

Model Name: GA-H81M-S

Revision 1.0

SHEET

TITLE

01	COVER SHEET
02	BOM & PCB MODIFY HISTORY
03	BLOCK DIAGRAM
04	CPU_LGA1150-A
05	CPU_LGA1150-B
06	CPU_LGA1150-C
07	DDR III CHANNEL A
08	DDR III CHANNEL B
09	PCH_FDI,DMI,USB,PCIE,NVRAM
10	PCH_DP,CLK BUFFER
11	PCH_HOST,SATA,PCI
12	PCH_GPIO,CTRL,AUDIO
13	PCH_PWR,GND
14	PCI EXPRESS*16 SLOT
15	PCI EXPRESS X1 *1 SLOT
16	ITE 8620 LPC IO
17	COM,KB_MS_USB,USB30_20
18	HWM,FAN CTRL,OV,-PROCHOT
19	DUAL BIOS
20	FP,FUSB,SPK,SATALED
21	Realtek ALC887-VD2
22	REAR AUDIO JACK
23	REALTEK RTL8111G
24	DISCRETE POWER
25	ATX , CLOCK GEN
26	VCORE ISL95812_1
27	VCORE ISL95812_2

SHEET

TITLE

28	RT8120_DDR POWER

www.aitech1.ru

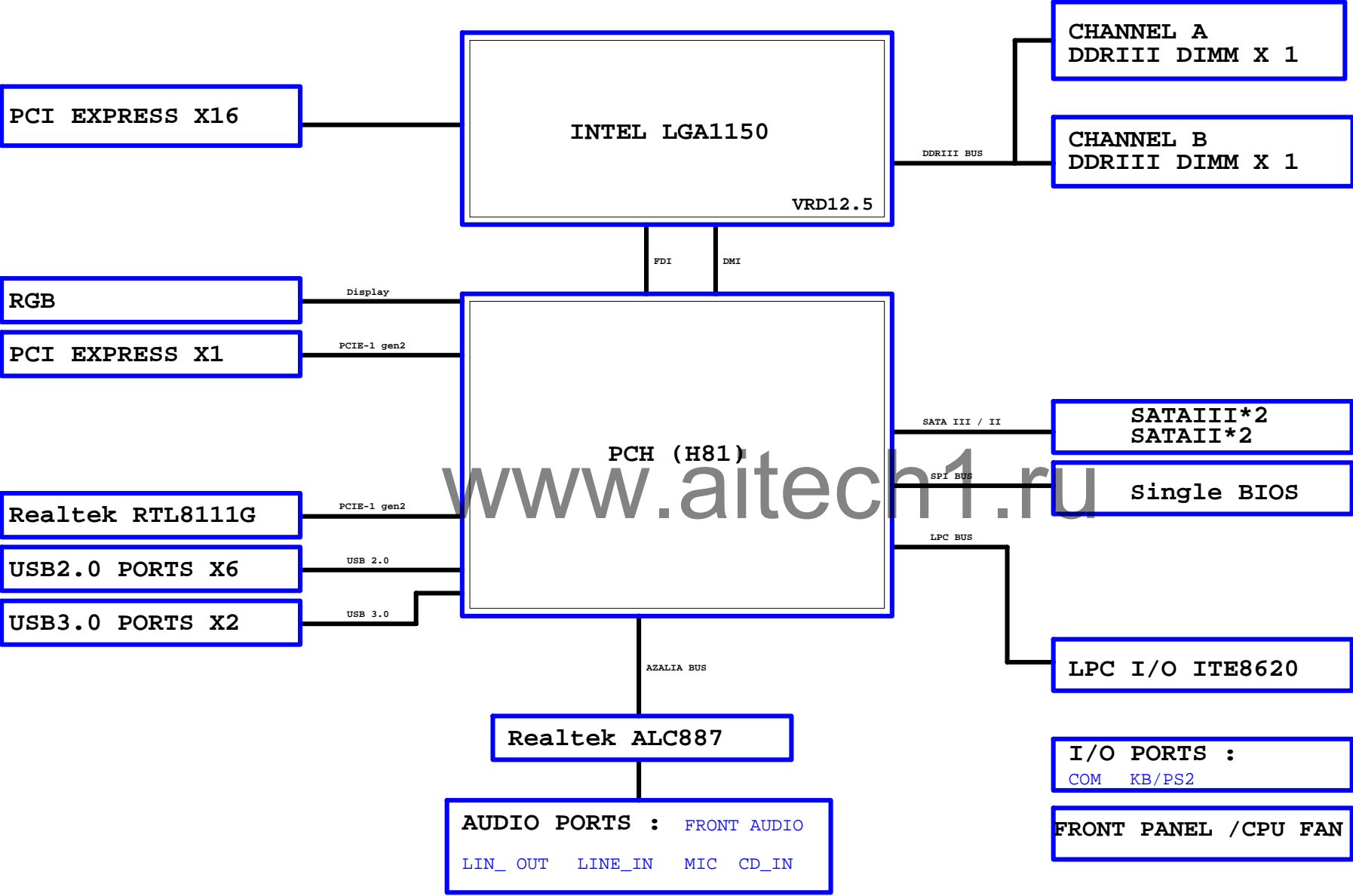
Gigabyte Technology

Cover Sheet		
Size	Document Number	Rev
Custom	GA-H81M-S	1.0
Date:	Wednesday, June 04, 2014	Sheet 1 of 29

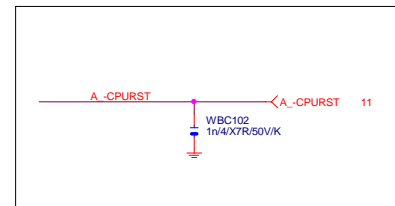
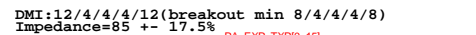
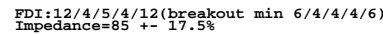
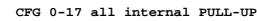
D

CD

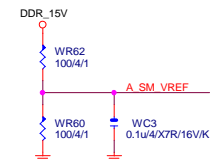
BLOCK DIAGRAM



LGA1150 (D)



CPU	PU/PD
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	10
11	11
12	12
13	13
14	14
15	15
16	16
17	17
18	18
19	19
20	20
21	21
22	22
23	23
24	24
25	25
26	26
27	27
28	28
29	29
30	30
31	31
32	32
33	33
34	34
35	35
36	36
37	37
38	38
39	39
40	40
41	41
42	42
43	43
44	44
45	45
46	46
47	47
48	48
49	49
50	50
51	51
52	52
53	53
54	54
55	55
56	56
57	57
58	58
59	59
60	60
61	61
62	62
63	63
64	64
65	65
66	66
67	67
68	68
69	69
70	70
71	71
72	72
73	73
74	74
75	75
76	76
77	77
78	78
79	79
80	80
81	81
82	82
83	83
84	84
85	85
86	86
87	87
88	88
89	89
90	90
91	91
92	92
93	93
94	94
95	95
96	96
97	97
98	98
99	99
100	100



Gigabyte Technology

Title				CPU LGA1150-A			
Size	Document Number						Rev
Custom	GA-H81M-S						1.0
Date:	Wednesday, June 04, 2014			Sheet	4		of 29

LGA1150 (A)

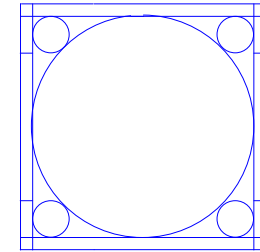
LGA1150 (B)

LGA1150 (CR)

LGA1150A

LGA1150B

CR
CPU RETAINION/X



LGA1150



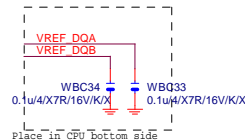
ILM_BP/1156/CSP/ILM_BP/1156/CSP/[12KRC-0F0001-52R_12KRC-0F0001-51R]

DDR BUS

- 7 MODT_A[0..1] ↔ MODT_A0..1
- 8 MODT_B[0..1] ↔ MODT_B0..1
- 7 MDA[0..63] ↔ MDA0..63
- 8 MDB[0..63] ↔ MDB0..63
- 7 DQSA[0..7] ↔ DQSA0..7
- 7 -DQSA[0..7] ↔ -DQSA0..7
- 7 MAA[0..15] ↔ MAA0..15
- 8 MAB[0..15] ↔ MAB0..15
- 8 DQSB[0..7] ↔ DQSB0..7
- 8 -DQSB[0..7] ↔ -DQSB0..7

HASWELL[10SC1-F01150-11R_10SC1-F01150-12R]

HASWELL[10SC1-F01150-11R_10SC1-F01150-12R]



未上件

Gigabyte Technology

CPU LGA1150-B

GA-H81M-S

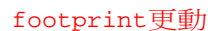
Rev 1.0

Size Custom

Date: Wednesday, June 04, 2014

Sheet 5 of 29

(F, J)



(G,H,I)



(X18)



(x9)



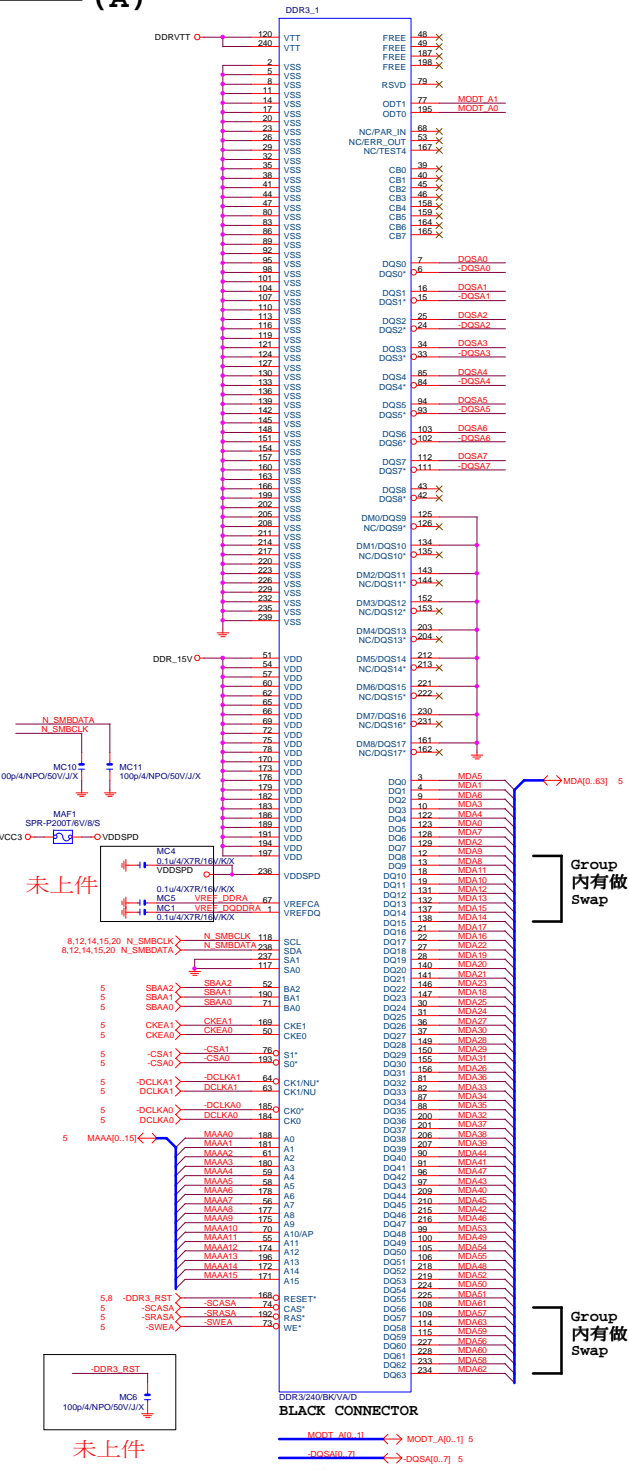
Title	CPU I GA1150-C
-------	----------------

