

Model Name: GA-H81M-S2PH

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	ITE 8620 LPC IO
16	COM,KB_MS,USB PWR
17	IT8892E
18	PCI SLOT 1,2
19	PCI EXPRESS*1 SLOT.LPT
20	HWM,FAN CTRL,OV,-PROCHOT
21	DUAL BIOS
22	FP,F_USB,SPK,SATALED
23	Realtek ALC887-VD2
24	REAR AUDIO JACK
25	REALTEK RTL8111F
26	DISCRETE POWER
27	ATX,DUMMY LOAD

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Revision 1.01

SHEET

TITLE

28	RT8120_DDR POWER
29	VCORE ISL95812_1
30	VCORE ISL95812_2
31	HDMI

Gigabyte Technology		
Cover Sheet		
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Date: Monday, July 15, 2013	Sheet 1	of 31

Revision 1.01

Component value change history

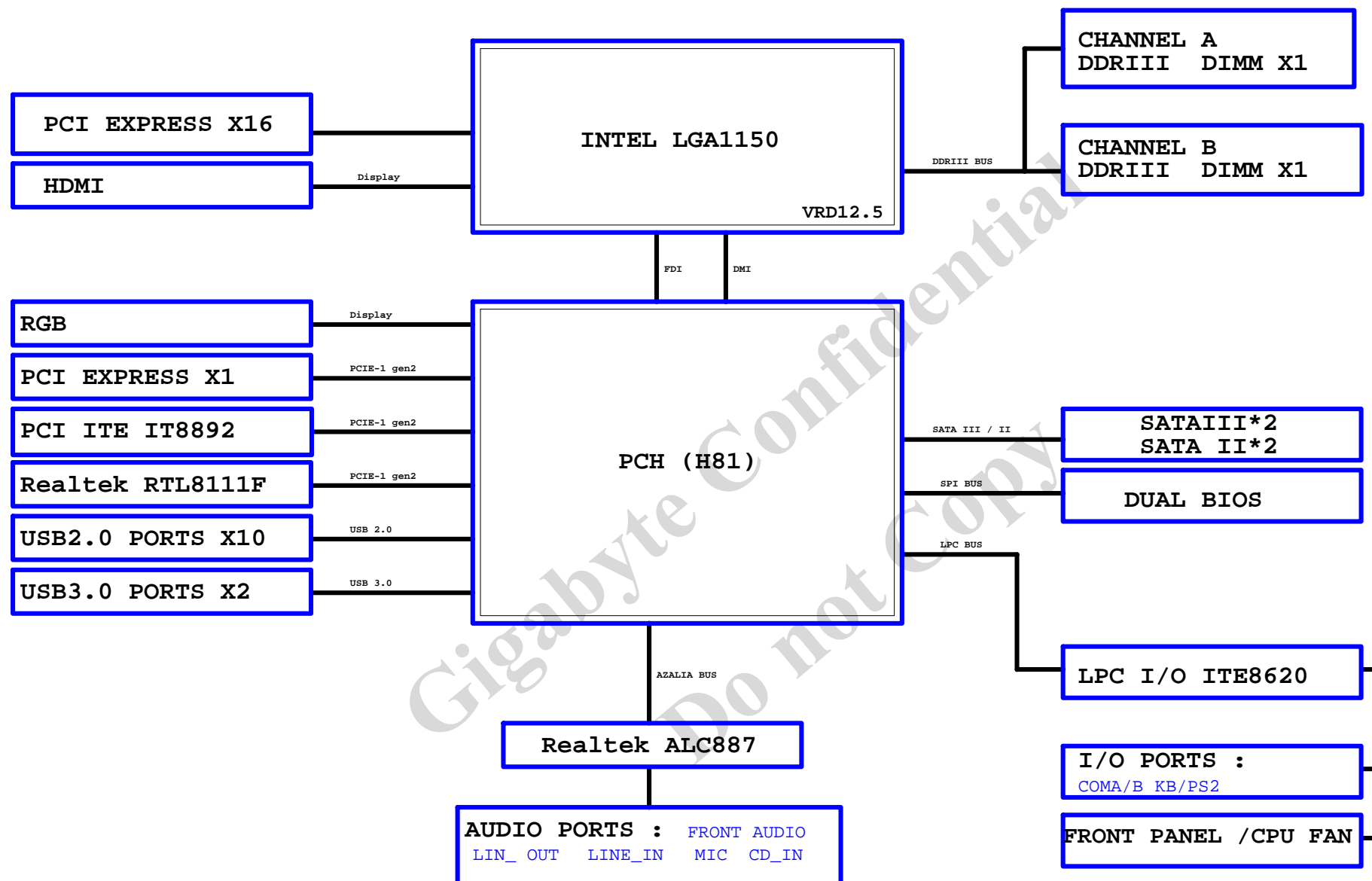
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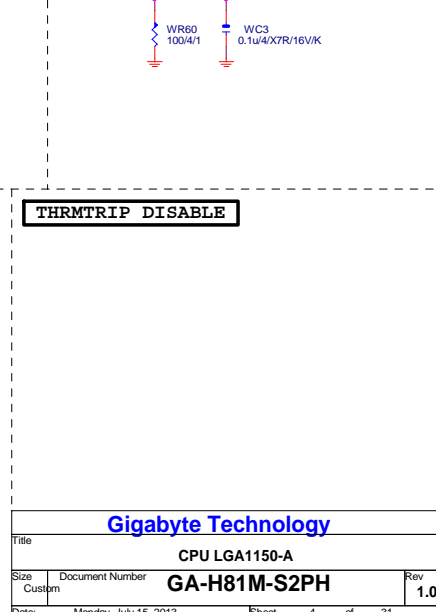
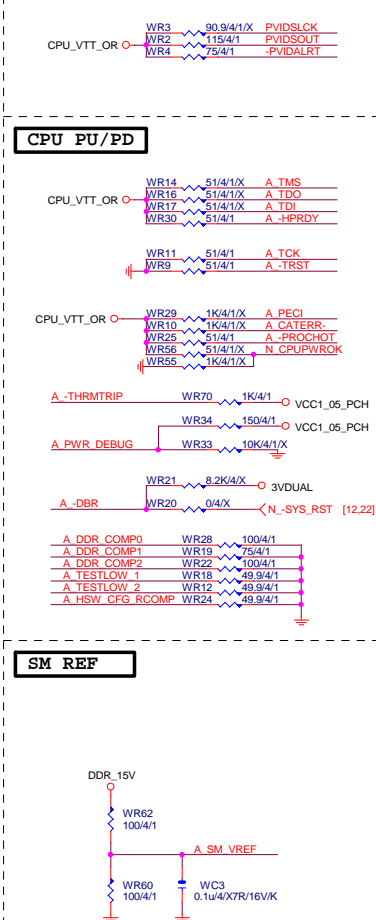
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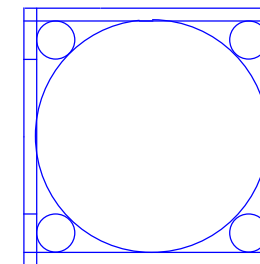
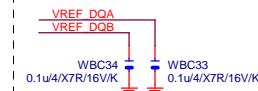
Circuit or PCB layout change

[illegible]

BLOCK DIAGRAM



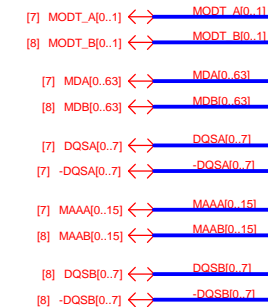




○

ILM_BP/1156/CSP/ILM_BP/1156/CSP/[12KRC-0F0001-52R_12KRC-0F0001-51R

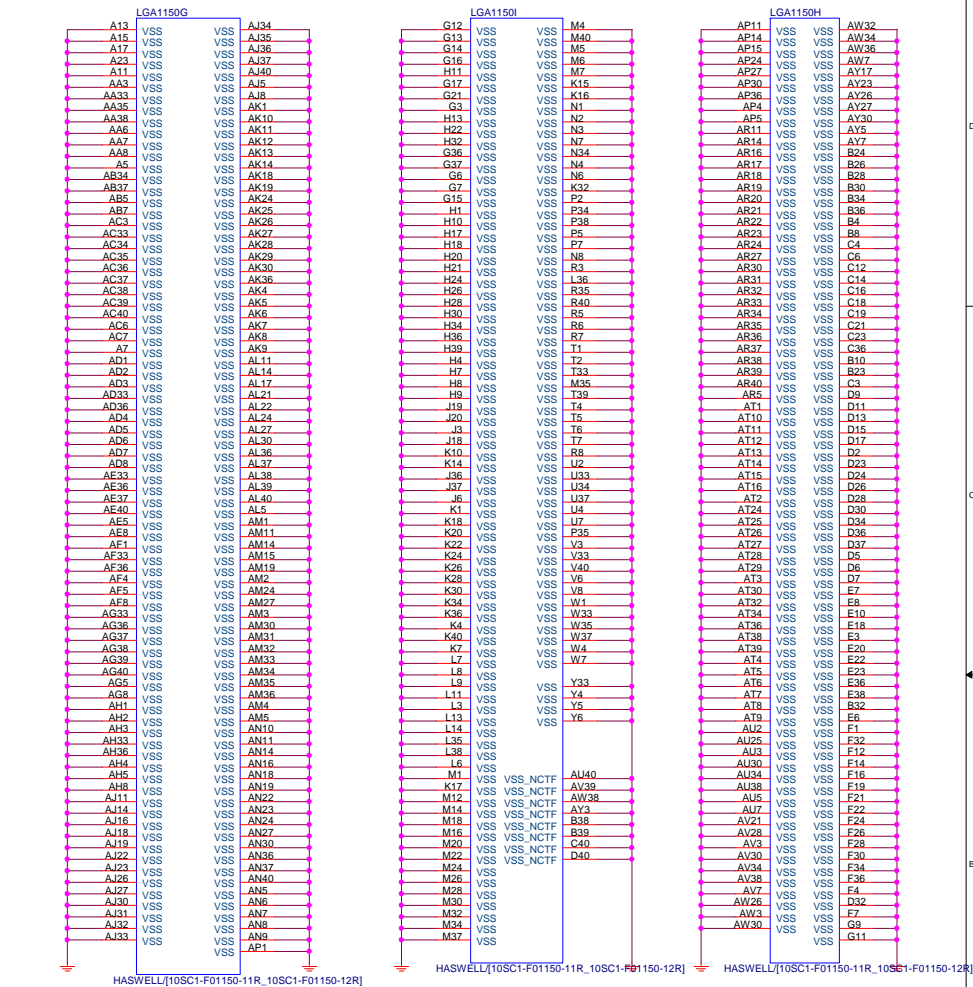
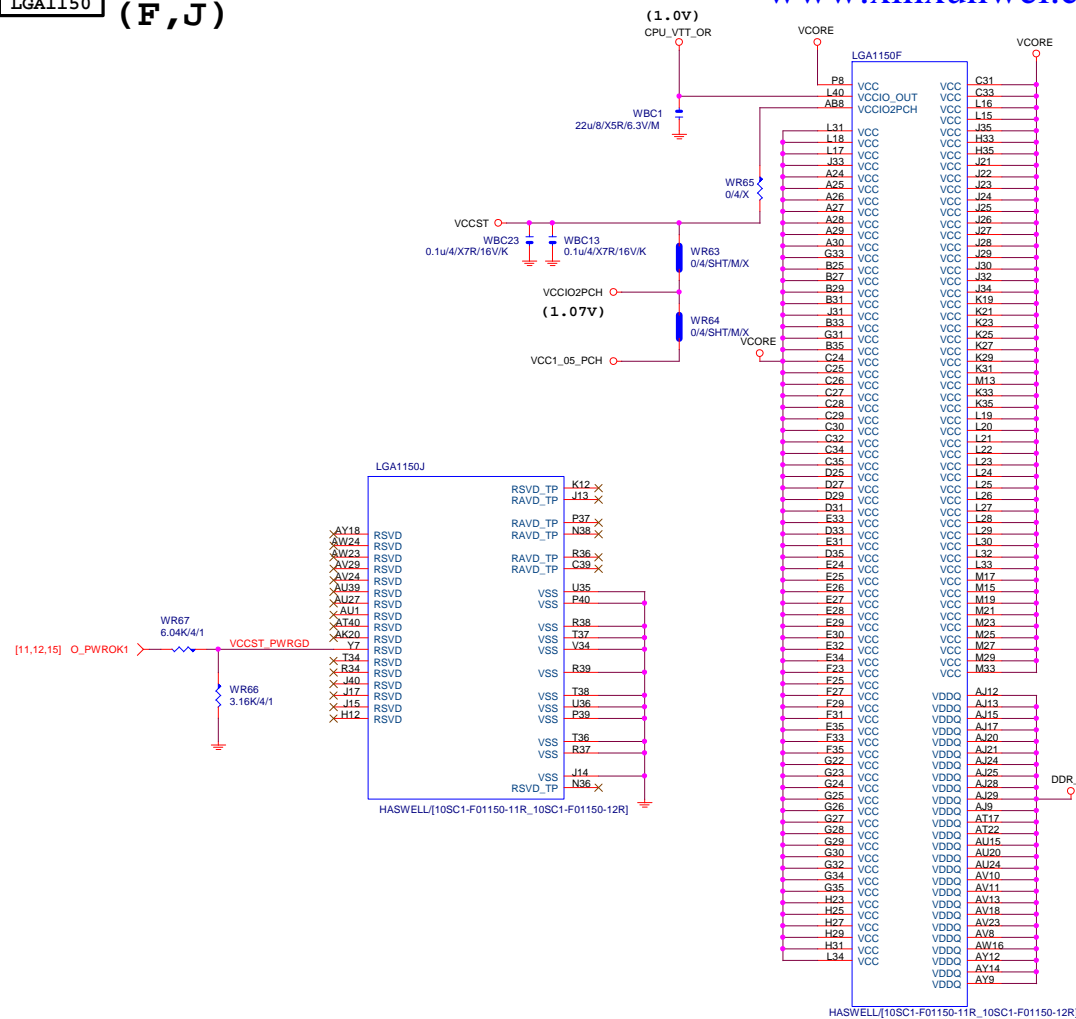
DDR BUS



