

Model Name: GA-H77N-WIFI

Revision 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	ITE 8728 LPC IO
16	COM,KB_USB30
17	HWM,FAN CTRL,OV,-PROCHOT
18	DUAL BIOS
19	FP,FUSB,SPK,SATALED
20	Realtek ALC892
21	REAR AUDIO JACK
22	Realtek RT8111E / RT8111F (A)
23	Realtek RT8111E / RT8111F (B)
24	DISCRETE POWER
25	ATX,CLK GEN
26	RT8120_CPU_VTT
27	RT8120_DDR POWER

SHEET

TITLE

28	VCORE ISL95836_1
29	VCORE ISL95836_2
30	DVI-I
31	HDMI * 2
32	mini PCI-E

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Gigabyte Technology

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Cover Sheet			
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Model Name: GA-H77N-WIFI

Revision 1.01

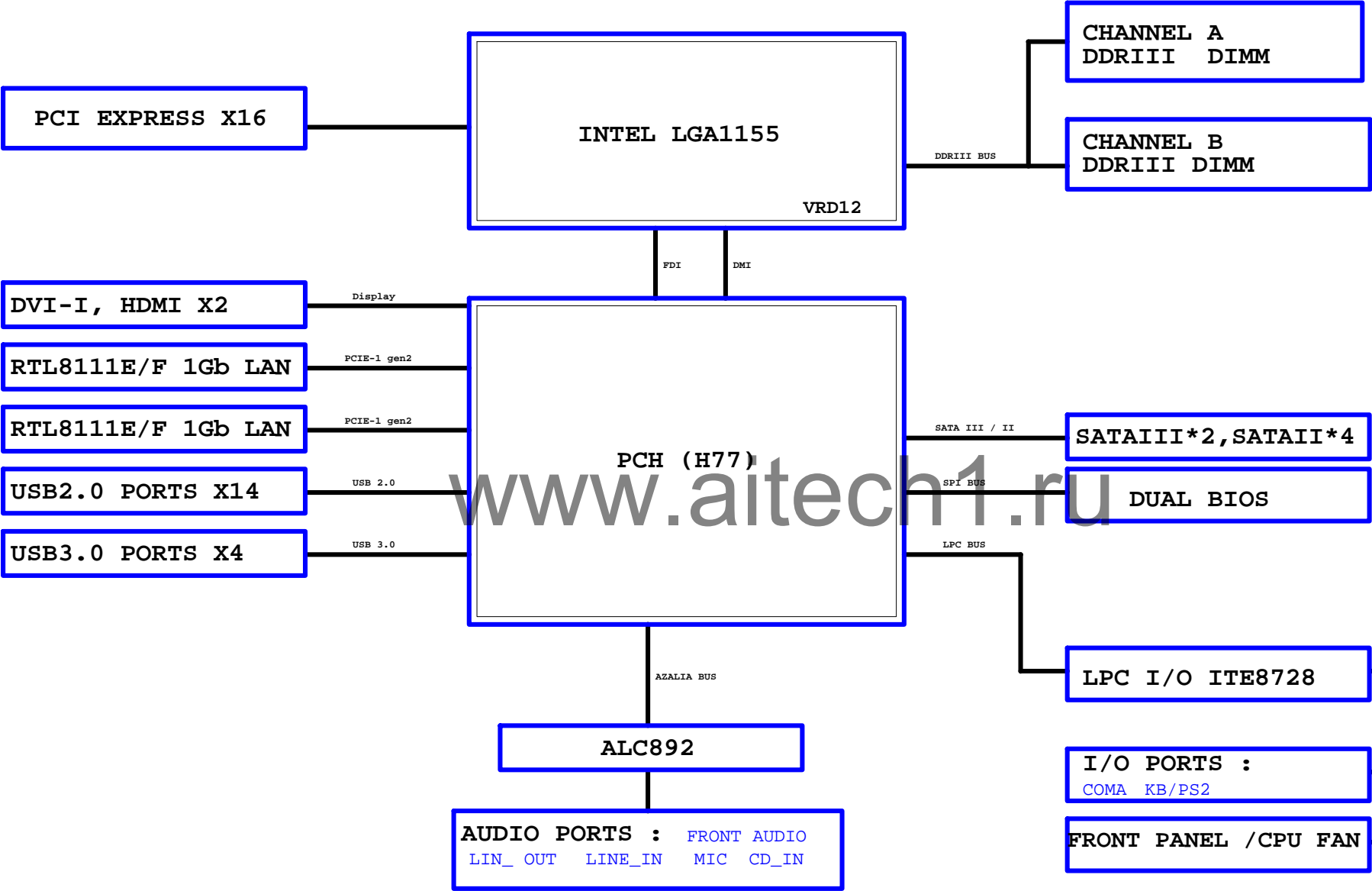
Circuit or PCB layout change

Component value change history

2012/10/23

[illegible][illegible]

BLOCK DIAGRAM



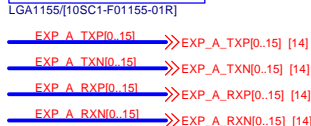
LGA1155E



LGA1155D



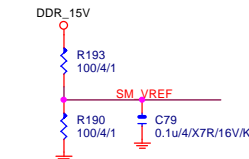
(c)



-CPURST



SM REF



Title				CPU LGA1155-A			
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(A)



1 OF 1

(B)

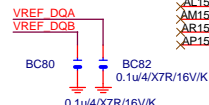


(CR)

C

ILM_BP/1156/BKNI/[12KRC-0F0001-23R

Timing diagram for VREF_DQB and VREF_DQA signals. The diagram shows two signals, VREF_DQB and VREF_DQA, with their respective clock signals, AN21 and AN29. The signals are shown as red lines, and the clock signals are shown as blue lines. The diagram is overlaid on a large watermark reading 'www.aitech1.ru'.



Gigabyte Technology

CPU LGA1156-B

Title			
CPU LGA1156-B			
Size	Document Number		Rev
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LGA1155



LGA1155/[10SC1-F01155-01R]

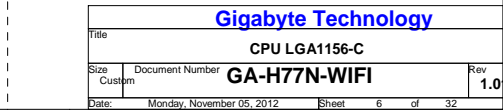
POWER OF 10

LGA1155



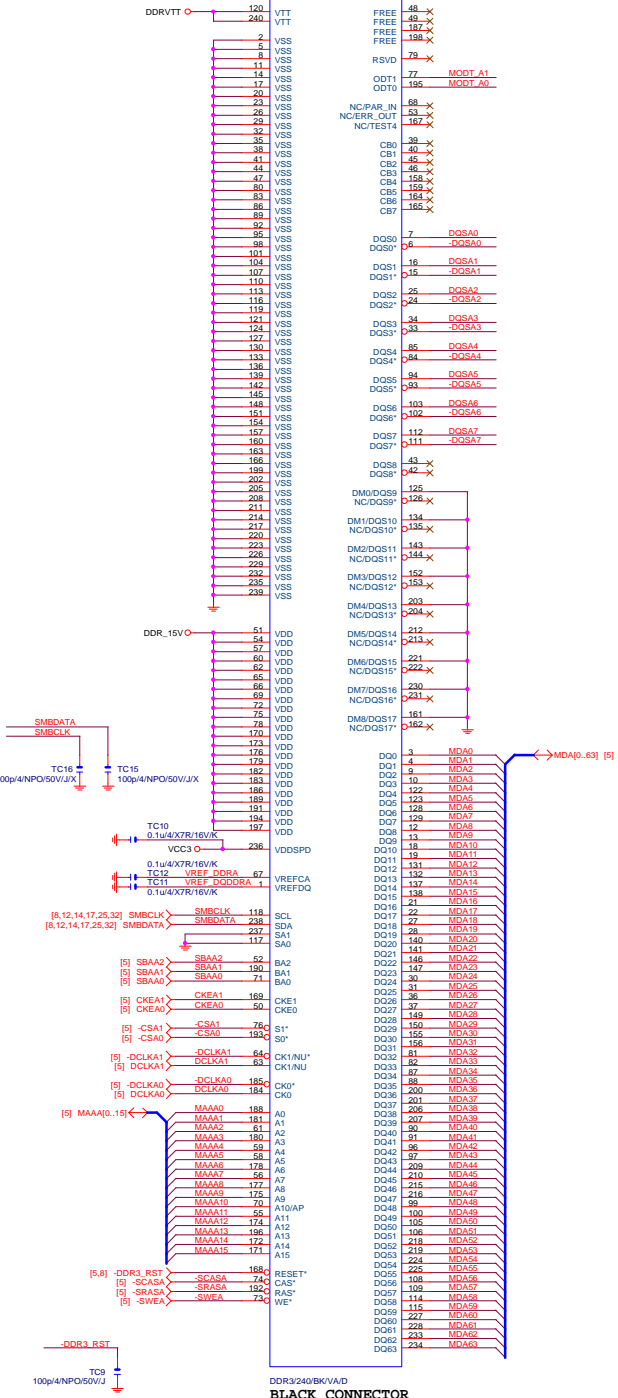
LGA1155/[10SC1-F01155-01R]

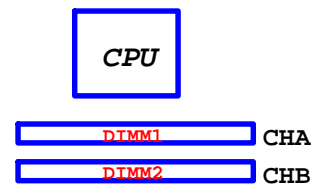
CAP



DDR3

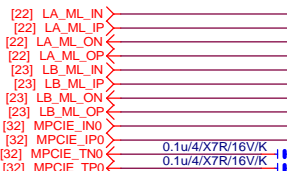
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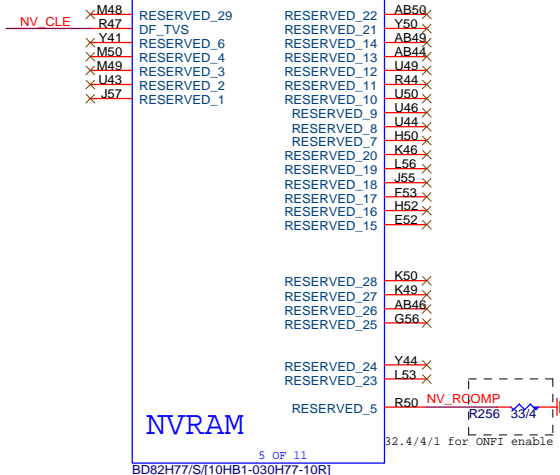


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Title			
DDRIII CHANNEL B			
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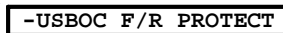
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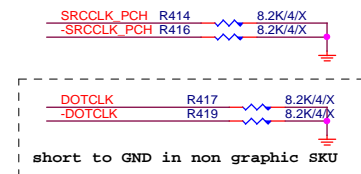
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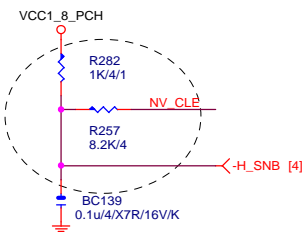
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PCH CLK PD




NVRAM PU



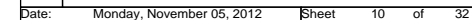
USB TABLE

USB OC#	Configure
OC0#	USB0,1(F_USB30)
OC1#	USB2,3(USB30_LAN)
OC2#	USB4,5(F_USB1)
OC3#	USB6,7(B75:N/A)
OC4#	USB8,9(USB_LAN)
OC5#	USB10,11(KB_USB)
OC6#	USB12(mini PCI-E)
OC7#	N/A

Gigabyte Technology

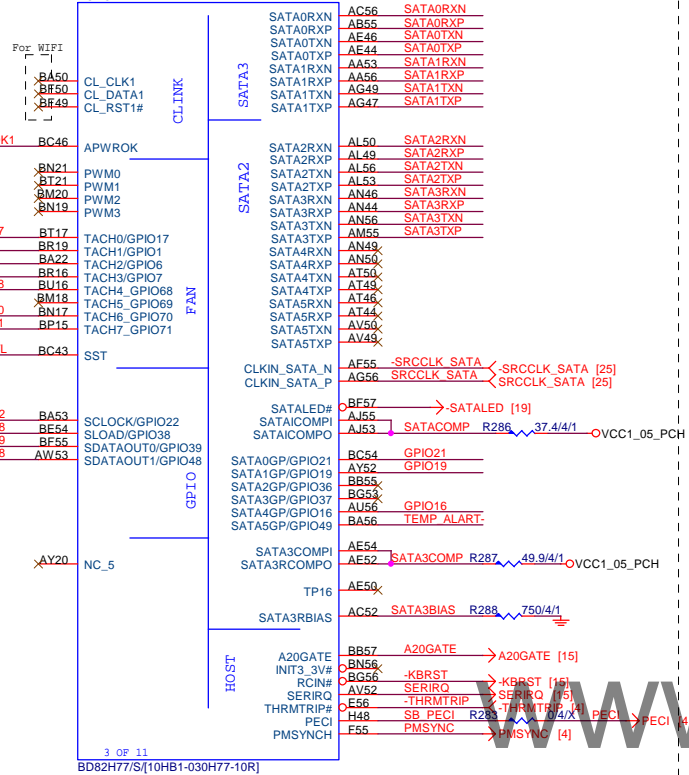
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PCH FDI,DMI,USB ,PCIE,NVRAM			
Size	Document Number	Rev	
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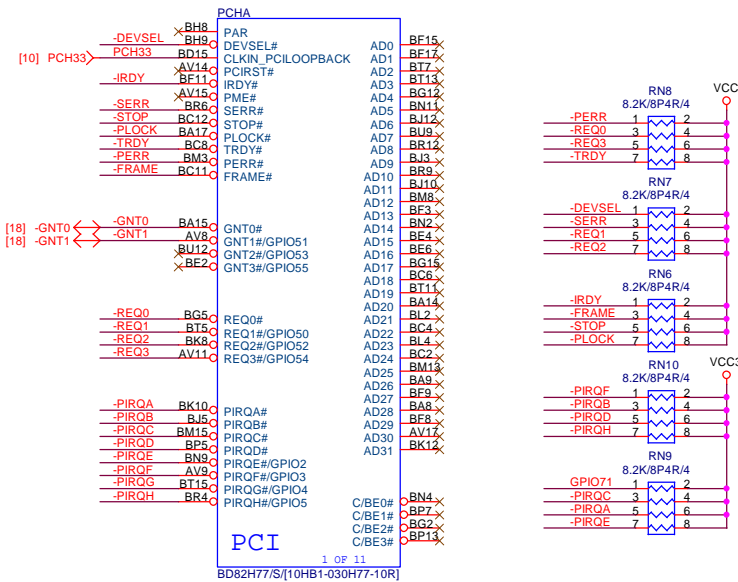


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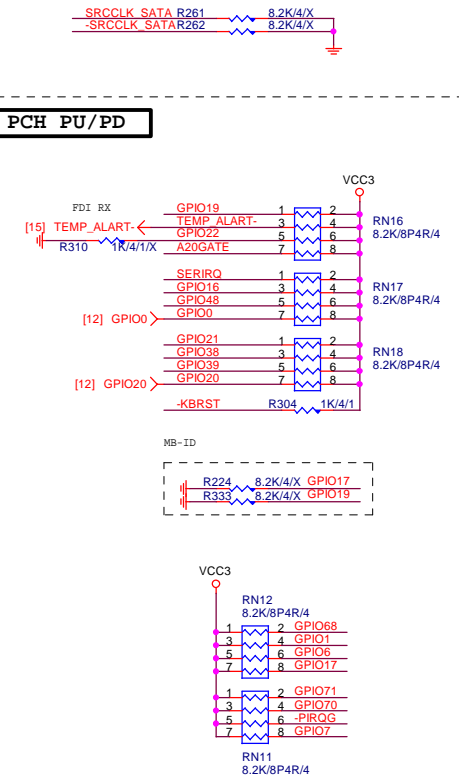
PCHC