Size	Document Number	GA-H81M-S
Custom		

Date: Wednesday, June 04, 2014 Sheet 6 of 29

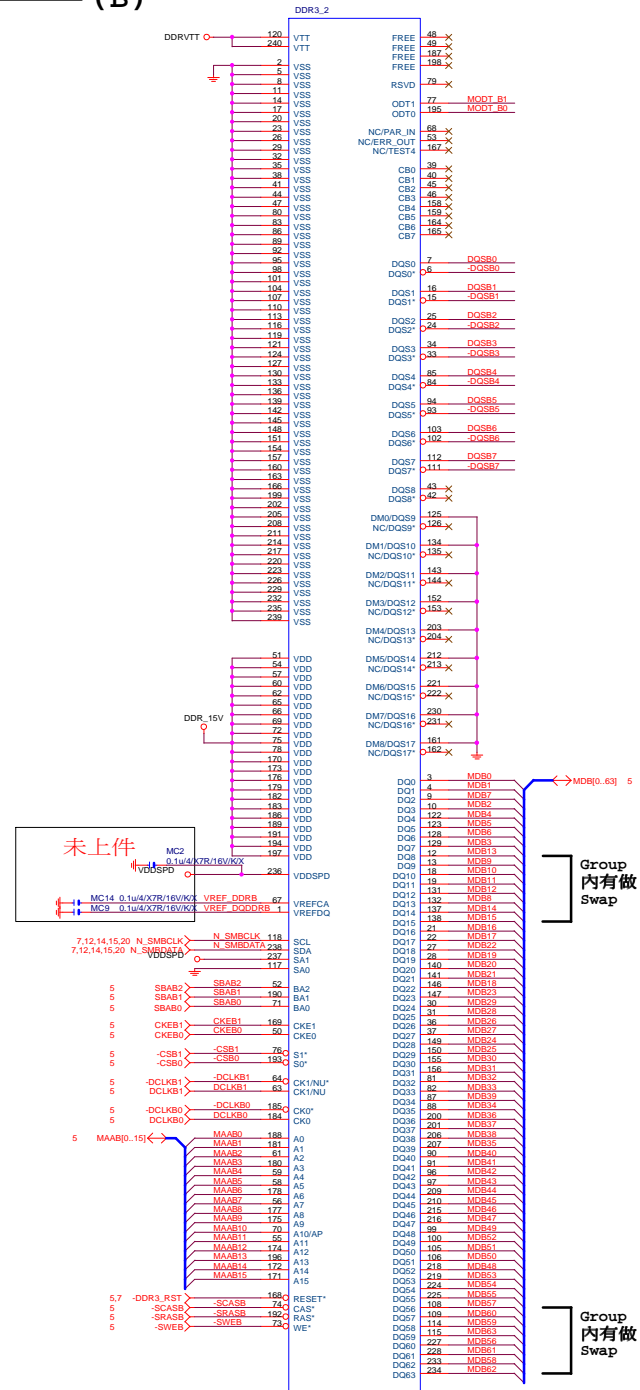
DDR3

(A)

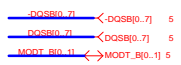


DDR3

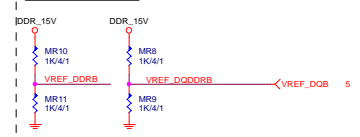
(B)



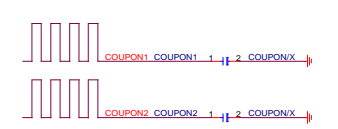
DDR3/240/BK/VA/D
BLACK CONNECTOR



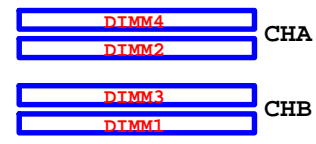
DDR3 VREF



COUPON



CPU



www.aitech1.ru

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

VCC1_5_PCH

NR50 7.5K/4/1 DMI_COMP

NR40 7.5K/4/1 PCIE_COMP

10 CK_SRCCLK_PCH CK_SRCCLK_PCH

10 CK_SRCCLK_PCH CK_SRCCLK_PCH

PCIE Only

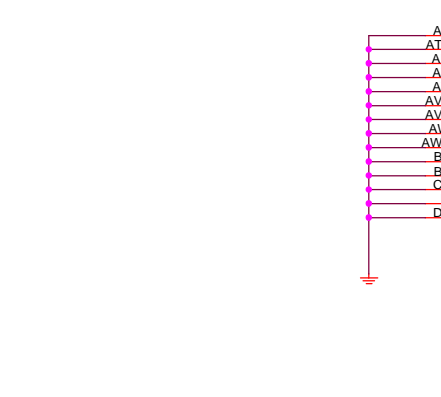
8111G

PCIEx1

N/A

放靠近 Device & PCI-E Slot
Impedance=80 +- 17.5%

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



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

PCHB

B85: Port 6/7 N/A

H81: Port 6/7/12/13 N/A

B85: Port 6/7 N/A

H81: Port 6/7/12/13 N/A

H81: Port 6/7/12/13 N/A

H81: Port 6/7/12/13 N/A

N GPIO14

GPIO14 W=4 mil out of F
S=15 mil out of
USBRBIAS NR47 22.6/4/1

CK_DOTCLK

GPIO14 $8.2K/4$ 3VDUAL

NBC82
0.1u/4/X7R/16V/K

NBC83
0.1u/4/X7R/16V/K

```

17 PCH_USB3_RXN0
17 PCH_USB3_RXP0
    17 PCH_USB3_TXN0
    17 PCH_USB3_TXP0

17 PCH_USB3_RXN1
17 PCH_USB3_RXP1
    17 PCH_USB3_TXN1
    17 PCH_USB3_TXP1

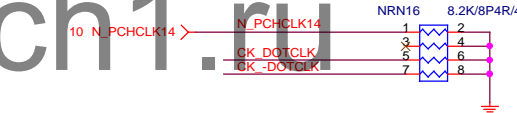
```

I

VCC3

PCH CLK PD

Mount for integrated clock Generation Mode



NR225 short to GND in non
graphic SKU

USB TABLE

```
OC[3:0]# for Device 29 (ports 0-7)
OC[7:4]# for Device 26 (ports 8-13)
```

USB OC# Configure	
OC0#	R_USB30
OC1#	USB_LAN
OC2#	Not Use
OC3#	N/A
OC4#	F_USB1
OC5#	F_USB2
OC6#	Not Use
OC7#	N/A

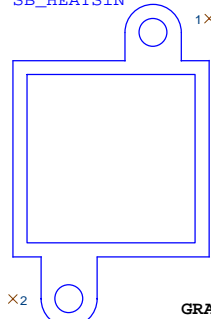
Gigabyte Technology

Title			
PCH FDI,DMI,USB ,PCIE,NVRAM			
Size	Document Number	Rev	
Custom	GA-H81M-S	1.0	
Date:	Wednesday, June 04, 2014	Sheet	9 of 29

PCH H/S

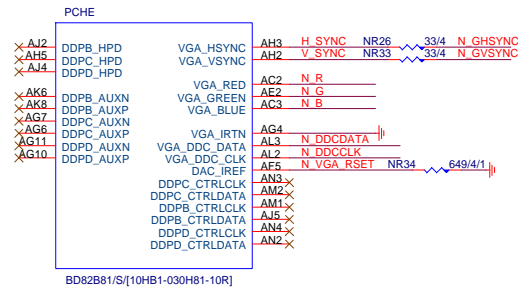
LOW COST ICH7 HEATSINK

SB_HEATSIN

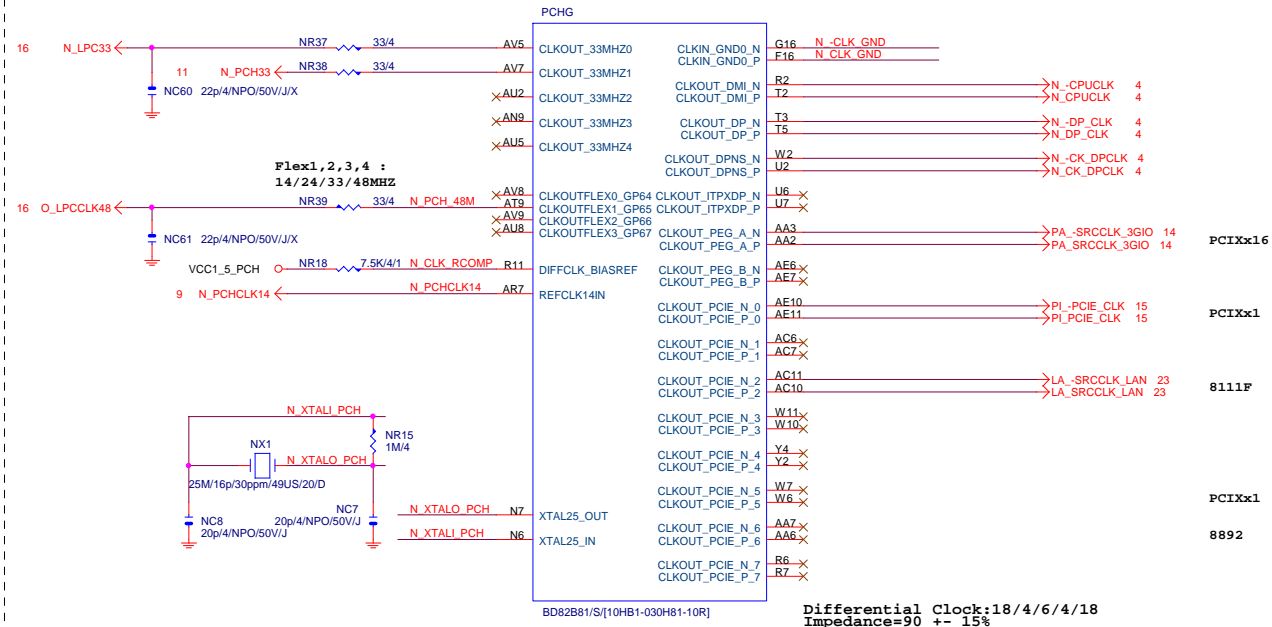


PCH_HS
PCH_HS/12SP2-030005-43R_12SP2-030005-41R_12SP2-030005-42R

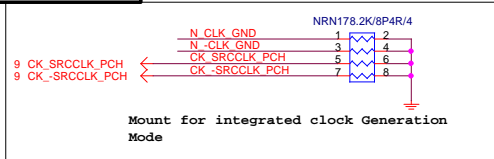
PCH (E)



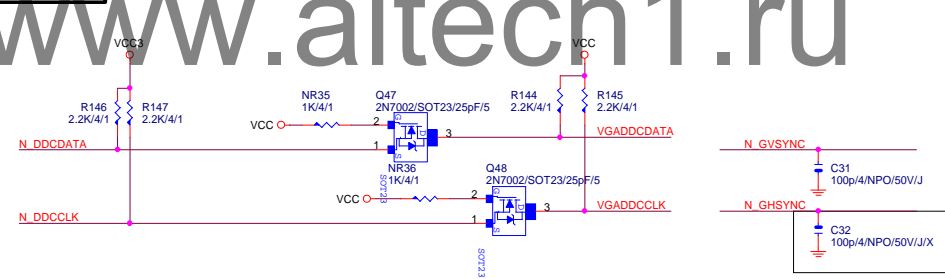
PCH (G)