LGA1150 (F,J)

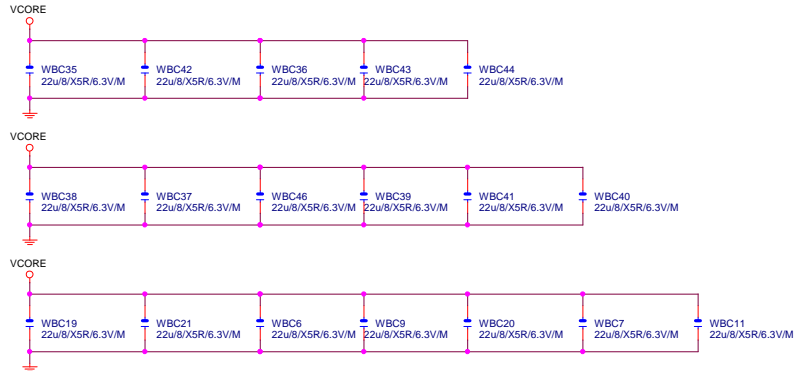
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LGA1155 (G,H,I)



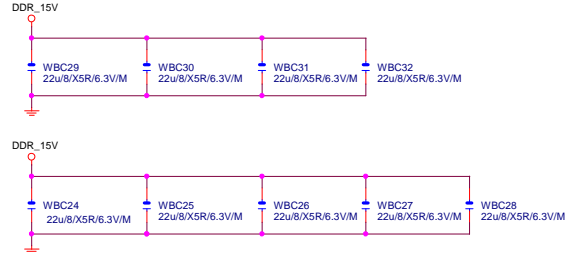
VCore CAP

(X18)



DDR CAP

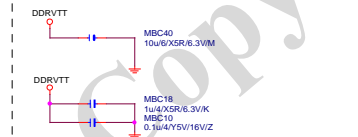
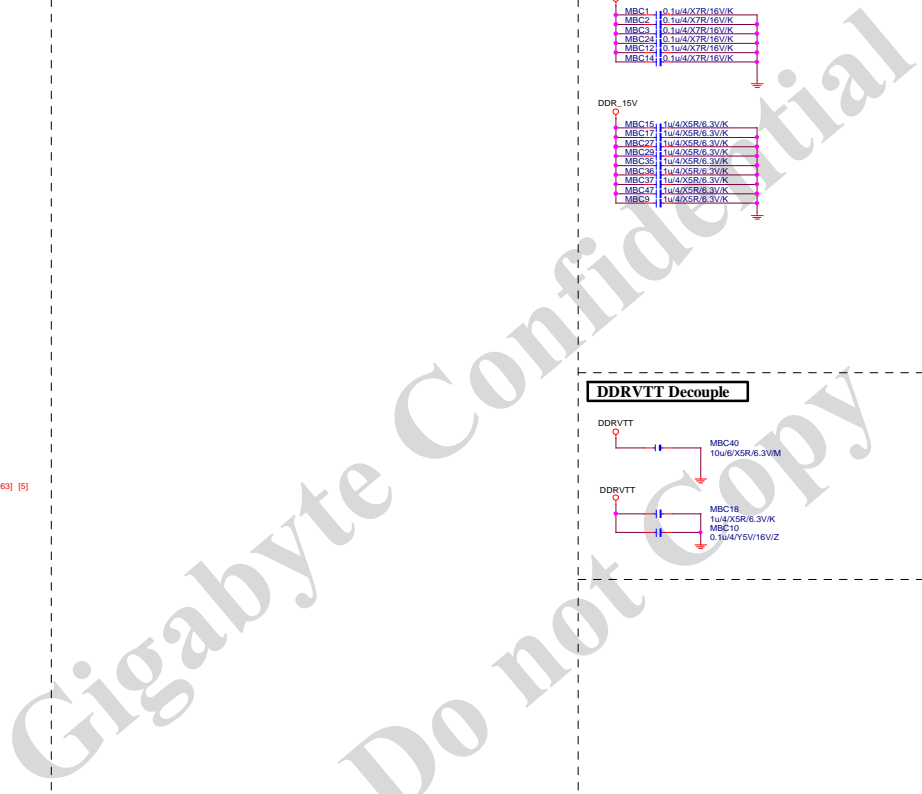
(X9)



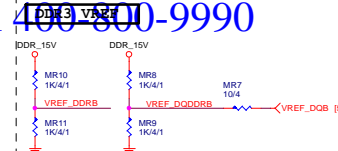
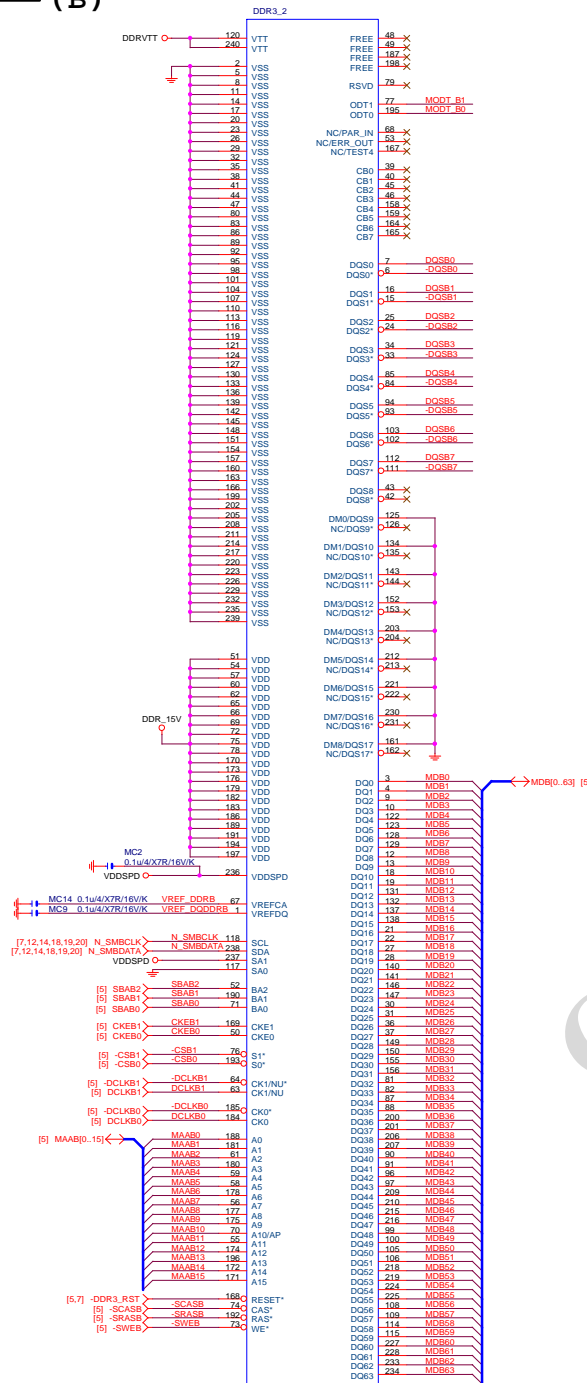
Gigabyte Technology

Title	CPU LGA1150-C		
Size	Custom	Document Number	GA-H81M-S2PH
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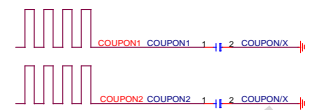
Rev 1.01



(B)



COUPON



CPU

DIMM1

CHA

DIMM2

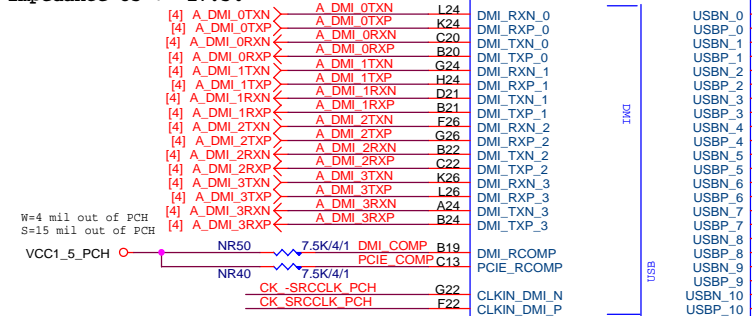
CHB

Gigabyte Technology

File	DDR3 CHANNEL B	Rev	1.01
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Customer			
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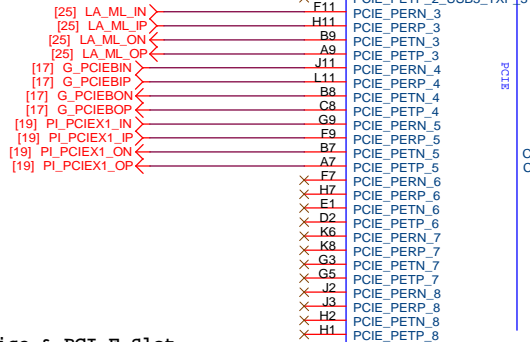
PCH (B)

DMI:12/4/4/4/12(breakout min 8/4/4/4/8)
Impedance=85 +- 17.5%



```
H81: USB3 only Port 0/1
```

PCIEx1	8892	LAN
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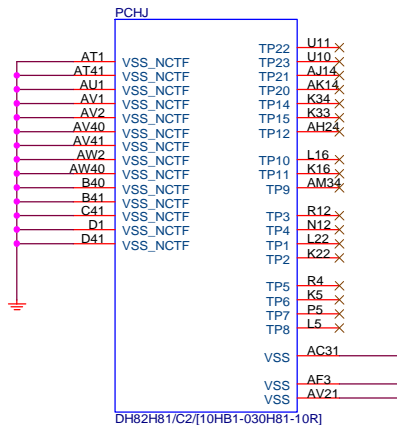


放靠近 Device & PCI-E Slot

Impedance=80 +- 17.5%

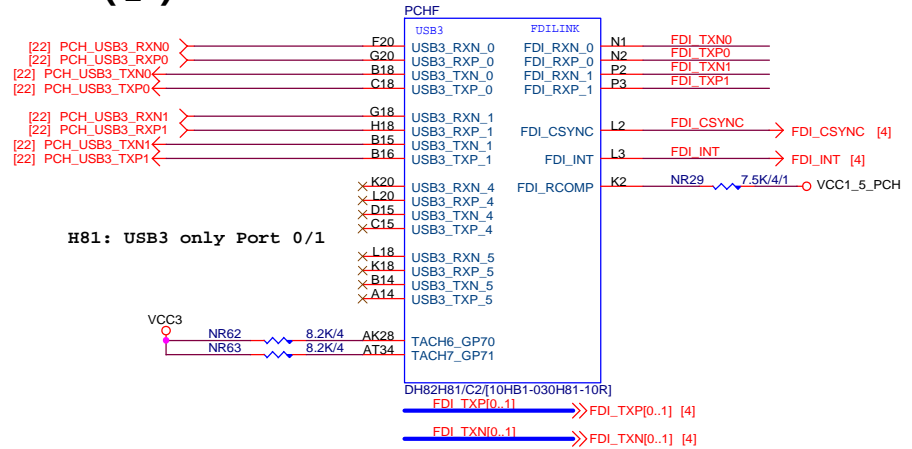
PCIEX1:16/5/5/5/16 (breakout min 8/4/4/4/8)

PCH (J)



DH82H81/C2/[10HB1-030H81-10R]

PCH (F)



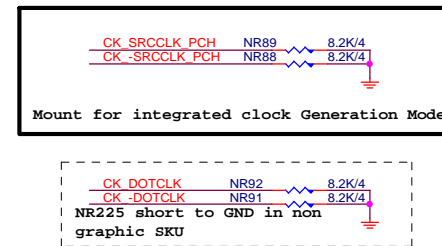
H81: USB3 only Port 0/1

USB3.0:20/5/7/5/20 (breakout min
8/4/4/4/8) ; ONLY 3 VIAS

Impedance=85 +/- 17.5%
Back Panel < 10000 MILS
Front Panel < 6000 MILS

Front Panel < 6000 MILS

PCH CLK PD

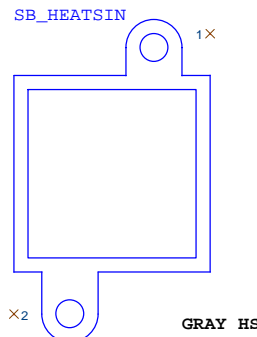


Mount for integrated clock Generation Mode

CK DOTCLK NR92 8.2K/4
CK -DOTCLK NR91 8.2K/4
NR225 short to GND in non
graphic SKU