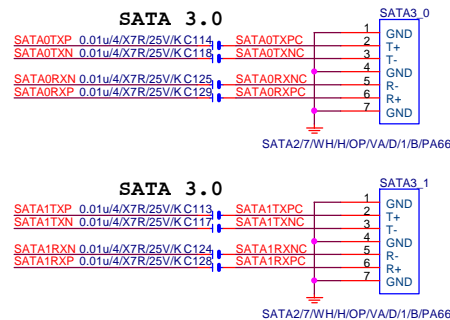
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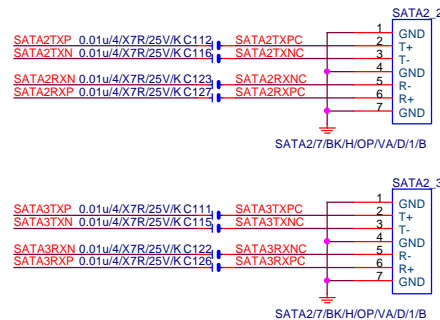
PCH	PU/PD
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WHITE CONNECTOR



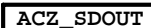
BLACK CONNECTOR



(D)

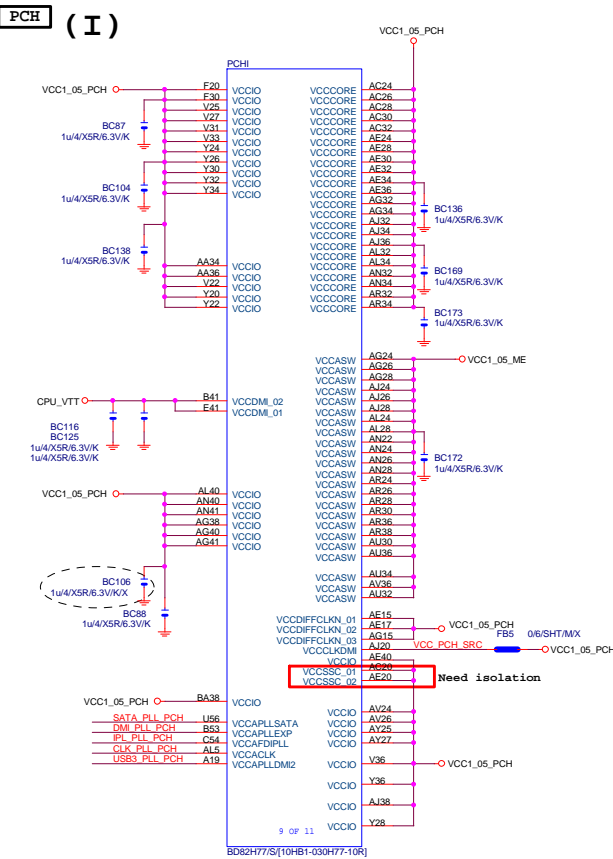


32.768KHZ

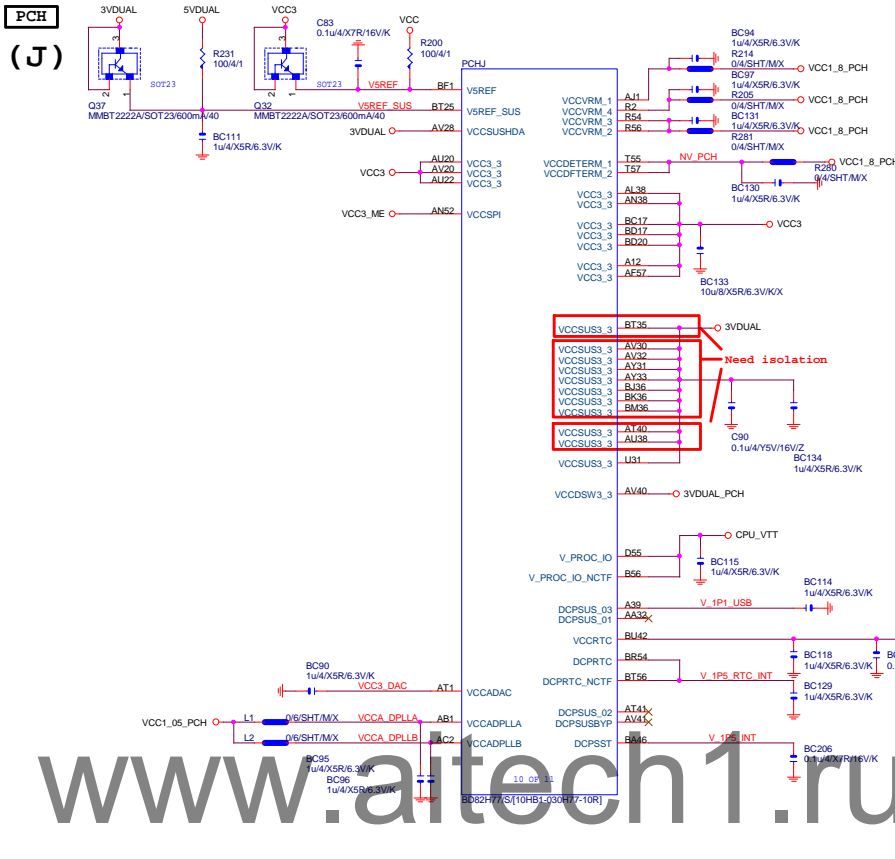


Title			
PCH GPIO , CTRL , AUDIO			
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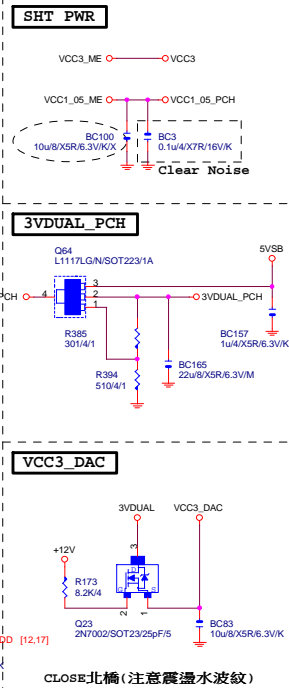
PCH (I)



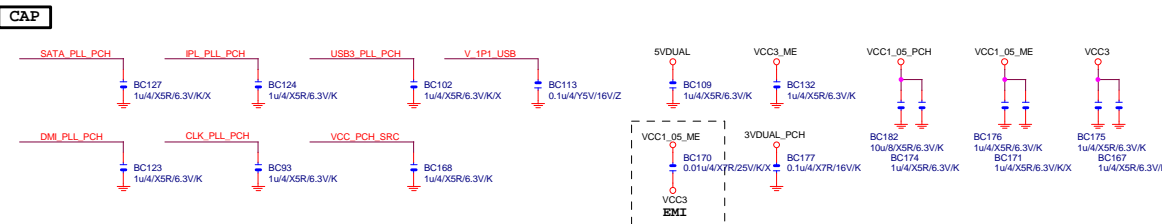
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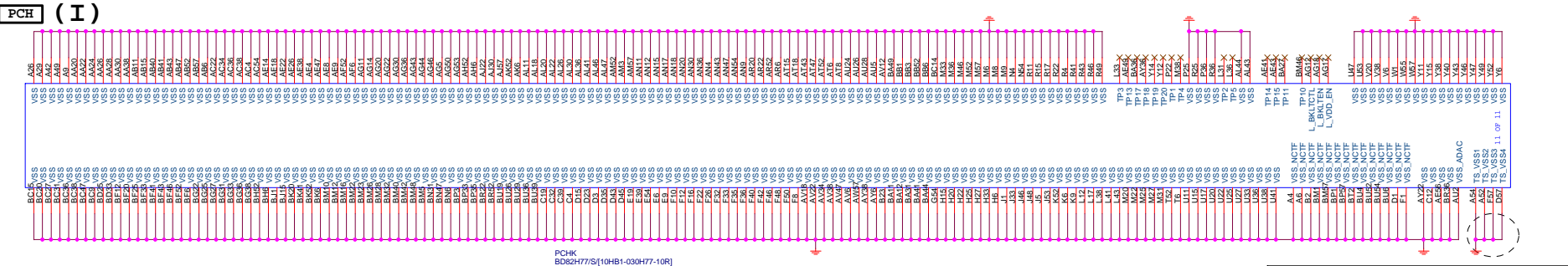
SHT	PWR
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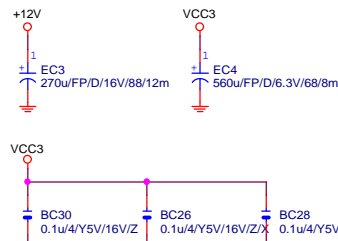
CAP



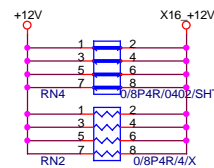
PCH (I)



PCIEX16 CAP



PCIEX16 PROTECT SHT



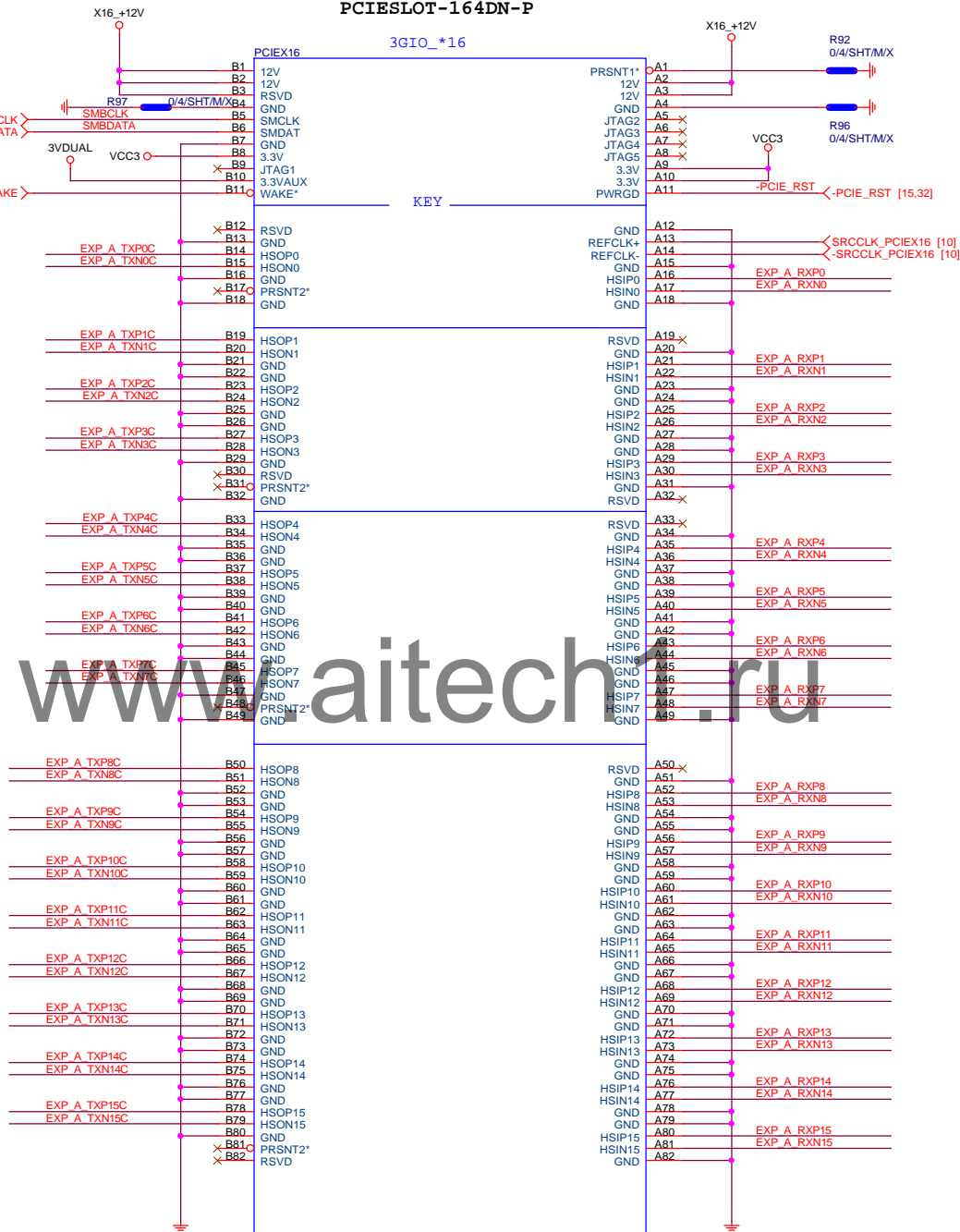
PCIEX16 AC CAP

EXP A TXP0	C32	0.22u/4X5R/6.3V/K	EXP A TXP0C
EXP A TXN0	C30	0.22u/4X5R/6.3V/K	EXP A TXN0C
EXP A TXP1	C35	0.22u/4X5R/6.3V/K	EXP A TXP1C
EXP A TXN1	C37	0.22u/4X5R/6.3V/K	EXP A TXN1C
EXP A TXP2	C39	0.22u/4X5R/6.3V/K	EXP A TXP2C
EXP A TXN2	C41	0.22u/4X5R/6.3V/K	EXP A TXN2C
EXP A TXP3	C43	0.22u/4X5R/6.3V/K	EXP A TXP3C
EXP A TXN3	C45	0.22u/4X5R/6.3V/K	EXP A TXN3C
EXP A TXP4	C46	0.22u/4X5R/6.3V/K	EXP A TXP4C
EXP A TXN4	C49	0.22u/4X5R/6.3V/K	EXP A TXN4C
EXP A TXP5	C50	0.22u/4X5R/6.3V/K	EXP A TXP5C
EXP A TXN5	C51	0.22u/4X5R/6.3V/K	EXP A TXN5C
EXP A TXP6	C52	0.22u/4X5R/6.3V/K	EXP A TXP6C
EXP A TXN6	C54	0.22u/4X5R/6.3V/K	EXP A TXN6C
EXP A TXP7	C57	0.22u/4X5R/6.3V/K	EXP A TXP7C
EXP A TXN7	C58	0.22u/4X5R/6.3V/K	EXP A TXN7C
EXP A TXP8	C60	0.22u/4X5R/6.3V/K	EXP A TXP8C
EXP A TXN8	C61	0.22u/4X5R/6.3V/K	EXP A TXN8C
EXP A TXP9	C62	0.22u/4X5R/6.3V/K	EXP A TXP9C
EXP A TXN9	C63	0.22u/4X5R/6.3V/K	EXP A TXN9C
EXP A TXP10	C64	0.22u/4X5R/6.3V/K	EXP A TXP10C
EXP A TXN10	C65	0.22u/4X5R/6.3V/K	EXP A TXN10C
EXP A TXP11	C66	0.22u/4X5R/6.3V/K	EXP A TXP11C
EXP A TXN11	C67	0.22u/4X5R/6.3V/K	EXP A TXN11C
EXP A TXP12	C68	0.22u/4X5R/6.3V/K	EXP A TXP12C
EXP A TXN12	C70	0.22u/4X5R/6.3V/K	EXP A TXN12C
EXP A TXP13	C72	0.22u/4X5R/6.3V/K	EXP A TXP13C
EXP A TXN13	C73	0.22u/4X5R/6.3V/K	EXP A TXN13C
EXP A TXP14	C74	0.22u/4X5R/6.3V/K	EXP A TXP14C
EXP A TXN14	C75	0.22u/4X5R/6.3V/K	EXP A TXN14C
EXP A TXP15	C77	0.22u/4X5R/6.3V/K	EXP A TXP15C
EXP A TXN15	C78	0.22u/4X5R/6.3V/K	EXP A TXN15C

