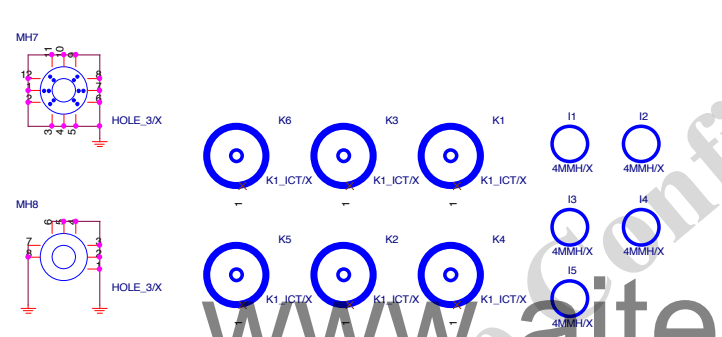
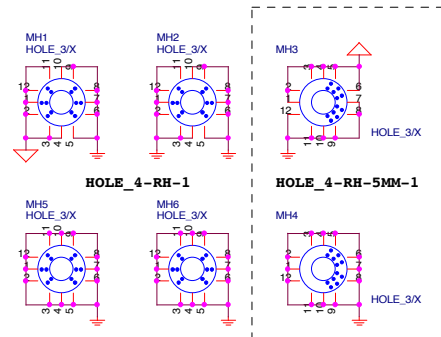
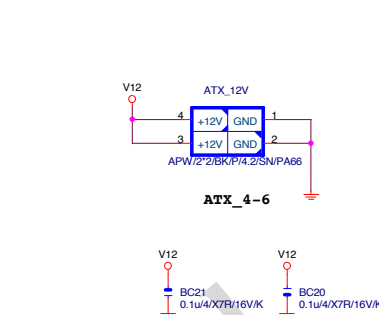
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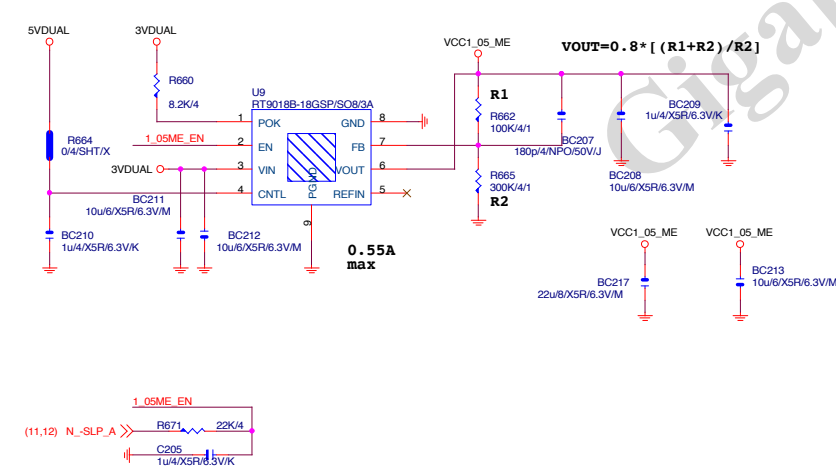
# ATXX24 POWER CONNECTOR



