

Model Name: GA-H77N-WIFI

Revision 1.0

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
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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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Revision 1.0

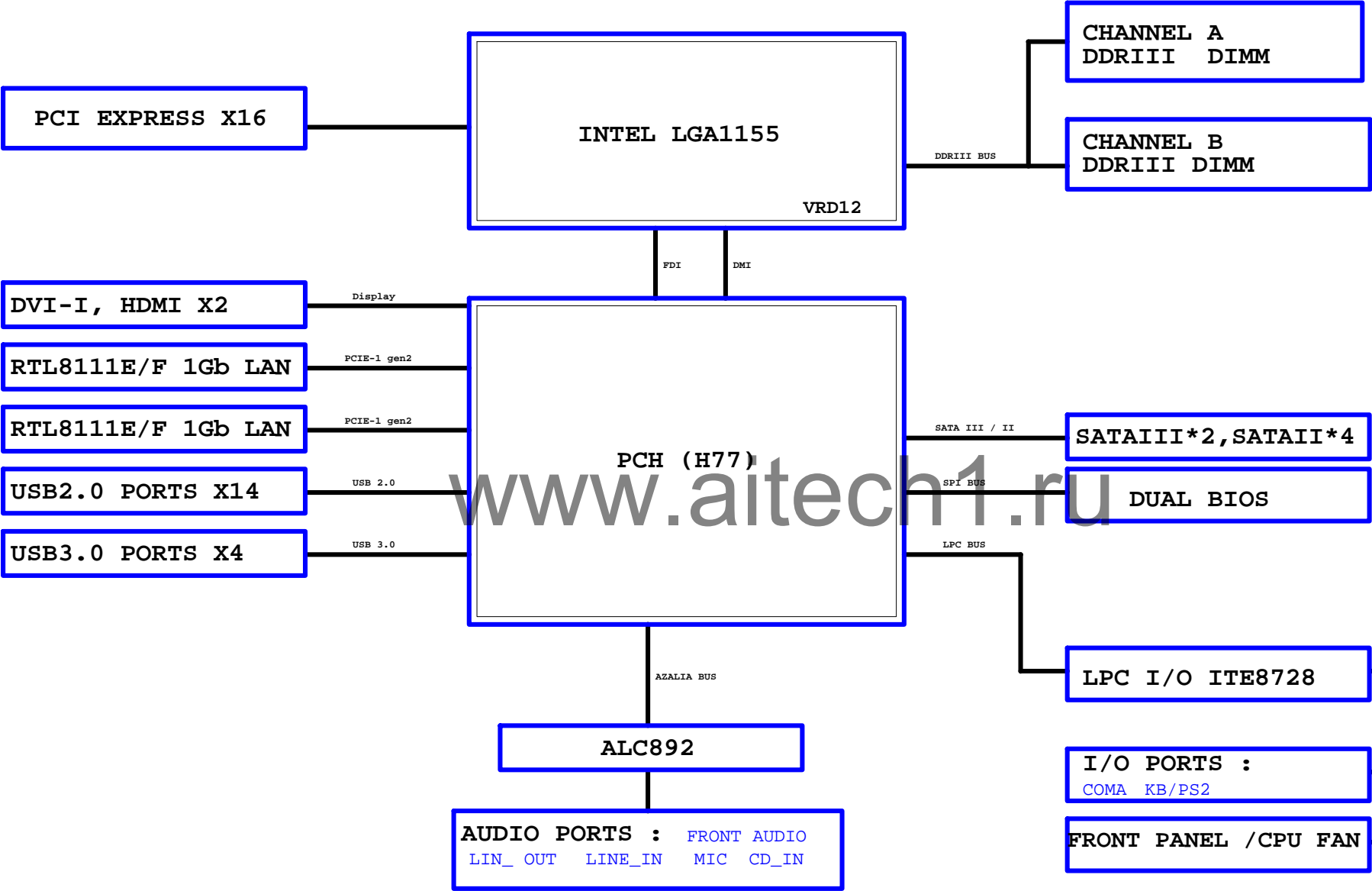
2012/08/08

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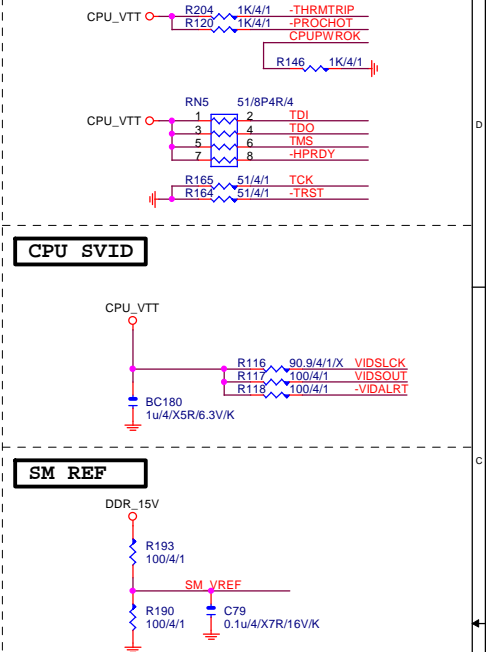
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Custom	GA-H77N-WIFI		1.0
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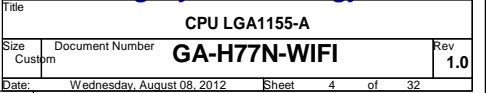
BLOCK DIAGRAM



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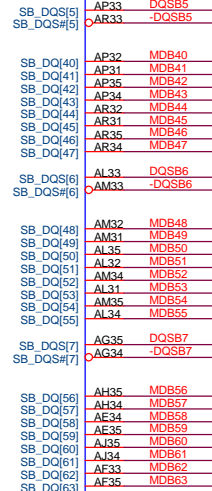
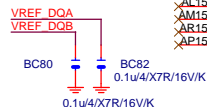
1 OF 10

(B)



2 OF 10

(CR)



LGA1155_P

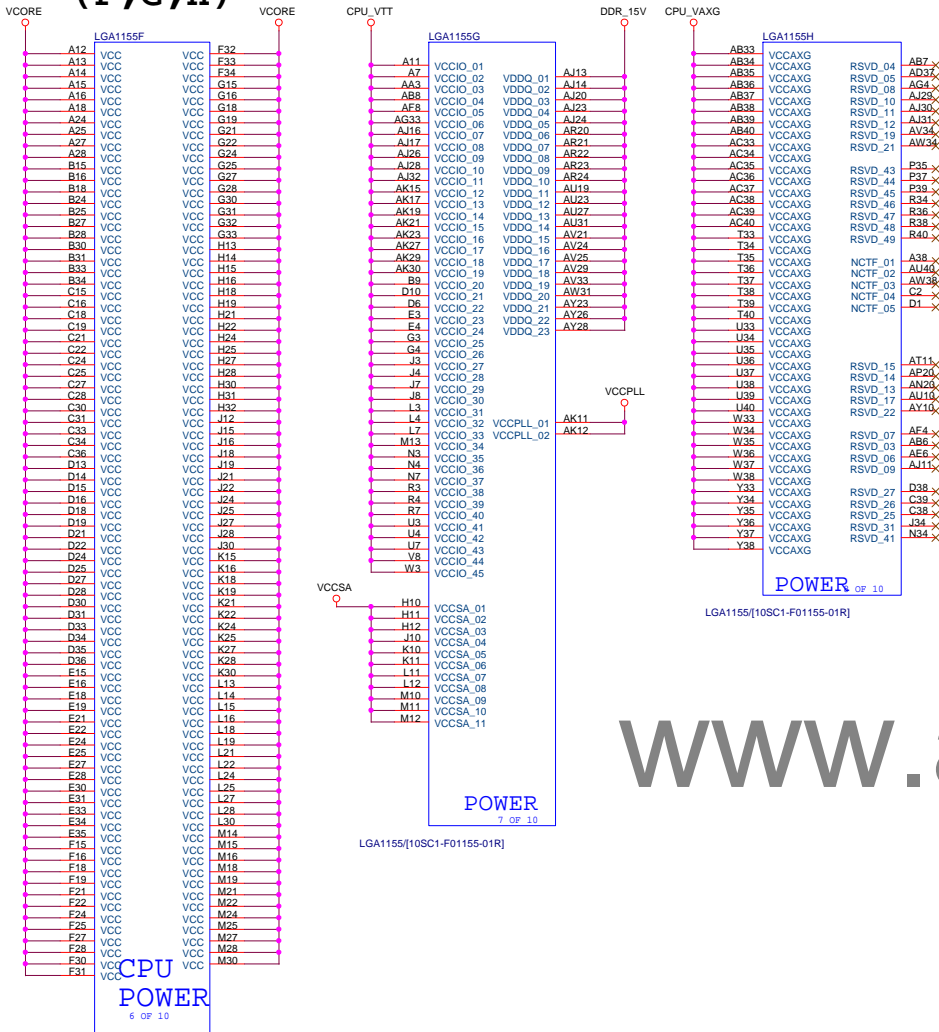
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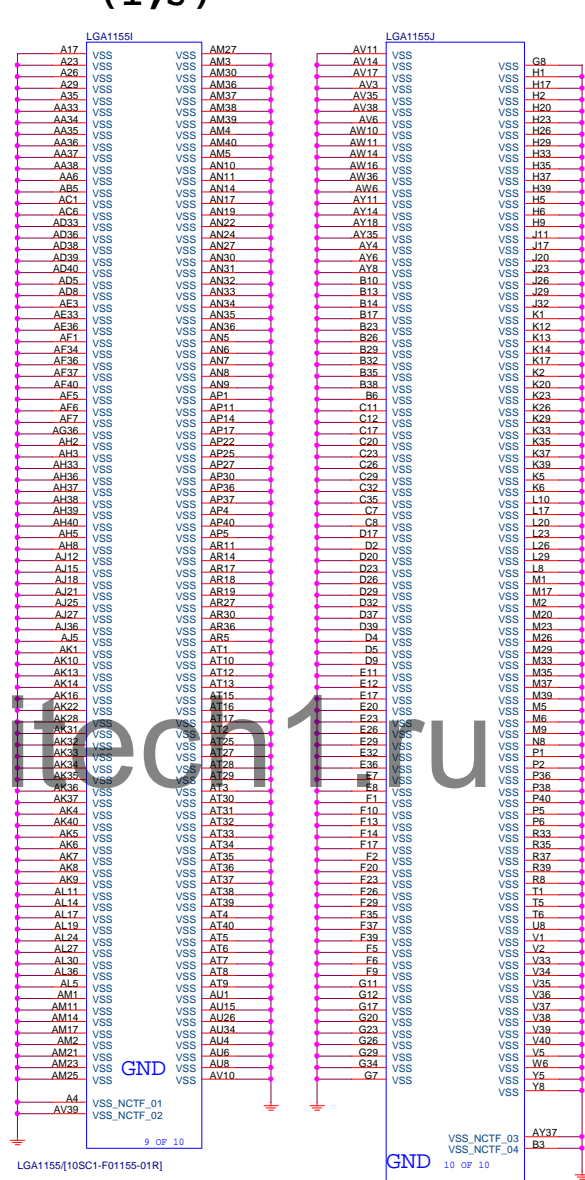
CPU LGA1156-B

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CPU LGA1156-B			
Size	Document Number		Rev
Custom	GA-H77N-WIFI		1.
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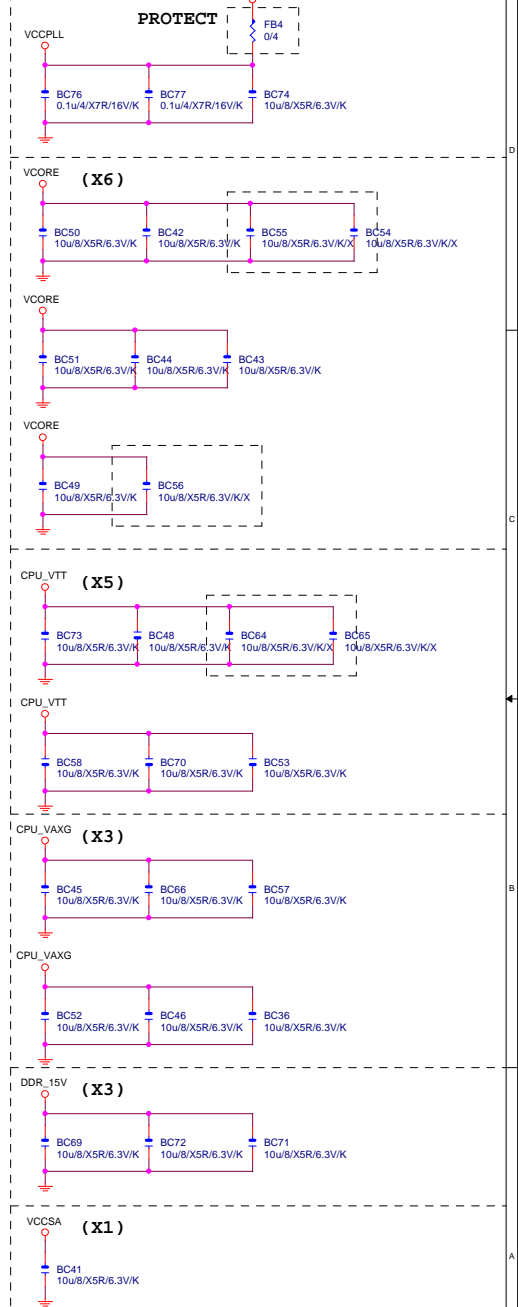
LGA1155 (F,G,H)



LGA1155 (I,J)