EXP A RXP0[0..15] >>> EXP_A_RXP[0..15] [4]
EXP A RXN0[0..15] >>> EXP_A_RXN[0..15] [4]
EXP A TXP0[0..15] >>> EXP_A_TXP[0..15] [4]
EXP A TXN0[0..15] >>> EXP_A_TXN[0..15] [4]

PCIEX16 SLOT

[7,8,12,17,25,32] SMBCLK
[7,8,12,17,25,32] SMBDATA
[12,22,23,32] -PCIE_WAKE



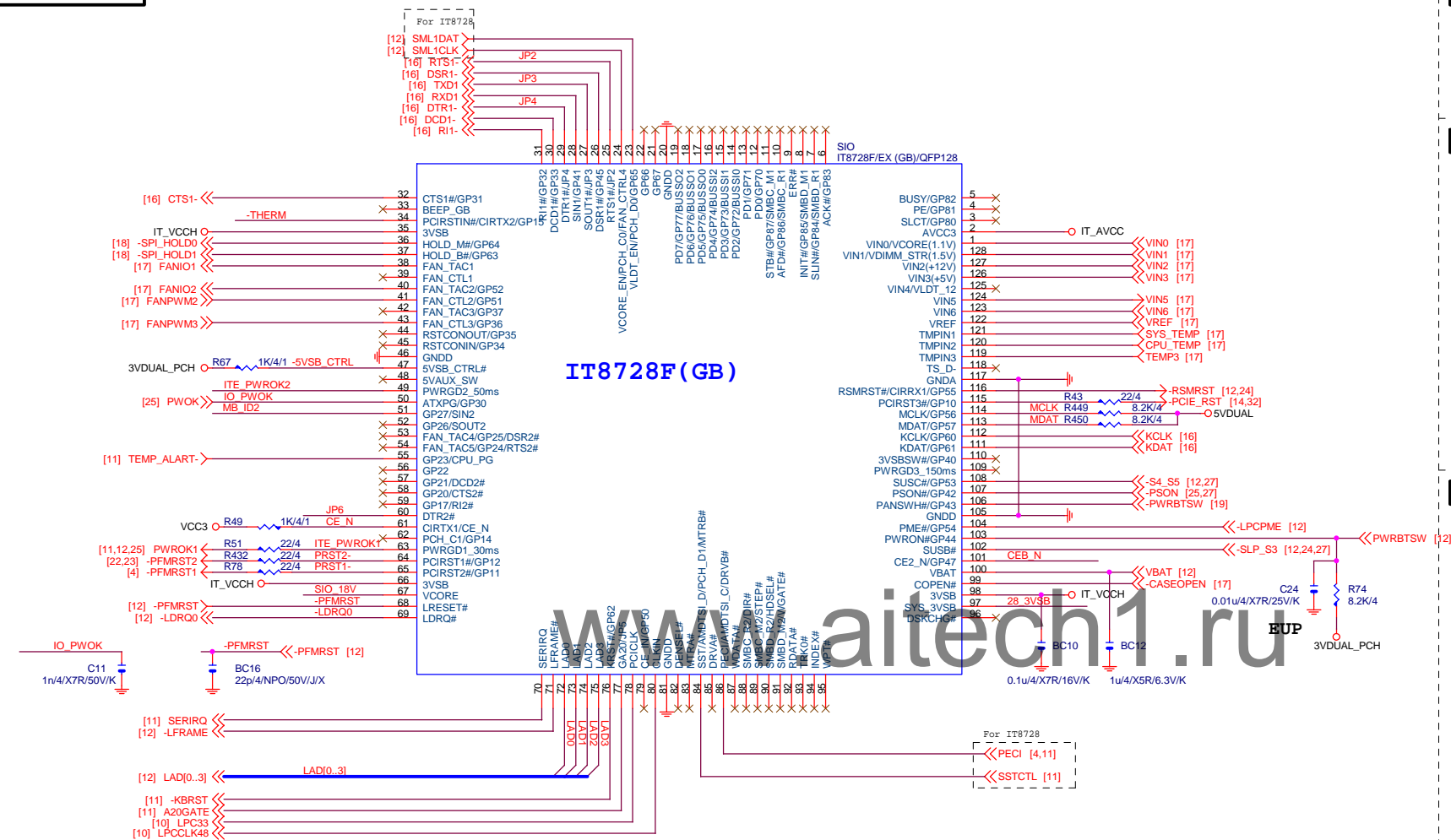
PCI-E/16X-164P/BK/RIGHT PUSH

BLACK CONNECTOR

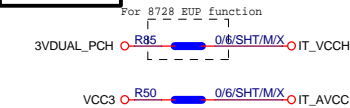
Gigabyte Technology

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Size			Document Number		
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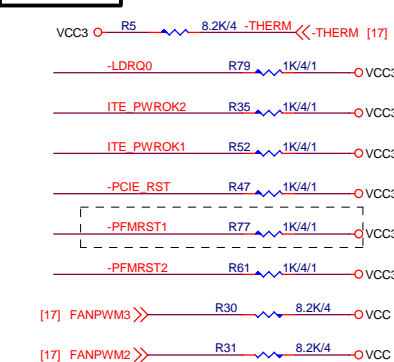
SIO IT8728F



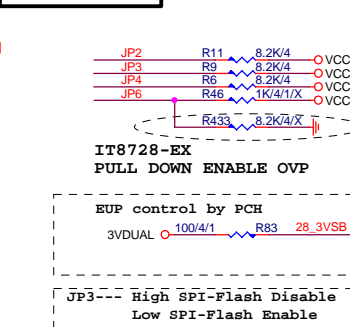
PWR SHT



SIO PU



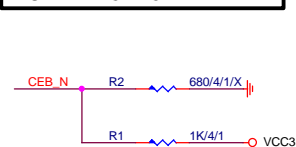
SIO STRAP



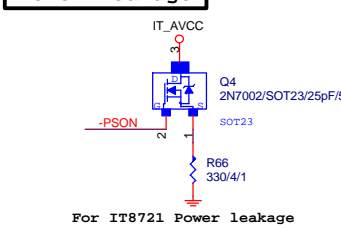
IT8728F NOTE

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_3VSB
PIN70	GP47
PIN95	VIN2 (VCC5)
PIN96	VIN1 (VCC12)
PIN97	VIN1/VDIMM_STR(1.5V)
PIN98	VIN0/VCORE(1.1V)/NC

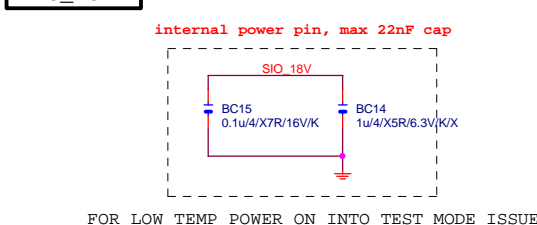
DUAL BIOS OPT STRAP



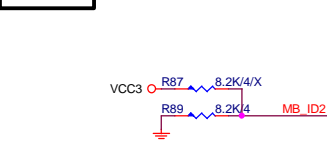
Power leakage



SIO_18V



MB ID



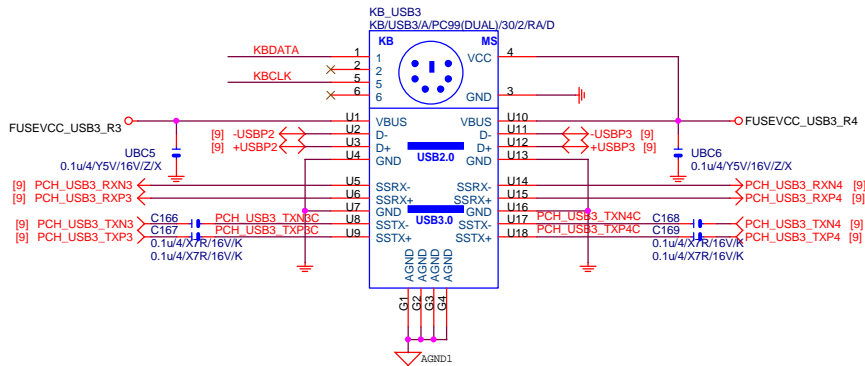
SIO CAP



Gigabyte Technology

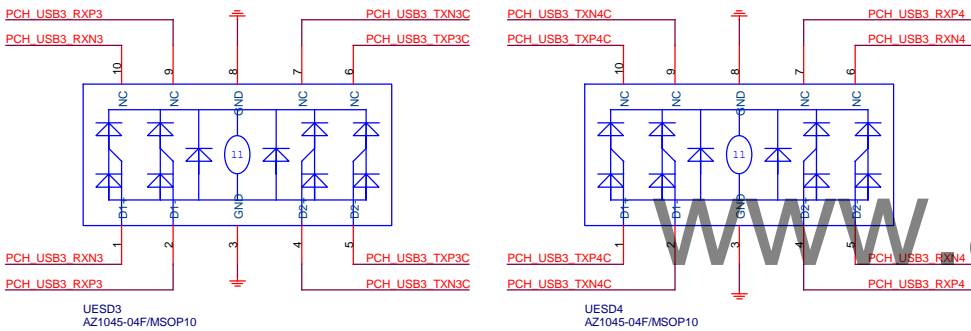
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Size	Document Number	GA-H77N-WIFI	
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KB/MS

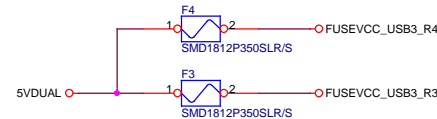


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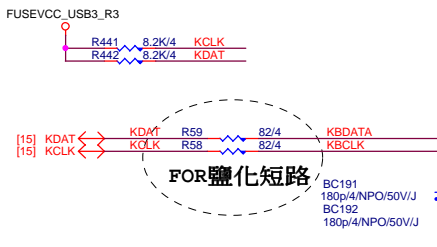
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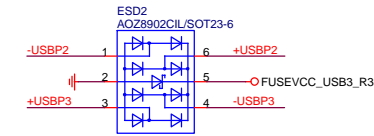
USB3.0 PWR



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



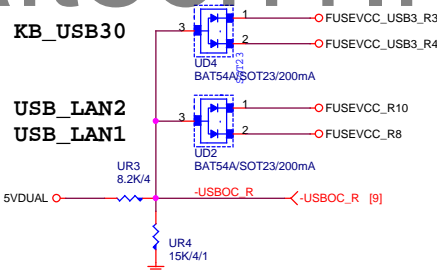
USB2.0 ESD



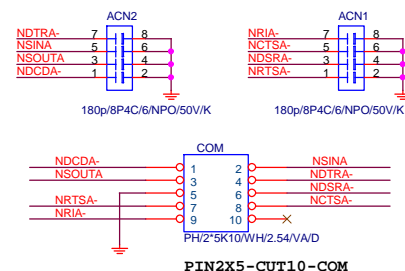
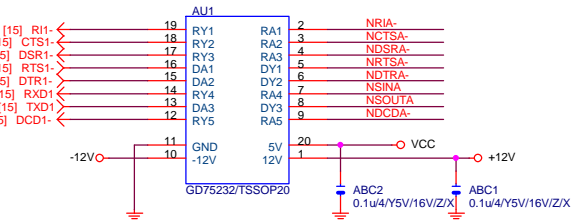
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KB_USB30

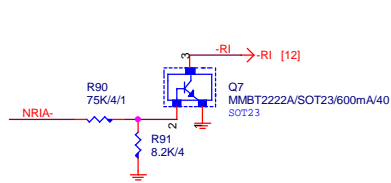
USB_LAN2 USB_LAN1



COM



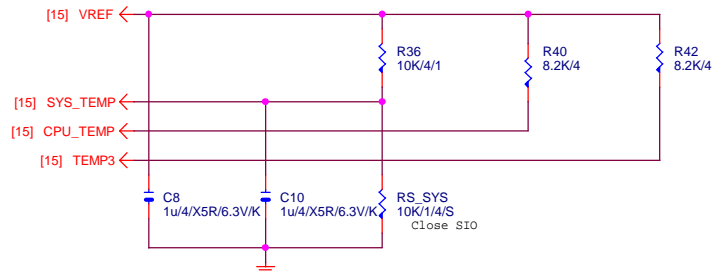
COM RI



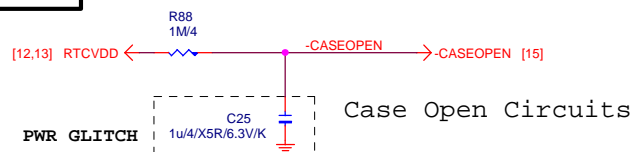
Gigabyte Technology

Title			COM,-RI,KB_USB,USB_ESATA,-PROCHOT		
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TEMP H/W MONITOR