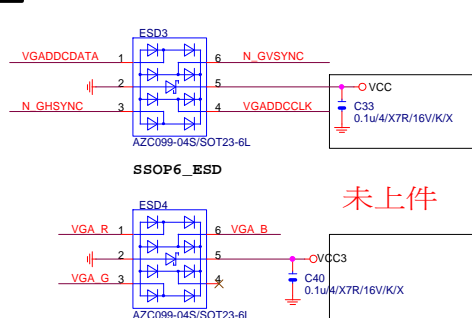
PCH CLK PD



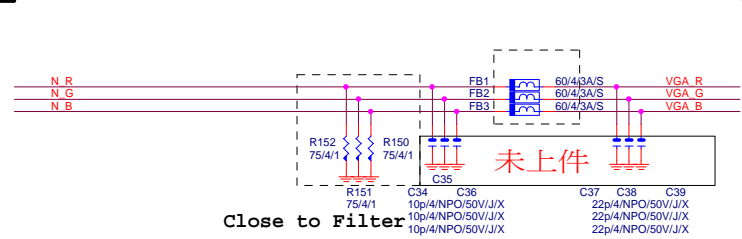
VGA DDC



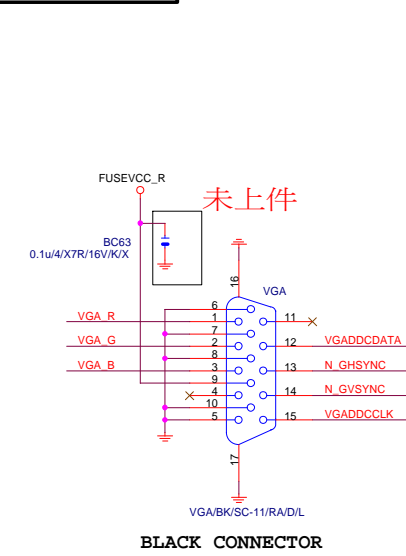
VGA ESD



VGA DDC



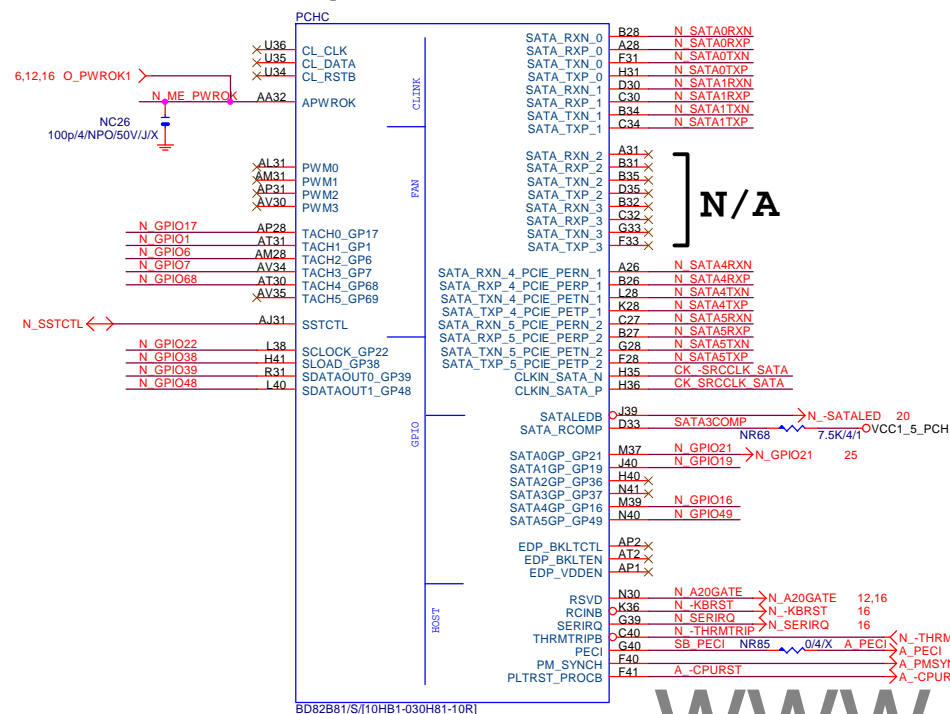
VGA CONNECTOR



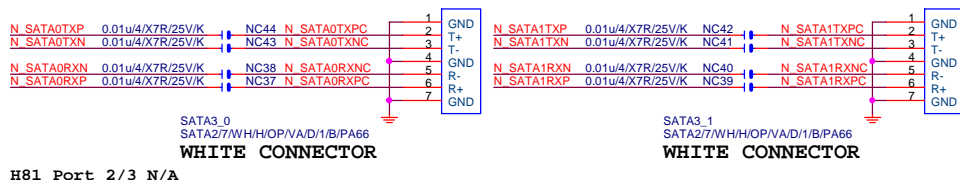
Gigabyte Technology			
PCH DISPLAY,CLK BUFFER			
GA-H81M-S			
Size	Document Number	Rev	1.0
Custom			
Date:	Wednesday, June 04, 2014	Sheet	10 of 29

(C)

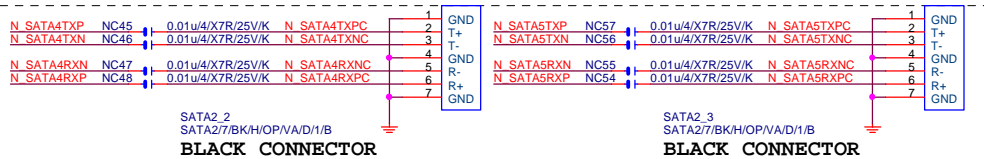
SATA3 : 20/7.5/4.5/7.5/20 (breakout min 8/4/4/4/8)
Impedance=90 +- 17.5%
SATA2 : 15/7.5/4.5/7.5/15 (breakout min 8/4/4/4/8)
Impedance=90 +- 17.5%



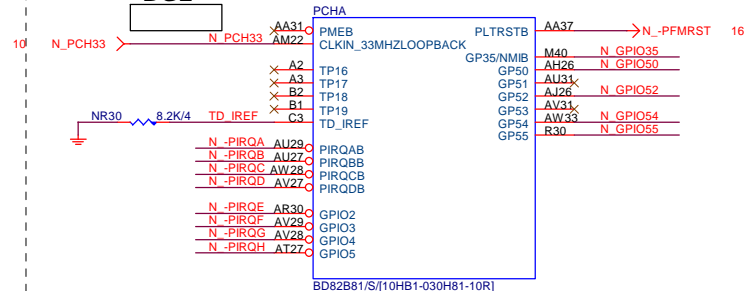
SATA CONNECTOR



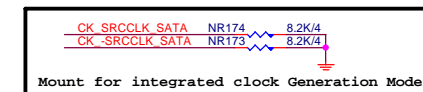
```
** Z87/H87 Port 4&5 SATA3.0
** B85 Port 4&5 SATA2.0
```



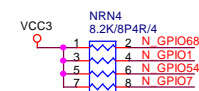
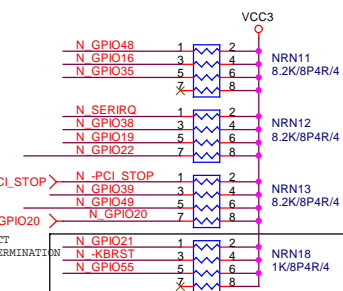
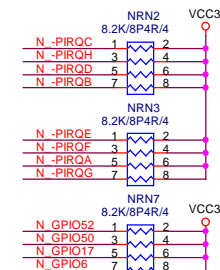
(A)

Del

PCH CLK PD

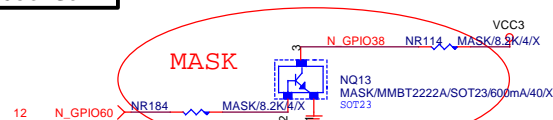


PCH	PU/PD
-----	-------



ME PWROK

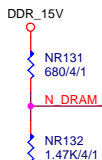
GPIO38 Ctrl



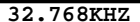
Gigabyte Technology

Title				PCH HOST , SATA, PCI			
Size	Custom	Document Number				Rev	1.0
		GA-H81M-S					
Date:	Wednesday, June 04, 2014			Sheet	11	of	29

(D)



HSW STRAP13



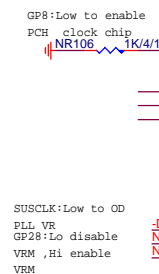
CLR CMOS



ACZ SDOUT



PCH	PU/PD
-----	-------



Gigabyte Technology

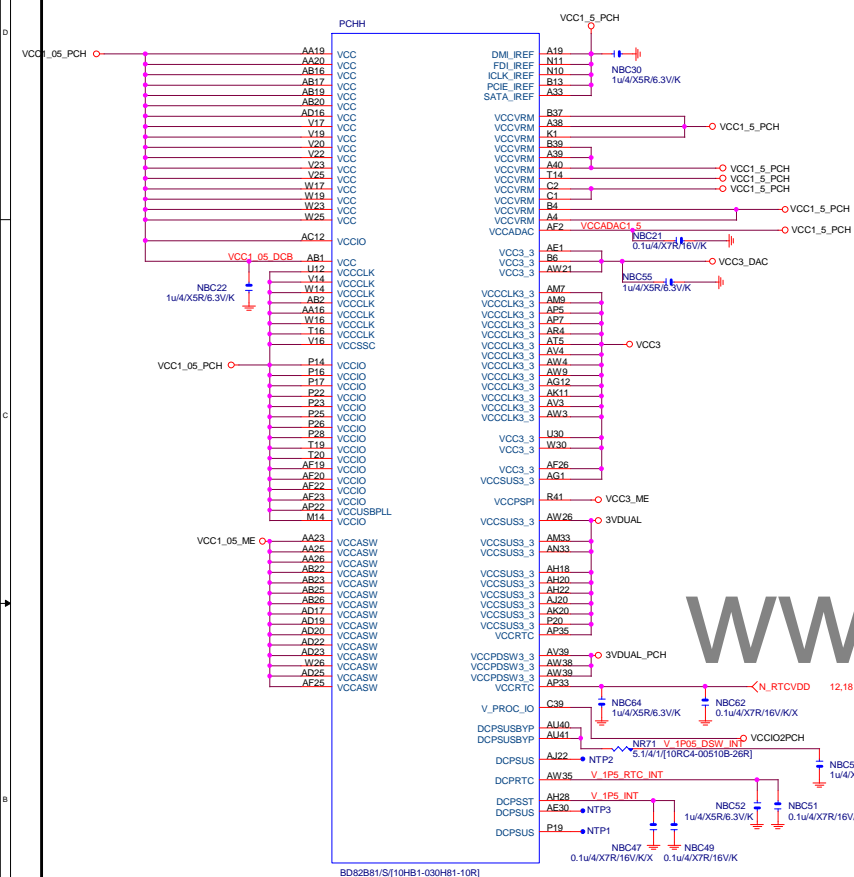
Title			
PCH GPIO , CTRL , AUDIO			
Size	Document Number		Rev
Custom	GA-H81M-S		1.0
Date:	Wednesday, June 04, 2014	Sheet	12 of 29

PCH (H)

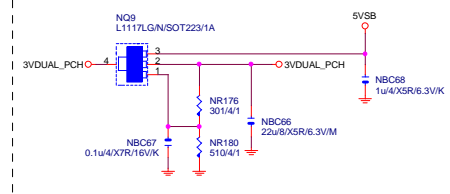
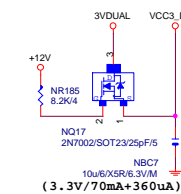
VCC3_DAC

3VDUAL_PCH

SHT_PWR



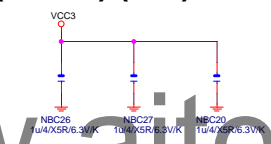
CLOSE北橋(注意震盪水波紋)



VCC3_ME ○ VCC3
VCC1_05_ME ○ VCC1_05_PCH

CAP

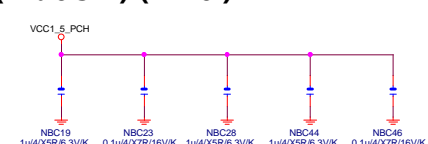
(3.3V) (X6)



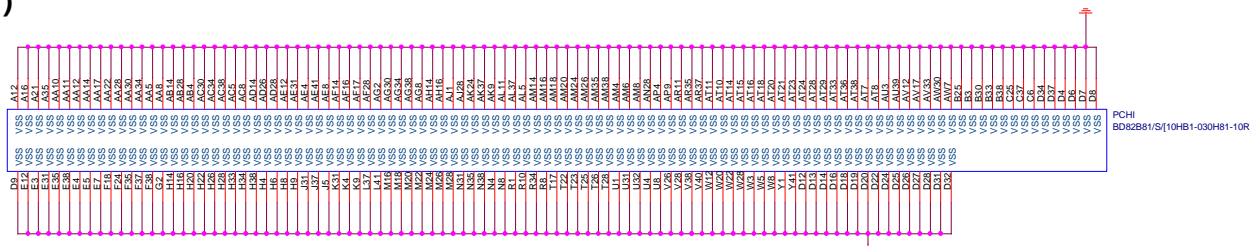
(1.05V) (X2) (3.3V) (X2)



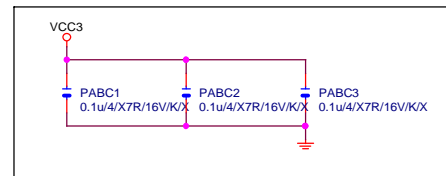
(1.05V) (X10)