PCH H/S

LOW COST ICH7 HEATSINK



PCH_HS
PCH_HS/[12SP2-030005-43R_12SP2-030005-41R_12SP2-030005-42R]

USB TABLE

OC[3:0]# for Device 29 (ports 0-7)

OC[7:4]# for Device 26 (ports 8-13)

USB OC# Configure	
OC0#	USB30_HDMI
OC1#	R_USB
OC2#	N/A
OC3#	N/A
OC4#	F_USB1
OC5#	F_USB2
OC6#	N/A
OC7#	Not Use

Gigabyte Technology

Title	PCH FDI,DMI,USB ,PCIE,NVRAM
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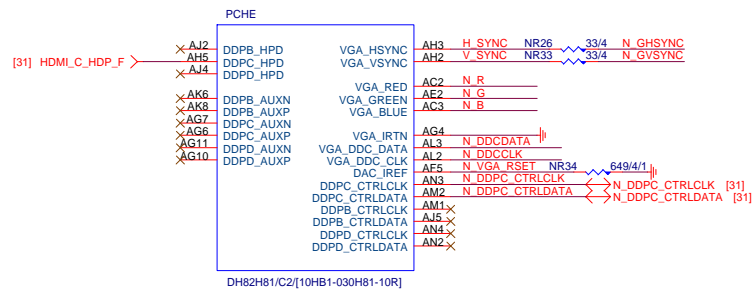
Size	Document Number	GA-H81M-S2PH
Custom		

Date:	Monday, July 15, 2013	Sheet	9	of	31
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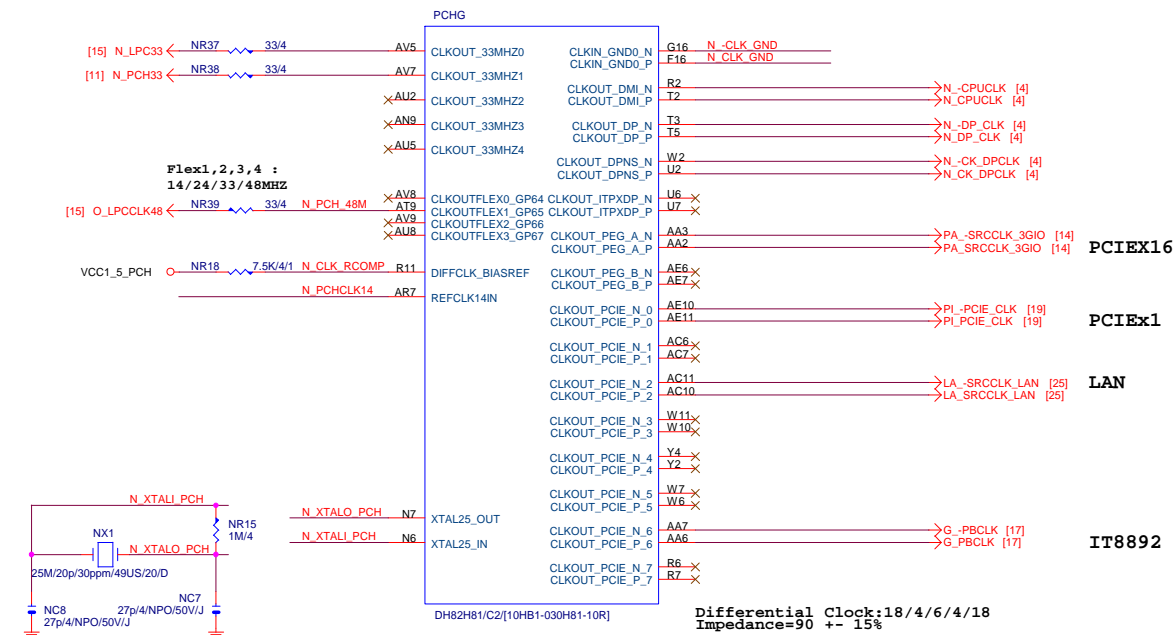
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PCH

(E)



PCH



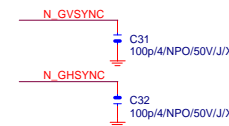
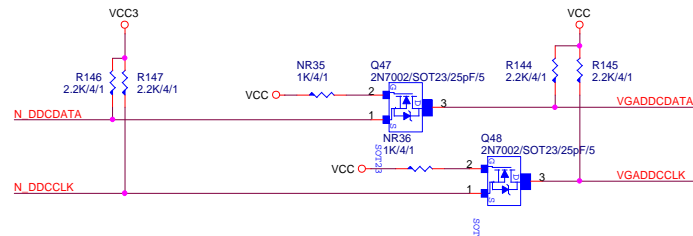
PCH CLK PD



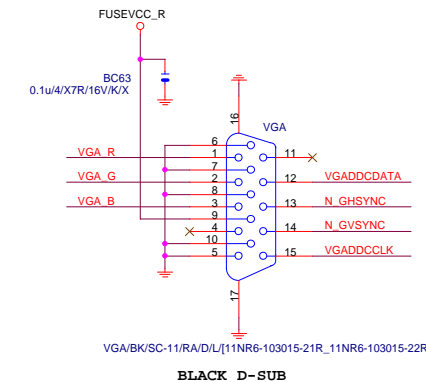
Mount for integrated clock Generation Mode



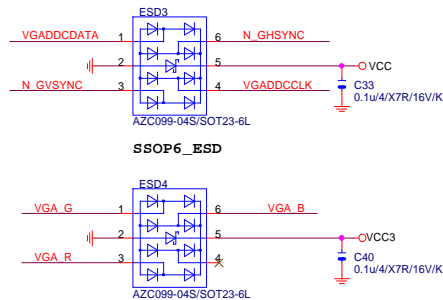
VGA DDC



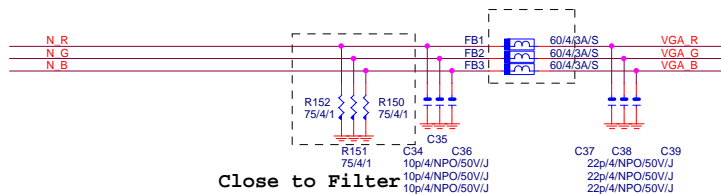
VGA CONNECTOR



VGA ESD



VGA DDC

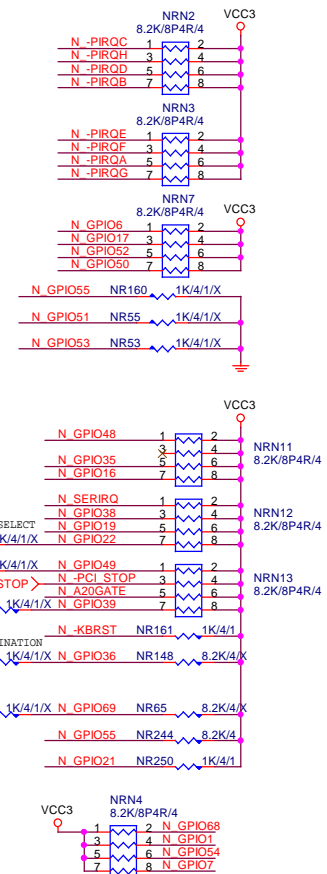
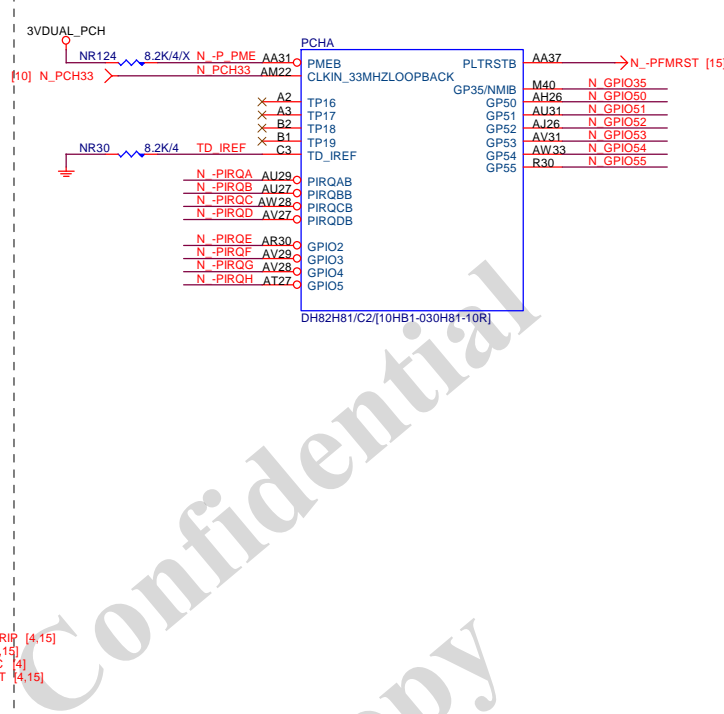


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PCH DISPLAY_CLK BUFFER

GA-H81M-S2PH

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SATA3_0
SATA27/WH/H/OP/NA/D1/B/PA66

WHITE CONNECTOR

SATA3_1
SATA27/WH/H/OP/NA/D1/B/PA66

WHITE CONNECTOR

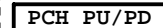
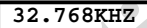
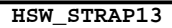
SATA2_2
 SATA2/7/BK/H/OP/VA/D/1/B
BLACK CONNECTOR

SATA2_3
 SATA2/7/BK/H/OP/VA/D/1/B
BLACK CONNECTOR

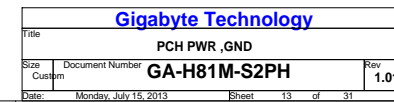
H81 N/A

GPIO37 PU VCC3 ENABLE SBA
For H87&B85

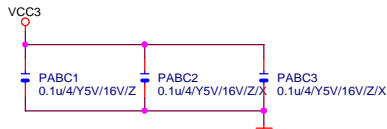
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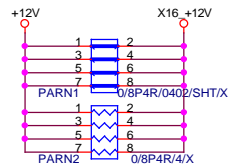
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PCH GPIO , CTRL , AUDIO			
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PCIEX16 CAP



PCIEX16 PROTECT SHT



PCIEX16 AC CAP

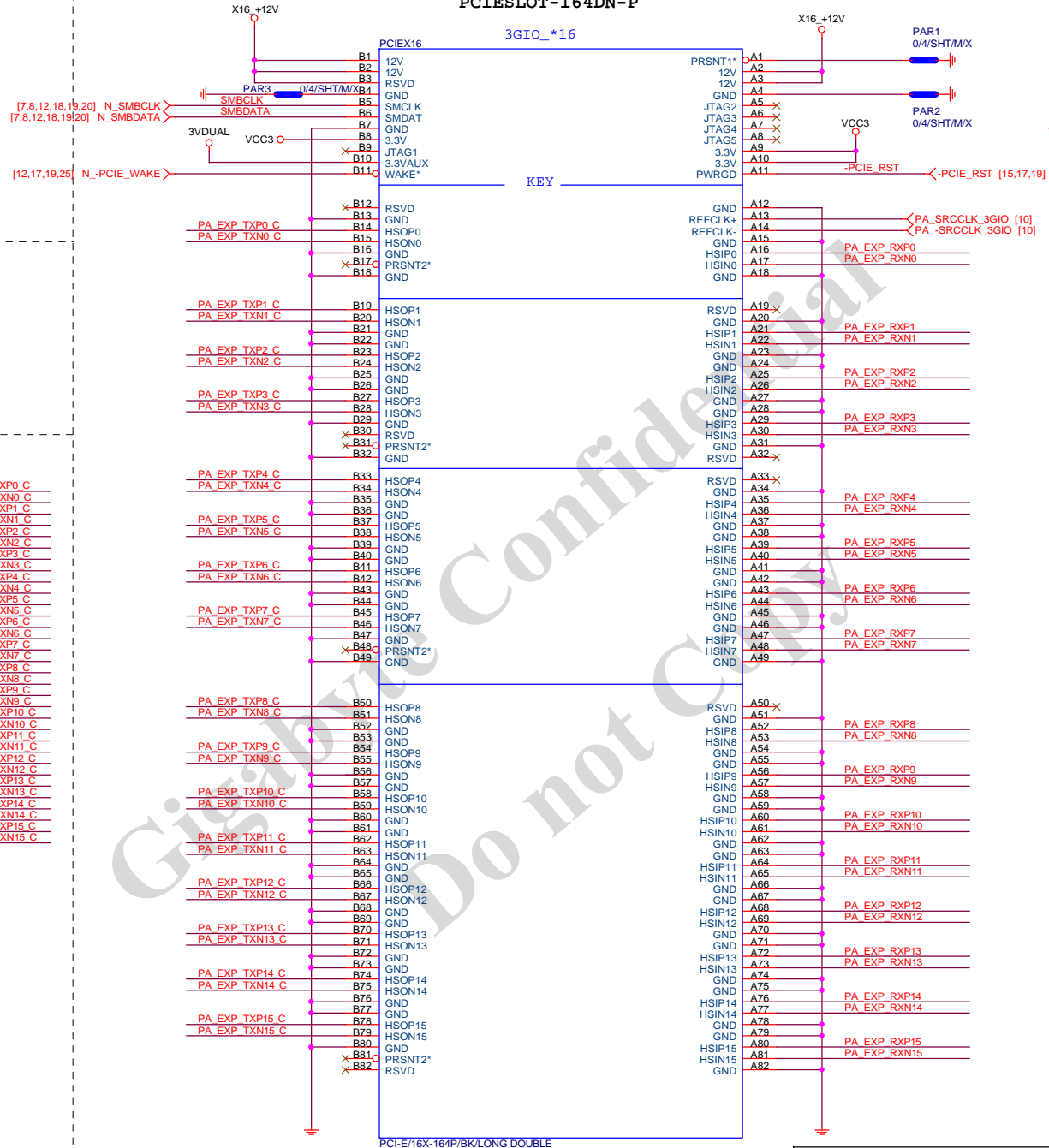
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PA EXP TXN0	PAC4	0.22u/4/X5R/6.3V/K	PA EXP TXN0 C
PA EXP TXP1	PAC6	0.22u/4/X5R/6.3V/K	PA EXP TXP1 C
PA EXP TXN1	PAC7	0.22u/4/X5R/6.3V/K	PA EXP TXN1 C
PA EXP TXP2	PAC8	0.22u/4/X5R/6.3V/K	PA EXP TXP2 C
PA EXP TXN2	PAC9	0.22u/4/X5R/6.3V/K	PA EXP TXN2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