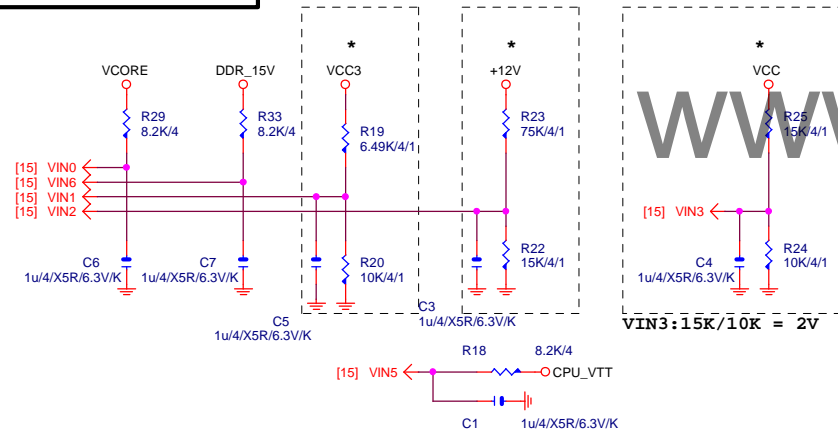


CASE OPEN

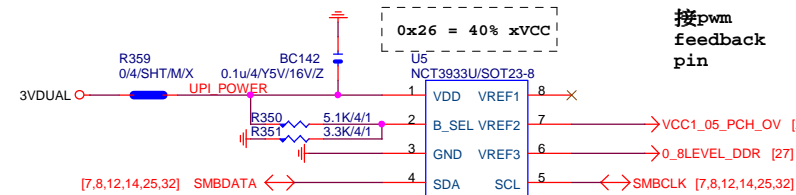


VOLTAGE-- H/W MONITOR

VIN2:75K/15K = 2V

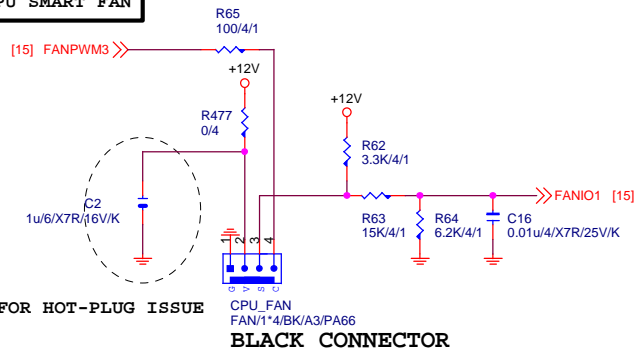


OV NCT3933

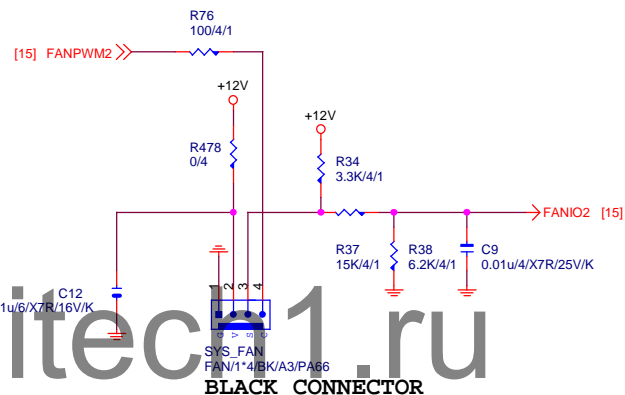


接pwm
feedback
pin

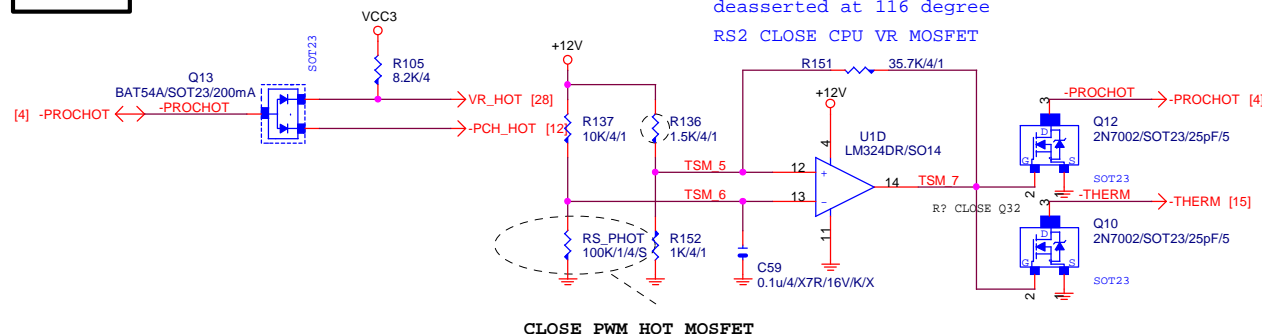
CPU SMART FAN



SYS SMART FAN



-PROHOT

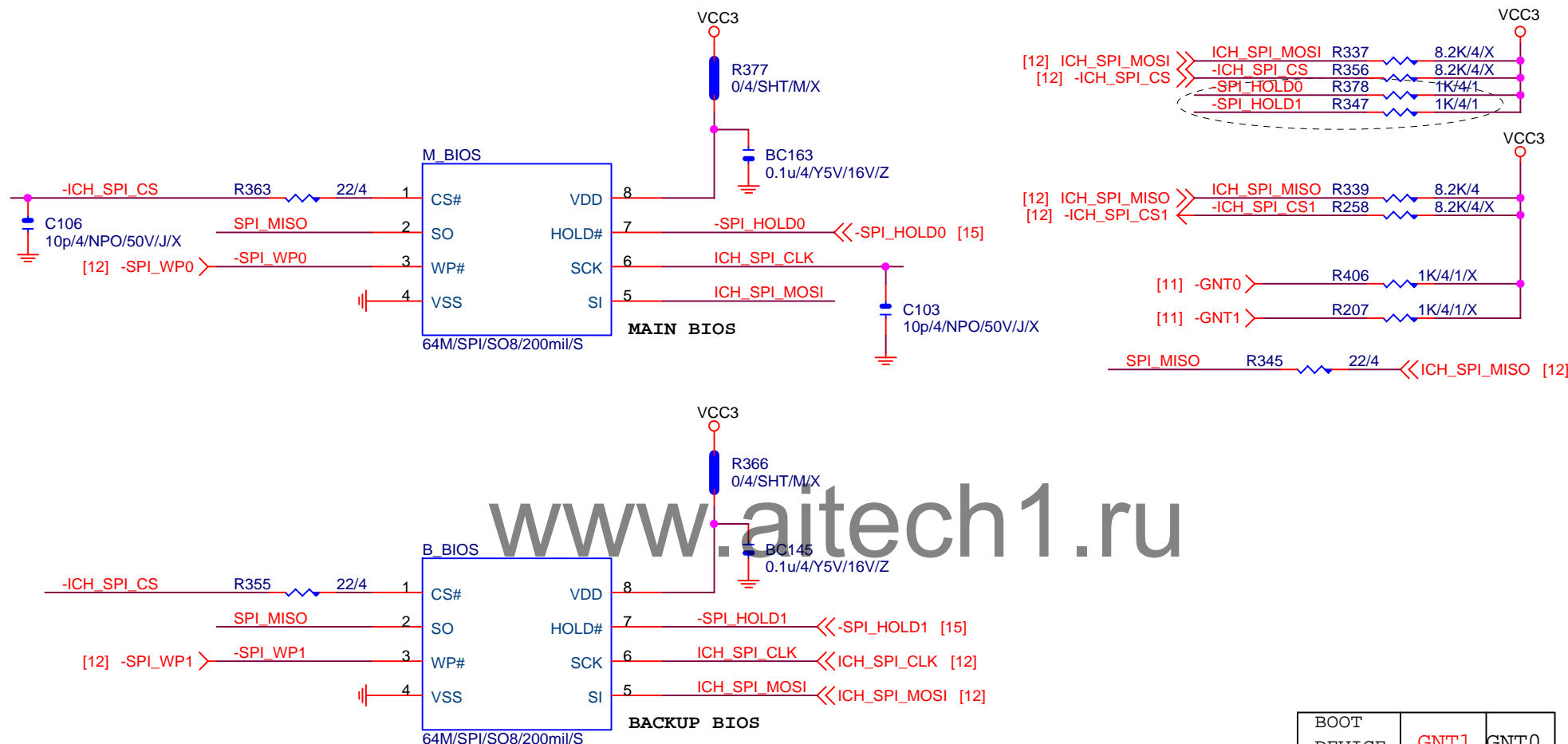


CLOSE PWM HOT MOSFET

Gigabyte Technology

Title		
HWM,FAN CTRL,OV		
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DUAL BIOS



B65使用64M BIOS
使用H67暫用32M
H61使用32M BIOS

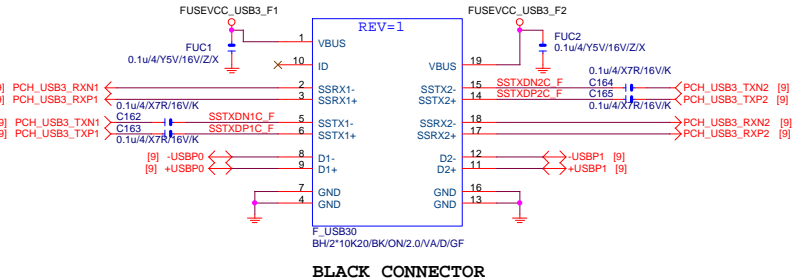
BOOT DEVICE	GNT1	GNT0
LPC	0	0
PCI	0	1
SPI	1	1

1 means floating
0 means PD 1K

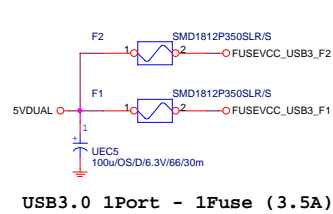
Gigabyte Technology

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DUAL BIOS		
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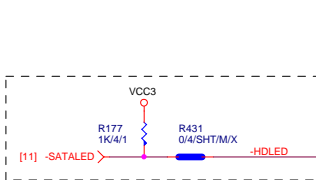
F_USB30