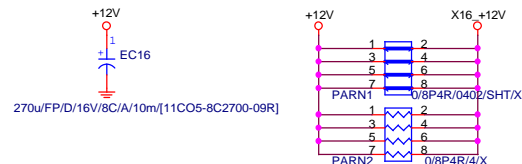
PCH (I)



PCIEX16 CAP



PCIEX16 PROTECT SHT

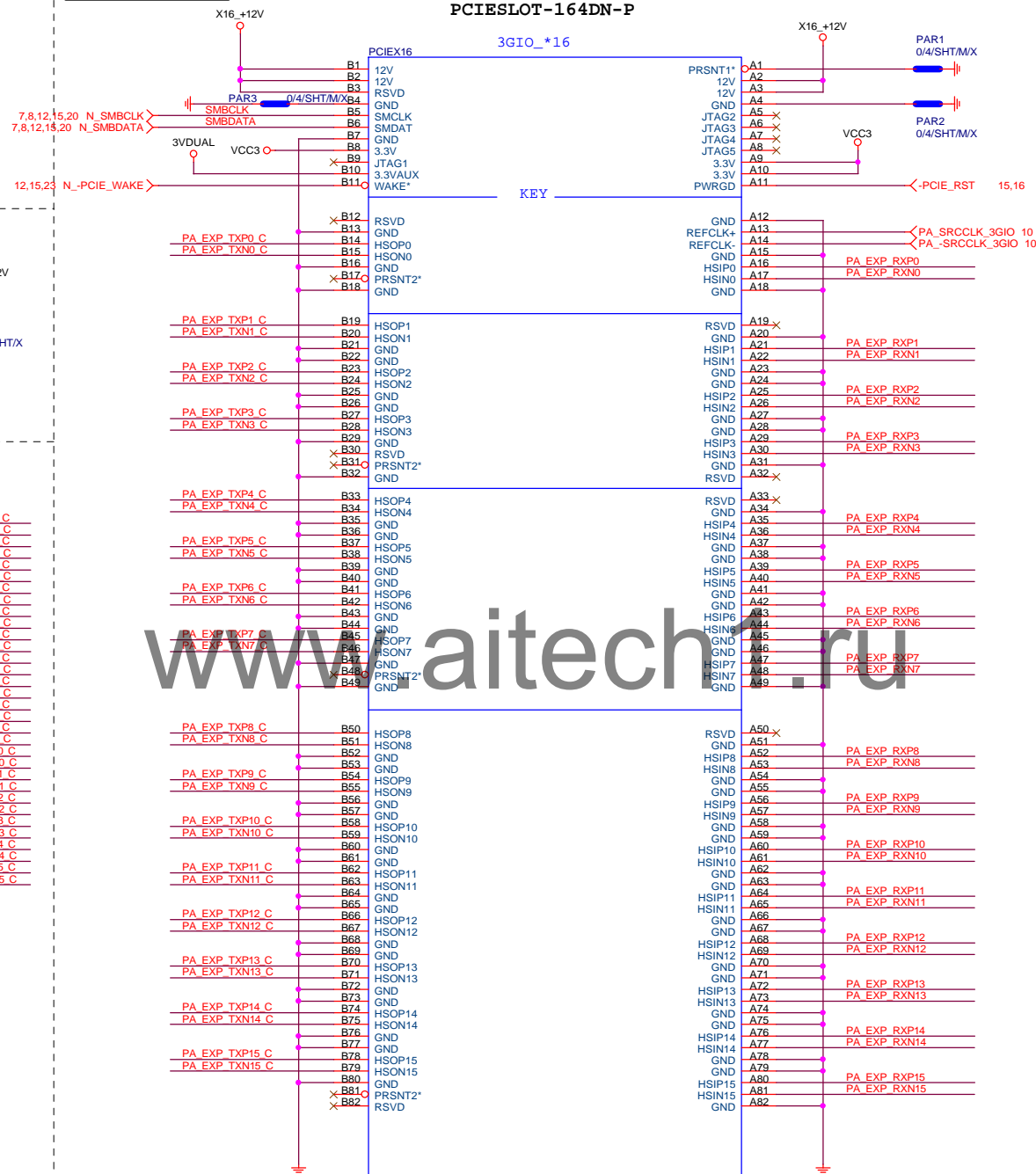


PCIEX16 AC CAP

PA EXP TXP0	PAC5	0.22u4/X5R/6.3V/K	PA EXP TXP0 C
PA EXP TXN0	PAC4	0.22u4/X5R/6.3V/K	PA EXP TXN0 C
PA EXP TXP1	PAC6	0.22u4/X5R/6.3V/K	PA EXP TXP1 C
PA EXP TXN1	PAC7	0.22u4/X5R/6.3V/K	PA EXP TXN1 C
PA EXP TXP2	PAC8	0.22u4/X5R/6.3V/K	PA EXP TXP2 C
PA EXP TXN2	PAC9	0.22u4/X5R/6.3V/K	PA EXP TXN2 C
PA EXP TXP3	PAC10	0.22u4/X5R/6.3V/K	PA EXP TXP3 C
PA EXP TXN3	PAC11	0.22u4/X5R/6.3V/K	PA EXP TXN3 C
PA EXP TXP4	PAC12	0.22u4/X5R/6.3V/K	PA EXP TXP4 C
PA EXP TXN4	PAC13	0.22u4/X5R/6.3V/K	PA EXP TXN4 C
PA EXP TXP5	PAC14	0.22u4/X5R/6.3V/K	PA EXP TXP5 C
PA EXP TXN5	PAC15	0.22u4/X5R/6.3V/K	PA EXP TXN5 C
PA EXP TXP6	PAC16	0.22u4/X5R/6.3V/K	PA EXP TXP6 C
PA EXP TXN6	PAC17	0.22u4/X5R/6.3V/K	PA EXP TXN6 C
PA EXP TXP7	PAC19	0.22u4/X5R/6.3V/K	PA EXP TXP7 C
PA EXP TXN7	PAC18	0.22u4/X5R/6.3V/K	PA EXP TXN7 C
PA EXP TXP8	PAC20	0.22u4/X5R/6.3V/K	PA EXP TXP8 C
PA EXP TXN8	PAC21	0.22u4/X5R/6.3V/K	PA EXP TXN8 C
PA EXP TXP9	PAC22	0.22u4/X5R/6.3V/K	PA EXP TXP9 C
PA EXP TXN9	PAC23	0.22u4/X5R/6.3V/K	PA EXP TXN9 C
PA EXP TXP10	PAC24	0.22u4/X5R/6.3V/K	PA EXP TXP10 C
PA EXP TXN10	PAC25	0.22u4/X5R/6.3V/K	PA EXP TXN10 C
PA EXP TXP11	PAC26	0.22u4/X5R/6.3V/K	PA EXP TXP11 C
PA EXP TXN11	PAC27	0.22u4/X5R/6.3V/K	PA EXP TXN11 C
PA EXP TXP12	PAC28	0.22u4/X5R/6.3V/K	PA EXP TXP12 C
PA EXP TXN12	PAC29	0.22u4/X5R/6.3V/K	PA EXP TXN12 C
PA EXP TXP13	PAC30	0.22u4/X5R/6.3V/K	PA EXP TXP13 C
PA EXP TXN13	PAC31	0.22u4/X5R/6.3V/K	PA EXP TXN13 C
PA EXP TXP14	PAC32	0.22u4/X5R/6.3V/K	PA EXP TXP14 C
PA EXP TXN14	PAC33	0.22u4/X5R/6.3V/K	PA EXP TXN14 C
PA EXP TXP15	PAC34	0.22u4/X5R/6.3V/K	PA EXP TXP15 C
PA EXP TXN15	PAC35	0.22u4/X5R/6.3V/K	PA EXP TXN15 C

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

PCIEX16 SLOT



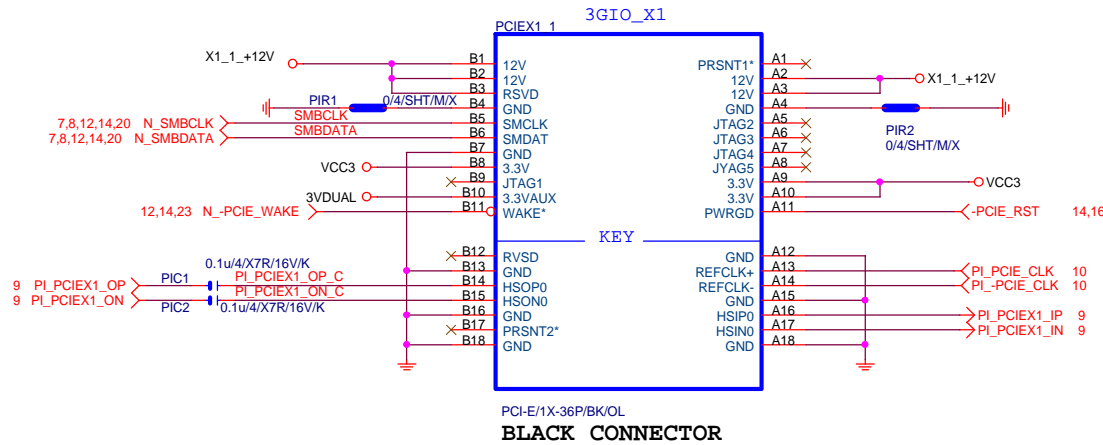
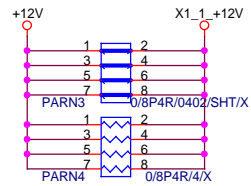
BLACK CONNECTOR

Gigabyte Technology

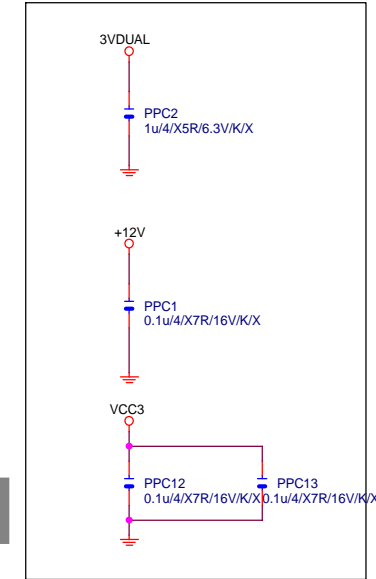
Title			PCI EXPRESS * 16	
Size			GA-H81M-S	
Custom			Rev 1.0	
Date: Wednesday, June 04, 2014			Sheet 14 of 29	

PCIEX1 SLOT

PCIEX1 PROTECT SHT



www.aitech1.ru 未上件



未上件

Gigabyte Technology			
PCI EXPRESS X 1 PORT			
Size	Document Number	Rev	
Custom	GA-H81M-S	1.0	
Date:	Wednesday, June 04, 2014	Sheet	15 of 29

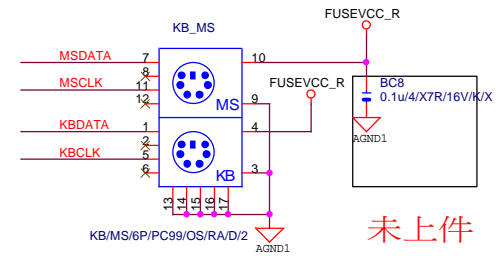
COM

KB/MS

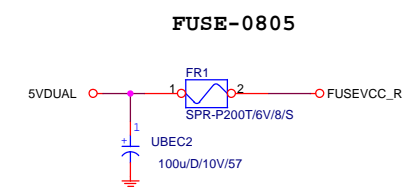
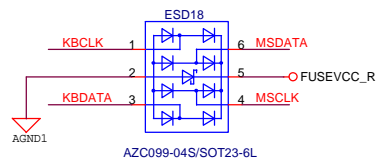
KB_MS ESD

USB2.0 PWR

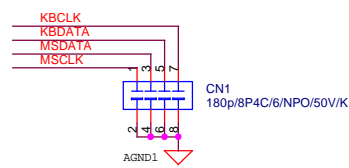
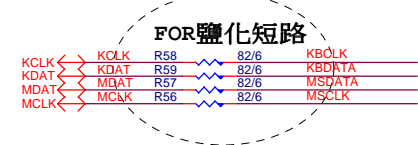
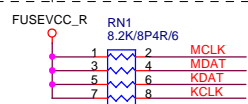
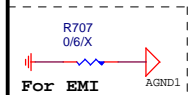
COM RI