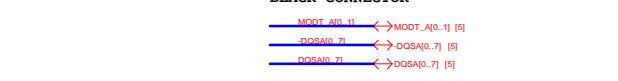
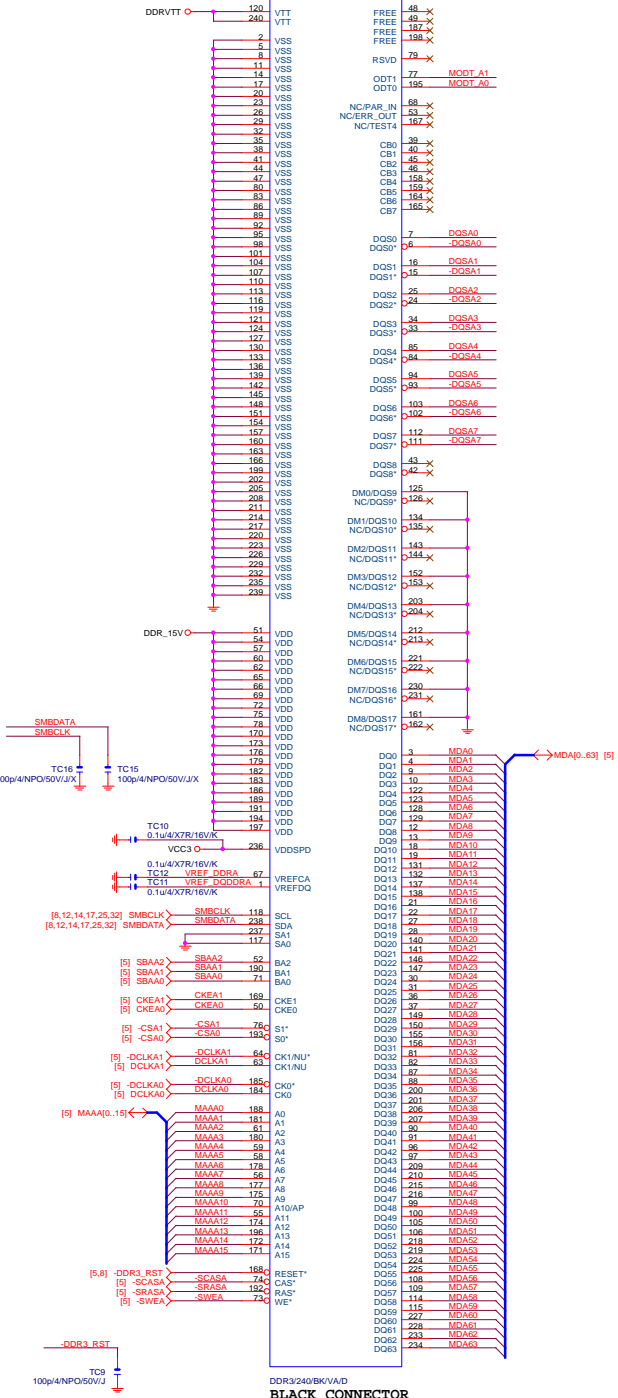


CAP

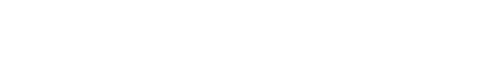


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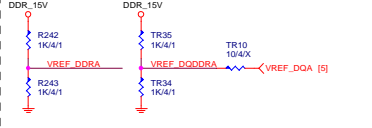
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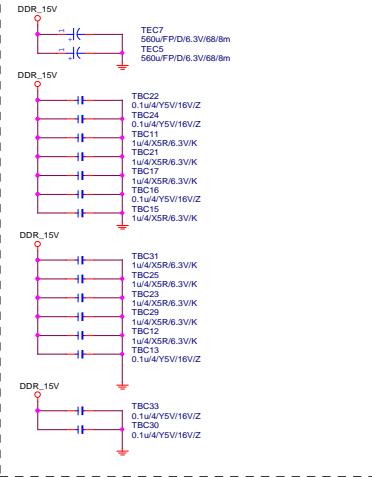
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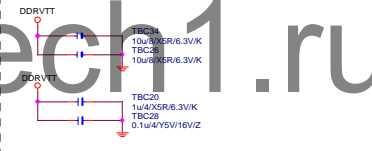
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DDR15V Decouple



DDRVTT Decouple

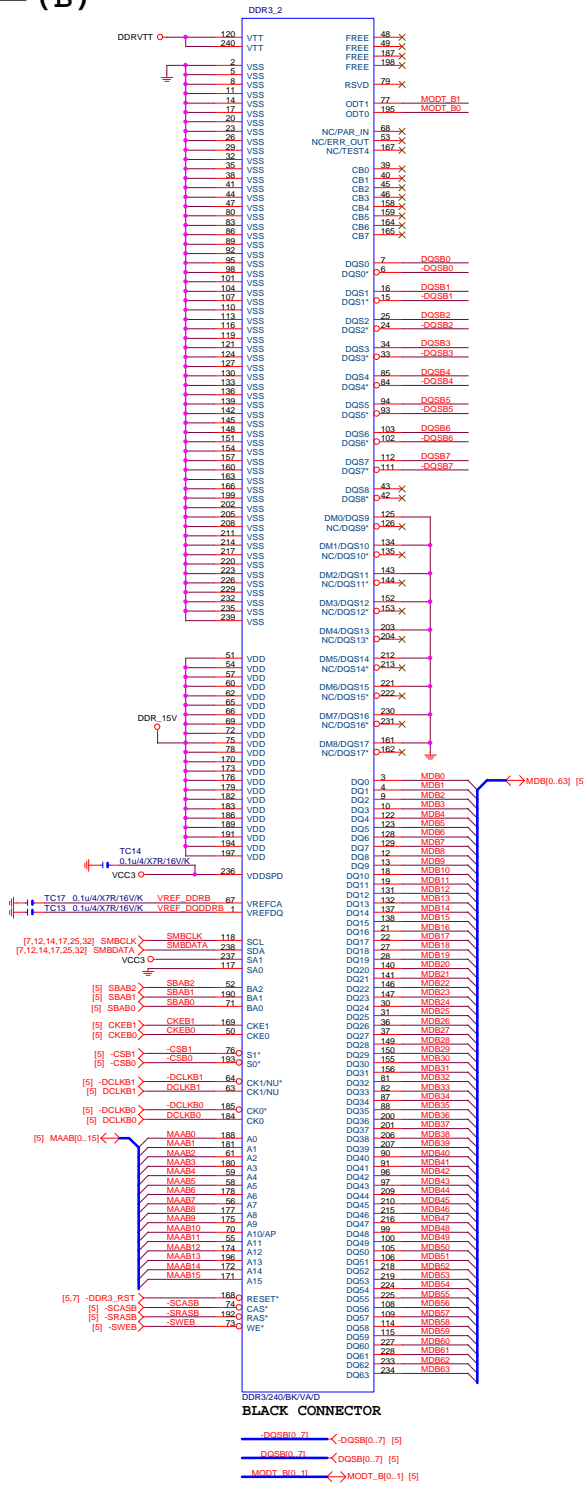


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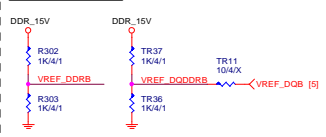
Gigabyte Technology	
DDR3 CHANNEL A	
GA-H77N-WIFI	
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Custom	
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DDR3

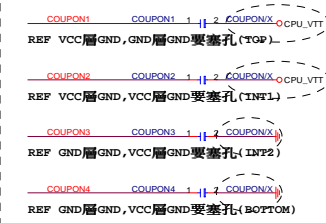
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DDR3 VREF



COUPON



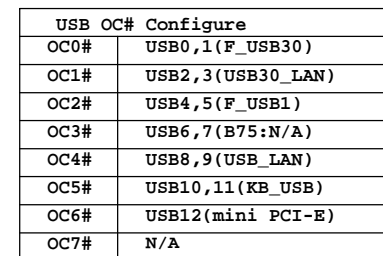
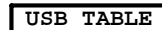
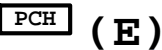
CPU

DIMM1 CHA
DIMM2 CHB

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DDR3 CHANNEL B			
Size			
Document Number			
GA-H77N-WIFI			
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(B)



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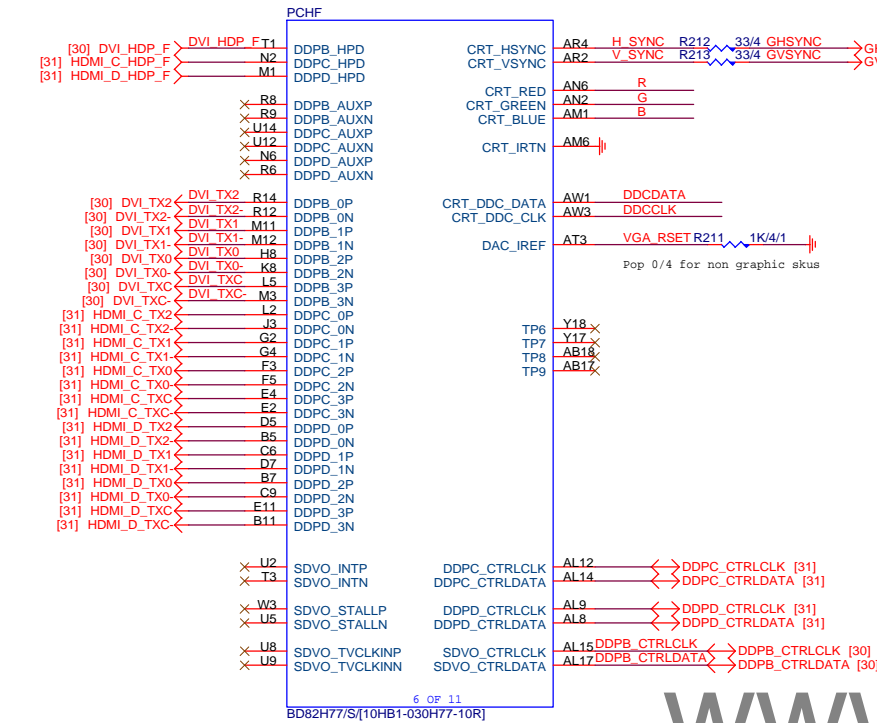
Title	PCH FDI,DMI,USB ,PCIE,NVRAM
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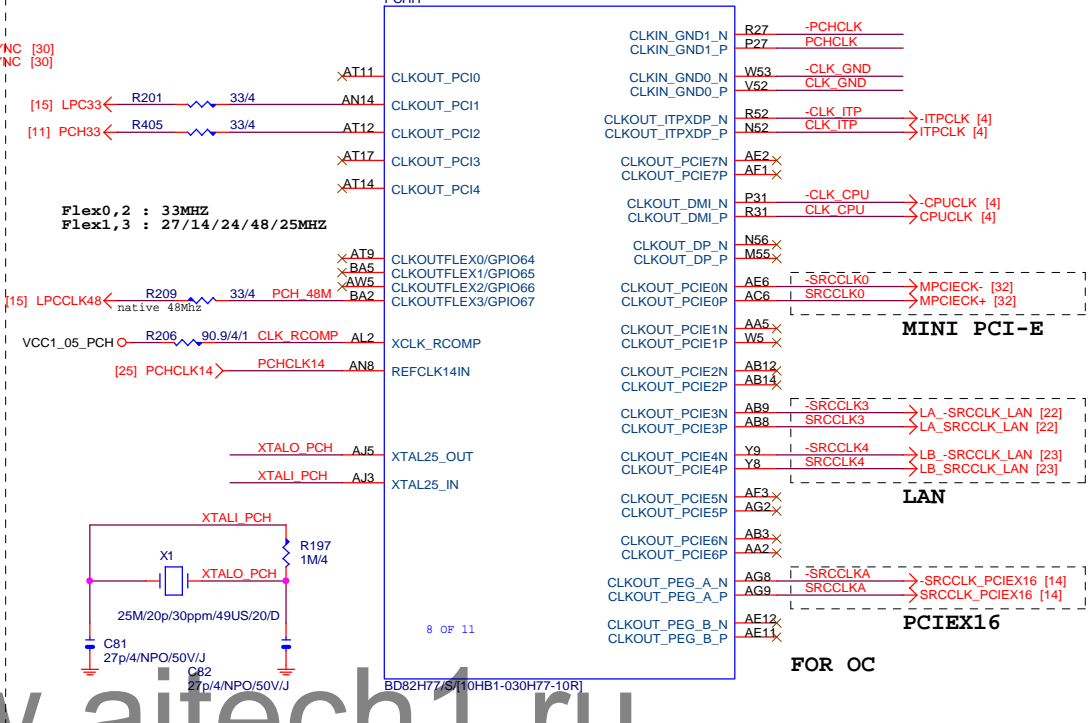
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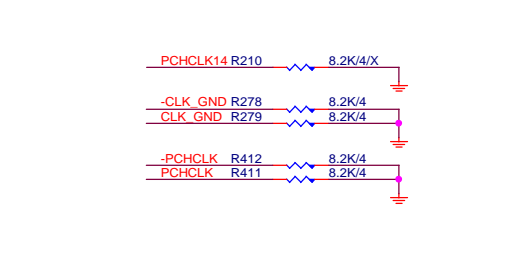