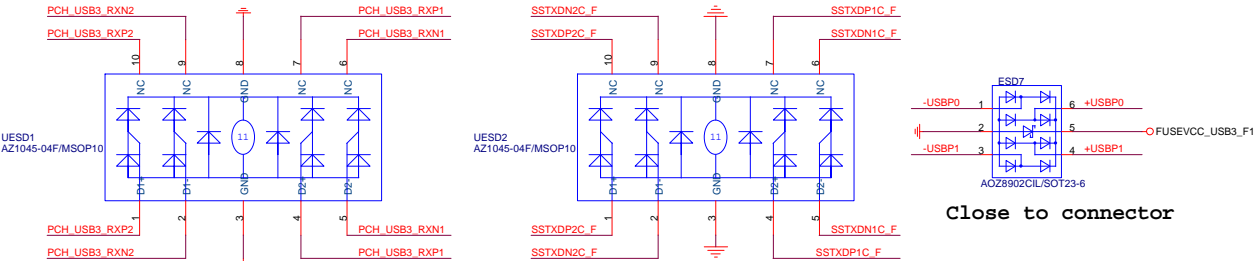
F_USB30 PWR



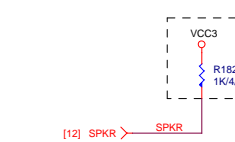
SATA LED



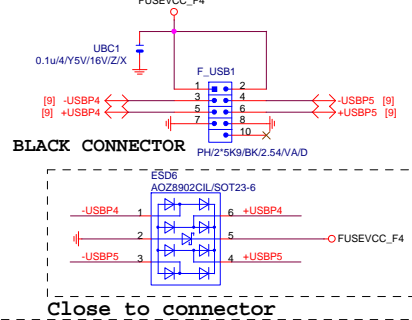
F_USB30 ESD PROTECT



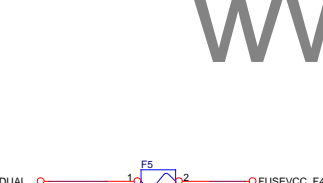
SPKR



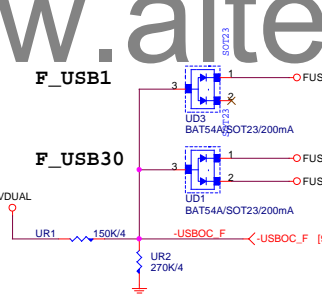
FRONT USB1



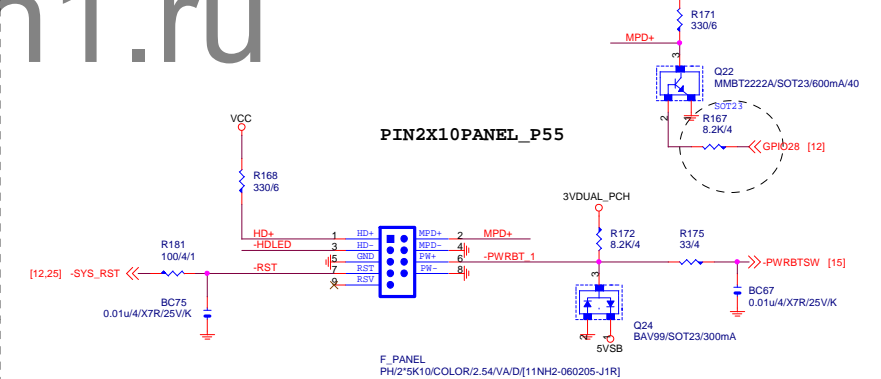
FUSEVCC_F



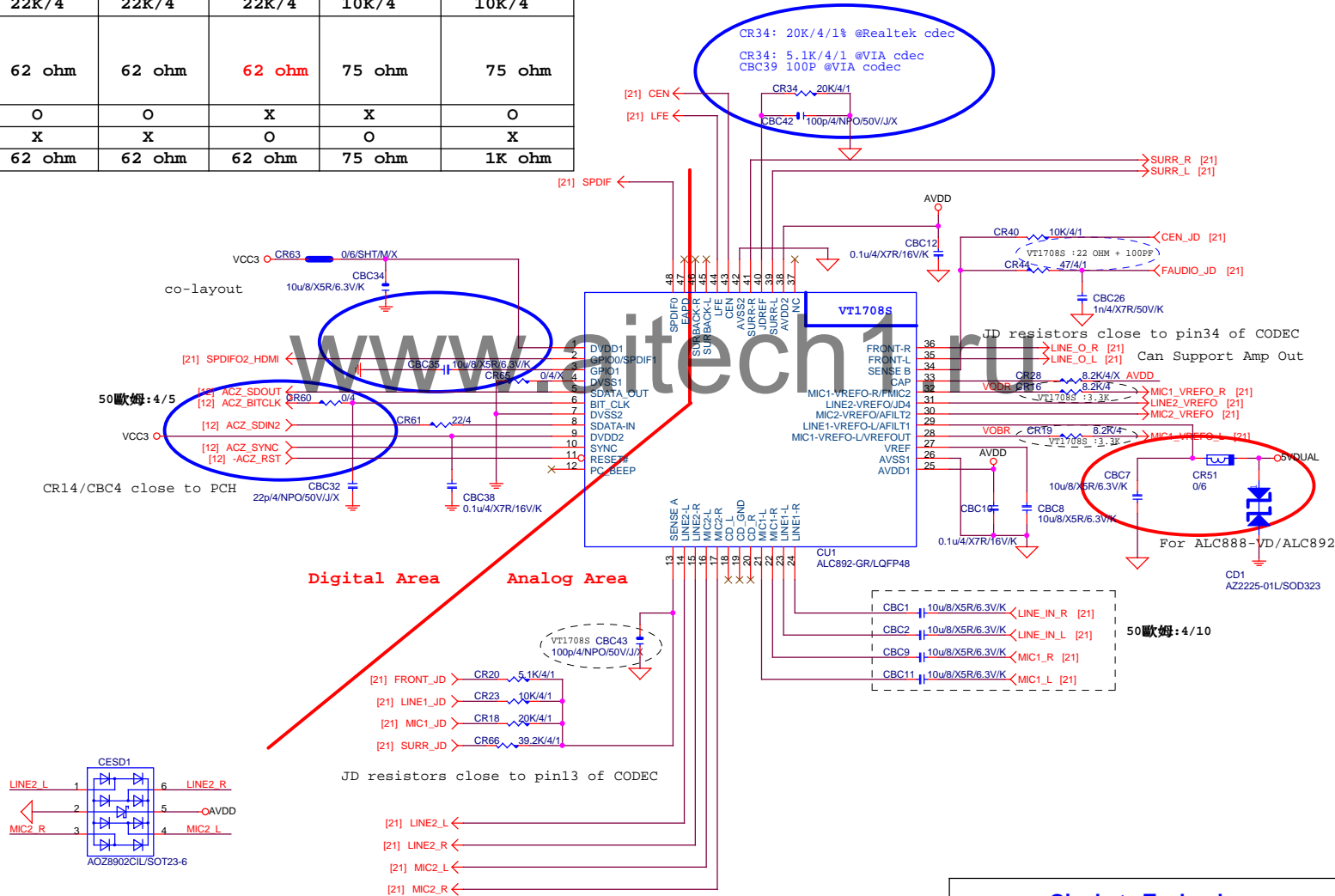
-USBOC_F

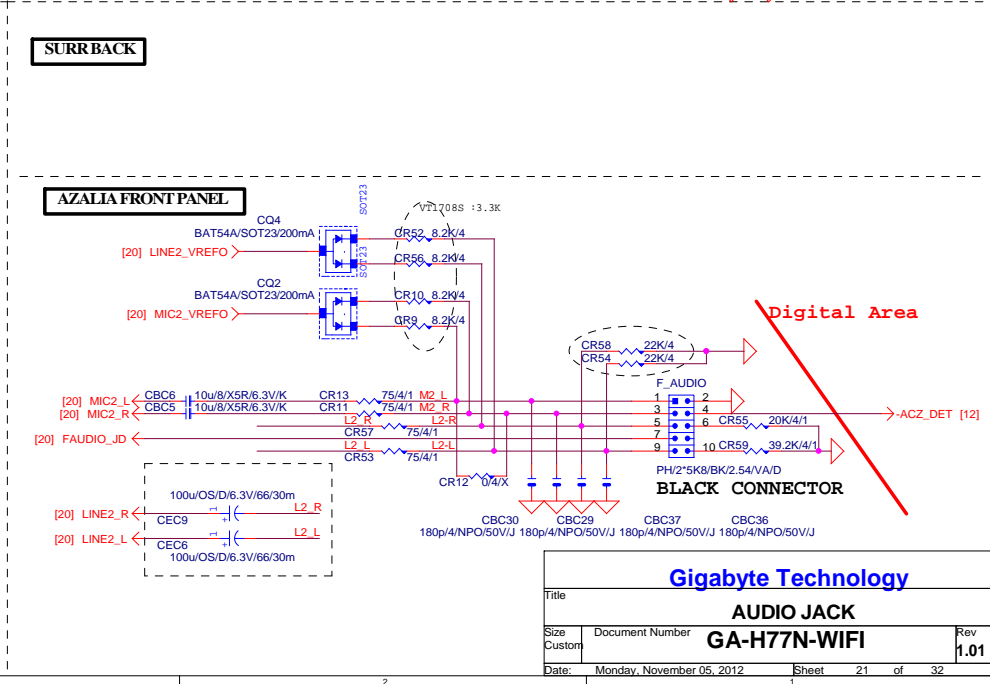
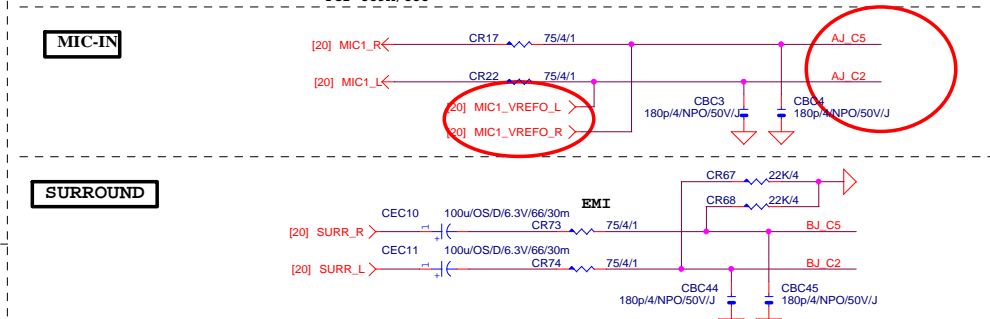
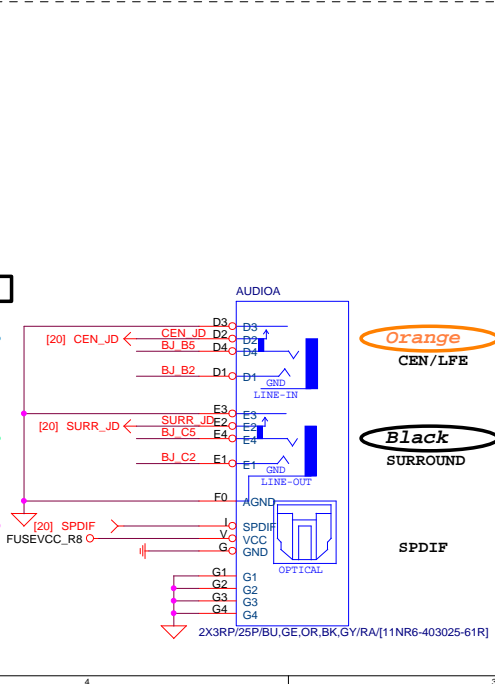
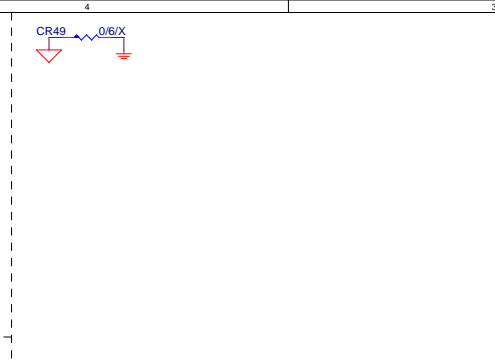


INTEL FRONT PANEL

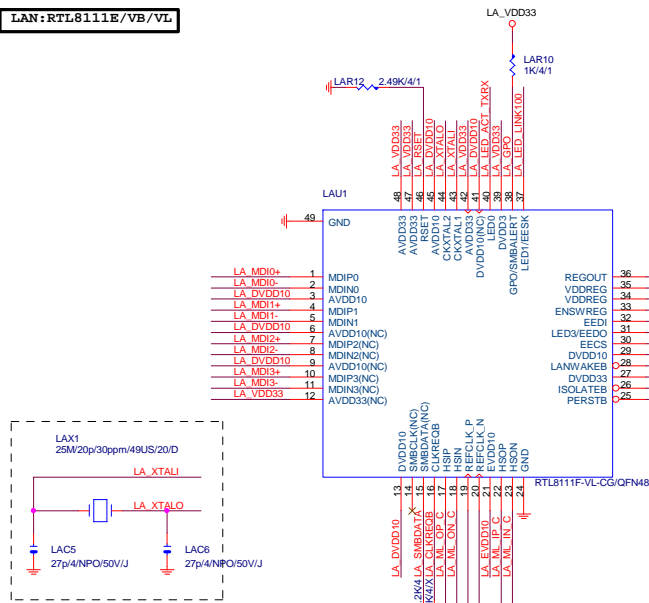


	ALC662	ALC887-VD2	ALC889	VT1708S	VT1708SCE
CR65	X	X	O	O	X
CR64	X	X	X	X	0.1u/4
CBC35	O	O	X	X	O
CR44/CBC6	47ohm+1nF	47ohm+1nF	47ohm+1nF	22ohm+100P	22ohm+100P
CR31	X	O	O	O	O
CR30	O	X	X	X	X
CBC1/CBC2	22uF/X5R	22uF/X5R	22uF/X5R	22uF/X5R	22uF/X5R
CR20	5.11K/4/1	5.11K/4/1	5.11K/4/1	5.1K/4/1	5.1K/4/1
CR34	20K/4/1	20K/4/1	20K/4/1	5.1K/4/1	20K/4/1
CBC39/CBC40	N/A	N/A	N/A	100P/4	100P/4
CR6/CR7/CR54/CR58	22K/4	22K/4	22K/4	10K/4	10K/4
CR5/CR8/CR11/CR4/ CR17/CR22/CR45/CR33/ CR47/CR40/CR26/CR37/ CR13/CR11/CR57/CR53	62 ohm	62 ohm	62 ohm	75 ohm	75 ohm
CR51/CD1/CBC7	O	O	X	X	O
CD2/CD3/CQ3/CQ5	X	X	O	O	X
CR1/CR14/CR17/CR22	62 ohm	62 ohm	62 ohm	75 ohm	1K ohm





LAN:RTL8111E/VB/VL

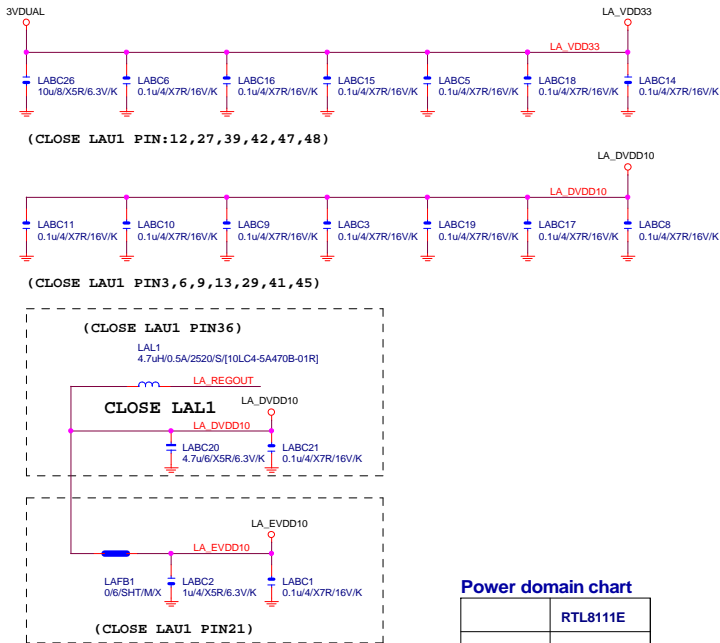


LA_ML-->80歐姆:[15/5/5/15]

SRCLK-->50歐姆:[18/4/10/4/18]

FIX PME ISSUE

LAN POWER

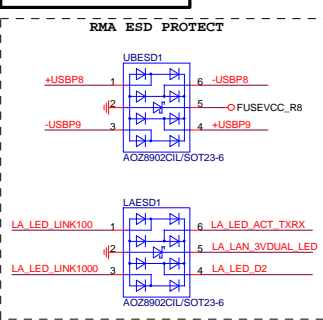


Power domain chart

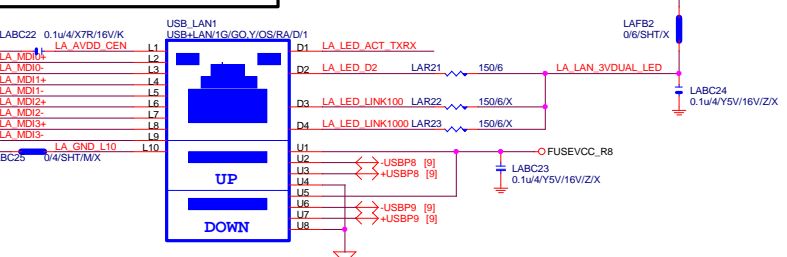
	RTL8111E
AVDD33	3.3V
DVDD33	3.3V
VDDREG	3.3V
DVDD10	1.05V

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USB LAN CONNECTOR

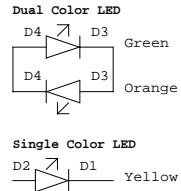


LA_MDI-->100歐姆:[20/4/8/4/20]



注意:LAN LED PROTECT:(CO-LAYOUT)
1.ESD(6PIN):AOZ8902CIL/SOT23-6(DEFAULT)
2.SURGE(5PIN):AZ2025-04S/SOT23-5L

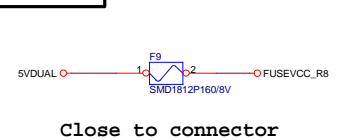
注意:USB PORT(目前:暫代6,7PORT)
USB-->90歐姆:[15/4.5/7.5/4.5/15]



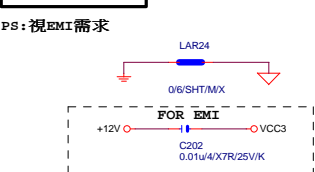
料號	規格	廠商
11NR6-702009-0ER	1G LAN (12core)	UDE
11NR6-702009-91R	1G LAN (8 core)	FOXCONN
11NR6-702009-92R	1G LAN (8 core)	UDE
11NR6-702009-11R	1G LAN (12core/RED)	UDE
11NR6-702009-12R	1G LAN (8 core/RED)	FOXCONN

USB LAN BOM區分:
1.(紅色/12CORE/三倍):USB+LAN/1G/GO,Y/OS/RA/D/1/RED
2.(黑色/12CORE):USB+LAN/1G/GO,Y/OS/RA/D/1
3.(黑色/8CORE):USB+LAN/1G/GO,Y/OS/RA/D/8C

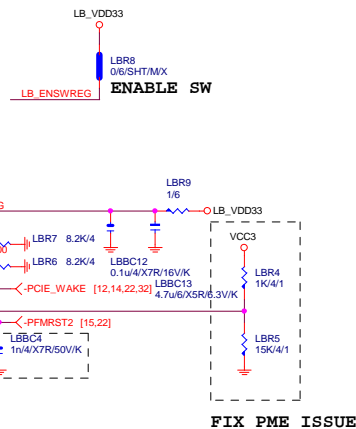
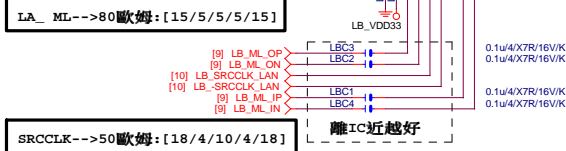
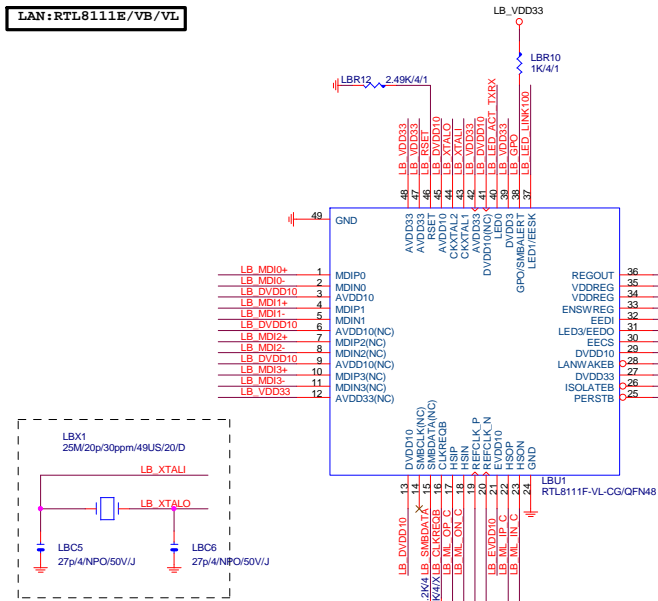
USB POWER