PA EXP RXP0[0..15] >>> PA_EXP_RXP[0..15] [4]
PA EXP RXN0[0..15] >>> PA_EXP_RXN[0..15] [4]
PA EXP TXP0[0..15] >>> PA_EXP_TXP[0..15] [4]
PA EXP TXN0[0..15] >>> PA_EXP_TXN[0..15] [4]

PCIEX16 SLOT

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PCIESLOT-164DN-P



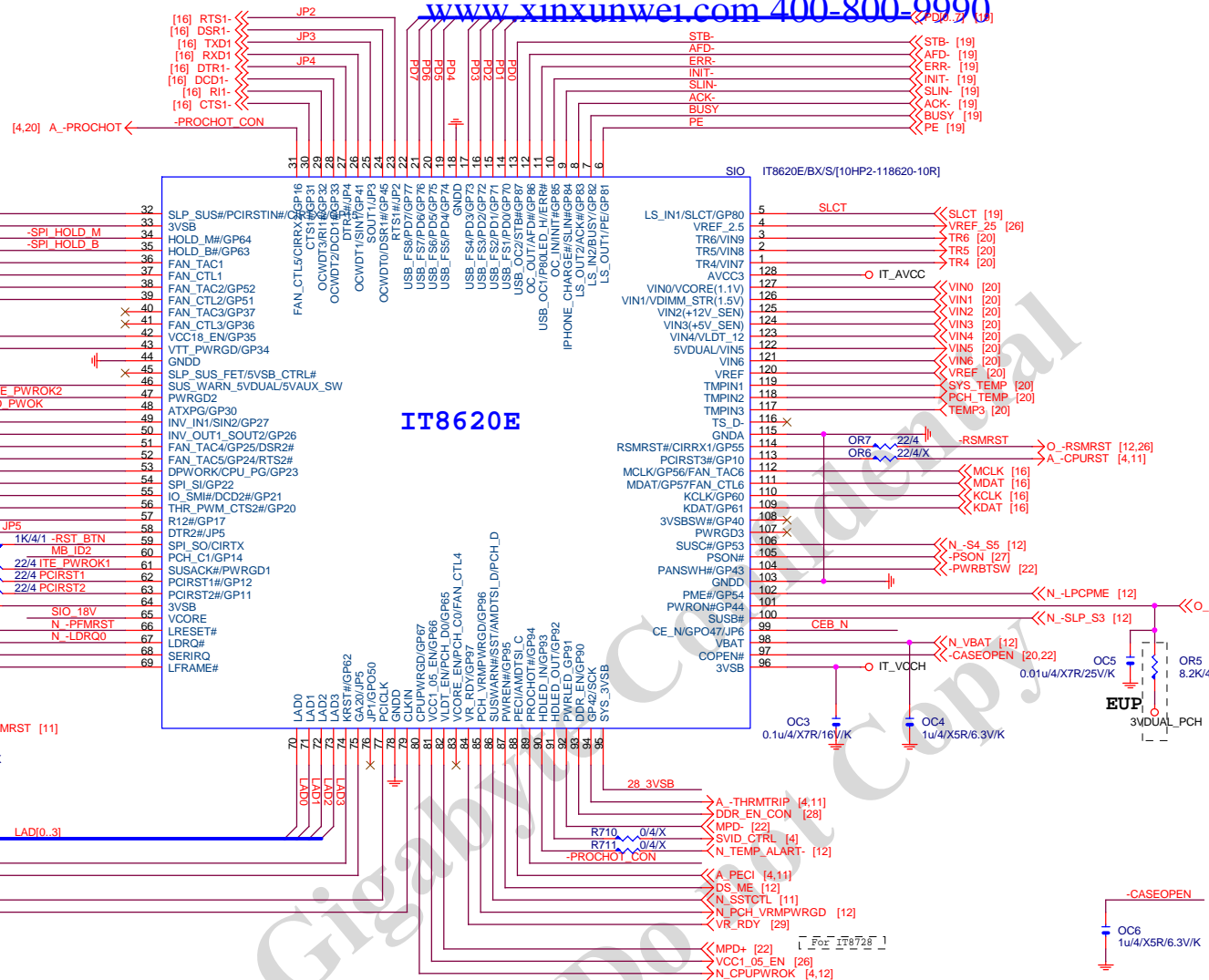
PCI-E/16X-164P/BK/LONG DOUBLE

BLACK CONNECTOR

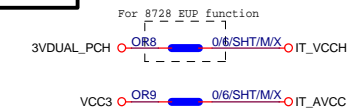
Gigabyte Technology

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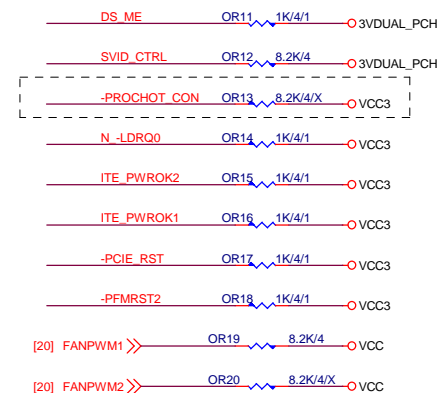
SIO IT8620E



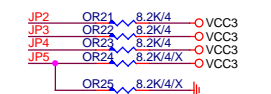
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6	0.00	0.00
7	0.00	0.00
8	0.00	0.00
9	0.00	0.00
10	0.00	0.00
11	0.00	0.00
12	0.00	0.00
13	0.00	0.00
14	0.00	0.00
15	0.00	0.00
16	0.00	0.00
17	0.00	0.00
18	0.00	0.00
19	0.00	0.00
20	0.00	0.00
21	0.00	0.00
22	0.00	0.00
23	0.00	0.00
24	0.00	0.00
25	0.00	0.00
26	0.00	0.00
27	0.00	0.00
28	0.00	0.00
29	0.00	0.00
30	0.00	0.00
31	0.00	0.00
32	0.00	0.00
33	0.00	0.00
34	0.00	0.00
35	0.00	0.00
36	0.00	0.00
37	0.00	0.00
38	0.00	0.00
39	0.00	0.00
40	0.00	0.00
41	0.00	0.00
42	0.00	0.00
43	0.00	0.00
44	0.00	0.00
45	0.00	0.00
46	0.00	0.00
47	0.00	0.00
48	0.00	0.00
49	0.00	0.00
50	0.00	0.00
51	0.00	0.00
52	0.00	0.00
53	0.00	0.00
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56	0.00	0.00
57	0.00	0.00
58	0.00	0.00
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60	0.00	0.00
61	0.00	0.00
62	0.00	0.00
63	0.00	0.00
64	0.00	0.00
65	0.00	0.00
66	0.00	0.00
67	0.00	0.00
68	0.00	0.00
69	0.00	0.00
70	0.00	0.00
71	0.00	0.00
72	0.00	0.00
73	0.00	0.00
74	0.00	0.00
75	0.00	0.00
76	0.00	0.00
77	0.00	0.00
78	0.00	0.00
79	0.00	0.00
80	0.00	0.00
81	0.00	0.00
82	0.00	0.00
83	0.00	0.00
84	0.00	0.00
85	0.00	0.00
86	0.00	0.00
87	0.00	0.00
88	0.00	0.00
89	0.00	0.00
90	0.00	0.00
91	0.00	0.00
92	0.00	0.00
93	0.00	0.00
94	0.00	0.00
95	0.00	0.00
96	0.00	0.00
97	0.00	0.00
98	0.00	0.00
99	0.00	0.00
100	0.00	0.00