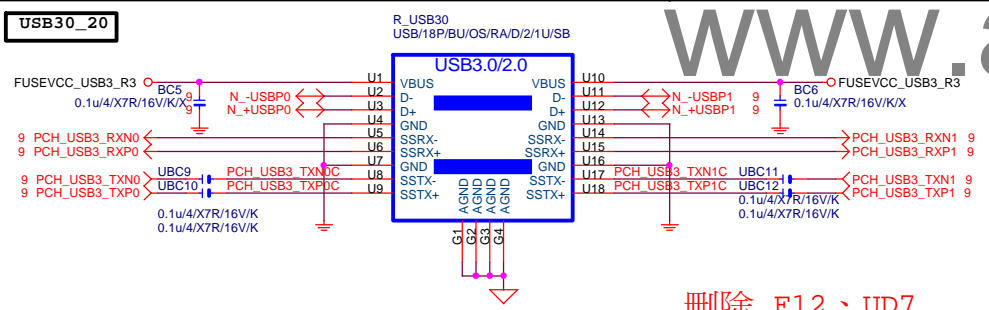
未上件



Close to connector



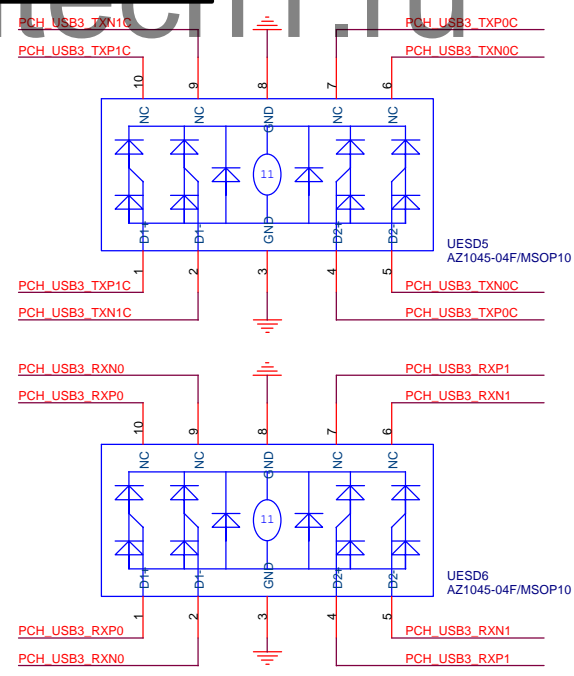
USB30_20



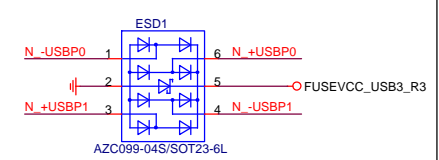
删除 F12、UD7

USB30_20 ESD PROTECT

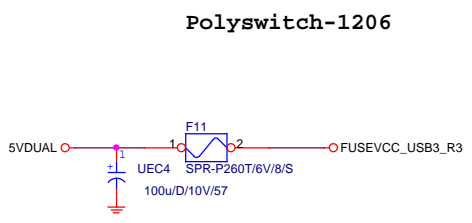
USB3.0 ESD



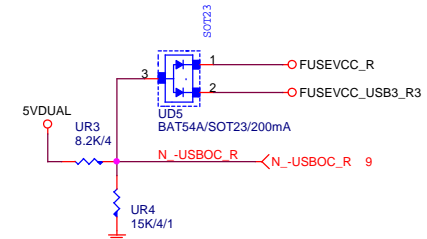
USB POWER PROTECT



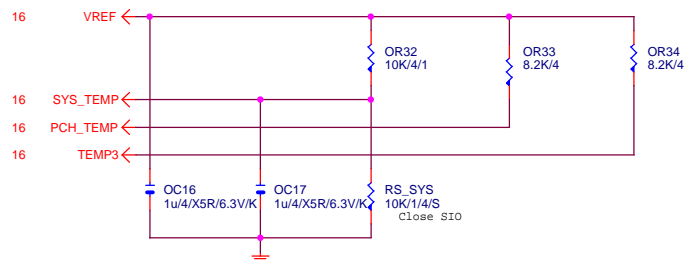
USB30_20 PWR



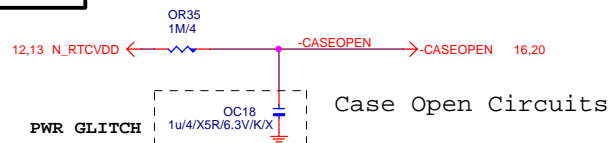
-USB0C_R0



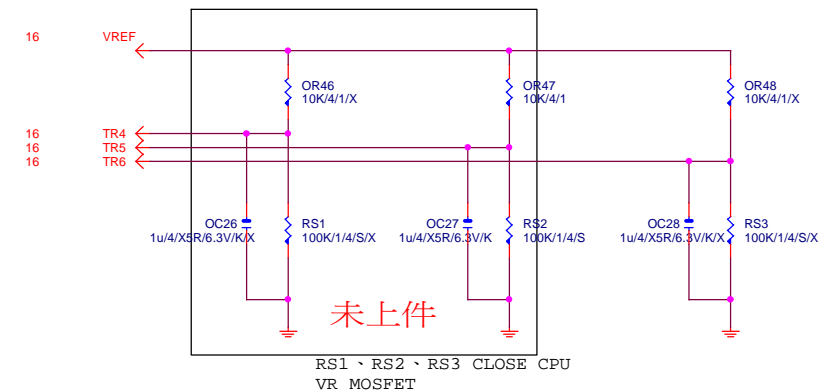
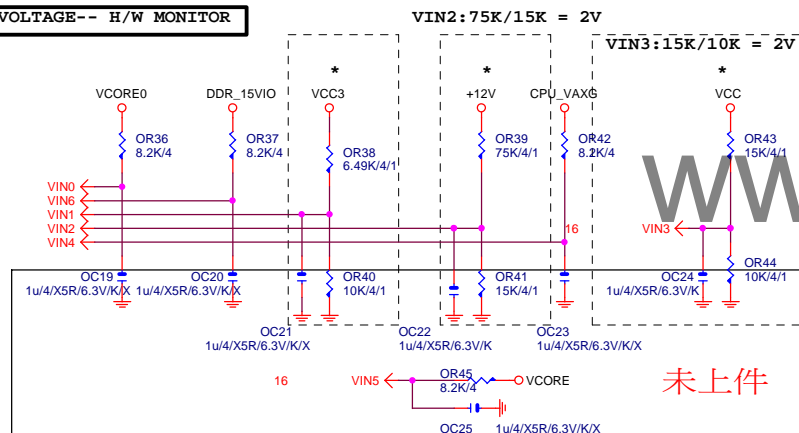
TEMP H/W MONITOR



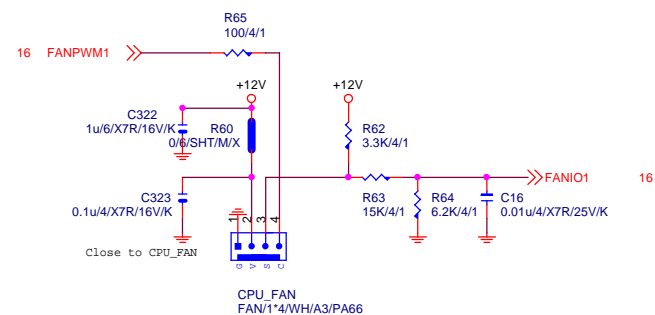
CASE OPEN



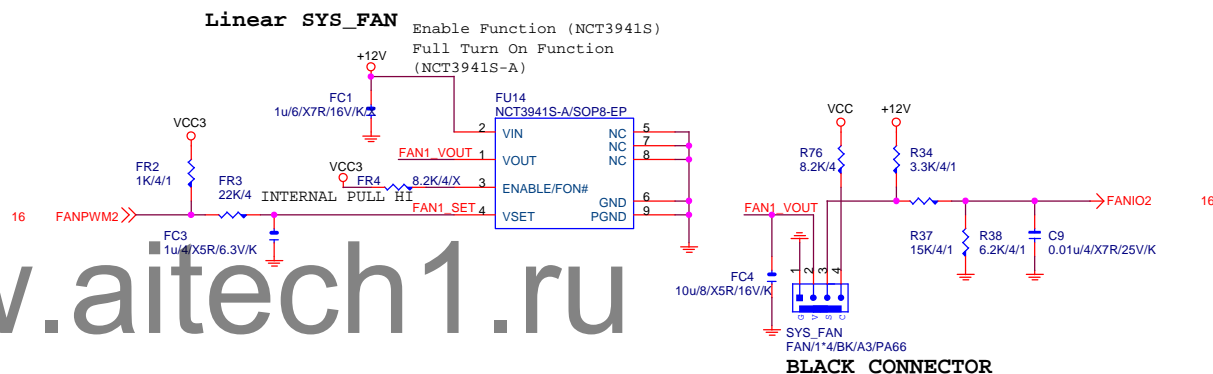
VOLTAGE-- H/W MONITOR



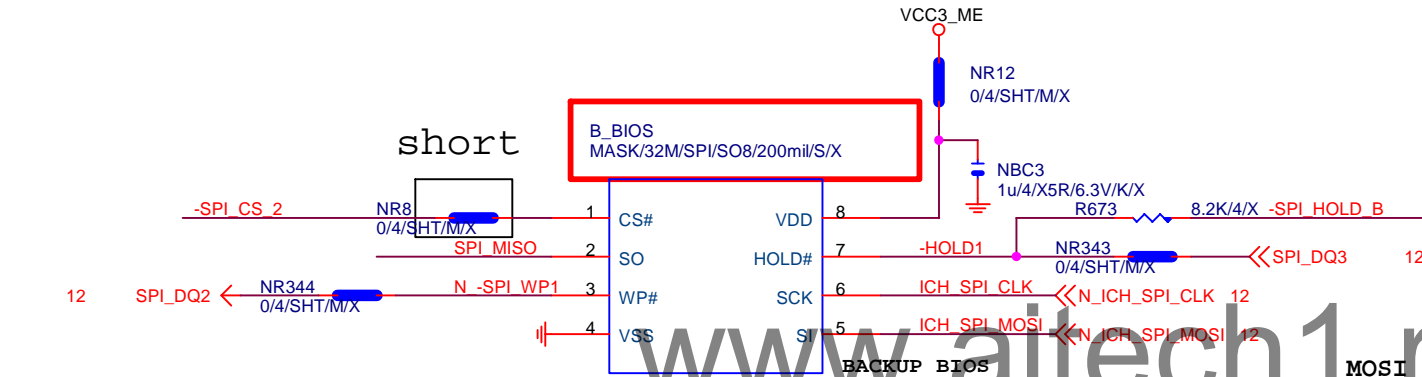
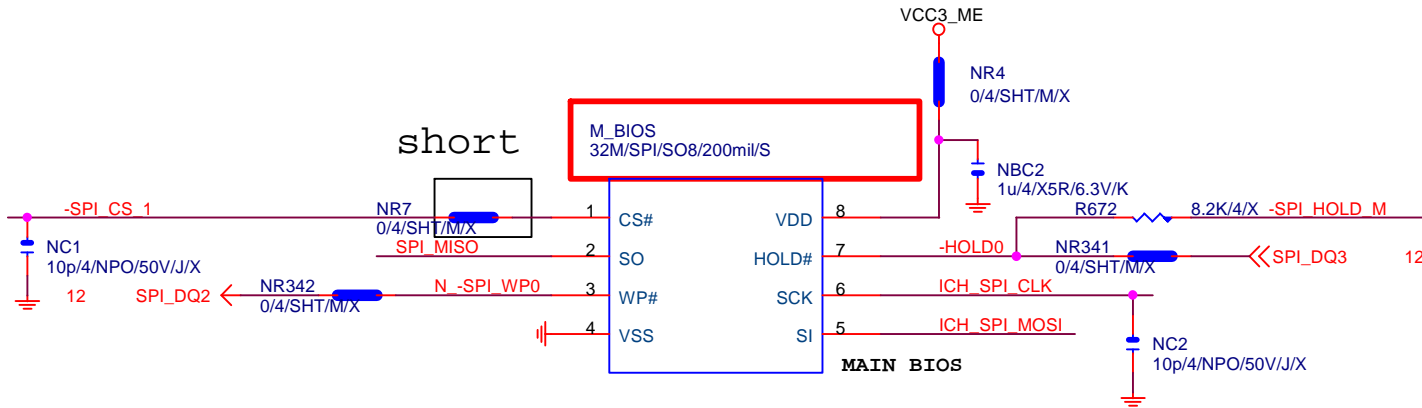
CPU SMART FAN