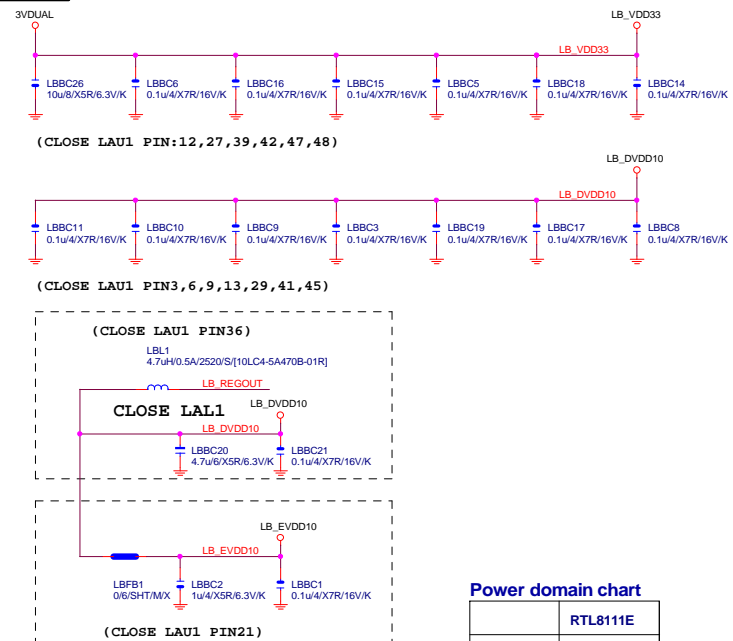
EMI SHORT PAD



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File ARTEROS AR8151/AR8161			
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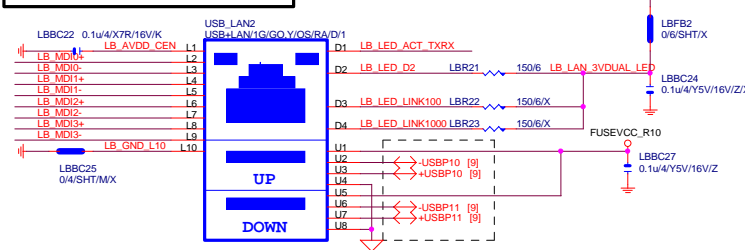
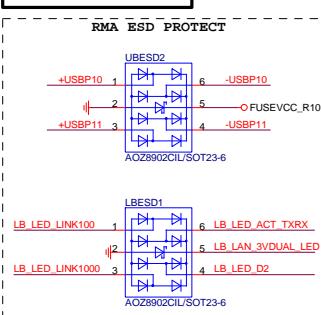
FIX PME ISSUE



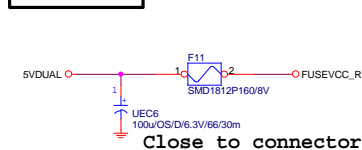
Power domain chart

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

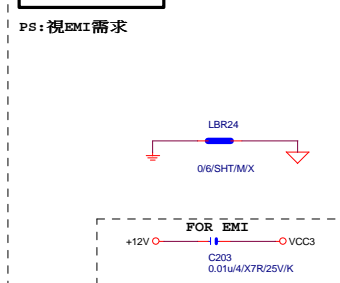
www.aitech1.ru



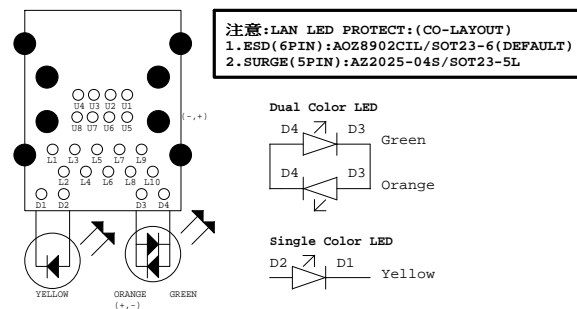
USB-->90歐姆:[15/4.5/7.5/4.5/15]



Close to connector



PS:視EMI需求



Dual Color LED

Single Color LED

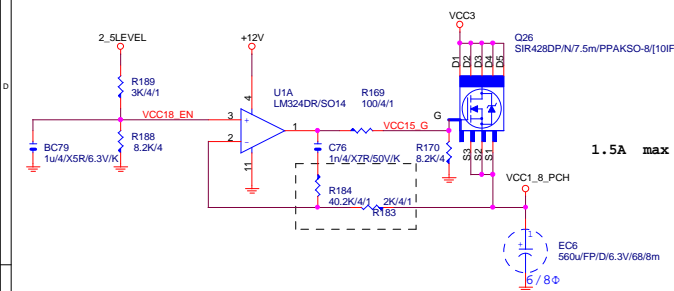
D2 71 D1 Yellow

料號	規格	廠商
11NR6-702009-0ER	1G LAN (12core)	UDE
11NR6-702009-91R	1G LAN(8 core)	FOXCONN
11NR6-702009-92R	1G LAN(8 core)	UDE
11NR6-702009-11R	1G LAN(12core/RED)	UDE
11NR6-702009-12R	1G LAN(8 core/RED)	FOXCONN

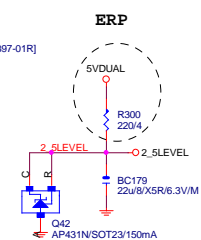
USB_LAN BOM區分:

1. (紅色/12CORE/三倍):USB+LAN/1G/GO,Y/OS/RA/D/1/RED
2. (黑色/12CORE):USB+LAN/1G/GO,Y/OS/RA/D/1
3. (黑色/8CORE):USB+LAN/1G/GO,Y/OS/RA/D/8C

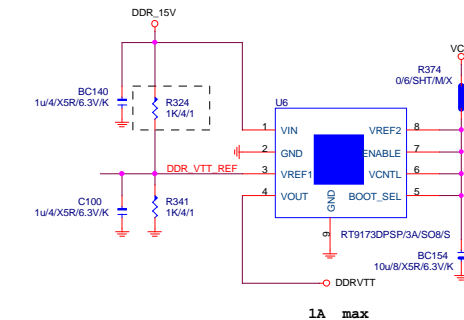
VCC1_8_PCH	
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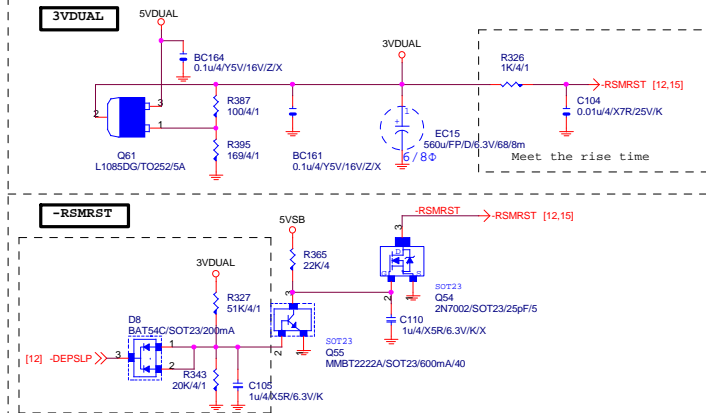
2_5LEVEL



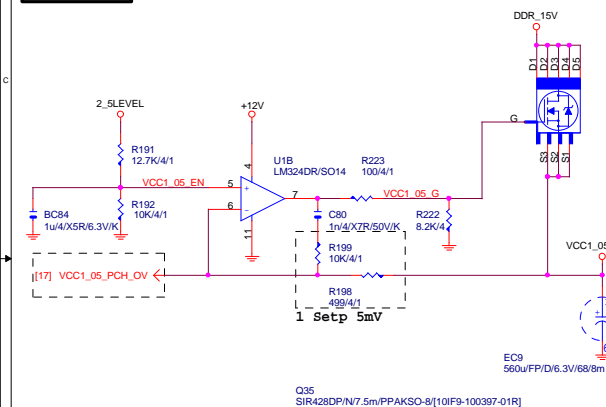
DDRVTT



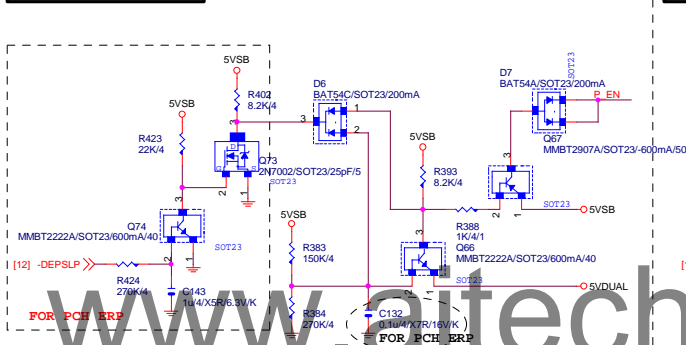
3VDUAL



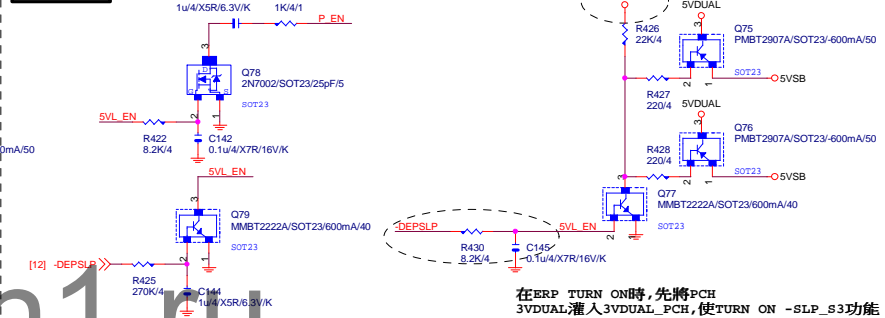
VCC1_05_PCH



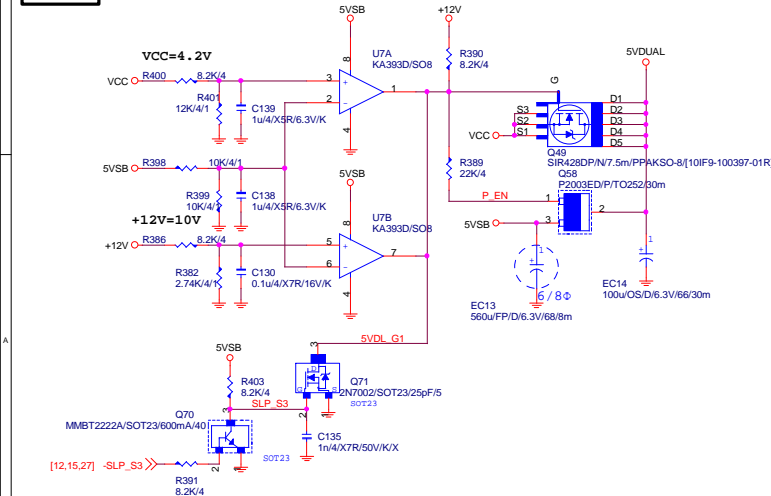
5VDUAL SHORT PROTECT



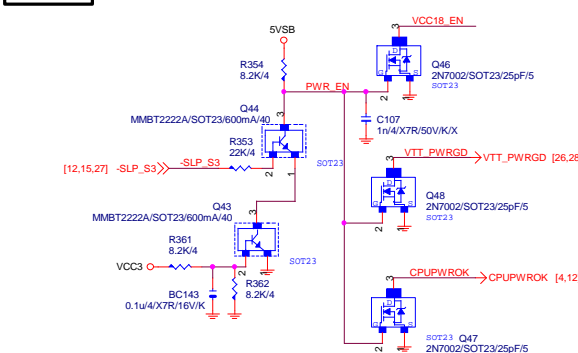
PCH ERP



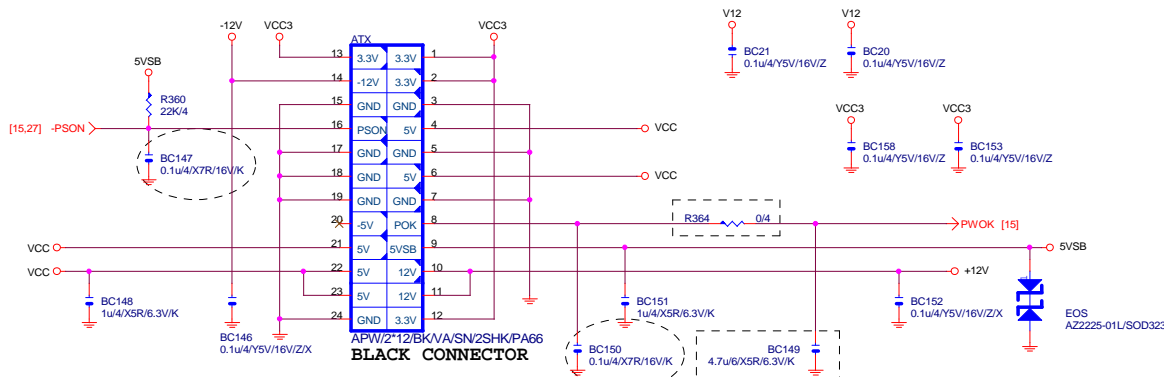
5VDUAL



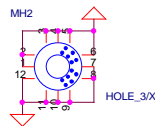
PWR SEQ



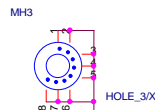
ATXX24 POWER CONNECTOR



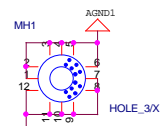
MB LOCATION



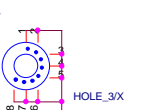
HOLE_4-RH-5MM-1



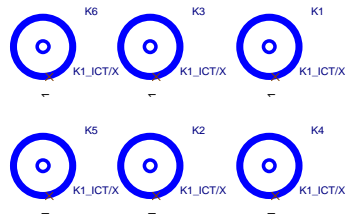
HOLE_4-RH-5MM-5PIN-1



HOLE_4-RH-5MM-1

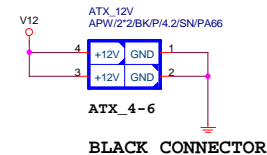


HOLE_4-RH-5MM-5PIN-1



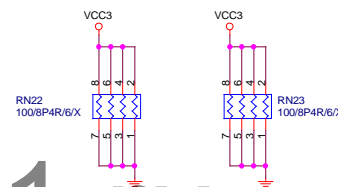
To prevent the 5VSB under loading when boot