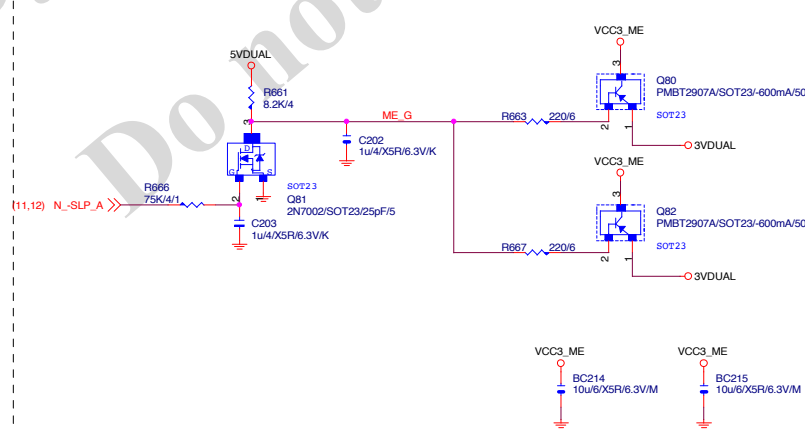
# ATXX4 POWER CONNECTOR



# VCC1\_05\_ME

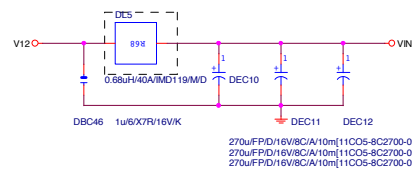
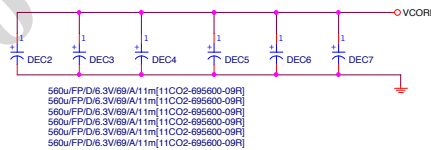
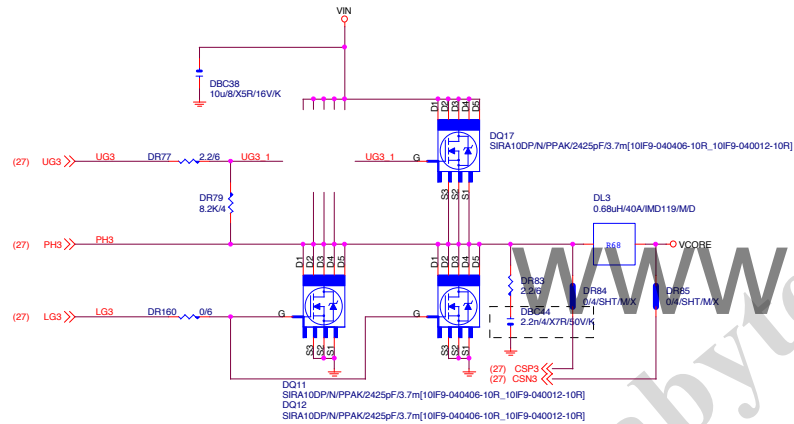
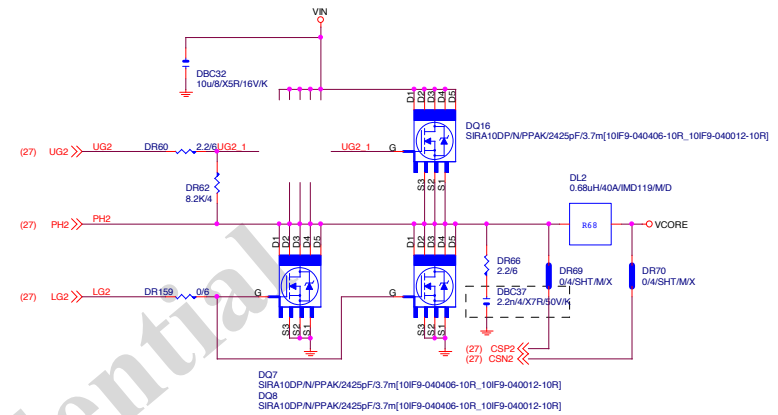
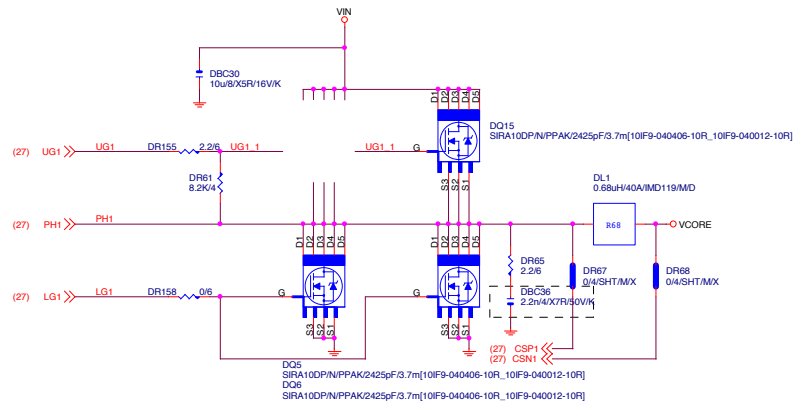