SYS SMART FAN



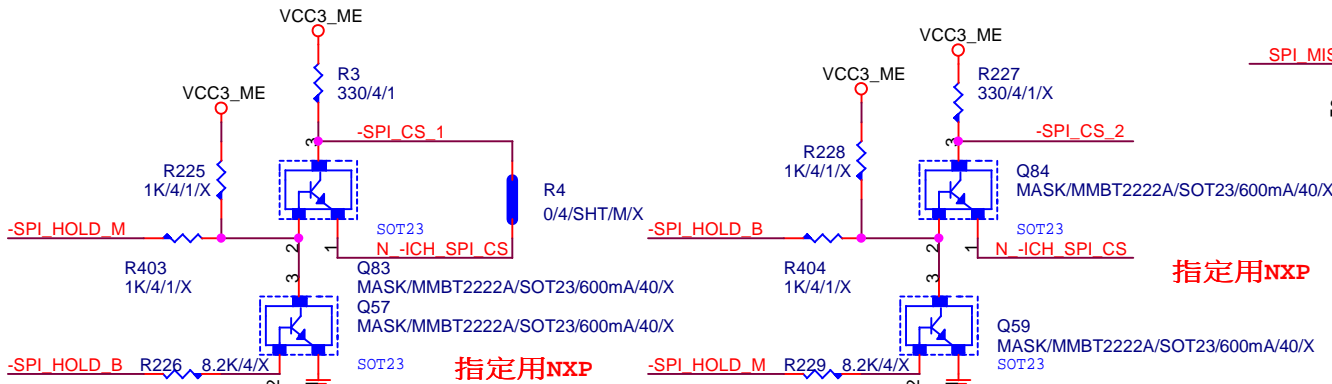
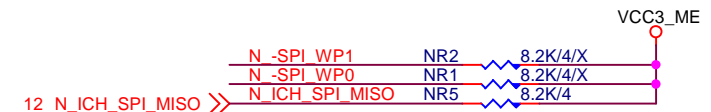
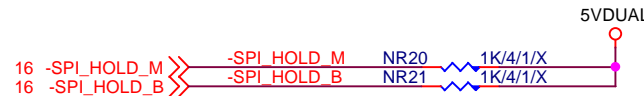
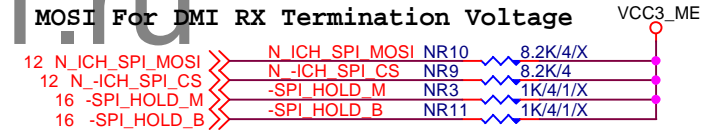
-PROHOT



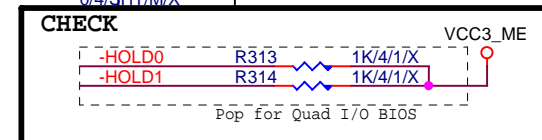
BOOT DEVICE	GNT0	GNT1
LPC	0	0
PCI	0	1
NAND	1	0
SPI	1	1

1 means floating
0 means PD 1K

MOSI For DMI RX Termination Voltage



short



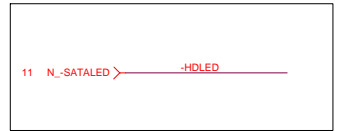
Gigabyte Technology

DUAL BIOS

GA-H81M-S

Title	DUAL BIOS		Rev
Size Custom	Document Number	GA-H81M-S	1.0
Date	Wednesday, June 04, 2014	Sheet	19 of 29

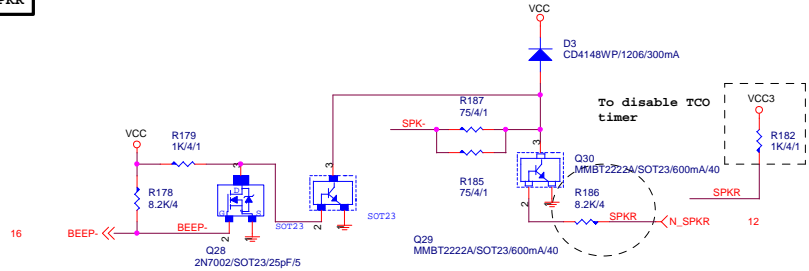
SATA LED



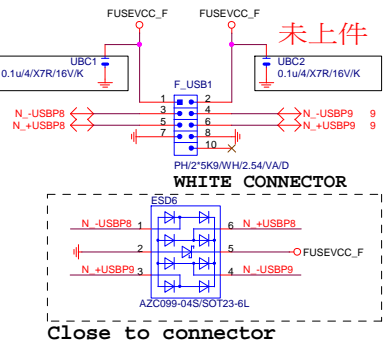
新增

-USBOC_F

SPKR

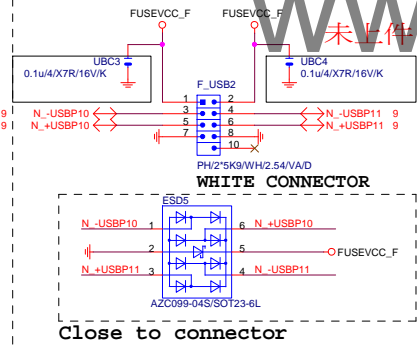


FRONT USB1



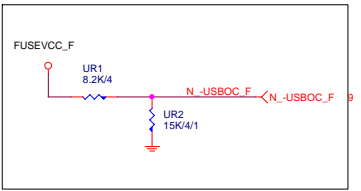
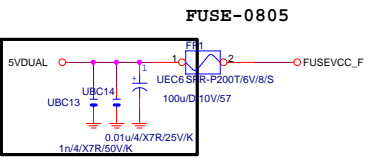
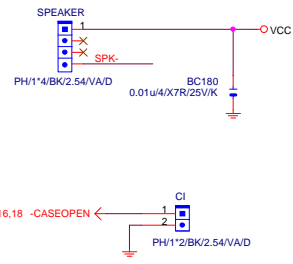
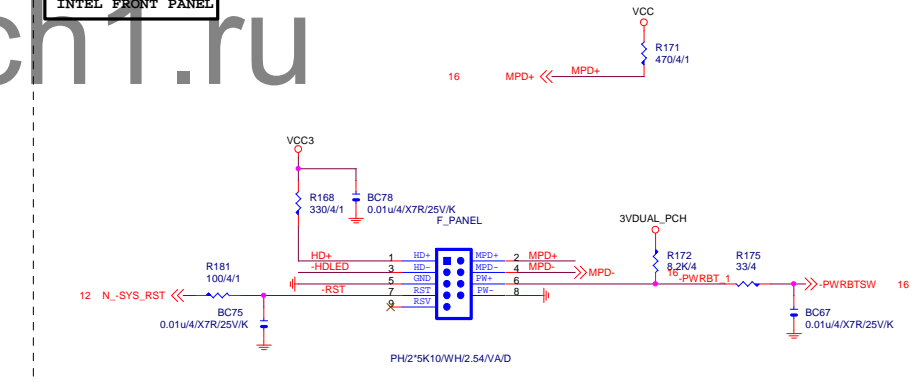
未上件

FRONT USB2



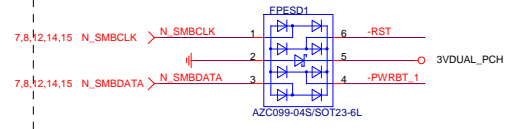
未上件

INTEL FRONT PANEL



删UD8，原UR1 5VDUAL改接FUSEVCC_F

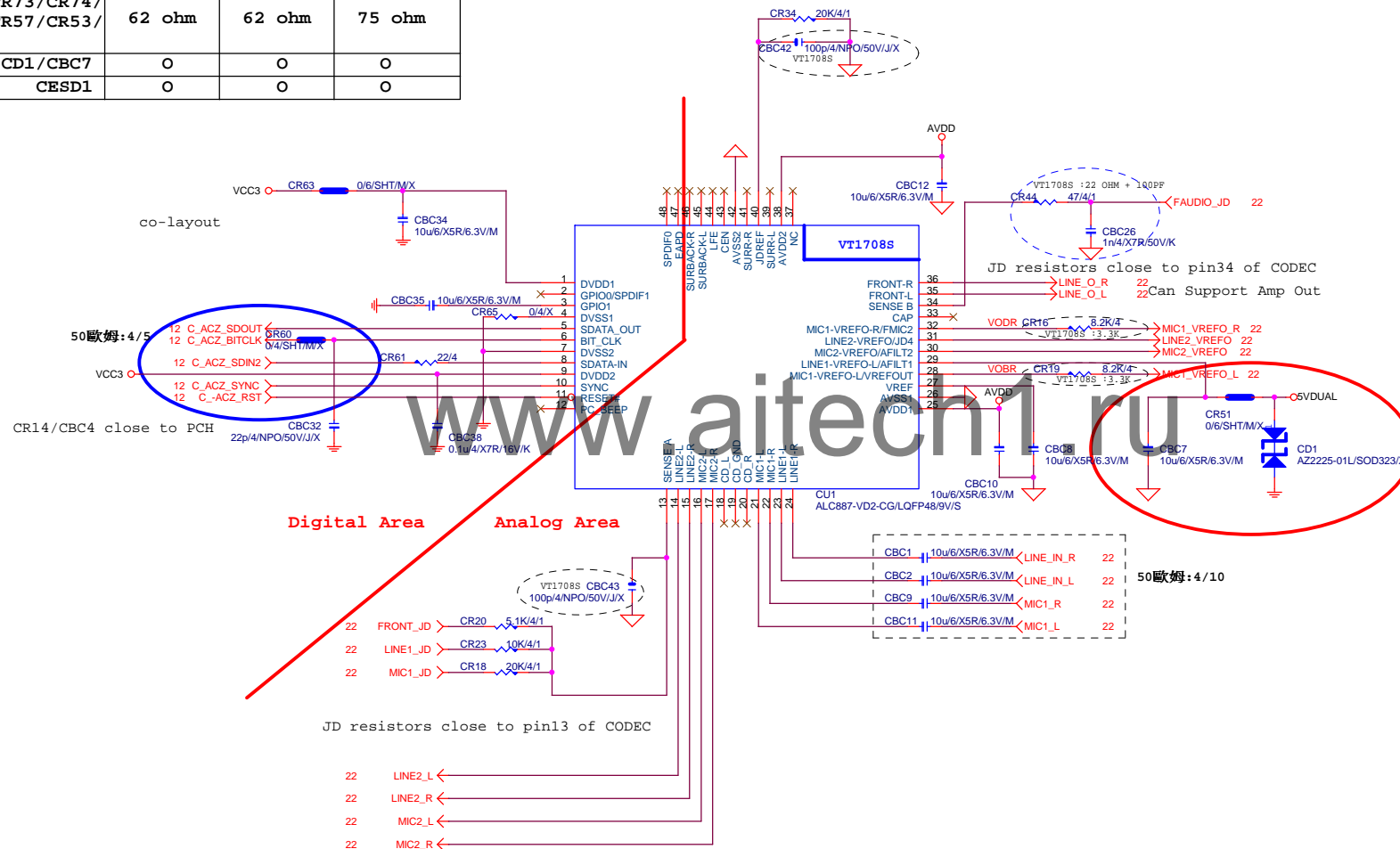
PIN2X10PANEL_NEW

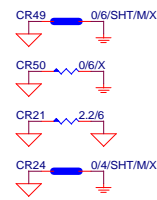


Gigabyte Technology			
FP,F_USB,USB PWR,SPKR,SATA LED			
GA-H81M-S			
Rev	1.0		

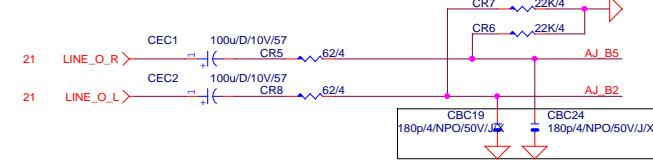
AZALIA CODEC ALC892/ALC887-VD2/VT1708-CE Colay