ATXX4 POWER CONNECTOR

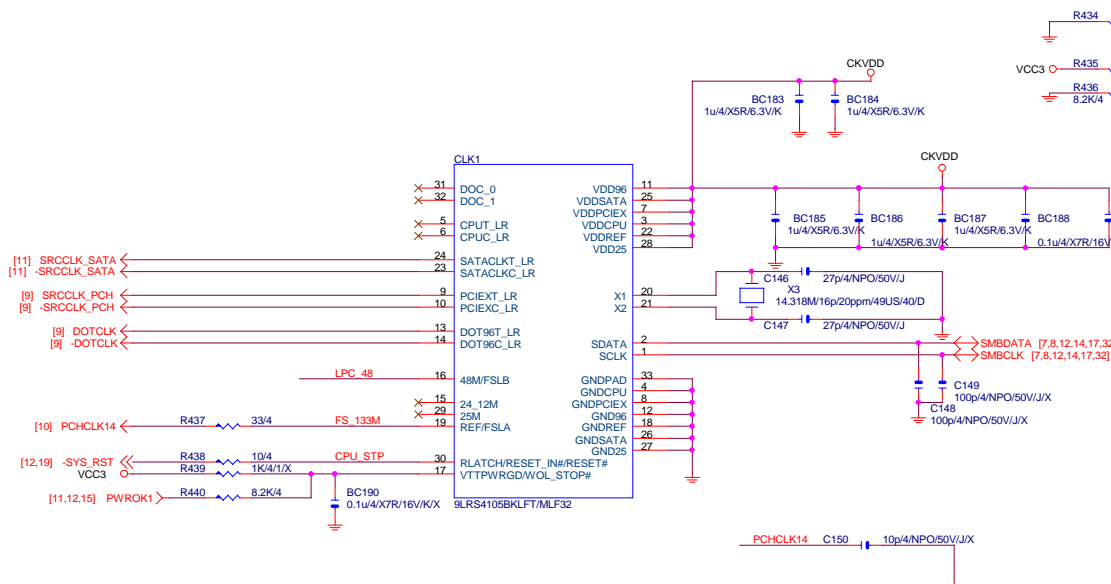


BLACK CONNECTOR

FIX PWR MINMUN LOAD



CLK GEN



CPU Frequency Selection

FS	CPU
0	100M <Default>
1	133M

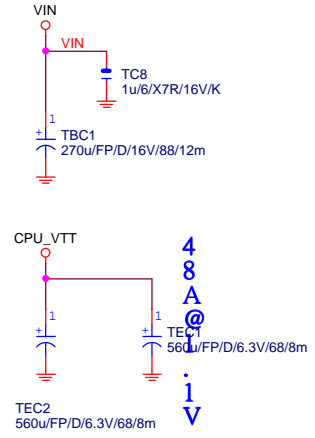
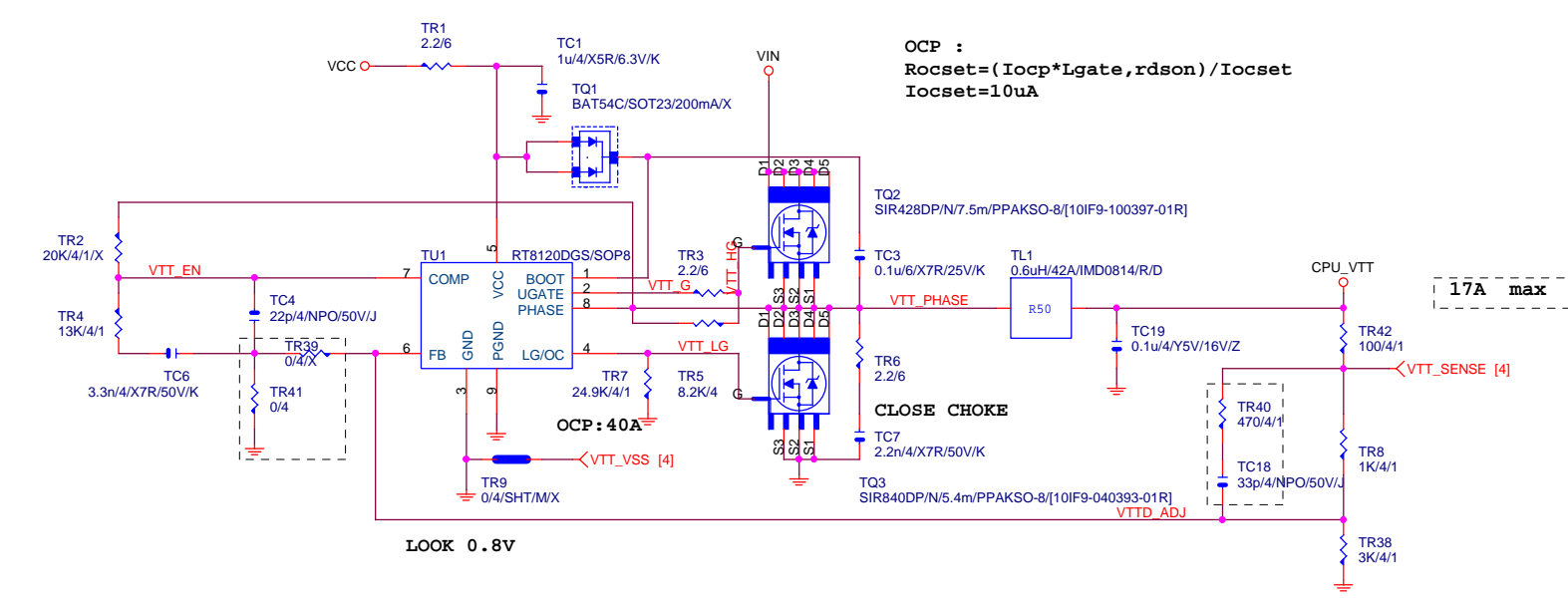
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ATX CONNECTOR

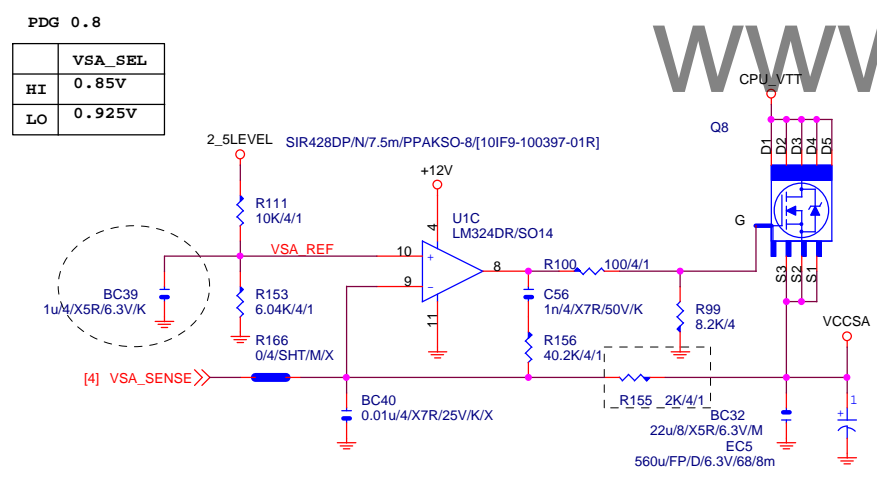
GA-H77N-WIFI

Rev 1.01

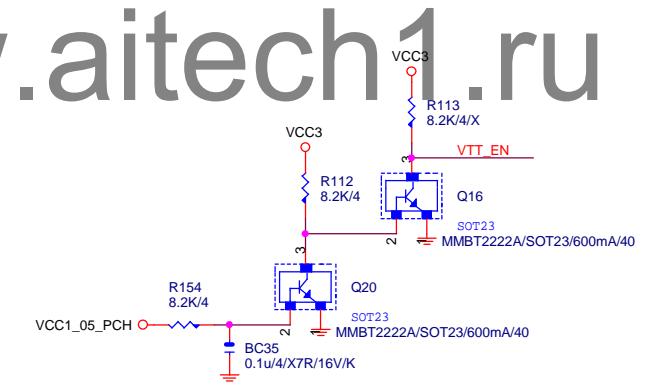
CPU_VTT



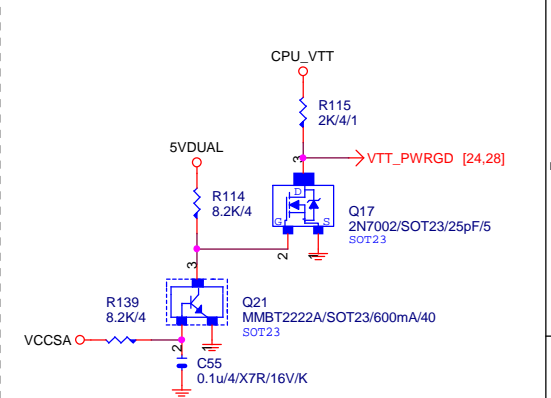
VCCSA



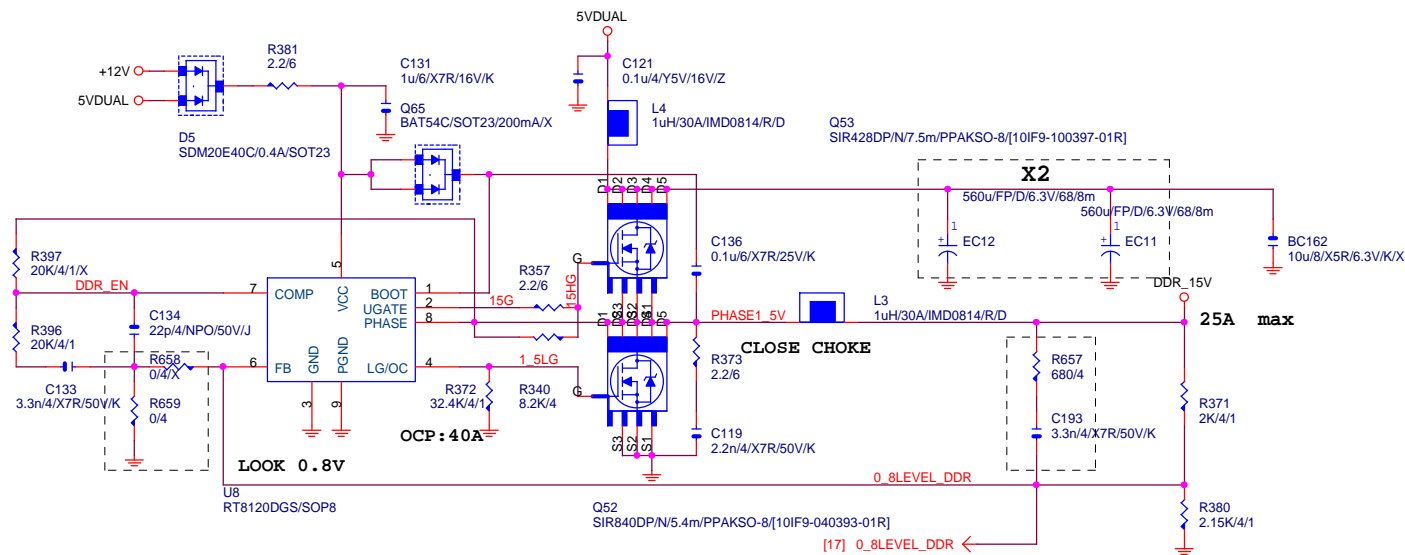
CPU_VTT PWR SEQ



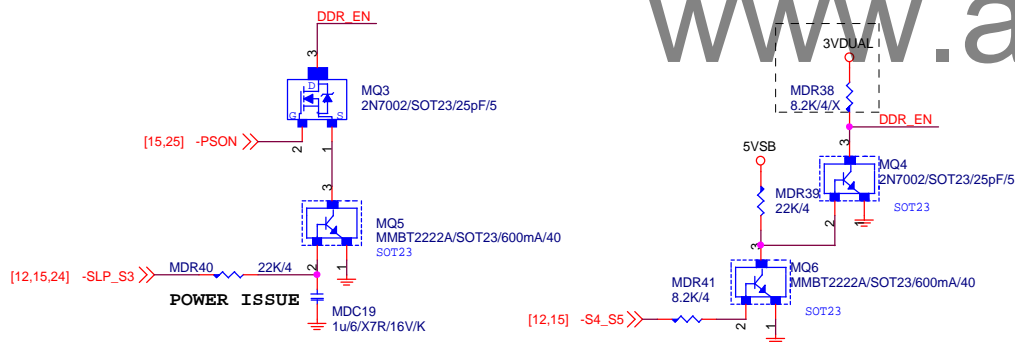
VTT_PWRGD



DDR15V



PWR SEQ



VIN=5V,VOUT=1.5V,IOUT=25A,PHASE=1
IRMS=11.45A
560uF/P/D/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 $2 \times 7.99 = 15.98 > 11.45A$

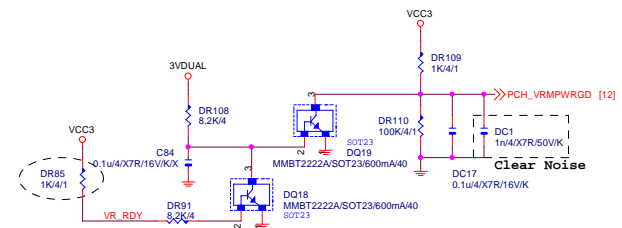
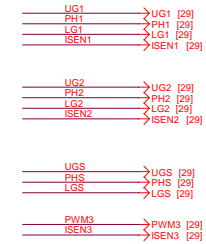
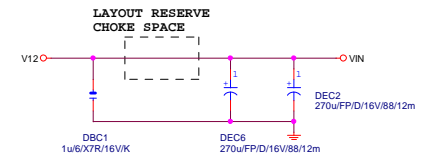
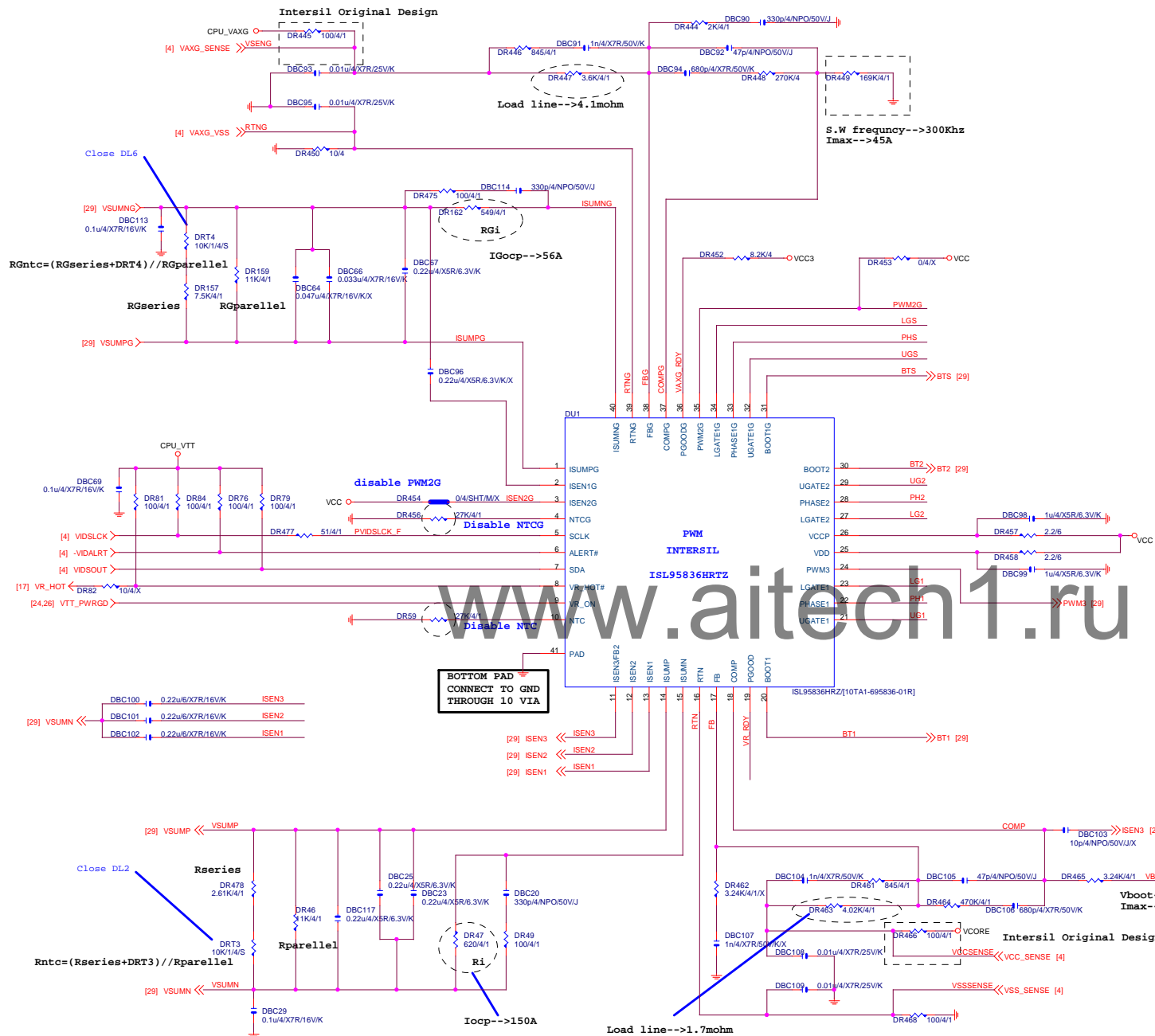
OCP : $I_{peak} = (2 \times I_{ocset} \times R_{ocset}) / R_{dson}$
 typ $I_{ocset} = 20\mu A$, $R_{ocset} = 4.7k$