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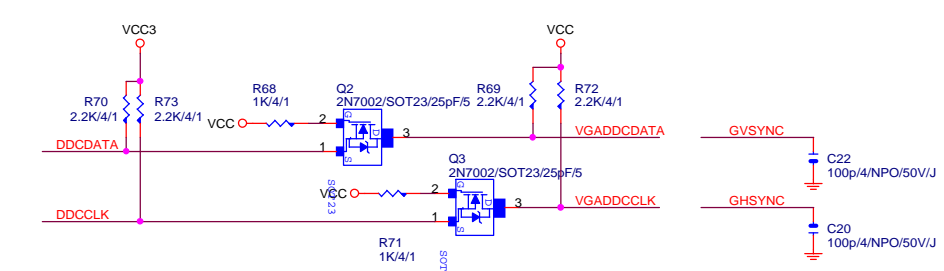
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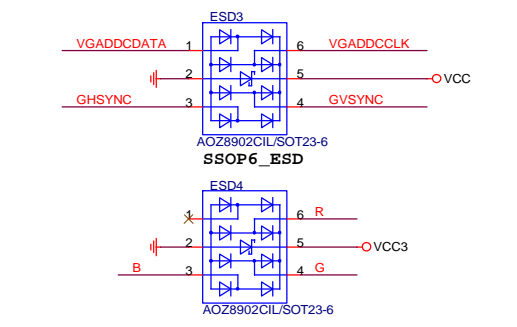
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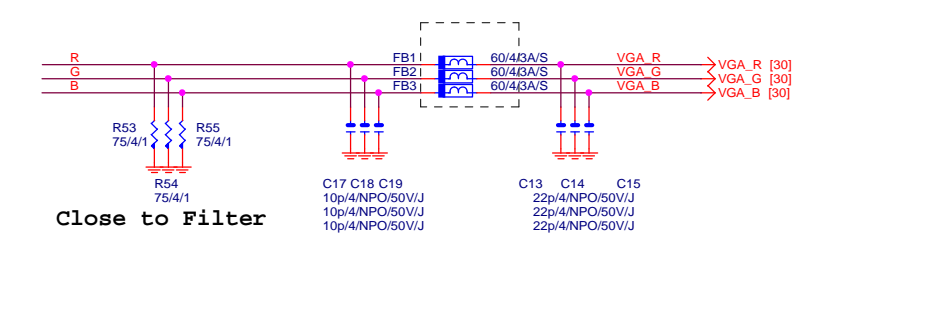
VGA DDC



VGA ESD

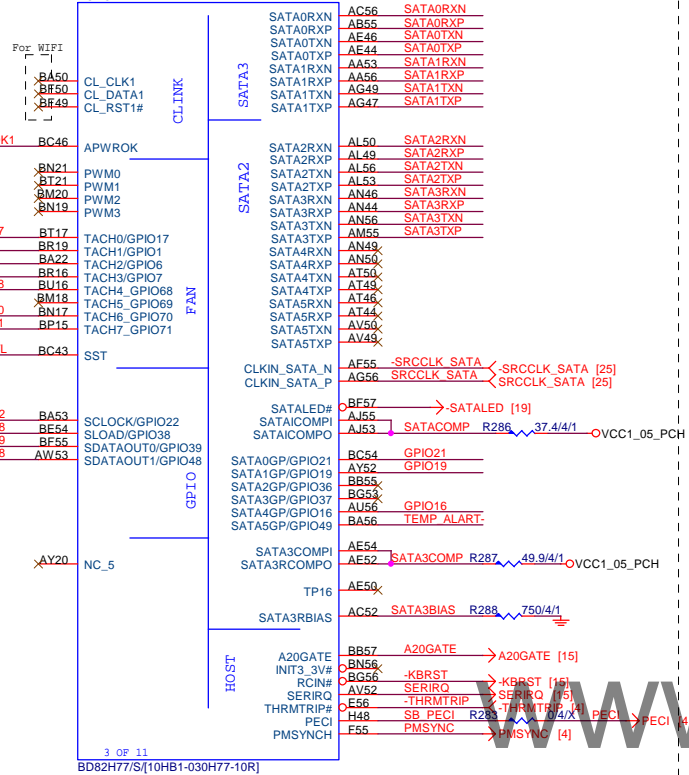


VGA DDC

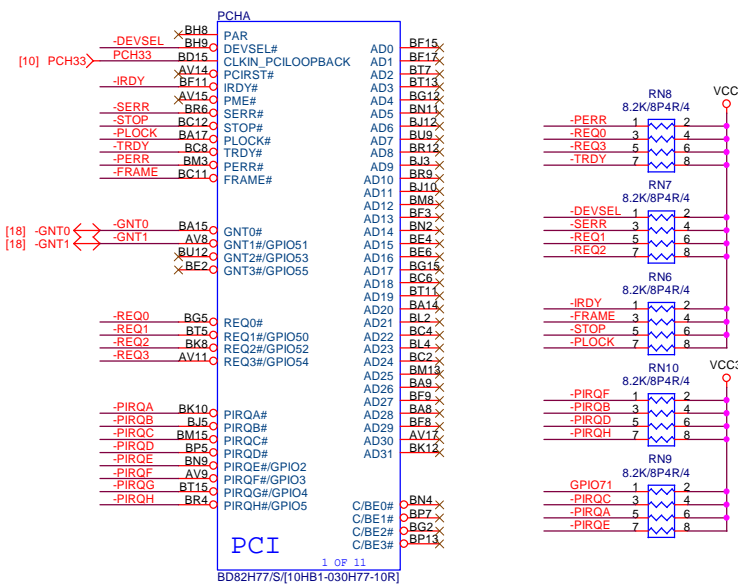


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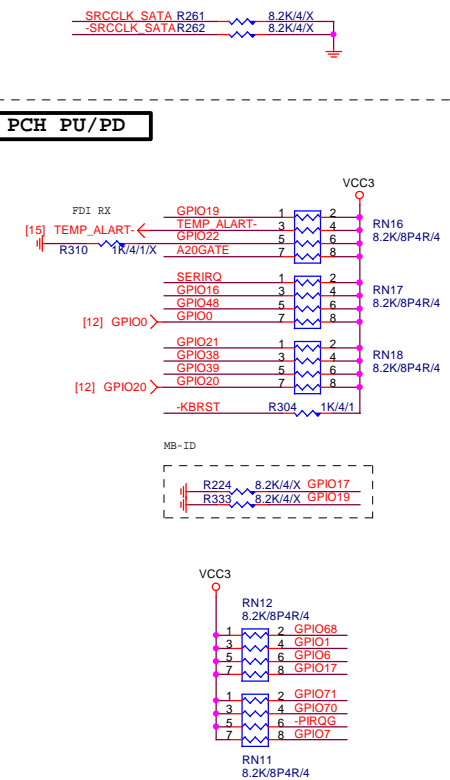
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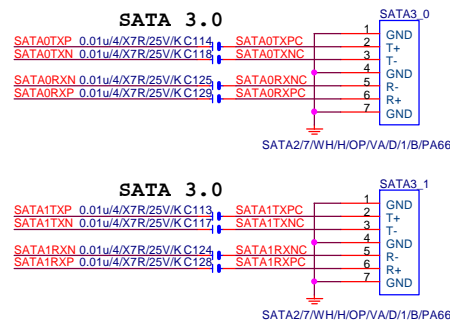
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PCH	PU/PD
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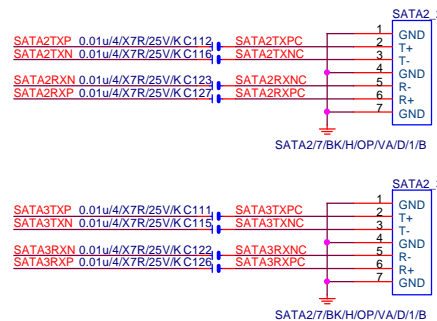


WHITE CONNECTOR

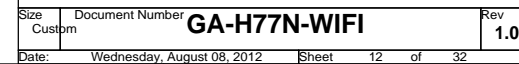


SATA2 FOOTPRINT

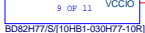
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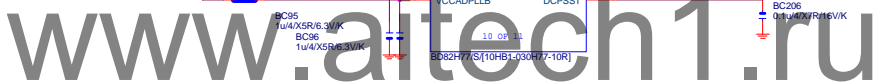
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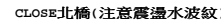
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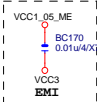


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SHT PWR

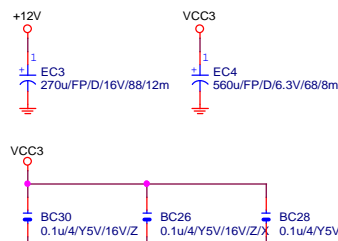




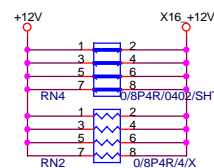
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PCIEX16	CAP
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PCIEX16 PROTECT SHT



PCIEX16	AC	CAP
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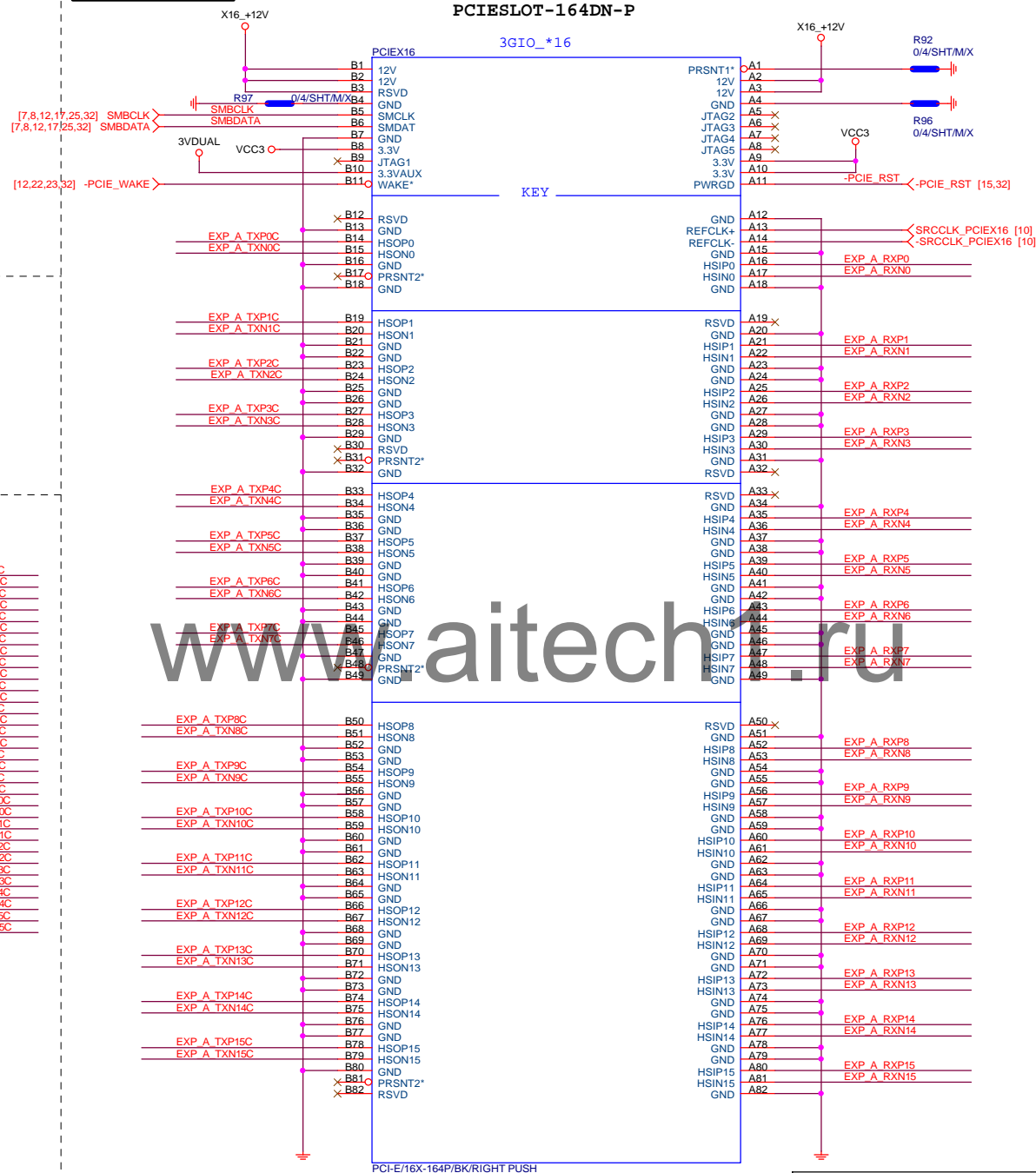
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EXP A TXP1	C35	0.22u4/X5R/6.3V/K	EXP A TXP1C
EXP A TXN1	C37	0.22u4/X5R/6.3V/K	EXP A TXN1C
EXP A TXP2	C39	0.22u4/X5R/6.3V/K	EXP A TXP2C
EXP A TXN2	C41	0.22u4/X5R/6.3V/K	EXP A TXN2C
EXP A TXP3	C43	0.22u4/X5R/6.3V/K	EXP A TXP3C
EXP A TXN3	C45	0.22u4/X5R/6.3V/K	EXP A TXN3C
EXP A TXP4	C46	0.22u4/X5R/6.3V/K	EXP A TXP4C
EXP A TXN4	C49	0.22u4/X5R/6.3V/K	EXP A TXN4C
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EXP A TXN5	C51	0.22u4/X5R/6.3V/K	EXP A TXN5C
EXP A TXP6	C52	0.22u4/X5R/6.3V/K	EXP A TXP6C
EXP A TXN6	C54	0.22u4/X5R/6.3V/K	EXP A TXN6C
EXP A TXP7	C57	0.22u4/X5R/6.3V/K	EXP A TXP7C
EXP A TXN7	C58	0.22u4/X5R/6.3V/K	EXP A TXN7C
EXP A TXP8	C60	0.22u4/X5R/6.3V/K	EXP A TXP8C
EXP A TXN8	C61	0.22u4/X5R/6.3V/K	EXP A TXN8C
EXP A TXP9	C62	0.22u4/X5R/6.3V/K	EXP A TXP9C
EXP A TXN9	C63	0.22u4/X5R/6.3V/K	EXP A TXN9C
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EXP A TXN10	C65	0.22u4/X5R/6.3V/K	EXP A TXN10C
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EXP A TXP14	C74	0.22u4/X5R/6.3V/K	EXP A TXP14C
EXP A TXN14	C75	0.22u4/X5R/6.3V/K	EXP A TXN14C
EXP A TXP15	C77	0.22u4/X5R/6.3V/K	EXP A TXP15C
EXP A TXN15	C78	0.22u4/X5R/6.3V/K	EXP A TXN15C

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EXP A RXN[0..15]    >> EXP_A_RXN[0..15] [4]
EXP A TXP[0..15]    >> EXP_A_TXP[0..15] [4]
EXP A TXN[0..15]    >> EXP_A_TXN[0..15] [4]