	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





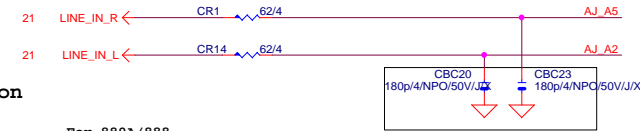
LINE-OUT



LINE-IN

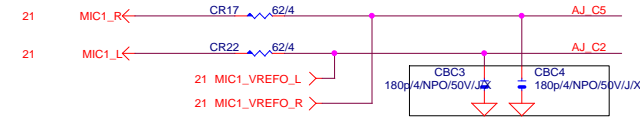
Verify MIC function
in LINE-in

Only reserved for ALC888



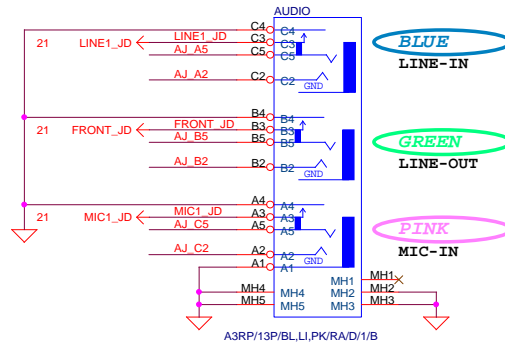
For 889A/888

MIC-IN

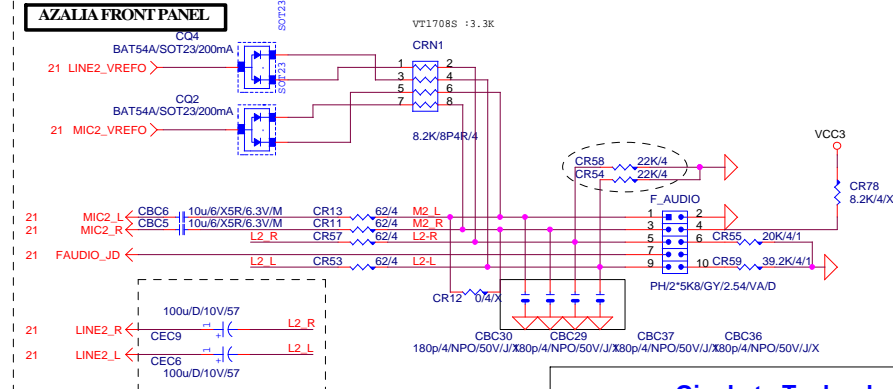


SPDIF_OUT

www.aitech1.ru

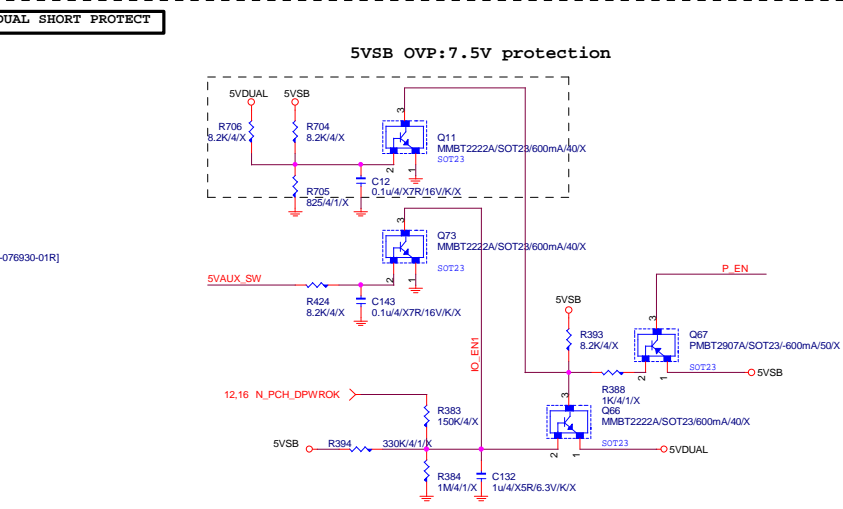
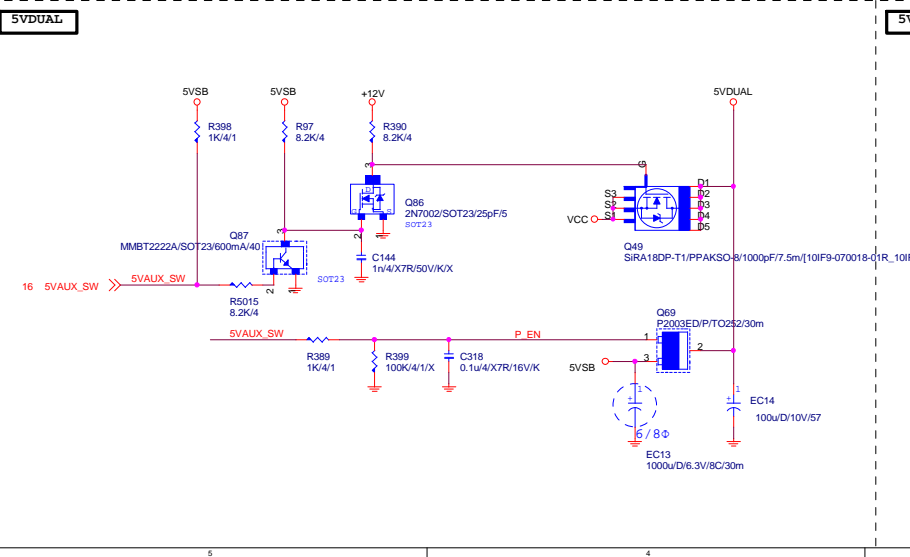
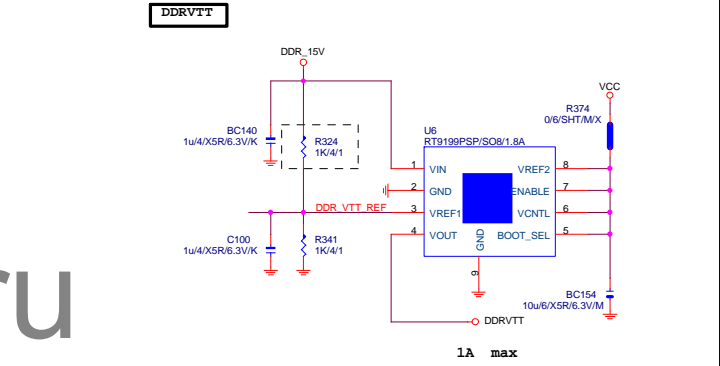
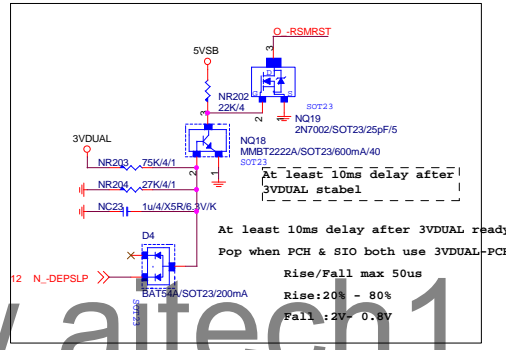
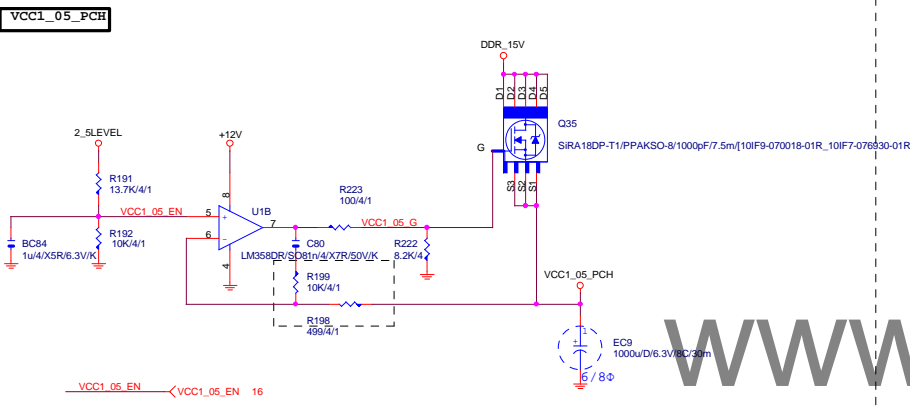
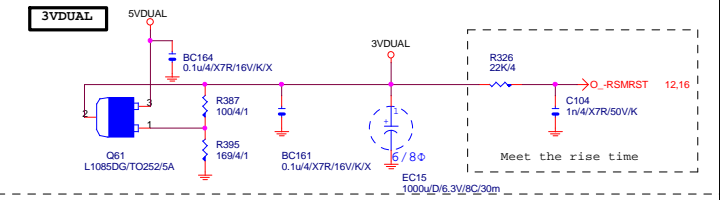
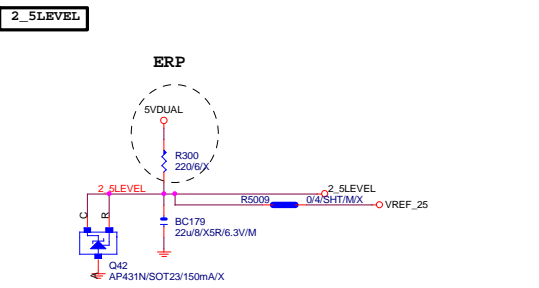
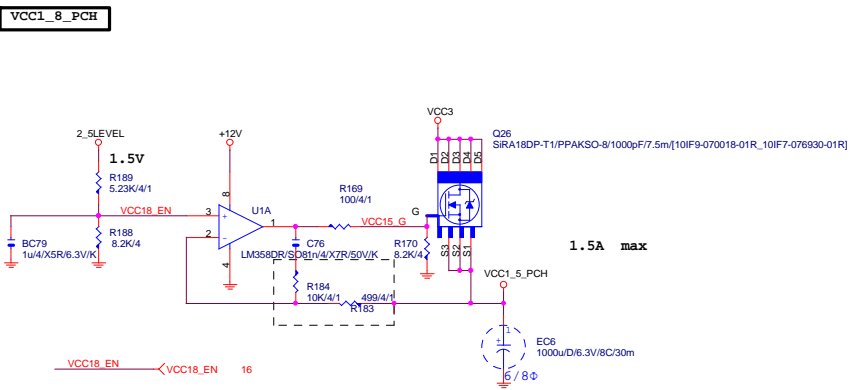


AZALIA FRONT PANEL



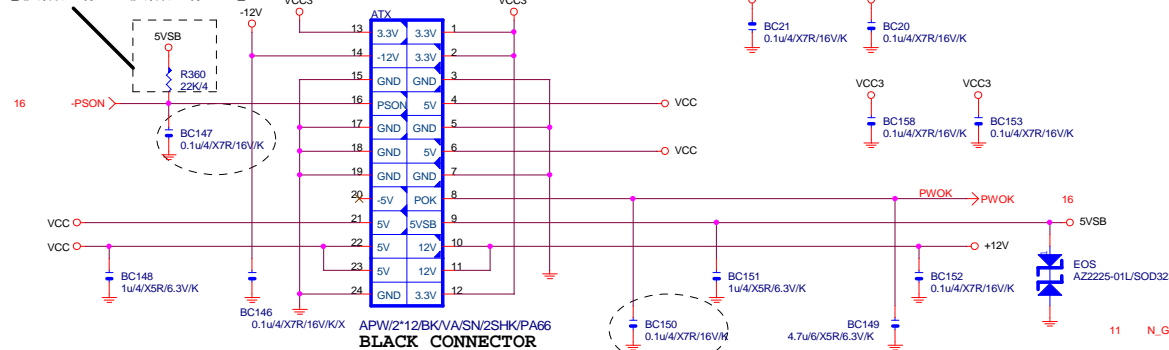
Gigabyte Technology

Title				Rev 1.0
AUDIO JACK				
Size	Document Number			
Custom	GA-H81M-S			
Date:	Wednesday, June 04, 2014		Sheet	22 of 29