# VCC3\_ME










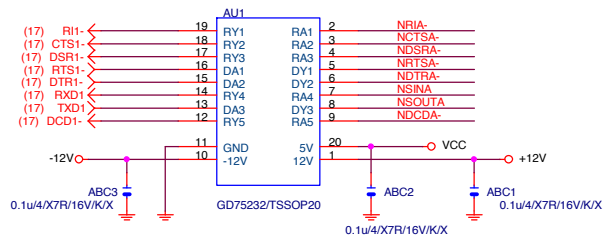
Gigabyte Technology

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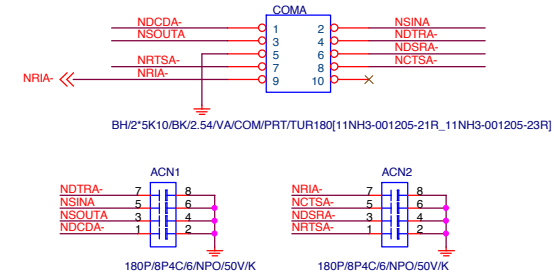
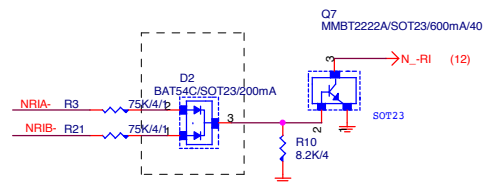
[illegible]
$$\begin{aligned} \text{Rocset} &= (\text{Iocp} * \text{Lgate}, \text{rdson}) / \text{Iocset} \\ \text{Rocset} &= (45\text{A} * 6.7\text{mOhm}) / 10\text{uA} = 30\text{K} \\ \text{Iocset} &= 10\text{uA} \end{aligned}$$