SIO PU



SIO STRAP



IT8620
PULL DOWN OVP REMOVE

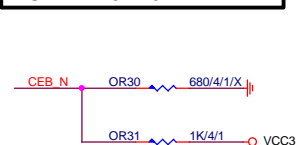
EUP control by PCH

```
| JP3--- High SPI-Flash Disable
|      Low SPI-Flash Enable
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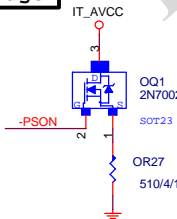
IT8620 NOTE

	IT8728
PIN121	VCORE_EN/PCH_C0
PIN120	VLED_EN/PCH_D0
PIN19	ATXPG
PIN31	PCH_C1
PIN53	SST/AMDS1_D/MTRB#/PCH_D1
PIN55	PECI/AMDS1_C/DRV#
PIN66	SYS_3VSB
PIN70	GP47
PIN95	VIN2(VCC5)
PIN96	VIN1(VCC12)
PIN97	VINI/VDIMM_STR(1.5V)
PIN98	VINO/VCORE(1.1V)/NC

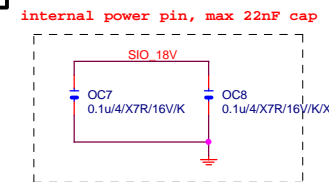
DUAL BIOS OPT STRAP



Power leakage

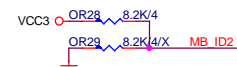


SIO 18V

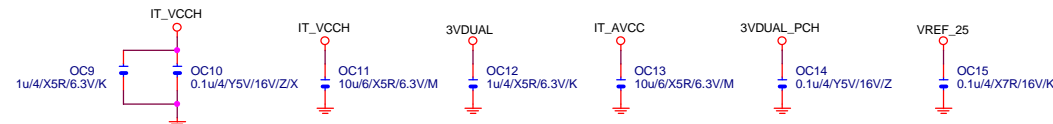


FOR LOW TEMP POWER ON INTO TEST MODE ISSUE

MB ID



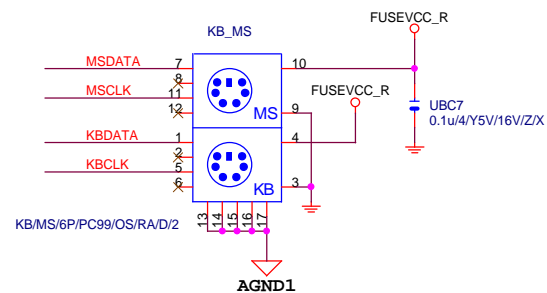
SIO	CAP
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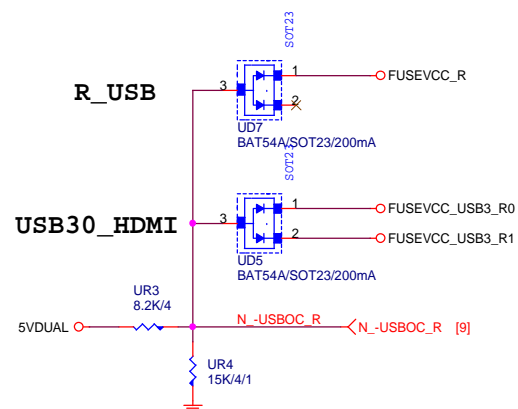
Gigabyte Technology

Title				ITE 8620 LPC IO			
Size	Custom	Document Number				GA-H81M-S2PH	Rev
						1.0	
Date:	Monday, July 15, 2013		Sheet	15		of	31

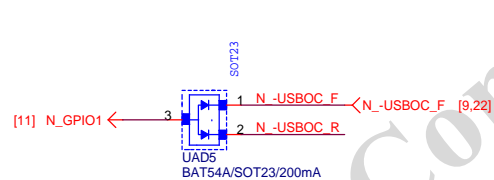
KB/MS



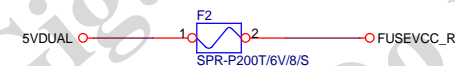
-USBOC_R



USB POWER PROTECT

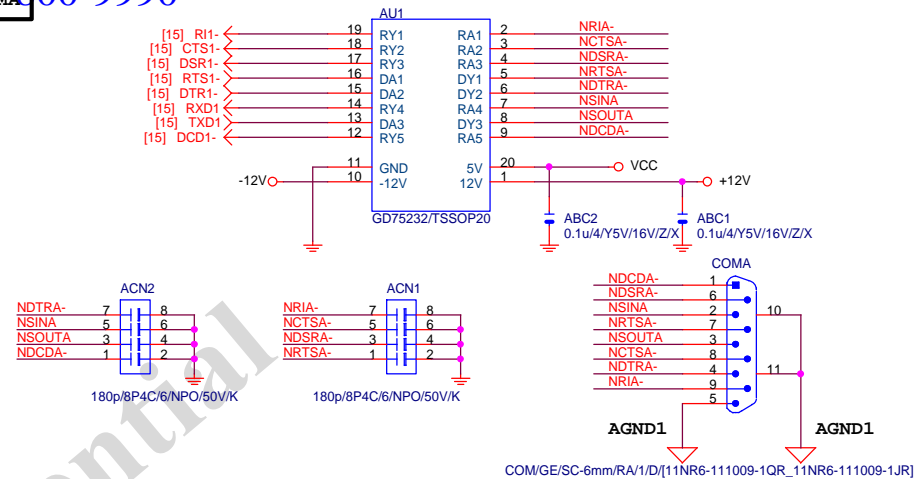


R_USB PWR

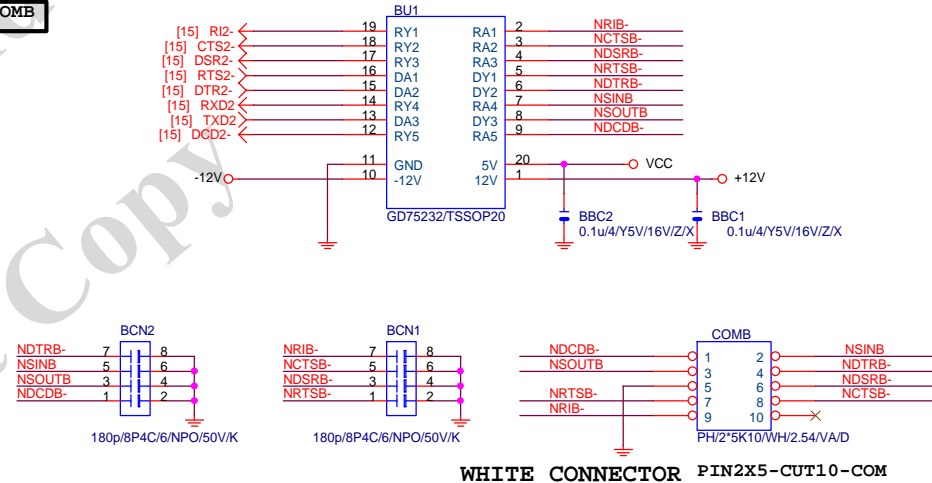


Close to connector
KB_MS_USB 2-Port 2.0A

COMA

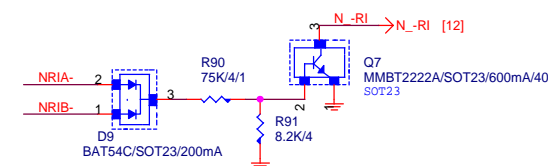


COMB



WHITE CONNECTOR PIN2X5-CUT10-COM

COM RI



Gigabyte Technology

Title			COM,-RI,KB_MS
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PCI:5/4/5 Impedance=50 +- 15%

BA D0_31] <-> BA_D0[0..31] [18]

-BC BE0 <-> BC_BE0 [18]
-BC BE1 <-> BC_BE1 [18]
-BC BE2 <-> BC_BE2 [18]
-BC BE3 <-> BC_BE3 [18]

-BPERR <-> BPERR [18]
-BSERR <-> BSERR [18]

-BPAR <-> BPAR [18]
-BPCLOCK <-> BPCLOCK [18]
-BDEVSEL <-> BDEVSEL [18]
-BSTOP <-> BSTOP [18]
-BTRDY <-> BTRDY [18]
-BIRDY <-> BIRDY [18]
-BFRAME <-> BFRAME [18]

-PCIE_RST <-> PCIE_RST [14,15,19]