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PCIEX16 SLOT



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

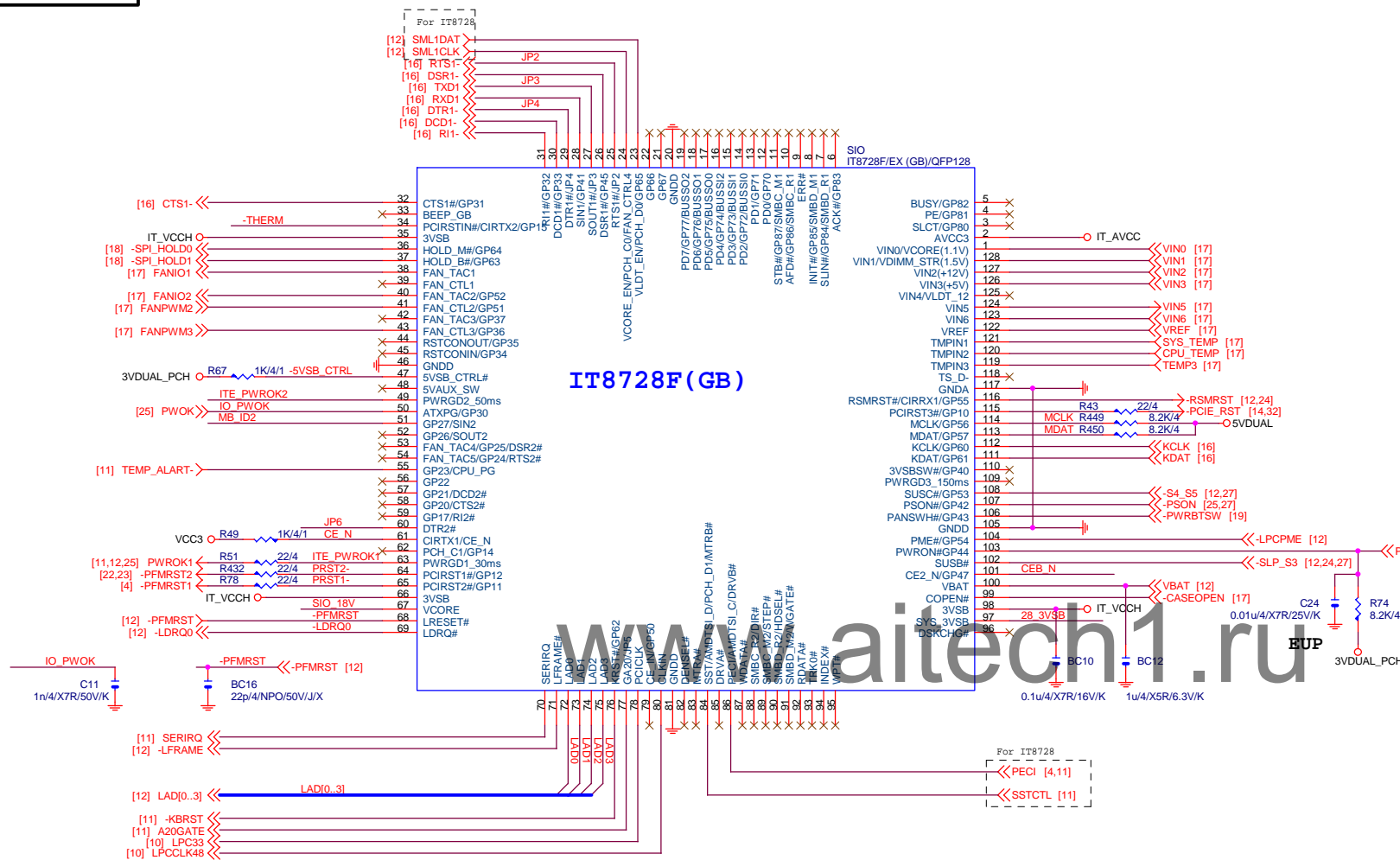
BLACK CONNECTOR

Gigabyte Technology

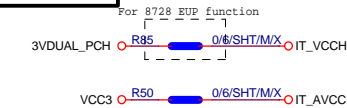
PCI EXPRESS * 16

Title			
PCI EXPRESS * 16			
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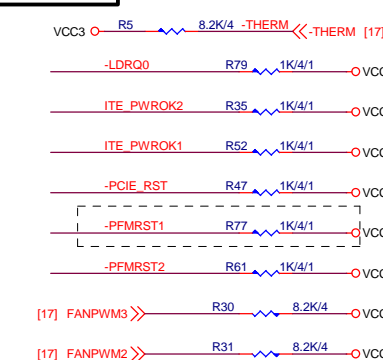
SIO IT8728F



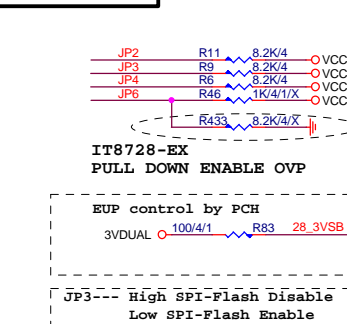
PWR SHT



SIO PU



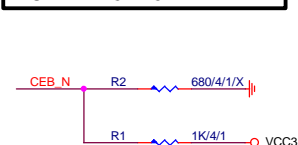
SIO STRAP



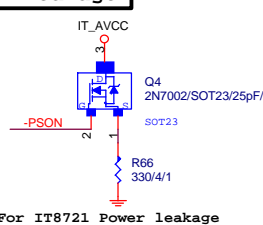
IT8728F NOTE

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

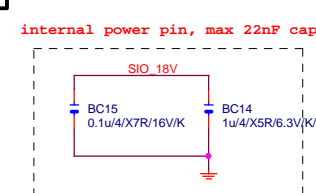


Power leakage



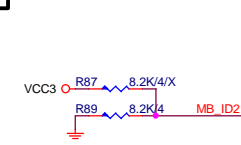
For IT8721 Power leakage

SIO_18V



FOR LOW TEMP POWER ON INTO TEST MODE ISSUE

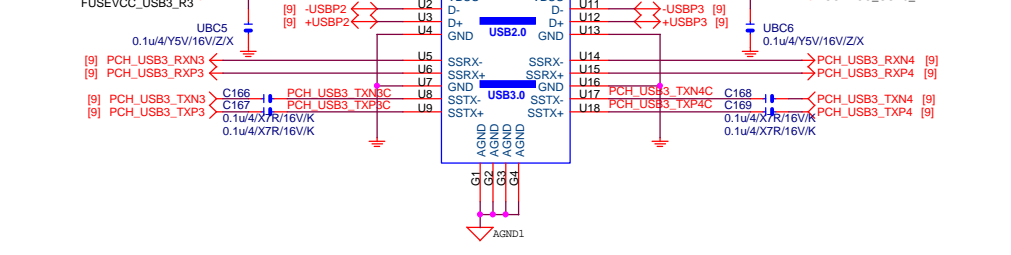
MB ID



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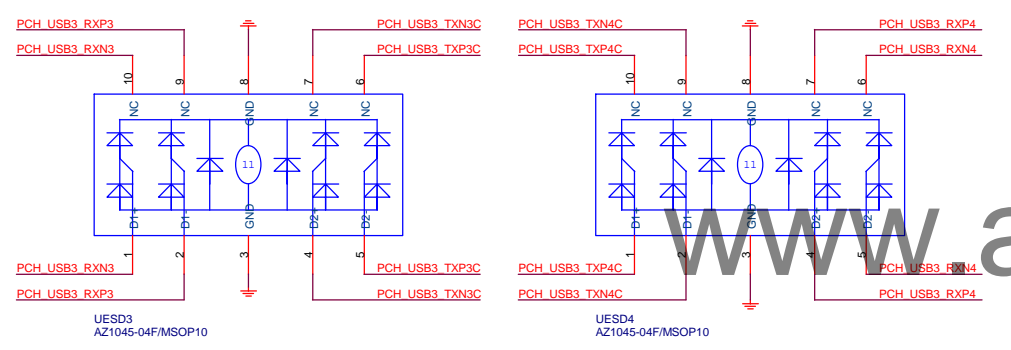
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KB/MS



USB30_LAN ESD PROTECT

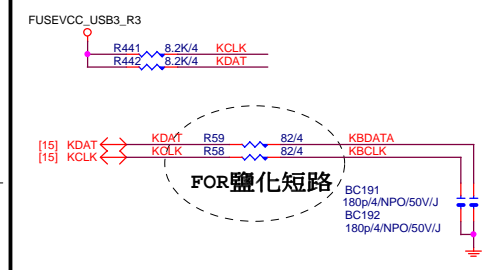
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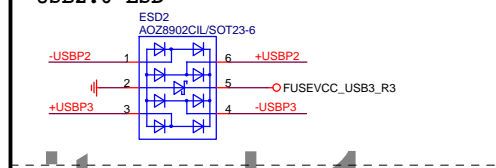
USB3.0 PWR



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



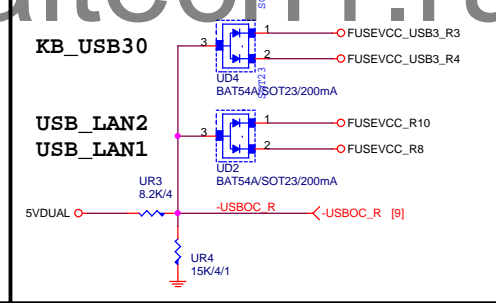
USB2.0 ESD



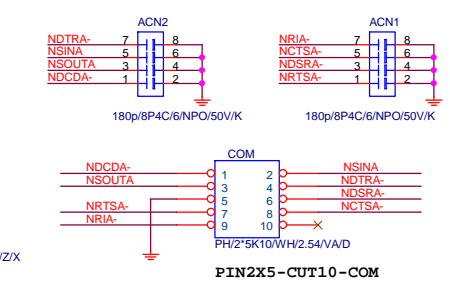
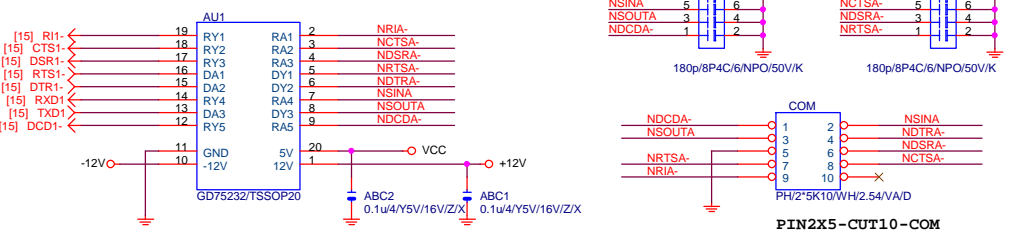
-USB-C R

KB USB30

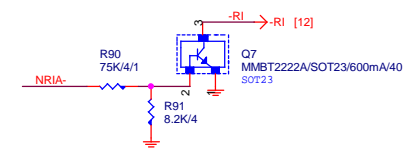
1 FUSEVCC_USB3_R3



COM



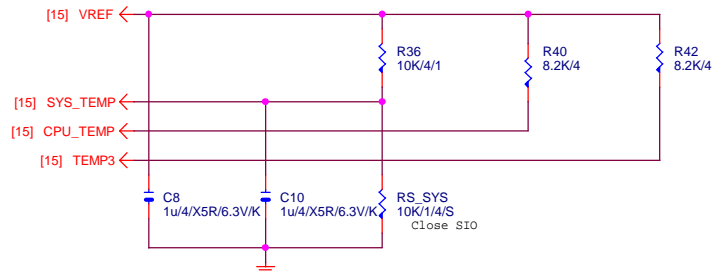
COM RI



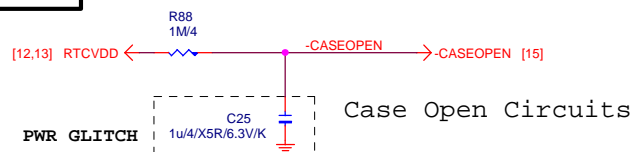
Gigabyte Technology

Title				COM-RI,KB_USB,USB_ESATA,-PROCHOT			
Size		Document Number		GA-H77N-WIFI		Rev	
Custom						1.0	
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TEMP H/W MONITOR