<div style="text-align: center;">  </div>			
Title			
DDR POWER			
Size	Document Number	Rev	
Custom	<b>Q87M-D2HM MS</b>	<b>1.11</b>	
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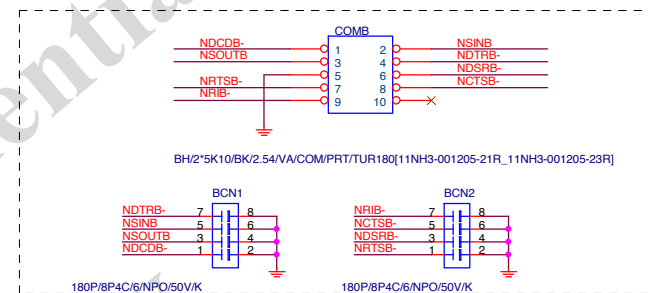
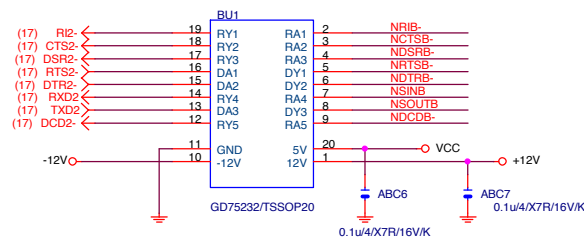
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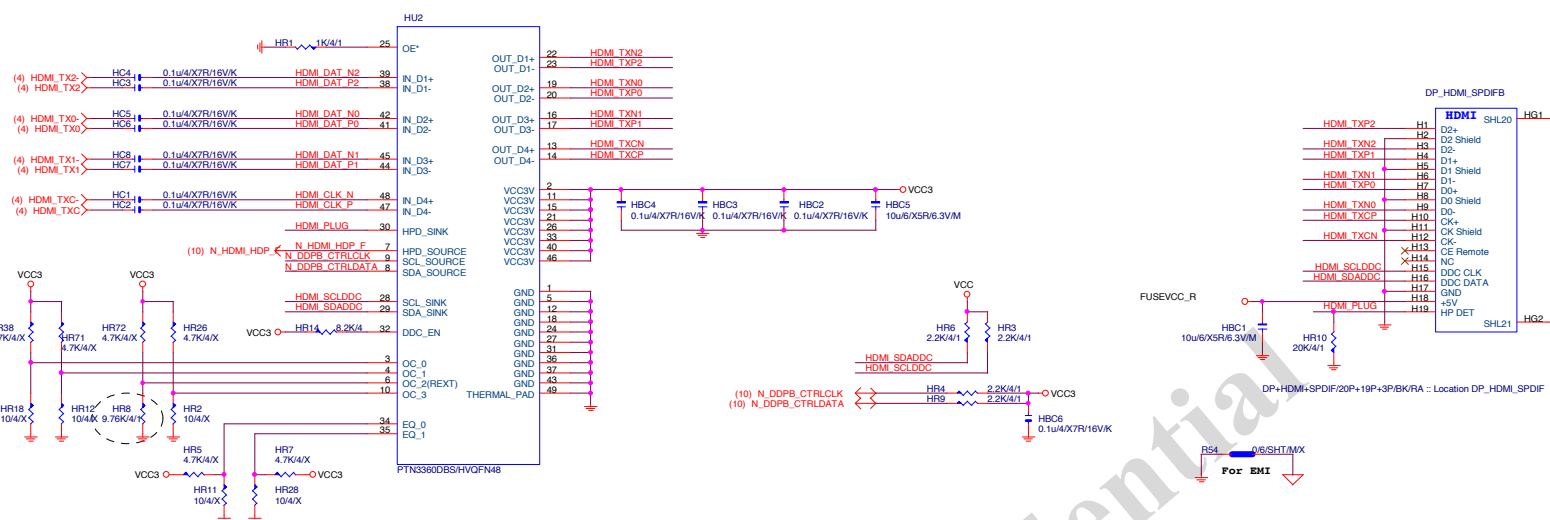
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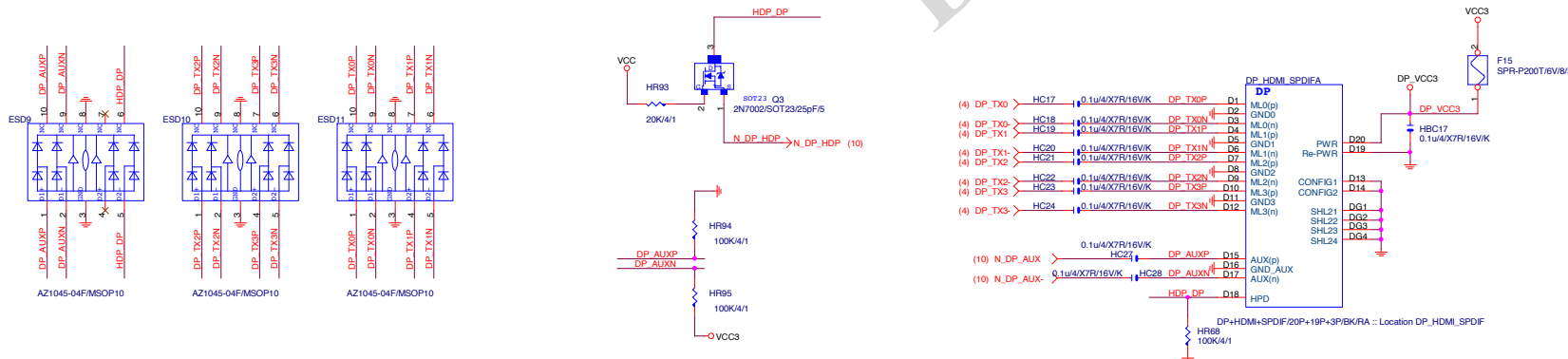
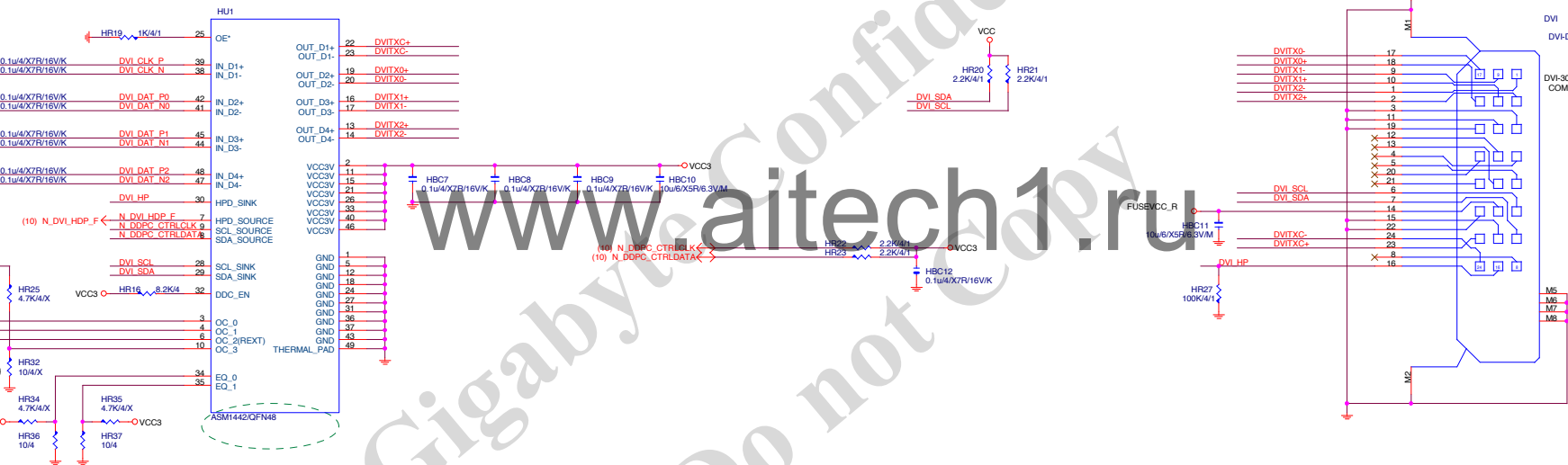
## COMB