-BPCIRST <-> BPCIRST [18]

-BRE00 <-> BRE00 [18]
-BRE01 <-> BRE01 [18]
-BGNT0 <-> BGNT0 [18]
-BGNT1 <-> BGNT1 [18]

-BPCIPME1 <-> BPCIPME1 [18]

[18] BPCLK0 <-> PR24 47/4/1 CLKOUT0

[18] BPCLK1 <-> PR19 47/4/1 CLKOUT1

RREF PR13 12K/4/1

TEST_EN PR21 10K/4/1

EXT_ARB PR22 10K/4/1

RST_SEL PR7 10K/4/1

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

PR42 1K/4/1

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

PR37 10K/4/1

IT8892
-BPIROA 1 2 <-> BPIROA1 [18]
-BPIROD 3 4 <-> BPIROD1 [18]
-BPIROB 5 6 <-> BPIROB1 [18]
-BPIROC 7 8 <-> BPIROC1 [18]

PCI slot

VCCP PR26 0/4/SHT/M/X 3VDUAL

PCI slot
-BPCIPME1 PR27 0/4/SHT/M/X <-> N-PCIE_WAKE [12,14,19,25]
chipset side

3VDUAL PR2 0/4/SHT/M/X

PCIEWAKE PR34 10K/4/1

-BPCIPME PR43 10K/4/1

PRN1 2.2K/8P4R/4
-BFRAME 1 2
-BTRDY 3 4
-BSTOP 5 6
-BDEVSEL 7 8

PRN2 2.2K/8P4R/4
-BPERR 1 2
-BSERR 3 4
-BPCLOCK 5 6
-BIRDY 7 8

PRN15 2.2K/8P4R/4
-BPIROA 1 2
-BPIROD 3 4
-BPIROB 5 6
-BPIROC 7 8

PRN4 2.2K/8P4R/4
-BGNT3 1 2
-BRE03 3 4
-BGNT1 5 6
-BRE01 7 8

PRN5 2.2K/8P4R/4
-BGNT2 1 2
-BRE02 3 4
-BGNT0 5 6
-BRE00 7 8

BPAR PR41 2.2K/4/1

LDO 18V PFB1 0/6/SHT/M/X 1.8VA

LDO 18V PFB2 0/6/SHT/M/X 1.8VD

LDOAUX 18V PFB3 0/6/SHT/M/X 1.8V_AUX

LDOAUX 18V PFB4 0/6/SHT/M/X 1.8V_AUXA

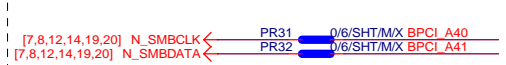
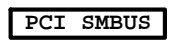
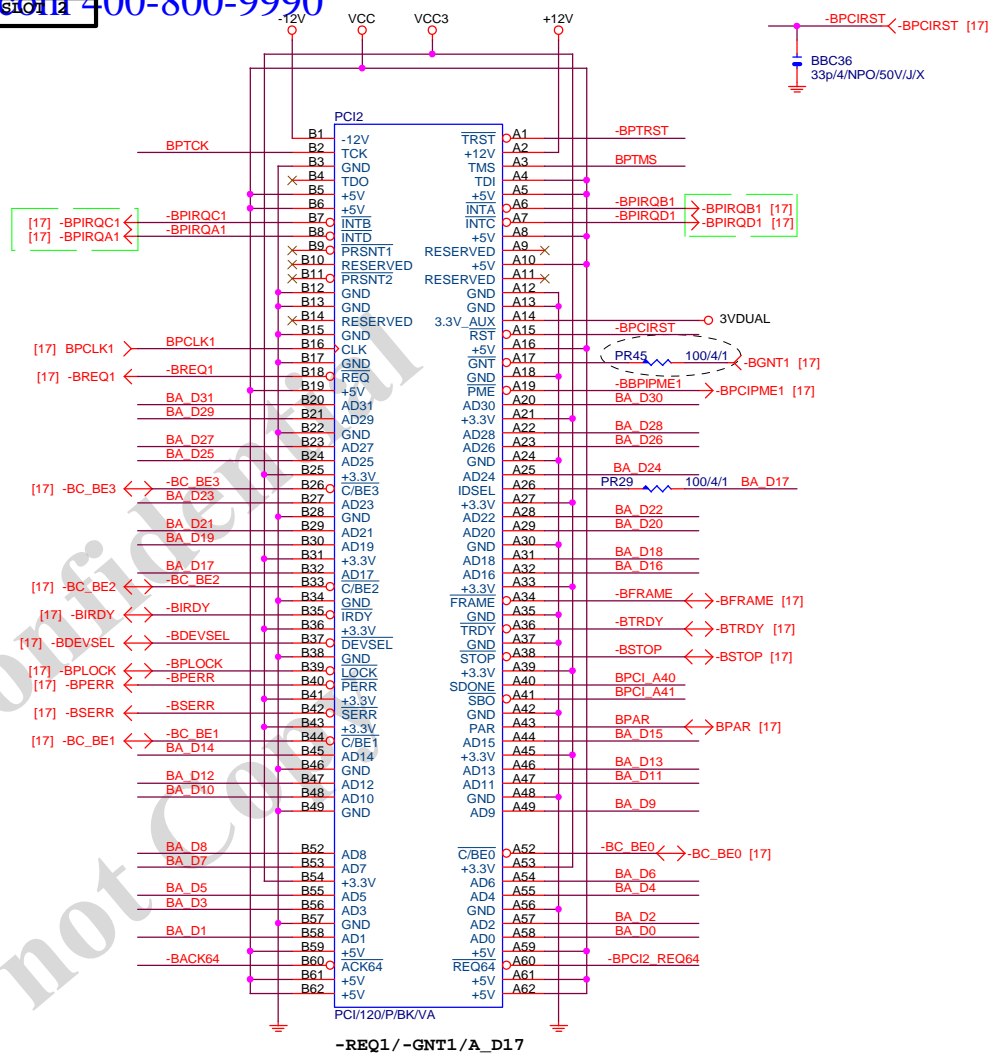
PCIEWAKE 1
-BPCIPME 2
WAKE# 3
PME# 4
VCCP 5
LDOAUX 18V 6
VSS_AUX 7
VCCP_AUX 8
VSS_AUX 9
CLKP 10
CLKN 11
VCC18A 12
VCC18A 13
GND4 14
GND4 15
RREF 16
DIP 17
DIN 18
VCC18A_AUX 19
DON 20
DOP 21
VSS 22
VCCP 23
SEG_EN1/GP3 24
SEG_EN2/GP4 25
EQSW 26
ECLK 27
EEDWDATA 28
EEDDDATA 29
AD0 30
AD1 31
SEG_G 32

[10] G_-PBCLK <->
[10] G_-PBCLK <->

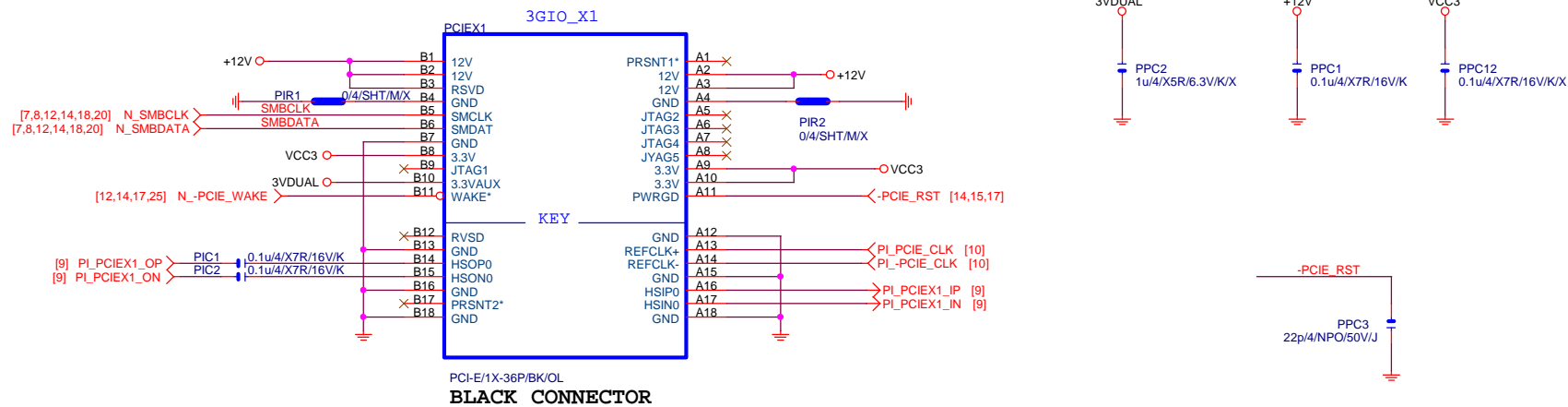
RREF
G PCIEBOP C
G PCIEBON C
1.8V_AUXA
PBC43 0.1u4/X7R/16V/K
PBC44 0.1u4/X7R/16V/K
G PCIEBIN C
G PCIEBIP C

1.8VD
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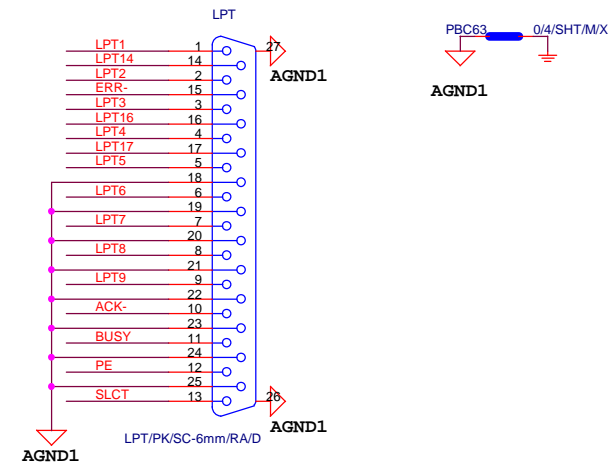