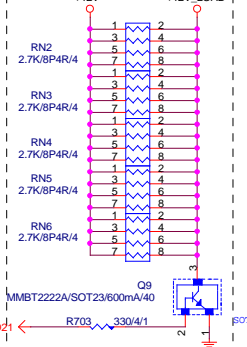
ATXX24 POWER CONNECTOR

【技術通報R&D技術通報155】



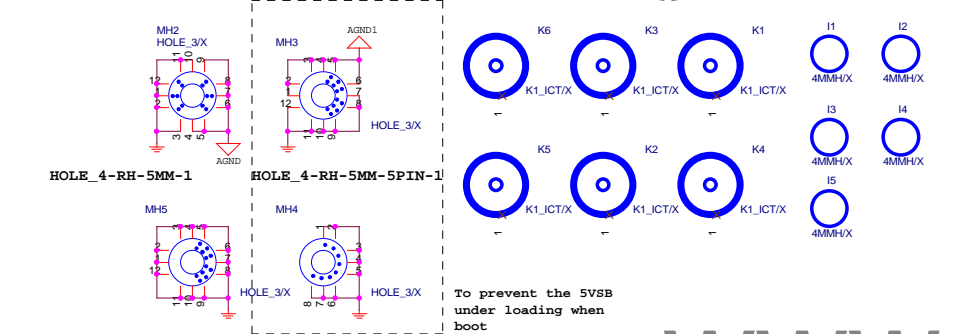
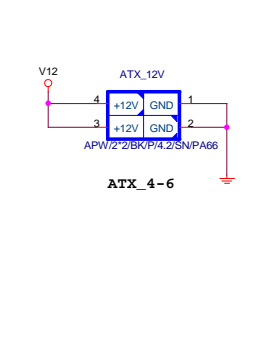
【技術通報R&D技術通報153】

To fix 12V light load abnormality issue



ATXX4 POWER CONNECTOR

To fix 12V light load abnormality issue



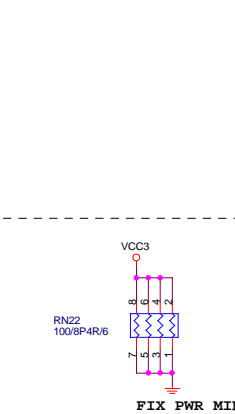
To prevent the 5VSB under loading when boot

www.aitech1.ru

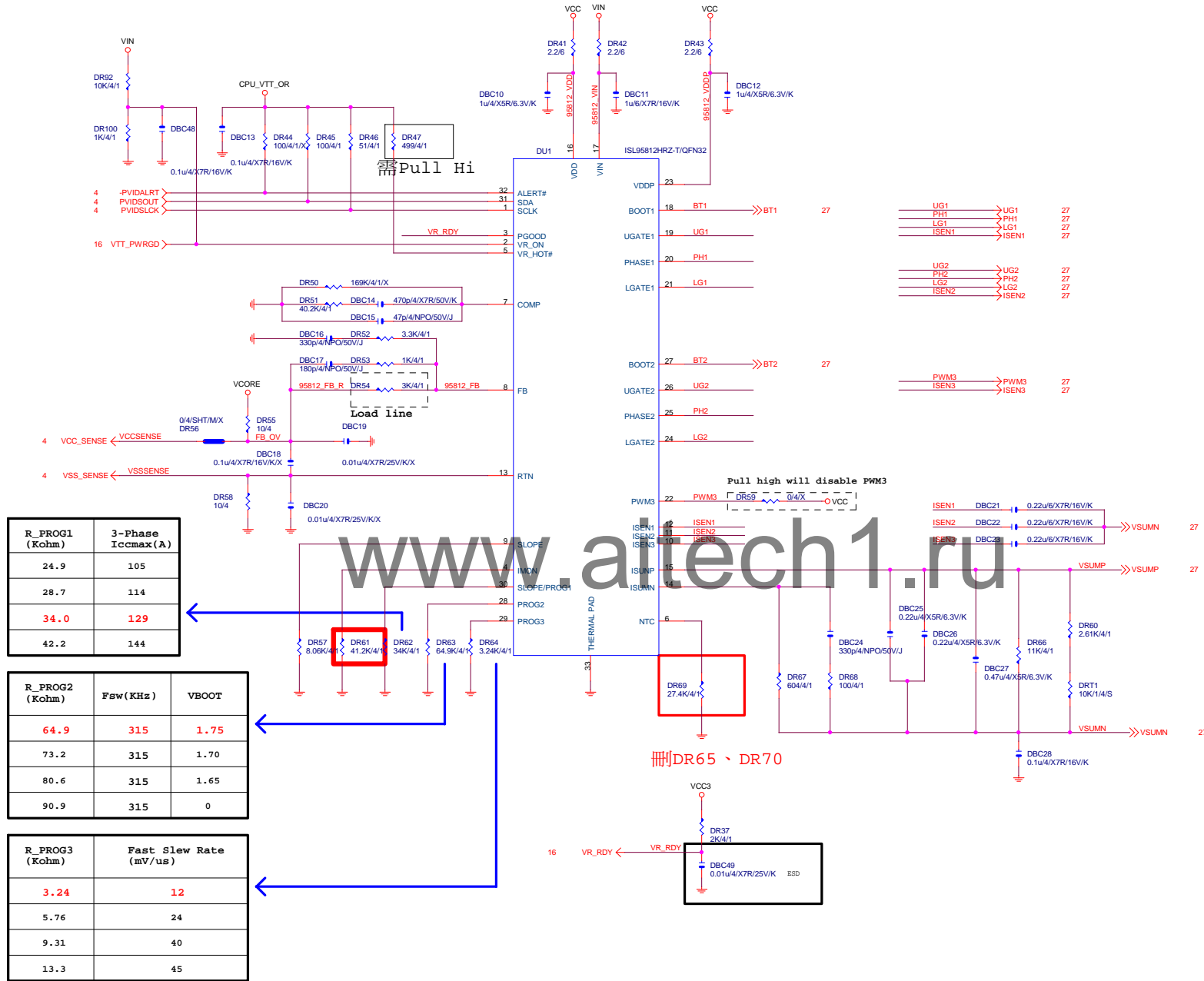
PWOK PATCH

【技術通報R&D技術通報154】

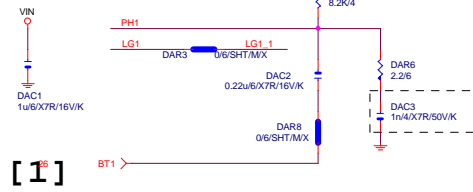
To fix 12V light load abnormality issue



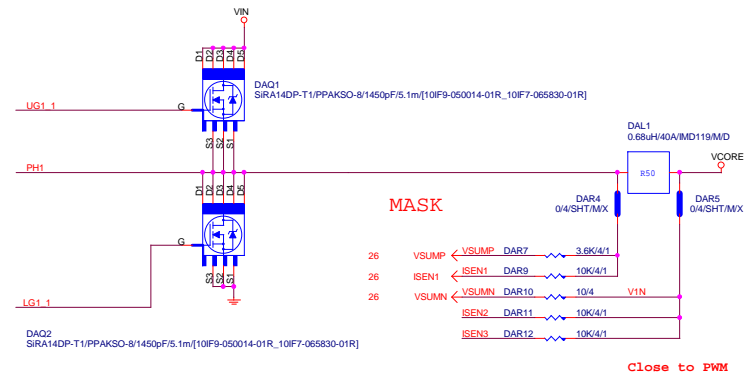
Gigabyte Technology		
ATX CONNECTOR		
GA-H81M-S		Rev 1.0
Date: Wednesday, June 04, 2014	Sheet 25	of 29



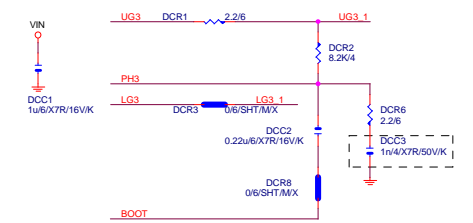
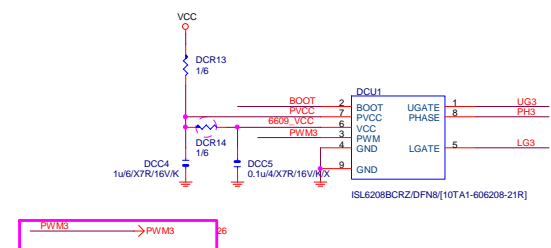
PHASE 1



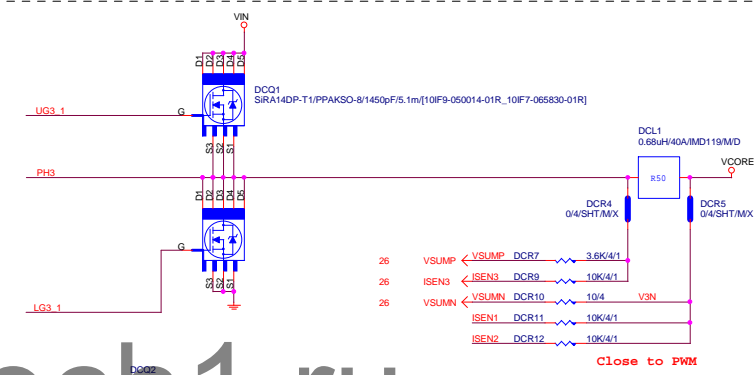
[1]



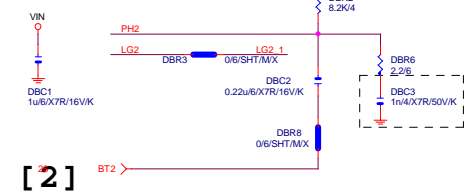
PHASE 3



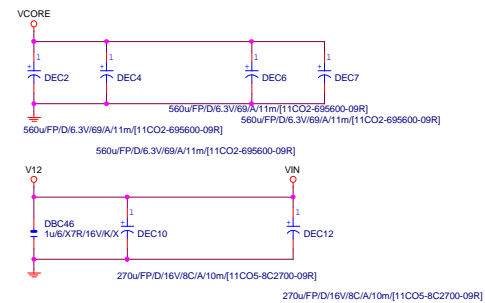
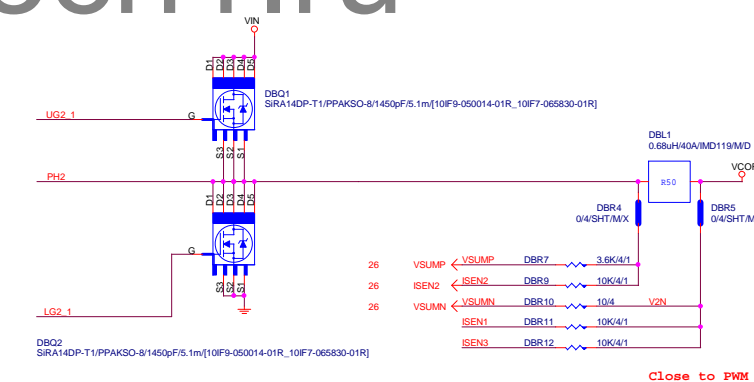
[3]



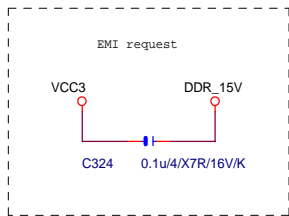
PHASE 2



[2]



Gigabyte Technology			
Title		CPU CORE VR-2	
Size	Document Number	GA-H81M-S	Rev 1.0
Custom			
Date	Wednesday, June 04, 2014	Sheet	27 of 29



VIN=5V, VOUT=1.5V, IOUT=25A, P
IRMS=11.45A
560u/FP/D/6.3V/688m RIPPLE

Iocset=10uA

Title			
DDR POWER			
Size Custom	Document Number	GA-H81M-S	Rev 1.0
Date:	Wednesday, June 04, 2014	Sheet 28 of 29	