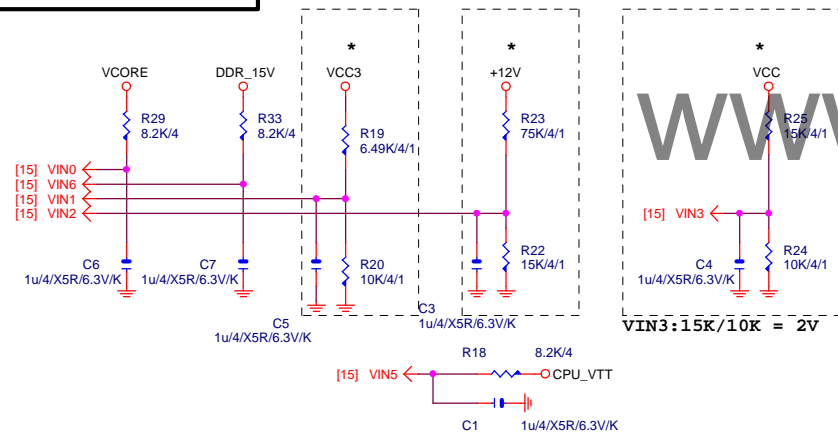


CASE OPEN



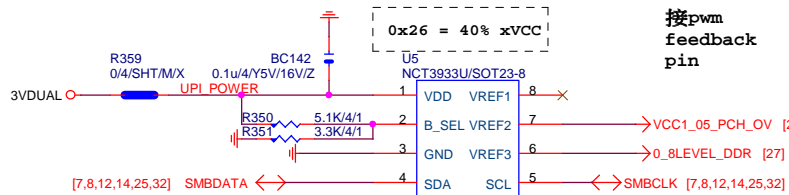
VOLTAGE-- H/W MONITOR

VIN2:75K/15K = 2V

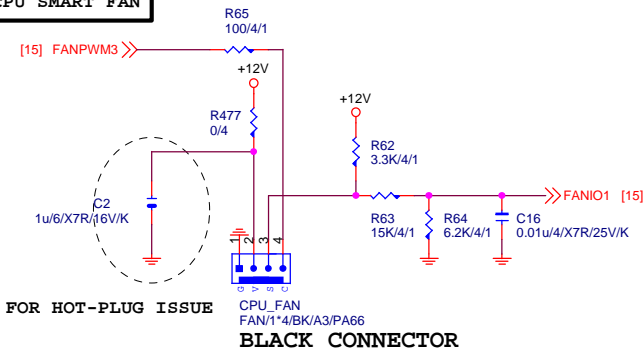


OV NCT3933

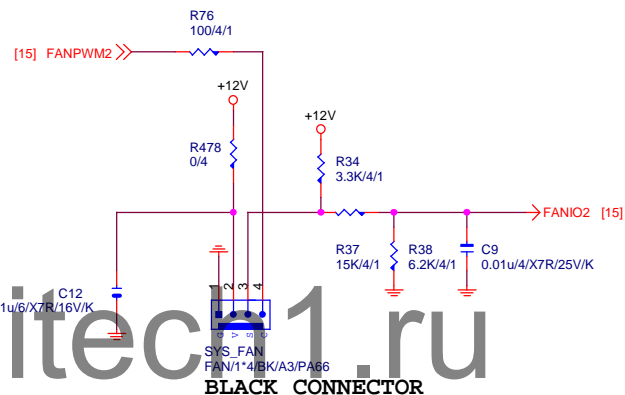
接pwm
feedback
pin



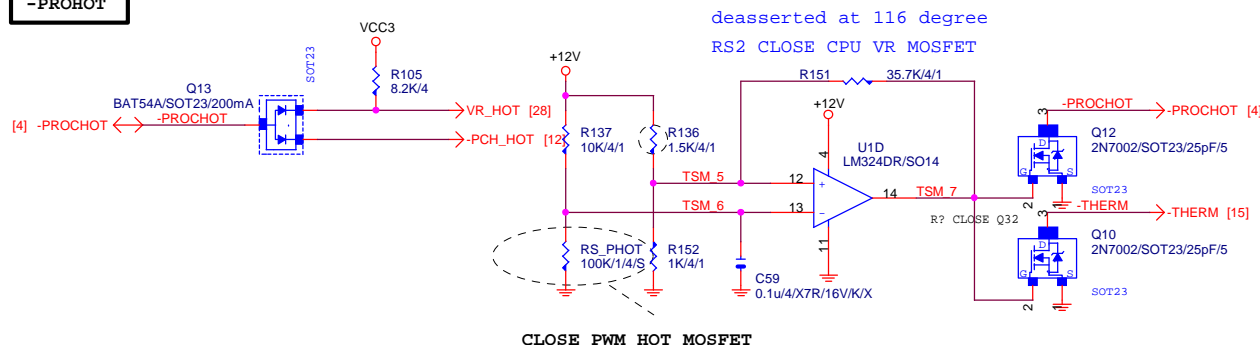
CPU SMART FAN



SYS SMART FAN



-PROHOT



CLOSE PWM HOT MOSFET

Gigabyte Technology

Title			HWM,FAN CTRL,OV
Size	Document Number	GA-H77N-WIFI	
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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

Title

DUAL BIOS

Size A

Document Number

GA-H77N-WIFI

Rev

1.0

Date:

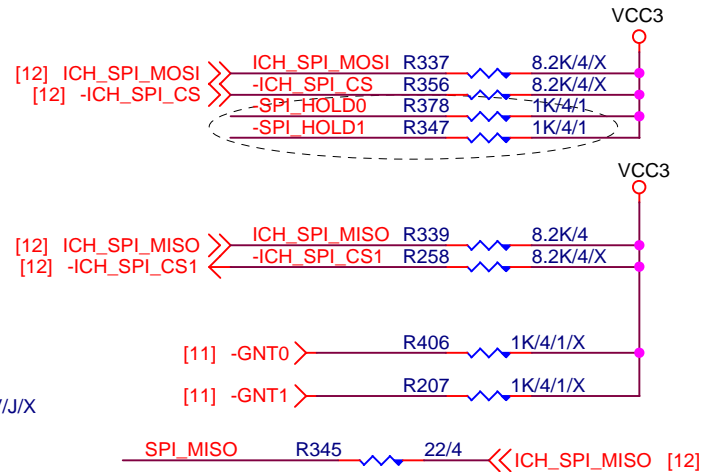
Wednesday, August 08, 2012

Sheet

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of

32

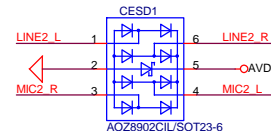


H61使用32M BIOS

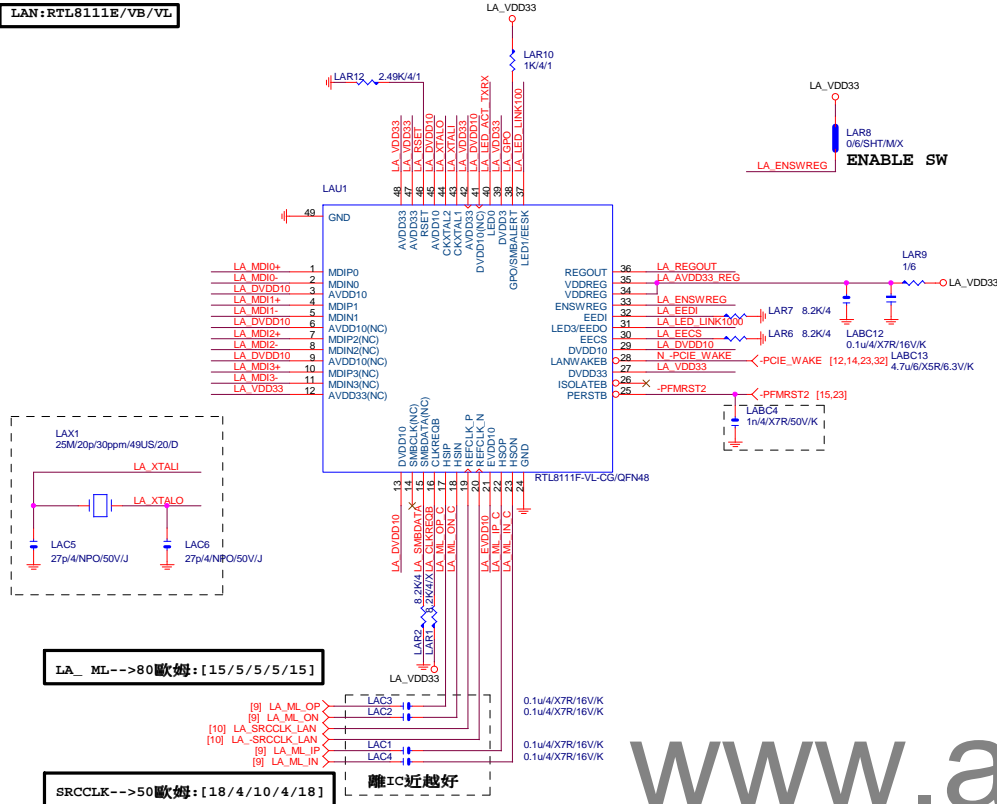
BOOT DEVICE	GNT1	GNT0
LPC	0	0
PCI	0	1
SPI	1	1

1	means	floating
0	means	PD 1K

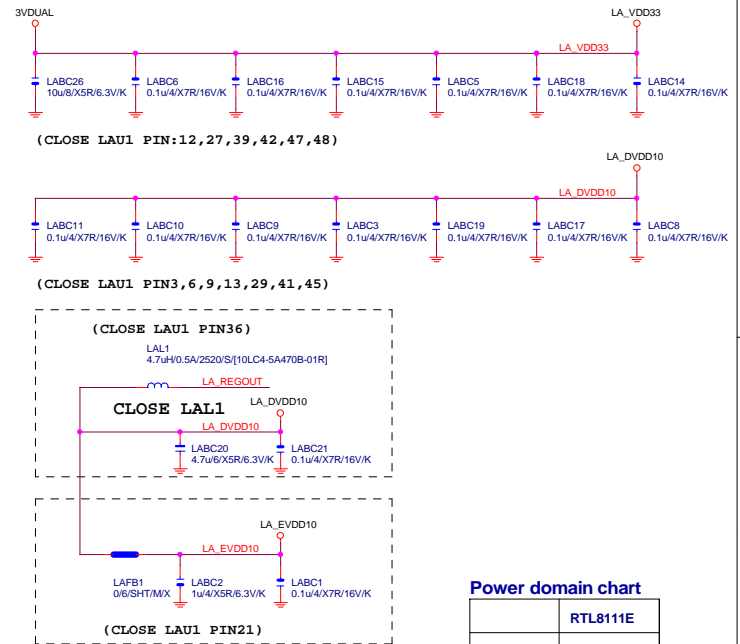
CR5/CR8/CR11/CR4/
CR17/CR22/CR45/CR33/
CR47/CR40/CR26/CR37/
CR13/CR11/CR57/CR53



LAN:RTL8111E/VB/VL



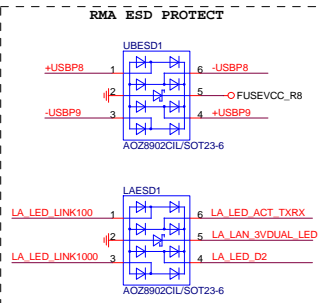
LAN POWER



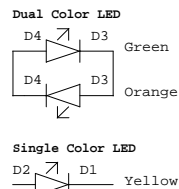
Power domain chart

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


USB_LAN CONNECTOR



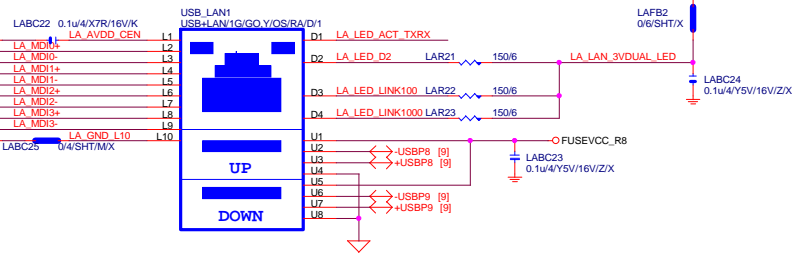
注意: LAN LED PROTECT: (CO-LAYOUT)
1.ESD(6PIN):AOZ8902CIL/SOT23-6(DEFAULT)
2.SURGE(5PIN):AZ2025-04S/SOT23-5L



Single Color LED

D2  D1 Yellow

LA_MDI-->100歐姆:[20/4/8/4/20]



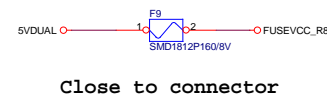
注意:USB PORT(目前:暫代6,7PORT)
USB-->90歐姆:[15/4.5/7.5/4.5/15]

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

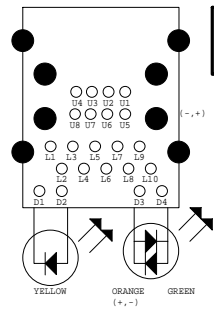
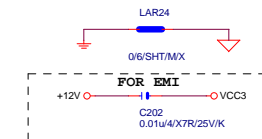
USB POWER