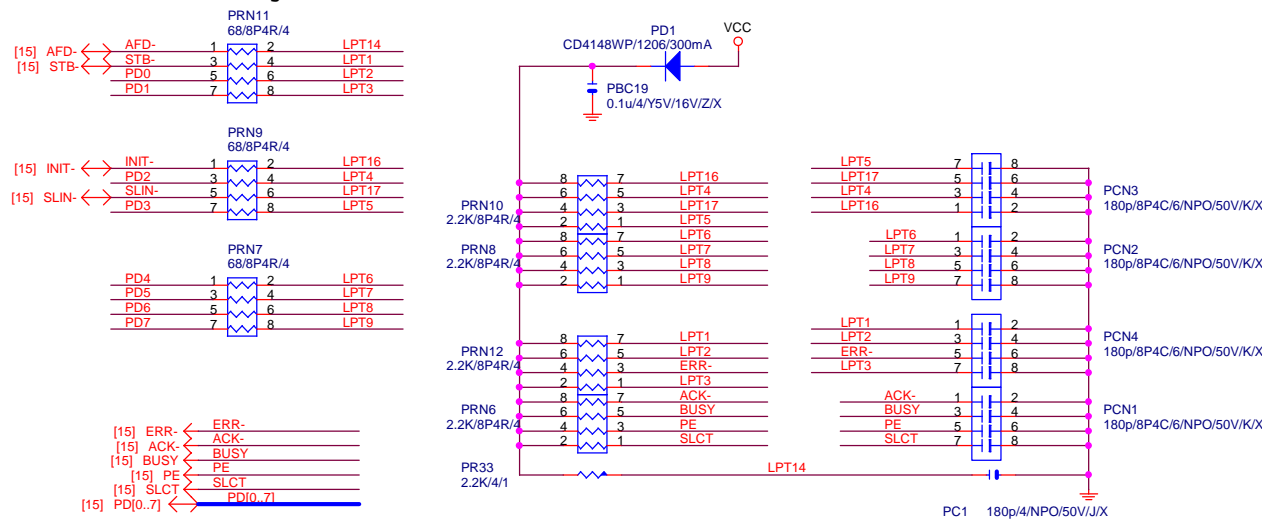


PCIEX1 SLOT



LPT PORT

【技術通報R&D技術通報151】
33ohm Change to 68ohm

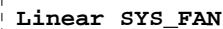
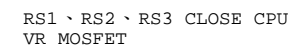


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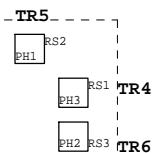
Title			LPT
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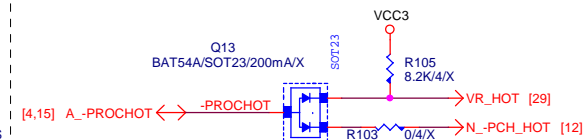
SYS SMART FAN

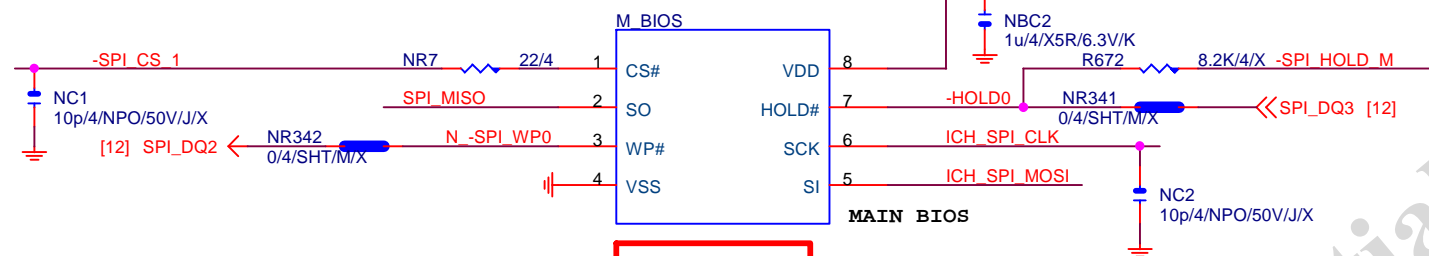

$$V_{IN2}: 75K/15K = 2V$$


接pwm feedback pin



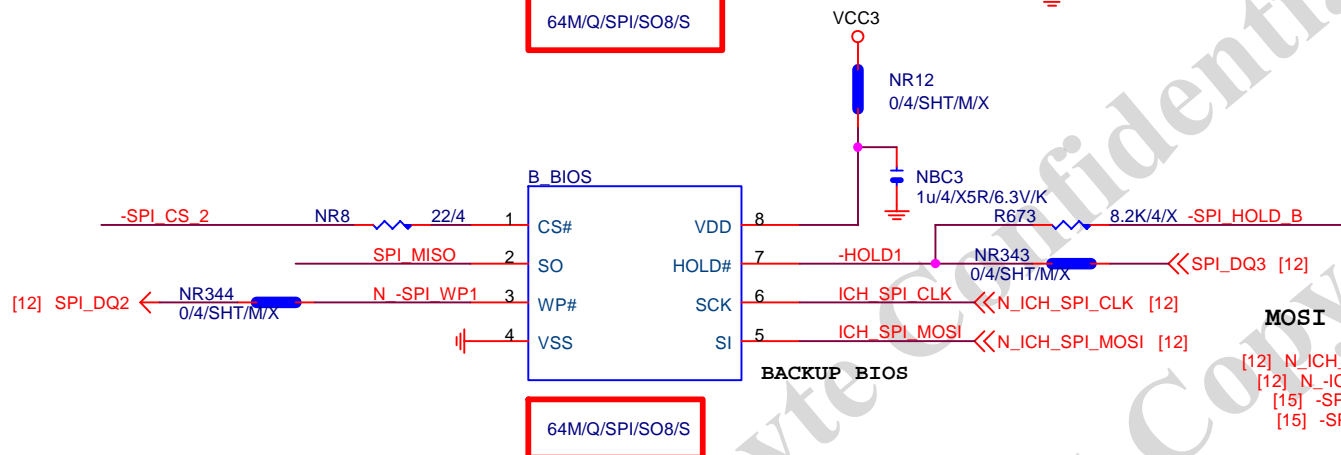
-PROHOT



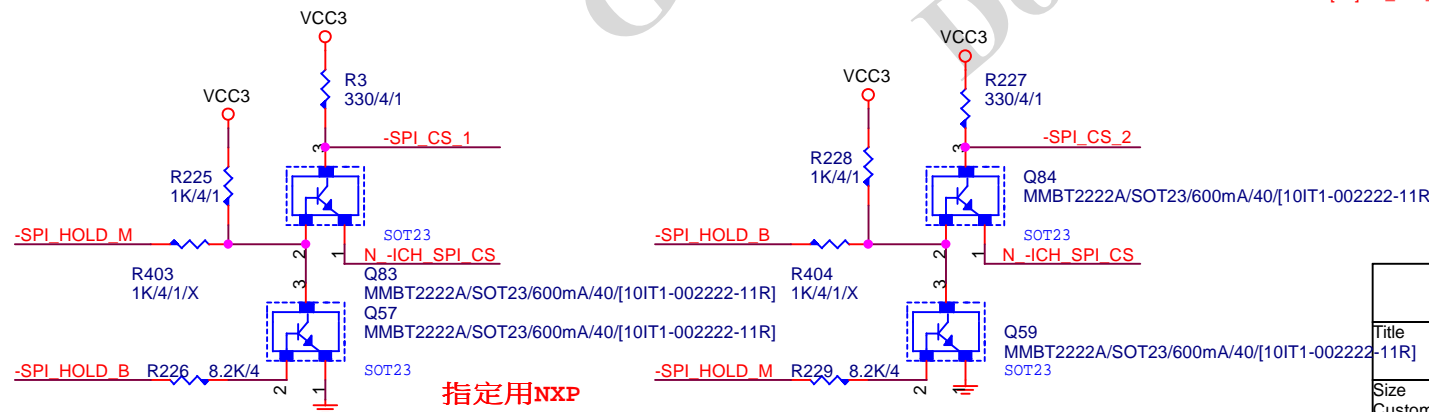
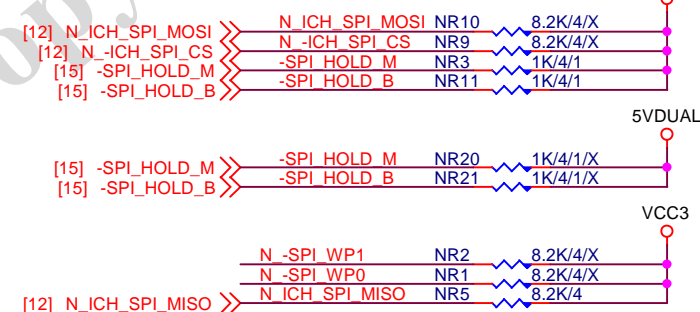


BOOT DEVICE	GNT0	GNT1
LPC	0	0
PCI	0	1
NAND	1	0
SPI	1	1

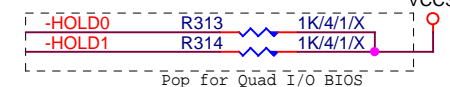
1 means floating
0 means PD 1K



MOSI For DMI RX Termination Voltage



CHECK



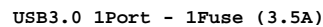
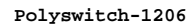
Gigabyte Technology

DUAL BIOS

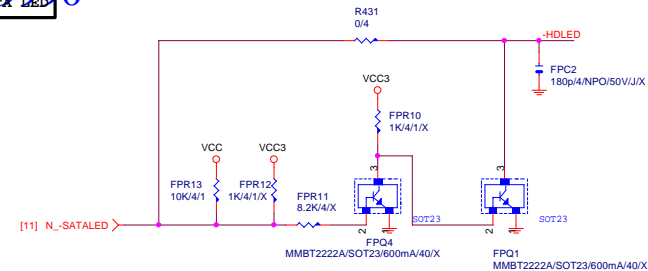
GA-H81M-S2PH

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R_USB30
USB3.0+HDMI/18P+19P/BK/OS/RA/[11NR6-302009-41R]



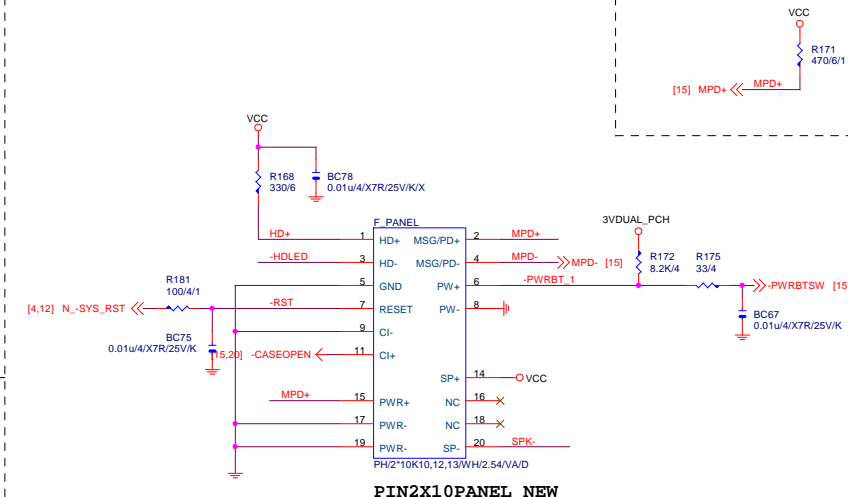
[11] N



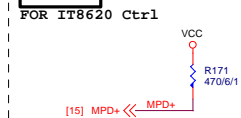
PCH_USB3_TXP0C



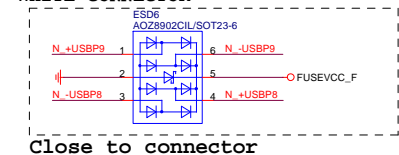
FRONT USB2



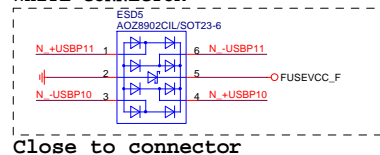
PWR LED



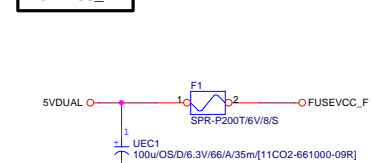
WHITE CONNECTOR



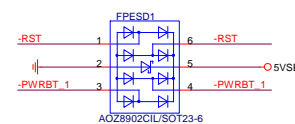
WHITE CONNECTOR



FUSEVCC_F

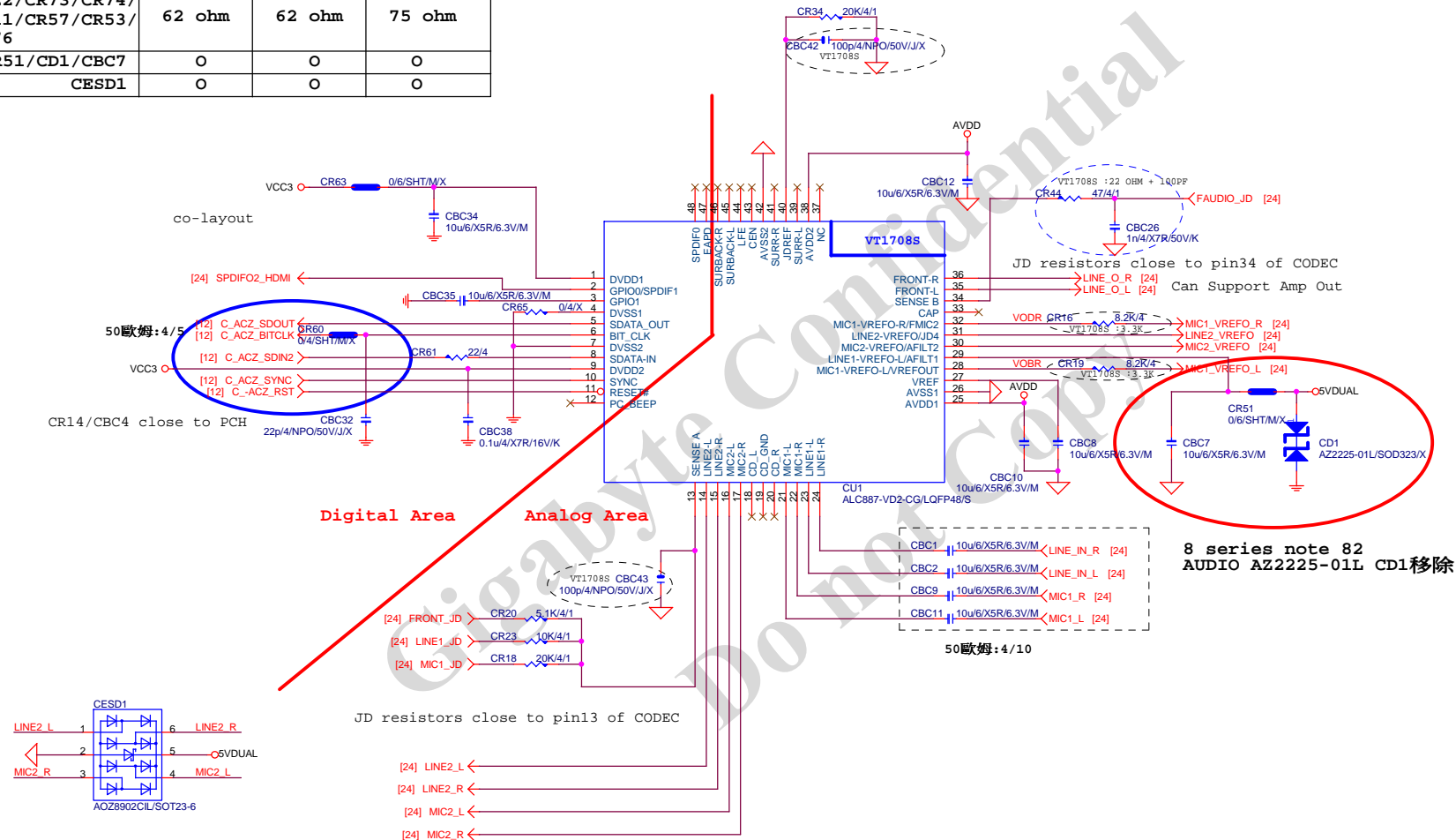


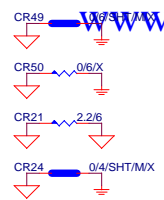
F_USB1, F_USB2 4-Port 2.6A



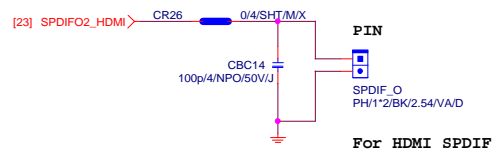
AZALIA CODEC *ALC892/ALC887-VD2/VT1708-CE* Colay

	ALC892	ALC887-VD2	VT1708S-CE
CR44/CBC26	47ohm+1nF	47ohm+1nF	22ohm+100P
CBC42/CBC43	X	X	100P/4
CR6/CR7/CR58/CR54/ CR67/CR68/CR69/CR70	22K/4	22K/4	10K/4/1
CR5/CR8/CR1/CR14/ CR17/CR22/CR73/CR74/ CR13/CR11/CR57/CR53/ CR75/CR76	62 ohm	62 ohm	75 ohm
CR51/CD1/CBC7	O	O	O
CESD1	O	O	O