# HDMI LEVEL SHIFT

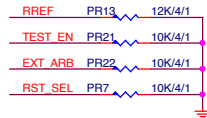
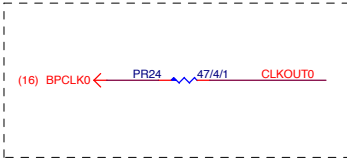
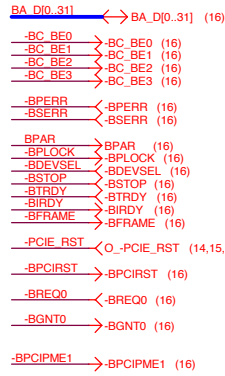


# DVI LEVEL SHIFT



# PCIE TO PCI

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

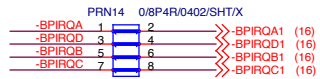


High: Enable PCI CLK 66MHz  
Low: Disable PCI CLK 66MHz



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

IT8892

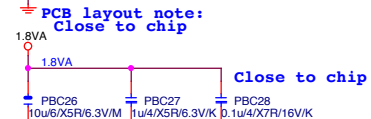
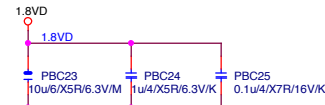
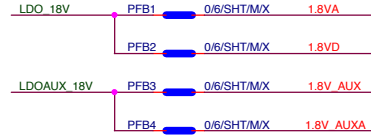
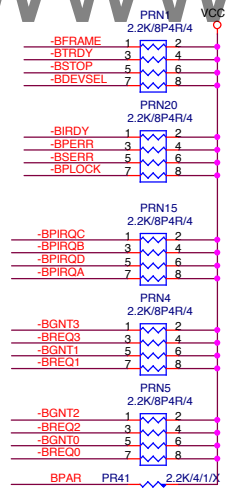
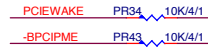


PCI slot

PCI slot

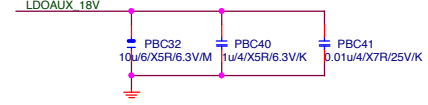
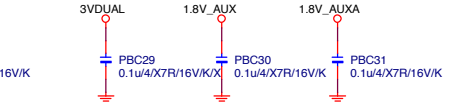
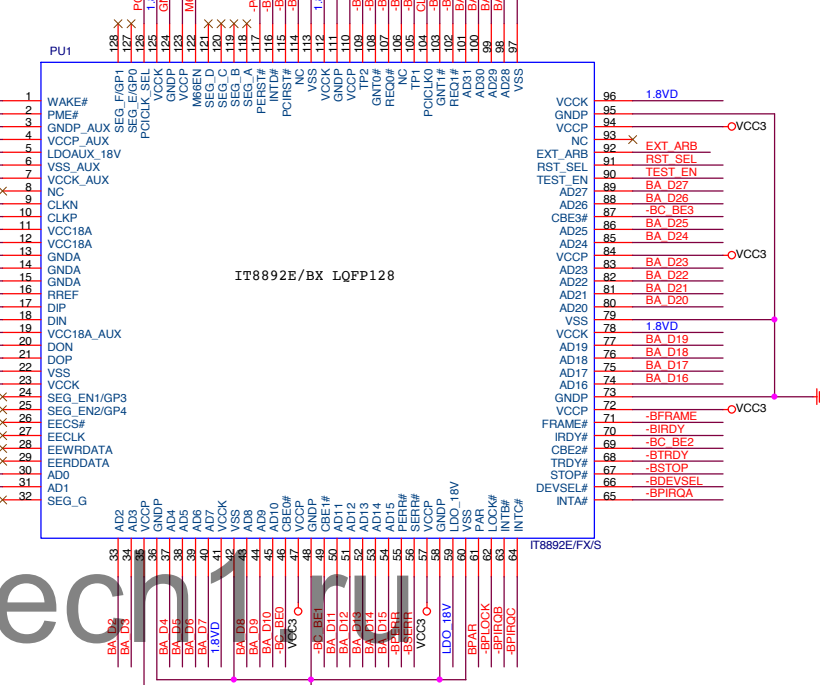


chipset side



PCB layout note:  
Close to chip

Close to chip



PCB layout note:  
Close to chip

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