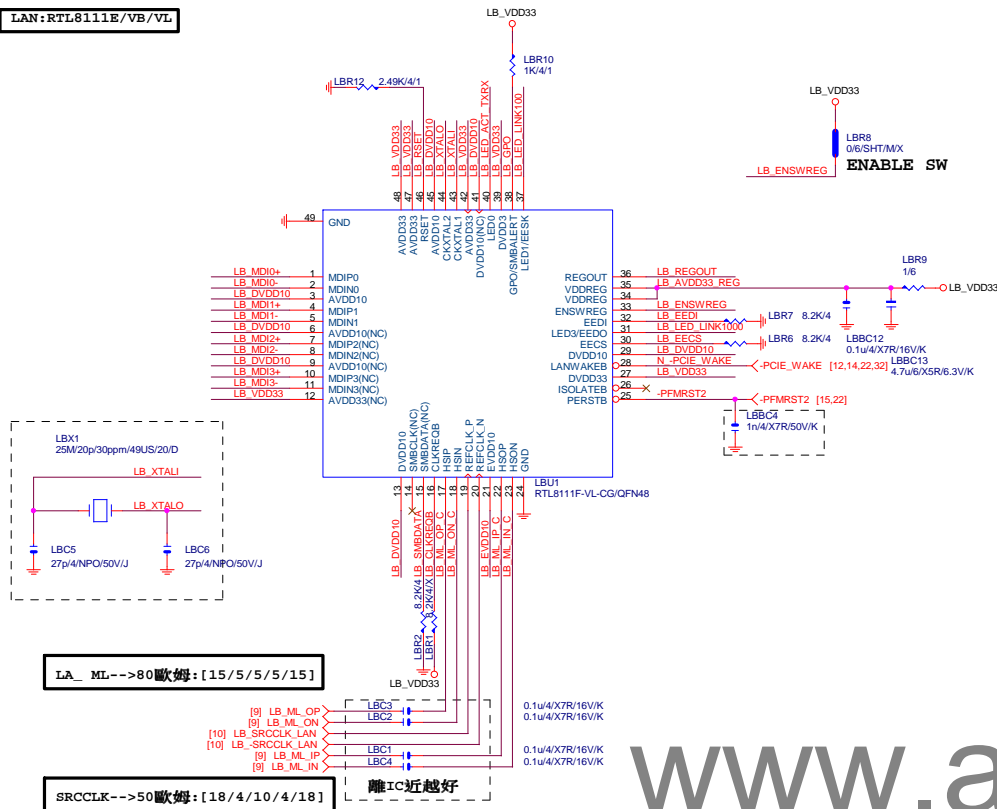
Close to connector

EMI SHORT PAD

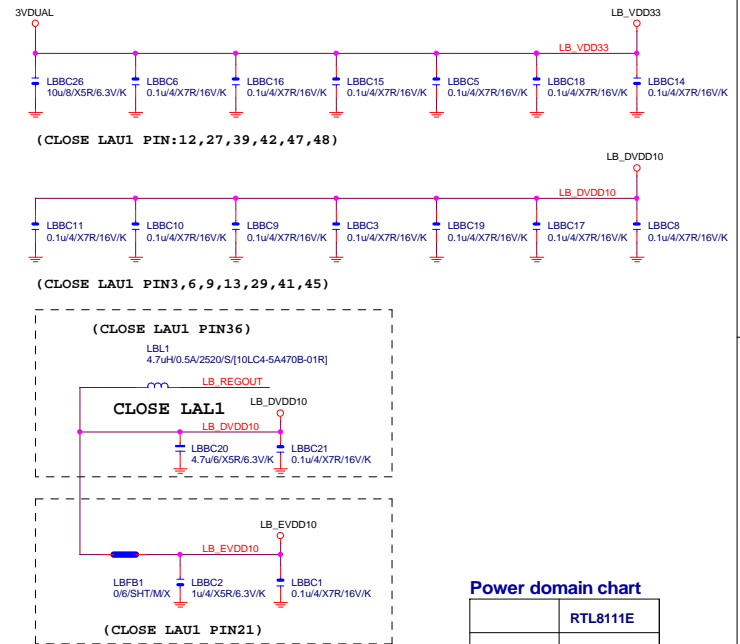
PS:視EMI需求



LAN:RTL8111E/VB/VL



LAN POWER

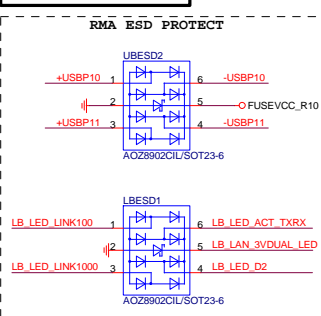


Power domain chart

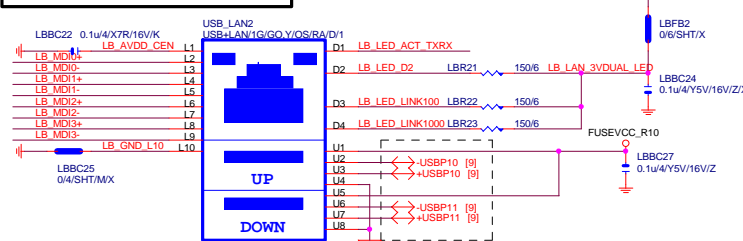
	RTL8111E
AVDD33	3.3V
DVDD33	3.3V
VDDREG	3.3V
DVDD10	1.05V

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USB LAN CONNECTOR



LA_MDI-->100歐姆:[20/4/8/4/20]



注意:USB PORT(目前:暫代6,7PORT)

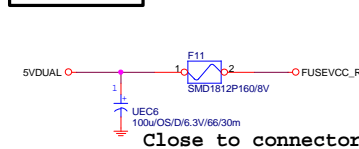
USB-->90歐姆:[15/4.5/7.5/4.5/15]

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

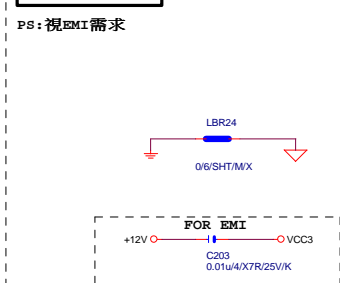
USB LAN BOM區分:

- 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 X3 POWER



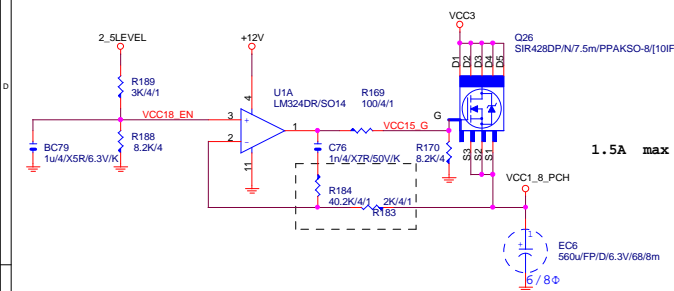
EMI SHORT PAD



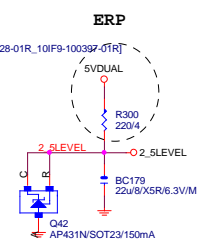
Gigabyte Technology

File			Rev
ARTHEROS AR8151/AR8161			1.0
Size	Document Number	GA-H77N-WIFI	
Custom			
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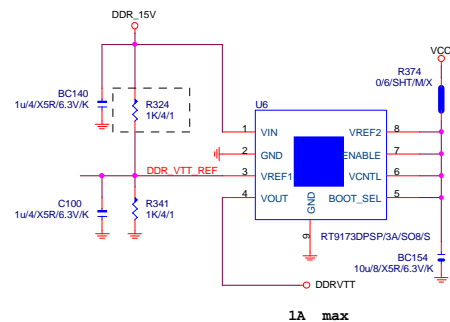
VCC1_8_PCH



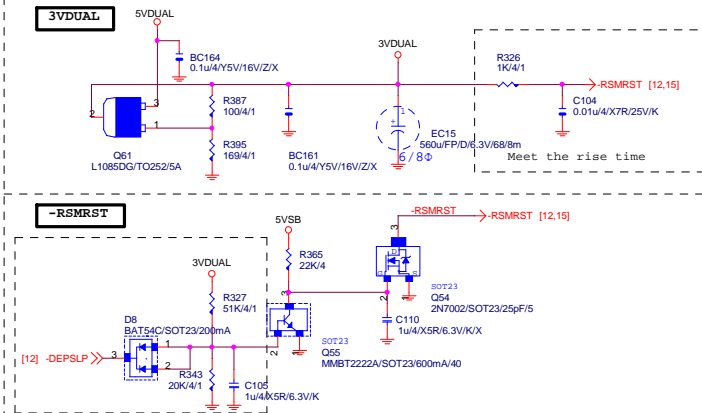
2_5LEVEL



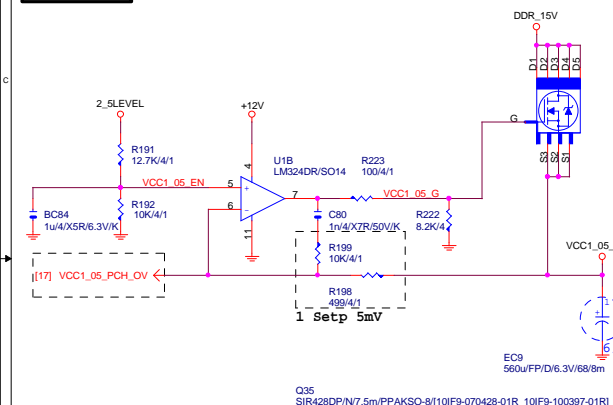
DDRVTT



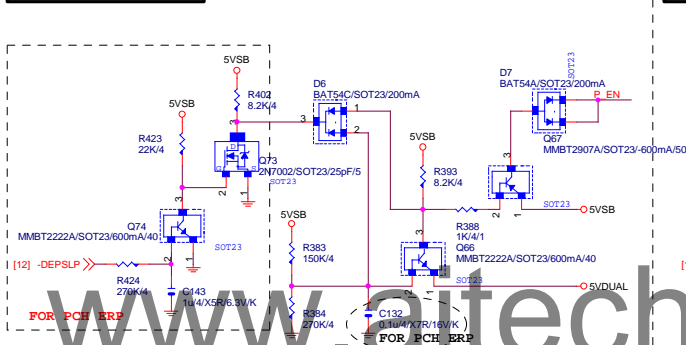
3VDUAL



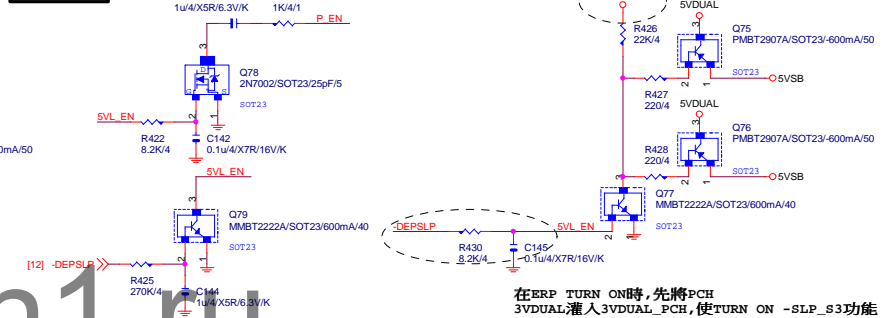
VCC1_05_PCH



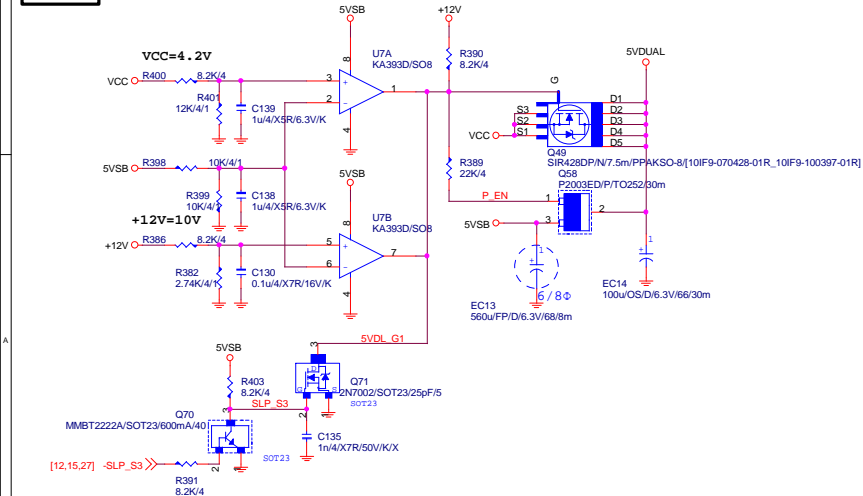
5VDUAL SHORT PROTECT



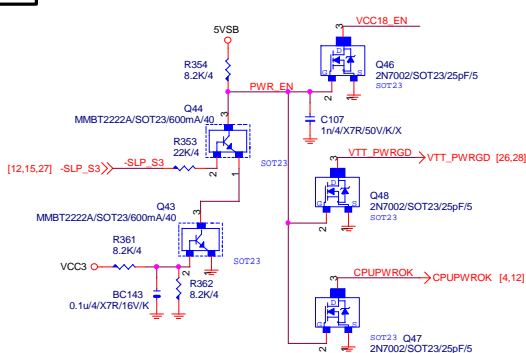
PCH ERP



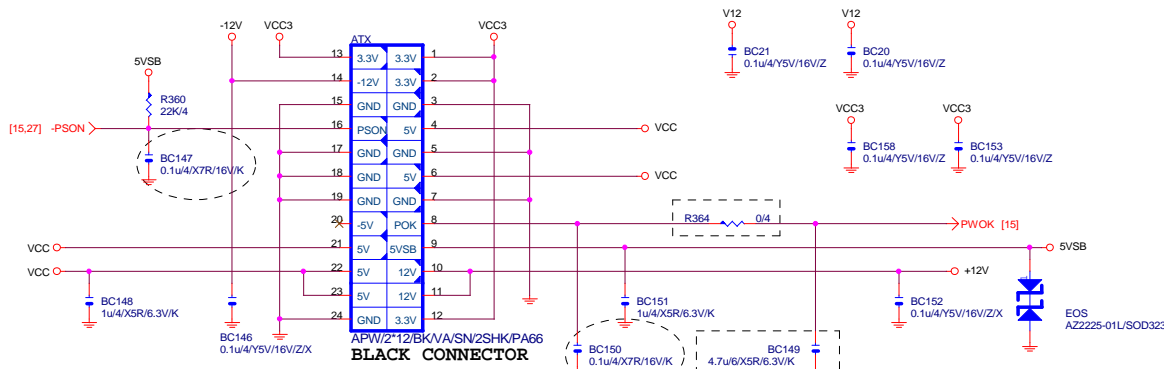
5VDUAL



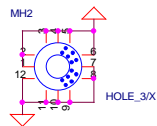
PWR SEQ



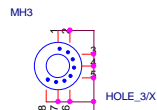
ATXX24 POWER CONNECTOR



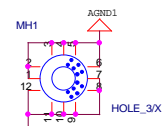
MB LOCATION



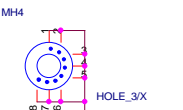
HOLE_4-RH-5MM-1



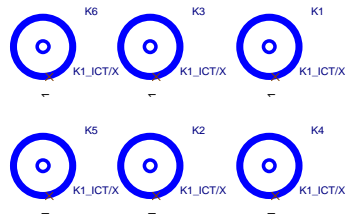
HOLE_4-RH-5MM-5PIN-1



HOLE_4-RH-5MM-1

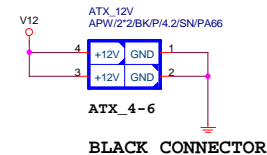


HOLE_4-RH-5MM-5PIN-1



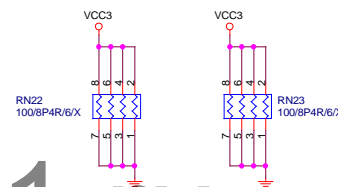
To prevent the 5VSB under loading when boot