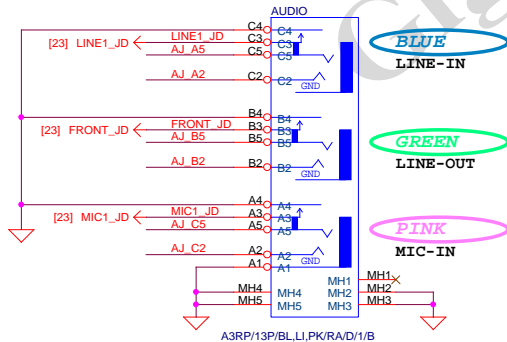




SPDIF_OUT



SPDIF_OUT

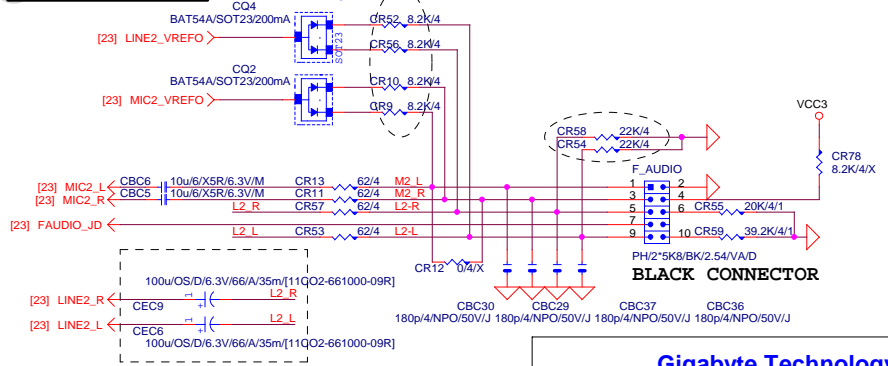


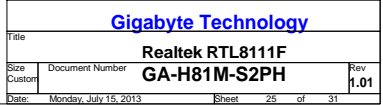
LINE-IN

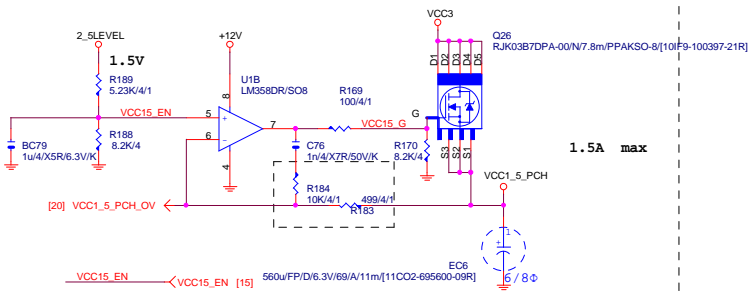
Verify MIC function in LINE-in

MIC-IN

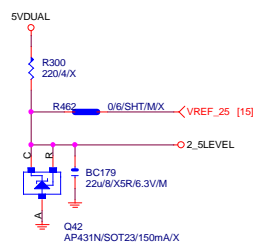
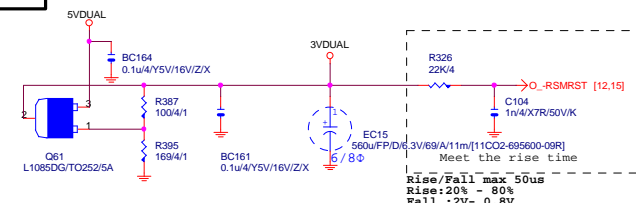
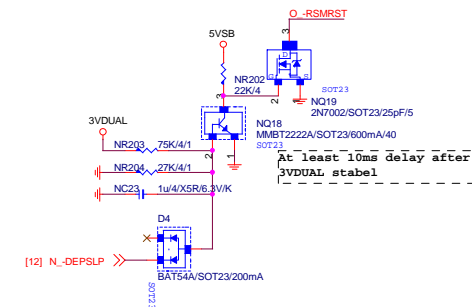
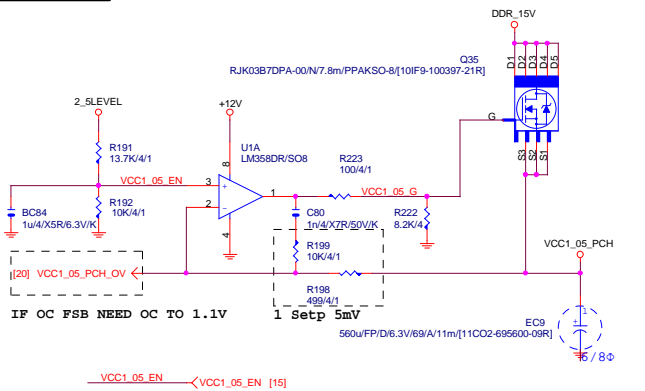
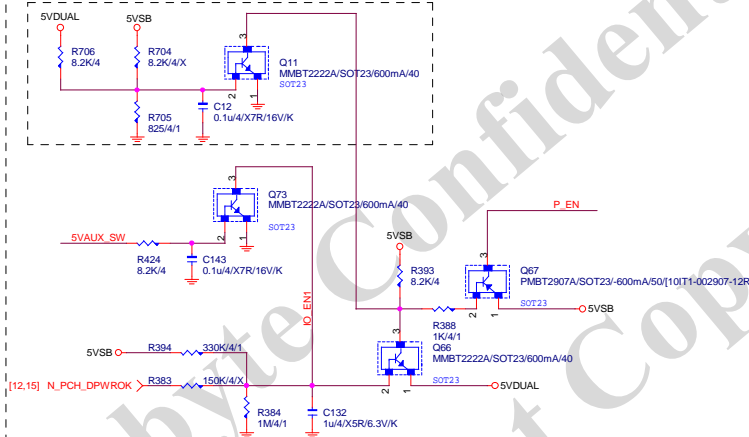
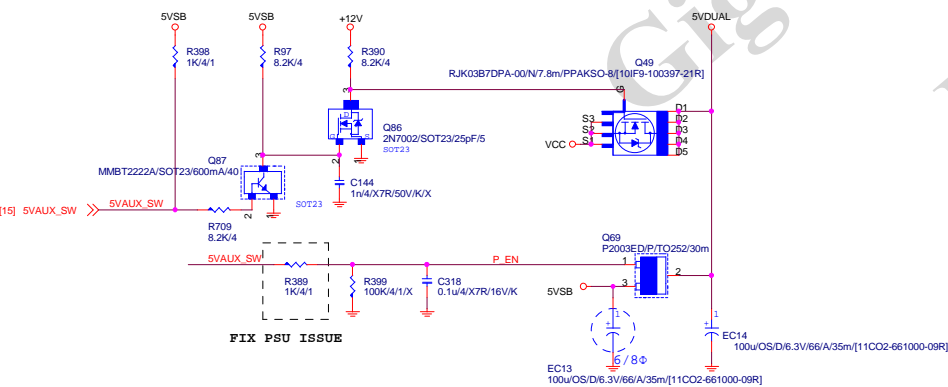
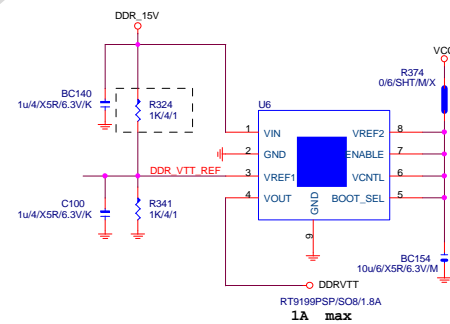
AZALIA FRONT PANEL





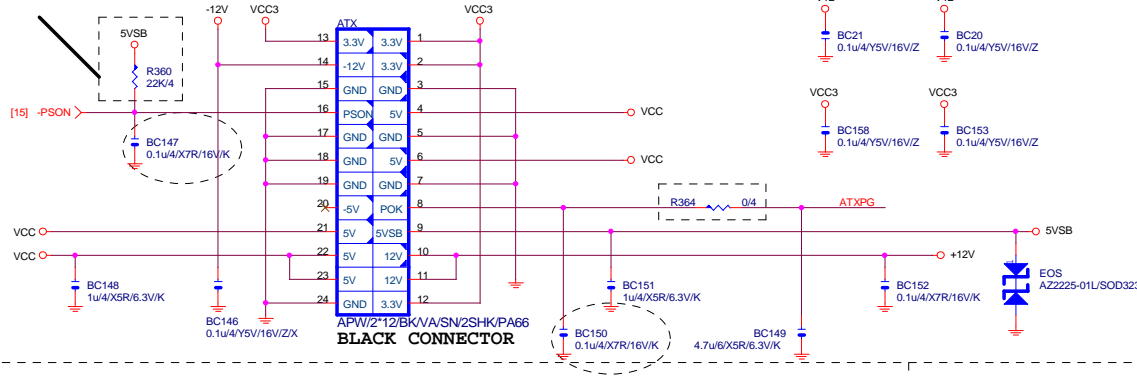
VCC1_5_PCH**2_5LEVEL**

FROM I/O

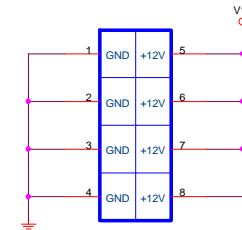
**3VDUAL****-RSMRST****VCC1_05_PCH****5VDUAL SHORT PROTECT**8 series note 82
5VSB OVP:6V protection**5VDUAL****DDR_VTT**

ATXX24 POWER CONNECTOR

【技術通報R&D技術通報155】



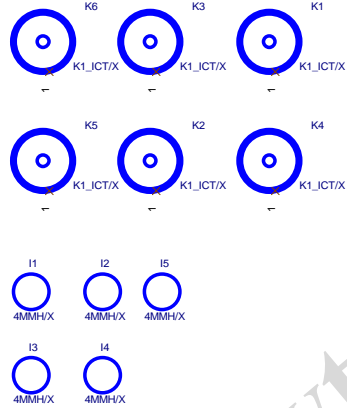
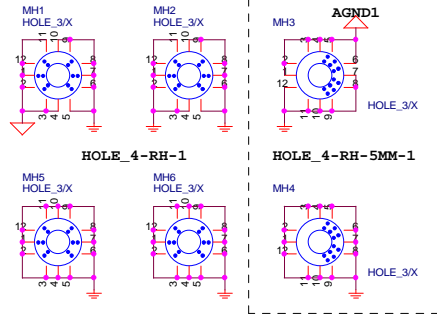
ATXX24 POWER CONNECTOR



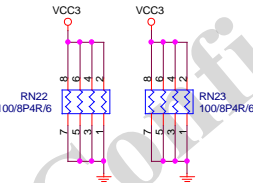
ATX_12V_2X4
APW/Z*4/BK/OC/P4.2VA/SN/OH:Location ATX_12V_2X4

BLACK CONNECTOR

MB LOCATION

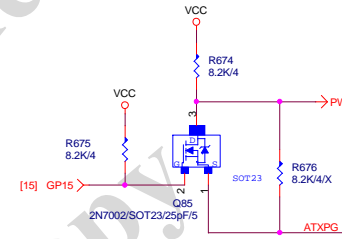


FIX PWR MINMUN LOAD



PWOK PATCH

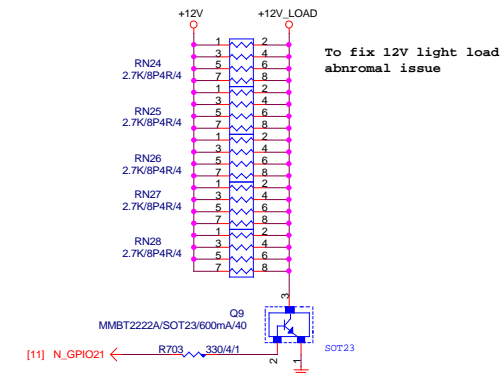
【技術通報R&D技術通報154】



CLK GEN

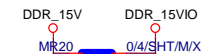
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【技術通報R&D技術通報153】

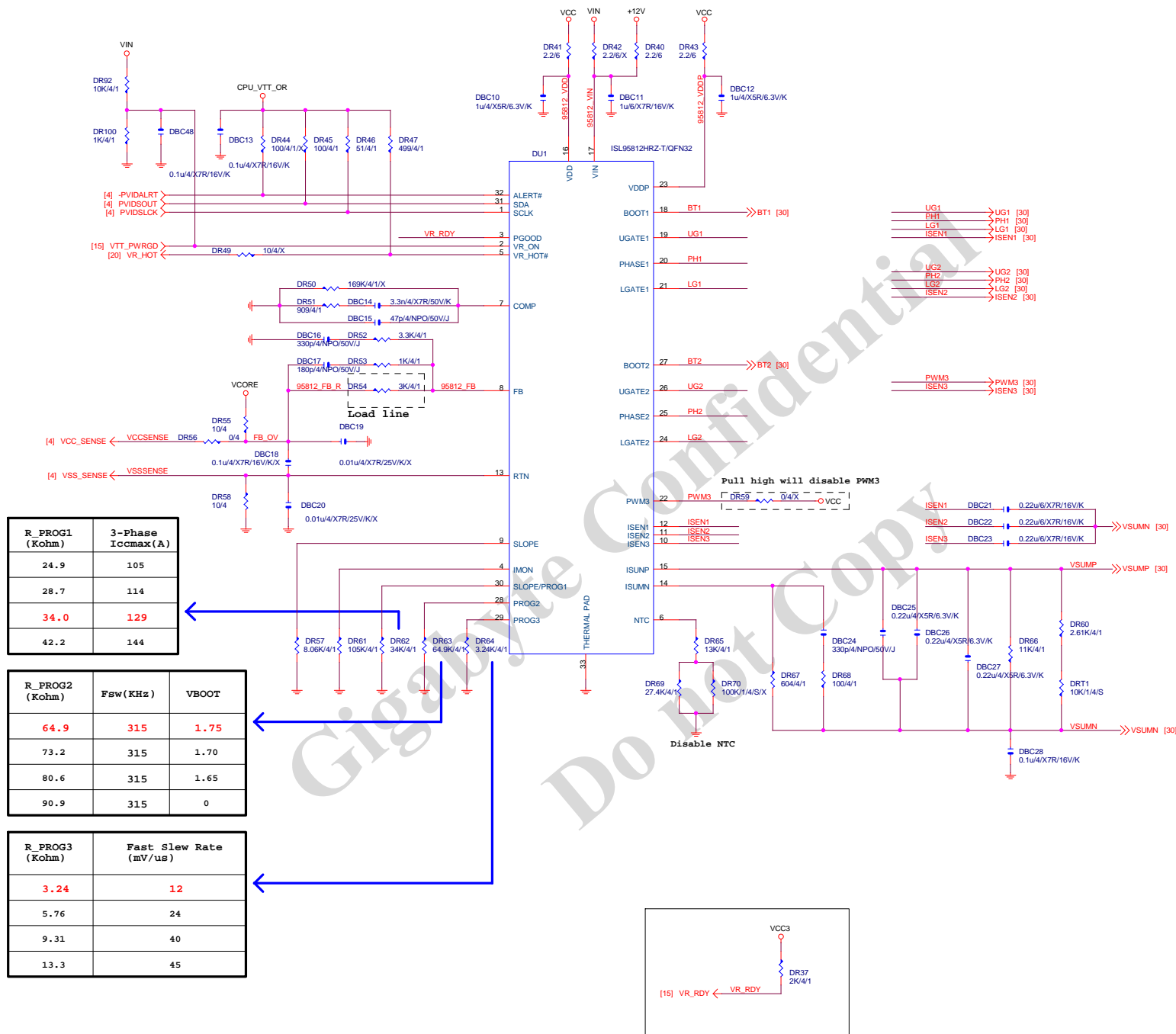


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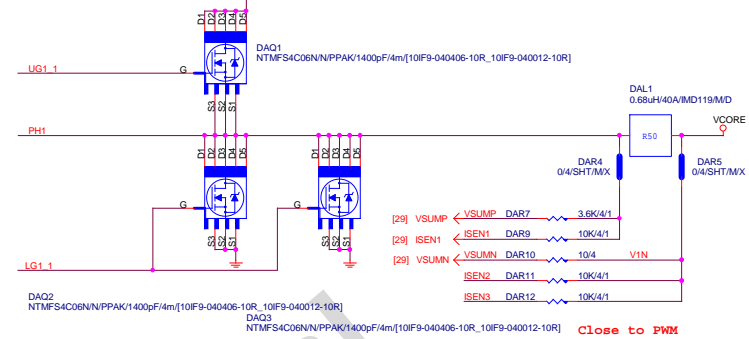
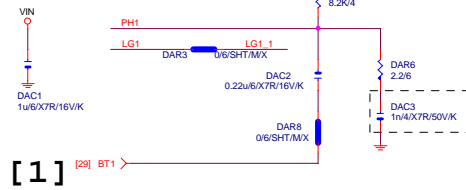
Title	ATX CONNECTOR	
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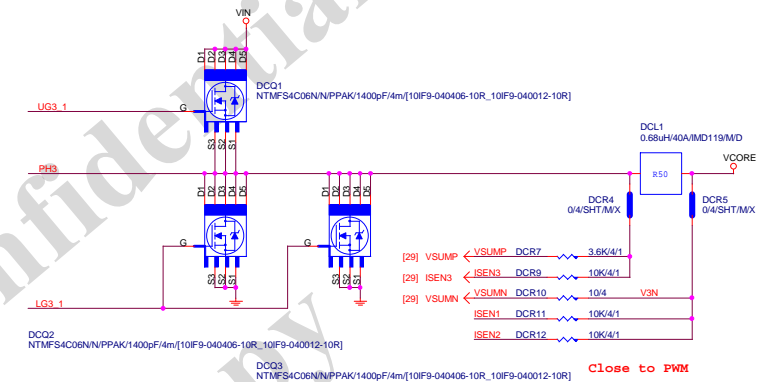
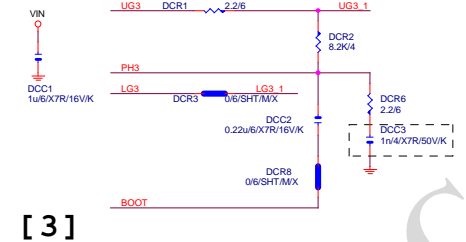
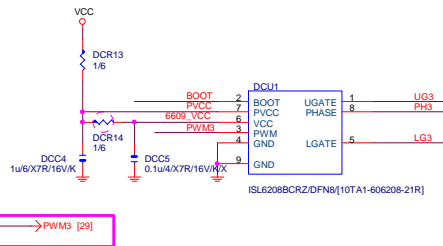
H81 N/A



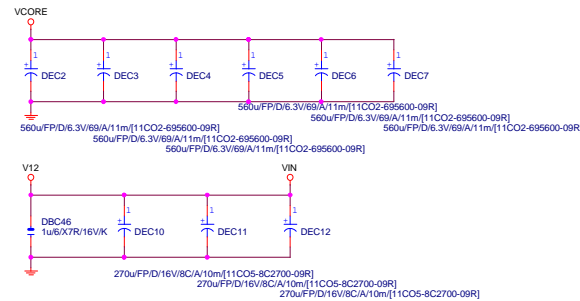
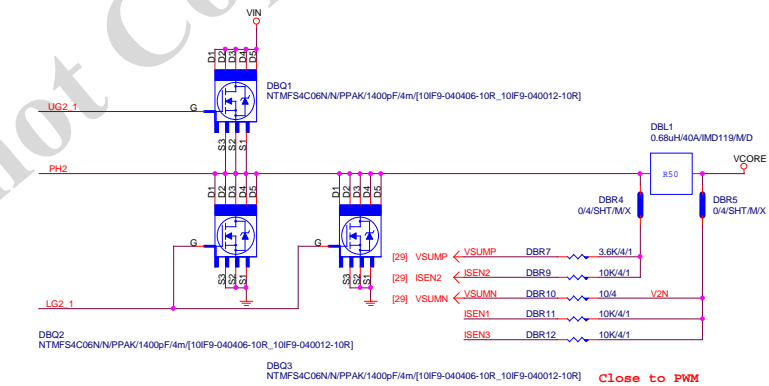
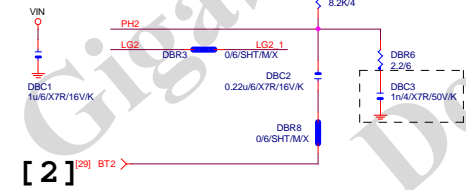
PHASE 1



PHASE 3



PHASE 2



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