OCP : $53.71A = (2 \times 20uax4.7k) / (7m // 7m)$

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DDR POWER

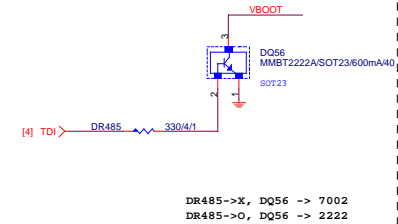
Size Custom	Document Number GA-H77N-WIFI	Rev 1.01
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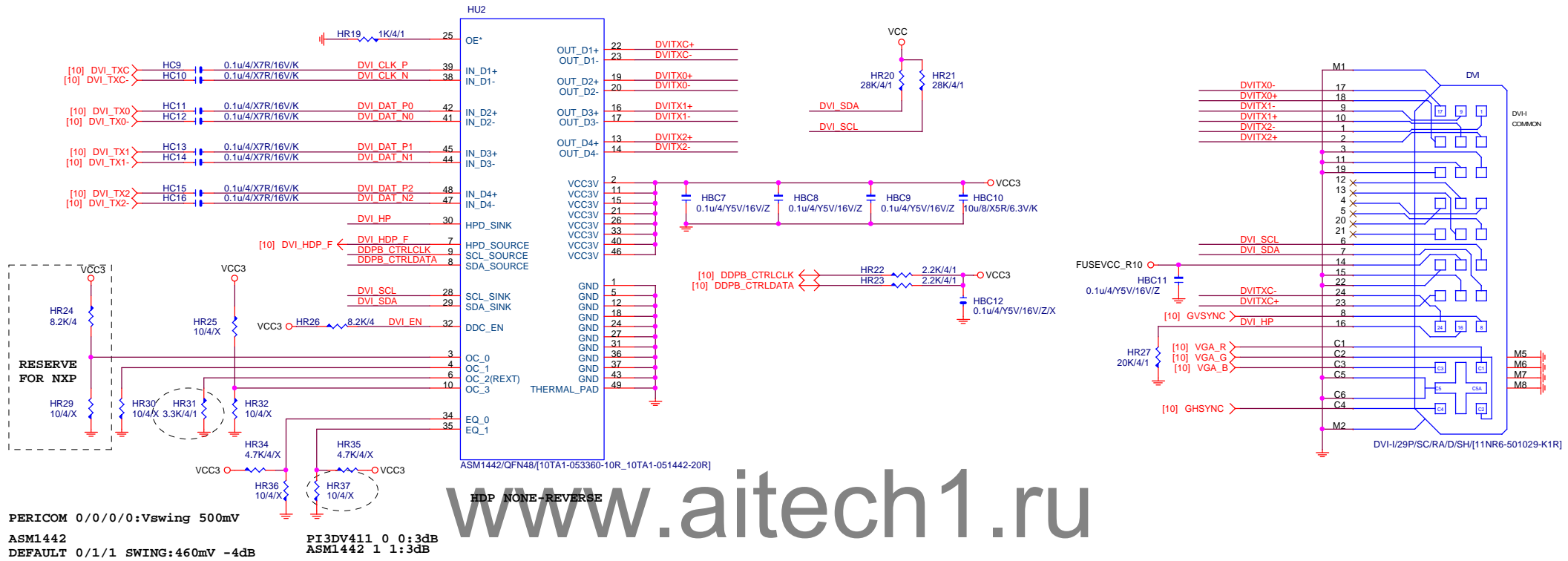
FOR RMA      Set VBOOT=GND  for Vboot=0V
              VBOOT=OPEN for
              Vboot=1.1V

```



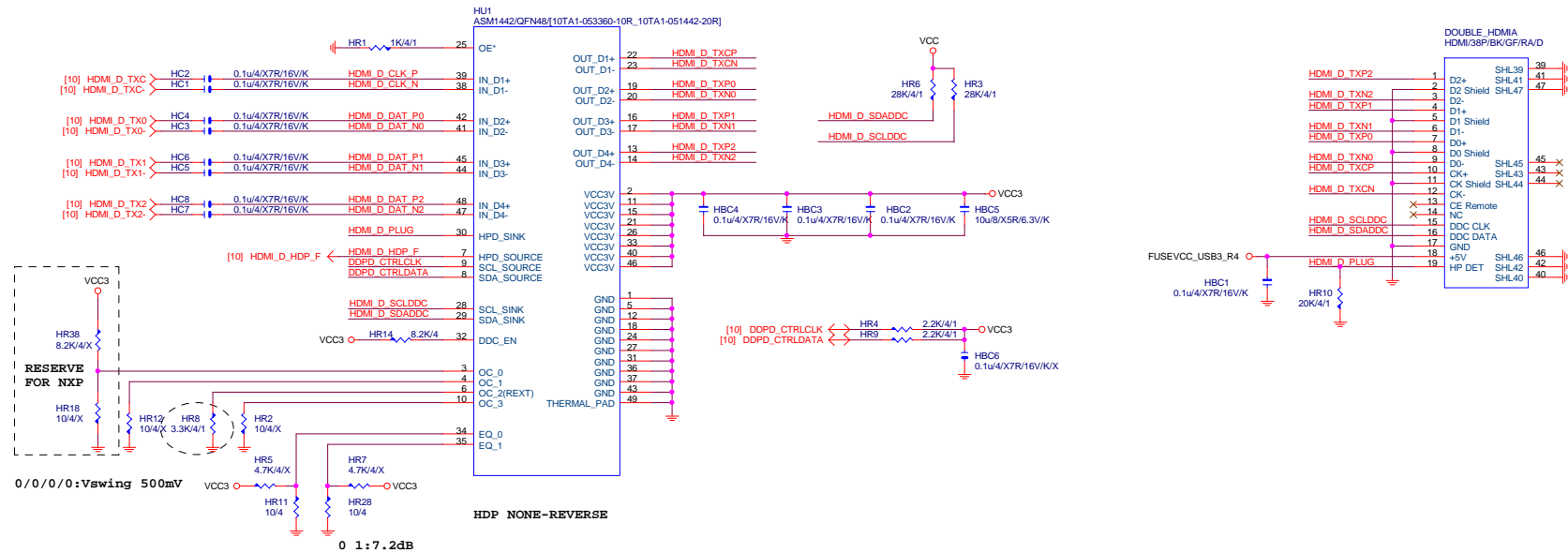
PHASE 1

DVI LEVEL SHIFT

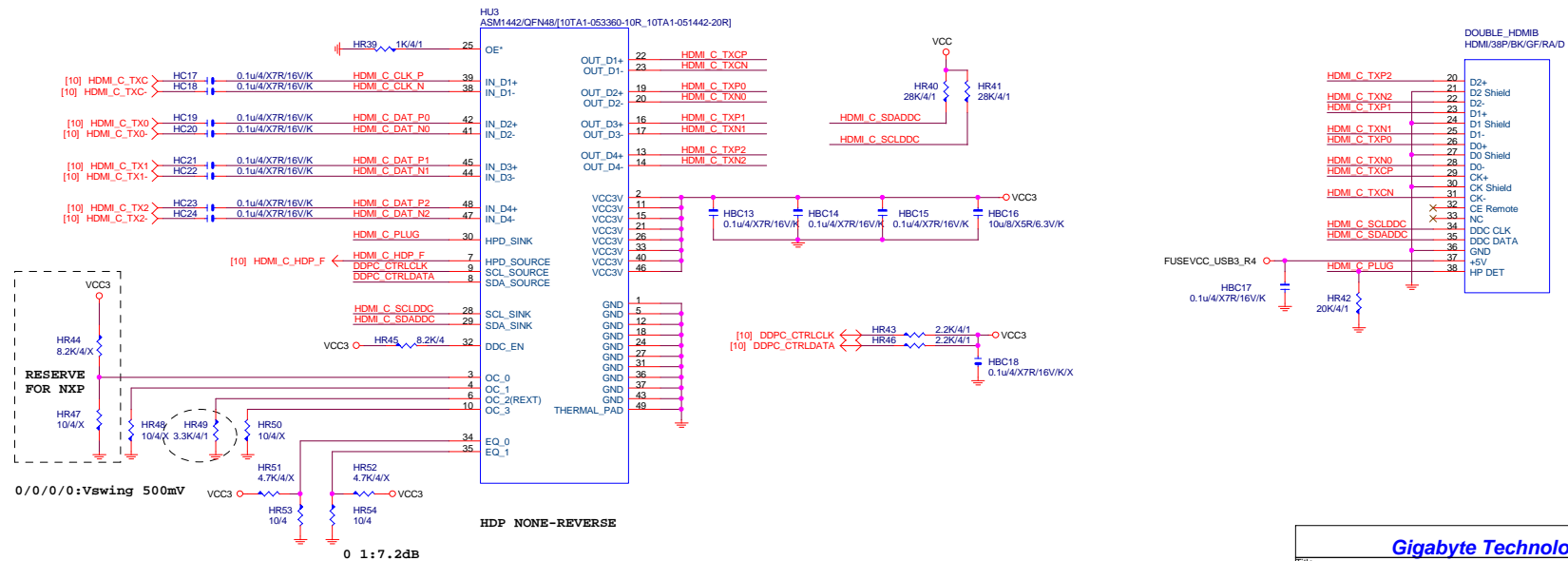


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Title			
DVI			
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HDMI LEVEL SHIFT

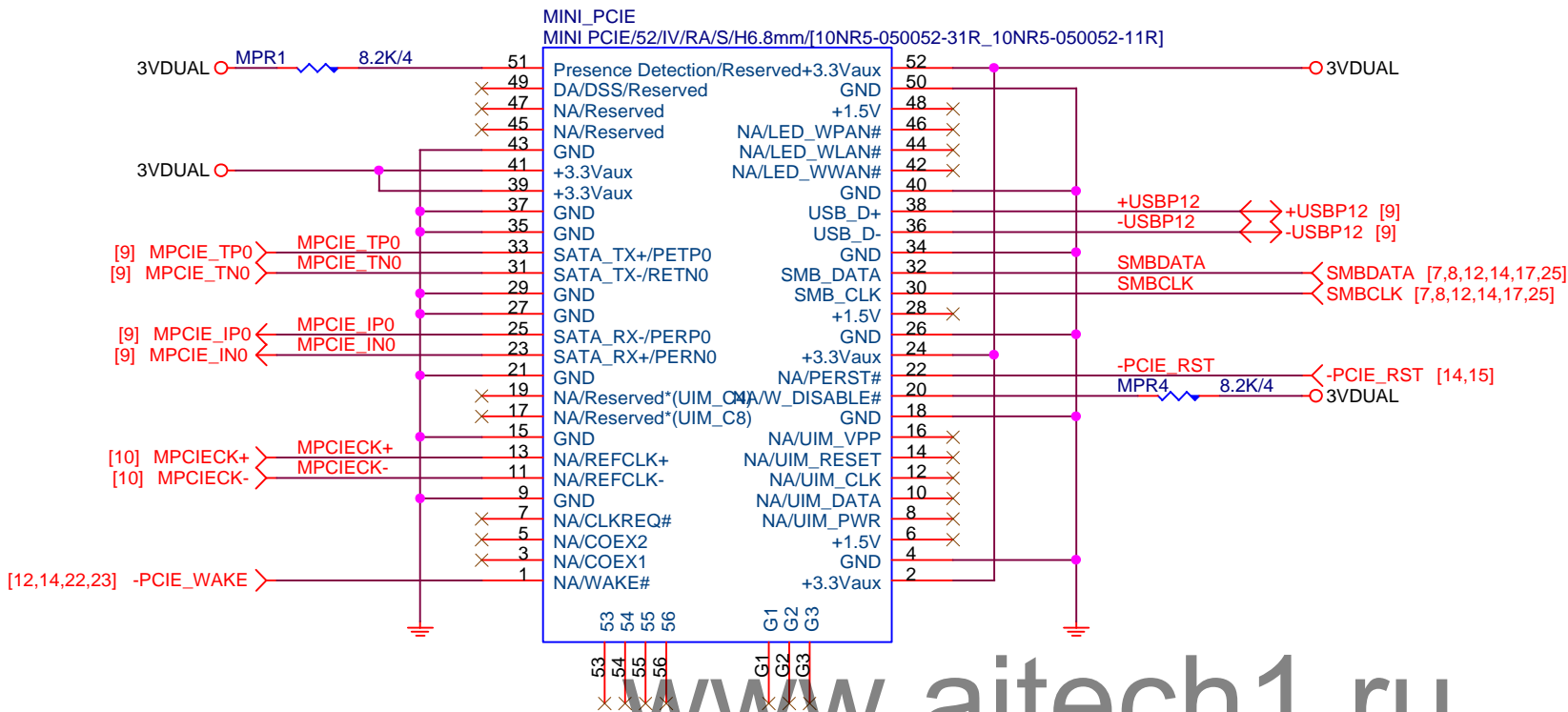


HDMI LEVEL SHIFT

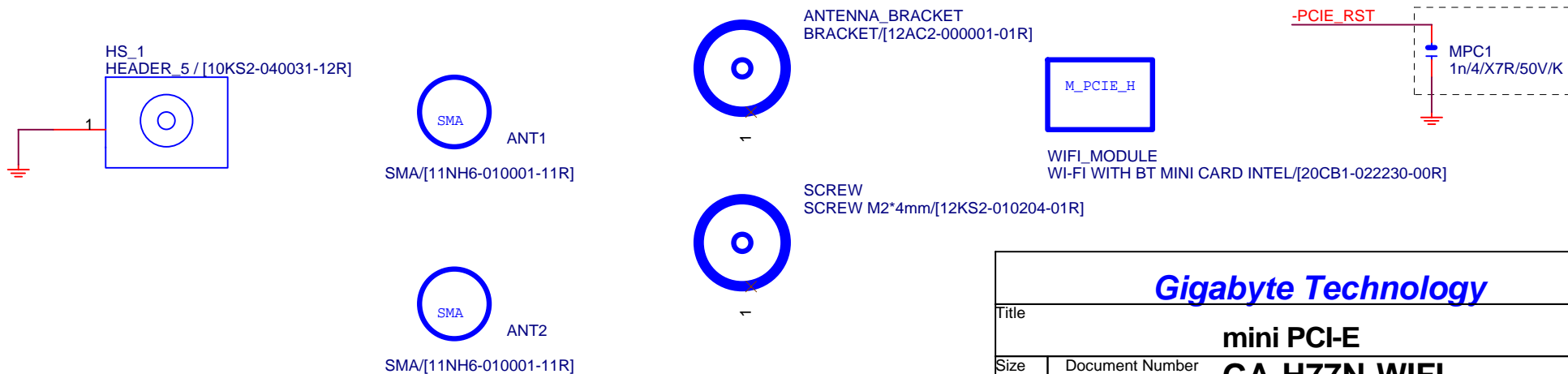


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Title		
mini PCI-E		
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