ATXX4 POWER CONNECTOR

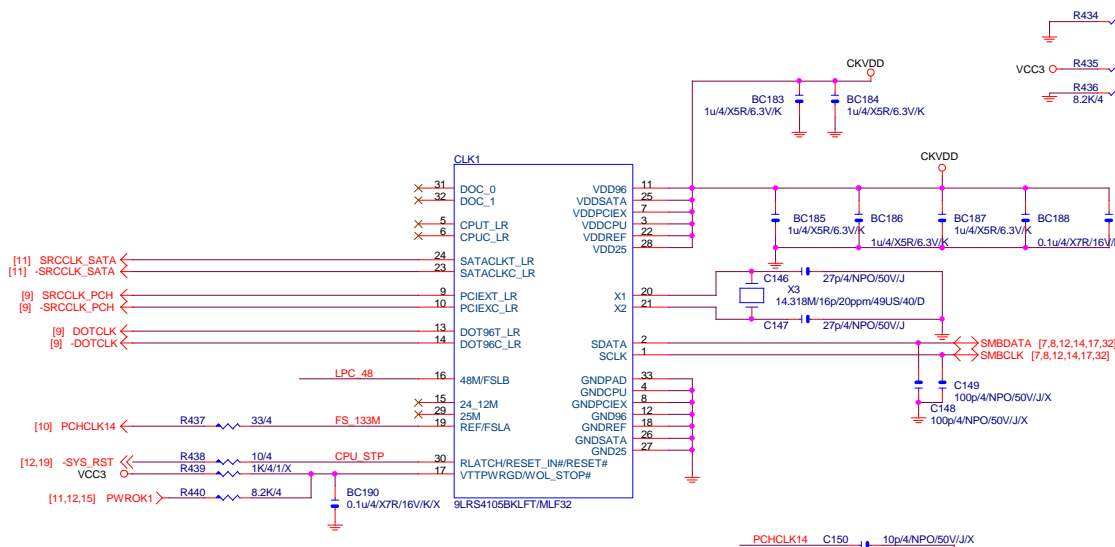


BLACK CONNECTOR

FIX PWR MINMUN LOAD



CLK GEN



CPU Frequency Selection

FS	CPU
0	100M <Default>
1	133M

Gigabyte Technology

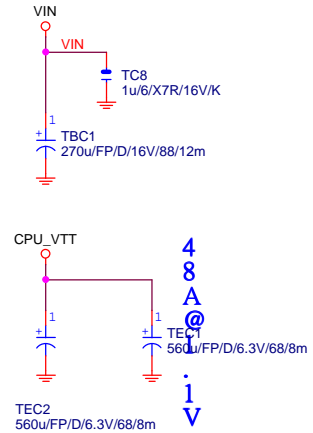
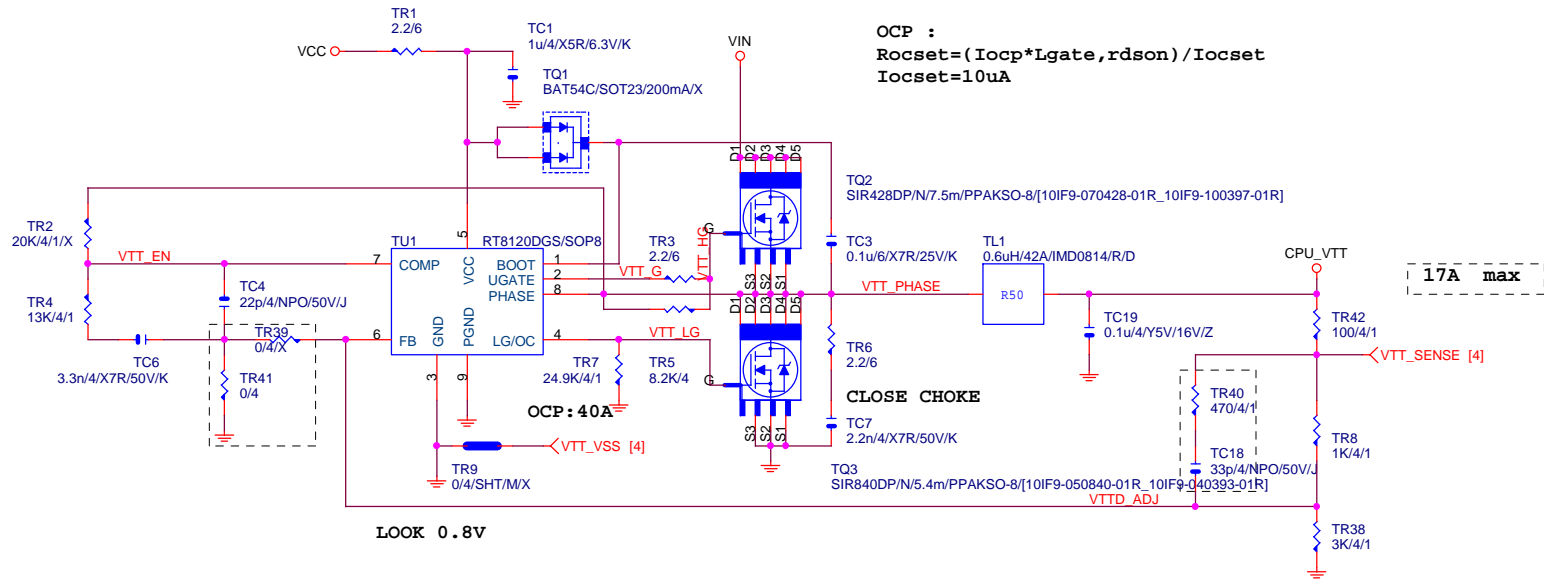
ATX CONNECTOR

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Rev 1.0

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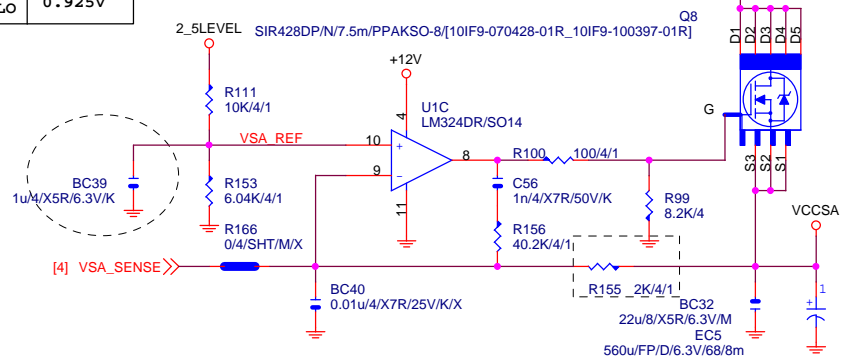
CPU_VTT



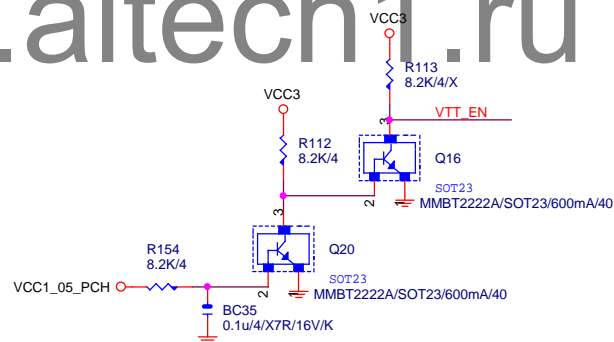
VCCSA

PDG 0.8

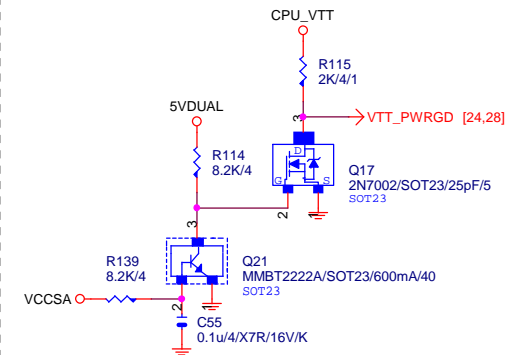
	VSA_SEL
HI	0.85V
LO	0.925V



CPU_VTT PWR SEQ



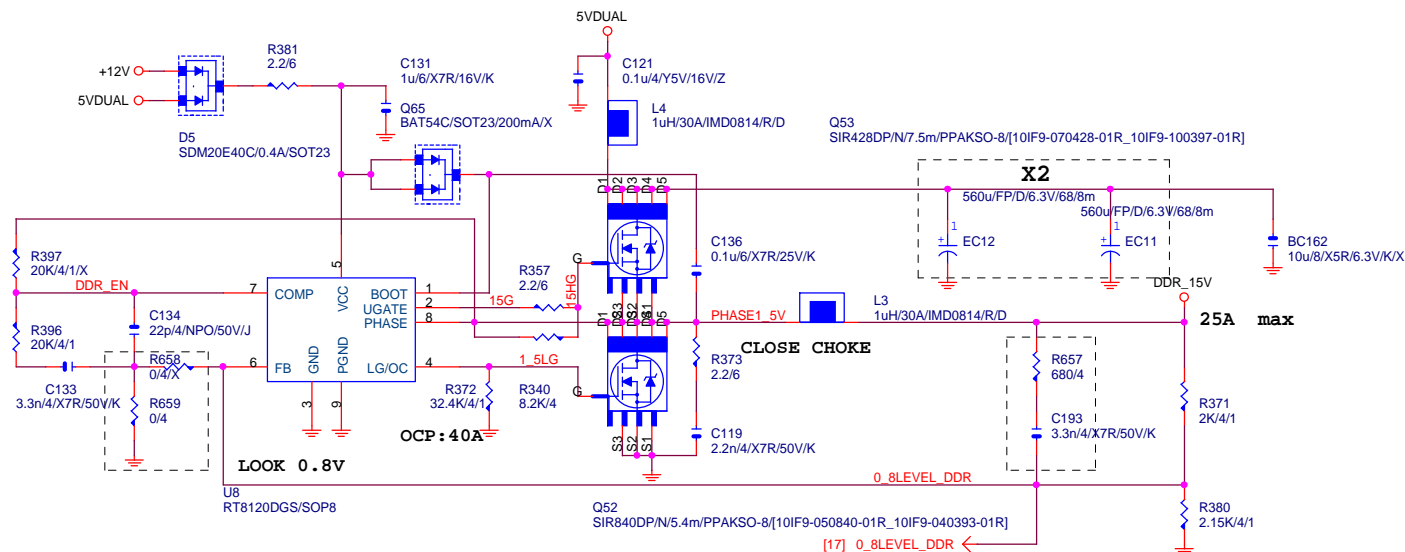
VTT_PWRGD



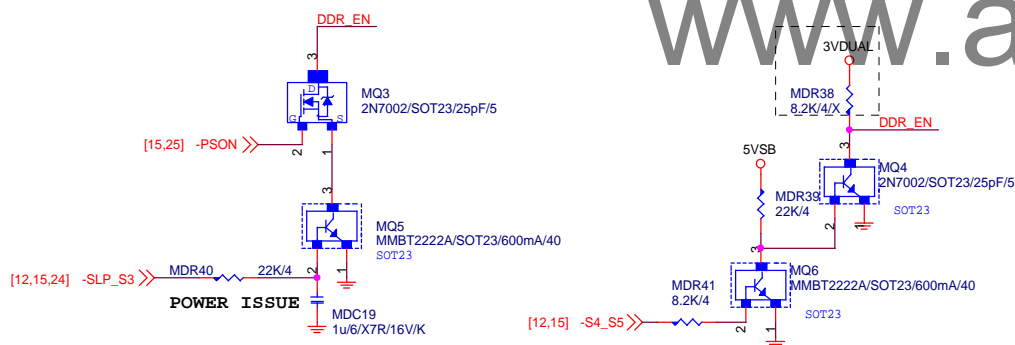
GIGABYTE

Title			
CPU_VTT			
Size	Document Number	Rev	
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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)

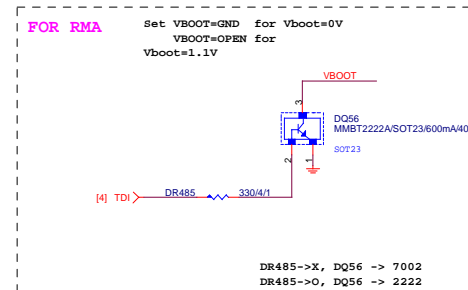
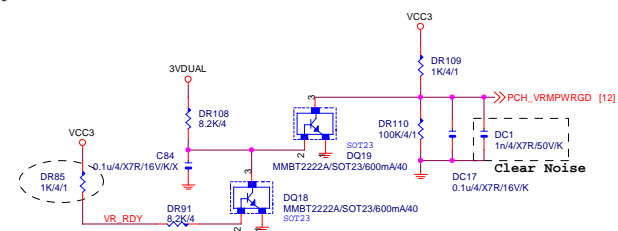
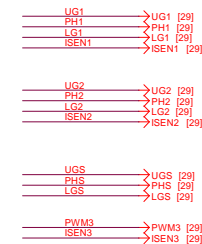
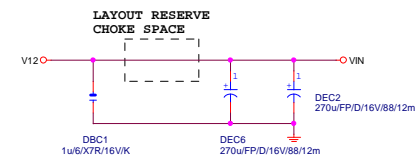
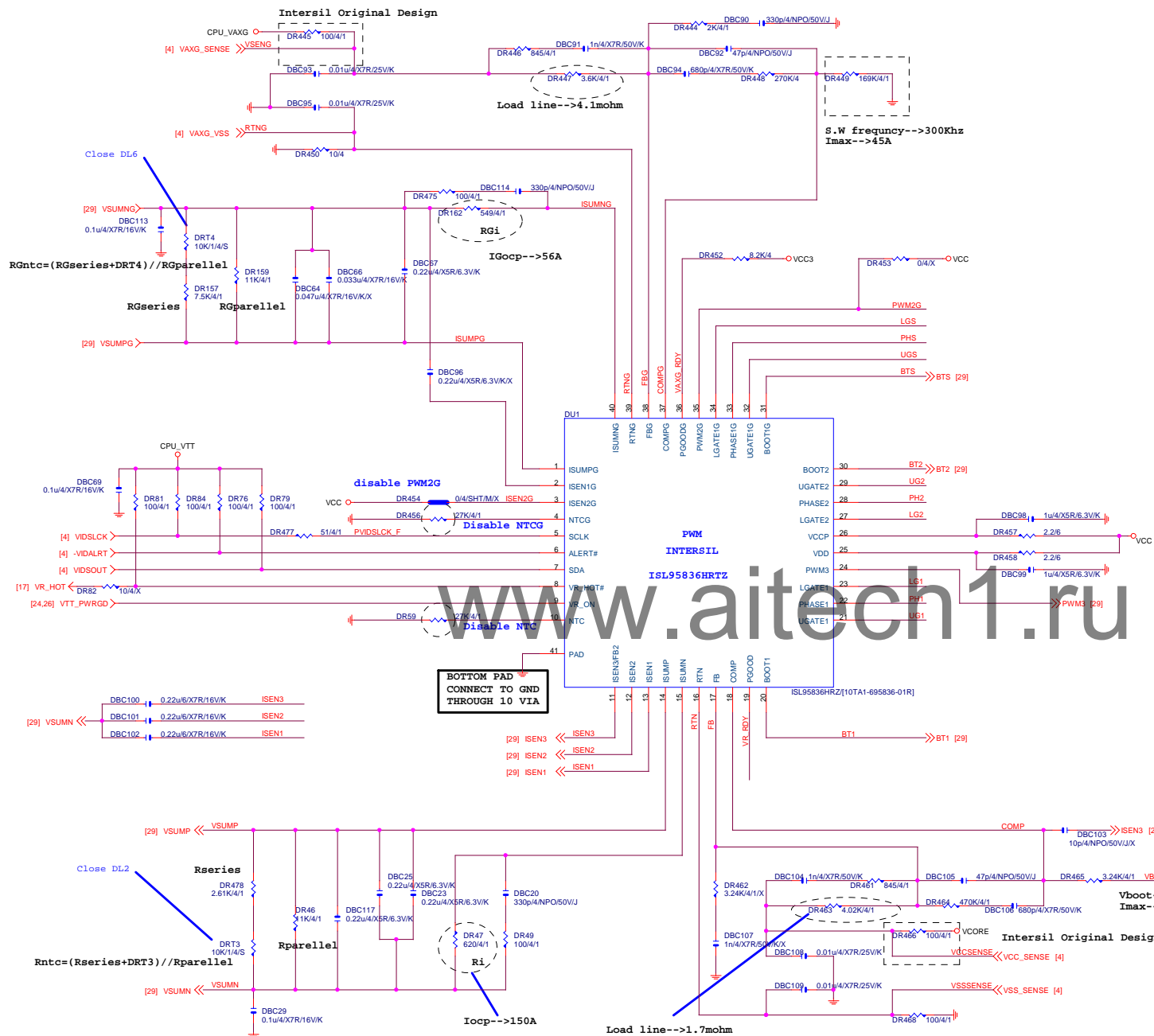
VIN Ripple current=4.7X1.7=7.99A(85°C)
 -->故固態電容須2X7.99=15.98>11.45A

OCP : $I_{peak} = (2 \times I_{ocset} \times R_{ocset}) / R_{dson}$
 typ $I_{ocset} = 20\mu A$, $R_{ocset} = 4.7k$
 OCP : $53.71A = (2 \times 20\mu A \times 4.7k) / (7m / 7m)$

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DDR POWER

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PHASE 1

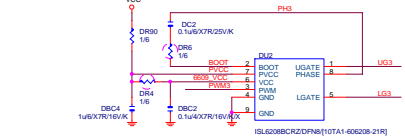


[1]

[PH] BT1

[PH] BT1

PHASE 3



PWM3

[3]

PHASE 2

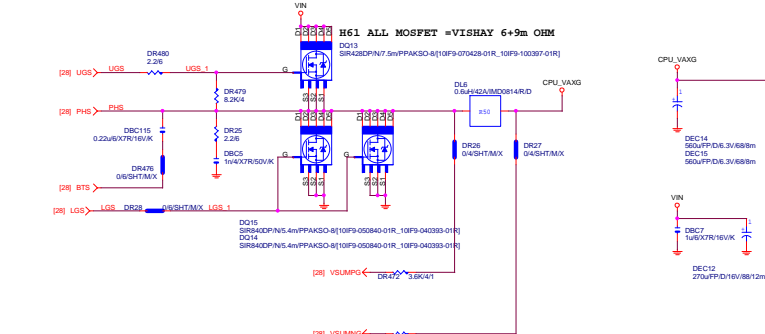


[2]

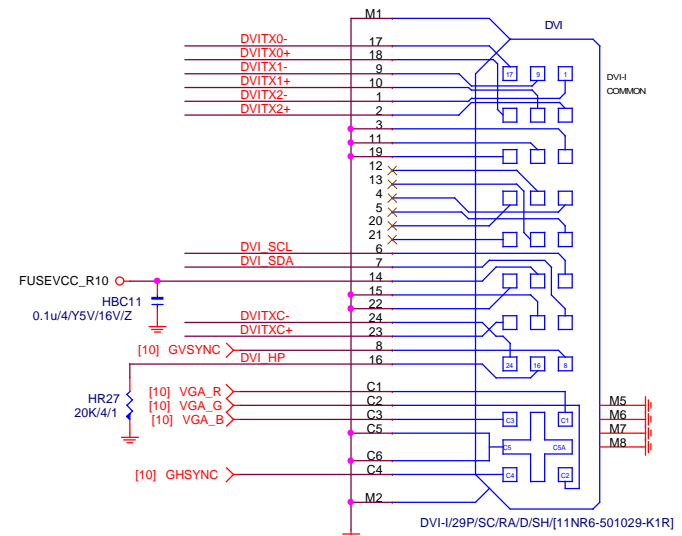
[PH] BT2

[PH] BT2

VAXG



ASM1442/QFN48/[T0TAT1-05336U-T0R_T0TAT1-051442-20R]
HDP NONE-REVERSE
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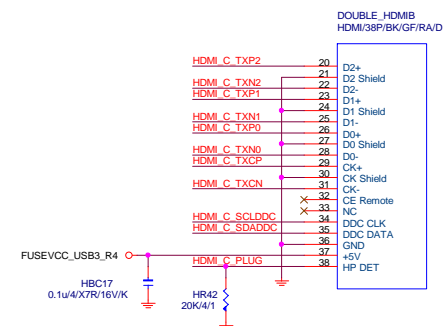
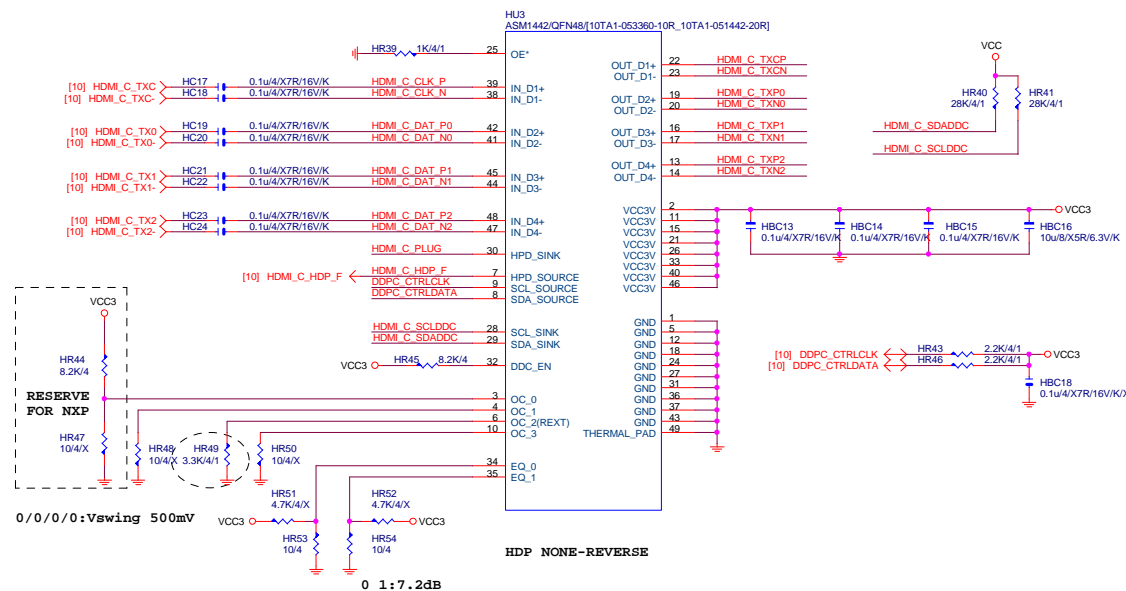
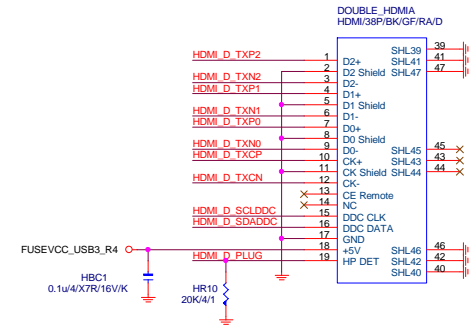


```
PI3DV411 0 0:3dB
ASM1442 1 1:3dB
```

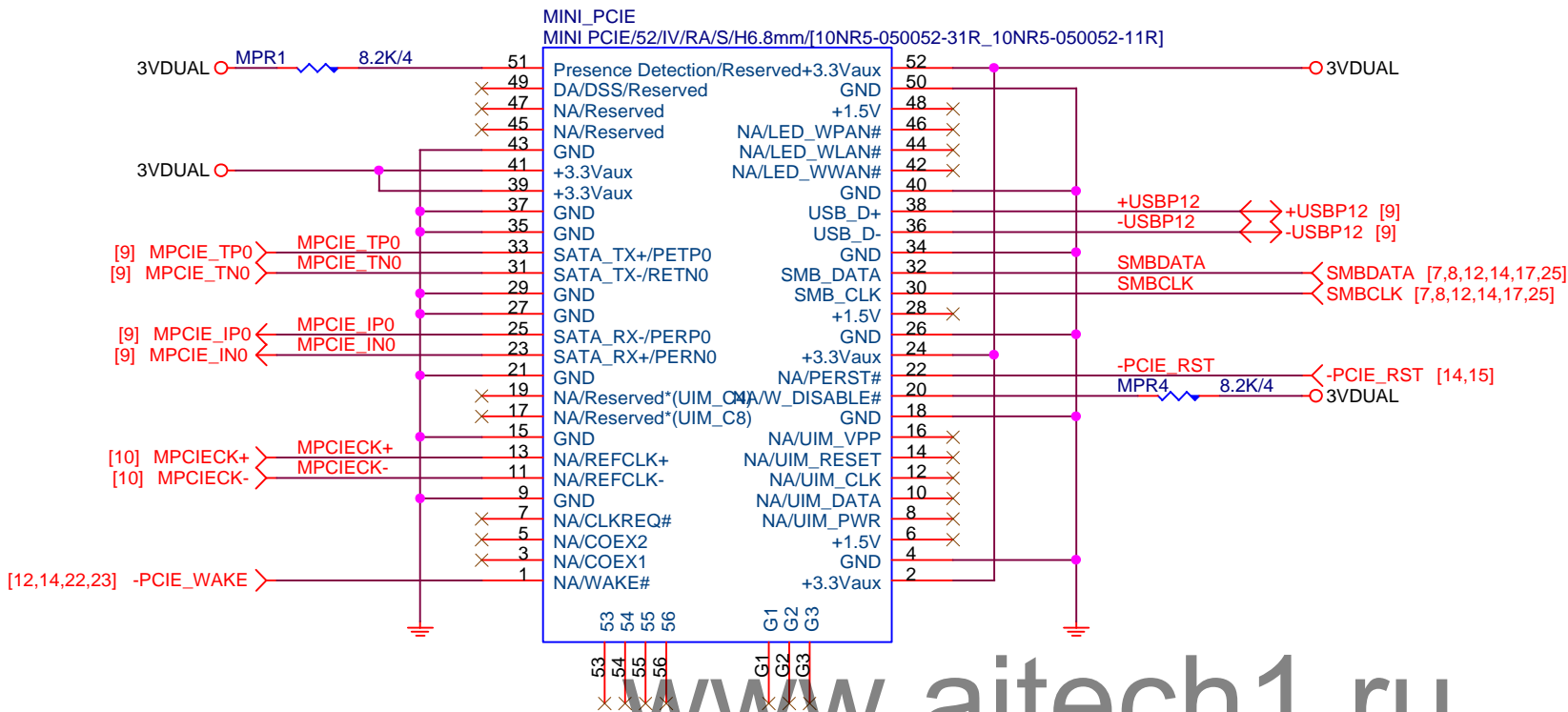
HDP NONE-REVERSE

Title			
DVI			
Size Custom	Document Number	GA-H77N-WIFI	Rev 1.0
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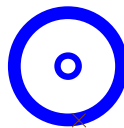
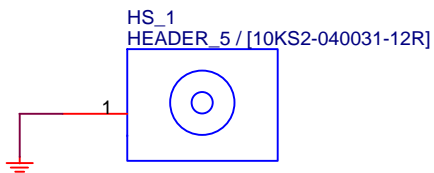
HDMI LEVEL SHIFT



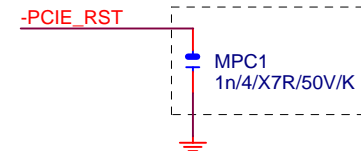
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HDMI * 2			
Size	Document Number	Rev	
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WIFI_MODULE
WI-FI WITH BT MINI CARD INTEL/[20CB1-022230-00R]



Gigabyte Technology			
Title			
mini PCI-E			
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Date:	Wednesday, August 08, 2012	Sheet	32 of 32